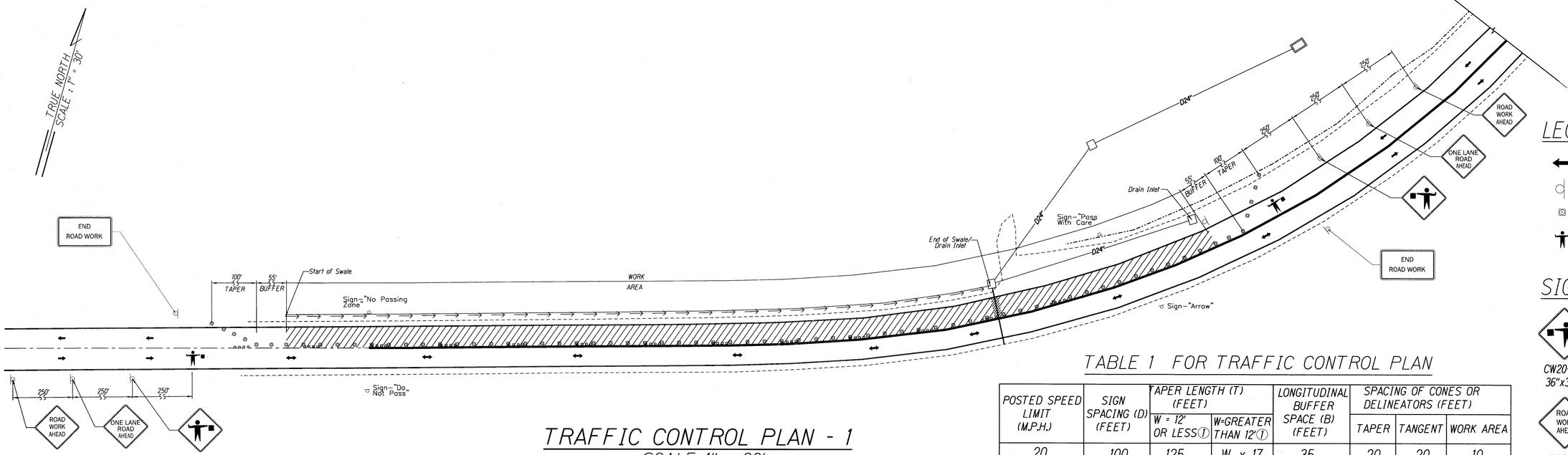
FED. ROAD DIST. NO.	STATE	HIGHWAY PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	460A-02-06	2010	6	16



TRAFFIC CONTROL PLAN - 1
SCALE 1" = 30'

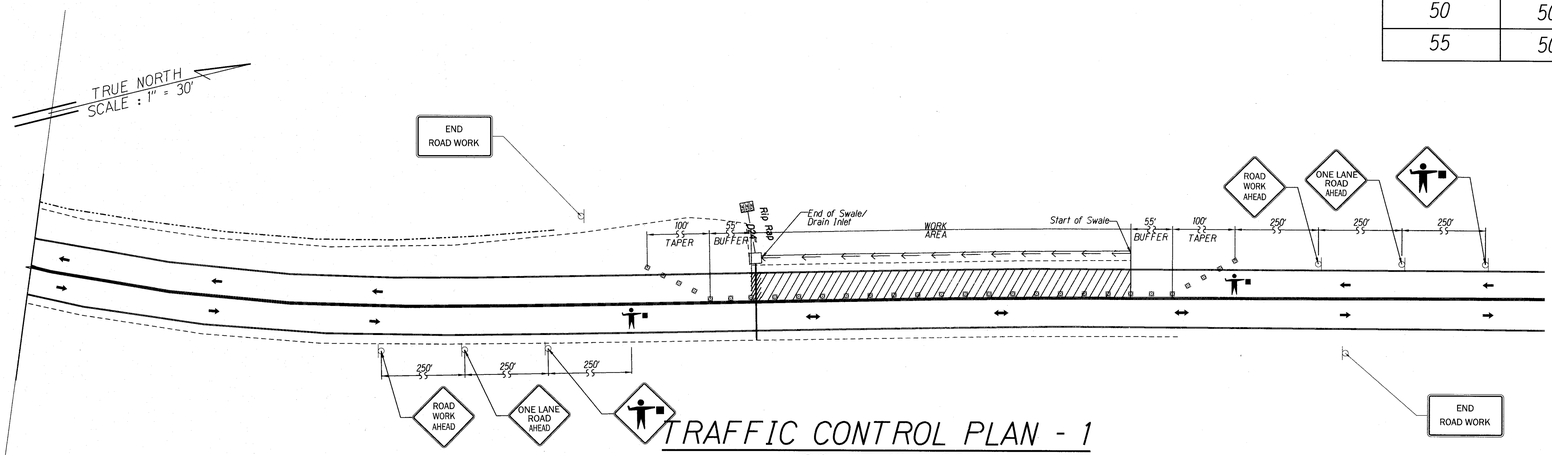
TABLE 1 FOR TRAFFIC CONTROL PLAN

POSTED SPEED LIMIT (M.P.H.)	SIGN SPACING (D) (FEET)	TAPER LENGTH (T) (FEET)		LONGITUDINAL BUFFER SPACE (B) (FEET)	SPACING OF CONES OR DELINEATORS (FEET)		
		W = 12' OR LESS①	W=GREATER THAN 12'①		TAPER	TANGENT	WORK AREA
20	100	125	W x 17	35	20	20	10
25	100	125	W x 17	55	25	25	10
30	200	180	W x 17	85	30	30	10
35	250	245	W x 17	120	35	35	10
40	250	320	W x 17	170	40	40	10
45	350	540	W x 17	220	45	45	10
50	500	600	W x 17	280	50	50	10
55	500	660	W x 17	335	55	55	10

① W=WIDTH OF LANE, SHOULDER OR OFFSET.

LEGEND
- Direction of traffic
- Sign
- Cone/Delineator
- Police Officer/Flagger

SIGN:
- CW20-7A 36"x36"
- CW20-4D 48"x48"
- CW21-4 48"x48"
- CG20-2A 48"x24"



TRAFFIC CONTROL PLAN - 1
SCALE 1" = 30'

NOTES:
During non-working hours, the trenches on streets shall be covered with non-skid steel plates and all lanes maintained open for traffic. Temporary steel plates for vehicular traffic shall be flush with, have an acceptably smooth transition with adjoining pavement or sidewalk.

Wherever the work area interferes with the pedestrian traffic, the Contractor shall re-route pedestrian traffic within coned-off lane and provide 4' minimum clearance for pedestrian access.

Minimum sign spacings, taper lengths and spacing of cones or delineators shall be as shown in the contract or as directed in the field by the Engineer.

1 See Sheet 5 for General Notes for Traffic Control Plan.

30' 0 30' 60' 90'
SCALE: 1"=30'

FRANK JAMES LYON LICENSED PROFESSIONAL ENGINEER No. 8256-C HAWAII, U.S.A.
Exp. 4/30/10
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC CONTROL PLAN - 1

MAUNALOA HIGHWAY
Slope Stabilization at Milepost 13
Highway Project No. 460A-02-06

Scale: AS NOTED Date: JAN 2010

SHEET No. 6 OF 16 SHEETS

ADD. 6

DATE	REVISION
2-19-10	1 Revised Sheet Reference Numbers

ORIGINAL PLAN
SURVEY PLOTTED BY
DRAWN BY
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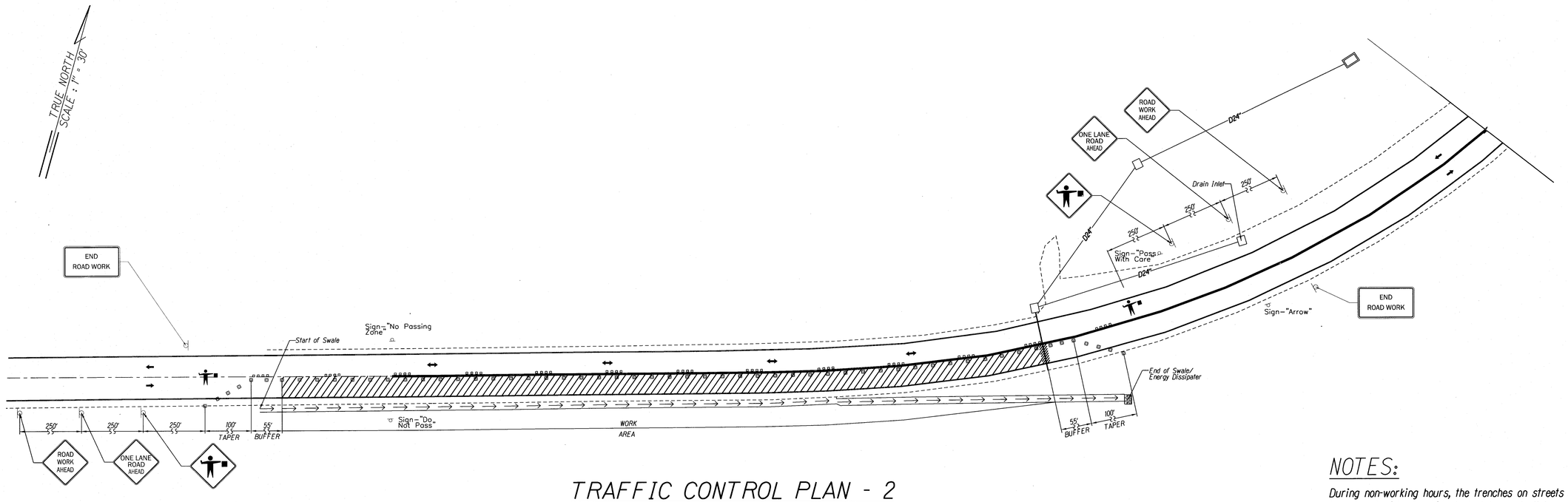
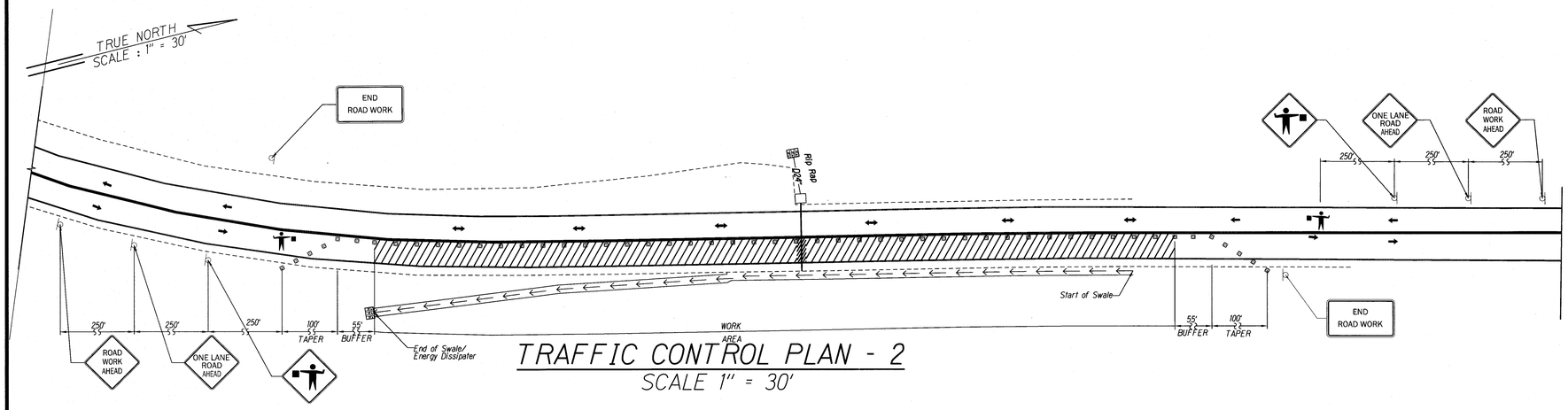
QUANTITIES BY
CHECKED BY
DATE

