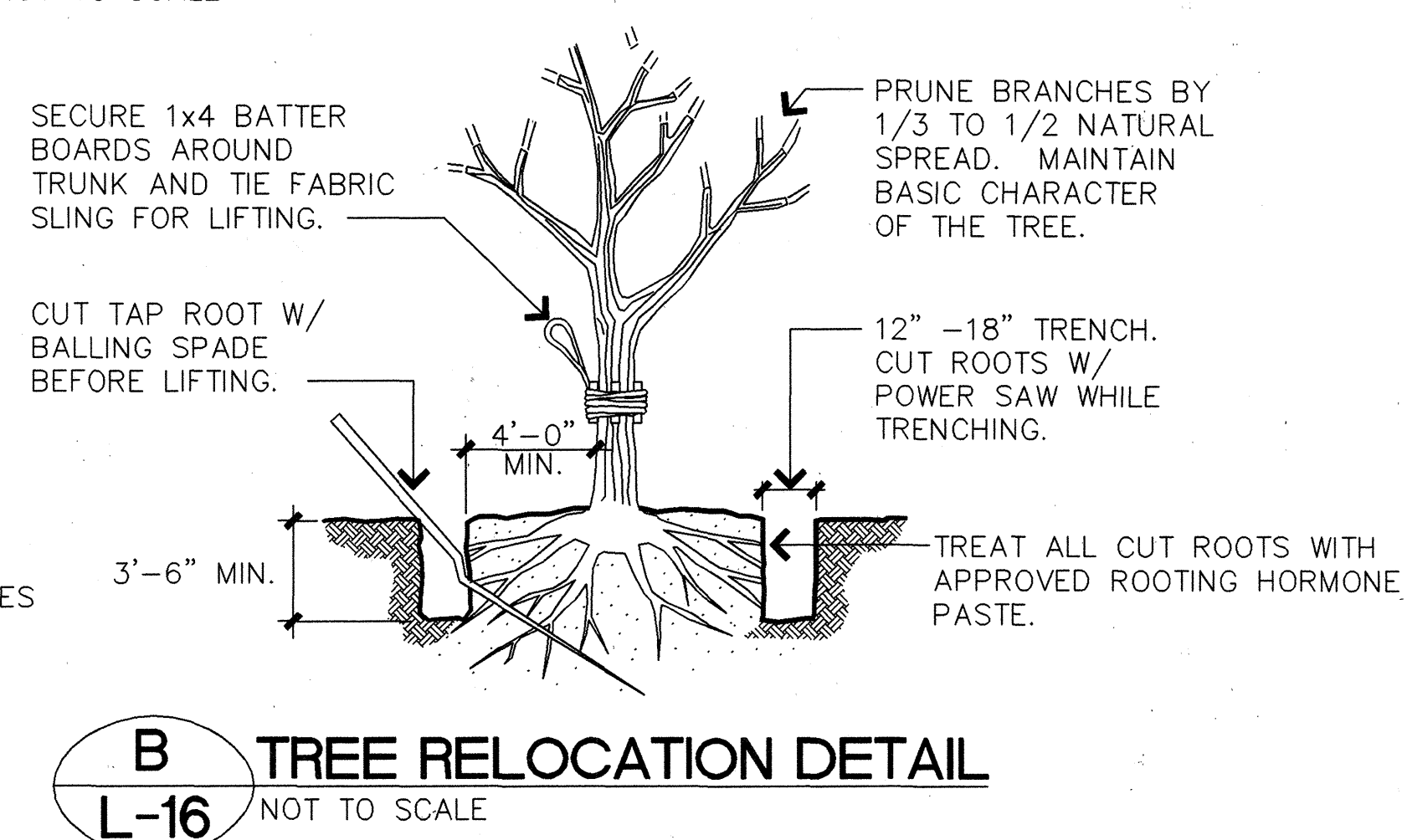
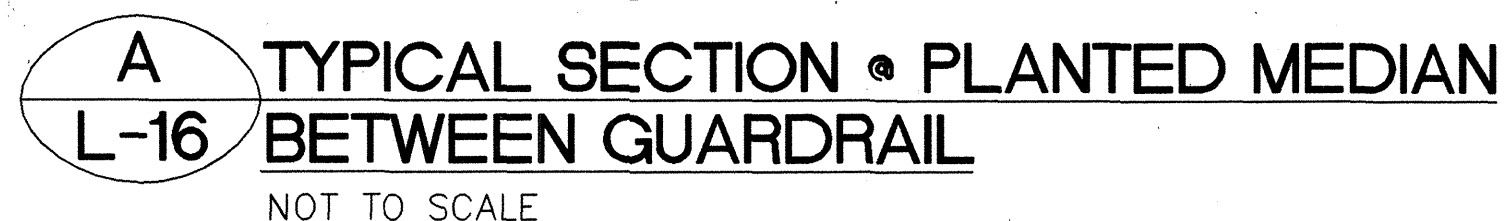




**B** TREE RELOCATION DETAIL  
**L-16** NOT TO SCALE

1. INSTALL IMPORTED PLANTING SOIL IN ALL PLANTING AREAS SHOWN ON PLANS, WITH THE EXCEPTION OF GRAVELLED AREAS, AND SHALL BE IN ACCORDANCE WITH SPECS. SECTIONS 617, 619, & 712.17.
2. INSTALL GRAVEL (4" DEPTH) IN ALL AREAS SHOWN ON PLANS. EXCEPT WHERE NOTED.
3. BACKFILL MIX SHALL CONSIST OF, BY VOLUME:  
3 PARTS IMPORTED PLANTING SOIL  
1 PART COMPOSTED ORGANIC CONDITIONER  
(MEDIUM MULCH, SEE SPEC SECTION 712.45(c))  
1 PART WELL POTTED CHERRY PLANT  
MIX THOROUGHLY ON PROJECT SITE PRIOR TO ANY PLANTING.
4. PLANT TABLETS SHALL BE 21 GRAM SIZE (20-10-5) AND PLACED IN THE FOLLOWING AMOUNTS:

| <u>PLANT/CONTAINER SIZE</u> | <u>AMOUNT OF TABLETS</u> |
|-----------------------------|--------------------------|
| 1 GALLON                    | 1 TABLET                 |
| 3 GALLON                    | 2 TABLETS                |
| 5 GALLON                    | 3 TABLETS                |
| 15 GALLON                   | 5 TABLETS                |
| 25 GALLON                   | 8 TABLETS                |
| FIELD SPECIMEN              | 12 TABLETS               |
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL QUANTITIES, MEASUREMENTS AND SITE CONDITIONS, INCLUDING LOCATION OF ALL EXISTING UTILITIES.
6. PLANTING OPERATIONS FOR ANY CONTAINED MEDIAN AREA OR REMNANT PARCEL SHALL NOT COMMENCE UNTIL PLANTING AREAS ARE PREPARED TO FINISH GRADE.

14. INSTALL TEXTURED PAVING 'TYPE A', IMPRESSED CONCRETE, "DEEP RIVER ROCK" PATTERN. CONTRACTOR SHALL SUBMIT SAMPLE FOR ENGINEER'S APPROVAL. ENGINEER WILL AUTHORIZE FIELD SAMPLE AREA. SAMPLES TO MATCH EXISTING TEXTURED PAVING 'TYPE A' AT EAST HALEMAUMAU STREET MEDIANS, AS REVISED AND APPROVED BY ENGINEER. FINISH SUBGRADE 8 INCHES BELOW TYPE OF CONCRETE CURB. SEE DETAIL H, SHEET L-17.
- INSTALL TEXTURED PAVING 'TYPE B', MOSSROCK BOULDERS AND GROUTED MOSSROCK PAVING. ENGINEER WILL AUTHORIZE FIELD SAMPLE AREA, LOCATION, AND LENGTH. FIELD SAMPLE TO MATCH EXISTING TEXTURED PAVING 'TYPE B' AT MEDIAN ADJACENT TO KAWAIKUI PARK (PHASE I, SECTION B), APPROX. STATION 137+00 TO 137+90, AS REVISED AND APPROVED BY ENGINEER. FINISH SUBGRADE 6 INCHES BELOW TOP OF LOWER CONCRETE BARRIER AND SLOPES TO UPPER BARRIER APPROX. 5:1. SEE DETAIL L, SHEET L-17.
15. PLANT ESTABLISHMENT PERIOD IS IN SPECIFICATION SECTION 619.03(E). CONTRACTOR IS TO BE AWARE OF THIS IMPORTANT ASPECT OF THE PROJECT.
16. SHRUBS SHALL NOT BE PLANTED WITHIN THE WATER BASIN OR CLOSER TO TRUNKS OF TREES/PALMS AS FOLLOWS:
- |                  |       |
|------------------|-------|
| AFRICAN IRIS     | 2'-6" |
| BEACH NAUPAKA    | 3'-6" |
| INDIAN HAWTHORNE | 2'-0" |
17. COMPOSTED ORGANIC 'COVER MULCH' (2" DEEP LAYER) SHALL BE APPLIED OVER ALL PLANTED AREAS, EXCEPT REMNANT PARCEL PARCELS 1 & 2. (SEE SPECS. SECTION 619.03 (D)(8) & 712.45 (D) OF SPECIAL SPECIFICATIONS)
- THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
- 11/18/2017
- 

|                                                                                                         |                          | PLANT LIST                                                                 |                                                                               |           |                                                                         |  |  | FED. ROAD<br>DIST. NO. | STATE | FED. AID<br>PROJ. NO. | FISCAL<br>YEAR | SHEET<br>NO. | TOTAL<br>SHEETS |
|---------------------------------------------------------------------------------------------------------|--------------------------|----------------------------------------------------------------------------|-------------------------------------------------------------------------------|-----------|-------------------------------------------------------------------------|--|--|------------------------|-------|-----------------------|----------------|--------------|-----------------|
|                                                                                                         |                          |                                                                            |                                                                               |           |                                                                         |  |  | HAWAII                 | HAW.  | NH-STP-072-1(35)      | 1993           | 300          | 340             |
| NEW<br>QUANTITY                                                                                         | ORIGINAL BID<br>QUANTITY | COMMON NAME                                                                | BOTANICAL NAME                                                                | SIZE      | REMARKS                                                                 |  |  |                        |       |                       |                |              |                 |
|                                                                                                         |                          | <u>TREES</u>                                                               |                                                                               |           |                                                                         |  |  |                        |       |                       |                |              |                 |
| 61                                                                                                      | 69                       | RAINBOW SHOWER 'QUEENS VAR.'                                               | CASSIA SP.                                                                    | 25 GALLON | 8' HT., 2'-3' SPD., 2" CA.                                              |  |  |                        |       |                       |                |              |                 |
| 15                                                                                                      | 15                       | TRUE KOU                                                                   | CORDIA SUBCORDATA                                                             | 25 GALLON | (SEE SPECIAL PROVISIONS - SECTION 619.02)<br>8' HT., 2'-3' SPD., 2" CA. |  |  |                        |       |                       |                |              |                 |
| 10                                                                                                      | 10                       | WHITE TECOMA                                                               | TABEBUIA BANKSII                                                              | 5 GALLON  | 3' HT., 1' SPD., 1" CA.                                                 |  |  |                        |       |                       |                |              |                 |
| 48                                                                                                      |                          | VERTICAL WILIWILI                                                          | ERYTHRINA VARIEGATA CV. TROPIC CORAL                                          | 25 GALLON | .                                                                       |  |  |                        |       |                       |                |              |                 |
| 98                                                                                                      | 61                       | <u>PALMS</u><br>MANILA PALM                                                | VEITCHIA MERRILLII                                                            | 25 GALLON | 6'-8' OVERALL HT.                                                       |  |  |                        |       |                       |                |              |                 |
| 13                                                                                                      | 13                       | LOULU PALM                                                                 | PRITCHARDIA PACIFICA                                                          | 25 GALLON | (SEE SPECIAL PROVISIONS - SECTION 619.02)<br>6'-8' OVERALL HT.          |  |  |                        |       |                       |                |              |                 |
|                                                                                                         |                          | <u>SHRUBS</u>                                                              |                                                                               |           |                                                                         |  |  |                        |       |                       |                |              |                 |
| 70                                                                                                      | 260                      | CROTON 'NORMA'                                                             | CODIAEUM VARIEGATUM VAR. PICTUM                                               | 3 GALLON  | 2' HT., 1'-6" SPD. @ 2' O.C.                                            |  |  |                        |       |                       |                |              |                 |
| 1288                                                                                                    | 1300                     | BEACH NAUPAKA                                                              | SCAEOVA FRUTESCENS VAR. SERICEA                                               | 1 GALLON  | 1' HT., 1' SPD. @ 2' O.C.                                               |  |  |                        |       |                       |                |              |                 |
| 14, 66 S.F.                                                                                             | 14,640 S.F.              | AFRICAN IRIS                                                               | MORAEA BICOLOR                                                                | QUART     | 1' HT. @ 12" O.C., WHITE FLOWER                                         |  |  |                        |       |                       |                |              |                 |
| 4200                                                                                                    | 4550                     | <del>DWARF PITTOSPORUM 'WHEELERII'</del><br>INDIAN HAWTHORNE 'ENCHANTRESS' | <del>PITTOSPORUM TODDIA 'WHEELERII'</del><br>RAPHIOLEPIS INDICA 'ENCHANTRESS' | 1 GALLON  | 1' HT., 1' SPD. @ 18" O.C.                                              |  |  |                        |       |                       |                |              |                 |
| 190                                                                                                     |                          | PINK HIBISCUS                                                              | HIBISCUS SPP.                                                                 | 3 GALLON  | 2' O.C.                                                                 |  |  |                        |       |                       |                |              |                 |
| 201                                                                                                     |                          | SPIDER LILY 'QUEEN EMMA'                                                   | CRINUM AUGUSTUM                                                               | 5 GALLON  | .                                                                       |  |  |                        |       |                       |                |              |                 |
|                                                                                                         |                          | <u>GROUND COVER</u>                                                        |                                                                               |           |                                                                         |  |  |                        |       |                       |                |              |                 |
| 9510 S.F.                                                                                               | 16,600 S.F.              | HOTTENTOT FIG                                                              | CARPOBROTUS EDULIS                                                            |           | ROOTED CUTTINGS @ 12" O.C.                                              |  |  |                        |       |                       |                |              |                 |
| 38                                                                                                      | 38                       | CREEPING FIG                                                               | FICUS PUMILA                                                                  | 4" POT    | @ 3' O.C.                                                               |  |  |                        |       |                       |                |              |                 |
| 7100 S.F.                                                                                               | 7100 S.F.                | WEDELIA                                                                    | WEDELIA TRILOBATA                                                             |           | ROOTED CUTTINGS @ 12" O.C.                                              |  |  |                        |       |                       |                |              |                 |
|                                                                                                         |                          | <u>MISC.</u>                                                               |                                                                               |           |                                                                         |  |  |                        |       |                       |                |              |                 |
| 319 C.Y.                                                                                                | 585 C.Y.                 | GRAVEL                                                                     | GRADE 'A'                                                                     | #3 COARSE | 4" DEPTH, SEE SPECIAL PROV. 702.02<br>SEE SPECIAL PROV. 712.60          |  |  |                        |       |                       |                |              |                 |
| 4240 L.F.                                                                                               | 5400 L.F.                | PLASTIC DIVIDER                                                            | COBRA 'HIGH TEST' OR APPROVED EQUAL                                           |           |                                                                         |  |  |                        |       |                       |                |              |                 |
| 2177 C.Y.                                                                                               | 1600 C.Y.                | IMPORTED PLANTING SOIL                                                     |                                                                               |           | HEIGHT FOR EARTH MOUNDS VARY -<br>SEE PLAN. SEE SPECIAL PROV. 600.617   |  |  |                        |       |                       |                |              |                 |
| 280 S.F.                                                                                                | 1965 S.F.                | TEXTURED PAVING 'TYPE A'                                                   | IMPRINTED RIVER ROCK                                                          |           | SEE SHT. L-17 FOR DETAIL AND<br>SPECIAL PROVISIONS - SECTION 660.11     |  |  |                        |       |                       |                |              |                 |
| 3250 S.F.                                                                                               | 3250 S.F.                | TEXTURED PAVING 'TYPE B'                                                   | MOSSROCK W/ GRP (GROUTED ROCK PAVING)                                         |           | SEE SHT. L-17 FOR DETAIL AND<br>SPECIAL PROVISIONS - SECTION 660.21     |  |  |                        |       |                       |                |              |                 |
| 74                                                                                                      | 94                       | MOSSROCK SPECIMEN                                                          |                                                                               | 12" - 30" |                                                                         |  |  |                        |       |                       |                |              |                 |
| 2560 L.F.                                                                                               | 2680 L.F.                | ROOT BARRIER                                                               | TYPAR 'BIOBARRIER' OR APPROVED EQUAL                                          |           | SEE DETAIL FOR TYPICAL APPLICATION<br>SEE SPECIAL PROV. 712.58(B)       |  |  |                        |       |                       |                |              |                 |
| 6940 S.F.                                                                                               |                          | EROSION CONTROL FABRIC                                                     | BELTON 'ANTI-WASH/GEOJUTE' OR APPROVED EQUAL                                  |           | SMOLDER-RESISTANT SEE SPECIAL<br>PROV. 712.59                           |  |  |                        |       |                       |                |              |                 |
| 184 C.Y.                                                                                                |                          | COMPOSTED 'COVER MULCH'                                                    |                                                                               | 2" DEPTH  | SEE SPECIAL PROV. 712.45(D)                                             |  |  |                        |       |                       |                |              |                 |
| NOTE: QUANTITIES SHOWN ON PLANT LIST ARE FOR REFERENCE ONLY. VERIFY ACTUAL QUANTITIES AS SHOWN ON PLAN. |                          |                                                                            |                                                                               |           |                                                                         |  |  |                        |       |                       |                |              |                 |

A circular professional seal for Melvin S. Kuraoka. The outer ring contains the text "MELVIN S. KURAOKA" at the top and "HAWAII, U.S.A." at the bottom, separated by two five-pointed stars. The inner circle contains the text "REGISTERED PROFESSIONAL LANDSCAPE ARCHITECT" and "No. 2768" below it.

THIS WORK WAS PREPARED BY ME  
OR UNDER MY SUPERVISION.

|         |                               |
|---------|-------------------------------|
| DRAWING | REVISION DETAILS, ADD. NOTES. |
| DATE    | REVISION                      |

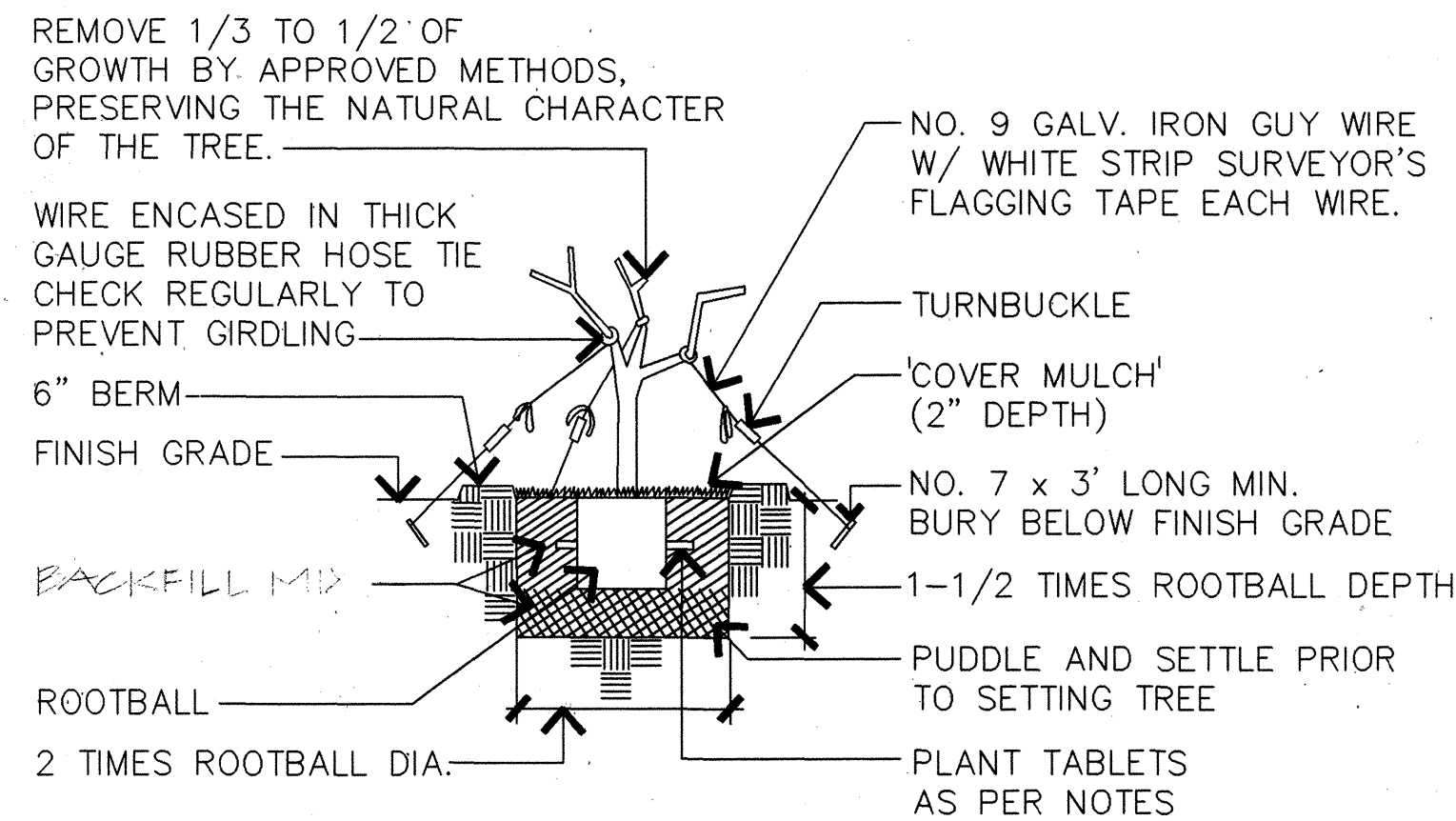
STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**PLANT LIST, DETAILS  
AND NOTES**

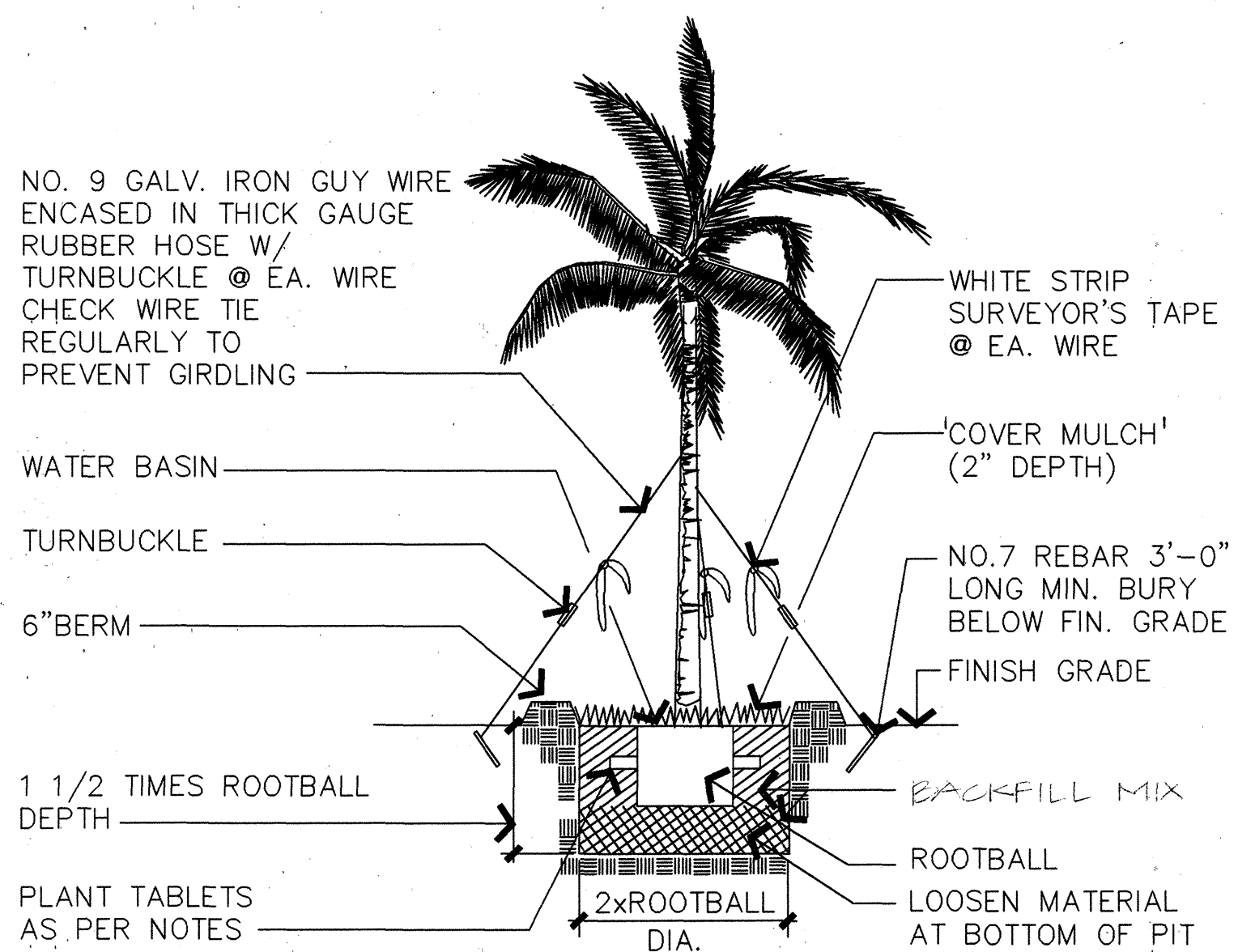
KALANIANA'OLE HIGHWAY WIDENING  
EAST HALEMAUUMAU ST. TO KEAHOLE ST.  
F.A. PROJECT NO. NH-STP-072-1(35)

