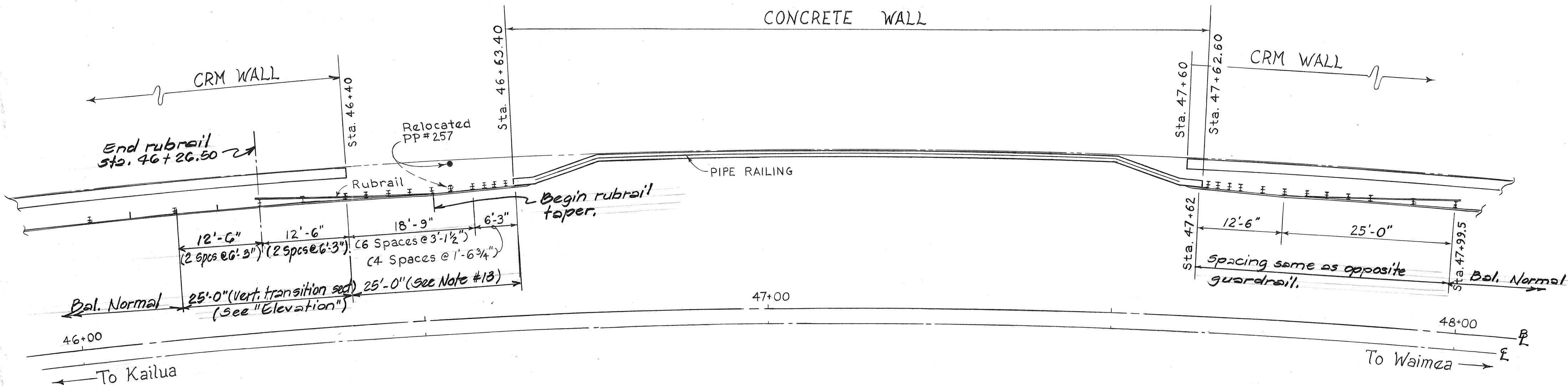


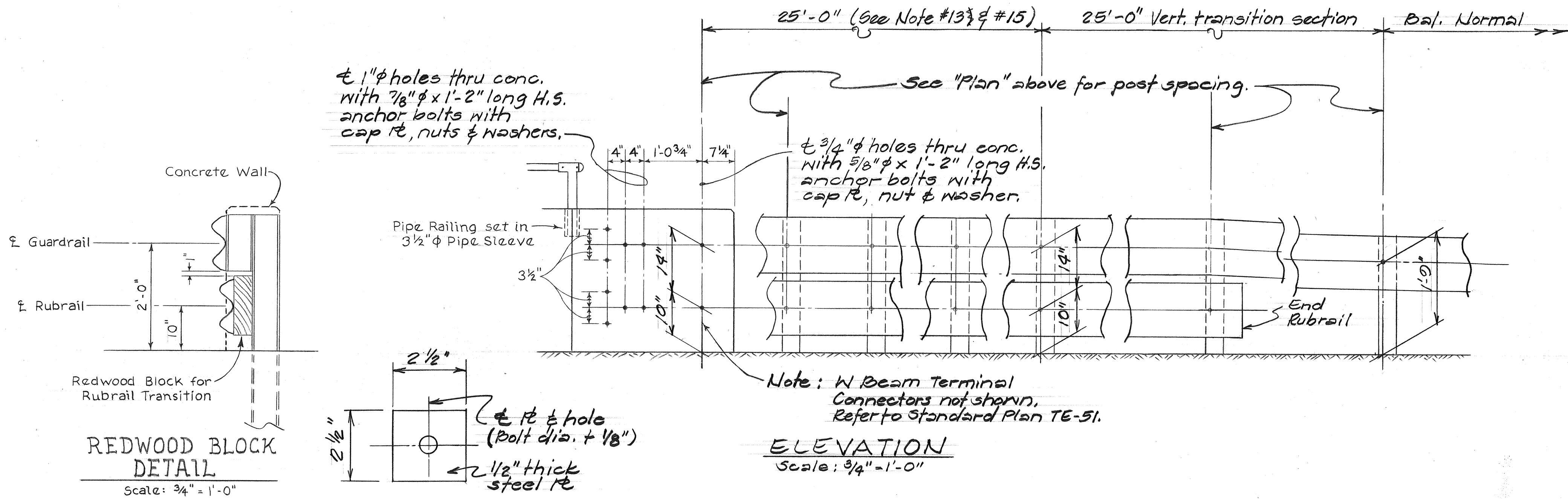
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HES-0190(9)	1990	6	24

NOTES:

