

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | NH-083-1(46)       | 2002        | 43        | 53           |

| MAJOR DIVISIONS                                                                                                                                          |                                                                                    |                                                            | GROUP SYMBOLS                                                                                                       | TYPICAL NAMES                                                  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|
| COARSE GRAINED SOILS<br>(More than 50% of the material is larger than the No. 4 sieve size.)                                                             | GRAVELS<br>(More than 50% of coarse fraction is larger than the No. 4 sieve size.) | CLEAN GRAVELS<br>(Little or no fines.)                     | GW                                                                                                                  | Well graded gravels, gravel-sand mixtures, little or no fines. |
|                                                                                                                                                          |                                                                                    | GP                                                         | Poorly graded gravels or gravel-sand mixtures, little or no fines.                                                  |                                                                |
|                                                                                                                                                          |                                                                                    | GM                                                         | Silty gravels, gravel-sand-silt mixtures.                                                                           |                                                                |
|                                                                                                                                                          | SANDS<br>(More than 50% of coarse fraction is smaller than the No. 4 sieve size.)  | CLEAN SANDS<br>(Little or no fines.)                       | SW                                                                                                                  | Well graded sands, gravelly sands, little or no fines.         |
|                                                                                                                                                          |                                                                                    | SP                                                         | Poorly graded sands or gravelly sands, little or no fines.                                                          |                                                                |
|                                                                                                                                                          |                                                                                    | SM                                                         | Silty sands, sand-silt mixtures.                                                                                    |                                                                |
| FINE GRAINED SOILS<br>(More than 50% of the material is smaller than No. 200 sieve size.)                                                                | SILTS AND CLAYS<br>(Liquid limit LESS than 50.)                                    | SC                                                         | Clayey sands, sand-clay mixtures.                                                                                   |                                                                |
|                                                                                                                                                          |                                                                                    | ML                                                         | Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity. |                                                                |
|                                                                                                                                                          |                                                                                    | CL                                                         | Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.                  |                                                                |
|                                                                                                                                                          | SILTS AND CLAYS<br>(Liquid limit GREATER than 50.)                                 | OL                                                         | Organic silts and organic silty clays of low plasticity.                                                            |                                                                |
|                                                                                                                                                          |                                                                                    | MH                                                         | Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.                                |                                                                |
|                                                                                                                                                          |                                                                                    | CH                                                         | Inorganic clays of high plasticity, fat clays.                                                                      |                                                                |
| HIGHLY ORGANIC SOILS                                                                                                                                     | OH                                                                                 | Organic clays of medium to high plasticity, organic silts. |                                                                                                                     |                                                                |
|                                                                                                                                                          | PT                                                                                 | Peat and other highly organic soils.                       |                                                                                                                     |                                                                |
|                                                                                                                                                          |                                                                                    |                                                            |                                                                                                                     | FRESH TO MODERATELY WEATHERED BASALT                           |
|                                                                                                                                                          |                                                                                    |                                                            |                                                                                                                     | VOLCANIC TUFF / HIGHLY TO COMPLETELY WEATHERED BASALT          |
|                                                                                                                                                          |                                                                                    |                                                            |                                                                                                                     | CORAL                                                          |
| SAMPLE DEFINITION                                                                                                                                        |                                                                                    |                                                            |                                                                                                                     |                                                                |
| <input checked="" type="checkbox"/> 2" O.D. Standard Split Spoon Sampler <input checked="" type="checkbox"/> Shelby Tube    RQD Rock Quality Designation |                                                                                    |                                                            |                                                                                                                     |                                                                |
| <input type="checkbox"/> 3" O.D. Split Tube Sampler <input checked="" type="checkbox"/> NX / 4" Coring <input checked="" type="checkbox"/> Water Level   |                                                                                    |                                                            |                                                                                                                     |                                                                |
| DR 257                                                                                                                                                   |                                                                                    | Kamehameha Highway Drainage Improvements - Kahuku          |                                                                                                                     |                                                                |
| Ernest K. Hirata & Associates, Inc.                                                                                                                      |                                                                                    | BORING LOG LEGEND                                          |                                                                                                                     |                                                                |
|                                                                                                                                                          |                                                                                    | Plate A1                                                   |                                                                                                                     |                                                                |