SCALE: NO SCALE DATE: 10/1/90

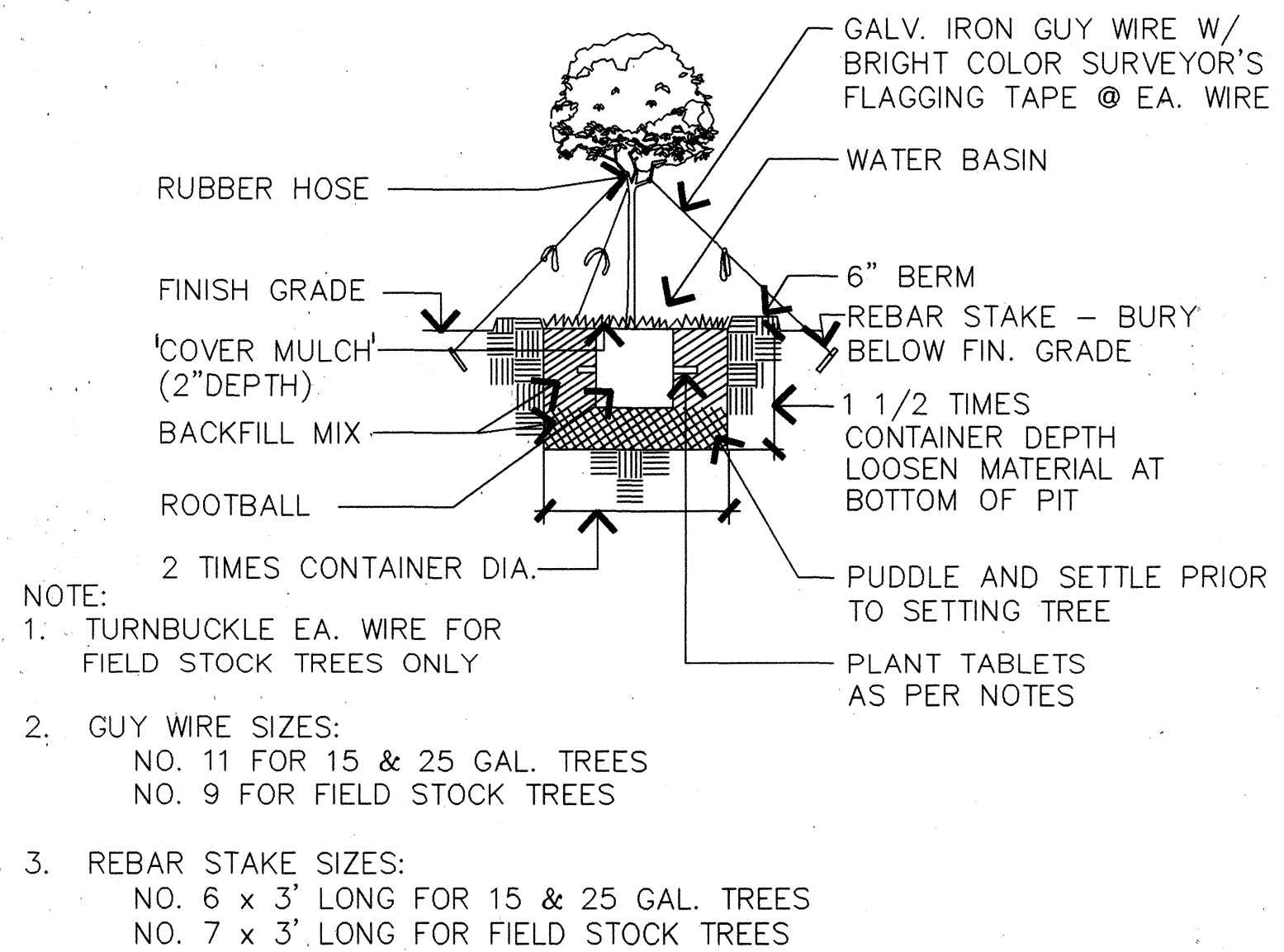
**SHEET No. 1-16 OF 30 SHEETS**



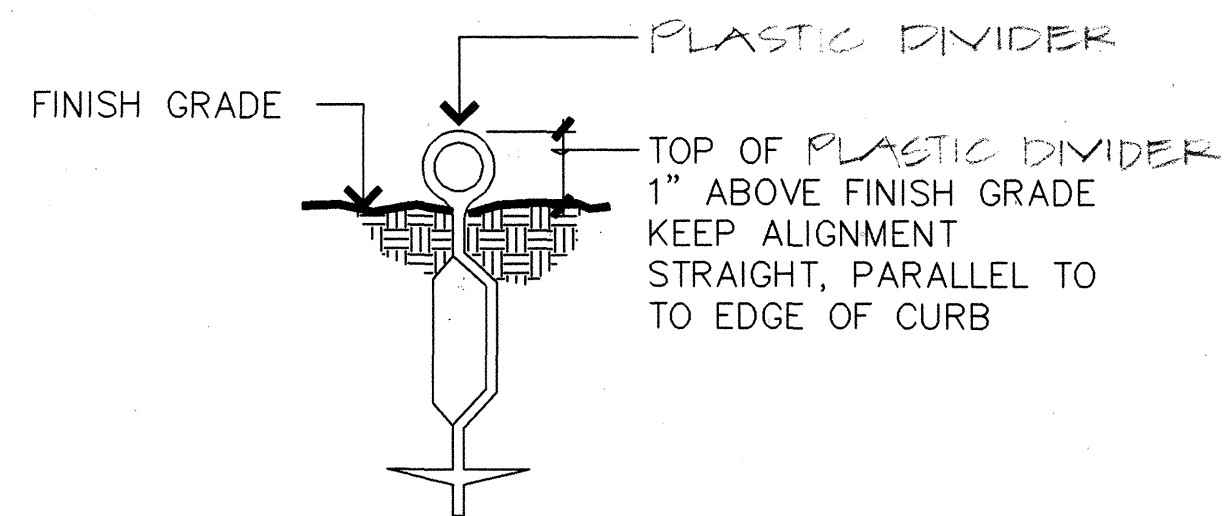
**C TREE TRANSPLANTING DETAIL**  
L-17 NOT TO SCALE



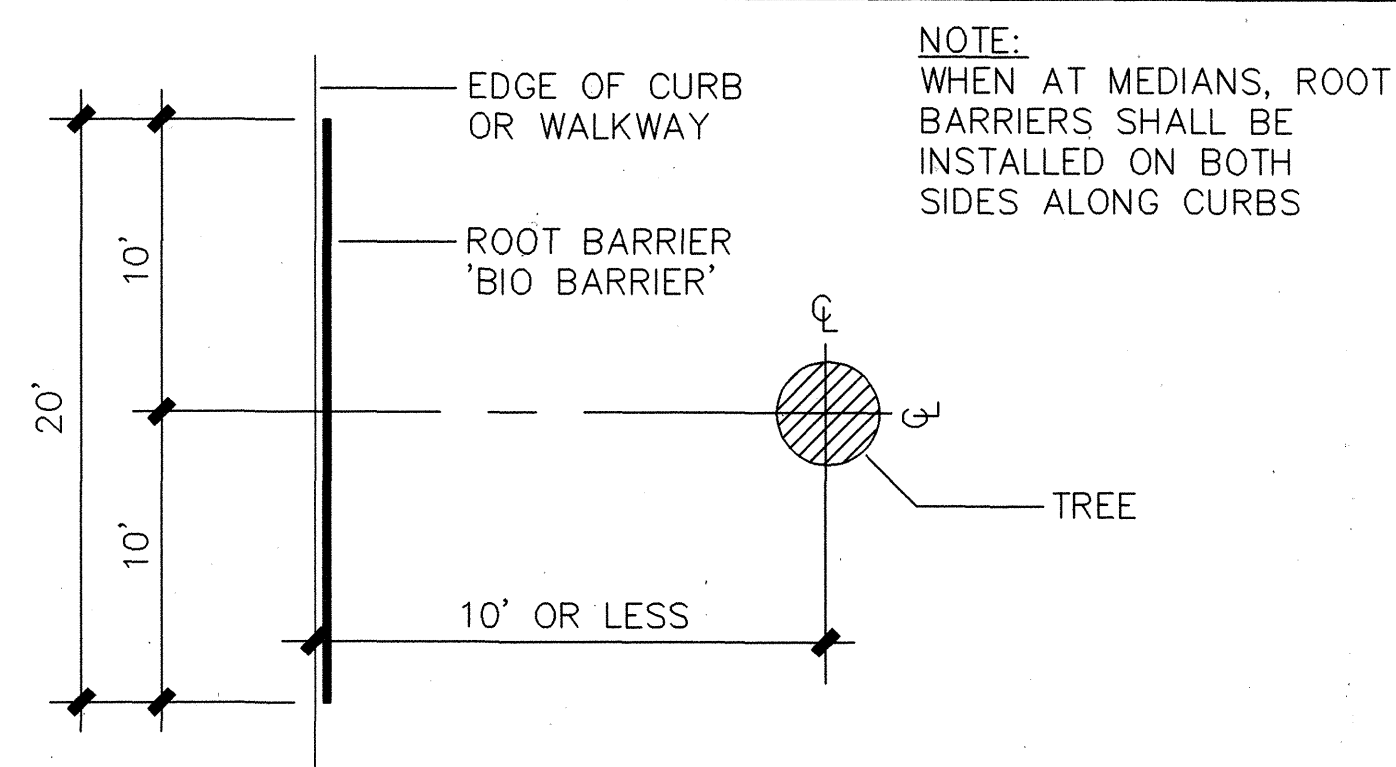
**D COCO PALM TRANSPLANTING DETAIL**  
L-17 NOT TO SCALE



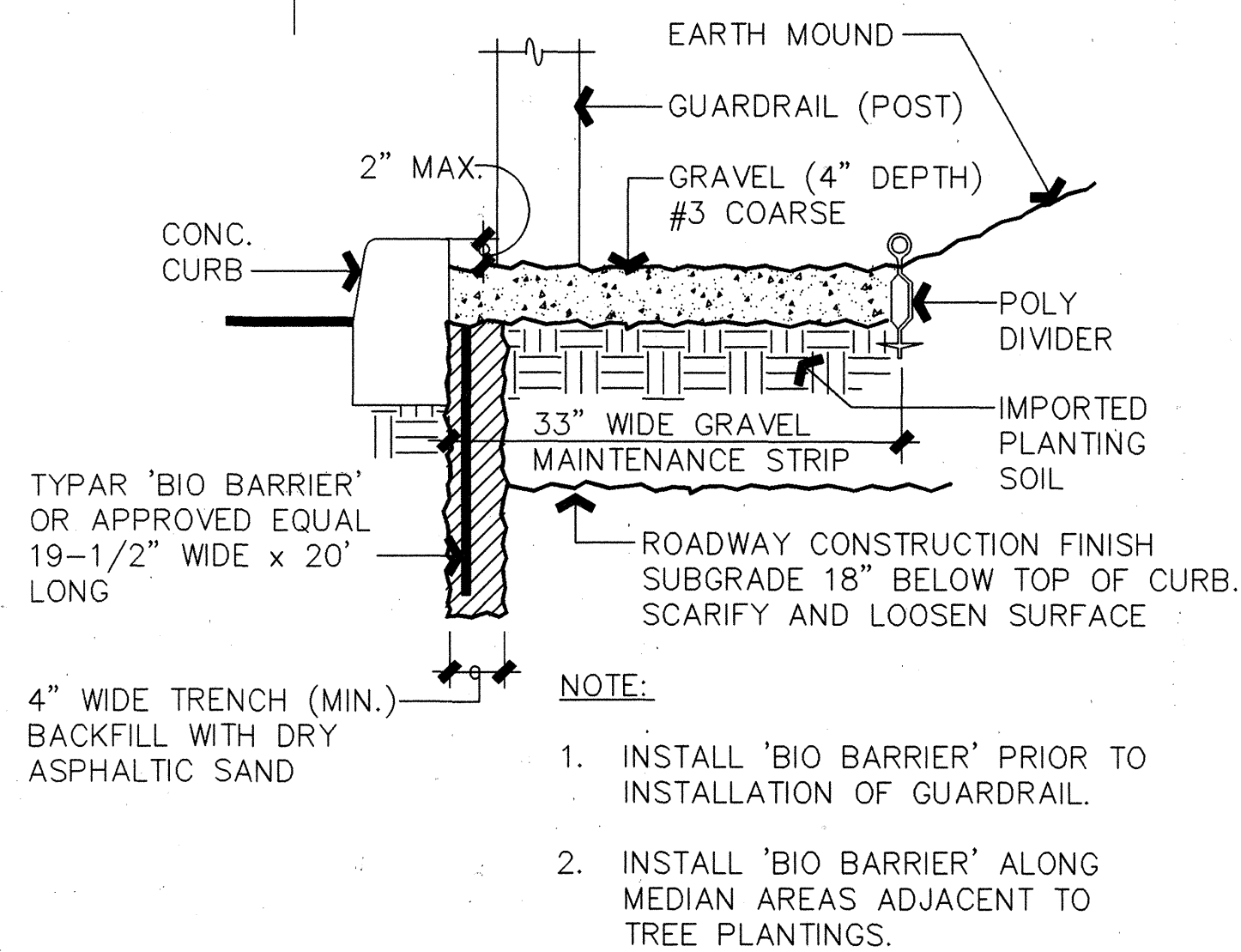
**E TREE PLANTING AND GUYING DETAIL**  
L-17 NOT TO SCALE



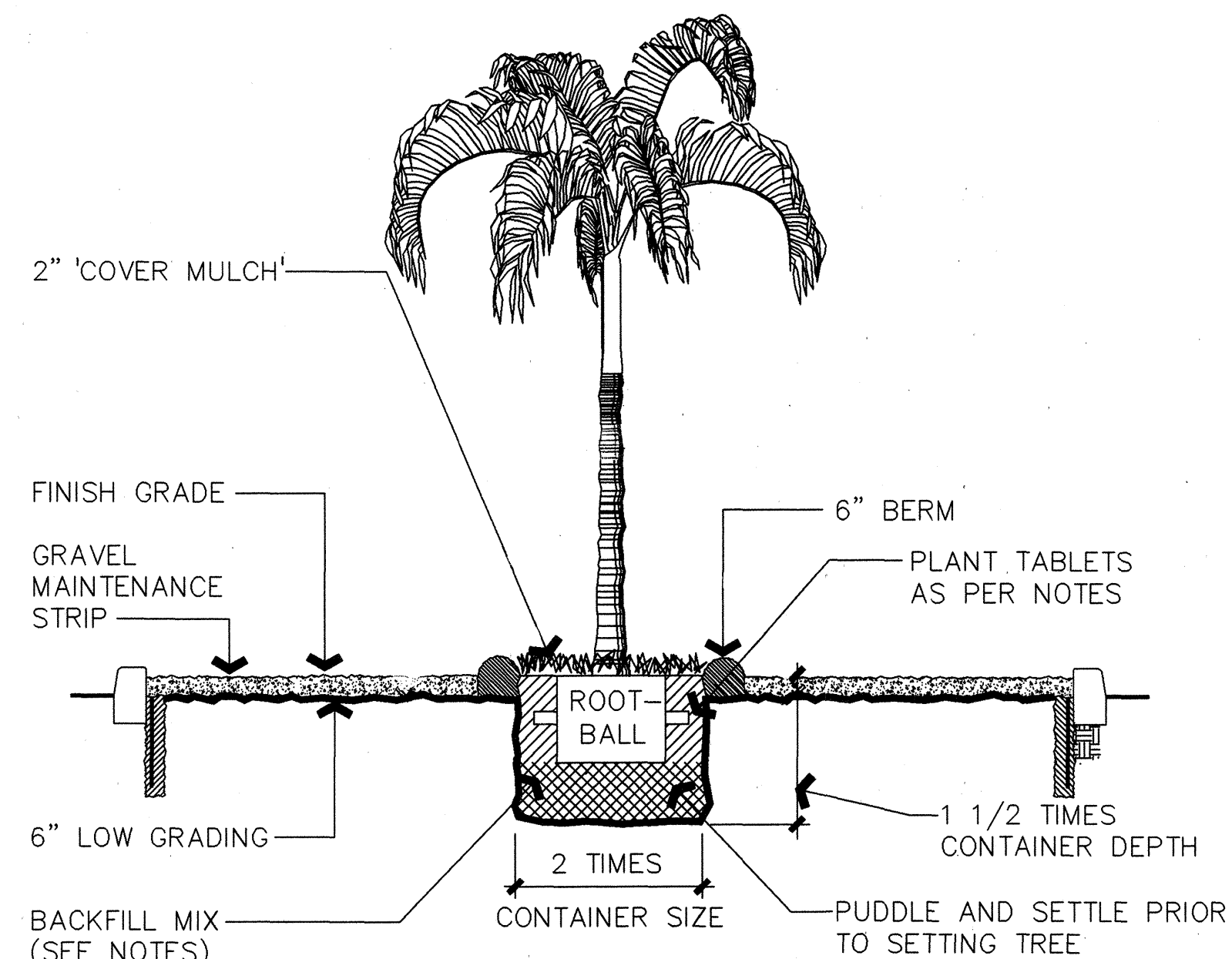
**F PLASTIC DIVIDER DETAIL**  
L-17 NOT TO SCALE



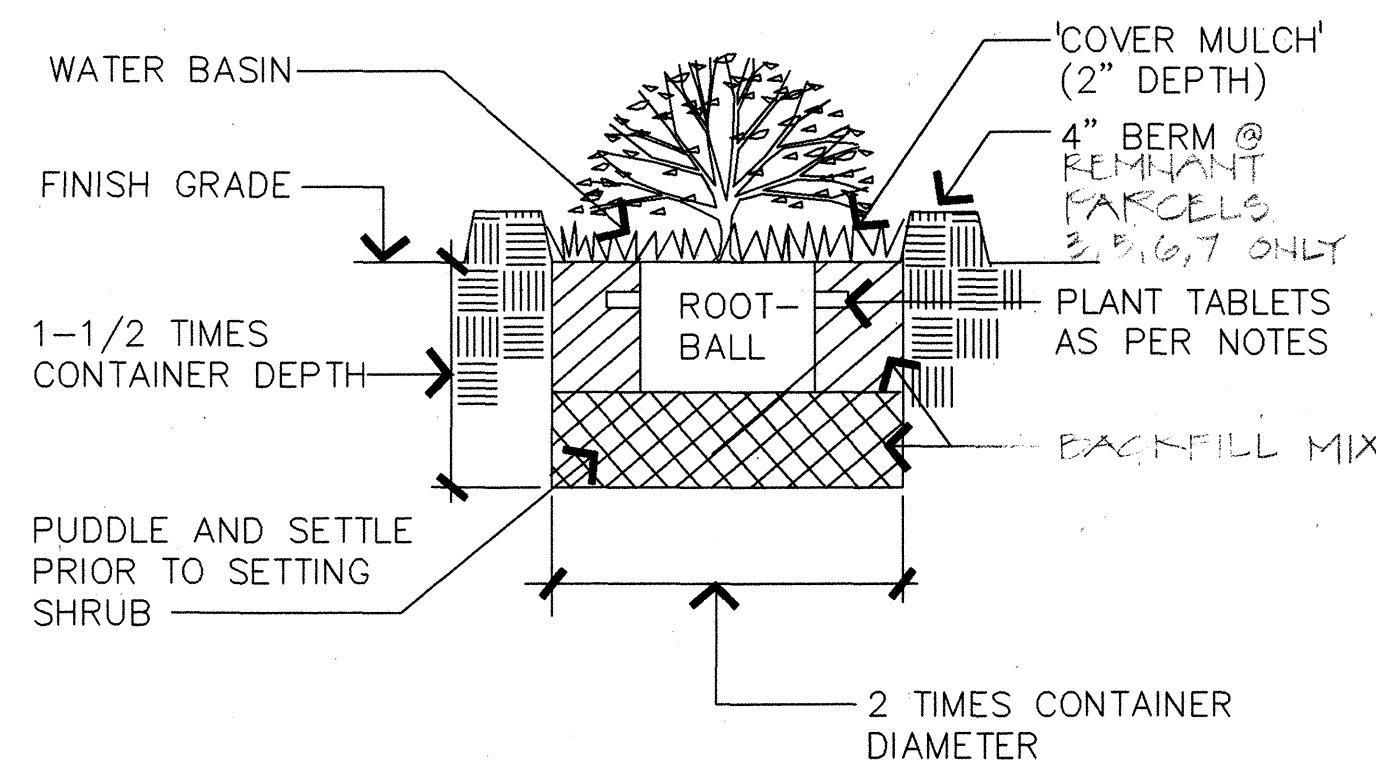
**G ROOT BARRIER DETAIL**  
L-17 NOT TO SCALE



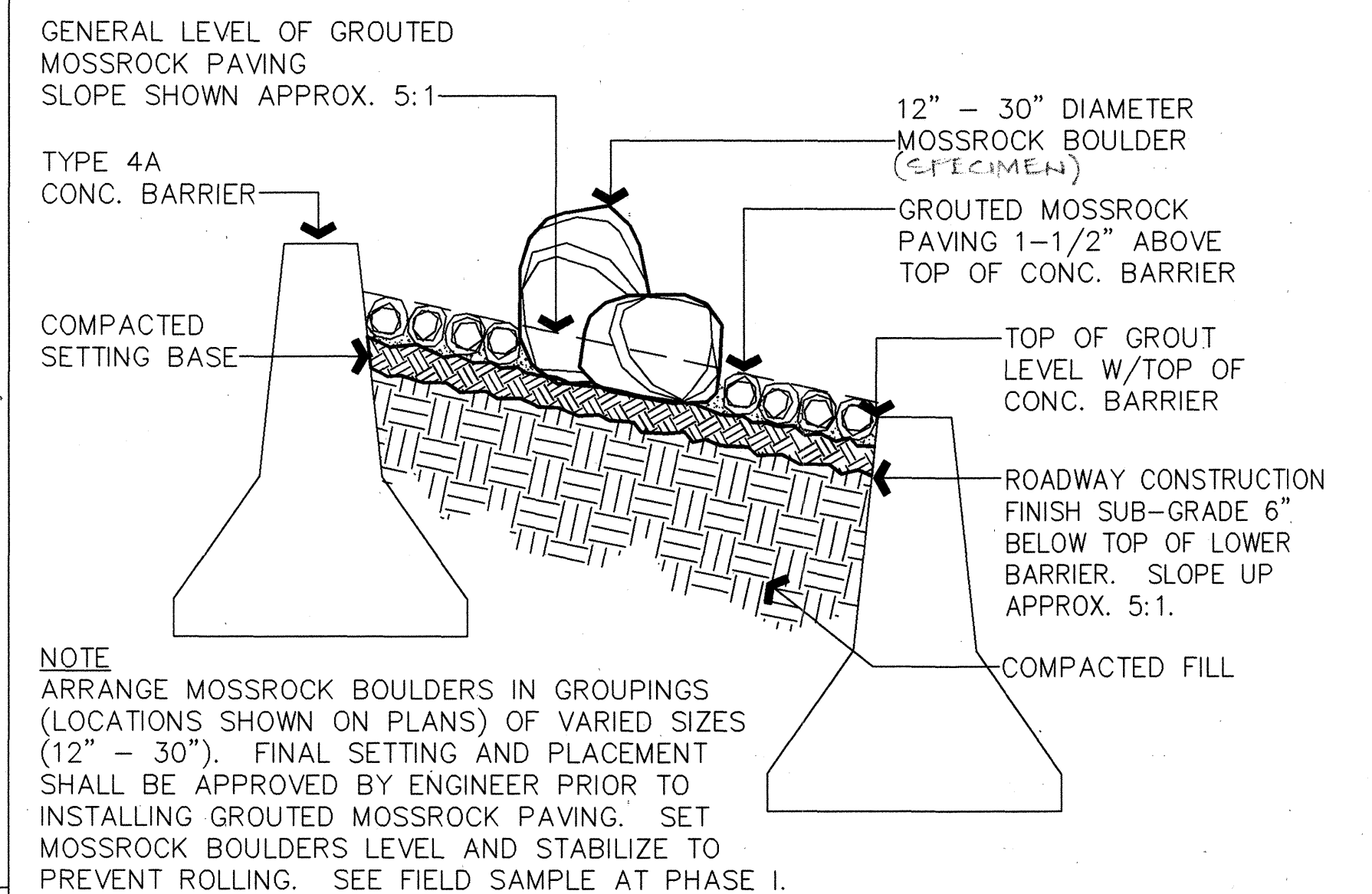
**H TEXTURED PAVING 'TYPE A'**  
L-17 NOT TO SCALE



