## 1.01 SCOPE OF WORK

A. PROVIDE LANDSCAPE PLANTINGS IN THE AREAS SHOWN ON THE DRAWINGS WITH PLANTS IN A HEALTHY, YIGOROUS GROWING CONDITION. ALL WORK INDICATED ON THE DRAWINGS BY NOTES SHALL BE PROVIDED WHETHER OF NOT SPECIFICALLY MENTIONED WITHIN THESE NOTES. ANY ITEMS NOT SPECIFICALLY SHOWN IN THE DRAWINGS OR NOTES, BUT NORMALLY REQUIRED TO CONFORM WITH SUCH INTENT, ARE CONSIDERED PART OF THE WORK.

8. PLANTING

12. INSPECTIONS

9. HYDROMULCHING OF BACOPA

10. FENCE, GATE, & SIGNAGE

MAINTENANCE PERIOD

- B. WORK INCLUDES:
- CLEARING AQUATIC PLANT REMOVAL
- PROTECTION OF EXISTING CONDITIONS
- 4. WATER BARRIER
- 5. VEHICLE OPERATION
- 6. CONTAMINATION PROTECTION 7. IRRIGATION & DUST CONTROL
- 1.02 CODES AND STANDARDS

PERFORM WORK IN ACCORDANCE WITH ALL APPLICABLE LAWS, CODES, AND REGULATIONS REQUIRED BY AUTHORITIES HAVING JURISDICTION OVER SUCH WORK. ALL ENHANCEMENT OPERATIONS SHALL BE PERFORMED IN CONFORMANCE WITH THE APPLICABLE PROVISIONS OF THE WATER POLLUTION CONTROL AND WATER QUALITY STANDARDS CONTAINED IN HAWAII ADMINISTRATIVE RULES, CHAPTER 11-55, "WATER POLLUTION CONTROL" AND CHAPTER 11-54, "WATER QUALITY STANDARDS", DEPT. OF HEALTH'S APPROVED SECTION 401 CERTIFICATION, AND IF APPLICABLE, THE NPDES PERMIT FOR THE PROJECT.

#### PART 2 - PRODUCTS

# 2.01 FERTILIZER

MANURE: WELL ROTTED CATTLE OR CHICKEN MANURE, DO NOT USE COMMERCIAL FERTILIZERS. THIS INCLUDES THE USE OF COMMERCIAL FERTILIZER IN THE HYDROMULCH. AGED, ORGANIC FERTILIZER MAY BE USED ON THE UPLAND AREAS

## 2.02 PRE-PLANTING HERBICIDE AND PESTICIDES

COMMERCIAL GRADE HERBICIDES AND PESTICIDES ARE NOT PERMITTED WITHIN THE PROJECT LIMITS.

## 2.03 PLANT MATERIAL

- A. QUANTITIES: PROVIDE SUFFICIENT QUANTITIES OF PLANT MATERIALS NEEDED TO COMPLETE THE WORK AS SHOWN ON THE PLANTING PLANS AND INDICATED IN THE DRAWINGS, QUANTITIES INDICATED ON THE PLANT LIST ARE APPROXIMATE ONLY AND ARE PROVIDED FOR THE CONVENIENCE OF THE CONTRACTOR. THE PLANTING PLANS SHALL HAVE PRECEDENCE OVER THE PLANT LIST.
- B. NOMENCLATURE: NAMES OF PLANTS SHALL CONFORM WITH NAMES GENERALLY ACCEPTED IN THE LOCAL NURSERY TRADE, AND AS INTERPRETED BY THE LANDSCAPE ARCHITECT.

# C. CONDITION:

- I. GROUND COYER SHALL HAVE A NORMAL HABIT OF GROWTH AND SHALL BE SOUND HEALTHY, VIGOROUS, AND FREE FROM INSECT INFESTATIONS.
- 2. PLANTS FROM CONTAINERS SHALL HAVE SUFFICIENT ROOTS TO HOLD THE ROOT BALL TOGETHER AFTER REMOVAL FROM CONTAINERS WITHOUT BEING ROOTBOUND.
- 3. ROOTED CUTTINGS SHALL BE HEALTHY, VEGETATIVE MATERIAL WITH WELL ESTABLISHED ROOTS AT ONE OR MORE NODES.

# 2.04 WATER

CONTRACTOR SHALL MAKE THEIR OWN ARRANGEMENTS FOR WATER.

