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Washington State
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INTRA-DEPARTMENTAL COMMUNICATION

DATE: February 15, 1984

FROM: R. W. Dugan RWD
PHONE: KT-11

SUBJECT: MP. 83,68 To MP 89,02
SR 101 L-7262
West Hoquiam Connection
SR 109 Spur
Geotechnical Report

TO: A. J. Peters
QM-21

The attached Geotechnical Report is a two volume report. Volume 1 contains the narrative, soils plan and profiles sheets, roadway sections, descriptive drawings, special provisions, photographs and the Log of Test Borings. Volume II contains the laboratory test data and will only be distributed to those indicated by the carbon copies with this correspondence. The recommendations and conclusions of this report meet with our concurrence.

RWD:pk
DJM/CLB
Attach.
cc: D. L. Barclay w/Volume II
R. George/J. M. Brascher
J. Vorass
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Materials File L-7262 w/Volume II
Serial File 84-43

Tom -
Please review
Looks good Al

Geotechnical Report

Washington State Department of Transportation

West Hoquiam Connection (SR 109 Spur) SR 101

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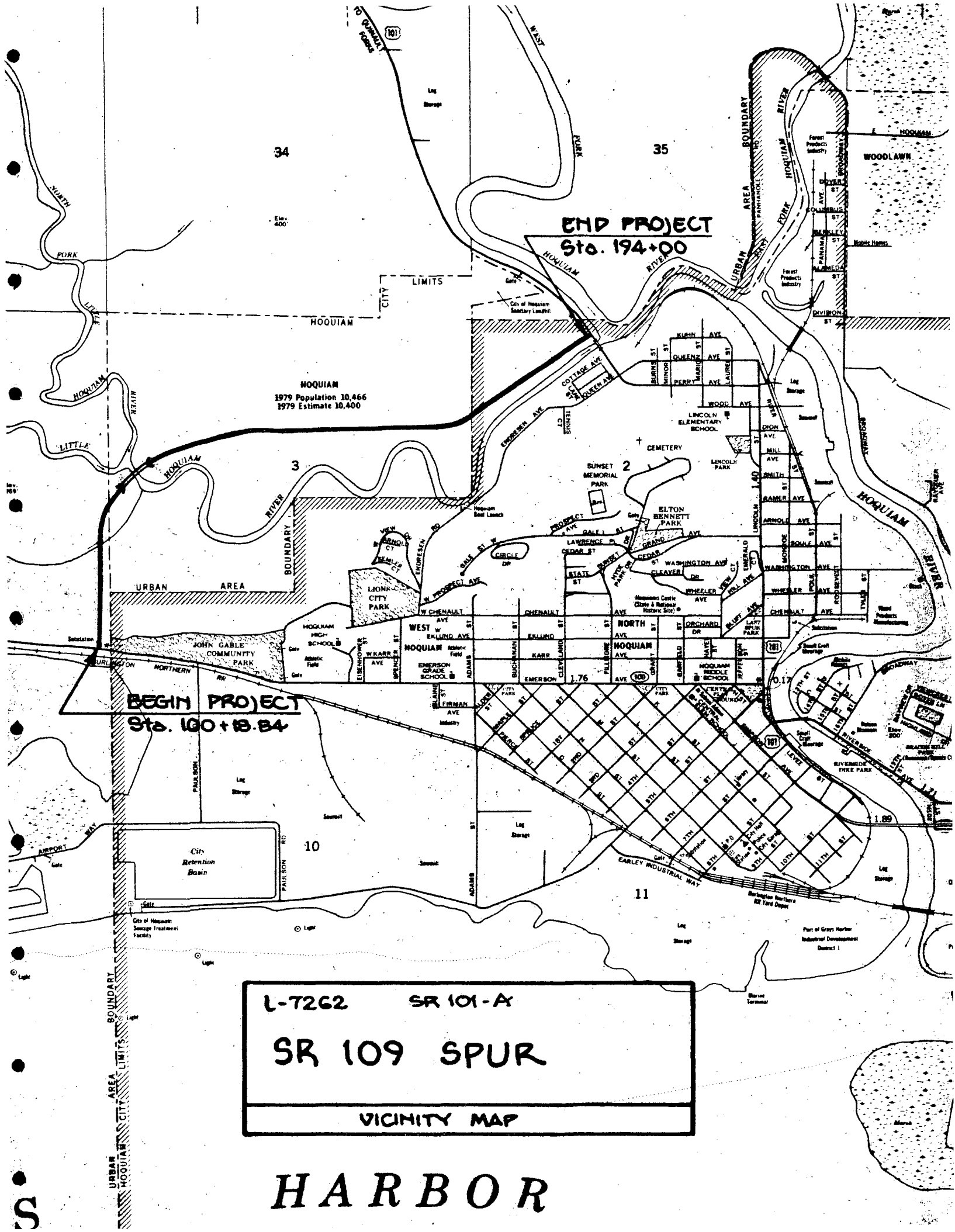


L-7262 SR 101-A

SR 109 SPUR

VICINITY MAP

HARBOR

I INTRODUCTION

This report discusses the soil investigation and recommendations for the alignment referred to as the SR 109 Spur. As shown on the attached vicinity map, the proposed alignment begins just outside of Hoquiam's city limits, SR 109, M.P. 1.79, and continues in a northeasterly direction, connecting with SR 101 just north of the existing Little Hoquiam River Bridge, M.P. 82.02.

This new alignment traverses undeveloped land beginning at station 123+17. Construction on the south side of the Little Hoquiam River involves major excavation and embankment work. Such work entails 185 to 95 ft. high cuts and a 40 ft. high fill. A proposed prestressed-concrete-girder bridge is planned to have 12 spans with a total length of 1470 ft. North of the river the maximum centerline cut is 40 ft. and embankments are a maximum of 14 ft. Other work on this project includes the placement of 12 major culverts and 2 game crossings and the widening of SR 109 to accommodate traffic turning left onto SR 109 Spur.

The analyses, conclusions and recommendations of this report are based on the site conditions existing at the time of the field exploration to the extent they have been explored and are based on the specific project description. The exploratory borings are assumed to be representative of the subsurface conditions throughout the project. If diverse conditions are encountered or appear to be present beneath or beyond the excavation or fills, we should be advised to help you in reviewing and/or reevaluating our recommendations.

Analysis and recommendations concerning the Little Hoquiam River ByPass structure has previously been prepared and transmitted by Headquarters Materials. Factual data, profiles and recommendations pertaining to this structure will not be included in this report except for six test holes that were drilled prior to the decision to lengthen the bridge.

Due to the magnitude of work required for this soils investigation some of the factual data will be found in Vol. II of this report. Soils plans and profiles, and log of test borings can be found in Volume I and laboratory test data is found in Appendix A of Volume II.

II GEOLOGY

During the early Miocene Epoch, thousands of feet of sedimentary rocks were deposited on the much older volcanic rocks already present in the Olympic Peninsula area. Late Miocene time saw the deformation and uplift of these rocks to form the ancestral Olympic Mountains. Erosion then reduced them considerably during the Oligocene and early Pliocene only to have them rebuilt by a north-south uplift at the close of the Tertiary Period.

Beginning in the late Pliocene and continuing into the Pleistocene, the lowlands bordering what is now Grays Harbor was receiving sedimentary material from the Olympic Mountains and Willapa Hills. These sediments range from stream-laid sand and gravel to fine-grained lacustrine silts and clays. The processes of erosion and deposition continue to the present.

Relating the above brief geologic history to this project is as follows. From the beginning of the project on SR 109 to a point a short distance north of the crossing of the Little Hoquiam River, the highway will cross the river-laid sand, gravel, and silt deposited during Pliocene-Pleistocene time. These sediments, although they have never born a significantly greater load than they do now, are fairly well indurated and are expected to be quite stable. The only exception to the foregoing statement is the very soft area crossed by the bridge; this, of course, is recent alluvium.

Approximately at Sta. 140, material derived from the much older Miocene rocks is encountered. The exact nature of this material is not known, some of it may be in place and deeply weathered, while some may be coluvial and some may be as deposited. The most positive statements that can be made are: (1) The material containing logs at depth should be coluvial; (2) The hard material found in the test holes and exposed near SR 101 is in-place Tertiary rock; and (3) The other materials are indeterminate as to origin. Except for the obvious recent swampy and peaty deposits these materials derived from Miocene rocks are present to the end of the project.

III SOILS INVESTIGATION

The soils investigation consisted of drilling a total of 60 test holes to determine the material present in the cut and embankment areas. Six of the test holes were originally drilled for 3 proposed culverts but have since been utilized in the bridge foundation analysis. Other methods of soils investigation includes a field geologic review, vane shear "in-situ" tests and torvane tests.

Very loose to loose silts and organic silts were found to depths of 40 ft. below existing ground elevation in embankment areas. Materials underlaying these silts are silty sand, silty sandy gravel, clayey silt and silt with siltstone fragments varying in density from very loose to very dense. Peaty material was occasionally found as well as wood fragments and logs.

The material found in the cut sections varied between the areas south of the bridge and the area to the north. The larger cuts, to the south, consist of mainly medium dense to very dense silty sandy gravel with layers or lenses of silt and sandy silt. The northern cuts commonly consist of very loose to medium dense silts, clays and clayey silts. Occasionally a denser silty sandy gravel, siltstone or sandstone was found underlaying the softer materials. The majority of the cuts did not encounter a denser material at the proposed grade.

The Log of Test Borings can be found in Appendix H, of this volume.

IV LABORATORY TESTING

The laboratory program consisted of identifying and classifying 776 disturbed samples obtained from the standard penetrometer tests. Generally, standard penetrometer tests were taken at five foot intervals. There were a total of 771 undisturbed samples obtained using shelby tubes and the Washington State undisturbed sampler.

Samples recovered were identified in the field and then submitted to Headquarters Materials for further analysis and a more detailed classification. Soil samples were classified under the Unified Soil Classification system. A total of 324 individual samples were tested as representative samples. Moisture contents were determined on selected samples in accordance with the procedures of ASTM D 2216-80 as soon as possible after their arrival in the laboratory. Nineteen samples were submitted specifically as moisture samples. The Atterberg Limits as described in AASHTO T90-70 and T89-68 were determined on 92 samples that were thought to contain clay-size particles. Grain-size analyses were conducted in the procedure detailed in AASHTO T88-78.

Design shear strengths were based on laboratory tests conducted on both the undisturbed samples and in place materials. A total of 20 unconsolidated, undrained triaxal shear tests were performed. In addition, 2 "in-situ" vane shear and 13 torvane tests were taken to support triaxial test results.

Laboratory test data is included in Volume II, under Appendix A.

V EXCAVATION AND EMBANKMENT SLOPE STABILITIES

Design recommendations are summarized in detail below for the entire project. The steepest allowable slopes are shown on the following lists according to approximate stations. The maximum heights listed reflect the difference between the proposed centerline subgrade elevation and the slope catch point in order to obtain a more realistic picture of the quantities involved.

SLOPE STABILITY TABULATION SHEETS

STATION	CUT/ FILL	MAX. HT.	FOUNDATION OR FORMATION	EMBANKMENT OR CUT SLOPE	RT/ LT	REMARKS
100+50.41						
	Cut	9'		1.5:1		
102+00						
	Cut	161'	Silty sandy	1.5:1		
103+27						
	Cut	190'	Silty sandy gravel, sandy silt	1.5:1	Lt.	10' Bench at Elev. 160
				2.1		From Bench To Catch
	Cut	118'		1.5:1	Rt.	
104+50						
	Cut	176'	Silty sandy gravel sandy silt, silt	1.5:1	Lt.	10' Bench at Elev. 160
				2.1		From Bench to Catch
	Cut	154'		1.5:1	Rt.	
105+50						
	Cut	161'	Silty sandy gravel, sandy silt, silt	1.5:1	Lt.	10' Bench at Elev. 160
				2.1		From Bench to Catch
	Cut	163'		1.5:1	Rt.	10' Bench at Elev. 160
				2.1		From Bench to Catch

107+00						
	Cut	137'	Silty sandy gravel, sandy silt, silt	1.5:1	Lt.	
	Cut	169'		1.5:1	Rt.	10' Bench at Elev. 160
				2:1		From Bench to Catch
108+00						
	Cut	135'	Silty sandy gravel, sandy silt, silt	1.5:1		
109+00						
	Cut	120'	Silty sandy gravel, sandy silt, silt	1.4:1		
110+40						
	Fill	40'	Swampy (extremely wet)	2:1		Sawdust Fill
118+40						
	Cut	120'	Silty sandy gravel, silty sand, silt	2:1		
123+17						
			Little Hoquiam River Bridge			
137+87						
	Cut	9'	Silt	2:1		"R" Value-37 Use of de-watering ditches
139+20						
	Fill	6'	Very loose silts, clayey silt, silty sandy gravel	2:1		
140+20						
	Cut	68'	Silt, clay, clayey silt, w/siltstone pieces, silty sandy gravel	3:1		Logs and pieces of wood were found. Use de-watering ditches

146+50	Fill	11'	Silt, silty sand wet	2:1	15' of very loose silt
147+70	Cut	27'	Silt, organic silt	2:1	Use dewatering ditches
148+60	Fill	11'	Silt, org. silt silty sandy gravel	2:1	20' of very loose silt
149+10	Cut	27'	Silt, organic silt	2:1	"R" Value-37 Use dewatering ditches
151+20	Fill	11'	Swampy	2:1	46' of highly organic silt
153+30	Cut	46'	Silt, sandy silt, silty sandy gravel	2:1	Use dewatering ditches
157+50	Fill	14'	Silt, clayey silt	2:1	20' of loose silt
159+90	Cut	30'	Silt, silty sand	2:1	Use dewatering ditches
163+50	Fill	14'	Swampy	2:1	45' of very loose silt
165+80	Sliver Cut/ Fill	9'	Silt	2:1	
168+60	Cut	12'	Silt	2:1	"R" Value-37
169+30					

	Fill	12'	Swampy	2:1		50' to 20' of very loose silt and org. silt
175+10	Cut	57'	Silt, org. silt, sandy silt	3:1		Use dewatering ditches
176+60	Fill	12'	Silt, org. silt, silt	2:1		Generally 30' of very loose silt
191+30	Cut	34'	Silt, sandy	1.4:1	Lt.	Slope may be con-structed a 1:1 when sandstone encountered
194+00				2.1	Rt.	

EXCAVATION

The two major cuts between stations 100+50 to 110+40 and 118+40 to 123+00 (approximately) consist of very dense silty sandy gravels, silts and sandy silts. Moisture contents of the samples taken varied between 79% to 6%. Dewatering ditches are suggested to be used during the excavation of these areas. Percentages passing the #200 sieve ranged between 90% to 6%. The use of this material as an embankment source is deterred by the high moisture contents and the amount of fines generally found. Aerating the material is not a feasible solution because:

1. The quantities involved would require a large area for suitable aeration, and,

2. The combination of high moisture contents and fines increases the time needed to obtain an adequate optimum moisture content. Considering the characteristically moist climate conditions prevalent to the Grays Harbor area, it is unlikely that adequate aeration could be achieved.

There are, however, a few small layers and one 30 ft. layer of material where low moisture contents and a minimum amount of fines coincide. These layers are shown on the diagram in Appendix E. We feel that the quantities involved along with trying to isolate this material during excavation is not cost effective.

The previous paragraph discussed the materials present in the cut between stations 102+00 to 110+40 which are also illustrated by test holes B-9 and 10 on sheet 2 of 5 in Appendix A. Photographs 1 and 2

show the actual drilling of these test holes. The face of this hill, which is south of these test holes and can be seen from SR 109, is shown in a number of views by photos #'s 3 through 6. This bank stands vertical in some areas because of a siltstone formation that can easily be seen in these photos. This is mentioned because this formation was not encountered in the test holes drilled for this cut. Although this material will be encountered during construction excavation we do not anticipate any adverse excavation difficulties. The 1.5:1 design cut slope should be maintained in the siltstone.

As shown on the tabulation sheet on pages 5 through 8, the suggested cut slopes vary according to location and elevation. Five sections will require a 10 ft. bench at elevation 160. Test hole data revealed loose silts, sands and silty clays in the upper portions of these cuts whereby slope stability can only be achieved with a 2:1 slope. There are a few sections where the cuts "catch" slightly above elevation 160 and a bench was not suggested. This is allowed because the catch point elevation differences were minor and did not warrant the extra excavation required to provide a 2:1 slope.

The cuts north of the river consisted predominantly of very loose to medium dense silts, clays and clayey silts. The material was very wet and commonly contained organic material. Very few test holes encountered a firm foundation at the proposed grade. Because of the high moisture contents and the types of materials involved we definitely recommend that dewatering ditches be used during the excavation of these cuts. A dewatering ditch diagram is attached in Appendix E. In addition, overexcavating the cut areas to a depth of 2 ft. below the proposed subgrade will be needed in order to provide an adequate foundation to construct the roadway.

The cut area between stations 140+20 to 146+50 is of particular importance in that the very soft to medium stiff silts and clays found, result in major concern regarding slope stability. Additional profile test holes were drilled to support the original test data, however, the drilling unexpectedly encountered numerous logs. Therefore, while excavating for the slopes of 3:1, the contractor can expect to find large logs or trees during construction which will have to be removed.

The water levels that were encountered are depicted on the soils profile. It is felt that the water found was perched water. The water will create some difficulties during construction excavation especially since the material has a high moisture content. We feel the dewatering ditches will help to reduce soil moisture and improve construction conditions. The actual extent of the aquifers will determine how well the water will flow and drain during construction. If an alternative is needed to achieve positive drainage we suggest the use of horizontal drains. Information pertaining to horizontal drains will depend on the site conditions at that time.

EMBANKMENT

The tabulation sheets list side slopes not steeper than 2:1 for all embankments. These slopes are considered stable if the following criteria are met:

1. Remove a minimum of 5 ft. of unsuitable foundation material.

2. construction fabric is placed (for exception see roadway section 4),

3. fills are consstructed from a suitable gravel borrow source and,

4. embankments do not exceed a maximum height of 14 ft. The one exception is the sawdust fill.

A detailed illustration of the limits and the above criteria is shown on the roadway sections in Appendix C.

VI FOUNDATION DESIGN

A. FILLS

The majority of the fills will be constructed over low swampy areas where, for the most part, the depths of marine silts exceed 20 ft. Photographs 7, 8 and 9 show some of the low flat areas where swampy conditions are commonly found.

Obviously the soft nature of the foundation material will cause some major problems. The decisions resulting in specific limited embankment heights were influenced by the expected settlements within the soft silts and also the instabilities that would occur if earth fills exceeded 15 ft. Fill heights could not be reduced any more than 12 ft. due to the height restrictions imposed by the Department of Game for game crossings. Other alternatives were considered including berms and lightweight fills but those were discarded because of additional Right of Way acquistions that would be needed and environmental regulations. There is one area where a lightweight fill is the only feasible solution.

As shown on the tabulation sheets, pages 5-8, the majority of the embankments do not exceed 12 ft. in height. The exception is a 40 ft. lightweight fill between Stations 110+45 to 118+45. Settlement analyses were performed for several embankment areas. We estimate that 3 ft. to 5 ft. of settlement can be expected depending upon fill height and depth of soft soil. Laboratory tests indicate that the silts encountered will consolidate slowly. Consolidation data indicates 70% of the predicted settlement will occur within a 5 year period. Since earth fills greater than 15 ft. in height will not be stable, the use of an overload to minimize post construction settlement is not feasible. The only alternative available to increase the rate of settlement would be the use of vertical drains.

The feasibility of vertical drain types and approximate costs are discussed in the section labled "Construction Considerations". Recommended construction procedures for the "earth fill" embankment areas are as follows:

1. Remove 5 ft. of existing material, clearing tree stumps, branches, etc. to provide a smooth surface.

2. Place fabric for stabilization on a surface that does not have any objects that could severely damage the fabric.

3. Replace the 5 ft. of excavated soil with a free draining gravel borrow.

4. Lay a second application of stabilization fabric.

5. Place temporary culverts in their prospective areas.

6. Set settlement indicating devices in the proximity of the culverts. Specific locations will be discussed further on in this report.

7. Construct the fill to the approximate elevation of the final grade. The fills should not exceed 15 ft.; therefore fills less than 15 ft. may be built to this height in order to shorten the time of settlement. Also, as embankments settle, the 15 ft. maximum heights may be maintained to help decrease the settlement delay period.

8. Monitor the settlement. For scheduling purposes we estimate a final construction delay period of 8 months. A more accurate construction delay period will be delineated by the time versus settelment data.

9. Excavation of the embankment material in the culvert areas will be allowed when a tolerable amount of settlement is remaining. Decisions concerning the "tolerable amount" will be made by Headquarters Foundation personnel.

10. Place permanent culverts and game crossings according to the Standard Specifications. Because of expected non-uniform settlement, metal pipe is preferred. The elevations of these structures will be determined by the projected long term settlement estimated from the time versus settlement data.

11. Build fill to the proposed subgrade with a gravel borrow material.

12. Final surfacing material should be placed after secondary settlements are reduced to a practical minimum. These will also be determined from settlement monitor readings.

NOTE: Specifications for stabilizing fabric may be found in Appendix F.

A lightweight fill is proposed between stations 110+45 to 118+45. Approximately 170 ft. of this fill will have a maximum embankment height of 40 ft. The majority of this fill area requires over 15 ft. of earth embankment which results in an unstable fill. To construct a fill in this area a sawdust embankment has been proposed. Construction of the lightweight fill will also reduce settlement to about one half of what an earth fill would experience.

A cross section view of this fill, found in Appendix C, illustrates the various embankment items required. As shown, a free draining gravel borrow will be encased in stabilization fabric. The gravel borrow will be a minimum height of 5 ft. and, in the lower areas, built to at least an elevation of 11.0 ft. This latter criteria will help assure that the lightweight material is not directly exposed to the mean high water level. The lightweight material or sawdust may be placed directly on the fabric in uncompacted lifts of not more than one foot. The specifications of allowable materials, methods of construction and measurement for the lightweight fill are provided in the Special Provision found in Appendix E. The 2:1 side slopes will require a 2 ft. cover of top soil.

A portion of the projected settlement will be reduced during the initial construction phases of clearing and grubbing. The remaining settlement will have to be adjusted by building the lighweight fill above the proposed grade by at least two feet with gravel borrow. Settlement adjustment in the culvert area is discussed later on in this section. Once again an 8 month delay period may be assumed for scheduling purposes; however, the longer the delay period the better. This is especially true for a lightweight fill because not only is there foundation settlements, but there will also be consolidation within the sawdust itself.

It should be obvious by now that the foundation conditions on this project are less than adequate and will likely cause a less than desirable roadway profile. The aforementioned construction procedures, for both fill types, will help reduce the so called "roller coaster" effect expected but will not eliminate it. There will still be the noticeable cut to fill sags; however, within the individual embankment sections we anticipate a uniform settlement.

B. CULVERTS

There are twelve major culverts and two game crossings proposed on this project. Test hole information for these structures are drawn on individual cross section views (see Appendix B). Other data such as the proposed locations, lengths and diameters are depicted for each structure. The embankment heights, existing ground and flow lines

shown on these sections may not represent truely accurate conditions as interpolations and estimations were used. We do not expect the actual differences to significantly vary from those assumed.

As described previously, temporary culverts will be needed during the delay period. These culverts should be designed for an eight month duration which will probably coincide with the fall and winter months. In addition, we suggest that these culverts be oversized by one foot and have a one foot camber in order to maintain drainage during this settlement period.

Permanent culverts and game crossings will be placed when the projected remaining settlement is minimal. Advice and recommendations for these structures will come directly from Headquarters Foundation once field settlement data is collected. At that time the respective elevations at which to place these culverts will also be given to allow for long term settlement. In addition, the culverts may require a one foot camber. Full camber should occur directly below the proposed finished shoulder with 20% of the camber built in at the culvert ends. Culvert placement should be constructed according to the Standard Specifications. When removing the embankment material in order to place the permanent culverts ,the temporary excavation slopes should be a minimum of 2 ft. outside of the new culverts. Care should be taken as not to damage the settlement indicating devices. Metal pipe is preferred because of the expected variable settlement along the length of the pipe.

Construction in the lightweight fill area does not require a temporary culvert; therefore, the following procedures are recommended.

Embankment construction for this section involves fabric placement directly on original ground after clearing and grubbing. The foundation, in the area of the proposed culvert, will be constructed in a slightly different manner in that removal of the existing soil will be required. Removal below the culvert will consist of a 5 ft. trench-like excavation having a bottom width of 35 ft. and side slopes not steeper than 1:1. Due to the soft nature of the native soil, a more realistic slope of 2:1 should be assumed in estimating quantities. After backfilling with gravel borrow the work shall continue with the placement of the stabilization fabric. The culvert will be placed according to the Standard Specifications, still requiring 0.65 ft. of gravel backfill for pipe bedding and a minimum gravel borrow cover of one foot above the culvert. Details concerning embankment construction for this area are illustrated on drawing #3 in Appendix E.

Settlement differential in the profile grade can easily be handled during construction. The predicted settlements that the culvert will have to withstand would be resolved initially. It is felt that a portion of the settlement will be taken up while constructing the backfilled trench. The remaining settlement may be absorbed by oversizing the culvert by one foot and cambering it as described previously.

Resistivity readings were taken and pH tests were performed on three culvert sites and both game crossings. Not all culvert locations were tested due to the uniform soil types found within the project limits. These results and the recommendations based on them are found in Appendix D.

VII SETTLEMENT DEVICES

Eleven settlement indicating devices will be required for this project. Placement of these devices should be within an area of maximum fill and a maximum offset of 10 feet from the proposed locations of the permanent culverts and game crossings. The following locations are the proposed centerline culvert stations of which we recommend to be monitored by settlement indicating devices:

Stations	115+50	Offset	10 feet
	139+40		10 "
	147+00		10 "
	152+45		10 "
	158+00		10 "
	164+12		10 "
	169+90		10 "
	172+20		10 "
	177+50		10 "
	180+00		10 "
	187+00		10 "

The settlement devices should, initially, be read daily. After two weeks they may be read 3 times a week until the fill reaches full height and twice weekly thereafter. If at all possible, the devices should be read by the same operator to ensure quality and consistency in the readings. The weekly reports should be sent to the Materials Office immediately following the completion of the week. Headquarters Materials will analyze the settlement data, prepare the appropriate graphs and make the recommendations pertaining to changes in the delay period and final culvert placement elevations. The special provisions and installation procedures for the settlement indicating devices are found in Appendix F.

VIII PAVING AND SURFACING

The recommended paving and surfacing depths are shown on the roadway sections found in Appendix C. Four sack samples were taken for the new alignment with "R" values ranging from 66 to the minimum design "R" of 37 (sample #2). All the samples obtained were considered frost susceptible and one sample (#3) had a swell pressure of 5.65 psi. The results of these tests can be found in Appendix D. The theoretical surfacing depths shown on the test data form are met by the proposed section depths which are a minimum of 4 ft.

SR 109 will be widened a maximum of 12 ft. to accommodate a two-way left-turn lane. The subgrade condition of this area (MP 1.79) was

investigated in 1976 for a project titled "SR 101, Hoquiam to Grays Harbor City". At that time, six representative sack samples were obtained having "R" values of 70 to 23 (see Appendix D). The controlling sample for this section is #3, a clay-sand-gravel requiring a 1.70 ft. theoretical surfacing depth. Widening for this section consists of shoulder grading one foot for surfacing and paving material replacement and minor fills. There is a possibility that the material described as sample #3 may be found at subgrade during construction. Instead of increasing the roadway section depth it is recommended that this material, if encountered, be removed and wasted, replacing it with gravel borrow.

The asphalt pavement depths for new roadway construction is 0.70 ft. total which meets the design requirements for a structural pavement. The Traffic Index for the SR 109 ByPass is 7.2.

IX BRIDGE FOUNDATION REPORT

This report was previously prepared and distributed by Headquarters Materials. It will not be included in this report due to the magnitude of both reports.

X CONSTRUCTION CONSIDERATIONS

Some construction considerations that will require special attention during the building of this project are listed below:

1. The excavation and compaction of native materials will be extremely difficult if performed during or immediately after the wetter months. Wet weather will alsorestrict fills with gravel borrow.

2. Stumps have the tendency to form buttons in the roadway surface as a result of settlement around them; therefore, tree stumps should not be any higher than one foot above original ground and in fill areas of less than a 5 ft. height, stumps should be removed.

3. Step sloping or terracing is required for the cut/fill areas as specified in Section 2-03.3(14) of the Standard Specifications. It is felt that step heights should not exceed 3 ft.

4. A stabilization fabric has not been recommended in the cut areas south of the proposed bridge because in place subgrade conditions are adequate. Yet, if these areas are left exposed to adverse weather conditions, particularly the siltstone, construction excavation may become difficult.

5. Vertical sand drains were suggested as a method to increase the rate of settlement in the embankment areas. We estimate that sand drain installation for all

embankment areas excluding the sawdust area would cost between 1.5 million to2 million dollars. This estimate is based on the assumption thatwick drains or geodrains can be used to minimize costs. The presence of any logs would restrict the use of this type of drain and another drain type of a higher cost would have to be used.

XI RECOMMENDATIONS

1. Paving and surfacing recommendations are shown in Appendix C.

2. We recommend that excavated material not be utilized as an embankment source.

3. Embankments should be constructed with gravel borrow quality material.

4. Cut and embankment slopes are listed on the tabulation sheets, pages 5 to 8.

5. Dewatering ditches should be used in all cuts. See Appendix E, diagram 2 for details.

6. Cut areas should be overexcavated a minimum of two feet below the proposed subgrade. Placement of a construction fabric is required for cuts north of the Little Hoquiam River excluding the cut between Stations 191+30 to 194+00.

7. Construction recommendations and procedures for the embankment areas are discussed in the text of this report. Recommendations include: overexcavation, stabilization fabric, delay periods, and temporary culverts.

8. The construction fabric specification for the fill areas is found in Appendix F. It should be noted that fabric properties for stabilization fabric (used in fill areas) differs from the fabric that may be used in cuts.

9. Settlement indicating devices are recommended for eleven locations. The specific locations were previously discussed.

10. Temporary culverts will be required for the interim delay period.

11. The height of the terrace steps for the cut/fill areas should not be higher than 3 ft.

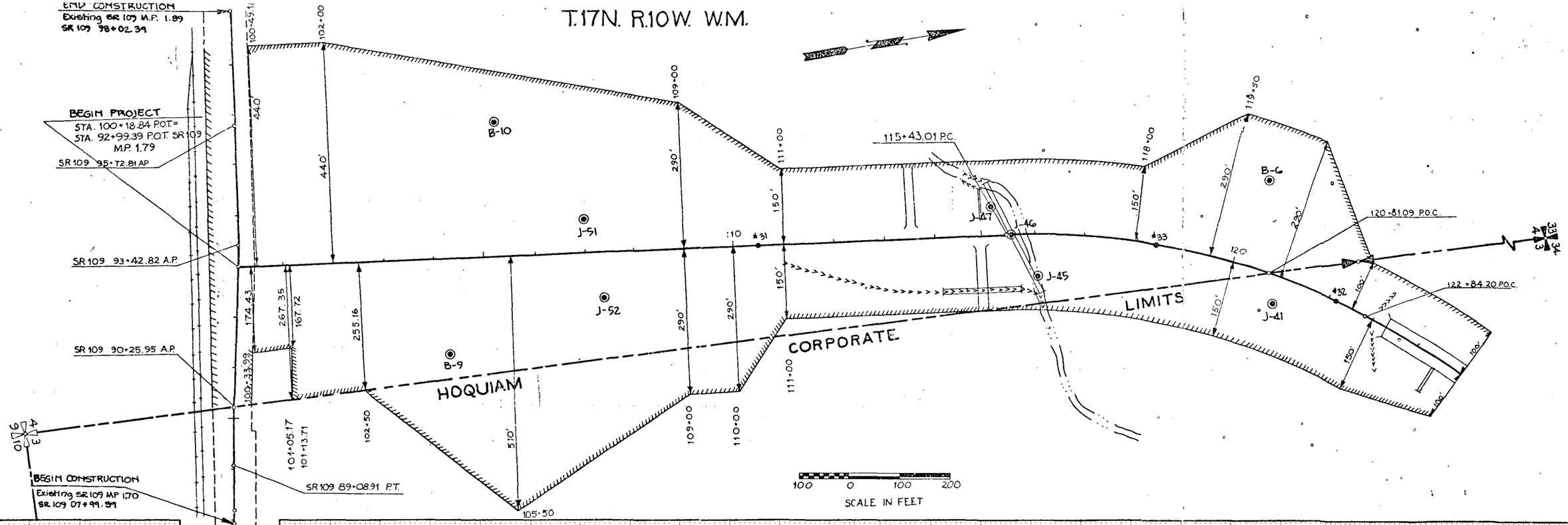
12. Tree stumps should be removed in fill areas less than

5 ft. in height.

13. Metal culverts and game crossings are recommended. Cambers for these structures were discussed in Section VI B of this report.

14. The specifications for Lightweight (sawdust) Material and the Settlement Indicating Devices are found in Appendix F.

APPENDIX A



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DRAWN C. OLSON	REGION NO. 10	STATE WASH	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
CHECKED	JOB NUMBER L-7262				
PROJ. ENGR. J. HART	CONTRACT NO.				

DIVISION OF HIGHWAYS

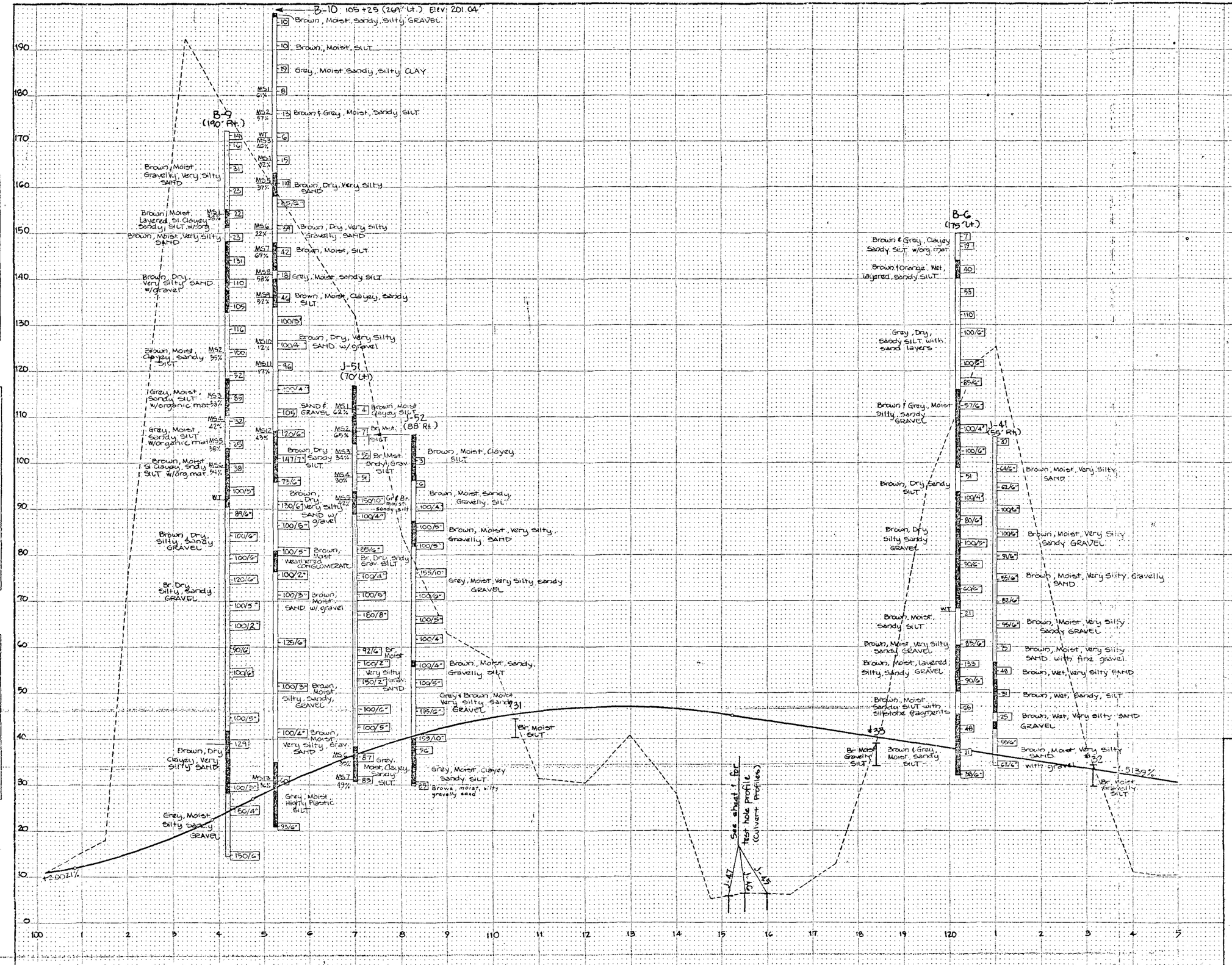
Washington State Department of Transportation

SR 109 SPUR

PLAN & PROFILE

SHEET 1 OF 5

FED. ROAD DIV. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
8	WASH.			



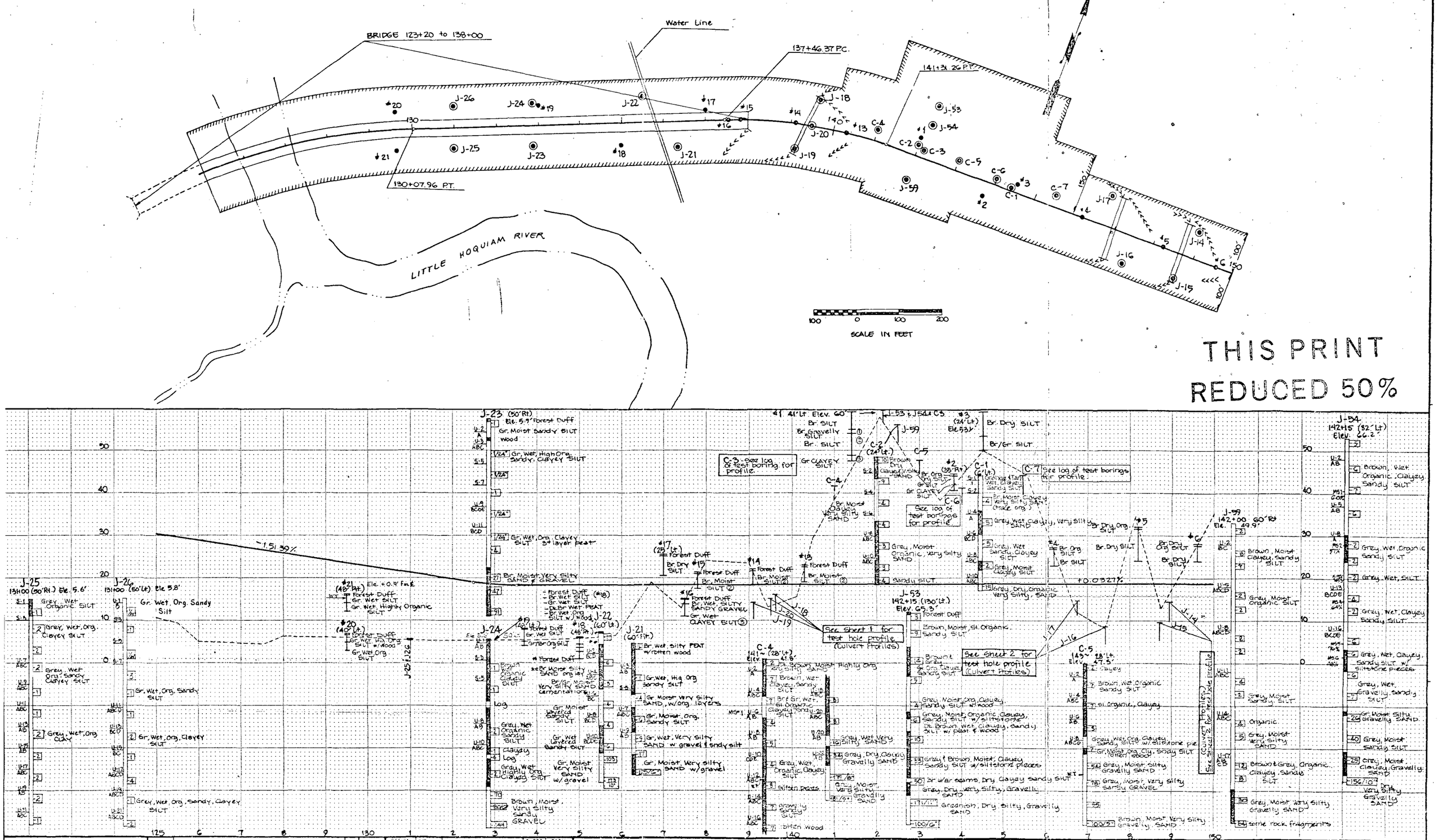
THIS PRINT REDUCED 50%

SOIL PROFILE

S.R. 101-A C.S.
PROJECT TITLE: SR 109 SFUR
PROJECT NO: JOB NO: L-7262
STA. TO STA.
COUNTY: GRAYS HARBOR SCALE: Horiz: 1" = 100' Vert: 1" = 10'
DATE: OCTOBER 1985
SOIL ENGR: D. MORROW
DIST. ENGR: J. HART
DRAWN BY: C. OLSON

SHEET 2 OF 5

T.17 N. R.10W. W.M.



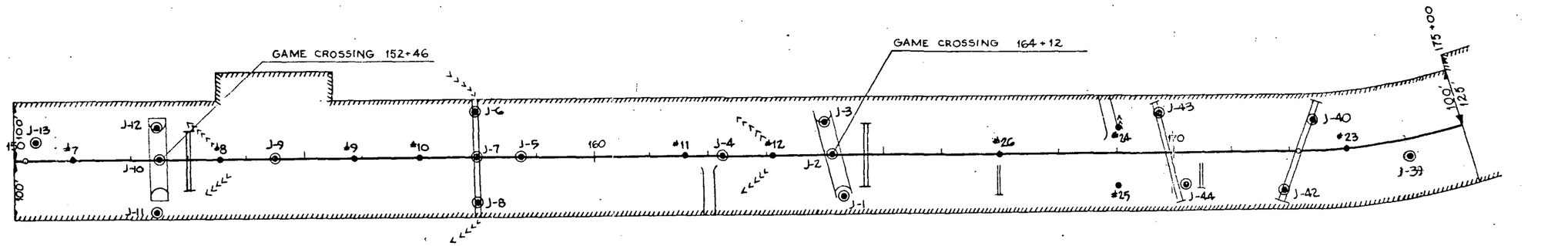
DRAWN C. OLSON		REGION NO. 10	STATE WASH	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
CHECKED R. Santo	10/83	JOB NUMBER L-7262				
PROJ. ENGR. J. HART		CONTRACT NO.				

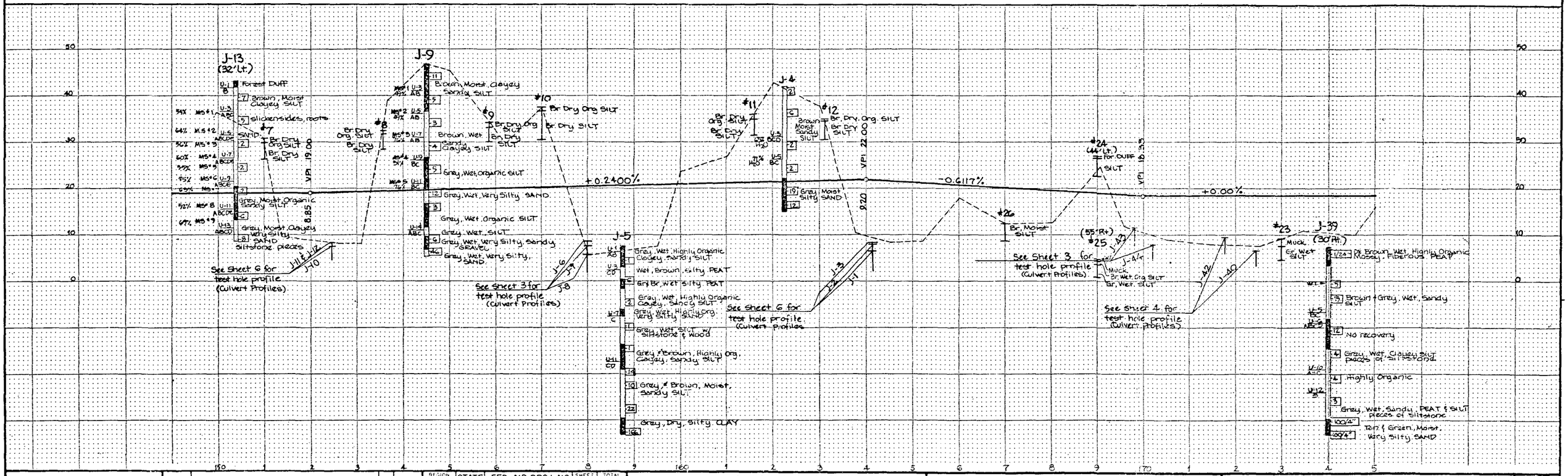
DIVISION OF HIGHWAYS

Washington State Department of Transportation

SR 109 SPUR

SHEET 3 OF





DRAWN C. OLSON			REGION NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
CHECKED R. Santo	10/83		10	WASH			
PROJ. ENGR. J. HART			JOB NUMBER L-7262				
			CONTRACT NO.				

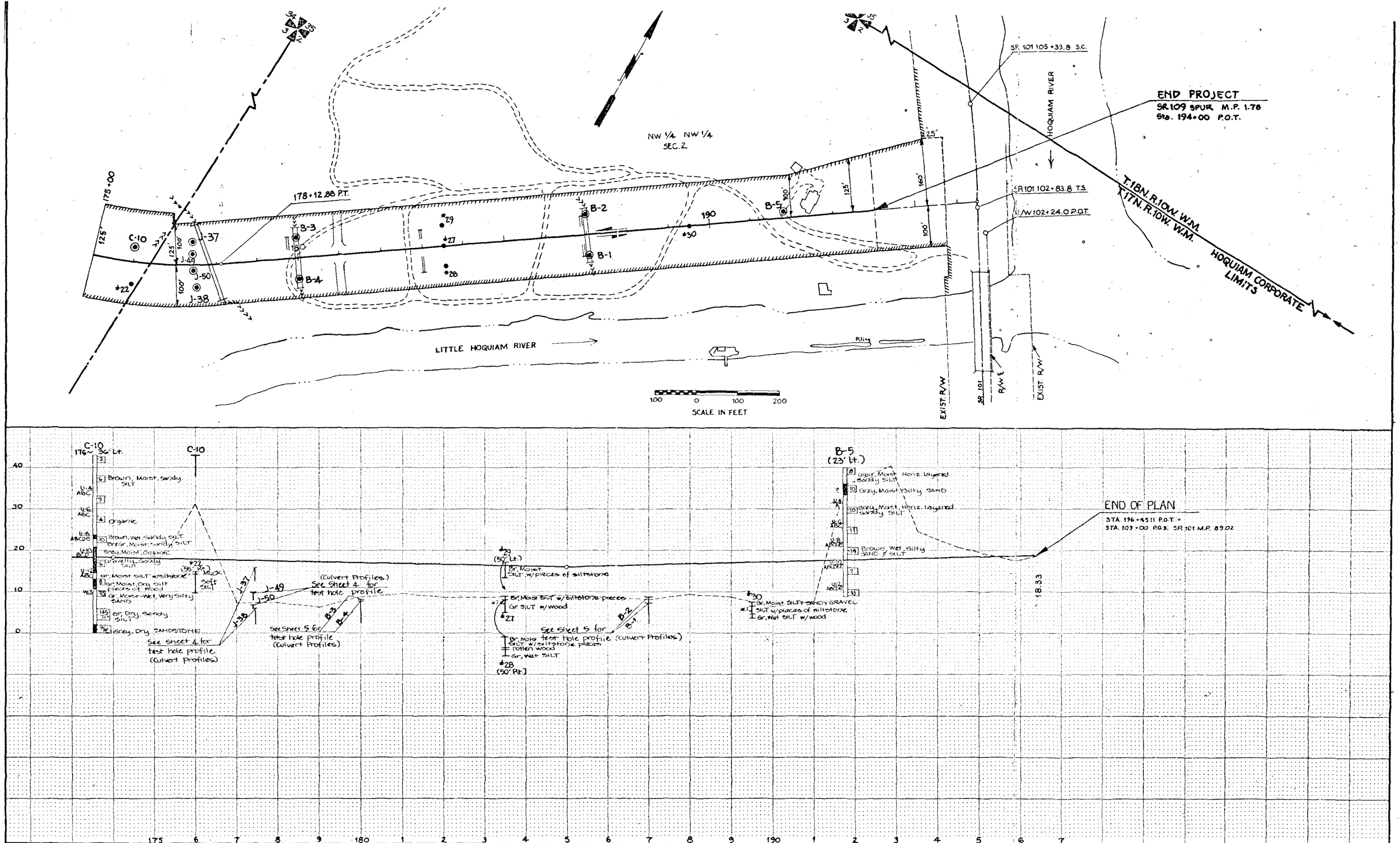
DIVISION OF HIGHWAYS

Washington State Department of Transportation

SR 109 SPUR

PLAN & PROFILE

SHEET 4 OF



DRAWN C. OLSON		REGION NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
CHECKED R. Santo	11-83	10	WASH			
PROJ. ENGR. J. HART		JOB NUMBER L-7262				
DIST. ADM. I.D. ZIRKLE		CONTRACT NO.				

DIVISION OF HIGHWAYS

APPROVED

Washington State Department of Transportation

SR 109 SPUR

PLAN & PROFILE

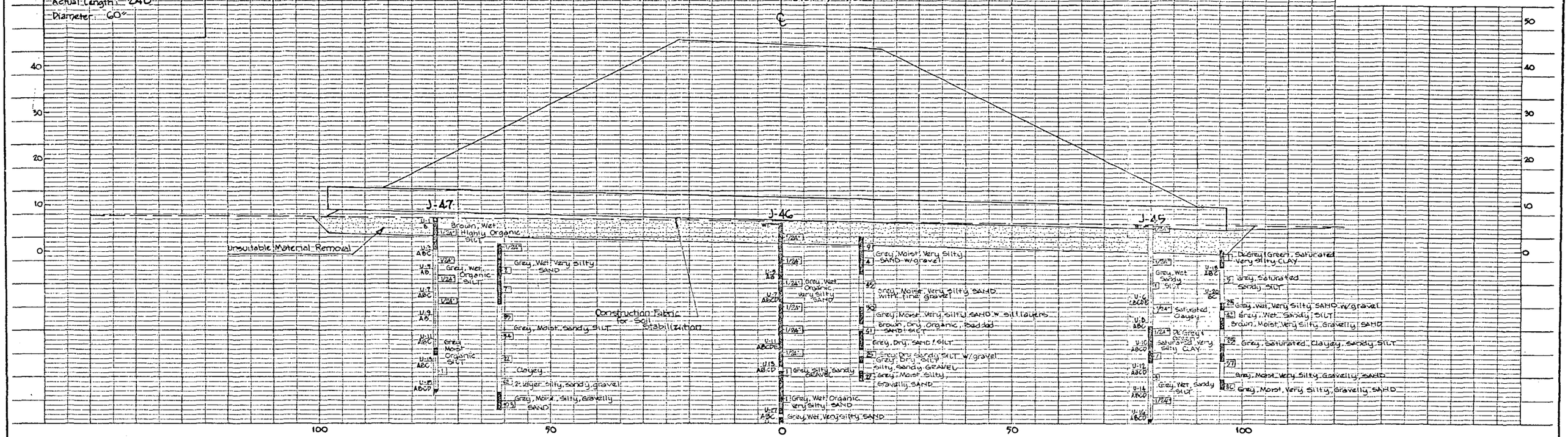
SHEET 5 OF 5

APPENDIX B

REGION NO.	STATE	FED. AID PROJECT NO.	SHEET NO.
10	WASH.		

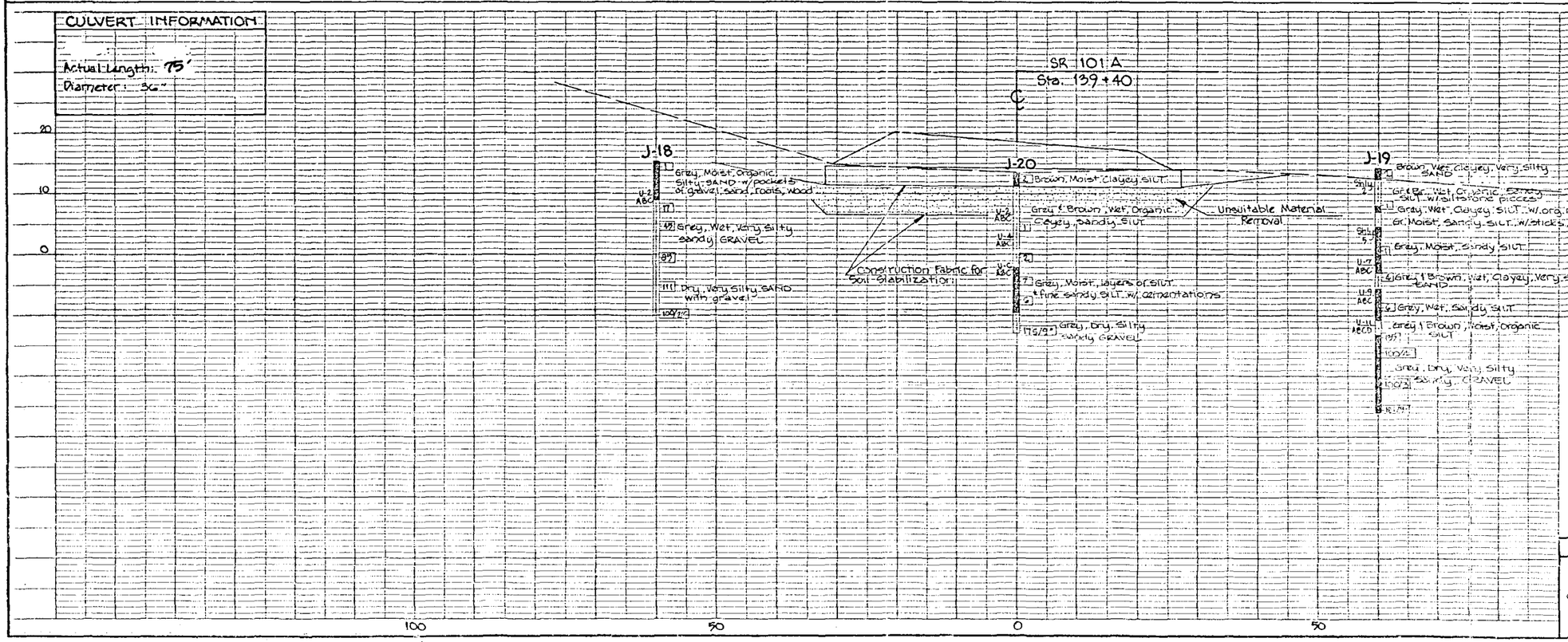
CULVERT INFORMATION

Actual Length: 240'
Diameter: 60"



CULVERT INFORMATION

Actual Length: 75'
Diameter: 36"



THIS PRINT REDUCED 50%

NOTE

ROADWAY X-SECTIONS DRAWN PERPENDICULAR TO ℄

GROUND LINE ELEVATIONS ARE ESTIMATED

Culvert Profile

SOIL PROFILE

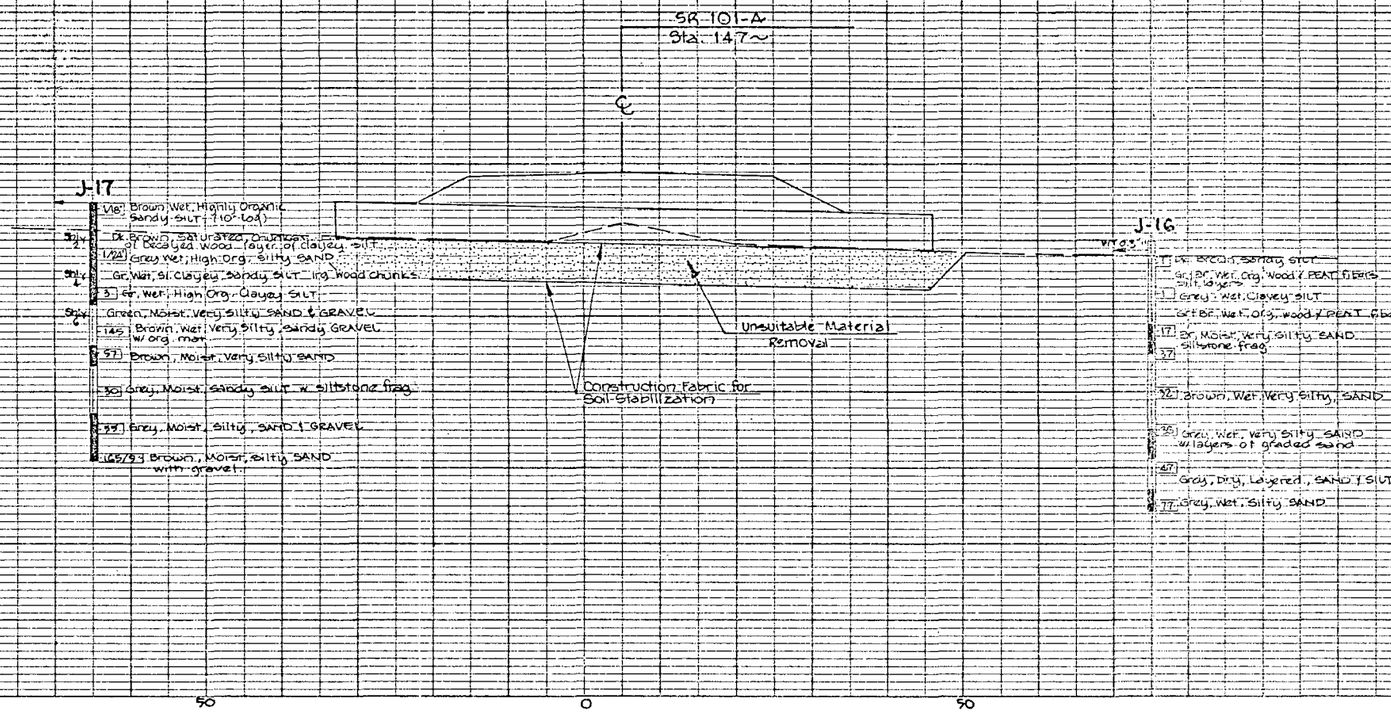
SR 101-A C.S.
PROJECT TITLE: SR 102 SPUR
PROJECT NO: JOB NO: L-7262
STA. TO STA.
COUNTY: GRAYS HARBOR SCALE: 1" = 10'
DATE: OCTOBER, 1983
SOIL ENGR: R.J. MORROW
DIST. ENGR: J.R. ZIRKLE
DRAWN BY: C. OLSON

SHEET 1 OF 7

REGION NO.	STATE	FED. AID PROJECT NO.	SHEET NO.
10	WASH.		

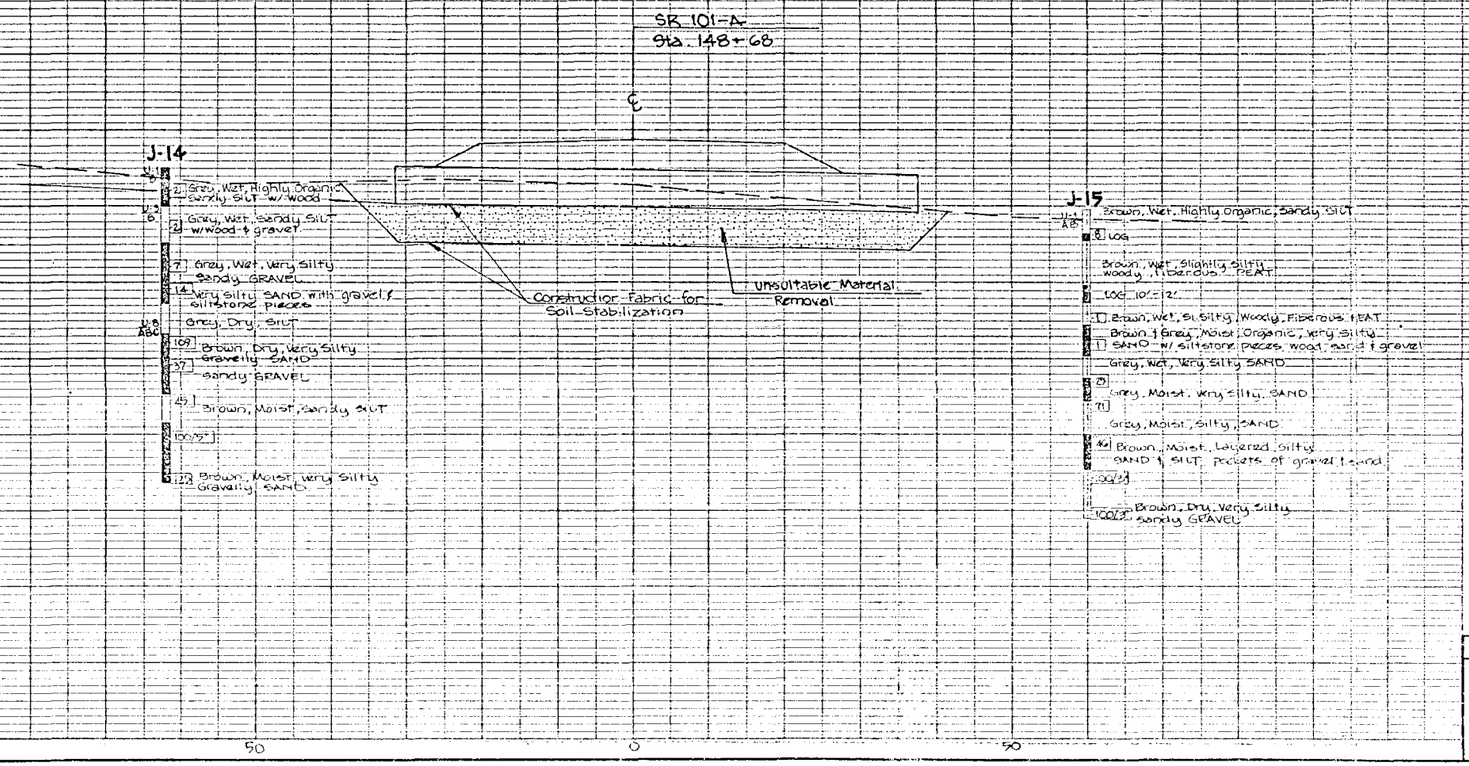
CULVERT INFORMATION

Actual Length: 95'
Diameter: 60"



CULVERT INFORMATION

Actual Length: 85'
Diameter: 60"



THIS PRINT REDUCED 50%

NOTE

ROADWAY X-SECTIONS DRAWN PERPENDICULAR TO ℄

GROUND LINE ELEVATIONS ARE ESTIMATED

Culvert Profile

SOIL PROFILE

S.R. 101-A C.S.
PROJECT TITLE S.R. 107 SPUR
PROJECT NO. JOB NO. L-7262
STA. TO STA.
COUNTY GRAYS HARBOR SCALE: 1" = 10'
DATE: OCTOBER, 1983
SOIL ENGR. D.J. MOZROW
PRST. ENGR. J.P. ZIEGLE
DRAWN BY C. OLSON

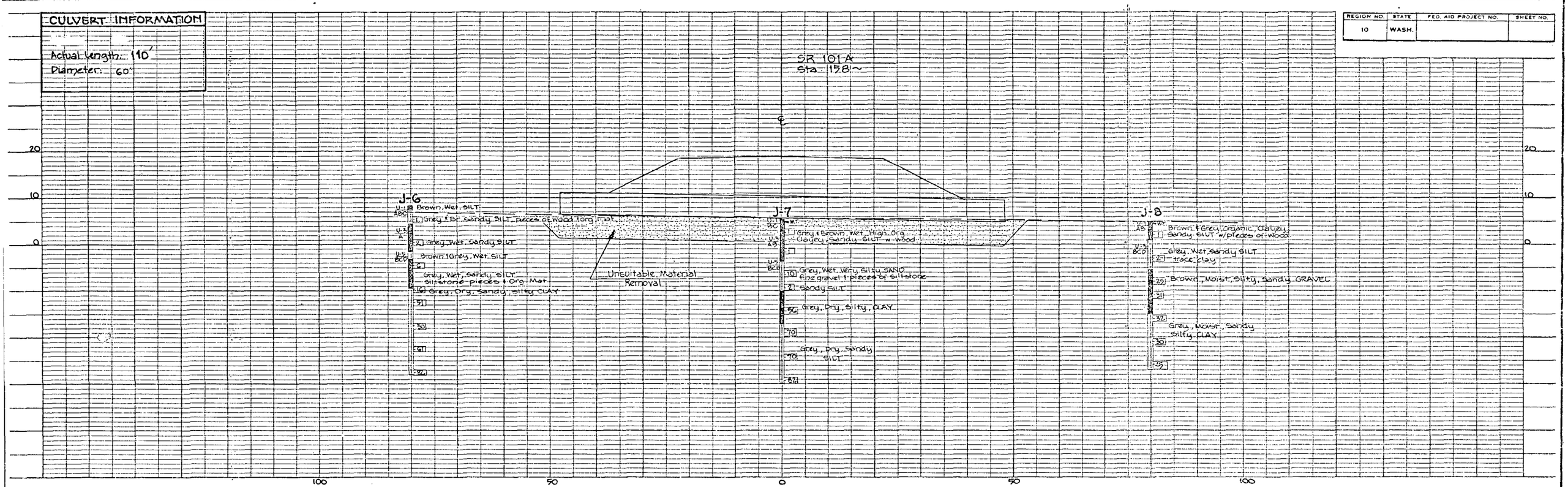
SHEET 2 OF 7

K-E

REGION NO.	STATE	FED. AID PROJECT NO.	SHEET NO.
10	WASH.		

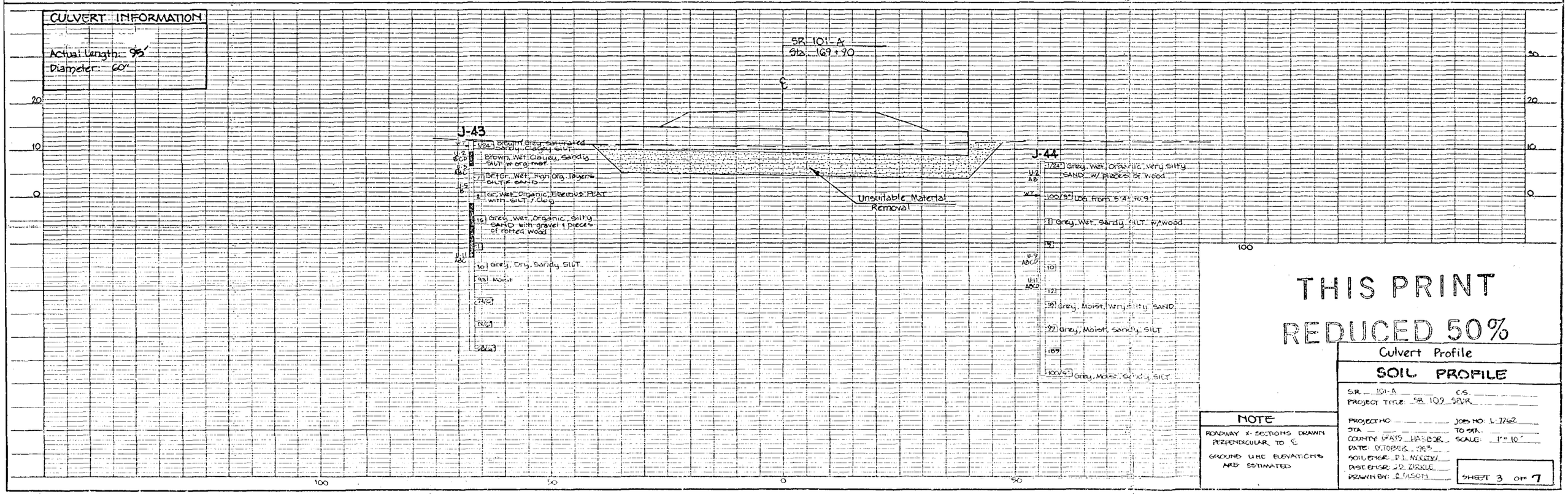
CULVERT INFORMATION

Actual Length: 110'
Diameter: 60"



CULVERT INFORMATION

Actual Length: 95'
Diameter: 60"



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NOTE

ROADWAY X-SECTIONS DRAWN PERPENDICULAR TO ℄

GROUND LINE ELEVATIONS ARE ESTIMATED

Culvert Profile

SOIL PROFILE

S.R. 101-A C.S.
PROJECT TITLE: SR 102 SPUR

PROJECT NO: JOB NO: L-7262
STA. TO STA.
COUNTY: GRAYS HARBOR SCALE: 1" = 10'
DATE: OCTOBER 1963
SOIL ENGR: P.L. WALTON
DIST. ENGR: J.D. ZIRKLE
DRAWN BY: R. GUSOM

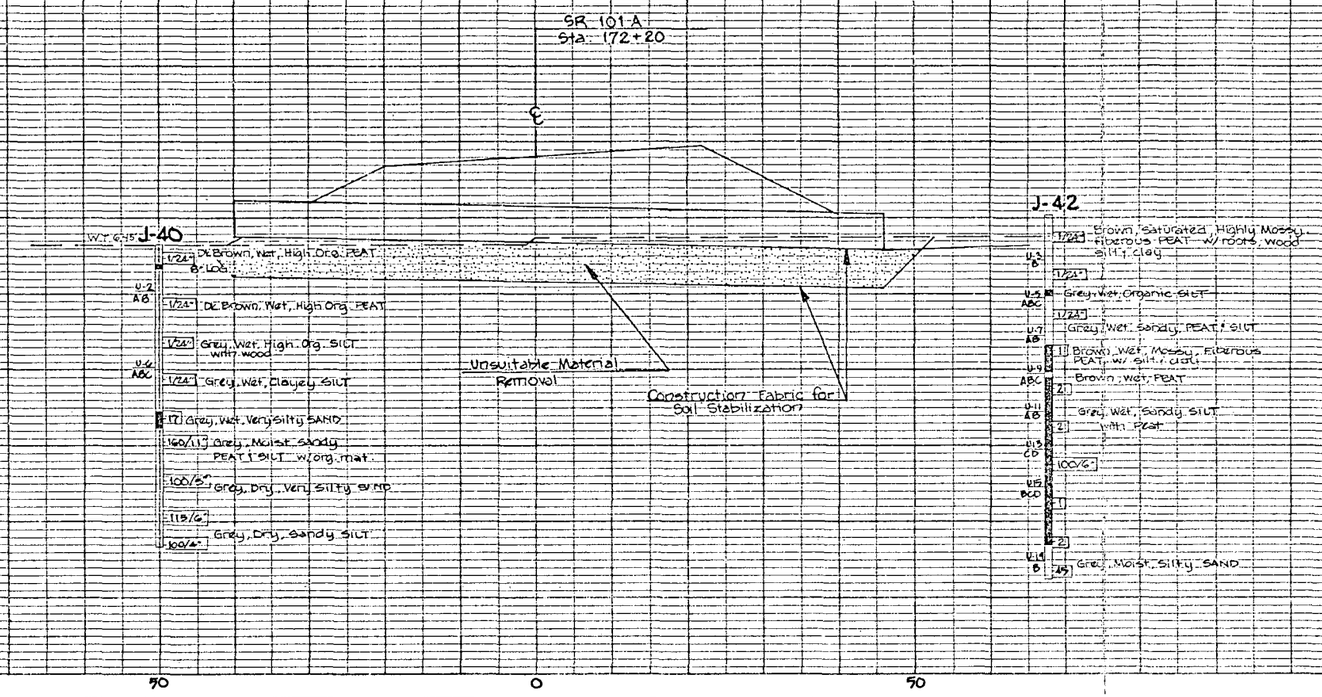
SHEET 3 OF 7

K+E

REGION NO.	STATE	FED. AID PROJECT NO.	SHEET NO.
10	WASH.		

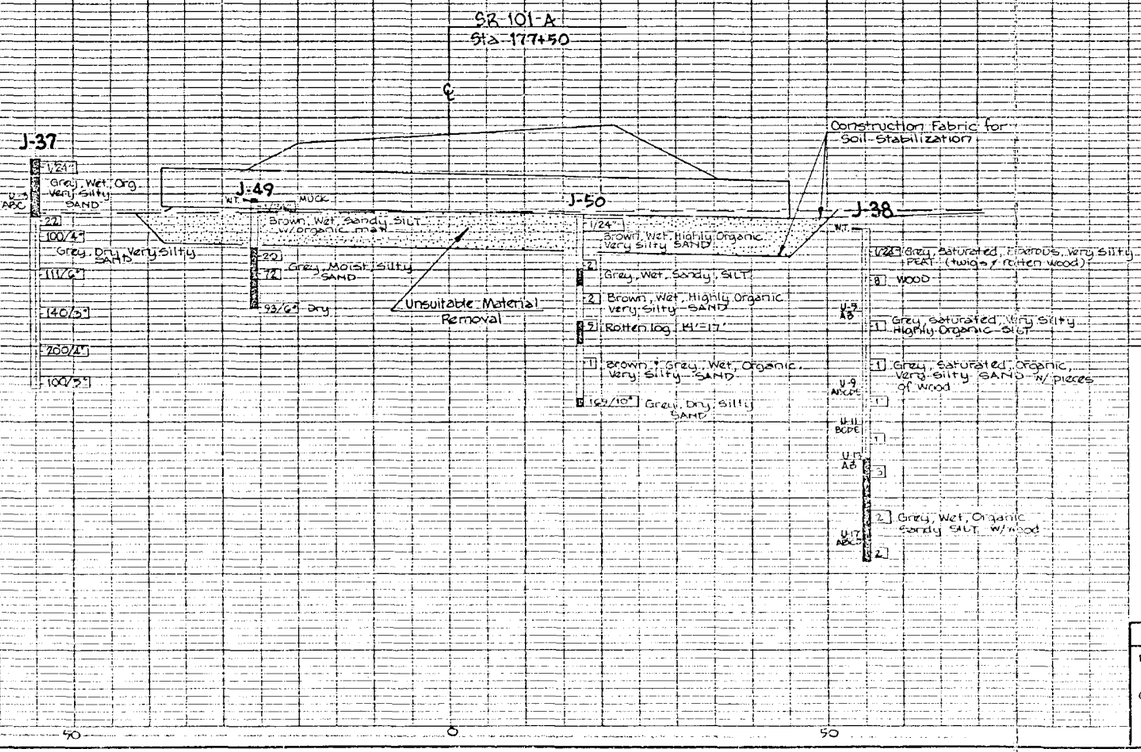
CULVERT INFORMATION

Actual Length: 110'
Diameter: 60"



CULVERT INFORMATION

Actual Length: 120'
Diameter: 60"



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NOTE

ROADWAY X-SECTIONS DRAWN PERPENDICULAR TO ℄.

GROUND LINE ELEVATIONS ARE ESTIMATED

Culvert Profile

SOIL PROFILE

SR 101-A CS
PROJECT TITLE S.R. 109 SPUR
PROJECT NO: JOB NO: L-7222
STA TO STA
COUNTY GRAYS HARBOR SCALE 1" = 10'
DATE OCTOBER 1983
SOIL ENGR. D.J. MORROW
DIST ENGR. J.D. ZIEGLER
DRAWN BY: C. OLSON

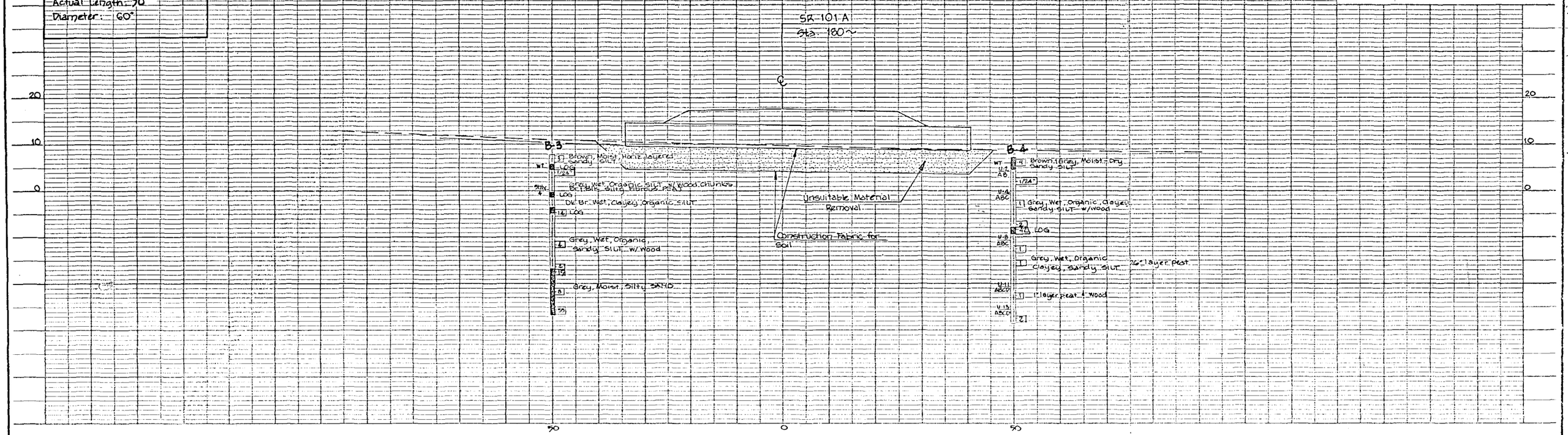
SHEET 4 OF 7

K-E

REGION NO.	STATE	FED. AID PROJECT NO.	SHEET NO.
10	WASH.		

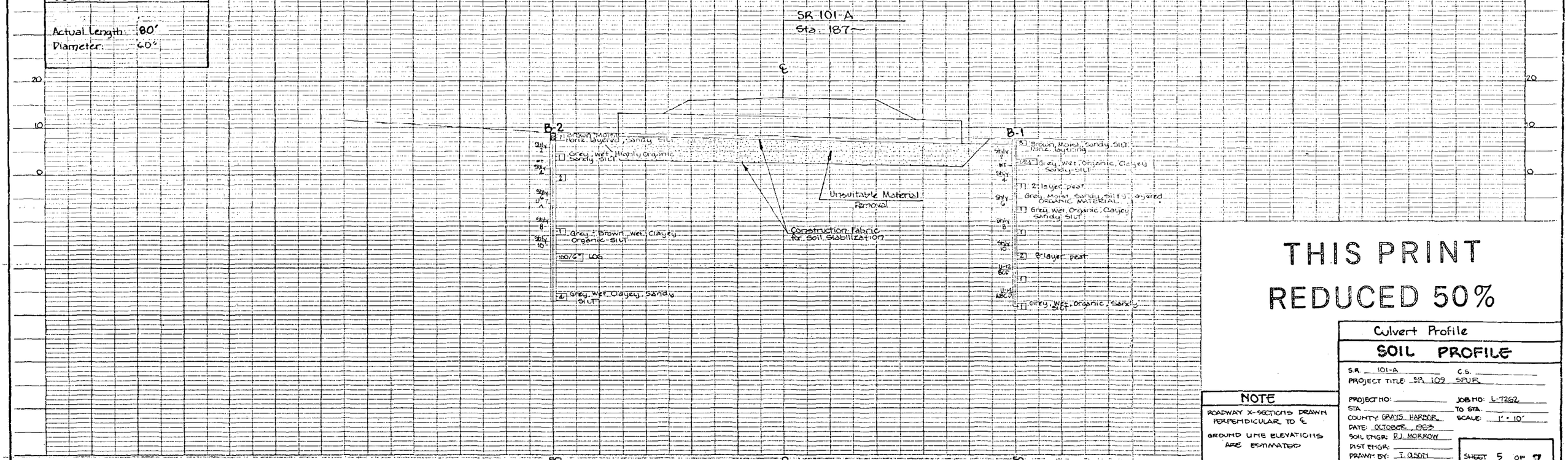
CULVERT INFORMATION

Actual Length: 90'
Diameter: 60"



CULVERT INFORMATION

Actual Length: 80'
Diameter: 60"



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NOTE

ROADWAY X-SECTIONS DRAWN PERPENDICULAR TO ℄

GROUND LINE ELEVATIONS ARE ESTIMATED

Culvert Profile

SOIL PROFILE

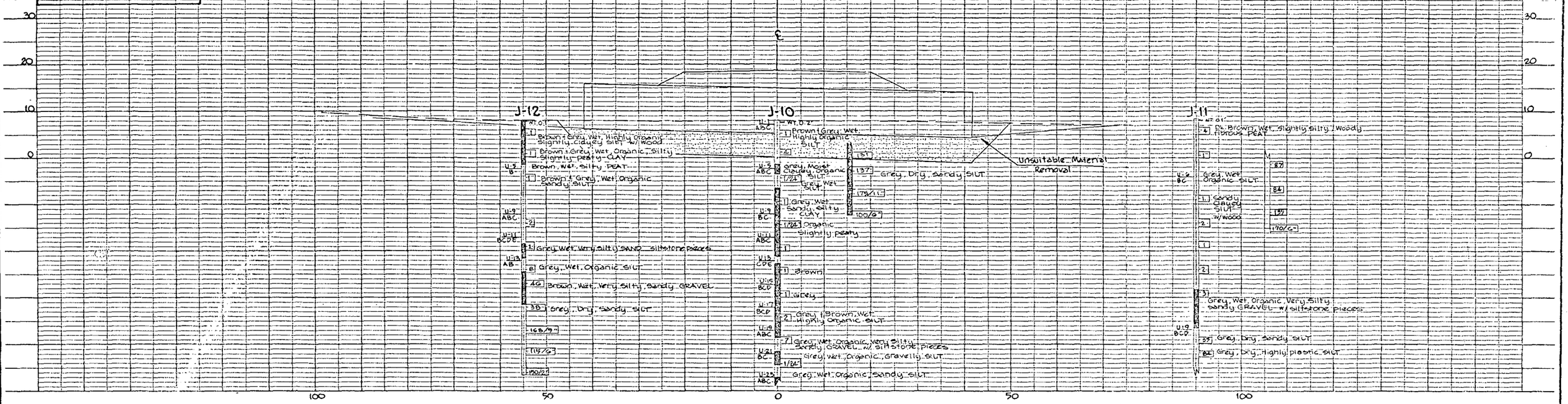
S.R. 101-A C.S.
PROJECT TITLE: SR 109 SPUR
PROJECT NO: JOB NO: L-7262
STA TO STA
COUNTY: GRAYS HARBOR SCALE: 1" = 10'
DATE: OCTOBER, 1993
SOIL ENGR: D.J. MORROW
DIST ENGR:
DRAWN BY: T. OLSON

SHEET 5 OF 7

REGION NO.	STATE	FED. AID PROJECT NO.	SHEET NO.
10	WASH.		

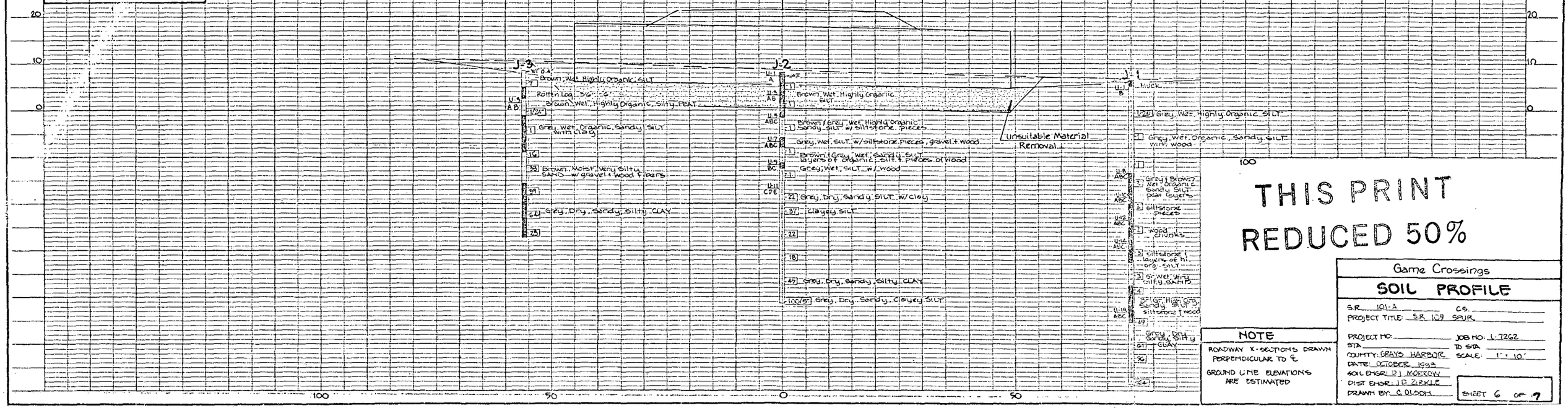
CULVERT INFORMATION

Actual Length: 110'
Diameter: 16' 5" span
9' 11" rise



CULVERT INFORMATION

Actual Length: 120'
Diameter: 18' 7" span
12' 8" rise



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NOTE

ROADWAY X-SECTIONS DRAWN PERPENDICULAR TO ℄

GROUND LINE ELEVATIONS ARE ESTIMATED

Game Crossings

SOIL PROFILE

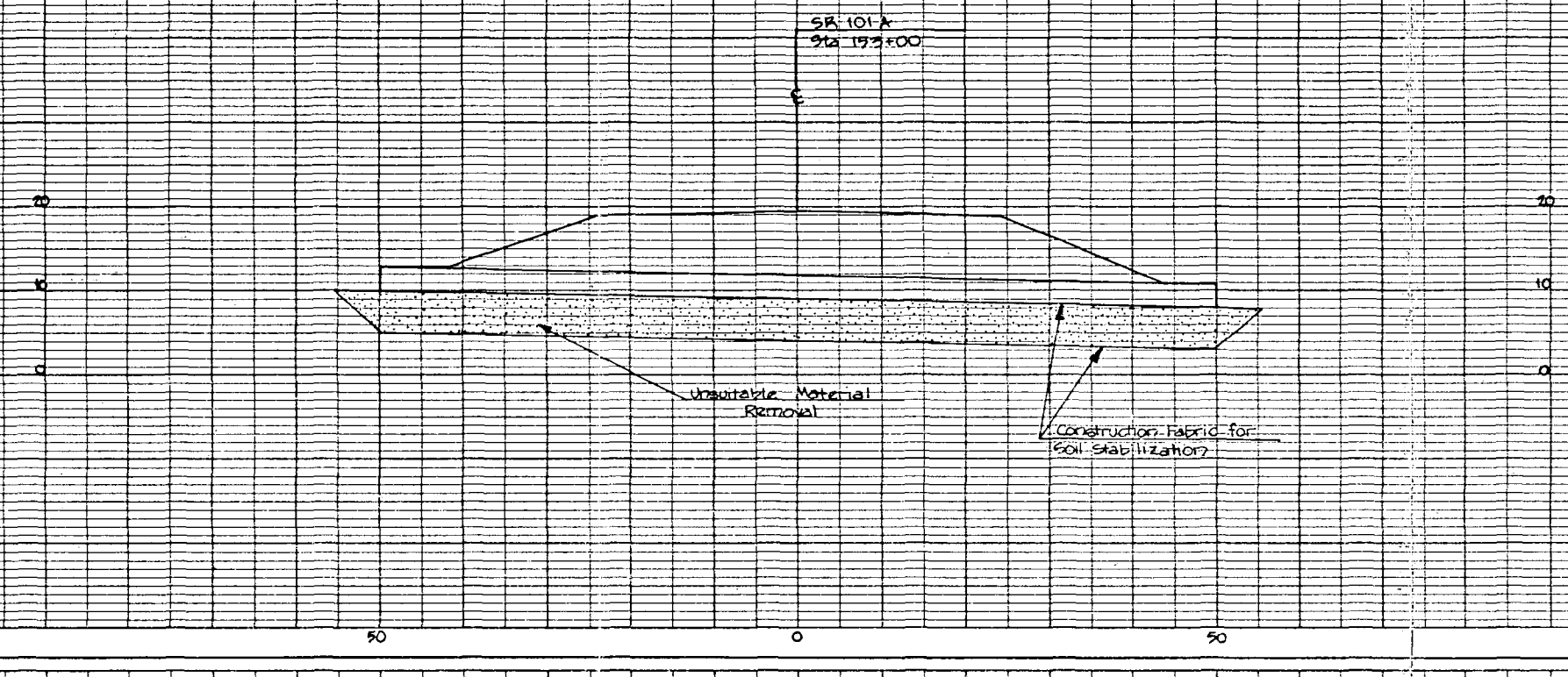
S.R. 101-A C.S.
PROJECT TITLE: S.R. 109 SPUR
PROJECT NO: JOB NO: L 7262
STA TO STA
COUNTY: GRAYS HARBOR SCALE: 1" = 10'
DATE: OCTOBER 1993
SOIL ENGR: D.J. MORROW
DIST ENGR: J.D. ZIRKLE
DRAWN BY: C. OLSON

SHEET 6 OF 7

REGION NO.	STATE	FED. AID PROJECT NO.	SHEET NO.
10	WASH.		

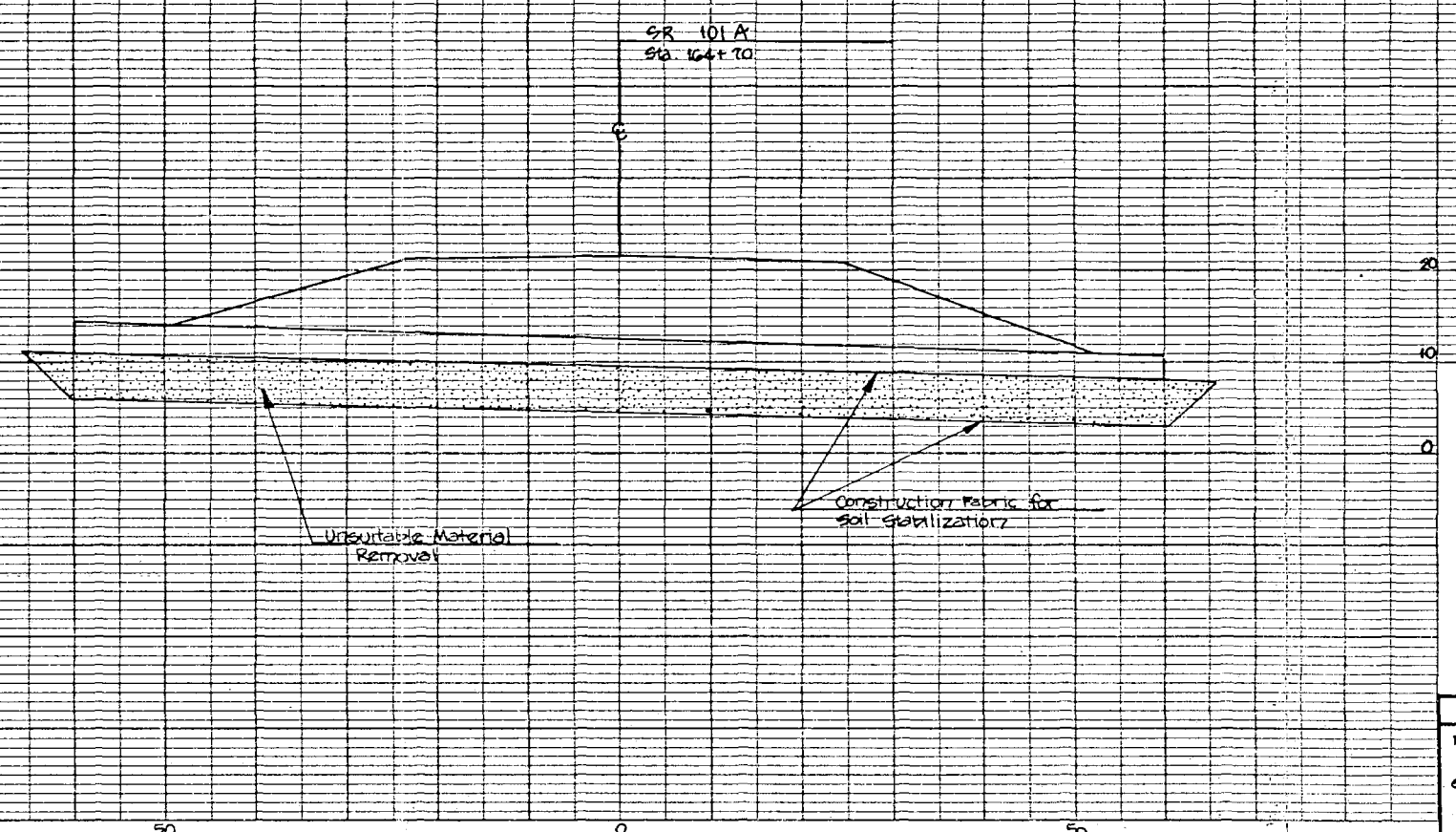
CULVERT INFORMATION

Skew: 0°
Actual Length: 100'
Diameter: 36"



CULVERT INFORMATION

Skew: 0°
Actual Length: 110'
Diameter: 36"



NOTE

ROADWAY X-SECTIONS DRAWN PERPENDICULAR TO ℄

GROUND LINE ELEVATIONS ARE ESTIMATED

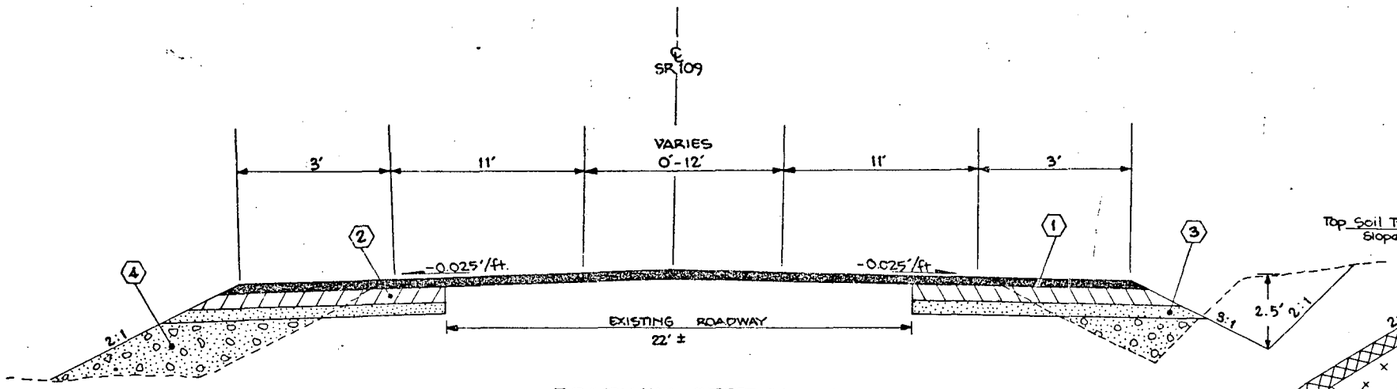
Culvert Profile

SOIL PROFILE

S.R. 101-A C.S.
PROJECT TITLE: SR 109 SPUR
PROJECT NO: JOB NO: L-7262
STA. TO STA.
COUNTY: GRAYS HARBOR SCALE: 1" = 10'
DATE: JANUARY, 1984
SOIL ENGR: P.J. MORROW
DIST. ENGR: J.P. ZIRKLE
DRAWN BY: C. OLSOTT

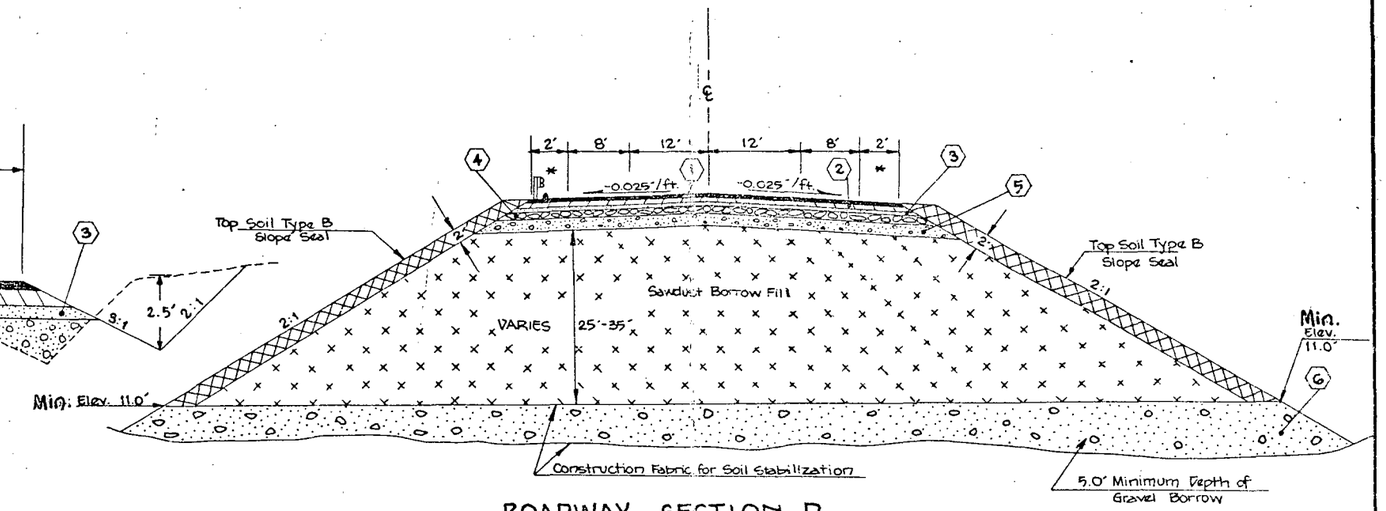
SHEET 7 OF 7

APPENDIX C



ROADWAY SECTION A

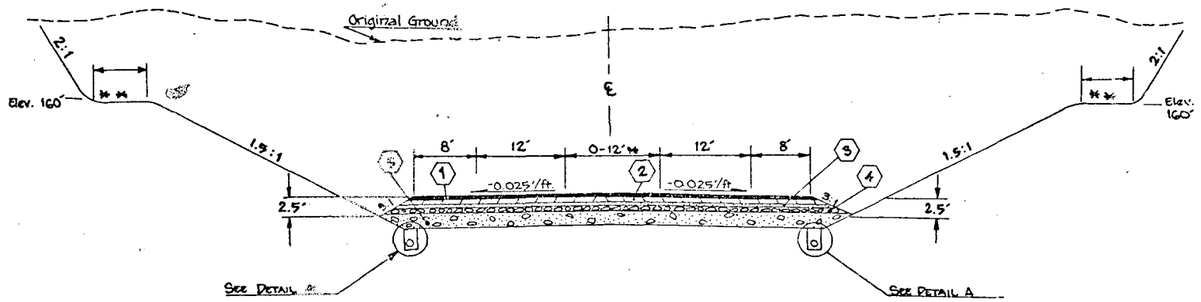
SR 109, STA 87+99.39 to STA 98+02.39



ROADWAY SECTION D

STA. 110+45 to STA. 118+45

✱ Widening for Curb and Guardrail See STANDARD PLAN F-2G

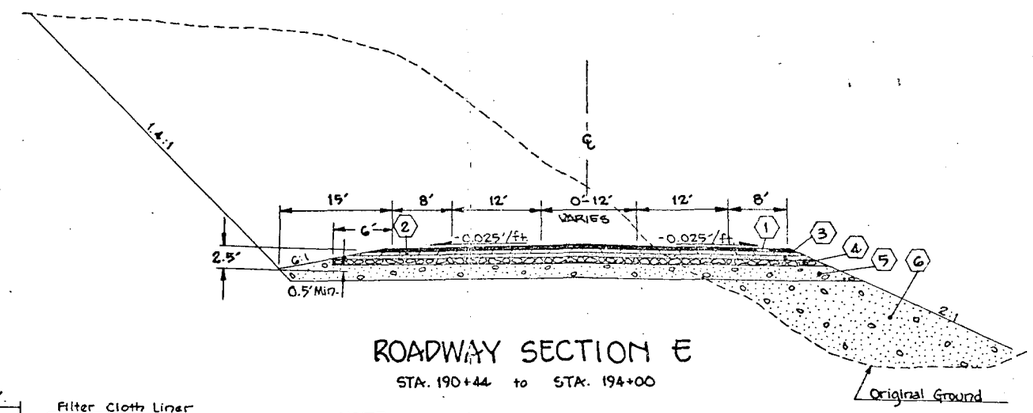


ROADWAY SECTION B

STA. 100+35.84 to STA. 110+45
STA. 118+45 to STA. 123+17

✱ Two Way Left Turn Lane STA. 100+35.84 to STA 106+33

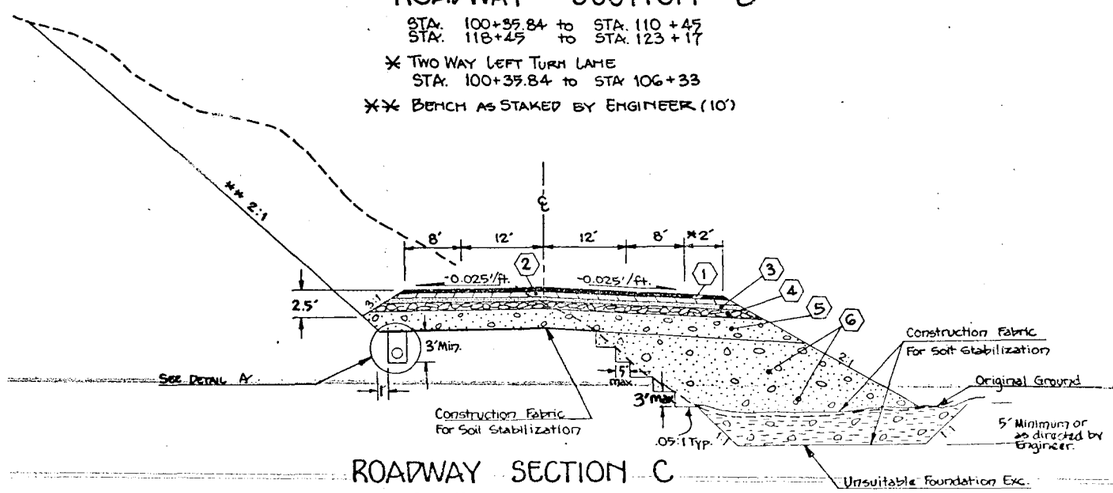
✱✱ Bench as Staked by Engineer (10')



ROADWAY SECTION E

STA. 190+44 to STA. 194+00

NOTE:
Embankment Area STA. 190+44 to 191+30 will require Construction Fabric for Soil Stabilization



ROADWAY SECTION C

STA. 137+87 to STA. 190+44

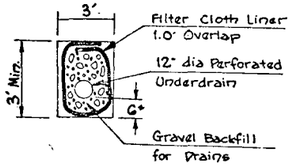
✱ Widening for curb and/or guardrail

STA. 158+00 to STA. 159+50 Rt.
STA. 163+70 to STA. 164+50 Lt.
STA. 163+70 to STA. 165+30 Rt.
STA. 166+90 to STA. 168+10 Rt.
STA. 171+50 to STA. 175+50 Rt.
STA. 177+90 to STA. 178+90 Rt.

✱✱ Slope Varies
STA. 175+00 to STA. 177+00 Lt & Rt. 3:1
STA. 140+20 to STA. 146+10 Lt & Rt. 3:1

No Unsuitable Foundation Excavation at:
STA. 177+00 to STA. 190+44

NOTE:
ALL ORIGINAL GROUND SLOPES UNDER EMBANKMENTS SHALL BE TERRACED AS SHOWN.



DETAIL A

INTERCEPTOR DRAIN

See Structure Notes for Location

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SURFACING DEPTHS

1	Asphalt Concrete Pavement Class B	0.15' Comp. Depth
2	Asphalt Concrete Pavement Class B	0.55' Comp. Depth
3	Crushed Surfacing Top Course	0.30' Comp. Depth
4	Gravel Base Class B	1.0' Comp. Depth
5	Gravel Borrow	2.0' or ℄ Comp. Depth
6	Gravel Borrow	Variable Depth

DRAWN C. Olson	REGION NO. 10	STATE WASH	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
CHECKED	JOB NUMBER L-7262				
PROJ. ENGR. J. HART	CONTRACT NO.				

HIGHWAY DIVISION

Washington State Department of Transportation

SR 109 SPUR

SHEET 1

APPENDIX D

D. J. Morrow

JOHN SPELLMAN
Governor

DUANE BERENTSON
Secretary

STATE OF WASHINGTON
DEPARTMENT OF TRANSPORTATION
Highway Administration Building • Olympia, Washington 98504 • (206) 753-6005

August 30, 1983

Mr. J. D. Zirkle
District 3 Administrator
Olympia, WA 98504

Re: C.S. 1402 & 140101, SR-101, L-7262
SR-109 Spur Intersection
West Hoquaim Connection - Stage I
MP 88.88 to MP 89.09
31240A

Dear Mr. Zirkle:

This project, as described in the District Soils Report and the PS & E, involves the widening of the Little Hoquiam River Bridge and construction of the intersection for the West Hoquiam connection.

We have finished our review of the Soils Report and concur in the recommendations and comments presented. We have previously approved the PS & E.

Submitted earlier were four samples representative of the subgrade materials which are expected to be encountered throughout the entire length of the proposed Spur. These samples are classified as frost-susceptible sandy silt, clay-sand and sandy silty gravel. The stabilometer "R" values of these materials range from 37 to 66. A swell equivalent of 5.65 psi was established for sample No. 3, the clay-sand. This material should be kept a minimum of 5.65 ft below finished grade.

Transmitted with this letter is a tabulation of the results of the tests performed on the above samples. While waiting for a response to our April, 1983 request for traffic data, we are using a traffic index of 7.2, derived from the PMS file, for this project.

Very truly yours,

A. J. Peters

A. J. PETERS, P. E.
Materials Engineer

RECD 9/1/83		
REF	TO	NOTED
✓	[illegible]	
✓	Asst	TLA
✓	CB	
✓	[illegible]	PK
	[illegible]	
✓	File	

AJP:mj
NCJ/DLS

Attachments

cc: D. J. Morrow
C. L. Slemmer

WASHINGTON
STATE HIGHWAY COMMISSION
DEPARTMENT OF HIGHWAYS
Materials Laboratory
Olympia

SOIL TEST DATA

Job No. L-7262 Proposed S.R. No. 101 Section West Hoquiam Connection

Field Sample No.	1.	2.	3.	4.		
Laboratory No.	S-4985	S-4986	S-4987	S-4988		
Sample from Station	142+00	142+00	142+00	120+00		
Offset	41' Lt.	41' Lt.	41' Lt.	40' Rt.		
Depth	4º - 5º	5º - 10º	10' - 11'5"	-		
Textural Classification	SANDY SILT	SANDY SILT	CLAY-SAND	SANDY SILTY GRAVEL		
Liquid Limit	—	—	68	—		
Plasticity Index	NP	NP	9	NP		
Grading - Maximum Size				2½"		
% Passing 1½"				97		
1"				93		
3/4"	100			87		
3/8"	100	100		61		
#4	92	98	100	31		
10	89	98	84	24		
40	80	92	77	18		
200	56	66	35	13		
pH Factor	5.2	5.4	5.3	6.9		
HRB Class. & Group Index	A-4(5)	A-4(7)	A-2-5(0)	A-1-a(0)		
Proctor (ASTM D698-42T):						
Opt. Moist. Cont.						
Max. Density						
Density in Place						
% of Max. Density						
Moist. Cont. in Place						
Hveem Stabilometer Test:						
Resistance Value "R"	59	37	(47)	66		
Equilibrium Swell Pressure (psi)			5.65			
Theoretical Total Surfacing and Bituminous Mat, MS Design Traffic Index 7.2	1.15'	1.80'	1.50'	1.00'		

DISTRIBUTION:
Materials Files
General Files
District Engineer
Dist. Soils Engr.
Plan. & Contracts
Hdq.Loc.Engr.
Bureau Pub. Roads
Soils Lab.

A. J. PETERS, P.E.
Materials Engineer

By N Jacobson

Date August 30, 1983

H.F. 26.02 (Rev.)

WASHINGTON
STATE HIGHWAY COMMISSION
DEPARTMENT OF HIGHWAYS
Materials Laboratory
Olympia

SOIL TEST DATA

Job No. L-5303 S.R. No. 109 Section SR-101, Hoquiam to Grays Harbor City Vic.

Field Sample No.	1.	2.	3.	4.	5.	6.
Laboratory No.	S-2102	S-2103	S-2104	S-2105	S-2106	
Sample from ~~Station~~ M.P.	1.3	1.3	1.6	1.6	1.8	106+00
Offset	12.5' Rt.	12.5' Rt.	13.5' Lt.	13.5' Lt.	13' Rt.	18' Rt
Depth	0.27'-1.1'	1.1'-1.5'	0.45'-0.6'	0.6'-2.0'	1.0'-1.9'	
Textural Classification	Silty Sandy Stone	Silty Sandy Stone	Clay-Sand Gravel	Silty Sandy Stone	Gravelly Clay-Sand	
Liquid Limit	—	—	38	—	41	
Plasticity Index	NP	NP	13	NP	12	
Grading - Maximum Size		2½"	2"	2½"	2½"	
% Passing 1½"	100	97	97	97	95	
1"	97	89	92	93	91	
3/4"	95	82	88	90	87	
3/8"	79	65	75	70	76	
#4	59	48	62	49	70	
10	40	34	50	32	64	
40	25	23	37	21	52	
200	14	13	24	13	35	9
pH Factor	6.4	6.2	6.4	6.5	6.4	
HRB Class. & Group Index	A-1-a (0)	A-1-a (0)	A-2-6 (0)	A-1-a (0)	A-2-7 (0)	
Proctor (ASTM D698-42T):						
Opt. Moist. Cont.						
Max. Density						
Density in Place						
% of Max. Density						
Moist. Cont. in Place						
Hveem Stabilometer Test:						
Resistance Value "R"	66	70	23	69	35	54
Equilibrium Swell Pressure (psi)						
Theoretical Total Surfacing and Bituminous Mat, Design Traffic Index 6.0	0.70'	0.60'	1.70'	0.65'	1.45'	

DISTRIBUTION:
Materials Files
General Files
District Engineer
Dist. Soils Engr.
Plan. & Contracts
Hdq.Loc.Engr.
Bureau Pub. Roads
Soils Lab.

H.F. 26.02 (Rev.)

ROGER V. LeCLERC, P.E.
Materials Engineer

By N. Jackson

Date 8/23/56

RECEIVED
SEP 1 1956
DISTRICT NO 3

DOT FORM 700-008 REVISED 11/77

DEPARTMENT OF TRANSPORTATION
INTRA-DEPARTMENTAL COMMUNICATION

DATE: April 1, 1983

FROM: D. D. Rude/C. Bauer
Phone: 3-7253

SUBJECT: L-7270 Grays Harbor College to SR 101
L-7262 W. Hoquiam Connection
Resistivity Readings & pH Values for Culvert Sites and Game Crossings

To: A. Williams/J. Schultz

Forwarded for your information and further processing are pH values and minimum resistivity readings for the subject projects.

L-7262 W. HOQUIAM CONNECTION

. Game Crossing Station 152+46

Minimum Resistivity : 3,600 ohm-cm
pH range : 5.4 - 6.4 (soil)
7.1 (water

. Culvert Station 158+00

Minimum Resistivity : 4,300 ohm-cm
pH range : 5.3 - 5.6 (soil)
7.4 (water)

. Game Crossing Station 164+12

Minimum Resistivity ; 4,700 ohm-cm
pH range : 5.4 - 5.7 (soil)
7.4 (water)

. Culvert Station 170 Vicinity

Minimum Resistivity : 3,900 ohm-cm
pH range : 4.9 - 5.6 (soil)
7.3 (water)

. Culvert Station 116+00

Minimum Resistivity ; 3,000 ohm-cm
pH range : 5.6 - 5.8 (soil)
7.1 (water)

RECD 4/4/83		
REF	TO	NOTED
✓	ENGR	DR
✓	HB	
	Check	
	Fwd	
	File	

L-7270 GRAYS HARBOR COLLEGE TO SR 101

. Culvert (Stockwell St. Vic.)
Minimum Resistivity : 4,000 ohm-cm
pH values : 5.6 - 6.4 (soil)
6.7 (water)

. Culvert (McFarlane St. Vic.)

Minimum Resistivity : 1,900 ohm-cm
pH Values 5.6 (soil)
(no water sample)

. Culvert (Schley Vicinity)

Minimum Resistivity : 2,000 ohm-cm
pH Values 5.6 (soil)
6.9 (water)

DDR:pk
CLB:CO
cc: Hdqts. Hydraulics/
McIntosh -
J. Hart
L-7270 Materials
L-7262 Materials
Serial File 83-77

DEPARTMENT OF TRANSPORTATION
INTRA-DEPARTMENTAL COMMUNICATION

DATE: April 12, 1983

FROM: A. Williams/J. Schultz
Phone:

SUBJECT: L-7270 Grays Harbor College to SR 101
L-7262 West Hoquiam Connection
Culvert Treatment

To: J. Hart

In reference to Mr. Rude's letter of April 1, 1983 concerning pH values and resistivity readings at the culvert and game crossing locations, we offer the following comments:

1. Except for the culvert at station 170 vicinity, all culvert and game crossing locations on these projects have pH values and resistivity readings within acceptable ranges for metal pipes. The July 15, 1981 revision to section 3-14 of the hydraulic manual indicates pH values of 5 to 8.5 and resistivity readings of 100 ohm-cm and above allow the use of metal culvert pipe alternates. In addition, section 3-14 indicates that the readings and values allow the use of steel or aluminum structural plate pipe for the game crossings.

2. I contacted Jack McIntosh of Headquarters Hydraulic Section on April 8, 1983, concerning the pH value of 4.9 at station 170 vicinity and it was his opinion that we could still use metal pipe alternates as provided in section 3-14 as revised.

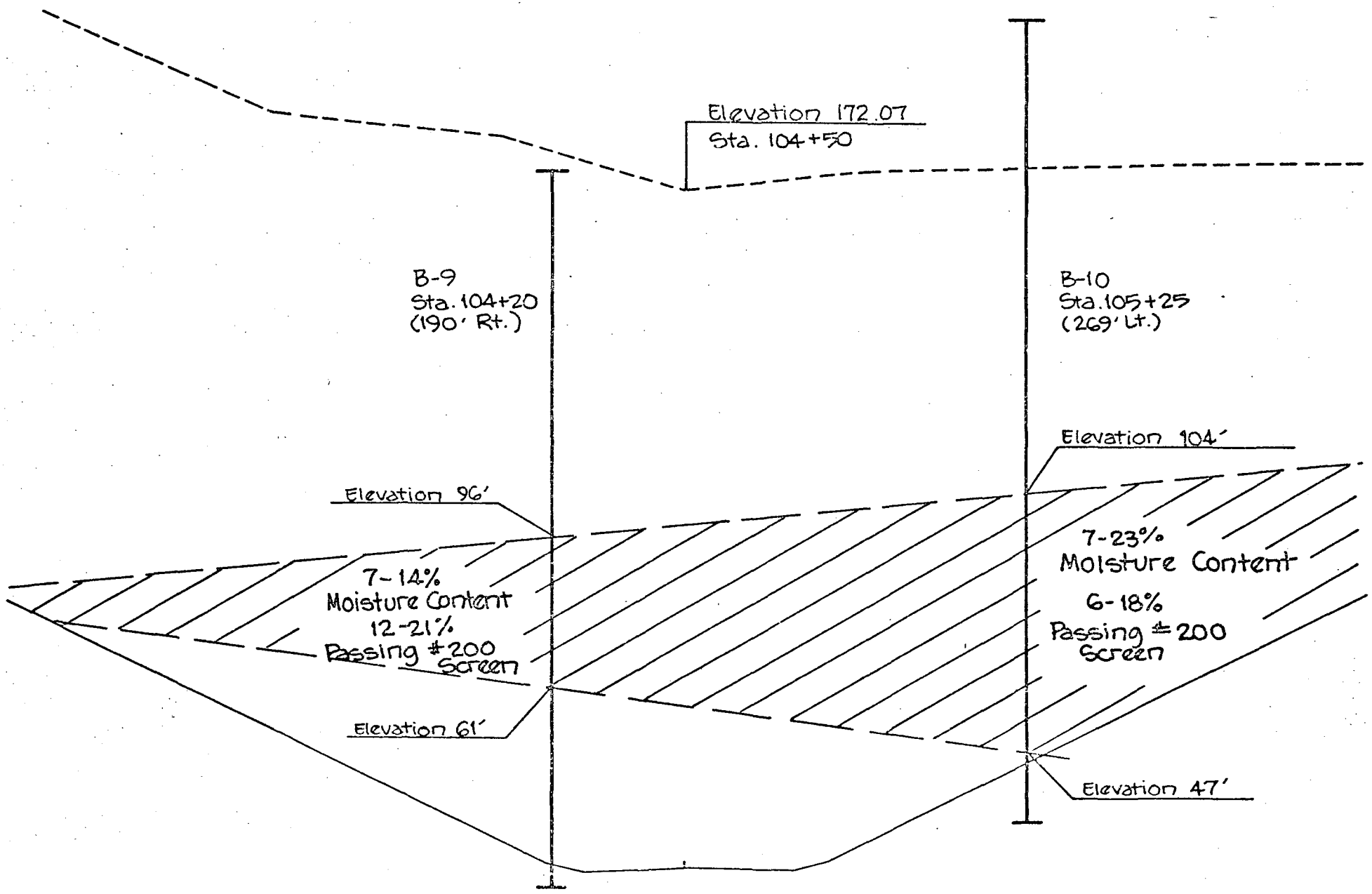
3. If your calculations indicate culvert velocities exceeding 8 fps and field reviews reveal an abrasive bedload condition, you may want to increase the wall thicknesses of your culverts or game crossings if they too transport water.

I have attached another copy of the revision to section 3-14 of the hydraulic manual for your convenience with reference to this letter.

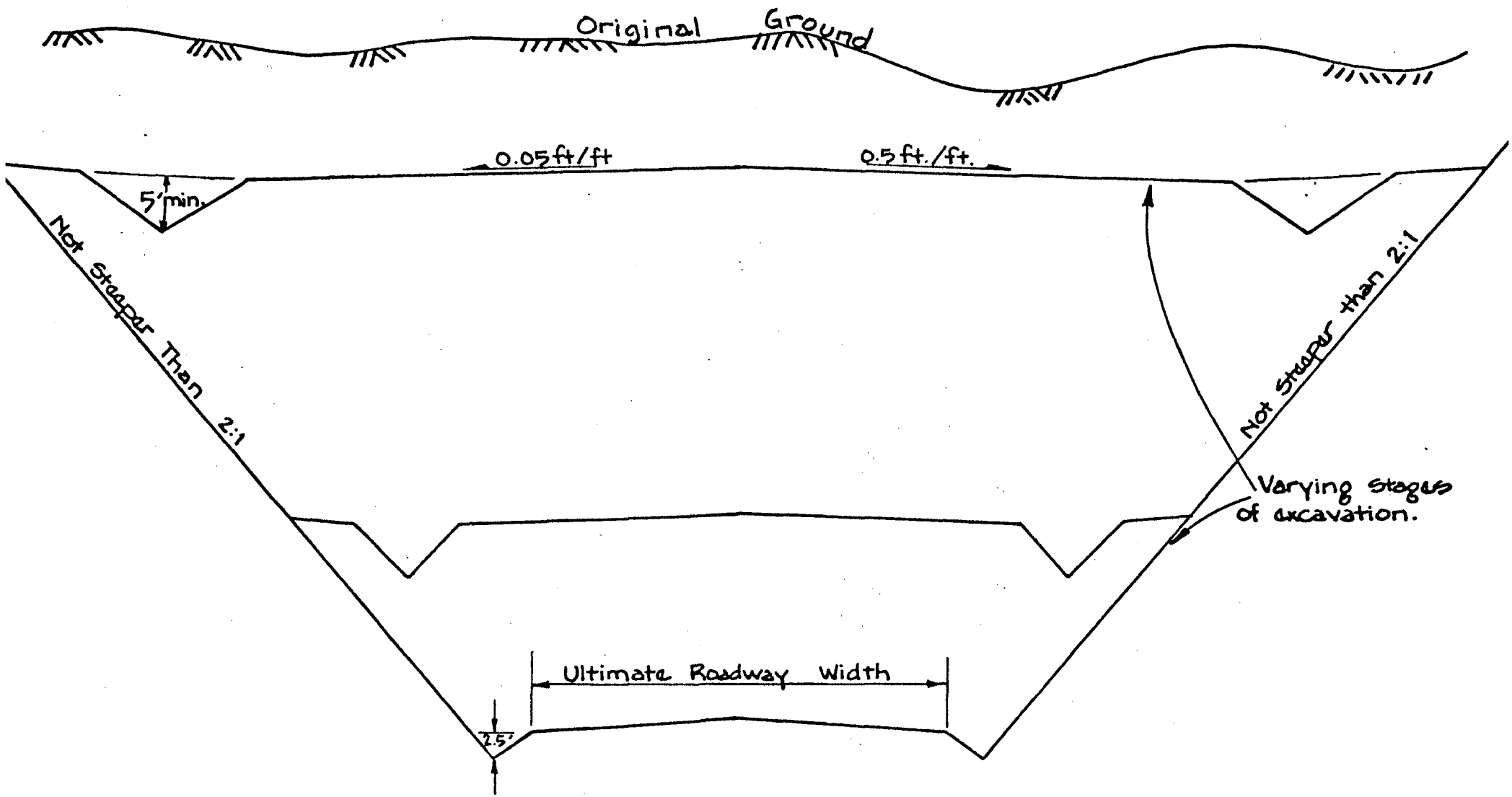
ALW/ad
JRS
Attach.
cc: A. Williams
J. McIntosh (HQ Hydraulics - KF 01)
D. Rude

4/13/83
Assr
CB
PK

APPENDIX E



Cross Section of Suitable Embankment Material

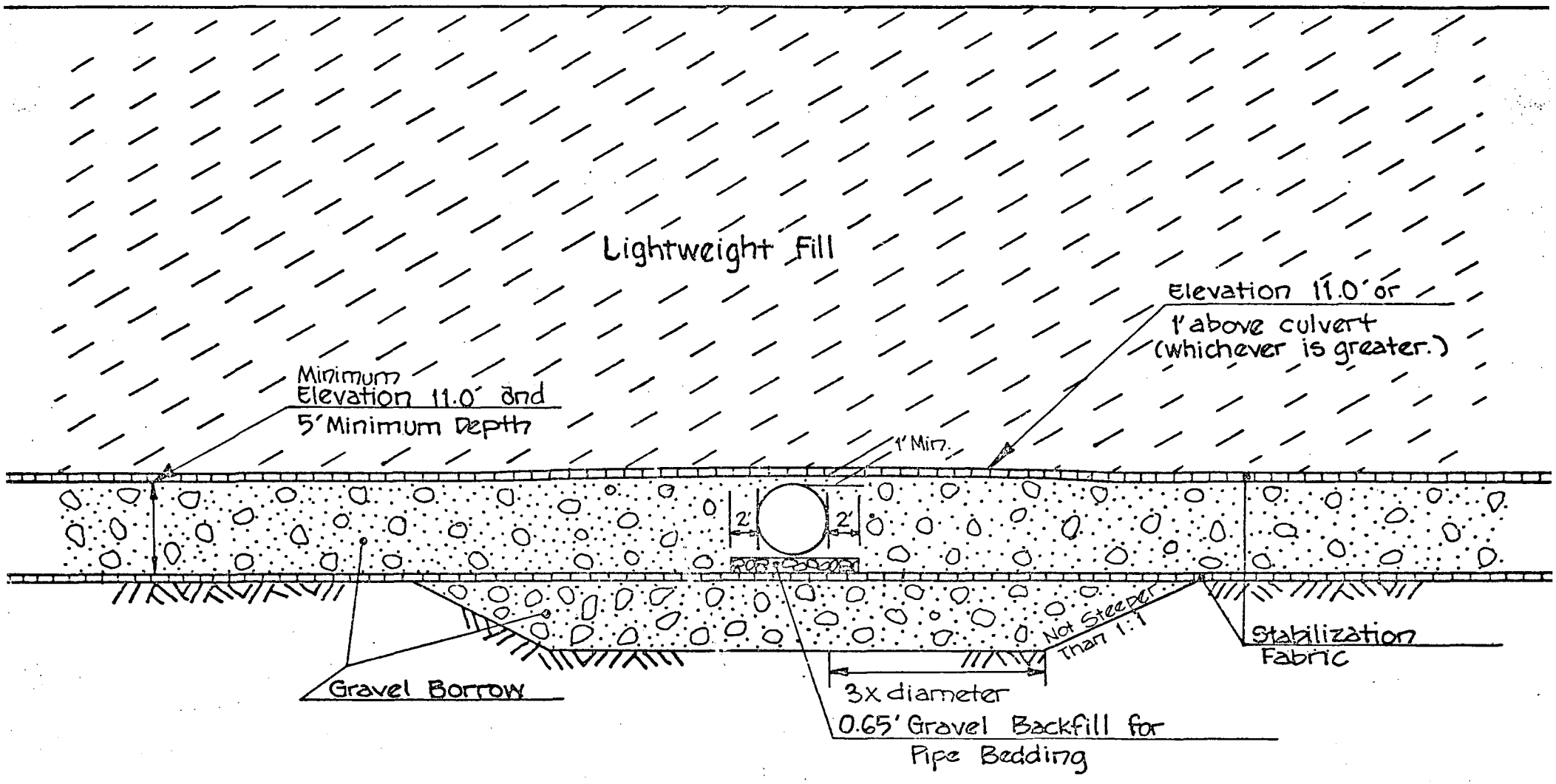


NOTES: Slope ditches to drain to the portal.
Erosion control will be required

Roadway Excavation
Dewatering Ditches

2

Station Vic: 115+50



Embankment Design - Culvert Area Lightweight Fill

APPENDIX F

Construction Fabric for Fill Areas

Where shown on the plans or where directed by the Engineer, the Contractor shall furnish and place construction fabric for soil stabilization in accordance with the details shown on the plans, these special provisions or as directed by the Engineer.

The material shall be a woven or nonwoven fabric consisting only of long chain polymeric filaments or yarns such as polypropylene, polyethylene or polyester formed into a stable network. The fabric shall be inert to commonly encountered chemicals and soil conditions. The material shall meet the following criteria:

Summary of Required Geotextile
Properties for SR 109 Spur

Property	Test Method	Min. Requirement
Grab Strength	ASTM D-1682	300 lbs.
Grab Strain @ Failure	ASTM D-1682	20%
Secant Modulus @ 10% Strain	ASTM D-1682	1500 lbs/in
Permeability		1×10^{-2} cm/sec

The fabric shall be stored in a dry place off the ground. Rolls shall be placed straight in piles. Under no circumstances, either during storage or placement, shall the material be exposed to sunlight for more than 40 hours.

The area to be covered shall be graded to a smooth, uniform condition free from ruts, potholes and protruding objects such as rocks or sticks. The fabric shall be spread immediately ahead of the covering operation. The fabric shall be smooth without excessive wrinkles. For soil stabilization, it shall be overlapped a minimum of three feet at all joints. The fabric will be covered with material designated in the plans or directed by the Engineer. Equipment placing the material will not be operated directly on the fabric.

Should the fabric be punctured or the overlaps disturbed, the backfill around the damaged or displaced area will be removed and the area repaired to the satisfaction of the Engineer.

Construction fabric will be measured by the square yard for the slope area actually covered.

The unit contract price per square yard for "Construction Fabric for Soil Stabilization", shall be full compensation for all labor, tools, equipment and materials necessary or incidental to construction of the fabric as specified.

SPECIAL PROVISION

SAWDUST BORROW IN PLACE

Where shown in the plans or where directed by the Engineer, the Contractor shall furnish, load, haul, place and compact sawdust borrow in place:

Materials

The sawdust borrow shall consist of 100 percent wood fibers, such as sawdust, hog fuel or wood chips. No composition wood products, such as particle or chip board, pressed hard board, or presto-log fragments shall be used in this embankment. Wood chips shall be non-uniform in size and irregular in shape so as to provide good interlock for internal stability of the sawdust fill. Maximum size shall be 6 inches in the greatest dimension. Sufficient smaller sized material shall be used to produce a uniformly dense fill.

Cedar sawdust borrow will not be allowed.

Construction

The sawdust borrow embankments may be constructed by dumping from trucks or by any other methods approved by the Engineer. Sawdust borrow shall be placed in lifts a maximum of 1 foot in depth of uncompacted material.

Compaction shall be obtained by covering the entire surface of each lift with a minimum of two passes with a D8-Caterpiller tractor or other similar compaction units as approved by the Engineer. Hauling units shall be routed over the entire fill for additional compaction.

Measurement

Sawdust borrow in place will be measured by the cubic yard of neat line volume in place.

SETTLEMENT INDICATING DEVICE

7-19-83
Revised

The contractor shall furnish and install a liquid settlement indicating device such as Settlement System S-6010 as distributed by Terra Technology Corporation, 3018 Western Avenue, Seattle, Washington; Model 51483 Liquid Settlement Transducer distributed by Slope Indicator Company, 3668 Albion Place North, Seattle, Washington, or an approved device that is equal. Approved devices shall be capable of producing a settlement system accuracy of 0.3 inches when used with the state's readout unit. The settlement system shall be capable of measuring a total settlement of at least 10 feet. The settlement indicating device shall be supplied with any necessary adaptors to make compatible the State's Model 51411A/AFC readout unit with the device provided by the Contractor. The Contractor shall install settlement indicating devices in accordance with these special provisions at the following approximate locations:

Station	Offset
See Section VII - Settlement Indicating Devices	

Settlement indicating devices shall be installed and fully operative before embankment construction will be permitted within the zone of influence as specified elsewhere in these special provisions. After installation, the device shall be tested under the supervision of the Engineer to ensure proper operating conditions. The Contractor shall take all percautions necessary to protect the settlement device from any disturbance or damage.

In the event of damage to any settlement indicating device installation, the Contractor shall immediately cease embankment construction within the zone of influence of the damaged unit until repairs have been made, or if repairs cannot be made, until another installation has been completed adjacent to the damaged unit. Repair or replacement of damaged units shall be at the Contractor's expense.

The State will not allow an extension of time or extra compensation for delay or expense incurred by the Contractor as a result of damage to, repair of, or replacement of any settlement indicating device installation.

Zone of Influence

The zone of influence for the embankments on this project is defined as all embankment within the following station limits:

Station	to	Station	Approximate Location of Device
114+80		116+50	115+50
139+40		140+10	139+40
146+70		147+40	147+00
151+40		153+10	152+45
158+00		159+50	158+00
163+80		165+10	164+12
169+60		171+00	169+90
171+00		173+00	172+20
177+00		178+50	177+50
179+00		181+50	180+00
186+00		188+00	187+00

The unit contract price per each for "Settlement Indicating Device" shall be full compensation for furnishing all labor, tools, equipment and materials for installing, repairing or replacing damaged installations, and maintaining in operating condition, for the life of the contract, each settlement indicating device.

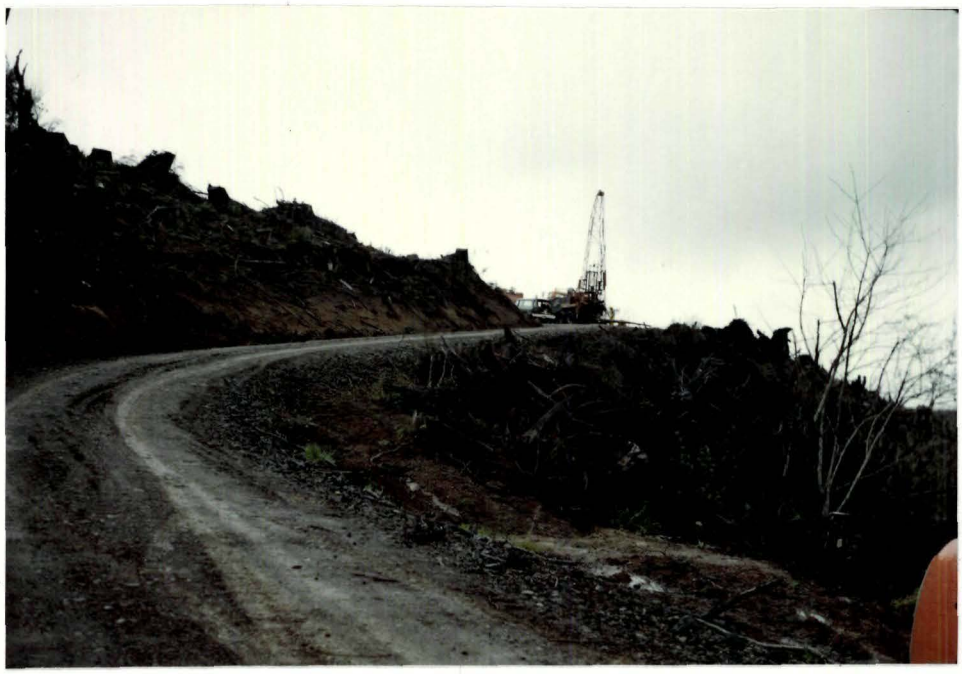
INSTALLATION PROCEDURE

1. The Contractor shall install the settlement devices at the locations where settlement is to be monitored as directed by the Engineer.
2. The sensor and interconnecting tubing shall be installed in a shallow trench a minimum 18 inches below ground level to minimize maintenance as well as interference with contractor operations. The settlement device tubing shall be arranged to allow sufficient slack for horizontal or differential settlements.
3. The reservoir terminal installation shall be in an easily accessible

location safely away from the work areas and on stable ground. The exact location of the trench and the reservoir terminal shall be as staked by the Engineer.

4. After the initial installation has been completed the settlement indicating system shall be tested and approved by the Engineer. After the installation is approved by the Engineer the trench shall be backfilled with sand (100% passing No. 10 sieve).

APPENDIX G



#1 Drilling Test Hole B-10
Station 105+25 269' Left

#2 Drilling Test Hole B-9
Station 104+20 190' Right
Facing West

#3 Facing north from SR 109

#4 Intersection of SR 109 and SR 109 Spur
Facing North

#5 Looking west along face of cut
Displaying siltstone

#6 Centerline SR 109 Spur
Station 101+00 approx.
Facing north

#7 Drilling culvert at Station 115+50 Centerline
Test Hole J-46

#8 Displaying, low flat areas
Water in foreground

#9 Test Hole J-47
Displaying swampy conditions and standing water

APPENDIX H

LOG OF TEST BORING — **WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

S.H. ____ S.R. 101A SECTION West Hoquiam By Pass Job No. L-7262

Hole No. B-1 Sub Section Culvert Cont. Sec. 1402

Station 187+00 Offset 50' Rt. Ground El. 7.2

Type of Boring Augers Casing 4" I.D. Augers to 32' W.T. El. 1.7

Inspector ____ Date September 28, 1982 Sheet 1 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	8		1 STD PEN 3 5 3 1	Loose, brown, moist, fine sandy SILT - with horizontal layering, traces of mica and organic material.
			S 2	Orange and tan, wet, SILT - with slight layering of silty fine sand and organic material, hard lumps of silt and a trace of medium sand.
5	1/24"		1/24" STD PEN 3	Very loose, gray, wet, organic, clayey, fine sandy SILT - with twigs.
			S 4	Gray, wet, SILT - with sticks and twigs.
10	1		1/12" STD PEN 1/12" 5	Very loose, gray, wet, organic, clayey, fine sandy SILT - with 2" layer of peat and some pieces of wood.
			S 6	Gray, moist, fine sandy, silty, layered, ORGANIC MATERIAL - with peat and traces of clay and mica.
15	1		1/12" STD PEN 1/12" 7	Very loose, gray, wet, organic, clayey, fine sandy SILT - with pieces of wood.
			S 8	Gray, wet, organic, clayey, fine sandy SILT - with pieces of wood
20	1		1/12" STD PEN	Very loose, gray, wet, organic, clayey, fine sandy SILT - with pieces of wood.

DOT FORM 381-003 REVISED 12/79

Original to Materials Engineer
Copy to Bridge Engineer
Copy to District Administrator

Copy to ____

FHWY Form 351-003-a (H. F. 26.66-A).
Revised 5-67.

Hole No. B-1 Sub Section Culvert Sheet 2 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			1/12" 9	
			S 10	Gray, wet, organic, SILT - with pieces of wood.
25	2		1 1 STD PEN	Soft, gray, wet, organic, clayey SILT - with 8" layer of peat.
			1 1 11	
			B C D U 12	
30	1		1/12" STD PEN	Very loose, gray, wet, organic, fine sandy SILT - with mica and twigs.
			1/12 13	
			A B C D U 14	
35	1		1/12" STD PEN	Very loose, gray, wet, organic, fine sandy SILT - with mica and twigs.
			1/12" 15	
				Test boring stopped 36' below ground elevation.
				This is a summary Log of Test Boring. Soil/rock descriptions are derived from visual field identifications and laboratoty tests.

LOG OF TEST BORING — **WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

S.H. ____ S.R. 101A SECTION West Hoquiam By Pass — Job No. L-7262

Hole No. B-2 Sub Section Culvert — Cont. Sec. 1402

Station 187+00 — Offset 50'Lt. — Ground El. 8.9

Type of Boring Augers — Casing 4" I.D. Augers to 32' — W.T. El. 2.7

Inspector ____ — Date October 1, 1982 — Sheet 1 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	7		2 3 STD PEN	Loose, brown, moist, horizontally layered, fine sandy SILT - with some gravel and traces of mica and organic material.
			4 3 1	
			S 2	Gray, wet, highly organic, fine sandy, SILT - with pieces of wood.
5	1		1/12" STD PEN	No recovery.
			1/12" 3	
			S 4 D	Gray-brown, wet, organic, fine sandy SILT - with pieces of wood, traces of mica and clay. Piece of log in sampler.
10	2		9 1 1 5	No sample submitted.
			1	
			S 6	No recovery.
15			A U	
			7	
			S 8	
20				

DOT FORM 351-003 REVISED 12/79

Original to Materials Engineer
Copy to Bridge Engineer
Copy to District Administrator

Copy to ____

HWY Form 351-003-a (H. F. 26.66-A).
Revised 5-67.

Hole No. B-2 Sub Section Culvert Sheet 2 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	1		1/12" STD PEN	No recovery.
			1/12" 9	
			S	Gray and brown, wet, clayey, organic SILT with pieces of wood.
			10	
25				
	100/6"		100 D 11	Log. No sample submitted.
30				
			U-12	No recovery.
35	4		2 2 STD PEN	Very loose, gray, wet, clayey, fine sandy SILT - with pieces of wood.
			2 2 13	

This is a summary log of Test Boring. Soil/rock descriptions are derived from visual field identifications and laboratory tests.

LOG OF TEST BORING — **WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

S.H. ____ S.R. 101 A SECTION West Hoquiam By Pass Job No. L-7262

Hole No. B-3 Sub Section Culvert Cont. Sec. 1402

Station 180+00 Offset 50' Lt Ground El. 10.4

Type of Boring Augers Casing 4" I.D. Augers to 32'6" W.T. El. 7.4

Inspector ____ Date October 5, 1982 Sheet 1 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	3		1 STD 1 PEN 2 1	Very loose, brown, moist, horizontally layered fine sandy SILT- with a trace of mica and organic material.
			S 2	No sample submitted.
				Log.
5	1/24"		1/24" STD PEN 3	Very loose, gray, wet, organic, SILT - with chunks of wood.
			S 4	Wet, brown and black, silty, fibrous PEAT - with a trace of sand.
				Sampler stopped on a log.
				Log.
10			1/12" STD PEN 5	
			9 4	Very soft, wet, dark brown, clayey, organic, SILT - with pieces of log.
			27 STD	Log
	14		9 5 PEN 6	Medium dense, brown, wet, SILT - with pieces of wood.
15				
			U 7	No recovery.
20	4		4 2 STD PEN 2	No recovery.

DOT FORM 351-003 REVISED 12/79

Original to Materials Engineer
Copy to Bridge Engineer
Copy to District Administrator

Copy to ____

WY Form 351-003-a (H. F. 26.66-A).
Revised 5-67.

Hole No. B-3 Sub Section Culvert Sheet 2 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			1 8	No recovery.
			U 9	Gray, wet, organic, fine sandy SILT - with pieces of wood.
	4		2 STD	
25	15		2 PEN 6 10 9	Medium dense, gray, moist, silty, fine SAND - with a trace of mica.
			U 11	No recovery.
			1 STD	Loose, gray, moist, silty, fine SAND - with a trace of mica
30	8		4 PEN 4 12 17	and organic material.
			8 STD	
	55		14 PEN 41 13 98	Very dense, gray, moist, slity, fine SAND - with a trace of mica.
35				
				Test broing stopped 34'6" below ground elevation.
				This is a summary Log of Test Boring. Soil/rock descriptions are derived from visual field identifications and laboratory tests.

LOG OF TEST BORING **WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

___ S.H. ___ S.R. 101A SECTION West Hoquiam By Pass Job No. L-7262

Hole No. B-4 Sub Section Culvert Cont. Sec. 1402

Station 180+00 Offset 50'Rt. Ground El. 7.4

Type of Boring Augers Casing 4" I.D. Augers to 32' W.T. El. 5.9

Inspector ___ Date October 7, 1982 Sheet 1 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	9		1 4 5 6 STD PEN 1	Loose, brown and gray, moist to dry, fine sandy SILT (fill material).
			A B U 2	
5	1/24"		1/24" STD PEN 3	Very loose, gray, wet, highly organic, clayey, fine sandy SILT - with 1" layers of peat.
			A B C U 4	
10	1		1/12" 1/12" STD PEN 5	Very loose, gray, wet, organic, clayey, fine sandy SILT - with pieces of wood.
			U 6	
15	2		1 1 STD PEN	Very loose, gray, wet, organic, clayey, fine sandy SILT - with pieces of wood.
	42		16 26 7	Log.
			A B C U 8	
20	1		1/12" STD PEN	Very loose, gray, wet, organic, clayey, fine sandy SILT - with a trace of mica and organic material.

DOT FORM 351-003 REVISED 12/79

Original to Materials Engineer
Copy to Bridge Engineer
Copy to District Administrator

Copy to ___

HWY Form 351-003-a (H. F. 26.66-A).
Revised 5-67.

Hole No. B-4 Sub Section Culvert Sheet 2 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			1/12" 9	
	1		1/12" STD PEN 1/12" 10	Very soft, gray, wet, organic, clayey, SILT - with 26" layer of peat.
25				
			A B C U D 11	
30	1		1/12" STD PEN 1/12" 12	Very loose, gray, wet, organic, clayey, fine sandy SILT - with 1" layer of peat and pieces of wood.
			A B C U D 13	
35	2		1 1 STD PEN 1 1 14	Very loose, gray, wet, organic, clayey, fine sandy SILT - with pieces of wood.
				Test boring stopped 36' below ground elevation.
				This is a summary Log of Test Boring. Soil/rock descriptions are derived from visual field identifications and laboratory tests.

LOG OF TEST BORING — **WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

S.H. ____ S.R. 101A SECTION West Hoquiam By Pass — Job No. L-7262

Hole No. B-5 — Sub Section Cut Section — Cont. Sec. 1402

Station 191+78 — Offset 23'Lt. — Ground El. 39.9

Type of Boring Augers — Casing 4" ID Augers to 32' — W.T. El. Not determined

Inspector ____ — Date October 20, 1982 — Sheet 1 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	8		4 4 STD PEN 1	Loose, gray, moist, horizontally layered, fine sandy SILT - with a trace of mica and organic material.
			U 2	No recovery.
5	10		5 4 STD PEN 6 6 3	Loose, gray, moist, silty, fine SAND.
			A U 4	
10	10		4 5 STD PEN 5 5 5	Loose, gray, moist, horizontally layered, fine sandy SILT - with a trace of mica and organic material.
				"A" tube sent to District 3 for moisture sample.
			A B C U 6	
15	11		3 5 STD PEN 6 8 7	Medium dense, gray, moist, horizontally layered, fine sandy SILT - with a trace of mica and organic material.
				Tubes "A" and "B" sent to District 3 for moisture sample.
			A B C U D E 8	
20			3 6 STD PEN	Medium dense, brown, wet, silty fine SAND and SILT.

DOT FORM 351-003 REVISED 12/79

Original to Materials Engineer
Copy to Bridge Engineer
Copy to District Administrator

Copy to ____

HWY Form 351-003-a (H. F. 26.66-A).
Revised 5-67.

Hole No. B-5 Sub Section Cut Section Sheet 2 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	14		8 8 9	
				Tubes "A", "B" and "C" sent to District 3 for moisture sample.
			A B C U	
			D E F 10	
25	7		1 3 STD PEN	Loose, brown, wet, silty fine SAND and SILT.
			4 3 11	
				Tubes "A" and "B" sent to District 3 for moisture sample.
			A B C U	
			D E 12	
30	12		4 6 STD PEN	Medium dense, brown, wet, silty fine SAND and SILT.
			6 6 13	
				Test boring stopped 31' below ground elevation.
35				
				This is a summary log of Test Boring. Soil/rock descriptions are derived from visual field identifications and laboratory tests.

LOG OF TEST BORING — **WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

S.H. ____ S.R. 101 A SECTION West Hoquiam By Pass Job No. L-7262

Hole No. B-6 Sub Section Cut Section Cont. Sec. 1402

Station 120+20 Offset 175' Lt. Ground El. 150.2

Type of Boring Augers Casing 4" ID Auger to 117' W.T. El. 67.7

Inspector ____ Date November 16, 1982 Sheet 1 of 6

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	7		1 STD 3 PEN; 4 9 1	Loose, wet, brown and gray, clayey, fine sandy SILT- with organic material.
	19		4 STD 9 PEN; 10 14 2	Medium dense, wet, brown and gray, clayey, fine sandy SILT - with organic material.
5				
	40		7 STD 15 PEN; 25 46 3	Desne, brown and orange, wet, layered fine sandy SILT - with lumps of silt, traces of clay and gravel.
10				
	53		14 STD 24 PEN; 29 37 4	Very dense, brown and orange, wet, clayey, fine sandy SILT - with a trace of fine sand.
15				
	110		23 STD 48 PEN; 62 5	Very dense, gray, dry, fine sandy SILT.
20				

DOT FORM 351-003 REVISED 12/79

Original to Materials Engineer
Copy to Bridge Engineer
Copy to District Administrator

Copy to ____

NWY Form 351-003-a (H. F. 26.66-A).
Revised 5-67.

Hole No. B-6 Sub Section Cut Section Sheet 2 of 6

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	100/6"		77 100 STD PEN 6	Very dense, gray, dry, fine sandy SILT - with very small layers of sand.
25				
	100/6"		50 100 STD PEN 7	Very dense, gray, dry, fine sandy SILT - with layers of sand.
30				
	85/6"		73 85 STD PEN 8	Very dense, gray, dry, fine sandy SILT - with layers of sand.
35				
	57/6"		30 57 STD PEN 9	Very dense, brown, moist, SILT - with fine to coarse sand and gravel.
40				
	100/4"		55 100/4" STD PEN 10	Very dense, brown and gray, moist, silty, fine to coarse sandy GRAVEL.
45				

WY Form 351-003-a (H. F. 26.66-A).
Revised 5-67.

Hole No. B-6 Sub Section Cut Section Sheet 3 of 6

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	100/6"		100 STD PEN 11	Very dense, brown and gray, moist, silty, fine to coarse sandy GRAVEL - with a trace of organic material.
50				
	51		9 21 30 78 STD PEN 12	Very dense, brown, dry, fine sandy SILT.
55				
	100/4"		100/4" STD PEN 13	Very dense, brown, dry, silty, fine to coarse sandy GRAVEL.
60				
	80/6"		80 STD PEN 14	Very dense, brown, dry, silty, fine to coarse sandy GRAVEL.
65				
	100/5"		60 100/5" STD PEN 15	Very dense, brown, dry, silty, fine to coarse sandy GRAVEL.
70				

Form 351-003-a (H. F. 26.66-A).
Revised 5-67.

Hole No. B-6 Sub Section Cut Section Sheet 4 of 6

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	90/6"		33 90 STD PEN 16	Very dense, brown, dry, very silty, fine to coarse sandy GRAVEL.
75				
	60/6"		25 60 STD PEN 17	Very dense, brown, dry, very silty, fine to coarse sandy GRAVEL.
80				
	21		7 8 STD PEN 13 80 18	Medium dense, brown, moist, fine sandy SILT - with a trace of mica and organic material.
85				
90	85/6"		85 STD PEN 19	Very dense, brown, moist, very silty, fine to coarse sandy GRAVEL.
	133		24 33 100 STD PEN 20	Very dense, brown, moist, layered, sandy silt and very silty, fine to coarse sandy GRAVEL - with small silt layers.
95				

HWY Form 351-003-a (H. F. 26.66-A).
Revised 5-67.

Hole No. B-6 Sub Section Cut Section Sheet 5 of 6

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	90/6"		90 STD PEN 21	Very dense, brown, moist, very silty, fine to coarse sandy GRAVEL.
100				
	68		16 31 37 STD PEN 22	Very dense, brown, moist, fine sandy SILT - with siltstone fragments.
105				
	48		12 18 30 STD PEN 23	Dense, gray, moist, fine sandy SILT - with organic material and a trace of clay.
110				
	21		7 8 13 20 STD PEN 24	Medium dense, gray, moist, fine sandy SILT.
115				
	38/6"		21 38 STD PEN 25	Very dense, brown, moist, fine sandy SILT.
				Test boring stopped 118' below ground elevation.
				Water level: 82.5' below ground elevation after setting over weekend.

WY Form 351-003-a (H. F. 26.66-A).
Revised 5-67.

Hole No. B-6 Sub Section Cut Section Sheet 6 of 6

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
				This is a summary Log of Test Boring. Soil/rock descriptions are derived from visual field identifications and laboratory tests.

LOG OF TEST BORING

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

S.H. ____ S.R. 101A SECTION Hoquiam By Pass Job No. L-7262

Hole No. B-9 Sub Section Cut Section Cont. Sec. 1402

Station 104+20 Offset 190' Rt. Ground El. 172.3

Type of Boring Augers & Tricone Casing 4" Augers to 112' W.T. El. 92.3

Inspector ____ Date February 25, 1983 Sheet 1 of 7

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	14		3 7 STD PEN 7 9 1	Medium dense, brown, moist, fine gravelly, very silty, fine SAND - with a trace of medium to coarse sand.
	16		3 6 STD PEN 10 13 2	Medium dense, brown, moist, fine gravelly, very silty, fine SAND - with a trace of medium to coarse sand.
5				
	31		10 13 STD PEN 18 14 3	Dense, brown, moist, fine gravelly, very silty, fine SAND- with a trace of medium to coarse sand.
10				
	23		8 11 STD PEN 12 13 4	Medium dense, brown, moist, fine gravelly, very silty, fine SAND - with a trace of medium to coarse sand.
15				
	22		6 5 STD PEN 17 28 5	Medium dense, brown, moist, layered, slightly clayey, fine sandy SILT - with organic material.
20				

DOT FORM 351-003 REVISED 12/79

Original to Materials Engineer
Copy to Bridge Engineer
Copy to District Administrator

Copy to ____

NAVY Form 351-003-a (H. F. 26.66-A).
Revised 5-67.

Hole No. B-9 Sub Section Cut Section Sheet 2 of 7

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	23		13 11 12 18 STD PEN 6	Medium dense, brown, moist, very silty fine SAND - with fine gravel.
25				
	131		22 47 84 STD PEN 7	Very dense, brown, moist, very silty, fine SAND - with fine gravel.
30				
	110		21 45 65 STD PEN 8	Very dense, brown, dry, very silty, fine SAND - with gravel.
35				
	105		18 30 75 STD PEN 9	Very dense, brown, dry, very silty, fine SAND - with gravel.
40				
	116		42 41 75 STD PEN 10	Very dense, brown, moist, slightly clayey, fine sandy SILT - with some gravel.
45				

HWY Form 351-003-a (H. F. 26.66-A).
Revised 5-67.

Hole No. B-9 Sub Section Cut Section Sheet 3 of 7

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	100		18 30 70 STD PEN 11	Very dense, brown, moist, clayey, fine sandy SILT - with organic material.
50				
	52		13 22 30 57 STD PEN 12	Very dense, gray, moist, fine sandy SILT.
55				
	85		9 25 60 STD PEN 13	Very dense, gray, moist, fine sandy SILT - with organic material.
60				
	32		10 12 20 45 STD PEN 14	Dense, gray, moist, fine sandy SILT - with organic material.
65				
	25		7 10 15 40 STD PEN 15	Dense, gray, moist, fine sandy SILT - with organic material.
70				

WY Form 351-003-a (H. F. 26.66-A).
Revised 5-67.

Hole No. B-9 Sub Section Cut Section Sheet 4 of 7

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	38		11 13 25 32 STD PEN 16	Dense, brown, moist, slightly clayey, fine sandy SILT- with some organic material.
75				
	100/5"		24 100/5" STD PEN 16	Very dense, brown, moist, fine sandy SILT - with layers of fine sand.
80				
	89/6"		89 STD PEN 18	Very dense, brown, moist, silty, fine to medium sandy, fine GRAVEL.
85				
	100/6"		100 STD PEN 19	Very dense, brown, dry, silty, fine to coarse sandy GRAVEL.
90				
	100/6"		100 STD PEN 20	Very dense, brown, dry, silty, fine to coarse sandy GRAVEL.
95				

NY Form 351-003-a (H. F. 26.66-A).
Revised 5-67.

Hole No. B-9 Sub Section Cut Section Sheet 5 of 7

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	120/6"		57 120 STD PEN 21	Very dense, brown, dry, very silty, fine gravelly, fine to coarse SAND.
100				
	100/5"		42 100 /5" STD PEN 22	Very dense, brown, dry, slity, fine to coarse sandy GRAVEL - with a 2" layer of brown silt.
105				
	100/2"		55 100 /2" STD PEN 23	Very dense, brown, dry, silty, fine to coarse sandy GRAVEL.
110				
	90/6"		40 90 STD PEN 24	Very dense, brown, dry, silty, fine to coarse sandy GRAVEL.
115				
	100/6"		45 100 STD PEN 25	Very dense, brown, moist, slightly clayey, silty fine to coarse, sandy GRAVEL.
120				

HWY Form 351-003-a (H. F. 26.66-A).
Revised 5-67.

Hole No. B-9 Sub Section Cut Section Sheet 6 of 7

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
125				
	100/5"		87 STD 100 PEN /5" 26	Very dense, brown, moist, slightly clayey, very silty, fine to coarse sandy GRAVEL.
130				
	129		33 STD 44 PEN 85 27	Very dense, brown, dry, clayey, very silty fine SAND.
135				
140				
	100/3"		37 STD 100/3" PEN 28	Very dense, brown, dry, clayey, fine sandy SILT - with organic material.
145				

WY Form 351-003-a (H. F. 26.66-A).
Revised 5-67.

Hole No. B-9 Sub Section Cut Section Sheet 7 of 7

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	150/4"		150/4" STD PEN 29	Very dense, gray, moist, silty, fine to coarse sandy GRAVEL - with a trace of clay.
150				
155				
	150/6"		150/6" STD PEN 30	Very dense, gray, moist, silty, fine to coarse sandy GRAVEL - with a trace of clay.
160				Test boring stopped 157'6" below ground elevation.
				This is a summary Log of Test Boring. Soil/rock descriptions are derived from visual field identifications and laboratory tests.
165				
170				

LOG OF TEST BORING — **WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

S.H. ____ S.R. 101 A SECTION Hoquiam By Pass — Job No. L-7262

Hole No. B-10 — Sub Section Cut Section — Cont. Sec. 1402

Station 105+25 — Offset 269'Lt. — Ground El. 201.04

Type of Boring Augers and Rotary — Casing 4" Augers to 122' — W.T. El. 174.04

Inspector ____ — Date March 14, 1983 — Sheet 1 of 8

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
				Brown, moist, sandy, silty GRAVEL.
	10		3 4 STD PEN 6 8 1	Layered, stiff, brown, moist, clayey silt and organic SILT - with twigs and wood.
5				
	10		2 3 STD PEN 7 9 2	Brown, moist, SILT, stiff.
10				
	19		4 9 STD PEN 10 11 3	Very stiff, gray, moist, fine sandy, silty CLAY.
15				
	8		3 4 STD PEN 4 6 4	Medium stiff, gray, moist, fine sandy, silty CLAY.
20				

DOT FORM 351-003 REVISED 12/79

Original to Materials Engineer
Copy to Bridge Engineer
Copy to District Administrator

Copy to ____

NWDY Form 351-003-a (H. F. 26.66-A).
Revised 5-67.

Hole No. B-10 Sub Section Cut Section Sheet 2 of 8

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	13		2 4 STD PEN 9 13 5	Medium dense, brown and gray, moist, fine sandy SILT - with chunks of siltstone.
25				
	6		2 2 STD PEN 4 6 6	Medium stiff, gray, wet, highly plastic SILT - with streaks of fine sand and mica.
30				
	15		3 6 STD PEN 9 17 7	Medium dense, gray, moist, fine sandy SILT - with chunks of siltstone.
35				
	110		13 50 STD PEN 60 8	Very dense, brown, dry, very silty, fine SAND - with chunks of siltstone.
40				
	85/6"		26 85 STD PEN 9	Very dense, brown, dry, very silty, fine gravelly, fine to coarse SAND.
				Material became softer at 44'.
45				

VY Form 351-003-a (H. F. 26.66-A).
Revised 5-67.

Hole No. B-10 Sub Section Cut Section Sheet 3 of 8

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	39		12 19 STD PEN 20 34 10	Dense, brown, dry, very silty, fine gravelly, fine to coarse SAND.
50				
	42		19 23 STD PEN 19 25 11	Dense, brown, moist, SILT - with a 4" layer of gray, organic, clayey silt and a 2" layer of fine sandy silt.
55				
	18		4 8 STD PEN 10 10 12	Medium dense, gray, moist, fine sandy SILT.
60				
	46		16 20 STD PEN 26 65 13	Dense, brown, moist, clayey, fine sandy SILT - with layers of silty sand.
65				
	100/3"		58 100 /3" STD PEN 14	Very dense, brown, dry, very silty, fine gravelly, fine to coarse SAND.
70				

NWY Form 351-003-a (H. F. 26.66-A).
Revised 5-67.

Hole No. B-10 Sub Section Cut Section Sheet 4 of 8

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	100/4"		44 100 /4" STD PEN 15	Very dense, brown, dry, very silty, fine to coarse SAND - with gravel.
75				
	96		20 40 56 STD PEN 16	Very dense, brown, dry, very silty, fine to coarse SAND - with gravel.
80				
	100/4"		65 100 /4" STD PEN 17	Very dense, brown, moist, very silty, fine to coarse sandy GRAVEL.
85				
	105		28 50 55 STD PEN 18	Very dense, brown, moist, very silty, fine to coarse SAND and fine GRAVEL.
90				
	120/6"		32 120 STD PEN 19	Very dense, brown, moist, fine sandy SILT - with pieces of siltstone.
95				

HWY Form 351-003-a (H. F. 26.66-A).
Revised 5-67.

Hole No. B-10 Sub Section Cut Section Sheet 5 of 8

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	147/7"		16 47 100 /1" STD PEN 20	Very dense, brown, dry, fine sandy SILT.
100				
	73/6"		19 73 STD PEN 21	Very dense, brown, dry, fine sandy SILT.
105				
	130/6"		130 STD PEN 22	Very dense, brown, moist, silty, fine to coarse sandy GRAVEL.
110				
	100/5"		100 /5" STD PEN 23	Very dense, brown, dry, very silty, fine to coarse SAND - with gravel.
115				
	100/5"		37 100 /5" STD PEN 24	Very dense, brown, moist, weathered, fine grained CONGLOMERATE.
120				

WY Form 351-003-a (H. F. 26.66-A).
Revised 5-67.

Hole No. B-10 Sub Section Cut Section Sheet 6 of 8

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	100/2"		45 STD 100 PEN /2" 25	Very dense, brown,dry, very silty, fine to medium SAND. Very dense, brown, moist, fine to coarse SAND - with fine gravel.
125				
	100/3"		100 STD /3" PEN 26	Very dense, brown, moist, fine to coarse SAND - with gravel.
130				
135				
	125/6"		125 STD PEN 27	Very dense, brown, moist, silty, fine to coarse sandy GRAVEL.
140				
145				

HWY Form 351-003-a (H. F. 26.66-A).
Revised 5-67.

Hole No. B-10 Sub Section Cut Section Sheet 7 of 8

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	100/3"		100 /3" STD PEN	Very dense, brown, moist, silty, fine to coarse sandy GRAVEL.
150				
155				
	100/4"		100 /4" STD PEN 29	Very dense, brown, moist, very silty, fine gravelly, fine to coarse SAND.
160				
165				
	60		16 20 40 100 /5" STD PEN 30	Hard, gray, moist, highly plastic SILT - with streaks of fine sand and mica.
170				

NY Form 351-003-a (H. F. 26.66-A).
Revised 5-67.

Hole No. B-10 Sub Section Cut Section Sheet 8 of 8

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
175				
	93/6"		28 STD 93 PEN 31	No recovery. Material on outside of the sampler looks like brown, SILT. The sample and spring retainer was sucked out of sampler.
180				Test boring stopped 177' below ground elevation.
				This is a summary log of Test Boring. Soil/rock descriptions are derived from visual field identifications and laboratory tests.
185				
190				
195				

LOG OF TEST BORING — **WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

S.H. ____ S.R. 101 A SECTION West Hoquiam By Pass Job No. L-7262

Hole No. C-1 Sub Section Cut Section Cont. Sec. 1402

Station 144+50 Offset 6' Lt. Ground El. 43.9

Type of Boring 3" Augers Casing 3" Augets to 23' W.T. El. Not determined

Inspector ____ Date August 25, 1982 Sheet 1 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			S 1	Orange and tan, wet, clayey, fine sandy SILT.
			S 2	Tan and rust-stained, clayey, fine sand SILT.
5	4		2 2 STD PEN; 2 4 3	Very loose, brown, moist, clayey, very silty, fine SAND - with a trace of organic material.
			A U 4	
10	5		1 3 STD PEN; 2 3 5	Loose, gray, wet, clayey, very silty, fine SAND.
			B C U 6	Gray, wet, fine sandy, clayey SILT.
15	5		D 1 3 STD PEN; 2 3 7	Gray, wet, fine sandy, clayey SILT.
20			A B C U 8	Wet, blue-gray, clayey, fine sandy SILT.

DOT FORM 351-003 REVISED 12/79

Original to Materials Engineer
Copy to Bridge Engineer
Copy to District Administrator

Copy to ____

Y Form 351-003-a (H. F. 26.66-A).
Revised 5-67.

Hole No. C-1 Sub Section Cut Section Sheet 2 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	2		1 1 STD PEN 1 1 9	Soft, gray, moist, clayey SILT.
25			A B C U 10	
	15		4 7 STD PEN 8 8 11	Medium dense, gray, dry, organic, very silty, fine SAND.
				Test boring stopped 27' below ground elevation.
30				This is a summary log of Test Boring. Soil/rock descriptions are derived from visual field identifications and laboratory tests.
35				
40				
45				

LOG OF TEST BORING **WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

S.H. ____ S.R. 101A SECTION West Hoquiam By Pass Job No. L-7262

Hole No. C-2 Sub Section Cut Section Cont. Sec. 1402

Station 142+00 Offset 24'Lt Ground El. 48.8

Type of Boring 3" Augers Casing 3" Augers to 28' W.T. El. Not determined

Inspector ____ Date August 25, 1983 Sheet 1 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	10		2 4 STD PEN 6 8 1	Loose, brown, dry, clayey, very silty, fine SAND.
5			S 2	Tan and rust, wet, slightly clayey, fine sandy SILT.
	9		4 4 STD PEN 5 5 3	Loose, brown, moist, clayey, very silty, fine SAND.
10			S 4	No recovery.
	4		1 1 STD PEN 3 2 5	Very loose, brown, moist, clayey, very silty, fine SAND.
15			S 6	Gray, wet, organic, SILT - with pieces of wood.
	4		1 2 STD PEN 2 3 7	Very loose, gray, moist, organic, layered, fine sandy SILT.
20			A B C U 8	

DOT FORM 351-003 REVISED 12/79

Original to Materials Engineer
Copy to Bridge Engineer
Copy to District Administrator

Copy to ____

Y Form 351-003-a (H. F. 26.66-A).
Revised 5-67.

Hole No. C-2 Sub Section Cut Section Sheet 2 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	3		2 1 STD PEN 2 3 9	Very loose, gray, moist, organic, very silty, fine SAND.
			A B C U 10	
25				
	3		1 1 STD PEN 2 2 11	Very loose, gray, moist, organic, very silty, fine SAND.
	4		1 2 STD PEN 2 3 12	Very loose, gray, moist, organic, layered, fine sandy SILT - with a trace of mica.
30				
				Test boring stopped 30' below ground elevation.
				This is a summary Log of Test Boring. Soil/ rock descriptions are derived from visual field identifications and laboratory tests.

LOG OF TEST BORING WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

S.H. _____ S.R. 101 A SECTION West Hoquiam By Pass Job No. L-7262

Hole No. C-3 Sub Section Cut Section Cont. Sec. 1402

Station 142+15 Offset 20'Lt. Ground El. 50.4

Type of Boring Augers Casing 3" Augers to 72' W.T. El. 32.3

Inspector _____ Date May 25, 1983 Sheet 1 of 4

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
5				
10				
15				
20				

DOT FORM 351-003 REVISED 12/79

Original to Materials Engineer
Copy to Bridge Engineer
Copy to District Administrator

Copy to _____

HWY Form 351-003-a (H. F. 26.66-A).
Revised 5-67.

Hole No. C-3 Sub Section Cut Section Sheet 2 of 4

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
25				
			B U 1	
30	4		1 2 STD PEN	Very loose, gray, wet, organic, very silty, fine SAND - with pieces of rotten wood and a trace of medium sand and mica.
			2 2 2	
			A B C U 3	
35	5		1 3 STD PEN	Loose, gray, wet, organic, SILT - with pieces of rotten wood.
			2 2 4	
			A B C U 5	
40	4		1 1 STD PEN	Soft, gray, moist, organic, clayey, SILT - with pieces of rotten wood.
			3 3 6	
			A B U 7	
45	8		5 4 STD PEN 8	Medium stiff, gray, moist, organic, fine sandy, clayey SILT- with pieces of rotten wood.

WY Form 351-003-a (H. F. 26.66-A).
Revised 5-67.

Hole No. C-3 Sub Section Cut Section Sheet 3 of 4

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			4 5	
			5 4 STD PEN	Loose, gray, wet, organic, clayey, fine sandy SILT.
	8		4 5 9	
50				
			A B C U 10	
			5 6 STD PEN	Medium dense, dark brown, moist, highly organic, very silty, fine SAND - with pieces of rotten wood.
55	13		7 8 11	
			A B C U 12	Gray, dry, clayey SILT.
60	48		7 17 STD PEN	Dense, gray, dry, organic, fine gravelly, fine to coarse sandy SILT.
			31 31 13	
	20		6 8 STD PEN	Medium dense, gray, moist, silty, fine to coarse sandy GRAVEL.
			12 12 14	
65				
	100/5"		4 100/5" STD PEN	Very dense, gray, moist, very silty, fine gravelly, fine to coarse SAND.
			15	
70				

Y Form 351-003-a (H. F. 26.66-A).
Revised 5-67.

Hole No. C-3 Sub Section Cut Section Sheet 4 of 4

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	180/9"		48 80 STD PEN	Very dense, gray, moist, very silty, fine gravelly, fine to coarse SAND.
			100/3" 16	
75				
				Test boring stopped 73'3" below ground elevation.
80				
				This is a summary Log of Test Boring. Soil/rock descriptions are derived from visual field identifications and laboratory tests.

LOG OF TEST BORING — **WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

S.H. ____ S.R. 101A SECTION Hoquiam By Pass Job No. L-7262

Hole No. C-4 Sub Section Cut Section Cont. Sec. 1402

Station 141+00 Offset 28' Lt. Ground El. 41.8

Type of Boring Augers Casing 3" Augers to 67' W.T. El. 28.4

Inspector ____ Date May 26, 1983 Sheet 1 of 4

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	2		1/12" STD PEN 1	Very loose, dark brown, moist, highly organic, very silty, fine to medium SAND - with pieces of wood and a trace of coarse sand.
			A U 2	
5	7		2 3 STD PEN 3	Loose, brown, wet, clayey, fine sandy SILT.
			4 5	
			A B C U 4	
10	7		3 3 STD PEN 5	Loose, brown and gray, wet, slightly organic, clayey, fine sandy SILT.
			4 6	
			A B U 6	
15	4		2 2 STD PEN 7	Soft, brown and gray, wet, clayey SILT.
			2 2	
			A B U 8	
20	5		2 2 STD PEN 9	Medium stiff, gray, wet, highly organic, fine sandy, clayey SILT - with pieces of rotten wood.

DOT FORM 351-003 REVISED 12/79

Original to Materials Engineer
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Copy to District Administrator

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Revised 5-67.

Hole No. C-4 Sub Section Cut Section Sheet 2 of 4

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			3 2	
			C U	
			D E 10	
25	4		3 2 STD PEN	Soft, gray, wet, organic, clayey SILT - with pieces of rotten wood.
			2 3 11	
			A B C U 12	
30	8		4 4 STD PEN	Medium stiff, gray, wet, organic, clayey SILT - with a 2" layer of siltstone pieces.
			4 4 13	
			A B C U 14	
35	7		2 3 STD PEN	Loose, gray, moist, fine gravelly, fine sandy SILT.
			4 4 15	
			A B C U 16	
40	7		3 3 STD PEN	Loose, gray, wet, organic, clayey, fine sandy SILT - with pieces of rotten wood.
			4 5 17	
			A B C U 18	
45	8		3 4 STD PEN 19	Medium stiff, gray, wet, organic, clayey SILT - with a trace of siltstone pieces.

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Hole No. C-4 Sub Section Cut Section Sheet 3 of 4

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			4 5	
			A B C U 20	
50	8		2 4 STD PEN	Loose, gray, wet, highly organic, clayey, fine sandy SILT.
			4 6 21	
			A B U 22	
55	16		5 8 STD PEN	Medium dense, gray, wet, very silty, fine to medium SAND.
			8 17 23	
	34		4 15 STD PEN	Dense, gray, dry, clayey, fine gravelly, fine SAND - with a trace of medium to coarse sand and organic material.
			19 24 24	
60				
	179/8"		16 79 STD PEN	Very dense, gray, moist, very silty, fine gravelly, fine to coarse SAND - with mica.
			100/2" 25	
65				
	181/9"		38 81 STD PEN	Very dense, gray, moist, very silty, fine to coarse sandy GRAVEL.
			100/3" 26	
70				Test boring stopped 68'3" below ground elevation.

Y Form 351-003-a (H. F. 26.66-A).
Revised 5-67.

Hole No. C-4 Sub Section Cut Section Sheet 4 of 4

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
				This is a summary log of Test Boring. Soil/rock descriptions are derived from visual field identifications and laboratory tests.

LOG OF TEST BORING — **WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

S.H. ____ S.R. 101A SECTION Hoquiam By Pass Job No. L-7262

Hole No. C-5 Sub Section Cut Section Cont. Sec. 1402

Station 143+00 Offset 28' Lt. Ground El. 47.3

Type of Boring Augers Casing 3" Augers to 37' W.T. El. 26.0

Inspector ____ Date May 27, 1983 Sheet 1 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	2		1 1 STD PEN	Very loose, dark brown, wet, organic, clayey, fine sandy SILT - with some pieces of wood.
			1 2 1	
			A U 2	
5	7		2 3 STD PEN	Loose, brown, wet, organic, fine sandy SILT.
			4 4 3	
			A B C U 4	
10	7		2 3 STD PEN	Loose, brown and gray, wet, slightly organic, clayey, fine sandy SILT.
			4 4 5	
			A B U 6	
15	3		1 1 STD PEN	Loose, brown and gray, wet, slightly organic, clayey, fine sandy SILT.
			2 2 7	
			A B C U 8	
20	7		D 4 3 STD PEN 9	a) Loose, gray, wet, organic, clayey, fine sandy SILT - with pieces of siltstone.

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Hole No. C-5 Sub Section Cut Section Sheet 2 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			4 5	b) Loose, gray, moist, organic, clayey, fine sandy SILT - with pieces of rotten wood.
			U 10	No recovery.
	54		18 27 STD PEN 27 34 11	Very dense, gray, moist, silty, fine gravelly, fine to coarse SAND.
25				
	78		19 45 STD PEN 33 45 12	Very dense, gray, moist, very silty, fine to coarse sandy fine GRAVEL.
30				
	55		12 20 STD PEN 35 50 13	Very dense, gray, moist, very silty, fine to coarse sandy fine GRAVEL.
35				
	100/5"		49 100 STD PEN /5" 14	Very dense, brown, moist, very silty, fine gravelly, fine to coarse SAND.
40				Test boring stopped 37'11" below ground elevation.
				This is a summary Log of Test Boring. Soil/rock descriptions are derived from visual field identifications and laboratory tests.
45				

LOG OF TEST BORING — **WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

S.H. ____ S.R. 101 A SECTION West Hoquiam By-Pass Job No. L-7262

Hole No. C-6 Sub Section Cut Section Cont. Sec. 1402

Station 144+00 Offset 14'Lt. Ground El. 41.1

Type of Boring Augers Casing ____ W.T. El. See Sheet 3

Inspector ____ Date June 1, 1983 Sheet 1 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	3		1/12" STD PEN	Very loose, brown, wet, clayey, fine sandy SILT.
			2 3 1	
			A B U-2	
5	14		3 6 8 8 STD PEN 3	Medium dense, brown, wet, clayey, fine sandy SILT - with pieces of siltstone and a trace of organic material.
			A B U-4	
10	4		2 2 2 2 STD PEN 5	Very loose, gray, wet, clayey, fine sandy SILT.
	2		1 1 1 1 STD PEN 6	a) Very loose, gray, wet, clayey, very silty fine SAND - with pieces of siltstone. b) Very loose, gray, wet, clayey, fine sandy SILT.
15				
			U-7	Gray, wet, clayey, very silty fine SAND.
20			5	

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Hole No. C-6 Sub Section Cut Section Sheet 2 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	10		5 STD 5 PEN 5 8	Loose, gray, moist, clayey, fine sandy SILT - with pieces of siltstone.
	8		2 STD 3 PEN 5 4 9	Loose, gray, moist, clayey, fine sandy SILT - with pieces of siltstone.
25				
	137		15 STD 37 PEN 100 10	Very dense, gray to brown, moist, silty, fine to coarse sandy GRAVEL. (2" layer of wet gravel from 28' to 28'2")
30				
	67		50 STD 32 PEN 35 11	Very dense, brown, wet, fine gravelly, fine to coarse sandy SILT.
35				
	38		24 STD 21 PEN 17	a) Dense, gray, moist, silty, fine to coarse, sandy GRAVEL.
40			20 12	b) Dense, gray, moist, fine to coarse, fine gravelly SILT.
	20		8 STD 8 PEN 12	Medium dense, gray, moist, very silty, fine SAND - with a trace of medium sand and mica.
45			21 13	

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Hole No. C-6 Sub Section Cut Section Sheet 3 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			7 STD	
	30		9 PEN 21	Dense, gray, moist, very silty fine SAND - with a trace of medium sand and mica.
50			35 14	
			10 STD	Very dense, gray, moist, fine gravelly, very silty, fine to coarse SAND.
	105		37 PEN 68 15	
55				
			15 STD	
	60		22 PEN 38 16	Very dense, gray, moist, layered, silty fine SAND and SILT.
60				
			15 STD	Very dense, gray, moist, layered, silty fine SAND and SILT - with a trace of organic material.
	61		23 PEN 38 17	
65				Test boring stopped 64' below ground elevation.
				Water level: Water showing on rods at 27' below ground elevation
				This is a summary Log of Test Boring. Soil/rock descriptions are derived from visual field identifications and laboratory tests.

LOG OF TEST BORING — **WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

S.H. ____ S.R. 101A SECTION West Hoquiam Bypass Job No. L-7262

Hole No. C-7 Sub Section Cut Section Cont. Sec. 1402

Station 145+45 Offset 28' Lt. Ground El. 47.8

Type of Boring Augers Casing 3" I.D. Augers to 63' W.T. El. 41

Inspector ____ Date June 3, 1983 Sheet 1 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	5		2 2 3 4 STD PEN 1	Medium stiff, brown, wet, organic, clayey SILT.
			A U-2	
5				
	6		1 3 3 4 STD PEN 3	Medium stiff, brown, wet, organic, clayey SILT.
			A_B U-4	
10				
	9		3 4 5 6 STD PEN 5	Loose, brown, wet, clayey, fine sandy SILT.
			A_{BC} U-6	
15			D	
	3		1 1 2 3 STD PEN 7	Soft, gray, moist, clayey SILT.
			A_{BC} U-8	
20			D	

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Hole No. C-7 Sub Section Cut Section Sheet 2 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	6		2 3 3 4 STD PEN 9	Loose, gray, moist, fine sandy SILT - with a trace of mica.
			B C U-10	
25	6		2 2 4 4 STD PEN 11	Loose, gray, moist, fine sandy SILT - with a trace of mica.
	6		2 2 4 4 STD PEN 12	Loose, gray, moist, organic, fine sandy SILT - with a trace of wood.
30				
			A B C U-13	
35				
	10		2 4 6 7 STD PEN 14	Loose, gray, moist, organic, slightly clayey, fine sandy SILT.
	23		7 11 12 12 STD PEN 15	Medium dense, brown, moist, slightly fine sandy SILT - with wood.
40				
	14		6 8 STD PENa	Medium dense, tan, wet, very silty, fine SAND.
45	155/11"		55 100/5" 16b	Very dense, gray and brown, dry, very silty, fine gravelly, fine to coarse SAND.

Hole No. C-7 Sub Section Cut Section Sheet 3 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	90		22 STD 40 PEN 50 17	Very dense, gray and brown, dry, very silty, fine gravelly,
50				fine to coarse SAND.
	61		9 STD 21 PEN 40 18 60	Very dense, brown, dry, very silty,fine SAND - with a trace
55				of medium sand and mica.
	24		16 STD 12 PEN 12 19 18	Medium dense, brown, moist, very silty, fine gravelly, fine
60				to coarse SAND - with a 2" layer mixed with seashells.
	46		10 STD 16 PEN 30 20 47	Dense, gray, dry, slightly clayey, very silty, fine to
65				coarse SAND - with a 3" layer of dark brown silt with seashells.
				Test boring stopped 65' below ground elevation.
				This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory tests.
70				

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LOG OF TEST BORING WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

S.H. ____ S.R. 101A SECTION Hoquiam Bypass Job No. L-7262

Hole No. C-10 Sub Section Cut Section Cont. Sec. 1402

Station 176+00 Offset 36' Lt. Ground El. 43.0

Type of Boring Augers Casing 3" I.D. Augers to 42'6" W.T. El. 9.5

Inspector ____ Date August 3, 1983 Sheet 1 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	2		1 1 1 1 STD PEN 1	Very loose, brown, moist to wet, fine sandy SILT - with some organic material.
			U-2	No Recovery. Piece of wood in bit.
5	6		2 3 3 3 STD PEN 3	Loose, brown, moist, fine sandy SILT.
			A B C U-4	
10	9		3 4 5 6 STD PEN 5	Loose, brown, moist, fine sandy SILT - with mica.
			A B C U-6	
15	4		2 2 2 3 STD PEN 7	Very loose, gray and brown, moist, organic SILT.
			A B C D U-8	
20			E 2 STD a	Loose, brown, wet, fine sandy SILT.

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Hole No. C-10 Sub Section Cut Section Sheet 2 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	10		6 4 5 PEN 9 b	Loose, brown and gray, moist, fine sandy SILT.
			B C D U- 10	
25			2 STD	
	6		2 4 5 PEN 11	Loose, gray, moist, organic, fine gravelly, fine to coarse sandy SILT.
			A B C U- 12	Gray, moist SILT - with siltstone.
30			4 STD	
	8		4 4 6 PEN 13	Loose, gray, moist, organic SILT - with pieces of wood. Water Table at 33'6".
			4 STD	
	10		5 5 6 PEN 14	Loose, gray, moist to wet, very silty, fine SAND - with mica.
35				
	145/11"		18 45 100/5" STD PEN 15	Very dense, gray, dry, fine sandy SILT - with a trace of mica.
40				
	75/6"		75 STD PEN 16	Very dense, gray, dry SANDSTONE.
45				Test boring stopped 43' below ground elevation.

DOT FORM 351-003A REVISED 4/80

Hole No. C-10 Sub Section Cut Section Sheet 3 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
				This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory tests.

DOT FORM 351-003A REVISED 4/80

LOG OF TEST BORING — **WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

S.H. ____ S.R. 101A SECTION Hoquiam By-Pass Job No. L-7262

Hole No. J-1 Sub Section Game crossing Cont. Sec. 1402

Station 164+12 Offset 73' Rt. Ground El. 6.6

Type of Boring Jet and Chop Casing 3" I.D. to 54' W.T. El. 6.2

Inspector ____ Date June 24, 1982 Sheet 1 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
				Muck.
			B U-1	
5			U-2	No recovery.
	1/24"		STD PEN 1/24" 3	Very soft, gray, wet, highly organic, SILT - with pieces of decaying wood.
10			U-4	No recovery.
				Piece of log in sampler.
	1		STD PEN 1/12" 1/12" 5	Very loose, gray, wet, organic, fine sandy SILT - with pieces of wood and a trace of medium sand.
15				
			U-6	No recovery.
	1		STD PEN 1/12" 1/12" 7	Very loose, gray, wet, organic, fine sandy SILT - with pieces of wood and a trace of medium sand.
20			A B C U-8	

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Hole No. J-1 Sub Section Game Crossing Sheet 2 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	2		1 1 STD PEN	Very loose, gray and brown, wet, organic fine sandy SILT - with layers of peat.
			1 1 9	
25			A B C U-10	
	2		1 1 STD PEN	Very loose, gray and brown, wet, organic SILT - with pieces of siltstone and a trace of mica.
			1 1 11	
30			A B C U-12	Gray and brown, wet, organic SILT - with layers of peat.
	2		1 1 STD PEN	Soft, brown and gray, wet, highly organic, SILT - with chunks of wood.
			1 1 13	
35			A B C U-14	
	3		2 2 STD PEN	Soft, brown and gray, wet, organic SILT - with pieces of sitlstone and layers of highly organic silt.
			1 3 15	
40			U-16	No recovery.
	3		1 2 STD PEN	Very loose, gray, wet, very silty, fine to coarse SAND - with a trace of fine gravel.
			1 1 17	
				Some small pieces of GRAVEL and ROCK fragments in wash.
45			1 2 STD PEN	

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Hole No. J-1 Sub Section Game Crossing Sheet 3 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	4		2 2 18	Very loose, brown and gray, highly organic, fine to coarse sandy SILT - with pieces of siltstone and wood.
50			A B C U-19	
	49		15 14 STD PEN 35 42 20	Hard, gray, dry, fine sandy, silty CLAY.
55				
	61		20 28 STD PEN 33 38 21	Very hard, gray, dry, fine sandy, silty CLAY.
60	96		26 43 STD PEN 53 22	Very hard, gray, dry, fine sandy, silty CLAY.
65	164		49 54 STD PEN 110 23	Very hard, gray, dry, fine sandy, silty CLAY.
				Test boring stopped 65'6" below ground elevation.
				This is a summary Log of Test Boring. Soil/rock descriptions are derived from visual field identifications and laboratory tests.

LOG OF TEST BORING WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

S.H. ____ S.R. 101 A SECTION Hoquiam By-Pass Job No. L-7262

Hole No. J-2 Sub Section Game Crossing Cont. Sec. 1402

Station 164+12 Offset ℄ Ground El. 8.1

Type of Boring Jet wash Casing 3"I.D. to 24' W.T. El. 7.2

Inspector ____ Date June 29, 1982 Sheet 1 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			A U-1	
	1		1/12" STD PEN 1/12" 2	Very soft, brown, wet, highly organic SILT.
5			A B U-3	
	1		1/12" STD PEN 1/12" 4	Very soft. brown, wet, highly organic SILT - with pieces of wood.
10			A B C U-5	Brown and gray, wet, organic SILT.
	1		1/12" STD PEN 1/12" 6	Very loose, brown and gray, wet, highly organic, fine sandy SILT - with small pieces of siltstone and a trace of medium sand.
15			A B C U-7	Gray, wet, SILT - with pieces of siltstone, gravel and wood.
	1		1/12" STD PEN 1/12" 8	Very loose, brown and gray, wet, sandy SILT - with layers of organic silt and pieces of wood.
20			B C U-9	Gray, wet, SILT - with pieces of wood.

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Hole No. J-2 Sub Section Game Crossing Sheet 2 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	1		1/12" STD PEN	Very loose, gray, moist, fine sandy SILT - with clay.
			1/12" 10	
25			C U-11	
			D E	
	22		7 8 STD PEN	Very stiff, gray, dry, fine sandy SILT - with clay.
			14 21 12	
30	37		11 17 STD PEN	Hard, gray, dry, fine sandy, clayey SILT.
			20 25 13	
35	22		8 10 STD PEN	No recovery.
			12 13 14	
40	18		4 7 STD PEN	Hard, gray, dry, fine sandy, clayey SILT.
			11 12 15	
45	45		16 22 STD PEN	Hard, gray, dry, fine sandy, silty CLAY.

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Hole No. J-2 Sub Section Game Crossing Sheet 3 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			23 24 16	
50	100/5"		49 100 /5" STD PEN 17	Very hard, gray, dry, fine sandy, clayey SILT.
				Test boring stopped 49'11" below ground elevation.
				This is a summary Log of Test Boring. Soil/rock descriptions are derived from visual field identifications and laboratory tests.

LOG OF TEST BORING — **WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

S.H. ____ S.R. 101 A SECTION Hoquiam Bypass Job No. L-7262

Hole No. J-3 Sub Section Game Crossing Cont. Sec. 1402

Station 164+12 Offset 56' Lt. Ground El. 8.2

Type of Boring Jet Wash Casing 3" I.D. to 25' W.T. El. 7.8

Inspector ____ Date July 1, 1982 Sheet 1 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			U-1	No recovery.
	7		1 2 STD PEN	Loose, brown, wet, highly organic SILT.
			5 3 2	
5				Rotten log 3'6" to 6'.
			A B U-3	
	1/24"		1/24" STD PEN 4	Very soft, brown, wet, highly organic, silty PEAT - with pieces of wood.
10				
			U-5	No recovery.
	1		1/12" STD PEN	Very loose, gray, wet, organic, fine sandy SILT - with clay.
			1/12" 6	
15				
			U-7	No recovery.
	16		3 7 STD PEN	a) Medium dense, gray, wet, fine sandy SILT - with clay and a trace of organic material.
			9 24 8	b) Medium dense, brown, moist, very silty, fine to coarse SAND - with fine gravel and wood fibers.
20				

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Hole No. J-3 Sub Section Game Crossing Sheet 2 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	38		15 18 STD PEN 20 21 9	Dense, brown, moist, very silty, fine to coarse SAND - with fine gravel and wood fibers.
25	39		7 13 STD PEN 26 30 10	Hard, gray, dry, fine sandy, silty CLAY.
30	64		20 21 STD PEN 43 65 11	Very hard, gray, dry, fine sandy,silty CLAY.
35	23		7 10 STD PEN 13 15 12	Very stiff, gray, dry, fine sandy, silty CLAY.
				Test boring stopped at 36' below ground elevation.
				This is a summary Log of Test Boring. Soil/rock descriptions are derived from visual field identifications and laboratory tests.

LOG OF TEST BORING — **WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

S.H. ____ S.R. 101A SECTION Hoquiam Bypass Job No. L-7262

Hole No. J-4 Sub Section Cut Section Cont. Sec. 1402

Station 162+25 Offset ℄ Ground El. 42.1

Type of Boring Jet wash Casing 3" I.D. to 24'6" W.T. El. Not determined.

Inspector ____ Date July 1, 1982 Sheet 1 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	2		1/12" STD PEN 1 2 1	Very loose, brown, moist, organic, fine sandy SILT - with twigs.
5	6		2 STD PEN 3 3 5 2	Loose, brown, moist, fine sandy SILT.
10			B C D U-3	
	2		1 STD PEN 1 1 2 4	Very loose, brown, moist, fine sandy SILT - with a trace of organic material.
15			B C U-5	
	2		1 STD PEN 1 1 2 6	Very loose, brown, moist, fine sandy SILT - with a trace of organic material.
20				

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Hole No. J-4 Sub Section Cut Section Sheet 2 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			U-7	
			5 STD	
	19		7 PEN 12	Medium dense, gray, moist, silty,fine SAND - with a trace of mica
			14 8	
25			7 STD	
	12		4 PEN 8	No recovery.
			9 9	
				Test boring stopped 26'6" below ground elevation.
				This is a summary Log of Test Boring. Soil/rock descriptions are derived from visual field identifications and laboratory tests.

LOG OF TEST BORING — **WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

S.H. ____ S.R. 101A SECTION Hoquiam Bypass Job No. L-7262

Hole No. J-5 Sub Section Fill Section Cont. Sec. 1402

Station 158+75 Offset ℄ Ground El. 7.6

Type of Boring Jet Wash Casing 3" I.D. to 29' W.T. El. Not determined.

Inspector ____ Date July 7, 1982 Sheet 1 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			A B U-1	
	1		1/12" STD PEN	Very loose, gray, wet, highly organic, clayey, fine sandy SILT - with pieces of wood.
			1/12" 2	
5			C U-3	Wet, brown, silty PEAT - with wood.
			D	
	6		1/12" STD PEN	Loose, gray and brown, wet, silty PEAT - with wood.
			6 2 4	
10			U-5	No recovery.
	2		1/12" STD PEN	Very loose, gray, wet, highly organic, clayey, fine sandy SILT - with pieces of wood.
			1 1 6	
15			C U-7	Gray, wet, highly organic, very silty, fine SAND - with pieces of siltstone and wood.
	1		1/12" STD PEN	Very loose, gray, wet, SILT - with siltstone pieces and pieces of wood.
			1/12" 8	
20			U-9	No recovery.

DOT FORM 351-003 REVISED 12/79

Original to Materials Engineer
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Hole No. J-5 Sub Section Fill Section Sheet 2 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	1		1/12" STD PEN 1 2 10	Very loose, gray and brown, highly organic, clayey, fine sandy SILT - with pieces of wood.
25			C U-11 D	
	14		5 STD 6 PEN 8 14 12	Medium dense, gray and brown, moist, fine sandy SILT - with a trace of clay.
30	10		2 STD 2 PEN 8 13 13	Loose, dense, gray and brown, moist, fine sandy SILT - with a trace of clay.
35	22		7 STD 7 PEN 15 20 14	Medium dense, gray and brown, moist, fine sandy SILT - with a trace of clay.
40	166		29 STD 78 PEN 88 15	Very hard, gray, dry, silty CLAY - with a trace of mica and organic material.
				Test boring stopped 40'6" below ground elevation.
				This is a summary log of Test Boring. Soil/rock descriptions are derived from visual field identifications and laboratory tests.

LOG OF TEST BORING — **WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

S.H. ____ S.R. 101 A SECTION Hoquiam Bypass Job No. L-7262

Hole No. J-6 Sub Section Culvert Cont. Sec. 1402

Station 158+00 Offset 80'Lt. Ground El. 8.4

Type of Boring Jet Wash Casing 3" I.D. to 20' W.T. El. Not determined

Inspector ____ Date July 7, 1982 Sheet 1 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			A B C U-1	Brown, wet, SILT.
	1		1/12" STD PEN 1/12" 2	Very loose, gray and brown, fine sandy SILT - with pieces of wood and organic material.
5				
	2		A U-3	
			1/12" STD PEN 1 1 4	Very loose, gray, wet, fine sandy SILT - with a trace of clay.
10				
	6		B C U-5 D	Brown and gray, wet, SILT.
			3 3 STD PEN 3 3 6	Loose, gray, wet, fine sandy SILT - with siltstone pieces and some organic material.
15				
	16		U-7	No recovery.
			5 9 STD PEN 7 11 8	Very stiff, gray, dry, fine sandy, silty CLAY - with a trace of mica and organic material.
20				

DOT FORM 351-003 REVISED 12/79

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Hole No. J-6 Sub Section Culvert Sheet 2 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	51		12 22 29 43 STD PEN 9	Hard, gray, dry, fine sandy, silty CLAY - with a trace of mica and organic material.
25	30		12 15 15 20 STD PEN 10	Very stiff, gray, dry, fine sandy, silty CLAY - with a trace of mica and organic material.
30	61		12 23 38 STD PEN 11	Very hard, gray, dry, fine sandy, silty CLAY - with a trace of mica and organic material.
35	82		25 35 47 STD PEN 12	Very hard, gray, dry, fine sandy, silty CLAY - with a trace of mica and organic material.
				Test boring stopped 36'6" below ground elevation.
				This is a summary log of Test Boring. Soil/rock descriptions are derived from visual field identifications and laboratory tests.

LOG OF TEST BORING — **WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

S.H. ____ S.R. 101A SECTION Hoquiam Bypass Job No. L-7262

Hole No. J-7 Sub Section Culvert Cont. Sec. 1402

Station 158+00 Offset ℄ Ground El. 5.6

Type of Boring Jet Wash Casing 3" I.D. to W.T. El. 5.1

Inspector ____ Date July 9, 1982 Sheet 1 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			B C U-1	Dark brown, wet, highly organic SILT.
	1		1/12" 1/12" STD PEN 2	Very loose, gray and brown, wet, highly organic, clayey, fine sandy SILT - with pieces of wood.
5			A B U-3	
	1		1/12" 1/12" STD PEN 4	Very loose, gray, wet, fine sandy SILT - with pieces of wood and a trace of clay.
10			B C U-5	
	10		D 2 2 8 14 STD PEN 6	Loose, gray, wet, very silty, fine to coarse SAND - with fine gravel and pieces of siltstone.
15	2		1/12" 1 6 STD PEN 7	Very loose, gray, wet, fine sandy SILT - with pieces of siltstone.
20			20 22 STD PEN	Hard, gray, dry, silty CLAY - with a trace of mica and organic material.

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Hole No. J-7 Sub Section Culvert Sheet 2 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	56		34 60 8	
25	70		15 25 45 STD PEN 9	Very dense, gray, dry, fine sandy SILT - with a trace of clay.
30	70		20 25 45 STD PEN 10	Very dense, gray, dry, fine sandy SILT - with a trace of clay.
35	82		27 32 50 STD PEN 11	Very dense, gray, dry, fine sandy SILT - with a trace of clay.
				Test boring stopped 35'6" below ground elevation.
				This is a summary Log of Test Boring. Soil/rock descriptions are derived from visual field identifications and laboratory tests.

LOG OF TEST BORING — **WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

S.H. ____ S.R. 101A SECTION Hoquiam Bypass Job No. L-7262

Hole No. J-8 Sub Section Culvert Cont. Sec. 1402

Station 158+00 Offset 80'Rt. Ground El. 4.5

Type of Boring Jet Wash Casing 3" I.D to 25' W.T. El. 4.2

Inspector ____ Date July 9, 1982 Sheet 1 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			A B U-1	
	1		1/12" 1/12" STD PEN 2	Very loose, brown and gray, organic, clayey, fine sandy SILT - with pieces of wood.
5				
			B C D U-3	
	2		1 1 STD PEN 1 1 4	Very loose, gray, wet, fine sandy SILT - with a trace of clay.
10				
			U-5	No recovery.
	25		10 13 STD PEN 12 15 6	Dense, brown, moist, silty, sandy, fine GRAVEL.
15				
	31		11 11 STD PEN 20 28 7	Dense, brown, moist, silty, sandy, fine GRAVEL.
20				

DOT FORM 351-003 REVISED 12/79

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Hole No. J-8 Sub Section Culvert Sheet 2 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	32		17 STD 14 PEN 18 29 8	Hard, gray, moist, fine sandy, silty CLAY - with a trace of mica and organic material.
25				
	30		12 STD 15 PEN 15 23 9	Very stiff, gray, moist, fine sandy, silty CLAY - with a trace of mica and organic material.
30				
	45		13 STD 19 PEN 26 41 10	Hard, gray, moist, fine sandy, silty CLAY - with a trace of mica and organic material.
				Test boring stopped 32' below ground elevation.
				This is a summary log of Test Boring. Soil/rock descriptions are derived from visual field identifications and laboratory tests.

LOG OF TEST BORING

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

S.H. ____ S.R. 101A SECTION Hoquiam Bypass Job No. L-7262

Hole No. J-9 Sub Section Cut Section Cont. Sec. 1402

Station 154+50 Offset ℄ Ground El. 46.4

Type of Boring Jet Wash Casing 3" I.D. to 40' W.T. El. Not determined.

Inspector ____ Date July 14, 1982 Sheet 1 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			U-1	No recovery.
	11		2 4 STD PEN 7 7 2	Medium dense, brown, moist, slightly clayey, fine sandy SILT .
5			A B U-3	
	5		2 2 STD PEN 3 6 4	Loose, brown, moist, slightly clayey, fine sandy SILT.
10			A B U-5	Brown, wet, fine sandy, clayey SILT.
	3		1 1 STD PEN 2 3 6	Very loose, brown, wet, fine sandy, clayey SILT.
15			A B U-7	
	4		1/12" 3 STD PEN 3 8	Very loose, brown, wet, fine sandy, clayey SILT.
20				

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Hole No. J-9 Sub Section Cut Section Sheet 2 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			B C U-9	Gray, wet, highly organic, fine sandy SILT - with a trace of medium sand.
	5		3 2 STD PEN	Loose, gray, wet, organic SILT.
			3 3 10	
25				
			B C U-11	
	12		5 7 STD PEN	Medium dense, gray, wet, very silty, fine to coarse SAND - with pieces of siltstone and atrace of fine gravel.
			5 4 12	
30				
	3		1 1 STD PEN	Very loose, gray, wet, organic, SILT - with a trace of fine gravel.
			2 3 13	
35				
			A B C U-14	Gray, wet, SILT - with siltstone pieces.
	6		2 2 STD PEN	Loose, gray, wet, very silty, fine to coarse sandy GRAVEL - with siltstone pieces.
			4 3 15	
40				
	46		12 16 STD PEN	Dense, gray, wet, very silty, fine to coarse SAND - with a trace of gravel.
			30 16	
				Test boring stopped 41'6" below ground elevation.
				This is a summary Log of Test Boring. Soil/rock descriptions are derived from visual field identifications and laboratory tests.

LOG OF TEST BORING — **WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

S.H. ____ S.R. 101A SECTION Hoquiam Bypass Job No. L-7262

Hole No. J-10 Sub Section Game Crossing Cont. Sec. 1402

Station G-2+30 Offset ℄ Ground El. 7.5

Type of Boring Jet Wash Casing 3" I.D. to W.T. El. 7.3

Inspector ____ Date July 15, 1982 Sheet 1 of 4

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			A B C U-1	
	1		1/12" STD PEN	Very soft, brown and gray, wet, highly organic SILT.
			1/12" 2	
5			U-3	Piece of log in sampler.
	4		3 3 STD PEN	Soft, brown, wet, highly organic SILT.
			1 2 4	
10			A	
			B C U-5	Gray, moist, clayey, organic SILT - with pieces of wood.
	1/24"		1/24" STD PEN 6	Very loose, gray, wet, SILT - with pieces of wood.
15				
			U-7	No recovery (piece of wood in sampler).
	1		1/12" STD PEN	Very soft gray, wet, fine sandy, silty CLAY - with twigs.
			1/12" 8	
20				

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Hole No. J-10 Sub Section Game Crossing Sheet 2 of 4

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			B C U-9	
			STD	
	1/24"		1/24" PEN 10	Very soft, gray, wet, organic, silty, slightly peaty CLAY - with pieces of wood.
25			A	
			B C U-11	
			1/ STD	
	1		12" PEN 1/12" 12	Very soft, gray, wet, organic, silty, slightly peaty CLAY- with pieces of wood.
30				
			C D U-13	
			E 1/ STD	
	1		12" PEN 1/12" 14	Very soft, brown, wet, highly organic CLAY - with pieces of wood.
35				
			B C D U-15	
			1/ STD	
	1		12" PEN 1/12" 16	Very soft, gray, wet, organic, silty, slightly peaty CLAY - with pieces of wood.
40				
			B C D U-17	
			1 STD	
	2		1 PEN 1 1 18	Soft, gray and brown, wet, highly organic SILT.
45			A	

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Hole No. J-10 Sub Section Game Crossing Sheet 3 of 4

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			B C U-19	
			2 STD	
	7		6 PEN 1	Loose, gray, wet, organic, very silty, fine to coarse sandy GRAVEL - with pieces of siltstone.
			1 20	
50				
			B C U-21	Gray, wet, organic, gravelly SILT.
	1/24"		1/24" STD PEN 12	Very loose, gray, wet, organic, fine sandy SILT - with a trace of fine gravel.
55			A	
			B C U-23	
			STD	
			8 PEN	Very dense, gray, dry, fine sandy SILT, - with a trace of organic material and mica.
	131		31 100 24	
60			40 STD	
	137		52 PEN 85 25	Very dense, gray, dry, fine sandy SILT - with a trace of organic material and mica.
65			50 STD	
	175/11"		75 PEN 100 /5" 26	Very dense, gray, dry, fine sandy SILT - with a trace of organic material and mica.
			STD	
70	100/6"		100 PEN 27	Very dense, gray, dry, fine sandy SILT - with a trace of organic material and mica.

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Hole No. J-10 Sub Section Game Crossing Sheet 4 of 4

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
				Test boring stoppec 70' below ground elevation.
				This is a summary Log of Test Boring. Soil/rock descriptions are derived from visaul field identifications and laboratory tests.

LOG OF TEST BORING — **WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

S.H. ____ S.R. 101 A SECTION Hoquiam Bypass Job No. L-7262

Hole No. J-11 Sub Section Game Crossing Cont. Sec. 1402

Station G-1+64 Offset ℄ Ground El. 8.15

Type of Boring Jet Wash Casing 3" to 44.5' W.T. El. 0.1

Inspector ____ Date July 20, 1983 Sheet 1 of 4

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			U 1	No recovery.
	4		22 2 STD PEN 2 2 2	Soft, dark brown, wet, slightly silty, woody, fibrous PEAT - with twigs and a log.
5				
			S 3	No recovery.
	1		1 1/12" STD PEN 1 1/12" 4	Soft, dark brown, wet, slightly silty, woody, fibrous PEAT - with pieces of wood.
10				
			S 5	No recovery.
			B U 6	Gray, wet, organic SILT - with pieces of wood.
15				
			S 7	
	1		1 1/12" STD PEN 1 1/12" 8	Very soft, gray, wet, organic, fine sandy, clayey SILT - with pieces of wood.
20				

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Original to Materials Engineer
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Hole No. J-11 Sub Section Game Crossing Sheet 2 of 4

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			S 9	
			STD PEN 10	Soft, gray, wet, organic, fine sandy, clayey SILT - with pieces of wood.
	2		1 1 1/12"	
25				
			S 11	
			STD PEN 12	Very soft, gray, wet, highly organic, fine sandy, clayey SILT - with pieces of wood.
	1		1 1/12" 1	
30				
			S 13	
			STD PEN 14	Very loose, gray, wet, highly organic, fine sandy SILT - with pieces of wood.
	2		1 1/12" 1	
35				
			S 15	
			STD PEN 16	Very loose, gray, wet, organic, very silty, fine to coarse sandy GRAVEL - with pieces of siltstone
	3		2 1 2 2	
40				
			S 17	
			STD PEN 18	Very loose, gray, wet, very silty, fine to coarse sandy GRAVEL - with pieces of siltstone.
	1/24"		1 1/24"	
45				

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Hole No. J-11 Sub Section Game Crossing Sheet 3 of 4

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			B C D U 19	
			8 STD	
	35		10 PEN 25	Dense, gray, dry, fine sandy SILT - with a trace of organic material and mica.
			32 20	
50			26 STD	
	84		34 PEN 50 21	Very hard, gray, dry, highly plastic SILT - with a trace of mica.
55			30 STD	
	87		30 PEN 57 22	Very hard, gray, dry, highly plastic SILT - with a trace of mica.
60			17 STD	
	84		32 PEN 52 23	Very hard, gray, dry, highly plastic SILT - with a trace of mica.
65			38 STD	Very hard, gray, dry, highly plastic SILT - with a
	139		39 PEN 100 24	trace of mica.
	170/6"		170 STD PEN 25	Very hard, gray, dry, highly plastic SILT - with a trace of mica.
70				Test boring stopped at 69'0".

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Hole No. J-11 Sub Section Game Crossing Sheet 4 of 4

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
				This is a summary Log of Test Boring. Soil/rock descriptions are derived from visual field identifications and laboratory tests.

LOG OF TEST BORING — **WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

S.H. ____ S.R. 101A SECTION Hoquiam Bypass Job No. L-7262

Hole No. J-12 Sub Section Game Crossing Cont. Sec. 1402

Station G-0+18 Offset ℄ Ground El. 8.15

Type of Boring Jet Wash Casing 3" to 40' W.T. El. 0.1'

Inspector ____ Date July 26, 1982 Sheet 1 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			U 1	No recovery.
	1		1/12" STD PEN 1/12" 2	Very soft, brown and gray, wet, highly organic, slightly clayey SILT - with wood.
5			U 3	No recovery.
	1		1/12" STD PEN 1/12" 4	Very soft, brown and gray, wet, organic, silty, slightly peaty CLAY.
10			U 5	Brown, wet, silty PEAT - with stems and leaves.
	1		1/12" STD PEN 1/12" 6	Very loose, brown and gray, wet, organic, fine sandy SILT.
15			U 7	No recovery.
			U 8	No recovery.
20			A U-9	

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Hole No. J-12 Sub Section Game Crossing Sheet 2 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			B C	
			1 STD	
	2		12" PEN 1 10	Very loose, brown and gray, wet, organic, fine sandy SILT - with pieces of wood and a trace of fine gravel.
			1	
25			B U	
			C 11 D E	
			1 STD	
	2		12" PEN 1 12	Very loose, gray, wet, very silty, fine to medium SAND - with a trace of coarse sand and pieces of siltstone.
			2	
30			A B U	
			13	Gray wet, organic, SILT.
			STD	
	8		1 12" PEN 8 14	Loose, gray, wet, silty, fine to coarse SAND - with a trace of fine gravel.
			13	
35			17 STD	
	46		17 29 PEN 15	Dense, brown, wet, very silty, fine to coarse sandy GRAVEL.
			36	
40			6 STD	
	38		14 24 PEN 16	Dense, gray, dry, fine sandy SILT - with a trace of mica.
			34	
45			40 STD	

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Hole No. J-12 Sub Section Game Crossing Sheet 3 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	168/9"		68 100 /3" PEN 17	Very dense, gray, dry, fine sandy SILT - with a trace of mica.
50	115/6"		115 STD PEN 18	Very dense, gray, dry, fine sandy SILT - with a trace of fine gravel and organic material.
55	150/2"		150 /2" STD PEN 19	Very dense, gray, dry, fine sandy SILT - with a trace of fine gravel and organic material.
				Teat boring stopped at 54'8" below ground elevation.
				This is a summary Log of Test Boring. Soil/rock descriptions are derived from visual field identifications and laboratory tests.

LOG OF TEST BORING — **WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

S.H. ____ S.R. 101A SECTION Hoquiam Bypass Job No. L-7262

Hole No. J-13 Sub Section Cut Section Cont. Sec. 1402

Station 150+38 Offset 32'Lt. Ground El. 42.8

Type of Boring Jet Wash Casing 3" I.D. to 25'6" W.T. El. Not determined.

Inspector ____ Date July 28, 1982 Sheet 1 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
				Forest Duff.
			B U-1	
			1 STD	
	7		3 PEN 4	Loose, brown, moist, clayey, very silty, fine SAND - with roots.
5			5 2	
			A	
			B C U-3	Brown, moist, clayey SILT - with slickensides, roots and a trace of fine gravel.
			2 STD	
	5		2 PEN 3	Loose, gray and brown, moist, clayey very silty, fine SAND.
10			4 4	
			A	
			B C D U-5	Gray and brown, moist, clayey SILT.
			E 1 STD	
	2		1 PEN 1	Very loose, gray and brown, wet, clayey, very silty, fine SAND.
15			1 6	
			A	
			B C D U-7	Brown and gray, wet, clayey SILT - with slickensides.
			E 1 STD	
	2		1 PEN 1	Very loose, brown and gray, wet, clayey, very silty, fine SAND.
20			1 8	

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Hole No. J-13 Sub Section Cut Section Sheet 2 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			A	
			B C D U-9	Wet, brown and gray, clayey SILT.
			E 1 STD	
	2		1 1 1 PEN 10	Very loose, gray, wet, organic, very silty, fine SAND.
25				
			A	
			B C D U-11	Gray, moist, organic, fine sandy SILT - with a trace of mica.
			E 1 STD	
	6		2 4 4 PEN 12	Loose, gray, moist, organic, clayey, very silty, fine SAND - with a trace of fine gravel.
30				
			A	
			B C D U-13	
			2 STD	
	8		4 4 7 PEN 14	Loose, gray, moist, clayey, very silty fine SAND - with siltstone pieces.
35				
				Test boring stopped 34'6" below ground elevation.
				This is a summary Log of Test Boring. Soil/rock descriptions are derived from visual field identifications and laboratory tests.

LOG OF TEST BORING — **WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

S.H. ____ S.R. 101 A SECTION Hoquiam Bypass Job No. L-7262

Hole No. J-14 Sub Section Culvert Cont. Sec. 1402

Station 148+95 Offset 62'Lt. Ground El. 14.8

Type of Boring Jet Wash Casing ____ W.T. El. Not Determined.

Inspector ____ Date July 28, 1982 Sheet 1 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			B U-1	
	2		1/12" STD PEN	Very loose, gray, wet, highly organic, fine sandy SILT - with pieces of wood.
			1 1 2	
5				
			B U-3	
	2		1/12" STD PEN	Very loose, gray, wet, fine sandy SILT - with pieces of wood and some gravel.
			2 2 4	
10				
			U-5	No recovery.
	7		2 2 STD PEN	Loose, gray, wet, very silty, fine to coarse sandy GRAVEL.
			5 4 6	
15				
	14		16 6 STD PEN	Medium dense, gray, wet, very silty, fine to coarse SAND - with some gravel and siltstone pieces.
			8 11 7	
20				

DOT FORM 351-003 REVISED 12/79

Original to Materials Engineer
Copy to Bridge Engineer
Copy to District Administrator

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NWY Form 351-003-a (H. F. 26.66-A).
Revised 5-67.

Hole No. J-14 Sub Section Culvert Sheet 2 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			A B C U-8	Gray, dry, SILT.
	109		8 24 85 STD PEN 9	Very dense, brown, dry, very silty, fine gravelly, fine to coarse SAND.
25				
	37		23 17 20 STD PEN 10	Dense, brown, dry, very silty, fine to coarse sandy GRAVEL.
30			91 STD	
	45		21 24 PEN 11	Dense, brown, moist, fine sandy SILT - with a trace of mica and clay.
35			STD	
	100/5"		100/5" PEN 12	No recovery.
40				
	125		120 50 75 STD PEN 13	Very dense, brown, moist, very silty, fine gravelly, fine to coarse SAND.
				Test Boring stopped 41'6" below ground elevation.
				This is a summary Log of Test Boring. Soil/rock descriptions are derived from visual field identifications and laboratory tests.

LOG OF TEST BORING — **WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

S.H. ____ S.R. 101 A SECTION Hoquiam Bypass Job No. L-7262

Hole No. J-15 Sub Section Culvert Cont. Sec. 1402

Station 148+70 Offset 60'RT. Ground El. 9.7

Type of Boring Jet wash Casing 3"I.D. to 40' W.T. El. Not determined.

Inspector ____ Date July 30, 1982 Sheet 1 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			A	
			B	
			U-1	
			1 STD	Loose, brown, wet, highly organic, fine sandy SILT - with
			6 PEN	pieces of wood.
	8		2	Log.
			1 2	
5				
			S-3	No recovery.
			U-4	Brown, wet, slightly silty, woody, fibrous PEAT.
10				
				Log 10' to 12'
			S-5	No recovery.
15	1		1/12" STD PEN 6	Very soft, brown, wet, slightly silty, woody, fibrous PEAT.
			U-7	No recovery.
	1		1/12" STD PEN	Very loose, brown and gray, moist, organic, very silty, fine to medium SAND - with pieces of siltstone, wood and a trace of coarse sand and fine gravel.
			1/12" 8	
20				

DOT FORM 351-003 REVISED 12/79

Original to Materials Engineer
Copy to Bridge Engineer
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Revised 5-67.

Hole No. J-15 Sub Section Culvert Sheet 2 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			U 9	Gray, wet, very silty fine SAND - with medium to coarse sand, fine gravel and pieces of wood.
	25		7 10 15 19 STD PEN 10	Dense, gray, moist, very silty, fine to medium SAND - with a trace of fine gravel and mica.
25	71		13 23 48 STD PEN 11	Very dense, gray, moist, silty, fine SAND.
30	46		22 30 16 37 STD PEN 12	Dense, brown, moist, layered, silty, fine SAND and SILT - with pockets of fine gravel and sand.
35	100/3"		47 100 /3" STD PEN 13	No recovery.
40	100/3"		80 100 /3" STD PEN 14	Very dense, brown, dry, very silty, fine to coarse sandy GRAVEL.
				Test boring stopped 40'9" bleow ground elevation.
				This is a summary Log of Test Boring. Soil/rock descriptions are derived from visual field identifications and laboratory tests.

LOG OF TEST BORING — **WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

S.H. ____ S.R. 101A SECTION West Hoquiam Bypass — Job No. L-7262

Hole No. J-16 Sub Section Culvert — Cont. Sec. 1402

Station 147+40 — Offset 70'Rt. — Ground El. 9.4

Type of Boring Jet Wash — Casing 3" casing to 14' — W.T. El. ____

Inspector ____ — Date August 20, 1982 — Sheet 1 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			U 1	No recovery.
	1		1/12" 1/12" STD PEN 2	Very loose, dark brown, fine sandy SILT - with wood and roots.
5			S 3	Gray and brown, wet, organic wood and PEAT fibers - with some silt layers and a trace of clay.
	1		1/12" 1/12" STD PEN 4	Very soft, gray, wet, clayey SILT-with a trace of organic material.
10			S 5	Gray and brown, wet, organic, wood and PEAT fibers - with some silt and a trace of clay.
	17		2 7 10 8 STD PEN 6	Medium dense, brown, moist, very silty, fine SAND - with siltstone fragments and traces of medium to coarse sand and mica.
15	37		21 19 18 23 STD PEN 7	Dense, brown, wet, very silty, fine to coarse SAND - with a trace of fine gravel and mica.
20	32		10 14 STD PEN	Dense, brown, wet, very silty fine SAND - with a trace of mica.

DOT FORM 351-003 REVISED 12/79

Original to Materials Engineer
Copy to Bridge Engineer
Copy to District Administrator

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Revised 5-67.

Hole No. J-16 Sub Section Culvert Sheet 2 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			18 22 8	
25	38		10 STD 16 PEN	Dense, gray, wet, very silty,fine SAND - with layers of fine sand, medium sand and a trace of mica.
			22 33 9	
30	47		12 STD 19 PEN	Dense, gray, dry, layered, fine SAND and SILT.
			28 120 10	
35	77		15 STD 27 PEN	Very dense, gray wet, silty,fine SAND - with a trace of mica.
			50 11	
				Test boring stopped 35.5' below ground elevation.
				This is a summary Log of Test Boring. Soil/rock descriptions are derived from visual field identifications and laboaratory tests.
40				
45				

LOG OF TEST BORING — **WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

S.H. ____ S.R. 101 A SECTION West Hoquiam Bypass Job No. L-7262

Hole No. J-17 Sub Section Culvert Cont. Sec. 1402

Station 146+70 Offset 70'Lt. Ground El. 14.5

Type of Boring Jet Wash Casing 3" casing to 20' W.T. El. Not determined.

Inspector ____ Date August 24, 1982 Sheet 1 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	1/18"		10 1/18" STD PEN 1	Very loose, brown, wet, highly organic, fine sandy SILT - with a 10" log.
5			S 2	Dark brown, saturated, chunks of decayed WOOD - with a layer of clayey silt.
	1/24"		1/24" STD PEN 3	Very loose, gray, wet, highly organic, very silty fine SAND.
10			S 4	Gray, wet, slightly clayey, fine sandy SILT - with large chunks of wood.
	3		1 1 2 2 STD PEN 5	Soft, gray, wet, highly organic, clayey SILT.
15			S 6	Green moist, very silty, fine to coarse SAND and fine GRAVEL.
	145		20 40 105 STD PEN 7	Very dense, brown, wet, very silty, fine to coarse sandy GRAVEL - with organic material.
20	57		12 19 STD PEN	Very dense, brown, moist, very silty, fine SAND - with a trace of mica and fine gravel.

DOT FORM 351-003 REVISED 12/79

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Revised 5-67.

Hole No. J-17 Sub Section Culvert Sheet 2 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			38 52 8	
25	30		8 14 STD PEN	Dense, gray, moist, fine sandy SILT - with siltstone fragments and a trace of mica and clay.
			16 20 9	
30	55		10 23 STD PEN	Very dense, gray, moist, silty, fine to coarse SAND and GRAVEL.
			32 10	
			40 65 100 STD PEN 11	Very dense, brown, moist, silty, fine to medium SAND - with fine gravel.
	165/9"		/3"	
35				
				Test boring stopped 33'9" from ground elevation.
				This is a summary Log of Test Boring. Soil/rock descriptions are derived from visual field identifications and laboratory tests.
40				

LOG OF TEST BORING — **WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

S.H. ____ S.R. 101 A SECTION West Houqiam Bypass Job No. L-7262

Hole No. J-18 Sub Section Culvert Cont. Sec. 1402

Station 139+60 Offset 60'Lt. Ground El. 16.5

Type of Boring Jet Wash Casing 3" casing to 24' W.T. El. Not determined.

Inspector ____ Date August 27, 1982 Sheet 1 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	1		1/12" STD PEN 1/12" 1	Very loose, gray, moist, organic, silty, fine SAND - with pockets of gravel, sand, roots, pieces of wood and a trace of mica.
5			A B C U 2	
	17		4 6 STD PEN 11 17 3	Medium dense, gray, wet, very silty, fine to coarse sandy GRAVEL.
10	45		20 22 STD PEN 23 28 4	Dense, gray, wet, very silty, fine to coarse sandy GRAVEL.
15	85		36 40 STD PEN 45 5	Medium dense, gray, wet, very silty, fine to coarse sandy GRAVEL.
20				

DOT FORM 351-003 REVISED 12/79

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Revised 5-67.

Hole No. J-18 Sub Section Culvert Sheet 2 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	111		25 STD 47 PEN 64 6	Very dense, gray, dry, very silty, fine to coarse SAND - with fine gravel.
25				
	100/2"		100 STD 100 PEN /2" 7	Very dense, gray, dry, very silty, fine to coarse SAND - with fine gravel.
				Test boring stopped 25'8" below ground elevation.
30				
				This is a summary Log of Test Boring. Soil/rock descriptions are derived from visual field identifications and laboratory tests.
35				
40				
45				

LOG OF TEST BORING — **WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

S.H. ____ S.R. 101 A SECTION West Hoquiam Bypass Job No. L-7262

Hole No. J-19 Sub Section Culvert Cont. Sec. 1402

Station 139+10 Offset 60'Rt. Ground El. 14.1

Type of Boring Jet Wash Casing 3" I.D. to 35' W.T. El. Not determined.

Inspector ____ Date September 1, 1982 Sheet 1 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	2		1/12" STD PEN 1 2 1	Very loose, brown, wet, clayey, very silty, fine SAND - with a trace of fine gravel and organic material.
			S 2	No recovery.
5				
	1		1/12" STD PEN	a) Very loose, gray and brown, wet, organic, fine sandy SILT - with pieces of siltstone.
			1/12" 3	b) Very soft, gray, wet, clayey SILT - with organic material.
			S 4	Gray, moist, fine to coarse sandy SILT - with sticks, twigs and a trace of fine gravel.
10				
			S 5	Gray, moist, fine sandy SILT - with a trace of fine gravel.
			1/12" STD PEN 1/12" 6	No recovery.
15	1			
			A B C U 7	
	4		1 1 3 3 STD PEN 8	Very loose, gray and brown, wet, clayey, very silty, coarse SAND.
20				

DOT FORM 351-003 REVISED 12/79

Original to Materials Engineer
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Revised 5-67.

Hole No. J-19 Sub Section Culvert Sheet 2 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			A B C U 9	
	6		1 2 4 4 STD PEN 10	Loose, gray, wet, fine sandy SILT - with a trace of mica.
25				
			A B C D U 11	Gray and brown, moist, organic SILT.
	135		2 25 110 STD PEN 12	a) Very hard, brown, wet, organic, fine sandy, clayey SILT - with a trace of medium sand and fine gravel. b) Very dense, gray, dry, silty, fine to coarse sandy GRAVEL.
30				
	100/4"		69 100 /4" STD PEN 13	Very dense, gray, dry, silty, fine to coarse sandy GRAVEL.
35				
	100/3"		76 100 /3" STD PEN 14	Very dense, gray, dry, very silty, fine to coarse sandy GRAVEL.
40	181/9"		40 81 100 /3" STD PEN 15	Very dense, brown, dry, very silty, fine to coarse SAND - with fine gravel.
				Test boring stopped 40'3" below ground elevation.
				This is a summary Log of Test Boring. Soil/rock descriptions are derived from visual field identifications and laboratory tests.

LOG OF TEST BORING WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

S.H. ____ S.R. 101A SECTION Hoquiam Bypass Job No. L-7262

Hole No. J-20 Sub Section Culvert Cont. Sec. 1402

Station 139+50 Offset ℄ Ground El. 14.0

Type of Boring Jet Wash Casing 3" I.D. to 25' W.T. El. Not determined

Inspector ____ Date September 1, 1982 Sheet 1 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	2		1 1 1 1 STD PEN 1	Very loose, brown, moist, clayey SILT - with branches and twigs and a trace of fine sand.
5				
			A B C U-2	
	1		1/12" 1/12" STD PEN 3	No recovery.
10			A B C U-4	
	2		1/12" 1 1 STD PEN 5	Very loose, gray and brown, wet, organic, clayey, fine sandy SILT.
15			A B C U-6	
	7		2 2 5 4 STD PEN 7	Loose, gray, moist, layers of SILT and fine sandy SILT - with cementations.
20				

DOT FORM 351-003 REVISED 12/79

Original to Materials Engineer
Copy to Bridge Engineer
Copy to District Administrator

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Hole No. J-20 Sub Section Culvert Sheet 2 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	6		2 3 3 4 STD PEN 8	Loose, gray, moist, layers of SILT and fine sandy SILT - with cementations.
25	175/9"		15 75 100/3" STD PEN 9	Very dense, gray, dry, silty, fine to coarse sandy GRAVEL.
				Test boring stopped 26'3" below ground elevation.
				This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory tests.

DOT FORM 351-003A REVISED 4/80

LOG OF TEST BORING — **WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

___ S.H. ___ S.R. 101A SECTION West Hoquiam Bypass Bridge Job No. L-7262

Hole No. J-21 Sub Section ___ Cont. Sec. 1402

Station 136+29 Offset 60' Rt. Ground El. 4.7

Type of Boring Chop Casing 3" I.D. Casing to 30' W.T. El. Not determined

Inspector ___ Date September 3, 1982 Sheet 1 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	1/24"		1/24" STD PEN 1	Very soft, brown, wet, silty PEAT - with rotten wood.
			U-2	Gray, wet, silty PEAT - with rotten wood and a trace of fine sand.
5			A B U-3	
	1		1/12" 1 1 STD PEN 3	Very loose, gray, wet, highly organic, fine sandy SILT - with pieces of wood.
10			S-5	Gray, moist, fine sandy SILT - with a trace of medium to coarse sand, clay and organic material.
	4		1 2 2 1 STD PEN 6	Very loose, gray, moist, very silty fine SAND - with layers of organic material.
15			A B C U-7	
	6		2 2 4 5 STD PEN 8	Loose, gray, moist, organic, fine sandy SILT - with a trace of mica.
20				

This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory tests.

DOT FORM 351-003 REVISED 12/79

Original to Materials Engineer
Copy to Bridge Engineer
Copy to District Administrator

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Hole No. J-21 Sub Section West Hoquiam Bypass Bridge Sheet 2 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			A B U-9	
			3 STD	Loose, gray, wet, very silty, fine to coarse SAND - with
	9		4 5 PEN 10	fine gravel, layered with sandy silt.
			4	
25				
	17		4 2 STD PEN	Medium dense, gray, wet, very silty, fine to coarse SAND - with fine gravel, layered with sandy silt.
			15 23 11	Medium dense, moist, gray, very silty, fine to coarse SAND - with fine gravel.
30				
	125/6"		75 125 STD PEN 12	Very dense, dry, gray, very silty, fine to coarse SAND -
				with fine gravel.
				Test boring stopped 31' below ground elevation.
35				

DOT FORM 351-003A REVISED 4/80

LOG OF TEST BORING — **WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

S.H. ____ S.R. 101A SECTION West Hoquiam Bypass Bridge Job No. L-7262

Hole No. J-22 Sub Section ____ Cont. Sec. 1402

Station 135+50 Offset 60' Lt. Ground El. 11.0 (contour)

Type of Boring Chop Casing 3" I.D. W.T. El. Not determined

Inspector ____ Date September 3, 1982 Sheet 1 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
				Forest Duff.
	1		1/ 12" 1/ 12" STD PEN 1	Very loose, brown, moist, very silty, fine SAND - with layers of organic material.
5			B_C D U-2	
	6		2 3 3 5 STD PEN 3	Loose, brown and gray, moist, very silty fine SAND - with small cementations and rust streaks.
10			A_{B_C} U-4	
	5		2 2 3 6 STD PEN 5	Loose, brown and gray, moist, very silty fine SAND - with small cementations and rust streaks.
15		??	B_C U-6	
	4		1 2 2 2 STD PEN 7	Very loose, gray, moist, layered, fine sandy SILT - with a trace of mica.
20			B_C U-8	

This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory tests.

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Original to Materials Engineer
Copy to Bridge Engineer
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Hole No. J-22 Sub Section West Hoquiam Bypass Bridge Sheet 2 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			D 8	
	4		2 2 STD PEN	Very loose, gray, wet, layered, fine sandy SILT - with a trace of mica.
			2 2 9	
25			B_C U-	
			D_E 10	
	6		2 3 STD PEN	Loose, gray, wet, layered, fine sandy SILT - with a trace of mica.
			3 3 11	
30	103		19 29 STD PEN	Gray, moist, very silty, fine to coarse SAND - with gravel.
			74 12	
35	175/10"		75 STD PEN	Very dense, brown, dry, very silty, fine to coarse SAND - with fine gravel.
			100/4" 13	
				Test boring stopped 35'4" below ground elevation.
				[illegible]
40				[illegible]
45				

DOT FORM 351-003A REVISED 4/80

LOG OF TEST BORING **WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

S.H. _____ S.R. 101A SECTION West Hoquiam Bypass Bridge Job No. L-7262

Hole No. J-23 Sub Section _____ Cont. Sec. 1402

Station 132+85 Offset 50' Rt. Ground El. 5.9

Type of Boring Chop Casing 3" I.D. to 34' L W.T. El. Not determined

Inspector _____ Date September 8, 1982 Sheet 1 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			1/ 12" STD PEN	Forest Duff.
	1		1/ 12" 1	Very loose, gray, moist, fine sandy SILT - with rotten wood.
			A U- 2	
5				Piece of wood 4'6" to 5'.
			A B C U- 3	
	1/24"		1/ 24" STD PEN 4	Very soft, gray, wet, highly organic, fine sandy, clayey SILT - with pieces of wood.
10				
			S 5	Gray, wet, fine sandy SILT - with peat, chunks of wood and a trace of clay.
	1/24"		1/ 24" STD PEN 6	Very soft, gray, wet, highly organic, fine sandy, clayey SILT - with pieces of wood.
15				
			S 7	Gray, wet, organic, fine sandy SILT.
	1		1/ 12" STD PEN 8 1/ 12"	Very soft, gray, wet, highly organic, fine sandy, clayey SILT - with pieces of wood.
20				

This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory tests.

DOT FORM 351-003 REVISED 12/79

Original to Materials Engineer
Copy to Bridge Engineer
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Hole No. J-23 Sub Section West Hoquiam Bypass Bridge Sheet 2 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			B C D U-9	
			E	
	1/24"		1/24" STD PEN 10	Very soft, gray, wet, highly organic, fine sandy, clayey SILT - with pieces of wood.
25				
			B C D U-11	
	1/24"		1/24" STD PEN 12	Very soft, gray, wet, organic, clayey SILT - with 3" layer of peat.
30			U-13	No Recovery. Log 29'8" to 30'6".
	4		11 2 2 2 STD PEN 14	No Recovery. Piece of wood in bit.
35				
	27		5 10 17 24 STD PEN 15	Dense, brown, moist, very silty, fine to coarse SAND and fine GRAVEL.
40	47		16 21 26 36 STD PEN 16	Dense, brown, moist, very silty, fine to coarse SAND and fine GRAVEL.
45			23 STD	

DOT FORM 351-003A REVISED 4/80

Hole No. J-23 Sub Section West Hoquiam Bypass Bridge Sheet 3 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	91		41 PEN 50 17 100	Very dense, gray, dry, very silty, fine to coarse SAND - with fine gravel.
				Test boring stopped 46'6" below ground elevation.
50				
55				

DOT FORM 351-003A REVISED 4/80

LOG OF TEST BORING — **WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

S.H. ____ S.R. 101A SECTION West Hoquiam Bypass Bridge Job No. L-7262

Hole No. J-24 Sub Section ____ Cont. Sec. 1402

Station 132+85 Offset 50' Lt. Ground El. 5.6

Type of Boring Chop Casing 3" I.D. to 34' W.T. El. Not determined

Inspector ____ Date September 10, 1982 Sheet 1 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			A B U-1	
			1/24" STD PEN 2	Very soft, brown, wet, organic, clayey SILT - with twigs.
5			S-3	Gray, wet, organic, clayey SILT.
	1		1/12" 1/12" STD PEN 4	Very soft, gray, wet, highly organic, fine sandy, clayey SILT - with a trace of mica.
10			S-5	
	1		1/12" 1/12" STD PEN 6	Very soft, gray, wet, organic, clayey SILT - with a trace of rust.
				Log.
15			32 47 10 11 STD PEN 7	No Recovery. Wood in sampler.
20			A B U-8	

This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory tests.

DOT FORM 351-003 REVISED 12/79

Original to Materials Engineer
Copy to Bridge Engineer
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Hole No. J-24 Sub Section West Hoquiam Bypass Bridge Sheet 2 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	2		1 1 1 1 STD PEN 9	Very loose, gray, wet, organic, fine sandy SILT.
25			A B C U- 10	
	1 4		1/12" 2 2 STD PEN 11	Very soft, gray, wet, organic, clayey SILT - with decomposed wood and a trace of rust. Log.
30			U- 12	No Recovery.
	2		1 1 1 1 STD PEN 13	Soft, gray, wet, highly organic, clayey SILT - with fibrous material.
35			U- 14	No Recovery.
	70		17 25 45 STD PEN 15	Very dense, brown, moist, very silty, fine to coarse sandy GRAVEL.
40	80/6"		75 80 STD PEN 16	Very dense, brown, moist, very silty, fine to coarse sandy GRAVEL.
	144		25 59 85 STD PEN 17	Very dense, brown, moist, very silty, fine to coarse sandy GRAVEL.
45				Test boring stopped 44'6" below ground elevation. Ground Elevation: Same as centerline elevation at Sta. 133+00.

LOG OF TEST BORING — **WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

S.H. ____ S.R. 101A SECTION West Hoquiam Bypass Bridge Job No. L-7262

Hole No. J-25 Sub Section ____ Cont. Sec. 1402

Station 131+00 Offset 50' Rt. Ground El. 5.6

Type of Boring Chop Casing 3" Casing to 34' W.T. El. Not Determined

Inspector ____ Date September 14, 1982 Sheet 1 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			S 1	
	1		1/12" STD PEN 2	Very loose, gray, wet, organic SILT - with pieces of wood and roots.
5			S 3	Gray, moist, organic, clayey SILT.
	2		1/12" STD PEN 4	Soft, gray, wet, organic, clayey SILT - with pieces of wood.
10			S 5	No Recovery.
	2		1 1 STD PEN 6	Soft, gray, wet, highly organic, fine sandy, clayey SILT - with pieces of wood and a trace of mica.
15			A B C U-7	
	2		1/12" STD PEN 8	Soft, gray, wet, highly organic, fine sandy, clayey SILT - with pieces of wood and a trace of mica.
20			A B C U-9	

This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory tests.

DOT FORM 351-003 REVISED 12/79

Original to Materials Engineer
Copy to Bridge Engineer
Copy to District Administrator

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Hole No. J-25 Sub Section West Hoquiam Bypass Bridge Sheet 2 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	1		1/ 12" STD PEN 1/ 12" 10	Very soft, gray, wet, highly organic, fine sandy, clayey SILT - with pieces of wood and a trace of mica.
25			A B C U-11	
	1		1/ 12" STD PEN 1/ 12" 12	Very soft, gray, wet, highly organic, fine sandy, clayey SILT - with pieces of wood and a trace of mica.
30			A B U-13	
	2		1/ 12" STD PEN 1 1 14	Soft, gray, wet, organic CLAY - with pieces of wood.
35			A B U-15	
	2		1 1 STD PEN 1 1 16	Soft, gray, wet, organic CLAY - with pieces of wood.
40			A B C U-17	
	2		1 1 STD PEN 1 2 18	Soft, gray, wet, organic CLAY - with pieces of wood.
45			A B U-19	

Hole No. J-25 Sub Section West Hoquiam Bypass Bridge Sheet 3 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			U-19	
	2		1/12" STD PEN	Soft, gray, wet, organic CLAY - with pieces of wood.
			1 1 20	
50			A B C U-21	
	1		1/12" STD PEN	Very soft, gray, wet CLAY - with pieces of wood.
			1/12" 22	
				Test boring stopped 53' below ground elevation.
55				
				Ground Elevation: 0.0' from centerline elevation at
				Sta. 131+00.
60				
65				
70				

DOT FORM 351-003A REVISED 4/80

LOG OF TEST BORING — **WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

S.H. ____ S.R. 101A SECTION West Hoquiam Bypass Bridge Job No. L-7262

Hole No. J-26 Sub Section ____ Cont. Sec. 1402

Station 131+00 Offset 50' Lt. Ground El. 5.8

Type of Boring Chop Casing 3" I.D. to 49'6" W.T. El. Not determined

Inspector ____ Date September 15, 1982 Sheet 1 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			B U-1	
	1/24"		1/24" STD PEN 2	Very soft, gray, wet, highly organic, fine sandy, clayey SILT - with rust and a trace of mica.
5			S 3	Gray, moist, organic, clayey SILT - with fibrous material.
	1		1/12" 1/12" STD PEN 4	Very soft, gray, wet, highly organic, fine sandy, clayey SILT - with a trace of mica.
10			S 5	Gray, wet SILT - with organic material, wood and a trace of mica.
	1/24"		1/24" STD PEN 6	Very soft, gray, wet, highly organic, peaty SILT.
15			S 7	Gray, moist, fine sandy SILT - with a trace of shells and mica.
	3		9 2 1 1 STD PEN 8	Soft, gray, wet, organic, clayey SILT - with small log and a trace of mica.
20				

This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory tests.

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Hole No. J-26 Sub Section West Hoquiam Bypass Bridge Sheet 2 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			U-9	No Recovery.
			1/ STD	
	1		12" PEN	Very loose, gray, wet, organic, fine sandy SILT - with a trace of mica.
			1/ 10	
			12"	
25			A U-	
			B 11	
			C	
			D	
			1/ STD	
	1		12" PEN	Very loose, gray, wet, organic, fine sandy SILT - with decomposed wood.
			1/ 12	
			12"	
30				
			B U-	
			C 13	
			D	
			1 STD	Soft, gray, wet, organic, clayey SILT.
	2		1 PEN	
			1 14	
			1	
35				
			B U-	
			C 15	
			1 STD	
	1		1/ PEN	Very soft, gray, wet, organic, fine sandy, clayey SILT - with a trace of mica.
			12" 16	
			1	
40			A U-	
			B 17	
			C	
			D	
			1 STD	
	4		2 PEN	Soft, gray, wet, organic, clayey SILT - with a 6" layer of highly organic silt, soft.
			2 18	
			2	
45			A	

Hole No. J-26 Sub Section West Hoquiam Bypass Bridge Sheet 3 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			B C D U-19	
			1/ 12" STD PEN 20	Very soft, gray, wet, organic, fine sandy, clayey SILT - with pieces of wood and a trace of shells and mica.
	1		1/ 12"	
50			A U-21	
			B C D	
			1 1 1 1 STD PEN 22	Soft, gray, wet, highly organic, fine sandy, clayey SILT - with pieces of wood.
	2			
55				Test boring stopped 53'6" below ground elevation.
				Ground Elevation: 0.2' above centerline elevation at Sta. 131+00.
60				
65				
70				

DOT FORM 351-003A REVISED 4/80

LOG OF TEST BORING

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

S.H. ____ S.R. 101A SECTION Hoquiam Bypass Job No. L-7262

Hole No. J-37 Sub Section Culvert Cont. Sec. 1402

Station 177+45 Offset 55' Lt. Ground El. 15.7

Type of Boring Jet Wash Casing 3" to 9'6" W.T. El. Not determined

Inspector ____ Date November 10, 1982 Sheet 1 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	1/24"		1/24" STD PEN 1	Very loose, gray, wet, organic, very silty, fine SAND - with roots.
			U-2	No recovery.
5			A B C U-3	
	22		3 7 15 45 STD PEN 4	Medium dense, gray and brown, dry, very silty, fine SAND - with a trace of mica.
10	100/4"		100/4" STD PEN 5	Very dense, gray, dry, very silty, fine SAND - with a trace of mica.
15	111/6"		111/6" STD PEN 6	Very dense, gray, dry, very silty, fine SAND - with a trace of mica.
20	140/3"		140/3" STD PEN 7	No recovery.

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Hole No. J-37 Sub Section Culvert Sheet 2 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
25	200/4"		200/4" STD PEN 8	Very dense, gray, dry, very silty, fine SAND - with a trace of mica.
30	100/5"		100/5" STD PEN 9	Very dense, gray, dry, very silty, fine SAND - with a trace of mica.
				Test boring stopped 29'11" below ground elevation.
35				
				This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory tests.

LOG OF TEST BORING

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

___ S.H. ___ S.R. 101A SECTION Hoquiam Bypass Job No. L-7262

Hole No. J-38 Sub Section Culvert Cont. Sec. 1402

Station 177+45 Offset 55' Rt. Ground El. 6.3

Type of Boring Jet Wash Casing 3" to 35' W.T. El. 6.3

Inspector ___ Date November 11, 1982 Sheet 1 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			U-1	No recovery.
	1/24"		1/24" STD PEN 2	Very loose, gray, saturated, fibrous, very silty PEAT - with twigs and rotten wood.
5				
	8		4 4 4 2 STD PEN 3	WOOD. No samples submitted.
			U-4	No recovery.
10			A B U-5	
	1		1/12" 1/12" STD PEN 6	Very loose, gray, saturated, very silty, highly organic SILT - with pieces of wood and a trace of clay and medium sand.
15				
			U-7	No recovery.
	1		1/12" 1/12" STD PEN 8	Very loose, gray, saturated, organic, very silty, fine SAND - with pieces of wood.
20				

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Hole No. J-38 Sub Section Culvert Sheet 2 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			A B C D E U-9	
	1		1/12" 1/12" STD PEN 10	Very loose, brown, wet, highly organic, very silty SAND - with pieces of wood.
25				
	1		B C D E U-11	
			1/12" 1/12" STD PEN 12	Very loose, gray, wet, organic, very silty, fine SAND - with pieces of wood.
30				
	3		A B U-13	
			2 2 1 1 STD PEN 14	No recovery.
35				
	2		U-15	No recovery.
			1/12" 1/12" 1 1 STD PEN 16	Very loose, gray, wet, organic, fine sandy SILT - with pieces of wood.
40				
	2		A B C D U-17	
			1 1 1 1 STD PEN 18	No recovery.
45				

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Hole No. J-38 Sub Section Culvert Sheet 3 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
				Test boring stopped 44' below ground elevation.
				This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory tests.

LOG OF TEST BORING — **WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

S.H. ____ S.R. 101A SECTION Hoquiam Bypass — Job No. L-7262

Hole No. J-39 — Sub Section Line Hole — Cont. Sec. 1402

Station 174+00 — Offset 30' Rt. — Ground El. 7.3

Type of Boring Jet Wash — Casing 3" to 20' — W.T. El. 7.4

Inspector ____ — Date November 17, 1982 — Sheet 1 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			STD PEN 1	
	1/24"		1/24"	Very loose, dark brown, wet, highly organic, mossy, fibrous PEAT - with silt, clay, roots, and pieces of wood.
5				
			U-2	No recovery.
	5		1 2 3 4 STD PEN 3	Loose, brown, wet, fine sandy SILT - with a trace of mica.
10				
	15		5 7 8 9 STD PEN 4	Medium dense, brown and gray, wet, fine sandy SILT - with a trace of rust.
			B C U-5	
15				
			A B C D U-6	
	12		3 5 7 6 STD PEN 7	No recovery.
20				

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Hole No. J-39 Sub Section Line Hole Sheet 2 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			U-8	No recovery.
	4		1 2 2 3 STD PEN 9	Very loose, gray, wet, clayey SILT - with pieces of siltstone.
25				
	4		A B C U-10	
			2 2 2 2 STD PEN 11	Very loose, gray and brown, wet, highly organic, clayey SILT.
30				
	3		B U-12	
			1 1 2 2 STD PEN 13	Very loose, gray, wet, clayey SILT - with pieces of siltstone.
35				
			U-14	Gray, wet, fine sandy PEAT and SILT - with pieces of siltstone.
	100/4"		38 100/4" STD PEN 15	Very dense, tan and green, moist, very silty fine SAND - with mica.
40				
	100/4"		100/4" STD PEN 16	Very dense, tan and green, moist, very silty fine SAND - with mica.
				Test boring stopped 40'4" below ground elevation.
				This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory tests.
45				

LOG OF TEST BORING — **WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

___ S.H. ___ S.R. 101A SECTION Hoquiam Bypass Job No. L-7262

Hole No. J-40 Sub Section Culvert Cont. Sec. 1402

Station 172+42 Offset 50' Lt. Ground El. 6.4

Type of Boring Jet Wash Casing 3" to 25' W.T. El. 6.45

Inspector ___ Date November 18, 1982 Sheet 1 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	1/24"		1/24" STD PEN 1	Very loose, dark brown, wet, highly organic PEAT - with pieces of wood, silt, and clay.
				8" log.
5				
			A B U-2	
	1/24"		1/24" STD PEN 3	Very loose, dark brown, wet, highly organic PEAT - with pieces of wood, silt, and clay.
10				
			U-4	No recovery.
	1/24"		1/24" STD PEN 5	Very loose, gray, wet, highly organic SILT - with wood.
15				
			A B C U-6	
	1/24"		1/24" STD PEN 7	Very loose, gray, wet, clayey SILT.
20				

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Hole No. J-40 Sub Section Culvert Sheet 2 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			U-8	No recovery.
	17		7 8 9 6 STD PEN 9	Medium dense, gray, wet, very silty SAND - with a trace of fine gravel.
25				
	160/11"		35 60 100/5" STD PEN 10	Very dense, gray, moist, fine sandy PEAT and SILT - with organic material.
30				
	100/5"		58 100/5" STD PEN 11	Very dense, gray, dry, very silty, fine SAND - with mica.
35				
	115/6"		115/6" STD PEN 12	Very dense, gray, dry, fine sandy SILT.
40	100/4"		100/4" STD PEN 13	Very dense, gray, dry, fine sandy SILT.
				Test boring stopped 39'4" below ground elevation.
				This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory tests.
45				

LOG OF TEST BORING

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

S.H. ____ S.R. 101A SECTION West Hoquiam Bypass Job No. L-7262

Hole No. J-41 Sub Section Cut Section Cont. Sec. 1402

Station 121+00 Offset 55' Rt. Ground El. 105.8

Type of Boring Jet Wash Casing 3" I.D. to 65' W.T. El. Not determined

Inspector ____ Date December 9, 1982 Sheet 1 of 4

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	20		3 9 11 13 STD PEN 1	Medium dense, brown, moist, silty, fine to coarse sandy, fine GRAVEL.
5				
	64/6"		30 64 STD PEN 2	Very dense, brown, moist, very silty, fine to coarse SAND - with layers of silty sand, layers of silt, and a trace of clay and gravel.
10				
	62/6"		27 62 STD PEN 3	Very dense, brown, moist, very silty, fine to coarse SAND - with a trace of clay and gravel.
15				
	100/6"		70 100 STD PEN 4	Very dense, brown, moist, very silty, fine to coarse sandy GRAVEL.
20				

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Hole No. J-41 Sub Section Cut Section Sheet 2 of 4

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	100/6"		70 100 STD PEN 5	Very dense, brown, moist, very silty, fine to coarse sandy GRAVEL.
25	91/6"		48 91 STD PEN 6	Very dense, brown, moist, very silty, fine to coarse SAND - with fine gravel.
30	55/6"		33 55 STD PEN 7	Very dense, brown, moist, very silty, fine gravelly, fine to coarse SAND.
35	82/6"		47 82 STD PEN 8	Very dense, brown, moist, very silty, fine gravelly, fine to coarse SAND.
40	95/6"		47 95 STD PEN 9	Very dense, brown, moist, very silty, fine to coarse sandy GRAVEL.
45				

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Revised 5-67.

Hole No. J-41 Sub Section Cut Section Sheet 3 of 4

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	75		32 25 50 STD PEN 10	Very dense, brown, moist, very silty, fine to coarse SAND - with fine gravel.
50				
	48		15 18 30 STD PEN 11	Dense, brown, wet, very silty, fine SAND - with small layers of sandy silt.
55				
	31		11 13 18 25 STD PEN 12	Dense, brown, wet, fine sandy SILT.
60				
	25		7 9 16 STD PEN 13	Dense, brown, wet, very silty, fine SAND, GRAVEL.
65				
	55/6"		38 55 STD PEN 14	Very dense, brown, moist, very silty, fine to coarse SAND - with gravel.
70				

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Hole No. J-41 Sub Section Cut Section Sheet 4 of 4

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	62/6"		39 STD 62 PEN 15	Very dense, brown, moist, very silty, fine to coarse SAND - with gravel.
				Test boring stopped 71'6" below ground elevation.
75				
				Water drained out of hole over night at 34' and 63' below ground elevation.
80				
				This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory tests.

LOG OF TEST BORING

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

S.H. _____ S.R. 101A SECTION West Hoquiam Bypass Job No. L-7262

Hole No. J-42 Sub Section Culvert Cont. Sec. 1402

Station 171+85 Offset 67' Rt. Ground El. 7.7

Type of Boring Jet Wash Casing 3" I.D. to 35' W.T. El. Not determined

Inspector _____ Date November 23, 1982 Sheet 1 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			U-1	No recovery.
	1/24"		1/24" STD PEN 2	Very loose, brown, saturated, highly mossy, fibrous PEAT - with roots, pieces of wood, silt and clay.
5				
			B U-3	
	1/24"		1/24" STD PEN 4	Very loose, brown, saturated, mossy, fibrous PEAT- with silt and clay.
10				
			A B C U-5	Gray, wet, organic SILT.
	1/24"		1/24" STD PEN 6	Very loose, gray, wet, fine sandy PEAT and SILT.
15				
			A B U-7	
	1		1/12" 1/12" STD PEN 8	Very loose, brown, wet, mossy, fibrous PEAT - with silt and clay.
20				

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Hole No. J-42 Sub Section Culvert Sheet 2 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			A B C U-9	Brown, wet PEAT.
	2		1 1 1 1 STD PEN 10	Very loose, gray, wet, highly organic SILT and WOOD FIBERS.
25				
	2		A B U-11	
			1 1 1 1 STD PEN 12	Very loose, gray, wet, fine sandy SILT - with peat.
30				
			C D U-13	
	100/6"		40 100 STD PEN 14	Very dense, gray, wet, fine sandy SILT - with peat.
				Log 32'4" to 34'10".
35				
	1		B C D U-15	Gray, wet, fine sandy SILT - with peat.
			1/12" 1/12" STD PEN 16	No recovery.
40				
			U-17	No recovery.
	2		1 1 1 5 STD PEN 18	Very loose, gray, wet, organic, fine sandy SILT.
45				

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Hole No. J-42 Sub Section Culvert Sheet 3 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			B U-19	
	45		9 15 STD PEN	Dense, gray, moist, silty, fine SAND.
			30 75 20	
				Test boring stopped 48' below ground elevation.
50				
				This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory tests.

LOG OF TEST BORING — **WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

S.H. ____ S.R. 101A SECTION West Hoquiam Bypass Job No. L-7262

Hole No. J-43 Sub Section Culvert Cont. Sec. 1402

Station 169+80 Offset 67' Lt. Ground El. 12.0

Type of Boring Jet Wash Casing 3" I.D. to 29' W.T. El. 11.0

Inspector ____ Date Novembe3 23, 1982 Sheet 1 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	1/24"		1/ 24" STD PEN 1	Very loose, brown and gray, saturated, fine sandy, clayey SILT - with layers of black, peaty SILT.
			B C D U- 2	Brown, wet, clayey, fine sandy SILT - with organic material.
5				
			A B C U- 3	Brown, wet, organic SILT.
	1		1/ 12" 1 1 STD PEN 4	Very loose, brown and gray, wet, highly organic layers SILT and fine SAND.
10			B U- 5	
	2		1 1 1 1 STD PEN 6	Very loose, gray, wet, organic, fibrous PEAT - with silt and clay.
15			U- 7	No recovery.
	16		9 9 7 3 STD PEN 8	Medium dense, gray, wet, organic, silty SAND - with gravel and pieces of rotted wood.
20			U-	

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Hole No. J-43 Sub Section Culvert Sheet 2 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			9	No recovery.
			1/ STD	
	1		12" PEN 1 10	Very loose, gray, wet, organic, silty SAND.
			1	
25			A B C U-	
			11	
	30		5 STD 10 PEN 20 12 40	Dense, gray, dry, fine sandy SILT - with a trace of mica.
30	93		18 STD 40 PEN 53 13	Very dense, gray, moist, fine sandy SILT - with a trace of mica.
35	74/6"		53 STD 74 PEN 14	Very dense, gray, moist, fine sandy SILT - with a trace of mica.
40	81/6"		52 STD 81 PEN 15	Very dense, gray, moist, fine sandy SILT - with a trace of mica.
45	63/6"		53 STD 63 PEN	No recovery.

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Hole No. J-43 Sub Section Culvert Sheet 3 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			16	
				Test boring stopped 45' below ground elevation.
				This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory tests.
50				

LOG OF TEST BORING — **WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

S.H. ____ S.R. 101A SECTION Hoquiam Bypass Job No. L-7262

Hole No. J-44 Sub Section Culvert Cont. Sec. 1402

Station 170+20 Offset 56' Rt. Ground El. 7.7

Type of Boring Jet Wash Casing 3" to 20' W.T. El. 0.1'

Inspector ____ Date November 30, 1982 Sheet 1 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	1/24"		1/24" STD PEN 1	Very loose, gray, wet, organic, very silty, fine SAND - with pieces of wood and a trace of clay.
			A B U- 2	
5				
			U- 3	No recovery.
	100/3"		70 100/3" STD PEN 4	Log from 5'4" to 9'. No recovery.
10				
			U- 5	No recovery.
	1		1/12" 1/12" STD PEN 6	Very loose, gray, wet, fine sandy SILT - with pieces of wood and traces of medium to coarse sand and fine gravel.
15				
			U- 7	No recovery.
	5		1 2 3 6 STD PEN 8	Loose, gray, wet, fine sandy SILT - with a trace of fine gravel.
20				

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Hole No. J-44 Sub Section Culvert Sheet 2 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			A B C D U-9	
	10		5 5 5 5 STD PEN 10	
25				
			A B C D U-11	
	12		6 6 6 9 STD PEN 12	Medium dense, gray, wet, fine sandy SILT - with pieces of wood.
30				
	18		5 8 10 12 STD PEN 13	Medium dense, gray, moist, very silty, fine to medium SAND - with a trace of coarse sand and fine gravel.
35				
	99		9 24 75 STD PEN 14	Very dense, gray, moist, fine sandy SILT.
40				
	185		60 75 110 STD PEN 15	Very dense, gray, moist, fine sandy SILT.
45				

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Hole No. J-44 Sub Section Culvert Sheet 3 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	100/5"		62 STD 100/5" PEN 5" 16	Very dense, gray, moist, fine sandy SILT.
				Test boring stopped 45'11" below ground elevation.
50				This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory tests.
55				
60				

LOG OF TEST BORING — **WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

S.H. ____ S.R. 101A SECTION West Hoquiam Bypass Job No. L-7262

Hole No. J-45 Sub Section Culvert Cont. Sec. 1402

Station 116+00 Offset 80' Rt. Ground El. 5.5

Type of Boring Jet Wash Casing 3" I.D. to 60' W.T. El. 0.3'

Inspector ____ Date January 5, 1983 Sheet 1 of 4

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	1/24"		1/24" STD PEN 1	No recovery.
5				
			U-2	No recovery.
	1/24"		1/24" STD PEN 3	Very loose, gray, wet, fine sandy SILT - with a trace of organic material.
10				
			U-4	No recovery.
	1		1/12" 1/12" STD PEN 5	Very loose, gray, wet, fine sandy SILT - with a trace of organic material.
15				
			A B C D E U-6	
	1/24"		1/24" STD PEN 7	Very loose, gray, saturated, fine sandy, clayey SILT.
20				

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Hole No. J-45 Sub Section Culvert Sheet 2 of 4

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			A B C D U-8	
	1/24"		1/24" STD PEN 9	Very soft, dark gray and green, saturated, very silty CLAY - with pieces of rotten wood.
25				
	1		A B C D U-10	
			1/12" 1/12" STD PEN 11	Very soft, dark gray and green, saturated, very silty CLAY - with pieces of rotten wood.
30				
	3		A B C D U-12	
			1/12" 3 2 STD PEN 13	Very loose, gray, wet, fine sandy SILT - with pieces of rotten wood.
35				
	1/24"		A B C D U-14	
			1/24" STD PEN 15	Very loose, gray, saturated, fine sandy SILT.
40				
	1		A B C D U-16	
			1/12" 1/12" STD PEN 17	Very soft, dark gray and green, saturated, very silty CLAY - with pieces of rotten wood.
45				

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Hole No. J-45 Sub Section Culvert Sheet 3 of 4

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			A B C U-18	
	5		1 2 3 5 STD PEN 19	Loose, gray, saturated, fine sandy SILT.
50				
	23		B C U-20	
			2 10 13 17 STD PEN 21	Medium dense, gray, wet, very silty, fine to coarse SAND - with fine gravel.
55	42		9 25 17 12 STD a PEN 22 b	Dense, gray, wet, fine sandy SILT.
				Medium dense, brown, moist, very silty, fine gravelly, fine to coarse SAND.
60	25		7 10 15 17 STD PEN 23	Dense, gray, saturated, clayey, fine sandy SILT.
65	57		17 17 40 80 STD PEN 24	Very dense, gray, moist, very silty, fine gravelly, fine to coarse SAND.
70				

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Hole No. J-45 Sub Section Culvert Sheet 4 of 4

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	86		23 STD 28 PEN 58 25	Very dense, gray, moist, very silty, fine gravelly, fine to coarse SAND.
				Test boring stopped 71'6" below ground elevation.
75				This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory tests.

LOG OF TEST BORING — **WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

S.H. ____ S.R. 101 A SECTION West Hoquiam By-Pass Job No. L-7262

Hole No. J-46 Sub Section Culvert Cont. Sec. 1402

Station 115+50 Offset ℄ Ground El. 6.6

Type of Boring Jet Wash Casing 3" I.D. to 70' W.T. El. 6.8

Inspector ____ Date January 11, 1983 Sheet 1 of 4

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			U-1	No recovery (MUCK).
	1/24"		STD PEN 2 (1/24")	Very loose, brown, saturated, organic, fine sandy SILT.
5				
			U-3	No recovery.
	1/24"		STD PEN 4 (1/24")	Very loose, gray, wet, organic, fine sandy SILT.
10				
			A B U-5	
	1/24"		STD PEN 6 (1/24")	Very loose, gray, wet, organic, very silty fine SAND - with pieces of wood.
15				
			A B C D U-7	
	1/24"		STD PEN 8 (1/24")	Very loose, gray, wet, organic, fine sandy SILT.
20				

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Hole No. J-46 Sub Section Culvert Sheet 2 of 4

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			U- 9	No recovery.
	1/24"		1/24" STD PEN 10	Very loose, gray, wet, organic, fine sandy SILT.
25				
			A B C U	
			D E 11	
	1/24"		1/24" STD PEN 12	Very loose, gray, wet, organic, fine sandy SILT - with pieces of wood.
30				
			A B C U	Gray, silty sandy GRAVEL.
			D 13	
	1		1/12" 1/12" STD PEN 14	Very loose, gray, moist, organic, fine sandy SILT - with pieces of wood and a trace of peat.
35				
			U 15	No recovery. (Wood in sampler).
	1		1/12" 1/12" STD PEN 16	Very loose, gray, wet, organic, very sitly, fine to medium SAND- with pieces of wood.
40				
			A B C U	Gray, wet, very silty, fine to medium SAND.
			D 17	
	9		1 3 6 7 STD PEN 18	Loose, gray, wet, organic, fine sandy SILT.
45				

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Hole No. J-46 Sub Section Culvert Sheet 3 of 4

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	4		4 STD 1 PEN 3 2 19	No recovery (Pieces of wood in sampler.)
50				
	45		10 STD 17 PEN 28 20	Dense, gray, moist, very silty, fine to coarse SAND - with fine gravel.
55				
	50		21 STD 24 PEN 26 75 21	a) Dense, gray and brown, moist, silty, fine to coarse SAND - with fine gravel. b) Dense, gray, moist, very silty fine SAND - with silt layers.
60				
	41		17 STD 18 PEN 23 30 22	a) Dense, brown, dry, organic bedded, fine SAND and SILT - with a trace of mica. b) Dense, gray, dry, fine SAND and SILT - with a trace of mica and organic material.
65				
	25		9 STD 11 PEN 14 21 23	Dense, gray, dry, fine sandy SILT - with gravel.
				Gray, dry, SILT.
				Silty sandy GRAVEL.
70				

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Hole No. J-46 Sub Section Culvert Sheet 4 of 4

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	27		9 STD 10 PEN 17 29 24	Dense, gray, moist, silty, fine gravelly, fine to coarse SAND.
				Test boring stopped 72' below ground elevation.
75				

LOG OF TEST BORING — **WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

S.H. _____ S.R. 101 A SECTION West Hoquiam By Pass Job No. L-7262

Hole No. J-47 Sub Section Culvert Cont. Sec. 1402

Station 115+15 Offset 75'Lt. Ground El. 7.5

Type of Boring Jet Wash Casing 3" I.D. to 50' W.T. El. Not Determined.

Inspector _____ Date January 18, 1983 Sheet 1 of 4

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			B U 1	
	1/24"		STD PEN 1/24" 2	Very loose, brown, wet, highly organic SILT - with roots and rotten wood.
5				
			A_{BC} U 3	
	1/24"		STD PEN 1/24" 4	Very loose, gray, wet, organic, fine sandy SILT.
10			A_B U 5	
	1/24"		STD PEN 1/24" 6	Very loose, gray, wet, organic, fine sandy SILT.
15				
			A_{BC} U 7	
	1/24"		STD PEN 1/24" 8	Very loose, gray, wet, organic, fine sandy SILT - with pieces of wood.
20				

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Hole No. J-47 Sub Section Culvert Sheet 2 of 4

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			A B U 9	
			STD PEN 1/24" 10	Very loose, gray, wet, organic, fine sandy SILT - with pieces of wood.
25				
			A B C U 11	
			1 1 STD PEN 1/12" 12	a) Very loose, gray, wet, organic fine sandy SILT - with twigs and wood. b) Very loose, gray, wet, organic, very silty fine SAND - with a trace of medium sand.
30				
			A B C U 13	
	1		1/12" STD PEN 1/12" 14	Very loose, gray, moist, organic SILT.
35				
			A B C D U 15	
	1/24"		3 1/24" STD PEN 16	Very loose, gray, wet, very silty fine SAND - with a trace of medium sand.
40				
	2		1 1 1 1 STD PEN 17	No recovery.
45				

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Hole No. J-47 Sub Section Culvert Sheet 3 of 4

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	7		4 STD 4 PEN 3 1 18	Loose, gray, wet, very silty fine SAND - with a trace of medium sand.
50				
	85		11 STD 32 PEN 53 19	Very dense, gray, moist, fine sandy SILT.
55				
	54		14 STD 22 PEN 32 20	Very dense, gray, moist, fine sandy SILT.
60				
	22		7 STD 9 PEN 13 15 21	Medium dense, gray, moist, clayey, fine sandy SILT.
65				
	62		13 STD 26 PEN 36 22	Very dense, gray, moist, clayey, fine sandy SILT - with 2" layer of silty sandy gravel and a trace of mica.
70				

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Hole No. J-47 Sub Section Culvert Sheet 4 of 4

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	103		12 STD 33 PEN 70 23	Very dense, gray, moist, silty, fine gravelly, fine to coarse SAND.
				Test boring stopped 71'6" below ground elevation.
75				

LOG OF TEST BORING — **WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

S.H. ____ S.R. 101A SECTION West Hoquiam by Pass Job No. L-7262

Hole No. J-49 Sub Section Culvert Cont. Sec. 1402

Station 177+40 Offset 26'Lt. Ground El. 10.2

Type of Boring Jet Wash. Casing 3" I.D. to 14' W.T. El. 10.3

Inspector ____ Date March 7, 1983 Sheet 1 of 1

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			STD	Muck.
	1/24"		1/24" PEN 1	Very loose, brown, wet, fine sandy SILT - with organic material and a trace of mica.
5				No recovery. Pieces of rotten log in sampler.
			U-2	
	20		2 STD 5 PEN 15 25 3	Medium dense, gray, wet to moist, silty, fine to medium SAND.
10	72		31 STD 42 PEN 30 55 4	Very dense, gray, moist, silty fine SAND.
15	93/6"		93 STD PEN 5	Very dense, gray, dry, silty fine SAND.
				Test boring stopped 14'6" below ground elevation.

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LOG OF TEST BORING — **WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

S.H. ____ S.R. 101A SECTION West Hoquiam By Pass Job No. L-7262

Hole No. J-50 Sub Section Culvert Cont. Sec. 1402

Station 177+40 Offset 17'Rt. Ground El. 7.0

Type of Boring Jet Wash Casing 3"I.D. to 24' W.T. El. Not determined

Inspector ____ Date March 8, 1983 Sheet 1 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	1/24"		1/24" STD PEN 1	Very loose, brown, wet, highly organic, very silty fine SAND - with roots.
5			U 2	No recovery.
	2		1 1 STD PEN	Very loose, moist, brown and gray, very silty fine SAND - with rotten wood.
			1 1 3	Gray, wet, sandy SILT, very soft.
10				
	2		U-4	No recovery. Pieces of rotten log in sampler.
			1 1 STD PEN	Very loose, brown, wet, highly organic, very silty, fine to medium SAND.
			1 1 5	
15	5		1 2 STD PEN	Rotten log 14' to 17'
			3 5 6	
20			1/12" STD PEN	

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Hole No. J-50 Sub Section Culvert Sheet 2 of 2

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	7		1/12" 7	Very loose, brown and gray, wet, organic, very silty, fine SAND - with a trace of mica.
25	169/10"		9 69 STD PEN 100/4" 8	Very dense, gray, dry, silty, fine to medium SAND.
				Test boring stopped at 25'4" below ground elevation.

LOG OF TEST BORING — **WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

S.H. ____ S.R. 101A SECTION West Hoquiam By Pass Job No. L-7262

Hole No. J-51 Sub Section Cut Section Cont. Sec. 1402

Station 107+00 Offset 70' Lt. Ground El. 117.2

Type of Boring Jet Wash Casing 3"I.D. to 80' W.T. El. Not determined.

Inspector ____ Date March 18, 1983 Sheet 1 of 4

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
5	4		1 2 STD PEN 2 3 1	Soft, brown, moist, clayey SILT.
10	7		2 2 STD PEN 5 6 2	Soft, brown, moist medium SILT - with a trace of organic material.
15	55		29 25 STD PEN 30 44 3	Very dense, brown, moist, fine to coarse sandy, fine gravelly SILT.
20			27 27 STD PEN	Very dense, brown, moist, fine to coarse sandy, fine gravelly SILT.

This is a summary Log of Test Boring. Soil/rock descriptions are derived from visual field identifications and laboratory tests.

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Hole No. 1-51 Sub Section Cut Section Sheet 2 of 4

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	51		24 20 4	
25			37 50 STD PEN	Very dense, gray and brown, moist, fine sandy SILT - with some pieces of gravel.
	150/10"		100/4" 5	
	100/4"		100/4" STD PEN 6	Very dense, brown, dry, very silty, fine to coarse sandy GRAVEL - with a trace of organic material.
30				
35				
	85/6"		30 85 STD PEN	Very dense, brown, dry, fine to coarse sandy, fine gravelly SILT.
40				
			45 STD PEN	Very dense, brown, dry, fine to coarse sandy, fine gravelly SILT.
	100/4"		100/4" 8	
45	100/5"		100/5" STD PEN 9	Very dense, brown, dry, fine to coarse sandy, fine gravelly SILT.

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Hole No. J-51 Sub Section Cut Section Sheet 3 of 4

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
50	180/8"		50 80 STD PEN 100 /2" 10	Very dense, brown, dry, fine to coarse sandy, fine gravelly SILT.
55				
	92/6"		28 92 STD PEN 11	Very dense, brown, moist, very silty, fine gravelly, fine to coarse SAND.
60				
	100/2"		75 100/2" STD PEN 12	Very dense, brown, moist, very silty, fine gravelly, fine to coarse SAND.
	150/2"		150/2" STD PEN 13	Very dense, brown, moist, very silty, fine gravelly, fine to coarse SAND.
65				
70				

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Hole No. J-51 Sub Section Cut Section Sheet 4 of 4

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	100/6"		100 STD PEN 14	Very dense, brown, moist, very silty, fine gravelly, fine to coarse SAND.
75	100/5"		100/5" STD PEN	Very dense, gray, moist, very silty, fine to coarse SAND.
80	87		23 31 56 STD PEN 16	Very dense, gray, moist, clayey, fine sandy SILT.
85	85		14 25 60 STD PEN 17	Very dense, gray, moist, clayey, fine sandy SILT.
				Test boring stopped 86'6" below ground elevation.

LOG OF TEST BORING — **WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

S.H. ____ S.R. 101A SECTION West Hoquiam By Pass Job No. L-7262

Hole No. J-52 Sub Section Cut Section Cont. Sec. 1402

Station 107+30 Offset 88'Rt Ground El. 106.2

Type of Boring Jet Wash Casing 3" I.D. 67' W.T. El. Not determined

Inspector ____ Date March 29, 1983 Sheet 1 of 4

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
5	3		1 STD PEN 1 2 3 1	Soft, brown, moist, clayey SILT.
10	6		2 STD PEN 2 4 15 2	Loose, brown, moist, fine to coarse sandy, fine gravelly SILT.
15	100/4"		44 STD PEN 100/4" 3	Very dense, brown, moist, fine to coarse sandy, fine gravelly SILT.
20			32 STD PEN	Very dense, brown, moist, very silty, fine gravelly, fine to coarse SAND.

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Hole No. J-52 Sub Section Cut Section Sheet 2 of 4

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	100/5"		100/5" 4	
			STD	
	100/5"		100/5" PEN 5	Very dense, gray, moist, very silty, fine gravelly, fine
25				to coarse SAND.
30			50 STD	Very dense, gray, moist, very silty, fine to coarse sandy
	155/10"		55 PEN 6	fine GRAVEL.
			100/4"	
			STD	
35			75 PEN	Very dense, gray, moist, very silty, fine to coarse sandy fine
	100/6"		100 7	GRAVEL.
			STD	
40			65 PEN	Very dense, gray, moist, very silty, fine to coarse sandy
	100/5"		100 8 /5"	fine GRAVEL.
			STD	Very dense, gray, moist, very silty, fine to coarse sandy
45			55 PEN	fine GRAVEL.

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Hole No. J-52 Sub Section Cut Section Sheet 3 of 4

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	100/4"		100/4" 9	
50			50 STD PEN	Very dense, brown, moist, fine to coarse sandy, fine gravelly SILT.
	100/4"		100/4" 10	
55	100/5"		100/5" STD PEN 11	Very dense, brown, moist, very silty, fine gravelly, fine to coarse SAND - with 3/4" layer of brown medium sand.
60			STD PEN	
	115/6"		115 12	Very dense, gray and brown, moist very silty, fine to coarse, sandy fine GRAVEL.
65			30 STD PEN	Very dense, gray and brown, moist very silty, fine to coarse, sandy fine GRAVEL.
	155/10"		55 100/4" 13	
	96		24 34 STD PEN	Very dense, gray, moist, clayey, fine sandy SILT.
			62 14	
70				

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Hole No. J-52 Sub Section Cut Section Sheet 4 of 4

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
75				
			20 STD	a) Very dense, gray, moist, clayey, fine sandy SILT.
	85		35 PEN	
			50 15	b) Very dense, brown, moist, silty, fine gravelly, fine to coarse SAND.
				Test boring stopped 76'6" below ground elevation.
80				

LOG OF TEST BORING — **WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

S.H. ____ S.R. 101A SECTION West Hoquiam By Pass Job No. L-7262

Hole No. J-53 Sub Section Cut Section Cont. Sec. 1402

Station 142+15 Offset 130'Lt. Ground El. 65.3

Type of Boring Chop Casing 3" I.D. to 34' W.T. El. Not determined

Inspector ____ Date May 16, 1983 Sheet 1 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			1 STD	Forest Duff.
	3		1 PEN	
			2	Very loose, brown, moist, slightly organic, fine sandy SILT.
			2 1	
			2 STD	
5	9		4 PEN	Loose, brown, moist, slightly organic fine sandy SILT.
			5	
			6 2	
10				
			5 STD	
	14		6 PEN	Medium dense, brown and gray, slightly organic, clayey, fine sandy SILT.
			8	
			10 3	
			U	No recovery.
15			4	
			3 STD	
	5		3 PEN	No recovery.
			2	
			5 5	
20			U	Gray, moist, organic, clayey, fine sandy SILT - with pieces of wood.

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Hole No. J-53 Sub Section Cut Section Sheet 2 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			6	
	4		3 2 STD PEN	Very loose, gray, moist, organic, clayey, fine sandy SILT - with pieces of wood.
			2 3 7	
25	6		2 3 STD PEN	a) Loose, gray, moist, organic, clayey, fine sandy SILT - with pieces of siltstone.
			3 4 8	b) Loose, dark brown, wet, clayey, fine sandy SILT - with small layer of peat and pieces of wood.
30	10		3 5 STD PEN	Loose, gray, wet, slightly organic, clayey, fine sandy SILT - with small pieces of siltstone.
			5 6 9	
35	33		8 14 STD PEN	Dense, gray and brown, moist, clayey, fine sandy SILT - with siltstone pieces.
			19 20 10	
40	50		18 21 STD PEN	a) Dense, brown with gray seams, dry, clayey, fine sandy SILT. b) Dense, gray, dry, very silty, fine gravelly, fine to coarse SAND.
			29 32 11	
45			41 71 STD PEN	Very dense, greenish, dry, silty, fine gravelly, fine to coarse SAND.

HWY Form 351-003-a (H. F. 26.66-A).
Revised 5-67.

Hole No. J-53 Sub Section Cut Section Sheet 3 of 3

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	171/11"		100/5" 12	
50	100/6"		40 STD PEN 100 13	Very dense, greenish, dry, silty, fine gravelly, fine to coarse SAND.

LOG OF TEST BORING

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

___ S.H. ___ S.R. 101A SECTION West Hoquiam By Pass Job No. L-7262

Hole No. J-54 Sub Section Cut Section Cont. Sec. 1402

Station 142+15 Offset 82' Lt. Ground El. 66.2

Type of Boring Chop Casing 3" I.D. to 30' W.T. El. Not determined

Inspector ___ Date May 18, 1983 Sheet 1 of 4

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	5		1 2 3 3 STD PEN 1	Loose, brown, wet, organic, fine sandy SILT.
5			A B U 2	
	6		2 3 3 4 STD PEN 3	Loose, brown, wet, organic, clayey, fine sandy SILT - with small pieces of siltstone.
10				
	7		3 3 4 6 STD PEN 4	Loose, brown and gray, wet, slightly organic, clayey, fine sandy SILT.
15			A B U 5	
	6		2 3 3 4 STD PEN 6	Loose, brown and gray, wet, slightly organic, clayey, fine sandy SILT.
20				

DOT FORM 351-003 REVISED 12/79

Original to Materials Engineer
Copy to Bridge Engineer
Copy to District Administrator

Copy to ___

Y Form 351-003-a (H. F. 26.66-A).
Revised 5-67.

Hole No. J-54 Sub Section Cut Section Sheet 2 of 4

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			V 7	Vane shear test.
			A U 8	
25	2		1 1 STD PEN	Very loose, gray, wet, organic, fine sandy SILT.
			1 1 9	
			1 1 STD PEN	a) Very loose, gray, wet, organic, fine sandy SILT.
	2		1 1 10	b) Very loose, brown, wet, SILT - with a trace of fine sand.
30			V 11	Vane shear test.
			1 1 STD PEN	Very loose, gray, wet SILT - with a trace of fine sand and organic material.
	2		1 1 12	
35				
			B U 13 C D E	
			F 1 1 STD PEN	
	4		2 2 3 14	Very loose, gray, wet, SILT - with a trace of organic material.
40			1	
	2		1 1 2 STD PEN 15	Very loose, gray, wet, clayey, fine sandy SILT - with a trace of organic material.
45			B U	

HWY Form 351-003-a (H. F. 26.66-A).
Revised 5-67.

Hole No. J-54 Sub Section Cut Section Sheet 3 of 4

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			C D E 16	
			2 STD	Loose, gray, wet, clayey, fine sandy SILT - with pieces of
	6		2 PEN 4 17	decomposed wood.
			4	
50			3 STD	
	6		3 PEN 3 18	Loose, gray, wet, clayey, fine sandy SILT - with pieces of siltstone and a trace of medium sand.
			4	
55			2 STD	
	6		3 PEN 3 19	Loose, gray, wet, fine gravelly, fine sandy SILT - with siltstone pieces.
			4	
60			3 STD	
	7		3 PEN 4 20	No recovery.
			5	
65			13 STD	a) Dense, gray, moist, silty, fine gravelly, fine to coarse SAND.
	26		13 PEN 13 21	b) Dense, gray, moist, fine sandy SILT - with mica.
			19	
70			12 STD	

HWY Form 351-003-a (H. F. 26.66-A).
Revised 5-67.

Hole No. J-54 Sub Section Cut Section Sheet 4 of 4

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	40		18 PEN 22 / 28 22	Dense, gray, moist, fine sandy SILT - with mica.
75	25		11 STD 11 PEN 14 / 28 23	Dense, gray, moist, clayey, fine gravelly, fine SAND - with a trace of medium to coarse sand.
80	156/10"		32 STD 56 PEN 100 /4" 24	Very dense, dry, very silty, fine gravelly, fine to coarse SAND.
				Test boring stopped 80'10" below ground elevation.
				This is a summary Log of Test Boring. Soil/rock descriptions are derived from visual field identifications and laboratory tests.

LOG OF TEST BORING

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

S.H. ____ S.R. 101A SECTION Hoquiam Bypass Job No. L-7262

Hole No. J-59 Sub Section Cut Section Cont. Sec. 1402

Station 142+00 Offset 60' Rt. Ground El. 49.9

Equipment (21C55-2)

Type of Boring ____ Casing ____ W.T. El. Not determined

Inspector ____ Date June 3, 1983 Sheet 1 of 4

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
			1/ 12" D-1	Very loose, brown, moist, organic, fine sandy SILT - with
	2		1	pieces of decomposed wood.
			4	
5			B C U-2	
	8		2 4 D-3	Loose, brown, moist, clayey, fine sandy SILT.
			4 5	
10	7		2 3 D-4	Loose, brown, moist, clayey, fine sandy SILT.
			4 4	
15			A B C U-5	
			D	
	2		1 1 D-6	Very loose, gray, moist, organic SILT - with layers of fine
			1 2	sand.
20			1 1 D-7	Very loose, gray, moist, organic SILT - with pieces of decomposed wood.

DOT FORM 351-003 REVISED 12/79

Original to Materials Engineer
Copy to Bridge Engineer
Copy to District Administrator

Copy to ____

Hole No. J-59 Sub Section Cut Section Sheet 2 of 4

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	2		1 2	
25			A B C U-8	
			D	
	2		1 1 D-9	Very loose, gray, moist, fine sandy SILT - with a trace
			1 1	of mica.
30	2		1 1 D-10	Very loose, gray, moist, organic SILT - with pieces of
			1 2	decomposed wood and a trace of fine sand.
35			A B C U-11	
	4		1 2 D-12	No Recovery.
			2 1	
40	2		1 1 D-13	Very loose, gray, moist, fine sandy SILT.
			1 2	
45			A B C U-14	

DOT FORM 351-003A REVISED 4/80

Hole No. J-59 Sub Section Cut Section Sheet 3 of 4

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
	4		2 2 D-15	Very loose, gray, moist, highly organic SILT.
			2 2	
50	5		1 2 D-16	Loose, gray, moist, very silty fine SAND - with some
			3 3	pieces of siltstone.
55			A B C U-17	
			D	
	12		5 5 D-18	Medium dense, dark brown and gray, organic, clayey, fine sandy
			7 7	SILT - with pieces of decomposed wood.
60	8		3 3 D-19	Loose, gray, moist, fine sandy SILT.
			5 7	
65	30		19 20 D-20	Dense, gray, moist, very silty, fine gravelly, fine to
			10 15	coarse SAND - with an 8" layer of sandy silt.
70	84		11 34 D-21	Very dense, gray, moist, very silty, fine gravelly, fine to coarse SAND - with some rock fragments.

Hole No. J-59 Sub Section Cut Section Sheet 4 of 4

DEPTH	BLOWS PER FT.	PROFILE	SAMPLE TUBE NOS.	DESCRIPTION OF MATERIAL
		↓	50 ↓	
				Test boring stopped at 70'6" below ground elevation.
75				
				This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory tests.
80				
85				
90				

DOT FORM 351-003A REVISED 4/80

Foundations

Geotechnical Report

Washington State Department of Transportation

West Hoquiam Connection (SR 109 Spur) SR 101

VOLUME II

Compiled by
D. J. Morrow, P.E., Materials Engineer
and C. Bauer

Washington State Department of Transportation
District 3
Materials Office
P. O. Box 9327
Olympia, Washington 98504

J. D. Zirkle, P.E., District Administrator
R. W. Dugan, P. E., District Location Engineer

APPENDIX A

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 9-28-82

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section West Higuiem bypass
SR No. 101A Sub-Section Culvert

Station & Offset 187+00 50' Rt. Hole # R-1

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3638	D-1	0' 0" 2' 0"	H2O 28%	ML	Moist, Rust & tan Lay. Layered F. Sdy. Silt w/T. Mica & org. Pieces
3639	S-2	2' 0" 4' 0"	H2O 37%	ML	Wet, orange & tan Silt w/slight Layering of Sty. F. Sand, org. & hard clumps of Silt Trace of med. Sand
3640	D-3	4' 0" 6' 0"	H2O 77%	ML	Like 3593 w/rust coat twigs, strong organic odor Wet, tan & GR., Soft, Cly. F. Sdy Silt F. Sdy. Silt w/T. organic & mica
3641	S-4	7' 0" 9' 0"	H2O 65%	ML	Wet, Gr. & Tan Silt w/Layered Org. MATL as sticks & Twigs
3642	D-5	9' 0" 11' 0"	77%	ML	Like 3593 w/chunk wood - No mica
3643	S-6	12' 0" 14' 0"	H2O 88%	OH	Like 3618 Moist, Gr. F. Sdy. Sty. Layered organic MATL w/peat, t. clay & t. mica.
3644	D-7	14' 0" 16' 0"	H2O 77%	ML	Like 3593 w/T. Rust streaks
3645	S-8	17' 0" 19' 0"			Like 3643 w/chunks of wood
3646	D-9	19' 0" 21' 0"	H2O 77%	ML	Like 3593

1 copy with samples
1 copy to addressee

Yours very truly,

Larry M. Moore
Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 9-28-82

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L7262 Section West Hoquiam by Pass
SR No. 101 A Sub-Section Culvert

Station & Offset 17+00 50 Rt. Hole # B-1

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3647	S-10	22 24' 0"	H2O 80%	OL	Wet, Gr. Sty. ORGANIC SILT w/ Lg. Chunks of Wood & Pieces of Grass
3648	D-11	24 26' 0"	109%	OL	Like 35'91 SAT, GR., Org., Cly. SILT w/ BLK. Org. Mtr. outside.
3649-1	U-12	27' 4" 27' 8"	B		
-2		27' 8 28' 0"	C		
-3		28' 0" 28' 4"	D		
3650	D-13	31' 0 31' 0"	H2O 61%	MU	Wet, Gr. & tan F. Sdy. SILT w/T. Mica & Twigs
3651-1	U-14	32' 0 32' 4"	A		
-2		32' 4" 32' 8"	B		
-3		32' 8" 33' 0"	C		

1 copy with samples
1 copy to addressee

Yours very truly,

Gary M. Moore
Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 9-28-82

Dear Sir:

I have forwarded by today's state car the following Foundation Samples.

Contract or Job No. E7262 Section West Nisqually by Pass
SR No. N/A Sub-Section Culvert

Station & Offset 187+00 50' Rt. Hole # B-1

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3651 -4	U-14	33' 0" 33' 4"	D		
3652	D-15	34' 0" 36' 0"	Hx 61%	ML	Like 3650 Wet, Gr. Brn F. Sdy. Silt W/T. Mica & twigs

1 copy with samples
1 copy to addressee

Yours very truly,
Barry M. Moore
Inspector.

DOT FORM 351-002 REVISED 2/80

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

Shelby

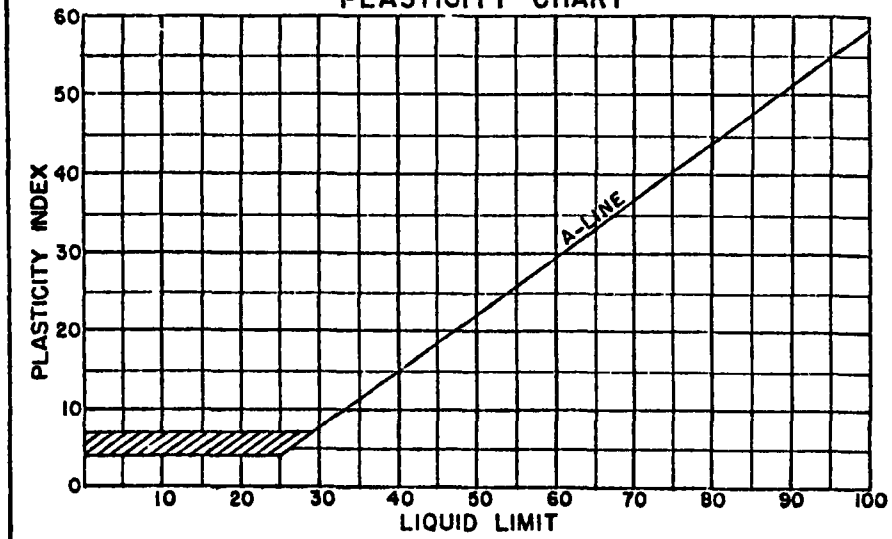
SAMPLE NO. 3641	JOB NO. HOG	HOLE NO. B-1
DATE 10-12-82	OPERATOR BB	

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Wet, Gr. & Tan Silt w/ Layered org. mat'l as sticks & Twigs.

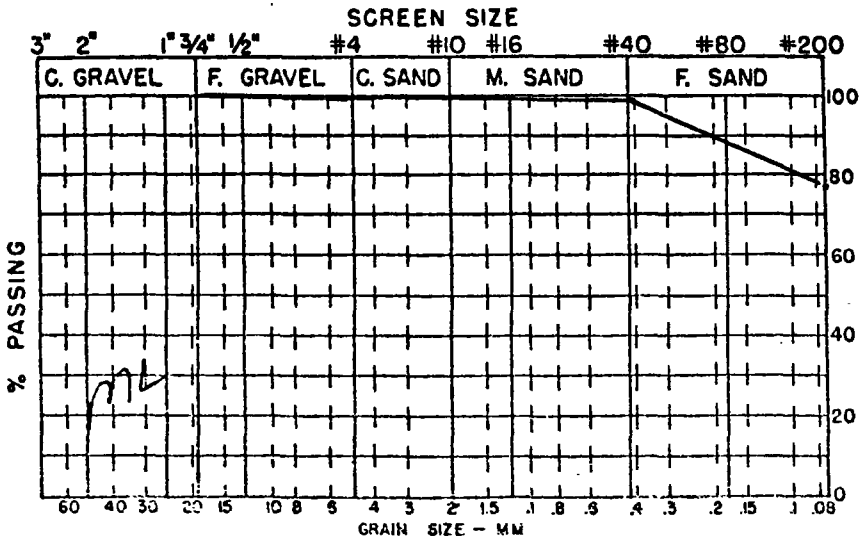
PLASTICITY CHART



H_2O = 65%

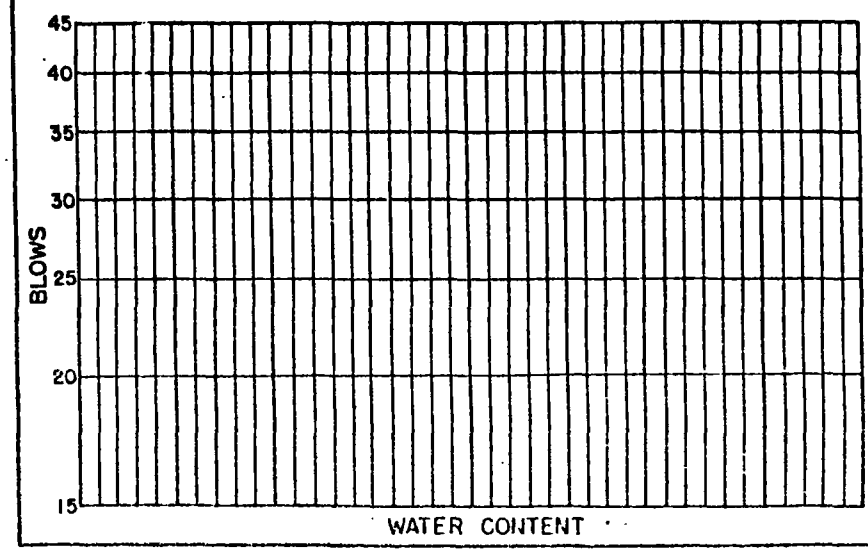
SIEVE ANALYSIS		% Passing	139.55	
		-40	31.22	99.6
-¾ .05	100%	-80		
-4 .03	99.9	-140		
-10 .38	99.9	-200	107.87	77%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

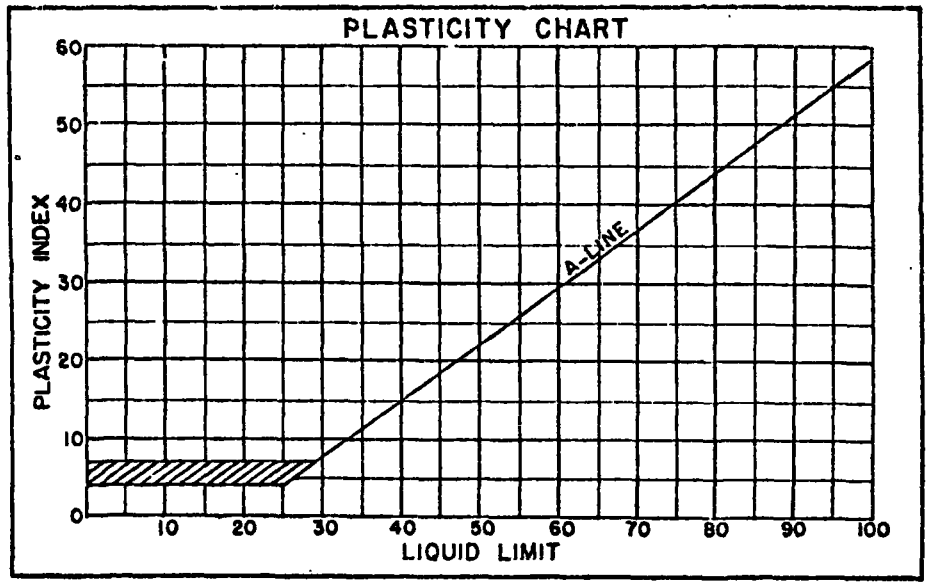
Shelby

SAMPLE NO. 2639	JOB NO. Hea.	HOLE NO. B-1
DATE 10-12-82	OPERATOR BB	

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Wet, orange & tan SILT w/ layering of Silty F. SAND, Organic & hard Clumps of Silt –

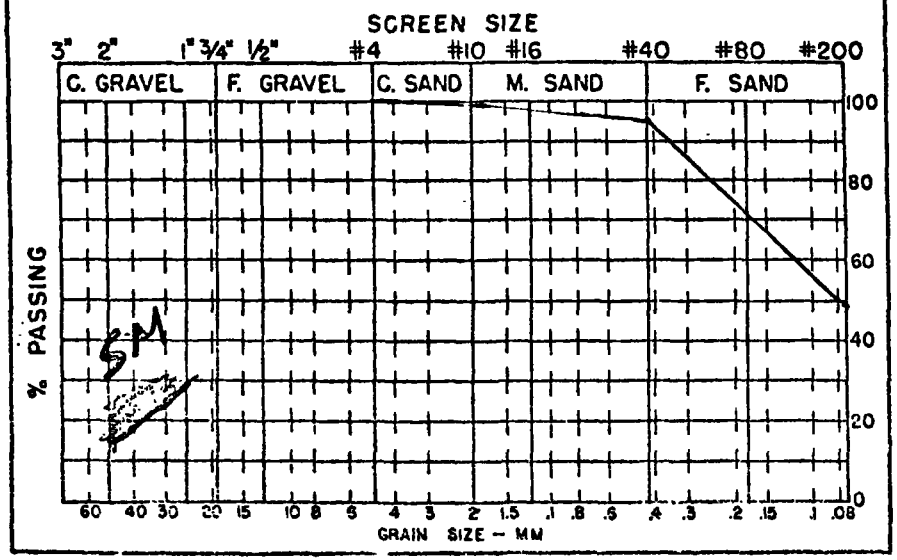


H_2O: 37%

SIEVE ANALYSIS % Passing 174.68

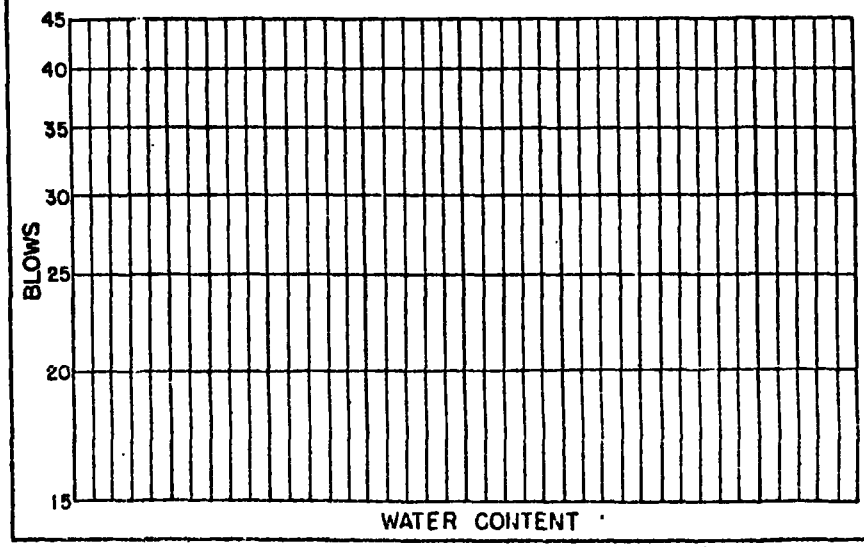
			-40	80.46	95%
-¾			-80		
-4	225	100%	-140		
-10	8.15	99.8%	-200	85.82	49%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

Shelby

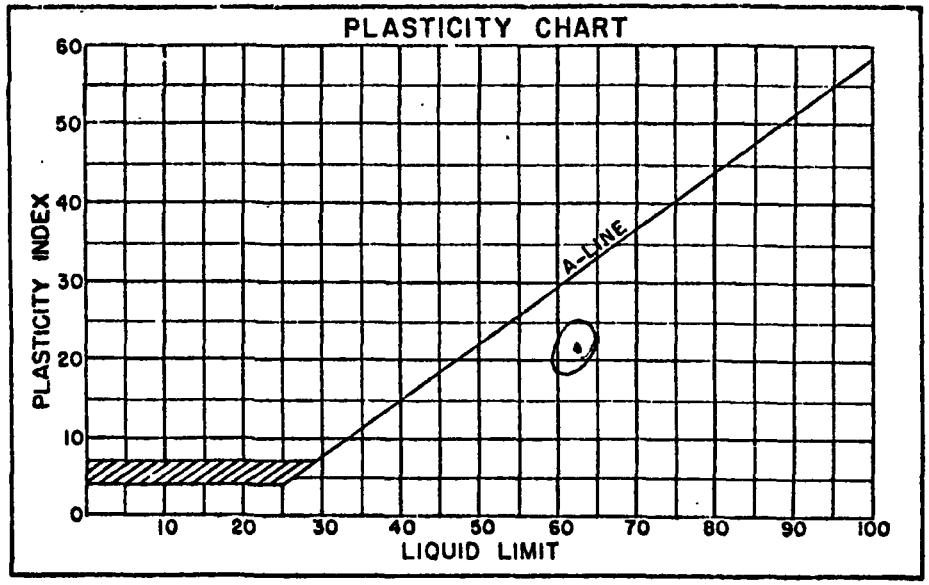
SAMPLE NO. 3647 JOB NO. 4609 HOLE NO. B-1

DATE 10-12-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS			✓

DESCRIPTION: Wet, Gr. ORGanic SILT w/ Lg. Chunks of Wood & Pieces of grass

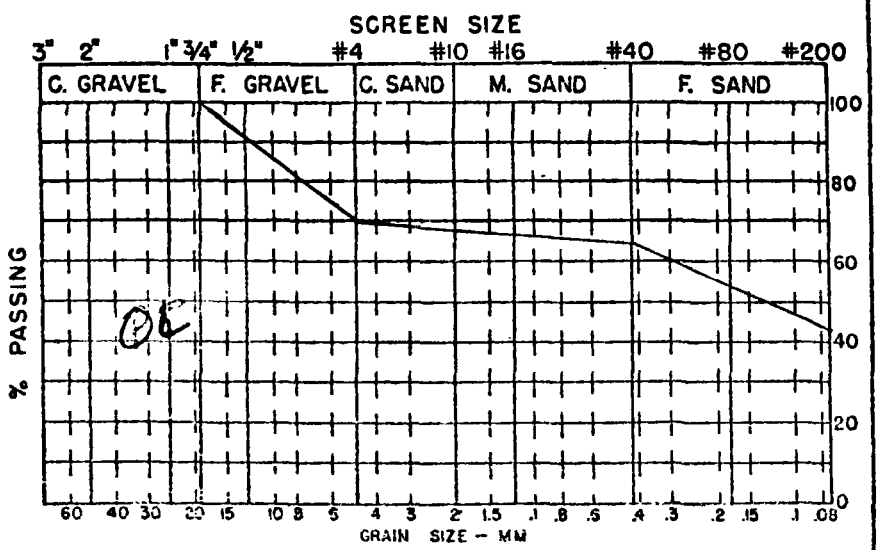


H_2O = 144 %

SIEVE ANALYSIS % Passing 25.65

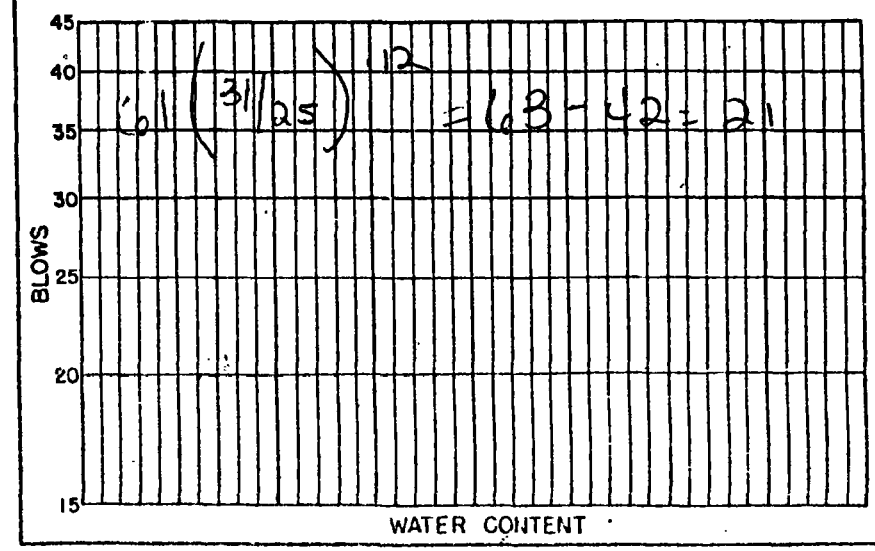
			-40	5.42	64%
-3/4	7.82	wood 100%	-80		
-4	.48	70%	-140		
-10	.82	68%	-200	11.11	43%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	75				42
Wet Wt.	12.58				6.60
Dry Wt.	7.80				4.65
% H_2O	61%				PL= 42%
Blows	31				PI= 21



61 (31/25)^.12 = 63 - 42 = 21

DOT FORM 351-019

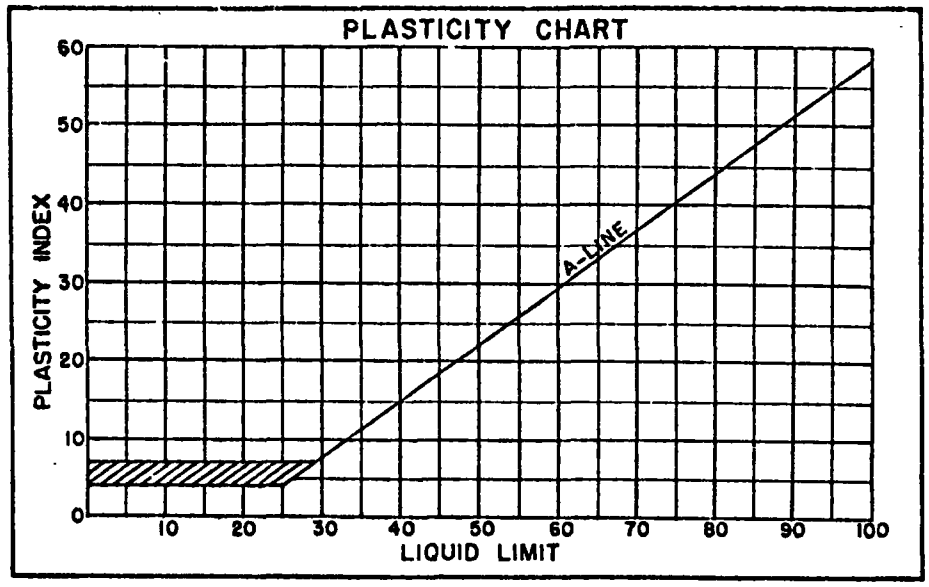
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3638 JOB NO. HOG. HOLE NO. B-1
DATE 11-10-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Moist, Rust & TAN horiz. Layered F. Sdy. SILT W/T. Wood & org Pieces



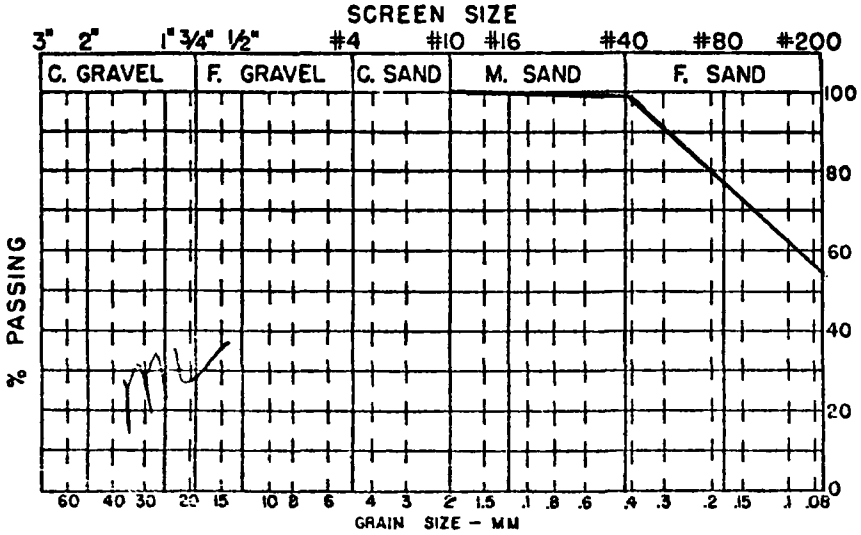
H2O = 28%

SIEVE ANALYSIS % Passing 91.12

		-40 42.06	99.9
-3/4		-80	
-4		-140	
-10 .08	100%	-200 48.98	57

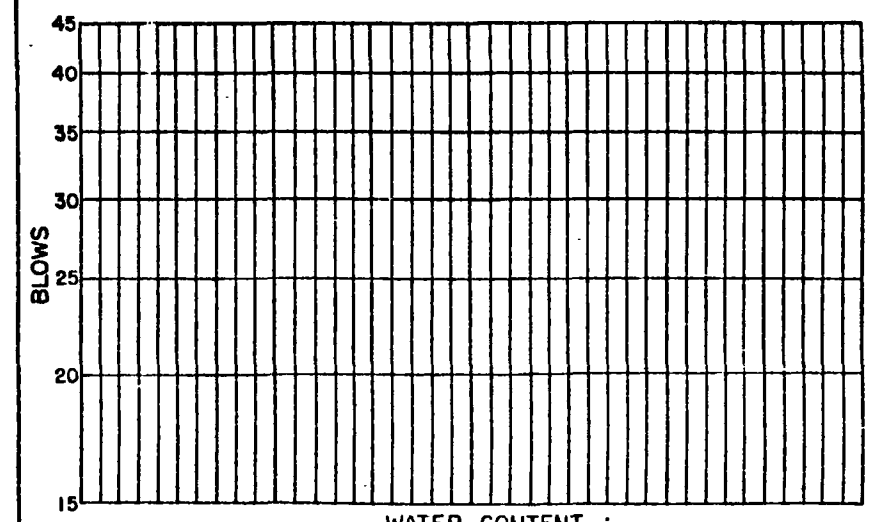
H2O 19.