**I MANILA PALM IN MEDIAN**  
L-17 NOT TO SCALE



**J SHRUB PLANTING DETAIL**  
L-17 NOT TO SCALE



**K MANILA PALM IN MEDIAN**  
L-17 NOT TO SCALE

**L TEXTURED PAVING 'TYPE B' (median b)**  
L-17 NOT TO SCALE

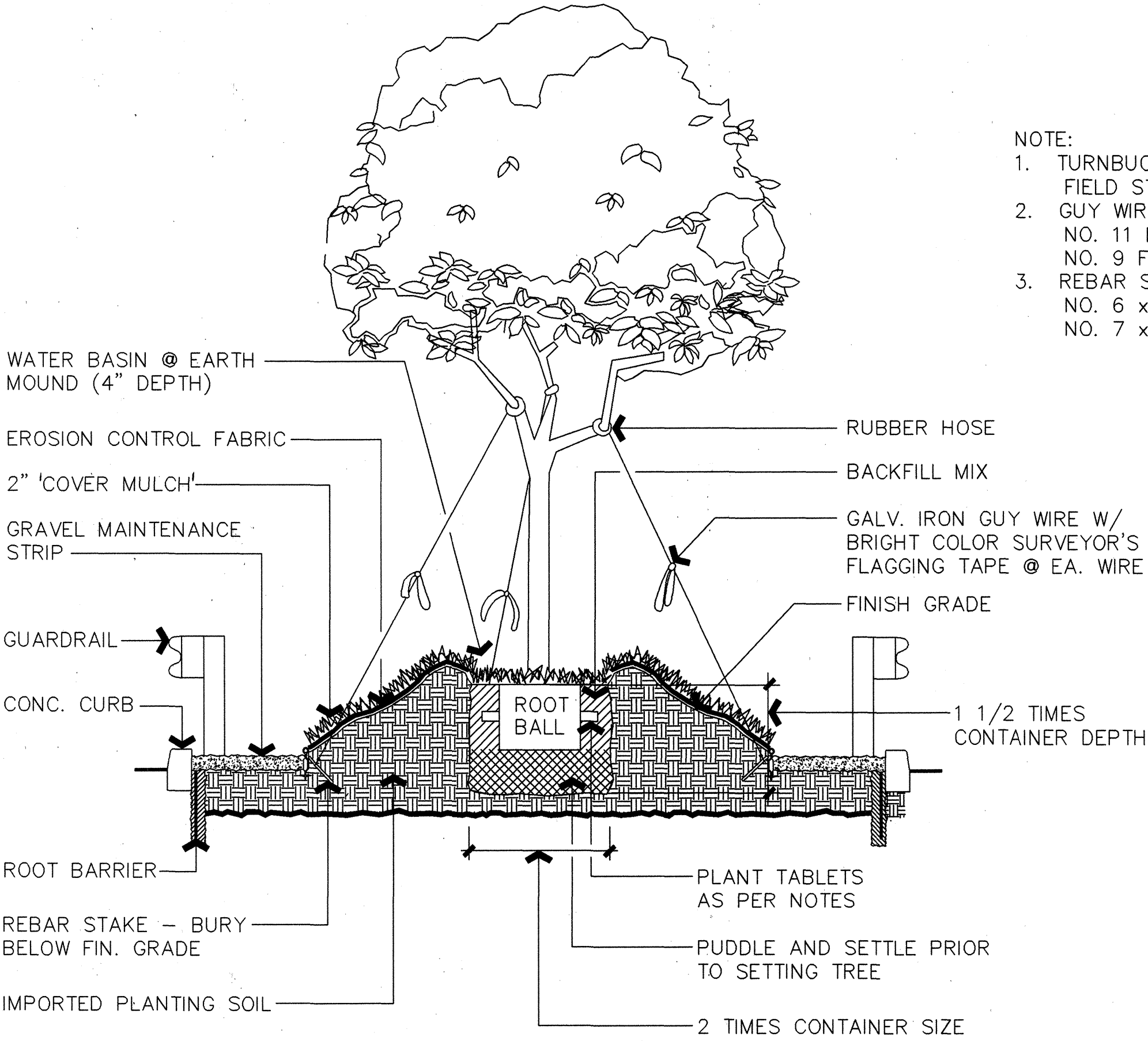


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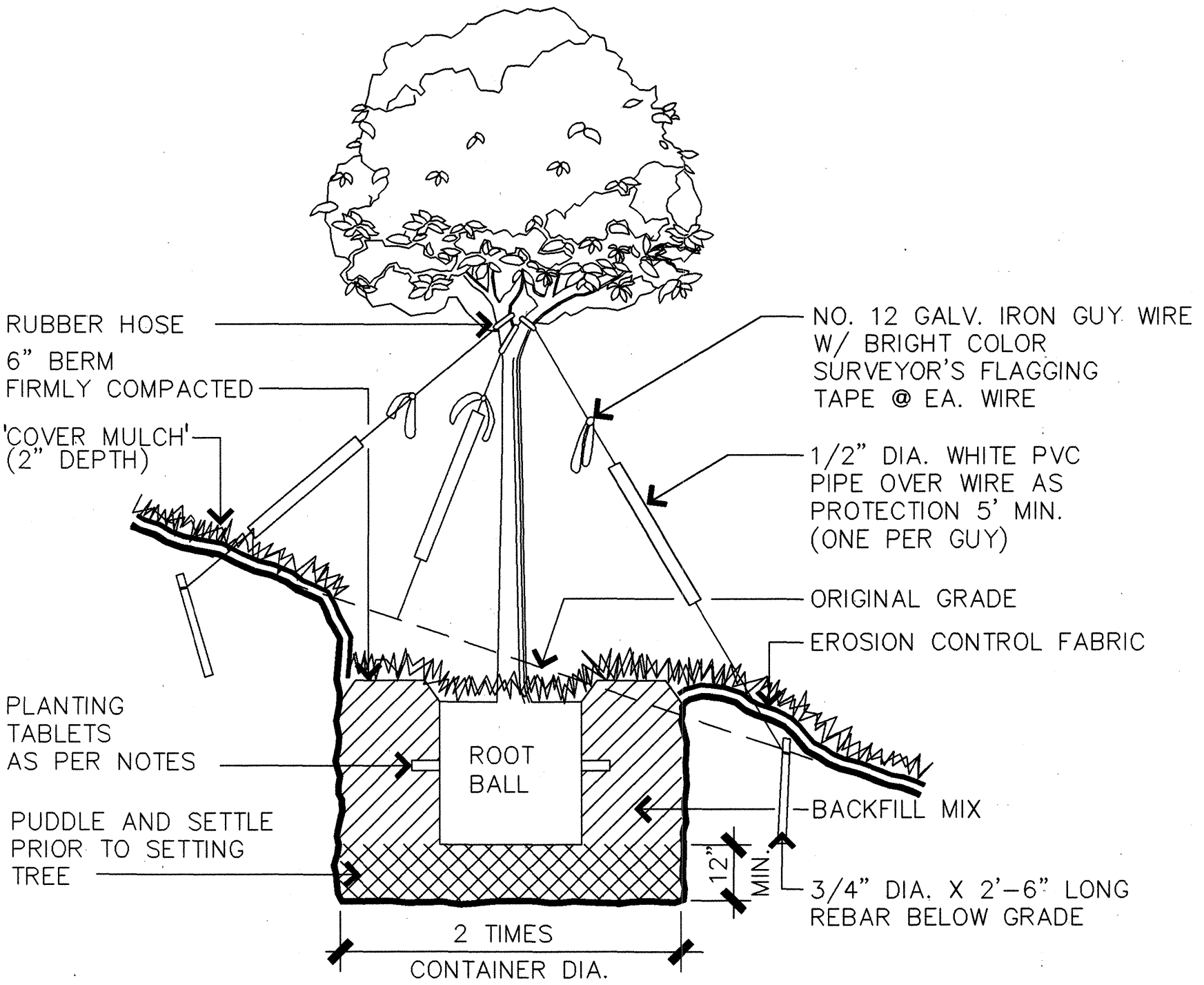
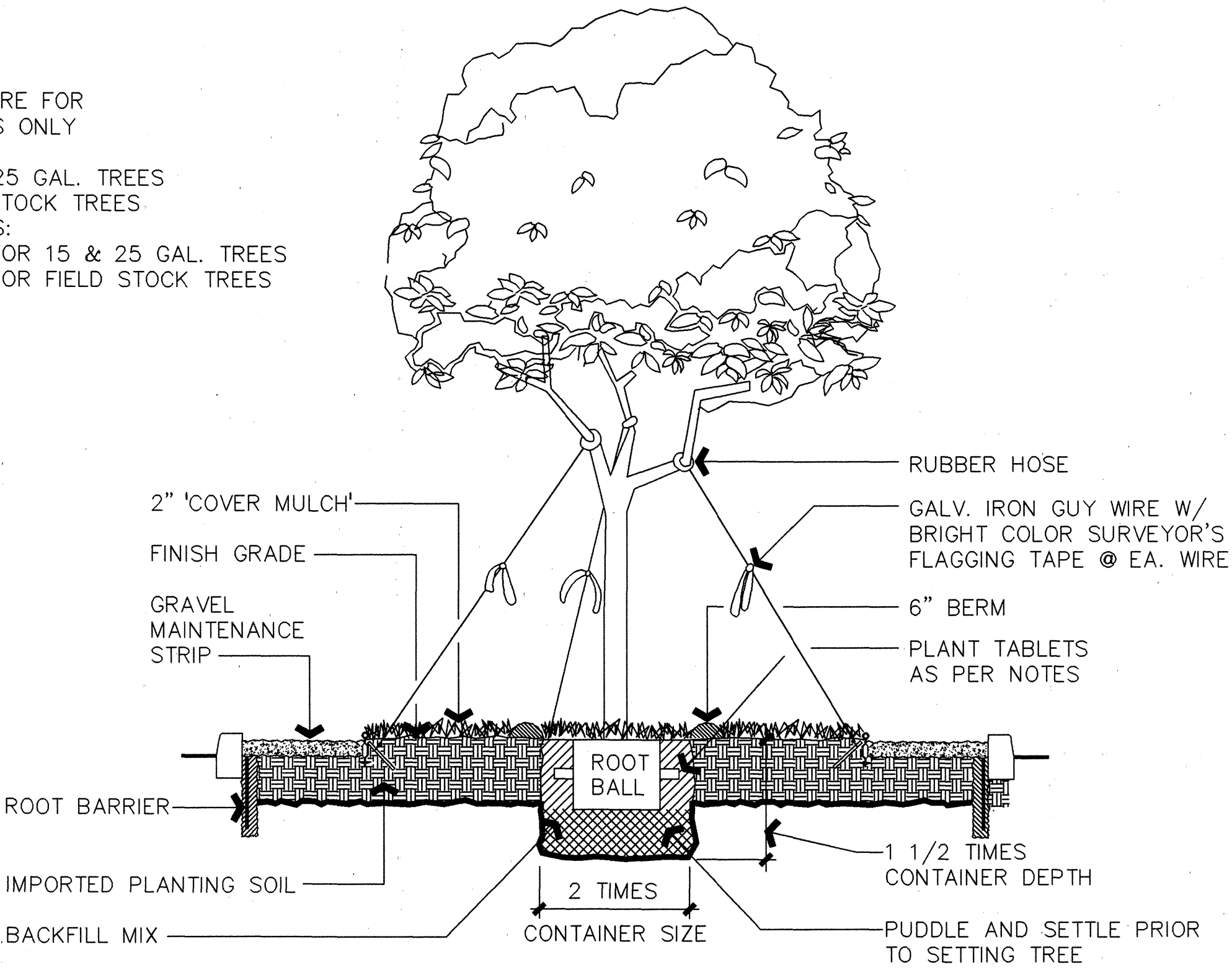
| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | NH-STP-072-1(35)   | 1993        | 301       | 340          |

| DATE                                                                 | REVISION      |
|----------------------------------------------------------------------|---------------|
|                                                                      |               |
| STATE OF HAWAII<br>DEPARTMENT OF TRANSPORTATION<br>HIGHWAYS DIVISION |               |
| PLANTING DETAILS                                                     |               |
| KALANIANA'OLE HIGHWAY WIDENING                                       |               |
| EAST HALEMAUMAU ST. TO KEAHOLE ST.                                   |               |
| F.A. PROJECT NO. NH-STP-072-1(35)                                    |               |
| SCALE: NO SCALE                                                      | DATE: 10/1/92 |
| SHEET No. L-17 OF 32 SHEETS                                          |               |

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | NH-STP-072-1(35)   | 1993        | 301       | 340          |

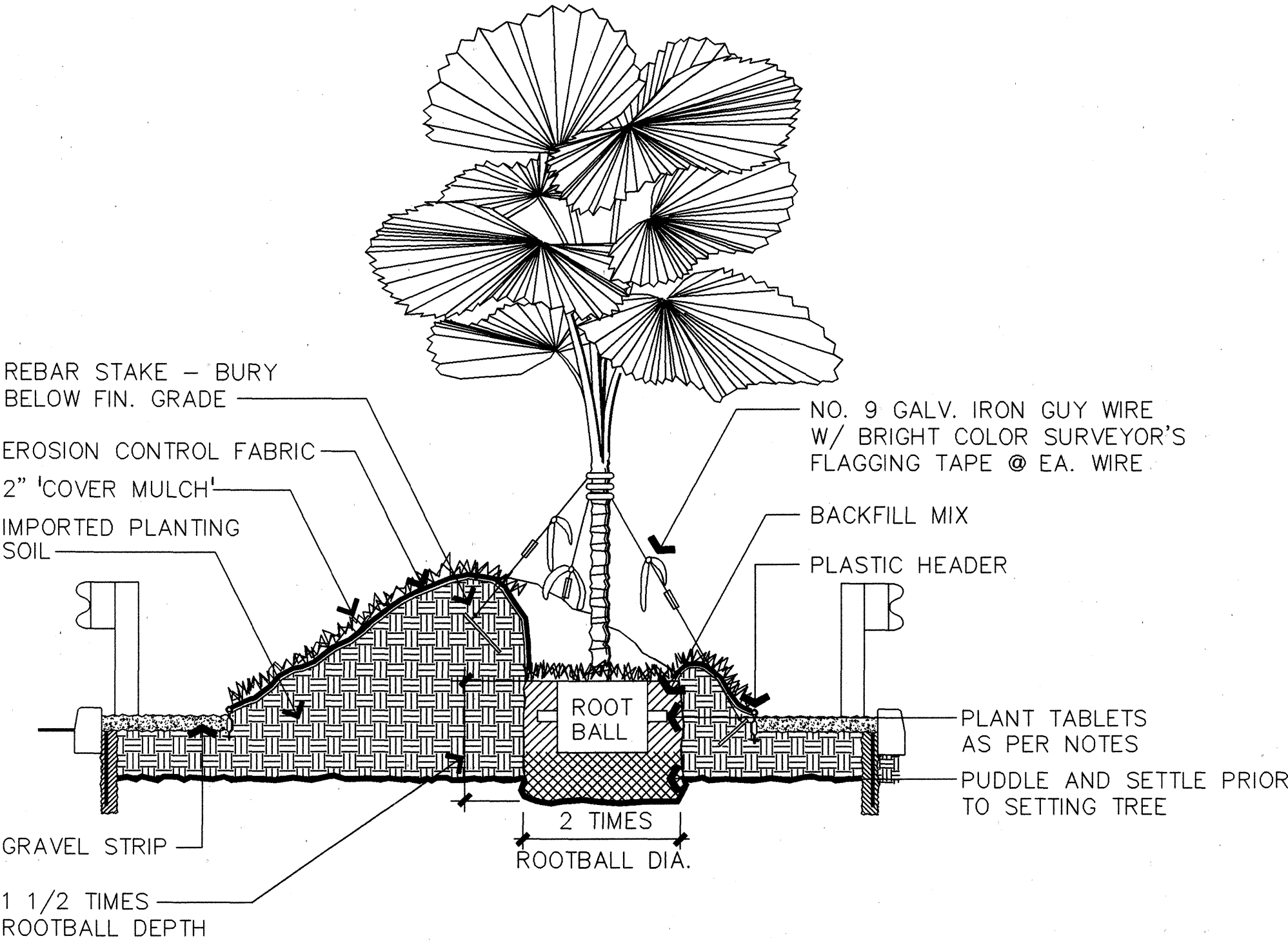
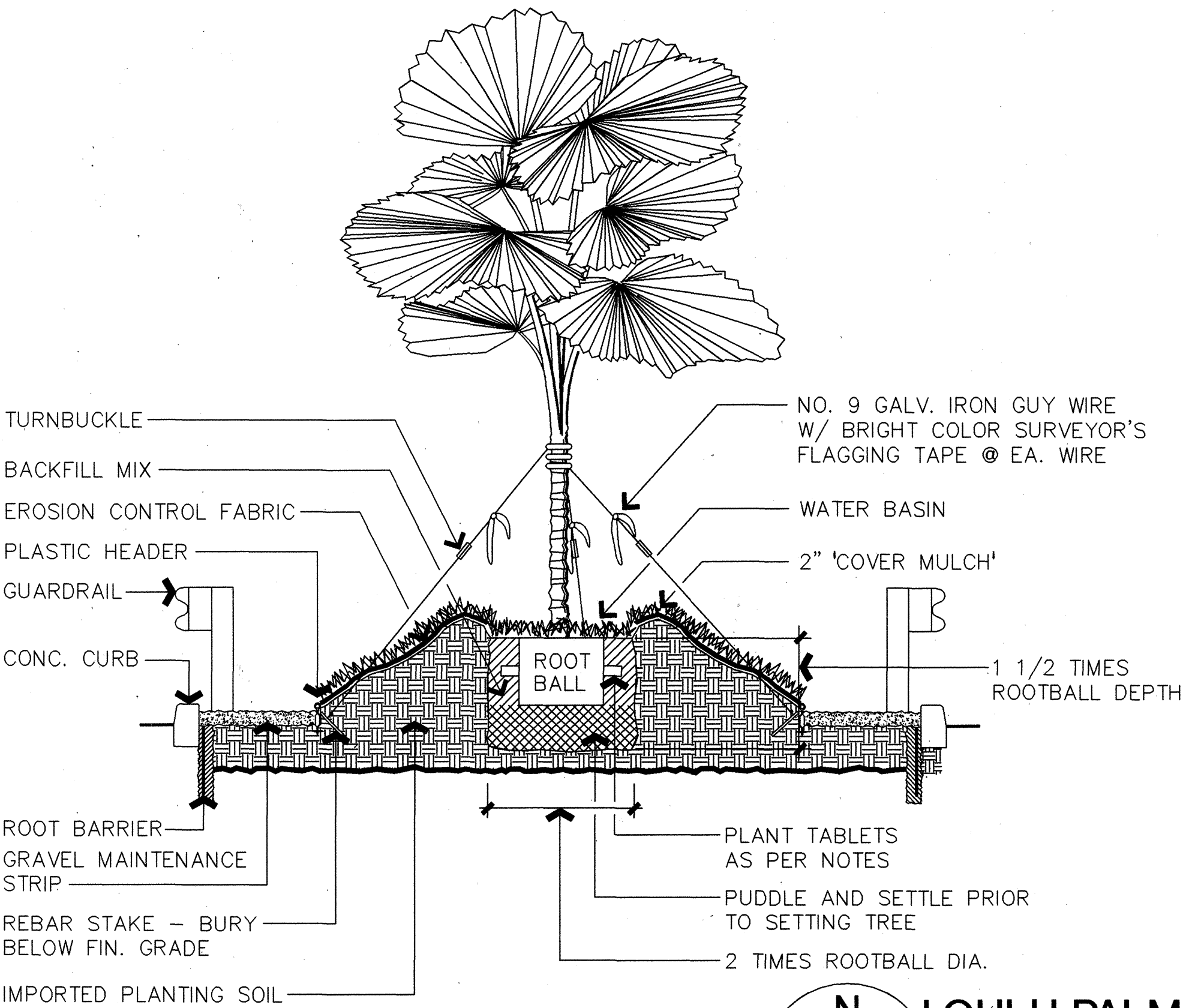


- NOTE:
1. TURNBUCKLE EA. WIRE FOR FIELD STOCK TREES ONLY
  2. GUY WIRE SIZES:  
NO. 11 FOR 15 & 25 GAL. TREES  
NO. 9 FOR FIELD STOCK TREES
  3. REBAR STAKE SIZES:  
NO. 6 x 3' LONG FOR 15 & 25 GAL. TREES  
NO. 7 x 3' LONG FOR FIELD STOCK TREES



- NOTE:
1. TURNBUCKLE EA. WIRE FOR FIELD STOCK TREES ONLY
  2. GUY WIRE SIZES:  
#12 FOR AND 25 GAL. TREES  
#9 FOR FIELD STOCK TREES
  3. REBAR STAKE SIZES:  
#4x2'-0" LONG FOR 25 GAL. TREES  
#7x3'-0" LONG FOR FIELD STOCK TREES
  4. TREE PLANTING WITH GUYS ON SLOPE: INSTALL TWO OF THE THREE STAKES AND GUY WIRES ON THE UPHILL SIDE OF THE TREE. USE GUYING ON TREES IN LOW DENSITY PEDESTRIAN TRAFFIC AREAS ONLY.

**O**  
**L-17a** **TREE PLANTING AND GUYING ON SLOPE DETAIL**  
NOT TO SCALE



**N**  
**L-17a** **LOULU PALM PLANTING AND GUYING IN MEDIAN**  
NOT TO SCALE

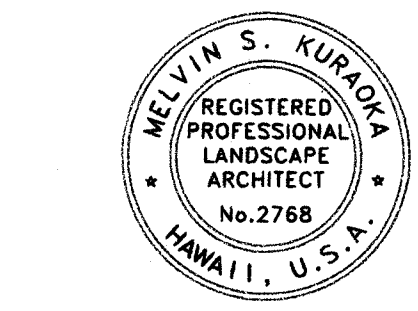
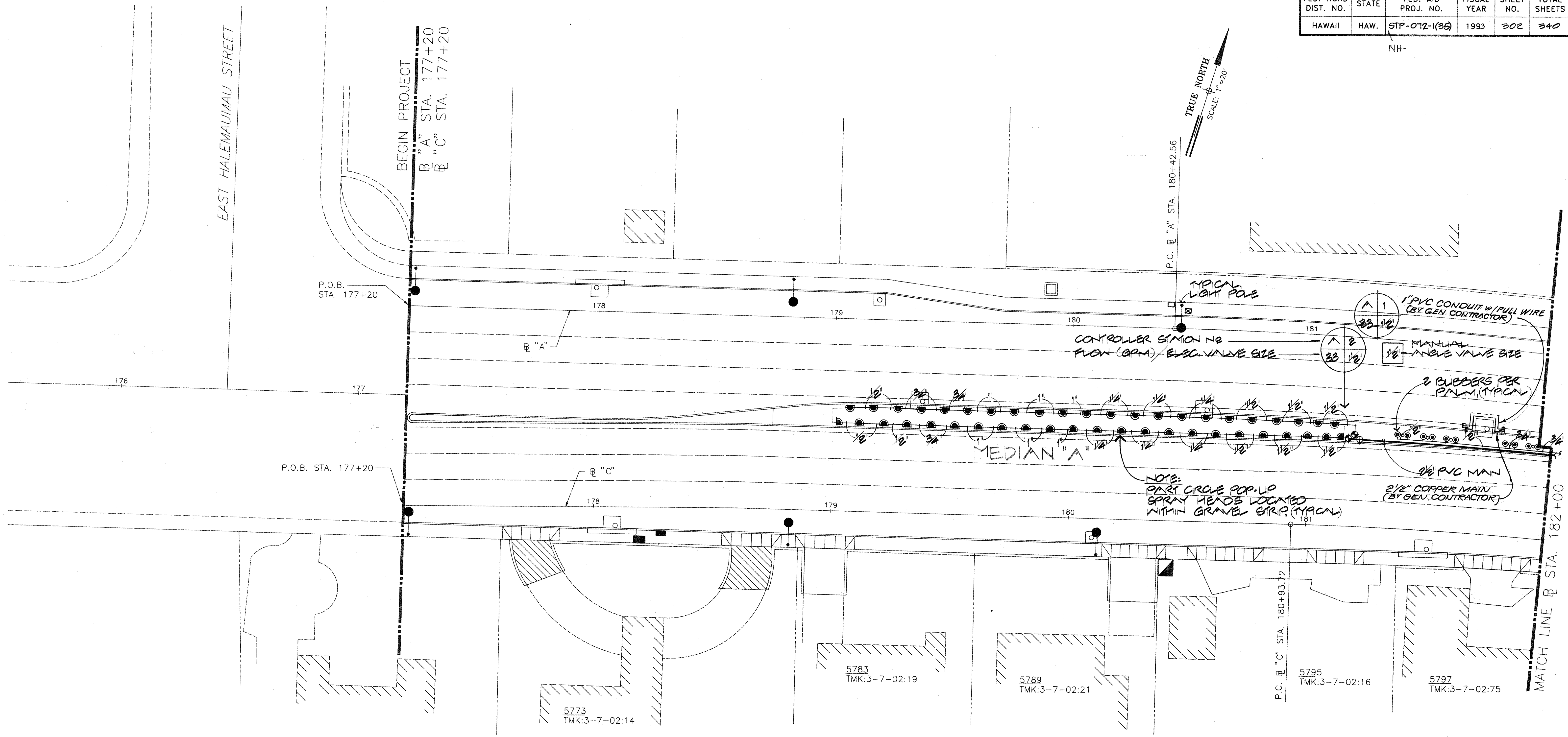
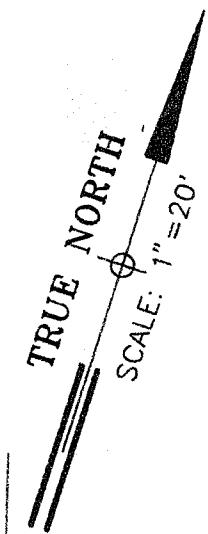