FED. ROAD DIST. NO.	STATE	HIGHWAY PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	460A-02-06	2010	7	16



TRAFFIC CONTROL PLAN - 2
SCALE 1" = 30'



TRAFFIC CONTROL PLAN - 2
SCALE 1" = 30'

LEGEND

- Direction of traffic
- Sign
- Cone/Delineator
- Police Officer/Flagger

SIGN:

CW20-7A 36"x36"	CW20-4D 48"x48"
CW21-4 48"x48"	CG20-2A 48"x24"

NOTES:

During non-working hours, the trenches on streets shall be covered with non-skid steel plates and all lanes maintained open for traffic. Temporary steel plates for vehicular traffic shall be flush with, have an acceptably smooth transition with adjoining pavement or sidewalk.

Wherever the work area interferes with the pedestrian traffic, the Contractor shall re-route pedestrian traffic within coned-off lane and provide 4' minimum clearance for pedestrian access.

Minimum sign spacings, taper lengths and spacing of cones or delineators shall be as shown in the contract or as directed in the field by the Engineer.

1 See Sheet 5 for General Notes for Traffic Control Plan.

1 See Table 1 on Sheet 6 for Traffic Control Plan.

FRANK JAMES LYON
LICENSED PROFESSIONAL ENGINEER
No. 8256-C
HAWAII, U.S.A.
Exp. 4/30/10

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ORIGINAL PLAN
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NOTE BOOK
DESIGNED BY
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CHECKED BY
DATE
No.

DATE	REVISION
2-19-10	1 Revised Sheet Reference Numbers

30' 0 30' 60' 90'
SCALE: 1"=30'

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC CONTROL PLAN – 2

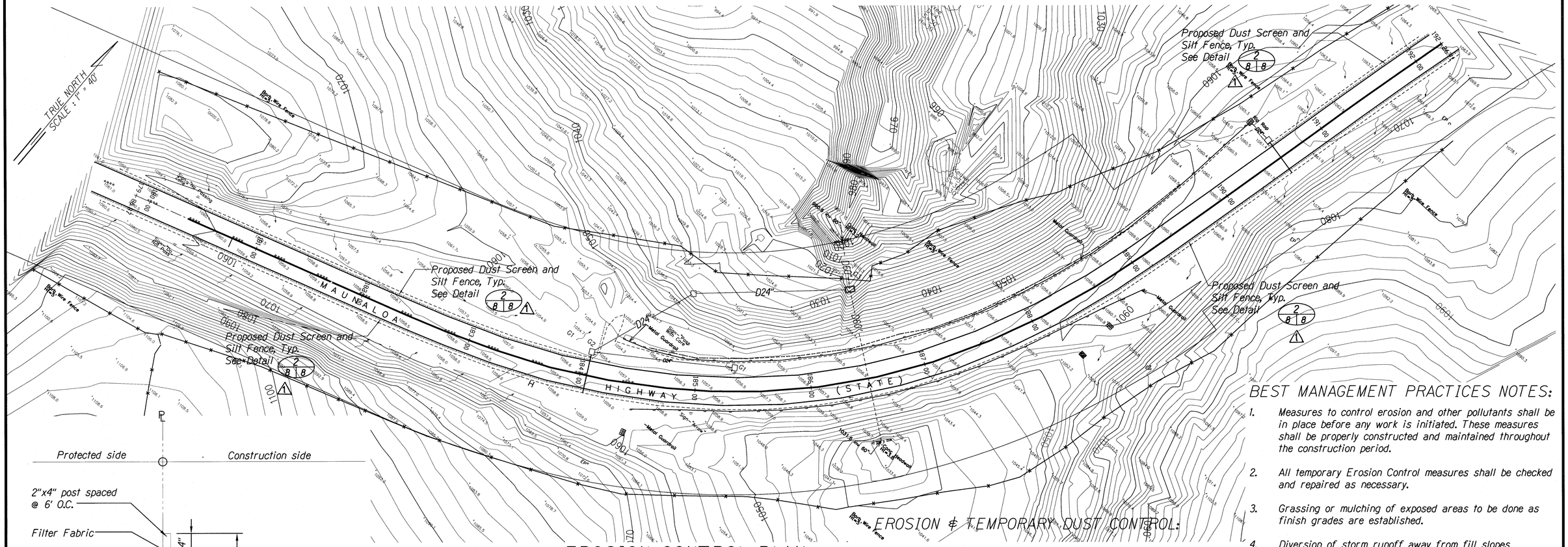
MAUNALOA HIGHWAY
Slope Stabilization at Milepost 13
Highway Project No. 460A-02-06

Scale: AS NOTED Date: JAN 2010

SHEET No. 7 OF 16 SHEETS

ADD. 7

FED. ROAD DIST. NO.	STATE	HIGHWAY PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	460A-02-06	2010	8	16



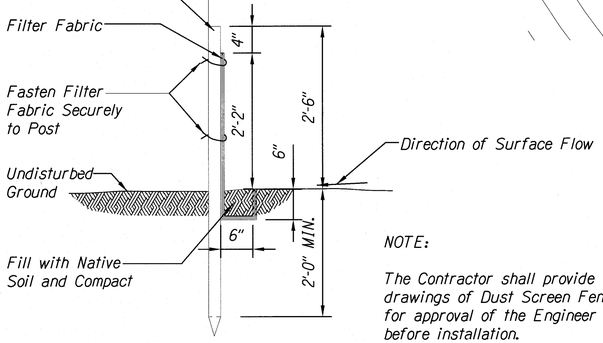
EROSION CONTROL PLAN
SCALE 1" = 40'

Notes:

1. Azimuth and line work including state right-of-way boundary referenced to State Plane NAD 83 coordinate system. Grid azimuth rotation to local Government Survey Triangulation Station "MAUNA LOA 1872" being -0 10'37".

2. Boundary lines shown taken from Federal Aid Secondary Project No. S21(1).

3. Elevations shown derived from a spike benchmark located near the intersection of Molokai Airport Road and Airport Loop, being 481.31. Spike benchmark information taken from State Department of Transportation, Cadastral Engineering Department for waterline project along Maunaloa Highway, Sheet No. 5712.5.



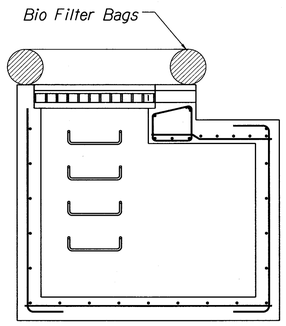
NOTE:

The Contractor shall provide drawings of Dust Screen Fence for approval of the Engineer before installation.

DETAIL - SILT FENCE 2/8 8
NOT TO SCALE

LEGEND

- Property Line
- Dust Screen w/ Silt Fence
- Exist. Contour Major (1060)
- Exist. Contour Minor (1054)
- Surface Flow



DRAIN INLET PROTECTION 3/8 8
SCALE 1/2"=1'-0"

EROSION & TEMPORARY DUST CONTROL:

1. *During construction, preventative measures shall be used to control foreseeable dust, erosion or sedimentation problems which may arise as the job progresses.*
2. *Fugitive dust and Solid Waste Disposal during grubbing and rading activities shall meet requirements of Administrative Rules, Title 11, Chapter 60, Air Pollution Control and Chapter 58, Solid Waste Management Control.*
3. *The Contractor, at his own expense, shall keep the project area and surrounding area free from dust nuisance. The work shall be in conformance with the Air Pollution Control Standards and Regulations of the State Department of Health.*
4. *All exposed areas to be left exposed for longer than six weeks shall be Hydromulch Seeded with Rye Grass.*
5. *All slopes and exposed areas shall be sodded or planted as soon as final grades have been established. Planting shall not be delayed until all grading work has been completed. Grading to final grade shall be continuous, and any area within which work has been interrupted or delayed shall be planted.*

BEST MANAGEMENT PRACTICES NOTES:

1. *Measures to control erosion and other pollutants shall be in place before any work is initiated. These measures shall be properly constructed and maintained throughout the construction period.*
2. *All temporary Erosion Control measures shall be checked and repaired as necessary.*
3. *Grassing or mulching of exposed areas to be done as finish grades are established.*
4. *Diversion of storm runoff away from fill slopes until grassing on fill slopes are established.*
5. *All temporary Erosion Control measures shall be removed by the Contractor after completion of the project prior to final acceptance or as directed by the Engineer in the field.*

FRANK JAMES [illegible] LICENSED PROFESSIONAL ENGINEER No. 8256-C HAWAII, U.S.A.

Exp. 4/30/10

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DATE	REVISION
2-19-10	1 Revised Sheet Reference Numbers

SURVEY PLOTTED BY
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No.

