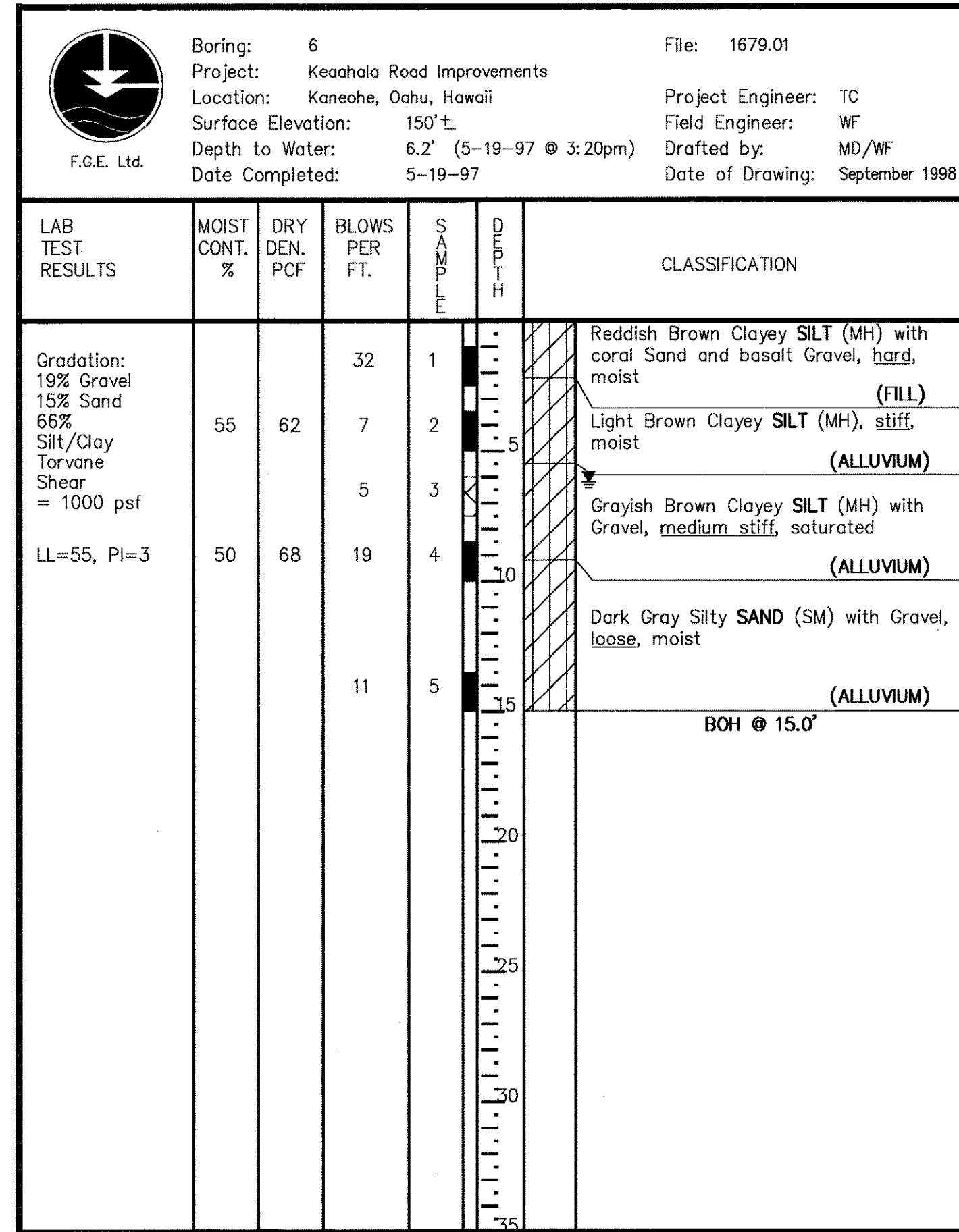
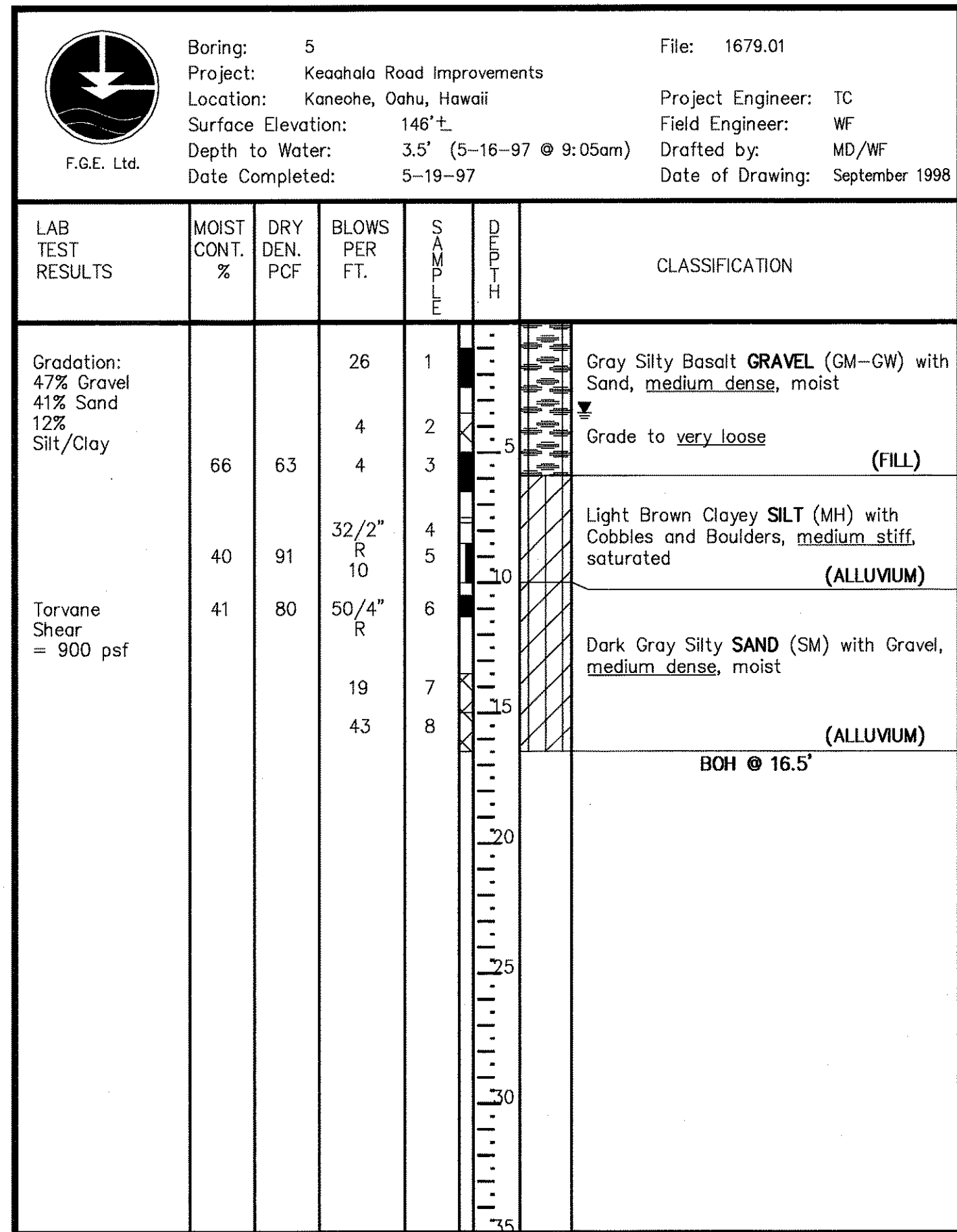