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| DATE                                                                 | ADDED DETAILS | REVISION      |
|----------------------------------------------------------------------|---------------|---------------|
|                                                                      |               |               |
| STATE OF HAWAII<br>DEPARTMENT OF TRANSPORTATION<br>HIGHWAYS DIVISION |               |               |
| PLANTING DETAILS                                                     |               |               |
| KALANIANA'OLE HIGHWAY WIDENING                                       |               |               |
| EAST HALEMAUMAU ST. TO KEAHOLE ST.                                   |               |               |
| F.A. PROJECT NO. NH-STP-072-1(35)                                    |               |               |
| SCALE: NO. SCALE                                                     |               | DATE: 10/1/92 |
| SHEET No. L-17a OF 32 SHEETS                                         |               |               |

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | STP-012-1(35)      | 1993        | 302       | 340          |

NH-



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|                                                                      |                                |
|----------------------------------------------------------------------|--------------------------------|
| MAR, '95                                                             | ADDED NOTES FOR CLARIFICATION. |
| DATE                                                                 | REVISION                       |
| STATE OF HAWAII<br>DEPARTMENT OF TRANSPORTATION<br>HIGHWAYS DIVISION |                                |
| LANDSCAPE IRRIGATION PLAN                                            |                                |
| KALANIANA'OLE HIGHWAY WIDENING                                       |                                |
| EAST HALEMAU ST. TO KEAHOE ST.                                       |                                |
| F.A. PROJECT NO. STP-012-1(35)                                       |                                |
| SCALE: 1"=20'                                                        | NH- DATE: 10/1/92              |

SHEET No. 1-100 OF 32 SHEETS

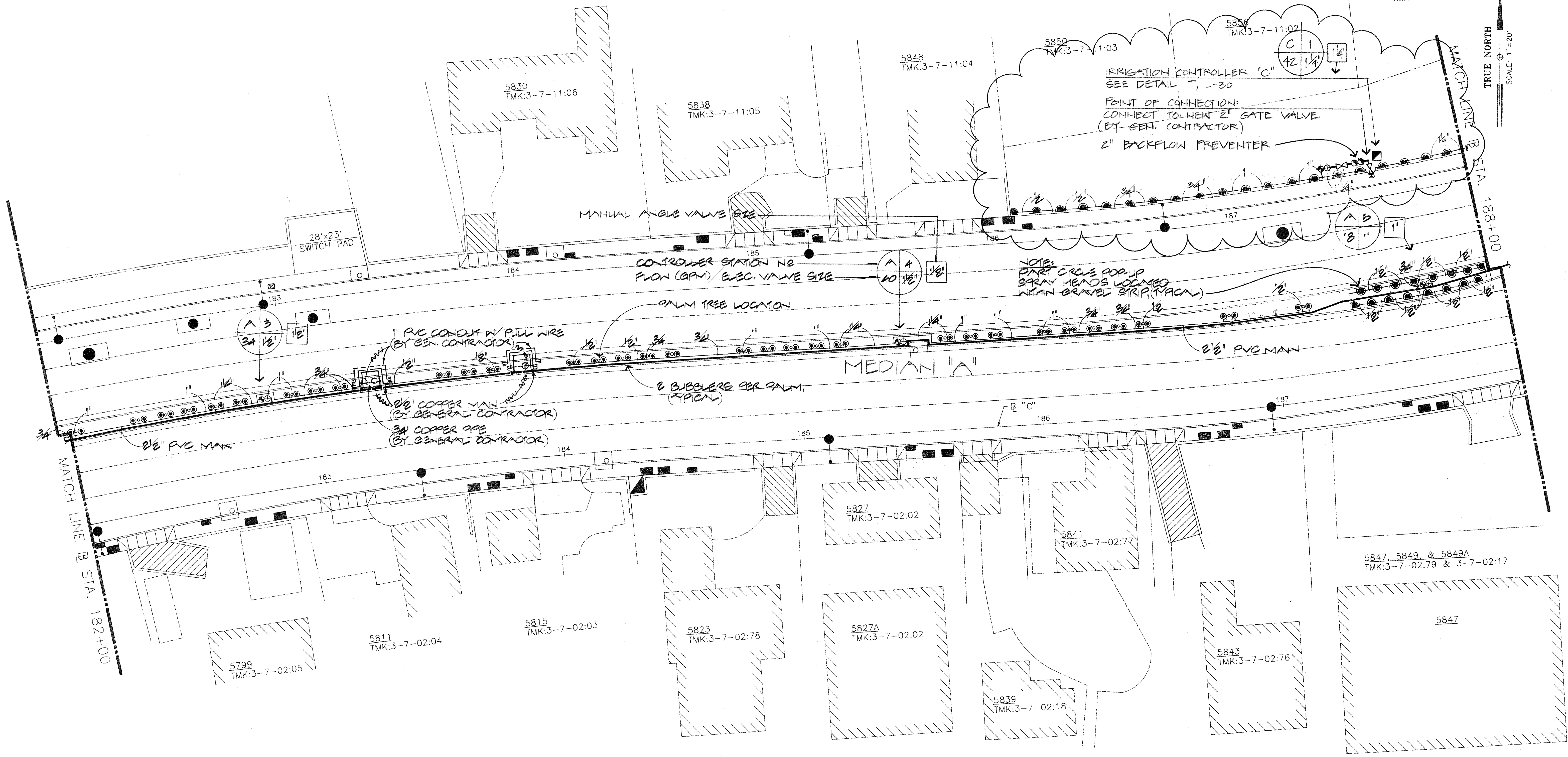
"AS-BUILT"

C.O. 302

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | STP-012-1(35)      | 1993        | 303       | 340          |

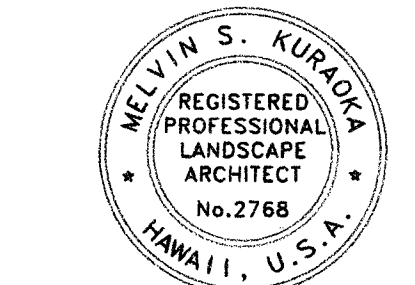
NH- 5858  
TMK:3-7-11:01

TRUE NORTH  
SCALE: 1"=20'



| DATE    | REVISION                          |
|---------|-----------------------------------|
| MAR. 95 | ADDED IRRIGATION TO REM. PAR. '01 |

SCALE IN FEET:  
20' 10' 0' 20' 40'



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STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

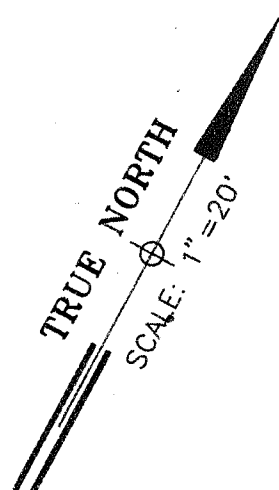
LANDSCAPE IRRIGATION PLAN

KALANIANA'OLE HIGHWAY WIDENING  
EAST HALEMAUMAU ST. TO KEAHOLE ST.  
F.A. PROJECT NO. STP-012-1(35)  
NH- DATE: 10/1/92

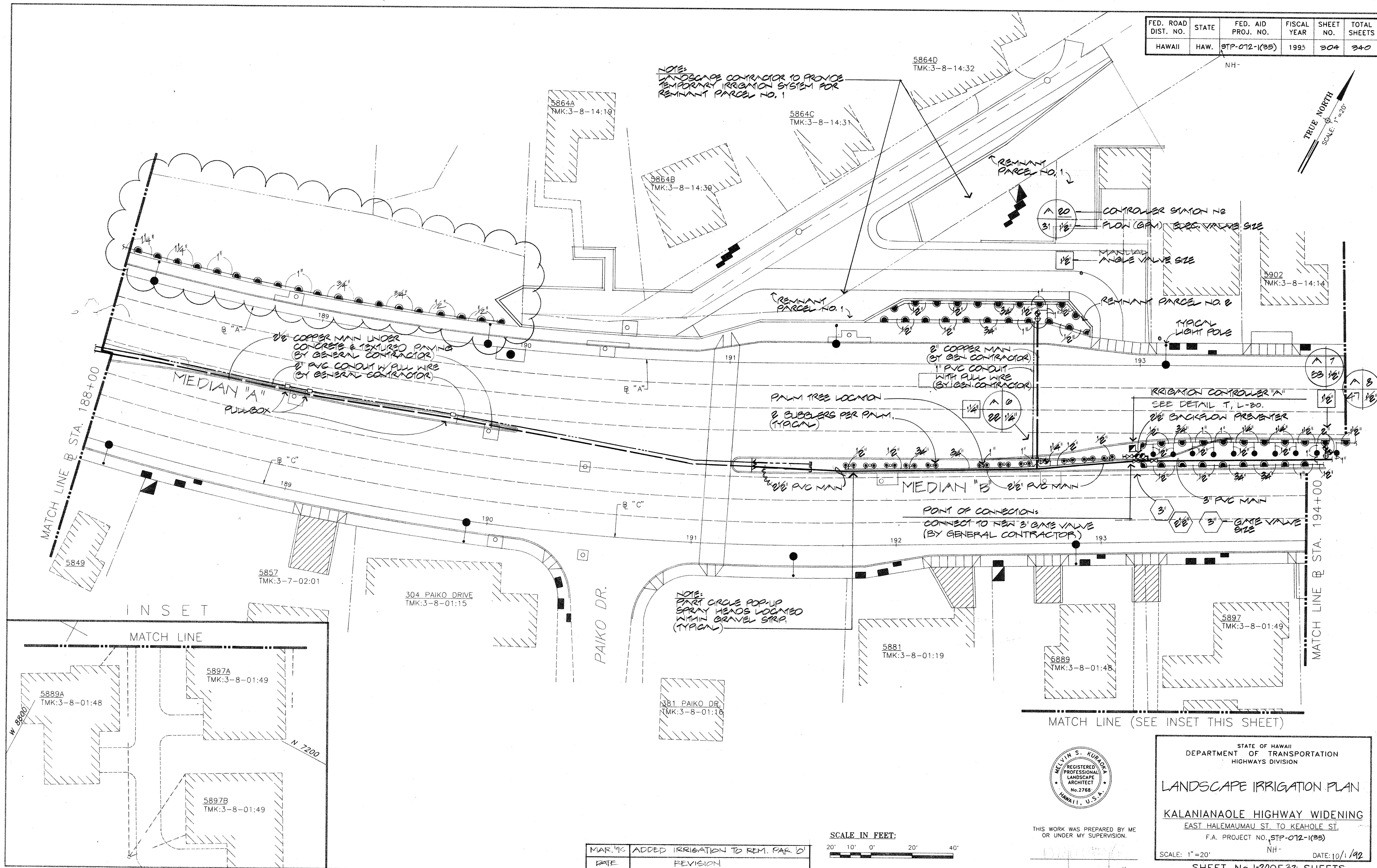
SCALE: 1"=20'

SHEET No. 19 OF 32 SHEETS

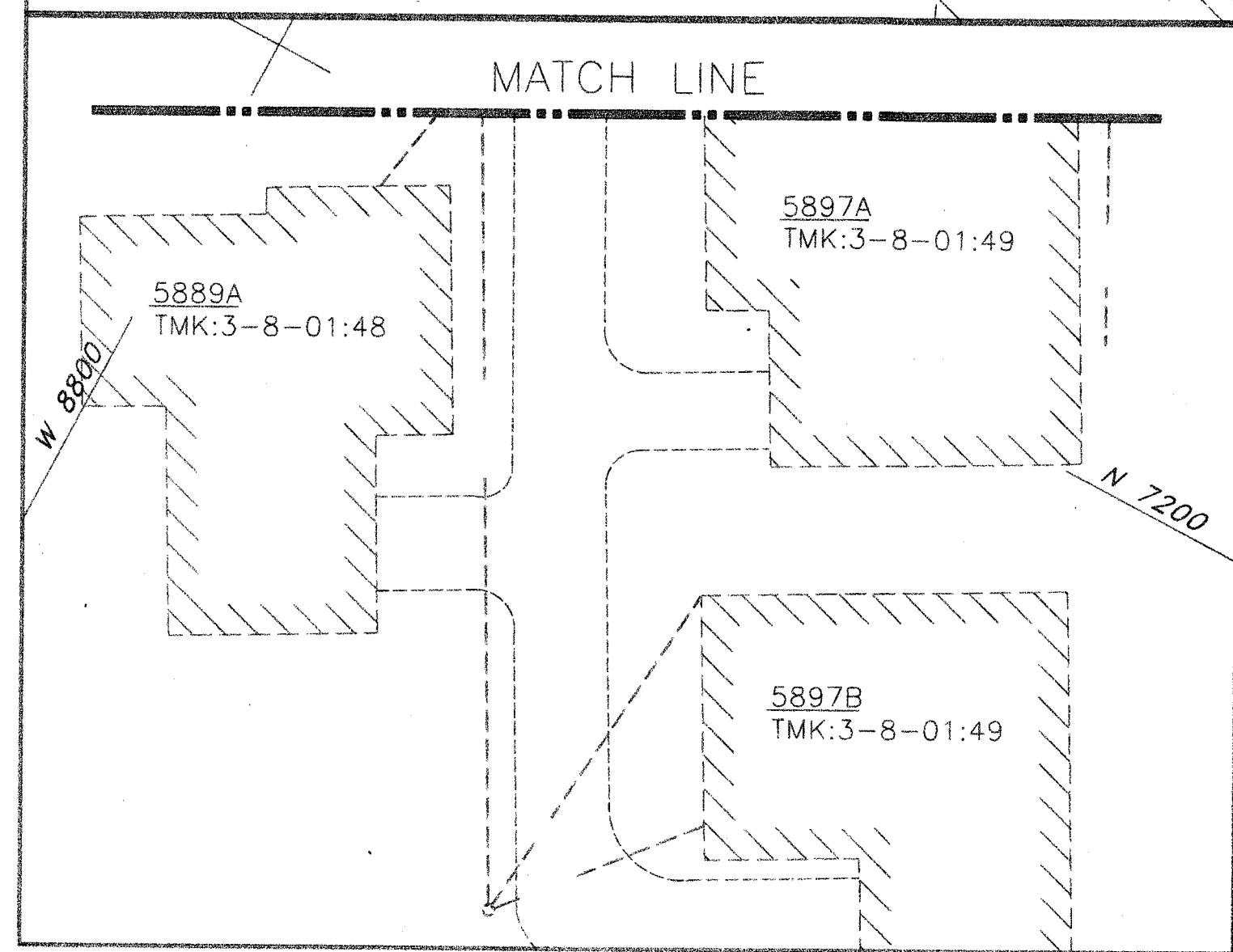
| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | STP-072-(195)      | 1993        | 304       | 340          |



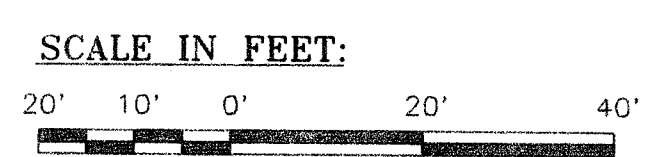
NOTE:  
LANDSCAPE CONTRACTOR TO PROVIDE  
TEMPORARY IRRIGATION SYSTEM FOR  
REMNANT PARCEL NO. 1



INSET



NOTE:  
PART CIRCLE POP-UP  
SPRAY HEADS LOCATED  
WITHIN GRAVEL STRIP  
(TYPICAL)



| DATE     | REVISION                          |
|----------|-----------------------------------|
| MAR. '90 | ADDED IRRIGATION TO REM. PAR. 'D' |



THIS WORK WAS PREPARED BY ME  
OR UNDER MY SUPERVISION.

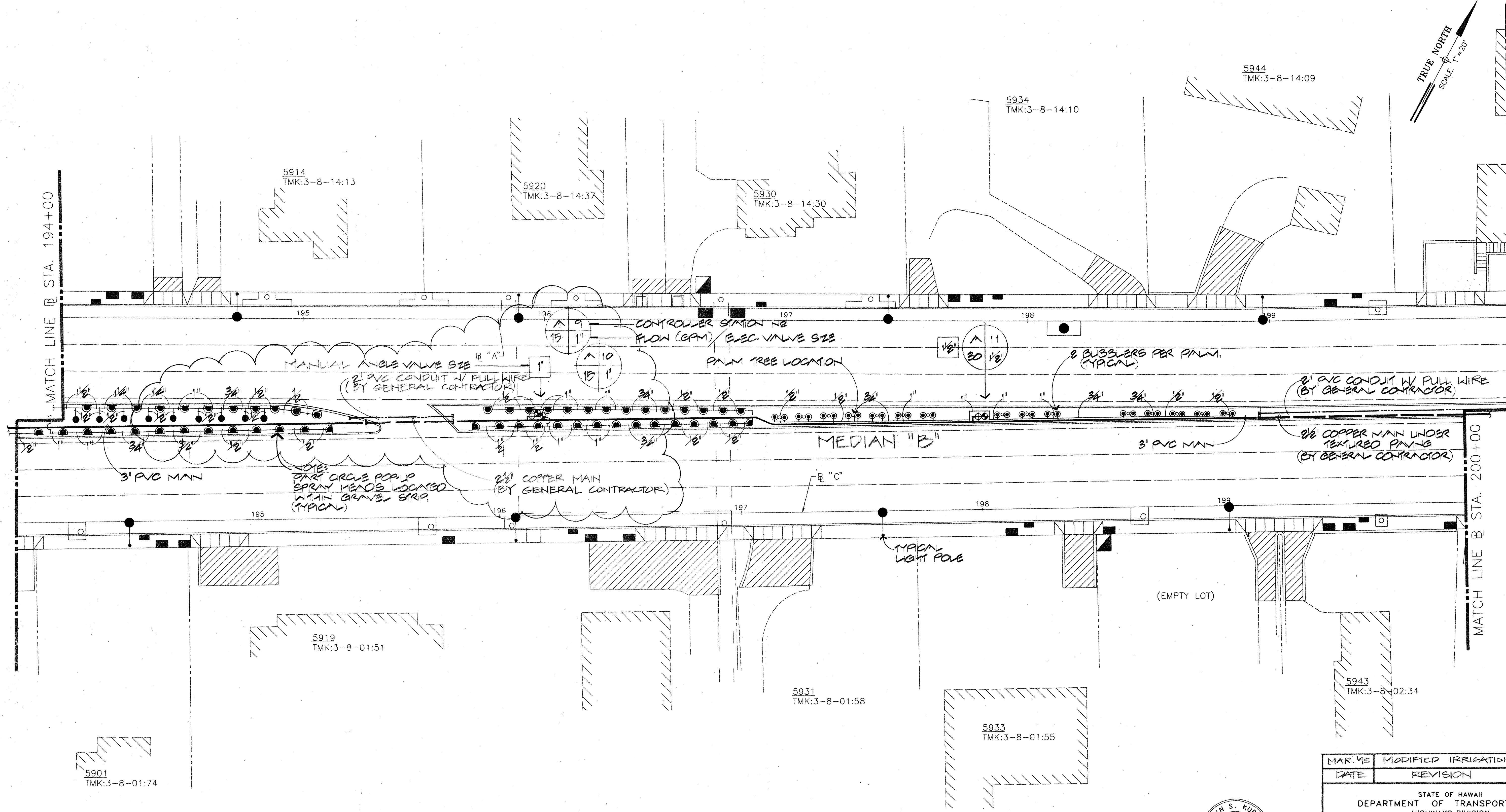
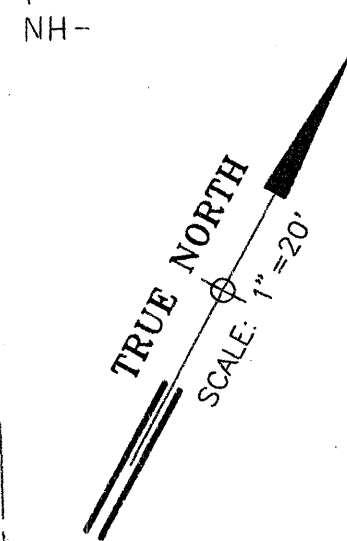
STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**LANDSCAPE IRRIGATION PLAN**  
  
**KALANIANA'OLE HIGHWAY WIDENING**  
EAST HALEMAUMAU ST. TO KEAHOE ST.  
F.A. PROJECT NO. STP-072-(195)  
NH-

SCALE: 1"=20'  
DATE: 10/1/92  
SHEET No. 200 OF 32 SHEETS  
**C.O. 304**

"AS-BUILT"

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | STP-072-1(35)      | 1993        | 305       | 340          |



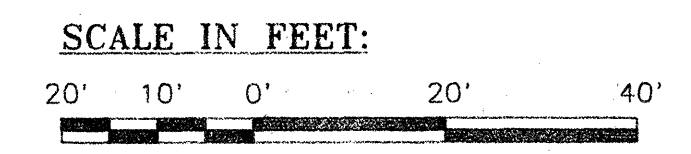
5901  
TMK:3-8-01:74

5919  
TMK:3-8-01:51

5931  
TMK:3-8-01:58

5933  
TMK:3-8-01:55

5943  
TMK:3-8-02:34



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OR UNDER MY SUPERVISION.

|      |                     |
|------|---------------------|
| DATE | MODIFIED IRRIGATION |
| DATE | REVISION            |

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

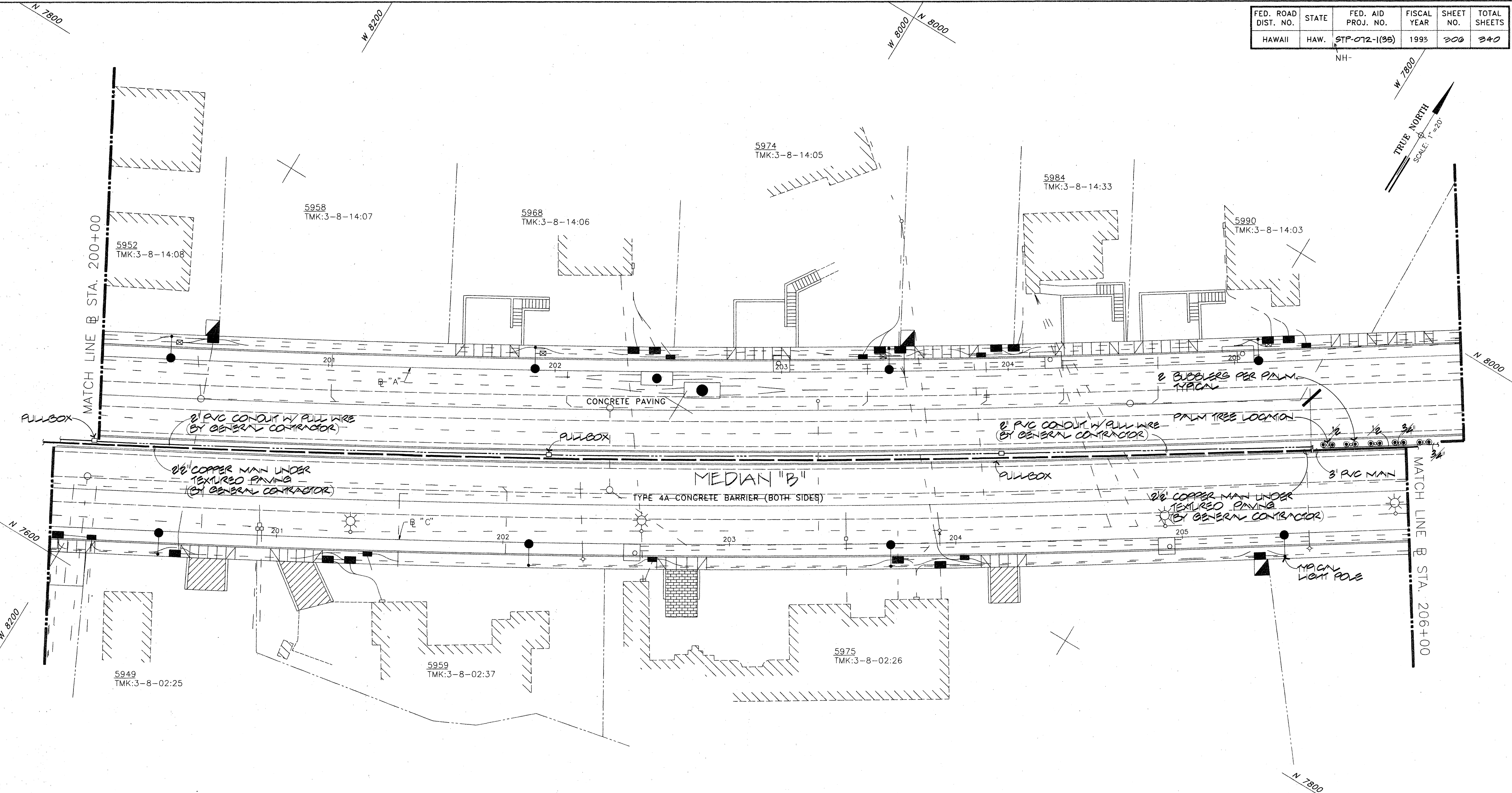
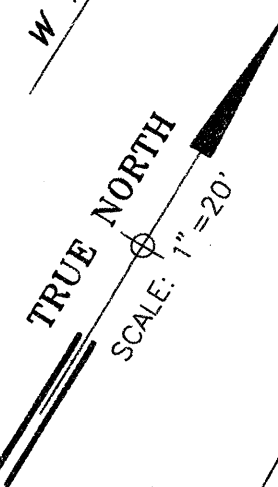
**LANDSCAPE IRRIGATION PLAN**