1. Work performed to construct the concrete wall shall be paid on a lump sum basis as indicated in the proposal. The work shall include structure excavation and backfill for concrete wall, reinforced concrete, railings, joints, and incidentals for the complete wall, as specified in the plans and specifications.
2. Removal of the existing GRM wall in order to construct the new reinforced concrete wall footing shall be considered as structural excavation incidental to the lump sum payment for concrete wall. The Contractor shall restore any damaged portions of the GRM wall to remain, at no cost to the State.
3. All anchor bolts shall be high strength bolts conforming to the requirements of ASTM A-325.
4. All anchor bolts, nuts, washers and plates shall be hot dip galvanized after fabrication.
5. Clearance for reinforcing bars shall be 2" for walls and 3" for footings.
6. Reinforcing bars shall be securely tied at all intersections and lap splices, and shall be held in place during pouring to maintain proper location.
7. All dimensions for reinforcing are to center of bars, unless otherwise noted.
8. All exterior corners shall be chamfered 3/4" x 3/4".
9. Railing joints shall be alternating Slip Joints and Sleeve Joints, unless otherwise specified on the plans.
10. Railing fittings shall be shaped to fit posts and welded in place with continuous welds. All cut edges shall be ground smooth and all visible welds shall present a smooth, even appearance when completed. After fabrication is completed, all parts of the railing assembly shall be hot-dip galvanized.
11. All anchor bolts shall be high strength bolts conforming to the requirements of ASTM 325.
12. "Terminal Connector" and standard spacer, including all bolts, cap R's, nuts, and washers, shall be hot-dip galvanized after fabrication.
13. First 25'-0" of guardrail adjoining "Terminal Connector" shall be of galvanized steel and supports spaced as shown on the detail drawings. This section of rail to be placed on tangent or parallel to roadway, unless conditions at site renders it impossible to do so. Flare point to be determined in field.
14. Anchor bolts, nuts, washers, and cap R's shall be incidental to metal guardrail, unless noted otherwise.
15. The Top "W-Beam" Guardrail Element at the Approaching and Transition ends of the guardrail at the scenic lookout shall be doubled.

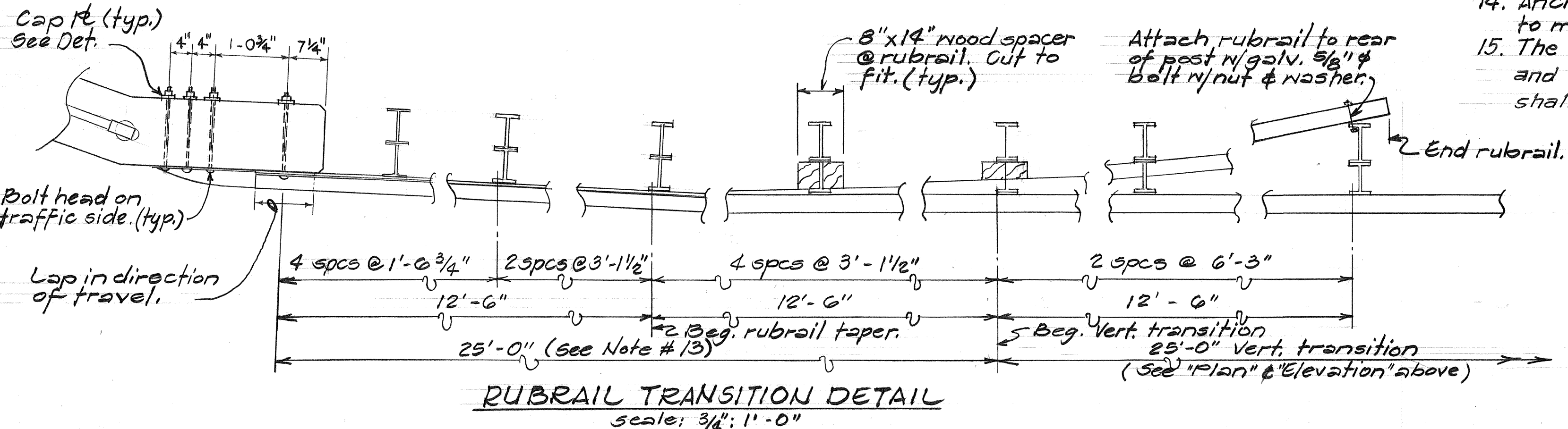


PLAN
Scale: 1" = 10'-0"



ELEVATION
Scale: 3/4" = 1'-0"

CAP PLATE DETAIL
N.T.S.