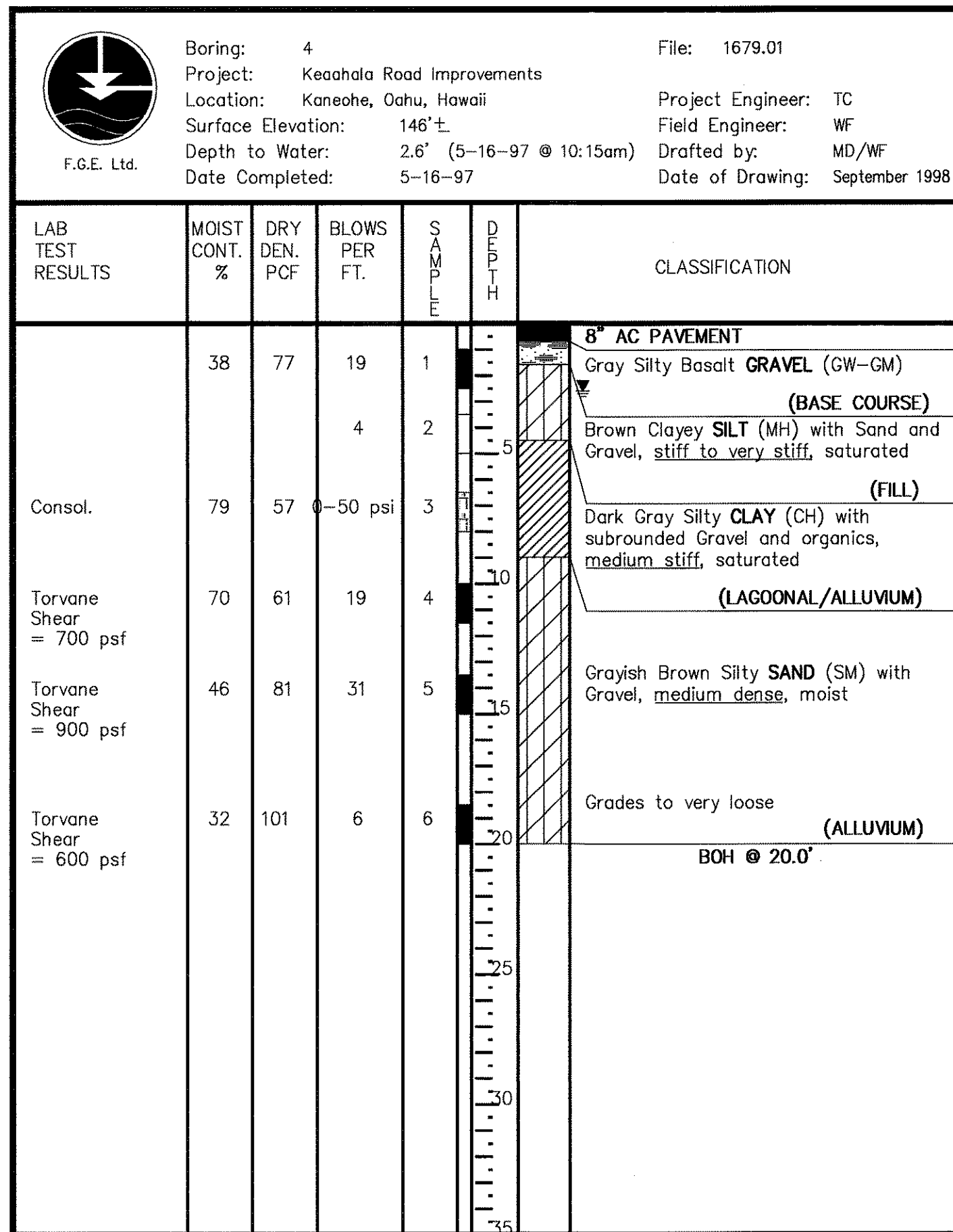
