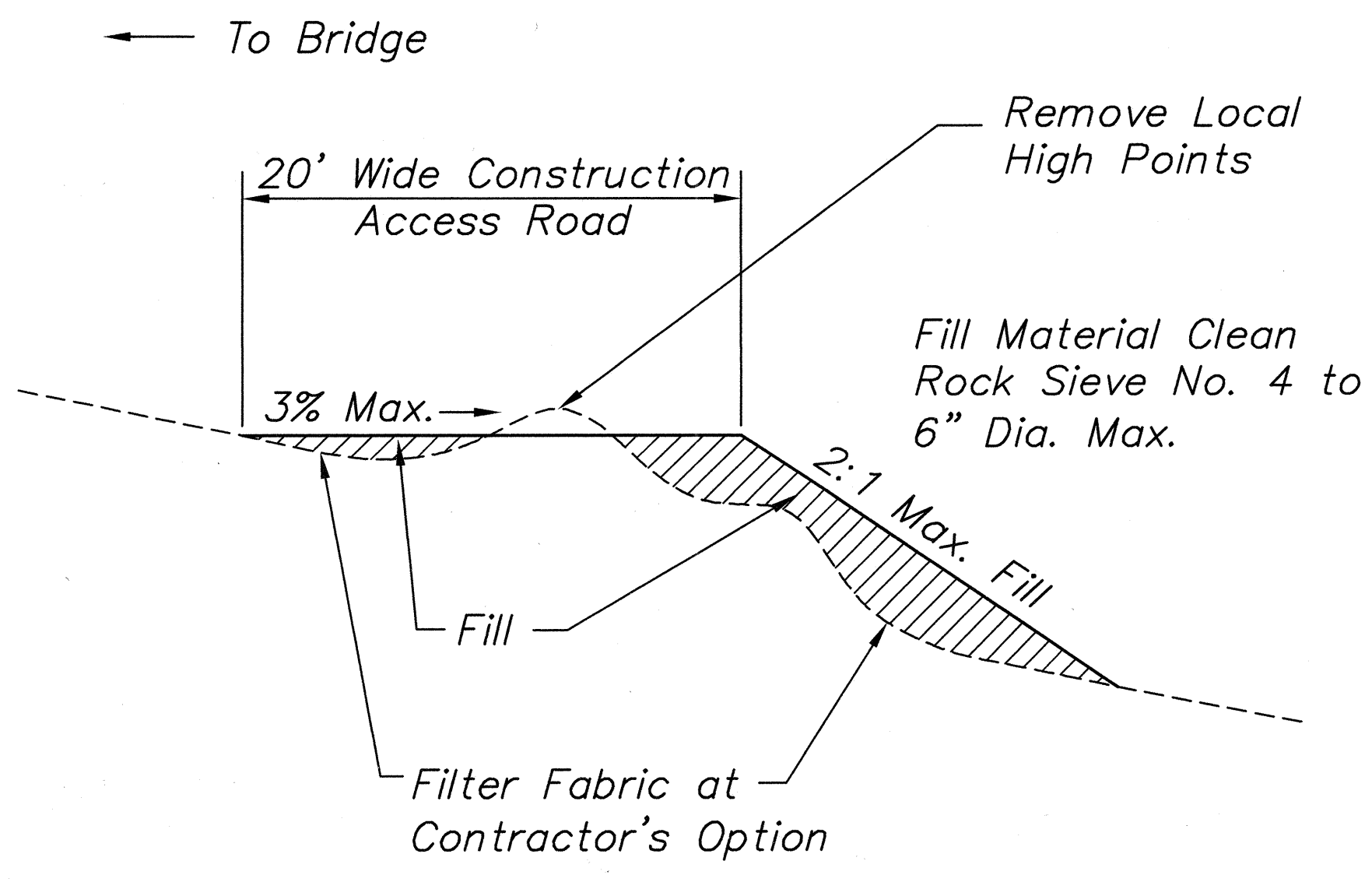


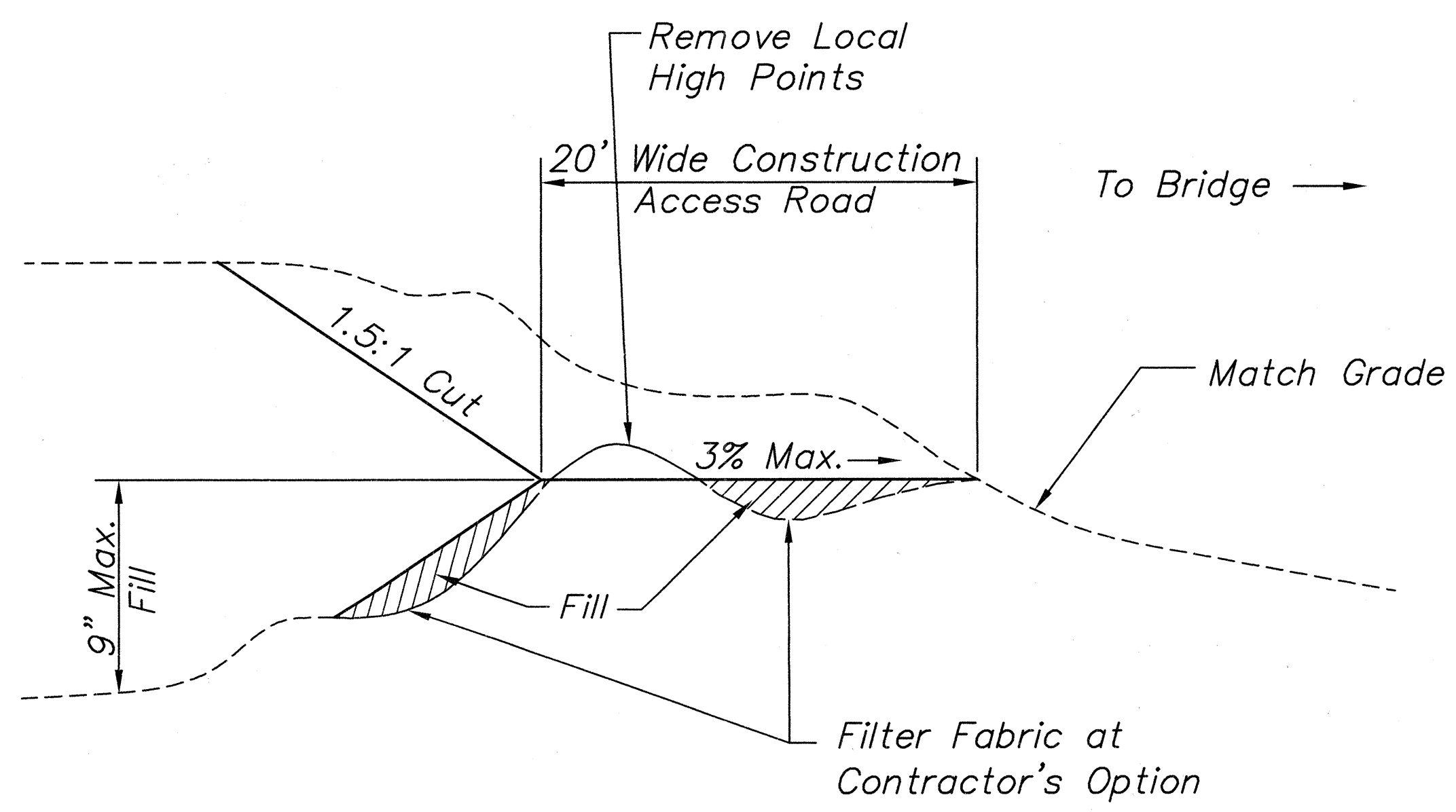
**BMP GENERAL NOTES:**

- Excavated material shall be hauled offsite for disposal. Rock crushing is not allowed onsite.
- Sandbags shall be installed to contain the work area. Sandbags shall be stacked in alternating directions.
- Sandbags with a 3-foot min. height shall be installed downslope of all contained work area to allow sedimentation of runoff.
- Always keep min. 80 L.F. of stream channel open and clear from debris in stream channel.
- Work above the ordinary highwater mark shall resume when stream flows subside to levels that can be diverted by sandbags and do not significantly affect water quality as approved by engineer.
