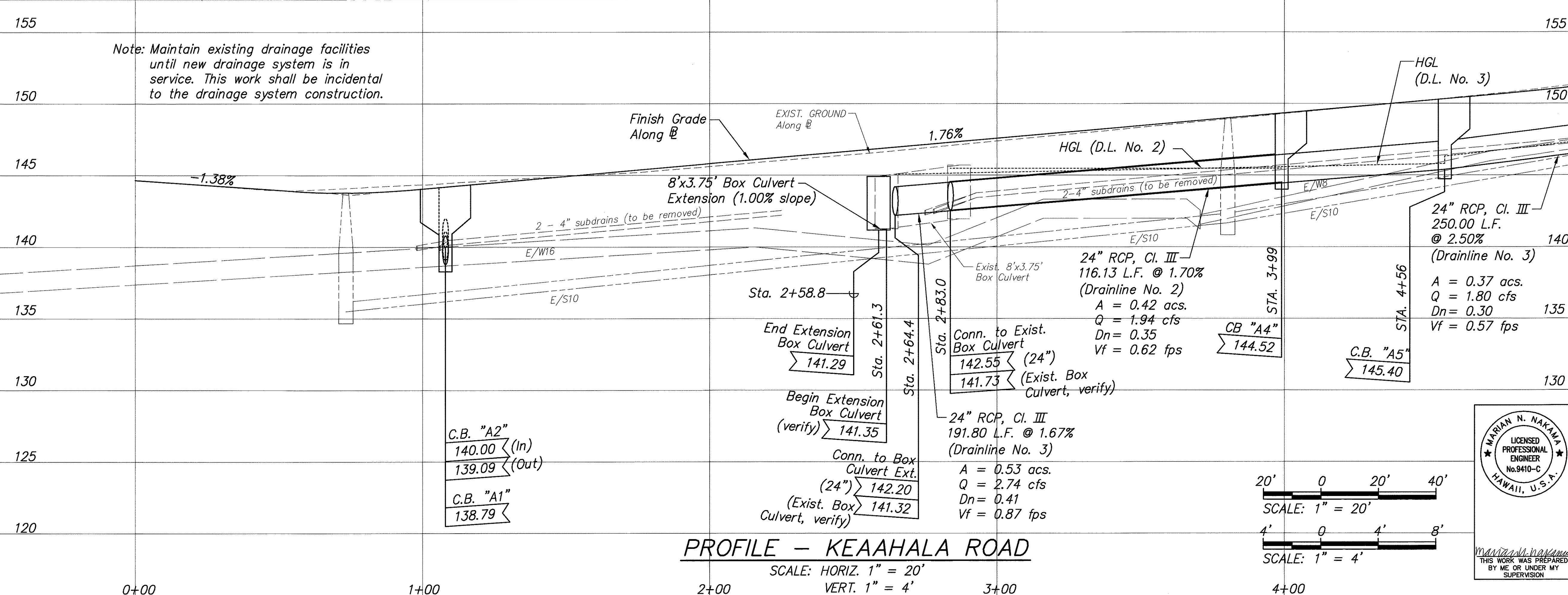
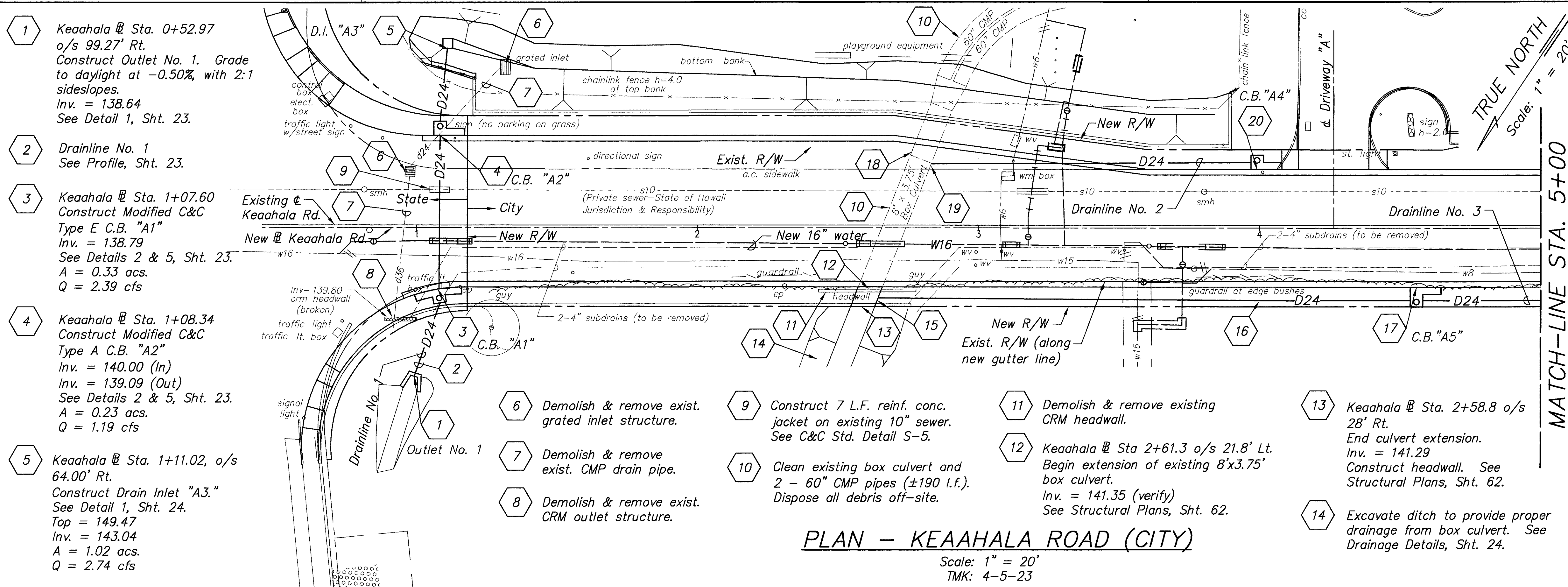


146"  
PM: STY  
OPER: SA, BKM, \*RGQ, RMK, MNN, MSM  
REVISED: 04/24/00

FILE: DOT95115  
SCALE: 1"=20'  
BEG: 5/3/97

|                   |      |
|-------------------|------|
| SURVEY PLOTTED BY | DATE |
| DRAWN BY          |      |
| CHECKED BY        |      |
| DESIGNED BY       |      |
| QUANTITIES BY     |      |
| NOTED BY          |      |
| ORIGINAL PLAN     |      |
| NO.               |      |

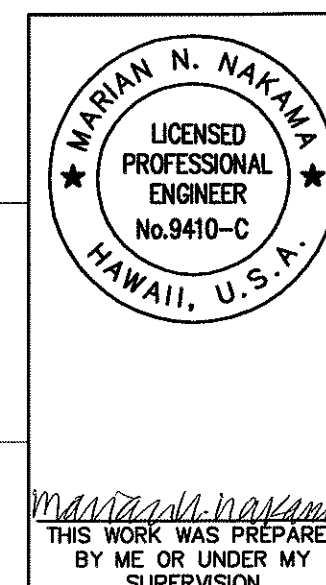


| FED. ROAD<br>DIST. NO. | STATE | PROJ. NO.   | FISCAL<br>YEAR | SHEET<br>NO. | TOTAL<br>SHEETS |
|------------------------|-------|-------------|----------------|--------------|-----------------|
| HAWAII                 | HAW.  | HWY-0-03-97 | 2000           | 21           | 110             |

- 15 Kealahala @ Sta 2+64.4 o/s 24.79' Lt.  
(Contractor to verify)  
Connect 24" RCP to box culvert ext.  
Inv. = 142.20 (24")
- 16 Deflect Drainline No. 3 (horizontal)  
between box culvert connection and  
 $\pm$ Sta. 4+00. Drain pipe must clear  
both joint pole at  $\pm$ Sta. 4+11 and  
headwall structure at box culvert  
extension. See Detail 4, Sht. 23 and  
Structural Plan, Detail 1/, Sht. 62 for  
clarification.
- 17 Kealahala @ Sta. 4+56  
Construct C&C Std. Type A C.B. "A5"  
See Details 2 & 4, Sht. 23 for  
additional information.  
Inv. = 145.40  
A = 0.16 acs.  
Q = 0.94 cfs
- 18 Demolish portion of box culvert top  
slab and reconstruct with traffic  
bearing slab. See Structural Plans,  
Sht. 61.
- 19 Kealahala @ Sta 2+83.0 o/s 22.5' Lt.  
Connect 24" RCP to exist. box culvert  
Inv. = 142.55 (24")  
Inv. = 141.73 (verify)  
See Detail 3, Sht. 23.
- 20 Kealahala @ Sta. 3+99  
Construct C&C Standard  
Type A C.B. "A4"  
See Detail 2, Sheet 23  
Inv. = 144.52  
A = 0.42 acs.  
Q = 1.94 cfs

APPROVED:

M. [Signature] S/4/m  
Chief, Civil Engineering Branch  
Dept. of Planning & Permitting  
City & County of Honolulu



STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION  
DRAINAGE PLAN & PROFILE  
STA. 0+00 TO STA. 5+00

KEAAHALA ROAD WIDENING  
KAHEKILI HIGHWAY TO PO'OKELA STREET  
State Project No. HWY-0-03-97

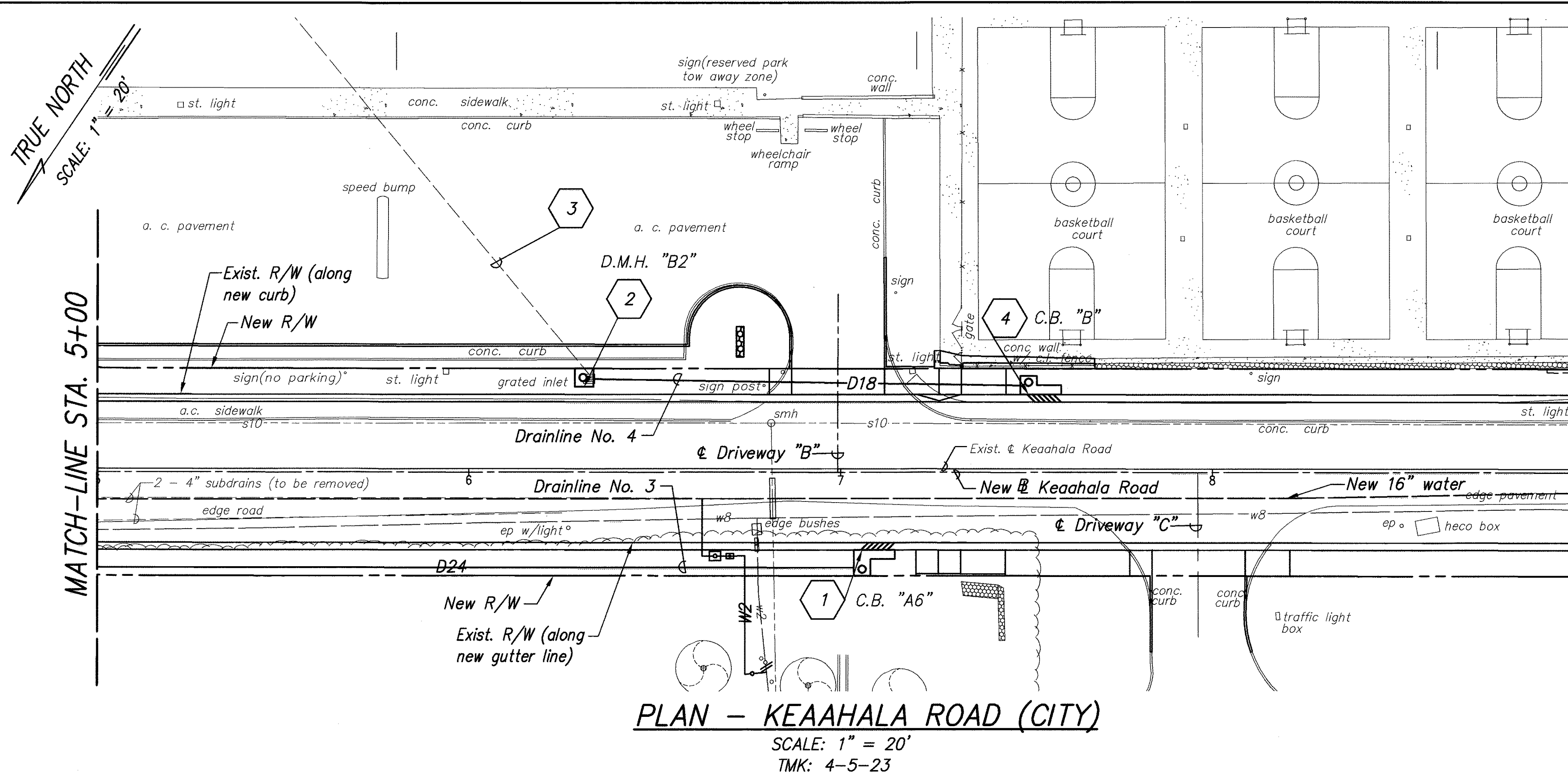
Scale: As shown Date: April 2000

SHEET NO. C-21 OF C-55 SHEETS

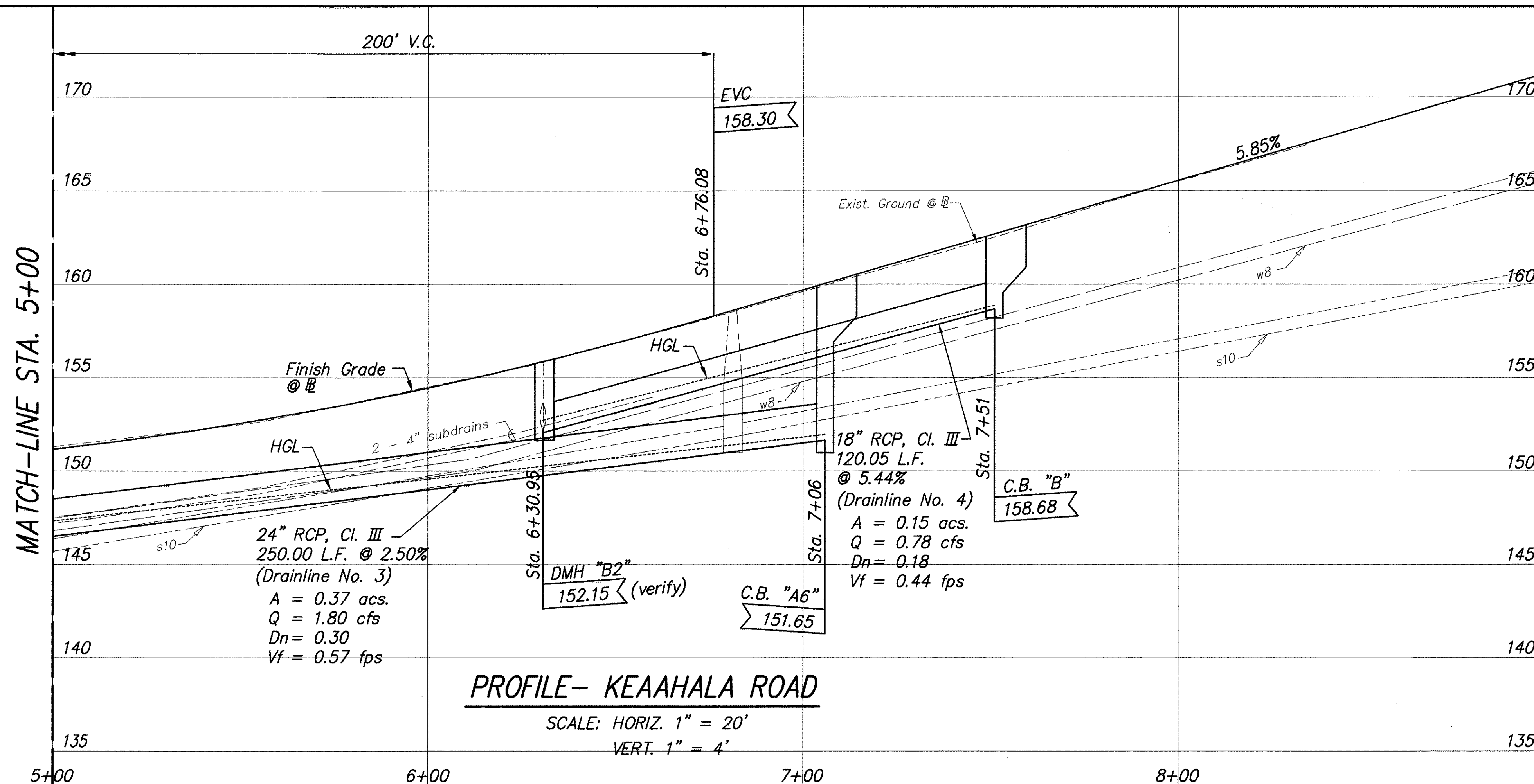
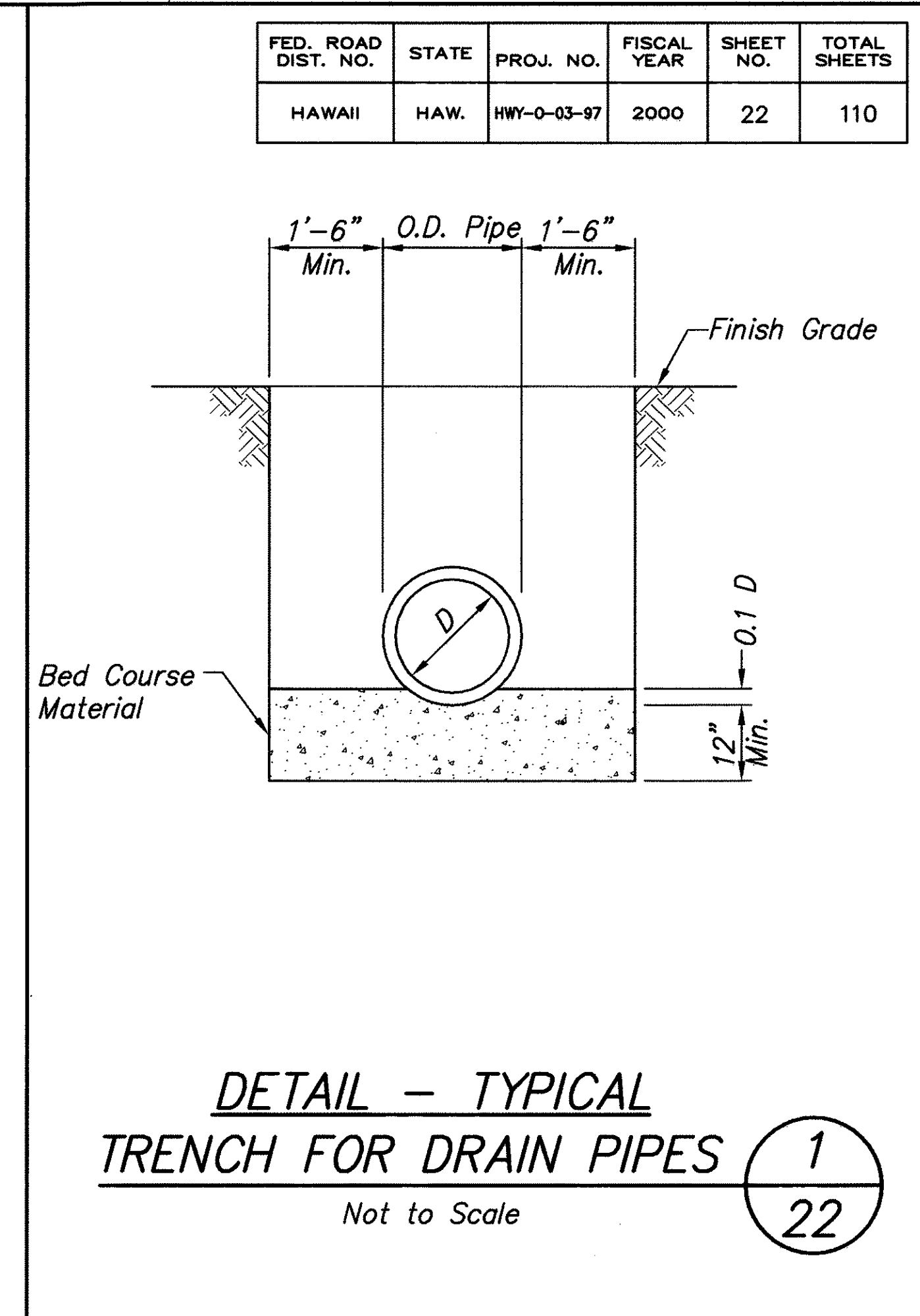