# PART 3 - EXECUTION

# 3.01 CLEARING OF UPLAND AND MARSHLAND AREAS

- A. CLEAR ALL UPLAND AND WETLAND AREAS OF EXISTING VEGETATION NOT SPECIFIED TO REMAIN AND ALL OTHER DEBRIS AND FOREIGN MATERIAL CONSIDERED A HINDRANCE TO PLANTING OPERATIONS AND/OR UNSIGHTLY IN APPEARANCE
- B. MAINTAIN EXISTING GRADES AND SWALES ON UPLAND AREAS.
- C. EXISTING TREES AND PALMS MARKED WITH RED AND WHITE RIBBONS SHALL BE REMOVED. EXISTING TREES AND PALMS MARKED WITH RED AND BLUE RIBBONS SHALL REMAIN. ONLY EXISTING PALMS ARE SHOWN ON THE PLAN. EXISTING TREES ARE NOT SHOWN ON THE PLAN BUT WILL BE TAGGED BY THE STATE RESIDENT ENGINEER AS INDICATED ABOYE AFTER THE CLEARING OF EXISTING SHRUBS AND LOW GROWING YEGETATION.
- D. EXISTING VEGETATION REMOVAL WILL BE DONE BY UPROOTING EACH PLANT AND ENSURING THE REMOVAL OF THE PLANT ROOTS (EXCEPT FOR EXISTING DATE PALMS WHICH SHALL BE CUT TO STUMPS AS INDICATED ON THE PLAN SHEET L-2).
- E. REMOVE DEAD, DYING, LOW BRANCHES AND FRONDS OF TREES AND PALMS TO REMAIN (THAT MAY BREACH FENCE AND WATER BARRIER).
- F. ALL EXTRICATED PLANT MATERIAL SUCH AS TREES, SHRUBS, GROUND COVERS AND GRASSES INCLUDING AQUATIC VEGETATION WHICH CAN BE MULCHED SHALL BE STOCKPILED WITHIN THE ADJACENT HALEIWA BY-PASS RIGHT-OF-WAY, IN AN AREA DESIGNATED AND APPROVED BY THE STATE RESIDENT ENGINEER. THE STOCKPILED MULCH SHALL BE ALLOWED TO AGE A MINIMUM OF 3 MONTHS DURING THE PLANT ESTABLISHMENT PERIOD.
- G. ALL 'GREEN WASTE' LIQUID GENERATED AS A RESULT OF MULCHING AND STOCKPILING OPERATIONS SHALL NOT BE ALLOWED TO RUN-OFF INTO THE MARSHLAND AREA.

- H. ALL EXTRICATED PLANT MATERIAL NOT SUITABLE TO BE MULCHED AS DETERMINED BY THE STATE RESIDENT ENGINEER, TRASH AND DEBRIS SHALL BE REMOVED FROM THE SITE.
- I. STATE RESIDENT ENGINEER SHALL VERIFY AND GIVE WRITTEN ACCEPTANCE OF CLEARING OPERATIONS PRIOR TO PLANTING BY CONTRACTOR.
- J. THE CONTRACTOR SHALL SPREAD THE AGED MULCH TO PROVIDE A 2" LAYER OF COVER MULCH ON UPLAND PLANTING AREAS AFTER ALL PLANTING OPERATIONS HAVE BEEN COMPLETED AND AS DIRECTED BY THE STATE RESIDENT ENGINEER.

#### 3.02 AQUATIC PLANT REMOVAL

- A. HEAVY CONSTRUCTION EQUIPMENT SHALL NOT BE ALLOWED ON OR IN THE MARSHLAND UNLESS APPROVED BY THE STATE RESIDENT ENGINEER.
- B. USE OF A 'CLAM SHELL' BUCKET AND BOOM OPERATED FROM THE MARSHLAND SHORELINE TO REMOVE EXISTING AQUATIC VEGETATION SHALL BE ALLOWED.
- C. THE CONTRACTOR SHALL SUBMIT AN AQUATIC PLANT REMOVAL PLAN PRIOR TO THE NOTICE-TO-PROCEED FOR APPROVAL BY THE STATE RESIDENT ENGINEER.

## 3.03 PROTECTION OF EXISTING CONDITIONS

- A. PROVIDE NECESSARY SAFEGUARDS AND EXERCISE CAUTION AGAINST INJURY TO ALL TREES TO REMAIN.
- B. MINIMIZE ALL VEHICULAR TRAFFIC IN THE PROJECT AREA BEFORE AND AFTER VEGETATION REMOVAL.
- C. AVOID DAMAGING THE EXPOSED LIMESTONE BEDS AND COVERING OF THE EXISTING NATURAL PONDS.
- D. THE EXISTING WATER FEATHER POND SHALL REMAIN AND DISTURBANCE FROM ADJACENT RESTORATION WORK BY THE CONTRACTOR SHALL BE MINIMIZED. THE PERIMETER OF THE WATER FEATHER POND SHALL BE STAKED BY THE STATE RESIDENT ENGINEER AND BORDERED WITH BRIGHT ORANGE COLORED PLASTIC CONSTRUCTION TAPE PRIOR TO ANY CLEARING WORK.