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

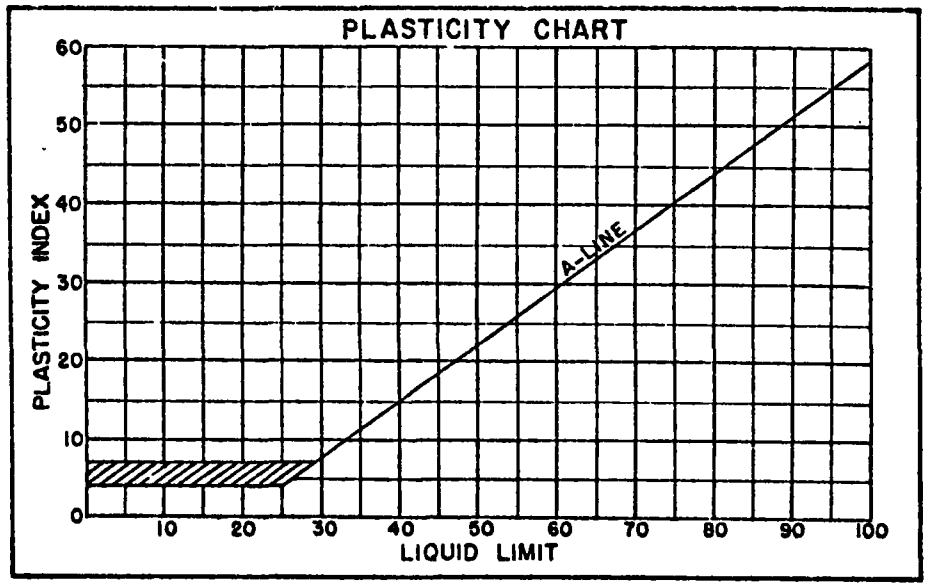
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3650 JOB NO. Hog. HOLE NO. 1
DATE 11-10-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

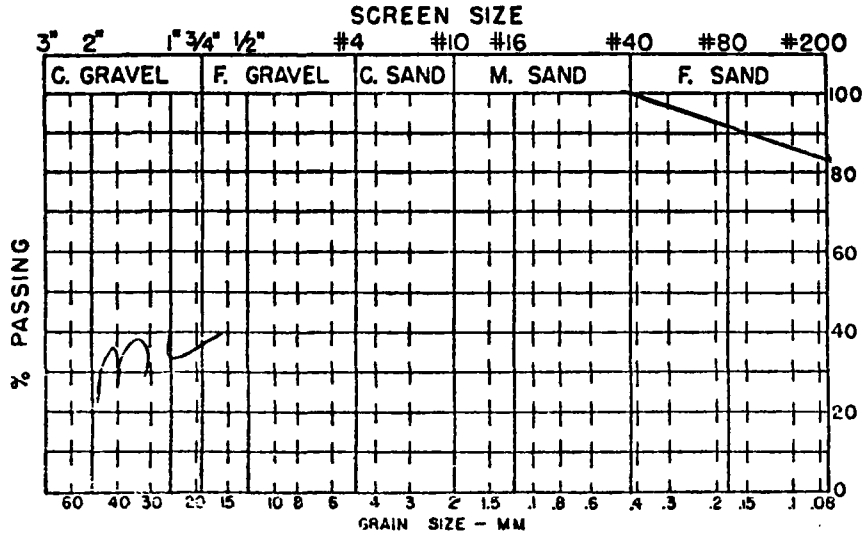
DESCRIPTION: Wet GR & TAN F. Sdy. SICT W/T. Mica & TWIGS.



H_2O = 61 %

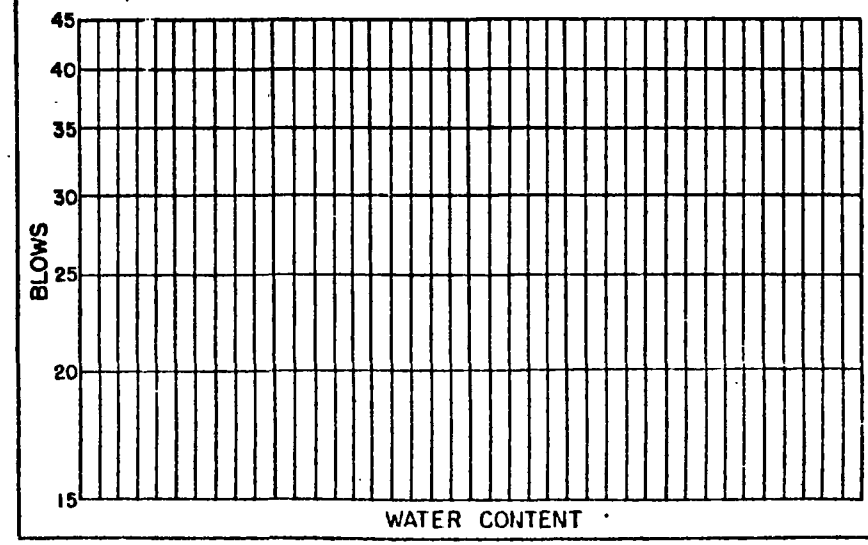
SIEVE ANALYSIS		% Passing 49.85
	-40	7.95 100%
-3/4	-80	
-4	-140	
-10	-200	41.90 84%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

TRIAXIAL COMPRESSION TEST (With Area Changes and Pore Pressures)

Project HOQUIAM Location Sta 187+00 50'Rt
Job No. L7262 Sample No. 3643 Boring No. B-1 Depth 12'-0" to 14'-0"
Area (Ao) 6.6 Length 6" Confining Pressure 800 PSF = 5.6 PSI
Rate of Loading .05"/min L. R. C. .92 ST Tested by R Brooks Date 30 MAR 83

Description

GROSS WT.	TARE	NET WT.	CAN NO.	WET WT.	DRY WT.	WT. H^2O	% H^2O	WET DENS.	DRY DENS.
		475	50	85.72	50.88		68	96.1	57.2

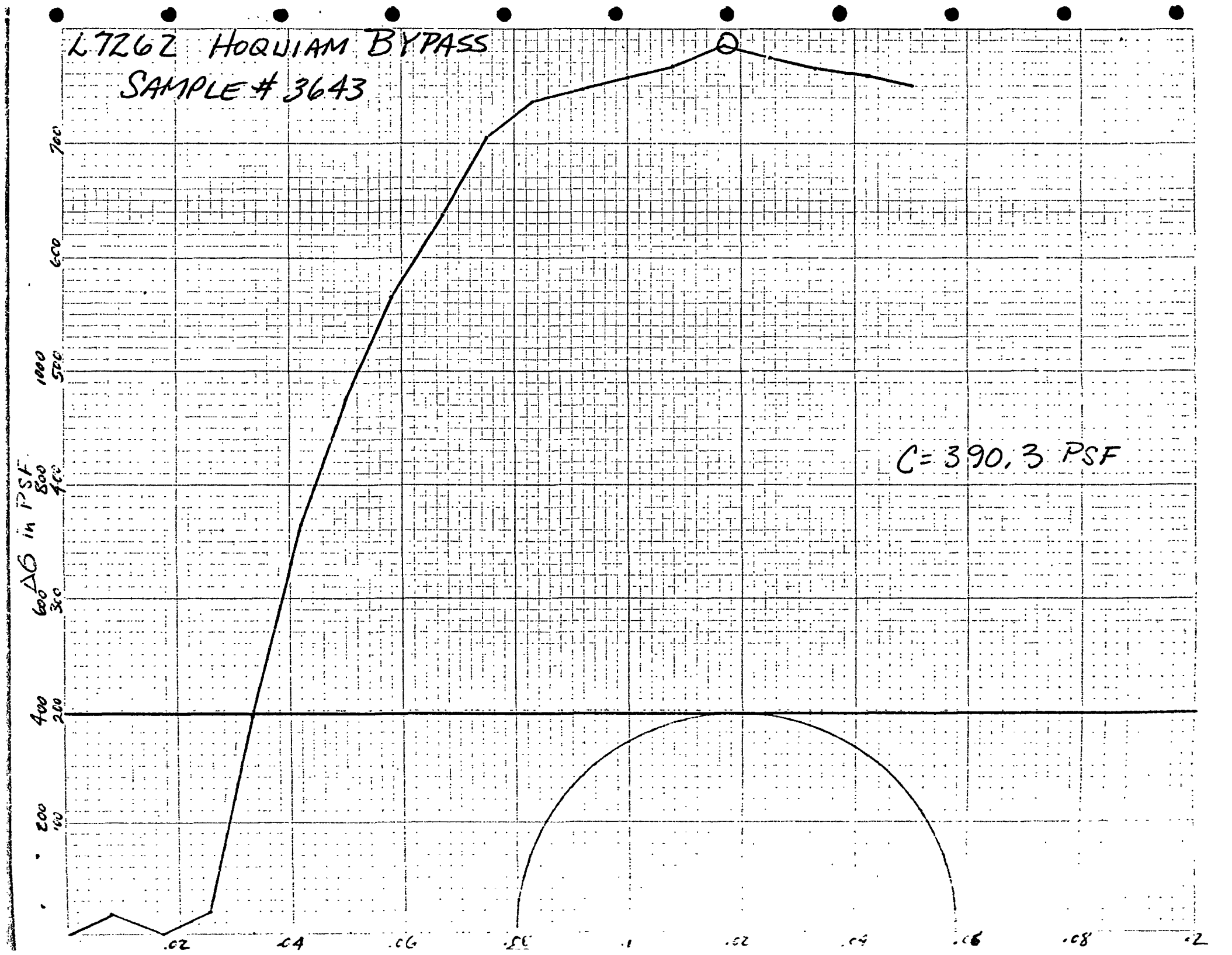
Data for Mohr's Envelope:
Max. Deviator Stress
Principal Stress
Effective Principal Stress

Failure

Back Press.
Saturation 100

ELASPED TIME (Hr.) (Min.)	LOAD DIAL READ (X 10 −4)	DEFORM. DIAL READ	ΔL (COL. 3 x 10 −3)	E. UNIT STRAIN (ΔL/L)	AREA C.F. (1 − E)	CORRECT. AREA A' ($\frac{A^0}{1-E}$)	PORE PRESS.	DEV. LOAD (Col. 2 X LRC)	DEV. STRESS (Col. 9 ÷ Col. 7)	PRINC. STRESS (Col 10 + conf. press.)
1	2	3	4	5	6	7	8	9	PSF 10	11
0							5.70			
1	1	050		.008	992	6.65	5.62	.92	19.92	
2	0	100		.017	983	6.71	5.56	0	0	
3	1	150		.025	975	6.77	5.70	.92	19.57	
4	10	200		.033	967	6.82	5.63	9.2	194.2	
5	19	250		.042	958	6.89	5.48	17.48	365.3	
6	25	300		.05	950	6.95	5.44	23	476.5	
7	30	350		.058	942	7.01	5.44	27.6	566.9	
8	34	400		.067	933	7.07	5.44	31.3	637.5	
9	38	450		.075	925	7.14	5.44	34.96	705.1	
10	40	500		.083	917	7.20	5.36	36.8	736	
11	41	550		.092	908	7.27	5.36	37.72	747.1	
12	42	600		.1	900	7.33	5.48	38.64	759.1	
12.5	43	650		.108	892	7.40	5.48	39.56	769.8	
13.25	44	700		.117	883	7.47	5.23	40.5	780.7	
14.5	44	750		.125	875	7.54	5.00	40.5	773.5	
15.5	44	800		.133	867	7.61	5.00	40.5	766.4	
16.25	44	850		.142	858	7.69	5.00	40.5	758.4	
17.25	44	900		.15	850	7.76	5.00	40.5	751.5	

DOT FORM 351-018 REVISED 4/80


L7262 HOQUIAM BYPASS
SAMPLE # 3643
C = 390.3 PSF
Δσ in PSF
700
600
1000
500
800
400
600
300
400
200
200
100
.02
.04
.06
.08
.1
.02
.04
.06
.08
.2

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

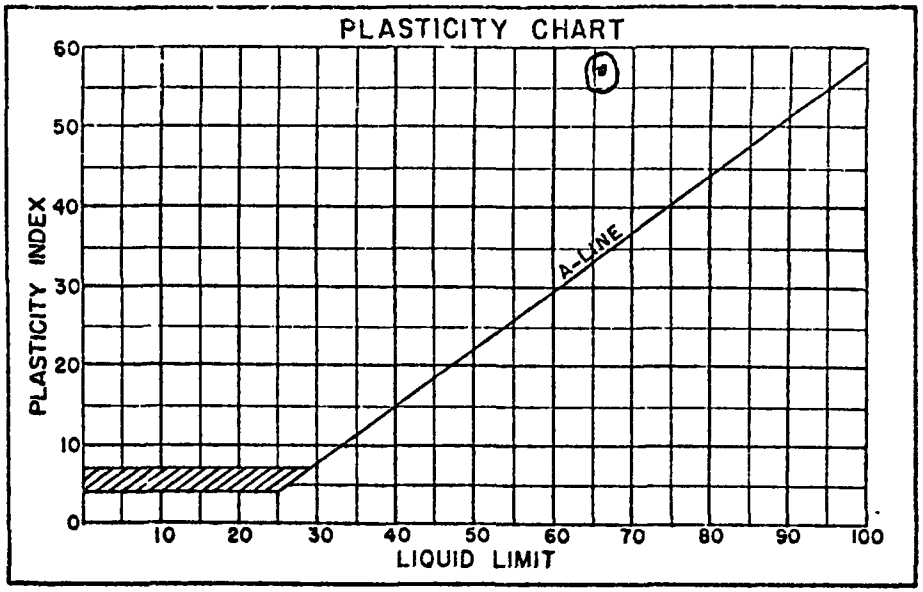
TRIAX

SAMPLE NO. 3643 JOB NO. HOQ HOLE NO.
DATE 5 APR 83 OPERATOR RB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			✓
DRIED CAST			✓
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: Moist grey micaceous CLAY
~~cogll~~ w/grasses & other dg mtr

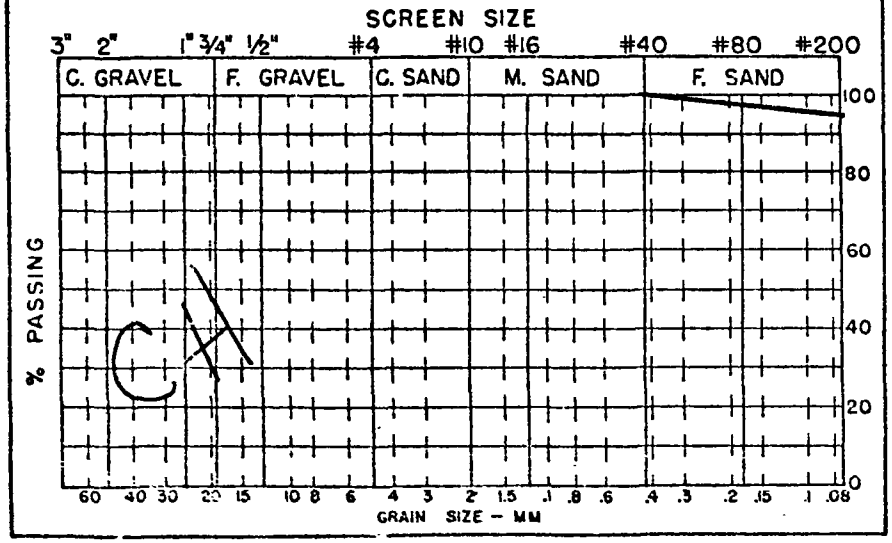


$H_2O = 68$

SIEVE ANALYSIS % Passing 151.53

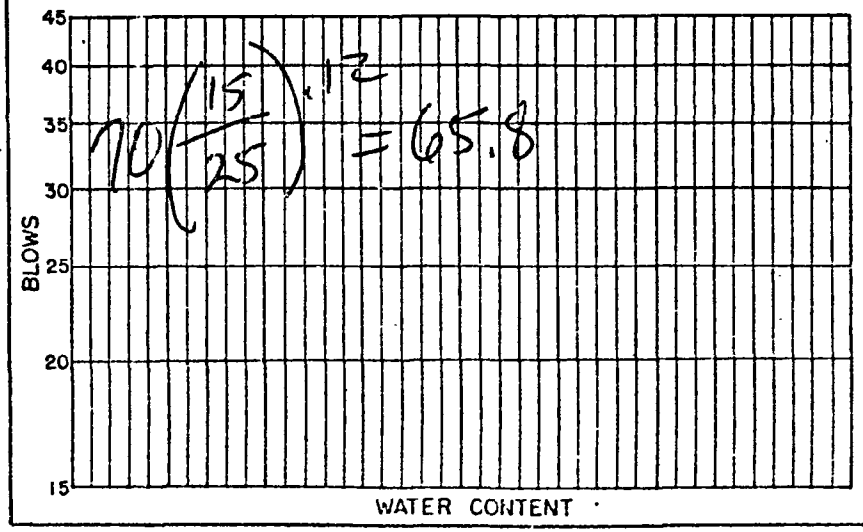
	-40	6.92	100
-3/4	-80		
-4	-140		
-10	-200	144.61	95

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	41				40
Wet Wt.	34.63				9.61
Dry Wt.	20.37				7.1
% H_2O	70				PL= 8.6
Blows	15				PI= 57.2



TRIAXIAL COMPRESSION TEST (With Area Changes and Pore Pressures)

Project HOQUIAM Location Sta 187+00 ~~#~~ 50' Rt
Job No. L7262 Sample No. 3645B Boring No. B1 Depth 17'-0" to 19'-0"
Area (Ao) 6.6 Length 6" Confining Pressure 1000 PSF = 6.9 PSI
Rate of Loading .05"/min L. R. C. .92 ST Tested by R Brooks Date 5 April 83

Description

GROSS WT.	TARE	NET WT.	CAN NO.	WET WT.	DRY WT.	WT. H^2O	% H^2O	WET DENS.	DRY DENS.
		932	69	80.8	47.12	33.68	71	91.9	53.7

Data for Mohr's Envelope:
Max. Deviator Stress
Principal Stress
Effective Principal Stress

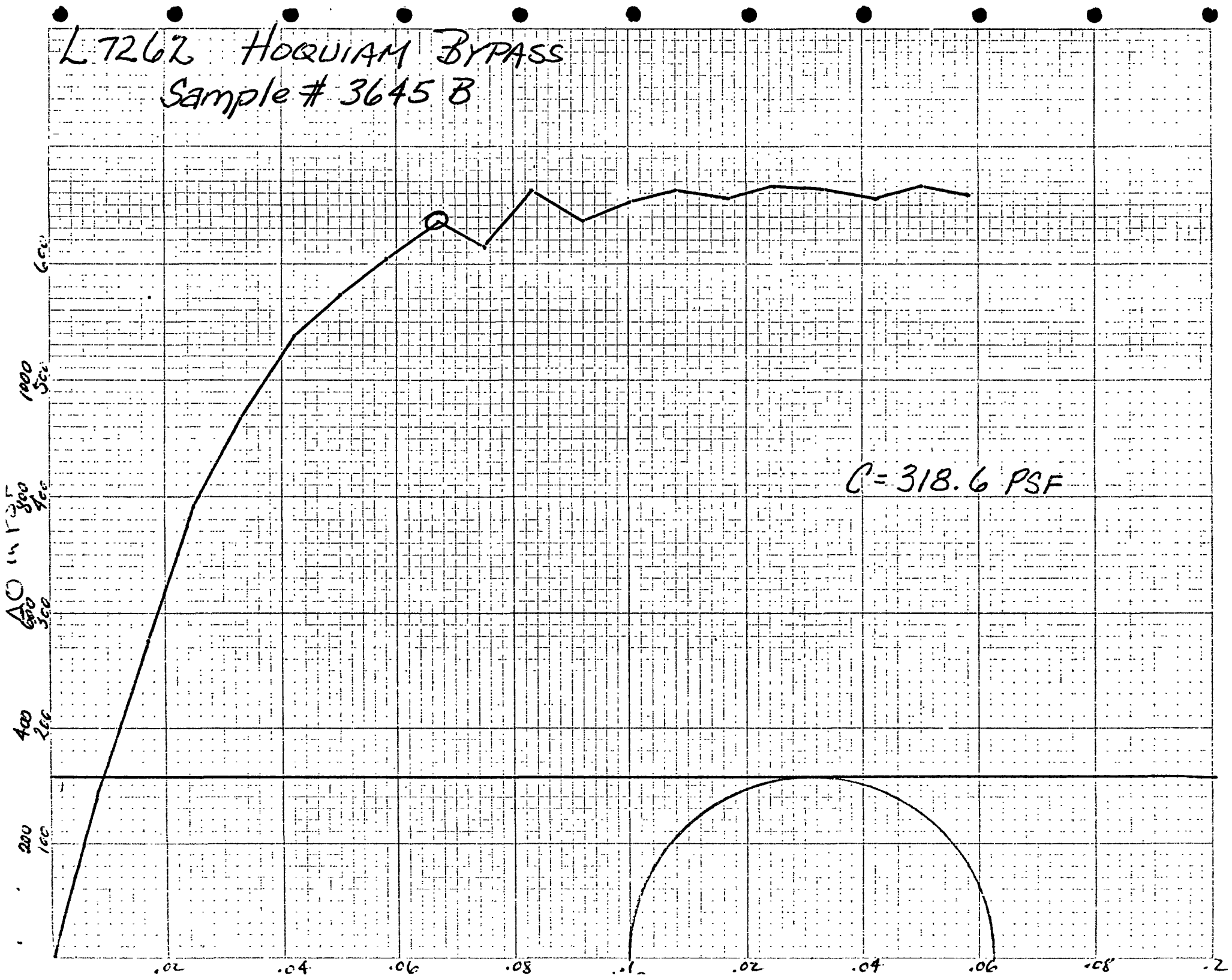
Failure

Back Press.
Saturation 96

ELASPED TIME (Hr.) (Min.)	LOAD DIAL READ (X 10−4)	DEFORM. DIAL READ	ΔL (COL. 3 x 10 −3)	E. UNIT STRAIN (ΔL/L)	AREA C.F. (1 − E)	CORRECT. AREA A' (A° / 1 − E)	PORE PRESS.	DEV. LOAD (Col. 2 X LRC)	DEV. STRESS (Col. 9 ÷ Col. 7)	PRINC. STRESS (Col 10 + conf. press.)
1	2	3	4	5	6	7	8	9	PSF 10	11
0							6.80			
1	7	050		.008	992	6.65	6.80	6.44	139.4	
2	14	100		.017	983	6.71	6.88	12.88	276.4	
3	20	150		.025	975	6.77	6.88	18.4	391.4	
4	24	200		.033	967	6.82	6.88	22.08	466.2	
5	28	250		.042	958	6.89	6.88	25.76	538.4	
6	30	300		.05	950	6.95	7.06	27.6	571.9	
7	32	350		.058	942	7.01	6.96	29.44	604.8	
8	34	400		.067	933	7.07	6.71	31.28	637.1	
9	33	450		.075	925	7.14	6.58	30.36	612.3	
10	36	500		.083	917	7.20	6.58	33.12	662.4	
11	35	550		.092	908	7.27	6.58	32.2	637.8	
12	36	600		.1	900	7.33	6.50	33.12	650.6	
13	37	650		.108	892	7.40	6.50	34.04	662.4	
13.75	37	700		.117	883	7.47	6.50	34.04	656.2	
14.5	38	750		.125	875	7.54	6.50	34.96	667.7	
15.5	38	800		.133	867	7.61	6.50	34.96	661.5	
16.5	38	850		.142	858	7.69	6.50	34.96	654.6	
17.5	39	900		.15	850	7.76	6.65	35.88	665.8	
18.5	39	950		.158	842	7.84	6.65	35.88	659.0	

DOT FORM 351-018 REVISED 4/80

L7262 HOQUIAM BYPASS
Sample # 3645 B



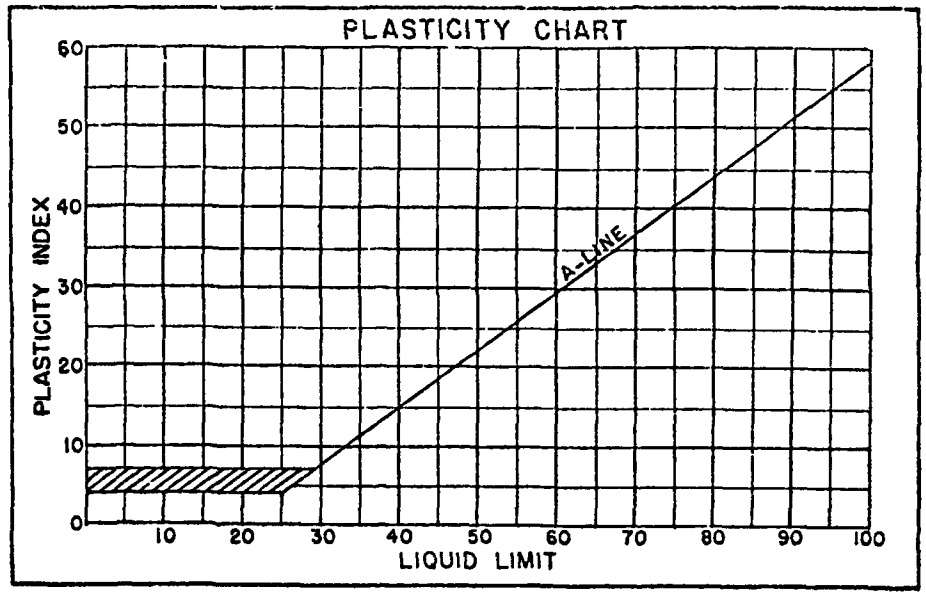
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3645B JOB NO. HOQ HOLE NO. TRIAX
DATE 11 APR 83 OPERATOR RB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL		✓	
DRIED CAST		✓	
DILATANCY			
BITE			
TOUGHNESS		✓	

DESCRIPTION: Moist grey Micaceous org SILT w/pieces of wood & grasses



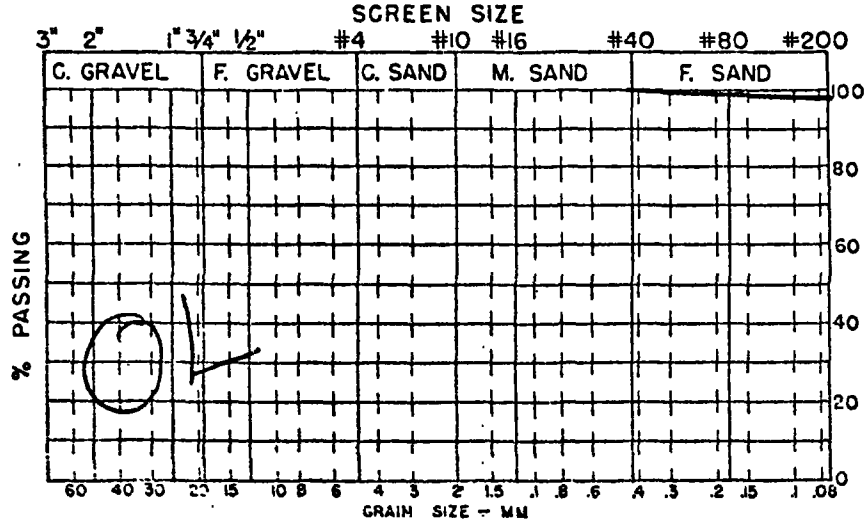
$H_2O = 71$

SIEVE ANALYSIS % Passing 223.40

			-40	5.13	99
-3/4	.2		-80		
-4	.2		-140		
-10	.86	99	-200	217.0	97

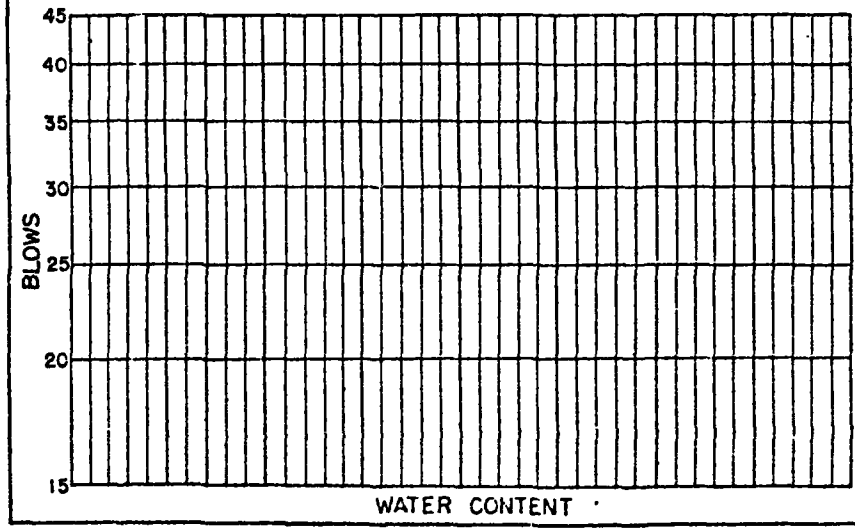
WOOD PIECES

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351 019

TRIM

2 of 3

DOT FORM 351-016 REVISED 5/81

CONSOLIDATION TEST DATA

Date 3-4-83 Sample No. 3645-C-Shelby

Job No. L-7262 Section Hoquiam Bypass

Depth 17-19' Station 187+00 Hole No. B-1

Material Moist, GR, dk. Brn. & Blk. ½=Silt w/org. mtr. ½=charred wood w/silt & small veg. mtr.

GROSS WEIGHT	TARE	NET WEIGHT	CAN NUMBER	WET WEIGHT	DRY WEIGHT	WEIGHT H^2O	PERCENT H^2O	WET DENSITY	DRY DENSITY
279	244	35	74	38.81	13.04	25.77	1987%	12	10.0
		CONSOL	75	27.79	12.74	15.05			

Weight ring bottom done testing

Didn't do dial - Mark correction

Sample Height =

hs = Wt. Dry Soil / K

eo = hvo/hs

hvo = 0.6250 – hs

K = 47.24 X sp. G

Hvf=hvo – Defl.

ef = hvf/hs

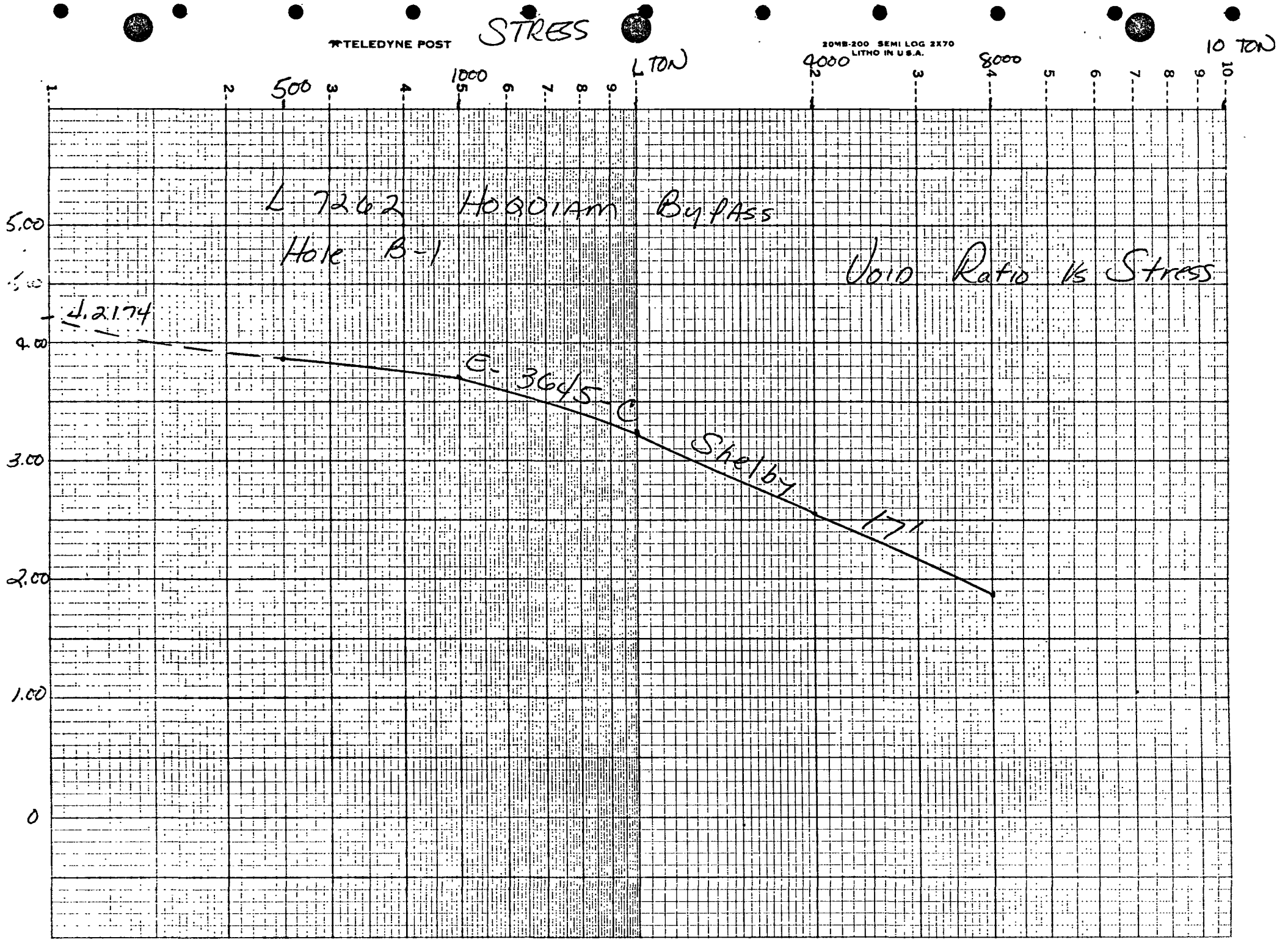
TIME	500 lbs/sq ft		1000 lbs/sq ft		2000 lbs/sq ft		4000 lbs/sq ft		8000 lbs/sq ft	
	DIAL	%	DIAL	%	DIAL	%	DIAL	%	DIAL	%
0										
1/4	.228	57	67	32	111	20	119	15	91	11
1/2	238	60	80	38	130	23	133	16	109	13
1	251	63	91	43	150	27	174	21	131	16
2 1/4	263	66	106	50	185	33	236	29	178	21
4	274	69	116	55	216	39	287	35	223	27
9	283	71	127	60	250	45	405	49	304	37
16	326	82	140	67	295	53	484	59	371	45
25	340	85	150	71	326	59	535	65	465	56
36	355	89	157	75	342	62	571	70	520	63
49	361	90	160	76	359	66	608	74	562	64
64	381	95	165	79	370	67	629	77	592	71
2 hrs	386	97	175	83	421	76	682	83	639	77
3	388	97	180	96	451	81	700	85	670	41
4	391	98	185	88	468	84	718	88	690	83
5	391	98	189	90	481	87	733	89	702	85
6	393	99	192	91	490	88	745	91	714	46
24	400	100	210	100	556	100	820	100	820	100
72										
hvo=	.5052		.4652		.4442		.3996		.3066	
hvf=	.4652		.4442		.3996		.3066		.2236	
ef=	2.8835		2.7078		3.2441		2.5596		1.9668	

Sp. Gr.	2.2519
K	106.3798
	0.6250
hs	.1198
hvo	.5052
eo	4.2174

Not sure I get a good representative sample (?) Total Defl. 0.2816

Sample obtained by pushing w/ tube - trimmed too much off - then filled in w/ material. since

Operator Ben Machine No. 6


TELEDYNE POST
STRESS
20MB-200 SEMI LOG 2X70
LITHO IN U.S.A.
500
1000
1 TON
4000
8000
10 TON
5.00
4.00
3.00
2.00
1.00
0
L 7262 HOOOIAM BYPASS
Hole B-1
Void Ratio Vs Stress
1.2174
G-3645-C
Shelby
171

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

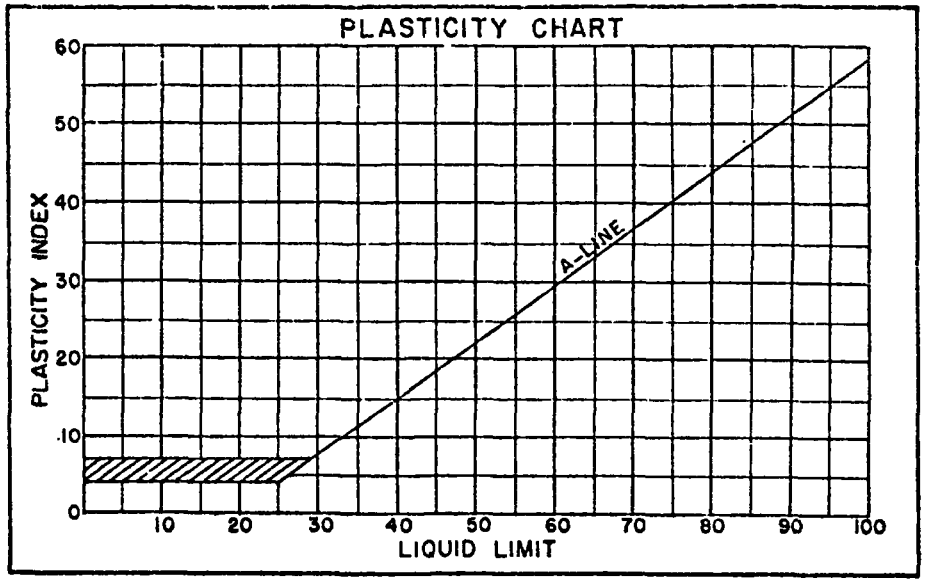
Consol- Shelby

SAMPLE NO. 3645-C JOB NO. H-8. HOLE NO.
DATE 3-10-83 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS moist, Gr., dk. Brn. & Blk.			

DESCRIPTION: 1/2 = Charred Wood w/ silt & small veg. mtr. 1/2 = Silt w/ org. Pty. mtr.

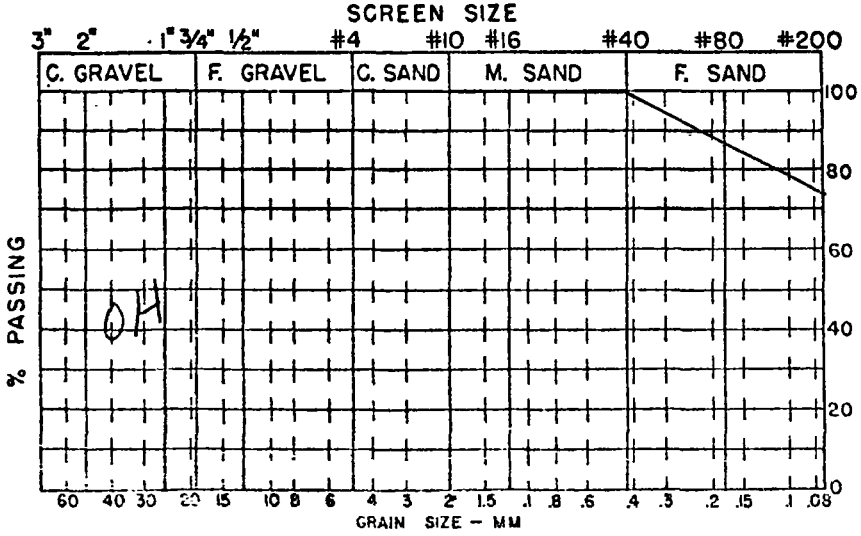


H_2O = 19.8%

SIEVE ANALYSIS % Passing 96.23

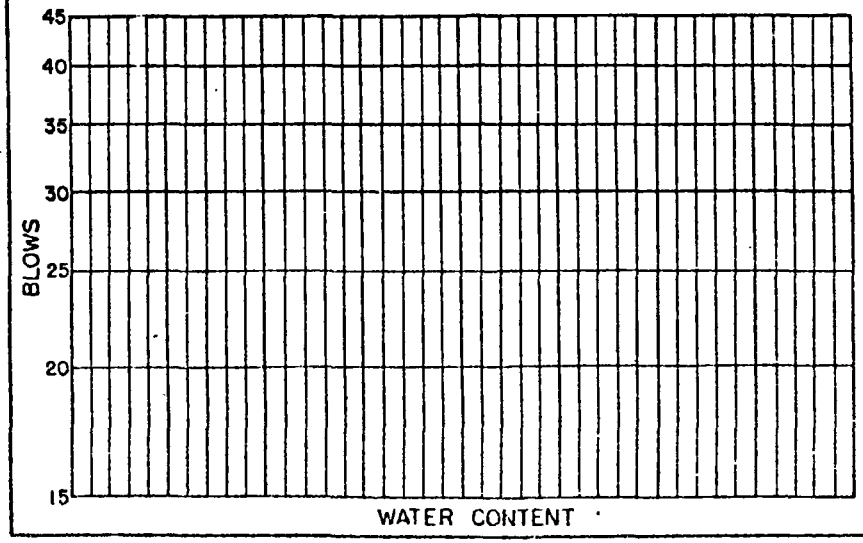
			-40	26.22	99%
-3/4			-80		
-4	.05	100%	-140		
-10	.03	99%	-200	69.93	73%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

TRIAXIAL COMPRESSION TEST (With Area Changes and Pore Pressures)

Project Hoquiam By Pass Location Sta 187+00 50' Rt
Job No. L7262 Sample No. 3639-A Boring No. B-1 Depth 2'-0 to 4'-0"
Area (Ao) 6.6 Length 6" Confining Pressure 500 PSF = 3.5 PSI
Rate of Loading .05"/Min L. R. C. .92 ST Tested by R Brooks Date 28 MAR 83

Description

GROSS WT.	TARE	NET WT.	CAN NO.	WET WT.	DRY WT.	WT. H^2O	% H^2O	WET DENS.	DRY DENS.
		837	43	62.65	40.15	22.5	56	81.5	52.3

Data for Mohr's Envelope:
Max. Deviator Stress
Principal Stress
Effective Principal Stress

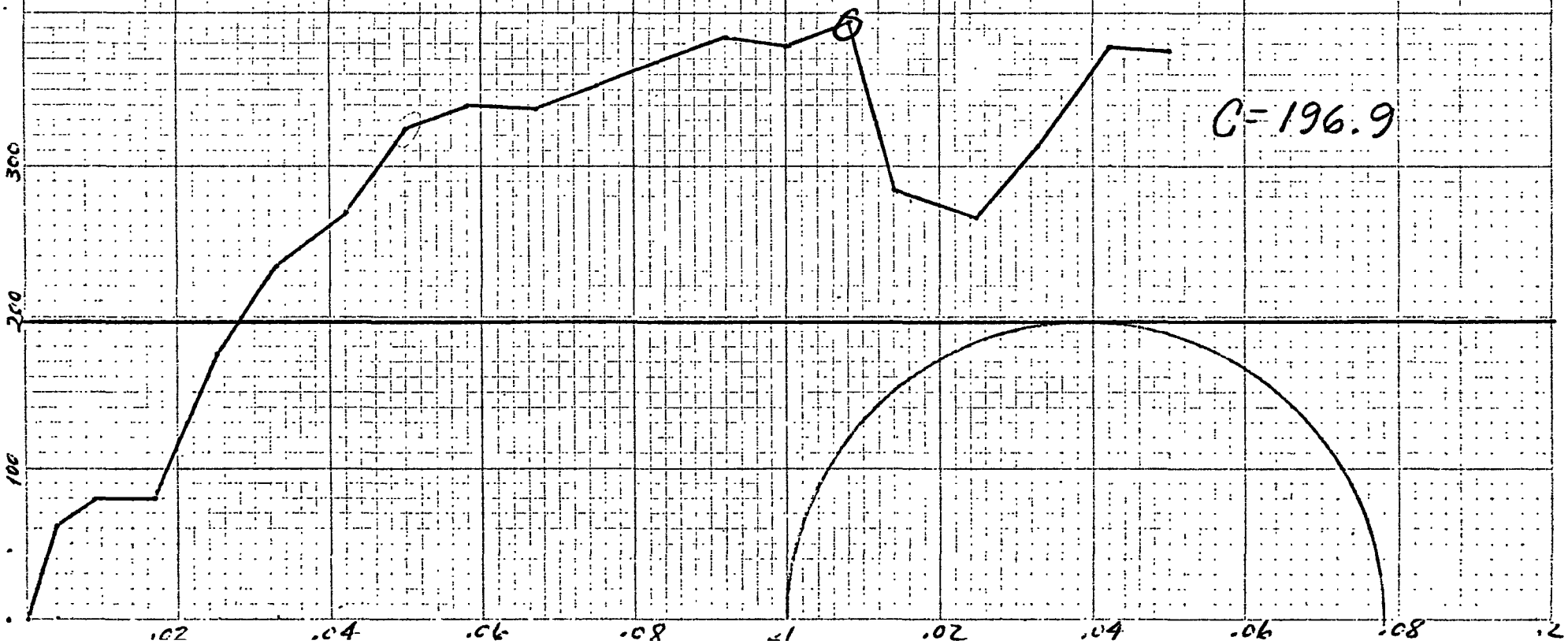
Failure

Back Press.
Saturation 85%

ELASPED TIME (Hr.) (Min.)	LOAD DIAL READ (X 10^{-4})	DEFORM. DIAL READ	ΔL (COL. 3 x 10^{-3})	E. UNIT STRAIN ($\Delta L/L$)	AREA C.F. (1 − E)	CORRECT. AREA A' ($\frac{A^o}{1-E}$)	PORE PRESS.	DEV. LOAD (Col. 2 X LRC)	DEV. STRESS (Col. 9 ÷ Col. 7)	PRINC. STRESS (Col 10 + conf. press.)
1	2	3	4	5	6	7	8	9	PSF 10	11
~~0~~							3.66			
.5	3	026		.004	996	6.62	3.66	.276	60.04	
1	4	052		.009	991	6.66	3.70	3.68	79.57	
2	4	100		.017	983	6.71	3.70	3.68	78.97	
3	9	150		.025	975	6.77	3.50	8.28	176.12	
3.75	12	200		.033	967	6.82	3.36	11.04	233.1	
5	14	250		.042	958	6.89	3.30	12.88	269.2	
6	17	300		.05	950	6.95	3.30	15.64	324.1	
7	18	350		.058	942	7.01	3.60	16.56	340.2	
8	18	400		.067	933	7.07	3.52	16.56	337.3	
8.75	19	450		.075	925	7.14	3.35	17.48	352.5	
9.75	20	500		.083	917	7.20	3.35	18.4	368	
10.75	21	550		.092	908	7.27	3.40	19.32	382.7	
11.5	21	600		.1	900	7.33	3.44	19.32	379.5	
12.5	22	650		.108	892	7.40	3.28	20.24	393.8	
13.25	16	685		.114	886	7.45	3.18	14.72	284.5	
14.5	15	750		.125	875	7.54	3.18	13.8	263.6	
15.5	18	800		.133	867	7.61	3.14	16.56	313.4	
16.5	22	850		.142	858	7.70	3.14	20.24	378.5	
17.25	22	900		.15	850	7.76	3.14	20.24	375.6	

DOT FORM 351-018 REVISED 4/80

LTR62 HOQUIAM BYPASS
SAMPLE # 3639-A



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

TRIAX

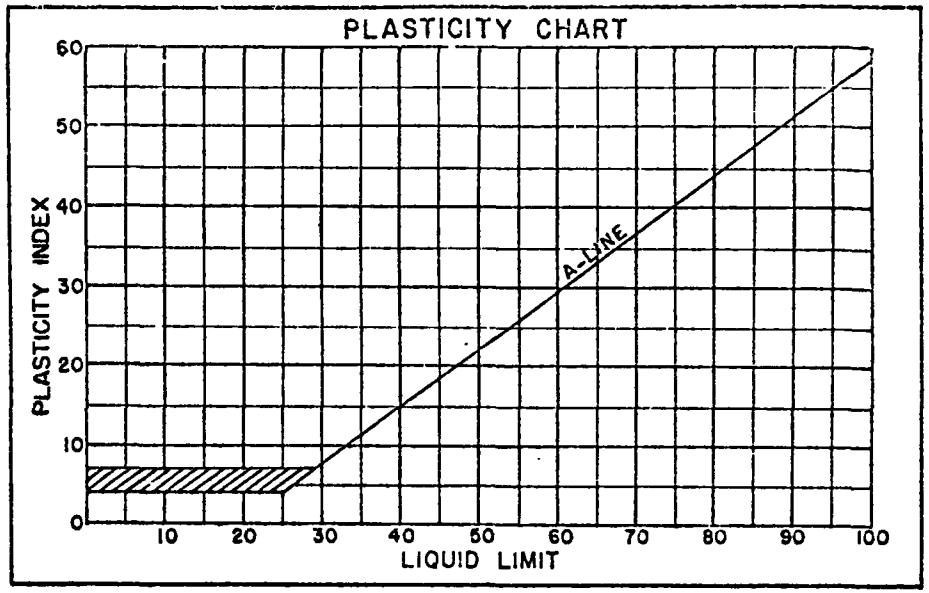
SAMPLE NO. 3639A JOB NO. HOQ HOLE NO.

DATE 6 APR 83 OPERATOR RB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST		✓	
DILATANCY			
BITE			
TOUGHNESS		✓	

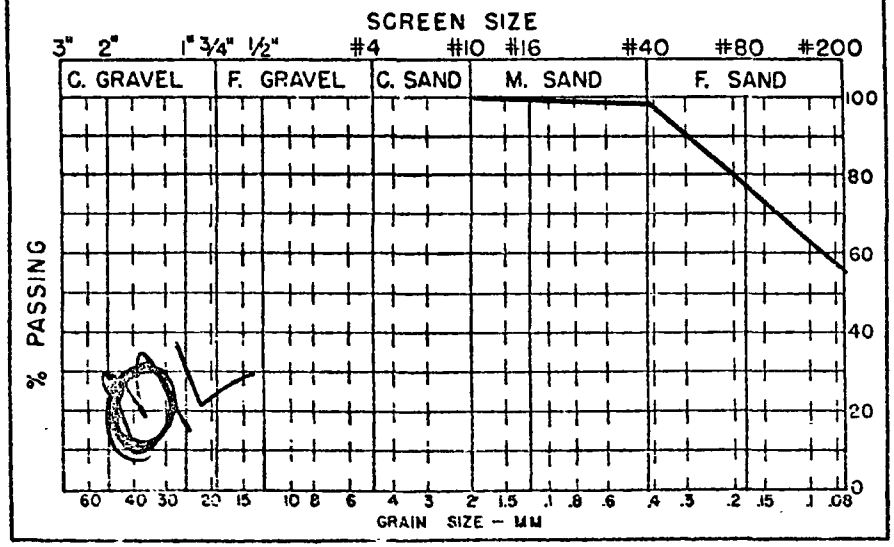
DESCRIPTION: Wet Brn V org SILT w/ zones of sty F SAND



$H_2O = 56$

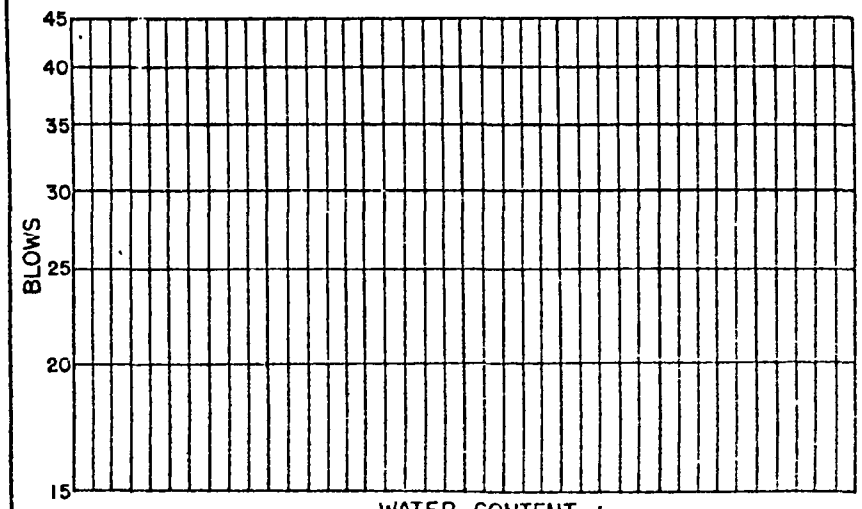
SIEVE ANALYSIS	% Passing 159.63		
		-40 70.88	99
-3/4		-80	
-4		-140	
-10 1.0	100	-200 87.75	55

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-016 REVISED 5/81

CONSOLIDATION TEST DATA

Date 3-4-83 Sample No. 3639-B-Shelby

Job No. L-7262 Section Hoquiam

Depth 2'-4 Station 187+00 Hole No. B-1

Material Moist, Gr. org. Silt w/veg., twigs, trace Pty. mtr.

GROSS WEIGHT	TARE 268	NET WEIGHT	CAN NUMBER	WET WEIGHT	DRY WEIGHT	WEIGHT H^2O	PERCENT H^2O	WET DENSITY	DRY DENSITY
310	~~242~~	42	65	21.77	9.22	12.55	136%	1.4	1.2.3
		CONSOL	40	34.95	20.03	14.92	75%		

Take Tare wt. of Ring when Done

Didn't "0" - Made correction

Sample Height =

hs = Wt. Dry Soil / K

eo = hvo/hs

hvo = 0.6250 – hs

K = 47.24 X sp. G

Hvf=hvo – Defl.

ef = hvf/hs

TIME	500 lbs/sq ft DIAL	%	1000 lbs/sq ft DIAL	%	2000 lbs/sq ft DIAL	%	4000 lbs/sq ft DIAL	%	8000 lbs/sq ft DIAL	%
0										
1/4	138	39	34	15	40	11	40	8	49	8
1/2	145	41	40	18	50	13	52	10	61	10
1	159	45	50	22	62	16	71	14	79	13
2 1/4	177	50	62	27	83	22	97	20	107	18
4	191	54	74	32	103	27	124	25	132	22
9	229	65	98	43	139	37	176	35	182	30
16	250	71	115	50	169	45	222	45	230	39
25	271	77	131	57	200	53	261	53	289	47
36	291	83	143	63	221	58	293	59	335	55
49	300	85	153	67	240	63	323	65	375	61
64	309	88	168	74	251	66	344	69	402	66
2 hrs	318	90	182	90	284	75	399	80	446	73
3	322	91	190	83	306	81	409	82	473	78
4	326	93	197	86	320	85	423	85	490	80
5	330	94	200	88	328	87	433	87	502	82
6	338	96	204	89	333	88	441	89	512	84
24	352	100	228	100	378	100	496	100	610	100
72										
hvo=	.4532		.4180		.3952		.3574		.3078	
hvf=	.4180		.3952		.3574		.3078		.2468	
ef=	2.4232		2.2005		2.0804		1.7917		1.4267	

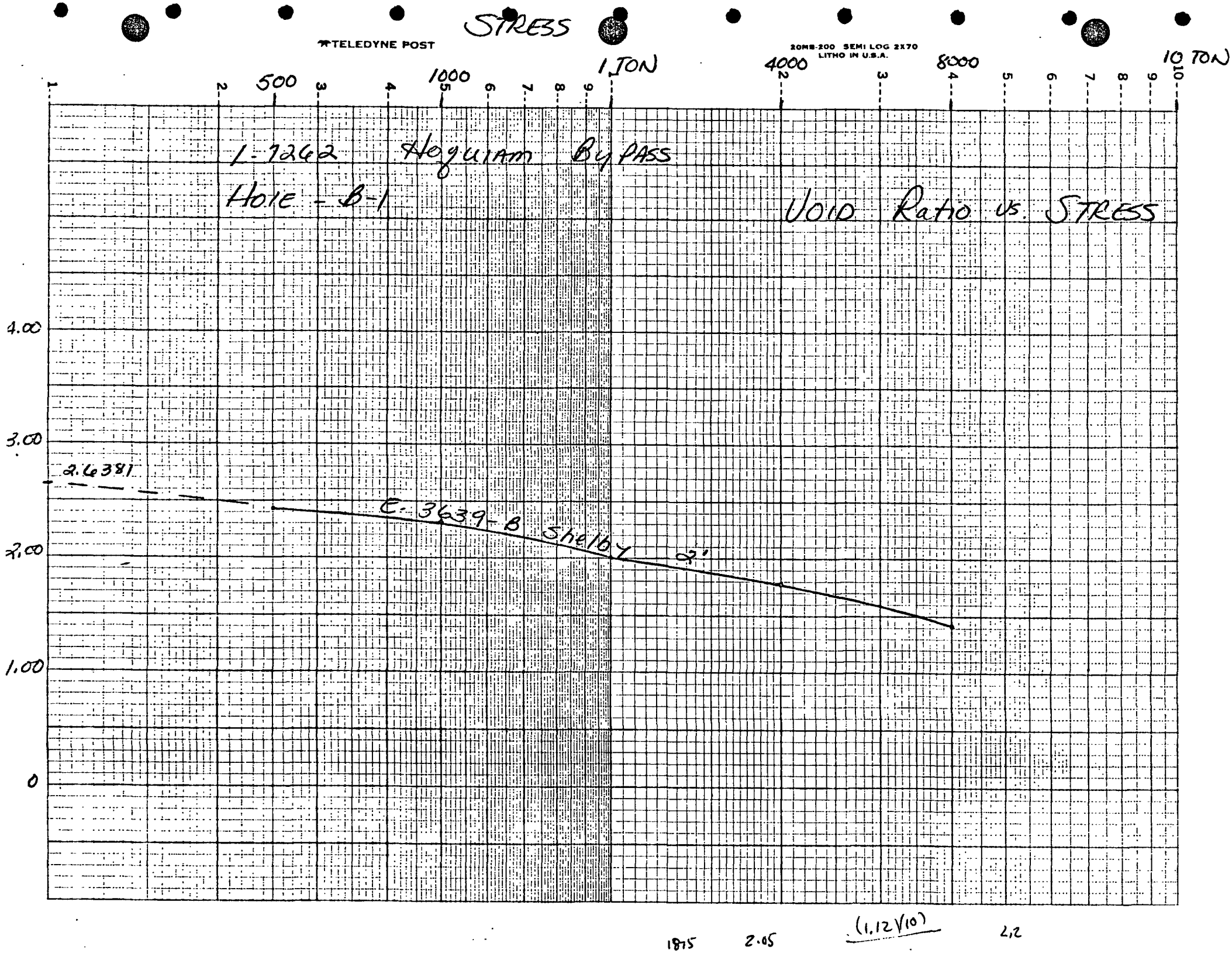
Sp. Gr.	2.4683
K	116.6025
	0.6250
hs	.1718
hvo	.4532
eo	2.6391

Consol sample was obtained from shelby sample by pushing w/ undist. tube.

NOTE: ~~Shelby~~ ~~Sample~~

Total Defl. 0.3064

Operator [illegible] Machine No. 4


STRESS
TELEDYNE POST
20MB-200 SEMI LOG 2X70
LITHO IN U.S.A.
500
1000
1 TON
4000
8000
10 TON
1-1262 Hoquiam By PASS
Hole - B-1
Void Ratio vs. STRESS
4.00
3.00
2.00
1.00
0
2.6381
E-3639-B Shelby 2"
1875
2.05
(1.12√10)
2.2

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

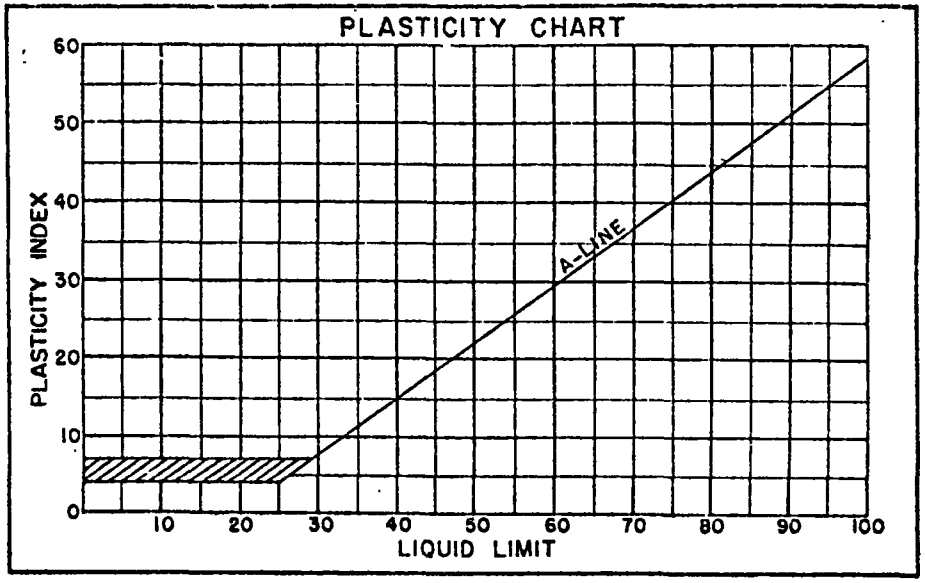
Consol.

SAMPLE NO. 3639 JOB NO. Hog HOLE NO. B-1
DATE 3-10-83 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: Moist, Gr. org. SICT w/ veg., twigs, trace. Pty.

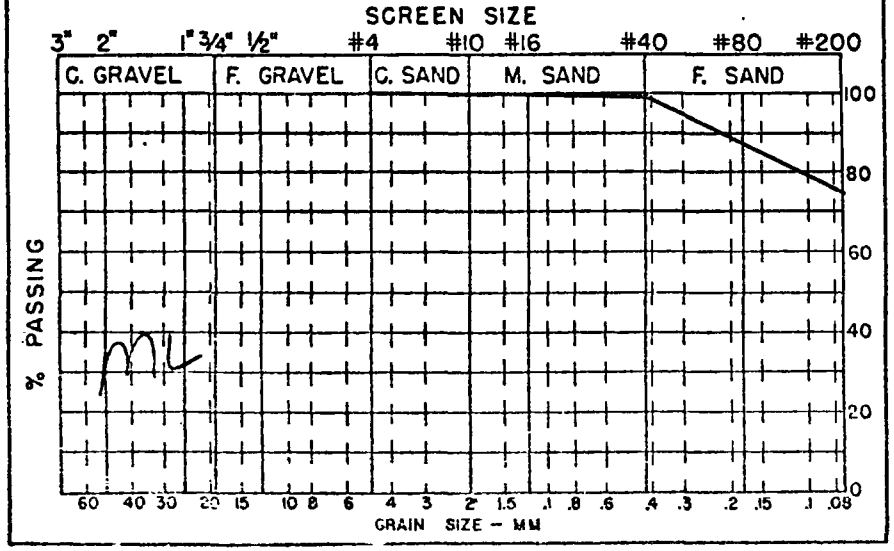


H_2O = 112 %

SIEVE ANALYSIS % Passing 68.28

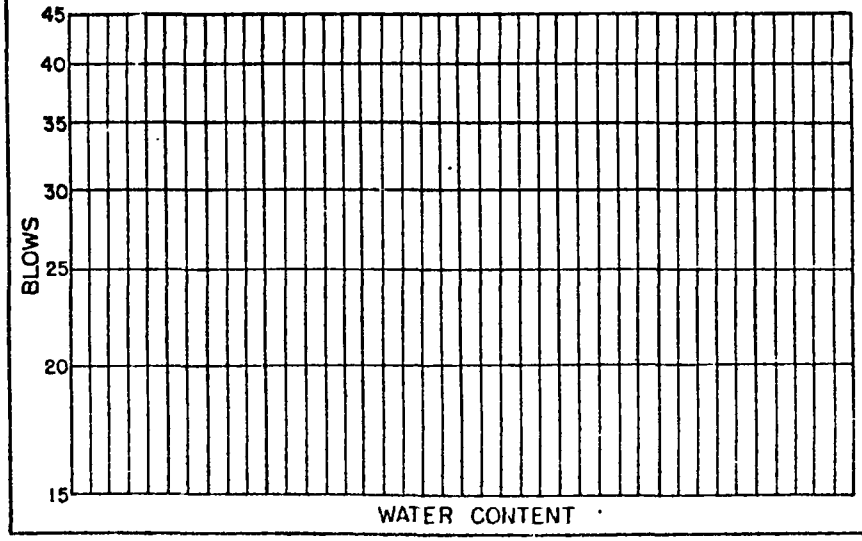
			-40	16.63	99.8%
-3/4			-80		
-4	.03	100 %	-140		
-10	.09	99.8 %	-200	51.53	25%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 10-1-82

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section West Hoquiam by Pass SR No. 101A Sub-Section Culvert

Station & Offset 187+00 50 Lt. Hole # B-2

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3653 -1	D-1	0' 0 / 2' 0	H= 28%	ML	Like 3638 Moist, Rust & tan Long. Layered F. Sdy. Silt w/T. mica & org. pieces
-2	S-2	2' 0' / 4' 0'	H= 51%	ML	Wet, Rust & Gr., hly. org. matl w/ twigs & wood F. Sdy. Weathered Silt
3654	S-4	7' 0' / 8' 6'	H= 121%	OL	Very Wet, Gr-Brn organic F. Sdy. Silt w/Lg. Wood Pieces, Grass, Trace mica & Clay.
3655	U-7	14' 4'	A		
3656	S-8	20' 0'			
3657 -1	S-10	24' 0'	H= 72%	OL	Like 3587-1 SAT, dk. Brn./Gr. Cly. Org. Silt w/Large Wood, Branches & t. mica.
-2	D-13	29' 0'		ML	Like 3593 w/F. Sdy. Wet, tan & Gr. Soft, Cly. F. Sdy. Silt w/T. organic & mica

1 copy with samples
1 copy to addressee

Yours very truly,

Inspector.

DOT FORM 351-002 REVISED 2/80

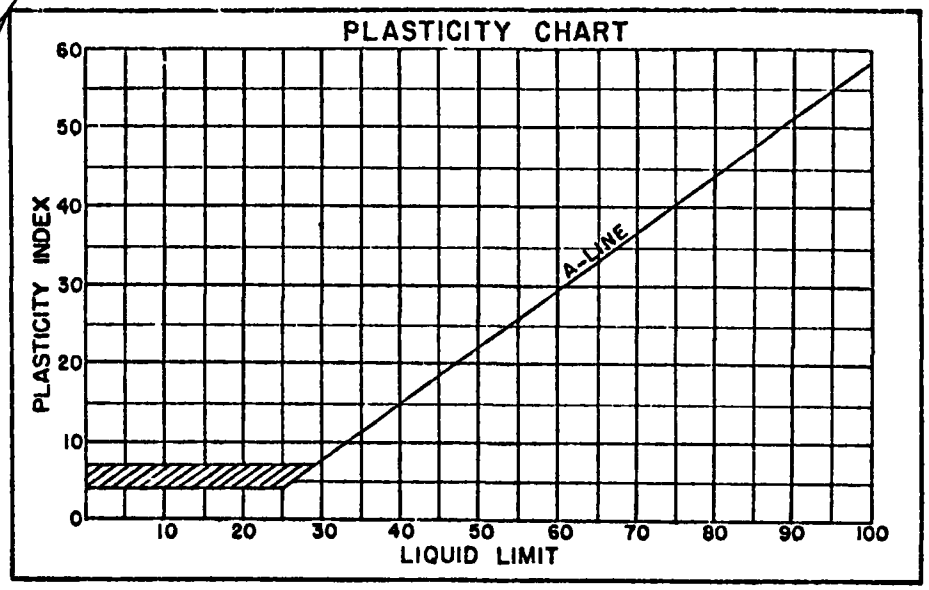
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3654 JOB NO. ~~Hog~~ Shelby HOLE NO. B-2
DATE 10-12-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			✓

DESCRIPTION: Very Wet, Gr-Brn. F. Sdy, SILT w/ Lg. Wood Pieces, Grass, Trace Mica & Clay.

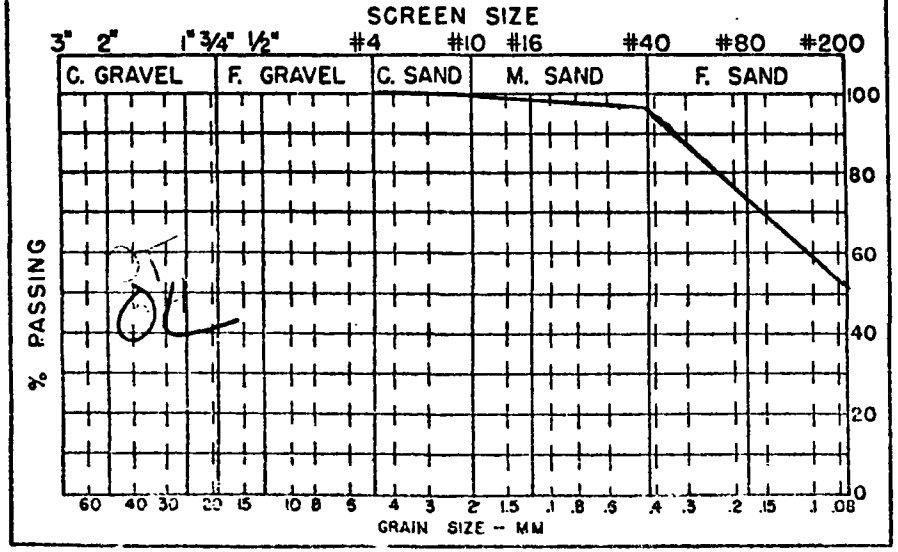


H_2O = 121%

SIEVE ANALYSIS % Passing 24.62

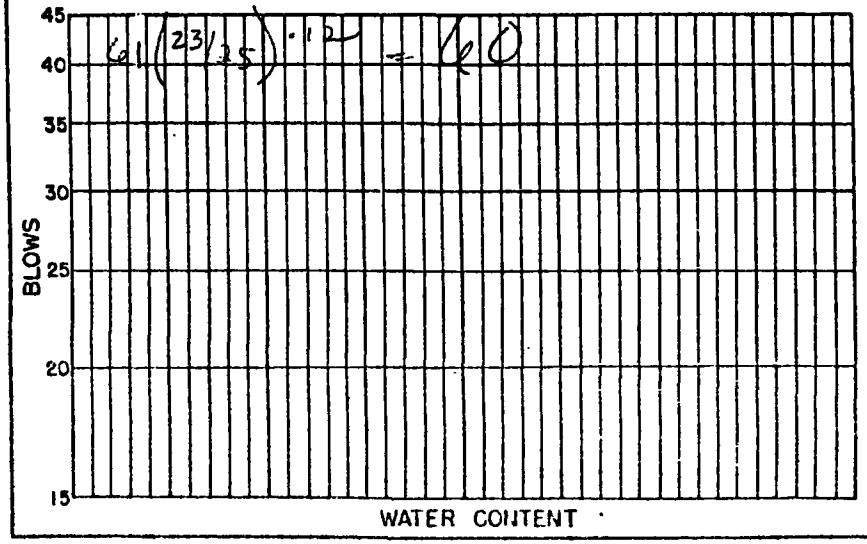
			-40	10.90	96%
-3/4			-80		
-4	.01	100%	-140		
-10	1.00	99.9	-200	12.71	52%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	49				N/P
Wet Wt.	13.10				
Dry Wt.	8.14				
% H_2O	61%				PL=
Blows	23				PI=



DOT FORM 351-019

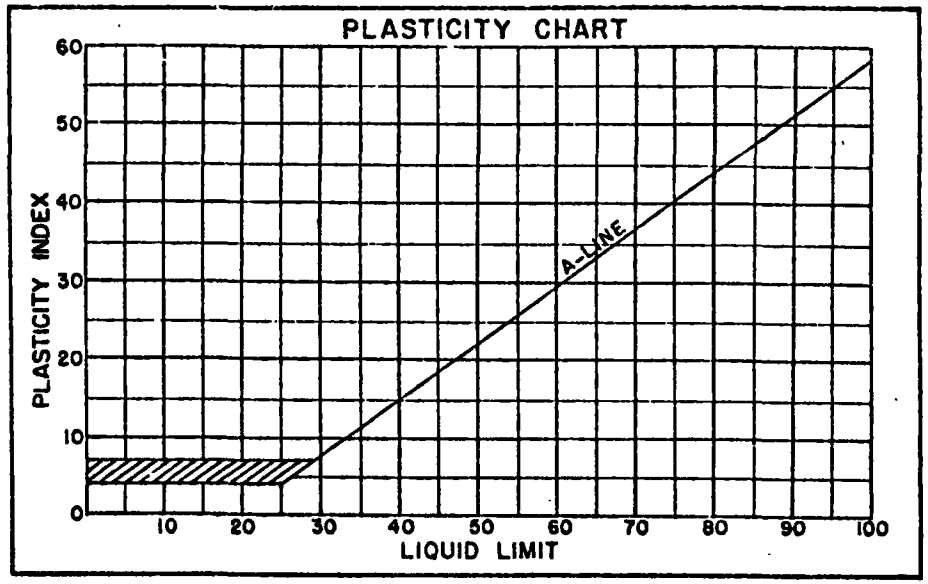
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3653-2 JOB NO. Hog. HOLE NO. 1 C
DATE 11-10-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Wet, Rust & GR
Hly. Organic Matl w/Twigs
& wood F. Sdy. Weathered
Silt

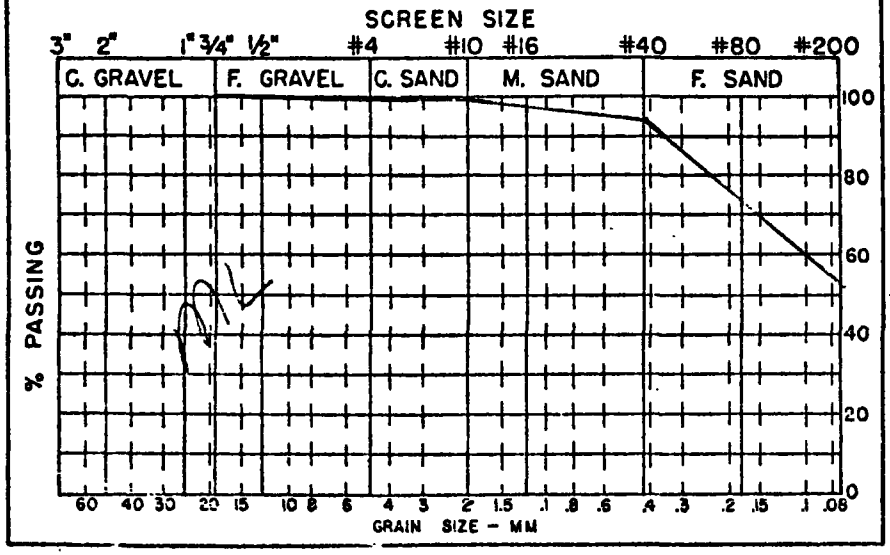


+1-20 = 51%

SIEVE ANALYSIS % Passing 100.00

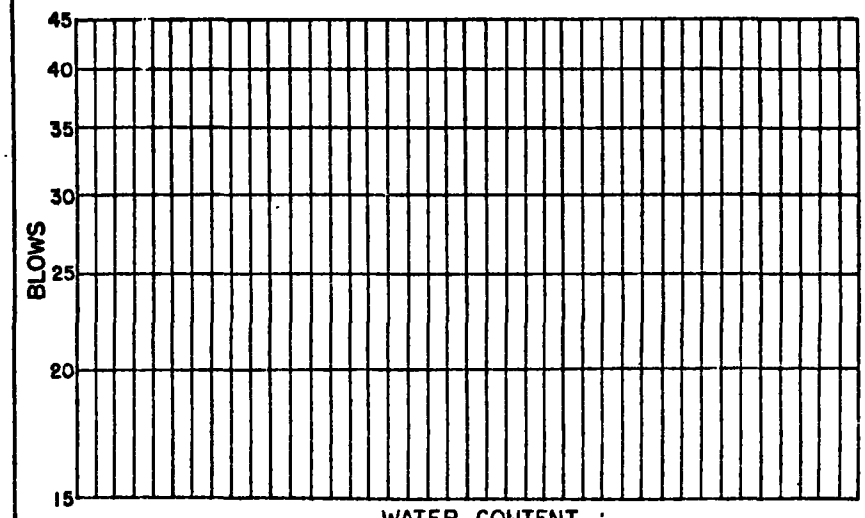
			-40	41.15	94
-3/4	1.45	100	-80		
-4	.02	99	-140		
-10	4.45	99	-200	52.93	53

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place [illegible]

Date 12-5-[illegible]

Dear Sir:

I have forwarded by today's [illegible] the following Foundation Samples.

Contract or Job No. [illegible] Section [illegible] SR No. [illegible] Sub-Section [illegible]

Station & Offset [illegible] FOILT

Hole # B-3

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3704 -1	D-1	0' 1' 6"	H_{2O} 28%	ML	Like 3638 Moist, Rust & tan horiz. Layered F. Sdy. Silt w/T. mica & org. Pieces.
-2	D-3	3' 5' 5' 5"		O	SAT. Brn-BLK., Sl Sty. 4-5 Chunks Rotten Wood
3705	D-4	5' 6" 5' 5"	H_{2O} 149%	PT	High moisture content, BLK., dk. Brn. & Brn. Silty. FIBROUS PEAT w/trace SAND
3706 -1	D-5	9' 6" 11' 6"	H_{2O} 72	OL	Like 3587-1 SAT., dk. Brn. / Gr., Cly., Org. SILT w/ Large Wood-Pieces, Branches & T. mica
-2	D-6	11' 6" 13' 6"		O	Like 3704-2 SAT. Brn-BLK., Sl. Sty. 4-5 Chunks Rotten Wood.
-3	U-9 I.D. 0.111.	21' 6" 23' 6"	H_{2O} 68%	ML	Wet, BLK. F. Sdy. Silt w/org. Pieces of Wood & PEAT
-4	D-10	23' 6" 25' 6"	H_{2O} 33%	SM	Moist, Gr. w/Rust Coat. Sty. F. SAND w/T. Mica
-5	D-12	27' 6" 30' 6"		SM	Same 3706-4 w/T. organic
-6	D-13	32' 6" 34' 6"		SM	Like 3706-4 w/Rust streaks

1 copy with samples
1 copy to addressee

Yours very truly,

[illegible]
Inspector.

FORM 351-002

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

Shelby

SAMPLE NO. 3705 JOB NO. Ho Q. HOLE NO. P-2

DATE 10-15-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

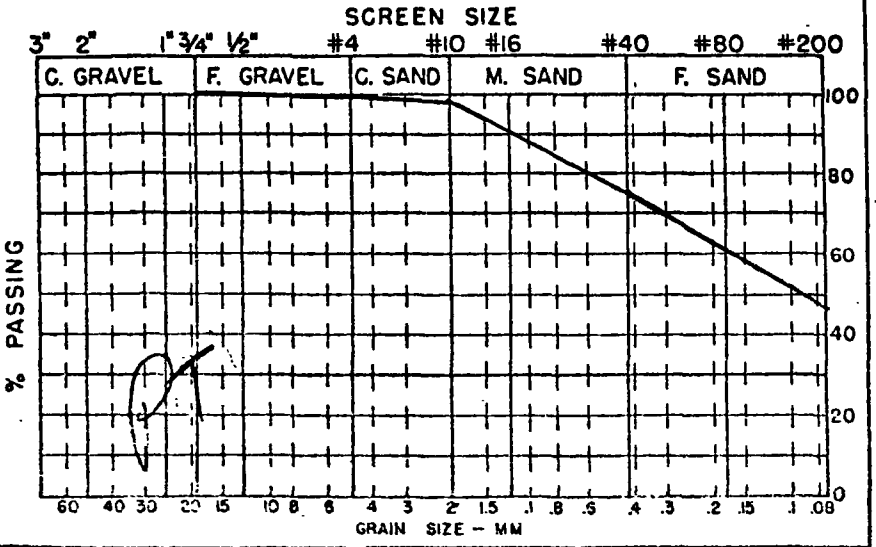
DESCRIPTION: High Moisture Content, Blk. dk. Brn. & Brn. Silty Fibrous PEAT w/ Trace f. Sand

H_2O = 149 %

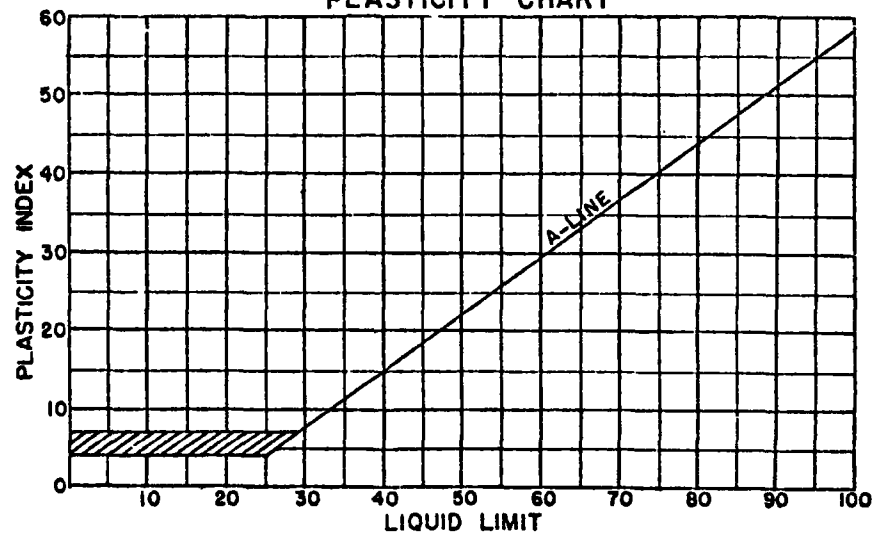
SIEVE ANALYSIS % Passing 98.20

			-40	27.22	75%
-3/4	1.40	100%	-80		
-4	1.30	99.5	-140		
-10	22.80	98%	-200	46.48	47%

GRAIN SIZE CURVE

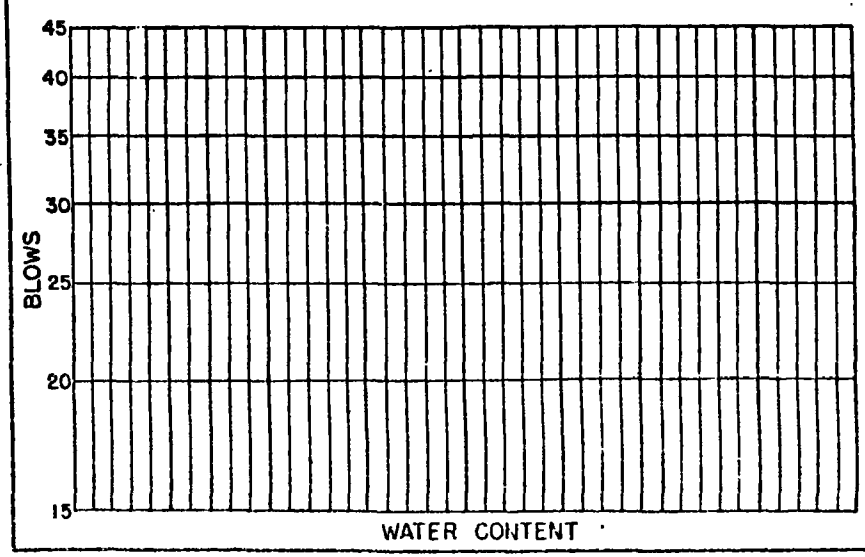


PLASTICITY CHART



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

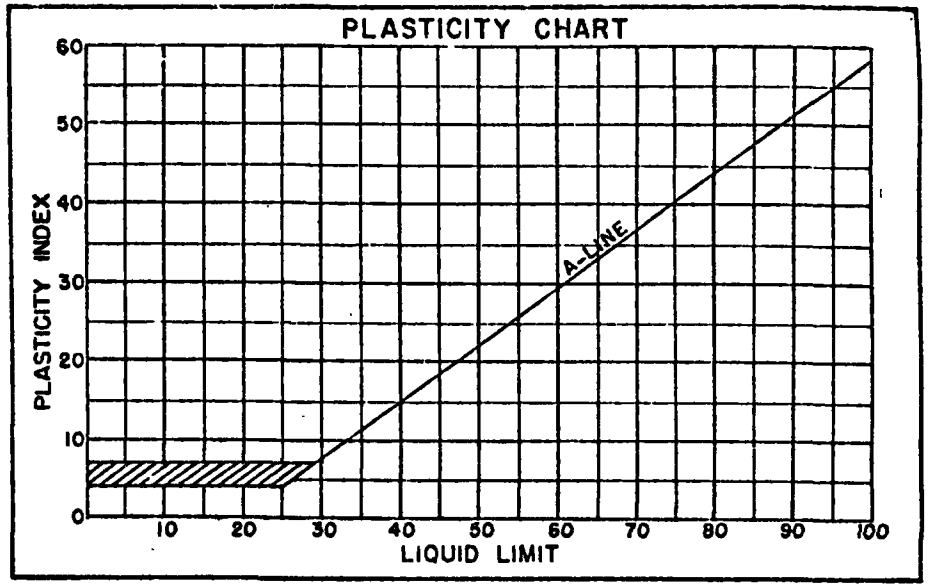
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3706-3 JOB NO. Hog. HOLE NO. B-3
DATE 11-16-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Wet, BLK. F. Sdy-SILT w/ org. pieces of wood & PEAT.

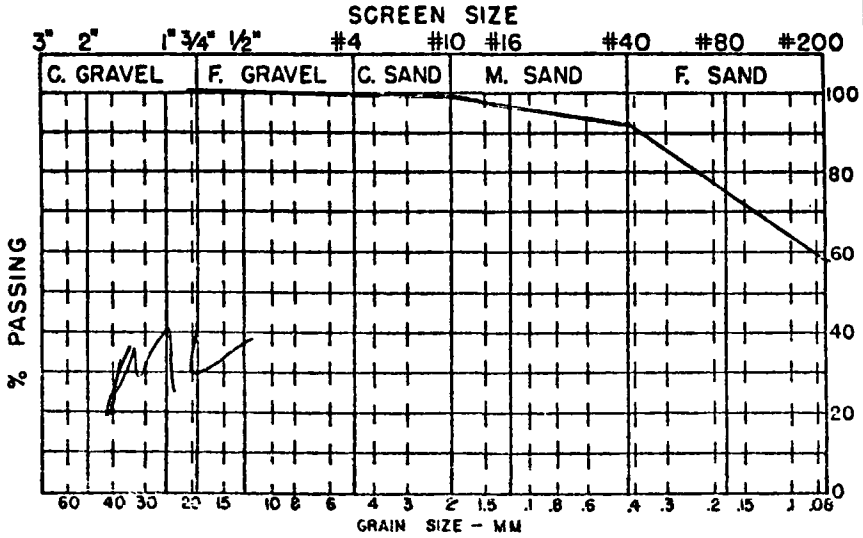


H_2O = 68%

SIEVE ANALYSIS % Passing 53.23

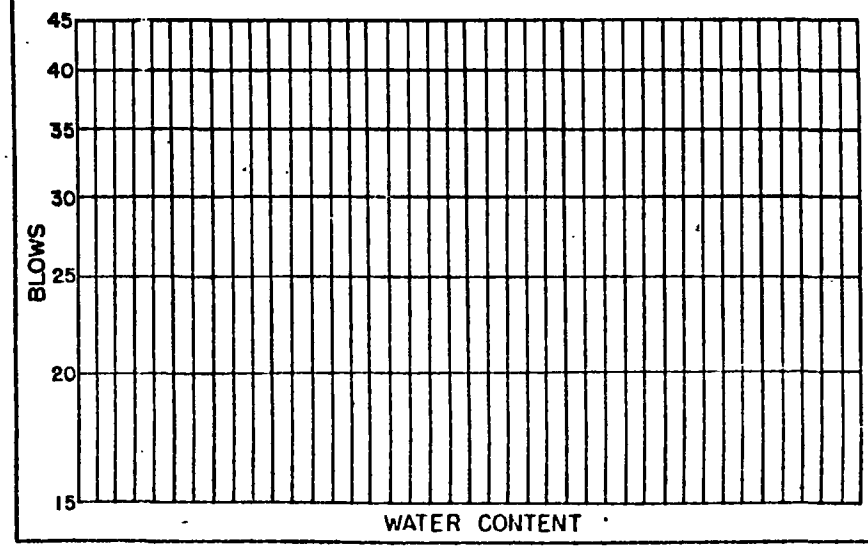
wood		-40 18.72	93%
-3/4 .02	100%	-80	
-4 .37	99.9	-140	
-10 3.59	99	-200 30.53	57%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3706-4 JOB NO. Hog. HOLE NO. B-3
DATE 11-16-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

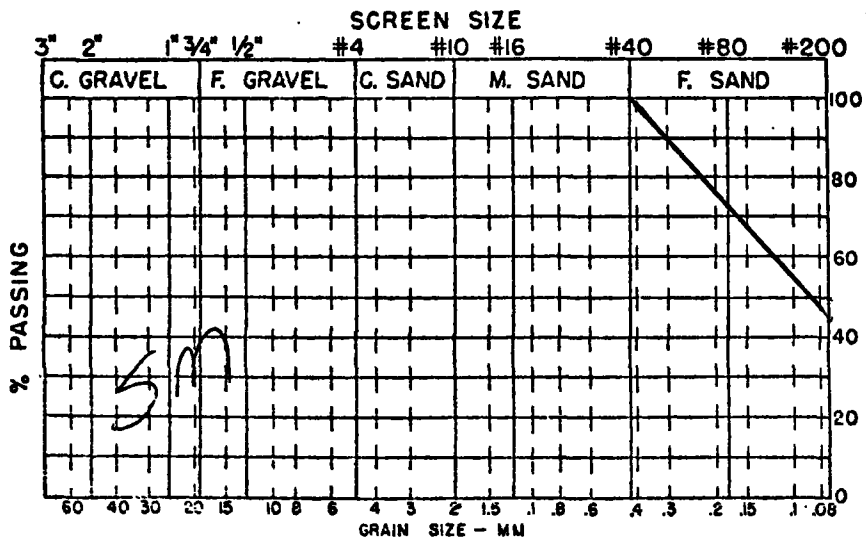
TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓		
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

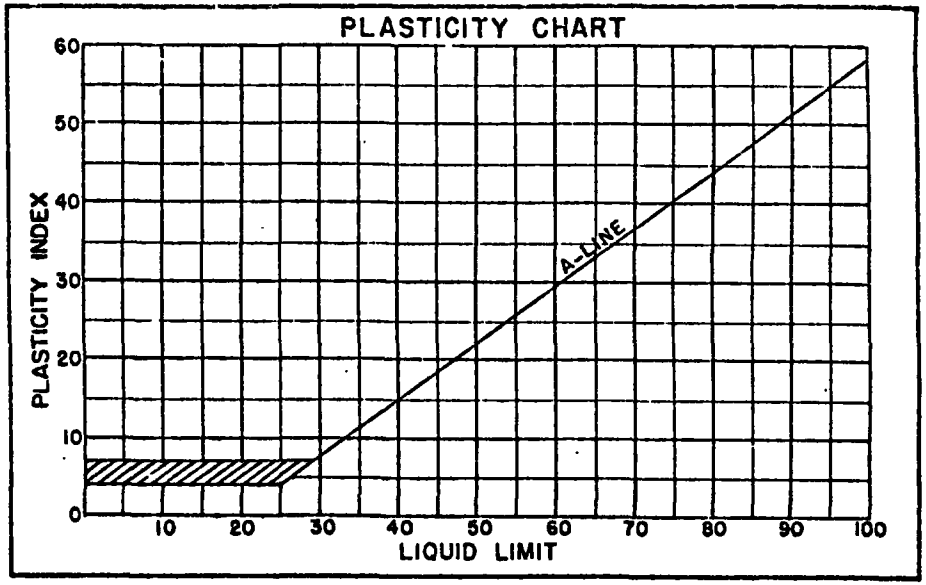
DESCRIPTION: Moist, GR w/ Rust Coat.
Sty. F. SAND w/ T. Mica

H_2O = 33%

SIEVE ANALYSIS	% Passing 100.00	
	-40 55.46	100%
-3/4	-80	
-4	-140	
-10	-200 44.60	45

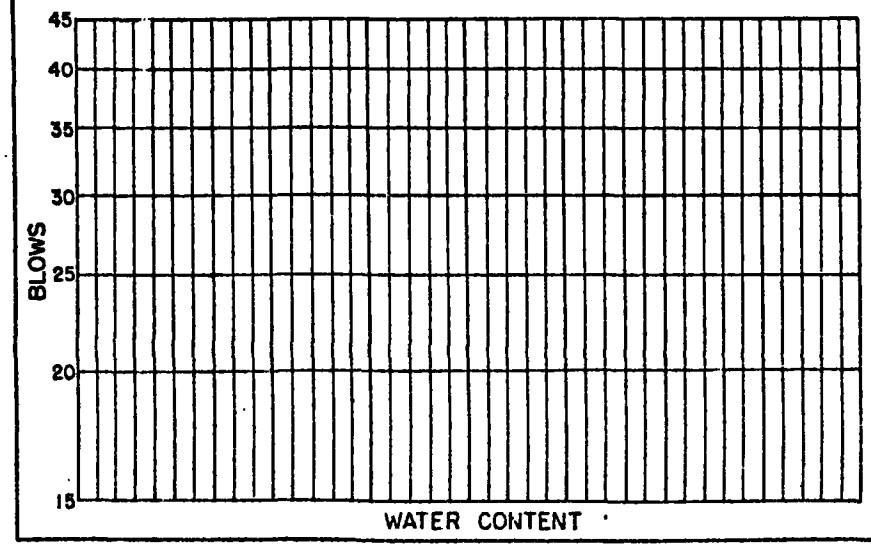
GRAIN SIZE CURVE





LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater

Date

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7162 Section [illegible] SR No. 101A Sub-Section Culvert

Station & Offset [illegible] 50 Rt

Hole # B-4

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3732	U-1	0' 0 / 2' 0	H=27%	ML	Moist, Orange Yellow-Olive Silt Lensize F Sdy. SiCT
3733 -1	U-2	2' 4 / 2' 4"	A		
-2		2' 4 / 2' 8"	B		
3734	D-3	4' / 6' 0	H=150%	OL	SAT. tan & Gr. Cly. F. Sdy. SiCT PEAT W/T. Org.
3735 -1	U-4	7' / 7' 4	A		
-2		7' 4 / 7' 8"	B		
-3		7' 8 / 8' 0"	C		
3736 -1	D-5	11' 0 / 11' 0"	H=150%	OL	Like 3734 Above
-2	D-7	14' 0 / 15' 0"	H=150%	OL	Like 3734

1 copy with samples
1 copy to addressee

Yours very truly,

Inspector.

DOT FORM 351-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place .....

Date .....

Dear Sir:

I have forwarded by today's ..... the following Foundation Samples.

Contract or Job No. ..... Section ..... SR No. ..... Sub-Section .....

Station & Offset 180+00 50' Rt. Hole # B-4

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3737 -1	U-8	17' 0" 17' 4"	A		
-2		17' 4" 17' 8"	B		
-3		17' 8" 18' 0"	C		
3738 -1	D-9	17' 0" 21' 0"	H-[illegible] 77%	mu	Like 3593 Wet, tan & Gr. Soft, Cly. F. Sdy. Slct w/T. org. & mica.
-2	D-10	22' 0" 24' 0"	H-[illegible] 109%	OL	Like 3591 w/Needles etc. Sat., Gel, Org., Cly. Silt w/ Blk. Org. mtr. Outside.
3739 -1	U-11	27' 0" 27' 4"	A		
-2		27' 4" 27' 8"	B		
-3		27' 8" 28' 0"	C		
-4		28' 0" 28' 4"	D		

1 copy with samples
1 copy to addressee

Yours very truly,

.....
Inspector.

DOT FORM 351-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater

Date

Dear Sir:

I have forwarded by today's ..... the following Foundation Samples.

Contract or Job No. ..... Section ..... SR No. ..... Sub-Section .....

Station & Offset 1[illegible]+20 50' Rt.

Hole # B-4

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3740	D-12	27' 0" 31' 0"	W = 77%	mc	Like 3593 Wet, tan & Gr. Soft Cly. F. Sdy. Silt w/t. org. & mica
3741 -1	U-13	32' 0" 32' 4"	A		
-2		32' 4" 32' 8"	B		
-3		32' 8" 33' 0"	C		
-4		33' 0" 33' 4"	D		
3742	D-14	34' 0" 36' 0"	W = 150%	ob	Like 3736-2 3734 SAT, Tan & Gr, Cly. F. Sdy. Sty. PEAT W/T. ORGANIC

1 copy with samples
1 copy to addressee

Yours very truly,

[illegible]
Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place .....

Date 10-19-82

1. VISUAL ID
2. Moisture ONLY

Dear Sir:

I have forwarded by today's ..... the following Foundation Samples.

Contract or Job No. L-7262 Section West Hoquiam Bypass SR No. ..... Sub-Section .....

Station & Offset 191+78 23' Lt. Hole # B-5

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3813-1	U-6-A	12' 12'4"	H_2O=50%	SM	Wet, orange & gr. F. SAND w/Layers of SILT, T. organic & mica
-2	U-8-A	17' 17'4"	H_2O=35%	SM	Wet, cinnamon sty. F. SAND w/T. mica & breakable hard clumps of SILT
-3	U-8-B	17'4" 17'8"	H_2O=35%	SM	Like 3813-2
-4	U-10-A	22' 22'4"	H_2O=41%	SM	Same
-5	U-10-B	22'4" 22'8"	H_2O=42%	SM	Like 3813-2 w/o clumps
-6	U-10-C	22'8" 23'	H_2O=44%	SM	Like 3813-5
-7	U-12-A	27' 27'4"	H_2O=39%	SM	Wet, cinnamon sty. F. SAND w/Layers of Silt, T. Rust & mica
-8	U-12-B	27'4" 27'8"		SM	Like 3813-7 but tan & Rust be

1 copy with samples
1 copy to addressee

Yours very truly,

.....
Inspector.

DOT FORM 351-002 REVISED 2/80

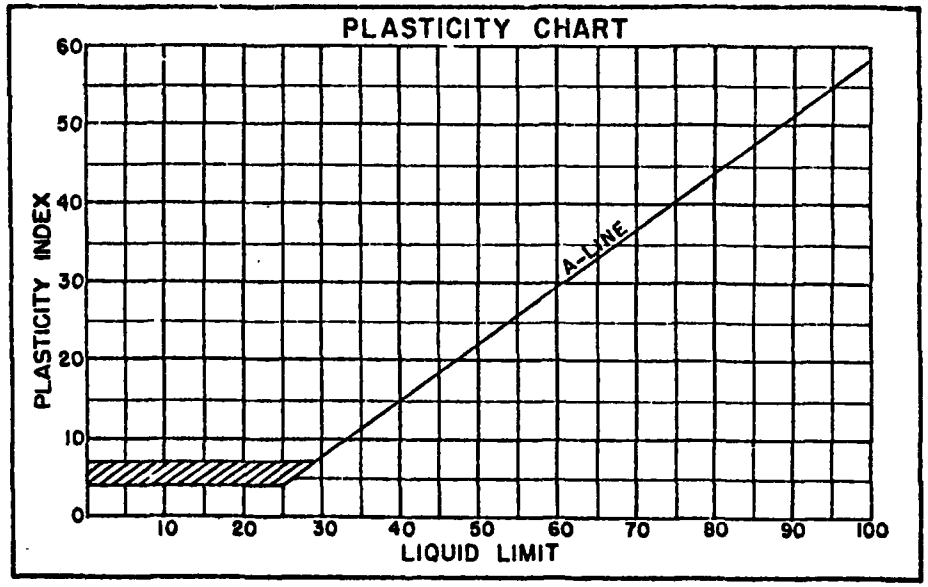
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3732 JOB NO. Ho2 HOLE NO. 1
DATE 11-10-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE		✓	
TOUGHNESS	✓	✓	

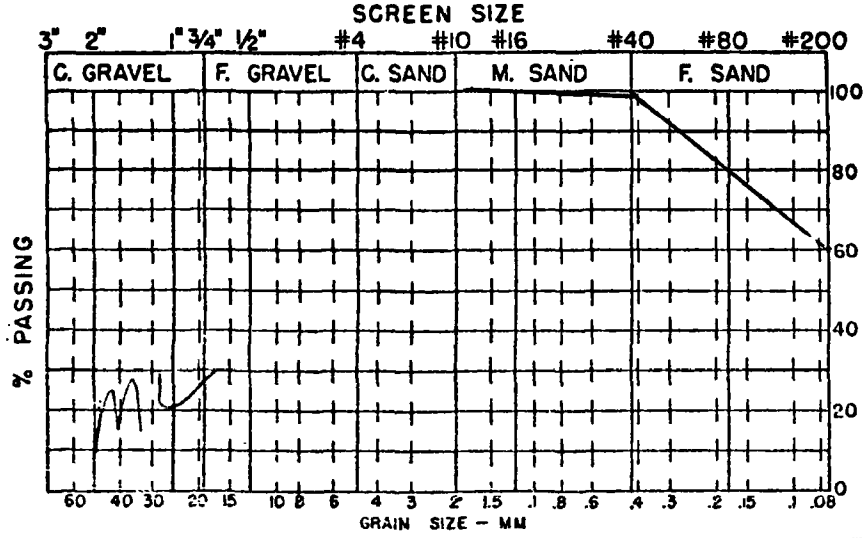
DESCRIPTION: Moist, Orange, yellow, olive, Slickensides - F. Sdy. SILT



H_2O = 27%

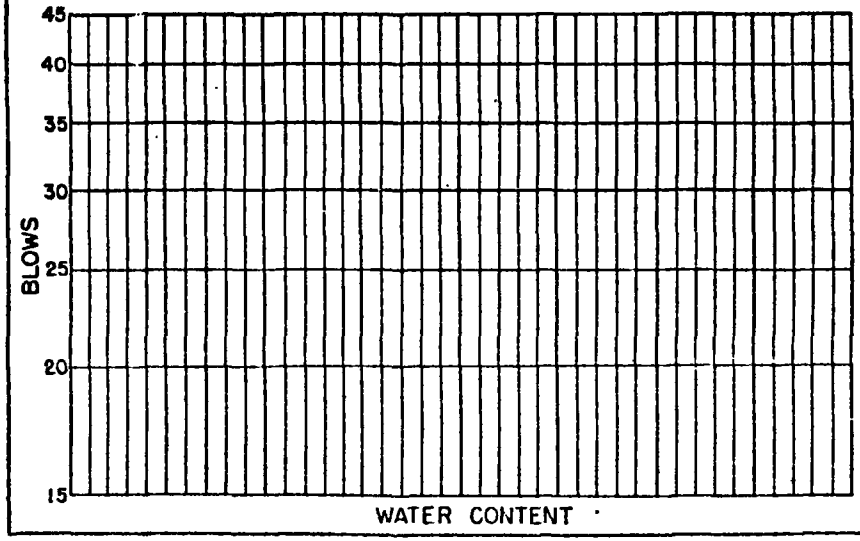
SIEVE ANALYSIS			% Passing	100.00
		-40	39.87	99.9
-3/4		-80		
-4		-140		
-10	.02	100% -200	60.11	60

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet. Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



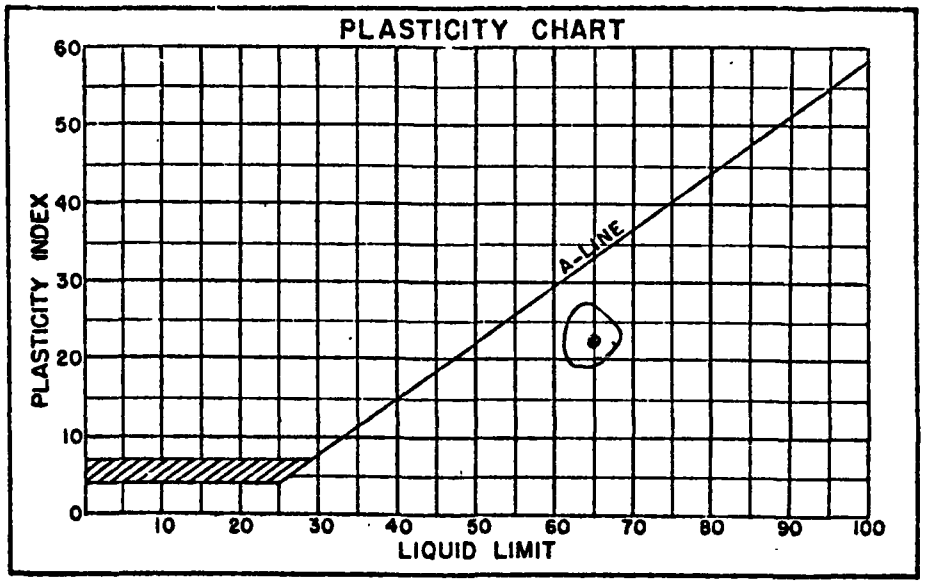
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3734 JOB NO. Hog. HOLE NO. 4
DATE 11-15-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓		✓

DESCRIPTION: SAT. tan & GR Cly.
SILT w/ T. ORG.

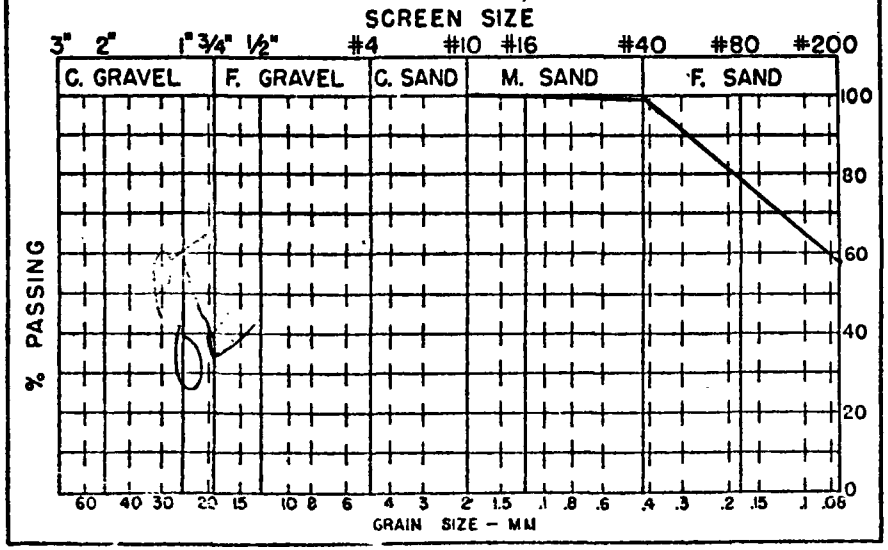


150 %

SIEVE ANALYSIS % Passing 65.40

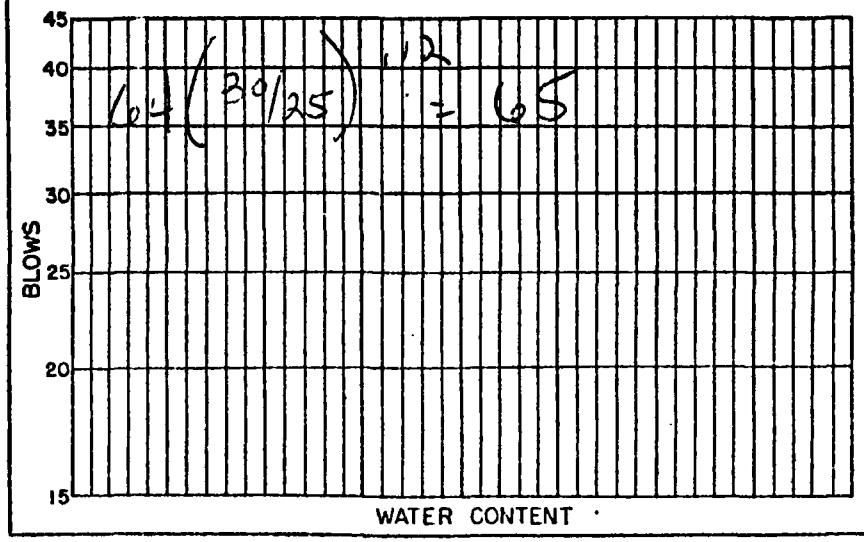
		-40	27.50	99.7
-3/4		-80		
-4		-140		
-10 .12	100%	-200	37.72	58

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	19				70
Wet Wt.	10.52				10.29
Dry Wt.	6.30				7.25
% H_2O	64%				PL= 42%
Blows	30				PI= 23



DOT FORM 351-019

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 10-20-82

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. -7262 Section [illegible] Hamilton by-pass
SR No. [illegible] Sub-Section [illegible]

Station & Offset 171+78 23' Lt. Hole # B-5

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3775 -1	D-1	0' 0" 1' 0"	Hp 28%	ML	Like 3638 moist, Rust & tan horiz. Layered F. Sdy. Silt w/T. Mica & Org. Pieces
-2	D-3	4' 0" 5' 0"	Hp 33%	SM	Like 3706-4 only TAN w/Rust Streaks moist, TAN Sty. F. SAND w/T. Mica
3776	U-4	7' 0" 7' 4"	A		
3777	D-5	11' 0" 11' 0"	Hp 28%	ML	Like 3638 Above
3778 -1	U-6	12' 4" 12' 8"	B		
-2		12' 8" 12' 9"	C		
3779	D-7	14' 0" 14' 0"		ML	Like 3638
3780 -1	U-8	15' 0" 15' 0"	C		
-2		15' 0" 15' 4"	D		

1 copy with samples
1 copy to addressee

Yours very truly,

Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater

Date 10-20-82

Dear Sir:

I have forwarded by today's ..... the following Foundation Samples.

Contract or Job No. ..... Section ..... SR No. ..... Sub-Section .....

Station & Offset _____ Hole # B-5

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3780 -3	U-8	18' 4" / 18' 8"	E		
3781	D-9	11' 0" / 21' 0"	H2O 34%	SM ML	Wet, Orange, Tan Sty F. SAND & SILT
3782 -1	U-10	23' [illegible] / 23' 4"	D		
-2		23' 4" / 23' 8"	E		
-3		23' 8" / 24' 0"	F		
3783	D-11	24' [illegible] / 26' 0"	H2O 34%	SM ML	Like 3781 ABOVE
3784 -1	U-12	27' 8" / 28' 0"	C		
-2		28' 0" / 28' 4"	D		
-3		28' 4" / 28' 8"	E		

1 copy with samples
1 copy to addressee

Yours very truly,

.....
Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place .....

Date 10-20-82

Dear Sir:

I have forwarded by today's ..... the following Foundation Samples.

Contract or Job No. ..... Section ..... SR No. ..... Sub-Section .....

Station & Offset _____ Hole # F-5

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3785	D-13	[illegible] [illegible]	H 3406	SM MU	Like 3781 ONLY TAN-[illegible] Sty. F. SAND & SILT
					W/Layers of Rust

1 copy with samples
1 copy to addressee

Yours very truly,

Paul H. Moore

Inspector.

DOT FORM 351-002 REVISED 3/80

3

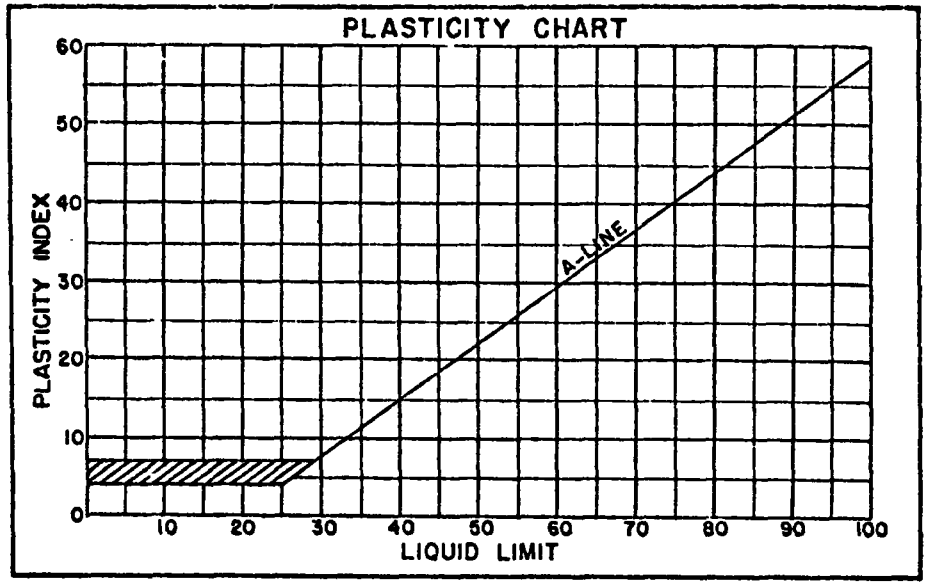
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3781 JOB NO. Hog. HOLE NO. B5
DATE 11-10-82 OPERATOR OB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Wet, Orange, Tan
Stg. F. SAND & SILT.

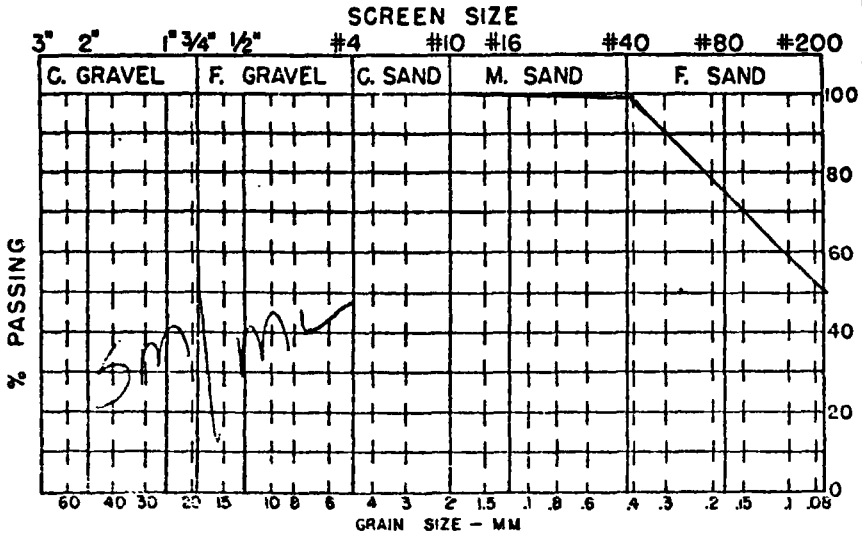


H2O - 34 %

SIEVE ANALYSIS % Passing 95.38

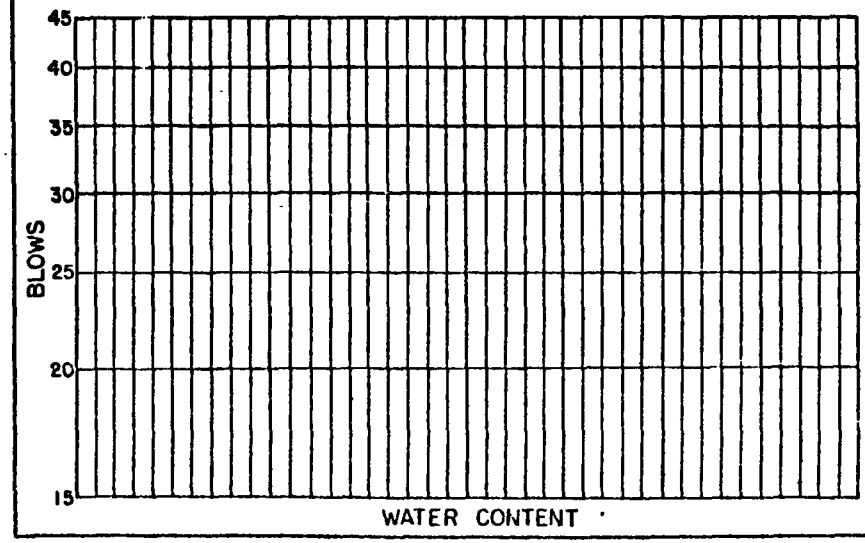
	-40	47.32	99.9
-3/4	-80		
-4	-140		
-10 .03 (60%)	-200	48.03	50

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

ATERIALS ENGINEER
aterials Laboratory
O. Box 167, Olympia, WA 98504 (Mailing Address)
55 So. 2nd Ave.
mwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 11-16-82

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section West Hoquiam by Pass
SR No. 101A Sub-Section Cut Section

Station & Offset 120+20 175' Lt. Hole # B-6

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3890-1	D-1	0' 0" 2' 0"	62%	OH	Wet, SAT. orange & tan, Cly. F. Sdy.
				SILT ~~Sdy~~	organic w/PEAT & dark Charcoal Matl.
-2	D-2	2' 0" 4' 0"		OH	SAME
-3	D-3	7' 0" 9' 0"	45%	ML	Wet, Orange Layers of F. Sdy.
					SILT w/hard clumps of Silt, + Cly. w/1" F. Gravel
-4	D-4	12' 0" 14' 0"		OH	Like 3890-1 w/T. F. Sand
-5	D-5	17' 0" 18' 6"		ML	Like 3809-3 w/org. & Rust Streaks
					Wet, GR. F. Sdy. SILT
-6	D-6	22' 0" 23' 0"		ML	Like 3890-5
-7	D-7	27' 0" 28' 0"		ML	Like 3890-5
-8	D-8	32' 0" 33' 0"		ML	SAME
-9	D-9	37' 0" 38' 0"	14%	ML	Like 3684-4 moist, Olive, grn & wh.
					SILT w/F-C SAND & 1"(-) SR Gravel

opy with samples
opy to addressee

Yours very truly,

Inspector.

FORM 351-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

ATERIALS ENGINEER
aterials Laboratory
O. Box 167, Olympia, WA 98504 (Mailing Address)
55 So. 2nd Ave.
mwater, Washington 98504 (Shipping Address)

Place .....

Date .....

Dear Sir:

I have forwarded by today's ..... the following Foundation Samples.

Contract or Job No. L-7262 Section ..... SR No. ..... Sub-Section .....

Station & Offset 120+20 175' Lt. Hole # B-6

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3890-10	D-10	42' 0" 42' 10"	5%	GW GM	DRY, Olive & Gr. Sty. F-C Sdy. 1/2" F) S.R. & & GRAVEL w/one Clump of Cly. SILT
-11	D-11	47' 0" 47' 6"		GW GM	Same w/ T. ORGANIC
-12	D-12	52' 0" 54' 0"		ML	Wet, ORANGE & TAN F. Sdy. SILT
-13	D-13	57' 0" 57' 4"		GW GM	Like 3890-10 w/ F. Gravel only & No Cly. Clump
-14	D-14	62' 0" 62' 6"		GW GM	Like 3890-10 w/ orange color too
-15	D-15	67' 0" 67' 11"		GW GM	Like 3890-10 Just F Gravel & orange too
-16	D-16	72' 0" 73' 0"	13%	GM	Moist. orange, Gr & wh. U. Sty. F-C Sdy. 1" F) & Gravel
-17	D-17	77' 0" 78' 0"		GM	Same
-18	D-18	82' 0" 84' 0"	49%	ML	Like 3820 Wet, orange & tan streaks F. Sdy. SILT w/T. Mica, org. & rust

opy with samples
opy to addressee

Yours very truly,

.....
Inspector.

T FORM 351-002
REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place .....

Date .....

Dear Sir:

I have forwarded by today's ..... the following Foundation Samples.

Contract or Job No. ..... Section ..... SR No. ..... Sub-Section .....

Station & Offset ..... Hole # C-6

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3890 -19	D-19		13%	GM	Like 3890-16 moist, orange, Gr & Wh. U. Sty. F-C Sdy. 1" ↔ & Gravel
-20	D-20			GM	Same except F. SR Gravel w/ some Layered Gravel - color - olive
-21	D-21			GM	Same
-22	D-22		38%	ML	Like 3809-3 Wet, Gr. F. Sdy. Silt w/ small clumps of Waxy Silt
-23	D-23		49%	ML	Wet, dk. gr. F. Sdy. Silt w/ rust specks, Charcoal & Silt streaks, T. Cly.
-24	D-24		35%	ML	Wet, dk. Gr. & Grn. F. Sdy Silt
-25	D-25			ML	Same only Lt. Brn.

1 copy with samples
1 copy to addressee

Yours very truly,

.....
Inspector.

DOT FORM 351-002 REVISED 2/80

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3890-1 JOB NO. ~~A08~~ B-6 HOLE NO. B-6
DATE 12-6-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

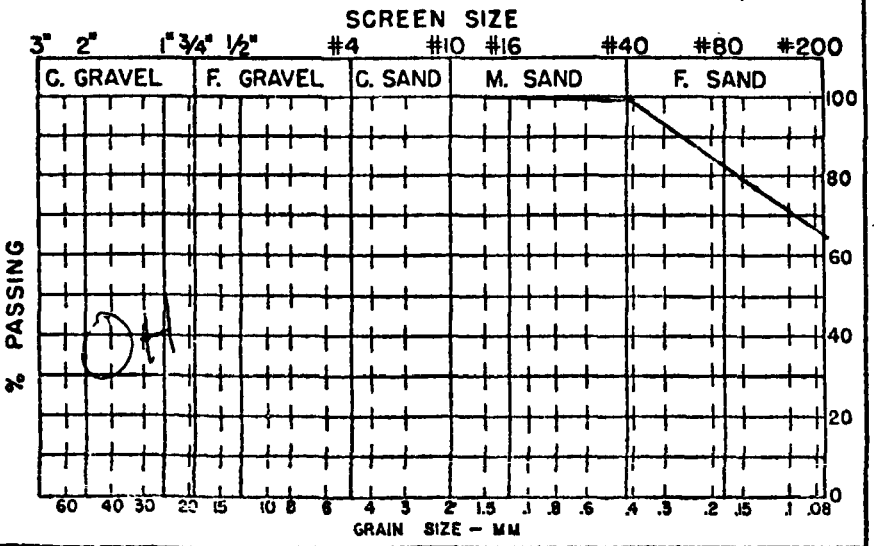
DESCRIPTION: Wet-Sat. orange & tan cly. F. Sdy. Sty. Organic w/ Peat & dark Charcoal Matr

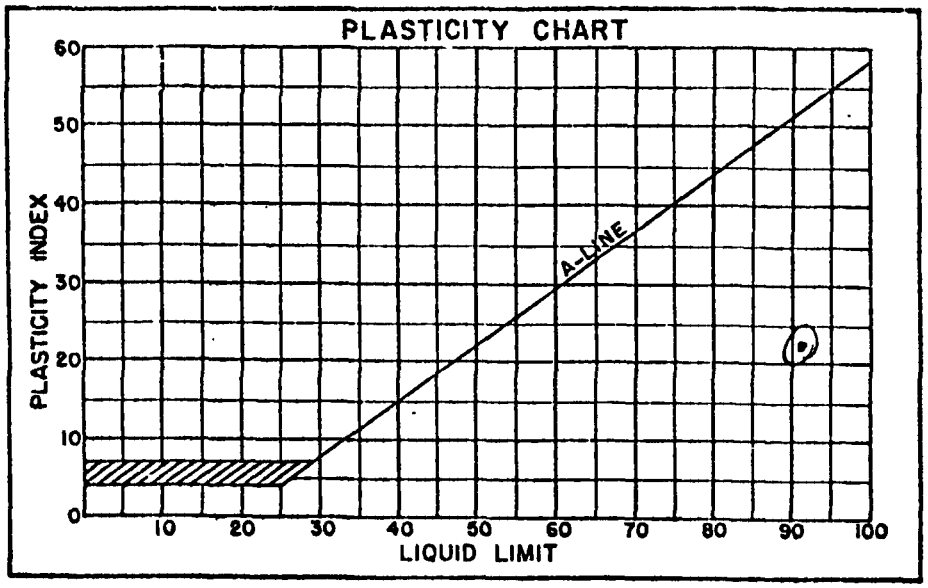
$H_2O = 62\%$

SIEVE ANALYSIS % Passing 40.28

			-40	14.05	99
-3/4			-80		
-4			-140		
-10	.01	100	-200	26.22	65

GRAIN SIZE CURVE.

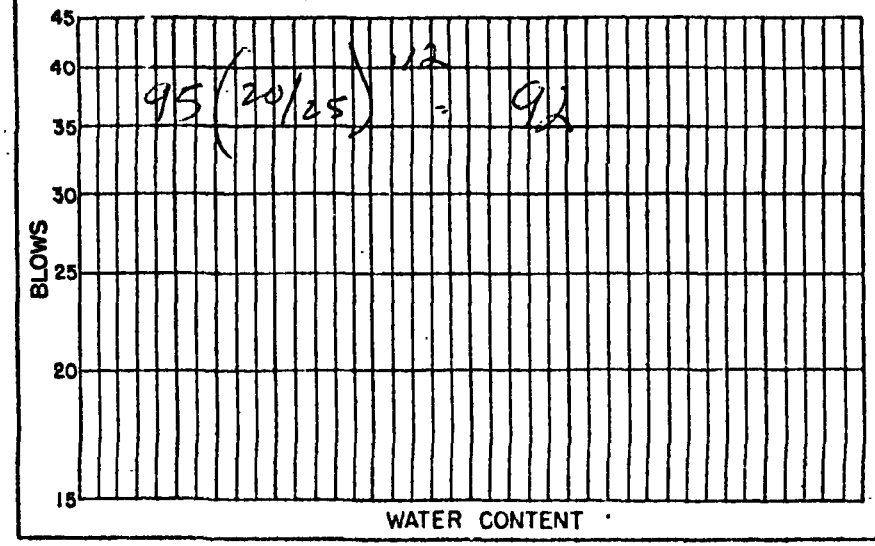




LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	58				NP 32
Wet Wt.	9.95				8.60
Dry Wt.	5.10				5.09
% H_2O	95%				PL= 69%
Blows	20				PI= 23

Did not roll out at all



$95\left(\frac{20}{25}\right)^{1/2} = 91$

DOT FORM 351-019

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3890-3 JOB NO. 168. HOLE NO. B-6
DATE 12-7-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	✓

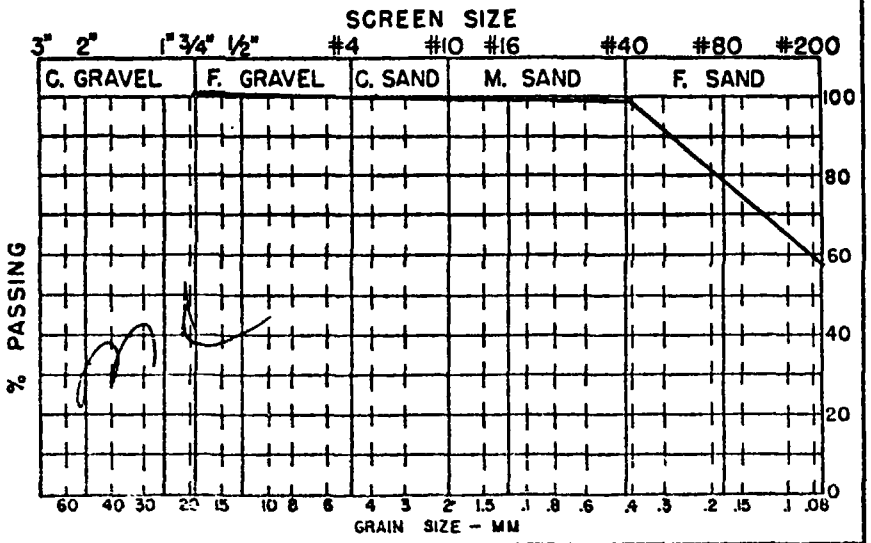
DESCRIPTION: Wet, orange layers of F. Sdy. SiCL w/ hard clumps of Silt, + Cly. w/ one F. Gravel

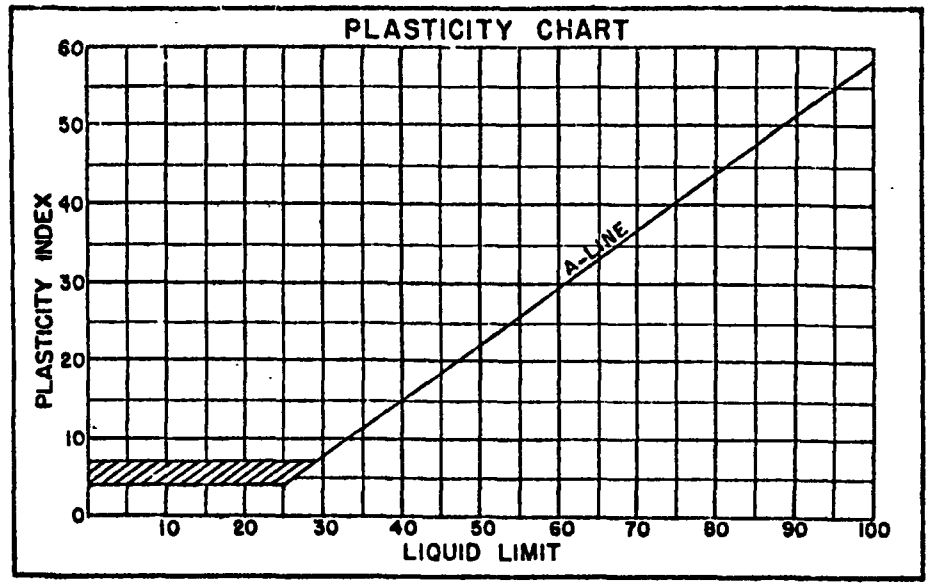
H2O: 45%

SIEVE ANALYSIS % Passing 109.65

			-40	45.68	99
-3/4	.82	100%	-80		
-4			-140		
-10	.01	99	-200	63.14	58

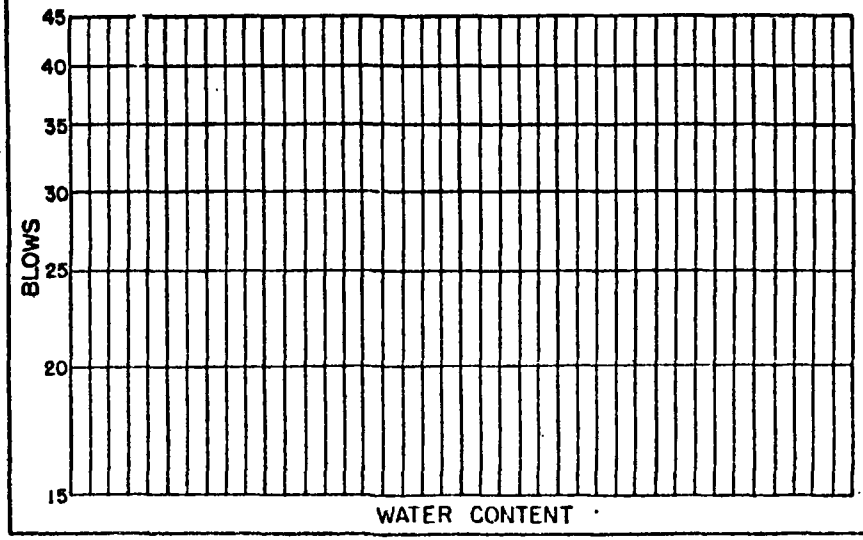
GRAIN SIZE CURVE.





LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3890-10 JOB NO. Hog HOLE NO. B-6
DATE 12-7-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

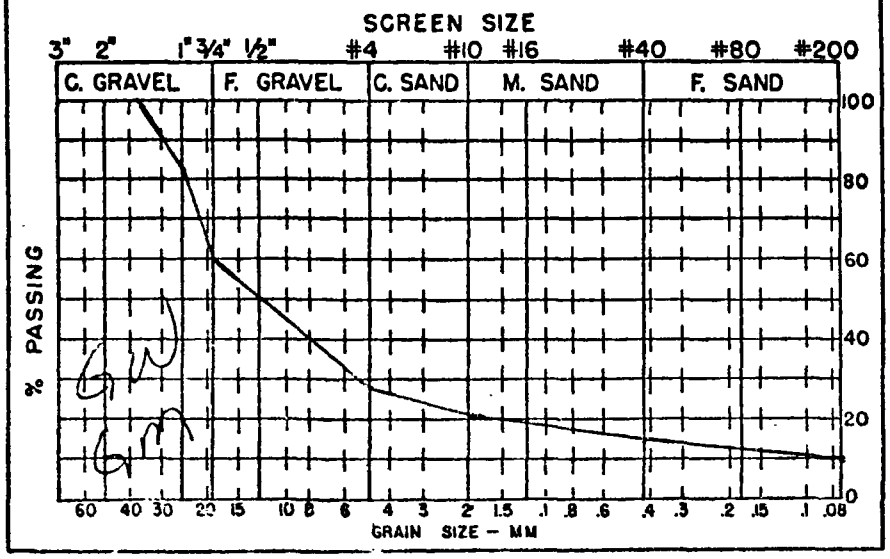
DESCRIPTION: Dry, Olive & gr. Sty. F-C Sdy. 1 1/2"(-) S.R & A GRAVEL w/ one clump cly Silt

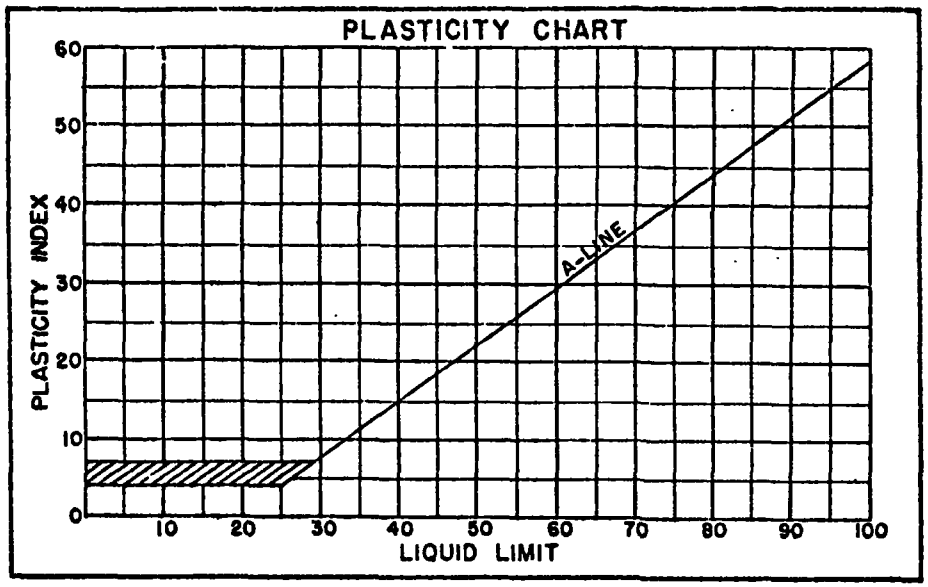
H 20 = 5%

100%

-	1 1/2	38.30	SIEVE ANALYSIS		% Passing	212.00
1-	1	47.32	82	-40	11.20	15
	-3/4	67.30	60	-80		
	-4	14.85	28	-140		
	-10	12.36	21	-200	20.73	10%

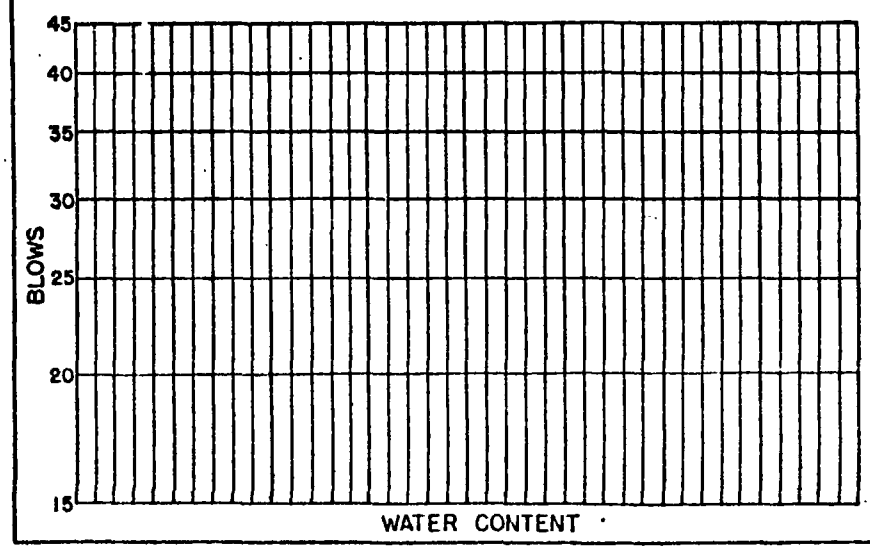
GRAIN SIZE CURVE.





LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

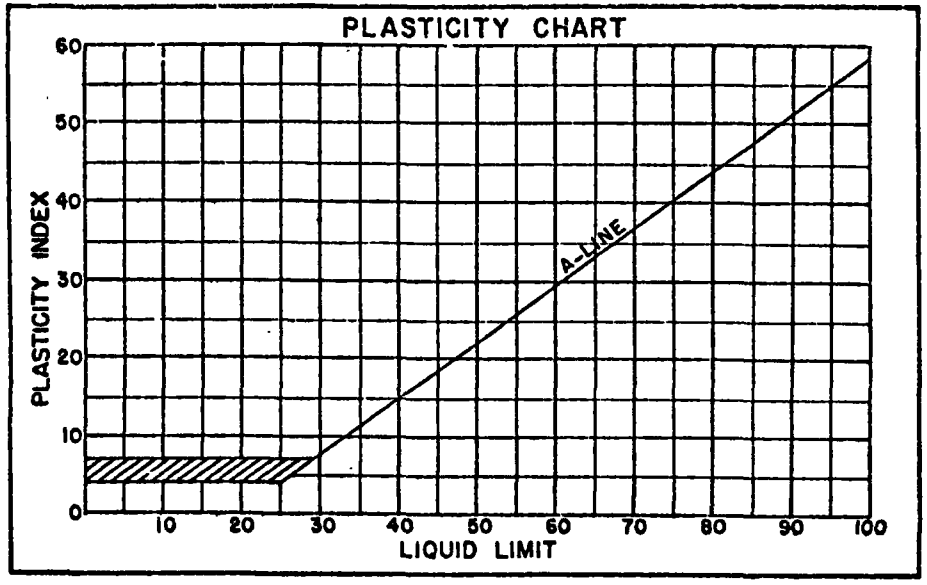
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3890-16 JOB NO. 46 HOLE NO. B6
DATE 12-7-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: Moist Orange, Grd Wh. V. Sty. F-C Sdy. 1"(-) 4 Gravel

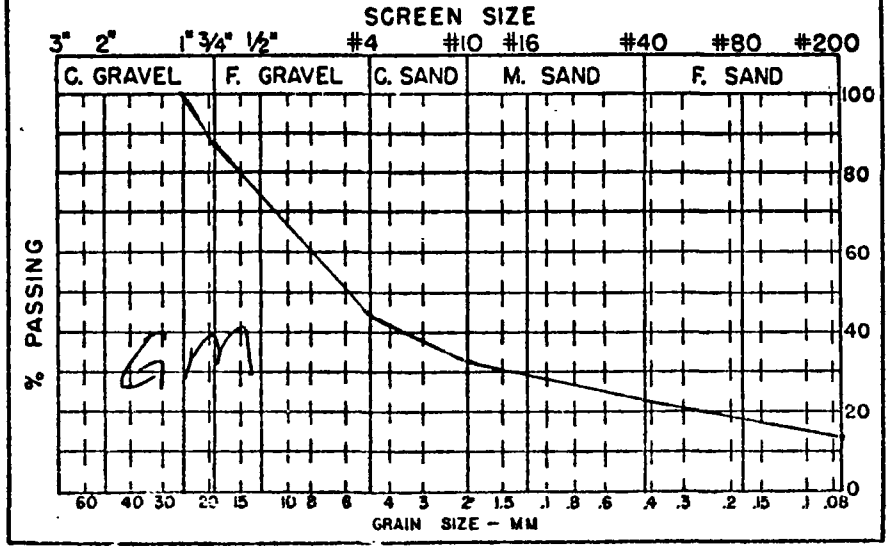


$H_2O = 13\%$

SIEVE ANALYSIS % Passing 190, 20

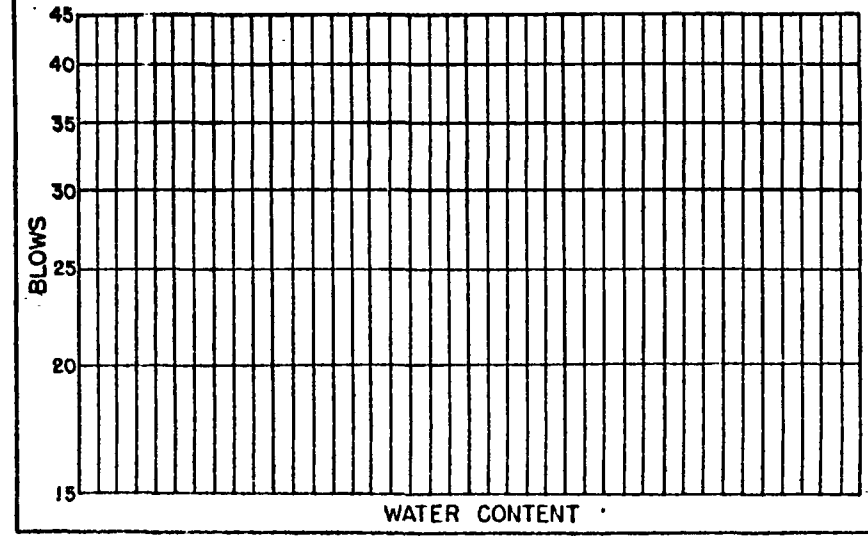
-1	23.60	100	-40	16.24	23
-3/4	83.53	87	-80		
-4	20.62	44	-140		
-10	19.28	33	-200	26.63	14

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3890-23 JOB NO. xbg HOLE NO. B-6
DATE 12-6-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	✓

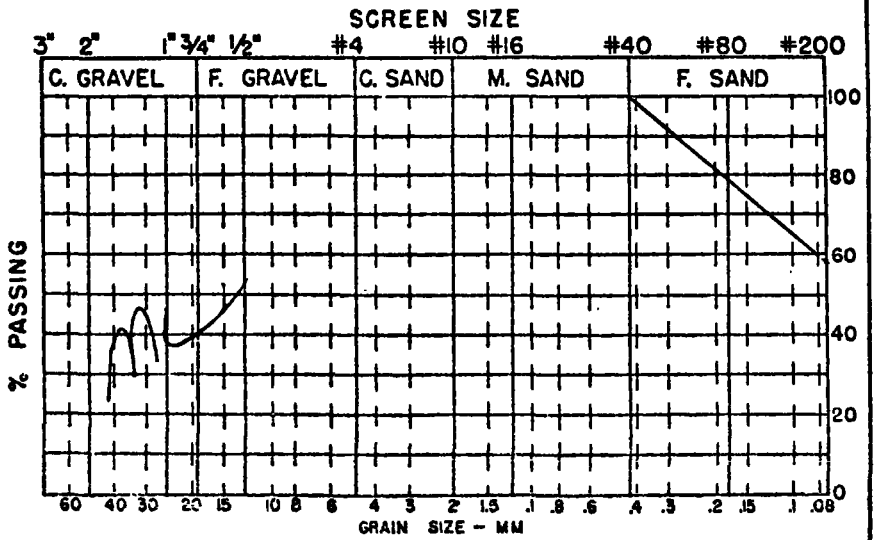
DESCRIPTION: wet, dk.Gr. F Sdy. SILT w/ specks of rust, Charcoal & Silt streaks, + Cly.

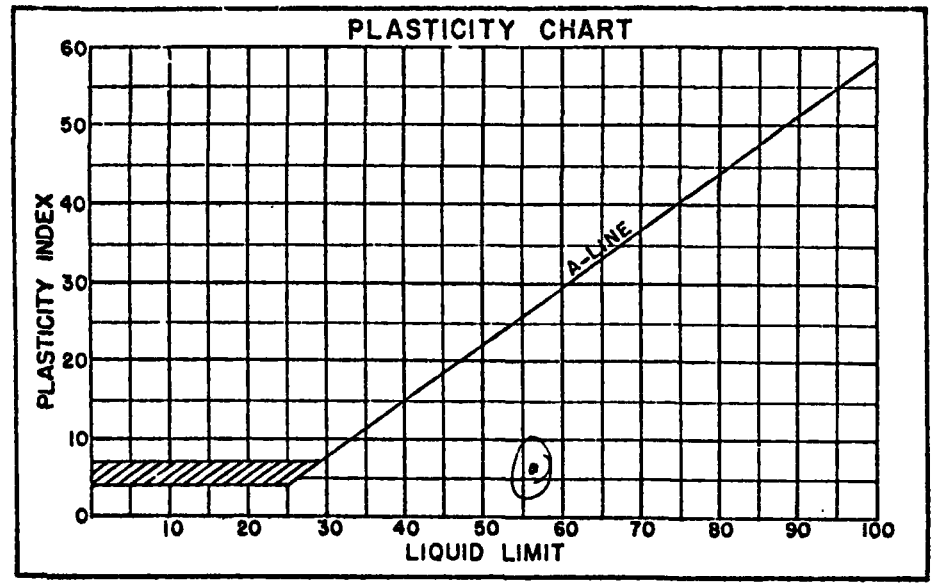
4w = 49 %

SIEVE ANALYSIS % Passing 23.22

	-40	9.80	100 %
-3/4	-80		
-4	-140		
-10	-200	13.42	58 %

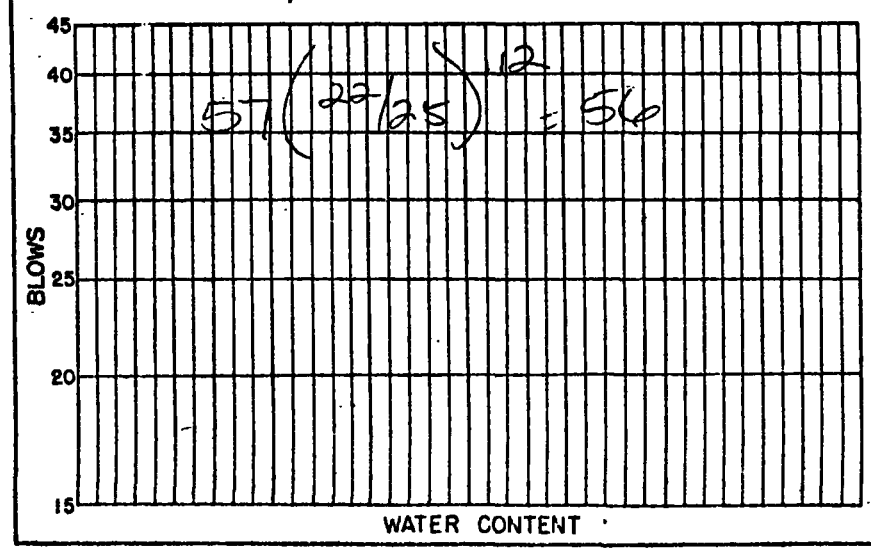
GRAIN SIZE CURVE.





LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	15				62
Wet Wt.	11.02				9.70
Dry Wt.	7.30				6.48
% H_2O	57				PL= 50
Blows	22				PI= 6



DOT FORM 351-019

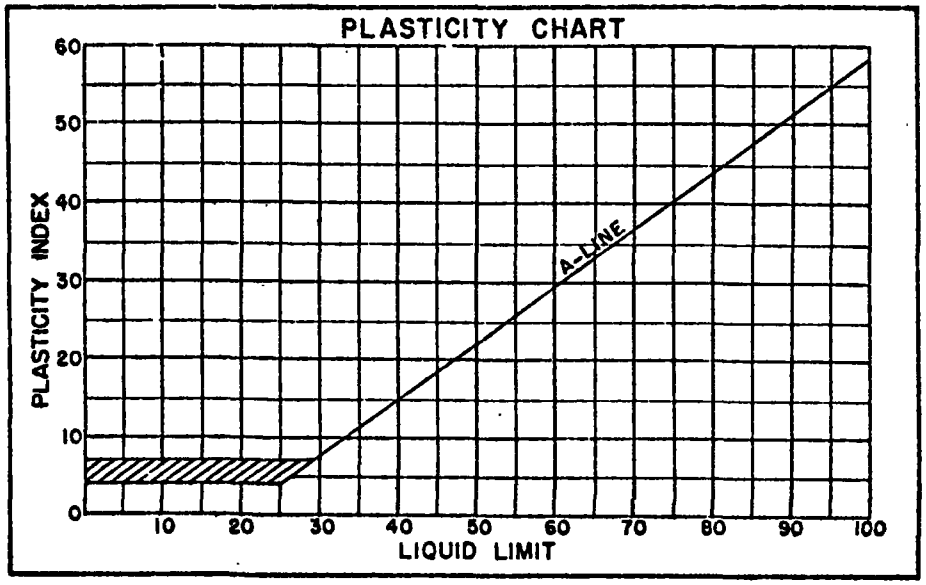
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3890-24 JOB NO. 149 HOLE NO. B-6
DATE 12-7-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

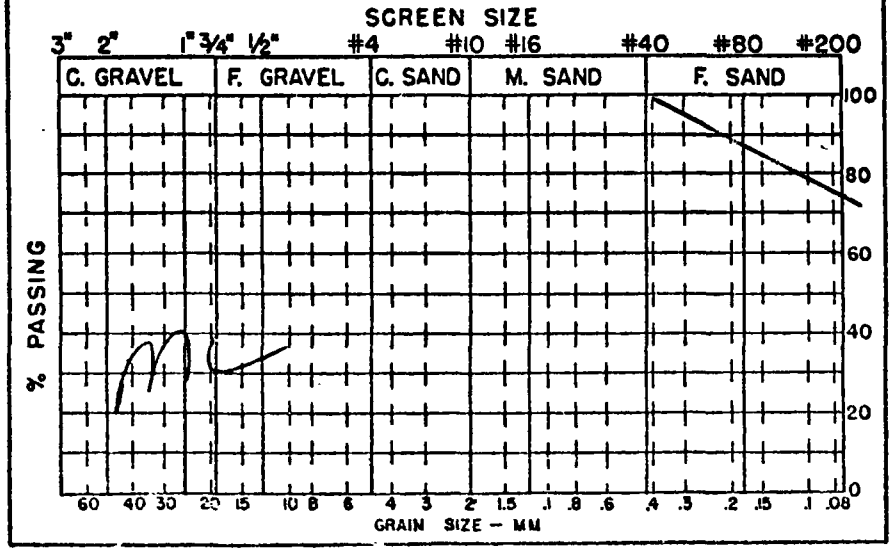
DESCRIPTION: Wet, dk. gr. → GRN
F. Sdy. SILT



H_2O = 35%

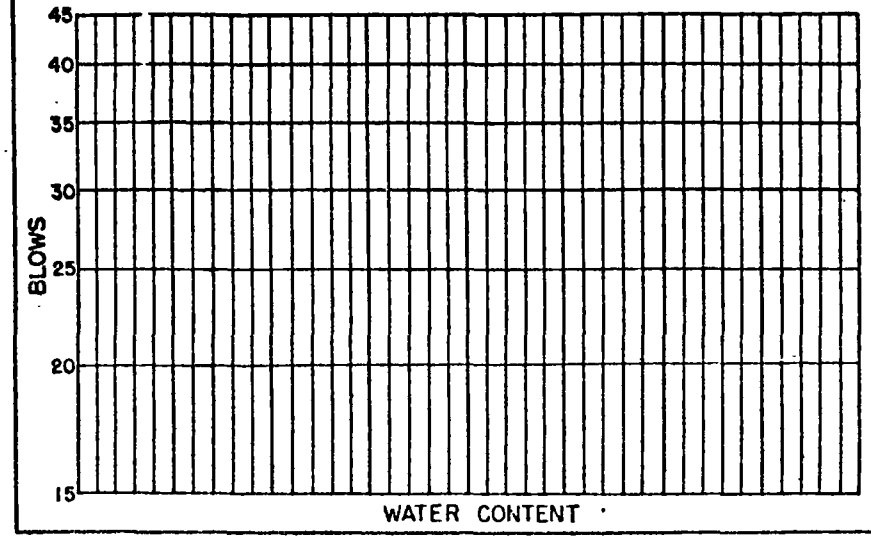
SIEVE ANALYSIS		% Passing 66.52
	-40	17.16 100%
-3/4	-80	
-4	-140	
-10	-200	49.36 74

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 2-18-83

Dear Sir:

I have forwarded by today's State Car the following Foundation Samples.

Contract or Job No. L-7262 Section West Hoquiam bypass SR No. 101A Sub-Section cut section

Station & Offset 104+20 190' RT Hole # B-9

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4228-1	D-1	0' 0" 2' 0"	H_2O=39%	SM	Dry, Brn., v. Sty. F. SAND w/ traces of F. gravel & cementations
-2	D-2	2' 0" 4' 0"		SM	Same But more C-SAND & DK. Brn.
-3	D-3	7' 0" 9' 0"		SM	Same
-4	D-4	12' 0" 14' 0"		SM	Like 4228-1
-5	D-5	17' 0" 19' 0"	H_2O=49%	ML	Dry, Lt. Brn. Layered, Sl. Cly. F. Sdy. SILT w/ arg. Partings
-6	D-6	22' 0" 24' 0"		SM	Like 4228-1
-7	D-7	27' 0" 28' 6"		SM	Like 4228-1 w/ more F. gravel
-8	D-8	32' 0" 33' 6"		SM	Like 4228-1 but w/ more gravel & some white cemented mtr.
-9	D-9	37' 0" 38' 6"		SM	Like 4228-8 above

1 copy with samples
1 copy to addressee

Yours very truly,
Milford Sanders
Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 2-18-83

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7762 Section Hoquiam Bypass
SR No. 101A Sub-Section Cut section

Station & Offset 104+20 190' Rt. Hole # B-9

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4228-10	D-10	42'0" 43'6"		ML	Like 4228-5 w/arg. partings Dry, Lt. Brn., layered, sl. cly. F. sdy. SILT
-11	D-11	47'0" 48'6"	H_2O=37%	OL	Dry, Brn., Cly. F. Sdy. SILT w/ arg. Partings
-12	D-12	52'0" 54'0"	H_2O=32%	ML	Dry, gr. & grn. F. Sdy. SILT
-13	D-13	57'0" 58'6"		ML	SAME 4228-12
-14	D-14	62'0" 64'0"		ML	SAME 4228-12 But w/ BLK. arg. Partings
-15	D-15	67'0" 69'0"		ML	SAME 4228-12
-16	D-16	72'0" 74'0"	H_2O=59%	MH	Dry, Brn., Sl. Cly. F. Sdy. SILT w/ cementations
-17	D-17	77'0" 77'11"	H_2O=27%	ML	Dry, Brn. F. Sdy. SILT
-18	D-18	82'0" 82'6"	H_2O=10%	GW GM	Moist, Brn., Sty., F-M Sdy. F. GRAVEL

1 copy with samples
1 copy to addressee

Yours very truly,
Milford Sanders
Inspector.

DOT FORM 351-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 2-18-83

Dear Sir:

I have forwarded by today's state car the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam bypass SR No. 101A Sub-Section cut section

Station & Offset 104+20 190' Rt. Hole # B-9

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4228-19	D-19	87'0" 87'6"	H20=7%	GW GM	Dry, Brn., Sty. F-C Sdy. GRAVEL
-20	D-20	92'0" 92'6"		GW GM	Same 4228-19 but w/ C. GRAVEL
-21	D-21	97'0" 98'0"	H20=14%	SM	Dry. Brn. V. Sty. F. gravelly. F-C SAND
-22	D-22	102'0" 102'11"		GW GM	Same 4228-19 but w/ C. Gravel
-23	D-23	107'0" 107'8"		GW GM	Same 4228-19 " " " "
-24	D-24	112'0" 113'0"			Same 4228-19 " " " " & w/ Cementations.
			More Samples To come		

1 copy with samples
1 copy to addressee

Yours very truly,
Milford Sanders
Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 2-25-83

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam bypass
SR No. 101 A Sub-Section cut section

Station & Offset 104+20 190' RT. Hole # B-9

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4233 -1	D-25	117'0" 118'0"	H20=19%	GM	Dry, Brn., Sl. Cly., Sty. F-C Sdy. GRAVEL
-2	D-26	127'0" 127'11"	H20=21%	GM	Dry, Brn., Sl. cly., V. Sty. F-C Sdy GRAVEL
-3	D-27	132'0" 133'6"	H20=40%	SM	Dry, Brn., cly., V. Sty F. SAND
-4	D-28	142'0" 142'9"	H20=44%	OL	Dry, DK. Brn., cly. F. Sdy. SILT w/ Org. Partings
-5	D-29	147'0" 147'4"	H20=11%	GW GM	Dry, Brn., T. cly. Sty. F-C Sdy. GRAVEL
-6	D-30	157'0" 157'6"		GW GM	Same 4233-5

1 copy with samples
1 copy to addressee

Yours very truly,
Milford J. Sanders
Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 2-22-83

Moisture Sample only

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section Hog bypass
SR No. SR-101A Sub-Section CUT section

Station & Offset 104+20 170' Rt Hole # B-9

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4227 -1	D-5	17'0" 19'0"	M.S. #1 ~~Moisture Sample only~~		H_2O = 38% #1
-2	D-11	47'0" 48'6"	M.S. #2		H_2O = 35%
-3	D-13	57'0" 58'6"	M.S. #3		H_2O = 38%
-4	D-14	62'0" 64'0"	M.S. #4		H_2O = 42%
-5	D-15	67'0" 69'0"	M.S. #5		H_2O = 38%
-6	D-16	72'0" 74'0"	M.S. #6		H_2O = 54%

1 copy with samples
1 copy to addressee

Yours very truly,
Milford Landers
Inspector.

DOT FORM 351-002 REVISED 2/80

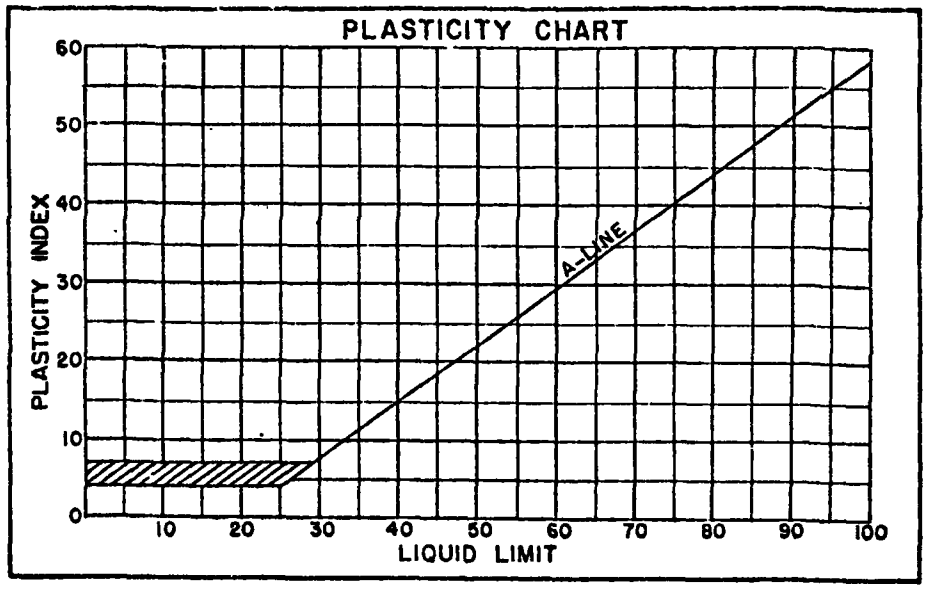
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 42281 JOB NO. Hef. HOLE NO. B9
DATE 3-9-83 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST		✓	✓
DILATANCY			
BITE			
TOUGHNESS		✓	✓

DESCRIPTION: Dry, Brn., V. Sty. F. SAND w/ traces of F. gravel & cementations

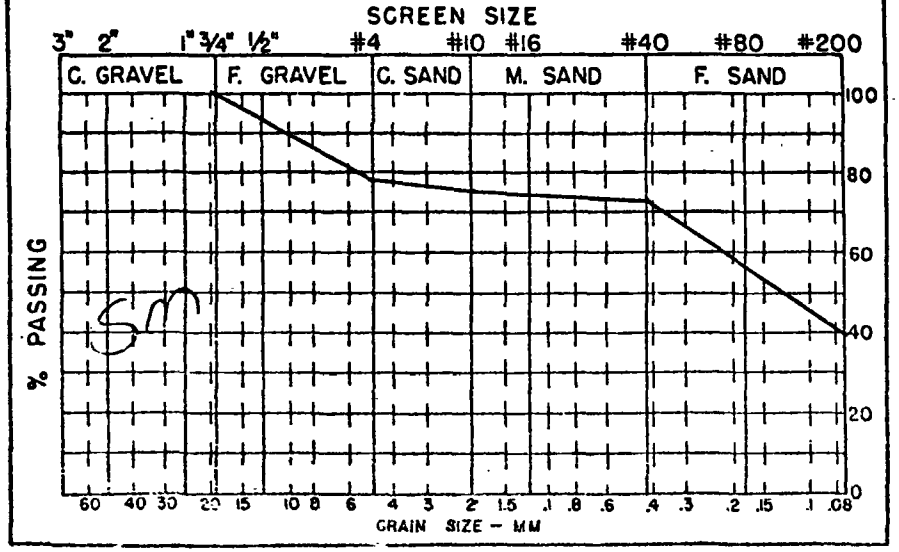


H_2O = 39%

SIEVE ANALYSIS % Passing 100.88

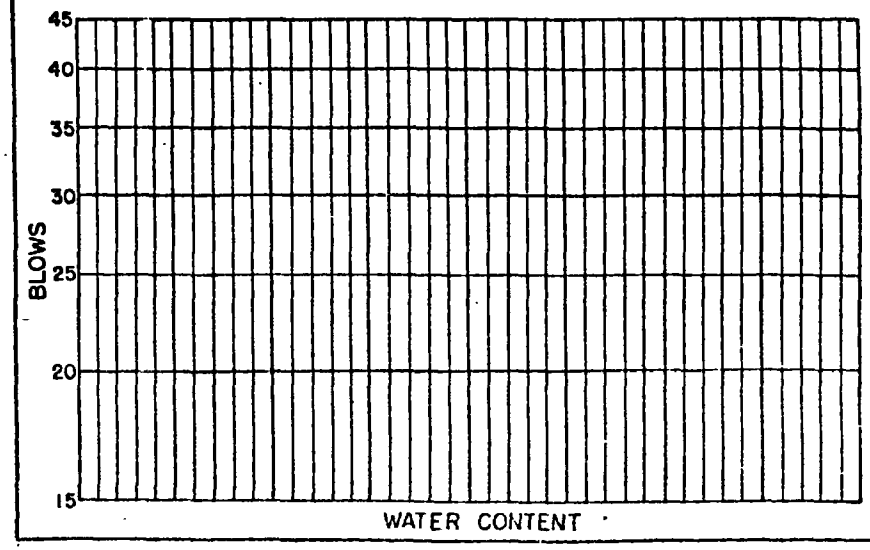
			-40	31.90	72
-¾	23.07	100%	-80		
-4	2.65	77	-140		
-10	2.42	75	-200	40.84	40

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



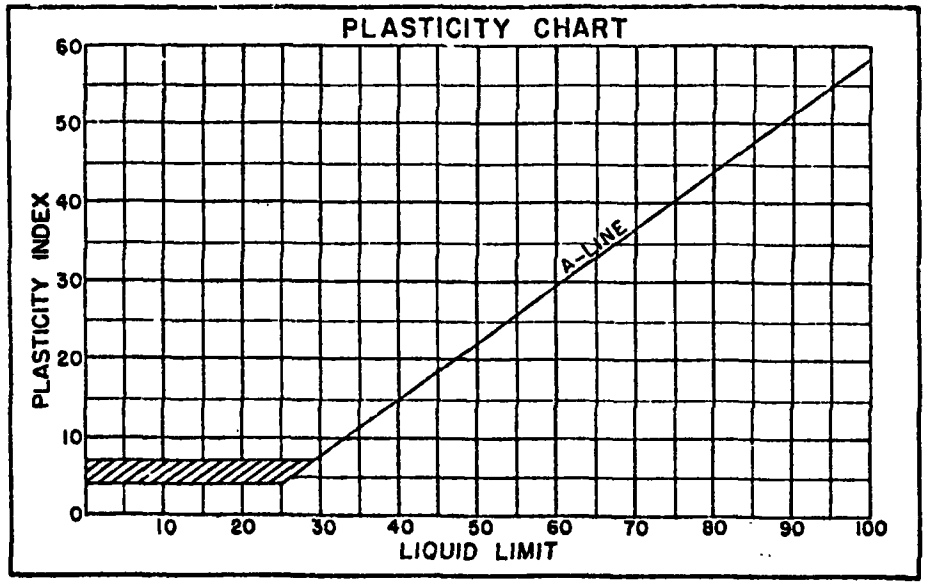
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4228-5 JOB NO. ~~Hoy~~ HOLE NO. B-9
DATE 3-9-83 OPERATOR CHB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS			

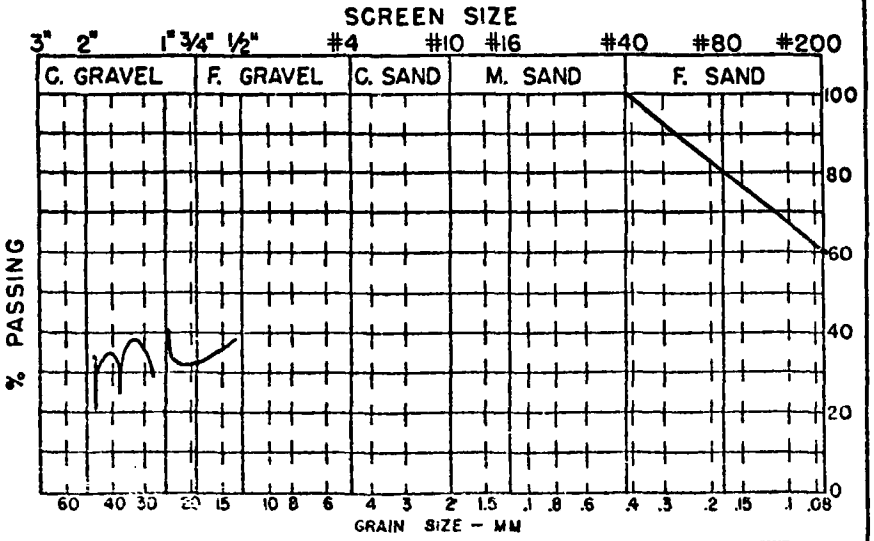
DESCRIPTION: Dry, Lt. Brn. Layered, Sl. Cly. Sdy. Silt w/ org. Partings.



H_2O = 4.9%

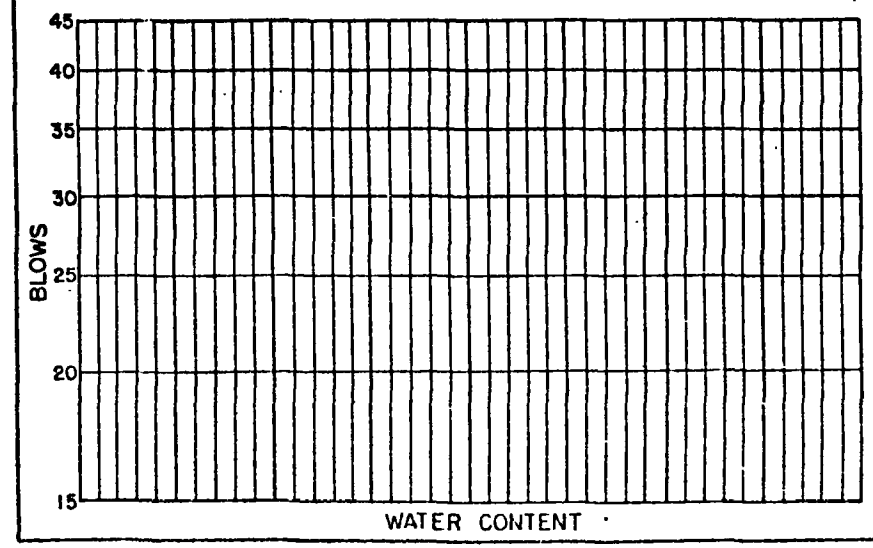
SIEVE ANALYSIS	% Passing 87.18	
	-40	35.12 100%
-3/4	-80	
-4	-140	
-10	-200	52.06 60%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

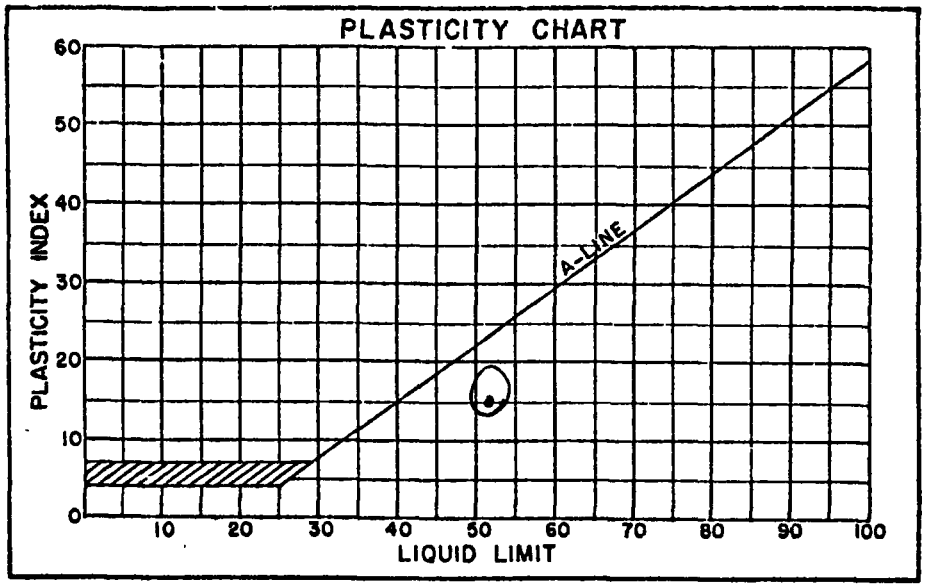
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4228-11 JOB NO. 46 HOLE NO. B-9
DATE 3-9-83 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: Dry, Brn., Cly. F. Sdy. Silt w/ org. Partings

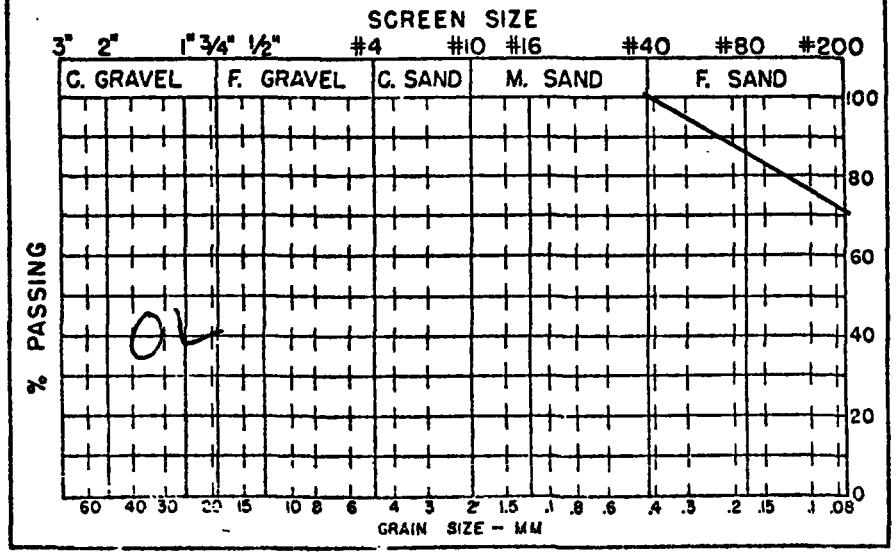


H_2O = 37%

SIEVE ANALYSIS % Passing 61.33

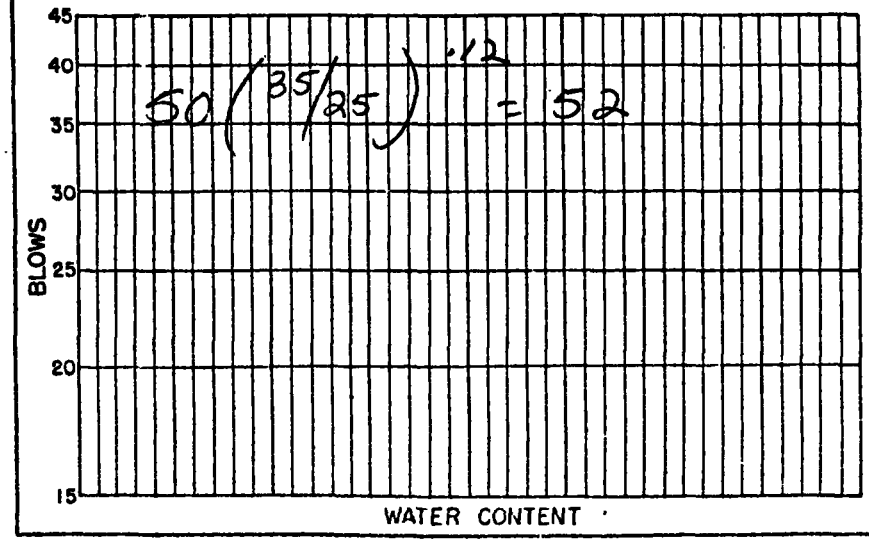
	-40	17.63 100%
-3/4	-80	
-4	-140	
-10	-200	43.70 71%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	48				19
Wet Wt.	11.22				8.94
Dry Wt.	7.50				6.53
% H_2O	50%				PL= 37%
Blows	35				PI= 15



$50\left(\frac{35}{25}\right)^{.12} = 52$

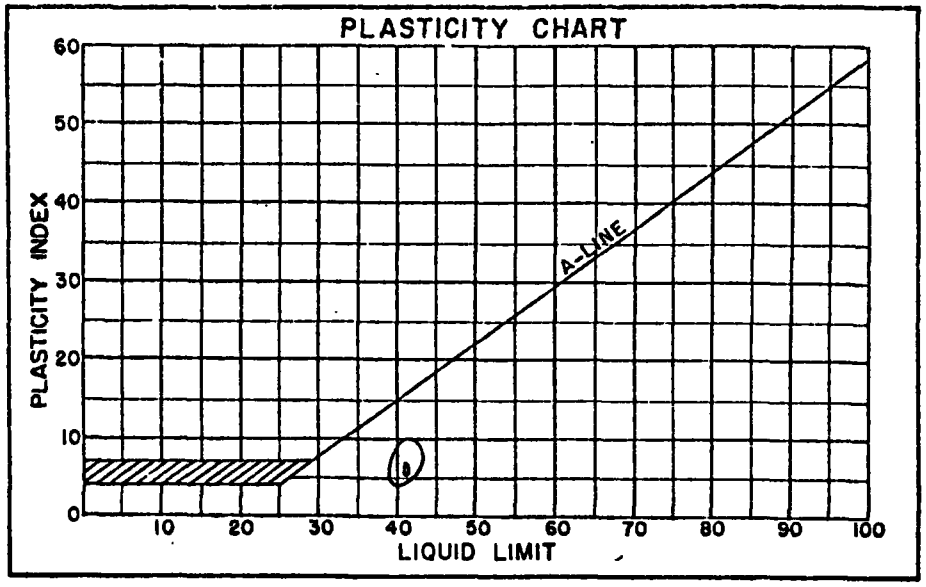
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4228-12 JOB NO. Neg. HOLE NO. B9
DATE 3-9-83 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE		✓	
TOUGHNESS	✓	✓	

DESCRIPTION: Dry, gr & grn., F. Sdy. Silt

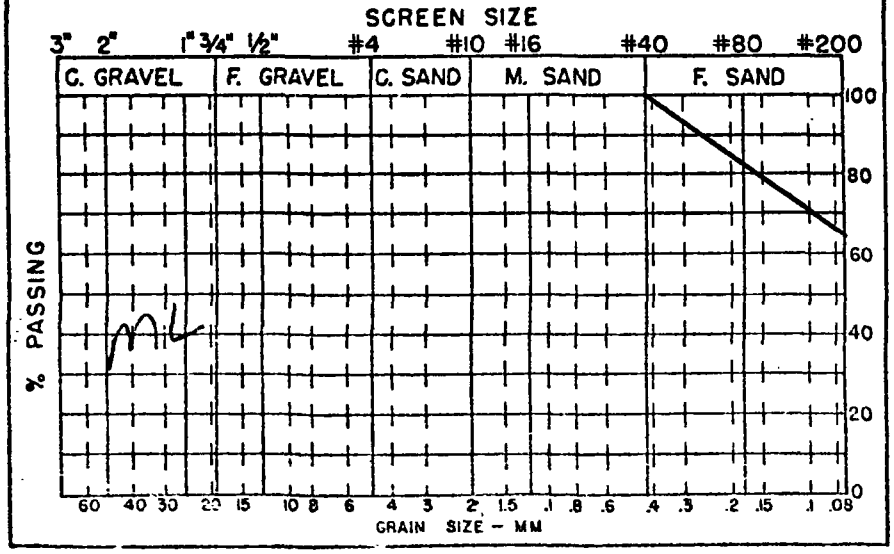


H_2O = 32%

SIEVE ANALYSIS % Passing 59.35

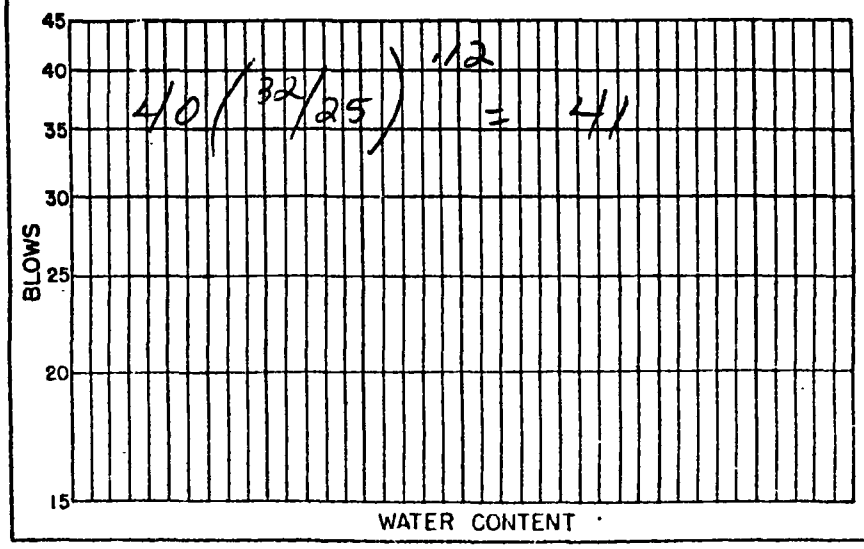
	-40 21.31	100%
-3/4	-80	
-4	-140	
-10	-200 37.93	60%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	67				58 N/P
Wet Wt.	12.45				8.59
Dry Wt.	8.88				6.40
% H_2O	40%				PL= 34
Blows	32				PI= 7



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4228-16 JOB NO. 468. HOLE NO. B-9
DATE 5-9-83 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

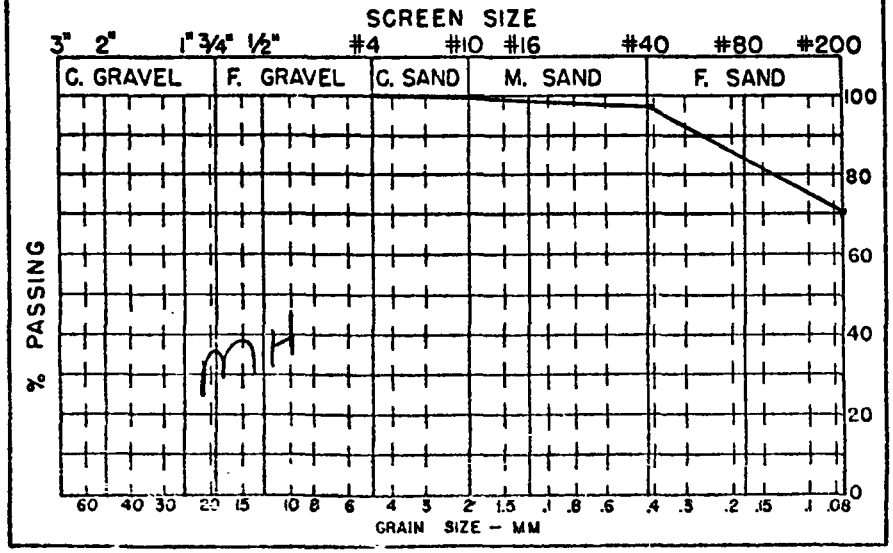
DESCRIPTION: Dry, Brn. st Cly. F. Sdy. SILT w/ cementations.

$H_2O = 59\%$

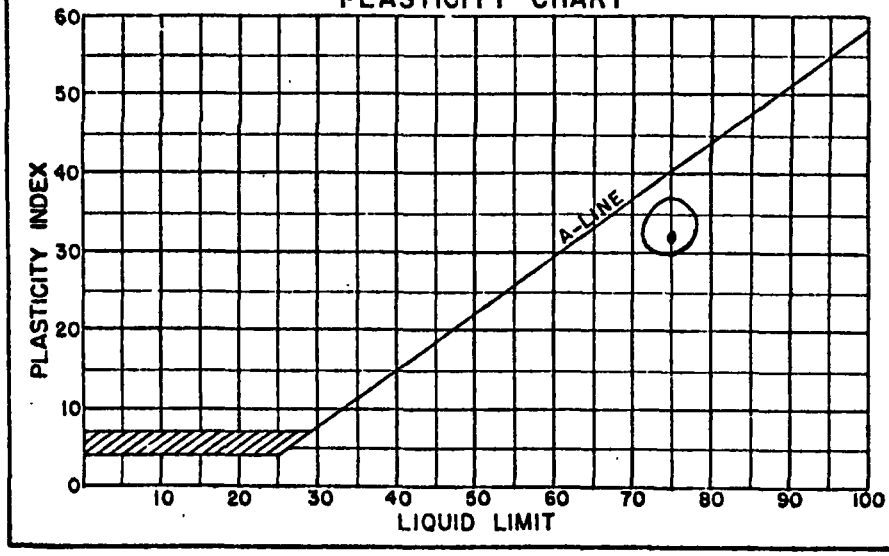
SIEVE ANALYSIS % Passing 60.57

			-40	16.03	97
-3/4			-80		
-4	.08	100	-140		
-10	1.80	99	-200	42.66	70

GRAIN SIZE CURVE

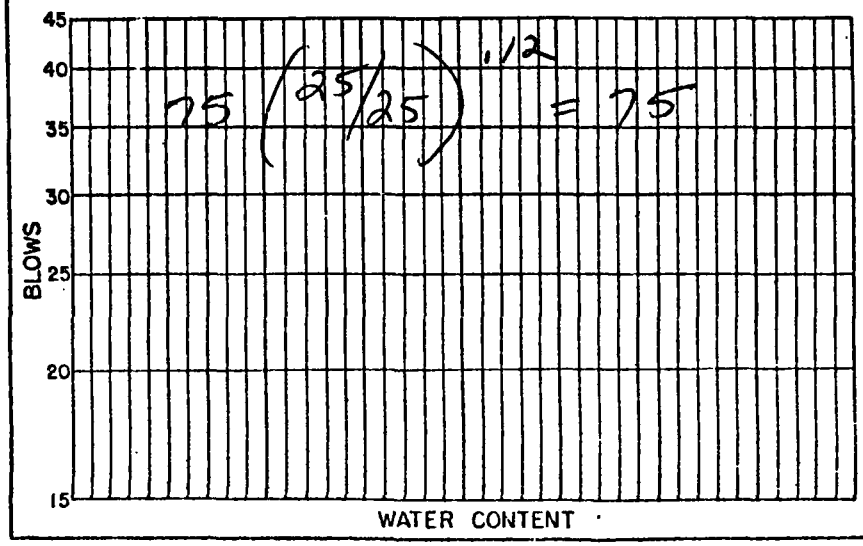


PLASTICITY CHART



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	38				65
Wet Wt.	12.04				8.3
Dry Wt.	6.88				5.80
% H_2O	75%				PL= 43%
Blows	25				PI= 32



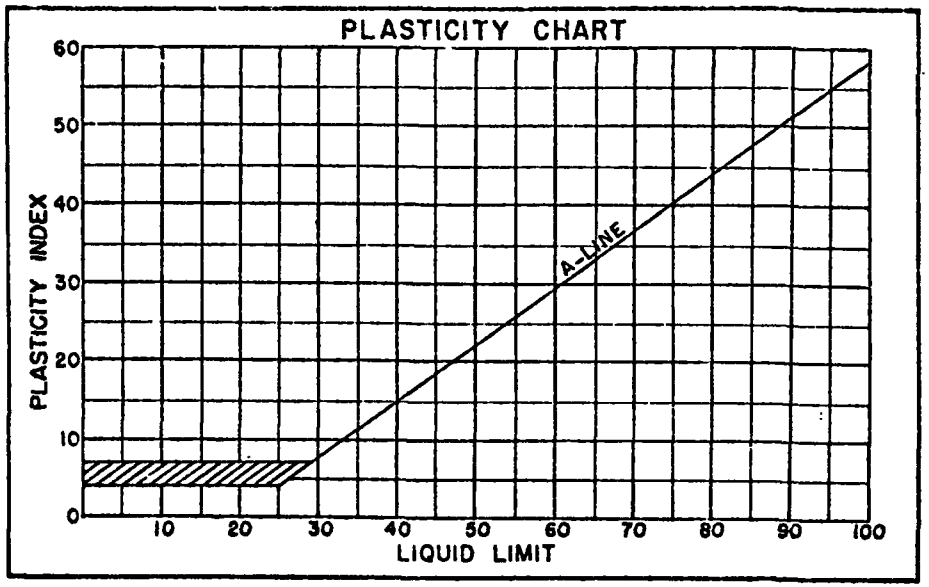
BOT FORM 351-019

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 422817 JOB NO. Hog. HOLE NO. B9
DATE 3-9-83 OPERATOR BB

SOIL FIELD IDENTIFICATION			
TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE		✓	
TOUGHNESS	✓	✓	

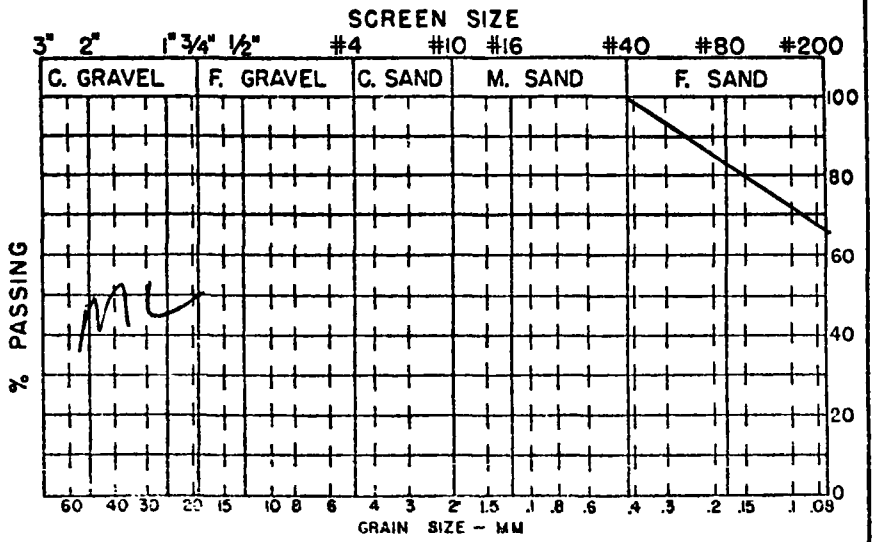
DESCRIPTION: Dry, Brn. F. Sdy. Silt



H_2O = 27%

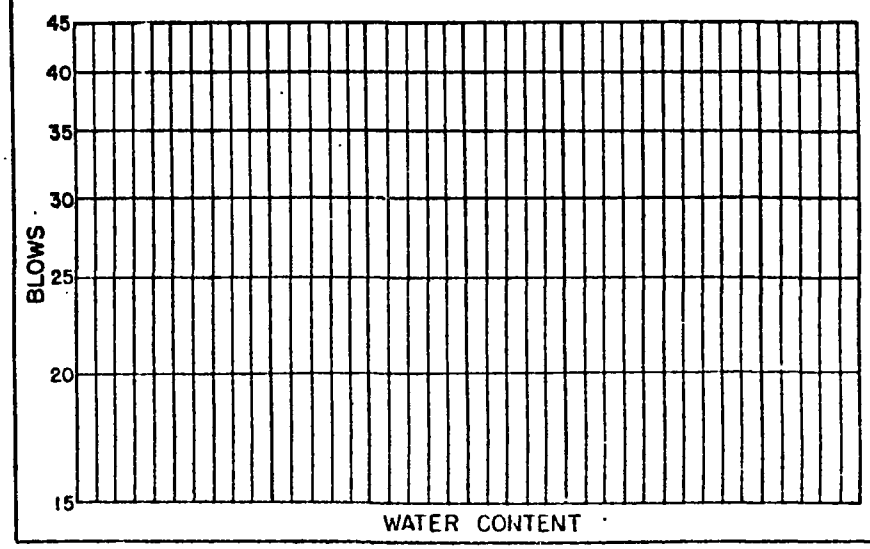
SIEVE ANALYSIS	% Passing 92.33	
	-40 31.50	100%
-3/4	-80	
-4	-140	
-10	-200 60.83	66%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



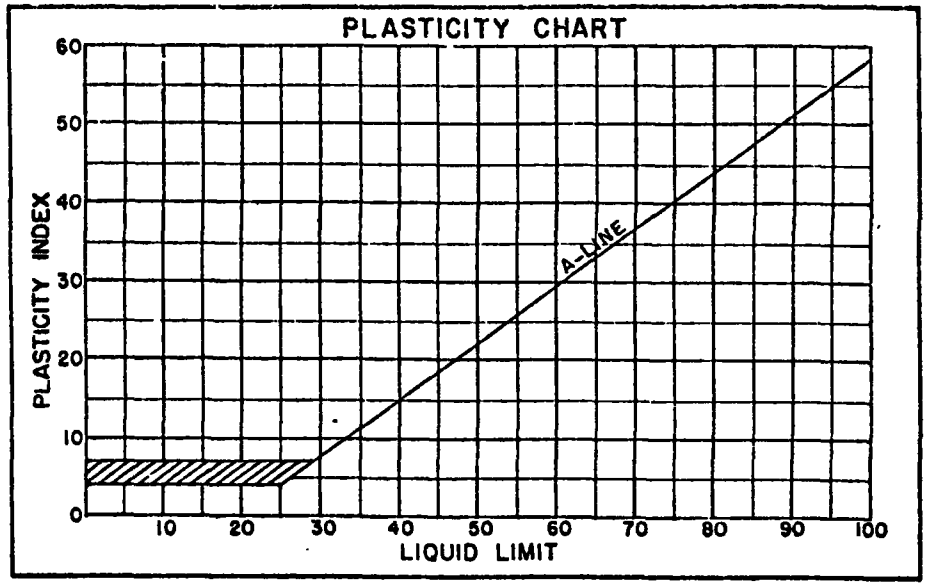
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4228-18 JOB NO. Hez. HOLE NO. B 9
DATE 3-9-83 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: Moist, Brn., Sty., F-M Sdy. F. GRAVEL

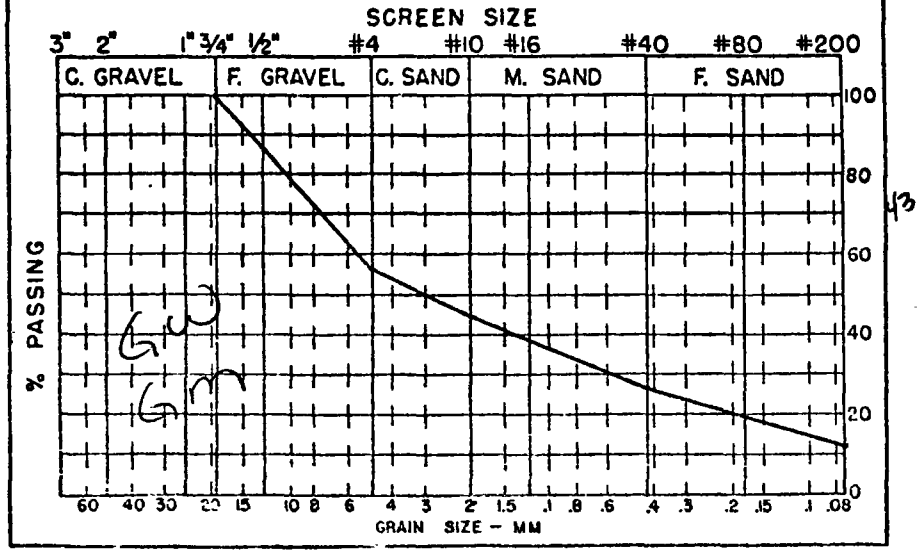


H2O = 10%

SIEVE ANALYSIS % Passing 233.95

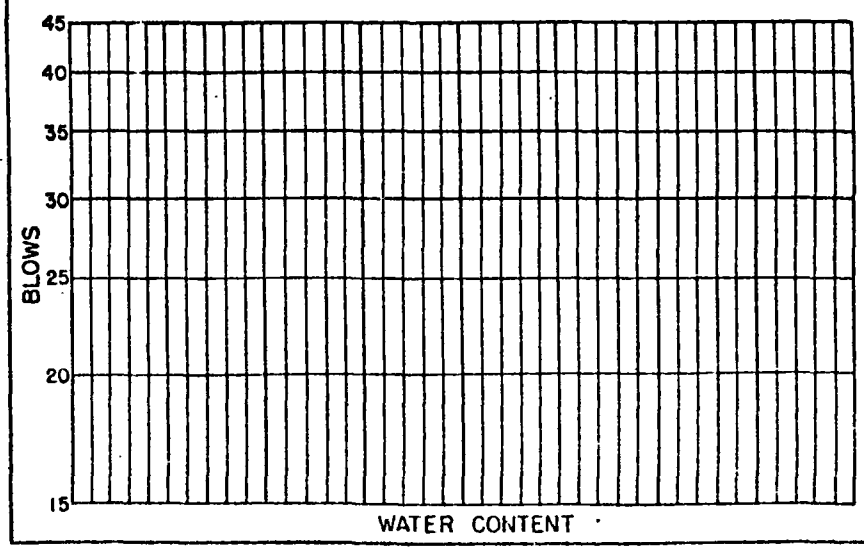
			-40	36.35	27%
-3/4	99.90	100%	-80		
-4	31.80	57%	-140		
-10	38.48	44%	-200	27.42	12%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



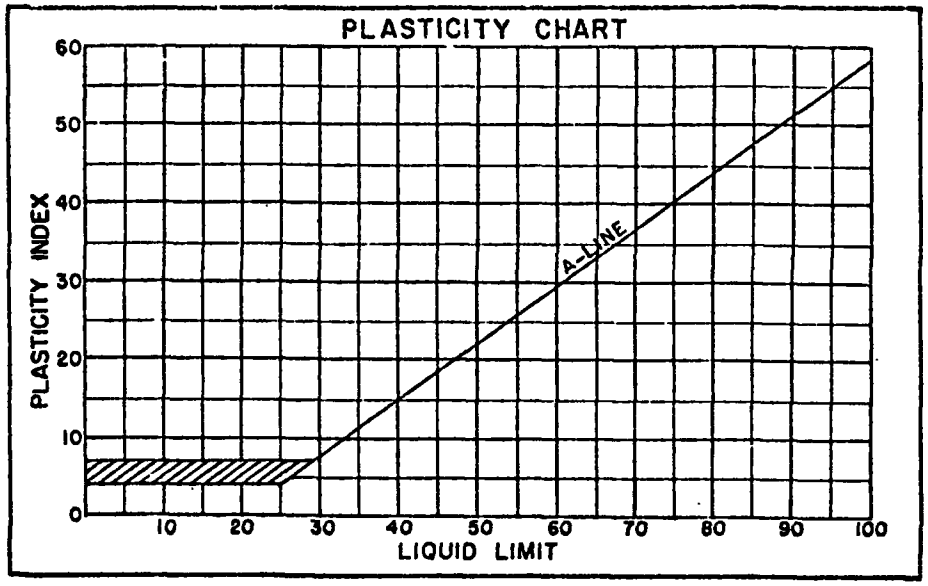
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4228-19 JOB NO. Hog HOLE NO. B9
DATE 3-9-83 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: Dry, Brn., Sty. F-C Sdy. Gravel

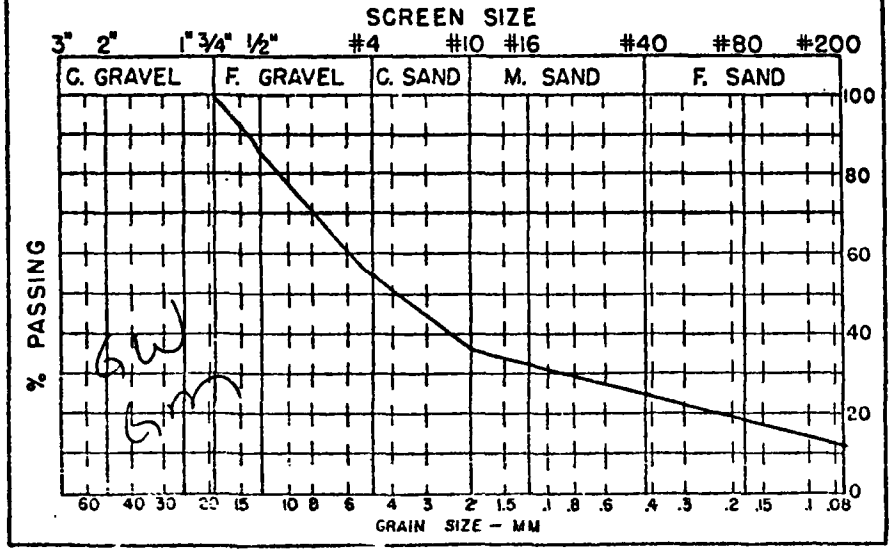


$H_2O = 7\%$

SIEVE ANALYSIS % Passing 215.13

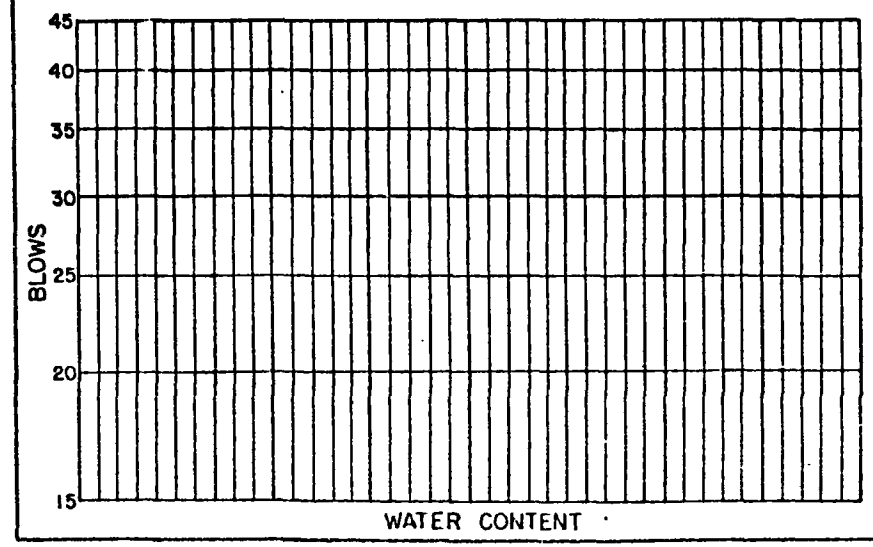
			-40	24.65	24%
-3/4	96.58	100%	-80		
-4	36.08	55%	-140		
-10	31.68	38%	-200	26.14	12%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



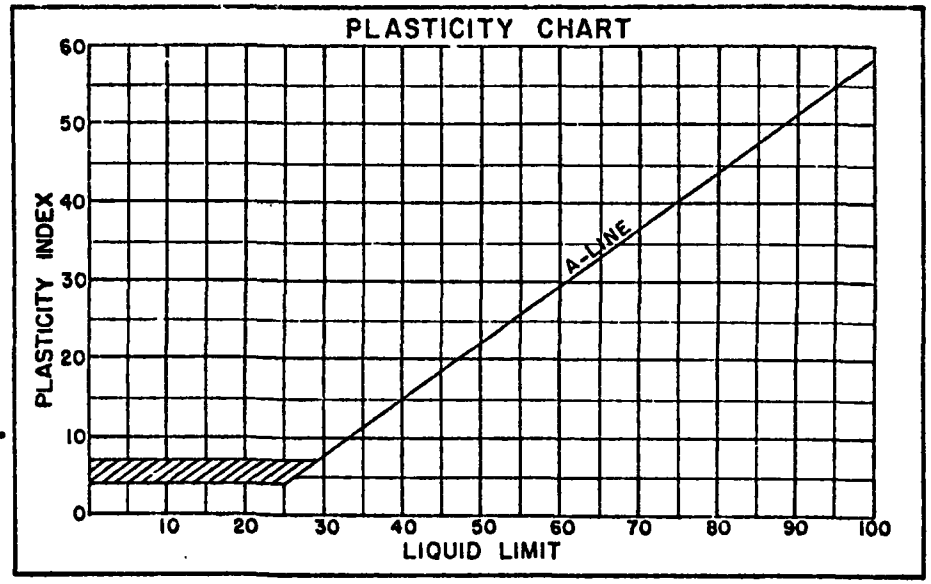
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 122821 JOB NO. Hoz. HOLE NO. B-9
DATE 3-9-83 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE	✓	✓	
TOUGHNESS			

DESCRIPTION: Dry, Brn., V. Sty., F. gravelly. F-C SAND

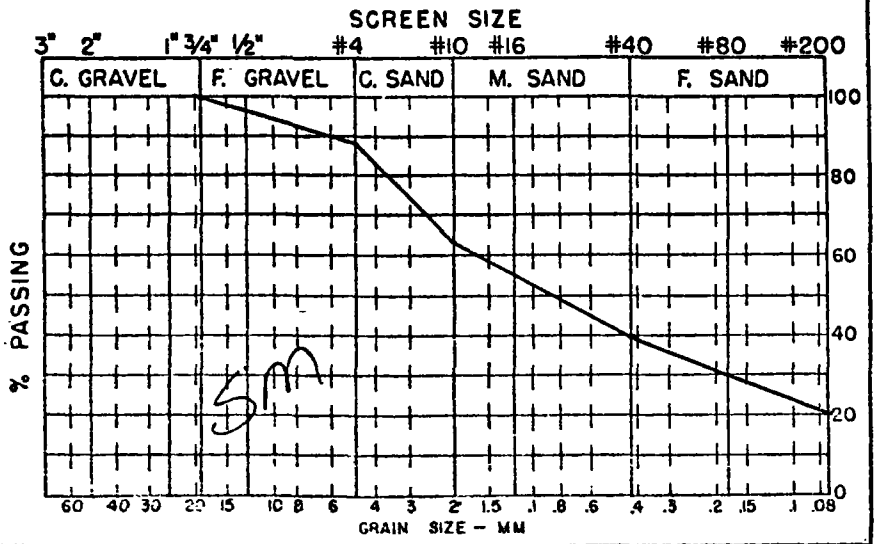


$H_2O = 14\%$

SIEVE ANALYSIS % Passing 97.55

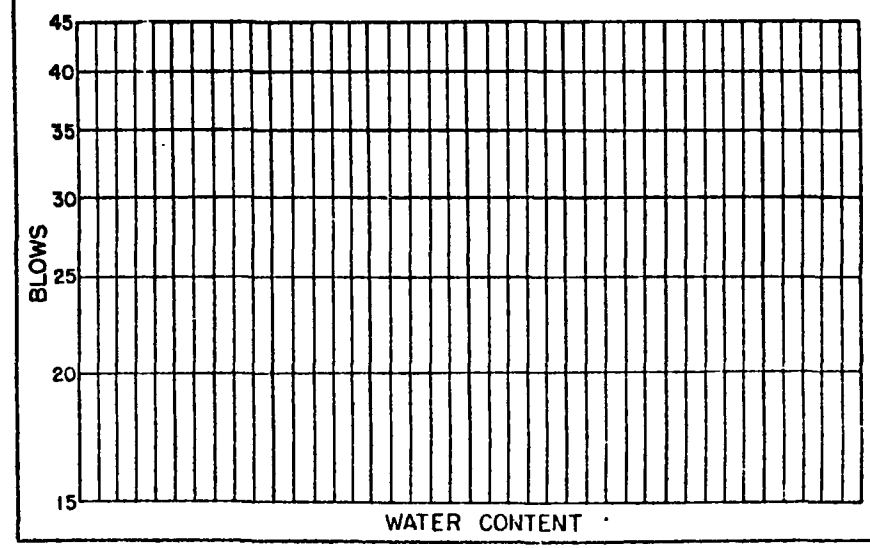
			-40	18.30	39%
-3/4	12.74	100%	-80		
-4	23.00	87%	-140		
-10	23.30	63%	-200	20.21	21%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

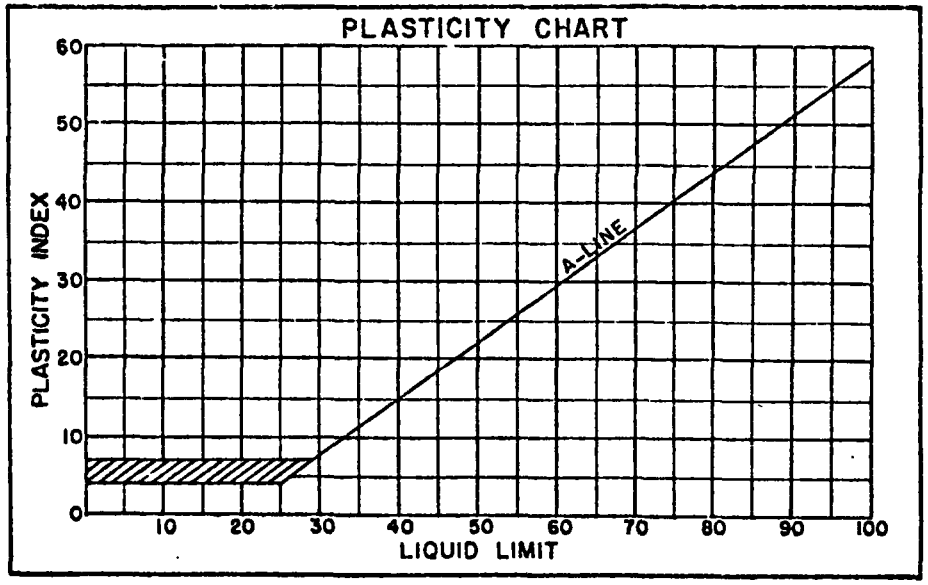
– Limited mtrl. –

SAMPLE NO. 4233-1	JOB NO. #6	HOLE NO. B 9
DATE 3-9-83	OPERATOR BB	

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: Dry, Brn., Sl. Cly. Sty. F-C Sdy. GRAVEL

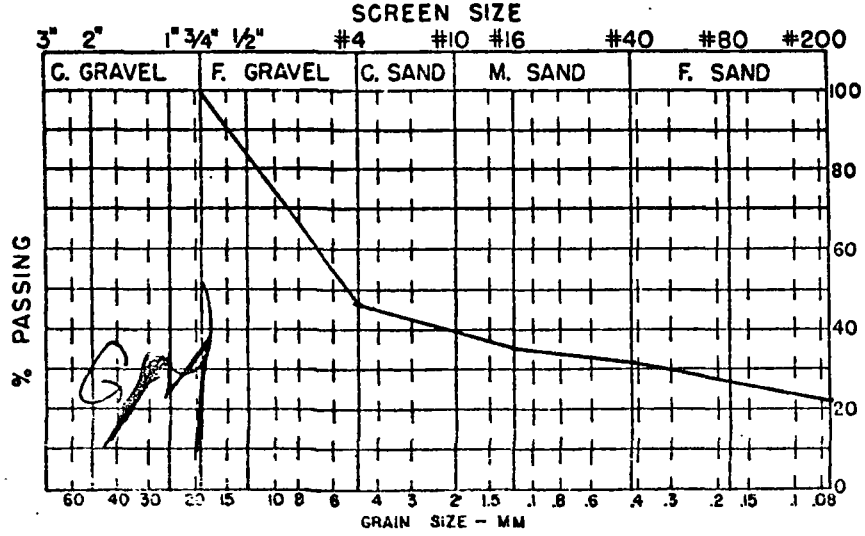


H_2O = 19%

SIEVE ANALYSIS % Passing 111.48

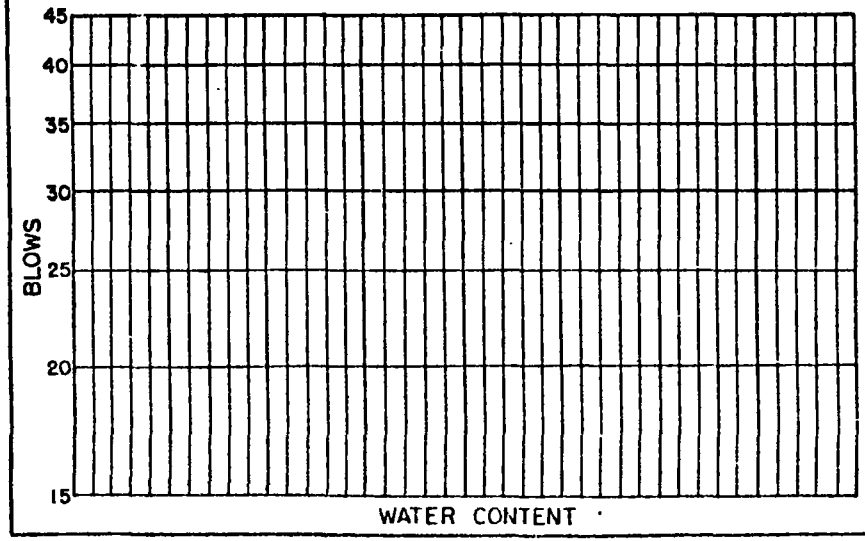
			-40	10.57	31%
-3/4	59.07	100%	-80		
-4	13.57	47%	-140		
-10	4.30	35%	-200	23.97	22%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



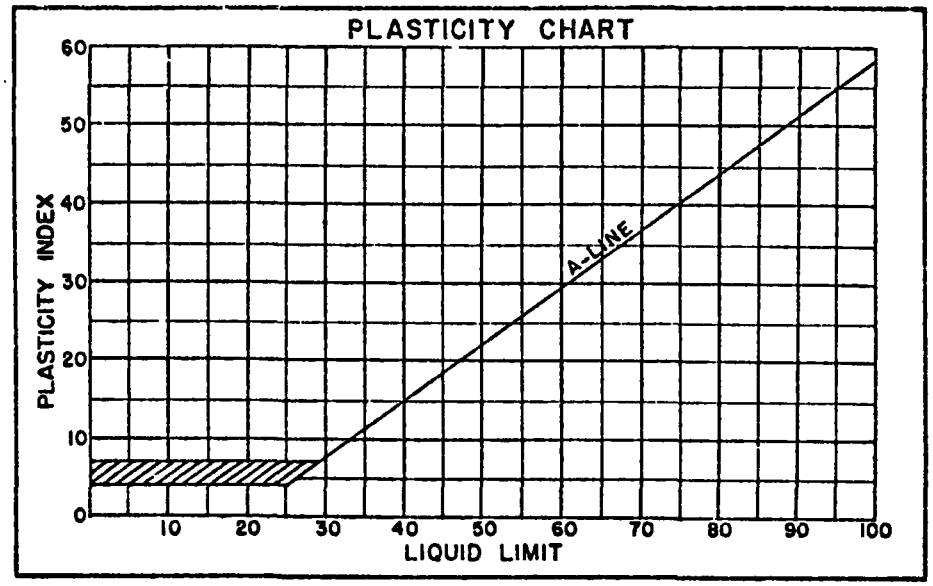
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4233-2 JOB NO. Hog. HOLE NO. B9
DATE 3-9-83 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: Dm. Brn. Sl. Cly.
V. Sty. F-C Sdy. GRAVEL

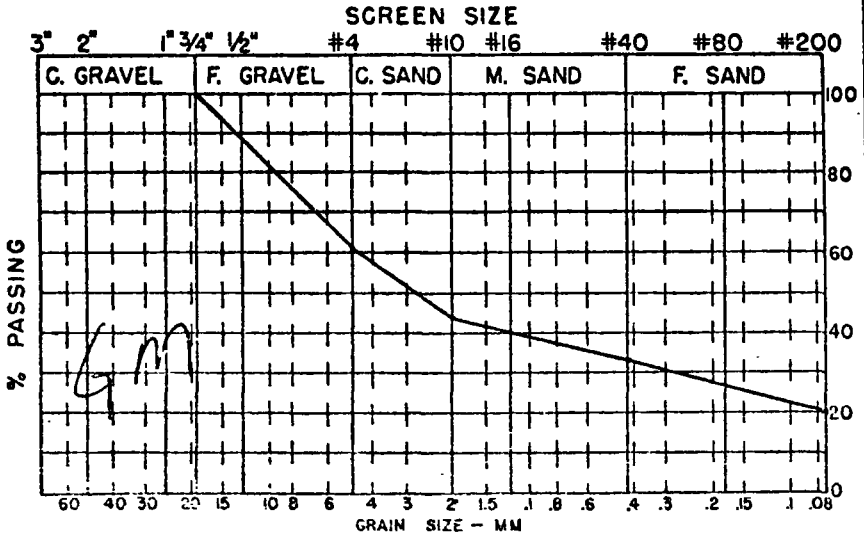


H_2O = 21%

SIEVE ANALYSIS % Passing 112.69

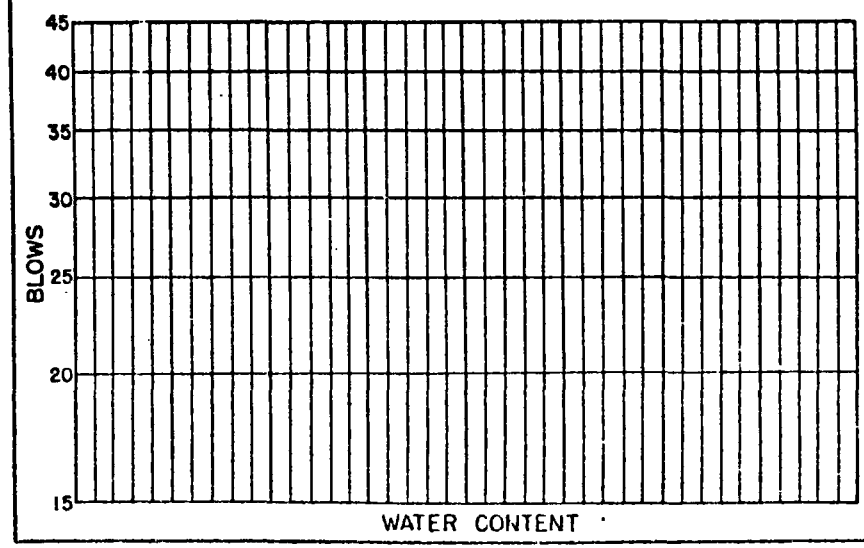
			-40	14.92	33%
-3/4	43.80	100%	-80		
-4	19.45	61%	-140		
-10	12.20	44%	-200	22.32	20%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

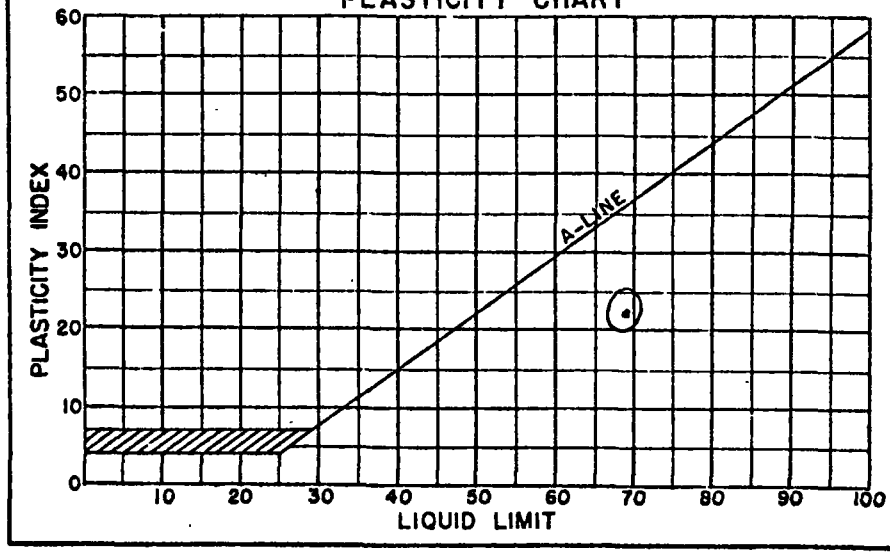
SAMPLE NO. 4233-3 JOB NO. 68 HOLE NO. B-9
DATE 3-9-83 OPERATOR RB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			✓

DESCRIPTION: Dry, Brn., Cly. U. Sty. F. SAND

PLASTICITY CHART

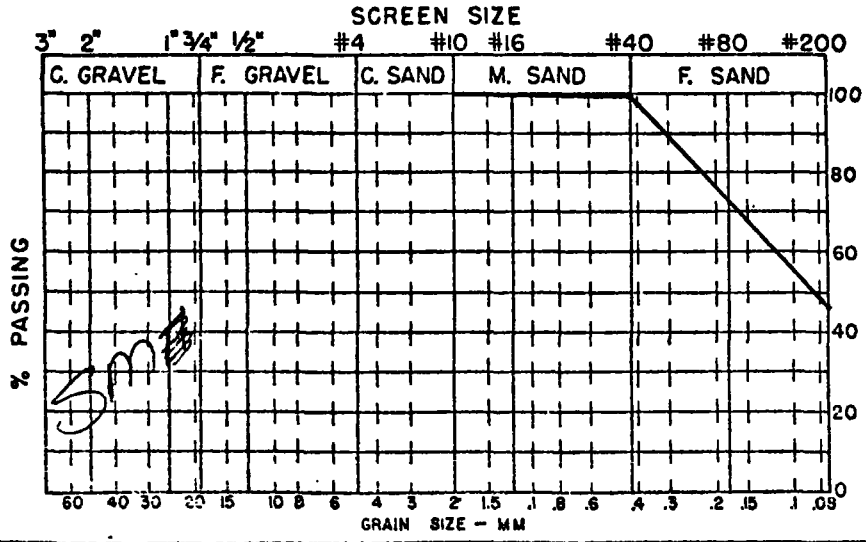


H20=40

SIEVE ANALYSIS % Passing 91.12

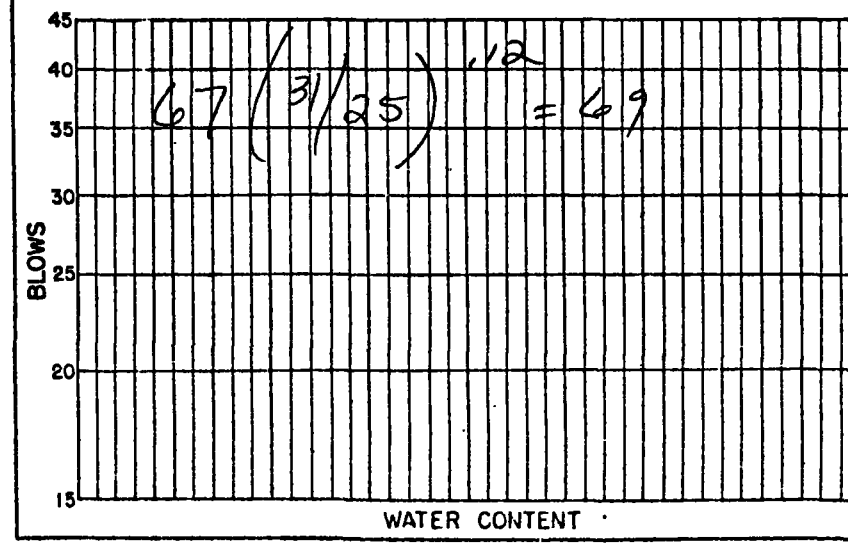
			-40	48	99
-3/4			-80		
-4			-140		
-10	.11	100%	-200	42.81	47

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	15				36
Wet Wt.	12.02				7.41
Dry Wt.	7.19				5.08
% H_2O	67%				PL= 46%
Blows	31				PI= 23



DOT FORM 351-019

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

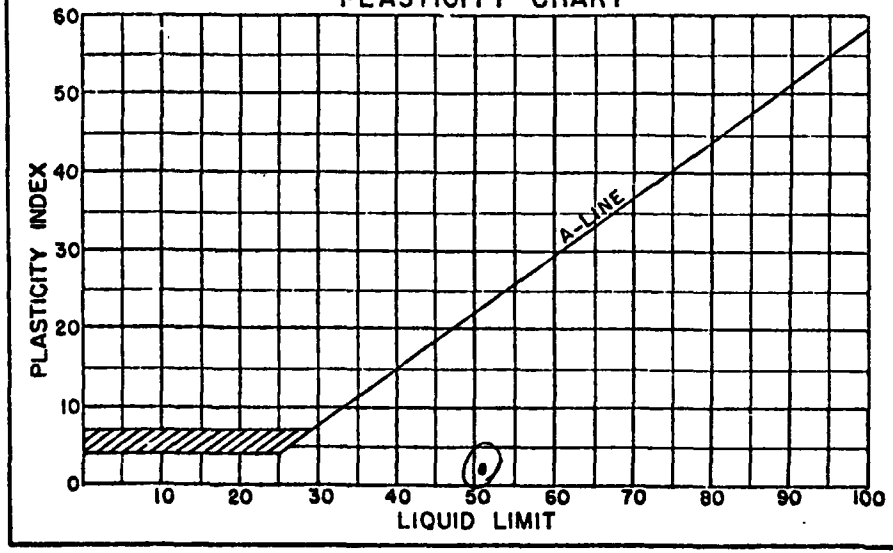
SAMPLE NO. 4233-4 JOB NO. 4-08 HOLE NO. B-9
DATE 3-9-83 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: Dry, dk Brn, Cly. F. Sdy. SILT w/ Org. Partings

PLASTICITY CHART

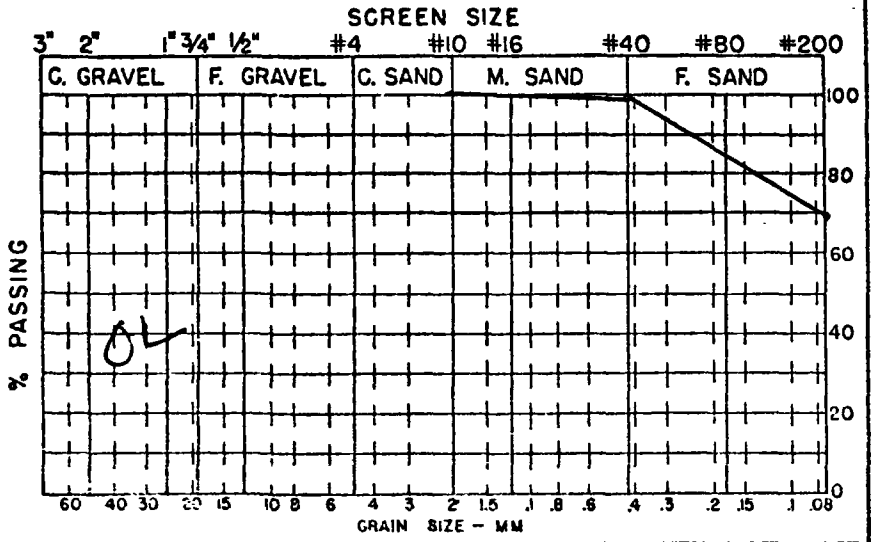


H_2O = 44%

SIEVE ANALYSIS % Passing 64.51

			-40	19.70	90%
-3/4			-80		
-4			-140		
-10	.05	100%	-200	44.76	69%

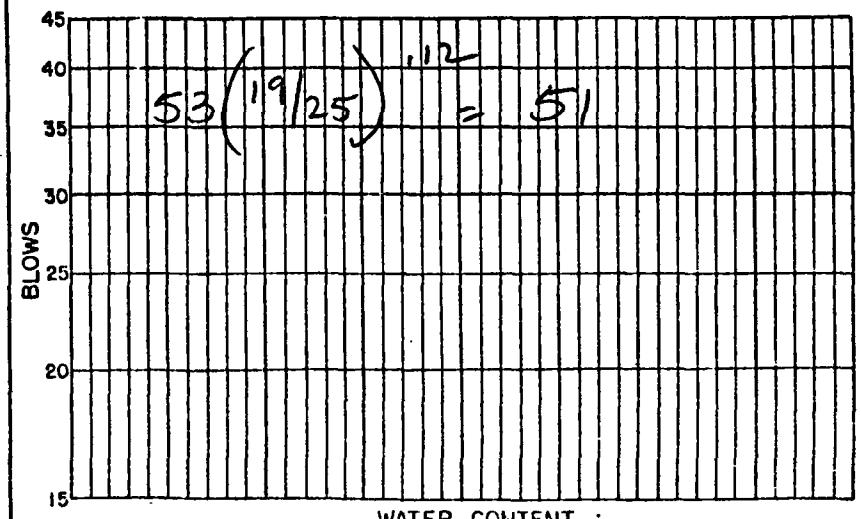
GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	32				40 N/P
Wet Wt.	13.65				10.04
Dry Wt.	8.91				6.878
% H_2O	53%				PL= 48%
Blows	19				PI= 3

Too much SAND



DOT FORM 351-019

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

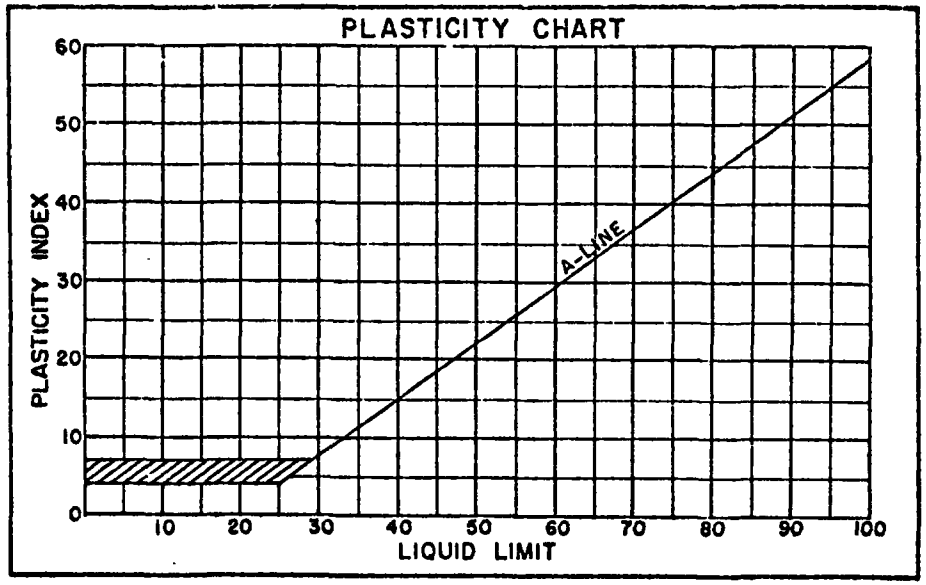
Limited Mtr.

SAMPLE NO. 4233-5 JOB NO. Log. HOLE NO. B-9
DATE 3-9-83 OPERATOR GB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: Dry, Brn. T.Cly., Stg. F-C Sdy. GRAVEL.

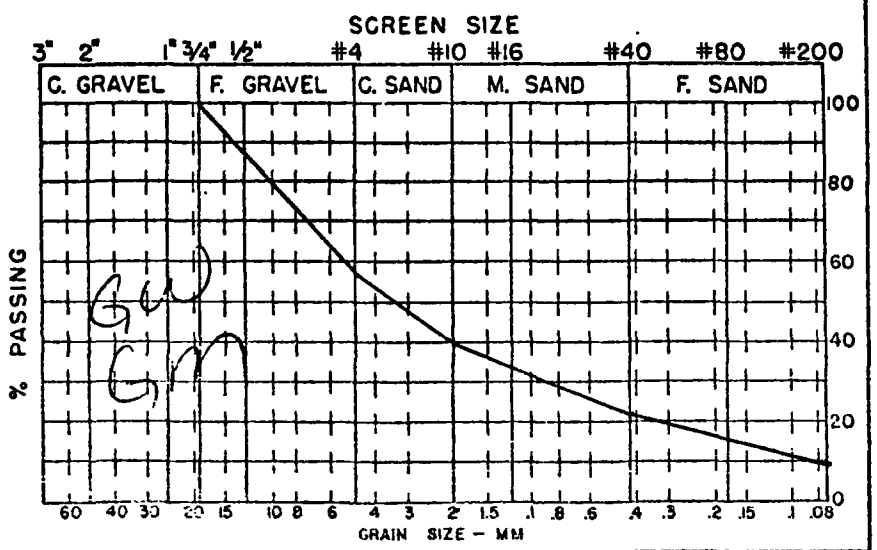


$H_2O = 11\%$

SIEVE ANALYSIS % Passing 43.35

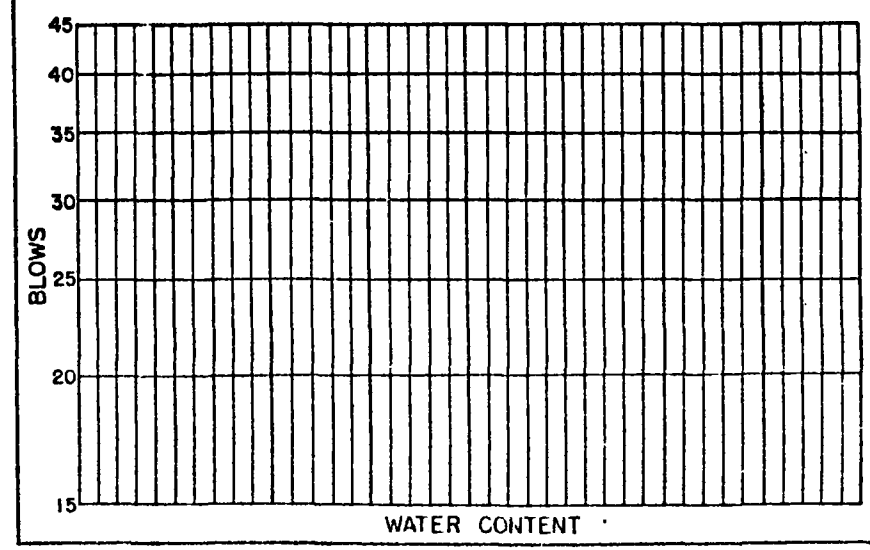
			-40	5.80	22%
-3/4	18.83	100%	-80		
-4	7.10	57	-140		
-10	7.87	40	-200	3.75	9%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

MOISTURE DETERMINATION

Job No. L-7262 Section Hog. bypass

Hole B-9

Can No.	Date	Station	Offset	Depth	Wt of can + wet soil	Wt of can + dry	Wt. of H_2O	Wt. of can	Wt. of dry soil	Wt. pass #4 (dry)	% of H_2O	% H_2O #4 minus
4239 7	2-24-83	104+20	190' RT	133'	103.90	74.18					40%	

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 3-4-83

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam bypass SR No. 101A Sub-Section cut section

Station & Offset 105+25 269 LT Hole # B-10

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4264 -1	D-1	1' 0" 2' 0"	55%	OH	M, w ½ = tan & Rust, ORG. SILT w/ Twigs & wood
					½ = DK. Brn. Cly. SILT - PI Done w/ this MTR
-2	D-2	6' 0" 8' 0"	79%	OH	Sl. moist (visual) ORG., Rusty & tAN OXIDIZED
					SILTSTONE or CLAYSTONE w/ Cemented streaks
-3	D-3	11' 0" 13' 0"	47%	CH	M, w tan, F. Sdy., Sty. CLAY
-4	D-4	16' 0" 18' 0"		CH	SAME
-5	D-5	21' 0" 23' 0"	53%	ML	M, tan & oxidized streaks & F. Sdy
					SILT w/ SILTSTONE (?)
-6	D-6	26' 0" 28' 0"	40%	MH CH	M, w GR. SILT & Clay w/ streaks &
					F. SAND & mica ; TIDAL odor
-7	D-7	31' 0" 33' 0"	43%	ML	M, w tan - oxidized F. Sdy. SILT
					(SILTSTONE ?)
-8	D-8	36' 0" 37' 6"	30%	SM	Dry Looking, Brn, oxidized, V. Sty. F. SAND
					W/ some SILT or Claystone ?
-9	D-9	41' 0" 42' 0"	11%	SM	D. Brn. - tan, V. Sty., F. Grully.
					F-C SAND (soil skeleton) ?

(F. Gravel does NOT Break down)

1 copy with samples
1 copy to addressee

Yours very truly,

Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 3-4-83

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam bypass SR No. 101A Sub-Section cut section

Station & Offset 105+25 269' LT Hole # B-10

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4264 -10	D-10	46'0" 48'0"		SM	Like 4264-9 Dry, Brn-tan, V. Sty., F-grvly.
					F-C SAND (soil skeleton?)
-11	D-11	51'0" 53'0"	44%	MH	M-W 1/2 = dk Brn., Blk., Cly. Silt
					1/2 = Oxidized & tan F. Sdy. Silt
					More Samples
					Coming

1 copy with samples
1 copy to addressee

Yours very truly,
Milford Sanders
Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 3-10-83

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section Hop bypass
SR No. 101A Sub-Section Cut section

Station & Offset 105+25 269'LT Hole # B-10

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4272-1	D-12	56'0" 58'0"	46%	ML	M-W, Grn. GR. V F. Sdy. SILT
-2	D-13	61'0" 63'0"	47%	MH	M,-W oxidized, Cly. F. Sdy. SILT
-3	D-14	66'0" 66'9"		SM	Like 4264-9 D, Brn.-tan, V. Sty. F. Gruly. F-C SAND (Soil skeleton)?
-4	D-15	71'0" 71'10"	6%	SM	D, yellow., Gr. & tan. V. sty. F-C SAND w/ f. gruly. mtr. & t. powdery streaks
-5	D-16	76'0" 77'6"		SM	Same
-6	D-17	81'0" 81'10"	13%	GM	M, Brn., olive & yellow, V. Sty. F-C Sdy. 1"(-) & GRAVEL
-7	D-18	86'0" 87'6"	16%	GM SM	M, Brn-orange, V. Sty. F-C SAND & F. GRAVEL w/ pocket of sty. white mtr.
-8	D-19	91'0" 92'0"	40%	ML	VISUAL = DRY / w: Wet / Brn. F. Sdy. SILT
-9	D-20	96'0" 97'1"	41%	ML	Wet, Brn. F. Sdy. SILT w/ t. mold!

1 copy with samples
1 copy to addressee

Yours very truly,
Milford Sanders
Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 3-10-83

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section Toguiam bypass
SR No. 101A Sub-Section cut section

Station & Offset 105+25 267'LT. Hole # B-10

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4272 -10	D-21	101' 0" 102' 0"		ML	Like 4272-9 w/T. mica Wet., Brn., F. Sdy. Silt w/t. Mold!
-11	D-22	106' 0" 106' 6"	11%	GW GM	M, dk. Brn., Sty. F-C Sdy. F & GRAVEL
-12	D-23	111' 0" 111' 5"	7%	SM	D, Brn., V. Sty. F-C SAND w/one 1"(+) & Gravel & t. f. gruly. mtr.
-13	D-24	116' 0" 116' 11"	12%	SM	D, Fine, Fine Weathered Conglomerate.
-14	D-25A	121' 0" 121' 3"	23%	SM	M, Brn., V. Sty. F-M SAND w/t. Crs. Sand & f. gruly. mtr.
-15	D-25B	121' 3" 121' 5"	15%	SP	M, olive, Brn & Grn. F-C SAND w/ f. gruls. & Pocket & Powdery mtr.
-16	D-26	126' 0" 126' 3"		SP	Same w/ one flat S.R. 1"(+) Rock
-17	D-27	136' 0" 136' 6"	10%	GM	M, Brn., Sl. oxid., Sty. F-C Sdy. 1"(+) & GRAVEL
-18	D-28	146' 0" 146' 3"		GM	Same

1 copy with samples
1 copy to addressee

Yours very truly,
Mellford Sanders
Inspector.

DOT FORM 351-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 3-16-83

Dear Sir:

I have forwarded by today's Tolecar the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam bypass
SR No. 1414 Sub-Section cut section

Station & Offset 105+25 26'LT. Hole # B-10

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4304-1	D-29	156'0" 156'4"	8%	SM	D, tan-olive, v. sty, f. gruly. F-C SAND
-2	D-30	166'0" 167'11"			Like 4264-6
					End of hole

1 copy with samples
1 copy to addressee

Yours very truly,
Milford Sanders
Inspector.

DOT FORM 351-002 REVISED 2/80

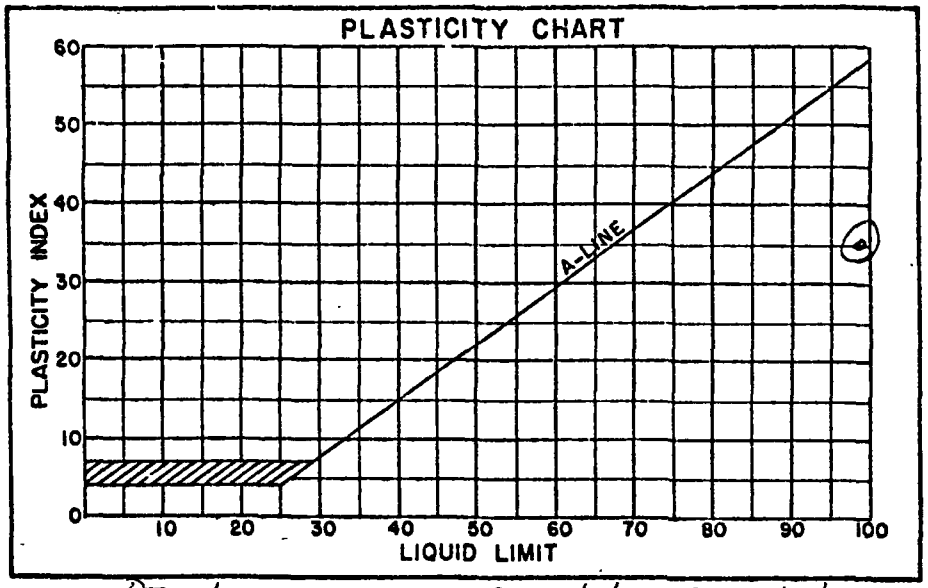
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4264-1 JOB NO. Hob. HOLE NO. B-10
DATE 5-12-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	✓

DESCRIPTION: M, 1/2 = tan-Rust, org.
SILT w/ Twigs & wood \ 1/2 = dk Brn.
Cly. SILT PI was done on this Mtr.

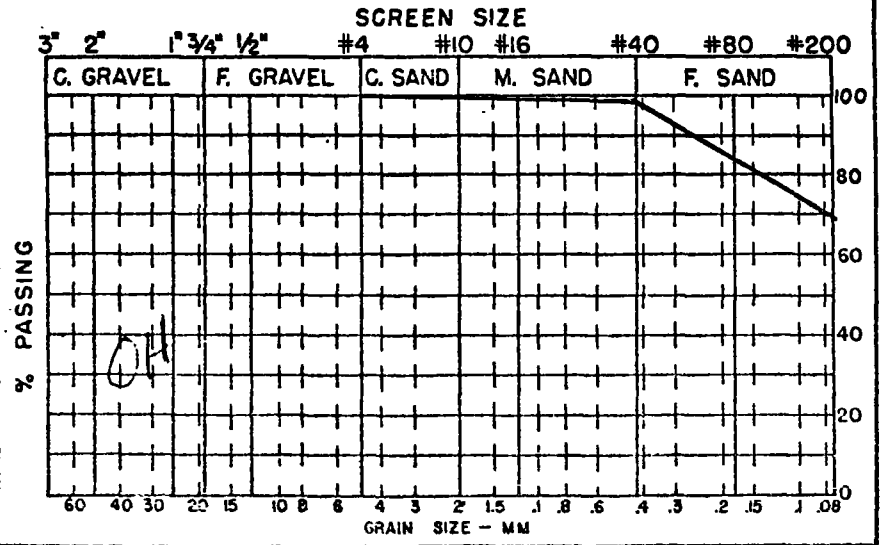


PI done with representative sample from Cly SILT mtr.

W- 29.15 D- 18.82 H2O= 55%

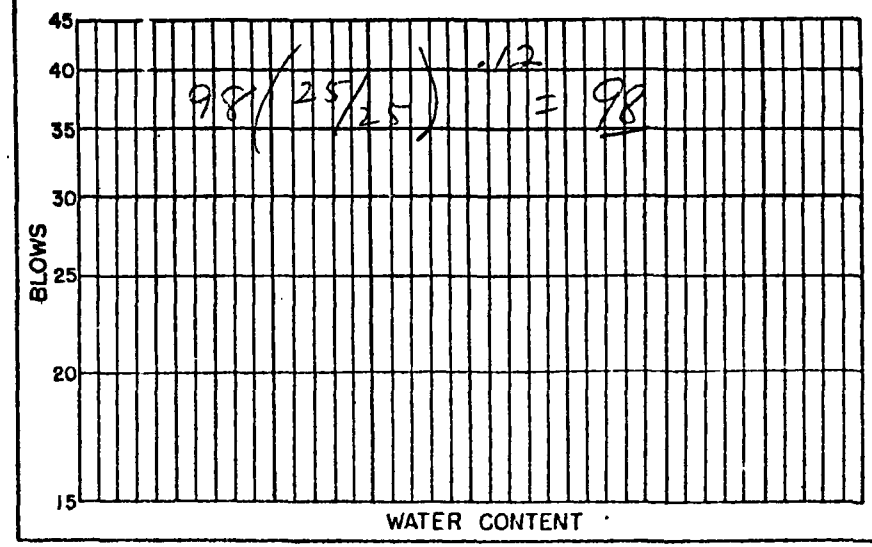
SIEVE ANALYSIS		% Passing			75.62
			-40	21.92	98
-3/4			-80		
-4	.20	100	-140		
-10	1.00	99	-200	52.5	69

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	69				58
Wet Wt.	25.92				10.23
Dry Wt.	13.07				6.28
% H_2O	98%				PL= 63
Blows	25				PI= 35

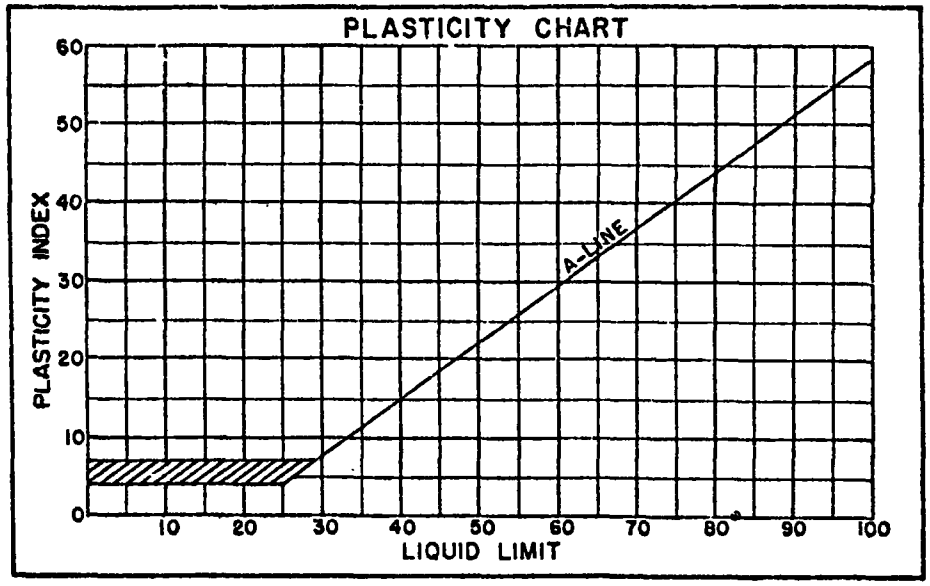


SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4264-2 JOB NO. Hg HOLE NO. B-10
DATE 4-28-83 OPERATOR BC

SOIL FIELD IDENTIFICATION			
TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

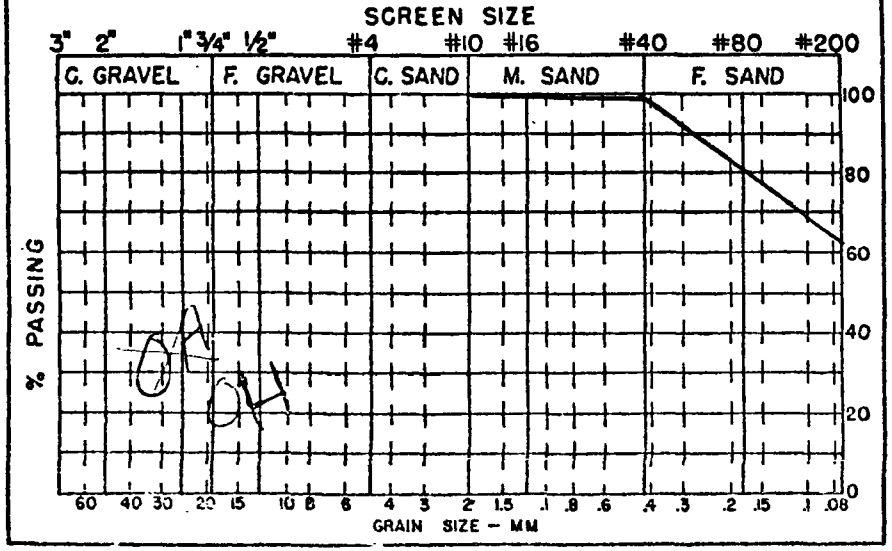
DESCRIPTION: Sl. moist (visual) org. Rusty, tan, oxidized siltstone or claystone w/ cemented streaks. Asked Tom Z. NOT Plastic



W = 22.28 D = 12.45 Hw = 79%

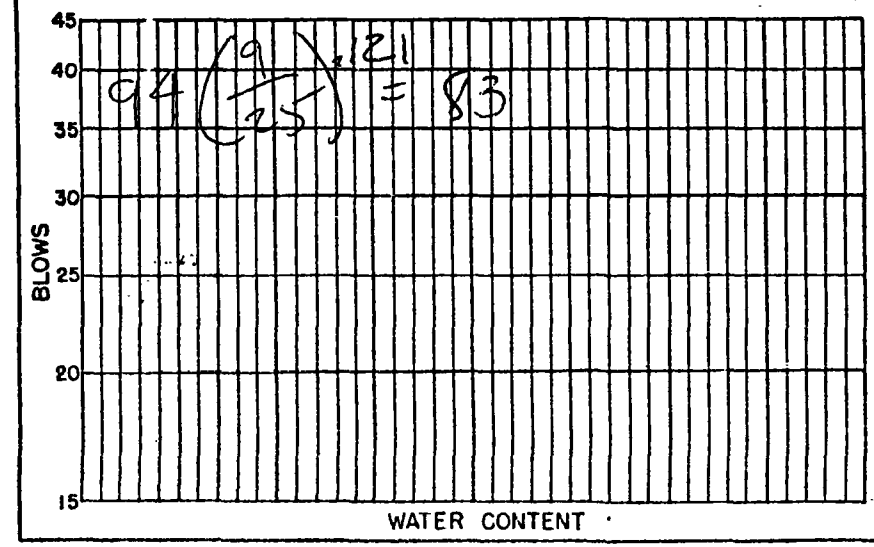
SIEVE ANALYSIS		% Passing 58.7
	-40 22.10	99
-3/4	-80	
-4	-140	
-10 .10 100	-200 36.6	62 %

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	38				
Wet Wt.	31.69				N/P
Dry Wt.	16.21				
% H_2O	94%				PL=
Blows	9				PI=



DOT FORM 351-019

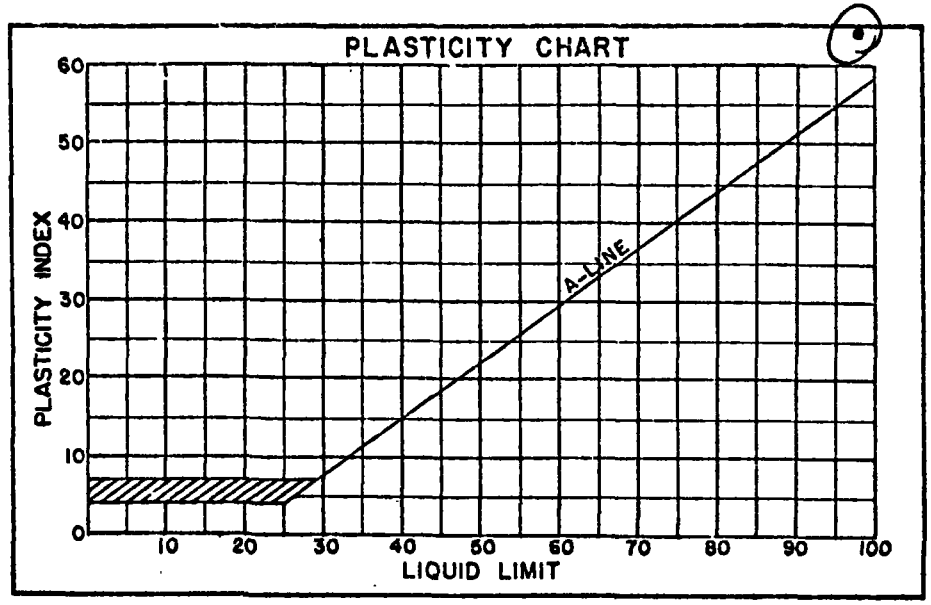
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4264-3 JOB NO. Hog. HOLE NO. B-10
DATE 4-28-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			✓

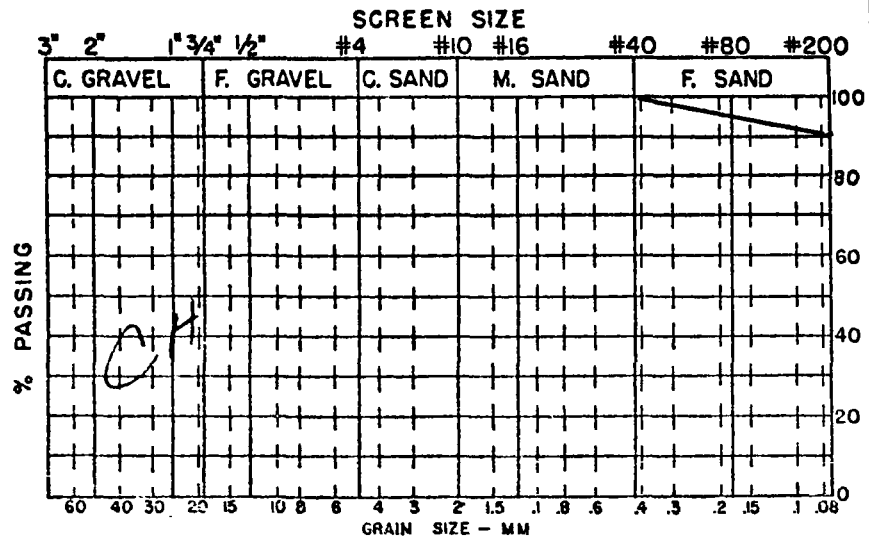
DESCRIPTION: M. tan F. Sdy. Sty. CLAY



W = 30.3 D = 20.65 H_{2O} = 47%

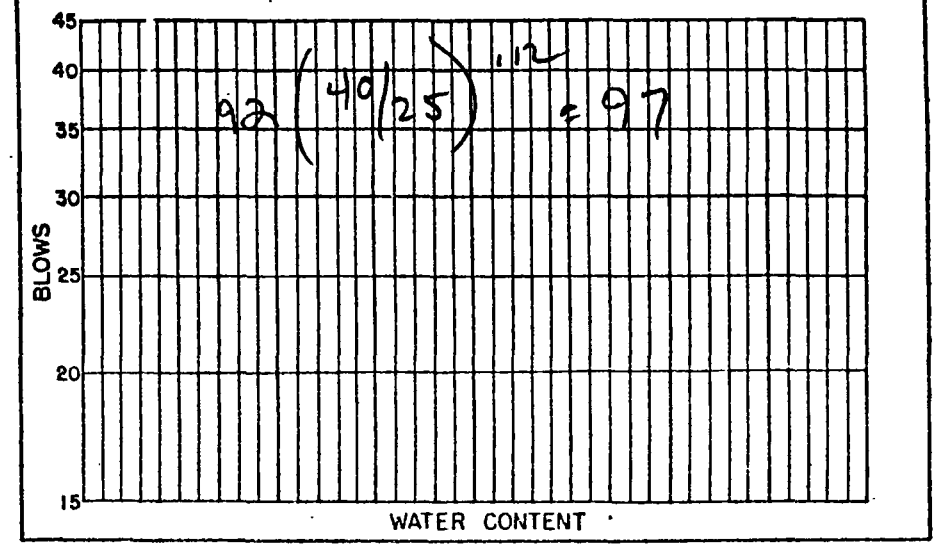
SIEVE ANALYSIS		% Passing 70.4	
	-40	7.03	100
-3/4	-80		
-4	-140		
-10	-200	63.37	90%

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	116				45
Wet Wt.	26.28				14.20
Dry Wt.	[illegible]				[illegible]
% H_2O	92				PL= 32
Blows	40				PI= 65



$92\left(\frac{40}{25}\right)^{.12} = 97$

DOT FORM 351-019

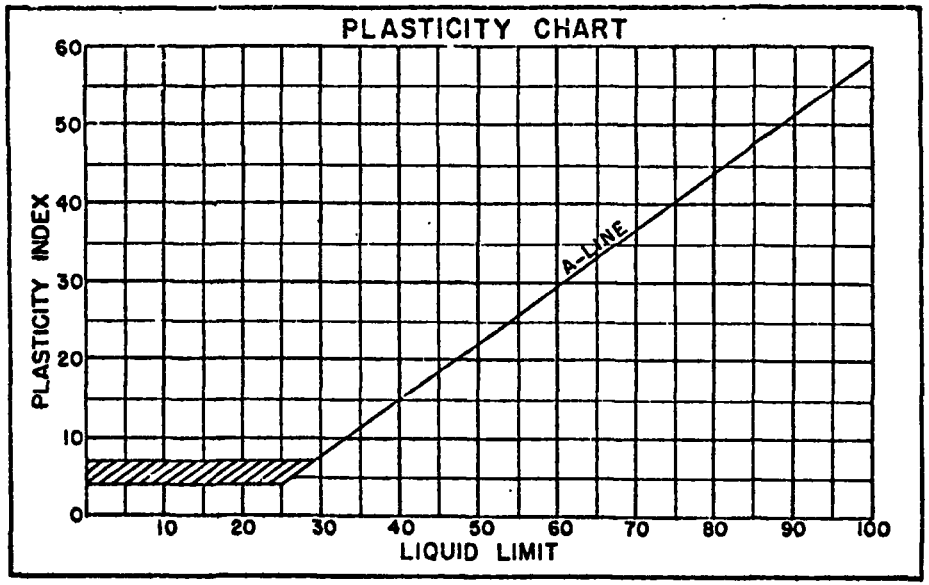
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4264-5 JOB NO. Hog. HOLE NO. B-10
DATE 5-10-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

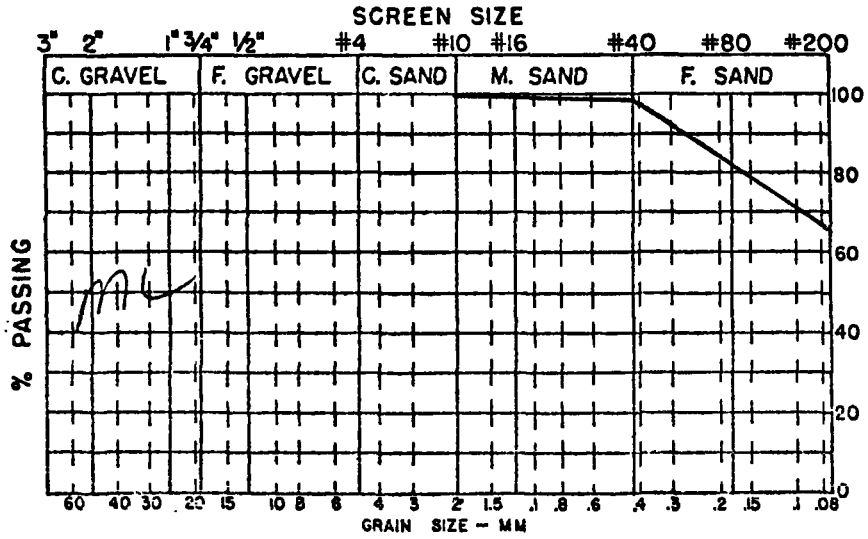
DESCRIPTION: M. tan & oxidized Strks of F. Sdy. SILT w/ siltstone (?)



W = 34.88 D = 22.76 H_2O = 53%

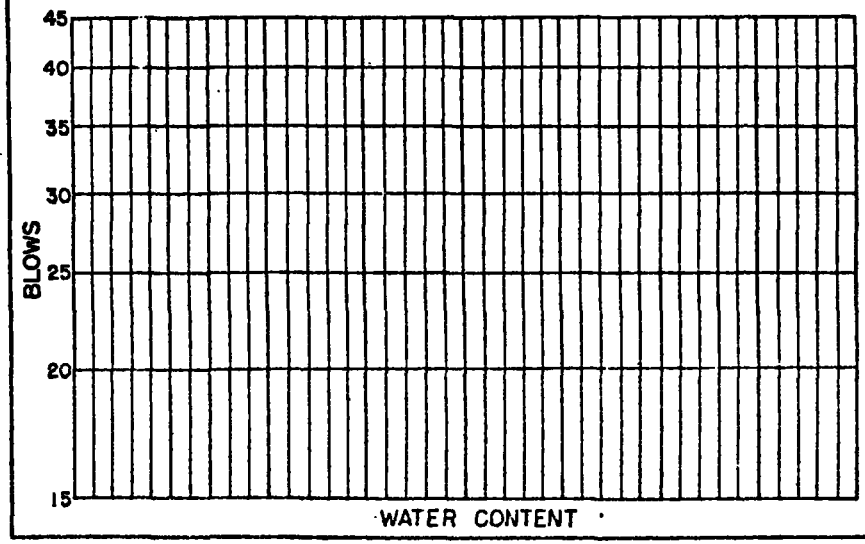
SIEVE ANALYSIS		% Passing 74.35	
		-40 23.8	98
-3/4		-80	
-4		-140	
-10 1.25	100	-200 49.3	66

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



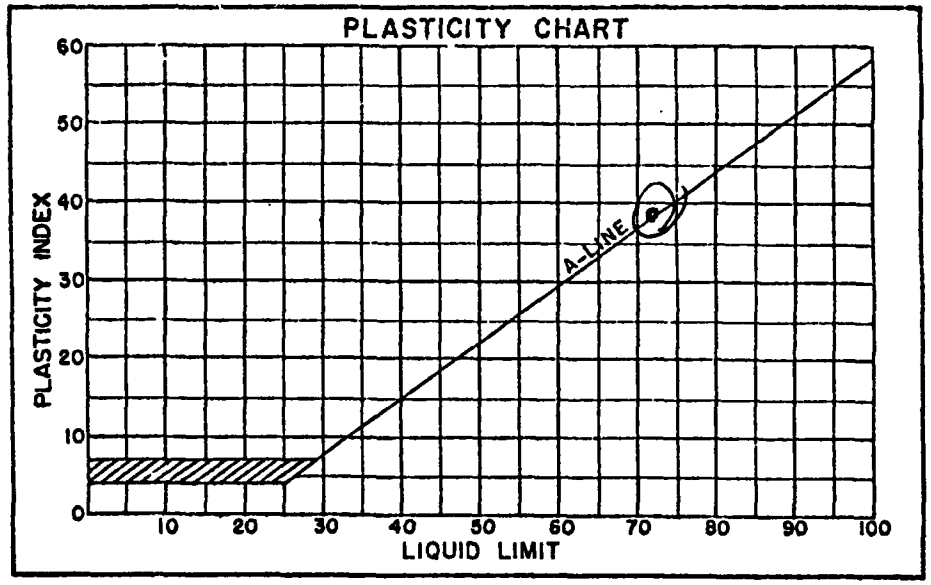
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4264-6 JOB NO. Hog. HOLE NO. B-10
DATE 4-28-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	✓
DRIED CAST	✓	✓	
DILATANCY			
BITE		✓	
TOUGHNESS	✓	✓	

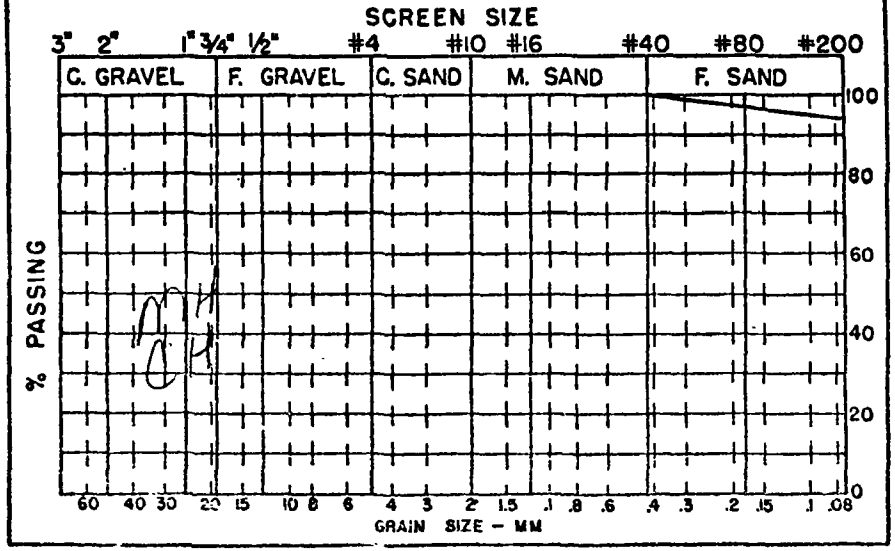
DESCRIPTION: M. GR. SILT & Clay w/ Streaks of F. Sand & MICA-Tiny Odor



W= 49.10 D= 35.13 H_2O= 40%

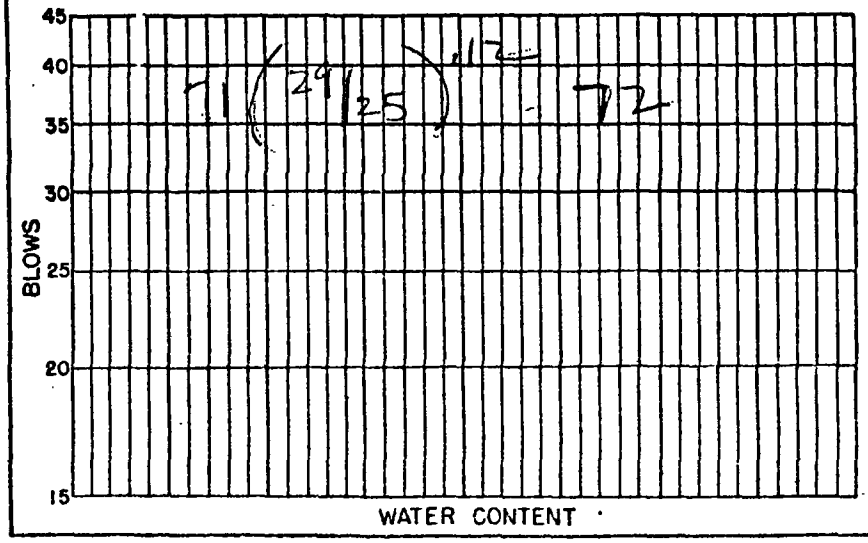
SIEVE ANALYSIS		% Passing 82.15
	-40	5.1 100%
-3/4	-80	
-4	-140	
-10	-200	77.05 94%

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	62				70
Wet Wt.	25.33				9.10
Dry Wt.	14.40				6.10
% H_2O	41				PL= 34
Blows	29				PI= 38



DOT FORM 351-019

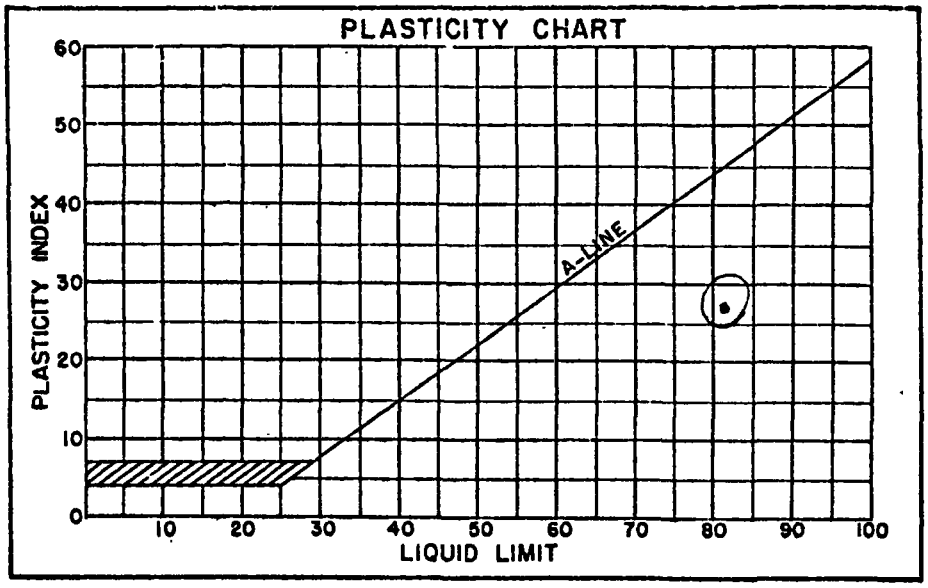
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4264-T JOB NO. 466 HOLE NO. B-10
DATE 5-10-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	✓

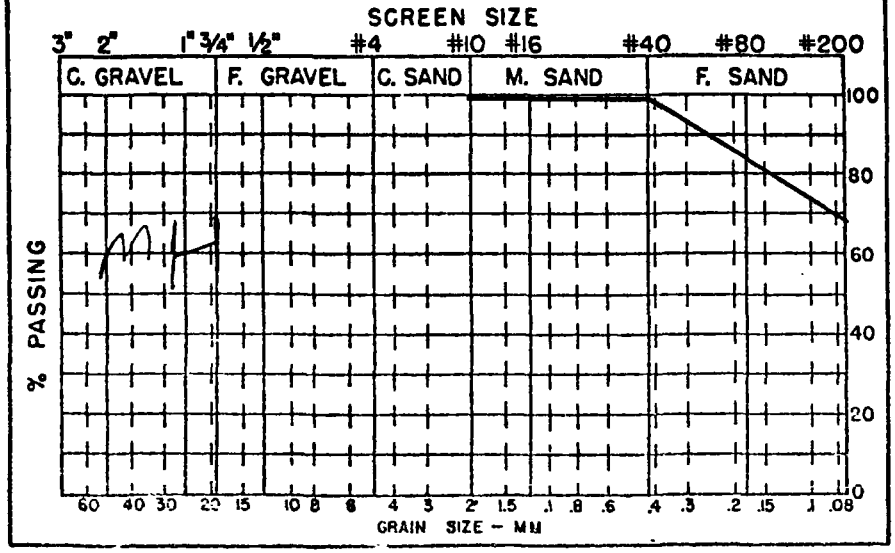
DESCRIPTION: M, tan - oxidized, Cly.
F. Sdy. SILT (siltstone ?)
claystone ?



W. 31.5 D=21.97 H_2O= 43%

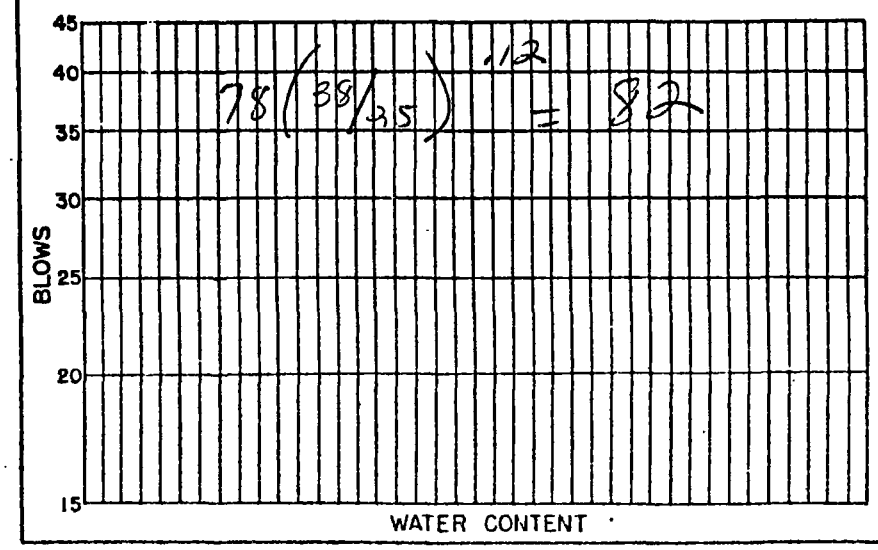
SIEVE ANALYSIS		% Passing 78.6
	-40 25.20	90
-3/4	-80	
-4	-140	
-10 .02 100	-200 53.38	68%

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	32				48
Wet Wt.	26.27				8.83
Dry Wt.	14.80				5.68
% H_2O	78%				PL= 55
Blows	38				PI= 27



DOT FORM 351-

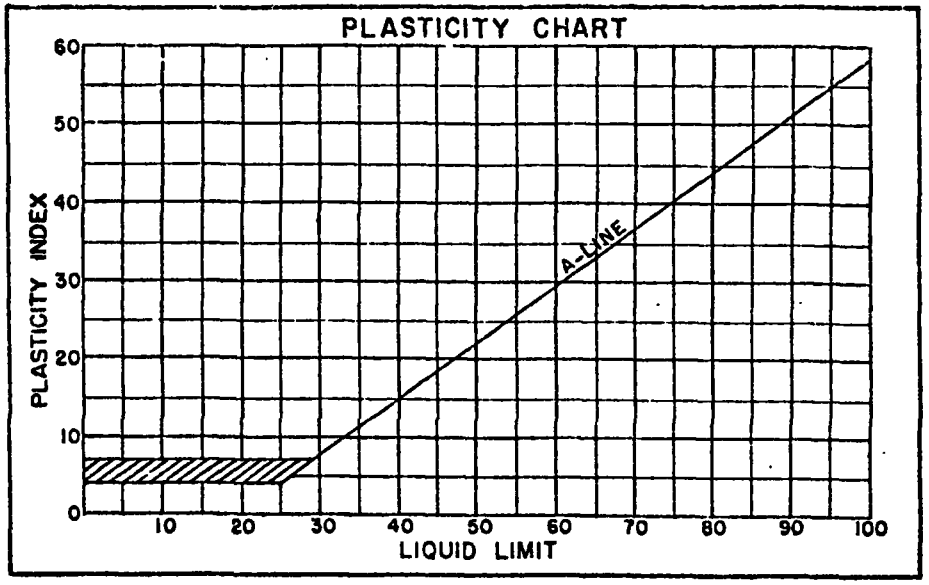
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4264-8 JOB NO. Hea. HOLE NO. B-10
DATE 5-6-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Dry Looking, Brn, oxidized V. Sty. F. SAND w/ some Siltstone or Claystone ?

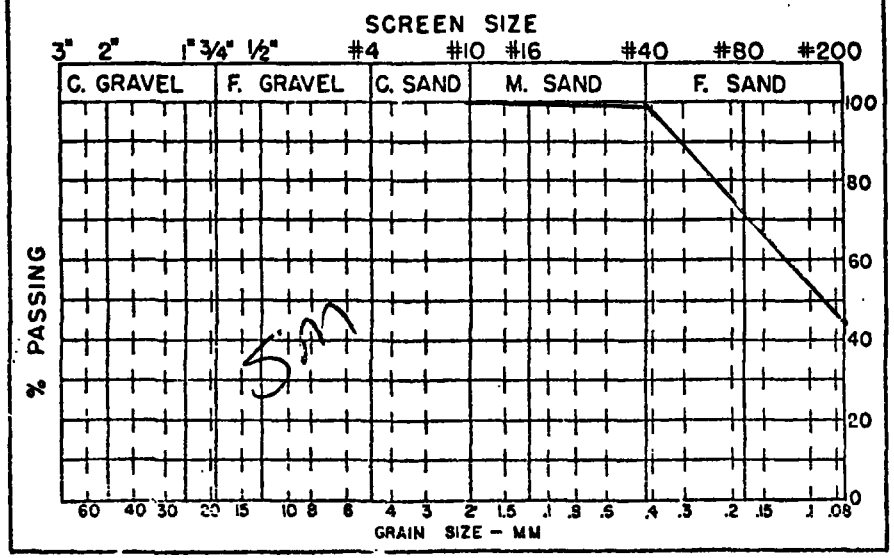


W= 41.05 D= 31.51 H_2O= 30%

SIEVE ANALYSIS % Passing 82.9

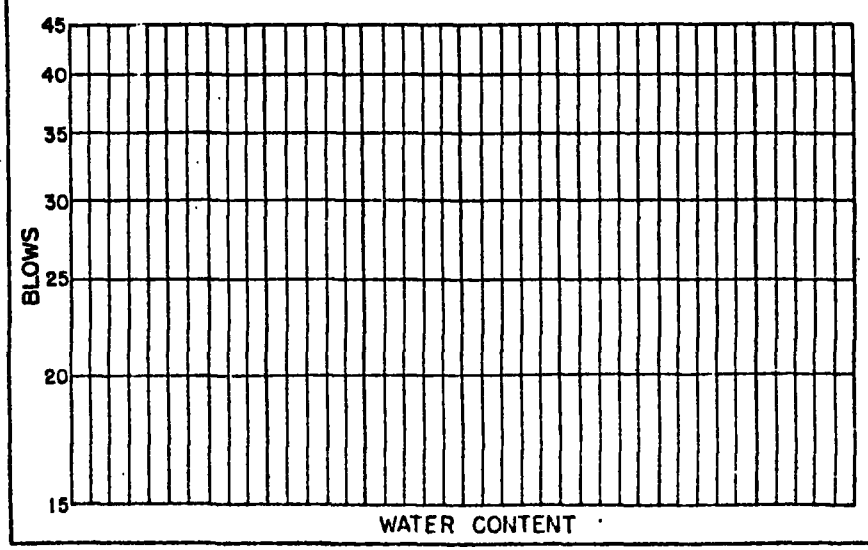
		-40	45.80
-3/4		-80	
-4		-140	
-10	37	-200	36.73

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4204-9 JOB NO. 4-08 HOLE NO. B-10
DATE 5-10-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE		✓	
TOUGHNESS		✓	

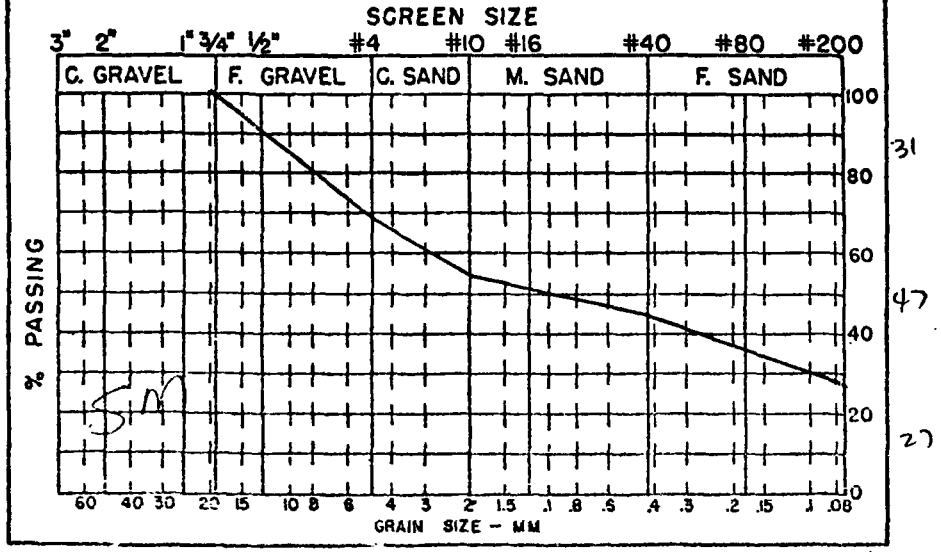
DESCRIPTION: D, Brn-tan, V. Sty. F. Gruly. F-C SAND. (Soil Skeleton ?)

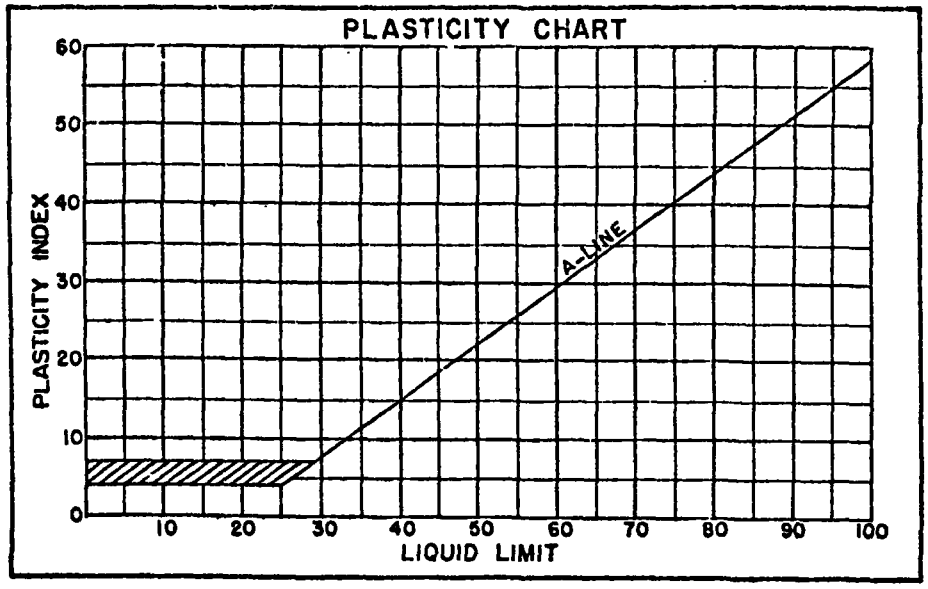
W = 50.46 D = 45.4 H_{2O} = 11%

SIEVE ANALYSIS % Passing 95.12

			-40	17.70	46
-3/4	30.18	100	-80		
-4	13.13	69	-140		
-10	8.68	55	-200	25.43	27%

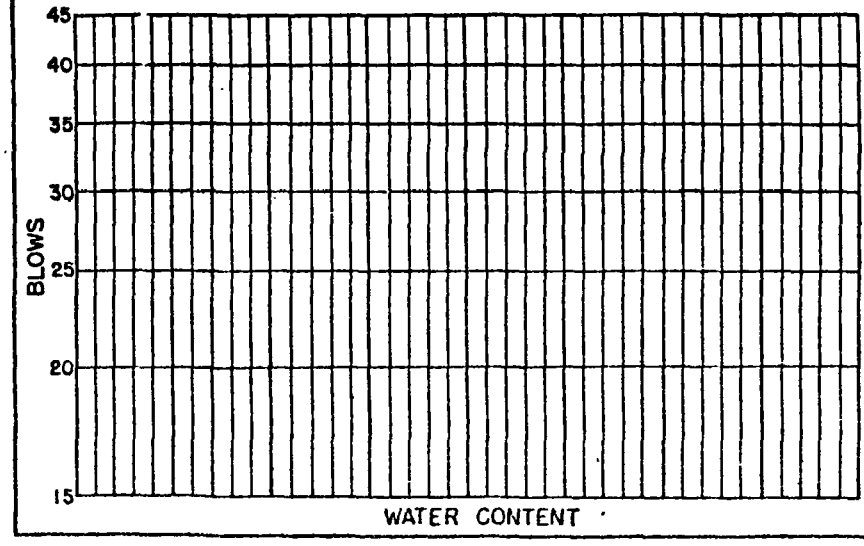
GRAIN SIZE CURVE





LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



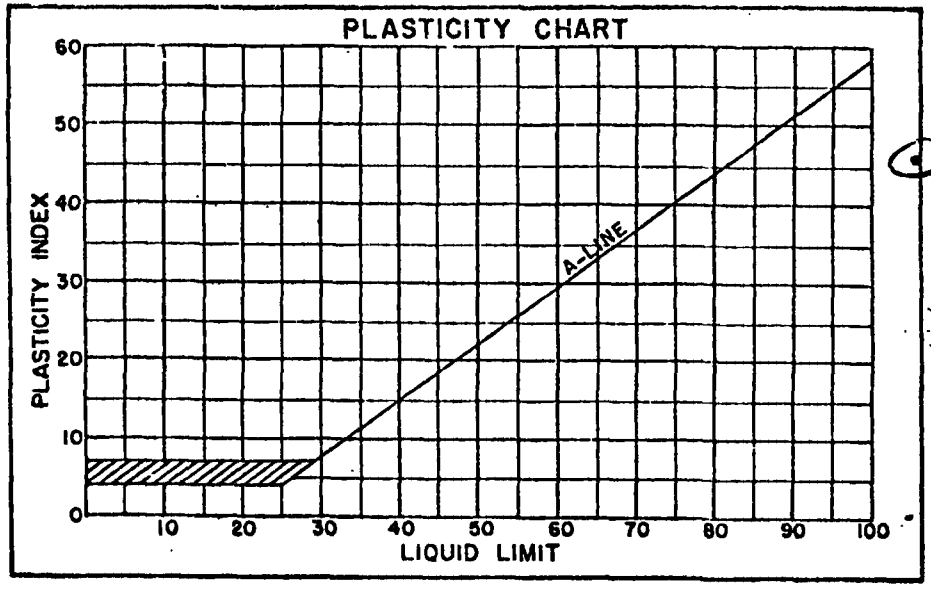
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4264-11 JOB NO. Hog. HOLE NO. B-10
DATE 4-28-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: M, 1/2 = dk. Brn., BLK. Cly. Silt 1/2 = oxidized & tan F. Sdy. Silt

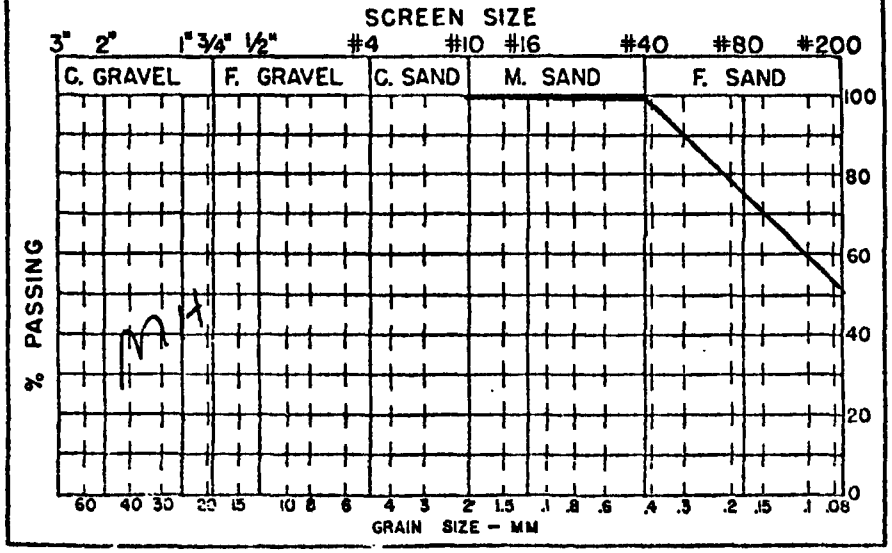


w = 45.95 D = 31.93 H2O = 44%

SIEVE ANALYSIS % Passing 55.43

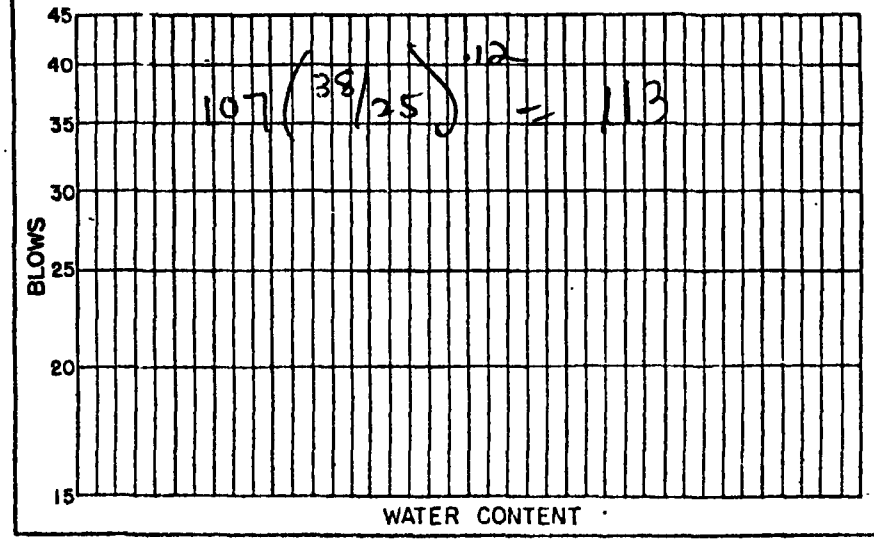
			-40	27.10	99
-3/4			-80		
-4			-140		
-10	.10	100	-200	28.23	51%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	35				117
Wet Wt.	34.71				7.91
Dry Wt.	16.72				7.74
% H_2O	107				PL= 67
Blows	38				PI= 46



107 (38/25)^.12 = 113

DOT FORM 351-014

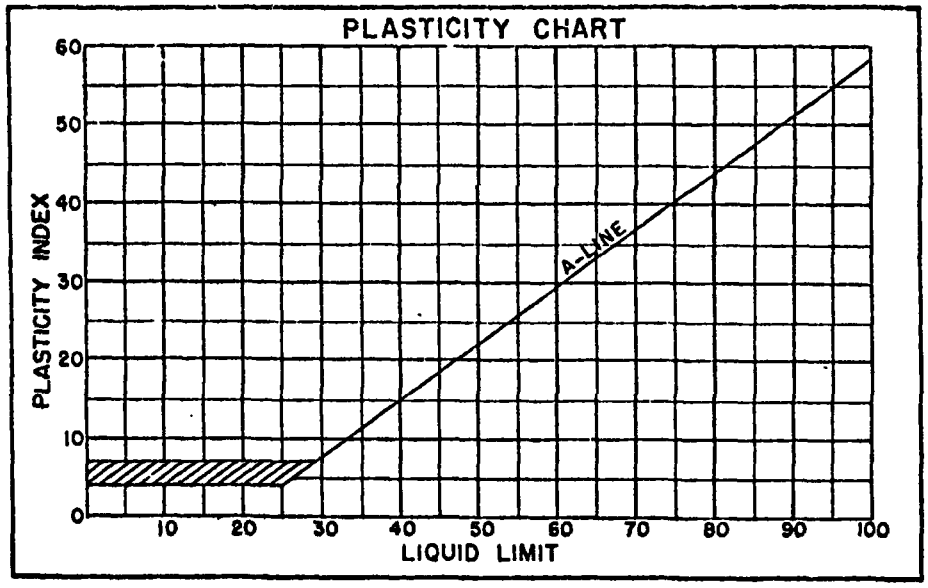
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4272-1 JOB NO. Hes. HOLE NO. B10
DATE 5-10-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST		✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

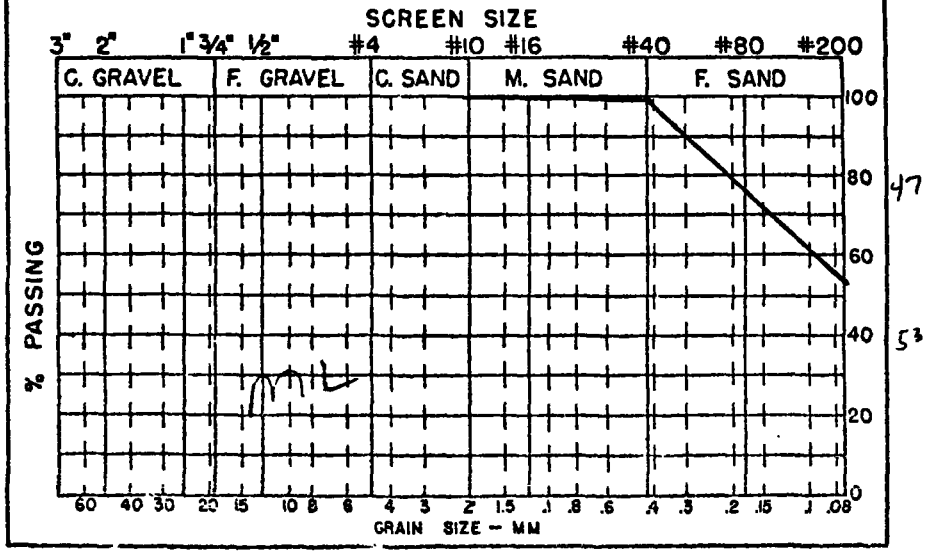
DESCRIPTION: M, GRN - Gr. V. F.
Sdy. SILT



W = 32.0 D = 21.9 H_{2O} = 46%

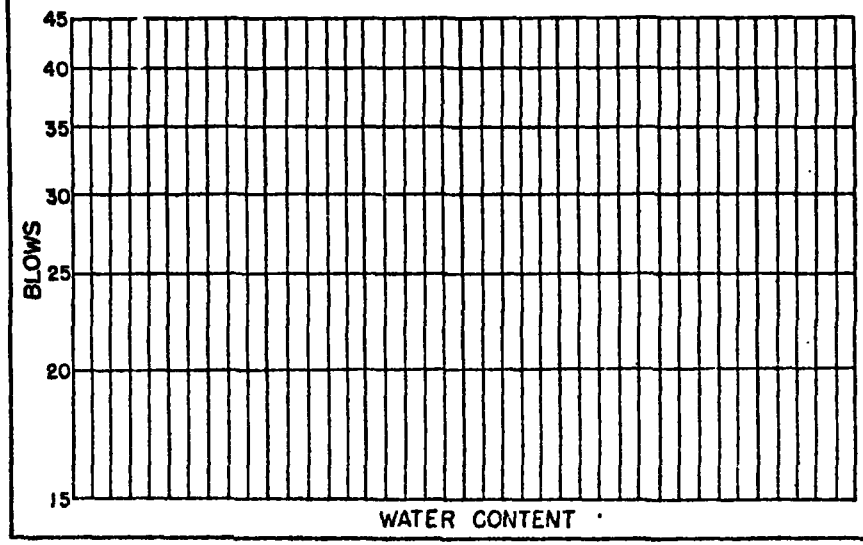
SIEVE ANALYSIS		% Passing 62.10	
		-40	29.35 99
-3/4		-80	
-4		-140	
-10 .08	100	-200	32.67 53%

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



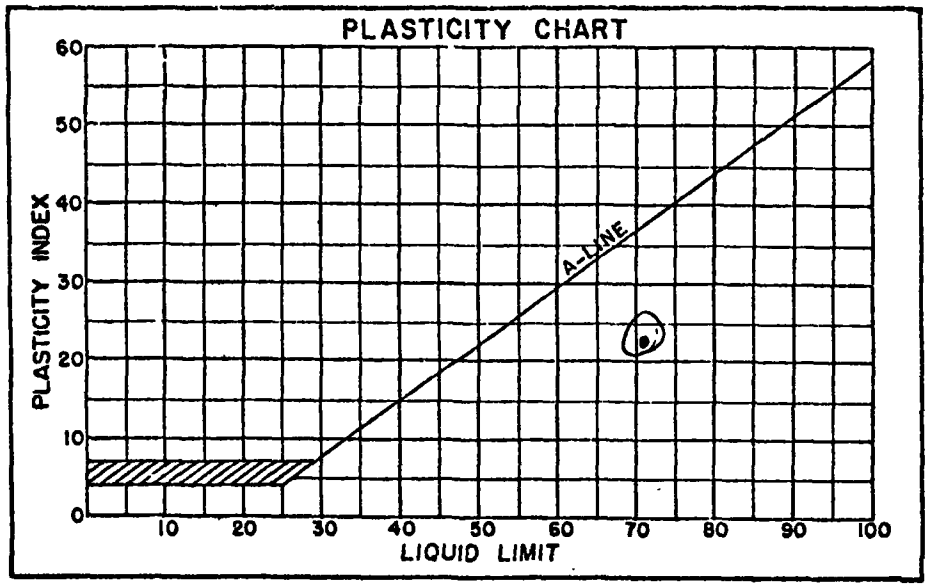
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4272-2 JOB NO. Hof. HOLE NO. B-10
DATE 4-28-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	✓
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: M, Oxidized, Cly.
F. Sdy. SILT

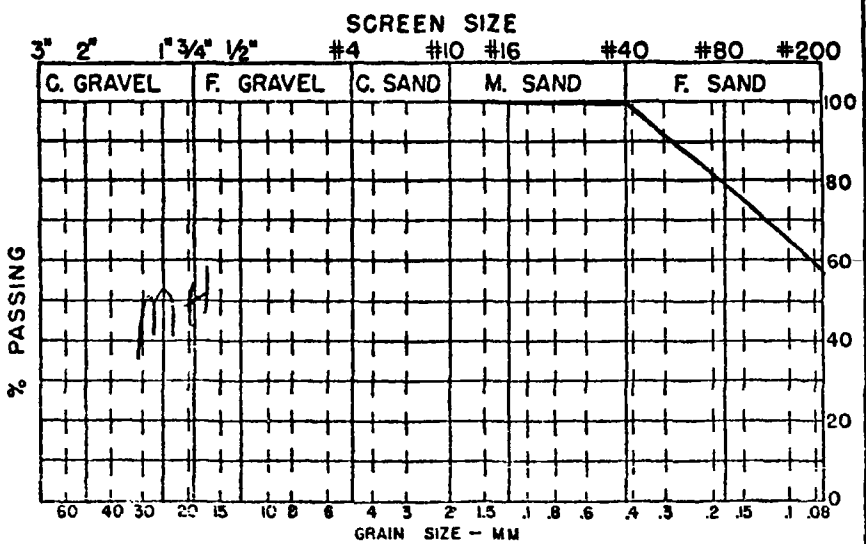


W= 24.05 D= 16.31 Hw= 47%

SIEVE ANALYSIS % Passing 60.2

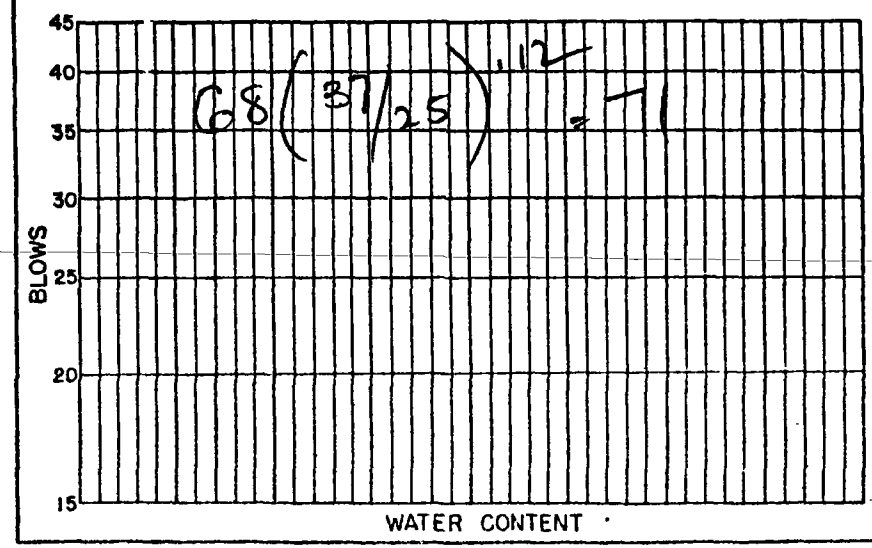
		-40	26.4	99
-3/4		-80		
-4		-140		
-10	.03	100% -200	34.77	57%

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	78				43
Wet Wt.	28.36				8.70
Dry Wt.	16.[illegible]				5.[illegible]
% H_2O	68				PL= 48
Blows	37				PI= 23



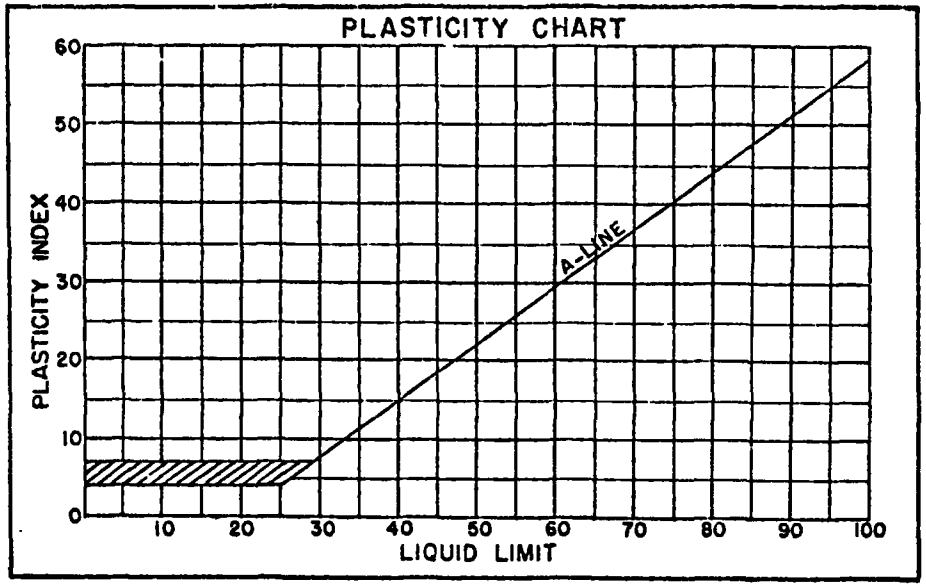
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4272-4 JOB NO. Hog. HOLE NO. B-10
DATE 5-6-83 OPERATOR PK

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE		✓	
TOUGHNESS	✓	✓	

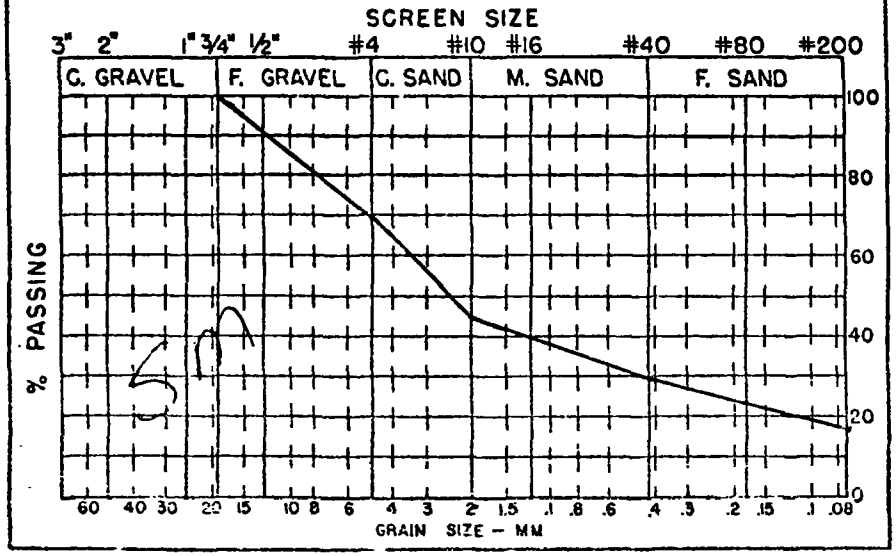
DESCRIPTION: Dry, yellow, GR & TAN V. Sty. F-C SAND w/ F. gravly. Mtr. & Trace Powdery streaks



W= 32.0 D= 30.2 H_{2O} = 6%

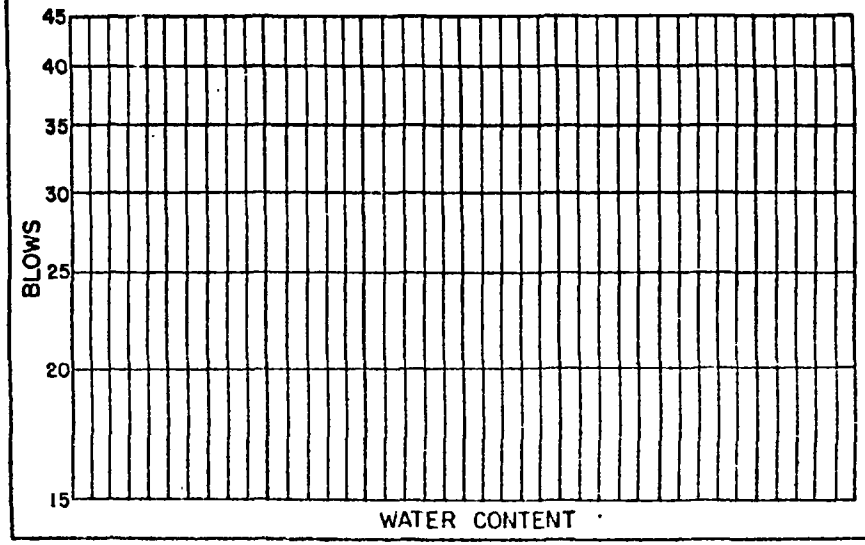
SIEVE ANALYSIS			% Passing 95.85		
			-40	11.35	29%
-3/4	29.7	100	-80		
-4	22.1	69%	-140		
-10	16.1	46%	-200	16.6	17%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



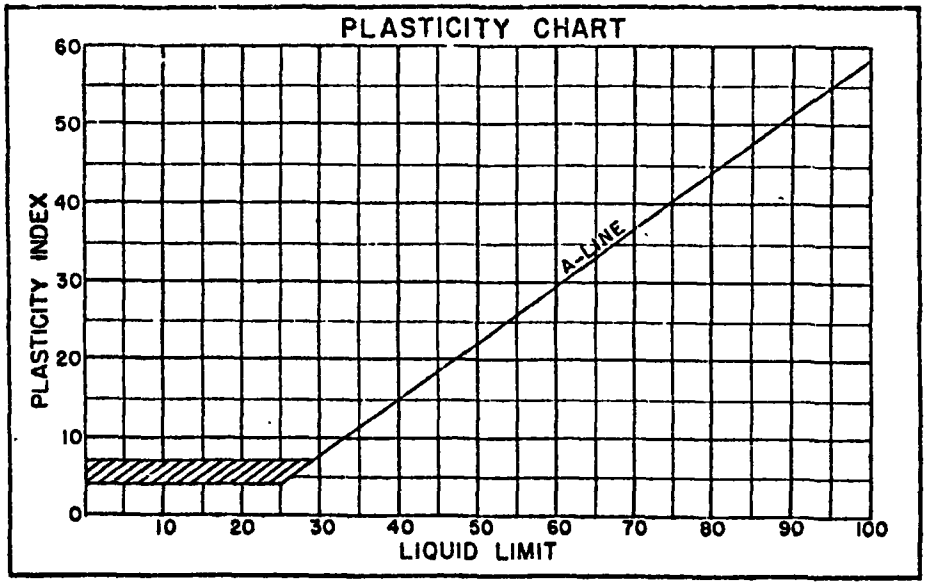
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4272-6 JOB NO. Hog. HOLE NO. B-10
DATE 5-6-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE		✓	
TOUGHNESS	✓	✓	

DESCRIPTION: M, Brn, olive & yellow. V. Sty. F-C Sdy. 1"(-) & GRAVEL

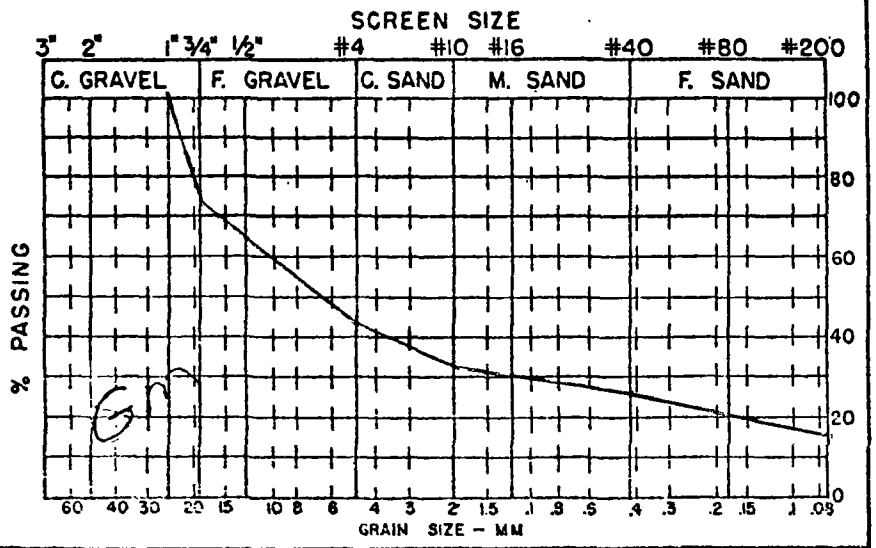


W= 36.92 D= 32.80 H_2O= 13%

SIEVE ANALYSIS % Passing 132.80

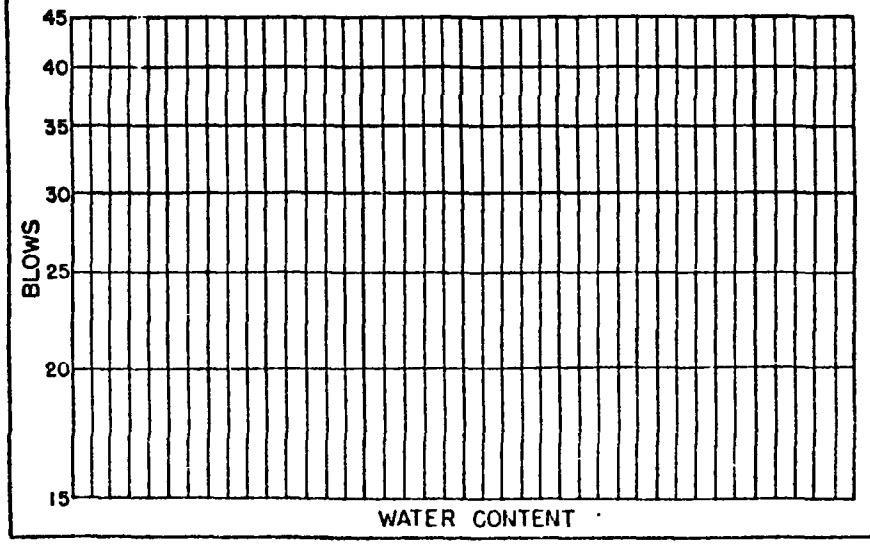
-1	36.28	100	-40	15.25	26%
-3/4	39.90	73%	-80		
-4	12.73	43%	-140		
-10	9.6	33%	-200	19.64	15%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

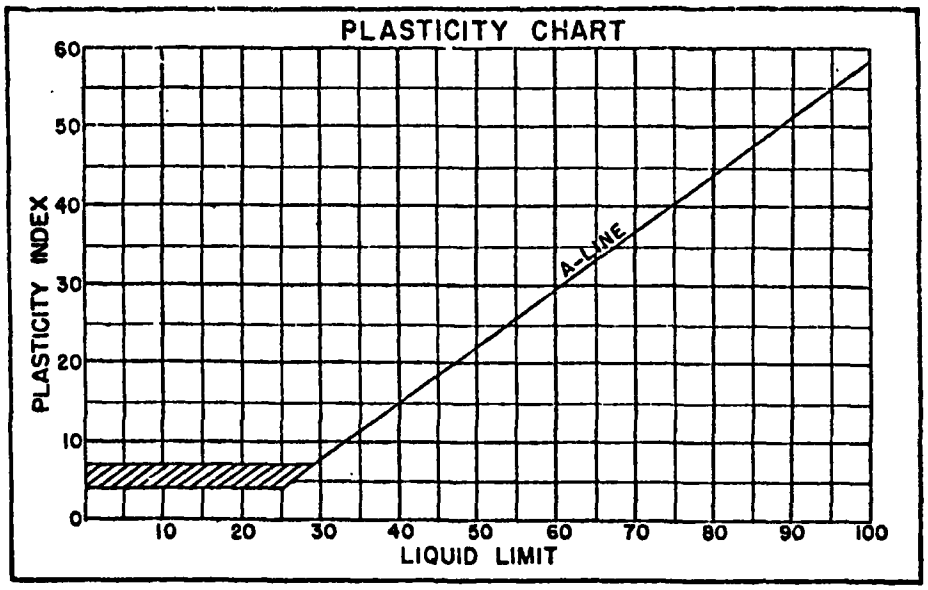
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4242-7 JOB NO. Hof. HOLE NO. B-10
DATE 5-10-83 OPERATOR BL

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

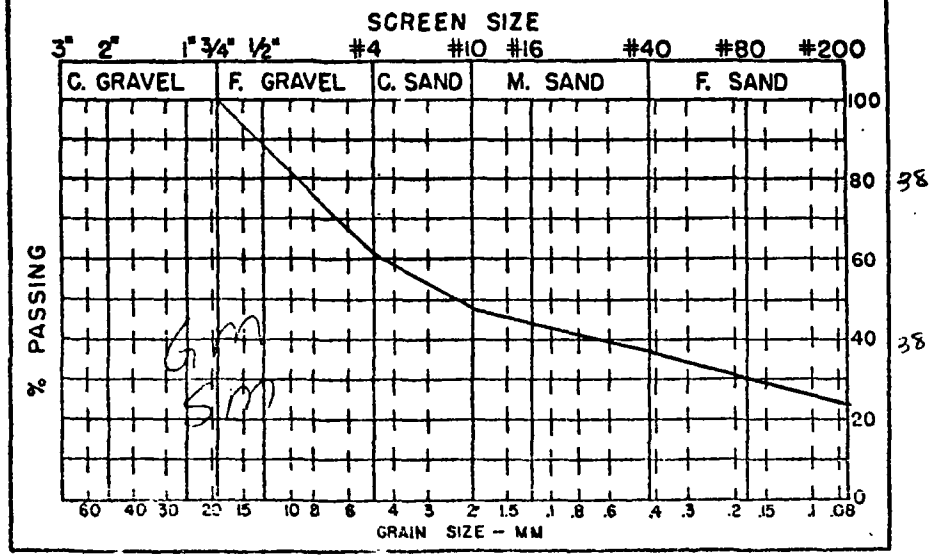
DESCRIPTION: M. Brn.-orange, V. Sty.
F-C SAND & F. GRAVEL
w/ Pocket of sty. white mtr. ?