1' 0 1' 2' 3' 4' 5'
SCALE: 1/2"=1'-0"

40' 0 40' 80' 120'
SCALE: 1"=40'

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

EROSION CONTROL PLAN

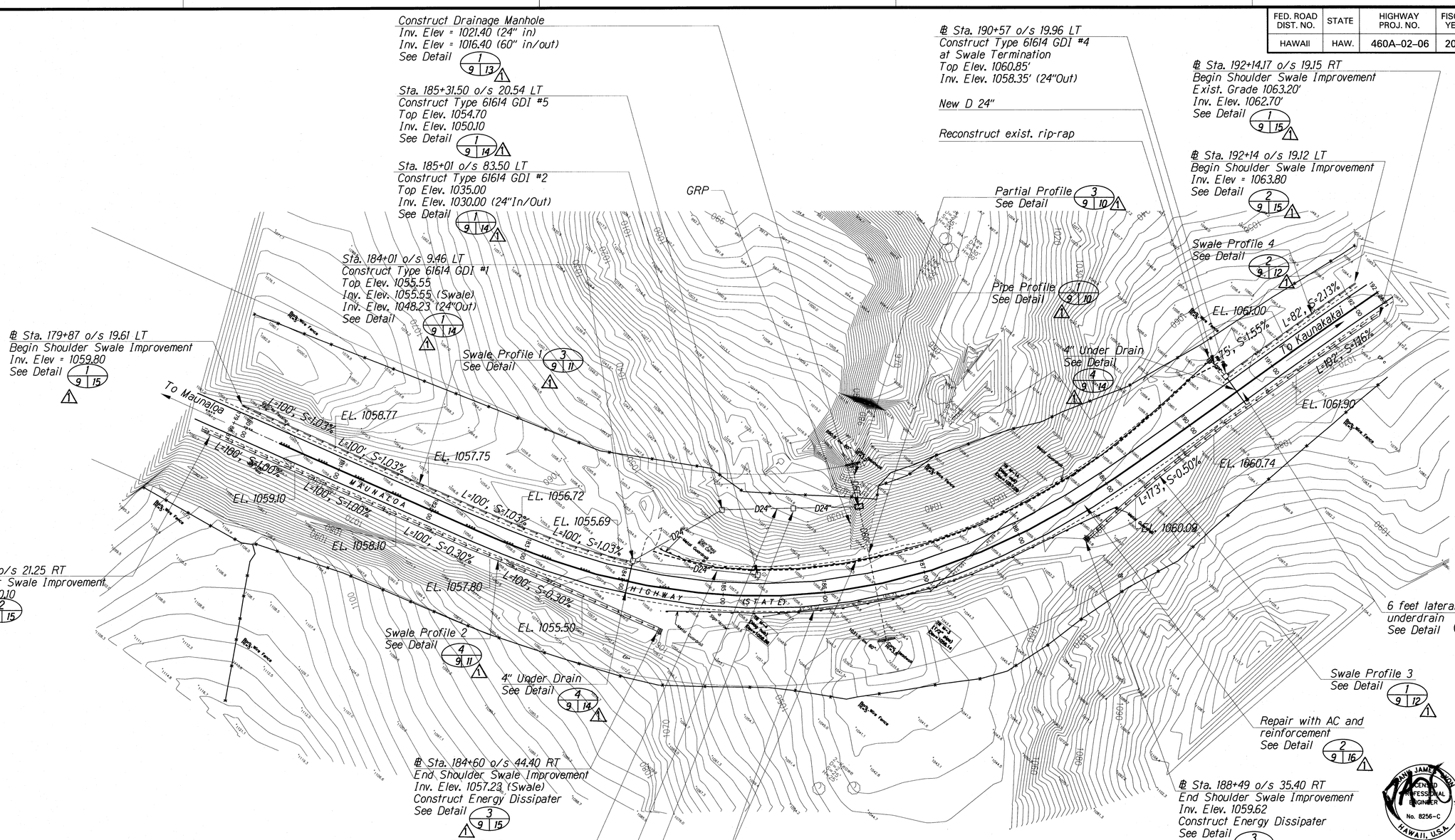
MAUNALOA HIGHWAY
Slope Stabilization at Milepost 13
Highway Project No. 460A-02-06

Scale: AS NOTED Date: JAN 2010

SHEET No. 8 OF 16 SHEETS

ADD. 8

FED. ROAD DIST. NO.	STATE	HIGHWAY PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	460A-02-06	2010	9	16



Notes:

1. Azimuth and line work including state right-of-way boundary referenced to State Plane NAD 83 coordinate system. Grid azimuth rotation to local Government Survey Triangulation Station "MAUNA LOA 1872" being -0 10'37".

2. Boundary lines shown taken from Federal Aid Secondary Project No. S21(1).

3. Elevations shown derived from a spike benchmark located near the intersection of Molokai Airport Road and Airport Loop, being 481.31. Spike benchmark information taken from State Department of Transportation, Cadastral Engineering Department for waterline project along Maunaloa Highway, Sheet No. 5712.5.

DATE	REVISION
2-19-10	1 Revised Sheet Reference Numbers

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

DRAINAGE LAYOUT PLAN
SCALE 1" = 50'

JOHN JAMES SHOW
LICENSED PROFESSIONAL ENGINEER
No. 8256-C
HAWAII, U.S.A.
Exp. 4/30/10

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE LAYOUT PLAN

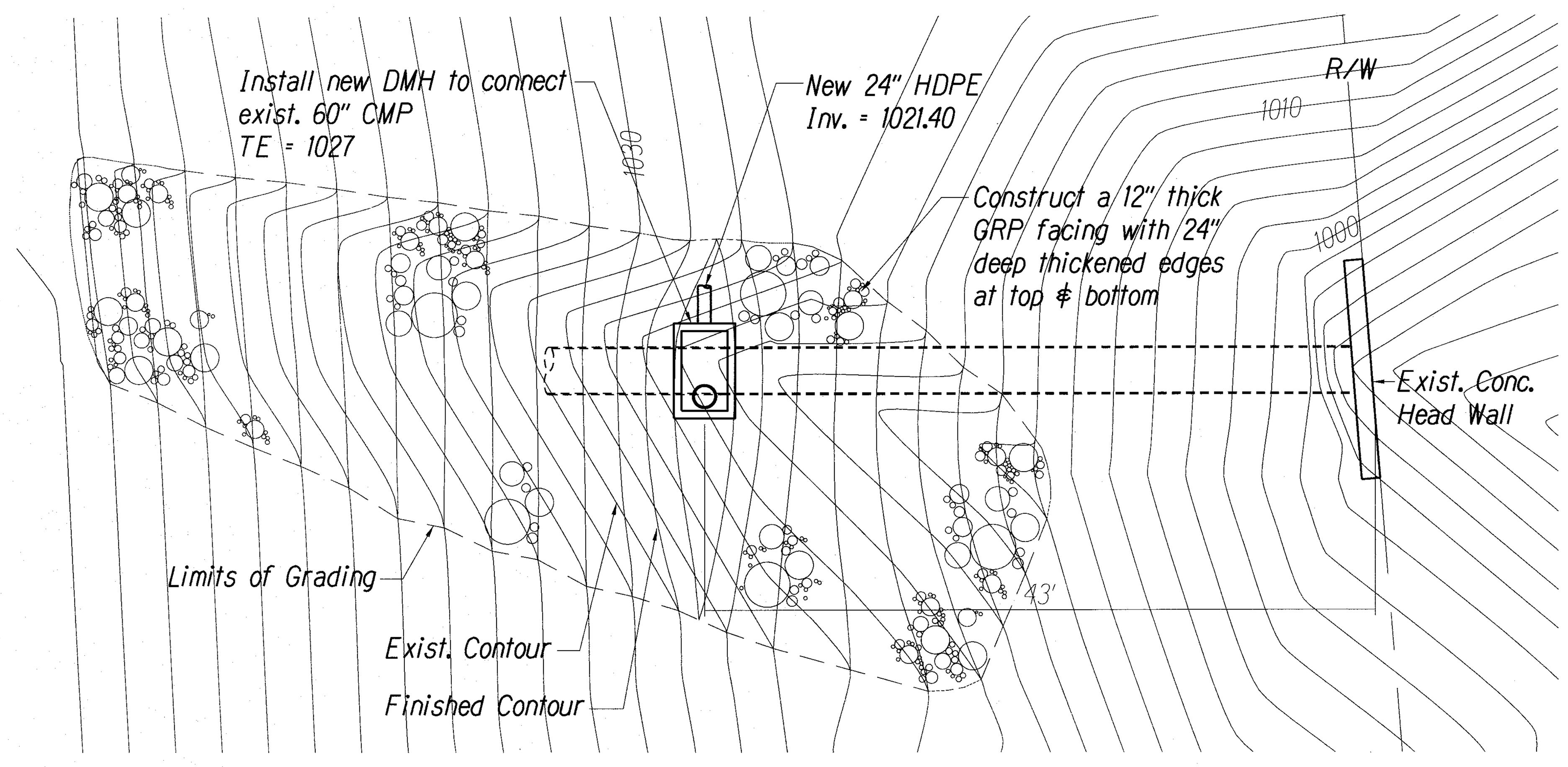
MAUNALOA HIGHWAY
Slope Stabilization at Milepost 13
Highway Project No. 460A-02-06

