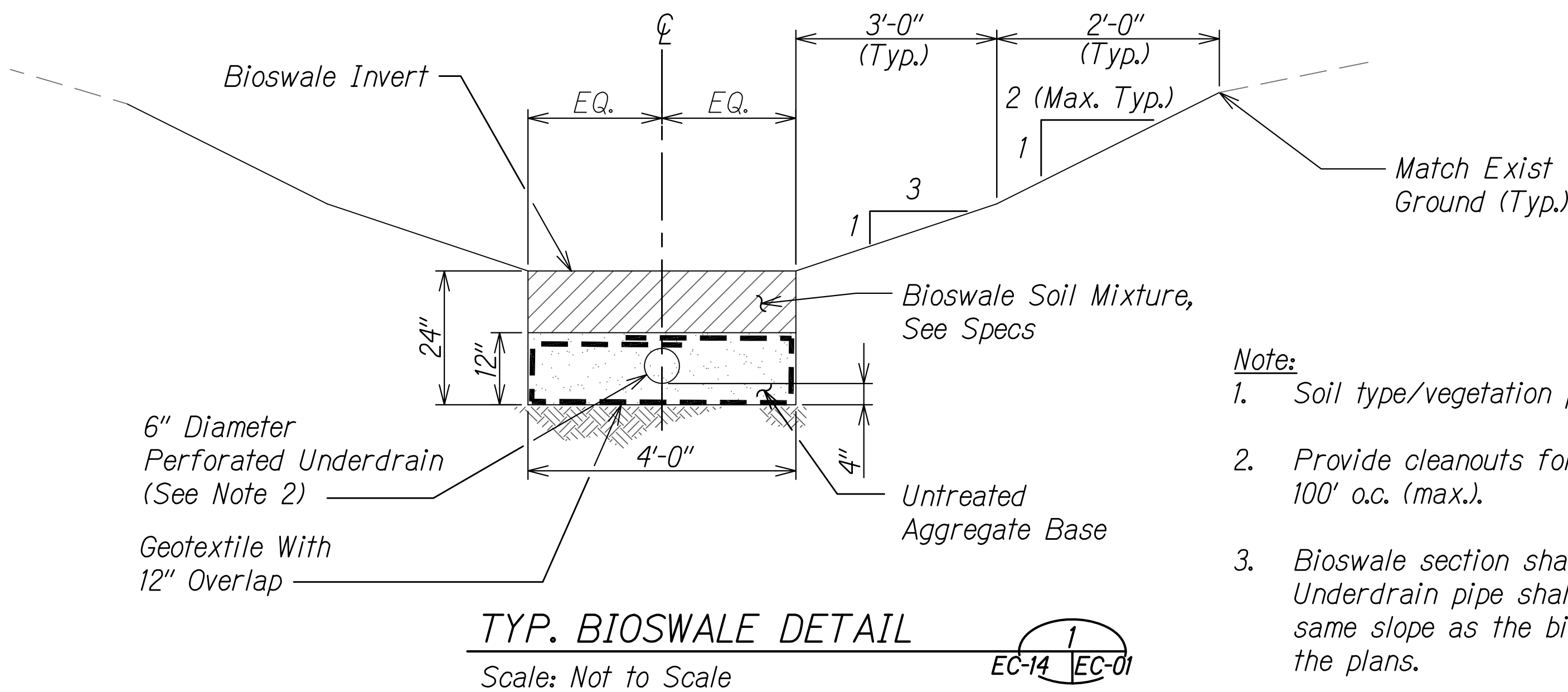
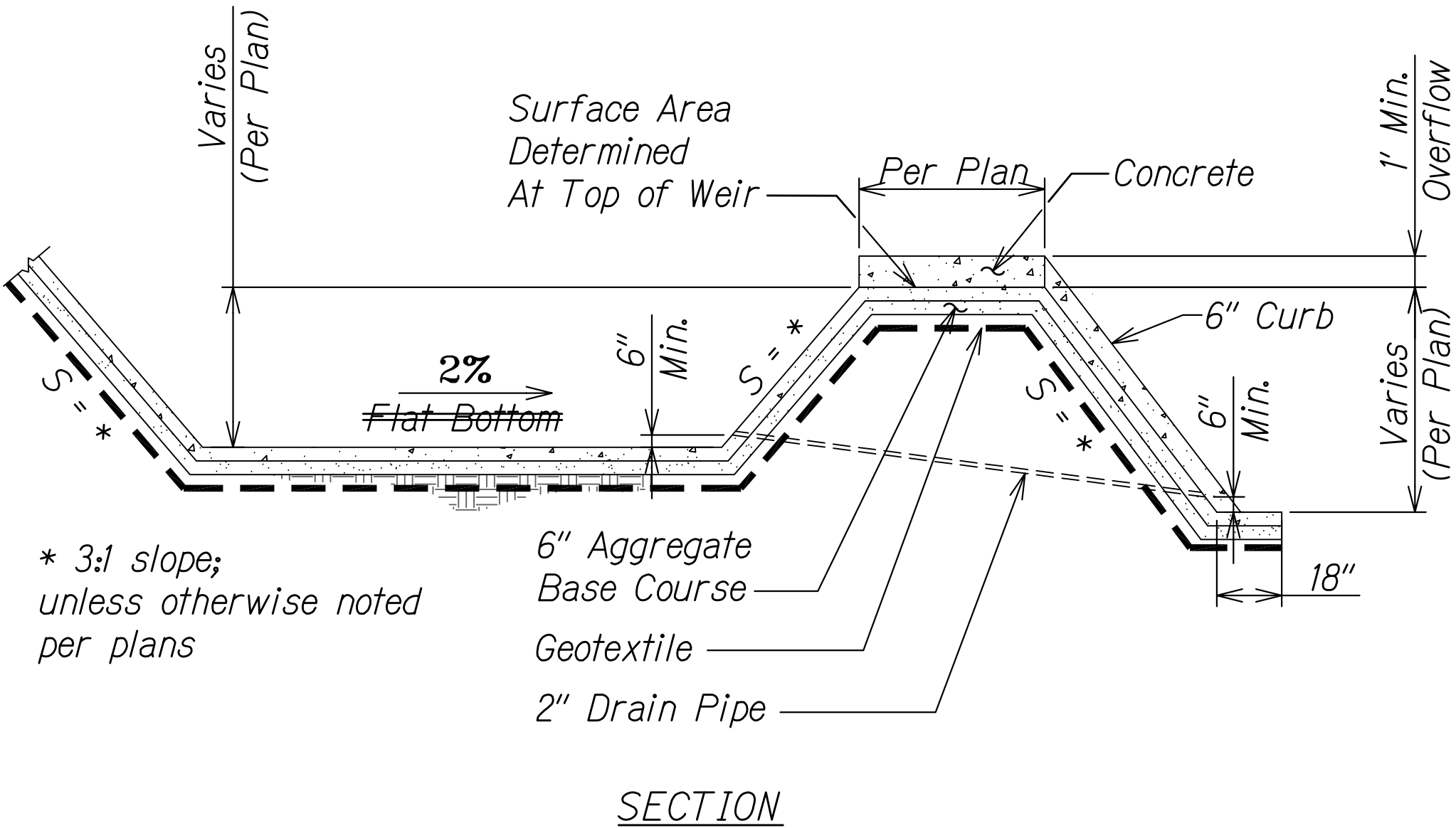


FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-O-04-14M	2014	15	67

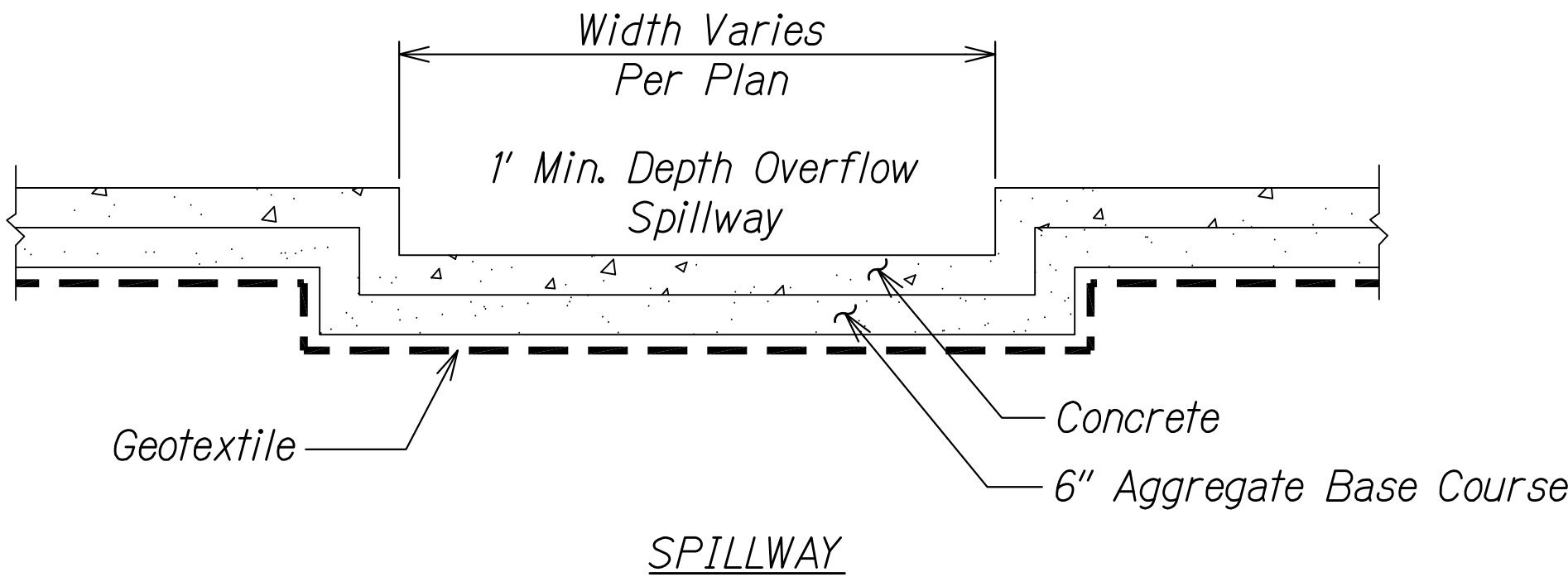


TYP. BIOSWALE DETAIL
Scale: Not to Scale

- Note:**
1. Soil type/vegetation per Landscape plans.
 2. Provide cleanouts for underdrain pipe at 100' o.c. (max.).
 3. Bioswale section shall be uniform. Underdrain pipe shall be placed at the same slope as the bioswale as indicated in the plans.



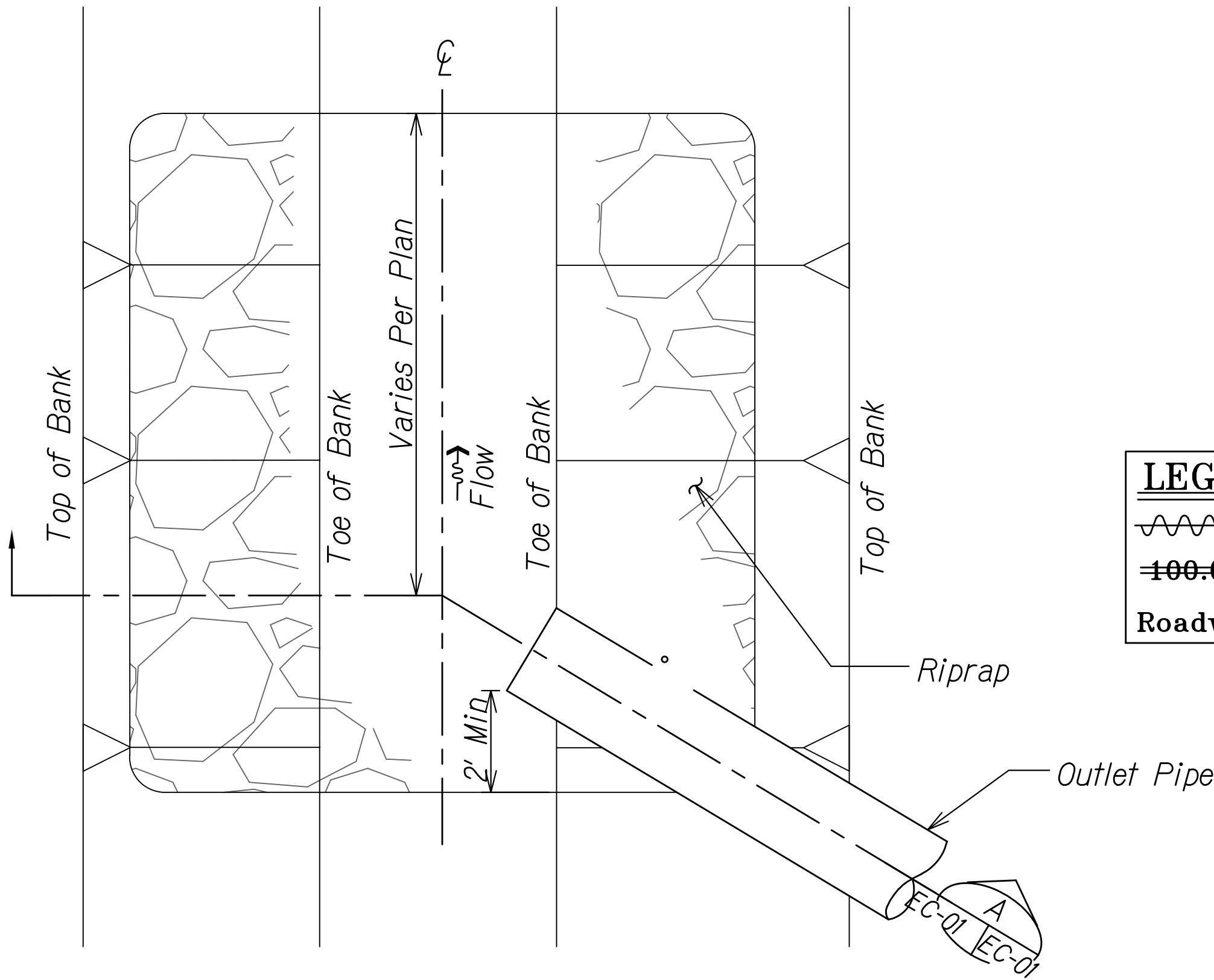
SECTION



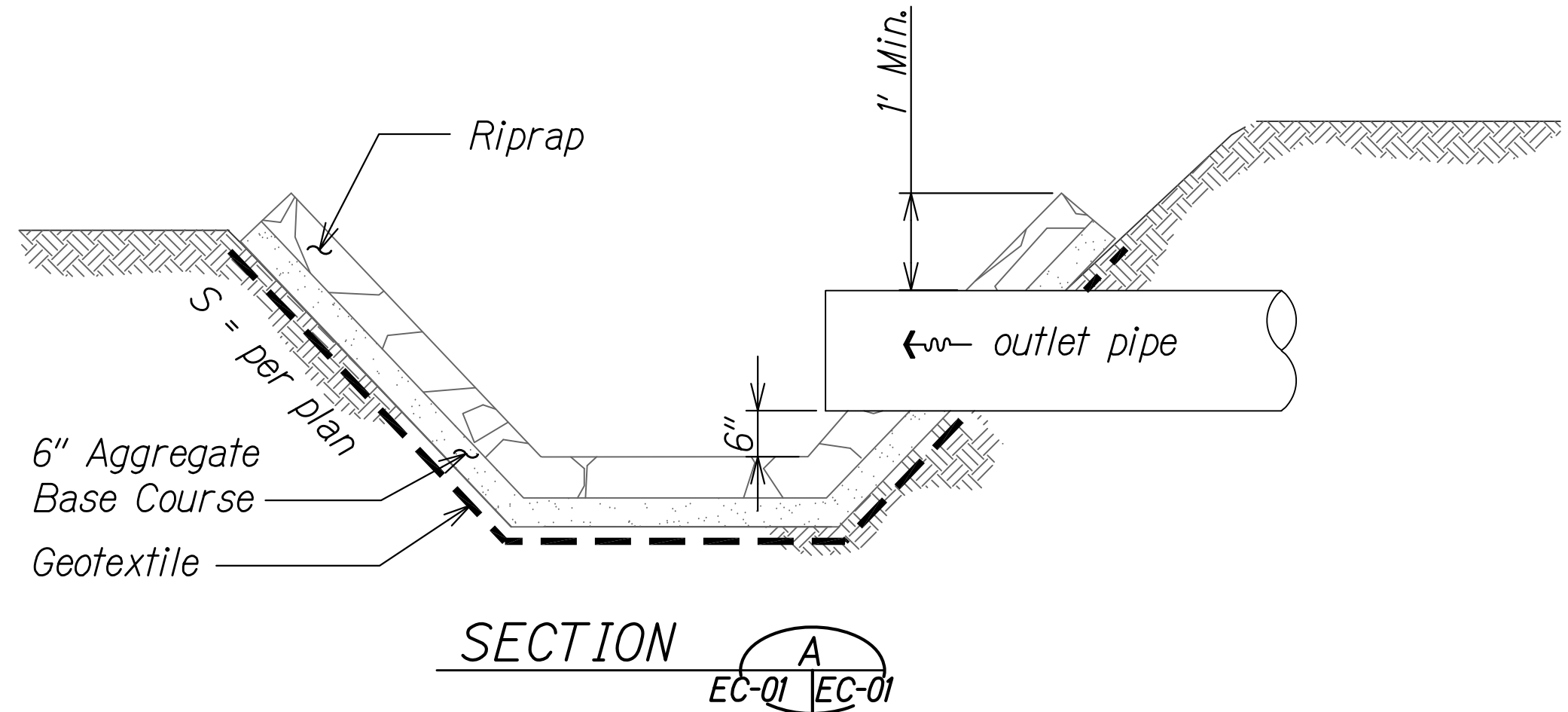
SPILLWAY

TYP. CONC. SETTLING BASIN AND SPILLWAY DETAIL
Scale: Not to Scale

- Notes:**
1. Sediment shall be removed from the settling basin when it reaches 6 inches in depth.
 2. Any damage to the settling basin slopes shall be repaired.
 3. For structural details, see Sheet EC-10.