| PLASTICITY CHART                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                        |                                    |  |           |            |          |              |         |                 |        |                          |               |                  |             |                            |      |                                       |             |                                    |             |                                     |           |                                        |               |                                 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------------------|--|-----------|------------|----------|--------------|---------|-----------------|--------|--------------------------|---------------|------------------|-------------|----------------------------|------|---------------------------------------|-------------|------------------------------------|-------------|-------------------------------------|-----------|----------------------------------------|---------------|---------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                        |                                    |  |           |            |          |              |         |                 |        |                          |               |                  |             |                            |      |                                       |             |                                    |             |                                     |           |                                        |               |                                 |
| GRADATION CHART                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                        |                                    |  |           |            |          |              |         |                 |        |                          |               |                  |             |                            |      |                                       |             |                                    |             |                                     |           |                                        |               |                                 |
| <table><tr><th colspan="2">COMPONENT DEFINITIONS BY GRADATION</th></tr><tr><th>COMPONENT</th><th>SIZE RANGE</th></tr><tr><td>Boulders</td><td>Above 12 in.</td></tr><tr><td>Cobbles</td><td>3 in. to 12 in.</td></tr><tr><td>Gravel</td><td>3 in. to No. 4 (4.76 mm)</td></tr><tr><td>Coarse gravel</td><td>3 in. to 3/4 in.</td></tr><tr><td>Fine gravel</td><td>3/4 in. to No. 4 (4.76 mm)</td></tr><tr><td>Sand</td><td>No. 4 (4.76 mm) to No. 200 (0.074 mm)</td></tr><tr><td>Coarse sand</td><td>No. 4 (4.76 mm) to No. 10 (2.0 mm)</td></tr><tr><td>Medium sand</td><td>No. 10 (2.0 mm) to No. 40 (0.42 mm)</td></tr><tr><td>Fine sand</td><td>No. 40 (0.42 mm) to No. 200 (0.074 mm)</td></tr><tr><td>Silt and clay</td><td>Smaller than No. 200 (0.074 mm)</td></tr></table> |                                        | COMPONENT DEFINITIONS BY GRADATION |  | COMPONENT | SIZE RANGE | Boulders | Above 12 in. | Cobbles | 3 in. to 12 in. | Gravel | 3 in. to No. 4 (4.76 mm) | Coarse gravel | 3 in. to 3/4 in. | Fine gravel | 3/4 in. to No. 4 (4.76 mm) | Sand | No. 4 (4.76 mm) to No. 200 (0.074 mm) | Coarse sand | No. 4 (4.76 mm) to No. 10 (2.0 mm) | Medium sand | No. 10 (2.0 mm) to No. 40 (0.42 mm) | Fine sand | No. 40 (0.42 mm) to No. 200 (0.074 mm) | Silt and clay | Smaller than No. 200 (0.074 mm) |
| COMPONENT DEFINITIONS BY GRADATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                        |                                    |  |           |            |          |              |         |                 |        |                          |               |                  |             |                            |      |                                       |             |                                    |             |                                     |           |                                        |               |                                 |
| COMPONENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | SIZE RANGE                             |                                    |  |           |            |          |              |         |                 |        |                          |               |                  |             |                            |      |                                       |             |                                    |             |                                     |           |                                        |               |                                 |
| Boulders                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Above 12 in.                           |                                    |  |           |            |          |              |         |                 |        |                          |               |                  |             |                            |      |                                       |             |                                    |             |                                     |           |                                        |               |                                 |
| Cobbles                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 3 in. to 12 in.                        |                                    |  |           |            |          |              |         |                 |        |                          |               |                  |             |                            |      |                                       |             |                                    |             |                                     |           |                                        |               |                                 |
| Gravel                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 3 in. to No. 4 (4.76 mm)               |                                    |  |           |            |          |              |         |                 |        |                          |               |                  |             |                            |      |                                       |             |                                    |             |                                     |           |                                        |               |                                 |
| Coarse gravel                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 3 in. to 3/4 in.                       |                                    |  |           |            |          |              |         |                 |        |                          |               |                  |             |                            |      |                                       |             |                                    |             |                                     |           |                                        |               |                                 |
| Fine gravel                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 3/4 in. to No. 4 (4.76 mm)             |                                    |  |           |            |          |              |         |                 |        |                          |               |                  |             |                            |      |                                       |             |                                    |             |                                     |           |                                        |               |                                 |
| Sand                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | No. 4 (4.76 mm) to No. 200 (0.074 mm)  |                                    |  |           |            |          |              |         |                 |        |                          |               |                  |             |                            |      |                                       |             |                                    |             |                                     |           |                                        |               |                                 |
| Coarse sand                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | No. 4 (4.76 mm) to No. 10 (2.0 mm)     |                                    |  |           |            |          |              |         |                 |        |                          |               |                  |             |                            |      |                                       |             |                                    |             |                                     |           |                                        |               |                                 |
| Medium sand                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | No. 10 (2.0 mm) to No. 40 (0.42 mm)    |                                    |  |           |            |          |              |         |                 |        |                          |               |                  |             |                            |      |                                       |             |                                    |             |                                     |           |                                        |               |                                 |
| Fine sand                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | No. 40 (0.42 mm) to No. 200 (0.074 mm) |                                    |  |           |            |          |              |         |                 |        |                          |               |                  |             |                            |      |                                       |             |                                    |             |                                     |           |                                        |               |                                 |
| Silt and clay                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Smaller than No. 200 (0.074 mm)        |                                    |  |           |            |          |              |         |                 |        |                          |               |                  |             |                            |      |                                       |             |                                    |             |                                     |           |                                        |               |                                 |
| DR 257                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                        |                                    |  |           |            |          |              |         |                 |        |                          |               |                  |             |                            |      |                                       |             |                                    |             |                                     |           |                                        |               |                                 |
| Kamehameha Highway Drainage Improvements - Kahuku                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                        |                                    |  |           |            |          |              |         |                 |        |                          |               |                  |             |                            |      |                                       |             |                                    |             |                                     |           |                                        |               |                                 |
| Ernest K. Hirata & Associates, Inc.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                        |                                    |  |           |            |          |              |         |                 |        |                          |               |                  |             |                            |      |                                       |             |                                    |             |                                     |           |                                        |               |                                 |
| UNIFIED SOIL CLASSIFICATION SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                        |                                    |  |           |            |          |              |         |                 |        |                          |               |                  |             |                            |      |                                       |             |                                    |             |                                     |           |                                        |               |                                 |
| Plate A2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                        |                                    |  |           |            |          |              |         |                 |        |                          |               |                  |             |                            |      |                                       |             |                                    |             |                                     |           |                                        |               |                                 |