PM: STY  
OPER: sai, SAIMN, MSM, \*RGQ  
REVIS: 04/26/00  
146"  
FILE: DOT95116  
SCALE: 1"=20'  
BEG: 5/3/97

|                   |      |
|-------------------|------|
| SURVEY PLOTTED BY | DATE |
| DESIGNED BY       |      |
| NOTED BY          |      |
| CHECKED BY        |      |
| ORIGINAL PLAN     |      |
| NO.               |      |



- Kealahala Sta. 7+06  
Construct C&C Std. Type A  
C.B. "A6" w/ Deflector Inlet  
Inv. = 151.65  
Deflector Inlet per C&C Std.  
Detail D-15.  
See Details 2 & 4, Sht. 23  
for additional information.  
A = 0.37 acs.  
Q = 1.80 cfs
- Kealahala Sta. 6+30.95  
Demolish and remove existing  
inlet. Construct Shallow Drain  
Manhole "B2"  
Connect to existing 18" drain.  
See C&C Std. Detail D-17.  
Inv. = 152.15 (verify)
- Clean Exist. 18" Drain Pipe.  
Dispose of debris off-site.  
(Approx. 135 l.f.)  
A = 0.15 acs.  
Q = 0.78 cfs  
S = 0.0257 ft/ft  
Dn = 0.22  
Vf = 0.44 fps
- Kealahala Sta. 7+51  
Construct Type A  
C.B. "B" w/ Deflector Inlet  
Inv. = 158.68  
See Detail 2, Sht. 23  
Deflector Inlet per C&C Std.  
Detail D-15.  
A = 0.15 acs.  
Q = 0.78 cfs



APPROVED:

M. 7-20  
Chief, Civil Engineering Branch  
Dept. of Planning & Permitting  
City & County of Honolulu

5/4/00  
Date

Scale: As shown  
Date: April 2000  
SHEET NO. C-22 OF C-55 SHEETS

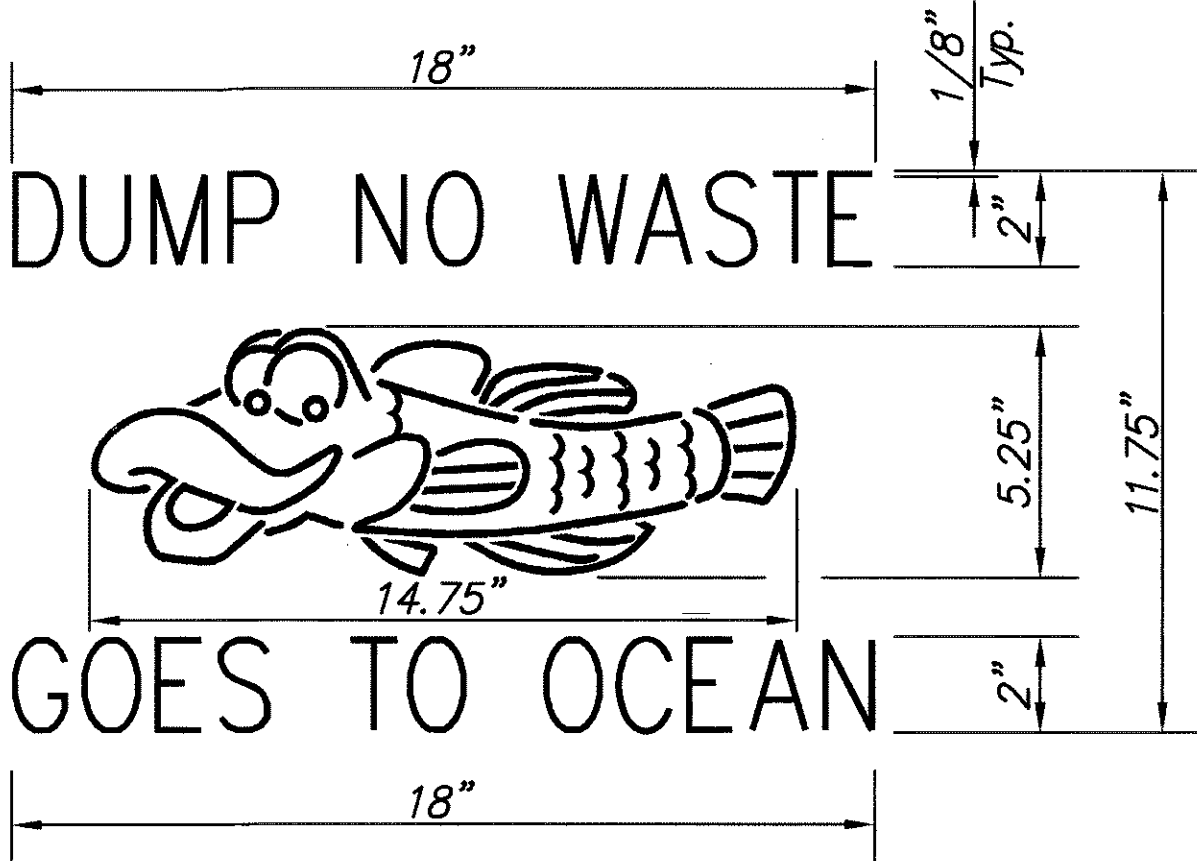
STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION  
DRAINAGE PLAN & PROFILE  
STA. 5+00 TO END  
KEAAHALA ROAD WIDENING  
KAHEKILI HIGHWAY TO PO'OKELA STREET  
State Project No. HWY-0-03-97

MARIAN N. NAKAMA  
LICENSED PROFESSIONAL ENGINEER  
No. 9410-C  
HAWAII, U.S.A.