- Upstream sample location shall be 30-feet from the nearest point of the project site.
- Impact water sample station shall be 3-feet downstream from the nearest point of the silt fencing and sandbags.
- Downstream water sample station shall be 50-feet downstream of the silt fencing/sandbags.
- Fill material for sandbags and temporary construction access roads shall be cleaned granular material.
- Runoff collected contained areas shall be disposed outside of stream channel and out of any state waters.
- Treated wood material is not permitted for forms and shoring within the stream channel.
- The hoe ram shall demolish embankment slopes armored with Class D concrete. Particles shall be as large as practical to avoid creating excess dust.
- A backhoe shall load the embankment rock onto a truck.
- Rock lodged in crevices (10%–20% of the embankment material) shall be removed manually.
- Cleanup contained work area then open min. 80 L.F. wide channel.
- Erosion control for road work and exposed embankments outside of stream channel shall conform to Water Pollution and Erosion Control notes on sheets 5 and 6.
- Shoring can remain in place within the open channels as required by the Engineer.
- BMPs are required for concrete pour at footings. Confine pour area with sandbags one layer high.

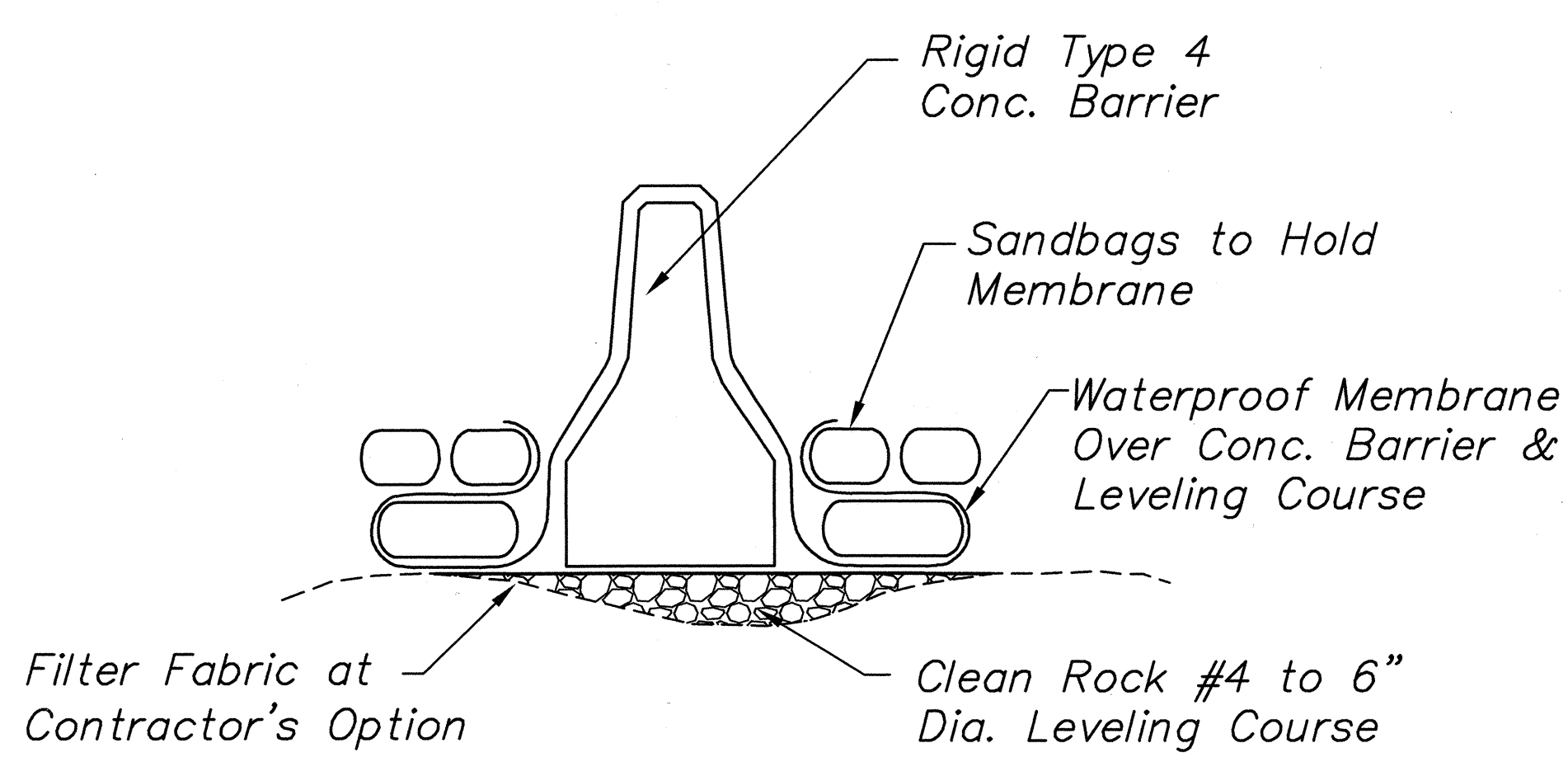
- BMPs are required for contractor's stockpile and staging area.
- Any deviations from these BMPs shall be at Contractor's cost and no additional workdays shall be added.