Scale: AS NOTED Date: JAN 2010

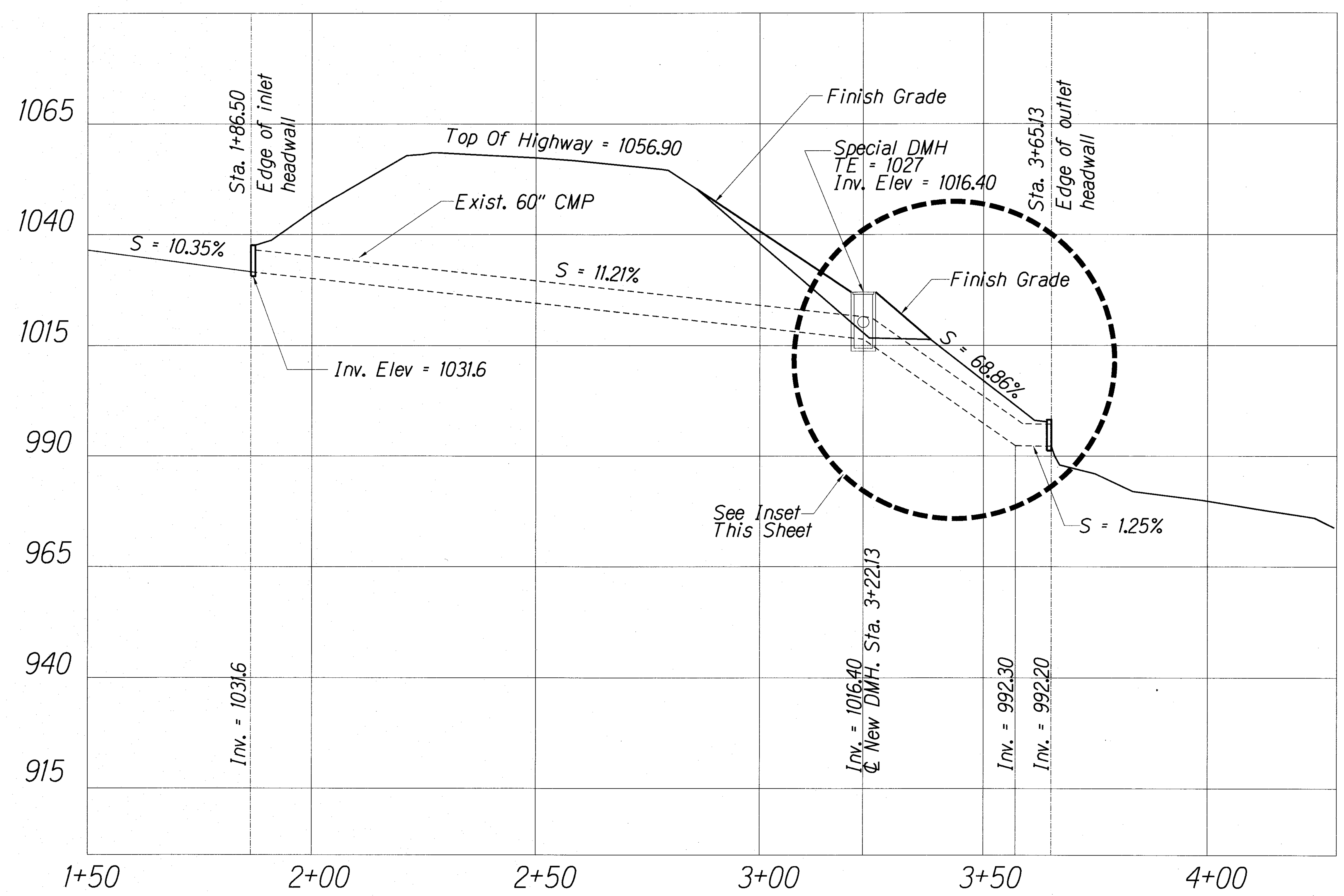
SHEET No. 9 OF 16 SHEETS

ADD. 9

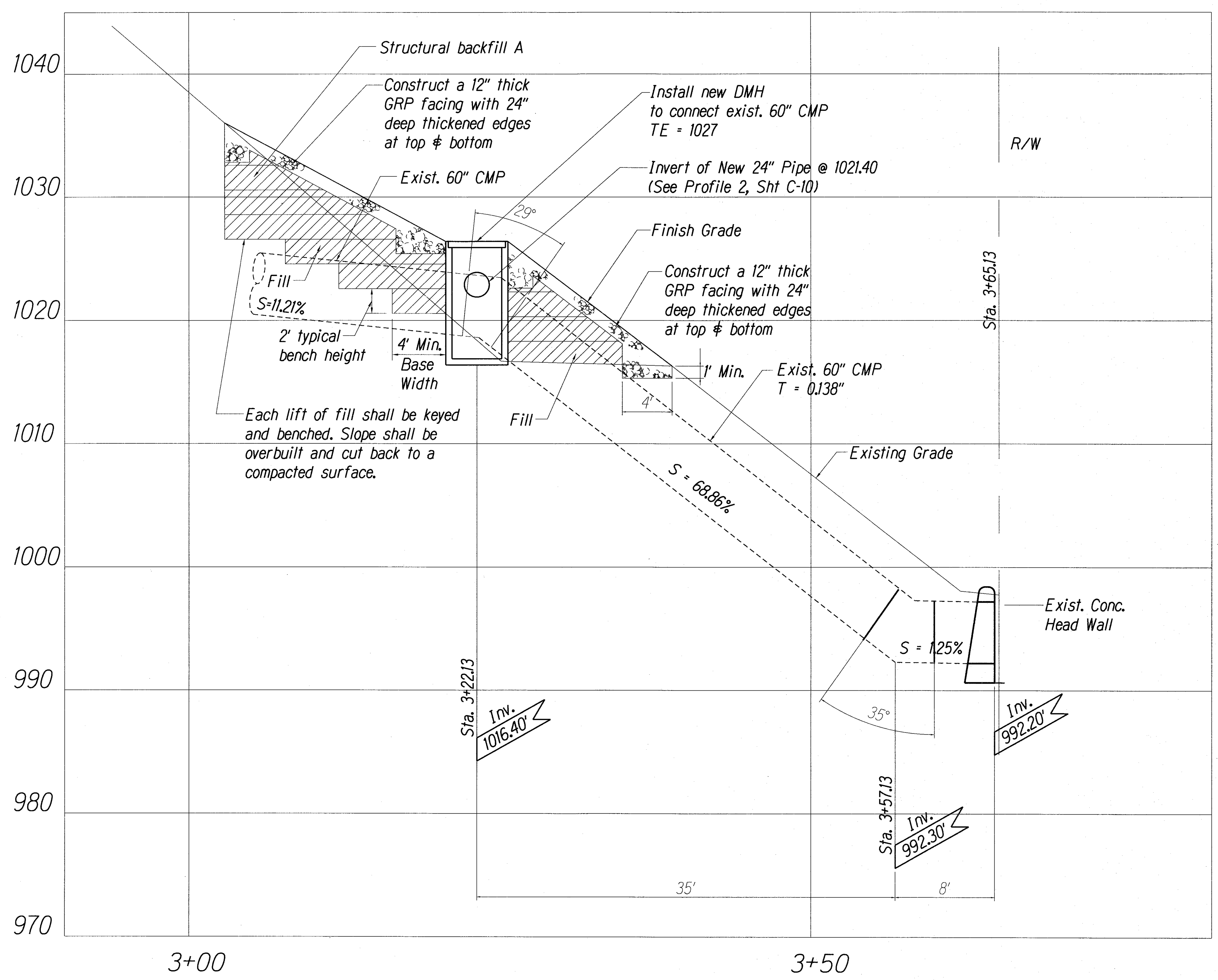
FED. ROAD DIST. NO.	STATE	HIGHWAY PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	460A-02-06	2010	10	16



PLAN (1 / 9 | 10) △1
Scale: 1"=10'-0"



PROFILE (2 / 9 | 10) △1
Scale: Horiz: 1"=20'-0"
Vert: 1"=1'-0"



INSET (3 / 9 | 10) △1
Scale: Horiz: 1"=6'-0"

FRANK JAMES ... LICENSED PROFESSIONAL ENGINEER No. 8256-C HAWAII, U.S.A.
Exp. 4/30/10
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DETAILS OF 60" CULVERT CONNECTION AT ℄ STA. 186+50

Scale: 1"=20'-0"
Vert: 1"=1'-0"

SCALE: 1"=1'-0" (1' 0 1' 2')
SCALE: 1"=10' (10' 0 10' 20' 30')
SCALE: 1"=20' (20' 0 20' 40' 60')

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PROFILE – 1

MAUNALOA HIGHWAY
Slope Stabilization at Milepost 13
Highway Project No. 460A-02-06

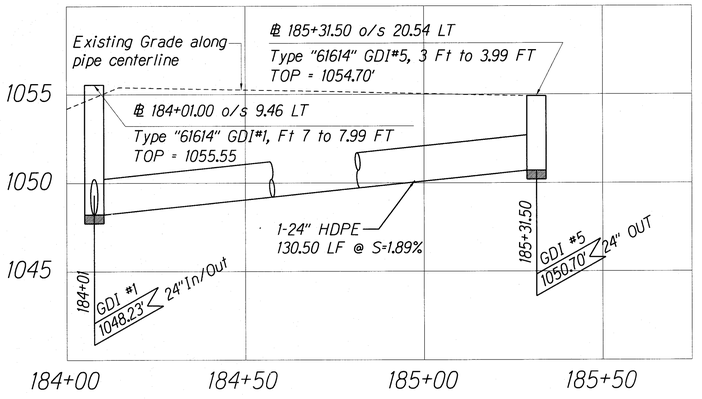
Scale: AS NOTED Date: JAN 2010

DATE	REVISION
2-19-10	△1 Revised Sheet Reference Numbers

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

ADD. 10

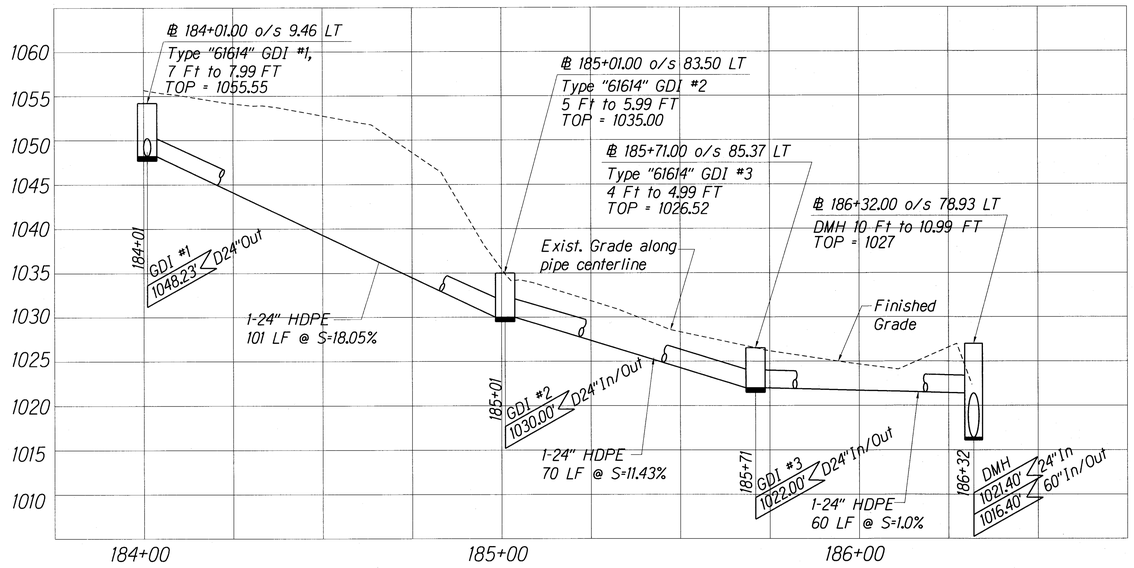
FED. ROAD DIST. NO.	STATE	HIGHWAY PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	460A-02-06	2010	11	16



PROFILE ALONG CENTERLINE

1/9/11 ⚠1

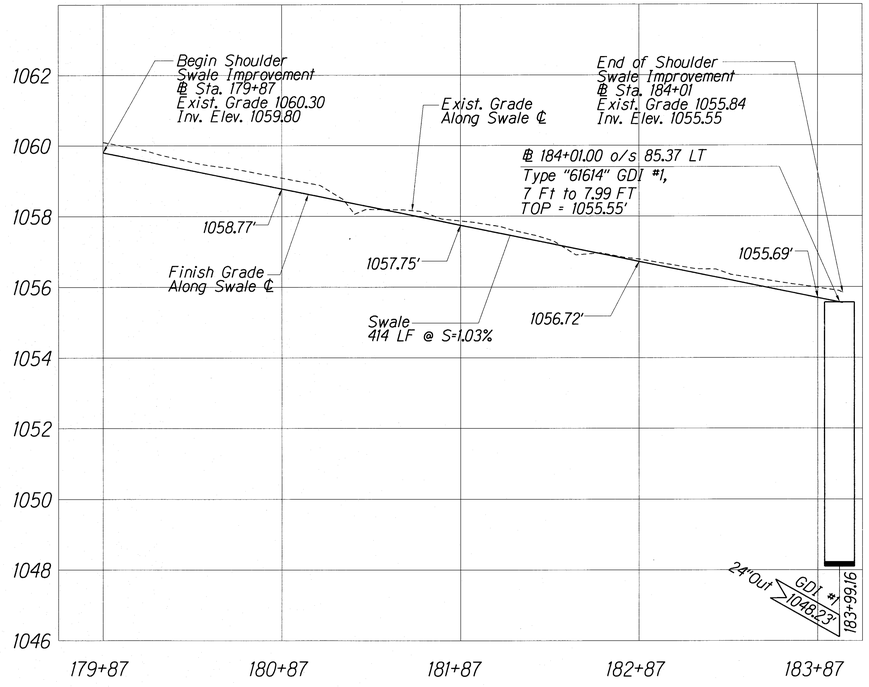
Scale: Horiz: 1"=20'-0"
Vert: 1"=4'-0"