THIS WORK WAS PREPARED  
BY ME OR UNDER MY  
SUPERVISION



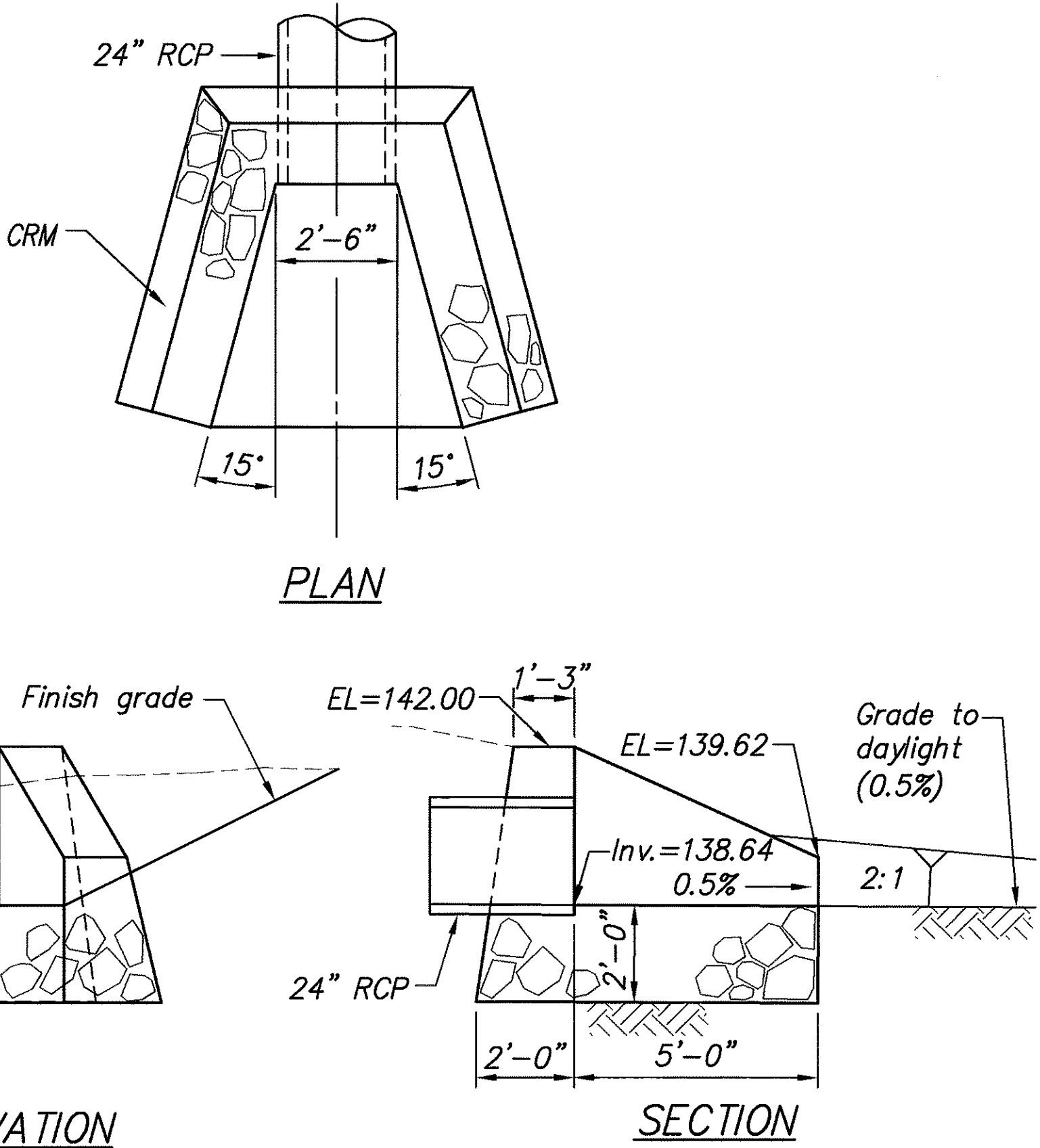
| FED. ROAD DIST. NO. | STATE | PROJ. NO.   | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|-------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | HWY-0-03-97 | 2000        | 23        | 110          |



- Specifications:**
- Material:** Aluminum alloy (cast aluminum), lead, or equal.
  - Lettering:** Height of letters shall be 2" high and 1/8" wide. The under side of all lettering shall be v-shaped.
  - Line Work:** All line work for the fish diagram shall be 1/8" thick. The under side of the line work shall be v-shaped.
  - Placement:** The stencil shall be centered on the top deck of the catch basin and shall be a minimum of 8" away from the front face of the inlet.
  - Impression:** The stencil shall be pressed 1/4" into the green concrete when the inlet is made.

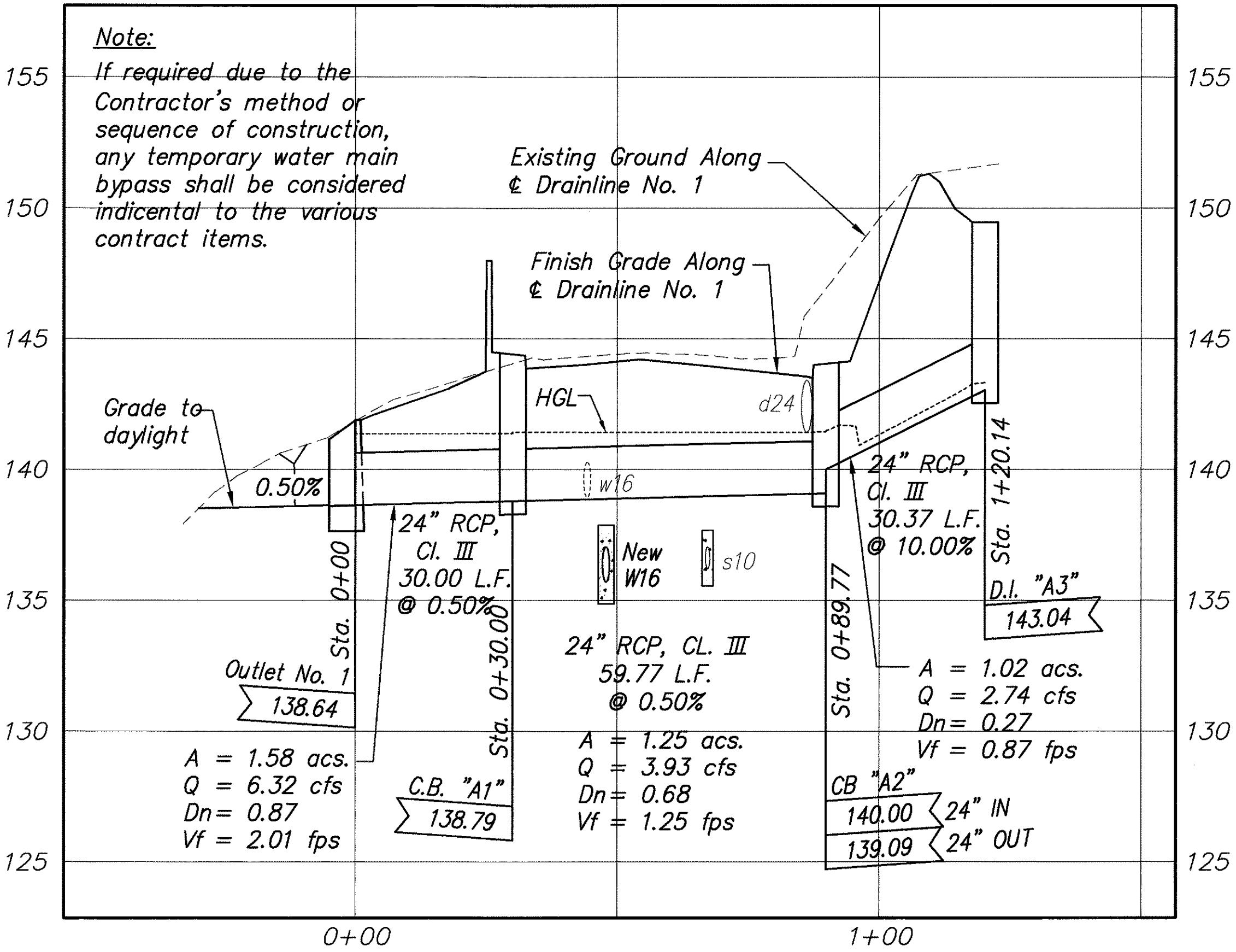
**STENCIL DETAIL FOR CATCH BASIN** 2  
23