W= 26.4 D= 22.77 H_{2O}= 16%

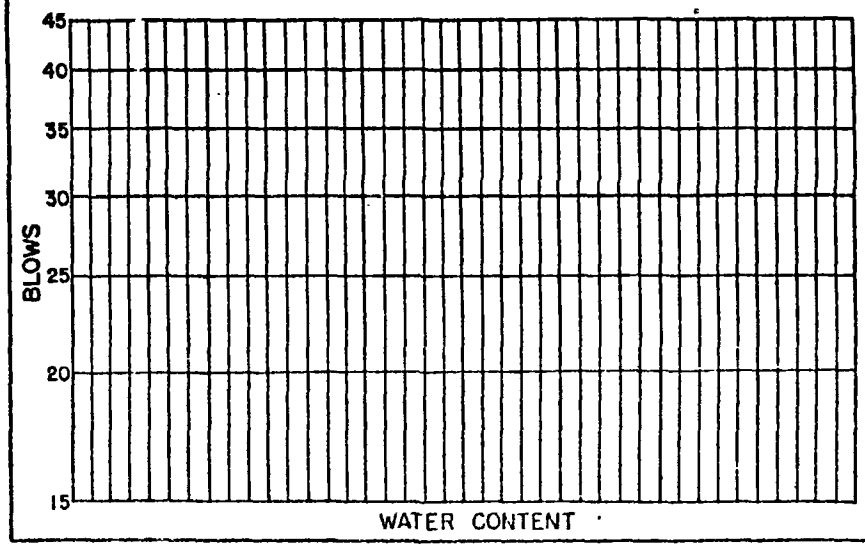
SIEVE ANALYSIS			% Passing 138.00		
			-40	19.82	37
-¾	52.04	100	-80		
-4	18.91	62	-140		
-10	15.70	48	-200	31.53	23%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



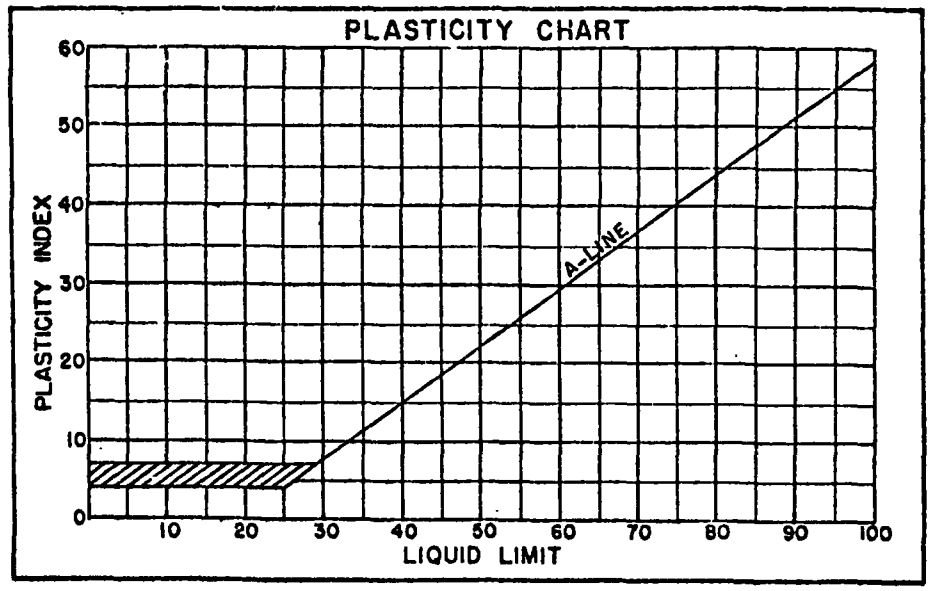
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4272-8 JOB NO. Hog HOLE NO. B-10
DATE 5-10-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

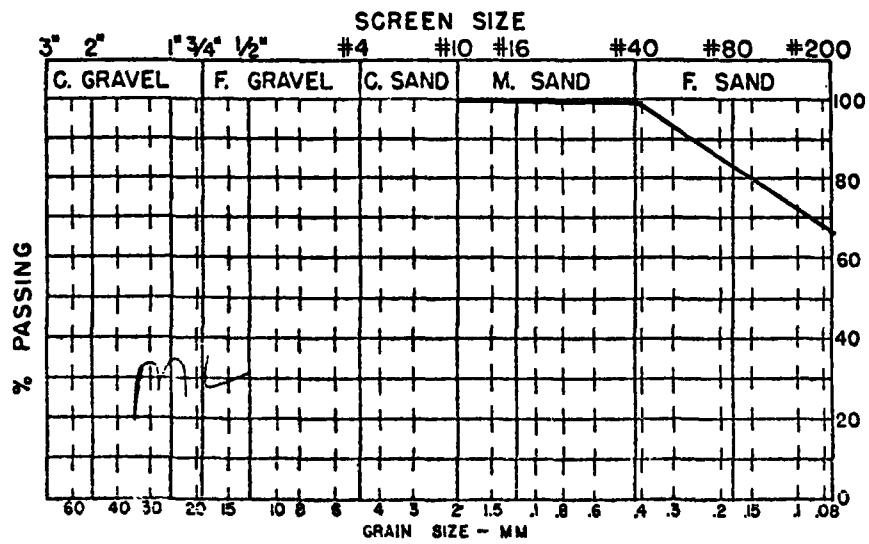
DESCRIPTION: VISUAL = Dry. % = Wet, Brn.
F. Sdy SILT



W = 25.28 D = 18.10 H_{2O} = 40%

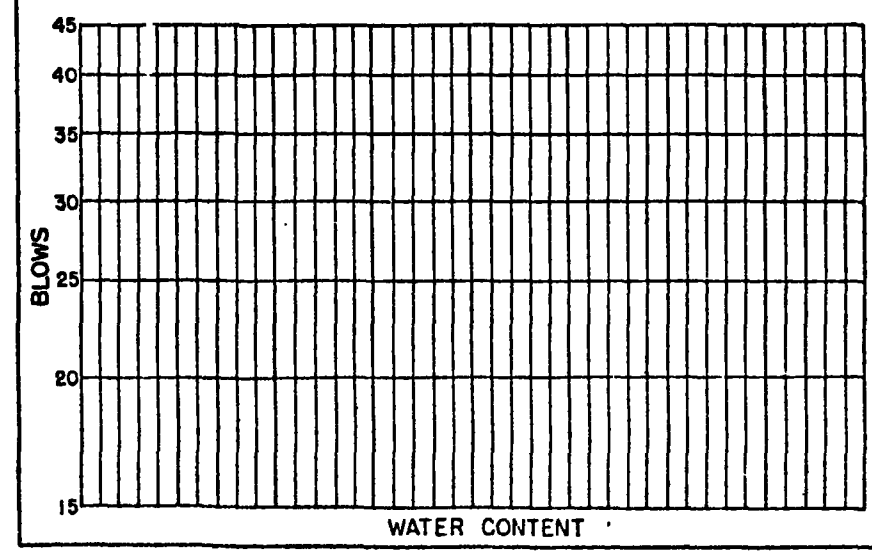
SIEVE ANALYSIS		% Passing 58.3
	-40 / 9.18	99
-3/4	-80	
-4	-140	
-10 .10 100	-200 39.02	67%

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



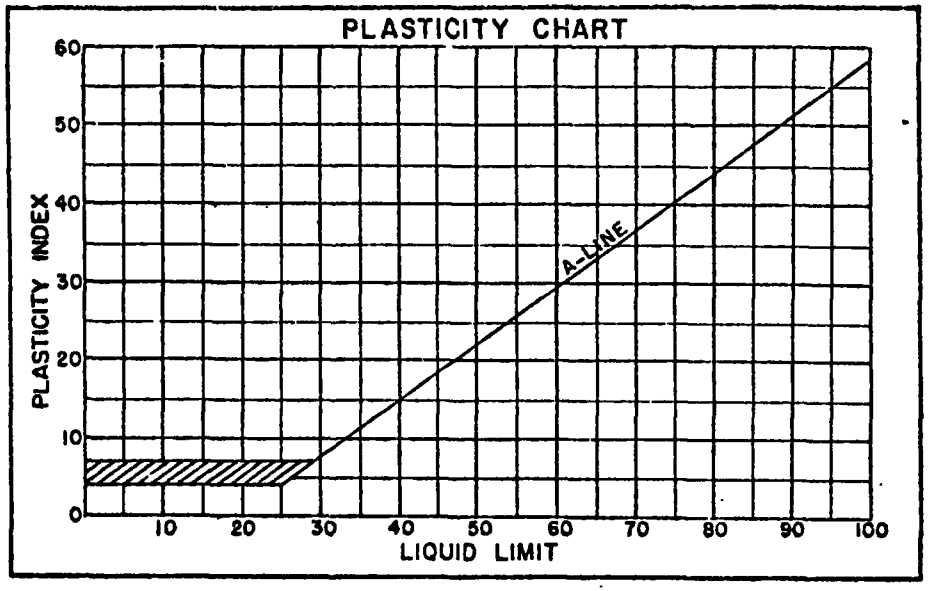
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4272-9 JOB NO. Hg HOLE NO. B-10
DATE 5-10-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

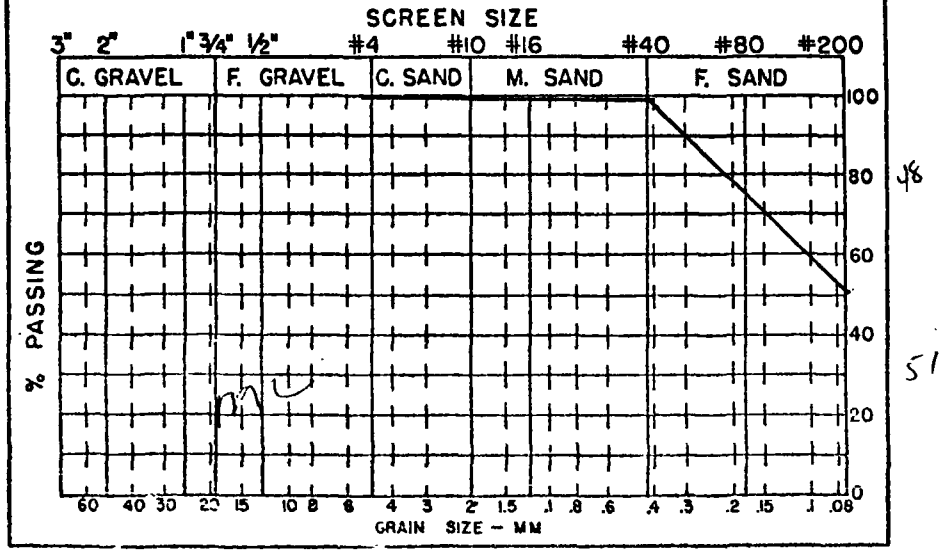
DESCRIPTION: Wet, Brn. F. Sdy. Silt w/t. Mold



W = 37.0 D = 26.22 H_2O = 41%

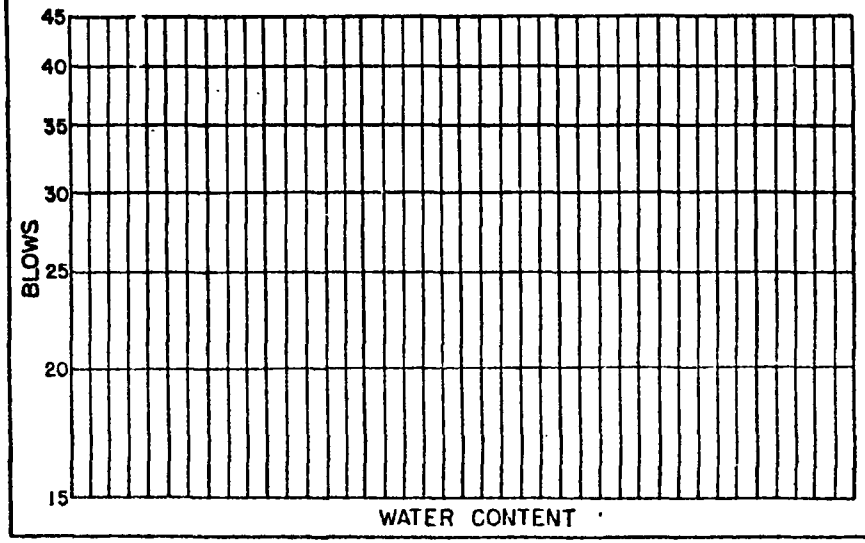
SIEVE ANALYSIS		% Passing 102.75		
		-40	49.2	99
-¾		-80		
-4	.02	100	-140	
-10	1.00	99	-200	52.53	51%

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

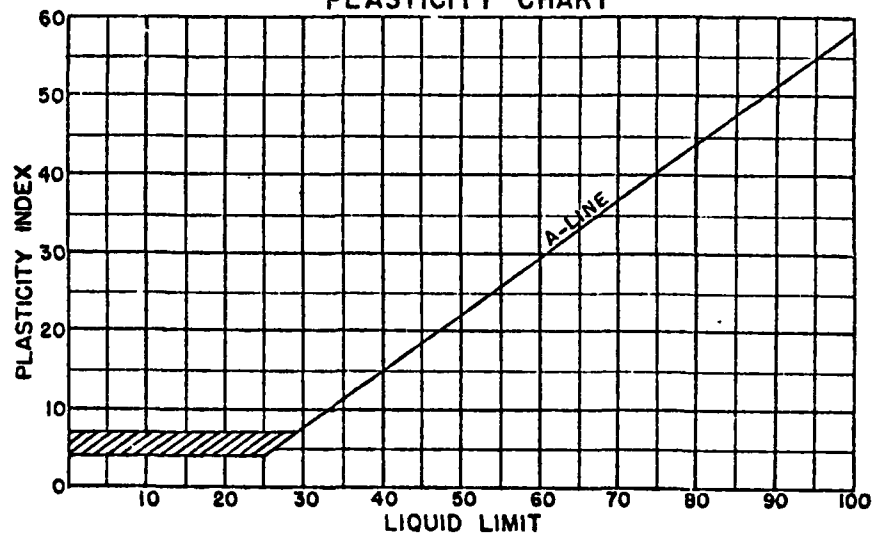
SAMPLE NO. 4272-11 JOB NO. Hog HOLE NO. B-10
DATE 5-6-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: M. dk. Brn. Sty. F-C Sdy. F. & GRAVEL

PLASTICITY CHART

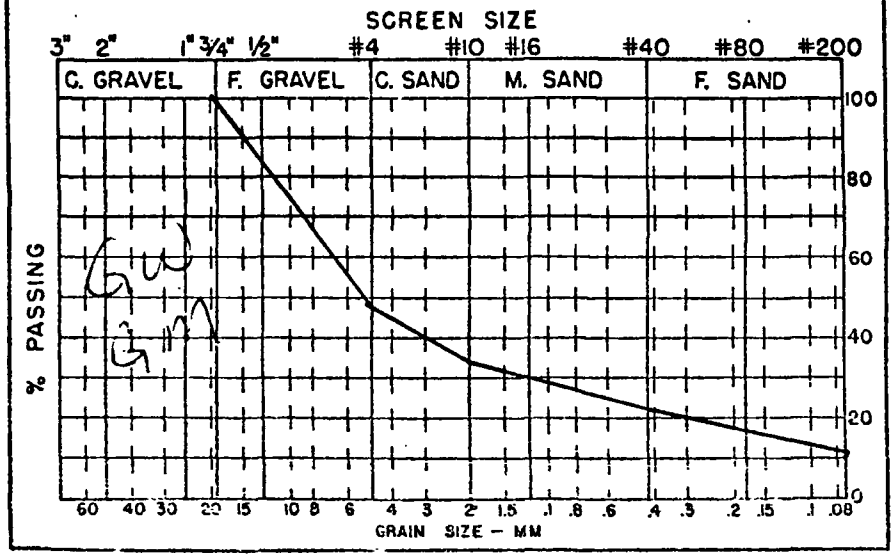


w = 38.6 D = 3.7 H_2O = 11%

SIEVE ANALYSIS % Passing 100.0

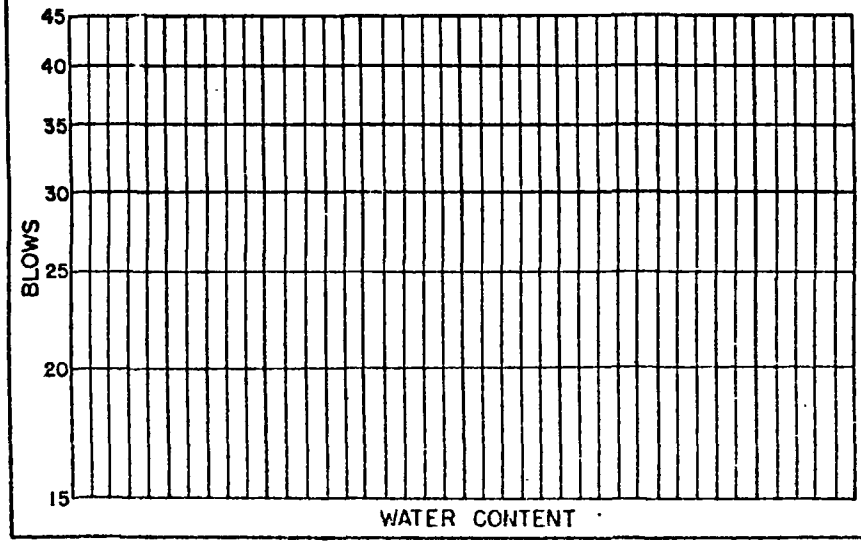
			-40	10.8	22%
-3/4	52.25	100	-80		
-4	14.25	48%	-140		
-10	11.85	34%	-200	10.85	11%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



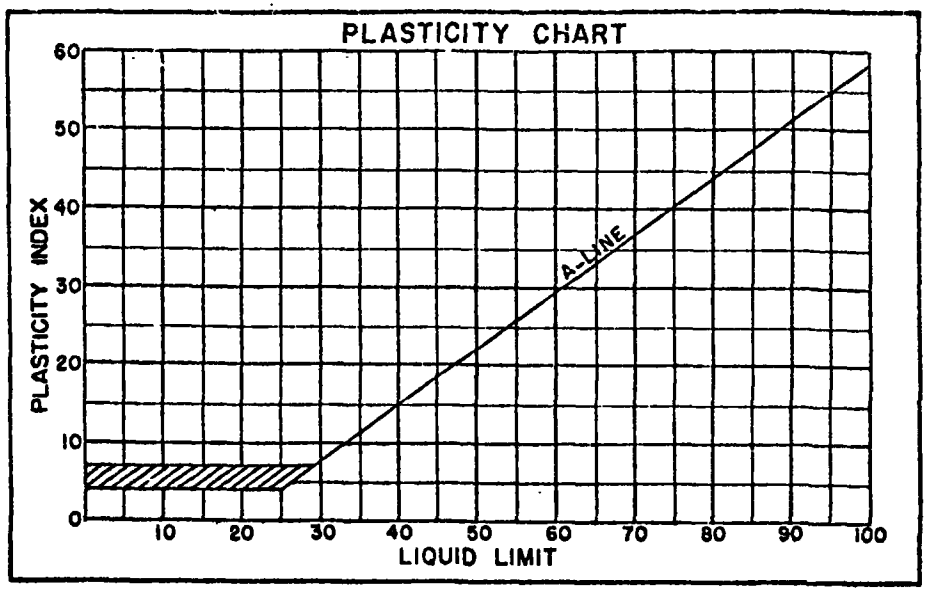
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 427212 JOB NO. Hog. HOLE NO. B-10
DATE 5-10-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Dry, Brn. V.Sty. F.C SAND w/ one 1"(+) & Gravel trace of grvl.

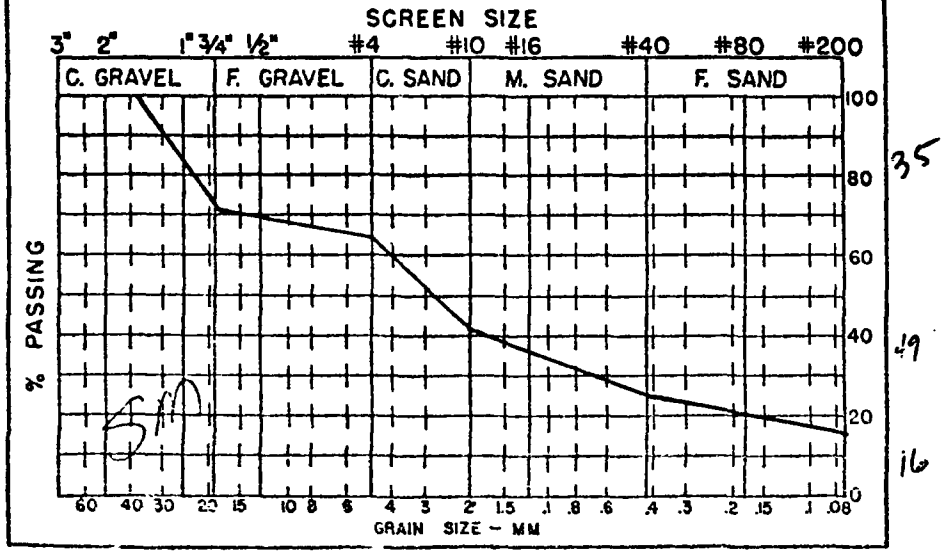


W = 27.01 D = 25.35 H_2O = 7%

SIEVE ANALYSIS % Passing 104.52

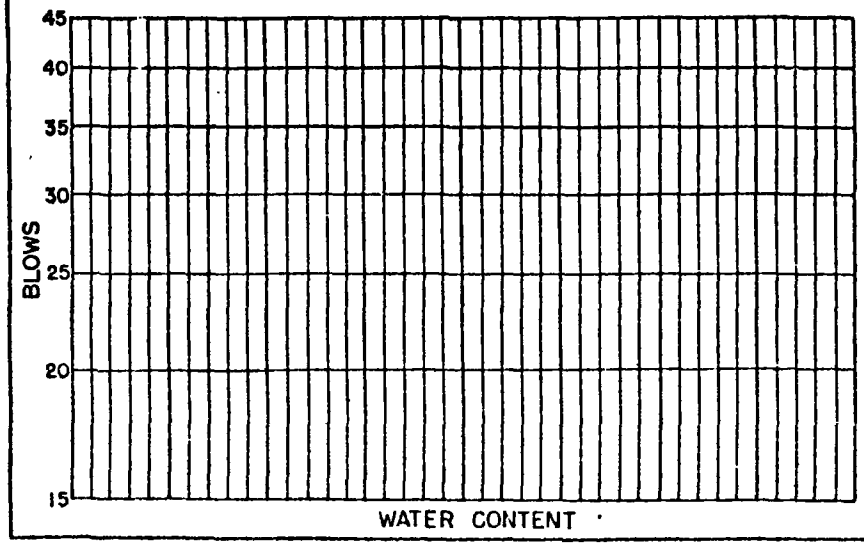
① 1½	29.70	100	-40	10.cf	26%
-¾	6.27	71	-80		
-4	24.15	65%	-140		
-10	17.2	42%	-200	16.76	16%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

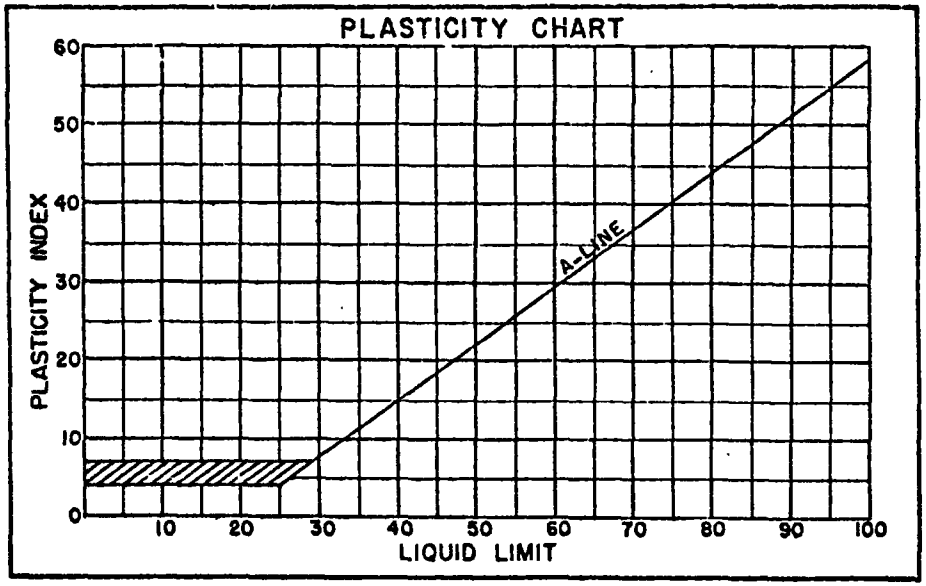
SAMPLE NO. 4272-13 JOB NO. 4108. HOLE NO. B-10
DATE 5-10-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE		✓	
TOUGHNESS	✓	✓	

DESCRIPTION: D, FINE FINE
Weathered Conglomerate

Asked Tom Z.

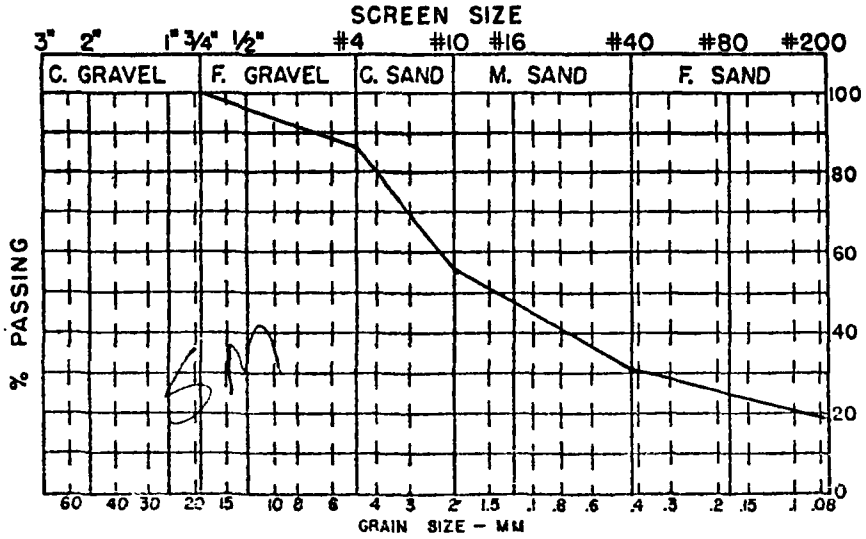


W= 38.9 D= 37.83 H_2O= 12 %

SIEVE ANALYSIS % Passing 96.05

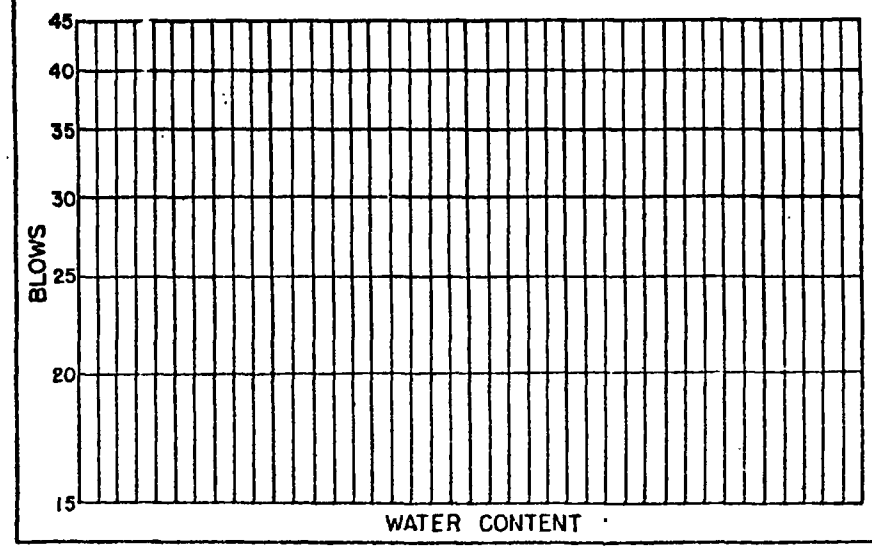
			-40	12.8	31%
-¾	12.72	100	-80		
-4	28.4	87%	-140		
-10	25.11	57%	-200	17.02	18%

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-010

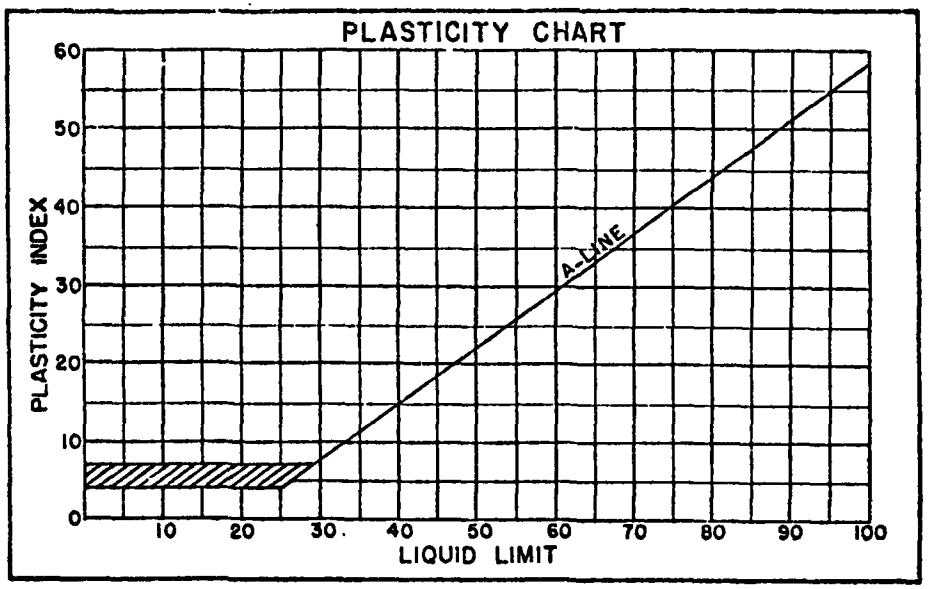
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4272-14 JOB NO. Ho 9. HOLE NO. B-10
DATE 5-6-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE		✓	
TOUGHNESS	✓	✓	

DESCRIPTION: M, Brn., V. Sty.
F-M SAND w/ t. crs. sand
& f. grvly. mtr.

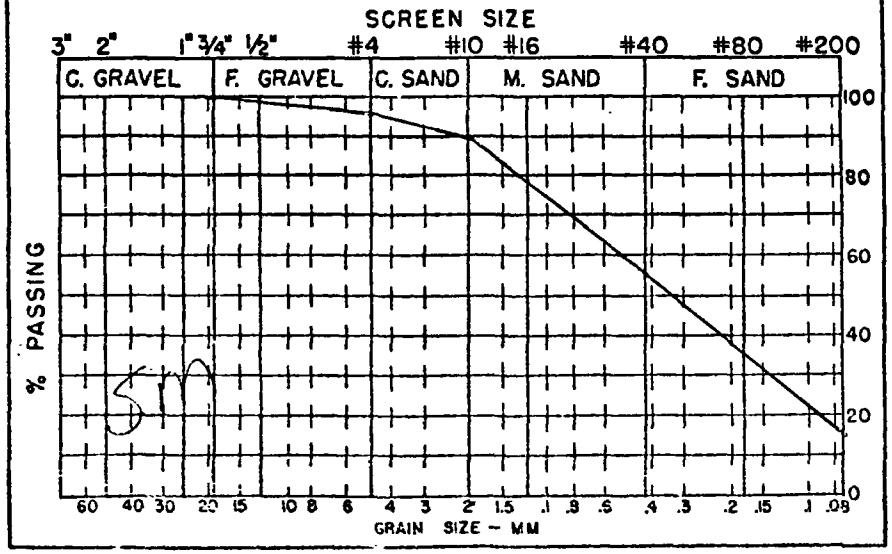


W = 37.60 D = 28.02 H_2O = 23%

SIEVE ANALYSIS % Passing 84.20

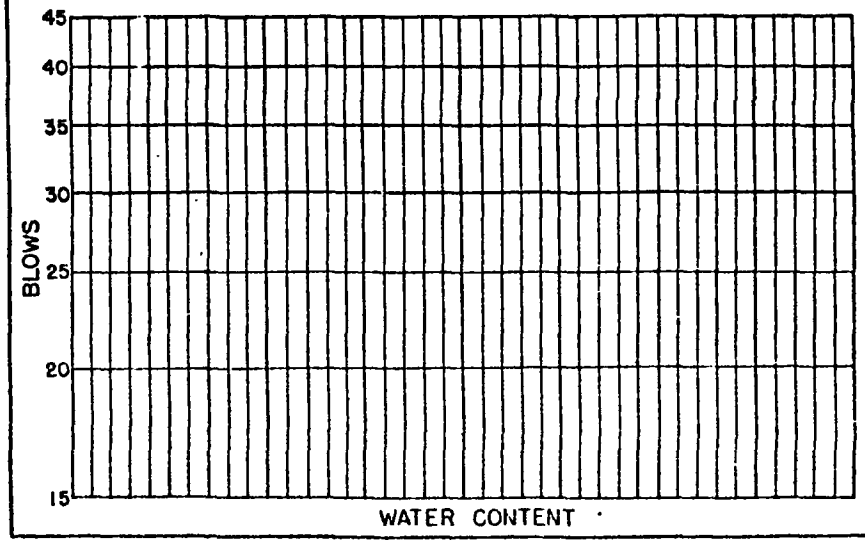
			-40	37.45	56%
-¾	1.95	00	-80		
-4	6.1	97	-140		
-10	28.95	90%	-200	12.75	15%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

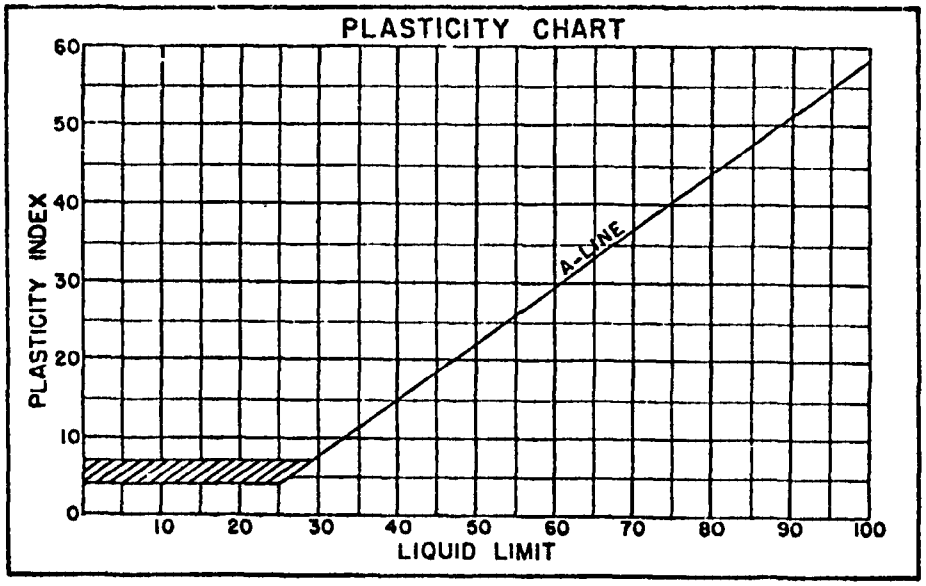
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4304-1 JOB NO. H09. HOLE NO. B10
DATE 5-6-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: D, tan-olive
M. stiff F-C SAND wet
C. gruty.

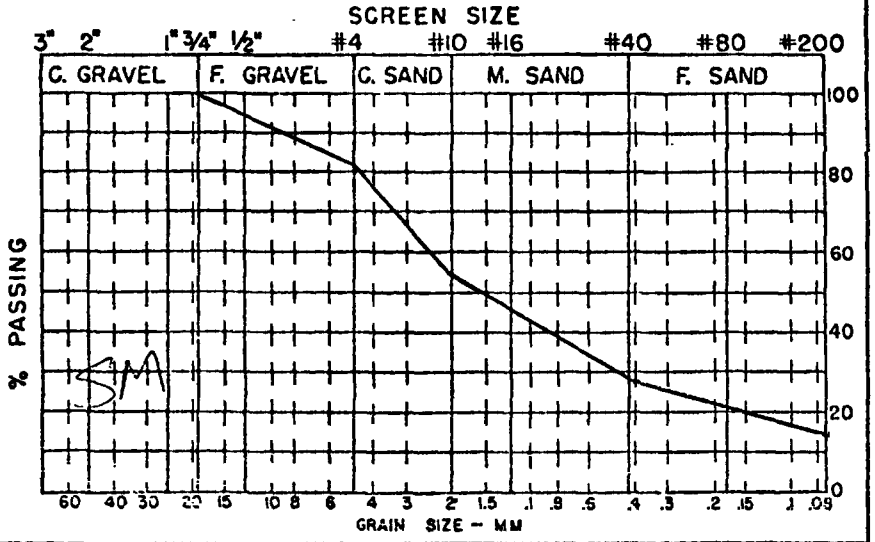


W= 35.32 D= 32.60 H_{2O}= 8%

SIEVE ANALYSIS % Passing 50.33

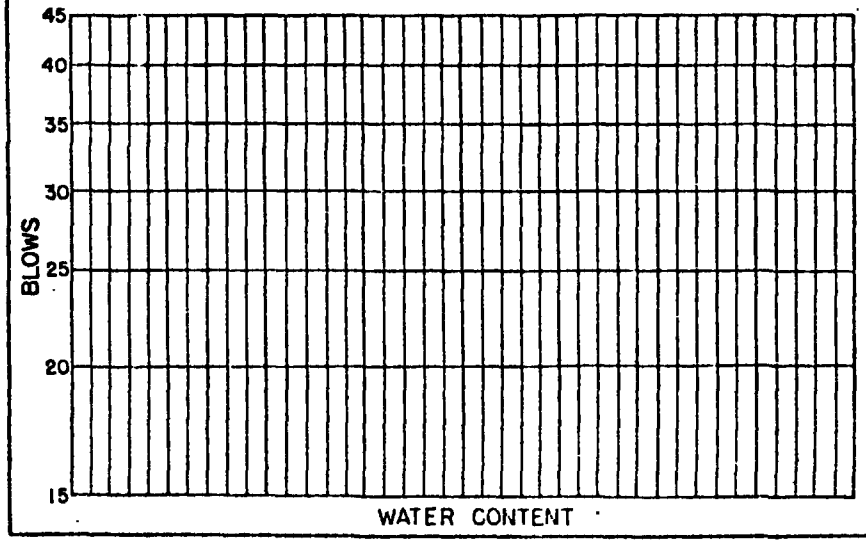
			-40	7.25	28%
-3/4	9.6	100	-80		
-4	13.4	81%	-140		
-10	12.9	54%	-200	7.18	14%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

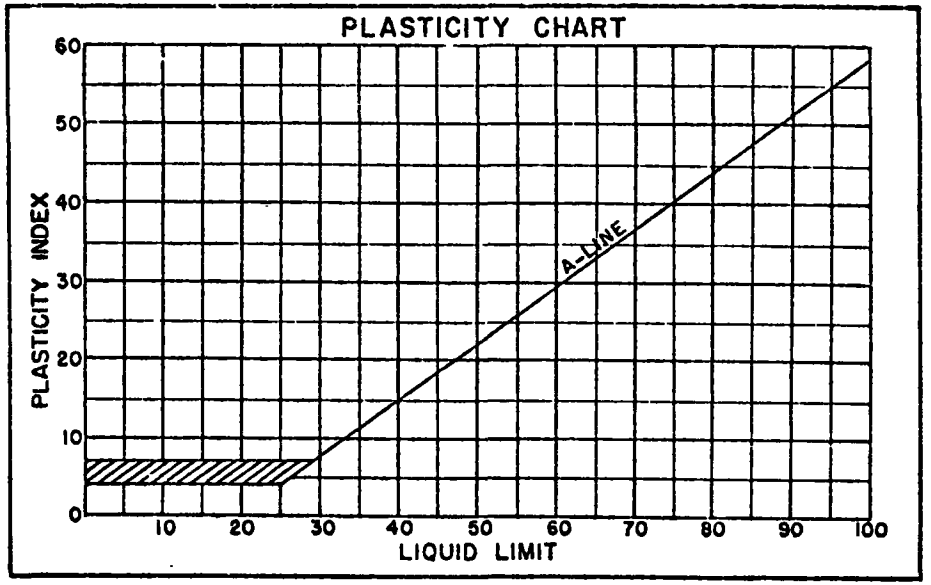
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4272-17 JOB NO. Hog HOLE NO. B.10
DATE 5-6-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: M, Brn. Sl oxid. Sty. F-C Sdy. (":-) & GRAVEL

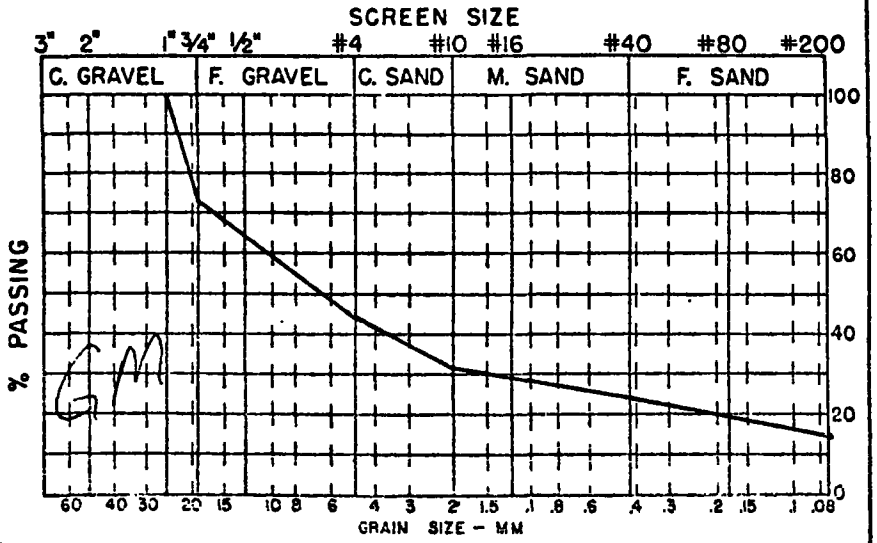


W= 40.73 D= 37.0 H_2O= 10%

SIEVE ANALYSIS % Passing 105.75

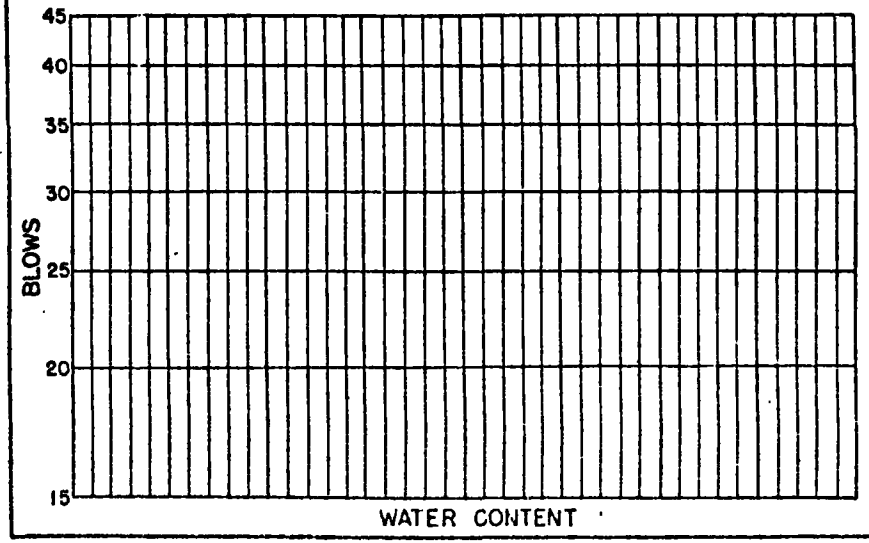
-1	29.5	100	-40	10.7	24%
-3/4	29.4	72%	-80		
-4	13.8	44%	-140		
-10	7.42	31%	-200	4.93	14%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



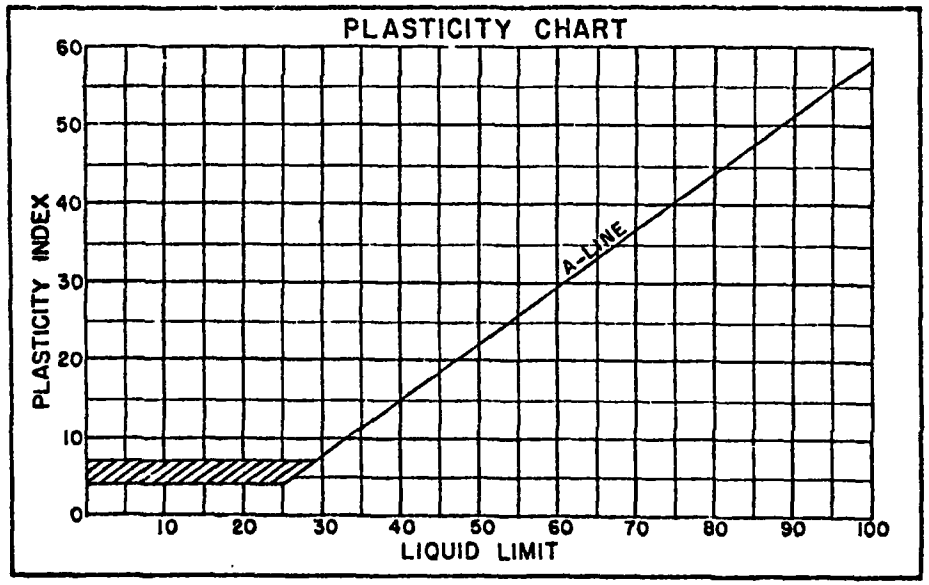
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4272-15 JOB NO. 469. HOLE NO. B-10
DATE 5-6-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: M. olive, brn., grn.
F-C SAND w/ f. gruls. & Trace
white Pewdery Pocketed mtr.

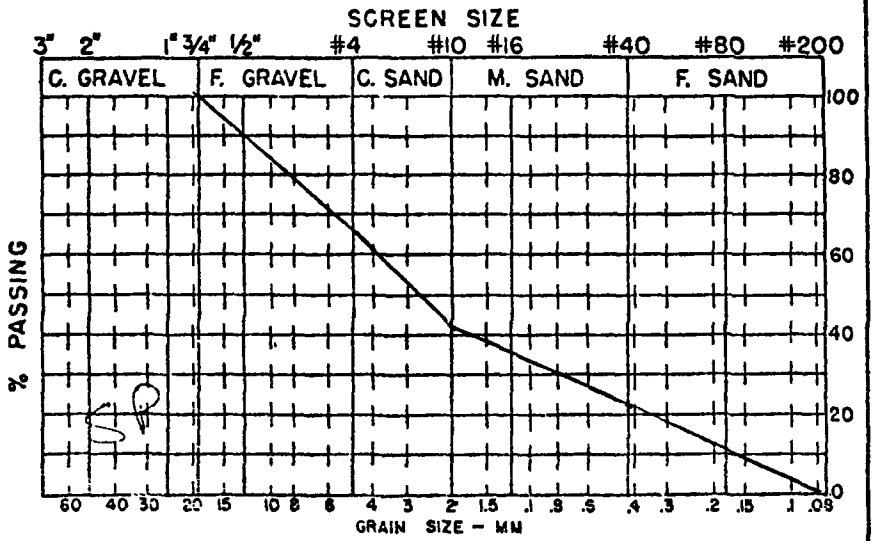


W= 35.93 D= 31.22 H_2O= 15%

SIEVE ANALYSIS % Passing 119.70

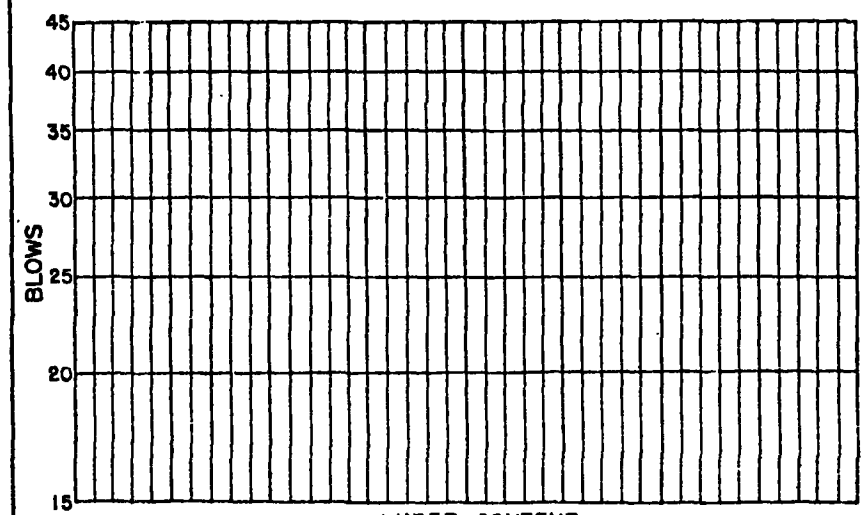
			-40	17.9	22%
-3/4	38.84	100	-80		
-4	29.32	67%	-140		
-10	25.28	43%	-200	8.36	0%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DJT FORM 351-019

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place .....

Date 3-3-84

Dear Sir: Moisture ONLY

I have forwarded by today's ..... the following Foundation Samples.

Contract or Job No. L.7242 Section Hoquiam SR No. ..... Sub-Section .....

Station & Offset 105+25 269'Lt. Hole # B-10

Lab No.	Drive #	Depth	Tube Position in Sampler	CAN NO. ~~Glas.~~	Description
4265-1	1	17'	H_2O=61%	118	WET WT : 41.92
					DRY WT : ~~29.40~~ 26.08
-2	2	22'	57%	56	43.73
					27.80
-3	3	27'	46%	69	59.12
					40.51
-4	4	32'	52%	54	63.30
					41.55
-5	5	37'	37%	60	72.95
					53.33
-6	6	47'	22%	78	68.32
					55.82
-7	7	52'	69%	39	49.78
					29.46

1 copy with samples
1 copy to addressee

Yours very truly,

.....
Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place .....

Date 3-7-83

Dear Sir:

I have forwarded by today's ..... the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam By Pass SR No. ..... Sub-Section .....

Station & Offset 105+25 269' Lt. Hole # B-10

Lab No.	CAN No. ~~Drive #~~	Depth	Tube Position in Sampler	Clas.	Description
-1					Wet WT: 46.68
4273	112	57'	H_2O=58%		DRY WT: 29.62
					64.66
-2	73	62'	52%		42.61
					83.60
-3	74	71'6"	12%		74.62
					70.07
-4	70	77'	17%		59.92
					47.41
-6	113	91'6"	43%		33.14
					72.95
4305	32	167'	36%		53.72

1 copy with samples
1 copy to addressee

Yours very truly,

.....
Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

TERIALS ENGINEER
erials Laboratory
). Box 167, Olympia, WA 98504 (Mailing Address)
; So. 2nd Ave.
iwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 8-25-82

RUN "UU" with Pore Pressure

Dear Sir:

I have forwarded by today's State Car the following Foundation Samples.

Contract or Job No. L-7262 Section West Hoquiam bypass SR No. 101A Sub-Section line Hole

Station & Offset 144+50 6' Lt. Hole # C-1

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3419-1	S-1	0' 0"	H_2O=40%	MH	Wet, ORANGE-TAN, Cly.
-		2' 0"			F. Sdy. SILT.
-2	S-2	3' 0"	H_2O=53%	MH	Wet, tan - Rust-Stained
		5' 0"			Cly. F. Sdy. SILT.
3420	D-3	5' 0"		SM	Like 3172 Wet, tan, Cly. V. Sty. F. SAND
		7' 0"			w/ Rust & org. ODOR (T. BLK. org MATC)
3421	U-4	8' 0"	A		
		8' 4"			
3422	D-5	10' 0"	H_2O=43%	SM	Like 3182 Wet, Gr., Tan, Cly., V. Sty.
		12' 0"			F. SAND. w/o ORG. & Grav.
3423-1	U-6	13' 4"	1000 PSF (B) "UU"	MH	Gray, wet, fine sandy, clayey silt
		13' 8"			
-2		13' 8"	C		
		14' 0"			
-3		14' 0"	D		
		14' 4"			
3424	D-7	15' 0"	43%	SM	~~Like 3182~~ Like 3422 Above.
		17' 0"			

opy with samples
opy to addressee

Yours very truly,
Milford Sanders
Inspector.

DT FORM 351-002
REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

ATERIALS ENGINEER
terials Laboratory
O. Box 167, Olympia, WA 98504 (Mailing Address)
55 So. 2nd Ave.
mwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 8-25-82

Dear Sir:

I have forwarded by today's state car the following Foundation Samples.

Contract or Job No. L-7262 Section west Hoquiam bypass
SR No. 101A Sub-Section line hole

Station & Offset 144+50 6' LT Hole # C-1

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3425 -1	U-8	18'0" 18'4"	A	MH	Wet, blue-gray, clayey, F-Sdy Silt
-2		18'4" 18'8"	B		
-3		18'8" 19'0"	C		
3426	D-9	20'0" 22'0"	H_2O=86%	MH	Moist, TAN, GR., Olive Green Cly., SILT NOTE: mtrl was wet-like during mulling
3427 -1	U-10	23'0" 23'4"	A		
-2		23'4" 23'8"	B		
-3		23'8" 24'0"	C		
3428	D-11	25'0" 27'0"	H_2O=60%	SM	Like 3180 No Layers & org but. T. rust & F. SAND Layers Moist, Brn-GR V. Sty. F. SAND.

py with samples
py to addressee

Yours very truly,
Milford Sanders
Inspector.

FORM 351-002

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

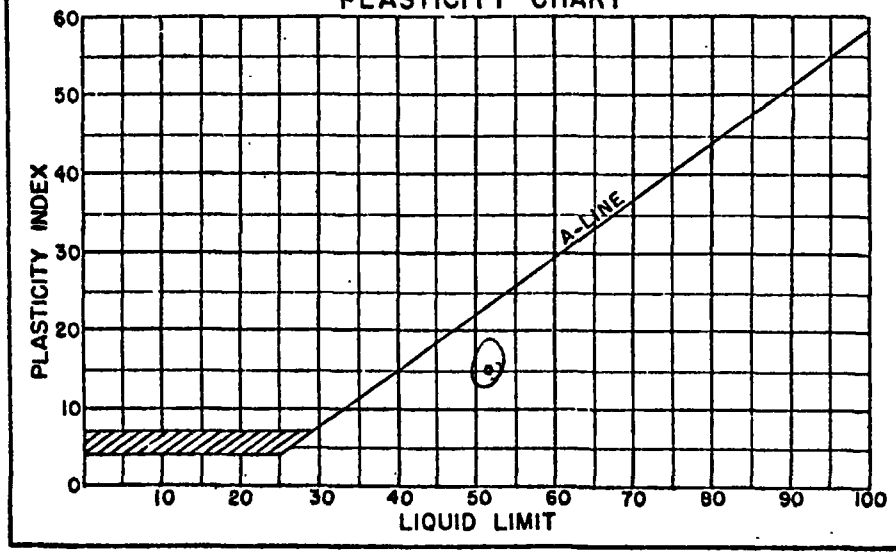
SAMPLE NO. 3419-1 JOB NO. 44-9 HOLE NO. 1
DATE 9-7-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			✓

DESCRIPTION: Wet, orange-tan Cly. F. Sdy. SILT

PLASTICITY CHART

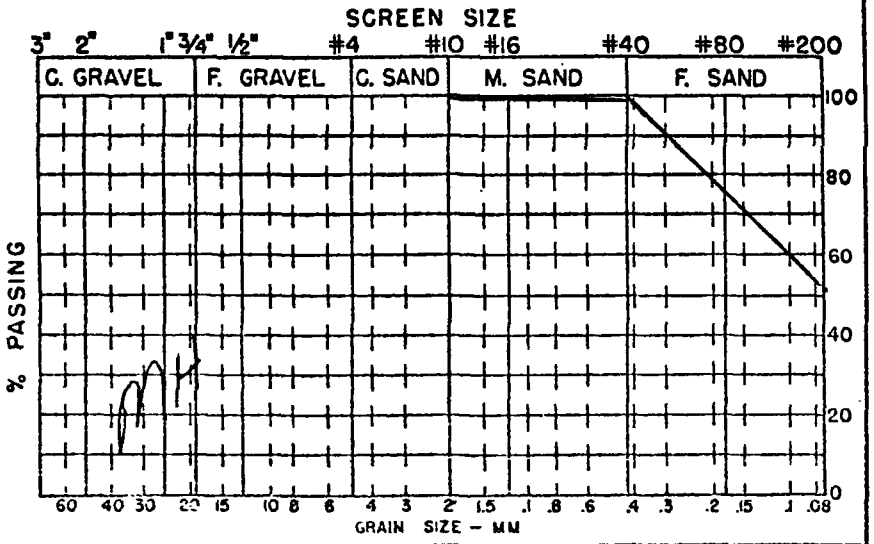


$H_2O = 40\%$

SIEVE ANALYSIS % Passing 82.02

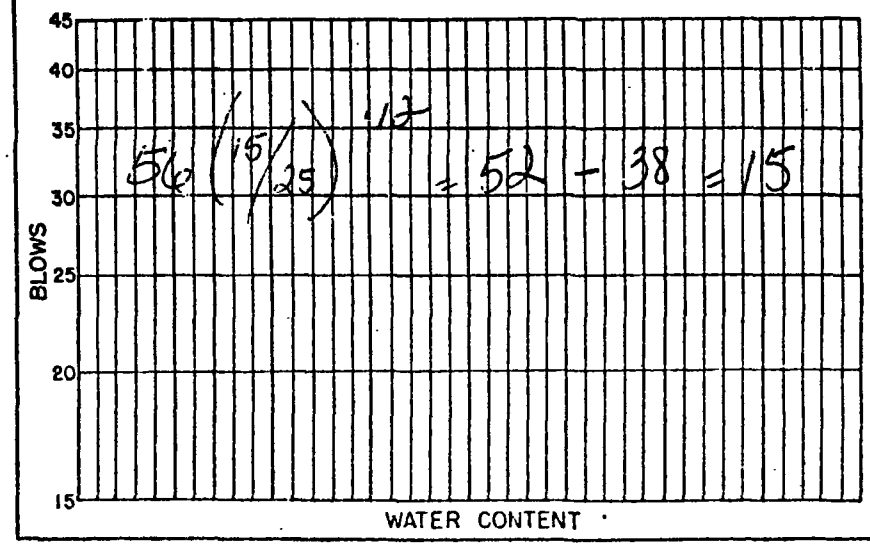
		-40	39.39	99.8
-3/4		-80		
-4		-140		
-10	.10	100% -200	42.53	52%

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	48				116
Wet Wt.	11.08				9.10
Dry Wt.	7.09				6.58
% H_2O	56%				PL= 38%
Blows	15				PI= 15



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

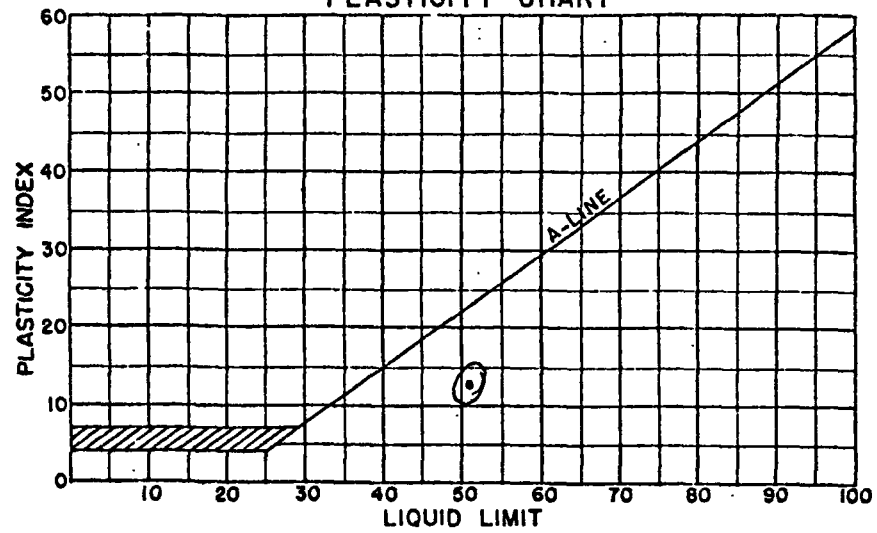
SAMPLE NO. 3419-2 JOB NO. 460. (Shelby) HOLE NO. C-1
DATE 9-7-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			✓

DESCRIPTION: Wet, tan - Rust-stained Cly. F. Sdy. SILT

PLASTICITY CHART

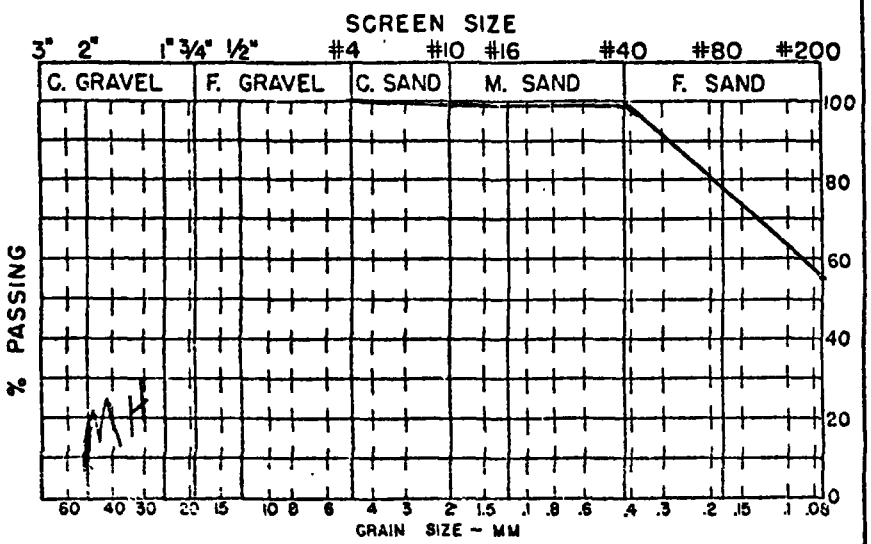


H_2O = 53 %

SIEVE ANALYSIS % Passing 73.40

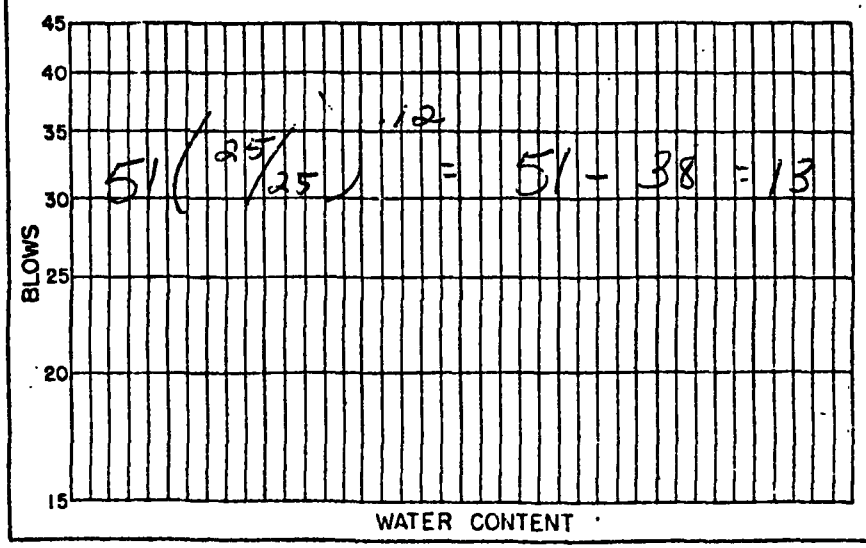
			-40	31.70	99%
-3/4			-80		
-4	.30	100%	-140		
-10	.55	99.5%	-200	40.85	56%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	71				44
Wet Wt.	12.60				9.68
Dry Wt.	8.35				7.01
% H_2O	51%				PL= 38%
Blows	25				PI= 13



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

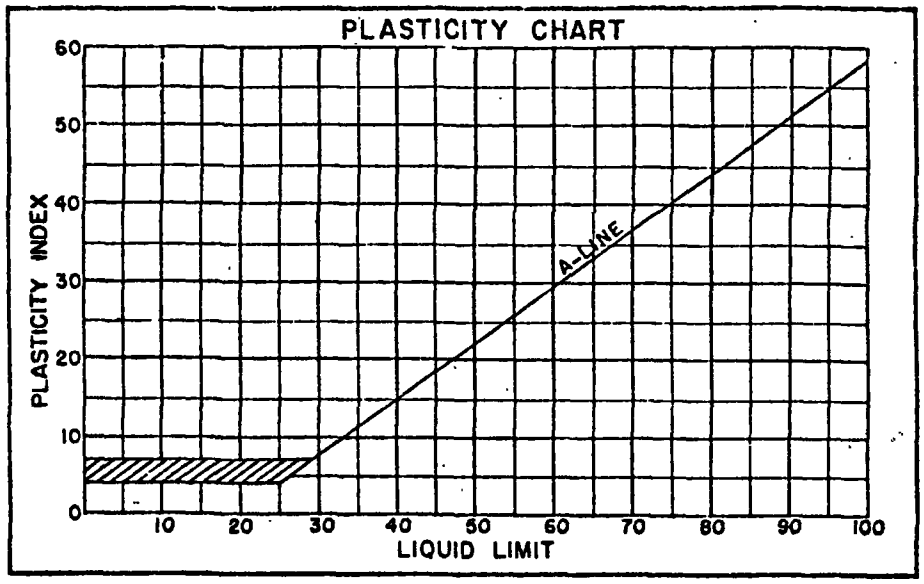
SAMPLE NO. 3426 JOB NO. Hog. HOLE NO. C-1
DATE 2.28.83 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			✓
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: M, tan, Gr., olive grn. Cly. SILT

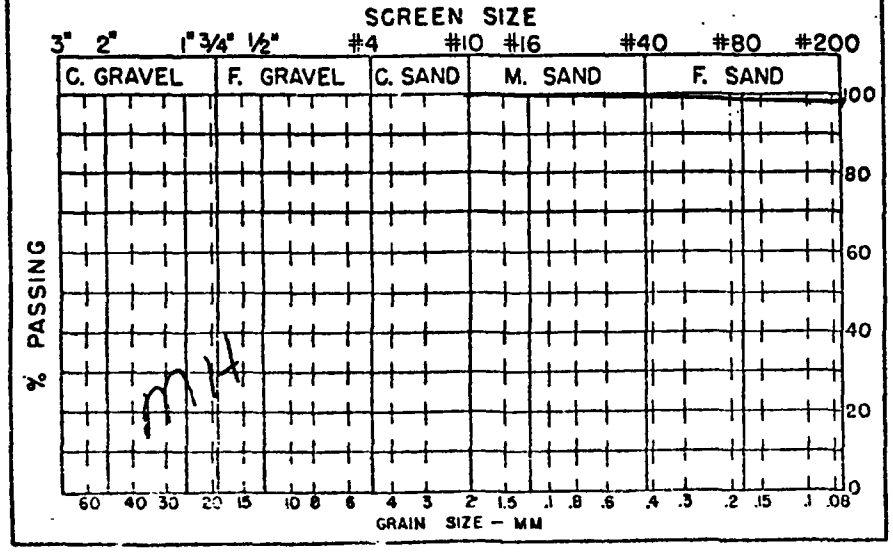
NOTE: Mtrl was wet-like during mulling.



$H_2O = 86\%$

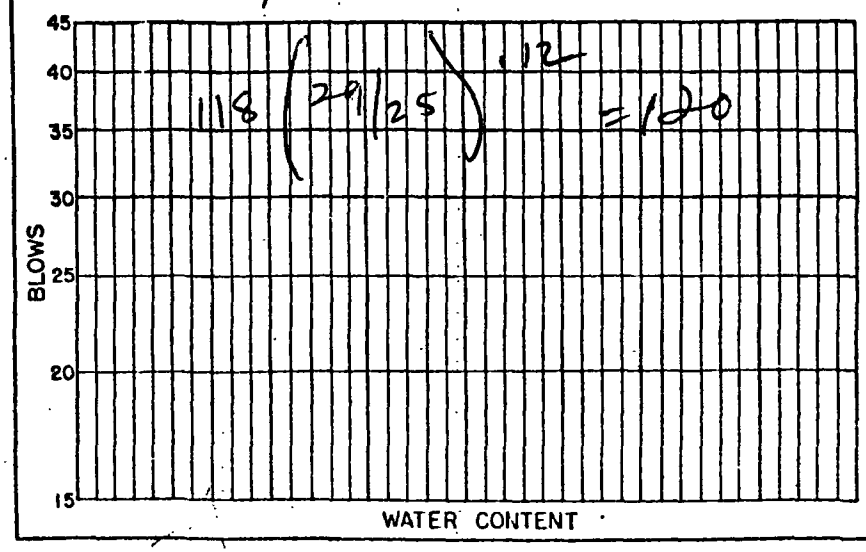
SIEVE ANALYSIS		% Passing 17.70		
		-40	.18	99%
-3/4		-80		
-4		-140		
-10	.01	100%	-200 17.51	98.9

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	67				73
Wet Wt.					2
Dry Wt.	5.93				3.14
% H_2O	118%				PL= 50
Blows	29				PI= 70



NDT FORM 351-019

TRIAXIAL COMPRESSION TEST (With Area Changes and Pore Pressures)

Project West Hoquiam Bypass Location 144+50 6' Lt
Job No. L7262 Sample No. 3423-1 Boring No. C-1 Depth 13'-4" to 13'-8"
Area (Ao) 2.92 Length 4" Confining Pressure 1000 PSF = 6.9 PSI
Rate of Loading .03"/min L. R. C. .825 Tested by R Brooks Date 9 May 53

Description Wet grey F sdy cly SILT

GROSS WT.	TARE	NET WT.	CAN NO.	WET WT.	DRY WT.	WT. H^2O	% H^2O	WET DENS.	DRY DENS.
		360	53	87.65	58.2	29.45	51	118.44	78.44

Data for Mohr's Envelope:
Max. Deviator Stress
Principal Stress
Effective Principal Stress

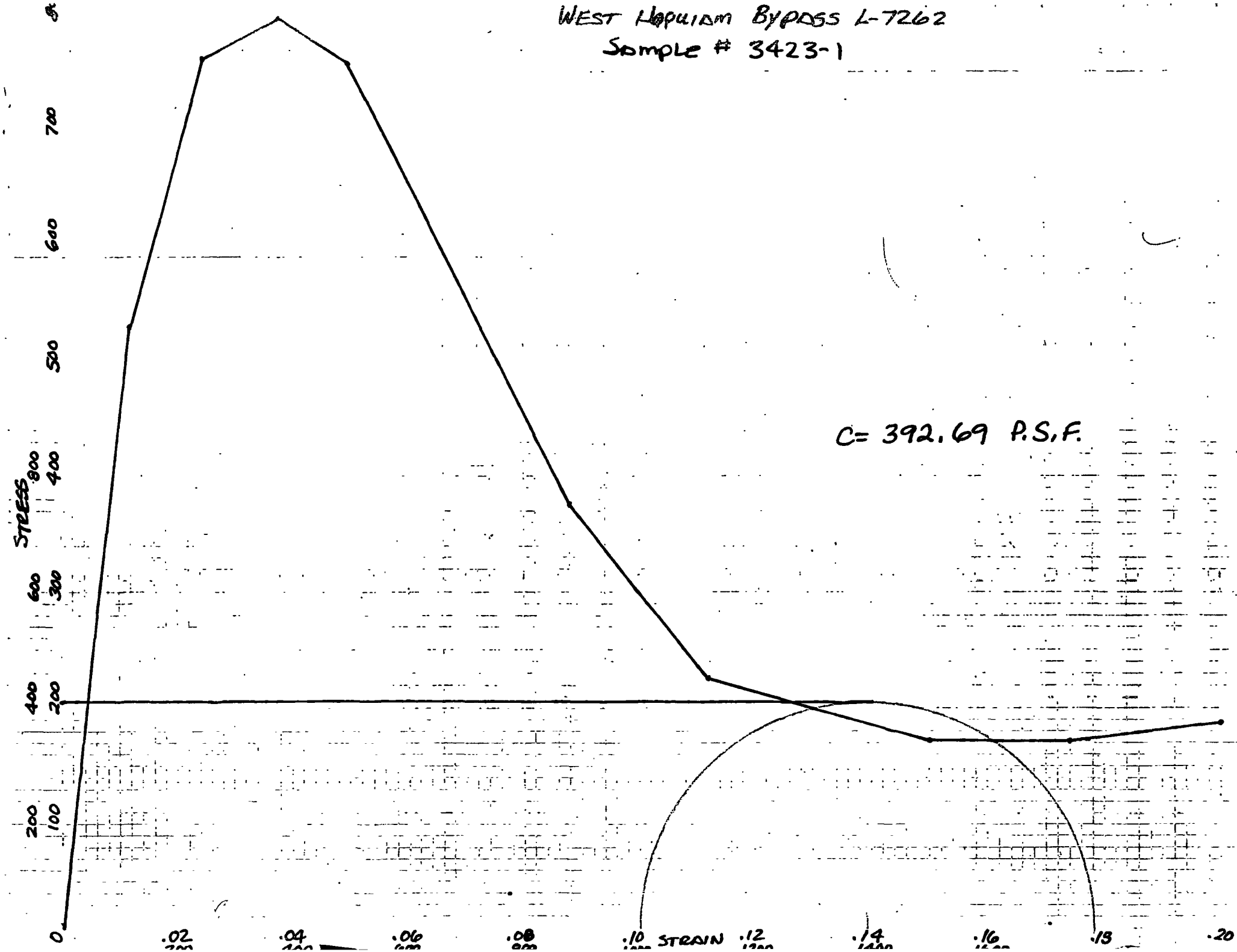
Failure

Back Press.
Saturation 98

ELASPED TIME (Hr.) (Min.)	LOAD DIAL READ (X 10^{-4})	DEFORM. DIAL READ	ΔL (COL. 3 x 10^{-3})	E. UNIT STRAIN (ΔL/L)	AREA C.F. (1 − E)	CORRECT. AREA A' ($\frac{A^0}{1-E}$)	PORE PRESS.	DEV. LOAD (Col. 2 X LRC)	DEV. STRESS (Col. 9 ÷ Col. 7)	PRINC. STRESS (Col 10 + conf. press.)
1	2	3	4	5	6	7	8	9	PSF 10	11
.75	14	20		.005	.995	2.93	6.68	4.55	223.62	
2	33	50		.012	.988	2.96	6.78	10.72	521.51	
3.5	48	100		.025	.975	2.99	6.78	15.60	751.30	
5	51	150		.038	.962	3.04	6.70	16.58	785.37	—
7	49	200		.050	.950	3.07	6.78	15.92	746.74	
8.5	42	250		.062	.938	3.11	6.83	13.65	632.02	
10	33	300		.075	.925	3.16	6.68	10.72	488.51	
11.5	25	350		.088	.912	3.20	6.67	8.12	365.40	
13	20	400		.100	.900	3.24	6.64	6.50	288.89	
15	15	450		.112	.888	3.29	6.64	4.88	213.59	
16.5	14	500		.125	.875	3.34	6.64	4.55	196.17	
18	13	550		.138	.862	3.39	6.82	4.22	179.26	
19.75	12	600		.150	.850	3.44	6.72	3.90	163.26	
23	12	700		.175	.825	3.54	6.60	3.90	158.64	
26.5	14	.800"		.200	.800	3.65	6.60	4.55	179.51	

DOT FORM 351-018 REVISED 4/00 0.03"/min ≈ 0.6%/min

WEST HAPUIDM BYPASS L-7262
Sample # 3423-1



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

TRIAX

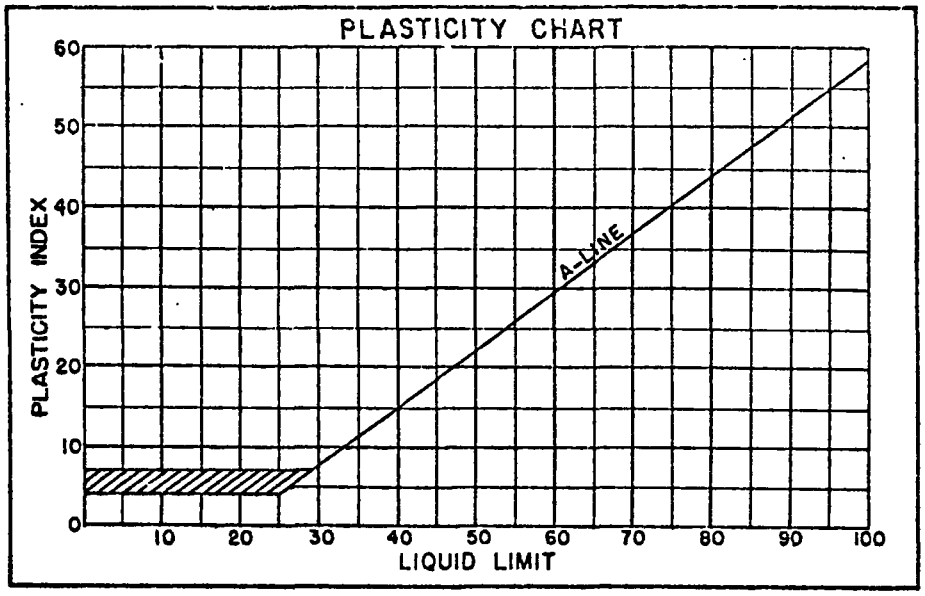
SAMPLE NO. 3423-1 JOB NO. HCQ HOLE NO.

DATE 19 MAY 83 OPERATOR RB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	✓
DRIED CAST	✓	✓	✓
DILATANCY			
BITE			
TOUGHNESS	✓	✓	✓

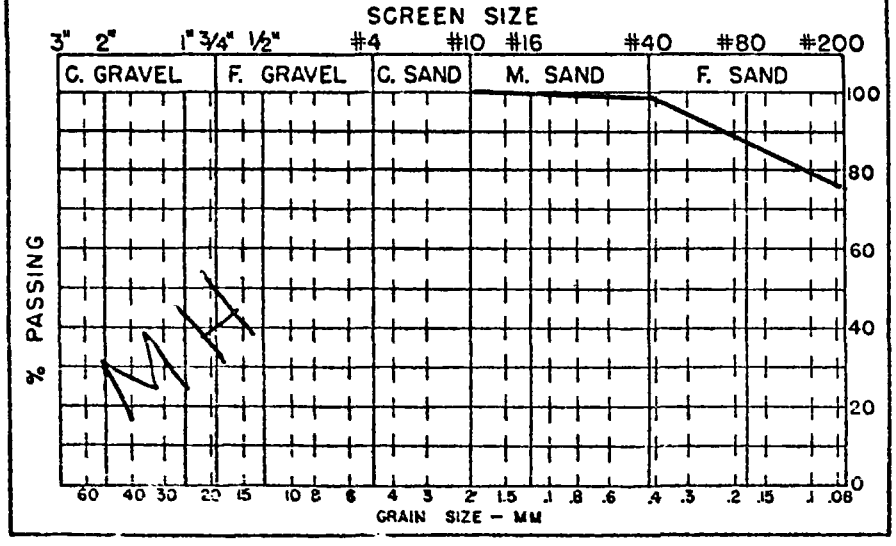
DESCRIPTION: Wet grey F sdy cly SILT



$H_2O = 51$

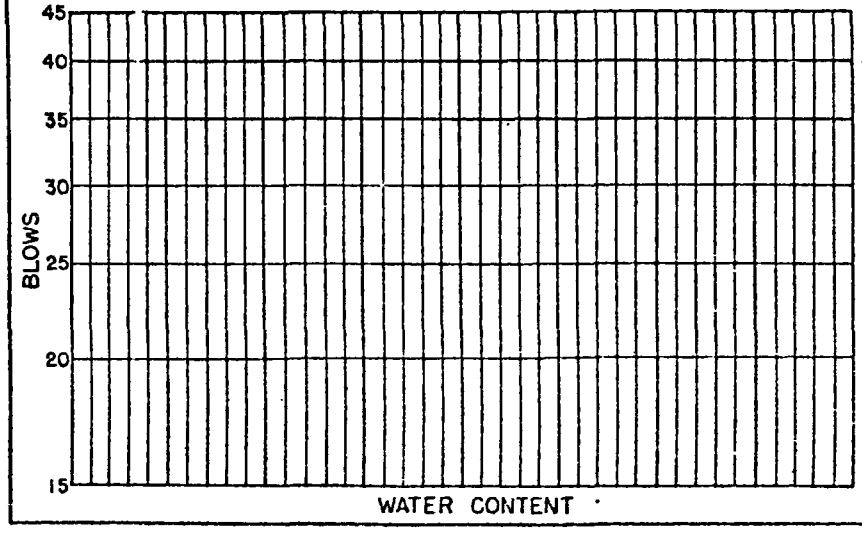
SIEVE ANALYSIS	% Passing 94.48		
		-40 23.7	99
-3/4		-80	
-4		-140	
-10 .1	100	-200 70.68	75

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

TRIAXIAL COMPRESSION TEST (With Area Changes and Pore Pressures)

Project West Hoquiam Bypass Location 144+50 6' Lt
Job No. 27262 Sample No. 3425-1 Boring No. C-1 Depth 18'-0" to 18'-4"
Area (Ao) 2.92 Length 4" Confining Pressure 1000 PSF = 6.9 PSI
Rate of Loading .05"/min L. R. C. .92 Tested by R Brooks Date 9 May 83

Description Wet Bluish grey F sdy clayey SILT (MH)

GROSS WT.	TARE	NET WT.	CAN NO.	WET WT.	DRY WT.	WT. H^2O	% H^2O	WET DENS.	DRY DENS.
435	142	293	47	34.1	18.75	15.35	82	96.40	52.96

Data for Mohr's Envelope:
Max. Deviator Stress
Principal Stress
Effective Principal Stress

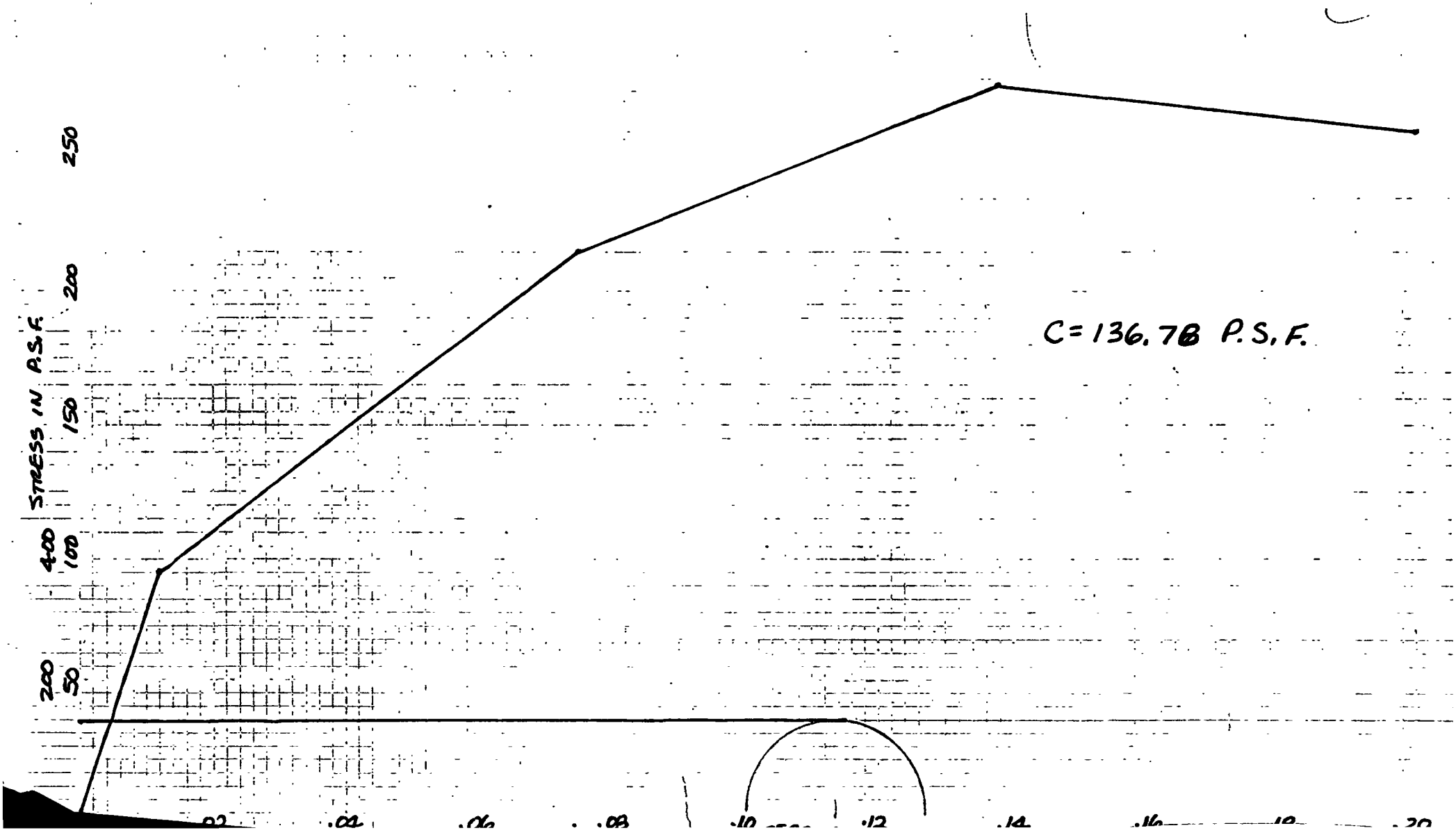
Failure

Back Press.
Saturation 98

ELASPED TIME (Hr.) (Min.)	LOAD DIAL READ (X 10^{-4})	DEFORM. DIAL READ	Δ L (COL. 3 x 10^{-3})	E. UNIT STRAIN ($\Delta L/L$)	AREA C.F. (1 − E)	CORRECT. AREA A' ($\frac{A^0}{1-E}$)	PORE PRESS.	DEV. LOAD (Col. 2 X LRC)	DEV. STRESS (Col. 9 ÷ Col. 7)	PRINC. STRESS (Col 10 + conf. press.)
1	2	3	4	5	6	7	8	9	PSF 10	11
1	2	50		.012	.988	2.96	6.75	1.84	89.51	
6	5	300		.075	.925	3.16	6.35	4.60	209.62	
11	7	550		.138	.862	3.39	6.18	6.44	273.56	
16	7	800		.200	.800	3.65	6.24	6.44	254.07	

DOT FORM 351-018 REVISED 4/80

WEST HOQUIAM BYPASS L-7262
Sample # 3425-1



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

P1

SAMPLE NO. 3425-1 JOB NO. Ho Q HOLE NO.

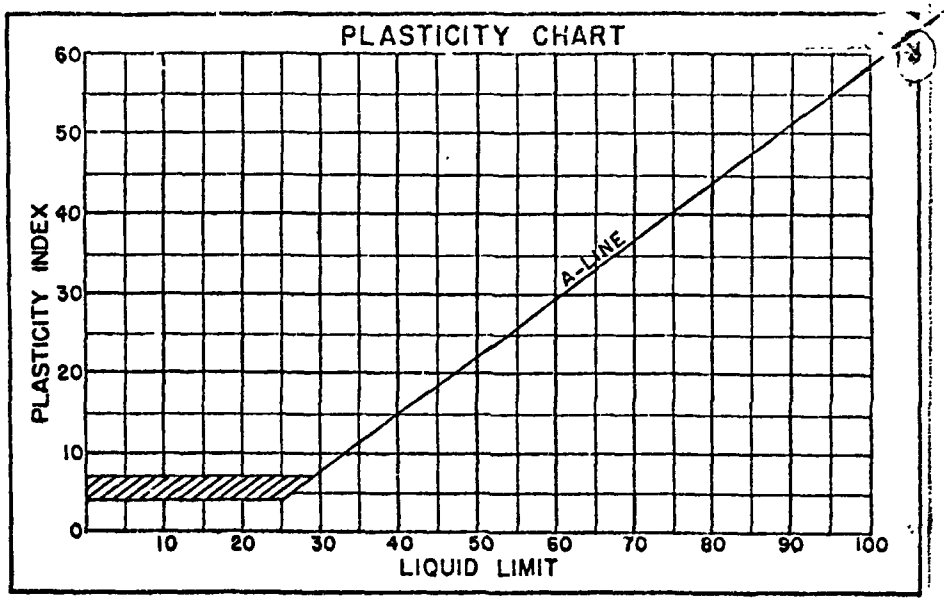
DATE 9 May 83 OPERATOR RB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓		✓
DRIED CAST	✓		✓
DILATANCY			
BITE			
TOUGHNESS	✓		✓

DESCRIPTION: Wet Bluish grey clayey F sdy SILT

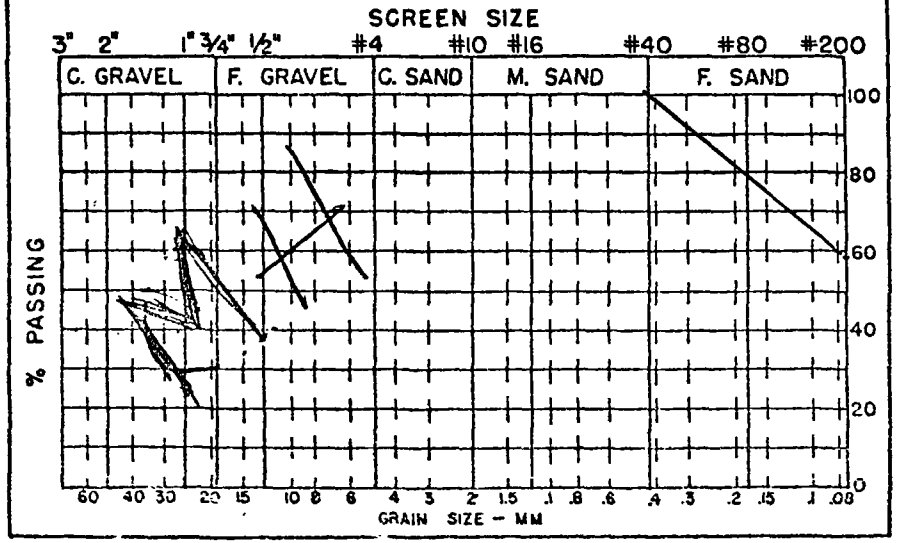
PLASTICITY CHART



H_2O = 82%

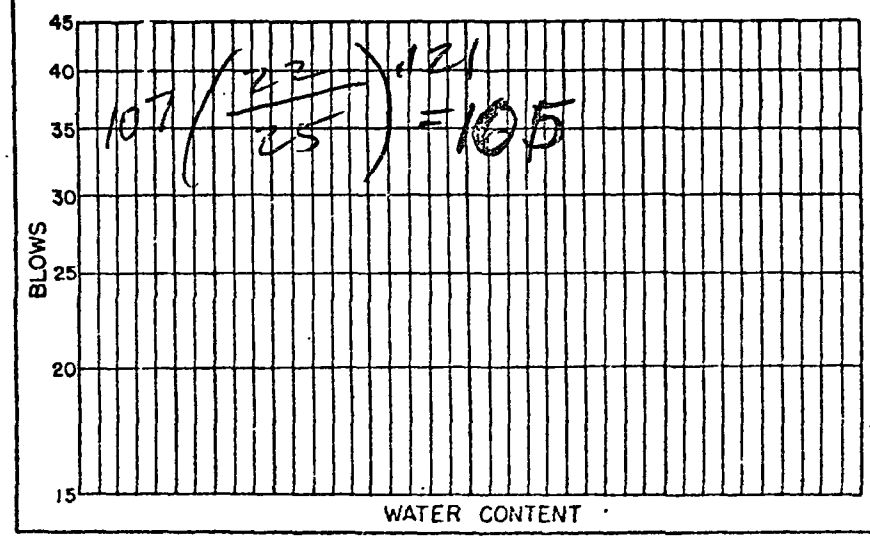
SIEVE ANALYSIS	% Passing 100.53	
	-40 42.35	100
-3/4	-80	
-4	-140	
-10	-200 58.18	58

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	74				15
Wet Wt.	38.8	1			10.9
Dry Wt.	18.70				7.55
% H_2O	107				PL= 44
Blows	22				PI= 61



WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

ATERIALS ENGINEER
terials Laboratory
O. Box 167, Olympia, WA 98504 (Mailing Address)
5 So. 2nd Ave.
nwater, Washington 98504 (Shipping Address)

Place Tumwater

Date 8-25-82

Run "UU" with Pore Pressure

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section West Moguiam bypass SR No. 101A Sub-Section Line hole

Station & Offset 142+00 24' LT Hole # C-2

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3429	D-1	0' 0" 2' 0"	H2O 56%	SM	Like 3172 w/Rust Streaks Wet, Tan, Cly, V. Sty. F. SAND
3430	S-2	3' 0" 5' 0"	H2O 56%	MH	Wet, tan & Rust Stained Sl. Cly. F. Sdy. SILT
3431 -1	D-3	5' 0" 7' 0"	"	SM	Like 3172 W/T. MICA wet, tan, Cly, V. Sty. F. SAND
-2	D-5	10' 0" 12' 0"		SM	Like 3172 Wet, tan, Cly. V. Sty. F. SAND.
3432	S-6	13' 0" 15' 0"	53%	ML OL	Wet, Gr., ORG. SILT W- Pieces of Wood
3433	D-7	15' 0" 17' 0"	46 %	ML	Like 3431-2 Wet, Gr & Lt. Brn. Layerd F. Sdy. Silt
3434 -1	U-8	18' 0" 18' 4"	A		
-2		18' 4" 18' 8"	B		
-3		18' 8" 19' 0"	C		

opy with samples
opy to addressee

Yours very truly,

Milford Sanders

Inspector.

DT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

23 40/920 100 psf

ATERIALS ENGINEER
terials Laboratory
O. Box 167, Olympia, WA 98504 (Mailing Address)
5 So. 2nd Ave.
mwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 8-25-82

Dear Sir:

I have forwarded by today's State Car the following Foundation Samples.

Contract or Job No. L-7262 Section West Hoquiam bypass SR No. 101A Sub-Section Line hole

Station & Offset 142+00 24' LT Hole # C-2

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3435	D-9	20'0" 22'0"		SM	Like 3380 Moist, Brn. Gr. V. Sty. F. SAND w/ Org. Layers.
3436 -1	U-10	23'0" 23'4"	Washington State Stage A		
-2		23'4" 23'8"	UU 1000 psf B		
-3		23'8" 24'0"	C		
3437 -1	D-11	25'0" 27'0"		SM	Like ~~3380~~ 3435 Above
-2	D-12	28'0" 30'0"	W = 54%	ML	Wet, Gr-Tan Layered F. Sdy. SILT w/ T. Mica

py with samples
py to addressee

Yours very truly,
Milford Sanders
Inspector.

FORM 251-002

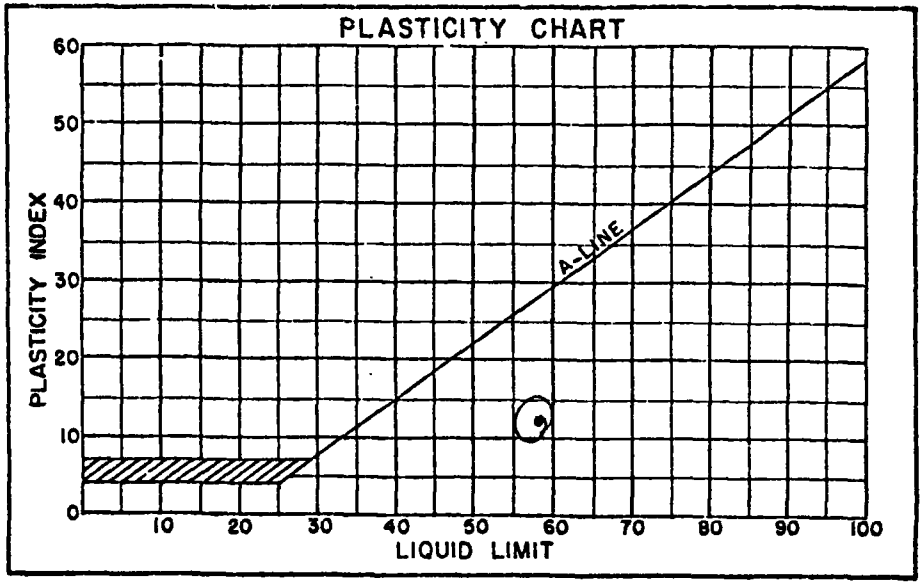
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3430 JOB NO. 460 HOLE NO. [illegible]
DATE 9-7-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS			✓

DESCRIPTION: Wet, tan & rust Stained
Sl. Cly. F. Sdy. SILT

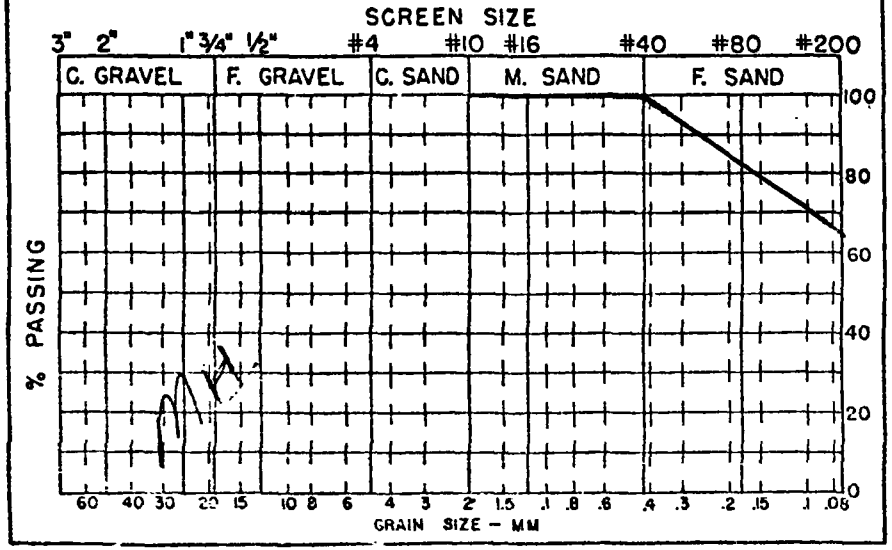


H_2O: 56 %

SIEVE ANALYSIS % Passing 57.90

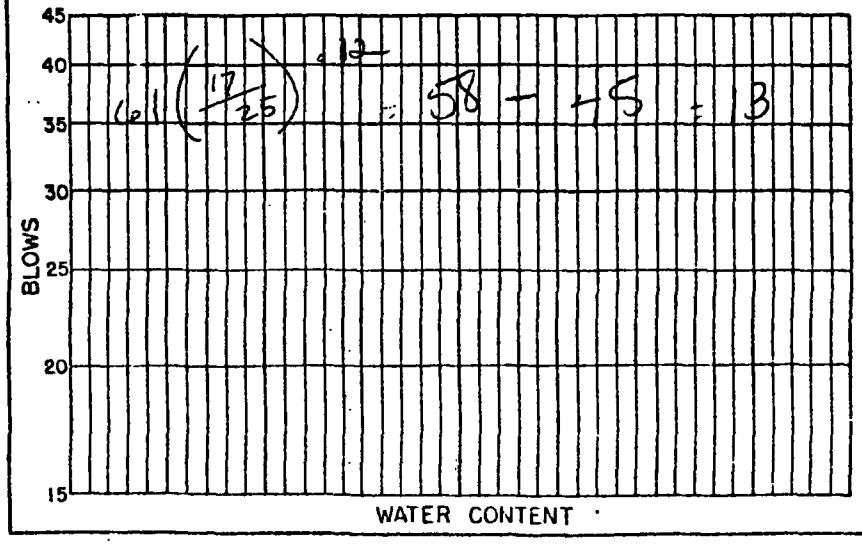
	-40	20.30	99.8
-3/4	-80		
-4	-140		
-10 .07 100%	-200	37.53	65%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	36				39
Wet Wt.	11.46				14.33
Dry Wt.	7.11				9.88
% H_2O	61%				PL= 45 %
Blows	17				PI= 13



61 (17/25)^.12 = 58 − 45 = 13

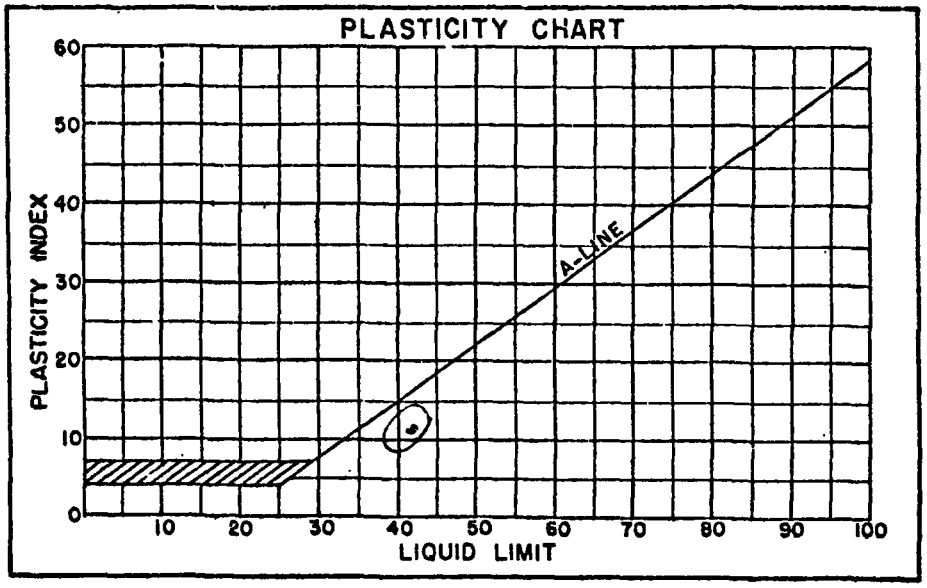
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3432 JOB NO. Hog. HOLE NO.
DATE 9-7-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

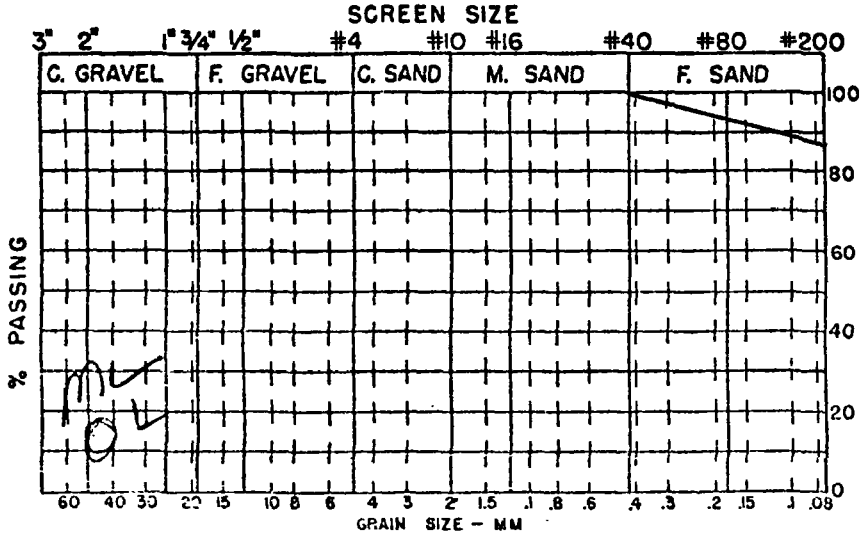
DESCRIPTION: Wet, Gr. Org. SILT W-
Pieces of Wood



H_2O = 53%

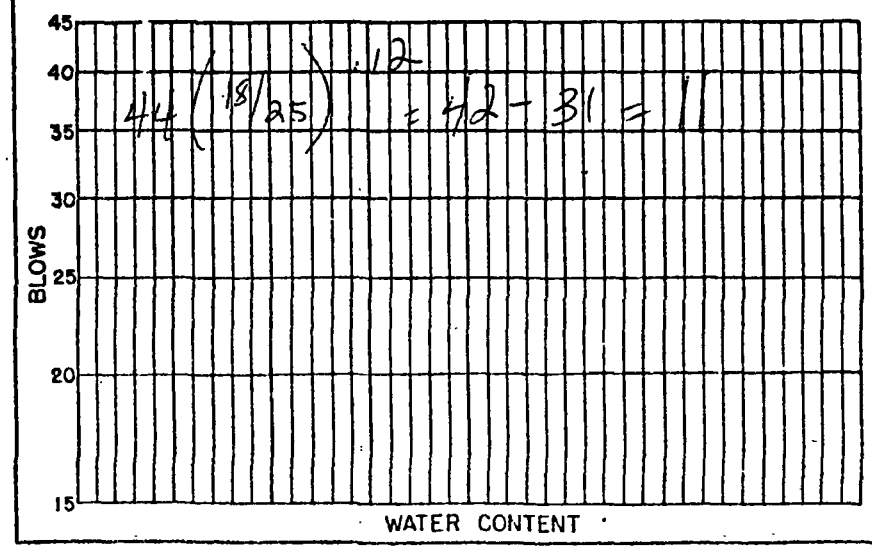
SIEVE ANALYSIS		% Passing 71.9%
	-40 9.62	100%
-3/4	-80	
-4	-140	
-10	-200 62.28	87%

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	15				54
Wet Wt.	16.55				16.46
Dry Wt.	11.48				12.48
% H_2O	44%				PL = 31%
Blows	18				PI = 11



DOT FORM 351-019

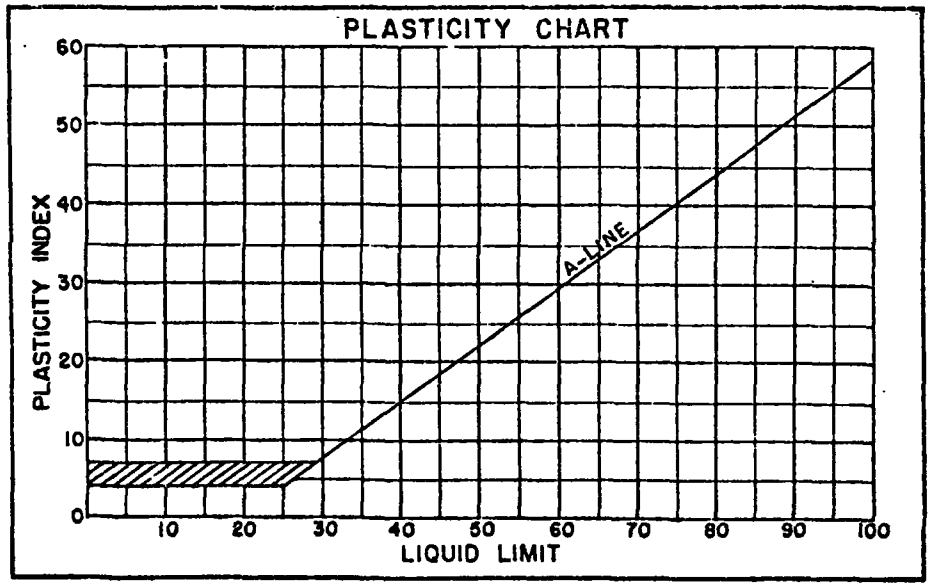
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3437-2 JOB NO. 40.6 HOLE NO. C-2
DATE 11-2-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Wet, Gr-Tan Layered F. Sdy. Silt w/T. Mica

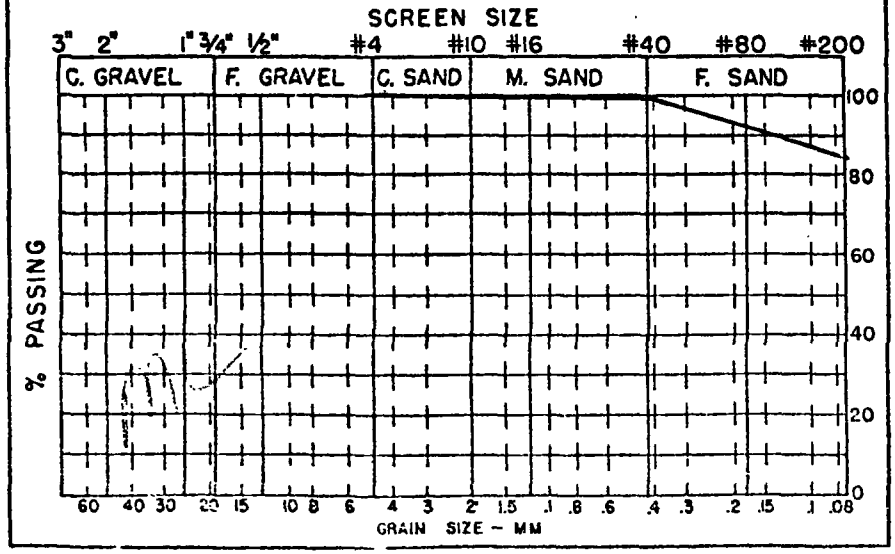


$H_2O = 54\%$

SIEVE ANALYSIS % Passing 71.45

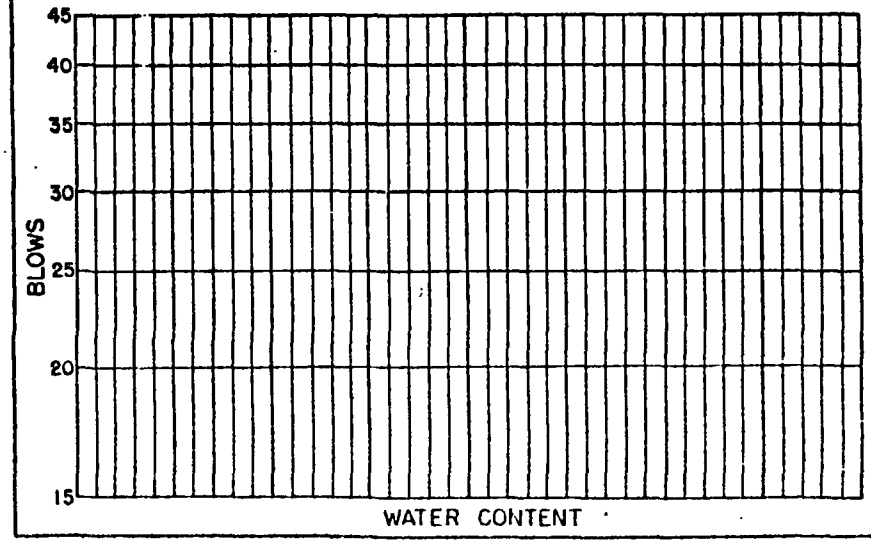
			-40	11.23	99.9
-3/4			-80		
-4	.01	100%	-140		
-10	.03	99.9	-200	60.18	84

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



TRIAXIAL COMPRESSION TEST (With Area Changes and Pore Pressures)

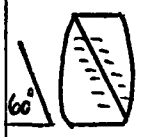
Project West Hoquiam By pass Location 142+00 24' Lt
Job No. L7262 Sample No. 3432 B Boring No. C-2 Depth 13'-0 to 15'-0"
Area (Ao) 2.92 Length 4" Confining Pressure 1000 PSF = 6.9 PSI
Rate of Loading 1%/Min L. R. C. .92 Tested by R Brooks Date 13 May 83

Description

GROSS WT.	TARE	NET WT.	CAN NO.	WET WT.	DRY WT.	WT. H^2O	% H^2O	WET DENS.	DRY DENS.
		305.95		59.56	36.18		65%	100.5	60.9

Data for Mohr's Envelope:
Max. Deviator Stress
Principal Stress
Effective Principal Stress

Failure

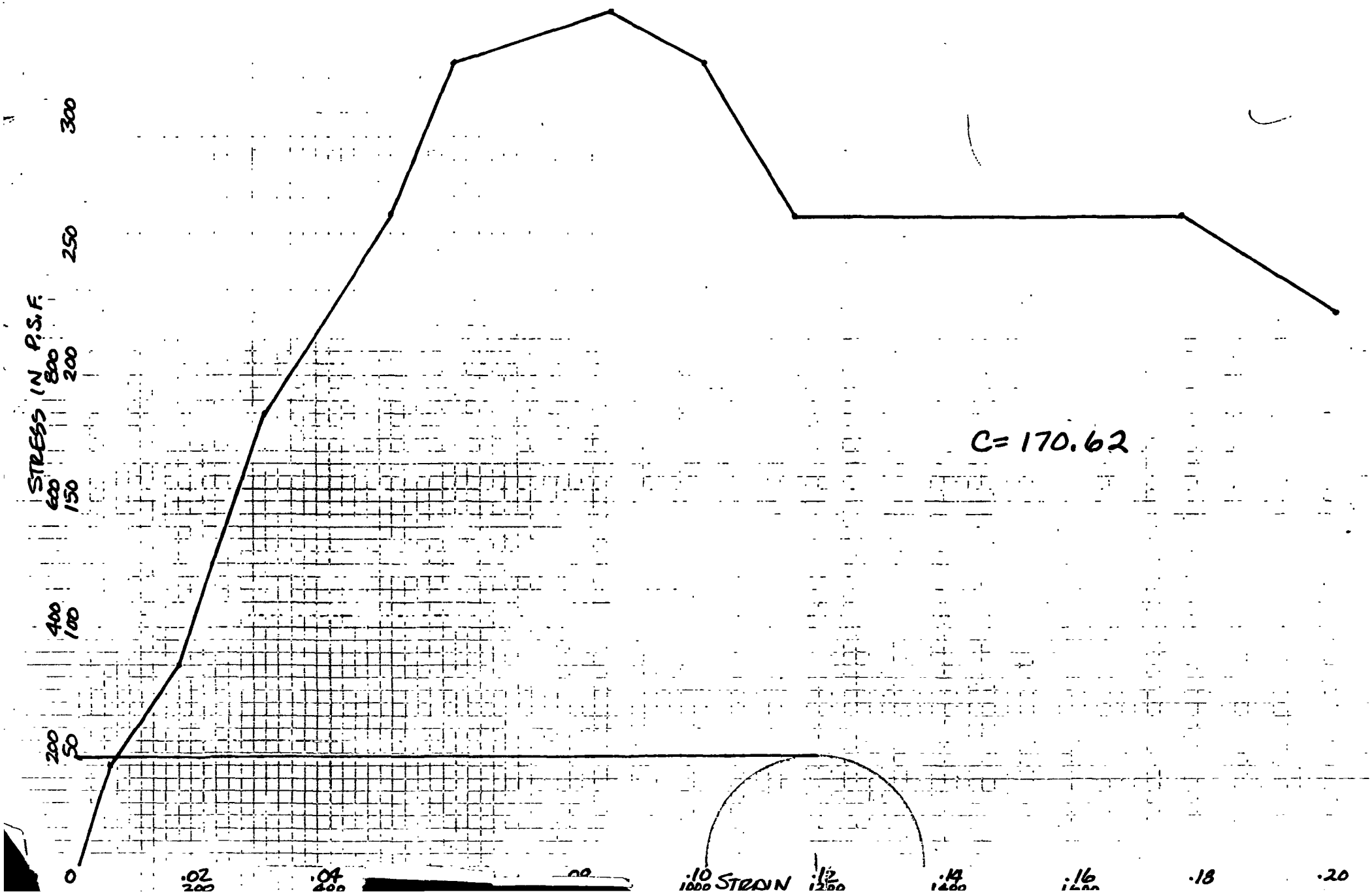


Back Press.
Saturation 98%

ELASPED TIME (Hr.) (Min.)	LOAD DIAL READ (X 10^{-4})	DEFORM. DIAL READ	Δ L (COL. 3 x 10^{-3})	E UNIT STRAIN (ΔL/L)	AREA C.F. (1 − E)	CORRECT. AREA A' ($\frac{A^0}{1-E}$)	PORE PRESS.	DEV. LOAD (Col. 2 X LRC)	DEV. STRESS (Col. 9 ÷ Col. 7)	PRINC. STRESS (Col 10 + conf. press.)
1	2	3	4	5	6	7	8	9	PSF 10	11
~~0~~							6.56			
.5	2	20		.005		6.6	6.67	1.84	40.14	
1.5	4	65		.016			6.67	3.68	80.29	
3	9	120		.030			6.55	8.28	180.65	
4	11	160		.040			6.48	10.12	220.8	
5	13	200		.050			6.40	11.96	260.94	
6	16	240		.060			6.56	14.72	321.16	
8	17	340		.085			6.10	15.64	341.24	
10	16	400		.100			5.90	14.72	321.16	
11	13	459		.115			5.84	11.96	260.94	
12	13	500		.125			5.74	11.96	260.94	
14.5	13	600		.150			5.62	11.96	260.94	
16.75	13	700		.175			5.58	11.96	260.94	
19	11	800		.200			5.51	10.12	220.8	

DOT FORM 351-018 REVISED 4/80

L-7262 WEST HOQUIAM BYPASS
Sample # 3432 B



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

TRIAX

SAMPLE NO. 3432B JOB NO. HoQ HOLE NO.

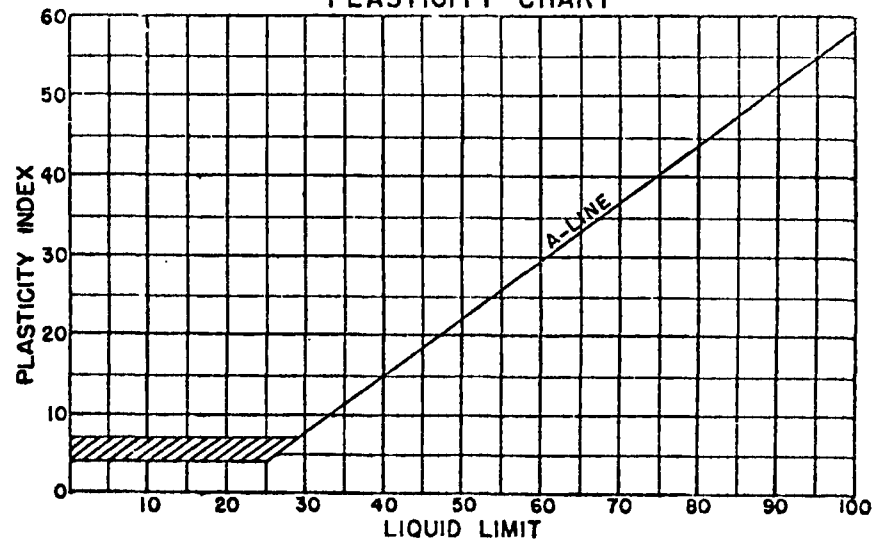
DATE 19 MAY 83 OPERATOR RB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL		✓	
DRIED CAST		✓	
DILATANCY		✓	
BITE			
TOUGHNESS		✓	

DESCRIPTION: Moist grey micaceous SILT

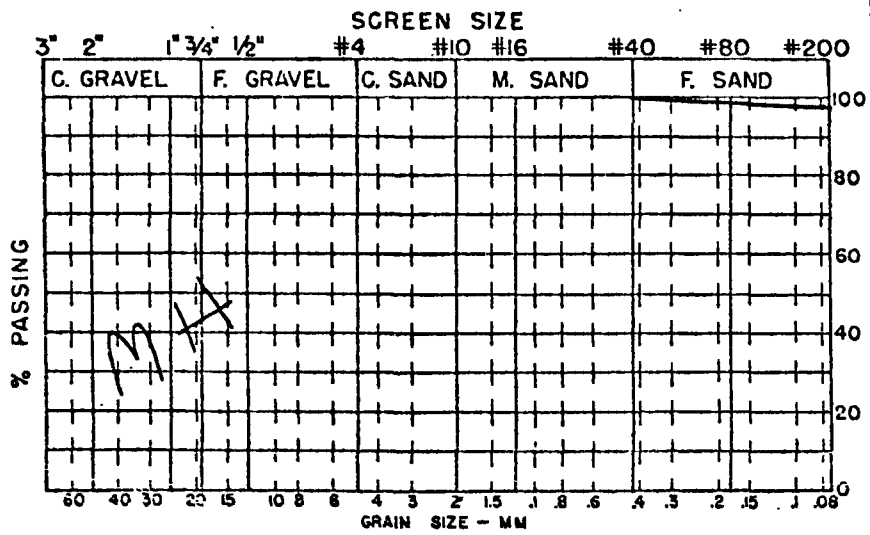
PLASTICITY CHART



$H_2O = 65\%$

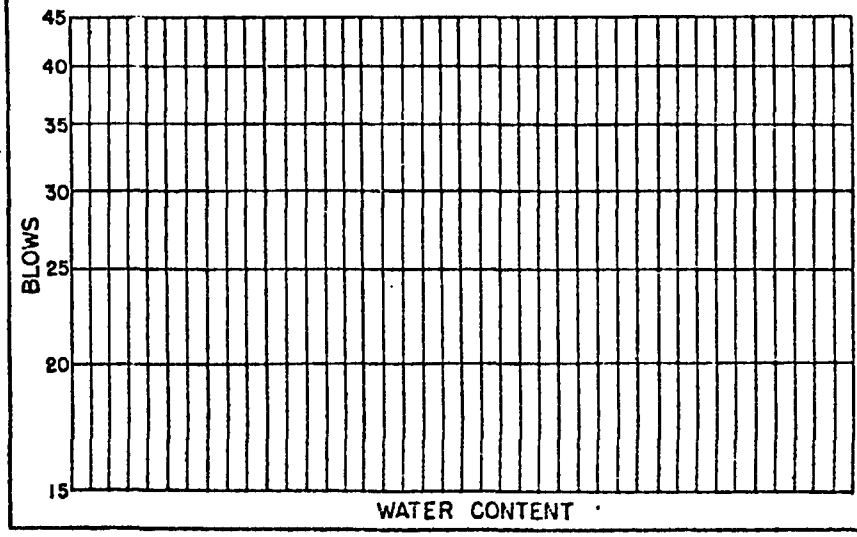
SIEVE ANALYSIS	% Passing 77.05	
	-40 1.35	100
-3/4	-80	
-4	-140	
-10	-200 75.7	98

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



TRIAXIAL COMPRESSION TEST (With Area Changes and Pore Pressures)

Project West Hoquiam Bypass Location 142+00 24' LT
Job No. L7262 Sample No. 3430 Boring No. C-2 Depth 3'-0" to 5'-0"
Area (Ao) 2.92 Length 4" Confining Pressure 1000 PSF = 6.9 PSI
Rate of Loading 1%/Min L. R. C. .92 Tested by R Brooks Date 12 May 83

Description

GROSS WT.	TARE	NET WT.	CAN NO.	WET WT.	DRY WT.	WT. H^2O	% H^2O	WET DENS.	DRY DENS.
		336.52		50.86	32.10		58	110.7	70.1

Data for Mohr's Envelope:
Max. Deviator Stress
Principal Stress
Effective Principal Stress

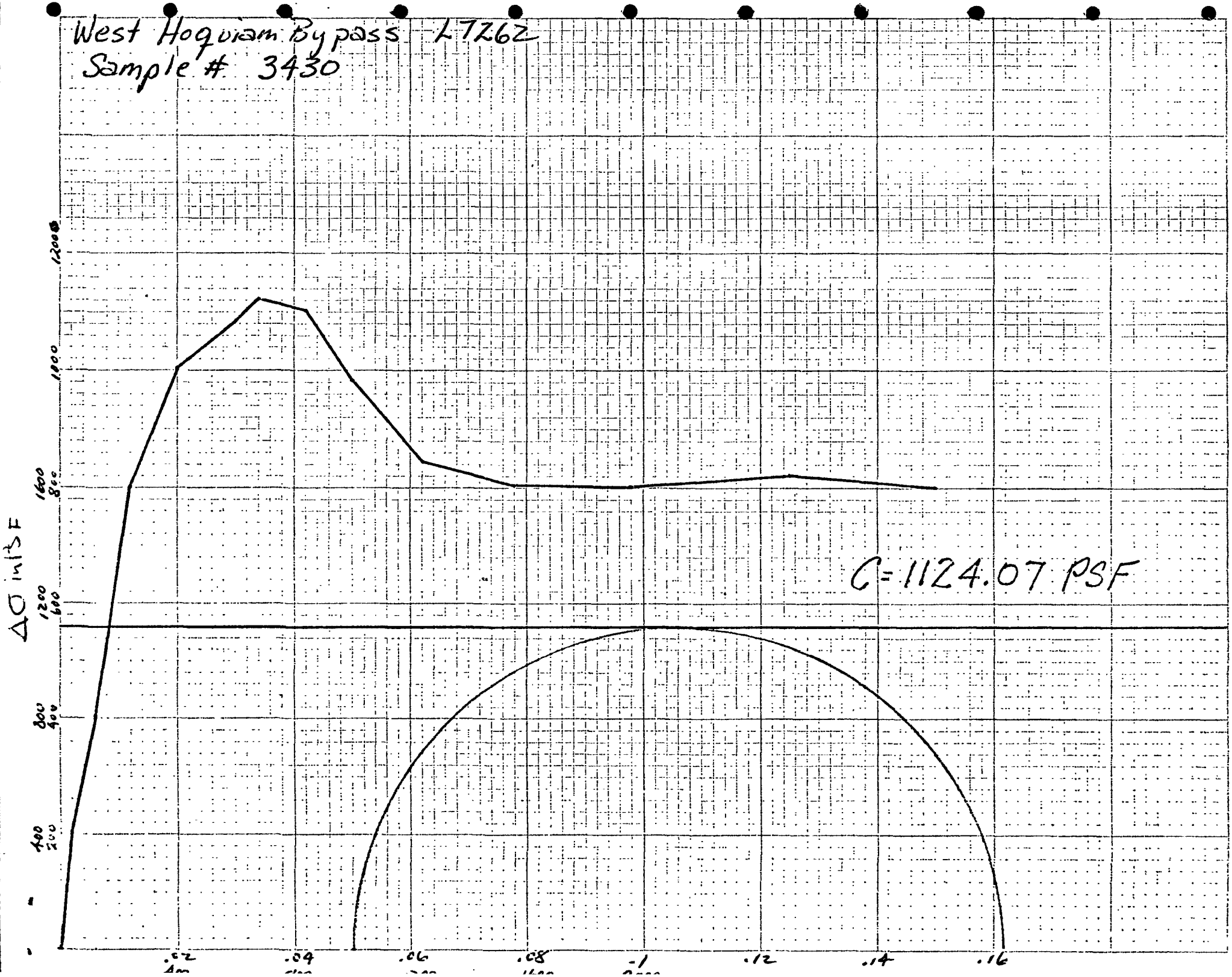
Failure

Back Press.
Saturation 87%

ELASPED TIME (Hr.) (Min.)	LOAD DIAL READ (X 10 −4)	DEFORM. DIAL READ	ΔL (COL. 3 x 10 − 3)	E. UNIT STRAIN (ΔL/L)	AREA C.F. (1 − E)	CORRECT. AREA A' ($\frac{A^o}{1-E}$)	PORE PRESS.	DEV. LOAD (Col. 2 X LRC)	DEV. STRESS (Col. 9 ÷ Col. 7)	PRINC. STRESS (Col 10 + conf. press.)
1	2	3	4	5	6	7	8	9	PSF 10	11
0							6.62			
.25	10	10		.002	.998	6.6	6.79	9.2	200.73	
.75	20	22		.0068	.994		6.79	18.4	401.45	
1.5	40	50		.012	.988		6.74	36.8	802.91	
2.33	50	80		.02	.980		6.39	46.0	1003.64	
3.25	54	118		.030	.970		5.72	49.68	1083.93	
3.75	56	138		.034	.966		5.39	51.52	1124.07	
4.5	55	168		.042	.958		5.10	50.6	1104.00	
5.33	49	200		.05	.950		5.10	45.08	983.56	
6.5	43	250		.062	.938		5.49	39.56	863.13	
8	40	310		.078	.922		5.45	36.8	802.91	
10	40	393		.098	.902		5.45	36.8	802.91	
12.75	41	500		.125	.875		5.40	37.72	822.98	
15.25	40	600		.15	.850		5.40	36.8	802.91	

FORM 351-01R

West Hoquiam Bypass L7262
Sample # 3430



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

TRIAX

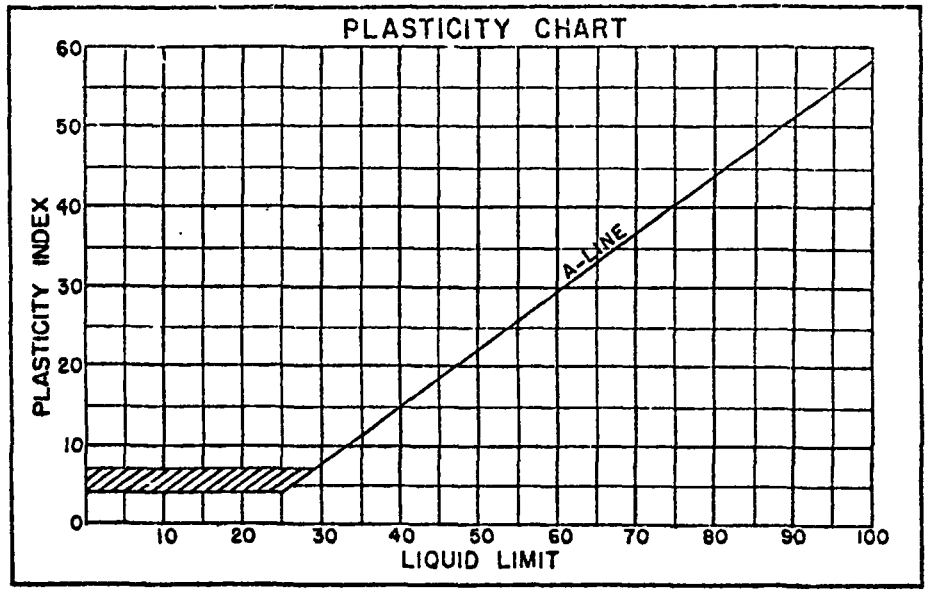
SAMPLE NO. 3430 JOB NO. HOQ HOLE NO.

DATE 19 MAY 83 OPERATOR RB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL		✓	
DRIED CAST		✓	
DILATANCY			
BITE			
TOUGHNESS		✓	

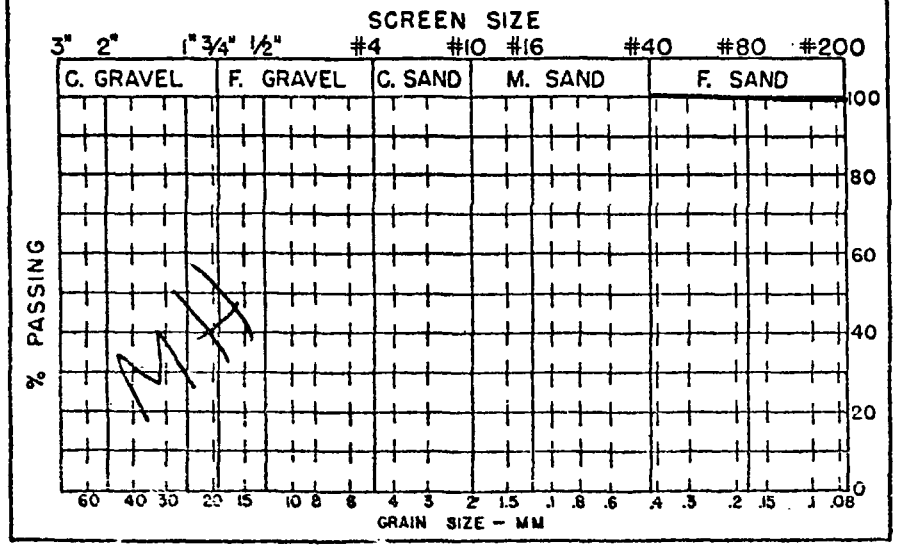
DESCRIPTION: Moist Tan w/rust streaks SILT



H_2O = 58%

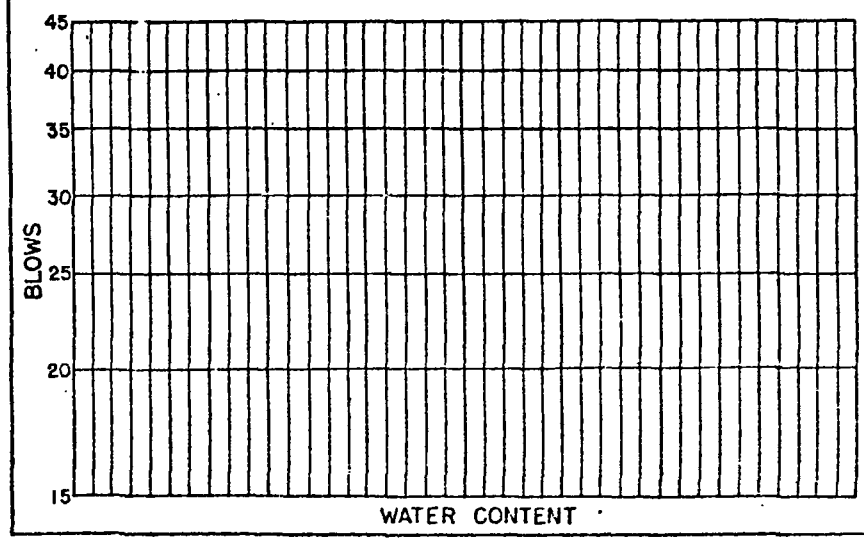
SIEVE ANALYSIS	% Passing 101.60	
	-40 .85	
-3/4	-80	
-4	-140	
-10 .1	-200 100.65	99

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 5-25-83

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section Hogum bypass
SR No. 101A Sub-Section cut section

Station & Offset 142+15 20' LT Hole # C-3

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4537	U-1	27' 4" 27' 8"	B		
4538	D-2	27' 0" 31' 0"		SM	LK 4527-2 Wet, Gr. Layers of org. mtr. U. Stg. F. SAND w/t. Med. Sand & micr
4539 -1	U-3	32' 0" 32' 4"	A		
-2		32' 4" 32' 8"	B		
-3		32' 8" 33' 0"	C		
4540	D-4	34' 0" 36' 0"		ML	LK 4532 Wet, Gr. SILT
4541 -1	U-5	37' 0" 37' 4"	A		
-2		37' 4" 37' 8"	B		
-3		37' 8" 38' 0"	C		

1 copy with samples
1 copy to addressee

Yours very truly,
Milford J. Landes
Inspector

DOT FORM 351-002 REVISED 2-80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 5-25-83

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section Hesquiam bypass
SR No. 101A Sub-Section Cut section

Station & Offset 142+15 26 LT Hole # C-3

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4542	D-6	39'0" 41'0"	52%	OL	M-W Brn., Cly. SILT w/org. odor
4543 -1	U-7	42'0" 42'4"	A		
-2		42'4" 42'8"	B		
4544 -1	D-8	44'0" 46'0"		MH	LK 4534 visual looks moist. wet, dk. Brn. F. Sdy., Cly. SILT
-2	D-9	47'0" 49'0"	62%	MH	Wet, Gr. Brn., Cly. F. Sdy. SILT
4545 -1	U-10	52'0" 52'4"	A		
-2		52'4" 52'8"	B		
-3		52'8" 53'0"	C ✓		TOOK Bottom Section & sample + Remember 3 4546 to Re-Do Sieve & PI
4546	D-11	54'0" 56'0"	97%	SM	BLACK Hcy org. U. Sty. F. SAND w/some OXIDIZ. -Tough mtr. to mull-

1 copy with samples
1 copy to addressee

Yours very truly,
Milford J. Sanders
Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 5-25-83

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam bypass SR No. 101A Sub-Section Cut section

Station & Offset ~~[illegible]~~ 142+15 20' LT. Hole # C-3

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4547 -1	U-12	57'0" 57'4"	A		Cly SILT EXAMINED this ONE to check for similarity w/ 4546 NONE LW
-2		57'4 57'8"	B		
-3		57'8" 58'0"	C		
4548 -1	D-13	59'0" 61'0"		ML	2K 4536-1 M, GR. ORG. F. X GRUly. F-C Sdy. SILT
-2	D-14	62'0" 64'0"	7%	GM GP	D, GR-Brn. Sty. F-C Sdy. 1"(-) X & S.R. GRAVEL
-3	D-15	67'0" 67'11"	13%	SM	M, GR. Lt. tan & BLK. V. Sty. f. gruly. zoned Sty. F-C SAND w/some tough waxy SILT Pieces
-4	D-16	72'0" 73'3"	14%	SM	M, dk. Gr. V. Sty. white f. gruly. F-C SAND
-					

1 copy with samples
1 copy to addressee

Yours very truly,
Mefford J. Sanders
Inspector.

DOT FORM 351-002 REVISED 2/80

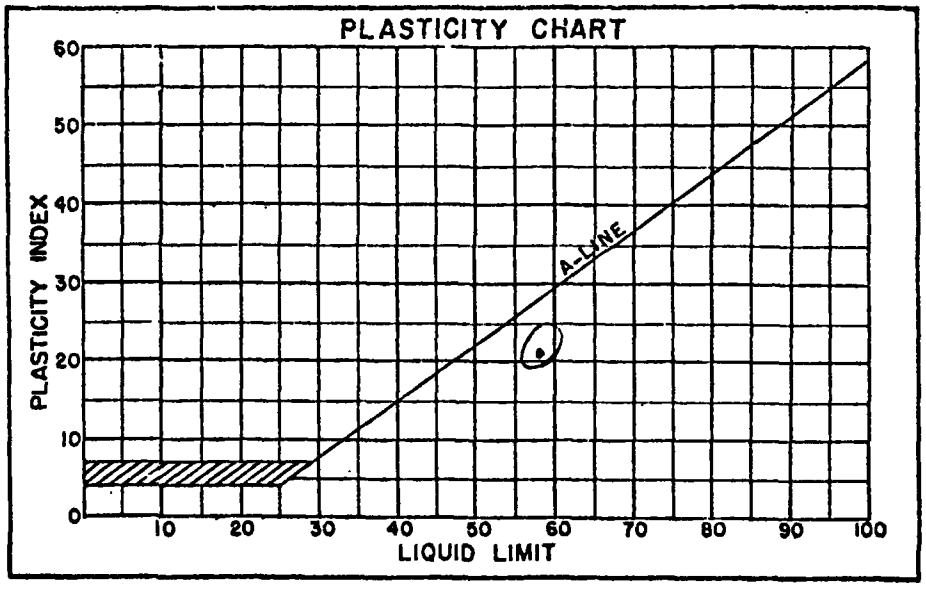
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4542 JOB NO. 408 HOLE NO. C-3
DATE 6-7-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			✓
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: M-W Brn. Cly. Silt
w/ org. odor

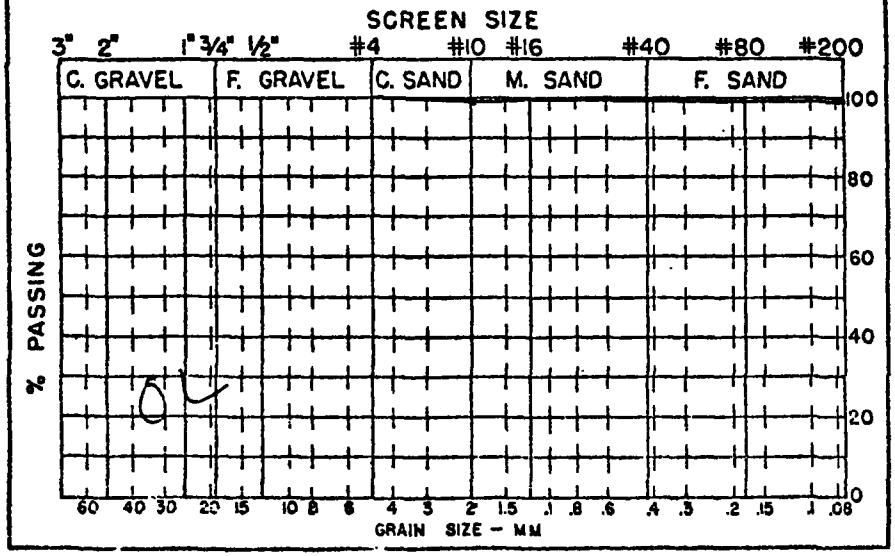


H_2O = 52%

SIEVE ANALYSIS % Passing 49.52

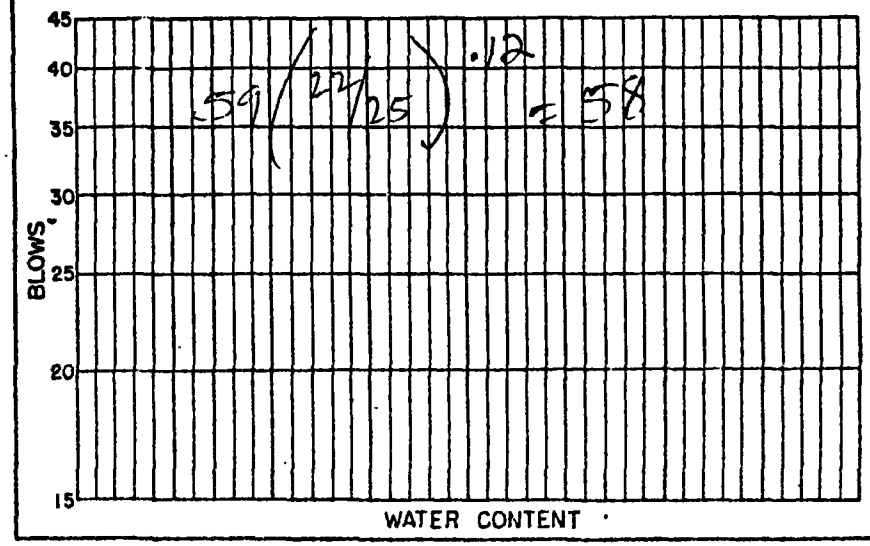
			-40	3	99
-3/4			-80		
-4	.01	100	-140		
-10	.01	99	-200	49.2	99

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	55				32
Wet Wt.	17.68				7.4
Dry Wt.	11.10				5.41
% H_2O	59				PL= 37
Blows	22				PI= 21



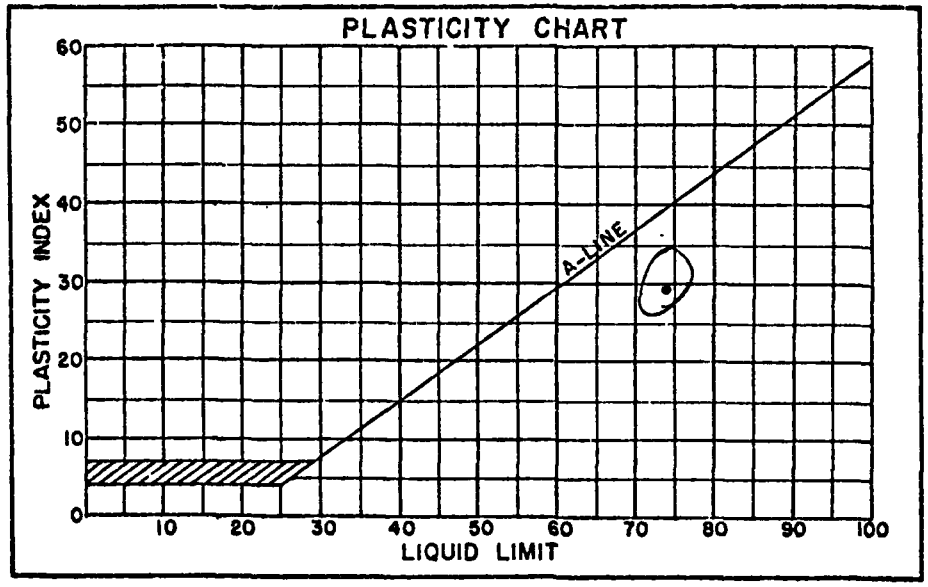
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4544-2 JOB NO. Hoz. HOLE NO. C-3
DATE 6-7-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			✓

DESCRIPTION: Wet, Gr-Brn., Clay.
F. Sdy. SILT

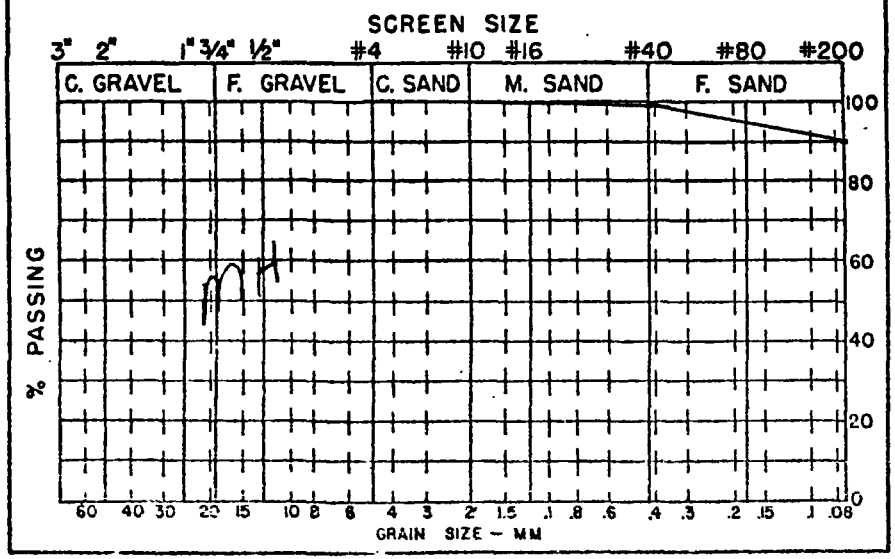


H_2O = 62%

SIEVE ANALYSIS % Passing 41.58

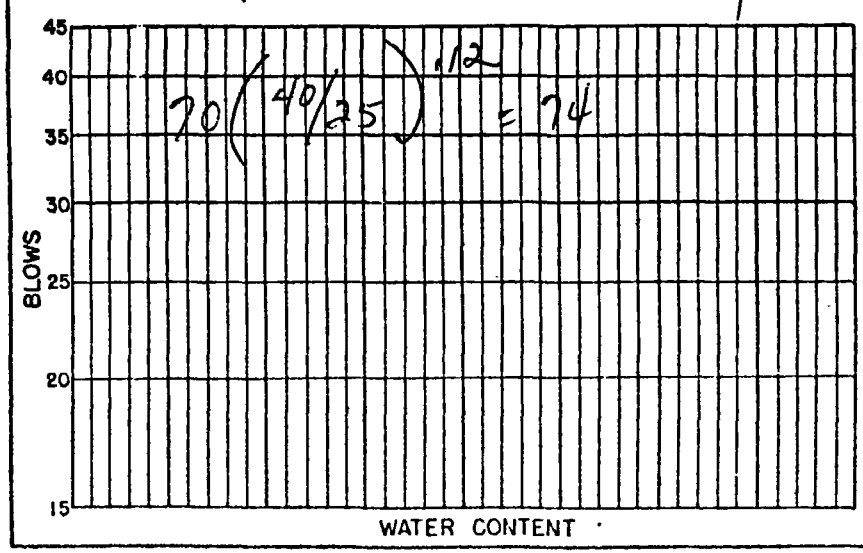
			-40	3.86	99
-3/4			-80		
-4	.02	100	-140		
-10	.12	99	-200	37.58	90

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT	
Can No.	49				74	6.9
Wet Wt.	16.68				~~16.08~~ ~~16.68~~	
Dry Wt.	9.81				4.76	
% H_2O	70				PL= 45	
Blows	40				PI= 29	



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

- TOUGH MTR. TO MULL -

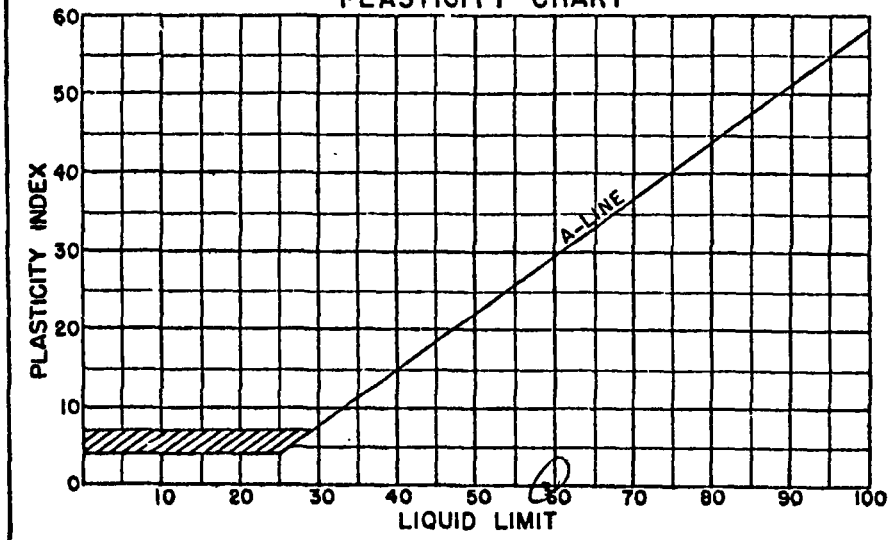
SAMPLE NO. 4546	JOB NO. Hef.	HOLE NO. C-3
DATE 6-23-83	OPERATOR BC	

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Hy. org. v. sty. F. SAND
Black w/ some oxidiz.
Tough mtr to mull

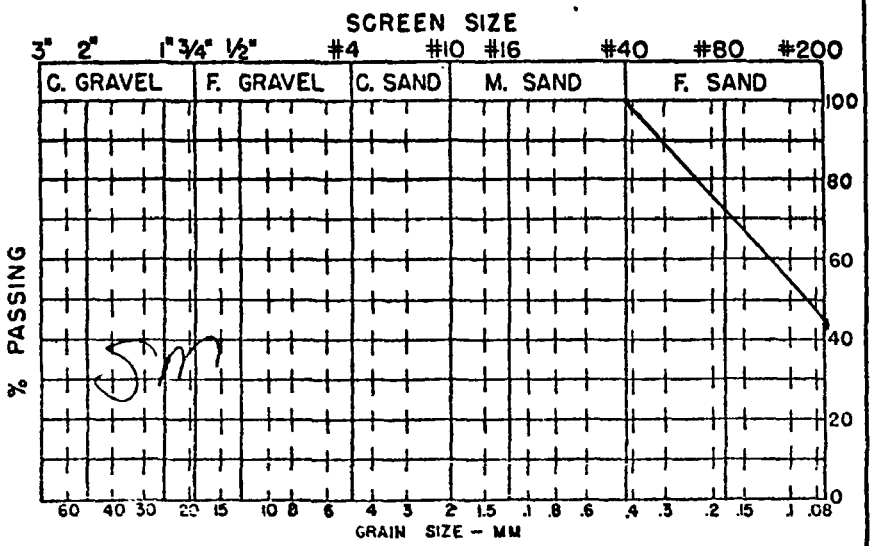
PLASTICITY CHART



H_2O = 97%

SIEVE ANALYSIS	% Passing 43.24	
	-40 24.38	100
-3/4	-80	
-4	-140	
-10	-200 18.86	44

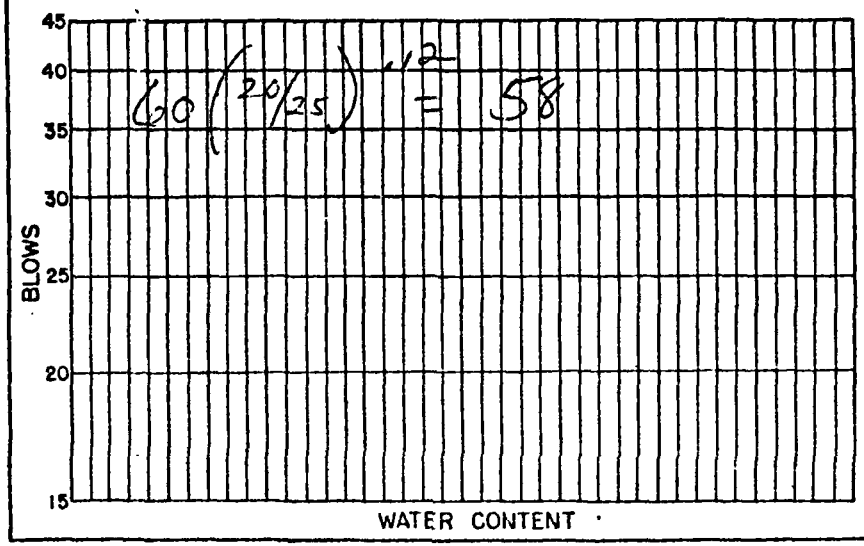
GRAIN SIZE CURVE.



→ DID NOT MAKE A GOOD PASTE

LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	38				N/P
Wet Wt.	27.5				
Dry Wt.	17.21				
% H_2O	60%				PL=
Blows	20				PI=



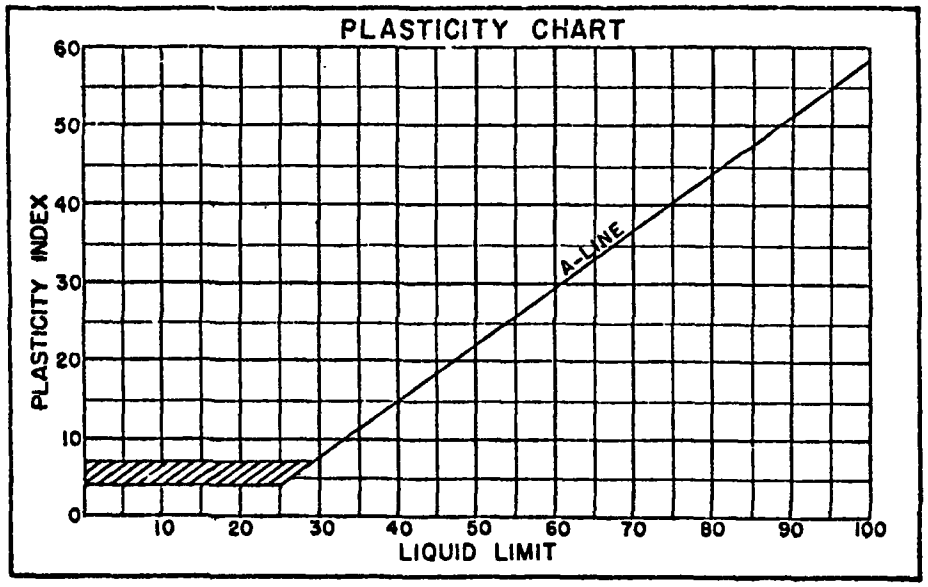
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4548-2 JOB NO. Hog. HOLE NO. C-3
DATE 6-15-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: D, GR-Brn. Sty.
F-C Sdy. 1"(F) & 95R
GRAVEL

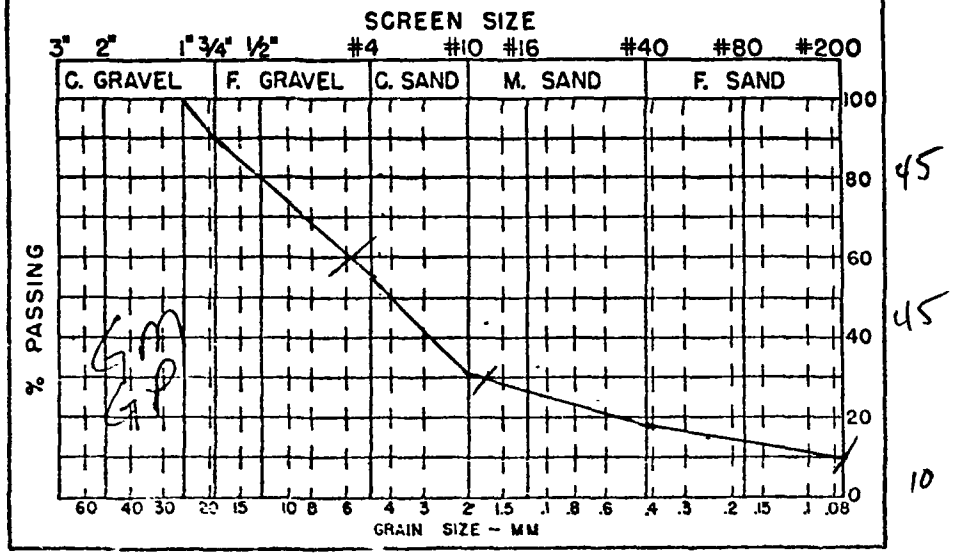


$H_{20} = 7\%$

SIEVE ANALYSIS % Passing 123.32

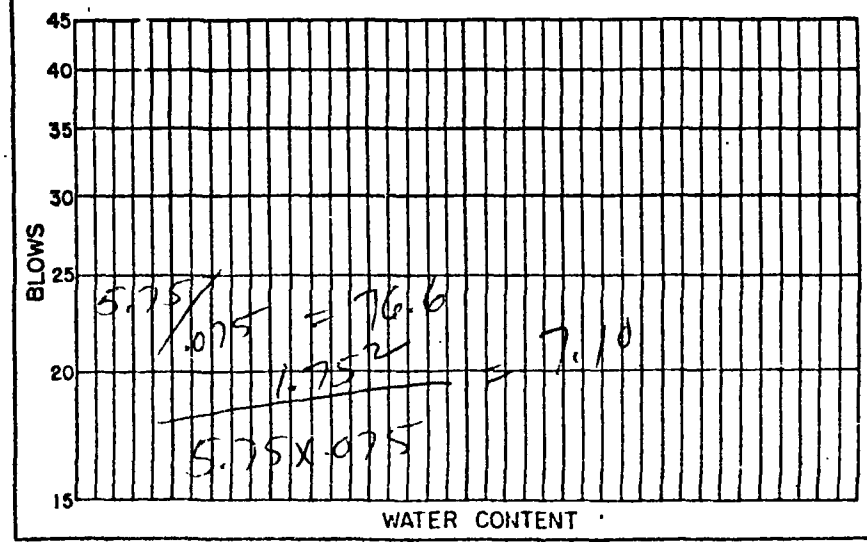
One -1	11.9	100	-40	9.55	18
-3/4	13.02	90	-80		
-4	31.53	55	-140		
-10	15.61	31	-200	12.71	10

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

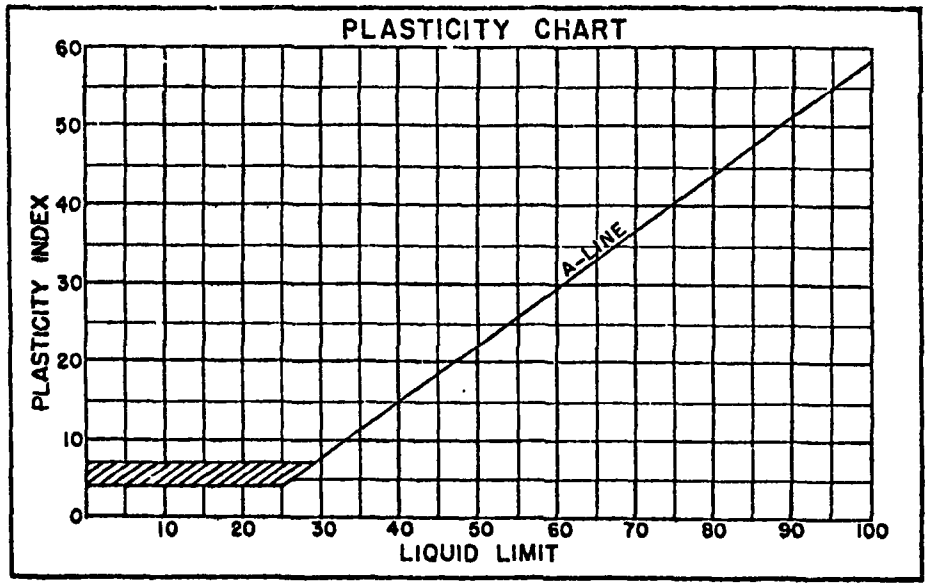
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4548-3 JOB NO. 7-68. HOLE NO.
DATE 6-15-83 OPERATOR BC C-3

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: M, GR. Lt. tan & BLK. V. Sty. f. gruly. Zone D sty. F-C SAND W/some tough Waxy SILT Pieces

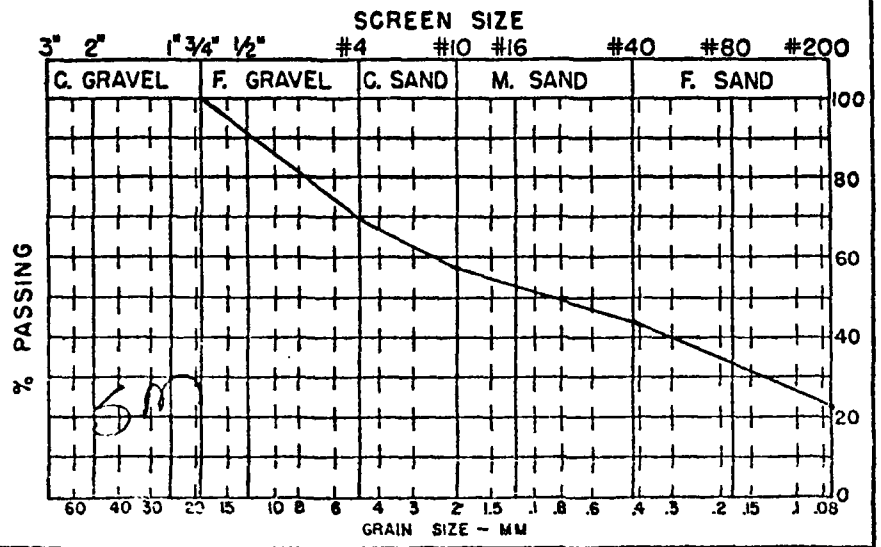


H_2O = 13%

SIEVE ANALYSIS % Passing 153.4

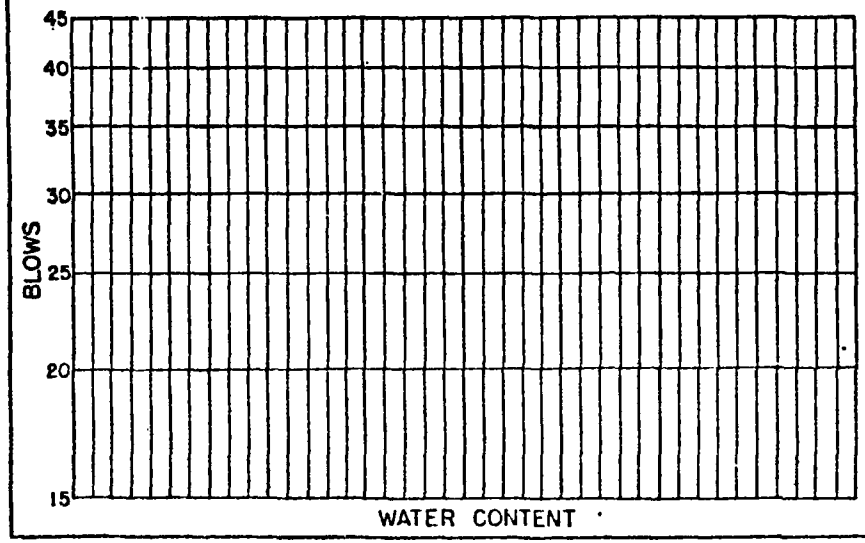
			-40	31.6	44
-¾	15.8	100	-80		
-4	18.0	70	-140		
-10	22.0	58	-200	36	23

GRAIN SIZE CURVE:



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

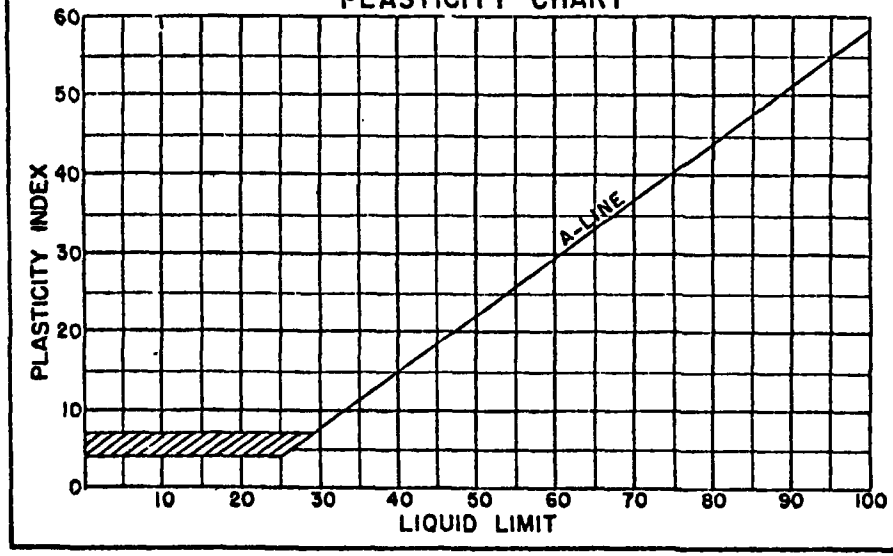
SAMPLE NO. 4548-4 JOB NO. Hof. HOLE NO. C-3
DATE 6-10-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: M, dk. gr. V. Sty. white f. gr uly. F-C SAND

PLASTICITY CHART

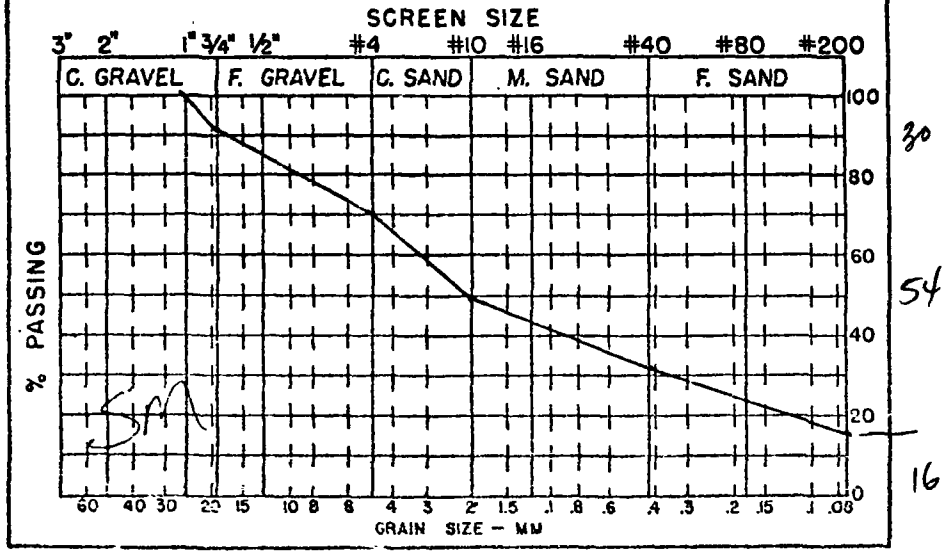


14 20 = 14%

SIEVE ANALYSIS % Passing 162.85

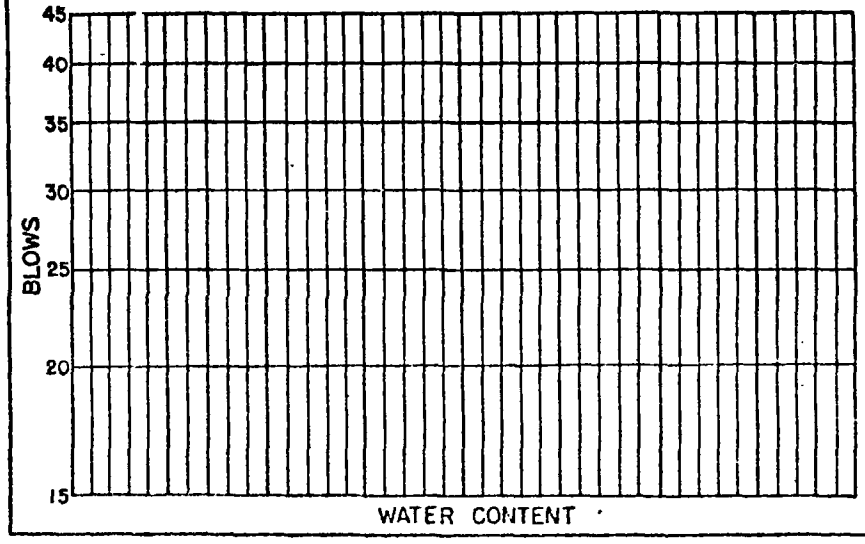
-1	14.15	100	-40	26.0	32
-3/4	34.7	91	-80		
-4	33.85	70	-140		
-10	28.28	49	-200	25.87	16

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 5-26-83

Dear Sir:

I have forwarded by today's State Car the following Foundation Samples.

Contract or Job No. L-7262 Section Hapuiam bypass
SR No. 101A Sub-Section cut section

Station & Offset 141+ 28' Lt. Hole # C-4

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4557	D-1	0' 0" 2' 0"	117%	SM	Reddish Brn., Blk., Lg. Org., U. Sty. F-M SAND w/t. Cls. SAND & WOOD; One tough Piece of tan cly-like mtr.
4558	U-2	2' 0" 2' 4"	A		
4559	D-3	4' 0" 6' 0"		OH	LK 4492-3 wet, tan & Gr. w/oxidiz., Sl. Org. Cly. F. Sdy. SILT
4560 -1	U-4	7' 0" 7' 4"	A		
-2		7' 4" 7' 8"	B		
-3		7' 8" 8' 0"	C		
4561	D-5	9' 0" 11' 0"		OH	LK 4492-3 wet, tan & Gr. w/oxidiz., Sl. Org. Cly. F. Sdy. SILT
4562 -1	U-6	12' 0" 12' 4"	A		
-2		12' 4" 12' 8"	B		

1 copy with samples
1 copy to addressee

Yours very truly,
Mufford J. Rowlands
Inspector.

DOT FORM 351-002 REVISED 2-80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater

Date 5-26-83

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam bypass
SR No. 101A Sub-Section Cut section

Station & Offset 141+ 28' Lt. Hole # C-4

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4563	D-7	14' 0" 16' 0"	61%	MH	Wet, tan + oxidized, Cly. Silt
4564 -1	U-8	17' 0" 17' 4"	A		
-2		17' 4" 17' 8"	B		
4565	D-9	19' 0" 21' 0"		MH	LK 4534 Wet (visual → moist) dk. Brn. F. Sdy. Cly. Silt
4566 -1	U-10	22' 8" 23' 0"	C		
-2		23' 0" 23' 4"	D		
-3		23' 4" 23' 8"	E		
4567	D-11	24' 0" 26' 0"		OH	LK 4552 Wet, Gr., Org., Cly. Silt
4568 -1	U-12	27' 0" 27' 4"	A		

1 copy with samples
1 copy to addressee

Yours very truly,

Milford J. Sanders
Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 5-26-83

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section Maguam bypass
SR No. 101A Sub-Section Cut Section

Station & Offset 141+ 28' LT. Hole # C-4

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4568 -2		27'4" 27'8"	B		
-3		27'8" 28'0"	C		
4569	D-13	29'0' 31'0'		OH	LK 4552 Wet, Gr. Org., Cly. Silt
4570 -1	U-14	32'0" 32'4"	A		
-2		32'4 32'8"	B		
-3		32'8" 33'0"	C		
4571	D-15	34'0" 36'0"	48%	ML	M-W, Gr. f. grvly. F-Sdy. Silt
4572 -1	U-16	37'0" 37'4"	A		
-2		37'4' 37'8"	B		

1 copy with samples
1 copy to addressee

Yours very truly,

Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 5-26-83

Dear Sir:

I have forwarded by today's State Car the following Foundation Samples.

Contract or Job No. L-7267 Section Tenino bypass
SR No. 101A Sub-Section Cut section

Station & Offset 141 ~ 38' Lt. Hole # C-4

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4572 -3		37'8" 38'0"	C		
4573	D-17	39'0" 41'0"	63%	OH	Wet, Gr., Cly. F. Sdy. SILT w/ Blk. org. Pieces & trace White Sty. mtr.
4574 -1	U-18	42'0" 42'4"	A		
-2		42'4" 42'8"	B		
-3		42'8" 43'0"	C		
4575	D-19	44'0" 46'0"		OH	LK 4552 Wet, Gr. Org., Cly. SILT
4576 -1	U-20	47'0" 47'4"	A		
-2		47'4" 47'8"	B		
-3		47'8" 48'0"	C		

1 copy with samples
1 copy to addressee

Yours very truly,

Milford J. Forsberg
Inspector.

DOT FORM 351-002 REVISED 2-80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 5-26-83

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam bypass
SR No. 101A Sub-Section cut section

Station & Offset 141+ 28' LT Hole # C-4

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4577	D-21	47'0" 51'0"		OH	LK 4578 Wet, GR., Cly. F. Sdy. Silt w/Blk. Org. Pieces & trace white Sty. mtr
4578 -1	U-22	52'0" 52'4"	A		
-2		52'4" 52'8"	B		
4579 -1	D-23	54'0" 56'0"	32%	SM	M-W GR. F. Gruly. U. Sty. F-M SAND w/Org. Wood Chips
-2	D-24	57'0" 59'0"		SM	LK 4515-7 VISUAL = DRY GR. Wet (Silvery), Cly. F. S.A. Gruly. F. SAND w/t. Organic & mica w/t. M-C SAND
-3	D-25	62'0" 63'2"		SM	LK 4556-7 M, GR. Green Org. (hair) U. Sty. F. gruly. Zones of F-C SAND w/mica
-4	D-26	67'0" 68'3"	13%	GW GM	M, GR. U. Sty. F-C Sdy. F. SR GRAVEL

1 copy with samples
1 copy to addressee

Yours very truly,
Milford J. Sanders
Inspector.

DOT FORM 351-002 REVISED 2/80

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4557 JOB NO. ~~Log~~. HOLE NO. C-4
DATE 6-15-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

Reddish

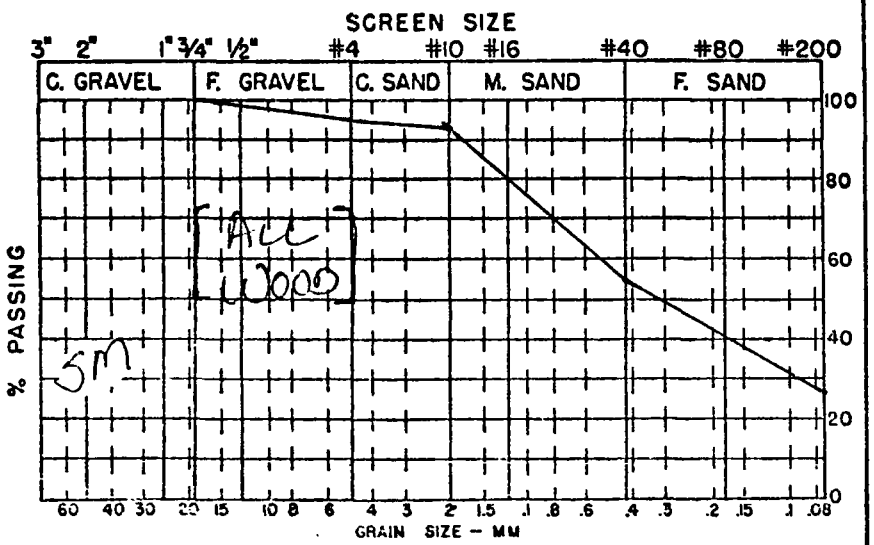
DESCRIPTION: Brn, BCK, Hly. ORG. V. Sty. F-M SAND W/ +. CRS. Sand & wood; One Tough piece tan Cly.-Like MTR.

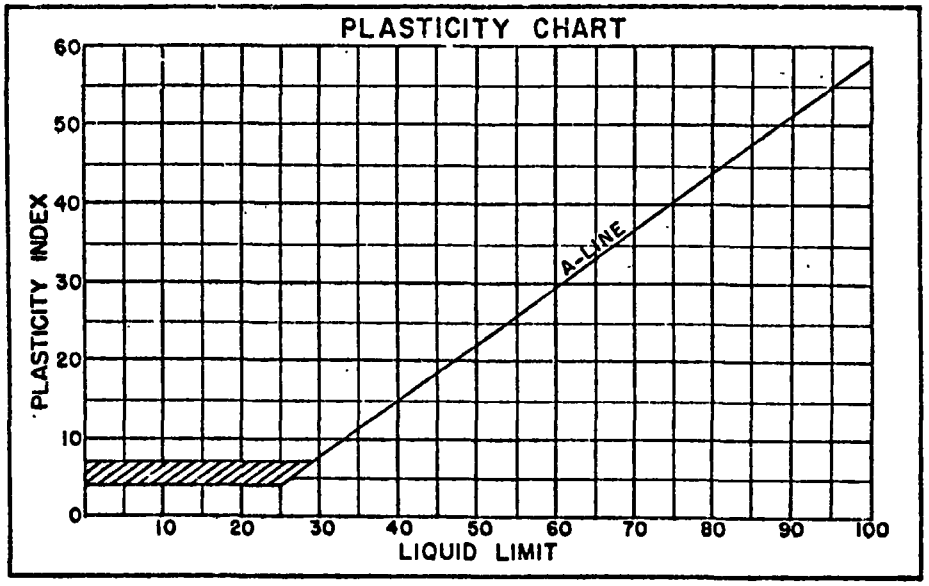
H_2O = 117 %

SIEVE ANALYSIS % Passing 37.8

			-40	10.05	54
-3/4	1.78	100	-80		
-4	.89	95	-140		
-10	14.72	93	-200	10.36	27

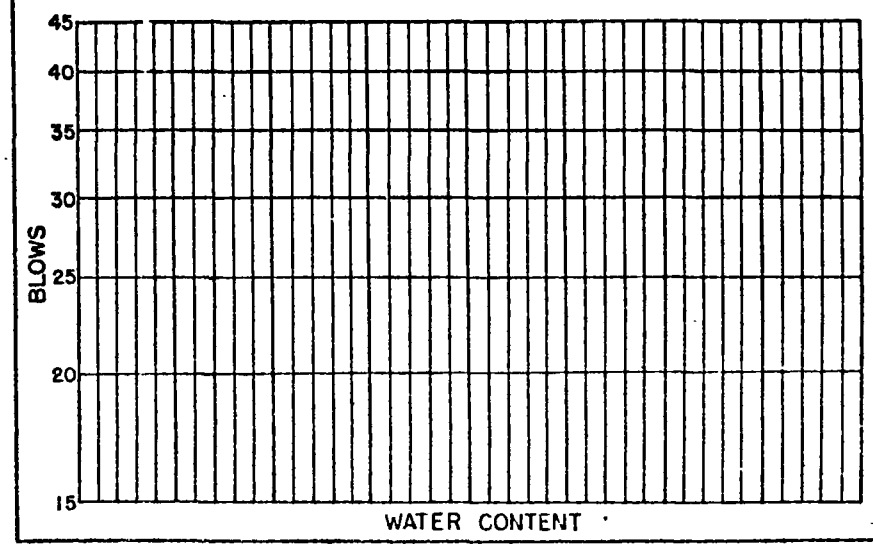
GRAIN SIZE CURVE.





LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

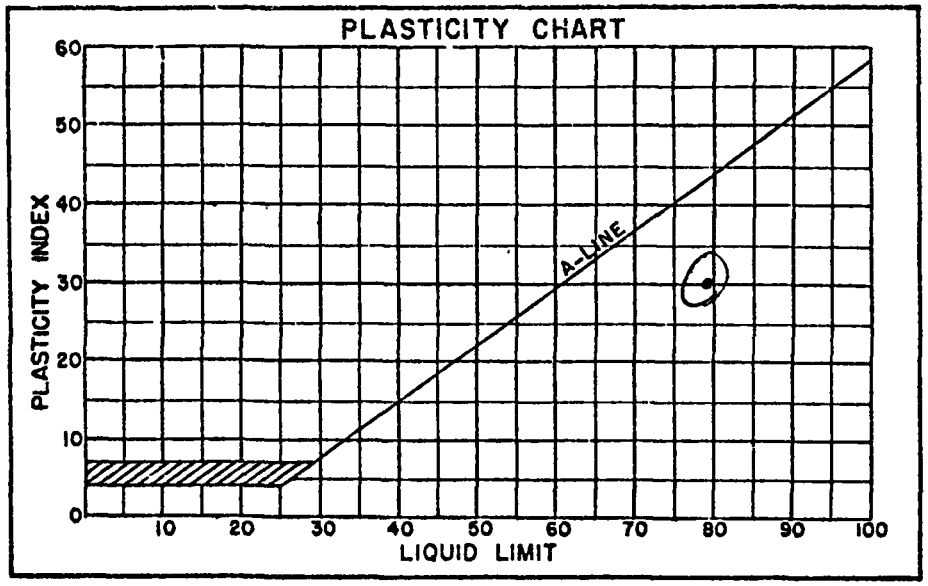
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4563 JOB NO. Hog. HOLE NO. C-4
DATE 6-7-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: Wet, TAN + OXID.
Cly. SILT.

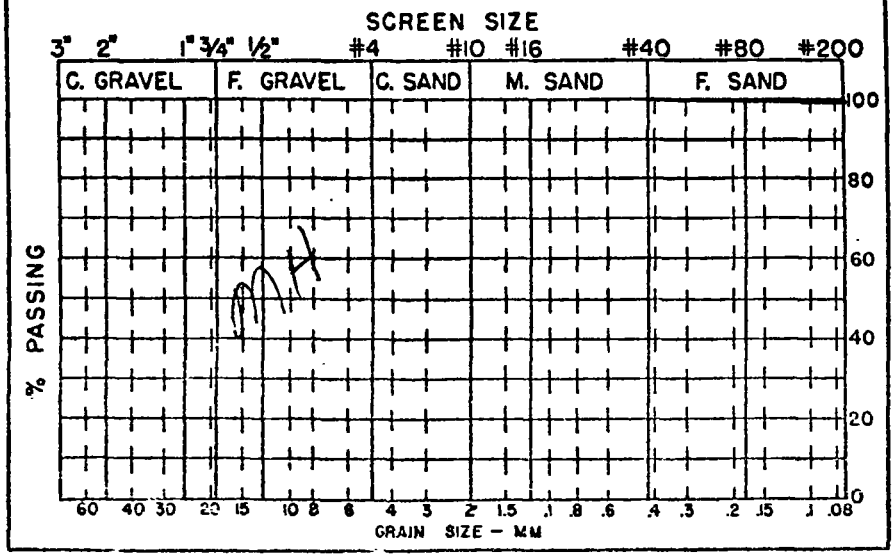


$H_2O = 61\%$

SIEVE ANALYSIS % Passing 43.65

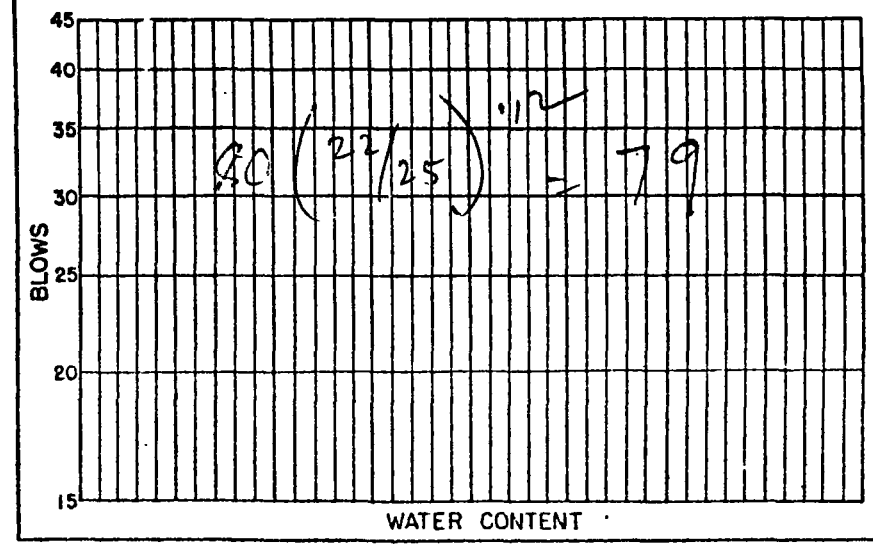
	-40	.22	100
-3/4	-80		
-4	-140		
-10	-200	43.43	99

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	76				115
Wet Wt.	15.55				10.95
Dry Wt.	8.64				7.35
% H_2O	80				PL= 49
Blows	22				PI= 30



DOT FORM 351-019

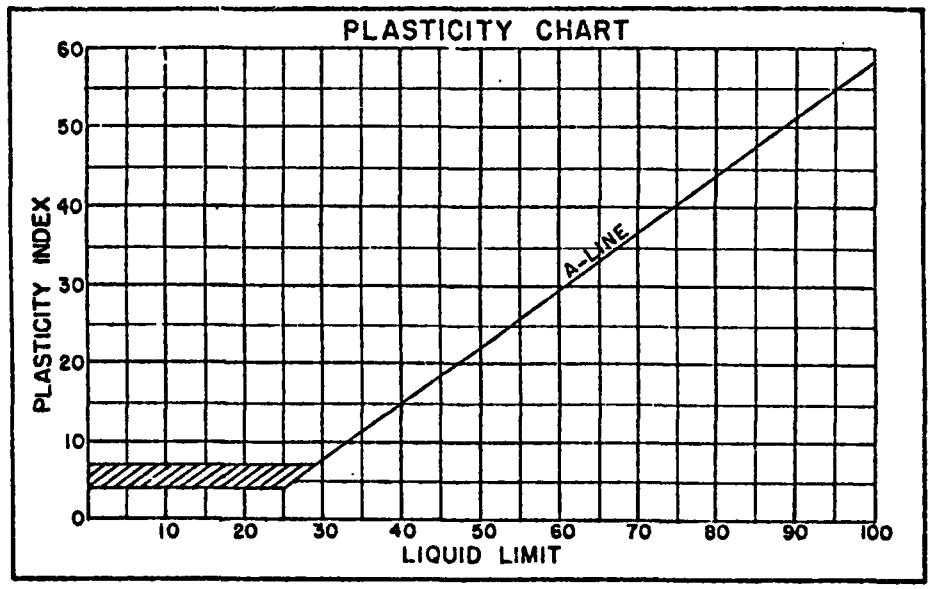
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4571 JOB NO. Hog. HOLE NO. C-4
DATE 6-14-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST		✓	✓
DILATANCY			
BITE			
TOUGHNESS		✓	✓

DESCRIPTION: M-W GR. f. gruly. F. Sdy. SILT

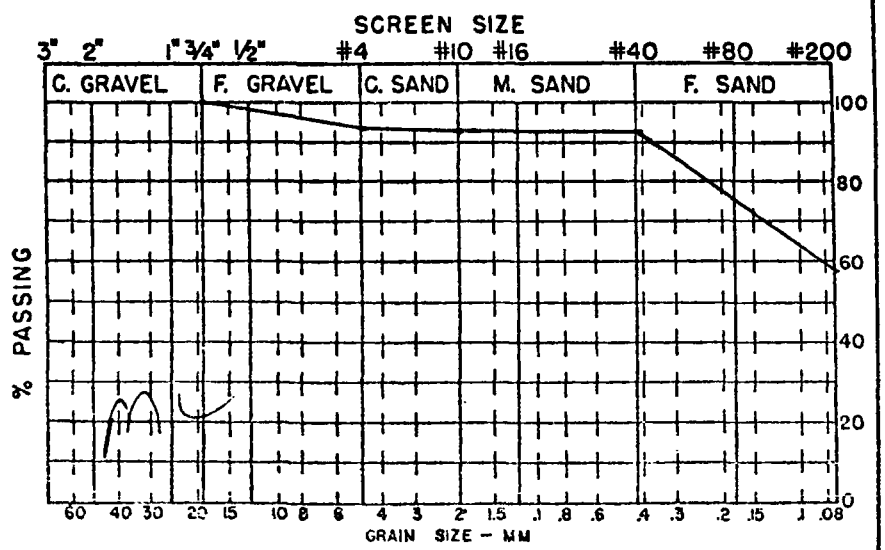


H_2O: 48%

SIEVE ANALYSIS % Passing 105.5

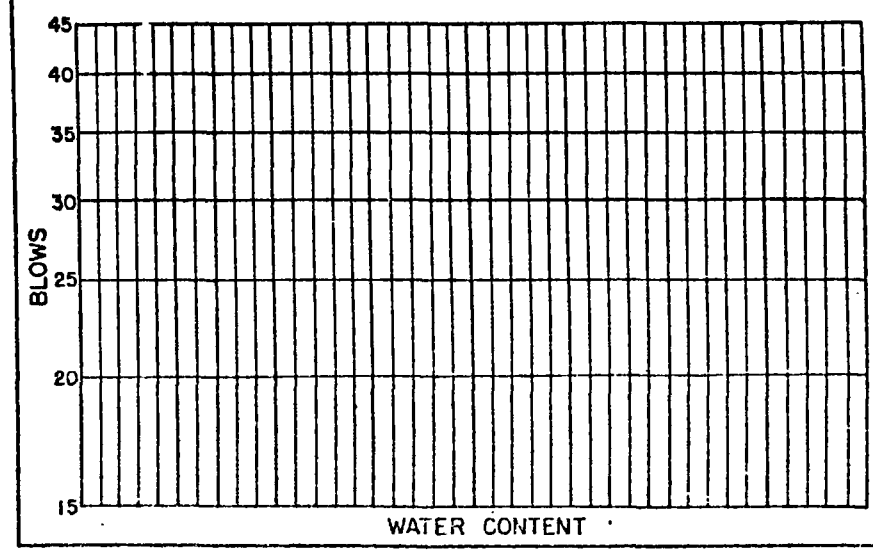
			-40	36.8	93
-3/4	6.72	100	-80		
-4	.4	94	-140		
-10	.10	93	-200	61.48	58

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



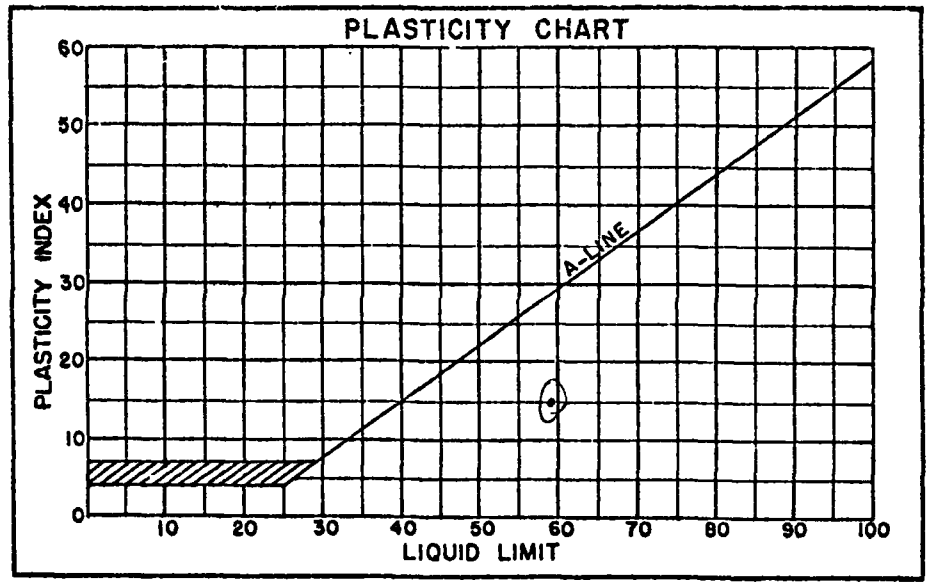
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4573 JOB NO. 4069. HOLE NO. C4
DATE 6-20-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	✓

DESCRIPTION: Wet, Gr. Cly. F. Sdy. SILT w/ BLK. Org. Pieces & w/ Trace white Sty. mtr.

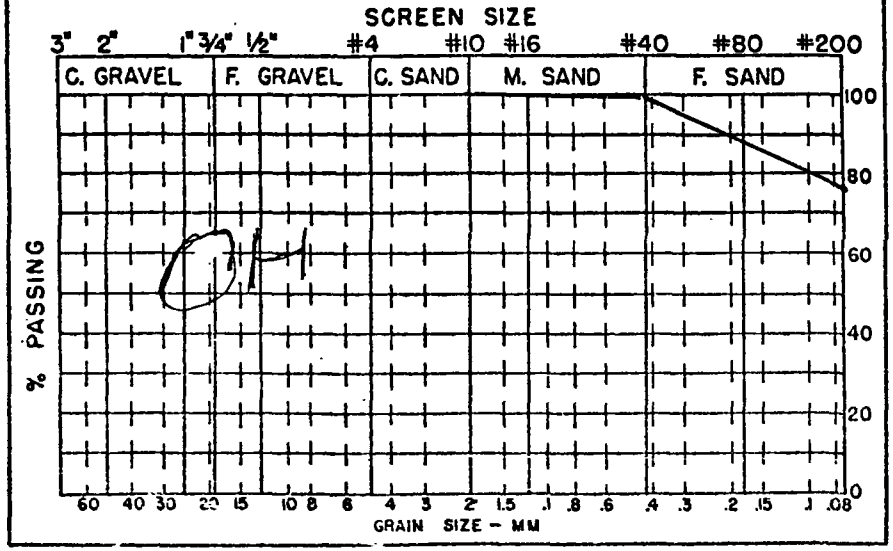


$H_2O = 63\%$

SIEVE ANALYSIS % Passing 63.9

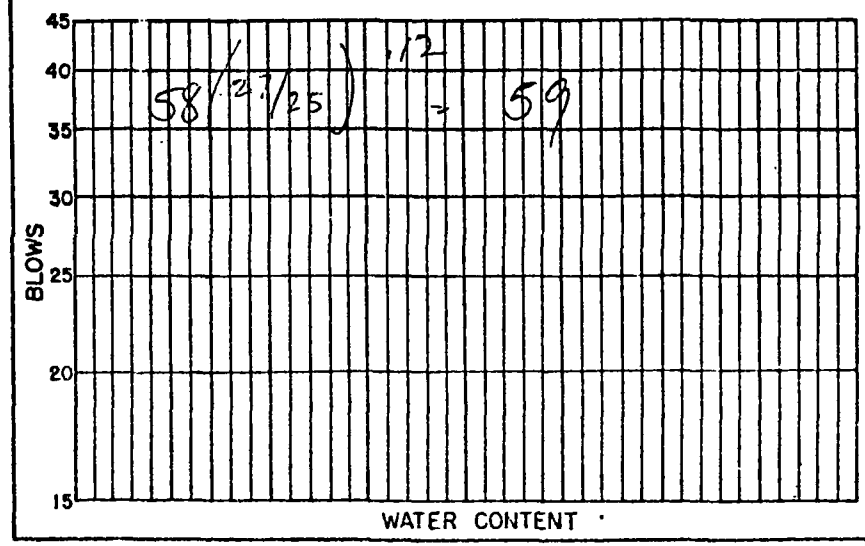
		-40	14.4	99	
-3/4		-80			
-4		-140			
-10	.05	100	-200	49.45	77

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.	19.22				8.31
Dry Wt.	12.18				5.78
% H_2O	58				PL= 44
Blows	27				PI= 15



DOT FORM 351-019

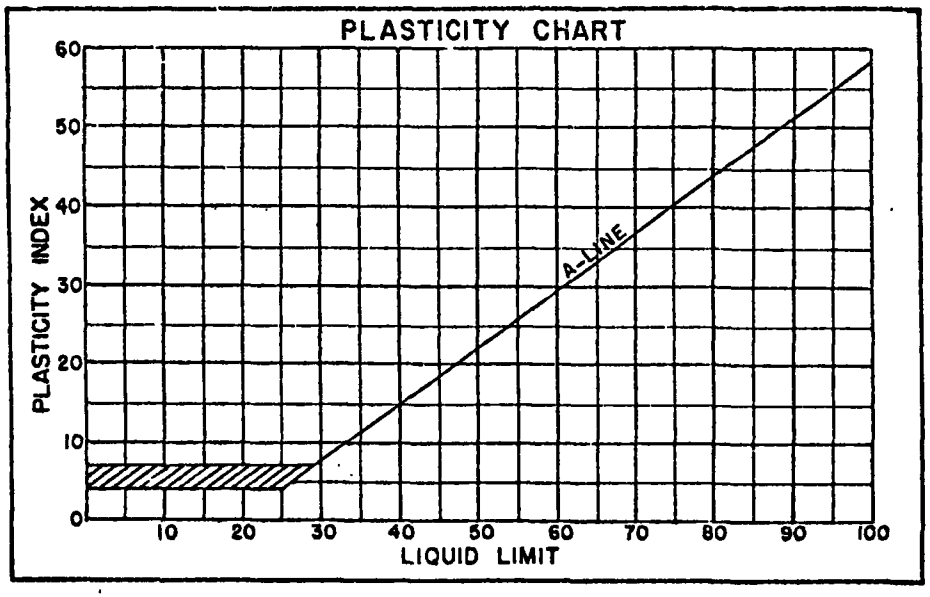
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4579-1 JOB NO. 400 HOLE NO. C-4
DATE 6-14-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE		✓	
TOUGHNESS	✓	✓	

DESCRIPTION: M-W GR. F. only. V. Sty. F-M SAND w/ org. wood chips

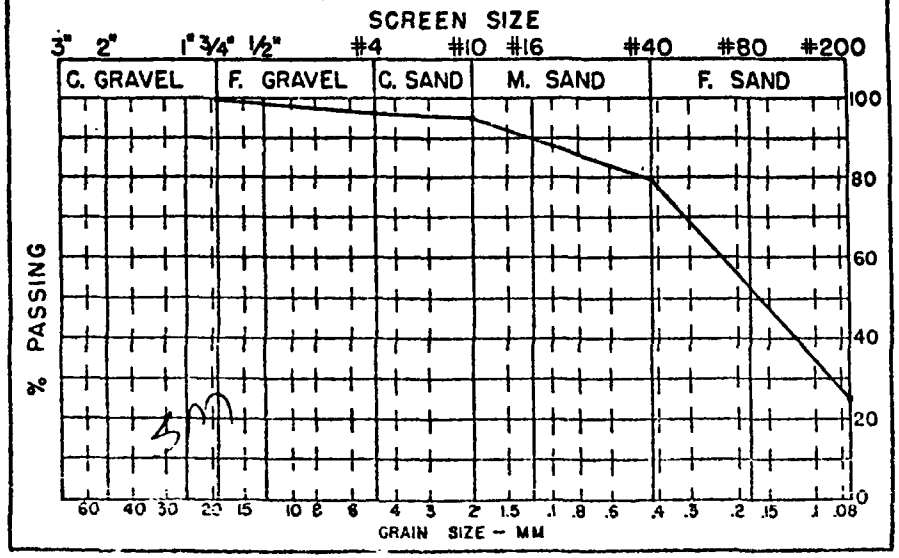


H_2O = 3.2%

SIEVE ANALYSIS % Passing 92.62

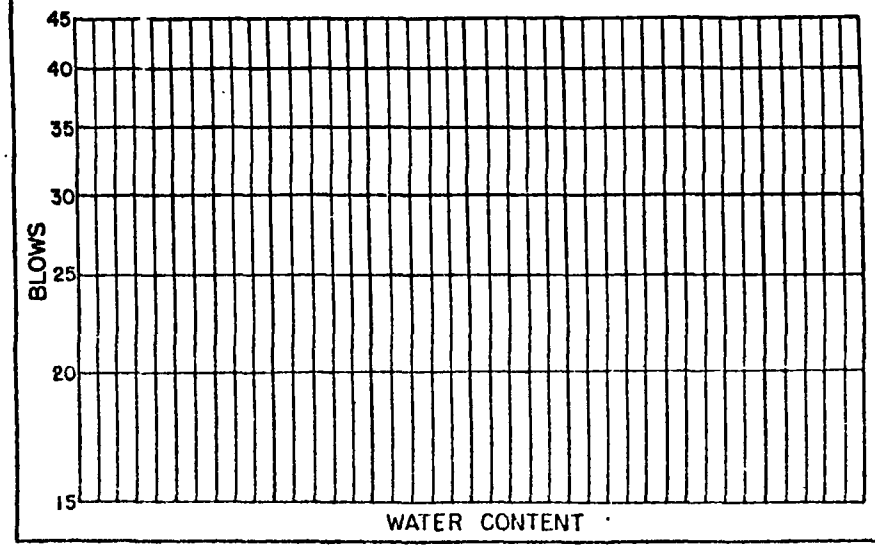
			-40	50.12	79
-3/4	2.53	100	-80		
-4	1.81	97	-140		
-10	15.22	95	-200	22.94	25

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

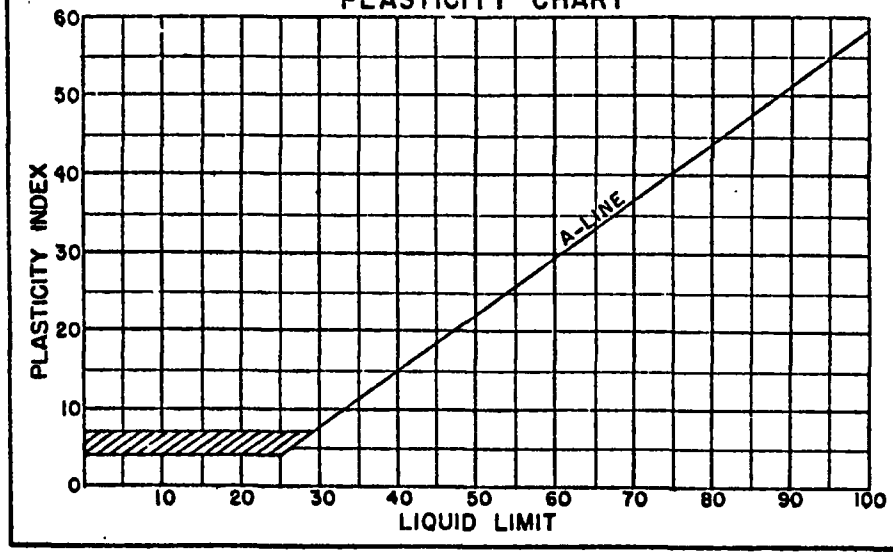
SAMPLE NO. 4579-4 JOB NO. 4-08 HOLE NO.
DATE 6-20-83 OPERATOR BC CJ

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: M, GR. V. Sty. F-C Sdy. F. SR GRAVEL

PLASTICITY CHART

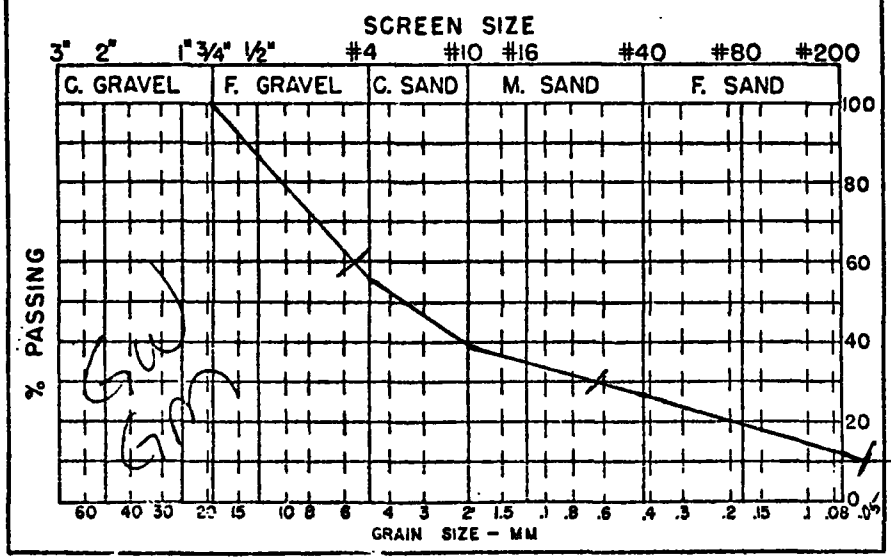


H2O = 13%

SIEVE ANALYSIS % Passing 144.2

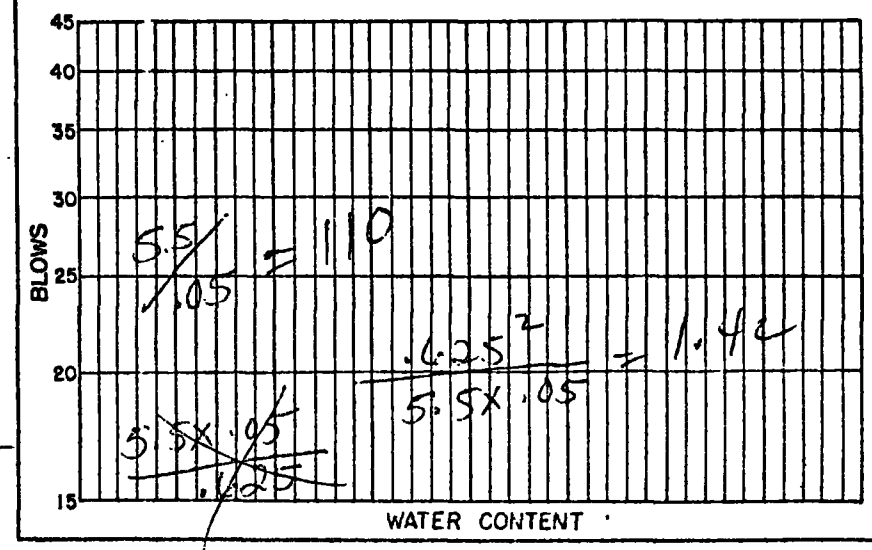
			-40	22.55	27
-3/4	63.62	100	-80		
-4	23.65	56	-140		
-10	17.6	39	-200	16.78	12

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place .....
Date 5-25-83

Dear Sir: Moist. ONLY.

I have forwarded by today's ..... the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam
SR No. ..... Sub-Section .....

Station & Offset 141 28' Lt. Hole # C-4

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4580		13'			CAN #18 51.27 33.89 H20: 51%

1 copy with samples
1 copy to addressee

Yours very truly,

.....
Inspector.

DOT FORM 351-002 REVISED 2/80

3

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 5-27-83

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7267 Section Hoquiam Bypass
SR No. 101A Sub-Section cut section

Station & Offset 143+ 28' LT Hole # C-5

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4581	D-1	0' 0" 2' 0"	89%	OH	Wet, Cly. F. Sdy. Silt w/ org. twigs & Blk. Burnt Wood Pieces
4582	U-2	2' 0" 2' 4"	A		
4583	D-3	4' 0" 6' 0"		OH	LK 4492-2 Wet, Sl. Orangish Brn., Org. F. Sdy. Silt w/small Cementations
4584-1	U-4	7' 0" 7' 4"	A		
-2		7' 4" 7' 8"	B		
-3		7' 8" 8' 0"	C		
4585	D-5	9' 0" 11' 0"		OH	LK 4492-3 Wet, tan & Gn. w/oxidiz., Sl. org. Cly. F. Sdy. Silt
4586-1	U-6	12' 0" 12' 4"	A		
-2		12' 4" 12' 8"	B		

1 copy with samples
1 copy to addressee

Yours very truly,
Milford J. Sanders
Inspector.

DOT FORM 351-002 REVISED 2-80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 5-27-83

Dear Sir:

I have forwarded by today's State Car the following Foundation Samples.

Contract or Job No. L-7262 Section Magnolia bypass
SR No. 101A Sub-Section Cut Section

Station & Offset 143 + 28' LT Hole # C-5

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4587	D-7	14' 0" 16' 0"		OH	LK 4492-3 wet, tan & Gr. w/oxidiz., Sl. Org. Cly. F. Sdy. SILT
4588-1	D-8	17' 0" 17' 4"	A		
-2		17' 4" 17' 8"	B		
-3		17' 8" 18' 0"	C		
-4		18' 0" 18' 4"	D		
4589-1	D-9A	19' 0" 20' 0"		OL	LK 4492-6 wet, Gr & Blk., Org., Cly. F. Sdy. SILT w/ Cementations
-2	D-9B	20' 0" 21' 0"	52%	OH	M-W Gr. Org., Cly. F. Sdy. SILT
-3	D-11	23' 0" 25' 0"		SP SM	LK 4492-12 Moist, Gr., Grn. & Olive yellow Sty. F. & Gruly. F-C SAND
-4	D-12	27' 0" 29' 0"		GW GM	LK 4579-4 M, Gr. V. Sty. F-C Sdy. F. SR GRAVEL

1 copy with samples
1 copy to addressee

Yours very truly,
Milford J. Rondeau
Inspector.

DOT FORM 351-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 5-27-83

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7202 Section Hoquiam bypass
SR No. N/A Sub-Section Cut Section

Station & Offset 1432 23' LT Hole # C-5

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4589 -5	D-13	32'0" 34'0"		SW GM	LK 4579-4 M, GR. V. Sty. F-C Sdy. F. SR GRAVEL
-6	D-14	37'0" 37'11"		SM	LK 4524-8 moist, orange-Gr., V. Sty F. S.R. Gravy. F-C SAND

1 copy with samples
1 copy to addressee

Yours very truly,

Milford J. Sanders
Inspector.

DOT FORM 351-002

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

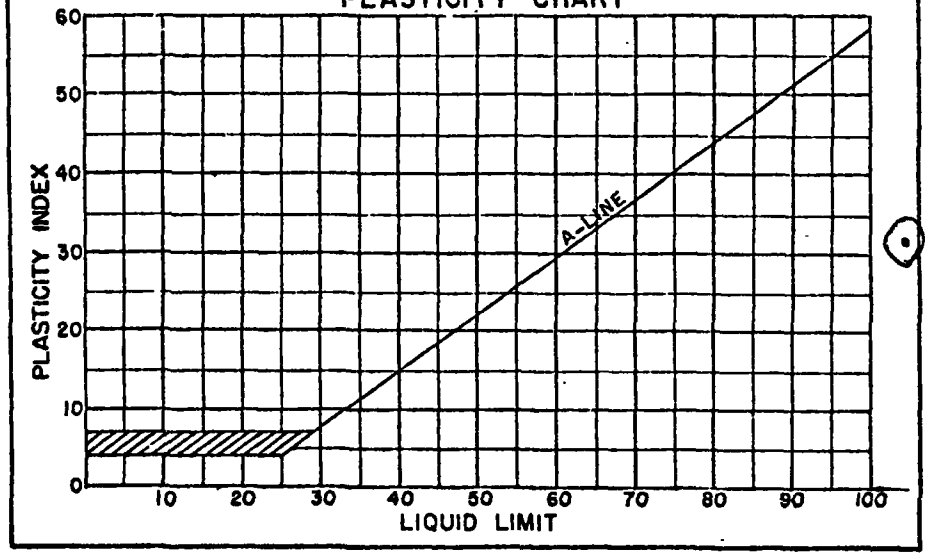
SAMPLE NO. 4581 JOB NO. 4108. HOLE NO. C-5
DATE 6-8-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			✓
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: Wet, Cly. F. Sdy. SILT W/ org. twigs & BLK. Burnt Wood Pieces

PLASTICITY CHART

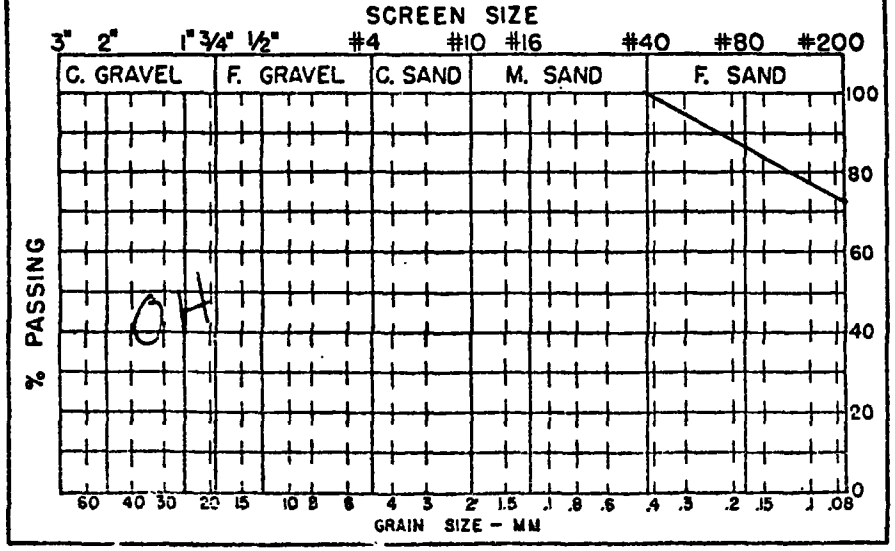


H2O = 89 %

SIEVE ANALYSIS % Passing 27.42

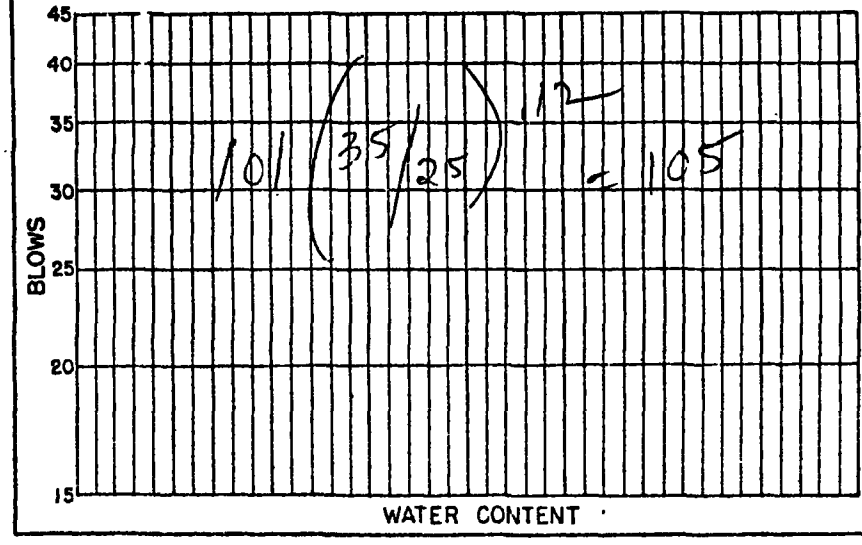
	-40	7.52	100
-3/4	-80		
-4	-140		
-10	-200	19.9	73

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	73				58
Wet Wt.	19.72				8.95
Dry Wt.	9.8				5.2
% H_2O	101				PL= 72
Blows	35				PI= 33



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

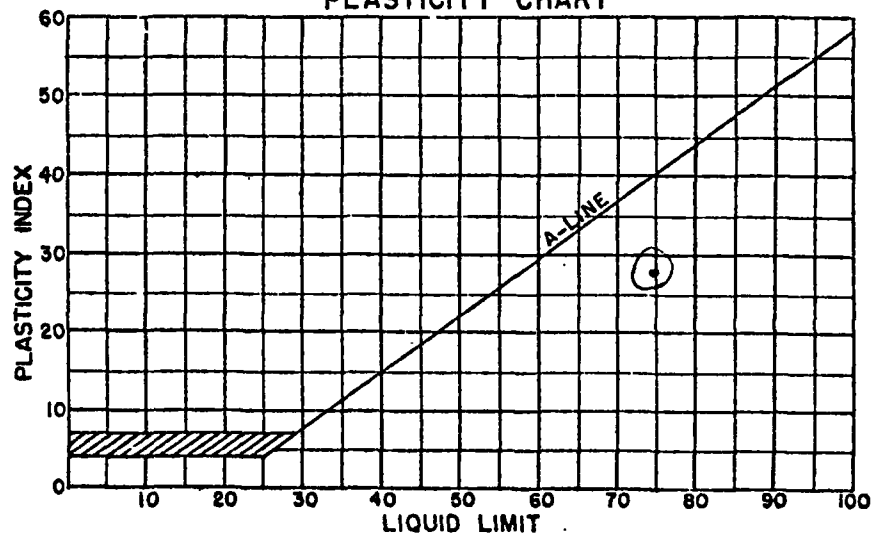
SAMPLE NO. 4589-2 JOB NO. Log. HOLE NO.
DATE 6-8-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: M-W Gr. org. cly. F. Sdy. Silt

PLASTICITY CHART

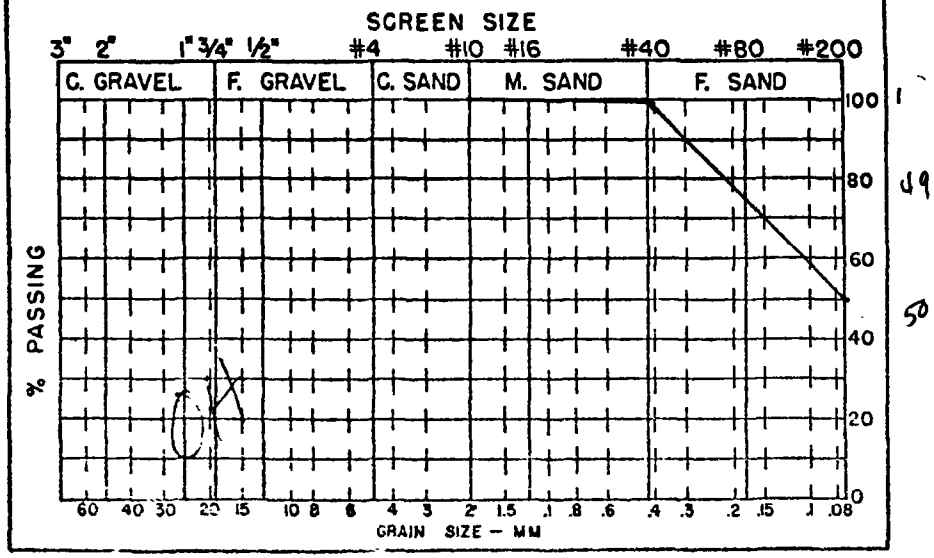


H2O = 52%

SIEVE ANALYSIS % Passing 56.12

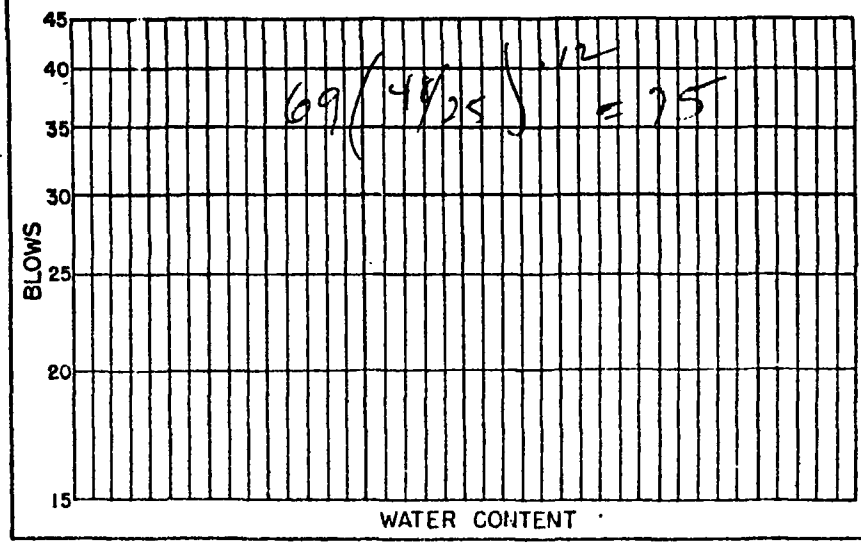
		-40	28.0	99
-3/4		-80		
-4		-140		
-10	.05	100	-200 28.05	50

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	74				71
Wet Wt.	25.32				8.92
Dry Wt.	14.99				6.05
% H_2O	69				PL= 47
Blows	48				PI= 28



DOT FORM 351-[illegible]

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

ATERIALS ENGINEER
aterials Laboratory
O. Box 167, Olympia, WA 98504 (Mailing Address)
55 So. 2nd Ave.
mwater, Washington 98504 (Shipping Address)

Place Tumwate
Date 6-2-83

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section West Hoquiam by Pass
SR No. 101A Sub-Section Cut section

Station & Offset 144~ 14' Lt. Hole # C-6

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4615	D-1	0' 0" 2' 0"	51%	MH	Wet, Orange-tan, Cly. F. Sdy. SILT
4616-1	U-2	2' 6" 2' 10"	A		
-2		2' 10" 3' 2"	B		
4617	D-3	4' 6" 6' 6"		MH	LK 4615 Above w/ trace organic & small cementations Wet, ORANGE-TAN, Cly. F. Sdy. SILT
4618-1	U-4	7' 6" 7' 10"	A		
-2		7' 10" 8' 2"	B		
4619-1	D-5	9' 6" 11' 6"		MH	LK 4544-2 Wet, Gr. Brn., Cly. F. Sdy. SILT
-2	D-6-A	12' 6" 13' 6"		SM	Wet, Gr. & TAN, Cly. V. Sdy. F. SAND w/some cementations
-3	D-6-B	13' 6" 14' 6"		MH	LK 4544-2 Wet, Gr. Brn., Cly. F. Sdy. SILT w/ cementations

opy with samples
opy to addressee

Yours very truly,

Inspector.

IT FORM 351-002 REVISED 2-80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

ATERIALS ENGINEER
aterials Laboratory
O. Box 167, Olympia, WA 98504 (Mailing Address)
55 So. 2nd Ave.
imwater, Washington 98504 (Shipping Address)

Place .....

Date .....

Dear Sir:

I have forwarded by today's ..... the following Foundation Samples.

Contract or Job No. L-7262 Section ..... SR No. ..... Sub-Section .....

Station & Offset 144~ 14' Lt Hole # C-6

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4620	U-7	17' 6" 19' 6"	I.D. only	SM	LK 4619-2 Wet, Gr. & Tan, Cly. V. Sty. F. SAND w/some Cementations
4621 -1	D-8	19' 6" 21' 6"	48%	MH	M, Gr-Grn., Cly. F. Sdy. SILT w/Lg. Waxy Cementations
-2	D-9	22' 6" 24' 6"		MH	SAME
-3	D-10	27' 6" 29' 0"	15%	GP GM	M. Olive, Gr Grn. Sty. F-C Sdy. 1"(-) S.R. GRAVEL
-4	D-11	32' 6" 34' 0"	51%	ML	Wet, Cinammon Brn f. gruly. F-C Sdy. SILT
-5	D-12-A	37' 6" 39' 0"	14%	GW GM	M, Gr. Grn. Sty. F-C Sdy. 1"(-) SA. & SR. GRAVEL
-6	D-12-B	39' 0" 39' 6"		MH	LK 4524-10 Wet, Gr. F-C Sdy. F. Gruly. SILT w/t. MICA & Zones & F. Sdy. mtr.
-7	D-13	42' 6" 44' 6"		SM	LK 4527-2 BUT W/O LAYERS OR ORGANIC Wet, Gr. V. Sty. F. SAND w/t. med. SAND & MICA
-8	D-14	47' 6" 49' 6"		SM	SAME

opy with samples
opy to addressee

Yours very truly,

.....
Inspector.

FORM 361-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

ATERIALS ENGINEER
aterials Laboratory
O. Box 167, Olympia, WA 98504 (Mailing Address)
55 So. 2nd Ave.
mwater, Washington 98504 (Shipping Address)

Place .....

Date .....

Dear Sir:

I have forwarded by today's ..... the following Foundation Samples.

Contract or Job No. L-7262 Section ..... SR No. ..... Sub-Section .....

Station & Offset 144~ 14' Lt. Hole # C-6

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4621-9	D-15	52' 6" 54' 0"	11%	SM	M, Grn. Gray f. gruly. V. Sty. F-C SAND
-10	D-16	57' 6" 59' 0"	30%	SM	M-W Grn. Gr. Zoned Layers of Sty. F. SAND
-11	D-17	62' 6" 64' 0"		SM	SAME w/t. ORG. STREAKS

opy with samples
opy to addressee

Yours very truly,

Barry M Moore

Inspector.

FORM 351-002

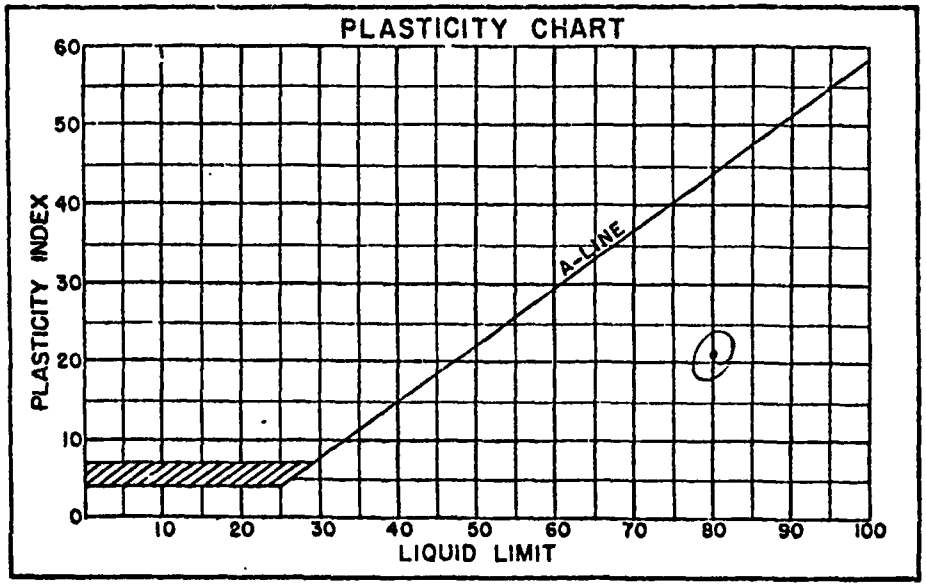
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4615 JOB NO. ~~408~~ HOLE NO. C-6
DATE 6-8-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	✓
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

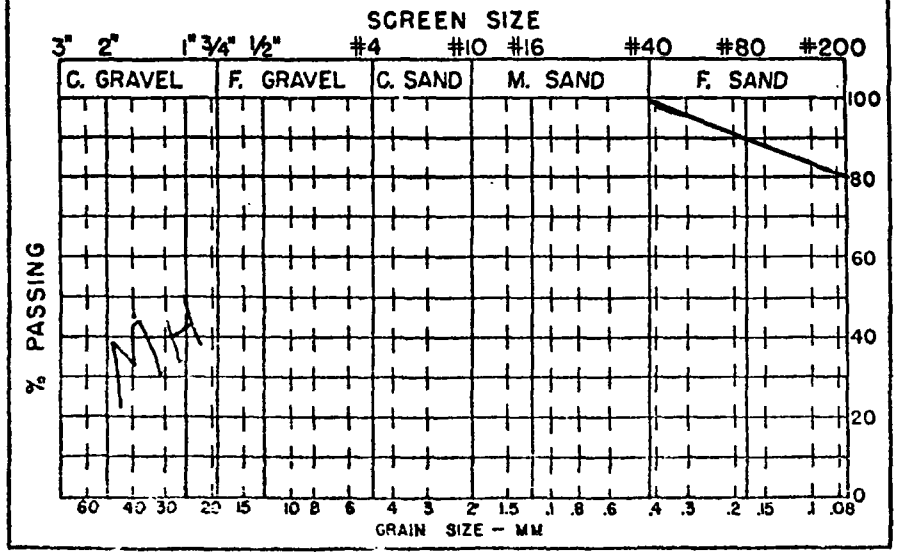
DESCRIPTION: Wet, orange - tan, Cly. F. Sdy. SILT



H_2O = 51%

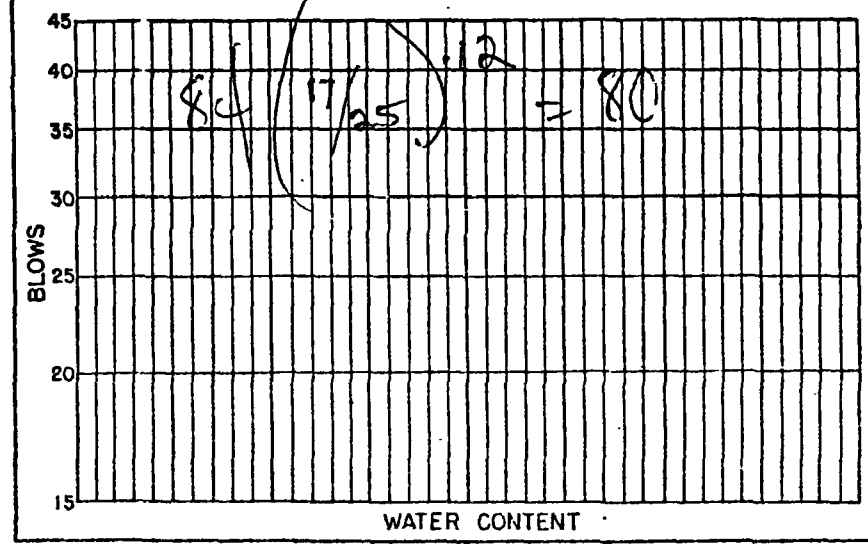
SIEVE ANALYSIS		% Passing 41.88
	-40 8.35	100
-3/4	-80	
-4	-140	
-10	-200 33.53	80

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	41				32 N/P
Wet Wt.	17.32				14.45
Dry Wt.	9.43				9.10
% H_2O	84				PL= 59
Blows	17				PI= 21



$84 \left(\frac{17}{25}\right)^{.12} = 80$

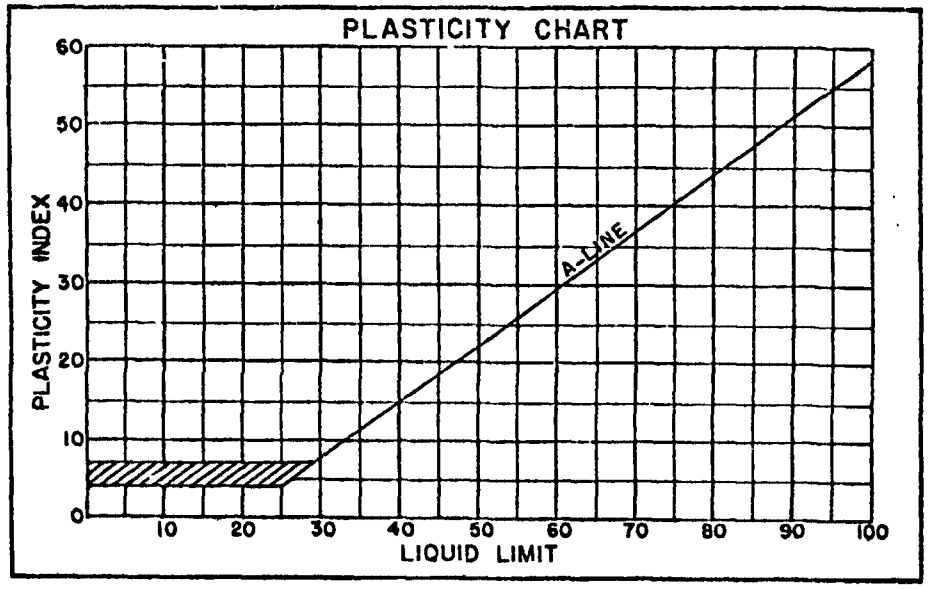
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4619-2 JOB NO. Hog HOLE NO.
DATE 6-20-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	✓

DESCRIPTION: Wet, GR., Cly. V. Sty. F. SAND w/some Cementations.

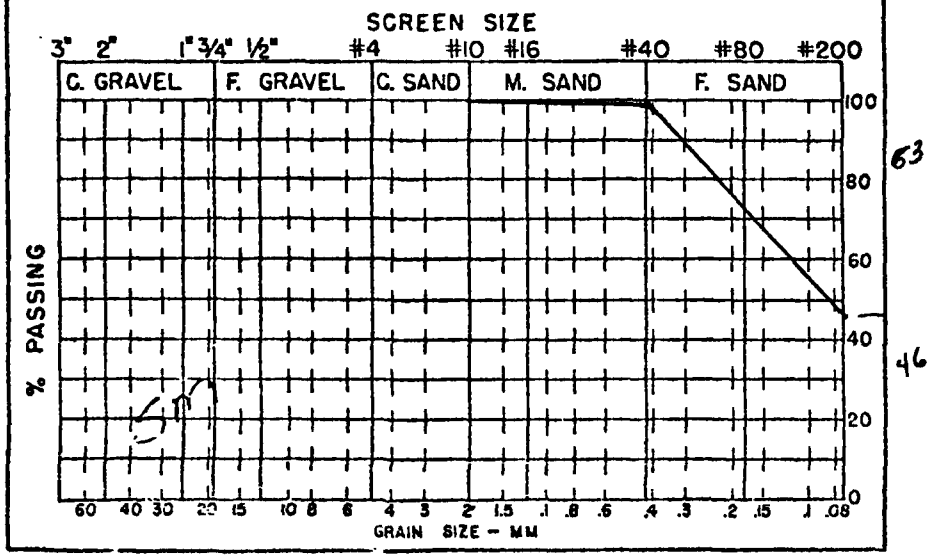


H_2O = 76%

SIEVE ANALYSIS % Passing 79.97

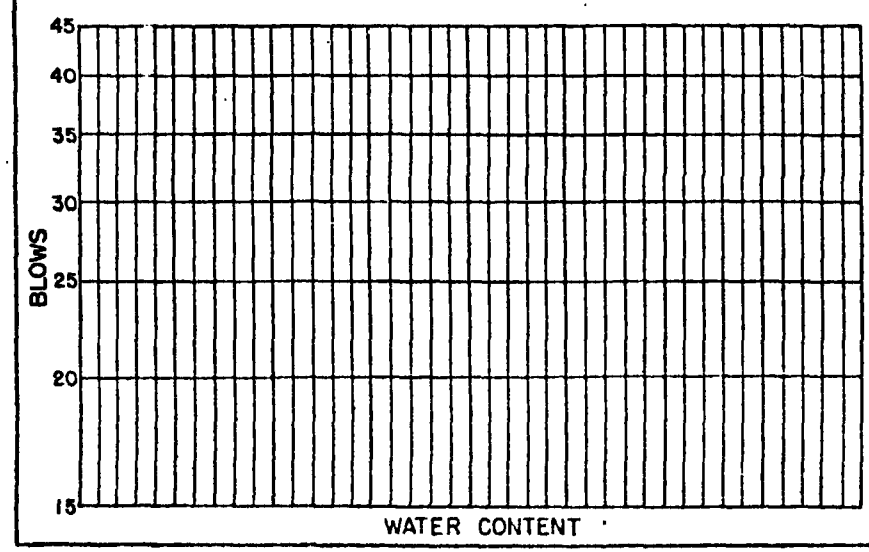
	-40	42.45	99
-3/4	-80		
-4	-140		
-10 1.10 100	-200	36.42	46

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



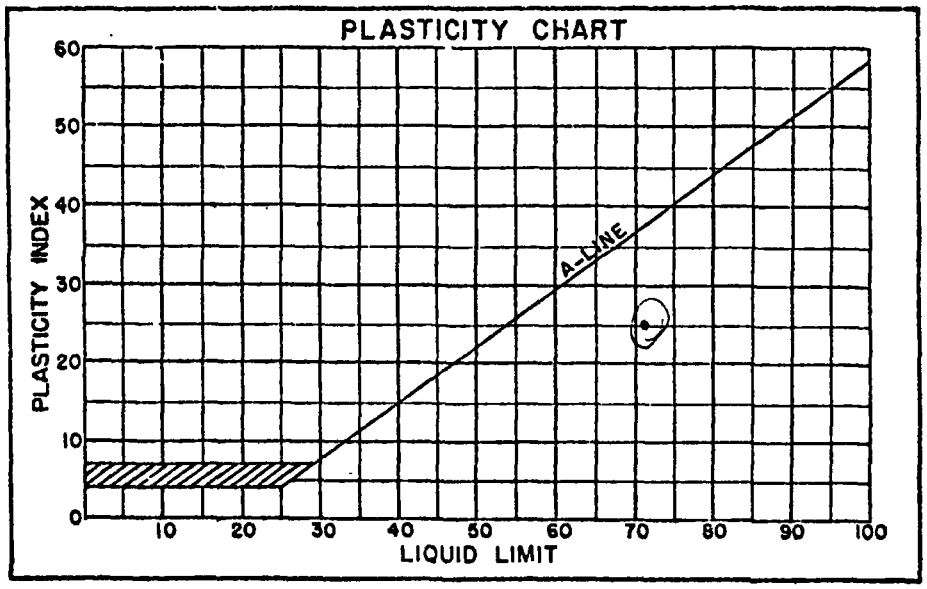
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4621-1 JOB NO. 108 HOLE NO. C-6
DATE 6-9-83 OPERATOR BL

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	✓

DESCRIPTION: M, GR-GRN., Cly. F. Sdy. SILT w/Lg. Waxy Cementations

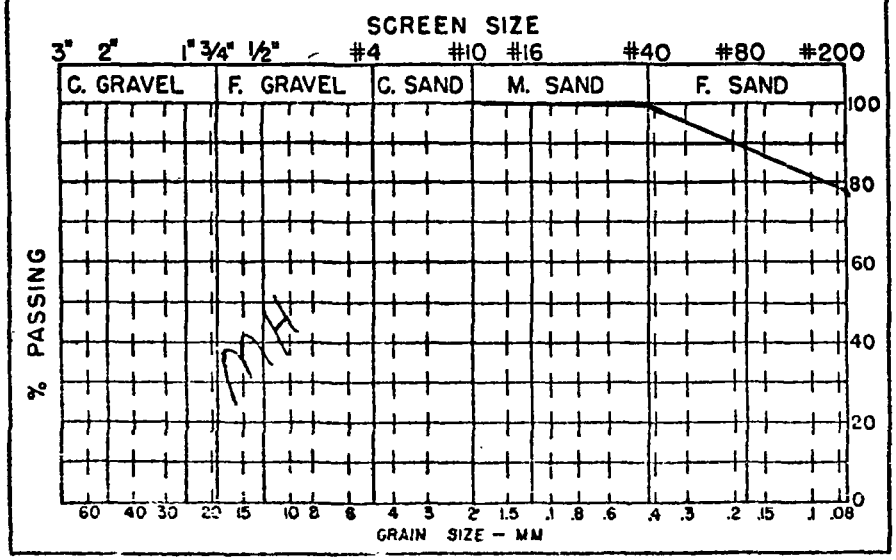


H_2O = 4.8%

SIEVE ANALYSIS % Passing 76.9

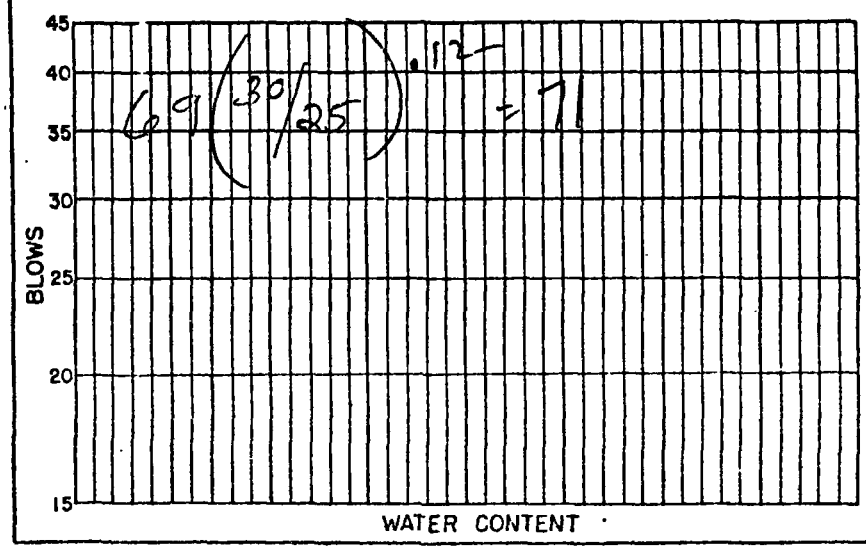
		-40 16.85	90
-3/4		-80	
-4		-140	
-10	.2	100 -200 59.85	78

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	62				65
Wet Wt.	16.10				8.88
Dry Wt.	9.55				~~6.20~~ 6.10
% H_2O	69				PL= 46
Blows	30				PI= 25



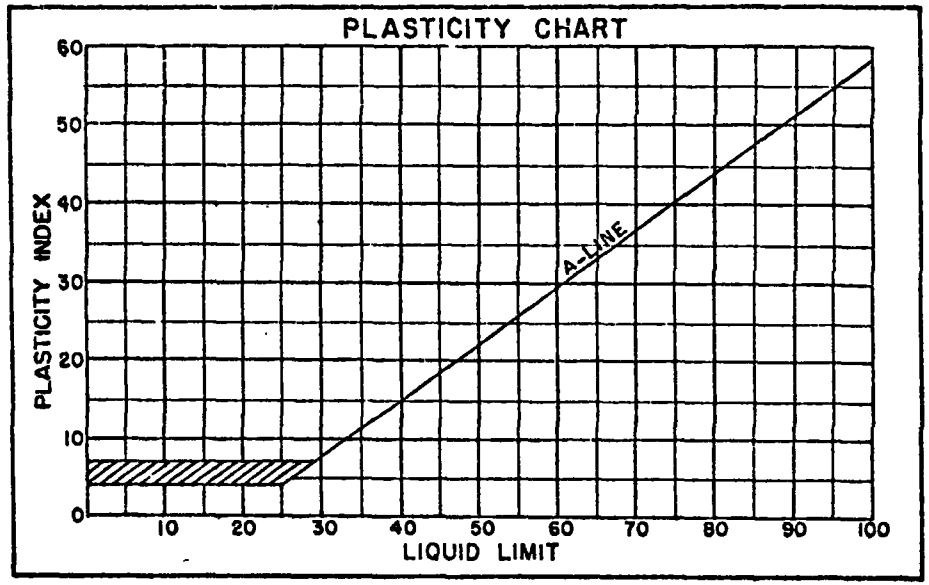
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4621-3 JOB NO. ~~Hog~~ HOLE NO. C6
DATE 6-20-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: M, Olive, 9R, GRN.
Sty. F-C Sdy. 1"(-)
SR. GRAVEL



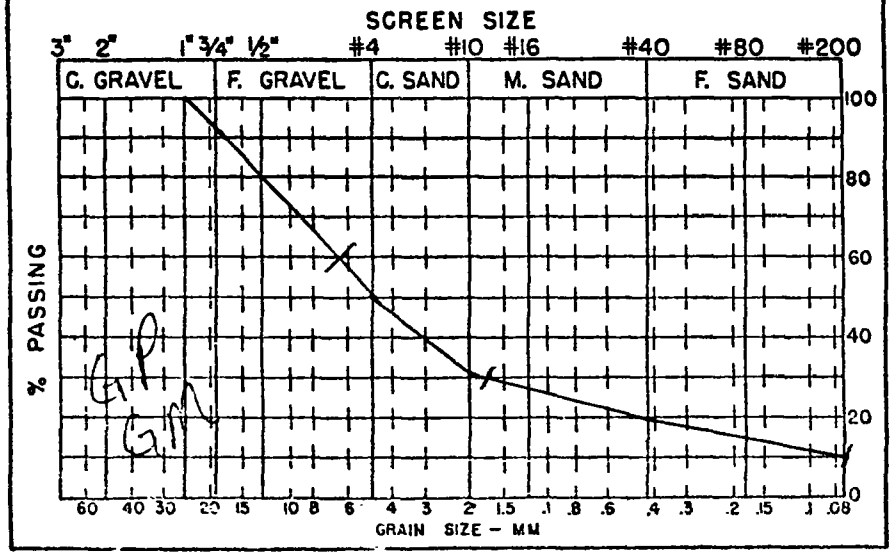
H_2O = 15%

SIEVE ANALYSIS % Passing 183.95

ONE

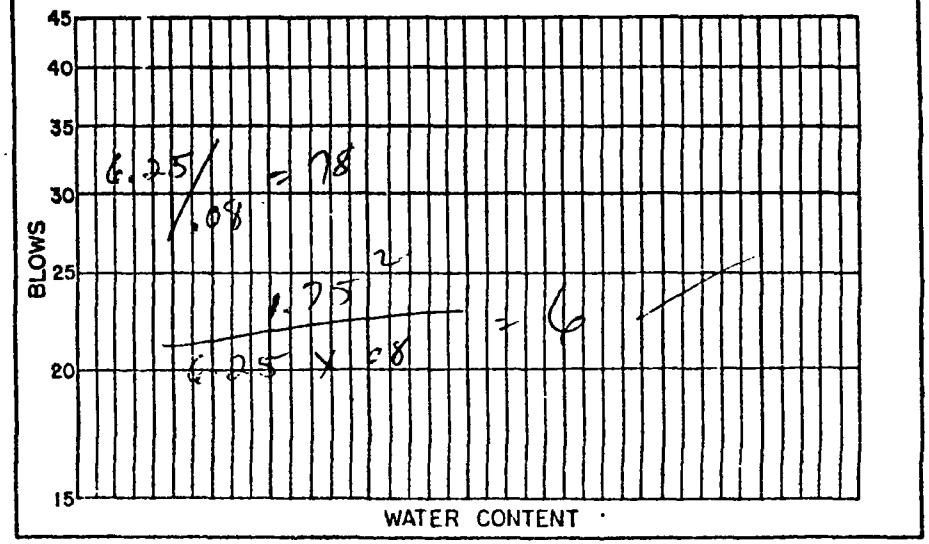
-1	13.32	100	-40	18.2	20
-3/4	28.8	99	-80		
-4	34.88	90	-140		
-10	20.42	31	-200	18.33	10%

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

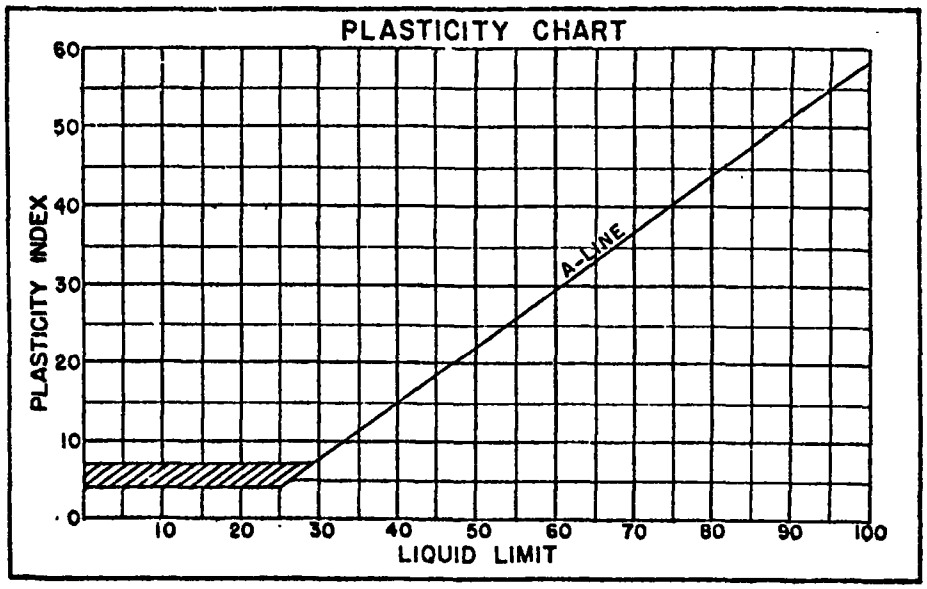
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4621-4 JOB NO. Hoy. HOLE NO. C6
DATE 6-20-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Wet, Cinnamon BRN
F. Gruly. F-C Sdy. SILT

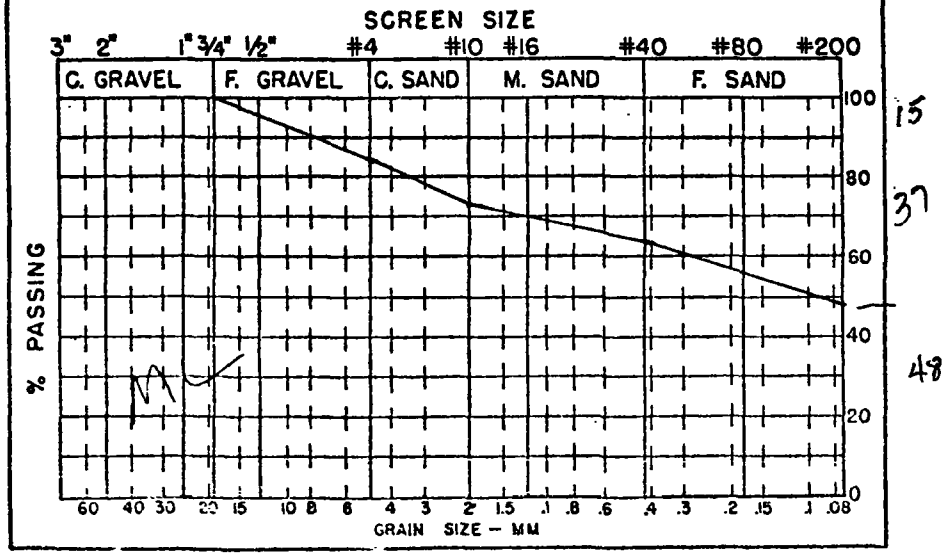


H_2O = 51 %

SIEVE ANALYSIS % Passing 138.0

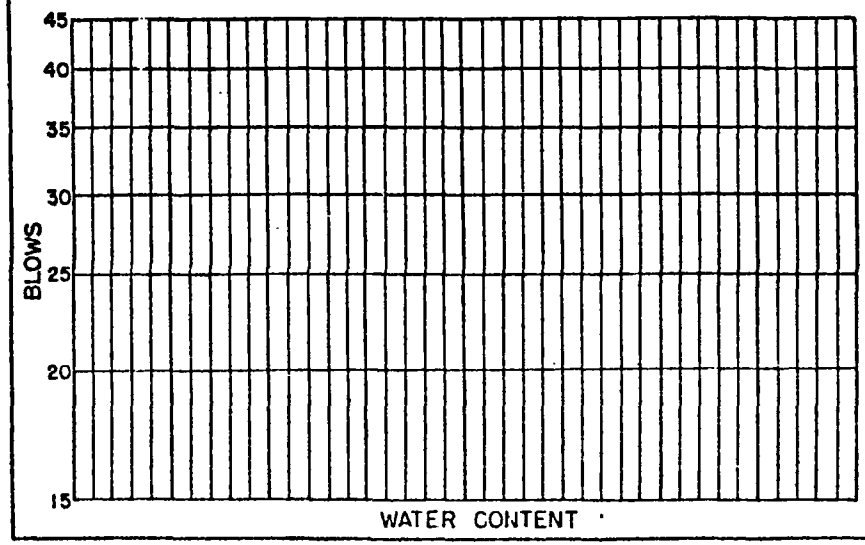
			-40	22.10	64
-¾	20.35	100	-80		
-4	16.35	85	-140		
-10	12.78	73	-200	16.42	48

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-014

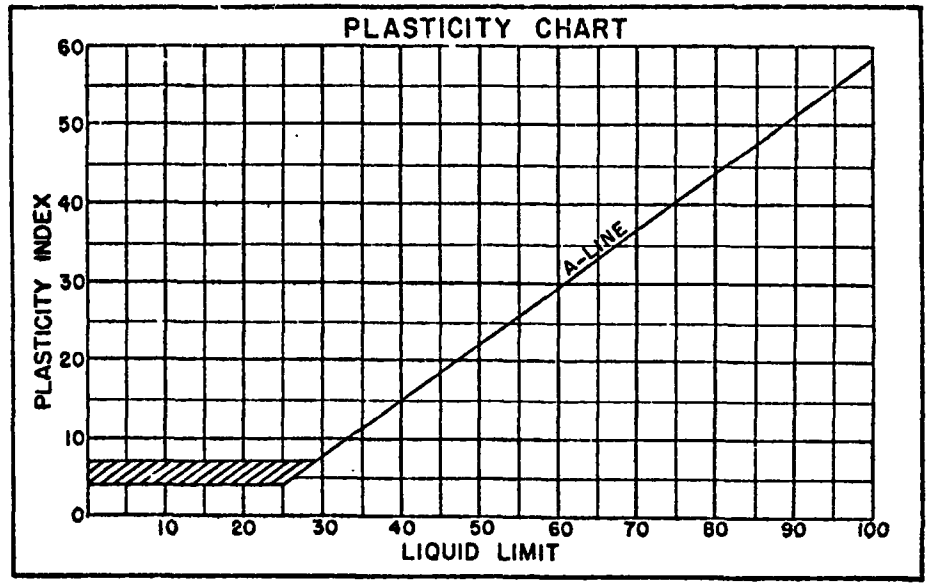
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4621-5 JOB NO. 8-69 HOLE NO. C-6
DATE 6-20-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: M, GR Grn. Sty.
F-C Sdy. 1"-F) SA & SR
GRAVEL

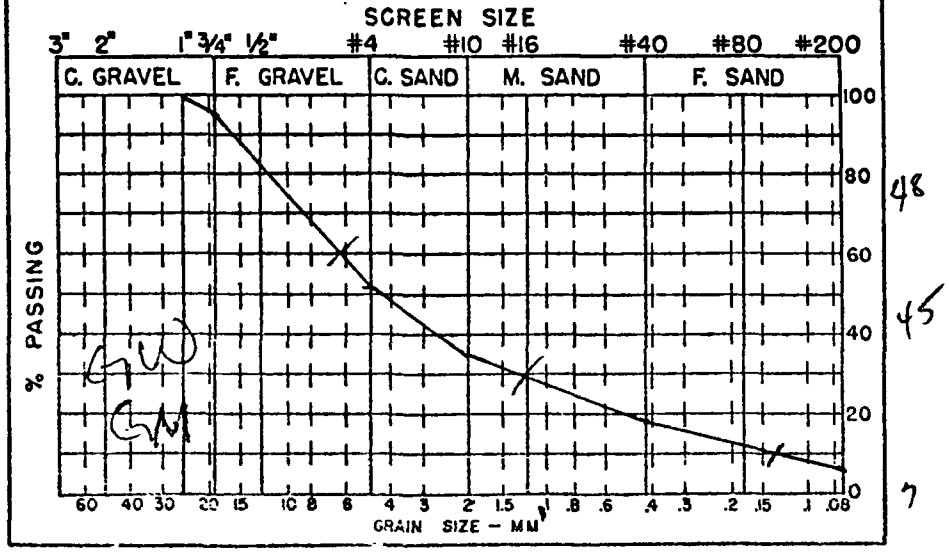


$H_2O = 14\%$

SIEVE ANALYSIS % Passing 160.85

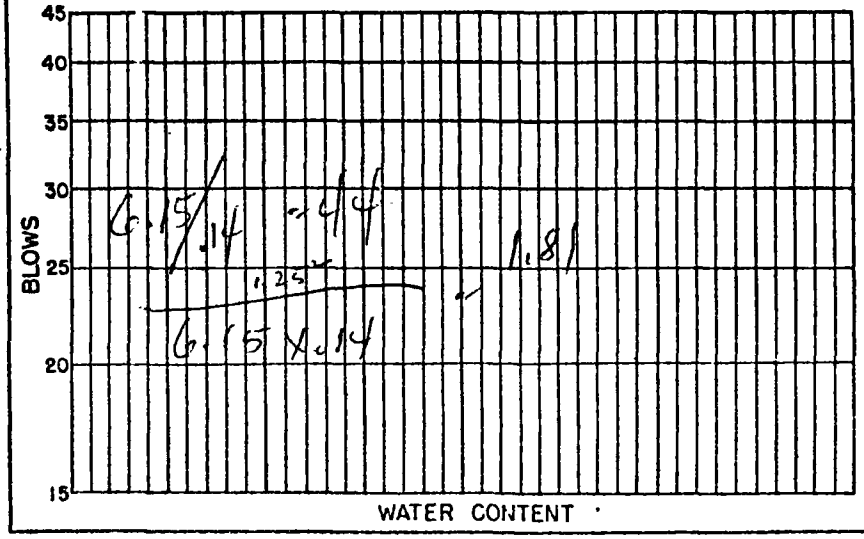
-1	8.82	100	-40	17.22	18
-3/4	67.93	95	-80		
-4	25.95	52	-140		
-10	29.72	36	-200	11.21	7

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



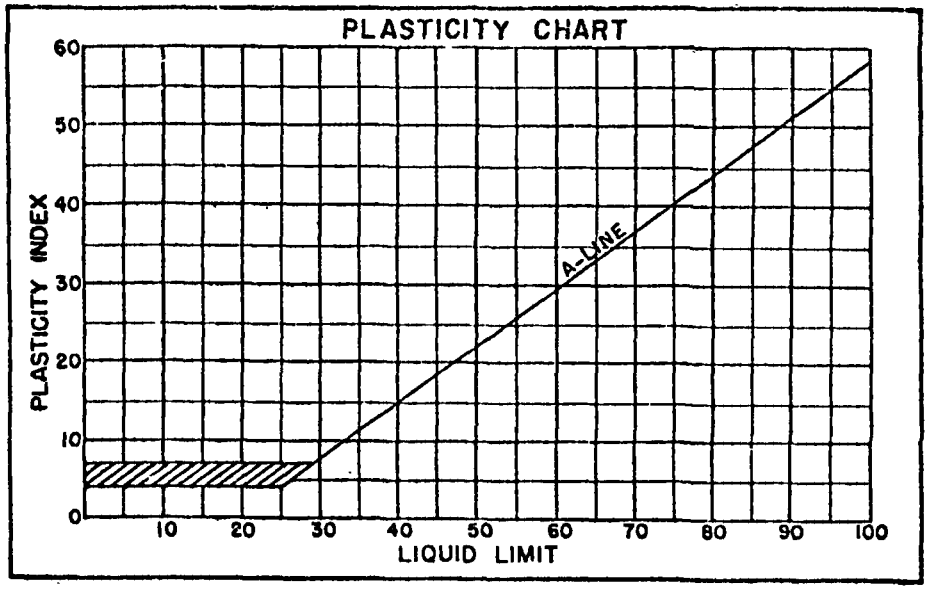
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4621-9 JOB NO. Hog. HOLE NO. C-6
DATE 6-20-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS		✓	

DESCRIPTION: M, GRN GRAY, f. gruly
U. Sty. F-C. SAND

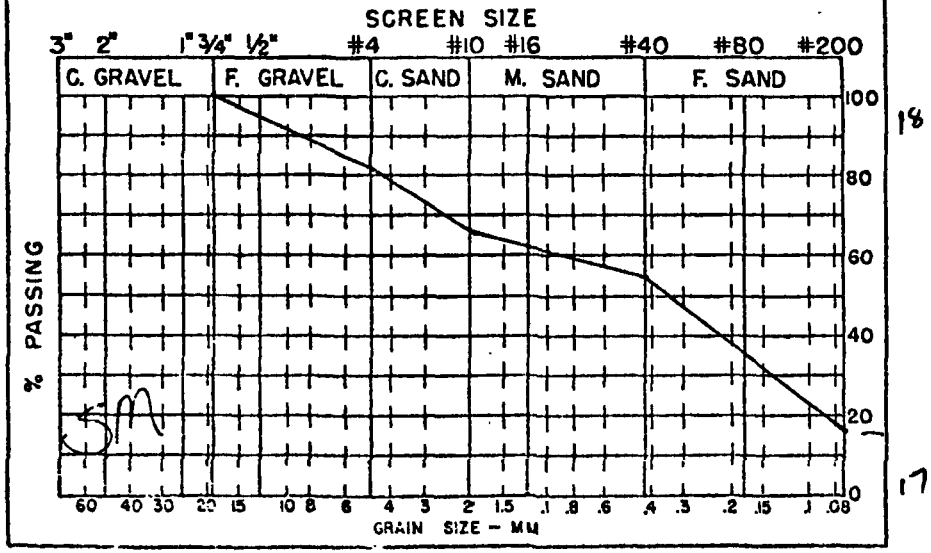


H_2O = 11%

SIEVE ANALYSIS % Passing 139.2

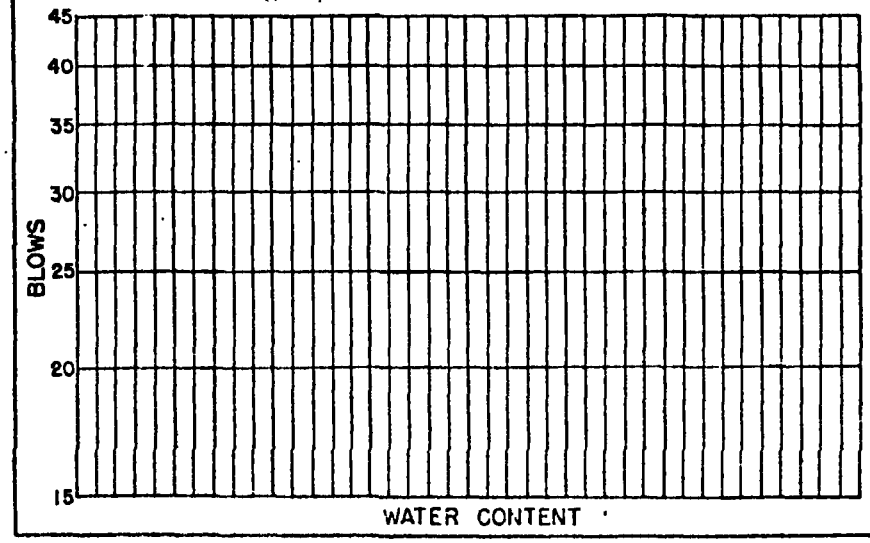
			-40	51.55	54
-¾	25.71	100	-80		
-4	20.82	82	-140		
-10	17.26	67	-200	23.84	17

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-014

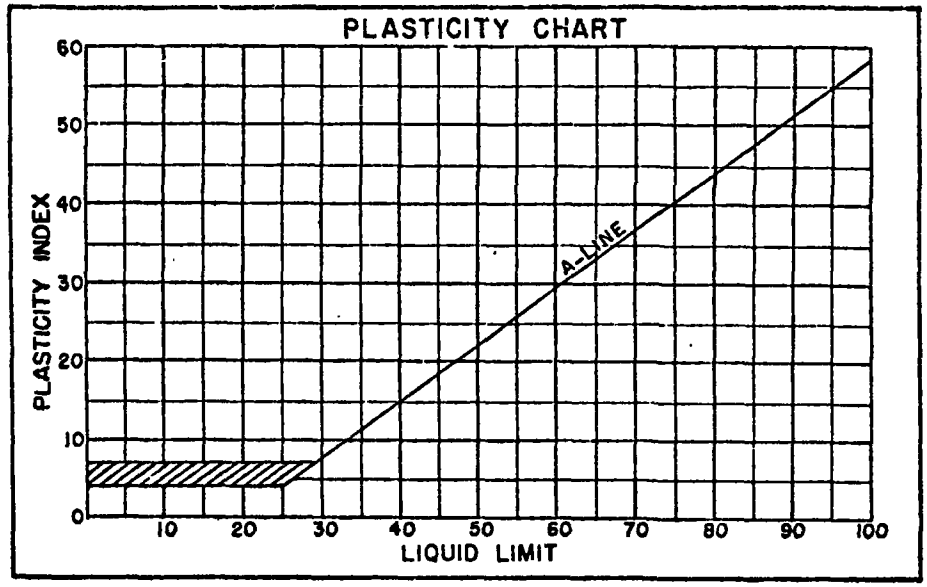
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4621-10 JOB NO. 4-08. HOLE NO. C6
DATE 6-20-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE		✓	
TOUGHNESS	✓	✓	

DESCRIPTION: M-W Grn. GR.
Zoned Layers of Sty.
F. SAND

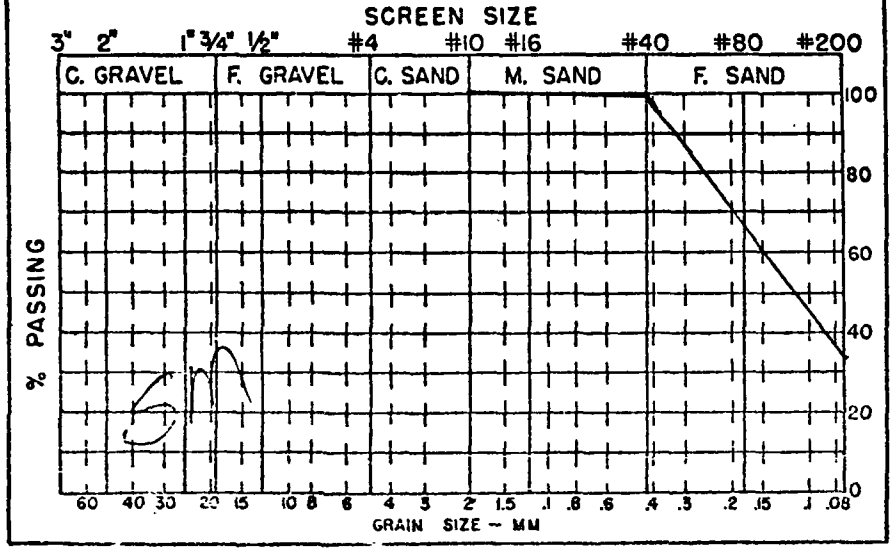


$H_2O = 30\%$

SIEVE ANALYSIS % Passing 123.0

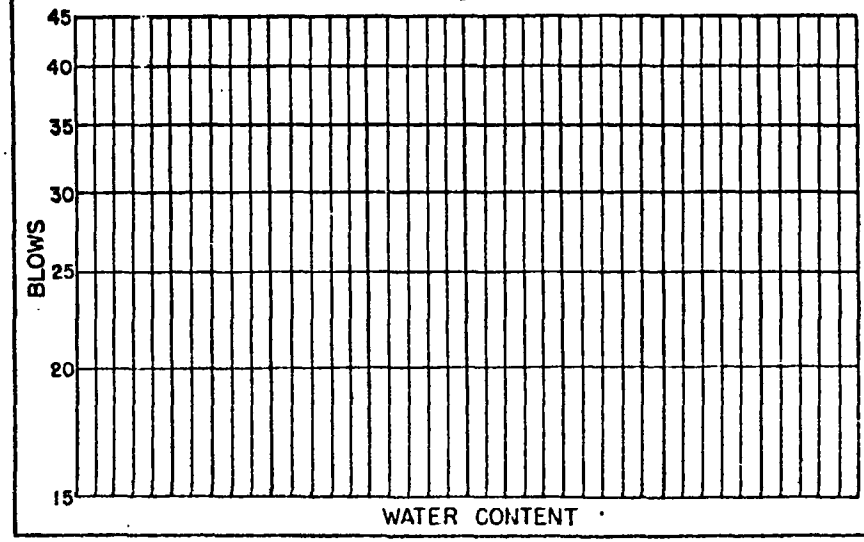
	-40	81.8	99
-3/4	-80		
-4	-140		
-10 .7	100	-200 40.5	33

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

ATERIALS ENGINEER
aterials Laboratory
O. Box 167, Olympia, WA 98504 (Mailing Address)
55 So. 2nd Ave.
mwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 6-3-83

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section West Hoquiam by PASS
SR No. 101 A Sub-Section Cut Section

Station & Offset 145+45 28' Lt Hole # C-7

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4635	D-1	0' 0" – 2' 0"	62%	OH	Wet, tan w/t. orange ORG. Cly. Silt w/ Cementations
4636	U-2	3' 0" – 3' 4"	A		
4637	D-3	5' 0" – 7' 0"	58%	OH	Wet, tan w/or throughout, Cly., ORG. Silt w/small Rust-color Cement.
4638 -1	U-4	8' 0" – 8' 4"	A		
-2		8' 4" – 8' 8"	B		
4639	D-5	10' 0" – 12' 0"	56%	MH	Wet, tan orange & BLK., Cly. F. Sdy. Silt w/ Cement.
4640 -1	U-6	13' 0" – 13' 4"	A		
-2		13' 4" – 13' 8"	B		
-3		13' 8" – 14' 0"	C		

opy with samples
opy to addressee

Yours very truly,

Inspector.

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

ATERIALS ENGINEER
aterials Laboratory
O. Box 167, Olympia, WA 98504 (Mailing Address)
55 So. 2nd Ave.
mwater, Washington 98504 (Shipping Address)

Place .....

Date .....

Dear Sir:

I have forwarded by today's ..... the following Foundation Samples.

Contract or Job No. L-7262 Section ..... SR No. ..... Sub-Section .....

Station & Offset 145+45 28'Lt. Hole # C-7

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4640 -4	U-6	14' 0" 14' 4"	D		
4641	D-7	15' 0" 17' 0"	65%	CH MH	Wet, Gr. Inside, grn., olive yellow out Clay & F. Sdy. Silt
4642 -1	U-8	18' 0" 18' 4"	A		
-2		18' 4" 18' 8"	B		
-3		18' 8" 19' 0"	C		
-4		19' 0" 19' 4"	D		
4643	D-9	20' 0" 22' 0"		ML	LR 4630 M-W Gr w/tan outside & t. Rust F. Sdy. Silt w/T. mica
4644 -1	U-10	23' 4" 23' 8"	B		
-2		23' 8" 24' 0"	C		

py with samples
py to addressee

Yours very truly,

.....
Inspector.

FORM 351-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
555 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place .....

Date .....

Dear Sir:

I have forwarded by today's ..... the following Foundation Samples.

Contract or Job No. L-7262 Section ..... SR No. ..... Sub-Section .....

Station & Offset 145+45 28' Lt. Hole # C-7

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4645 -1	D-11	24' 0" 26' 0"		mL	LK 4630 M-W Gr w/ Tan outside & T. Rust F. Sdy. Silt w/T. Mica
-2	D-12	28' 0" 30' 0"	56%	mL	M-W Brn. F. Sdy., Org. Silt w/one 3/4" (±) Piece of wood which mulled down
4646 -1	U-13	33' 0" 33' 4"	A		
-2		33' 4" 33' 8"	B		
-3		33' 8" 34' 0"	C		
4647 -1	D-14	35' 0" 37' 0"	77%	mL	Visual Looks moist - % = Water Bearing. Brn & dk. Brn., Sl. Cly. F. Sdy. Silt w/ org. Layer
-2	D-15	38' 0" 40' 0"	202%	OL	Blk & Brn. decomposed wood Sl. F. Sdy. Silt w/ Mica
-3	D-16-A	43' 0" 44' 0"	48%	SM	Wet, tan Org. V. Sty. F. SAND
-4	D-16-B	44' 0" 45' 0"	40%	SM	Visual = Dry % = Wet Gr-Brn. V. Sty. F. S.A. Gruly. F-C SAND

Copy with samples
Copy to addressee

Yours very truly,

.....
Inspector.

FORM 351-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place .....

Date .....

Dear Sir:

I have forwarded by today's ..... the following Foundation Samples.

Contract or Job No. L-7262 Section ..... SR No. ..... Sub-Section .....

Station & Offset 145+45 28' Lt. Hole # C-7

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4647 -5	D-17	48' 0" 49' 6"	24%	SM	M, Brn. & Gr. V. Sty. F. SR Gruly. F-C SAND
-6	D-18	53' 0" 55' 0"	29%	SM	M, Cinnamon w/t. tan & orange V. Sty. F. Layered Sand w/t. MICA AND Med. Sand
-7	D-19	58' 0" 60' 0"	23%	SM	M, Olive, yellow. & Gr. f. S.R. Gruly. V. Sty. F-C SAND
-8	D-20	63' 0" 65' 0"	19%	SM	M, Gr., Blk. & White (M-C SAND), Sl. Cly. V. Sty. F-C SAND Hy. Calc. white mtr.

Copy with samples
Copy to addressee

Yours very truly,

Barry M Moore
Inspector.

FORM 351-002

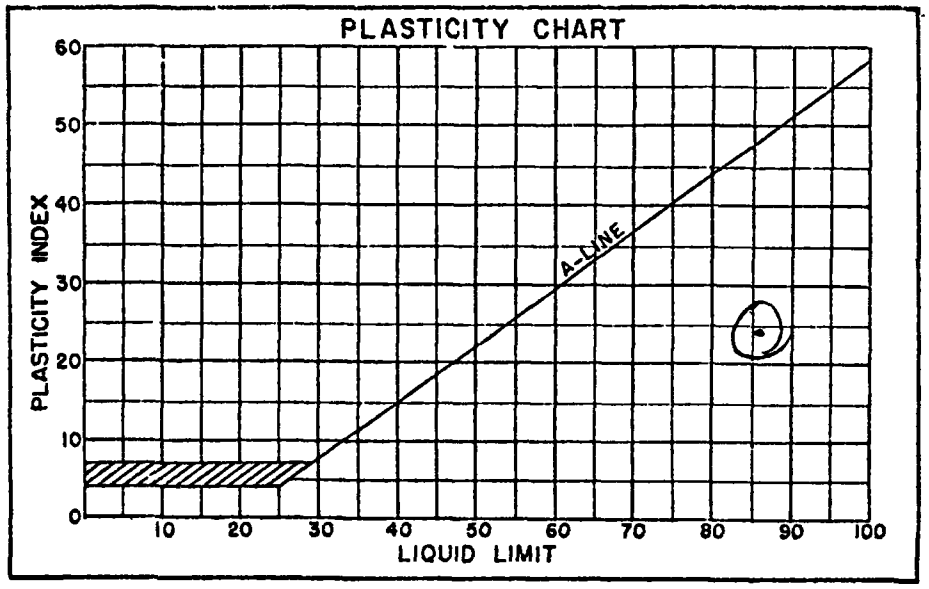
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4635 JOB NO. Hof. HOLE NO. C-7
DATE 6-21-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL		✓	✓
DRIED CAST		✓	
DILATANCY			
BITE			
TOUGHNESS		✓	

DESCRIPTION: Wet, tan w/ t. orange ORG., Cly. SILT w/ cementation

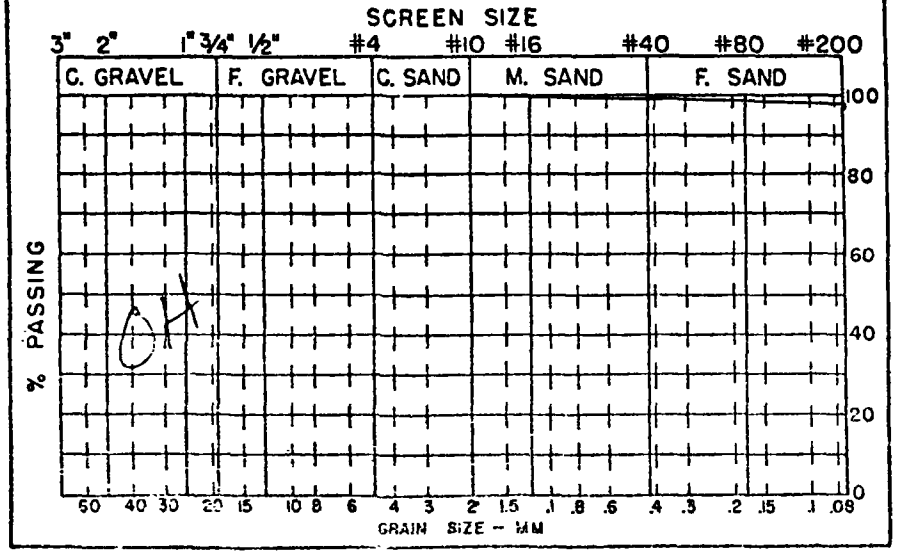


H2O = 6.27%

SIEVE ANALYSIS % Passing 45.95

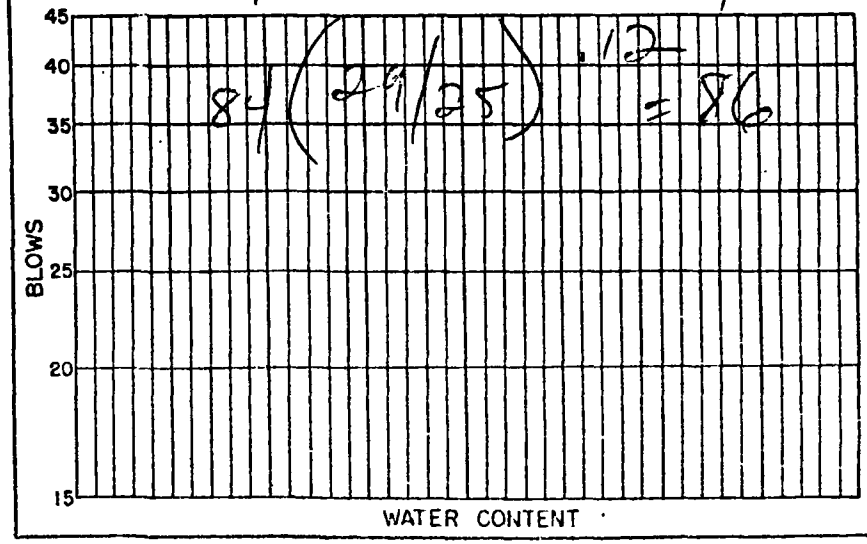
			-40	1.23	99
-3/4			-80		
-4			-140		
-10	.02	00	-200	44.7	97

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	57				64 N/P
Wet Wt.	20.9				6.145
Dry Wt.	11.37				3.97
% H_2O	84				PL= 62
Blows	29				PI= 24



DOT FORM 351-019

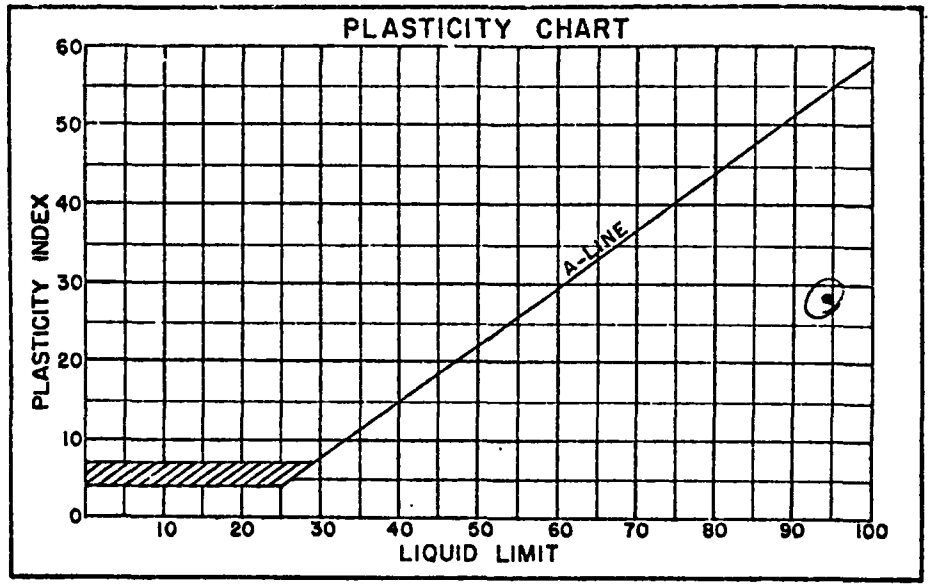
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4637 JOB NO. Hog. HOLE NO. C-7
DATE 6-21-83 OPERATOR BC ~~159~~

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	•		
DRIED CAST			
DILATANCY			
BITE			
SI. TOUGHNESS			✓

DESCRIPTION: Wet TAN w/ orange throughout
Cl. Sy. SI. LT w/ small Rust-Color
Cementations

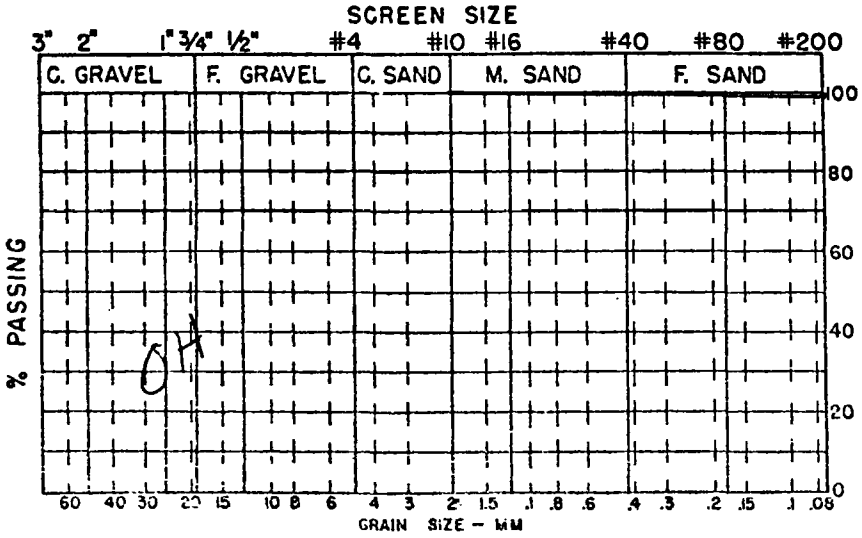


H_2O = 58%

SIEVE ANALYSIS % Passing 56.46

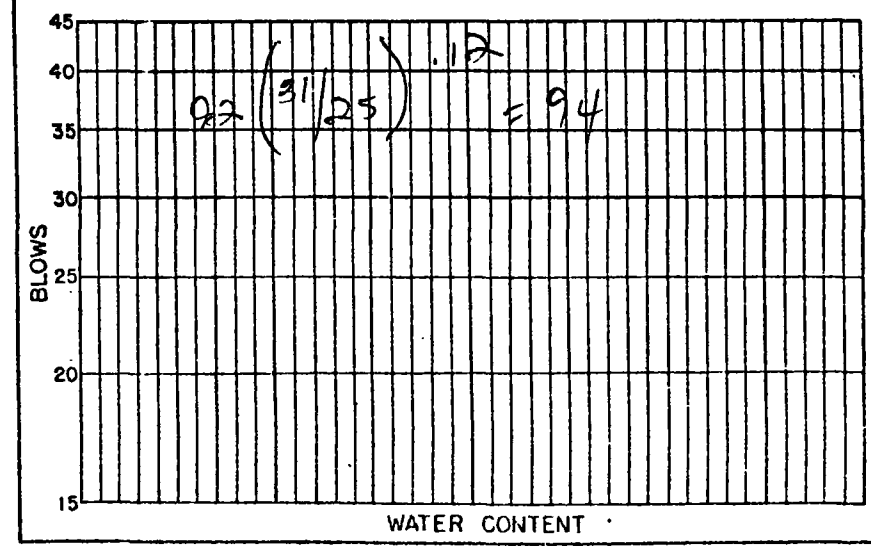
			-40	.78	99
-3/4			-80		
-4			-140		
-10	.02	100	-200	55.66	99

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	78				18
Wet Wt.	18.5				9.98
Dry Wt.	9.66				6.01
% H_2O	92				PL= 66
Blows	31				PI= 28



DOT FORM 351-019

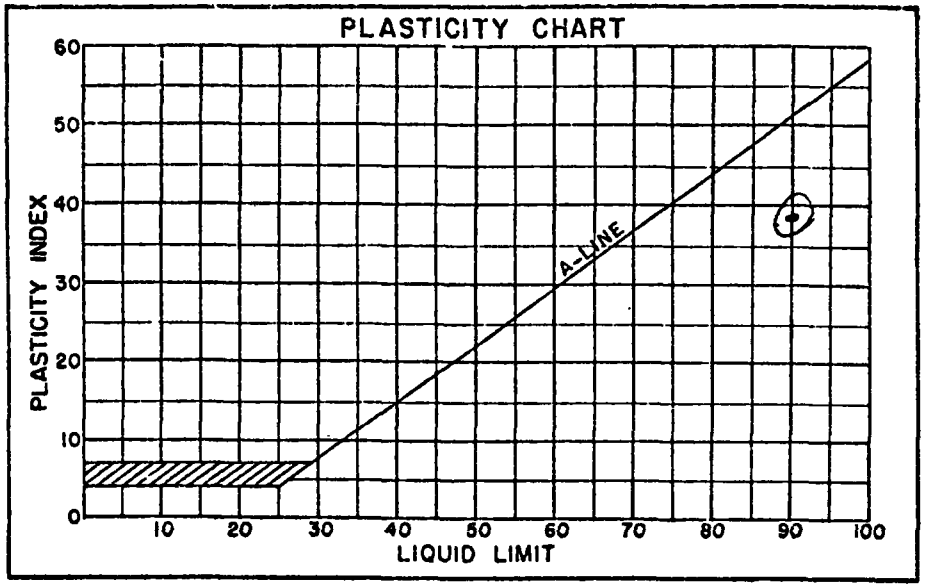
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4639 JOB NO. 4637 HOLE NO. C-7
DATE 6-21-83 OPERATOR BC ~~JSG~~

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			✓

DESCRIPTION: Wet TAN, Orange & Blk. Cly. F. Sdy. SiCT w/ Cementations

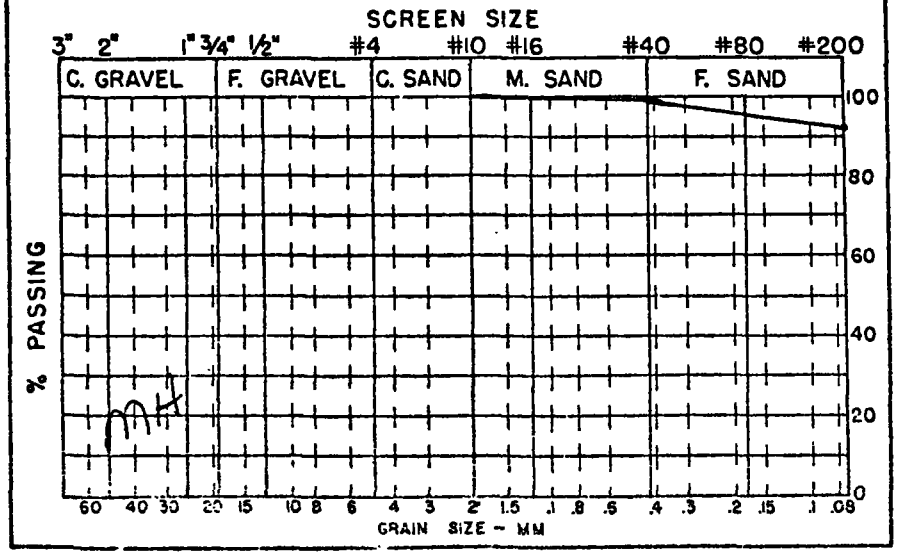


H20 - 56%

SIEVE ANALYSIS % Passing 68.4

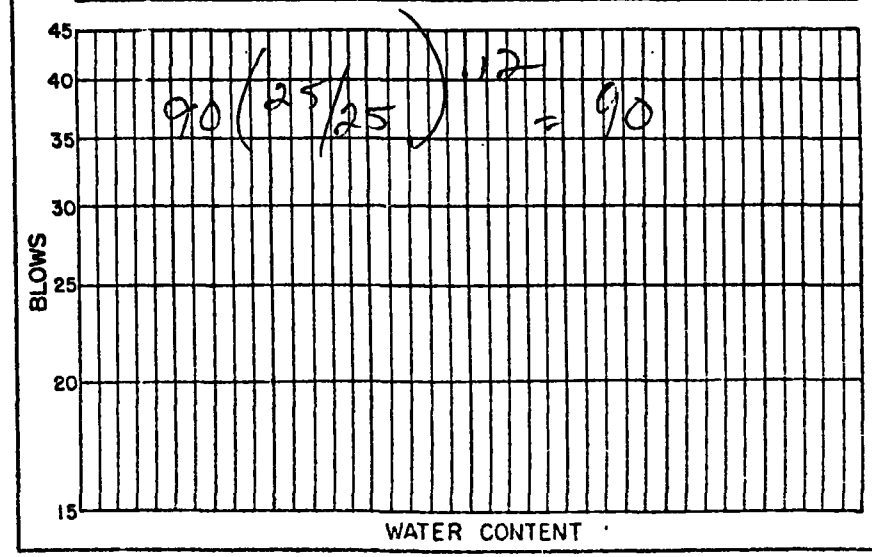
		-40	5.62	99
-3/4		-80		
-4		-140		
-10 .02	100	-200	62.76	92

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	68				74
Wet Wt.	20.62				7.74
Dry Wt.	16.86				4.91
% H_2O	90				PL= 52
Blows	25				PI= 38

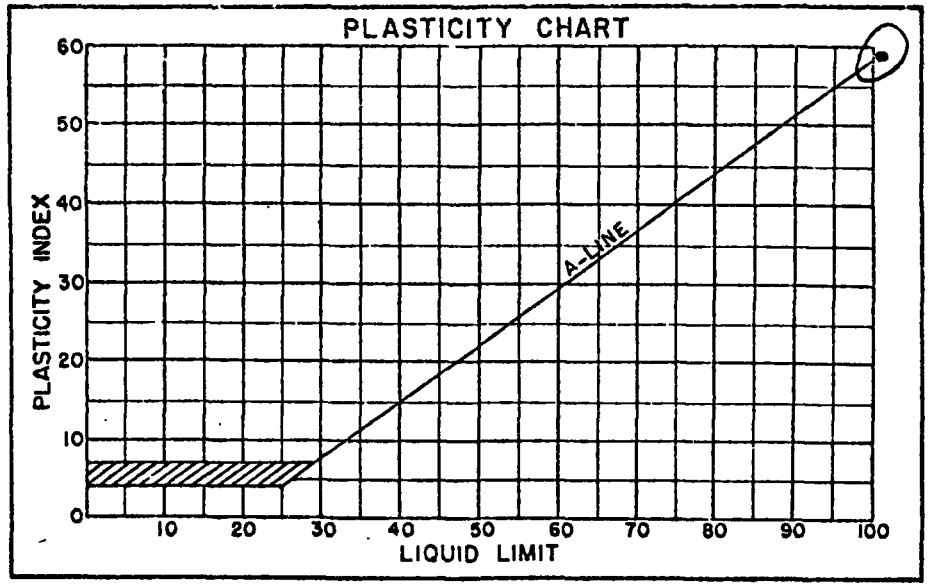


SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4641 JOB NO. 4-08 HOLE NO.
DATE 6-21-83 OPERATOR BC

SOIL FIELD IDENTIFICATION			
TEST	SAND	SILT	CLAY
VISUAL			✓
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			•

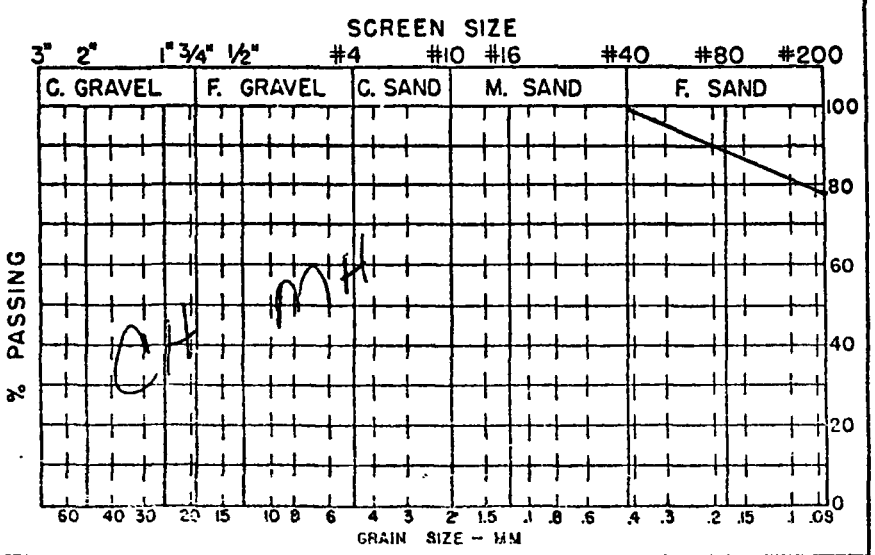
DESCRIPTION: Wet, GR Inside, grn olive yellow Out Clay & F. Sdy. Silt



H_{20}=65%

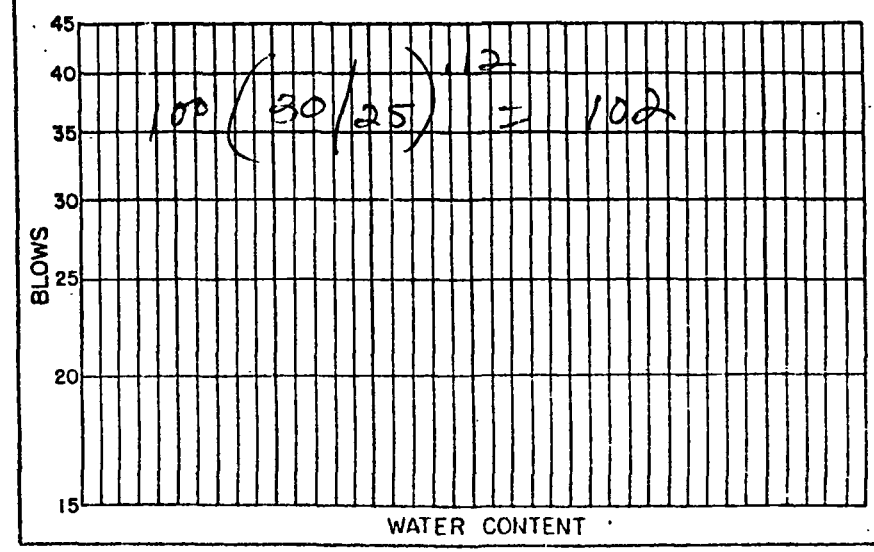
SIEVE ANALYSIS	% Passing 58.9	
	-40 12.9	100
-3/4	-80	
-4	-140	
-10	-200 46	78

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	76				41
Wet Wt.	23.43				4.95
Dry Wt.	11.7				3.44
% H_2O	100				PL= 44
Blows	30				PI= 58



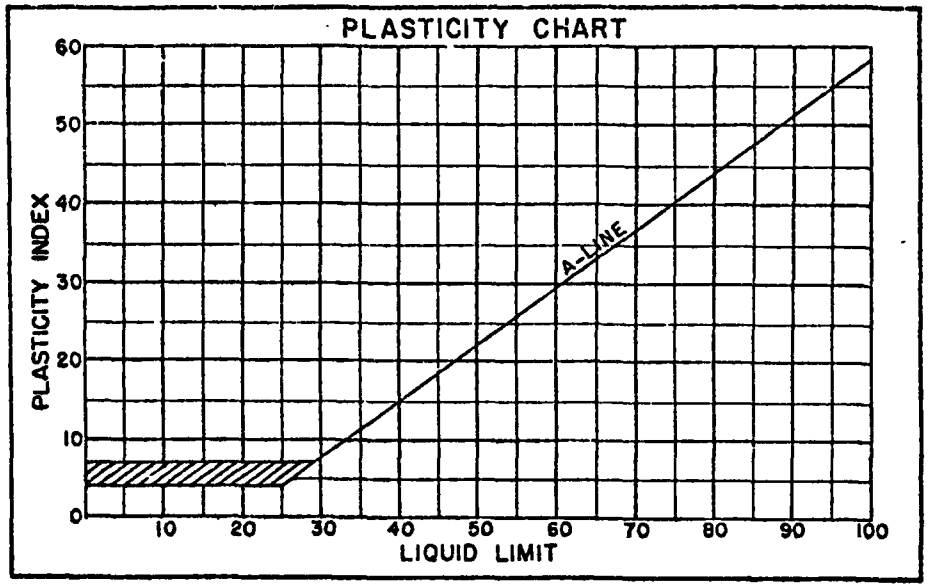
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4645-2 JOB NO. 4 log. HOLE NO. C-7
DATE 6-22-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: M-W BRN. M.F. Sdy. ORG. SILT w/ one 3/4" Rnd. piece of wood which split up during mulling.