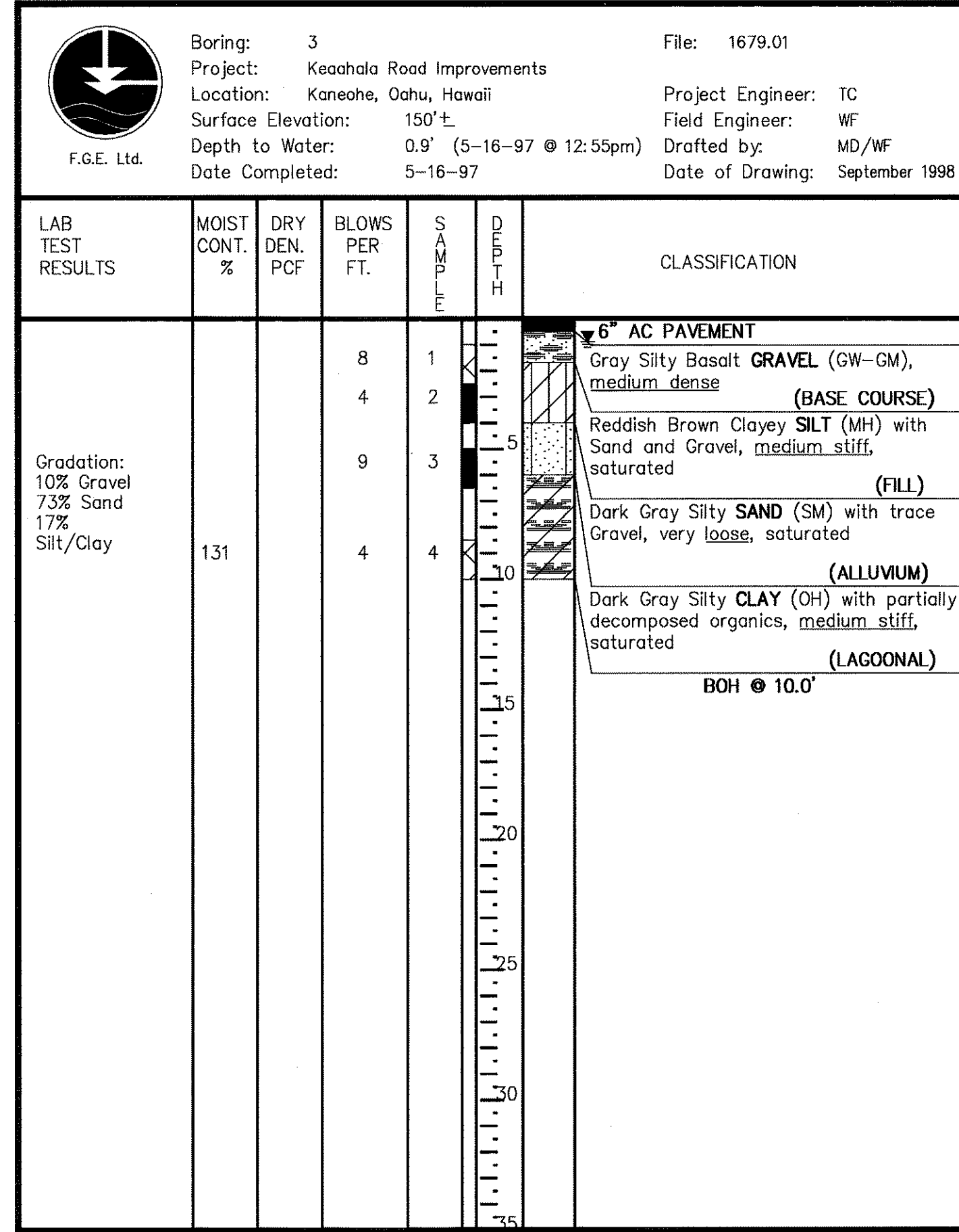
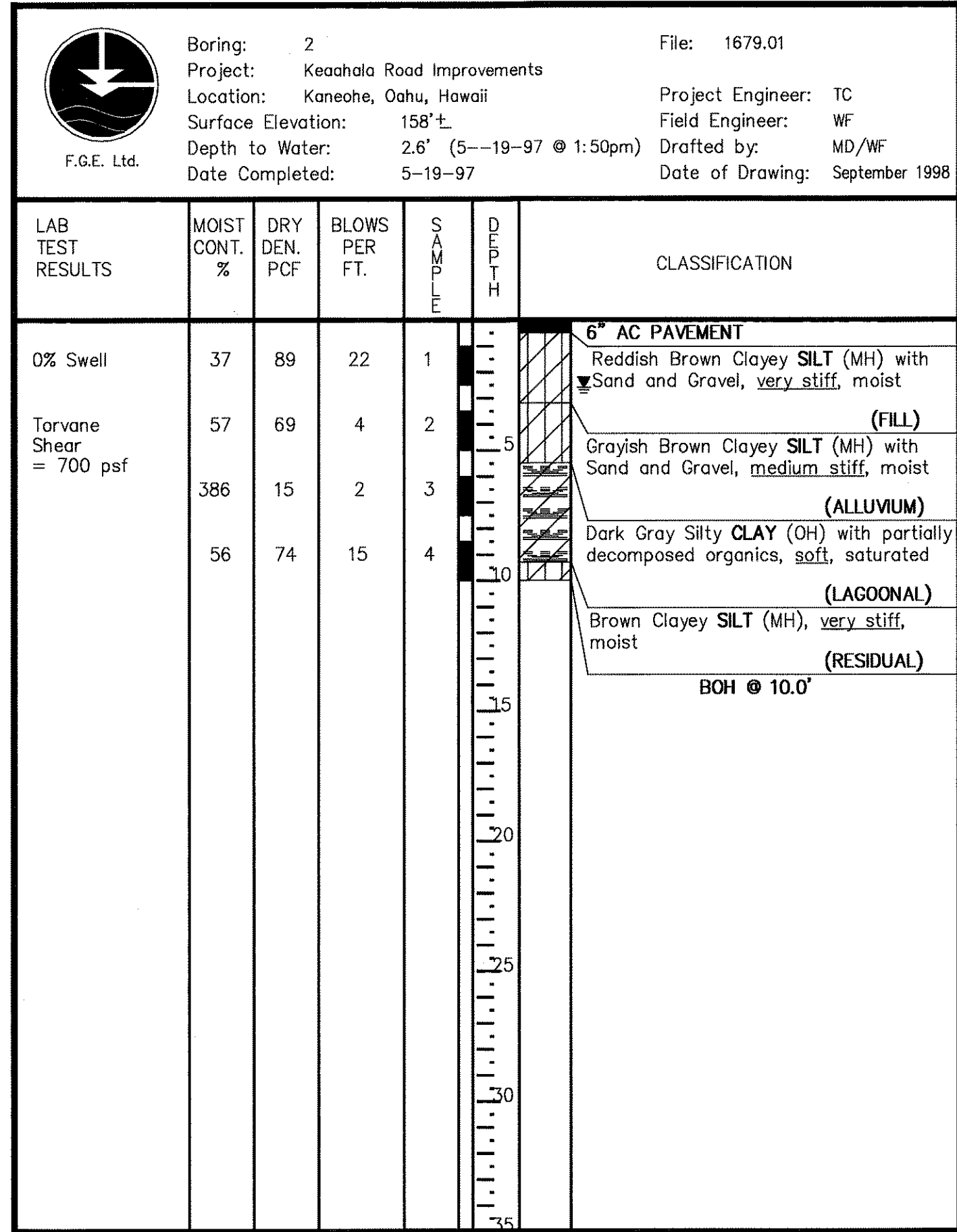