NOT TO SCALE



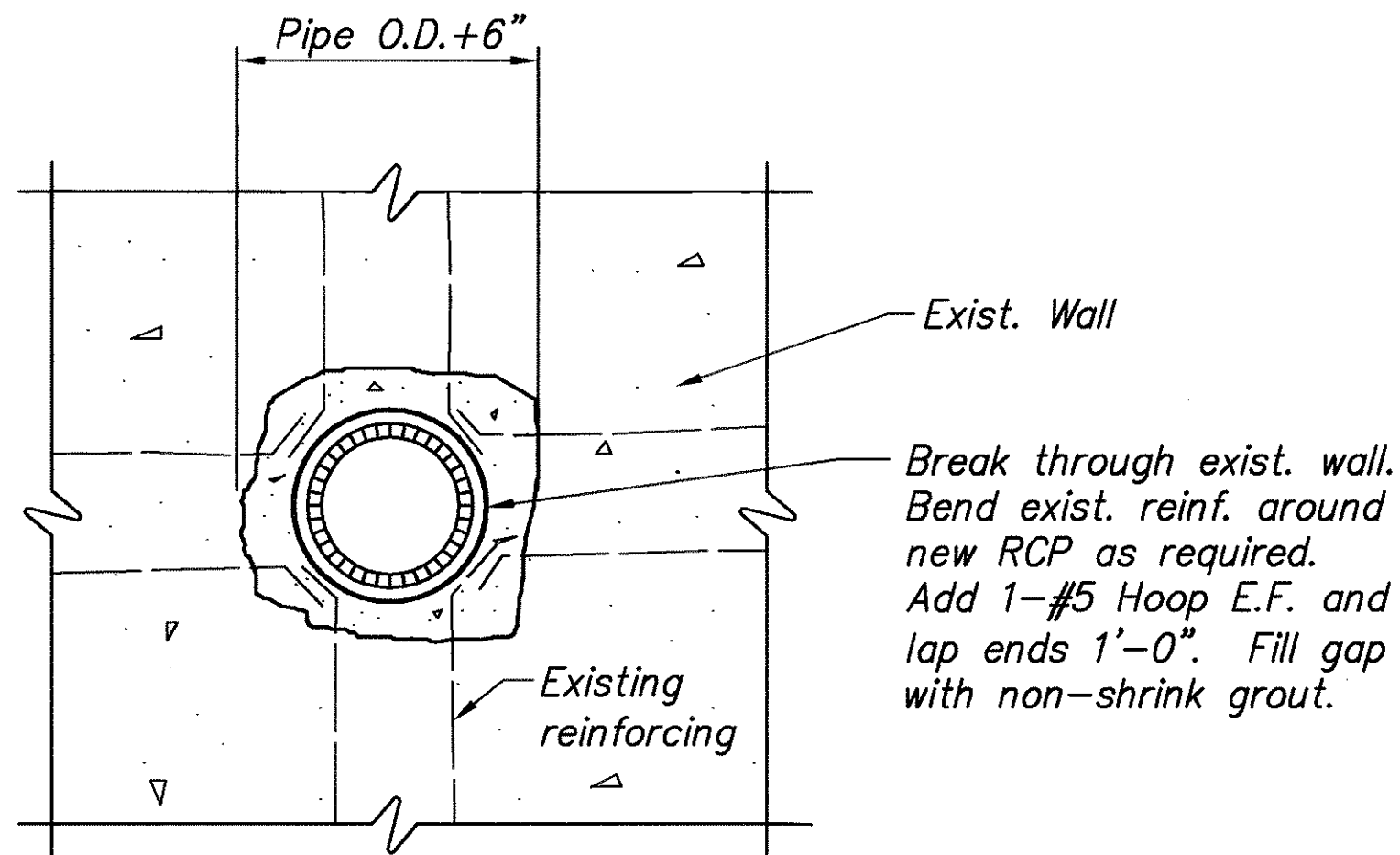
**DETAIL - OUTLET NO. 1** 1  
23

SCALE: 3/8" = 1'-0"



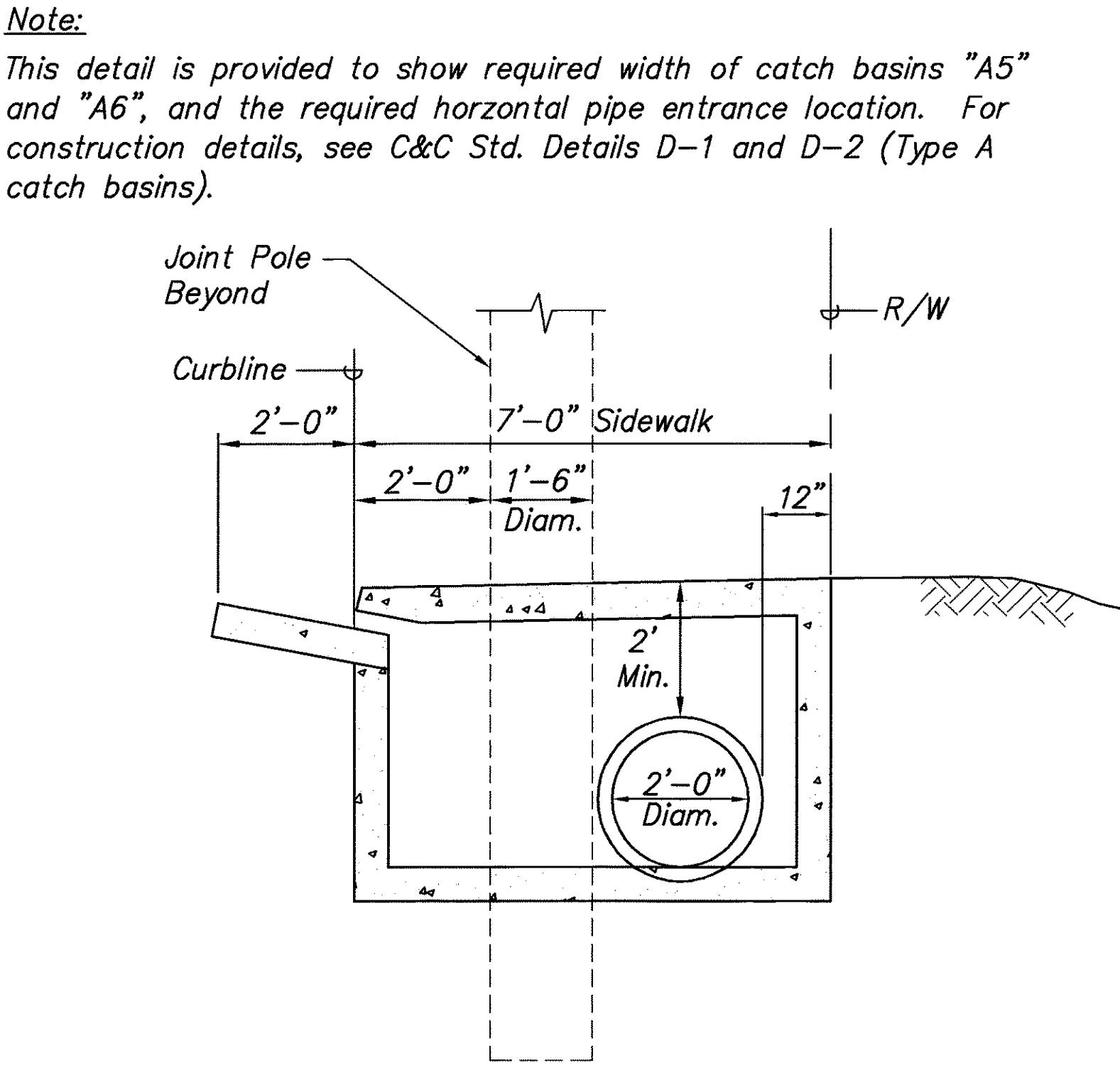
**PROFILE - DRAIN LINE No. 1**

SCALE: HORIZ. 1" = 20'  
VERT. 1" = 4'