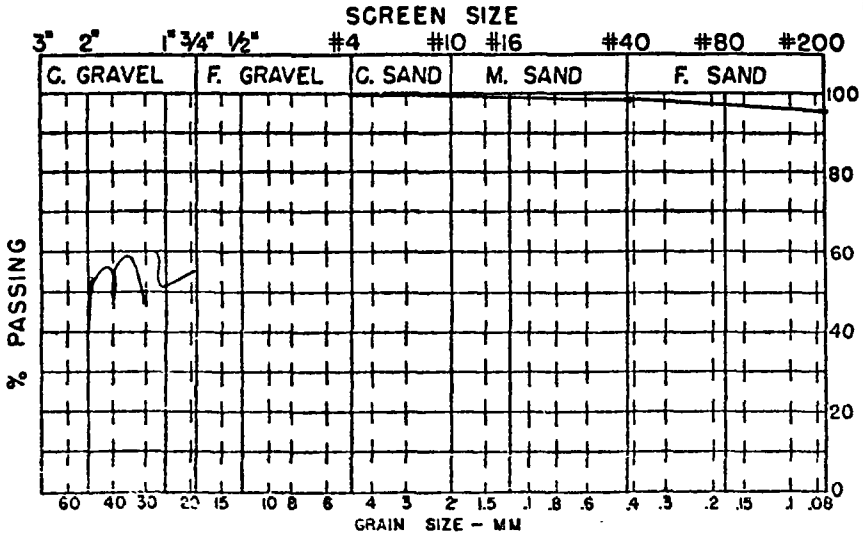


H_{2O} = 56%

SIEVE ANALYSIS % Passing 77.55

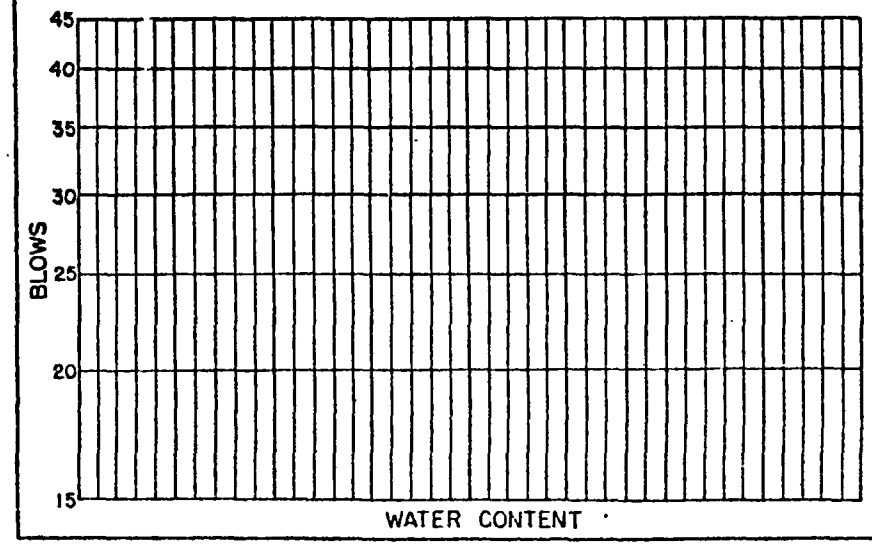
			-40	1.9	98
-3/4			-80		
-4	.72	100	-140		
-10	.6	99	-200	74.33	96

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

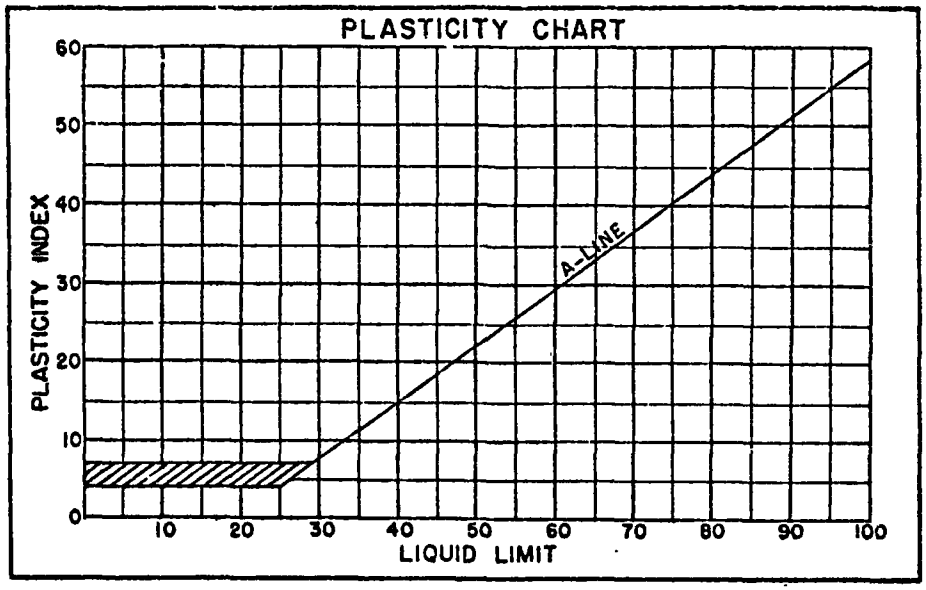
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4647-1 JOB NO. Hog. HOLE NO. C-7
DATE 6-22-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	✓

DESCRIPTION: Visual Looks Moist But % Shows Water Bear. Brn & Dk. Brn, Sl. Cly. F. Sdy. SILT w/ Org. Layer

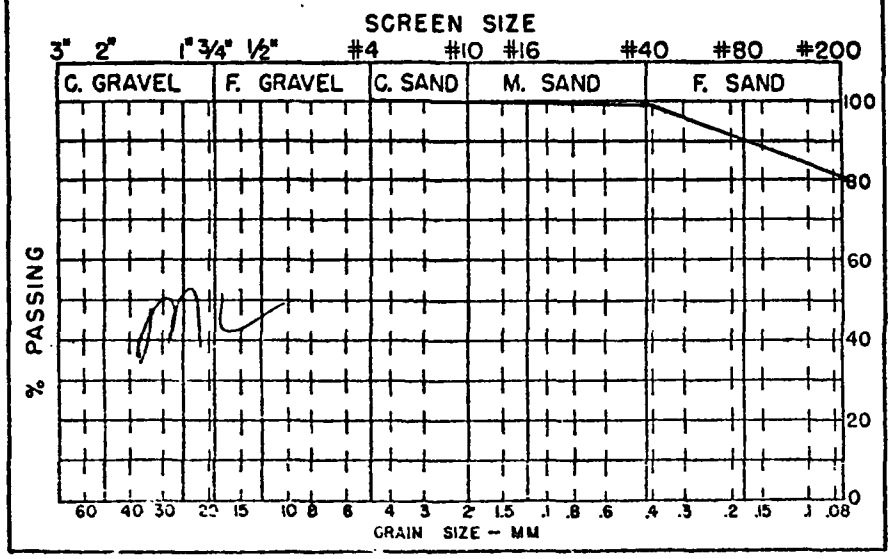


77 %

SIEVE ANALYSIS % Passing 99.78

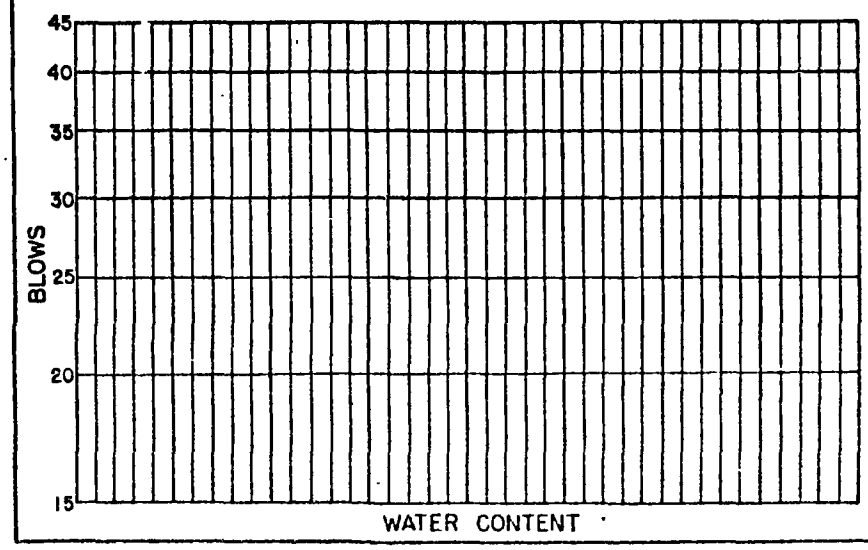
			-40	20.0	99
-3/4			-80		
-4	.02	100	-140		
-10	.38	99	-200	79.39	80

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



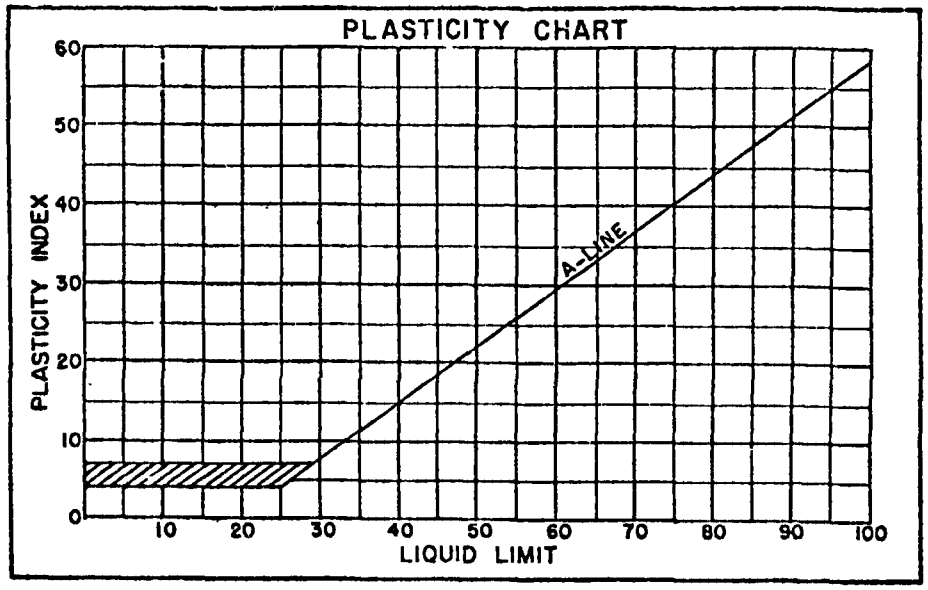
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4647-2 JOB NO. Hog. HOLE NO.
DATE 6-22-83 OPERATOR BC C-7

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE		✓	
TOUGHNESS	✓	✓	✓

DESCRIPTION: BLK. & Br. Decomposed Wood
Sl. F. Sdy. SILT W/ MICA

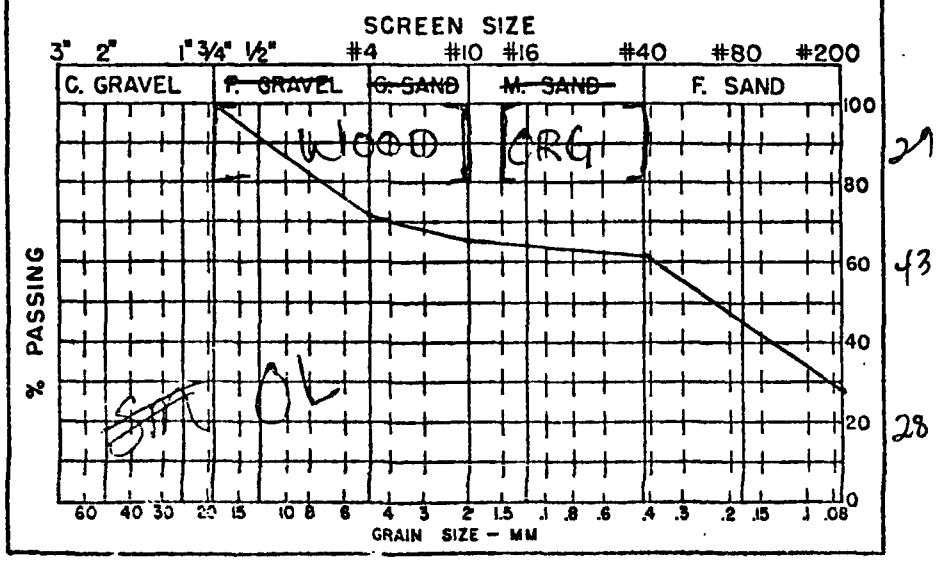


H_2O = 202 %

SIEVE ANALYSIS % Passing 42.33

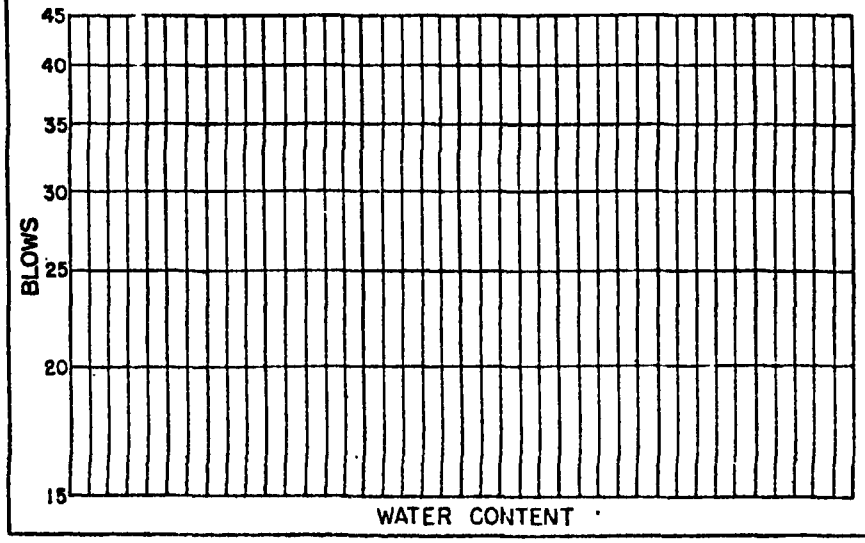
			-40	14.3	62
-3/4	12.4	100	-80		
-4	2.2	71	-140		
-10	1.56	66	-200	11.87	28

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

-LIMITED MTR-

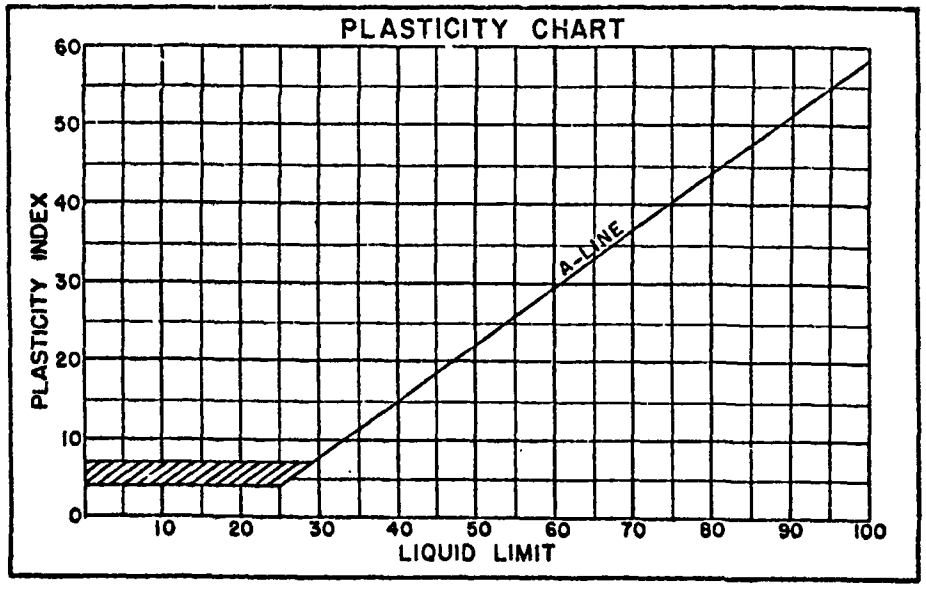
SAMPLE NO. 4647-3 JOB NO. Hog. HOLE NO. C-7

DATE 6-22-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE		✓	
TOUGHNESS	✓	✓	

DESCRIPTION: L/lt, tan, org.
V. Sty. F. Sand

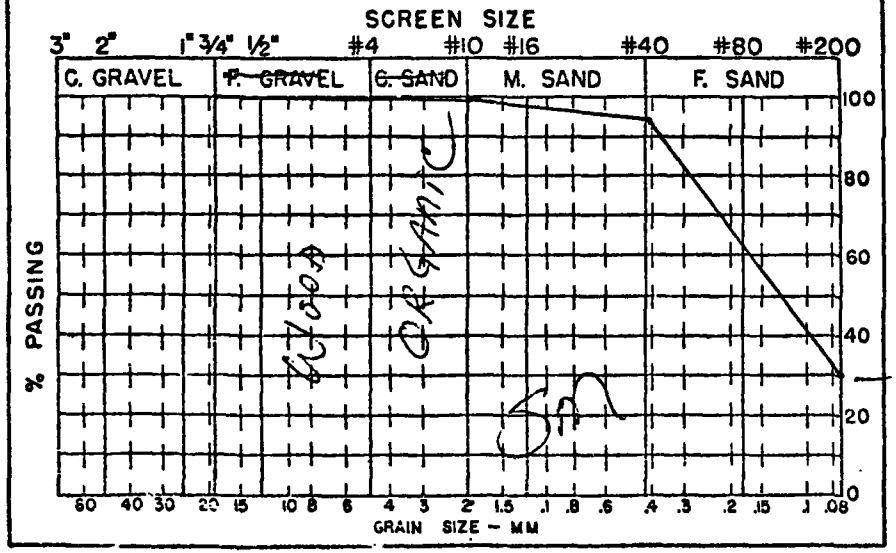


H2O = 4.8%

SIEVE ANALYSIS % Passing 66.0

			-40	42.7	94
① -3/4	.2 wood	100	-80		
-4	.01 org.	99	-140		
-10	3.45	99	-200	10.64	30

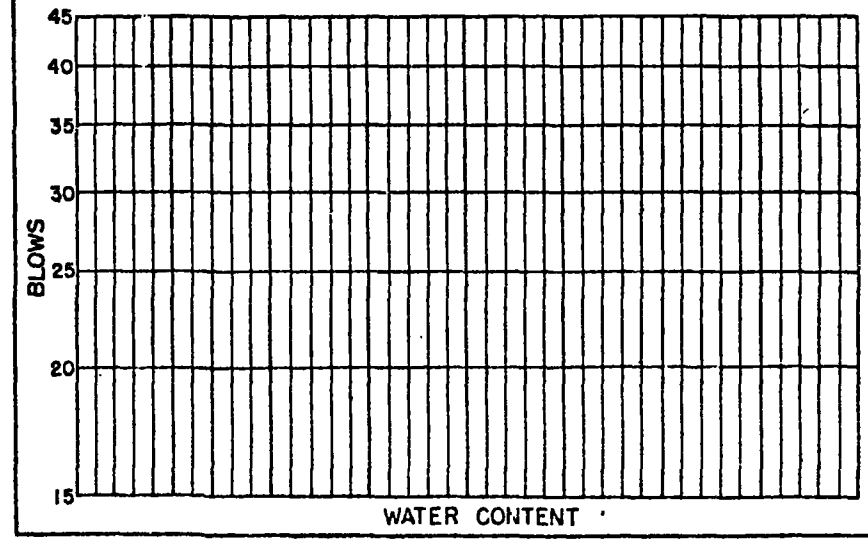
GRAIN SIZE CURVE.



30

LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



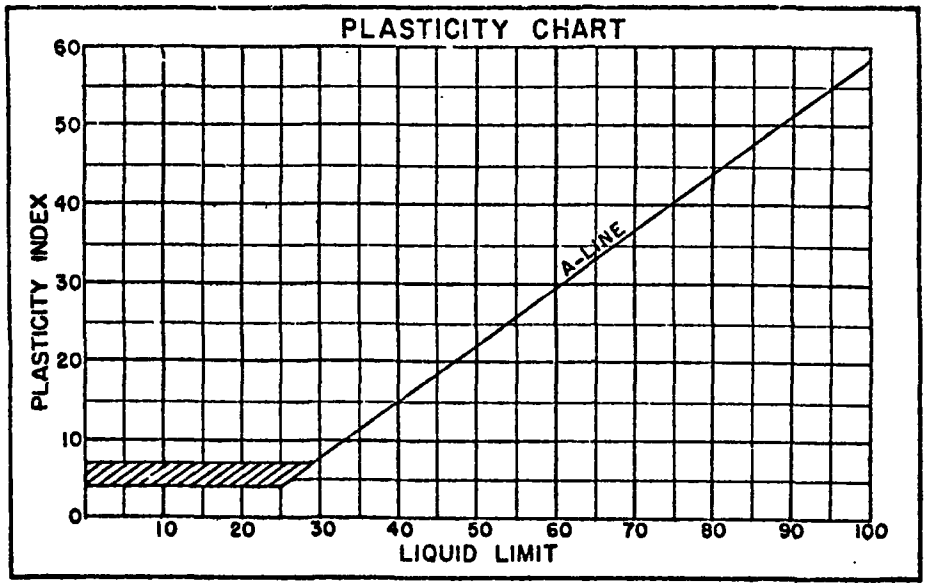
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4647-4 JOB NO. Hoz. HOLE NO. C-7
DATE 6-22-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Visual Looks Dry - % = Wet
Gr- Brn. V. Sty. F. SA Gruly.
F-C SAND

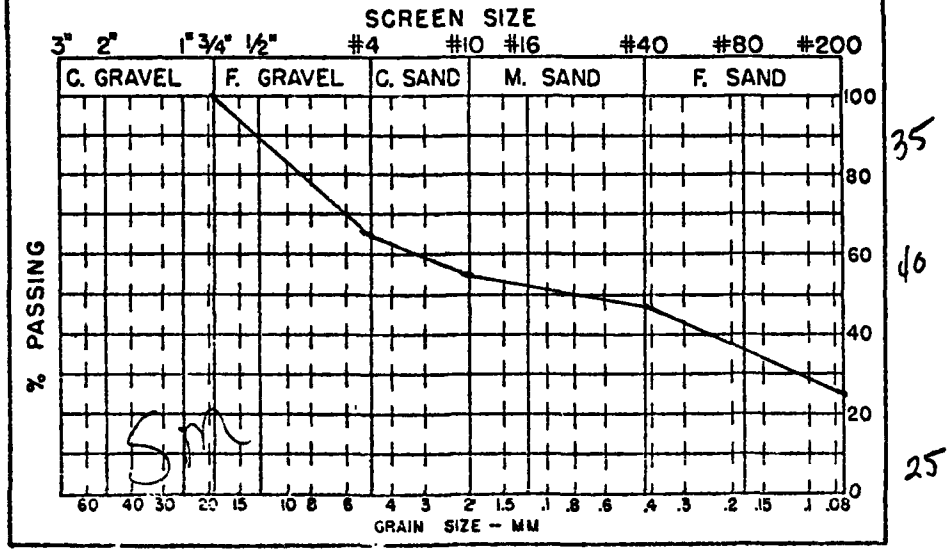


$H_2O = 40\%$

SIEVE ANALYSIS % Passing 149.0

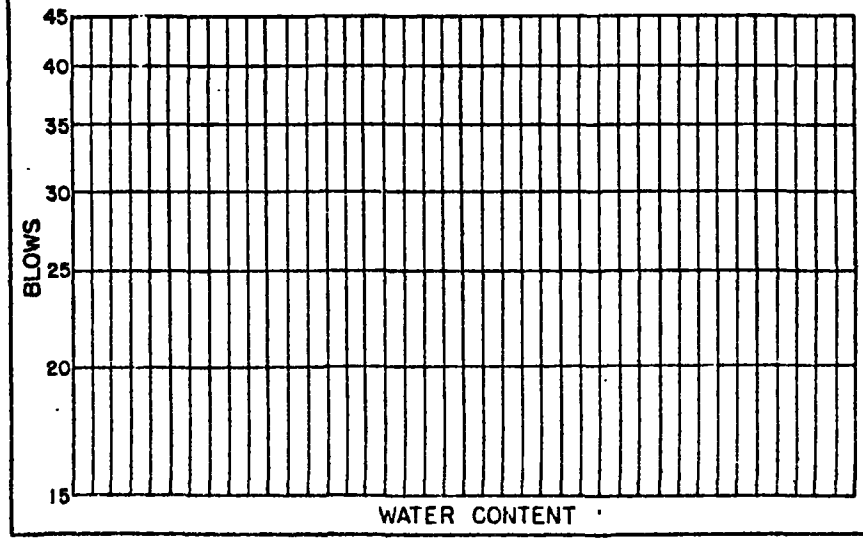
			-40	32.9	47
-3/4	52.02	100	-80		
-4	15.2	65	-140		
-10	11.10	55	-200	37.78	25

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



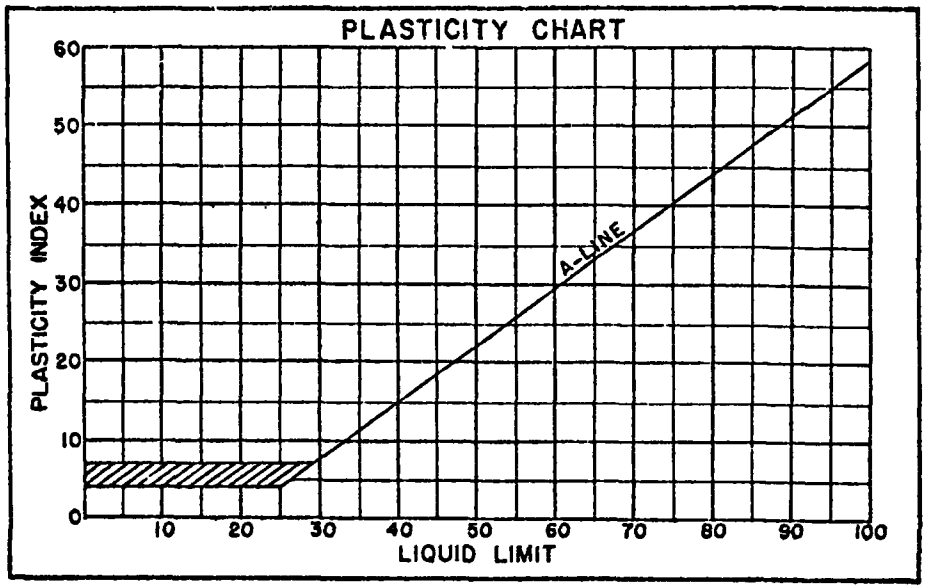
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4647-5 JOB NO. Hoz. HOLE NO. C-7
DATE 6-22-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE		✓	
TOUGHNESS	✓	✓	

DESCRIPTION: M. Brn & Gr. V. Sty. F. SR grvly. F-C SAND

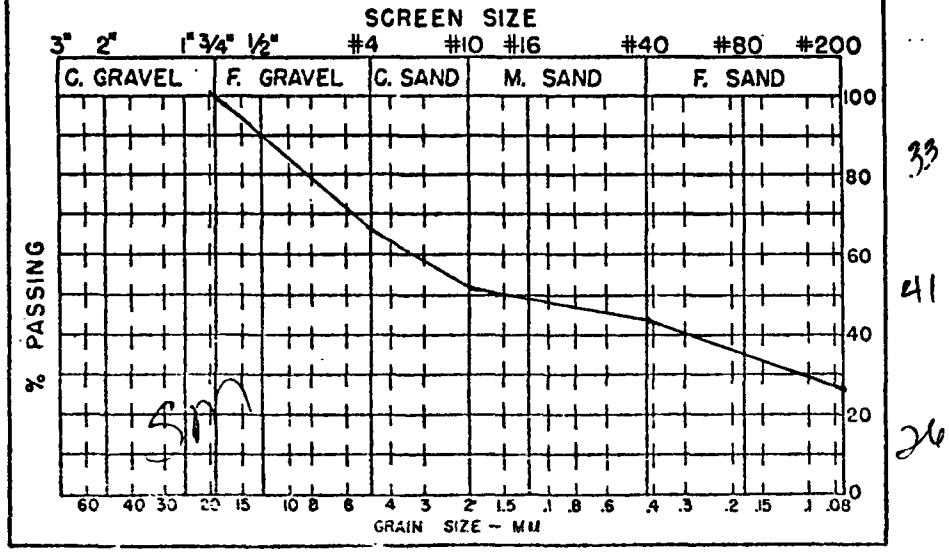


$H_2O = 24\%$

SIEVE ANALYSIS % Passing 169.65

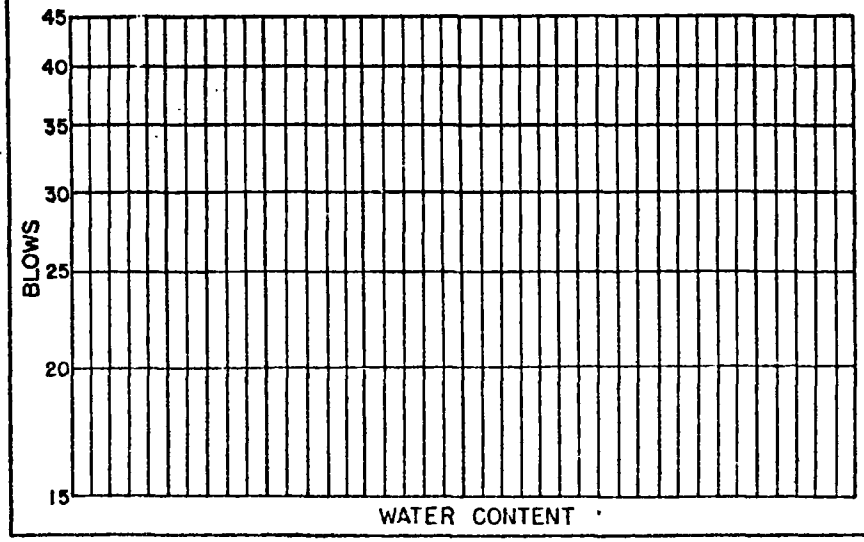
			-40	29.8	44
-3/4	55.35	105	-80		
-4	26.0	67	-140		
-10	13.68	52	-200	24.82	26

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



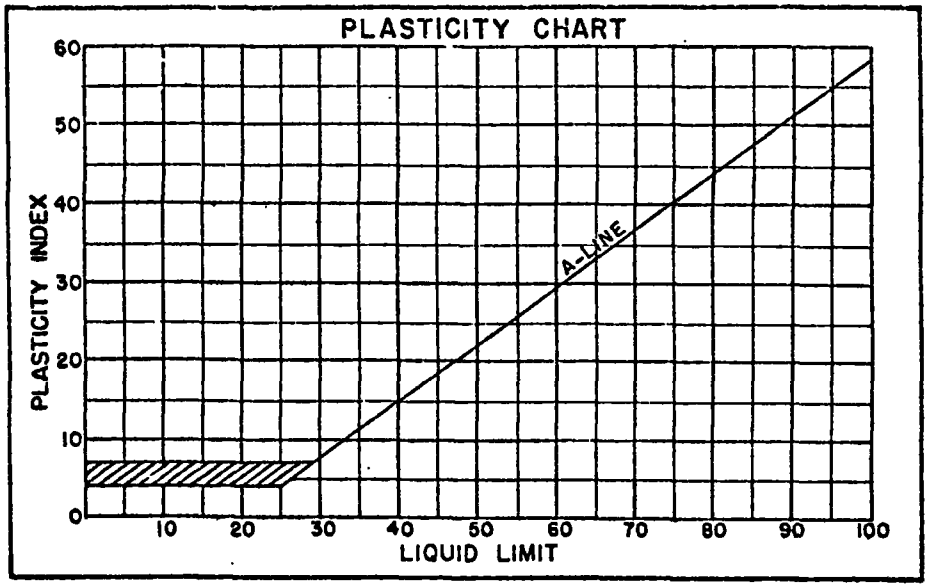
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4647-6 JOB NO. Hoy. HOLE NO. C-7
DATE 6-23-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

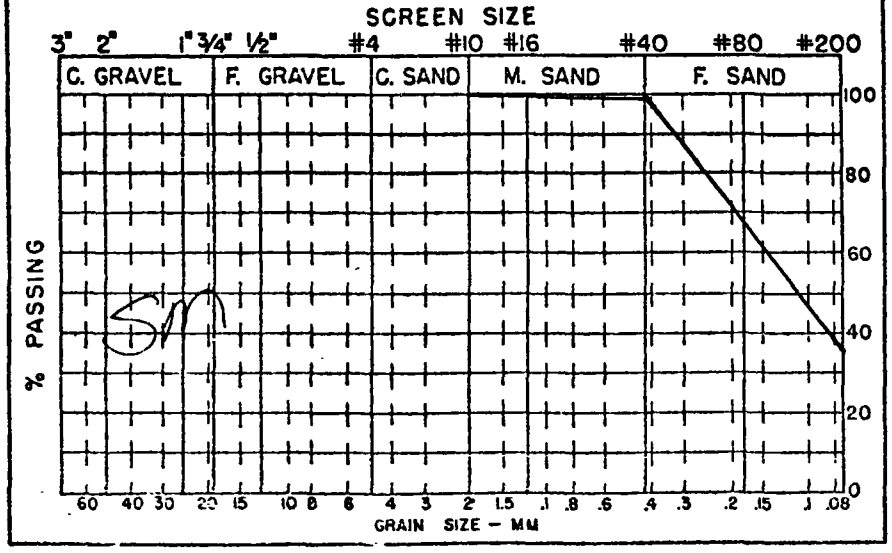
DESCRIPTION: M, Cinnamon, w/t. Tan & orange, V. Sty F. Layered Sand w/t. mica &. Med. Sand



H2O: 29 %

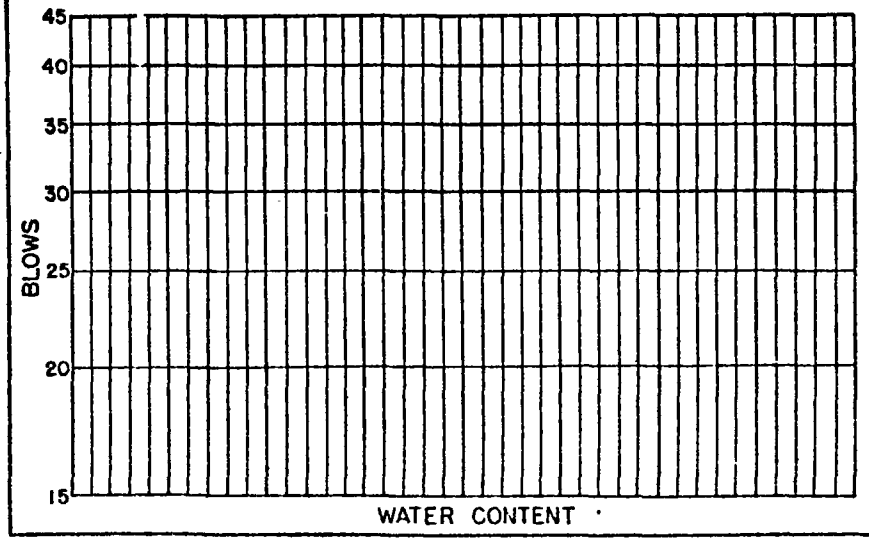
SIEVE ANALYSIS	% Passing 176.9	
	-40 113.4	99
-3/4	-80	
-4	-140	
-10 .12	100 -200 63.38	36

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

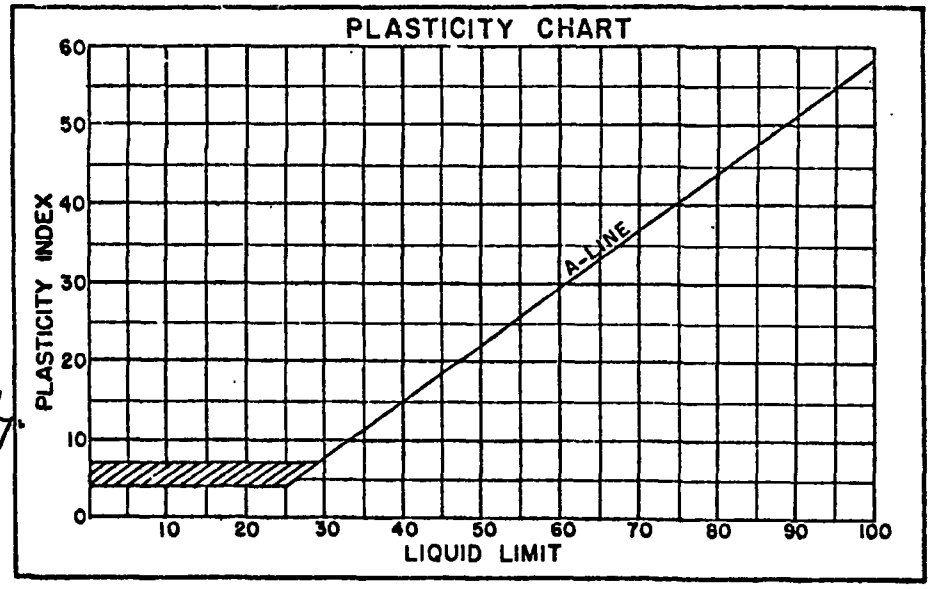
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4647-7 JOB NO. Hog. HOLE NO. C-7

DATE 6-22-83 OPERATOR BC

SOIL FIELD IDENTIFICATION			
TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE		✓	
TOUGHNESS	✓	✓	

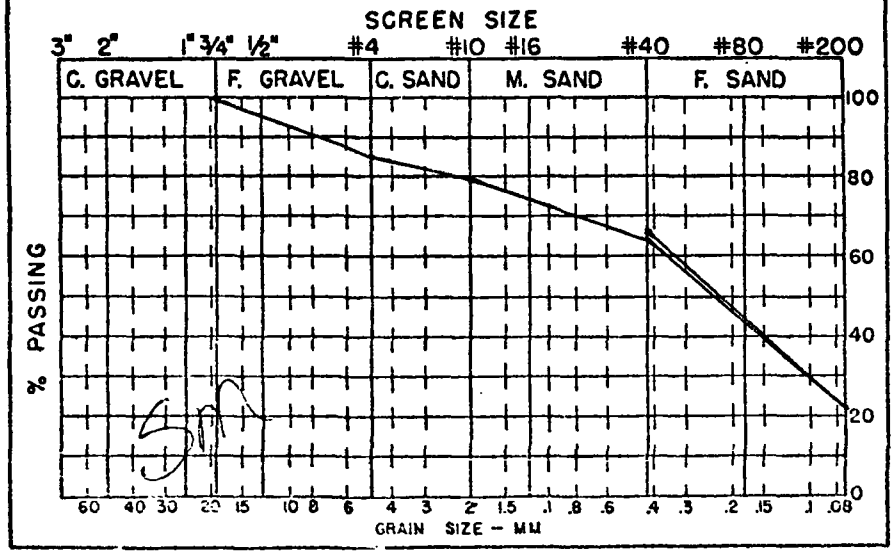
DESCRIPTION: M, Olive, yell., Gr. f. SR GRUL. V. Sty. F-C SAND



H_2O = 23%

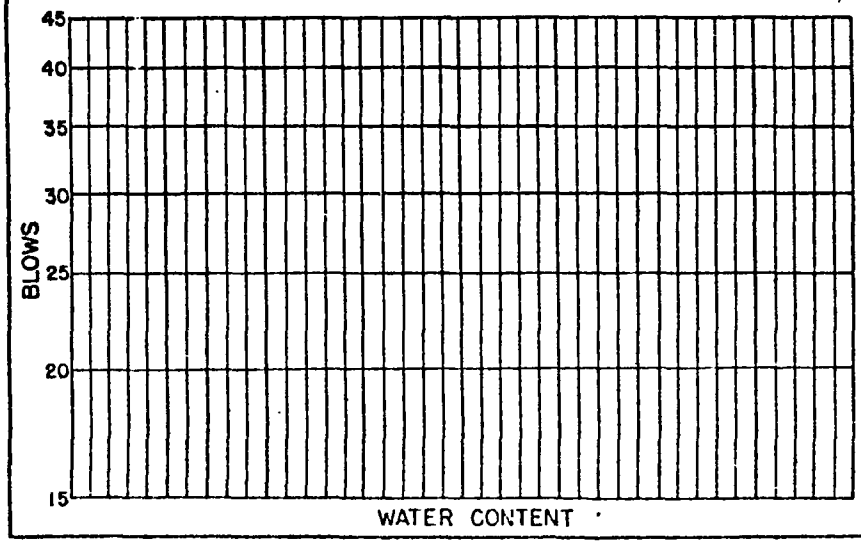
SIEVE ANALYSIS		% Passing 160.2			
			-40	67.3	64
-3/4	22.45	100	-80		
-4	10.85	86	-140		
-10	24.3	79	-200	35.3	22

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



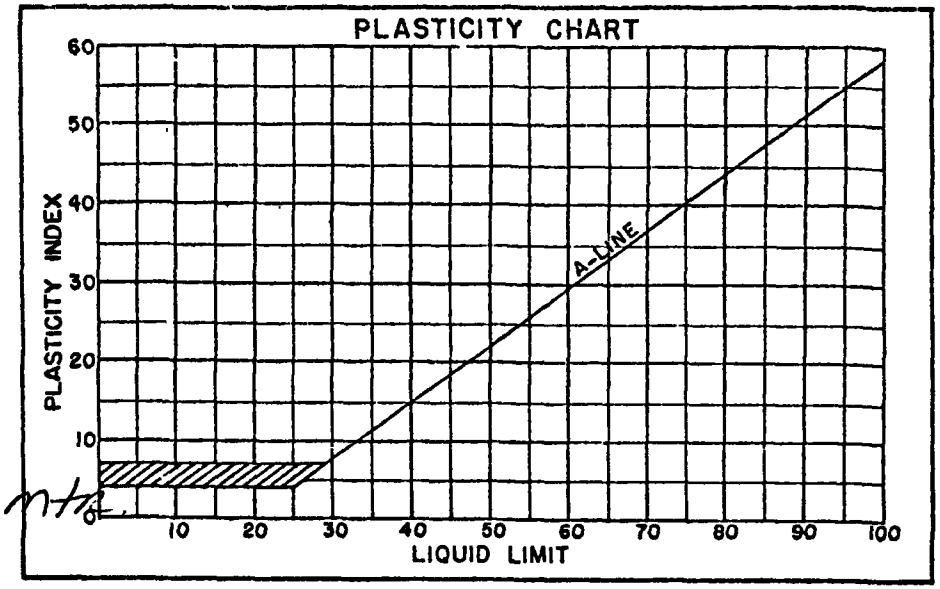
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4647-8 JOB NO. ~~Hy.~~ HOLE NO. C-7
DATE 6-22-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE		✓	
TOUGHNESS	✓	✓	✓

DESCRIPTION: M, GR, BLK. & White*
Sl. Cly. V. Sty. F-C SAND
* m-c sand is white → Hly. CA/C. white mtl.

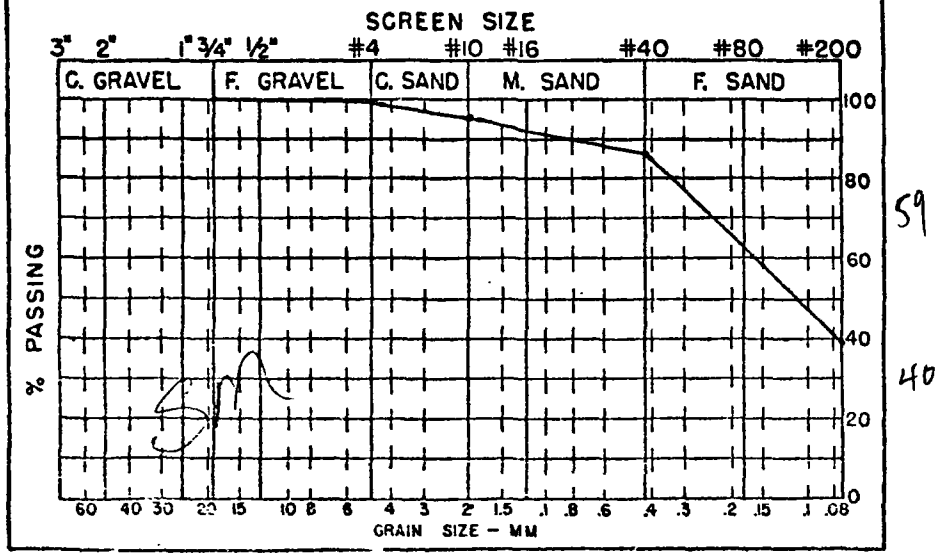


H_2O = 19 %

SIEVE ANALYSIS % Passing 178.2

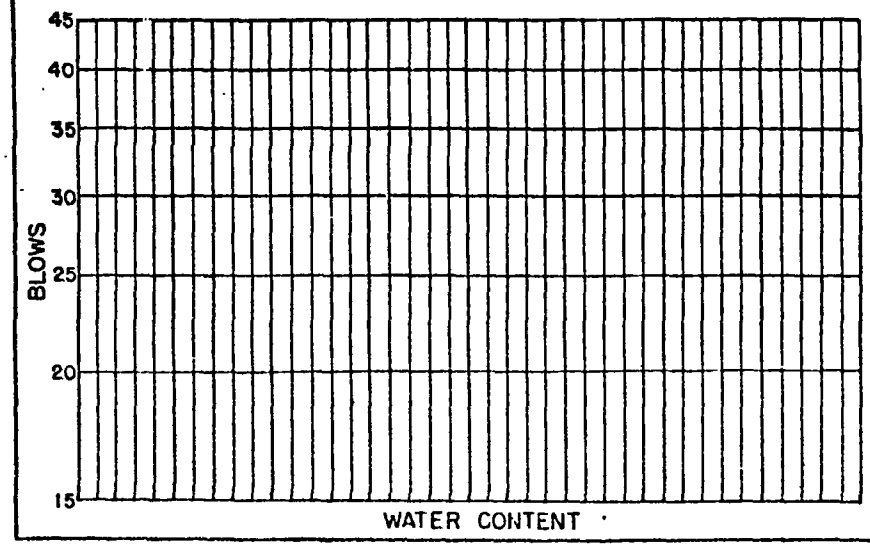
			-40	86.9	87
-3/4	2.55	100	-80		
-4	5.14	99	-140		
-10	14.88	96	-200	68.73	39

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

ATERIALS ENGINEER
aterials Laboratory
O. Box 167, Olympia, WA 98504 (Mailing Address)
55 So. 2nd Ave.
mwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 8-3-83

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section West Hoquiam by Pass
SR No. 101A Sub-Section Cut Section.

Station & Offset 176~ 36' Lt. Hole # C-10

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4803 -1	D-1	0' 0" 2' 0"	48%	mc	m-W Brn. Org. twigs + wood F. Sdy. SILT
	U-2		No Recovery		
-2	D-3	4' 6' 6' 6"	67%	mc	Wet, Brn. F. Sdy. SILT
4804 -1	U-4	7' 6" 7' 10"	A		
-2		7' 10" 8' 2"	B		
-3		8' 2" 8' 6"	C		
4805	D-5	9' 6" 11' 6"	33%	mc	moist cinnamon-Brn F. Sdy. SILT w/mica
4806 -1	U-6	12' 6" 12' 10"	A		
-2		12' 10" 13' 2"	B		

opy with samples
opy to addressee

Yours very truly,

Inspector.

FORM 351 002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

ATERIALS ENGINEER
aterials Laboratory
. O. Box 167, Olympia, WA 98504 (Mailing Address)
55 So. 2nd Ave.
mwater, Washington 98504 (Shipping Address)

Place .....

Date .....

Dear Sir:

I have forwarded by today's ..... the following Foundation Samples.

Contract or Job No. L-7262 Section ..... SR No. ..... Sub-Section .....

Station & Offset 176~ 36' Lt. Hole # C-10

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4806 -3	U-6	13' 2" 13' 6"	C		
4807	D-7	14' 6" 16' 6"	55%	OL	Beigh F. Sdy. Organic SILT
4808 -1	U-8	17' 6" 17' 10"	A		
-2		17' 10" 18' 2"	B		
-3		18' 2" 18' 6"	C		
-4		18' 6" 18' 10"	D		
-5		18' 10" 19' 2"	E		
4809 -1	D-9-A	19' 6" 20' 6"	35%	mc	Wet, Brn. F. Sdy. SILT
-2	D-9-B	20' 6" 21' 6"	44%	mc	Wet, alt. Rust & tan F. Sdy. SILT

opy with samples
opy to addressee

Yours very truly,

.....
Inspector.

FORM 351-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place .....

Date .....

Dear Sir:

I have forwarded by today's ..... the following Foundation Samples.

Contract or Job No. L-7262 Section ..... SR No. ..... Sub-Section .....

Station & Offset 176~ 36' Lt. Hole # C-10

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4810 -1	U-10	22' 10" 23' 2"	B		
-2		23' 2" 23' 6"	C		
-3		23' 6" 23' 10"	D		
4811	D-11	24' 6" 26' 6"	64%	OL	wet, GR w/ BLK. f. gruly ORG Sdy. SILT
4812 -1	U-12	27' 6" 27' 10"	A		
-2		27' 10" 28' 2"	B		
-3		28' 2" 28' 6"	C		
4813 -1	D-13	29' 6" 31' 6"	51%	OL	wet, dk. gr. & BLK. F. Sdy. ORganic SILT w/ mica
-2	D-14	32' 6" 34' 6"	17%	SM	m, grn. outside w/ gr. v. Sty. F. SAND w/ mica

1 copy with samples
1 copy to addressee

Yours very truly,

.....
Inspector.

DOT FORM 351-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place .....

Date .....

Dear Sir:

I have forwarded by today's ..... the following Foundation Samples.

Contract or Job No. L-7262 Section ..... SR No. ..... Sub-Section .....

Station & Offset 176~ 36' Lt. Hole # C-10

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4813 -3	D-15	37' 6" 38' 11"	40%	MC	Wet, Brn. w/t. rust org. layered F. Sdy. Silt w/t. mica
-4	D-16	42' 6" 43' 0"		SM	LK 4813-2 m, grn. outside w/gr. v. Sty. F. SAND w/ mica
4814 -1	Moist. #1	10'	#46		Wet wt: 52.8 Dry wt: 39.02 H20 = 35%
-2	Moist #2	16'	#76		Wet WT: 50.68 Dry wt. 32.6 H20 = 55%

1 copy with samples
1 copy to addressee

Yours very truly,

Larry M Moore
Inspector.

DOT FORM 351 002

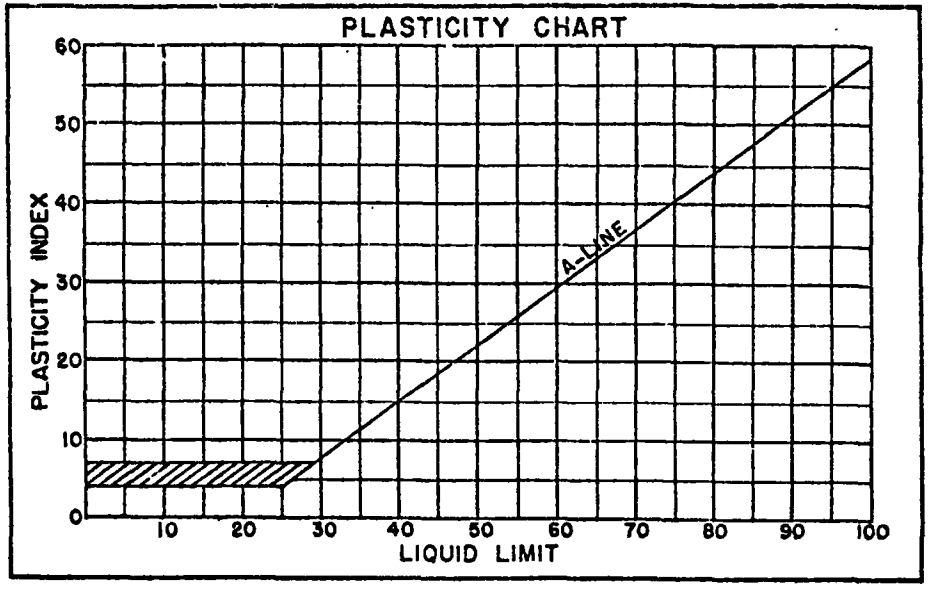
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4805 JOB NO. Hog. HOLE NO. C-10
DATE 8-19-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

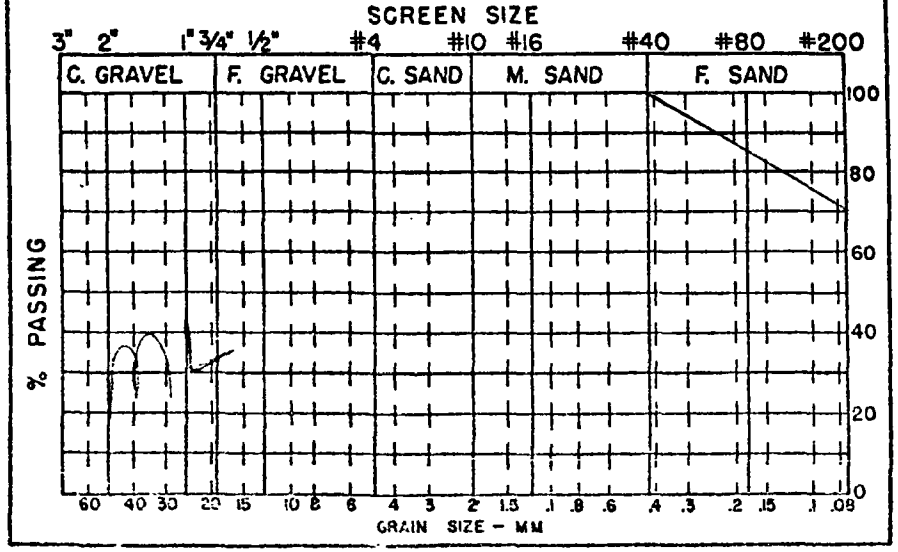
DESCRIPTION: M, Cinnamon Brn.
F. Sdy S. LT w/ MICA



32.56 24.43 H_2O = 33 %

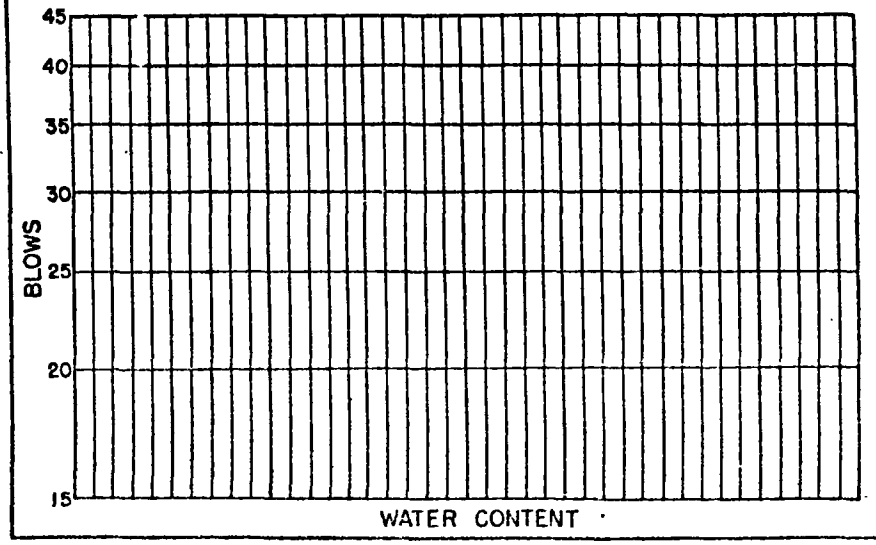
SIEVE ANALYSIS	% Passing 74.0		
	-40	22.4	100
-3/4	-80		
-4	-140		
-10	-200	51.6	70

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4807 JOB NO. Hog HOLE NO. C-10
DATE 8-19-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

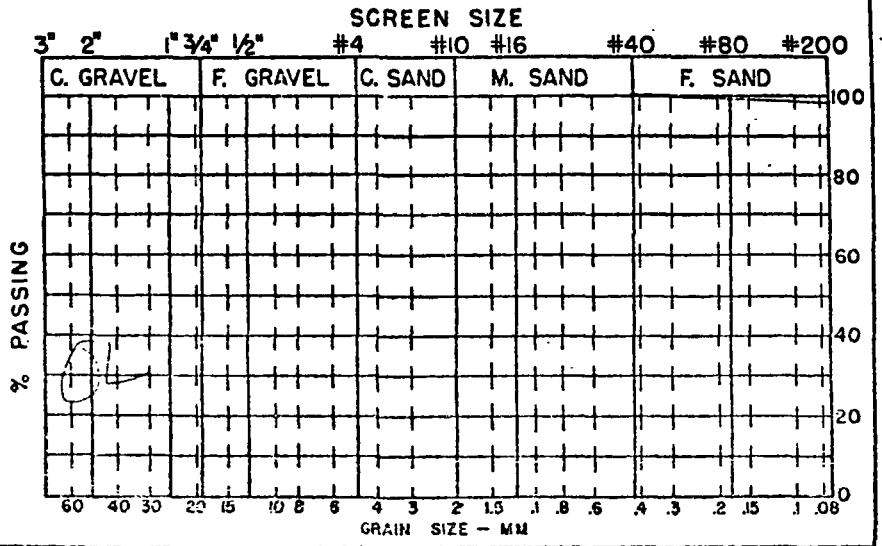
TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

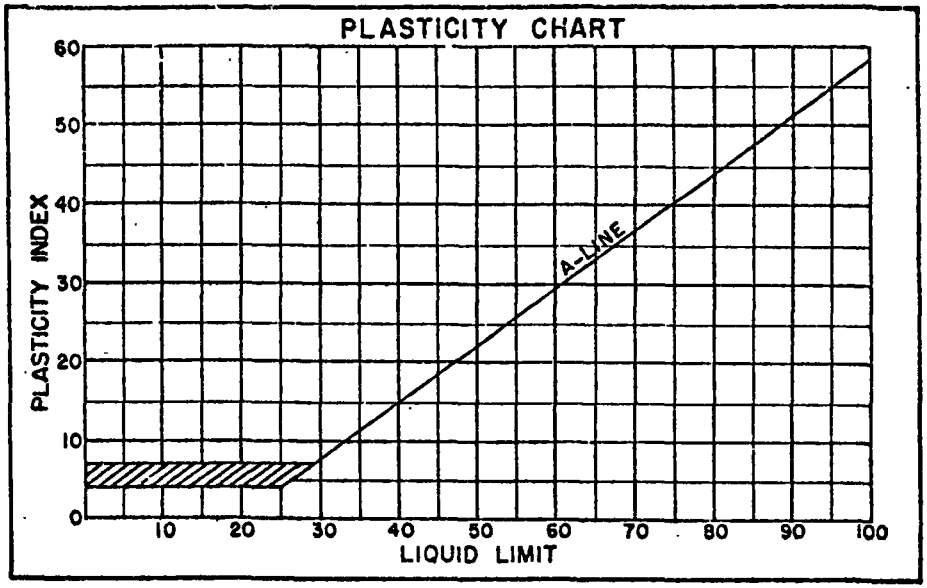
DESCRIPTION: Leigh F. Sdy ORGanic Silt

29.4 19.0 H_2O = 55 %

SIEVE ANALYSIS		% Passing 60.8	
	-40	1.05	100
-3/4	-80		
-4	-140		
-10	-200	59.75	98

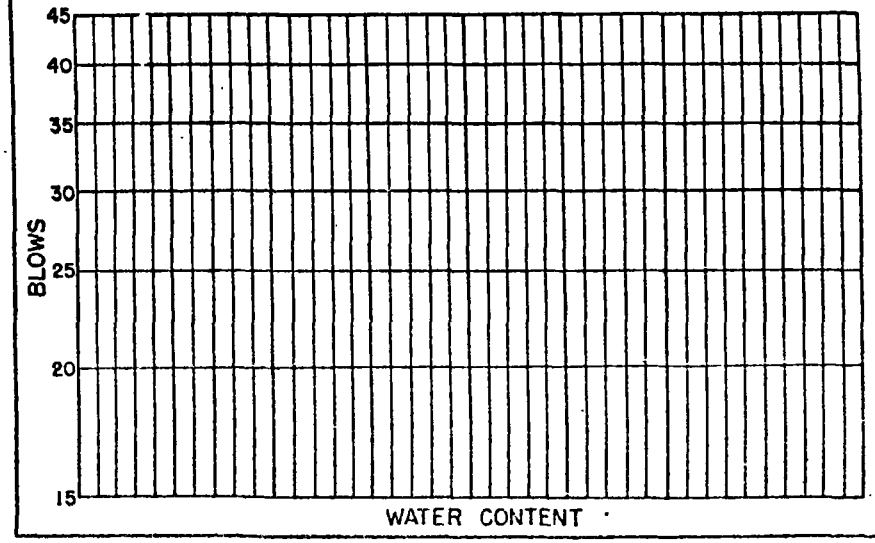
GRAIN SIZE CURVE.





LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4809-2 JOB NO. 4608 HOLE NO. C.10
DATE 8-19-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

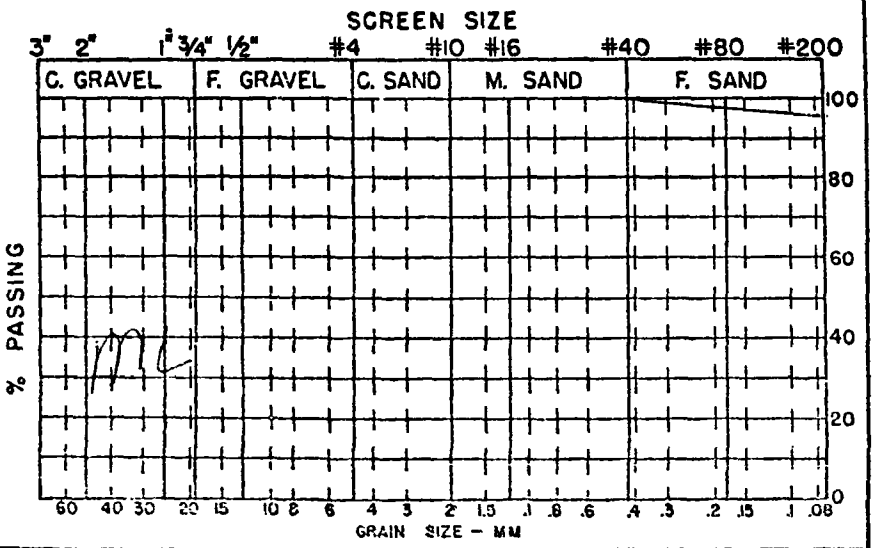
DESCRIPTION: Wet, alt. Rust & tan
F. Sdy SILT

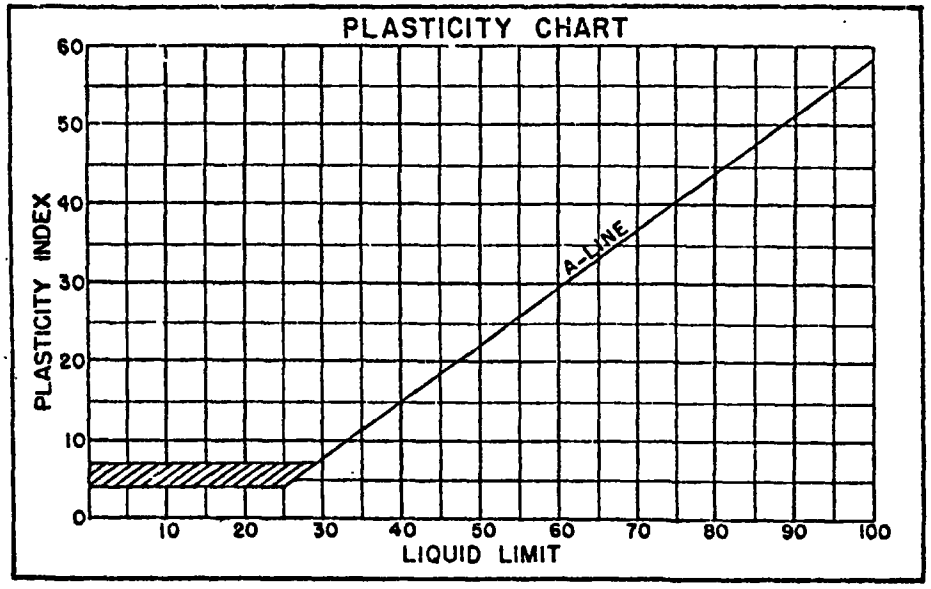
33.55 23.28 H/20 = 44%

SIEVE ANALYSIS % Passing 83.55

	-40	36	100
-3/4	-80		
-4	-140		
-10	-200	79.45	96

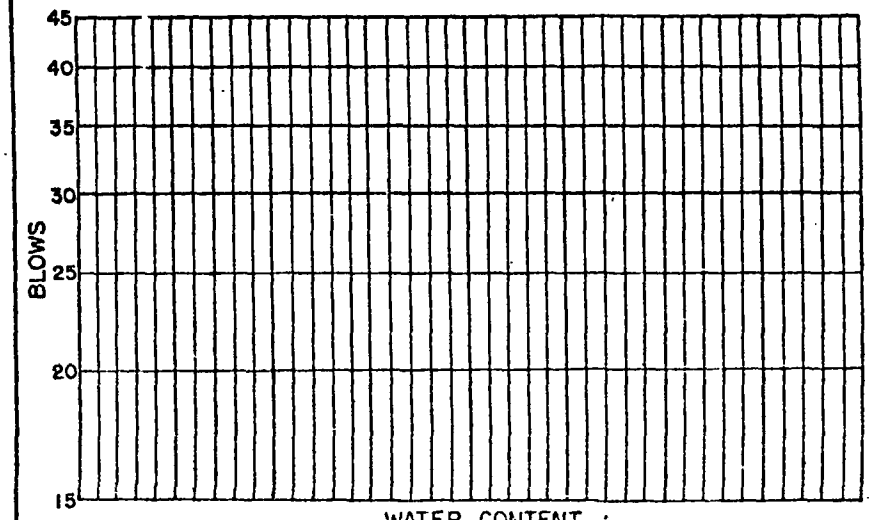
GRAIN SIZE CURVE.





LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4811 JOB NO. Hog. HOLE NO. C-10
DATE 8-19-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

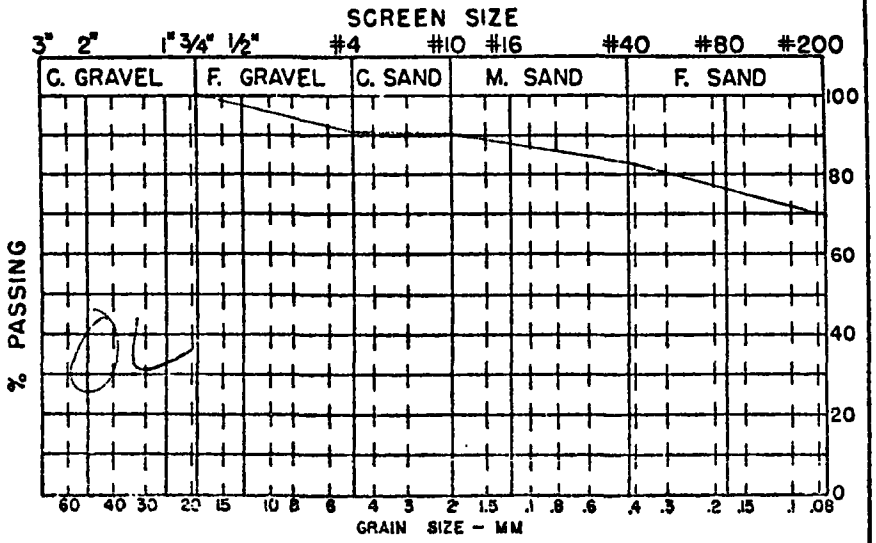
DESCRIPTION: Wet, GR w/ BLK. f. gruly. ORg. Sdy. SILT

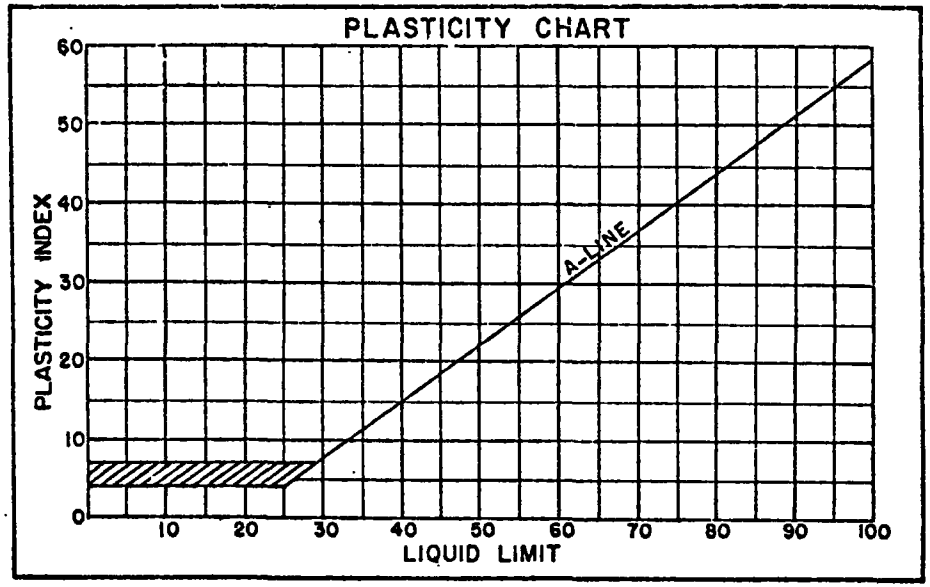
29.97 18.3 H2O: 64 %

SIEVE ANALYSIS % Passing 109.6

			-40	14.10	83
-3/4	10.4	100	-80		
-4	.72	91	-140		
-10	7.88	90	-200	76.5	70

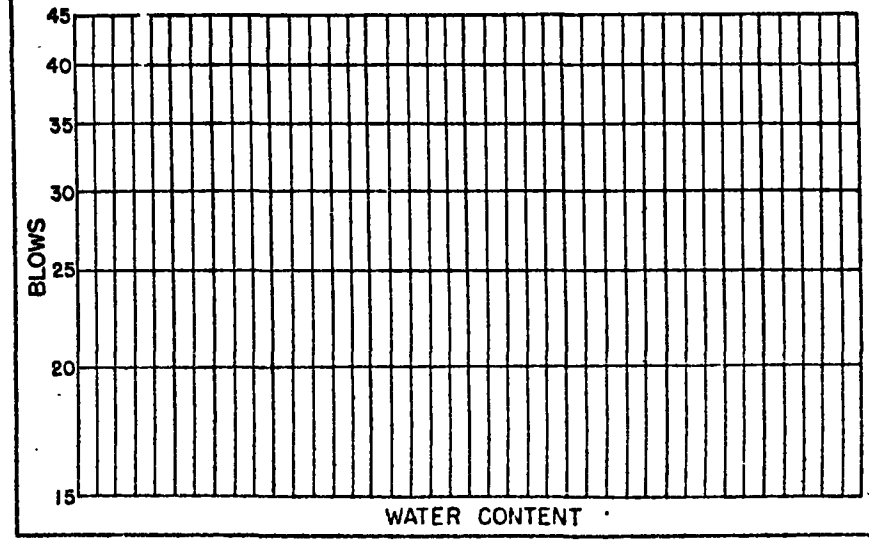
GRAIN SIZE CURVE.





LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



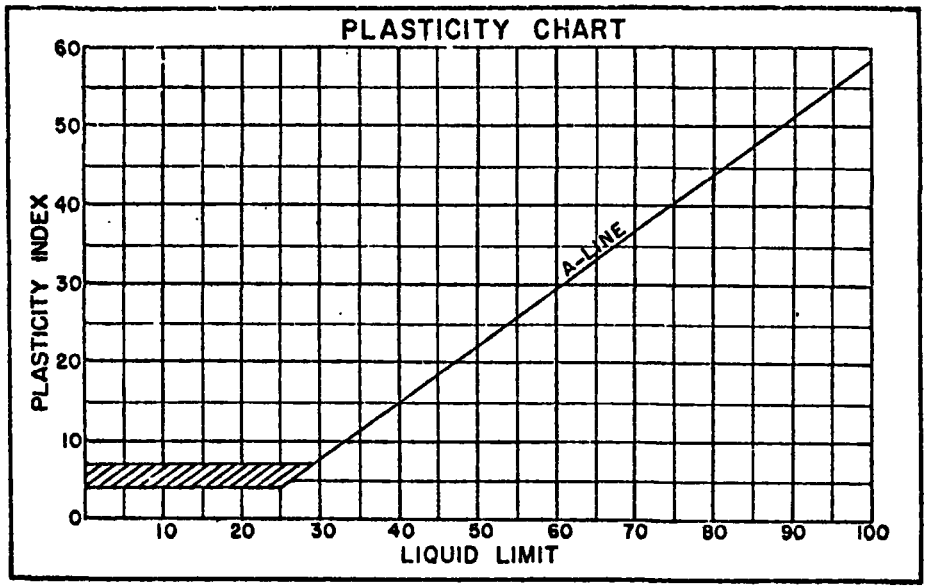
DOT FORM 351-019

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4813-1 JOB NO. Hoy HOLE NO. C-10
DATE 8-19-83 OPERATOR BC

SOIL FIELD IDENTIFICATION			
TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

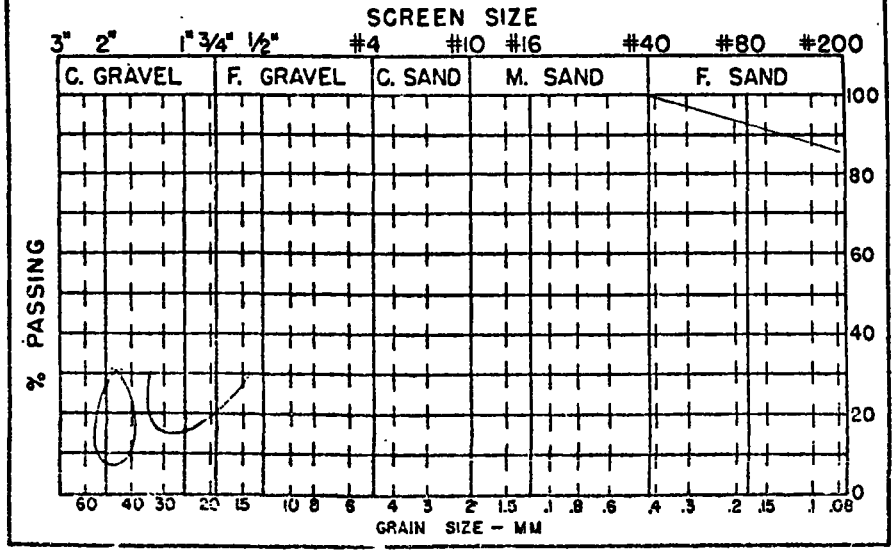
DESCRIPTION: Wet, dk GR & BLK F. Sdy Organic SILT w/ Mica



34.35 22.73 1/20 = 51%

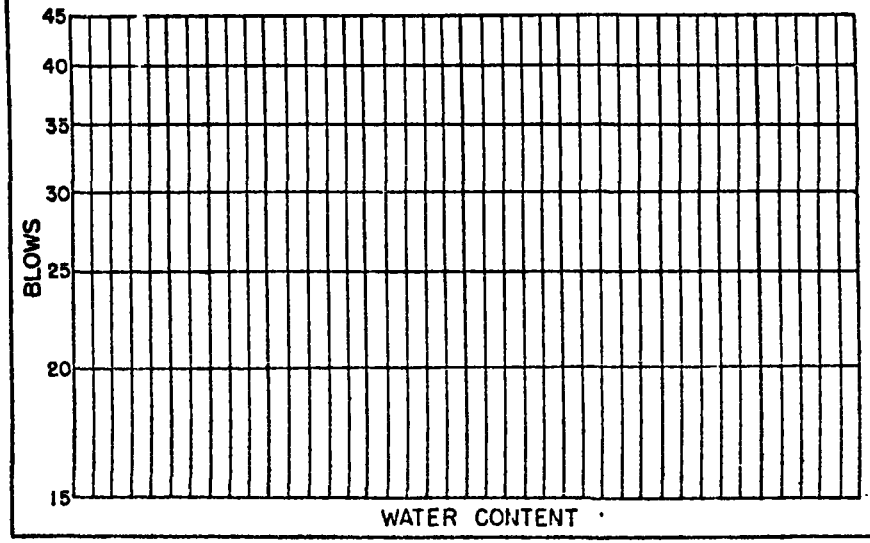
SIEVE ANALYSIS		% Passing 68.4	
		-40 10.10	100
-3/4		-80	
-4		-140	
-10 .02	100	-200 58.28	85

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

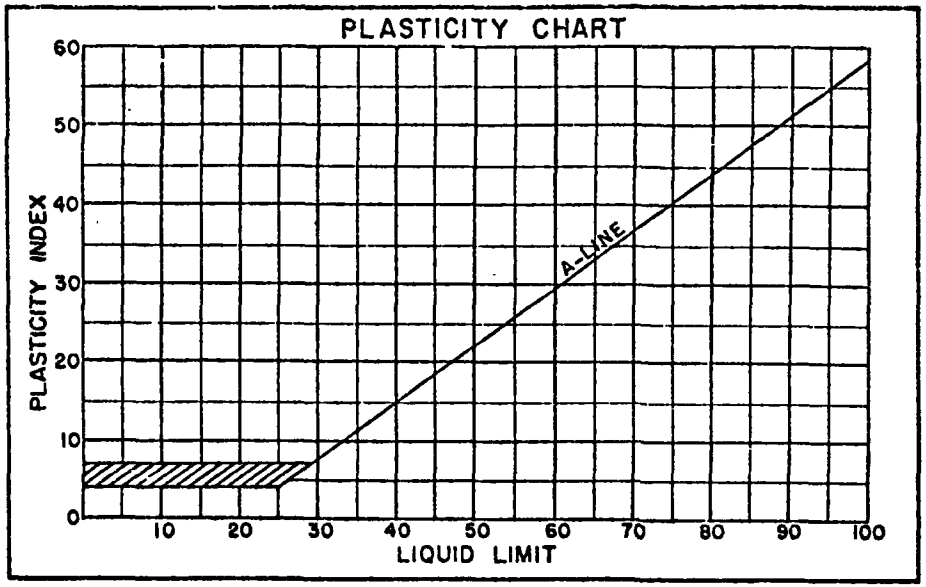
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4803-1 JOB NO. Hog HOLE NO. C-10
DATE 8-30-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE		✓	
TOUGHNESS	✓	✓	

DESCRIPTION: M-W Brn Org twigs + wood
F. Sdy SiCT

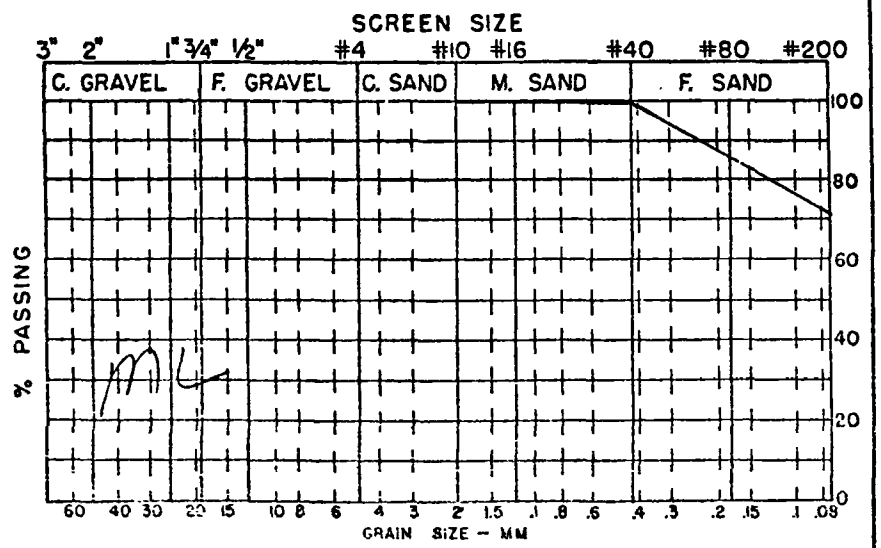


27.3 18.5 1/20 = 48%

SIEVE ANALYSIS % Passing 45.92

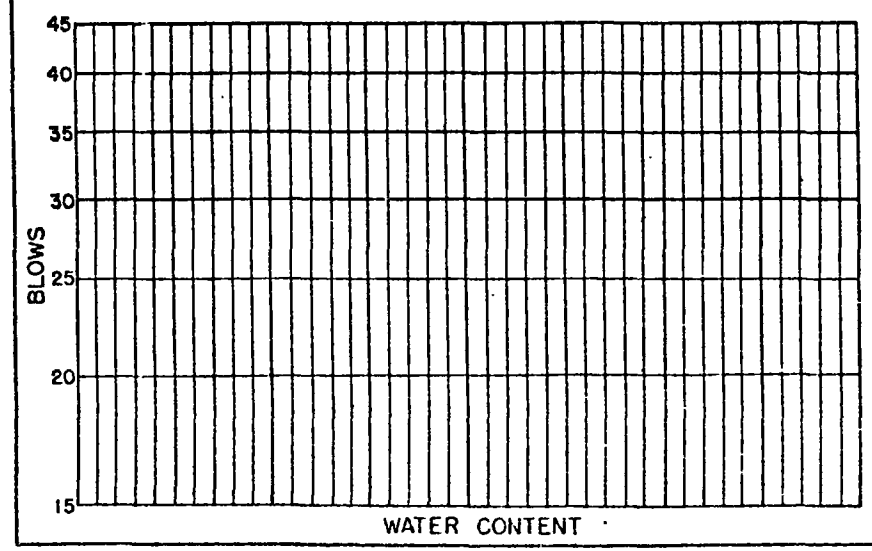
		-40 12.28	94
-3/4		-80	
-4		-140	
-10 .43	100	-200 33.21	72

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

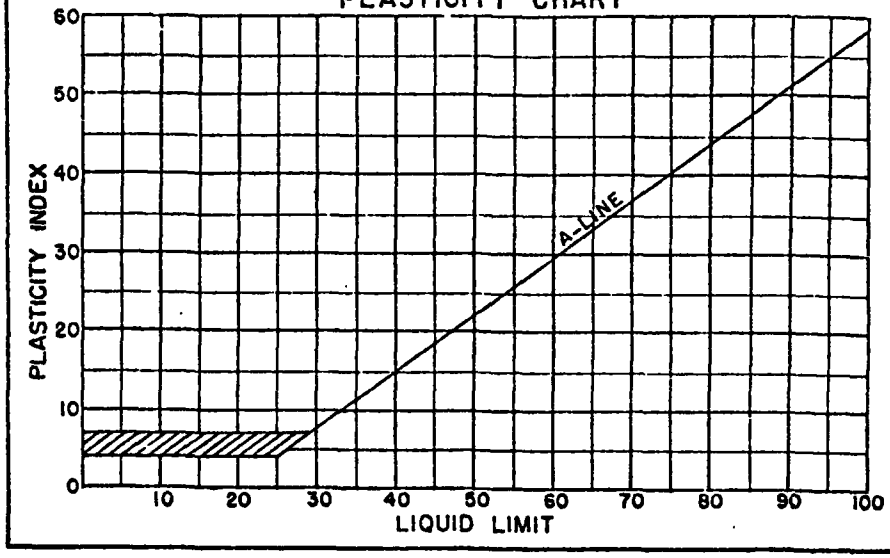
SAMPLE NO. 4803-2 JOB NO. Hoz. HOLE NO. 0-10
DATE 8-30-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Wet, Brn. F. Sdy. Silt

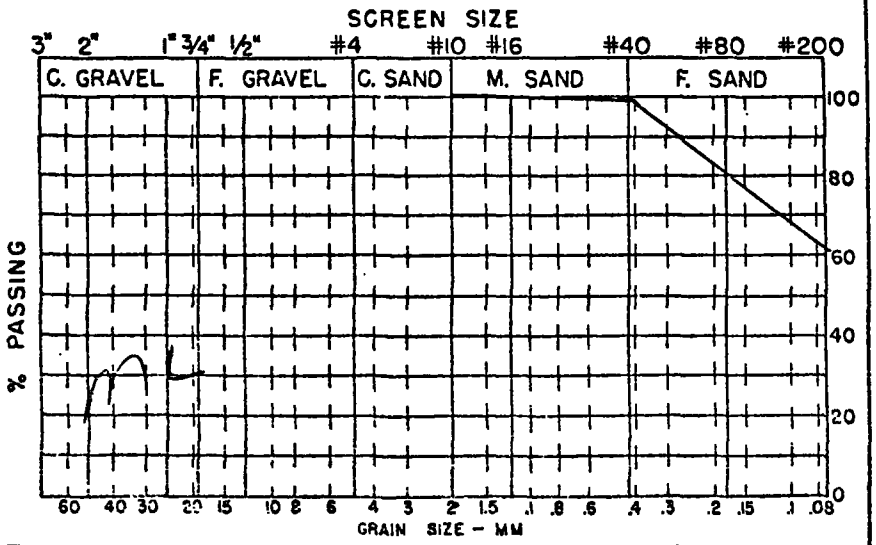
PLASTICITY CHART



SIEVE ANALYSIS % Passing 67% 108.65

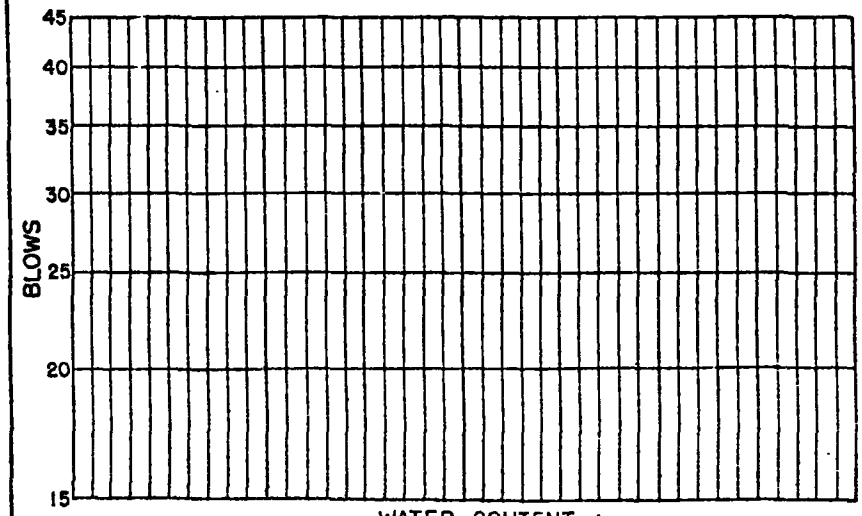
		-40 40.81	99
-3/4		-80	
-4		-140	
-10 .51	100	-200 67.33	62

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

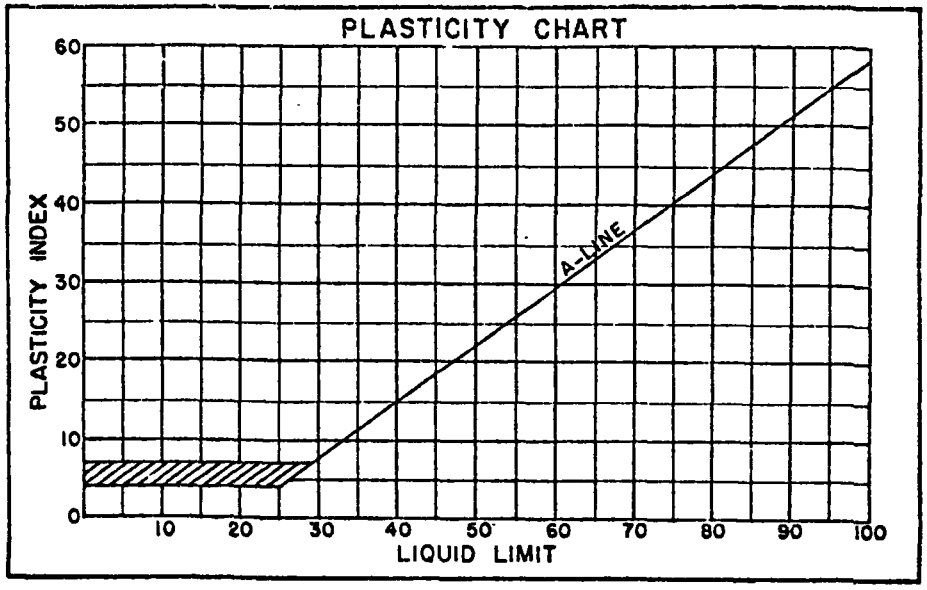
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4809-1 JOB NO. 408. HOLE NO. C-10
DATE 8-30-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE	✓	✓	
TOUGHNESS			

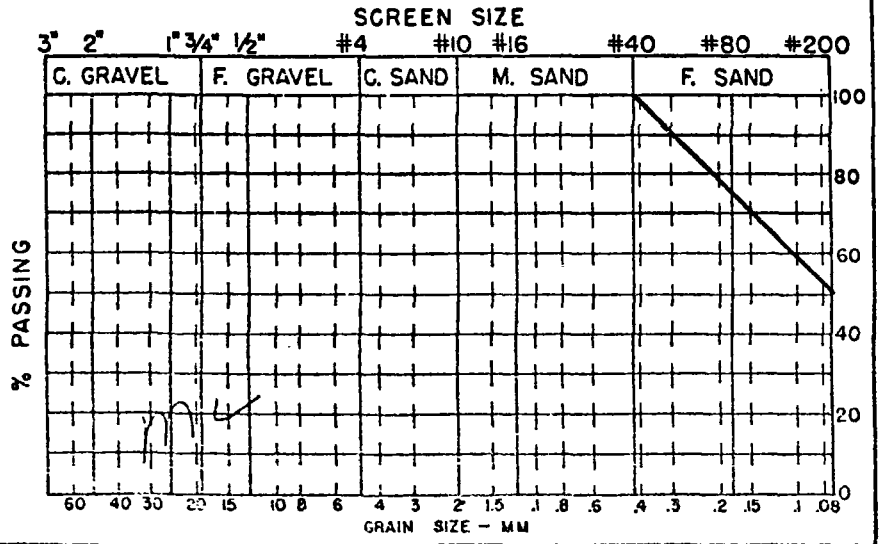
DESCRIPTION: Wet, Brn. F. Sdy. Silt



H_2O = 35%

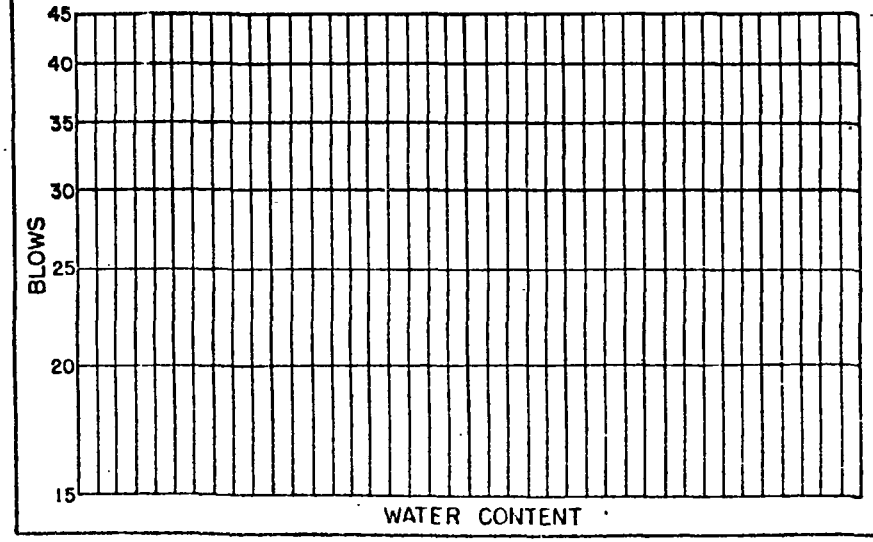
SIEVE ANALYSIS	% Passing 74.73	
	-40 35.93	100
-¾	-80	
-4	-140	
-10	-200 38.8	52

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



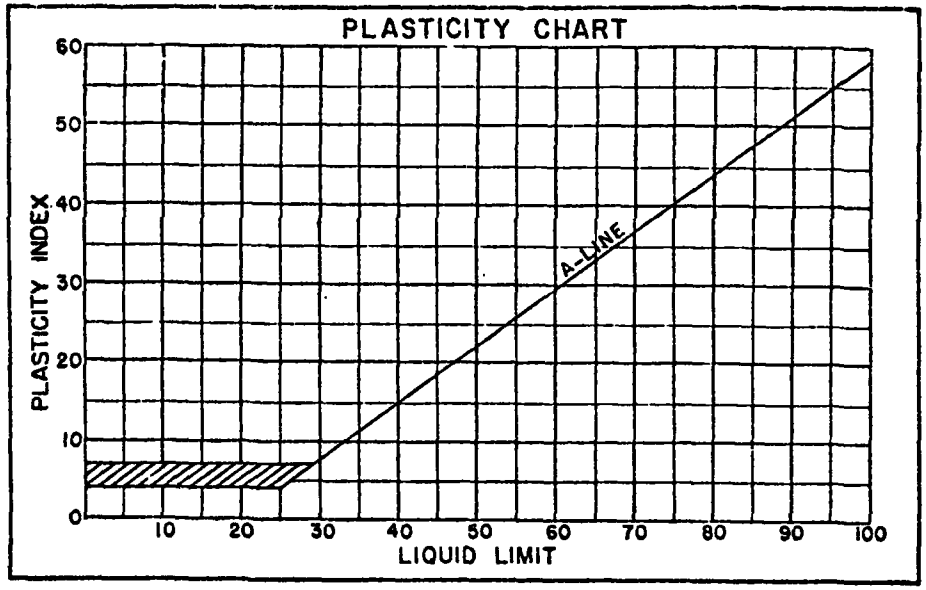
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4813-2 JOB NO. Hog. HOLE NO. C-10
DATE 8-30-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	/	
DRIED CAST	/	/	
DILATANCY			
BITE			
TOUGHNESS	/	/	

DESCRIPTION: M. grn. outs. sc w/gr.
Sty. F. SAND w/mica

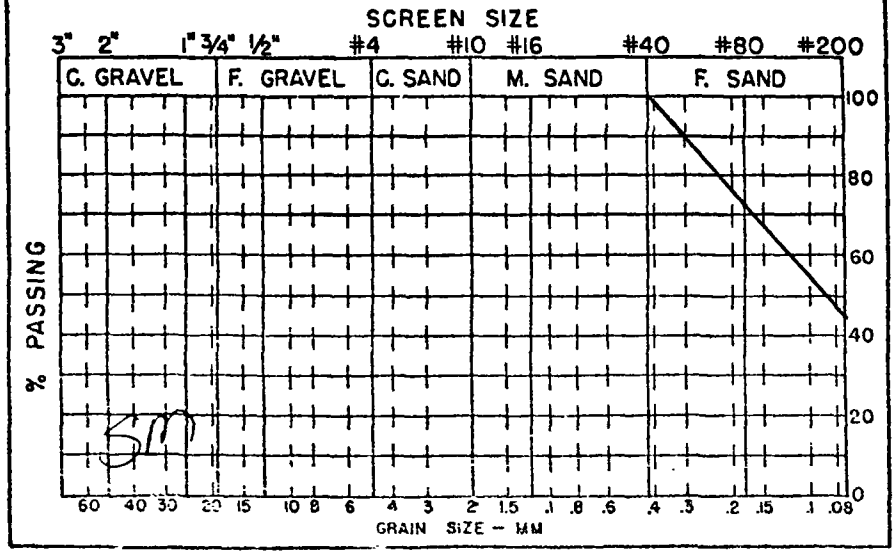


H_2O: 17%

SIEVE ANALYSIS % Passing 104.92

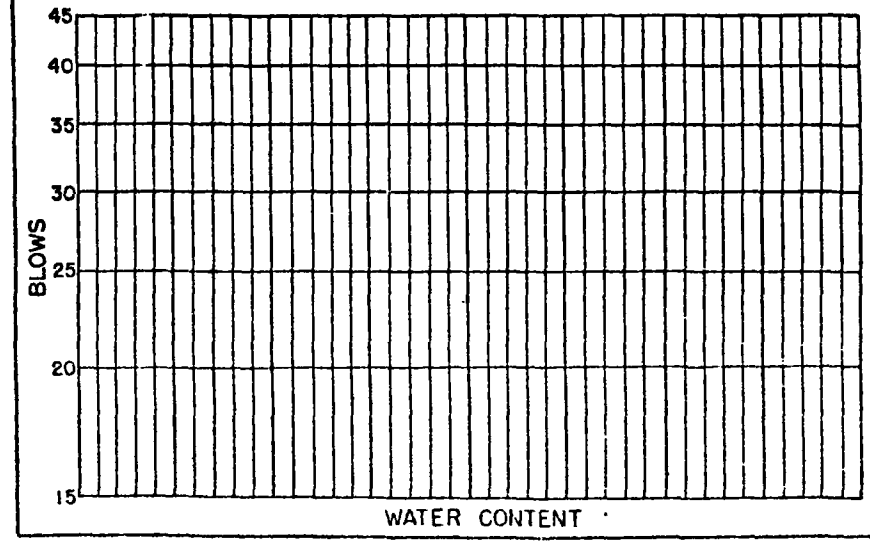
	-40 56.19	100
-3/4	-80	
-4	-140	
-10	-200 48.73	46

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

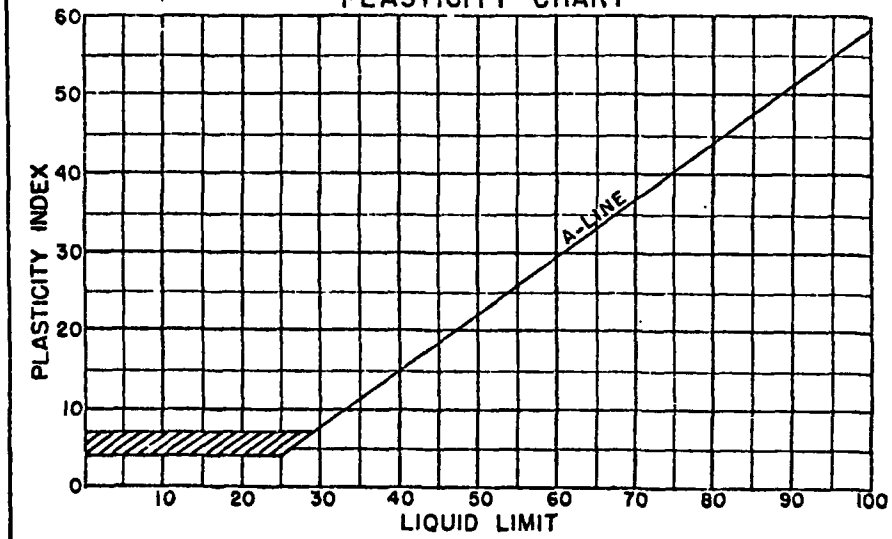
SAMPLE NO. 4813-3 JOB NO. 408 HOLE NO. C-10
DATE 8-30-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL		✓	
DRIED CAST		✓	
DILATANCY			
BITE			
TOUGHNESS		✓	

DESCRIPTION: Wet, Brn w/ t. rust org. Layered F. Sdy. SILT w/ t. MICA

PLASTICITY CHART



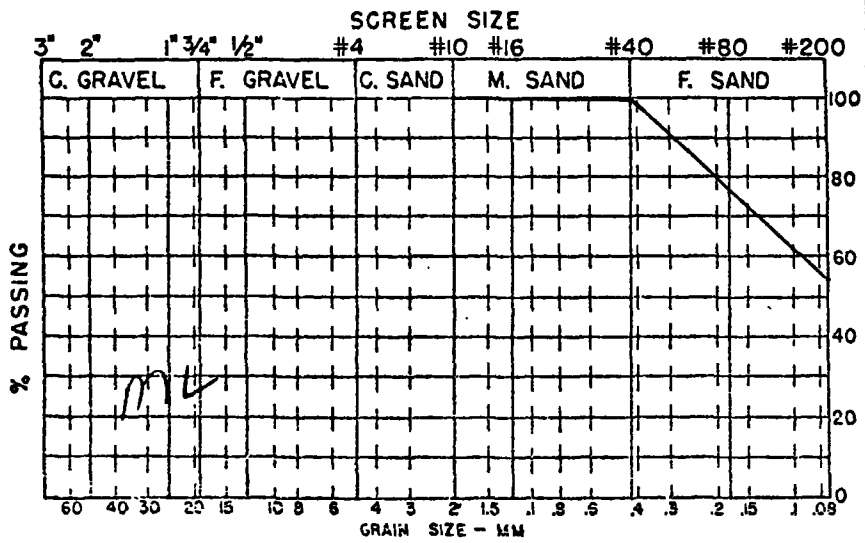
SIEVE ANALYSIS

H2O = 40%

% Passing 88.0

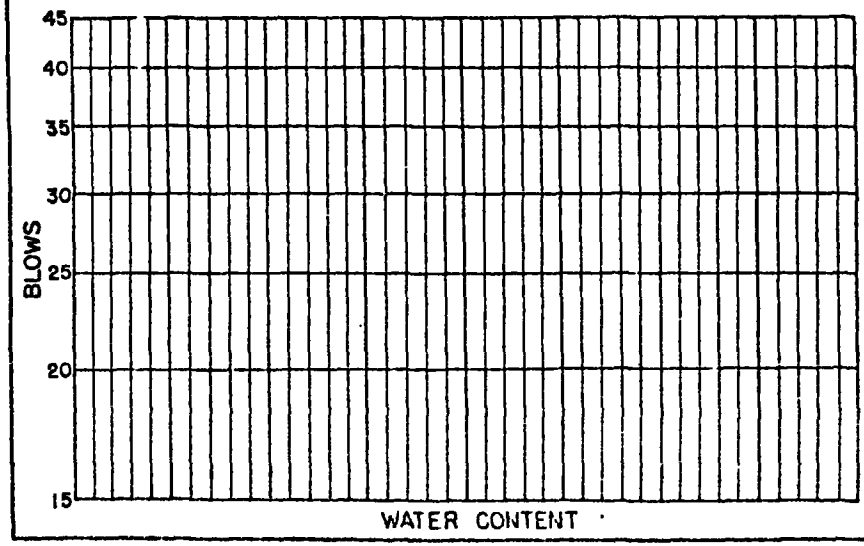
	-40	40.06	99
-3/4	-80		
-4	-140		
-10 .1 100	-200	47.84	54

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-919

TRIAXIAL COMPRESSION TEST (With Area Changes and Pore Pressures)

Project Hoquiam by Ass Location Sta. 176 ≈ 36' Lt.
Job No. L Sample No. 4810-1 Boring No. C-10 Depth 22'10" to 23'2"
Area (Ao) 2.92 in² Length 4" Confining Pressure 2000 psf (13.89 psi)
Rate of Loading 1% L. R. C. 0.92 Tested by A.G.S. Date 10/5/83

Description

GROSS WT.	TARE	NET WT.	CAN NO.	WET WT.	DRY WT.	WT. H^2O	% H^2O	WET DENS.	DRY DENS.
493	149	344	48	63.38	37.40	30.98	82.8		

Data for Mohr's Envelope:
Max. Deviator Stress
Principal Stress
Effective Principal Stress

Failure

Back Press. 0
Saturation 95.7%

ELASPED TIME (Hr.) (Min.)	LOAD DIAL READ (X 10^{-4})	DEFORM. DIAL READ	Δ L (COL. 3 x 10^{-3})	E. UNIT STRAIN ($\Delta L/L$)	AREA C.F. (1 − E)	CORRECT. AREA A' ($\frac{A^0}{1-E}$)	PORE PRESS.	DEV. LOAD (Col. 2 X LRC)	DEV. STRESS (Col. 9 ÷ Col. 7)	PRINC. STRESS (Col 10 + conf. press.)
1	2	3	4	5	6	7	8	9	10	11
0	0	0	0	0			12.36	0		
1.00	3	24	0.024	0.006			12.44	2.76	0.945	
2.00	13	61	0.061	0.015			12.44	11.96	4.100	
3.00	25	99	0.099	0.025			12.42	23.00	7.88	
4.00	33	138	0.138	0.034			12.38	30.36	10.40	
5.00	33.5	175	0.175	0.044			12.14	30.82	10.55	
6.00	33.0	218	0.218	0.054			11.72	30.36	10.40	
7.00	33.0	260	0.260	0.065			11.34	30.36	10.40	
8.00	33.0	294	0.294	0.074			11.18	30.36	10.40	
9.00	33.0	332	0.332	0.083			11.04	30.36	10.40	
10.00	33.0	372	0.372	0.093			11.00	30.36	10.40	
11.00	33.0	408	0.408	0.102			11.00	30.36	10.40	
12.00	33.0	448	0.448	0.112			11.03	30.36	10.40	
13.00	33.0	488	0.488	0.122			11.05	30.36	10.40	

DOT FORM 351-018 REVISED 4/80

"C" ≈ 748 psf

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

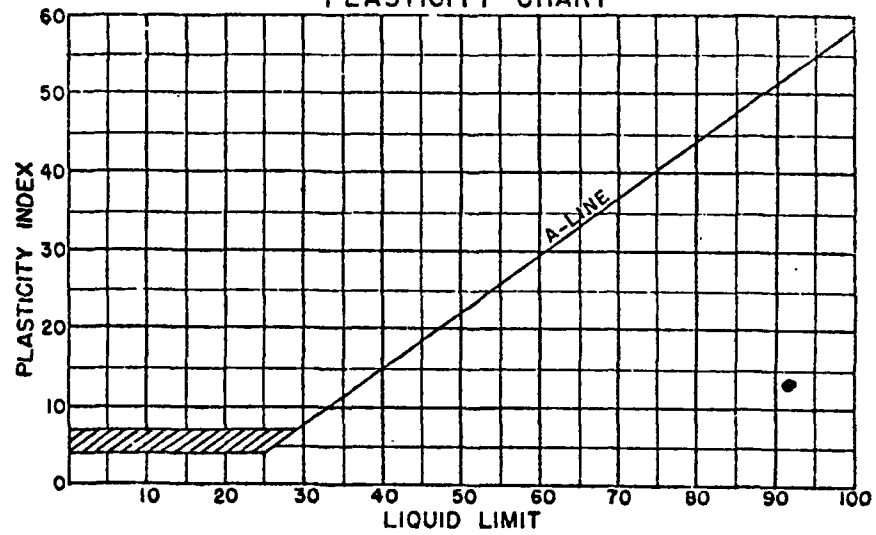
SAMPLE NO. 4810-1 JOB NO. HOLE NO.
DATE 10/7/83 OPERATOR AS

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION:

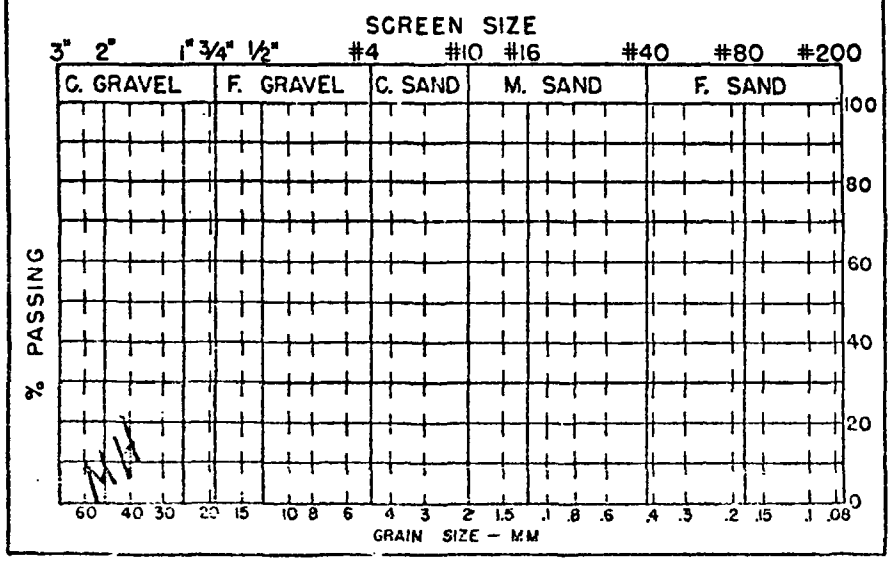
PLASTICITY CHART



SIEVE ANALYSIS % Passing

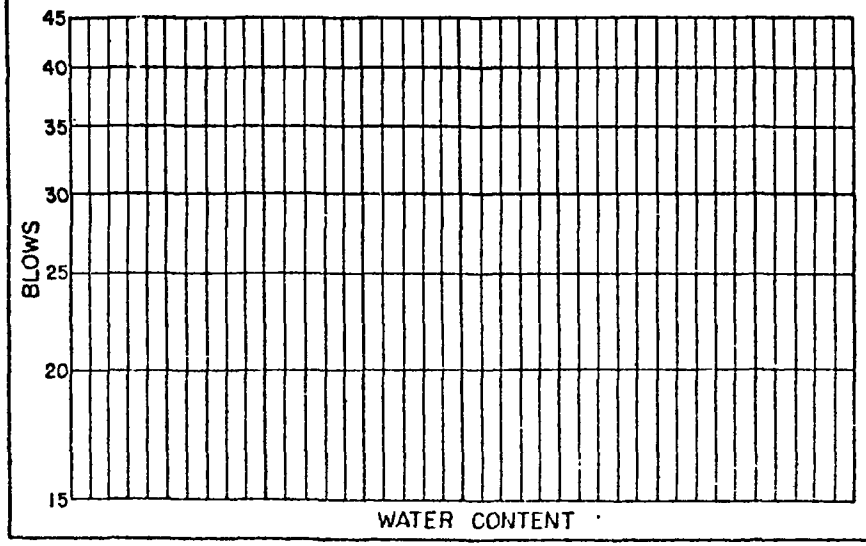
	-40
-¾	-80
-4	-140
-10	-200

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	60				113
Wet Wt.	24.7				5.72
Dry Wt.	12.80				3.20
% H_2O	92.97				PL= 78.75
Blows	25				PI= 14.22



DOT FORM 351-019

TRIAXIAL COMPRESSION TEST (With Area Changes and Pore Pressures)

Project Hoquiam by Pass Location Sta. 176 ≈ 36 Lt.
Job No. L- Sample No. 4804-2 Boring No. C-10 Depth 7'10" to 8'2"
Area (Ao) 2.92 in² Length 4" Confining Pressure 1000 psf (6.94 psi)
Rate of Loading 1% L. R. C. 0.92 Tested by A.G.S. Date 10/5/83

Description

GROSS WT.	TARE	NET WT.	CAN NO.	WET WT.	DRY WT.	WT. H^2O	% H^2O	WET DENS.	DRY DENS.
488	142	346	44	57.21	40.48	16.73	41.3		

Data for Mohr's Envelope:
Max. Deviator Stress
Principal Stress
Effective Principal Stress

Failure

Back Press. 0
Saturation 72%

ELASPED TIME (Hr.) (Min.)	LOAD DIAL READ (X 10⁻⁴)	DEFORM. DIAL READ	ΔL (COL. 3 x 10⁻³)	E. UNIT STRAIN (ΔL/L)	AREA C.F. (1 − E)	CORRECT. AREA A' ($\frac{A^0}{1-E}$)	PORE PRESS.	DEV. LOAD (Col. 2 X LRC)	DEV. STRESS (Col. 9 ÷ Col. 7)	PRINC. STRESS (Col 10 + conf. press.)
1	2	3	4	5	6	7	8	9	10	11
0	0	0	0				5.10	0	0	
1.00	16	27	0.027	0.0068			5.20	14.72	5.04	
2.00	25	67	0.067	0.0168			4.99	23.00	7.88	
3.00	28	107	0.107	0.0268			4.61	25.76	8.82	
4.00	30.5	150	0.150	0.0375			4.29	28.06	9.61	
5.00	32.0	190	0.190	0.0475			4.03	29.44	10.08	
6.00	32.2	232	0.232	0.0580			3.89	29.64	10.15	
7.00	33.2	278	0.278	0.0695			3.82	30.54	10.45	
8.00	34.0	319	0.319	0.0798			3.79	31.28	10.71	
9.00	34.2	362	0.362	0.0905			3.75	31.46	10.77	
10.00	34.2	405	0.405	0.1012			3.70	31.46	10.77	
11.00	34.5	447	0.447	0.1118			3.69	31.74	10.87	
12.00	34.5	485	0.485	0.1212			3.69	31.74	10.87	
13.00	34.5	530	0.530	0.1325			3.66	31.74	10.87	
14.00	34.5	571	0.571	0.1428			3.66	31.74	10.87	

DOT FORM 351-018 REVISED 4/80

"C" ≈ 782 psf

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

Triax

SAMPLE NO. 4804-2 JOB NO. HOLE NO.

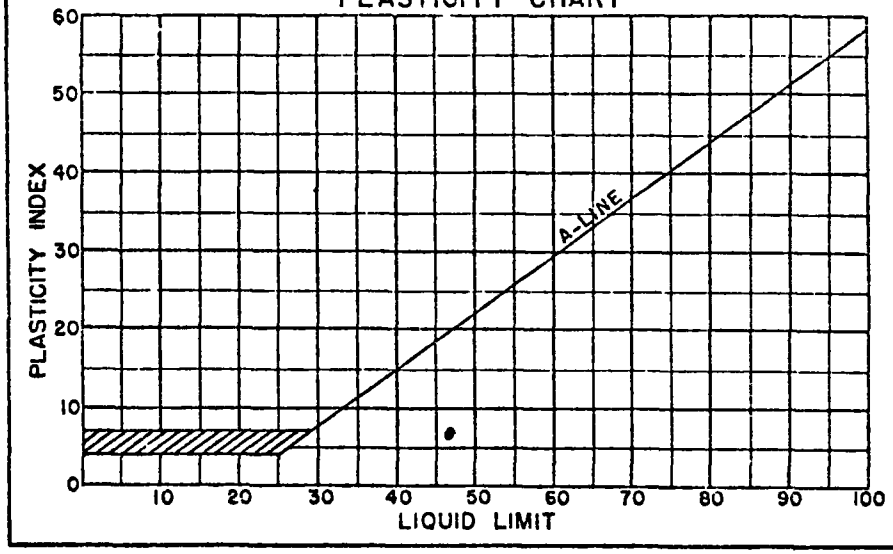
DATE 10/7/83 OPERATOR AS

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

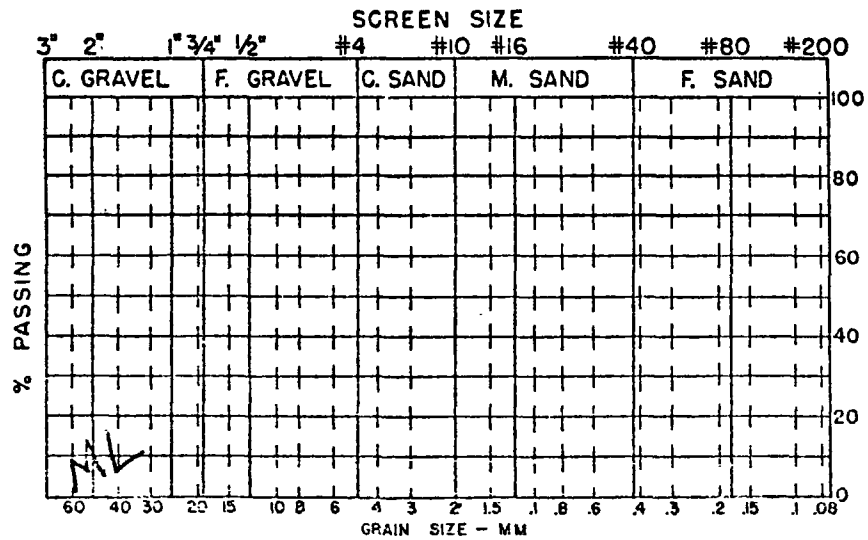
DESCRIPTION:

PLASTICITY CHART



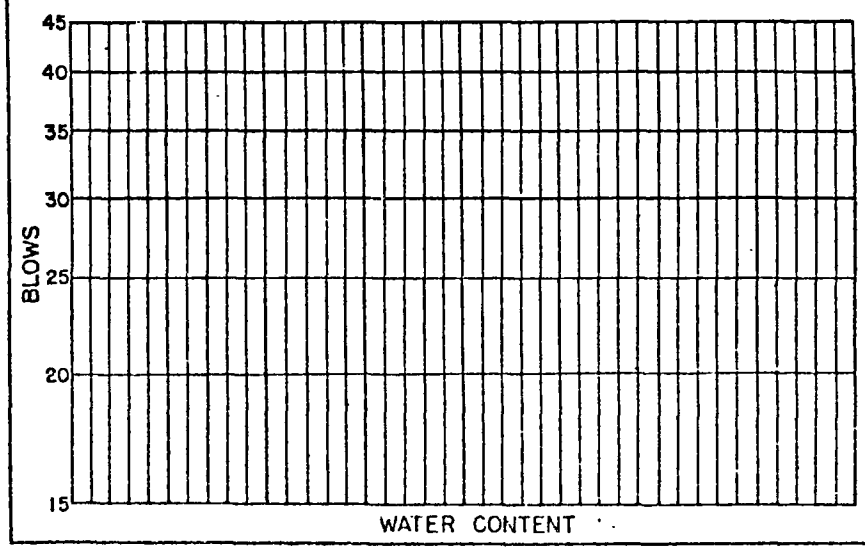
SIEVE ANALYSIS	% Passing
	-40
-3/4	-80
-4	-140
-10	-200

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	114				32
Wet Wt.	30.81				3.60
Dry Wt.	20.96				2.70
% H_2O	46.99				PL= 40.74
Blows	30				PI= 7.29



BJT FORM 351-019

TRIAXIAL COMPRESSION TEST (With Area Changes and Pore Pressures) U.U.

Project Hoquiam by Pass Location Sta. 176 ± 36' Lt.
Job No. L-7262 Sample No. 4806-1 Boring No. [illegible] Depth 12'6" to 12'10"
Area (Ao) 2.92 in² Length 4" Confining Pressure 800 psf (5.56 psi)
Rate of Loading 1% L. R. C. 0.92 Tested by A.G.S. Date 9-28-85

Description

GROSS WT.	TARE	NET WT.	CAN NO.	WET WT.	DRY WT.	WT. H^2O	% H^2O	WET DENS.	DRY DENS.
364	146	218.0	49	62.58	37.68	24.90	66.1		

Data for Mohr's Envelope:
Max. Deviator Stress
Principal Stress
Effective Principal Stress

Failure

Back Press. —
Saturation 96% +

ELASPED TIME (Hr.) (Min.)	LOAD DIAL READ (X 10⁻⁴)	DEFORM. DIAL READ	ΔL (COL. 3 x 10⁻³)	E. UNIT STRAIN (ΔL/L)	AREA C.F. (1 − E)	CORRECT. AREA A' ($\frac{A^0}{1-E}$)	PORE PRESS.	DEV. LOAD (Col. 2 X LRC)	DEV. STRESS (Col. 9 ÷ Col. 7)	PRINC. STRESS (Col 10 + conf. press.)
1	2	3	4	5	6	7	8	9	10	11
0	0	0	0	0	1.00	2.92	4.22	0	0	
0.50	0.5	20	0.020	0.005	0.995	2.935	4.14	0.46	0.157	
1.00	1.0	40	0.040	0.010	0.990	2.950	4.06	0.92	0.312	
1.50	2.2	61	0.061	0.015	0.985	2.965	3.91	2.024	0.683	
2.00	4.5	81	0.081	0.020	0.980	2.980	3.79	4.140	1.389	
3.00	7.0	124	0.124	0.031	0.969	3.013	3.55	6.440	2.137	
4.00	9.2	161	0.161	0.040	0.960	3.042	3.25	8.464	2.782	
5.00	11.5	204	0.204	0.051	0.949	3.077	2.98	10.580	3.438	
6.00	12.5	245	0.245	0.061	0.939	3.110	2.77	11.500	3.700	
7.00	13.0	285	0.285	0.071	0.929	3.143	2.62	11.960	3.805	
8.00	14.5	329	0.329	0.082	0.920	3.174	2.47	13.34	4.203	
9.00	15.2	370	0.370	0.092	0.908	3.216	2.35	13.984	4.348	
10.00	15.5	409	0.409	0.102	0.898	3.252	2.24	14.260	4.385	
11.00	16.0	452	0.452	0.113	0.887	3.292	2.12	14.72	4.471	
12.00	15.2	491	0.491	0.123	0.877	3.330	2.40	13.984	4.200	
13.00	15.2	530	0.530	0.132	0.868	3.364	2.66	13.984	4.157	
14.00	15.2	570	0.570	0.142	0.858	3.403	2.96	13.984	4.109	

TRIAXIAL COMPRESSION TEST (With Area Changes and Pore Pressures)

Project Hoquiam by Pass Location Sta 176 ± 36' Lt.
Job No. L-7262 Sample No. 4808-3 Boring No. C-10 Depth 18'2" - 18'6"
Area (Ao) 2.92 in² Length 4" Confining Pressure 1000 psf (6.94 psi)
Rate of Loading 1% L. R. C. 0.92 Tested by A.G.S. Date 9-27-83

Description

GROSS WT.	TARE	NET WT.	CAN NO.	WET WT.	DRY WT.	WT. H^2O	% H^2O	WET DENS.	DRY DENS.
364	144	220	46	52.62	33.14	19.48	58.8		

Data for Mohr's Envelope:
Max. Deviator Stress
Principal Stress
Effective Principal Stress

Failure

Back Press. 0
Saturation 78 %

ELASPED TIME (Hr.) (Min.)	LOAD DIAL READ (X 10^{-4})	DEFORM. DIAL READ	Δ L (COL. 3 x 10^{-3})	E. UNIT STRAIN (ΔL/L)	AREA C.F. (1 − E)	CORRECT. AREA A' ($\frac{A^o}{1-E}$)	PORE PRESS.	DEV. LOAD (Col. 2 X LRC)	DEV. STRESS (Col. 9 ÷ Col. 7)	PRINC. STRESS (Col 10 + conf. press.)
1	2	3	4	5	6	7	8	9	10	11
0	0	0	0	0	0	0	2.98	0	0	
0.50	4	23	0.023	0.0058	0.994	2.938	3.34	3.68	1.252	
1.00	6	42	0.042	0.010	0.990	2.950	3.40	5.52	1.871	
1.50	9.2	62	0.062	0.016	0.984	2.967	3.38	8.464	2.853	
2.00	12	83	0.083	0.021	0.979	2.983	3.28	11.04	3.701	
2.50	15	98	0.098	0.024	0.976	2.992	3.13	13.80	4.612	
3.00	19	121	0.121	0.030	0.970	3.010	2.97	17.48	5.807	
3.50	21	142	0.142	0.036	0.964	3.029	2.72	19.32	6.378	
4.00	24	162	0.162	0.040	0.960	3.042	2.45	22.08	7.258	
4.50	28	182	0.182	0.046	0.954	3.061	2.18	25.76	8.416	
5.00	30	201	0.201	0.050	0.950	3.074	2.01	27.60	8.978	
6.00	37	238	0.238	0.060	0.940	3.106	1.56	34.04	10.96	
7.00	42	282	0.282	0.071	0.929	3.143	1.14	38.64	12.29	
8.00	48	318	0.318	0.080	0.920	3.174	0.78	44.16	13.91	
9.00	52	358	0.358	0.090	0.910	3.209	0.42	47.84	14.91	
10.00	54	400	0.400	0.100	0.900	3.244	0.10	49.68	15.31	
11.00	56.5	440	0.440	0.110	0.890	3.281	-0.22	51.98	15.84	
12.00	58.5	480	0.480	0.120	0.880	3.318	-0.40	53.82	16.22	
13.00	62.0	521	0.521	0.130	0.870	3.356	-0.58	57.04	17.00	
15.00	66.0	599	0.599	0.150	0.850	3.435	-0.92	60.72	17.68	
17.00	67.0	686	0.686	0.172	0.828	3.526	-1.36	61.64	17.48	
19.00	67.5	766	0.766	0.192	0.808	3.614	-1.56	62.10	17.18	
21.00	67.5	844	0.844	0.211	0.789	3.701	-1.61	62.10	16.78	
23.00	67.5	928	0.928	0.232	0.768	3.802	-1.61	62.10	16.33	

DOT FORM 351-018 REVISED 4/80

"c" = 1273 psf

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4808-3 JOB NO. HOLE NO.

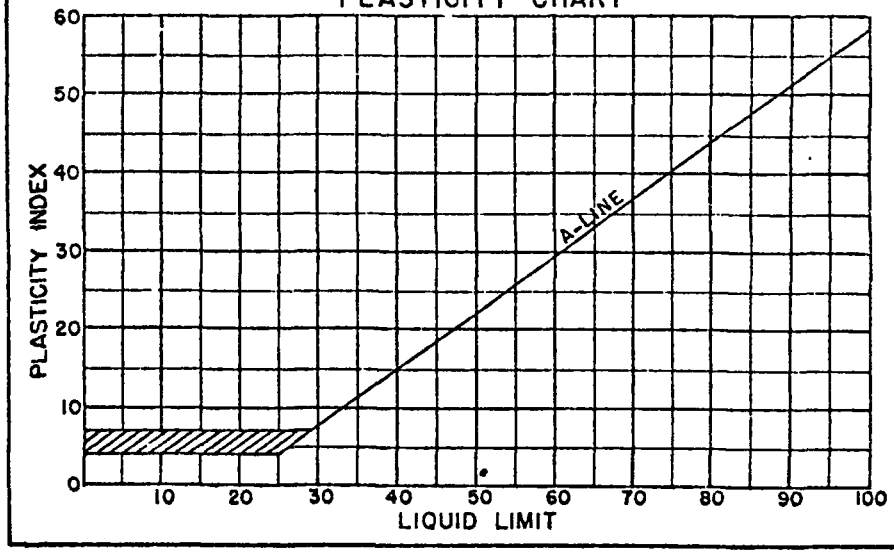
DATE 9-29-83 OPERATOR AS

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	✓
DRIED CAST	✓	✓	✓
DILATANCY			
BITE			
TOUGHNESS	✓	✓	✓

DESCRIPTION: Moist, Reddish-Brown F. Sdy Silt

PLASTICITY CHART

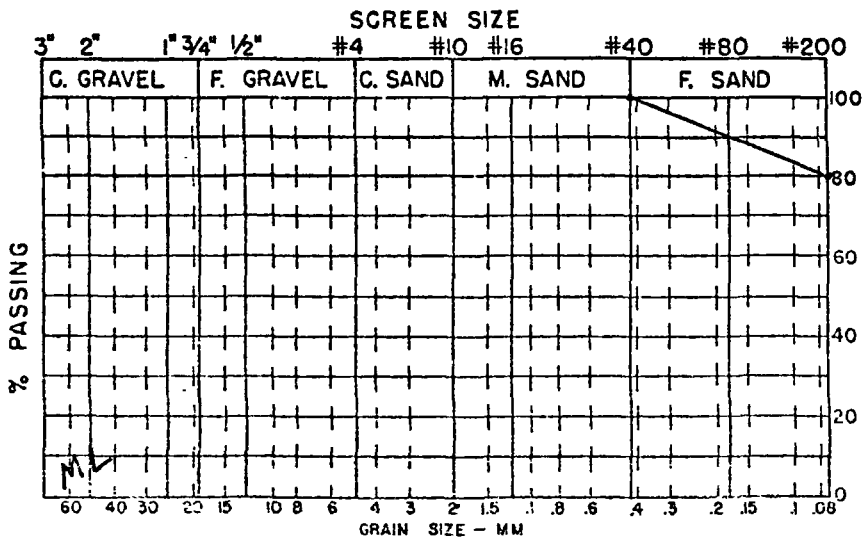


33.14, 52.62 64.49

SIEVE ANALYSIS % Passing

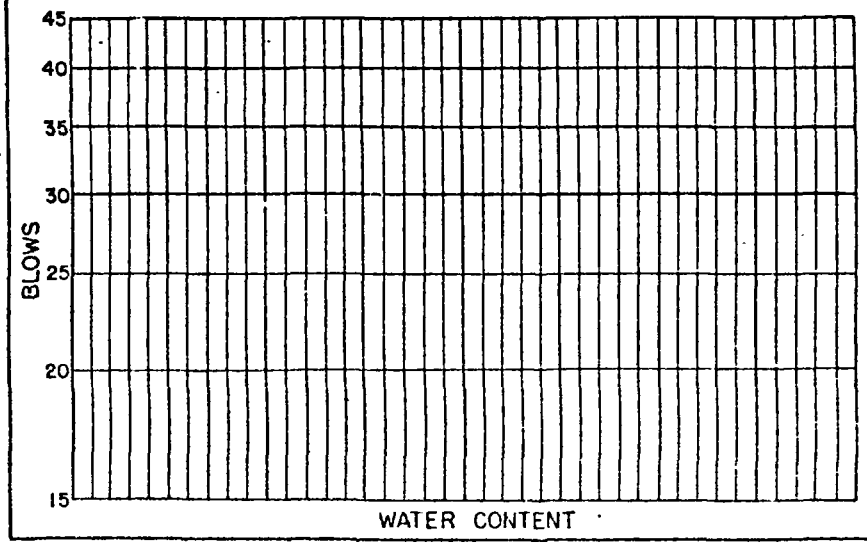
	-40 13.07	100 %
-3/4	-80	
-4	-140	
-10	-200 51.42	79.7

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	19				51
Wet Wt.	48.51				12.29
Dry Wt.	32.20				8.48
% H_2O	50.7				PL= 44.93
Blows	13				PI= 1.90



WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

(ATERIALS ENGINEER
(aterials Laboratory
O. Box 167, Olympia, WA 98504 (Mailing Address)
55 So. 2nd Ave.
mwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 6-28-82

Dear Sir:

I have forwarded by today's state car the following Foundation Samples.

Contract or Job No. L-6504 Section Hoquiam bypass SR No. 101 A Sub-Section Game crossing.

Station & Offset 164+12 73' Rt. Hole # J-1

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
E-3017	U-1	1' 4" / 1' 8"	B		
3018-1	D-3	6' 0" / 8' 0"		OL	Moist, BLK. SOFT, Hly. Org. SILT w/ Rotten Lg. Chunks of Wood
-2	D-5	11' 0" / 13' 0"		OL	SAME but No Wood
-3	D-7	17' 0" / 19' 0"	H_2O=105%	ML	Moist, Brn. & BLK., Org. Sticky F. Sdy. SILT W-T m SAND
3019-1	U-8	19' 0" / 19' 4"	A		
-2		19' 4" / 19' 8"	B		
-3		19' 8" / 20' 0"	C		
E-3020	D-9	21' 0" / 23' 0"		ML	Like 3018-3 Above Moist, Brn. & BLK. Org. Sticky F. Sdy. SILT W-T Med. Sand
3021-1	U-10	24' 0" / 24' 4"	A		

opy with samples
opy to addressee

Yours very truly,
Larry M Moore
Inspector.

FORM 351-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 6-28-82

Dear Sir:

I have forwarded by today's state car the following Foundation Samples.

Contract or Job No. L-6501 Section Hogovisan by pass
SR No. 101 A Sub-Section Game crossing

Station & Offset 164+12 73' Rt. Hole # J-1

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3021 -2	U-10	24' 4" 24' 8"	B		
-3		24' 8" 25' 0"	C		
3022	D-11	26' 0" 28' 0"	H2O=48%	ML	Moist, Gr & Rust, SILT / crystals w/ chunks & Siltstone w/ t. Mica
3023 -1	U-12	29' 0" 29' 4"	A		
-2		29' 4" 29' 8"	B		
-3		29' 8" 30' 0"	C		
3024	D-13	31' 0" 33' 0"		OL	Like 3018-1 Moist, Blk., Soft, hly org., Sly SILT w- Lg. Chunks of Wood (decayed rotten)
3025 -1	U-14	34' 0" 34' 4"	A		
-2		34' 4" 34' 8"	B		

1 copy with samples
1 copy to addressee

Yours very truly,

Larry M Moore
Inspector.

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

ATERIALS ENGINEER
aterials Laboratory
. O. Box 167, Olympia, WA 98504 (Mailing Address)
55 So. 2nd Ave.
mwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 6-28-82

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-6504 Section Hoquiam bypass SR No. 101 A Sub-Section Game crossing.

Station & Offset 164+12 73' Rt. Hole # J-1

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3025 -3	L-14	34' 8" 35' 0"	C		
3026 -1	D-15	36' 0" 38' 0"		ML	Like 3022 Moist, Gr. & Rust Silt w/ Clay w/ Chunks of Siltstone & T. Mica's
-2	D-17	41' 0" 43' 0"		SM	Moist, Gr & Brn., V. Sty. F-C Sand W-T. Fine Gravel
-3	D-18	44' 0" 46' 0"	H_2O=99%	SM	Moist, Gr, Blk. & Brn. Org. F-C Sdy. Silt W- Fine Gravel
3027 -1	L-19	49' 0" 49' 4"	A		
-2		49' 4" 49' 8"	B		
-3		49' 8" 50' 0"	C		
3028 -1	D-20	51' 0" 53' 0"		CH	Like 3028-2 Dry, Gr. F Sdy. Sty. Clay
-2	D-21	56' 0" 58' 0"	H_2O=22%	CH	Dry, Gr. F. Sdy., Sty. Clay

opy with samples
opy to addressee

Yours very truly,

Larry M. Moore
Inspector.

FORM 351-002
REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater

Date 6-28-82

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-6504 Section Highway bypass SR No. 101 A Sub-Section Gamis crossing

Station & Offset 164+12 73' Rt. Hole # J-1

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3028-3	D-22	59' 0" 60' 6"		CH	Like 3028-2 Dry, Gr. F. Sdy, Sty Clay.
-4	D-23	64' 0" 65' 6"		CH	Like 3028-2

1 copy with samples
1 copy to addressee

Yours very truly,

Larry M Moore
Inspector.

DOT FORM 351-002

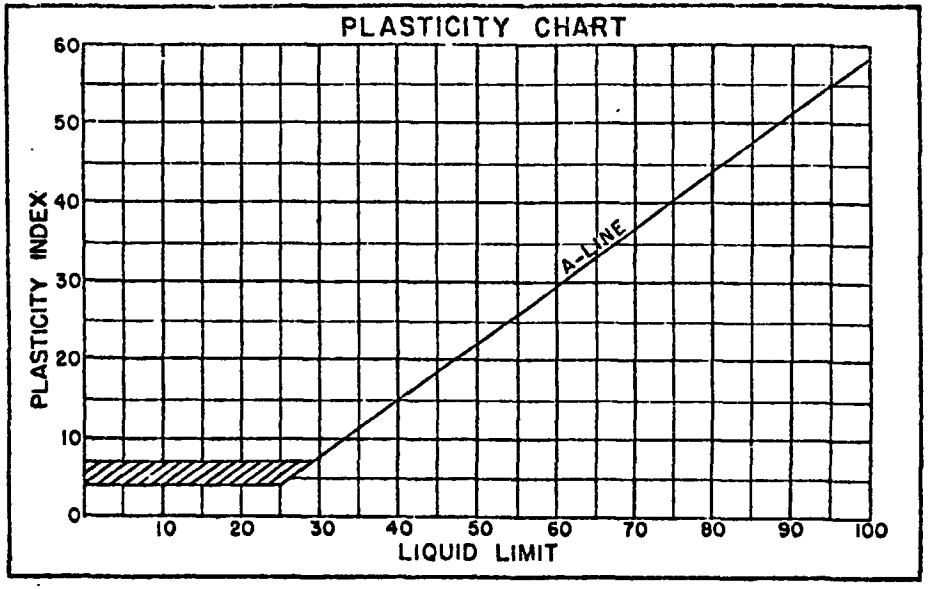
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3318-3 JOB NO. Hoz HOLE NO. J-1
DATE 7-23-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Moist, Brn. & Blk. Org., sticky. F. Sdy. SILT

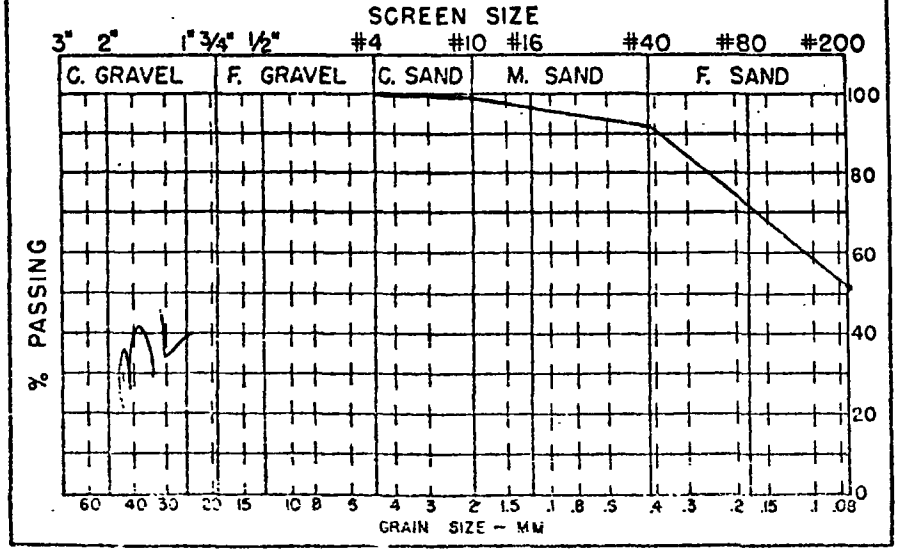


H_2O = 105 %

SIEVE ANALYSIS % Passing 60.40

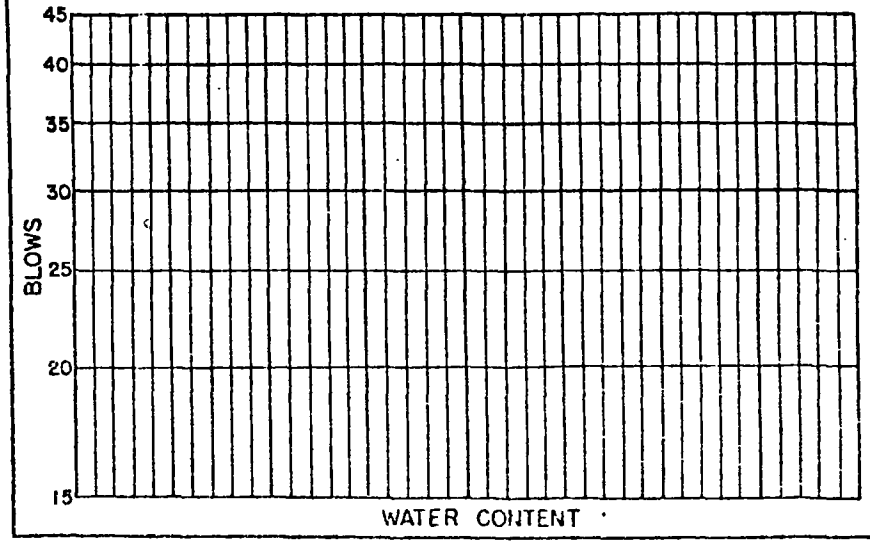
		-40 24.48	93%
-3/4		-80	
-4 .10	100%	-140	
-10 4.21	99.9%	-200 31.61	52%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

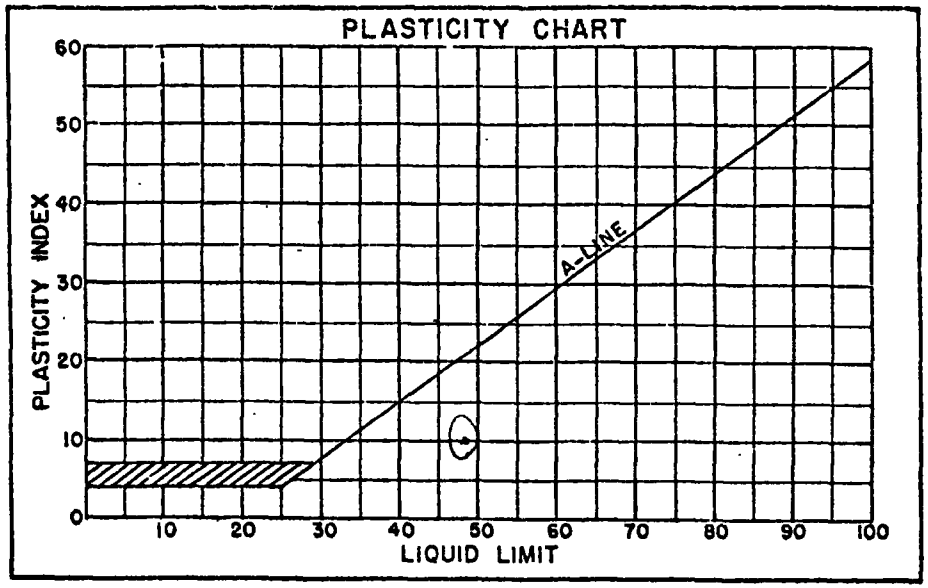
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3022 JOB NO. 40a HOLE NO. J-1
DATE 7-21-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

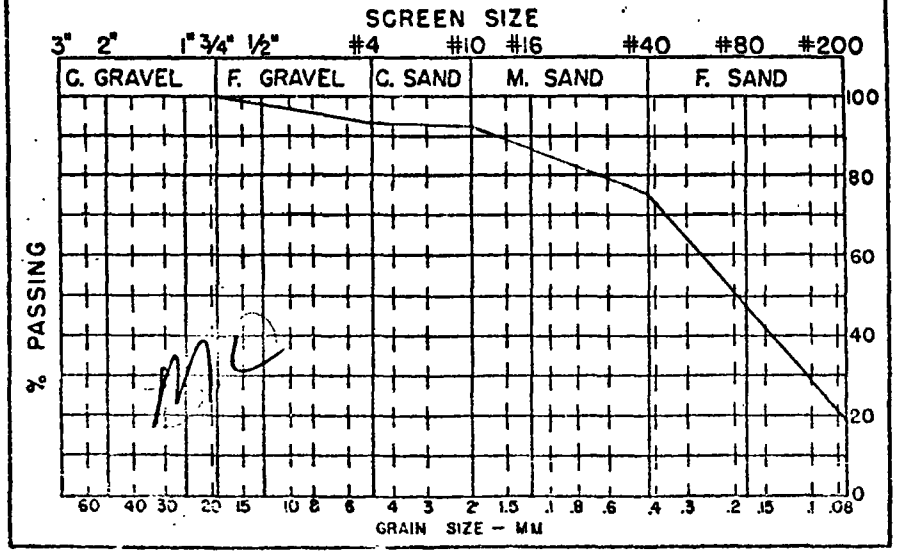
DESCRIPTION: Moist, Gr & Rust Sty. SILT w/ Chunks of SILT Stone w/T. Mica Concentrations



H_2O = 48%

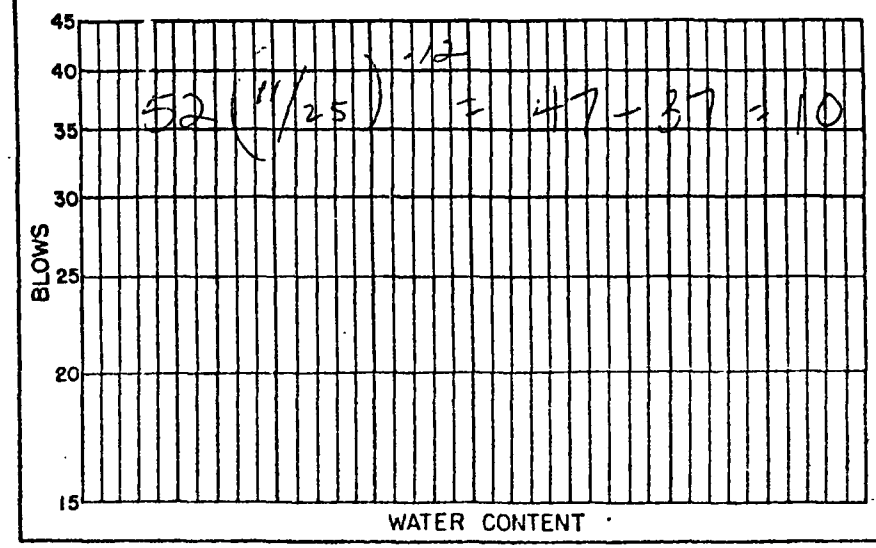
SIEVE ANALYSIS	% Passing		% Passing
		-40	74%
-3/4	100%	-80	
-4	94%	-140	
-10	93%	-200	19%

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	41				44
Wet Wt.	11.29				7.22
Dry Wt.	7.42				5.28
% H_2O	52%				PL= 37%
Blows	11				PI= 10



52 (11/25) .12 = 47 − 37 = 10

DOT FORM 351-019

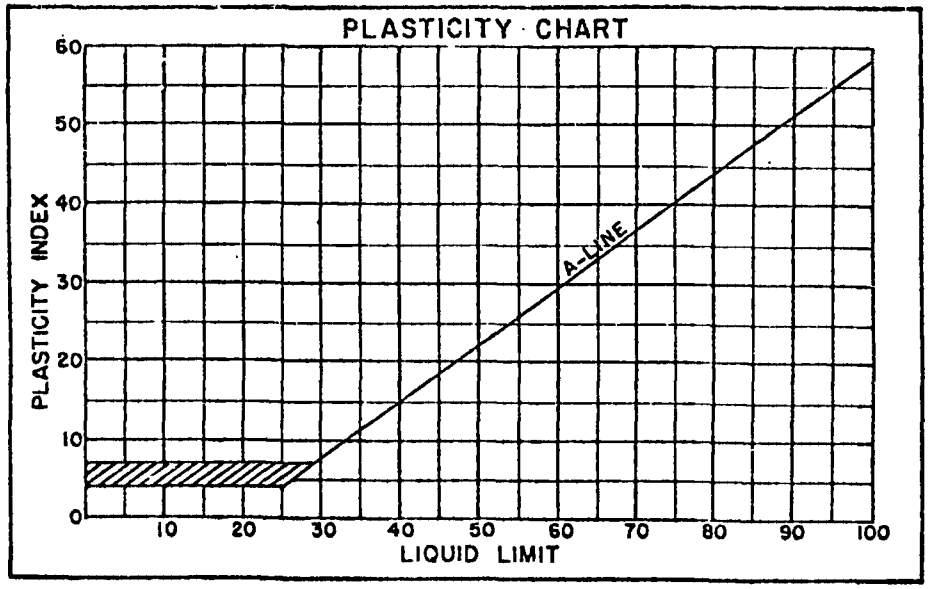
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3026-2 JOB NO. Hog HOLE NO. J-1
DATE 7-23-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

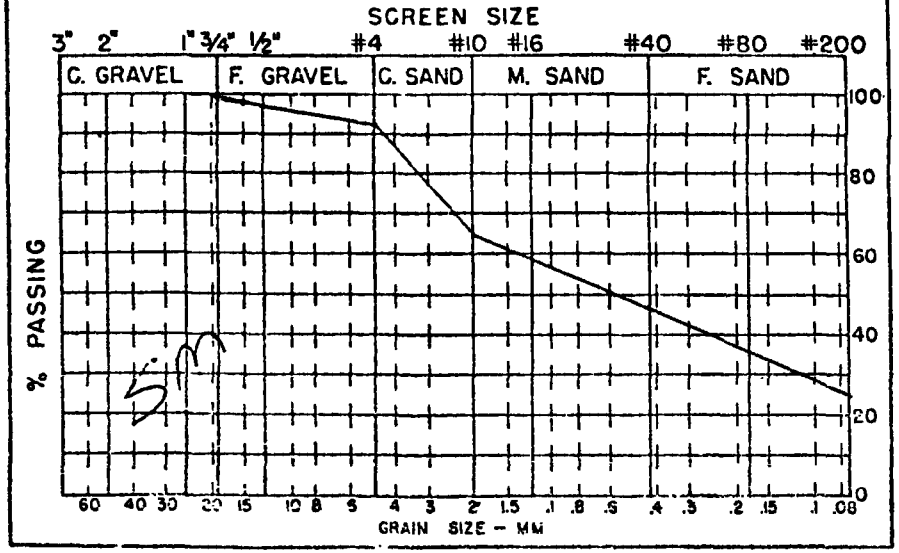
DESCRIPTION: Moist, Gr & Brn.
V. Sty. F-C SAND
W-T. F. GRAVEL



SIEVE ANALYSIS % Passing 44.07

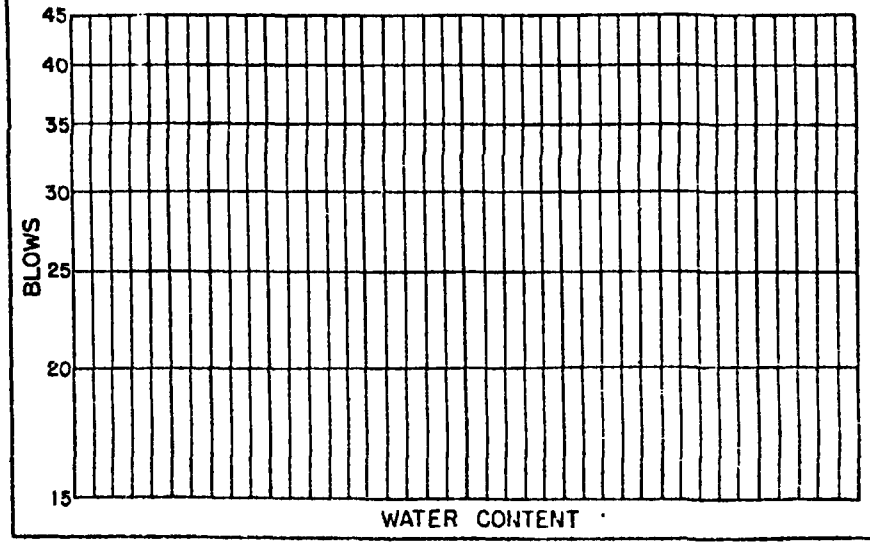
			-40	9.84	47%
-¾	3.15	100%	-80		
-4	12.62	93%	-140		
-10	7.41	64%	-200	11.05	25%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3026-3 JOB NO. Hog. HOLE NO. J-1
DATE 7-23-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

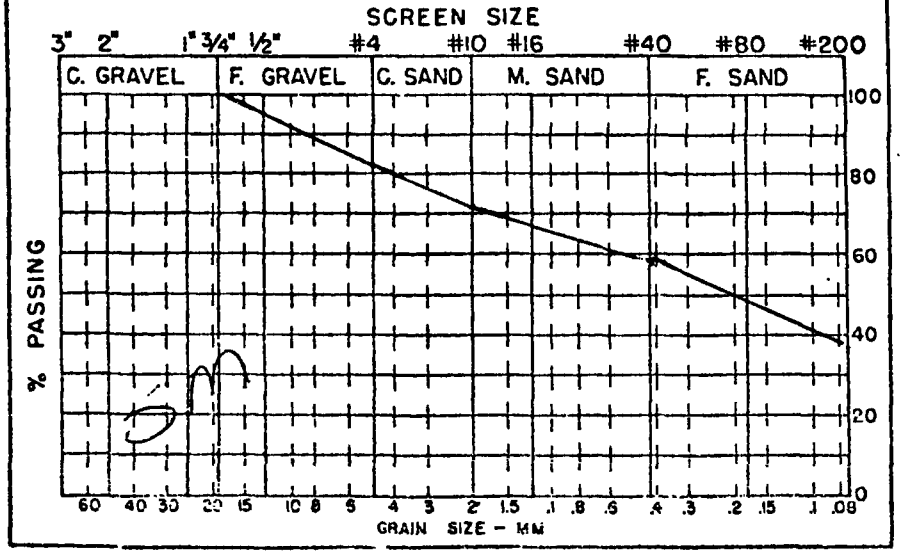
DESCRIPTION: Moist, GR, Blk. & Brn. Org. F-C Sdy. SILT W-F. Gravel

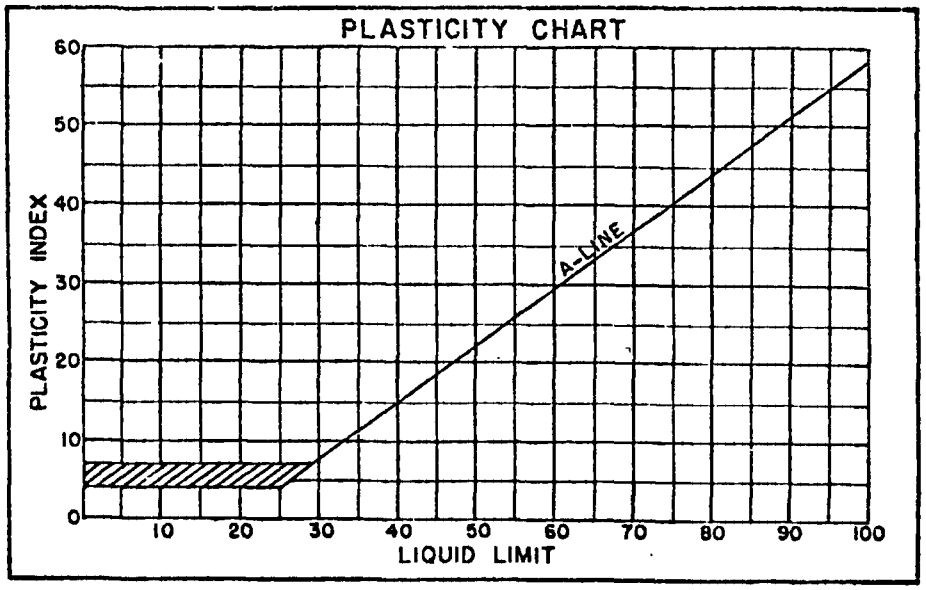
H_2O = 99%

SIEVE ANALYSIS % Passing 99.12

			-40	21.03	59%
-¾	18.12	100%	-80		
-4	10.69	82%	-140		
-10	11.48	71%	-200	37.80	38%

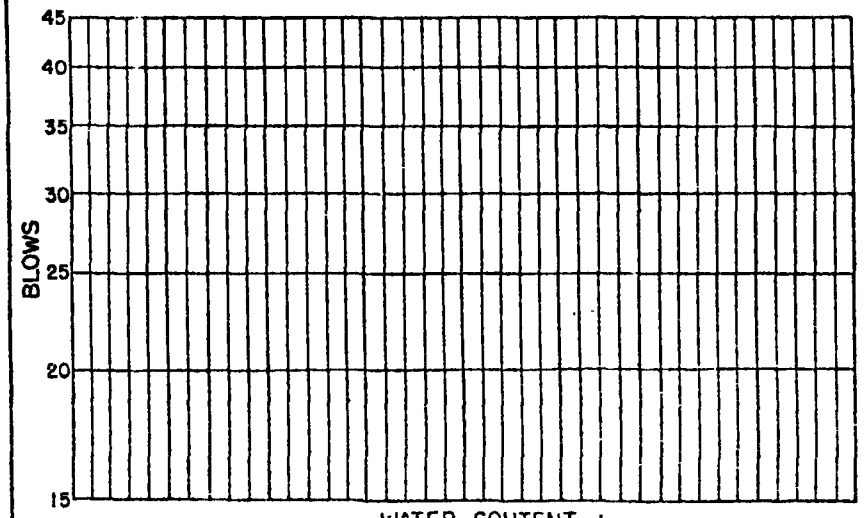
GRAIN SIZE CURVE





LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

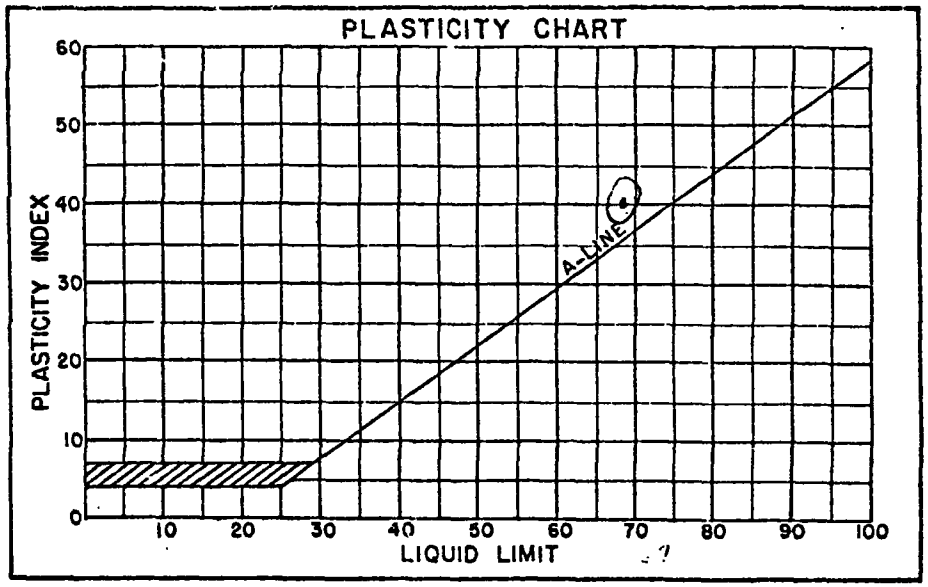
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3028-2 JOB NO. Hof. HOLE NO. J-1
DATE 7-23-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Dry, Gr. F. Sdy. Stg. CLAY

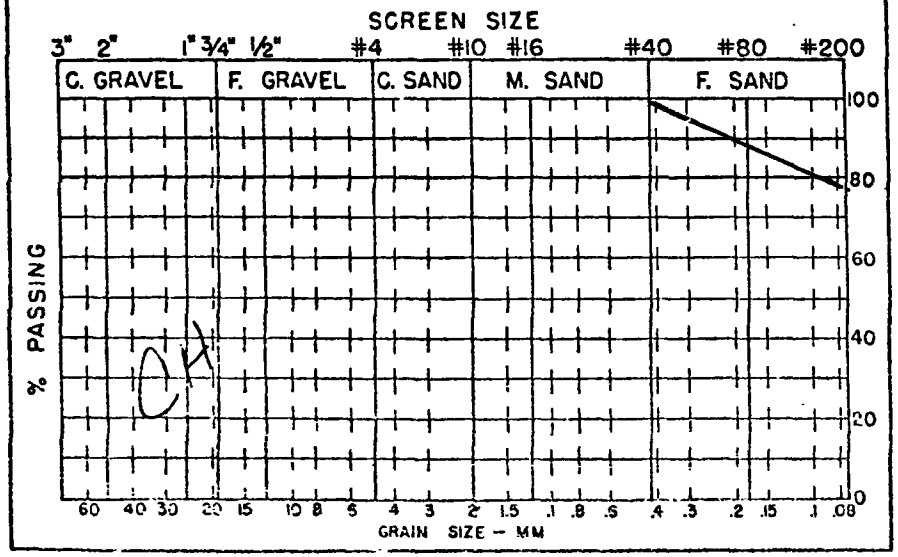


H_2O: 22 %

SIEVE ANALYSIS % Passing 41.89

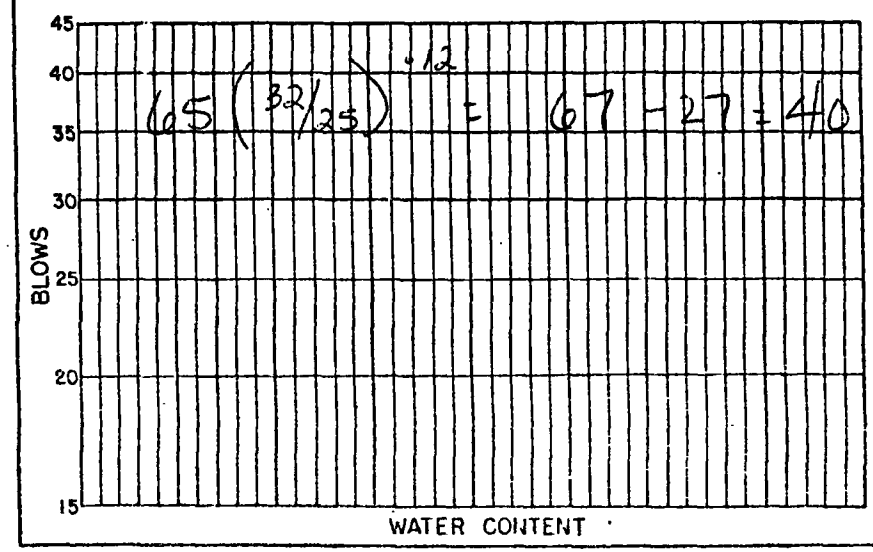
	-40	9.05	100 %
-3/4	-80		
-4	-140		
-10	-200	32.84	78 %

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	116				75
Wet Wt.	13.70				6.20
Dry Wt.	8.30				4.90
% H_2O	65%				PL= 27%
Blows	32				PI= 40



$65\left(\frac{32}{25}\right)^{.12} = 67 - 27 = 40$

DOT FORM 351-019

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

ATERIALS ENGINEER
laterials Laboratory
O. Box 167, Olympia, WA 98504 (Mailing Address)
55 So. 2nd Ave.
mwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 6-29-82

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-6504 Section Hoquiam by pass
SR No. 101 A Sub-Section Game crossing

Station & Offset 164+12 ℄ Hole # J-2

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
E. 3029	U-1	0' 0" – 0' 4"	A		
3030	D-2	2' 0" – 4' 0"		OL	Like 3018-1 Moist, Blk., Soft., hly org. Silt (No large wood) but fibrous
3031-1	U-3	4' 0" – 4' 4"	A		
-2		4' 4" – 4' 8"	B		
3032	D-4	6' 0" – 8' 0"		OL	Like 3030
3033-1	U-5	9' 0" – 9' 4"	A		
-2		9' 4" – 9' 8"	B	OH	green/gray, wet, organic silt w/ ½" layer dark brown organic material.
-3		9' 8" – 10' 0"	C		
3034	D-6	11' 0" – 13' 0"		ML	Like 3018-3 Moist, Brn. & Blk., org. Sticky, F. Sdy. Silt w-T. Med. Sand

copy with samples
copy to addressee

Yours very truly,

Larry M. Moore
Inspector.

DT FORM 351-002 REVISED 8/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

ATERIALS ENGINEER
aterials Laboratory
O. Box 167, Olympia, WA 98504 (Mailing Address)
55 So. 2nd Ave.
mwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 6-29-82

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-6504 Section Hoquiam bypass
SR No. 101A Sub-Section Game Crossing

Station & Offset 164+12 ℄ Hole # J-2

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3035 -1	U-7	14' 0" 14' 4"	A		
-2		14' 4" 14' 8"	B		
-3		14' 8" 15' 0"	C		
3036	D-8	16' 0" 18' 0"			Like 3035-1 Moist, Gr. & Rust, Silt w/ Chunks of Silt stone & tan Mica
3037 -1	U-9	19' 4" 19' 8"	B		
-2		19' 8" 20' 0"	C		
-3		20' 0" 20' 4"	D		
3038	D-10	21' 0" 23' 0"		MH CH	Like 3040-1 Moist, tan & Gr. F. Sdy Silt w- Clay
3039 -1	U-11	24' 8" 25' 0"	C		

copy with samples
copy to addressee

Yours very truly,

Inspector.

FORM 351-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 6-29-82

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-6505 Section Hoquiam bypass
SR No. 101 A Sub-Section SAME crossing.

Station & Offset 164+12 L Hole # J-2

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3039 -2	U-11	25' 0" 25' 4"	D		
-3		25' 4" 25' 8"	E		
3040 -1	D-12	26' 0" 28' 0"	H_2O=32%	MH CH	DRY, Olive F. Sdy. Silt w- Clay.
-2	D-13	29' 0" 31' 0"	H_2O=28%	MH	Moist, Gr. & Brn. F. Sdy. Cly. Silt
-3	D-15	39' 0" 41' 0"		MH	SAME Like 3040-2
-4	D-16	44' 0" 46' 0"		CH	Like 3028-2 DRY, Gr. F. Sdy. Sty. CLAY
-5	D-17	49' 0" 49' 11"		MH	Like 3040 2 Moist, Gr. [illegible] F. Sdy. Cly. Silt

1 copy with samples
1 copy to addressee

Yours very truly,
Randy M. Moore
Inspector.

FORM 361-002

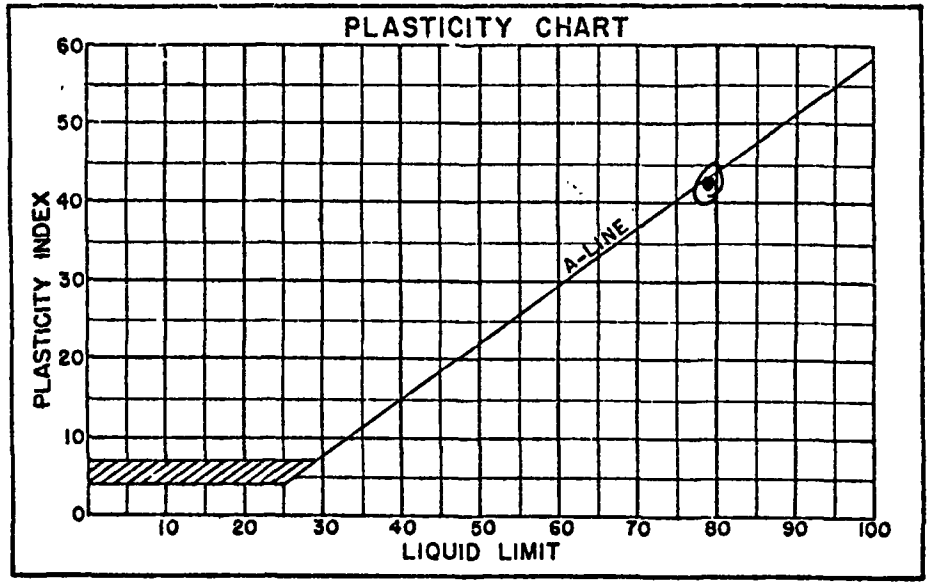
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3040-1 JOB NO. Ho a HOLE NO. 1-2
DATE 7-11-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

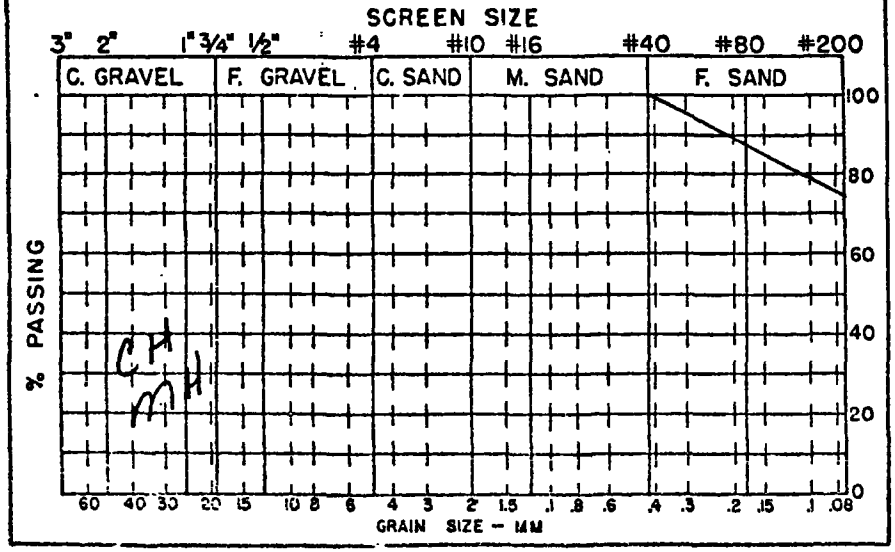
DESCRIPTION: Dry, Olive F. Sdy Silt w/ Clay



$H_2O = 32\%$

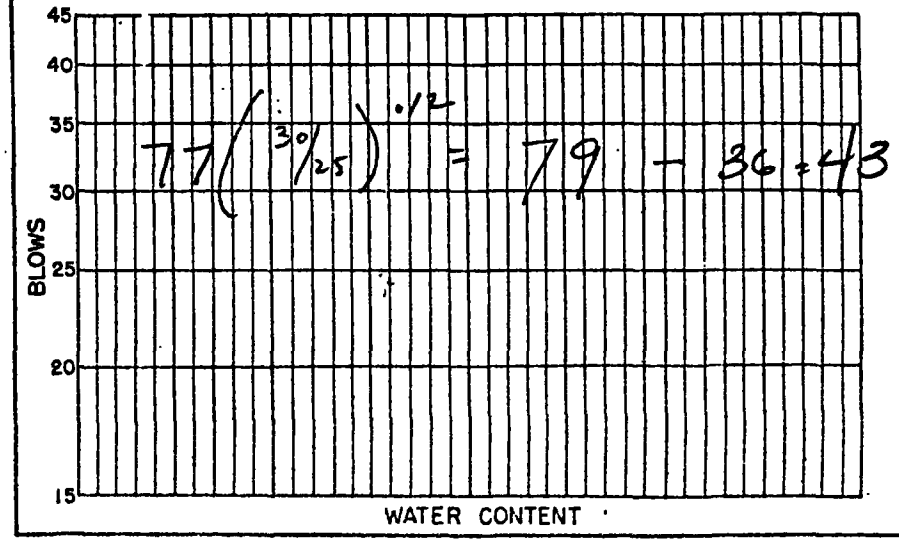
SIEVE ANALYSIS		% Passing 35.65	
	-40	8.90	100%
-3/4	-80		
-4	-140		
-10	-200	26.75	75%

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	57				115
Wet Wt.	12.83				8.05
Dry Wt.	7.25				5.90
% H_2O	77%				PL= 36%
Blows	30				PI= 43



$77\left(\frac{30}{25}\right)^{.12} = 79 - 36 = 43$

DOT FORM 351-019

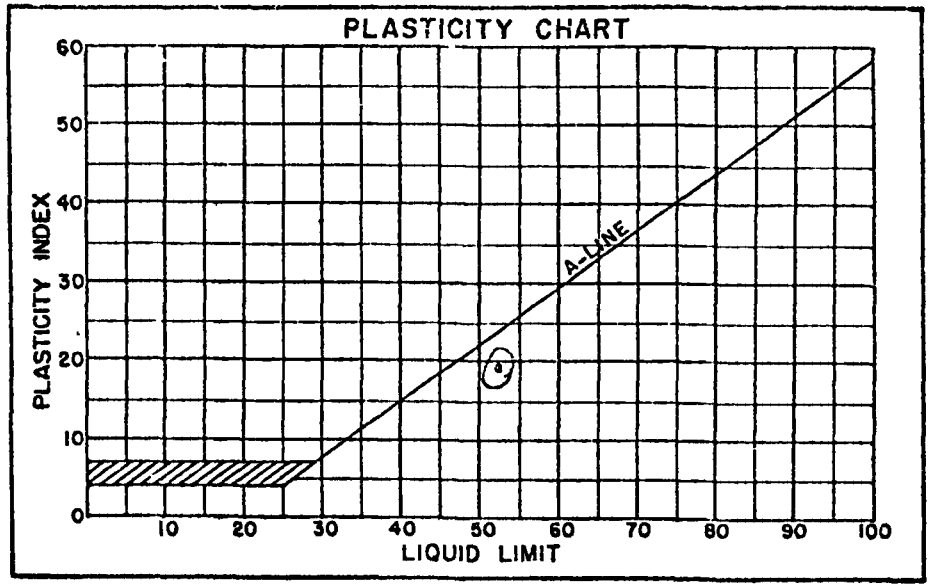
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3040-2 JOB NO. 46a HOLE NO. J-2
DATE 7-21-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS			✓

DESCRIPTION: Moist, Gr. & Brn. F. Sdy., Cly. SILT

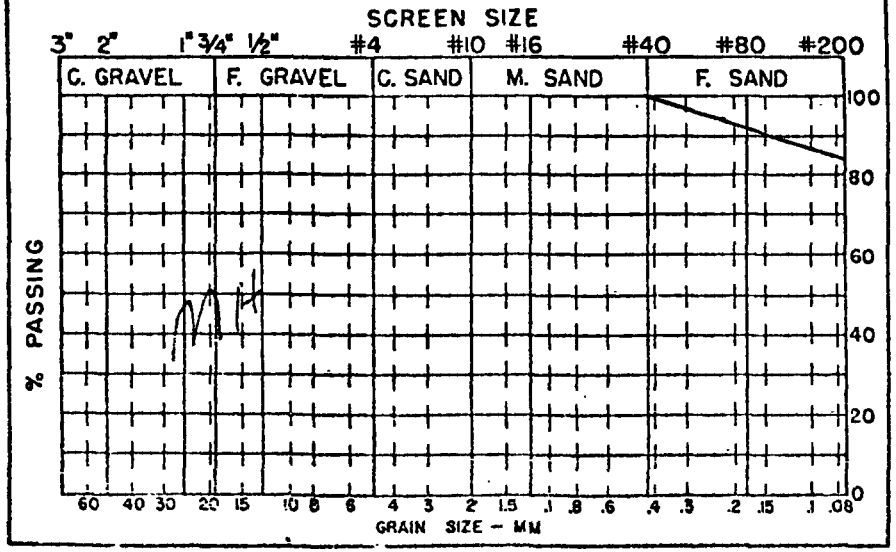


1-120: 28%

SIEVE ANALYSIS % Passing 52.50

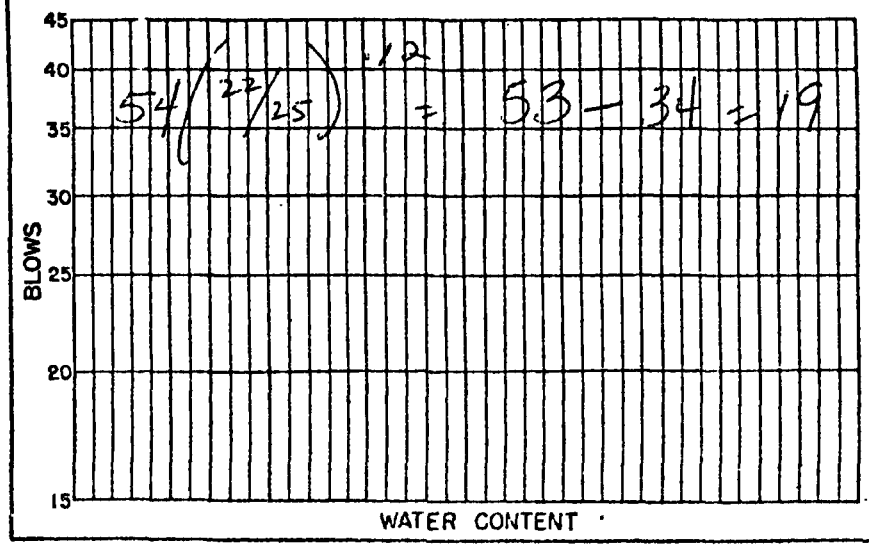
	-40	7.72	100%
-3/4	-80		
-4	-140		
-10	-200	44.78	85%

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	69				46
Wet Wt.	12.08				7.40
Dry Wt.	7.85				5.53
% H_2O	54%				PL= 34%
Blows	22				PI= 19



$54\left(\frac{22}{25}\right)^{.12} = 53 - 34 = 19$

DOT FORM 351-019

TRIAXIAL COMPRESSION TEST (With Area Changes and Pore Pressures)

Project HOQUIAM BYPASS Location GAME CROSSING sta 164+12 ℄
Job No. L 6504 Sample No. 3033-2 Boring No. J-2 Depth 2'-4" to 9'-8"
Area (Ao) 2.92 Length 4" Confining Pressure 600 PSF = 4.2 PSI
Rate of Loading .085%/Min L. R. C. .325 UW Tested by R Brooks Date 16 MAR 83

Description

GROSS WT.	TARE	NET WT.	CAN NO.	WET WT.	DRY WT.	WT. H^2O	% H^2O	WET DENS.	DRY DENS.
386	134	252	58	38.6	18.92	19.68	104	82.9	40.6

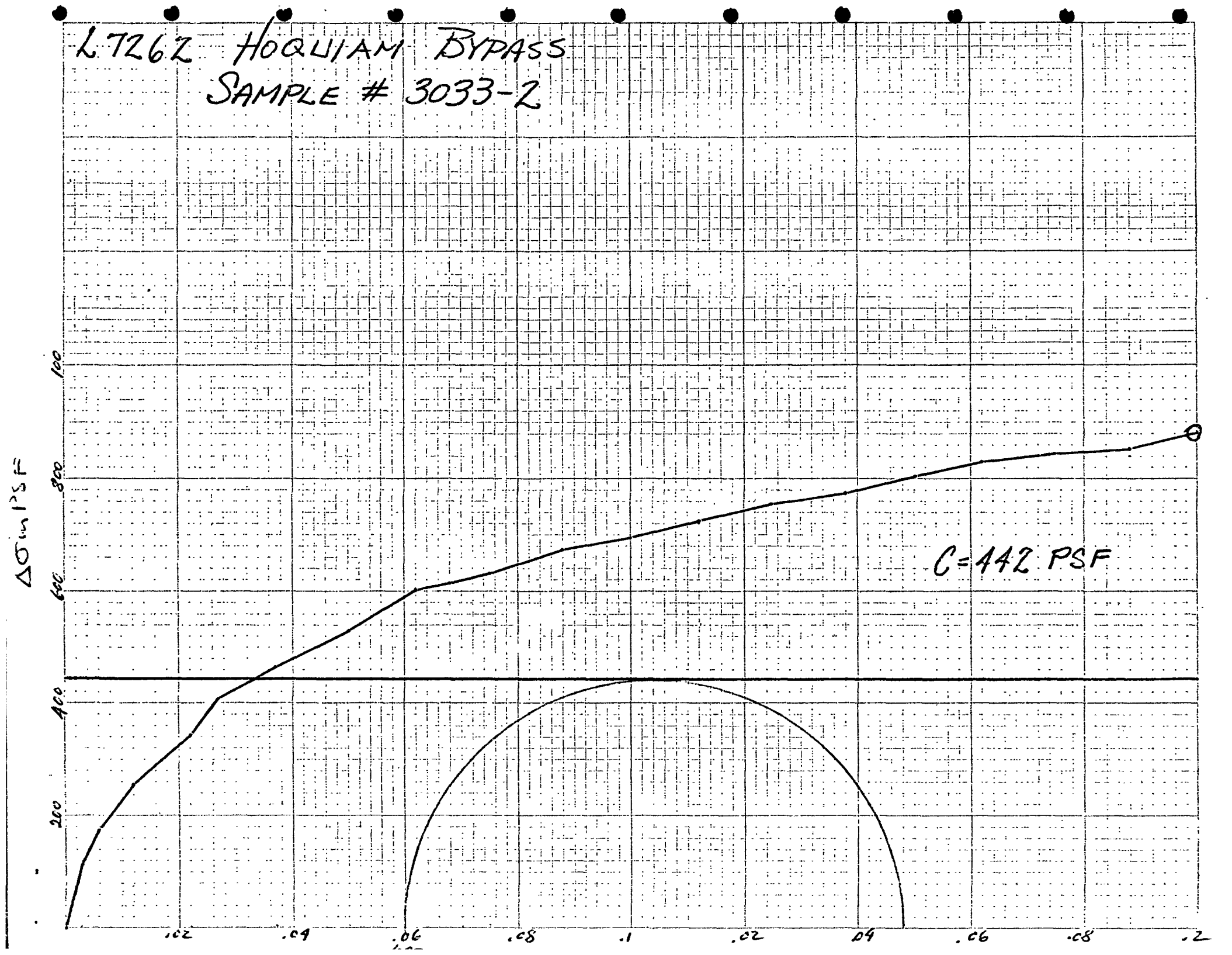
Data for Mohr's Envelope:
Max. Deviator Stress
Principal Stress
Effective Principal Stress

Failure

Back Press.
Saturation 94

ELASPED TIME (Hr.) (Min.)	LOAD DIAL READ (X 10−4)	DEFORM. DIAL READ	ΔL (COL. 3 x 10 − 3)	E. UNIT STRAIN (ΔL/L)	AREA C.F. (1 − E)	CORRECT. AREA A' (A° / 1 − E)	PORE PRESS.	DEV. LOAD (Col. 2 X LRC)	DEV. STRESS (Col. 9 ÷ Col. 7)	PRINC. STRESS (Col 10 + conf. press.)
1	2	3	4	5	6	7	8	9	BF 10	11
30	7	012		.003	.997	2.93	2.71	2.28	112.0	
1	11	026		.006	.994	2.94	2.80	3.58	175.3	
1.75	16	048		.012	.988	2.96	2.99	5.2	253.0	
3	22	086		.022	.978	2.99	2.87	7.15	344.3	
4	26	109		.027	.973	3.00	2.86	8.45	405.6	
5	30	148		.037	.963	3.03	2.86	9.75	463.4	
6.75	35	200		.05	.95	3.07	3.08	11.38	533.8	
8.5	40	250		.062	.938	3.11	2.73	13	601.9	
9	41	270		.068	.932	3.13	2.63	13.32	612.8	
10	43	300		.075	.925	3.16	3.20	13.98	637.1	
11.75	46	350		.088	.912	3.20	3.34	14.95	672.8	
13.25	48	400		.1	.9	3.24	3.62	15.6	693.3	
15	51	450		.112	.888	3.29	3.68	16.58	725.7	
16.5	54	500		.125	.875	3.34	3.60	17.55	756.6	
18.25	56	550		.138	.862	3.39	3.78	18.2	773.1	
20	59	600		.15	.85	3.44	3.64	19.18	802.9	
21.5	62	650		.162	.838	3.48	3.70	20.15	833.8	
23.25	64	700		.175	.825	3.54	3.98	20.8	846.1	
24.75	66	750		.188	.812	3.60	3.98	21.45	858	
26.5	69	800		.2	.8	3.65	3.68	22.42	884.5	

DOT FORM 351-018 REVISED 4/80


L T26Z HOQUIAM BYPASS
SAMPLE # 3033-Z
C=442 PSF
Δσ in PSF
100
800
600
400
200
.02
.04
.06
.08
.1
.02
.04
.06
.08
.2

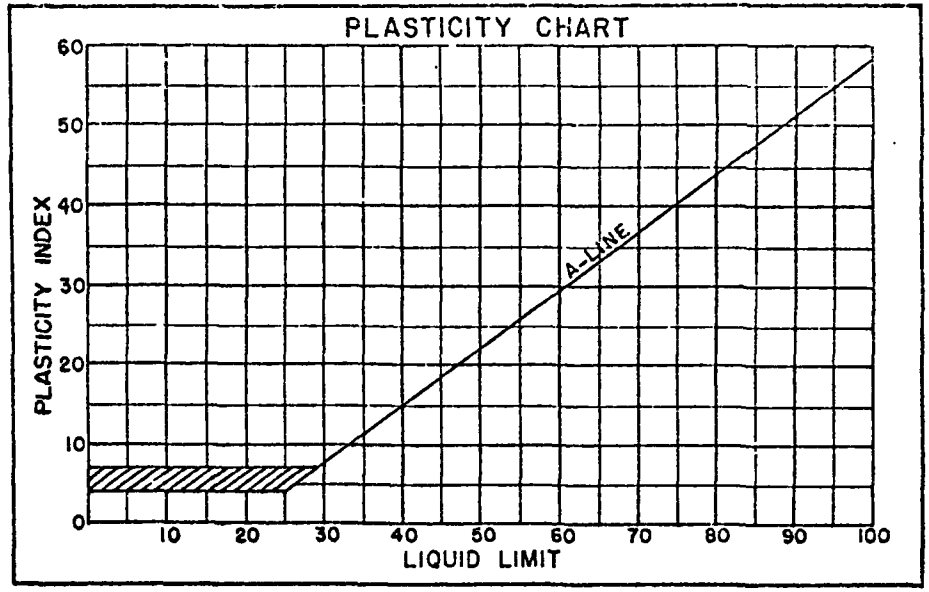
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3033-2 JOB NO. HOQ HOLE NO. TRIAX
DATE 30 MAR 83 OPERATOR RB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL		✓	
DRIED CAST		✓	
DILATANCY			
BITE			
TOUGHNESS		✓	

DESCRIPTION: Wet green/grey Org SILT w/ ¼" Layer org Mtr DARK ~~Color~~ Brn

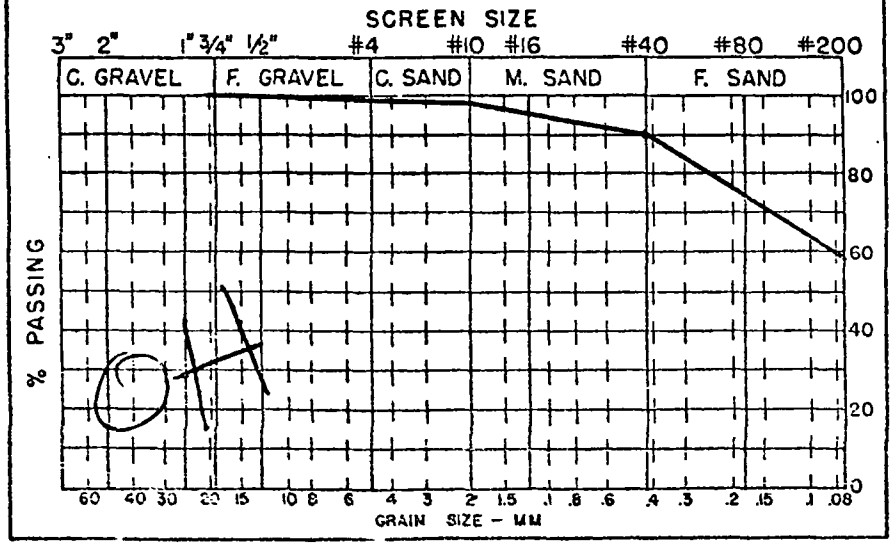


H_2O=104

SIEVE ANALYSIS % Passing 90.0

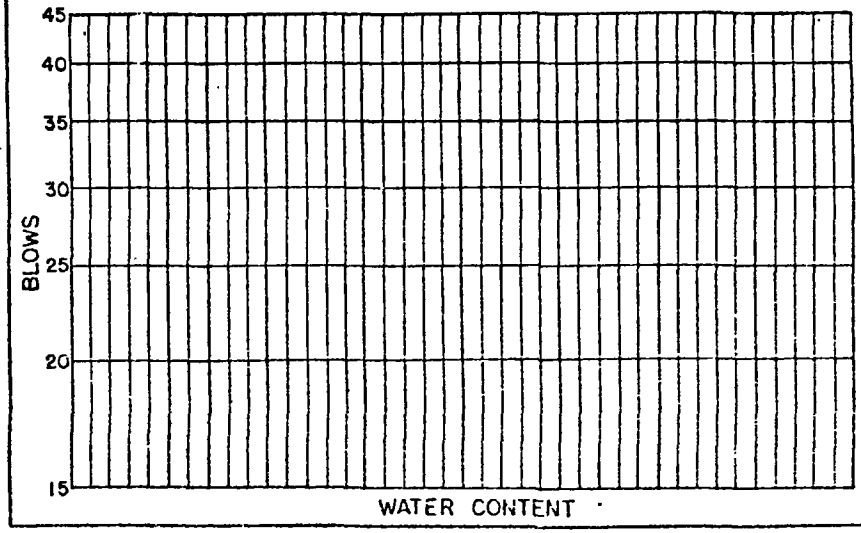
			-40	27.92	90
-¾	.05	100	-80		
-4	.19	99	-140		
-10	8.68	99	-200	53.16	59

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



NOTE: sample may have been disturbed during preparation — filled voids w/ SAND

DOT FORM 351-016 REVISED 5/81

CONSOLIDATION TEST DATA

Date 3-4-83 Sample No. 3031-1

Job No. L-7262 Section Hoquiam Bypass

Depth 4' - 4'4" Station 164+12 Hole No. J-2

Material SAT. DK. Brn., V. Hly. Pty., fibrous Sticko-Silt w/dk. Brn. Charcoal mtr.

GROSS WEIGHT	TARE	NET WEIGHT	CAN NUMBER	WET WEIGHT	DRY WEIGHT	WEIGHT H²O	PERCENT H²O	WET DENSITY	DRY DENSITY
354	146	208	57	33.10	7.78	25.32	325%	68	51.3
		CONSOL	15	19.90	8.12	11.78	145%		

This column is NOT Accurate — Forgot lbs/sq ft Dial Correction Made - But may not be Accurate

Sample Height = 4"

hs = Wt. Dry Soil / K

eo = hvo/hs

hvo = 0.6250 – hs

K = 47.24 X sp. G

Hvf=hvo – Defl.

ef = hvf/hs

Sticky gague

Piston is locked down Reads 60?

Ring sample down below ring

TIME	500 lbs/sq ft DIAL	%	1000 lbs/sq ft DIAL	%	2000 lbs/sq ft DIAL	%	4000 lbs/sq ft DIAL	%	8000 lbs/sq ft DIAL	%
0			496							
1/4	695	10	60	14	65	10	68	11	71	11
1/2	730	52	106	24	92	15	105	16	92	14
1	884	63	140	32	122	20	142	22	128	19
2 1/4	943	67	178	41	171	27	292	46	175	26
4	983	70	210	48	211	34	334	52	222	33
9	1030	73	254	58	259	42	393	61	390	58
16	1094	78	270	62	302	49	424	66	432	63
25	1116	79	297	68	423	69	452	71	451	67
36	1211	86	318	73	448	72	467	73	482	71
49	1224	87	331	53	464	74	502	78	506	75
64	1232	88	346	79	482	77	515	80	520	77
2 hrs	1252	89	267	84	521	84	555	87	548	82
3	1260	90	276	86	542	87	563	88	562	84
4	1363	97	295	90	553	89	573	89	573	85
5	1371	98	299	91	562	90	584	91	582	87
6	1382	98	306	93	566	91	601	94	591	88
24	1406	100	327	100	623	100	641	100	672	100
72										
hvo=	.5398		.3992		.3555		.2932		.2291	
hvf=	.3992		.3555		.3932		.2291		.1619	
ef=	4.6910		4.1774		3.4454		2.6921		1.9025	

Sp. Gr.	2.0190
K	95.3303
	0.6250
hs	.0851
hvo	.5398
eo	6.3434

Total Defl. 0.3779

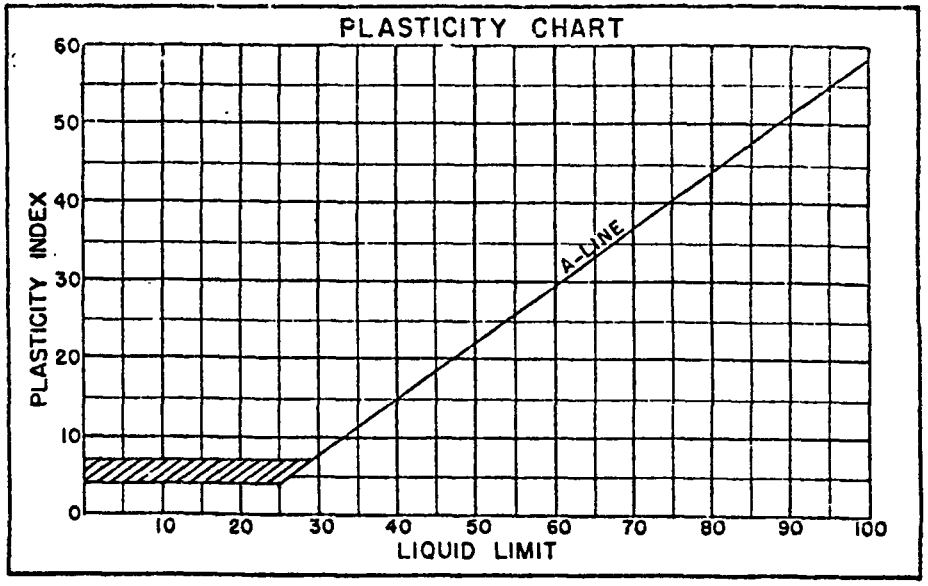
Operator BB Machine No. 1

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3031-1 JOB NO. Hog. HOLE NO. J-2
DATE 3-9-83 OPERATOR BB

SOIL FIELD IDENTIFICATION			
TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

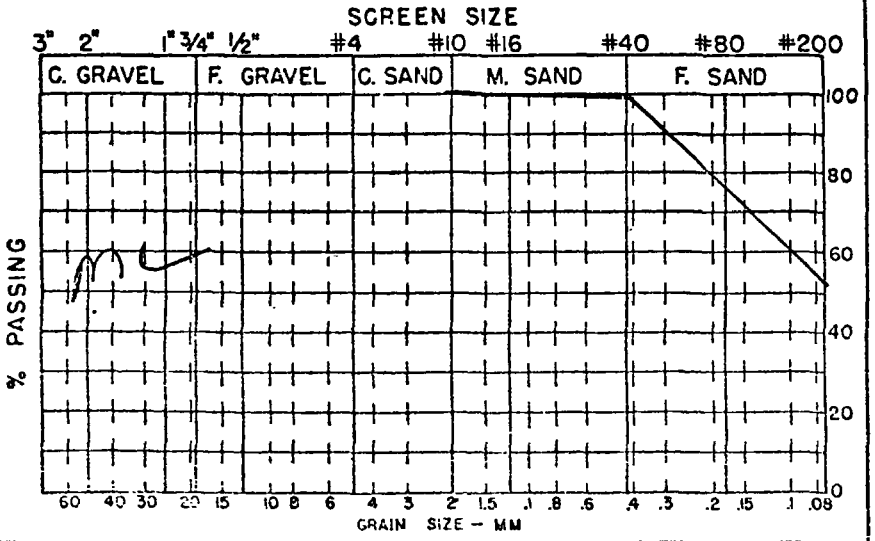
DESCRIPTION: Sat., dk. Brn., V. hly. PTY, fibrous, Sticks & SILT
DK. Brn. Charcoal-Like, Burnt mtr.



H_2O: 32.5%

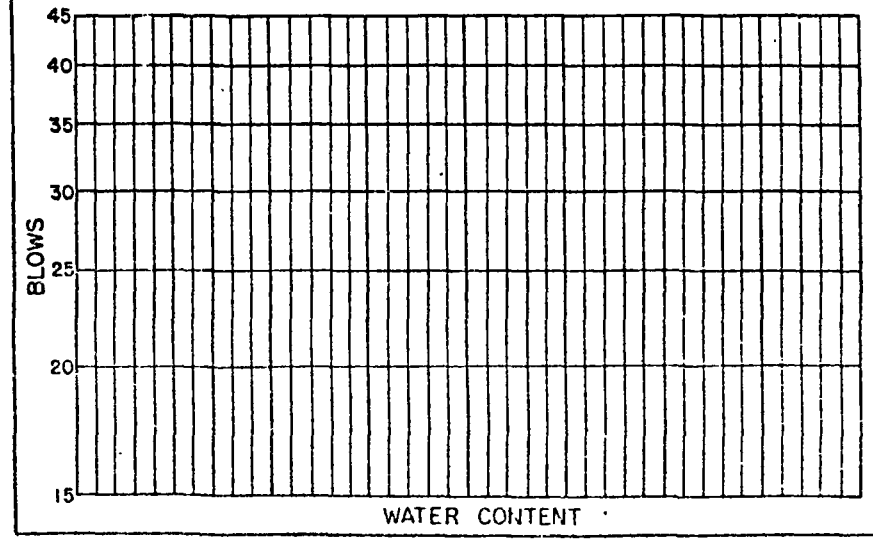
SIEVE ANALYSIS		% Passing 31.15	
		-40 14.77	99.8
-3/4		-80	
-4		-140	
-10 .04	100%	-200 16.34	52%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 7-1-82

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-6504 Section Hoquiam By Pass
SR No. 101 A Sub-Section Chenie crossing

Station & Offset 164+12 56'Lt. Hole # T-3

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
E-3041	D-2	2' 0" – 4' 0"		OL	Like 3018-1 Moist, Blk., Soft Hly. org. Silt w-Lg. Chunks of Wood (Rotten)
3042-1	U-3	6' 0" – 6' 4"	A		
-2		6' 4" – 6' 8"	B		
3043-1	D-4	8' 0" – 10' 0"		OL	Like 3041 Moist, Blk. Soft hly. org., Sty. Peat w- Lg. Chunks of Wood.
-2	D-6	12' 0" – 14' 0"		mH CH	Like 3038 Moist, tan & Gr. F. Sdy. Silt w- Clay.
-3	D-8-A	17' 0" – 17' 6"		MH CH	Like 3038 w-T org. Twigs Moist, tan & Gr. F. Sdy. Silt w-Clay & T. org. twigs.
-4	D-8-B	17' 6" – 19' 0"	H_2O=38%	SM	Moist, Gr. & Brn., V. Sty. F-C SAND w-T. F. Gravel & wood fibers
-5	D-9	20' 0" – 22' 0"		SM	Same
-6	D-10	25' 0" – 27' 0"		CH	Like 3028-2 Dry, Gr F. Sdy., Sty. Clay

1 copy with samples
1 copy to addressee

Yours very truly,

Larry M. Meade
Inspector.

DOT FORM 351-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

ATERIALS ENGINEER
laterials Laboratory
. O. Box 167, Olympia, WA 98504 (Mailing Address)
55 So. 2nd Ave.
umwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 7-1-82

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-6504 Section Hoquiam bypass SR No. 101 A Sub-Section Game crossing.

Station & Offset 164+12 56' Lt Hole # J-3

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3043 -7	D-11	30' 0" 32' 0"		CH	Like 3028-2 Dry, Gr. F. Sdy. Sty. CLAY
-8	D-12	34' 0" 36' 0"		CH	Same

copy with samples
copy to addressee

Yours very truly,

Larry M. Moore
Inspector.

FORM 351-002

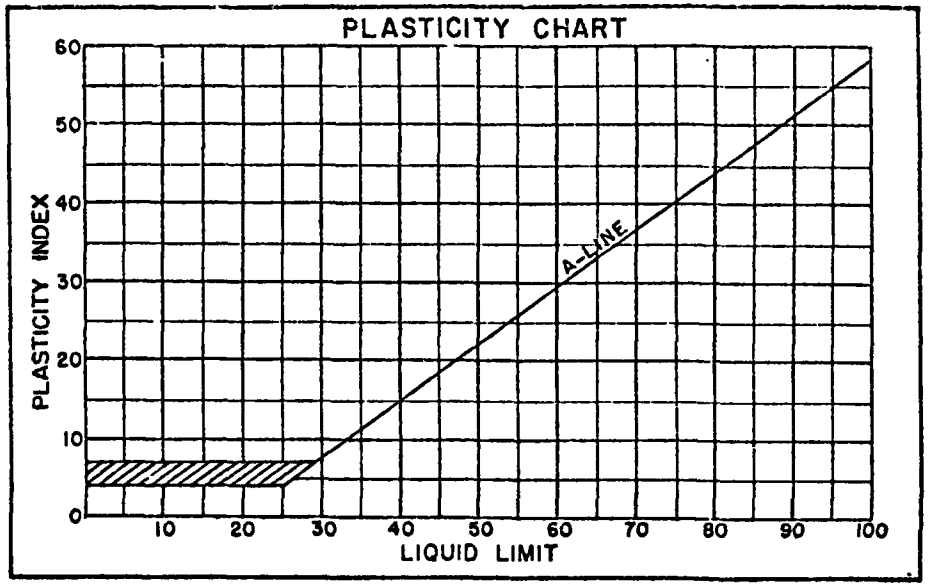
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3043-4 JOB NO. 46 HOLE NO. 3
DATE 7-23-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Moist, Gr. & Brn., V. Sty. F-C SAND w/ T. F. Gravel & Wood FIBERS.

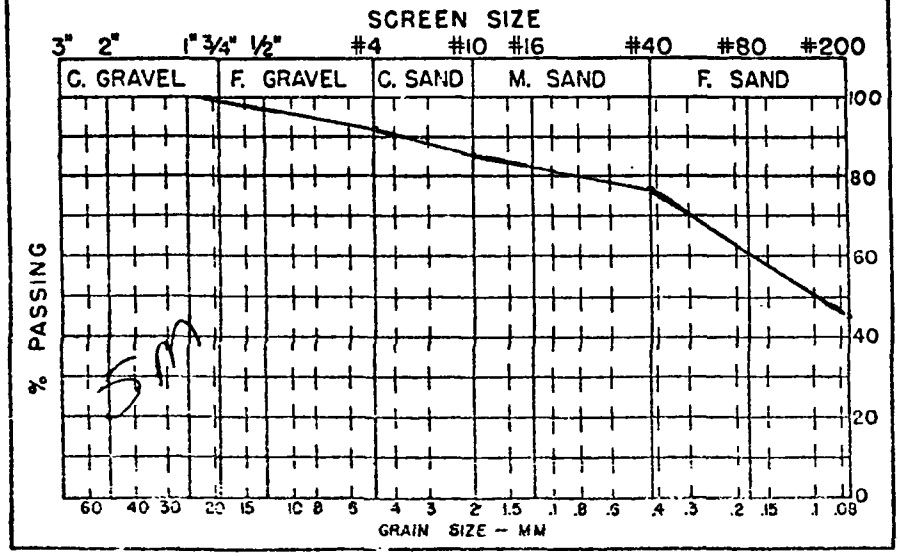


#120 = 38%

SIEVE ANALYSIS % Passing #20, 50

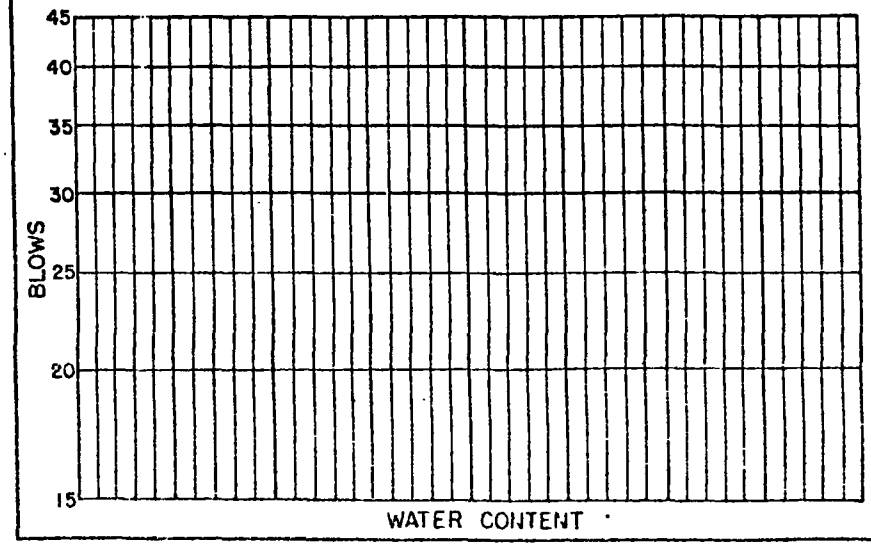
			-40	38.48	78%
½ wood -3/4	9.10	100%	-80		
-4	8.05	92%	-140		
-10	9.32	86%	-200	55.55	46%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

IATERIALS ENGINEER
laterials Laboratory
. O. Box 167, Olympia, WA 98504 (Mailing Address)
i55 So. 2nd Ave.
umwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 7-1-82

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-6504 Section Hoquiam bypass
SR No. 101A Sub-Section Cut

Station & Offset 162+25 ℄ Hole # J-4

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
E-3044 -1	D-1	0' 0" 2' 0"	H_2O = 75%	ML	Moist, reddish Brn. Org. F. Sdy. Silt W- Twigs
-2	D-2	4' 6" 6' 6"	H_2O = 58%	ML	Moist, tan & Rust F. Sdy. Silt
3045 -1	L'-3	9' 10" 10' 2"	B		
-2		10' 2" 10' 6"	C		
-3		10' 6" 10' 10"	D		
3046	D-4	11' 6" 13' 6"		ML	Like 3044-2 Moist, tan & Rust F. Sdy. Silt W- T. Org.
3047 -1	L'-5	14' 10" 15' 2"	B		
-2		15' 2" 15' 6"	C		
3048 -1	D-6	16' 6" 13' 6"		ML	Like 3046 Moist, tan & rust F. Sdy. Silt W- T. Org.

opy with samples
opy to addressee

Yours very truly,

Larry M Moore
Inspector.

FORM 351-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 7-1-82

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-6504 Section Hoquiam bypass
SR No. 101 A Sub-Section CUT.

Station & Offset 162+25 ℄ Hole # J-4

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3048-2	D-8	21' 6"		SM	Moist, dk. Brn. Sty. F.
		23' 6"	H_2O=38%		SAND w- T. Mica

1 copy with samples
1 copy to addressee

Yours very truly,
Leroy M Moore
Inspector.

DOT FORM 351-002
REVISED 2/90

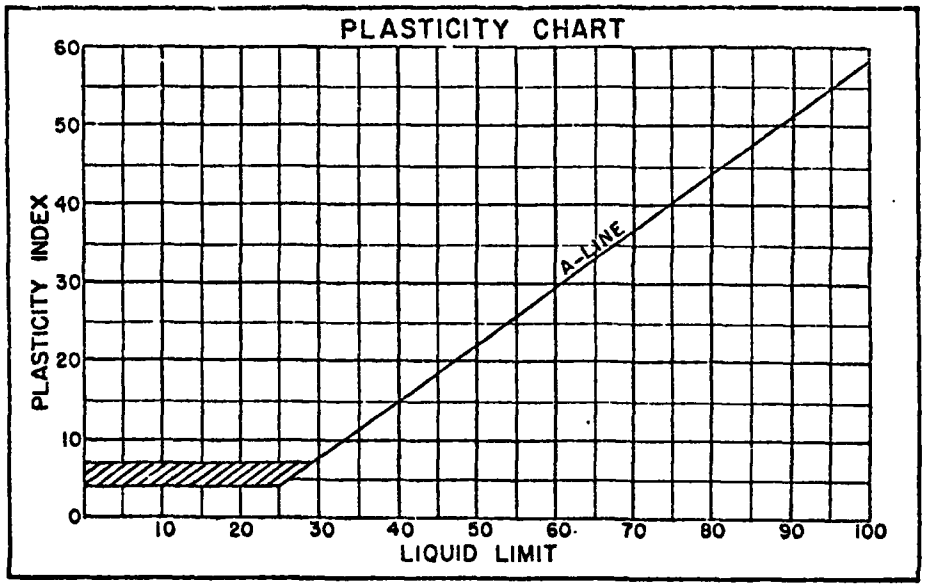
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3044-1 JOB NO. ~~Hog~~ HOLE NO. J-4
DATE 7-23-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Moist, Reddish Brn. Dry. F. Sdy. SILT w. Twigs

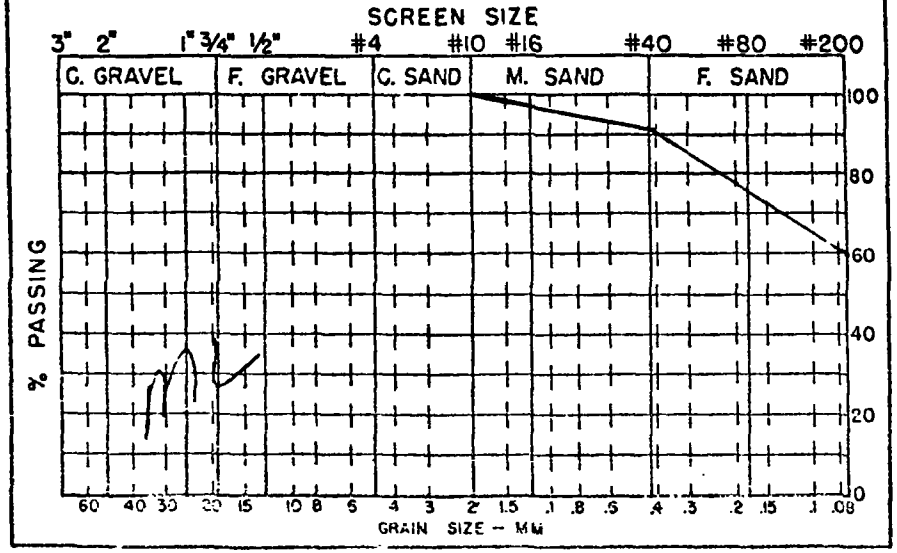


H_2O = 75%

SIEVE ANALYSIS % Passing 56.27

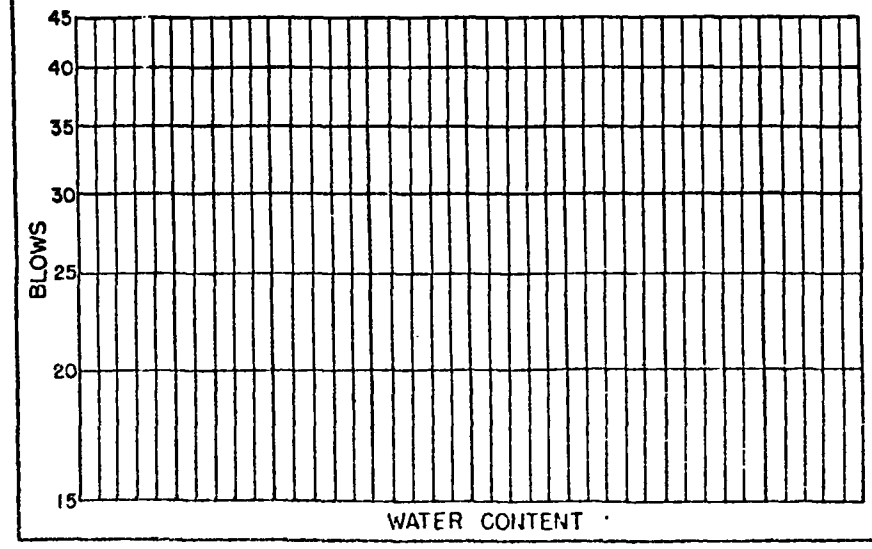
		-40 17.45	91%
-3/4		-80	
-4		-140	
-10 5.20	100%	-200 33.62	60%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



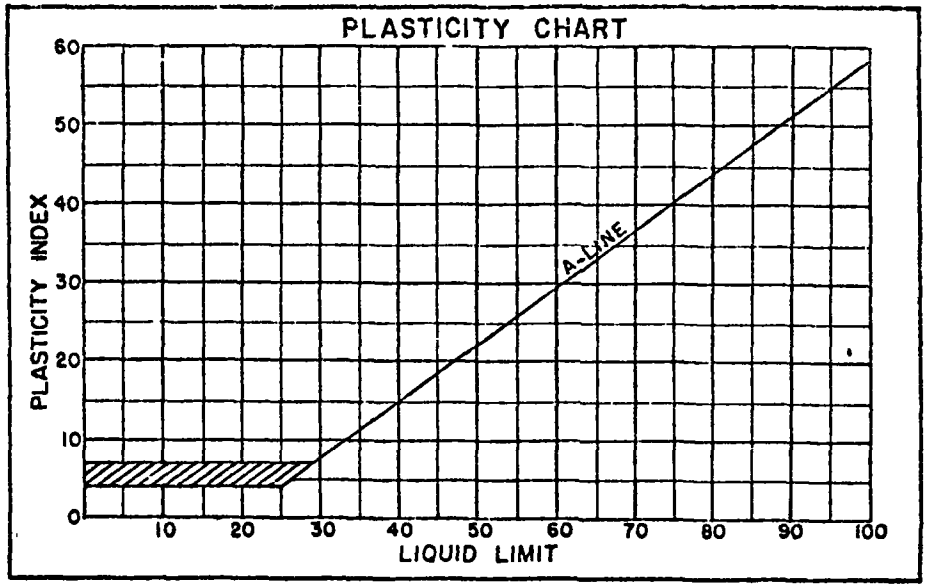
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3044-2 JOB NO. Hog HOLE NO. J-4
DATE 7-23-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

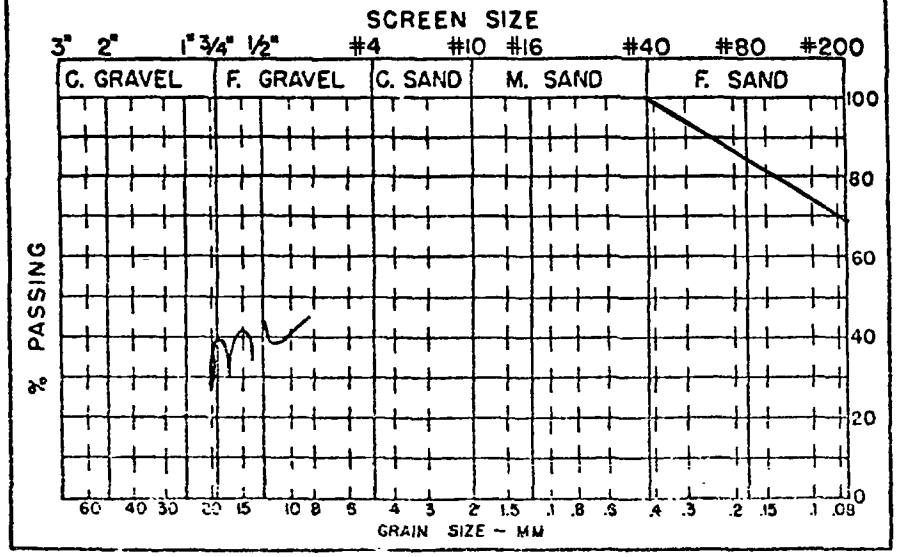
DESCRIPTION: Moist, Tan & Rust
F. Sdy. SILT



H_2O = 58%

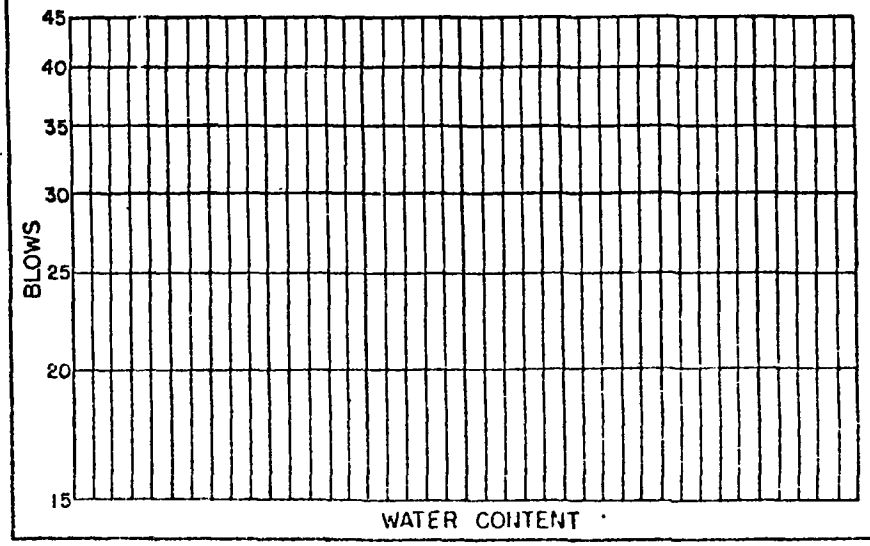
SIEVE ANALYSIS	% Passing 74.15	
	-40 23.25	100%
-3/4	-80	
-4	-140	
-10	-200 50.90	69%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-014

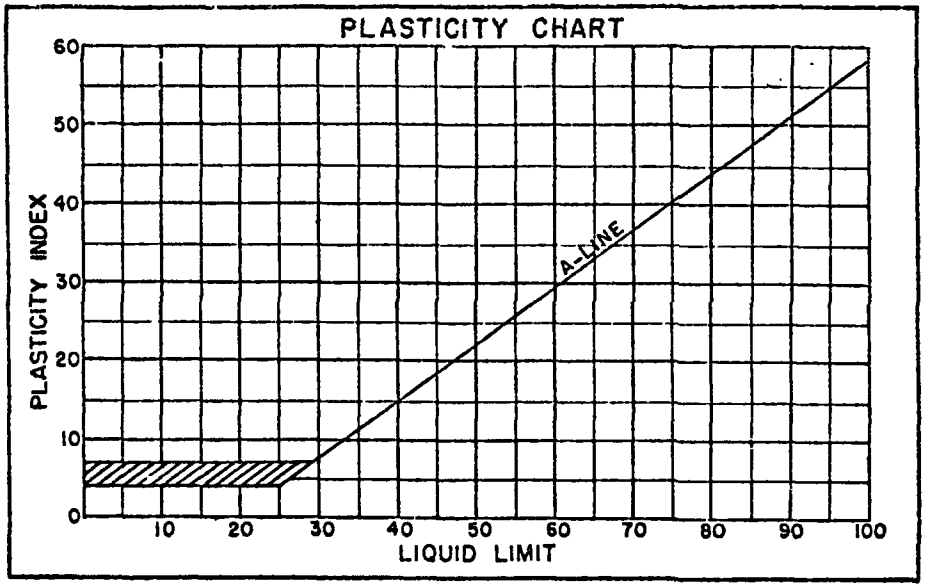
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3048-2 JOB NO. Hog HOLE NO. J-4
DATE 7-23-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Moist, Dk Brn. Sity. F- SAND W- T. Mica

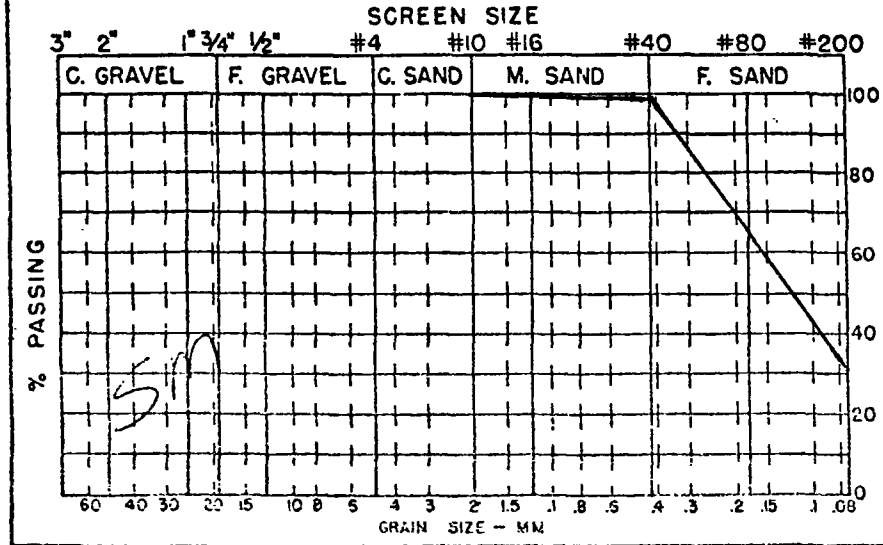


H_2O = 38%

SIEVE ANALYSIS % Passing 87.48

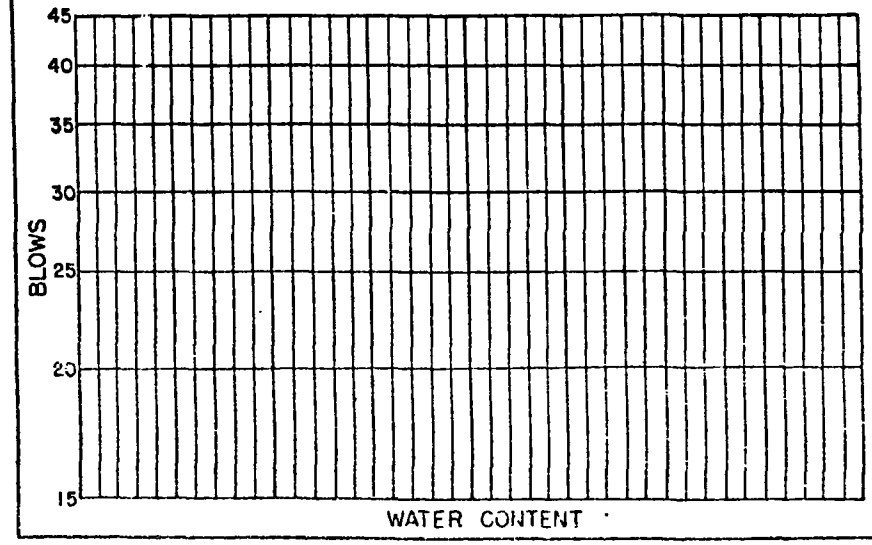
		-40	59.92 99.5
-3/4		-80	
-4		-140	
-10	.39 100%	-200	27.17 31%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 7-7-82

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam by pass
SR No. 101 K Sub-Section [redacted] Fill Section

Station & Offset 158+75 ℄ Hole # J-5

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
E-3064 -1	U-1	0' 0" / 0' 4"	A		
-2		0' 4" / 0' 8"	B		
3065	D-2	2' 0" / 4' 0"	135%	OL	Wet, dk brn CLY F Sdy SILT + W- Pieces of Wood & hly ORGANIC MAT
3066 -1	U-3	4' 8" / 5' 0"	C	PT	Wet, brown, silty Peat w/wood
-2		5' 0" / 5' 4"	D		
3067 -1	D-4	6' 0" / 8' 0"		OL	Like 3065
-2	D-6	11' 0" / 13' 0"		OL	SAme but GR & Brn w-hly org ODOR
3068	U-7	14' 8" / 15' 0"	C	SM	Wet, green, V sty F Sand, w/T F-gravel, highly organic.
3069 -1	D-8	16' 0" / 18' 0"	92%	OL	Moist GR & BRN. SILT - W- ORG. ODOR Wood & twigs. w/ small trace m-c sdy. OR gravel mtr., cementation & Possibly Oil or gas substance

1 copy with samples
1 copy to addressee

Yours very truly,

Larry M Moore
Inspector.

FORM 351-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater

Date 7-7-82

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam bypass SR No. 101A Sub-Section Fill section

Station & Offset 153+75 ℄ Hole # J-5

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3069 -2	D-10	21' 0" 23' 0"	H2O 135%	OL	Like 3065 W-org. wood & dried grass embedded wet, dk. Brn. Cly, F. Sdy. SILT W. Wood & dried grass embedded.
3070 -1	U-11	24' 8" 25' 0"	C		
-2		25' 0" 25' 4"	D		
3071 -1	D-12	26' 0" 28' 0"	H2O 42%	ML	Moist, & GR with orange & tan outside F. Sdy. SILT W- T. Clay
-2	D-13	29' 0" 31' 0"		ML	SAME
-3	D-14	34' 0" 36' 0"		ML	Like 3071-1 [illegible]
-4	D-15	39' 0" 40' 6"	H2O 23%	CL	Dry, Gr. F. Sdy., Sty. CLAY W- Trace Mica & ORGanic

1 copy with samples
1 copy to addressee

Yours very truly,

Larry M Moore
Inspector.

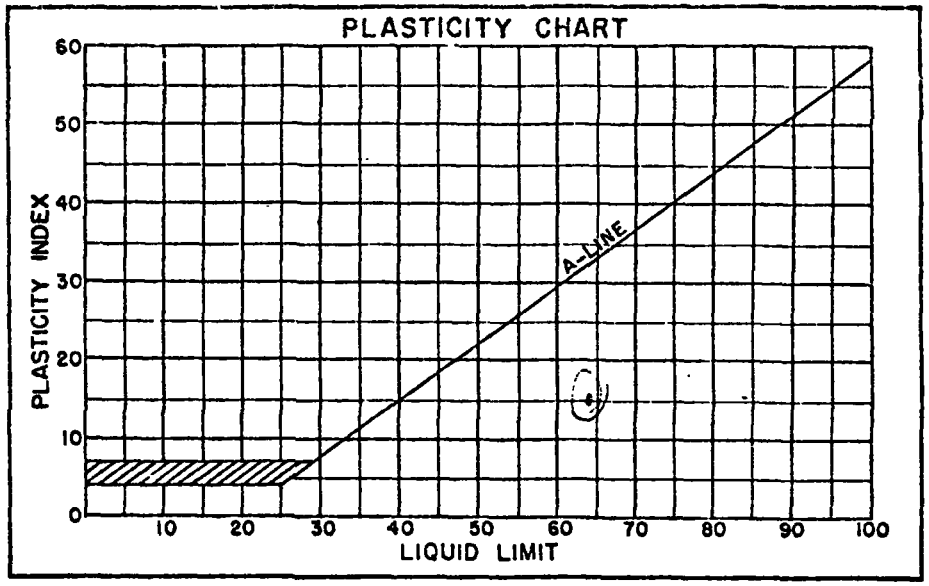
DOT FORM 351-002 REVISED 2/80

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3065 JOB NO. 16a. HOLE NO. J-5
DATE 9-15-82 OPERATOR BB

SOIL FIELD IDENTIFICATION			
TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			✓

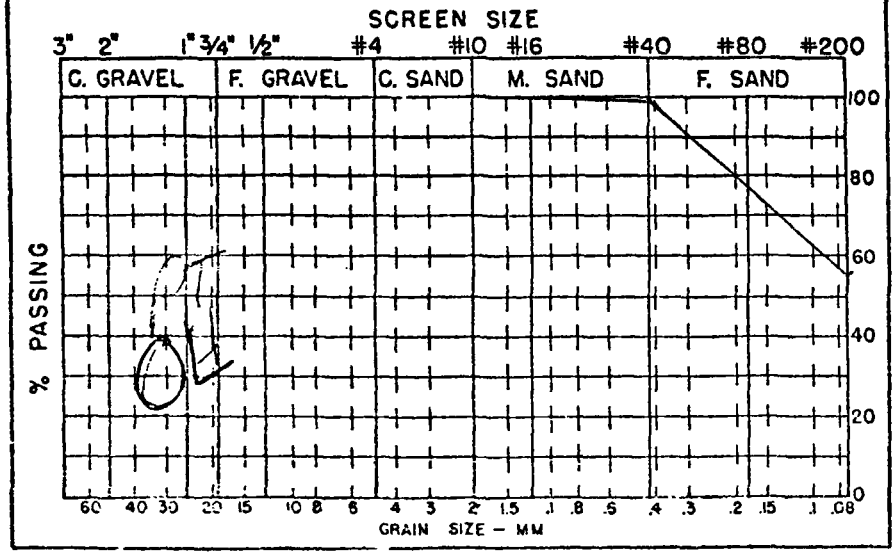
DESCRIPTION: Wet, dk. Brn Cly. Fdy. n Silt; w- Pieces of wood -- nty. Organic



H20= 135%

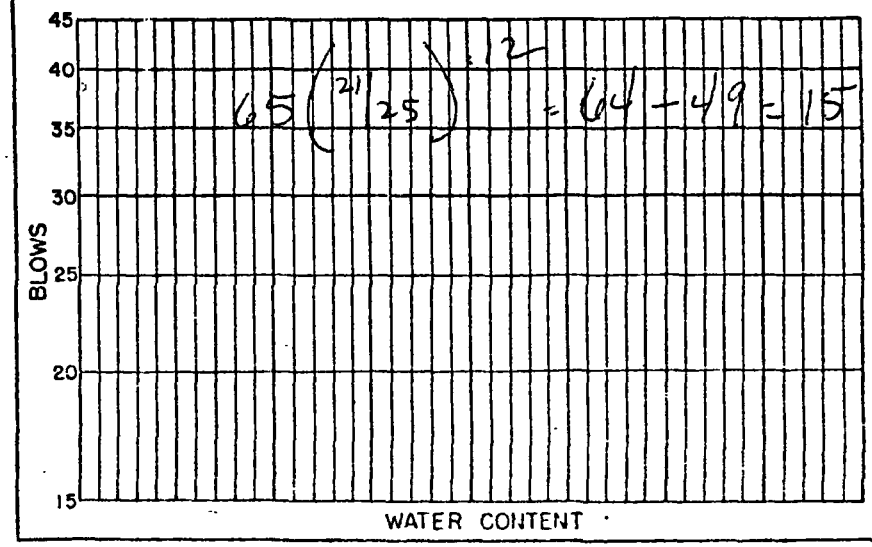
SIEVE ANALYSIS		% Passing 64.38	
	-40	28.30	39.5%
-3/4	-80		
-4	-140		
-10 .02 100%	-200	35.82	56%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	69				47
Wet Wt.	12.70				6.85
Dry Wt.	7.68				4.59
% H_2O	65%				PL= 49%
Blows	21				PI= 15



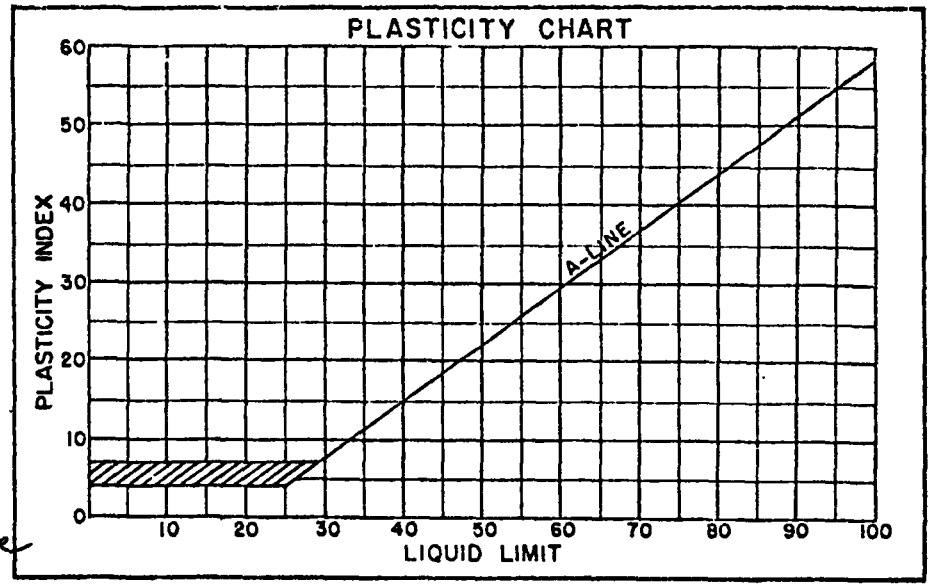
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3069-1 JOB NO. 46G. HOLE NO. J-5
DATE 9-16-82 OPERATOR CB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			✓

DESCRIPTION: moist, Gr-Brn. SILT-
Org. odor, Wood & twigs w/
small trace M-C Sdy. gravelly. mtr &
Cementation. Possibly trace oil or gas substance

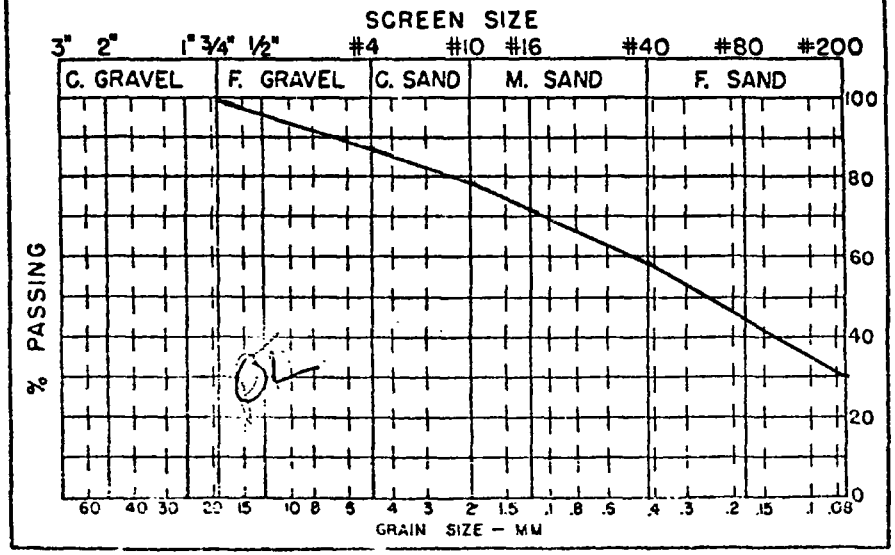


H2O = 92 %

SIEVE ANALYSIS % Passing 41.32

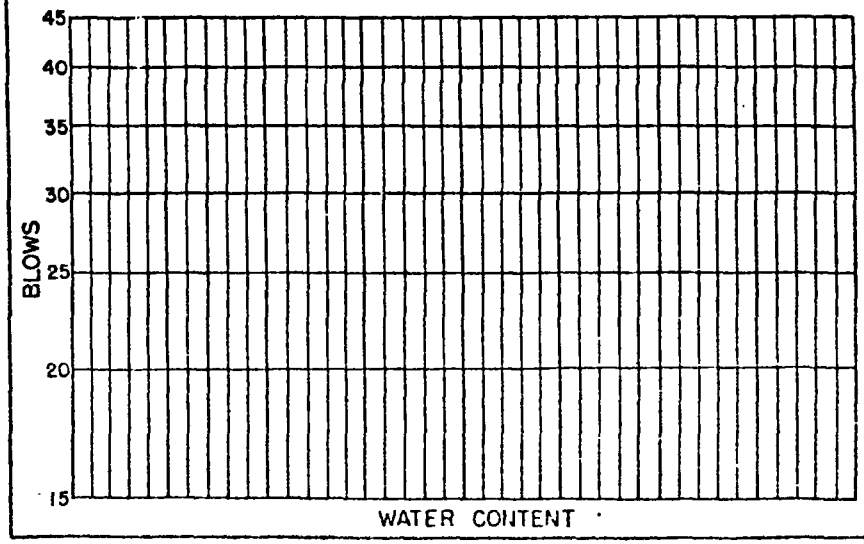
			-40	11.85	58%
-3/4	5.47	100%	-80		
-4	3.65	87%	-140		
-10	8.08	78%	-200	12.27	30%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

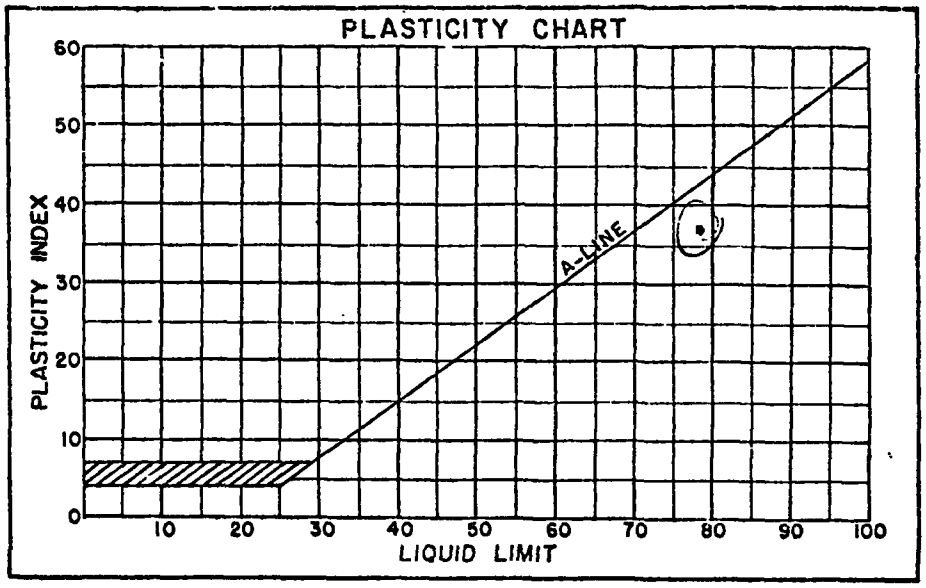
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3071-1 JOB NO. Hoc. HOLE NO. J-5
DATE 9-15-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS			✓

DESCRIPTION: M, Gr. w- orange fan outside F. Sdy. SILT w- T. Clay

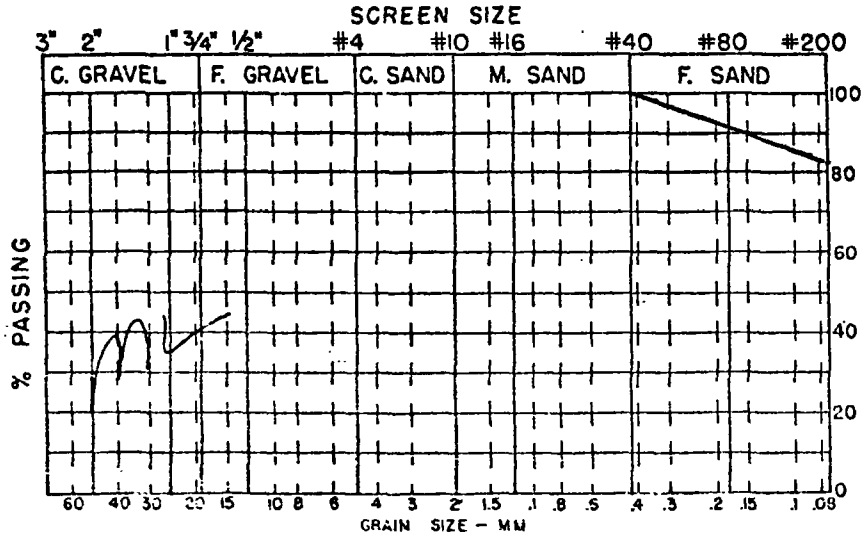


H_2O = 42%

SIEVE ANALYSIS % Passing 28.06

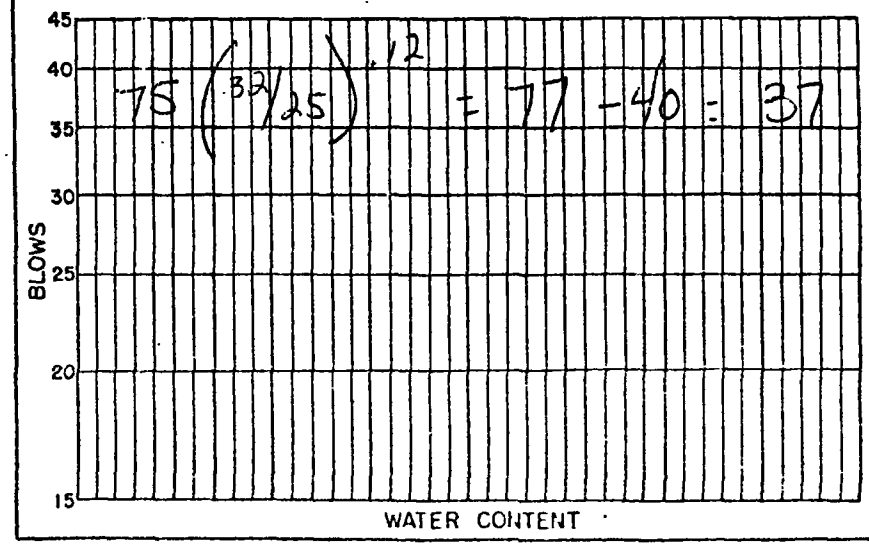
	-40	5.10	100%
-3/4	-80		
-4	-140		
-10	-200	22.90	82%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	53				50
Wet Wt.	12.62				8.12
Dry Wt.	7.20				5.82
% H_2O	75%				PL= 40%
Blows	32				PI= 37



$75\left(\frac{32}{25}\right)^{.12} = 77 - 40 = 37$

DOT FORM 351-019

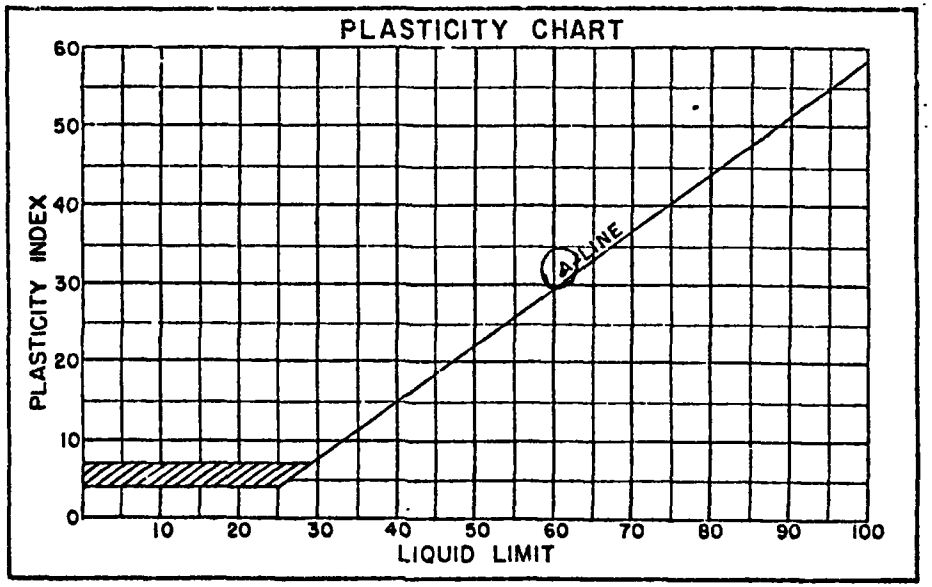
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3071-4 JOB NO. Hoa. HOLE NO. J-5
DATE 9-15-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: DRY, GR F. Sdy, Sty. CLAY W- T- Mica & ORGanic

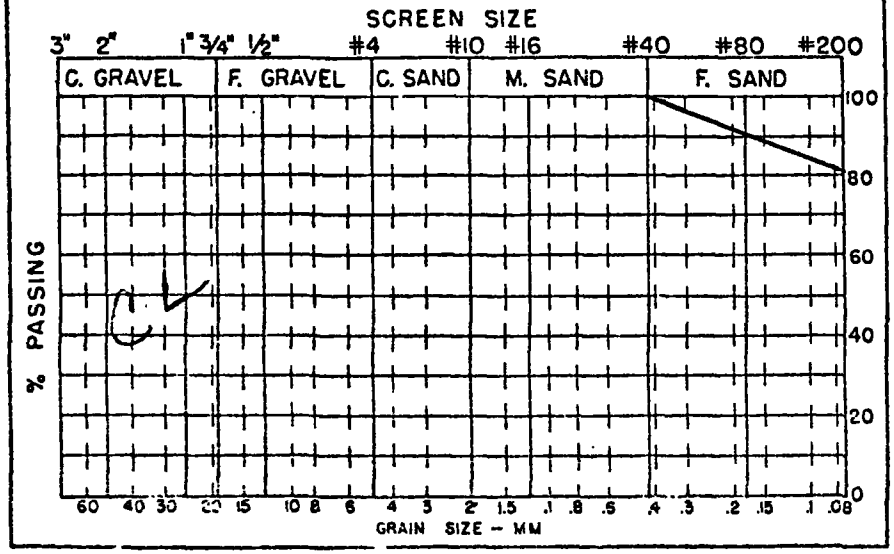


#120 = 23%

SIEVE ANALYSIS % Passing 43.83

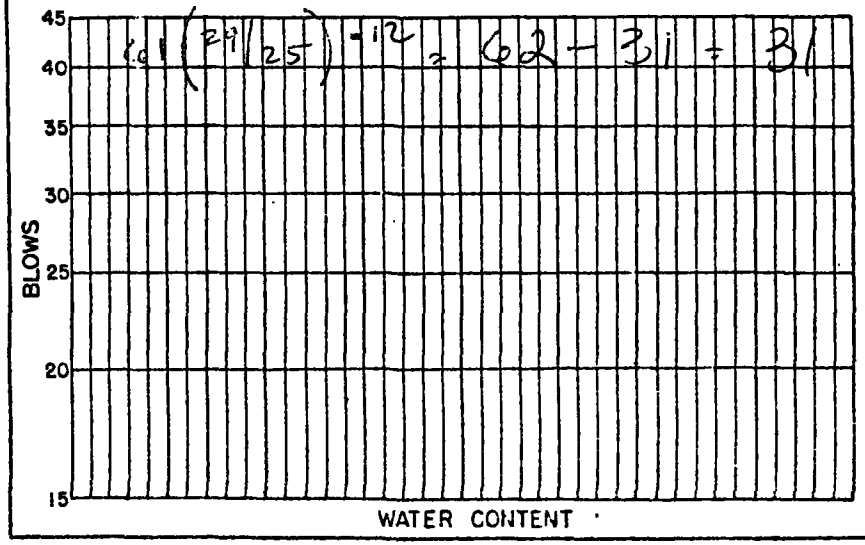
	-40 8.35	100%
-3/4	-80	
-4	-140	
-10	-200 35.48	81%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	70				75
Wet Wt.	16.58				8.27
Dry Wt.	10.30				6.33
% H_2O	61%				PL= 21 %
Blows	29				PI= 31



61 (29/25)^.12 = 62 - 31 = 31

DOT FORM 351-019

TRIAXIAL COMPRESSION TEST (With Area Changes and Pore Pressures)

Project HOQUIAM (FILL SECTION) Location Sta 158+75 ℄
Job No. L7262 Sample No. 3066-1 Boring No. J-5 Depth 4'-8" to 5'-0"
Area (Ao) 2.92 Length 4" Confining Pressure 400 PSF = 2.8 PSI
Rate of Loading .085%/min L. R. C. .325 UW Tested by R Brooks Date 21 MAR 83

Description

GROSS WT.	TARE	NET WT.	CAN NO.	WET WT.	DRY WT.	WT. H^2O	% H^2O	WET DENS.	DRY DENS.
347	147	200	55	57.29	9.50	47.79	503	65.8	10.9

Data for Mohr's Envelope:
Max. Deviator Stress
Principal Stress
Effective Principal Stress

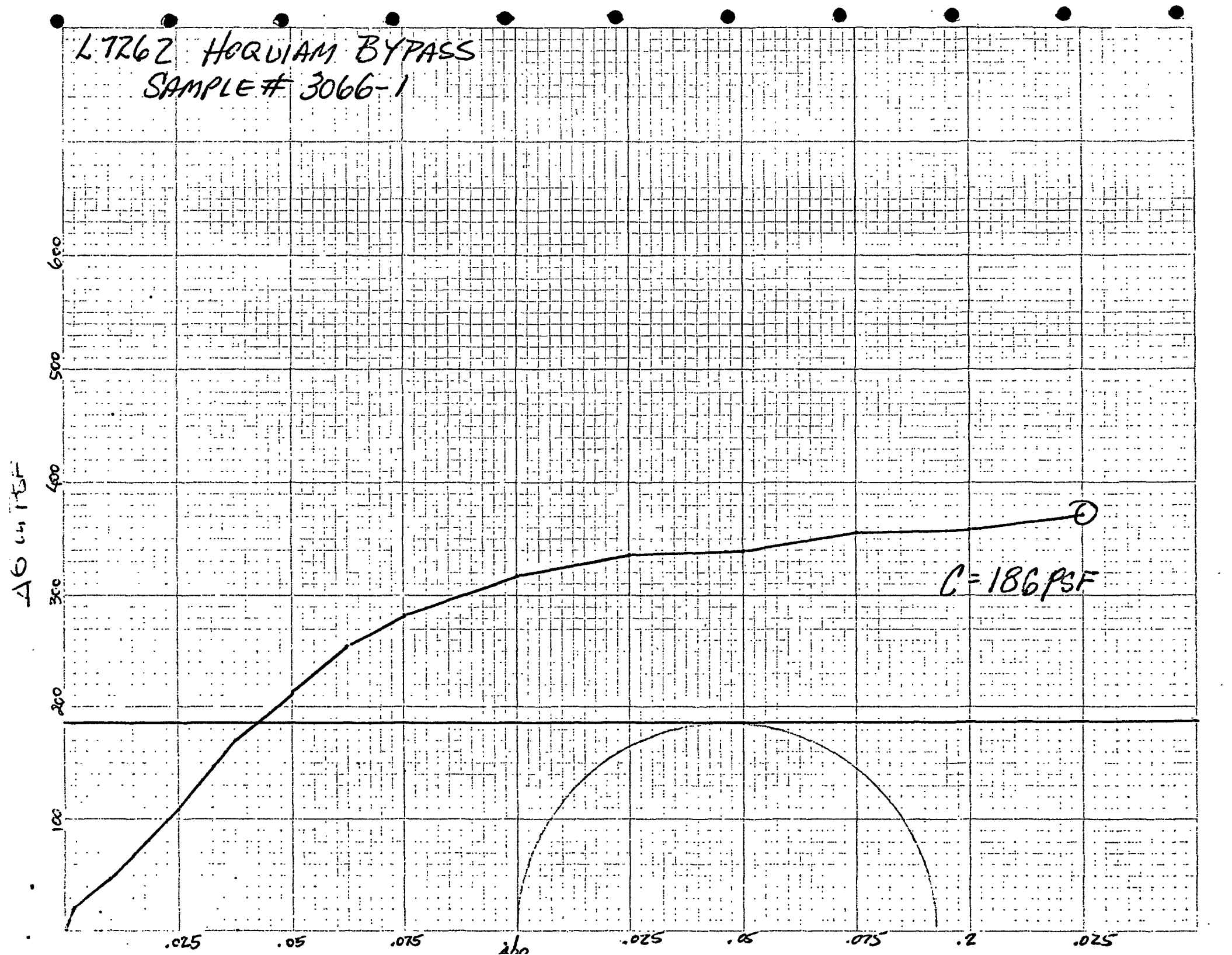
Failure

Back Press.
Saturation 92

ELASPED TIME (Hr.) (Min.)	LOAD DIAL READ (X 10^{-4})	DEFORM. DIAL READ	Δ L (COL. 3 x 10^{-3})	E. UNIT STRAIN (ΔL/L)	AREA C.F. (1 − E)	CORRECT. AREA A' ($\frac{A^0}{1-E}$)	PORE PRESS.	DEV. LOAD (Col. 2 X LRC)	DEV. STRESS (Col. 9 ÷ Col. 7)	PRINC. STRESS (Col 10 + conf. press.)
1	2	3	4	5	6	7	8	9	10	11
0							2.00			
.5	1	008		.002	998	2.92	2.00	.325	16.0	
1.5	3	038		.010	990	2.95	2.09	.975	47.6	
3.75	7	100		.025	975	2.99	2.24	2.275	109.6	
5.5	11	150		.038	962	3.04	2.48	3.58	169.6	
7	14	200		.05	950	3.07	2.75	4.55	213.4	
8.75	17	250		.062	938	3.12	2.71	5.525	255	
10.25	19	300		.075	925	3.16	2.68	6.175	281.4	
13.5	22	400		.1	900	3.24	2.71	7.15	317.8	
17	24	500		.125	875	3.34	2.80	7.8	336.3	
20	25	600		.15	850	3.44	2.97	8.125	340.1	
23.5	27	700		.175	825	3.54	2.78	8.775	356.9	
26.75	28	800		.2	800	3.65	2.80	9.1	359.0	
30	30	900		.225	775	3.77	2.86	9.75	372.4	

DOT FORM 351-018 REVISED 4/80

L7262 HOQUIAM BYPASS
SAMPLE # 3066-1



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3066	JOB NO. HOQ	HOLE NO. TRIAX	
DATE 30 MAR 83	OPERATOR RB		

SOIL FIELD IDENTIFICATION

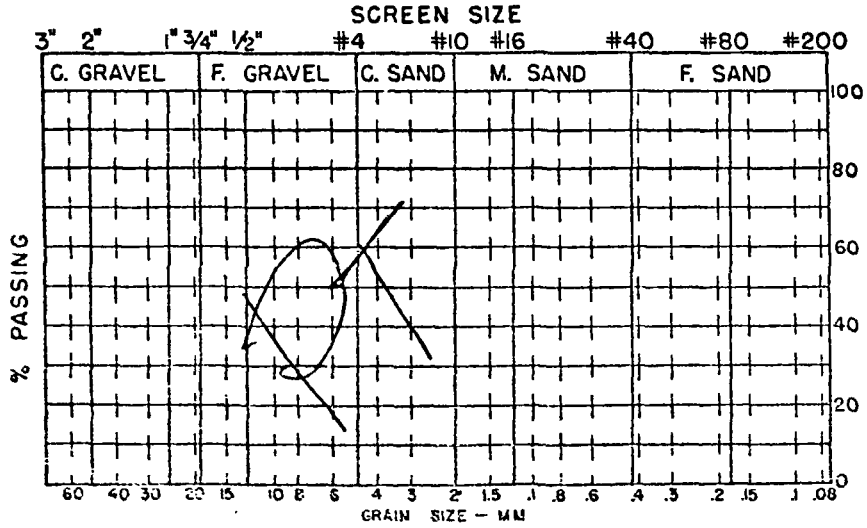
TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: Wet Brown Sty PEAT w/wood

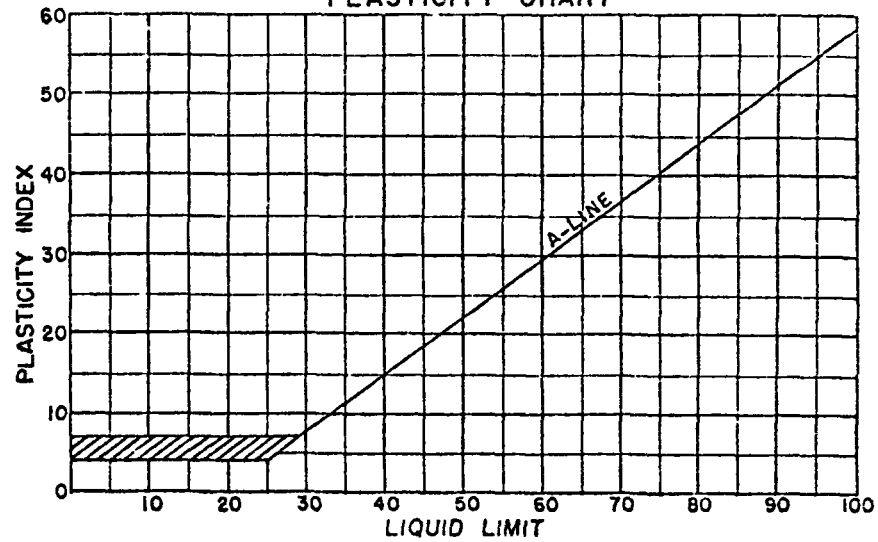
$H_2O = 503\%$

SIEVE ANALYSIS	% Passing
	-40
-3/4	-80
-4	-140
-10	-200

GRAIN SIZE CURVE

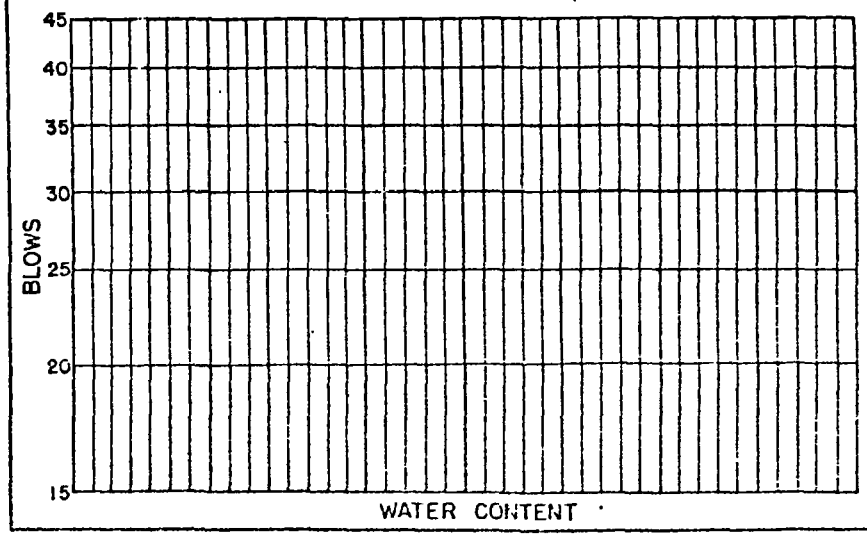


PLASTICITY CHART



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



TRIAXIAL COMPRESSION TEST (With Area Changes and Pore Pressures)

Project HOQUIAM BYPASS Location Sta 158+75 ℄
Job No. L7262 Sample No. 3068 Boring No. J-5 Depth 14'-8" to 15'-0"
Area (Ao) 2.92 Length 4" Confining Pressure 900 PSF = 6.25 PSI
Rate of Loading .085%/min L. R. C. .325 UW Tested by R Brooks Date 21 MAR 83

Description

GROSS WT.	TARE	NET WT.	CAN NO.	WET WT.	DRY WT.	WT. H^2O	% H^2O	WET DENS.	DRY DENS.
435	145	290	117	64.10	44.68	19.42	43	95.41	66.7

Data for Mohr's Envelope:
Max. Deviator Stress
Principal Stress
Effective Principal Stress

Failure

Back Press.
Saturation 97

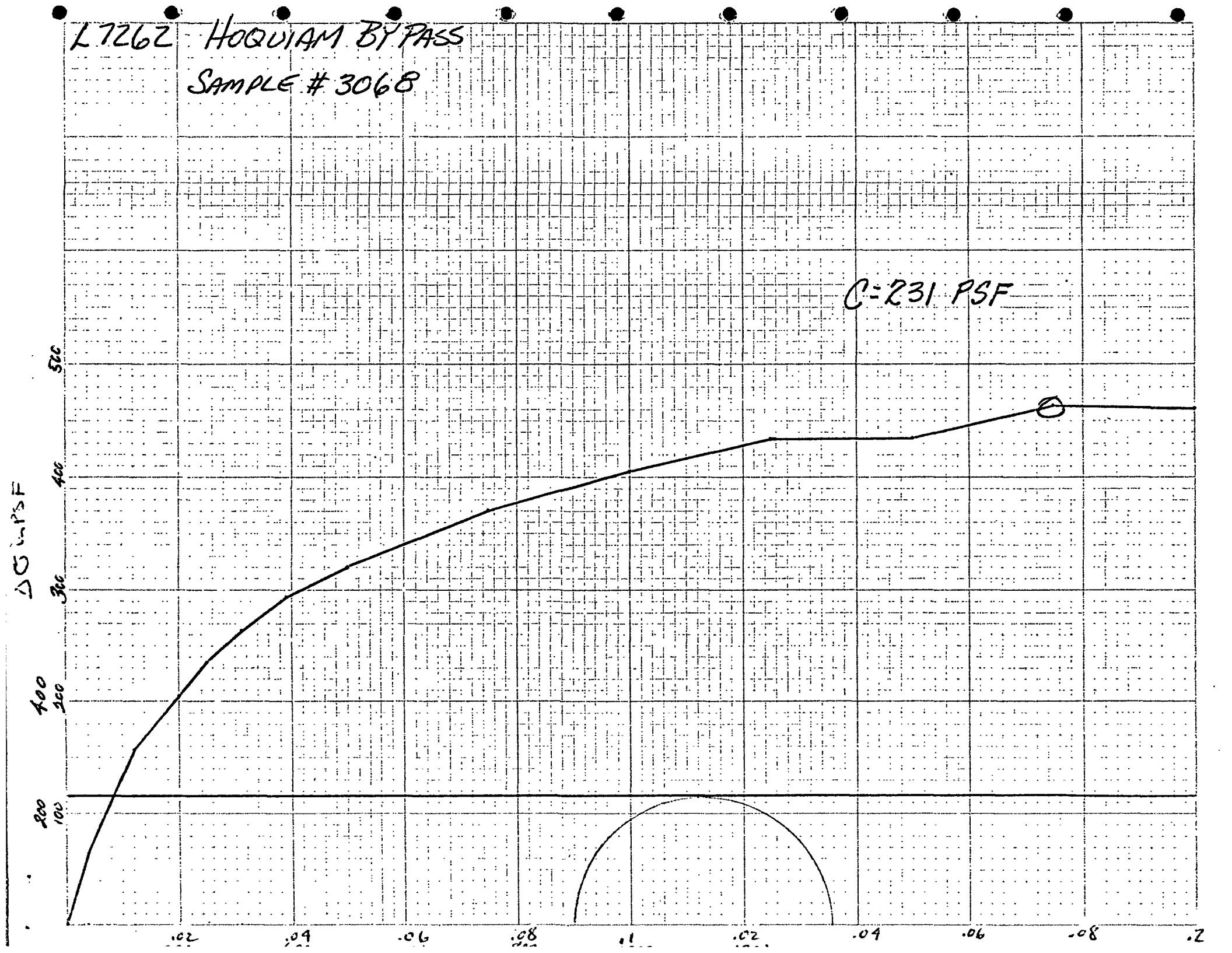
ELASPED TIME (Hr.) (Min.)	LOAD DIAL READ (X 10^{-4})	DEFORM. DIAL READ	Δ L (COL. 3 x 10^{-3})	E UNIT STRAIN (ΔL/L)	AREA C.F. (1 − E)	CORRECT. AREA A' ($\frac{A^o}{1-E}$)	PORE PRESS.	DEV. LOAD (Col. 2 X LRC)	DEV. STRESS (Col. 9 ÷ Col. 7)	PRINC. STRESS (Col 10 + conf. press.)
1	2	3	4	5	6	7	8	9	PSF 10	11
~~0~~							5.74			
.5	4	016		.004	996	2.93	5.63	1.3	63.9	
1.5	10	050		.012	988	2.96	5.73	3.25	158.1	
2.5	13	079		.020	98	2.98	5.91	4.22	203.9	
3.25	15	100		.025	975	2.99	5.84	4.88	235.0	
4	17	124		.031	969	3.01	5.84	5.52	264.1	
5	19	156		.039	961	3.04	5.81	6.18	292.7	
6.5	21	200		.050	950	3.07	5.99	6.82	319.9	
9.75	25	300		.075	925	3.16	5.92	8.12	370.0	
13	28	400		.100	900	3.24	5.76	9.1	404.4	
16.25	31	500		.125	875	3.34	5.88	10.08	434.6	
19.5	32	600		.150	850	3.44	5.85	10.4	435.3	
22.75	35	700		.175	825	3.54	5.74	11.38	462.9	
26	36	800		.200	800	3.65	5.75	11.7	461.6	

DOT FORM 351-018 REVISED 4/80

L7262 HOQUIAM BYPASS

SAMPLE # 3068

C=231 PSF



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

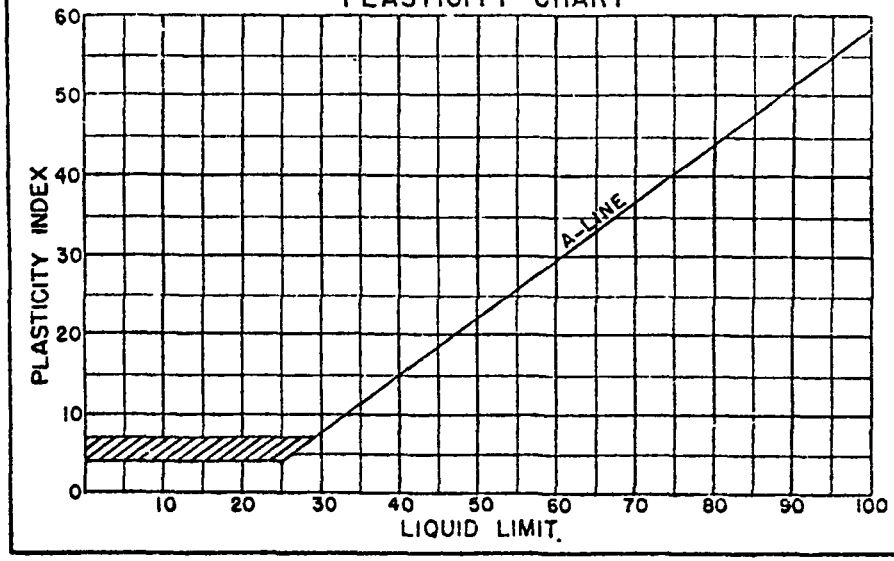
SAMPLE NO. 3068 JOB NO. HOQ TRIAX HOLE NO.
DATE 30 MAR 83 OPERATOR RB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓		
DRIED CAST	✓		
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: Wet green V stiff F SAND w/trace F gravel, highly organic

PLASTICITY CHART

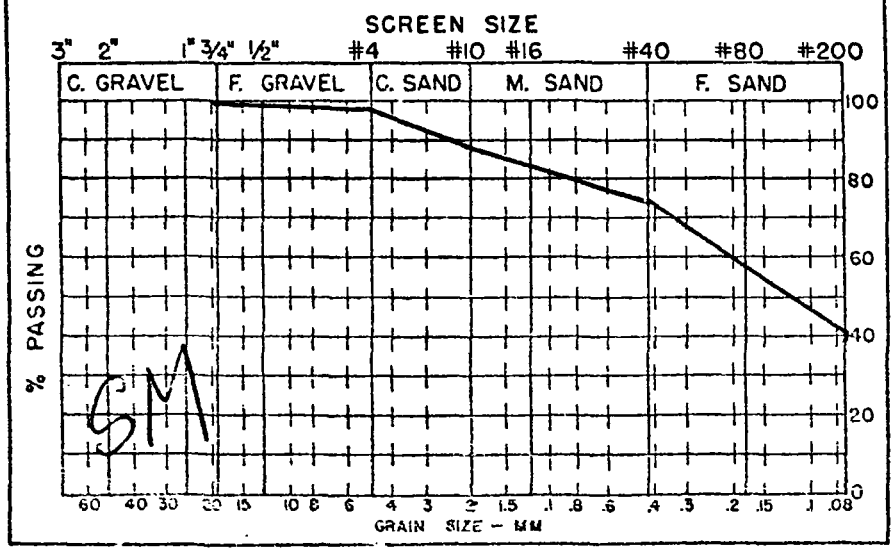


$H_2O = 43\%$

SIEVE ANALYSIS % Passing 170, 30

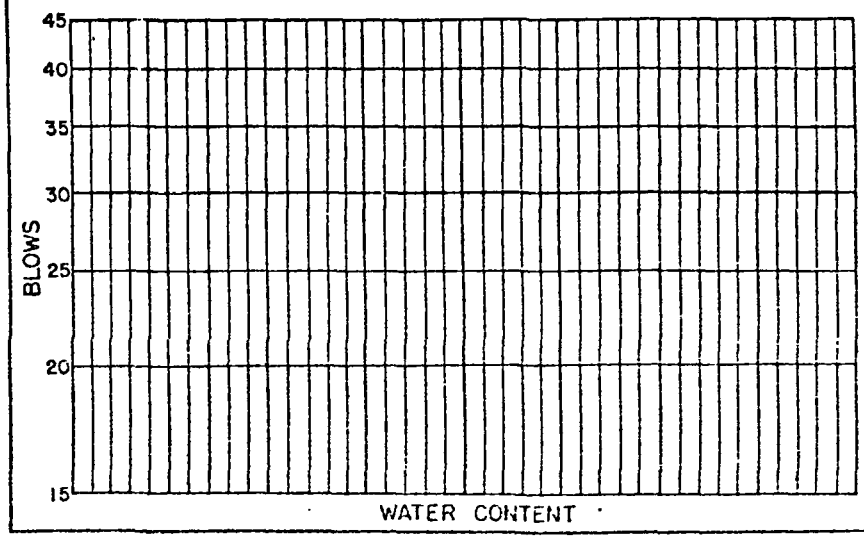
			-40	54.55	72
-¾	4.38	100	-80		
-4	17.32	97	-140		
-10	25.9	87	-200	68.15	40

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

ATERIALS ENGINEER
aterials Laboratory
O. Box 167, Olympia, WA 98504 (Mailing Address)
55 So. 2nd Ave.
mwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 7-7-82

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam bypass
SR No. 101 A Sub-Section culvert

Station & Offset 158+00 80' Lt Hole # J-6

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
E-3072 -1	U-1	0' 0" / 0' 4"	A		
-2		0' 4" / 0' 8"	B		
-3		0' 8" / 1' 0"	C		
3073	D-2	2' 0" / 4' 0"		OL	Like 3065 Wet, dk. brn. F. Sdy. F. Silt; Peaty w. Pieces of Wood & organic matl
3074	U-3	5' 0" / 5' 4"	A		
3075	D-4	7' 0" / 9' 0"		ML	Like 3071-2 Moist & Gr w/orange & tan outside F. Sdy. Silt w/ Trace Clay
3076 -1	U-5	10' 4" / 10' 8"	B		
-2		10' 8" / 11' 0"	C		
-3		11' 0" / 11' 4"	D		

opy with samples
opy to addressee

Yours very truly,
Larry M Moon
Inspector.

FORM 351-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 7-7-86

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam by pass
SR No. 101A Sub-Section Culvert

Station & Offset 153+00 30' Lt. Hole # J-6

Lab No.	Drive #	Depth	Tube Position in Sample	Clas.	Description
3077	D-6	12' 0" 14' 0"	38%	ML	Moist, Gr. & Tan F. Sdy. Silt (Altered Sand)
3078	D-7	15' 0" 16' 0"	I.D. only		
3079-1	D-8	17' 0" 19' 0"	23%	CL	Like 3071-4 only green/Gray/orange Dry, Green, Gr. Orange F. Sdy., Sty Clay w/ Trace mica & organic
-2	D-9	20' 0" 22' 0"		CL	Like 3079-1 Above
-3	D-10	25' 0" 27' 0"		CL	Like 3071-4 w- some Layering Dry, Gr F. Sdy., Sty Clay w/ Trace mica & organic
-4	D-11	30' 0" 31' 6"	23%	CL	Like 3079-3 w- " Above
-5	D-12	35' 0" 36' 6"		CL	Like 3078-3 Above

1 copy with samples
1 copy to addressee

Yours very truly,

Larry M Moore
Inspector.

DOT FORM 351-002 REVISED 2/80

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3077 JOB NO. HOQ HOLE NO. 1-6
DATE 9/21/82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

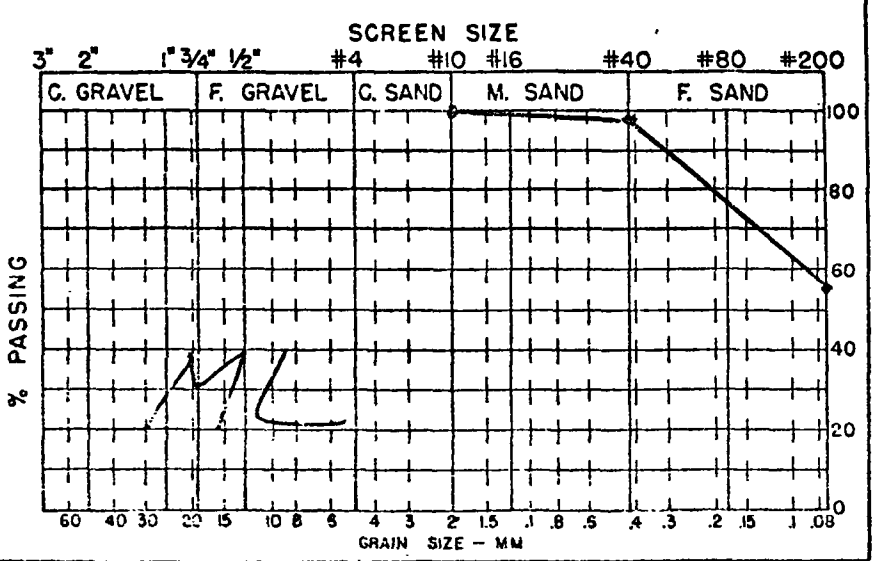
DESCRIPTION: Moist Gr-Tan f-sdy SILT (altered sand)

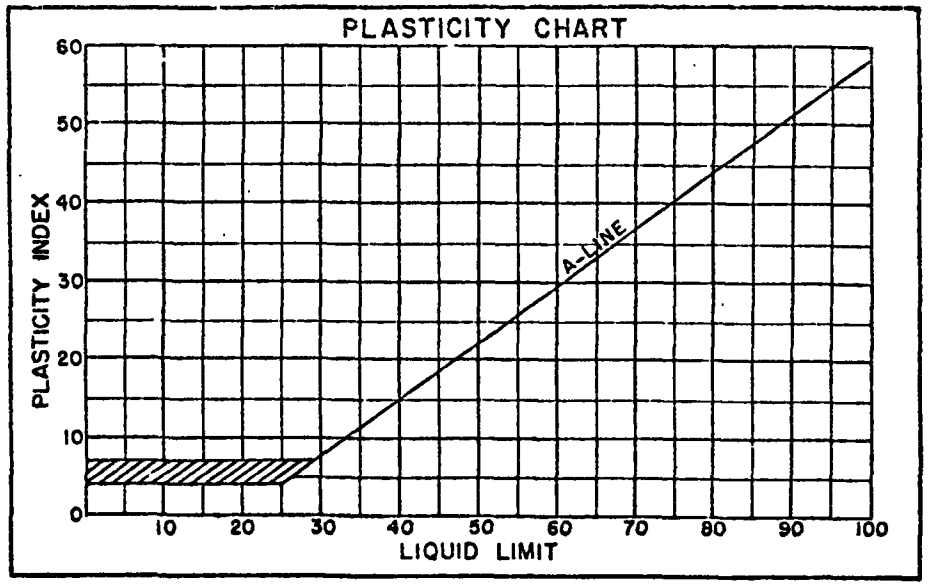
H_2O = 38 %

SIEVE ANALYSIS % Passing 74.10

		-40 32.00	99%
-3/4		-80	
-4		-140	
-10 .23	100%	-200 41.70	56%

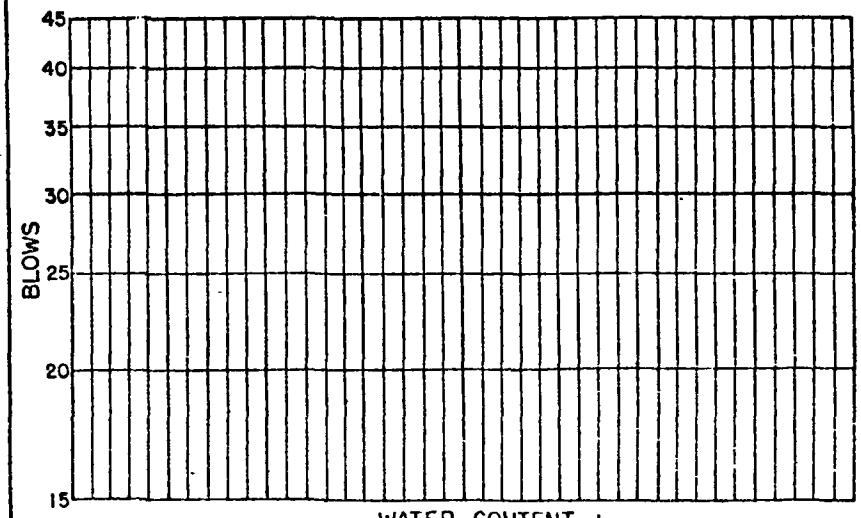
GRAIN SIZE CURVE





LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 7-7-82

Dear Sir:

I have forwarded by today's state car the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam by Pass
SR No. 101A Sub-Section Culvert

Station & Offset 158+00 ℄ Hole # J-7

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
E 3080 -1	U-1	0' 4" 0' 8"	B		
-2		0' 8" 1' 0"	C		
3081	D-2	2' 0" 4' 0"		OL	Like 3065 Wet dk. brn., Clyey F. Sdy. SILT
					W- Pieces of Wood & Org. mat'l
3082 -1	U-3	4' 0" 4' 4"	A		
-2		4' 4" 4' 8"	B		
3083	D-4	6' 0" 8' 0"	H.C. 77%	ML	Wet, Gr. & Tan F. Sdy. SILT
					W/ Trace Clay
3084 -1	U-5	9' 4" 9' 8"	B		
-2		9' 8" 10' 0"	C		
-3		10' 0" 10' 4"	D		

1 copy with samples
1 copy to addressee

Yours very truly,
Milford SANDERS
Inspector.

FORM 351-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

:ATERIALS ENGINEER
:aterials Laboratory
O. Box 167, Olympia, WA 98504 (Mailing Address)
.55 So. 2nd Ave.
ımwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 7-9-82

Dear Sir:

I have forwarded by today's state car the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam by pass SR No. 101 K Sub-Section culvert

Station & Offset 158+00 ℄ Hole # J-7

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3085-1	D-6	11' 0" – 13' 0"	H.: 21%	SM	Moist, Brun, GR V. Sty. F-CRS. SAND W. Fine S. Rounded Gravel
-2	D-7	14' 0" – 16' 0"		ML	Like 3071-1 Moist & Gray w-orange & tan outside F. Sdy. Silt W-T. Clay
-3	D-8	19' 0" – 21' 0"	H. 23%	CL	Like 3071-4 DRY, GR. F. Sdy., Sty. CLAY w/ Trace Mica & organic
-4	D-9	24' 0" – 25' 6"	H. 26%	MH	DRY, GR. F. Sdy. SILT w/ Trace of CLAY
-5	D-10	29' 0" – 30' 6"	"	MH	Like 3085-4 w-org. odor
-6	D-11	34' 0" – 35' 6"	"	MH	Like 3085-4 w-org. odor

·opy with samples
·opy to addressee

Yours very truly,

Milford SANDERS
Inspector.

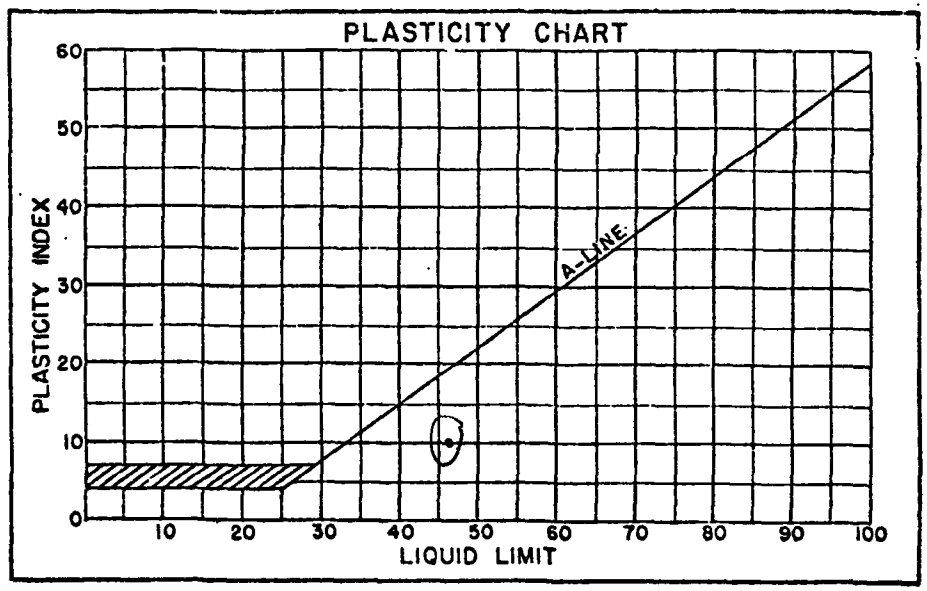
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3083 JOB NO. 110a. HOLE NO. 17
DATE 9-15-82 OPERATOR CBB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS			✓

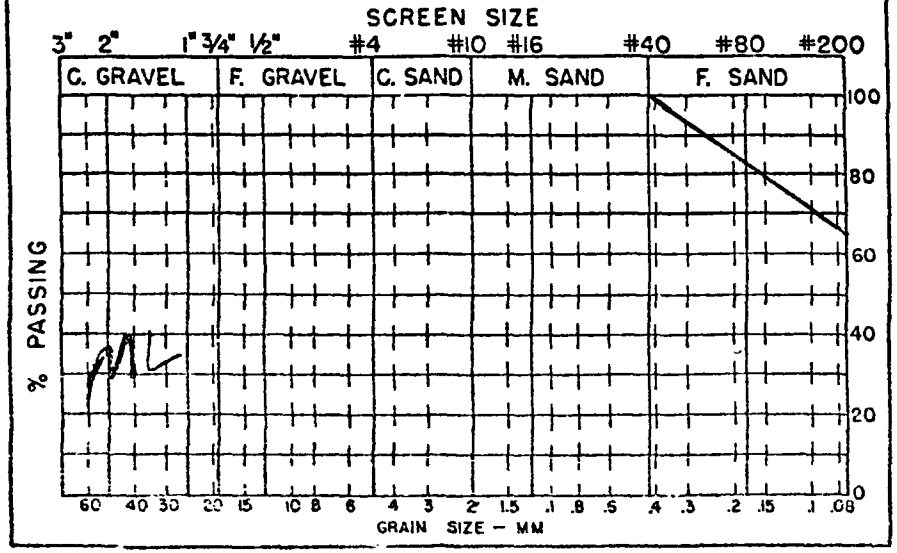
DESCRIPTION: Wet, GR & TAN F. Sdy. SILT w/ Trace Clay



H_2O: 77%

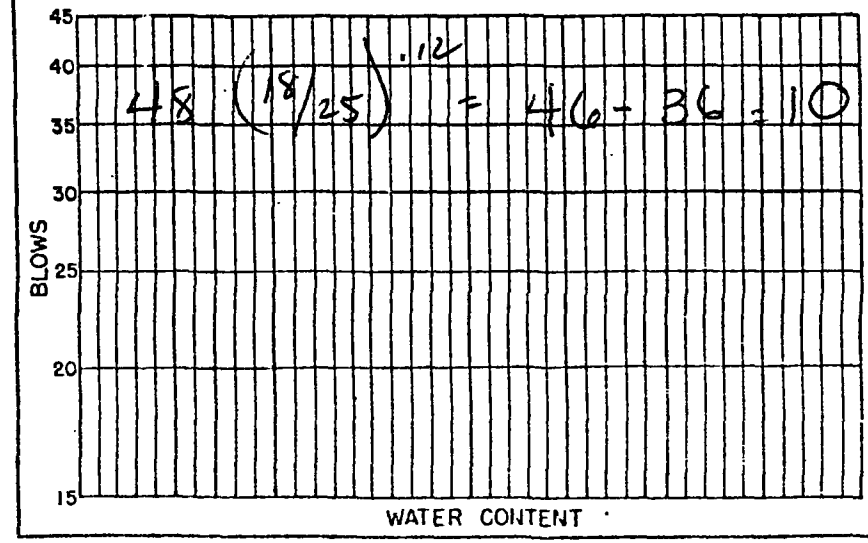
SIEVE ANALYSIS		% Passing 25.12
	-40 8.67	100%
-3/4	-80	
-4	-140	
-10	-200 16.45	65%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	58				113
Wet Wt.	11.55				7.42
Dry Wt.	7.82				5.45
% H_2O	48				PL= 36%
Blows	18				PI= 10



$48 \left(\frac{18}{25}\right)^{.12} = 46 - 36 = 10$

DOT FORM 351-019

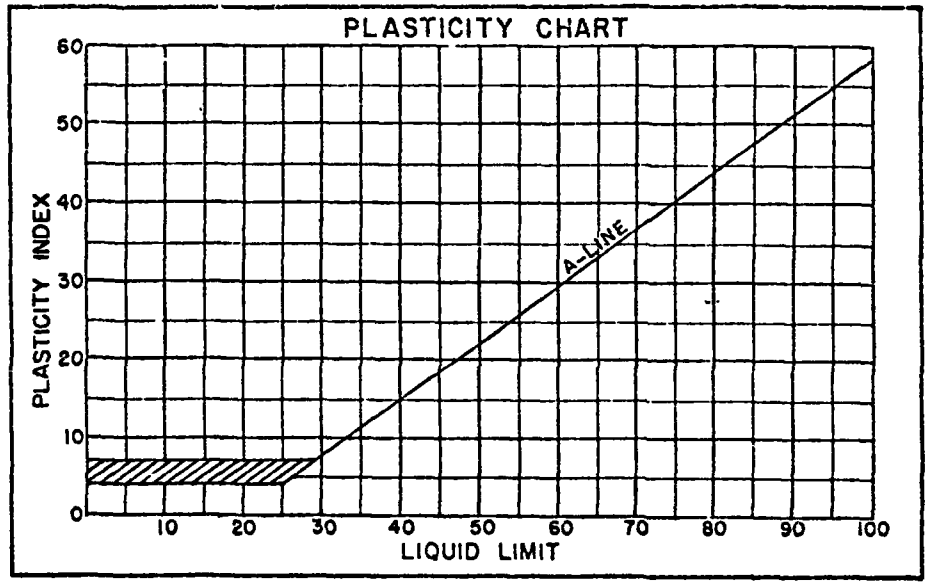
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3085-1 JOB NO. Hoa. HOLE NO. J-7
DATE 9-16-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Moist, Green, Gr
V. Sty. F.-CRS. SAND W-
F. S.R. Gravel

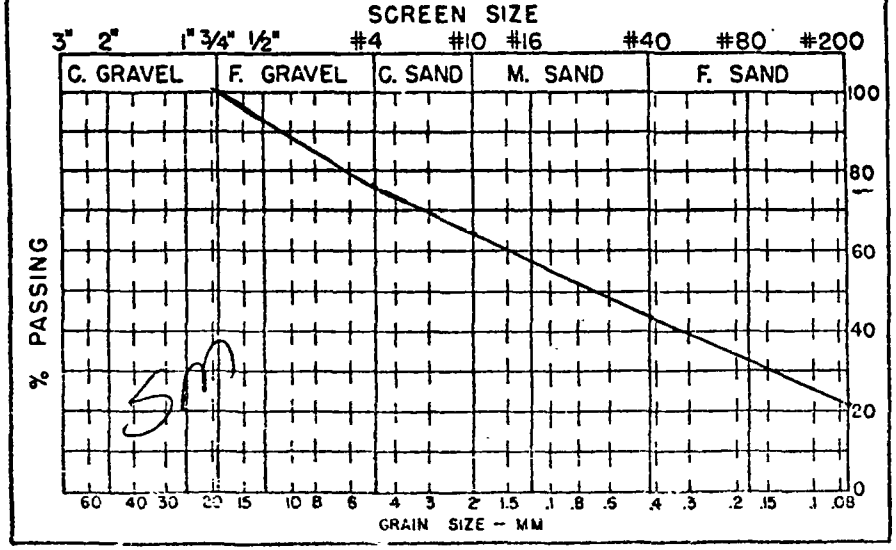


H_2O = 21%

SIEVE ANALYSIS % Passing 98.82

			-40	22.73	44%
-3/4	22.85	100%	-80		
-4	13.00	77%	-140		
-10	19.22	64%	-200	21.02	21%

GRAIN SIZE CURVE



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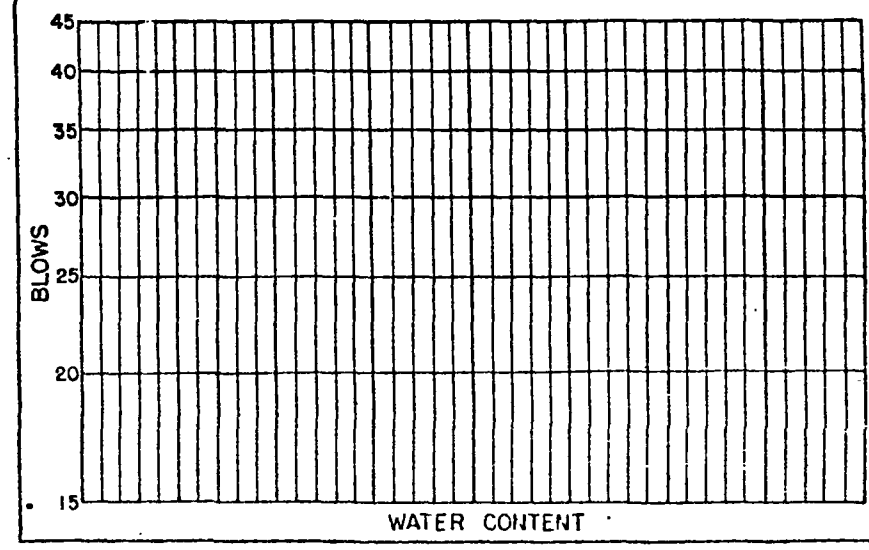
LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

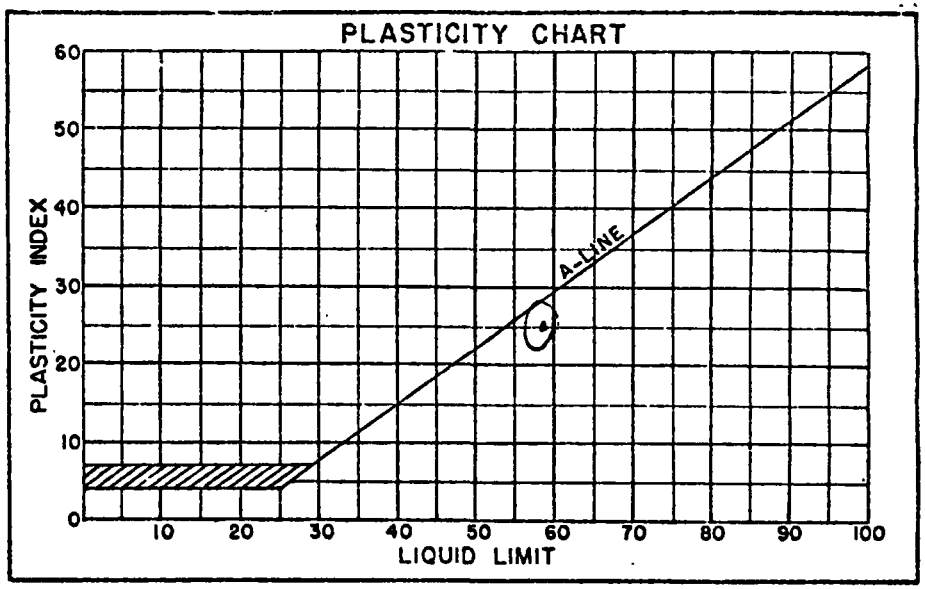
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3085-4 JOB NO. HOQ. HOLE NO. 7
DATE 9-15-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS			✓

DESCRIPTION: DRY. GR. F. Sdy. SILT W- Trace of Clay.

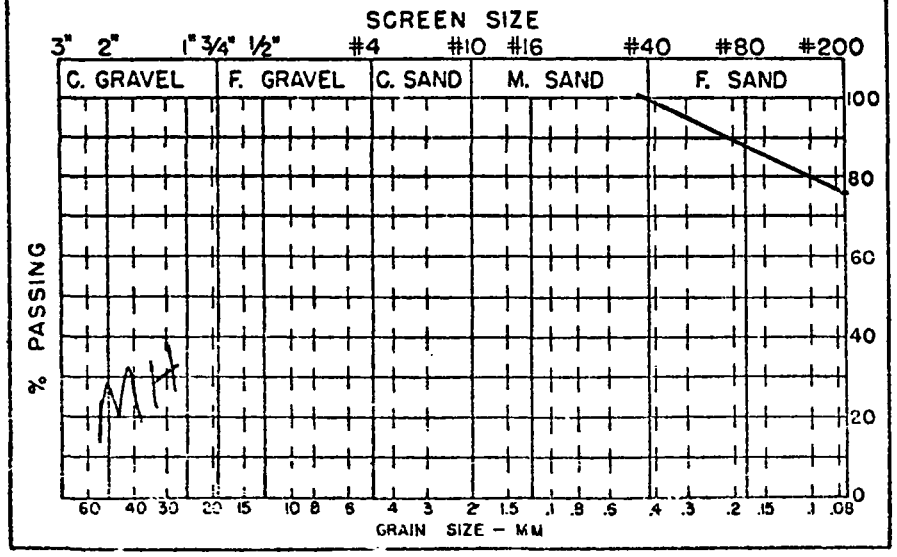


H2O = 26 %

SIEVE ANALYSIS % Passing 36.85

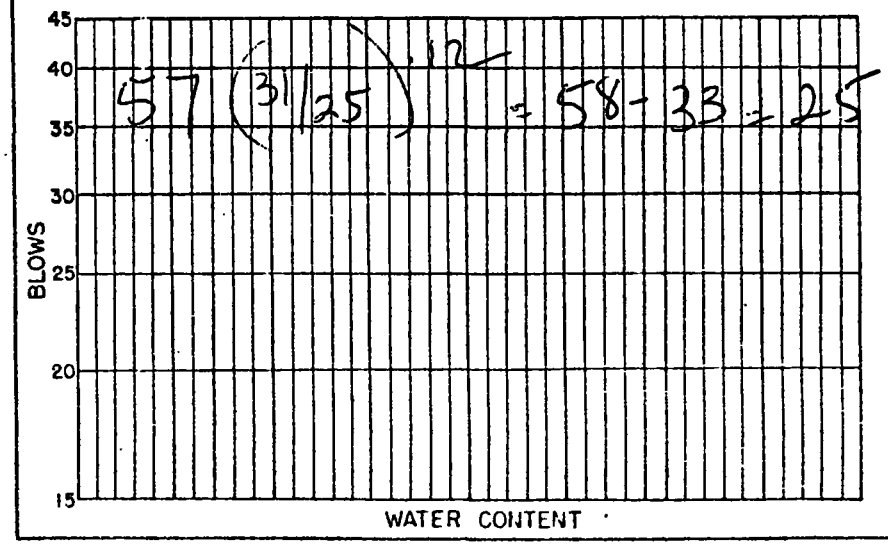
	-40	9.02	100%
-3/4	-80		
-4	-140		
-10	-200	27.83	76%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	112				47
Wet Wt.	12.4				7.42
Dry Wt.	7.93				5.66
% H_2O	57				PL= 33%
Blows	31				PI= 25



DOT FORM 351-019

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

ATERIALS ENGINEER
aterials Laboratory
. O. Box 167, Olympia, WA 98504 (Mailing Address)
55 So. 2nd Ave.
mwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 7-9-82

Dear Sir:

I have forwarded by today's state car the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam by pass
SR No. 101 A Sub-Section Culvert

Station & Offset 158+00 80' Rt. Hole # J-8

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
E-3086 -1	U-1	0' 0" – 0' 4"	A		
-2		0' 4" – 0' 8"	B		
3087	D-2	2' 0" – 4' 0"		OL	Like 3065 Wet, dk. brn. Cty. F. Sdy. SILT w-Pieces of Wood & organic matt
3088 -1	U-3	5' 4" – 5' 8"	B		
-2		5' 8" – 6' 0"	C		
-3		6' 0" – 6' 4"	D		
3089 -1	D-4	7' 0" – 9' 0"	42%	ML	Like 3071-2 Moist, Gr. w/ orange & tan outside, F. Sdy. SILT w/ Trace Clay.
-2	D-6	12' 0" – 14' 0"	14%	GM	Moist, Orange, olive & tan Sty. Sdy. F. S. Rounded GRAVEL
-3	D-7	15' 0" – 17' 0"		GM	Like 3089-2 above

opy with samples
opy to addressee

Yours very truly,

[illegible]
Inspector.

T FORM 351-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

:ATERIALS ENGINEER
!aterials Laboratory
O. Box 167, Olympia, WA 98504 (Mailing Address)
)55 So. 2nd Ave.
ımwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 7-9-82

Dear Sir:

I have forwarded by today's state car the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam bypass SR No. 101 A Sub-Section culvert

Station & Offset 158+00 80' Rt. Hole # J-8

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3089 -4	D-8	20' 0" 22' 0"	23%	CL	Like 3071-4 Dry, GR., F. Sdy., Sty. CLAY w/ trace mica & organic
-5	D-9	25' 0" 27' 0"		CL	Like 3071-4
-6	D-10	30' 0" 32' 0"		CL	Like 3071-4

opy with samples
opy to addressee

Yours very truly,

Randy Moore
Inspector.