### 3.04 WATER BARRIER

- A. THE STATE RESIDENT ENGINEER SHALL SUPERVISE THE CLEARING AND GRUBBING OF THE UPLAND AREA. DURING THIS OPERATION THE STATE RESIDENT ENGINEER SHALL IDENTIFY AND STAKE THE CONFIGURATION OF THE MARSHLAND EDGE AND WATER BARRIER.
- B. WATER BARRIER SHALL BE EXCAVATED ALONG THE EXISTING LIMESTONE EDGE AND SOIL MARSH SHORELINE AS IDENTIFIED AND STAKED BY THE RESIDENT ENGINEER WITHIN THE PROJECT LIMITS. THE WATER BARRIER SHALL BE AS SHOWN ON SHEET L-3 DETAIL # 2 AND 5.
- C. THE 'MUCK' EXCAYATED FROM THE MARSHLAND TO CREATE THE WATER BARRIER SHALL BE STOCKPILED WITHIN THE ADJACENT HALEIWA BY-PASS RIGHT-OF-WAY IN AN AREA DESIGNATED AND APPROVED BY THE STATE RESIDENT ENGINEER. ENSURE THAT WATER FROM THE EXCAVATED AND STOCKPILED MUCK DOES NOT RUN-OFF INTO THE MARSHLAND.

# 3.05 VEHICLE OPERATION

- A. HEAVY EQUIPMENT MAY BE USED IN THE REMOVAL OF UPLAND VEGETATION PROVIDED THE EXISTING TERRAIN IS NOT ALTERED IN ELEVATION IN THE GRUBBING PROCESS. DO NOT STORE MATERIALS NEAR OR UNDER THE BRANCHES OF ANY EXISTING TREES THAT ARE TO REMAIN.
- B. SHOULD THE CONTRACTOR REQUIRE TO GO INTO THE MARSHLAND TO EXTRACT YEGETATIVE MATERIAL WITH MECHANIZED EQUIPMENT, EXCESSIVE EQUIPMENT MOVEMENT AND AGITATING THE MARSH BOTTOM SHALL BE KEPT TO A MINIMUM.

# 3.06 CONTAMINATION PROTECTION

- A. INSTALL SILT CURTAINS (AMOCO PROPLEX SILT STOP, OR EQUAL) AND/OR OTHER "BEST MANAGEMENT PRACTICES" TO PREVENT POLLUTION OF ADJACENT WATERS.
- B. PRIOR TO CLEARING AND EARTH MOVING PHASE, MEASURES TO CONTROL EROSION AND OTHER POLLUTANTS FROM ENTERING UKOA POND, SHALL BE IN PLACE. SILT CURTAINS SHALL NOT BE REMOVED UNTIL THE END OF THE MAINTENANCE PERIOD.

# 3.07 IRRIGATION AND DUST CONTROL

- A. THE CONTRACTOR SHALL INSTALL A TEMPORARY IRRIGATION SYSTEM TO BE USED DURING THE PLANT ESTABLISHMENT AND MAINTENANCE PERIOD. THE SYSTEM SHALL PROVIDE COMPLETE AND EQUAL COVERAGE FOR ALL NEW PLANTINGS WITHIN THE PROJECT LIMITS. THE TEMPORARY IRRIGATION SYSTEM SHALL BE COMPLETED PRIOR TO THE BEGINNING OF THE MAINTENANCE PERIOD AND INSPECTED BY RESIDENT ENGINEER.
- B. THE CONTRACTOR SHALL MINIMIZE THE HEAVY APPLICATION OF WATER TO ALL EXPOSED SURFACES IN AN EFFORT TO CONTROL DUST. WATER RUNOFF INTO THE MARSHLANDS IS NOT PERMITTED.