**KALANIANA'OLE HIGHWAY WIDENING**  
EAST HALEMAUMAU ST. TO KEAHOE ST.  
F.A. PROJECT NO. STP-072-1(35)  
NH-  
SCALE: 1" = 20' DATE: 10/1/92

SHEET No. 21 OF 32 SHEETS

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | STP-072-1(35)      | 1993        | 306       | 340          |

NH-



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| DATE    | ADDED NOTES FOR CLARIFICATION |
|---------|-------------------------------|
| MAR '96 | REVISION                      |

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**LANDSCAPE IRRIGATION PLAN**

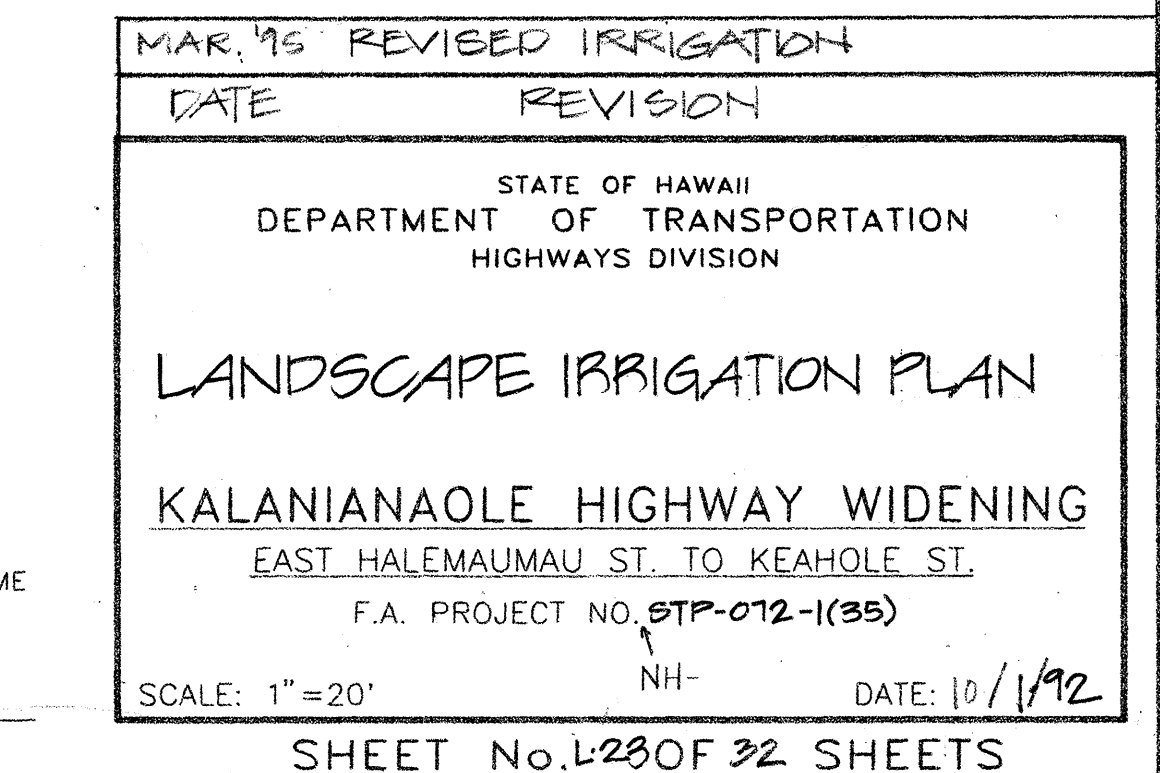
**KALANIANA'OLE HIGHWAY WIDENING**  
EAST HALEMAUMAU ST. TO KEAHOE ST.  
F.A. PROJECT NO. STP-072-1(35)  
NH- DATE: 10/1/92

SCALE: 1"=20'

SHEET No. 22 OF 32 SHEETS

306

NH-

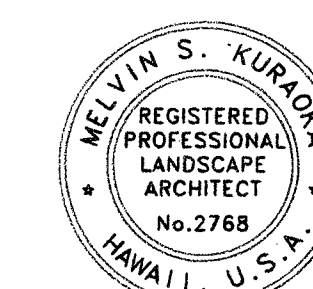
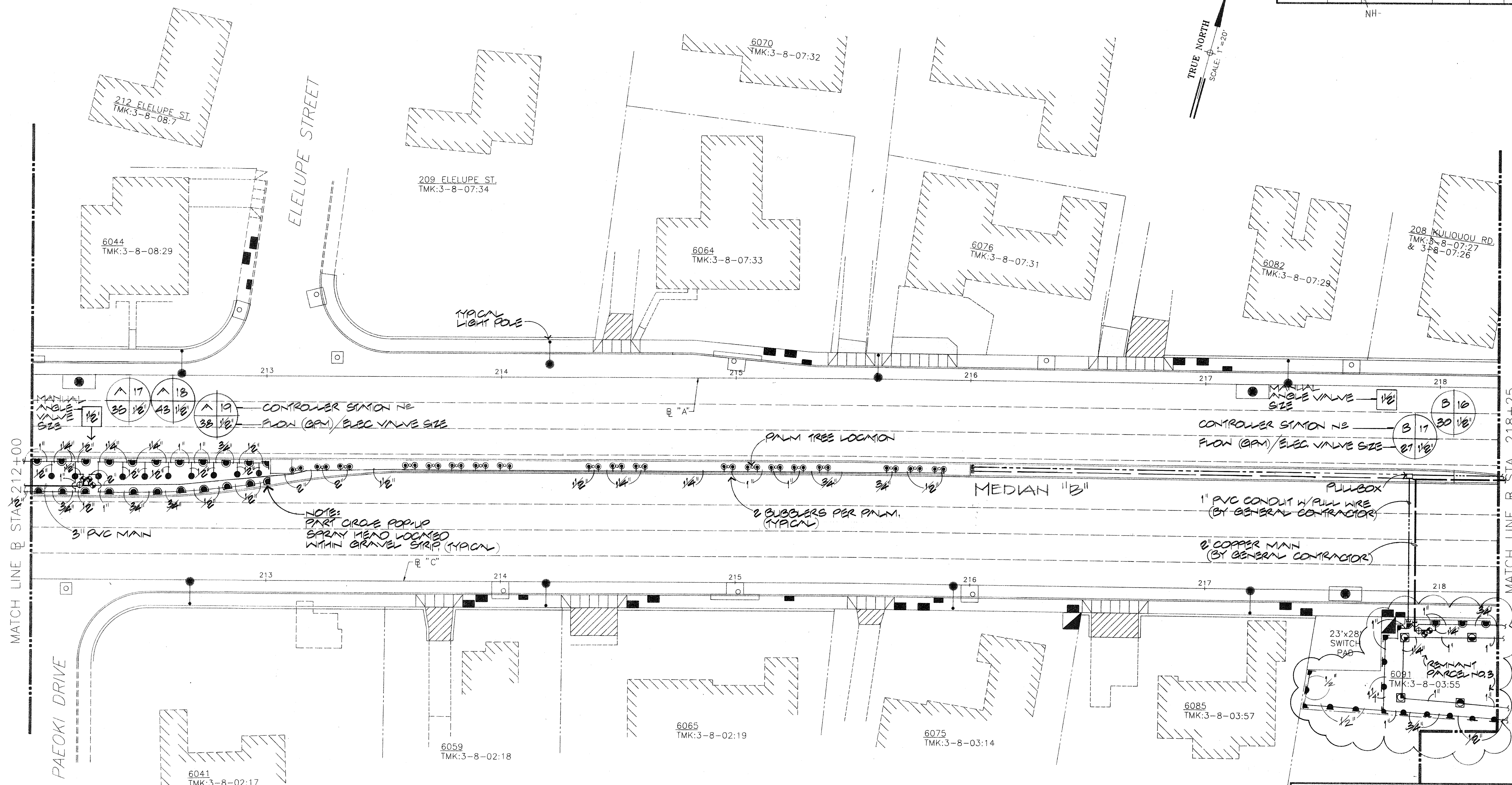
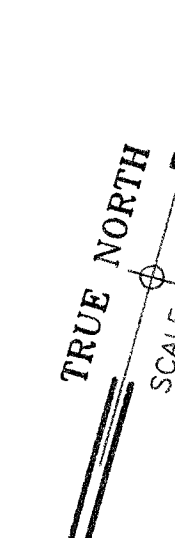


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OR UNDER MY SUPERVISION.

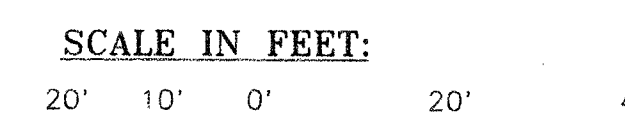
C.O 307

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | STP-012-1(35)      | 1993        | 308       | 341          |

NH-



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| DATE    | REVISION           |
|---------|--------------------|
| MAK 9/5 | REVISED IRRIGATION |
|         | REVISION           |

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**LANDSCAPE IRRIGATION PLAN**

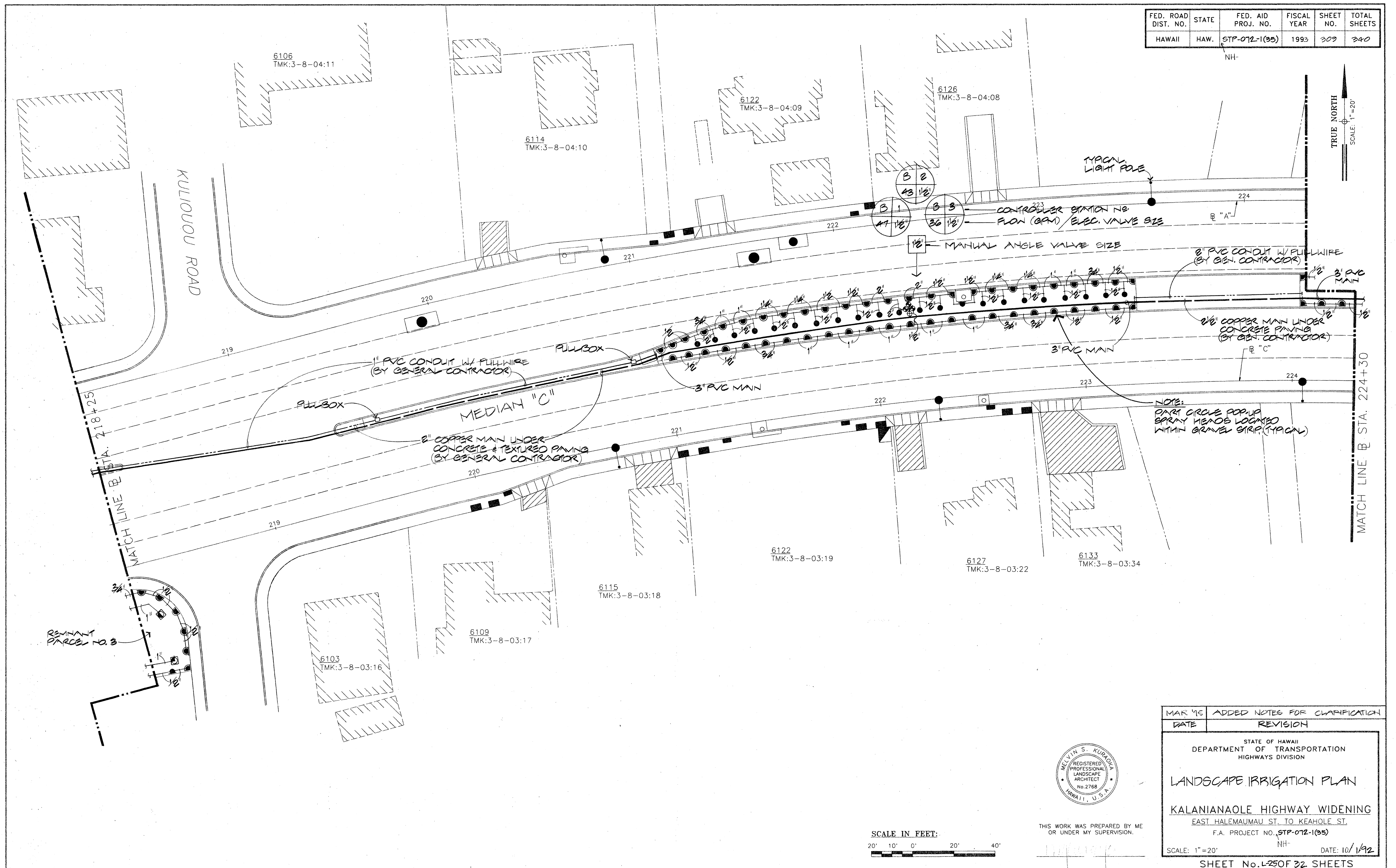
**KALANIANA'OLE HIGHWAY WIDENING**  
EAST HALEMAUMAU ST. TO KEAHOE ST.  
F.A. PROJECT NO. STP-012-1(35)  
NH-

SCALE: 1" = 20' DATE: 10/1/92

SHEET No. 124 OF 32 SHEETS

"AS-BUILT"

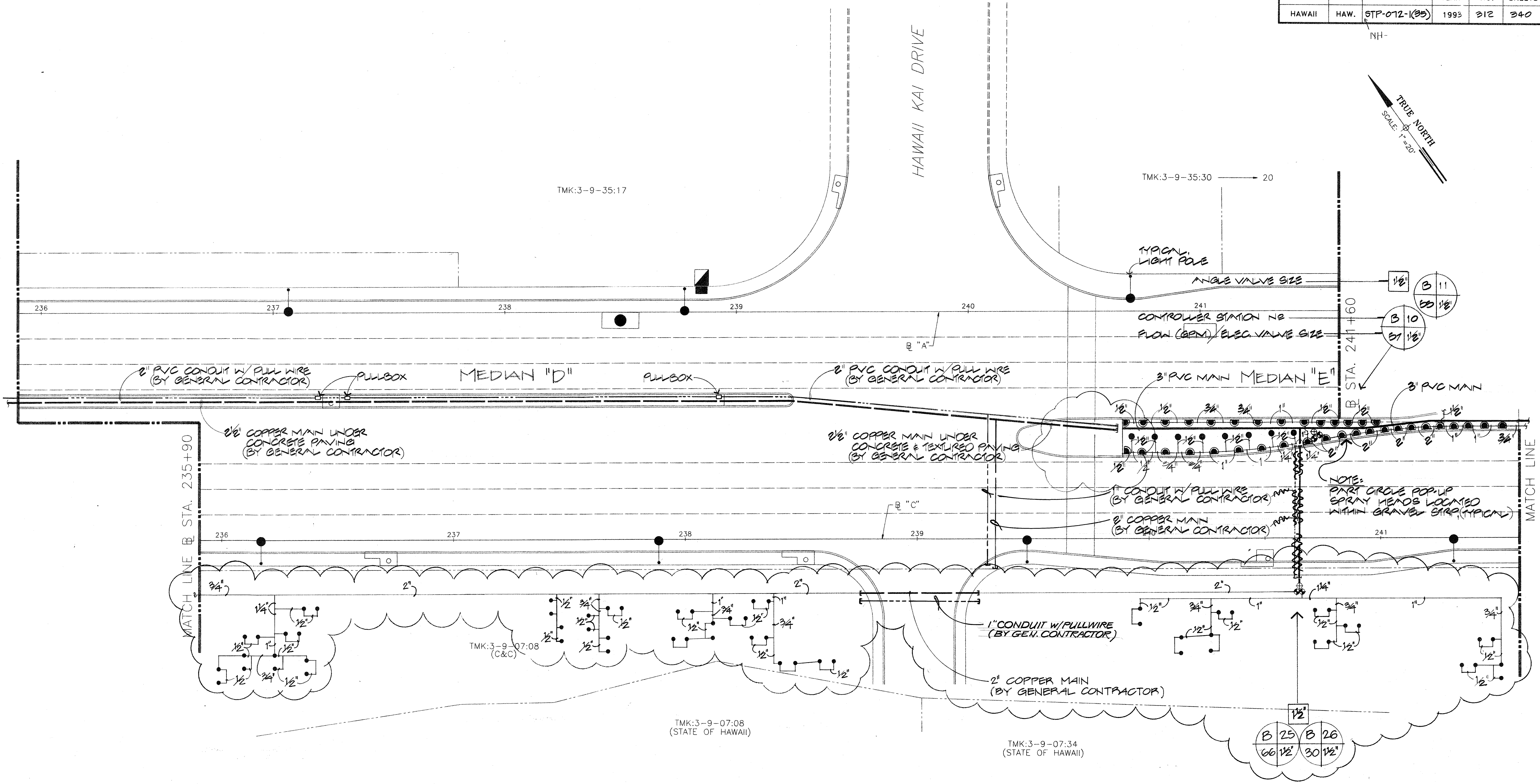
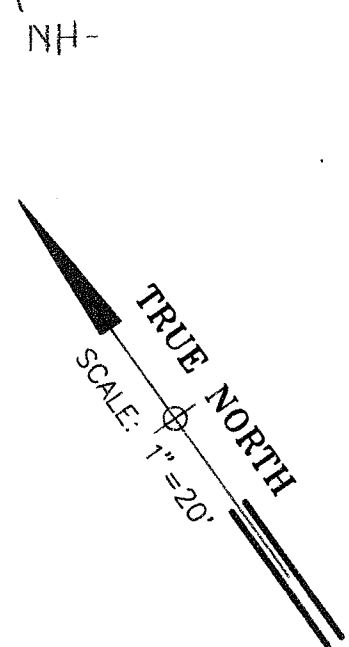
| FED. ROAD<br>DIST. NO. | STATE | FED. AID<br>PROJ. NO. | FISCAL<br>YEAR | SHEET<br>NO. | TOTAL<br>SHEETS |
|------------------------|-------|-----------------------|----------------|--------------|-----------------|
| HAWAII                 | HAW.  | STP-072-1(35)         | 1993           | 309          | 340             |







| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | STP-012-1(35)      | 1993        | 312       | 340          |



MATCH LINE B STA. 235+90

MATCH LINE

TMK:3-9-07:08 (STATE OF HAWAII)

TMK:3-9-07:34 (STATE OF HAWAII)



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|         |                    |
|---------|--------------------|
| MAK 96  | REVISED IRRIGATION |
| 6/30/93 | C.O. #1            |
| DATE    | REVISION           |



STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**LANDSCAPE IRRIGATION PLAN**

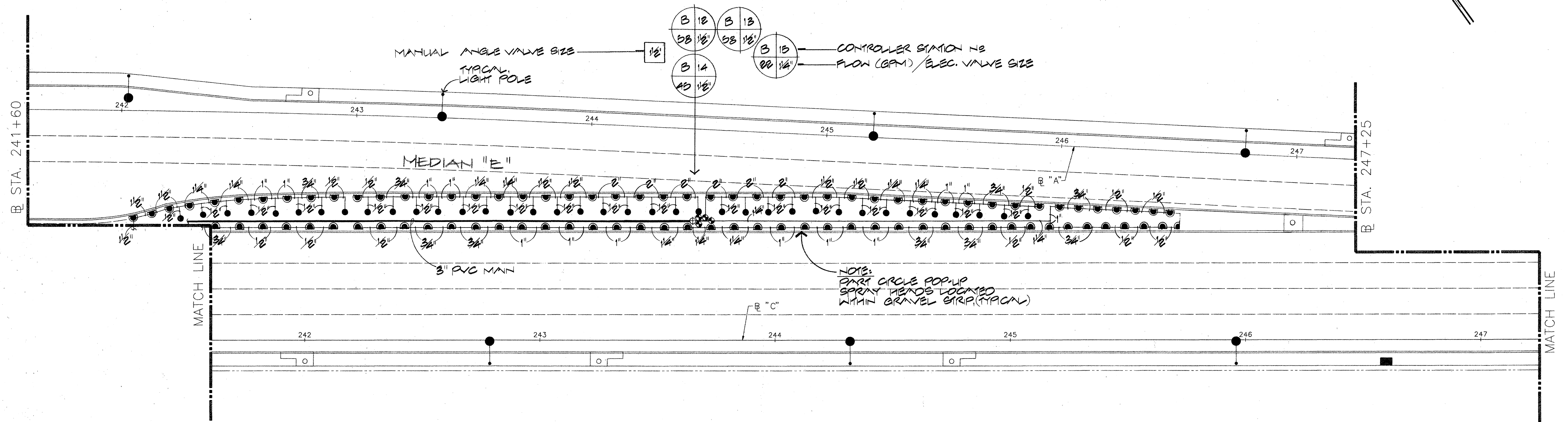
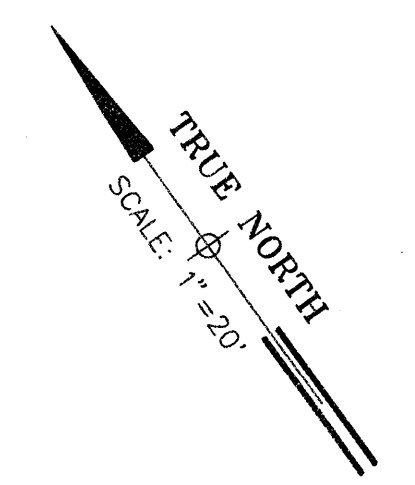
**KALANIANA'OLE HIGHWAY WIDENING**  
EAST HALEMAUMAU ST. TO KEAHOLE ST.  
F.A. PROJECT NO. STP-012-1(35)  
NH

SCALE: 1"=20' DATE: 10/1/92

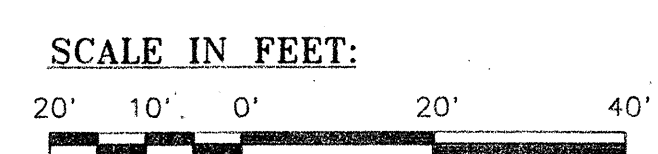
SHEET No. L-280 OF 32 SHEETS

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | STP-072-1(35)      | 1993        | 313       | 340          |

NH-



NOTE:  
PART CIRCLE POP-UP  
SPRAY HEADS LOCATED  
WITHIN GRAVEL STRIP (TYPICAL)



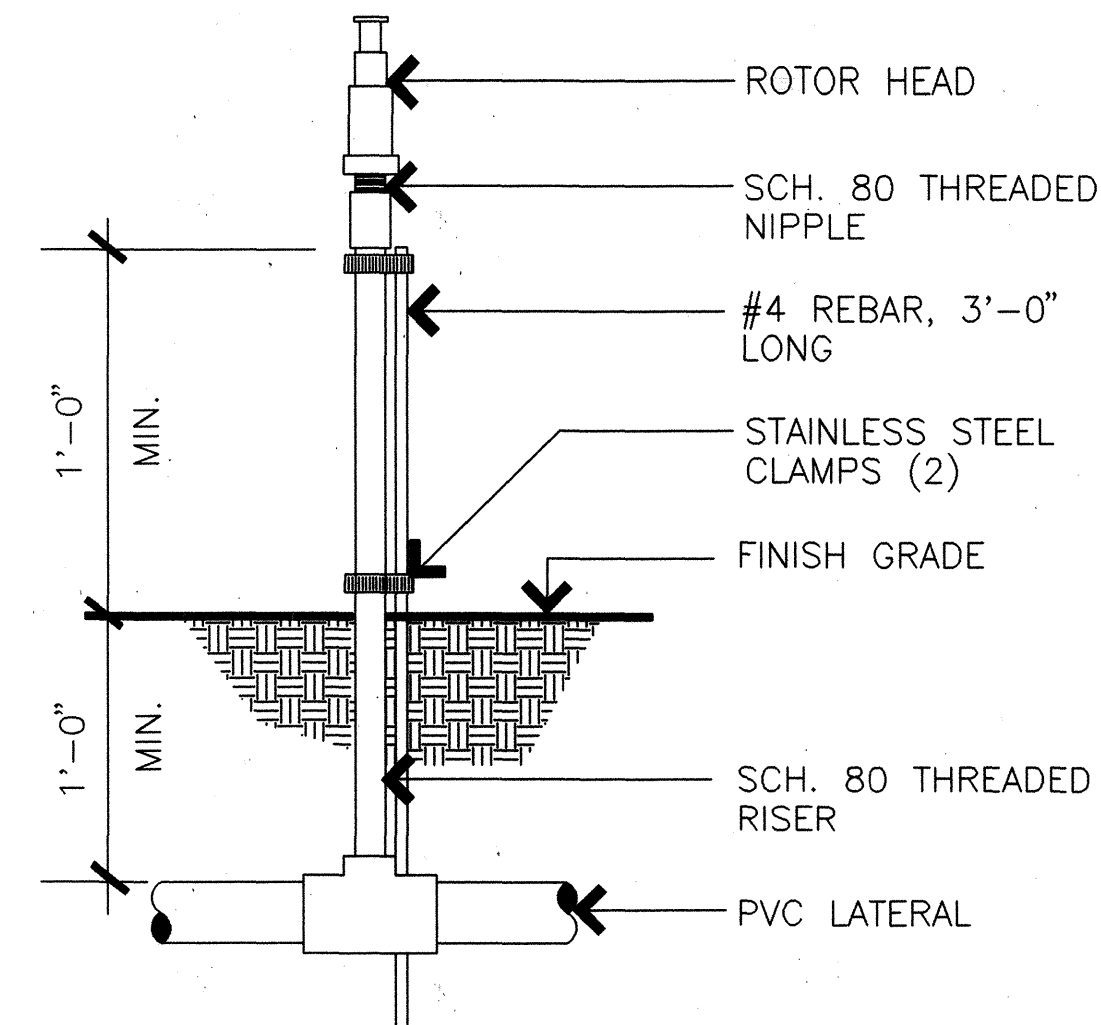
THIS WORK WAS PREPARED BY ME  
OR UNDER MY SUPERVISION.