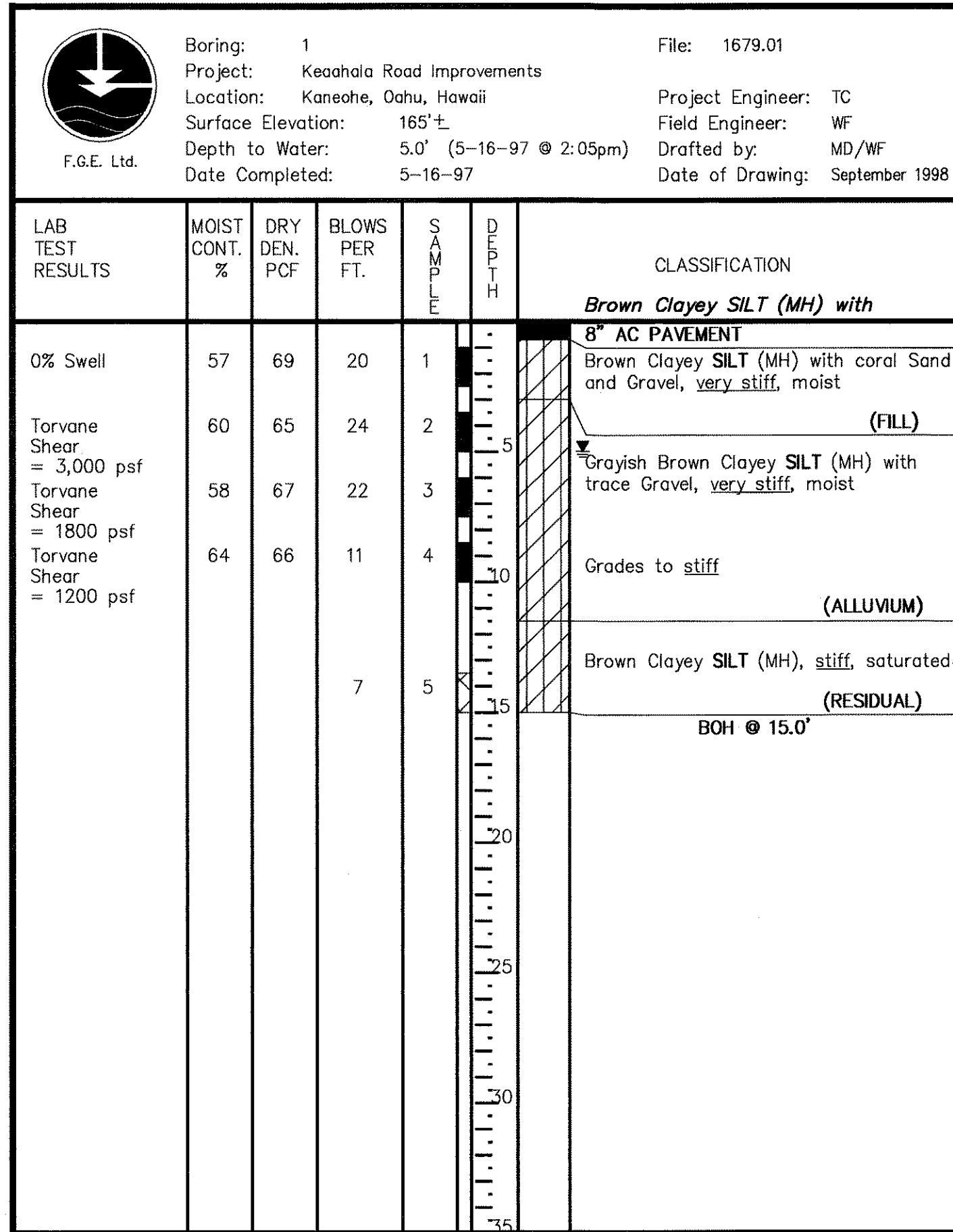