|                                                                                                                                                |       |        |                |                   |                  |
|------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------|----------------|-------------------|------------------|
| ERNEST K. HIRATA & ASSOCIATES, INC.                                                                                                            |       |        |                |                   |                  |
| Geotechnical Engineering                                                                                                                       |       |        |                |                   |                  |
| BORING LOG                                                                                                                                     |       |        |                |                   |                  |
| DR 257                                                                                                                                         |       |        |                |                   |                  |
| BORING NO. E1    DRIVING WT. 140 lb.    DATE OF DRILLING 11/7/01                                                                               |       |        |                |                   |                  |
| SURFACE ELEV. 14±    DROP 30 in.    WATER LEVEL 13.5 ft.                                                                                       |       |        |                |                   |                  |
| DEPTH                                                                                                                                          | GRAPH | SAMPLE | BLOWS PER FOOT | DRY DENSITY (PCF) | MOIST. CONT. (%) |
| 0                                                                                                                                              |       |        |                |                   |                  |
|                                                                                                                                                |       |        | 21             |                   | 30.1             |
| 5                                                                                                                                              |       |        | 12             |                   | 33.8             |
|                                                                                                                                                |       |        |                |                   |                  |
| 10                                                                                                                                             |       |        | 5              |                   | 54.2             |
|                                                                                                                                                |       |        |                |                   |                  |
| 15                                                                                                                                             |       |        | 10             |                   | 53.7             |
|                                                                                                                                                |       |        |                |                   |                  |
| 20                                                                                                                                             |       |        | 25             |                   | 46.3             |
|                                                                                                                                                |       |        |                |                   |                  |
| 25                                                                                                                                             |       |        | 23             |                   | 49.1             |
|                                                                                                                                                |       |        |                |                   |                  |
| 30                                                                                                                                             |       |        | 21             |                   | 48.3             |
| DESCRIPTION                                                                                                                                    |       |        |                |                   |                  |
| Silty CLAY (MH) - Reddish brown, moist, medium stiff, with sand and coral fragments. Covered by 8" of asphaltic concrete and 6" of coral base. |       |        |                |                   |                  |
| Clayey SILT (MH) - Mottled reddish and grayish brown, moist, firm to soft.                                                                     |       |        |                |                   |                  |
| Medium stiff from 15 feet.                                                                                                                     |       |        |                |                   |                  |
| Clayey and medium stiff to stiff from 19 to 30 feet.                                                                                           |       |        |                |                   |                  |
| Plate B1                                                                                                                                       |       |        |                |                   |                  |

|                                                                              |       |        |                |                   |                  |
|------------------------------------------------------------------------------|-------|--------|----------------|-------------------|------------------|
| ERNEST K. HIRATA & ASSOCIATES, INC.                                          |       |        |                |                   |                  |
| Geotechnical Engineering                                                     |       |        |                |                   |                  |
| BORING LOG                                                                   |       |        |                |                   |                  |
| DR 257                                                                       |       |        |                |                   |                  |
| BORING NO. E1 (continued)    DRIVING WT. 140 lb.    DATE OF DRILLING 11/7/01 |       |        |                |                   |                  |
| SURFACE ELEV. 14±    DROP 30 in.    WATER LEVEL 13.5 ft.                     |       |        |                |                   |                  |
| DEPTH                                                                        | GRAPH | SAMPLE | BLOWS PER FOOT | DRY DENSITY (PCF) | MOIST. CONT. (%) |
| 30                                                                           |       |        |                |                   |                  |
|                                                                              |       |        | 9              |                   | 61.8             |
| 35                                                                           |       |        |                |                   |                  |
|                                                                              |       |        | 10             |                   | 59.4             |
| 40                                                                           |       |        |                |                   |                  |
|                                                                              |       |        | 12             |                   | 60.2             |
| 45                                                                           |       |        |                |                   |                  |
|                                                                              |       |        | 17             |                   | 54.8             |
| 50                                                                           |       |        |                |                   |                  |
|                                                                              |       |        | 23             |                   | 55.7             |
| 55                                                                           |       |        |                |                   |                  |
|                                                                              |       |        | 13             |                   | 68.1             |
| 60                                                                           |       |        |                |                   |                  |
| DESCRIPTION                                                                  |       |        |                |                   |                  |
| Medium stiff from 34 feet. Brown color from 34 feet.                         |       |        |                |                   |                  |
| Silty sand with gravel at 39 feet.                                           |       |        |                |                   |                  |
| Clayey from 54 feet.                                                         |       |        |                |                   |                  |
| Plate B2                                                                     |       |        |                |                   |                  |