## 3.08 PLANTING

- A. ON THE DAMP UPLAND, ADJACENT TO THE MARSHLAND EDGE BACOPA SHALL BE HYDROMULCHED (AS SPECIFIED IN NOTES 3.09) IN AREAS INDICATED ON THE PLAN AND AS DIRECTED BY THE STATE RESIDENT ENGINEER. DO NOT HYDROMULCH EXPOSED LIMESTONE AREAS ADJACENT TO WATER BARRIER AND OVER SPRAY SLURRY MIX INTO OPEN WATER AREA.
- B. WITHIN THE MARSHLAND, BACOPA SHALL BE HYDROMULCHED (AS SPECIFIED IN NOTES 3.09) ON ISLANDS AND MUDFLATS AS INDICATED ON THE PLAN AND AS DIRECTED BY THE STATE RESIDENT ENGINEER.
- C. LANDSCAPE AREAS ON THE UPLAND NOT HYDROMULCHED WITH BACOPA SHALL BE PLANTED WITH AKULIKULI (SESUYIUM PORTULACASTRUM) AS SHOWN ON THE PLAN AND AT THE SIZE AND SPACING AS DESCRIBED IN THE PLANT LIST, SHEET L- 3. THE AKULIKULI FROM 2" POTS SHALL HAVE SUFFICIENT ROOTBALL GROWTH SO AS TO HOLD THE SOIL FROM THE CONTAINER UPON REMOVAL.

## 3.09 HYDROMULCHING OF BACOPA

- A. LIMITS OF HYDROMULCHING SHALL BE AS INDICATED ON THE DRAWINGS AND AS DIRECTED BY THE STATE RESIDENT ENGINEER.
- B. THE CONTRACTOR SHALL APPLY HYDROMULCH AT A RATE WHICH WILL ACHIEVE A MINIMUM OF 75% OF PLANT GROWTH COVERAGE 4 MONTHS PRIOR TO THE END OF THE MAINTENANCE PERIOD. AREAS WHICH DO NOT ACHIEVE 80% COVERAGE ONE MONTH PRIOR TO THE END OF THE MAINTENANCE PERIOD SHALL BE RE-HYDROMULCHED AND SHALL BE MAINTAINED UNTIL ESTABLISHED.
- C. HYDROMULCH SLURRY SHALL CONTAIN NO CHEMICAL FERTILIZERS, PESTICIDES, OR HERBICIDES.

## 3.10 FENCE, GATE, AND SIGNAGE

- A. THE FENCE LINE LOCATION AS SHOWN ON THE PLAN IS APPROXIMATE ONLY THE FINAL LOCATION OF THE FENCE LINE SHALL BE STAKED BY THE STATE RESIDENT ENGINEER AFTER THE CONTRACTOR HAS CLEARED THE EXISTING YEGETATION FROM THE UPLAND AREAS.
- B. INSTALL 4' HT. CHAIN LINK FENCE, WITHOUT TOP RAIL, AS SHOWN ON STATE D.O.T. STANDARD PLANS DETAIL D-02.
- C. INSTALL BOTTOM OF CHAIN LINK FENCE 6" BENEATH EXISTING GRADE SO AS TO AVOID GAP BETWEEN BOTTOM OF FENCE AND GROUND.
- D. INSTALL 4' HT, CHAIN LINK DOUBLE-SWING GATE ON EXISTING FENCE AS SHOWN ON PLAN. THE CONTRACTOR SHALL PROVIDE ONE HEAVY DUTY PAD LOCK AND A MINIMUM OF 3 L.F. OF I" WIDTH CHAIN LINK TO SECURE GATE. PROVIDE 3 SETS OF KEYS FOR PAD LOCK TO THE STATE RESIDENT ENGINEER.
- E. INSTALL TWO MARSHLAND SIGNS ON FENCE POST 6" FROM TOP OF FENCE, SEE PLAN FOR LOCATION AND SEE DETAIL # 3 ON SHEET L-3

# 3.11 MAINTENANCE PERIOD

- A. THE MAINTENANCE PERIOD WILL BEGIN AFTER ALL PLANTING HAS BEEN COMPLETED AND ACCEPTED BY THE RESIDENT ENGINEER. THE PLANTING PERIOD WILL BE FOR A MINIMUM OF 3 MONTHS AND WILL BE FOLLOWED BY THE 9 MONTH MAINTENANCE PERIOD. MAINTENANCE SHALL INCLUDE BUT NOT LIMITED TO:
  - REMOVE ALL ANIMALS THAT PREY UPON WATER BIRDS AND THEIR EGGS. THIS INCLUDES THE REMOVAL OF ANY AND ALL RAT NESTINGS, INCLUDING THOSE IN DATE PALMS, WITHIN THE PROJECT LIMITS.
- 2. IRRIGATE PLANTING ON UPLAND AREAS AS REQUIRED TO INSURE ACTIVE GROWTH.
- 3. FERTILIZE UPLAND PLANTING WITH APPROVED NATURAL ORGANIC FERTILIZER AS NEEDED THROUGHOUT THE MAINTENANCE PERIOD, NOT LESS THAN ONCE EVERY 4 MONTHS.
- 4. KEEP PLANTING AREAS FREE OF WEEDS AND UNDESIRABLE GRASSES. DISPOSE OF WEEDS OFF SITE.