RUBRAIL TRANSITION DETAIL
Scale: 3/4" = 1'-0"

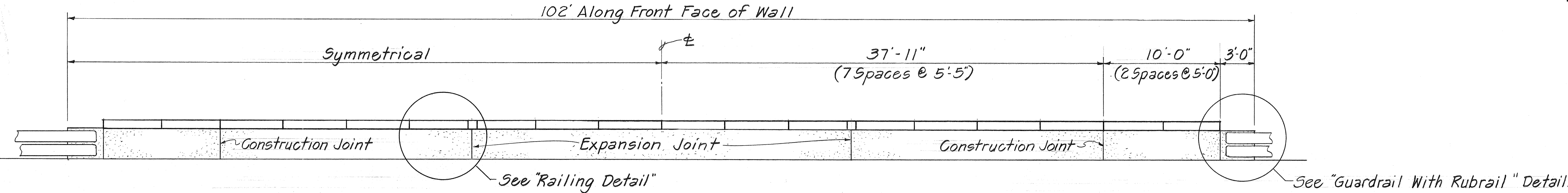
CONCRETE WALL AND METAL GUARDRAIL WITH RUBRAIL CONNECTION DETAIL

ESTIMATED QUANTITIES

Class "A" Concrete	50 C.Y.
Reinforcing Steel	6,504 Lbs
Railing	96 L.F.
Structural Excavation (for Concrete Wall)	91 C.Y.
Structural Backfill (for Concrete Wall)	37 C.Y.

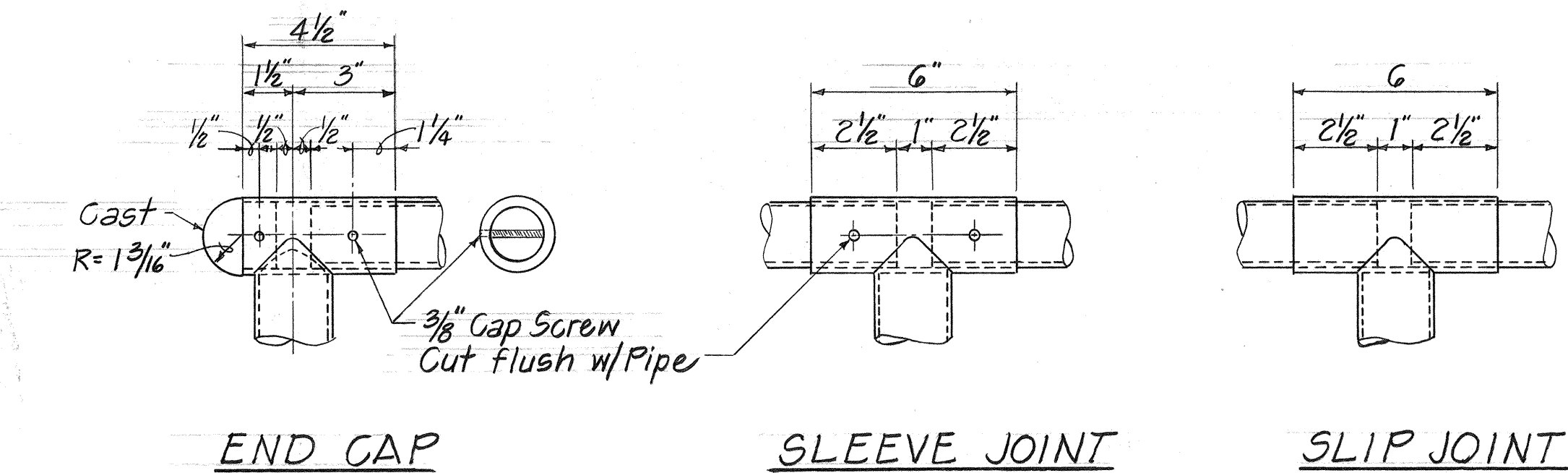
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION
CONCRETE WALL, GUARDRAIL AND RUBRAIL DETAILS RTE-190 HAWAII BELT ROAD GUARDRAIL & SHOULDER IMPROVEMENTS AT KAUPULEHU FED. AID PROJ. NO. HES-0190(9) Scale: As Noted Date: April 1990
SHEET NO. 1 OF 4 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HES-0190(2)	1990	7	24