TYP. PIPE/CULVERT OUTLET PROTECTION
Scale: Not to Scale



SECTION
A

LEGEND FOR AS-BUILT POSTINGS	
	Squiggly line for as-built deletion
	Double line for as-built deletion
	Text for as-built posting

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

MISC DETAILS.DWG 8/23/2021 9:56:06 AM

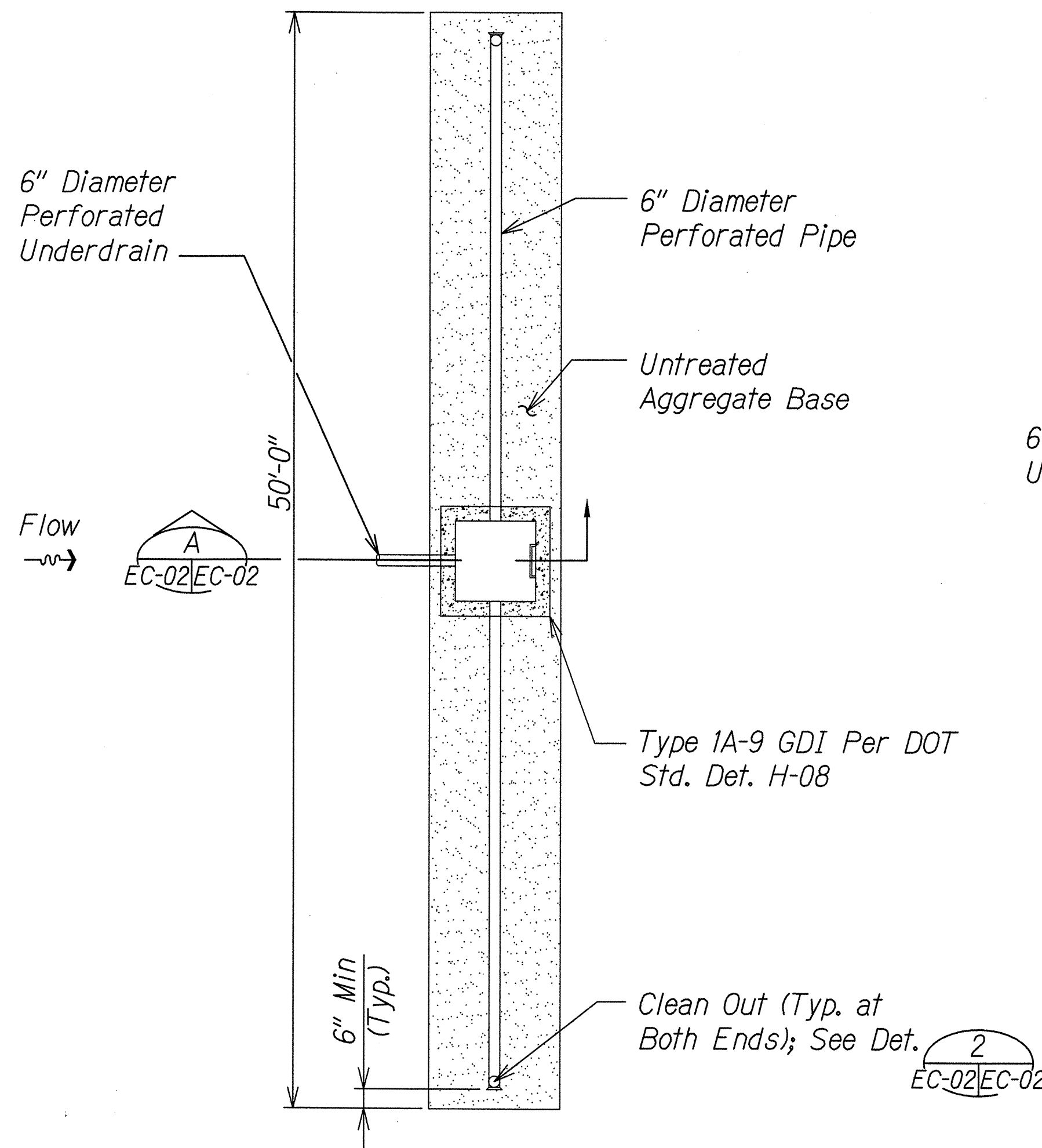
4/30/14
EXP. DATE
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

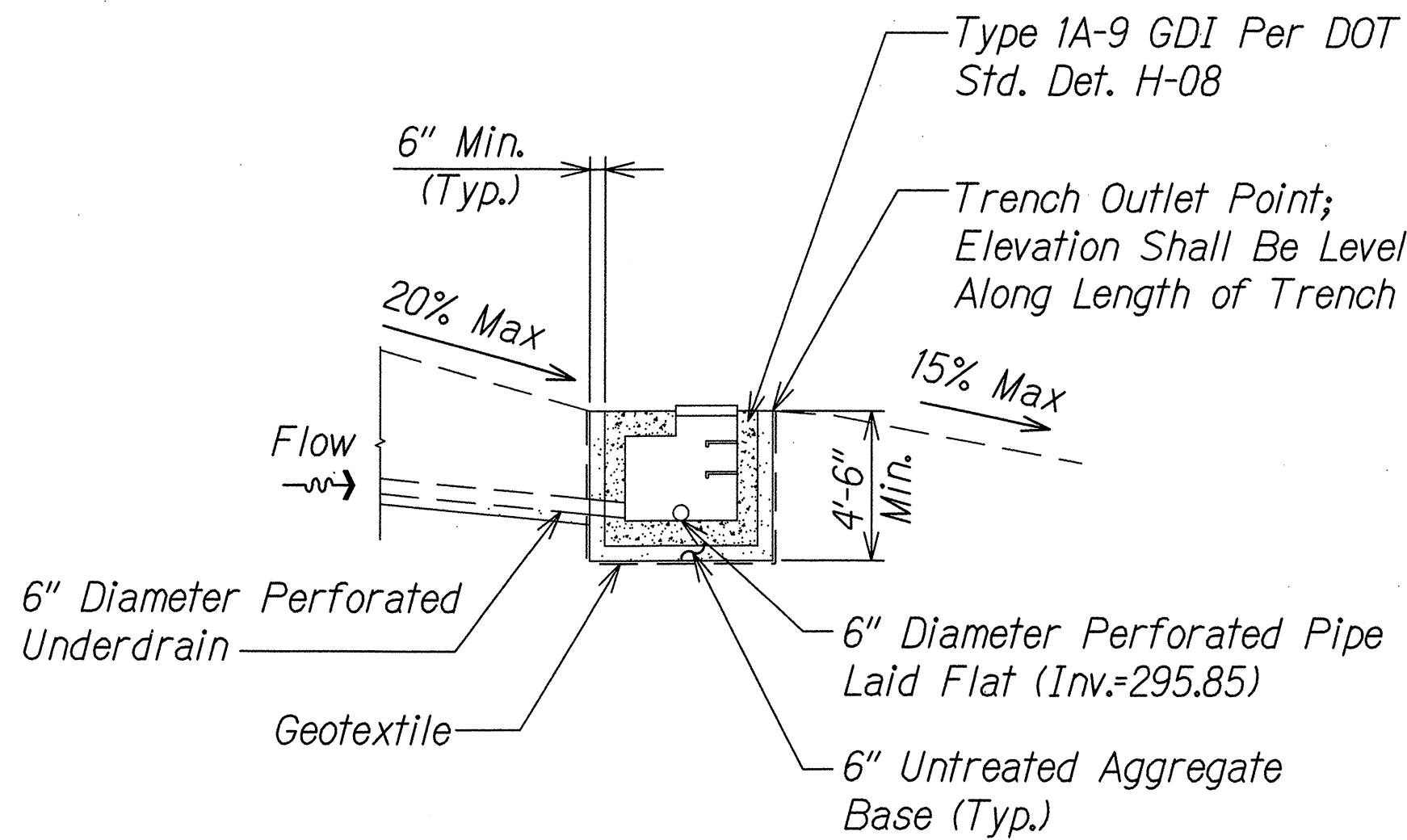
TYPICAL DETAILS
BIOSWALE, SETTLING BASIN & OUTLET PROTECTION

KANEOHE WATERSHED STORM WATER
BEST MANAGEMENT PRACTICES ON OAHU
Project No. HWY-O-04-14M
Scale: Not to Scale Date: March 2014

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-O-04-14M	2014	16	67

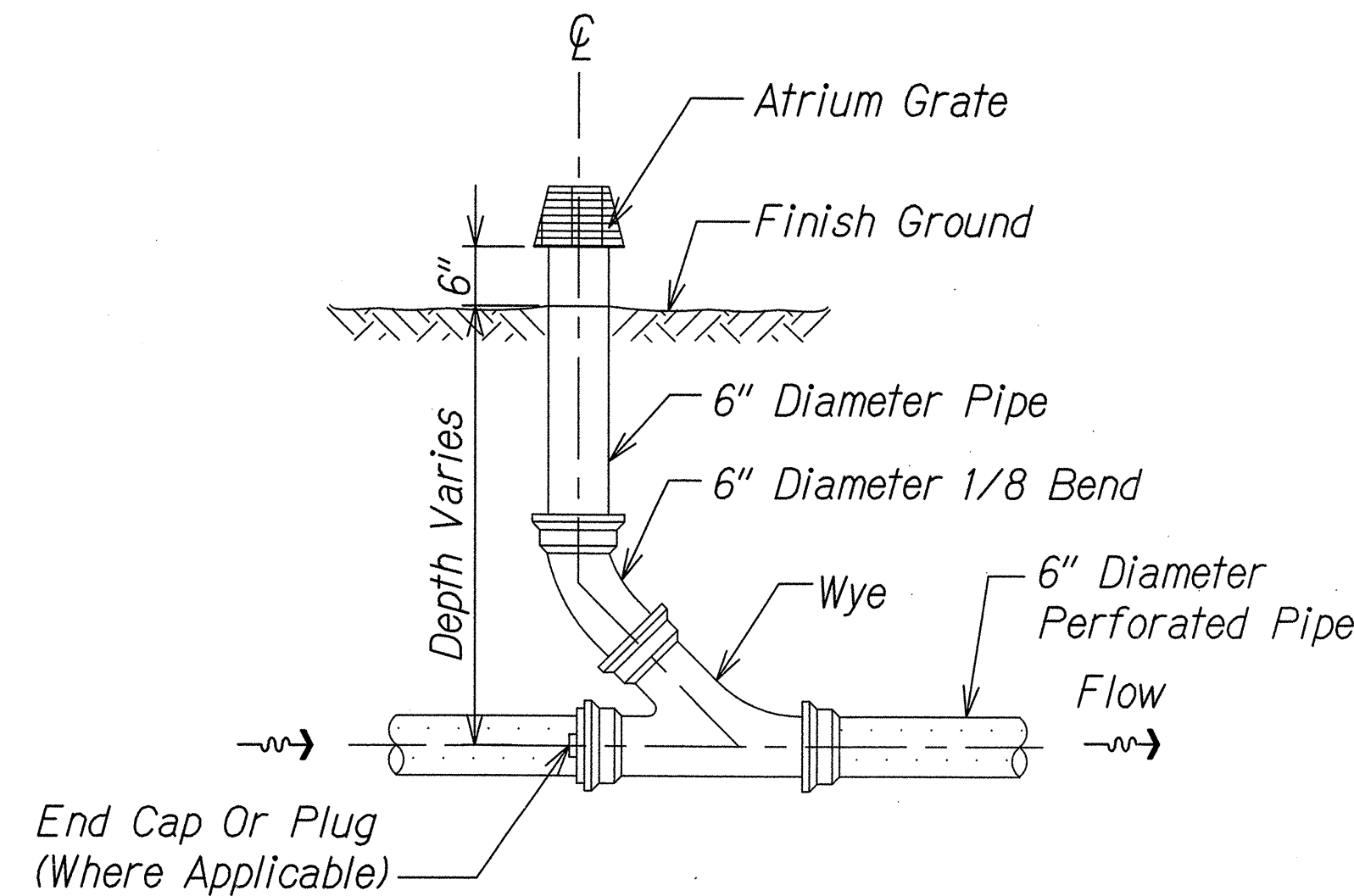


TYP. FLOW DISPERSAL TRENCH
Scale: Not to Scale



- Notes:
1. This trench shall be constructed to prevent point discharge and erosion.
 2. Trench bottom and outlet point shall be level. Align to follow contours of site.

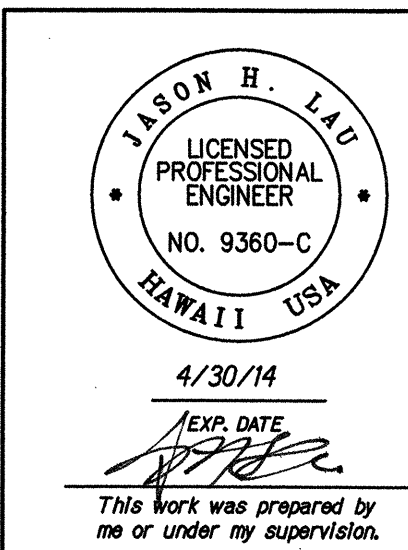
SECTION A
EC-02/EC-02



TYP. CLEANOUT DETAIL
Scale: Not to Scale

DESIGNED BY	DATE
DRAWN BY	
CHECKED BY	
NOTED BY	
QUANTITIES BY	
DATE	

FLOW DISPERSAL DETAILING 3/23/2014 10:46:06 AM

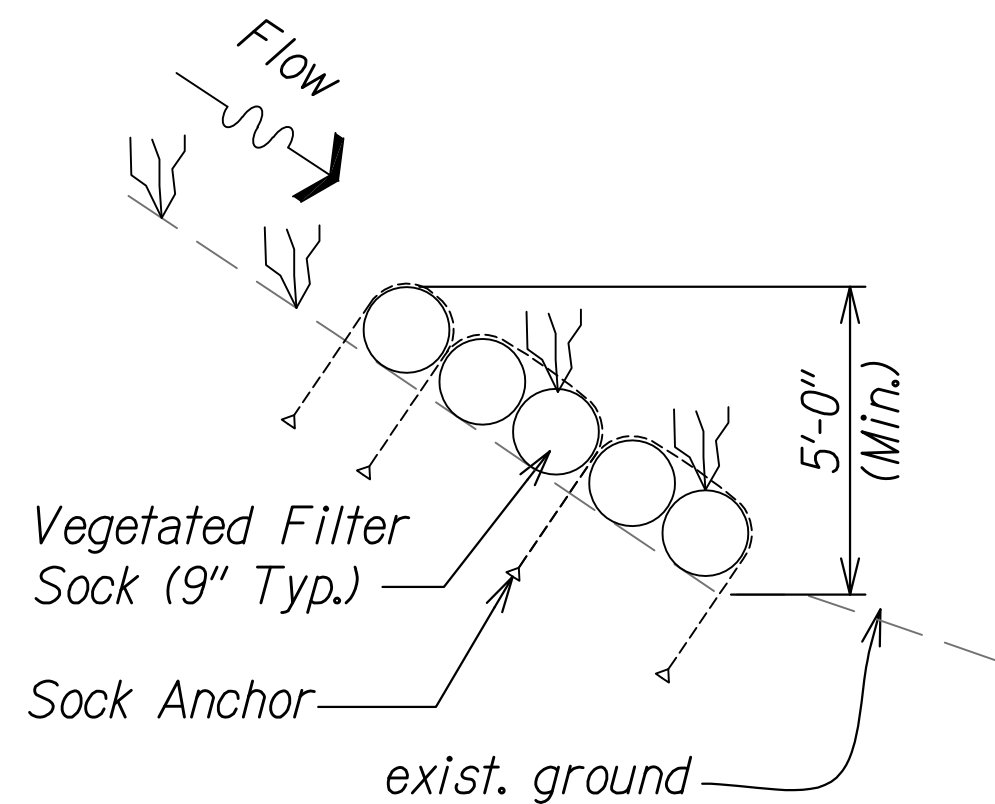


STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL DETAILS
FLOW DISPERSAL TRENCH
KANEHOE WATERSHED STORM WATER
BEST MANAGEMENT PRACTICES ON OAHU
Project No. HWY-O-04-14M
Scale: Not to Scale Date: March 2014