hawaii design

associates

landscape architecture

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//PROFESSIONAL\\

LANDSCAPE

ARCHITECT

No.2768

THIS WORK WAS DONE BY ME OR UNDER MY SUPERVISION

BY MAMMA

- 5. REMOVE DAMAGED OR DISEASED GROWTH FROM EXISTING TREES AND EXISTING PALMS. REMOVE FALLEN FRONDS AND BRANCHES WHICH MAY HANG OVER FENCING AND WATER BARRIER.
- 6. REMOVE ANY PLANTS NOT IN A VIGOROUS GROWING CONDITION, AND REPLACE WITH THE SAME SPECIES AND SIZE AS ORIGINALLY PLANTED
- REPLANT OR ADD ADDITIONAL PLANT MATERIAL AS NECESSARY TO OBTAIN A MINIMUM OF 80% COYERAGE BY THE END OF THE MAINTENANCE PERIOD.

6/2/97

DATE

ADDED SHEET.

REVISION

# HAWAII HAW. |NH-083-1(26)

3.12 INSPECTIONS

FED. ROAD

DIS. NO.

A. MONTHLY INSPECTIONS WILL BE CARRIED OUT BY A REPRESENTATIVE OF THE STATE'S RESIDENT ENGINEER DURING THE ONE YEAR PERIOD (PLANTING AND MAINTENANCE PERIODS). IN ADDITION THE RESIDENT ENGINEER WILL CONDUCT SITE INSPECTIONS ON A QUARTERLY BASIS IN CONJUNCTION WITH REPRESENTATIVES FROM THE FISH AND WILDLIFE SERVICE, CORPS OF ENGINEERS, D.L.N.R., DIVISION OF FORESTRY, AND KAMEHAMEHA SCHOOLS / BISHOP ESTATE. STATE D.O.T. WILL COORDINATE THESE INSPECTIONS. THE STATE VERMIN CONTROL INSPECTOR WILL INSPECT FOR RODENTS UPON COMPLETION OF THE PLANTING PERIOD AND ONE MONTH PRIOR TO THE FINAL INSPECTION OF THE MAINTENANCE

FED. AID

PROJ. NO.

FISCAL

YEAR

1997

B. THE CONTRACTOR SHALL NOTIFY THE FOLLOWING PEOPLE 10 DAYS IN ADVANCE FOR FINAL INSPECTION:

DEPT. OF TRANSPORTATION OAHU DISTRICT CONSTRUCTION 455-4104

438-9258 EXT. IT CORPS OF ENGINEERS OPERATIONS DIVISION

RESIDENT ENGINEER

U.S. FISH & WILDLIFE SERVICE WETLAND BIOLOGIST 541-3441

KAMEHAMEHA SCHOOLS 523-6240 MANAGER REGION II BERNICE PAUAHI BISHOP ESTATE

523-6239

SHEET | TOTAL

NO.

SHEETS

238

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION GENERAL NOTES & PROCEDURES PLAN

EVANGELINE FUNK, PhD., WETLAND CONSULTANT

KAHEKILI WETLAND ENHANCEMENT PLAN

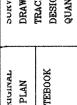
KAHEKILI HIGHWAY WIDENING

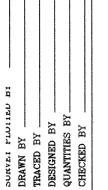
Likelike Hwy. to Vicinity of Haiku Road F.A. PROJECT NO. NH-083-1(26)