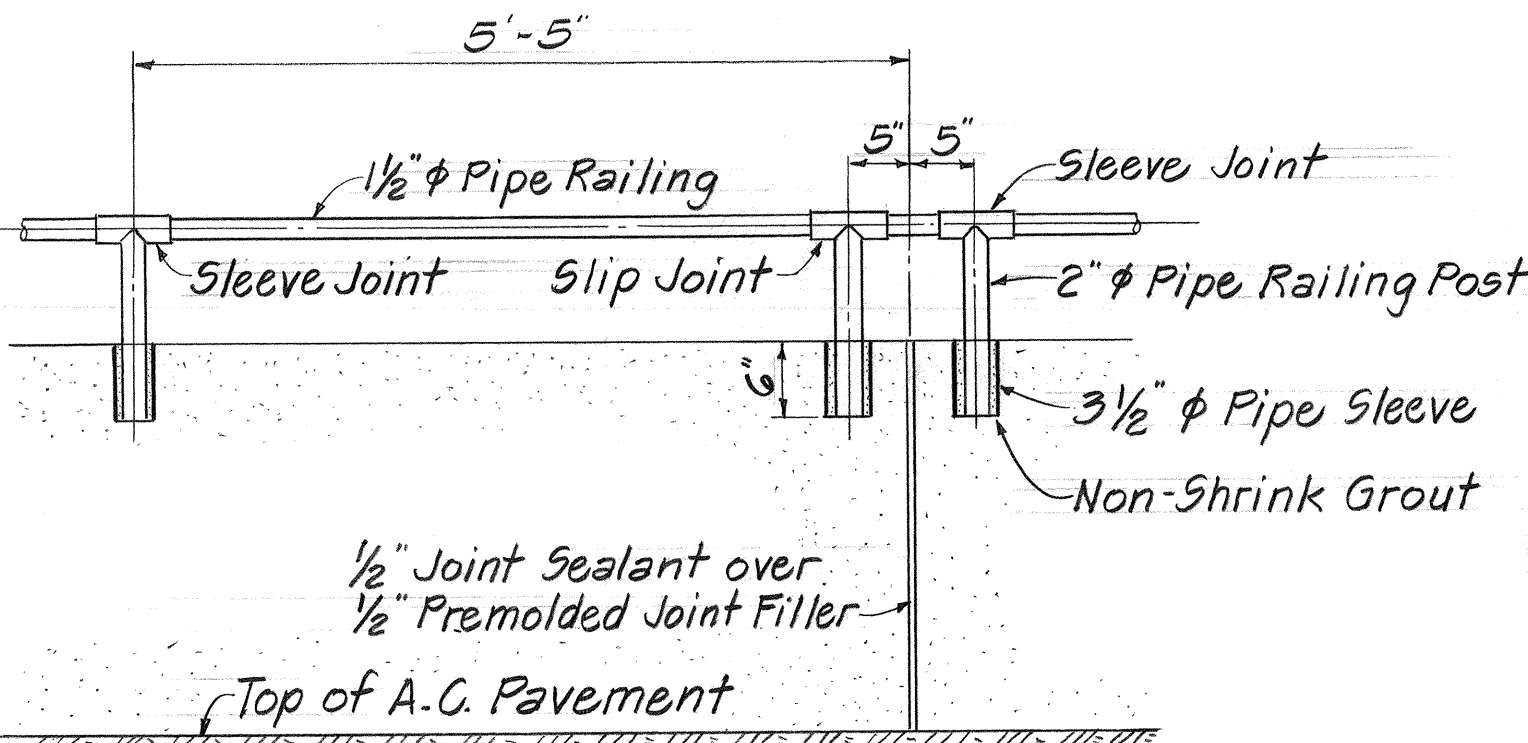
CONCRETE WALL ELEVATION

Scale: 1" = 5'-0"