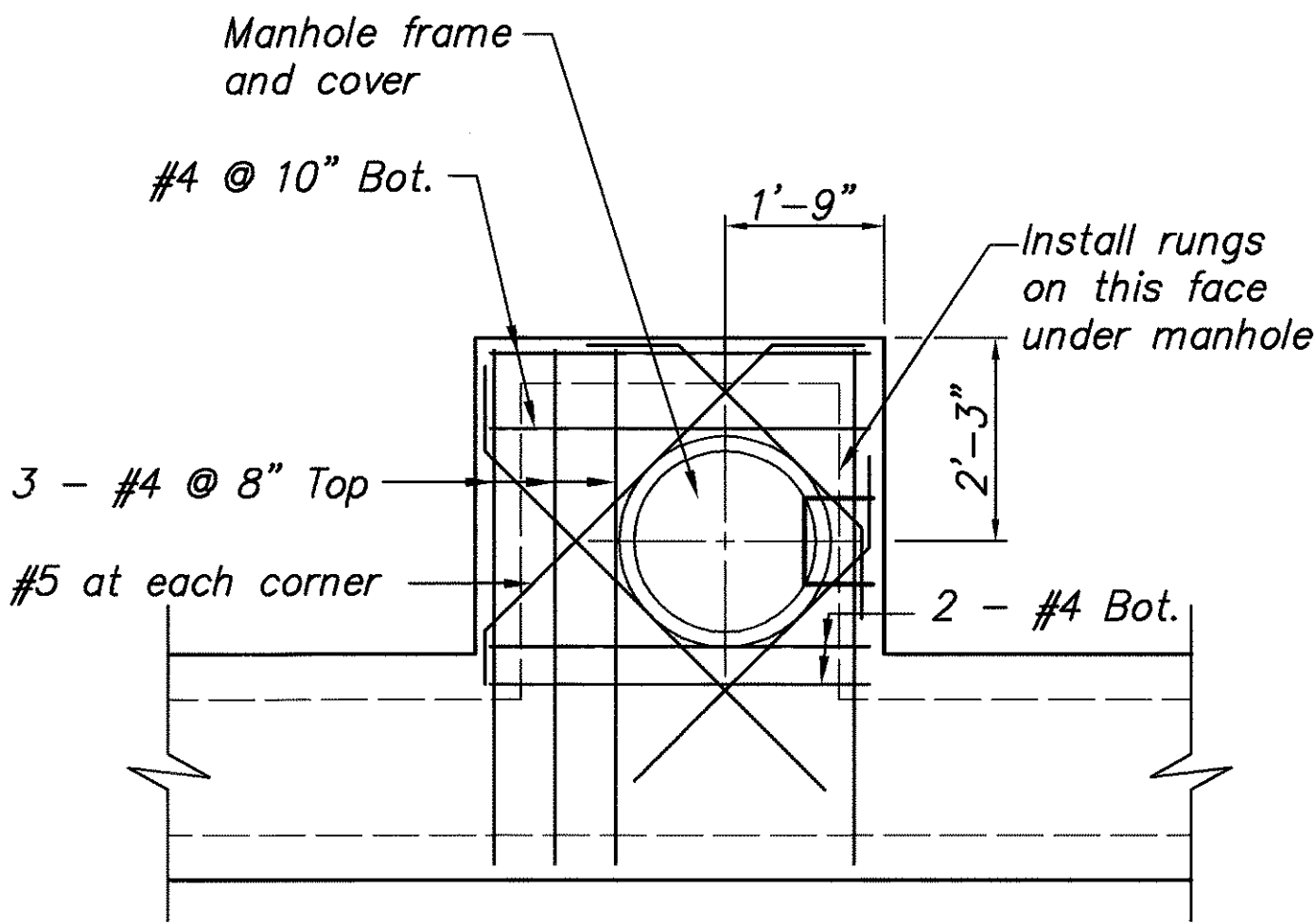
**DRAIN CONNECTION TO EXISTING BOX CULVERT** 3  
23

NOT TO SCALE



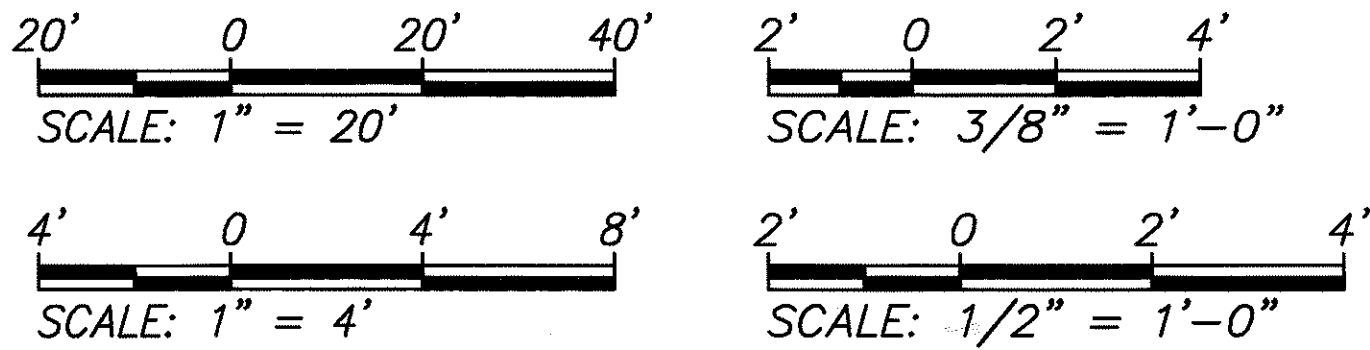
**DETAIL - CATCH BASINS "A5" & "A6"** 4  
23

SCALE: 1/2" = 1'-0"



**MODIFIED TYPE "A" & "E" CATCH BASIN REINF. DETAIL** 5  
23

SCALE: 1/2" = 1'-0"



**APPROVED:**

*M. Nakama* 5/4/00  
 Chief, Civil Engineering Branch  
 Dept. of Planning & Permitting  
 City & County of Honolulu Date

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**DRAINAGE DETAILS**

KEAAHALA ROAD WIDENING  
KAHEKILI HIGHWAY TO PO'OKELA STREET  
State Project No. HWY-0-03-97

Scale: As shown Date: April 2000

SHEET NO. C-23 OF C-55 SHEETS

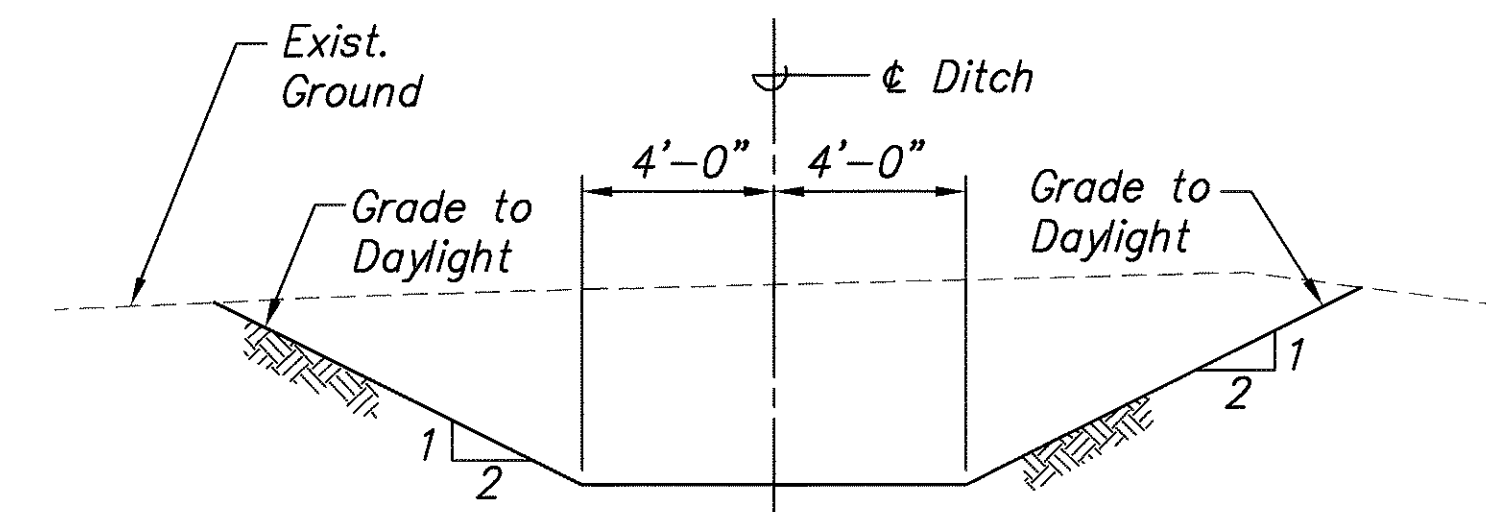
FILE: DOT95123  
SCALE: 1" = 20'  
BEG: 09/29/98

|                   |      |
|-------------------|------|
| SURVEY PLOTTED BY | DATE |
| DRAWN BY          |      |
| TRACED BY         |      |
| CHECKED BY        |      |
| NOTED BY          |      |
| NO.               |      |