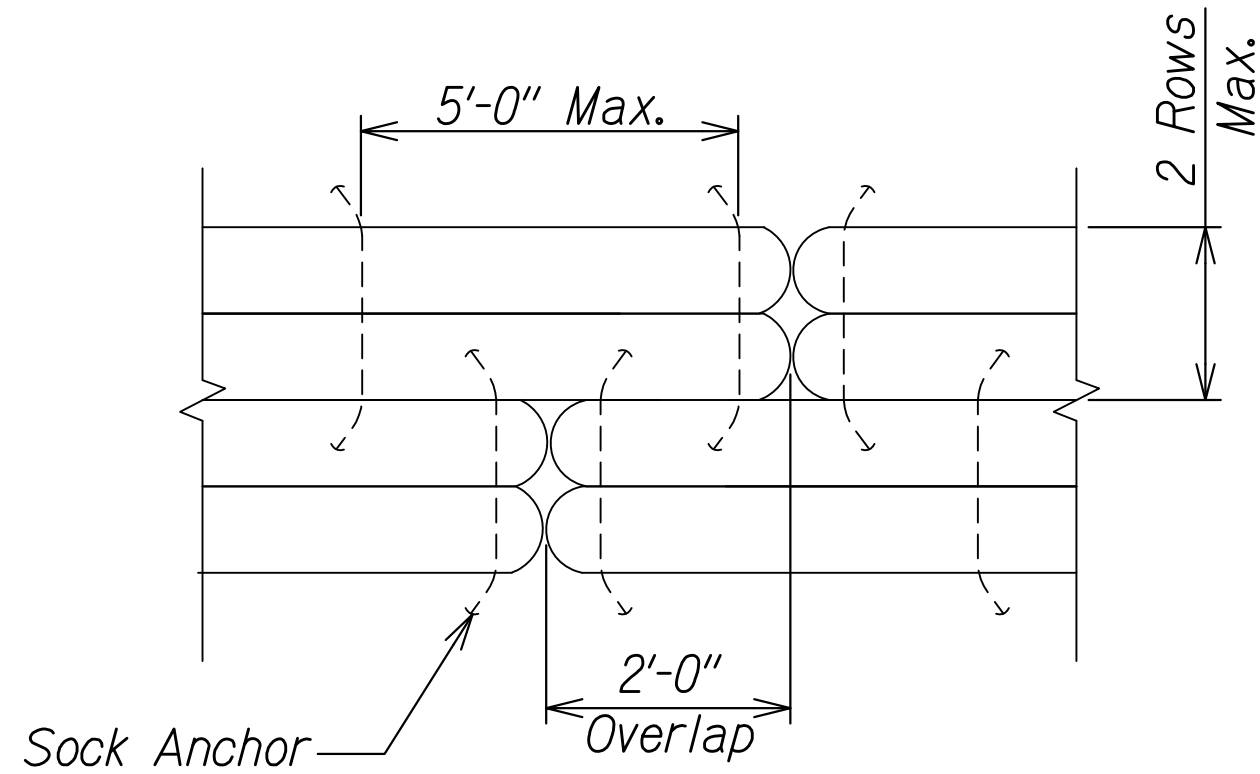
SHEET No. EC-02 OF 30 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-O-04-14M	2014	C.O. 17	67

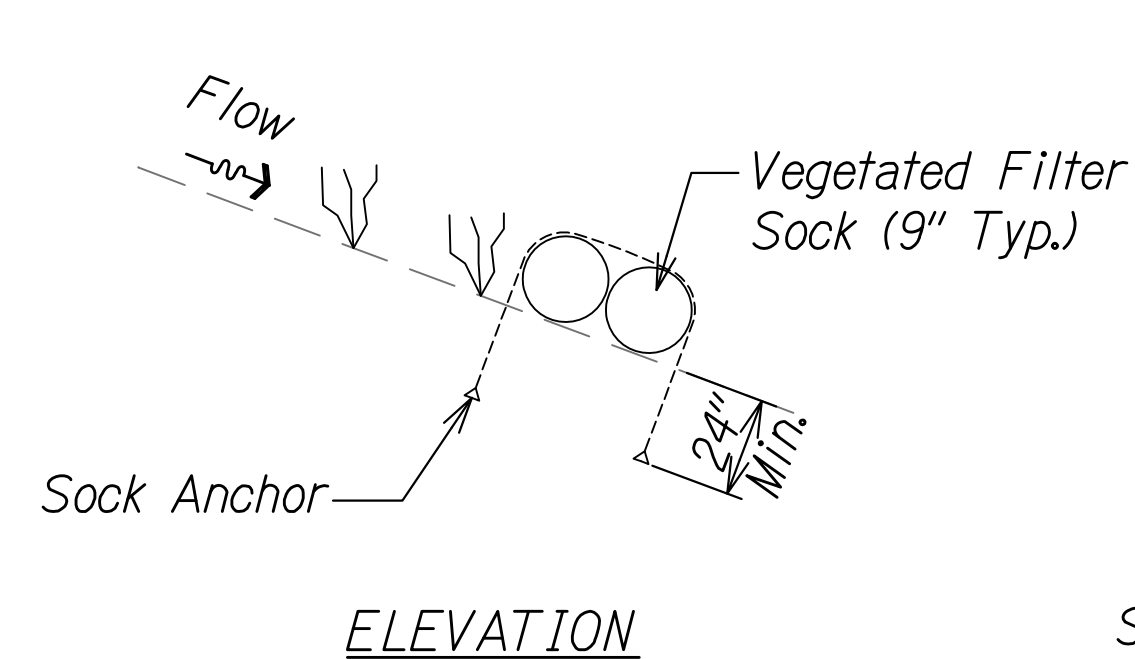


- Notes:
- Filtration media to meet specifications.
 - Slope on top of vegetated filter sock to be hydro-seeded per Landscape plans and specifications.
 - Sock anchors to be installed per det. ²EC-03 EC-03
 - Where it is not feasible to go around obstacles, the Contractor shall secure the vegetated filter sock as close to the obstacle as possible to prevent runoff flow between the vegetated filter sock and the obstacle. See det. ³EC-03 EC-03
 - Where feasible, the Contractor shall place the vegetated filter sock around obstacles. See det. ⁴EC-03 EC-03

TYP. VEGETATED WALL DETAIL ¹EC-03 EC-03
Scale: Not to Scale

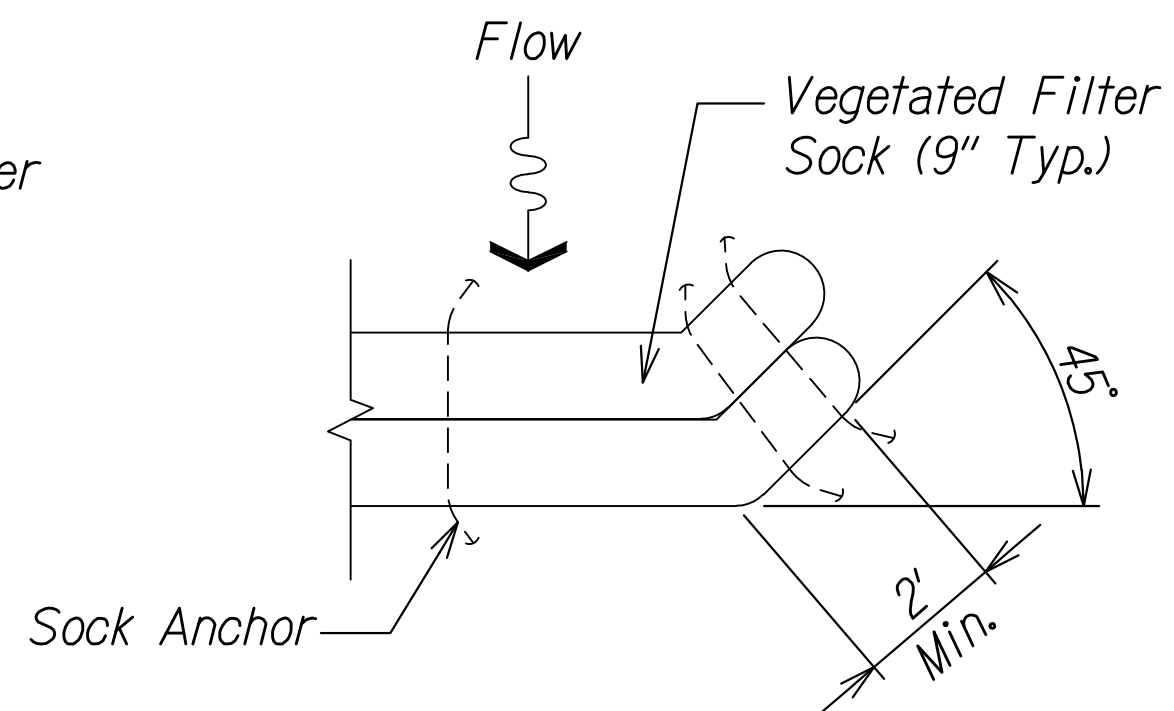


PLAN

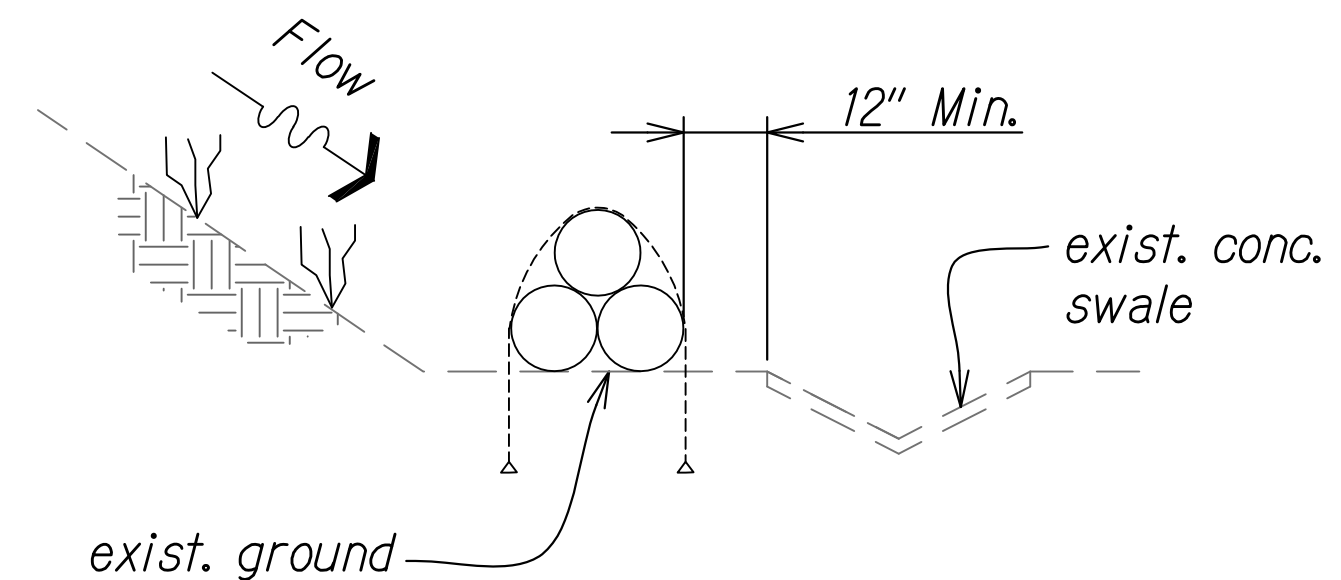


ELEVATION

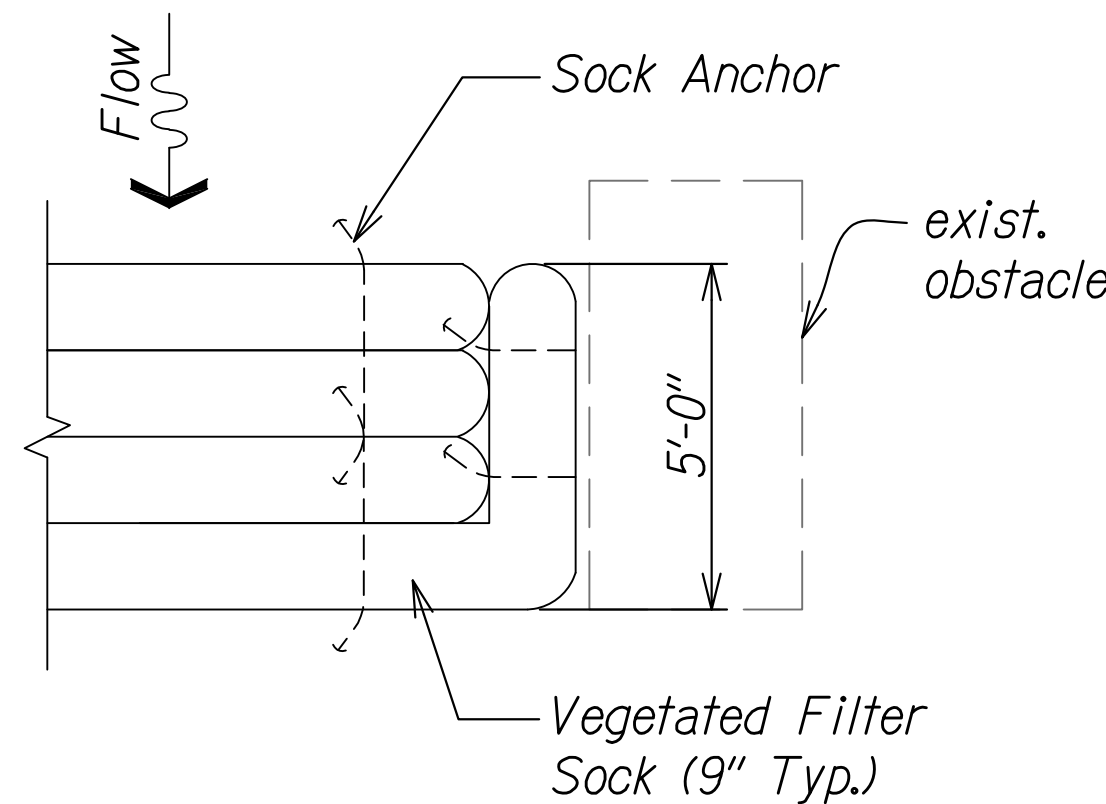
SOCK ANCHOR DETAIL ²EC-03 EC-03
Scale: Not to Scale



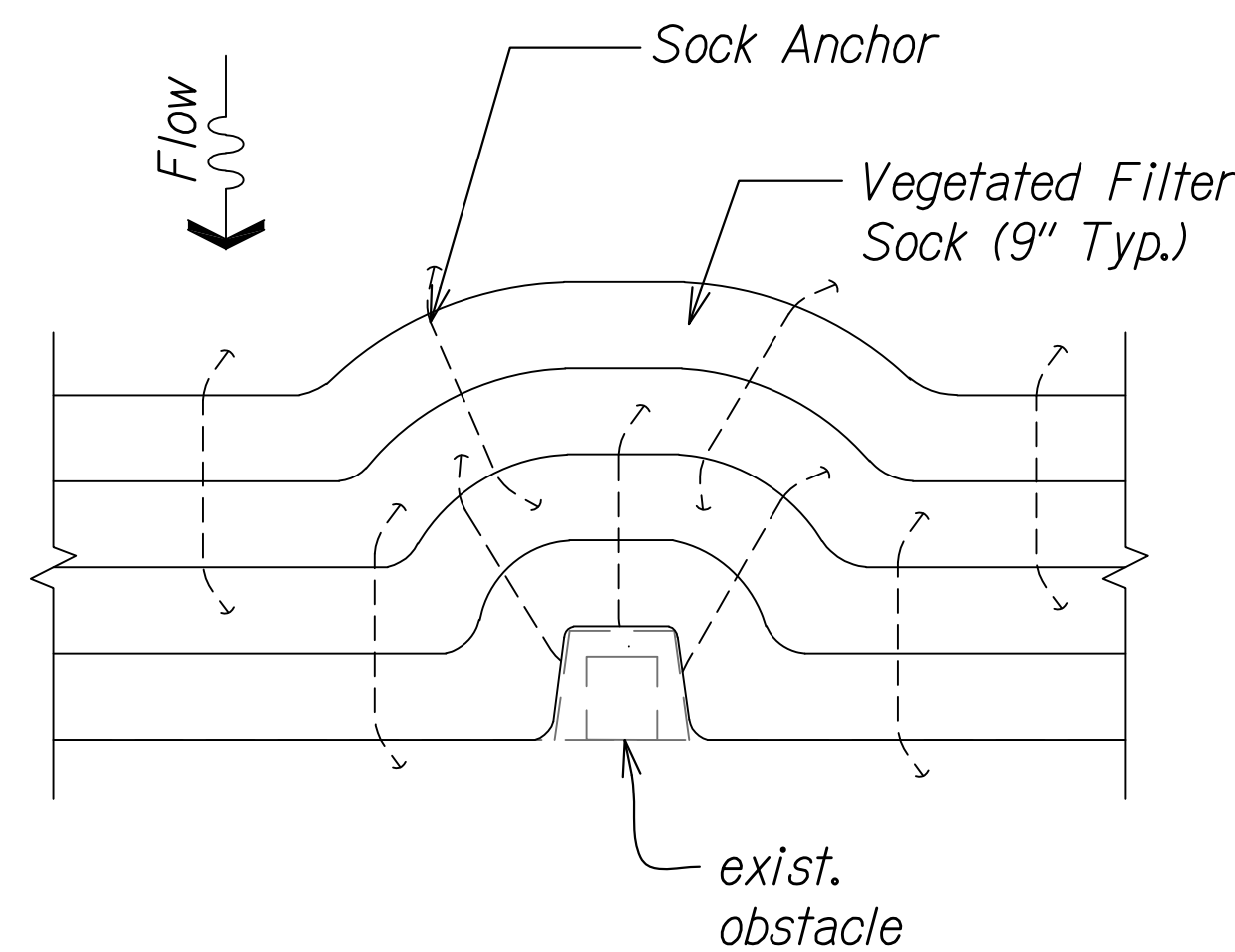
END DETAIL



STACKED VEGETATED WALL DETAIL ⁵EC-03 EC-03
Scale: Not to Scale



VEGETATED WALL AT OBSTACLE ³EC-03 EC-03
Scale: Not to Scale



VEGETATED WALL AROUND OBSTACLE ⁴EC-03 EC-03
Scale: Not to Scale

LEGEND FOR AS-BUILT POSTINGS	
	Squiggly line for as-built deletion
	Double line for as-built deletion
Roadway	Text for as-built posting