|                                                                              |       |        |                |                   |                  |
|------------------------------------------------------------------------------|-------|--------|----------------|-------------------|------------------|
| ERNEST K. HIRATA & ASSOCIATES, INC.                                          |       |        |                |                   |                  |
| Geotechnical Engineering                                                     |       |        |                |                   |                  |
| BORING LOG                                                                   |       |        |                |                   |                  |
| DR 257                                                                       |       |        |                |                   |                  |
| BORING NO. E1 (continued)    DRIVING WT. 140 lb.    DATE OF DRILLING 11/8/01 |       |        |                |                   |                  |
| SURFACE ELEV. 14±    DROP 30 in.    WATER LEVEL 13.5 ft.                     |       |        |                |                   |                  |
| DEPTH                                                                        | GRAPH | SAMPLE | BLOWS PER FOOT | DRY DENSITY (PCF) | MOIST. CONT. (%) |
| 60                                                                           |       |        |                |                   |                  |
|                                                                              |       |        | 8              |                   | 68.2             |
| 65                                                                           |       |        |                |                   |                  |
|                                                                              |       |        | 36             |                   | 48.8             |
| 70                                                                           |       |        |                |                   |                  |
|                                                                              |       |        | 31             |                   | 54.2             |
| 75                                                                           |       |        |                |                   |                  |
|                                                                              |       |        | 30             |                   | 61.6             |
| 80                                                                           |       |        |                |                   |                  |
|                                                                              |       |        | 59             |                   | 45.0             |
| 85                                                                           |       |        |                |                   |                  |
|                                                                              |       |        | 59             |                   | 48.1             |
| 90                                                                           |       |        |                |                   |                  |
| DESCRIPTION                                                                  |       |        |                |                   |                  |
| Firm from 64 feet.                                                           |       |        |                |                   |                  |
| Silty SAND (SM) - Brown, stiff, with sand. (Completely weathered rock)       |       |        |                |                   |                  |
| Grayish brown from 74 feet.                                                  |       |        |                |                   |                  |
| End boring at 90.5 feet.                                                     |       |        |                |                   |                  |
| Plate B3                                                                     |       |        |                |                   |                  |

|                                      |  |  |  |  |  |
|--------------------------------------|--|--|--|--|--|
| STATE OF HAWAII                      |  |  |  |  |  |
| DEPARTMENT OF TRANSPORTATION         |  |  |  |  |  |
| HIGHWAYS DIVISION                    |  |  |  |  |  |
| BORING LOGS                          |  |  |  |  |  |
| KAMEHAMEHA HIGHWAY                   |  |  |  |  |  |
| DRAINAGE IMPROVEMENTS                |  |  |  |  |  |
| Vicinity of Kahuku Hospital and      |  |  |  |  |  |
| Replacement of Kii Bridge            |  |  |  |  |  |
| Federal Aid Project No. NH-083-1(46) |  |  |  |  |  |
| Date: April 2002                     |  |  |  |  |  |
| SHEET No. 1 OF 3 SHEETS              |  |  |  |  |  |



| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | NH-083-1(46)       | 2002        | 44        | 53           |

ERNEST K. HIRATA & ASSOCIATES, INC.  
Geotechnical Engineering

BORING LOG

DR 257

BORING NO. E2 DRIVING WT. 140 lb. DATE OF DRILLING 11/5/01  
SURFACE ELEV. 7± DROP 30 in. WATER LEVEL 5.2 ft.

| DEPTH<br>H<br>O | GRAPH | SAMPLE | BLOWS<br>PER<br>FOOT | DRY<br>DENSITY<br>(PCF) | MOIST.<br>CONT.<br>(%) | DESCRIPTION                                                                                                                                                                    |
|-----------------|-------|--------|----------------------|-------------------------|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0               |       |        |                      |                         |                        |                                                                                                                                                                                |
|                 |       |        | 8                    |                         | 14.7                   | Silty SAND (SM) - Tan to light brown, moist, loose to medium dense, with coral gravel. Covered by 5" of asphaltic concrete and 10" of coral base. Grinding from 1.5 to 2 feet. |
|                 |       |        | 17                   |                         | 13.7                   | Medium dense from 6 feet.                                                                                                                                                      |
| -10             |       |        | 4                    |                         | 29.9                   | Silty SAND (SM) - Gray, loose.                                                                                                                                                 |
| -15             |       |        | 1                    |                         | 57.3                   | Clayey SILT (ML) - Gray to grayish brown, soft, with sand and occasional coral fragments.                                                                                      |
| -20             |       |        | 7                    |                         | 38.2                   |                                                                                                                                                                                |
| -25             |       |        | 21                   |                         | 46.5                   | Medium stiff and clayey from 24 feet.                                                                                                                                          |
| -30             |       |        | 48                   |                         | 19.8                   | Silty SAND (SM) - Light brown, dense, with coral fragments.                                                                                                                    |

Plate B4

ERNEST K. HIRATA & ASSOCIATES, INC.  
Geotechnical Engineering

BORING LOG

DR 257

BORING NO. E2 (continued) DRIVING WT. 140 lb. DATE OF DRILLING 11/5/01  
SURFACE ELEV. 7± DROP 30 in. WATER LEVEL 5.2 ft.