PROFILE 2

2/9/11 ⚠1

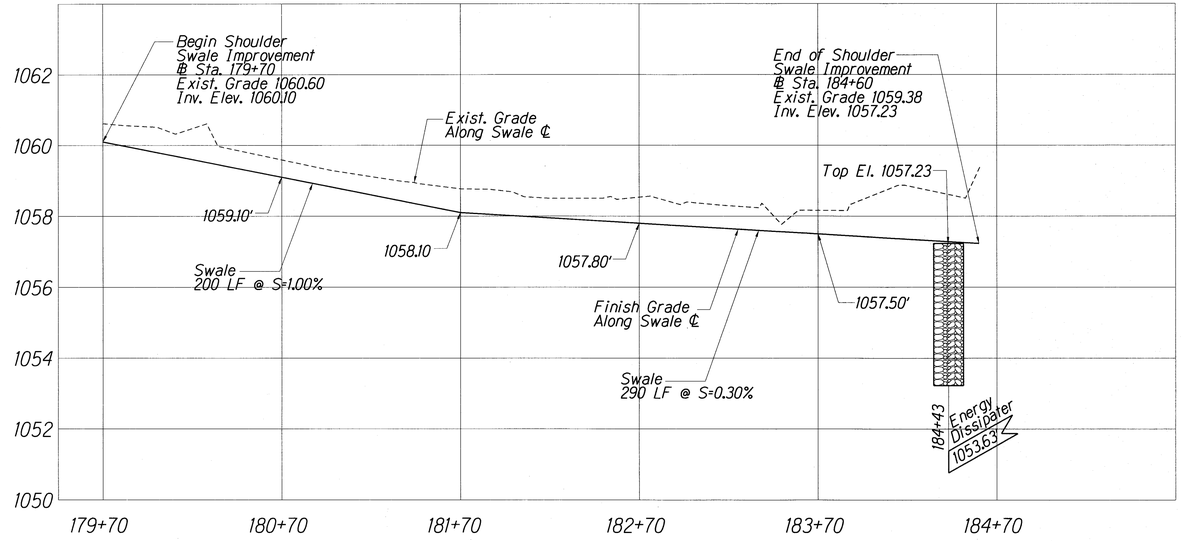
Scale: Horiz: 1"=40'-0"
Vert: 1"=8'-0"



SWALE PROFILE 1

3/9/11 ⚠1

Scale: Horiz: 1"=40'-0"
Vert: 1"=2'-0"



SWALE PROFILE 2

4/9/11 ⚠1

Scale: Horiz: 1"=40'-0"
Vert: 1"=2'-0"

2' 0 2' 4' 6'
SCALE: 1"=2'

4' 0 4' 8' 12'
SCALE: 1"=4'

8' 0 8' 16' 24'
SCALE: 1"=8'

20' 0 20' 40' 60'
SCALE: 1"=20'

40' 0 40' 80' 120'
SCALE: 1"=40'

FRANK JAMES LYON
LICENSED PROFESSIONAL ENGINEER
No. 8256-C
HAWAII, U.S.A.
Exp. 4/30/10

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PROFILE – 2

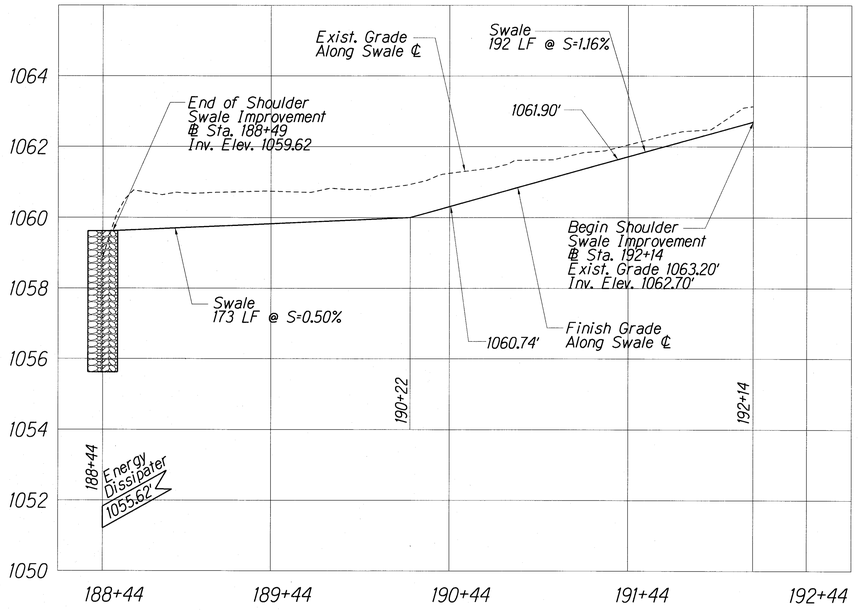
MAUNALOA HIGHWAY
Slope Stabilization at Milepost 13
Highway Project No. 460A-02-06

Scale: AS NOTED Date: JAN 2010

SHEET No. 11 OF 16 SHEETS

ADD. 11

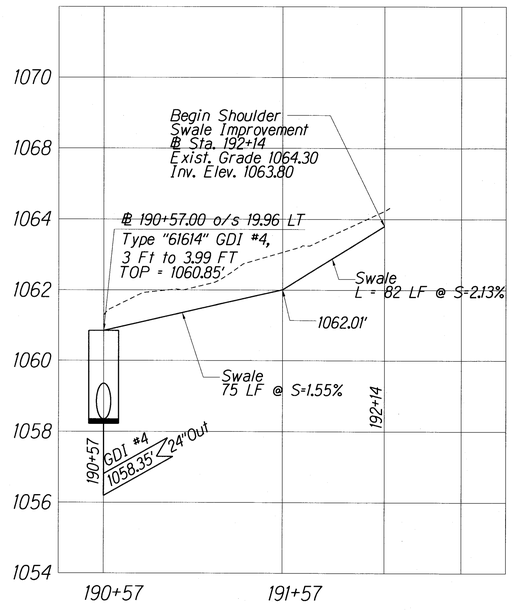
FED. ROAD DIST. NO.	STATE	HIGHWAY PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	460A-02-06	2010	12	16



SWALE PROFILE 3

Scale: Horiz: 1"=40'-0"
Vert: 1"=2'-0"

(9 | 12) ⚠1



SWALE PROFILE 4

Scale: Horiz: 1"=40'-0"
Vert: 1"=2'-0"

(9 | 12) ⚠1

DATE	REVISION
2-19-10	⚠1 Revised Sheet Reference Numbers

2' 0 2' 4' 6'
SCALE: 1"=2'

40' 0 40' 80' 120'
SCALE: 1"=40'

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No. 8256-C
HAWAII, U.S.A.
Exp. 4/30/10

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PROFILE – 3

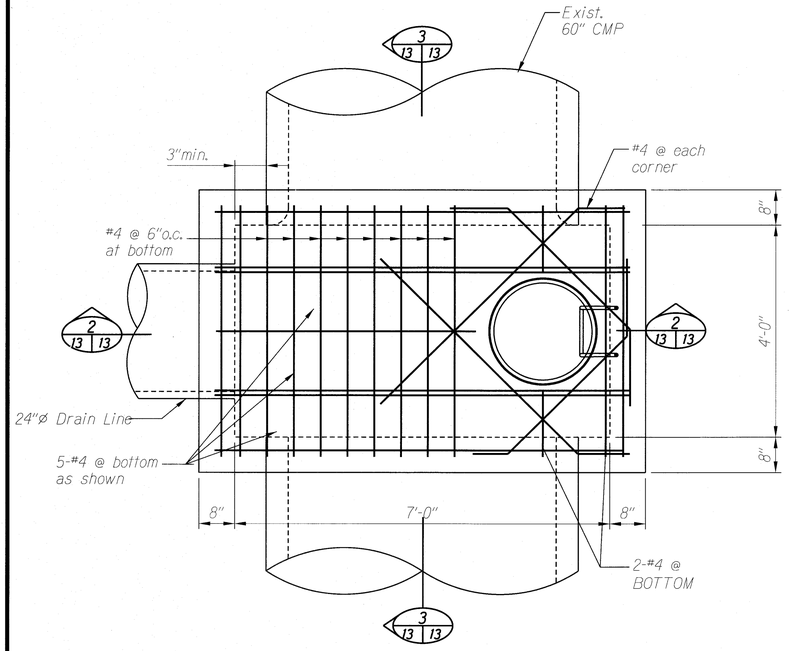
MAUNALOA HIGHWAY
Slope Stabilization at Milepost 13
Highway Project No. 460A-02-06