FORM 351-002

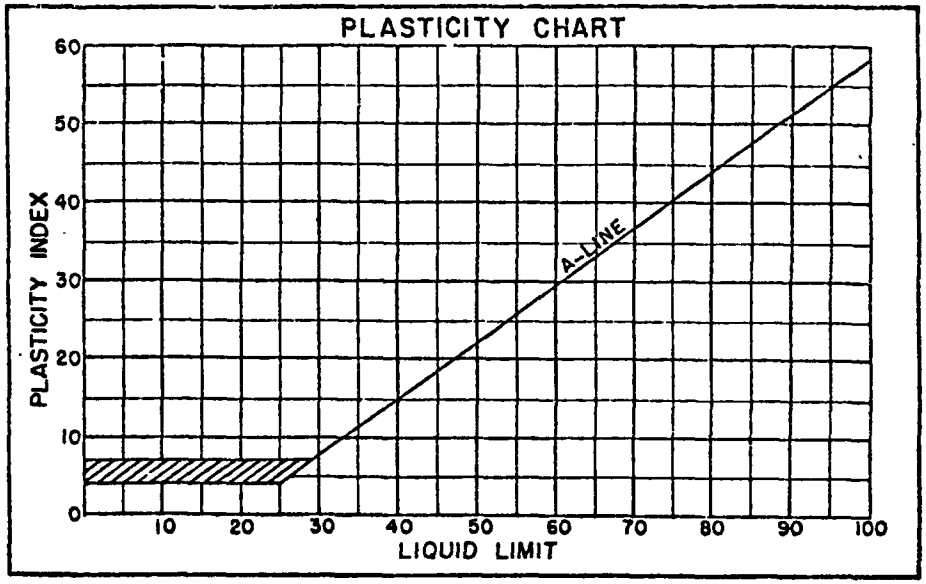
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3089-2 JOB NO. 466. HOLE NO.
DATE 9-16-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

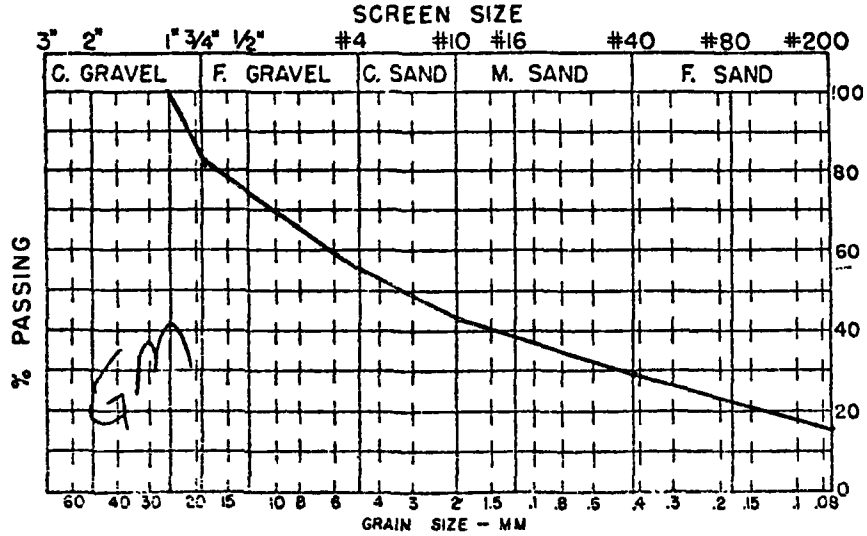
DESCRIPTION: Moist, orange, olive & Tan Sty. Sdy. F. S.R. Gravel



$H_2O = 14\%$

SIEVE ANALYSIS		% Passing			182.17
-1	53.02	100%	-40	25.30	29%
-3/4	46.90	82%	-80		
-4	23.75	56%	-140		
-10	25.40	43%	-200	27.80	15%

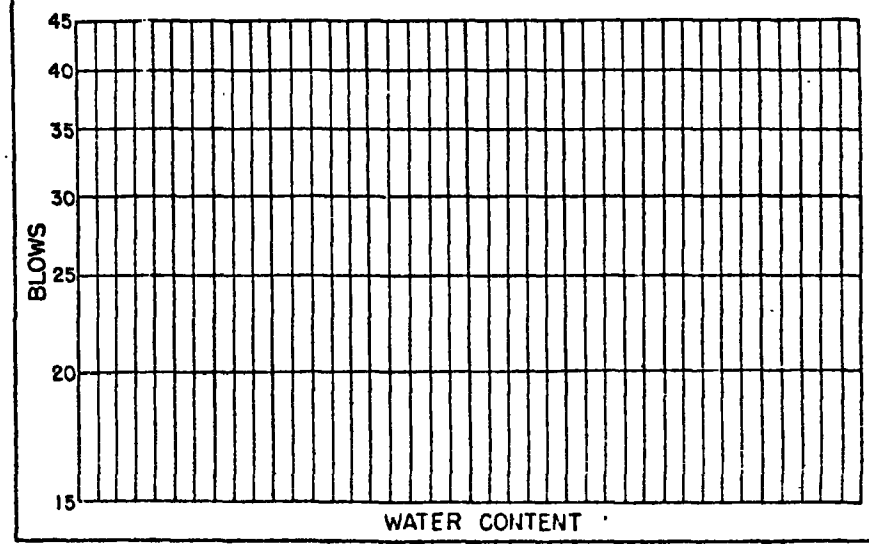
GRAIN SIZE CURVE



J4

LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

ATERIALS ENGINEER
aterials Laboratory
O. Box 167, Olympia, WA 98504 (Mailing Address)
55 So. 2nd Ave.
ımwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 7-14-82

RUN "UU" with Pore Pressure

Dear Sir:

I have forwarded by today's Statecar the following Foundation Samples.

Contract or Job No. L-7262 Section Hequisiz-1 bypass SR No. 101 A Sub-Section Cut Section

Station & Offset 154+50 ℄ Hole # J-9

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
E-3101	D-2	2' 0" 4' 0"	Hw-49%	ML	Moist, tan w/ Rust Stain, Sl. Cly.
				F.	Sdy. SILT
3102 -1	U-3	5' 0" 5' 4"	A		
-2		5' 4" 5' 8"	B		
3103	D-4	7' 0" 9' 0"		ML	Like 3101 w/ more Rust coloring
3104 -1	U-5	10' 0" 10' 4"	A	UU	Wet, tan w/rust, F Sdy Clayey Silt w/ pockets of rust-colored limonitic root traces. 1000 PSF Confining
-2		10' 4" 10' 8"	B		
3105	D-6	12' 0" 14' 0"	49%	ML	Like 3101 Moist, TAN w/ Rust Stain, Sl. Cly.
				F.	Sdy. SILT
3106 -1	U-7	15' 0" 15' 4"	A		
-2		15' 4" 15' 8"	B		

opy with samples
opy to addressee

Yours very truly,

[illegible]
Inspector.

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

IATERIALS ENGINEER
laterials Laboratory
O. Box 167, Olympia, WA 98504 (Mailing Address)
55 So. 2nd Ave.
umwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 7-14-82

Run "UU" with Pore Pressure

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section Hequirad by PBSS
SR No. 101A Sub-Section Cut Section

Station & Offset 154+50 ℄ Hole # J-9

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3107	D-8	17' 0" – 19' 0"		ML	Like 3105 moist, tan w/ rust stain, Sl. Cly F. Sdy. Silt
3108 -1	U-9	20' 4" – 20' 8"	B UU		wet, dk brown, highly organic, F Sdy Silt 2000 PSF confining w/T med. Sand
-2		20' 8" – 21' 0"	C		
3109	D-10	22' 0" – 24' 0"	H₂O 76%	ML	moist, dk. brn. Silt w/ Layers of org. or dk. thin matt.
3110 -1	U-11	25' 4" – 25' 8"	B		
-2		25' 8" – 26' 0"	C		Consol. drain 500, 1000, 2000 PSF confining
3111 -1	D-12	27' 0" – 29' 0"	H₂O 31%	SM	Moist, olive, green & gr, V. Sty. F-C SAND w/ trace F. Sub-Round. Gravel
-2	D-13	30' 0" – 32' 0"	H₂O 76%	ML	Like 3109 w/ T. Fine sub-Round. Gravel & V. org. odor
3112 -1	U-14	35' 0" – 35' 4"	A		

opy with samples
opy to addressee

Yours very truly,

Larry W. Moore
Inspector.

DT FORM 351-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

ATERIALS ENGINEER
aterials Laboratory
O. Box 167, Olympia, WA 98504 (Mailing Address)
55 So. 2nd Ave.
mwater, Washington 98504 (Shipping Address)

Place Tumwater

Date 7-14-82

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam to Pass
SR No. 101 A Sub-Section CUT Section

Station & Offset 154+50 ℄ Hole # J-9

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3112 -2	U-14	35' 4" 35' 8"	B		
-3		35' 8" 36' 0"	C		
3113 -1	D-15	37' 0" 39' 0"	Hu 39%	GM	Wet, Gr, V. Sty. F-C Sdy. F. Ang. GRAVEL
-2	D-16	40' 0" 41' 6"	Hu: 31%	SM	LIKE 3111-1 moist, Olive green gr., V. Sty. F-C SAND w/trace 1"+ & Gravel & v. org. odor
3114 -1	moist #1 UNDIST.	5'8 - 6'			
-2	#2	10'8" 11'			
-3	#3	15'8" 16'			
-4	#4	20 - 20'4"			
-5	#5	25 - 25'4"			

opy with samples
opy to addressee

Yours very truly,

[illegible]
Inspector.

OT FORM 351-002
REVISED 2-80

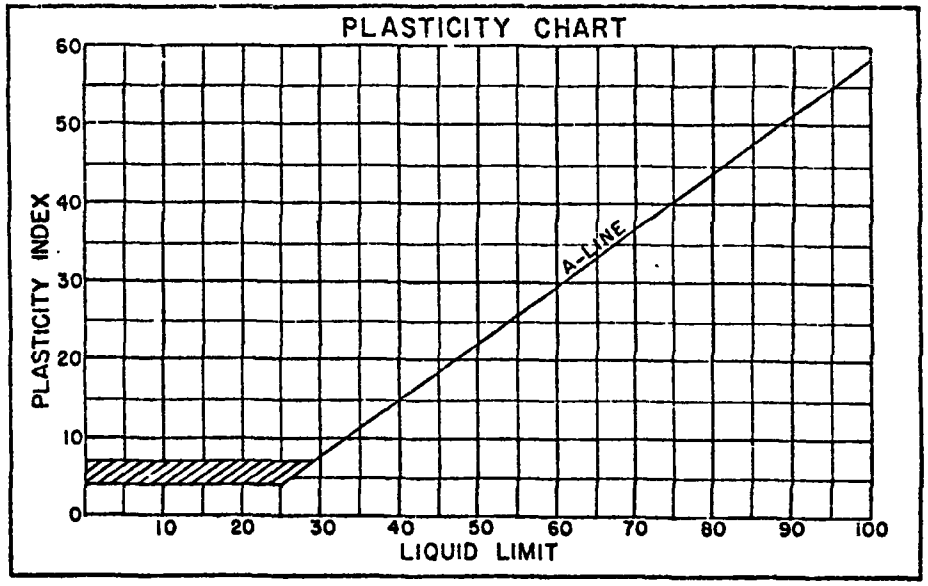
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3101	JOB NO. 408	HOLE NO. 19
DATE 9-28-82	OPERATOR BB	

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS			✓

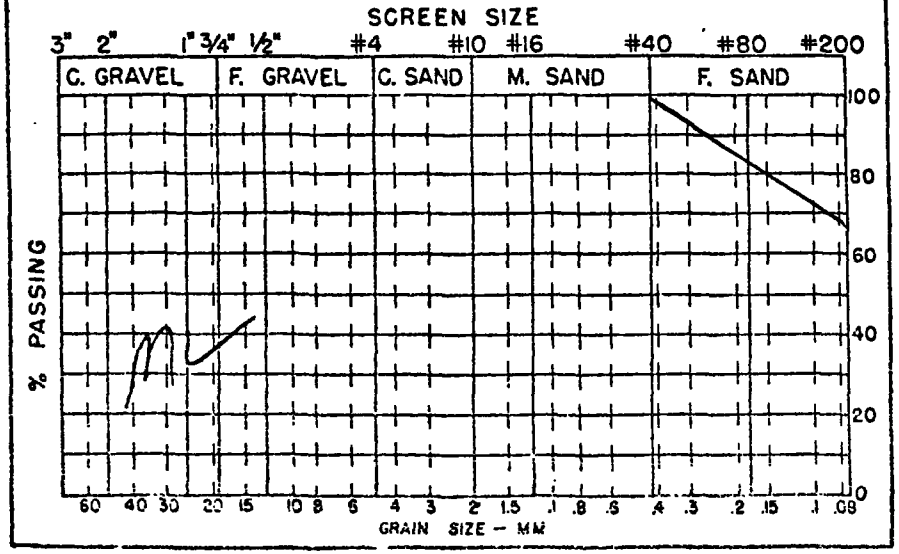
DESCRIPTION: Moist, tan w/rust stain
Sl. Cly. F. Sdy. SILT



#20 = 49%

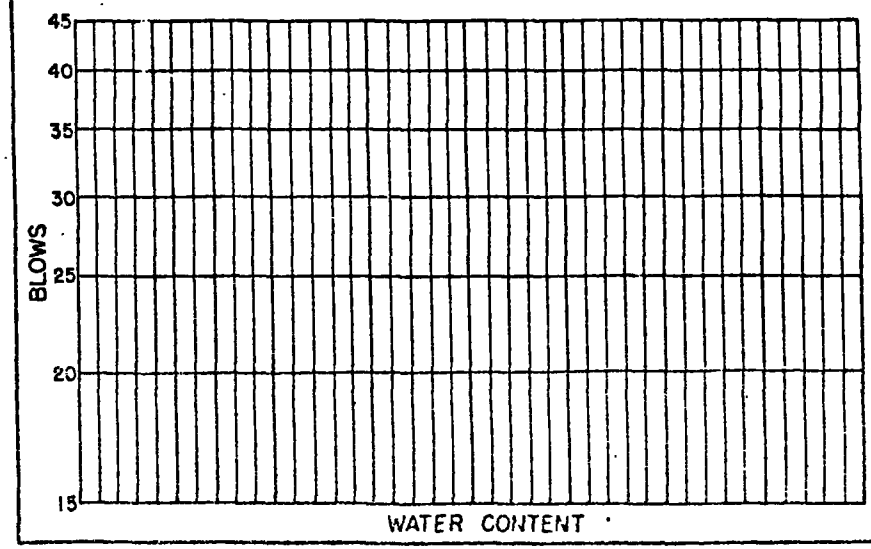
SIEVE ANALYSIS		% Passing 22.02
	-40	9.15 100%
-3/4	-80	
-4	-140	
-10	-200	14.87 68%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	417				
Wet Wt.	13.90				NP
Dry Wt.	9.28				
% H_2O	50%				PL=
Blows	22				PI=



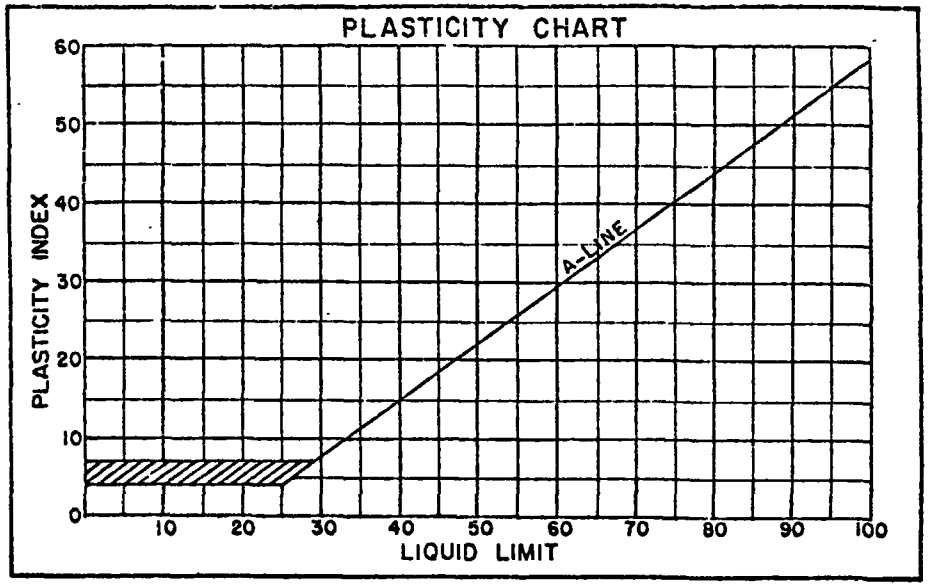
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3109 JOB NO. H07- HOLE NO. J-1
DATE 9-28-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Moist, dk. Brn. Silt w/ Layers of Org. & dk. thin Mat'l.

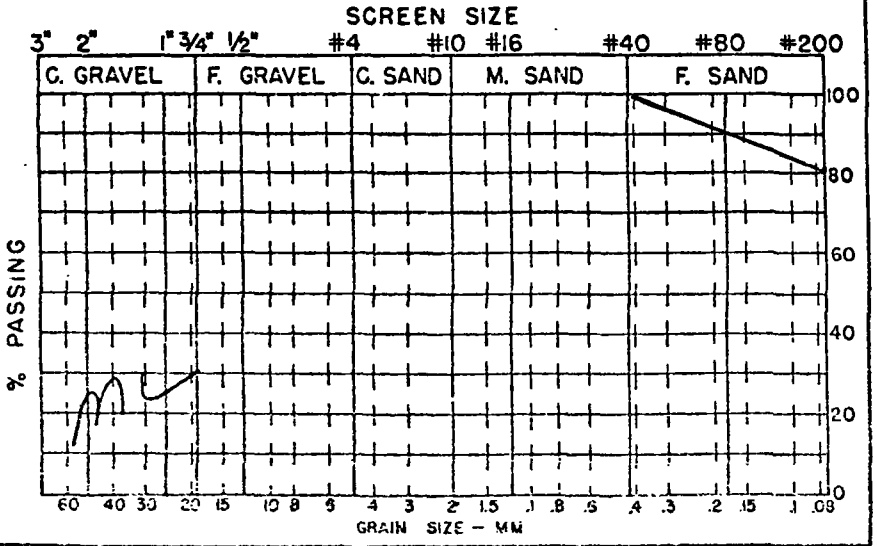


H_2O = 7.6%

SIEVE ANALYSIS % Passing 50.00

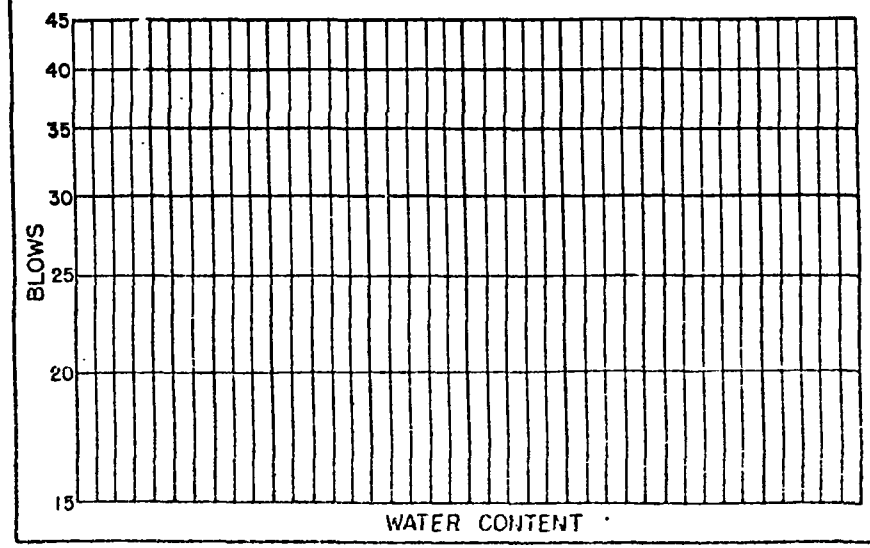
	-40 9.65	100 %
-3/4	-80	
-4	-140	
-10	-200 40.35	81 %

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

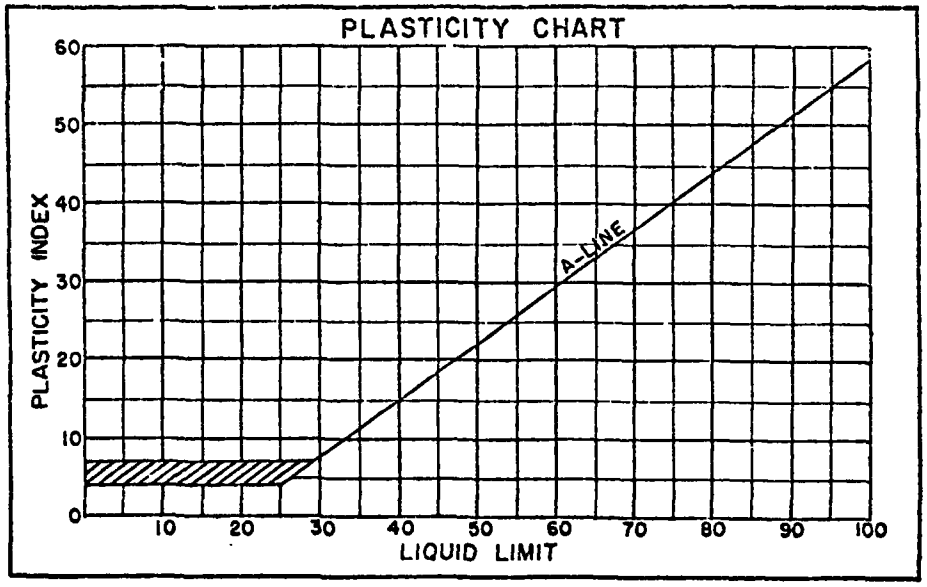
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3111-1	JOB NO. 4-8	HOLE NO. 1-1
DATE 9-28-82	OPERATOR BB	

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Moist, Olive, gray & gr. U. Sty F-C SAND w/ T. F. S.R. Gravel

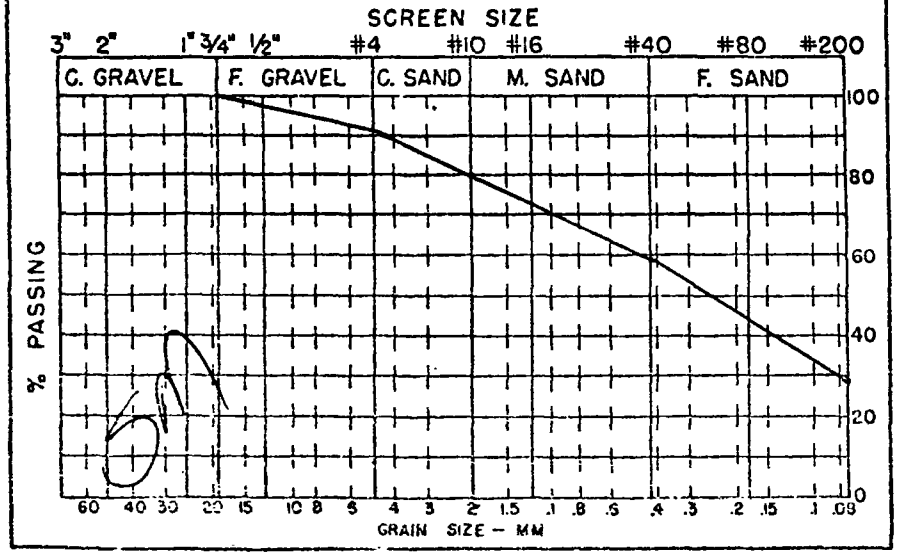


H_2O = 31%

SIEVE ANALYSIS % Passing 149.20

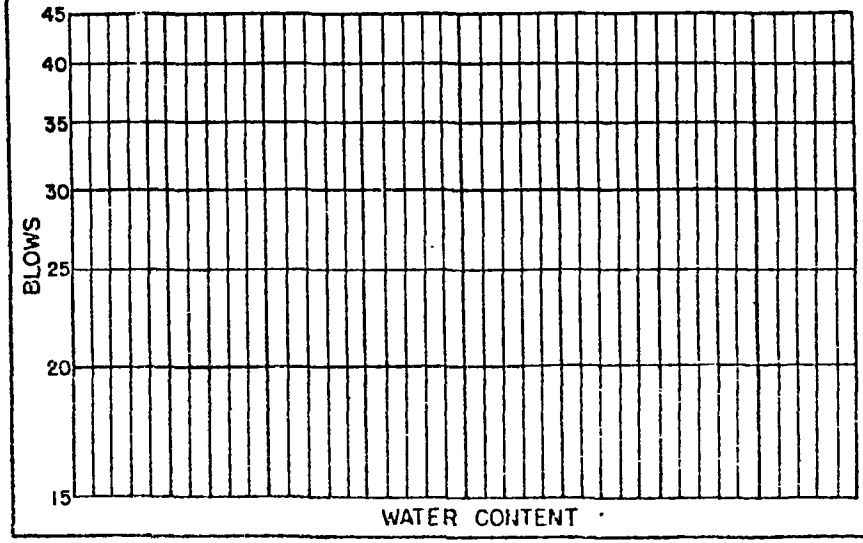
			-40	45.30	59%
-3/4	13.43	100%	-80		
-4	17.73	91%	-140		
-10	29.69	79%	-200	43.05	29%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



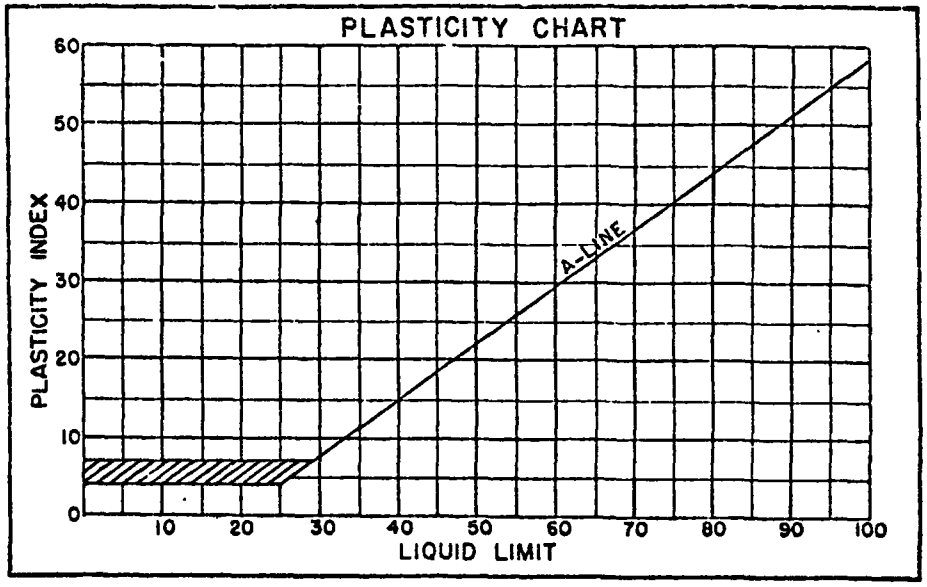
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3113-1 JOB NO. ~~Hog.~~ HOLE NO. 1-9
DATE 9-28-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Wet, GR. V. Sfy.
F-C Sdy. F. Ang. Gravel

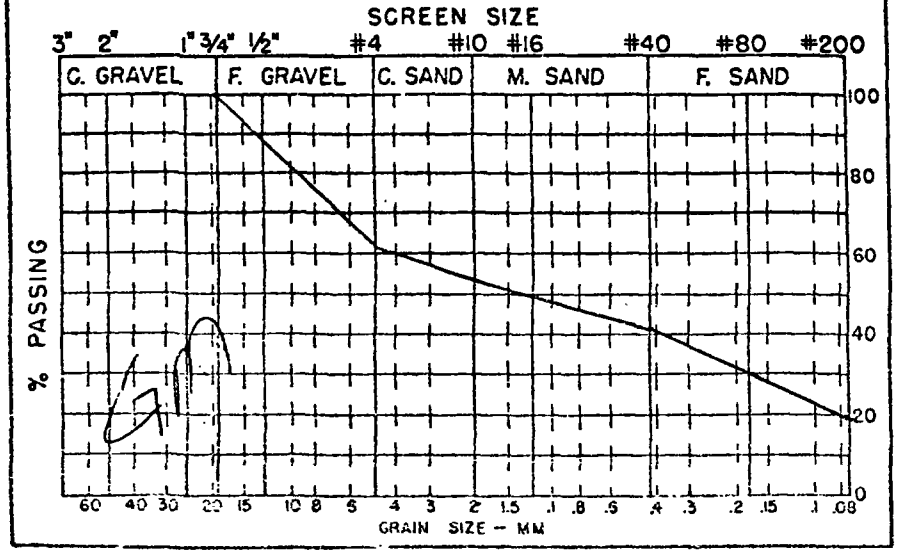


39%

SIEVE ANALYSIS % Passing 116.95

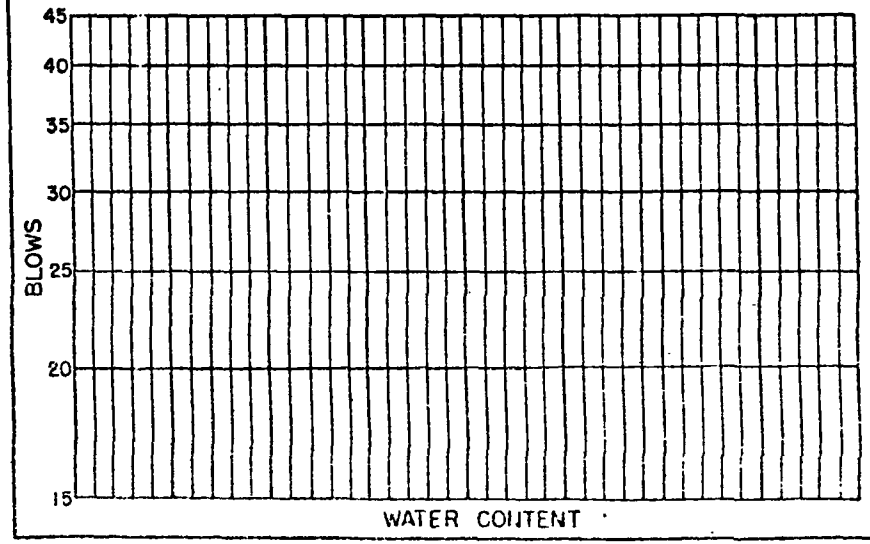
			-40	26.35	42%
-3/4	45.12	100%	-80		
-4	10.00	61%	-140		
-10	13.08	53%	-200	22.40	19%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



TRIAXIAL COMPRESSION TEST (With Area Changes and Pore Pressures)

Project West Hoquiam Bypass Location 154+50 ℄
Job No. L7262 Sample No. 3104-1 Boring No. J-9 Depth 10'-0 to 10'-4"
Area (Ao) 2.92 Length 4" Confining Pressure 1000 PSF = 6.9 PSI
Rate of Loading .03"/Min L. R. C. .325 Tested by R Brooks Date 10 MAY 83

Description

GROSS WT.	TARE	NET WT.	CAN NO.	WET WT.	DRY WT.	WT. H^2O	% H^2O	WET DENS.	DRY DENS.
446	142	304	14	33.0	19.52		69	100.0	59.2

Data for Mohr's Envelope:
Max. Deviator Stress
Principal Stress
Effective Principal Stress

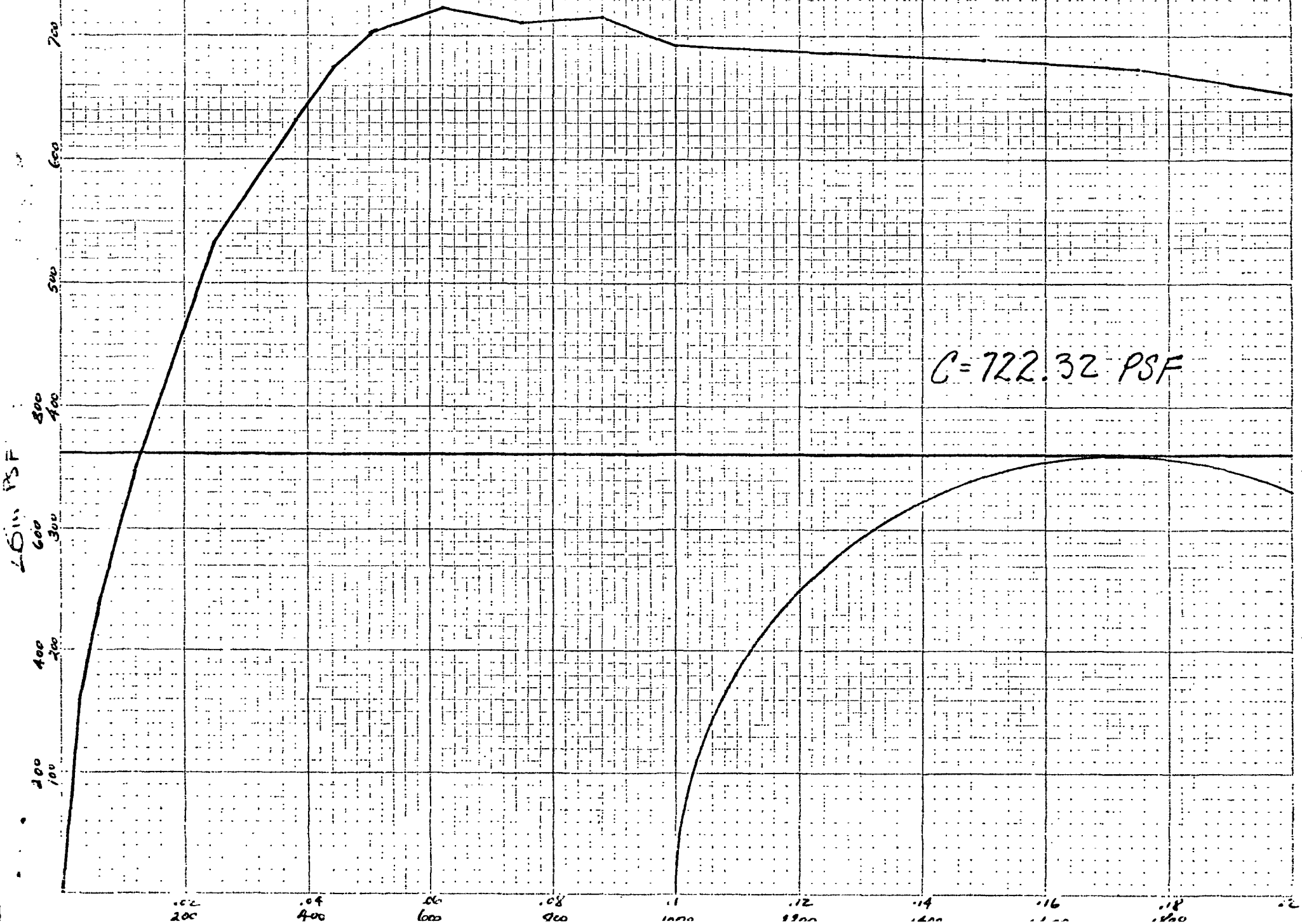
Failure

Back Press.
Saturation 98

ELASPED TIME (Hr.) (Min.)	LOAD DIAL READ (X 10 −4)	DEFORM. DIAL READ	Δ L (COL. 3 x 10 −3)	E. UNIT STRAIN (ΔL/L)	AREA C.F. (1 − E)	CORRECT. AREA A' (A° / 1 − E)	PORE PRESS.	DEV. LOAD (Col. 2 X LRC)	DEV. STRESS (Col. 9 ÷ Col. 7)	PRINC. STRESS (Col 10 + conf. press.)
1	2	3	4	5	6	7	8	9	10	11
0							6.88			
.5	10	13		.003	.997	2.93	6.77	3.25	159.73	
1	15	25		.006	.994	2.94	6.77	4.88	239.02	
1.75	22	50		.012	.988	2.96	6.85	7.15	347.84	
3.5	34	100		.025	.975	2.99	6.50	11.05	532.17	
5	41	150		.038	.962	3.04	6.19	13.32	630.95	
6	44	178		.044	.956	3.05	5.94	14.30	675.15	
6.75	46	200		.050	.950	3.07	5.70	14.95	701.24	
8.33	48	250		.062	.938	3.11	5.52	15.60	722.32	
10	48	300		.075	.925	3.16	5.45	15.60	710.89	
11.5	49	350		.088	.912	3.20	5.45	15.92	716.40	
13.25	48	400		.100	.900	3.24	5.50	15.60	693.33	
16.5	49	500		.125	.875	3.34	5.70	15.92	656.37	
19.25	50	600		.150	.850	3.44	5.40	16.25	680.23	
23	51	700		.175	.825	3.54	5.50	16.58	674.44	
26.25	51	800		.200	.800	3.65	5.54	16.58	654.12	

DOT FORM 351-018 REVISED 4/80

West Hoquiam Bypass L7262
Sample# 3104-1



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

TRIAX : P1

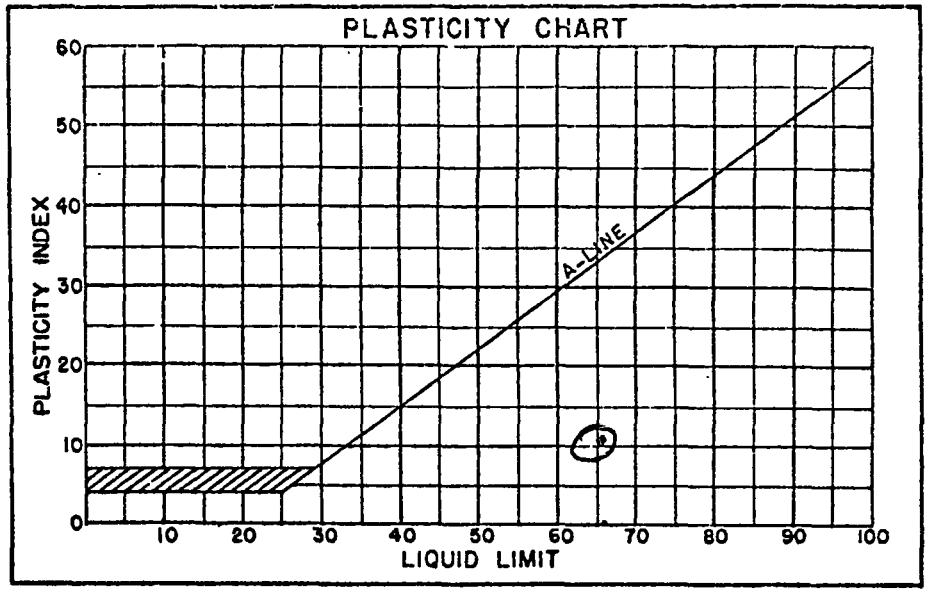
SAMPLE NO. 3104-1 JOB NO. HOQ HOLE NO.

DATE 10 MAY 83 OPERATOR RB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Wet Tan w/rust
F sdy c/y SILT w/pockets of rust-
colored limonitic root traces

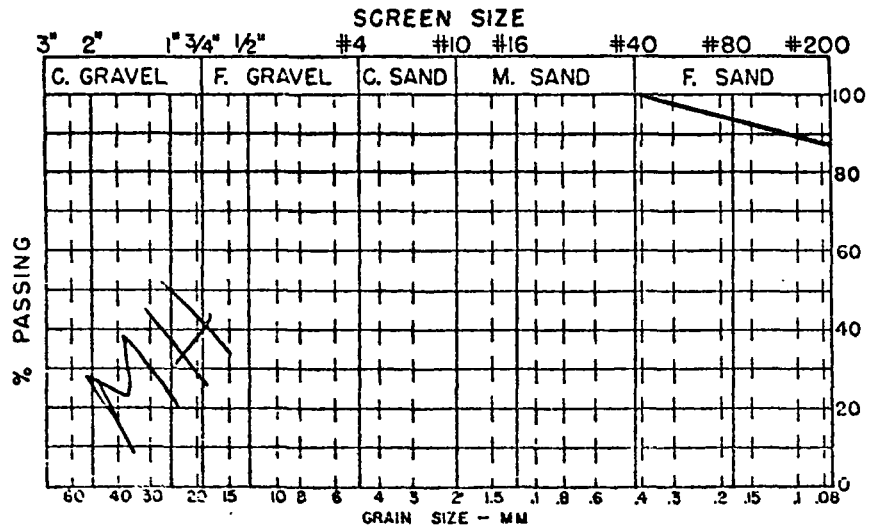


$H_2O = 69\%$

SIEVE ANALYSIS % Passing 87.3

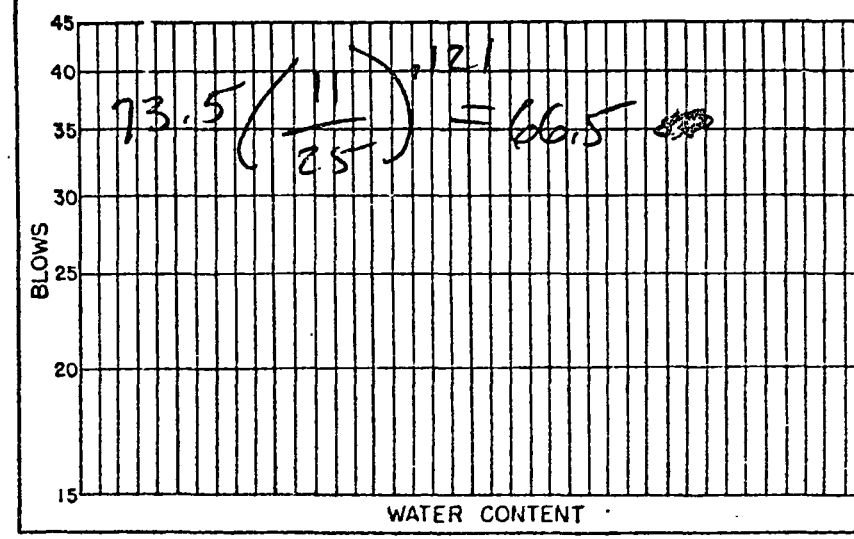
	-40 11.05	100
-3/4	-80	
-4	-140	
-10	-200 76.25	87

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	43				58
Wet Wt.	42.03				18.21
Dry Wt.	24.22				11.66
% H_2O	73.5				PL= 56.3
Blows	11				PI= 10.2



DOT FORM 351-019

TRIAXIAL COMPRESSION TEST (With Area Changes and Pore Pressures)

Project West Hoquiam Bypass Location 154+50 ℄
Job No. L7262 Sample No. 3108-1 Boring No. J-9 Depth 20'-4" to 20'-8"
Area (Ao) 2.92 Length 4" Confining Pressure 2000 PSF = 13.9 PSI
Rate of Loading 1%/Min L. R. C. .92 Tested by R. Brooks Date 11 MAY 83

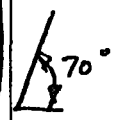
Description

GROSS WT.	TARE	NET WT.	CAN NO.	WET WT.	DRY WT.	WT. H^2O	% H^2O	WET DENS.	DRY DENS.
316	64	252	44	48.01	19.35		148	82.9	33.4

Data for Mohr's Envelope:
Max. Deviator Stress
Principal Stress
Effective Principal Stress

Failure

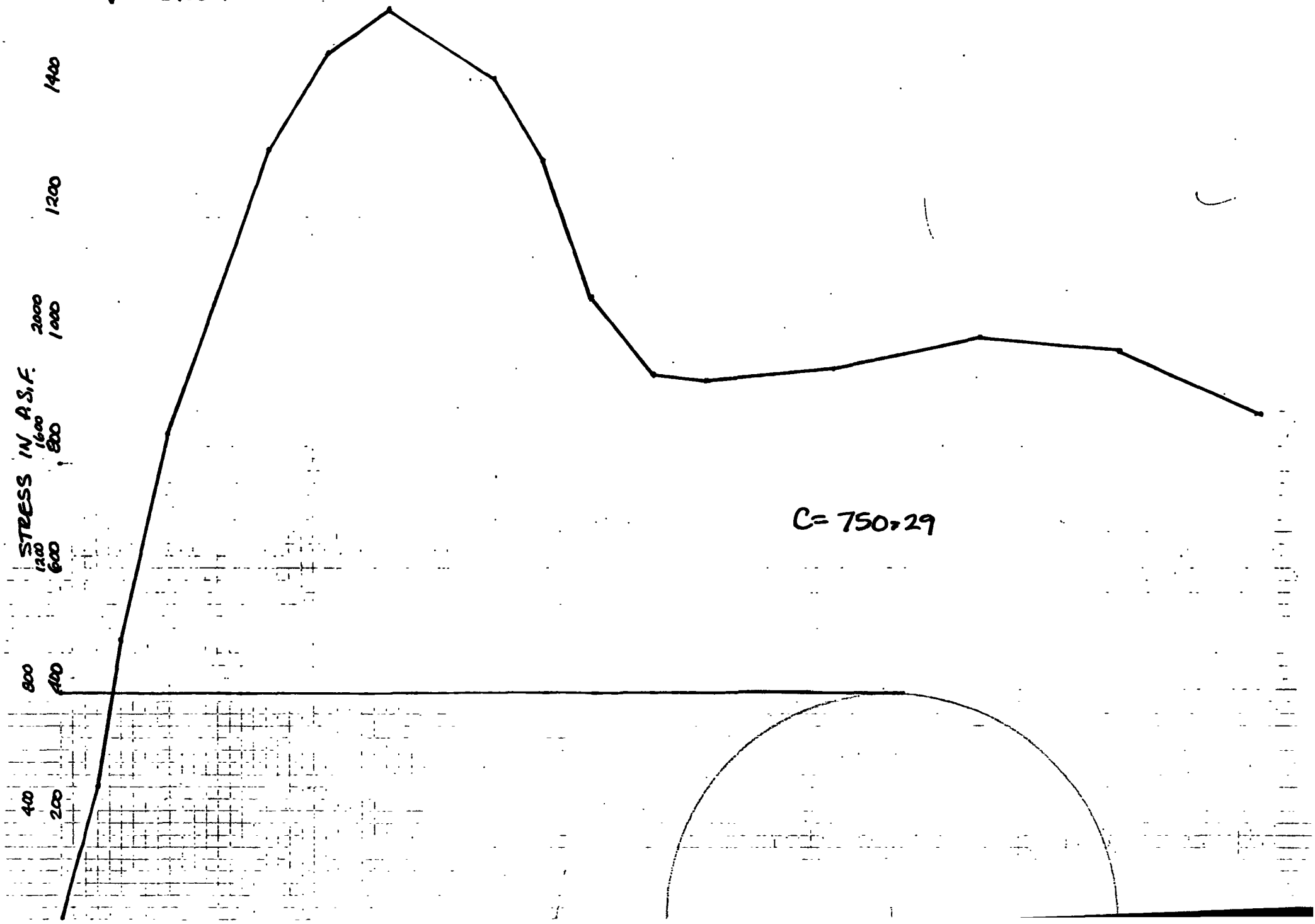
Back Press.
Saturation 99%



ELASPED TIME (Hr.) (Min.)	LOAD DIAL READ (X 10^{-4})	DEFORM. DIAL READ	Δ L (COL. 3 x 10^{-3})	E. UNIT STRAIN ($\Delta L/L$)	AREA C.F. (1 − E)	CORRECT. AREA A' ($\frac{A^o}{1-E}$)	PORE PRESS.	DEV. LOAD (Col. 2 X LRC)	DEV. STRESS (Col. 9 ÷ Col. 7)	PRINC. STRESS (Col 10 + conf. press.)
1	2	3	4	5	6	7	8	9	PSF 10	11
~~0~~							13.82			
.5	5	023		.006	.994	2.94	13.82	4.6	225.31	
1	10	040		.010	.980	2.95	13.82	9.2	449.08	
2	18	070		.018	.982	2.97	13.82	16.56	802.91	
2.75	23	100		.025	.975	2.99	13.82	21.16	1019.08	
3.45	29	140		.035	.965	3.02	13.82	26.68	1272.16	
4.75	33	180		.045	.955	3.06	13.82	30.36	1428.71	
5.75	35	220		.055	.945	3.09	13.82	32.20	1500.58	
7.5	33	290		.072	.928	3.15	13.53	30.36	1387.88	
8.25	30	322		.080	.920	3.17	13.73	27.6	1253.75	
9	25	351		.088	.912	3.20	13.62	23.0	1035.0	
10	22	392		.098	.902	3.24	12.96	20.24	899.56	
11	22	429		.107	.893	3.27	—	20.24	891.30	
13	23	511		.128	.872	3.35	9.36	21.16	909.56	
15.5	25	609		.152	.848	3.44	7.49	23.0	962.79	
17.8	25	700		.175	.825	3.54	7.35	23.0	935.59	
20	23	794		.198	.802	3.64	13.50	21.16	837.09	

DOT FORM 351-018 REVISED 4/80

No L-7262 WEST HOQUIAM BYPASS
Sample 3108-1



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

TRIAX

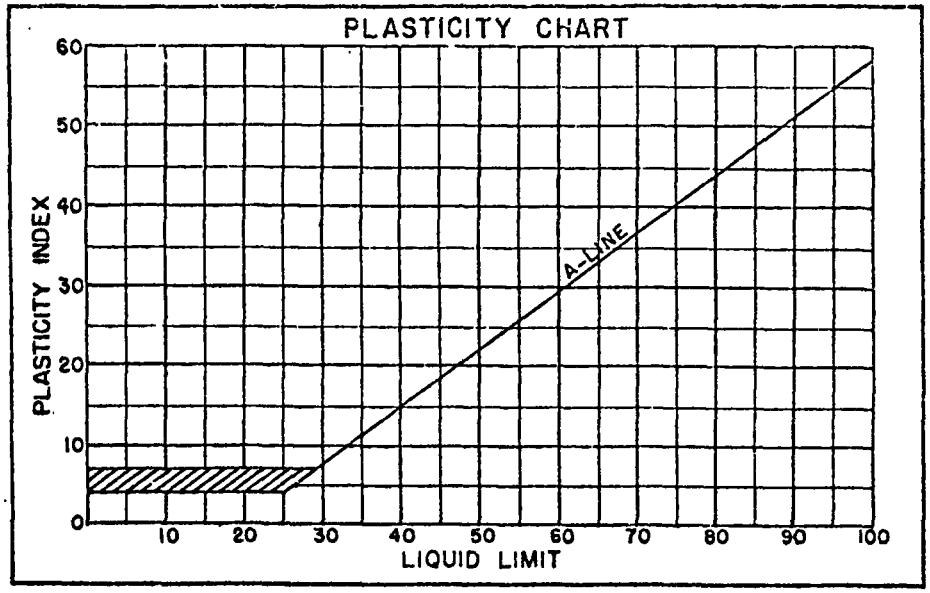
SAMPLE NO. 3108-1 JOB NO. Hoa HOLE NO.

DATE 19 MAY 83 OPERATOR RB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Wet Dark Brown Highly organic Fsdy SILT w/T Msand

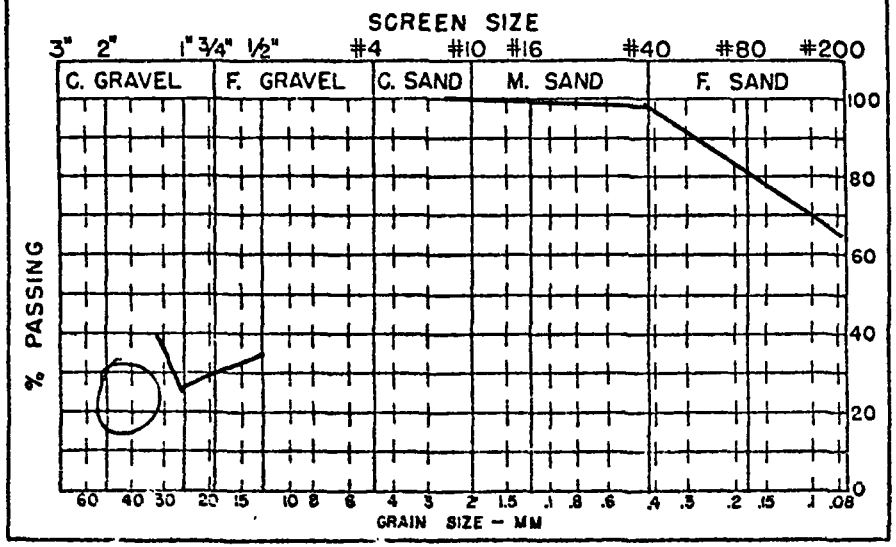


H_2O = 148%

SIEVE ANALYSIS % Passing 74.13

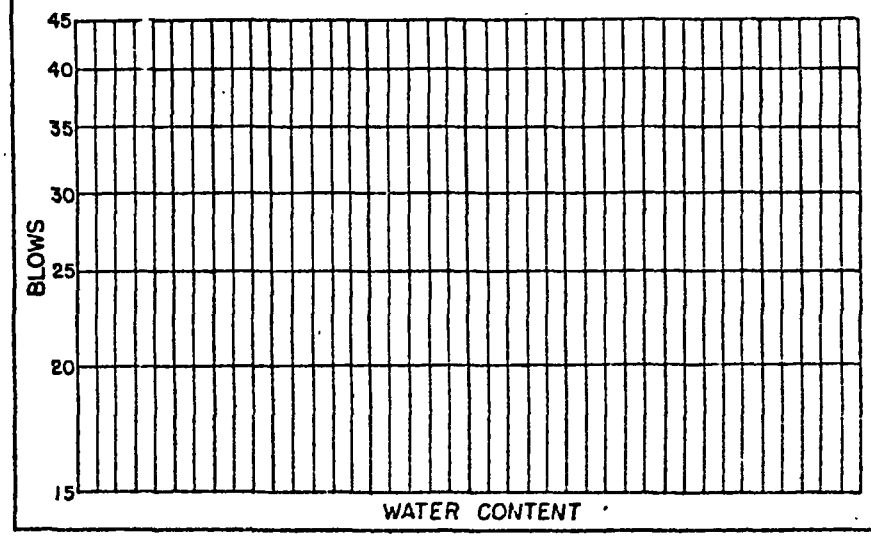
		-40 26.53	99
-3/4		-80	
-4		-140	
-10 .2	100	-200 47.9	64

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

IATERIALS ENGINEER
laterials Laboratory
O. Box 167, Olympia, WA 98504 (Mailing Address)
55 So. 2nd Ave.
umwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 7-15-82

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam by Pass SR No. 101 A Sub-Section Game crossing

Station & Offset G-2+30 ℄ Hole # J-10

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
E-3115-1	U-1	0' 0" – 0' 4"	A		
-2		0' 4" – 0' 8"	B		
-3		0' 8" – 1' 0"	C		
3116-1	D-2	2' 0" – 4' 0"	H2O=192%	OL	Wet, Gr. & Brn. Sl. Cly, Hly. ORG. SILT w/ grasses
-2	D-4	6' 0" – 8' 0"	"	ML	Like 3116-1 Above
3117-1	U 5	9' 6" – 9' 10"	A	PT	Wet, brown silty PEAT
-2		9' 10" – 10' 2"	B		DISTURBED BY DROPPING BB 3/4/83
-3		10' 2" – 10' 6"	C	ML	Gray, moist, clayey, organic silt w/ twigs and wood chips
3118-1	D-6	11' 6" – 13' 6"		OH	SAT., TAN SMALL Pieces of Silt & Lg. Pieces of wood & twigs; organic odor

copy with samples
copy to addressee

Yours very truly,

Barry T. Meeve
Inspector.

DOT FORM 351-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

IATERIALS ENGINEER
laterials Laboratory
. O. Box 167, Olympia, WA 98504 (Mailing Address)
55 So. 2nd Ave.
umwater, Washington 98504 (Shipping Address)

Place Tumwater

Date 7-15-82

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam by pass SR No. 101 A Sub-Section Game crossing

Station & Offset G-2+30 ℄ Hole # J-10

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3118 -2	D-8	16' 6" 18' 6"	H_2O=93%	CH	moist, GR. olive, grn. F. Sdy. Sty. FAT CLAY w/ twigs & STICKS
3119 -1	U-9	19' 10" 20' 2"	B		
-2		20' 2" 20' 6"	C		
3120	D-10	21' 6" 23' 6"	H_2O=122%	CH	Moist, dk Brn., Similar to 3118-2 Sty., Grassy Sl. PEATY. CLAY.
3121 -1	U-11	24' 6" 24' 10"	A		
-2		24' 10" 25' 2"	B		
-3		25' 2" 25' 6"	C		
3122	D-12	26' 6" 28' 6"	H_2O=122%	CH	LIKE 3120 Above.
3123 -1	U-13	30' 2" 30' 6"	C		

opy with samples
opy to addressee

Yours very truly,

Inspector.

FORM 351-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

ATERIALS ENGINEER
laterials Laboratory
O. Box 167, Olympia, WA 98504 (Mailing Address)
55 So. 2nd Ave. WA 98504 (Mailing Address)
mwater, Washington 98504 (Shipping Address)
98504 (Shipping Address)

Place Tumwater

Date 7-15-82

Date

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam by pass
SR No. 101 A Sub-Section Game Crossing

Station & Offset G-2+30 ℄ Hole # J-10

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3123 -2	U-13	30' 6" 30' 10"	D		
-3		30' 10" 31' 2"	E		
3124	D-14	31' 6" 33' 6"		CH	LIKE 3120 Moist, dk. brn. CLAY, w/org. stg. grassy PEAT, mtr. w/ form of Gas or oil
3125 -1	U-15	34' 10" 35' 2"	B		
-2		35' 2" 35' 6"	C		
-3		35' 6" 35' 10"	D		
3126	D-16	36' 6" 38' 6"		CH	LIKE 3120 & 3116-1
3127 -1	U-17	39' 10" 40' 2"	B		
-2		40' 2" 40' 6"	C		

opy with samples
opy to addressee

Yours very truly,

Inspector.

FORM 351-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

'ATERIALS ENGINEER
'aterials Laboratory
O. Box 167, Olympia, WA 98504 (Mailing Address)
,55 So. 2nd Ave.
ımwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 7-15-82

Dear Sir:

I have forwarded by today's state car the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam by Pass SR No. 101 A Sub-Section Game Crossing

Station & Offset G-2+30 ℄ Hole # J-10

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3127 -3	U-17	40' 6" 40' 10"	D		
3128	D-18	41' 6" 43' 6"	H_2O=192%	ML	LIKE 3116-1 Wet, GR. & BRN., SL. CLY., HY. ORG. SILT w/ Grasses
3129 -1	U-19	44' 6" 44' 10"	A		
-2		44' 10" 45' 2"	B		
-3		45' 2" 45' 6"	C		
3130	D-20	46' 6" 48' 6"	H_2O=39%	GM	LIKE 3113-1 Wet, GR., TAN & orange, V. Sty. F-C Sdy. 1" F) & GRAVEL w/ org. grasses.
3131 -1	U-21	49' 10" 50' 2"	B		
-2		50' 2" 50' 6"	C		
3132	D-22	51' 6" 51' 6"	H_2O=51%	ML	Moist, Tan-Brn. F. Sdy. SILT w/ trace F. & Gravel

'opy with samples
'opy to addressee

Yours very truly,

Kathy M. Moore
Inspector.

FORM 211-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

ATERIALS ENGINEER
aterials Laboratory
O. Box 167, Olympia, WA 98504 (Mailing Address)
55 So. 2nd Ave.
mwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 7-15-82

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam bypass
SR No. 101A Sub-Section Grade crossing

Station & Offset G-2+30 ℄ Hole # J-10

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3133 -1	U-23	54' 6" 54' 10"	A		
-2		54' 10" 55' 2"	B		
-3		55' 2" 55' 6"	C		
3134 -1	D-24	56' 6" 58' 0"	H_2O=20%	ML	Dry, tan & Gr. F. Sdy. SILT
				W	Trace Org. & Mica
-2	D-25	59' 6" 61' 0"		ML	Like 3134-1
-3	D-26	64' 6" 65' 11"		ML	SAME
-4	D-27	69' 6" 70' 0"		ML	SAME

opy with samples
opy to addressee

Yours very truly,

Kenny T. T. Moore
Inspector.

OT FORM 351-002
REVISED 2-80

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3116-1 JOB NO. 400. HOLE NO.
DATE 9-29-30 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS			✓

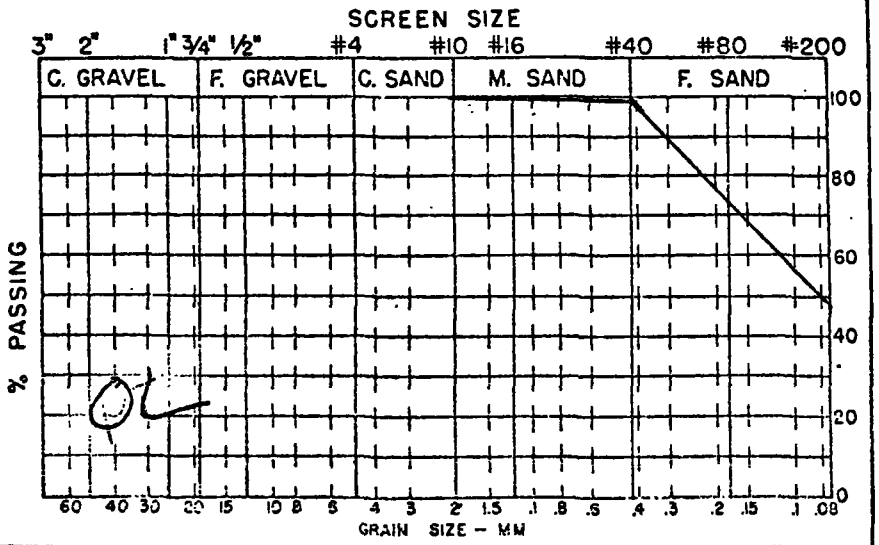
DESCRIPTION: Wet, GR & Brn., Sl. Cly. Hly Org. SILT w/ grasses.

H_2O = 192 %

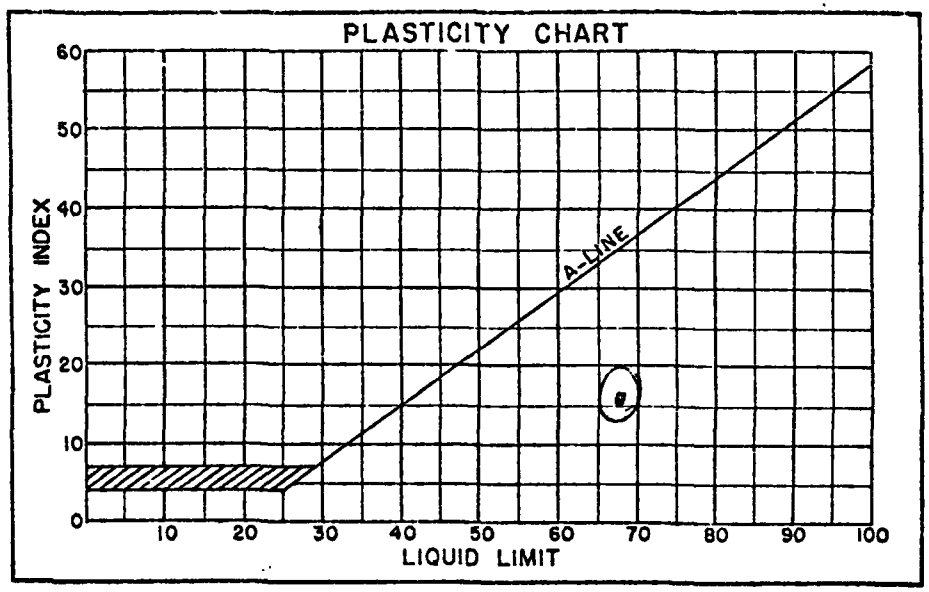
SIEVE ANALYSIS % Passing 55.52

			-40	29.18	99.9
-3/4			-80		
-4			-140		
-10	.86	100 %	-200	26.30	47 %

GRAIN SIZE CURVE

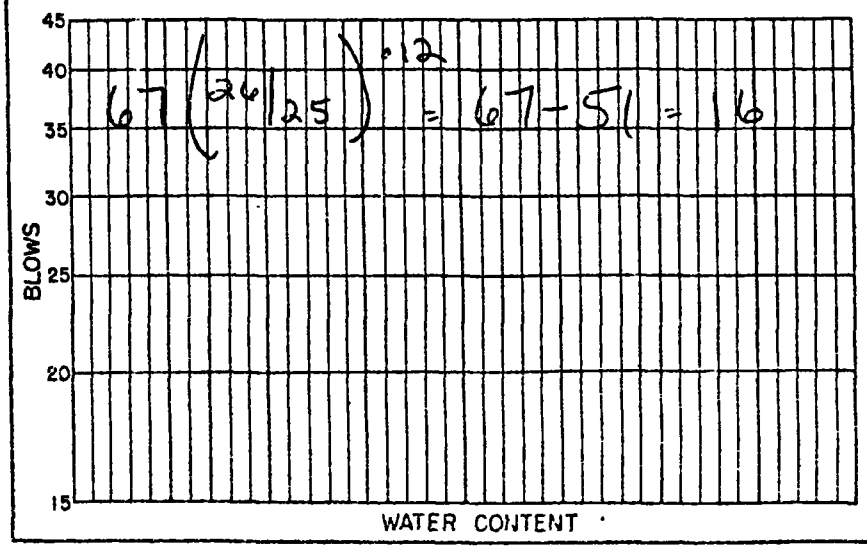


PLASTICITY CHART



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	118				43
Wet Wt.	12.62				7.70
Dry Wt.	7.20				5.10
% H_2O	67 %				PL= 51 %
Blows	26				PI= 16



DOT FORM 351-019

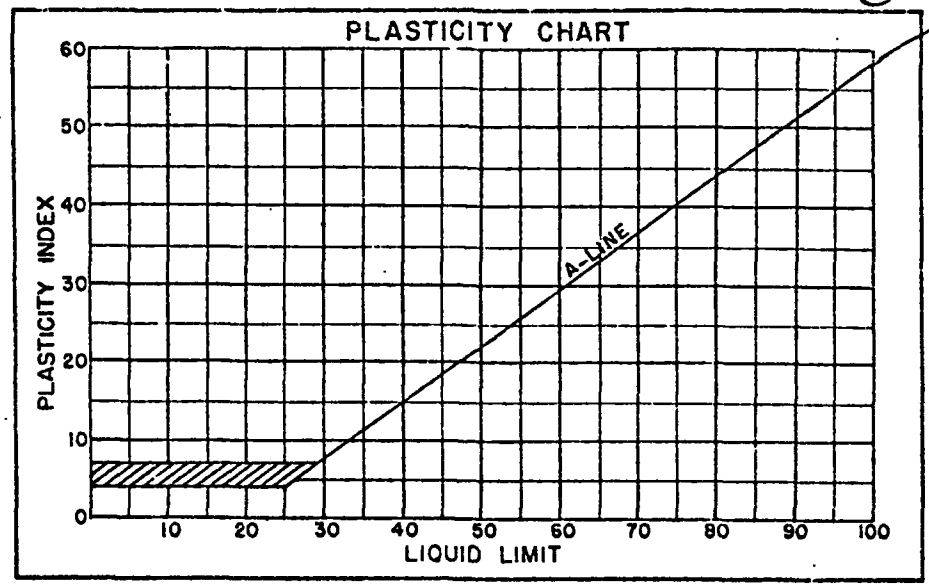
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3118-2 JOB NO. Abg HOLE NO. J-10
DATE 2-28-83 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: Moist, gr. olive, grn. F. Sdy. Sty. FAT CLAY w/ + twigs & sticks.

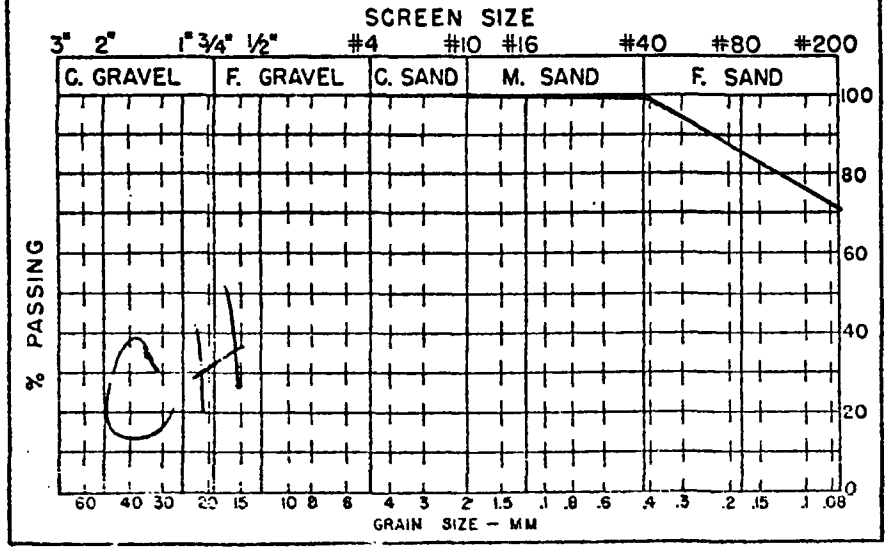


H_2O = 93%

SIEVE ANALYSIS % Passing 33.52

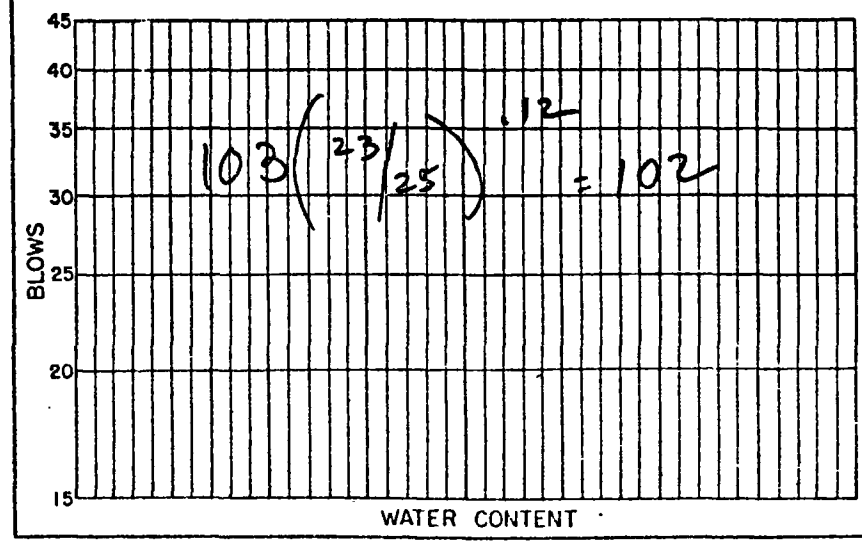
			-40	9.45	99
-3/4			-80		
-4	.02	100%	-140		
-10	.25	99%	-200	23.80	71%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	57				62
Wet Wt.	9.98				3.62
Dry Wt.	4.92				2.84
% H_2O	103%				PL= 27%
Blows	23				PI= 75



DOT FORM 351-019

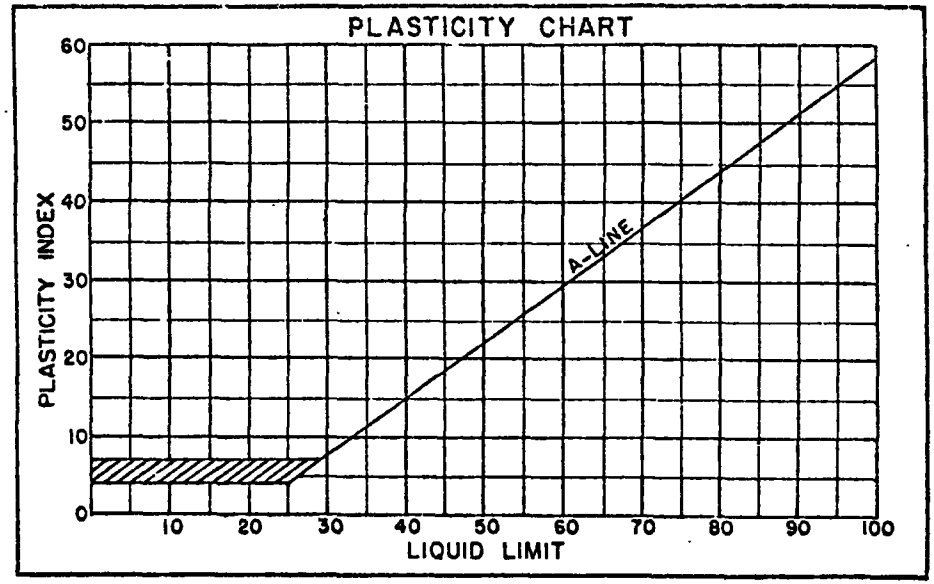
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3120 JOB NO. ~~H8~~ HOLE NO. J-10
DATE 9-28-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS			✓

DESCRIPTION: Moist, dk. Brn, ~~Sl. Cly~~ Org., Sty., Grassy PEATY CLAY
Similar to 3118-2

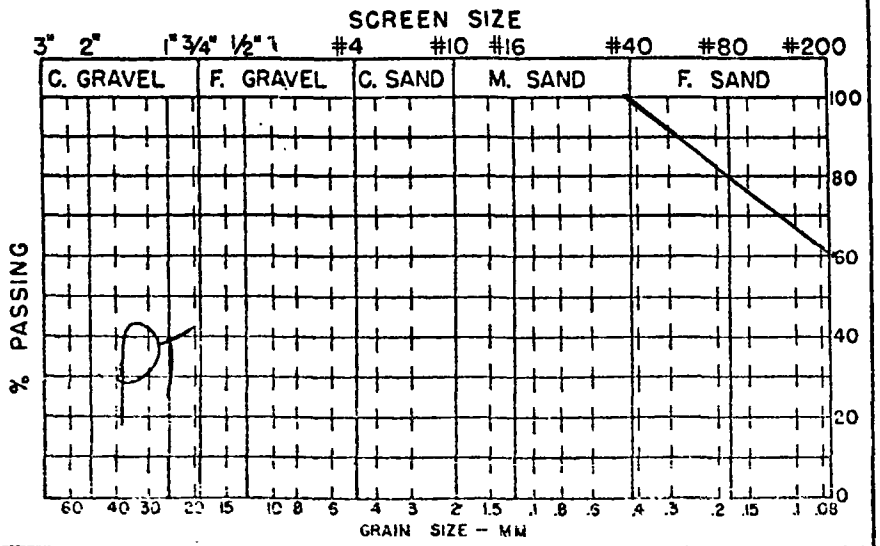


#20 = 122%

SIEVE ANALYSIS % Passing 48.60

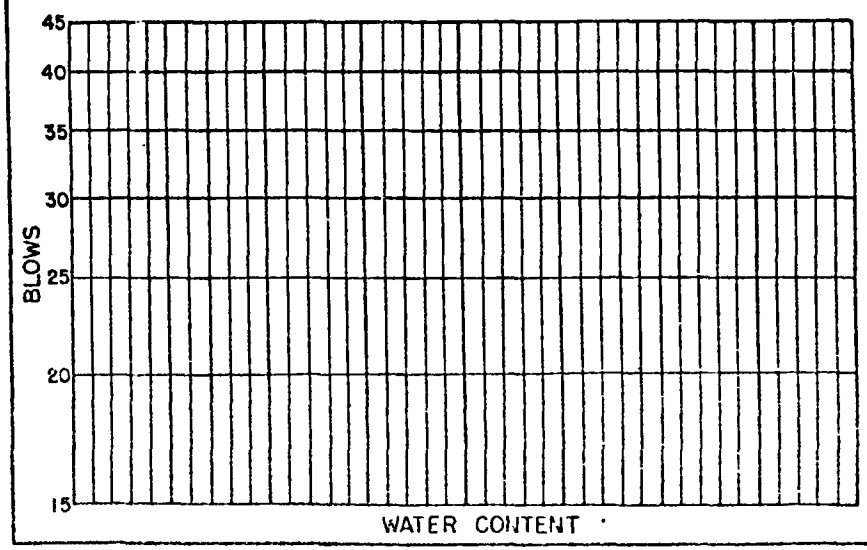
	-40	19.03	100%
-3/4	-80		
-4	-140		
-10	-200	29.57	61%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

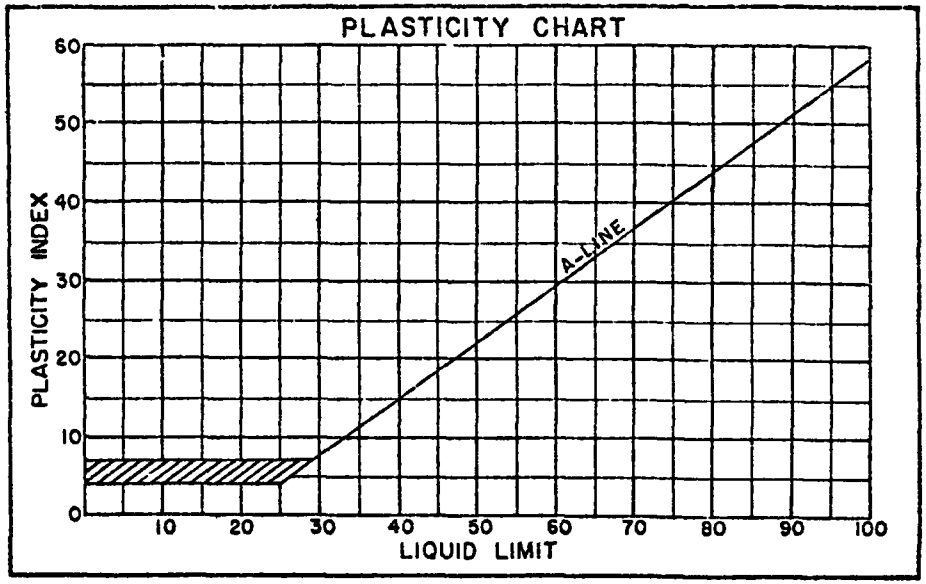
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3134-1 JOB NO. 408. HOLE NO. J-10
DATE 9-28-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

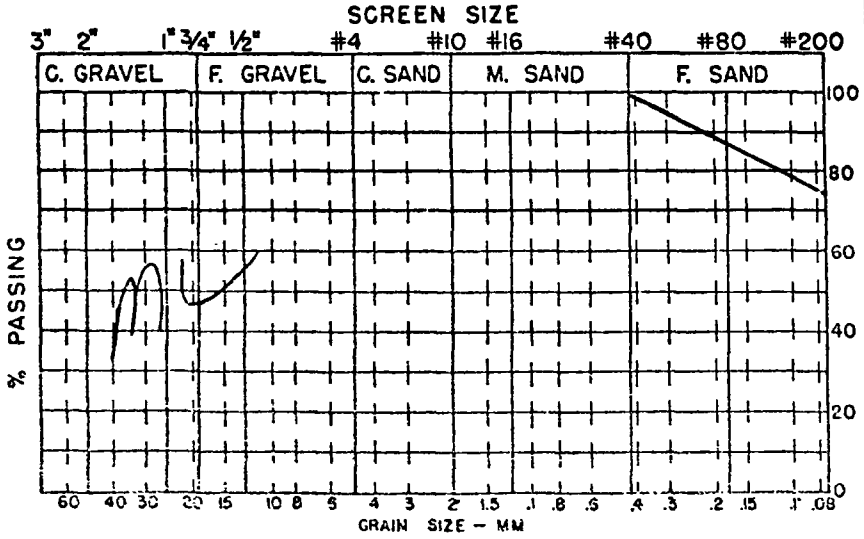
DESCRIPTION: Dry, tan & Gr. F. Sdy. Silt w/ Trace Org. & Mica.



$H_2O = 20\%$

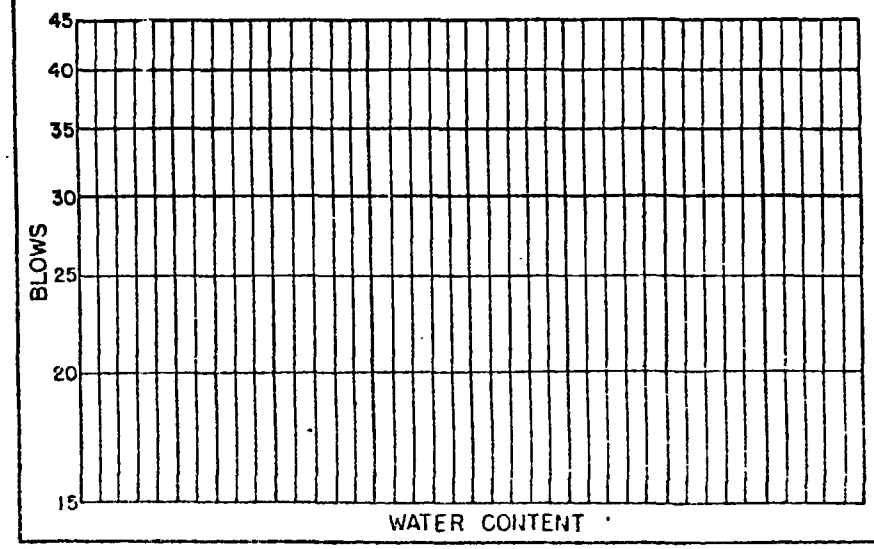
SIEVE ANALYSIS		% Passing 50.00
	-40	12.30 100%
-3/4	-80	
-4	-140	
-10	-200	37.70 75%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

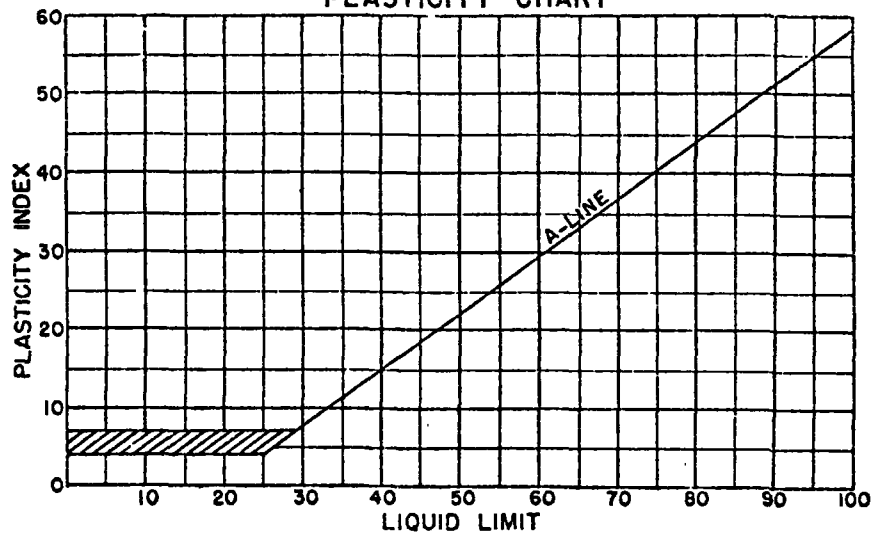
SAMPLE NO. 3132 JOB NO. 4b7 HOLE NO. J 10
DATE 9-28-82 OPERATOR CBB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Moist, tan-Brn. F. Sdy. Silt w/ T. F. & Gravel

PLASTICITY CHART

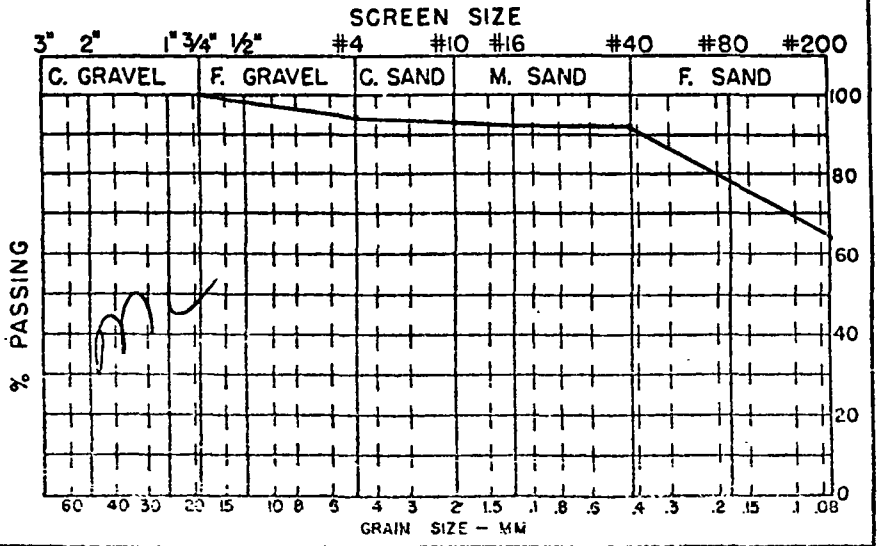


H_2O = 57 %

SIEVE ANALYSIS % Passing 114.60

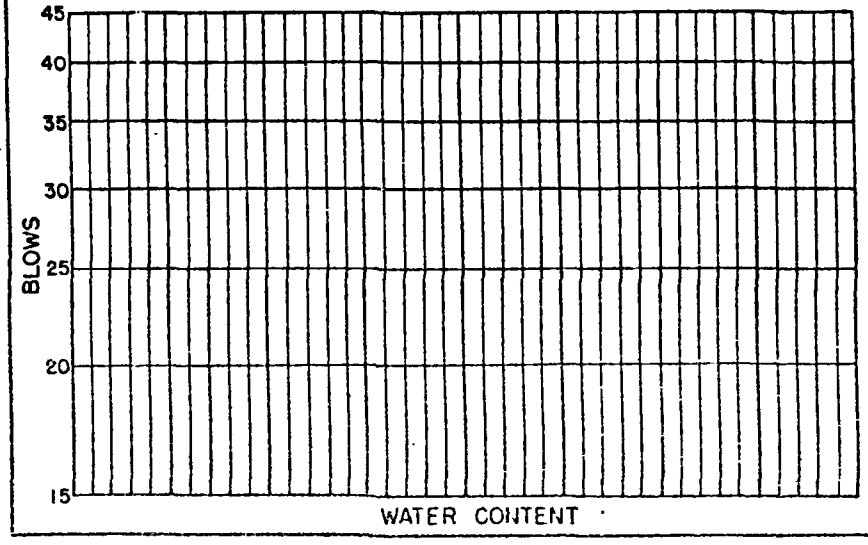
			-40	32.30	92%
-3/4	6.51	100%	-80		
-4	1.30	94	-140		
-10	.95	93%	-200	73.54	64%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



TRIAXIAL COMPRESSION TEST (With Area Changes and Pore Pressures)

Project HOQUIAM BYPASS Location G 2+30 ℄
Job No. L7262 Sample No. 3117-1 Boring No. J-10 Depth 9'-6" to 9'-10"
Area (Ao) 2.97 Length 4" Confining Pressure 600 PSF = 4.2 PSI
Rate of Loading .085%/Min L. R. C. .325 UW Tested by R Brooks Date 22 MAR 83

Description

GROSS WT.	TARE	NET WT.	CAN NO.	WET WT.	DRY WT.	WT. H^2O	% H^2O	WET DENS.	DRY DENS.
358	147	211	116	54.04	16.77	37.27	222	69.42	21.6

Data for Mohr's Envelope:
Max. Deviator Stress
Principal Stress
Effective Principal Stress

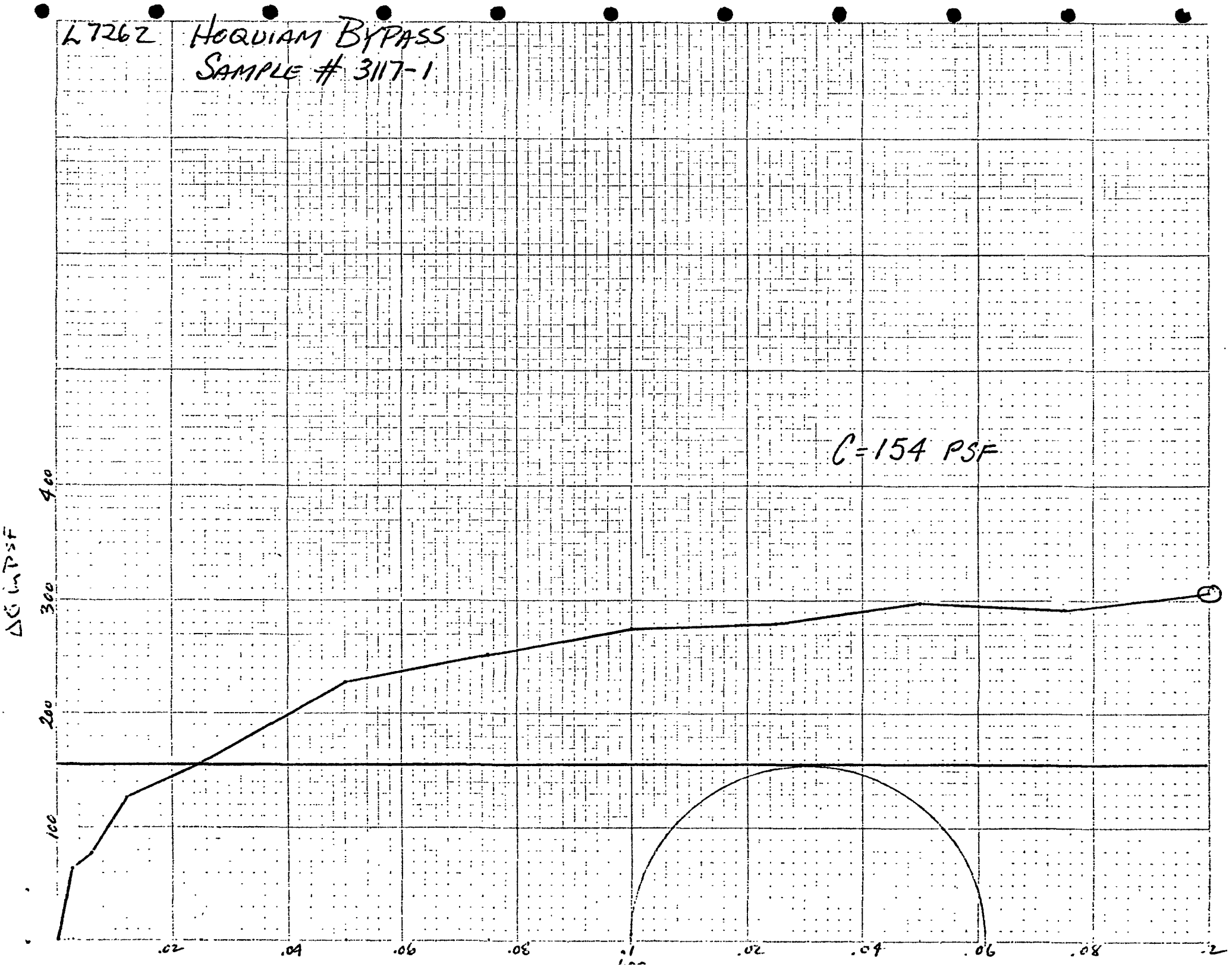
Failure

Back Press.
Saturation 94

ELASPED TIME (Hr.) (Min.)	LOAD DIAL READ (X 10^{-4})	DEFORM. DIAL READ	ΔL (COL. 3 x 10^{-3})	E. UNIT STRAIN (ΔL/L)	AREA C.F. (1 − E)	CORRECT. AREA A' ($\frac{A^o}{1-E}$)	PORE PRESS.	DEV. LOAD (Col. 2 X LRC)	DEV. STRESS (Col. 9 ÷ Col. 7)	PRINC. STRESS (Col 10 + conf. press.)
1	2	3	4	5	6	7	8	9	PSF 10	11
							3.03			
30 sec	4	012		.003	997	2.93	3.03	1.3	63.89	
1	5	026		.006	994	2.94	3.03	1.62	79.3	
2	8	050		.012	988	2.96	3.32	2.6	126.5	
3.5	10	100		.025	975	2.99	3.32	3.25	156.5	
6.75	15	200		.05	950	3.07	3.50	4.88	228.9	
10	17	300		.075	925	3.16	3.90	5.52	251.5	
13.25	19	400		.1	900	3.24	3.69	6.18	274.7	
16.5	20	500		.125	875	3.34	3.75	6.5	280.2	
19.75	22	600		.15	850	3.44	4.01	7.15	299.3	
23	22	700		.175	825	3.54	3.80	7.15	290.8	
26.5	24	800		.2	800	3.65	3.80	7.8	307.7	
29.5	25	900		.225	775	3.77	4.06	8.12	310.2	

DOT FORM 351-018 REVISED 4/80

L7262 HOQUIAM BYPASS
SAMPLE # 3117-1



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

TRIAX

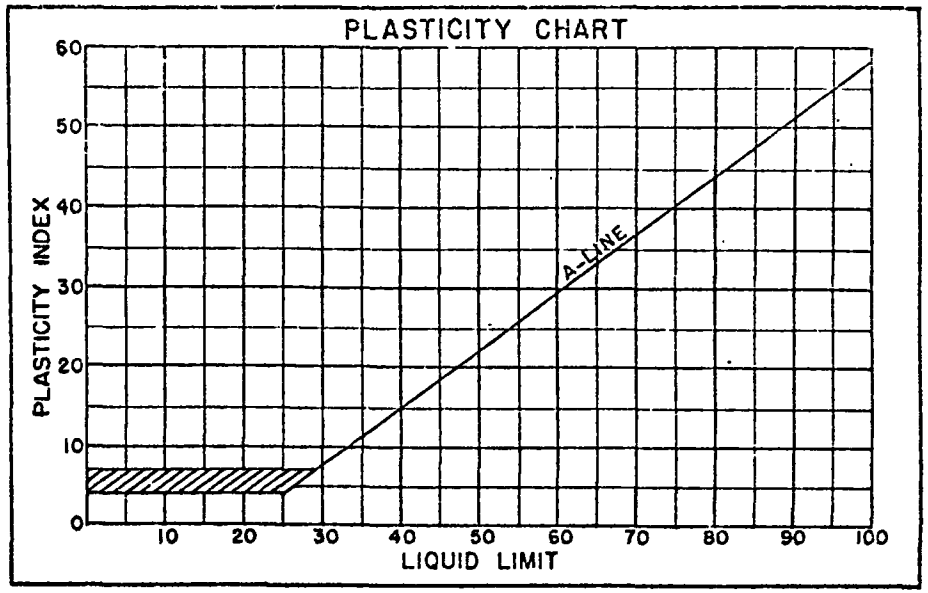
SAMPLE NO. 3117-1 JOB NO. HOQ HOLE NO.

DATE 30 MAR 83 OPERATOR RB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

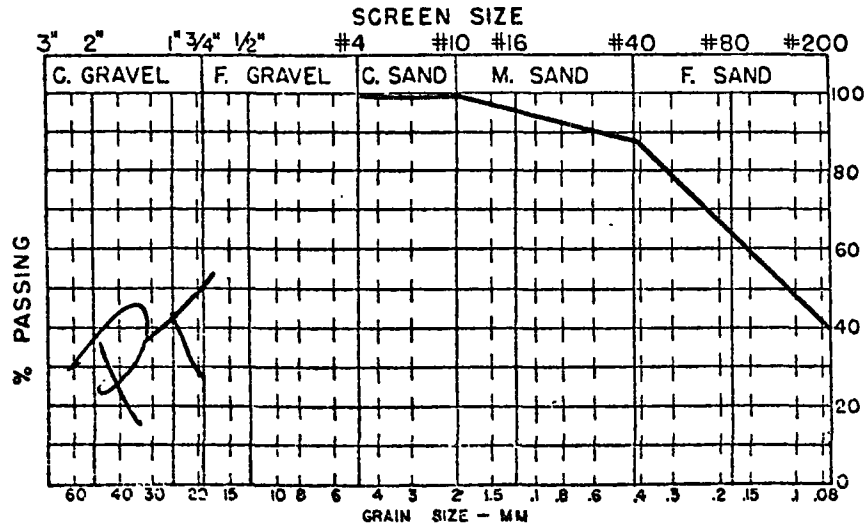
DESCRIPTION: Wet Brn silty PEAT



H_2O=222

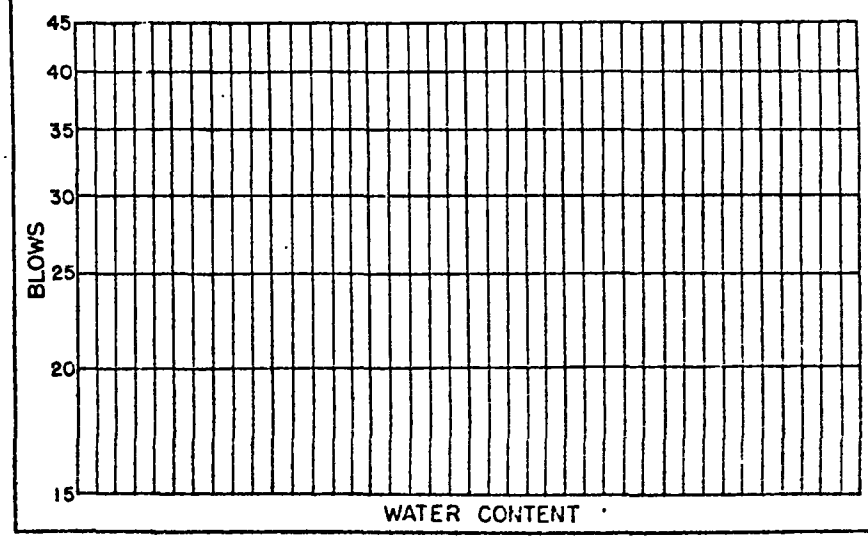
SIEVE ANALYSIS		% Passing 54.13		
		-40	25.85	88
-3/4		-80		
-4 .09	100	-140		
-10 6.58	99	-200	21.61	40

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



NOTE: Filled VOID w/SAND

DOT FORM 351-016 REVISED 5/81

CONSOLIDATION TEST DATA

Date 3-4-83 Sample No. 3117-3

Job No. L-7262 Section Hoquiam ByPass

Depth 10'2"-10'6" Station G-2+30 Hole No. J-10

Material Morst, Gr., Cly., org. SILT w/ twigs & wood chips

GROSS WEIGHT	TARE	NET WEIGHT	CAN NUMBER	WET WEIGHT	DRY WEIGHT	WEIGHT H^2O	PERCENT H^2O	WET DENSITY	DRY DENSITY
409	141	268	41	43.70	23.81	19.89	84%	88	47.8
		CONSOL		35.48	21.15	14.33	68%		

Forgot "0" Dial make correction

Sample Height = 4"

hs = Wt. Dry Soil / K

eo = hvo/hs

hvo = 0.6250 – hs

K = 47.24 X sp. G

Hvf=hvo – Defl.

ef = hvf/hs

TIME	500 lbs/sq ft DIAL	%	1000 lbs/sq ft DIAL	%	2000 lbs/sq ft DIAL	%	4000 lbs/sq ft DIAL	%	8000 lbs/sq ft DIAL	%
0										
1/4	125	21	55	17	68	15	63	14	70	14
1/2	248	43	65	20	87	19	89	19	89	18
1	278	48	81	25	112	24	157	34	119	24
2 1/4	327	56	108	33	152	33	195	42	161	33
4	363	62	134	41	181	39	252	54	200	41
9	414	71	169	52	236	51	297	64	258	52
16	448	77	194	60	271	59	326	70	291	59
25	479	82	209	64	300	65	345	74	327	66
36	496	85	226	69	319	69	359	77	347	71
49	501	86	235	72	335	73	376	81	364	74
64	513	88	246	75	347	75	410	88	378	77
2 hrs	532	91	265	81	377	82	410	88	402	82
3	540	93	275	84	395	85	419	90	417	85
4	546	94	283	87	408	88	427	92	425	86
5	551	95	290	89	417	90			431	88
6	556	95	295	90	423	92	431	92	436	89
24	583	100	326	100	462	100	466		492	100
72										
hvo=	.4530		.3947		.3621		.3159		.2693	
hvf=	.3947		.3621		.3159		.2693		.2201	
ef=	2.2948		2.1052		1.8366		1.5657		1.2797	

Sp. Gr.	2.6030
K	122.9657
	0.6250
hs	.1720
hvo	.4530
eo	2.6337

Total Defl. 0.2329

Operator Ben Machine No. 2

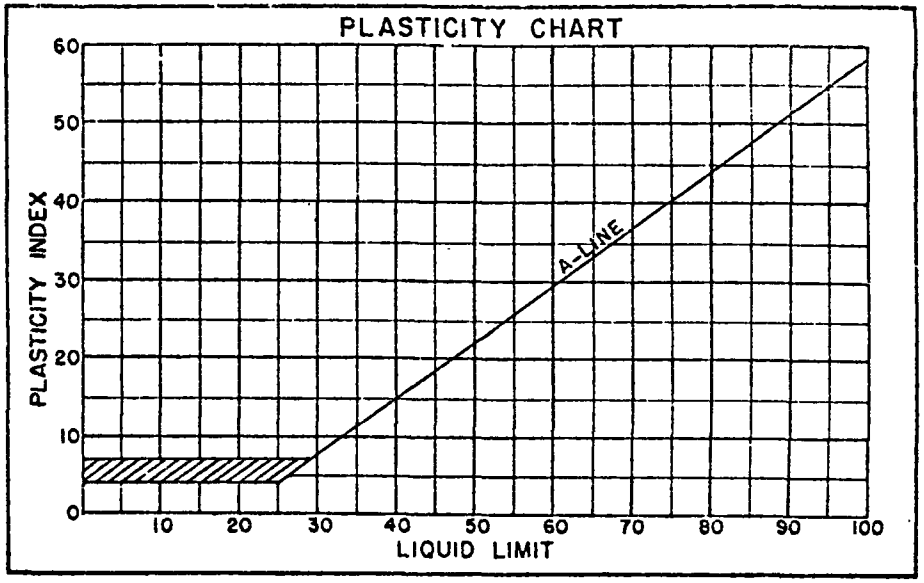
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3117-3 JOB NO. Hog. HOLE NO. J-10
DATE 3-10-83 OPERATOR GB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	✓
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Moist, Gr., Cly., org. SILT w/ twigs & wood chips

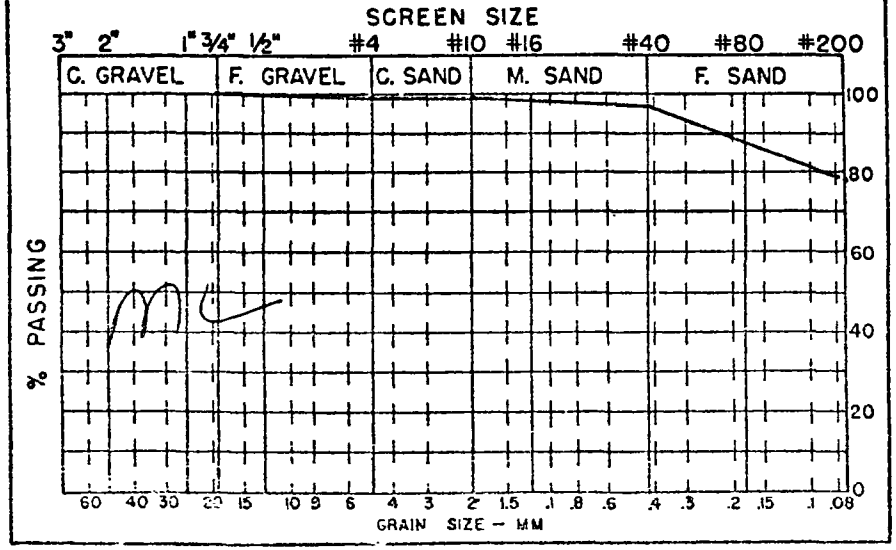


H_2O = 84%

SIEVE ANALYSIS % Passing 45.95

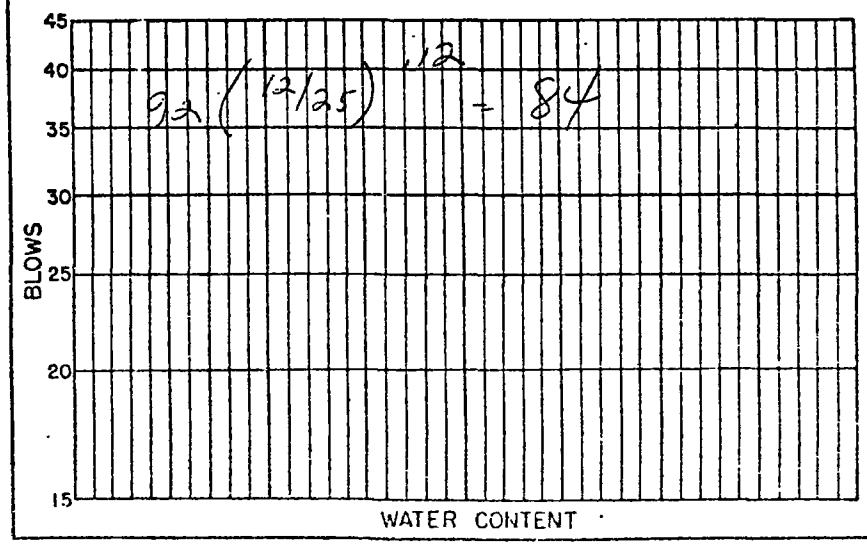
			-40	9.05	97%
-3/4	1.10	100%	-80		
-4	.03	97.6	-140		
-10	.06	98%	-200	35.71	78%

GRAIN SIZE CURVE

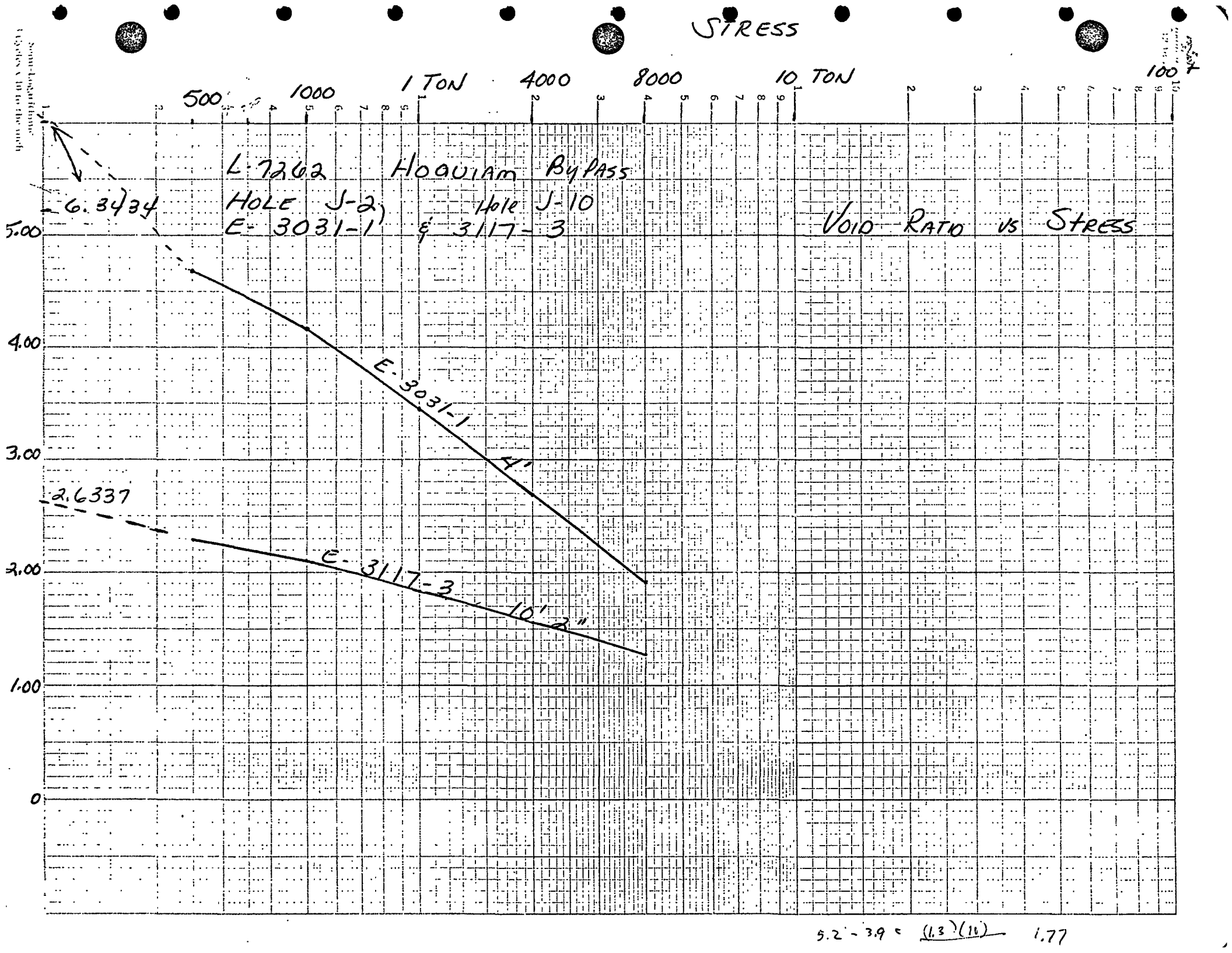


LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	112				43
Wet Wt.	10.40				4.22
Dry Wt.	5.42				3.00
% H_2O	92%				PL= 41%
Blows	12				PI= 43



DOT FORM 351-019



5.2 - 3.9 = (1.3)(11) 1.77

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

ATERIALS ENGINEER
aterials Laboratory
O. Box 167, Olympia, WA 98504 (Mailing Address)
55 So. 2nd Ave.
mwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 7-23-82

Dear Sir:

I have forwarded by today's State Car the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam Bypass
SR No. 101A Sub-Section Game Crossing

Station & Offset G-1+64 ℄ Hole # J-11

Lab No	Drive #	Depth	Tube Position in Sampler	Clas.	Description
E-3138 -1	D-2	2' 0" 4' 0"	H_{2O} = 276%	PT	SAT, dk. brn./blk. Sl. Sty. Woody Fibrous PEAT w/ twigs
-2	D-4	7' 0" 9' 0"		PT	Like 3138-1
3139 -1	U-6	11' 10" 12' 2"	B	OH	Wet, green/gray, org. Silt w/org. material.
-2		12' 2" 12' 6"	C		
3140	S-7	14' 6" 14' 11"			
3141	D-8	16' 6" 18' 6"	H_{2O}=174%	OH	Some of same qualities as in 3118-2 – CLAY (CH) SAT., dk. brn., gushy, PTY., F. sdy., Cly. SILT w/ small FIBERS, sticks & wood
3142	S-9	19' 6" 20' 7"			
3143	D-10	21' 6" 23' 6"	H_{2O}=174%	OH	Like 3141 [illegible]
3144	S-11	24' 6" 25' 6"			

opy with samples
opy to addressee

Yours very truly,
Milford Sanders
Inspector.

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tum.
Date 7-23-82

Dear Sir:

I have forwarded by today's ..... the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam
SR No. ..... Sub-Section Game Cross

Station & Offset G-1 +64 ℄ Hole # J-11

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3145	D-12	26'6" 28'6	93% Hro=~~122%~~	ML	moist, Brn. F. Sdy., Cly. SILT w/wood & fibrous mtr.
3146	S-13	29'6" 30'8"			
3147	D-14	31'6" 33'6"	130% Hro ~~122%~~	OH	Moist, dk. Brn., F. Sdy. organic SILT w/ t. mica.
3148	S-15	34.6" 35'9"			
3149	D-16	36'6" 38'6"	39%	GM	Like 3130 Wet, Gr. tan & orange V. Sty. F-C Sdy. 1"(-) & Gravel w/org grasses
3150	S-17	39'6" 40'11"			
3151	D-18	41'6" 43'6"	39%	GM	Like 3113-1 Wet, Gr., V. Sty. F-C Sdy. F. Ang. Gravel
3152-1	U-19	44'10" 45'2"	B		
3152-2		45'2" 45'6"	C		

1 copy with samples
1 copy to addressee

Yours very truly,
Milford Sanders.
Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

ATERIALS ENGINEER
aterials Laboratory
O. Box 167, Olympia, WA 98504 (Mailing Address)
55 So. 2nd Ave.
mwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 7-23-82

Dear Sir:

I have forwarded by today's State Car the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam bypass SR No. 101A Sub-Section Game Crossing

Station & Offset 6-1+64 ℄ Hole # J-11

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3152 -3	U-19	45' 6" 45' 10"	D		
3153 -1	D-20	46' 6" 48' 6"	20%	ML	Like 3134-1 Dry, tan & Gr. F. Sdy. SILT w/ trace org. & mica
-2	D-21	49' 6" 51' 0"	23%	CH MH	DRY, GR. & Brn w/rust streaks Clay & Layered F. Sdy. SILT w/ Trace mica
-3	D-22	54' 6" 56' 0"	23%	CH MH	Like 3153-2 No Layering
-4	D-23	59' 6" 61' 0"		CH MH	SAME 3153-2
-5	D-24	64' 6" 66' 0"		CH MH	SAME
-6	D-25	68' 6" 69' 0"		CH MH	SAME

opy with samples
opy to addressee

Yours very truly,
Milford Sanders
Inspector.

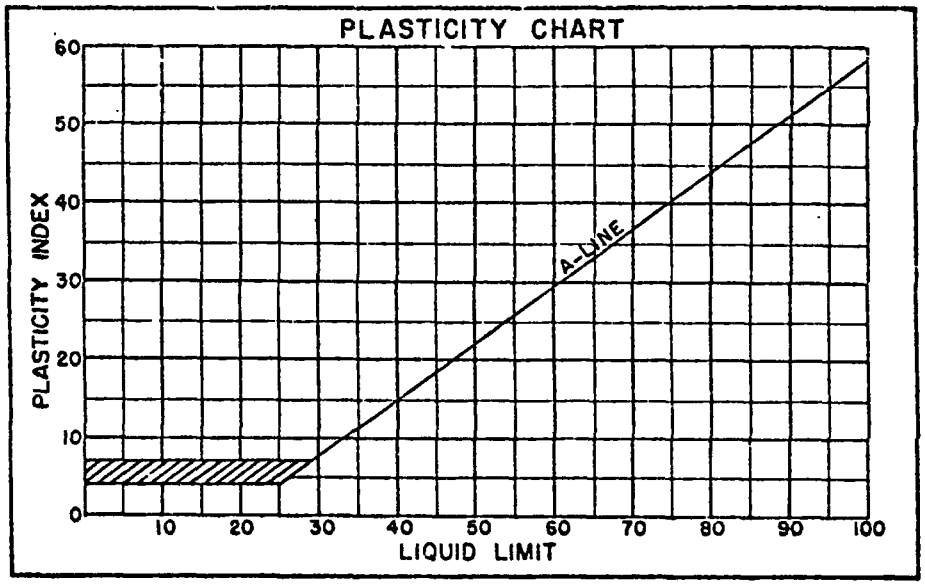
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3141 JOB NO. ~~Leg.~~ HOLE NO. J-11
DATE 2-28-83 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS Dk. Brn.			

DESCRIPTION: Sat., gushy, Pty. F. Sdy. Cly. SILT w/ small FIBERS Sticks & WOOD.

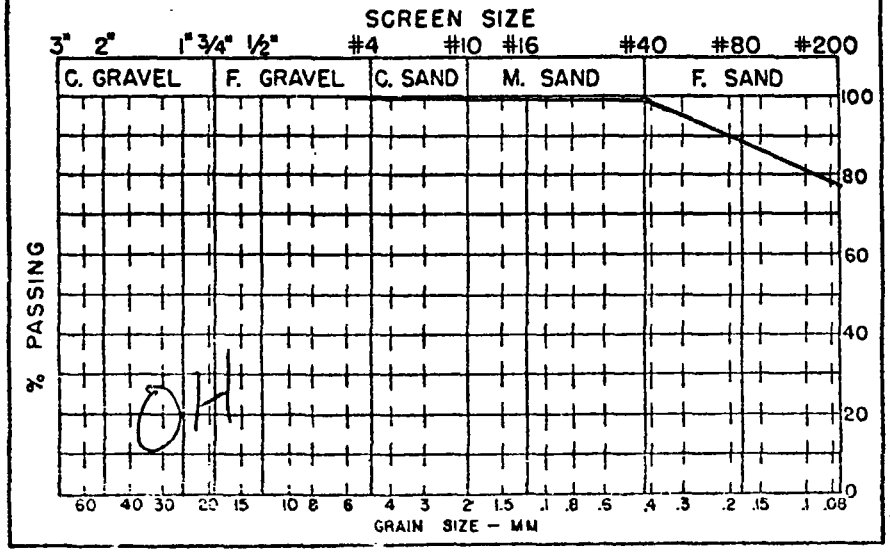


$H_2O = 174\%$

SIEVE ANALYSIS % Passing 31.08

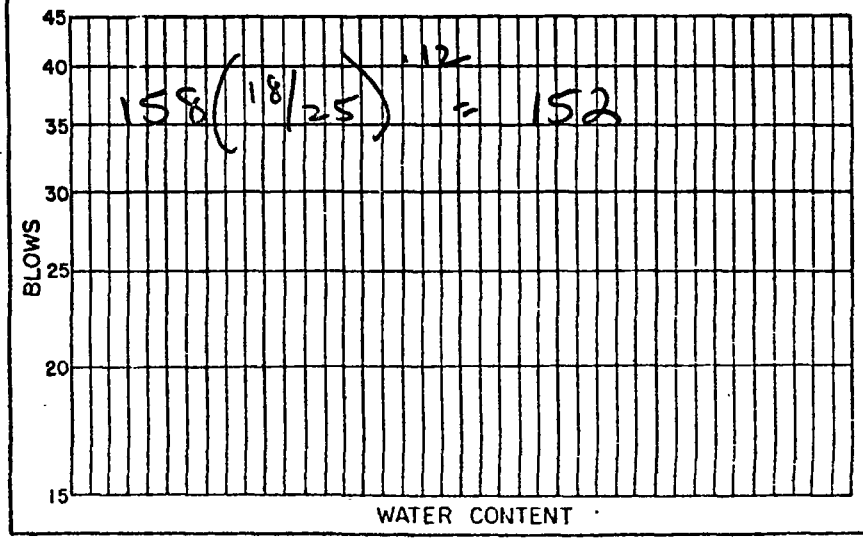
			-40	6.82	99%
-3/4			-80		
-4	.08	100%	-140		
-10	.20	99%	-200	23.88	77%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	32				118
Wet Wt.	16.57				5.01
Dry Wt.	6.43				2.71
% H_2O	158%				PL= 85
Blows	18				PI= 67



$158\left(\frac{18}{25}\right)^{.12} = 152$

DOT FORM 351-019

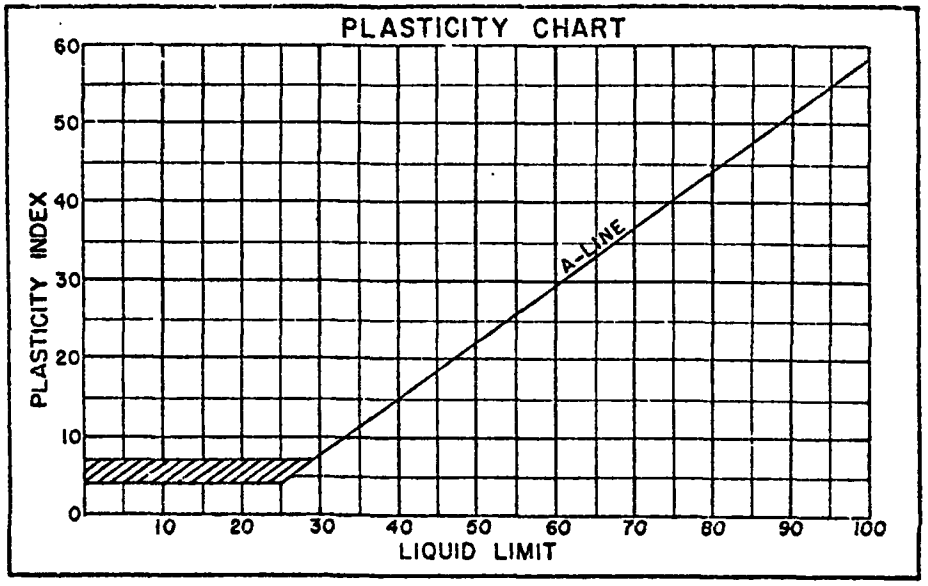
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3145 JOB NO. Hog HOLE NO. J-11
DATE 3-3-83 OPERATOR CB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	✓
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: M, Brn. F. Sdy., Cly. SILT w/ Wood & fibrous mtr.

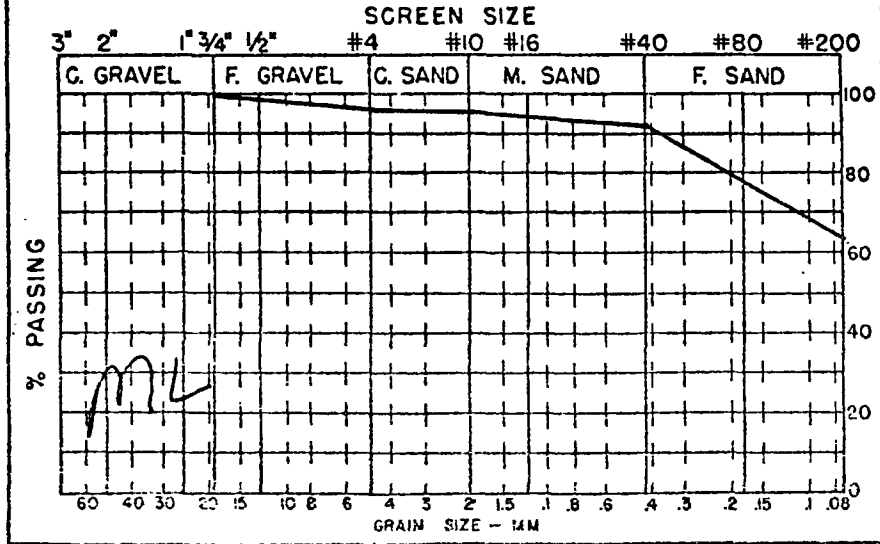


Hw = 93%

SIEVE ANALYSIS % Passing 41.80

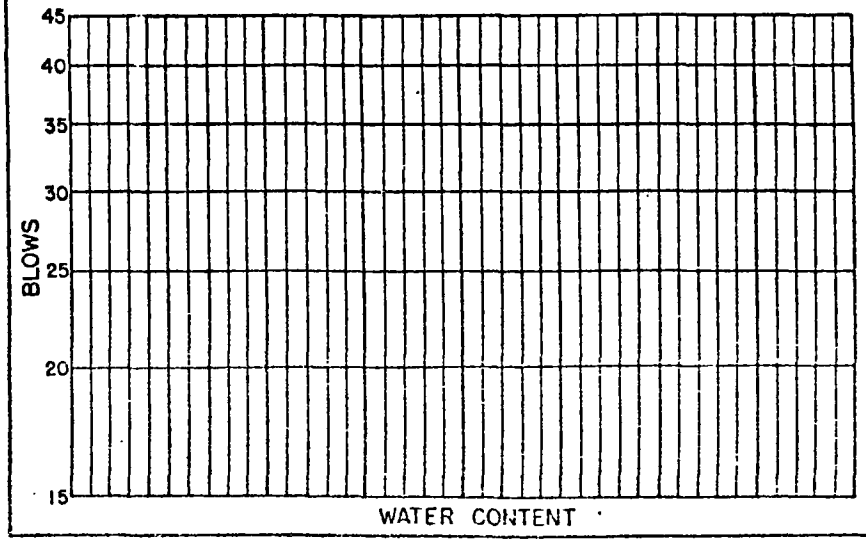
			-40	12.22	92%
-3/4	1.50	100%	-80		
-4	.20	96%	-140		
-10	1.72	96%	-200	26.16	63%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



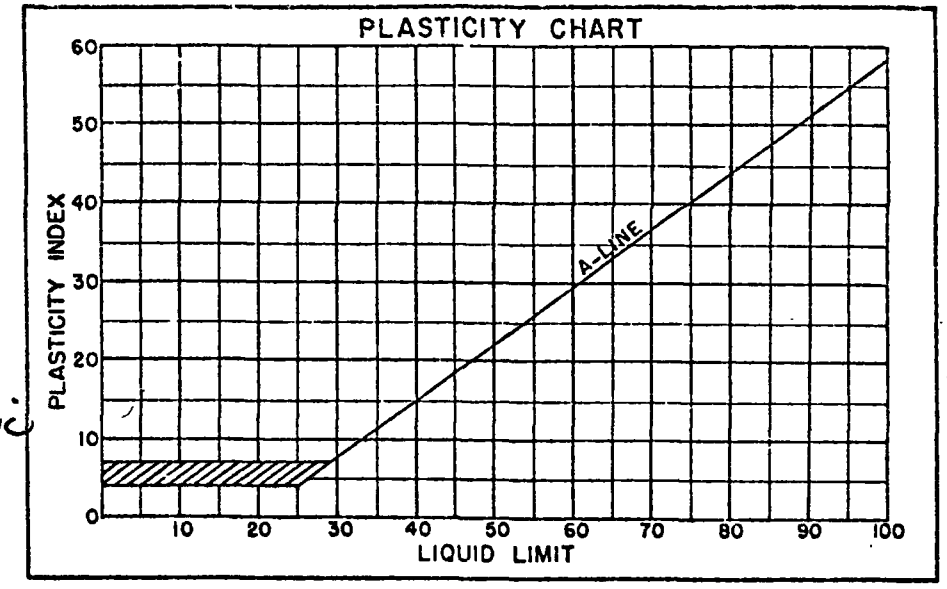
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3147 JOB NO. Hog. HOLE NO. J11
DATE 3-3-83 OPERATOR BA

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: M, dk. brn. F. Sdy., ORganic SILT w/ t. mica

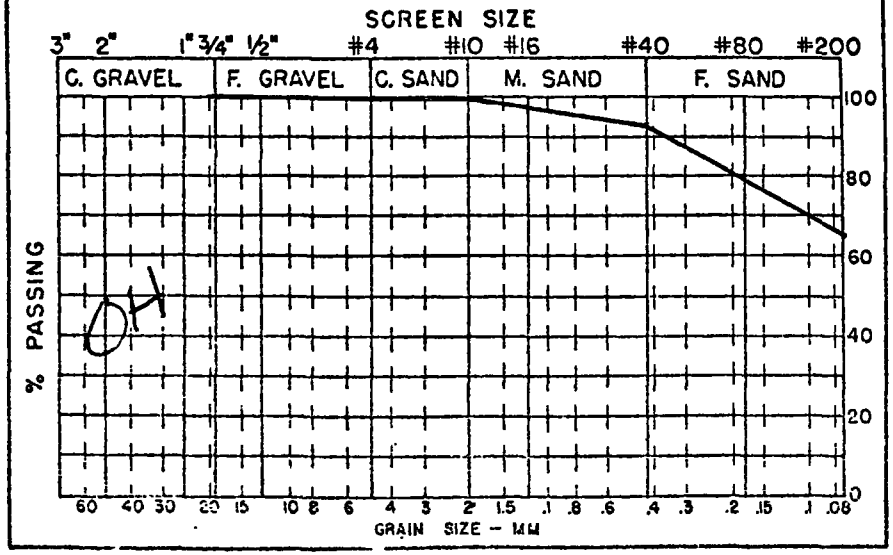


H_2O = 13.0 %

SIEVE ANALYSIS % Passing 50.03

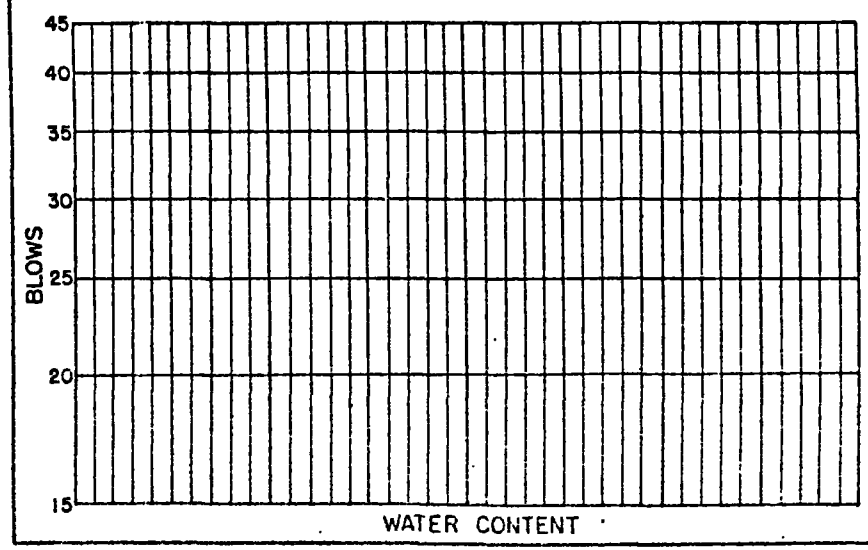
			-40	13.80	93%
-3/4	.08	100 %	-80		
-4	.25	99 %	-140		
-10	3.38	97 %	-200	32.52	65%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=

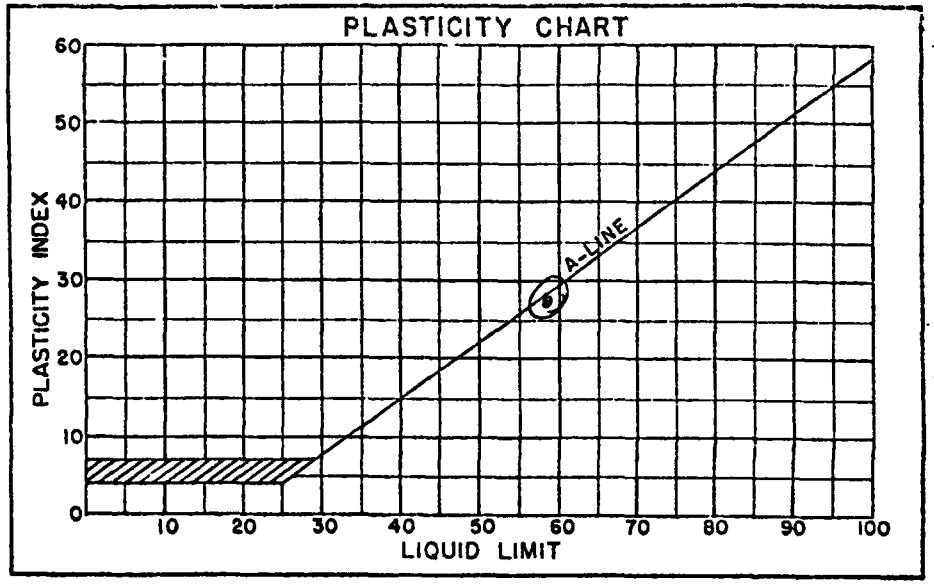


SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3153-2 JOB NO. Hoa. HOLE NO. J-11
DATE 9-29-82 OPERATOR BB

SOIL FIELD IDENTIFICATION			
TEST	SAND	SILT	CLAY
VISUAL	✓	✓	✓
DRIED CAST	✓	✓	✓
DILATANCY			
BITE			
TOUGHNESS	✓	✓	✓

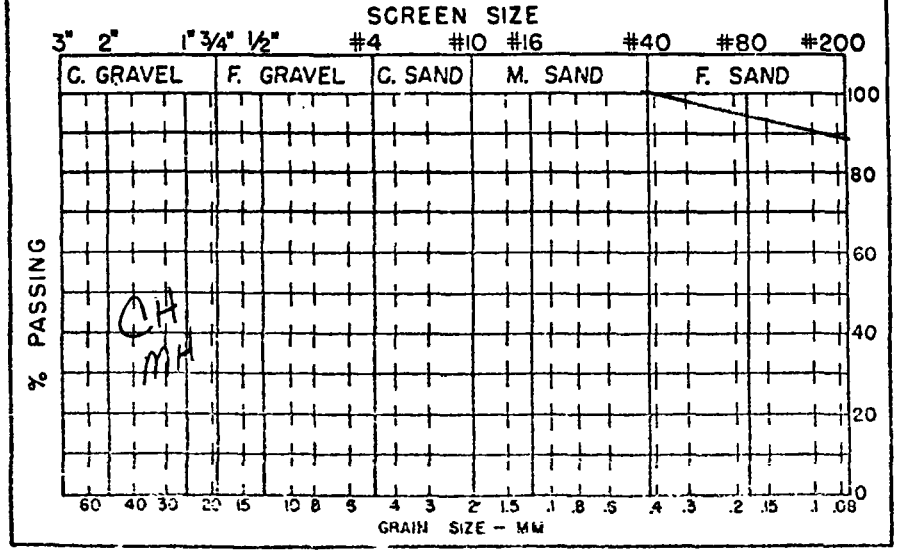
DESCRIPTION: DRY, GR & BRN w/ Rust STREAKS - CLAY & Layered F sdy SILT w/ T. Mica



H_2O = 23%

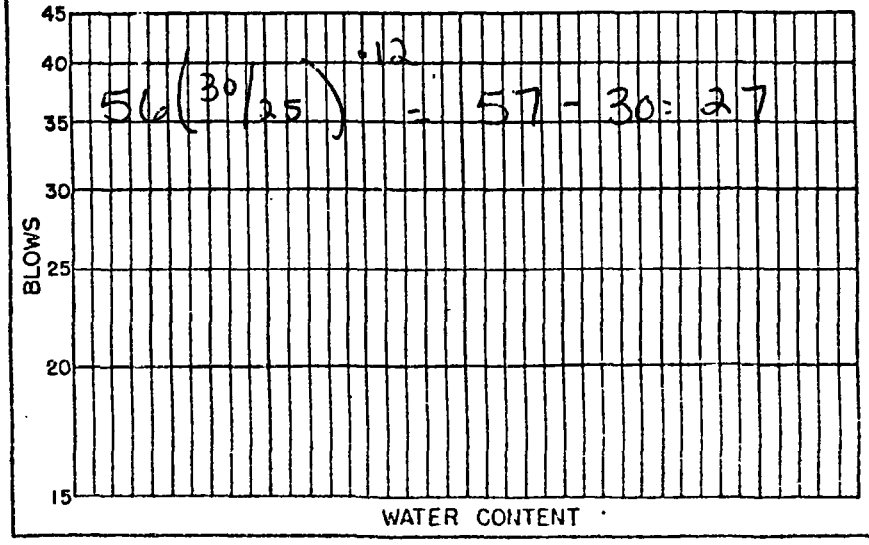
SIEVE ANALYSIS		% Passing 27.38	
	-40	3.10	100%
-3/4	-80		
-4	-140		
-10	-200	24.28	89%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	18				77
Wet Wt.	9.57				7.10
Dry Wt.	6.15				5.47
% H_2O	56%				PL= 30%
Blows	30				PI= 27



$56\left(\frac{30}{25}\right)^{.12} = 57 - 30 = 27$

TRIAXIAL COMPRESSION TEST (With Area Changes and Pore Pressures)

Project HOQUIAM Location G-1+64 ℄
Job No. L7262 Sample No. 3139-1 Boring No. J-11 Depth 11'-10" to 12'-2"
Area (Ao) 2.92 Length 4" Confining Pressure 600 PSF ~~=~~ 4.2 PSI
Rate of Loading .085%/MIN L. R. C. .325 DIV Tested by R BROOKS Date 22 MAR 83

Description

GROSS WT.	TARE	NET WT.	CAN NO.	WET WT.	DRY WT.	WT. H^2O	% H^2O	WET DENS.	DRY DENS.
410	146	264	78	46.58	21.33	25.25	118	86.86	39.84

Data for Mohr's Envelope:
Max. Deviator Stress
Principal Stress
Effective Principal Stress

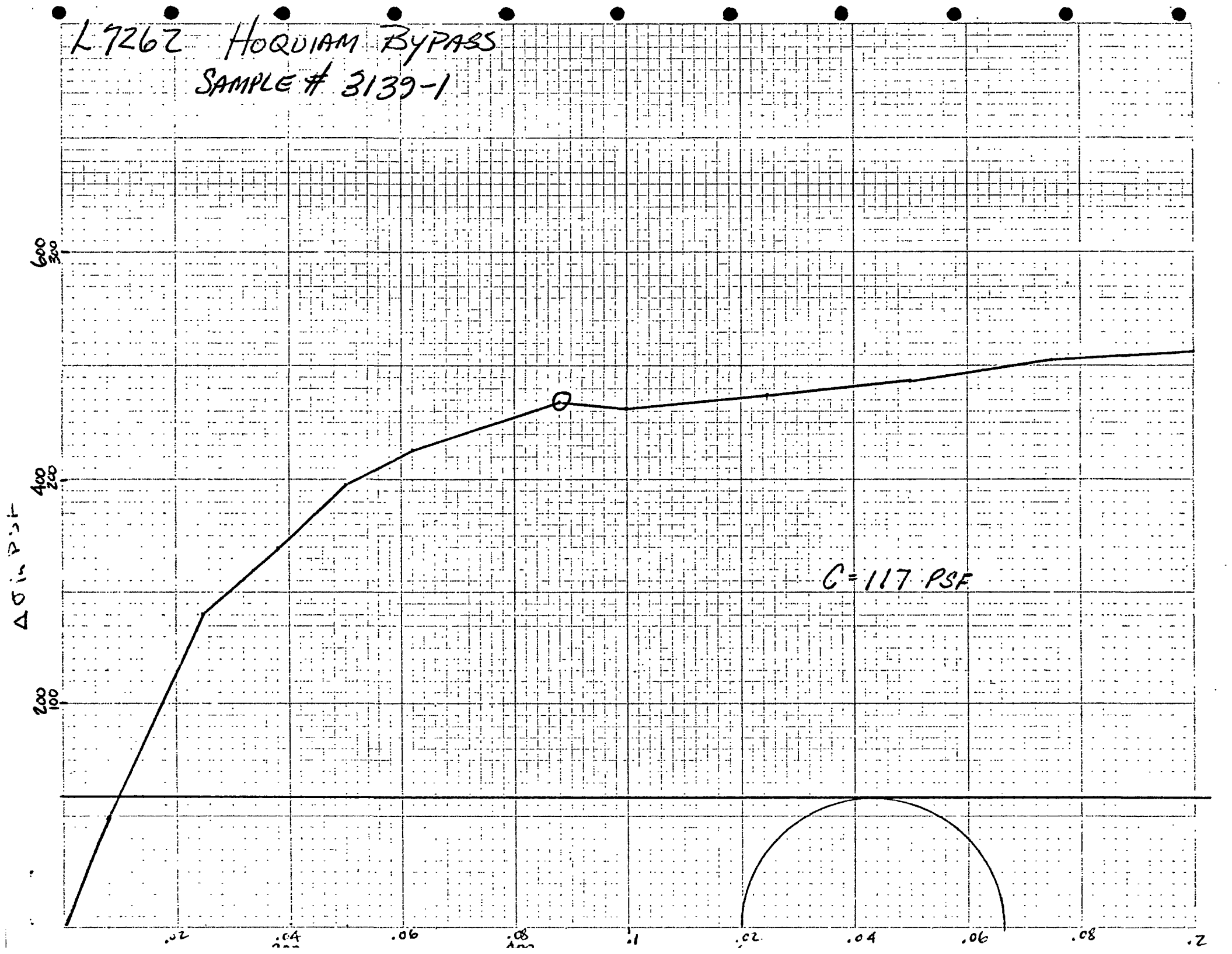
Failure

Back Press.
Saturation 93

ELASPED TIME (Hr.) (Min.)	LOAD DIAL READ (X 10−4)	DEFORM. DIAL READ	ΔL (COL. 3 x 10 − 3)	E. UNIT STRAIN (ΔL/L)	AREA C.F. (1 − E)	CORRECT. AREA A' (A° / 1 − E)	PORE PRESS.	DEV. LOAD (Col. 2 X LRC)	DEV. STRESS (Col. 9 ÷ Col. 7)	PRINC. STRESS (Col 10 + conf. press.)
1	2	3	4	5	6	7	8	9	10	11
~~0~~							4.17			
1	3	030		.008	992	2.94	4.02	1.0	48.0	
3.5	9	100		.025	975	2.99	4.12	2.9	139.8	
5	11	150		.038	962	3.04	4.12	3.58	169.6	
6.5	13	200		.05	950	3.07	4.12	4.2	197.0	
8.5	14	250		.062	938	3.11	4.23	4.6	213.0	
11.5	16	350		.088	912	3.20	3.99	5.2	234.	
13.25	16	400		.1	900	3.24	4.02	5.2	231.1	
16.5	17	500		.125	875	3.34	4.02	5.5	237.1	
20	18	600		.15	850	3.44	4.09	5.8	242.8	
23	19	700		.175	825	3.54	3.90	6.2	252.2	
26.5	20	800		.2	800	3.65	3.90	6.5	256.4	

DOT FORM 351-018 REVISED 4/80

L 7262 HOQUIAM BYPASS
SAMPLE # 3139-1



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

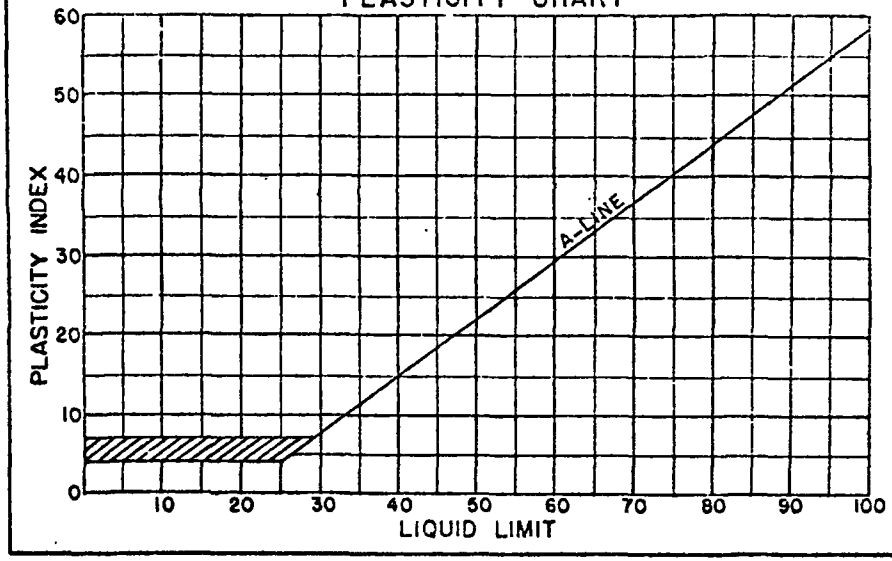
SAMPLE NO. 3139-1 JOB NO. HOQ HOLE NO. TRIAX
DATE 30 MAR 83 OPERATOR RB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL		✓	
DRIED CAST		✓	
DILATANCY		✓	
BITE			
TOUGHNESS		✓	

DESCRIPTION: Wet green/grey org SILT w/ org Intr

PLASTICITY CHART

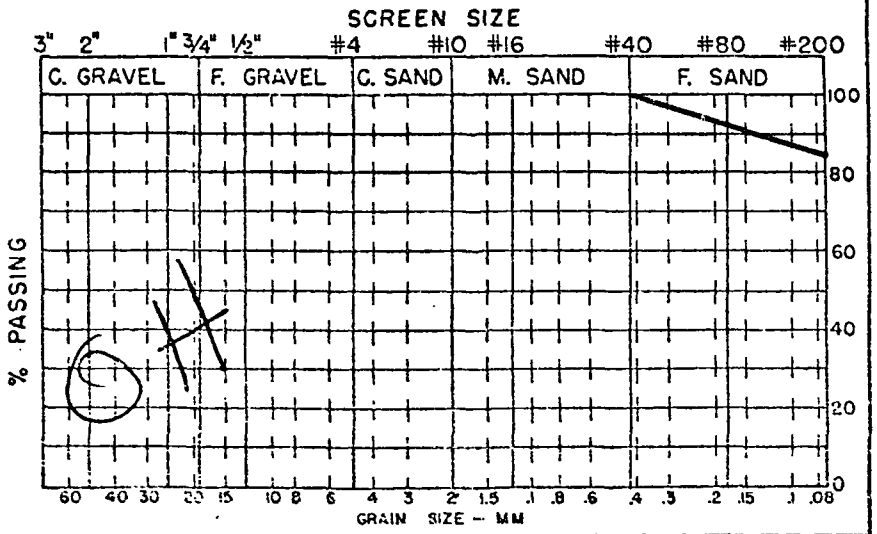


$H_2O = 118$

SIEVE ANALYSIS % Passing 88.9

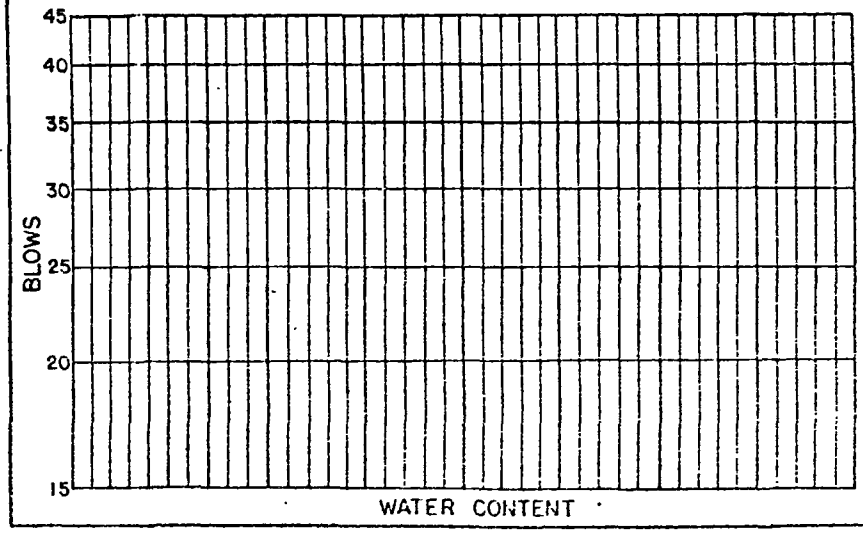
	-40 13.33	100
-3/4	-80	
-4	-140	
-10	-200 75.57	85

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 7-26-82

Dear Sir:

I have forwarded by today's State Car the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam bypass SR No. SR-101A Sub-Section Game Crossing

Station & Offset G-0+18 ℄ Hole # J-12

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
E-3162 -1	D-2	2' 0" 4' 0"	H 192%	MC	Like 3116-1 & org. wood Wet, Gr & Brn Sl. Cly. hly. org. SILT w/grasses & wood
-2	D-4	6' 6" 8' 8"	H 122%	CH	Like 3120 Moist, dk. brn. Sty. org. Sty., Grassy Sl. PEATY CLAY.
3163	U-5	9' 10" 10' 2"	B		Wet, brown, silty Peat with stems and leaves
3164	D-6	11' 6" 13' 6"	H 121%	MC	Moist, Brn. w/Rust outside, F. Sdy. SILT w/FIBERS
3165 -1	U-9	19' 6" 19' 10"	A		
-2		19' 10" 20' 2"	B		
-3		20' 2" 20' 6"	C		
3166	D-10	21' 6" 23' 6"	H 57%	MC	Like 3132 Wet, Tan-Brn F. Sdy. SILT w/trace F & Gravel
3167 -1	U-11	24' 6" 24' 10"	B		

1 copy with samples
1 copy to addressee

Yours very truly,
Milford Sanders
Inspector.

FORM 351-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 7-26-82

Dear Sir:

I have forwarded by today's State Car the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam Bypass
SR No. SR-101A Sub-Section Game Crossing

Station & Offset G-0+18 ℄ Hole # J-12

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3167 -2	U-11	24' 10" 25' 2"	C		
-3		25' 2" 25' 6"	D		
-4		25' 6" 25' 10"	E		
3168	D-12	26' 6" 28' 6"	73%	SM	Wet; tan & Gr. Rust, V. Sty. F-M SAND w/ trace. CRS. SAND
3169 -1	U-13	29' 6" 29' 10"	A		
-2		29' 10" 30' 2"	B		
3170 -1	D-14	31' 6" 33' 6"	24%	SW SM	Moist, GR-TAN Sty. F-C SAND W/T. F. GRAVEL
-2	D-15	34' 6" 36' 6"	10%	GM	Moist, Slue, Grn. & orange, V. Sty. F-C Sdy. 1 1/2" (-) & GRAVEL
-3	D-16	39' 6" 41' 6"	33%	ML	Moist, Gr. & tan F. Sdy. SILT W/. T. MICA

1 copy with samples
1 copy to addressee

Yours very truly,
Melford J. Sanders
Inspector.

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 7-26-82

Dear Sir:

I have forwarded by today's State Car the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam Bypass SR No. 101A Sub-Section Game Crossing

Station & Offset G-0+18 ℄ Hole # J-12

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3170 -4	D-17	44' 6" 45' 9"	H. 33%	ML	Like 3170-3 Moist, GR & Brn. F. Sdy. SILT w/ T. Mica
-5	D-18	49' 6" 50' 0"		ML	Same Gray w/ T. F. Gravel & one org. Piece / No mica
-6	D-19	54' 6" 54' 8"		ML	Same w/o mica. w/ org. stem

1 copy with samples
1 copy to addressee

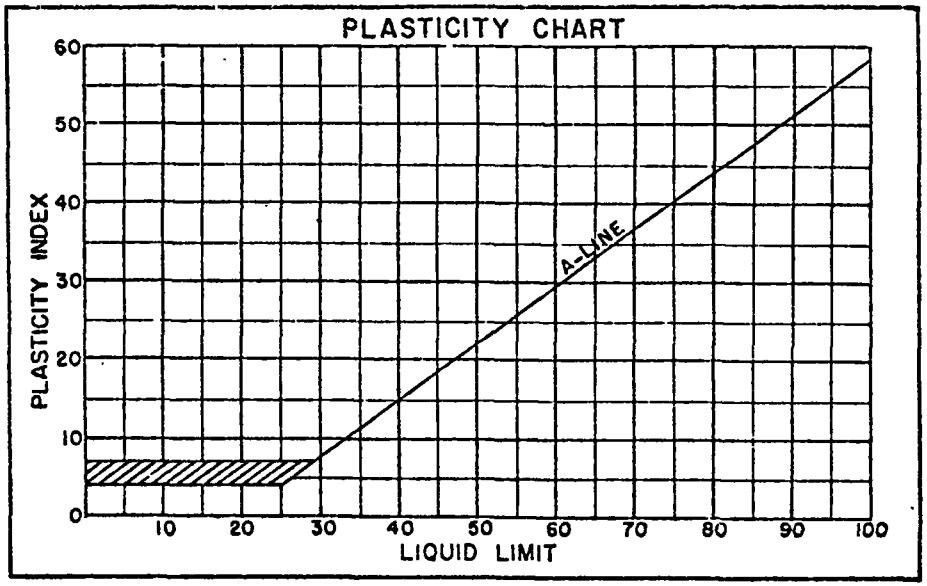
Yours very truly,
Milford Sanders
Inspector.

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3164 JOB NO. 4b8 HOLE NO. J-12
DATE 3-3-83 OPERATOR BB

SOIL FIELD IDENTIFICATION			
TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

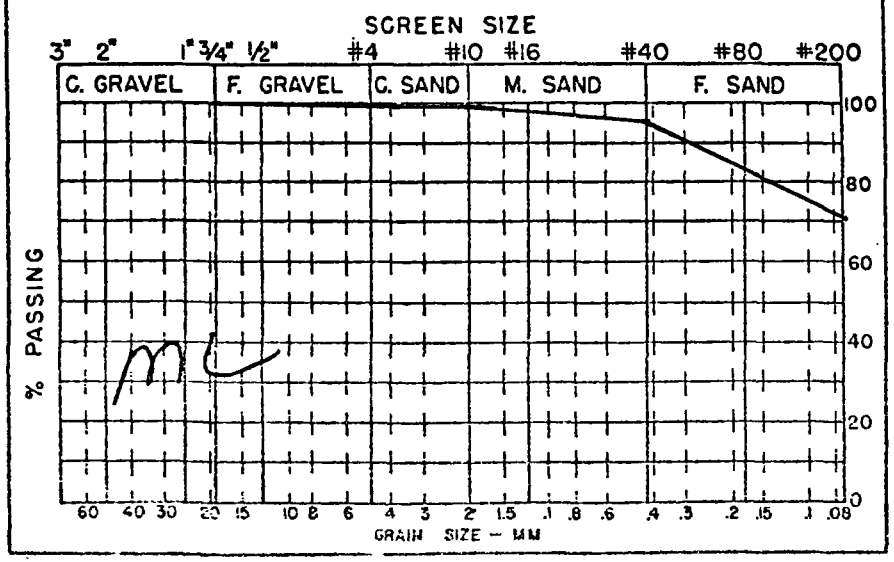
DESCRIPTION: M. Brn. w/ rust. outer F. Sdy. SILT w/ FIBERS.



H_2O = 12.1 %

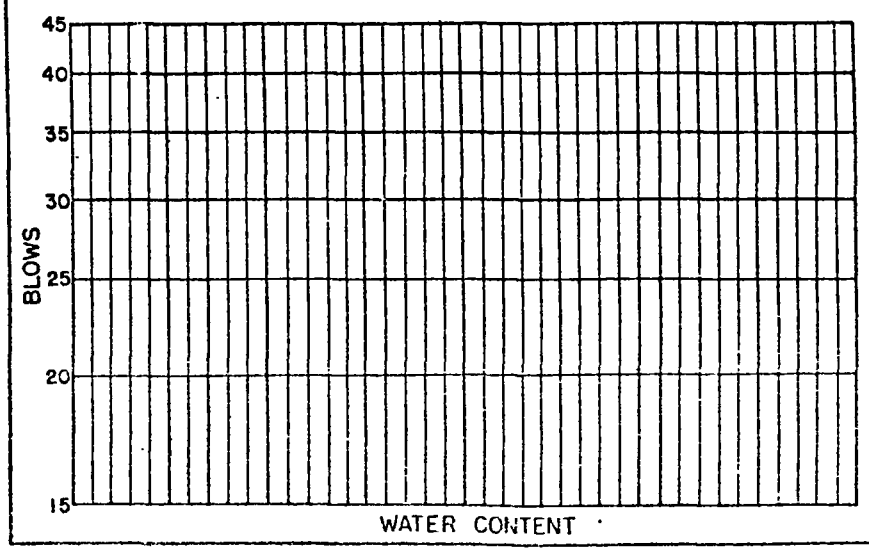
SIEVE ANALYSIS		% Passing			35.00
			-40	8.60	95%
-3/4	.12	100%	-80		
-4	.09	99	-140		
-10	1.40	99	-200	24.79	71%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

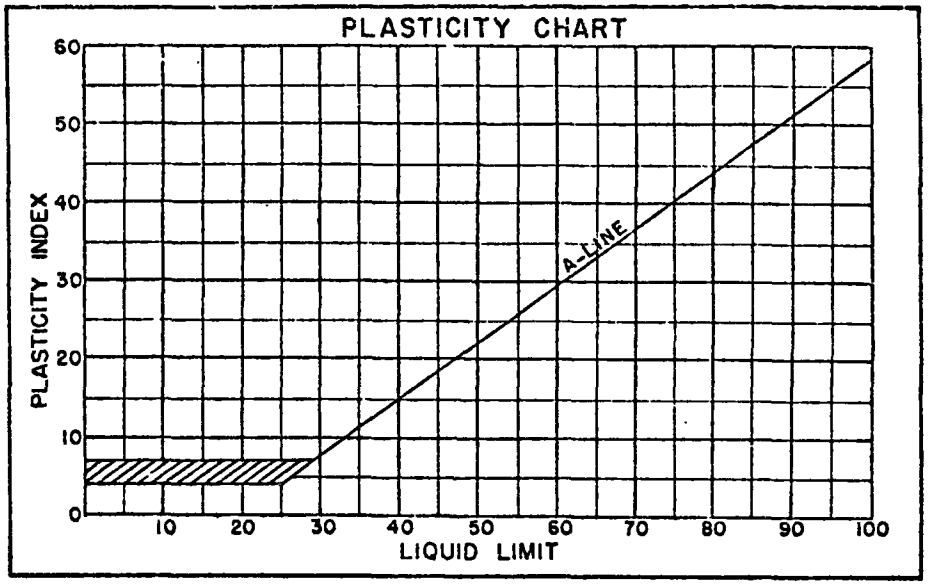
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3168 JOB NO. ~~Hog~~. HOLE NO.
DATE 9-28-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	Wet ✓	✓	

DESCRIPTION: Moist, Wet tan, Gr. Rust
U. Sty. F-M SAND w- T. Crs.
SAND

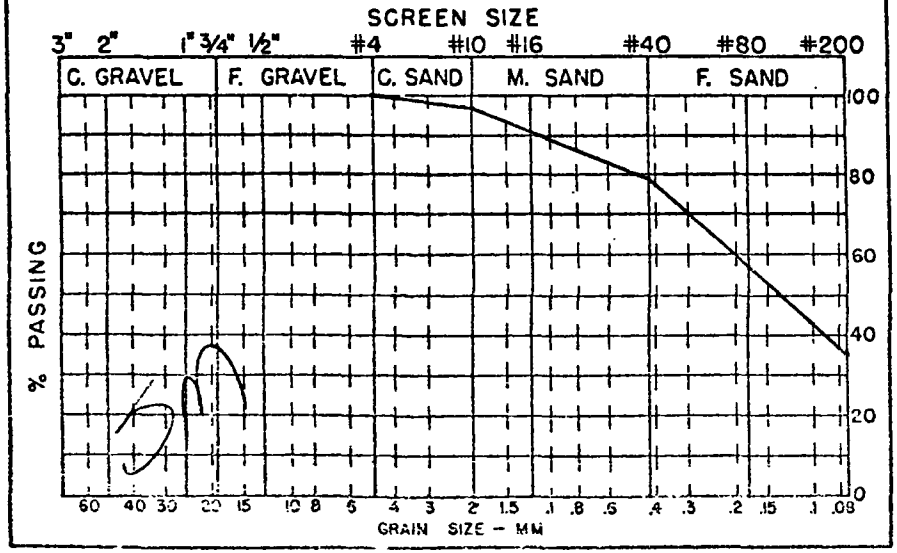


Uro = 73%

SIEVE ANALYSIS % Passing 84.80

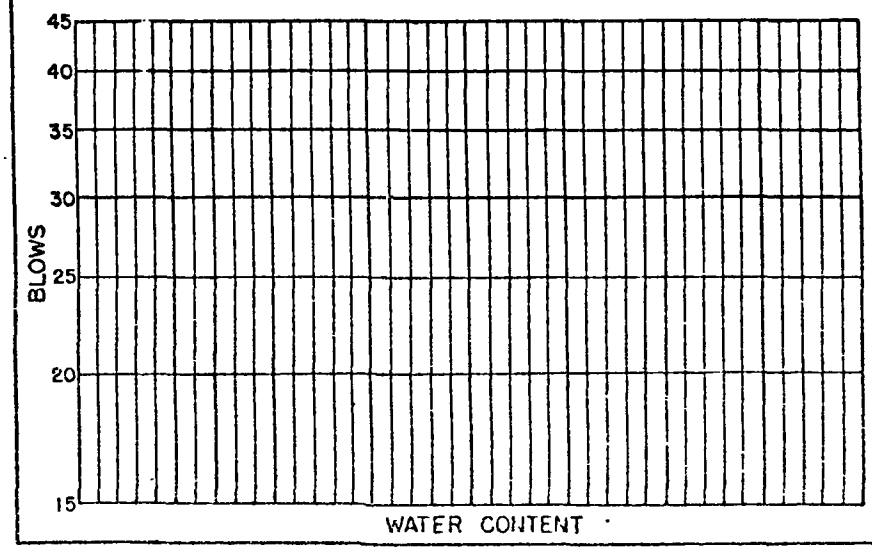
			-40	36.62	79%
-3/4			-80		
-4	2.42	100%	-140		
-10	15.58	97%	-200	30.18	36%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

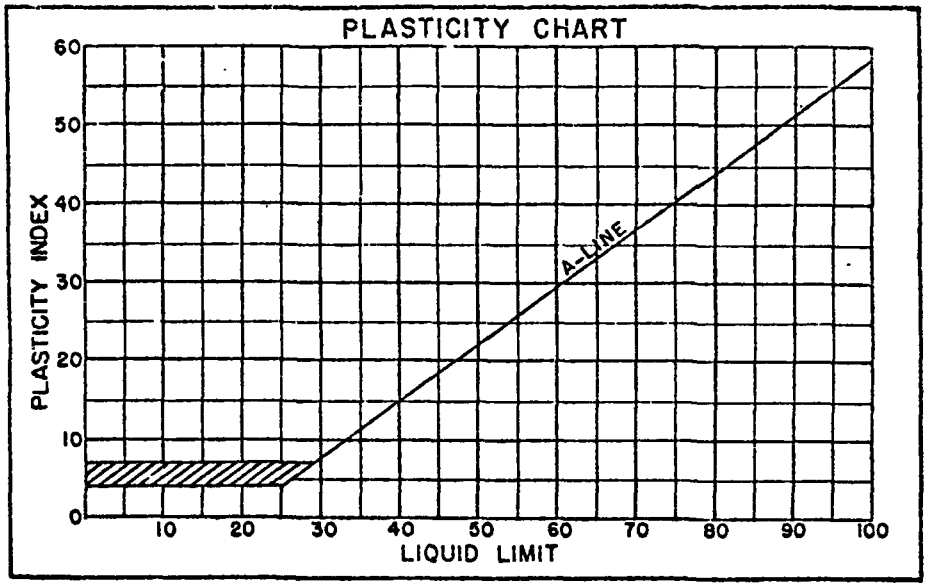
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3170-1 JOB NO. Hog. HOLE NO. J-18
DATE 11-1-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: Moist, GR-TAN Sty. F.C SAND W/ T. F. Gravel

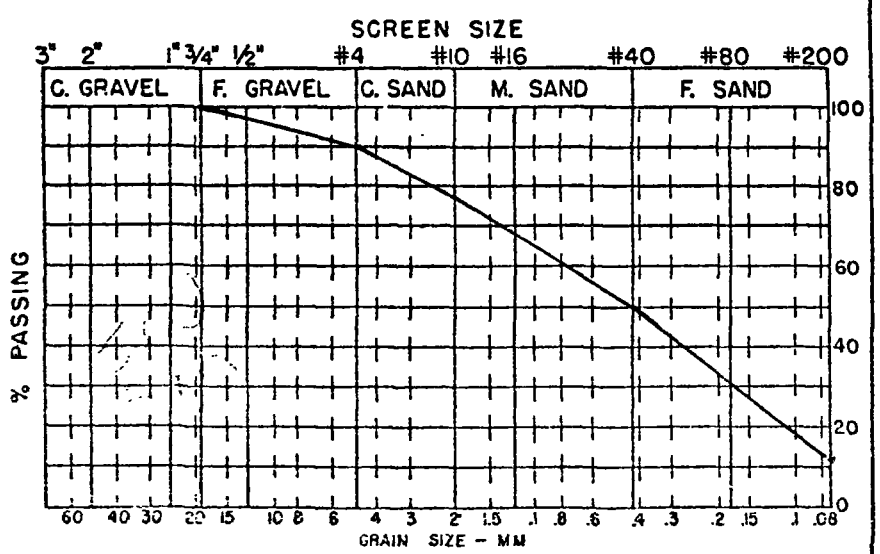


Hw: 24 %

SIEVE ANALYSIS % Passing 103.01

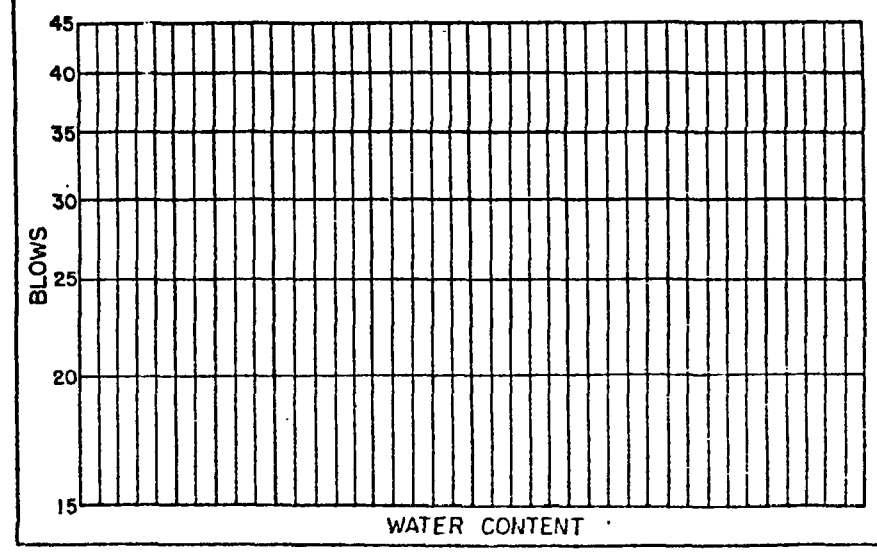
			-40	38.90	50 %
-3/4	10.10	100 %	-80		
-4	14.03	90	-140		
-10	27.67	77	-200	12.31	12 %

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

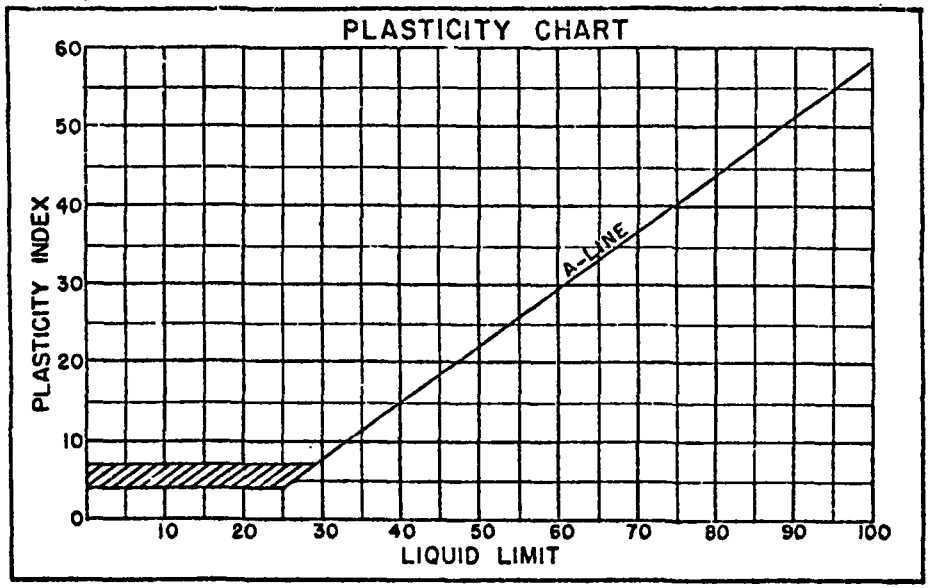
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3170-2 JOB NO. ~~Hog.~~ HOLE NO. J-17
DATE 11-1-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: Moist, Olive, grn. orange
Sty. F-C Sdy. 1½"(-) *
GRAVEL

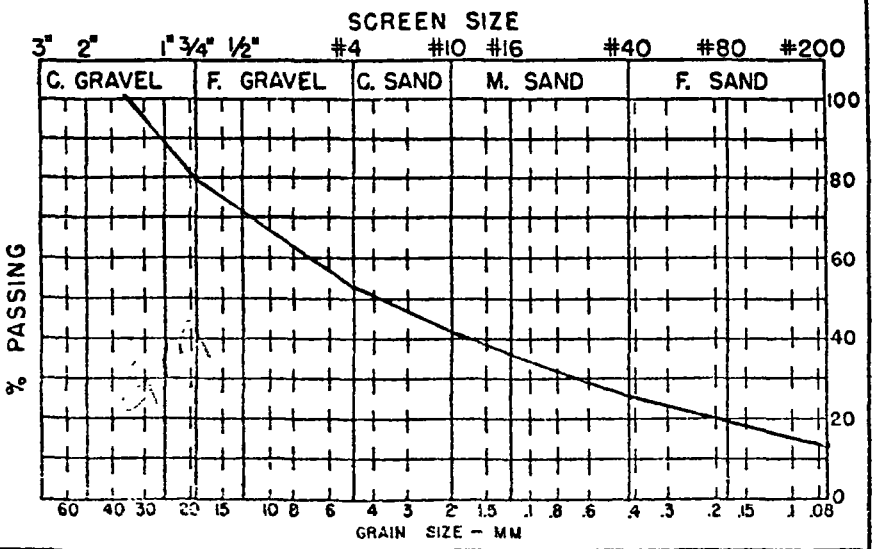


H2O - 10%

SIEVE ANALYSIS % Passing 110.15

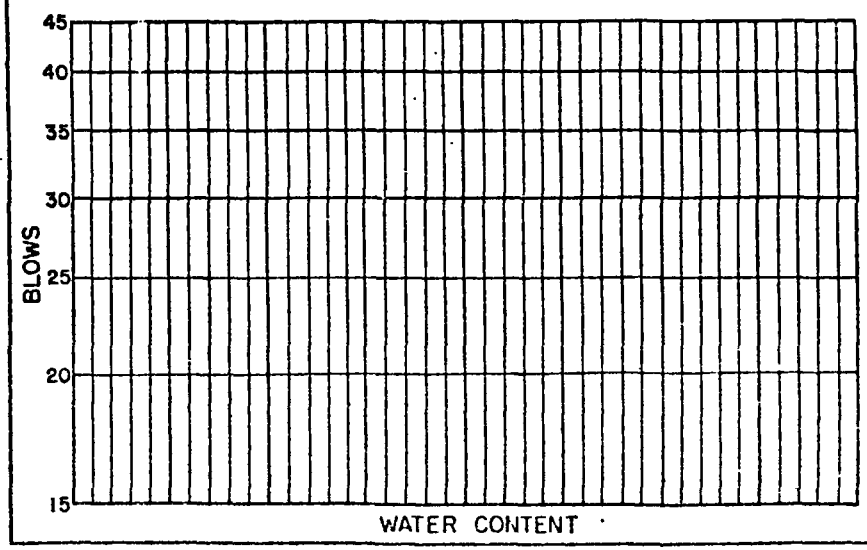
one -1½	33.25	100 %	-40	14.47	26%
-¾	28.23	79	-80		
-4	13.55	53	-140		
-10	16.12	41	-200	14.53	13

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

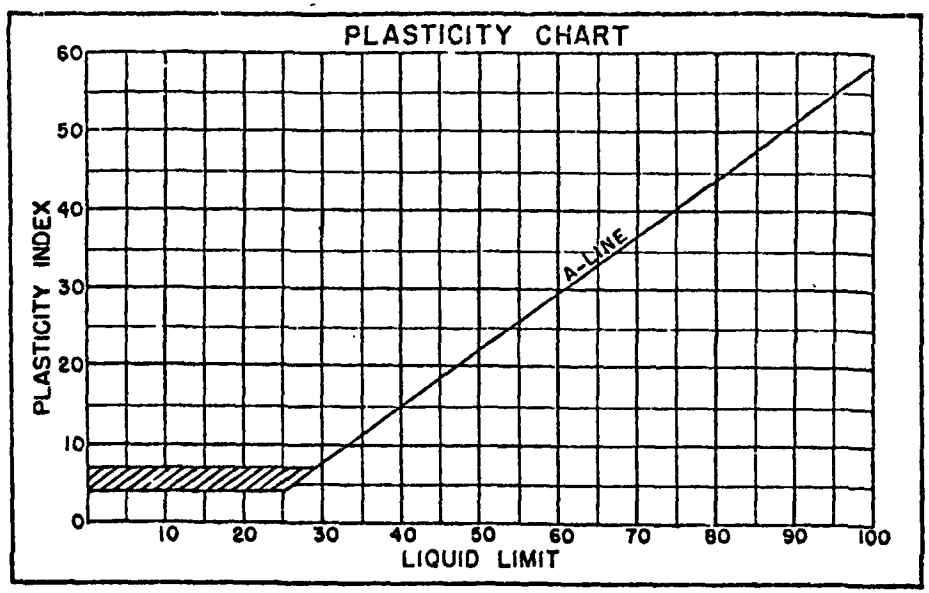
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3170-3 JOB NO. Hy. HOLE NO. J-17
DATE 11-1-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

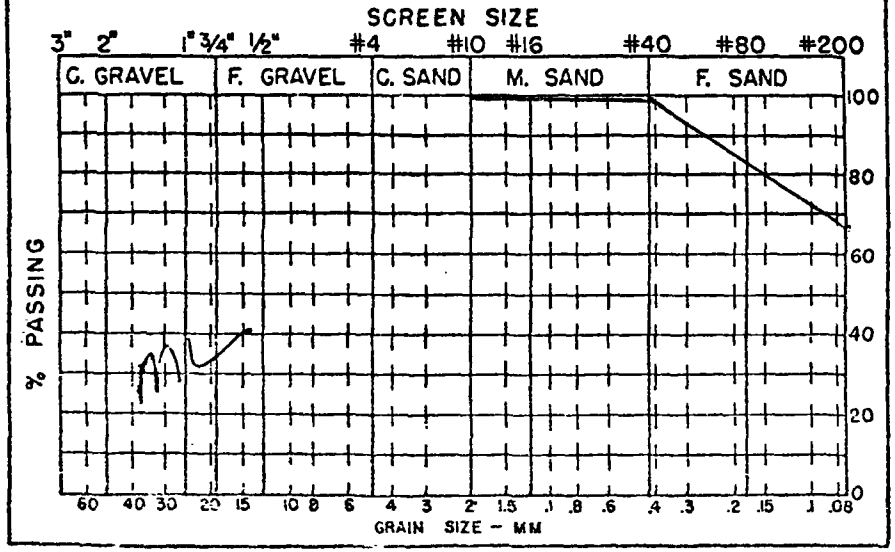
DESCRIPTION: Moist Gr. & Tan F. Sdy. Silt w/T. Mica



H_2O = 33%

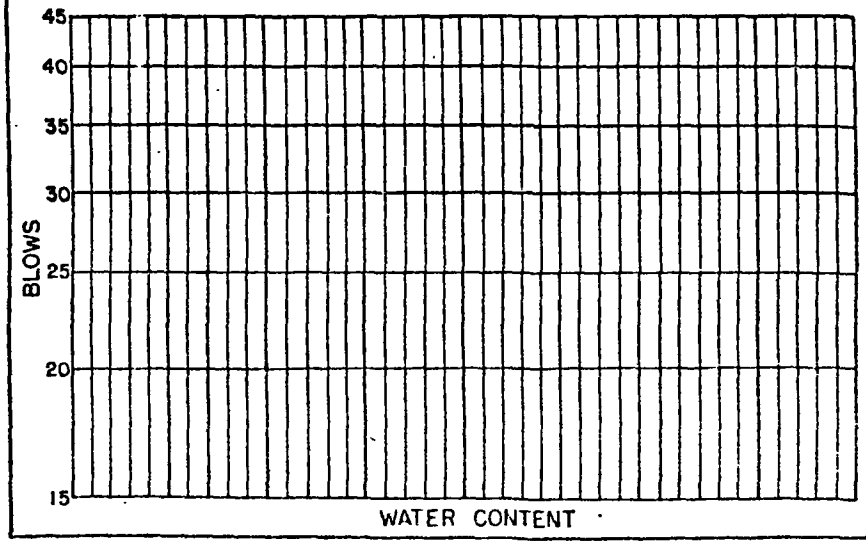
SIEVE ANALYSIS		% Passing 66.80	
	-40	21.23	99.9%
-3/4	-80		
-4	-140		
-10 .02 100%	-200	45.55	68%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

TRIAXIAL COMPRESSION TEST (With Area Changes and Pore Pressures)

Project Hoquiam By Pass Location G-0+18 ℄
Job No. L7262 Sample No. 3163 Boring No. J-12 Depth 9'-10" to 10'-2"
Area (Ao) 2.92 Length 4" Confining Pressure 600 PSF = 4.2 PSI
Rate of Loading .085%/Min L. R. C. .325 Tested by R Brooks Date 22 MAR 83

Description

GROSS WT.	TARE	NET WT.	CAN NO.	WET WT.	DRY WT.	WT. H^2O	% H^2O	WET DENS.	DRY DENS.
367	142	225	49	49.0	12.86	36.14	281	74.0	19.4

Data for Mohr's Envelope:
Max. Deviator Stress
Principal Stress
Effective Principal Stress

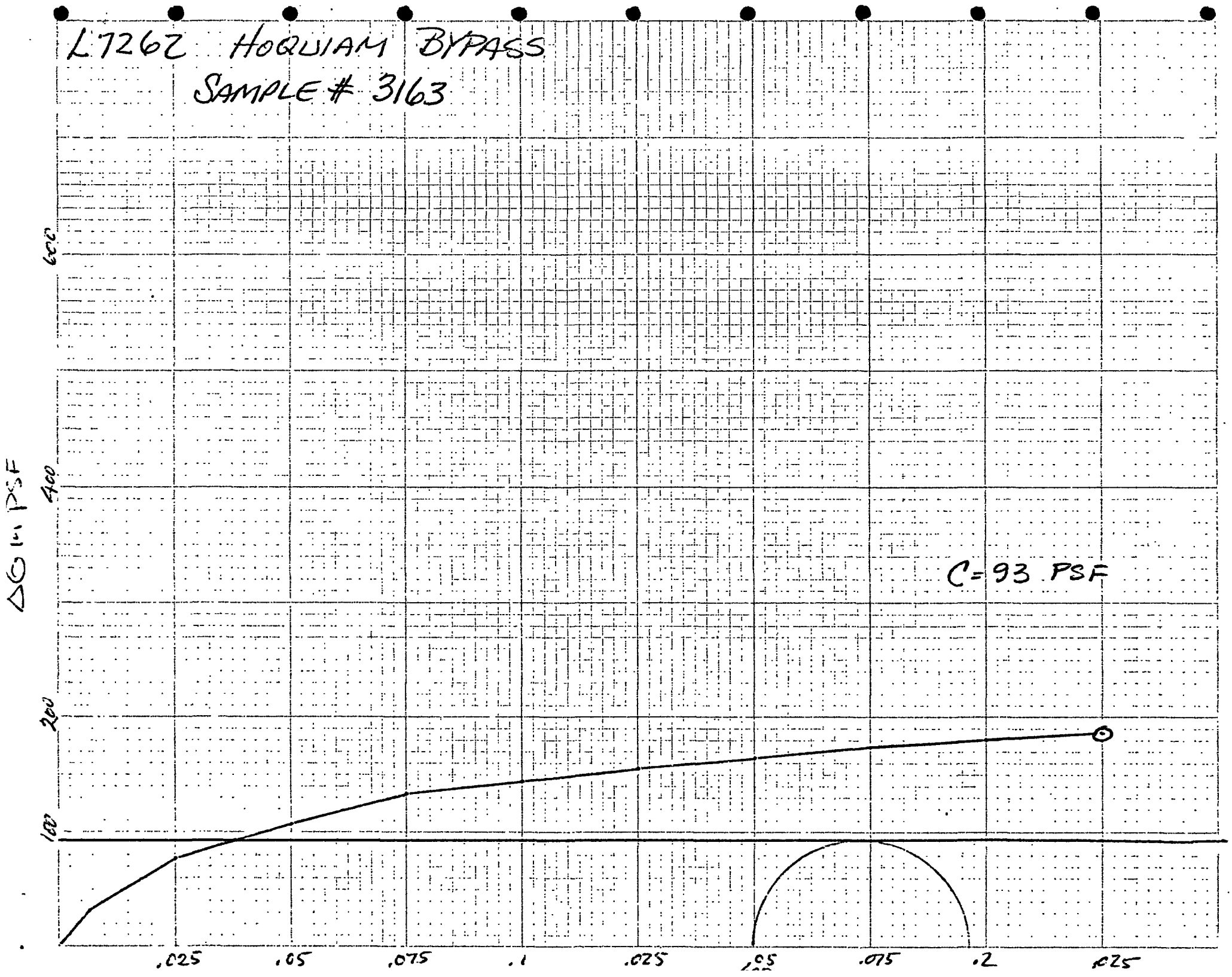
Failure

Back Press.
Saturation 96

ELASPED TIME (Hr.) (Min.)	LOAD DIAL READ (X 10^{-4})	DEFORM. DIAL READ	Δ L (COL. 3 x 10^{-3})	E. UNIT STRAIN (ΔL/L)	AREA C.F. (1 − E)	CORRECT. AREA A' ($\frac{A^o}{1-E}$)	PORE PRESS.	DEV. LOAD (Col. 2 X LRC)	DEV. STRESS (Col. 9 ÷ Col. 7)	PRINC. STRESS (Col 10 + conf. press.)
1	2	3	4	5	6	7	8	9	PSF 10	11
0							4.20			
1	2	029		.007	993	2.94	4.15	.65	31.84	
3.5	5	100		.025	975	2.99	4.15	1.62	78.02	
5	6	150		.038	962	3.04	4.28	1.95	92.37	
6.75	7	200		.05	950	3.07	4.10	2.28	106.94	
10	9	300		.075	925	3.16	4.10	2.92	133.06	
13.25	10	400		.1	900	3.24	4.30	3.25	144.44	
16.5	11	500		.125	875	3.34	4.30	3.58	154.35	
20	12	600		.15	85	3.44	4.10	3.9	163.26	
23	13	700		.175	825	3.54	4.10	4.22	171.66	
26.25	14	800		.2	8	3.65	4.20	4.55	179.51	
29.5	15	900		.225	775	3.77	4.20	4.88	186.40	

DOT FORM 351-018 REVISED 4/80

L7262 HOQUIAM BYPASS
SAMPLE # 3163



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

TRIAX

SAMPLE NO. 3163 JOB NO. HOQ HOLE NO.

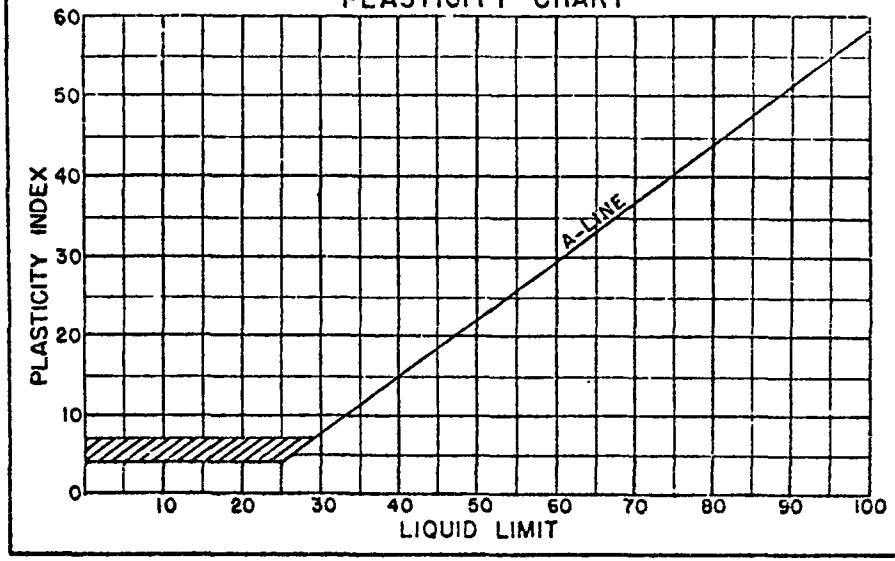
DATE 30 MAR 83 OPERATOR RB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL		✓	
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: Wet Brn silty PEAT w/ stems & Leaves

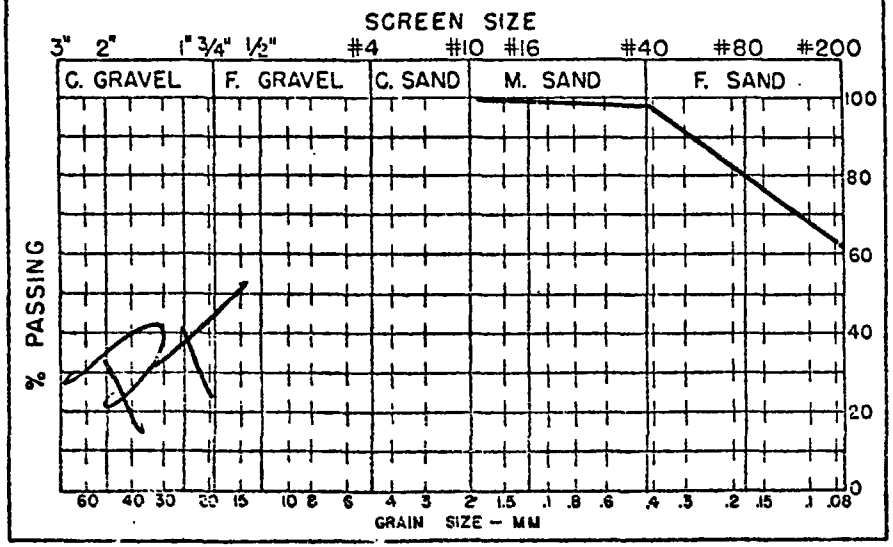
PLASTICITY CHART



$H_2O = 281$

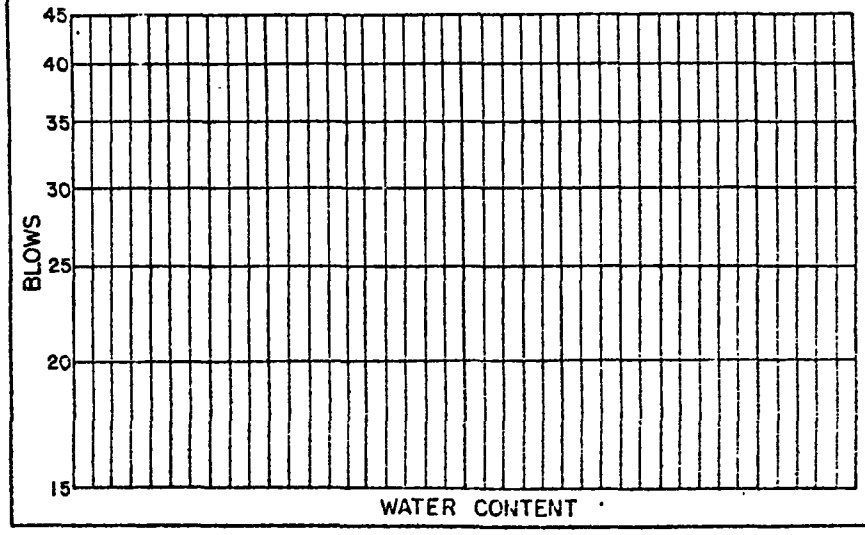
SIEVE ANALYSIS		% Passing 70.10	
		-40 25.23	98
-3/4		-80	
-4		-140	
-10 1.02	100	-200 43.85	62

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

IATERIALS ENGINEER
laterials Laboratory
O. Box 167, Olympia, WA 98504 (Mailing Address)
55 So. 2nd Ave.
umwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 7-28-82

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam by Pass
SR No. 101 K Sub-Section Cut Section

Station & Offset 150+38 32' Lt. Hole # J-13

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
E-3171	U-1	0' 10" / 1' 2"	B		
3172	D-2	2' 6" / 4' 6"	Wo 56%	SM	Wet, tan, Cly., V. Sty. F. SAND
3173 -1	U-3	5' 6" / 5' 10"	A		
-2		5' 10" / 6' 2"	B		
3174	D-4	7' 6" / 9' 6"	"	SM	Like 3172 w/Rust STREAKS
3175 -1	U-5	10' 10" / 11' 2"	B		
-2		11' 2" / 11' 6"	C		
-3		11' 6" / 11' 10"	D		
3176	D-6	12' 6" / 14' 6"	"	SM	Like 3172 w/Rust Stks

opy with samples
opy to addressee

Yours very truly,

Larry M. Moore
Inspector.

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

ATERIALS ENGINEER
aterials Laboratory
O. Box 167, Olympia, WA 98504 (Mailing Address)
55 So. 2nd Ave.
mwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 7-28-82

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam by Pass
SR No. 101A Sub-Section cut Section

Station & Offset 150+38 32' Lt. Hole # J-13

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3177 -1	U-7	15' 10" 16' 2"	B		
-2		16' 2" 16' 6"	C		
-3		16' 6" 16' 10"	D		
3178	D-8	17' 6" 19' 6"	Hum 56%	SM	Like 3172 w/Rust Wet, tan Cly V. Sty. F. SAND.
3179 -1	U-9	20' 10" 21' 2"	B		
-2		21' 2" 21' 6"	C		
-3		21' 10" 22' 2"	E		
3180	D-10	22' 6" 24' 6"	Hum 60%	SM	Moist, Brn.-Gr. V. Sty. F. SAND w/ Org. Layers
3181 -1	U-11	25' 10" 26' 2"	B		

opy with samples
opy to addressee

Yours very truly,

Jerry M Moore
Inspector.

DOT FORM 351-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

ATERIALS ENGINEER
aterials Laboratory
O. Box 167, Olympia, WA 98504 (Mailing Address)
55 So. 2nd Ave.
umwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 7-28-82

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam by Pass
SR No. 101 A Sub-Section Cut Section

Station & Offset 150+38 32' Lt. Hole # J-13

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3181 -2	U-11	26' 2" / 26' 6"	C		
-3		26' 6" / 26' 10"	D		
3182	D-12	27' 6" / 29' 6"	H.M. 43%	SM	Wet, Gr/TAN, Cly., V. Sty. F. SAND W/ T. Org. grass & F. Gravel
3183 -1	U-13	30' 6" / 30' 10"	A		
-2		30' 10" / 31' 2"	B		
-3		31' 2" / 31' 6"	C		
-4		31' 6" / 31' 10"	D		
3184	D-14	32' 6" / 34' 6"	"	SM	Like 3182 w/o Gravel, w/ c vs. SAND & org. ODOR

opy with samples
opy to addressee

Yours very truly,

Derry M Moore
Inspector.

FORM 351-002

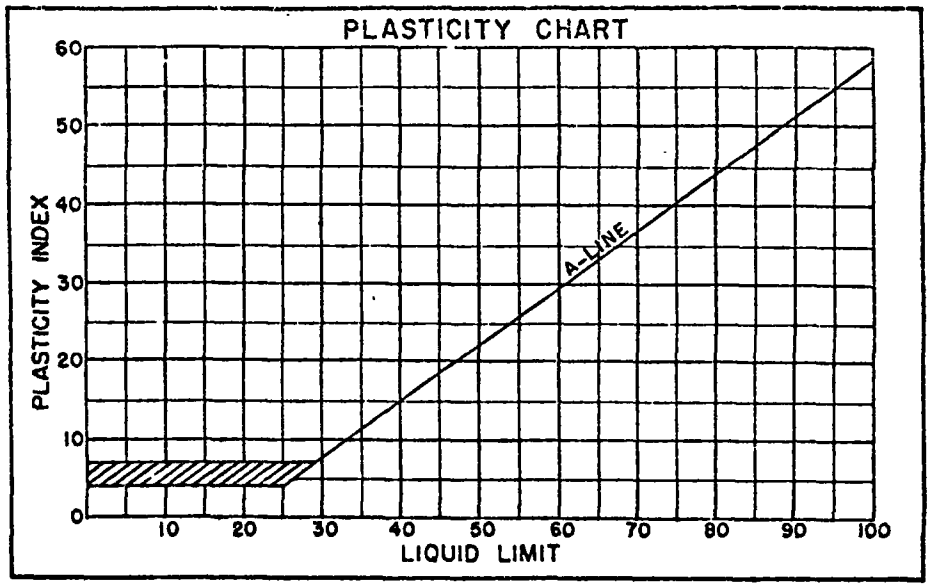
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3180 JOB NO. Hog. HOLE NO. J-13
DATE 11-1-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓		
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Moist, Brn - Gr. V. Sty. F. SAND w/ org. Layers.

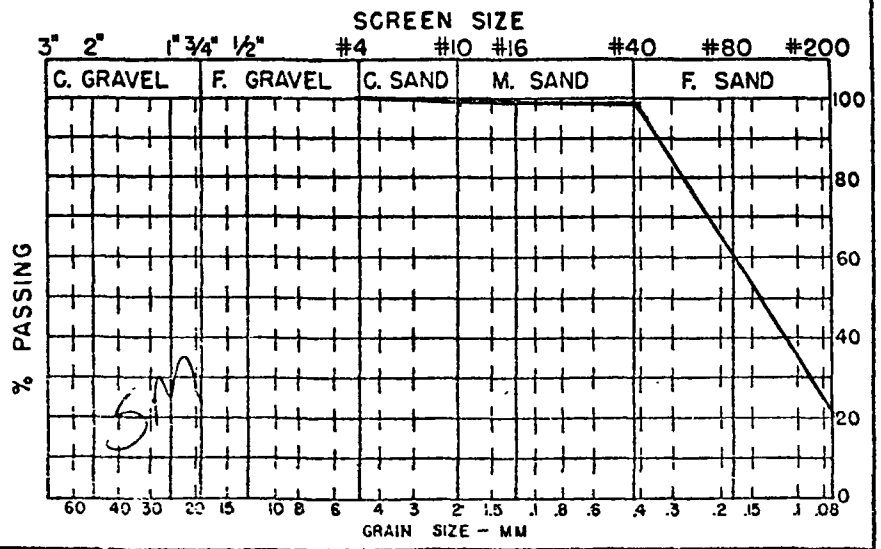


H_2O = 60%

SIEVE ANALYSIS % Passing 63.86

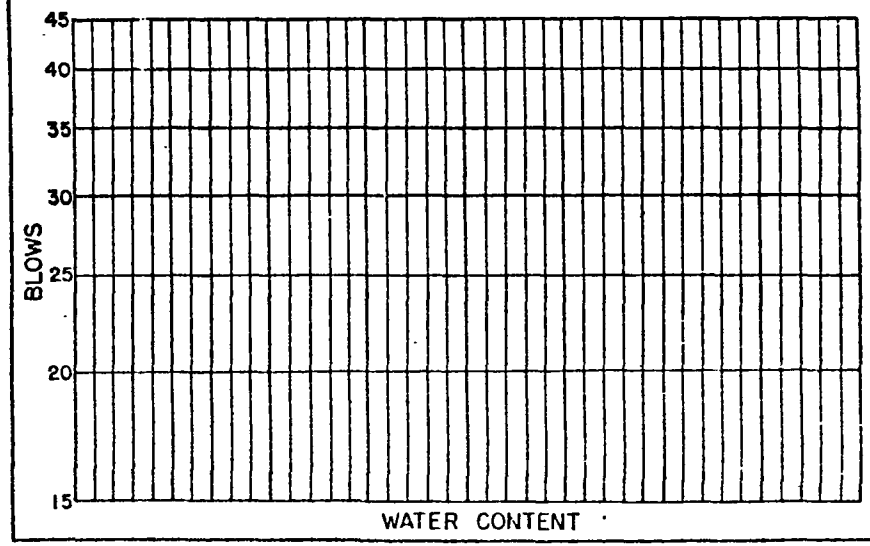
			-40	76.96	79.9
-3/4			-80		
-4	.02	100%	-140		
-10	.01	99.9	-200	13.13	21

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

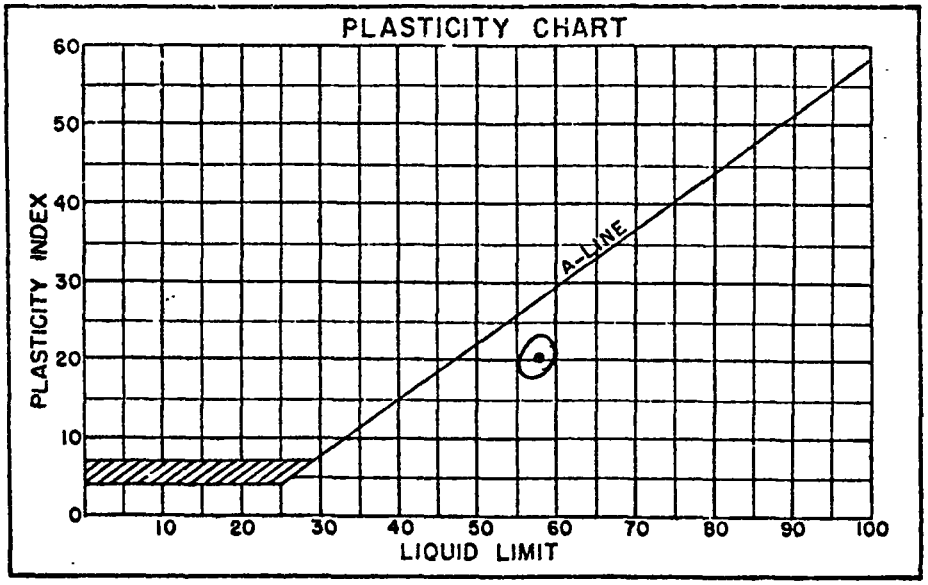
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3172 JOB NO. 4608 HOLE NO. J-13
DATE 11-2-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	✓

DESCRIPTION: Wet, tan, Clay., v. Sty.
F. SAND

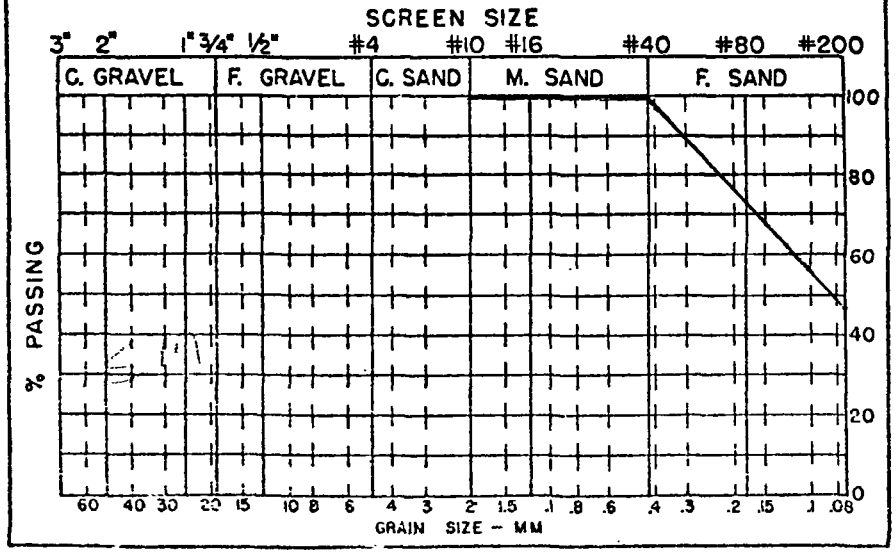


H2O = 56%

SIEVE ANALYSIS % Passing 85.25

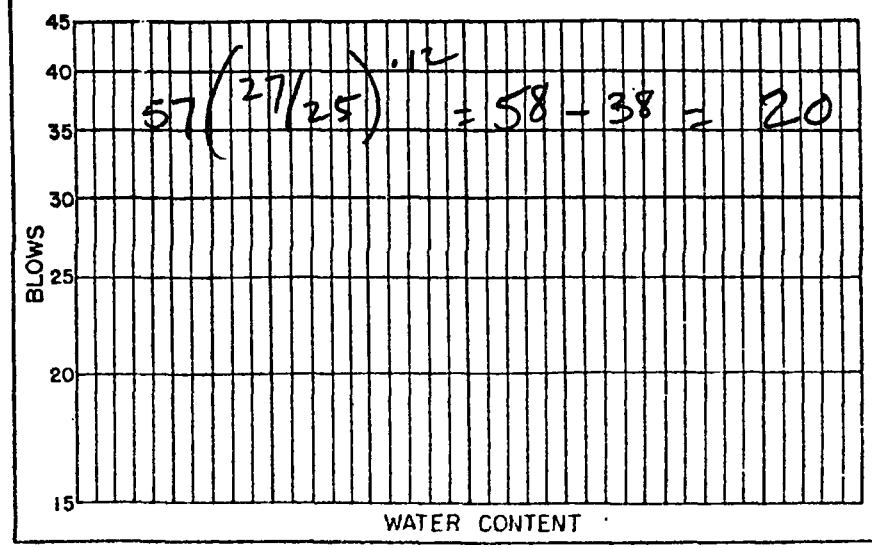
		-40	44.55	49.6
-¾		-80		
-4		-140		
-10	.10	100% -200	40.40	47

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	74				70
Wet Wt.	10.58				9.25
Dry Wt.	6.73				6.72
% H_2O	57%				PL= 38%
Blows	27				PI= 20



$57\left(\frac{27}{25}\right)^{.12} = 58 - 38 = 20$

DOT FORM 351-019

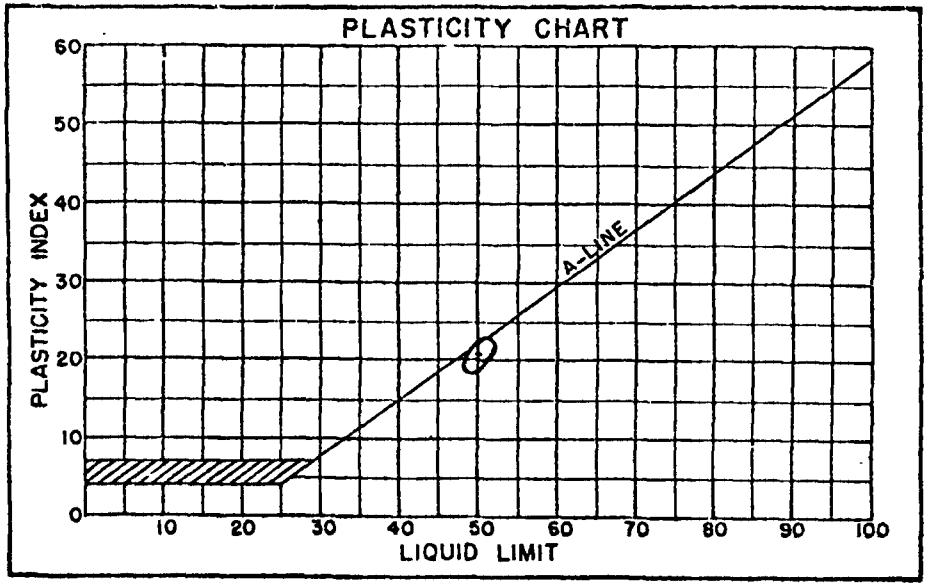
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3182 JOB NO. Hoa. HOLE NO. 1-13
DATE 11-2-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	✓

DESCRIPTION: Wet, Gr/Tan, Cly.
M. Sty. F. SAND w/ T. Cly.
grass & F. GRAVEL

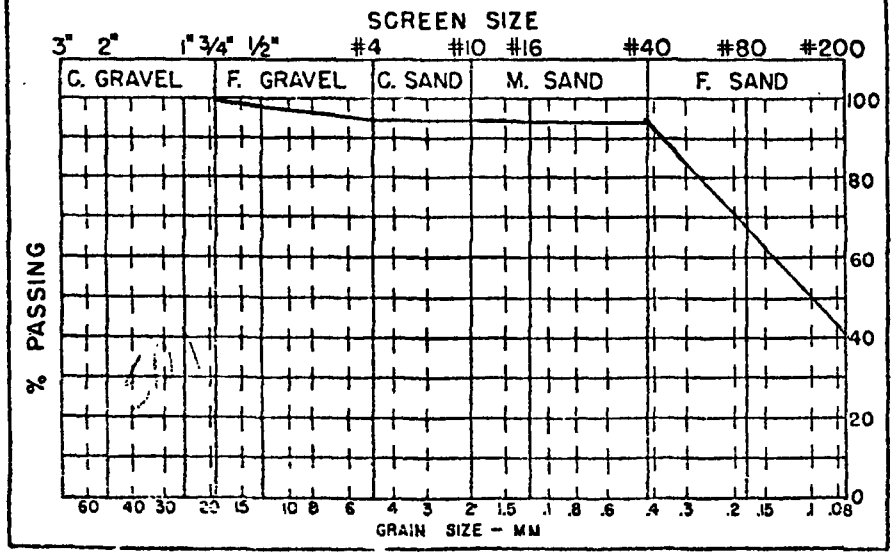


H2O = 43%

SIEVE ANALYSIS % Passing 127.30

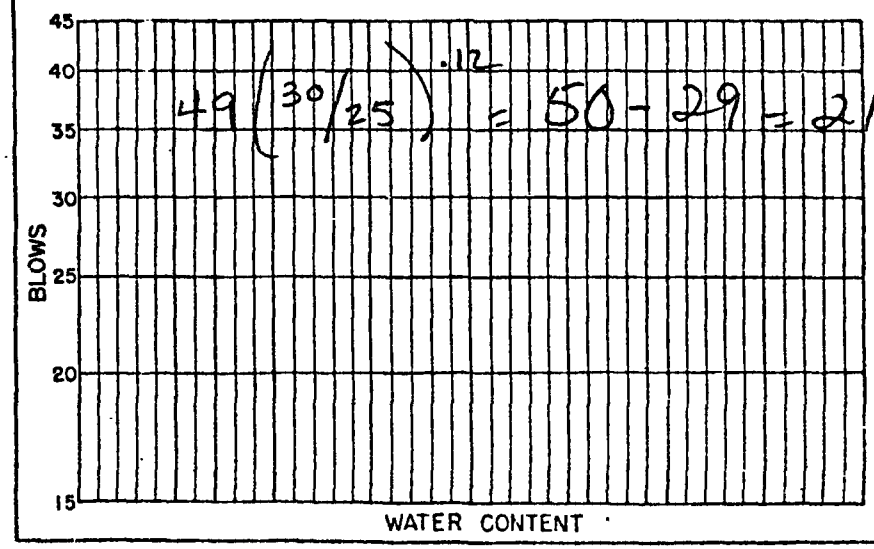
			-40	66.55	94
-3/4	6.75	100	-80		
-4	.93	94	-140		
-10	.21	94	-200	52.55	41

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	68				78
Wet Wt.	11.70				8.14
Dry Wt.	7.84				6.32
% H_2O	49%				PL= 29%
Blows	30				PI= 21



$49\left(30/25\right)^{.12} = 50 - 29 = 21$

DOT FORM 351-019

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

1. VISUAL ID. 2. MOISTURE ONLY

Place .....

Date 7-28-82

Dear Sir:

I have forwarded by today's ..... the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam Bypass (cut sect.) SR No. ..... Sub-Section .....

Station & Offset 150+38 32' Lt. Hole # J-13

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
E-3185-1	UNDIST. 1	6'2" 6'6"	H_2O: 54%	ML	Wet, TAN & ORANGE Cly. SILT w/ Slickensides - hard Breakable Lumps & T. F. Gravel.
-2	2	10'6 10'10	H_2O: 64%	ML	Wet, TAN & Rust Cly. SILT w/ Rust STREAKS & small breakable clumps of SILT
-3	3	11'10 12'2"	H_2O: 56%	ML	Wet, TAN-Rust Cly. SILT w/Rust Stains & small breakable clumps of SILT Like 3185-2
-4	4	15'6" 15'10"	H_2O: 60%	ML	Like 3185-2 w/ Slickensides
-5	5	16'10 17'2	H_2O: 55%	ML	Wet, tan-Rust Cly. SILT w/Rust
-6	6	20'6 20'10	H_2O: 75%	ML	Like 3185-5
-7	7	21'6 21'10	H_2O: 63%	ML	Like 3185-3
-8	8	25'6 25'10"	H_2O: 52%	ML	Wet, Gr. F. Sdy. SILT w/ T. MICA
-9	9	26'10 27'2	H_2O: 69%	ML	Wet, dk. Gr., BLK. Cly. org. chunks of Wood in F. Sdy. SILT & break. clumps of Silt.

1 copy with samples
1 copy to addressee

Yours very truly,

.....
Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

IATERIALS ENGINEER
laterials Laboratory
. O. Box 167, Olympia, WA 98504 (Mailing Address)
555 So. 2nd Ave.
umwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 7-29-82

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section Hequiam by Pass SR No. 101 A Sub-Section culvert

Station & Offset 148+95 68' Lt. Hole # J-14

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
E-3186	U-1	0' 4" / 0' 8"	B		
3187	D-2	2' 0" / 4' 0"	71%	MC	Wet, orange, tan, Blk. & Gr. F. Sdy. SILT
3188	U-3	5' 4" / 5' 8"			
3189-1	D-4	7' 0" / 9' 0"		MC	Like 3187
-2	D-6	12' 0" / 14' 0"	272	GM	Moist, Rust & Gr. V. Sty. Sdy 1"(-) & GRAVEL
-3	D-7	15' 0" / 17' 0"		GM	Same
3190-1	U-8	20' 0" / 20' 4"	A		
-2		20' 4" / 20' 8"	B		
-3		20' 8" / 21' 0"	C		

opy with samples
opy to addressee

Yours very truly,

Barry M. Moore
Inspector.

FORM 351-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater

Date 7-27-82

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam by Pass SR No. 101A Sub-Section Culvert

Station & Offset 148+95 62' Lt. Hole # J-14

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3191-1	D-9	22' 0" 23' 6"	25%	SM	Moist, tan, Brn. & Rust W/ Layers of F. SAND, Sdy. Silt & F. Gravel w/T. MICA embedded.
-2	D-10	25' 0" 26' 6"	27%	GM	Like 3189-2 moist, Rust & Gr., V. Sty. Sdy. 1"(-) & GRAVEL
-3	D-11	29' 6" 31' 0"	36%	ML	Moist, tan, Orange w/rust Stks., F. Sdy. SILT w/ T. Mica & Clay
-4	D-13	40' 0" 41' 6"	25%	SM	Like 3191-1

1 copy with samples
1 copy to addressee

Yours very truly,

Larry M Moore
Inspector.

DOT FORM 351-002 REVISED 2-80

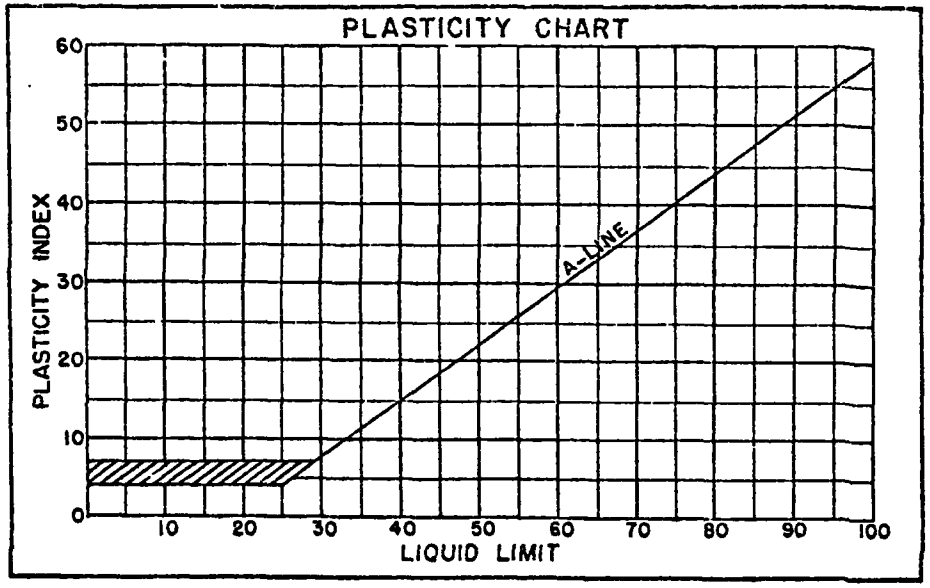
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3187 JOB NO. Hog. HOLE NO. J-19
DATE 11-1-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Wet Orangie, tan, BLK. Agr. F. Sdy SILT

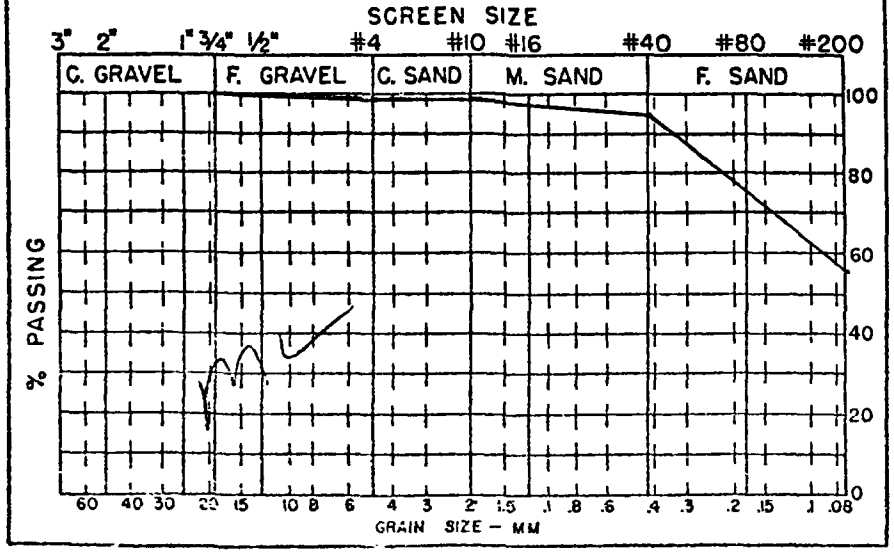


H_2O = 71%

SIEVE ANALYSIS % Passing 71.62

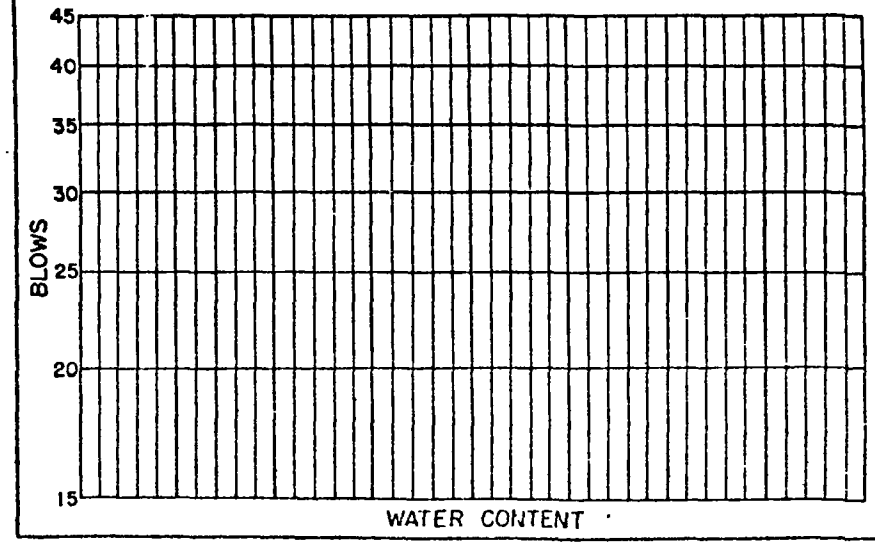
			-40	28.35	95
one -3/4	1.30	100%	-80		
-4	.05	98	-140		
-10	1.92	98	-200	40	56

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DJT FORM 351-019

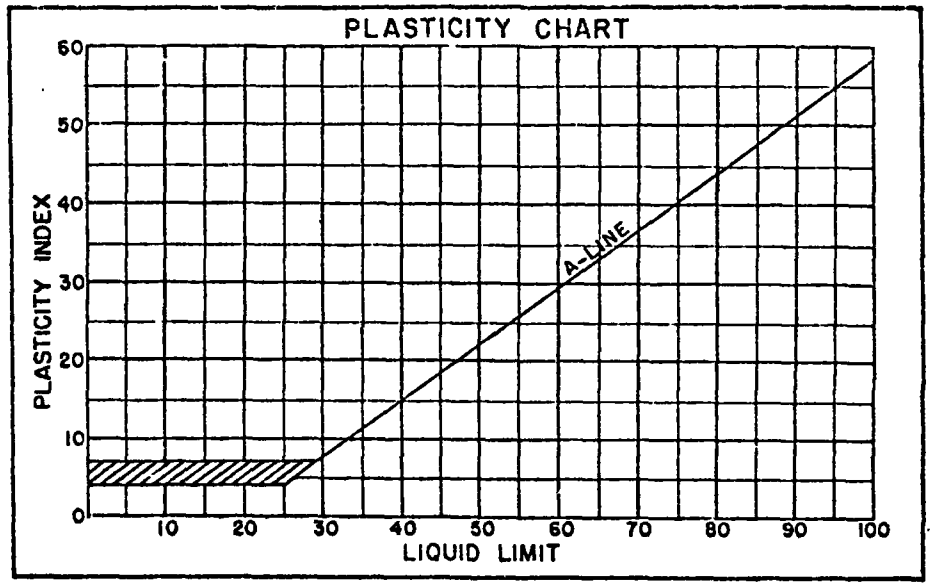
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3189-2 JOB NO. Hg. HOLE NO. J-14
DATE 11-1-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: Moist, Rust & Gr.
V. Sty. Sdy. 1"(-) & GRAVEL

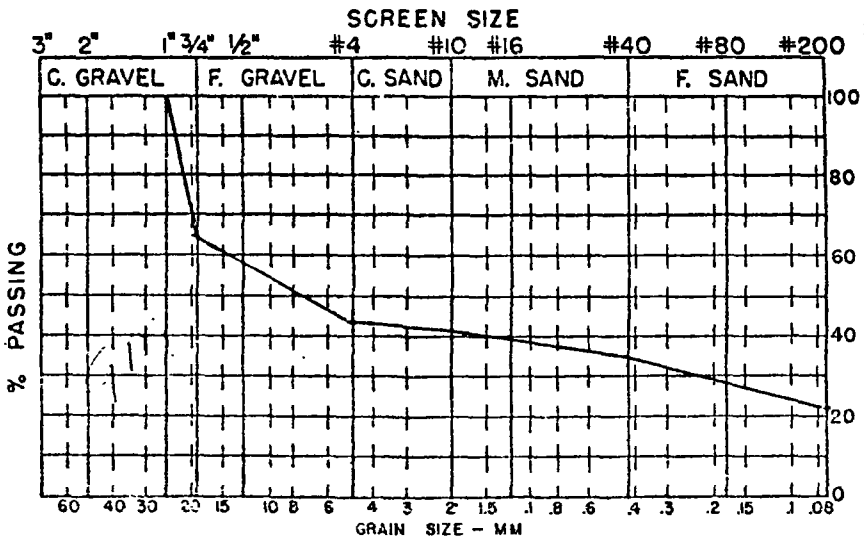


H_2O=27%

SIEVE ANALYSIS % Passing 115.31

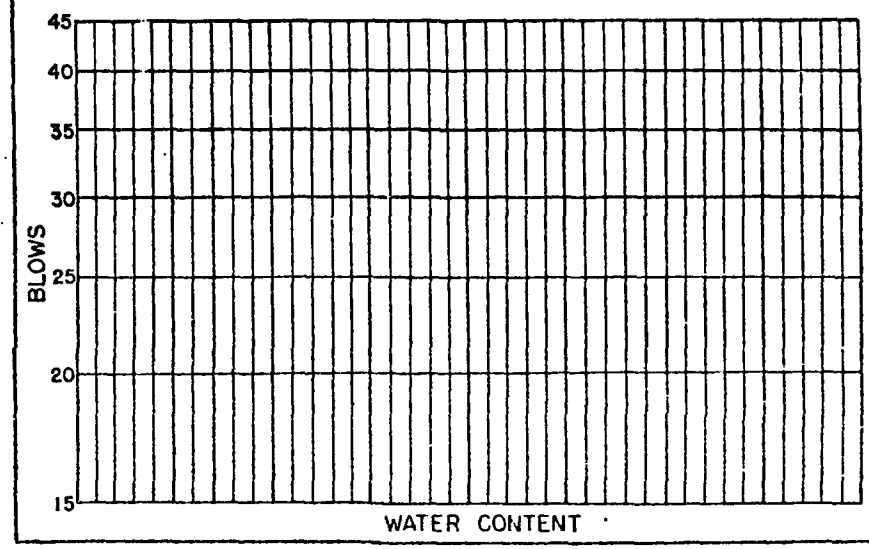
-1	41.70	100%	-40	15.61	.35
-3/4	23.80	64	-80		
-4	3.09	44	-140		
-10	6.78	41	-200	2.83	.22

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DJT FORM 351-019

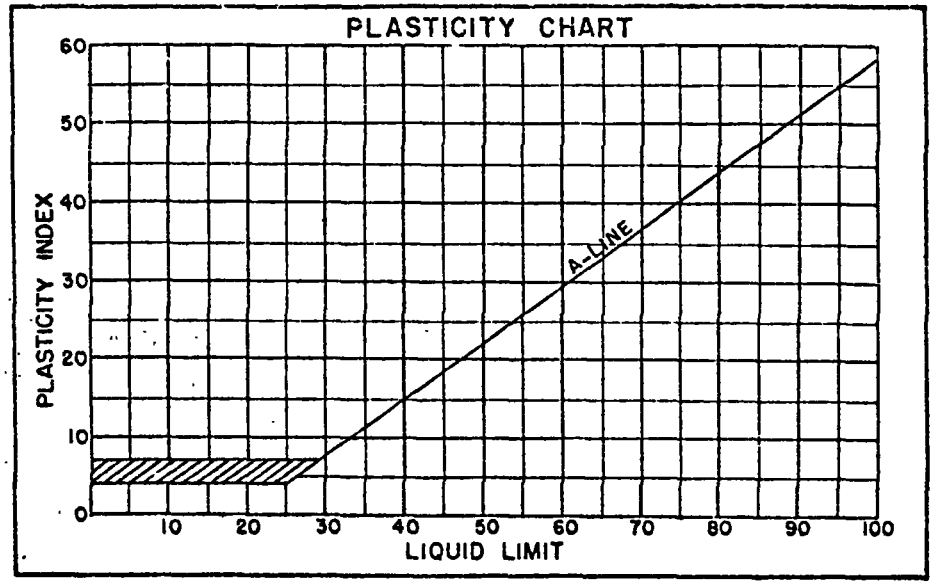
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3191-1 JOB NO. Hog HOLE NO. J-14
DATE 11-1-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Moist, tan, Brn & Rust w/ Layers of F. SAND & Sdy. SILT F. Gravel embedded w/ T. Mica

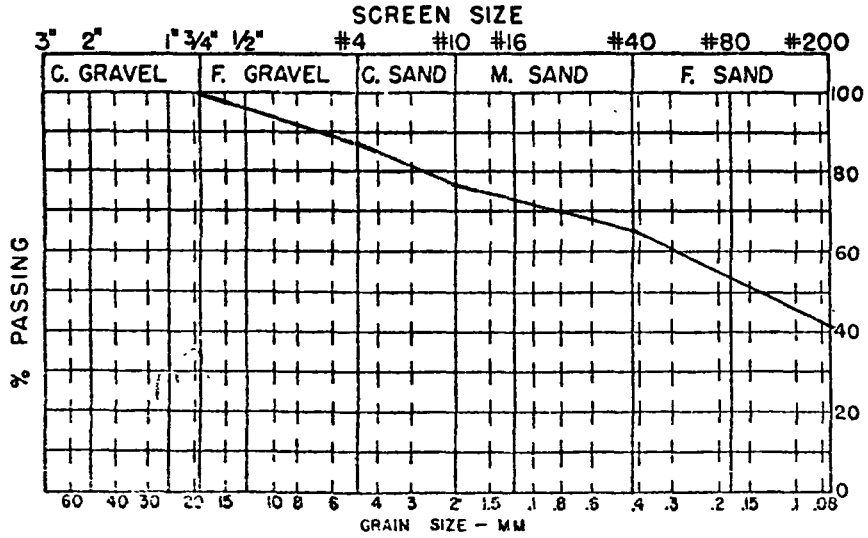


H_2O = 25 %

SIEVE ANALYSIS % Passing 127.80

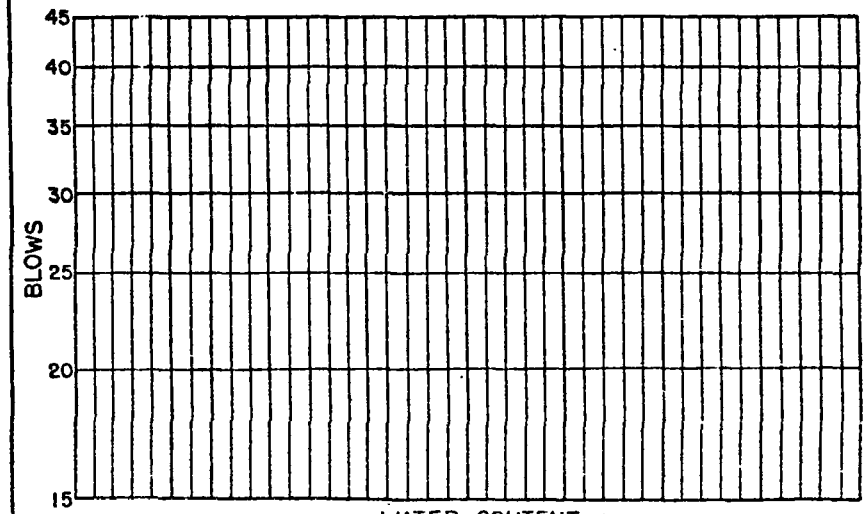
			-40	29.50	65
-3/4	14.90	100%	-80		
-4	14.82	88	-140		
-10	14.96	77	-200	53.62	42

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DJT FORM 351-019

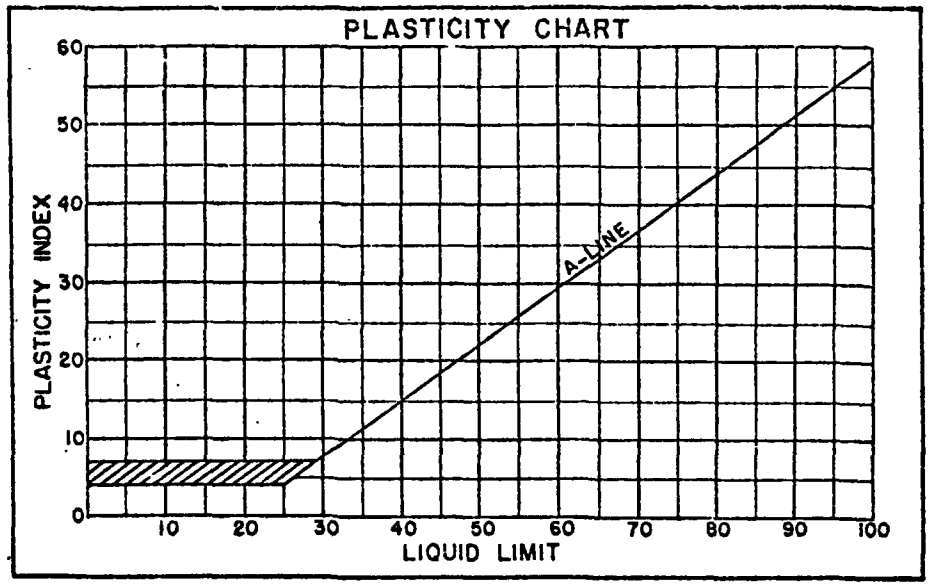
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3191-3 JOB NO. Hog HOLE NO. J-14
DATE OPERATOR

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	✓

DESCRIPTION: Moist, tan, orange w/ rust streaks. F. Sdy. Silt w/ T. Mica & T. Cly

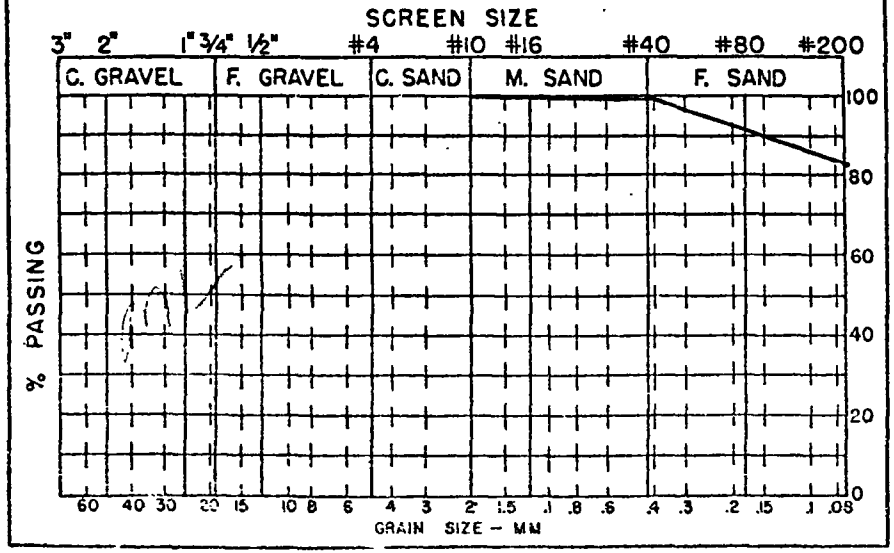


H-20 = 36%

SIEVE ANALYSIS

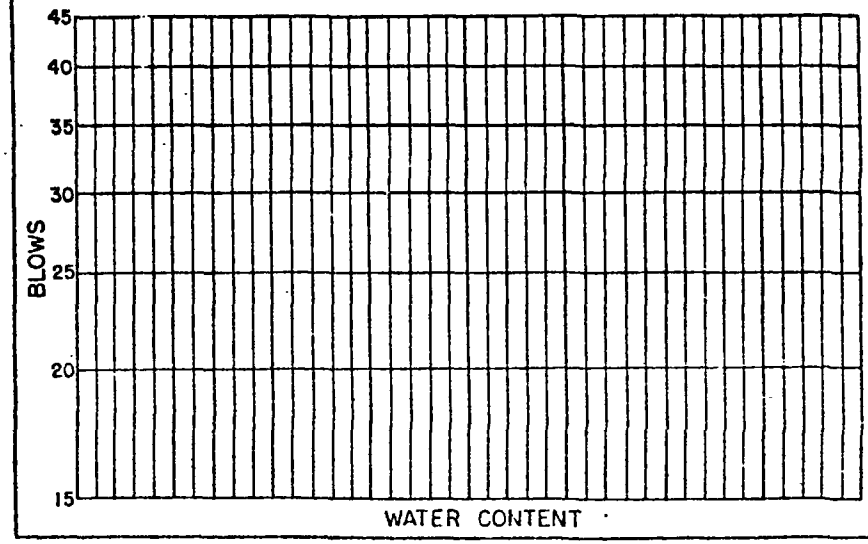
		% Passing		
		-40	22.35	99.9
-3/4		-80		
-4		-140		
-10	1.08 100	-200	111.37	83

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 7-30 82

Dear Sir:

I have forwarded by today's state car the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam by Pass SR No. 101 A Sub-Section Culvert

Station & Offset 148+70 60' Rt. Hole # F15

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
E-3192 -1	U-1	0' 6" 0' 10"	A		
-2		0' 10" 1' 2"	B		
3193	D-2	2' 6" 4' 6"	422%	OL	SAT., DARK BRN., BLK., (Trace Cly.) F. Sdy. SILT w/ 2 Large chunks of WOOD & Roots
3194	U-4	I.D. only.	276%	PT	Like 3138-1 Sat, dk. Brn./BLK. Sl. Sty. WOODY FIBROUS PEAT w/ twigs.
3195 -1	D-6	14' 0" 15' 0"		PT	Like 3194
-2	D-8	17' 0" 19' 0"	54%	ML	Moist, tan, Brn., BLK. Layers of Silt & org. Sticks w/ F. Gravels embedded
3196 -	U-7	I.D. only.	62%	SM	moist, Gr. w/ tan orange coat. V. Sty. F. SAND w/ org. Wood.
3197 -1	D-10	22' 0" 24' 0"	28%	SM	moist, olive, greenish, V. Sty. F-M SAND w/ T. F. Grav. & mica.
-2	D-11	25' 0" 26' 6"	26%	SM	Moist, Greenish, grayish Layers of Sty. F. SAND & F SAND w/ Rust Streaks & mica

1 copy with samples
1 copy to addressee

Yours very truly,

Larry Y. Y. Toone
Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

'ATERIALS ENGINEER
:aterials Laboratory
O. Box 167, Olympia, WA 98504 (Mailing Address)
55 So. 2nd Ave.
ımwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 7-30-82

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam by Pass SR No. 101 A Sub-Section Culvert

Station & Offset 148+70 60' Rt. Hole # J-15

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3197 -3	D-12	30' 0" 32' 0"	H: 20%	SM	Moist, Gr. (w/rust Layers) Layers of SILTY F. SAND & Silt w/pockets of F. Grav. SAND & T. mica
-4	D-14	40' 0" 40' 9"	27%	GM	Like 3189-2 Moist, Rust & Gr, V. Sty. Sdy. 1"F) & GRAVEL

opy with samples
opy to addressee

Yours very truly,

Larry M Moore
Inspector.

FORM 351-002

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

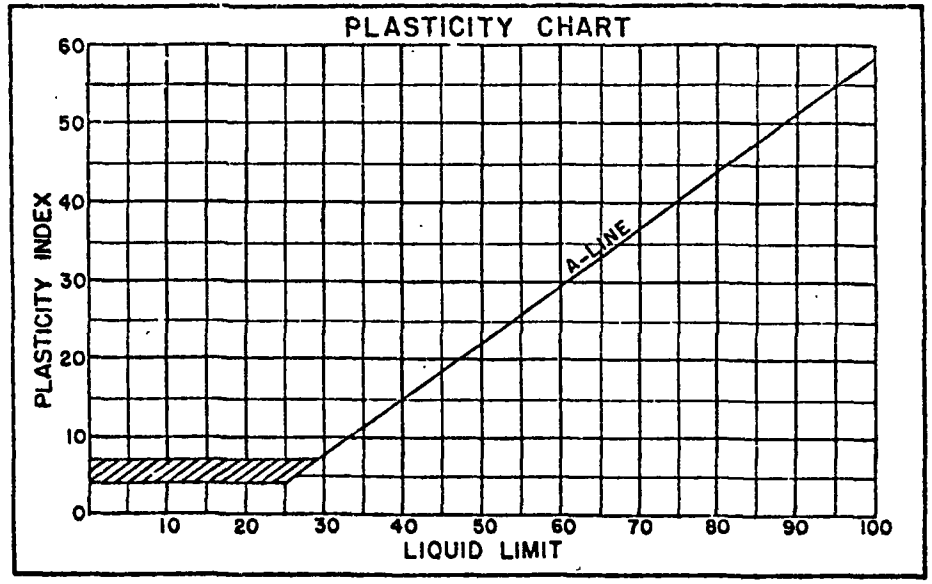
SAMPLE NO. 3193 JOB NO. Hog HOLE NO. J-15
DATE 11-1-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	✓

DESCRIPTION: Sat. DK. Brn., BLK. Sdy. F. Sdy. SILT w/ wood & Roots w/ t. clay. & Large pieces

PLASTICITY CHART

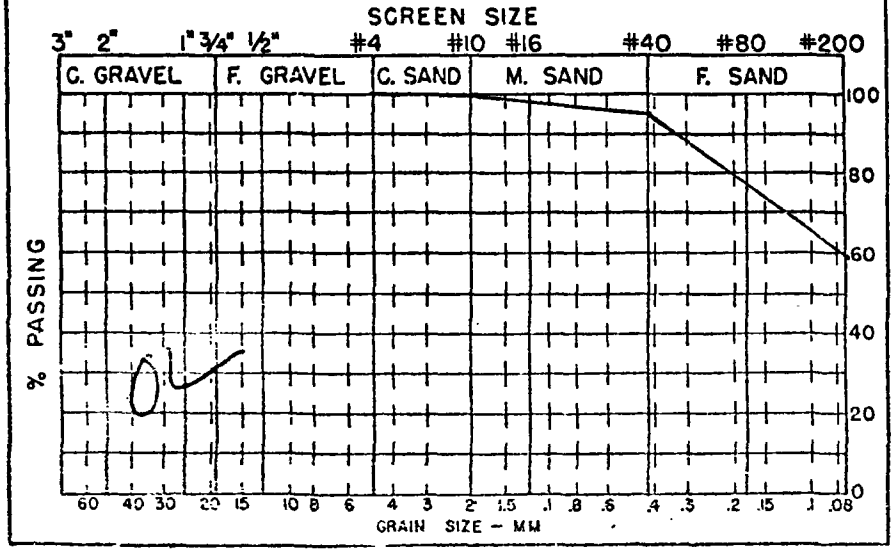


H20 - 42.29%

SIEVE ANALYSIS % Passing 42.47

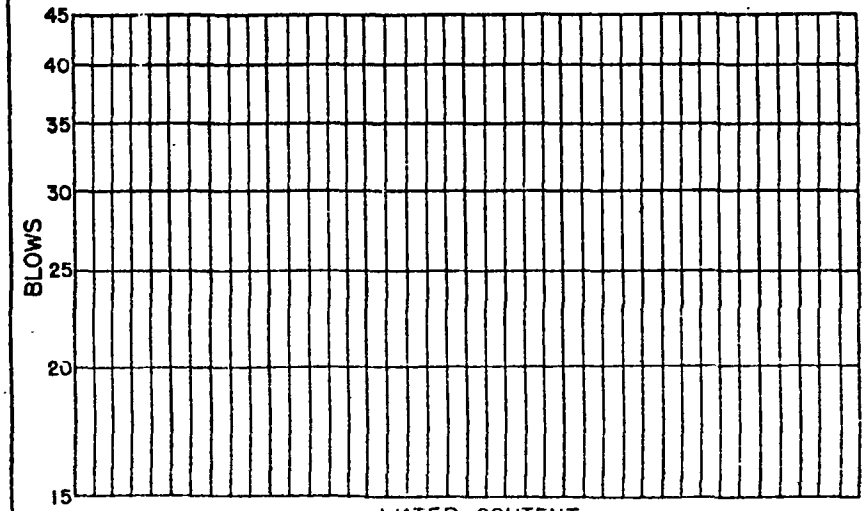
			-40	15.28	95
-3/4			-80		
-4	.20	100	-140		
-10	2.09	99.9	-200	24.90	59

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

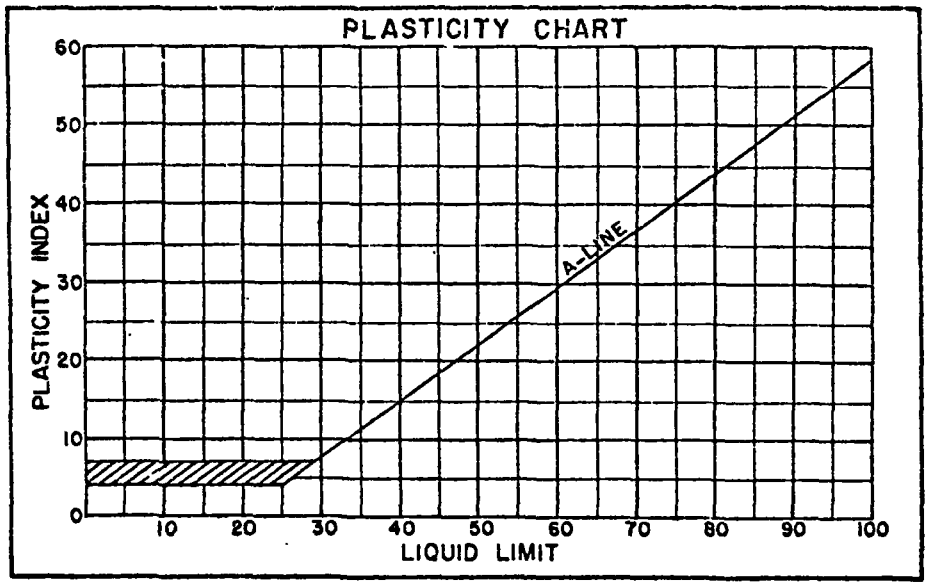
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3195-2 JOB NO. ~~Hog~~ HOLE NO. J-15
DATE 11-1-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST		✓	
DILATANCY			
BITE			
TOUGHNESS		✓	

DESCRIPTION: Moist, tan, Brn., BLK. Layers of Silt & org. Sticks w/F. Granule Embedded.

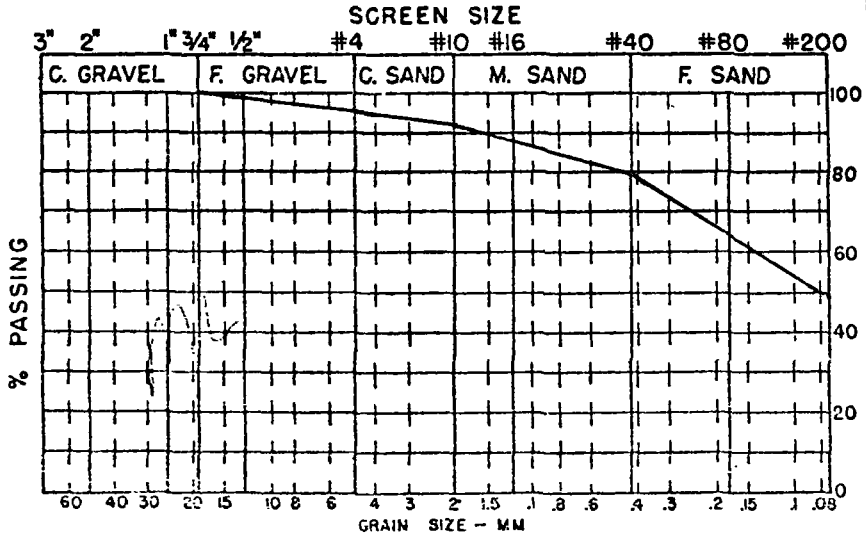


H_2O = 54 %

SIEVE ANALYSIS % Passing/107.12

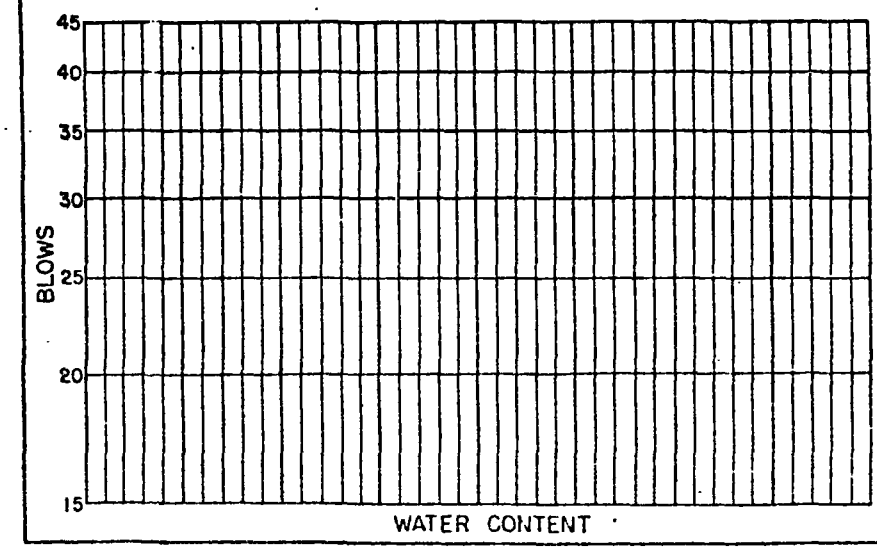
			-40	32.47	79
-¾	4.23	100%	-80		
-4	3.65	96	-140		
-10	14.58	93	-200	52.19	49

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



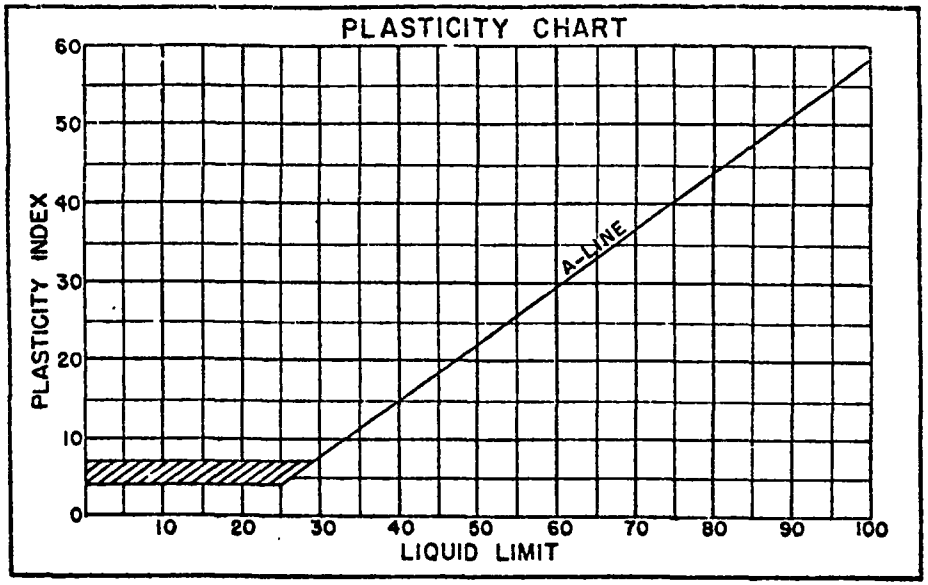
DOT FORM 351-019

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3196 JOB NO. ~~Hog~~. HOLE NO. J-15
DATE 11-1-82 OPERATOR BB

SOIL FIELD IDENTIFICATION			
TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST		✓	
DILATANCY			
BITE			
TOUGHNESS			

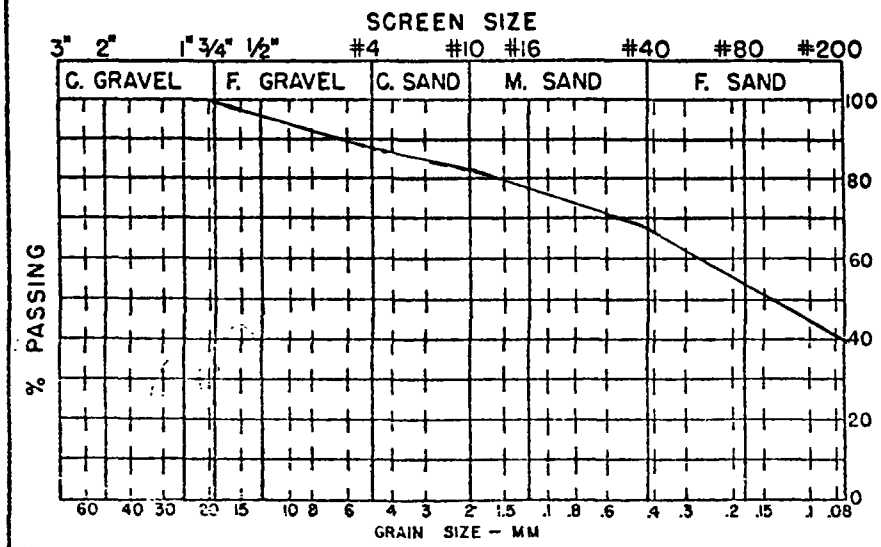
DESCRIPTION: Moist, Gr. w/tan orange coat. V. Sty. F. SAND w/org. Wood.



$H_2O = 62\%$

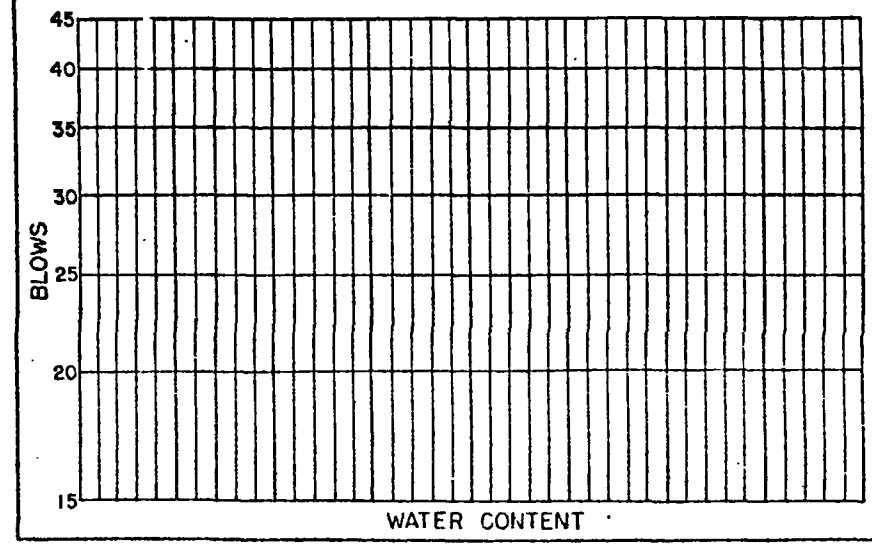
SIEVE ANALYSIS			% Passing 96.30		
			-40	27.50	68
-3/4	11.91	100%	-80		
-4	5.80	88	-140		
-10	12.72	82	-200	38.37	40

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

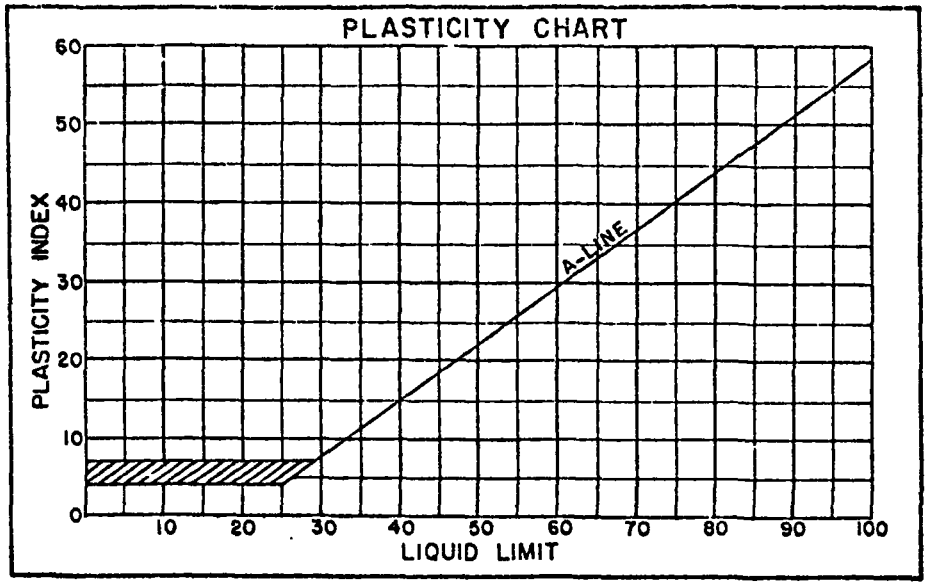
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3197-1 JOB NO. Hoy HOLE NO. J-15
DATE 11-1-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Moist, Olive, Greenish U. Sty. F. M. SAND w/ T. Fine Gravel & Mica

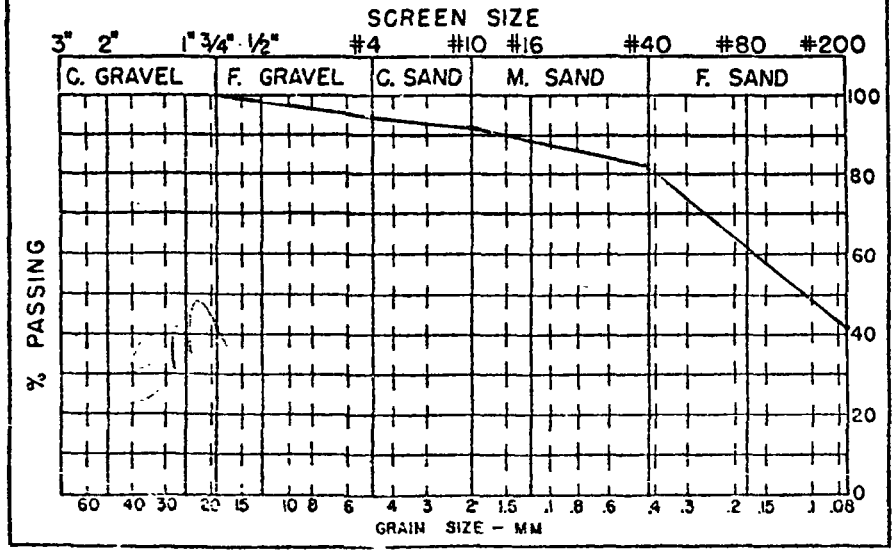


1-1/20 = 28%

SIEVE ANALYSIS % Passing 104.30

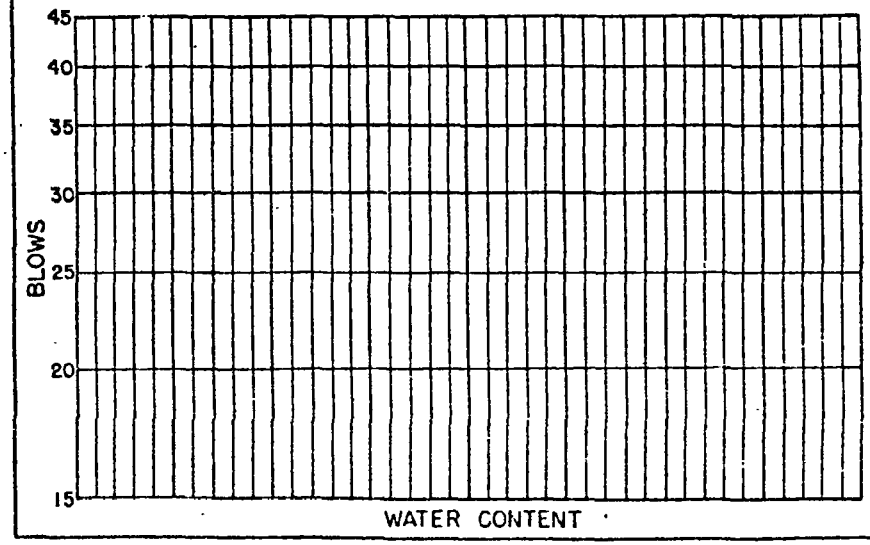
			-40	40.92	81
-3/4	5.42	100	-80		
-4	3.40	95	-140		
-10	11.10	92	-200	43.46	42

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

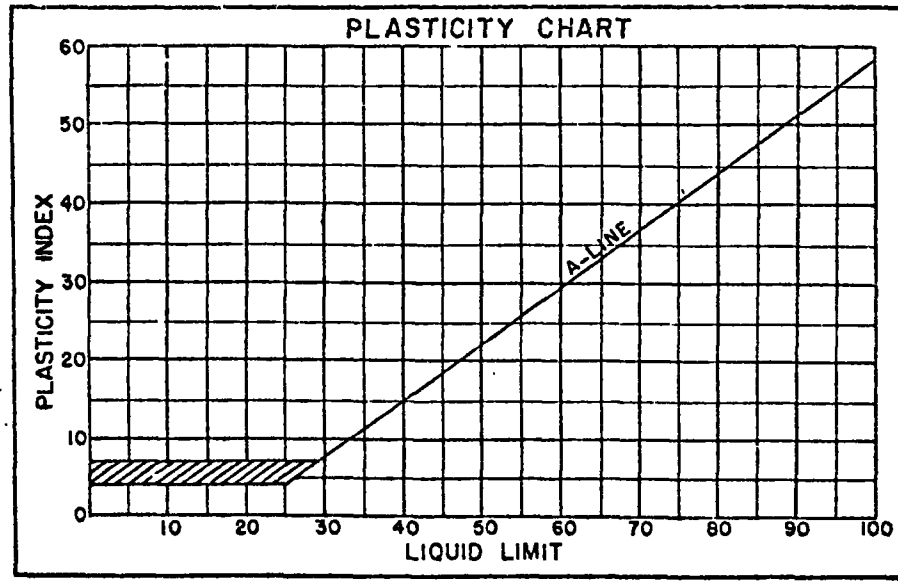
SAMPLE NO. 3197-3 JOB NO. Hog HOLE NO. J-15
DATE 11-1-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Moist, Gr. (w) rust layers) Layers of Silt & Sty. F. SAND w/ Pockets of F. Grav. SAND & T. Mica.

PLASTICITY CHART

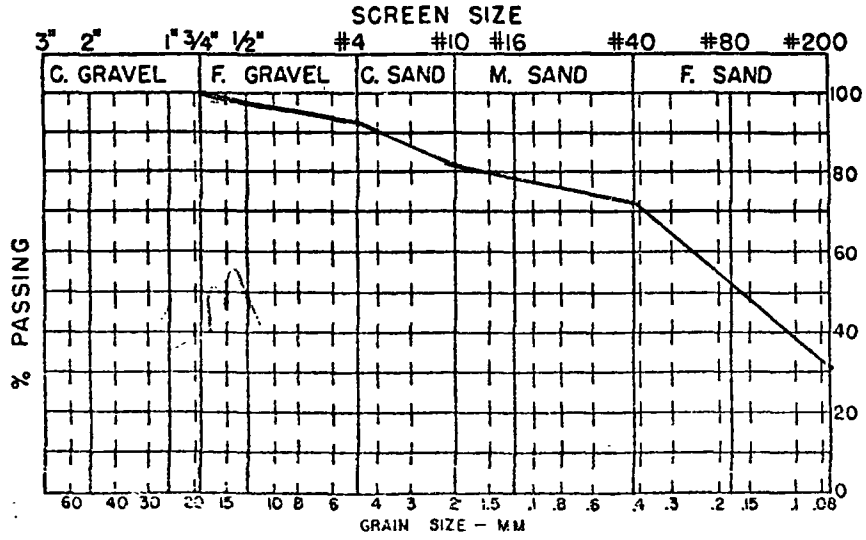


11-20-2020

SIEVE ANALYSIS % Passing 94.20

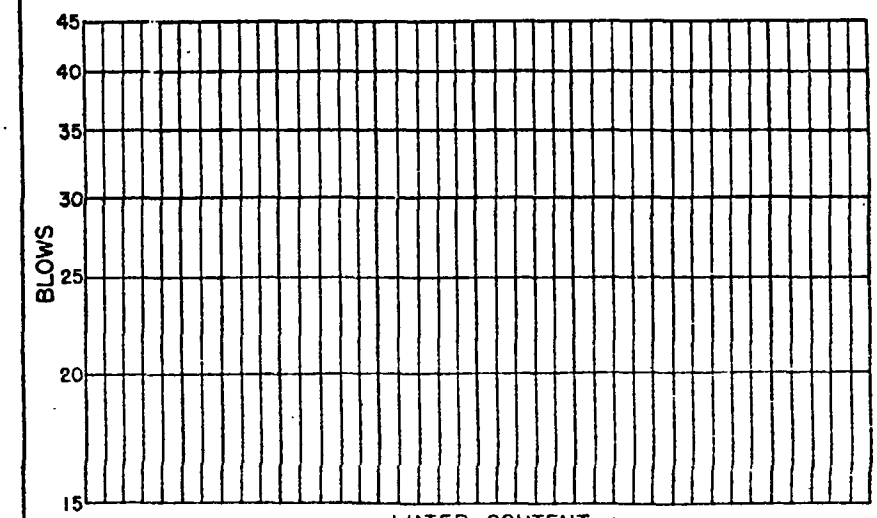
			-40	39.14	73
-3/4	6.09	100	-80		
-4	11.81	93	-140		
-10	7.62	81	-200	29.74	31

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

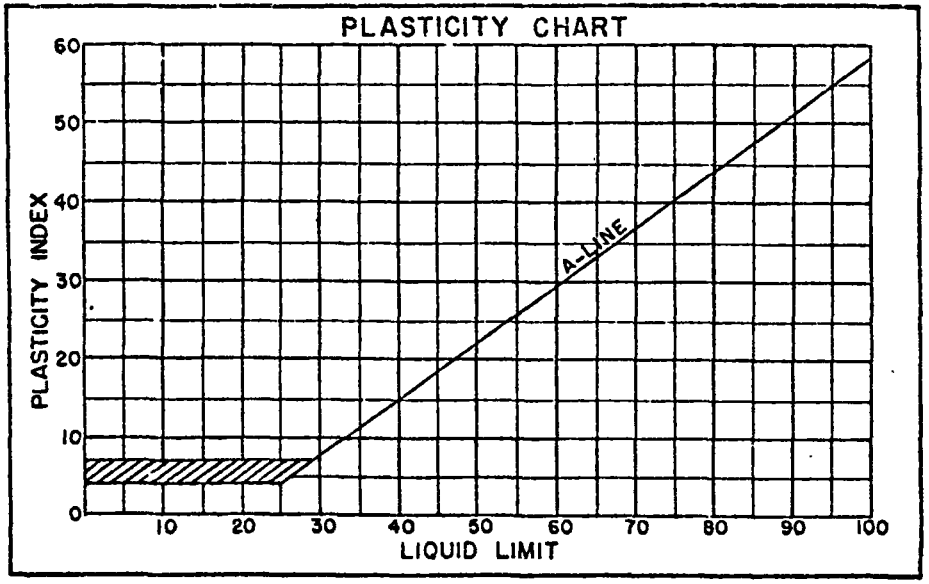
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3197-2 JOB NO. Hog. HOLE NO. J-15
DATE 11-2-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: MOIST Greenish, Grayish Lays of Sty F. SAND & F. SAND W/ Rust streaks & MICA.

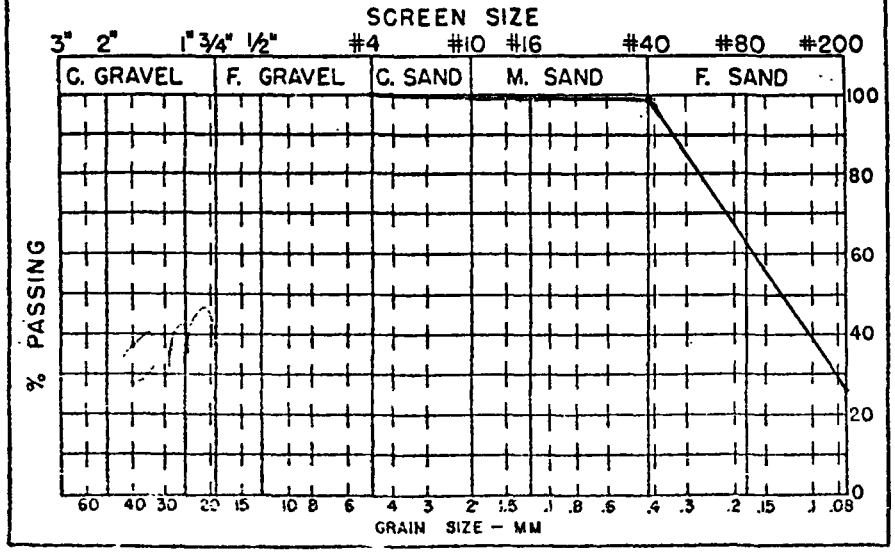


H2O = 26 %

SIEVE ANALYSIS % Passing 122.30

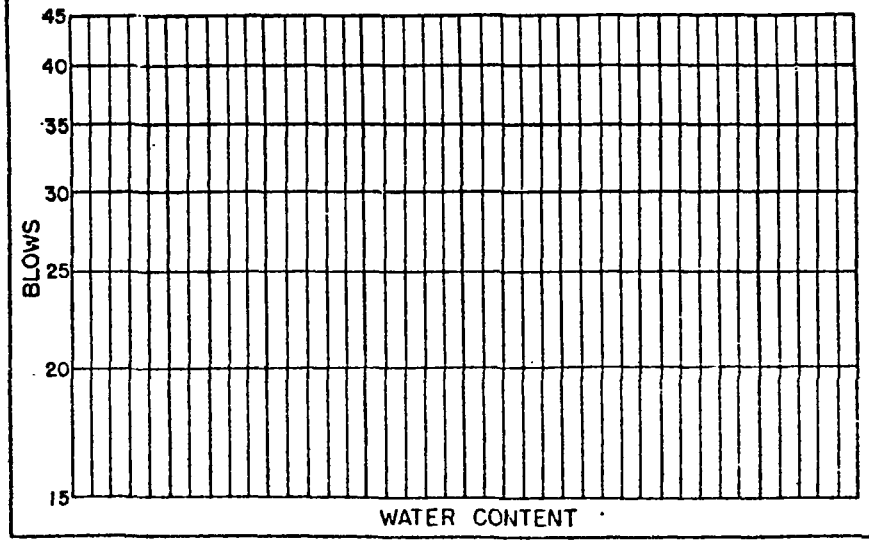
			-40	90.22	99%
-3/4			-80		
-4	.01	100%	-140		
-10	.70	99.9	-200	31.37	26%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

ATERIALS ENGINEER
terials Laboratory
O. Box 167, Olympia, WA 98504 (Mailing Address)
5 So. 2nd Ave.
nwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 8-19-82

Dear Sir:

I have forwarded by today's State Car the following Foundation Samples.

Contract or Job No. L-7262 Section west Hoquiam bypass
SR No. 10 A Sub-Section culvert

Station & Offset 147+40 70' Rt. Hole # J-16

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
E-3412	D-2	2' 0" 4' 0"	W. 422	OL	Like 3193 SAT. Dk. Brn, Blk. F. Sdy. SILT w/ Wood & Roots.
3413	S-3	4' 0" 6' 0"	W. 226%	OL	Very Moist, dk. Brn., Gr. Org. Wood & Pty. FIBERS w-Some Silt layers & T. Clay.
3414	D-4	6' 0" 8' 0"	W. 98%	OL	SAT. Tan, Brn. Cly. SILT w/ Trace of ORGanic TWIGS
3415	S-5	9' 0" 11' 0"		OL	Like 3413 except NO Apparent Layering
3416-1	D-6	11' 0" 13' 0"	W. 47%	SM	Wet, Olive, orange, tan, V. Sty F. SAND & F. GRAVELS w/ Traces M-C SAND & MICA
-2	D-7	14' 0" 16' 0"	W. 28%	SM	Like 3197-1 Moist, Cinnamon & grn. V. Sty. F-C vs. SAND w/T. F. Grav. & Mica
-3	D-8	19' 0" 21' 0"	W. 25%	SM	Moist, Cinnamon-Brn., V. Sty. F. SAND w/ T. Mica.
-4	D-9	24' 0" 26' 0"	W. 18%	SM	Moist, Lt. Brn. & Gr., V. Sty. F. SAND w/ Layers & F. SAND, Med. sand, T. Mica & Rust.
-5	D-10	29' 0" 31' 0"	W. 24%	SM	Moist, tan w/ Rust Layers, Layers of F. SAND & Silt

py with samples
py to addressee

Yours very truly,
Milford Sanders
Inspector.

FORM 351-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 8-19-82

Dear Sir:

I have forwarded by today's State Car the following Foundation Samples.

Contract or Job No. L-7262 Section West Hoquiam bypass SR No. 10A Sub-Section culvert

Station & Offset 147+40 70' Rt. Hole # J-16

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3416-6	D-11	34' 0" 35' 5"	4-27%	SM	Moist, Brn-Gr. Layers of Gr & Tan Sty. F. SAND w/Rust Streaks & T. mica

1 copy with samples
1 copy to addressee

Yours very truly,
Milford Landers
Inspector.

DOT FORM 351-002 REVISED 2/80

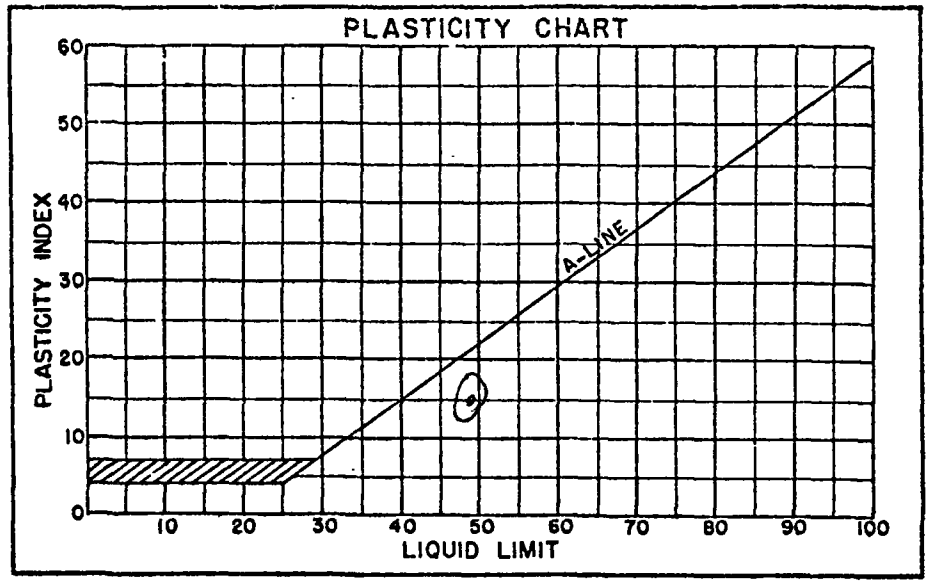
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3413	JOB NO. Hog.	HOLE NO. J-16
DATE 9-7-82	OPERATOR BB	

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			✓

DESCRIPTION: Very Moist, dk. Brn., Gr. ORG Wood & FIBERS w. Some Silt Layers. T. Cly.

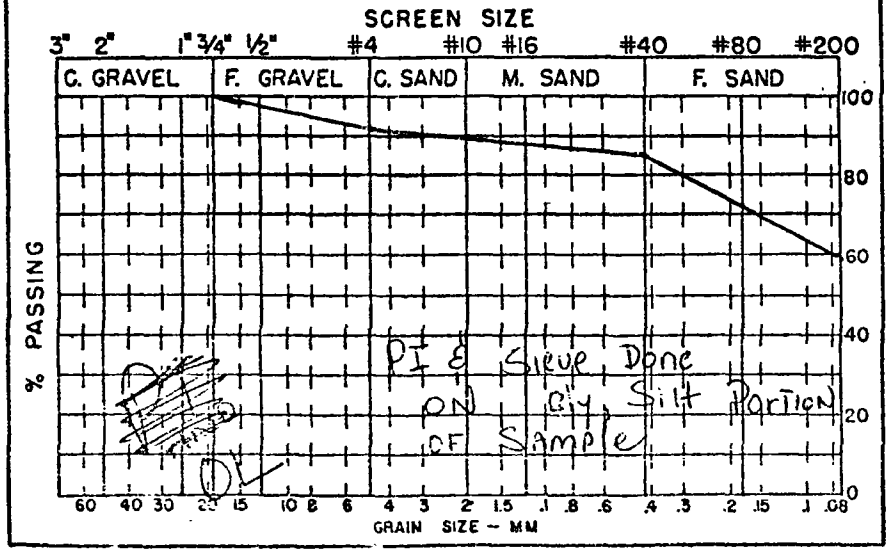


H_2O = 226 %

SIEVE ANALYSIS % Passing 76.35

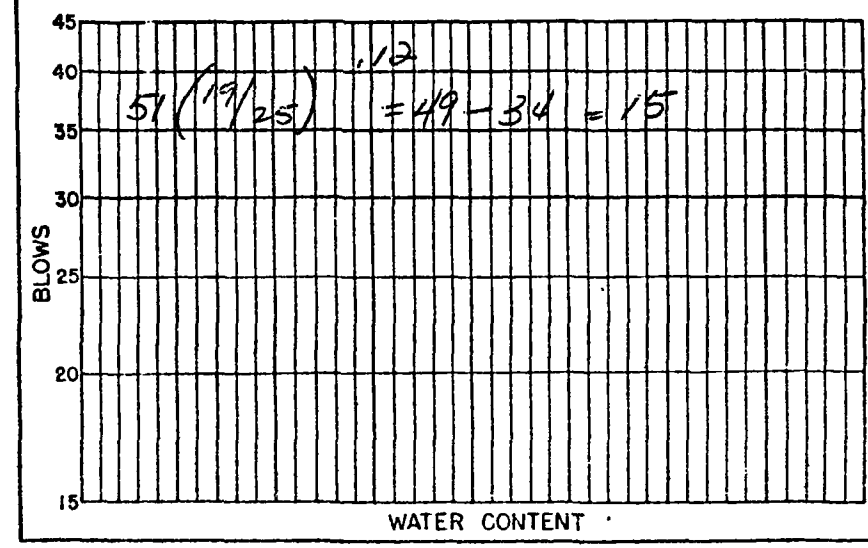
			-40	20.32	85
Wood -3/4	6.51	100%	-80		
-4	1.00	91	-140		
-10	3.62	90	-200	47.90	59%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	32				47
Wet Wt.	11.75				7.44
Dry Wt.	7.80				5.57
% H_2O	51%				PL= 34%
Blows	19				PI= 15



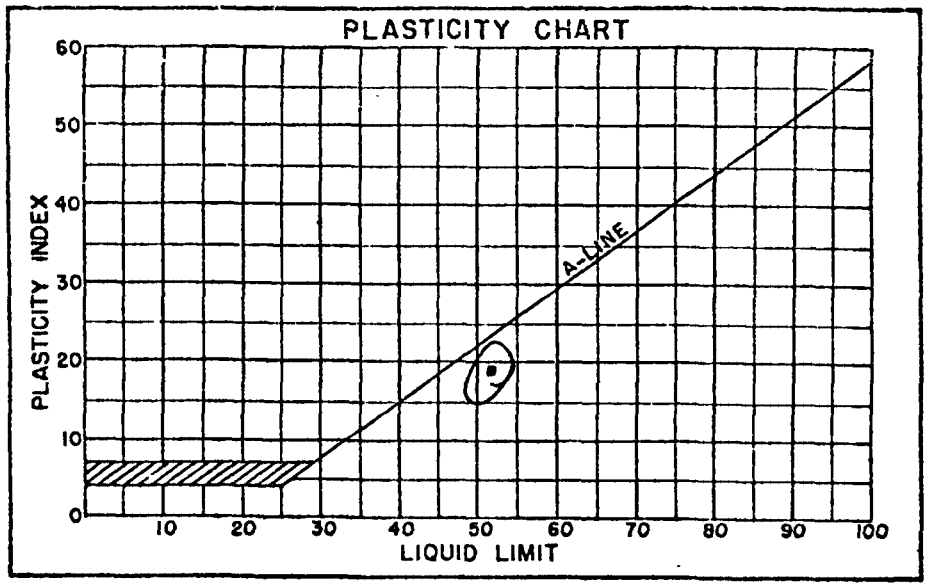
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3414 JOB NO. Hog HOLE NO. J-16
DATE 11-2-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			✓

DESCRIPTION: SAT. tan, Brn. Cly. Sty. ORGanic DEAT w/ twigs

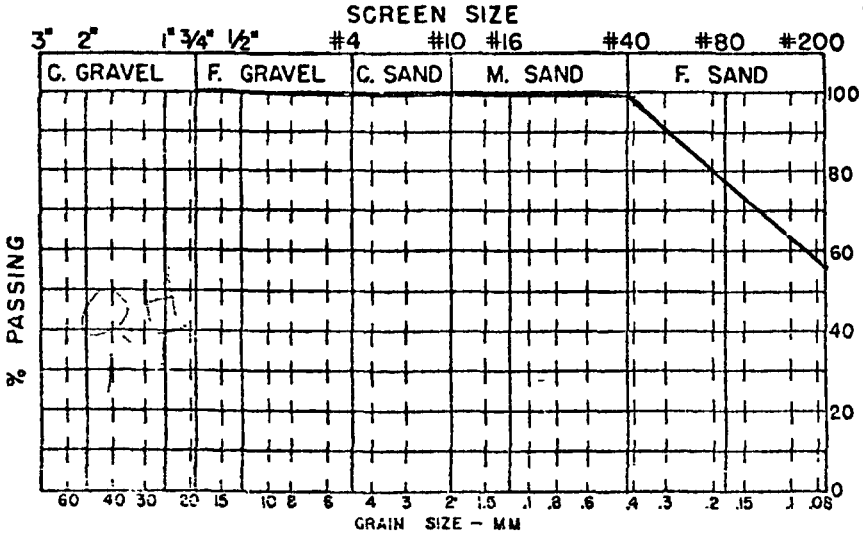


H2O = 98%

SIEVE ANALYSIS % Passing 50.53

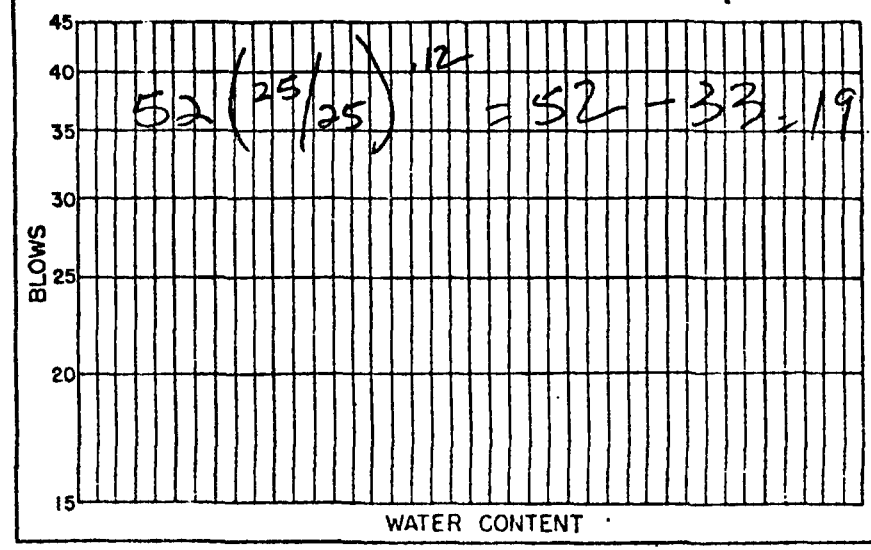
			-40	21.47	99
-3/4	.66	100%	-80		
-4	.04	99	-140		
-10	.12	99	-200	28.47	56%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	15				115
Wet Wt.	10.78				7.88
Dry Wt.	7.08				5.92
% H_2O	52%				PL= 33%
Blows	25				PI= 19



DOT FORM 351-019

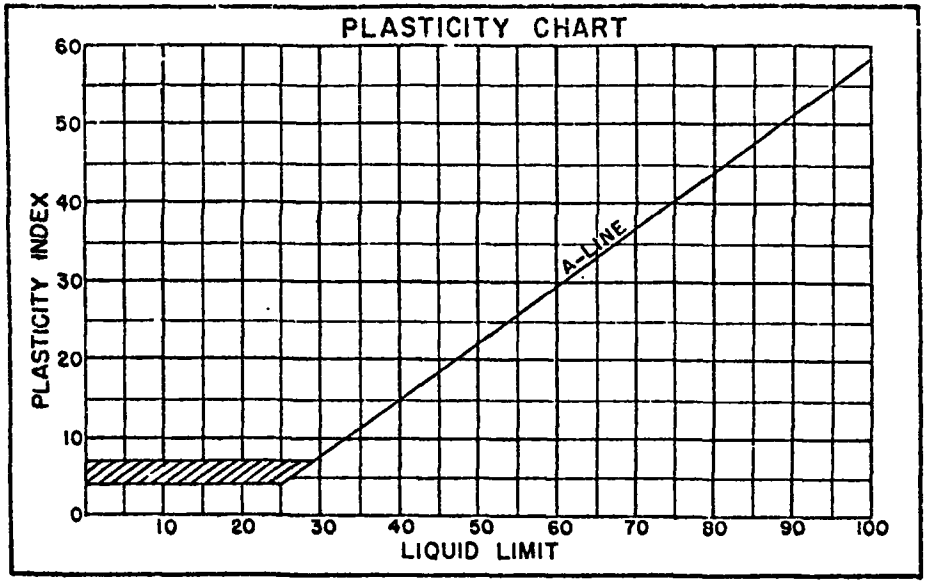
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3416-3 JOB NO. Hog. HOLE NO. J-16
DATE 11-2-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

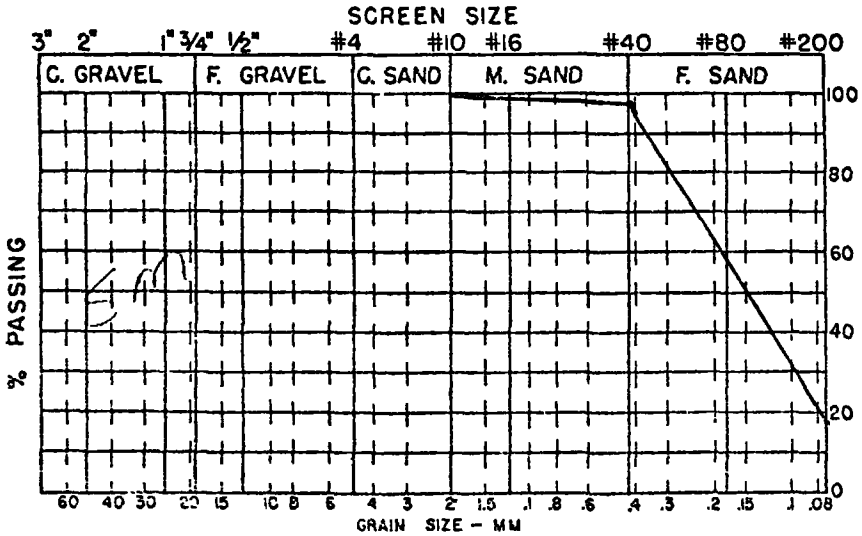
DESCRIPTION: Moist, Cinnamon-Brn
U. Sty. F. SAND w/
T. MICA



$H_2O = 25\%$

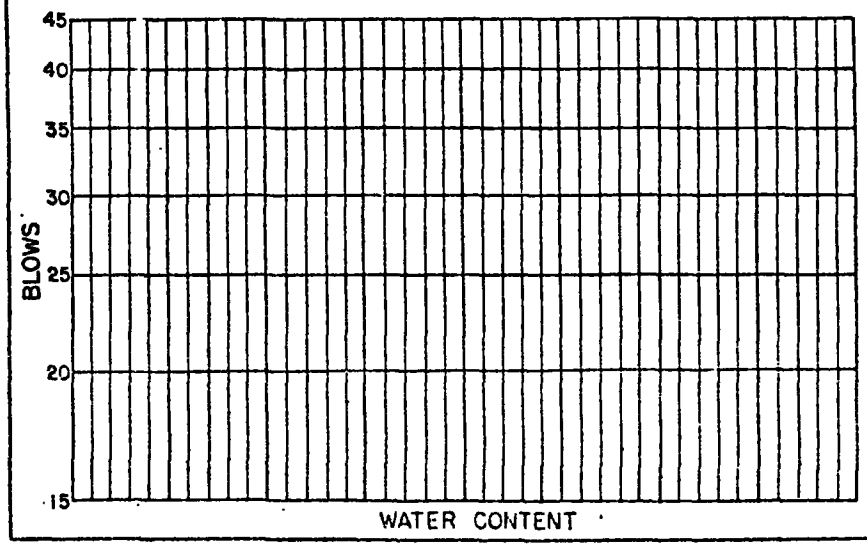
SIEVE ANALYSIS		% Passing 69.83	
	-40	56.32	97
-3/4	-80		
-4	-140		
-10 1.80 100%	-200	11.71	17

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DJT FORM 351-019

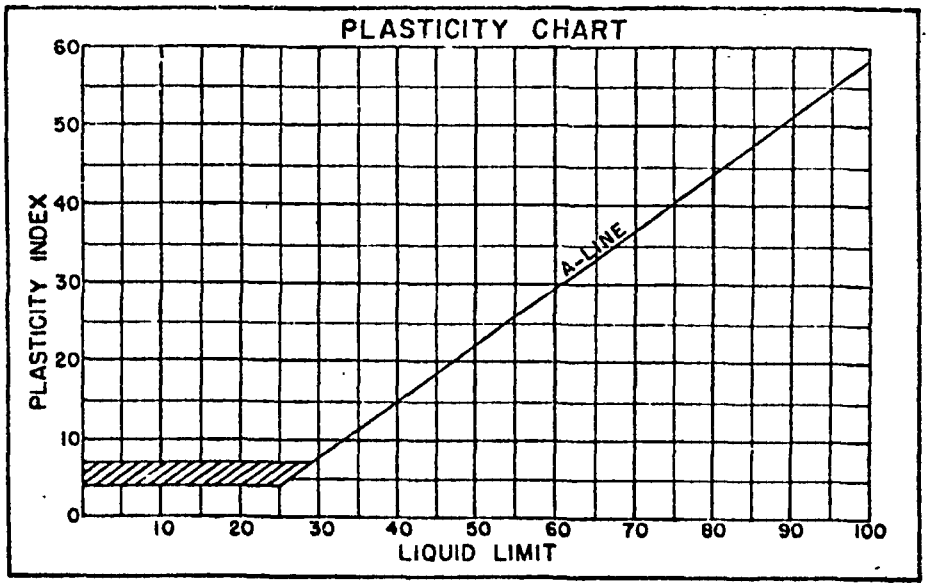
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3416-4 JOB NO. 40a. HOLE NO. J16
DATE 11-2-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Moist, Lt. Brn. & Gr. Sty. F. SAND w/ Lays. of F. SAND, Med. SAND, Tr. mica & Rust

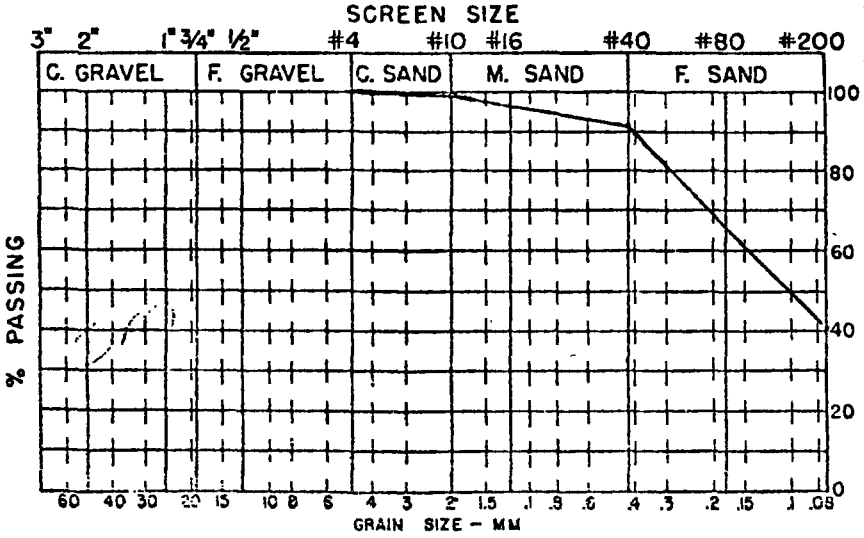


H_2O = 18%

SIEVE ANALYSIS % Passing 107.64

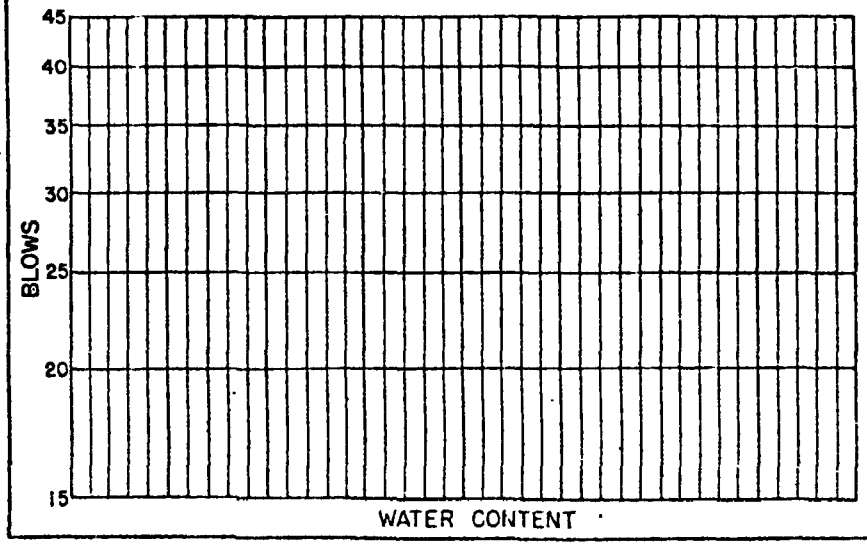
			-40	54.30	91
-3/4			-80		
-4	.81	100%	-140		
-10	8.68	99	-200	43.85	41

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DJT FORM 351-019

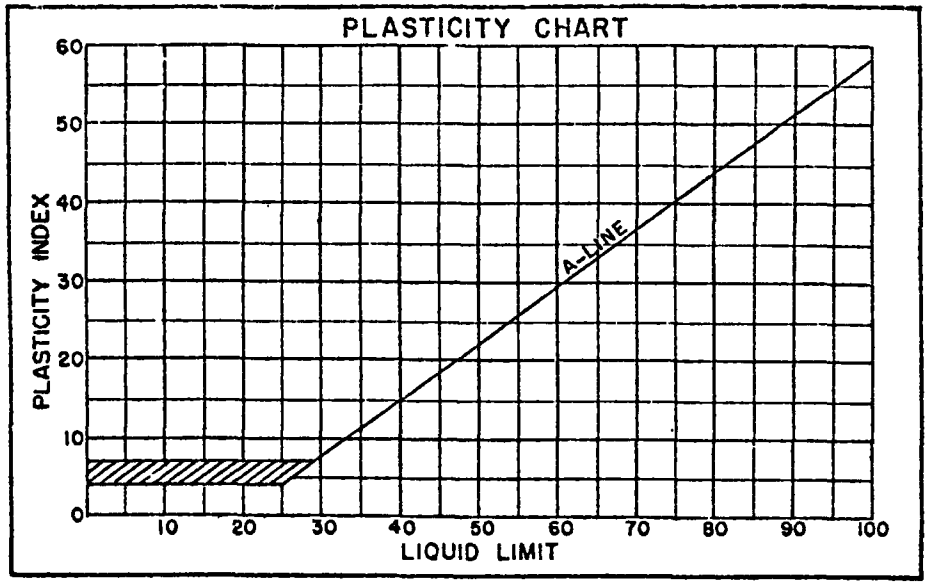
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3416-5 JOB NO. Hog. HOLE NO. J-16
DATE 11-2-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Moist, tan w/Rust Layers. Layers of F. SAND & SILT W/ Rust throughout.

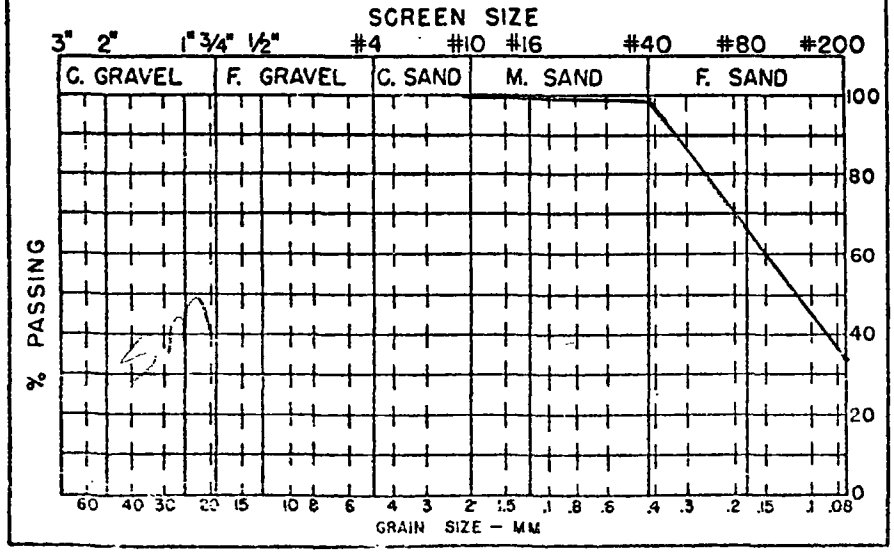


H2O = 24.9%

SIEVE ANALYSIS % Passing 101.60

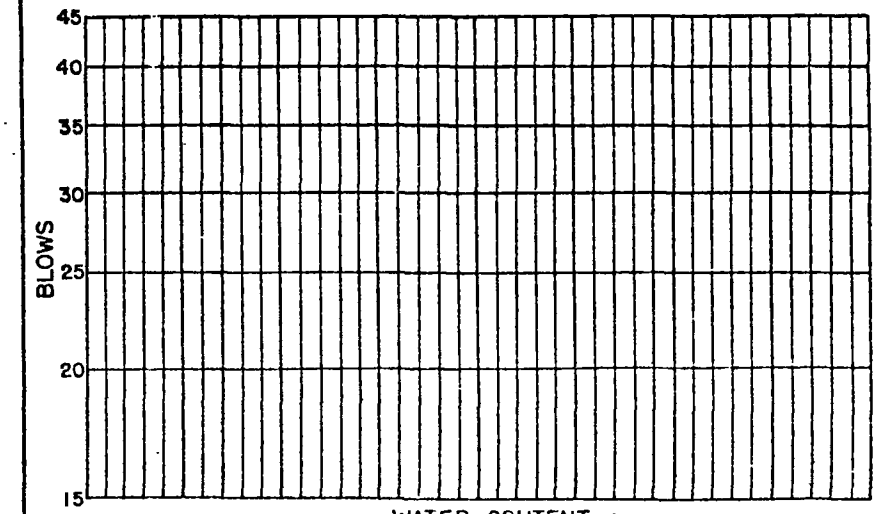
		-40	66.22 99
-3/4		-80	
-4		-140	
-10	.70 100%	-200	34.08 34

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

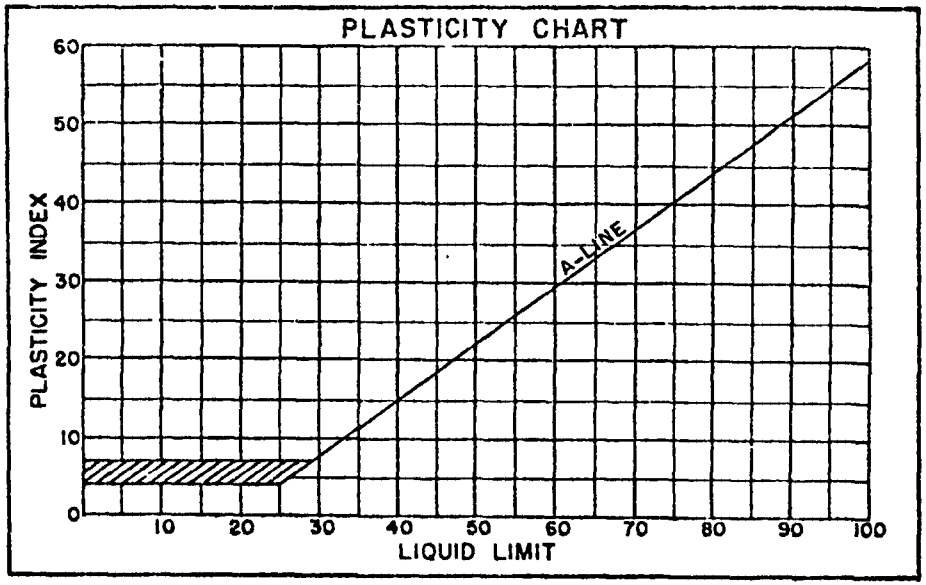
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3-16-1 JOB NO. 166. HOLE NO. J-16
DATE 11-2-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Wet, olive, orange, tan U. Sty F. SAND AND F. Gravels w/ Traces M-C SAND & Mica

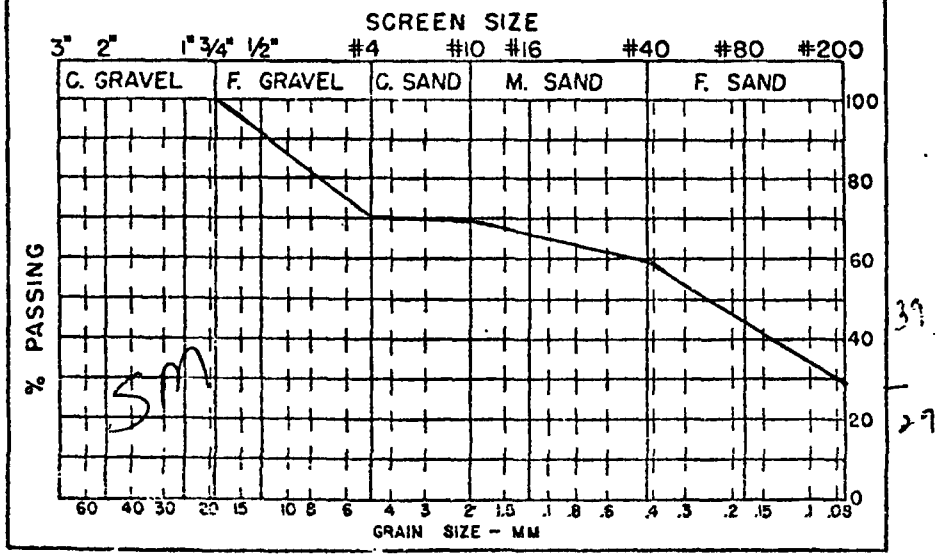


H_2O: 47%

SIEVE ANALYSIS % Passing 81.48

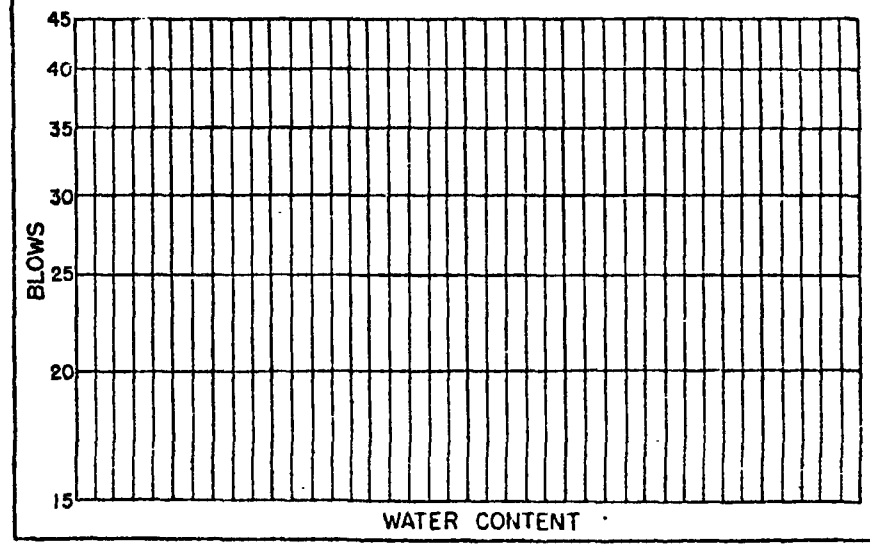
			-40	24.02	59
-3/4	24.22	100	-80		
-4	1.32	70	-140		
-10	8.12	69	-200	23.80	29

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



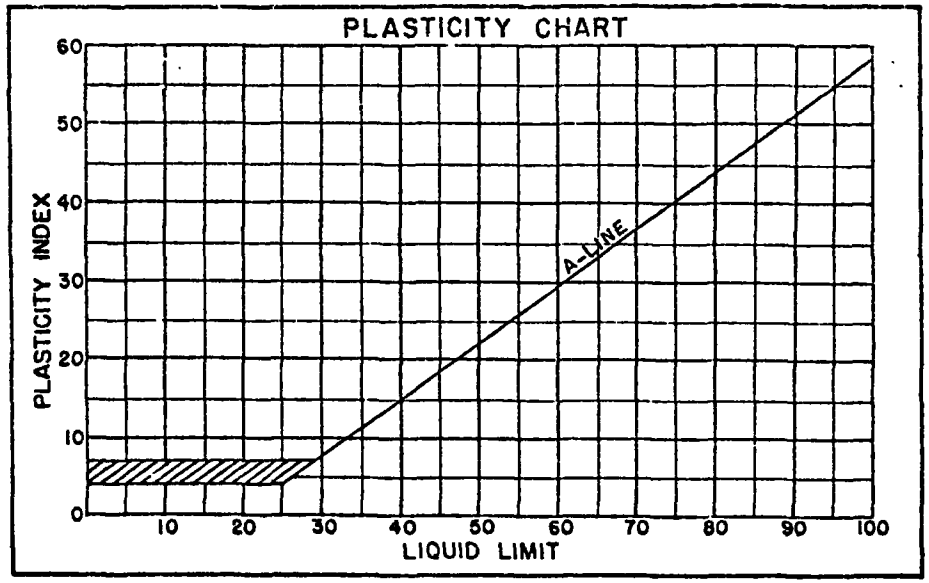
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3416-6 JOB NO. Hog. HOLE NO. J-16
DATE 11-2-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Moist, Brn.-Gr. Layers of Gr. Sty. F. SAND & tan Sty. F. SAND Dwl Rust Streak Layers & T. Mica

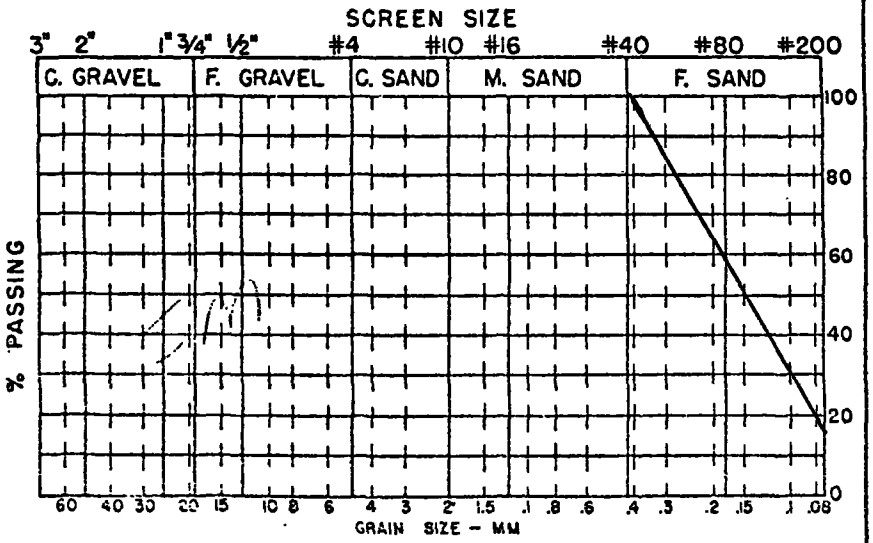


H_2O: 27%

SIEVE ANALYSIS % Passing 96.04

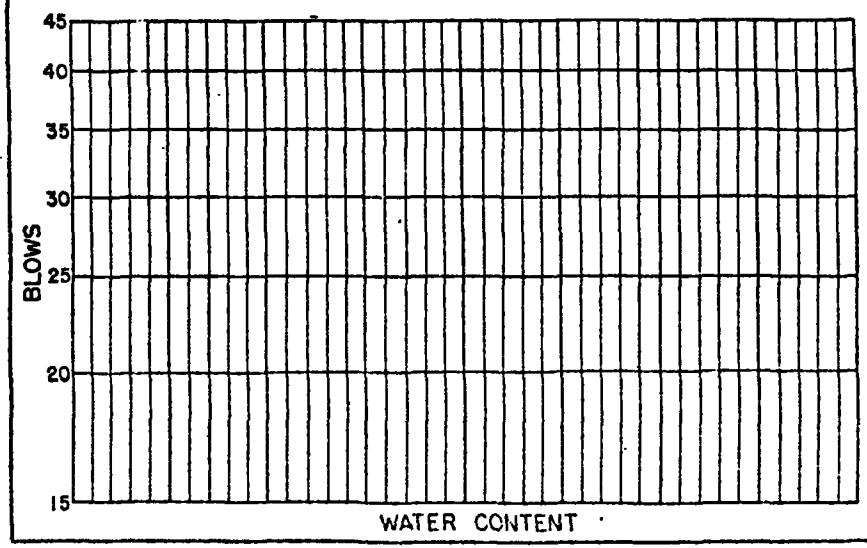
	-40	80.46 100%
-3/4	-80	
-4	-140	
-10	-200	15.58 16%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 8-24-82

Dear Sir:

I have forwarded by today's State Car the following Foundation Samples.