| DEPTH<br>H<br>O | GRAPH | SAMPLE | BLOWS<br>PER<br>FOOT       | DRY<br>DENSITY<br>(PCF) | MOIST.<br>CONT.<br>(%) | DESCRIPTION                                                                                               |
|-----------------|-------|--------|----------------------------|-------------------------|------------------------|-----------------------------------------------------------------------------------------------------------|
| -30             |       |        |                            |                         |                        |                                                                                                           |
| -35             |       |        | 20/3"<br>10/No Penetration |                         | 10.2                   | Increased coral fragment content at 34 feet. Begin 4" coring at 35 feet. 44% recovery from 35 to 40 feet. |
| -40             |       |        | 25                         |                         | 47.2                   | End 4" coring at 40 feet. Silty CLAY (MH) - Brown, medium stiff to stiff.                                 |
| -45             |       |        | 54                         |                         | 50.1                   |                                                                                                           |
| -50             |       |        | 17                         |                         | 51.3                   | Medium stiff with sand and coral fragments from 49 feet.                                                  |
| -55             |       |        | 14                         |                         | 69.1                   | Brown Sandy clay with coral fragments at 54 feet.                                                         |
| -60             |       |        | 25                         |                         | 40.4                   | Sandier from 59 feet.                                                                                     |

Plate B5

ERNEST K. HIRATA & ASSOCIATES, INC.  
Geotechnical Engineering

BORING LOG

DR 257

BORING NO. E2 (continued) DRIVING WT. 140 lb. DATE OF DRILLING 11/5/01  
SURFACE ELEV. 7± DROP 30 in. WATER LEVEL 5.2 ft.

| DEPTH<br>H<br>O | GRAPH | SAMPLE | BLOWS<br>PER<br>FOOT | DRY<br>DENSITY<br>(PCF) | MOIST.<br>CONT.<br>(%) | DESCRIPTION                               |
|-----------------|-------|--------|----------------------|-------------------------|------------------------|-------------------------------------------|
| -60             |       |        |                      |                         |                        |                                           |
| -65             |       |        | 35                   |                         | 33.1                   | Dense clayey gravel with sand at 64 feet. |
| -70             |       |        | 23                   |                         | 41.8                   |                                           |
| -75             |       |        |                      |                         |                        | End boring at 70.5 feet.                  |
| -80             |       |        |                      |                         |                        |                                           |
| -85             |       |        |                      |                         |                        |                                           |
| -90             |       |        |                      |                         |                        |                                           |

Plate B6

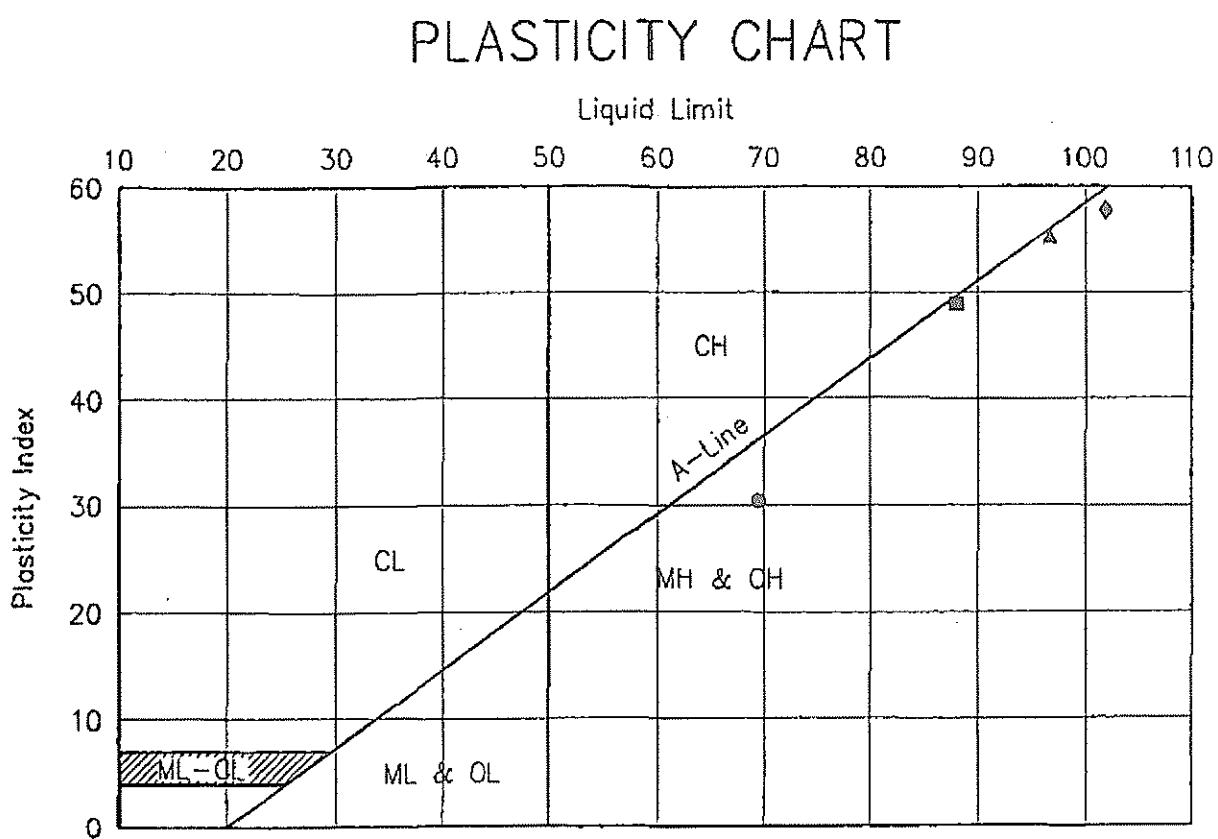
|               |         |
|---------------|---------|
| DESIGNED BY   | DATE    |
| TRACED BY     | 12-5-01 |
| DESIGNED BY   |         |
| QUANTITIES BY |         |
| CHECKED BY    |         |