JASON H. LAU

LICENSED PROFESSIONAL ENGINEER

NO. 9360-C

HAWAII USA

4/30/14

EXP. DATE

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STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

HIGHWAYS DIVISION

TYPICAL DETAILS

VEGETATED WALL

KANEOHE WATERSHED STORM WATER

BEST MANAGEMENT PRACTICES ON OAHU

Project No. HWY-O-04-14M

ScaleNot to Scale

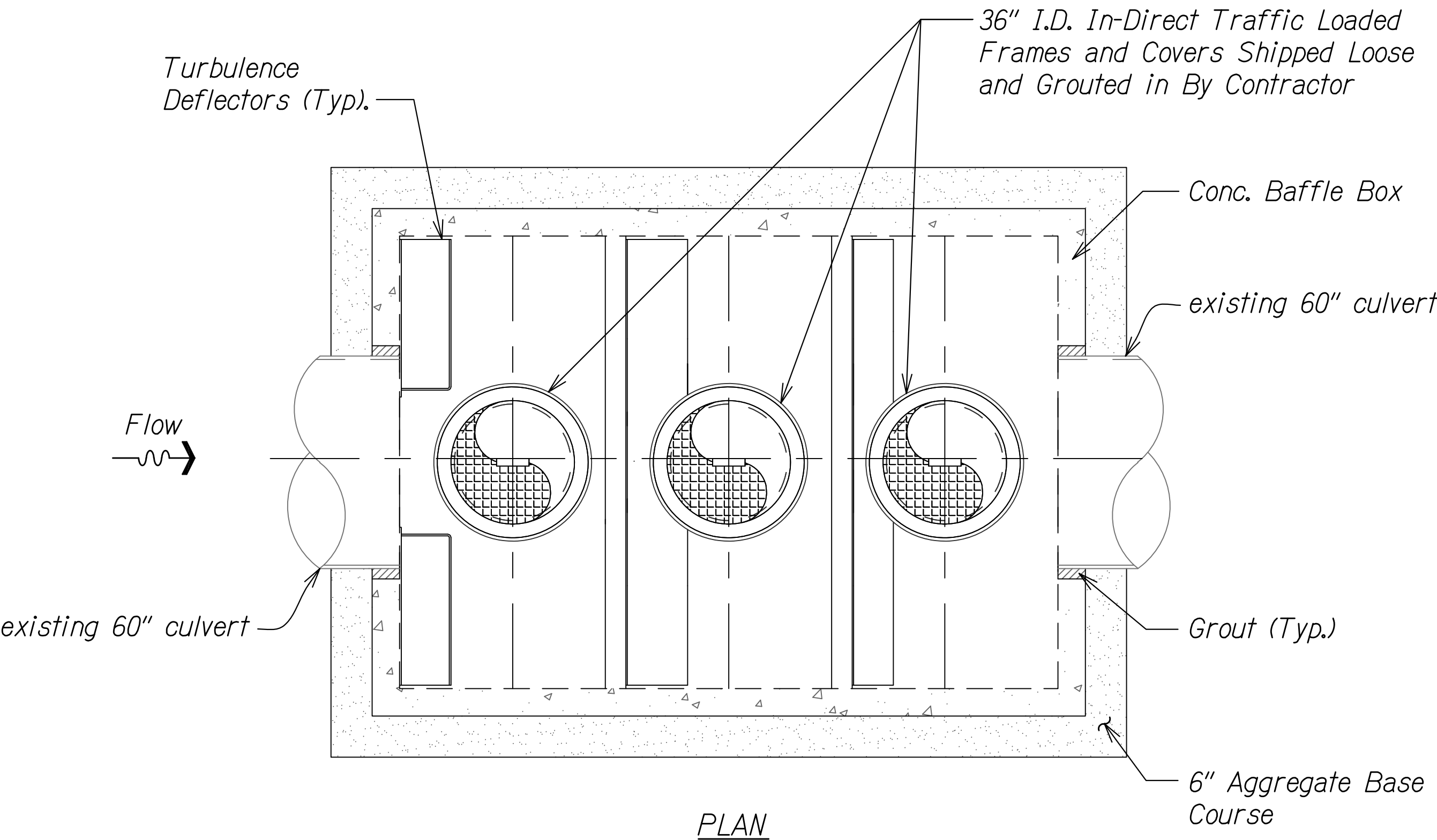
Date: March 2014

SHEET No. EC-03 OF 30 SHEETS

”AS-BUILT”

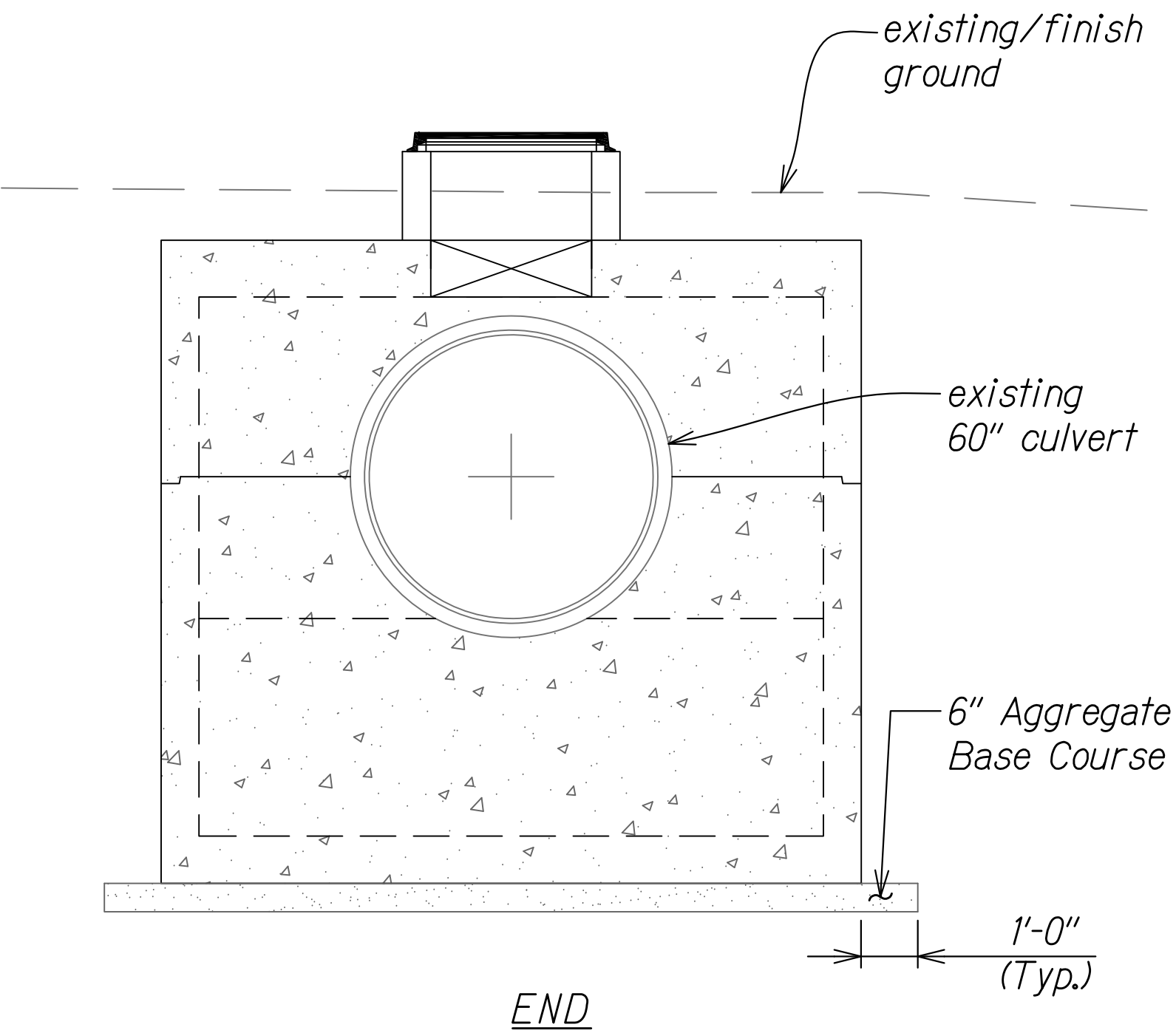
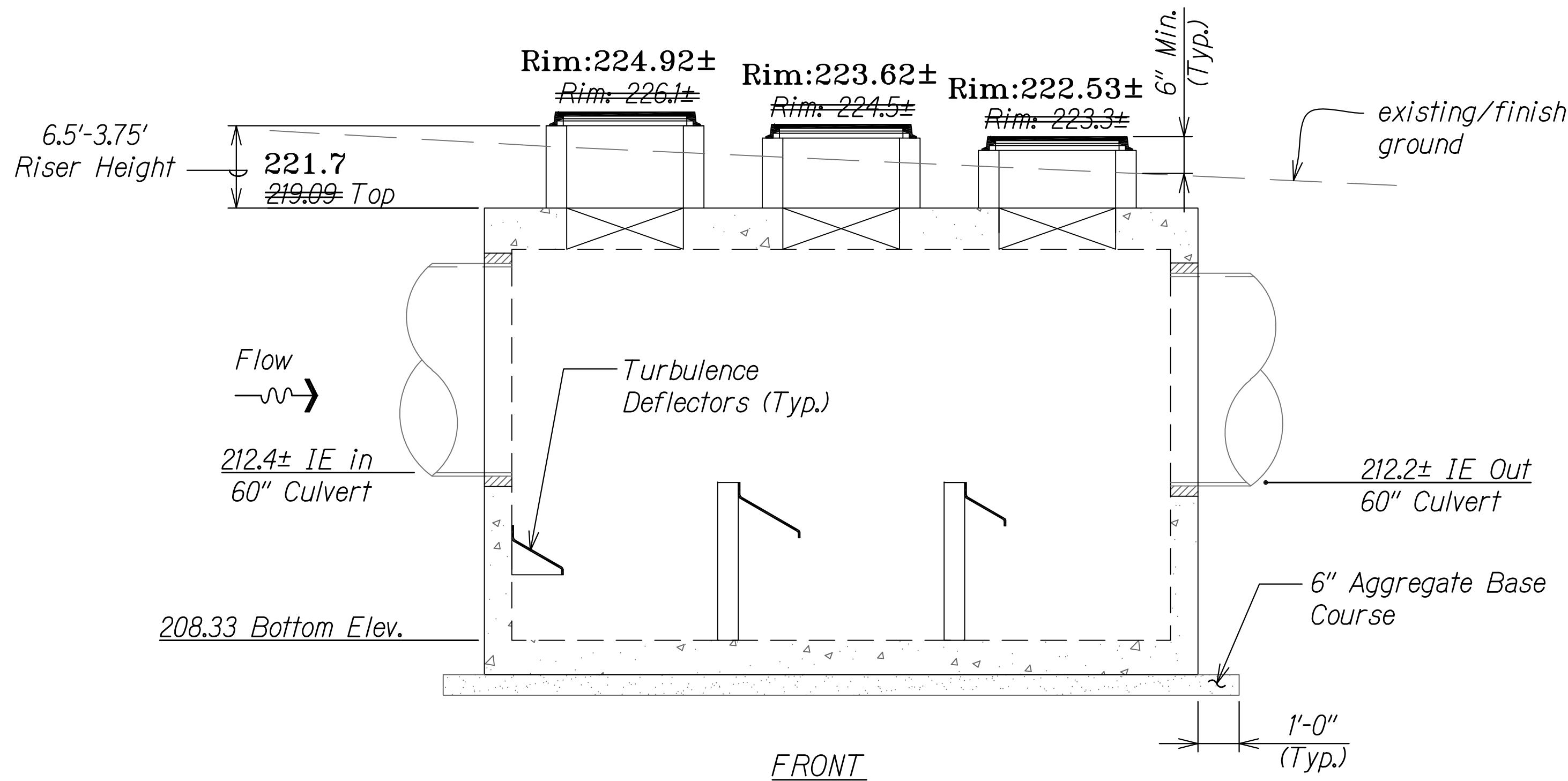
C.O. 17

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-O-04-14M	2014	18	67



STORM WATER TREATMENT SYSTEM (TYPE 1) FLOW REQUIREMENTS	
Q50 (cfs)	59.10
WQFR (cfs)	4.22

LEGEND FOR AS-BUILT POSTINGS	
	Squiggly line for as-built deletion
	Double line for as-built deletion
Roadway	Text for as-built posting



- Notes:
- Concrete 28 day compressive strength $f_c=5,000$ psi.
 - Reinforcing: ASTM A-615, Grade 60.
 - Joint sealant: BUTYL rubber SS-S-00210.
 - Inflow and outflow pipes shall be cut flush with the inside surface of the structure.

STORM WATER TREATMENT SYSTEM (TYPE 1) -
BAFFLE BOX DETAIL

Scale: Not to Scale

EC-04/EC-04

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

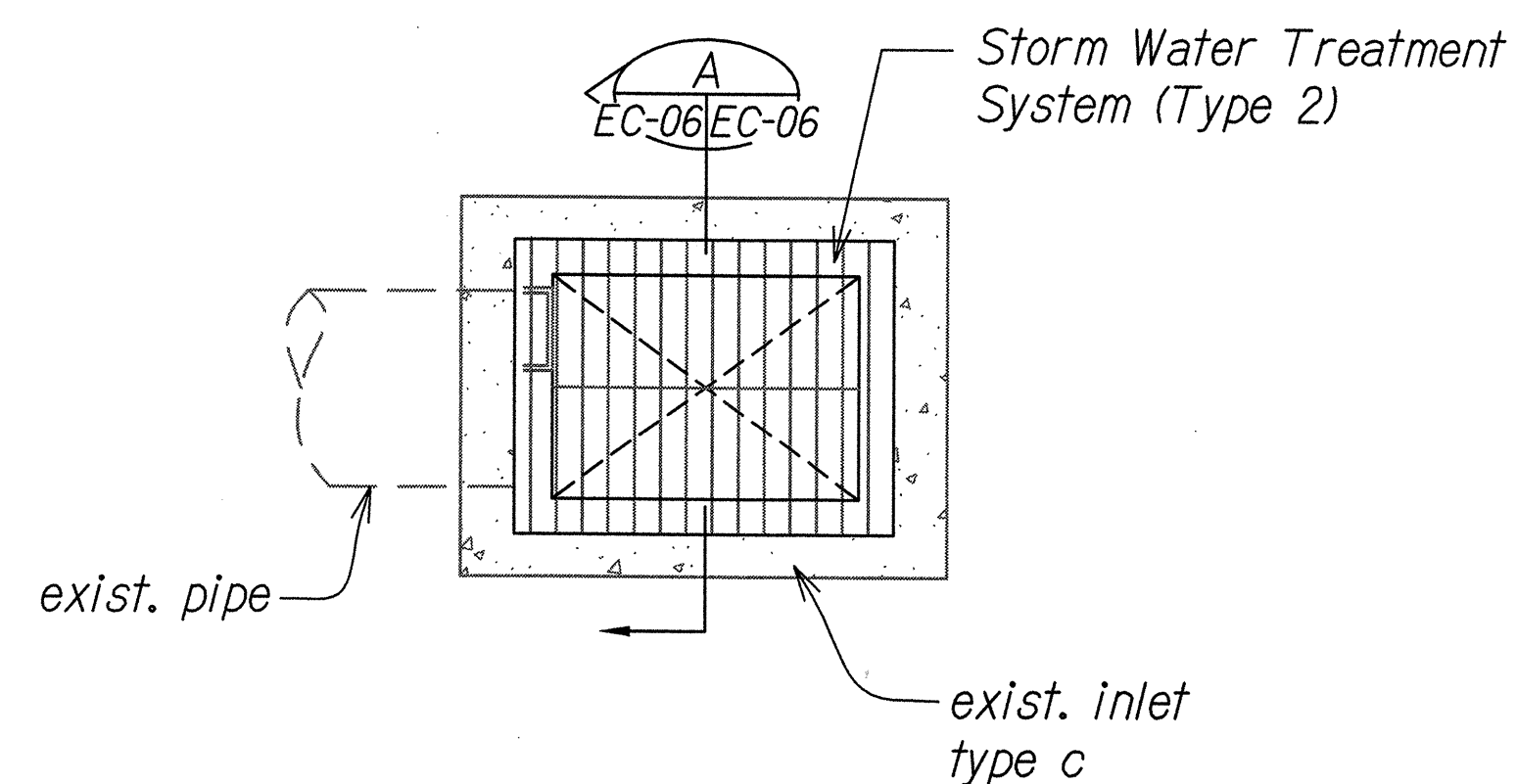
TYPICAL DETAILS
STORM WATER TREATMENT SYSTEM
KANEOHE WATERSHED STORM WATER
BEST MANAGEMENT PRACTICES ON OAHU
Project No. HWY-O-04-14M
Scale: Not to Scale Date: March 2014