|                                                                      |                              |
|----------------------------------------------------------------------|------------------------------|
| MAR '95                                                              | ADDED NOTE FOR CLARIFICATION |
| DATE                                                                 | REVISION                     |
| STATE OF HAWAII<br>DEPARTMENT OF TRANSPORTATION<br>HIGHWAYS DIVISION |                              |
| LANDSCAPE IRRIGATION PLAN                                            |                              |
| KALANIANA'OLE HIGHWAY WIDENING                                       |                              |
| EAST HALEMAUMAU ST. TO KEAHOLE ST.                                   |                              |
| F.A. PROJECT NO. STP-072-1(35)                                       |                              |
| NH-                                                                  |                              |
| SCALE: 1"=20'                                                        | DATE: 10/1/92                |
| SHEET No. 129 OF 32 SHEETS                                           |                              |

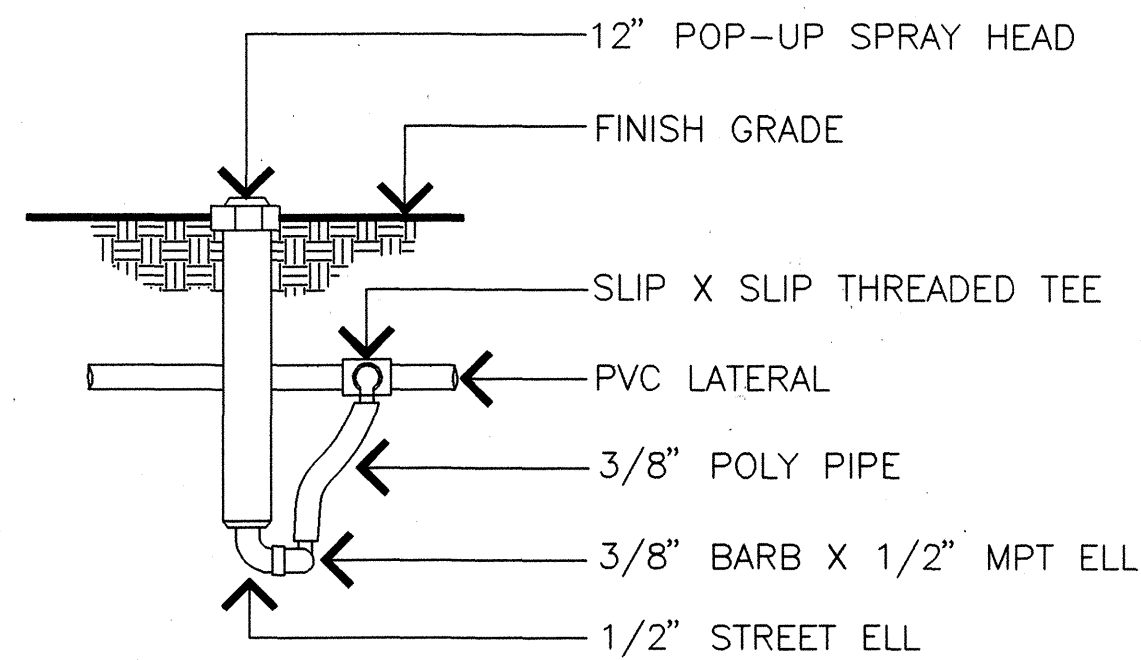
## IRRIGATION EQUIPMENT LIST

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | NH-STP-072-1(35)   | 1993        | 314       | 340          |

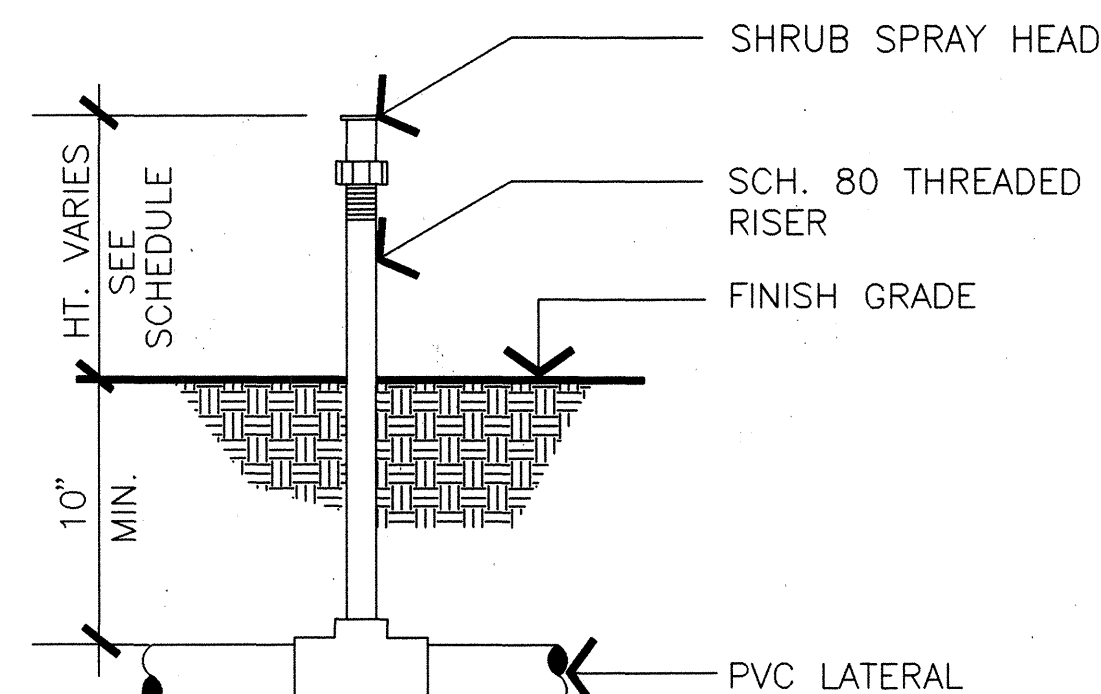
| SYMBOL | MANUFACTURER/CATALOG NUMBER                                               | DESCRIPTION                                                                                                     | G.P.M. | RADIUS  | P.S.I. |
|--------|---------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|--------|---------|--------|
| ●      | BUCKNER B-10-F-PC W/13141 OR APPROVED EQUAL                               | BRASS SHRUB SPRAY W/BRASS ADAPTOR/15' LOW ANGLE/FULL CIR./PRESS. COMP.                                          | 2.2    | 10'     | 30     |
| ●      | BUCKNER B-10-H-PC W/13141 OR APPROVED EQUAL                               | BRASS SHRUB SPRAY W/BRASS ADAPTOR/15' LOW ANGLE/HALF CIR./PRESS. COMP.                                          | 1.1    | 10'     | 30     |
| ●      | BUCKNER B-10-Q-PC W/13141 OR APPROVED EQUAL                               | BRASS SHRUB SPRAY W/BRASS ADAPTOR/15' LOW ANGLE/QTR. CIR./PRESS. COMP.                                          | .5     | 10'     | 30     |
| ●      | BUCKNER B-10-F-PC ON 13604 OR APPROVED EQUAL                              | 4" POP-UP SPRAY W/BRASS NOZ./15' LOW ANGLE/FULL CIR./PRESS. COMP.                                               | 2.2    | 10'     | 30     |
| ●      | BUCKNER B-10-H-PC ON 13604 OR APPROVED EQUAL                              | 4" POP-UP SPRAY W/BRASS NOZ./15' LOW ANGLE/HALF CIR./PRESS. COMP.                                               | 1.1    | 10'     | 30     |
| ●      | BUCKNER B-10-Q-PC ON 13604 OR APPROVED EQUAL                              | 4" POP-UP SPRAY W/BRASS NOZ./15' LOW ANGLE/QTR. CIR./PRESS. COMP.                                               | .5     | 10'     | 30     |
| ●      | BUCKNER B-10-F-PC ON 13612 OR APPROVED EQUAL                              | 12" POP-UP SPRAY W/BRASS NOZ. 15' LOW ANGLE/FULL CIR./PRESS. COMP.                                              | 2.2    | 10'     | 30     |
| ●      | BUCKNER B-10-H-PC ON 13612 OR APPROVED EQUAL                              | 12" POP-UP SPRAY W/BRASS NOZ. 15' LOW ANGLE/HALF CIR./PRESS. COMP.                                              | 1.1    | 10'     | 30     |
| ●      | BUCKNER B-10-Q-PC ON 13612 OR APPROVED EQUAL                              | 12" POP-UP SPRAY W/BRASS NOZ. 15' LOW ANGLE/QTR. CIR./PRESS. COMP.                                              | .5     | 10'     | 30     |
| ●      | BUCKNER 11019 W/NOZZLE 6 OR APPROVED EQUAL                                | GEAR DRIVEN ROTOR ON RISER/ADJUSTABLE/HALF CIRCLE                                                               | 6.0    | 30'-35' | 30     |
| ●      | BUCKNER 11019 W/NOZZLE 3 OR APPROVED EQUAL                                | GEAR DRIVEN ROTOR ON RISER/ADJUSTABLE/QTR. CIRCLE                                                               | 3.0    | 30'-35' | 30     |
| ●      | BUCKNER B-5-H ON 13604 OR APPROVED EQUAL                                  | 4" POP-UP STREAM BUBBLER/HALF CIRCLE                                                                            | 1.5    | 5'      | 30     |
| ●      | AMERICAN NO. 3 OR APPROVED EQUAL                                          | GATE VALVE                                                                                                      |        |         |        |
| ●      | FEBCO 805Y OR B.W.S. APPROVED                                             | DOUBLE CHECK VALVE                                                                                              |        |         |        |
| ●      | BUCKNER 22000 SERIES OR APPROVED EQUAL                                    | MANUAL ANGLE VALVE                                                                                              |        |         |        |
| ●      | BUCKNER 20020 SERIES, SOLATROL LEMA 1520, AND SPLI 2201 OR APPROVED EQUAL | REMOTE CONTROL VALVE, MICROPOWER ACTUATOR AND SPLICE L.D. TAG                                                   |        |         |        |
| ●      | SOLATROL LEIT 8000-2, AMG 2039, AND XKIT 8724 OR APPROVED EQUAL           | LIGHT-ENERGIZED UNIVERSAL CONTROL UNIT, 6' HIGH ANTENNA MOUNTING COLUMN KIT, AND EXPANDER MODULE KIT 24 STATION |        |         |        |
| ●      | PVC SCHEDULE 40                                                           | IRRIGATION MAIN                                                                                                 |        |         |        |
| ●      | PVC CLASS 200                                                             | IRRIGATION LATERAL                                                                                              |        |         |        |
| ●      | PVC SCHEDULE 40                                                           | IRRIGATION SLEEVE (BY GENERAL CONTRACTOR - SEE CIVIL SHTS.)                                                     |        |         |        |
| ●      | PVC SCHEDULE 40                                                           | IRRIGATION CONDUIT (BY GENERAL CONTRACTOR - SEE CIVIL SHTS.)                                                    |        |         |        |
| ●      | COPPER TYPE 'K' HARD                                                      | MAIN UNDER PAVEMENT (BY GENERAL CONTRACTOR - SEE CIVIL SHTS.)                                                   |        |         |        |



**P**  
**L-30** GEAR DRIVEN ROTOR ON RISER  
NOT TO SCALE



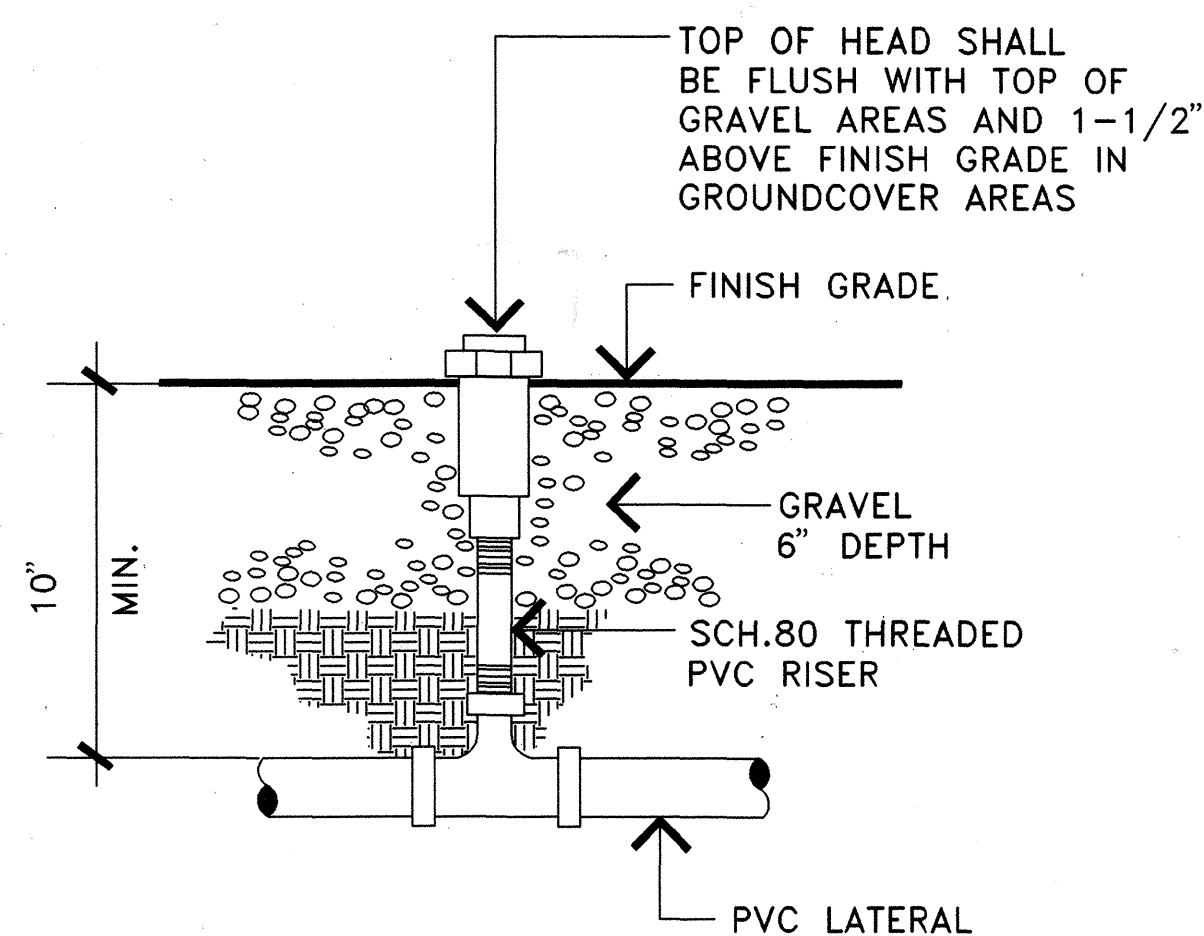
**Q**  
**L-30** 12" POP-UP SPRAY DETAIL  
NOT TO SCALE



\*RISER HEIGHT SCHEDULE  
18" HT. - DWARF PITTOSPORUM  
18" HT. - AFRICAN IRIS  
24" HT. - BEACH NAUPAKA  
24" HT. - CROTON 'NORMA'

\*RAISE AS NECESSARY DURING PLANT ESTABLISHMENT PERIOD

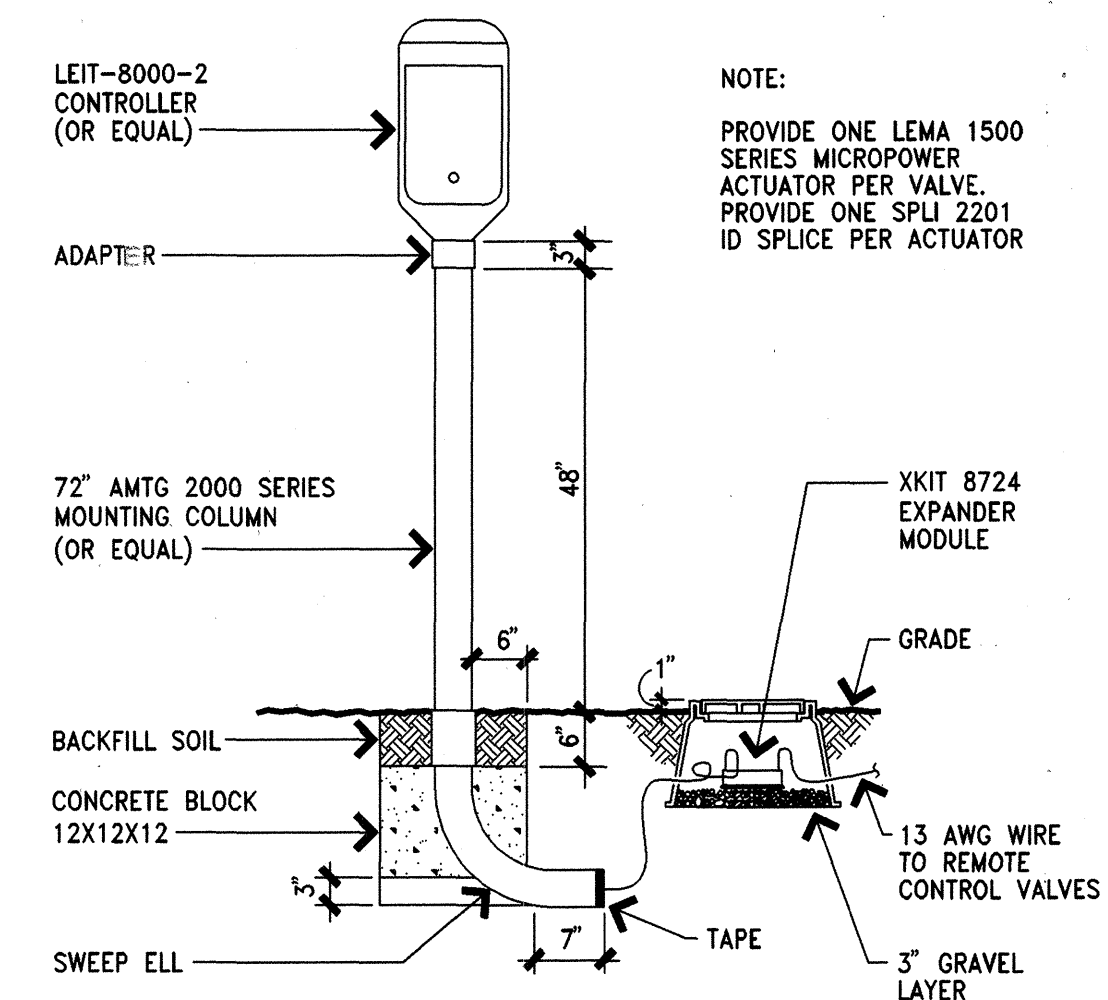
**R**  
**L-30** SHRUB SPRAY DETAIL  
NOT TO SCALE



**S**  
**L-30** 4" POP-UP/STREAM BUBBLER DETAIL  
NOT TO SCALE

## IRRIGATION NOTES:

- IRRIGATION SYSTEMS SHOWN ON THE DRAWINGS ARE DIAGRAMMATIC AND ARE SUBJECT TO ADJUSTMENTS DUE TO UNANTICIPATED FIELD CONDITIONS. UNLESS OTHERWISE NOTED, LOCATE ALL SPRINKLER HEADS, VALVES, AND PIPES WITHIN PLANTING AREAS. FINAL LOCATIONS SHALL BE DETERMINED BY THE ENGINEER.
- THE IRRIGATION SYSTEM DESIGN IS BASED ON A MINIMUM STATIC WATER PRESSURE OF 55 PSI AT THE POINT OF CONNECTION. NOTIFY PROJECT ENGINEER IF PRESSURE IS LESS THAN 55 PSI OR GREATER THAN 100 PSI.
- CONTRACTOR IS RESPONSIBLE FOR THE COORDINATION OF THE INSTALLATION OF ALL SLEEVES, CONDUITS, MAINS AND LATERALS UNDER PAVEMENT AND THROUGH WALLS AND SHALL ASSURE THAT THESE ITEMS ARE LAID PRIOR TO THE PLACEMENT OF PAVEMENT/WALL. STUB-OUTS AND CONDUITS RUNNING THROUGH THE BUILDING STRUCTURE WILL BE DONE BY OTHERS. ALL IRRIGATION WIRES SHALL BE BUNDLED AND INSTALLED UNDER THE IRRIGATION MAIN FOR IN-GRADE INSTALLATION. INSTALL IRRIGATION WIRES IN CONDUITS WHERE WIRES ARE NOT FOLLOWING THE IRRIGATION MAIN AND ALL ABOVE-GRADE INSTALLATIONS. VERIFY UTILITY LOCATIONS BEFORE TRENCHING. CONTRACTOR WILL BE RESPONSIBLE FOR ANY DAMAGE TO UTILITIES. CONTRACTOR SHALL FURNISH AND INSTALL "METALLIC SOUNDING TAPE" IN MAIN LINE TRENCHES AS PER MANUFACTURER'S SPECIFICATIONS.
- INSTALL SPRINKLER HEADS 6" AWAY FROM WALKWAYS, DRIVEWAYS AND STRUCTURES. FLEX RISERS SHALL BE USED ON ALL SHRUB HEADS ON RISERS INSTALLED ALONG WALKWAYS, DRIVEWAYS AND PARKING SPACES. ADJUST ALL SPRINKLER HEADS TO OBTAIN BEST COVERAGE. ADJUST FLOW CONTROL OF CONTROL VALVES TO MINIMIZE MISTING.
- THE CONTRACTOR, TOGETHER WITH THE ENGINEER SHALL PROGRAM THE IRRIGATION CONTROLLER TO ACCOMMODATE THE LANDSCAPE AND SITE REQUIREMENTS, AND SHALL INSTRUCT THE ENGINEER ON THE OPERATION OF THE COMPLETE SYSTEM.
- IN MEDIANS WITH TREES, INSTALL IRRIGATION MAINS 2'-6" AWAY FROM CURBS TO AVOID GUARDRAIL INSTALLATION.
- ALL COPPER MAINS AND CONDUITS UNDER PAVED SURFACES SHALL BE PROVIDED BY GENERAL CONTRACTOR. (SEE CIVIL SHTS.) ALL CONDUITS SHALL BE INSTALLED WITH PULL WIRES.
- ALL PULL BOXES SHALL BE PROVIDED AND INSTALLED BY THE GENERAL CONTRACTOR. (SEE CIVIL SHTS.)
- IRRIGATION SYSTEM PREFERRED WATERING TIMES ARE 10:00 AM TO 2:00 PM; EXPANDED TIMES ARE 08:00 AM TO 4:00 PM; MAXIMUM TIMES ARE 06:00 AM TO 6:00 PM DURING SUMMER MONTHS ONLY.
- WIRING FROM CONTRACTOR TO REMOTE CONTROL VALVES SHALL NOT EXCEED 2000' L.F. IN ONE CONTINUOUS RUN, AND SHALL BE LOW VOLTAGE 13-AWG CABLE.
- PROVIDE ONE NEW SOLATROL T-KIT 3000 TOOL KIT, PER CONTROLLER, TO THE ENGINEER AT THE FINAL FIELD TEST FOR THE SPRINKLER SYSTEM.
- ALL REMOTE CONTROL VALVES SHALL BE EQUIPPED WITH LEMA 1500 SERIES MICROPOWER ACTUATORS PRIOR TO DELIVERY AND INSTALLATION AT THE SITE.
- PROVIDE ONE PULL BOX AT A MINIMUM OF EVERY 250' L.F. OF CONTROLLER WIRE, AT EACH GROUPING OF VALVE(S), AND PRIOR TO PAVING, (CONCRETE, OR OTHER HARD SURFACES) AREAS THAT ARE LONGER THAN 10' L.F. (I.E. ROADWAY AREA FROM ONE PLANTING MEDIAN TO ANOTHER PLANTING MEDIAN).