Contract or Job No. L-7262 Section West Itoguiam bypass
SR No. 101A Sub-Section culvert

Station & Offset 146+70 70'LT Hole # J-17

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3438	D-1	0' 0" 2' 0"	H_2O = .198%	OL	Sat., Lt. Brn., Lg. Chunks of wood w/trace F. Sdy. SILT & Org. Veg., sprouts & twigs.
3439	S-2	4' 0" 6' 0"	95%	OL	SAT, dk. Brn. Chunks of Rotten Wood w- a Layer of Cly. SILT
3440	D-3	6' 0" 8' 0"	60%	SM	Like 3180 w/T. Rust Moist, Brn-Gr., V. Sty. F. SAND w/ org. Layers
3441	S-4	9' 0" 11' 0"	66%	ML OH	Wet, Gr. & Rust, Sl. Cly. F. Sdy. SILT W- Lg. Chunks of WOOD
3442	D-5	11' 0" 13' 0"	98%	OH	Like 3414 SAT., Tan-Brn. Cly. SILT Organic PEATY TWIGS & Grass
3443	S-6	14' 0" 16' 0"	29%	SM	Moist, GREEN, V. Sty. F-Coarse SAND & F. SUB-Rounded GRAVEL
3444-1	D-7	16' 0" 17' 6"	10%	GM	Like 3170-2 w/org. Moist, Olive, grn. & orange, V. Sty. F-C Sdy. 1½"-1 & GRAVEL w/org.
-2	D-8	19' 0" 21' 0"	25%	SM	Like 3416-3 w/T. F. GRAVEL Moist, Cinnamon Brn, V. Sty. F SAND w/T. Mica & F. Gravel
-3	D-9	24' 0" 26' 0"	36%	ML	Like 3191-3 w/T. F. Gravel Moist, tan, orange w/rust streaks F. Sdy. Silt w/T. Mica & Clay

1 copy with samples
1 copy to addressee

Yours very truly,
Milford J. Sanders
Inspector.

DOT FORM 351-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 8-24-82

Dear Sir:

I have forwarded by today's State Car the following Foundation Samples.

Contract or Job No. L-7262 Section West Hoquiam bypass
SR No. 101A Sub-Section Culvert

Station & Offset 146+70 70' Lt Hole # J-17

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3444 -4	D-10	29'0" 30'6"	23%	SM	Moist, Gr., Calc., Sty. F-C SAND & F. Gravel w/ one 1"+/- Rock
-5	D-11	32'6" 33'9"	28%	SM	Like 3197-1 but orangish-tan moist, v. Sty. F-M SAND w/T. F. Grav. & Mica.

1 copy with samples
1 copy to addressee

Yours very truly,
Melford J. Sanders
Inspector.

DOT FORM 351-002

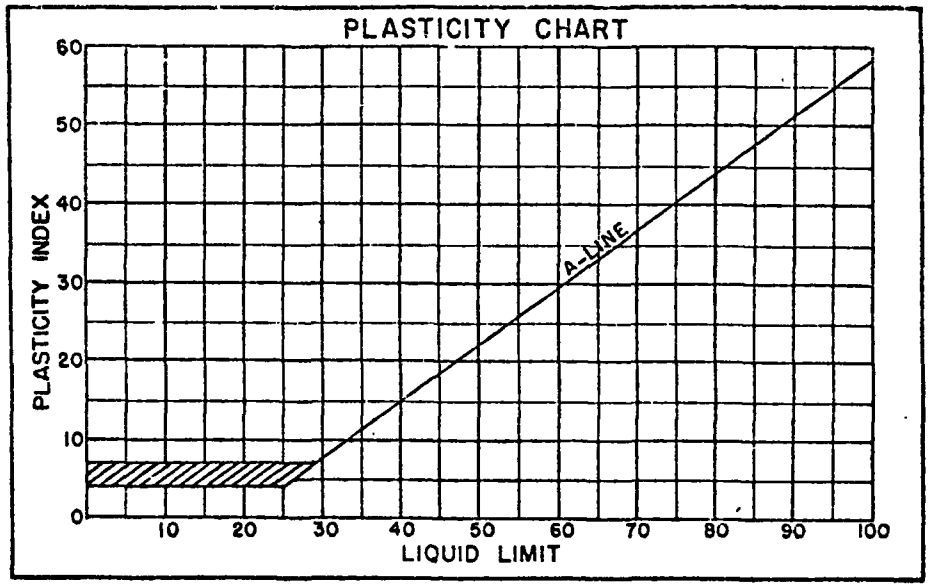
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3438 JOB NO. Hog HOLE NO. J.17
DATE 3-2-83 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: Sat., Lt. Brn. Lg. Chunks of wood w/ F. sdy. SILT & Org. Veg., Sprouts & Twigs

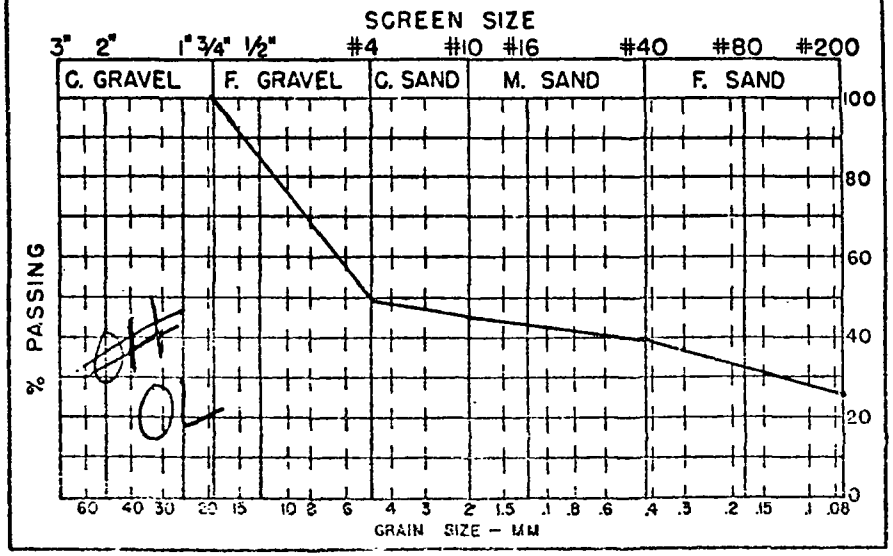


H_2O = 19.8%

SIEVE ANALYSIS % Passing 24.23

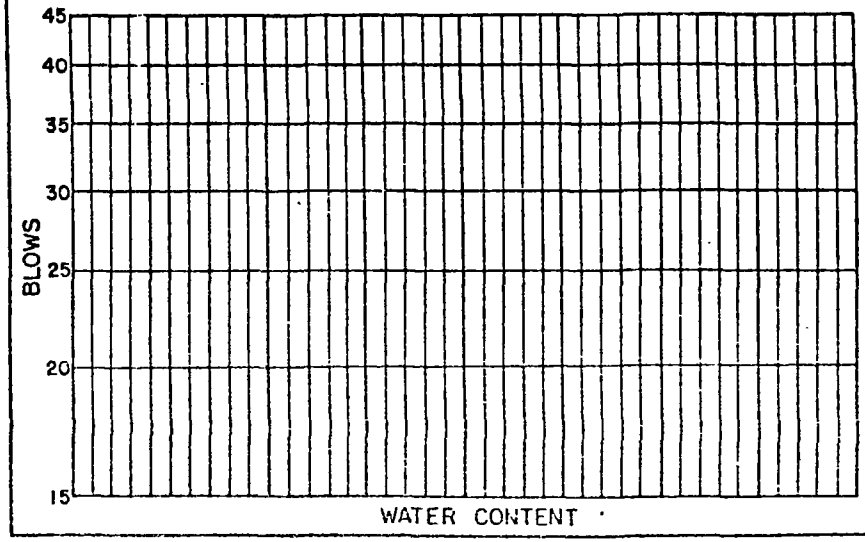
			-40	3.33	39%
-¾	12.25	100 %	-80		
-4	.90	49%	-140		
-10	1.58	46%	-200	6.17	25%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



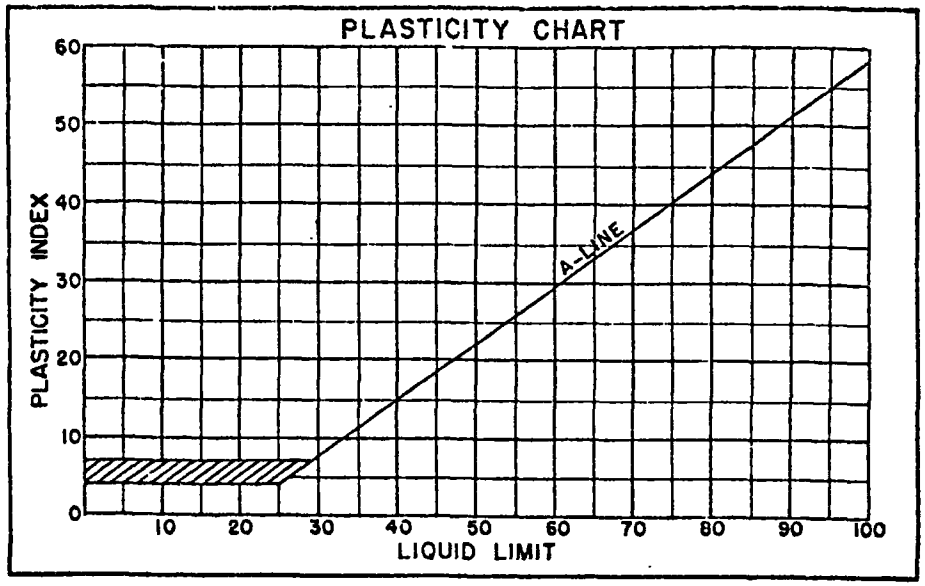
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3043 JOB NO. 46a. HOLE NO. 1-17
DATE 9-7-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Moist, Brown, V. Sty.
F-C SAND & F. S.R. Gravel.

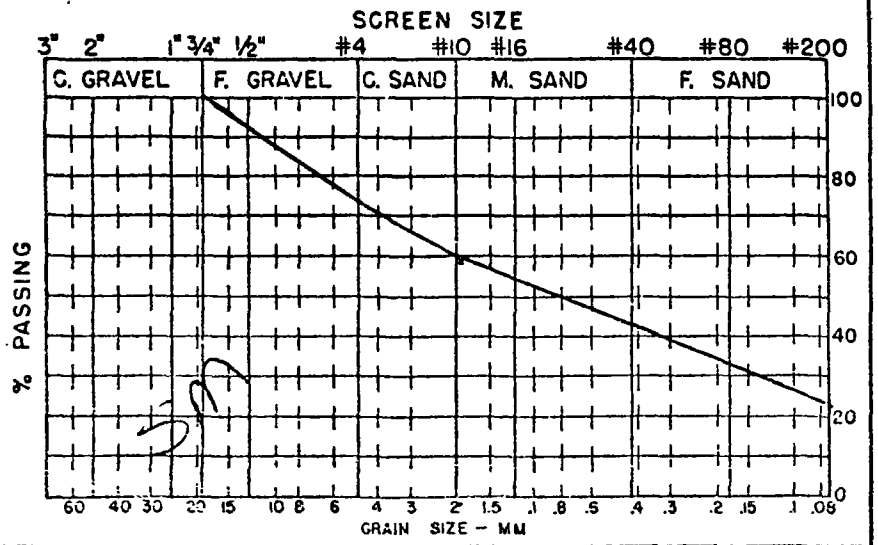


H2O: 29 %

SIEVE ANALYSIS % Passing 166.82

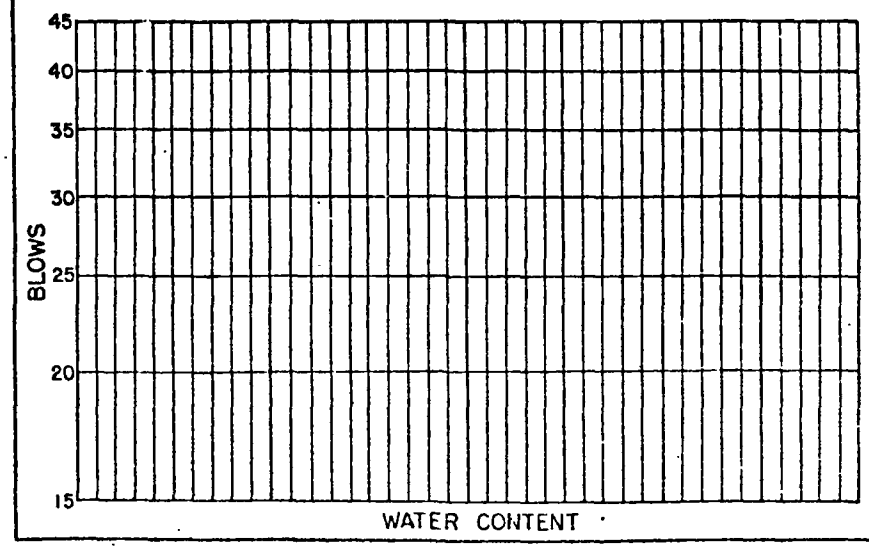
			-40	33.15	43%
-3/4	42.78	100 %	-80		
-4	34.71	74 %	-140		
-10	28.40	60 %	-200	37.78	23%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

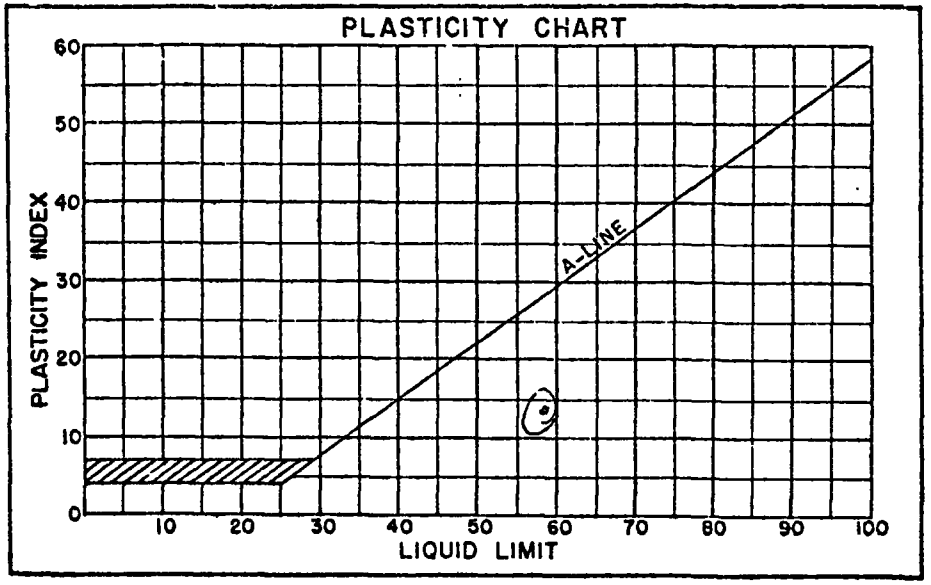
Shelby

SAMPLE NO. 3439	JOB NO. Hoa.	HOLE NO.
DATE 9-7-82	OPERATOR BB	

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS			✓

DESCRIPTION: Moist, dk. Brn. Chunks of rotten wood w- a Layer of Cly. SILT.

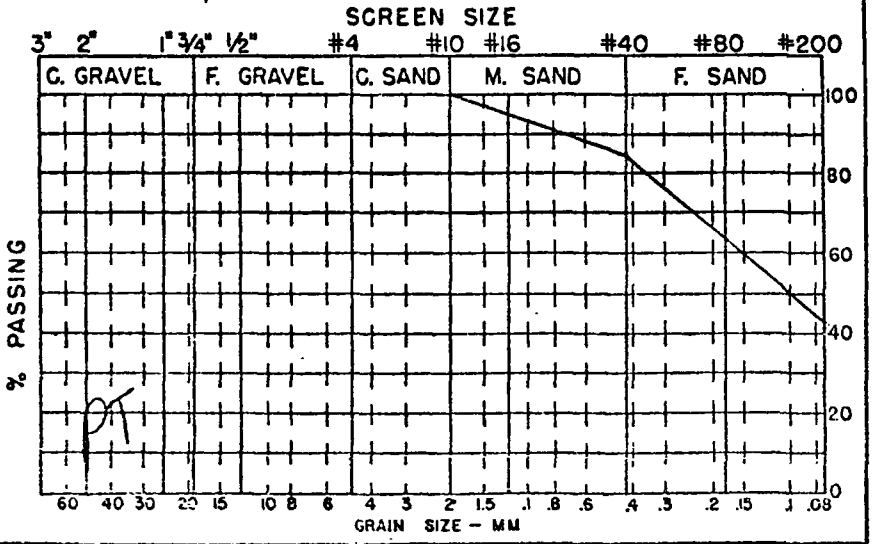


H_2O = 95%

SIEVE ANALYSIS % Passing 44.82

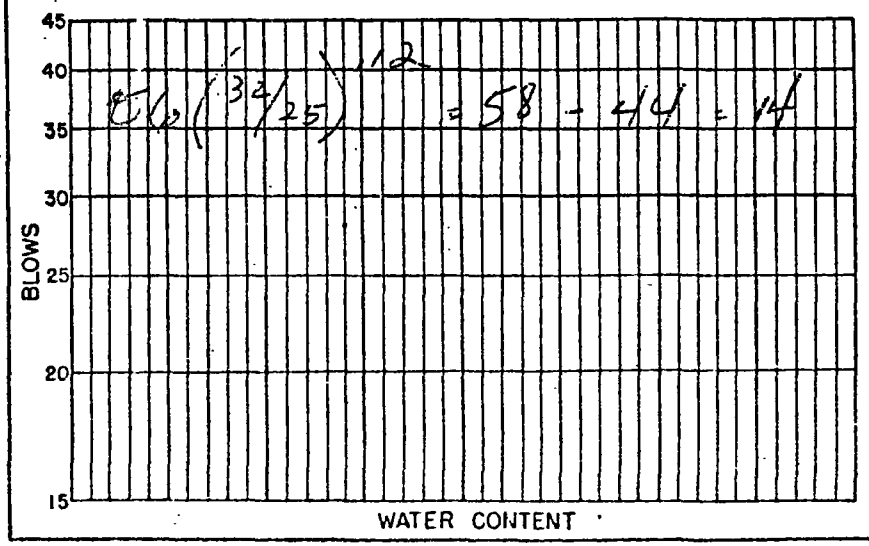
		-40 18.15	84%
-3/4		-80	
-4	.10 wood	-140	
-10	7.38 ½ wood 100%	-200 19.36	43%

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	53				58
Wet Wt.	9.93				10.20
Dry Wt.	6.37				7.10
% H_2O	56%				PL= 44%
Blows	32				PI= 14



$Cu\left(\frac{32}{25}\right)^{1/2} = 58 - 44 = 14$

DOT FORM 351-019

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

Shelby.

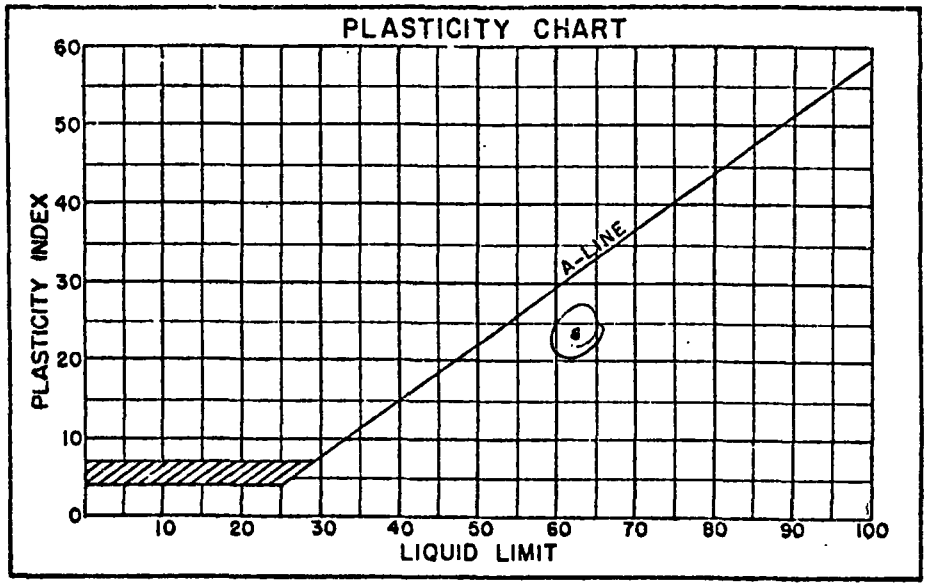
SAMPLE NO. 3441 JOB NO. 4bo. HOLE NO. J-17

DATE 9-7-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS			✓

DESCRIPTION: Wet, Gr. & Rust, Sl. Cly. F. Sdy. Silt W- Lg. Chunks of Wood.

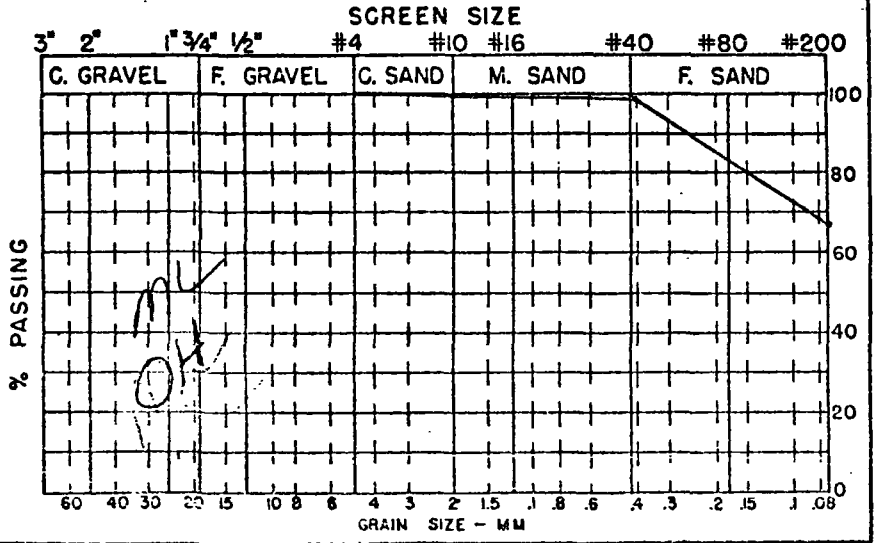


$H_2O = 66\%$

SIEVE ANALYSIS % Passing 79.05

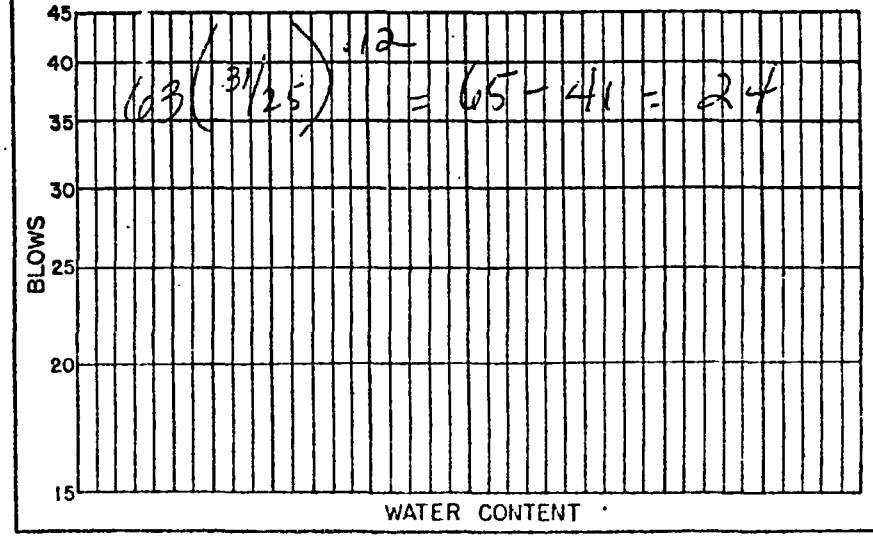
			-40	24.95	99%
1-3/4	.42	100%	-80		
-4			-140		
-10	.08	99%	-200	53.60	68%

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	68				65
Wet Wt.	13.37				10.12
Dry Wt.	8.22				7.18
% H_2O	63%				PL= 41%
Blows	31				PI= 24



$63\left(\frac{31}{25}\right)^{.12} = 65 - 41 = 24$

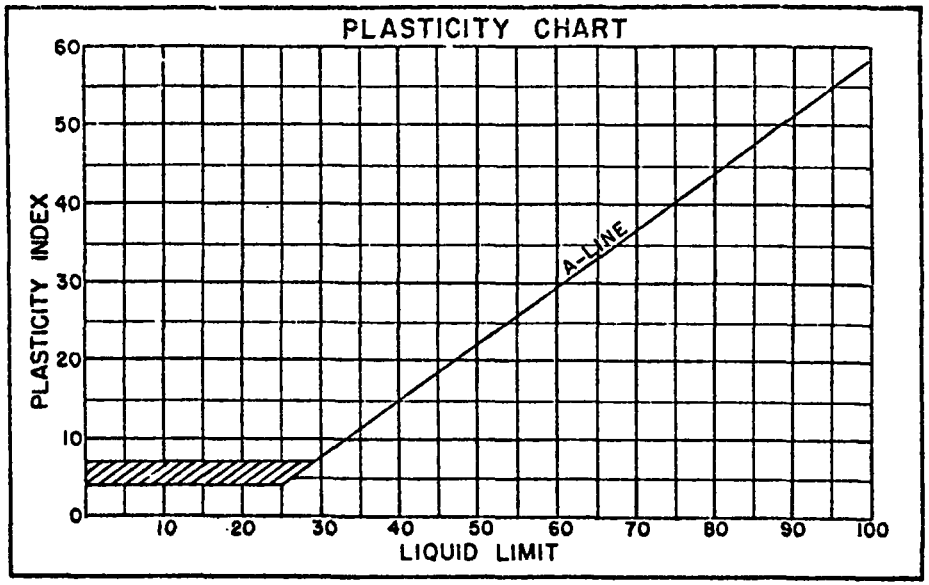
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3444-4 JOB NO. Hog HOLE NO. J17
DATE 11-2-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

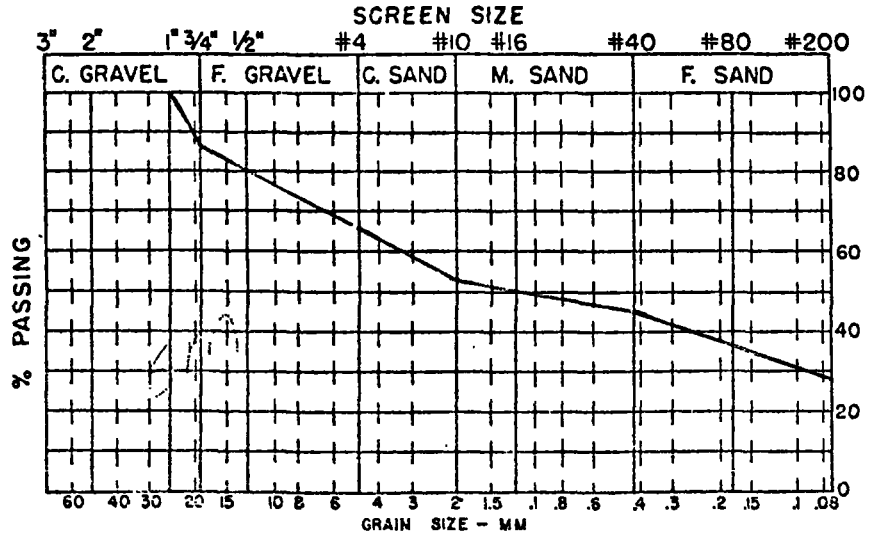
DESCRIPTION: Moist, Gr. Calc. Sty. F-C SAND & F. Gravel w/ one 1" Rock



H2O: 23%

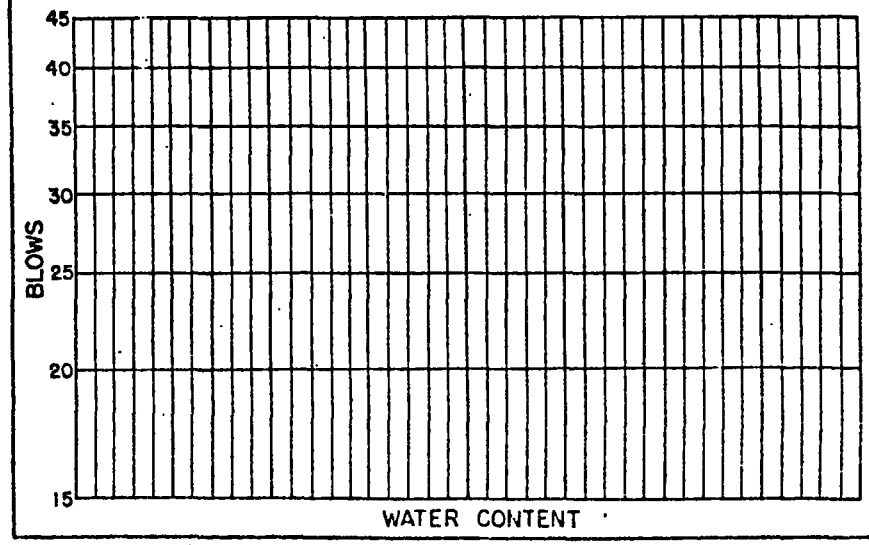
	SIEVE ANALYSIS		% Passing 125.87		
one	-1 15.78	100	-40 24.18	46	
	-3/4 25.32	87	-80		
	-4 18.02	67	-140		
	-10 8.70	53	-200 33.87	27%	

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

TRIAXIAL COMPRESSION TEST (With Area Changes and Pore Pressures)

Project HOQUIAM Location ~~Sta 187+00~~ 146+70 50' Rt

Job No. L7262 Sample No. 3443 B Boring No. J-17 Depth

Area (Ao) 2.92 Length 4" Confining Pressure 900 PSF = 6.25 PSI

Rate of Loading .085%/Min L. R. C. .325 Tested by R Brooks Date 23 MAR 83

Description

GROSS WT.	TARE	NET WT.	CAN NO.	WET WT.	DRY WT.	WT. H^2O	% H^2O	WET DENS.	DRY DENS.
		358	113	70.04	46.01	24.03	52	117.8	77.5

Data for Mohr's Envelope:

Max. Deviator Stress

Principal Stress

Effective Principal Stress

Failure

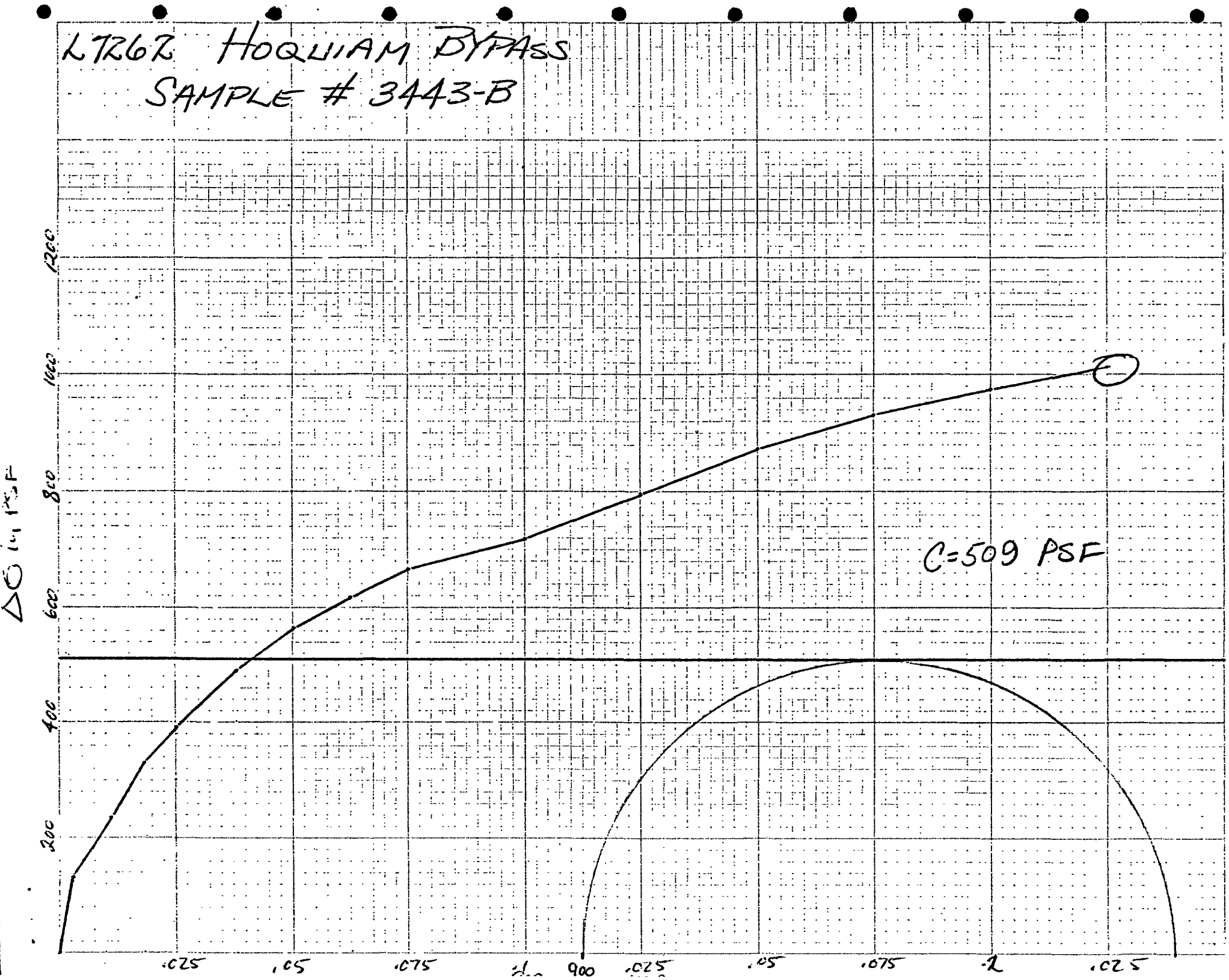
Back Press.

Saturation 93

ELASPED TIME (Hr.) (Min.)	LOAD DIAL READ (X 10 −4)	DEFORM. DIAL READ	Δ L (COL. 3 x 10 − 3)	E. UNIT STRAIN (ΔL/L)	AREA C.F. (1 − E)	CORRECT. AREA A' (A° / 1 − E)	PORE PRESS.	DEV. LOAD (Col. 2 X LRC)	DEV. STRESS (Col. 9 ÷ Col. 7)	PRINC. STRESS (Col 10 + conf. press.)
1	2	3	4	5	6	7	8	9	PSF 10	11
~~0~~							5.90			
.5	8	013		.003	997	2.93	6.00	2.6	127.8	
1.5	15	043		.011	989	2.95	6.00	4.88	238.2	
2.5	21	072		.018	982	2.97	6.04	6.82	330.7	
3.5	25	100		.025	975	2.99	6.04	8.12	391.1	
5	32	150		.038	962	3.04	6.20	10.4	492.6	
6.75	37	200		.05	950	3.07	5.98	12.0	562.9	
8.5	41	250		.062	938	3.11	5.91	13.3	615.8	
10	45	300		.075	925	3.16	5.84	14.6	665.3	
13.25	50	400		.1	900	3.24	5.92	16.2	720	
16.5	57	500		.125	875	3.34	5.55	18.5	797.6	
19.75	64	600		.15	850	3.44	5.48	20.8	870.7	
23	70	700		.175	825	3.54	5.55	22.8	927.5	
26.33	76	800		.2	800	3.65	5.06	24.7	974.5	
29.5	82	900		.225	775	3.77	4.87	26.65	1017.9	

DOT FORM 351-018 REVISED 4/80

LT262 HOQUIAM BYPASS
SAMPLE # 3443-B



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

TRIAX

SAMPLE NO. 3443B JOB NO. HOQ HOLE NO.

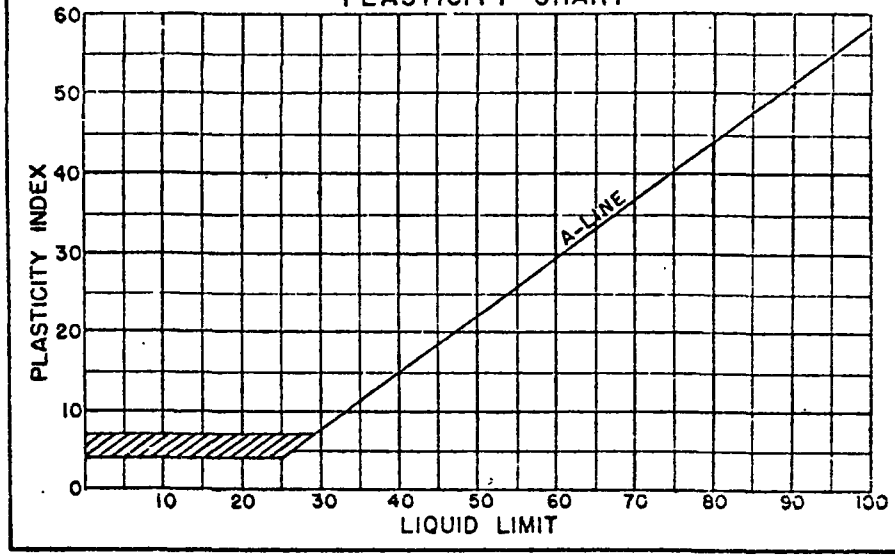
DATE 30 MAR 83 OPERATOR RB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Moist Blue grey micaceous F sdy SILT alternately Layered w/ sty F SAND oxidized outside

PLASTICITY CHART

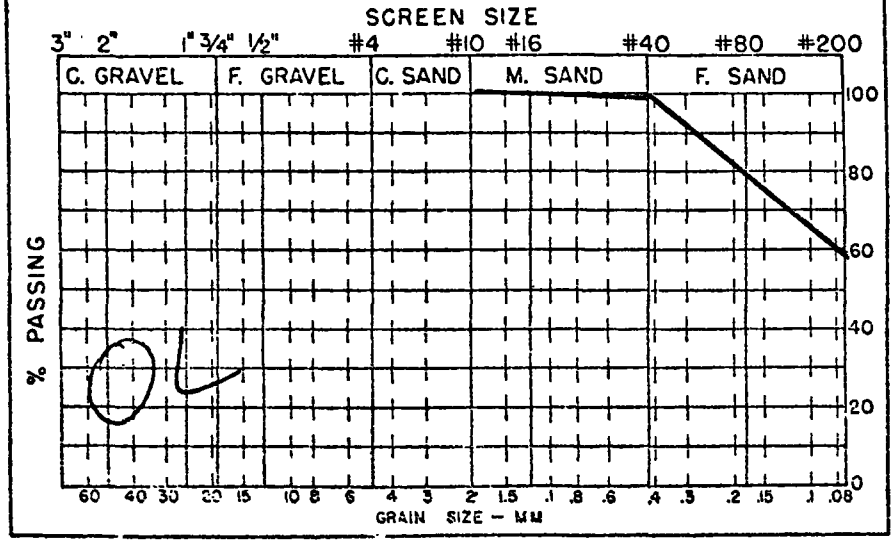


$H_2O = 52$

SIEVE ANALYSIS % Passing 212, D8

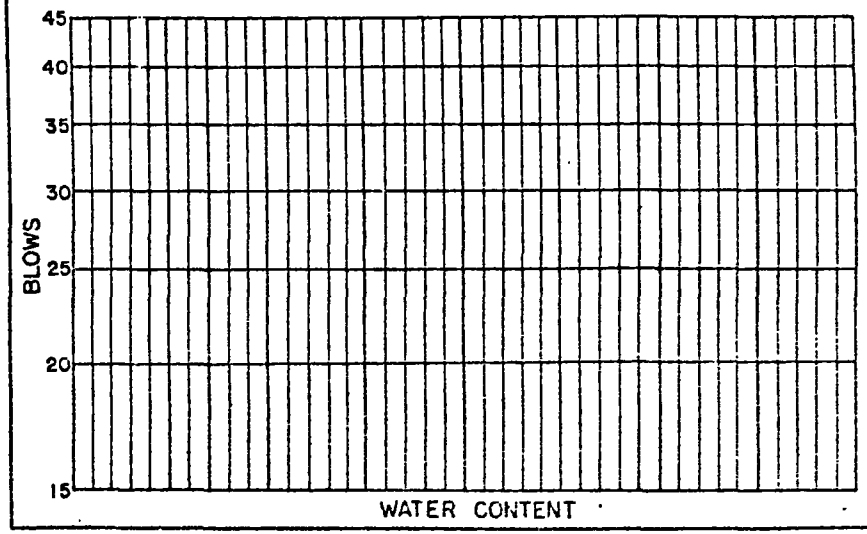
	-40	85.86	99
-3/4	-80		
-4	-140		
-10 .1	100	-200 126.12	59

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

ATERIALS ENGINEER
terials Laboratory
O. Box 167, Olympia, WA 98504 (Mailing Address)
5 So. 2nd Ave.
mwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 8-27-82

Dear Sir:

I have forwarded by today's state car the following Foundation Samples.

Contract or Job No. L-72-62 Section West Hoquiam Bypass
SR No. 101A Sub-Section culvert

Station & Offset 139+60 60' Lt Hole # J-18

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3491	D-1	0' 0" 2' 0"	Hole 20%	SM	Like 3197-3 NOT Layered (w/org. Twigs moist, GR. Sty. F. SAND w/ Pockets of F. Grav., Sand & T. Mica
3492 -1	U-2	5' 0" 5' 4"	A		
-2		5' 4" 5' 8"	B		
-3		5' 8" 6' 0"	C		
3493 -1	D-3	7' 0" 9' 0"	Hole 10%	GM	Like 3170-2 Moist, Olive, grn. & orange U. Sty. F-C Sdy. 1½" (-) & GRAVEL
-2	D-4	10' 0" 12' 0"		GM	SAME only - orange - olive
-3	D-5	15' 0" 16' 6"		GM	SAME only Rust orange - olive
-4	D-6	20' 0" 21' 6"	Hole 18%	SM	Moist, GRN. - GR., Olive, U. Sty F-C SAND W/F. Gravel
-5	D-7	25' 0" 25' 8"		SM	SAME

py with samples
py to addressee

Yours very truly,
Melford Sanders
Inspector.

FORM 351-002

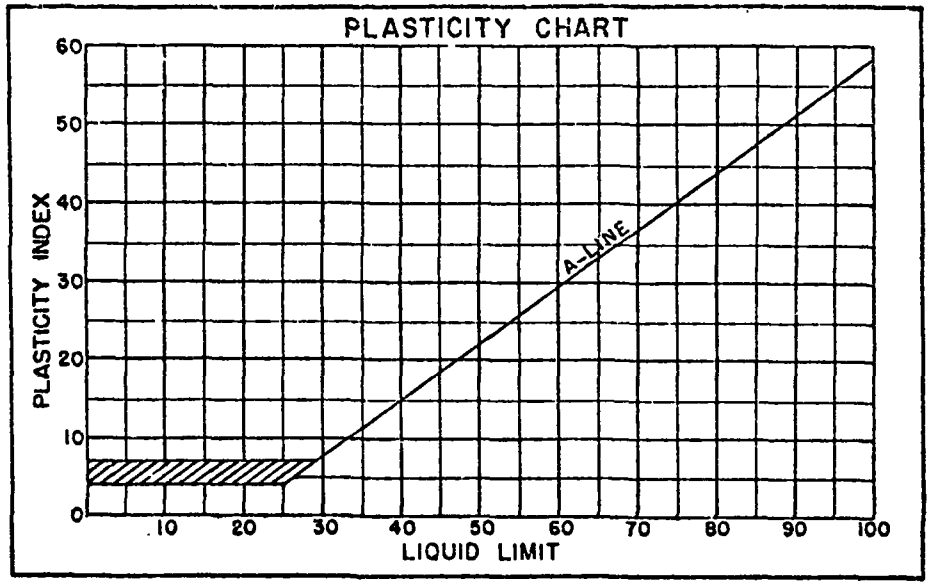
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3493-4 JOB NO. HOQ HOLE NO. J-18
DATE 11-2-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: MOIST, GRD, GR., Olive V. Sty. F-C SAND w/ F. Gravel

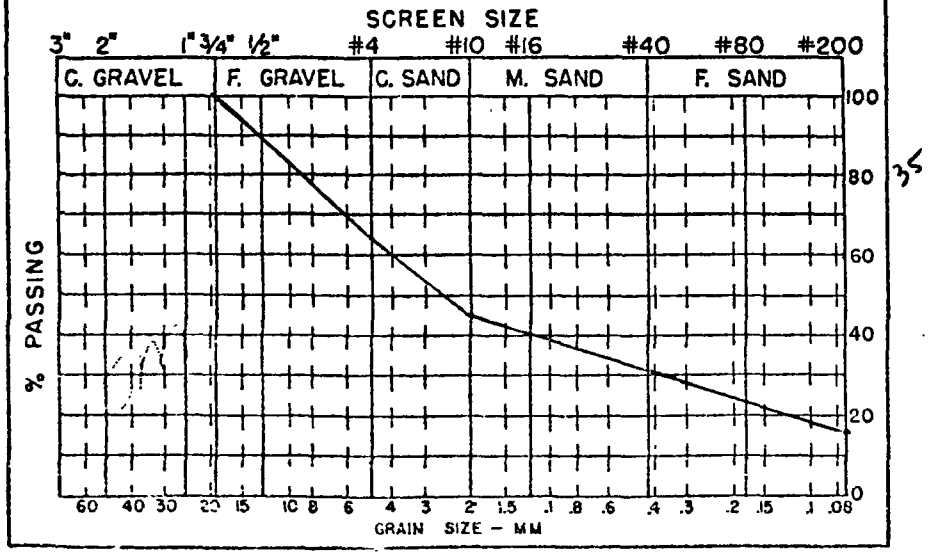


H_2O = 18%

SIEVE ANALYSIS % Passing 159.36

			-40	24.13	31
-3/4	57.58	100%	-80		
-4	30.02	64	-140		
-10	22.12	45	-200	25.45	16%

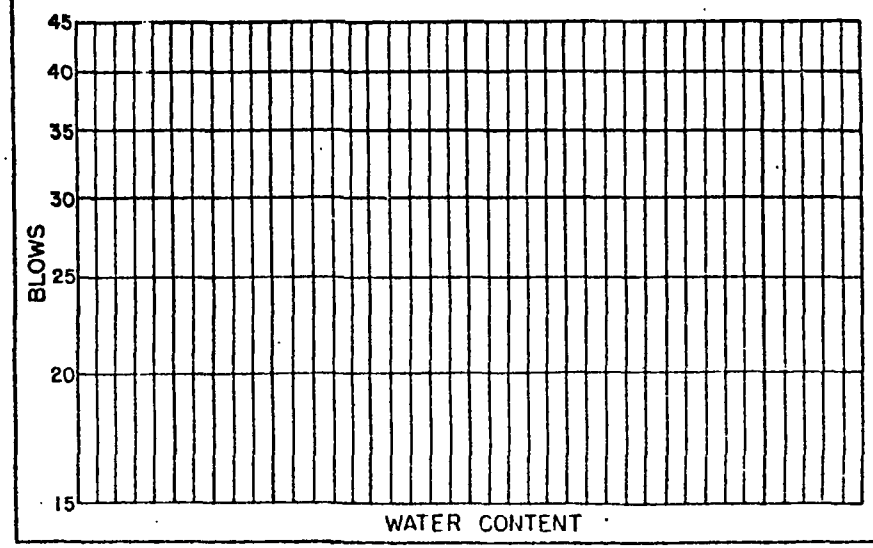
GRAIN SIZE CURVE



35

LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

ATERIALS ENGINEER
aterials Laboratory
O. Box 167, Olympia, WA 98504 (Mailing Address)
55 So. 2nd Ave.
mwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 9-1-82

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section West Hogan bypass SR No. 101 A Sub-Section Culvert

Station & Offset 139+10 60' Rt. Hole # J-19

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3494 -1	D-1	0' 0" 2' 0"	43%	SM	Like 3182 w/Layers of Rust Wet, Brn-Orange, Cly, V. Sty. F. SAND w/T. Org. grass & F. Gravel
-2	D-3-A	5' 0" 6' 0"	55%	ML	SAT. dk. Brn., tan, grn., F. Sdy. SILT w/ Wood FIBERS.
-3	D-3-B	6' 0" 7' 0"	66%	ML	Wet, Gr., Tan & rusty. Cly. Silt w/org. FIBERS & Sm. hard lumps of Cly. Silt
3495 -1	S-4	7' 0" 9' 0"	33%	ML	Moist, Gr. F-C Sdy. SILT w/ org. sticks, branches & Trace of S. Ang F. Gravel
-2	S-5	10' 0" 12' 0"	50%	ML	Moist, Gr. F. Sdy. SILT w/ Trace F. Gravel
3496 -1	V-7	15' 0" 15' 4"	A		
-2		15' 4" 15' 8"	B		
-3		15' 8" 16' 0"	C		
3497	D-8	17' 0" 19' 0"	43%	SM	Like 3182 But-Wet, dk. Brn. Cly., V. Sty. CRS. SAND

py with samples
py to addressee

Yours very truly,

Larry M. Moore
Inspector.

FORM 351-002
REVISED 2-80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

:ATERIALS ENGINEER
'aterials Laboratory
O. Box 167, Olympia, WA 98504 (Mailing Address)
:55 So. 2nd Ave.
:mwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 9-1-82

Dear Sir:

I have forwarded by today's state car the following Foundation Samples.

Contract or Job No. L-7262 Section West Hoquiam by pass
SR No. 101A Sub-Section Culvert

Station & Offset 139+10 60' Rt Hole # J-19

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3498 -1	U-9	20' 0" – 20' 4"	A		
-2		20' 4" – 20' 8"	B		
-3		20' 8" – 21' 0"	C		
3499	D-10	22' 0" – 24' 0"	Hole 54%	ML	Like 3437-2 Wet, GR-TAN F. Sdy. Silt w/T. Mica & org. odor
3500 -1	U-11	25' 0" – 25' 4"	A		
-2		25' 4" – 25' 8"	B		
-3		25' 8" – 26' 0"	C		
-4		26' 0" – 26' 4"	D		
3501 -1	D-12-A	27' 0" – 27' 6"	Hole 54%	ML	Wet, dk. Brn. F. Sdy., Cly. Silt w/ org. grass & T. M-C SAND & F Gvl.

:py with samples
:py to addressee

Yours very truly,

Jerry M. Moore
Inspector.

FORM 351-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

ATERIALS ENGINEER
terials Laboratory
O. Box 167, Olympia, WA 98504 (Mailing Address)
5 So. 2nd Ave.
mwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 9-1-82

Dear Sir:

I have forwarded by today's state car the following Foundation Samples.

Contract or Job No. L-7262 Section West Hoquiam by pass
SR No. 101 A Sub-Section Culvert.

Station & Offset 139+10 60' Rt. Hole # J-19

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3501 -2	D-12-B	27' 6" 28' 6"	H2O = 9%	GW GM	DRY, GR, Green, Sty. F-C Sdy. 1" (-) & GRAVEL w/ org. Needles.
-3	D-13	30' 0" 30' 10"		GW GM	Like 3501-2 w/ org. ODOR
-4	D-14	35' 0" 35' 9"	H2O = 10%	GM	Like 3493-1 moist, olive, grn. & orange, V. Sty. F-C Sdy. 1 1/2" (-) & GRAVEL
-5	D-15	39' 0" 40' 3"	H2O = 18%	SM	Like 3493-4 moist, Orange & tan V. Sty. F-C SAND w/ F. Gravel

py with samples
py to addressee

Yours very truly,

Barry M. Moore
Inspector.

FORM 351-002

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

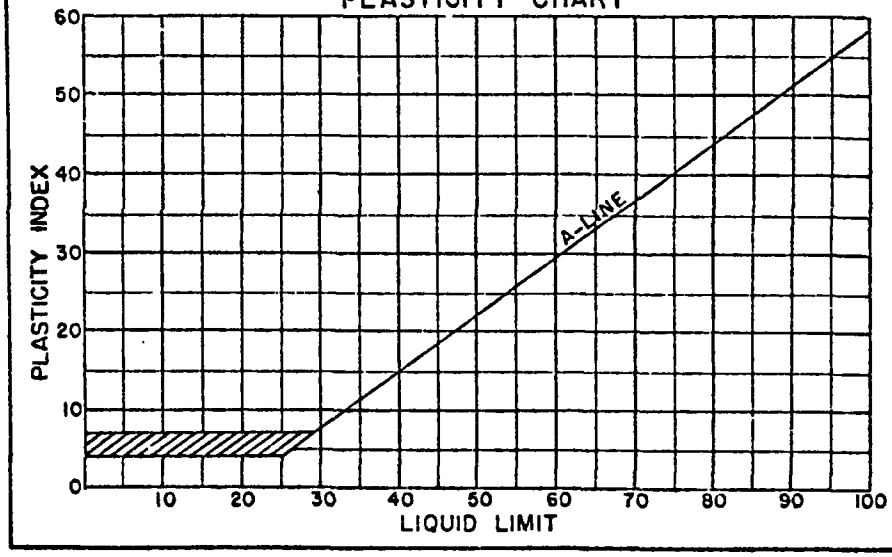
SAMPLE NO. 34942 JOB NO. Hog HOLE NO. 19
DATE 3-3-83 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Sat. dk. Brn.-tan-gin. F. Sdy. SILT w/ Wood fibers.

PLASTICITY CHART

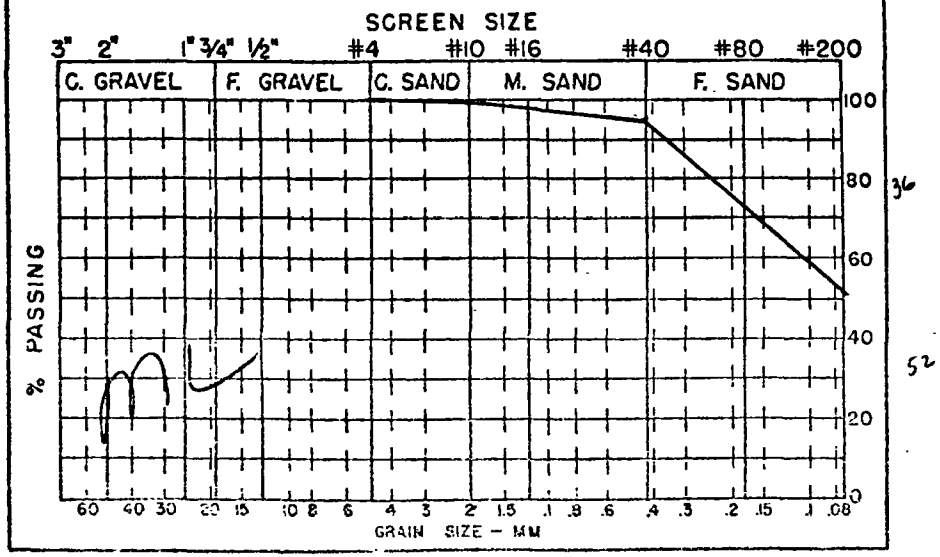


H_2O = 55%

SIEVE ANALYSIS % Passing 28.76

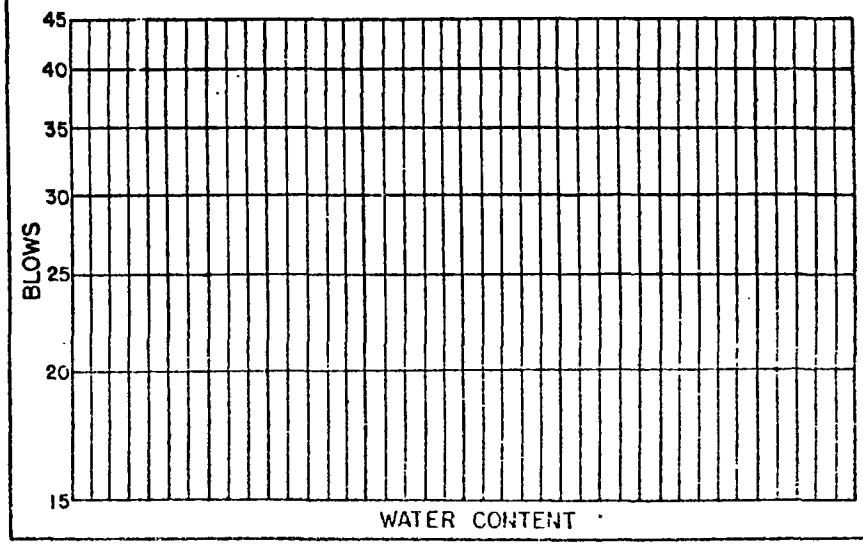
			-40	12.20	94%
-3/4			-80		
-4	.02	100%	-140		
-10	1.62	99%	-200	14.92	52%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

— Silt Sample —

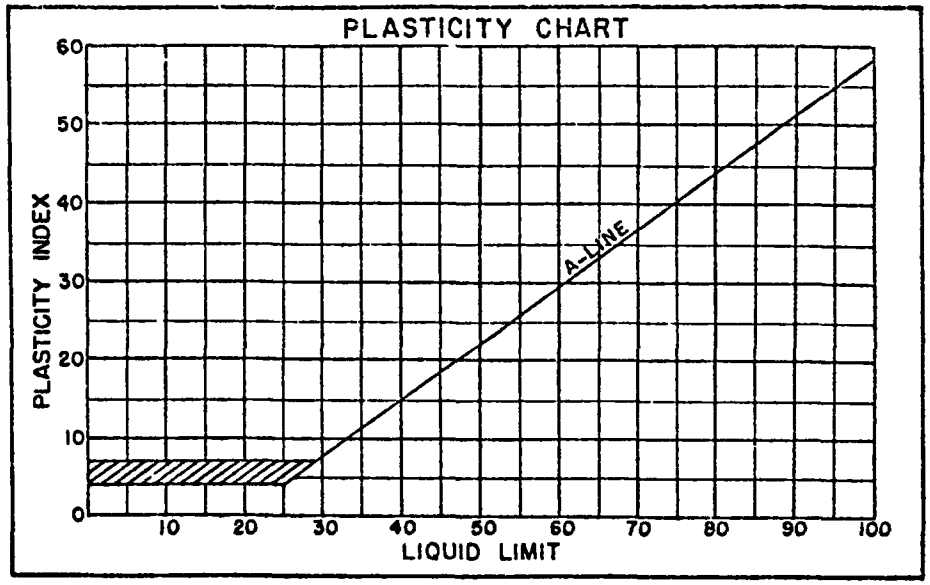
SAMPLE NO. 3494-3 JOB NO. 408 HOLE NO. J-19

DATE 11-2-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	✓

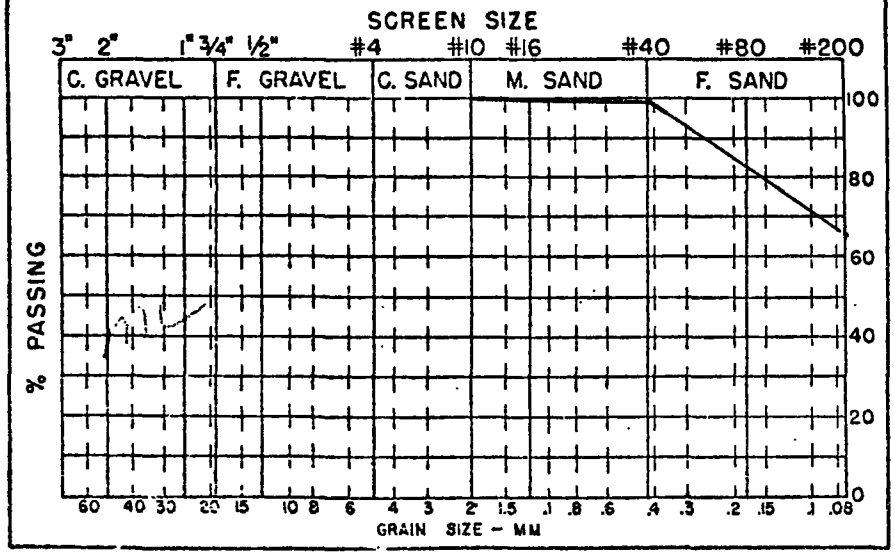
DESCRIPTION: Wet, GR, Tan trusty Cly. Silt w/ org. fibers & sm hard Lumps of Clayey Silt



H_2O = 66 %

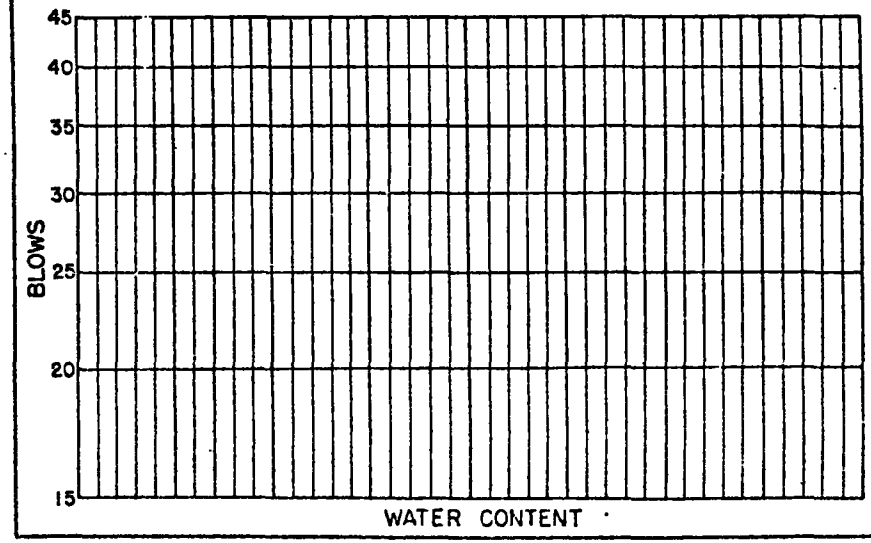
SIEVE ANALYSIS		% Passing 54.39	
	-40	18.70	99.7
-3/4	-80		
-4	-140		
-10 115 100%	-200	35.54	65

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3495-1 JOB NO. Mog. Shelby HOLE NO. 1-1
DATE 9/20/82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

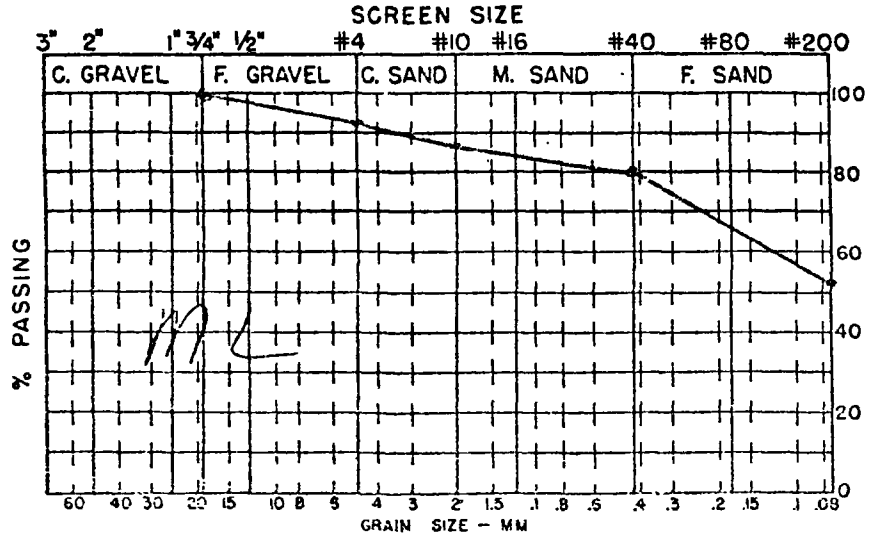
DESCRIPTION: Moist, Gr, f-crs, sdy SILT w/ org. sticks, branches & & f. gravel

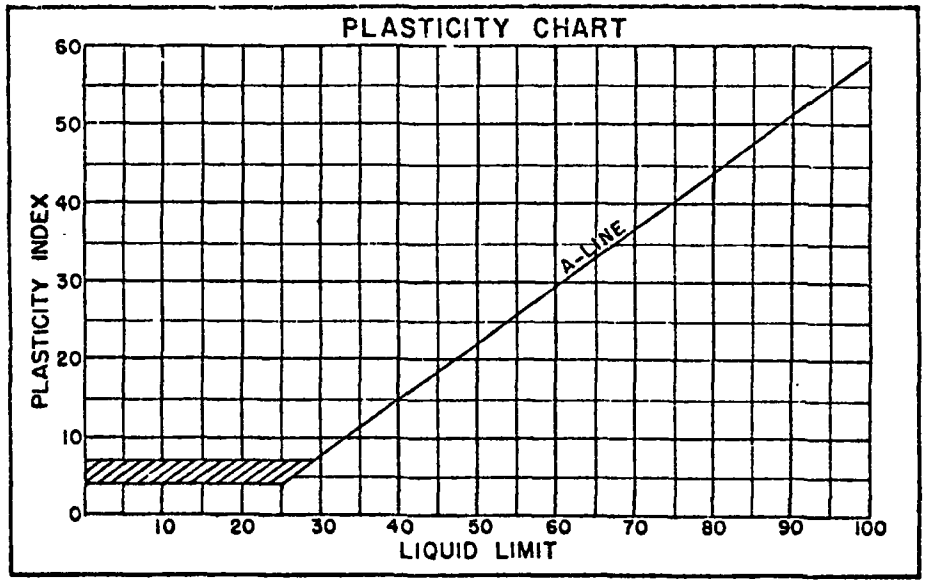
H_2O = 33%

SIEVE ANALYSIS % Passing 100.00

			-40	26.51	80%
-¾	8.32	100%	-80		
-4	5.18	92%	-140		
-10	6.53	87%	-200	53.46	53%

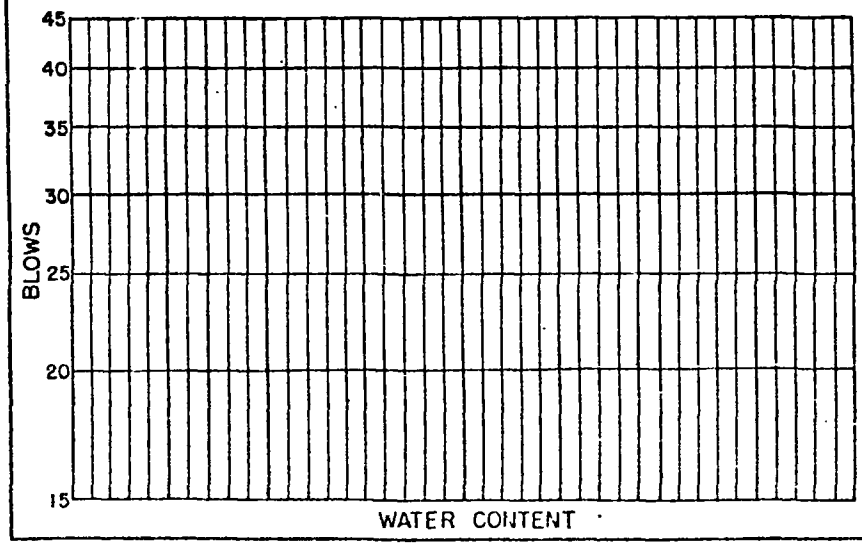
GRAIN SIZE CURVE





LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-319

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3495-2 JOB NO. HOQ. Shelby HOLE NO.
DATE 9/17/82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

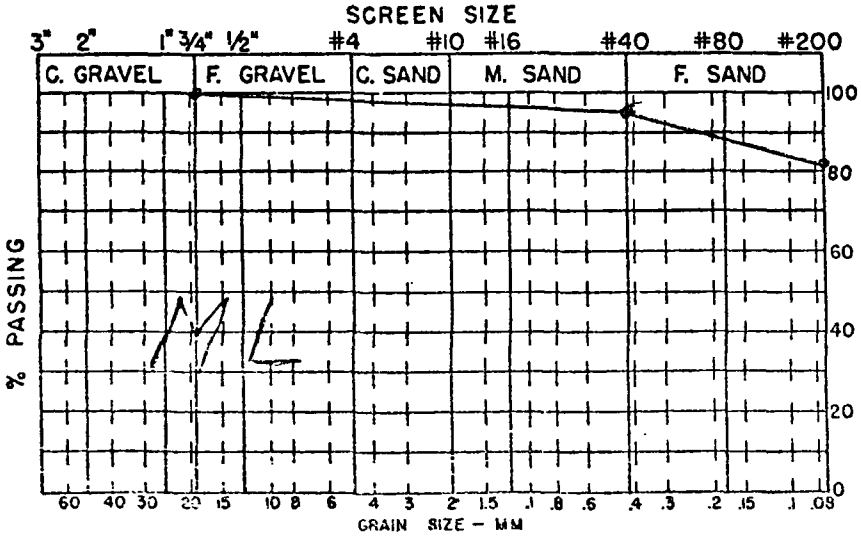
DESCRIPTION: Moist, Gr., f. sdy SILT w-t. f. gravel

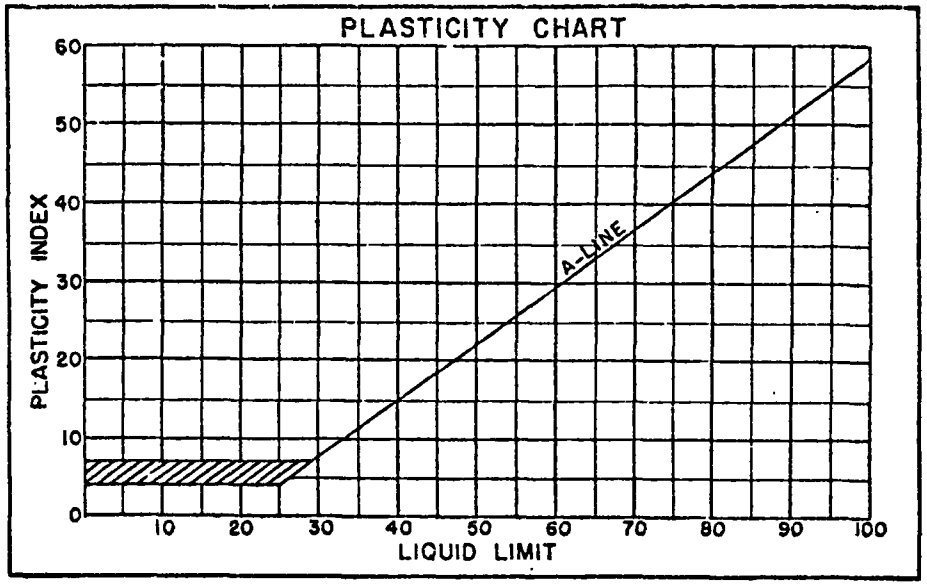
H_2O = 50%

SIEVE ANALYSIS % Passing 100.00

		-40 14.91	96%
-¾ 3.90	100%	-80	
-4		-140	
-10		-200 81.19	81%

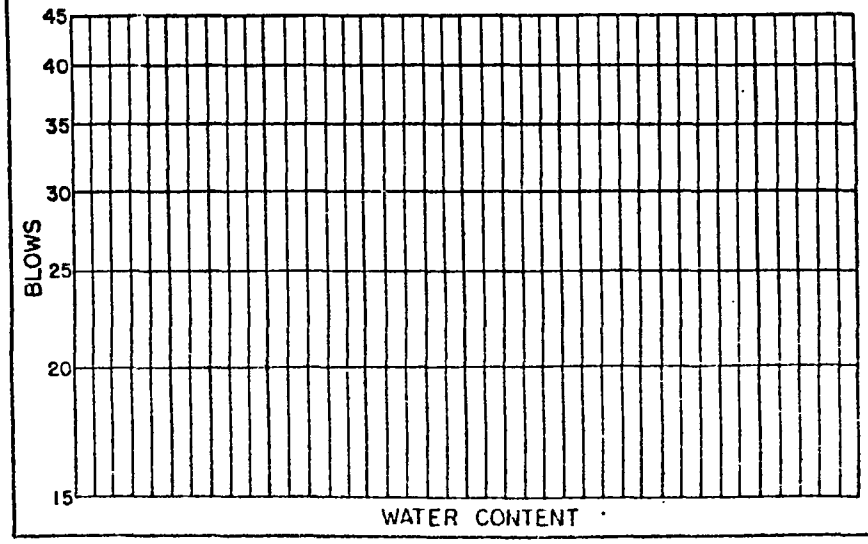
GRAIN SIZE CURVE





LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



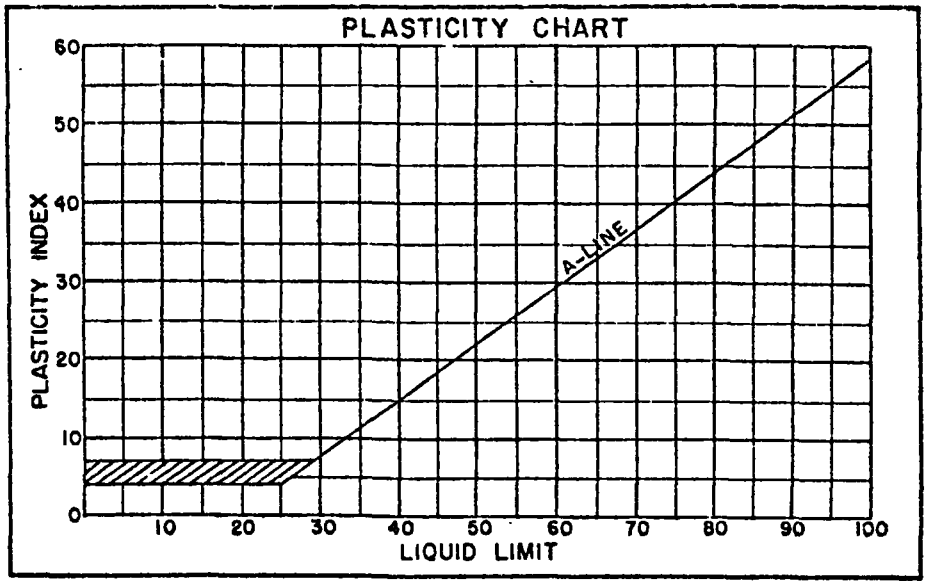
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3501-1 JOB NO. 46a. HOLE NO. J-19
DATE 11-2-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS	✓	✓	✓

DESCRIPTION: Wet dk. Brn. F. Sdy. Cly. Silt w/ dry. grass & T. M-crs. Sand & F. Grand

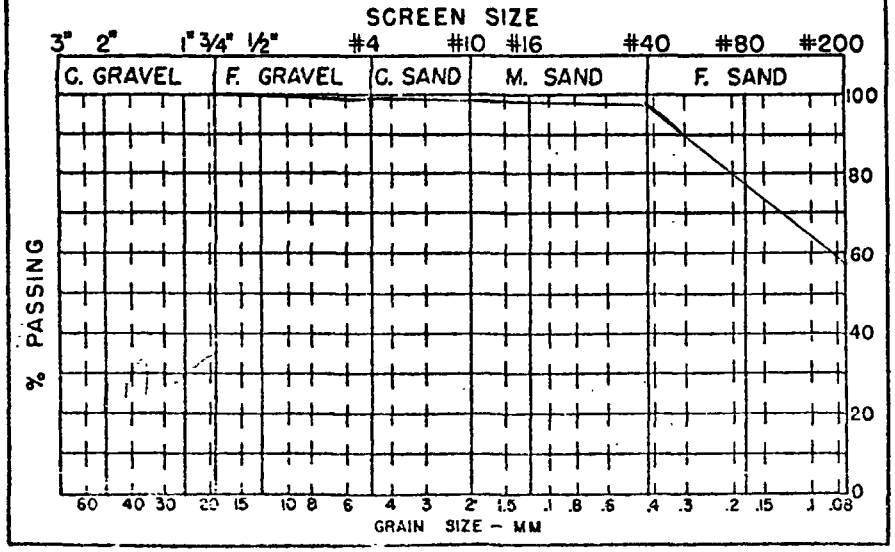


11/20 = 54 %

SIEVE ANALYSIS % Passing 77.80

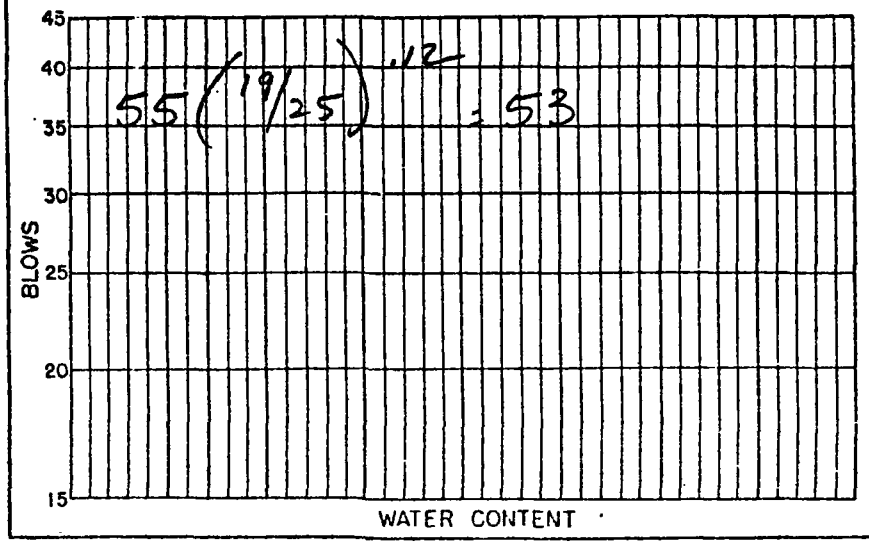
			-40	31.12	97
-¾	.75	100	-80		
-4	.82	99	-140		
-10	.53	48	-200	44.53	57

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	56				
Wet Wt.	11.19				N/P
Dry Wt.	7.22				
% H_2O	55%				PL=
Blows	19				PI=



DJT FORM 351-019

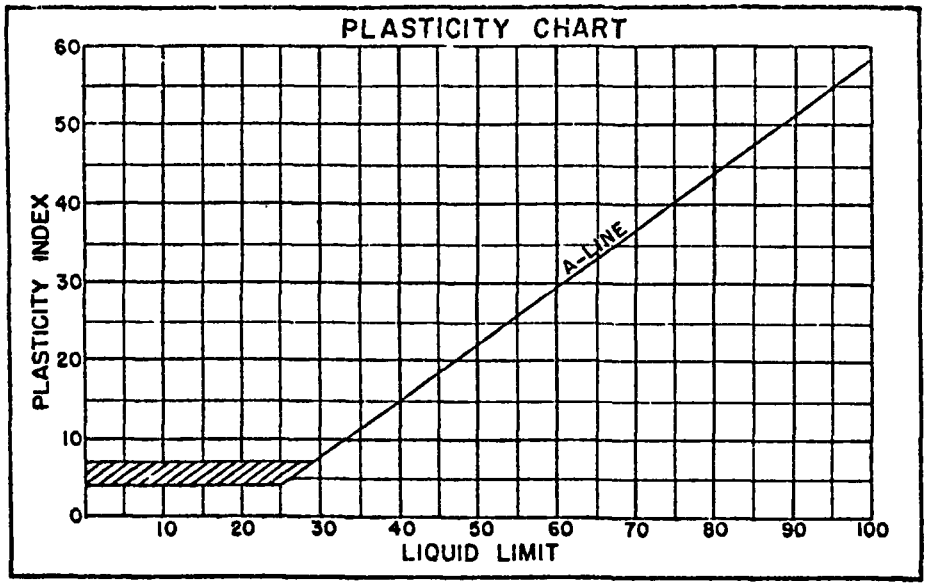
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3501-2 JOB NO. 4bq. HOLE NO. J-19
DATE 11.2-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

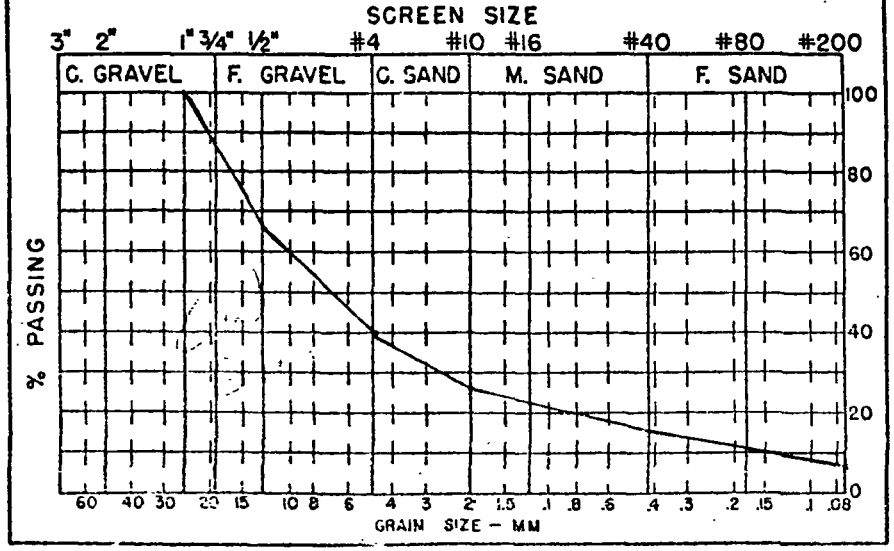
DESCRIPTION: Dry GR, Green
Sty. F-C Sdy. 1"(+) Δ
Gravel w/ Org. Needles.



H_2O = 9%

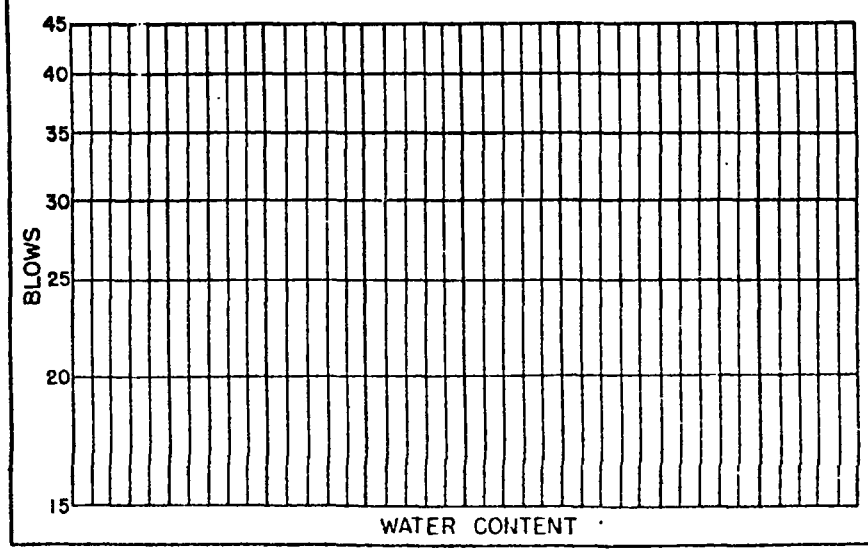
SIEVE ANALYSIS		% Passing			152.83
-1	51.08	100%	-40	12.30	16%
-3/4	40.80	67%	-80		
-4	19.01	40%	-140		
-10	17.82	27%	-200	11.82	8%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

TRIAXIAL COMPRESSION TEST (With Area Changes and Pore Pressures)

Project HOQUIAM Location Sta 139+10 60' Rt
Job No. L7262 Sample No. 3495-1 Boring No. J-19 Depth 7'-0" to 9'-0"
Area (Ao) 2.92 Length 4" Confining Pressure 400 PSF = 2.8 PSI
Rate of Loading .085%/Min L. R. C. .325 Tested by R Brooks Date 24 MAR 83

Description

GROSS WT.	TARE	NET WT.	CAN NO.	WET WT.	DRY WT.	WT. H^2O	% H^2O	WET DENS.	DRY DENS.
		291	40	52.62	28.65	23.97	84	95.7	52

Data for Mohr's Envelope:
Max. Deviator Stress
Principal Stress
Effective Principal Stress

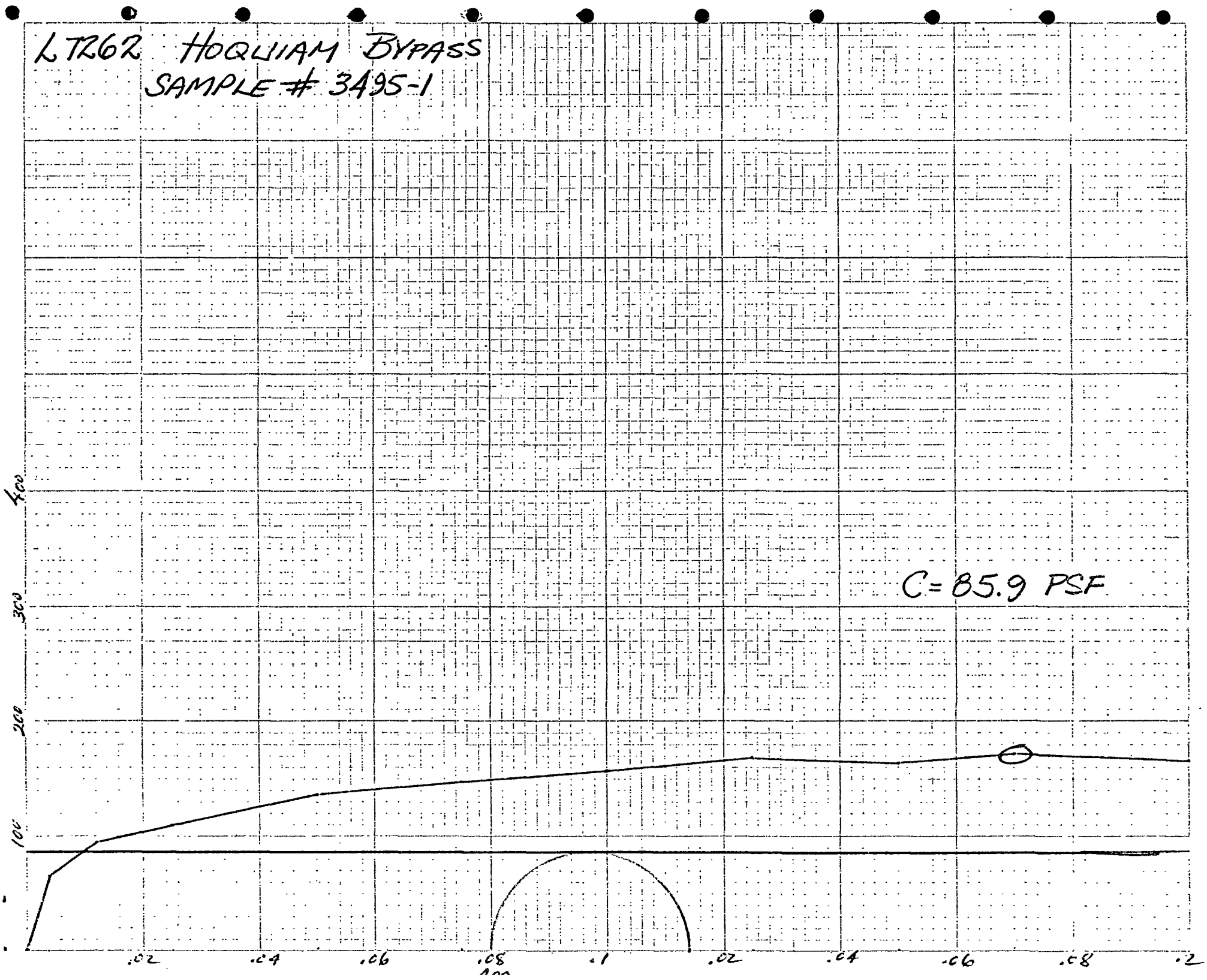
Failure

Back Press.
Saturation 96

ELASPED TIME (Hr.) (Min.)	LOAD DIAL READ (X 10 −4)	DEFORM. DIAL READ	Δ L (COL. 3 x 10 − 3)	E. UNIT STRAIN (ΔL/L)	AREA C.F. (1 − E)	CORRECT. AREA A' ($\frac{A^o}{1-E}$)	PORE PRESS.	DEV. LOAD (Col. 2 X LRC)	DEV. STRESS (Col. 9 ÷ Col. 7)	PRINC. STRESS (Col 10 + conf. press.)
1	2	3	4	5	6	7	8	9	PSF 10	11
~~0~~							2.80			
.5	4	016		.004	996	2.93	2.70	1.3	63.9	
1.75	6	050		.012	988	2.96	2.54	1.95	94.9	
3.25	7	100		.025	975	2.99	2.42	2.28	109.8	
6.5	9	200		.05	95	3.07	2.42	2.92	136.9	
9.75	10	300		.075	925	3.16	2.42	3.25	148.1	
13	11	400		.1	9	3.24	2.16	3.58	159.1	
16	12	500		.125	875	3.34	2.16	3.9	168.1	
19.5	12	600		.15	85	3.44	2.43	3.9	163.3	
22.75	13	700		.175	825	3.54	2.22	4.22	171.7	
26	13	800		.2	8	3.65	2.37	4.22	166.5	

DOT FORM 351-018 REVISED 4/80

LT262 HOQUIAM BYPASS
SAMPLE # 3495-1



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

TRIAX

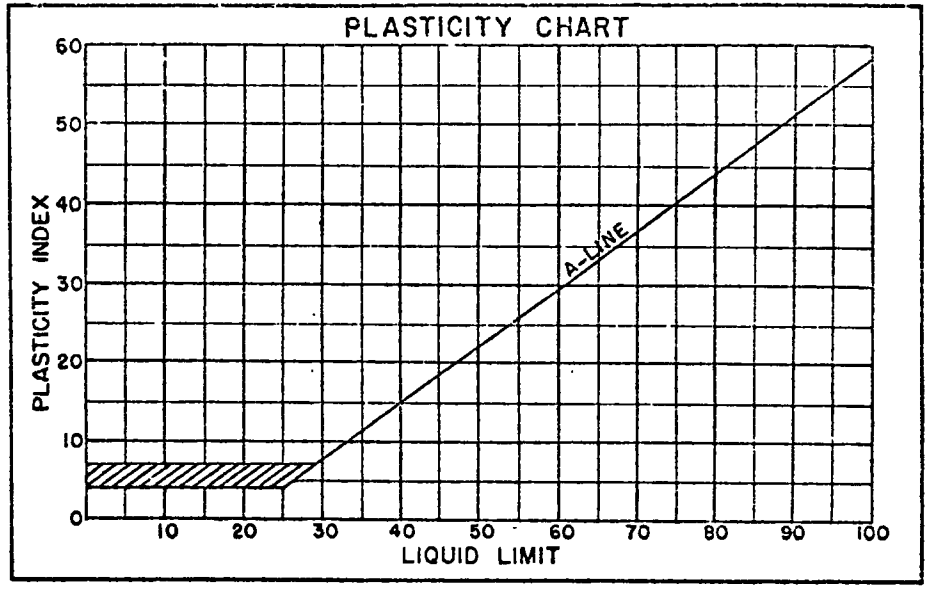
SAMPLE NO. 3495-1 JOB NO. HOQ HOLE NO.

DATE 30 MAR 83 OPERATOR RB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL		✓	
DRIED CAST		✓	
DILATANCY		✓	
BITE			
TOUGHNESS		✓	

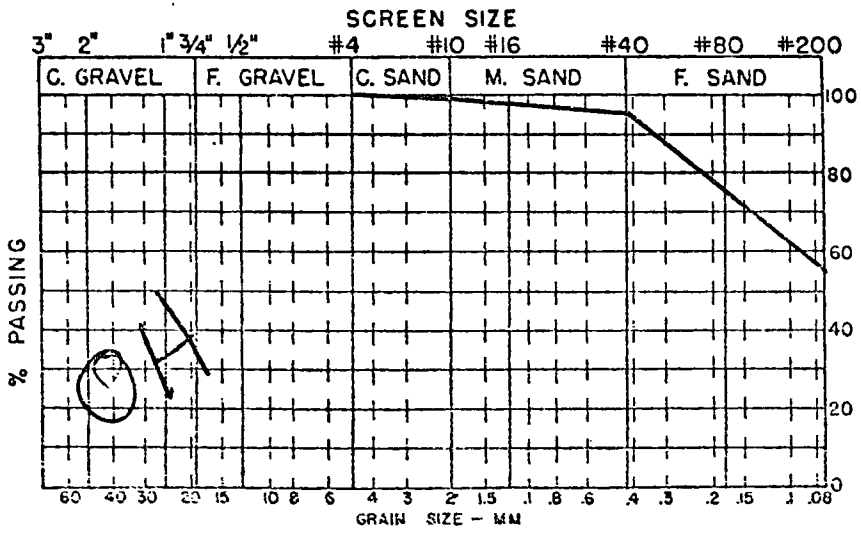
DESCRIPTION: Wet grey w/rust outside
org SILT w/ org mtr



Hygr 84

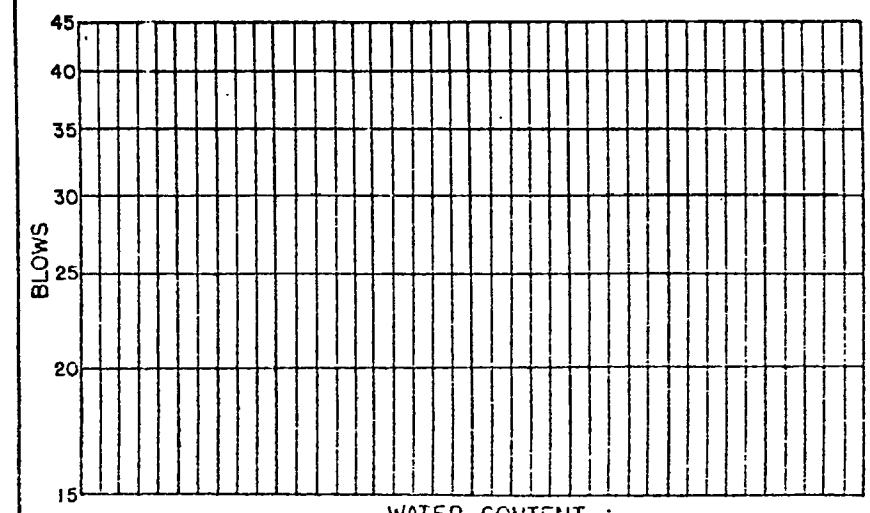
SIEVE ANALYSIS	% Passing				40.89
			-40	53.21	94
-3/4			-80		
-4	.32	100	-140		
-10	8.22	99	-200	79.14	56

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

ATERIALS ENGINEER
aterials Laboratory
O. Box 167, Olympia, WA 98504 (Mailing Address)
55 So. 2nd Ave.
mwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 9-1-82

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section West Hoquiam by pass
SR No. 101A Sub-Section Culvert

Station & Offset 139+50 ℄ Hole # J-20

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3502	D-1	0' 0" – 2' 0"	H20=66%	ML	Like 3494-3 Wet, Gr., Tan & Rusty, Cly. Silt w/ Org. Branches & twigs w/ T. F. SAND
3503-1	U-2	6' 0" – 6' 4"	A		
-2		6' 4" – 6' 8"	B		
-3		6' 8" – 7' 0"	C		
3504-1	U-4	10' 0" – 10' 4"	A		
-2		10' 4" – 10' 8"	B		
-3		10' 8" – 11' 0"	C		
3505	D-5	12' 0" – 14' 0"	H20=37%	MH	MOIST, TAN, Orangish-[illegible], Cly., F. Sdy., Shiny SILTS [illegible]
3506-1	U-6	15' 0" – 15' 4"	A		

opy with samples
opy to addressee

Yours very truly,

Donald M. Moore
Inspector.

FORM 351-002
REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

ATERIALS ENGINEER
terials Laboratory
O. Box 167, Olympia, WA 98504 (Mailing Address)
5 So. 2nd Ave.
mwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 9-1-82

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section West Hoquiam by Pass
SR No. 101 A Sub-Section Culvert

Station & Offset 139+50 ℄ Hole # J-20

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3506 -2	U-6	15' 4" 15' 8"	B		
-3		15' 8" 16' 0"	C		
3507 -1	D-7	17' 0" 19' 0"	H_2O=49%	ML	moist, greenish, gr. olive Layers of Silt & F. Sdy. Silt w/hard Lumps (breakable — Cemen-tations)
-2	D-8	20' 0" 22' 0"	"	ML	Like 3507-1 above.
-3	D-9	25' 0" 26' 3"	H_2O=9%	GW GM	Like 3501-2 Dry, Gr., Green Sty. F.C Sdy. 1"(-) & GRAVEL w/org. odor

py with samples
py to addressee

Yours very truly,

Larry M Moore
Inspector.

T FORM 351-002
REVISED 2/80

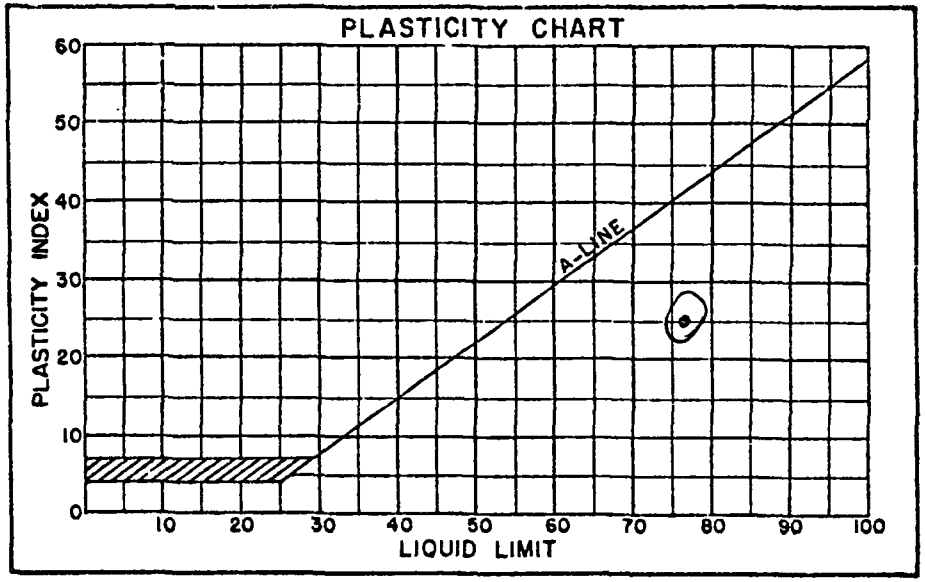
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3505 JOB NO. Nog. HOLE NO. 20
DATE 2-28-83 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	✓
DRIED CAST	✓	✓	✓
DILATANCY			
BITE			
TOUGHNESS	✓	✓	✓

DESCRIPTION: M, tan-orange, Cly. F. Sdy. Shiny SILTS.

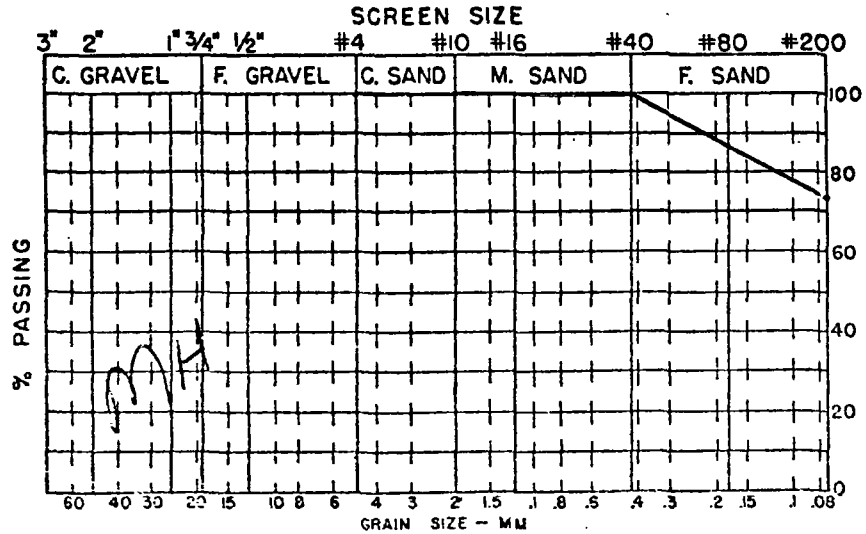


H_2O = 37%

SIEVE ANALYSIS % Passing 45.18

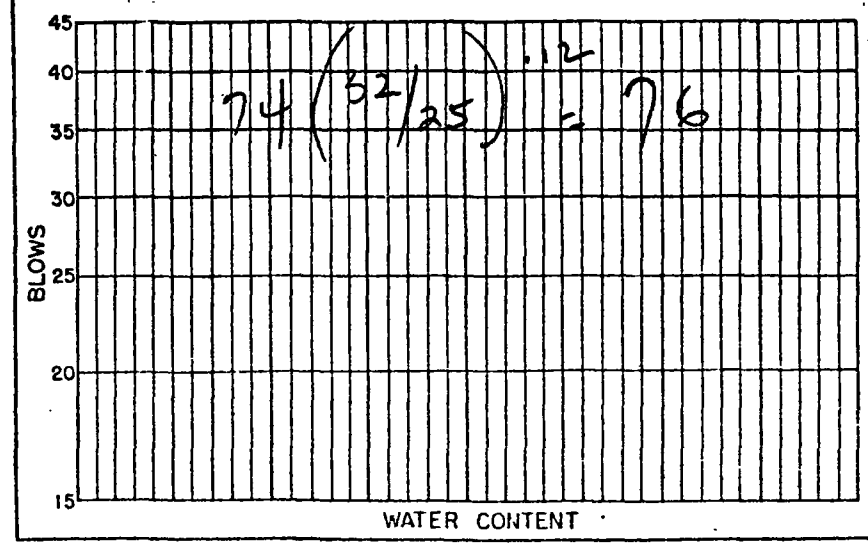
			-40	11.30	99%
-3/4			-80		
-4	.13	100%	-140		
-10	.10	99%	-200	33.65	74%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	74				49
Wet Wt.	22.73				4.69
Dry Wt.	13.03				3.10
% H_2O	74%				PL= 51
Blows	32				PI= ~~26~~ 25



DOT FORM 351-519

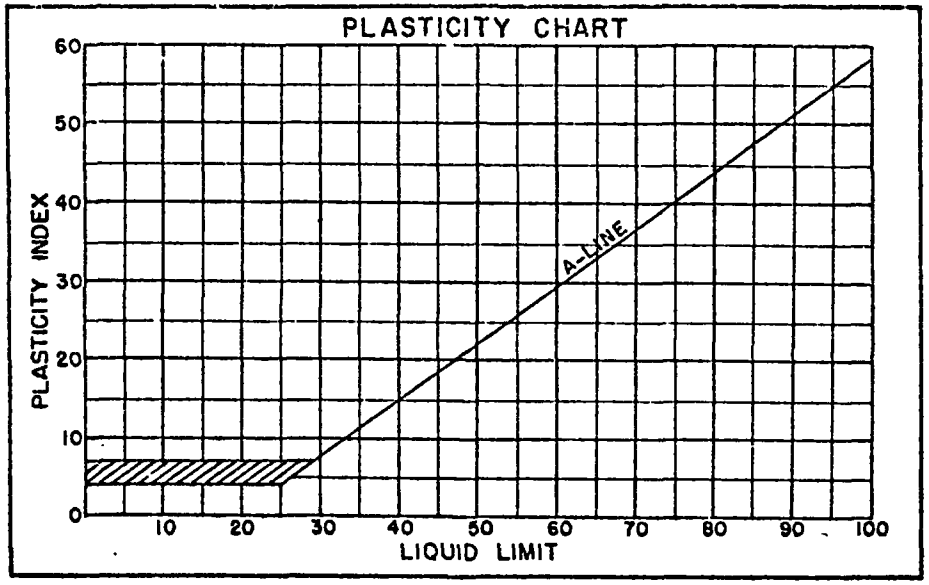
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3507-1 JOB NO. H&9 HOLE NO. 20
DATE 11-2-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Moist, greenish gr.-olive Layers of Silt & F. Sdy. Silt w/ hard Lumps (breakable-cementations)

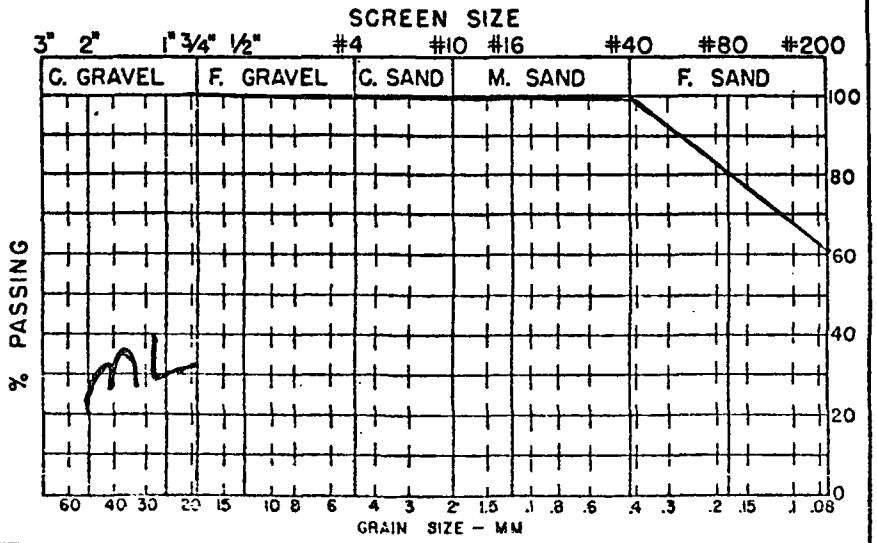


H_2O = 49 %

SIEVE ANALYSIS % Passing 105.05

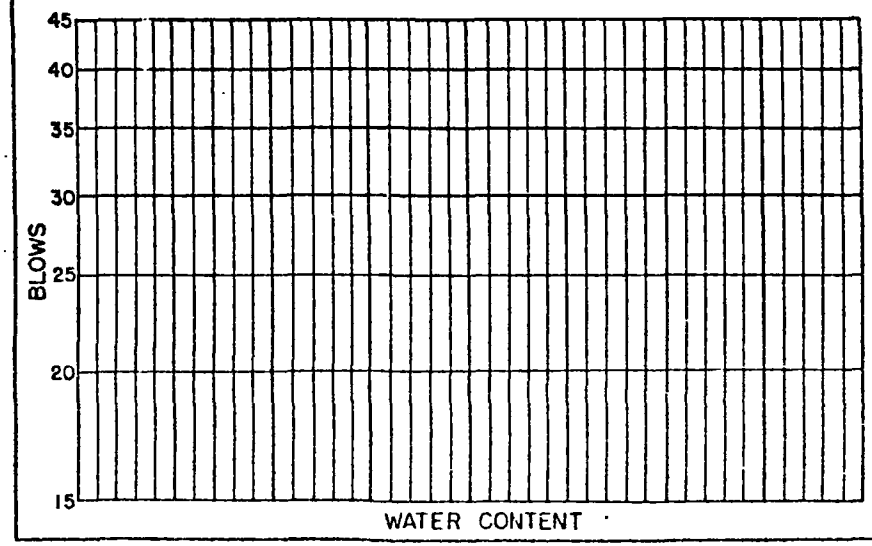
			-40	39.45	99
-3/4	180	100	-80		
-4	32	99	-140		
-10	22	99	-200	64.26	61

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 9-3-82

Dear Sir:

I have forwarded by today's state car the following Foundation Samples.

Contract or Job No. L-7262 Section West Hoquiam by Pass
SR No. 101 A Sub-Section Culvert

Station & Offset 136+29 60' Rt. Hole # J-21

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3508 -1	D-1	0' 0" – 2' 0"	H_2O=283%	PT	SAT. BLK.-dk. Brn. Sty. PEAT w/Lg. Wood Chunks & Org. Stems
3508 -2	U-2	3' 0" – 5' 0"	I.D. only	PT	Same w/T. F. SAND
3509 -1	U-3	5' 0" – 5' 4"	A		
-2		5' 4" – 5' 8"	B		
3510	D-4	7' 0" – 9' 0"	H_2O=156%	OL	SAT. dk. Brn., F. Sdy. SILT w/mold & chunks of wood-hly. organic.
3511	S-5	10' 0" – 12' 0"	H_2O=53%	ML	Moist, Gr. F. Sdy. SILT w-trace M-C SAND, trace Cly. & ORG. Pieces
3512	D-6	12' 0" – 14' 0"	H_2O=60%	SM	Like 3180 MOIST, Brn.-Gr., V. Sty. F. SAND w/Org Layers
3513 -1	U-7	15' 0" – 15' 4"	A		
-2		15' 4" – 15' 8"	B		

1 copy with samples
1 copy to addressee

Yours very truly,
Larry M. Moore
Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

.TERIALS ENGINEER
terials Laboratory
O. Box 167, Olympia, WA 98504 (Mailing Address)
5 So. 2nd Ave.
nwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 9-3-82

Dear Sir:

I have forwarded by today's state car the following Foundation Samples.

Contract or Job No. L-7262 Section west Hoquiam by Pass
SR No. 101 A Sub-Section culvert

Station & Offset 136+29 60' Rt. Hole # J-21

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3513 -3	U-7	15' 8" 16' 0"	C		
3514	D-8	17' 0" 19' 0"	H2O=33%	ML	Like 3170-3 w/org. odor Moist, Gr. & tan F. Sdy. SICT w/T. Mica.
3515 -1	U-9	20' 0" 20' 4"	A		Like 3660
-2		20' 4" 20' 8"	B		
3516 -1	D-10	21' 6" 23' 6"	H2O=18%	SM	Like 3493-4 w/org. Needles & stems Moist, grn.-gr., olive, V. Sty. F-C SAND w/F. Gravel
-2	D-11	25' 0" 27' 0"		SM	SAME.
-3	D-12	30' 0" 31' 0"		SM	SAME

copy with samples
copy to addressee

Yours very truly,
Larry M Moore
Inspector.

FORM 351-002

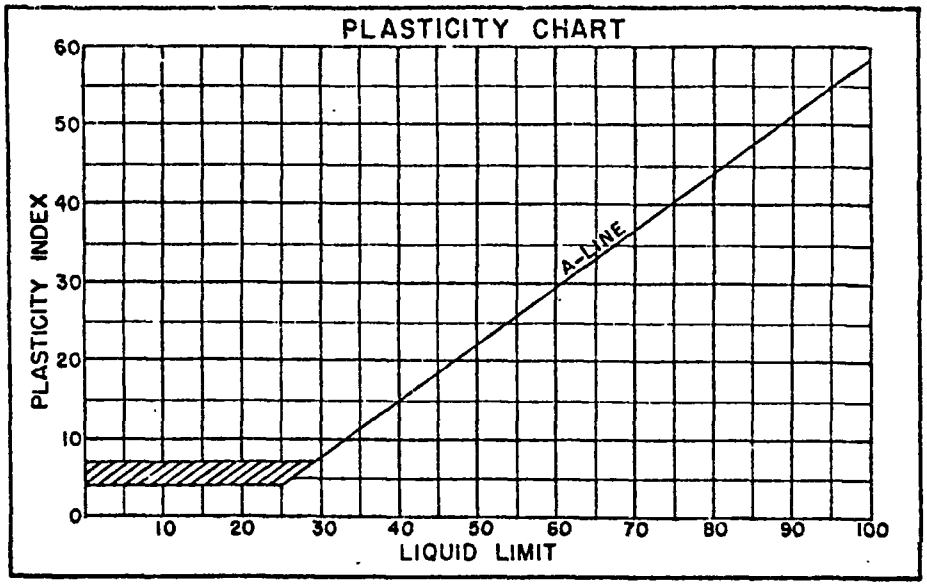
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3508-1 JOB NO. Hoj HOLE NO. J-21
DATE 3-3-83 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: Sat. Blk. - dk. Brn. Sty. PEAT w/ Lg. Wood Chunks & org. Stems

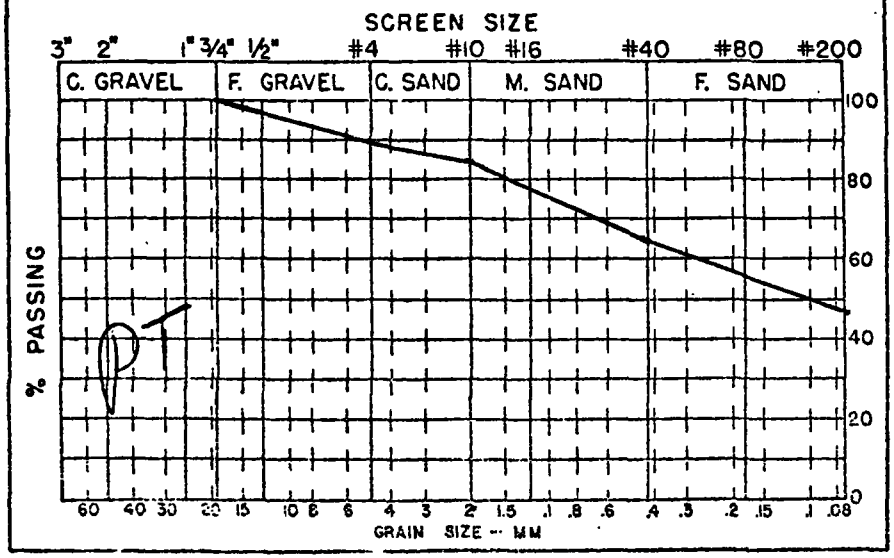


H_2O = 28.3%

SIEVE ANALYSIS % Passing 30.18

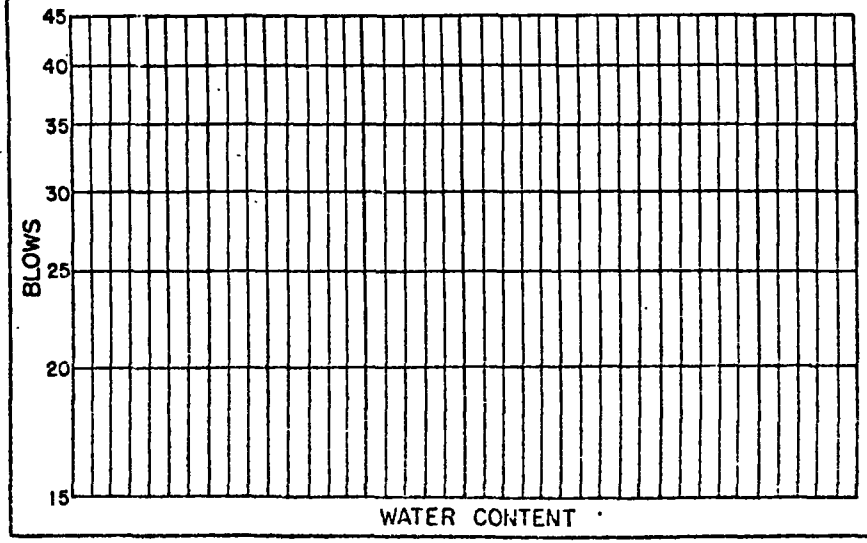
			-40	4.99	6%
-3/4	3.31	100%	-80		
-4	1.38	89	-140		
-10	6.19	84	-200	14.31	47%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



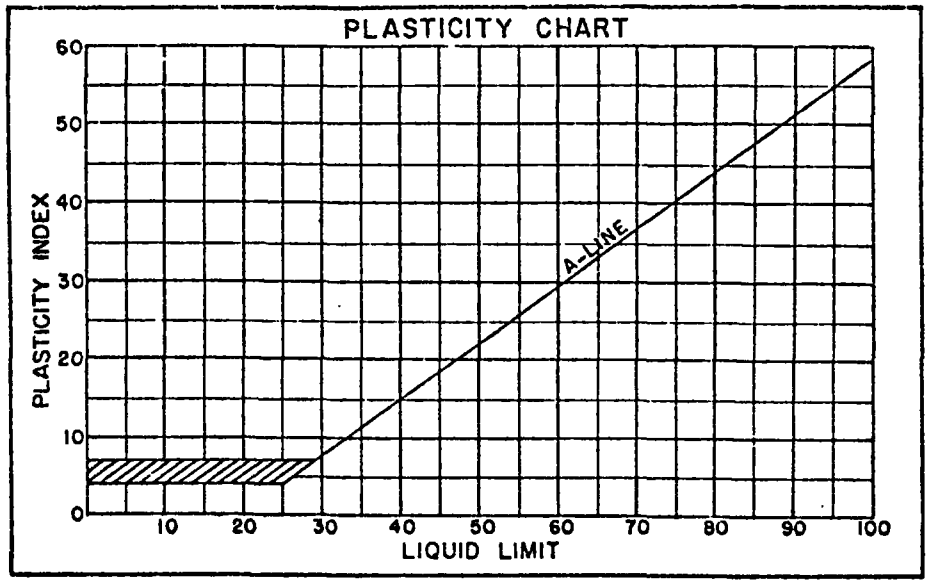
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3510	JOB NO. Hog	HOLE NO. J-21
DATE 3-3-83	OPERATOR BB	

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

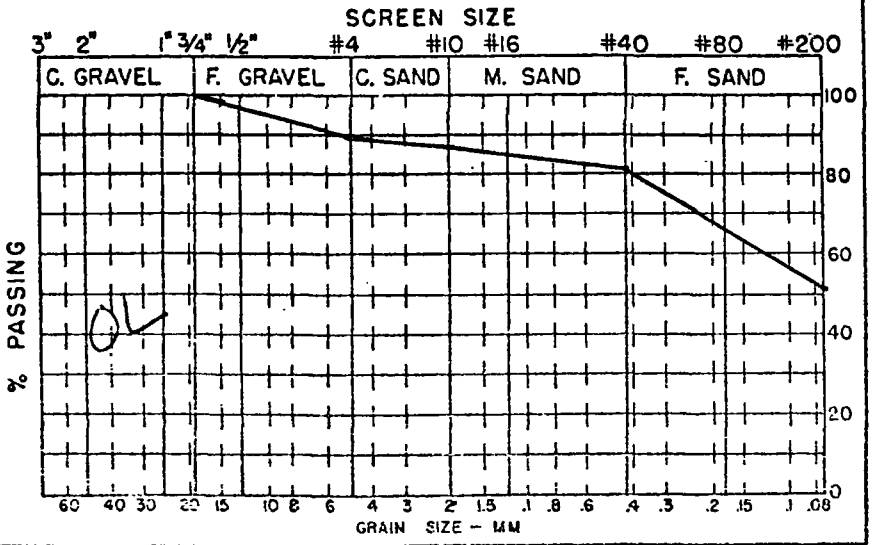
DESCRIPTION: Wet, dk. Brn. F. Sdy. SILT, hly. Org. w/ mold & chunks of Wood.



H_2O = 156 %

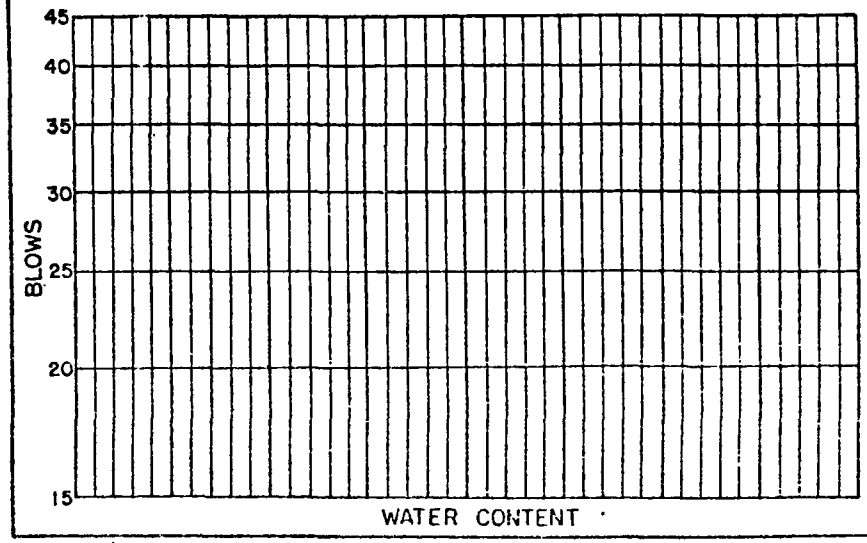
SIEVE ANALYSIS			% Passing 34.62	
			-40 9.98	81 %
-¾ 3.78	100 %		-80	
-4 .62	89 %		-140	
-10 2.30	85 %		-200 17.94	52 %

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3511 JOB NO. HCQ Shelby HOLE NO.
DATE 9/20/82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	✓

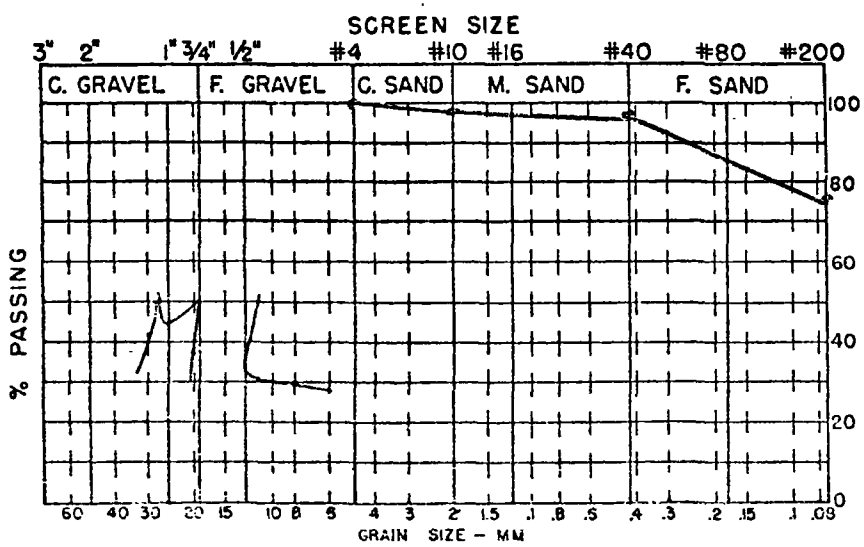
DESCRIPTION: Moist, Gr., f. sdy SILT w- t. crs.-m. sand, t. cly/t. org. pieces

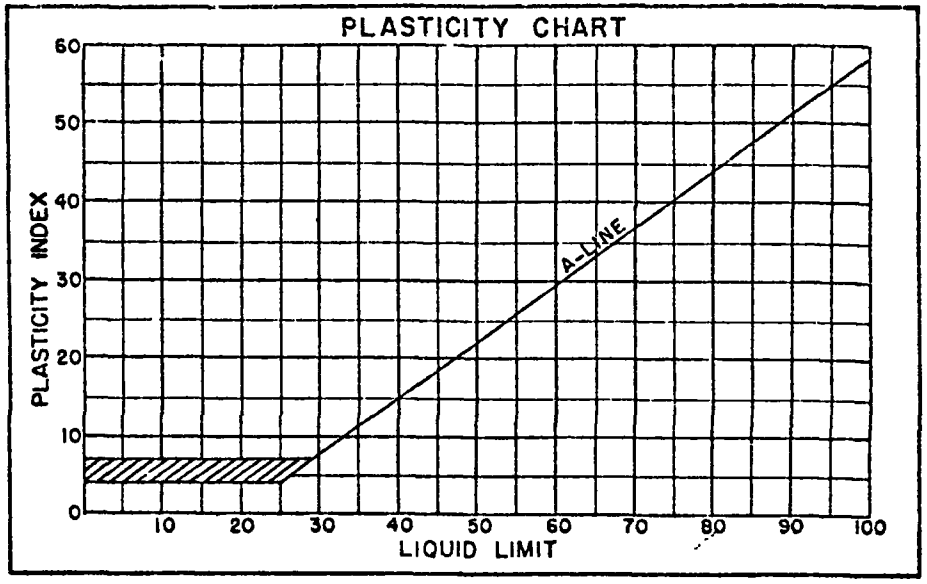
H_2O = 53%

SIEVE ANALYSIS % Passing 100.00

			-40	22.70	98%
-3/4			-80		
-4	0.80	100%	-140		
-10	1.00	99%	-200	75.50	76%

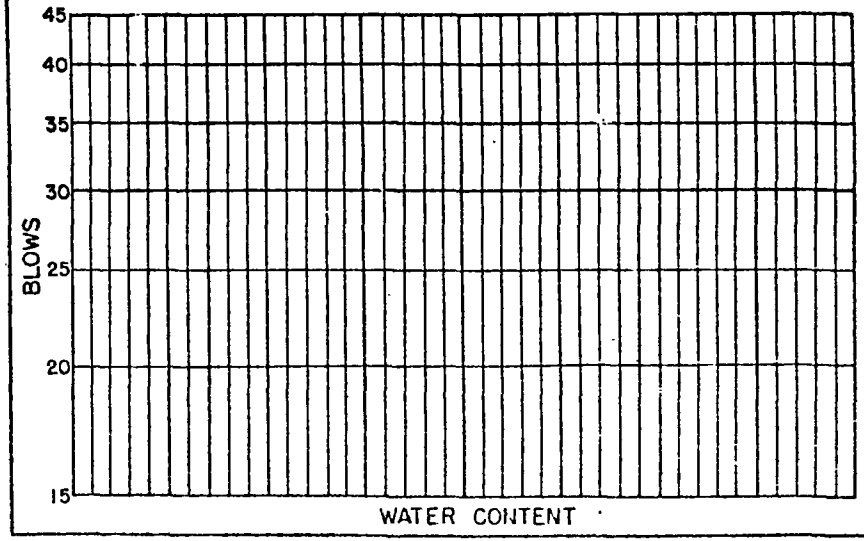
GRAIN SIZE CURVE





LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

ATERIALS ENGINEER
terials Laboratory
O. Box 167, Olympia, WA 98504 (Mailing Address)
5 So. 2nd Ave.
mwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 9-3-82

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section West Hoquiam by pass
SR No. 101 A Sub-Section Culvert

Station & Offset 135+50 60' LT Hole # J-22

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3517	D-1	0' 6" / 2' 6"	H: 79%	SM	SILT, dk. Brn. Blk. silty SAND w/Layers of Org. Leaves, Needles & Stems / Rust Layers & Sl. Cly.
3518-1	U-2	4' 4" / 4' 8"	B		
-2		4' 8" / 5' 0"	C		
-3		5' 0" / 5' 4"	D		
3519	D-3	11' 0" / 13' 0"	H: 56%	SM	Like 3172 Wet, tan, Cly., V. Sty. F. SAND w/sm. cementations & rust streaks
3520-1	U-4	9' 0" / 9' 4"	A		
-2		9' 4" / 9' 8"	B		
-3		9' 8" / 10' 0"	C		
3521	D-5	11' 0" / 13' 0"	56%	SM	Like 3519 Above

opy with samples
opy to addressee

Yours very truly,
Larry M Moore
Inspector.

FORM 351-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

ATERIALS ENGINEER
terials Laboratory
O. Box 167, Olympia, WA 98504 (Mailing Address)
5 So. 2nd Ave.
mwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 9-3-82

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section West Hoquiam bypass SR No. 101A Sub-Section Culvert

Station & Offset 135+50 60' Lt. Hole # J-22

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3522-1	U-6	14' 4" 14' 8"	B		
-2		14' 8" 15' 0"	C		
3523	D-7	16' 0" 18' 0"	H=54%	ML	Like 3437-2 Wet, Gr.-Tan Layered F. Sdy. Silt w/T. Mica
3524-1	U-8	19' 4" 19' 8"	B		
-2		19' 8" 20' 0"	C		
-3		20' 0" 20' 4"	D		
3525	D-9	21' 0" 23' 0"	54%	ML	Like 3437-2 Above
3526-1	U-10	24' 4" 24' 8"	B		
-2		24' 8" 25' 0"	C		

py with samples
py to addressee

Yours very truly,
Terry M Moore
Inspector.

FORM 351-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 9-3-82

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section West Hoquiam bypass
SR No. 101 A Sub-Section Culvert

Station & Offset 135+50 60' Lt. Hole # J-22

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3526 -3	U-10	25' 0" 25' 4"	D		
3526 -4		25' 4" 25' 8"	E		
3527 -1	D-11	26' 0" 28' 0"	Ho 54%	ML	Like 3437-2 Wet, Gr-Tan Layered F. Sdy. SILT w/T. Mica
-2	D-12	29' 0" 30' 6"	49%	ML	Like 3507-1 Moist, greenish, gr. olive - Layer. of Silt & F. Sdy. Silt w/ cementations
-3	D-13	34' 6" 35' 4"	18%	SM	Like 3493-4 Moist, Gen. - Gr. olive, V. Sty. F-C SAND w/F. Gravel

1 copy with samples
1 copy to addressee

Yours very truly,
Terry M Moore
Inspector.

DOT FORM 351-002 REVISED 2/40

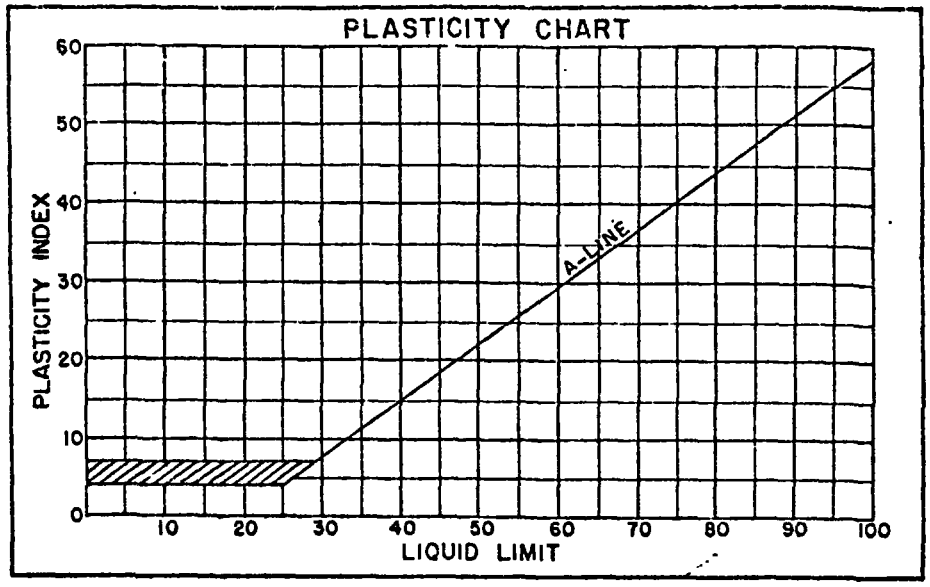
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3517 JOB NO. 1-0G HOLE NO. J-22
DATE 11-2-82 OPERATOR C.B.

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	—	✓

DESCRIPTION: SAT. dk. Brn., BLK. silty F-SAND w/ Layers of org. leaves, Needles & stems / Rust Layers & sl. Cly.

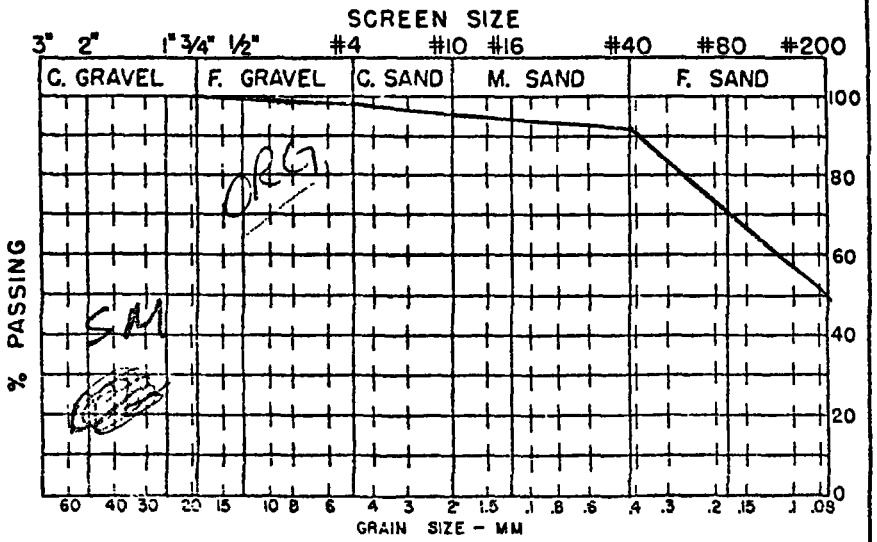


4/20 = 79 %

SIEVE ANALYSIS % Passing 36.22

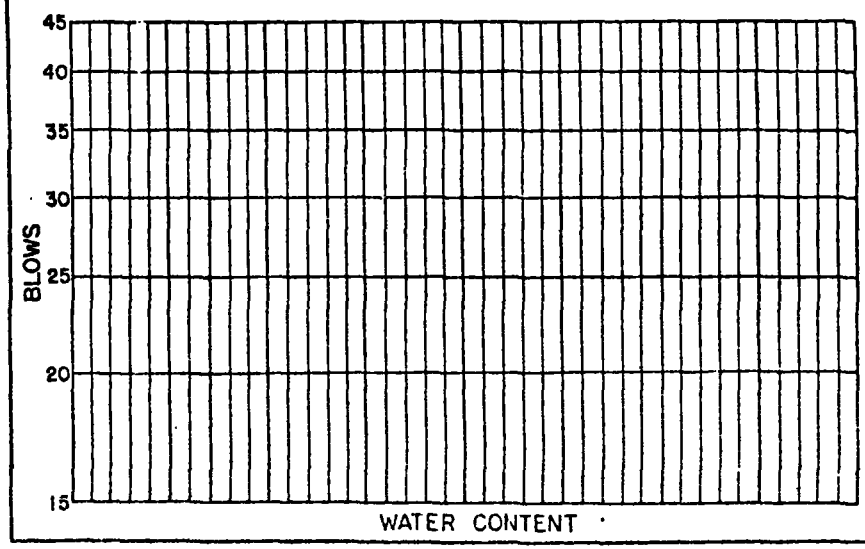
			-40	15.62	92
ORG. -3/4	.83	100%	-80		
-4	.58	98	-140		
-10	1.62	96	-200	17.57	49

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 9-8-82

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section West Hoquiam by Pass
SR No. 101 A Sub-Section Culvert

Station & Offset 132+85 50' Rt. Hole # J-23

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3528	D-1	0' 0" – 2' 0"	H2O=174%	OL	Sat., Dk. Brn., Blk. Sdy. F. Sdy. SILT w/ wood fiberg & Roots
3529-1	U-2	2' 0" – 2' 4"	A		
-2	U-3	5' 0" – 5' 4"	A		
-3		5' 4" – 5' 8"	B		
-4		5' 8" – 6' 0"	C		
3530	D-4	7' 0" – 9' 0"	H2O=79%	OH	SAT. GR. & TAN, F. Sdy. Cly. SILT w/ HLY ORGANIC Stems w/ T mica
3531	S-5	9' 6" – 11' 6"	H2O=109%	OH	Wet, GR. F. Sdy. SILT w/ PEATY mtr. & chunks of Wood, t. Cly.
3532	D-6	11' 6" – 13' 6"		OH	Like 3530 ABOVE
3533	S-7	14' 6" – 16' 6"	H2O=84%	ML	Wet, GR. ORG. SILT F. Sdy.

1 copy with samples
1 copy to addressee

Yours very truly,

Gary M Moore
Inspector.

DOT FORM 351-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 9-8-82

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section West Hoquiam by Pass SR No. 101 A Sub-Section Culvert

Station & Offset 132+85 50' Rt Hole # J-23

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3534	D-8	16' 6" 18' 6"	79%	OH	Like 3530 Sat. Gr. & Tan F. Sdy. Cly.
				SILT	hly. Organic Stems w/T. mica.
3535-1	U-9	19' 10" 20' 2"	B		
-2		20' 2" 20' 6"	C		
-3		20' 6" 20' 10"	D		
-4		20' 10" 21' 2"	E		
3536	D-10	21' 6" 23' 6"	79%	OH	Like 3530 Above.
3537-1	U-11	24' 10" 25' 2"	B		
-2		25' 2" 25' 6"	C		
-3		25' 6" 25' 10"	D		

1 copy with samples
1 copy to addressee

Yours very truly,
Larry M Moore
Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 9-8-82

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section West Hoquiam by Pass
SR No. 101 A Sub-Section culvert

Station & Offset 132+85 50' Rt. Hole # J-23

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3538 -1	D-12	26' 6" 28' 6"	11-98%	OH	Like 3414 SAT., TAN, Brn., Cly. Silt w/Trace of Organic Twigs/Twigs
-2	D-14	30' 0" 32' 0"	NO REC		
-3	D-15	36' 6" 38' 6"	47%	SM	Like 3416-1 Wet, Orange, V. Sty. F.C SAND & F. Grav.
-4	D-16	39' 6" 41' 6"	49%	ML	Like 3507-1 w/o cementations Moist, grnish., gr. olive layered Silt & F. Sdy. Silt
-5	D-17	44' 6" 46' 6"	18%	SM	Like 3493-4 Moist, Grn.-Gr. Olive, V. Sty. F.C SAND w. F. Gravel

1 copy with samples
1 copy to addressee

Yours very truly,

Daryl M Moore
Inspector.

DOT FORM 351-002 REVISED 2/80

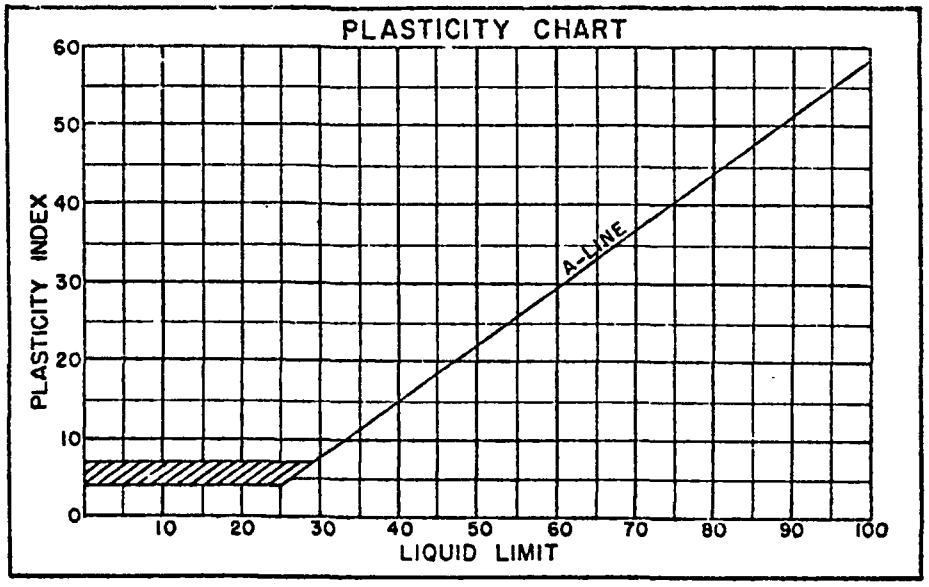
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3528 JOB NO. ~~Hog~~ HOLE NO. J-23
DATE 3-3-83 OPERATOR BP

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

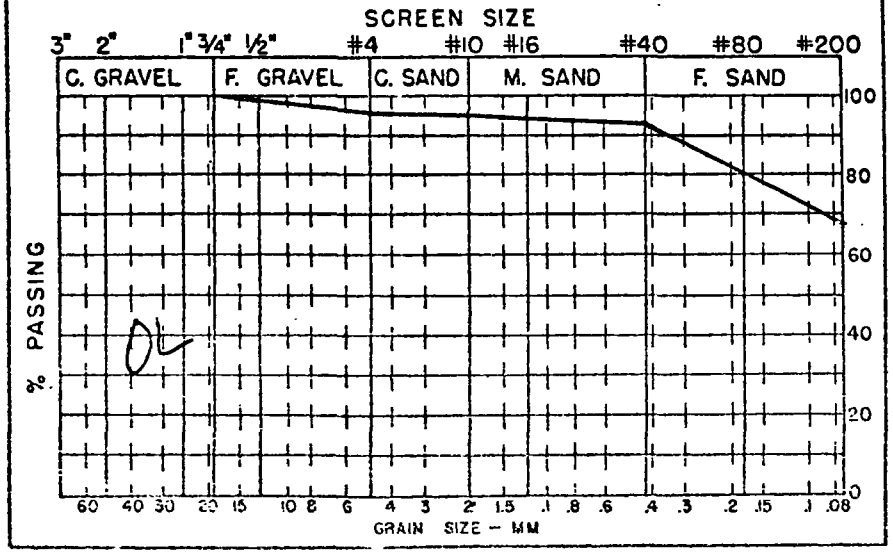
DESCRIPTION: Sat. dk. Brn. - BLK F. Sdy. SILT W/ WOOD fibers & roots.



H_2O = 17.4 %

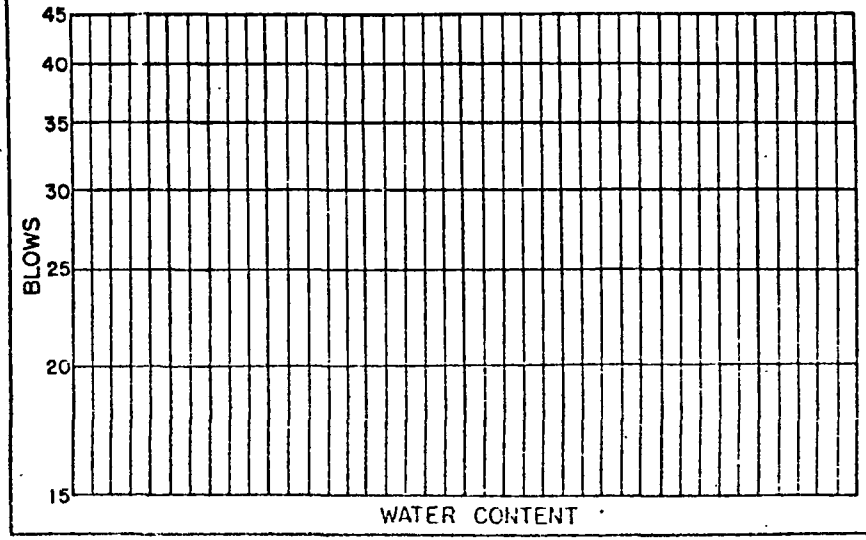
SIEVE ANALYSIS			% Passing 25.92		
			-40	6.32	93 %
-3/4	1.05	100 %	-80		
-4	.30	96 %	-140		
-10	.63	95 %	-200	17.62	68 %

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



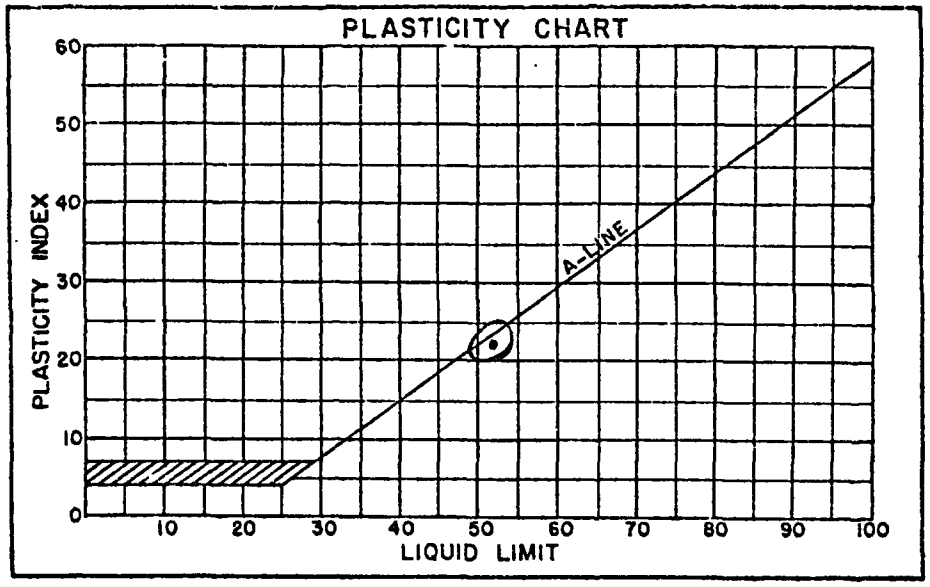
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3530 JOB NO. H09. HOLE NO. J-23
DATE 11-2-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			✓

DESCRIPTION: SAT., GR-TAN F. Sdy. Cly. SILT, HIGHLY ORGANIC (Stems) w/ T. Mica

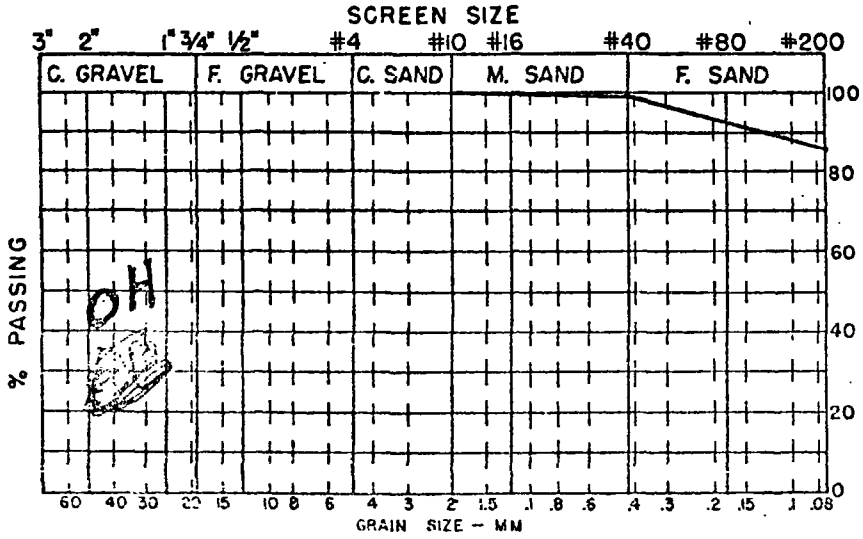


H_2O = 79%

SIEVE ANALYSIS % Passing 33.55

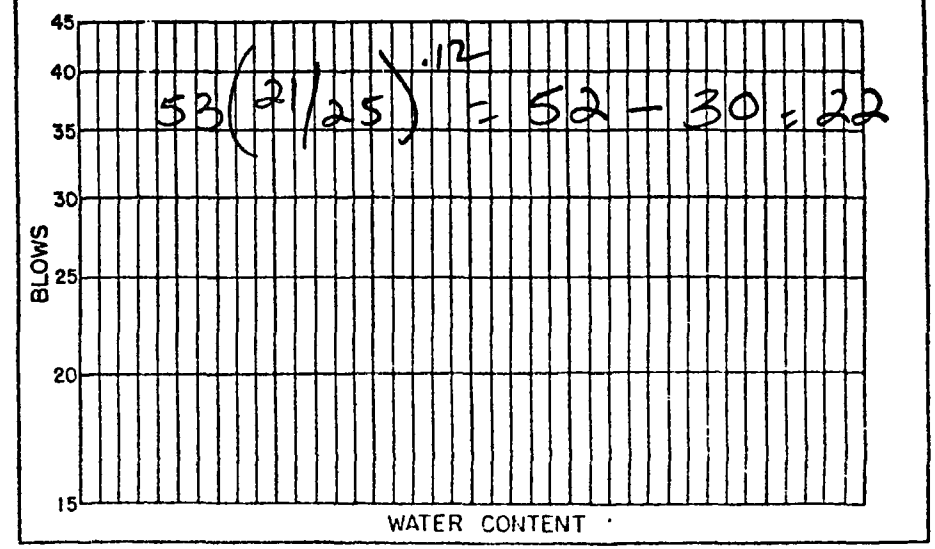
		-40	4.85	99.9
-3/4		-80		
-4		-140		
-10 .01	100%	-200	28.69	86

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	35				112
Wet Wt.	12.91				8.59
Dry Wt.	8.43				6.62
% H_2O	53%				PL= 30%
Blows	21				PI= 22



$53\left(\frac{21}{25}\right)^{.12} = 52 - 30 = 22$

DOT FORM 351-019

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3531 JOB NO. Hca Shelby HOLE NO. 1-23
DATE 9/17/82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	✓

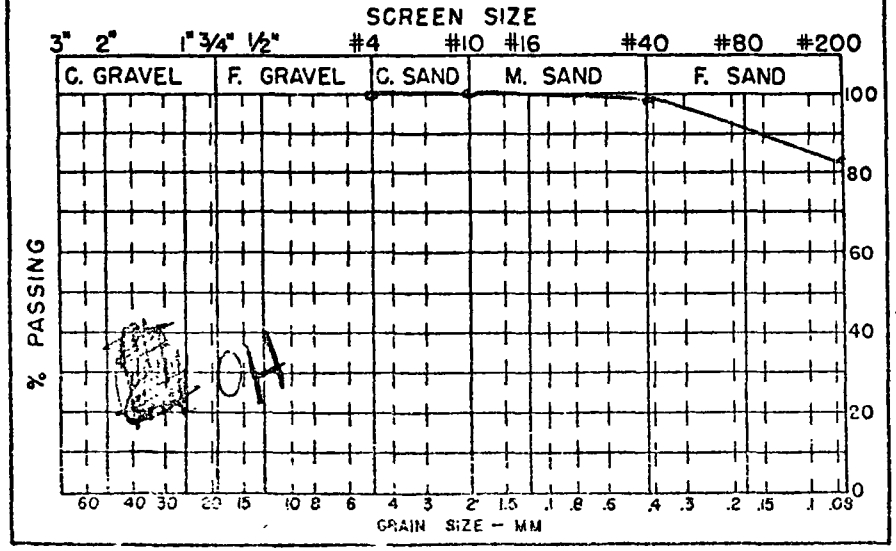
DESCRIPTION: Wet, Gr. F. Sdy. SILT w/ PEAT mix & chunks of Wood & t. Cly.

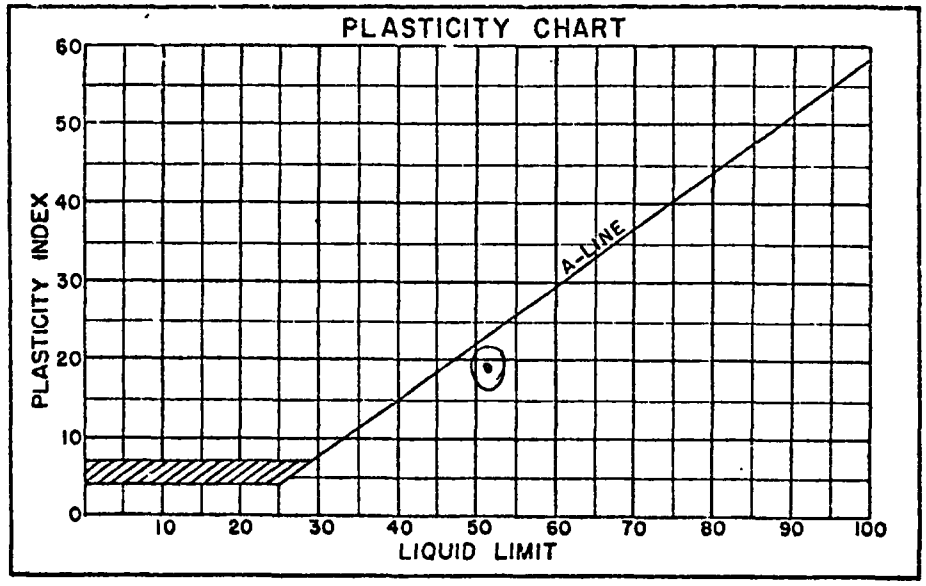
H_2O = 109%

SIEVE ANALYSIS % Passing 100.00

			-40	16.34	99%
-3/4			-80		
-4	0.13	—	-140		
-10	0.91	100%	-200	82.62	83%

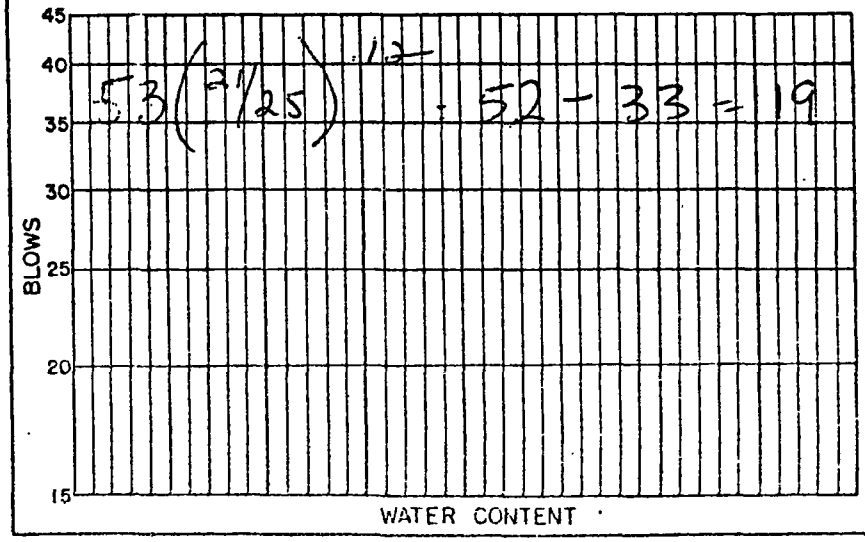
GRAIN SIZE CURVE





LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	50				69
Wet Wt.	10.92				9.10
Dry Wt.	7.15				6.85
% H_2O	53				PL= 33%
Blows	21				PI= 19



DOT FORM 351-019

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3533 JOB NO. HCQ Shelby HOLE NO. 1-23
DATE 9/17/82 OPERATOR BB

SOIL FIELD IDENTIFICATION

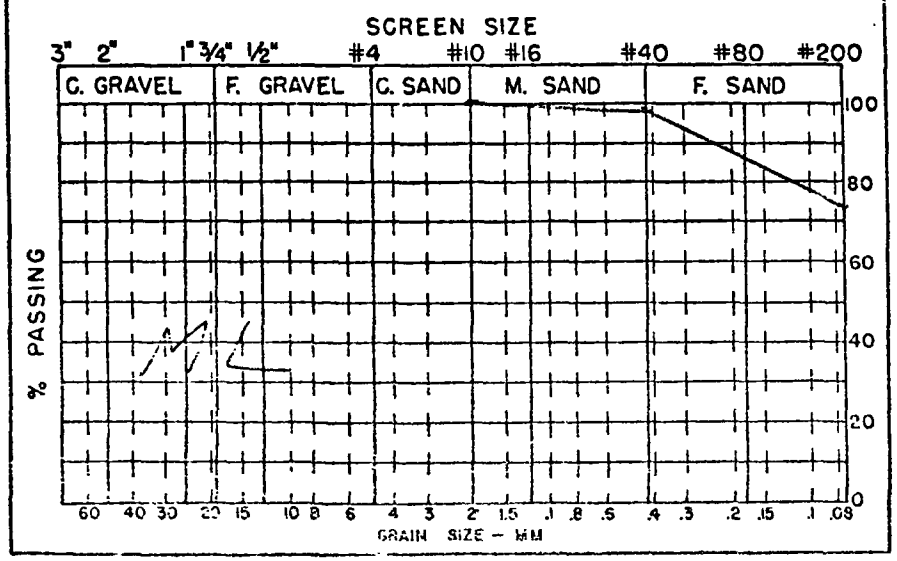
TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Moist, Gr. org. SILT
F. Sdy.

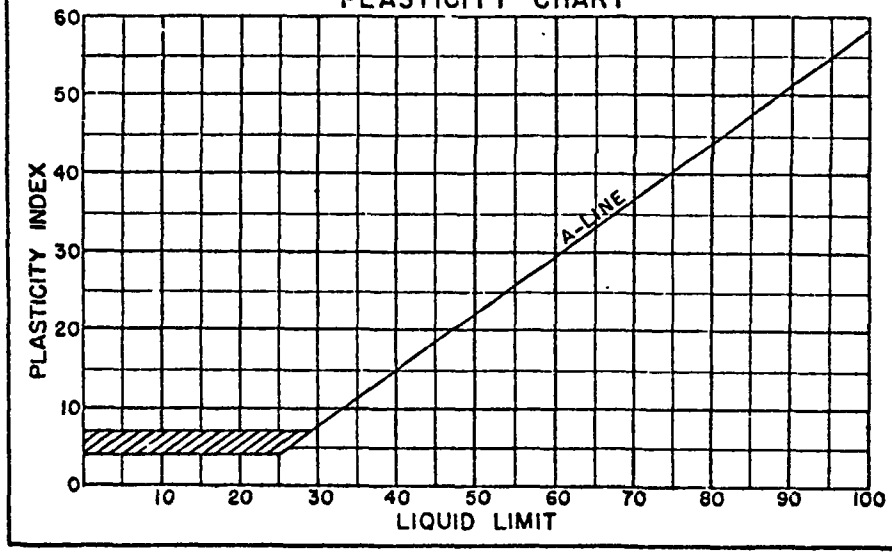
H_2O = 84%

SIEVE ANALYSIS		% Passing 100.00	
		-40 25.18	99%
-3/4		-80	
-4		-140	
-10 0.90	100%	-200 73.92	74%

GRAIN SIZE CURVE

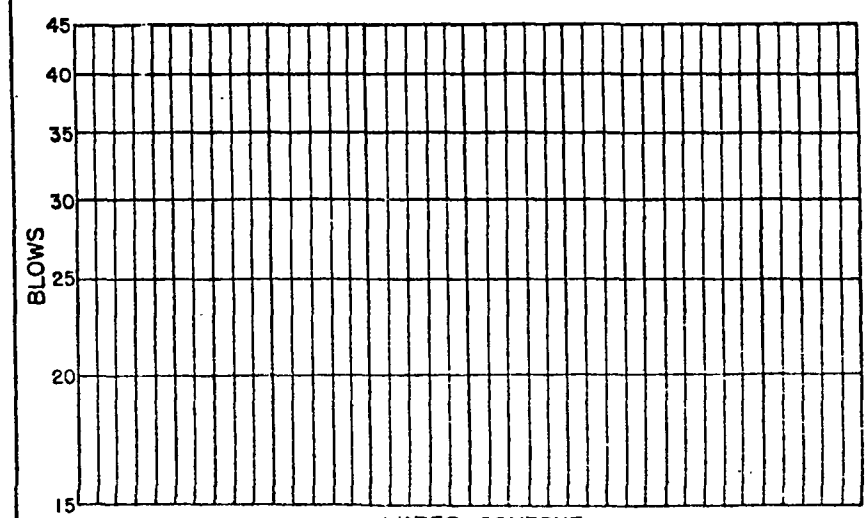


PLASTICITY CHART



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 9-10-82

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section West Hoquiam bypass SR No. 101 A Sub-Section culvert

Station & Offset 132+85 50' LT. Hole # J-24

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3547 -1	U-1	0' 0" 0' 4"	A		
-2		0' 4" 0' 8"	B		
3548	D-2	2' 0" 4' 0"	H2O=122%	OH	SAT., DK Brn., ORGANIC, clayey SILT w/ TWIGS.
3549	S-3	4' 0" 6' 0"	H2O=109%	OH	Moist, GR. & BLK., Cly. SILT ORGANIC MAT'L & PEAT
3550	D-4	6' 0" 8' 0"	79%	OL	Like 3530 SAT. GR. & TAN F. Sdy. Cly. SILT w/ hly. Org. Stems & w/T. Mica.
3551	S-5	9' 0" 11' 0"			
3552	D-6	11' 0" 13' 0"	61%	OH	Moist, GR., LT. BRN., w/trace Rust ORG. (Stems) clayey SILT w/ med. Plasticity
3553 -1	U-8	19' 0" 19' 4"	A		
-2		19' 4" 19' 8"	B		

1 copy with samples
1 copy to addressee

Yours very truly,
Barry M. Moore
Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
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Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 9-10-82

Dear Sir:

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Contract or Job No. L-7262 Section West Hoquiam by pass
SR No. 101 A Sub-Section culvert

Station & Offset 132+85 50' Lt Hole # J-24

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3554	D-9	21' 0" 23' 0"	57%	MC	Like 3166 w/o F. Gravel Wet, GR. & TAN F Sdy. SILT
3555 -1	U-10	24' 0" 24' 4"	A		
-2		24' 4" 24' 8"	B		
-3		24' 8" 25' 0"	C		
3556 -1	D-11	26' 0" 28' 0"	H_2O-61%	OH	Like 3552 But! M., GR, LT. Brn. w/trace Rust, org. Clayey SILT w/med. Plasticity; W/ BLK & dk. Brn. decomp. Wood.
-2	D-13	31' 0" 33' 0"	122%	OH	Like 3548 But BLK. SAT, DK. BRN, hly. Org., Clayey SILT w/ STEMS & sl. Pty. fibrous mtr.
-3	D-15	36' 0" 38' 0"	26%	Gm	Moist, tan & Orange, V. Sty. F-C Sdy. F. GRAVEL
-4	D-16	39' 0" 40' 0"		Gm	SAME
-5	D-17	43' 0" 44' 6"		Gm	SAME

1 copy with samples
1 copy to addressee

Yours very truly,

Larry M. Moore
Inspector.

DOT FORM 351-002 REVISED 2/80

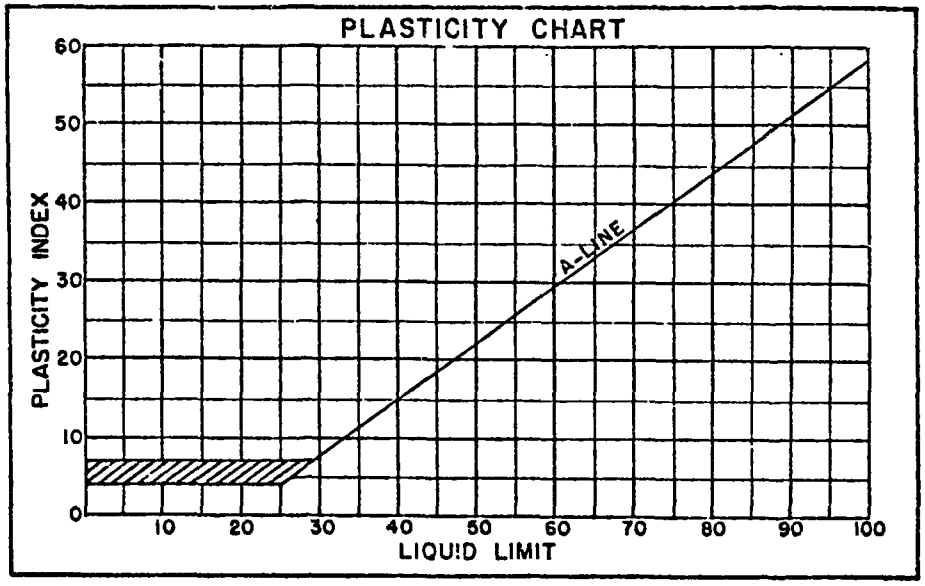
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3548 JOB NO. Hog. HOLE NO. J-24
DATE 2-28-83 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			✓

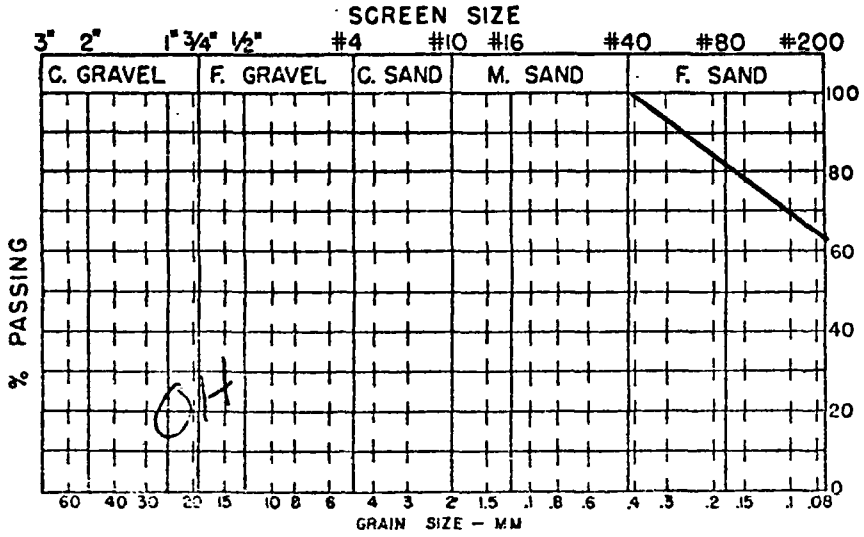
DESCRIPTION: Sat. dk. Brn. Organic Clayey SILT



H_2O = 122 %

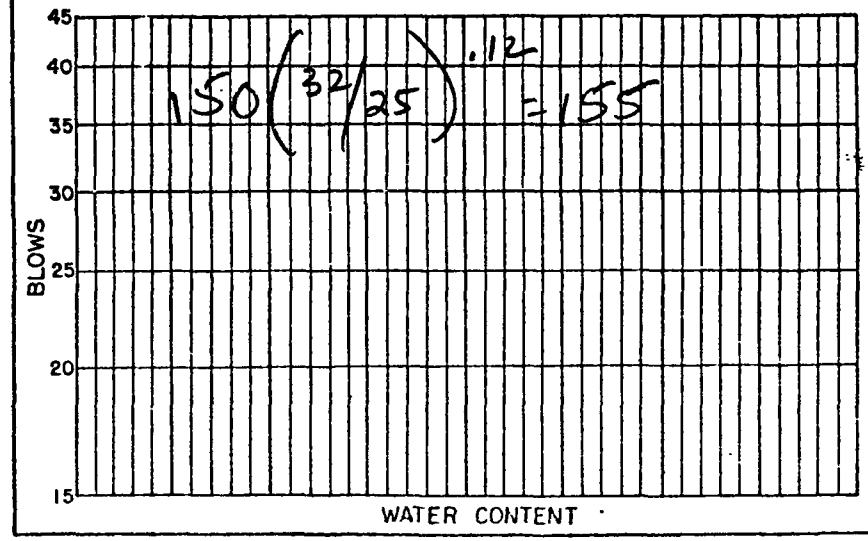
SIEVE ANALYSIS		% Passing 27.50	
	-40	10.20	100%
-3/4	-80		
-4	-140		
-10	-200	17.30	63%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	51				77
Wet Wt.	14.11				3.25
Dry Wt.	5.65				2.01
% H_2O	150%				PL= 62
Blows	32				PI= 93



$150\left(\frac{32}{25}\right)^{.12} = 155$

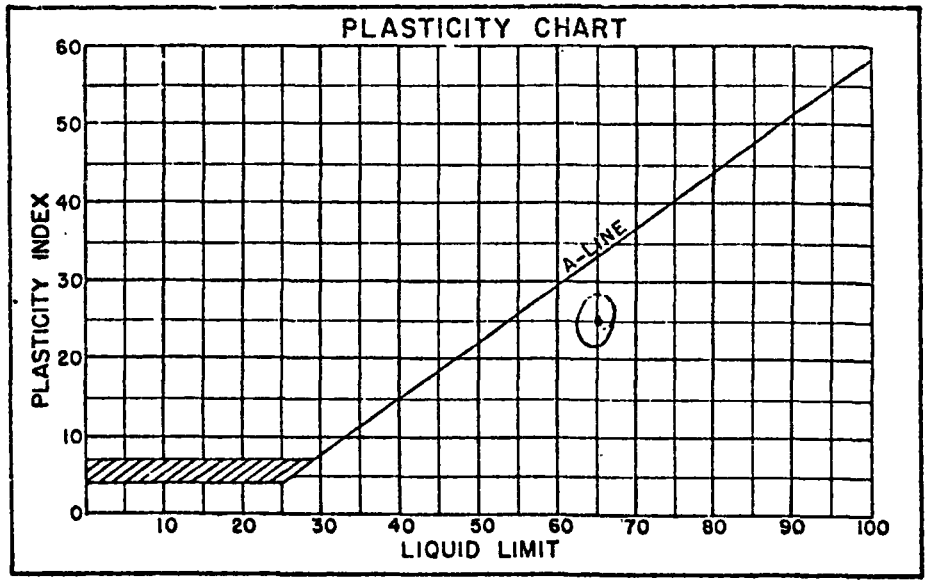
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

Shelby

SAMPLE NO. 3549 JOB NO. 46Q. HOLE NO. J-24
DATE 9-15-82 OPERATOR BB

SOIL FIELD IDENTIFICATION			
TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			✓

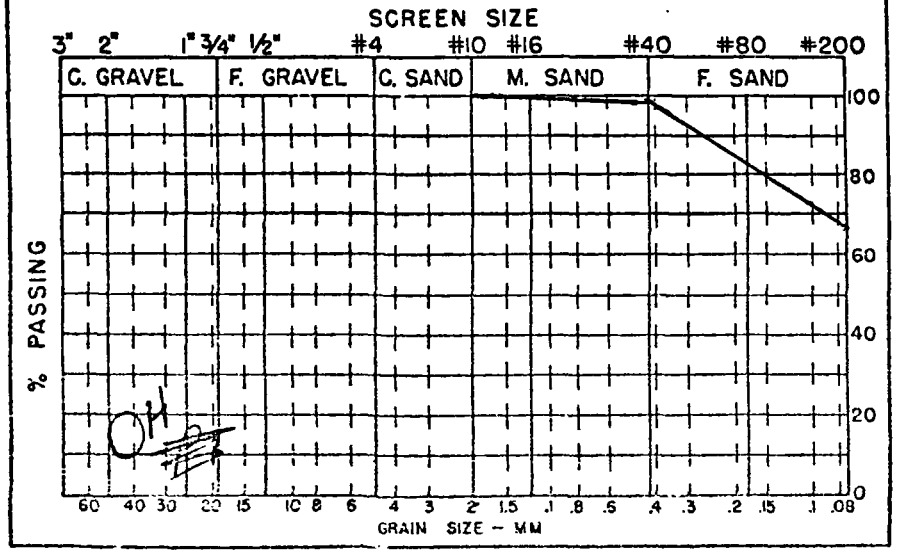
DESCRIPTION: Moist, GR & BLK., CLY. STY. ORGANIC MATL & PEAT



H_2O = 109 %

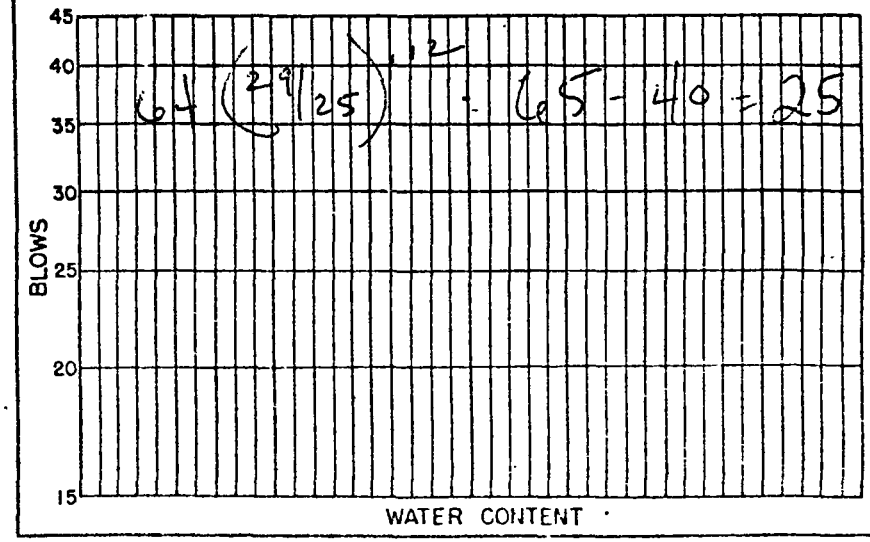
SIEVE ANALYSIS	% Passing 87.32		
		-40 27.75	98%
-¾		-80	
-4		-140	
-10 1.11	100%	-200 58.20	67%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	55				38
Wet Wt.	10.82				7.93
Dry Wt.	6.58				5.65
% H_2O	64%				PL= 40%
Blows	29				PI= 25



64 (29/25)^.12 = 65 - 40 = 25

DOT FORM 351-019

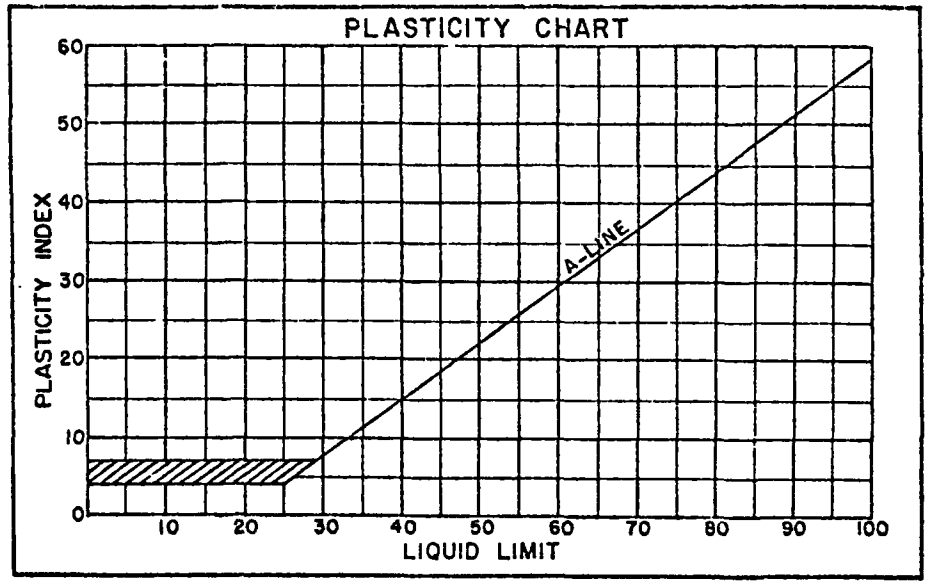
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3552 JOB NO. Ho 6. HOLE NO. J-24
DATE 2-28-83 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: M, GR., Lt. Brn. w/t. Rust, org. (stems) Clayey silt w/ med. plasticity.

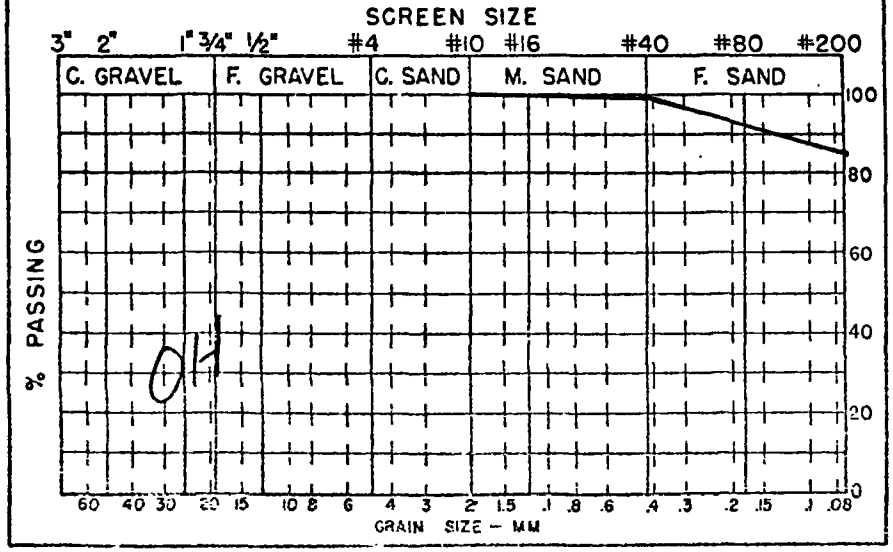


H_2O = 61%

SIEVE ANALYSIS % Passing 22.55

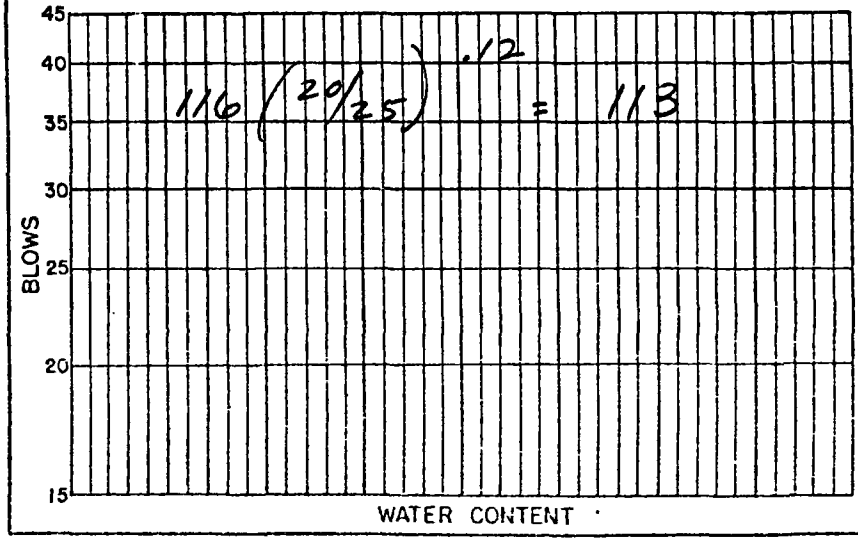
			-40	3.33	99.7%
-3/4			-80		
-4			-140		
-10	.05	100%	-200	19.17	85%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Con No.	66				14
Wet Wt.	12.12				4.48
Dry Wt.	5.60				2.87
% H_2O	116%				PL= 56%
Blows	20				PI= 57



DOT FORM 351-019

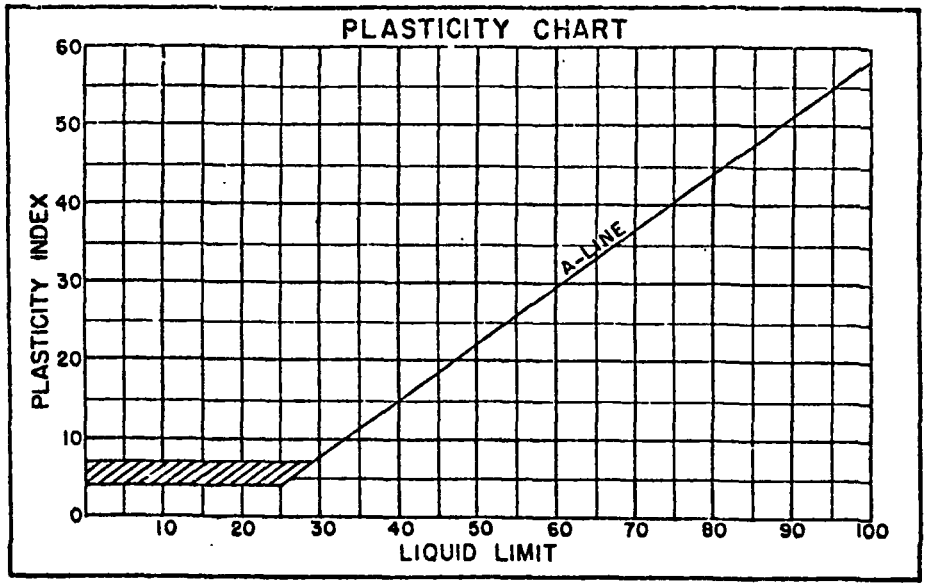
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3556-3 JOB NO. HOG. HOLE NO. L-29
DATE 11-2-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

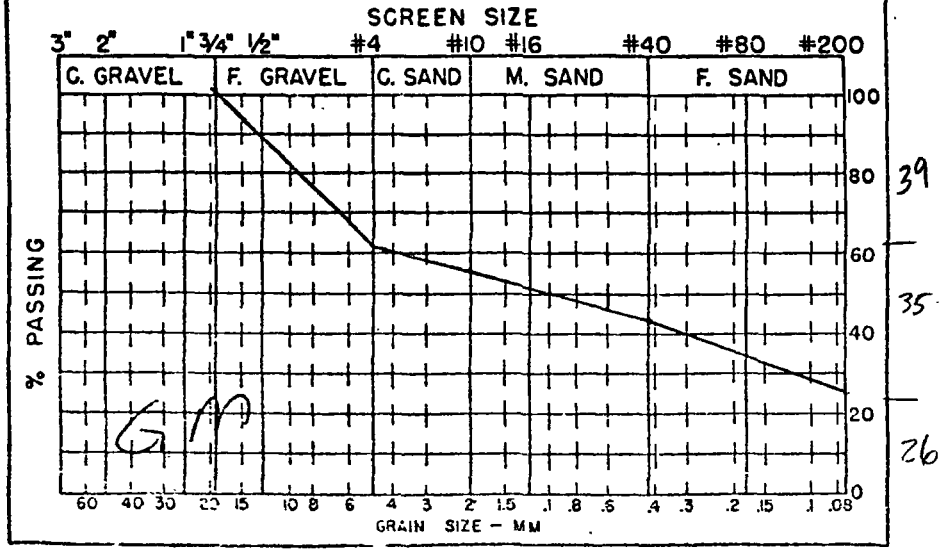
DESCRIPTION: Moist, tan & orange
lt. Stg. F.C Sdy. F. GRAVEL



H_2O = 2.6%

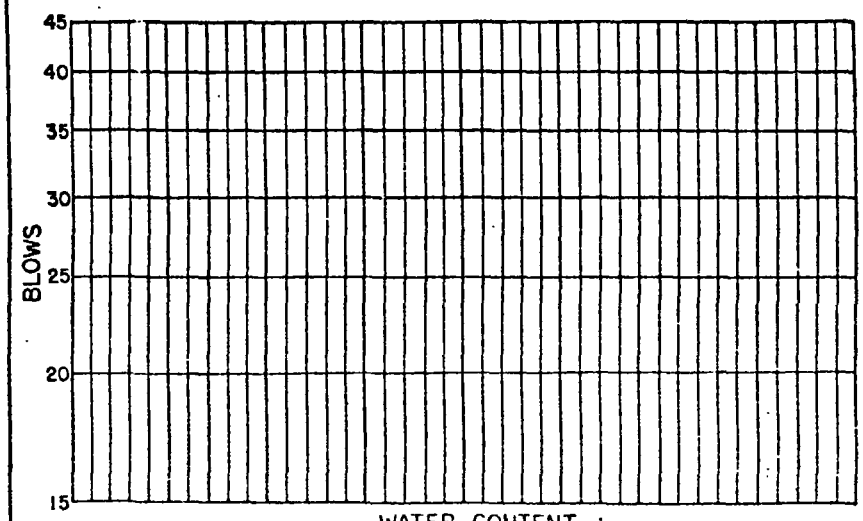
SIEVE ANALYSIS		% Passing			138.80
			-40	23.80	43
-¾	54.18	100	-80		
-4	8.15	61	-140		
-10	16.49	55	-200	36.18	26

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-319

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 9-14-82

Dear Sir:

I have forwarded by today's State Car the following Foundation Samples.

Contract or Job No. L-7262 Section West Roosevelt Interchange
SR No. 181A Sub-Section Culvert

Station & Offset 131+00 50 RT. Hole # J-2C

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3558	C-1	0' 0" – 2' 0"	H2O=122%	OL	DAST, dk. brn. SILT [redacted]
					Lots of org. matl grass & twigs.
3559	D-2	2' 0" – 4' 0"	79%	OL	Like 3530 SAT. GR. & tan F. Sdy. Cly. SILT;
					hly. org. stems w/T. mica
3560	C-3	4' 0" – 6' 0"	H2O=42%	OL	Moist, Gr., Cly., Org. SILT sty. org.
					matl w/layer of wh. matl & org. grasses
3561	D-4	6' 0" – 8' 0"	61%	OH	Like 3552 Moist, GR & Lt. Brn. w/t. rust. Clayey SILT, w/t.
					organic stems, w/ TWIGS & Pieces of Wood.
3562	C-5	9' 0" – 11' 0"	No Recovery		
3563	D-6	11' 0" – 13' 0"	73%	OL	Like 3530 Only Gr. Sat., Gr. F. Sdy., Cly. SILT;
					hly org. stems w/T. mica
3564-1	U-7	14' 0" – 14' 4"	A		
-2		14' 4" – 14' 8"	B		
-3		14' 8" – 15' 0"	C		

1 copy with samples
1 copy to addressee

Yours very truly,

Milford Sanders
Inspector.

FORM 351-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 9-14-82

Dear Sir:

I have forwarded by today's State Car the following Foundation Samples.

Contract or Job No. L-7262 Section West Hoquiam Bypass
SR No. 101A Sub-Section Culvert

Station & Offset 131+00 50' Rt Hole # J-25

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3565	D-8	16'0" 18'0"	79%	OL	LIKE 3530 SAT., GR & TAN F. Sdy. Cly. SILT; hly. Org. Stems w/T. Mica.
3566-1	U-9	19'0" 19'4"	A		
-2		19'4" 19'8"	B		
-3		19'8" 20'0"	C		
3567	D-10	21'0" 23'0"	79%	OL	LIKE 3530
3568-1	U-11	24'0" 24'4"	A		
-2		24'4" 24'8"	B		
-3		24'8" 25'0"	C		
3569	D-12	26'0" 28'0"	79%	OL	LIKE 3530

1 copy with samples
1 copy to addressee

Yours very truly,
Milford Sanders
Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 9-14-82

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section West Hoquiam Bypass
SR No. 101A Sub-Section Culvert

Station & Offset 131+00 50' Rt Hole # J-25

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3570 -1	U-13	27'0" 29'4"	A		
-2		29'4" 29'8"	B		
3571	D-14	31'0" 33'0"	78%	OH	SAT. tan-Brn., Clayey SILT w/
				Trace of Organic	w/ Twigs
3572 -1	U-15	34'0" 34'4"	A		
-2		34'4" 34'8"	B		
3573	D-16	36'0" 38'0"	98%	OL	Like 3571
3574 -1	U-17	39'0" 39'4"	A		
-2		39'4" 39'8"	B		
-3		39'8" 40'0"	C		

1 copy with samples
1 copy to addressee

Yours very truly,
Milford Leader
Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.,
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 9-14-82

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section West Hoquiam Bypass
SR No. 101A Sub-Section Culvert

Station & Offset 121+00 50 RT Hole # J-25

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3575	D-18	41'0" 43'0"	79 %	OL	Like 3530 but SAT., Gr. & Brn F. Sdy, Cly. Silt; hly. Organic Stems w/T. Mica
3576 -1	U-19	44'0" 44'4"	A		
-2		44'4" 44'8"	B		
3577	D-20	46'0" 48'0"	H_2O= 84 %	OL	Like 3530 But Gr & Lt. Brn
3578 -1	U-21	49'0" 49'4"	A		
-2		49'4" 49'8"	B		
-3		49'8" 50'0"	C		
3579	D-22	51'0" 53'0"		OL	Like 3530 w/o Organic Pieces but w/ OOOR

1 copy with samples
1 copy to addressee

Yours very truly,
Milford Sanders
Inspector.

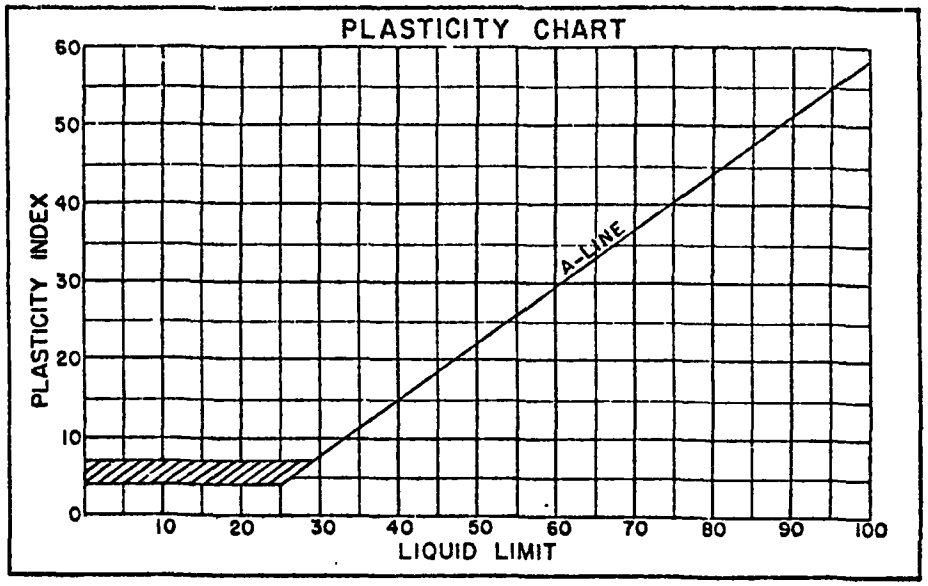
DOT FORM 351-002 REVISED 2/80

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3558 JOB NO. Hog. Shelby HOLE NO. [illegible]
DATE 9-28-82 OPERATOR BB

SOIL FIELD IDENTIFICATION			
TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

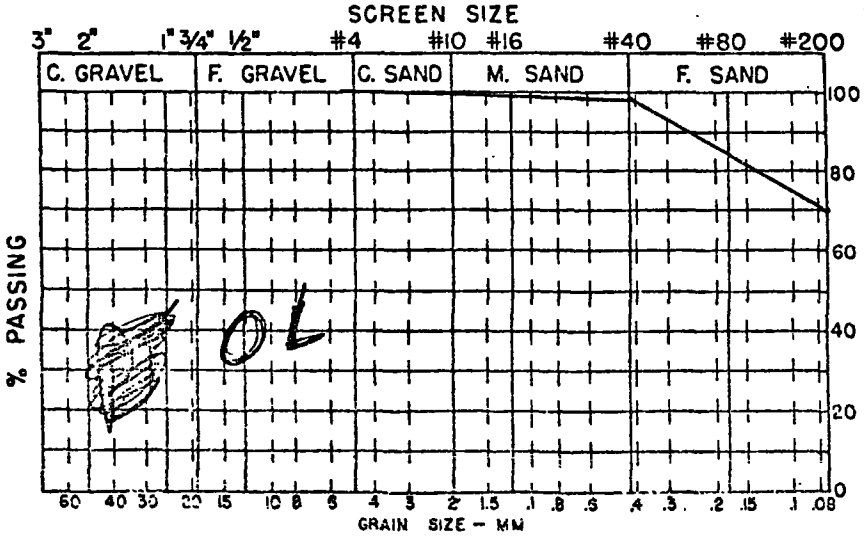
DESCRIPTION: Moist, org, dk. Brn. Sty. w/ Lots of Org. matr, grass & twigs



H_2O = 12.2 %

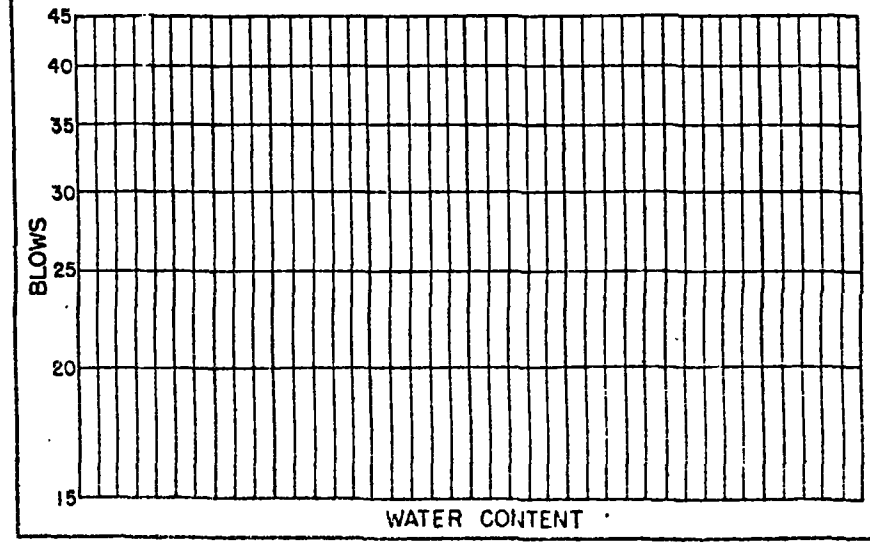
SIEVE ANALYSIS		% Passing 56.4	
	-40	16.25	98%
-3/4 org.	-80		
-4 .89	100% -140		
-10	-200	39.26	70%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



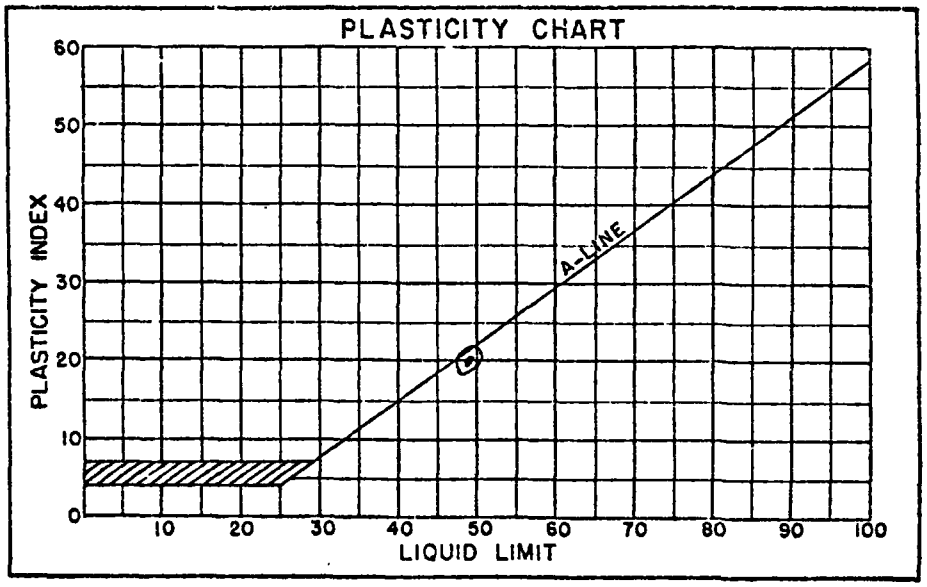
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3560 JOB NO. 4896 HOLE NO. J-25
DATE 9-29-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			✓

DESCRIPTION: Moist, Gr., Cly. F. Sdy. Sty. Org. mate w/ Layer of White Mat'L & Org. grasses.

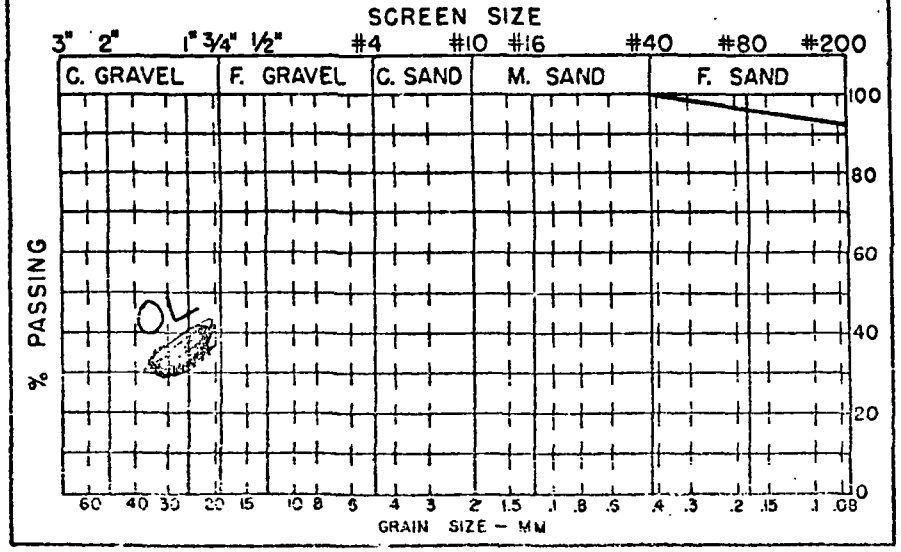


H_2O = 42%

SIEVE ANALYSIS % Passing 60.58

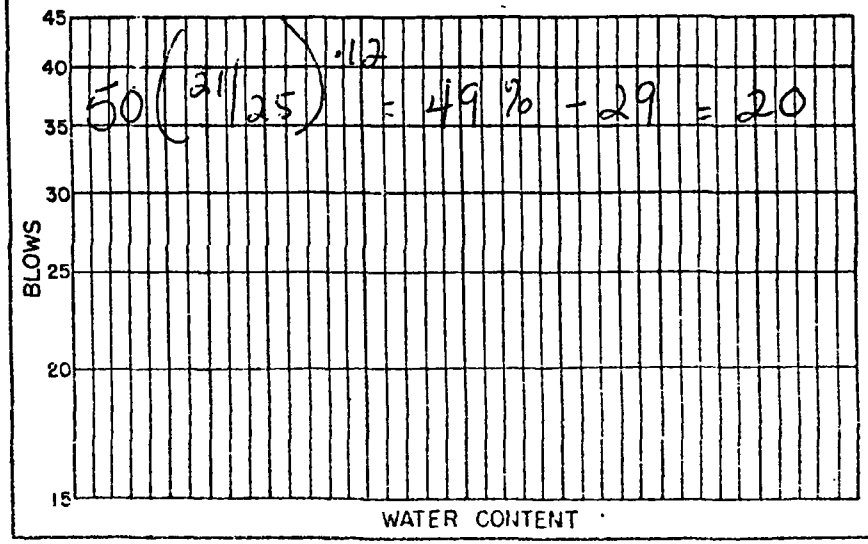
	-40 4.30	100%
-3/4	-80	
-4	-140	
-10	-200 56.28	93%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	35				15
Wet Wt.	9.72				5.08
Dry Wt.	6.50				3.95
% H_2O	50%				PL= 29%
Blows	21				PI= 20



$50\left(\frac{21}{25}\right)^{.12} = 49\% - 29 = 20$

DOT FORM 351-019

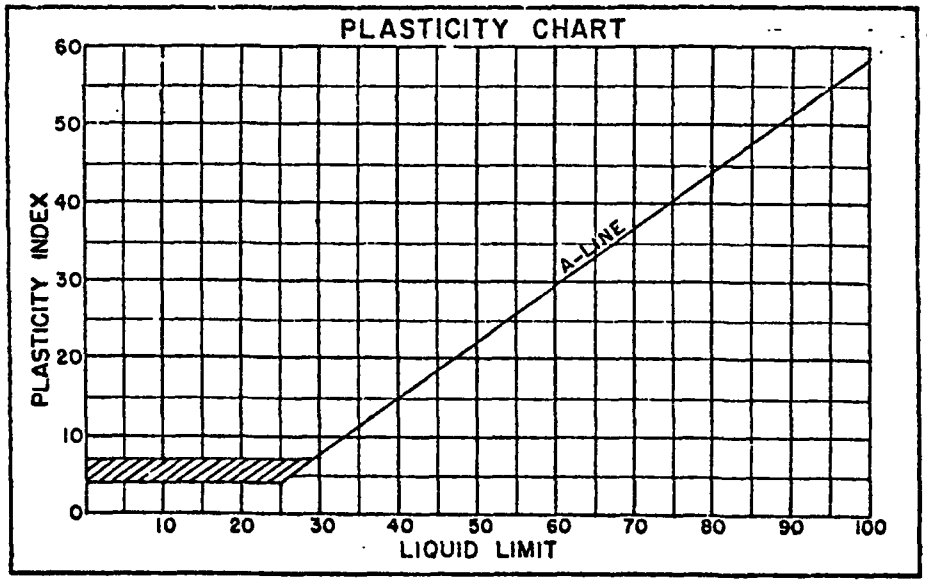
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3571 JOB NO. Hog. HOLE NO. L25
DATE 2-28-83 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: Sat., tan, Brn., ~~Sty.~~
~~Silt~~ w/ t. org. CLAY

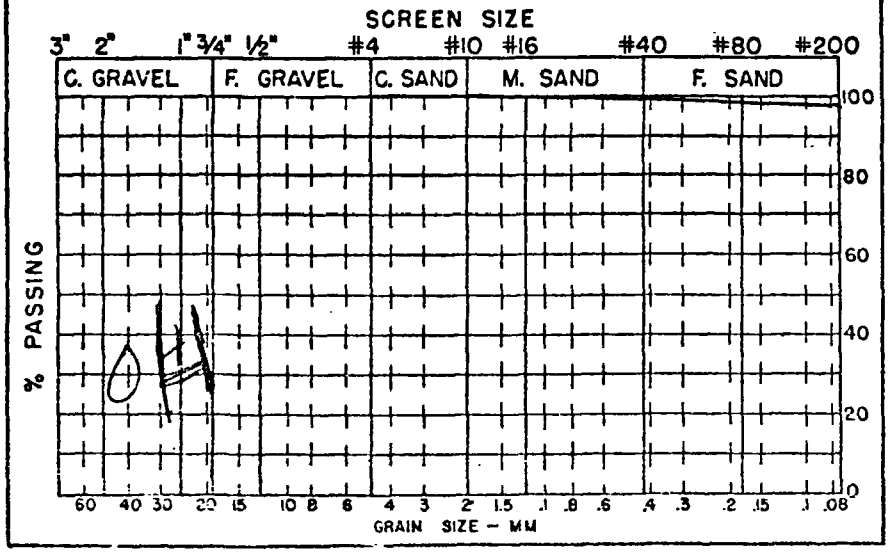


H_2O = 78%

SIEVE ANALYSIS % Passing 51.40

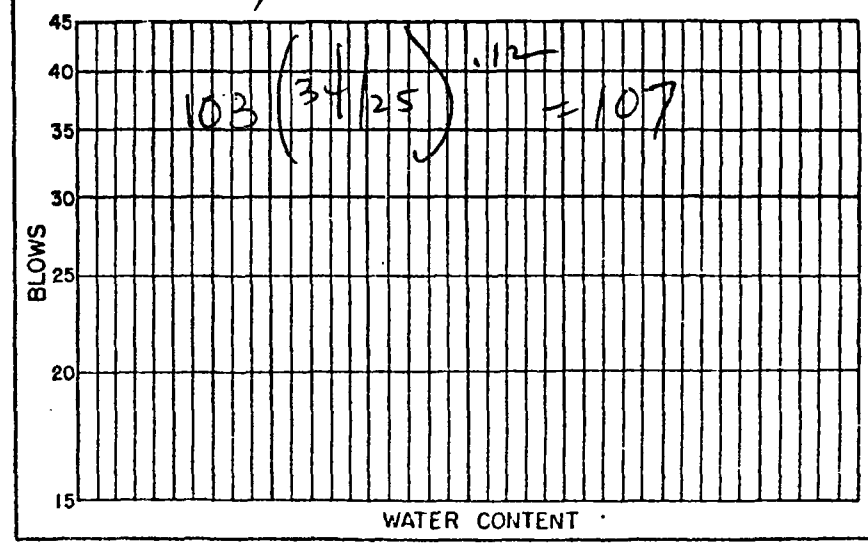
			-40	.85	99.6
-3/4			-80		
-4	.1	100%	-140		
-10	.09	99.8%	-200	50.36	98%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	41				69
Wet Wt.	13.50				4.78
Dry Wt.	6.17				3.29
% H_2O	103%				PL= 45
Blows	34				PI= 62



DJT FORM 351-019

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 9-15-82

Dear Sir:

I have forwarded by today's State Car the following Foundation Samples.

Contract or Job No. L-7262 Section Tri-Cities Bypass SR No. 1014 Sub-Section Culvert

Station & Offset 121+00 50'LT Hole # J-26

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3580	U-1	0' 4" 0' 8"	B		
3581	D-2	2' 0" 4' 0"	77%	OL	Like 3575 But: SAT. Gr. & Brn. F. Sdy. Cly. SILT; hly. org. Stems w/T. mica & rust coat.
3582	S-3	4' 6" 6' 6"	72%	OH	Moist, Gr., Cly. ORG. SILT w/ grass & fibrous PEATY mtr.
3583	D-4	6' 6" 8' 6"	79%	OL	Like 3530 SAT. Gr. & Tan, F. Sdy. Cly. SILT; hly. org. Stems w/T. mica
3584	S-5	9' 6" 12' 0"	94%	OL	Wet SILT w/ Org. wood - PEATY mtr & T. mica.
3585	D-6	12' 0" 14' 0"	141%	OL	Moist, Gr. & BLK, F. Sdy., hly. org. Sy. PEATY SILT.
3586	S-7	14' 6" 17' 0"	85%	ML	Moist, Gr. F. Sdy. SILT w/ trace Shells & mica.
3587-1	D-8	17' 0" 19' 0"	72%	OH	SAT, dk. Brn., Gr. Cly. Org. SILT w/ Branches & t. mica.
-2	D-10	21' 6" 23' 6"	74%	OL	SAT., TAN & DK. Brn. F Sdy. SILT w/ Org. PEATY (Twigs) horiz. layering & SILT w/ t. mica

1 copy with samples
1 copy to addressee

Yours very truly,

Larry Moore
Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 9-15-82

Dear Sir:

I have forwarded by today's State Car the following Foundation Samples.

Contract or Job No. L-7262 Section Hanson Bypass
SR No. 101A Sub-Section Culvert

Station & Offset 131+00 50' LT Hole # J-26

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3588 -1	U-11	24'6" 24'10"	A		
-2		24'10" 25'2"	B		
-3		25'2" 25'6"	C		
-4		25'6" 25'10"	D		
3589	D-12	26'6" 28'6"	H.= 74%	ML	LIKE 3587-2 W/ROTTEN WOOD SAT, TAN & DK. BRN. F. Sdy SILT W/ Org. PEATY (TWIGS) horiz. Layering of SILT
3590 -1	U-13	29'10" 30'2"	B		
-2		30'2" 30'6"	C		
-3		30'6" 30'10"	D		
3591	D-14	31'6" 33'6"	H.= 194%	OH	SAT., GR., Org., Cly. SILT W/ BLK. ORG. MTR. outside.

1 copy with samples
1 copy to addressee

Yours very truly,
Larry Moore
Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 9-15-82

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section Hogansen Bypass SR No. 101A Sub-Section Culvert

Station & Offset 131+00 50' LT Hole # J-26

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3592 -1	U-15	34'10" 35'2"	B		
-2		35'2" 35'6"	C		
3593	D-16	36'6" 38'6"	H_2O=77%	MH	Wet, tan & Gr. Soft, Cly. F. Sdy. Silt w/T. organic & mica
3594 -1	U-17	39'6" 39'10"	A		
-2		39'10" 40'2"	B		
-3		40'2" 40'6"	C		
-4		40'6" 40'10"	D		
3595	D-18	41'6" 43'6"	H_2O=109%	OL	Like 3591 w/o Layering Sat, Gr, org., Cly. Silt w/ Blk Org. mtr. on outside.
3596 -1	U-19	44'6" 44'10"	A		

1 copy with samples
1 copy to addressee

Yours very truly,

Larry Moore
Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater

Date 9-15-82

Dear Sir:

I have forwarded by today's State Car the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam Bypass SR No. 101A Sub-Section Culvert

Station & Offset 131+00 50'LT Hole # J-26

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3596 -2		44'10" 45'2"	B		
-3		45'2" 45'6"	C		
-4		45'6" 45'10"	D		
3597	D-20	46'6" 48'6"	Hw=77%	ML	Like 3593 w/T. wh. shells Wet, tan & GR. Soft. Cly. F. Sdy. Silt w/T. organic, mica & wh. shells.
3598 -1	U-21	49'6" 49'10"	A		
-2		49'10" 50'2"	B		
-3		50'2" 50'6"	C		
-4		50'6" 50'10"	D		
3599	D-22	51'6" 53'6"		ML	Like 3593 w/Layers & milky powdery silt

1 copy with samples
1 copy to addressee

Yours very truly,

Larry Moore
Inspector.

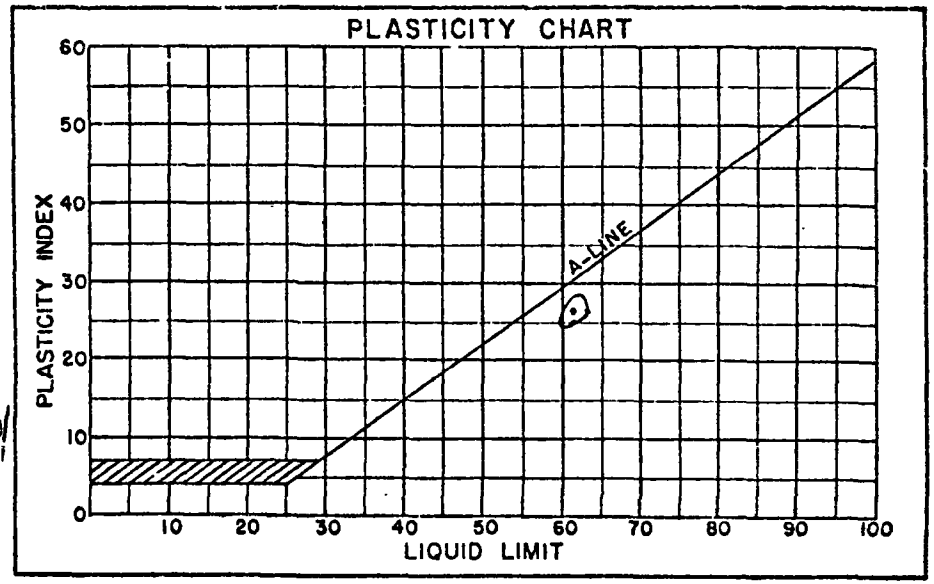
DOT FORM 351-002 REVISED 2/80

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3582 JOB NO. Hog. Shelby HOLE NO. J-26
DATE 9-29-82 OPERATOR BB

SOIL FIELD IDENTIFICATION			
TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			✓

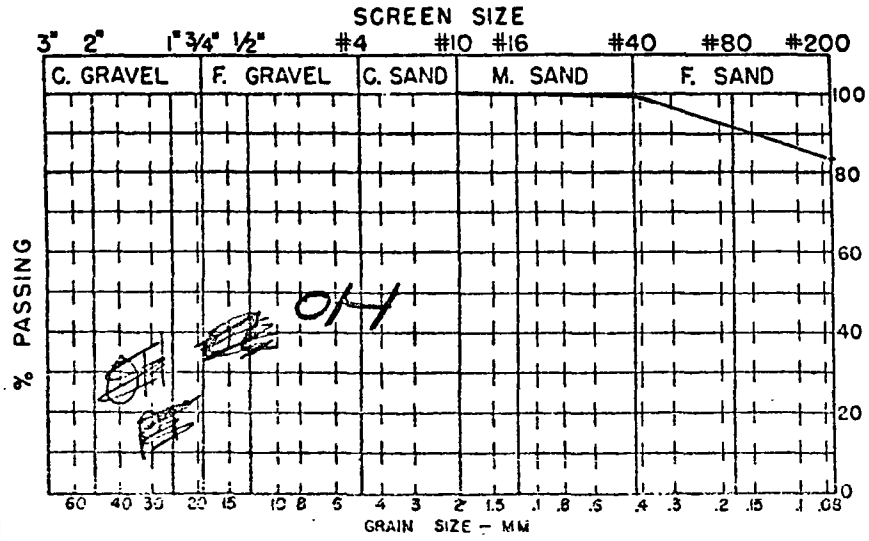
DESCRIPTION: Moist, Gr. Cly. organic silt w/ grass & Fibrous Peaty mtr.



H_2O = 72 %

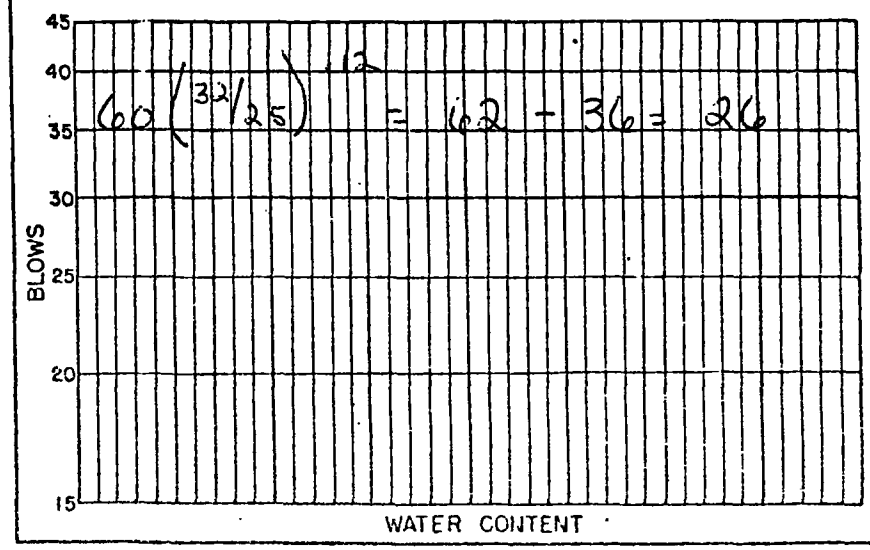
SIEVE ANALYSIS		% Passing	56.16
	-40	9.20	99 %
-3/4	-80		
-4	-140		
-10 .32 100 %	-200	46.58	83%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	72				78
Wet Wt.	9.62				5.70
Dry Wt.	6.02				4.18
% H_2O	60 %				PL= 36 %
Blows	32				PI= 26



DOT FORM 351-019

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3584 JOB NO. ~~48~~ HOLE NO. J-26
DATE 9-28-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

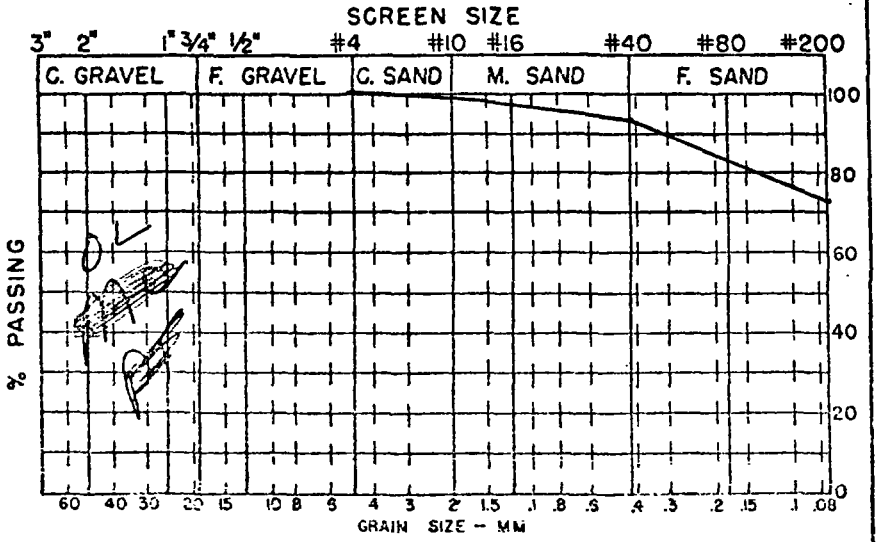
DESCRIPTION: Wet, Silt w/ org wood - Peat mtr. & T. Mica

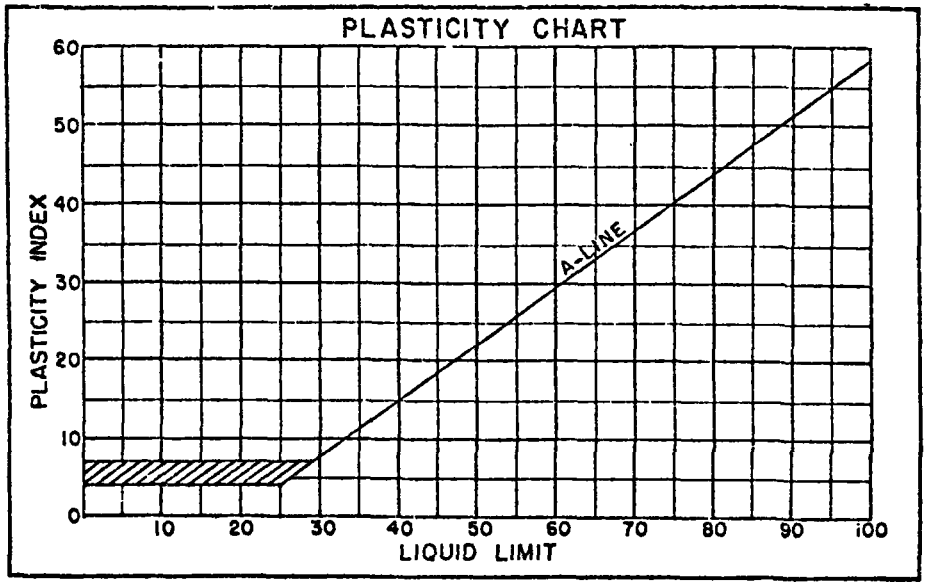
#20: 97%

SIEVE ANALYSIS % Passing 47.42

			-40	10.07	94%
-3/4 wood			-80		
-4	.08	100%	-140		
-10	2.72	99.8	-200	34.55	73%

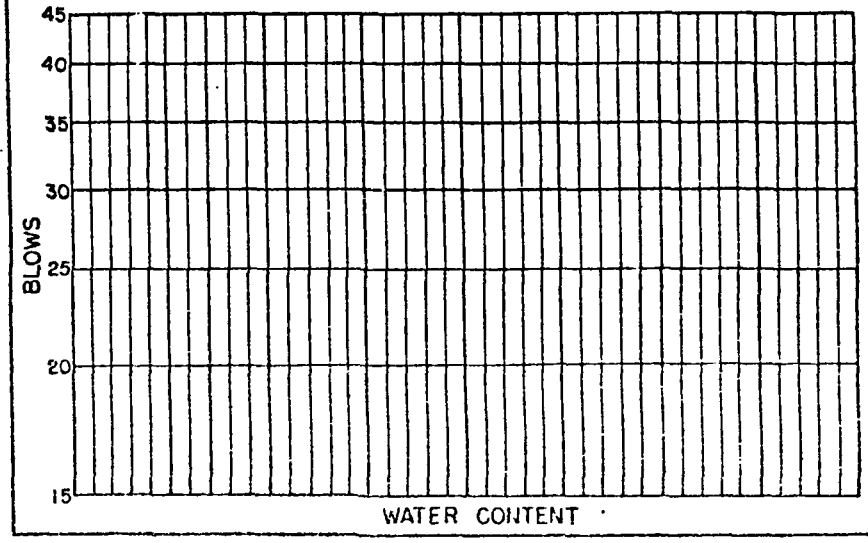
GRAIN SIZE CURVE





LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

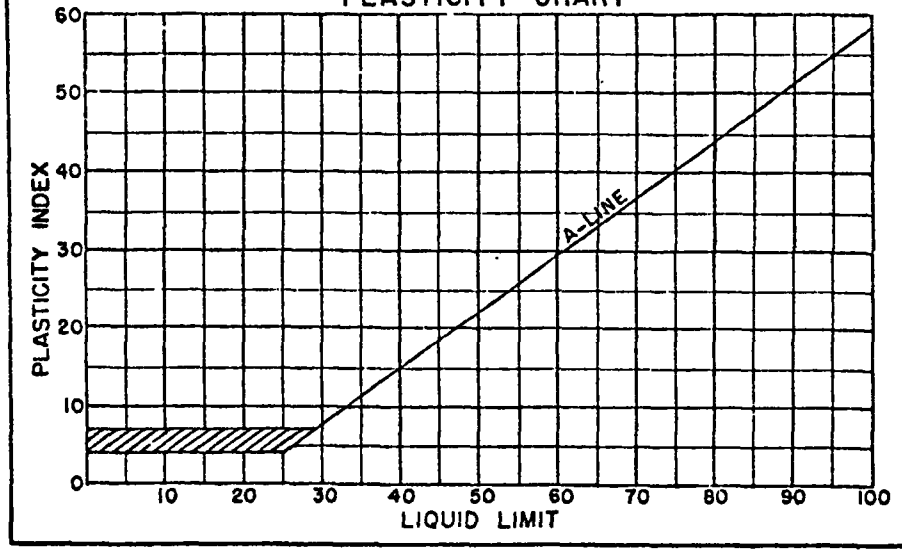
SAMPLE NO. 3585 JOB NO. Hog. HOLE NO. 1-26
DATE 3-3-83 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: M, Gr., Blk., hly. org. Pty. Silt

PLASTICITY CHART

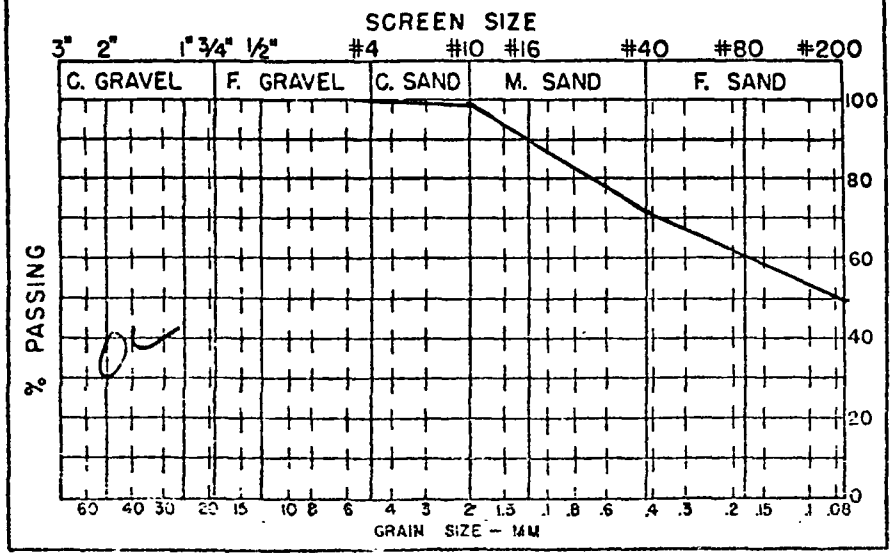


H_2O = 141%

SIEVE ANALYSIS % Passing 34.73

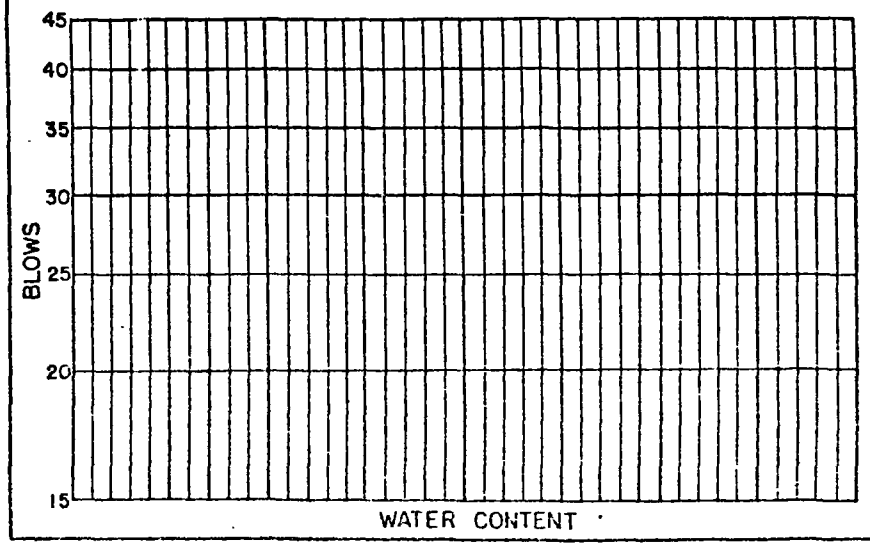
			-40	7.98	72%
-3/4			-80		
-4	160	100%	-140		
-10	9.12	98%	-200	17.03	49%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



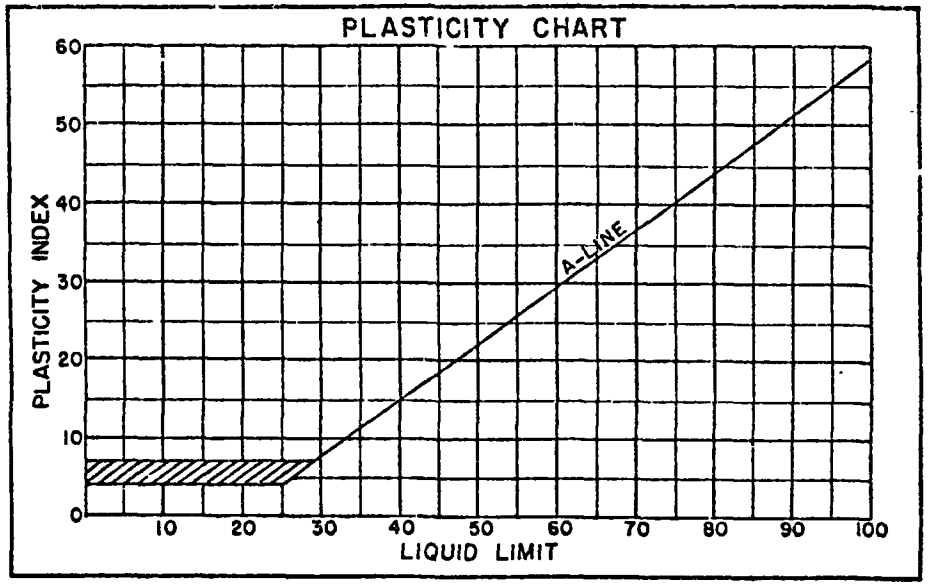
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3586 JOB NO. Hog. HOLE NO. J-26
DATE 9-28-82 OPERATOR BD

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: Moist, Gr. F. Sdy. Silt w/ T. Shells & mica

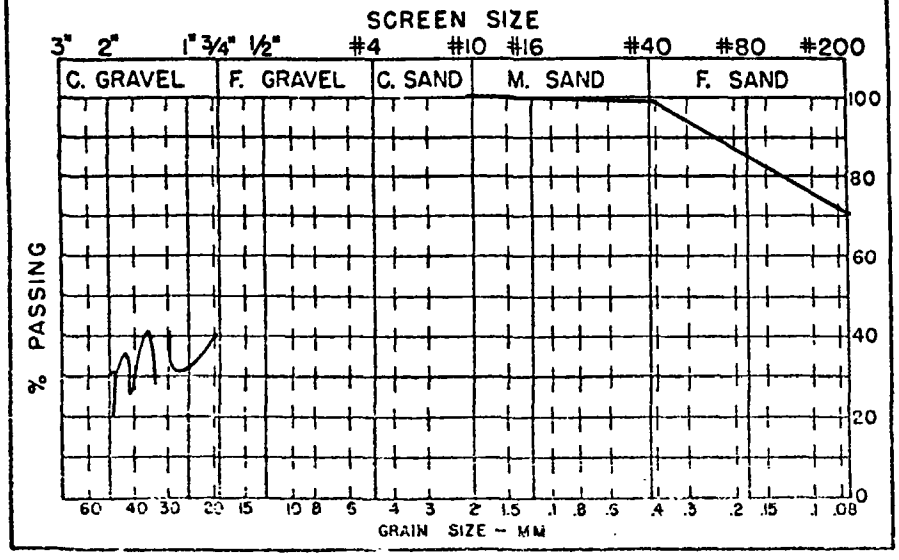


#20 = 85%

SIEVE ANALYSIS % Passing 50.00

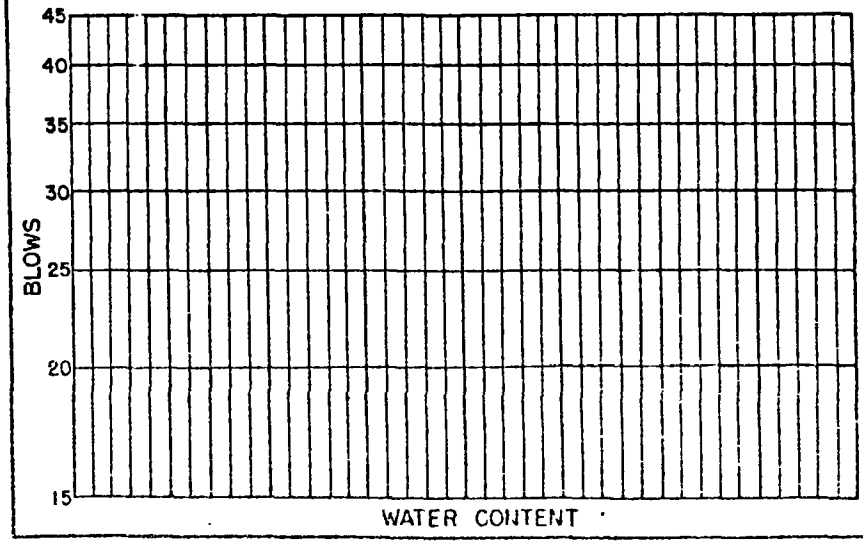
		-40 13.85	99%
-3/4		-80	
-4		-140	
-10 .03	100%	-200 36.17	72%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



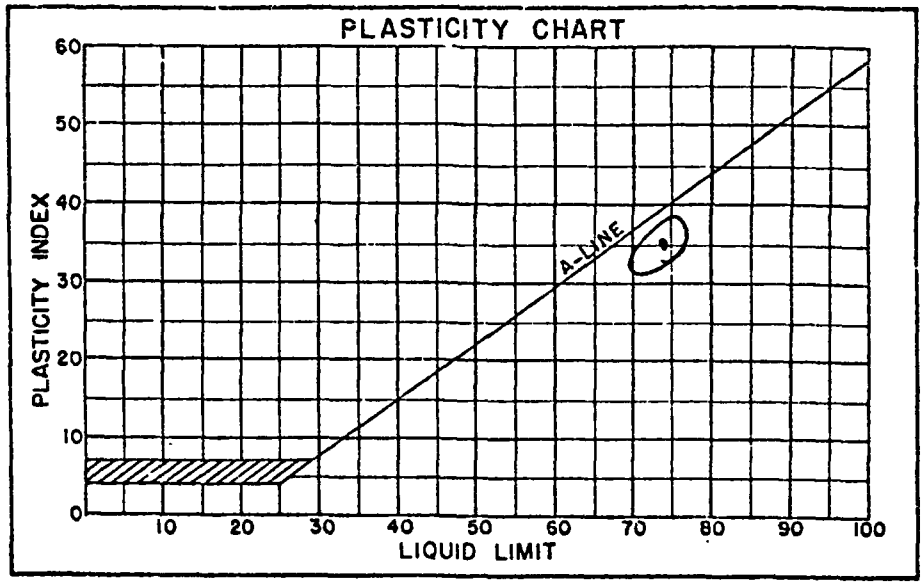
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3587-1 JOB NO. Hej. HOLE NO. J-26
DATE 3-1-83 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	✓
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	✓

DESCRIPTION: Sat., dk. Brn. & Gr., Cly. Organic Silt w/ Branches And T. Mica.

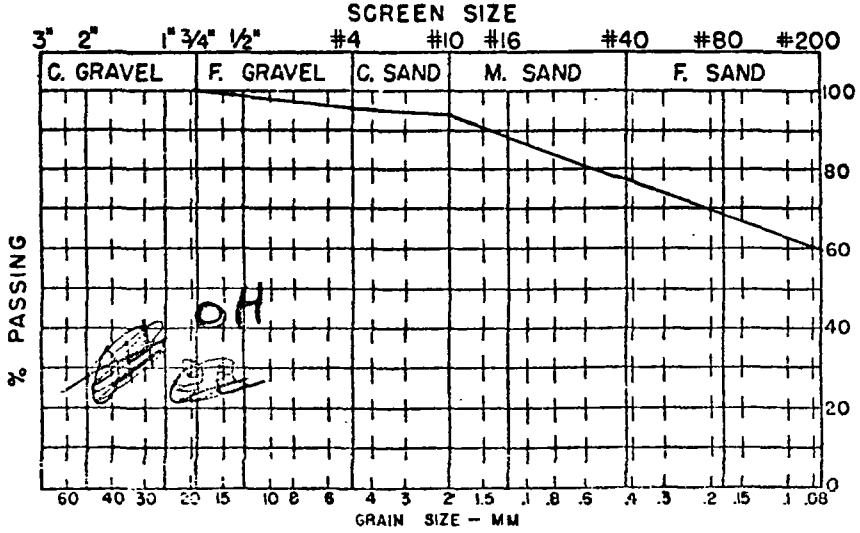


$H_2O = 72\%$

SIEVE ANALYSIS % Passing 34.40

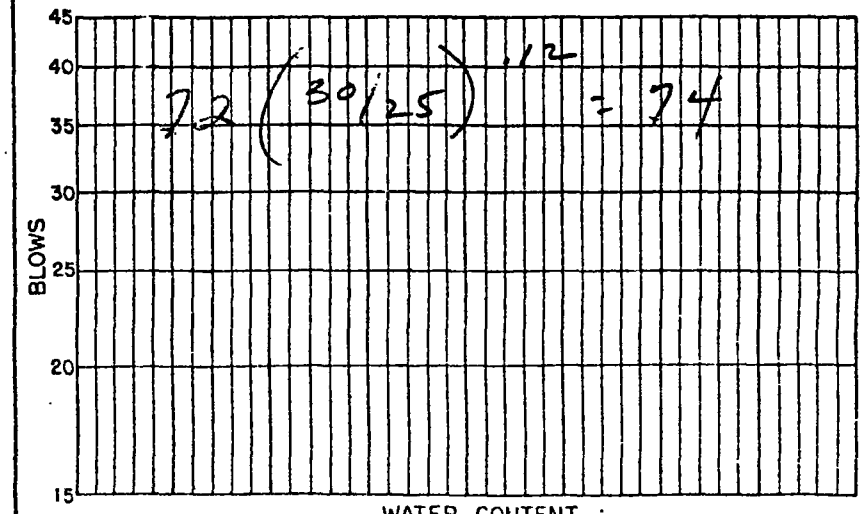
			-40	5.98	77%
-3/4	1.38	100%	-80		
-4	.70	96%	-140		
-10	5.78	94%	-200	20.60	60%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	40				72
Wet Wt.	11.92				4.24
Dry Wt.	6.93				3.05
% H_2O	72%				PL= 39
Blows	30				PI= 35



DOT FORM 351-019

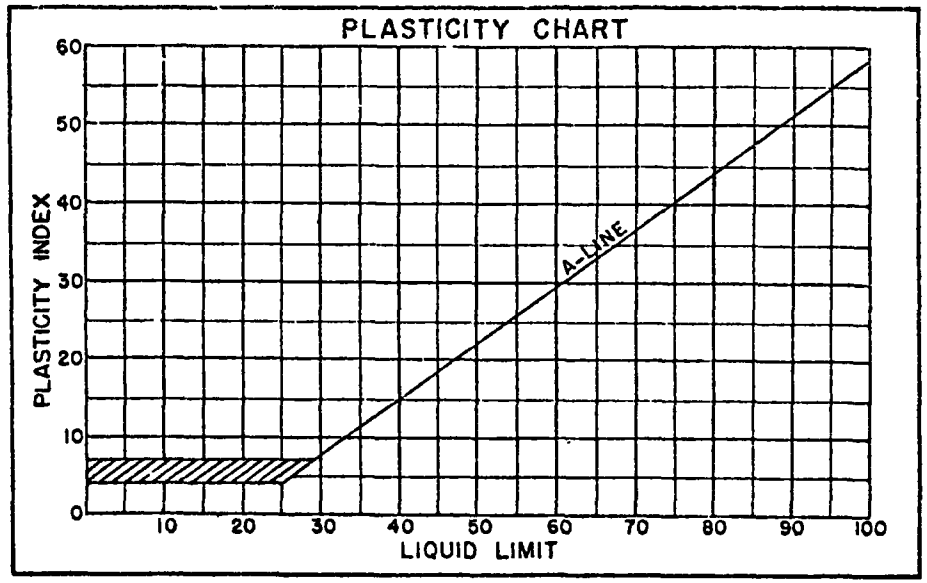
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3587-2 JOB NO. Hag HOLE NO. J-26
DATE 11-16-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Sat. Tan & dk. Brn. F. Sdy SILT w/ org. PEAT (twigs) w/ Mica. Layering of SILT w/ Mica

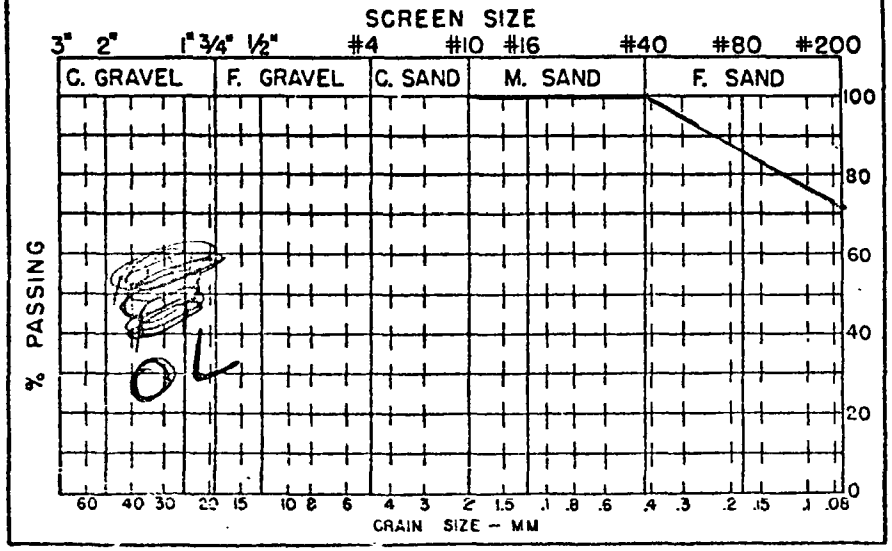


H_2O = 74 %

SIEVE ANALYSIS % Passing 50.00

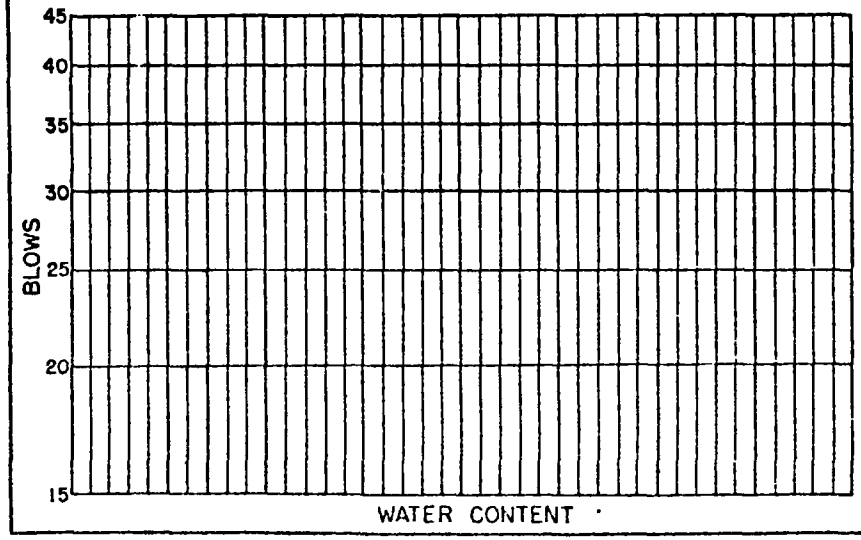
		-40	14.12	99.9
-3/4		-80		
-4		-140		
-10	.01	100%	-200 35.87	72%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

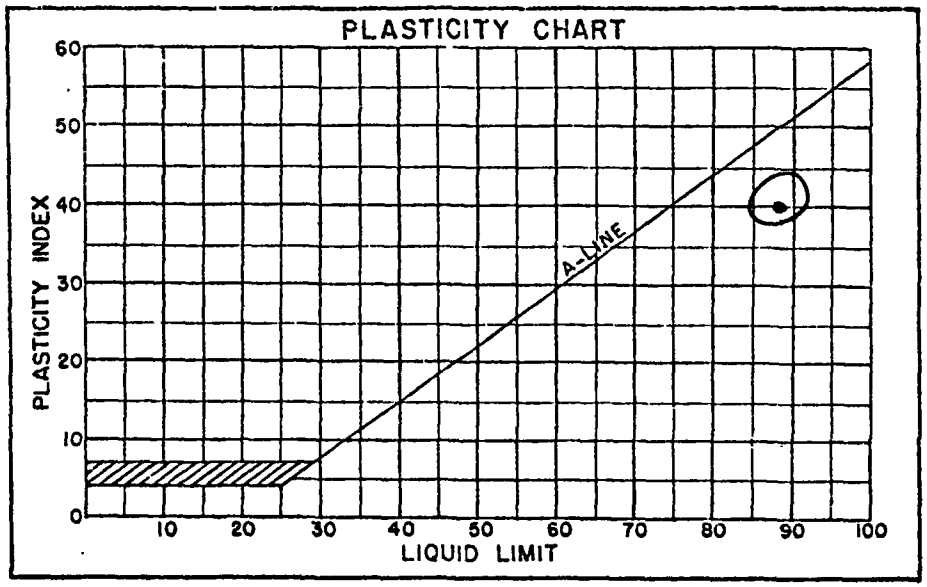
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3591 JOB NO. Hg. HOLE NO. J26
DATE 2-1-83 OPERATOR

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	✓

DESCRIPTION: Sat. GR, Org. Cly. Silt w/ BLK org mtr on outside

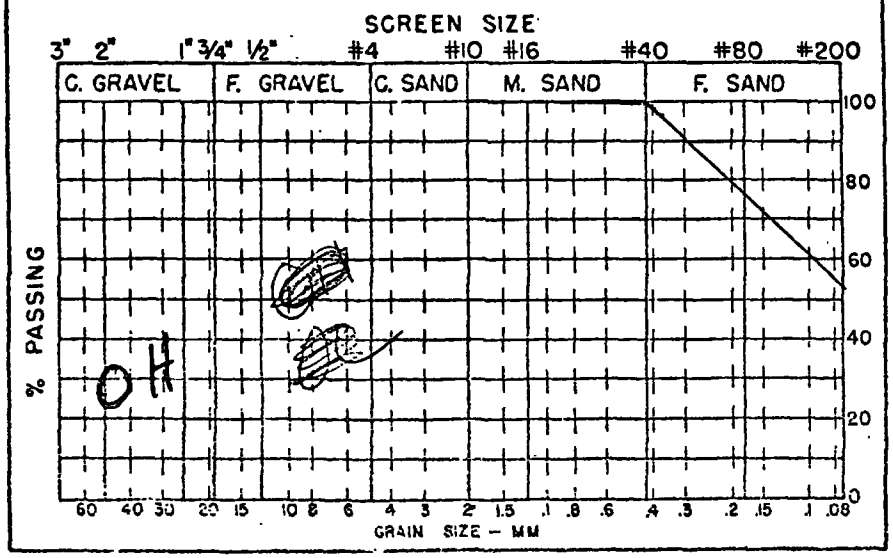


H_2O = 109%

SIEVE ANALYSIS % Passing 46.67

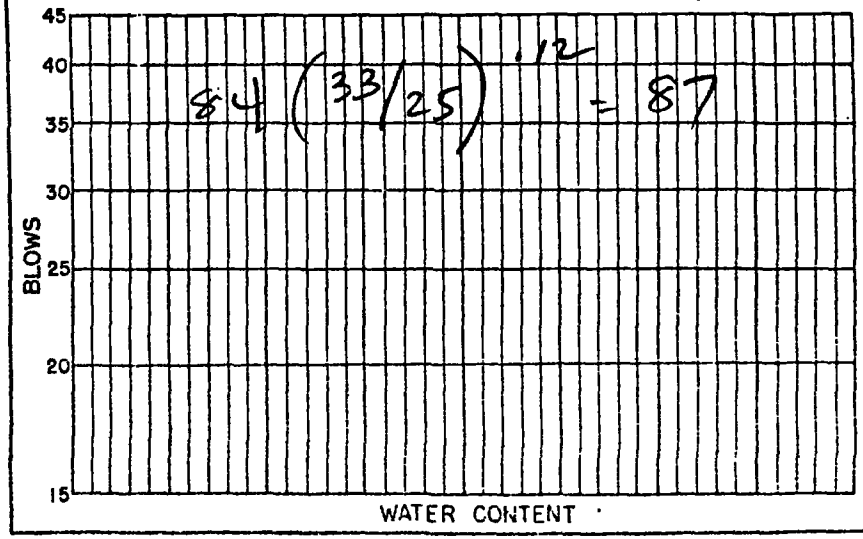
		-40	21.79	99.9%
-3/4		-80		
-4		-140		
-10	.03	100%	-200	24.85	53%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	15				18
Wet Wt.	12.23				4.12
Dry Wt.	6.65				2.81
% H_2O	84%				PL= 47
Blows	33				PI= 40



$84\left(\frac{33}{25}\right)^{.12} = 87$

DOT FORM 351-019

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3593 JOB NO. 1409 HOLE NO. 1

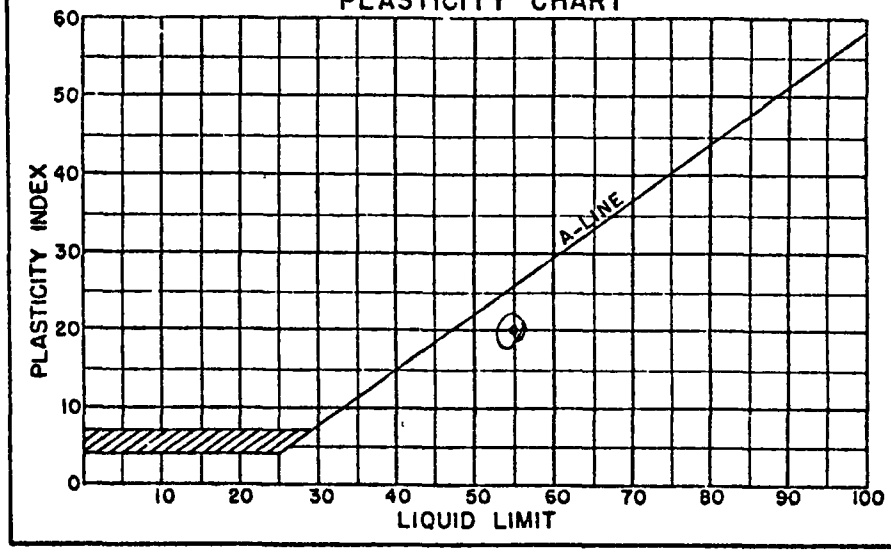
DATE 11-15-82 OPERATOR

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	✓

DESCRIPTION: Wet, tan & Gr. Soft, Cly.
F. Sandy Silt w/ T. Organic & mica

PLASTICITY CHART



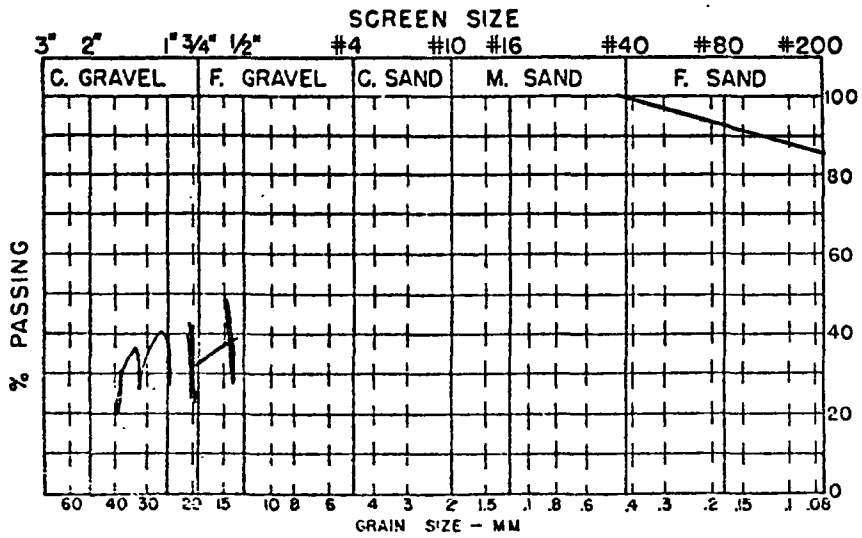
H_2O: 77%

SIEVE ANALYSIS

% Passing 30.76

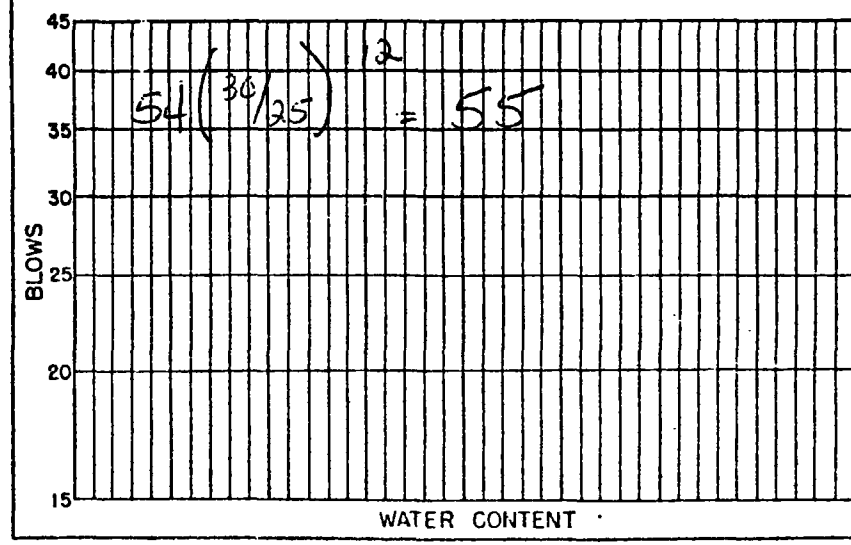
	-40 4.72	100%
-3/4	-80	
-4	-140	
-10	-200 26.04	85

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	113				64
Wet Wt.	9.21				6.85
Dry Wt.	5.99				5.07
% H_2O	54%				PL= 35%
Blows	30				PI= 20



DOT FORM 351-019

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 11-9-82

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam bypass & SR No. 101A Sub-Section culvert

Station & Offset 177+45 55' LT. Hole # J-37

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3868	D-1	0' 0" 2' 0"	H2O=62%	SM	SAT., GR. & BRN. ORGANIC, V. Sty. F. SAND
3869-1	U-3	4' 6" 4' 10"	A		
-2		4' 10" 5' 2"	B		
-3		5' 2" 5' 6"	C		
3870-1	D-4	6' 6" 8' 6"	H2O=25%	SM	moist, GR. & Rust, thick Layers gr. Sty. F. SAND w/ T. Mica
-2	D-5	9' 6" 9' 10"		SM	moist, GR. Sty. F. SAND w/ T. MICA
-3	D-6	14' 6" 15' 0"		SM	Like 3870-2 ABOVE
-4	D-8	24' 6" 24' 10"	18%	SM	moist, GR. V. Sty. F. SAND w/ Sty. Streaks & T. MICA
-5	D-9	29' 6" 29' 11"	25%	SM	Like 3870-2

1 copy with samples
1 copy to addressee

Yours very truly,
Milford Sanders
Inspector.

DOT FORM 351-002 REVISED 2/80

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 38608 JOB NO. 4069 HOLE NO. J-37
DATE 11-22-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

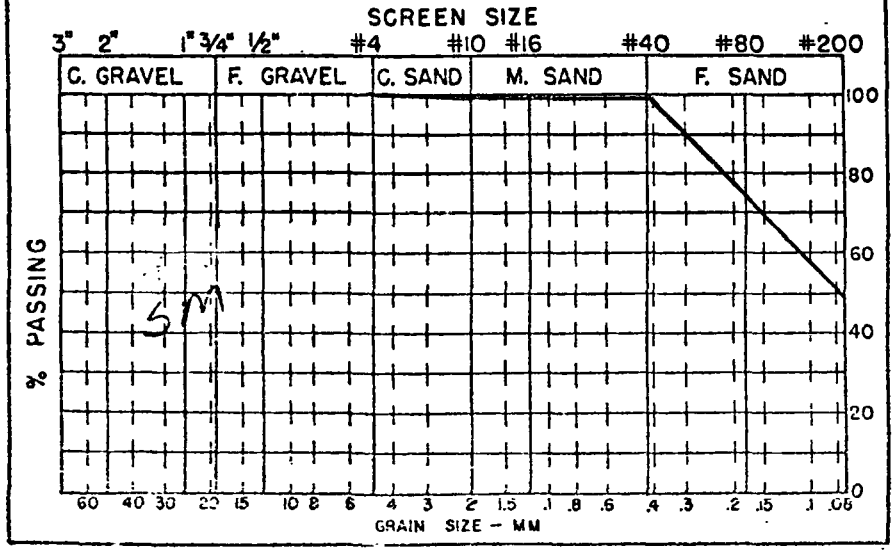
TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

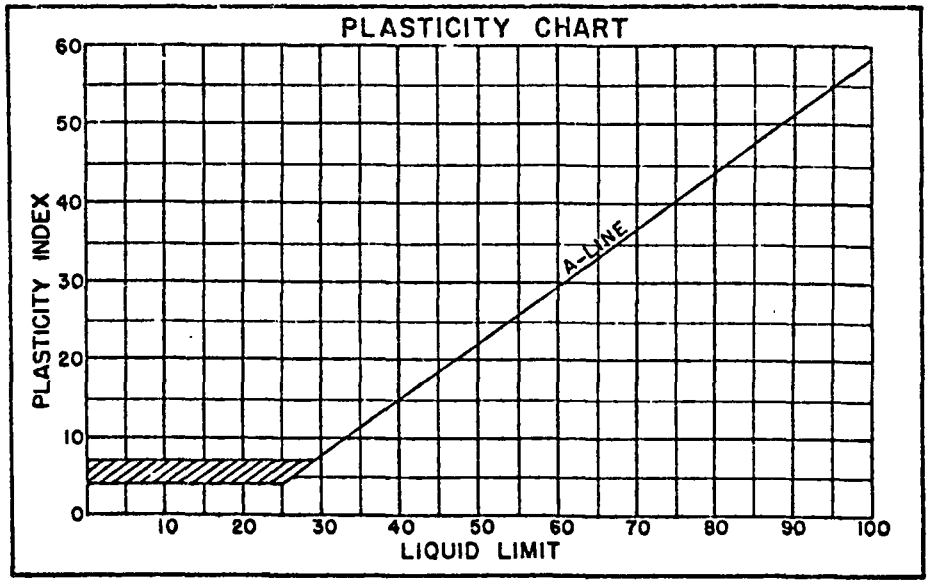
DESCRIPTION: SAT. GR & Brn. Organic
Vsicty F. SAND

H2O = 62%

SIEVE ANALYSIS		% Passing 56.80	
		-40 28.67	99%
-3/4		-80	
-4 .05	100%	-140	
-10 .50	99%	-200 27.58	49%

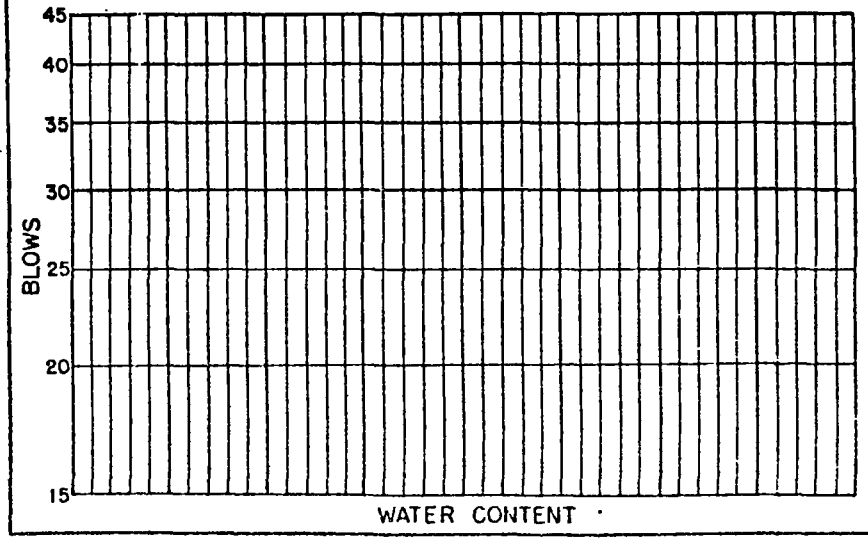
GRAIN SIZE CURVE





LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

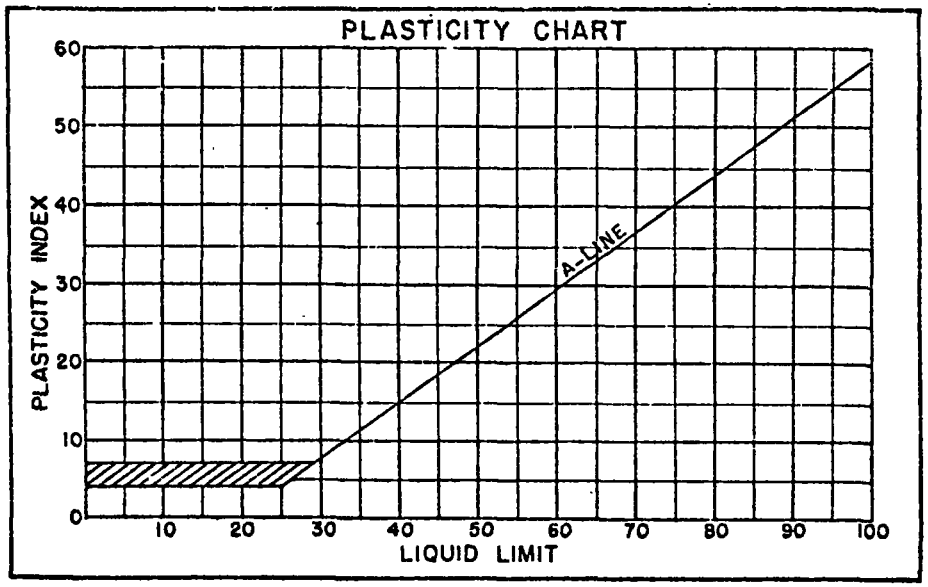
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3870-1 JOB NO. Neg. HOLE NO. J-37
DATE 11-22-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Moist, Gr & Rust
Thick layers of V. Sty. F. SAND
w/ T Mica

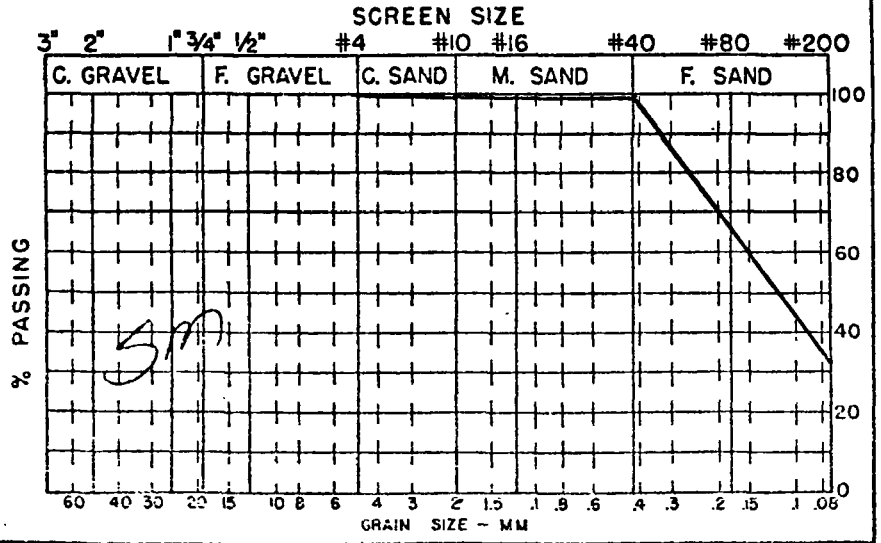


H_2O = 25%

SIEVE ANALYSIS % Passing 99.80

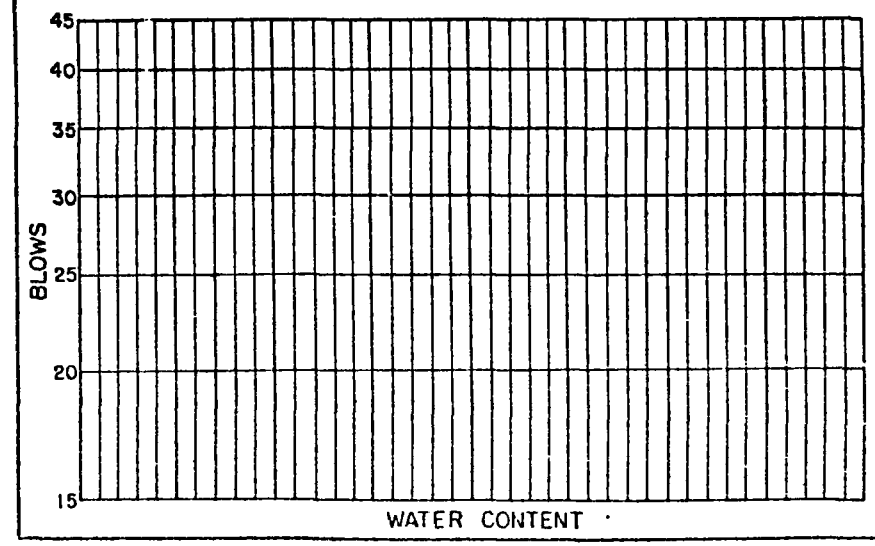
			-40	66.38	99%
-¾			-80		
-4	.11	100 %	-140		
-10	.72	99.8 %	-200	32.54	33%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

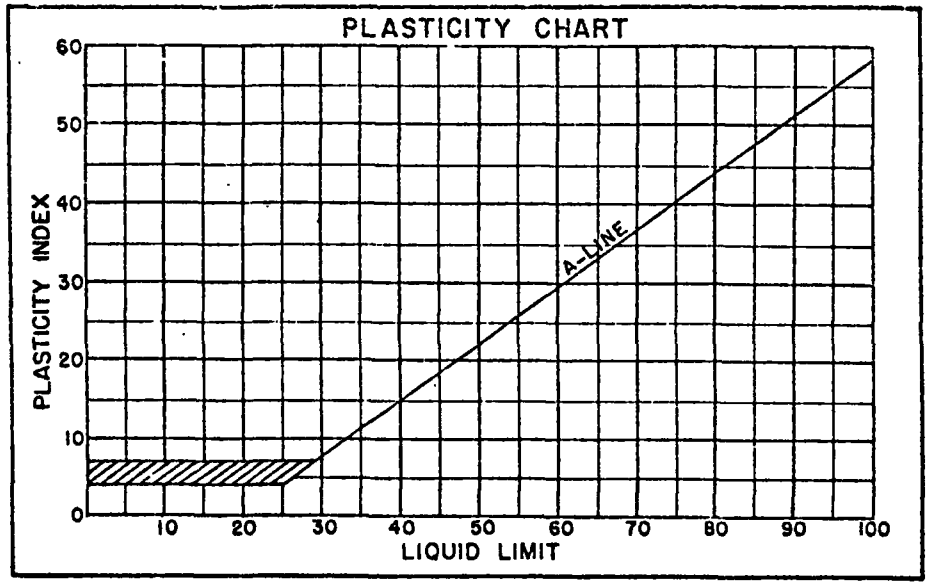
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3870-4 JOB NO. 4069. HOLE NO. J-37
DATE 11-22-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Moist, Gr. V. Sty. F. SAND w/ Sty. Streaks. & T. Mica.

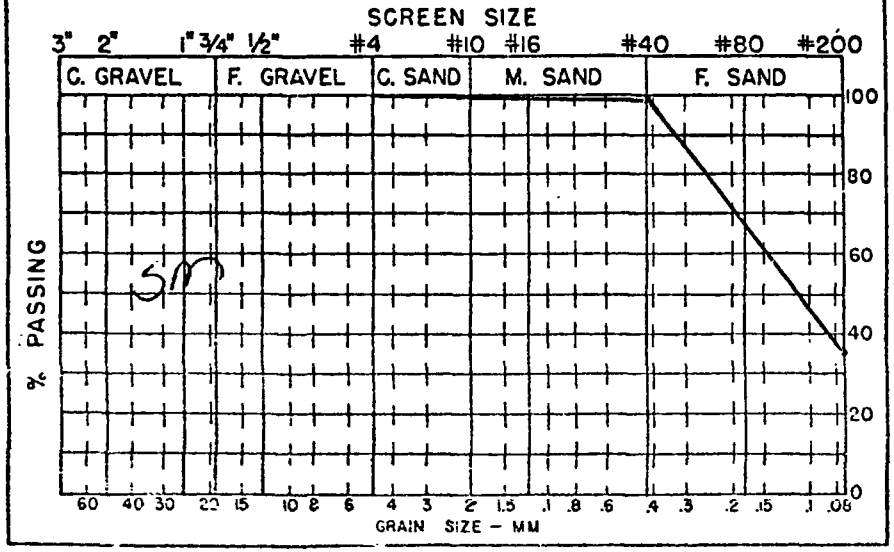


H2O = 18%

SIEVE ANALYSIS % Passing 72.90

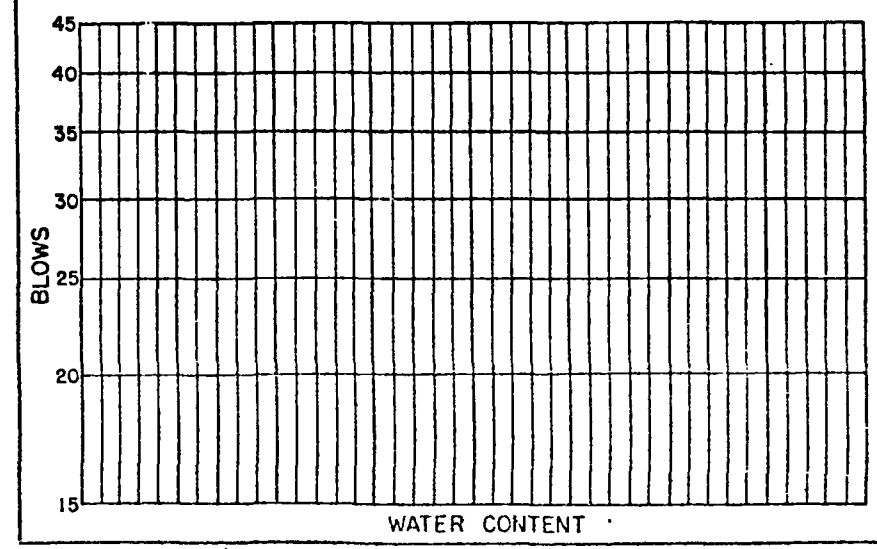
			-40	47.03	90%
-3/4			-80		
-4	.01	100%	-140		
-10	.02	99%	-200	25.84	35%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 11-10-82

Dear Sir:

I have forwarded by today's State Car the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam bypass SR No. 101A Sub-Section Culvert

Station & Offset 177+45 55' Rt. Hole # J-38

3871	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3870	D-2	2' 0" 4' 0"	H2O = 221%	PT	SAT, dk. Brn. fibrous, V. Sty. PEAT w/Twigs & Rotten Wood.
3872 -1	U-5	10' 0" 10' 4"	A		
-2		10' 4" 10' 8"	B		
3873 -1	D-6	12' 0" 14' 0"	90%	OH	SAT, GR & dk. Brn., V. Sty. hly. ORGANIC MATL w/ T. Cly.
-2	D-8	17' 0" 19' 0"	62%	SM	Like 3868 SAT. GR & Brn. Organic V. Sty. F. SAND
3874 -1	U-9	20' 0" 20' 4"	A		
-2		20' 4" 20' 8"	B		
-3		20' 8" 21' 0"	C		
-4		21' 0" 21' 4"	D		

1 copy with samples
1 copy to addressee

Yours very truly,
Milford Landtz
Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 11-11-82

Dear Sir:

I have forwarded by today's State Cor the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam bypass SR No. 101A Sub-Section Culvert

Station & Offset 177+45 55'Rt Hole # J-38

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3874 -5		21' 4" 21' 8"	E		
3875	D-10	22'0" 24'0"	H_2O= 183%	OH	moist, Gr, dk. Brn. Sty. F. Sdy. PEATY SILT w/org. stems & T. hard cly. Clumps
3876 -1	U-11	25'4" 25'8"	B		
-2		25'8" 26'0"	C		
-3		26'0" 26'4"	D		
-4		26'4" 26'8"	E		
3877	D-12	27'0" 29'0"	66%	SM	moist, Organic, Brn. V. Sty. F. SAND
3878 -1	U-13	30'0" 30' 4"	A		
-2		30' 4" 30'8"	B		

1 copy with samples
1 copy to addressee

Yours very truly,
Milford Sanders
Inspector.

DOT FORM 351-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater

Date 11-11-82

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam bypass SR No. 101A Sub-Section Culvert

Station & Offset 177+45 55' Rt. Hole # J-38

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3879	D-16	37'0" 39'0"	10 1/2	OH	SAT, Gr & Brn., Ptly. F. Sdy. Silt w/ org. twigs & stems
3880-1	U-17	40'0" 40'4"	A		
-2		40'4" 40'8"	B		
-3		40'8" 41'0"	C		
-4		41'0" 41'4"	D		
	~~D-18~~				

1 copy with samples
1 copy to addressee

Yours very truly,

Inspector.

FORM 351-002

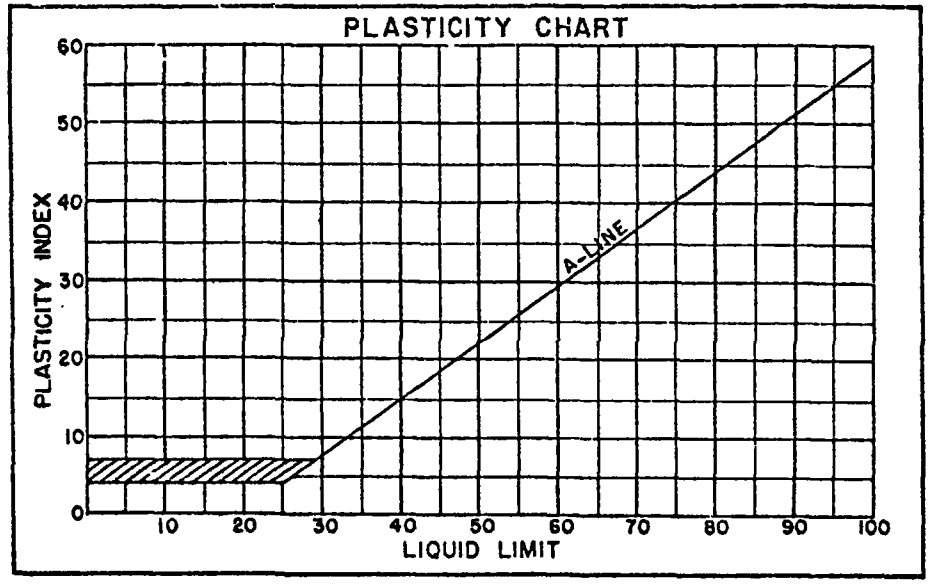
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3871 JOB NO. 4 of. HOLE NO. J-38
DATE 11-22-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: SAT., DK. Brn. fibrous, v. sty. PEAT w/ twigs & Rotten Wood.

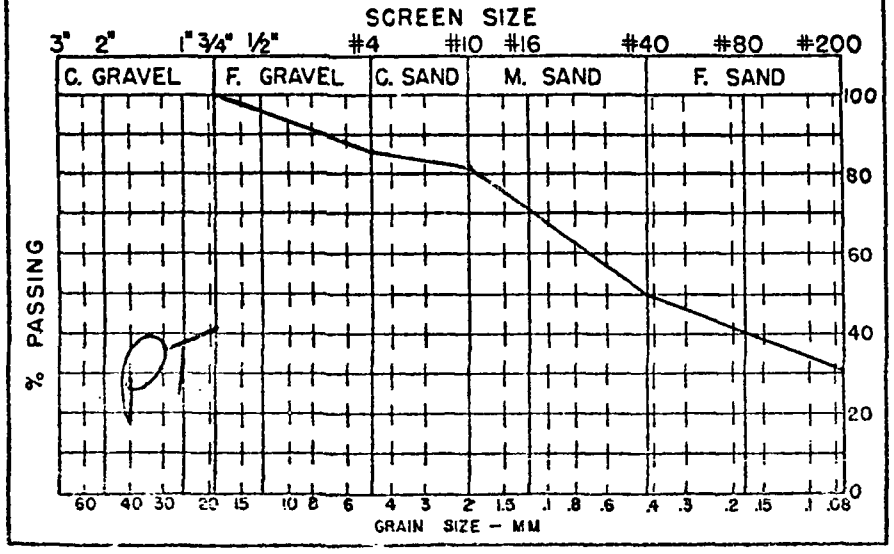


H2O: 221 %

SIEVE ANALYSIS % Passing 26.76

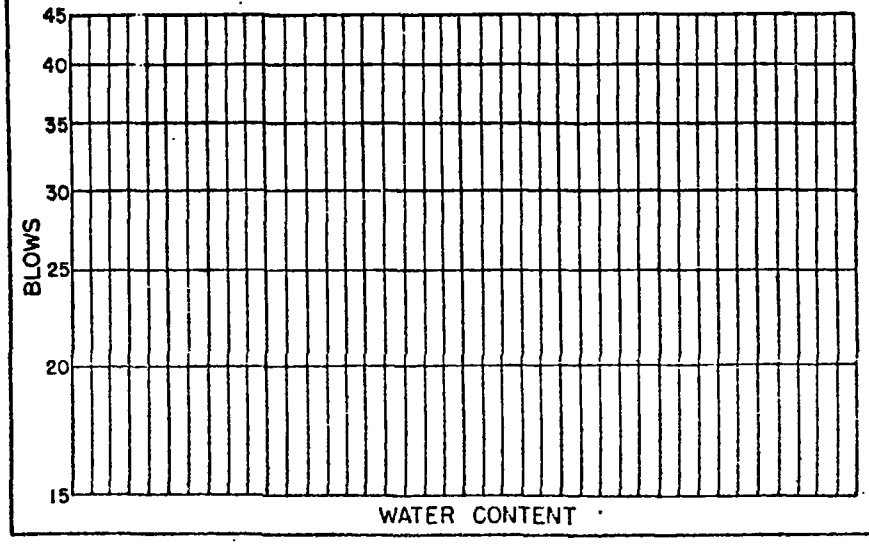
			-40	5.23	50%
-3/4	3.85	100%	-80		
-4	1.08	86%	-140		
-10	8.45	82%	-200	3.15	30%

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3873-1 JOB NO. 1-08 HOLE NO. 1-38
DATE 11-19-82 OPERATOR BB

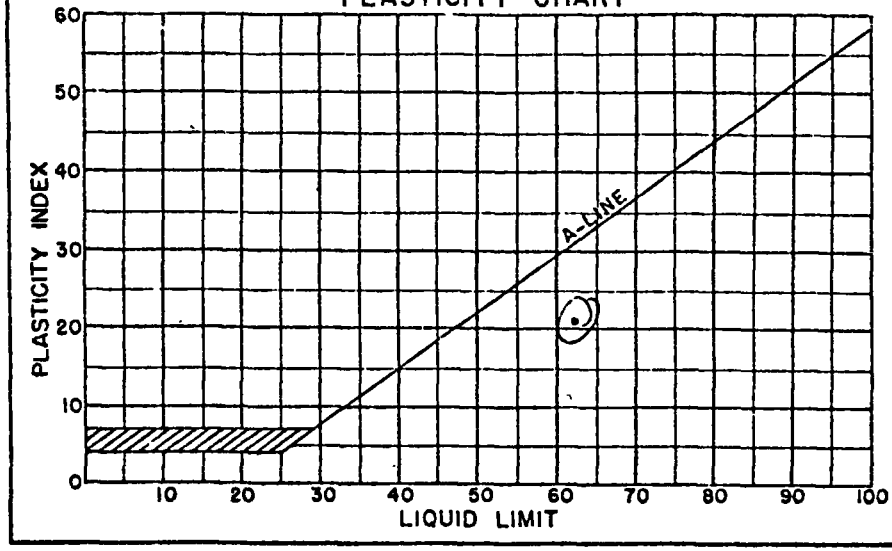
SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	✓

DESCRIPTION: SAT. GR. & DK. BRN. V. STY. HLY ORGANIC MAT. W/T. CLY.

H_2O = 90%

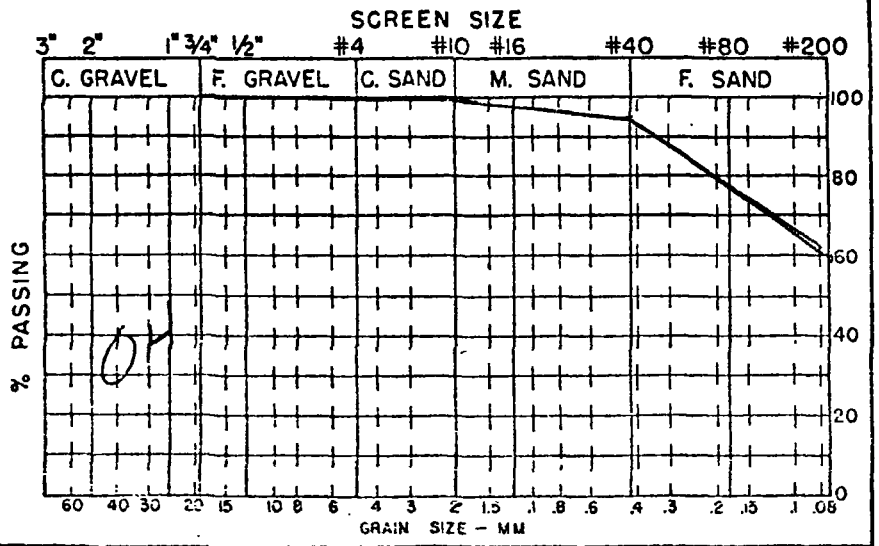
PLASTICITY CHART



SIEVE ANALYSIS % Passing 18.90

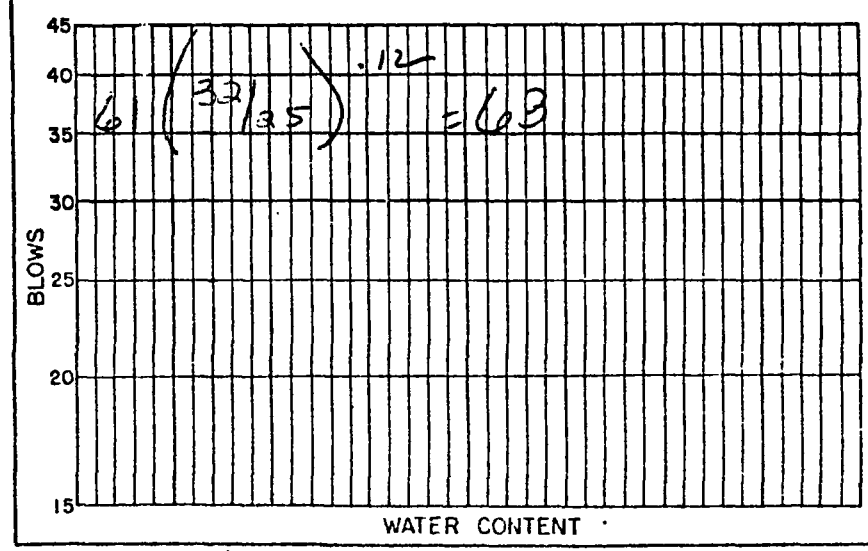
			-40	6.70	95%
-3/4	.12	100%	-80		
-4	.05	99	-140		
-10	.82	99	-200	11.21	59%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	115				69
Wet Wt.	8.92				6.88
Dry Wt.	5.55				4.87
% H_2O	61				PL= 42%
Blows	32				PI= 21



DOT FORM 351-019

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

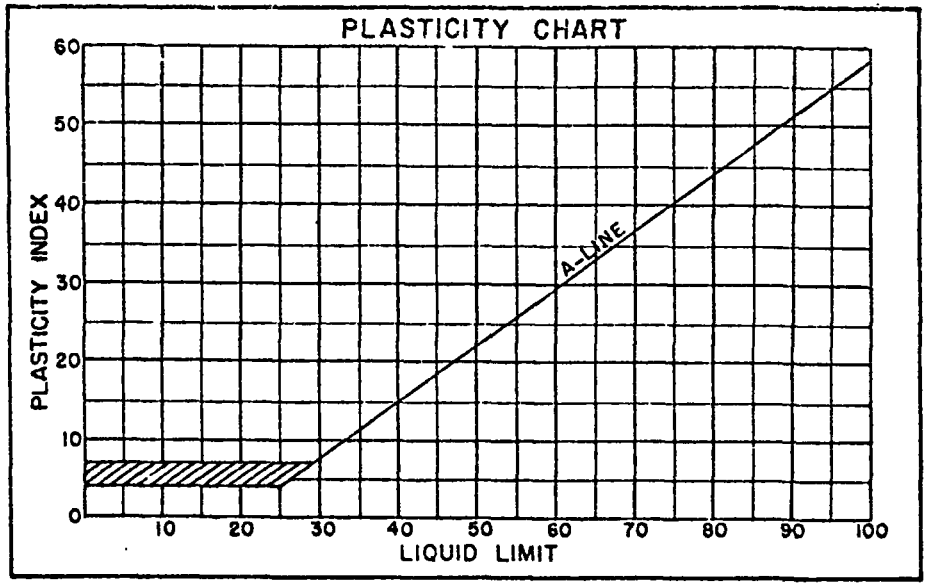
SAMPLE NO. 3875 — JOB NO. 4-08 HOLE NO. J-38
DATE 11-19-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	✓

DESCRIPTION: Moist, Gr. dil. Brn. Sty. F. Sand w/org. stems & f. hard clumps of Cly. matr.

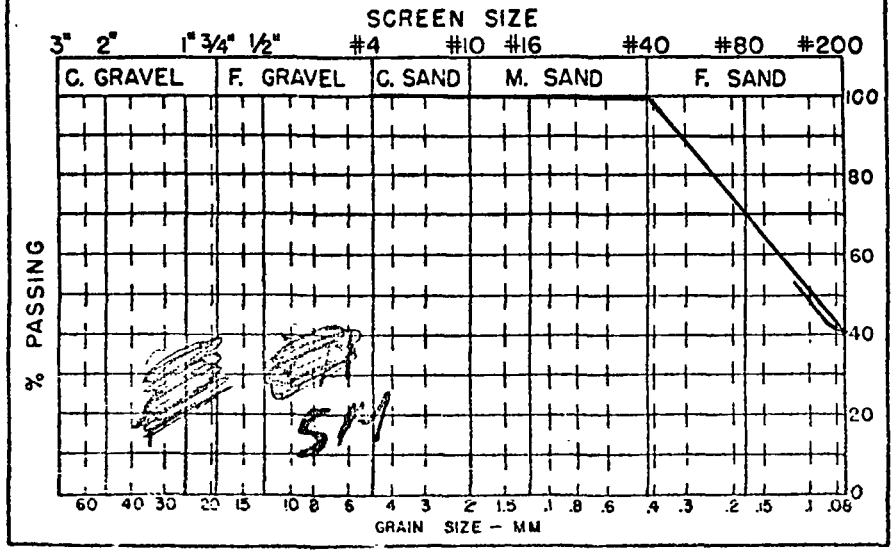
1/20 = 1839g



SIEVE ANALYSIS % Passing 47.40

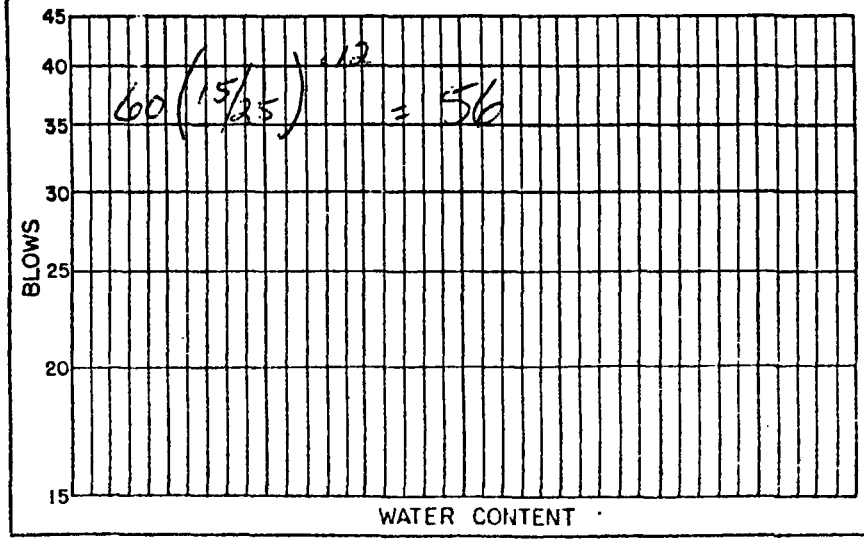
			-40	27.85	99
-3/4			-80		
-4	.01	100	-140		
-10	.30	100	-200	19.30	41

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	62				N/P
Wet Wt.	9.90				
Dry Wt.	6.20				
% H_2O	60				PL=
Blows	15				PI=



DOT FORM 351-019

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

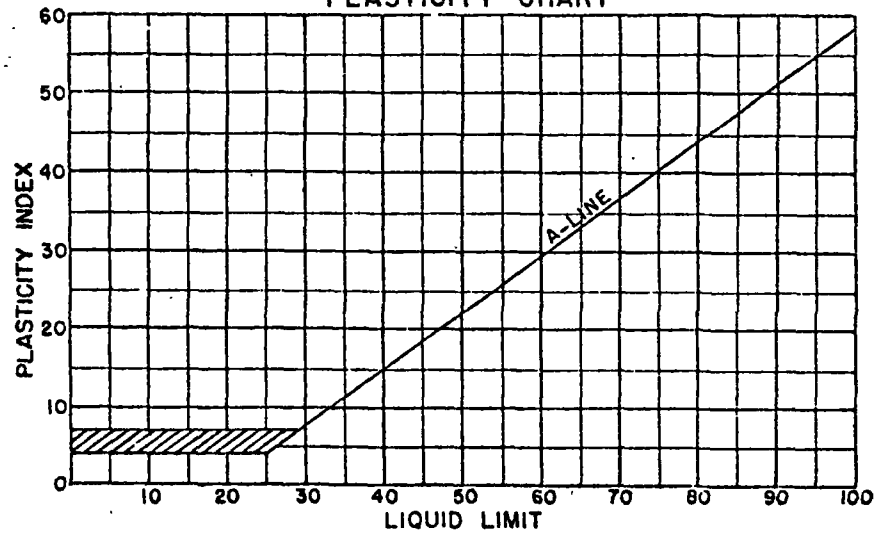
SAMPLE NO. 3877 JOB NO. 268 HOLE NO. J-38
DATE 3-4-83 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: Org. Moist, Brn.
V. Sty. F-SAND

PLASTICITY CHART

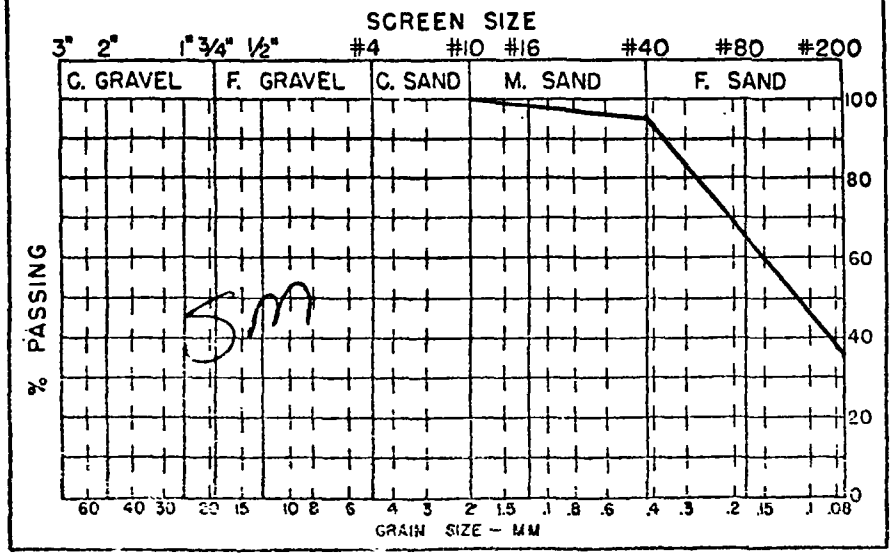


H20=6.6 %

SIEVE ANALYSIS % Passing 62.0

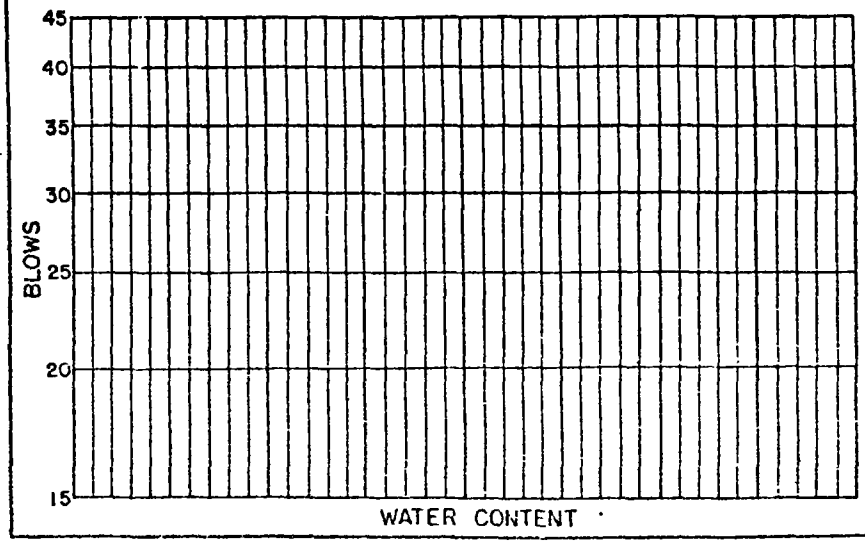
		-40 36.82	95
-3/4		-80	
-4		-140	
-10 3.32	100%	-200 21.86	35%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



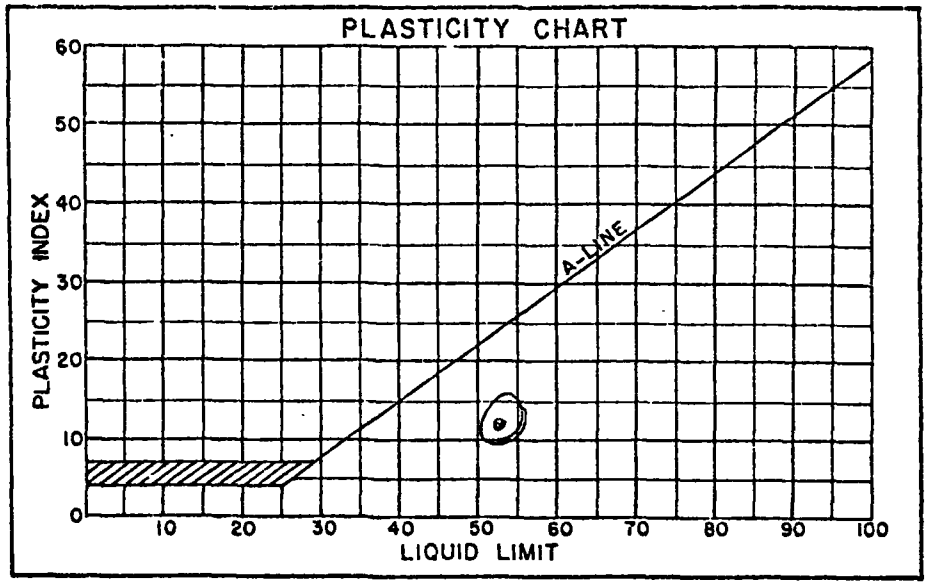
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3879	JOB NO. ~~Hol~~	HOLE NO. 138
DATE 11-19-82	OPERATOR BB	

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			✓

DESCRIPTION: SAT. GR & Brn PTY. F. Sdy. SILT w/ dry. twigs & Stems

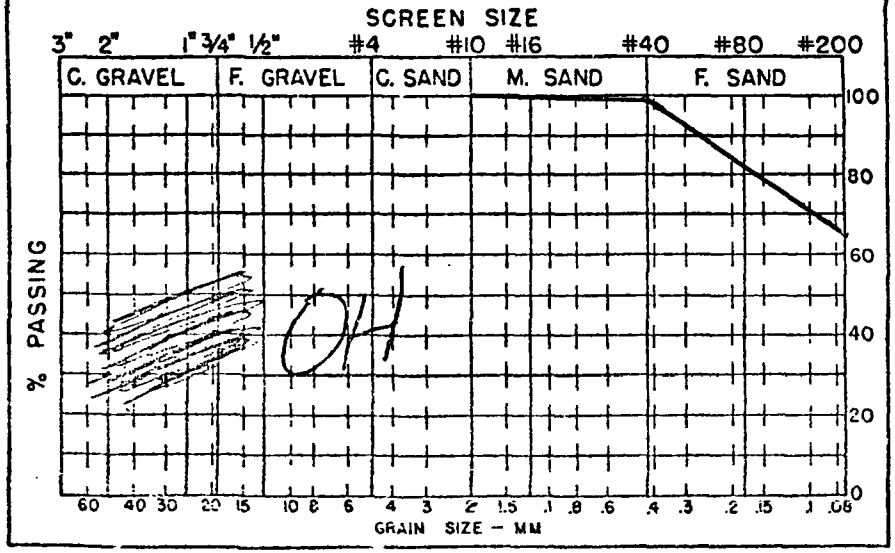


H_2O: 104 %

SIEVE ANALYSIS % Passing 17.42

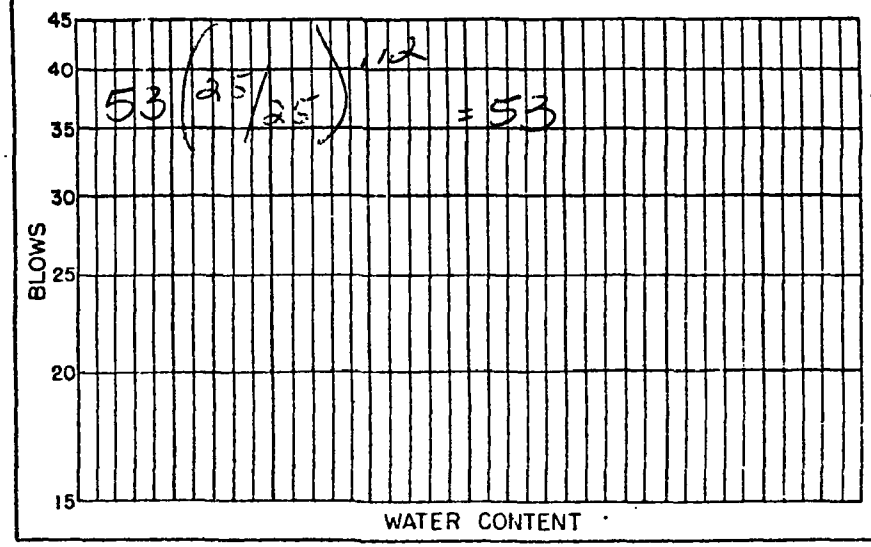
			-40	6.10	90.7
-¾			-80		
-4			-140		
-10	.05	100 %	-200	11.27	65

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	73				51
Wet Wt.	12.30				5.95
Dry Wt.	8.05				4.22
% H_2O	53				PL= 41
Blows	25				PI= 12



DOT FORM 351-019

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater

Date 11-17-82

Dear Sir:

I have forwarded by today's State Car the following Foundation Samples.

Contract or Job No. L-7762 Section Hoquiam bypass
SR No. 101 Sub-Section line hole

Station & Offset 74+00 30' RT Hole # J-39

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3881 -1	D-1	0' 6" 2' 6"	109%	PT	Like 3685 Dk. Brn. & Blk. Org., mossy Fibrous Peat w/ Silt & Clay
-2	D-3	7' 0" 9' 0"	49%	ML	Like 3820 Wet, Orange F. Sdy. Silt ; No Org.
-3	D-4	10' 0" 12' 0"		ML	Like 3820 Wet, orange, F. Sdy. Silt w/T. Rust
3882 -1	U-5	13' 10" 14' 2"	B		
-2		14' 2" 14' 6"	C		
-3	U-6	15' 0" 15' 4"	H_2O = 70% A		Moisture Only
-4		15' 4" 15' 8"	B		
-5		15' 8" 16' 0"	C		
-6		16' 0" 16' 4"	D		

1 copy with samples
1 copy to addressee

Yours very truly,
Milford Sandberg
Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 11-17-82

Dear Sir:

I have forwarded by today's State Car the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam bypass
SR No. 101A Sub-Section Line hole

Station & Offset 174+00 30' RT. Hole # J-39

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3883 -11	D-7	17'0" 19'0"	No Recovery		
3883 -4	D-9	22'0" 24'0"	41%	ML	Wet, Gr. & Lt. Brn., Cly. Silt w/ small ~~[illegible]~~ pieces of siltstone
3884 -1	U-10	25'0" 25'4"	H_2O=442 A		MOISTURE ONLY
-2		25'4" 25'8"	B		
-3		25'8" 26'0"	C		
3885	D-11	27'0" 29'0"		ML	Like 3883 w/one F. & Gravel
3886	U-12	30'4" 30'8"	B H_2O=50%		MOISTURE ONLY
3887	D-13	32'0" 34'0"		ML	Like 3883
3886	U-14	35'0" 37'0"	I D 702 sample only	PT	Like 3690 Gr. F. Sdy. Peat & Silt w/ small breakaway clumps of siltstone

1 copy with samples
1 copy to addressee

Yours very truly,
Milford Sanders
Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 11-17-82

Dear Sir:

I have forwarded by today's ..... the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam bypass
SR No. 101 Sub-Section Line hole

Station & Offset 174+00 30' Rt Hole # J-39

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3889-1	D-15	37'0" 37'10"	26%	SM	Like 3697-6 Moist. Tan & Grn. V. Sty. F. SAND w/ MICA
-2	D-16	40'0" 40'4"		Sm	SAME

1 copy with samples
1 copy to addressee

Yours very truly,
Milford Sanders
Inspector.