4/30/14
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SHEET No. EC-04 OF 30 SHEETS

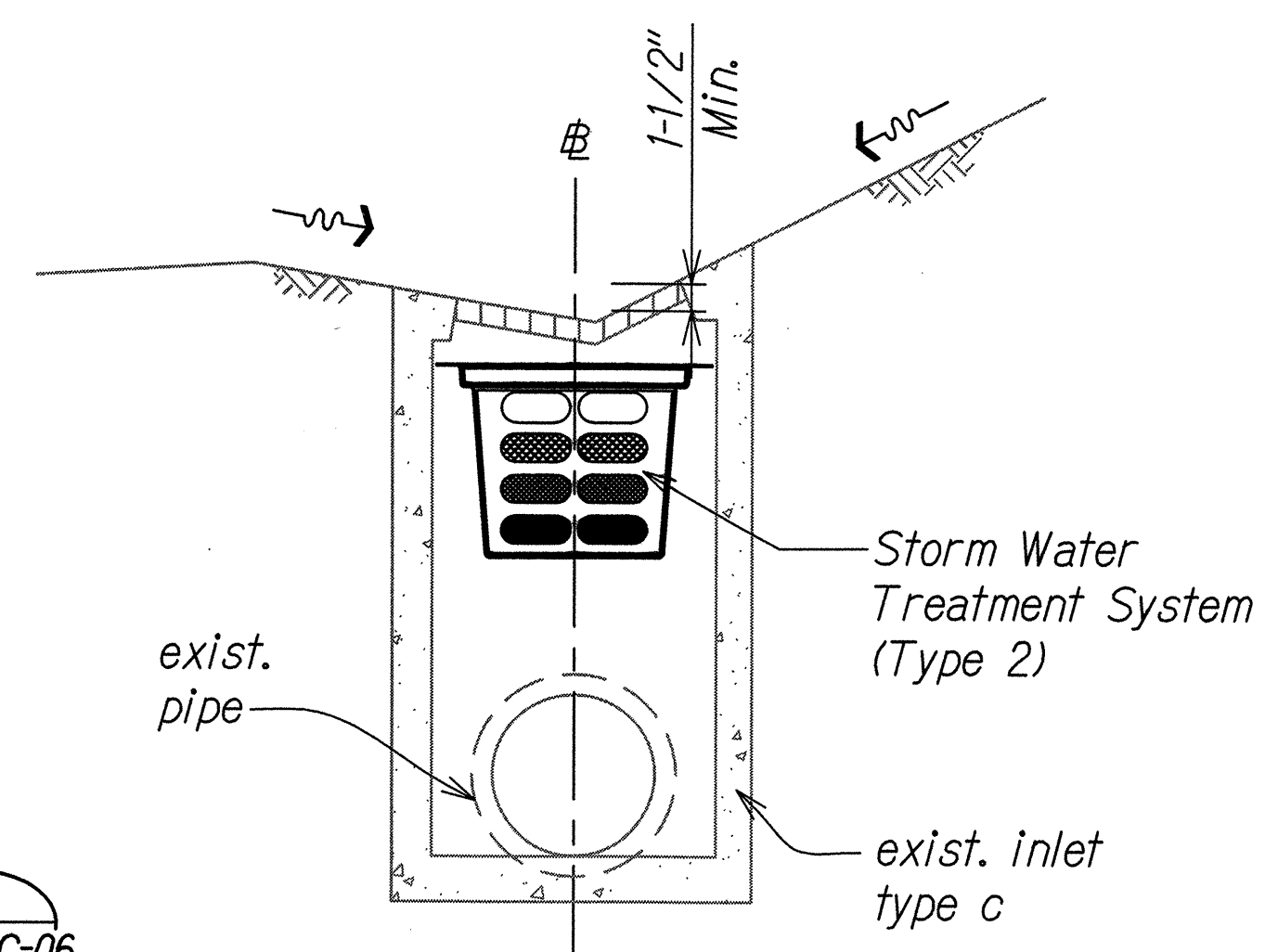
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-O-04-14M	2014	20	67