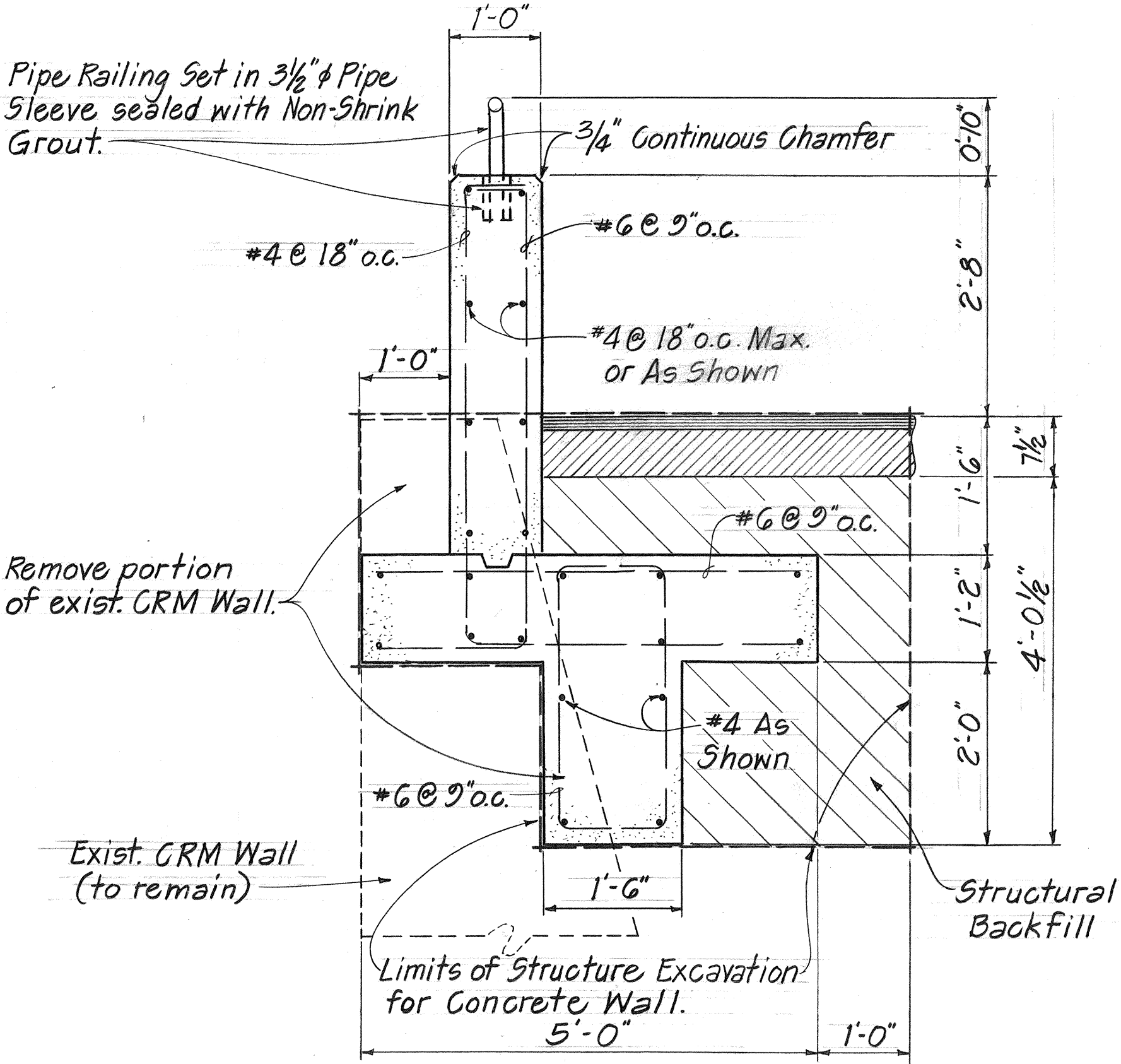
RAILING JOINT DETAILS

Scale: 3" = 1'-0"



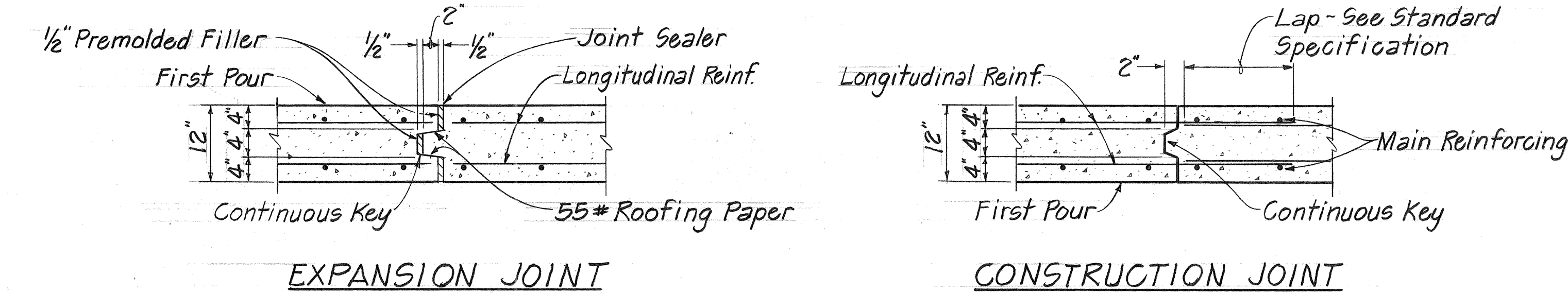
RAILING DETAILS

Not To Scale



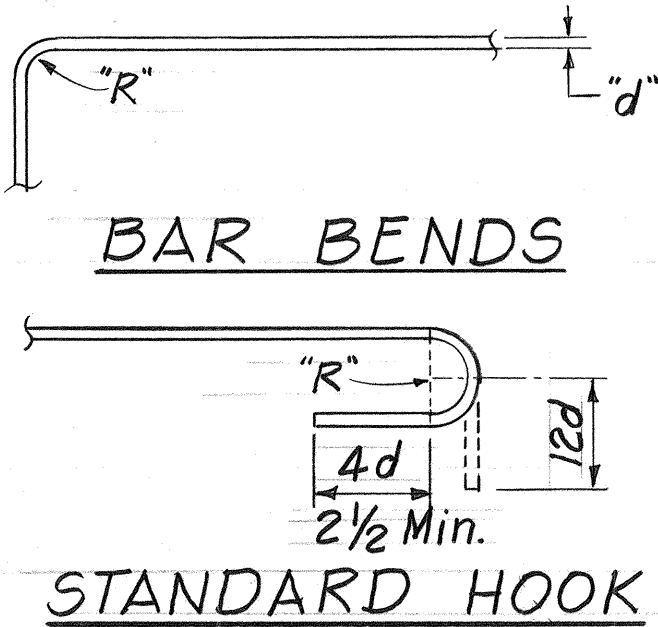
CONCRETE WALL DETAIL

Scale: 3/4" = 1'-0"