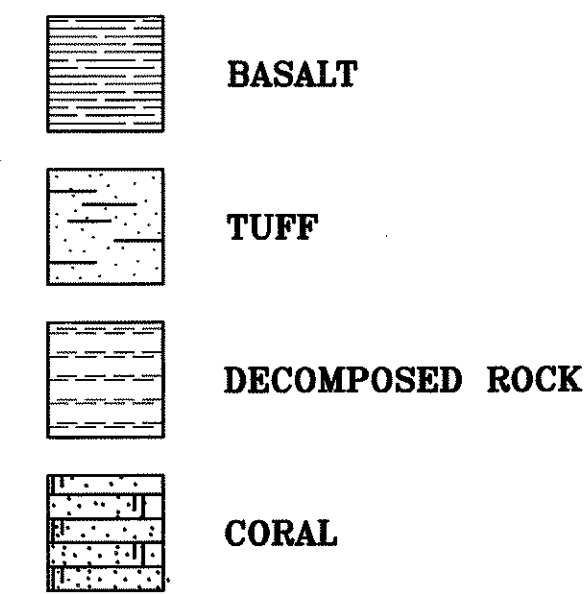
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REVISED: 04/26/00  
FILE: DOT95122  
SCALE: 1"=1'  
BEG: 09/29/98