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION  
**BORING LOGS**  
KAMEHAMEHA HIGHWAY  
DRAINAGE IMPROVEMENTS  
Vicinity of Kahuku Hospital and  
Replacement of Kii Bridge  
Federal Aid Project No. NH-083-1(46)  
Date: April 2002

SHEET No. 2 OF 3 SHEETS

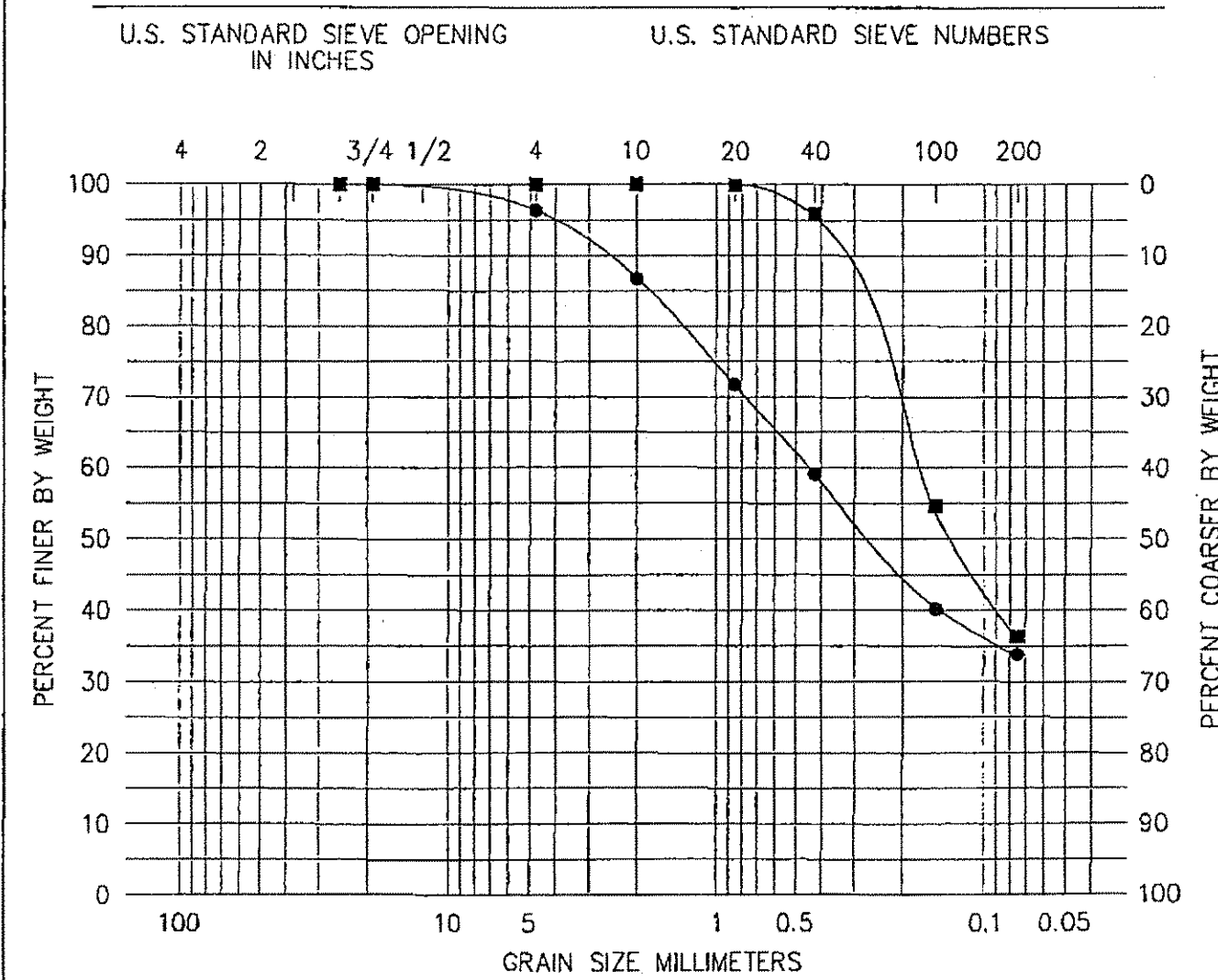


| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | NH-083-1(46)       | 2002        | 45        | 53           |



|             |                                 |
|-------------|---------------------------------|
| • Sample #1 | Location: Boring E1 at 9 feet.  |
| ■ Sample #2 | Location: Boring E1 at 24 feet. |
| ◆ Sample #3 | Location: Boring E1 at 54 feet. |
| ▲ Sample #4 | Location: Boring E2 at 44 feet. |