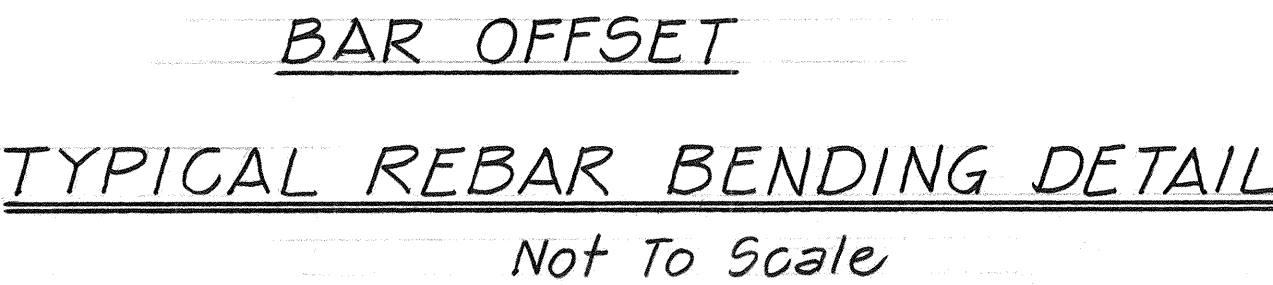


REINFORCED CONCRETE WALL JOINT DETAILS

Not To Scale



BAR SIZE	"R"
#3, #4, #5	2 1/2 "d"
#6, #7, #8	3 "d"
#9, #10, #11	4 "d"



Not To Scale

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

HIGHWAYS DIVISION

CONCRETE WALL & RAILING DETAILS

RTE-19 HAWAII BELT ROAD

GUARDRAIL & SHOULDER IMPROVEMENTS

AT KAUPULEHU

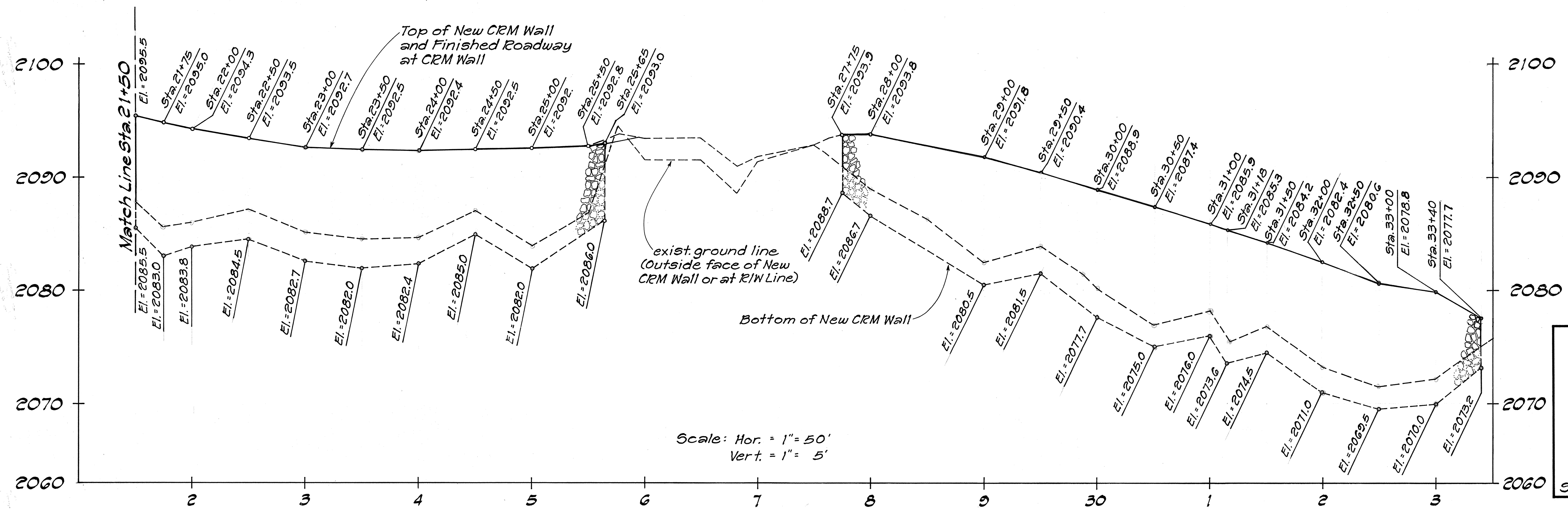
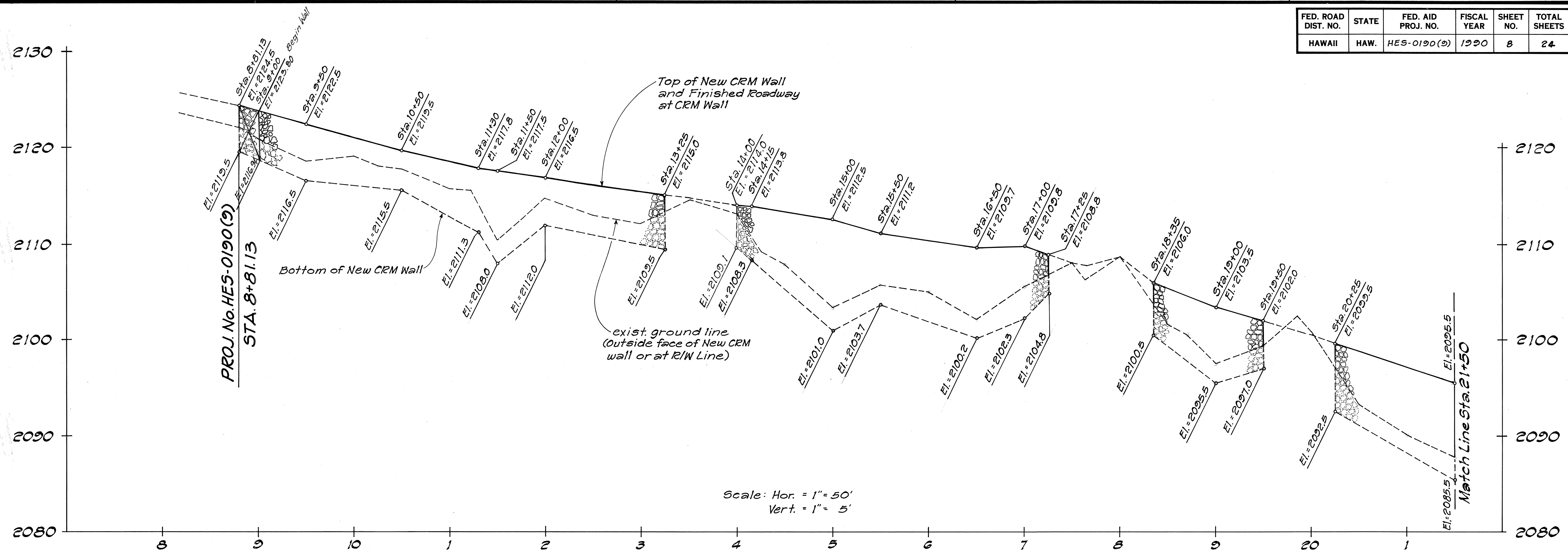
FED. AID PROJ. NO. HES-0190(2)