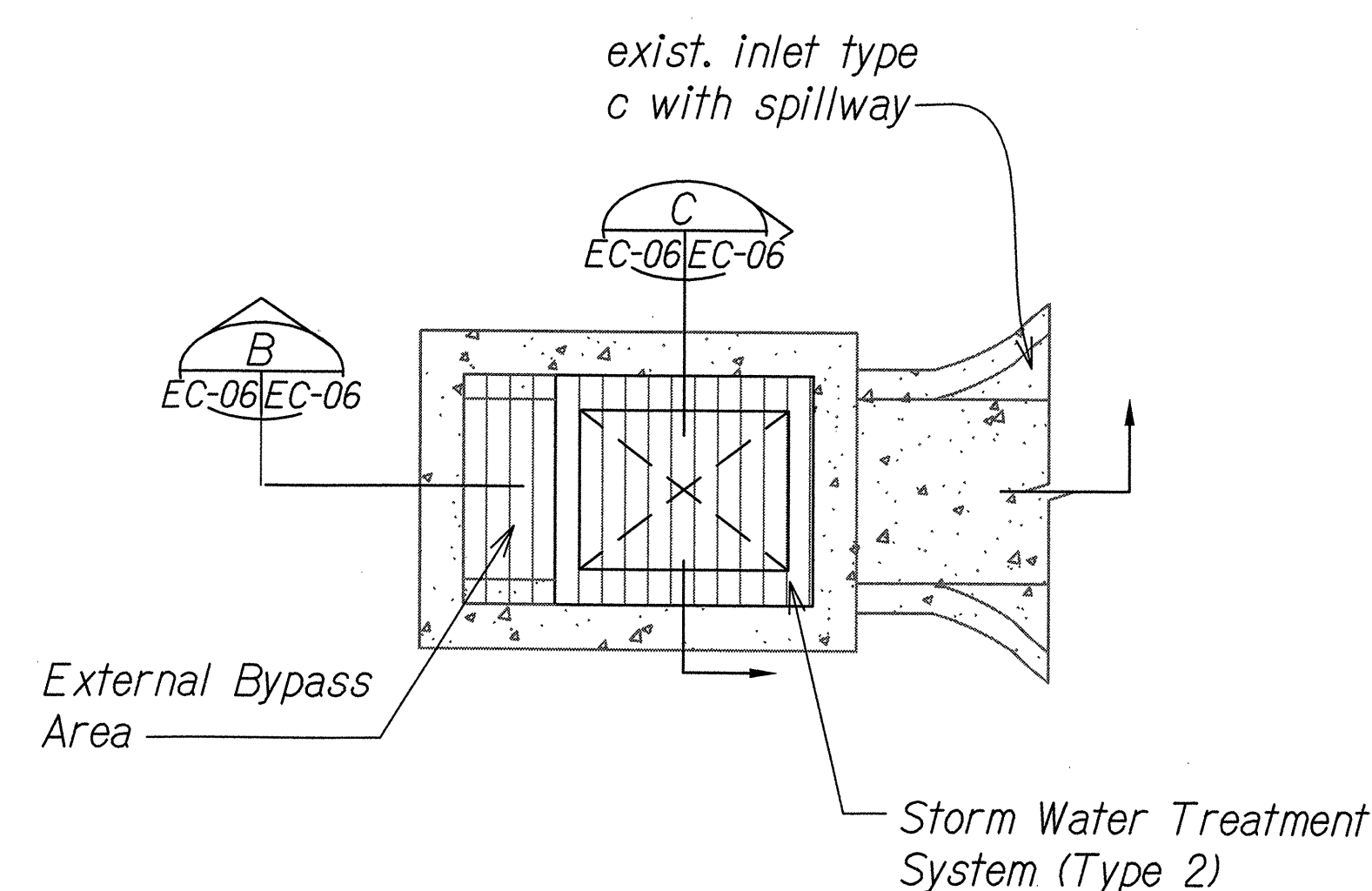


STORM WATER TREATMENT SYSTEM (TYPE 2) -
EXIST. INLET TYPE C
Scale: Not to Scale

EC-06/EC-06

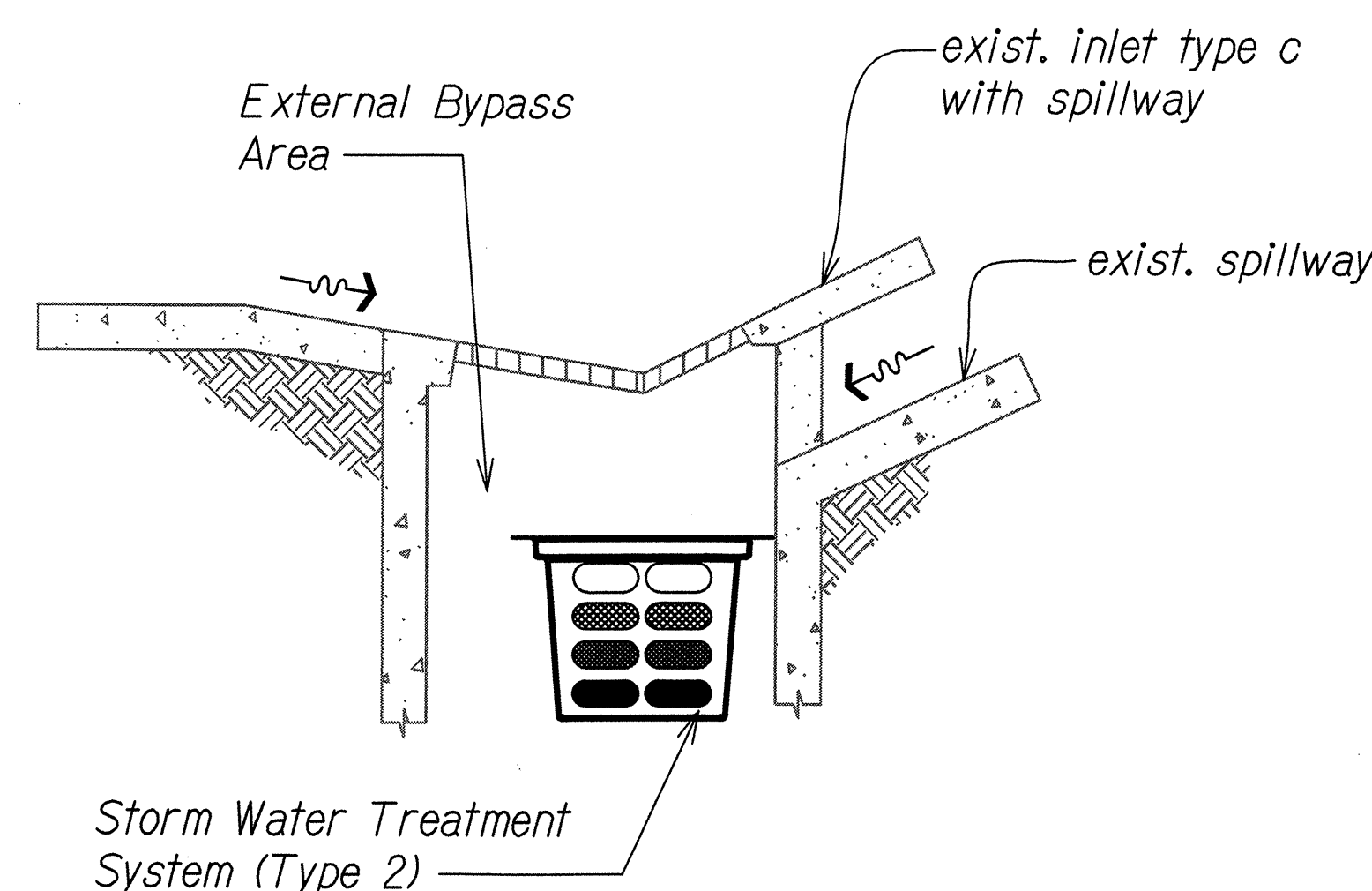


SECTION A
EC-06/EC-06

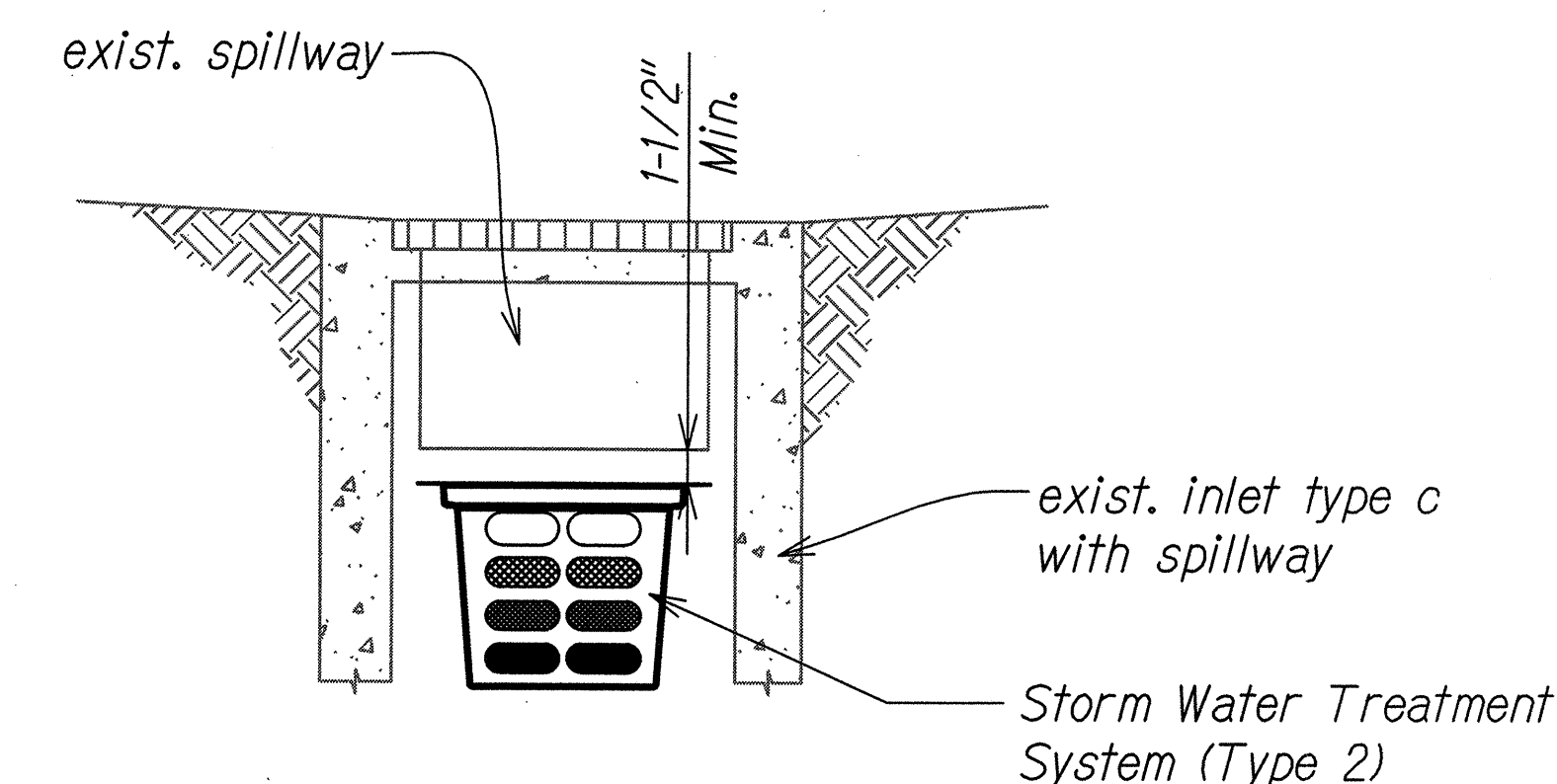


STORM WATER TREATMENT SYSTEM (TYPE 2) -
EXIST. INLET TYPE C WITH SPILLWAY
Scale: Not to Scale

EC-06/EC-06



SECTION B
EC-06/EC-06

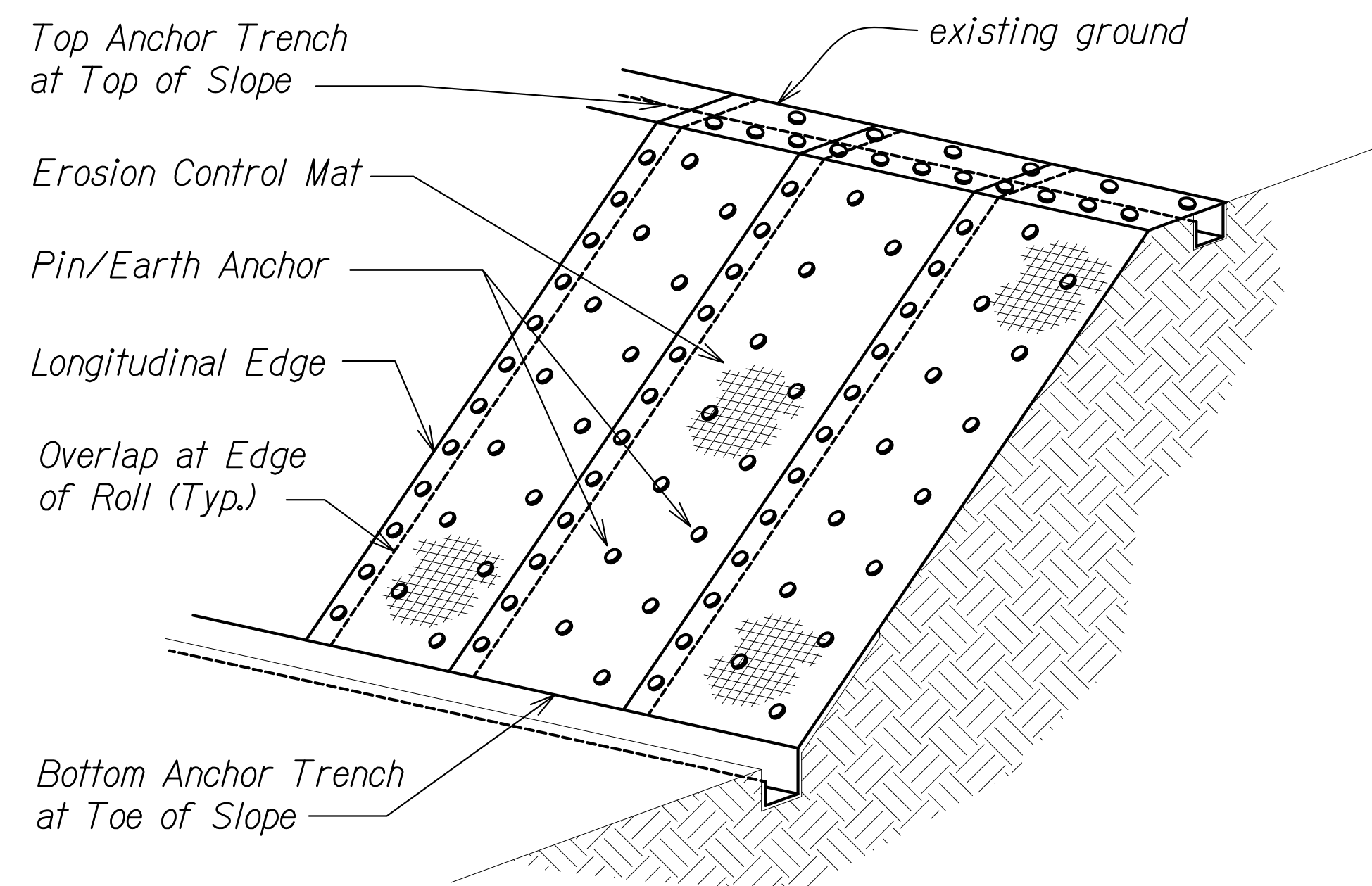


SECTION C
EC-06/EC-06

Note:
Install Storm Water Treatment System per
manufacturer's recommendations.

	STATE OF HAWAII
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	HIGHWAYS DIVISION
	TYPICAL DETAILS
	STORM WATER TREATMENT SYSTEM
	KANEIHOE WATERSHED STORM WATER
	BEST MANAGEMENT PRACTICES ON OAHU
	Project No. HWY-O-04-14M
	Scale: Not to Scale Date: March 2014
	SHEET No. EC-06 OF 30 SHEETS

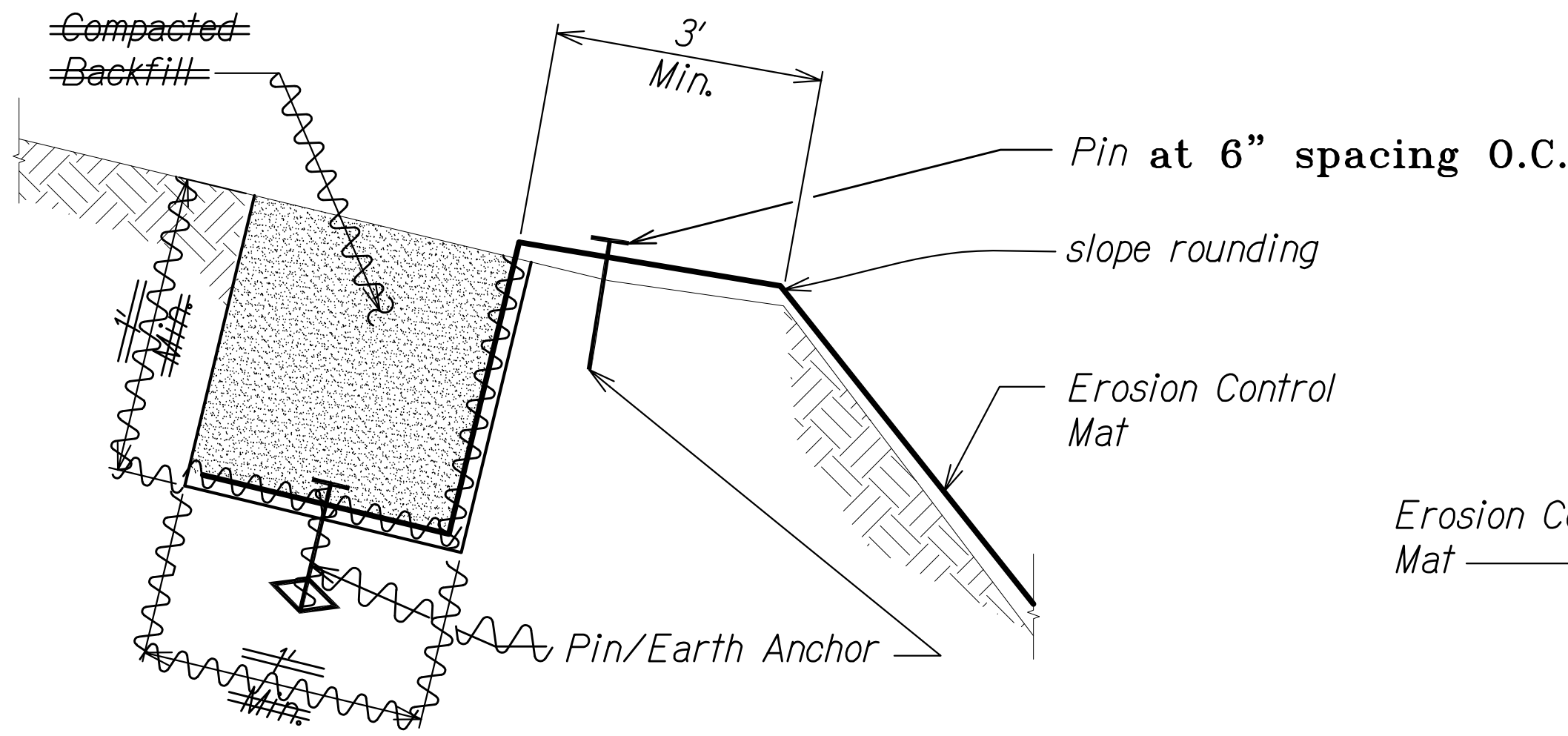
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-O-04-14M	2014	21	67



OVERVIEW OF EROSION CONTROL MATTING SYSTEM

Scale: Not to Scale

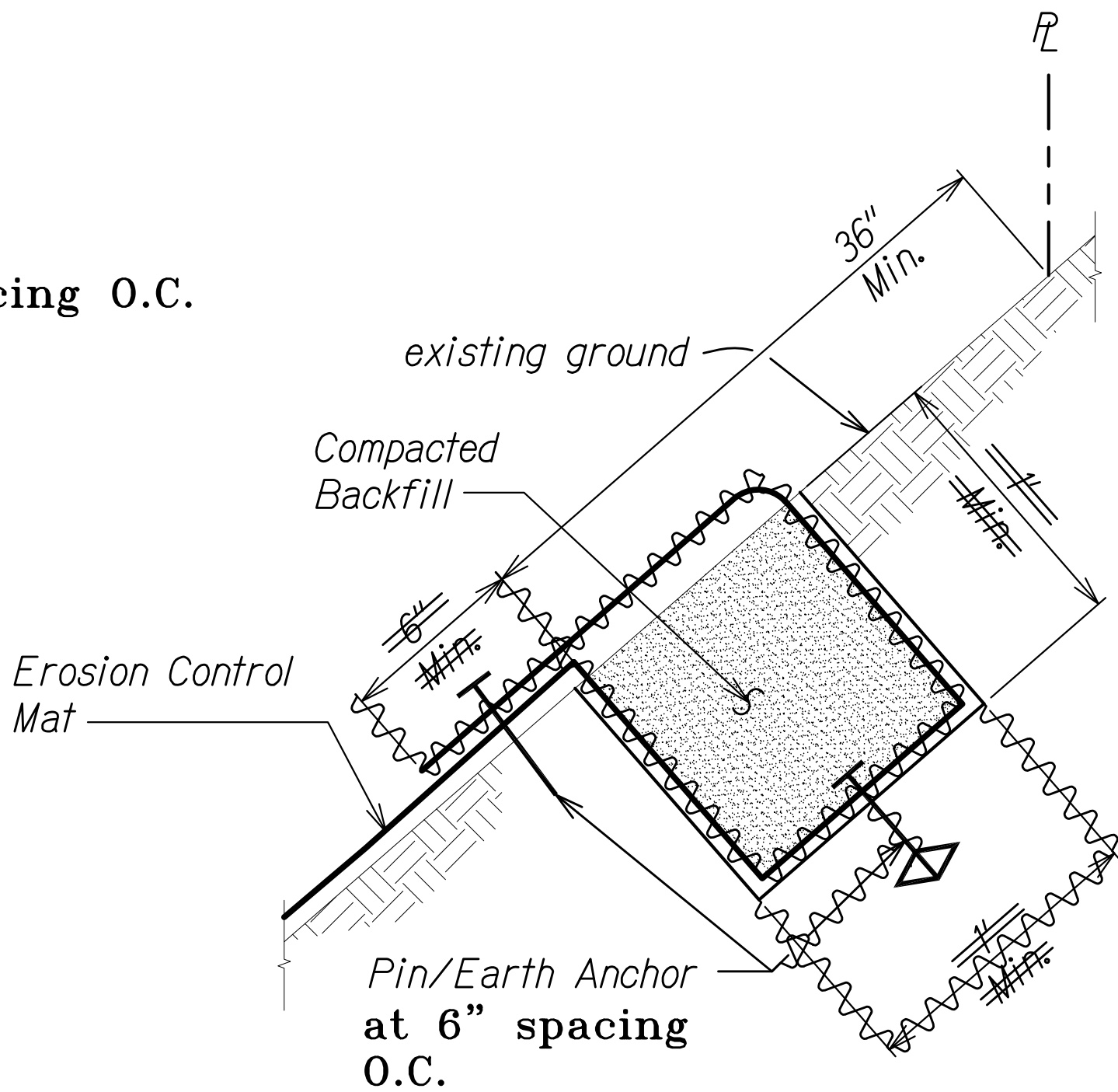
1
EC-03EC-03



TOP ANCHOR TRENCH AT TOP OF SLOPE DETAIL

Scale: Not to Scale

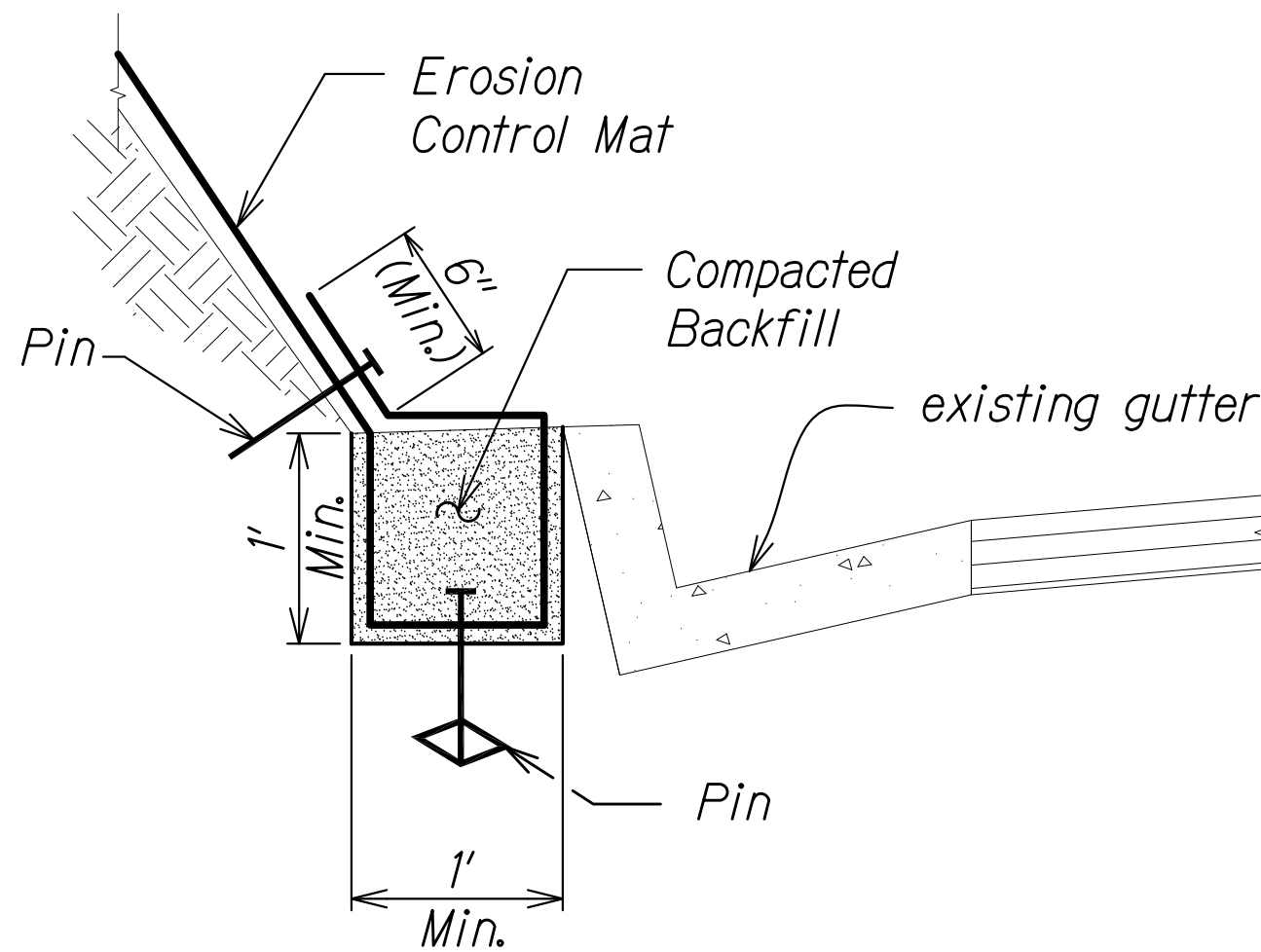
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EC-03EC-03