NOTE:  
PROVIDE ONE LEMA 1500 SERIES MICROPOWER ACTUATOR PER VALVE.  
PROVIDE ONE SPLI 2201 ID SPLICE PER ACTUATOR

**T**  
**L-30** LIGHT-ENERGIZED AUTOMATIC CONTROLLER  
NOT TO SCALE

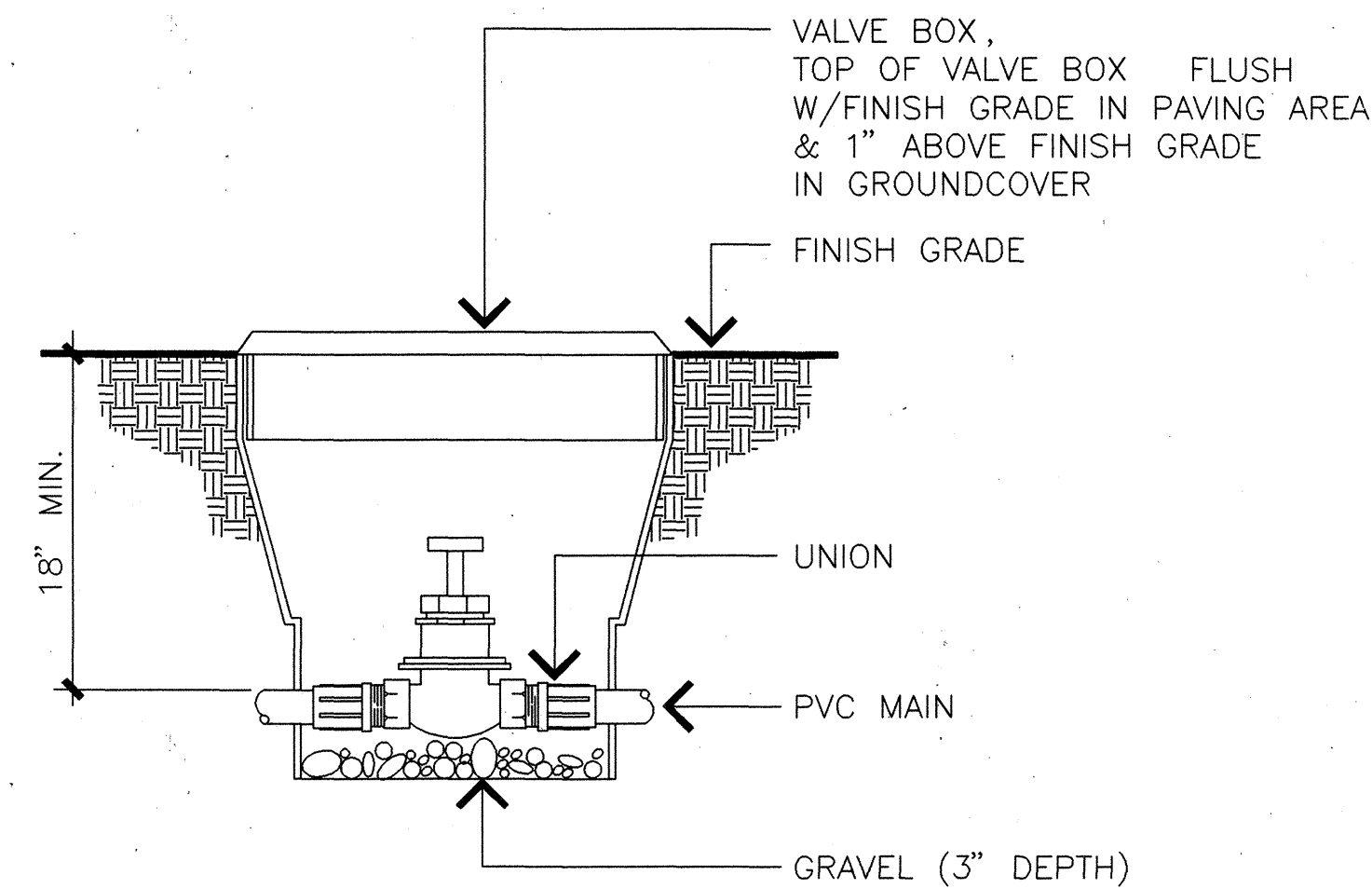
|         |                         |
|---------|-------------------------|
| MAR. 93 | ADDED & REVISED DETAILS |
| 6/30/93 | C.O. #1                 |
| DATE    | REVISION                |



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|                                                                      |               |
|----------------------------------------------------------------------|---------------|
| STATE OF HAWAII<br>DEPARTMENT OF TRANSPORTATION<br>HIGHWAYS DIVISION |               |
| IRRIGATION EQUIPMENT LIST,<br>DETAILS AND NOTES                      |               |
| KALANIANA'OLE HIGHWAY WIDENING                                       |               |
| EAST HALEMAUMAU ST. TO KEAHOLE ST.                                   |               |
| F.A. PROJECT NO. NH-STP-072-1(35)                                    |               |
| SCALE: NO SCALE                                                      | DATE: 10/1/92 |
| SHEET No. L-30 OF 32 SHEETS                                          |               |

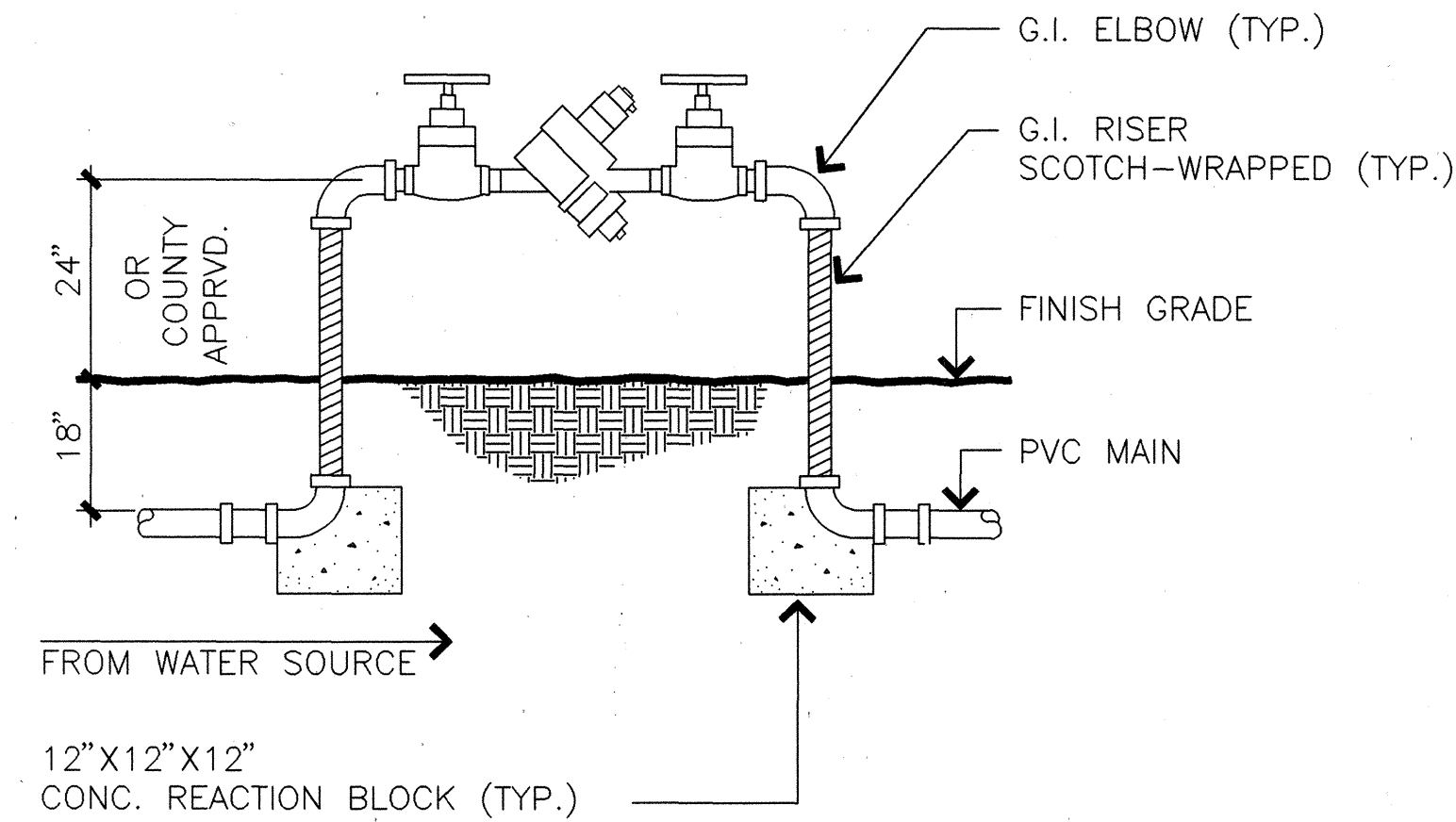
NOTE:  
IN MEDIANS, INSTALL IN  
GRAVEL MAINTENANCE STRIP



**U GATE VALVE DETAIL**  
L-31 NOT TO SCALE

NOTES:

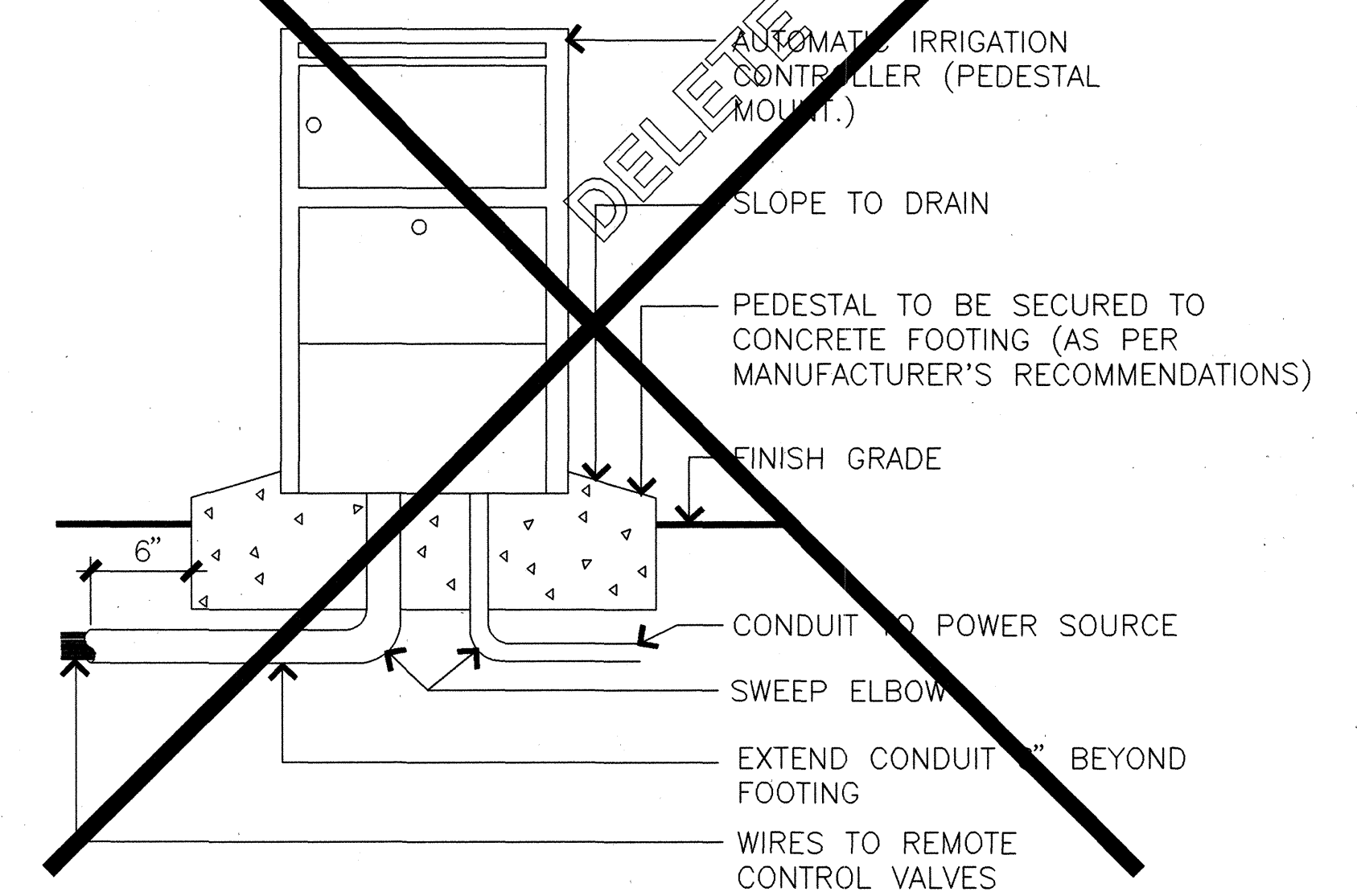
1. G.I. IS GALVANIZED IRON PIPE OR FITTINGS - SCHEDULE 40
2. INSTALL WITHIN GUARDRAIL IN PLANTING AREA ADJACENT TO GRAVEL MAINTENANCE STRIP



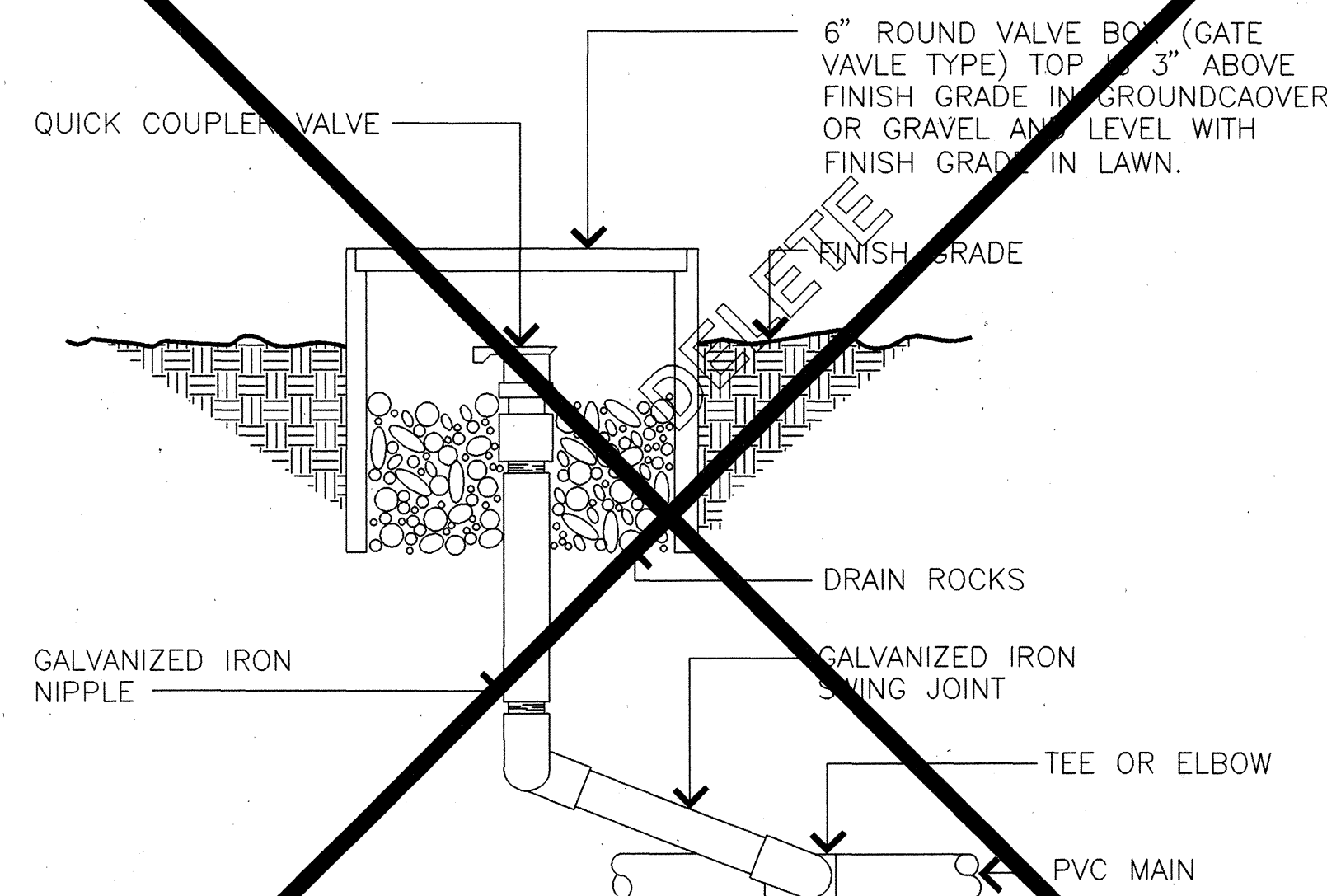
**V DOUBLE CHECK VALVE DETAIL**  
L-31 NOT TO SCALE

NOTES:

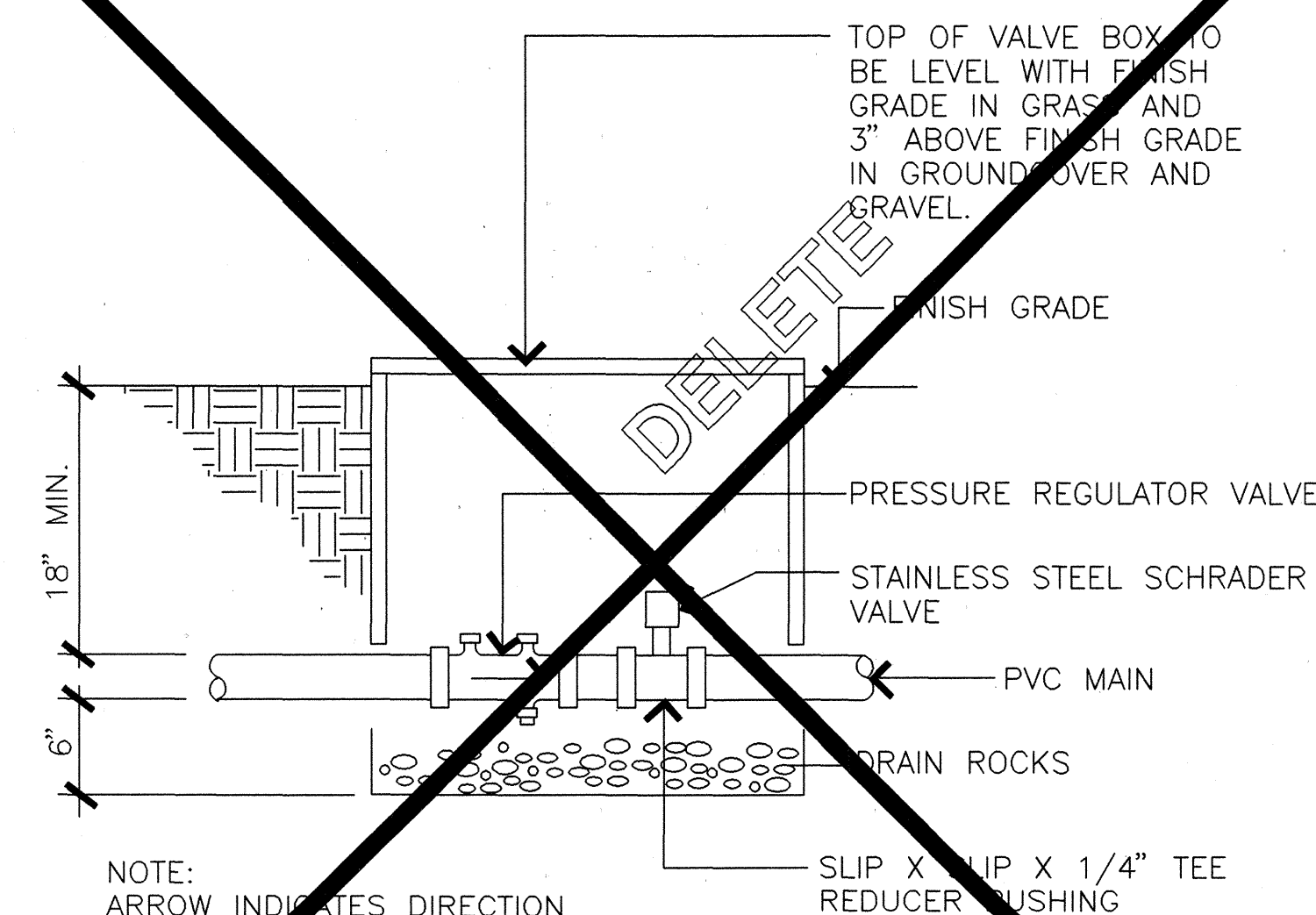
1. ALL WIRING TO BE INSTALLED AS PER LOCAL CODE.
2. SEE MANUFACTURER'S RECOMMENDATIONS FOR MOUNTING
3. INSTALL WITHIN GUARDRAIL IN PLANTING AREA ADJACENT TO GRAVEL MAINTENANCE STRIP



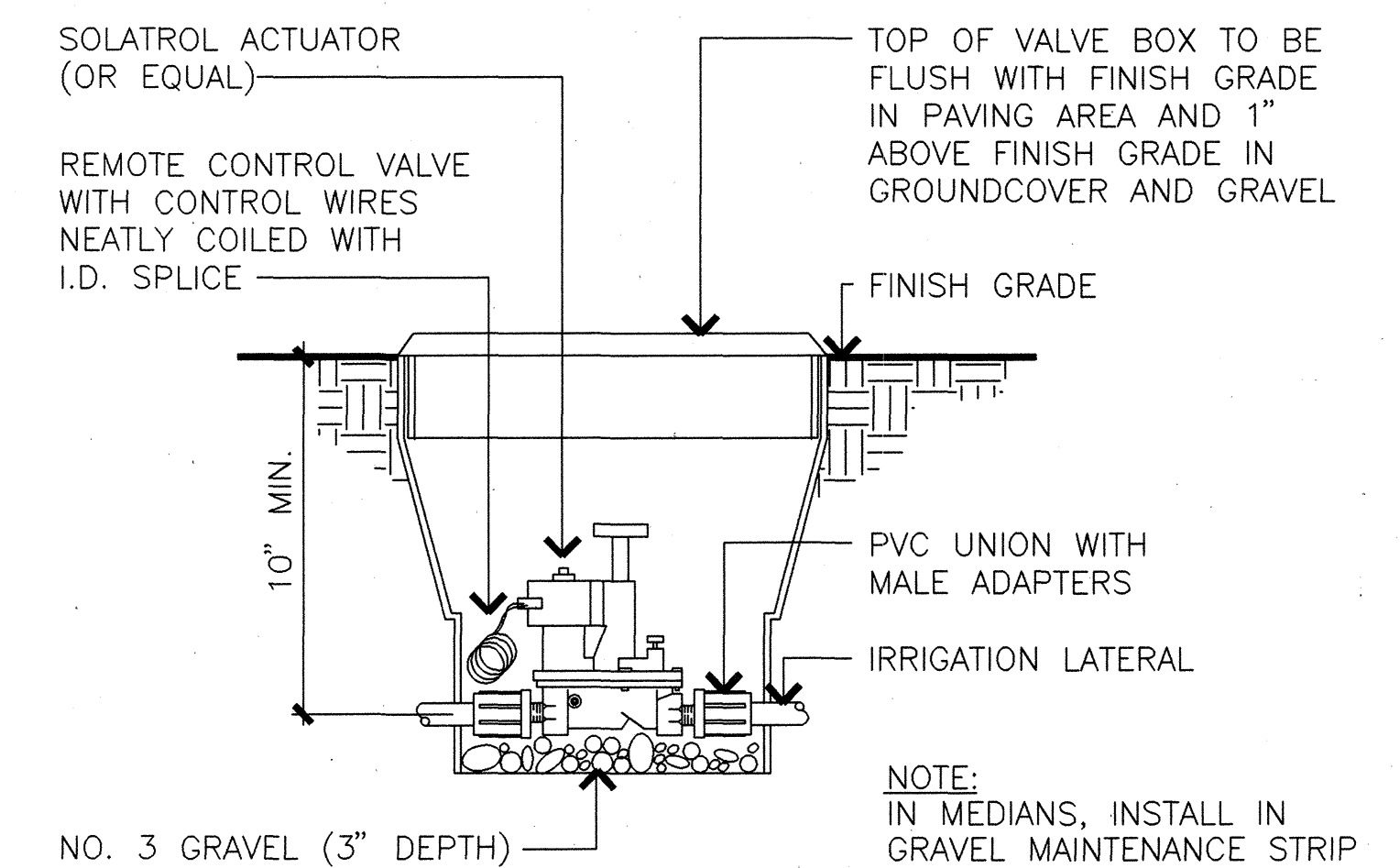
**AUTOMATIC CONTROLLER DETAIL**  
NOT TO SCALE



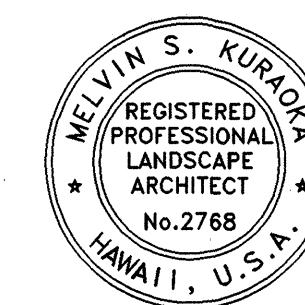
**QUICK COUPLER VALVE DETAIL**  
NOT TO SCALE



**PRESSURE REGULATOR DETAIL**  
NOT TO SCALE



**W REMOTE CONTROL VALVE DETAIL**  
L-31 NOT TO SCALE



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OR UNDER MY SUPERVISION.