DATE	_____
SURVEY PLOTTED BY	_____
DRAWN BY	_____
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DESIGNED BY	_____
QUANTITIES BY	_____
CHECKED BY	_____
ORIGINAL PLAN	_____
NOTEBOOK	_____
No.	_____

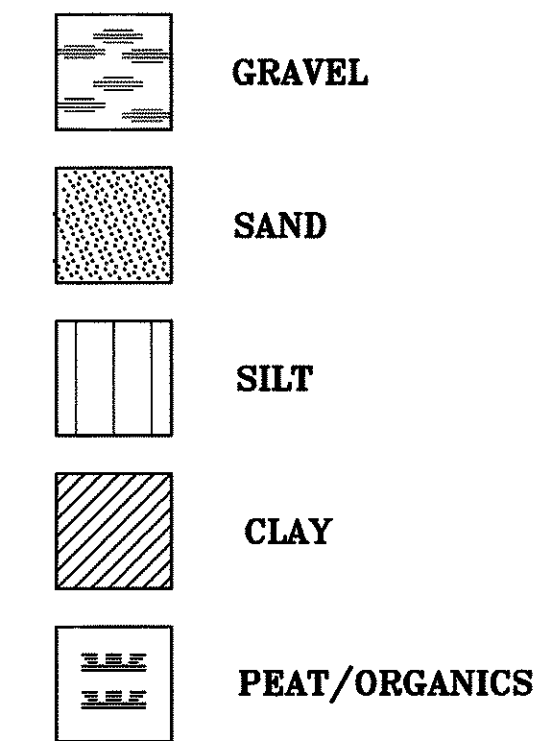


FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-03-97	2000	9	110

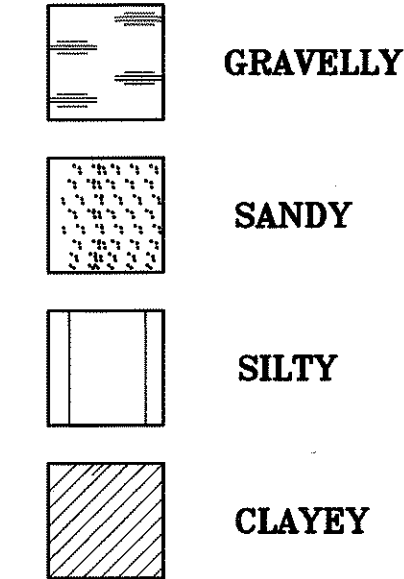
MAJOR ROCK TYPES



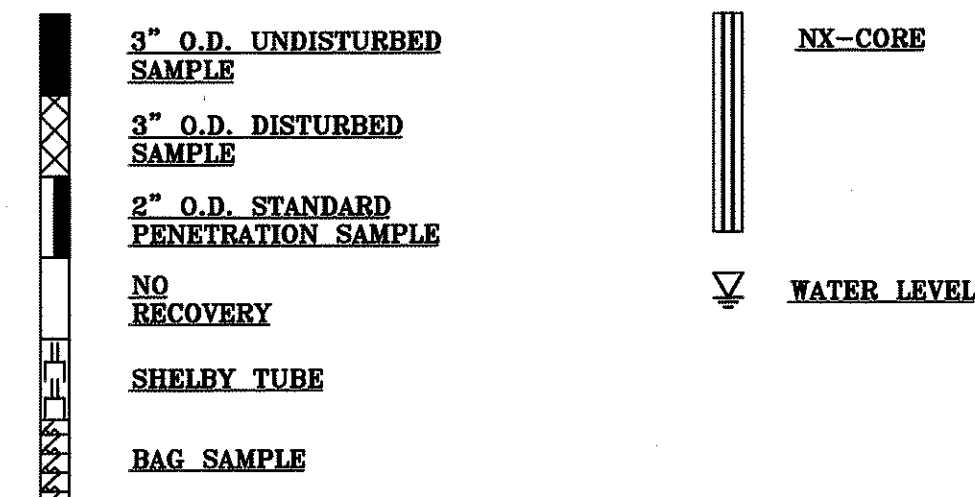
MAJOR SOIL TYPES



SECONDARY CLASSIFICATION



SAMPLING SYMBOLS



Source: "SUBSURFACE INVESTIGATION REPORT, KEAAHALA ROAD IMPROVEMENTS - KAHEKILI HIGHWAY TO PO'OKELA ROAD" by Fewell Geotechnical Engineering, Ltd. Dated October 5, 1998

Note: For Boring Locations See General Plan, Sheets 7 & 8.