TOP ANCHOR TRENCH AT MID-SLOPE DETAIL

Scale: Not to Scale

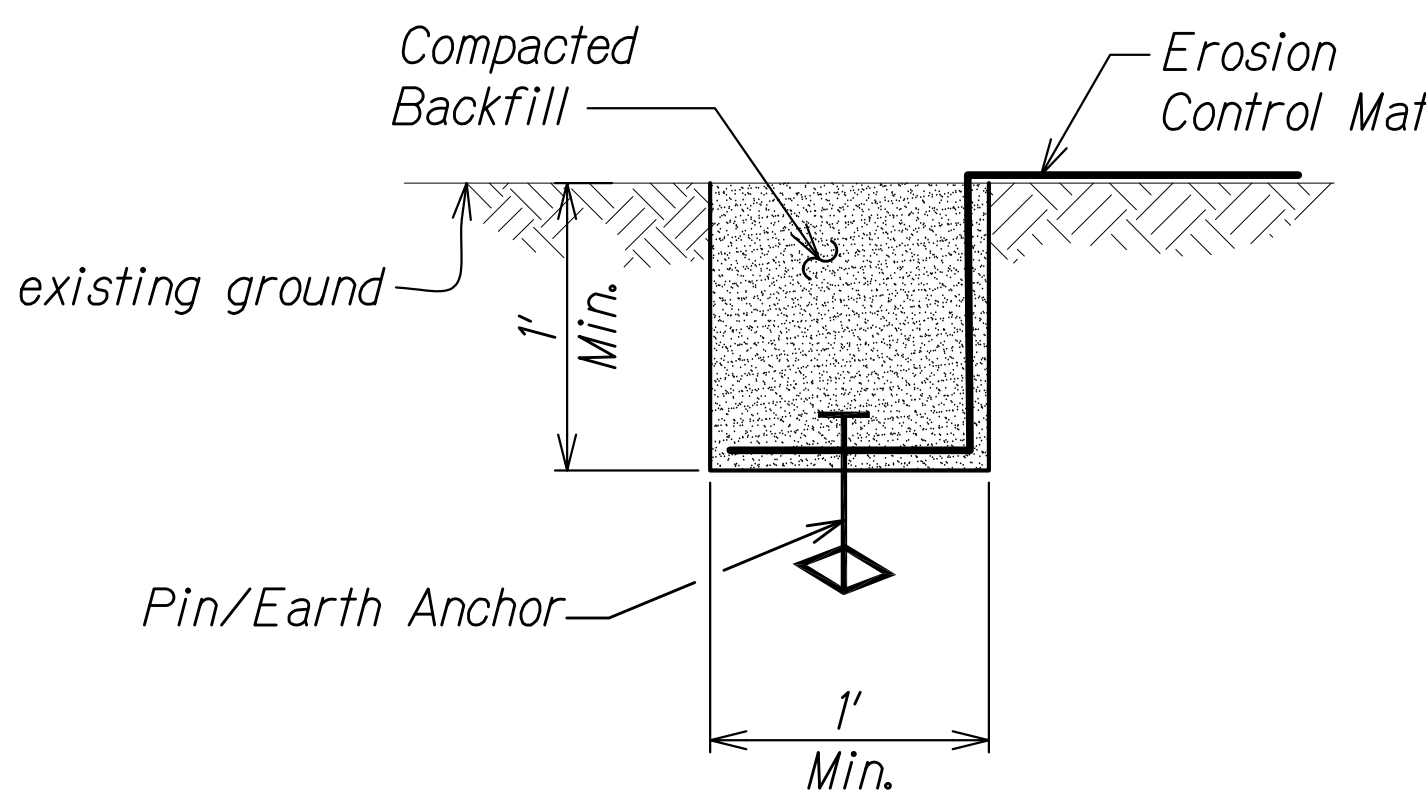
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EC-03EC-03



BOTTOM ANCHOR TRENCH DETAIL

Scale: Not to Scale

4
EC-03EC-03



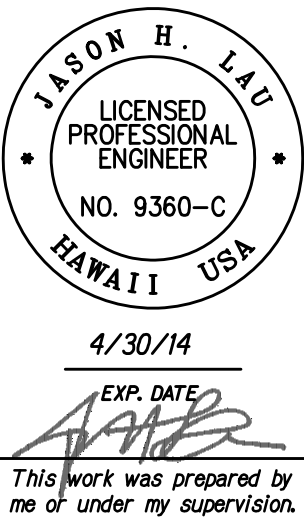
LONGITUDINAL EDGE TRENCH DETAIL

Scale: Not to Scale

5
EC-03EC-03

LEGEND FOR AS-BUILT POSTINGS

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	Double line for as-built deletion
Roadway	Text for as-built posting



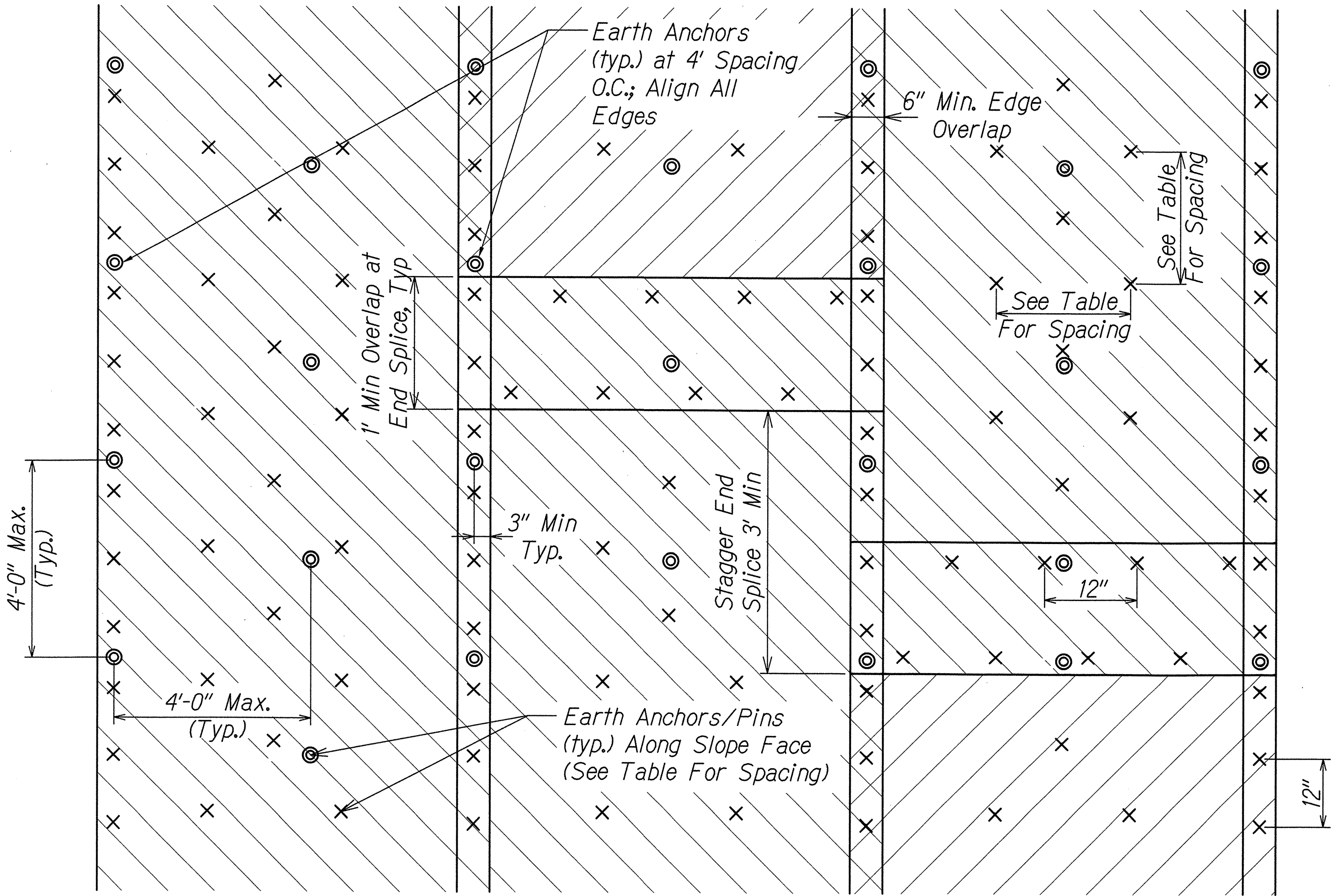
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL DETAILS
EROSION CONTROL MATTING
KANEOHE WATERSHED STORM WATER
BEST MANAGEMENT PRACTICES ON OAHU
Project No. HWY-O-04-14M
Scale: Not to Scale Date: March 2014

SHEET No. EC-07 OF 30 SHEETS

”AS-BUILT”

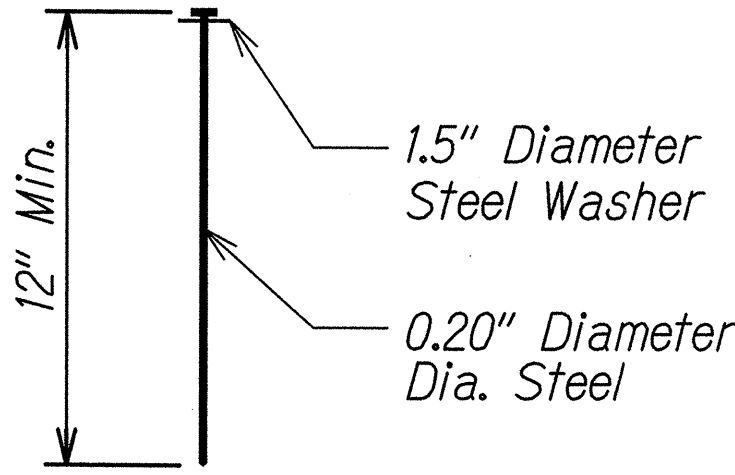
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HAWAII	HAW.	HWY-O-04-14M	2014	22	67



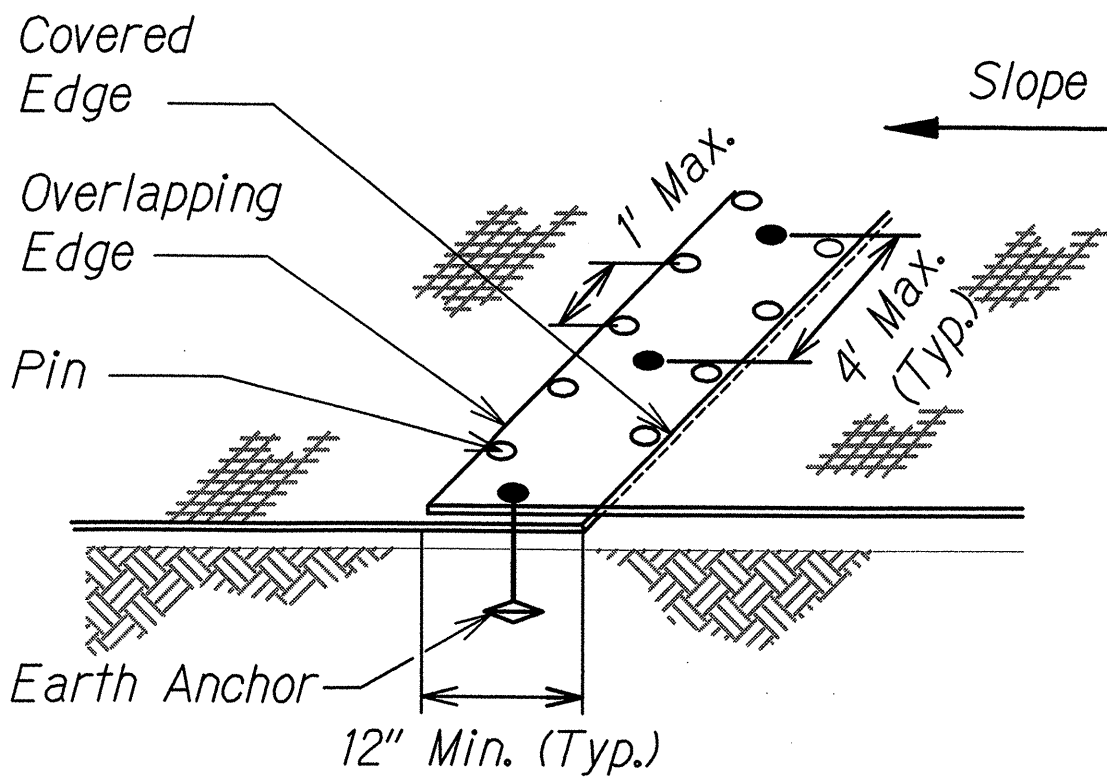
TYPICAL EROSION CONTROL MAT AND EARTH ANCHOR/PIN LAYOUT 1
EC-08/EC-08
Scale: Not to Scale

Pin/Earth Anchor Spacing		
Fastener Type	Along Slope Face	Top, Bottom & Edge Trenches
Pin	1.5'	1'
Earth Anchor	4'	4'

- Notes:
- Secure all erosion control mat edges with pins and earth anchors at the spacing indicated.
 - For slopes 3H:1V or flatter, no ECM required.
 - Earth anchors in trenches shall extend a minimum depth of 3' from the slope face.
 - The upper 4 rows of earth anchors shall extend a minimum depth of 10' from the slope face.
 - The remaining earth anchors shall be installed per row to alternating depths of 4' and 6' respectively.



PIN DETAIL 2
EC-08/EC-08
Scale: Not to Scale



OVERLAP END DETAIL 3
EC-08/EC-08
Scale: Not to Scale

DESIGNED BY	DATE
DRAWN BY	
CHECKED BY	
IN CHARGE	
NOTED BY	
QUANTITIES BY	
CHECKED BY	

EC-43 EROSION CONTROL MATTING DETAILS 2/10/14 3/3/2014 10:49:36 AM

4/30/14
EXP. DATE
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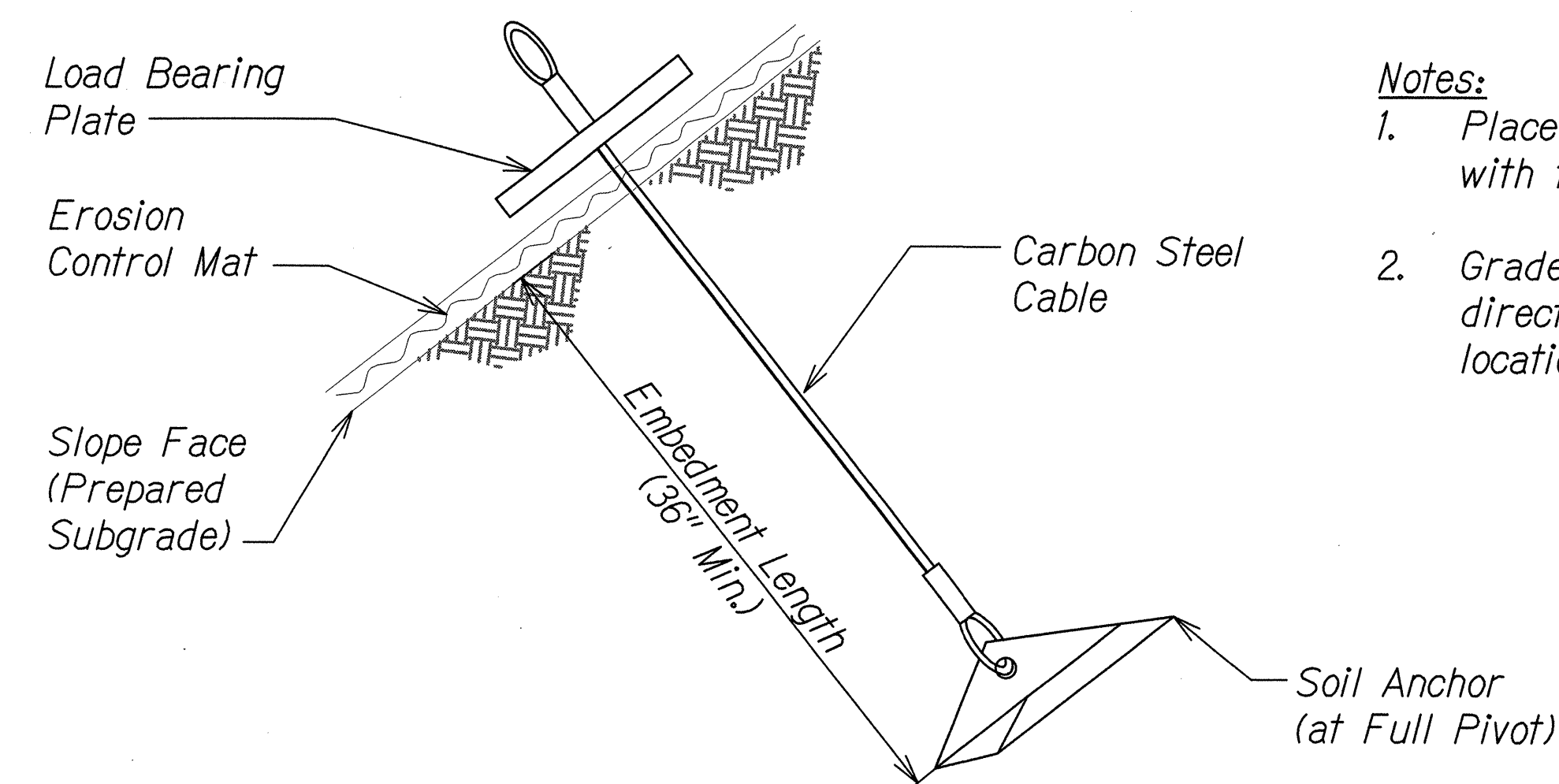
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL DETAILS
EROSION CONTROL MATTING

KANEHOE WATERSHED STORM WATER
BEST MANAGEMENT PRACTICES ON OAHU
Project No. HWY-O-04-14M
Scale: Not to Scale Date: March 2014