Scale: AS NOTED Date: JAN 2010

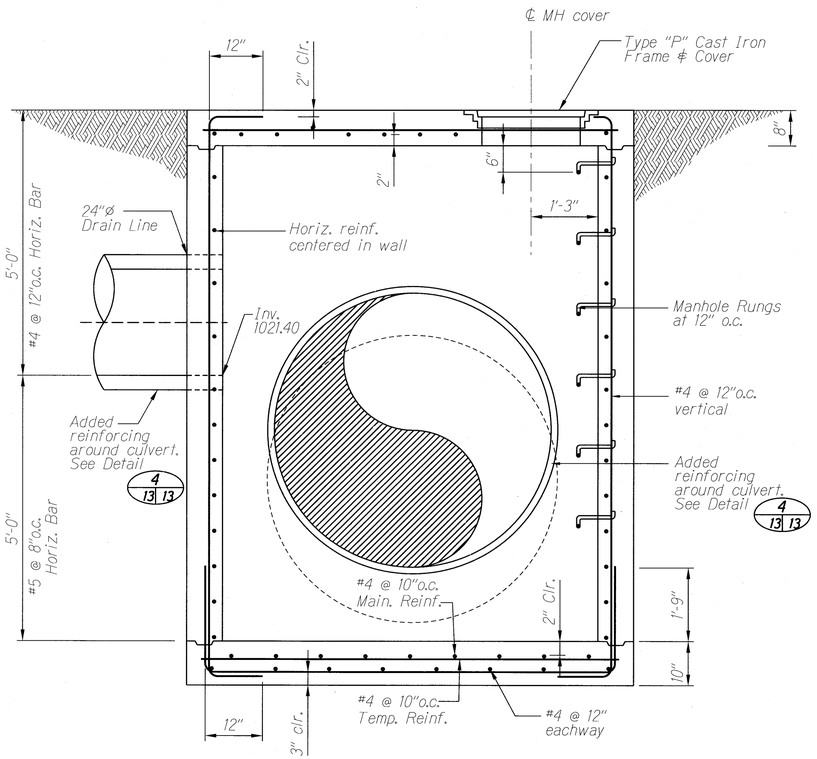
SHEET No. 12 OF 16 SHEETS

ADD. 12

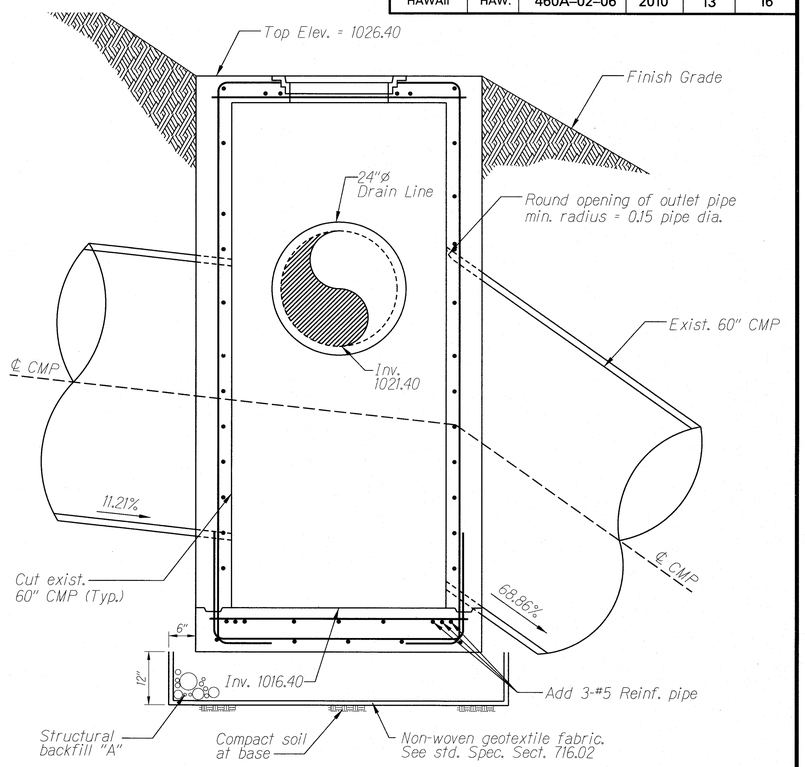
FED. ROAD DIST. NO.	STATE	HIGHWAY PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	460A-02-06	2010	13	16



PLAN
SCALE: 3/4"=1'-0"

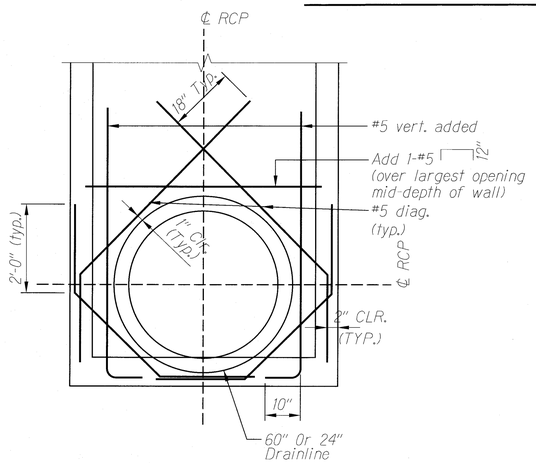


SECTION
SCALE: 3/4"=1'-0"

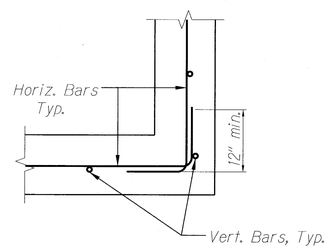


SECTION
SCALE: 3/4"=1'-0"

SPECIAL DRAIN MANHOLE DETAIL (NOT IN PAVEMENT)
SCALE: AS SHOWN



TYP. ADDED REINF. AT PIPES
SCALE: 3/4"=1'-0"



TYP. CORNER REINFORCEMENT LAPPING
SCALE: 3/4"=1'-0"

DATE	REVISION
2-19-10	1 Revised Sheet Reference Numbers

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ORIGINAL PLAN
NOTE BOOK
DATE

SCALE: 1' 0 1' 2' 3' — 3/4"=1'-0"

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No. 8256-C
HAWAII, U.S.A.
Exp. 4/30/10
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE MISC. DETAILS – 1

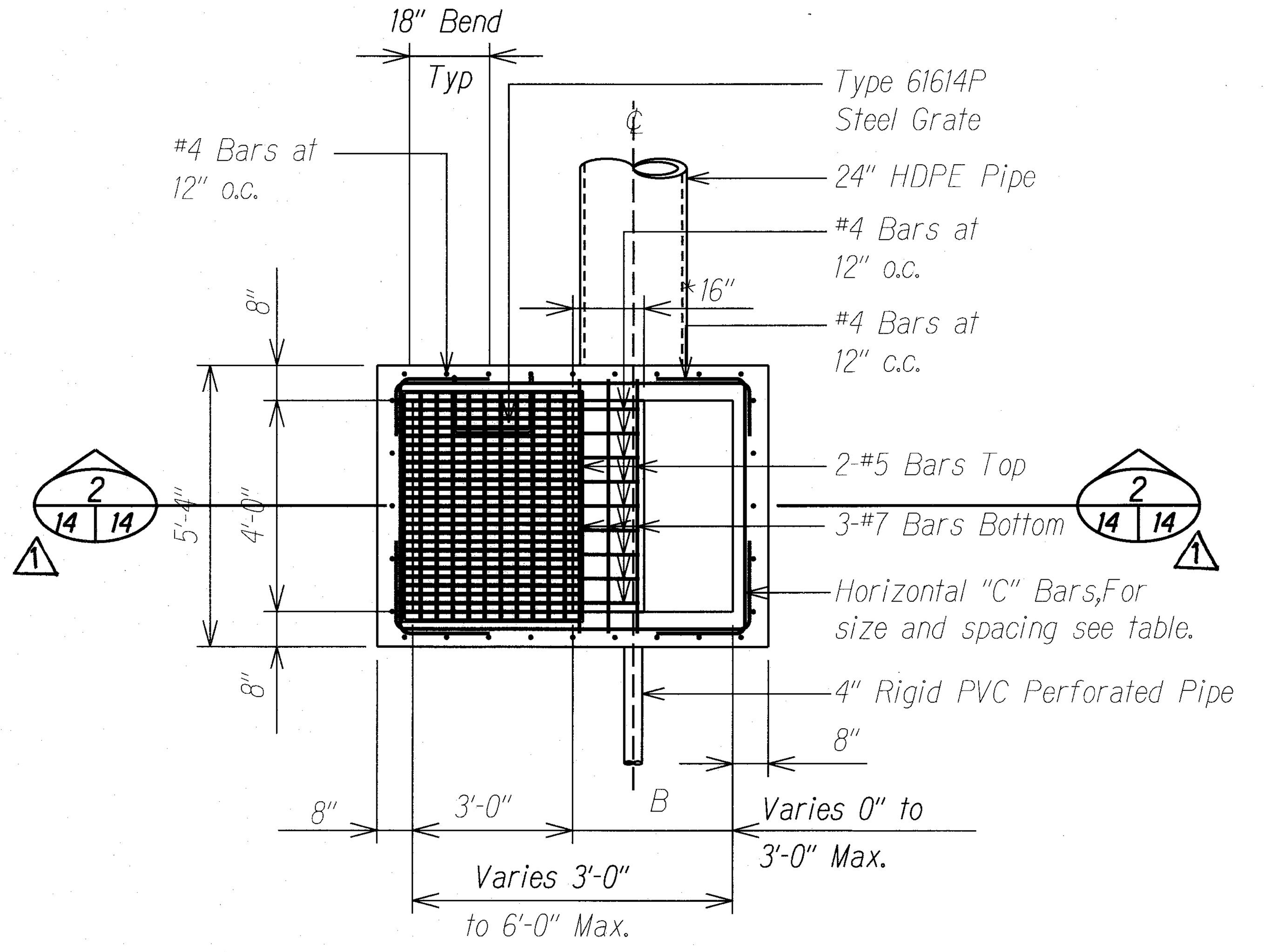
MAUNALOA HIGHWAY
Slope Stabilization at Milepost 13
Highway Project No. 460A-02-06

Scale: AS NOTED Date: JAN 2010

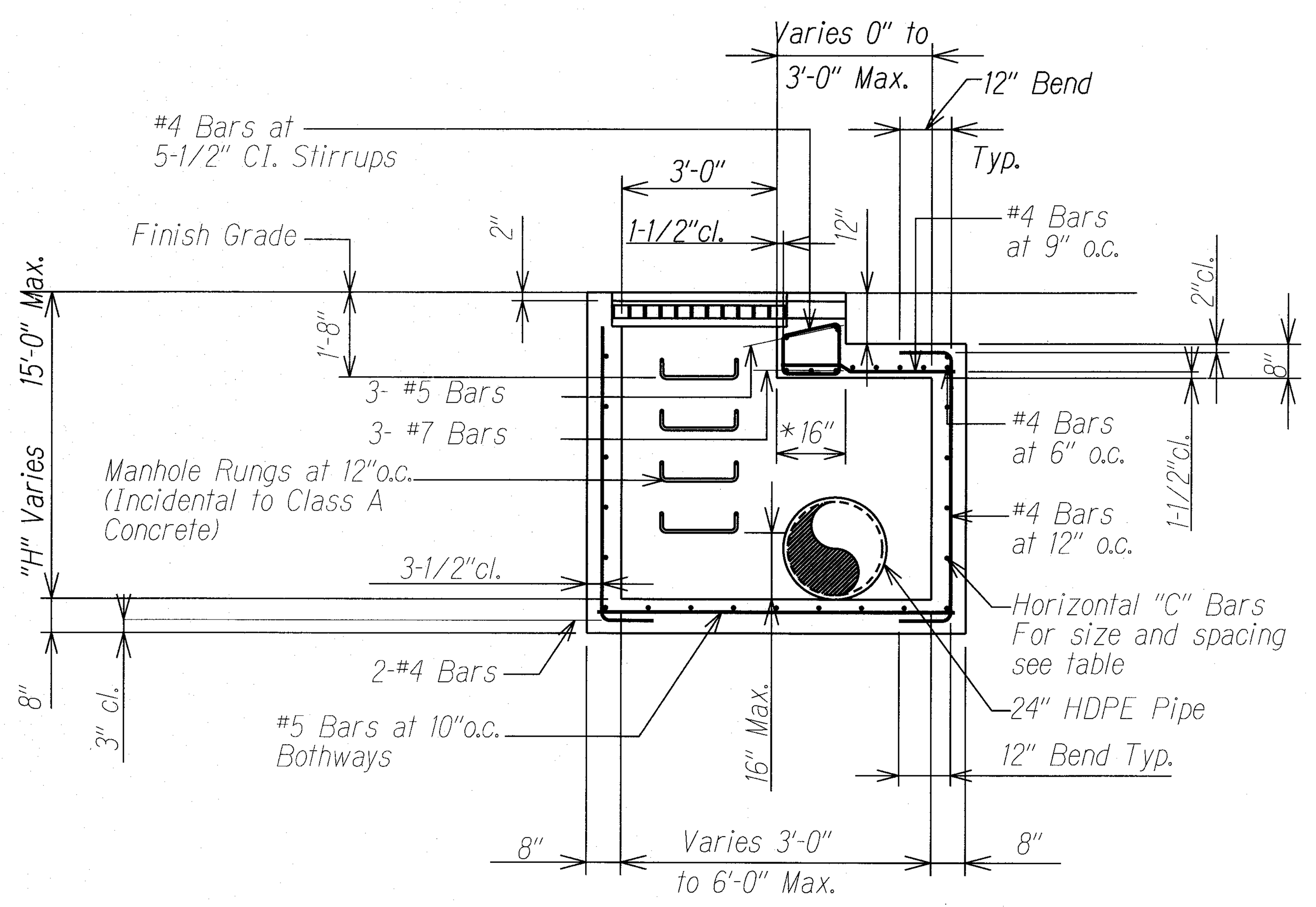
SHEET No. 13 OF 16 SHEETS

ADD. 13

FED. ROAD DIST. NO.	STATE	HIGHWAY PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	460A-02-06	2010	14	16