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | NH-STP-072-1(35)   | 1993        | 315       | 340          |

| DATE                                                                 | REVISION       |
|----------------------------------------------------------------------|----------------|
| MAR. 95                                                              | REVISED DETAIL |
| STATE OF HAWAII<br>DEPARTMENT OF TRANSPORTATION<br>HIGHWAYS DIVISION |                |
| IRRIGATION DETAILS                                                   |                |
| KALANIANA'OLE HIGHWAY WIDENING                                       |                |
| EAST HALEMAUMAU ST. TO KEAHOE ST.                                    |                |
| F.A. PROJECT NO. NH-STP-072-1(35)                                    |                |
| SCALE: NO SCALE                                                      | DATE: 10/1/92  |
| SHEET No. L-31 OF 32 SHEETS                                          |                |

C.O. 315

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | NH-STP-072-1(35)   | 1993        | 316       | 340          |

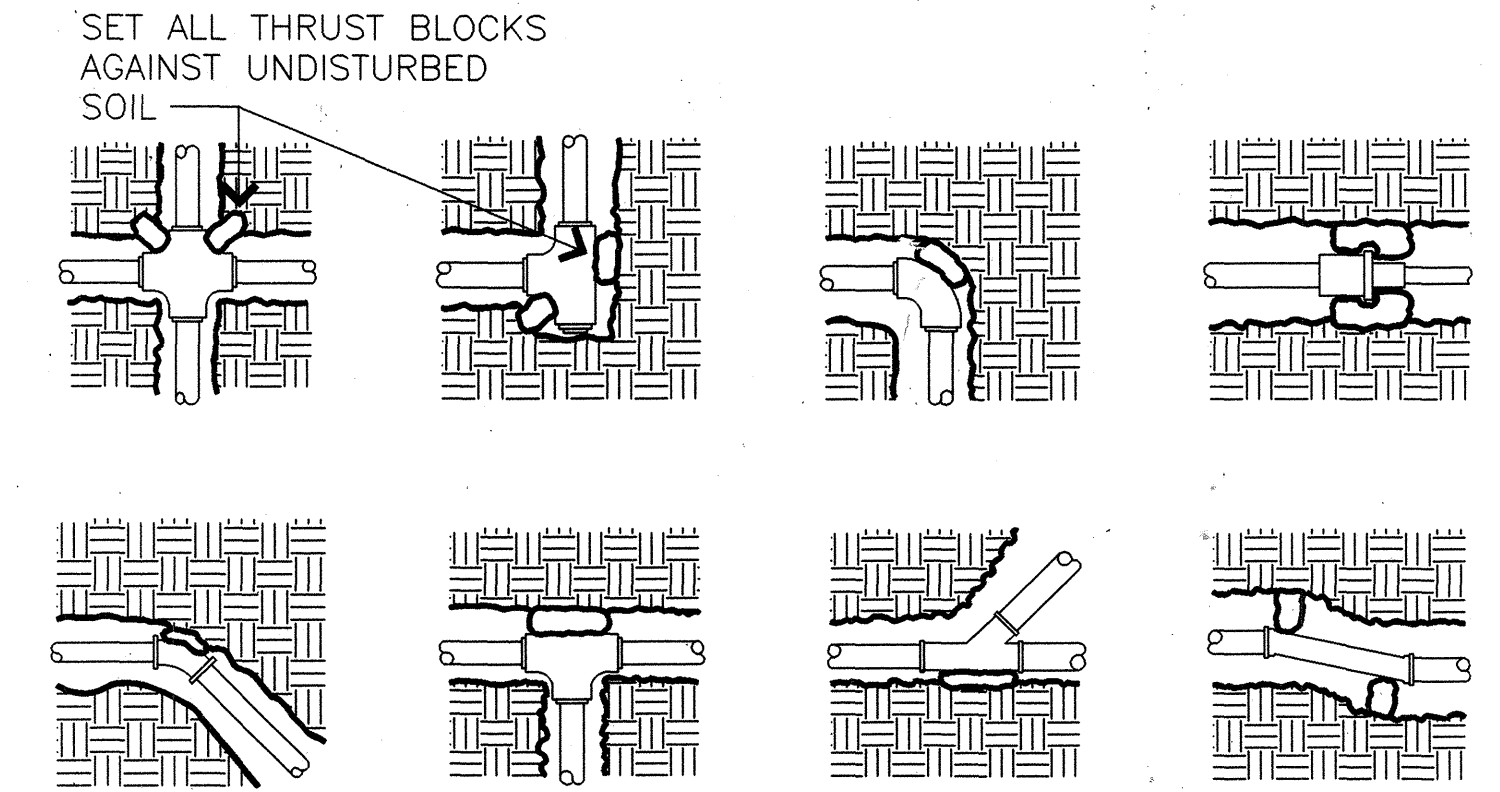
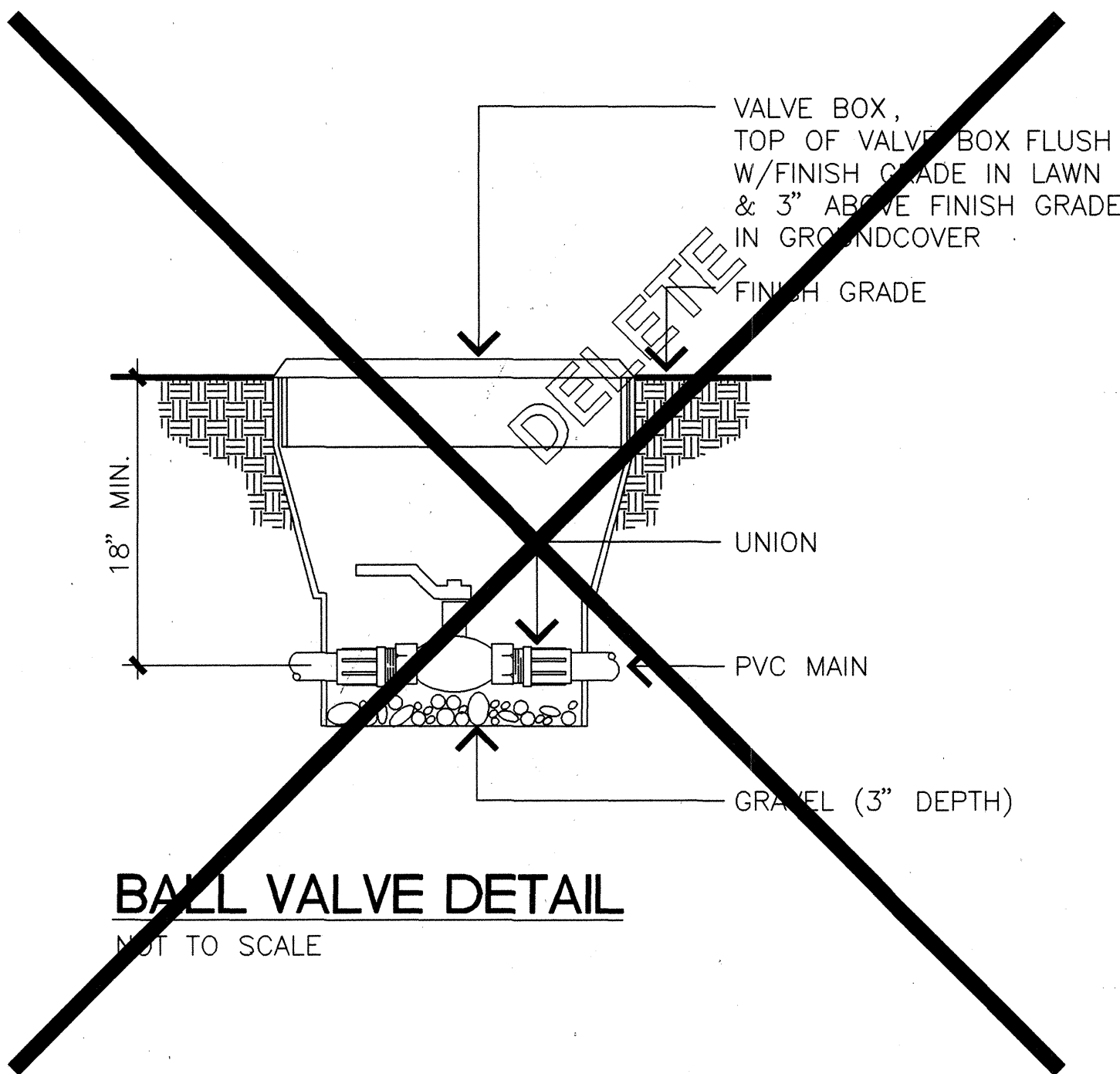
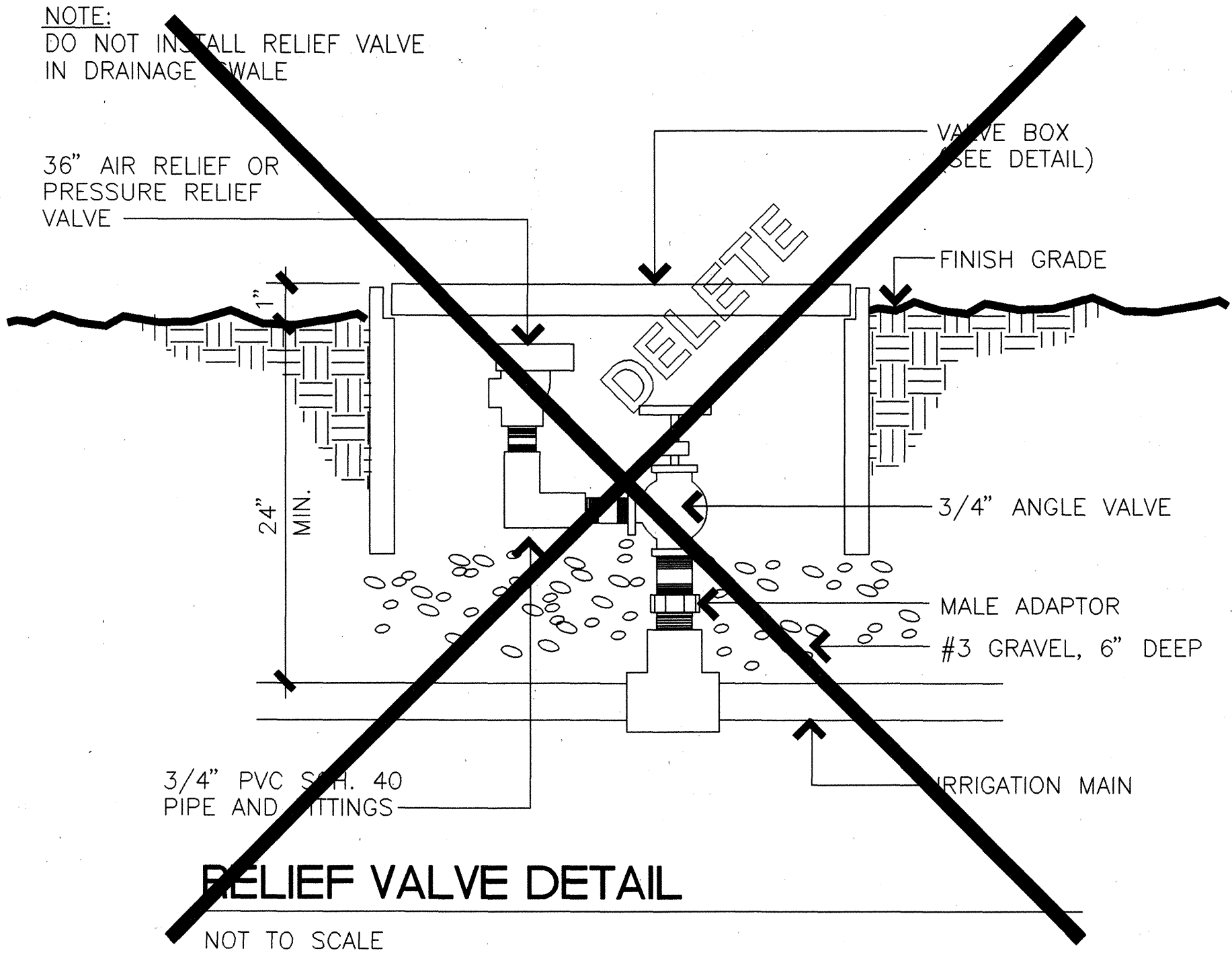


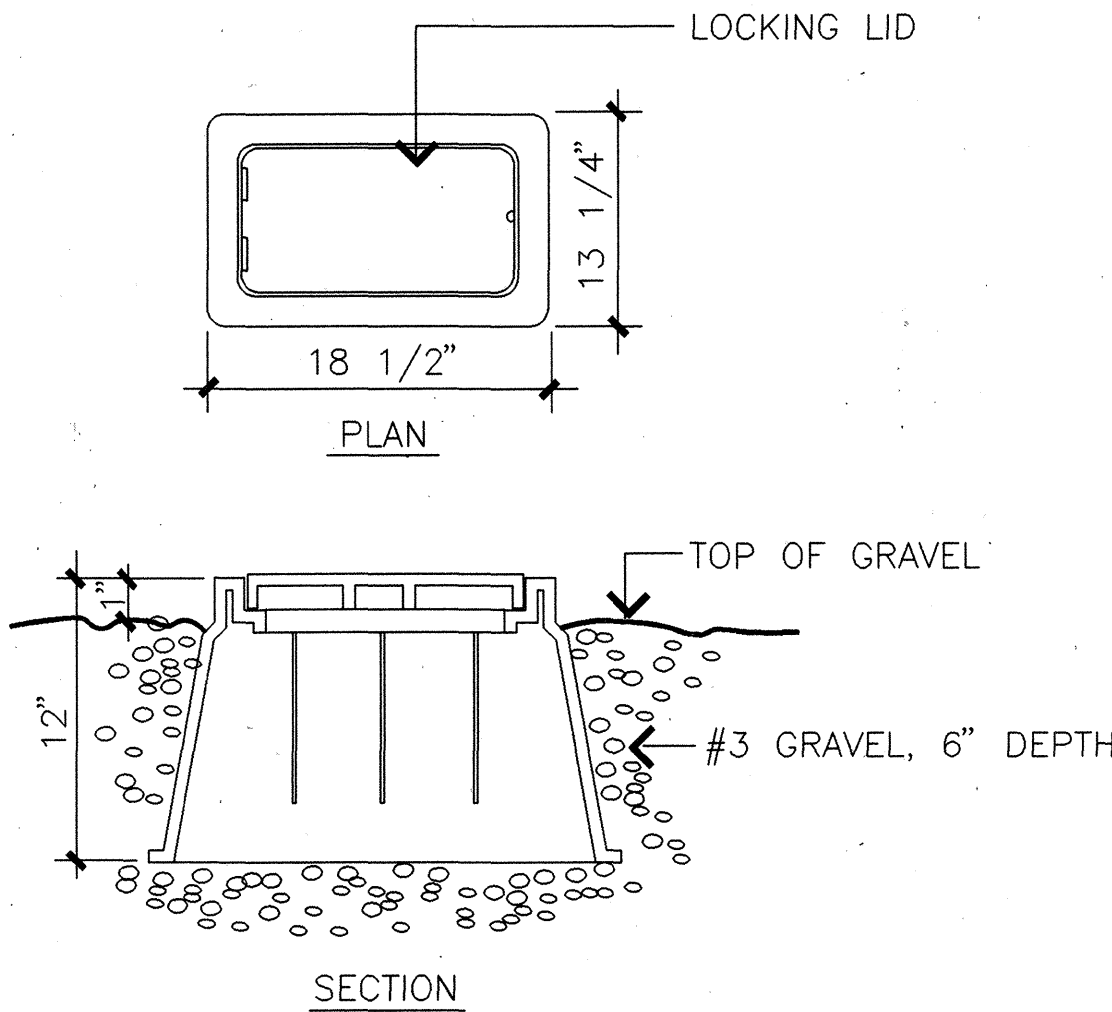
TABLE FOR BEARING AREA OF THRUST BLOCKS (SQ. FT.)

| PIPE SIZE      | 1-1/4" | 1-1/2" | 2"   | 2-1/2" | 3"   | 4"   | 6"  |
|----------------|--------|--------|------|--------|------|------|-----|
| TEES & CROSSES | 0.50   | 0.50   | 0.50 | 0.50   | 1.00 | 1.25 | 3.2 |
| 90° BEND       | 0.50   | 0.50   | 0.50 | 0.75   | 1.25 | 2.00 | 4.5 |
| 45° BEND       | 0.50   | 0.50   | 0.50 | 0.50   | 0.75 | 1.00 | 2.4 |

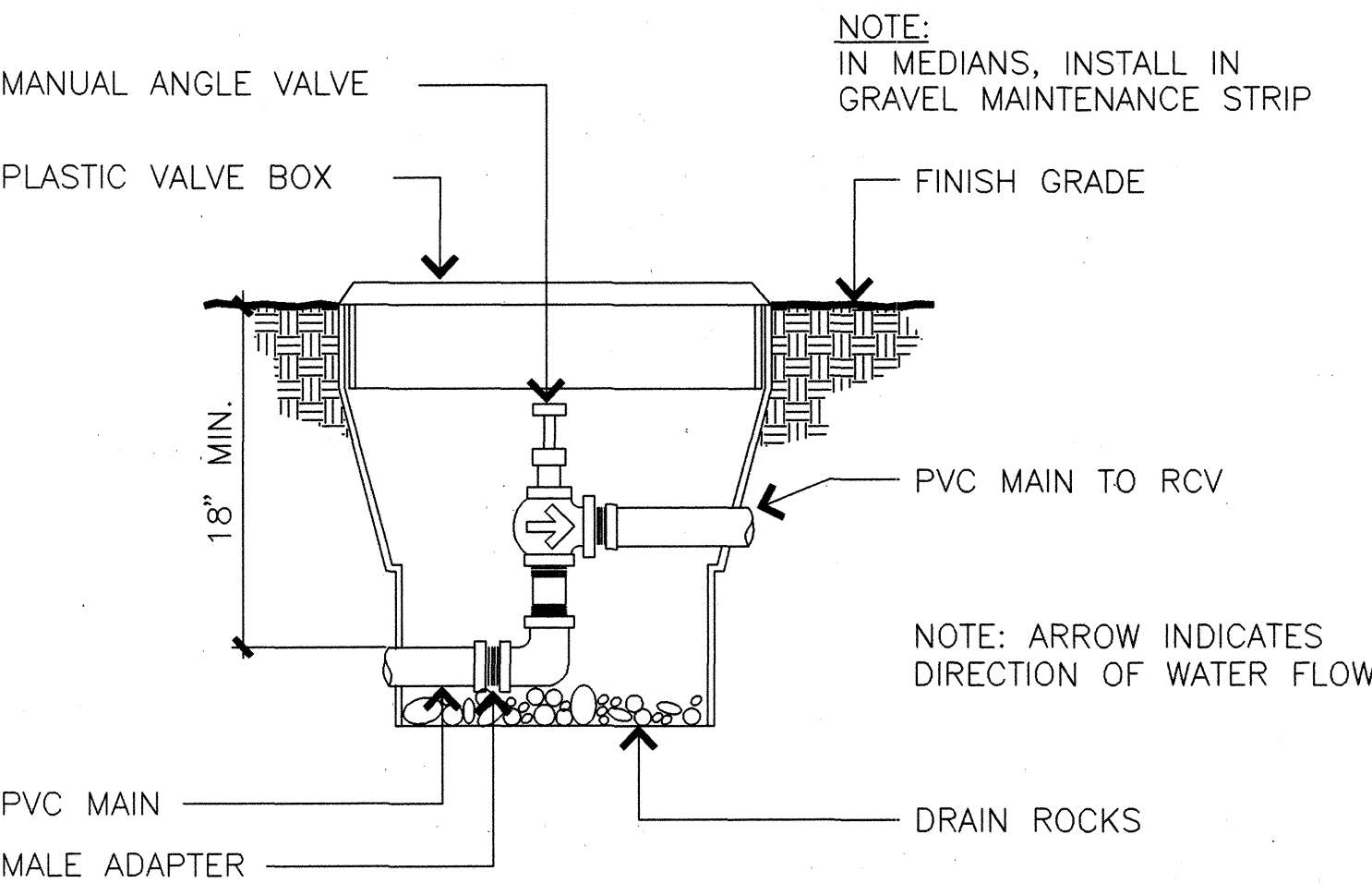
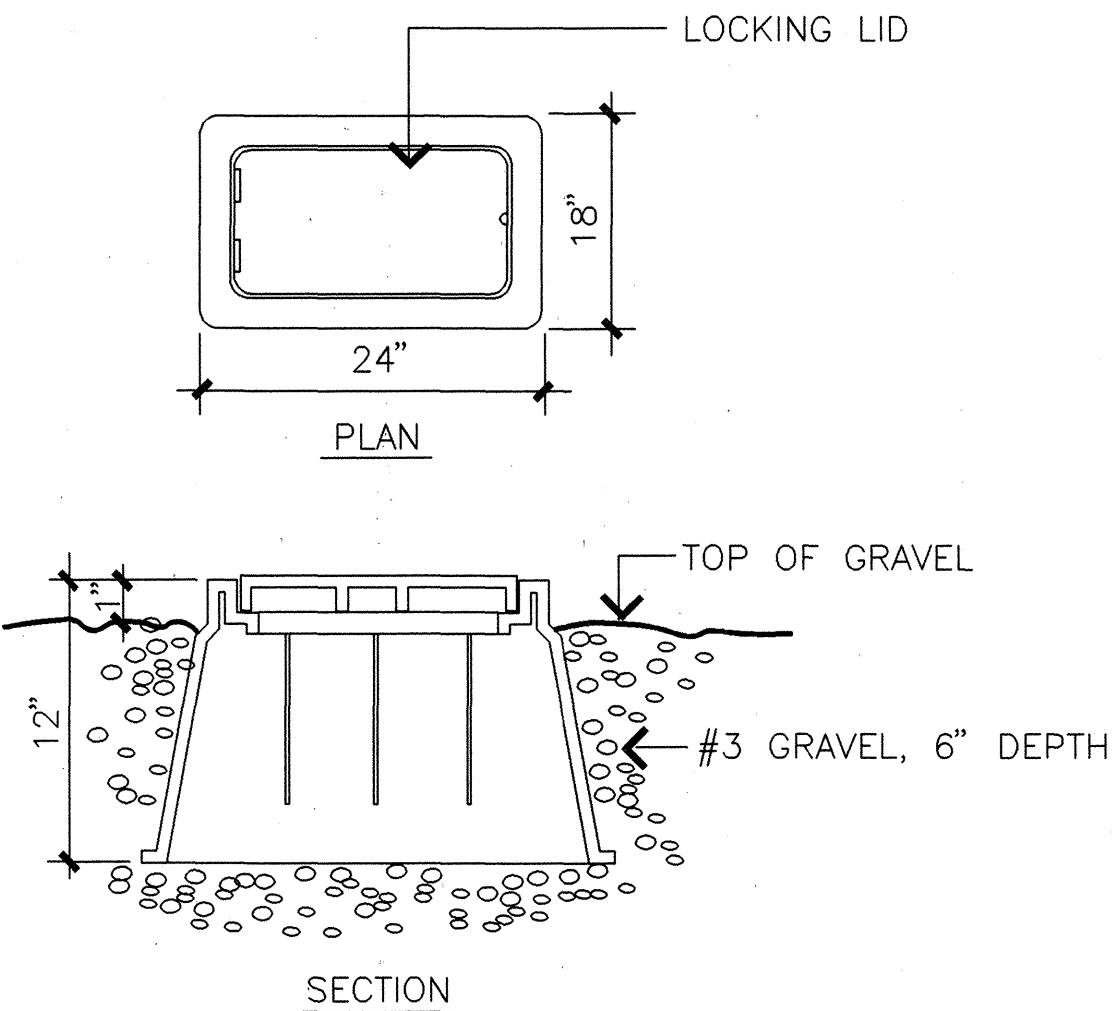
**X**  
**L-32** TYPICAL THRUST BLOCK DETAIL FOR IRRIGATION MAINS  
NOT TO SCALE



NOTE: IN MEDIANS, INSTALL IN GRAVEL MAINTENANCE STRIP



NOTE: IN MEDIANS, INSTALL IN GRAVEL MAINTENANCE STRIP



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

| DATE                                                                 | REVISION        |
|----------------------------------------------------------------------|-----------------|
| MAR. 1995                                                            | DELETED DETAILS |
| STATE OF HAWAII<br>DEPARTMENT OF TRANSPORTATION<br>HIGHWAYS DIVISION |                 |
| IRRIGATION DETAILS                                                   |                 |
| KALANIANA'OLE HIGHWAY WIDENING                                       |                 |
| EAST HALEMAUMAU ST. TO KEAHOE ST.                                    |                 |
| F.A. PROJECT NO. NH-STP-072-1(35)                                    |                 |
| SCALE: NO SCALE                                                      | DATE: 10/1/92   |
| SHEET No. L-32 OF 32 SHEETS                                          |                 |