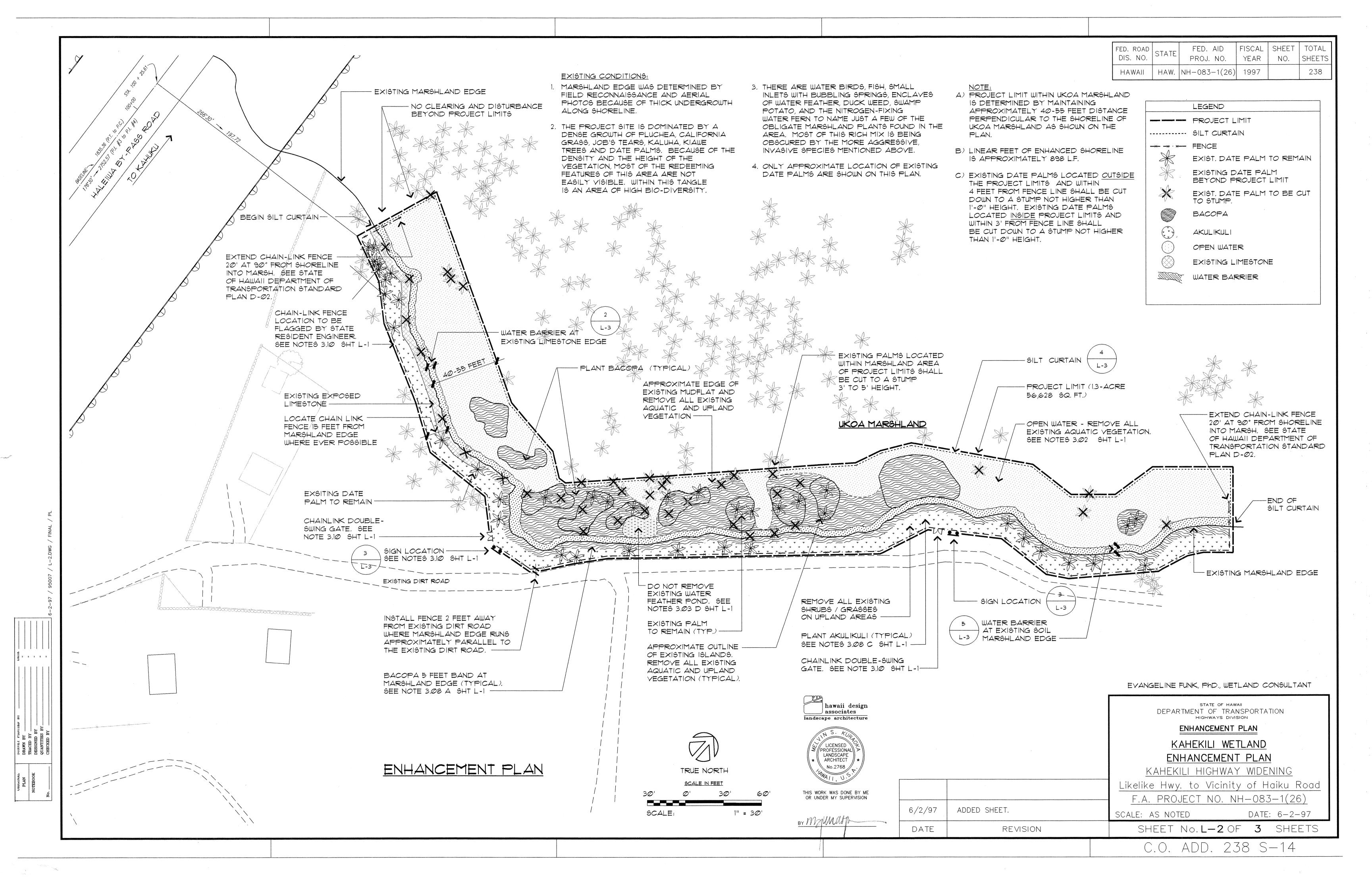
DATE: 6-2-97SCALE: AS NOTED