~~APPROVED:~~

~~Chief, Civil Engineering Branch~~  
~~Department of Planning & Permitting~~  
~~City & County of Honolulu~~

	STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION  <b>BORING LOGS</b>  KEAAHALA ROAD WIDENING KAHEKILI HIGHWAY TO PO'OKELA STREET State Project No. HWY-0-03-97  Scale: As shown Date: April 2000  SHEET NO. C-9 OF C-55 SHEETS
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General Notes

1. The eastern, approximately 60 percent of the road alignment is underlain by weak, compressible soils and a shallow water table which will require special grading measures and geogrid reinforcing to facilitate the road construction and provide adequate subgrade support for the new pavement and the new retaining wall planned along the northern edge of the road.
2. The weak alluvial and lagoonal soils along the eastern portion of the road alignment will not provide adequate support for heavy construction traffic, such as large compactors or concrete trucks. Heavy equipment (16,000 pounds or more) should be restricted from the roadway prism until the new pavement section has been constructed up to the bottom of the base course layer.
3. Groundwater was encountered as shallow as 11 inches below the existing ground surface in the borings of this investigation. Occasional dewatering should be anticipated for excavations in the lower, central portions of the road alignment. The design of the dewatering system shall be the responsibility of the contractor.
4. The remaining western portion of the road is underlain by a thin mantle of fill over more competent soils which should provide adequate pavement support without the special grading procedures anticipated for the eastern portion of the roadway. However, some overexcavation will likely be required in this area to remove deeper pockets of uncompacted fill. The actual transition must be determined in the field during construction.
5. Prior to the start of actual grading operations, areas designated to receive new construction should be cleared and grubbed in accordance with Section 201 of the Hawaii Standard Specifications for Road, Bridge, and Public Works Construction (Standard Specifications). All organics, rubbish, and other deleterious materials should be wasted off-site. Where the road is widened into the marsh area on the northern side of the existing road, the contractor should anticipate clearing and grubbing to a depth of at least 8 inches below the existing ground surface.

Grading

6. Fill should consist of Aggregate Subbase conforming to Section 703.17 of the Standard Specifications and should be placed in relatively level lifts of no more than 6 inches in thickness, moisture conditioned to within 3 percent of its optimum moisture content, and uniformly compacted to at least 95 percent relative compaction as determined by ASTM D1557.
7. Vehicle traffic and all construction equipment, except light compaction equipment of less than 6,000 pounds, should be kept off the road embankment until after the fill has attained a height of at least 10 inches above the existing subgrade. After at least 10 inches of geogrid-reinforced, granular fill has been placed and compacted, moderate-sized compaction and excavating equipment, with a maximum vehicle weight of 16,000 pounds, may be used to complete the road grading. Vehicles and construction equipment with a vehicle weight exceeding 16,000 pounds should not be allowed on the new fill area until the road grading has been completed to within a depth of 1 foot below the finish road or sidewalk grades.
8. Retaining Wall No. 1, Type 1A (reinforced concrete section): Surcharging of this wall alignment will be required during the 1.5 month period during which the majority of the settlements should occur. See Structural Plans for limits of surcharging and details. The surcharge material shall exhibit a unit weight similar to aggregate subbase, i.e., 130 p.c.f. No utilities shall be constructed within the surcharge area during the surcharging operations.
9. The construction of any settlement sensitive structures such as sidewalks, etc., should be scheduled after the completion of the surcharging and grading operations on the northern edge of the road, along Retaining Wall No. 1.
10. The estimated 1.5 month surcharging/delay period may be reduced provided a settlement monitoring program is performed to verify that the estimated 1 1/2" settlements have been completed. The cost of a settlement monitoring program, if used, shall be considered as incidental to the Contract work and no separate payment shall be made.