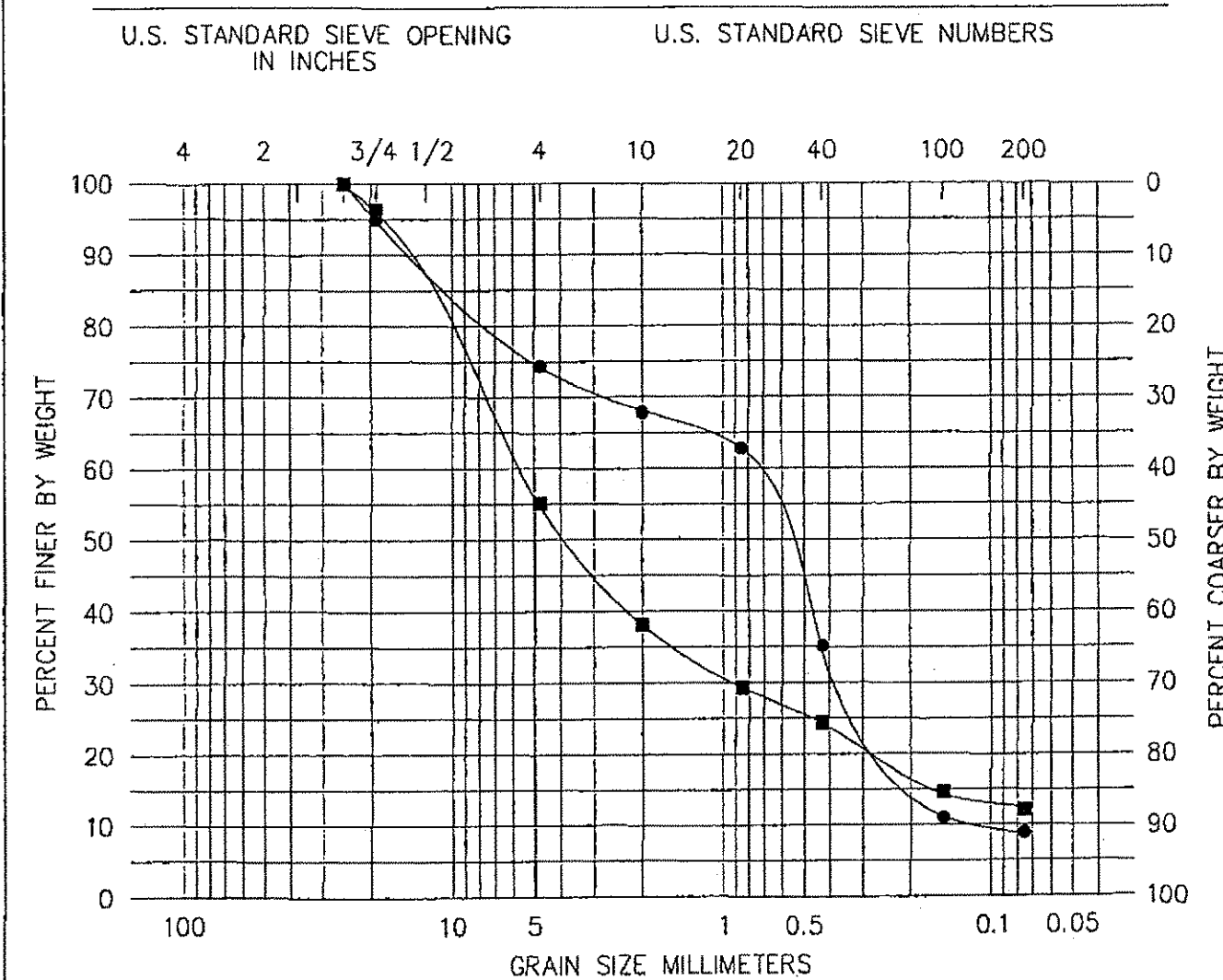
|                                        |                                                   |
|----------------------------------------|---------------------------------------------------|
| DR 257                                 | Kamehameha Highway Drainage Improvements - Kahuku |
| Ernest K. Hirata<br>& Associates, Inc. | ATTERBERG LIMITS TEST RESULTS<br>Plate C          |



| COBBLES | GRAVEL |      | SAND   |        |      | SILT or CLAY |
|---------|--------|------|--------|--------|------|--------------|
|         | Coarse | Fine | Coarse | Medium | Fine |              |

|             |                                                                   |
|-------------|-------------------------------------------------------------------|
| • Sample #1 | Location: Boring E1 at 39 feet.                                   |
|             | Description: Brown silty sand with sand and gravel                |
| ■ Sample #2 | Location: Boring E1 at 74 feet.                                   |
|             | Description: Grayish brown silty sand (completely weathered rock) |