DOT FORM 351-002 REVISED 2/80

Moisture ONLY

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3882-3 JOB NO. 108 HOLE NO. 39
DATE 11-18-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

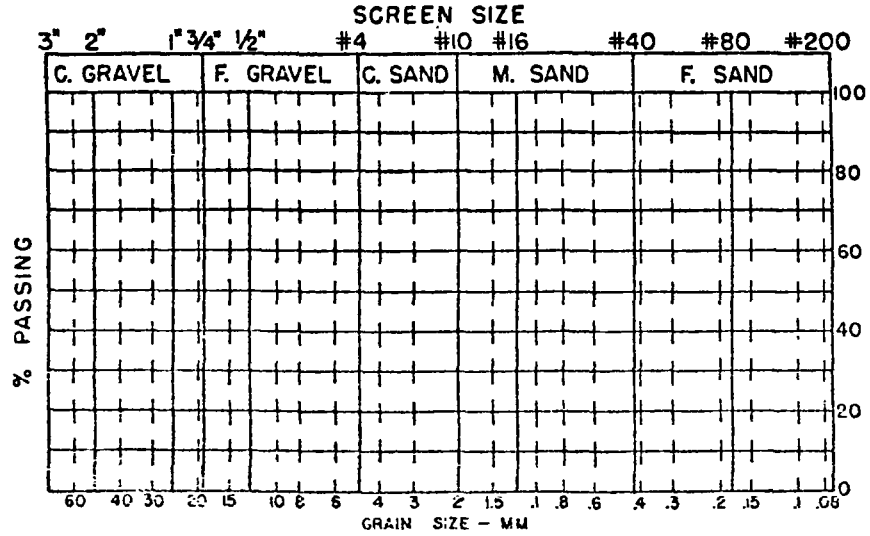
DESCRIPTION:

CAN NO: 19
Wet WT: 38.37 DRY WT: 22.57 H_2O = 70%

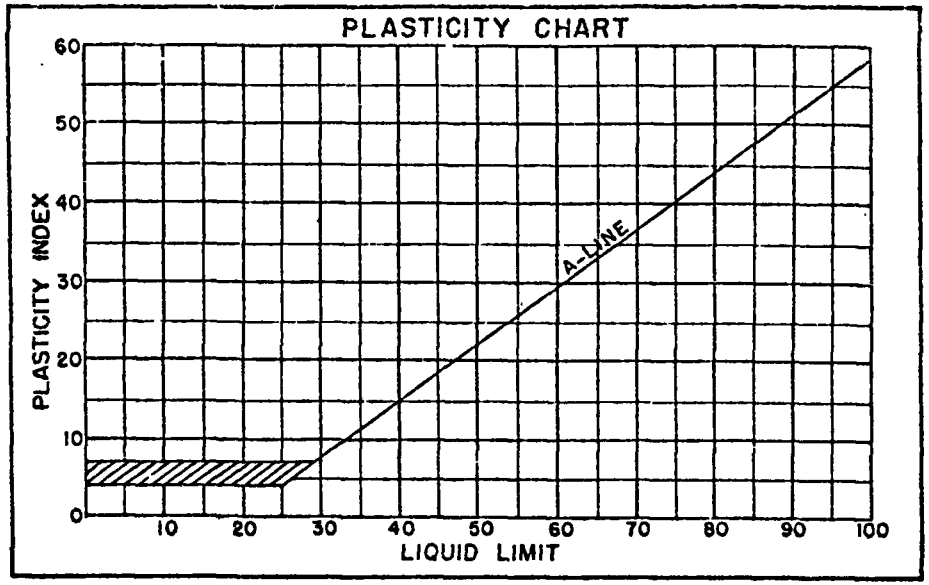
SIEVE ANALYSIS % Passing

	-40
-3/4	-80
-4	-140
-10	-200

GRAIN SIZE CURVE

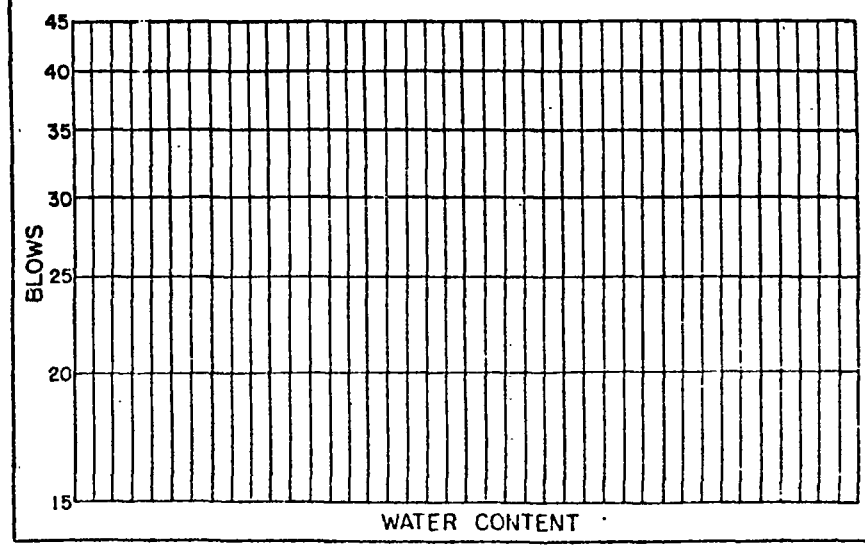


PLASTICITY CHART



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

Moisture Only

SAMPLE NO. 3884-1	JOB NO. 408.	HOLE NO. 39
DATE 11-18-82	OPERATOR BB	

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION:

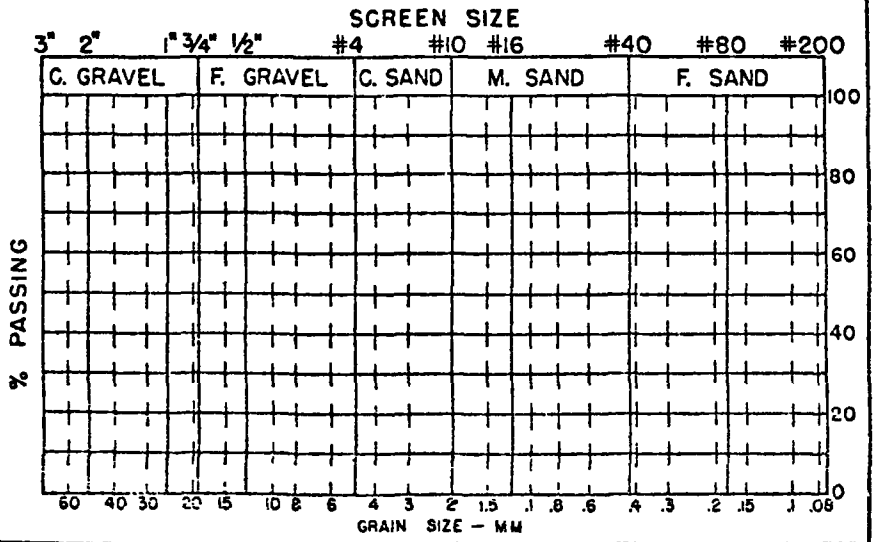
CAN NO: 15

Wet Wt: 55.00 Dry Wt: 38.10 H_2O=44%

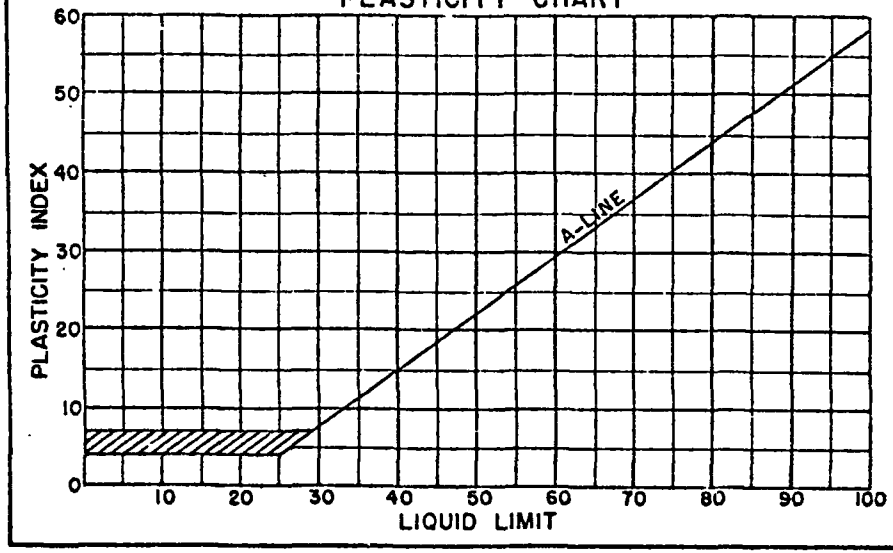
SIEVE ANALYSIS % Passing

	-40
-3/4	-80
-4	-140
-10	-200

GRAIN SIZE CURVE

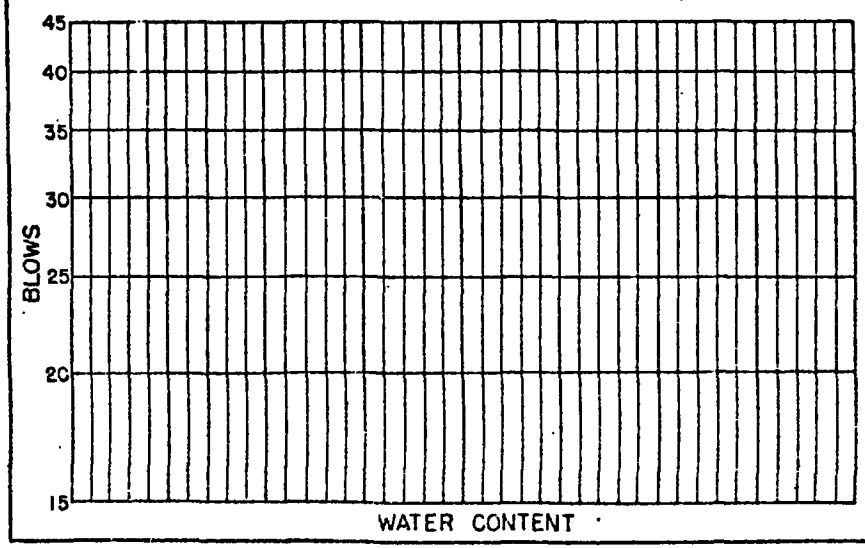


PLASTICITY CHART



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DJT FORM 351-019

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 5883 JOB NO: Hol. HOLE NO. 139
DATE 12-7-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	✓

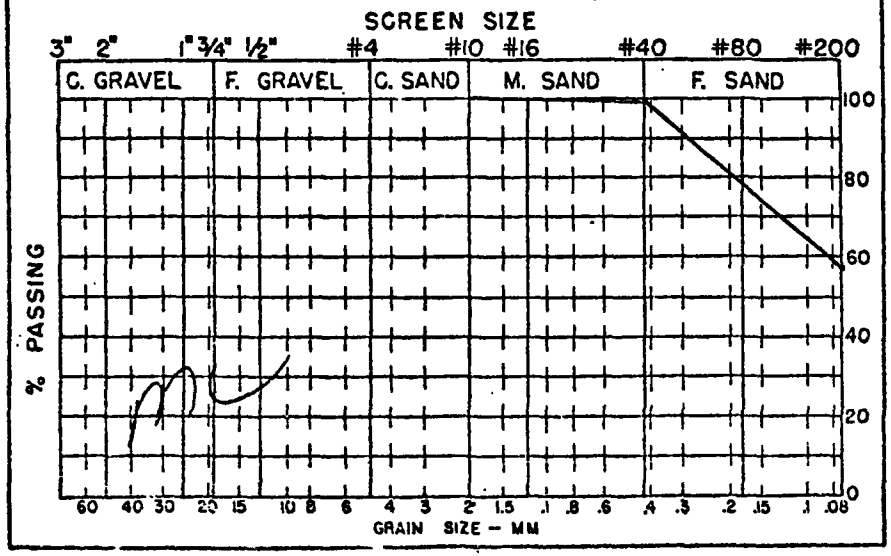
DESCRIPTION: Wet, Gr & Lt. Brn. Cly. SILT W/ Small Breakable Clumps

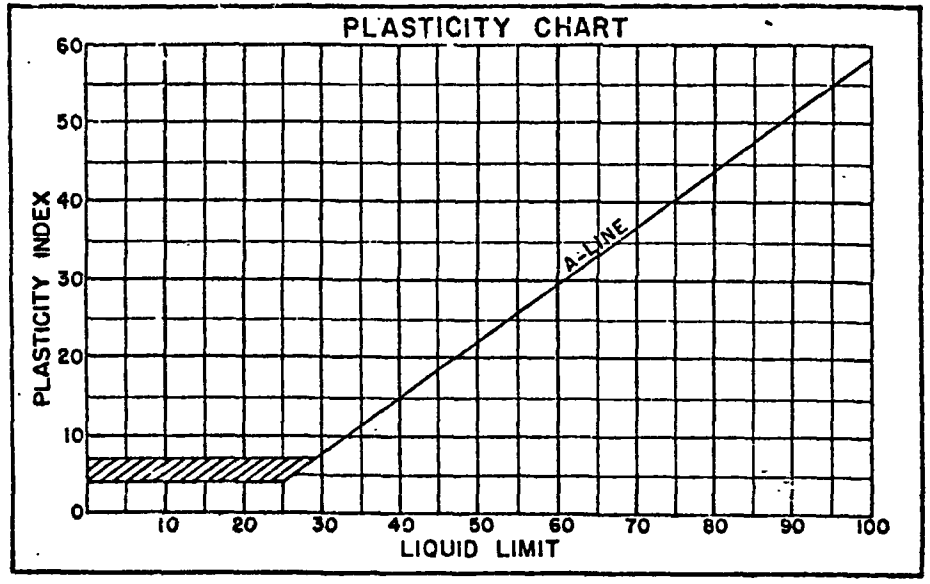
+1/20 = 4/%

SIEVE ANALYSIS % Passing 56.26

		-40	23.10	99
-3/4		-80		
-4		-140		
-10	.125 100 %	-200	32.91	58

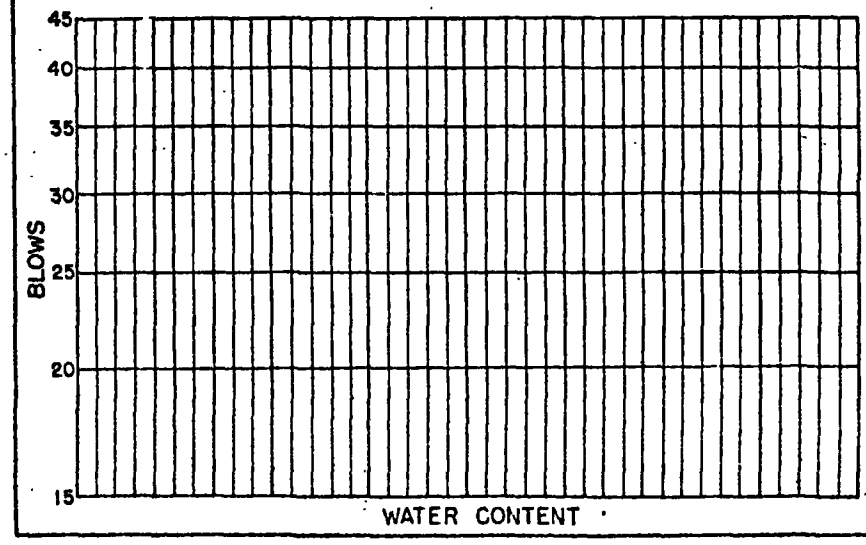
GRAIN SIZE CURVE.





LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

Moisture Only

SAMPLE NO. 3886	JOB NO. 408	HOLE NO. 39
DATE 11-18-82	OPERATOR BB	

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION:

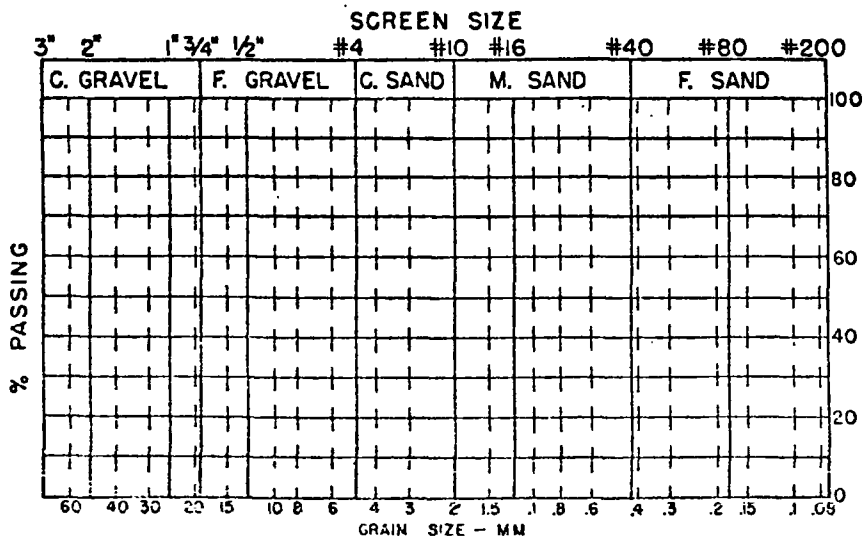
CAN # 48

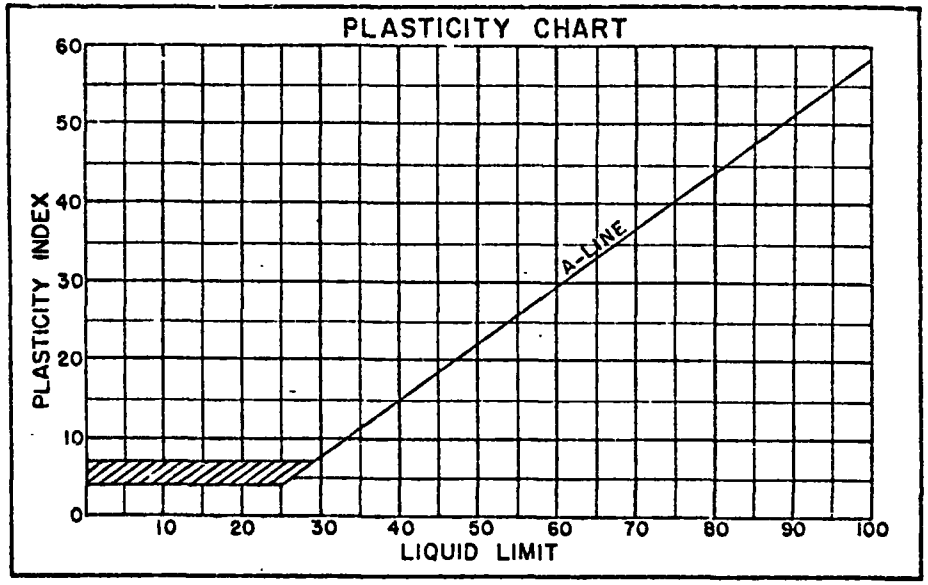
Wet Wt: 58.00 Dry Wt: 38.63 H2O = 50%

SIEVE ANALYSIS % Passing

	-40
-3/4	-80
-4	-140
-10	-200

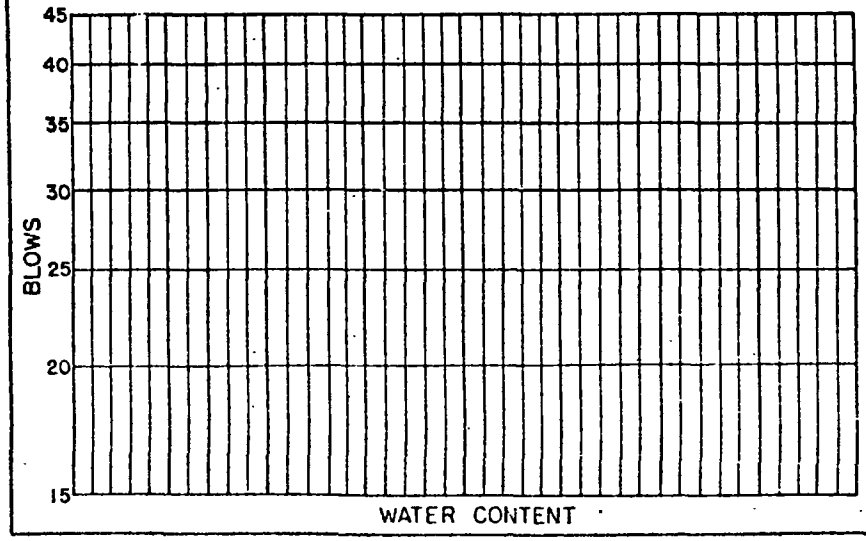
GRAIN SIZE CURVE





LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 11-18-82

Dear Sir:

I have forwarded by today's State Car the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam bypass
SR No. 101A Sub-Section Culvert

Station & Offset 172+42 50' Lt. Hole # J-40

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3891	D-1	1'0" 3'0"	109%	PT	Like 3685 Dk. Brn., Org., stems & grass Mossy. Fibrous Peat w/ Silt & Clay.
3892 -1	U-2	5'0" 5'4"	A		
-2		5'4" 5'8"	B		
3893	D-3	7'0" 9'0"		PT	Same w/ twigs & Roots
3894	U-4	10'0" 12'0"	ID only #U-4		
3895	D-5	12'0" 14'0"	67%	ML	Like 3800 Wet, hly. Org., Gr & Blk. Silt & Wood Fibers w/roots & wood Chips
3896 -1	U-6	15'0" 15'4"	A		
-2		15'4" 15'8"	B		
-3		15'8" 16'0"	C		

1 copy with samples
1 copy to addressee

Yours very truly,
Mufford Sanders
Inspector.

FORM 351-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 11-18-82

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam bypass
SR No. 101A Sub-Section Culvert

Station & Offset 172+42 50' LT. Hole # J-40

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3897-1	D-7	17'0" 19'0"	41%	ML	Like 3883 Wet, Gr & Lt. Brn., Cly. SILT w/ small breakable clumps
-2	D-9	22'0" 24'0"	46%	SM	Like 3804-1 Wet, Gr & dk. Grn. V. Sty. SAND W/T. Fine SR & & Gravel
-3	D-10	25'0" 26'5"	70%	PT	Like 3690 Gr. F. Sdy. PEAT & SILT w/org. stems
-4	D-11	30'0" 30'11"	26%	SM	Like 3697-6 Moist, tan-Gr. V. Sty. F. SAND w/mica (slight Layering)
-5	D-12	35'0" 35'6"	35%	ML	Like 3690-24 Wet, dk. gr. & grn. F. Sdy. SILT w/small clumps of silt
-6	D-13	39'0" 39'4"		ML	SAME

1 copy with samples
1 copy to addressee

Yours very truly,
Milford Sanders
Inspector.

DOT FORM 351-002 REVISED 2-80

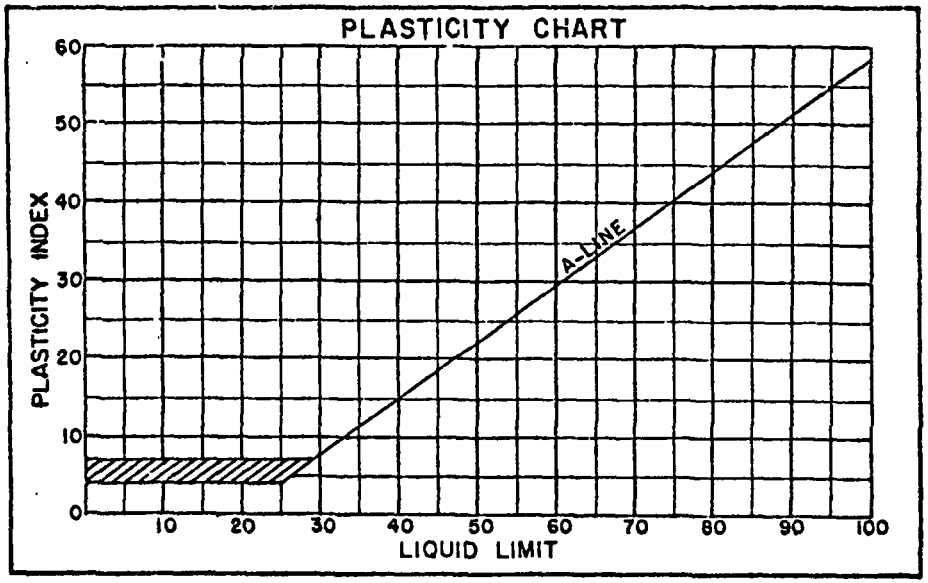
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 39.4 ? JOB NO. 401. HOLE NO. J-40 ~~J-10~~
DATE 12-7-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: DK. BRN & GR F. Sdy. Sty PEAT w/ fibers & org

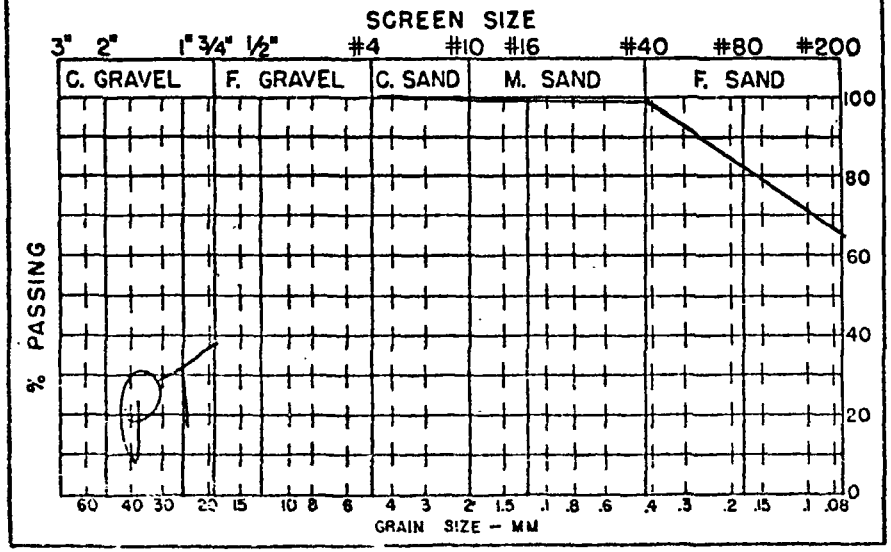


H2O = 89%

SIEVE ANALYSIS % Passing 77.03

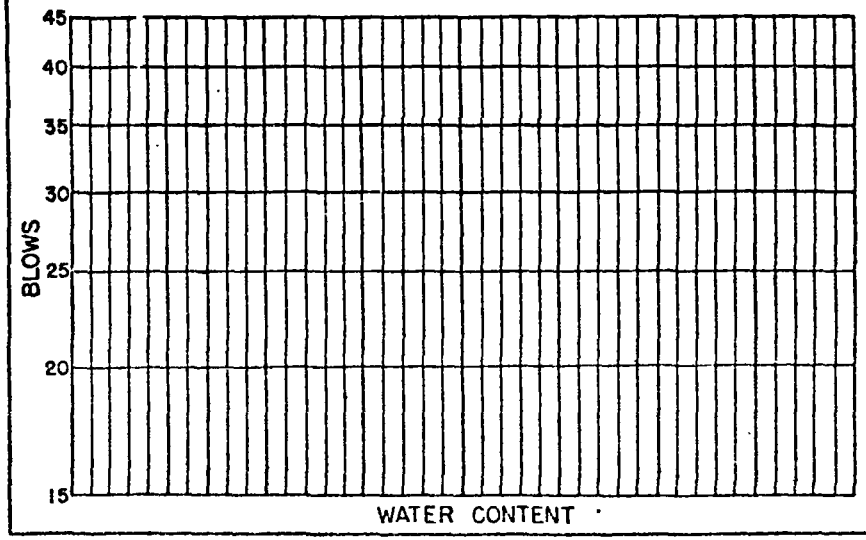
			-40	26.20	99
-3/4	.18	100 %	-80		
-4			-140		
-10	.50	99	-200	50.15	65

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater

Date 12-9-82

Dear Sir:

I have forwarded by today's Stat car the following Foundation Samples.

Contract or Job No. 1-7-62 Section West Hoquiam Viaduct
SR No. 101 Sub-Section Cut [illegible]

Station & Offset [illegible] 55 Rt. Hole # J-41

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3962-1	D-1	0' 0" / 5' 0"	H_{2O}=16%	GW GM	Moist, Reddish Brn., Sty. f-c Sdy. F. GRAVEL
-2	D-2	6' 0" / 7' 0"		SM	Moist, Brn., V. Sty. F-C SAND w/ t. cly. & one 1"(+) (Rounded gravel)
-3	D-3	10' 0" / 11' 0"		SM	SAME
-4	D-4	15' 0" / 15' 10"	17%	GM	Moist, Brn., V. Sty. F-C Sdy. 1½"(+) GRAVEL
-5	D-5	20' 0" / 20' 11"	"	GM	SAME
-6	D-6	25' 0" / 26' 0"		SM	Moist, Lt. Brn.-Brn., V. Sty. F-C SAND w/ F. GRAVEL
-7	D-7	30' 0" / 31' 0"	36%	SM	Moist, Brn., V. Sty. F. Gravelly f-c SAND
-8	D-8	35' 0" / 36' 0"	"	SM	SAME
-9	D-7	40' 0" / 41' 0"	9%	GM	Dry, Lt. Brn., V. Sty. FC Sdy. 1"(+) GRAVEL

1 copy with samples
1 copy to addressee

Yours very truly,

Inspector.

DOT FORM 351-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place .....

Date .....

Dear Sir:

I have forwarded by today's ..... the following Foundation Samples.

Contract or Job No. L-7262 Section ..... SR No. ..... Sub-Section .....

Station & Offset 12100 55' Lt. Hole # T-41

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3962 -10	D-10	45' 0" 46' 6"	16%	SM	Like 3962-6 Moist, Lt. Brn.-Brn. V. Sty. FC SAND w/ F. gravel
-11	D-11	50' 0" 51' 6"	H_2O = 48%	SM	Wet, Lt. Brn., V. Sty. F. SAND
-12	D-12	55' 0" 57' 0"	52%	ML	Wet, Brn. F. Sdy. SILT
-13	D-13	60' 0" 61' 6"	39%	SM	Wet, dk. Brn., V. Sty. F. SAND
-14	D-14	66' 0" 67' 6"	10%	SM	Moist, Lt. Brn., V. Sty. F-C SAND w/ 1"-, gravel & Diesel odor.
-15	D-15	70' 6" 71' 6"	"	SM	SAME w/ slight organic odor NO Diesel odor.

1 copy with samples
1 copy to addressee

Yours very truly,

[signature]

Inspector.

DOT FORM 351-002 REVISED 2/80

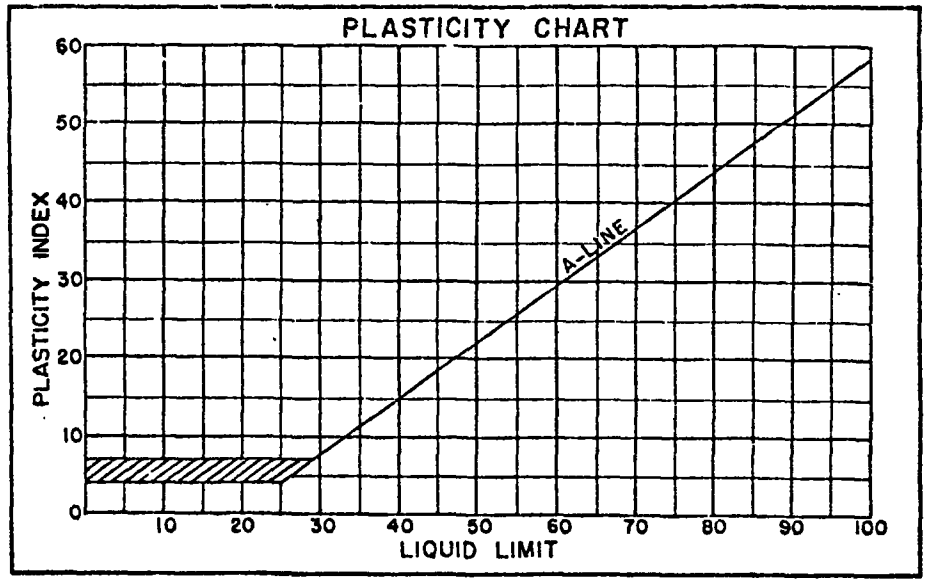
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3962-1 JOB NO. 52101 HOLE NO. J-41
DATE 24 JAN 83 OPERATOR RB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS moist			

DESCRIPTION: ~~Dry~~ Redish Brown
stiff, dry GRAVEL

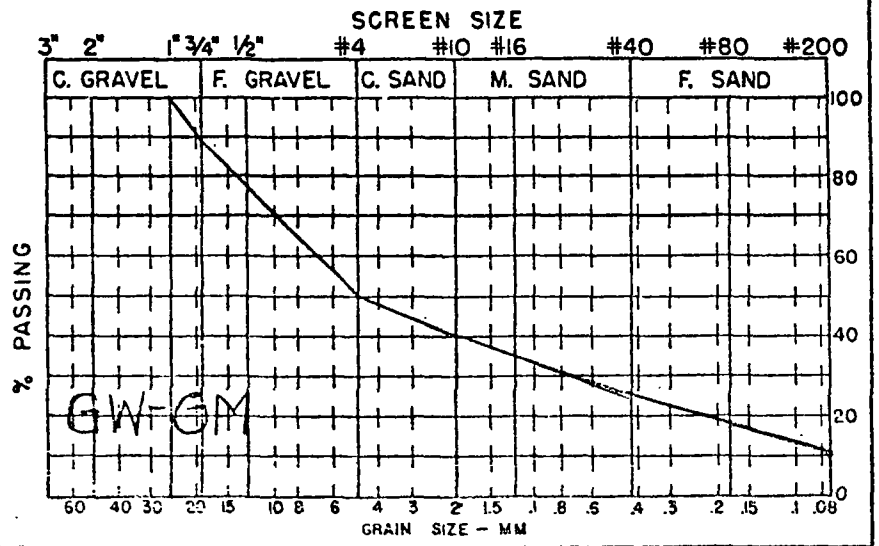


$H_2O = 16\%$

SIEVE ANALYSIS % Passing 139.0

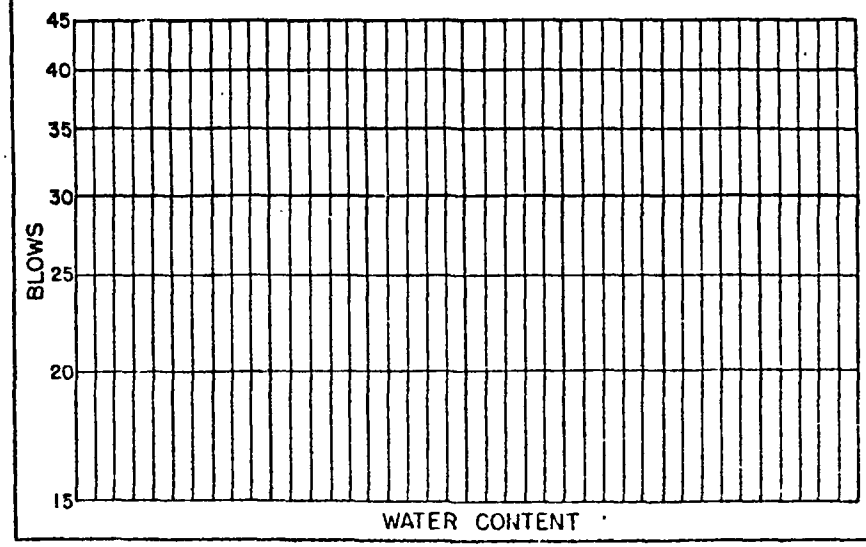
-1 1658	100	-40 18.47	24
-3/4 53.0	88	-80	
-4 13.15	50	-140	
-10 22.88	40	-200 14.92	11%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



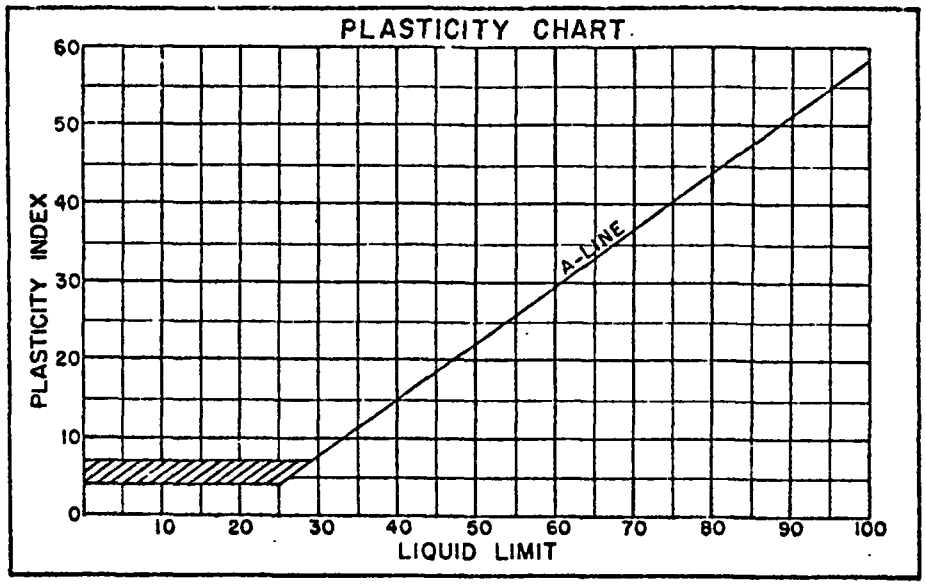
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3962-2 JOB NO. 52101 HOLE NO. Jell
DATE 1 Feb 83 OPERATOR RB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	—	—	
DRIED CAST	—	—	
DILATANCY			
BITE			
TOUGHNESS Moist	—	—	

DESCRIPTION: ~~Dry~~ Brn
V sty FC SAND w/ trace cly
w/ 1 (-1" Rounded gravel)

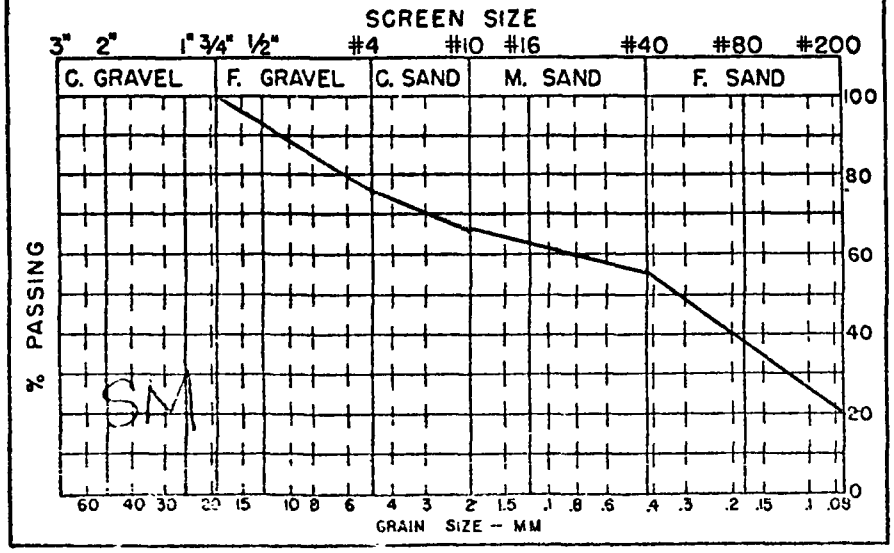


$H_2O = 27\%$

SIEVE ANALYSIS % Passing 93.50

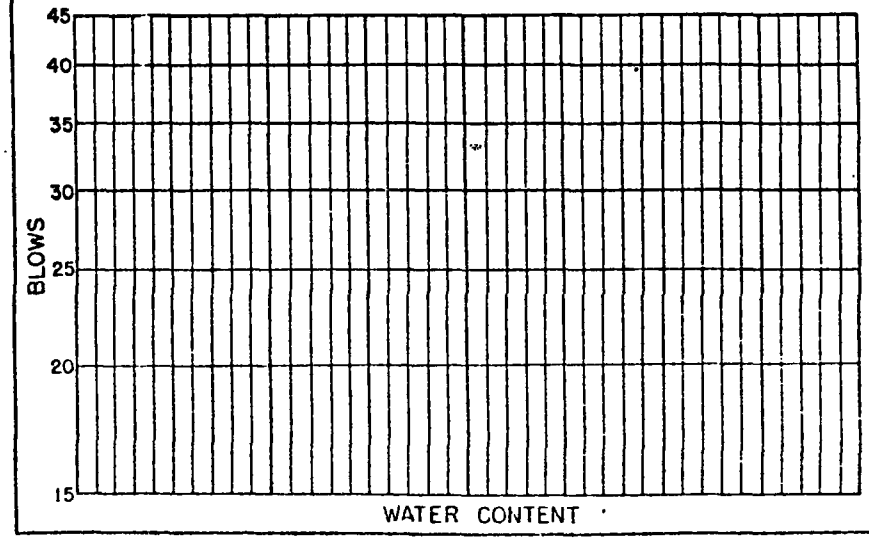
			-40	34.58	56
-3/4	21.92	100	-80		
-4	8.5	76	-140		
-10	10.18	67	-200	18.32	20%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



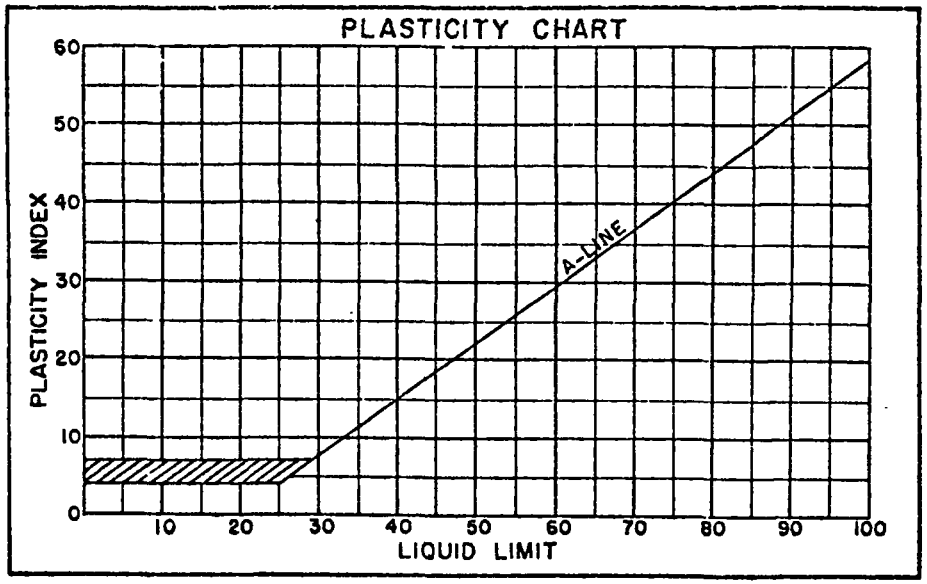
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3962-4 JOB NO. SR101 HOLE NO. J-41
DATE 24 JAN 83 OPERATOR RB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

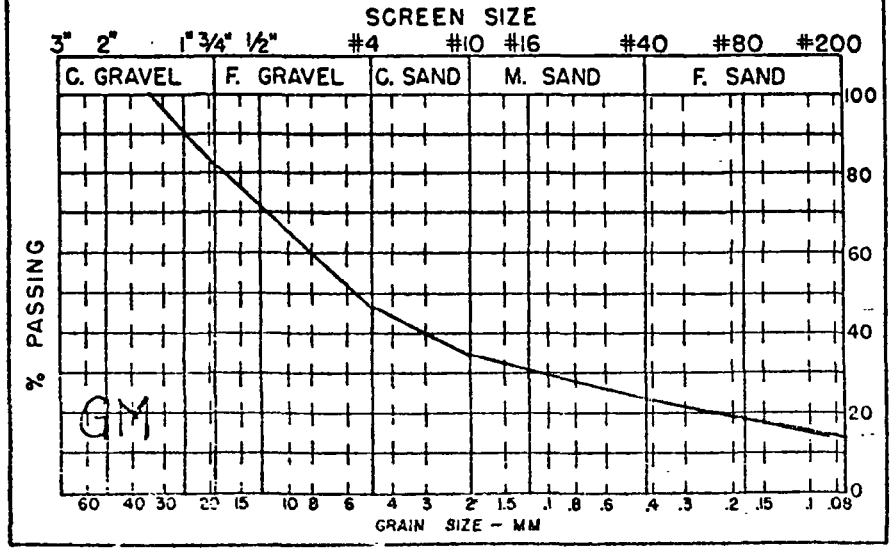
DESCRIPTION: Moist Brown V Sty FC Sdy GRAVEL



H_2O = 17%

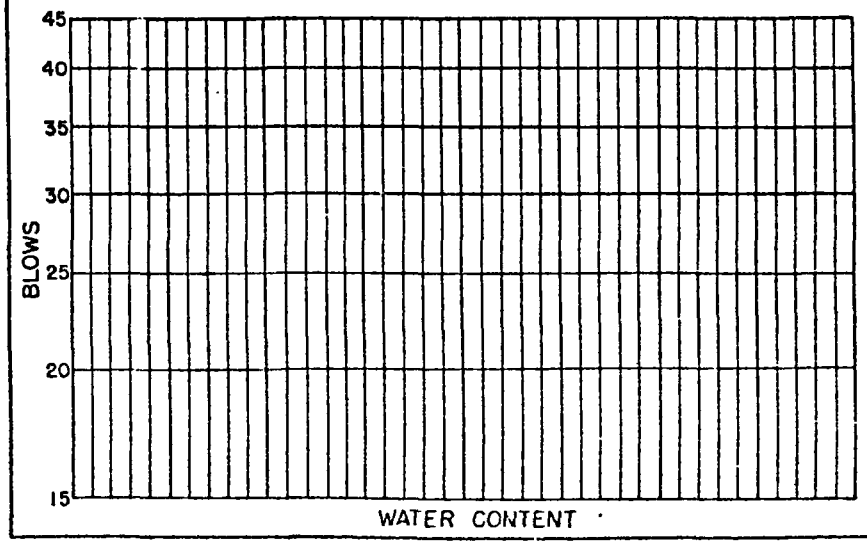
SIEVE ANALYSIS		% Passing 165.56		
-1½ 32.15	100	-40 14.5	22	
-¾ 56.08	81	-80		
-4 20.72	47	-140		
-10 19.35	34	-200 22.76	14	

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

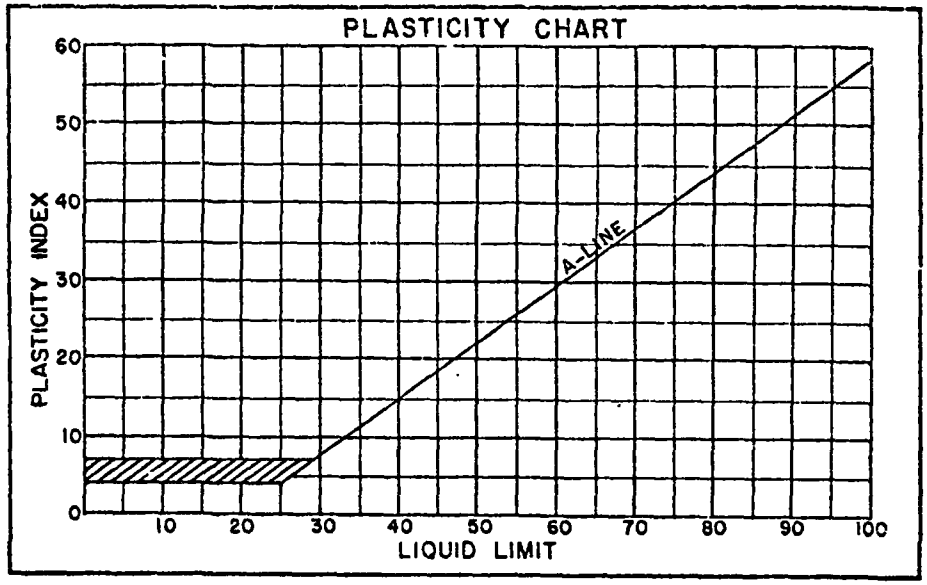
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3962-6 JOB NO. SR101 HOLE NO. J-41
DATE 31 JAN 83 OPERATOR RB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	–	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Moist Lt Brn–Brown
V sty FCSAND w F gravel

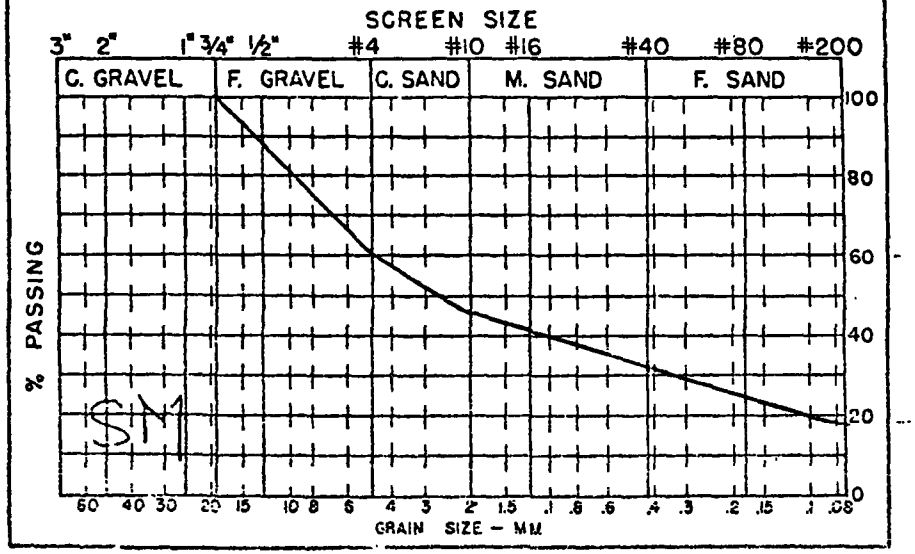


H_2O = 16%

SIEVE ANALYSIS % Passing 218.74

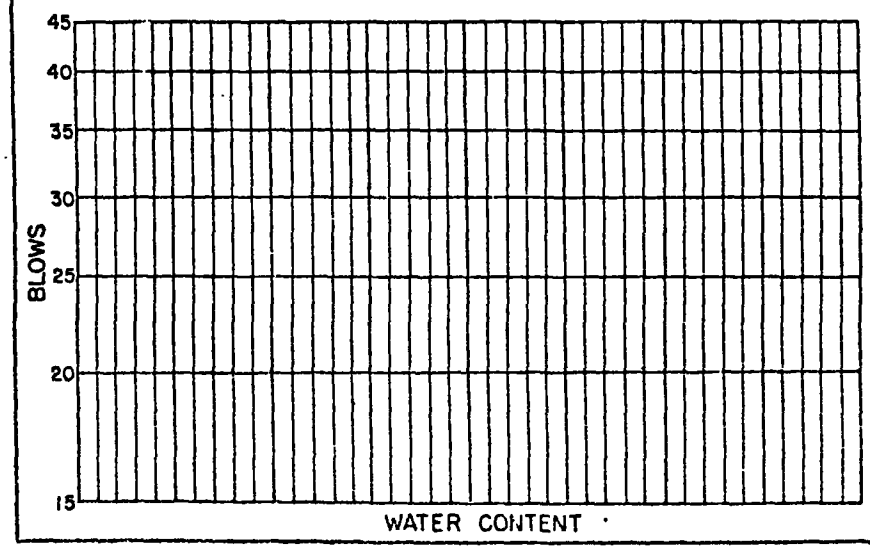
			-40	29.03	31%
-¾	88.3	100	-80		
-4	30.13	60	-140		
-10	33.28	46	-200	38	17%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

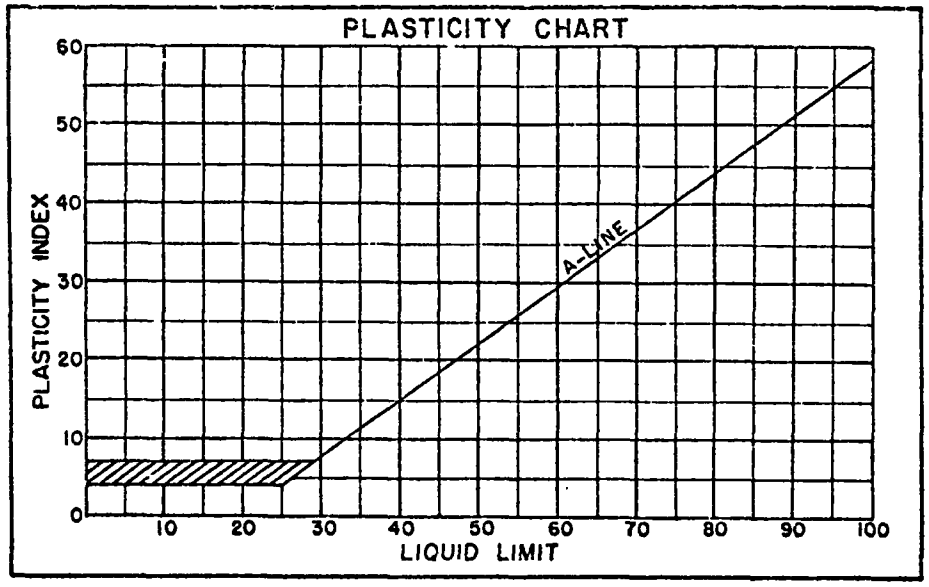
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3962-7 JOB NO. 82101 HOLE NO. J-41
DATE 31 JAN 83 OPERATOR RB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Moist Brown
V sty F gravelly SAND

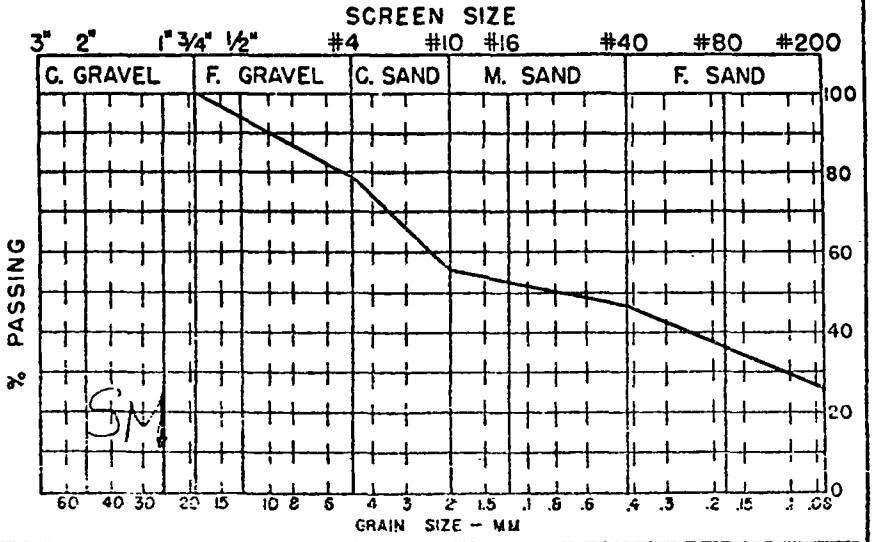


$H_2O = 36\%$

SIEVE ANALYSIS % Passing 73.73

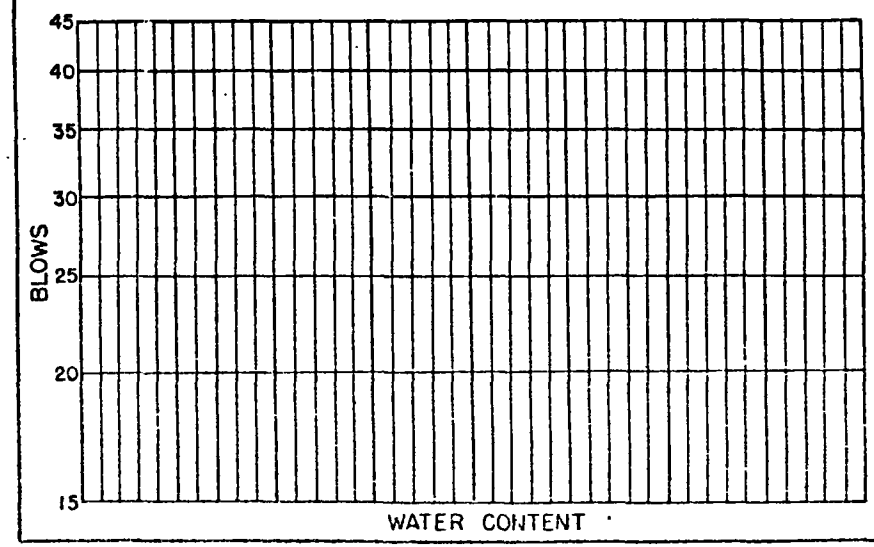
			-40	15.28	47
-3/4	16.28	100	-80		
-4	15.15	78	-140		
-10	7.83	57	-200	19.19	26

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



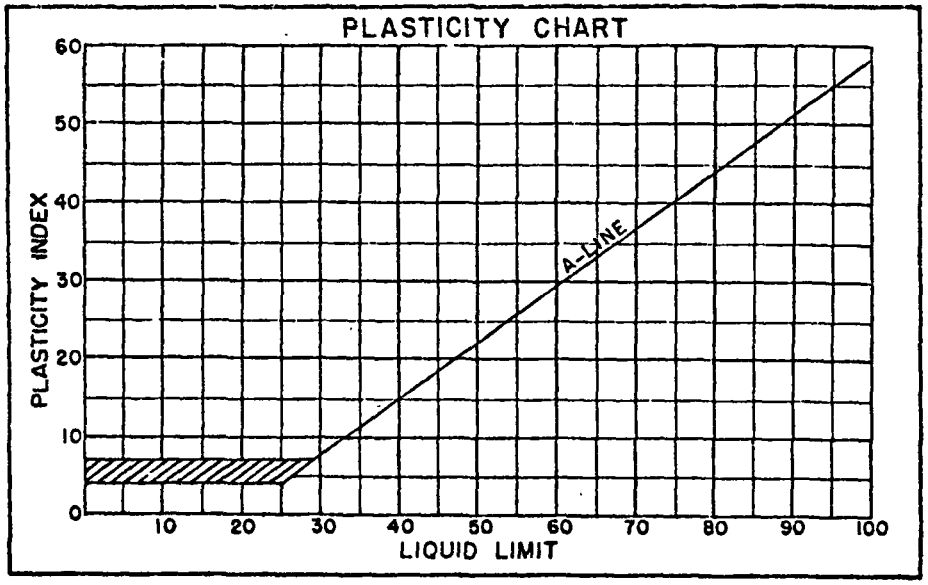
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3962-9 JOB NO. Hg. HOLE NO. J-41
DATE 2-1-83 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: Dry, Lt. Brn. V. Sty.
F-C Sdy. 1"(-) GRAVEL

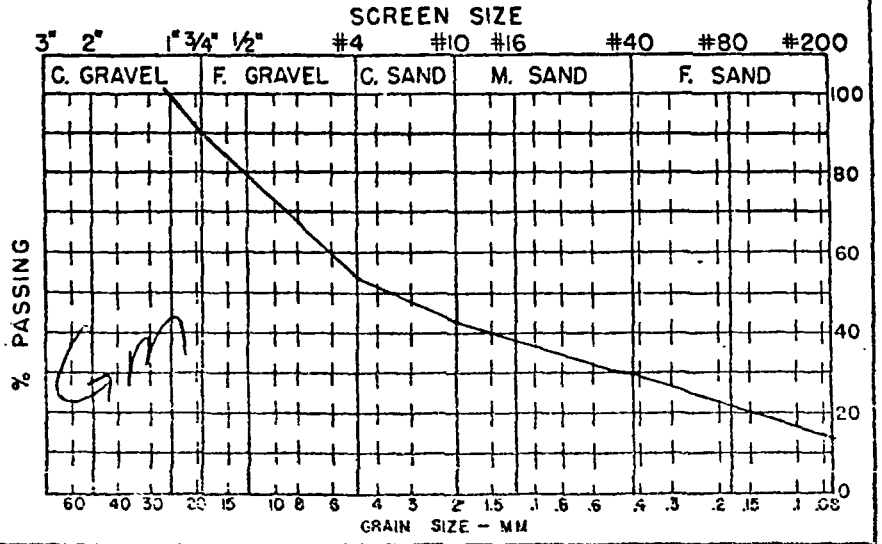


H2O = 9%

SIEVE ANALYSIS % Passing 158.01

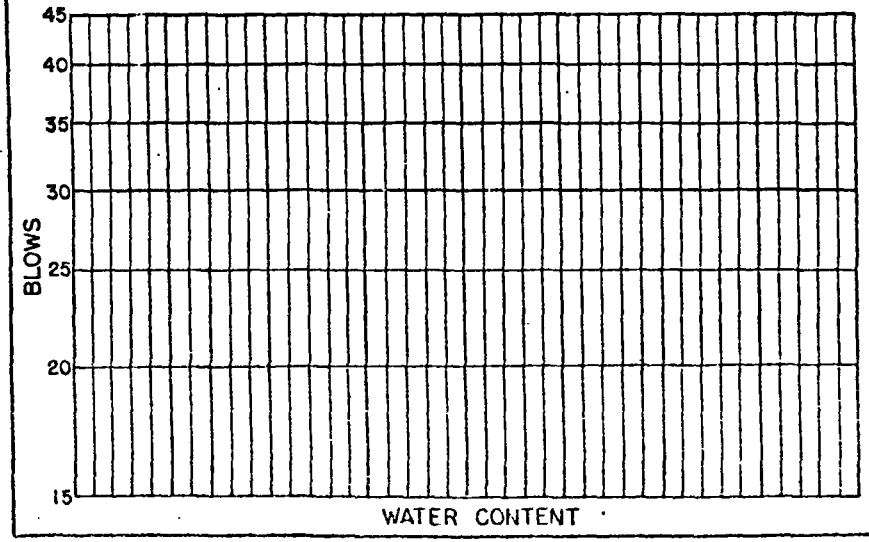
-1	16.25	100	-40	23.81	29%
-3/4	55.90	90	-80		
-4	17.18	54	-140		
-10	23.23	43	-200	21.64	14%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



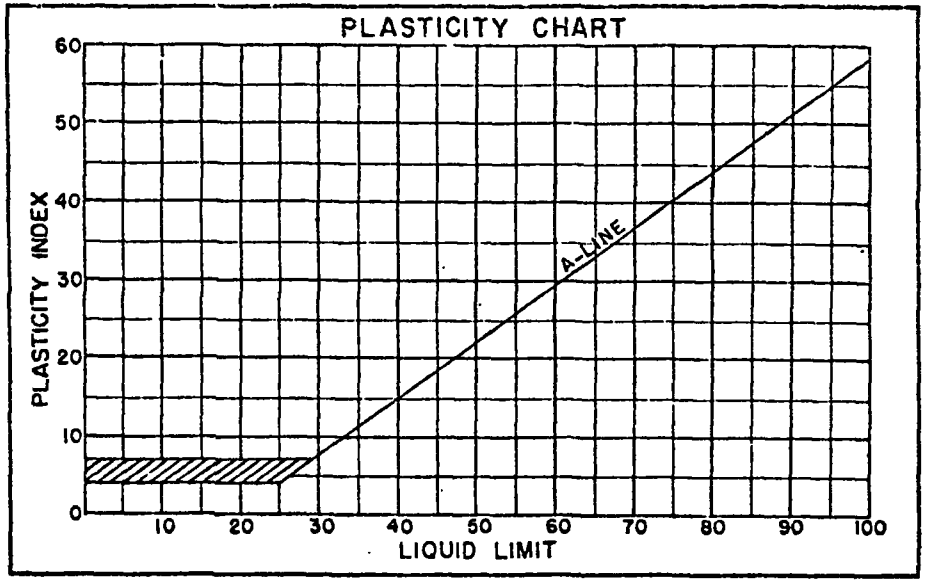
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3262-11 JOB NO. SR101 HOLE NO. J-41
DATE 25 JAN 83 OPERATOR RB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

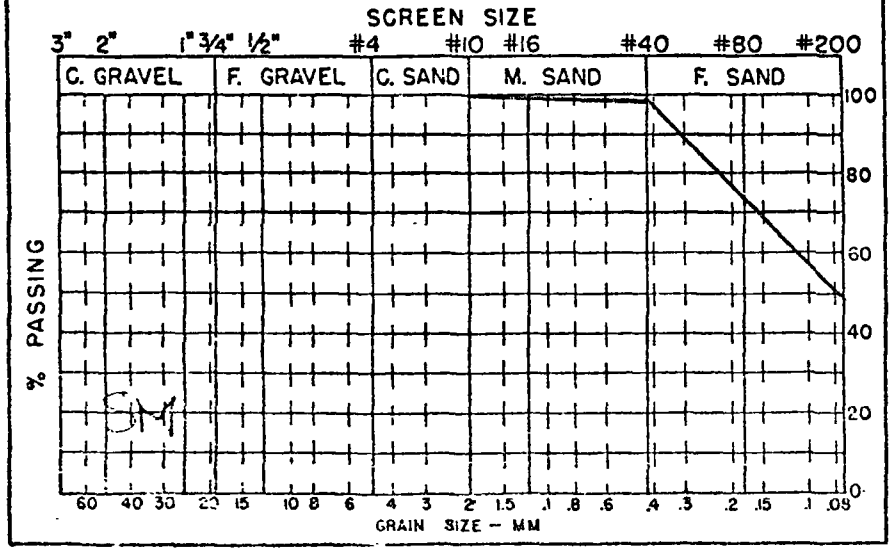
DESCRIPTION: ~~Moist~~ wet Lt Brown
V sty F SAND



H_2O = 48%

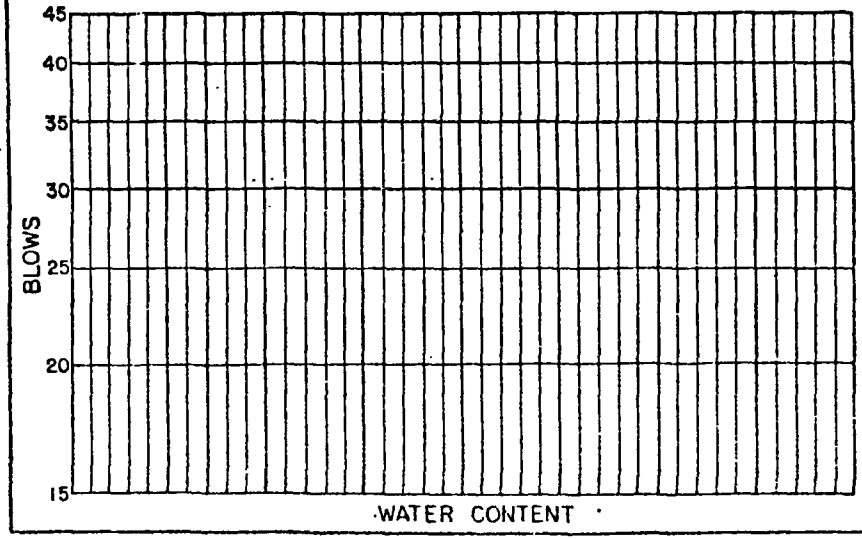
SIEVE ANALYSIS		% Passing 97.52
	-40 49.60	99
-3/4	-80	
-4	-140	
-10 +21 100%	-200 47.71	48%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



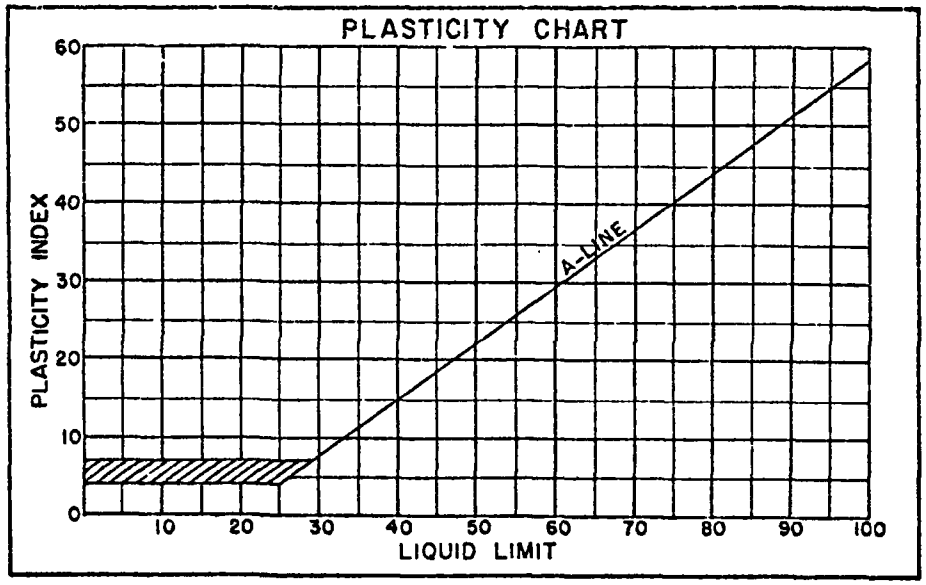
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3962-12 JOB NO. 5R101 HOLE NO. J-11
DATE 24 JAN 83 OPERATOR RB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	—	

DESCRIPTION: ~~Moist~~ wet Brown F sdy SILT

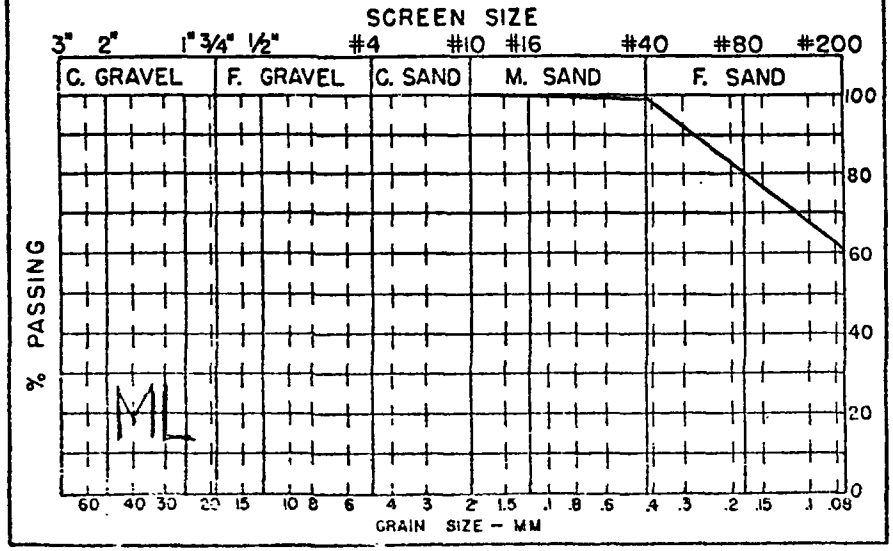


H_2O = 52%

SIEVE ANALYSIS % Passing 97.68

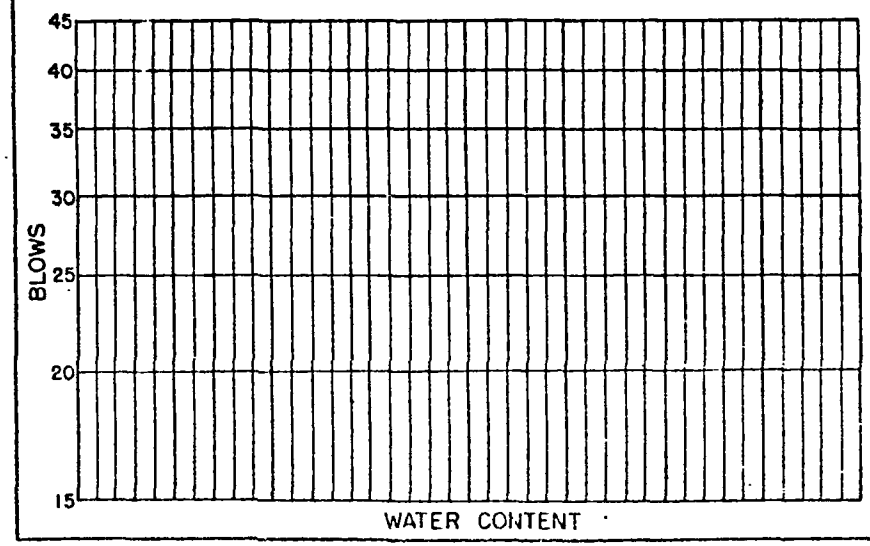
		-40 37.98	99
-3/4		-80	
-4		-140	
-10 .03	100	-200 59.67	61

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



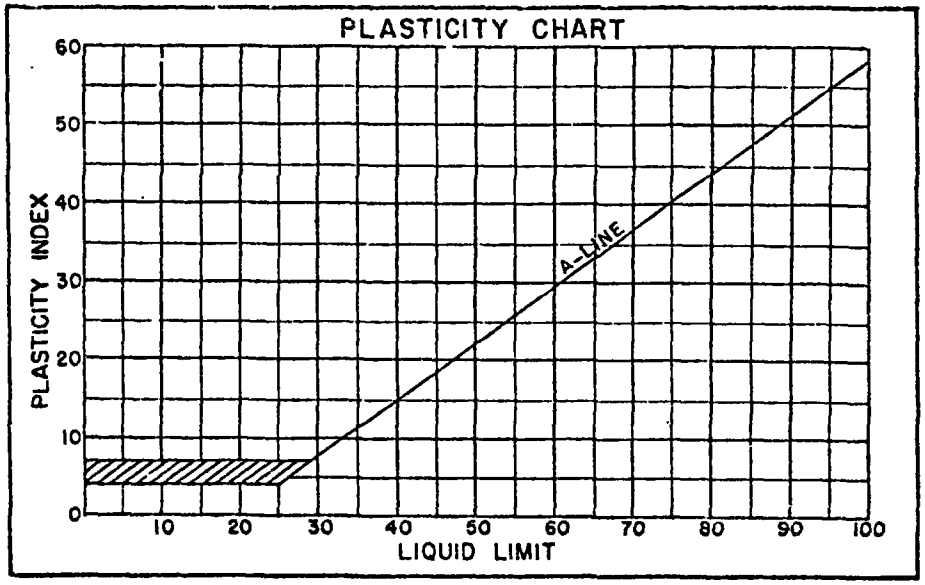
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3962-13 JOB NO. SR101 HOLE NO. 41
DATE 24 JAN 83 OPERATOR RB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: ~~Moist~~ Dk Brown Vsty F SAND

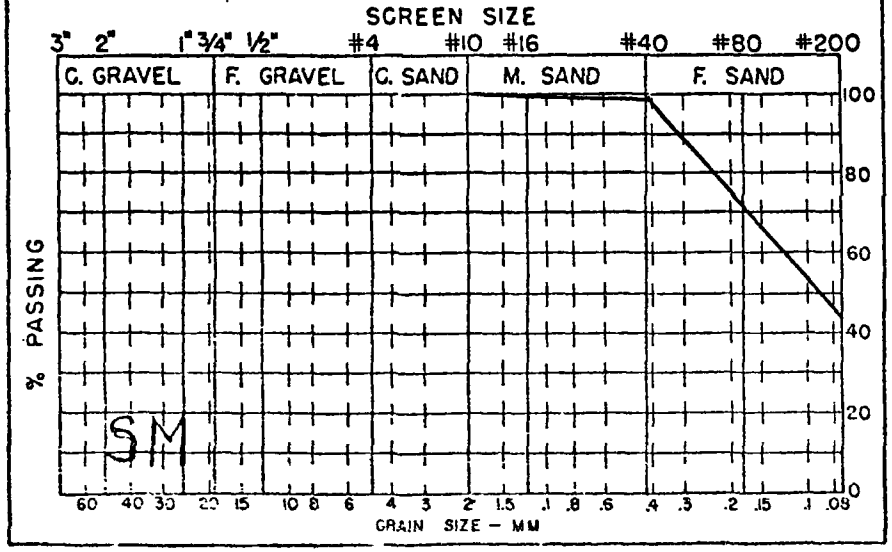


$H_2O = 39\%$

SIEVE ANALYSIS % Passing 103.68

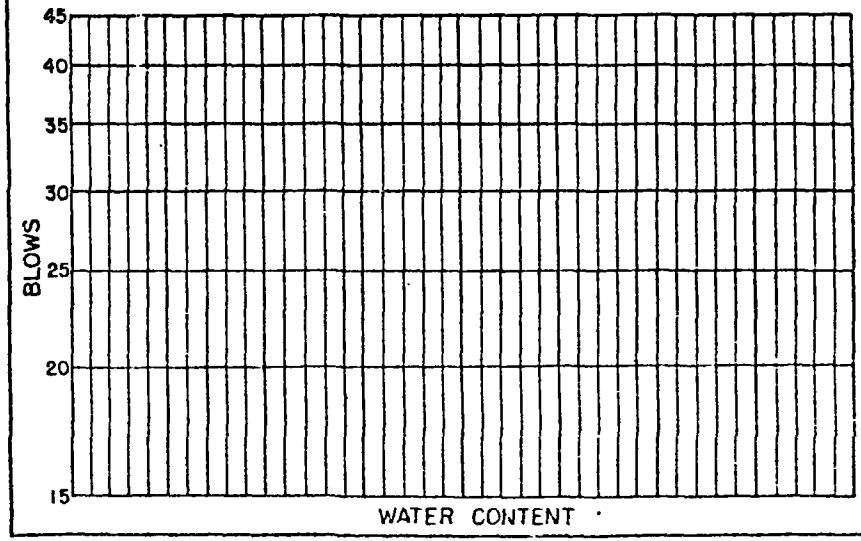
		-40 57.95	99
-3/4		-80	
-4		-140	
-10 .11	100	-200 45.62	44

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



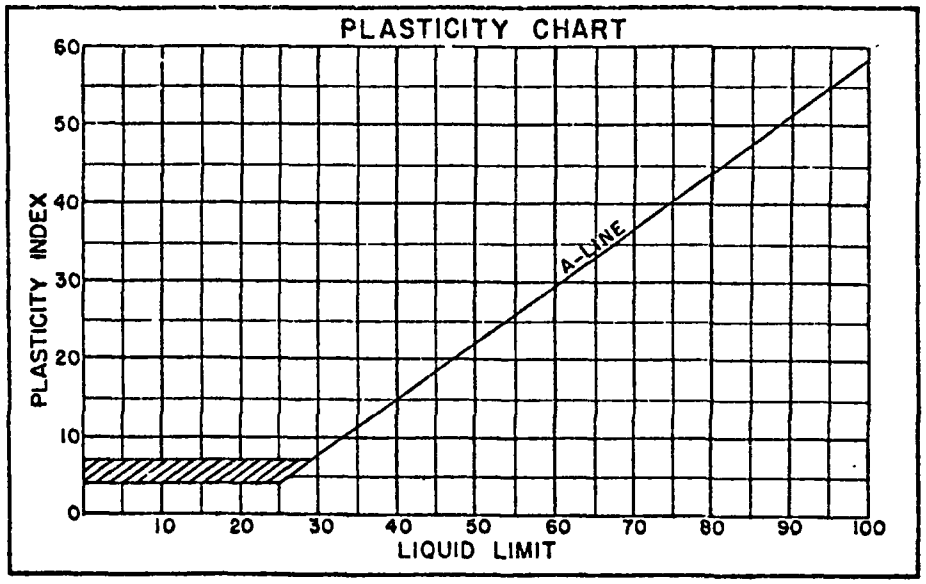
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3962.14 JOB NO. SR101 HOLE NO. J-41
DATE 25 JAN 83 OPERATOR RB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	–	–	
DRIED CAST	–	–	
DILATANCY			
BITE			
TOUGHNESS	–	–	

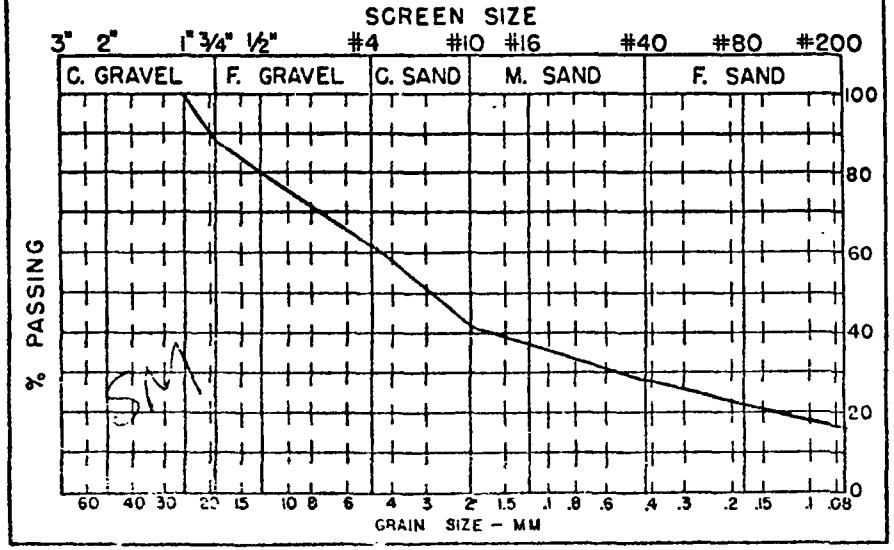
DESCRIPTION: Moist Lt Brown
V sty FC SAND w/ FC gravel
smells of Diesel



H_2O = 10%

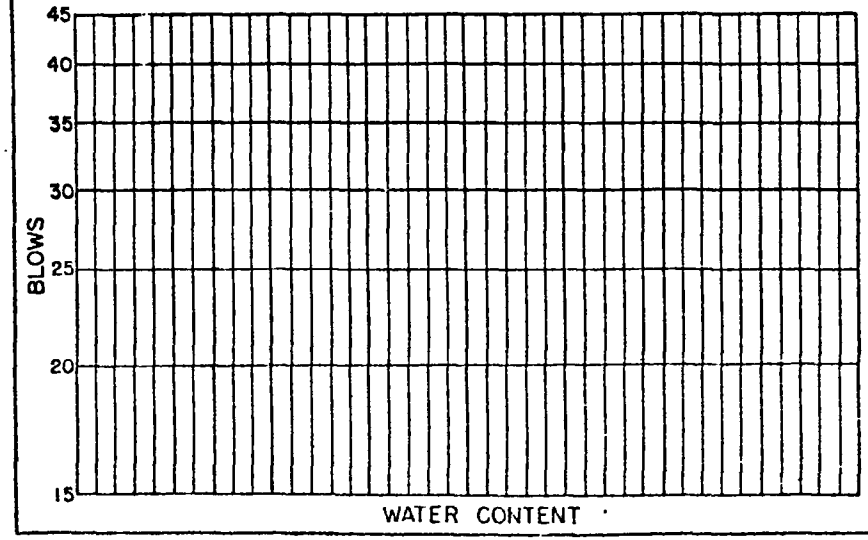
SIEVE ANALYSIS		% Passing			204.83
-1	27.42	100	-40	22.35	27
-3/4	52.83	87	-80		
-4	39.59	61	-140		
-10	29.46	41	-200	33.18	16%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 11-23-82

Dear Sir:

I have forwarded by today's [illegible] the following Foundation Samples.

Contract or Job No. I-7242 Section West Mainline by 1833
SR No. 101A Sub-Section Culvert

Station & Offset 11+33 67' Rt. Hole # T-42

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
E. 3904.8	D-2	2' 4' 0"	109%	PT	Like 3685 Dk. Brn.-Blk., Org., Mossy fibrous Peat w/ silt & clay
3905	U-3	5' 4" 5' 7"	B		
3906	D-4	7' 3" 7' 0"		PT	Same
3907 -1	U-5	10' 10' 4"	A		Green/gray, wet, org. silt with grass.
-2		10' 4" 10' 8"	B		
-3		10' 8" 11' 0"	C		
3908	D-6	12' 14' 0"		PT	Like 3690, Gr. F. Sdy. Peat & Silt Possibly T. Cly. - ?
3909 -1	U-7	15' 15' 4"	A		
-2		15' 4" 15' 8"	B		

1 copy with samples
1 copy to addressee

Yours very truly,

Inspector.

FORM 351-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place .....

Date .....

Dear Sir:

I have forwarded by today's ..... the following Foundation Samples.

Contract or Job No. ..... Section ..... SR No. ..... Sub-Section .....

Station & Offset 1711 + 67 Rt Hole # J-4Z

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3910	D-8	17' [illegible] / 11' 0"		PT	Like 3685 BLK., org., Mossy fibrous PEAT w/ SILT & Clay
3911 -1	U-7	[illegible] / [illegible] +	A		
-2		20' 4" / 20' 6"	B		
-3		20' [illegible] / 21' 0	C		
3912	D-10	[illegible] / 24' 0"	67%	ML	Like 3800 Wet, hly. org. gr. & BLK. SILT & WOOD FIBERS
3913 -1	U-11	[illegible] / 25' 4"	A		
-2		25 + / 25' 8"	B		
3914	D-12	[illegible] / [illegible]	84%	ML	Moist, Brn. F. Sdy. SILT w/ org. PEAT
3915 -1	U-13	30' 8" / [illegible]	C		

1 copy with samples
1 copy to addressee

Yours very truly,

.....
Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place .....

Date .....

Dear Sir:

I have forwarded by today's ..... the following Foundation Samples.

Contract or Job No. L-7262 Section ..... SR No. ..... Sub-Section .....

Station & Offset 171+85 67 Rt. Hole # J-4

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3915-2	U-12	31' 0" 31' 4"	D		
3916	D-14	34' 0" 34' 0"			Like 3914
3917	U-15		L+C I.D. [illegible]		Like 3914
3918	U-15	36' 4"	D		
3919	D-15	44' 0"	60%	ML	Like 3756 Wet, Gr & tan F. Sdy. SILT w/ Layers of organic
3920	U-17	45' 0" 45' 4"	B		
3921	D-20	45' 0" 45' 0"	26%	SM	Like 3697-6 moist, [illegible] yellow & grn. Layers of sty F SAND - Tan, Grn & Gr.

1 copy with samples
1 copy to addressee

Yours very truly,

[illegible]
Inspector

DOT FORM 351-002 REVISED 2/80

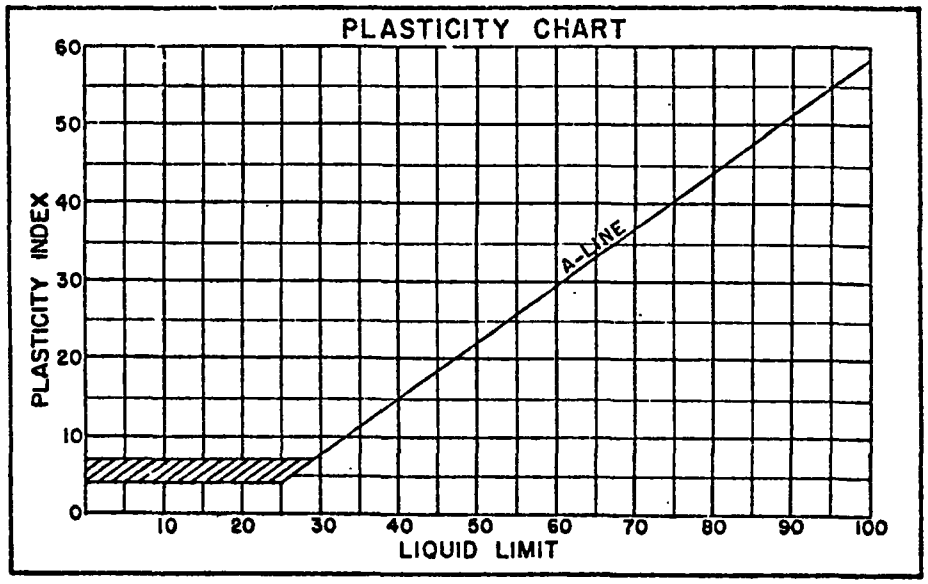
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3914 JOB NO. 4069 HOLE NO. 42
DATE 12-10-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE		✓	
TOUGHNESS	✓	✓	

DESCRIPTION: Moist, BRN. F. Sdy. SILT w/ org. PEAT.

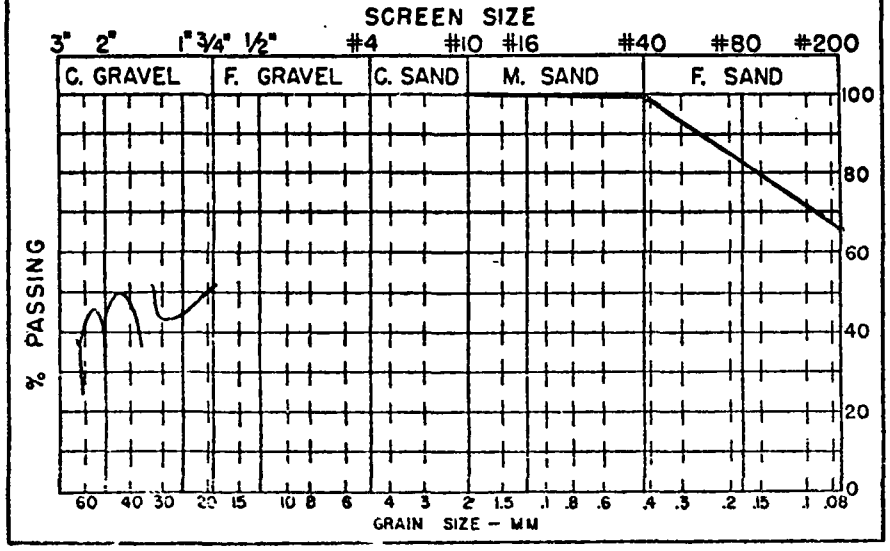


H2O = 84%

SIEVE ANALYSIS % Passing 32.32

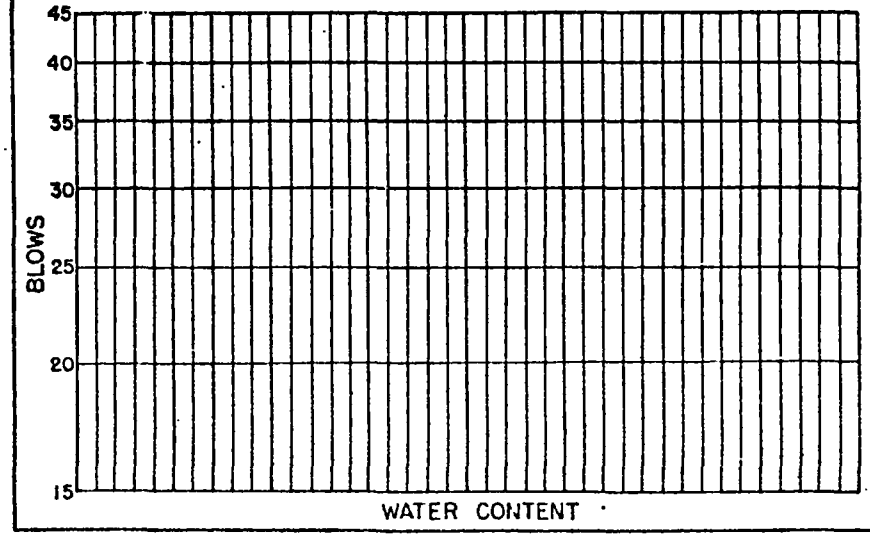
			-40	10.80	99%
-3/4			-80		
-4			-140		
-10	1/0	100	-200	21.42	66%

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

TRIAXIAL COMPRESSION TEST (With Area Changes and Pore Pressures)

Project HOQUIAM Location Sta 171+85 67' Rt
Job No. L7262 Sample No. 3907-1 Boring No. J42 Depth 10'-0 to 10'-4"
Area (Ao) 2.92 Length 4 Confining Pressure 600 PSF = 4.16 PSI
Rate of Loading .085%/Min L. R. C. .325 Tested by R Brooks Date 18 MAR 83

Description

GROSS WT.	TARE	NET WT.	CAN NO.	WET WT.	DRY WT.	WT. H^2O	% H^2O	WET DENS.	DRY DENS.
420	146	274	77	42.89	24.48	18.41	75	90.15	51.5

Data for Mohr's Envelope:
Max. Deviator Stress
Principal Stress
Effective Principal Stress

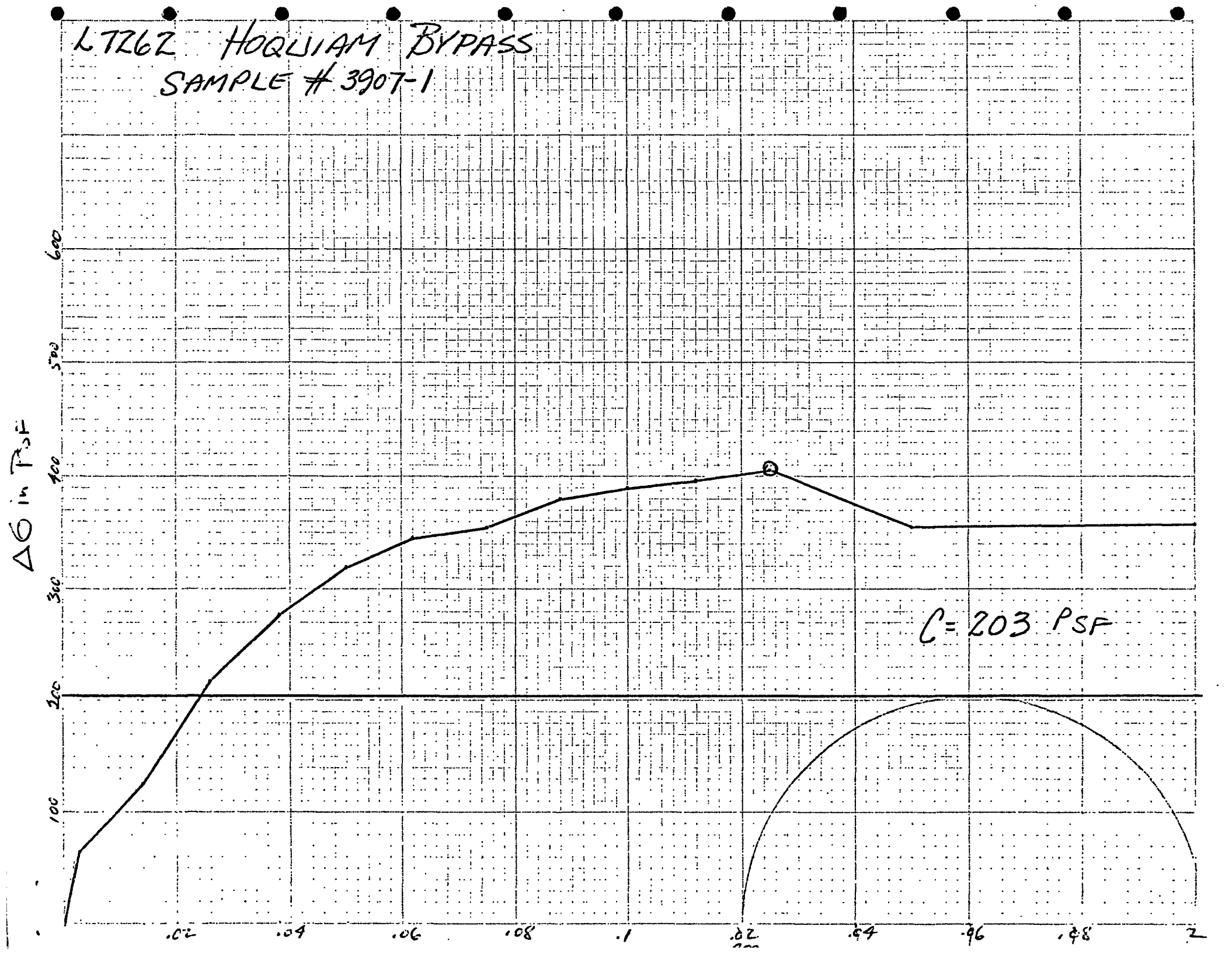
Failure

Back Press.
Saturation 96.7

ELASPED TIME (Hr.) (Min.)	LOAD DIAL READ (X 10^{-4})	DEFORM. DIAL READ	Δ L (COL. 3 x 10^{-3})	E. UNIT STRAIN (ΔL/L)	AREA C.F. (1 − E)	CORRECT. AREA A' ($\frac{A^o}{1-E}$)	PORE PRESS.	DEV. LOAD (Col. 2 X LRC)	DEV. STRESS (Col. 9 ÷ Col. 7)	PRINC. STRESS (Col 10 + conf. press.)
1	2	3	4	5	6	7	8	9	10	11
—0—							3.10			
30 sec	4	012		.003	997	2.93	3.28	1.3	63.9	
2	8	057		.014	986	2.96	3.34	2.6	126.5	
3.5	14	103		.026	974	3.00	3.60	4.55	218.4	
5	18	150		.038	962	3.04	3.72	5.85	277.1	
6.75	21	200		.05	95	3.07	4.16	6.825	320.1	
8.25	23	250		.062	938	3.11	3.95	7.48	346.3	
10	24	300		.075	925	3.16	3.75	7.8	355.4	
11.75	26	350		.088	912	3.2	3.86	8.45	380.2	
13.25	27	400		.1	9	3.24	3.73	8.78	390.2	
15	28	450		.112	888	3.29	3.84	9.1	398.3	
16.5	29	500		.125	875	3.34	3.99	9.42	406.1	
20	26	600		.15	85	3.44	3.76	8.45	353.7	
26.5	28	800		.2	8	3.65	4.24	9.1	359.0	

DOT FORM 351-018 REVISED 4/80

LTZ6Z HOQUIAM BYPASS
SAMPLE # 3907-1



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

TRIAX

SAMPLE NO. 3907-1 JOB NO. HOQ HOLE NO.

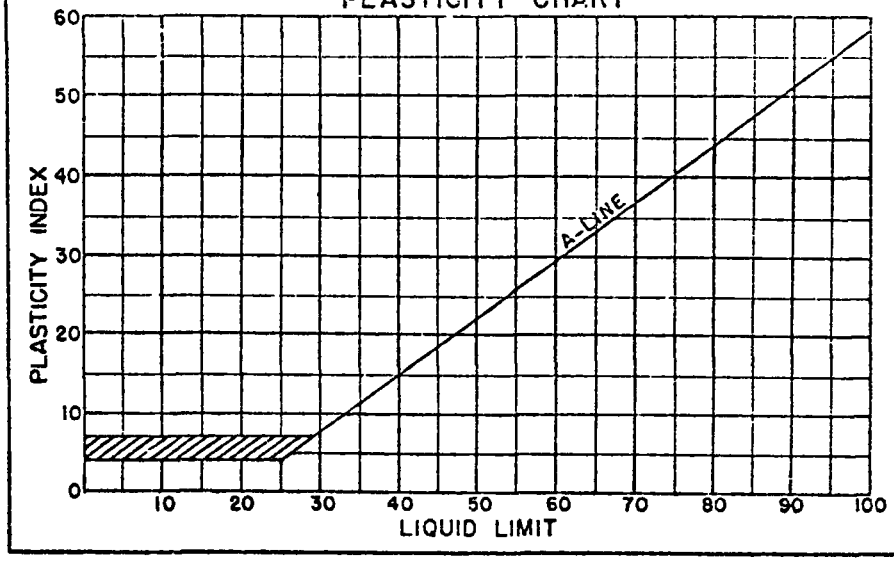
DATE 30 MAR 83 OPERATOR RB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL		✓	
DRIED CAST		✓	
DILATANCY		✓	
BITE			
TOUGHNESS		✓	

DESCRIPTION: Wet green/grey org SILT w/ grasses in it

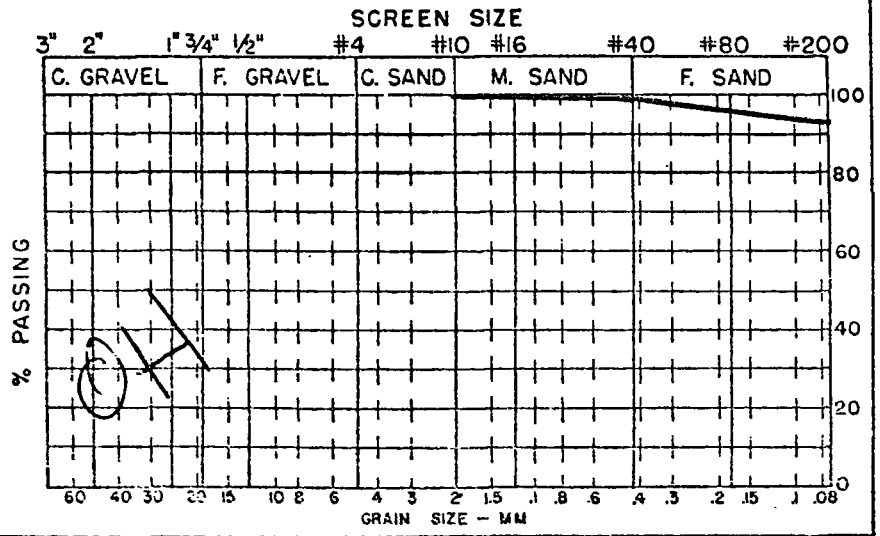
PLASTICITY CHART



$H_2O = 75$

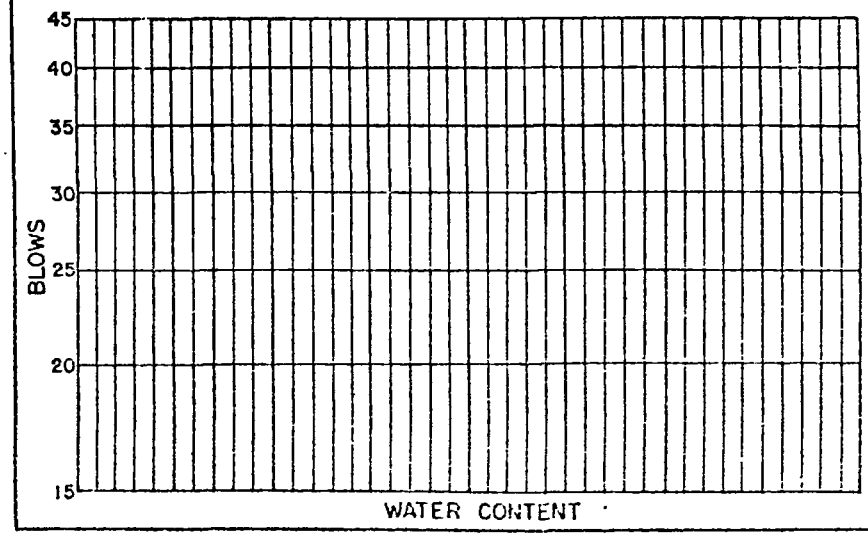
SIEVE ANALYSIS	% Passing 142.41		
		-40 8.92	99
-3/4		-80	
-4		-140	
-10 1.05	100	-200 132.44	93

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater

Date 11-24-82

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section West Hoquiam Bridge Less
SR No. 101A Sub-Section Culvert

Station & Offset 101+70 67' Lt

Hole # J-43

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
E-3922	D-1	0' 0" / 2' 2"	70%	ML	SILT, GR. w/Rust Streaks, F. Sdy., Cly.
					GR. SILT w/Layers of BLK. PTY. SILT.
3923-1	U-2	2' 4" / 2' 9"	B	OH	M, gray, cly. F-Sdy silt w/org. stems
-2		2' 9" / 3' 0"	C		
-3		3' 0" / 3' 4"	D		
~~3924~~ -4	U-3	5' 0" / 5' 4"	A	OH	wet, green, org. SILT w/grasses
-5		5' 4" / 5' 8"	B		
-6		5' 8" / 6' 2"	C		
3924	D-4	7' 0" / 1' 0"	71%	ML	Like 3764-2 GR & Tan hly. organic
					Layers of SILT & F. SAND
3925	U-5	1' 4" / 1' 8"	B		

1 copy with samples
1 copy to addressee

Yours very truly,

Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place .....

Date .....

Dear Sir:

I have forwarded by today's ..... the following Foundation Samples.

Contract or Job No. L-7262 Section ..... SR No. ..... Sub-Section SULSIT

Station & Offset ..... Hole # J-43

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3926 -1	D-6	11' 0" 13' 0"	109%	PT	Like 3685 DK. Brn., org. sticks & stems fibrous PEAT w/ SILT & Clay.
-2	D-8	16' 0" 18' 0"	267%	SM	Like 3924 w/ Lg. wood fibers & chips Moist, Gr. w/org. cont. v. sty. F-C SAND w/ F. S.R. Gravel
-3	D-10	21' 6" 23' 6"		SM	Same w/ Slickensides Clumps, fresh grn. Leaf, Stems & Roots
3927 -1	U-11	24' 0" 24' 4"	A		
-2		24' 4" 24' 8"	B		
-3		24' 8" 25' 0"	C		
3928 -1	D-12	26' 0" 28' 0"	35%	ML	Like 3890-24 Wet, dk. Gr. & Grn. F. Sdy. SILT w/ T. MICA
-2	D-13	29' 0" 30' 6"	22%	ML	Moist, Gr. & yellow Layered colors of F. Sdy. SILT w/ T. MICA.
-3	D-14	34' 0" 35' 0"		ML	Same

1 copy with samples
1 copy to addressee

Yours very truly,

.....
Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place .....

Date .....

Dear Sir:

I have forwarded by today's ..... the following Foundation Samples.

Contract or Job No. L-7262 Section ..... SR No. ..... Sub-Section .....

Station & Offset _____ Hole # J-43

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3928-4	D-15	37'0" 40'0"	22%	ML	Like 3928-3 Moist, Gr & yellow Layered colors of F. Sdy. Silt w/T. Mica

1 copy with samples
1 copy to addressee

Yours very truly,

Inspector.

DOT FORM 351-002 REVISED 2/80

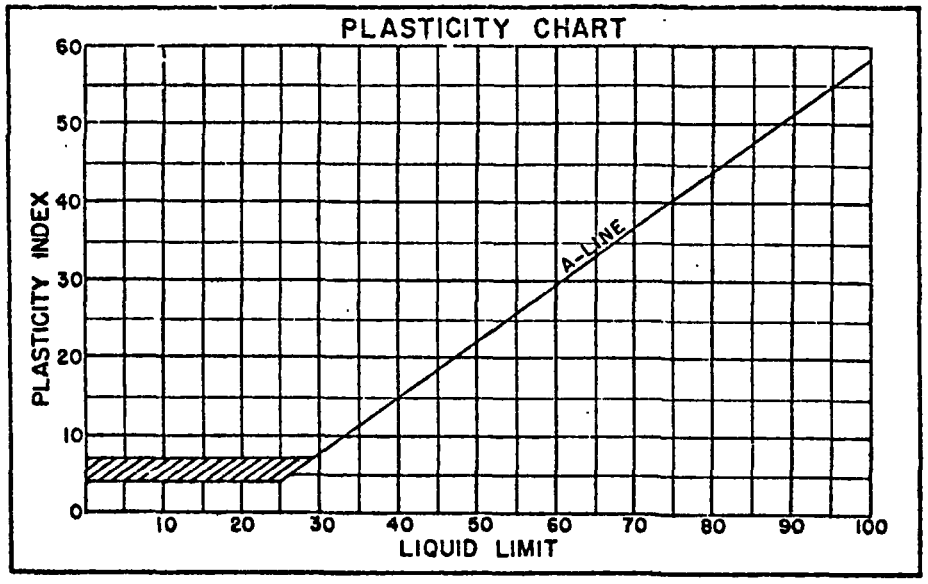
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3922 JOB NO. Alog HOLE NO. J-43
DATE 12-8-82 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

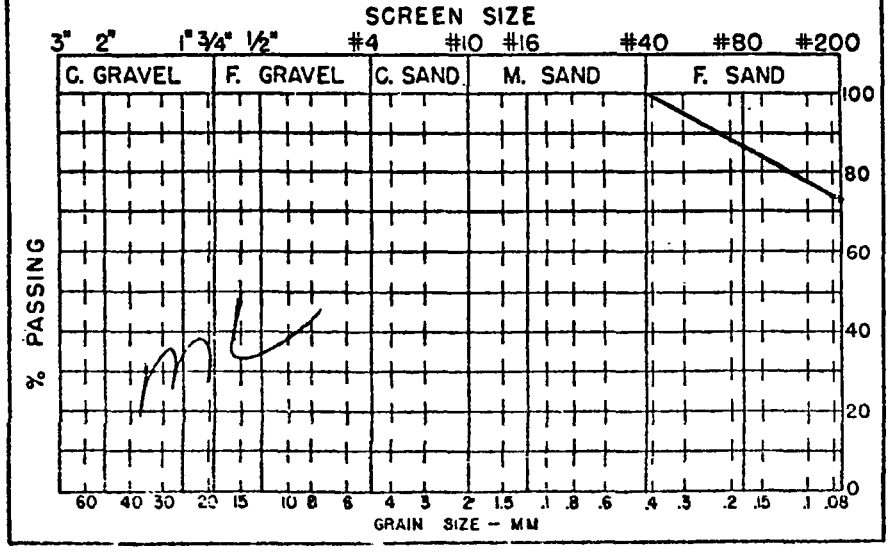
DESCRIPTION: SAT. GR W/ Rust stns. F. Sdy. Cly. gr. Silt w/ Layers of Blk. darker PTY. Silt.



H_2O = 70 %

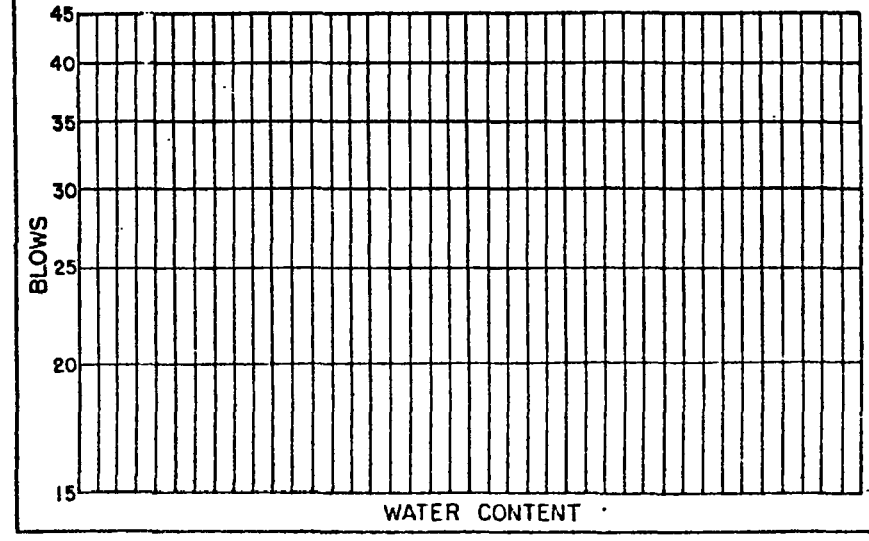
SIEVE ANALYSIS	% Passing 50.00	
	-40 13.45	100
-3/4	-80	
-4	-140	
-10	-200 36.55	73

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

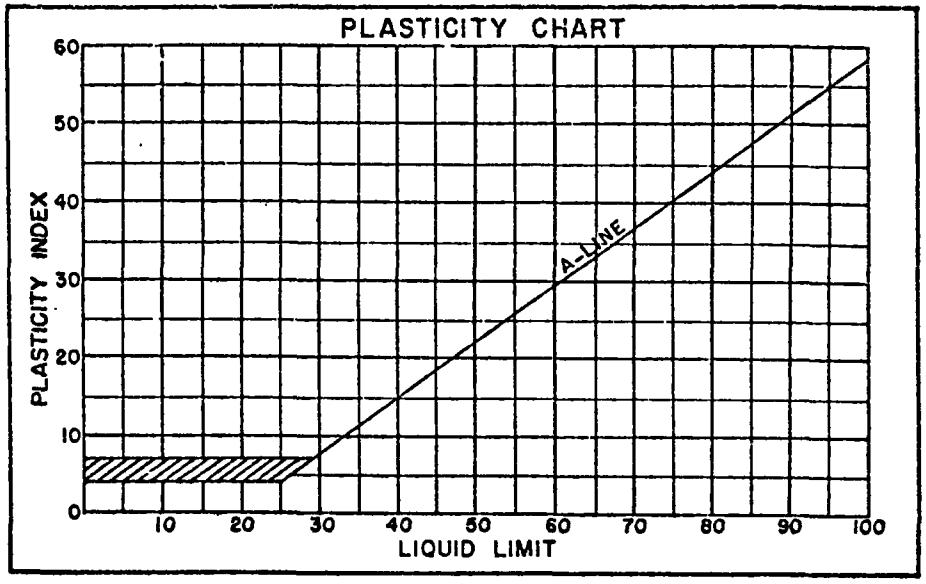
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3928-2 JOB NO. Hog HOLE NO. 3-43
DATE 12-7-82 OPERATOR GB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE	✓	✓	
TOUGHNESS	✓	✓	

DESCRIPTION: Moist, Gr & yellow Layered colors of F. Sdy. Silt w/T. of Mica.

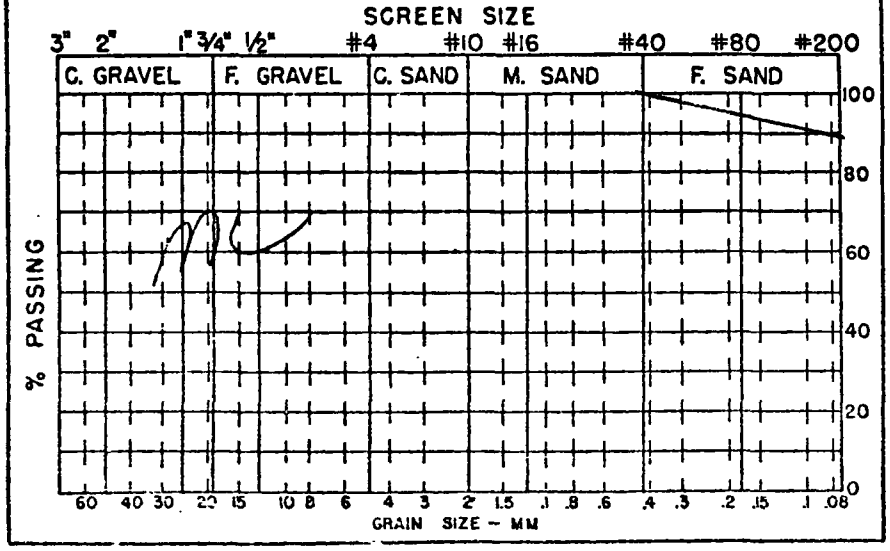


H_2O: 22 %

SIEVE ANALYSIS % Passing 53.28

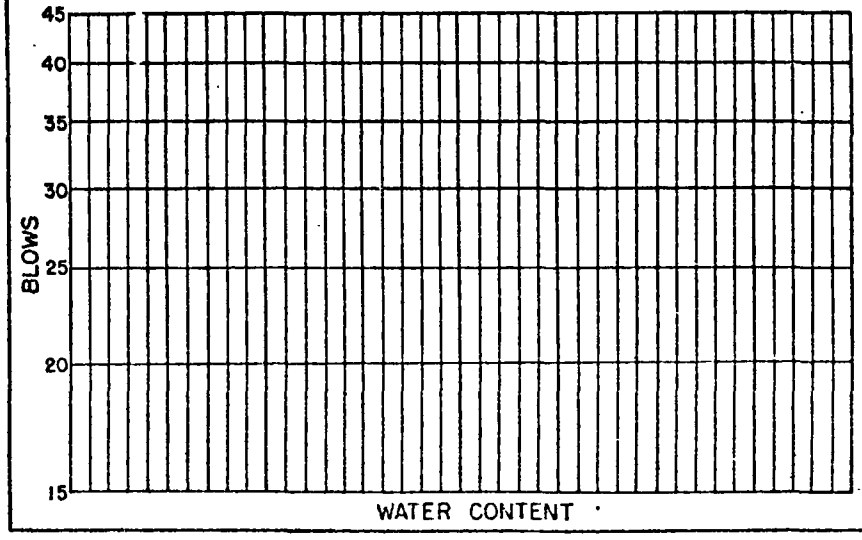
	-40	6.00	100
-3/4	-80		
-4	-140		
-10	-200	47.28	89

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

TRIAXIAL COMPRESSION TEST (With Area Changes and Pore Pressures)

Project HOQUIAM Location CULVERT Sta 169+80 67' LT
Job No. L7262 Sample No. 3923-4 Boring No. J-43 Depth 5'-0" to 5'-4"
Area (Ao) 2.92 Length 4 Confining Pressure 400 PSF = 2.8 PSI
Rate of Loading .085%/Min L. R. C. .325 UW Tested by R Brooks Date 21 MAR 83

Description

GROSS WT.	TARE	NET WT.	CAN NO.	WET WT.	DRY WT.	WT. H^2O	% H^2O	WET DENS.	DRY DENS.
400	143	257	66	44.73	20.12	24.61	122	84.55	38.07

Data for Mohr's Envelope:
Max. Deviator Stress
Principal Stress
Effective Principal Stress

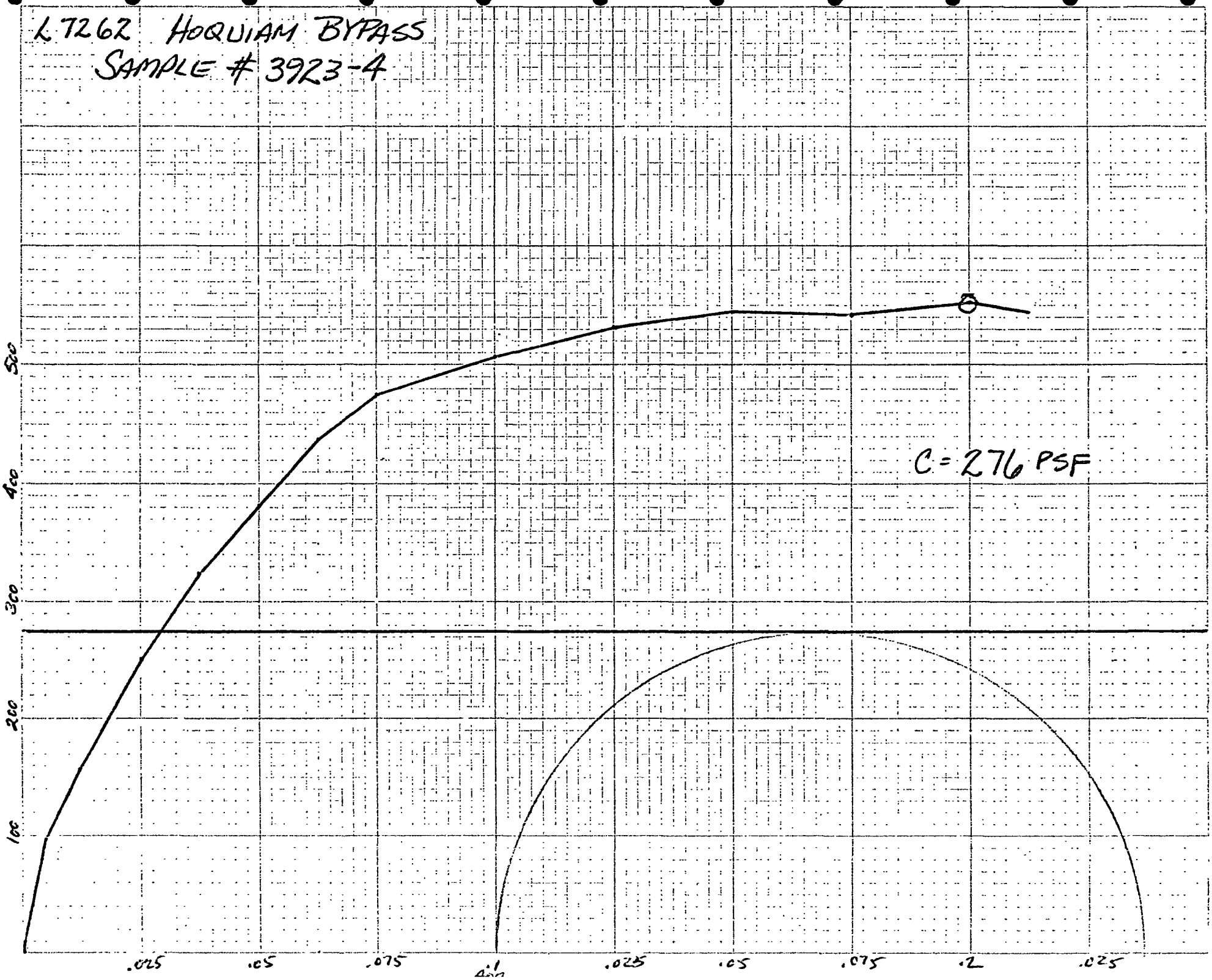
Failure

Back Press.
Saturation 94

ELASPED TIME (Hr.) (Min.)	LOAD DIAL READ (X 10^{-4})	DEFORM. DIAL READ	Δ L (COL. 3 x 10^{-3})	E. UNIT STRAIN ($\Delta L/L$)	AREA C.F. (1 − E)	CORRECT. AREA A' ($\frac{A^o}{1-E}$)	PORE PRESS.	DEV. LOAD (Col. 2 X LRC)	DEV. STRESS (Col. 9 ÷ Col. 7)	PRINC. STRESS (Col 10 + conf. press.)
1	2	3	4	5	6	7	8	9	PSF 10	11
30 sec	6	020		.005	995	2.93	1.66	1.95	95.8	
1.5	10	049		.012	988	2.96	1.70	3.25	158.1	
3.25	16	100		.025	975	2.99	1.75	5.2	250.4	
5	21	150		.038	962	3.04	1.78	6.82	323.0	
6.5	25	200		.05	950	3.07	1.92	8.12	380.9	
8.25	29	250		.062	938	3.11	1.74	9.42	436.2	
10	32	300		.075	925	3.16	1.64	10.4	473.9	
13	35	400		.1	900	3.24	1.95	11.38	505.8	
16.5	38	500		.125	875	3.34	2.30	12.35	532.5	
19.75	40	600		.15	850	3.44	2.24	13.0	544.2	
23	41	700		.175	825	3.54	2.12	13.32	541.8	
26.25	43	800		.2	800	3.65	2.02	13.98	551.5	
28	43	850		.212	788	3.71	2.02	13.98	542.6	

DOT FORM 351-018 REVISED 4/80

L7262 HOQUIAM BYPASS
SAMPLE # 3923-4



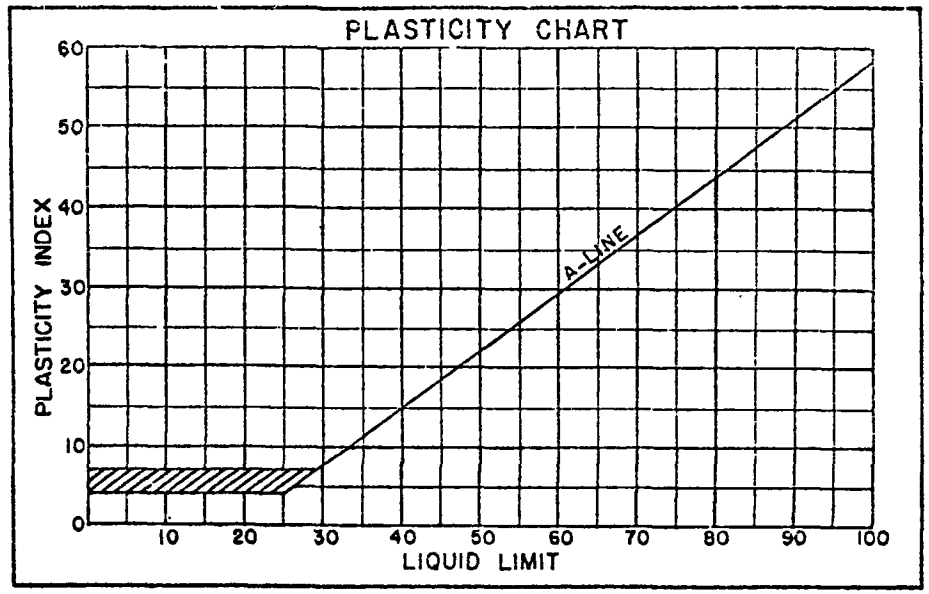
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3023-4 JOB NO. HOQ HOLE NO. TRIAY
DATE 30 Mar 83 OPERATOR RB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL		✓	
DRIED CAST		✓	
DILATANCY		✓	
BITE			
TOUGHNESS		✓	

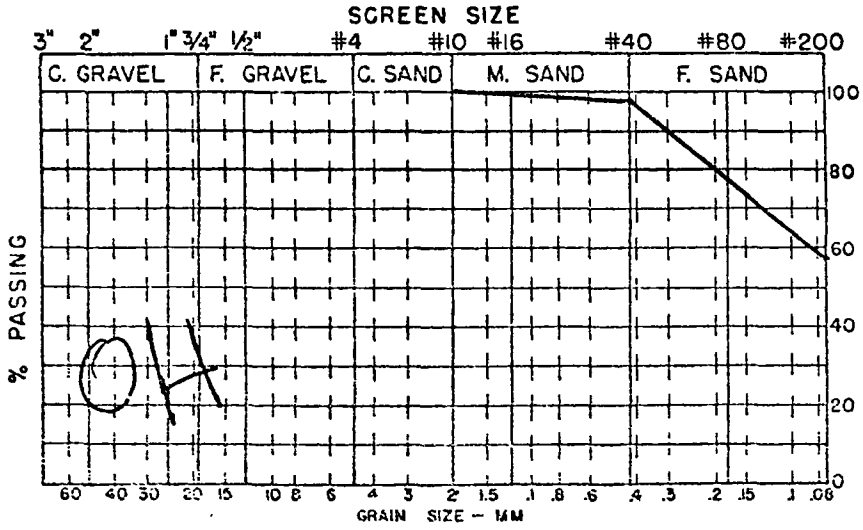
DESCRIPTION: Wet green org SILT w/grasses



H_2O = 122

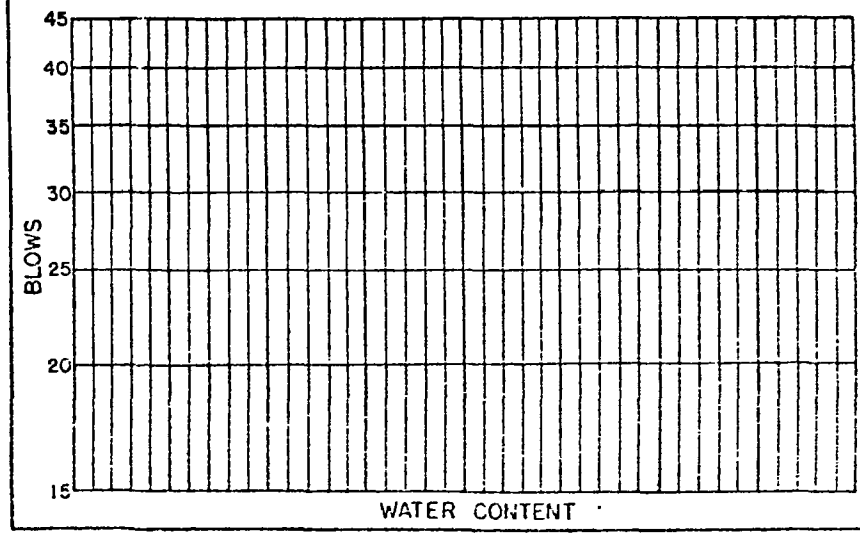
SIEVE ANALYSIS	% Passing 118.54		
		-40 48.31	98
-3/4		-80	
-4		-140	
-10 2.78	100	-200 67.55	57

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-016 REVISED 5/81

CONSOLIDATION TEST DATA

Date 3-4-83 Sample No. 3923-1

Job No. L-7262 Section Hoquiam By Pass

Depth 2'4" – 2'8" Station 169+80 Hole No. J-43

Material Moist, Gr. Inside w/ rust color out (aft. Dry = tan) Cly., F. Sdy. Silt w/ org. Stems

GROSS WEIGHT	TARE	NET WEIGHT	CAN NUMBER	WET WEIGHT	DRY WEIGHT	WEIGHT H^2O	PERCENT H^2O	WET DENSITY	DRY DENSITY
431	156	275	69	43.32	22.70	20.62	91.0	90	47.1
		CONSOL	25	36.95	22.92	14.03	61.0		

Sample Height = 4"

hs = Wt. Dry Soil / K

eo = hvo/hs

hvo = 0.6250 – hs

K = 47.24 X sp. G

Hvf=hvo – Defl.

ef = hvf/hs

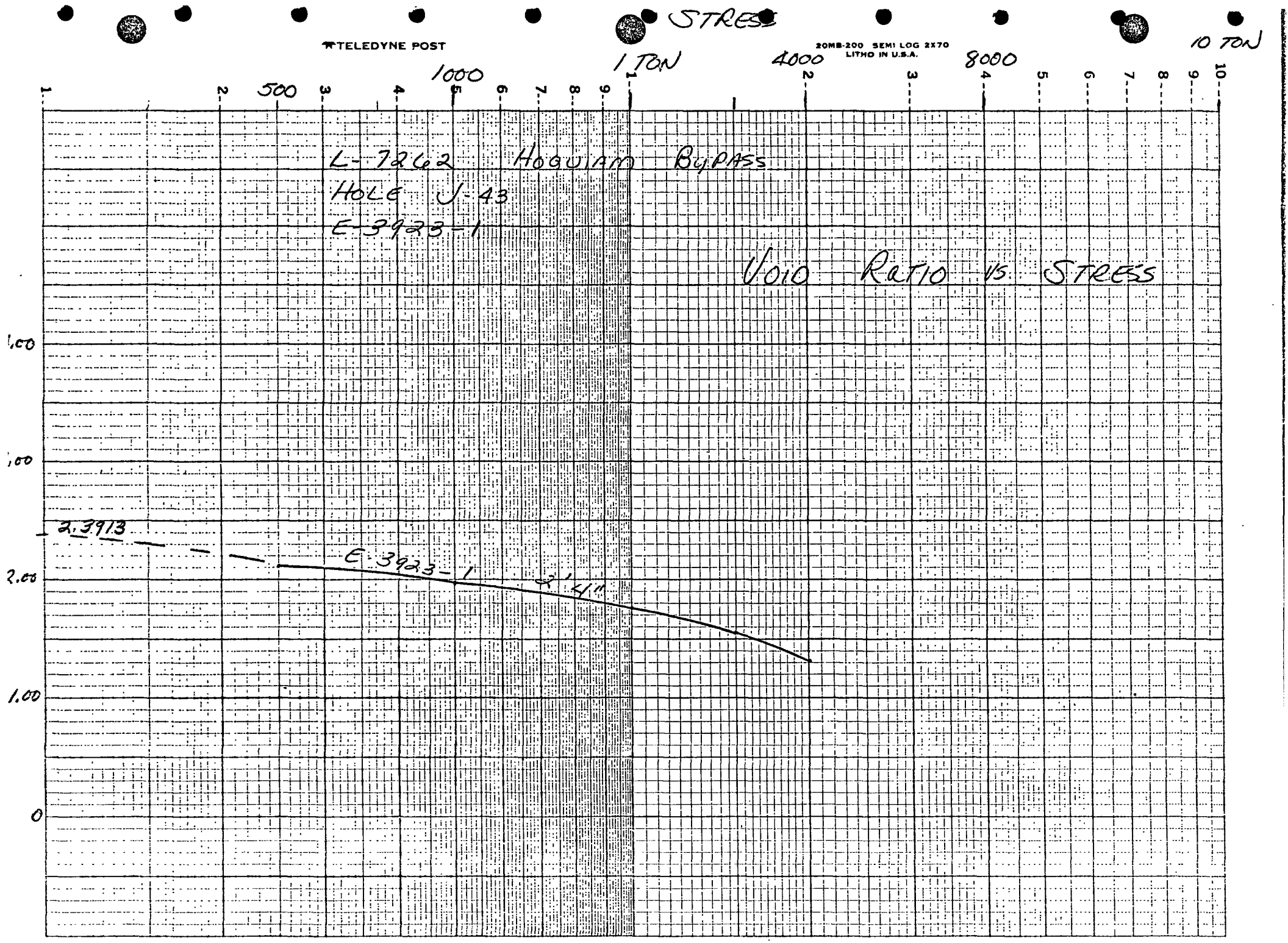
Dial "0" Dial - made correction

TIME	500 lbs/sq ft DIAL	%	1000 lbs/sq ft DIAL	%	2000 lbs/sq ft DIAL	%	4000 lbs/sq ft DIAL	%	8000 lbs/sq ft DIAL	%
0										
1/4	160	22	20	11	36	9	28	7	59	13
1/2	175	35	40	15	47	12	48	12	75	17
1	198	40	49	18	64	17	56	14	95	21
2 1/4	227	45	67	25	90	24	76	20	134	30
4	256	51	83	31	116	31	109	29	169	38
9	310	62	111	41	172	45	144	37	225	51
16	364	73	139	52	219	58	201	52	258	58
25	408	81	158	59	259	69	256	66	294	66
36	438	87	186	69	280	74	287	74	365	82
49	451	90	191	71	293	77	307	79	376	85
64	461	92	218	81	303	80	323	83	399	90
2 hrs	475	95	235	87	338	89	338	87	391	91
3	478	95	242	90	348	92	357	92	401	91
4	482	96	246	91	353	93	360	93	405	91
5	482	96	250	93	357	94	365	94	407	92
6	489	98	252	94	360	95	369	95	41	
24	501	100	269	100	379	100	389	100	443	100
72										
hvo=	.4407		.3906		.3637		.3258		.2869	
hvf=	.3906		.3637		.3258		.2869		.2426	
ef=	2.1194		1.9734		1.7678		1.5567		1.3163	

Sp. Gr.	2.6328
K	124.3735
	0.6250
hs	.1843
hvo	.4407
eo	2.3913

Total Defl. 0.1981

Operator Bev Machine No. 3


STRESS
TELEDYNE POST
20MB-200 SEMI LOG 2X70
LITHO IN U.S.A.
10 TON
1 TON
1000
500
4000
8000
L-7262 HOGUIAM BYPASS
HOLE J-43
E-3923-1
VOID RATIO VS STRESS
1.00
2.3913
E-3923-1
2.00
1.00
0

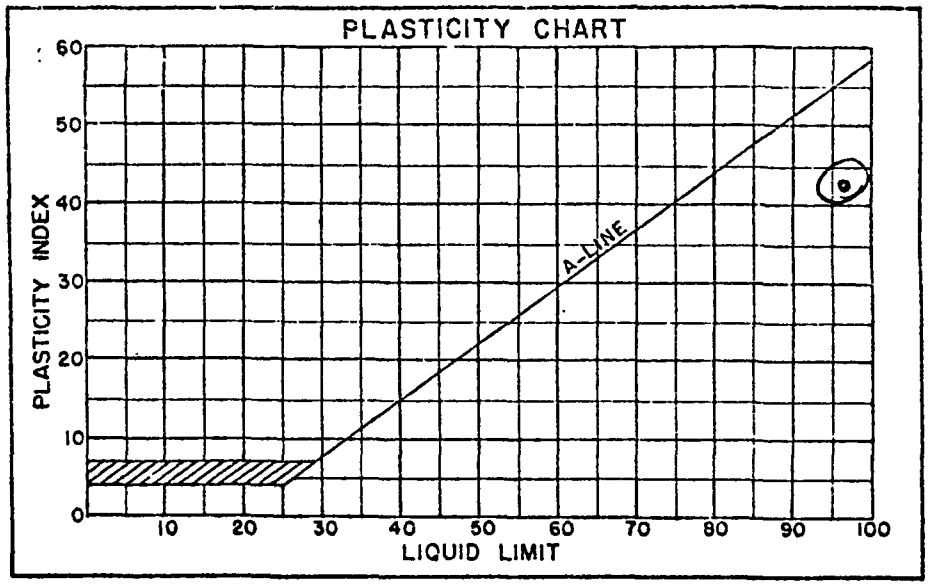
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3923-1 JOB NO. Hog Canal HOLE NO.
DATE 3-4-83 OPERATOR GB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	✓
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

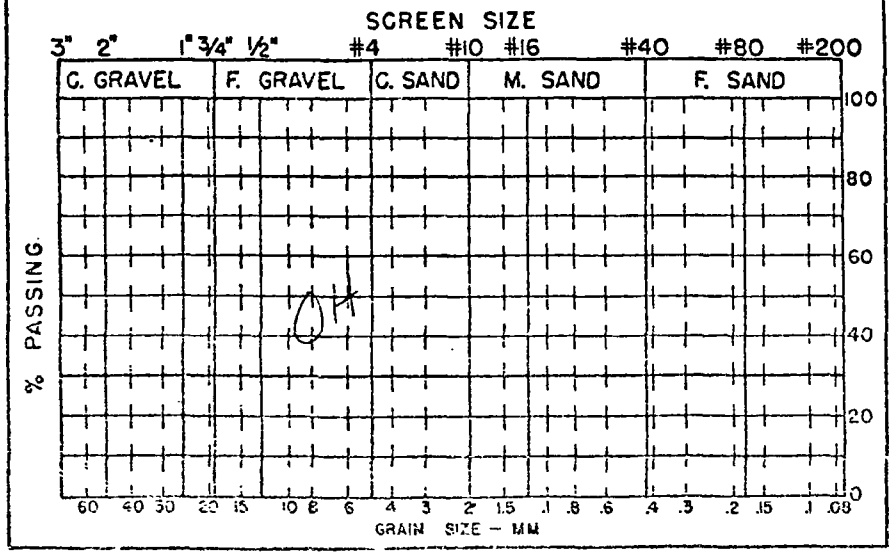
DESCRIPTION: Moist, Gr. Inside, Rust color out
(aft. Dry = Tan) Cly, F. Sdy. Silt
w/org. Stems



SIEVE ANALYSIS % Passing

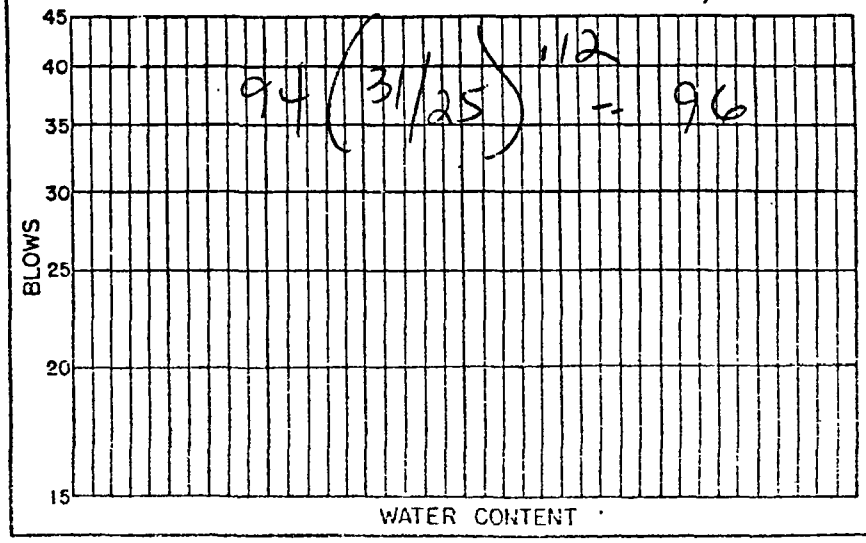
	-40
-3/4	-80
-4	-140
-10	-200

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	36				40
Wet Wt.	10.44				4.08
Dry Wt.	5.22				2.67
% H_2O	94%				PL= 53
Blows	31				PI= 43



WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

ATERIALS ENGINEER
aterials Laboratory
O. Box 167, Olympia, WA 98504 (Mailing Address)
55 So. 2nd Ave.
mwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 11-30-82

Dear Sir:

I have forwarded by today's State Car the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam bypass SR No. 101A Sub-Section Culvert

Station & Offset 170+20 56' Rt. Hole # J-44

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3938	D-1	0' 0" 2' 0"	H_2O=72%	SM	~~##~~ Wet, tan outside/Gr. Inside, V. Sty. F. SAND w/org. mtr. & trace of clay.
3939 -1	U-2	2' 0" 2' 4"	A		
-2		2' 4" 2' 8"	B		
3940 -1	D-6	12' 0" 14' 0"	H_2O=96%	ML	Moist, Grn./Gr. F. Sdy. SILT w/ Traces of M-C Sand & F. Gravel
-2	D-8	17' 0" 19' 0"	50%	ML	SAT., Gr. F. Sdy. SILT w/ traces of F. Gravel
3941 -1	U-9	20' 0" 20' 4"	A		
-2		20' 4" 20' 8"	B		
-3		20' 8" 21' 0"	C		
-4		21' 0" 21' 4"	D		

opy with samples
opy to addressee

Yours very truly,
Milford Sanders
Inspector.

FORM 351-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

'ATERIALS ENGINEER
aterials Laboratory
. O. Box 167, Olympia, WA 98504 (Mailing Address)
55 So. 2nd Ave.
umwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 11-30-82

Dear Sir:

I have forwarded by today's State Car the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam bypass SR No. 101A Sub-Section culvert

Station & Offset 170+20 56' Rt Hole # J-44

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3942	D-10	22' 0" 24' 0"	N.T. delivered.		
3943 -1	U-11	25' 0" 25' 4"	A		
-2		25' 4" 25' 8"	B		
-3		25' 8" 26' 0"	C		
-4		26' 0" 26' 4"	D		
3944 -1	D-12	27' 0" 29' 0"	Hw=41%	ML	Wet, gr. F. Sdy. SILT w/T. org.
-2	D-13	30' 0" 32' 0"	26%	SM	Moist, Gr., V. Sty. F-m SAND w/t. crs. Sand & f. grav.
-3	D-14	35' 0" 36' 6"	"	ML	Moist, Gr. F. Sdy. SILT
-4	D-15	40' 0" 41' 6"	24%	ML	Moist, Gr. F. Sdy. SILT

opy with samples
opy to addressee

Yours very truly,
Milford Lambert
Inspector.

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

ATERIALS ENGINEER
aterials Laboratory
O. Box 167, Olympia, WA 98504 (Mailing Address)
55 So. 2nd Ave.
mwater, Washington 98504 (Shipping Address)

Place Tumwater

Date 11-30-82

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam bypass SR No. 101A Sub-Section culvert

Station & Offset 170+20 56' RT Hole # J-44

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3944-5	D-16	45'0" 45'11"	2/90	ML	Like 3944-4 Moist, Gr. F. Sdy. Silt

opy with samples
opy to addressee

Yours very truly,

Milford Landes
Inspector.

FORM 351-002

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3938 JOB NO. SR 101 HOLE NO. J-44
DATE 1 FEB 83 OPERATOR RB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	–	–	
DRIED CAST	–	–	
DILATANCY			
BITE			
TOUGHNESS	–	–	

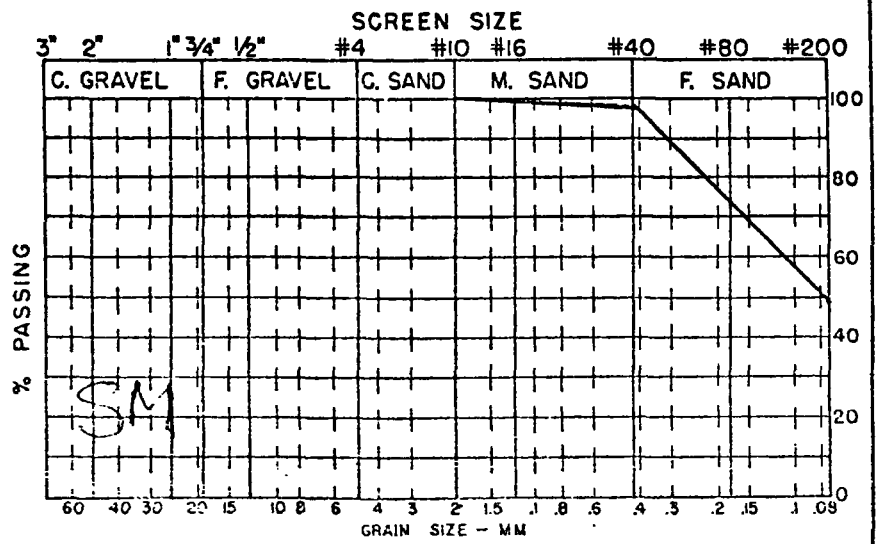
DESCRIPTION: ~~Moist~~ Wet Tan outside/Grey inside
V sty F SAND w/ org mtr & traces clay

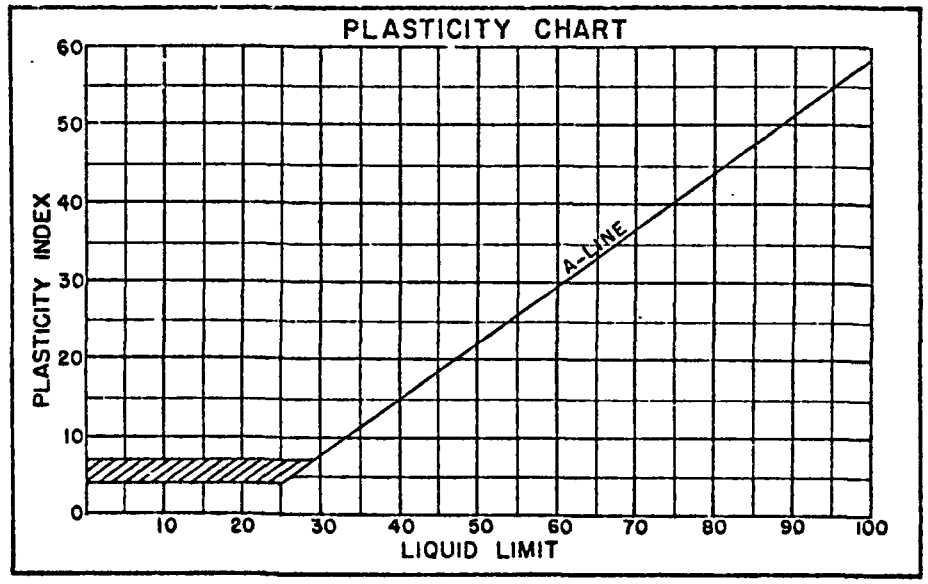
H_2O = 72 %

SIEVE ANALYSIS % Passing 82.28

		-40 40.24	99
-3/4		-80	
-4		-140	
-10 1.09	100	-200 40.95	49%

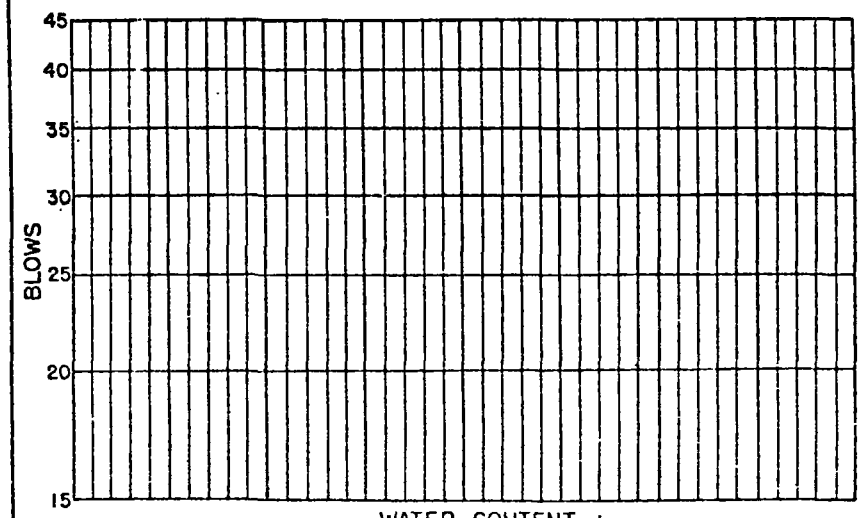
GRAIN SIZE CURVE





LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

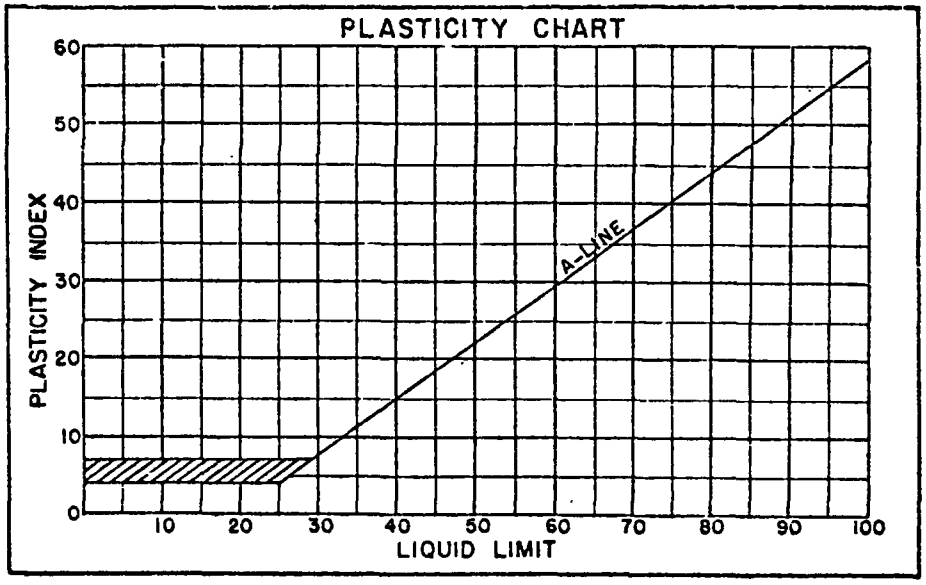
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3940-1 JOB NO. 5R101 HOLE NO. J-44
DATE 25 JAN 83 OPERATOR RB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Moist Grn Grey F sdy SILT w/traces of F gravel & M-C Sand.

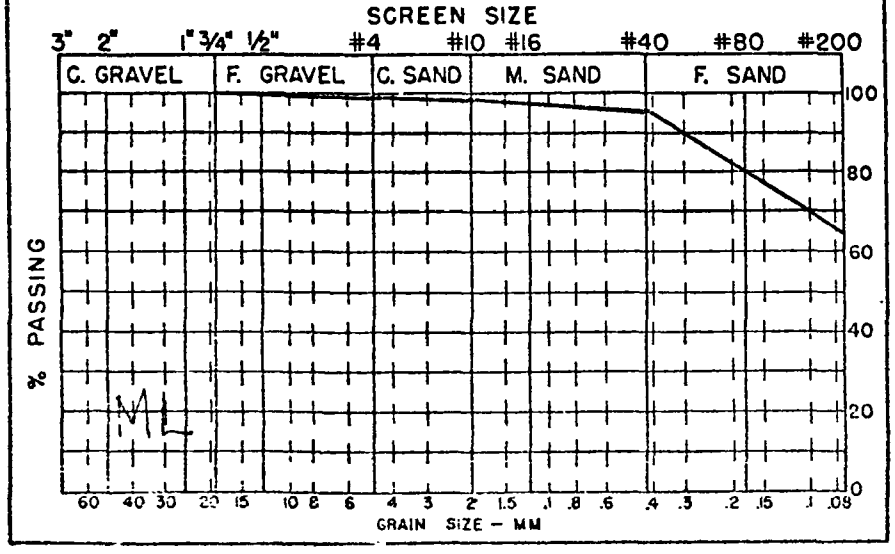


H_2O = 96%

SIEVE ANALYSIS % Passing 145.85

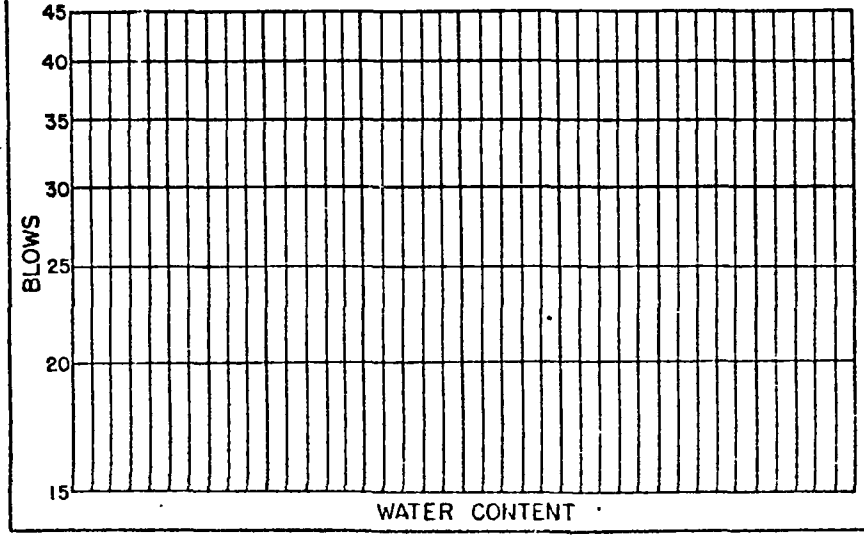
			-40	47.93	96%
-¾	1.03	100	-80		
-4	.53	99	-140		
-10	3.0	98	-200	93.36	64%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



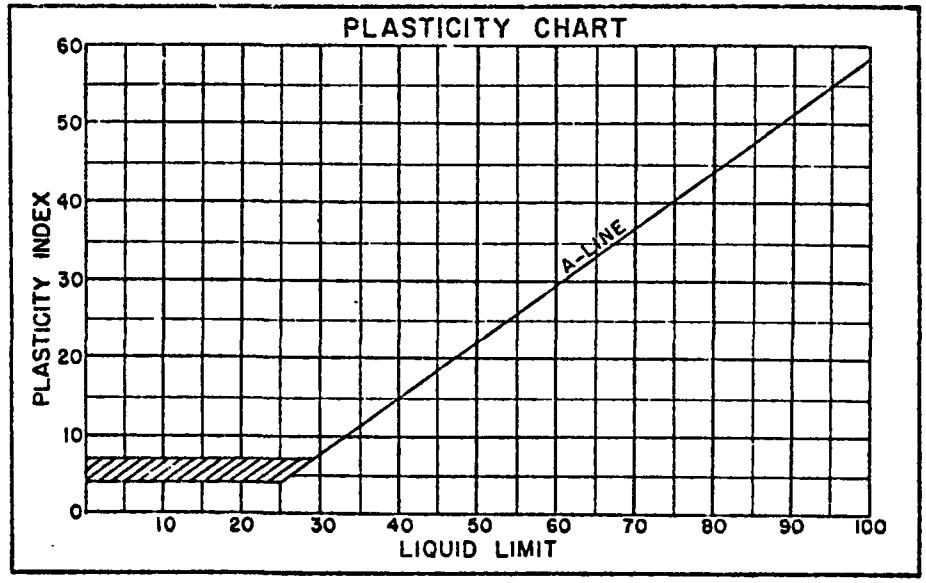
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3940-2 JOB NO. SR101 HOLE NO. Jd4
DATE 24 JAN 83 OPERATOR RB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: SATURATED Gry F sdy SILT w/ traces of F gravel

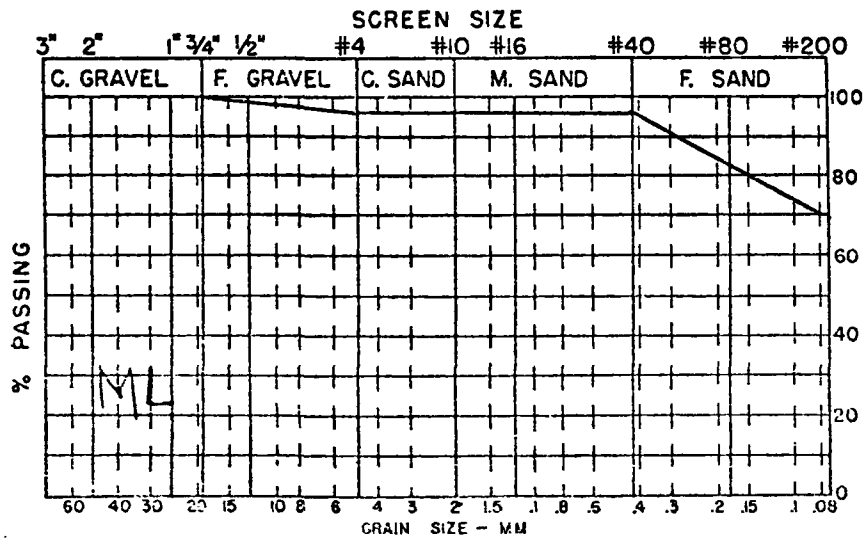


H_2O = 50%

SIEVE ANALYSIS % Passing 117.2

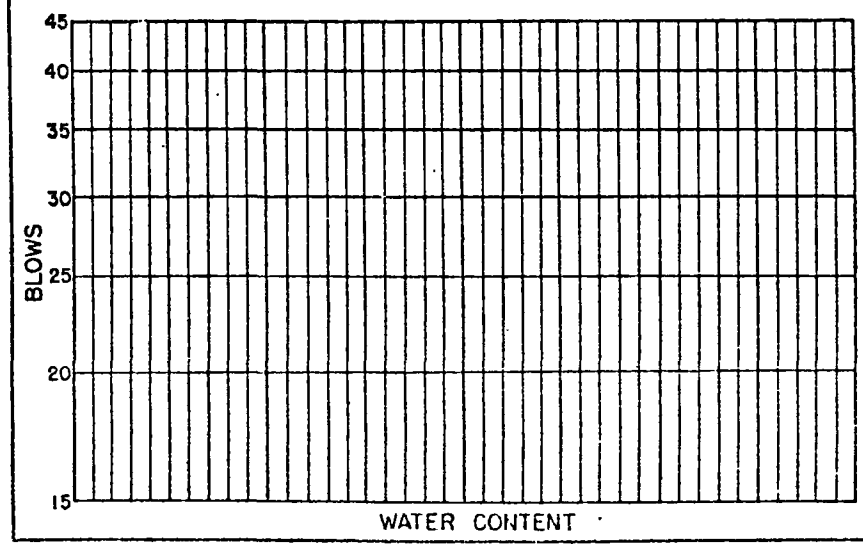
			-40	31.32	96%
-3/4	4.68	100%	-80		
-4			-140		
-10	0.16	96	-200	81.04	69 %

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



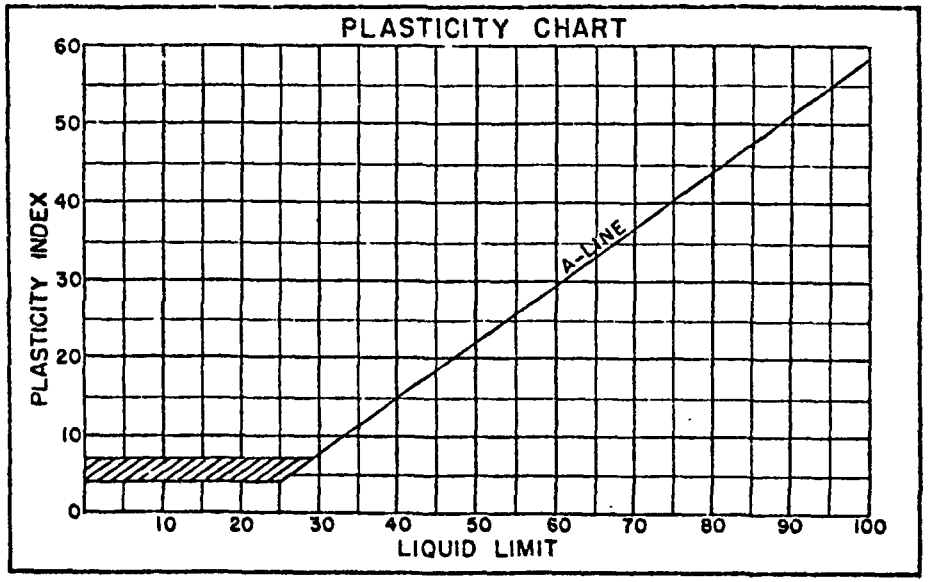
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3944-1 JOB NO. 82101 HOLE NO. J-44
DATE 1 FEB 83 OPERATOR RB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	–	✓	
DRIED CAST	–	✓	
DILATANCY			
BITE			
TOUGHNESS wet	✓	–	

DESCRIPTION: Moist grey
F Sdy SILT w/org mtr ~~Sgm~~

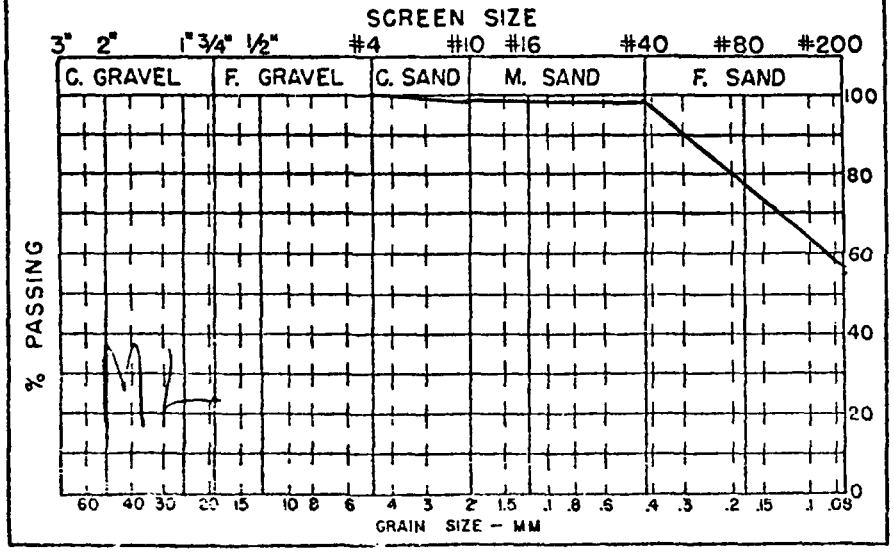


$H_2O = 41\%$

SIEVE ANALYSIS % Passing 137.28

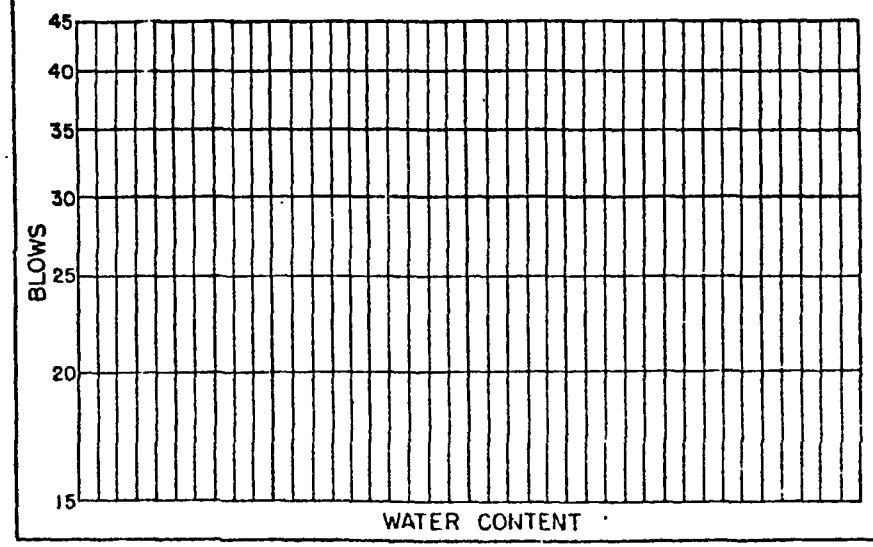
			-40	56.6	98
-3/4			-80		
-4	.02	100	-140		
-10	1.81	99	-200	78.85	57

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

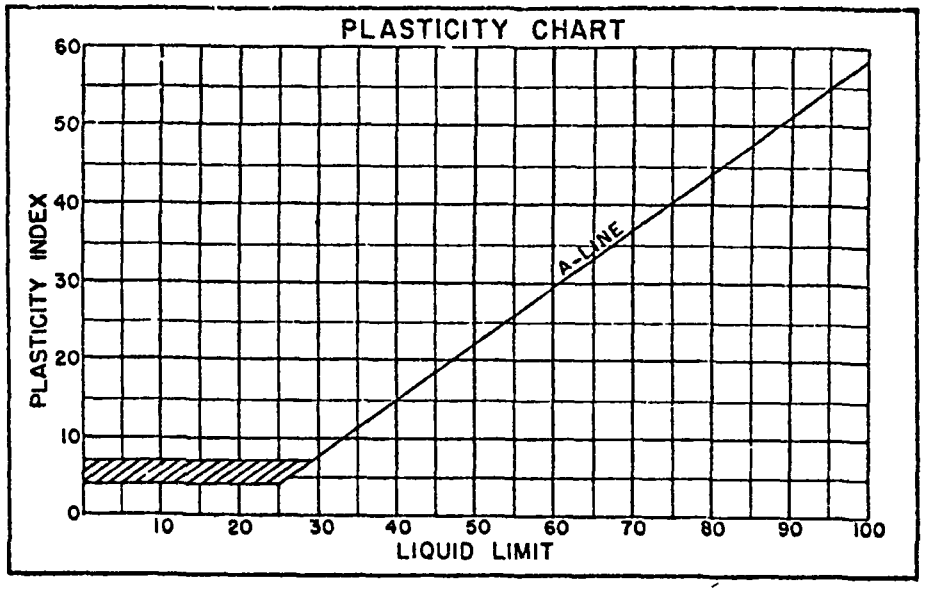
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3944-2 JOB NO. SR101 HOLE NO. J-44
DATE 25 JAN 83 OPERATOR RB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Moist grey
V sty Fi SAND w/Traces of F gravel

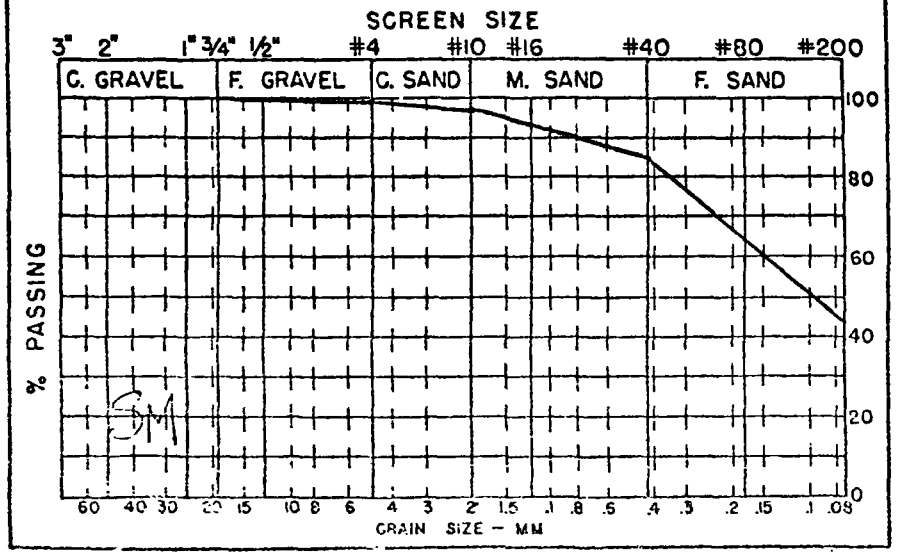


H_2O = 26%

SIEVE ANALYSIS % Passing 137.14

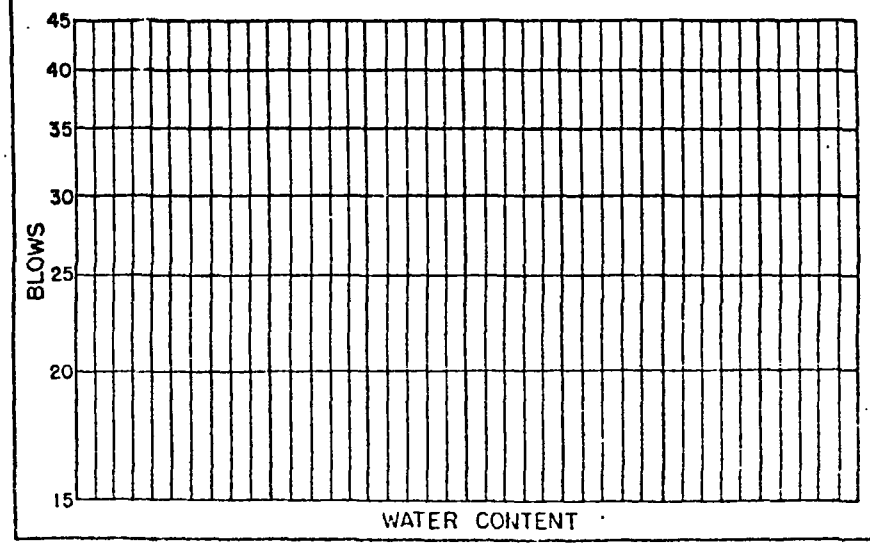
			-40	55.69	84%
-¾	1.25	100	-80		
-4	2.71	99	-140		
-10	18.5	97	-200	58.44	43%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



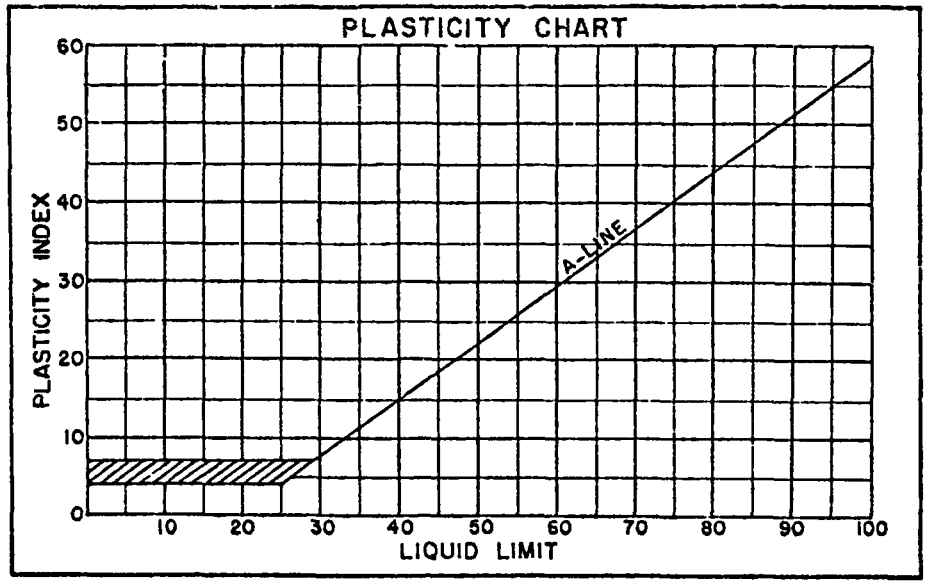
DOT FORM 351-019

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3944-3 JOB NO. SR 101 HOLE NO. J-44
DATE 24 JAN 83 OPERATOR RB

SOIL FIELD IDENTIFICATION			
TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

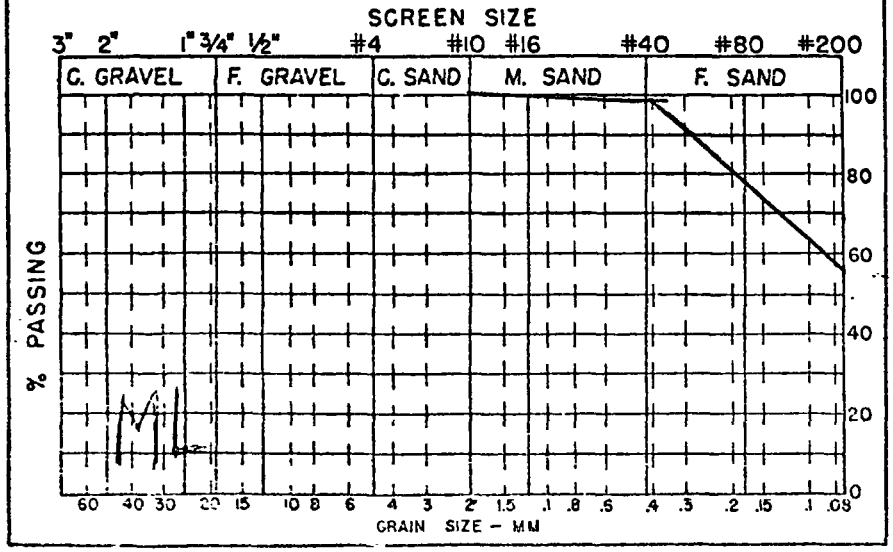
DESCRIPTION: ~~Dry~~ moist, grey F sdy SILT



H_2O = 26%

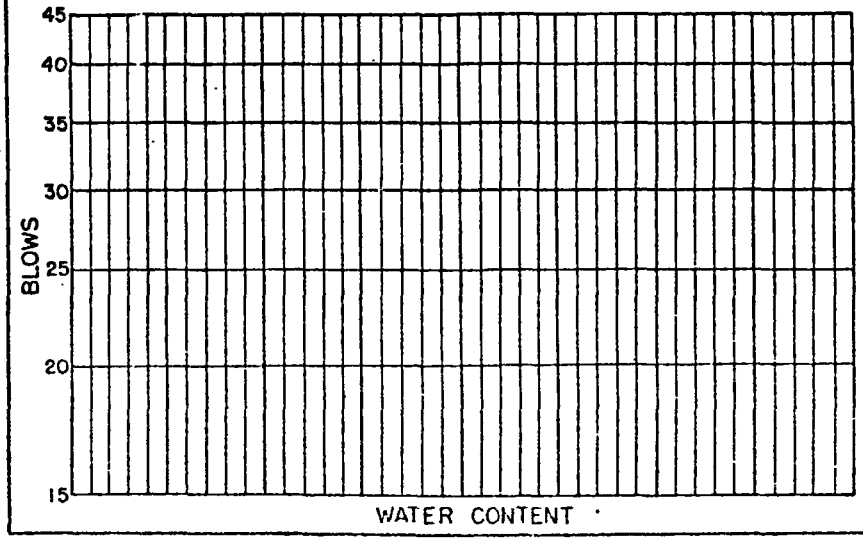
SIEVE ANALYSIS	% Passing 123.28		
	-40	53.62	99%
-3/4	-80		
-4	-140		
-10 .02	100%	-200 69.64	56%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

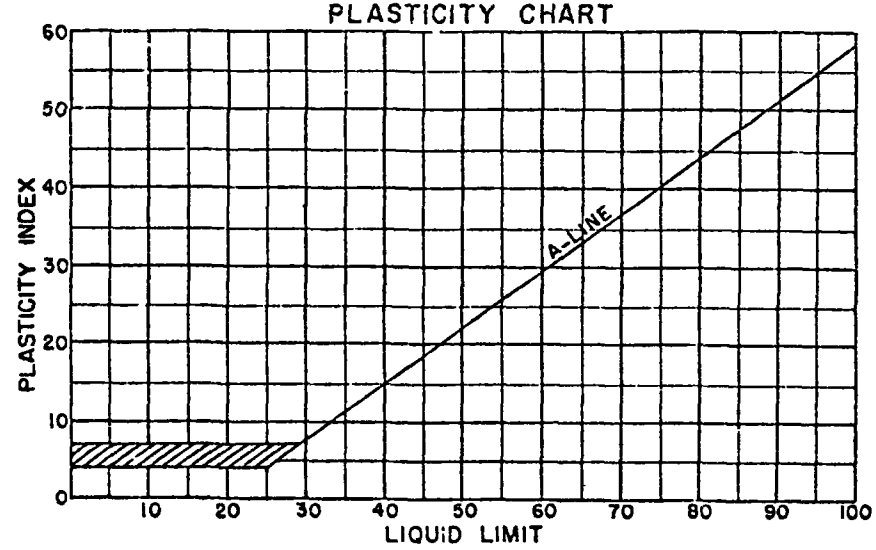
SAMPLE NO. 3944-4 JOB NO. SR101 HOLE NO. J-44
DATE 25 JAN 83 OPERATOR RB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: ~~Dry~~ moist Grey F Sdy SILT

PLASTICITY CHART

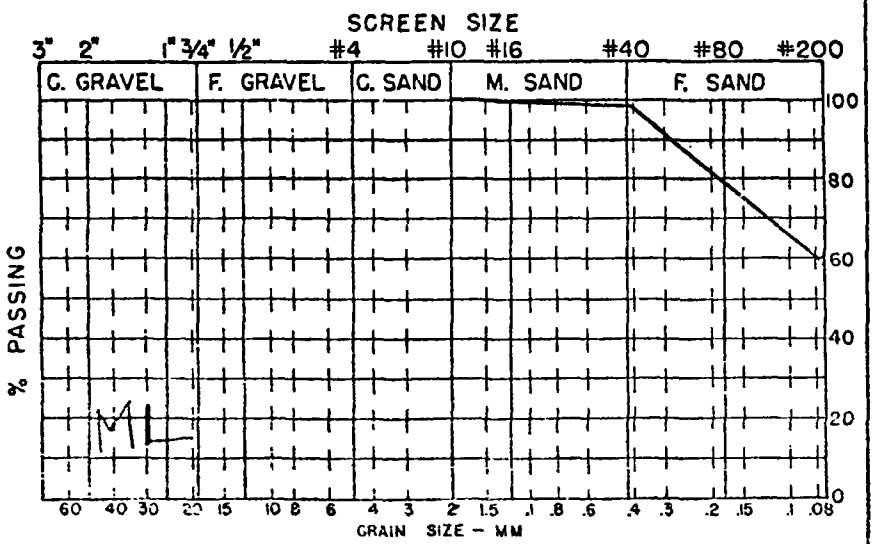


H_2O = 24%

SIEVE ANALYSIS % Passing 96.78

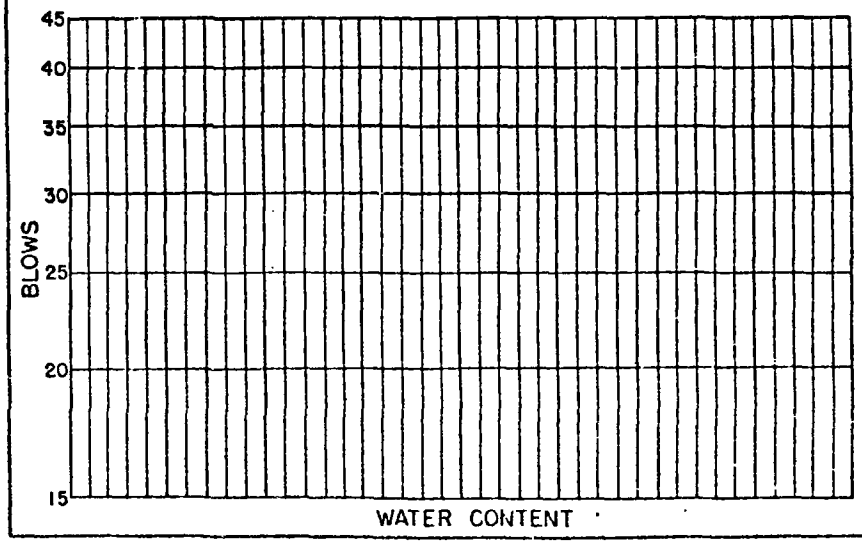
		-40 40.22	99%
-3/4		-80	
-4		-140	
-10 .13	100%	-200 56.43	58%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 12-15-82

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section West Hoquiam by Pass
SR No. 101A Sub-Section Culvert

Station & Offset 116+00 80' Rt. Hole # ~~J-42~~ J-45

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3963 -1	D-3	7' 0" 9' 0"	H2O = 78%	ML	Wet, grey & brn. F. Sdy. SILT w/ t. of organic mtr.
-2	D-5	12' 0" 14' 0"		ML	Same
3964 -1	U-6	15' 0" 15' 4"	A		
-2		15' 4" 15' 8"	B		
-3		15' 8" 16' 0"	C		
-4		16' 0" 16' 4"	D		
-5		16' 4" 16' 8"	E		
3965	D-7	17' 0" 19' 0"	87%	MH	Sat, gr. F. Sdy. Cly. SILT
3966 -1	U-8	20' 0" 20' 4"	A		

1 copy with samples
1 copy to addressee File

Yours very truly,

Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place .....

Date .....

Dear Sir:

I have forwarded by today's ..... the following Foundation Samples.

Contract or Job No. L-7262 Section ..... SR No. ..... Sub-Section Culvert

Station & Offset 116+00 80' Rt. Hole # J-42 45

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3966 -2	U-8	20' 4" 20' 8"	B		
-3		20' 8" 21' 0"	C		
3967	D-9	22' 0" 24' 0"	Hw = 123%	OH	Sat., dk. gr. & grn., v. sty. CLAY w/ org. mtr.
3968 -1	U-10	25' 0" 25' 4"	A		
-2		25' 4" 25' 8"	B		
-3		25' 8" 26' 0"	C		
-4		26' 0" 26' 4"	D		
3969	D-11	27' 0" 29' 0"		OH	Like 3967
3970 -1	U-12	30' 0" 30' 4"	A		

1 copy with samples
1 copy to addressee

Yours very truly,

.....
Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place .....

Date .....

Dear Sir:

I have forwarded by today's ..... the following Foundation Samples.

Contract or Job No. L-7262 Section ..... SR No. ..... Sub-Section .....

Station & Offset 116+00 80' Rt Hole # J-4245

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3970 -2	U-12	30' 4" 30' 8"	B		
-3		30' 8" 31' 0"	C		
-4		31' 0" 31' 4"	D		
3971	D-13	32' 0" 34' 0"	H_2O = 115% ? Lab Error Possibly	MC	Wet, dk. gr., grn. & BLK. F. Sdy. SILT w/ org. mtr.
3972 -1	U-14	35' 0" 35' 4"	A		
-2		35' 4" 35' 8"	B		
-3		35' 8" 36' 0"	C		
-4		36' 0" 36' 4"	D		
3973	D-15	37' 0" 39' 0"	H_2O = 103%	MC	Sat, grn., gr. F. Sdy. SILT

1 copy with samples
1 copy to addressee

Yours very truly,

.....
Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place .....

Date .....

Dear Sir:

I have forwarded by today's ..... the following Foundation Samples.

Contract or Job No. L-7262 Section ..... SR No. ..... Sub-Section .....

Station & Offset 116+00 80' Rt. Hole # J-4245

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3974 -1	U-16	40' 0" 40' 4"	A		
-2		40' 4" 40' 8"	B		
-3		40' 8" 41' 0"	C		
-4		41' 0" 41' 4"	D		
3975	D-17	42' 0" 44' 0"		OH	Like 3967 Sat, dk. gr. & grn., V. Sty. Clay w/ org. mtr.
3976 -1	U-18	45' 0" 45' 4"	A		
-2		45' 4" 45' 8"	B		
-3		45' 8" 46' 0"	C		
3977	D-19	47' 0" 49' 0"	94%	ML	Sat. dk grn. F. Sdy. SiCT

1 copy with samples
1 copy to addressee

Yours very truly,

.....
Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place .....

Date .....

Dear Sir:

I have forwarded by today's ..... the following Foundation Samples.

Contract or Job No. L-7262 Section ..... SR No. ..... Sub-Section .....

Station & Offset 116+00 80' Rt. Hole # J-4245

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
3978 -1	U-20	50' 4" 50' 8"	B		
-2		50' 8" 51' 0"	C		
3979 -1	D-21	52' 0" 54' 0"	48%	SM	Wet, dk. grn & gr., V. Sty. FC SAND w/ F. gravel
-2	D-22-A	54' 6" 55' 6"	53%	ML	Wet, gr. F. Sdy. SILT
-3	D-22-B	55' 6" 56' 6"		SM	Like 3962-7 Moist, Brn., V. Sty. F. gravly. SAND.
		Hole is NOT Finish More samples To come at later Date.			

1 copy with samples
1 copy to addressee

Yours very truly,

Larry M Moore
Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 1-5-83

Dear Sir:

I have forwarded by today's [illegible] the following Foundation Samples.

Contract or Job No. [illegible] Section [illegible] SR No. [illegible] Sub-Section [illegible]

Station & Offset [illegible] Hole # J-2-85

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4017 -1	D-3		60%	MH	Sil, moldy grn., Cly. F. Sdy. SILT
-2	D-4		Ho=35%	SM	Moist, grn., gr., V. Sty. F. gr. Vly. FC SAND
-3	D-5			SM	Same

1 copy with samples
1 copy to addressee

Yours very truly,
[illegible]
Inspector.

DOT FORM 351-002 REVISED 2/80

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3963-1 JOB NO. 5R101 HOLE NO. J-45
DATE 24 JAN 83 OPERATOR RB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

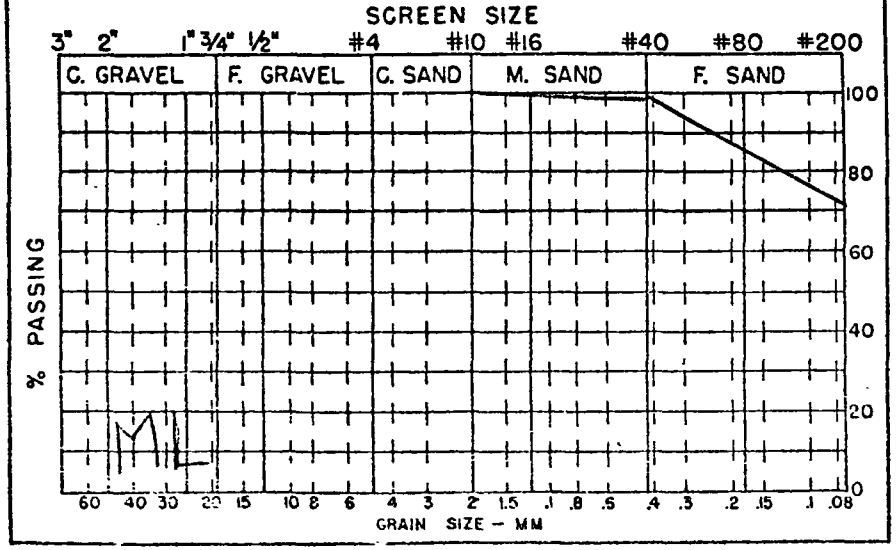
DESCRIPTION: Wet grey & brown F sdy SILT w/traces of organic matter

H_2O = 78%

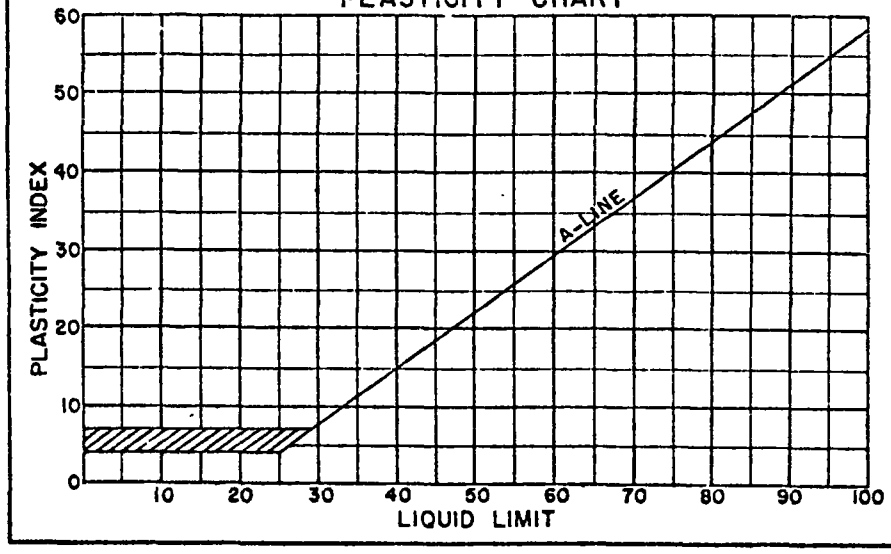
SIEVE ANALYSIS % Passing 52.16

		-40 14.32	99%
-3/4		-80	
-4		-140	
-10 .03	100%	-200 37.81	72%

GRAIN SIZE CURVE

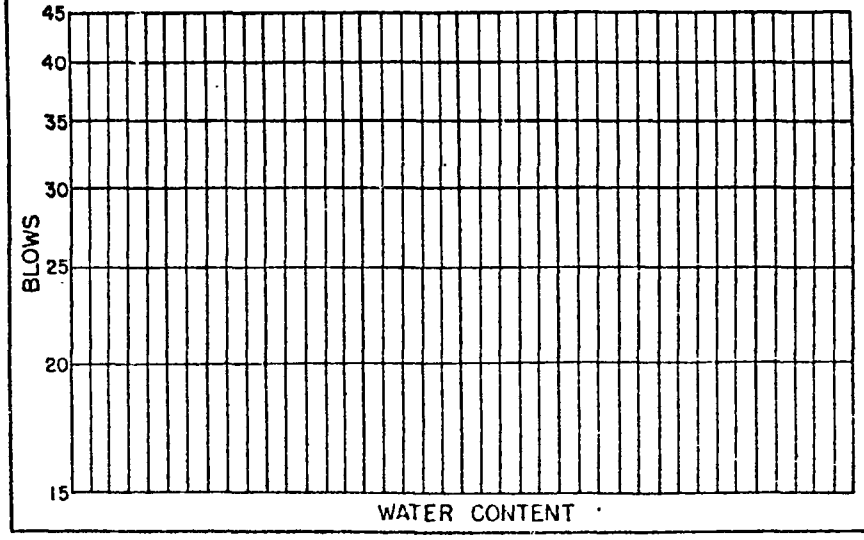


PLASTICITY CHART



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



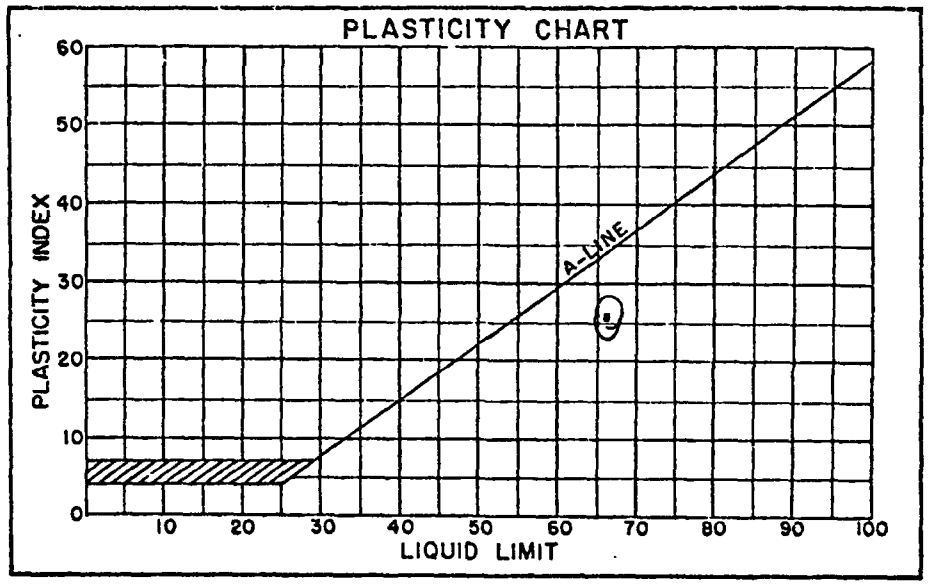
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 5965 JOB NO. Hef. HOLE NO. 145
DATE 2-1-83 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

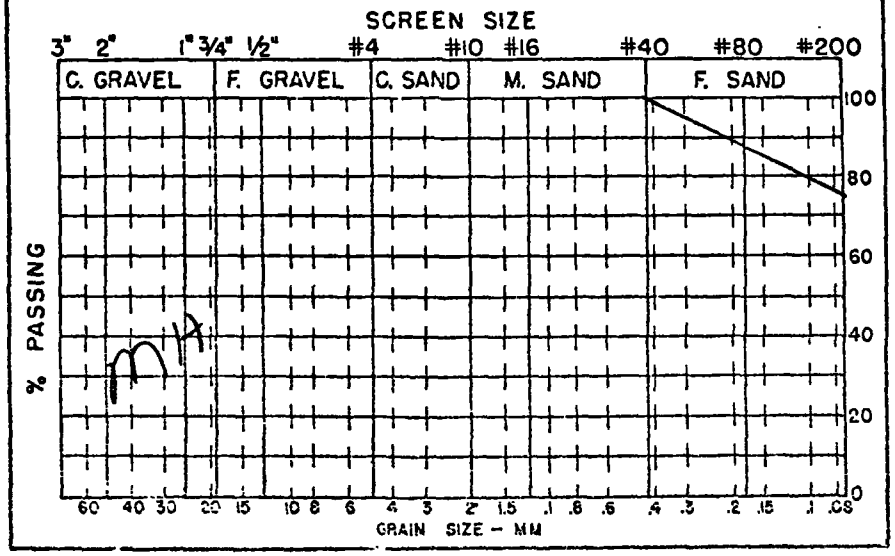
DESCRIPTION: Sat. gry. F. Sdy. Cly. SILT.



$H_2O = 87\%$

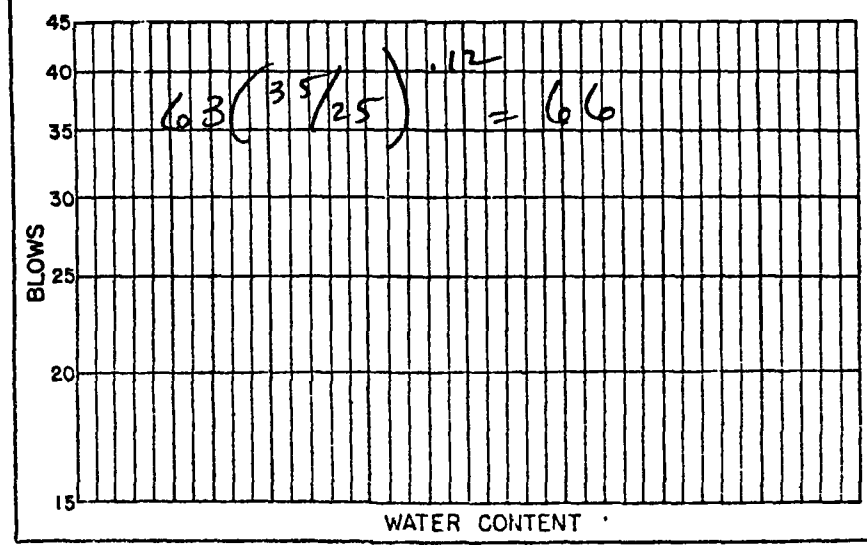
SIEVE ANALYSIS		% Passing 75.01
	-40 18.50	100%
-3/4	-80	
-4	-140	
-10	-200 56.51	75%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	64				46
Wet Wt.	6.53				5.58
Dry Wt.	4.01				3.98
% H_2O	63%				PL= 40%
Blows	35				PI= 26



$63\left(\frac{35}{25}\right)^{.12} = 66$

DOT FORM 351-019

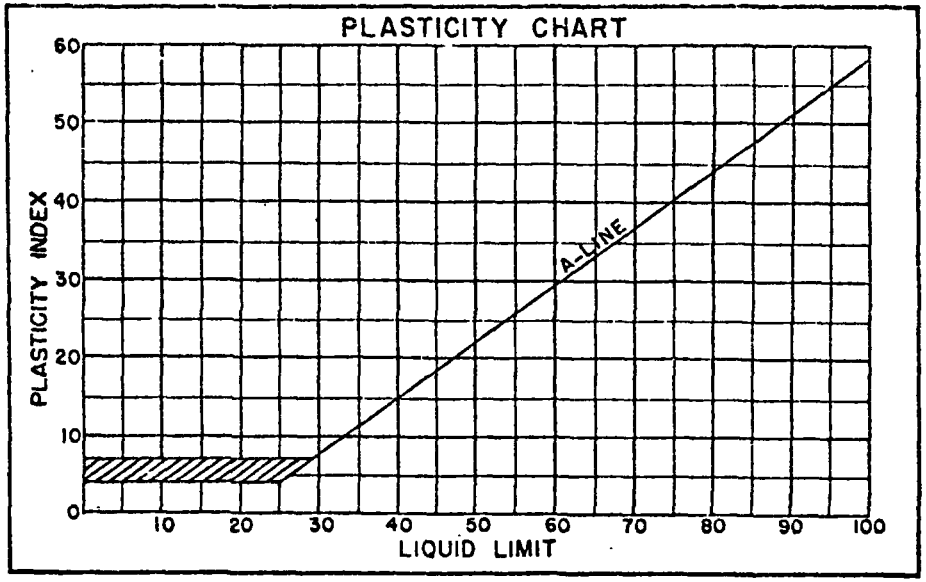
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3967 JOB NO. SR101 HOLE NO. J-45
DATE 31 JAN 83 OPERATOR RB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	–	–	–
DRIED CAST	–	– –	–
DILATANCY			
BITE			
TOUGHNESS	–	–	–

DESCRIPTION: ~~Lt~~ Dk grey grn
V'sty Clay w/org mtr

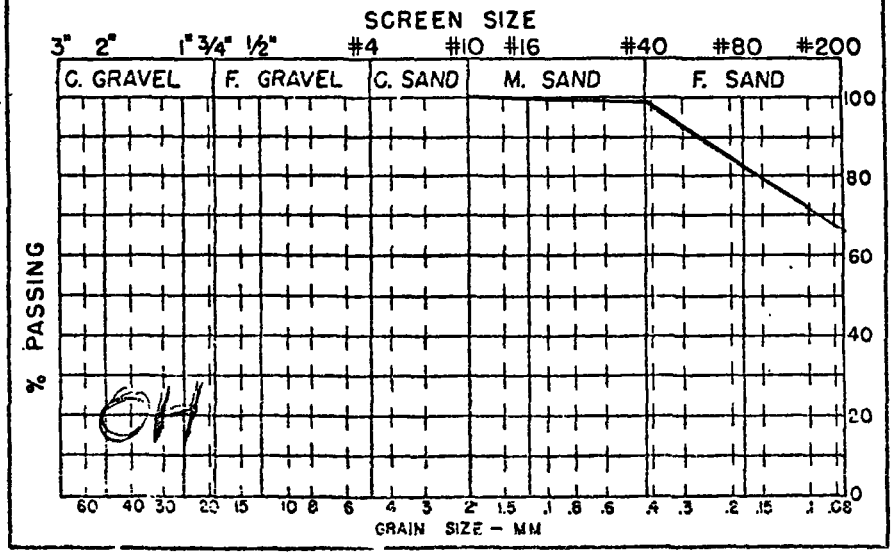


$H_2O = 12.3\%$

SIEVE ANALYSIS % Passing 63.90

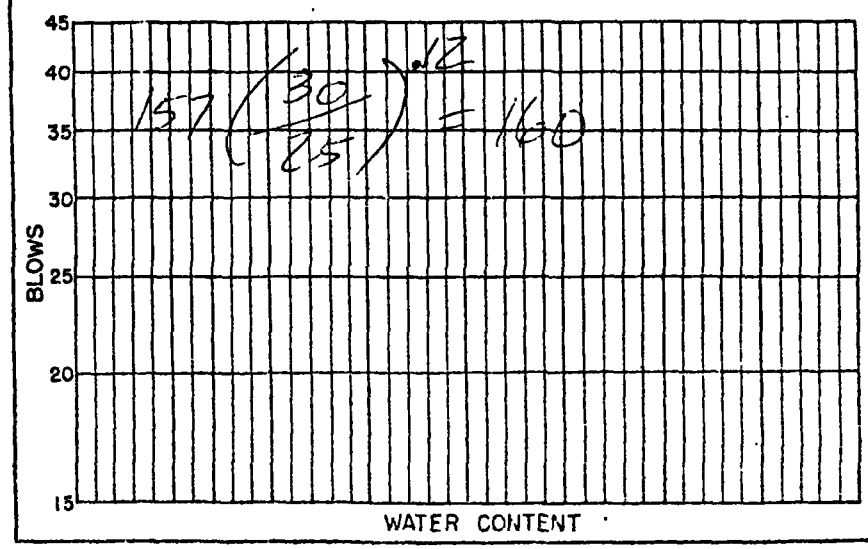
			-40	21.65	99
-¾			-80		
-4			-140		
-10	.19	100	-200	42.06	66

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	118				50
Wet Wt.	22.57				1.46
Dry Wt.	8.77				.70
% H_2O	157				PL= 108
Blows	30				PI= ~~49~~ 52



DOT FORM 351-019

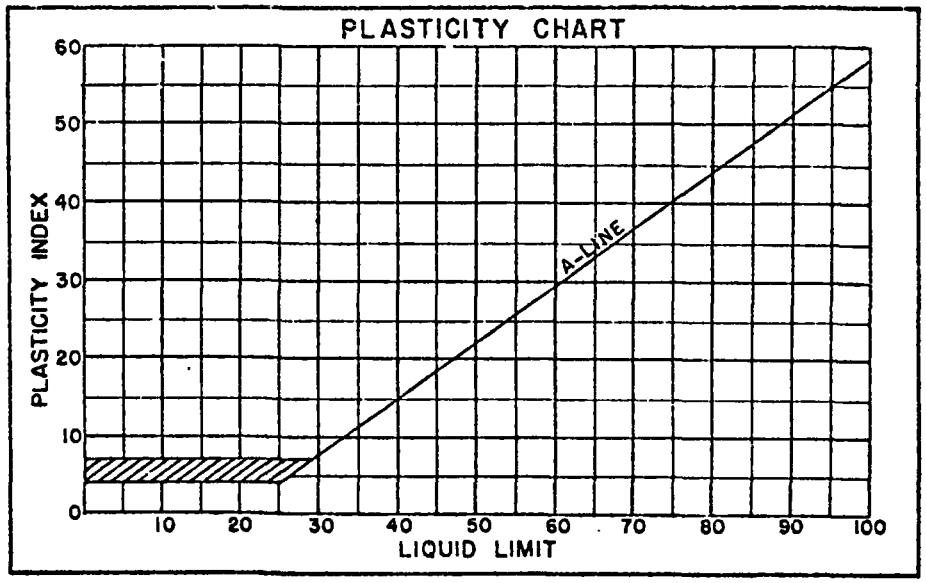
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3971 JOB NO. 5R101 HOLE NO. 5-45
DATE 25 JAN 83 OPERATOR RB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	—	—	
DRIED CAST	—	—	
DILATANCY			
BITE			
TOUGHNESS	—	—	

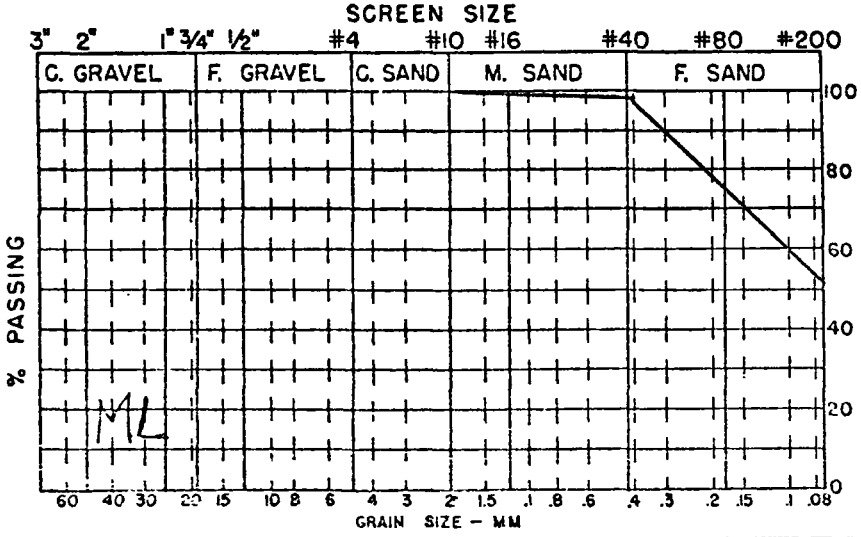
DESCRIPTION: Moist Dk grey, Green & Blk
F Sdy SILT w/org. mtr.



SIEVE ANALYSIS % Passing 19.76

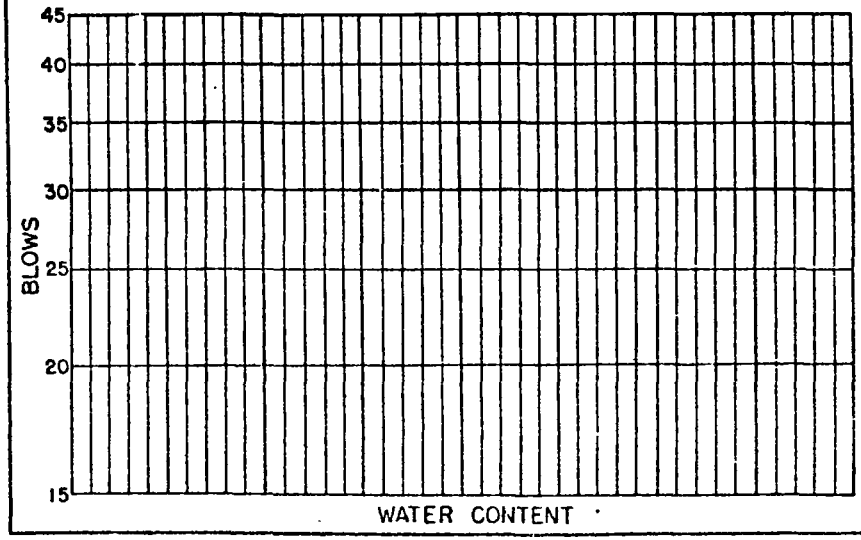
			-40	9.21	99%
-3/4			-80		
-4			-140		
-10	.12	100	-200	10.43	52%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



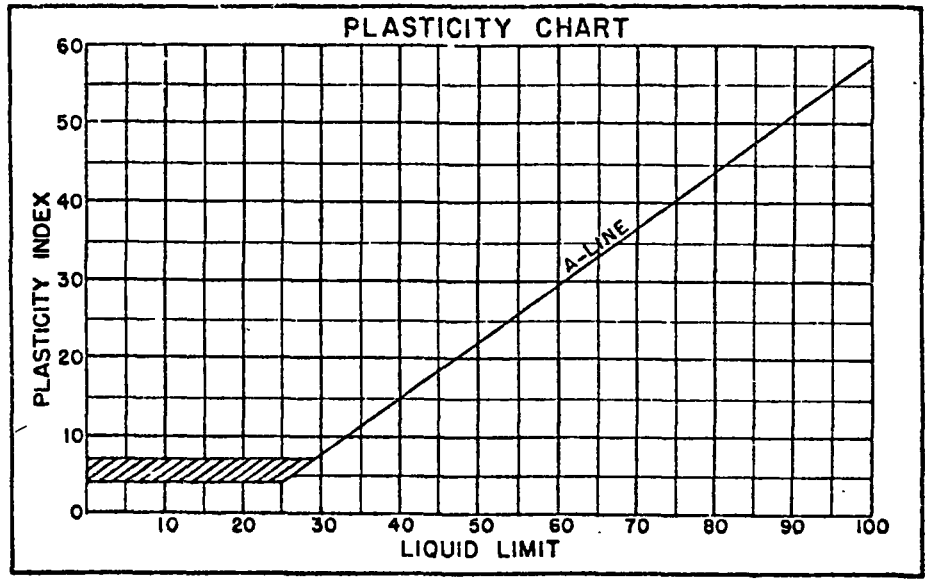
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3973 JOB NO. SR101 HOLE NO. 45
DATE 24 JAN 83 OPERATOR RB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: ~~Moist~~ Green Grey F sdy SILT
Sat.

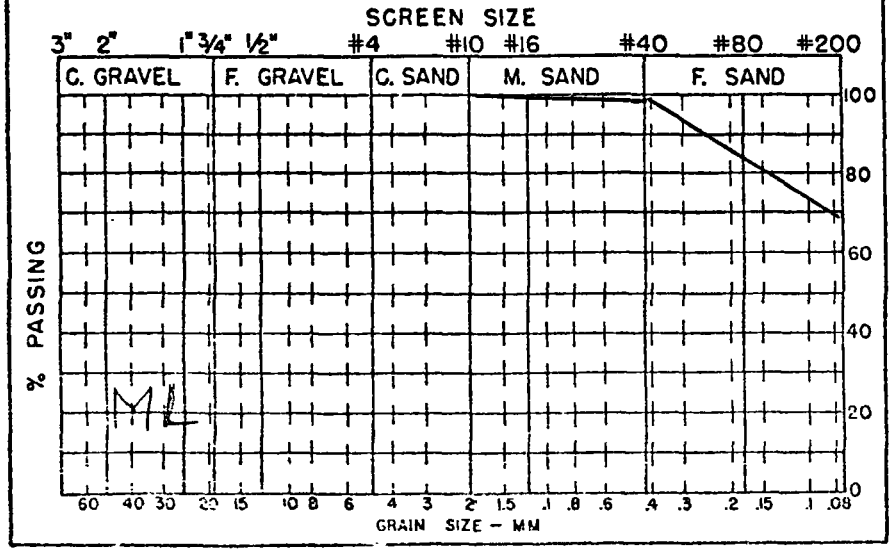


H_2O = 103%

SIEVE ANALYSIS % Passing 82.69

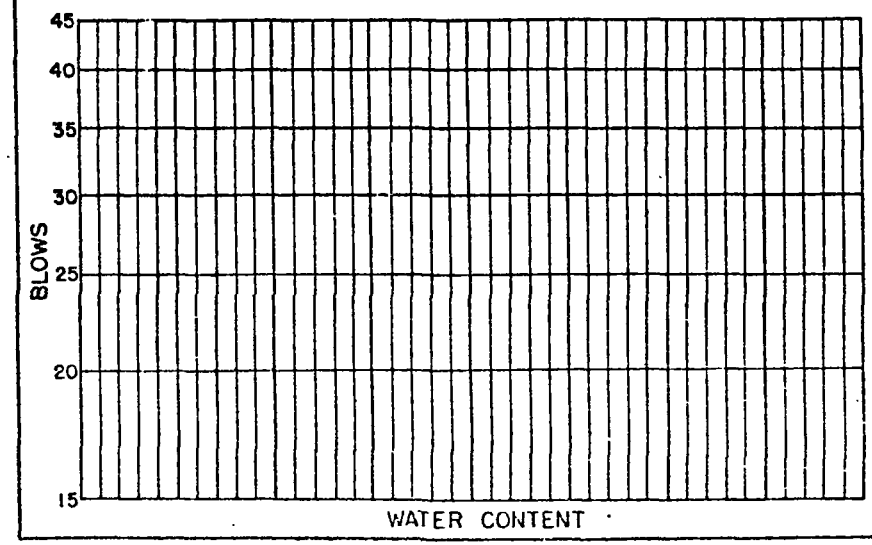
		-40 25.83	99
-3/4		-80	
-4		-140	
-10 0.20	100%	-200 56.66	68%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

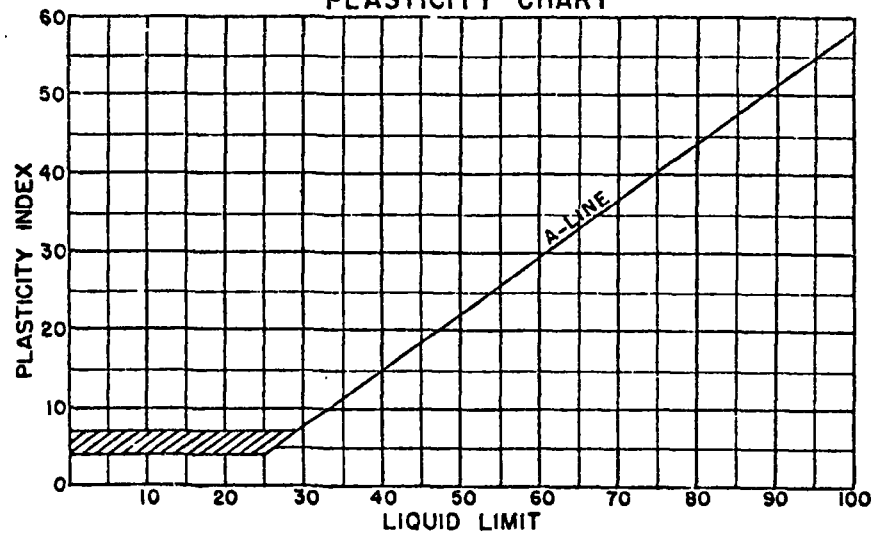
SAMPLE NO. 3977 JOB NO. 512101 HOLE NO. J-45
DATE 24 JAN 83 OPERATOR RB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Moist Dk green F sdy SILT

PLASTICITY CHART

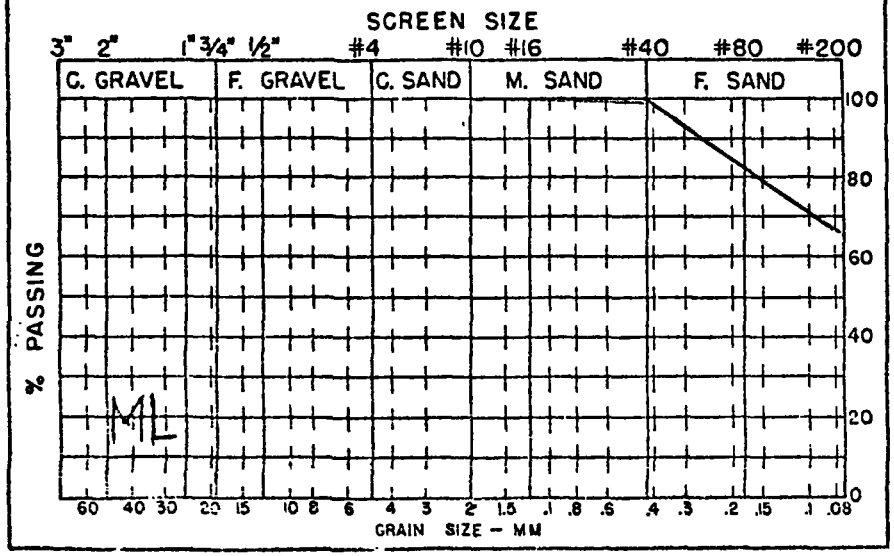


H_2O = 94%

SIEVE ANALYSIS % Passing 57.29

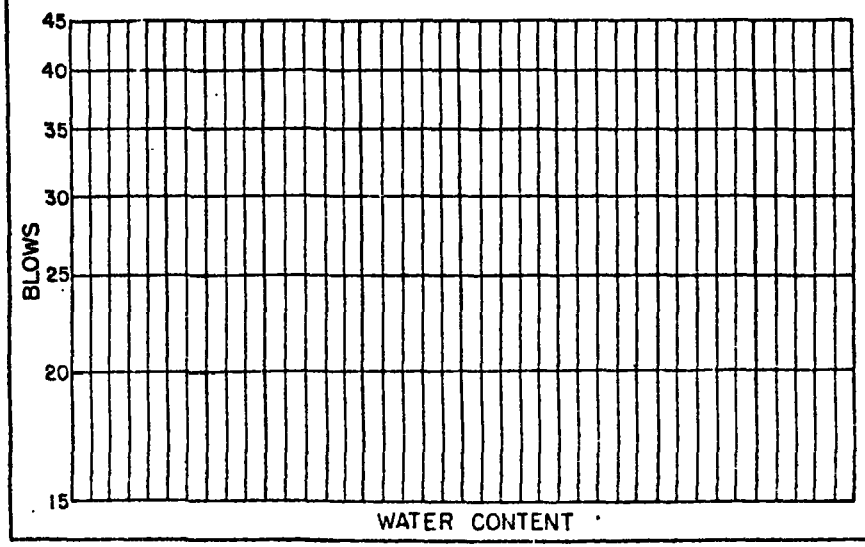
		-40 19.00	99%
-3/4		-80	
-4		-140	
-10 0.47	100%	-200 37.77	66%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

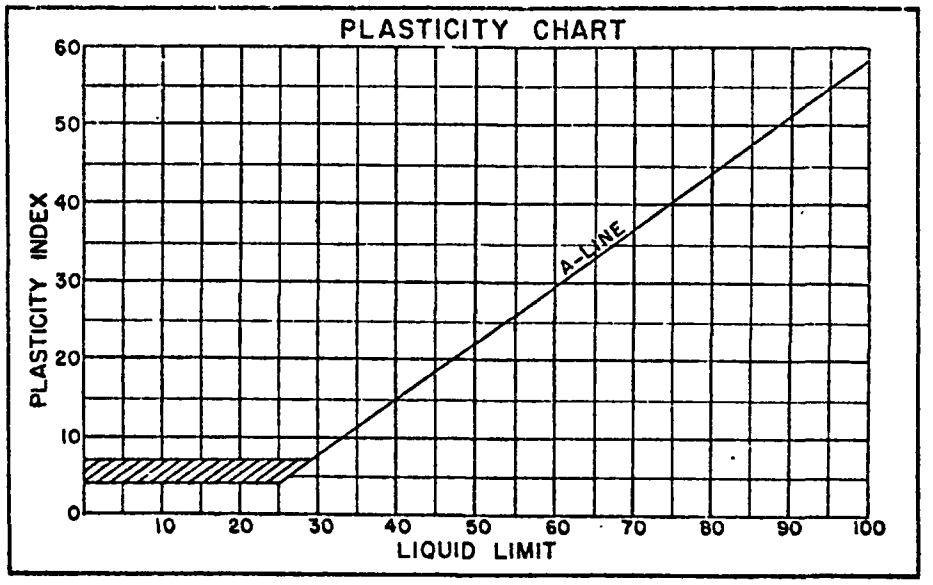
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 3979-1 JOB NO. SR101 HOLE NO. J-45
DATE 1 FEB 83 OPERATOR RB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	–	–	
DRIED CAST	–	–	
DILATANCY			
BITE			
TOUGHNESS	–	–	

DESCRIPTION: Moist Dk gry grey
V Sty FC SAND w/F gravel

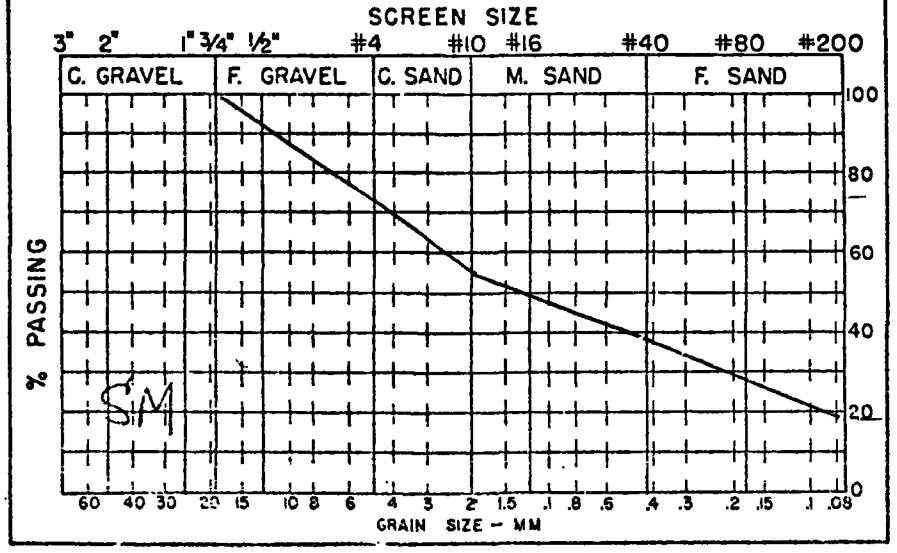


H2O = 48%

SIEVE ANALYSIS % Passing 16 1-86

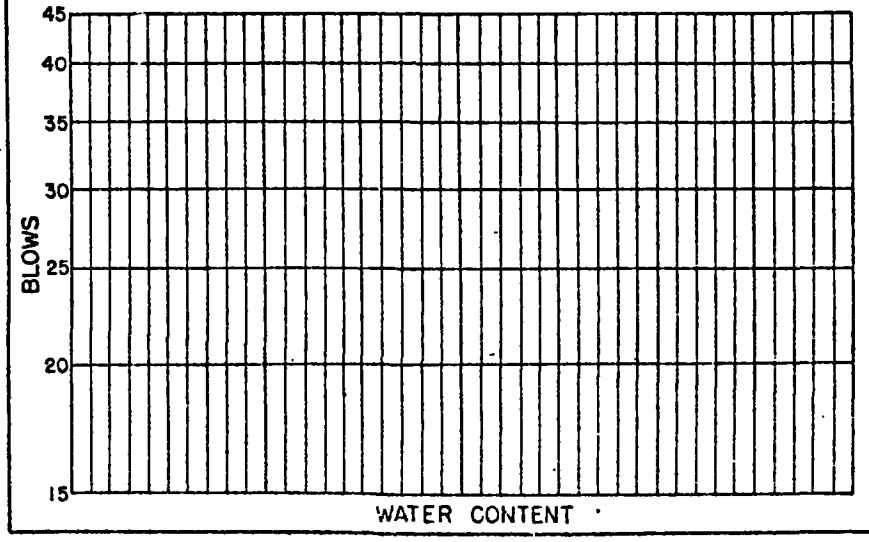
			-40	33.79	38%
-3/4	46.22	100	-80		
-4	28.48	71	-140		
-10	23.91	53	-200	28.16	18%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



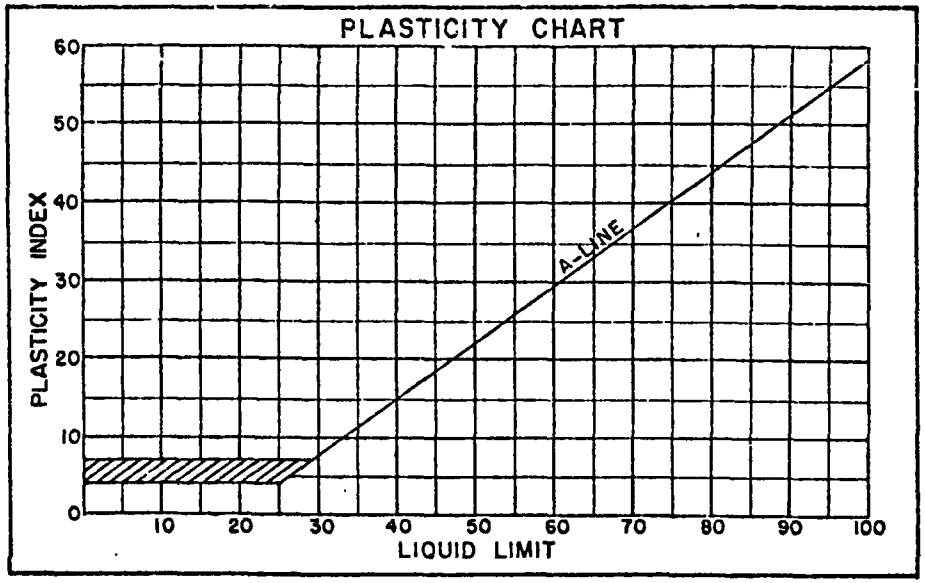
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 39A-2 JOB NO. SR101 HOLE NO. J-45
DATE 25JAN83 OPERATOR RB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	—	✓	
DRIED CAST	—	✓	
DILATANCY			
BITE			
TOUGHNESS	—	✓	

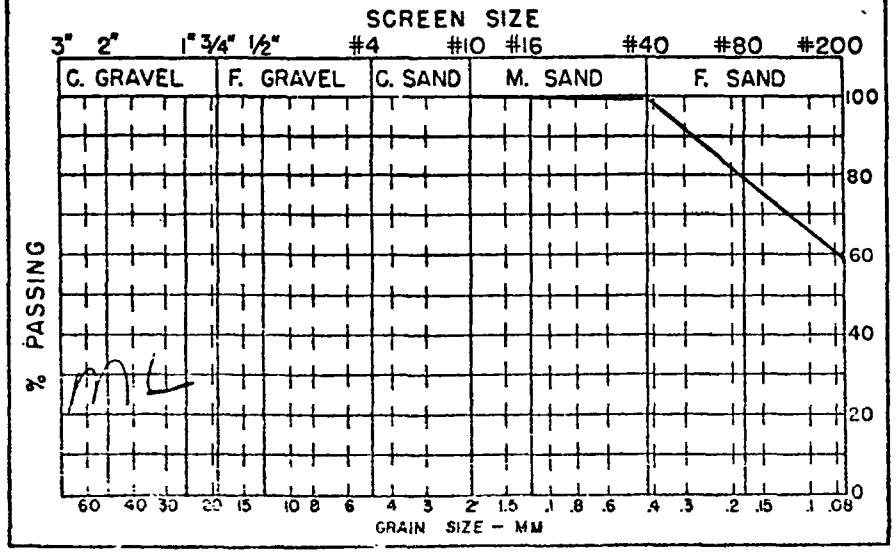
DESCRIPTION: Moist grey F sdy SILT



H_2O = 53%

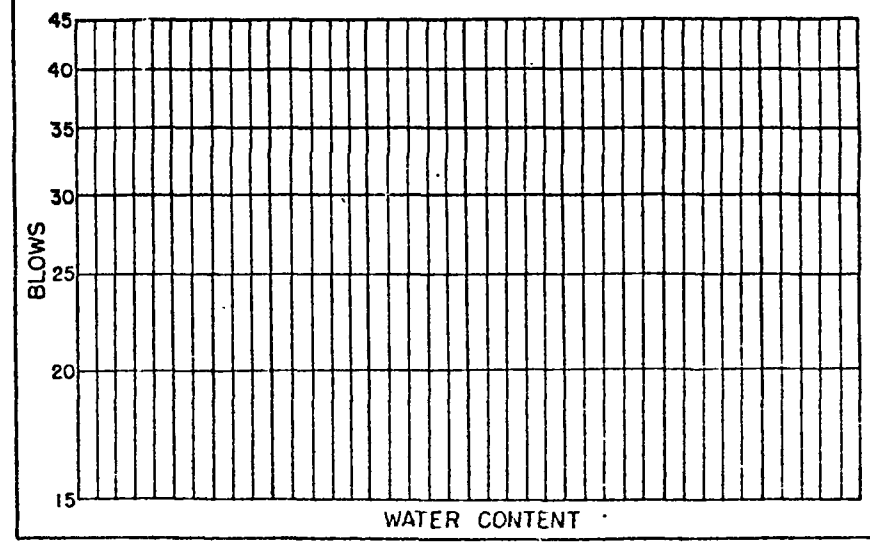
SIEVE ANALYSIS		% Passing 92.89	
		-40 38.02	99
-¾		-80	
-4		-140	
-10 0.02	100	-200 54.85	59

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

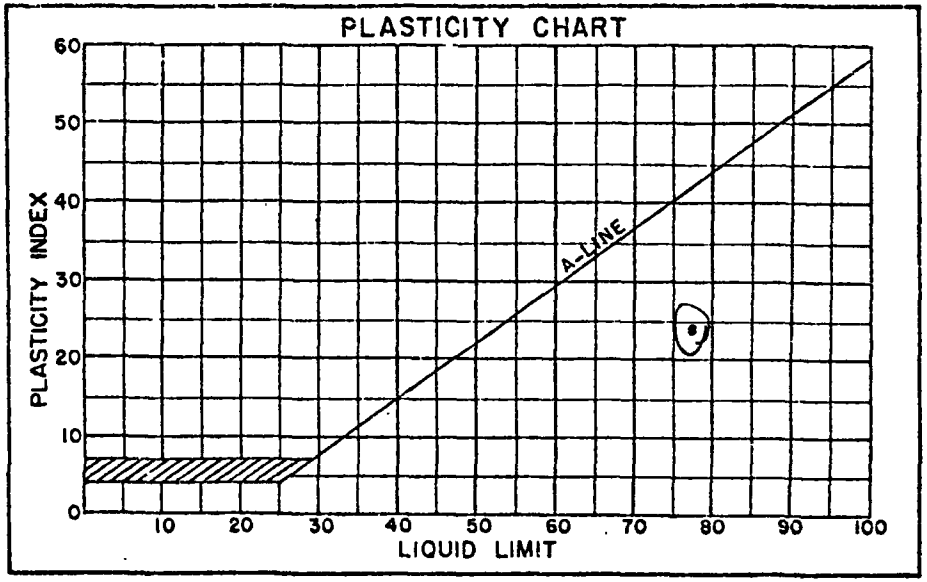
SAMPLE NO. 4017-1 JOB NO. Hef HOLE NO. J-45
DATE 2-1-83 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: Sat. Moldy grn. Cly.
F. Sdy. SILT

PLASTICITY CHART

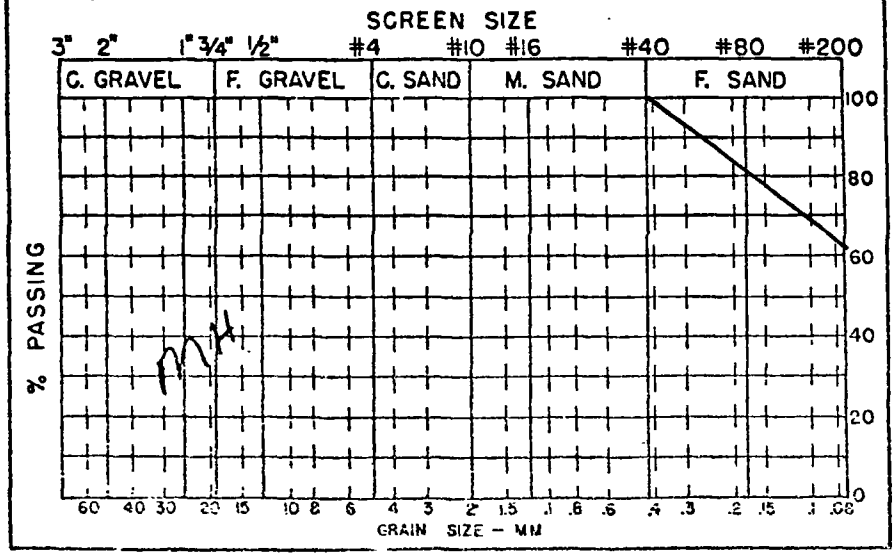


$H_2O = 60\%$

SIEVE ANALYSIS % Passing 81.47

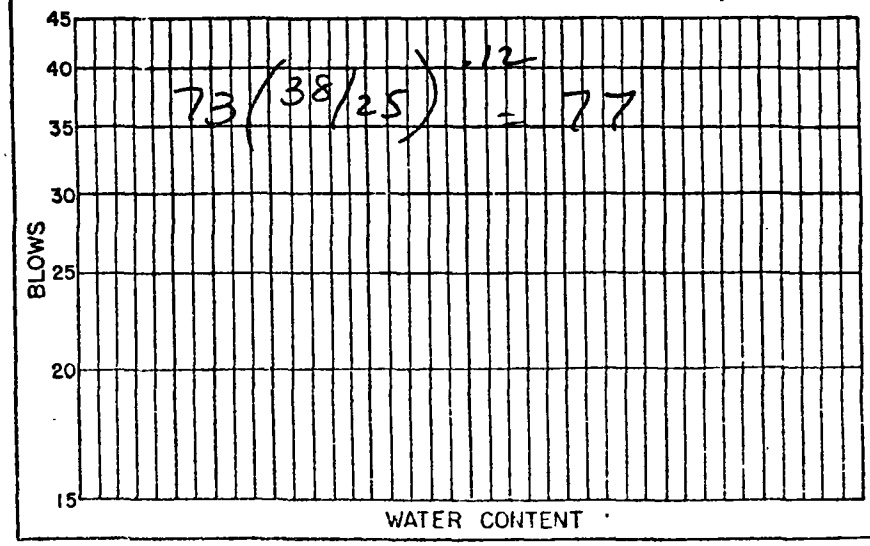
	-40	30.71	100%
-3/4	-80		
-4	-140		
-10	-200	50.76	62%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	75				615
Wet Wt.	8.12				5.90
Dry Wt.	4.70				3.85
% H_2O	73%				PL= 53%
Blows	38				PI= 24



DJT FORM 351-019

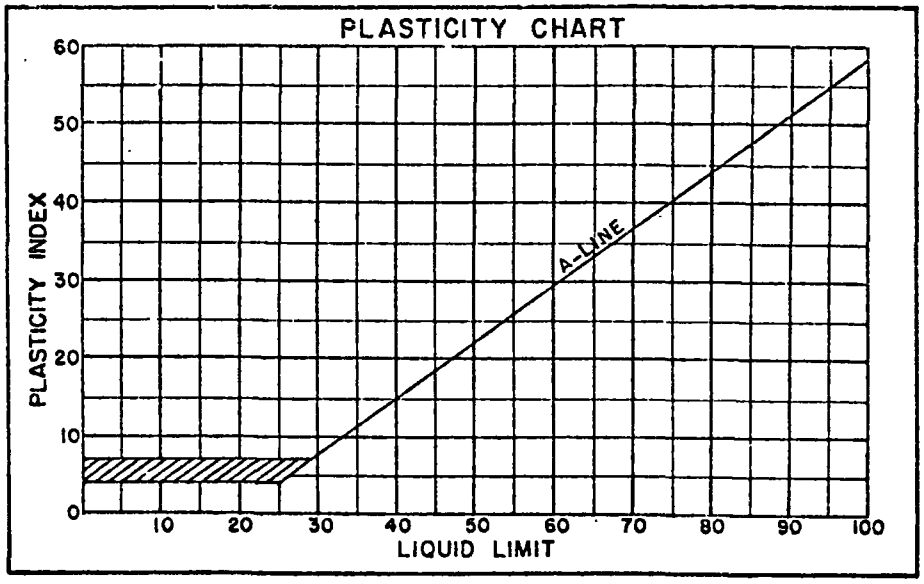
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4017-2 JOB NO. SR101 HOLE NO. J-45
DATE 24 JAN 83 OPERATOR RB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Dry, Green grey V sty F grly FC SAND

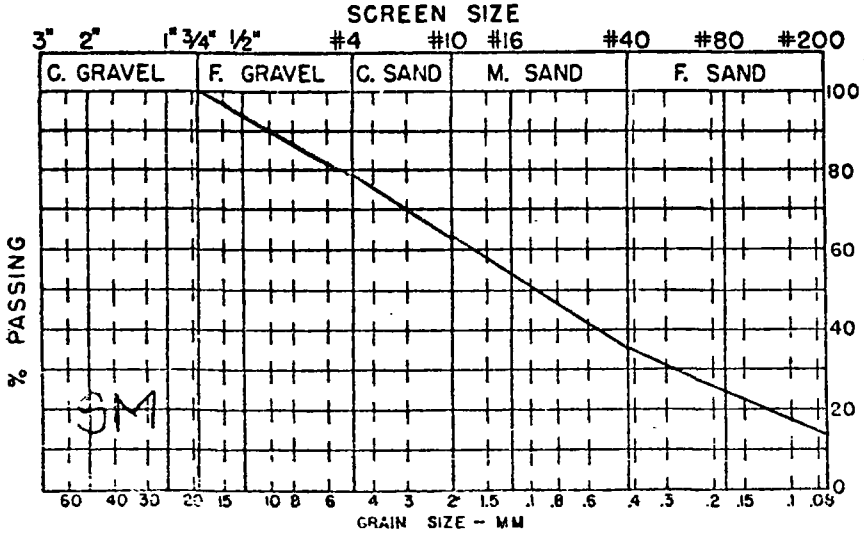


$H_2O = 35\%$

SIEVE ANALYSIS % Passing 130.88

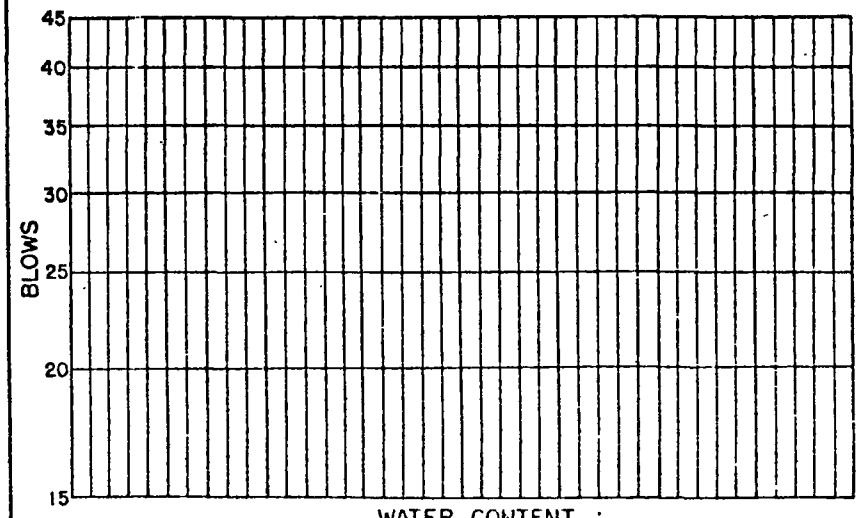
			-40	28.30	35
-3/4	27.01	100	-80		
-4	20.96	79	-140		
-10	36.95	63	-200	18.16	14%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 1-7-82

Dear Sir:

I have forwarded by today's state car the following Foundation Samples.

Contract or Job No. L-7262 Section west Hoquiam by Pass
SR No. 101 A Sub-Section Culvert

Station & Offset 115+50 ℄ Hole # ~~J-45~~ J-46

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4018 -1	D-2	2' 0" 4' 0"	479%	OL	Sat., Brn., F. Sdy. ORGANIC SILT
-2	D-4	7' 0" 9' 0"	113%	ML	Sat., gr., grn., F. Sdy. SILT
4019 -1	U-5	10' 0" 10' 4"	A		
-2		10' 4" 10' 8"	B		
4020	D-6	12' 0" 14' 0"	136%	SM	Sat, gr. V. Sty. FM SAND
4021-1	U-7	15' 0" 15' 4"	A		
4021 -2		15' 4" 15' 8"	B		
-3		15' 8" 16' 0"	C		
4 -~~3~~		16' 0" 16' 4"	D		

1 copy with samples
1 copy to addressee

Yours very truly,

Inspector.

DOT FORM 351-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place .....

Date .....

Dear Sir:

I have forwarded by today's ..... the following Foundation Samples.

Contract or Job No. L-7262 Section ..... SR No. ..... Sub-Section .....

Station & Offset 115+50 ℄ Hole # J-~~43~~ 46

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4022 -1	D-8	17' 0" 19' 0"	H_2O= 103%	mL	Like 3973 Slt., grn., gr. F. Sdy. SILT.
-2	D-10	22' 0" 24' 0"	94%	mL	Like 3977 Slt, dk. grn. F. Sdy. SILT
4023 -1	U-11	25' 0" 25' 4"	A		
-2		25' 4" 25' 8"	B		
-3		25' 8" 26' 0"	C		
-4		26' 0" 26' 4"	D		
-5		26' 4" 26' 8"	E		
4024	D-12	27' 0" 29' 0"		mL	Like ~~3973~~ 4022 above.
4025 -1	U-13	30' 0" 30' 4"	A		

1 copy with samples
1 copy to addressee

Yours very truly,

.....
Inspector.

DOT FORM 351-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place .....

Date .....

Dear Sir:

I have forwarded by today's ..... the following Foundation Samples.

Contract or Job No. L-7262 Section ..... SR No. ..... Sub-Section .....

Station & Offset 115+50 ℄ Hole # J-4346

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4025 -2	U-13	30' 4" 30' 8"	B		
-3		30' 8" 31' 0"	C		
-4		31' 0" 31' 4"	D		
4026 -1	D-14	32' 0" 34' 0"	118%	ML	Sat, dk. Brn., F. Sdy. SILT w/t. PEAT.
-2	D-16	37' 0" 39' 0"	136%	SM	Like 4020 Sat, gr. V. Sty. FM SAND
4027 -1	U-17	40' 0" 40' 4"	A		
-2		40' 4" 40' 8"	B		
-3		40' 8" 41' 0"	C		
4028	U-17	41' 0" 41' 4"	D 67% I.D. only	SM	Wet, gr., V. Sty. FM SAND

1 copy with samples
1 copy to addressee

Yours very truly,

.....
Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place .....

Date .....

Dear Sir:

I have forwarded by today's ..... the following Foundation Samples.

Contract or Job No. L-7262 Section ..... SR No. ..... Sub-Section .....

Station & Offset 115+50 ℄ Hole # J-~~43~~ 46

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4029 -1	D-18	42' 0" 44' 0"	94%	ML	Like 3977 Sat, dk. grn., F. Sdy. SILT
-2	D-19	45' 0" 47' 0"	NOT 17 W/ Logged W/ Sample Bag		
-3	D-20	50' 0" 51' 6"	48%	SM	Like 3979-1 Wet, dk. grn. & gr., v. Sty. FC SAND W/ F. Gravel
			Hole Not Finish		
			More Samples later.		

1 copy with samples
1 copy to addressee

Yours very truly,

Gary M Moore
Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 1-13-85

Dear Sir:

I have forwarded by today's [illegible] the following Foundation Samples.

Contract or Job No. LT-62 Section West Hoquiam by [illegible]
SR No. 101A Sub-Section [illegible]

Station & Offset 115+50 ℄ Hole # J-42 46

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4034 -1	D-21-A	55' 0" 56' 0"	H_2O=11%	SM	Moist, Layers of gr. & Rust Sty. F-C SAND embedded in F. Gravel
-2	D-21-E	56' 0" 57' 0"	25%	SM	Moist, Gr., V. Sty. F. SAND
-3	D-22-A	60' 0" 61' 0"	53%	SM ML	Dry, BLK., dk. Brn. & Gr. Bedded F. SAND & SILT w/t. Mica & org. sticks
-4	D-22-E	61' 0" 62' 0"		SM MS	Same w/o Bedding
-5	D-23	65' 0" 67' 0"	46%	ML	Moist, Gr. F. Sdy. SILT w/ F. Gravels & one 1"(-) Rock
-6	D-24	70' 0" 72' 0"	44%	SM	Moist, Grn. outer w/grn., yellow, gr & BLK. Inside mix. of Sty., F. grav. F-C SAND Leopard Pattern

1 copy with samples
1 copy to addressee

Yours very truly,
[illegible]
Inspector.

DOT FORM 351-002 REVISED 2/80

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4018-1 JOB NO. Hog HOLE NO. J-46
DATE 2-1-83 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

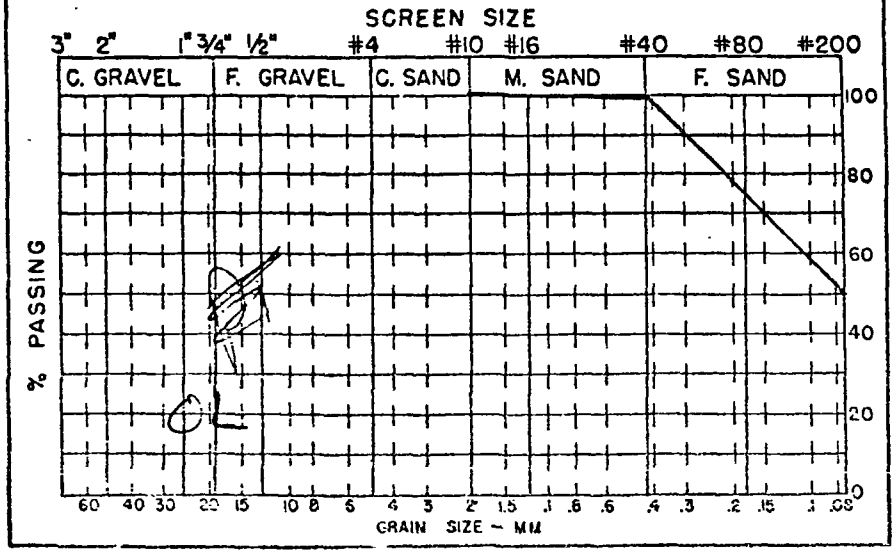
DESCRIPTION: Sat., Brn. F. Sdy. SILT Organic

H_2O = 479 %

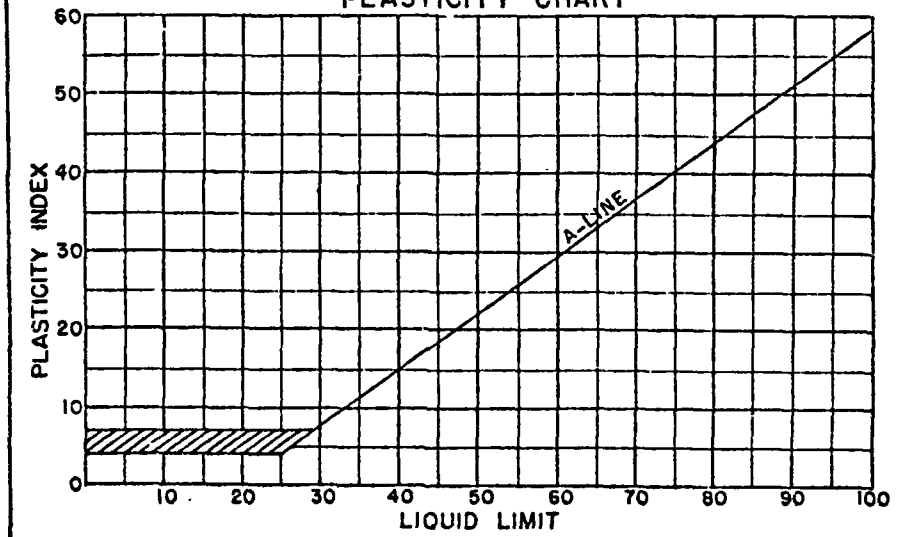
SIEVE ANALYSIS % Passing 17.38

		-40 8.45	99%
-3/4		-80	
-4		-140	
-10 .20	100%	-200 8.63	50%

GRAIN SIZE CURVE

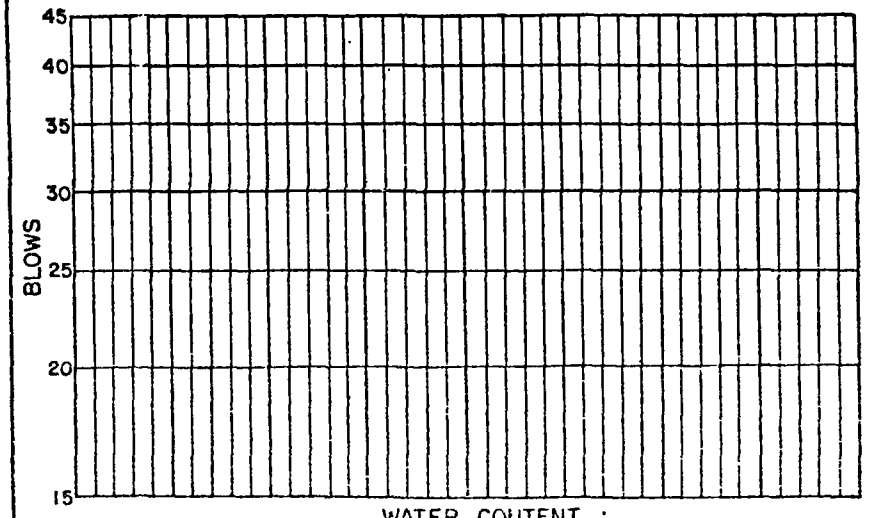


PLASTICITY CHART



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DJT FORM 351-019

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4018-2 JOB NO. Hog. HOLE NO.
DATE 2-1-83 OPERATOR BB

SOIL FIELD IDENTIFICATION

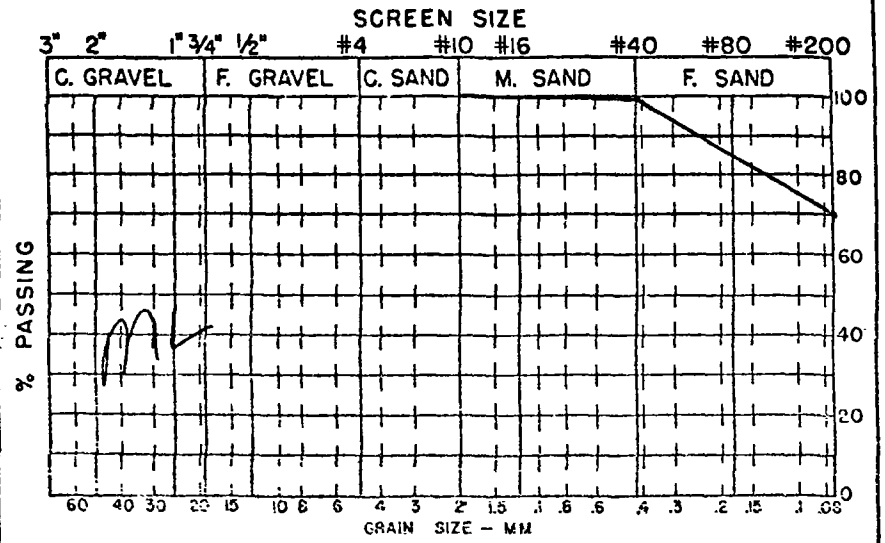
TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

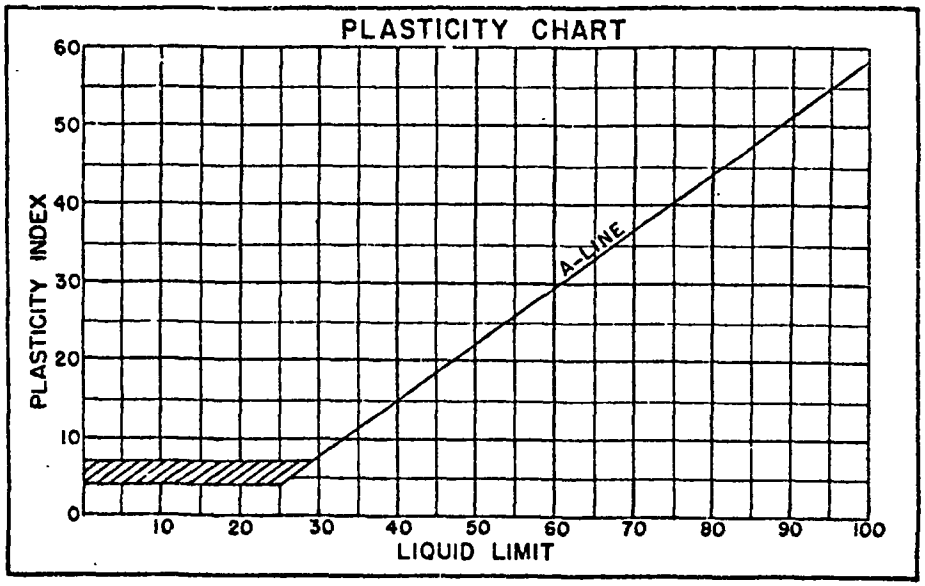
DESCRIPTION: Sat, Gry, Grn. F. Sdy. SILT

H-20-11370

SIEVE ANALYSIS		% Passing 71.06	
		-40	20.55 99
-3/4		-80	
-4		-140	
-10	.73 100%	-200	49.78 70

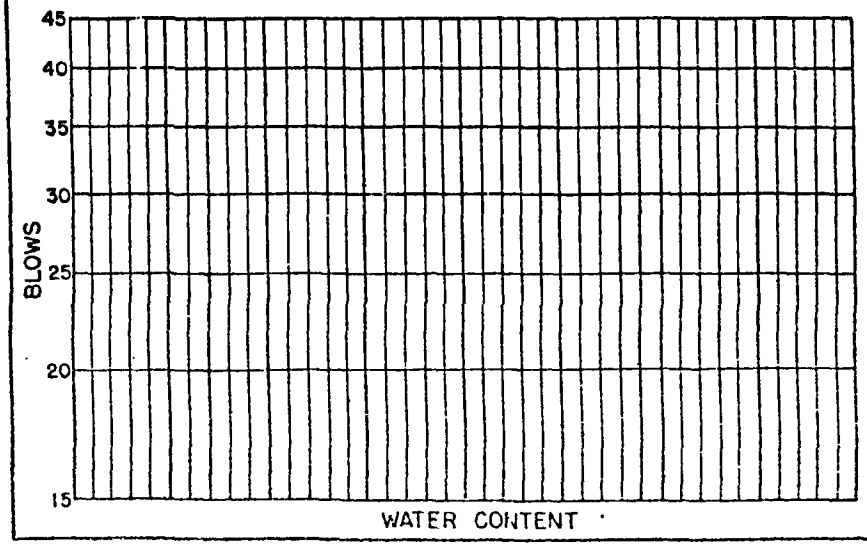
GRAIN SIZE CURVE





LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

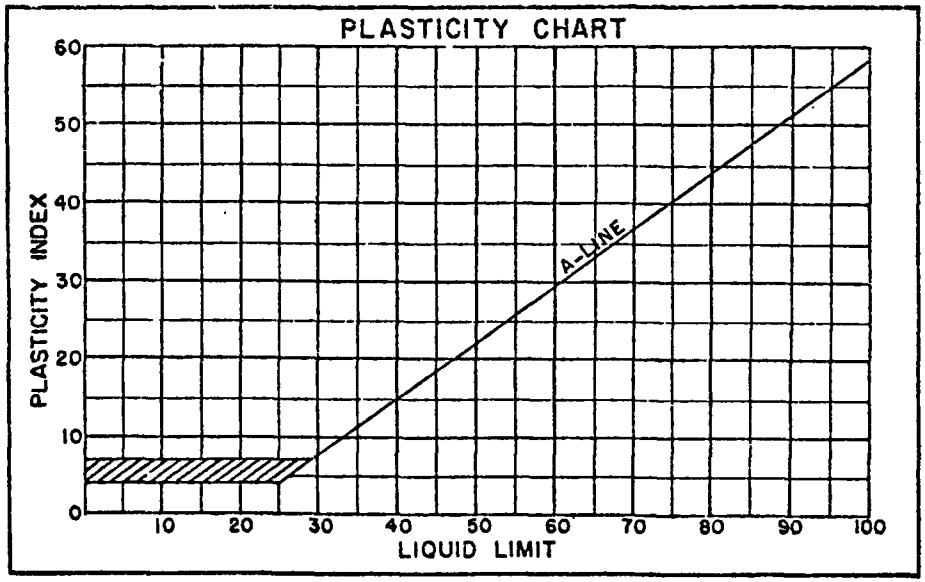
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4020 JOB NO. SR101 HOLE NO. J-46
DATE 24 JAN 83 OPERATOR R B

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Wet grey V sty FM SAND

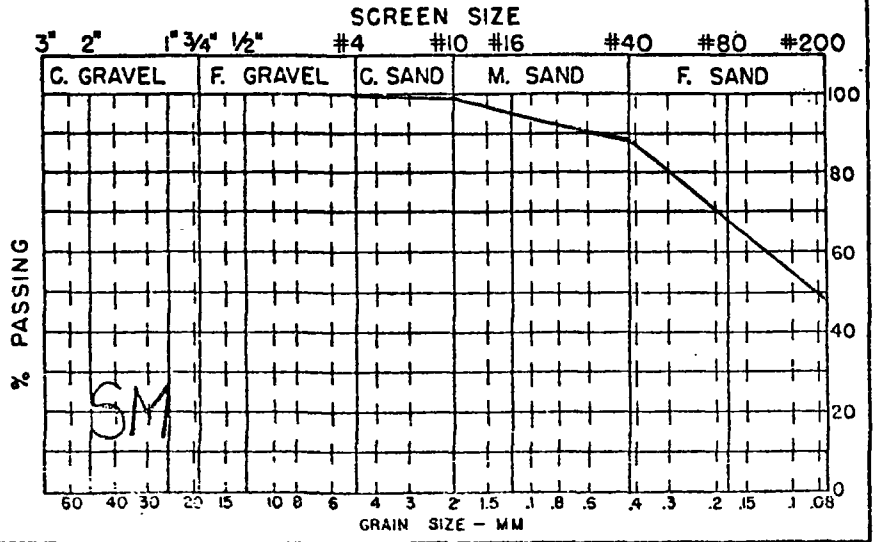


H_2O = 136%

SIEVE ANALYSIS % Passing 54.38

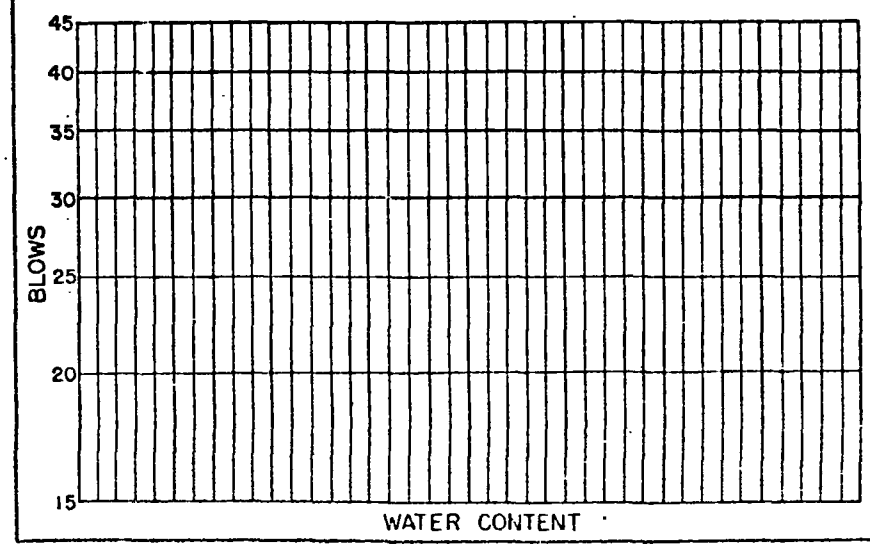
			-40	21.47	89.
-3/4			-80		
-4	0.17	100	-140		
-10	6.53	99	-200	26.21	48%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

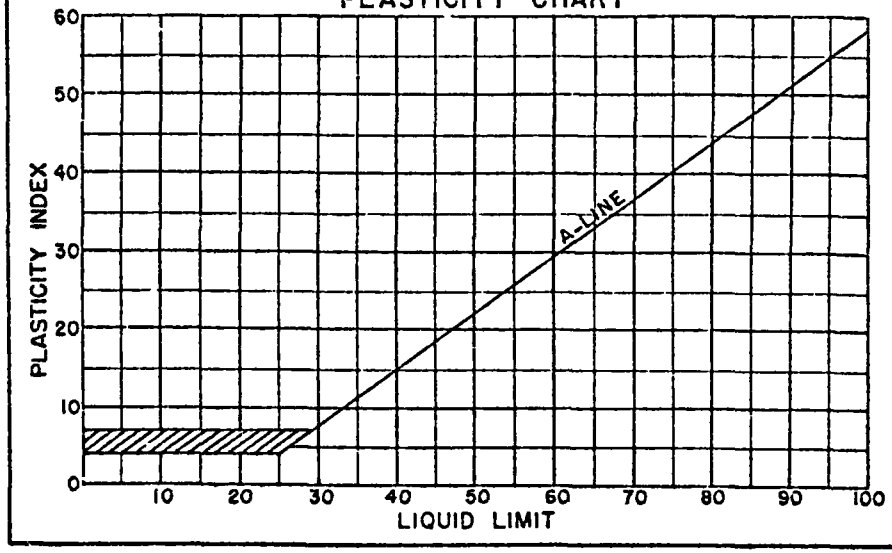
SAMPLE NO. 40261 JOB NO. SR101 HOLE NO. 46
DATE 25 JAN 83 OPERATOR RB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS Sat.	✓	✓	

DESCRIPTION: ~~Moist~~ Dk Brn
F Sdy SILT w/ traces of Peat

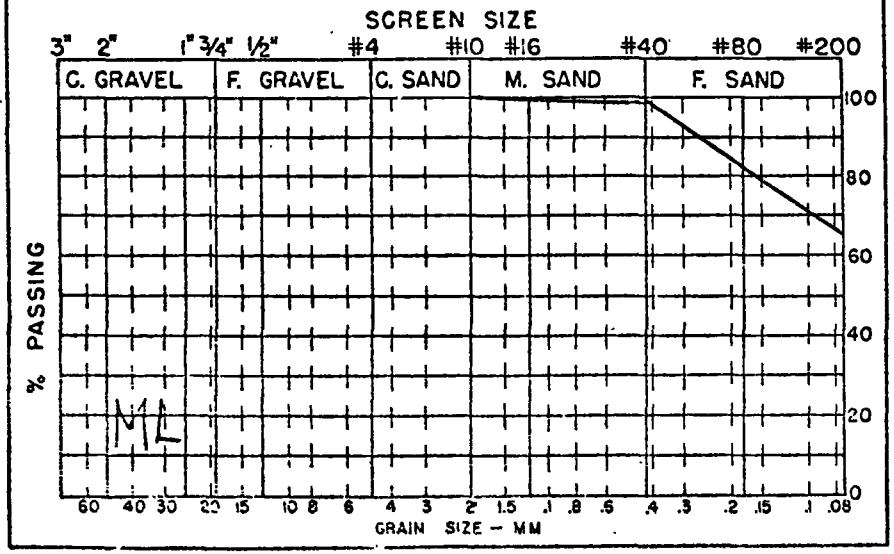
PLASTICITY CHART



$H_2O = 118\%$

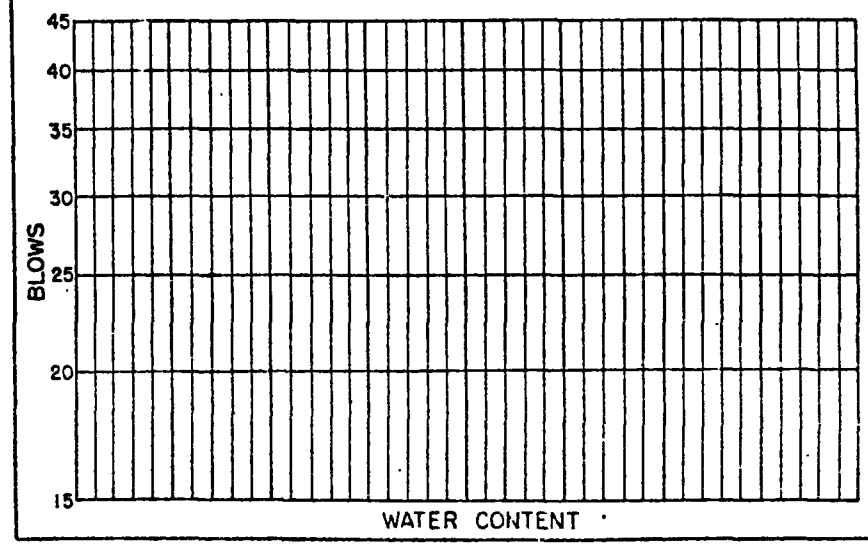
SIEVE ANALYSIS		% Passing 55.60	
		-40 19.29	99
-3/4		-80	
-4		-140	
-10 .21	100%	-200 36.1	65%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



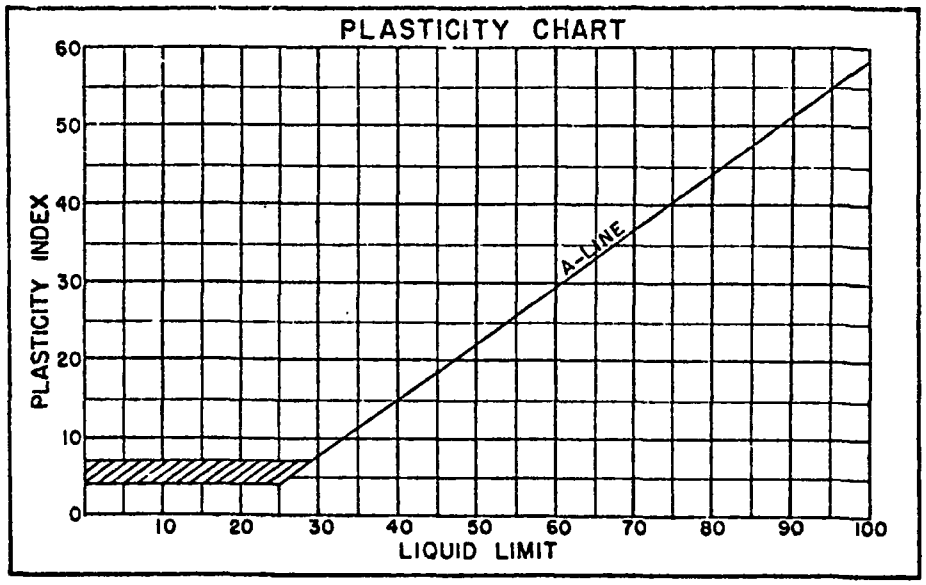
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4028 JOB NO. SR101 HOLE NO. J-46
DATE 24 JAN 83 OPERATOR RB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

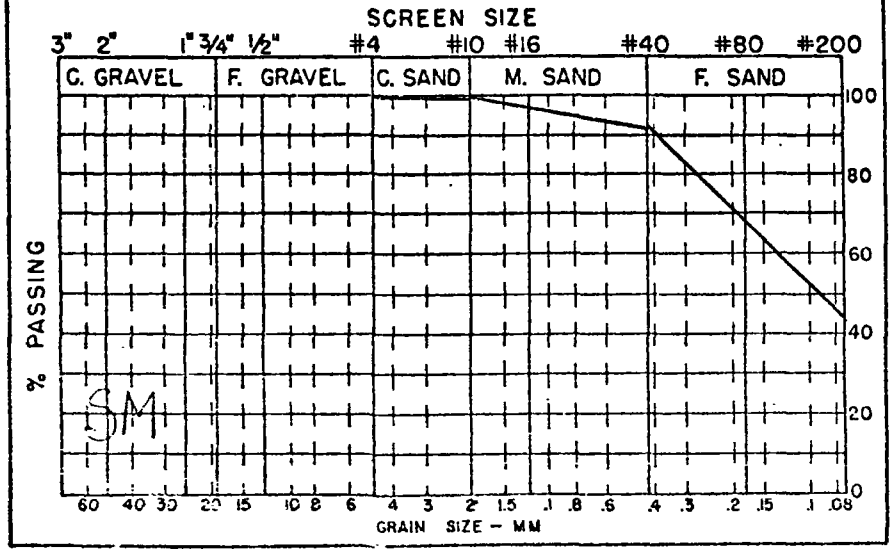
DESCRIPTION: WET Grey VSty FM SAND



$H_2O = 67\%$

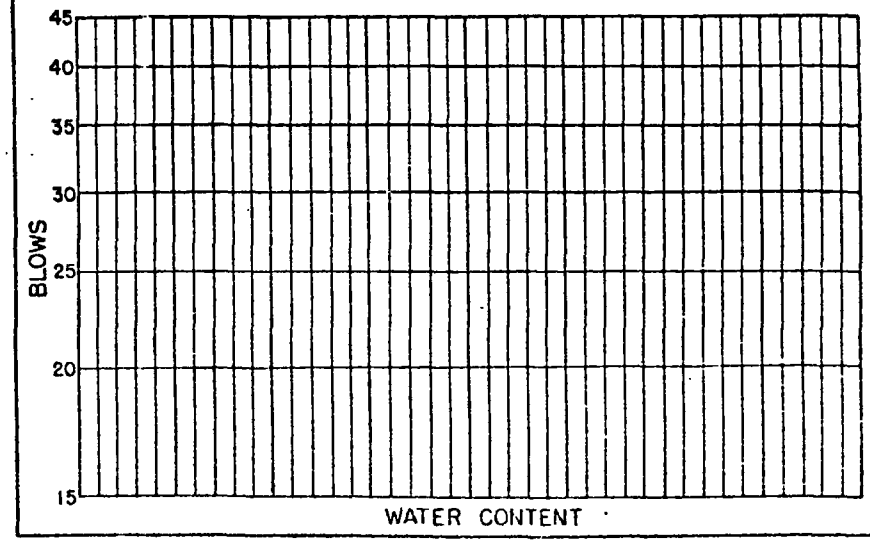
SIEVE ANALYSIS		% Passing 66.98		
			-40 31.68	91
-3/4			-80	
-4	0.09	100	-140	
-10	6.13	99	-200 27.08	43

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



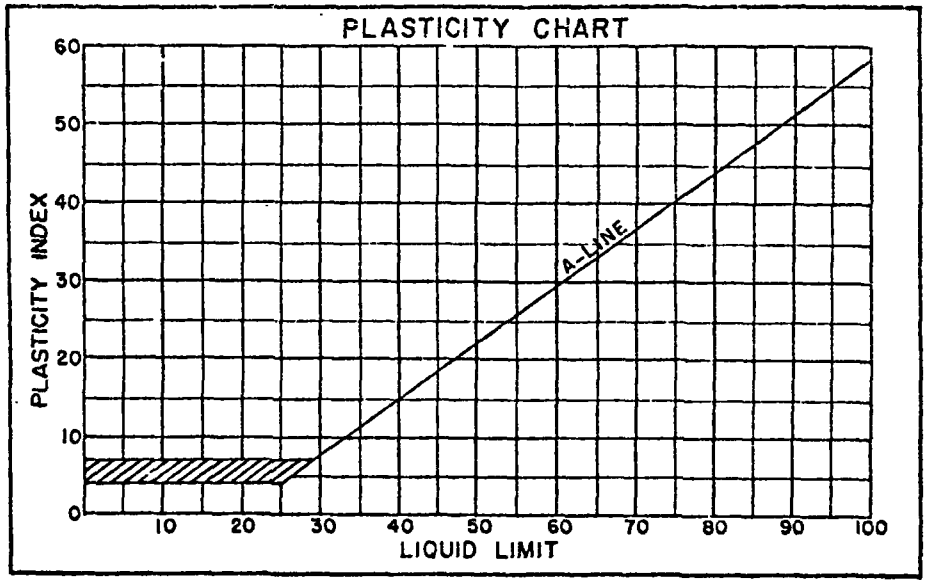
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4C34-1 JOB NO. Hcl. HOLE NO. 1-46
DATE 2-10-83 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Moist, layers of grt
Rust Sty. F-C SAND
embedded in F. gravel

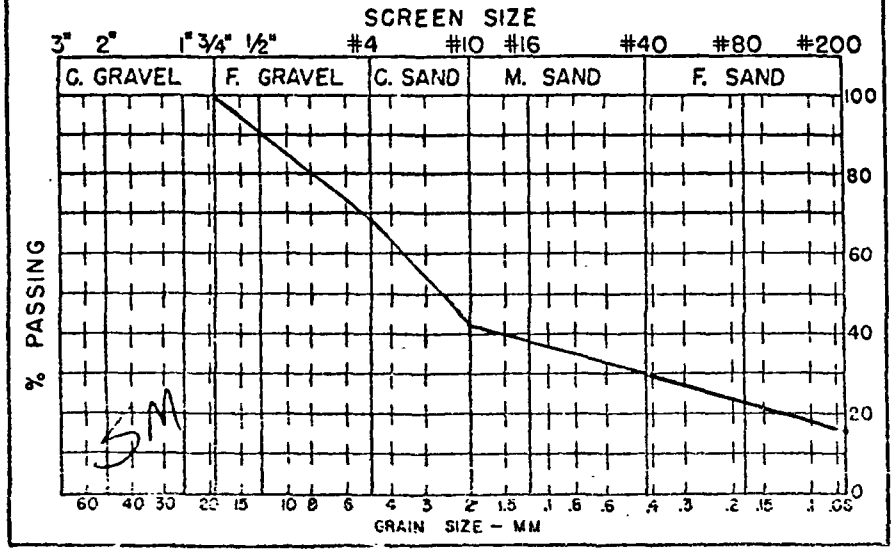


H2O = 11 %

SIEVE ANALYSIS % Passing 170.88

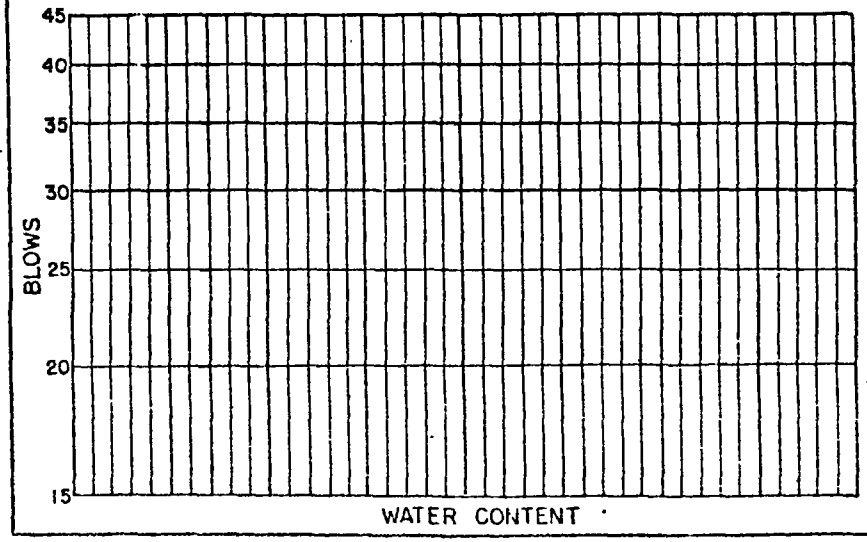
			-40	24.98	30%
-3/4	54.00	100	-80		
-4	42.62	68	-140		
-10	23.42	43	-200	25.86	15%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



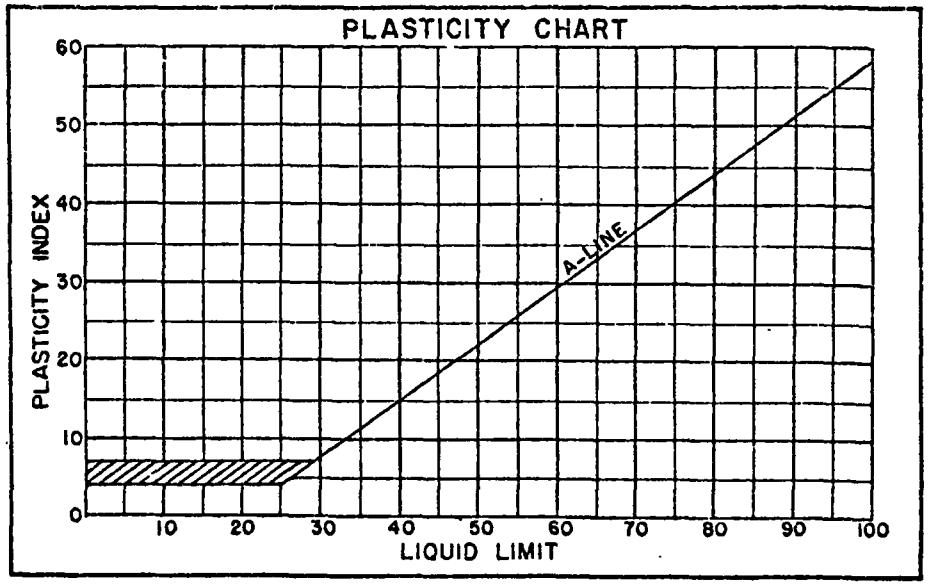
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4034-2 JOB NO. Hoy. HOLE NO. J. 46
DATE 2-10-83 OPERATOR GB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Moist, Gr., V. Sty. F. SAND

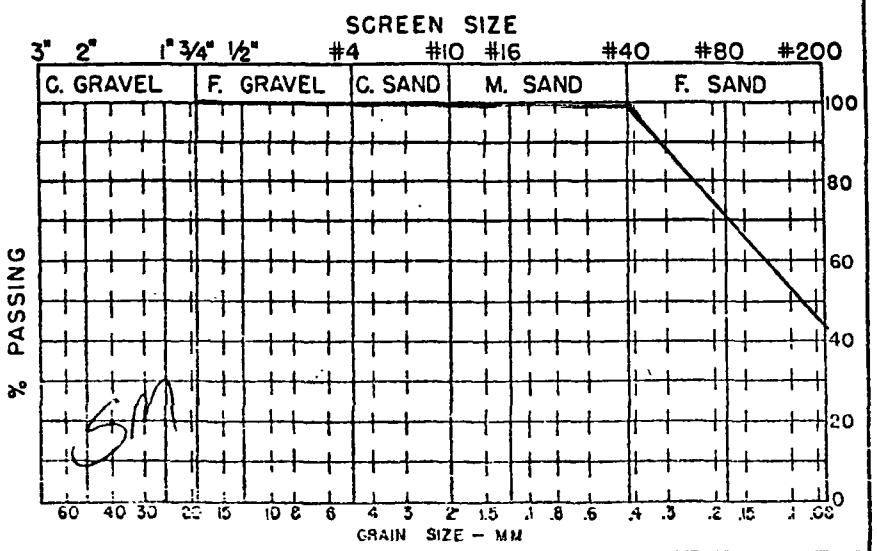


H_2O: 25%

SIEVE ANALYSIS % Passing 83.35

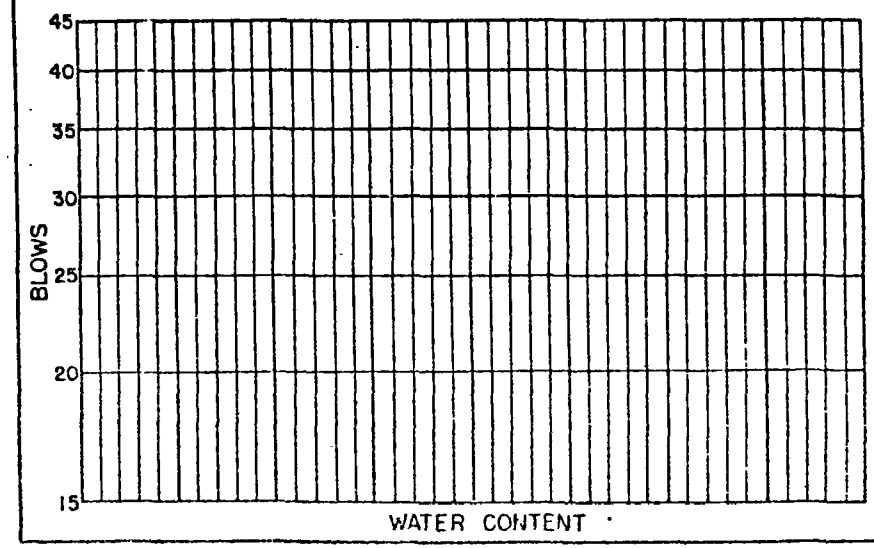
			-40	46.34	99
-3/4	.30	100	-80		
-4	.68	99.6	-140		
-10	.20	99	-200	35.83	43%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

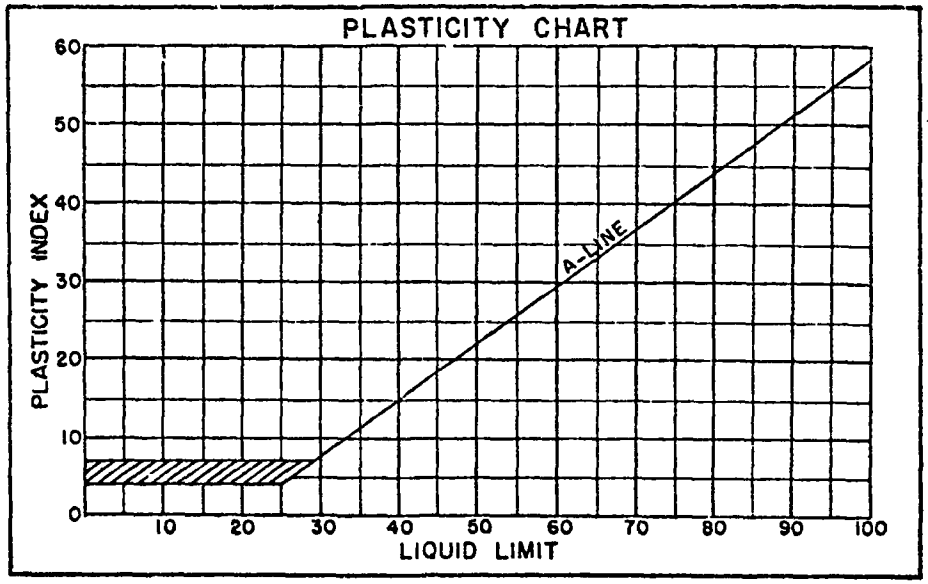
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4034-3 JOB NO. 408 HOLE NO. J-46
DATE 2-10-83 OPERATOR CB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST		✓	✓
DILATANCY			
BITE			
TOUGHNESS Dry.		✓	✓

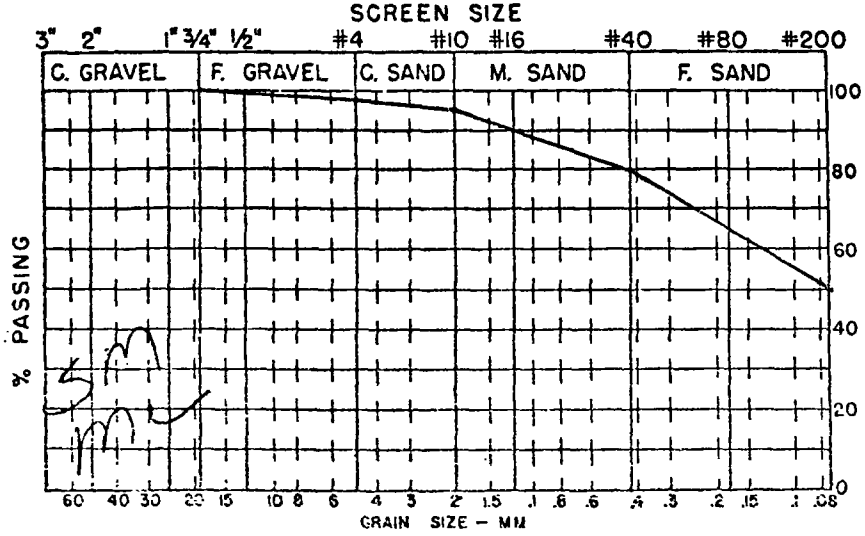
DESCRIPTION: wet, BLK, dk. Brn. & GR.
Bedded F. SAND & SILT
w/ t. Mica & org. Sticks.



H_2O = 53%

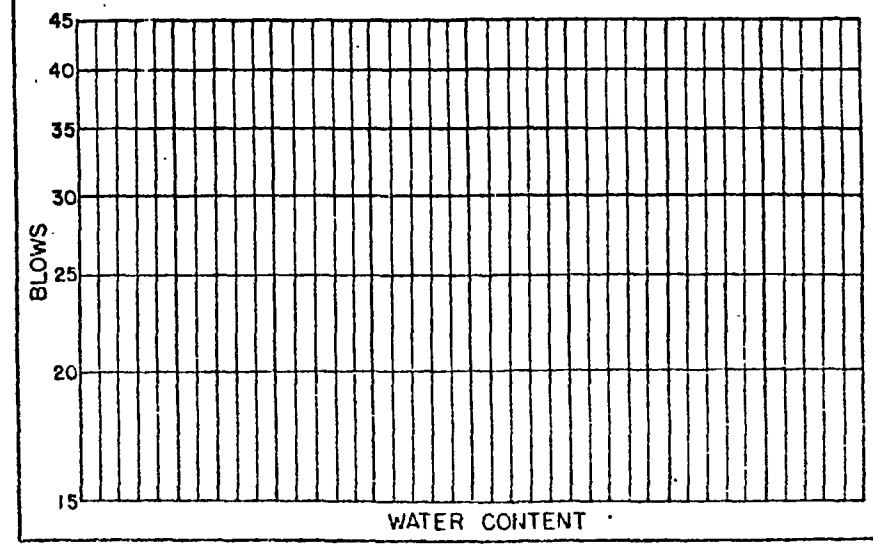
SIEVE ANALYSIS		% Passing			69.30
			-40	19.89	79
-¾	2.10	100%	-80		
-4	1.10	97	-140		
-10	1.48	95%	-200	34.73	50%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4034-5 JOB NO. Ref. HOLE NO. J-46
DATE 2-10-83 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS		✓ v. silty Sand	

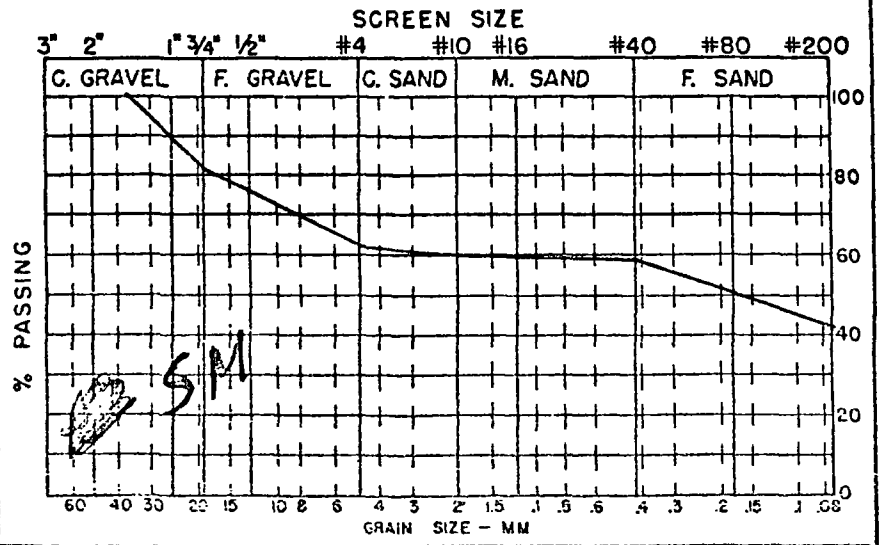
DESCRIPTION: Moist, GR[illegible] w/ F. GRAVELS & One 1" (+) Rock

H2O = 46.9%

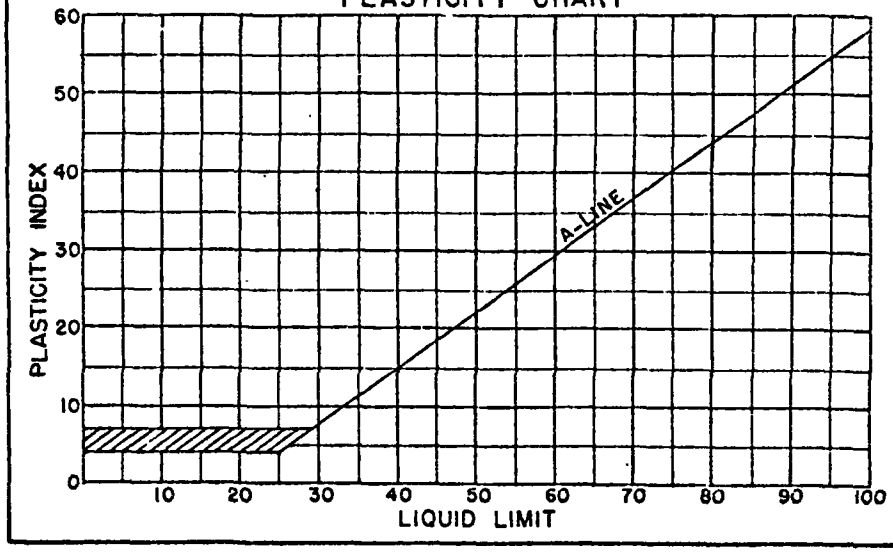
SIEVE ANALYSIS % Passing 120.16

1	1½ 23.25	100	-40 19.25	58%	
	-¾ 22.62	81	-80		
	-4 2.00	62	-140		
	-10 3.15	60	-200 49.89	42%	

GRAIN SIZE CURVE

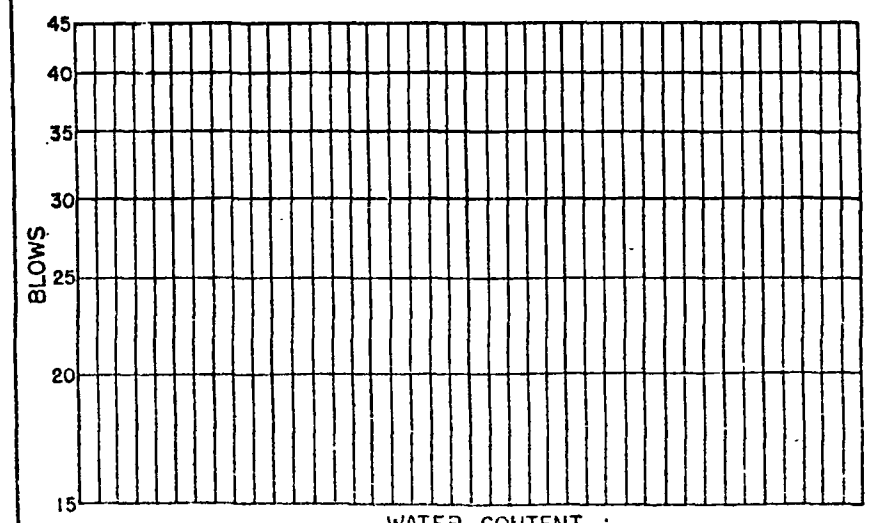


PLASTICITY CHART



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

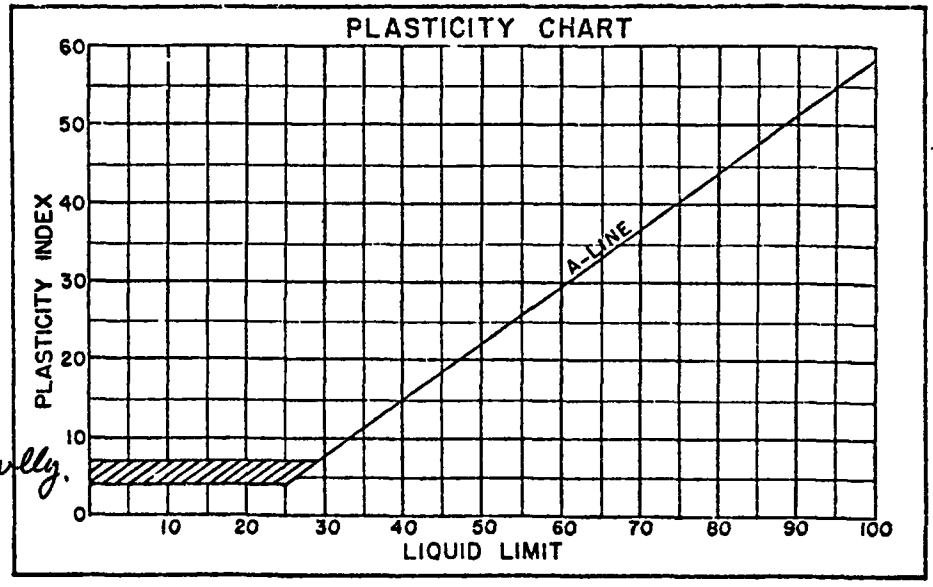
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4034-6 JOB NO. 46 HOLE NO. J-46
DATE 2-10-83 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Moist, Grn, outer w/gm. yellow gr & BLK. Insiac. mix. of SILTY, F gravelly. F-C SAND - Leopard Pattern

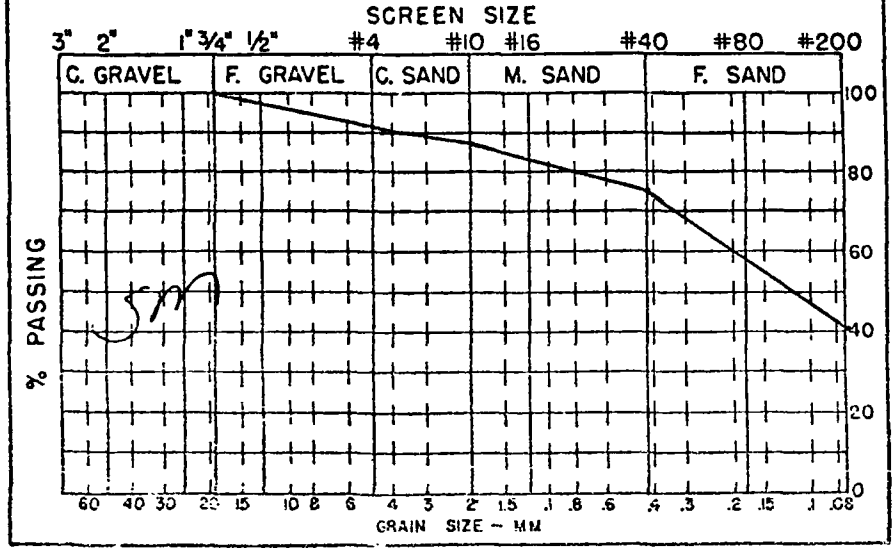


44%

SIEVE ANALYSIS % Passing 111.37

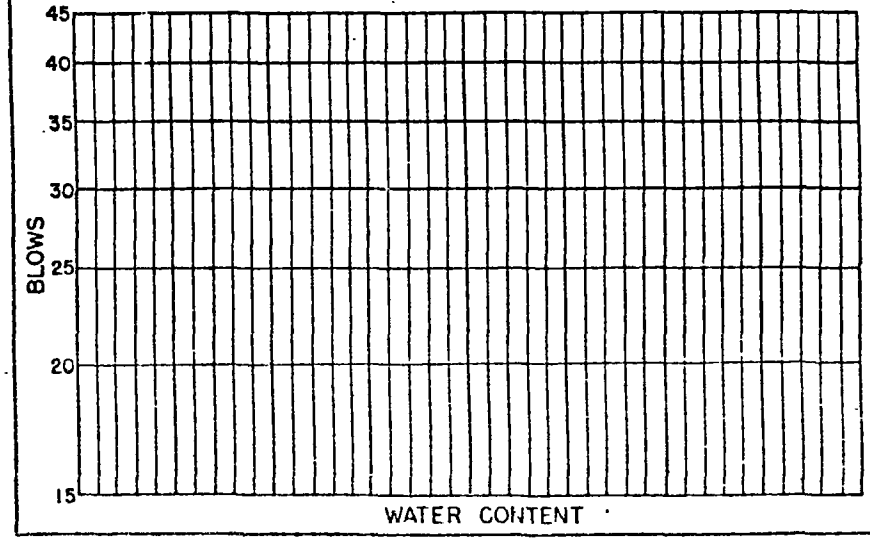
			-40	38.20	76
-3/4	9.76	100	-80		
-4	3.21	91	-140		
-10	14.20	88	-200	46	41%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater

Date 1-18-83

Dear Sir:

I have forwarded by today's State Car the following Foundation Samples.

Contract or Job No. L-7262 Section [illegible] Hoquiam to Pass
SR No. 101A Sub-Section [illegible]

Station & Offset 115+15 15' Lt.

Hole # J-47

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4071	U-1	[illegible]	B		
4072	D-2	3' [illegible] 4' [illegible]	H_2O = 363%	OL	SAT., dk. Brn., Sthly. organic SILT w/ stems, roots & branches & veg. m
4073 -1	U-3	[illegible] 6' 4"	A		
-2		6' 4" 6' 8"	B		
-3		6' 5" 7' 0"	C		
4074	D-4	8' 0" 10' 0"	118%	OL	Sat., dk. Brn. F. Sdy. SILT w/ org. mtr.
4075 -1	U-5	10' 0" 10' 4"	A		
-2		10' 4" 10' 5"	B		
4076	D-6	12' 0" 14' [illegible]	104%	OL	Moist, Brn. F. Sdy. SILT

1 copy with samples
1 copy to addressee

Yours very truly,

Inspector.

FORM 351-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place .....

Date 1-18-83

Dear Sir:

I have forwarded by today's ..... the following Foundation Samples.

Contract or Job No. L7262 Section ..... SR No. 1-1A Sub-Section .....

Station & Offset _____ Hole # J-47

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4077 -1	U-7	14' 4"	A		
-2		15' 5"	B		
-3		17' 0"	C		
4078	D-8	17' 0"	1042	OL	Like 4076 Moist, Brn. F. Sdy. SILT w/ WOOD PIECES
4079 -1	U-9	4	A		
-2		5' 6"	B		
4080	D-10	9' 0"		OL	Like 4078
4081 -1	U-11	4	A		
-2		23' 5"	B		

1 copy with samples
1 copy to addressee

Yours very truly,

.....
Inspector.

FORM 351-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place .....

Date 1-18-83

Dear Sir:

I have forwarded by today's ..... the following Foundation Samples.

Contract or Job No. L 7262 Section ..... SR No. L N/A Sub-Section .....

Station & Offset _____ Hole # J-47

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4081 -3	U-11	23' 8" 26' 0"	C		
4082 -1	D-12-A	27' 0" 29' 0"		OL	Like 4076 moist, Brn. F. Sdy. SILT w/ twigs & wood
-2	D-12-B	29' 0" 27' 0"	H_2O: 48%	SM	Moist, Brn-gr. v. Sty. F. SAND w/ t. med. sand
4083 -1	U-13	30' 0" 30' 4"	A		
-2		30' 4" 30' 8"	B		
-3		30' 8" 31' 0"	C		
4084	D-14	34' 0" 34' 0"	91%	OL	Moist-Sat. SILT w/ org. fibers & sticks.
4085 -1	U-15	35' 0" 35' 4"	A		
-2		35' 4" 35' 8"	B		

1 copy with samples
1 copy to addressee

Yours very truly,

.....
Inspector.

DOT FORM 351-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place .....

Date 1-18-83

Dear Sir:

I have forwarded by today's ..... the following Foundation Samples.

Contract or Job No. L-7262 Section ..... SR No. 101A Sub-Section .....

Station & Offset _____ Hole # J-47

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4085 -3	U-15	35' 8" 36' 0"	C		
-4		36' 0" 36' 4"	D		
4086 -1	D-16	37' 0" 39' 0"	48%	SM	Like 4082-2 Moist, Gr., V. Sty. F. SAND w/t. med. sand
-2	D-17	40' 0" 42' 0"	No Recovey.		
-3	D-18	45' 0" 47' 0"		SM	Like 4086-1 w/ strong org. odor
-4	D-19	51' 0" 52' 6"	32%	ML	Moist, Gr. F. Sdy. SILT
-5	D-20	55' 0" 56' 6"		ML	Same
-6	D-21	60' 0" [illegible]	38%	MH	Moist, Gr. w/tan streaks, Cly. F. Sdy. SILT w/streaks of tan SILT.
-7	D-22	65' 0" [illegible]		MH	Same w/t. mica

1 copy with samples
1 copy to addressee

Yours very truly,

.....
Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place .....

Date 1-18-83

Dear Sir:

I have forwarded by today's ..... the following Foundation Samples.

Contract or Job No. L-7262 Section ..... SR No. 101A Sub-Section .....

Station & Offset _____ Hole # J-47

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4086-8	D-23	70' 0" 71' 6"	H/W: 44%	SM	moist, grn. outer w/grn., yellow, gr. & BLK Insiac mix. of Stg. F. grav. F-C SAND Leonard Patter

1 copy with samples
1 copy to addressee

Yours very truly,

Larry M Moore
Inspector.

DOT FORM 351-002 REVISED 2/80

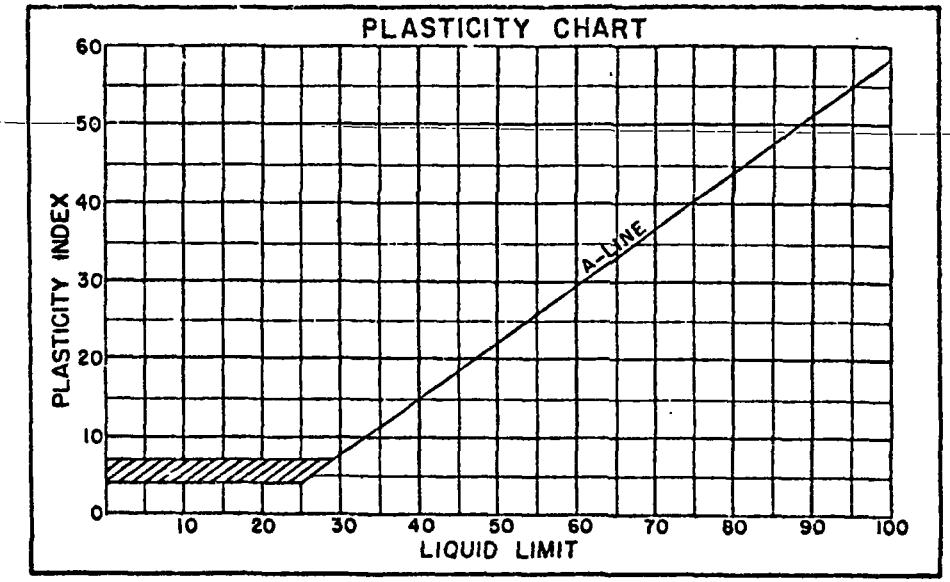
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4082-2 JOB NO. Hoy HOLE NO. Jm1
DATE 2-10-83 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE	✓	✓	
TOUGHNESS			

DESCRIPTION: Moist, Brn-gr. V., Sty. F SAND w/t. med. sand

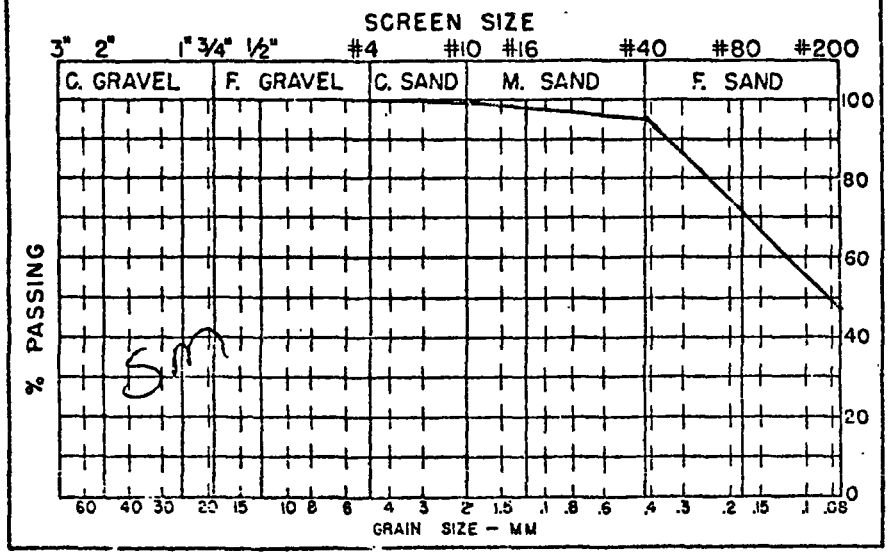


H_2O = 48%

SIEVE ANALYSIS % Passing 52.42

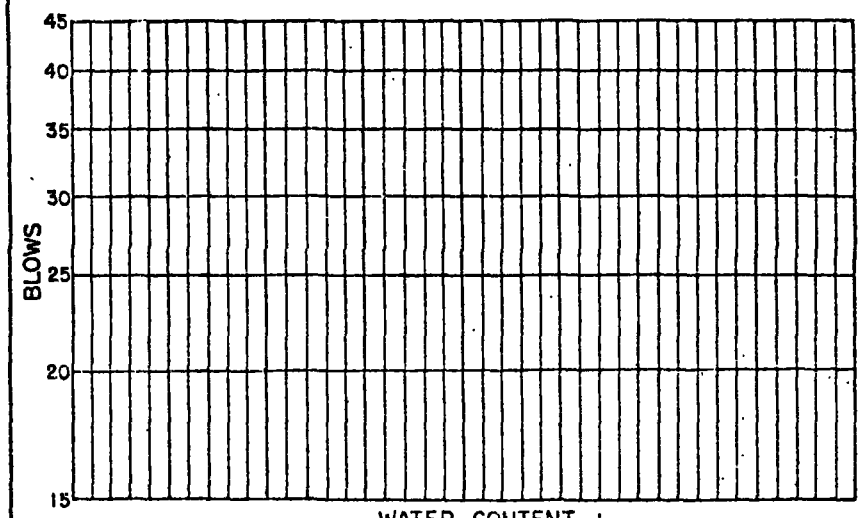
			-40	24.85	95
-3/4			-80		
-4	.35	100	-140		
-10	2.50	99	-200	24.72	47

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

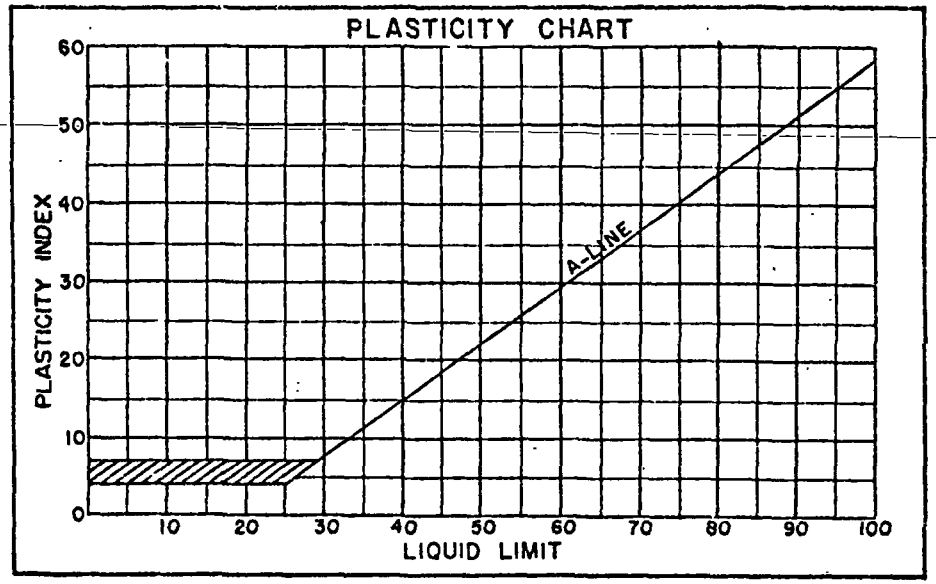
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4074 JOB NO. Hoj HOLE NO. J-47
DATE 2-10-83 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE		✓	
TOUGHNESS	✓	✓	

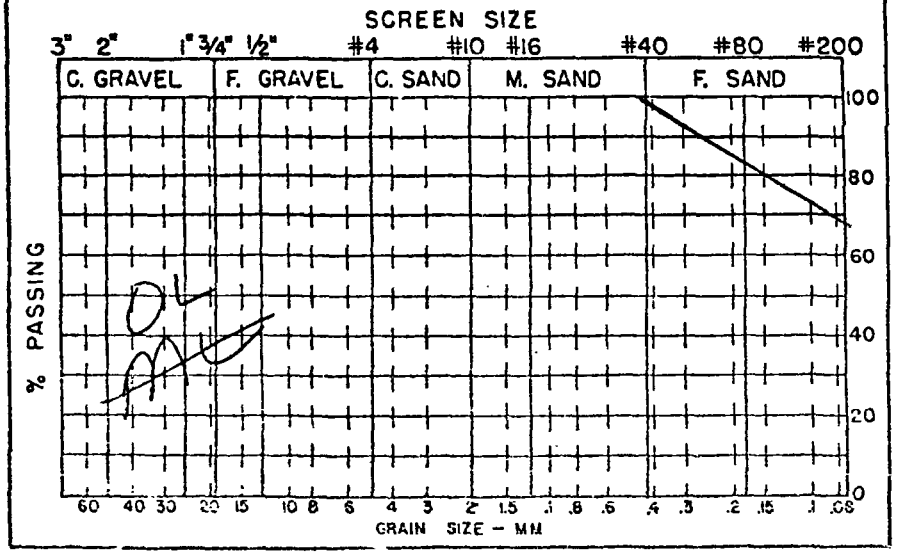
DESCRIPTION: Sat, dk. Brn. F. Sdy. SILT w/ org. Mtr.