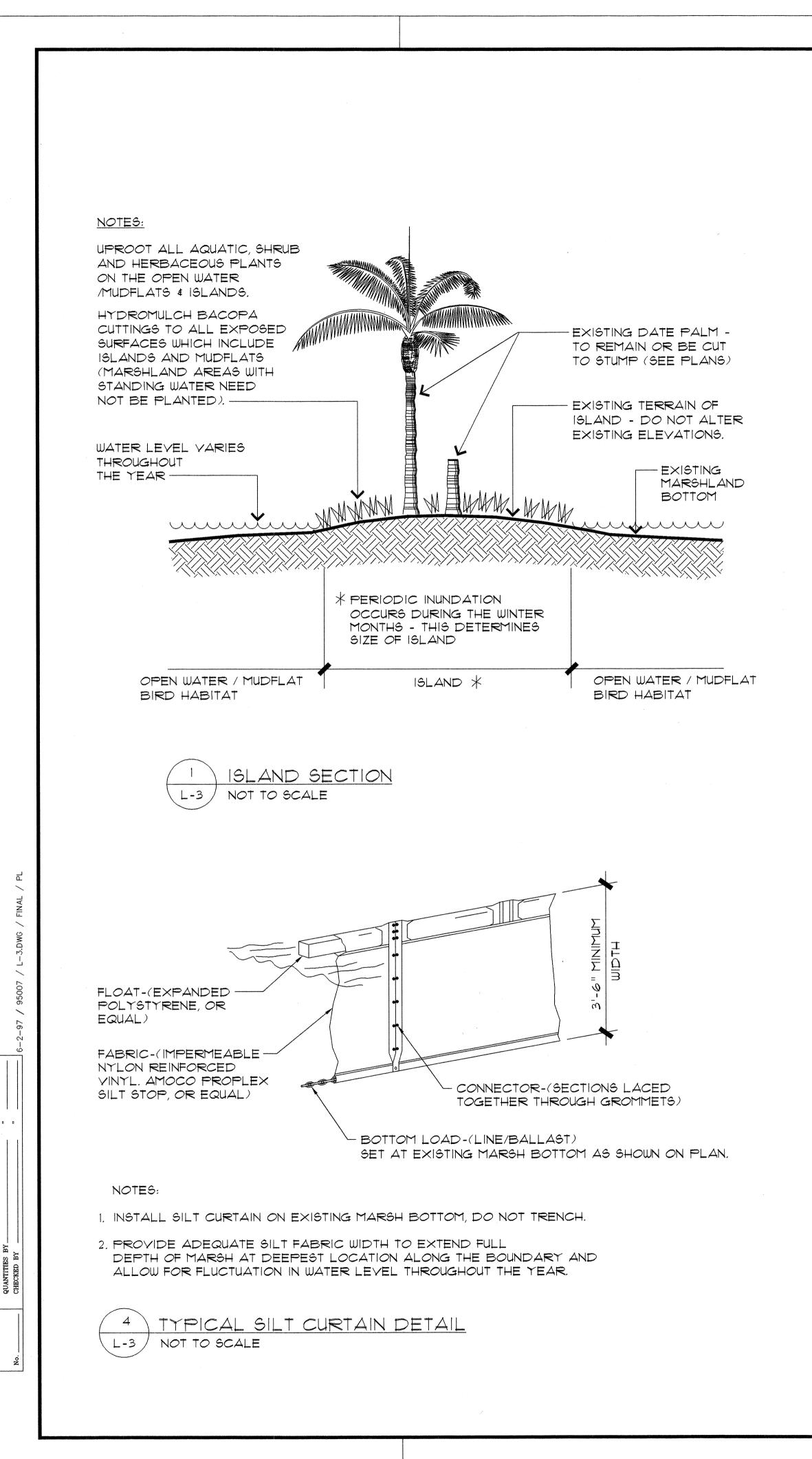
SHEET No. L-1 OF 3 SHEETS 238 S - 13

4 . . . .