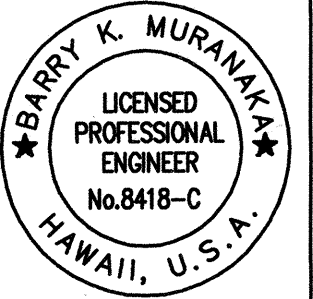
**TYPICAL DOWNSTREAM SECTION**  
NOT TO SCALE



**TYPICAL UPSTREAM SECTION**  
NOT TO SCALE



**ALTERNATIVE TO SANDBAG WALLS**  
NOT TO SCALE



THIS WORK WAS PREPARED  
BY ME OR UNDER MY  
SUPERVISION

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**BMP GENERAL NOTES  
AND DETAILS**

MAMALAHOA HIGHWAY  
EMERGENCY REPLACEMENT OF PAAUAAU STREAM BRIDGE,  
IMPROVEMENTS AT KAMANI STREET, AND  
REHABILITATION OF VARIOUS BRIDGES  
FEDERAL AID PROJECT NO. ER-12(3)

Scale: As shown Date: Jan. 2002

SHEET NO. 1 OF 5 SHEETS

P.M.: BKM  
CURRENT OPR: mkf  
PREV. OPR:  
CURRENT TIME: Mar 26, 2002 - 3:37pm  
LAST SAVED BY: rki  
LAST MODIFIED: Mon, 07 Jan 2002 - 11:04am