$H_2O = 118\%$

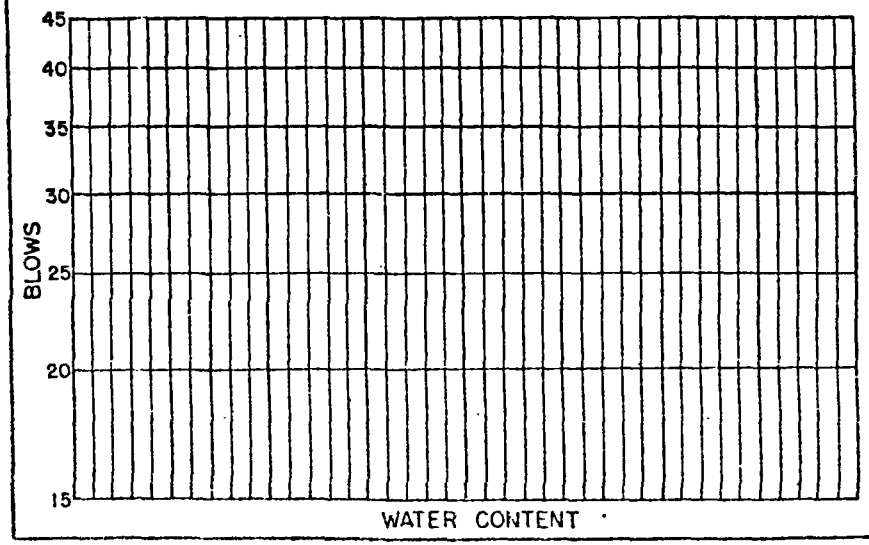
SIEVE ANALYSIS	% Passing 32.55	
	-40 10.40	100%
-3/4	-80	
-4	-140	
-10	-200 22.15	68%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

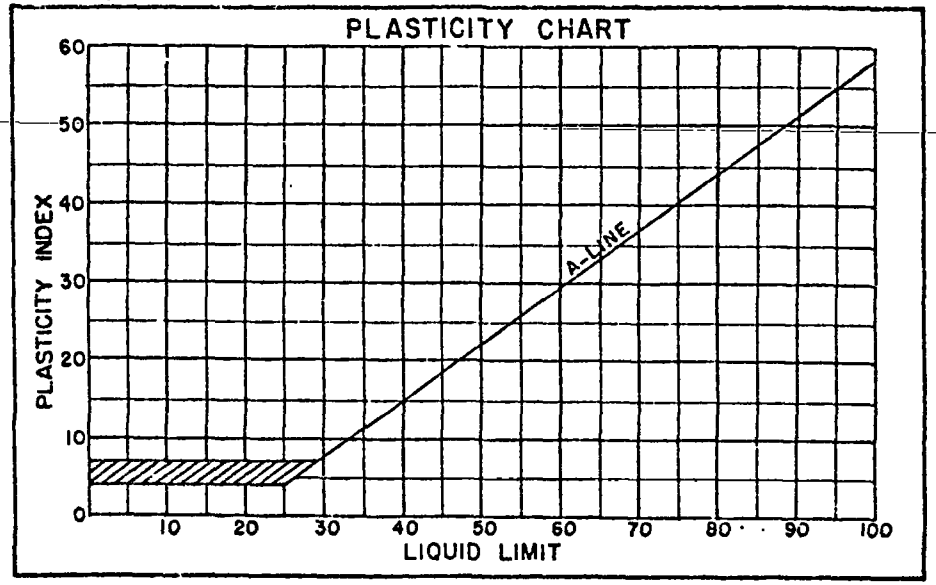
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4072 JOB NO. 400. HOLE NO. J-47
DATE 2-10-83 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: Sat, Dk. Brn. Sty.
ORGANIC Stems, Roots, & Branches
PEAT



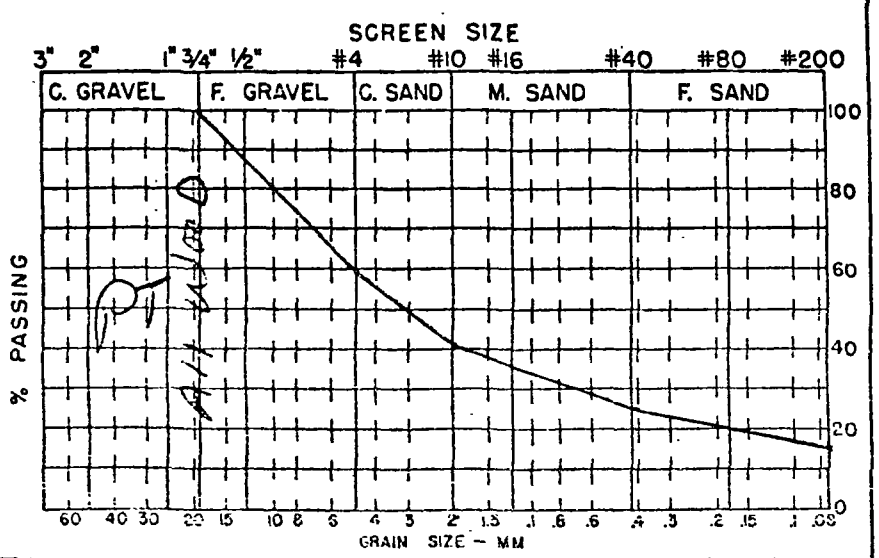
$H_2 = 36.3\%$

SIEVE ANALYSIS

% Passing 23.65

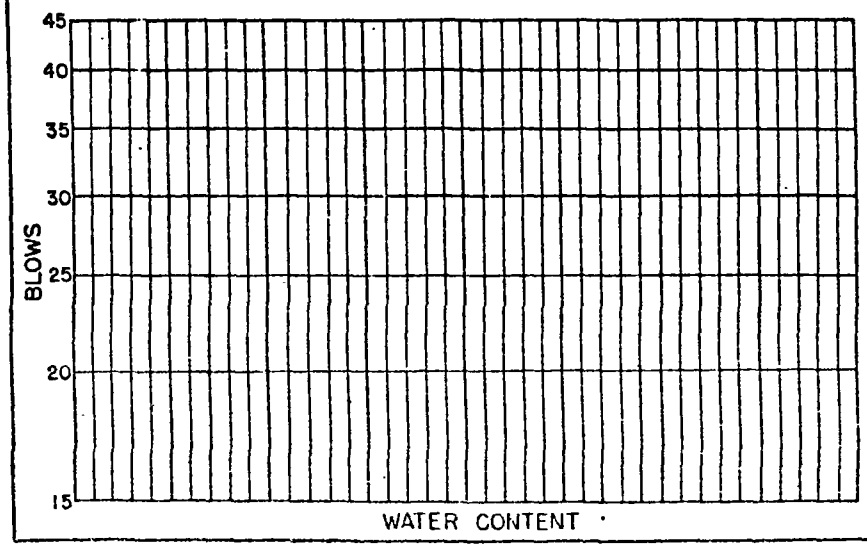
			-40	50	26%
All wood	3/4	9.77	100	-80	
	-4	4.30	59	-140	
	-10	3.49	41	-200 3.59	15%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

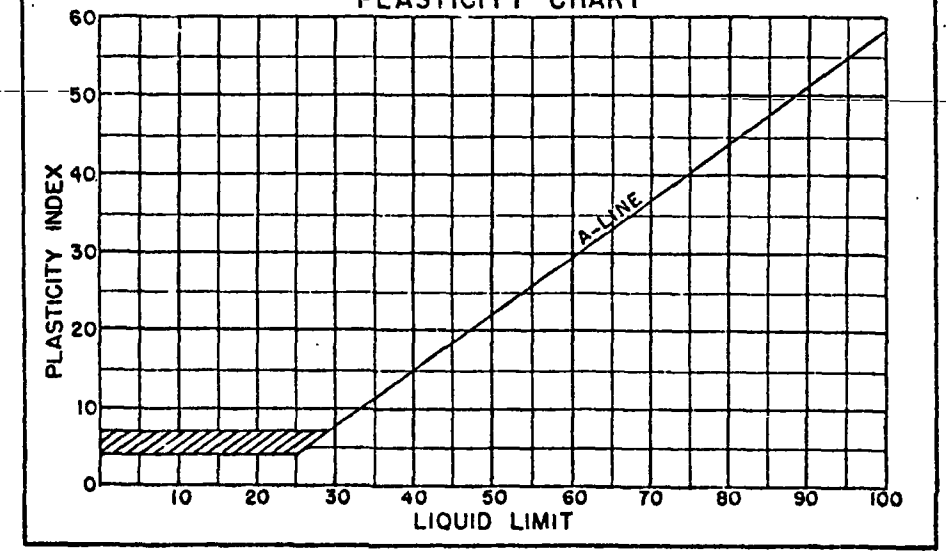
SAMPLE NO. 4076 JOB NO. Hof. HOLE NO. J-47
DATE 2-10-83 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: Moist, Brn. F. Sdy. SILT

PLASTICITY CHART

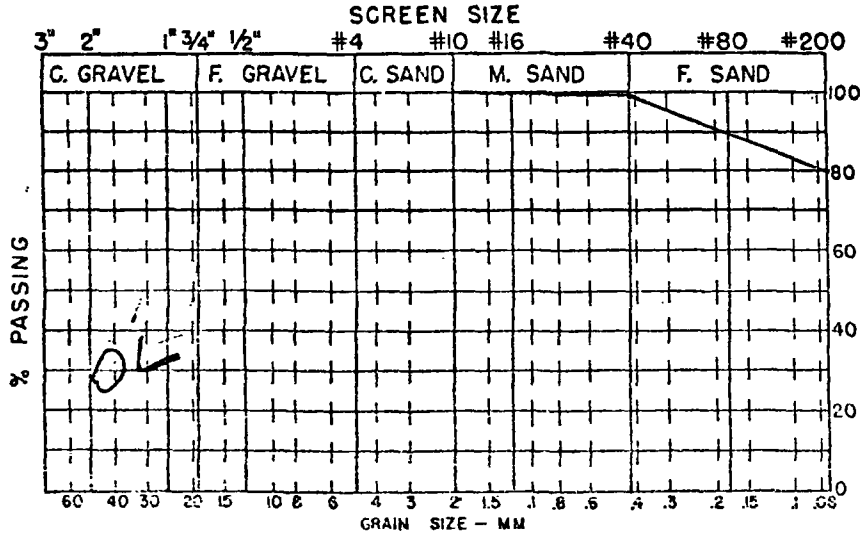


H_2O = 104 %

SIEVE ANALYSIS % Passing 54.03

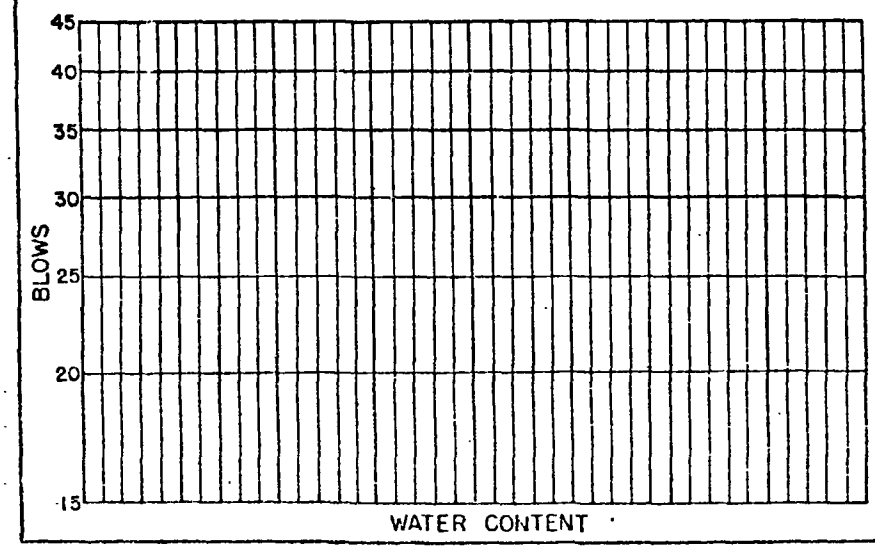
			-40	10.78	99
-¾			-80		
-4			-140		
-10	.05	100%	-200	43.20	80

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

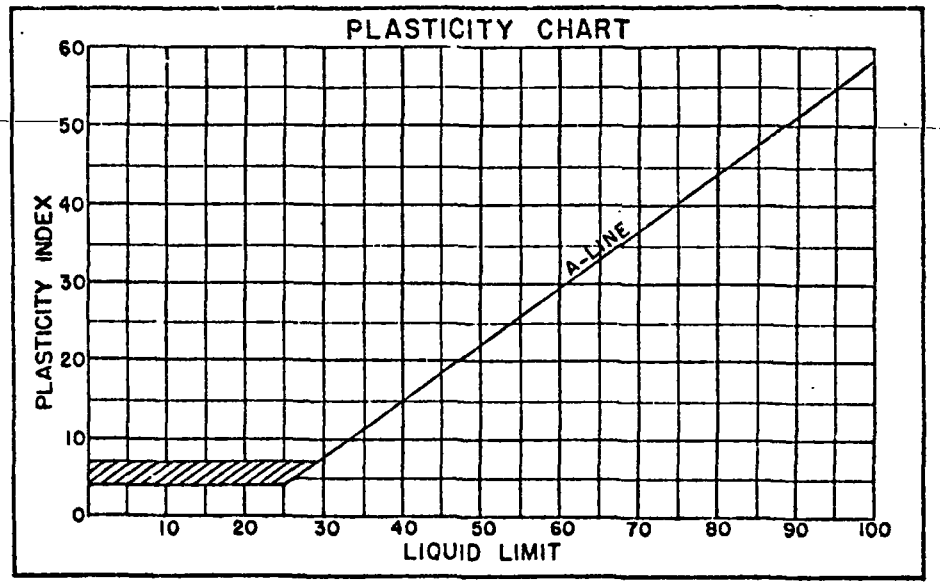
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4084 JOB NO. 4b8. HOLE NO. 1-47
DATE 2-10-83 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: M-Sat. Silt w/ Org. fibers & sticks

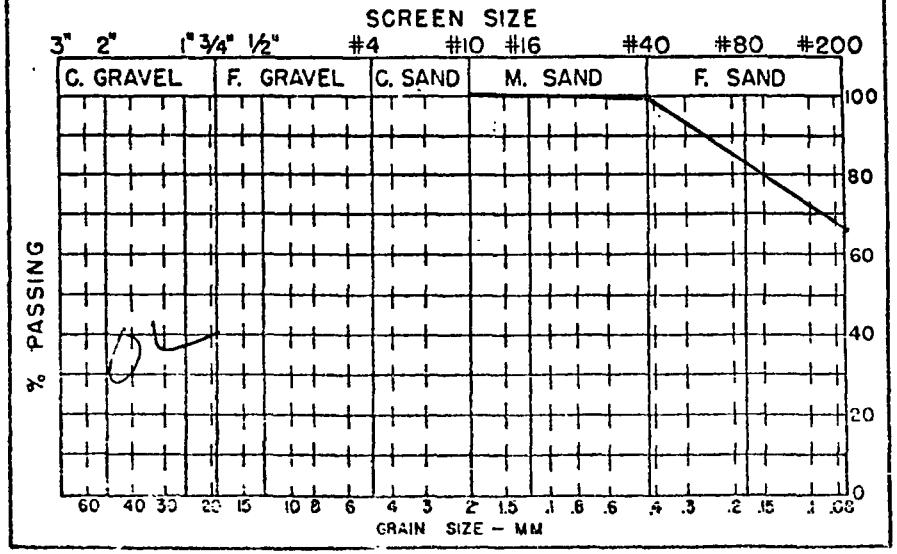


H20: 91%

SIEVE ANALYSIS % Passing 47.73

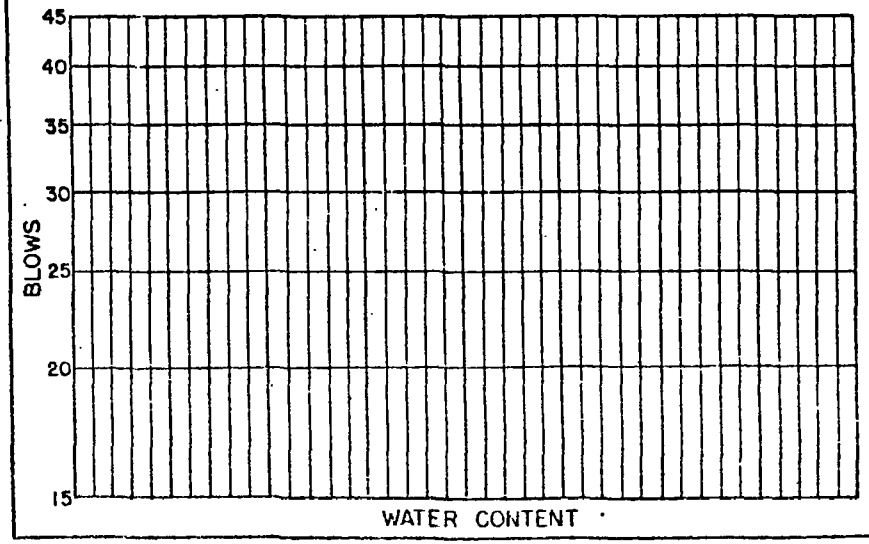
		-40	16.15 99.7
-3/4		-80	
-4		-140	
-10	110 100%	-200	31.48 66%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

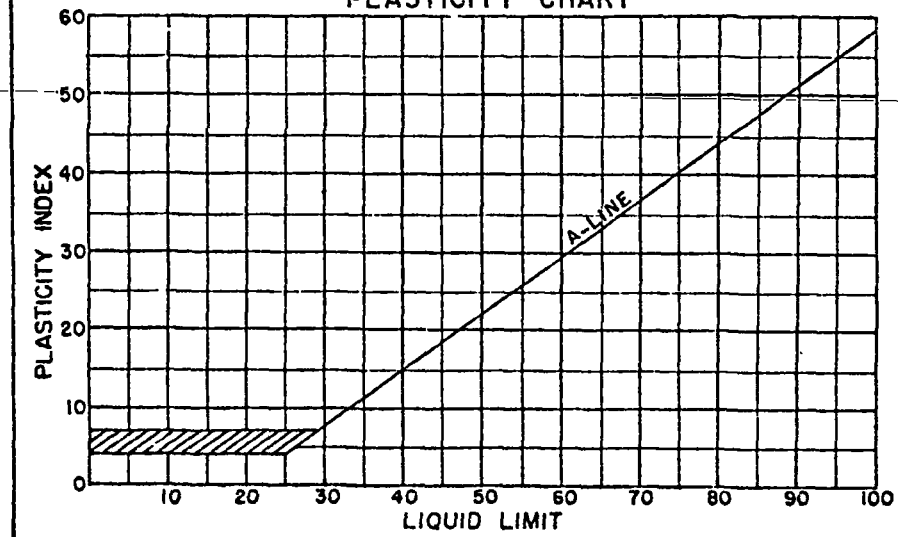
SAMPLE NO. 4086-4 JOB NO. Hag. HOLE NO. 147
DATE 2-10-83 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Moist, Gr. F. Sdy. SILT

PLASTICITY CHART



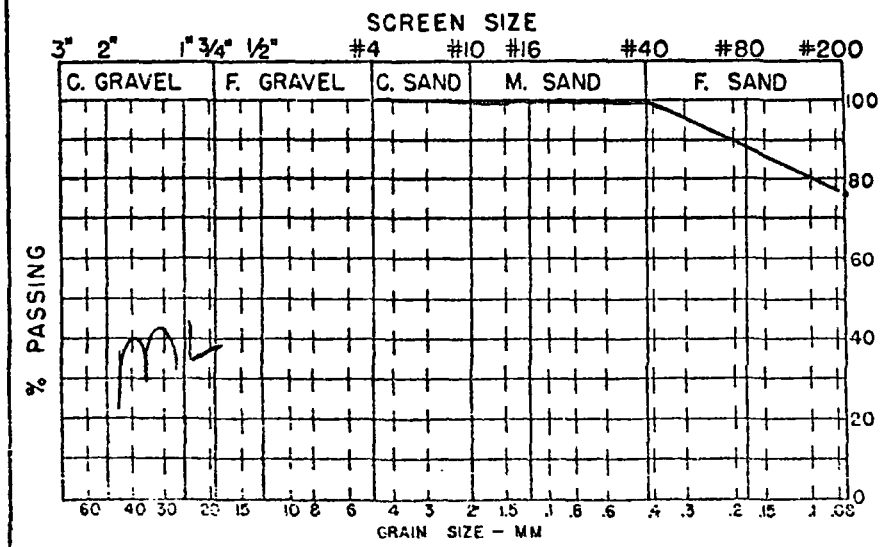
$H_2O = 32\%$

SIEVE ANALYSIS

% Passing 83.88

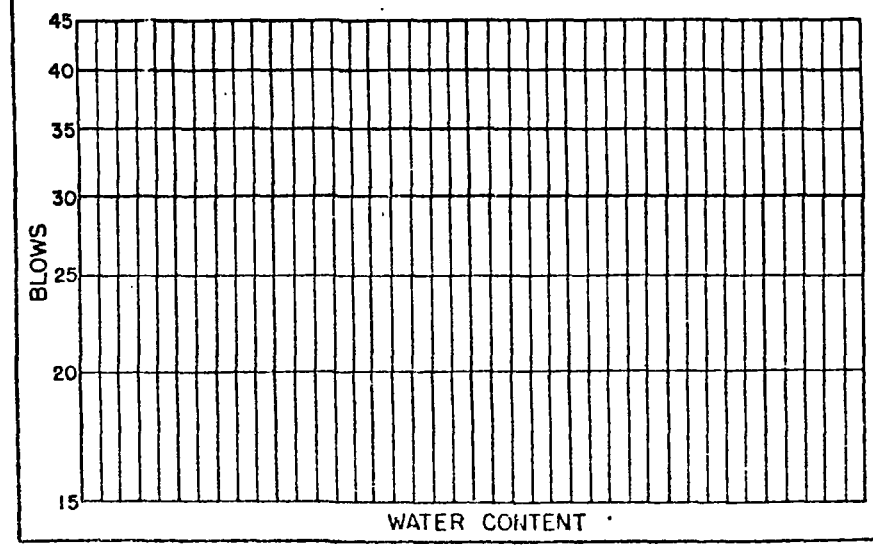
			-40	19.20	99%
-3/4			-80		
-4	.05	100%	-140		
-10	.42	99%	-200	64.21	77%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



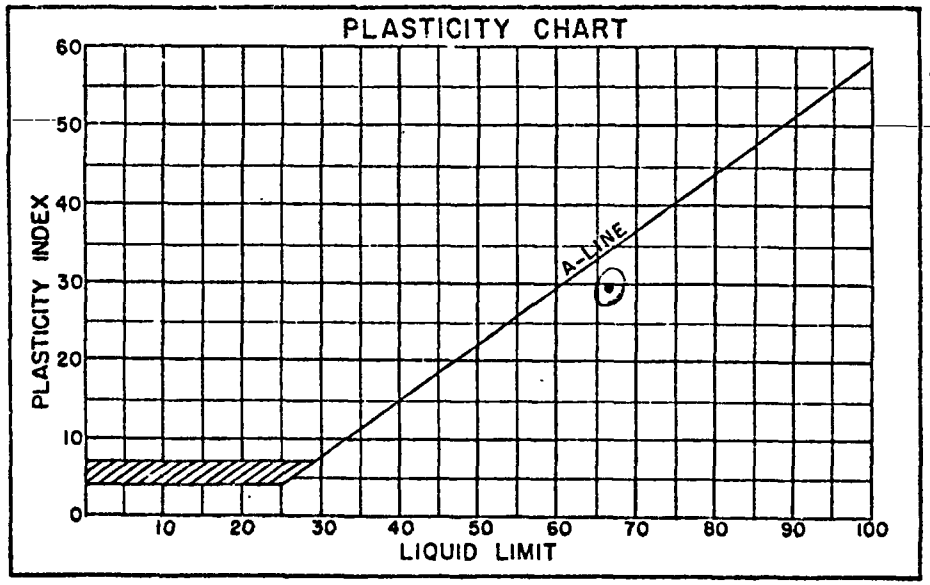
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4086-6 JOB NO. Hoz. HOLE NO. J-47
DATE 2-8-83 OPERATOR BB

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	✓

DESCRIPTION: Moist, Gr w/ tan streaks clay, F. Sdy. SILT w/ streaks of tan silt.

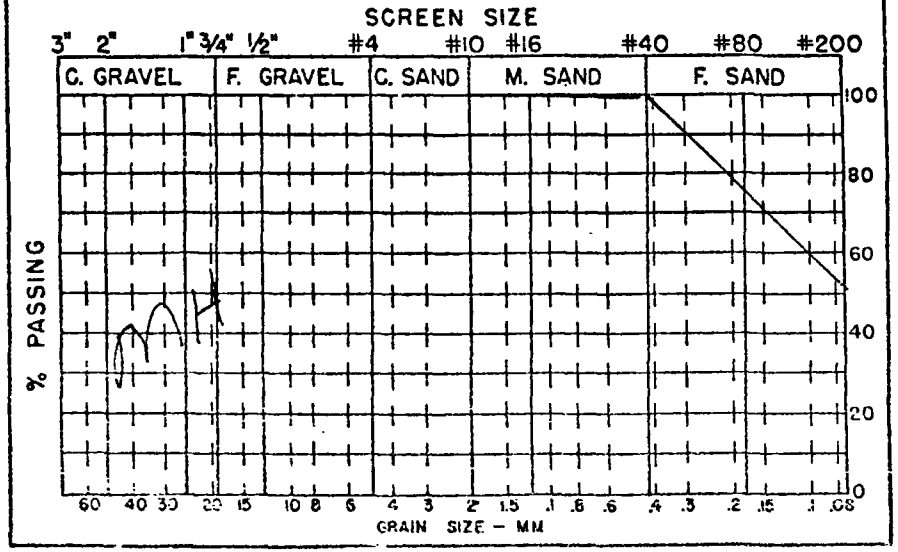


H_2O - 38%

SIEVE ANALYSIS % Passing 92.88

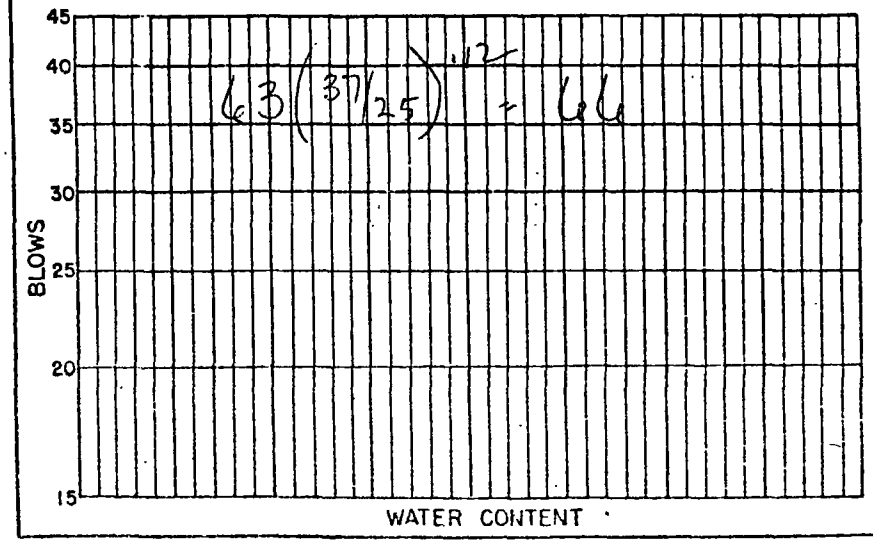
			-40	43.70	99
-3/4			-80		
-4			-140		
-10	.50	100%	-200	47.95	52%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	118				60
Wet Wt.	11.06				6.17
Dry Wt.	6.79				4.51
% H_2O	63%				PL= 37%
Blows	37				PI= 29



$63\left(\frac{37}{25}\right)^{.12} = 66$

DOT FORM 351-019

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place .....

Date .....

Dear Sir:

I have forwarded by today's ....rail cart.... the following Foundation Samples.

Contract or Job No. ....7262.... Section ....West Hayward by Ross.... SR No. ....191 A.... Sub-Section ....Fill cut....

Station & Offset ....177+40 36 Lt.... Hole # ....J-4-7....

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4275 -1	D-1	0' 0" – 2' 0"		ML	Like 4259-1 M, Gr. (Inside) Brn. (out) F. Sdy. Silt w/ org. mtr. & t. mica + twigs & leaves
-2	D-3	6' 0" – 7' 6"		SM	Like 4274-5 M, orange, Rust & Brn., some Alternating Colors of Sty. F-M Sand w/ mica
-3	D-4	9' 0" – 11' 0"	19%	SM	(Dry Looking) Moist Gr-Brn. w/ rust outside, V. Sty. F. Sand
-4	D-5	14' 0" – 14' 6"		SM	Like 4275-3 only GRN & GR.

1 copy with samples
1 copy to addressee

Yours very truly,

Gary M Moore
Inspector.

DOT FORM 351-002 REVISED 2/80

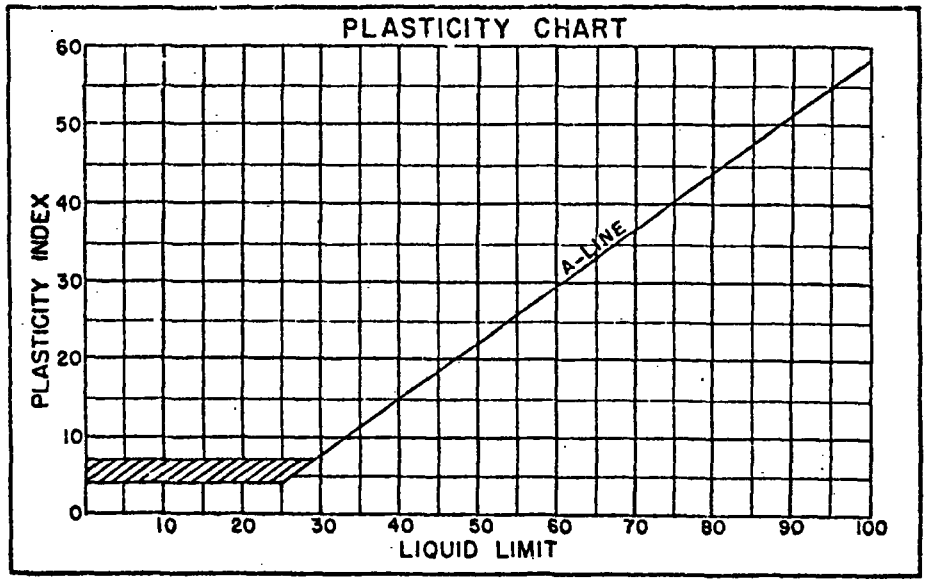
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4275-3 JOB NO. ~~Hz.~~ HOLE NO. J-49
DATE 5-6-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

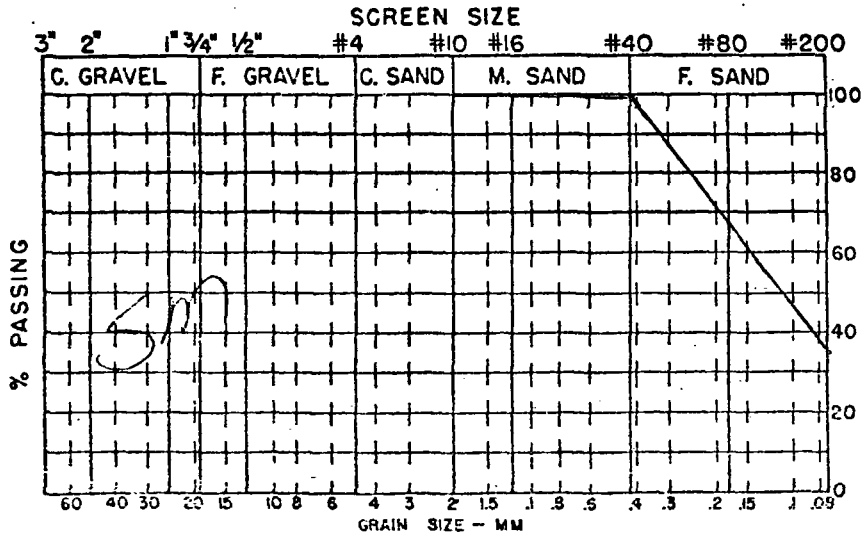
DESCRIPTION: (Dry Looking) Moist, Gr-Brn. w/ rust Qrt. V. Sty. F. SAND



W= 34.23 D= 28.69 H_2O= 19%

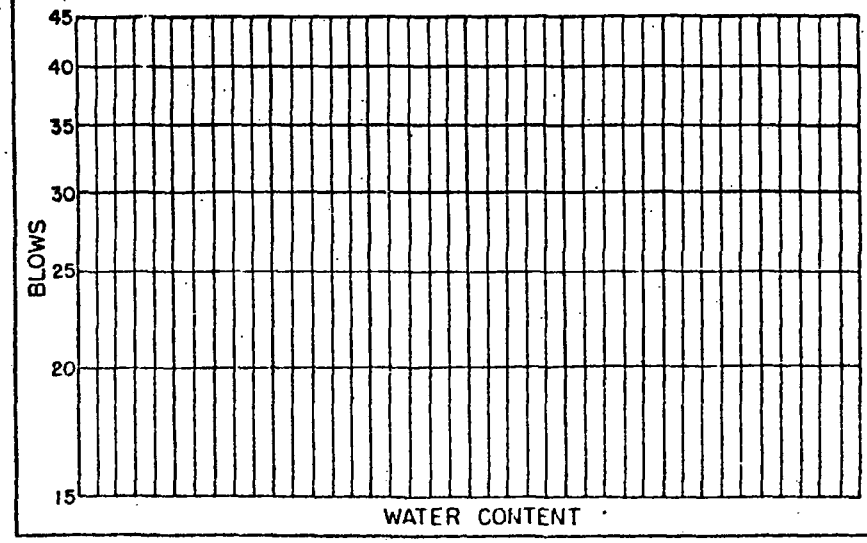
SIEVE ANALYSIS		% Passing 95.25	
	-40	62.00	79
-3/4	-80		
-4	-140		
-10 .29 100	-200	32.96	35%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 3-8-83

Dear Sir:

I have forwarded by today's state car the following Foundation Samples.

Contract or Job No. L-7262 Section West Hoquiam Ly Pass
SR No. 101A Sub-Section Culvert

Station & Offset 177+40 17' Rt. Hole # T-50

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4274 -1	D-1	0' 0" / 2' 0"	223%	SM	M, dk. Brn. hly. ORG. V. Sty. F. SAND
-2	D-3	6' 0" / 8' 0"	41%	SM	M, Gr-Brn., V. Sty. F. SAND w/t. org. mtr. & mica
-3	D-5	10' 0" / 12' 0"	150%	SM	M, Blk., dk. Brn. hly. org., V. Sty. F-M SAND w/ Stems, hairs & Lg. chunk wood
	D-6	14 / 16' 0"	NOT Delivered		
-4	D-7	19' 0" / 21' 0"		SM	Like 4274-2
-5	D-8	24' 0" / 25' 4"	17%	SM	M, orange, rust & Brn., some Alternating colors of Sty. F-M SAND w/mica

1 copy with samples
1 copy to addressee

Yours very truly,

Inspector

DOT FORM 351-002 REVISED 2/80

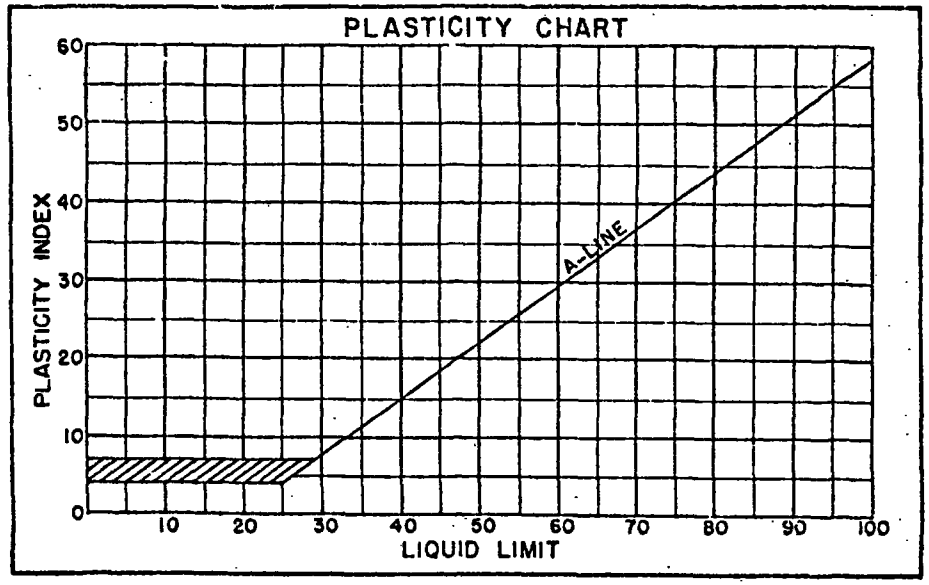
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4274-1 JOB NO. 469. HOLE NO. 50
DATE 5-6-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: M. dk. Brn. Hly. ORG.
V. Sty. F. SAND

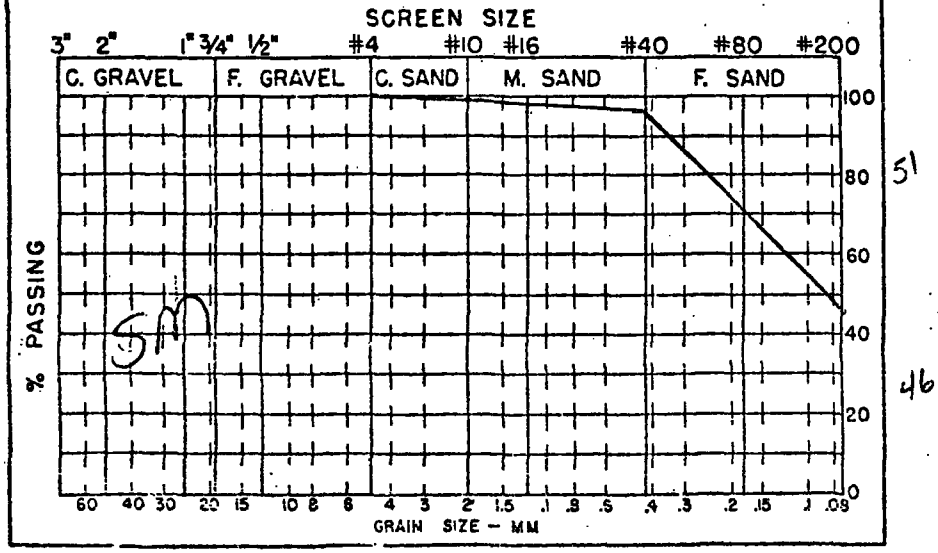


W=29.70 D=9.20 H_{20} = 22390

SIEVE ANALYSIS % Passing 27.95

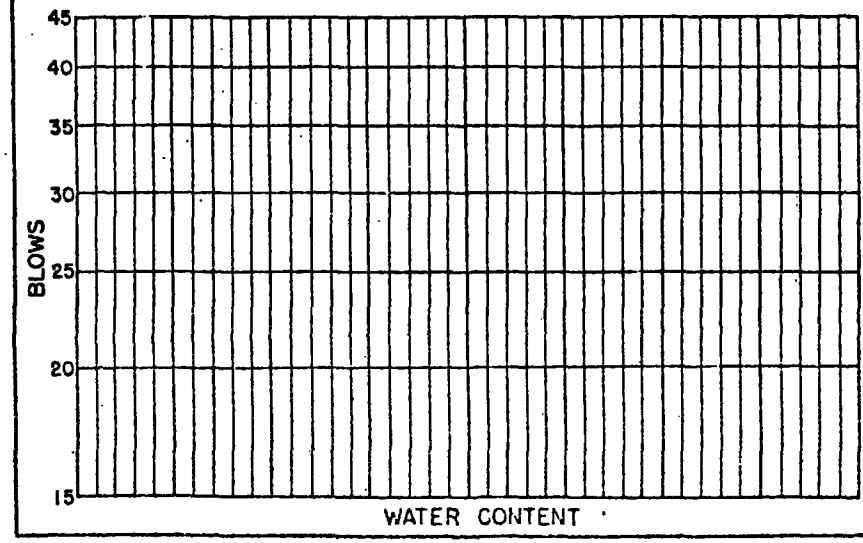
			-40	14.37	97%
-3/4			-80		
-4	.02	100	-140		
-10	.60	99	-200	12.96	46%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

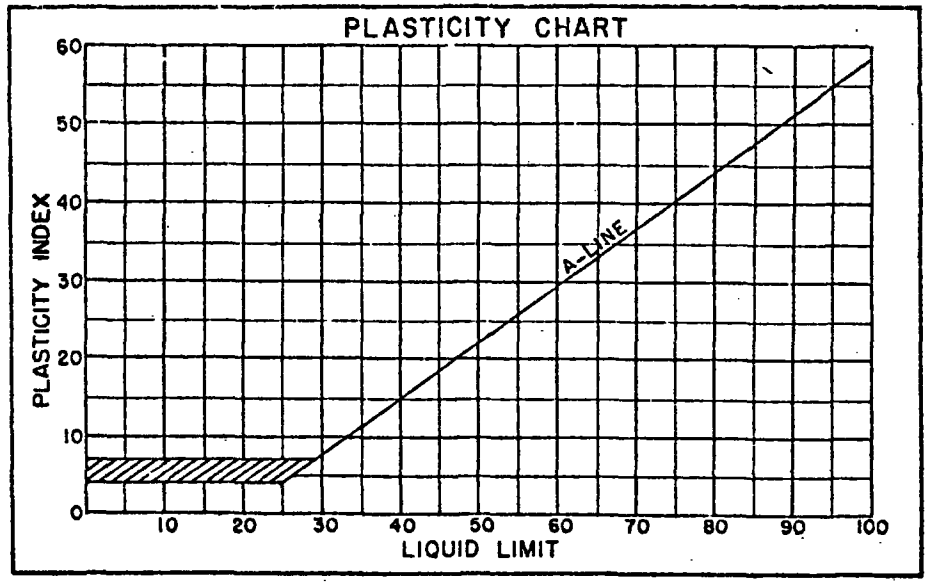
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4274-2 JOB NO. Hog. HOLE NO. 50
DATE 5-6-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: M, Gr- Brn. V. Sty. F. SAND w/ + org. mtr. & mica



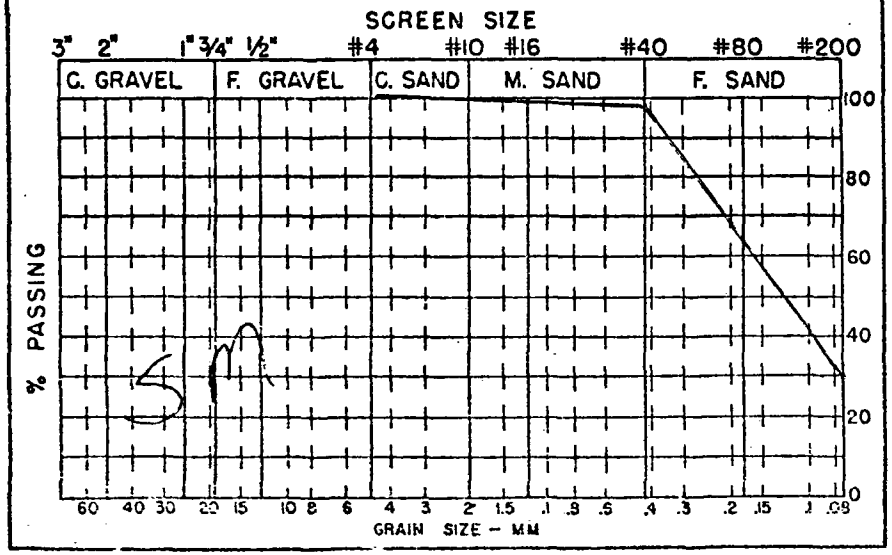
W= 21.05 D= 14.88 H_2O= 41%

SIEVE ANALYSIS % Passing 42.38

			-40	29.45	98
-3/4			-80		
-4	.07	100	-140		
-10	.50	99	-200	12.36	29%

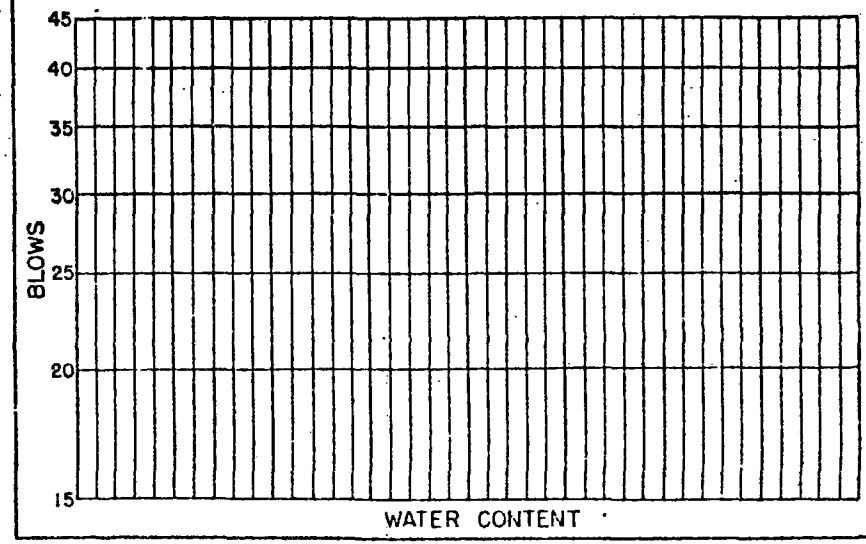
2019 pieces

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

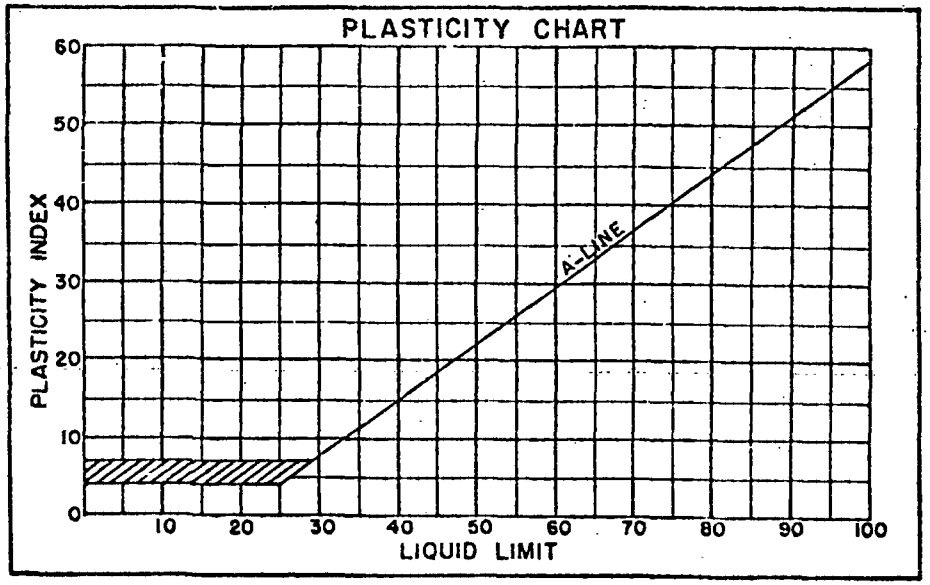
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4274-3 JOB NO. Hog. HOLE NO. 50
DATE 5-6-83 OPERATOR Bc

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: M, Blk.-dk. Brn. hly. Org. V. Sty. F-M SAND w/ Stems, hairs & Lg. Chunk of wood

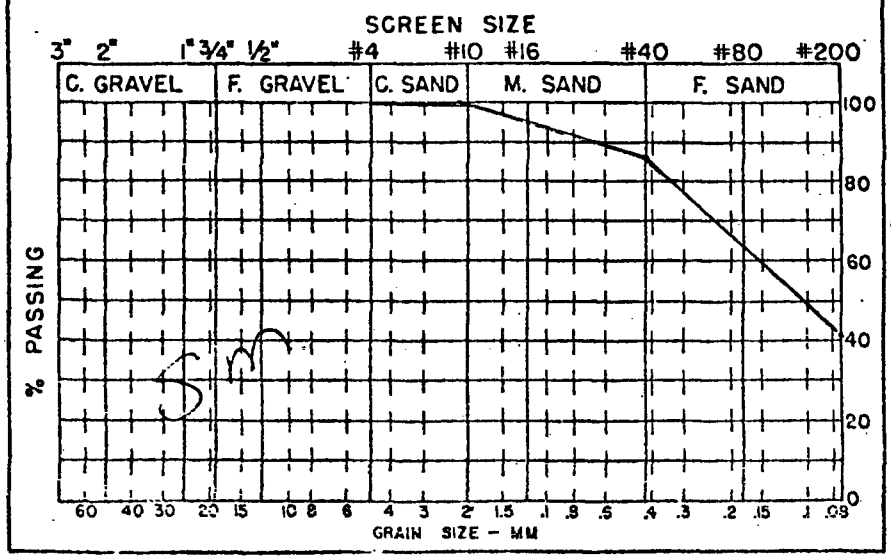


W = 30.03 D = 12.03 H_{2O} = 150%

SIEVE ANALYSIS % Passing 27.10

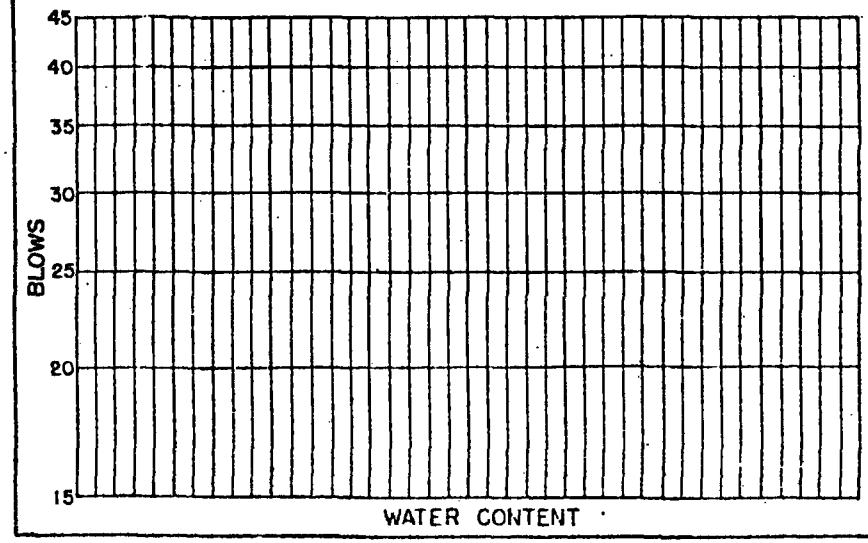
			-40	12.50	87%
-3/4			-80		
org -4	.10	100	-140		
-10	3.45	99	-200	11.05	41%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4274-5 JOB NO. Hog. HOLE NO. 50
DATE 5-6-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

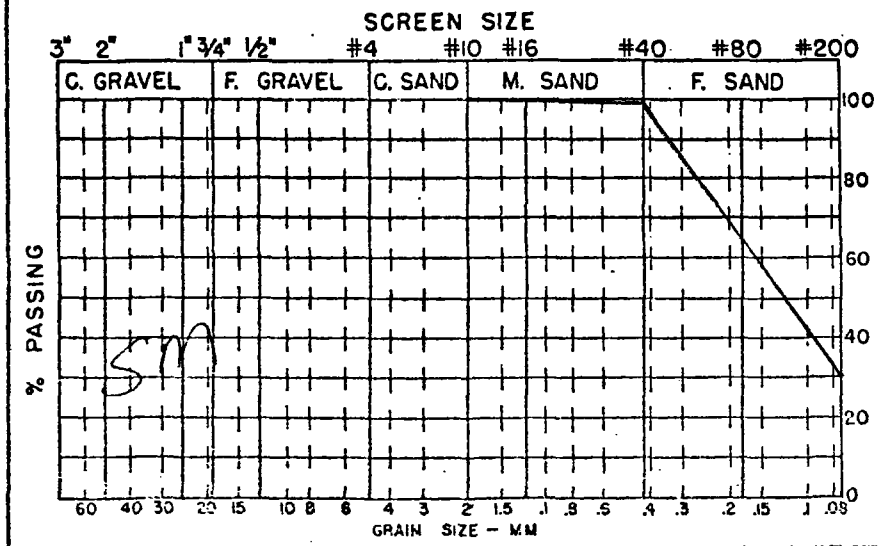
TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE		✓	
TOUGHNESS	✓	✓	

DESCRIPTION: M. orange, rust & Brn.
Some Alternating colors of
Stg. F-M SAND w/ Mica

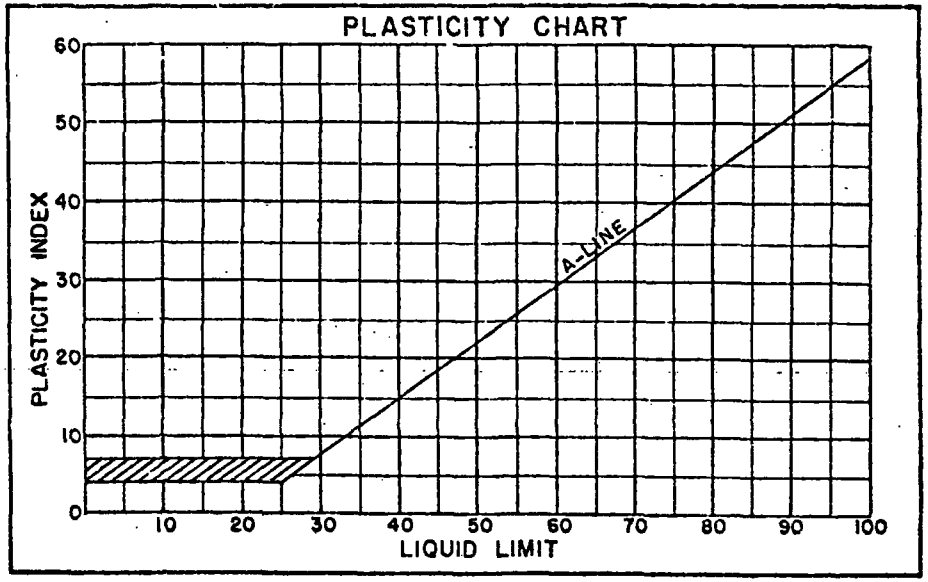
W= 28.70 D= 24.48 H_2O= 17%

SIEVE ANALYSIS		% Passing 99.28	
		-40 68.65	99%
-3/4		-80	
-4		-140	
-10 .53	100%	-200 30.10	30%

GRAIN SIZE CURVE

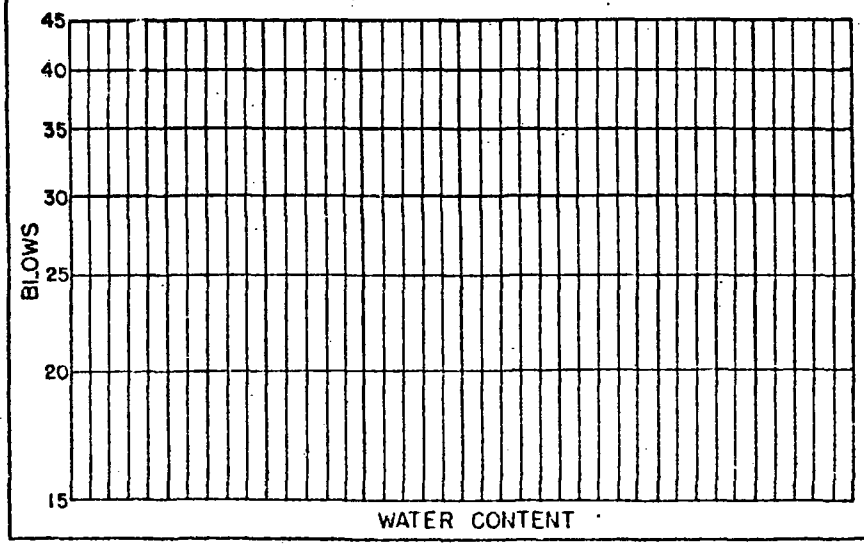


PLASTICITY CHART



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 3-17-83

Dear Sir:

I have forwarded by today's [illegible] the following Foundation Samples.

Contract or Job No. L-7262 Section [illegible]
SR No. [illegible] Sub-Section

Station & Offset [illegible] 70 LT Hole # T-51

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4325-1	D-1	4' 0" / 6' 0"	56%	MH	M, orange & Brn., Cly. SILT w/ Cementations (t. F. Sdy. MTR - Possibly Not molten)?
-2	D-2	1' 0" / 11' [illegible]		MH	SAme w/ T. ORGANIC MTR.
-3	D-3	14' [illegible] / 16' [illegible]	29%	ML	M, Brn. orange F-C Sdy., f. Gruly. SILT (SOILS Skeleton - cementation ?)
-4	D-4	11' 6" / 21' [illegible]		ML	SAme
-5	D-5	24' [illegible] / 26' 4"	42%	ML	(Dry Looking) Moist, GRN-GR[illegible] F. Sdy. SILT. w/ t. Cly. Cement ?
-6	D-6	27' [illegible] / 29' 4"		GM	Like 4259-3 M, Brn., v. Sty. F-C Sdy. F. GRAVEL w/ t. Org.
-7	D-7	35' [illegible] / 36' [illegible]		ML	Like 4325-3 only Brn., gr Some Yellow & Grn.
-8	D-8	9' 6" / 11' 4"		ML	SAME
-9	D-1	11' [illegible] / 11' [illegible]		ML	Same

1 copy with samples
1 copy to addressee

Yours very truly,

Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place .....

Date .....

Dear Sir:

I have forwarded by today's ..... the following Foundation Samples.

Contract or Job No. 1-7262 Section ..... SR No. ..... Sub-Section .....

Station & Offset 1071+ 70' Lt. Hole # J-51

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4325 -10	D-10	41' 6" 41' 11"		ML	Like 4325-3 M, Brn. orange F-C Sdy. F. Gruly. SILT (Soils Skeleton - cement.)?
-11	D-11	56' 6" 57' 6"	14%	SM	M, Brn.-yellow-tan, V. Sty. F. Gruly. F-C SAND
-12	D-12	60' 6" 60' 11"		SM	Same
-13	D-13	69' 6" 69' 11"		SM	Same
-14	D-14	70' 6" 70' 11"		SM	Same
-15	D-15	74' 6" 74' 11"	16%	SM	M, Gr & Grn., V. Sty. F. Gruly. F-C SAND
-16	D-16	80' 6" 81' 6"	33%	ML	Moist (Looks dry) Gr. Cly. F. Sdy. SILT
-17	D-17	95' 0" 96' 6"		ML	Same Only Brn-orange

1 copy with samples
1 copy to addressee

Yours very truly,

Gary M Moon
Inspector.

DOT FORM 351-002 REVISED 2/80

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4325-1 JOB NO. HOLE NO. J-51
DATE 4-21-83 OPERATOR BG

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	✓
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

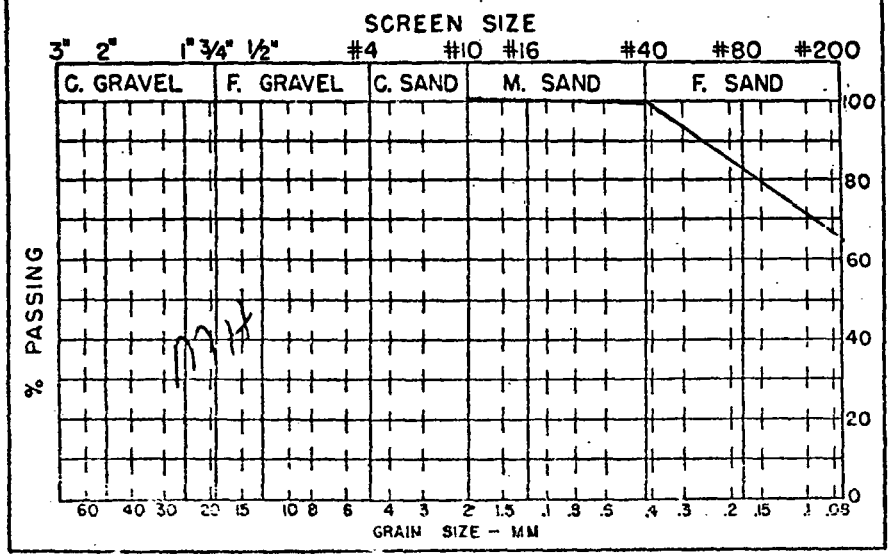
DESCRIPTION: M, Orange, Brn, Cly Silt w/ cementations (+ F. Sdy.) mtr Possible wasn't mulled thoroughly –

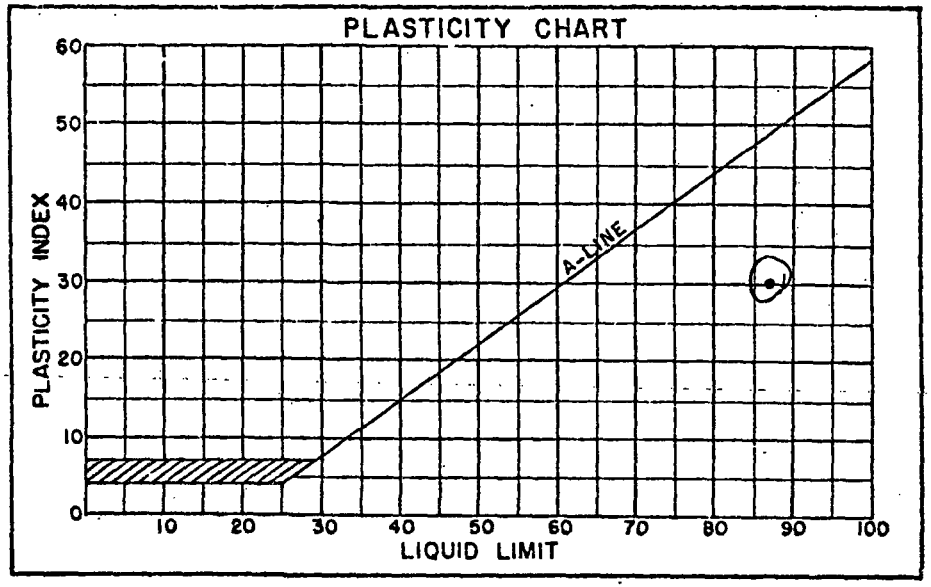
W = 16.22 D = 10.38 H_2O = 56 %

SIEVE ANALYSIS % Passing .38 13

		-40	13.32	99
-3/4		-80		
-4		-140		
-10	.03	100	-200 34.78	65%

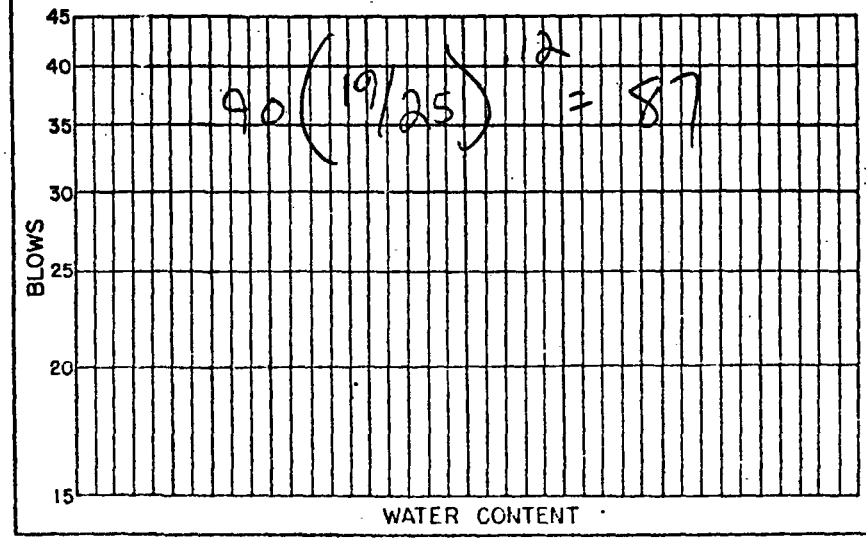
GRAIN SIZE CURVE





LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	72				15
Wet Wt.	9.41				3.70
Dry Wt.	4.95				2.35
% H_2O	90%				PL= 57
Blows	19				PI= 30



DOT FORM 351-019

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

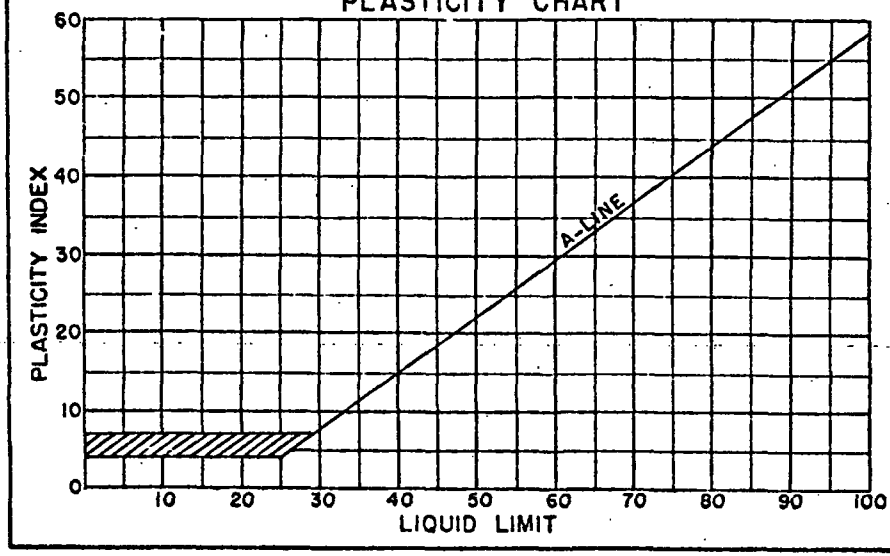
SAMPLE NO. 4325-3 JOB NO. Hoz. HOLE NO. J-51
DATE 5-6-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: M, Brn-Orange [redacted], f. gruly. SILTY SAND
Soils Skeleton ?
cements ?

PLASTICITY CHART

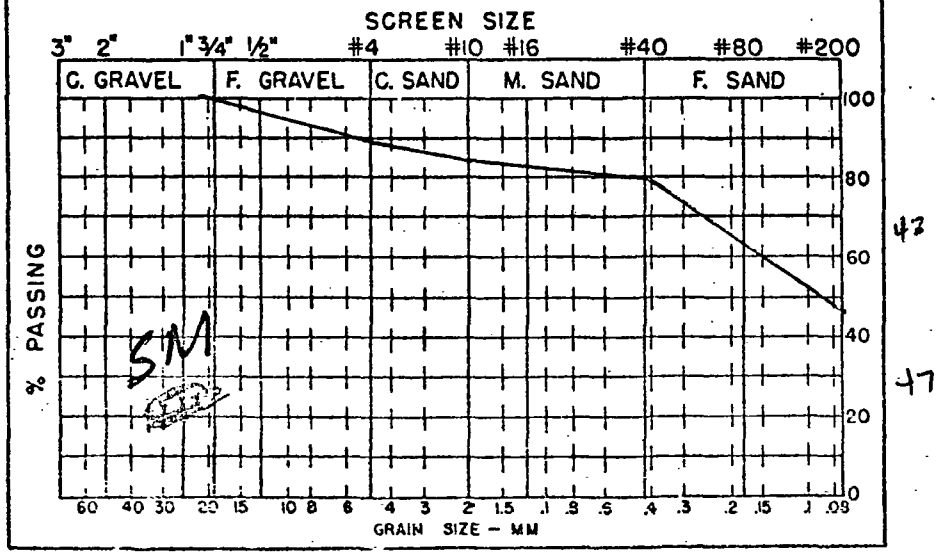


W-37.02 D-28.71 H_2O = 29%

SIEVE ANALYSIS % Passing 94.78

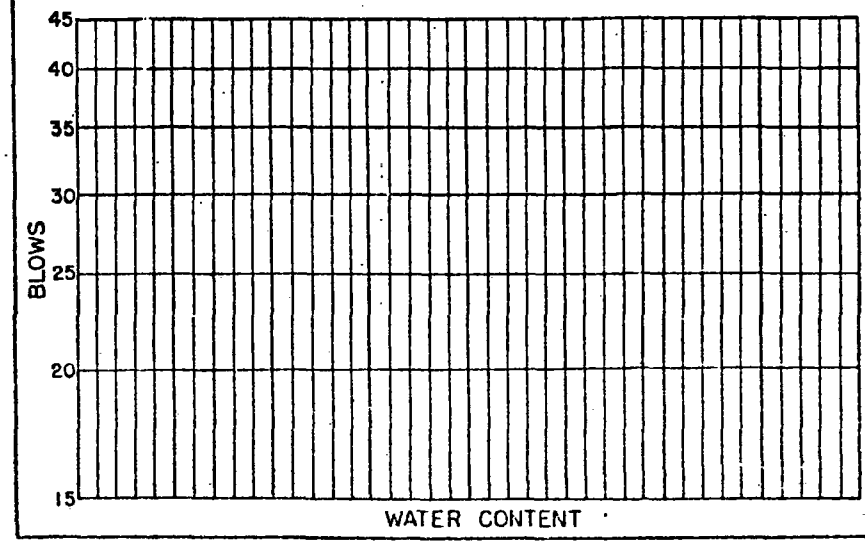
			-40	30.90	80%
-3/4	11.70	100	-80		
-4	4.40	89%	-140		
-10	3.68	84%	-200	44.10	47%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

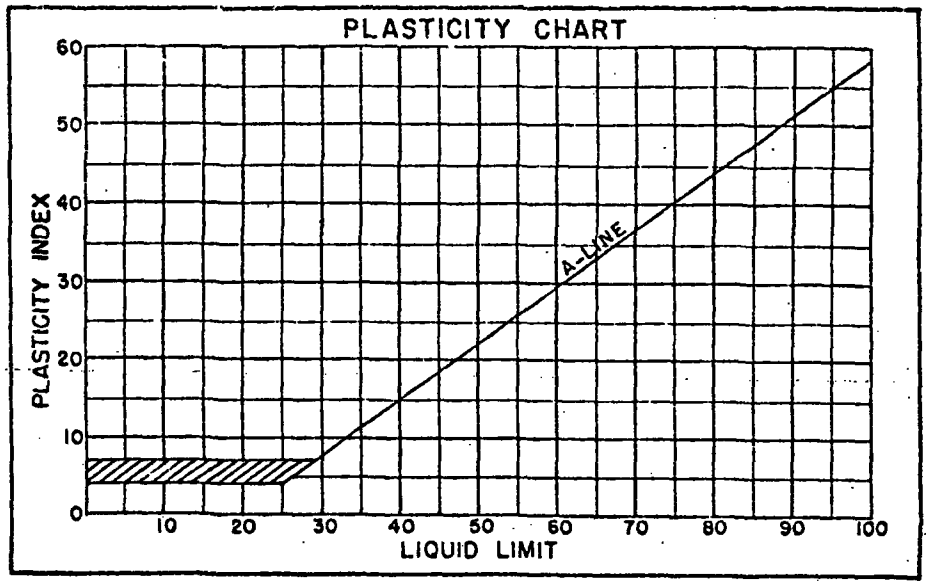
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4325-5 JOB NO. Hog. HOLE NO. J-51
DATE 5-6-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: (Dry Looking) Moist GRN-GR
F. Sdy. SILT w/ t. Cly. Cement.

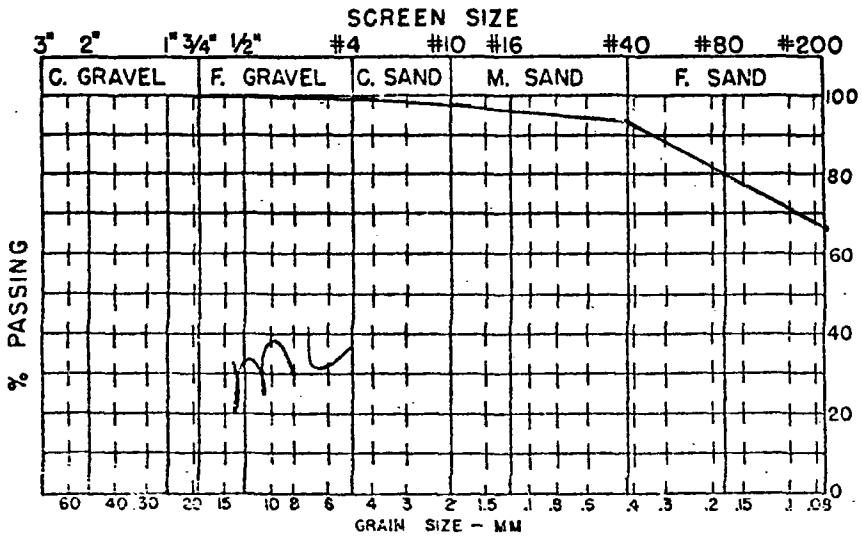


W= 22.20 D= 15.58 H_2O= 42 %

SIEVE ANALYSIS % Passing 92.75

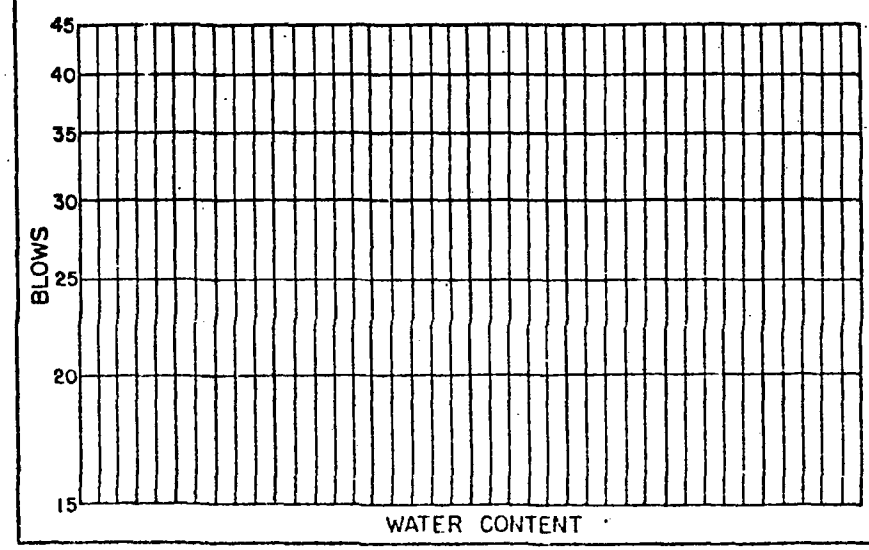
			-40	24.95	93%
-¾	1.16	100	-80		
-4	1.62	99	-140		
-10	4.20	98%	-200	60.82	66%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

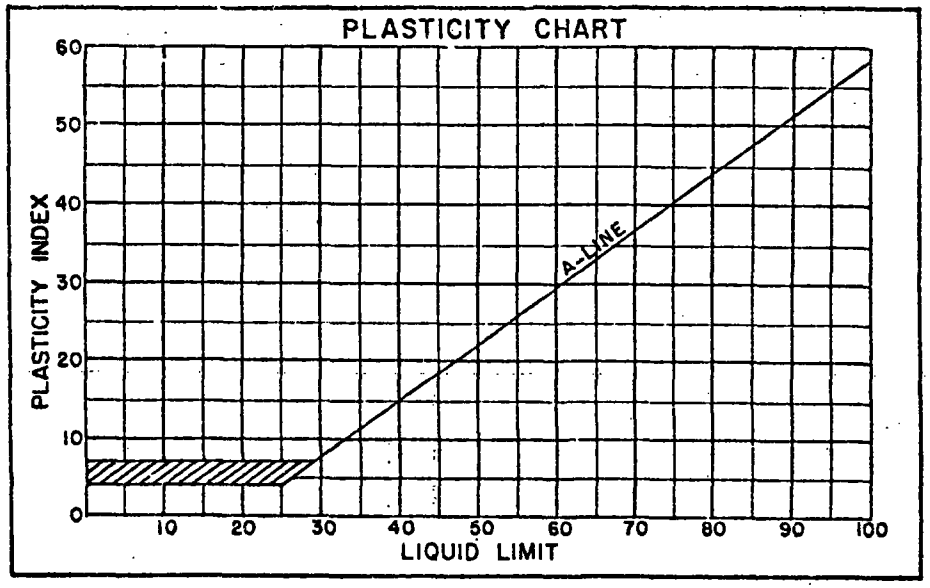
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4325-11 JOB NO. Hog. HOLE NO. 51
DATE 5-6-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: M. Brn., yellow-tan
U. Sty. F. Gruly. F-C SAND

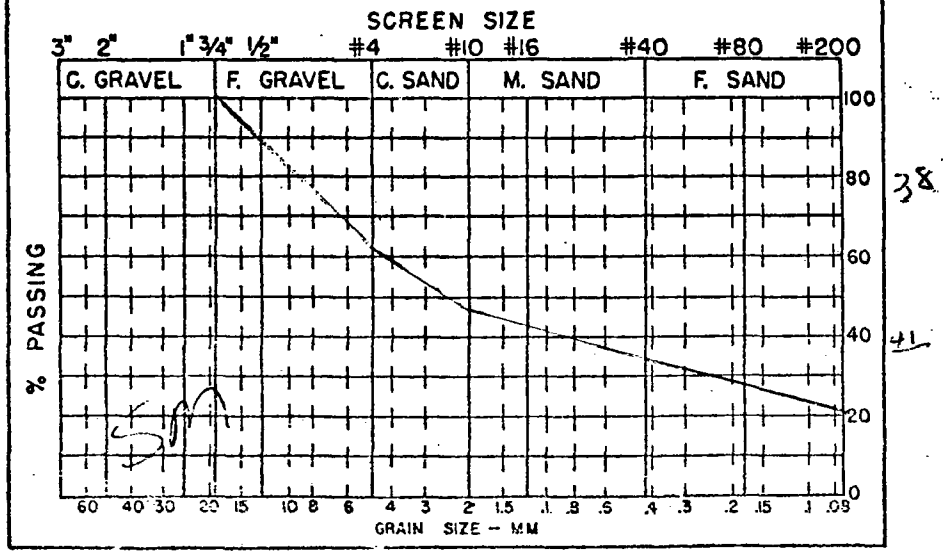


W- 27.53 D- 24.15 H_2O = 14%

SIEVE ANALYSIS % Passing 98.10

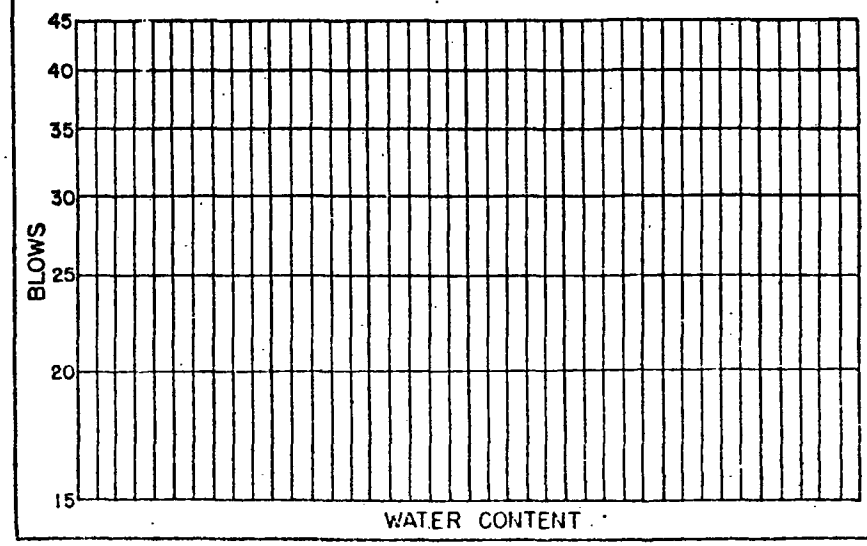
			-40	12.32	32%
-¾	37.6	100	-80		
-4	13.8	62	-140		
-10	14.22	48%	-200	20.16	21%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

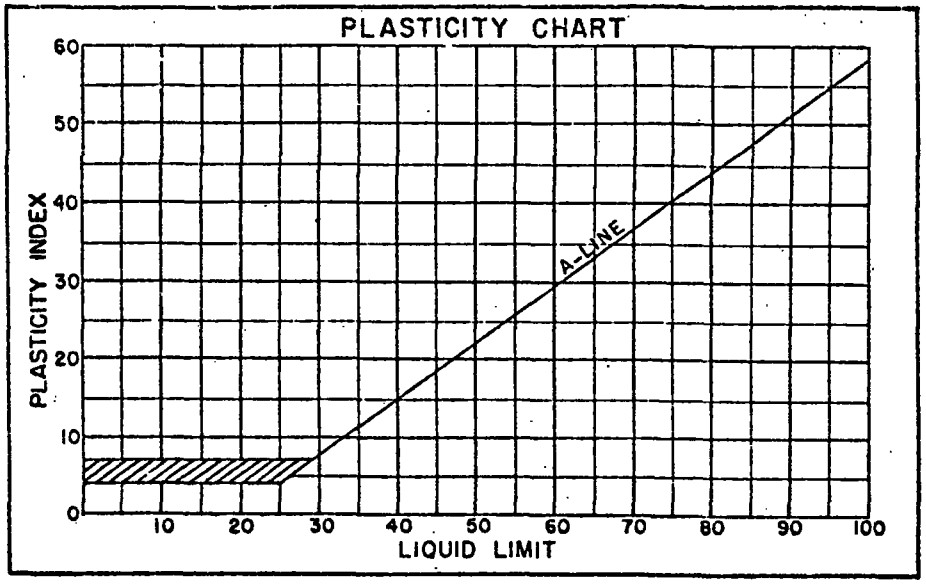
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4325-15 JOB NO. Hog HOLE NO. 51
DATE 5-6-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE		✓	
TOUGHNESS	✓	✓	

DESCRIPTION: M, Gr. & Grn., V. Sty. F. Gruy. F-C SAND

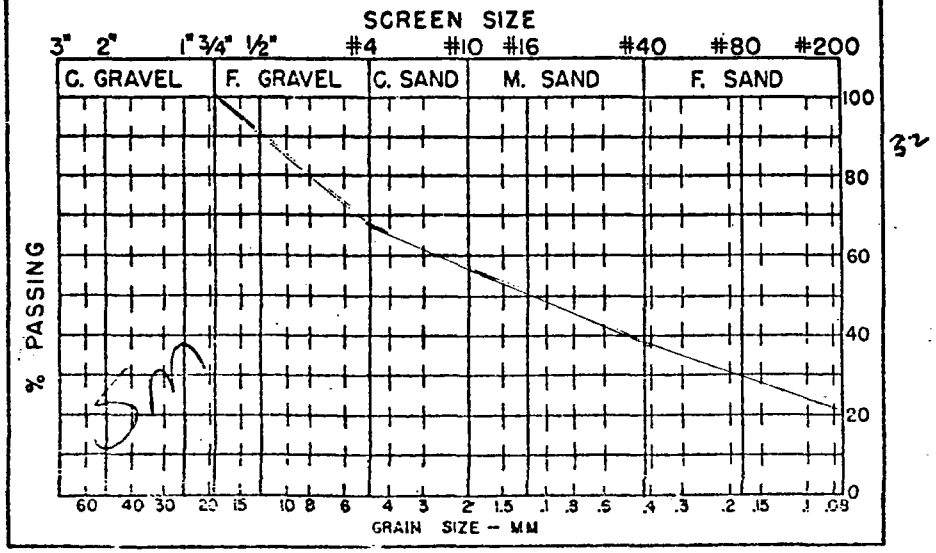


W= 37.4 D= 32.15 H_2O= 16.70

SIEVE ANALYSIS % Passing 125.10

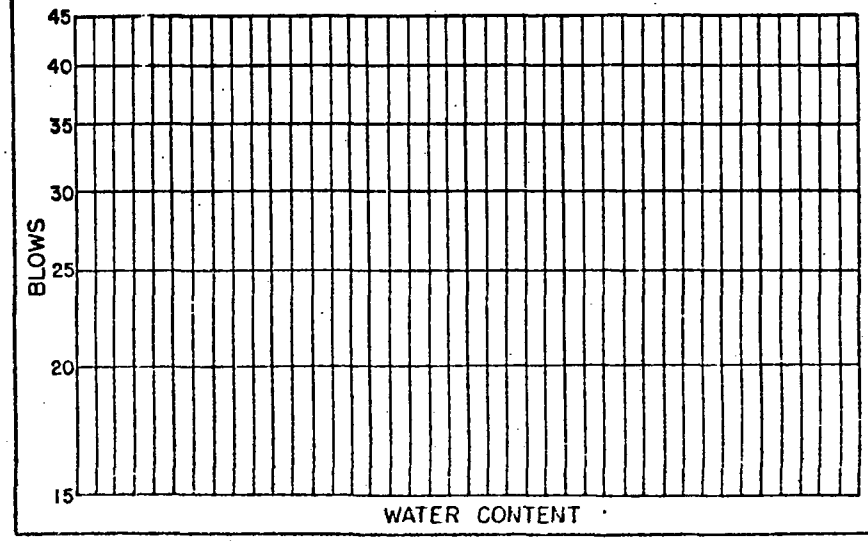
			-40	21.05	38%
-¾	40.9	100	-80		
-4	13.63	68%	-140		
-10	23.65	57%	-200	25.87	21%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

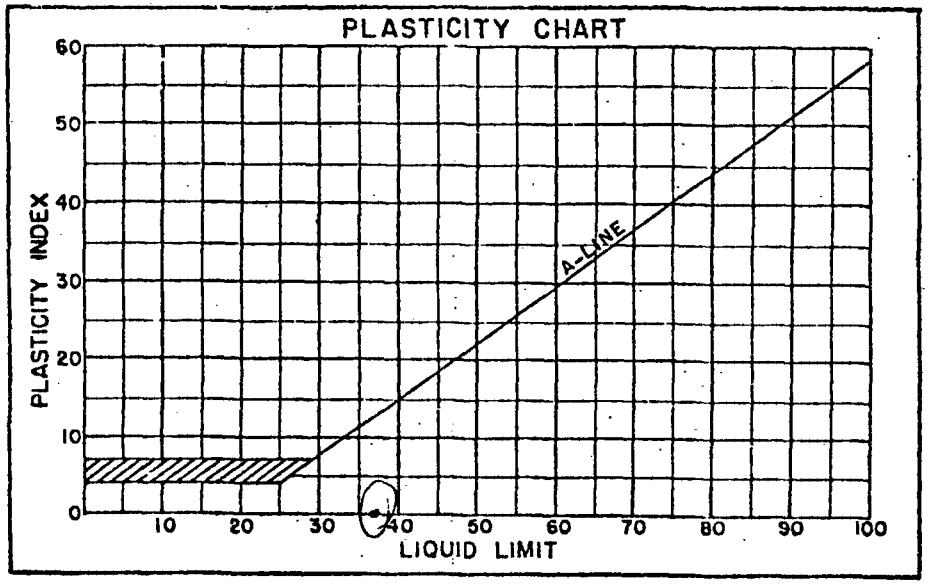
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4325-16 JOB NO. HOLE NO. 51
DATE 4-21-83 OPERATOR B.E.

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	✓
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Moist, (Looks Dry) GR. Cly. F. Sdy. SILT

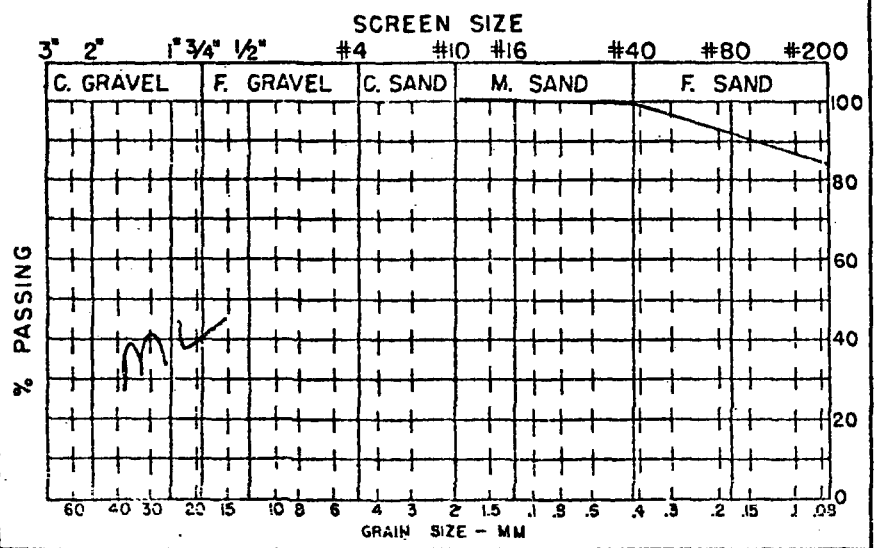


W= 34.45 D= 25.86 H_2O = 33%

SIEVE ANALYSIS % Passing 40.75

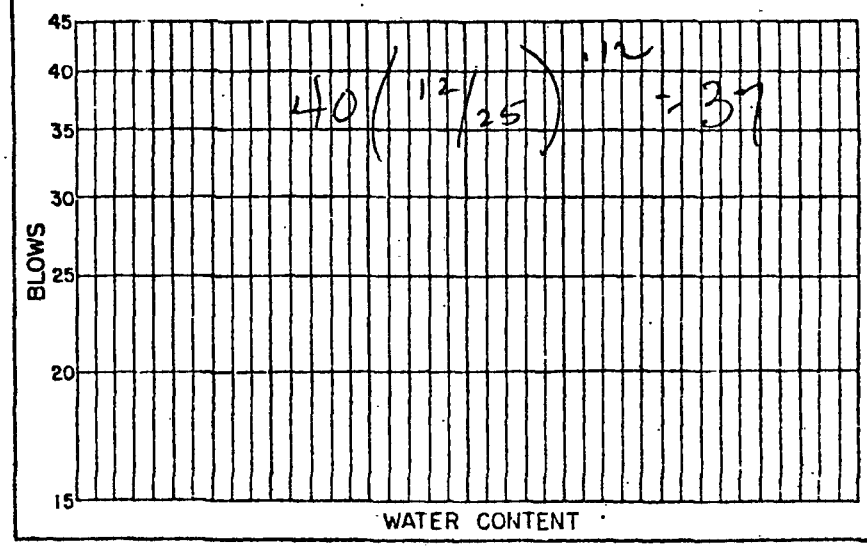
		-40 6.30	99
-3/4		-80	
-4		-140	
-10 .08	100	-200 34.37	84%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	45				53 118
Wet Wt.	15.10				7.30
Dry Wt.	10.80				5.33
% H_2O	40%				PL= 37
Blows	12				PI= 0



DOT FORM 351-013

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place .....

Date 3-10-83

Dear Sir:

I have forwarded by today's ..... the following Foundation Samples.

Contract or Job No. L-7262 Section West Hoquiam By PASS SR No. ..... Sub-Section .....

Station & Offset 107— 70' Lt. Hole # J-51

Lab No.	~~Drive #~~	Depth	Tube Position in Sampler	Clas.	Description
4276 -1	CAN NO. 47	5'	H_2O: 62%		CAN NO. wet wt: 45.34 Dry wt: 28.01 =
-2	38	10'	65%		67.51 / 44.14
-3	54	15'	34%		54.61 / 40.90
-4	114	20'	30%		68.94 / 52.92
-5	53	24	42%		57.92 / 40.82
4326 -1		80'	35%		73.08 / 54.30
-2		86'	49%		51.48 / 34.5

1 copy with samples
1 copy to addressee

Yours very truly,

.....
Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater

Date

Dear Sir:

I have forwarded by today's [illegible] the following Foundation Samples.

Contract or Job No. L-72[illegible] Section [illegible] Pass
SR No. [illegible] Sub-Section [illegible]

Station & Offset 107+[illegible] Hole # J-[illegible]

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Like 4325-1 Only: Description
4393 -1	D-1	[illegible]		MH	M, Orange, Cly. SILT w/cement.
					& t. F. Sdy. mtr. - Possibly not milled ?
-2	D-2	1' 6" / 11' 6"		ML	Like 4325-3 M, Brn. Orange F-C Sdy. F. gruly.
					SILT (Soils Skeleton - cement ?)
-3	D-3	14' [illegible] / 15' 4"		ML	Same w/ org. stems
-4	D-4	11' 6" / [illegible]		SM	M, Rust - iron V. Sty.
					F. Gruly. F-C SAND
-5	D-5	[illegible]		SM	Like 4325-15 M, GR. & Grn., V. Sty. F. gruly.
					F-C SAND
-6	D-6	[illegible]	14/26	GM	M, GR., Grn., Blk. & Brn. V. Sty
					F-C Sdy. F. GRAVEL
-7	D-7	[illegible] / 5' [illegible]		GM	Same
-8	D-8	[illegible] / 10' 5"		GM	Same
-9	D-9	44' 6" / 45' 4"		GM	Same

1 copy with samples
1 copy to addressee

Yours very truly,

Inspector.

DOT FORM 351-002 REVISED 2/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place .....

Date .....

Dear Sir:

I have forwarded by today's ..... the following Foundation Samples.

Contract or Job No. L-7-62 Section ..... SR No. ..... Sub-Section .....

Station & Offset [illegible] Hole # [illegible]

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4393 -10	D-10	[illegible]		ML	Like 4325-3 M, Brn., Orange F-C Sdy. f. grvly.
					SILT (Soils Skeleton - Cement ?)
-11	D-11	5' [illegible]	20%	SM	M, tan, yellow, GR., V. Sty.
					f. grvly. SAND
-12	D-12	[illegible]		GM	Like 4393-6 M, GR., Grn., BLK & Brn., V. Sty.
					F-C Sdy. F. GRAVEL
-13	D-13	[illegible]		GM	Same w/ Trace Org. Rains.
-14	D-14	[illegible]		ML	Like 4325-16 Moist (Looks Dry) GR., Cly.
					F. Sdy. SILT
-15	D-15-A	[illegible]		ML	Same only tan & Rust
-16	D-15-B	[illegible]	46%	SM	M, yellowish, tan, Brn. Sheets &
					SILT, f. grvlly. SAND w/T. org. Rains

1 copy with samples
1 copy to addressee

Yours very truly,

[illegible]

Inspector.

DOT FORM 351-002 REVISED 2/80

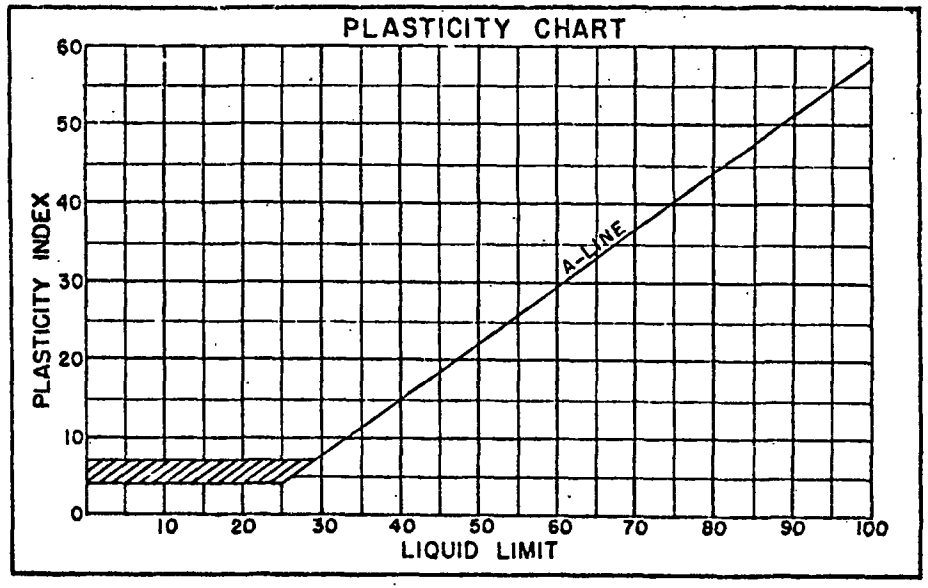
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4393-4 JOB NO. Hog. HOLE NO. 52
DATE 5-6-83 OPERATOR Bc

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: M, rust-Iron V. Sty., f. gRVLY. F-C SAND

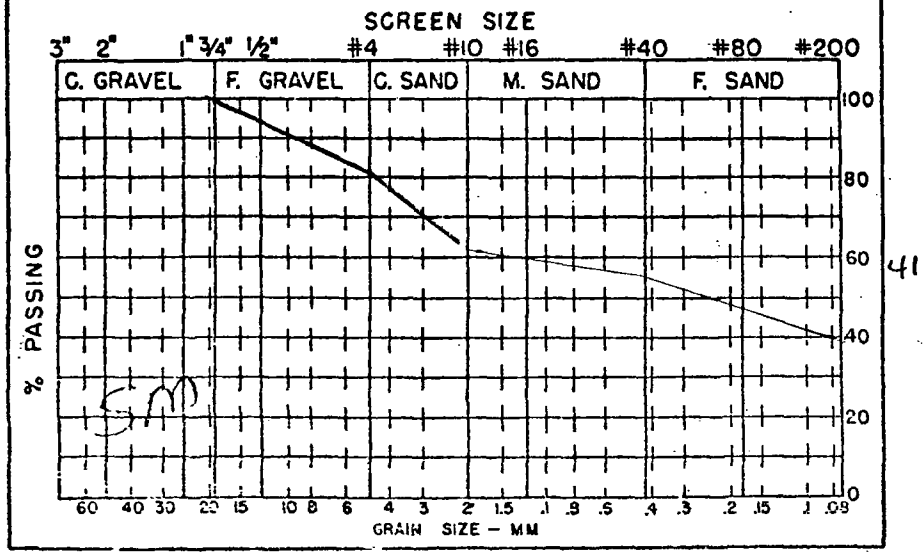


W= 38.08 D= 30.25 H_2O= 26.70

SIEVE ANALYSIS % Passing 81.36

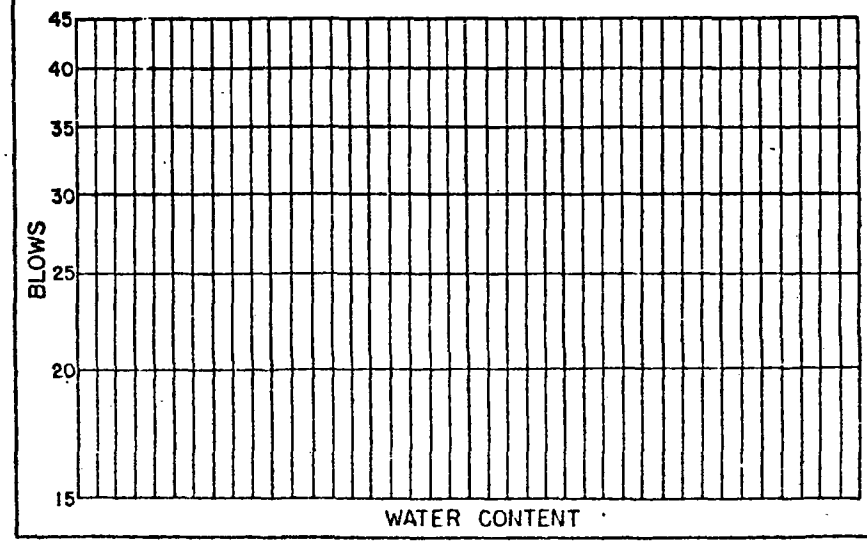
			-40	13.58	56%
-¾	15.66	100%	-80		
-4	15.10	81	-140		
-10	5.10	62%	-200	31.92	39%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

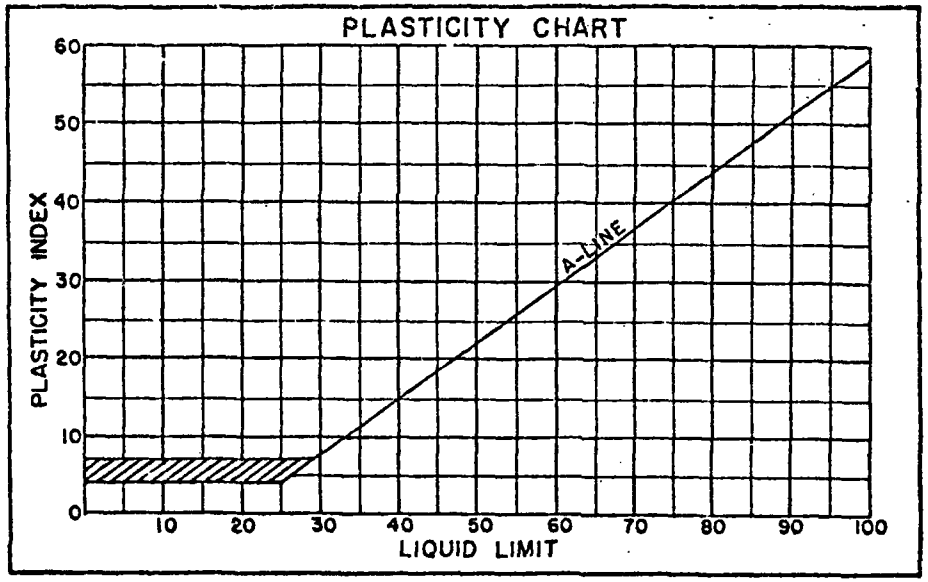
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4393-6 JOB NO. Hog HOLE NO. 52
DATE 5-6-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: M, GR., Grn., BLK. & Brn.
V. Sty. F-C Sdy. F. GRAVEL

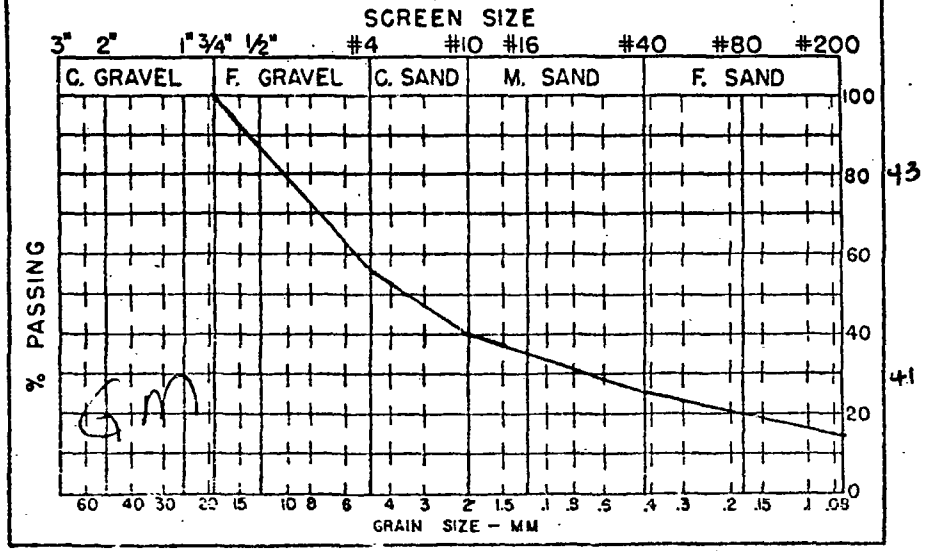


W= 44.20 D= 38.62 H_2O= 14.90

SIEVE ANALYSIS % Passing 109.6

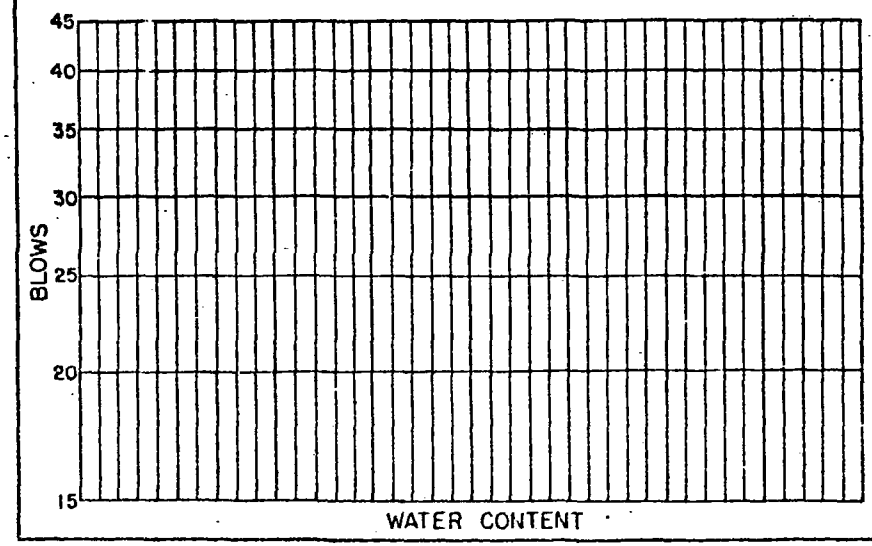
			-40	13.05	26%
-3/4	46.85	100	-80		
-4	18.72	57%	-140		
-10	15.23	40%	-200	15.75	14%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

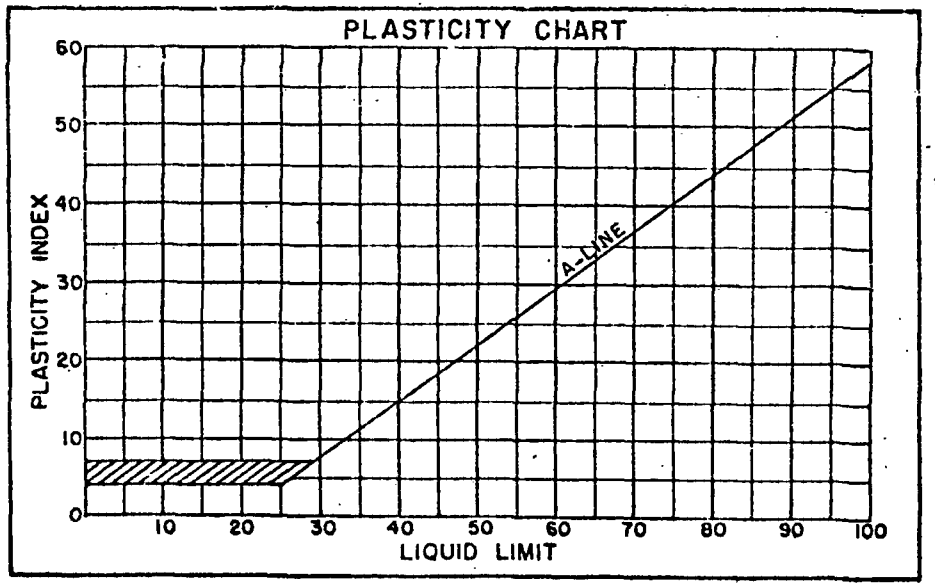
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4393-11 JOB NO. Hgs. HOLE NO. 52
DATE 5-6-83 OPERATOR BL

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

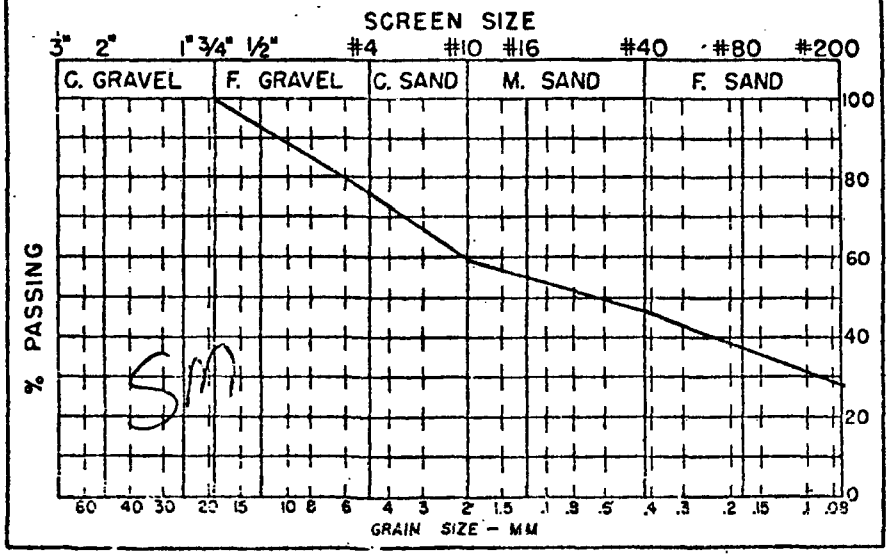
DESCRIPTION: M, tan, yellow, GR
W. Sty. F. grum. SAND



W: 56.63 D: 47.05 H_{2O}: 20%

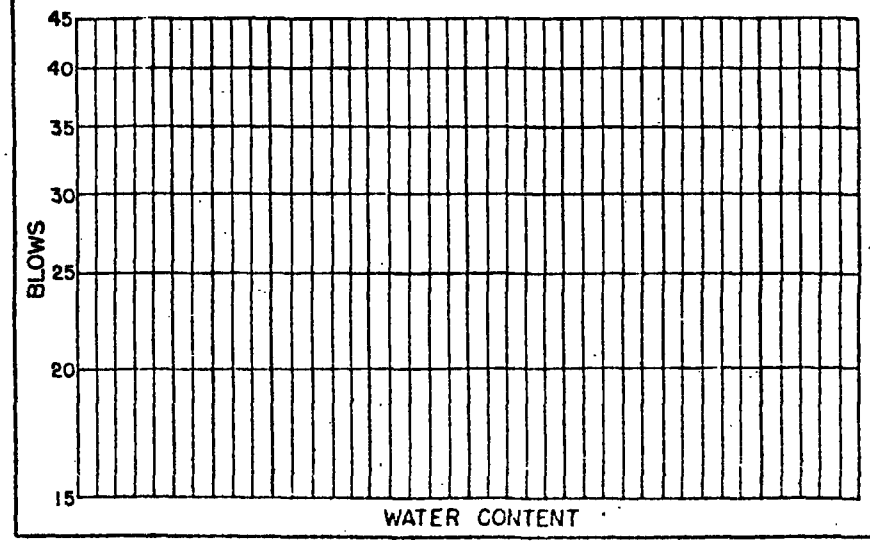
SIEVE ANALYSIS		% Passing 111.32		
			-40 20.8	47%
-3/4	26.6	100	-80	
-4	19.3	76%	-140	
-10	13.6	59%	-200 31.02	28%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

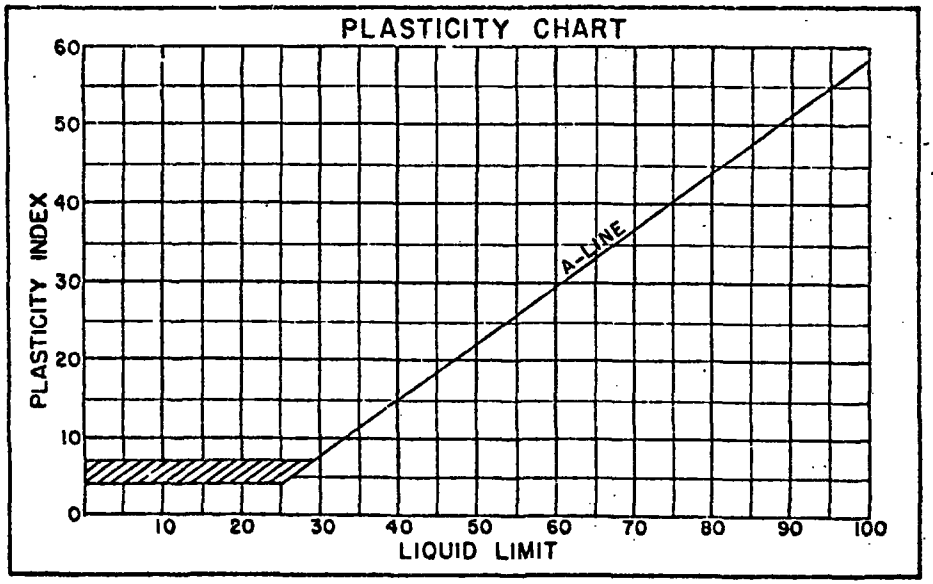
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4393-16 JOB NO. Hog HOLE NO. 52
DATE 5-6-83 OPERATOR Bc

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

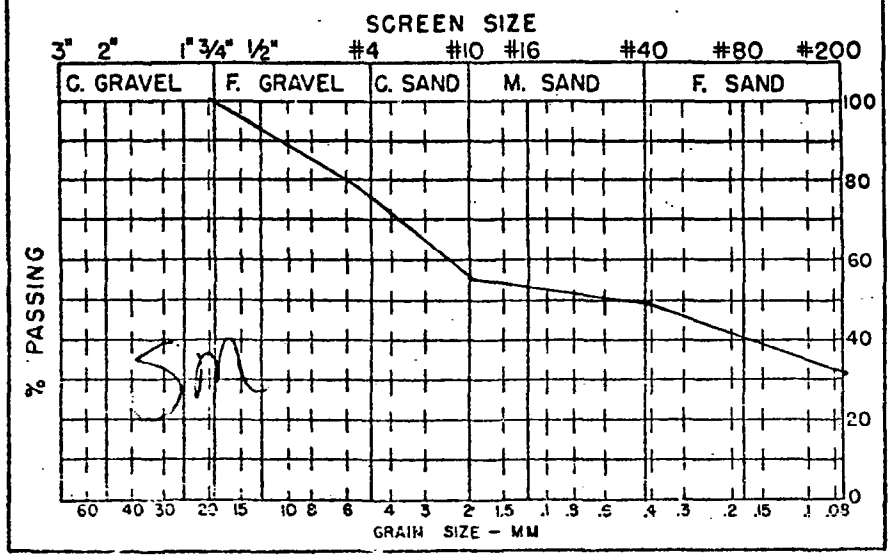
DESCRIPTION: M, yellowish, tan, Brn. shades of SILT, f. grvlg SAND w/ org. hairs.



W= 26.10 D= 17.82 H_2O= 46%

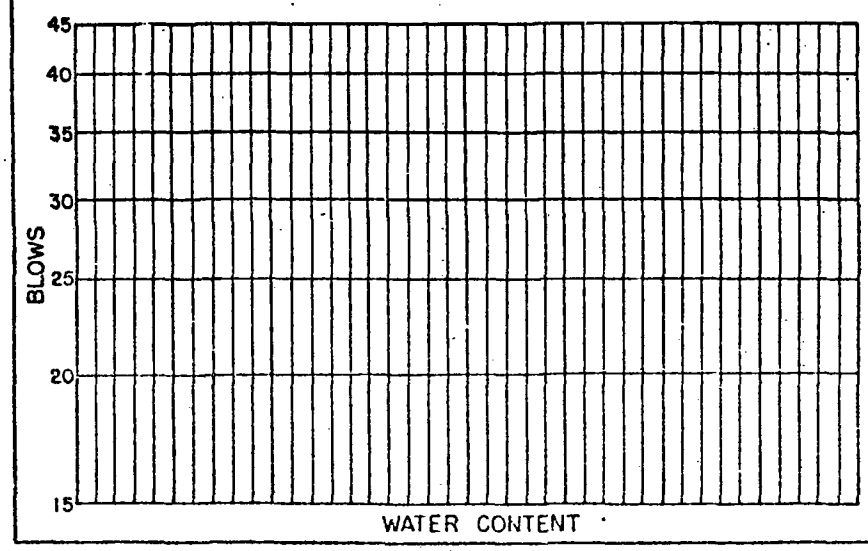
SIEVE ANALYSIS		% Passing			97.65
			-40	16.89	49%
-¾	32.08	100	-80		
-4	11.7	67%	-140		
-10	6.0	55%	-200	30.98	32%

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

ATERIALS ENGINEER
aterials Laboratory
O. Box 167, Olympia, WA 98504 (Mailing Address)
55 So. 2nd Ave.
mwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 5-13-85

Dear Sir:

I have forwarded by today's State car the following Foundation Samples.

Contract or Job No. L-7262 Section West Hoquiam by Pass
SR No. 101A Sub-Section cut section

Station & Offset 142+15 130'Lt. Hole # J-53

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4492-1	D-1	0' 0" 2' 0"	72%	ML	Wet, ORANGISH BRN, SL. ORG. F. Sdy. SILT
-2	D-2	4' 0" 6' 0"	42%	OH	Wet, SL. ORANGISH BRN., ORG. F. Sdy. SILT w/small Cementations
-3	D-3	10' 6" 12' 6"	59%	OH	Wet, tan & GR w/oxidiz., SL. ORG. Cly. F. Sdy. SILT
	U-4	No Recovery			
	D-5	No Recovery			
-4	U-6	19' 0" 21' 0"	I.D. only 65%	OH	Wet, GR-BLK. ORG., Cly. F. Sdy. SILT w/MICA. NOTE: A Shiny Oily-Like RESIDUE WAS OBSERVED IN 200-BRASS PAN
-5	D-7	21' 0" 23' 0"		OH	SAME
-6	D-8-A	24' 0" 25' 0"	63%	OL	Wet, GR & BLK., ORG., Cly. F. Sdy. SILT w/ Cementations
-7	D-8-B	25' 0" 26' 0"	53%	MH	Wet, GRN.-GR w/some Rust, Cly. F. Sdy. SILT

opy with samples
opy to addressee

Yours very truly,

Inspector.

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place .....

Date .....

Dear Sir:

I have forwarded by today's ..... the following Foundation Samples.

Contract or Job No. L-7262 Section ..... SR No. ..... Sub-Section .....

Station & Offset _____ Hole # J-53

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4492-8	D-9	29' 0" 31' 0"		OH	ZK 4492-4 wet, GR-BLK. ORG. Cly. F. Sdy. SILT w/mica
					NOTE: Shiny RESIDUE
-9	D-10	34' 0" 36' 0"	39%	OH	Moist, GR-GRN, Sl. Org., Cly.
					F. Sdy. SILT w/ Cementations
-10	D-11-A	39' 0" 40' 0"	33%	MH	VISUAL = DRY OLIVE, Cly. (Waxy-glossy-Look)
					F. Sdy. SILT
-11	D-11-B	40' 0" 41' 0"	32%	SM	VISUAL = moist GR. ORG. twigs, V. Sty.
					F. SR Gruly. F-C SAND
-12	D-12	44' 0" 45' 5"	16%	SP SM	moist, GR., GRN & olive yellow
					Sty. F. & Gruly. F-C SAND
-13	D-13	49' 0" 50' 0"		SP SM	Same only BLK
					Hole ~~Not~~ Finished
					No More samples later.

Copy with samples
Copy to addressee

Yours very truly,

Gary M Moore
Inspector.

FORM 251-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place .....

Date 5-16-83

Dear Sir: Moist. Content Only

I have forwarded by today's ..... the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam SR No. ..... Sub-Section .....

Station & Offset 142+15 130' Lt. Hole # J-53

Lab No.	Drive #	Depth	~~Tube Position in Sampler~~	Clas.	Description
4493 -1	1	CAN NO 116	20'		Wet Wt. 58.94 H_2O = 65%
					Dry Wt: 35.70
-2	2	113	29'6"		61.60
					40.68 51%
-3	3	64	35'		45.73
					32.08 43%

1 copy with samples
1 copy to addressee

Yours very truly,

.....
Inspector.

DOT FORM 351-002 REVISED 2/80

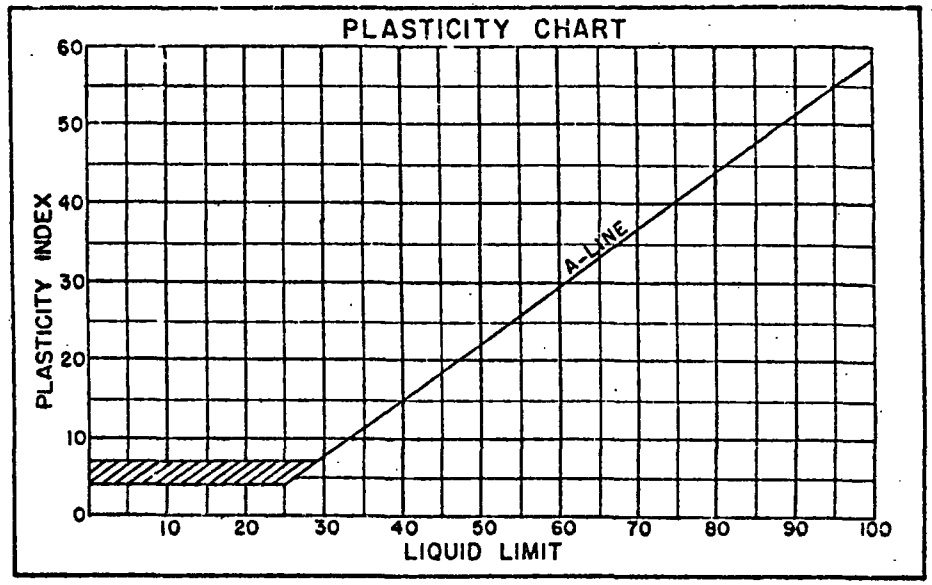
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4492-1 JOB NO. Hog. HOLE NO. J-53
DATE 6-15-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST		✓	
DILATANCY			
BITE		✓	
TOUGHNESS		✓	

DESCRIPTION: Wet, Orangish, Brn.
Sl. Org. F. Sdy. Silt

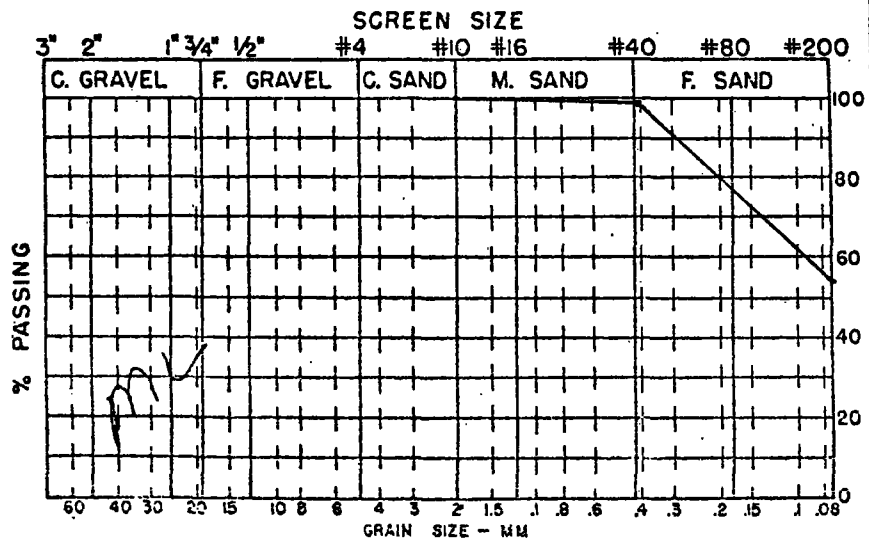


H_2O = 72%

SIEVE ANALYSIS % Passing 60.55

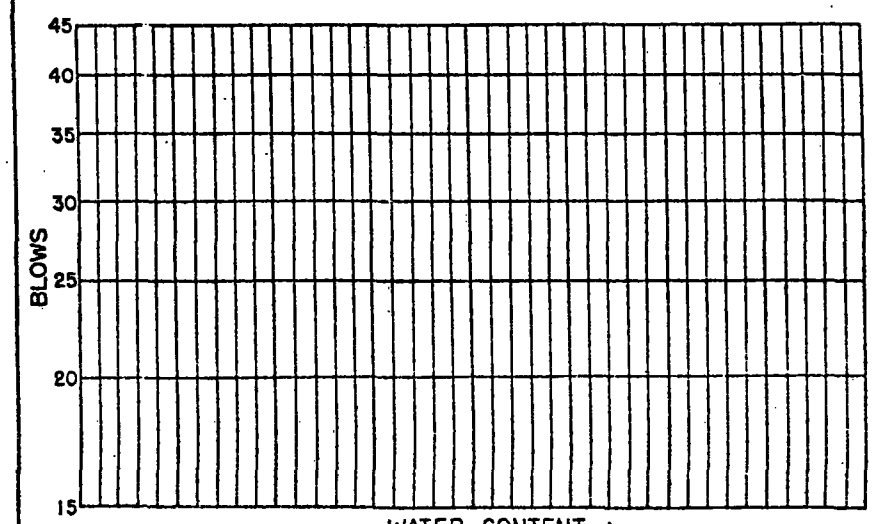
		-40 26.85	99
-3/4		-80	
-4		-140	
-10 .8	100	-200 32.9	54

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-010

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

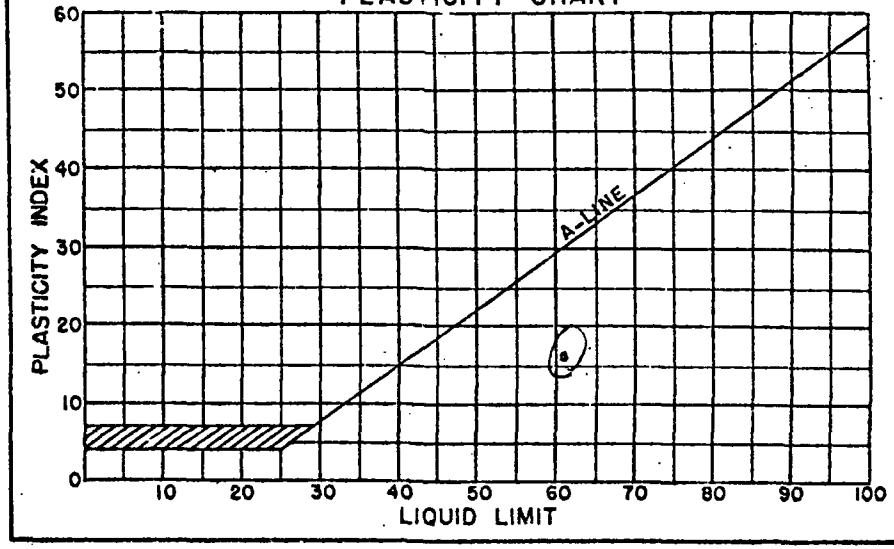
SAMPLE NO. 4492-2 JOB NO. Hbg. HOLE NO. 1.53
DATE 6-8-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: Wet, Sl. orangish, Brn. Arg. F. Sdy. SILT w/ small Cementations

PLASTICITY CHART

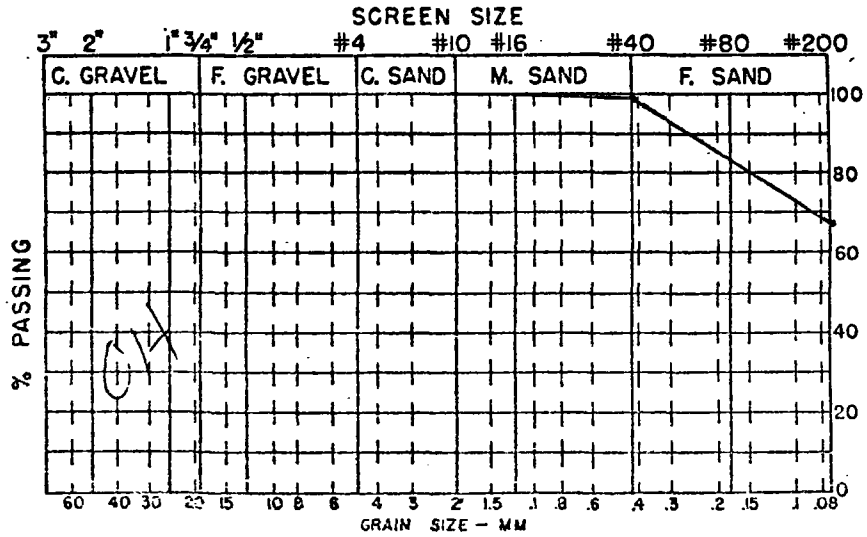


$H_2O = 42\%$

SIEVE ANALYSIS % Passing 46.10

		-40	15.4	97
-3/4		-80		
-4		-140		
-10	.01	-200	30.69	67

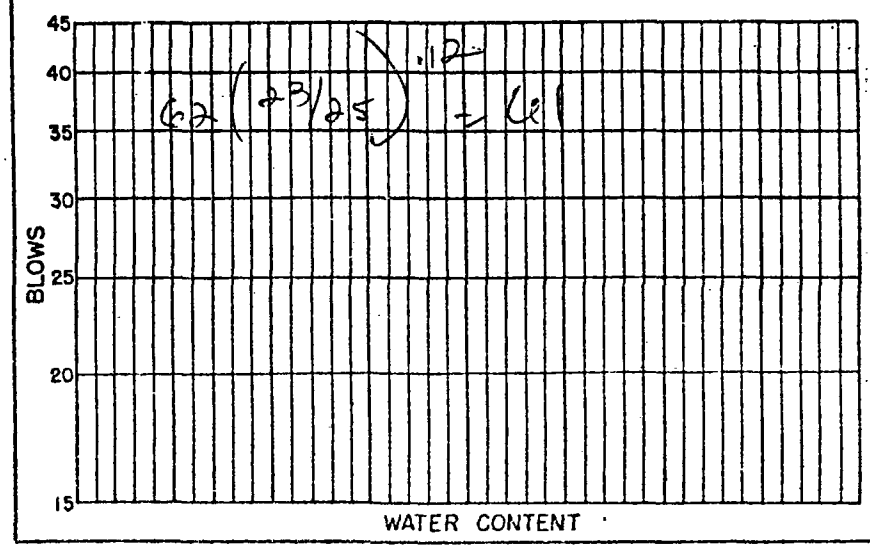
GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	46				116
Wet Wt.	19.22				11.02
Dry Wt.	11.89				7.6
% H_2O	62%				PL= 45
Blows	23				PI= 16

Did Not Roll out 1st to 1/8"



62 (23/25) .12 = 61

DOT FORM 351-014

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

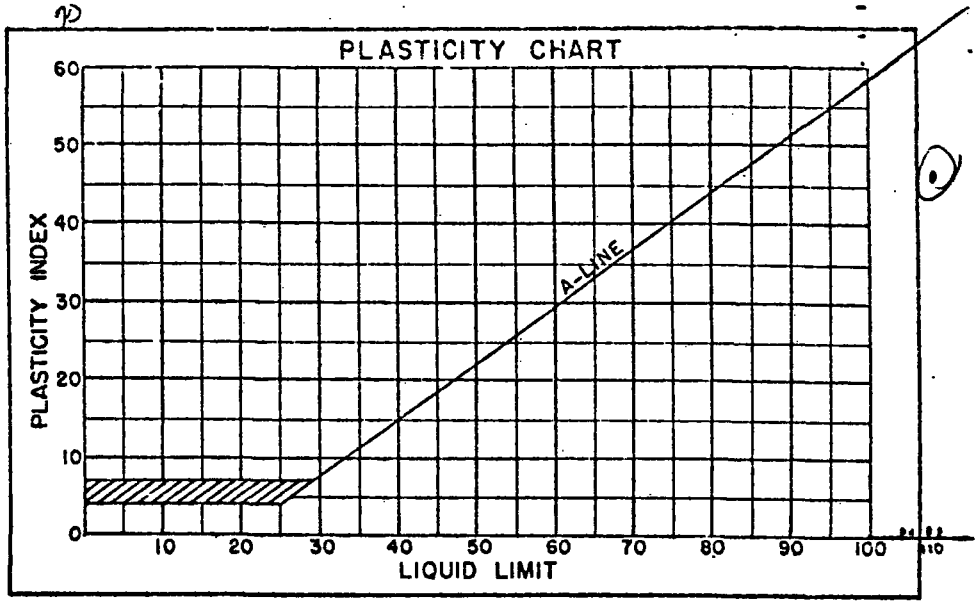
4492-3

SAMPLE NO. 4492-3	JOB NO. 108	HOLE NO. 153	
DATE 6-6-83	OPERATOR BC		

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST		✓	
DILATANCY			
BITE			
TOUGHNESS		✓	✓

DESCRIPTION: Wet, tan & GR w/ oxidiz.
Sl. Org., Cly. F. Sdy. SILT

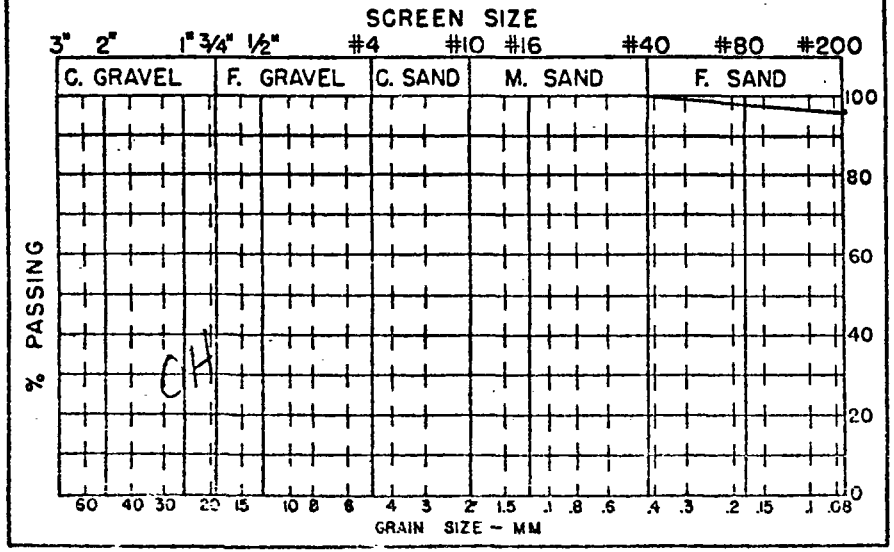


H_2O = 59%

SIEVE ANALYSIS % Passing 70.08

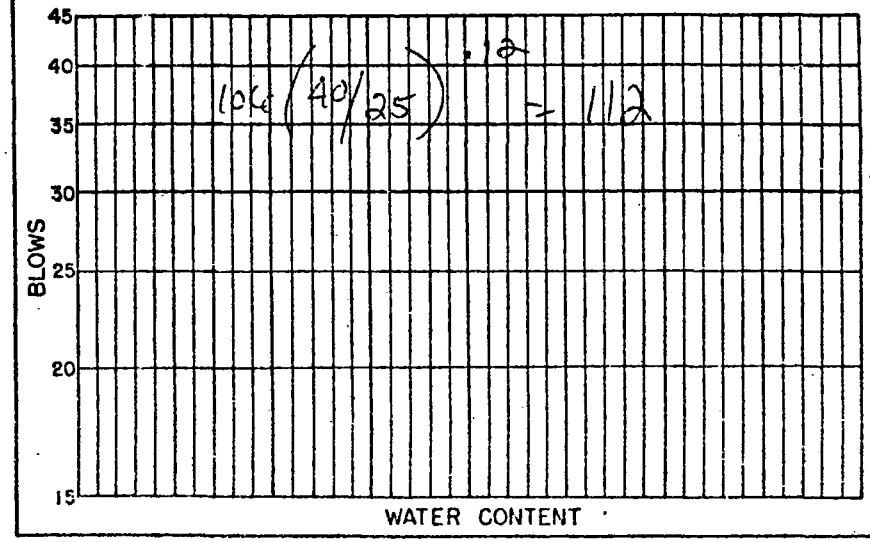
	-40	2.62	100
-3/4	-80		
-4	-140		
-10	-200	67.46	96

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	76				14
Wet Wt.	19.23				9.60
Dry Wt.	9.35				5.8
% H_2O	106				PL= 66
Blows	40				PI= 46



DOT FORM 351-010

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4492-4 JOB NO. ~~[illegible]~~ HOLE NO. J.53
DATE 6-6-83 OPERATOR BC

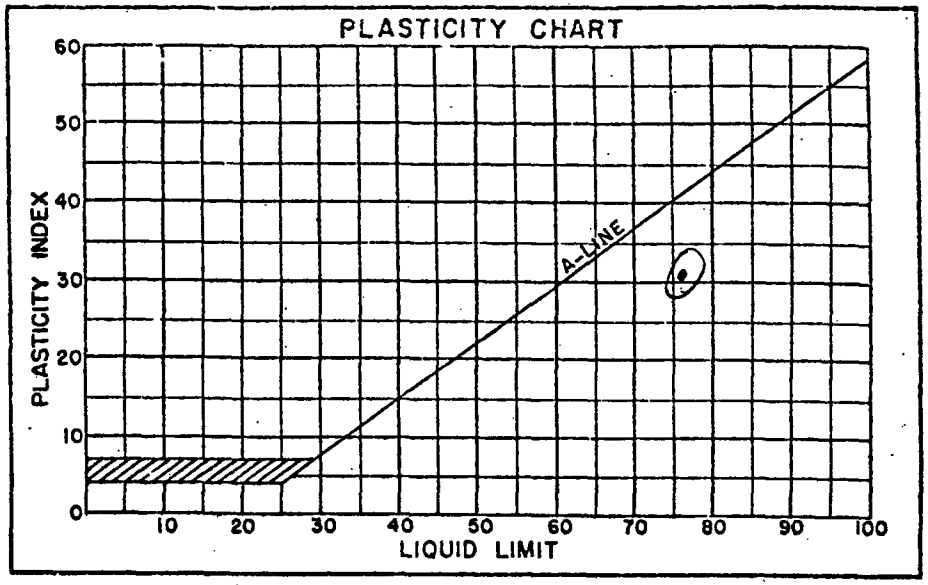
SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	✓

DESCRIPTION: Wet, GR- BLK. ORG. Cly. F. Sdy. SILT w/mica

NOTE: A Residue which was Shiny & Oily Looking was left in 200- Brass Pan

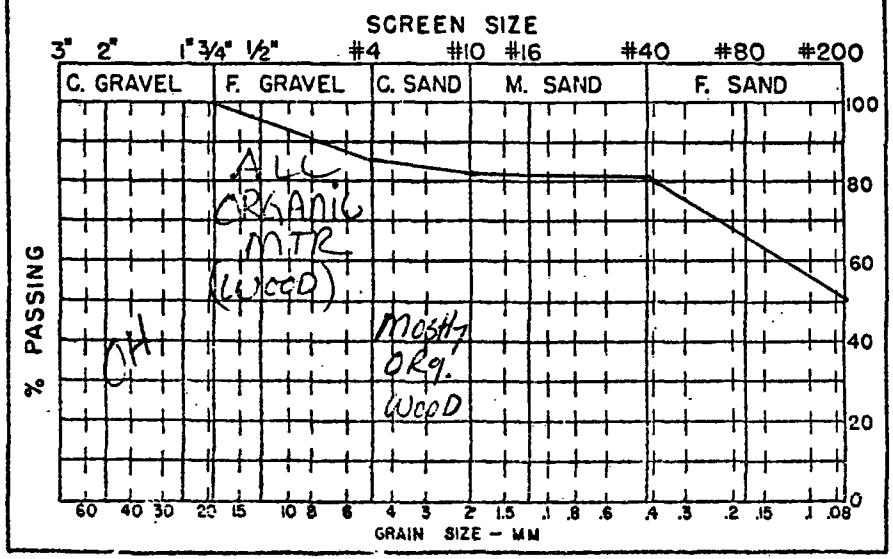
PLASTICITY CHART



SIEVE ANALYSIS % Passing 35.58 H2O-6.5%

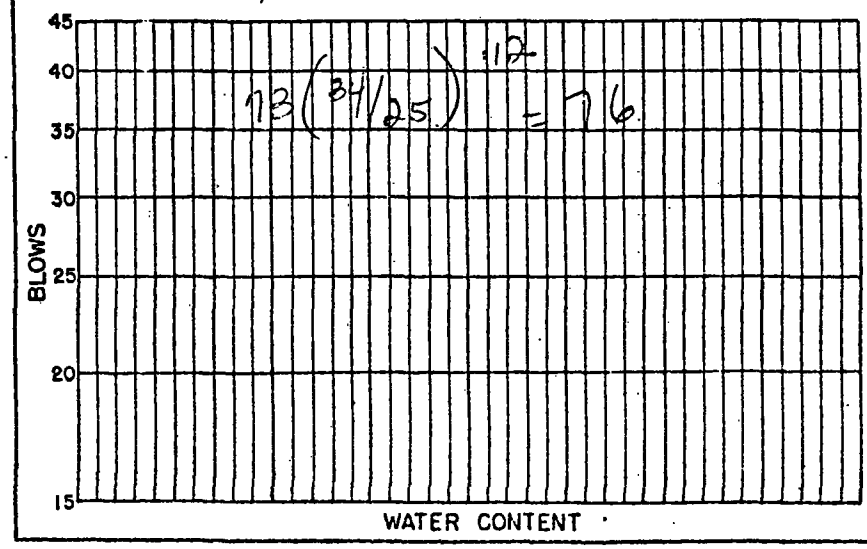
			-40	10.8	81
-3/4	5.08	100	-80		
-4	1.36	86	-140		
-10	.28	82	-200	18.06	51

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	58				75
Wet Wt.	~~58~~	18.36			7.81
Dry Wt.	~~18.36~~	10.62			5.4
% H_2O		73			PL= 45
Blows	34				PI= 31



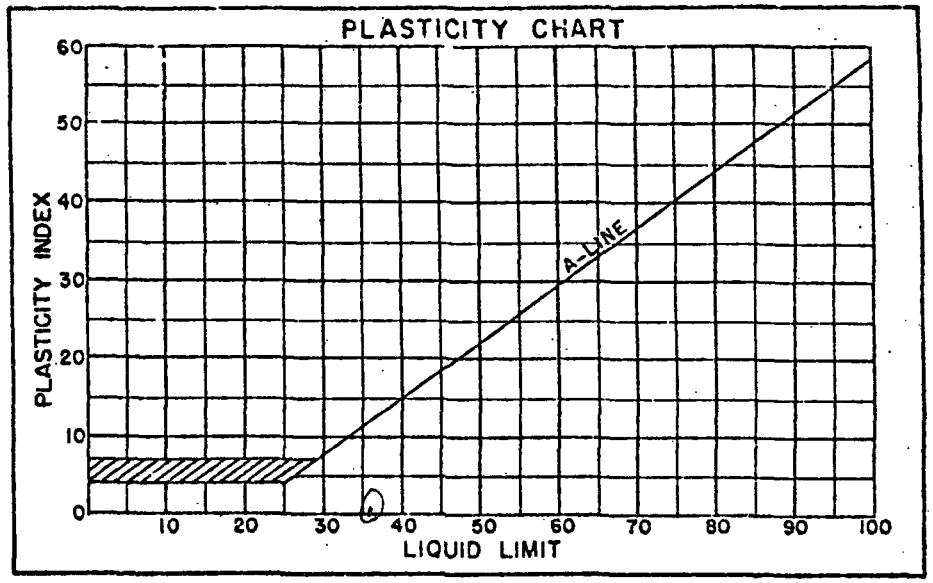
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4492-6 JOB NO. Hog. HOLE NO. 1-53
DATE 6-9-83 OPERATOR Bc

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			✓
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: Wet, gray & BLK, org. Cly. F. Sdy. SILT w/ Cement.

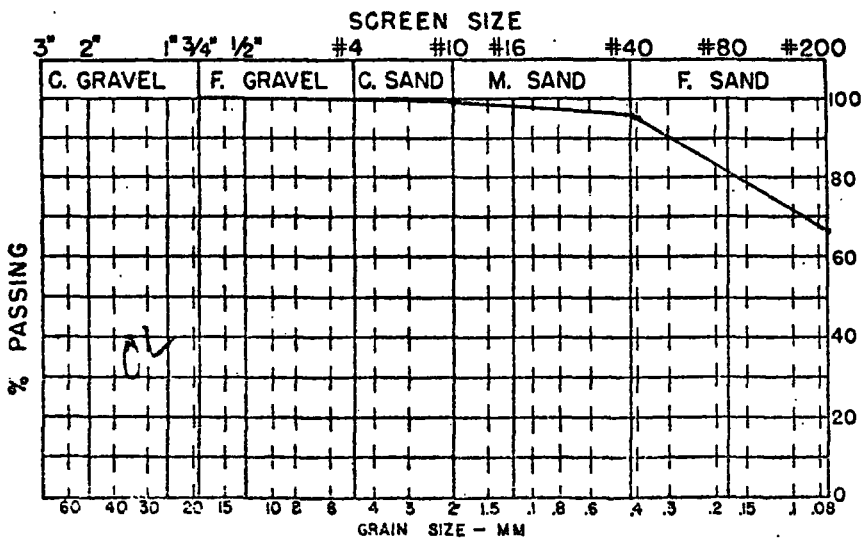


$H_2O = 6.3\%$

SIEVE ANALYSIS % Passing 61.15

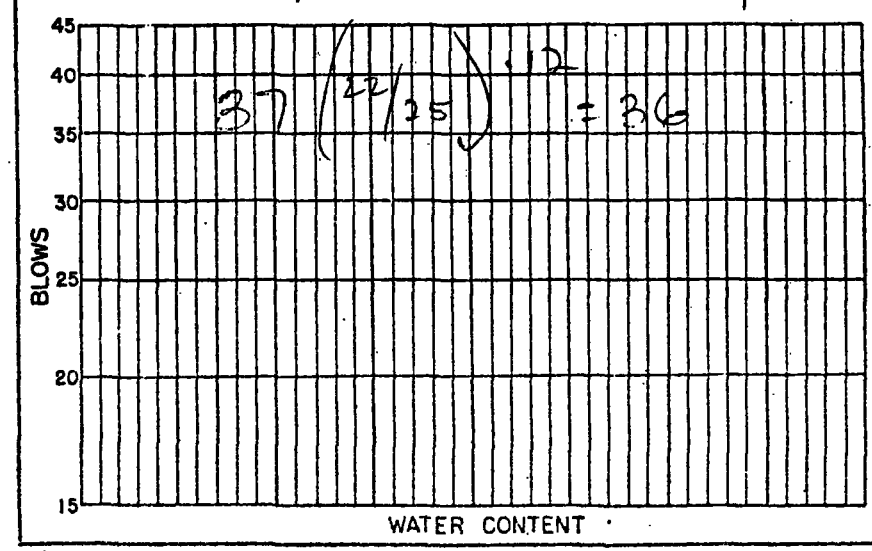
			-40	19.05	97
-3/4	.10	100	-80		
-4	.05	99	-140		
-10	1.55	99	-200	40.4	66

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	45				117
Wet Wt.	21.52				7.55
Dry Wt.	15.75				5.4
% H_2O	37				PL= 40
Blows	22				PI= N P



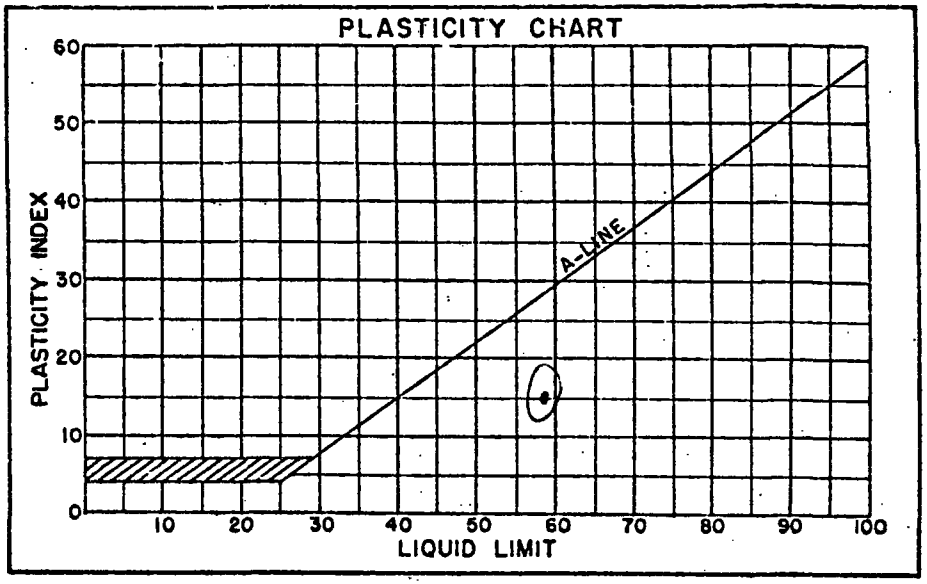
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4492-7 JOB NO. Hog. HOLE NO. J-53
DATE 6-6-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	✓

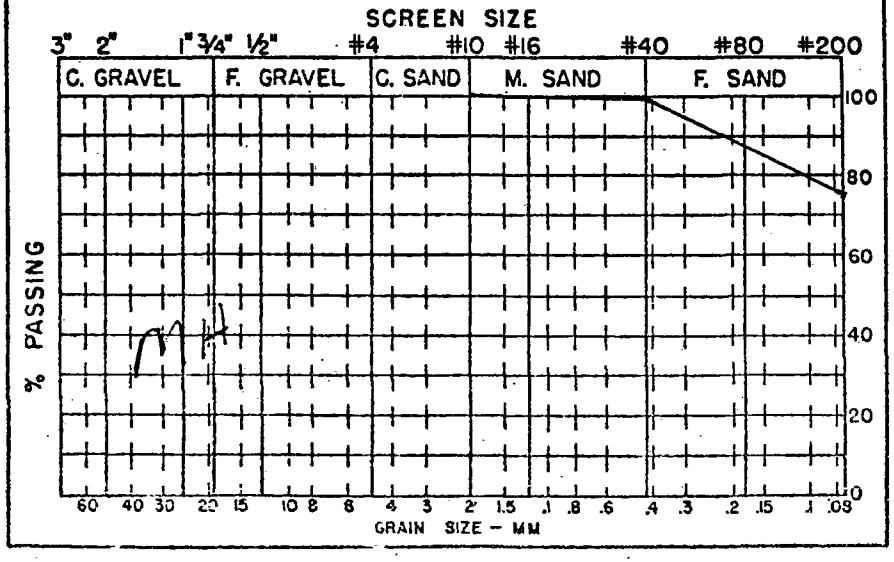
DESCRIPTION: Wet, Grn., Gr & some Rust, Cly. F. Sdy. Silt



SIEVE ANALYSIS % Passing 66.8 H20=53%

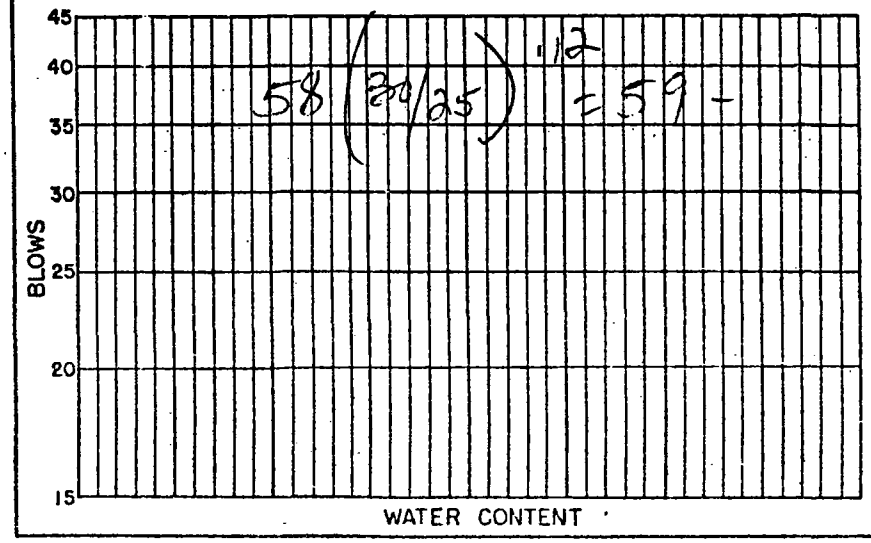
		-40	16.4	99
-3/4		-80		
-4		-140		
-10	.05	100	-200 50.35	75

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	41				64
Wet Wt.	18.80				10.58
Dry Wt.	11.93				7.35
% H_2O	58				PL= 44
Blows	30				PI= 15



DOT FORM 351-019

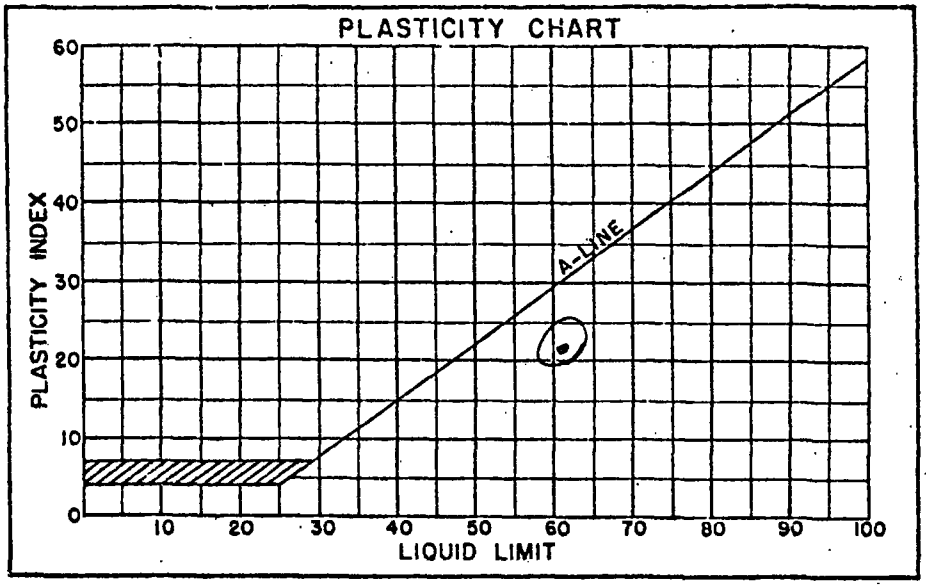
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4492-9 JOB NO. 408 HOLE NO. 53
DATE 6-13-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			✓
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			✓

DESCRIPTION: M. Gray - GRN
Sl. Org. Cly. F. Sdy Silt
w/ Cementations

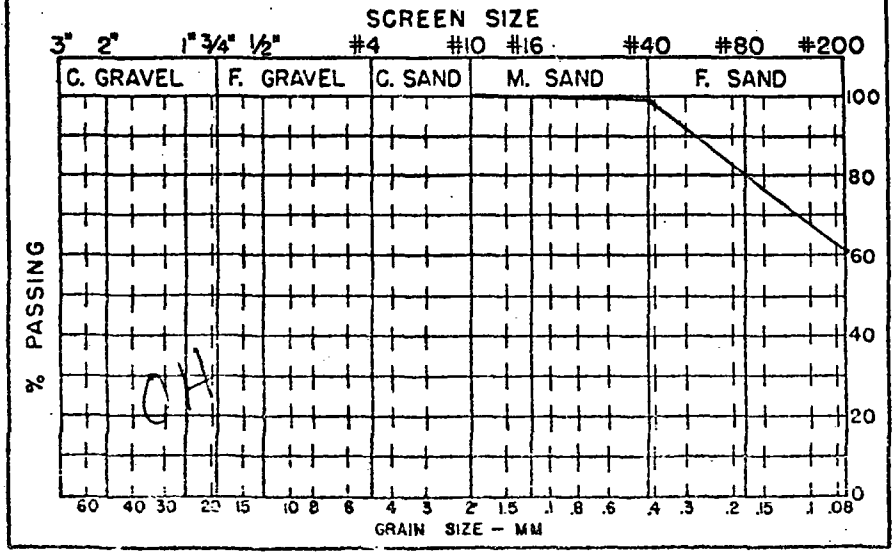


H_2O = 39%

SIEVE ANALYSIS % Passing 54.42

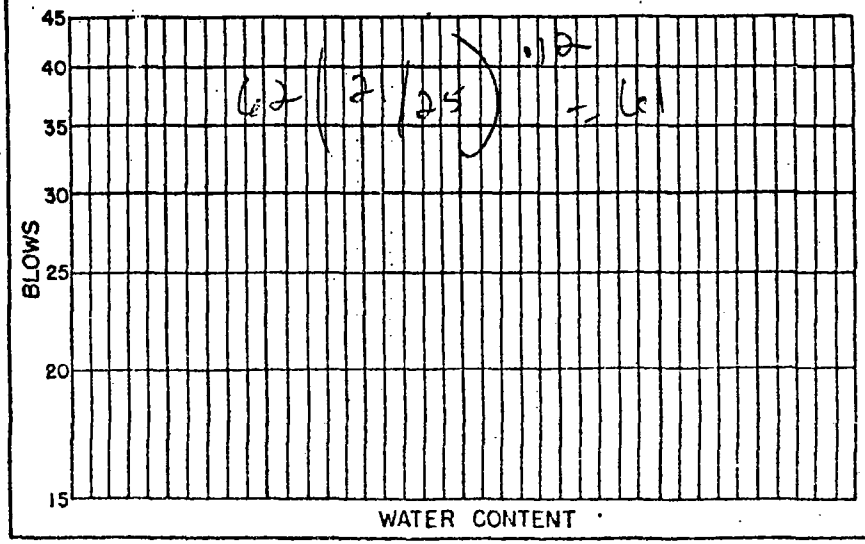
			-40	21.5	99
-3/4			-80		
-4			-140		
-10	.02	100	-200	33.02	61

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	38				73
Wet Wt.	18.83				6.9
Dry Wt.	11.6				4.95
% H_2O	62				PL= 39
Blows	21				PI= 22



BRT FORM 351

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

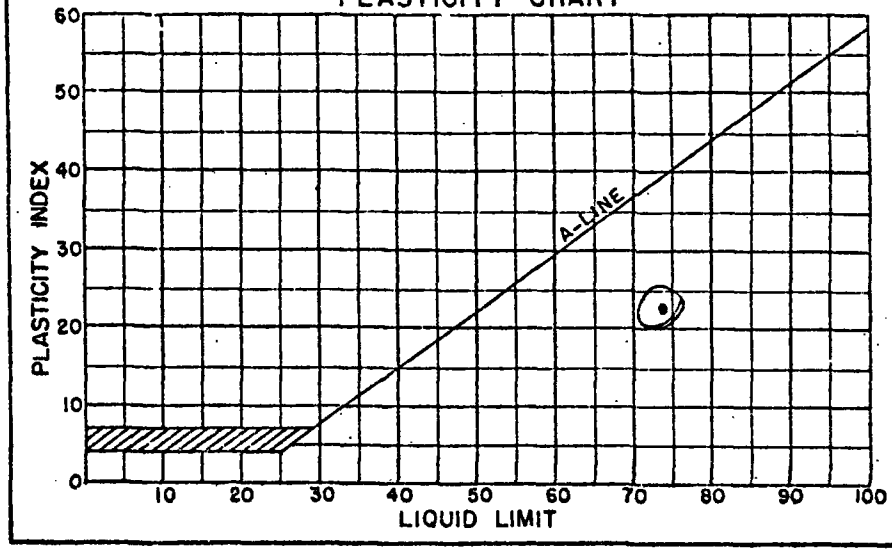
SAMPLE NO. 41492-10 JOB NO. Hog. HOLE NO. 1-53
DATE 6-6-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			✓

DESCRIPTION: Visual = Dry, olive Cly. (waxy - glossy look) F. Sdy. Silt

PLASTICITY CHART



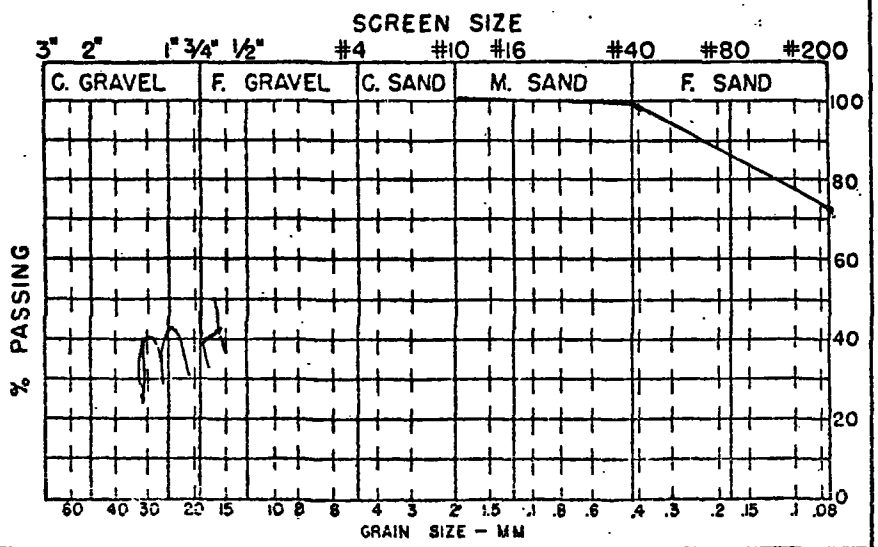
H_2O = 33%

SIEVE ANALYSIS

% Passing 59.88

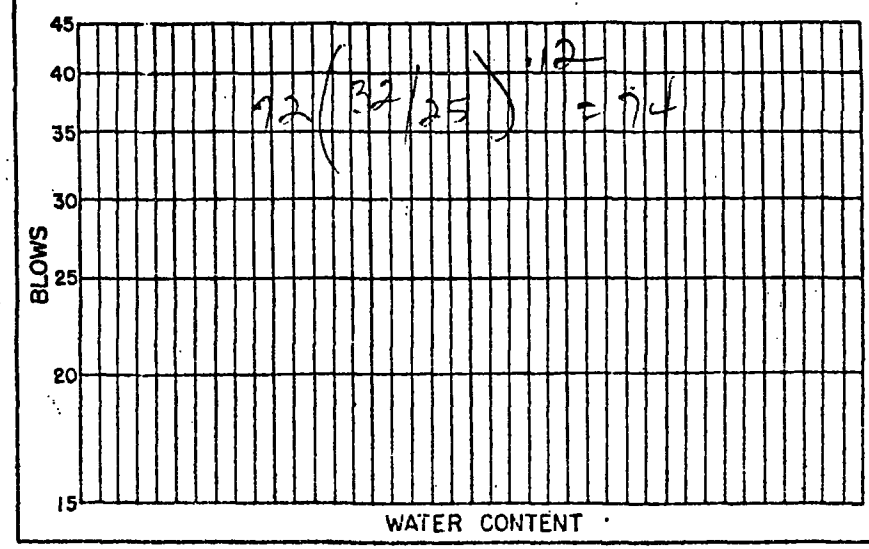
			-40	16.23	99
-3/4			-80		
-4			-140		
-10	.02	100	-200	43.63	73

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	118				39
Wet Wt.	20.28				8.40
Dry Wt.	11.81				5.55
% H_2O	72				PL= 51
Blows	32				PI= 23



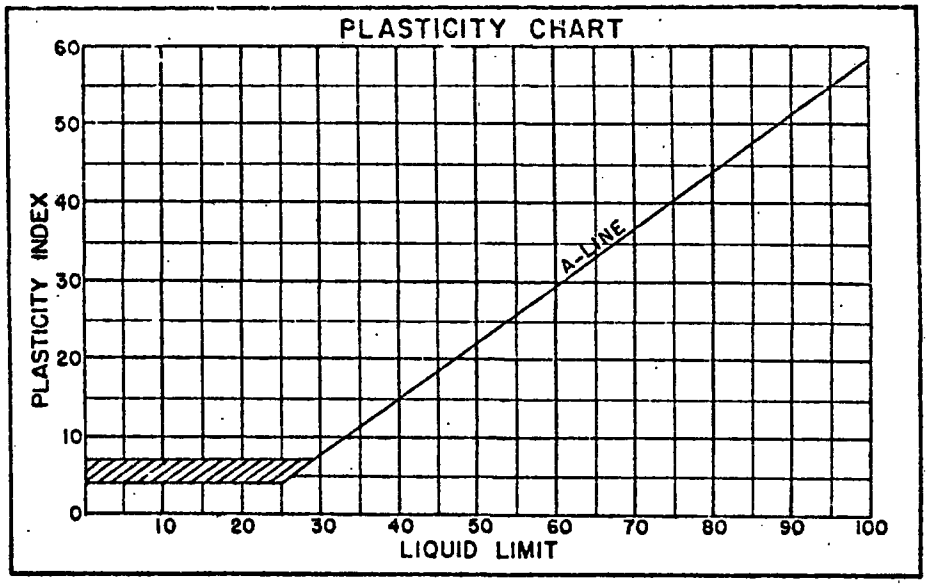
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4492-11 JOB NO. 8-68. HOLE NO. J-53
DATE 6-15-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE		✓	
TOUGHNESS	twigs	✓	

DESCRIPTION: M-Wet, GR. ORG. V. Sty., F. SR. Gruly. F-C SAND

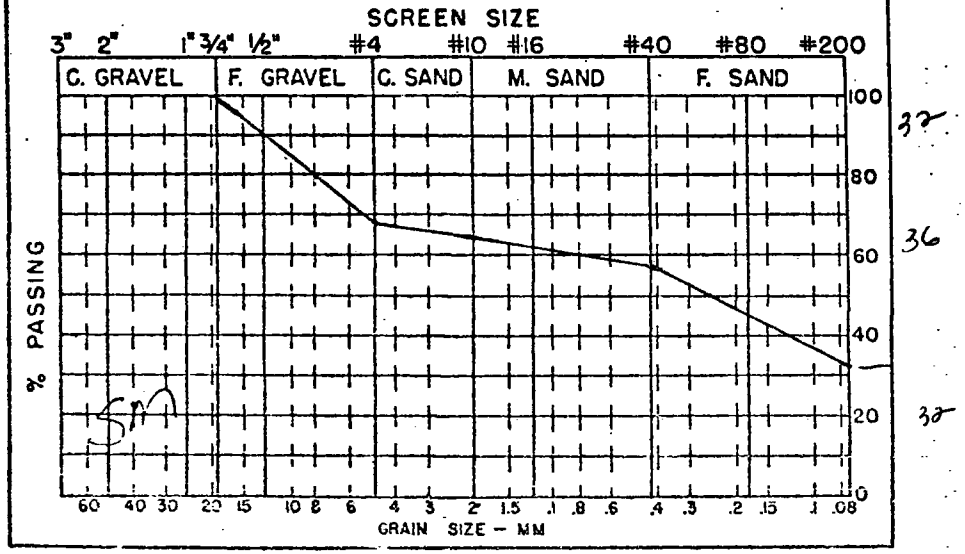


H_2O = 32%

SIEVE ANALYSIS % Passing 123.92

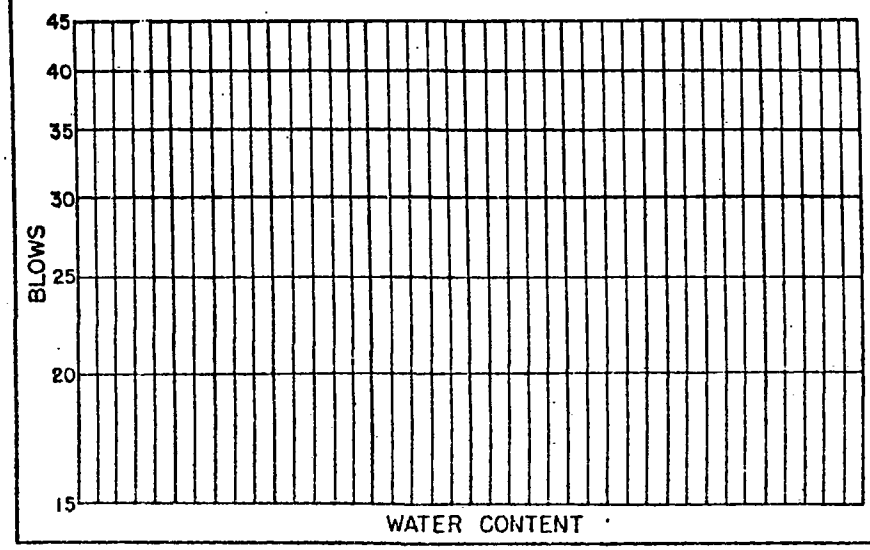
			-40	32.52	58
-3/4	39.72	100	-80		
-4	4.78	68	-140		
-10	7.68	54	-200	39.22	32

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 35

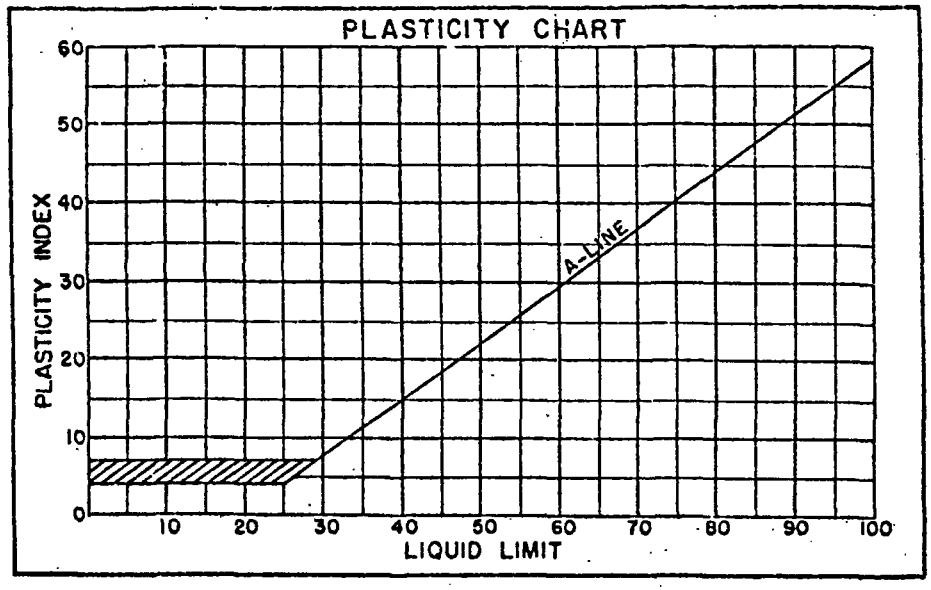
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 44 92-12 JOB NO. 4 log. HOLE NO. J.53
DATE 6-15-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL		✓	✓
DRIED CAST		✓	✓
DILATANCY			
BITE		✓	✓
TOUGHNESS		✓	

DESCRIPTION: M, Gr. Grn & Olive yellow. Sty. F. & Gruly. F-C SAND

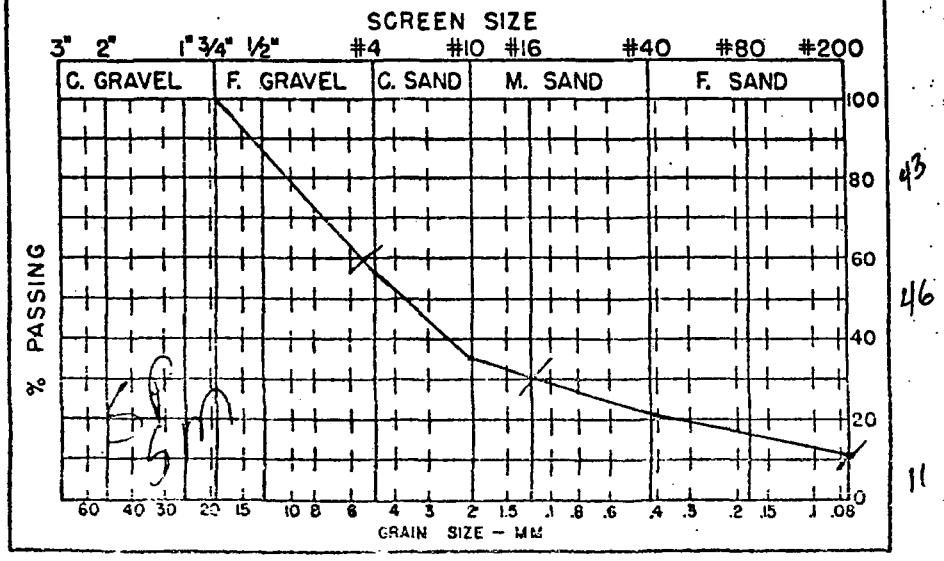


H_{20}=16 %

SIEVE ANALYSIS % Passing 151.7

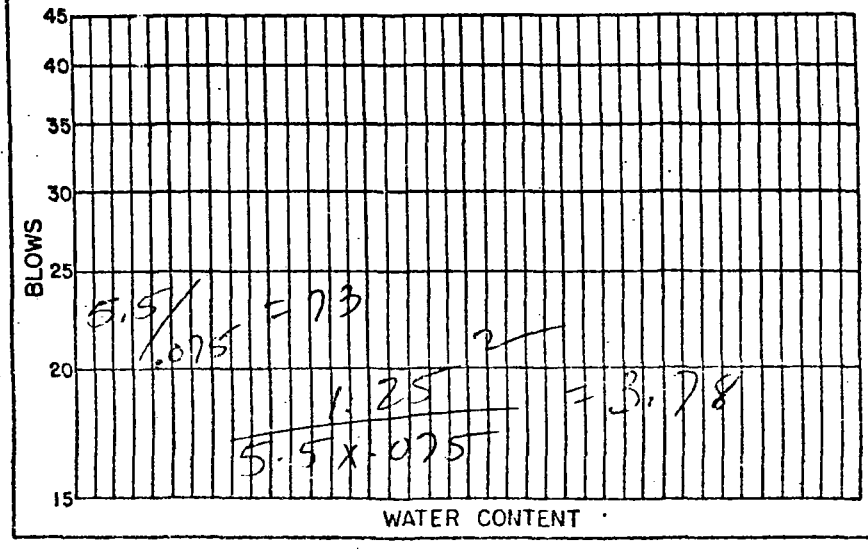
			-40	14.7	21
-3/4	64.5	100	-80		
-4	32.85	57	-140		
-10	22.4	36	-200	17.25	11

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place Tumwater

Date

Dear Sir:

I have forwarded by today's [illegible] the following Foundation Samples.

Contract or Job No. L-7262 Section West Hequiam by Pass
SR No. 101A Sub-Section Cut section.

Station & Offset 142+15 82' Lt. Hole # J-54

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4505	D-1	0' 0" – 2' 0"		ML	LK 4492-1 w/org. twigs wet, orangish Brn, org. (twigs) F. Sdy. SILT
4506-1	U-2	4' 0" – 4' 4"	A		
-2		4' 4" – 4' 8"	B		
4507-1	D-3	6' 0" – 8' 0"		OH	LK 4492-3 w/org & cement. wet, tan & Gr. w/oxidiz., ORG. Cly. F. Sdy. SILT w/cementations
-2	D-4	11' 0" – 13' 0"		OH	LK 4492-3 wet, tan & Gr w/oxid., Sl. Org. Cly. F. Sdy. SILT
4508-1	U-5	14' 8" – 14' 10"			
-2		14' 10" – 15' 2"			
4509	D-6	17' 6" – 18' 6"		OH	LK 4492-3 Above wet, tan & Gr. w/oxid., Sl. org., Cly. F. Sdy. SILT
4510	U-8	[illegible] 0" – [illegible] 4"	A		

1 copy with samples
1 copy to addressee

Yours very truly,

Inspector.

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place .....

Date .....

Dear Sir:

I have forwarded by today's ..... the following Foundation Samples.

Contract or Job No. 7262 Section ..... SR No. ..... Sub-Section .....

Station & Offset 14+15 82' Lt. Hole # J-54

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4511-1	D-1	24' 0 / 26' 0	44%	ML	Wet, Gn., org. F. Sdy. SILT
-2	[illegible]	27' 6 / 29' 0		ML	SAME
-3	[illegible]	27' 6 / 29' 6	65%	ML	Wet, Brn. SILT w/ Sl. Trace F. SAND
-4	D-12	31' 6" / 33' 6		ML	SAME w/ TRACE Org. LAYER
4512-1	U-13	34' 10" / 35' 2"	B		
-2		35' 2" / 35' 6"	C		
-3		35' 6" / 35' 10"	D		
-4		35' 10" / 36' 2"	E		
-5		36' 2" / 36' 6"	F		

1 copy with samples
1 copy to addressee

Yours very truly,

.....
Inspector.

DOT FORM 351-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place .....

Date .....

Dear Sir:

I have forwarded by today's ..... the following Foundation Samples.

Contract or Job No. L-7262 Section ..... SR No. ..... Sub-Section .....

Station & Offset 142+15 82' LT. Hole # J-54

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4513-1	D-14	36' 5" / 38' 6"	58%	ML	Wet, Gr. Brn. Silt
-2	D-15	39' 6" / 41' 6"	67%	OL	Wet, Gr-Brn, Cly. (org. odor) F. Sdy. Silt
4514-1	U-16	44' 10" / 45' 2"	B		
-2		45' 2" / 45' 6"	C		
-3		45' 6" / 45' 10"	D		
-4		45' 10" / 46' 2"	E		
4515-1	D-17	46' 6" / 48' 6"		OL	LK 4513-2 Above w/ Blk. decomposed wood pieces
-2	D-18	49' 6" / 51' 6"	46%	ML	Wet, Gr.-Brn., Cly. F. Sdy. Silt w/ trace med. Sand & some cementations
-3	D-19	54' 6" / 56' 6"	55%	MH	Wet, Gr. F. Gruly. F. Sdy. Silt

1 copy with samples
1 copy to addressee

Yours very truly,

.....
Inspector.

DOT FORM 351-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

MATERIALS ENGINEER
Materials Laboratory
P. O. Box 167, Olympia, WA 98504 (Mailing Address)
1655 So. 2nd Ave.
Tumwater, Washington 98504 (Shipping Address)

Place .....

Date .....

Dear Sir:

I have forwarded by today's ..... the following Foundation Samples.

Contract or Job No. L-7266 Section ..... SR No. ..... Sub-Section .....

Station & Offset 14+15 82' LT. Hole # J-54

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
~~4518~~ ~~-4~~	D-21	[illegible] 61' [illegible]	No Recovery.		
4515 -~~3~~4	D-21-A	64' 6" 65' 0"		SP SM	LR 4492-12 Moist, Gr. Grn. & Olive yellow Sty. F. & Gruly. F-C SAND
-5 ~~-6~~	D-21-B	65' 0" 66' 6"	37%	ML	Wet, Gr. GREEN F. Sdy. SILT w/ MICA
-6 -~~7~~	D-22	69' 6" 71' 6"		ML	SAME only GRAY.
-7 ~~-8~~	D-23	74' 6" 76' 6"	50%	SM	VISUAL = DRY Gr. wet (silvery), Cly. F. S.A. Gruly. F. SAND w/t. M-C SAND
-8 ~~-9~~	D-24	79' 6" 80' 10"	11%	SM	Dry, olive, V. Sty., F. Gruly. F-C SAND

1 copy with samples
1 copy to addressee

Yours very truly,

Larry M Moore
Inspector

DOT FORM 351-002

VANE BORER SHEAR TEST

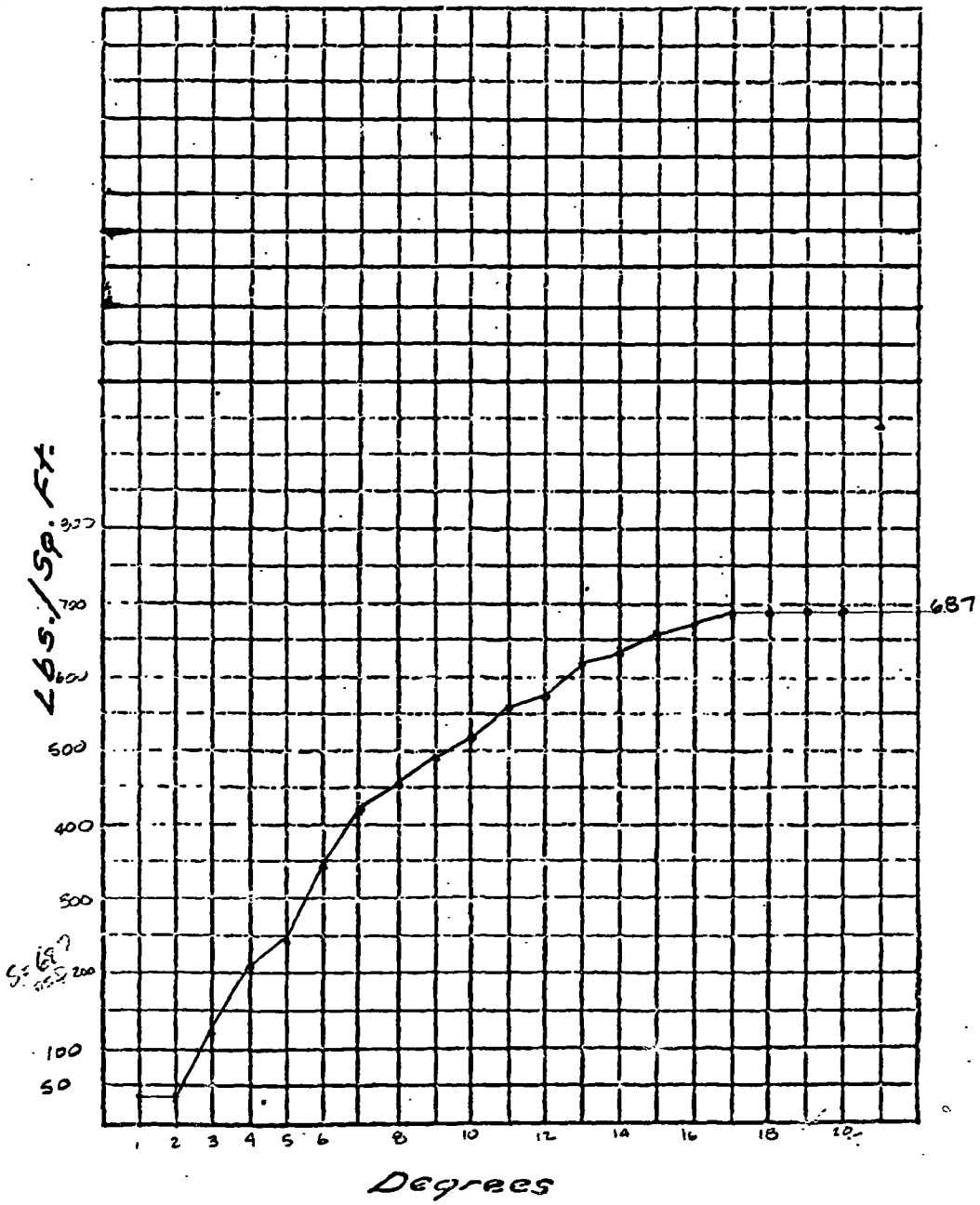
Inspector MOORE, BAUER

Job No. L7262 Section W. HOQUIAM CONN S.H. No 101A

Hole No. J-54 Sta. 142+15 Offset 82 Elev. 66' Date 5/17/83

Depth	Material	Strain Degree	Gauge Rdg.-lbs		Shear Str. #/Ft.²	
21'	CLAY	1	20		151	
	Slightly silty	2	37		279.4	
		3	49		370.	
		4	50		377.5	
	NO VANE	5	50		377.5	
		6	50		377.5	
		7	50		377.5	
				REMOLD		REMLD
		1	25	8	188.8	60.4
		2	42	10	317.2	75.6
		3	65	10	490.8	75.5
		4	77	11	581.4	83
		5	86	12	649.5	90.6
		6	95	13	724.8	98.2
		7	106	14	800.5	105.7
		8	110	14	830.5	105.7
		9	115	14	868.3	105.7
		10	118	16	890.9	120.8
		11	124	18	936.2	135.9
		12	126	19	951.3	143.5
		13	132	20	996.4	151
		14	134	22	1011.7	166.1
		15	137	23	1034.4	173.7
		16	139	24	1049.5	181.2
		17	141	25	1064.6	188.8
		18	141	26	"	196.3
		19	141	28	"	211.4
		20	142	28	1072.2	211.4

Remarks:



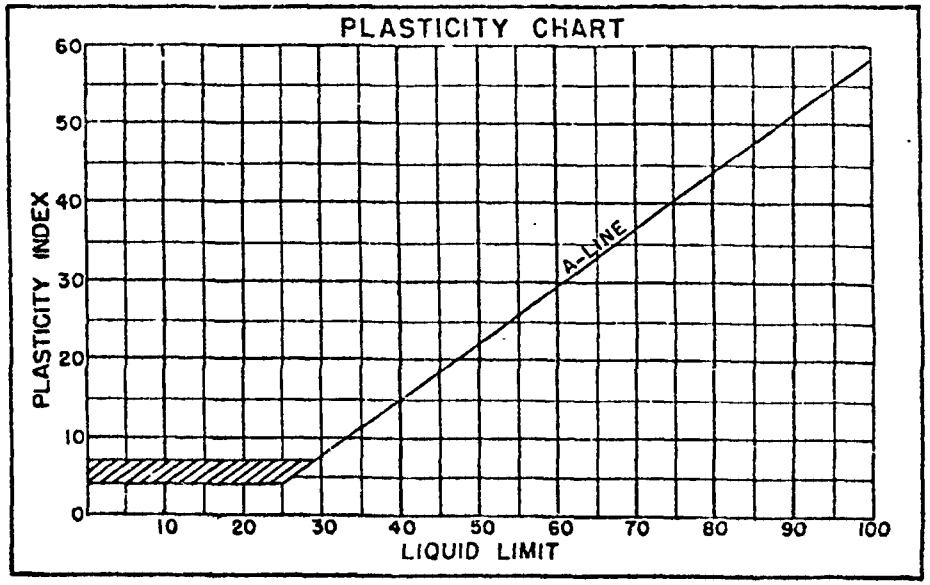
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4511-1 JOB NO. Hcf. HOLE NO. J-5d
DATE 6-15-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓✓	
DRIED CAST	✓	✓✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓✓	

DESCRIPTION: Mlpt, Gr., Org.
F. Sdy. SILT

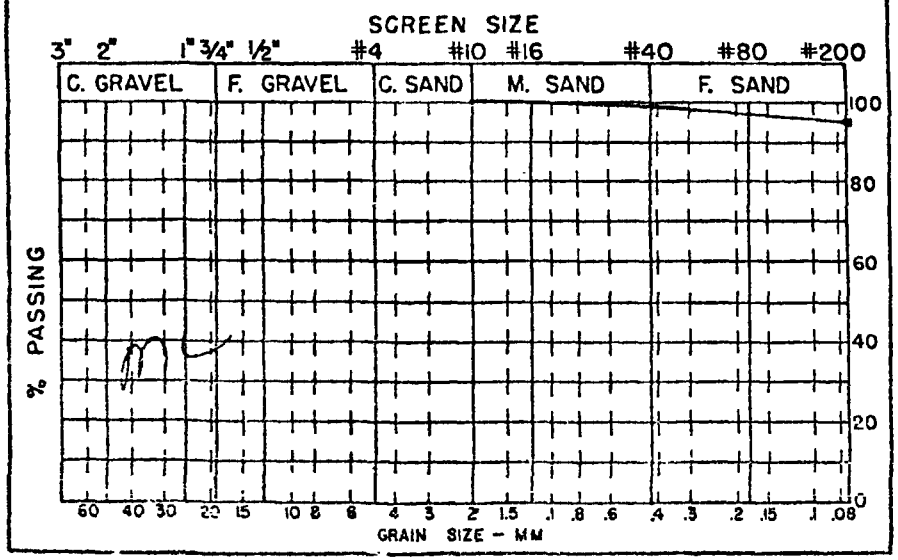


H_2O = 44 %

SIEVE ANALYSIS % Passing 74.06

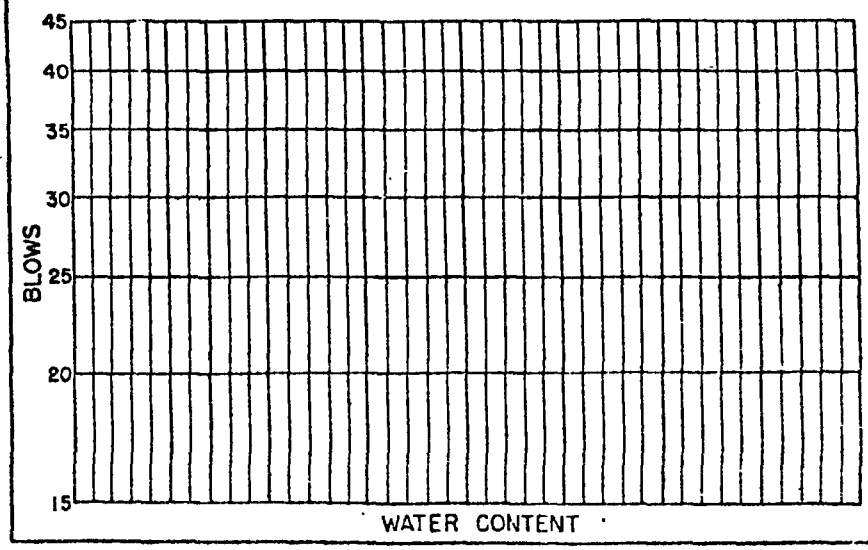
	-40	3.75	99
-3/4	-80		
-4	-140		
-10 .01	-200	70.3	95

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



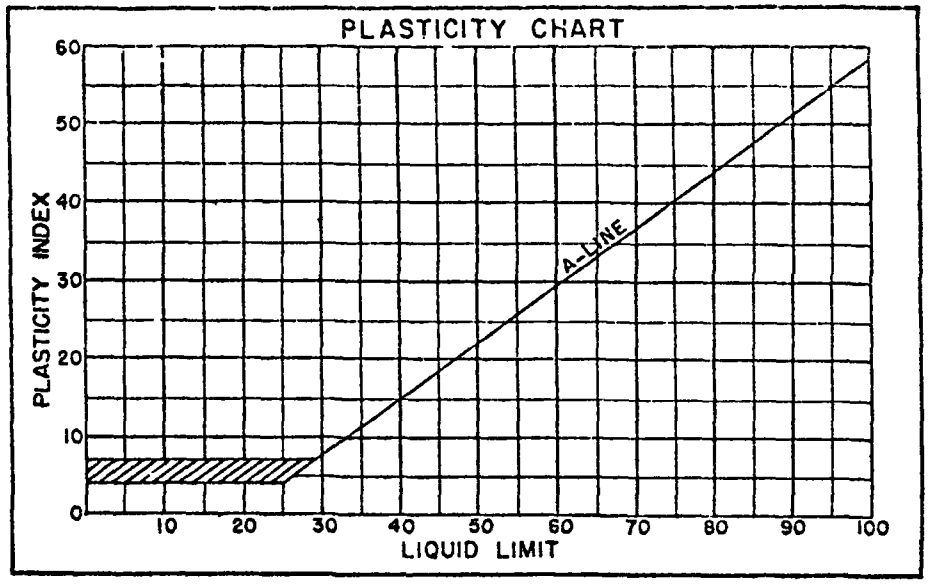
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4511-3 JOB NO. 208. HOLE NO. 1-54
DATE 6-10-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: Wet, BRN. SILT w/ Sl. Trace F. Sand

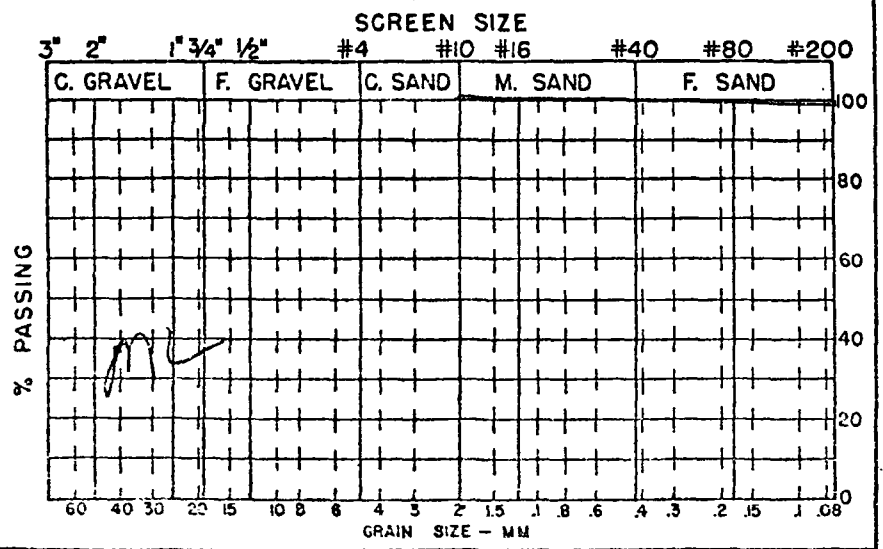


$H_2O = 65\%$

SIEVE ANALYSIS % Passing 35.8

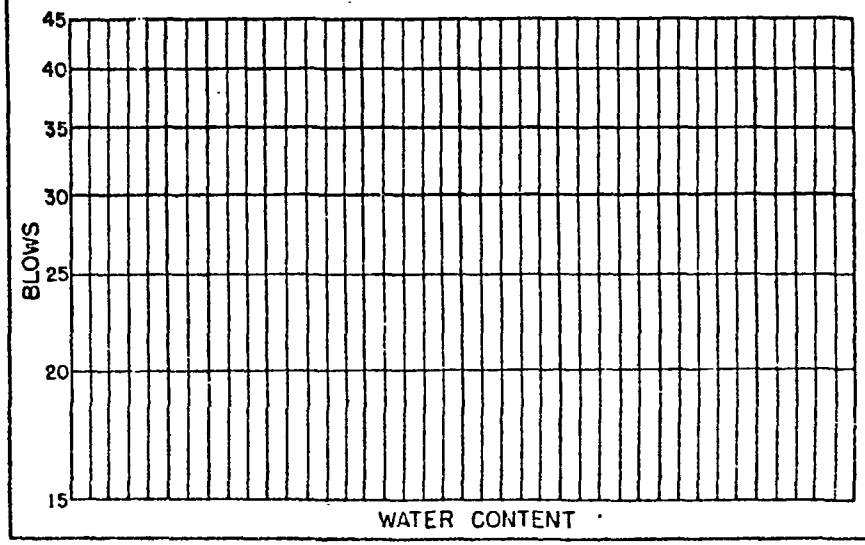
			-40	.25	99
-3/4			-80		
-4			-140		
-10	.05	100	-200	35.5	99

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



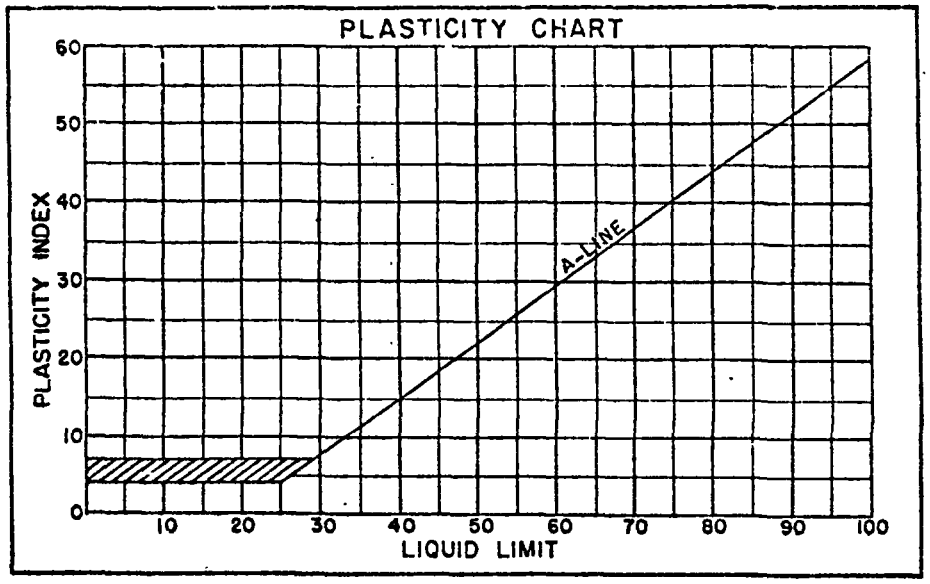
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4513-1 JOB NO. Hof. HOLE NO. J-54
DATE 6-20-83 OPERATOR BC.

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

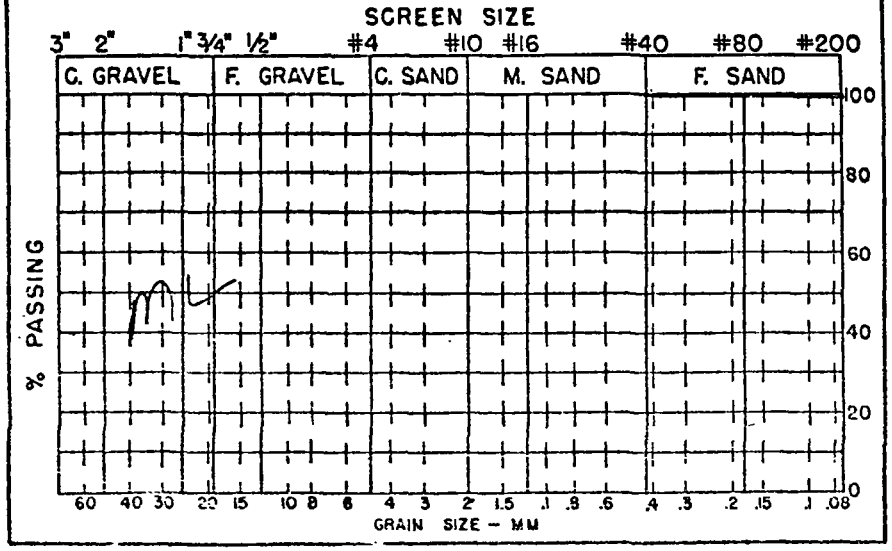
DESCRIPTION: Wet, GR- BRN. SILT



H_2O = 58%

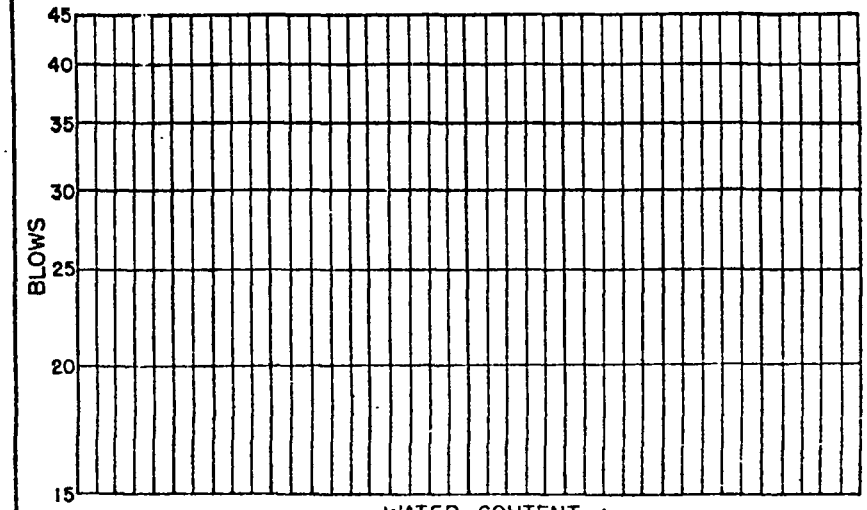
SIEVE ANALYSIS		% Passing 55.62
	-40 . 5	100
-3/4	-80	
-4	-140	
-10	-200 55.12	99

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

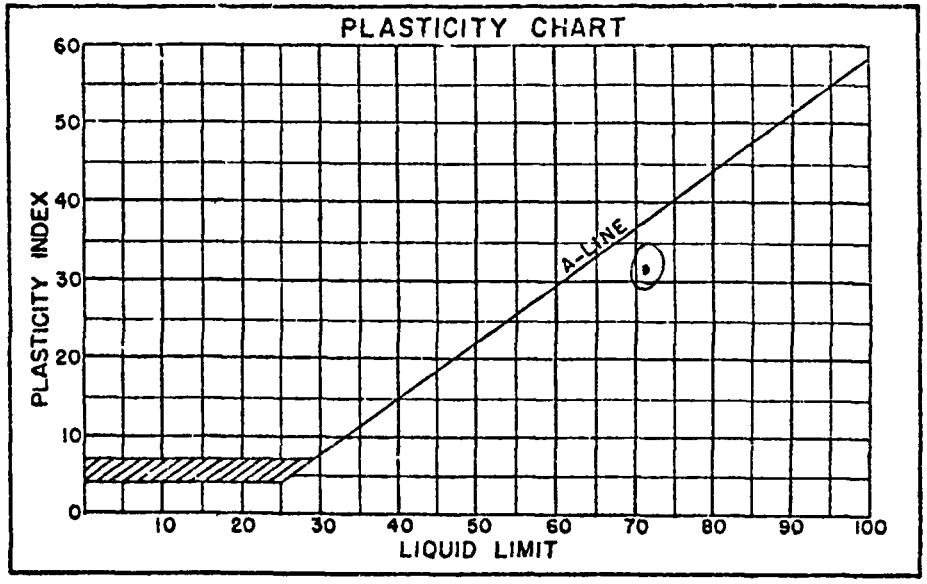
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4513-2 JOB NO. Hog. HOLE NO. J-54
DATE 6-6-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			✓
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: Wet, GR-BRN, Cly. (ORG. ODOR) F. Sdy. SILT

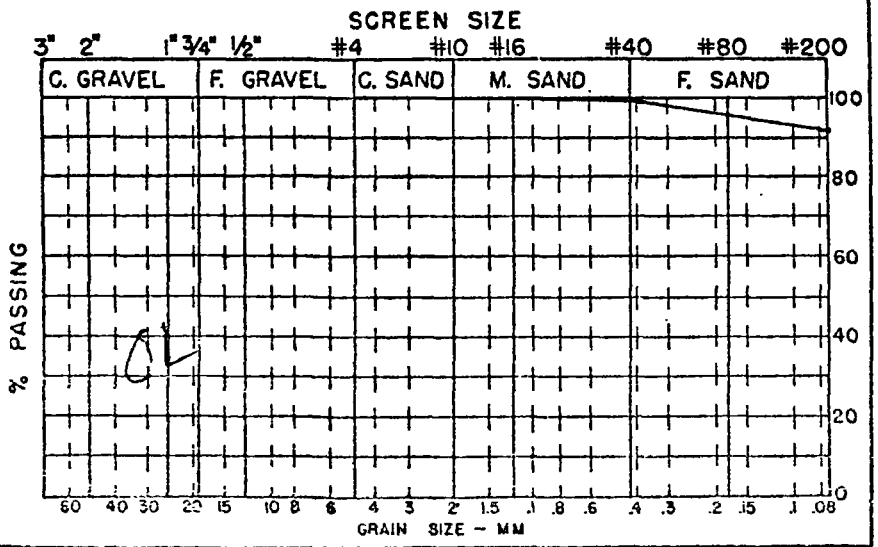


H_2O = 67%

SIEVE ANALYSIS % Passing 52.88

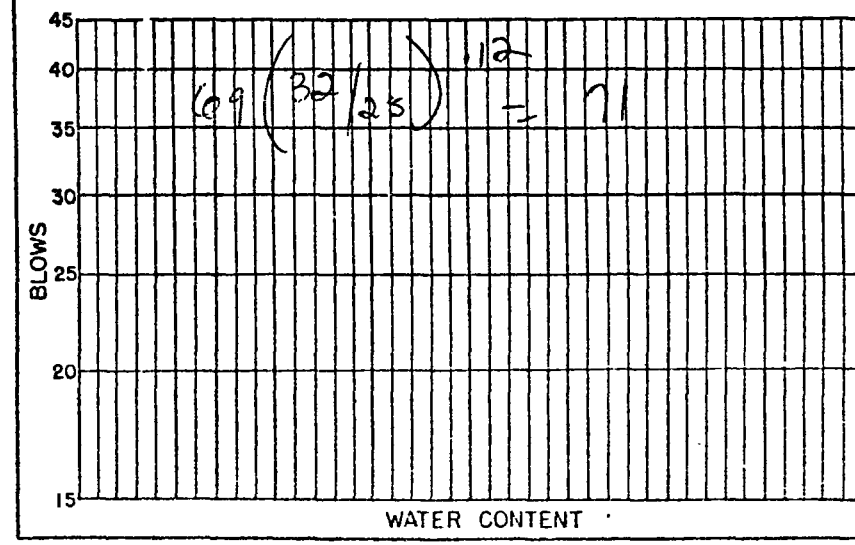
			-40	4.4	99
-3/4			-80		
-4	.01	100	-140		
-10	.02	99	-200	48.45	92

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	115				~~47~~ 66
Wet Wt.	18.90				6.60
Dry Wt.	11.15				4.76
% H_2O	69%				PL= 39
Blows	32				PI= 32



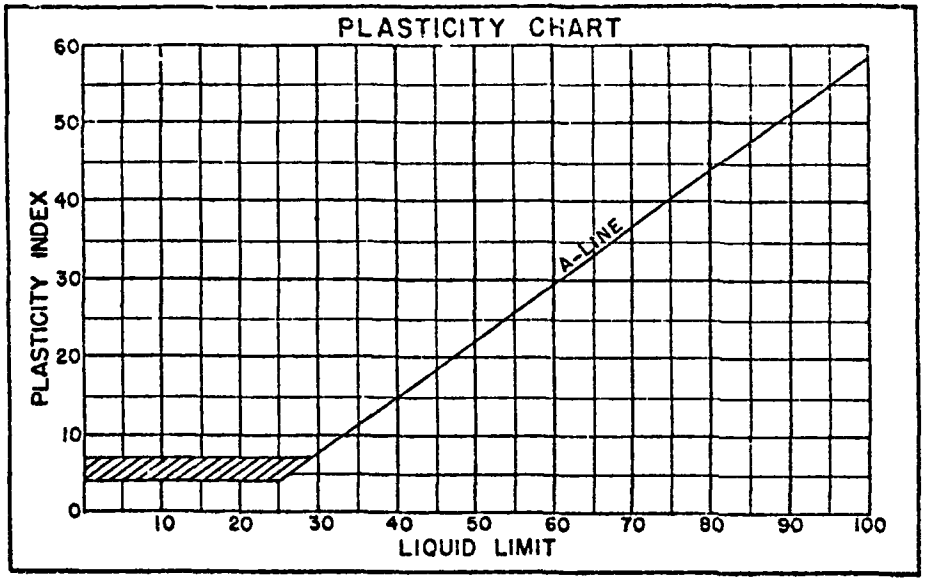
DOT FORM 351-014

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4515-2 JOB NO. 11 HOLE NO. J-54
DATE OPERATOR

SOIL FIELD IDENTIFICATION			
TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	✓

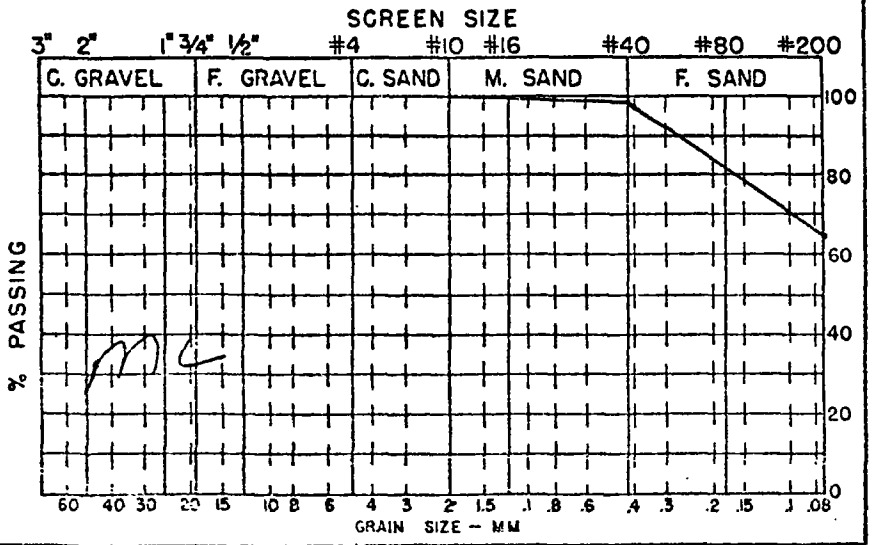
DESCRIPTION: Wet, GR-Brn. Cl-F. Sdy. Silt w/ T. Med. Sand w/ Some Cementations



H_2O = 46 %

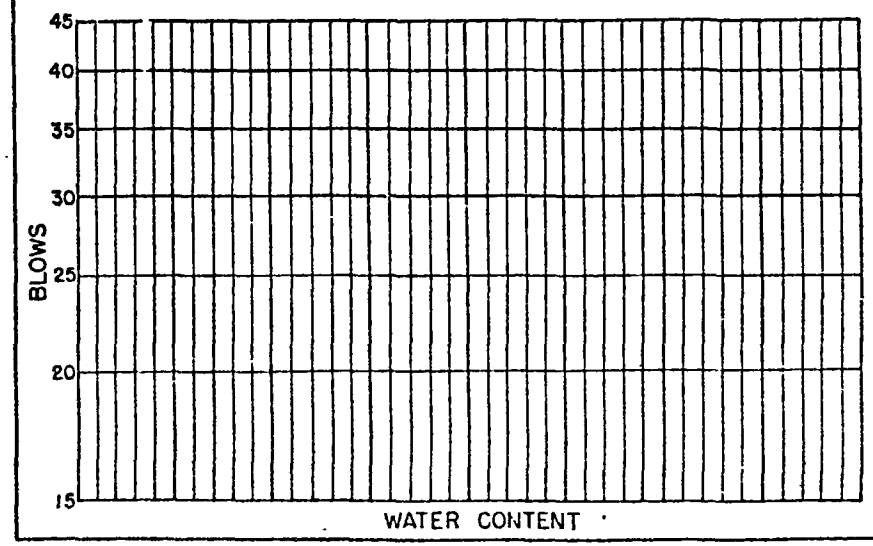
SIEVE ANALYSIS		% Passing	76.92
	-40	26.3	98
-3/4	-80		
-4	-140		
-10 1.4 100	-200	49.22	64

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

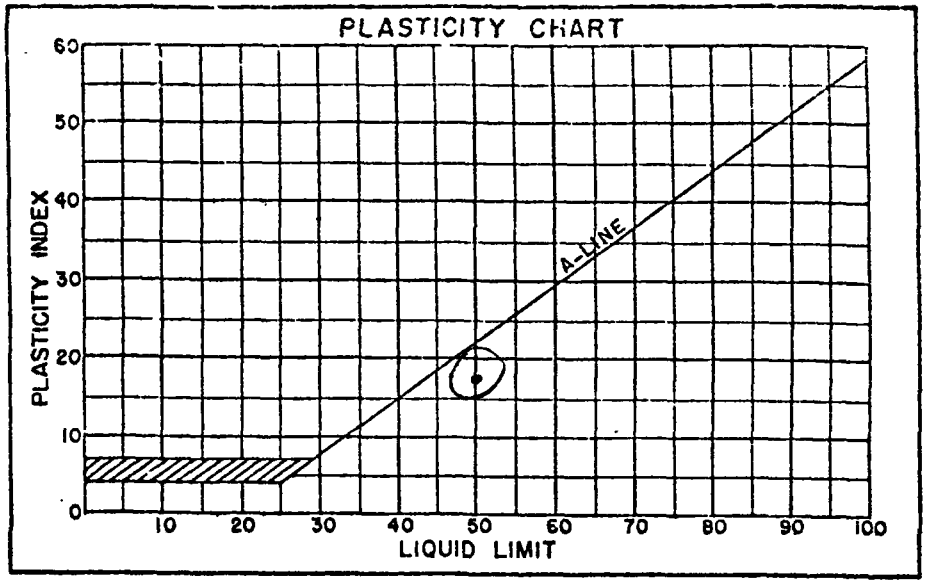
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4515-3 JOB NO. X-08. HOLE NO. J.54
DATE 6-9-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			✓
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: Wet, Gr. F. gruly. F. Sdy. Silt

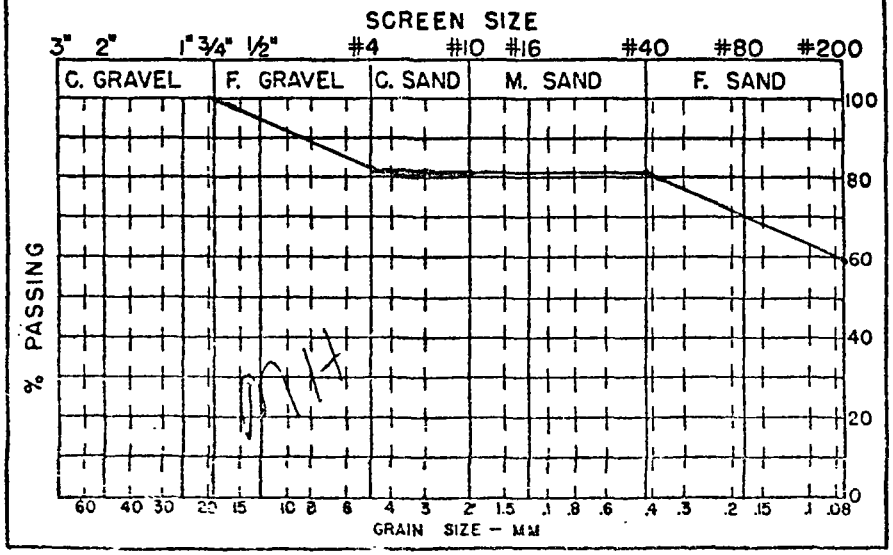


H 20 = 55%

SIEVE ANALYSIS % Passing 85.45

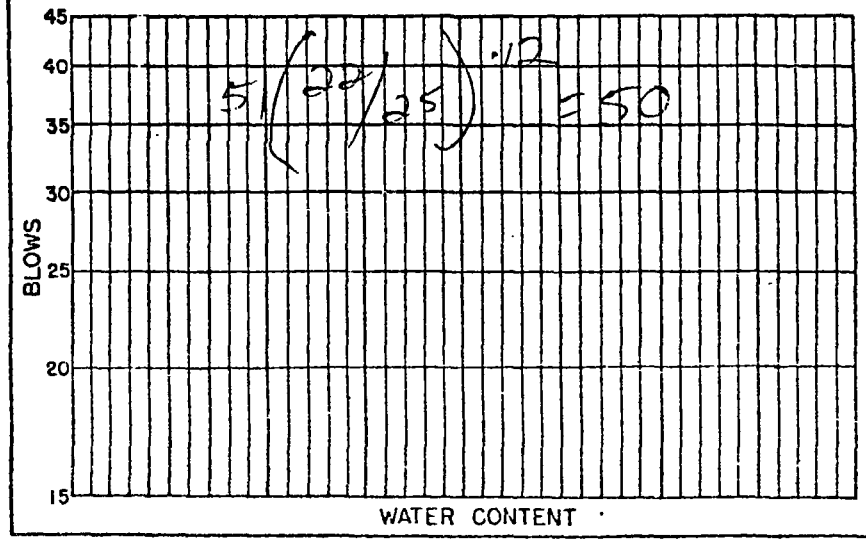
			-40	18.68	61
-3/4	15.5	100	-80		
-4	.45	82	-140		
-10	.13	81	-200	50.69	59

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	56				72
Wet Wt.	19.7				7.52
Dry Wt.	13.02				5.67
% H_2O	51				PL= 33
Blows	22				PI= 17



DOT FORM 351-019

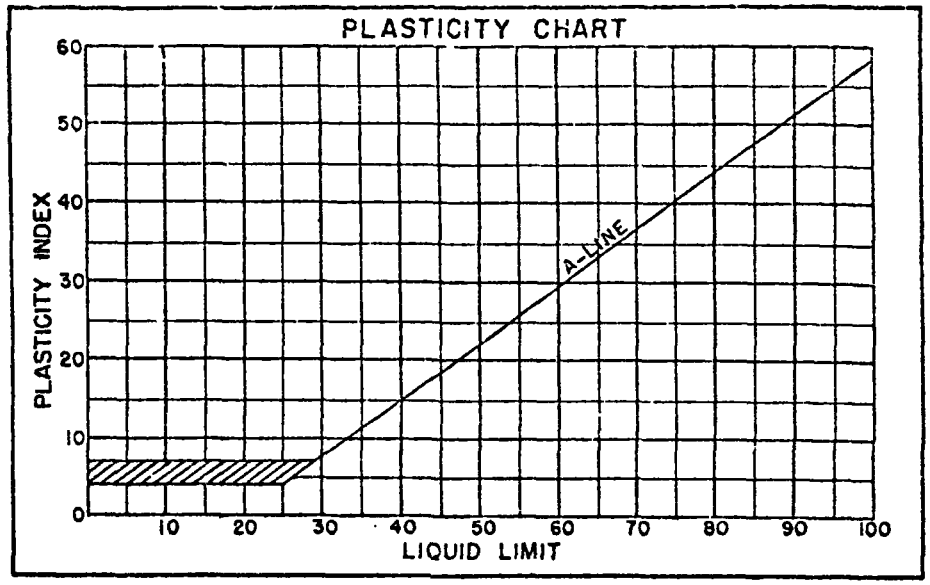
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4515-5 JOB NO. 4-08. HOLE NO. J-54
DATE 6-10-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: Wet, Gr. Green F. Sdy. Silt w/ Mica

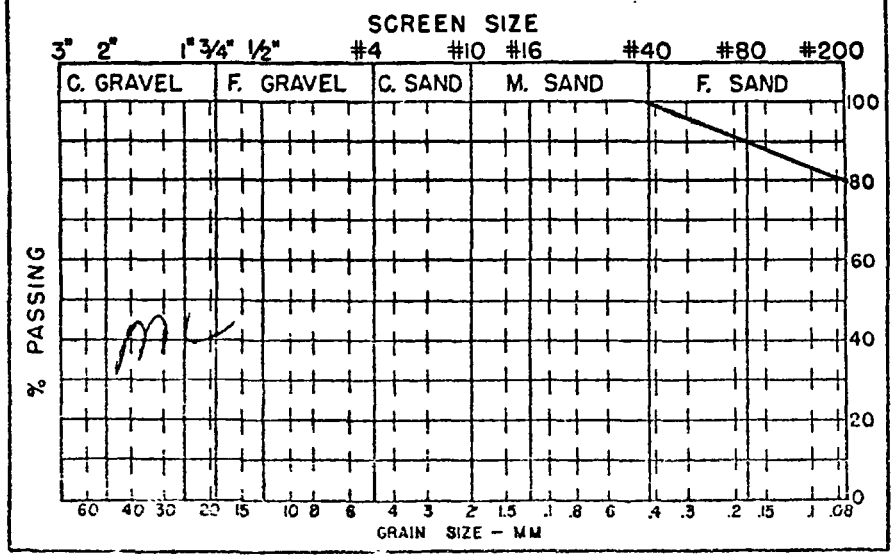


H2O = 37 %

SIEVE ANALYSIS % Passing 83.82

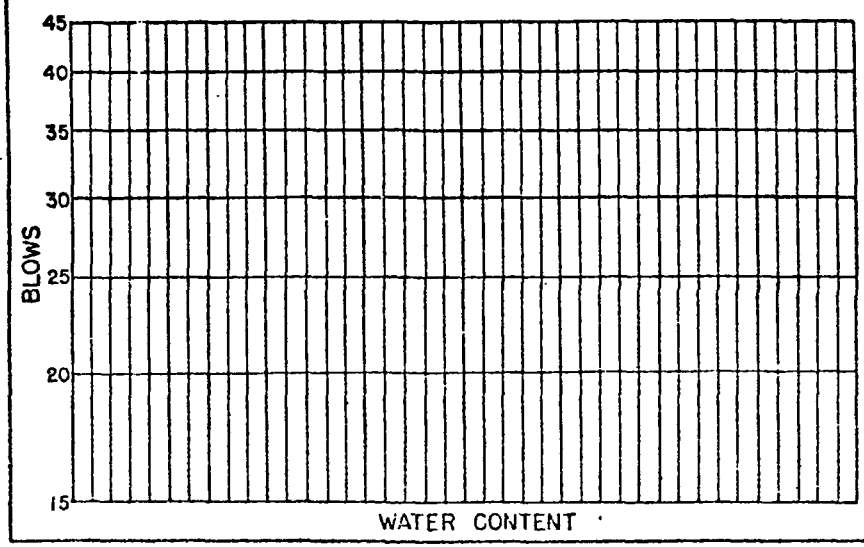
	-40	16.82	100
-3/4	-80		
-4	-140		
-10	-200	67.0	80

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-010

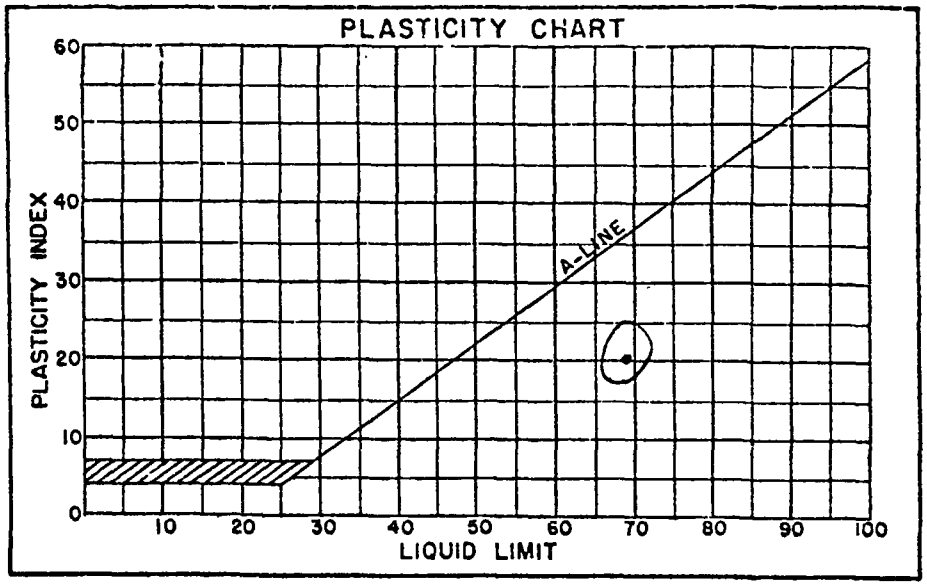
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4515-7 JOB NO. 7/8. HOLE NO. J-54
DATE 6-13-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	✓
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: Visual - D, GR. (Silvery) Cly. F. S.A. Gruly. F. SAND w/ t. M-C SAND

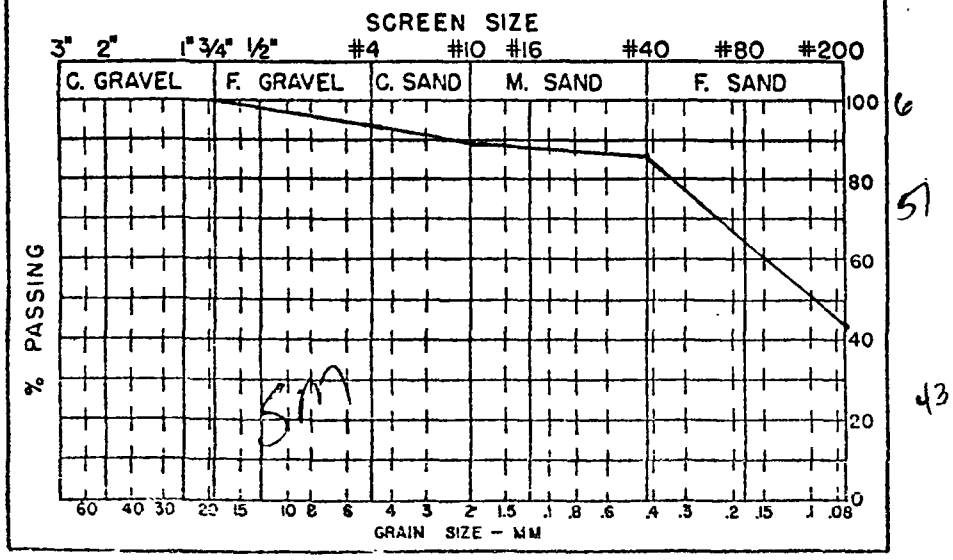


H2O: 50%

SIEVE ANALYSIS % Passing 71.95

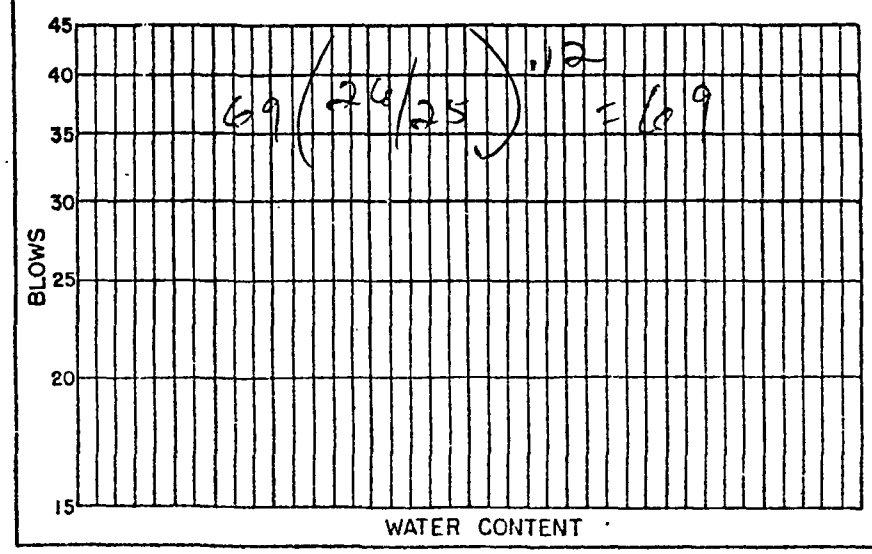
			-40	31.4	86
-3/4	4.06	100	-80		
-4	3.68	94	-140		
-10	1.78	89	-200	30.8	43

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	116				50
Wet Wt.	20.84				9.72
Dry Wt.	12.31				6.52
% H_2O	69				PL= 49
Blows	26				PI= 20



DOT FORM 351-010

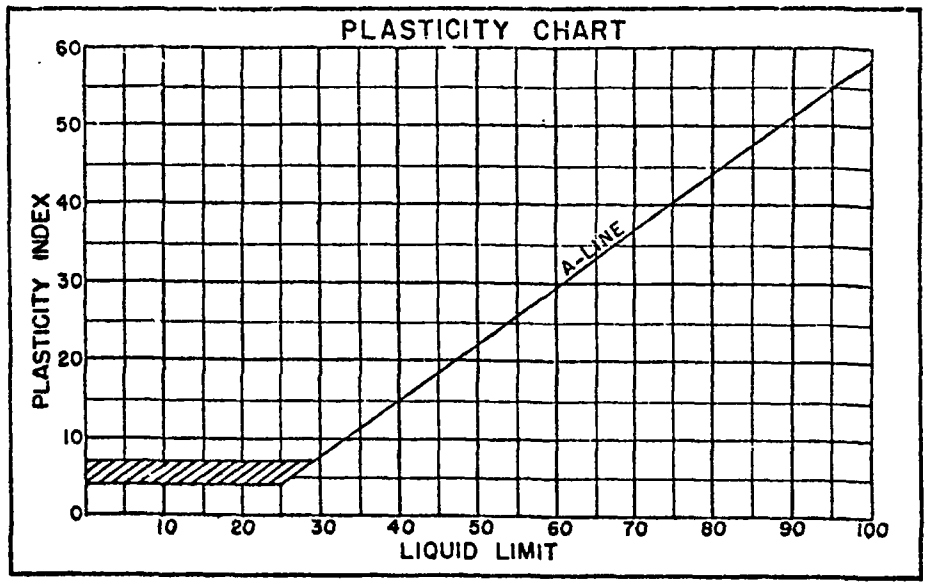
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4515-8 JOB NO. 7-69. HOLE NO. J-54
DATE 6-15-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: D. Clive J-54 F. gruly. F-C SAND

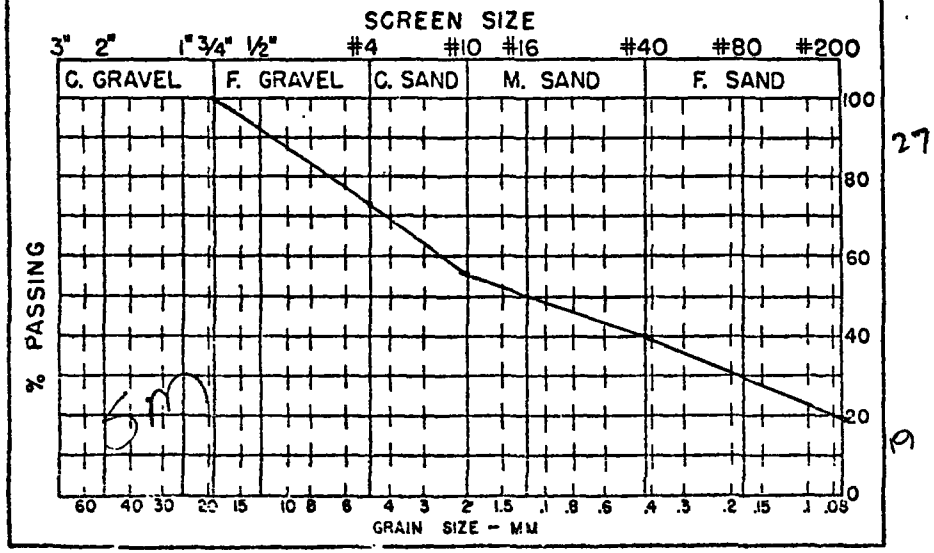


H_2O = 11%

SIEVE ANALYSIS % Passing 152.52

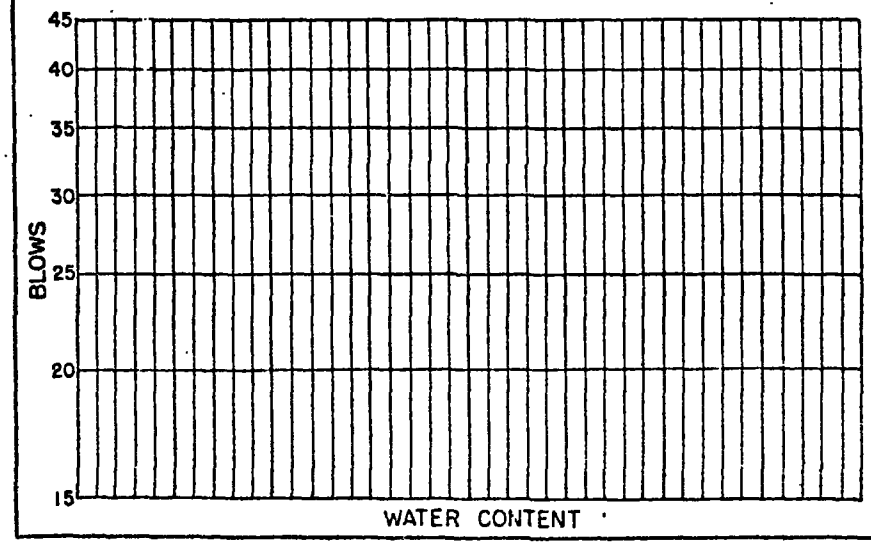
			-40	32.2	40
-¾	41.5	100	-80		
-4	25.75	73	-140		
-10	23.96	56	-200	29.11	19

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

MOISTURE DETERMINATION

Job No. L-7262 Section West Hoquiam by Pass cut section.

Hole 154

	Can No.	Date	Station	Offset	Depth	Wt of can + wet soil	Wt of can + dry	Wt. of H_2O	~~Wt. of~~ can	~~Wt. of~~ wet ~~dry soil~~	Dry Wt. pass #4 (dry)	% of H_2O	% H_2O #4 minus
154-1	1	5-17-83	142+15	82' LT.	12'	~~Can~~	~~No~~		112	46.22	28.80	60	
-2	2				25'	~~WT.~~	~~WT.~~		68	63.08	40.18	57	
-3	3				33'				51	61.50	40.22	53	
-4	4	5-18-83			38'				42	59.78	36.32	64	
-5	5				48'				40	51.38	29.26	76	
-6	6				51'				74	58.87	39.62	48	

~~TRIAXIAL COMPRESSION TEST (With Area Changes and Pore Pressures)~~

Project W. Hoquiam Bypass Location Sta. 142+15

Job No. L-7262 Sample No. 4512-2 Boring No. T-54 Depth 35'2" to 35'6"

Area (Ao) _____ Length _____ Confining Pressure _____

Rate of Loading _____ L. R. C. _____ Tested by _____ Date _____

Description _____

GROSS WT.	TARE	NET WT.	CAN NO.	WET WT.	DRY WT.	WT. H^2O	% H^2O	WET DENS.	DRY DENS.

Data for Mohr's Envelope:

Max. Deviator Stress _____

Principal Stress _____

Effective Principal Stress _____

Failure

Back Press. _____

Saturation _____

ELASPED TIME (Hr.) (Min.)	LOAD DIAL READ (X 10^{-4})	DEFORM. DIAL READ	Δ L (COL. 3 x 10^{-3})	E. UNIT STRAIN (ΔL/L)	AREA C.F. (1 − E)	CORRECT. AREA A' ($\frac{A^o}{1-E}$)	PORE PRESS.	DEV. LOAD (Col. 2 X LRC)	DEV. STRESS (Col. 9 ÷ Col. 7)	PRINC. STRESS (Col 10 + conf. press.)
1	2	3	4	5	6	7	8	9	10	11
.66"	from	top			Torvane		600 PSF			
					Pocket	Penetrometer		1500 PSF		

DOT FORM 351-018 REVISED 4/00

~~TRIAXIAL COMPRESSION TEST (With Area Changes and Pore Pressures)~~

Project West Hoquiam Bypass Location Sta. 142+15
Job No. L-7262 Sample No. E-4512-1 Boring No. J-54 Depth
Area (Ao) Length Confining Pressure
Rate of Loading L. R. C. Tested by Date

Description

GROSS WT.	TARE	NET WT.	CAN NO.	WET WT.	DRY WT.	WT. H^2O	% H^2O	WET DENS.	DRY DENS.

Data for Mohr's Envelope:
Max. Deviator Stress
Principal Stress
Effective Principal Stress

Failure

Back Press.
Saturation

ELASPED ~~TIME (Hr.)~~ (Min.)	LOAD DIAL READ (X 10^{-4})	DEFORM. DIAL READ	Δ L (COL. 3 x 10^{-3})	E. UNIT STRAIN (ΔL/L)	AREA C.F. (1 − E)	CORRECT. AREA A' ($\frac{A^o}{1-E}$)	PORE PRESS.	DEV. LOAD (Col. 2 X LRC)	DEV. STRESS (Col. 9 ÷ Col. 7)	PRINC. STRESS (Col 10 + conf. press.)
1	2	3	4	5	6	7	8	9	10	11
Top of Sample				Torvane		800 psf				
1/2" from Top				Torvane		900 psf				
1 1/8" from Top				Torvane		840 psf				
1 3/4" from Top				Torvane		800 psf				
2 5/8" from Top				Torvane		> 800 psf				

DOT FORM 351-018

~~TRIAXIAL COMPRESSION TEST (With Area Changes and Pore Pressures)~~

Project West Hoquiam Bypass Location Sta. 142+15
Job No. L-7262 Sample No. 4510 Boring No. T-54 Depth
Area (Ao) Length Confining Pressure
Rate of Loading L. R. C. Tested by Date

Description

GROSS WT.	TARE	NET WT.	CAN NO.	WET WT.	DRY WT.	WT. H^2O	% H^2O	WET DENS.	DRY DENS.

Data for Mohr's Envelope:
Max. Deviator Stress
Principal Stress
Effective Principal Stress

Failure

Back Press.
Saturation

~~ELASPED TIME (Hr.) (Min.)~~	LOAD DIAL READ (X 10^{-4})	DEFORM. DIAL READ	Δ L (COL. 3 x 10^{-3})	E. UNIT STRAIN ($\Delta L/L$)	AREA C.F. (1 − E)	CORRECT. AREA A' ($\frac{A^o}{1-E}$)	PORE PRESS.	DEV. LOAD (Col. 2 X LRC)	DEV. STRESS (Col. 9 ÷ Col. 7)	PRINC. STRESS (Col 10 + conf. press.)
1	2	3	4	5	6	7	8	9	10	11
Top of Sample				Torvane		500	psf			
1/2" from Top				Torvane		950	psf			
1 1/8" from Top				Torvane		1000	psf			
1 3/4" from Top				Torvane		1100+	psf			
2 3/8" from Top				Torvane		1100	psf			
4511-1	SPT	Drive		Sample		Torvane on disturbed sample			400 psf	
4511-2	SPT	Drive		Sample		Torvane on disturbed sample			500 psf	

DOT FORM 351-018 REVISED 4/80

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

ATERIALS ENGINEER
aterials Laboratory
O. Box 167, Olympia, WA 98504 (Mailing Address)
55 So. 2nd Ave.
mwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 6-3-83

Dear Sir:

I have forwarded by today's State Car the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam bypass SR No. 10PA Sub-Section cut sec.

Station & Offset 142+00 60' RT. Hole # ~~J-57~~ J-59 Per Gerald Bower 6/7/83

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4622	D-1	0' 6" 2' 6"	54%	ML	M-W ORANGE BRN F. Sdy. SILT w/ ORG. Layers & WOOD + twigs
4623 -1	U-2	4' 4" 4' 8"	B		
-2		4' 8" 5' 0"	C		
4624 -1	D-3	6' 0" 8' 0"	54%	ML	M-W tan + OXID. (RUST) Cly. F. Sdy. SILT
-2	D-4	9' 0" 11' 0"		ML	Same only MORE TAN w/ RUSTY STKS.
4625 -1	U-5	14' 0" 14' 4"	A		
-2		14' 4" 14' 8"	B		
-3		14' 8" 15' 0"	C		
-4		15' 0" 15' 4"	D		

opy with samples
opy to addressee

Yours very truly,
Milford Sanders
Inspector.

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

ATERIALS ENGINEER
aterials Laboratory
O. Box 167, Olympia, WA 98504 (Mailing Address)
55 So. 2nd Ave.
mwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 6-3-83

Dear Sir:

I have forwarded by today's State Car the following Foundation Samples.

Contract or Job No. L-7262 Section Hoq. bypass
SR No. 10PA Sub-Section Cut Sec.

Station & Offset 142 ~ 60' Rt. Hole # J-57 J-59

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4626 -1	D-6	16'0" 18'0"	60%	ML	M-W Part: GR w/Rusty Stks. & Silt
					Part: GR & Blk. Org. Layered Silt w/ F. Sand
-2	D-7	19'0" 21'0"	68%	ML	M-W GR w/Blk. Org. Silt
4627 -1	U-8	24'0" 24'4"	A		
-2		24'4" 24'8"	B		
-3		24'8" 25'0"	C		
-4		25'0" 25'4"	D		
4628 -1	D-9	26'0" 28'0"	64%	ML	M-W GR. w/some Rust Outside
					F. Sdy. Silt w/ T. Mica
-2	D-10	29'0" 31'0"		ML	LK 4626-2 Above w/ T. F. Sand and
					Org. Layers
4629 -1	U-11	34'0" 34'4"	A		

py with samples
py to addressee

Yours very truly:
Milford Sanders
Inspector.

FORM 351-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

ATERIALS ENGINEER
aterials Laboratory
O. Box 167, Olympia, WA 98504 (Mailing Address)
55 So. 2nd Ave.
umwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 6-3-83

Dear Sir:

I have forwarded by today's State Car the following Foundation Samples.

Contract or Job No. L-7262 Section Hog bypass
SR No. 101A Sub-Section Cut section

Station & Offset 142 ~ 60' Rt. Hole # J-57 J-59

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4629 -2		34'4" 34'8"	B		
-3		34'8" 35'0"	C		
4630	D-13	39'0" 41'0"	43%	ML	M-W GR w/tan outside & T. RUST
				F.	Sdy. SILT
4631 -1	U-14	44'0" 44'4"	A		
-2		44'4" 44'8"	B		
-3		44'8" 45'0"	C		
4632 -1	D-15	46'0" 48'0"		ML	LK. 4626-2 M-W GR. w/BLK.
				ORG.	SILT Also org Stems
-2	D-16	49'0" 51'0"	45%	SM	M, GR. w/BLK. Layers & Sections (ORG.?)
				F.	embedded gruy. v. sty. F. SAND
4633 -1	U-17	54'0" 54'4"	A		

opy with samples
opy to addressee

Yours very truly,
Milford Sonler
Inspector.

FORM 351-002

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

ATERIALS ENGINEER
ıterials Laboratory
O. Box 167, Olympia, WA 98504 (Mailing Address)
55 So. 2nd Ave.
mwater, Washington 98504 (Shipping Address)

Place Tumwater
Date 6-3-83

Dear Sir:

I have forwarded by today's State Car the following Foundation Samples.

Contract or Job No. L-7262 Section Hoquiam bypass SR No. 101A Sub-Section cut section

Station & Offset B142 ~ 60' Rt. Hole # ~~J-57~~ J-59

Lab No.	Drive #	Depth	Tube Position in Sampler	Clas.	Description
4633 -2		54'4" 54'8"	B		
-3		54'8" 55'0"	C		
-4		55'0" 55'4"	D		
4634 -1	D-18	56'0" 58'0"	113%	OH	DK. GR. & BRN. w/T. orange org. Cly. F. Sdy. Silt w/some sheeting sample was TOUGH & very LIGHT WT.
-2	D-19	59'0" 61'0"	40%	ML	M-W GR. F. Sdy. Silt w/ 1/2" STRIP & White Sty. mtr.; Some Layering.
-3	D-20	64'0" 66'0"	18%	SM	M, GRN-GR F. Gruly., V. Sty. F-C SAND w/t. white CRS. SAND
-4	D-21	69'0" 70'6"	25%	SM	M, GRN. GR, V. Sty. F. R. gruly. w/t. 1"(+); one S.A. Rock F-C SAND w/ some white mtr. scattered

·py with samples
·py to addressee

Yours very truly,
Milford Sanders
Inspector.

FORM 151-005

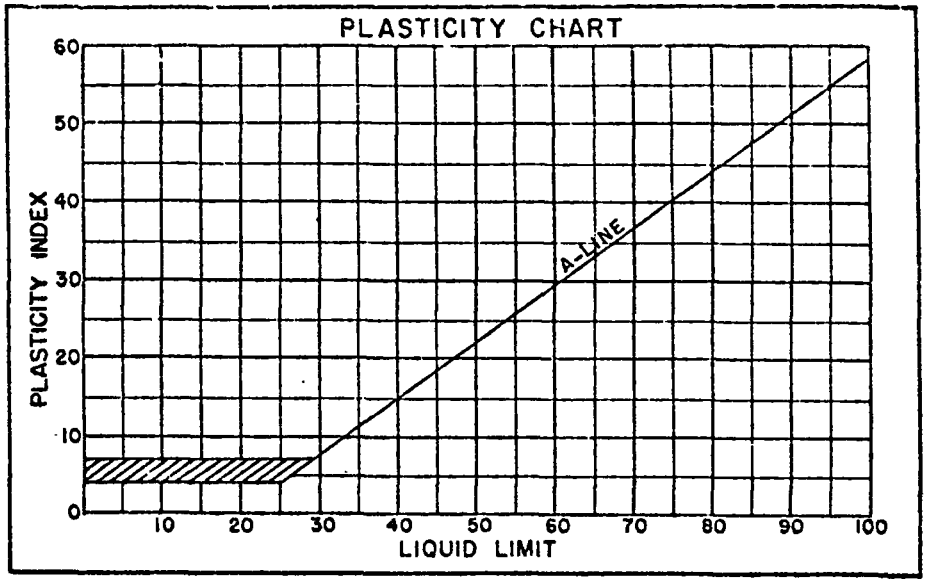
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4622 JOB NO. 8-08 HOLE NO. 159
DATE 6-22-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST		✓	✓
DILATANCY			
BITE		✓	✓
TOUGHNESS		✓	✓

DESCRIPTION: M-W Orange Brn. F. Sdy. SILT w/ Org. Layers. & wood + twigs.

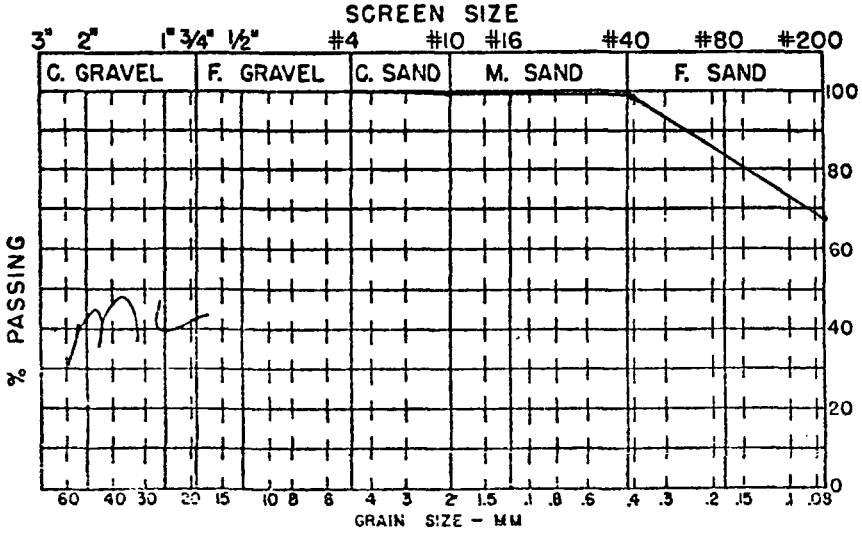


F/20 = 54%

SIEVE ANALYSIS % Passing 69.75

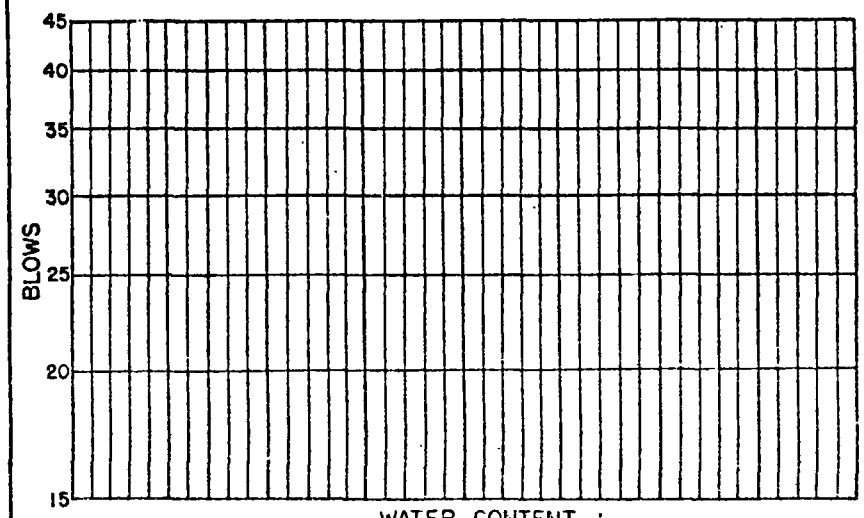
			-40	22.10	99
-3/4			-80		
-4	.01	100	-140		
-10	.2	99	-200	47.44	68

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

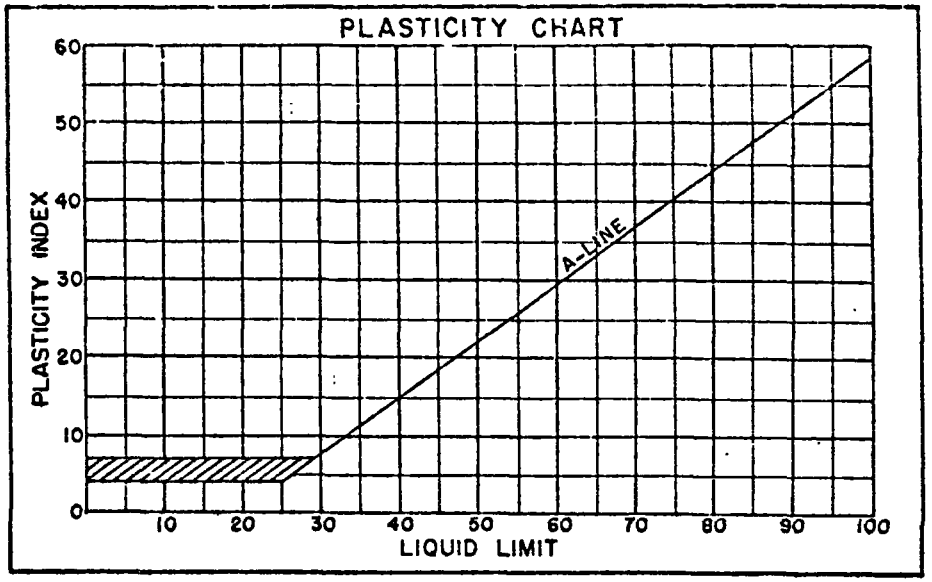
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4624-1 JOB NO. Hof. HOLE NO.
DATE 6-22-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	✓

DESCRIPTION: M-W tan + oxid (Rust)
CH F- Sdy. SILT

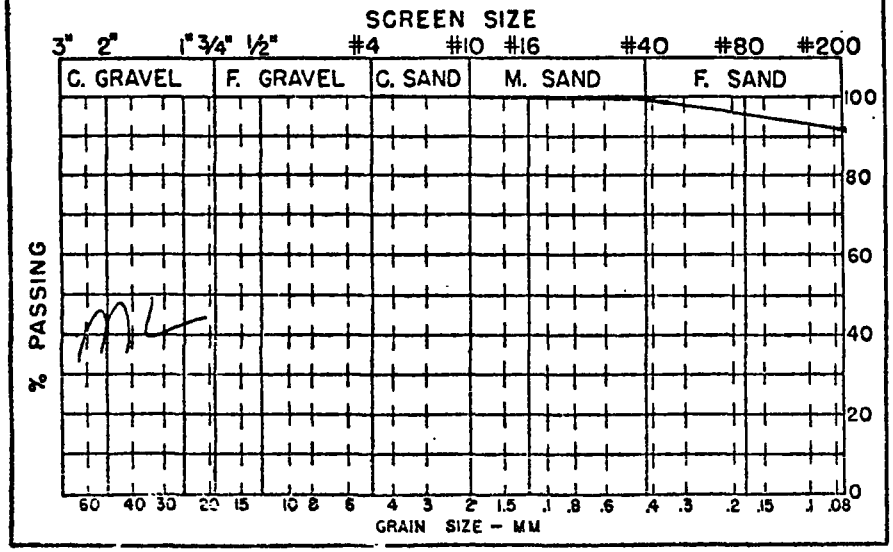


Hx: 54 %

SIEVE ANALYSIS % Passing 53.3

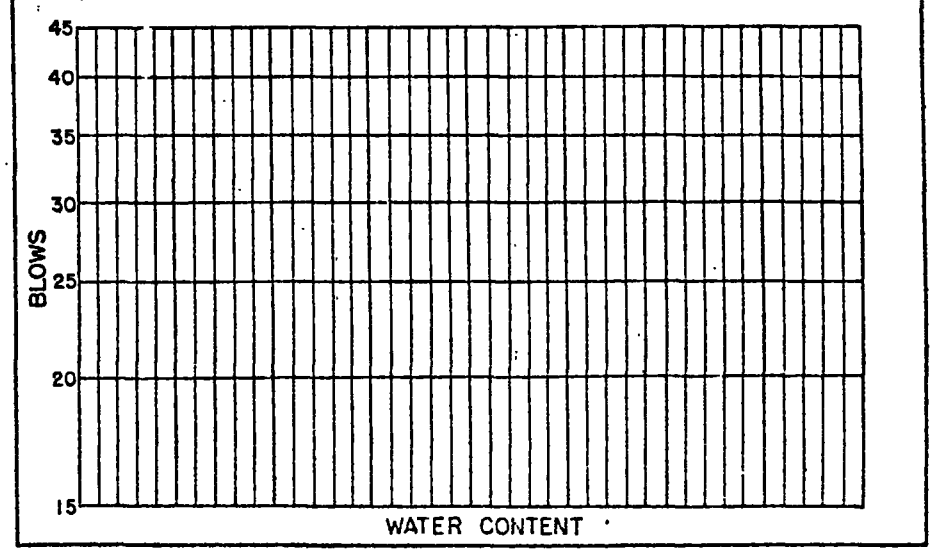
			-40	4.28	99
-3/4			-80		
-4	.03	100	-140		
-10	.16	99	-200	48.83	92

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



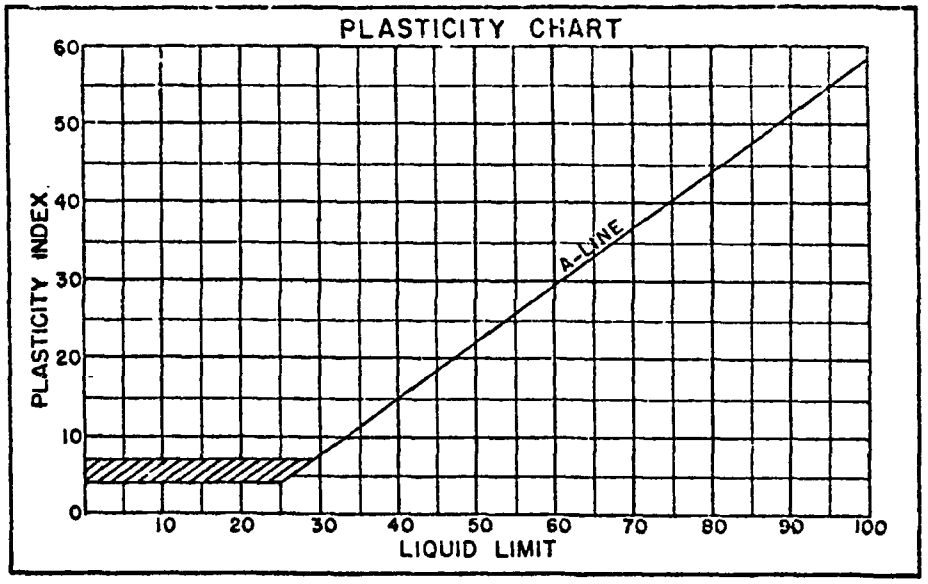
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4626-1 JOB NO. Hol. HOLE NO. J-59
DATE 6-22-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: M - Wlt Part= GR w/Rusty. STRKS. & SILT / Part= GR & BLK, Org. Layered SILT w/F. F. Sand

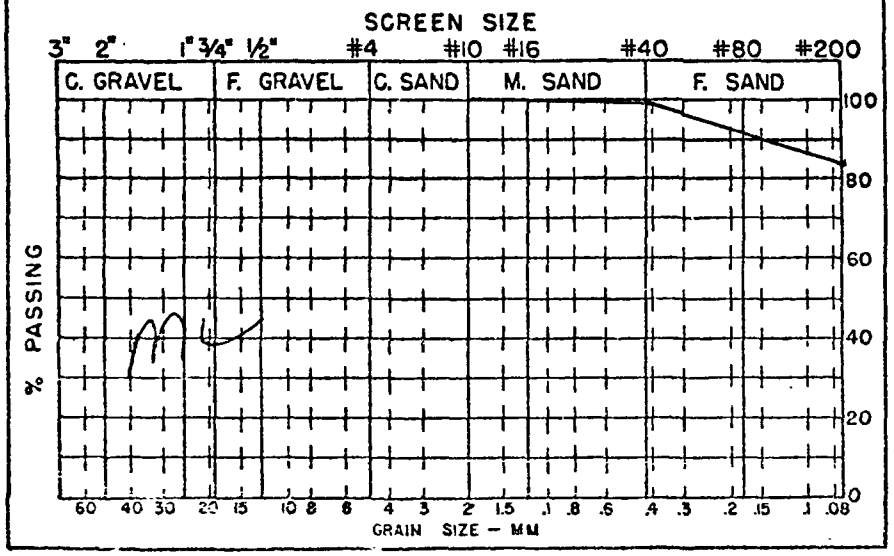


H_2O= 60%

SIEVE ANALYSIS % Passing 66.42

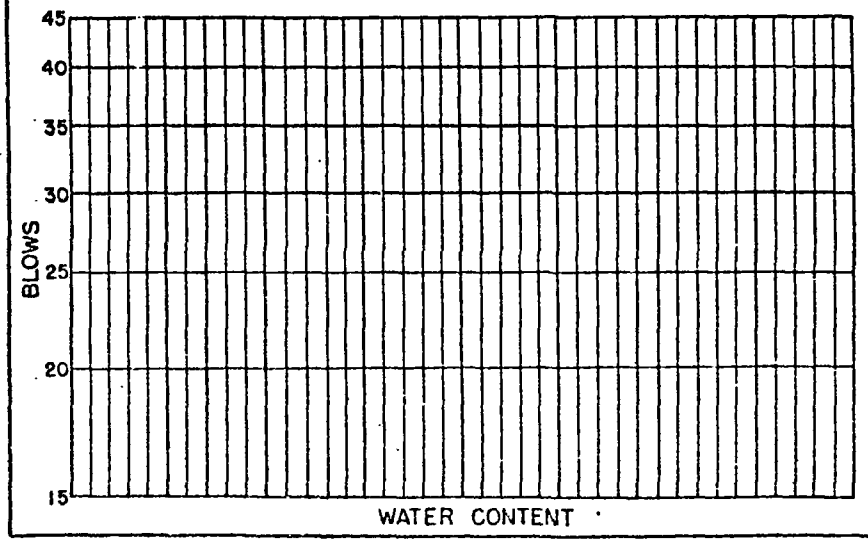
			-40	10.72	99
-3/4			-80		
-4			-140		
-10	.04	100	-200	55.66	84

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

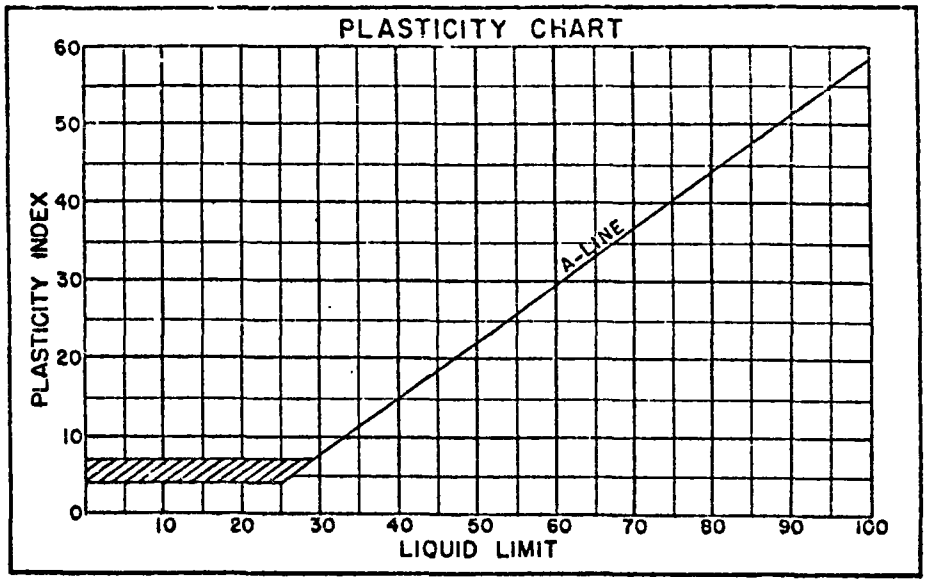
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4626-2 JOB NO. Hq. HOLE NO. J-59
DATE 6-22-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

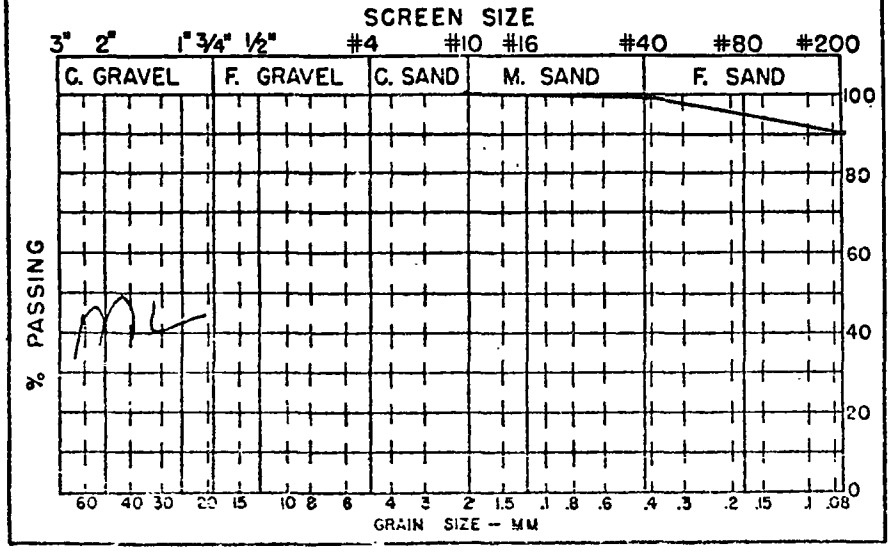
DESCRIPTION: M - Wet GR w/ BLK. Org. SILT



H2O = 68%

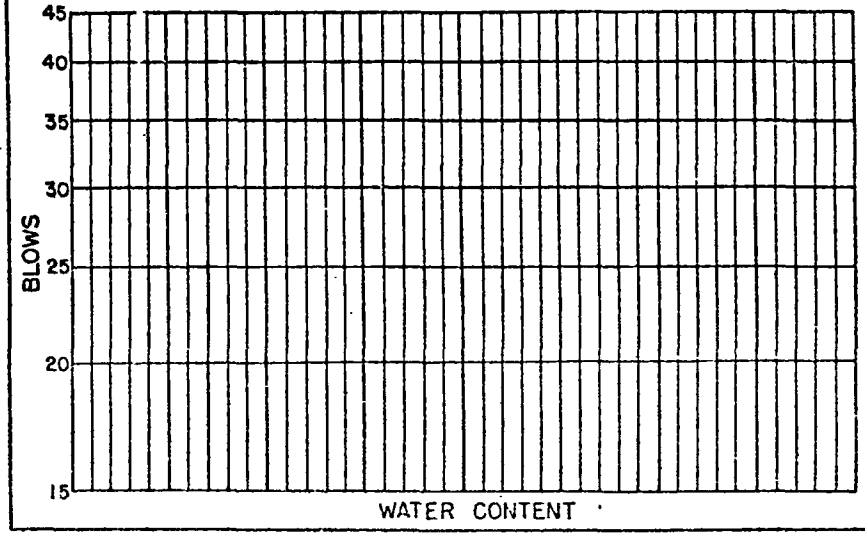
SIEVE ANALYSIS		% Passing 72.47
	-40 7.05	99
-3/4	-80	
-4	-140	
-10 .12	100 -200 65.3	90

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



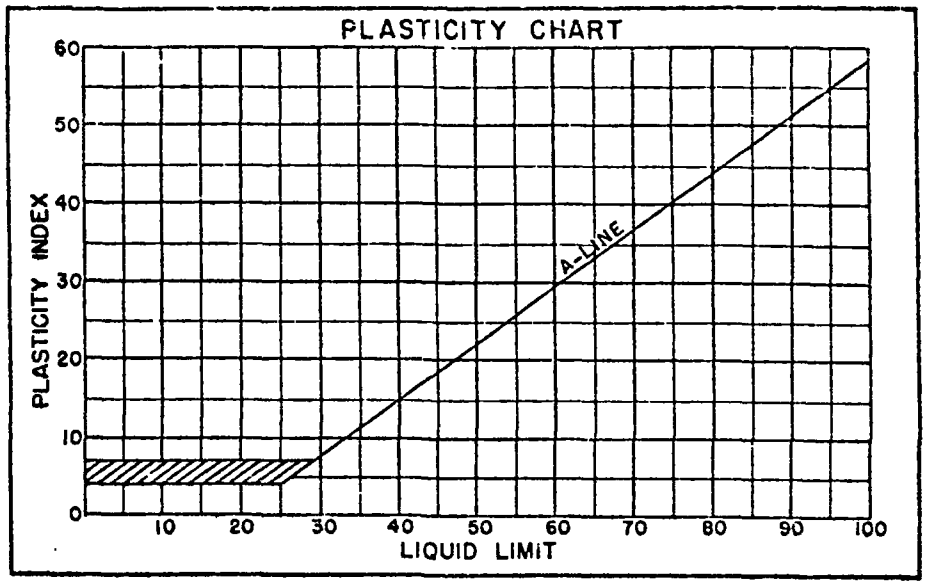
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 46281-1 JOB NO. Hog HOLE NO.
DATE 6-22-83 OPERATOR BC J-59

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE		✓	
TOUGHNESS		✓	

DESCRIPTION: M-W GR. w/some rust outside F. Sdy. Silt w/t. MICA

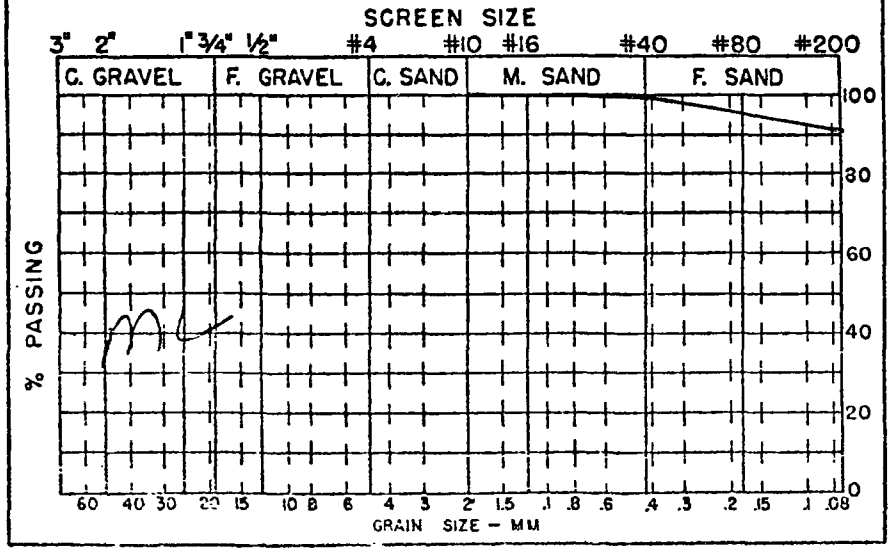


$H_2O = 6.4\%$

SIEVE ANALYSIS % Passing 81.0

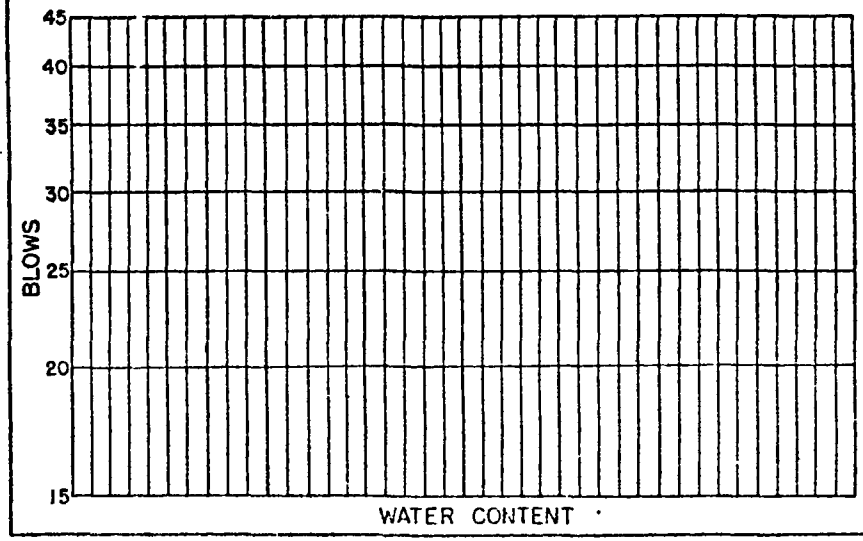
			-40	7.05	99
-3/4			-80		
-4	.01	100	-140		
-10	.08	99	-200	13.86	91

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

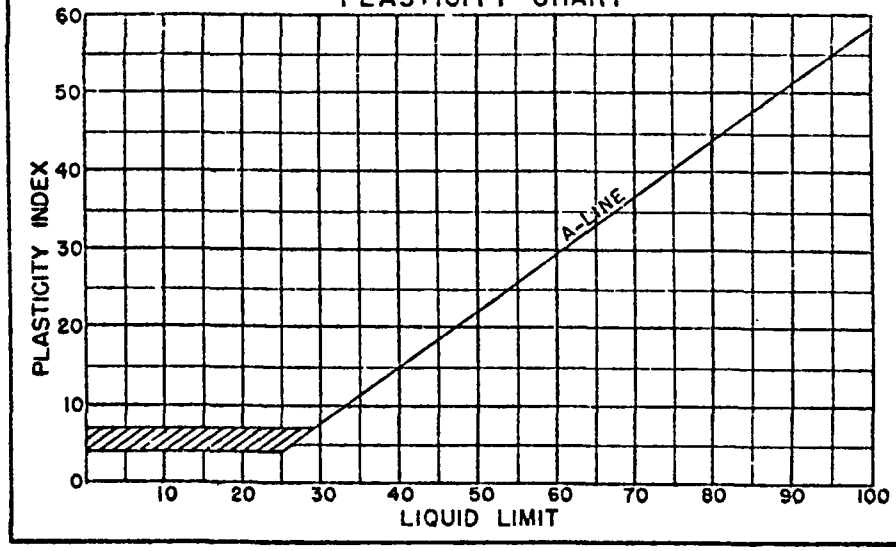
SAMPLE NO. 4630 JOB NO. 4608 HOLE NO.
DATE 6-22-83 OPERATOR BC J-59

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST		✓	✓
DILATANCY			
BITE		✓	✓
TOUGHNESS		✓	✓

DESCRIPTION: M-W GR w/tan outside & T. Rust (outso) F. Sdy. Silt

PLASTICITY CHART

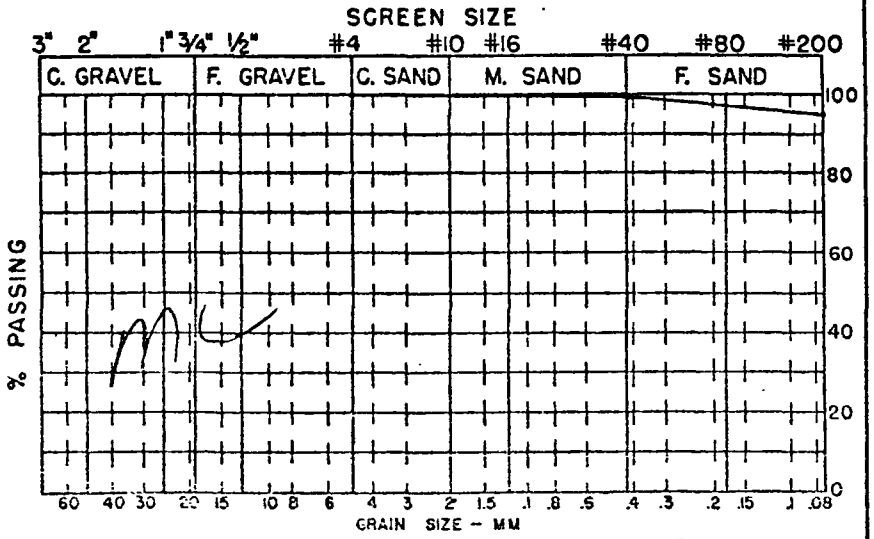


H_2O: 43%

SIEVE ANALYSIS % Passing 81.8

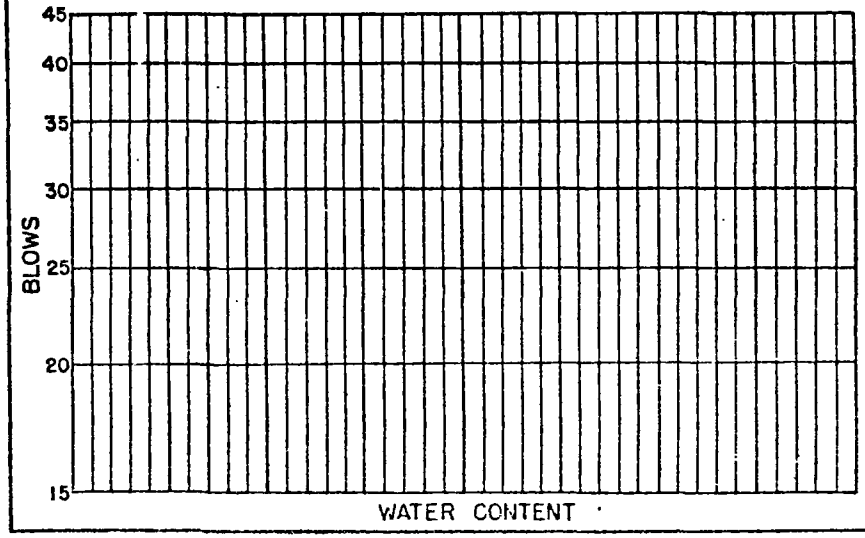
			-40	3.6	99
-3/4			-80		
-4	.05	100	-140		
-10	.10	99	-200	78.05	95

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



DOT FORM 351-019

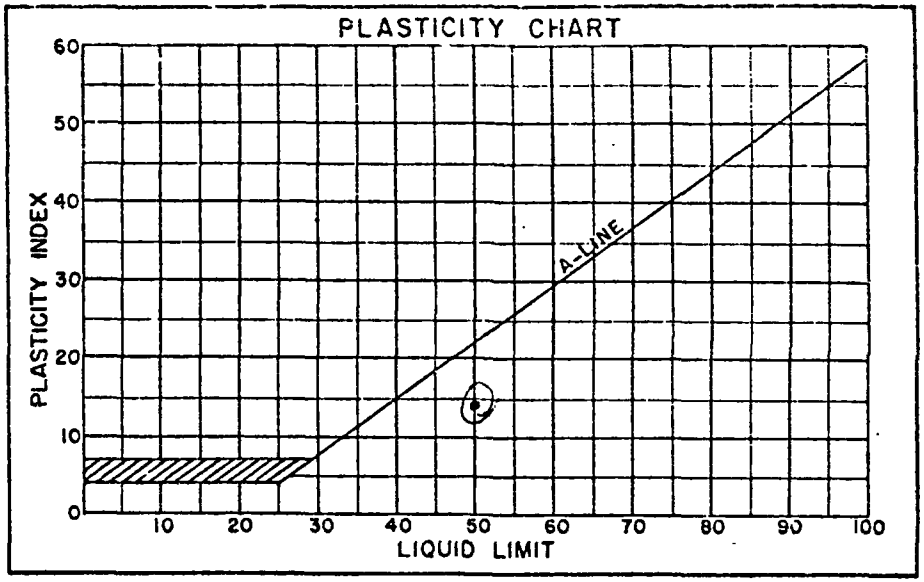
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4632-2 JOB NO. 48 HOLE NO. 1-59
DATE 6-21-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL			
DRIED CAST			
DILATANCY			
BITE			
TOUGHNESS			

DESCRIPTION: M. GR w/BLK layers & sections (org.?) F. embedded gruly. Sty. F. SAND

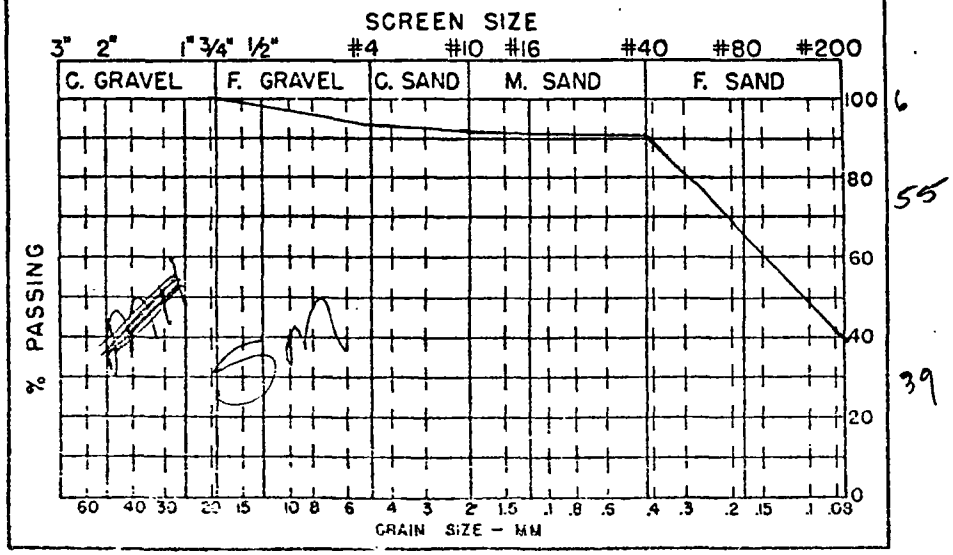


4/30 = 4/5%

SIEVE ANALYSIS % Passing 123.4

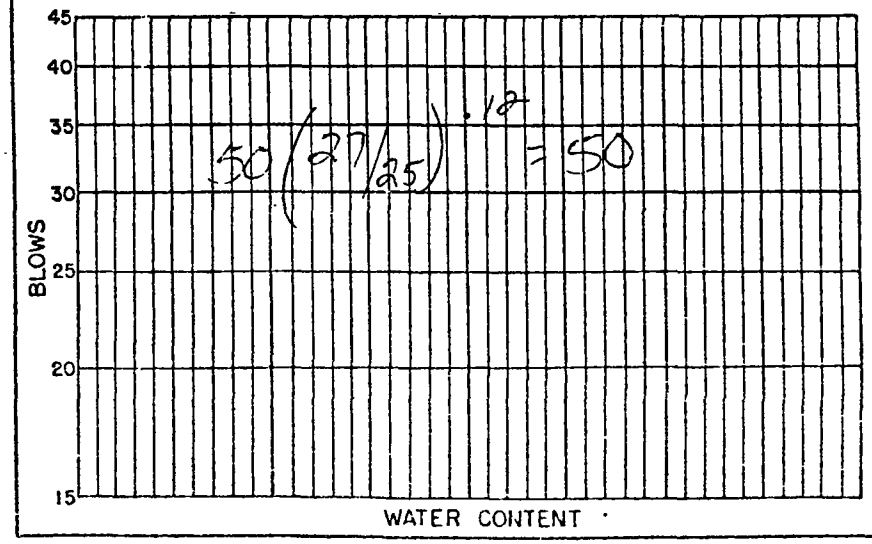
			-40	64.47	92
-3/4	7.9	100	-80		
-4	.8	94	-140		
-10	1.66	93	-200	48.6	39

GRAIN SIZE CURVE



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	66				47
Wet Wt.	27.22				11.48
Dry Wt.	18.18				8.45
% H_2O	50				PL= 36
Blows	27				PI= 14



DOT FORM 351-019

SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

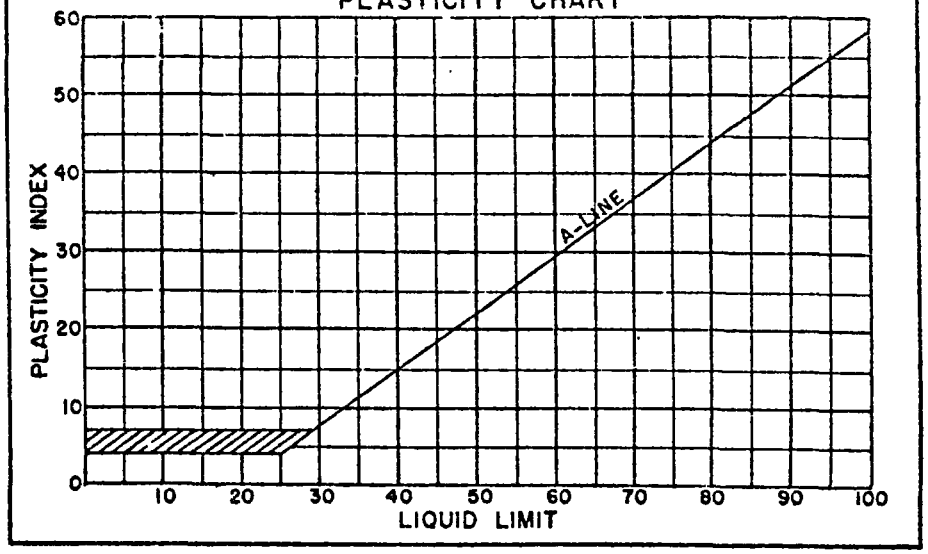
SAMPLE NO. 4634-1 JOB NO. ~~Hof.~~ HOLE NO.
DATE 6-21-83 OPERATOR BC J.59

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST		✓	
DILATANCY			
BITE			✓
TOUGHNESS		✓	✓

DESCRIPTION: DK GR & Brn. w/ T. orange ORG. Ely., F. Sdy. SILT w/ some Shrinking Sample was Tough & Very Light Weight.

PLASTICITY CHART

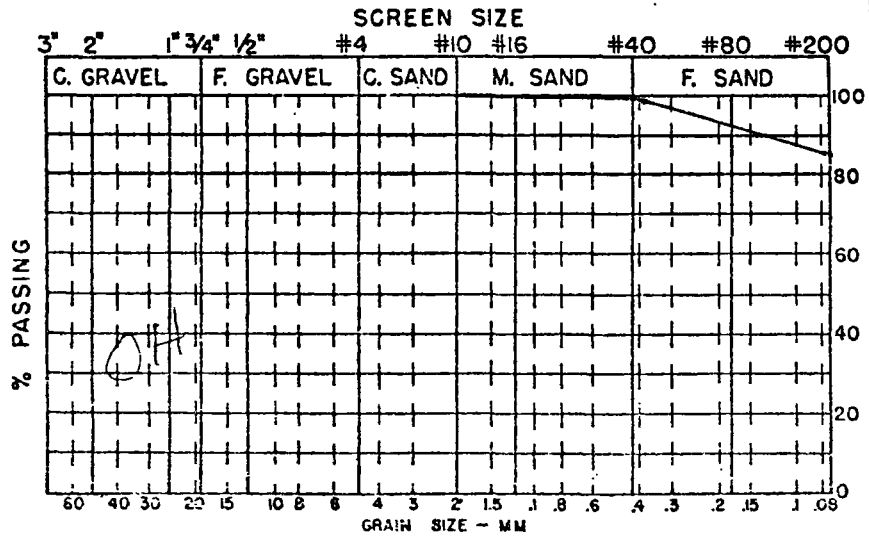


$H_2O = 113\%$

SIEVE ANALYSIS % Passing 39.0

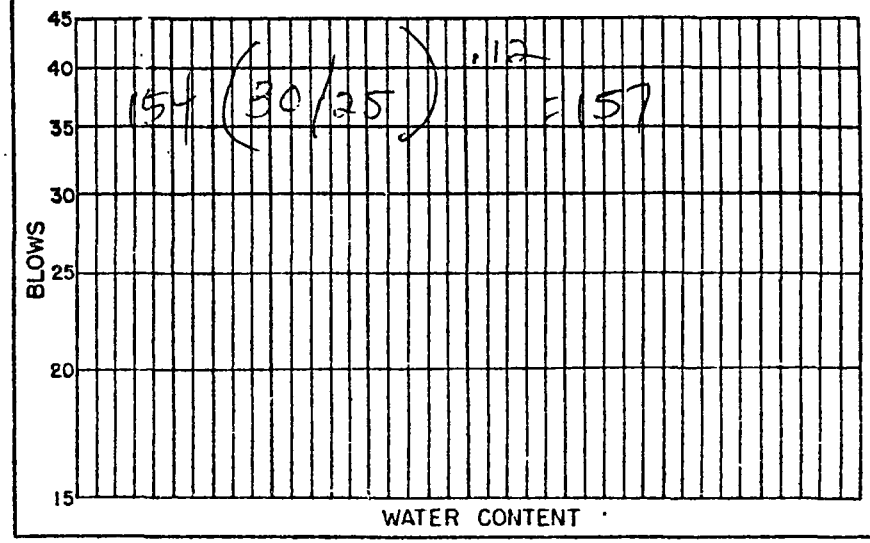
		-40	5.7	99
-3/4		-80		
-4		-140		
-10 .02	100	-200	33.28	85

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.	58				70
Wet Wt.	25.75				4.57
Dry Wt.	10.12				2.36
% H_2O	154				PL= 94
Blows	30				PI= 63



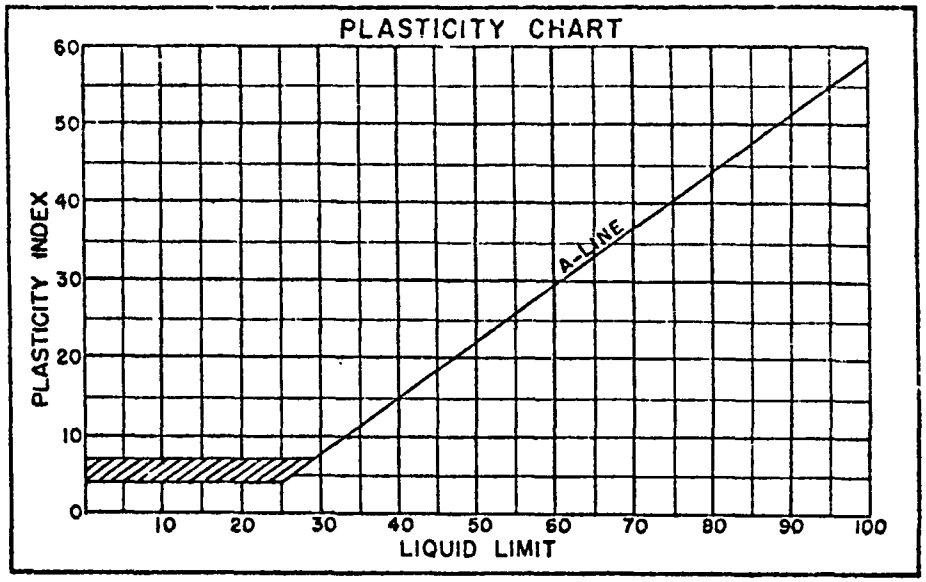
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4634-2 JOB NO. Hq. HOLE NO.
DATE 6-22-83 OPERATOR BC J-59

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE		✓	
TOUGHNESS	✓	✓	

DESCRIPTION: M-W GR. F. Sdy SILT w/ ½" strip of white Sty. mtl. Some Layering -

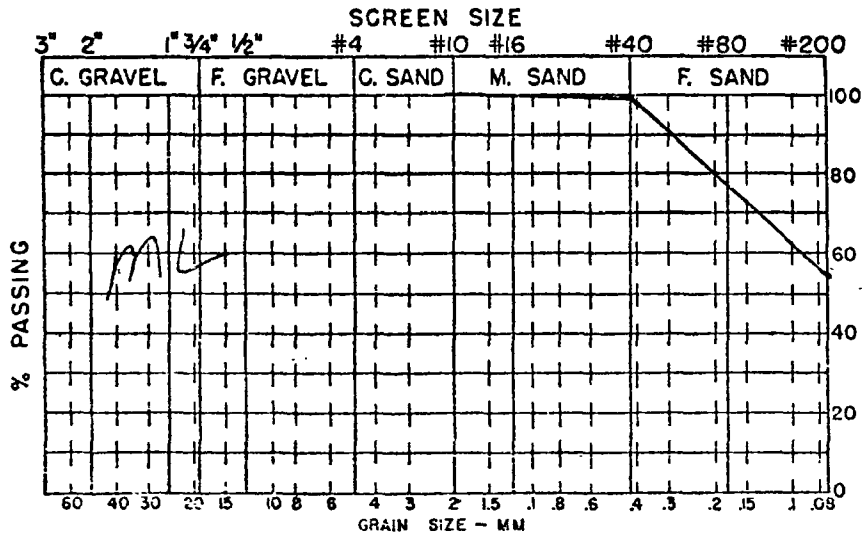


$H_2O = 40\%$

SIEVE ANALYSIS % Passing 126.25

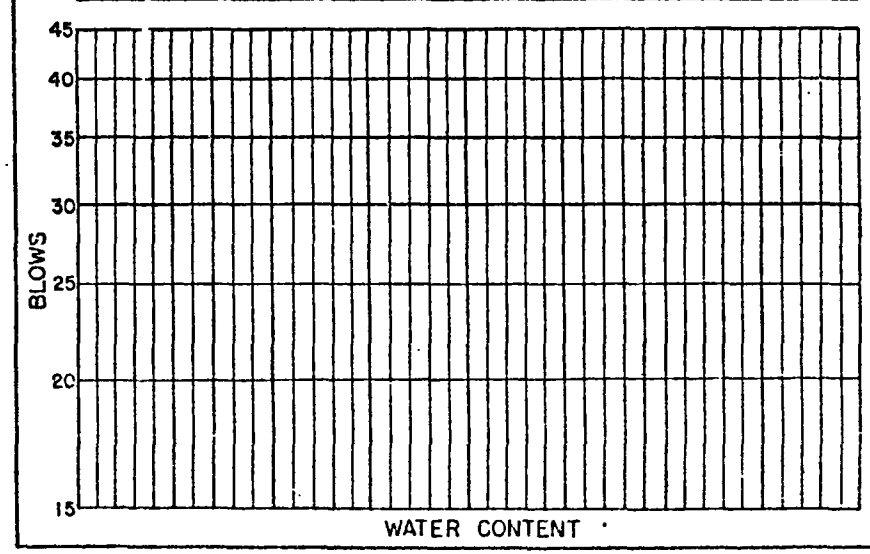
	-40	56.3	99
-¾	-80		
-4	-140		
-10 · 6	100	-200 69.35	55

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



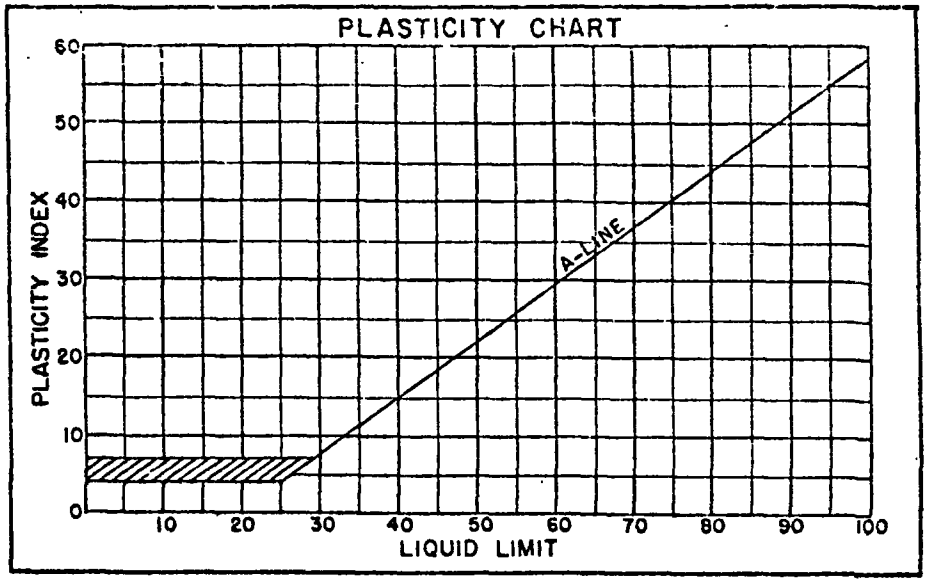
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4634-3 JOB NO. Hoe HOLE NO. J-59
DATE 6-22-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: M, GRN GR ~~+ St~~
F. gruly., V. Stg. F-C SAND
w/ t. White CRS. SAND

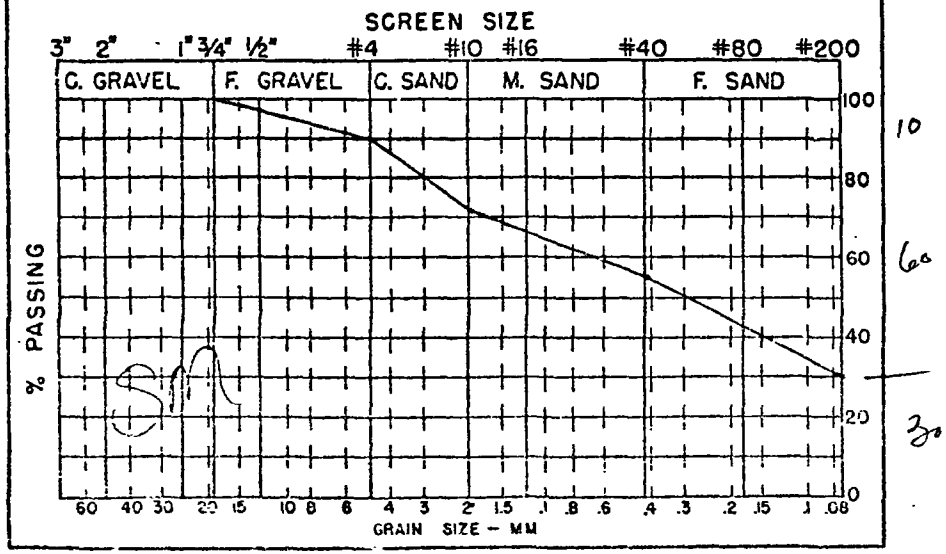


H_2O = 18%

SIEVE ANALYSIS % Passing 164.2

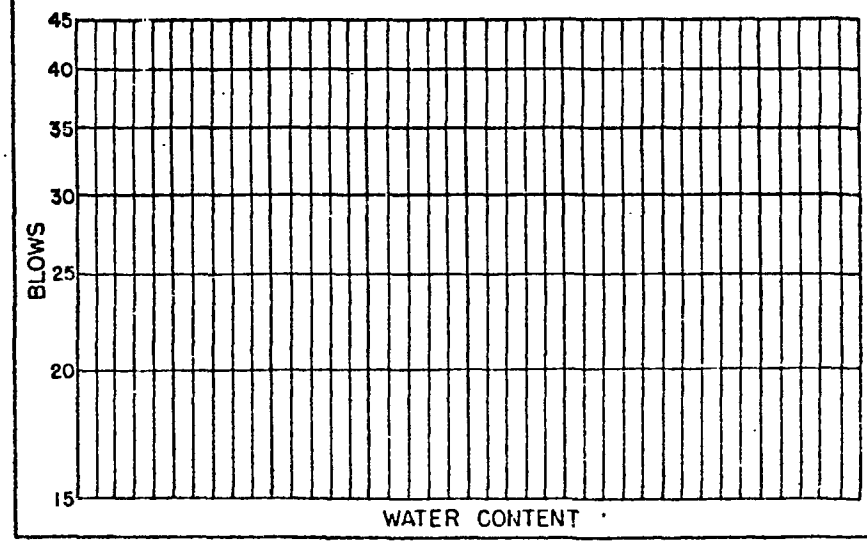
			-40	41.86	56
-3/4	16.62	100	-80		
-4	29.01	90	-140		
-10	26.77	72	-200	49.94	30

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=



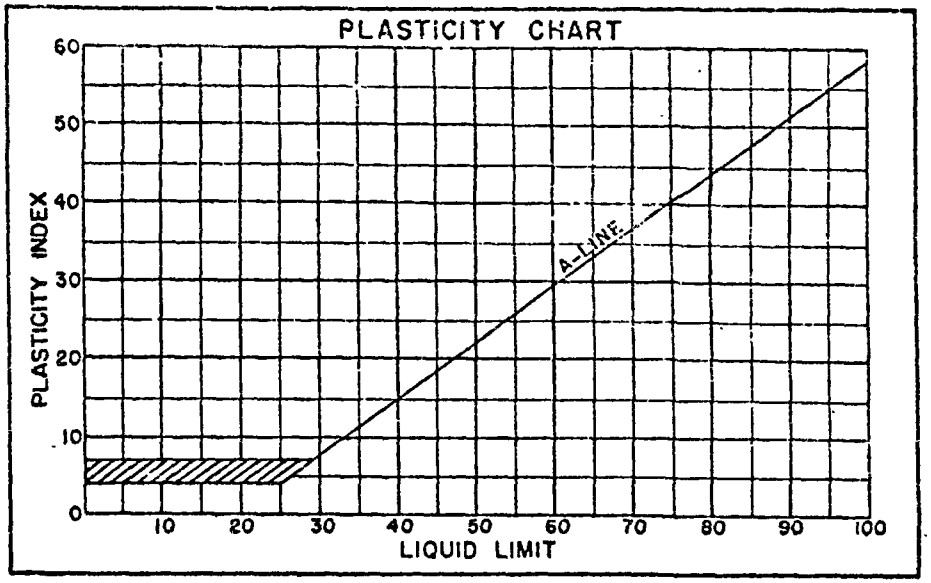
SOIL CLASSIFICATION AND IDENTIFICATION WORKSHEET

SAMPLE NO. 4634-4 JOB NO. Hof. HOLE NO. J-59
DATE 6-22-83 OPERATOR BC

SOIL FIELD IDENTIFICATION

TEST	SAND	SILT	CLAY
VISUAL	✓	✓	
DRIED CAST	✓	✓	
DILATANCY			
BITE			
TOUGHNESS	✓	✓	

DESCRIPTION: M, Grn. Gr. V. Sty. f. R. Gruly (w/f. 1"+) ; one S.A. Rock F.C SAND w/some white in tr. scattered.

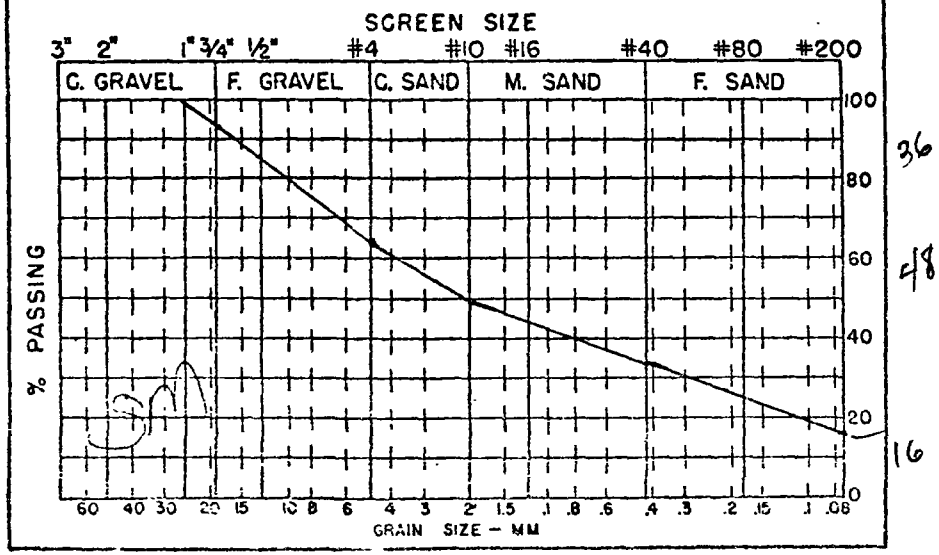


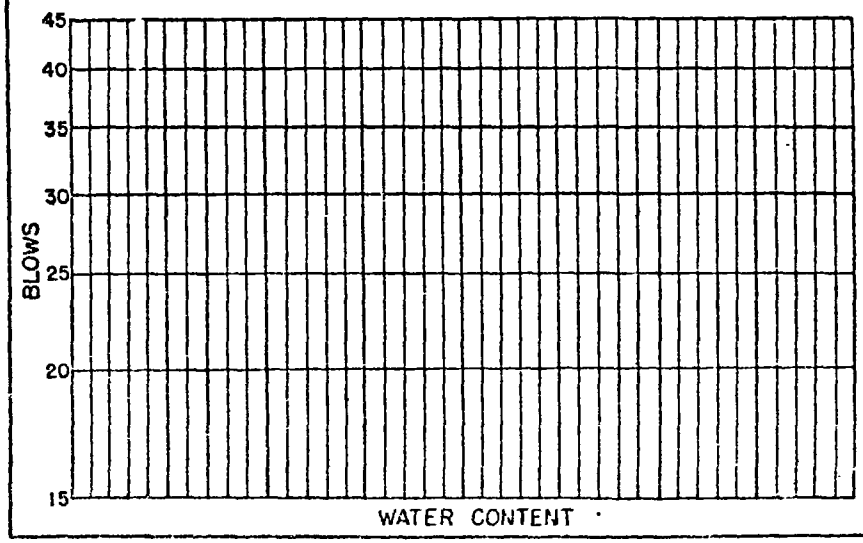
H_2O = 25%

SIEVE ANALYSIS % Passing 192.9

1	12.52	100	-40	35.84	24
-3/4	57.4	94	-80		
-4	28.2	64	-140		
-10	28.62	49	-200	30.32	16

GRAIN SIZE CURVE.



LIQUID LIMIT DETERMINATION

	LIQUID LIMIT				PLASTIC LIMIT
Can No.					
Wet Wt.					
Dry Wt.					
% H_2O					PL=
Blows					PI=