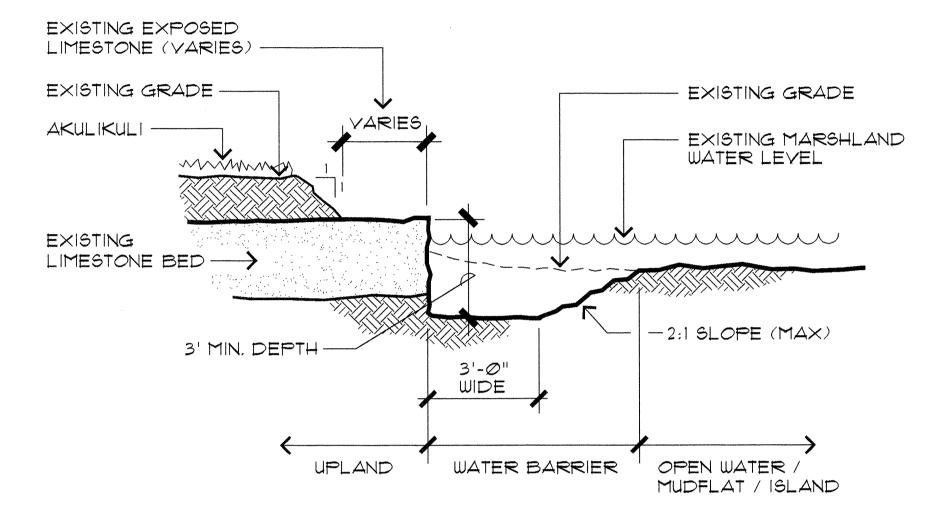




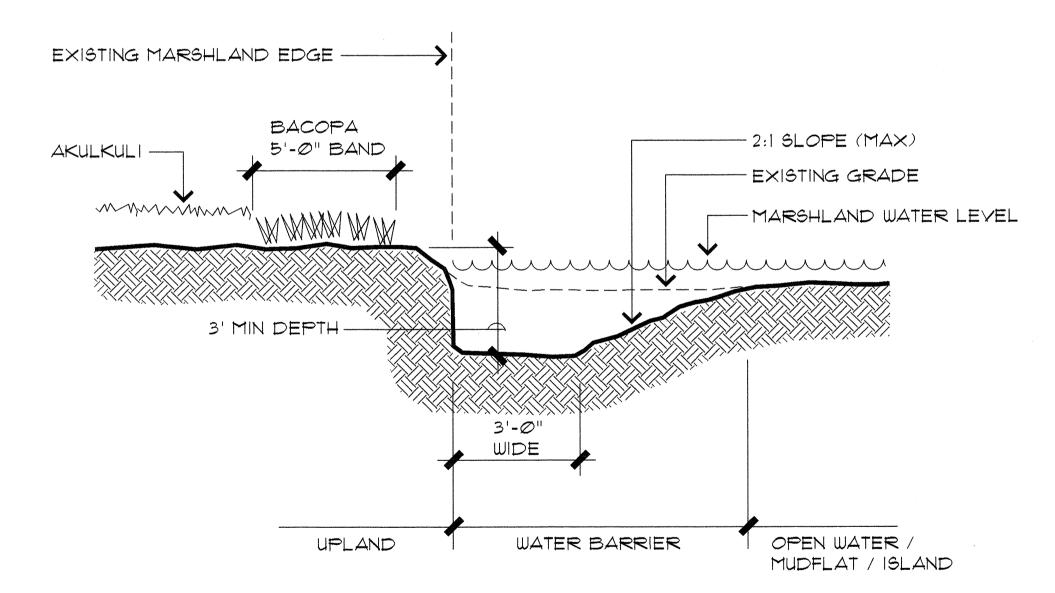


PLANT LIST						STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
QUANTITY	COMMON NAME	BOTANICAL NAME	SIZE	REMARKS	HAWAII	HAW.	NH-083-1(26)	1997		238
16,900 S.F.	BACOPA	BACOPA MONNIERI	HYDROMULCH	SEE NOTES ON L-1						
8,500 S.F.	AKULIKULI	SESUVIUM PORTULACASTRUM	2" POTS	12" Ø.C. WELL ROOTED						

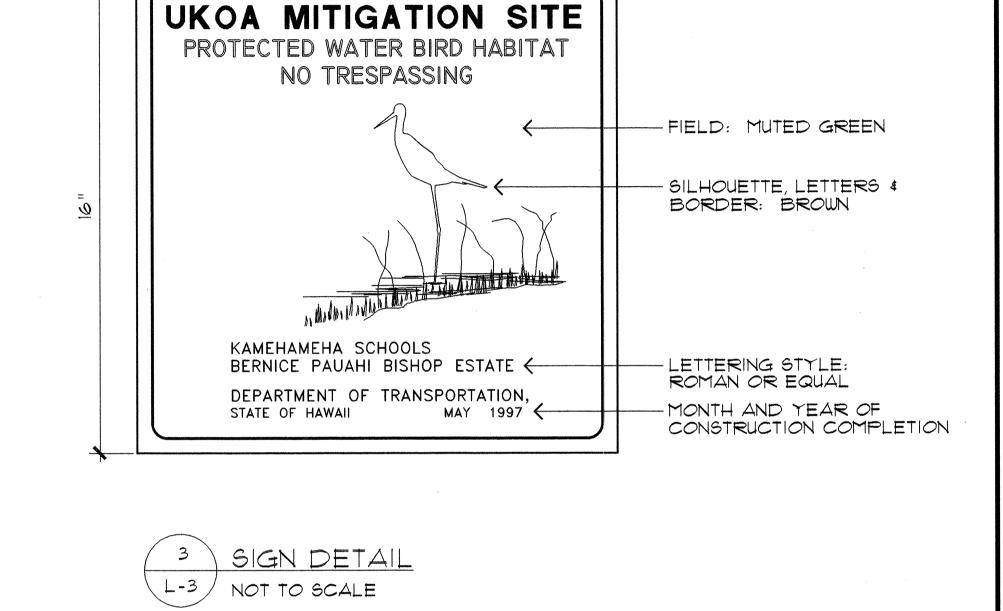
VERIFY ACTUAL QUANTITIES AS SHOWN ON PLAN



WATER BARRIER AT EXISTING EXPOSED LIMESTONE SECTION NOT TO SCALE



WATER BARRIER SECTION NOT TO SCALE



EVANGELINE FUNK, PhD., WETLAND CONSULTANT

DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION PLANT LIST AND DETAILS KAHEKILI WETLAND

STATE OF HAWAII

ENHANCEMENT PLAN KAHEKILI HIGHWAY WIDENING

Likelike Hwy. to Vicinity of Haiku Road F.A. PROJECT NO. NH-083-1(26)

ADDED SHEET. SCALE: AS NOTED DATE: 6-2-97

C.O. ADD. 238 S-15

hawaii design associates landscape architecture LICENSED PROFESSIONAL P LANDSCAPE ARCHITECT No.2768 THIS WORK WAS DONE BY ME OR UNDER MY SUPERVISION

6/2/97

SHEET No. L-3 OF 3 SHEETS DATE REVISION