PREFIX: G:\Kai00-01\ACAD\  
FILE: KAI0047.dwg  
BEGIN: 12/26/00  
SCALE: 1=1

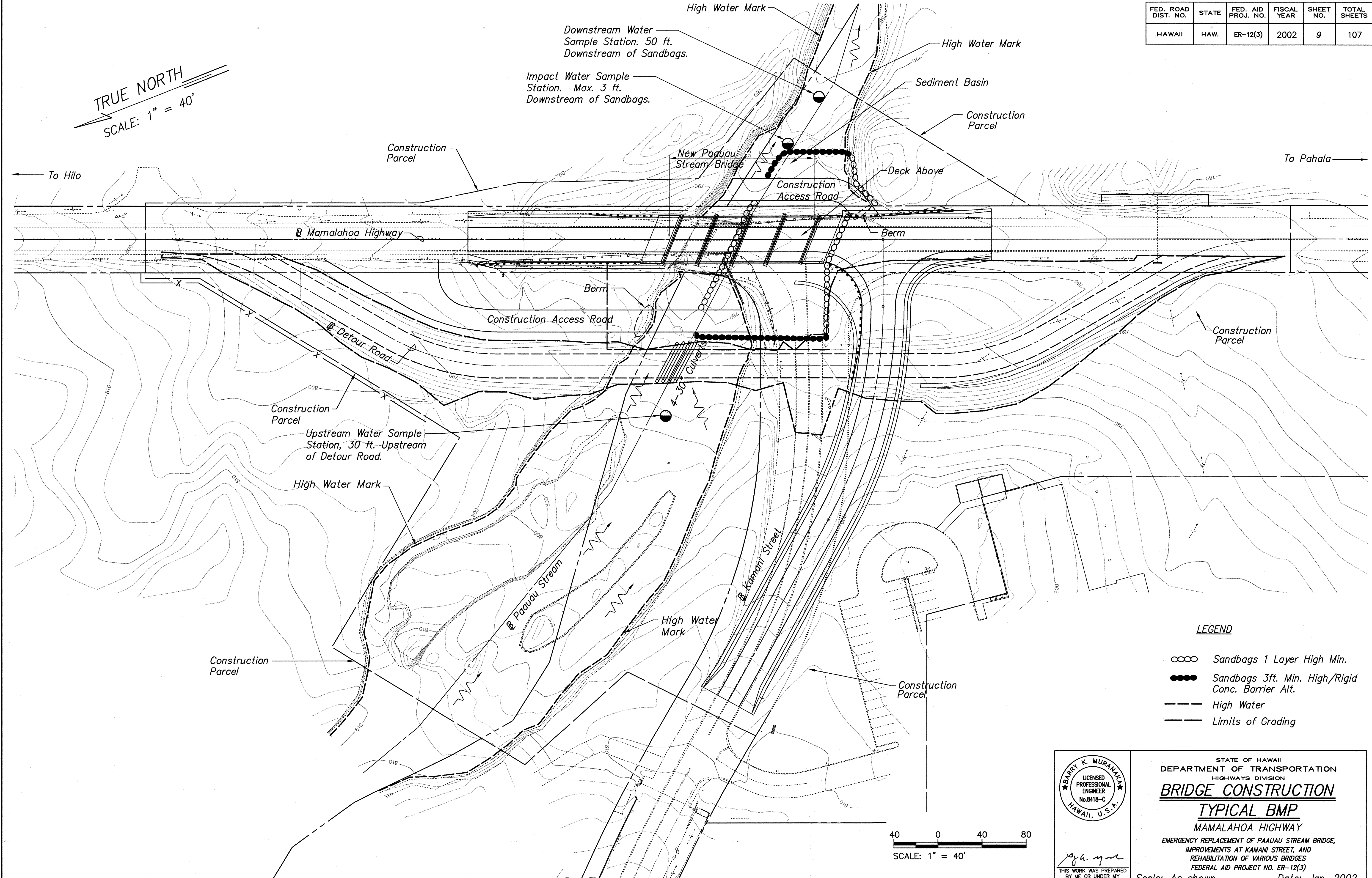
DATE	_____
SURVEY PLOTTED BY	_____
DRAWN BY	_____
DESIGNED BY	_____
QUANTITIES BY	_____
CHECKED BY	_____
ORIGINAL PLAN	_____
NOTEBOOK	_____
No.	_____







FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-12(3)	2002	9	107



P.M.: BKM  
 CURRENT OPR: mkf  
 PREVIOUS OPR:  
 CURRENT TIME: Mar 25, 2002 - 1:08pm  
 LAST SAVED BY: rki  
 LAST MODIFIED: Mon, 07 Jan 2002 - 11:16am

PREF: G:\kai00-01\ACAD\  
 FILE: KAI0043.dwg  
 BEGIN: 12/26/00  
 SCALE: 1"=1

DATE	SURVEY PLOTTED BY
DATE	DRAWN BY
DATE	DESIGNED BY
DATE	CHECKED BY
DATE	NOTED BY

#### LEGEND

- Sandbags 1 Layer High Min.
- Sandbags 3ft. Min. High/Rigid Conc. Barrier Alt.
- High Water
- Limits of Grading