Scale: As Noted Date: April 1990

SHEET NO. 2 OF 4 SHEETS

SURVEY PLOTTED BY	DATE
DRAWN BY	
DESIGNED BY	
QUANTITIES BY	
CHECKED BY	
ORIGINAL PLAN	
NOTE BOOK	
NO.	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HES-0190(9)	1990	8	24



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CRM WALL DETAILS

RTE. 190, HAWAII BELT ROAD, GRDRL. AND
SHLDR. IMPVTS. AT KAUPULEHU

FED. AID PROJ. No. HES-0190(9)

Scale: As Noted Date: May 1990

SHEET No. 3 OF 4 SHEETS

ORIGINAL	SURVEY PLOTTED BY	DATE
PLAN	DRAWN BY	
NOTE BOOK	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

Top of New CRM Wall and Finished Roadway at CRM Wall

(END WALL)

36+16
Sta 36+16
El. = 2067.5
2068.84

37+00
Sta 37+00
El. = 2068.0
2068.16

37+50
Sta 37+50
El. = 2068.6

35+71
Sta 35+71
El. = 2069.8

35+00
Sta 35+00
El. = 2072.2

34+50
Sta 34+50
El. = 2073.9

34+25
Sta 34+25
El. = 2068.1

exist ground line (Outside face of New CRM Wall or at R/W Line)