PM: MNN  
OPR: MNN,\*RGQ,MSM  
REVISED: 04/21/00



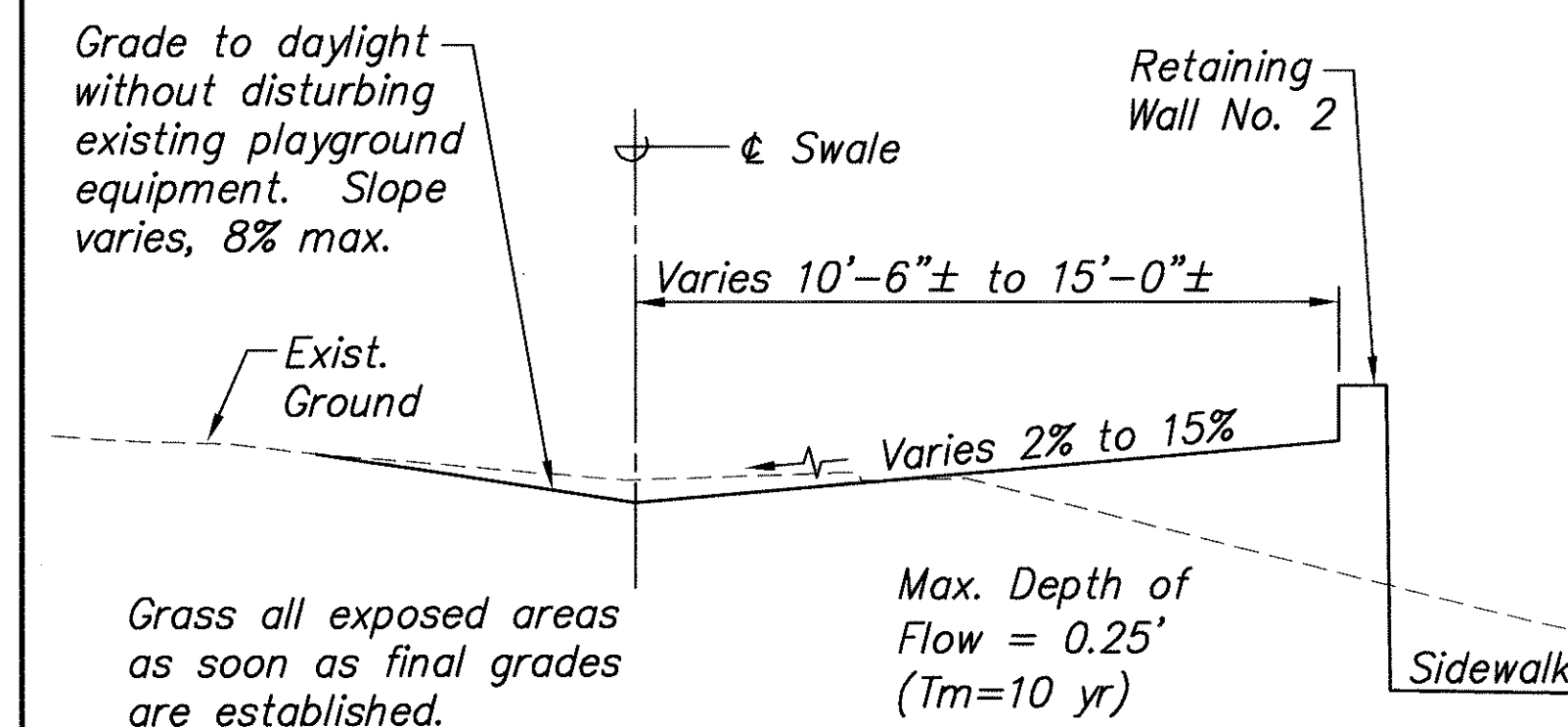
| FED. ROAD DIST. NO. | STATE | PROJ. NO.   | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|-------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | HWY-0-03-97 | 2000        | 24        | 110          |



Hydromulch and install 100% biodegradable erosion control blanket on all exposed slopes as soon as final grades established

Max. Depth of Flow:  
2.51' (Tm=50 yr)  
2.12' (Tm=10 yr)

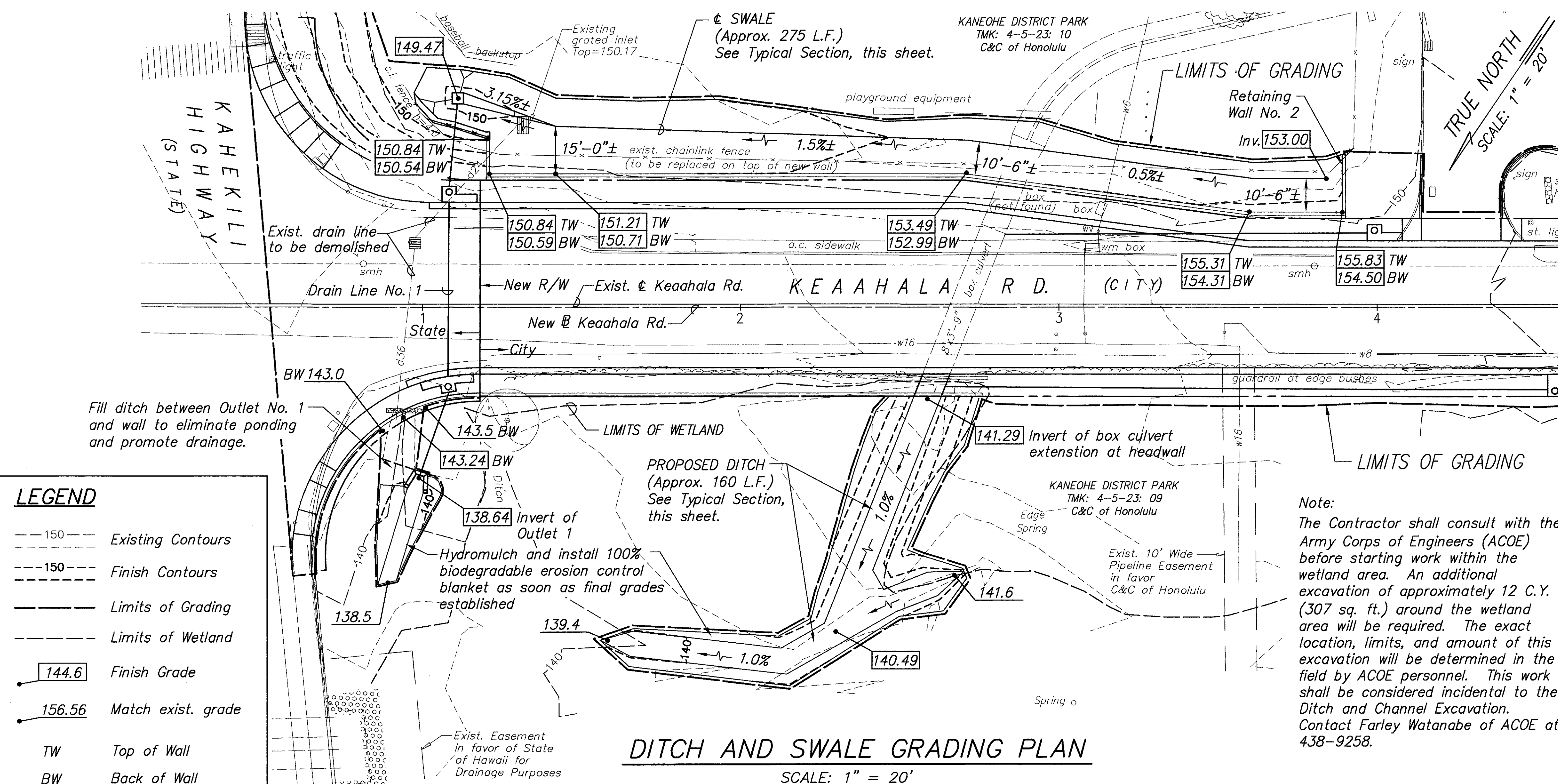
**TYPICAL SECTION - DITCH**  
SCALE: 1" = 4'



Grass all exposed areas as soon as final grades are established.

Max. Depth of Flow = 0.25' (Tm=10 yr)