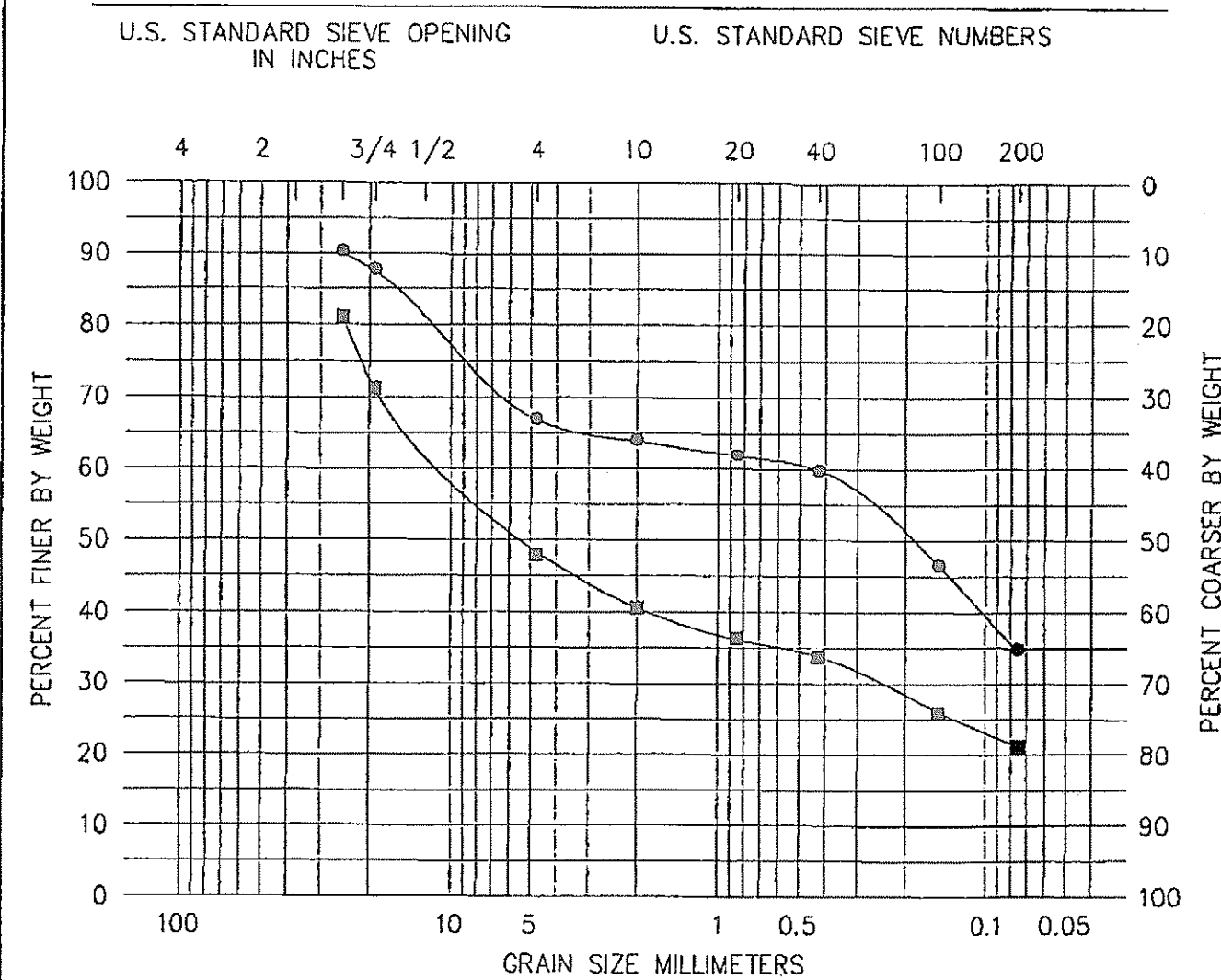
|                                        |                                                   |
|----------------------------------------|---------------------------------------------------|
| DR 257                                 | Kamehameha Highway Drainage Improvements - Kahuku |
| Ernest K. Hirata<br>& Associates, Inc. | GRADATION CURVES<br>Plate D1                      |



| COBBLES | GRAVEL |      | SAND   |        |      | SILT or CLAY |
|---------|--------|------|--------|--------|------|--------------|
|         | Coarse | Fine | Coarse | Medium | Fine |              |

|             |                                                          |
|-------------|----------------------------------------------------------|
| • Sample #1 | Location: Boring E2 at 9 feet.                           |
|             | Description: Gray silty sand                             |
| ■ Sample #2 | Location: Boring E2 at 29 feet.                          |
|             | Description: Light brown silty sand with coral fragments |

|                                        |                                                   |
|----------------------------------------|---------------------------------------------------|
| DR 257                                 | Kamehameha Highway Drainage Improvements - Kahuku |
| Ernest K. Hirata<br>& Associates, Inc. | GRADATION CURVES<br>Plate D2                      |



| COBBLES | GRAVEL |      | SAND   |        |      | SILT or CLAY |
|---------|--------|------|--------|--------|------|--------------|
|         | Coarse | Fine | Coarse | Medium | Fine |              |

|             |                                                               |
|-------------|---------------------------------------------------------------|
| • Sample #1 | Location: Boring E2 at 54 feet.                               |
|             | Description: Brown sandy clay with coral fragments at 54 feet |
| ■ Sample #2 | Location: Boring E2 at 64 feet.                               |
|             | Description: Brown clayey gravel with sand                    |

|                                        |                                                   |
|----------------------------------------|---------------------------------------------------|
| DR 257                                 | Kamehameha Highway Drainage Improvements - Kahuku |
| Ernest K. Hirata<br>& Associates, Inc. | GRADATION CURVES<br>Plate D3                      |

|               |                   |         |
|---------------|-------------------|---------|
| ORIGINAL PLAN | SURVEY PLOTTED BY | DATE    |
|               | DRAWN BY          | 12/2/01 |
|               | DESIGNED BY       |         |
|               | NOTED BY          |         |
| NOTE BOOK     | QUANTITIES BY     |         |
|               | CHECKED BY        |         |

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION  
**BORING LOGS**  
KAMEHAMEHA HIGHWAY  
DRAINAGE IMPROVEMENTS  
Vicinity of Kahuku Hospital and  
Replacement of Kii Bridge  
Federal Aid Project No. NH-083-1(46)  
Date: April 2002  
SHEET No. 3 OF 3 SHEETS