STATE OF HAWAII  
 DEPARTMENT OF TRANSPORTATION  
 HIGHWAYS DIVISION

### BRIDGE CONSTRUCTION

#### TYPICAL BMP

MAMALAHOA HIGHWAY  
 EMERGENCY REPLACEMENT OF PAAU Stream BRIDGE,  
 IMPROVEMENTS AT KAMAHI STREET, AND  
 REHABILITATION OF VARIOUS BRIDGES  
 FEDERAL AID PROJECT NO. ER-12(3)

Scale: As shown Date: Jan. 2002

SHEET NO. 3 OF 5 SHEETS



FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-12(3)	2002	10	107

TRUE NORTH  
SCALE: 1" = 40'

Begin Detour Road Construction

Construction Parcel

Downstream Water Sample Station. 50 ft. Downstream of Sandbags.

High Water Mark

High Water Mark

Construction Parcel

End Detour Road Construction

To Hilo

Mamalahoa Highway

Detour Road

Limits of Grading

Construction Parcel

Upstream Water Sample Station, 30 ft. Upstream of Detour Road.

High Water Mark

Construction Parcel

High Water Mark

Poouou Stream

Kamani Street

Sediment Basin

Impact Water Sample Station. Max. 3 ft. Downstream of Sandbags.

See Notes for Detour Road Demolition

Culverts

Construction Parcel

Limits of Grading

Construction Parcel

LEGEND

○○○○ Sandbags 1 Layer High Min.

●●●● Sandbags 3ft. Min. High/Rigid Conc. Barrier Alt.

--- High Water

--- Limits of Grading

Notes for Detour Road Demolition

1. See BMP General Notes Sheet 7.

2. The pavement shall be broken into particles as large as possible for practical loading into a truck.

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION  
**DETOUR ROAD DEMOLITION**  
**TYPICAL BMP**  
MAMALAHOA HIGHWAY  
EMERGENCY REPLACEMENT OF PAAUUA STREAM BRIDGE,  
IMPROVEMENTS AT KAMANI STREET, AND  
REHABILITATION OF VARIOUS BRIDGES  
FEDERAL AID PROJECT NO. ER-12(3)  
Scale: As shown Date: Jan. 2002  
SHEET NO. 4 OF 5 SHEETS

Barry K. Muranka  
LICENSED PROFESSIONAL ENGINEER  
No. 8418-C  
HAWAII, U.S.A.

THIS WORK WAS PREPARED  
BY ME OR UNDER MY  
SUPERVISION

SCALE: 1" = 40'





PREFIX: G:\Kai00-01\ACAD\  
FILE: KAI0044.dwg  
BEGIN: 12/26/00  
SCALE: 1=1

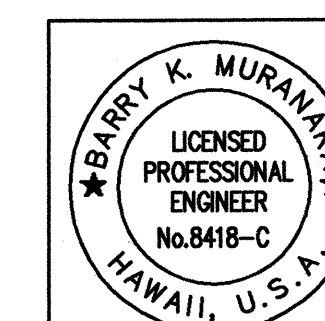
ORIGINAL PLAN	SURVEY PLOTTED BY _____ DATE _____
NOTEBOOK	DRAWN BY _____
	TRACED BY _____
	DESIGNED BY _____
	QUANTITIES BY _____
No. _____	CHECKED BY _____

Notes for Detour Road Demolition

1. See BMP General Notes Sheet 7.
2. The pavement shall be broken into particles as large as possible for practical loading into a truck.

*LEGEND*

-  Sandbags 1 Layer High Min.  
 Sandbags 3ft. Min. High/Rigid Conc. Barrier Alt.  
 High Water  
 Limits of Grading



STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

DETOUR ROAD DEMOLITION

TYPICAL BMP

EMERGENCY REPLACEMENT OF PAAUUA STREAM BRIDGE,  
IMPROVEMENTS AT KAMANI STREET, AND  
REHABILITATION OF VARIOUS BRIDGES  
FEDERAL AID PROJECT NO. ER-12(3)

Scale: As shown Date: Jan. 2002

SHEET NO. 4 OF 5 SHEETS