**TYPICAL SECTION - SWALE**  
SCALE: 1" = 4'

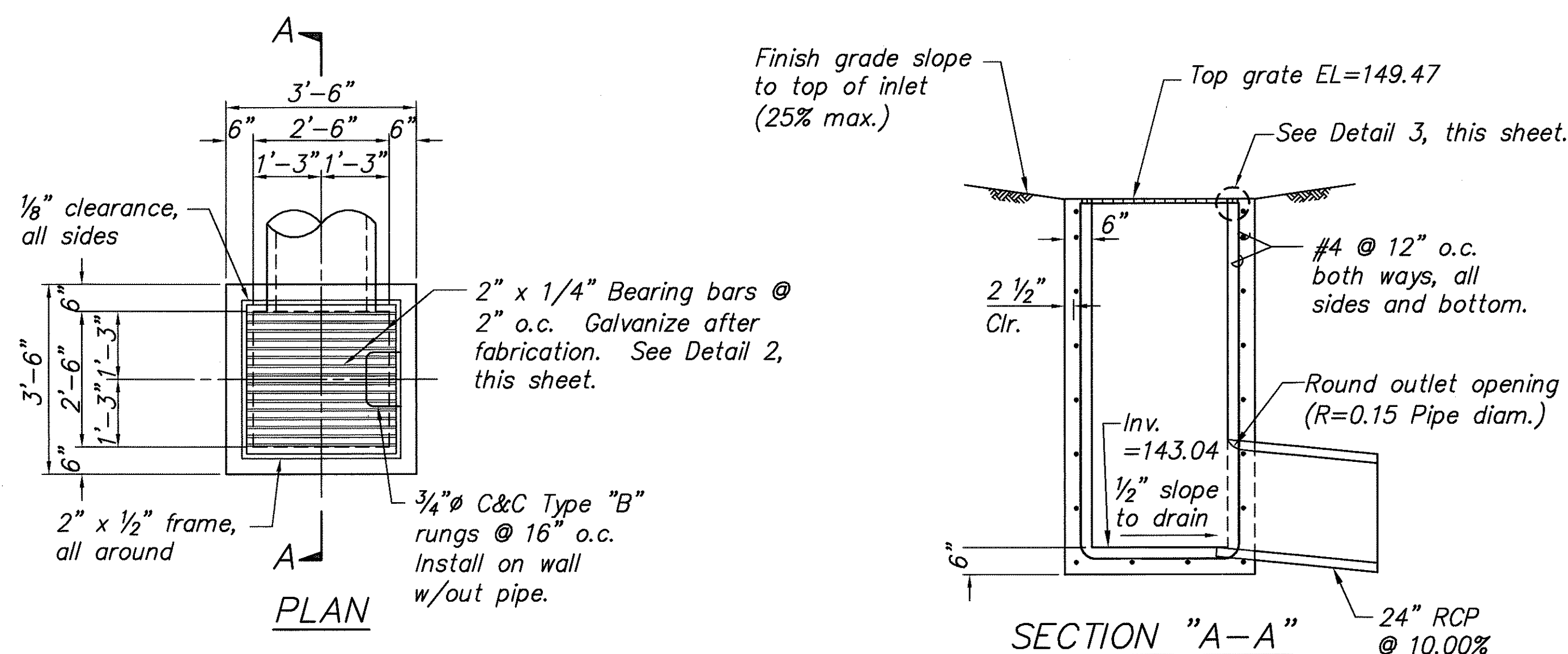


**LEGEND**

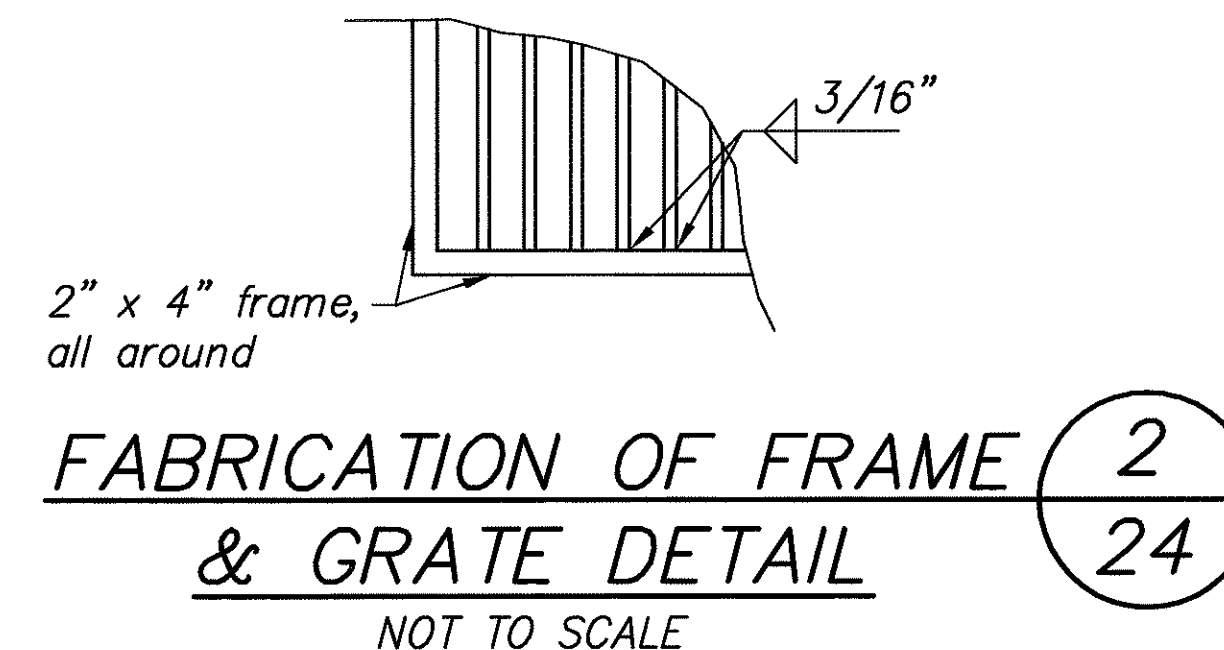
- 150--- Existing Contours
- 150--- Finish Contours
- Limits of Grading
- Limits of Wetland
- 144.6 Finish Grade
- 156.56 Match exist. grade
- TW Top of Wall
- BW Back of Wall (bottom)

Note:  
The Contractor shall consult with the Army Corps of Engineers (ACOE) before starting work within the wetland area. An additional excavation of approximately 12 C.Y. (307 sq. ft.) around the wetland area will be required. The exact location, limits, and amount of this excavation will be determined in the field by ACOE personnel. This work shall be considered incidental to the Ditch and Channel Excavation. Contact Farley Watanabe of ACOE at 438-9258.

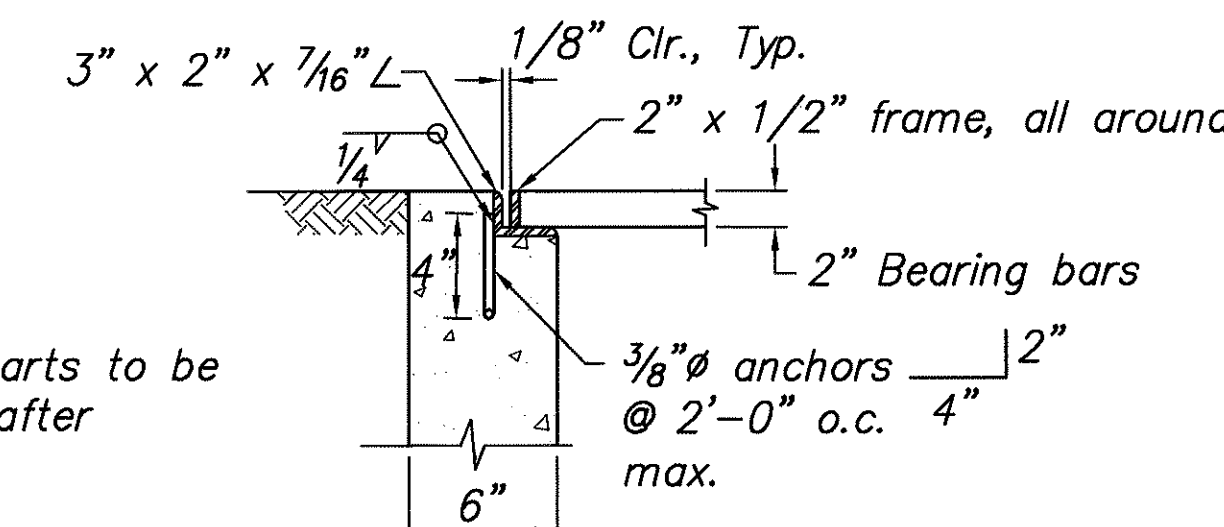
**DITCH AND SWALE GRADING PLAN**  
SCALE: 1" = 20'



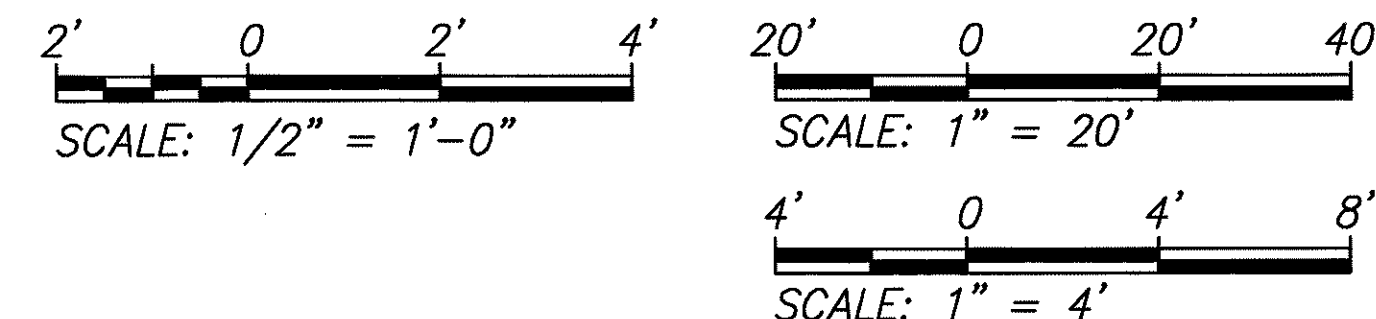
**DRAIN INLET "A3" DETAIL** 1  
SCALE: 1/2" = 1'-0" 24



**FABRICATION OF FRAME & GRATE DETAIL** 2  
NOT TO SCALE 24

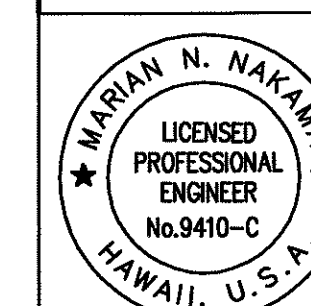


**TYPICAL ANGLE SEAT DETAIL** 3  
NOT TO SCALE 24



APPROVED:

M. J. [Signature] 5/4/00  
Chief, Civil Engineering Branch  
Dept. of Planning & Permitting  
City & County of Honolulu



STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**DRAINAGE DETAILS**

KEAAHALA ROAD WIDENING  
KAHEKILI HIGHWAY TO PO'OKELA STREET  
State Project No. HWY-0-03-97

Scale: As shown Date: April 2000

SHEET NO. C-24 OF C-55 SHEETS