SHEET No. EC-08 OF 30 SHEETS

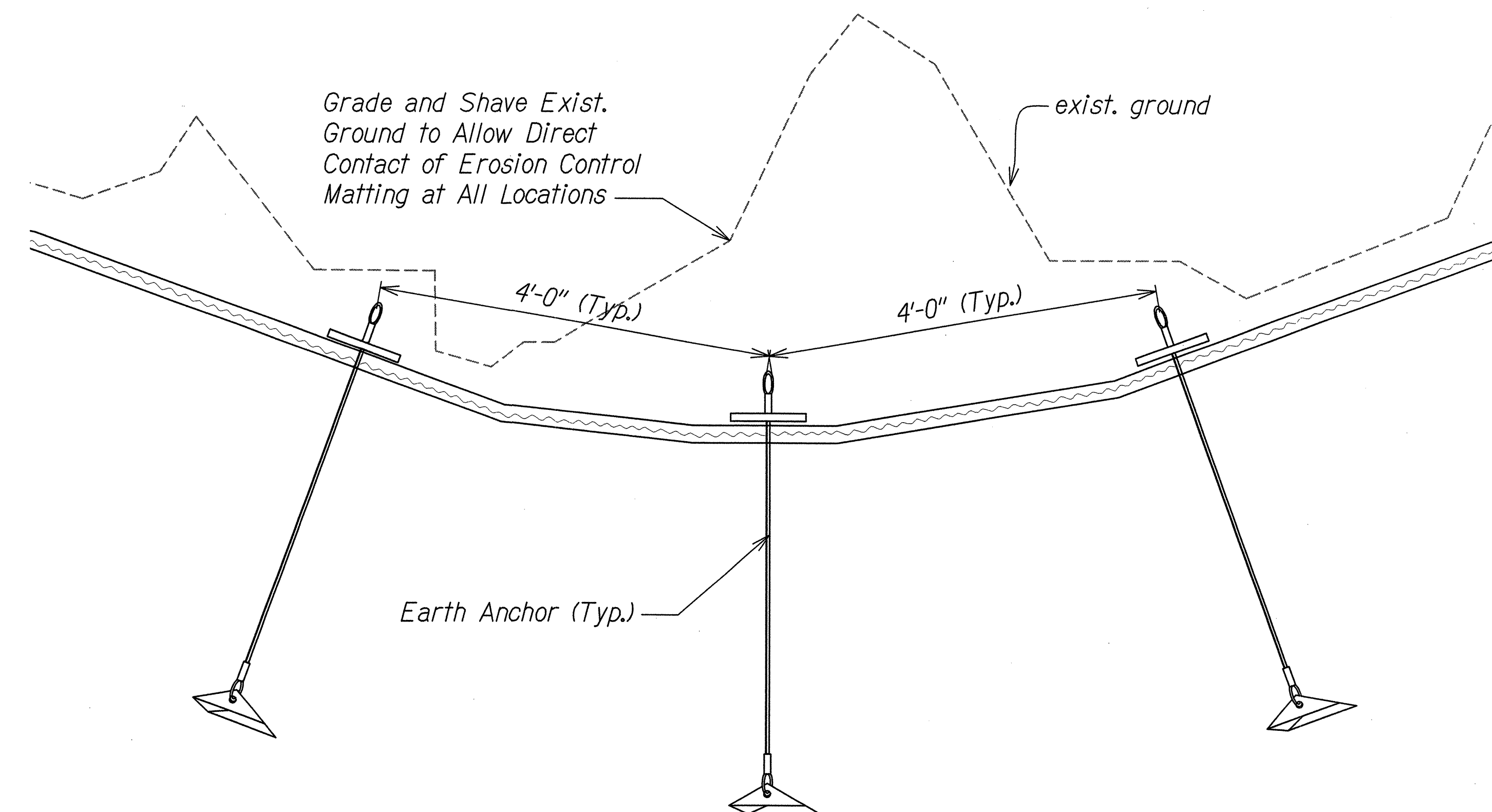
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-O-04-14M	2014	23	67



TYPICAL EARTH ANCHOR DETAIL
Scale: Not to Scale

1
EC-09/EC-09

- Notes:
1. Place erosion control mat in direct contact with finish grade.
 2. Grade and shave existing ground to allow direct contact of erosion control mat at all locations.



TYPICAL LONGITUDINAL VIEW OF RILLS AND GULLIES
Scale: Not to Scale

2
EC-09/EC-09

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

EC-XX-EARTH-ANCHOR-DETAILS.DWG 3/3/2014 10:45:31 AM

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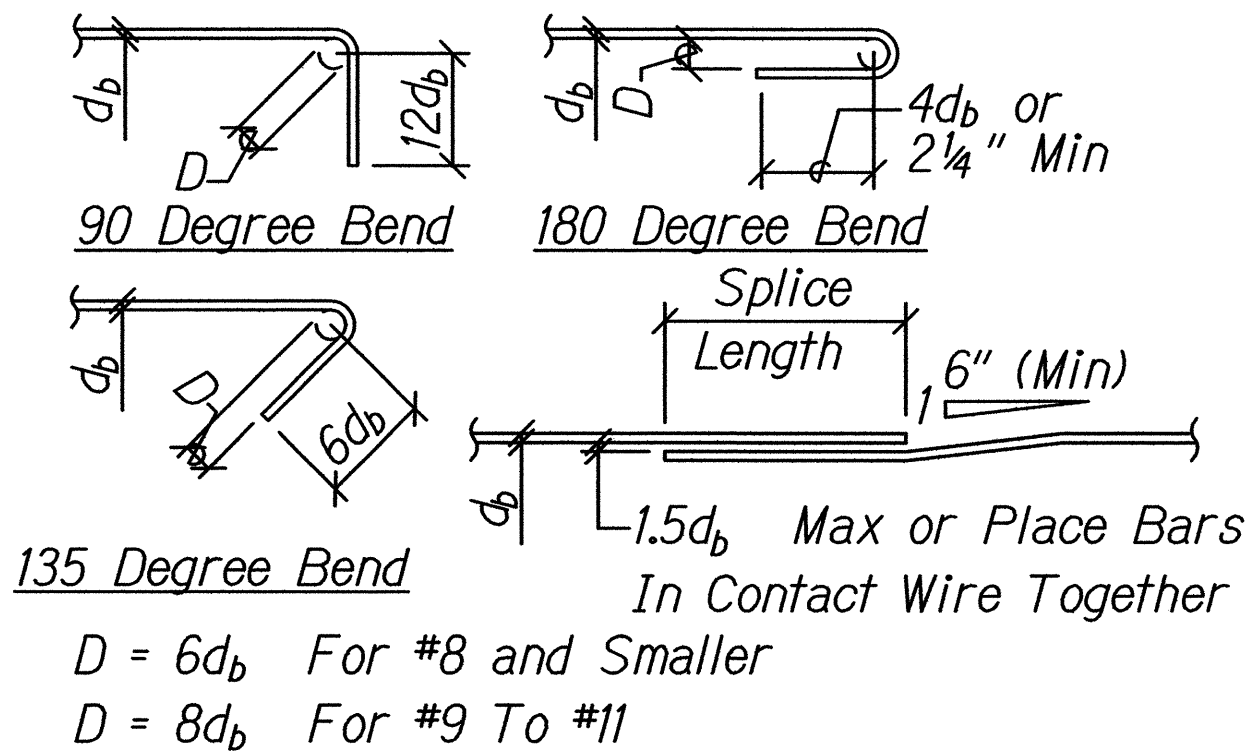
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL DETAILS
EARTH ANCHOR

KANEHOE WATERSHED STORM WATER
BEST MANAGEMENT PRACTICES ON OAHU
Project No. HWY-O-04-14M
Scale: Not to Scale Date: March 2014

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-O-04-14M	2014	24	67

Minimum Splice & Embedment Lengths					
Bar Size	Lap Splice		Embedment		
	Bot Bar Or Wall Bar	Top Bar	Straight		w/ Std Hook
			Bot Bar Or Wall Bar	Top Bar	
#3, #4	29"	38"	22"	29"	11"
#5	36"	47"	28"	36"	14"
#6	43"	56"	33"	43"	17"
#7	63"	82"	48"	63"	20"
#8	72"	94"	55"	72"	22"
#9	81"	106"	62"	81"	25"
#10	91"	119"	70"	91"	28"
#11	101"	132"	78"	101"	31"

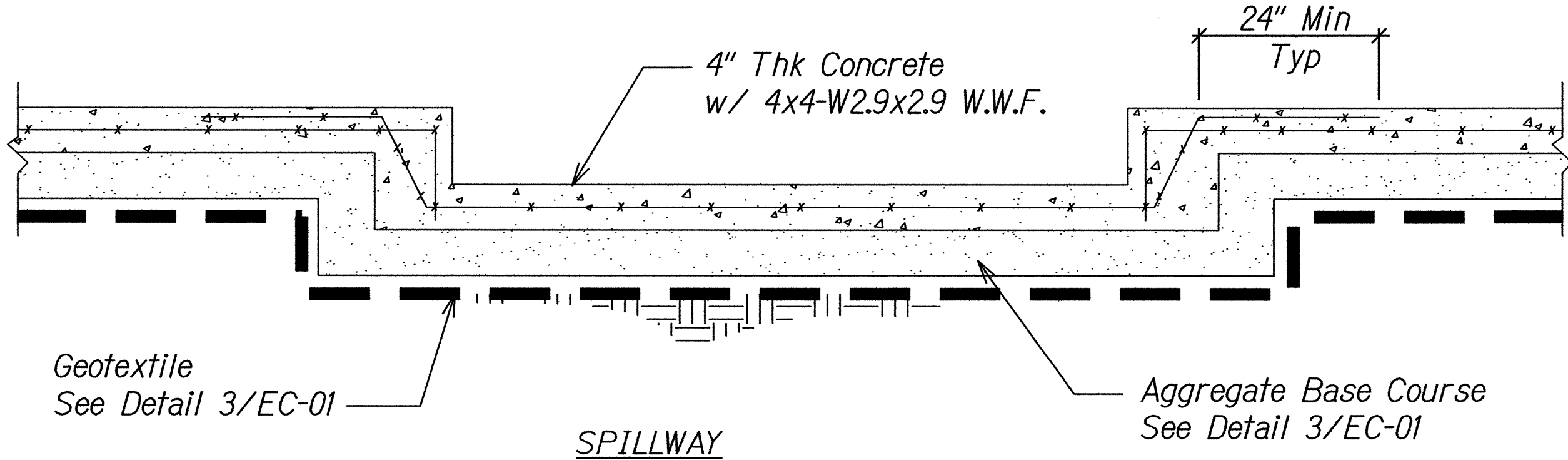
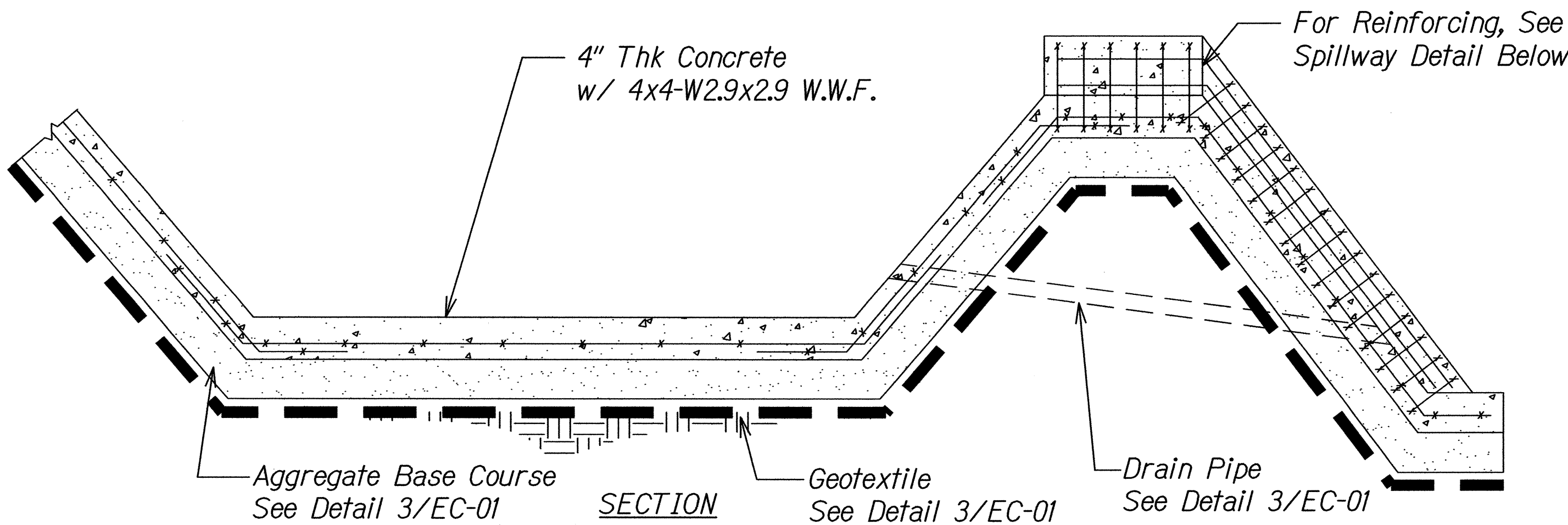


- Lengths Are For Concrete Beams & Columns With Rebar Spaced 1 Bar Diameter Min O.C. And Concrete Walls with Rebars Spaced 2 Bar Diameters Min O.C. Increase Bar Length 50% For Bars Spaced Closer Than Minimums Specified.
- "Top Bars" Are Horizontal Bars With 12" Or More Of Concrete Cast Below.

TYPICAL REBAR SPLICE & EMBEDMENT LENGTH SCHEDULE

Scale: Not To Scale

1
EC-10/EC-10



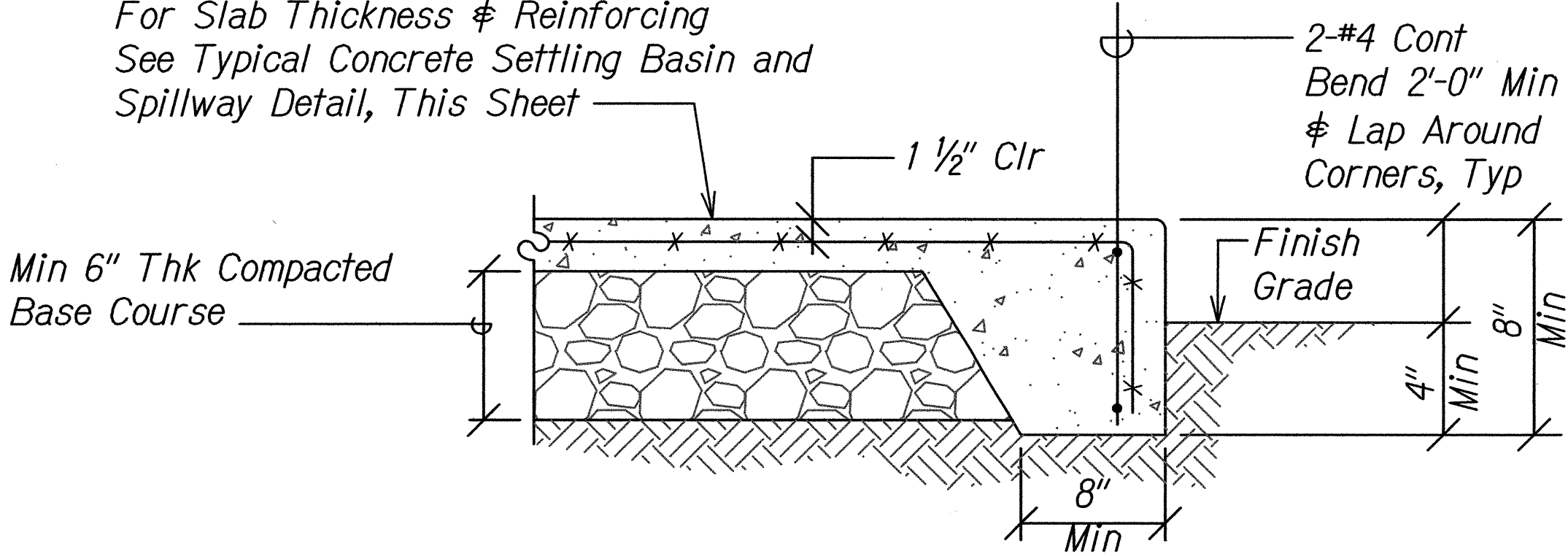
- Notes:
- For balance of information, See Detail 3 on Sheet EC-01.
 - Contractor shall provide thickened slab edges. See Typical Slab-On-Grade Detail At Thickened Slab Edge, this sheet.

TYPICAL CONC SETTLING BASIN AND SPILLWAY REINFORCING DETAIL

Scale: Not To Scale

3
EC-10/EC-10

For Slab Thickness & Reinforcing See Typical Concrete Settling Basin and Spillway Detail, This Sheet



Notes: Welded wire fabric reinforcement shall be chaired to maintain proper concrete clear cover throughout the slab.

TYPICAL SLAB-ON-GRADE DETAIL AT THICKENED SLAB EDGE

Scale: Not To Scale

2
EC-10/EC-10

DATE	10/29/2012
DESIGNED BY	ROY E. IWAMOTO
TRACED BY	ROY E. IWAMOTO
NOTE BOOK	ROY E. IWAMOTO
QUANTITIES BY	ROY E. IWAMOTO
CHECKED BY	ROY E. IWAMOTO
NO.	10/29/2012 3:50:04 PM

ROY E. IWAMOTO
LICENSED PROFESSIONAL ENGINEER
No. 8871-S
HAWAII, USA

4/30/14
EXP. DATE

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL STRUCTURAL DETAILS

KANEHOE WATERSHED STORM WATER
BEST MANAGEMENT PRACTICES ON OAHU
Project No. HWY-O-04-14M
Scale: None Date: March 2014

SHEET No. EC-10 OF 26 SHEETS