PLAN (1 — 9|14)
SCALE: 3/8"=1'-0"



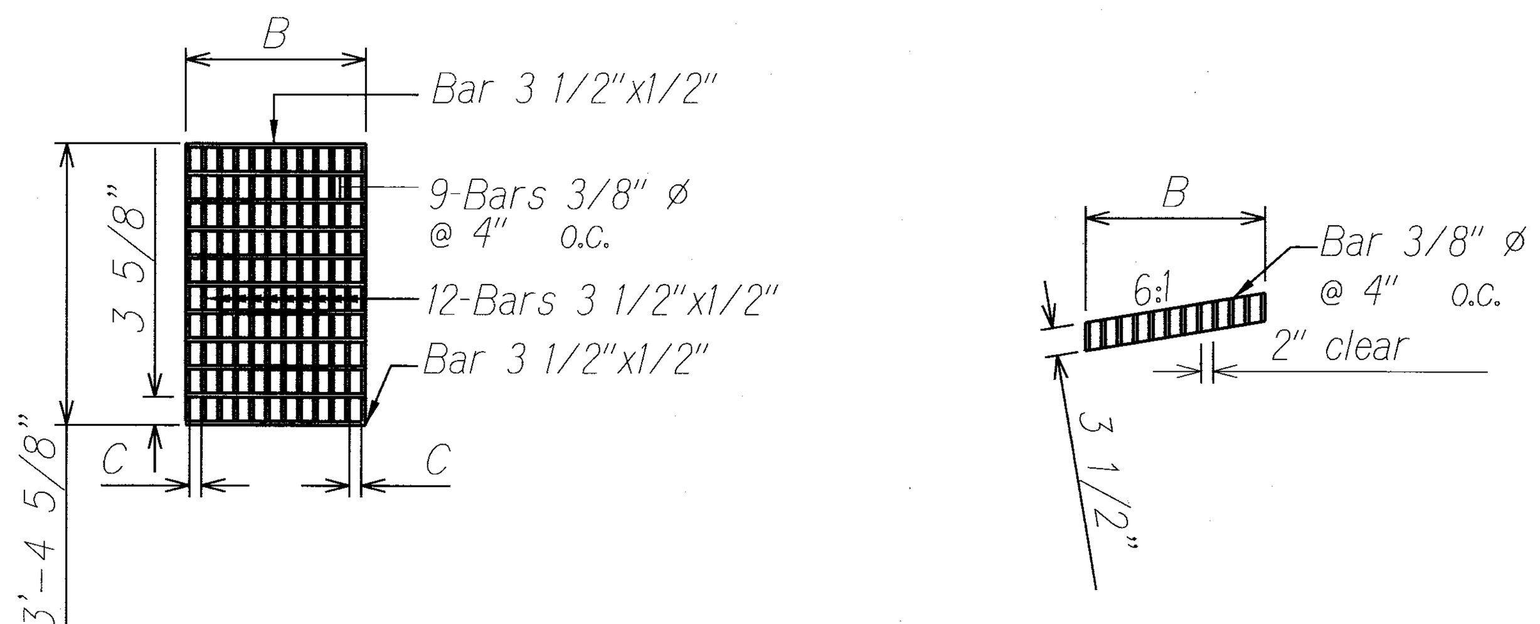
SECTION (2 — 14|14)
SCALE: 3/8"=1'-0"

DRAIN INLET/FLANKER INLET DETAIL
SCALE: AS SHOWN

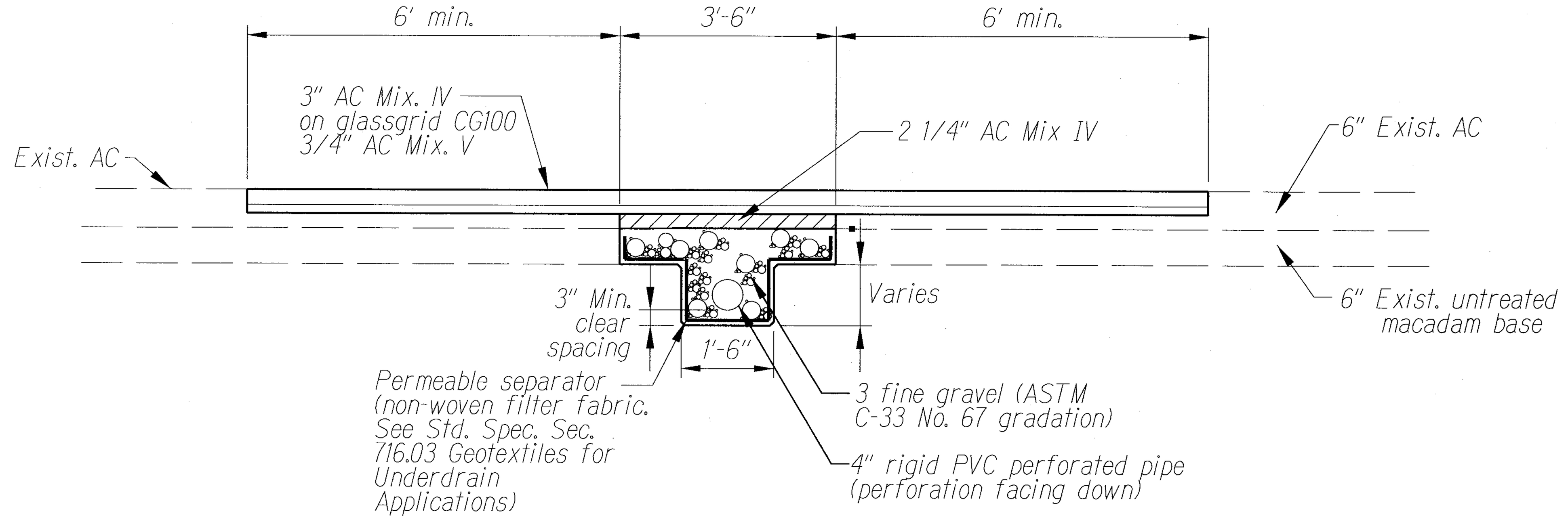
DIMENSIONS			
TYPE	NO. BARS	B	C
61614P	12	1'-11 1/2"	2"

GENERAL NOTES

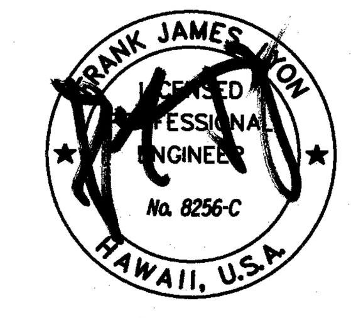
1. Steel frame details for grates shall be the steel frames shown on Standard Plan H-16.
2. Grates shal be hot dip galvanized after fabrication.
3. Use in locations off the road bed on all types of highways. (Pedestrian safe)



TYPE 61614P STEEL GRATE (3 — 14|14)
SCALE: 1/2"=1'-0"



TYPICAL ROAD DRAIN DETAIL (4 — 9|14)
SCALE: 1/2"=1'-0"



Exp. 4/30/10

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DATE	REVISION
2-19-10	⚠1 Revised Sheet Reference Numbers

SCALE: 3/8"=1'-0" (1' 0 2' 4' 6')

SCALE: 1/2"=1'-0" (1' 0 1' 2' 3' 4' 5')

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE MISC. DETAILS - 2

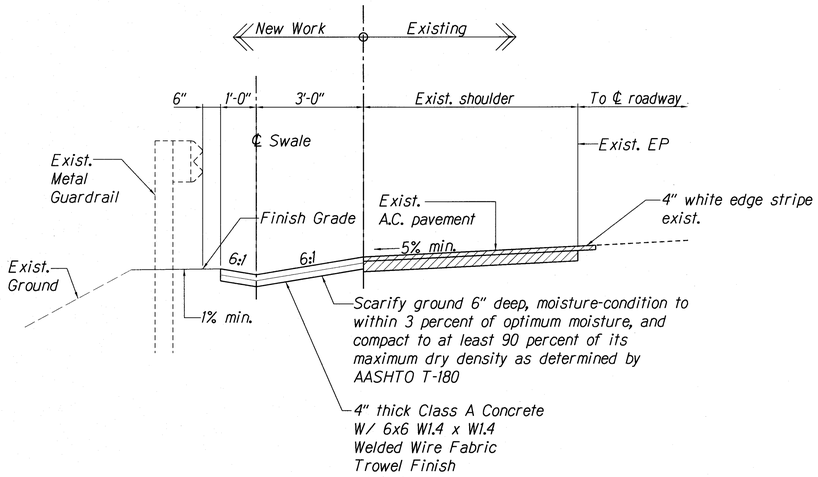
MAUNALOA HIGHWAY
Slope Stabilization at Milepost 13
Highway Project No. 460A-02-06

Scale: AS NOTED Date: JAN 2010

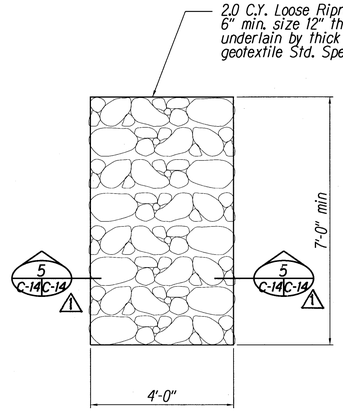
SHEET No. 14 OF 16 SHEETS

ADD. 14

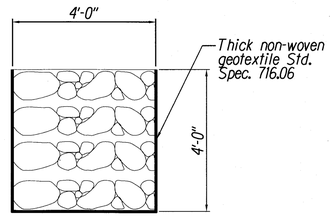
FED. ROAD DIST. NO.	STATE	HIGHWAY PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	460A-02-06	2010	15	16



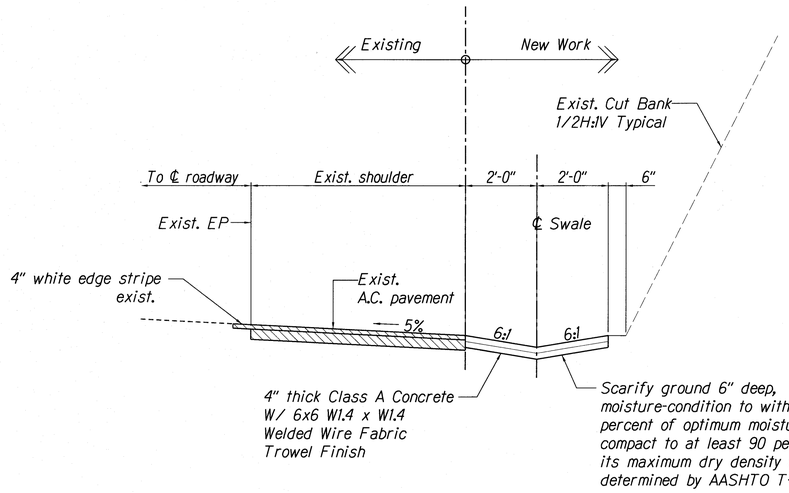
LEFT SHOULDER DETAIL (1 / 9 | 15)
SCALE: 1/2"=1'-0"