Pavements

Sta. 0+52 to about Sta. 1+18

11. The existing pavement section in this area consists of 4 inches of Asphalt Concrete Pavement and 9 1/2 inches of Asphalt Concrete Base Course over 10" of Permeable Base Course. The pavement section should be modified by removing the existing 4 inches of Asphalt Concrete Pavement and 4 1/2 inches of the Asphalt Concrete Base Course. The new Asphalt Concrete Pavement should be placed and compacted to attain the finish road grades. The thickness of the new Asphalt Concrete layer will vary between a minimum of 4 1/2 inches to 8 1/2 inches. A paving fabric which conforms to Section 716.04 of the Standard Specifications should be placed 2 inches above the bottom of the Asphalt Concrete layer.

about Sta. 1+18 to about Sta. 7+00

12. The pavement section should consist of 3 inches of Asphalt Concrete and 6 inches of Asphalt Concrete Base Course over 10 inches of Aggregate Subbase (Select Borrow). A biaxial geogrid, such as a Tensor BX1200 or equivalent, should be provided between the Aggregate Subbase layer and the underlying subgrade.
13. Where deemed necessary by the Engineer, an additional 12 inches below the planned subgrade level should be overexcavated. A biaxial geogrid should be placed at the bottom of the overexcavated area, then backfilled up to the original pavement subgrade level with surge rock material. Another reinforcing geogrid should be placed over the surge rock material, and the pavement section described in the previous note constructed.
14. The pavement subgrade between Sta. 1+18 and Sta. 7+00 should be excavated clean and the geogrid placed directly over the undisturbed subgrade. Due to the relatively weak underlying soils and the shallow water table in this area, compaction of the subgrade in this area should not be attempted. The Aggregate Subbase layer should be placed in one 10-inch lift and compacted using light to moderate-sized compaction equipment weighing no more than 16,000 pounds. Vibratory equipment should not be used to compact the Aggregate Subbase between Sta. 1+18 and Sta. 7+00 to reduce the potential for over-stressing the underlying weak subgrade.
15. Where pumping occurs during the compaction of the Subbase layer, the affected area should be overexcavated to a depth of 12 inches below the planned subgrade level and an additional reinforcing grid placed at the bottom of the overexcavated area. The resulting depression should then be backfilled up to the original pavement subgrade level with surge rock material and compacted using light, hand-operated compaction equipment. The original geogrid and the overlying subbase should then be reinstalled and compacted using light compaction equipment.

about Sta. 7+00 to Sta. 11+90

16. The pavement section should consist of 3 inches of Asphalt Concrete and 6 inches of Asphalt Concrete Base Course over 6 inches of Aggregate Subbase.
17. Where uncompacted fills are present at the subgrade level between Sta. 7+00 and Sta. 11+90, they should be removed down to the very stiff alluvium and replaced with fill that is placed and compacted in accordance with the grading specifications.
18. The pavement subgrade should be shaped to drain and compacted to at least 95 percent relative compaction prior to the placement of the Aggregate Subbase. The Aggregate Subbase should conform to Sections 703.06 and 703.17 of the Standard Specifications and should be compacted to at least 95 percent relative compaction as determined by ASTM D1557.
19. The exact location of the change in pavement section to be used cannot be accurately determined with the available subsurface and topographic information. Sta. 7+00 is the best estimate of that location based on the available information. The Engineer, or his duly authorized representative, shall determine the actual location in the field once the subgrade soils have been exposed.

Miscellaneous

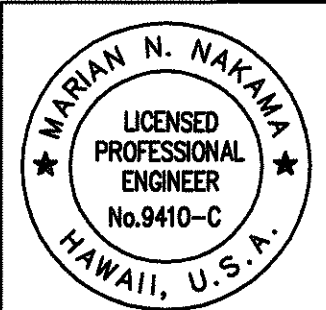
20. Where the weak alluvial and lagoonal soils are encountered at the invert of the drainage culvert extension, they should be overexcavated to a depth of at least 1 foot below the bottom of the structure and the resulting depression backfilled with Bed Course conforming to Section 703.16 of the Standard Specifications.
21. Utilities should be installed in accordance with Sections 206, 603 and 604 of the Standard Specifications. Backfills should be placed and compacted utilizing the appropriate mechanical compactors above and around the pipes. Jetting and ponding of the backfill shall not be allowed.
22. Temporary site excavations should be sloped back, or shored and braced, by the contractor in accordance with HIOSH or other applicable governmental regulations. The design of temporary excavations and shoring systems, including costs, should be the responsibility of the Contractor.

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-03-97	2000	10	110

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OPER: SALMNNJMSM,\*RGO  
REVISED: 05/22/00

FILE: DOT95138  
SCALE: 1"=1'  
BEC: 08/27/99

SURVEY PLOTTED BY	DATE	
DRAWN BY		
TRACED BY		
DESIGNED BY		
QUANTITIES BY		
CHECKED BY		
ORIGINAL PLAN		
NOTEBOOK		
No.		



THIS WORK WAS PREPARED  
BY ME OR UNDER MY  
SUPERVISION

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION  
**GEOTECHNICAL ENGINEER'S**  
**NOTES**  
KEAAHALA ROAD WIDENING  
KAHEKILI HIGHWAY TO PO'OKELA STREET  
State Project No. HWY-0-03-97  
Scale: As shown      Date: April 2000  
SHEET NO.C-10 OF C-55 SHEETS