2063.7
El. = 2063.7

2060.3
El. = 2060.3

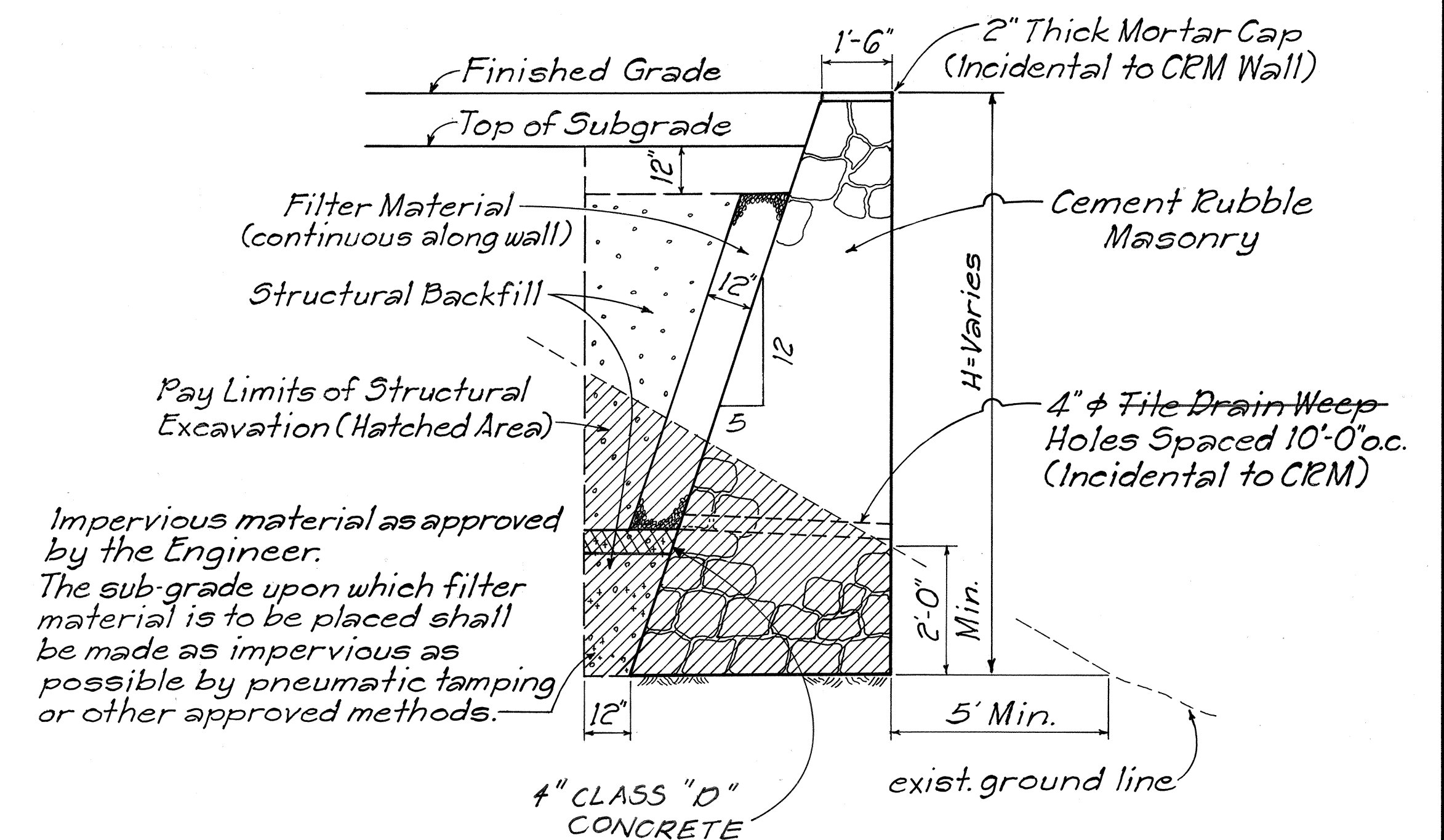
2062.6
El. = 2062.6

2060.0
El. = 2060.0

2061.1
El. = 2061.1

Bottom of New CRM Wall

Scale: Hor. = 1" = 50'
Vert. = 1" = 5'



Top of New CRM Wall and Finished Roadway at CRM Wall

Match Line Sta. 44+00

Sta. 44+50 El. = 2041.7

Sta. 45+00 El. = 2030.5

Sta. 45+50 El. = 2038.4

Sta. 46+00 El. = 2036.5

Sta. 46+40 El. = 2035.2

Sta. 46+60 El. = 2036.7

Sta. 47+00 El. = 2030.8

Sta. 47+60 El. = 2032.5

Sta. 48+00 El. = 2029.3

Sta. 48+99 El. = 2025.7

70 26.34

32 El. = 2025.2

El. = 2023.1

El. = 2017.2

El. = 2018.0

El. = 2020.2

El. = 2023.8

El. = 2028.5

El. = 2030.3

El. = 2039.5

31.5

36.5

El. = 2043.1

exist. ground line (Outside face of New CRM Wall or at R/W Line)

Bottom of New CRM Wall

Conc. Wall @ Scenic Lookout

Scale: Hor. = 1" = 50'

Vert. = 1" = 5'

STA. 42+50

END PROJECT HES-0190(2)

Structure Exc. for CRM	2,800	
Structure Backfill	2,370	C.Y.
for CRM Wall	347	
Filter Material	1,550	C.Y.
Cement Rubble Masonry	553 520	C.Y.
Structure Backfill	3,100	C.Y.
(Impervious Material)	301	
	320	C.Y.

ORIGINAL PLAN	SURVEY PLOTTED BY _____ DATE _____
NOTE BOOK	DRAWN BY _____
	TRACED BY _____
	DESIGNED BY _____
	QUANTITIES BY _____
No. _____	CHECKED BY _____

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CRM WALL DETAILS

RTE. 190, HAWAII BELT ROAD, GRDRL. AND
SHLDR. IMPVTS. AT KAUPULEHU
FED. AID PROJ. No. HES-0190(9)

Scale: As Noted Date: May 1990

SHEET NO. 4 OF 4 SHEETS