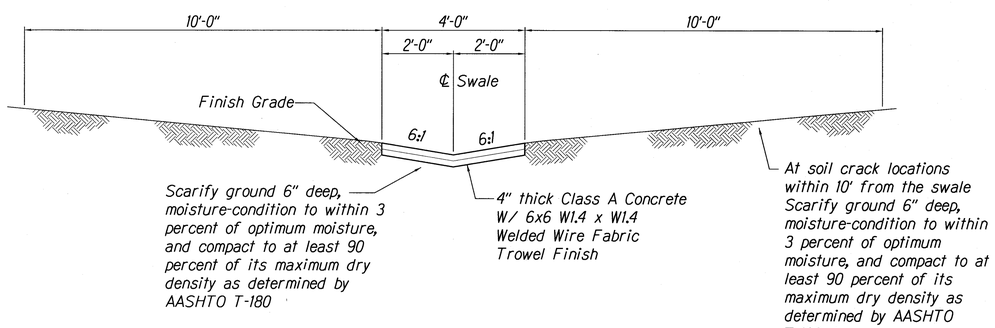
ENERGY DISSIPATER (3 / 9 | 15)
SCALE: 1/2"=1'-0"



SECTION (5 / 15 | 15)
SCALE: 1/2"=1'-0"



RIGHT SHOULDER DETAIL (2 / 9 | 15)
SCALE: 1/2"=1'-0"



TYPICAL SWALE SECTION - OFF ROAD (4 / 9 | 15)
SCALE: 1/2"=1'-0"

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

DATE	REVISION
2-19-10	⚠1 Revised Sheet Reference Numbers

FRANK JAMES VON — LICENSED PROFESSIONAL ENGINEER — No. 8256-C — HAWAII, U.S.A. — Exp. 4/30/10

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

SCALE: 1' 0 1' 2' 3' 4' 5' — 1/2"=1'-0"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE MISC. DETAILS – 3

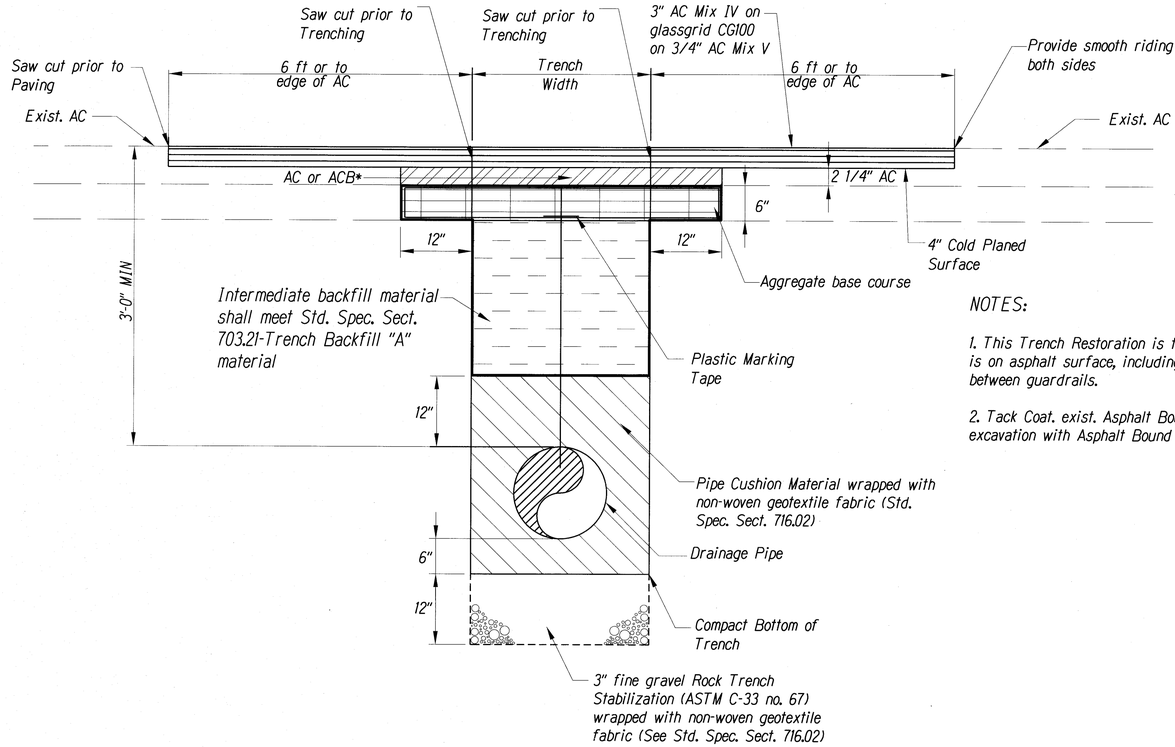
MAUNALOA HIGHWAY
Slope Stabilization at Milepost 13
Highway Project No. 460A-02-06

Scale: AS NOTED Date: JAN 2010

SHEET No. 15 OF 16 SHEETS

ADD. 15

FED. ROAD DIST. NO.	STATE	HIGHWAY PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	460A-02-06	2010	16	16



NOTES:

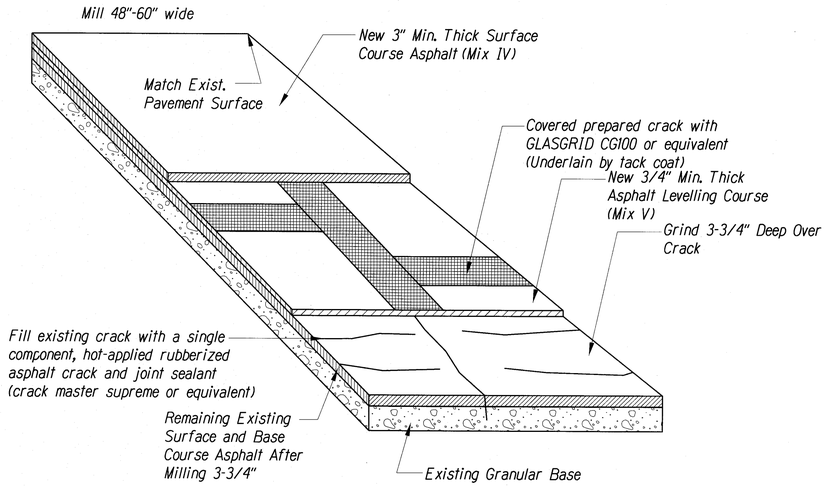
1. This Trench Restoration is to be used wherever the pavement is on asphalt surface, including medians and paved areas between guardrails.

2. Tack Coat. exist. Asphalt Bound Material faces prior to filling excavation with Asphalt Bound Material.

ASPHALT PAVEMENT RESTORATION OVER TRENCH EXCAVATIONS FOR EXISTING PAVEMENTS

SCALE: NOT TO SCALE

1 | 16 | 16 ⚠1



NOTES:

1. Contractor to be field verify locations at crack Asphalt surfaces.

2. Glassgrid to be applied to entire Asphalt surface (shoulders and travel lanes) as shown on Sheet 9. ⚠4

3. When tested in accordance with ASTM D6690, the sealant shall have the following chemical and physical properties.

Recommended application temperature:	350 to 400 degrees Fahrenheit
Maximum heating temperature:	350 to 400 degrees Fahrenheit
Cone Penetration at 25 degrees Celsius:	50 Maximum
Flow at 60 degrees Celsius:	0
Softening point:	200 degress Fahrenheit
Resiliency:	60 percent Minimum
Flexibility at 0 degrees Fahrenheit:	(1" Mandrel) - Passes
Specific Gravity:	1.17
Asphalt Compatibility:	Passes
Environmental Properties:	Non-hazardous

Prior to placement of the crack sealant, the crack shall be cleaned with compressed air to remove dust, loose aggregate, debris, and moisture. The blocks of sealant shall be melted in a proper melting device to its application temperature of 350 to 400 degrees Fahrenheit. Once the sealant is heated, it must be utilized, otherwise it must be properly disposed of, as it may not be reheated. Overheating of the sealant shall be avoided as it could cause the material to gel. A significant viscosity increase accompanied by stringiness signals the approach of gelation. If this occurs, the sealant shall not be utilized, and where this material was used, it shall be removed. All appropriate OSHA safety regulations shall be adhered to during the use of the sealant material.

The sealant shall be applied with either a pump and wand system or a pour pot. After pouring the sealant into the crack, a sealing shoe or squeegee shall be used to level the material and to create an application width 2 to 3 inches wide over the crack.

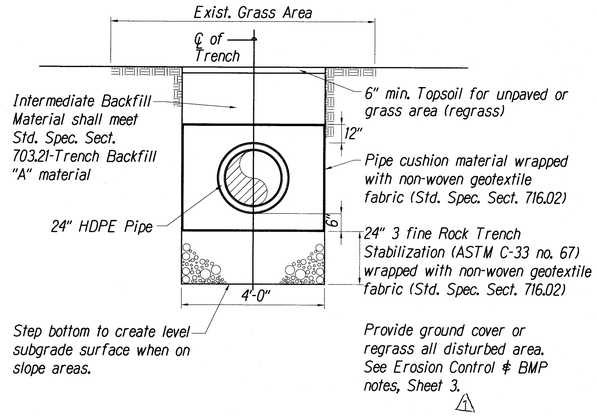
4. The manufacturer or local product supplier representative of the pavement grid must be present during the first day of installation. The manufacturer's installation guidelines shall be adhered to unless otherwise indicated by the engineer.

5. Crack sealing work shall not be paid for separately but shall be considered incidental to the various paving items.

DETAIL FOR ASPHALT CONCRETE PAVEMENT REPAIR

SCALE: NOT TO SCALE

2 | 16 | 16 ⚠1



TRENCH RESTORATION DETAIL WITHIN GRASSED AREAS

SCALE: NOT TO SCALE

3 | 16 | 16 ⚠1

FRANK JAMES LYON
LICENSED PROFESSIONAL ENGINEER
No. 8256-C
HAWAII, U.S.A.
Exp. 4/30/10
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE MISC. DETAILS – 4

MAUNALOA HIGHWAY
Slope Stabilization at Milepost 13
Highway Project No. 460A-02-06

Scale: AS NOTED Date: JAN 2010

SHEET No. 16 OF 16 SHEETS

DATE	REVISION
2-19-10	⚠1 Revised Sheet Reference Numbers

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

ADD. 16