

FILE: K:\Civil\19869 Makaha Bridges\Draw\Construction Notes\ADD_01.dwg (0.5-C01.13_Construction Notes.dwg saved November 17, 2020

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

WATER NOTES

1. Unless otherwise specified, all materials and construction of water system facilities and appurtenances shall be in accordance with the 2005 Standard Specifications for Road and Bridge Constructions, as amended, of the Hawaii Highways Division, Department of Transportation, City and County of Honolulu Board of Water Supply's "Water System Standards" dated 2002, the "Water System External Corrosion Control Standards", Volume 3, Dated 1991, and all subsequent ammendments and additions.

2. All plans approved by the Board of Water Supply are based solely on the adequacy of the water supply.

3. Test pressure shall be 150 psi. During the 30-minute pressure test, the pressure shall not drop more than 10 PSI

4. The Contractor shall notify BWS Capital Projects Division, Construction Section in writing and submit six (6) sets of approved construction plans one week prior to commencing work on the water system.

5. Water commitment shall be canceled if the approved construction plans are allowed to lapse.

6. The Contractor shall chlorinate the entire inside surface of each pipe and fitting with disinfection solution of 5 ounces of Sodium Hypochlorite mixed with 10 gallons of water. (For connection only)

7. The Contractor shall be responsible for the protection of all water lines during construction. The Contractor shall be especially careful when excavating behind water lines, tees, and bends wherever there is a possibility of water line movement due to the removal of the supporting earth behind the existing reaction blocks. The Contractor shall take whatever measures necessary to protect the water lines, such as constructing special reaction blocks (with BWS approval) and/or modifying his construction method.

8. The existence and location of underground utilities and structures as shown on the plans are from the latest available data but is not guaranteed as to the accuracy or the encountering of other obstacles during the course of the work. The Contractor shall be responsible and shall pay for all damages to existing utilities. The Contractor shall not assume that where no utilities are shown, that none exist.

9. Prior to installation, the Contractor shall submit for approval by Board of Water Supply, the Manufacturer's Certification that all cast iron (gray or ductile) fittings for the project conform in all respects to the Water System Standards, Dated 2002.

10. Polygon shape for mechanical joint glands as described in AWWA Standard C111 shall be "straight-sided" or an approved equal on a job to job basis.

11. Re-approval shall be required if this project is not under construction within a period of two years.

12. Contractor shall cut and plug all existing unused laterals at the main whether or not shown on the plans. The damaged area shall be repaired to an equal or better condition than the immediate area. All work shall be done at the expense of the Contractor.

13. At the electrical/cable/signal ductline water crossings, adjust all electrical/cable/signal ductline elevations to maintain 12" vertical clear separation from all waterlines (12" clear for all electrical/signal ductline structures larger then 16") at no cost to the Board of Water Supply.

14. Maintain 3'-0" min. horizontal clear separation between all waterlines and the nearest electrical/cable/signal ductlines paralleling the water system at no cost to the Board of Water Supply.
15. Maintain 3'-0" min. horizontal clear separation between electrical/cable/signal appurtenances (including modular units) and the nearest waterlines or water appurtenance. Contractor shall field verify for any conflicts at each street electrical/cable/signal appurtenance location. Where conflicts occur, the Contractor shall coordinate with the Project Engineer to revise electrical/cable/signal appurtenance to provide the required clearances at no cost to the Board of Water Supply.

16. The Contractor/developer shall obtain a NPDES permit prior to chlorination and/or dewatering. A copy of the permit shall be submitted to the Board of Water Supply, Capital Projects Division, construction section.

17. All ductile iron pipe, fittings and valves shall be wrapped with two (2) layers of 8 mil. polyethylene wrap. The inside surface of the polyethelene wrap to be in contact with the pipe exterior shall be infused with a blend of an antimicrobial to mitigate microbiologically influenced corrosion and a volatile corrosion inhibitor to control galvanic corrosion.

18. All ductile iron pipe and fittings including sections requiring reinforced concrete jacketing shall be ductile iron class 53 and zinc coated as per BWS Water System Standards.

19. Pipe cushion shall be of high resistivity material. The Contractor shall submit a soil certification that high resistant cushion material has a resistivity greater than 5,000 Ohm-cm. Remainder of the backfill material shall be as specified in volume 1 of the water system standards. Pipe cushion and backfill material shall contain no hazardous substances above regulatory action levels including but not limited to lead, asbestos, mercury, chromium, cadmium, zinc, strontium, and polychlorinated biphenyls (PCB).

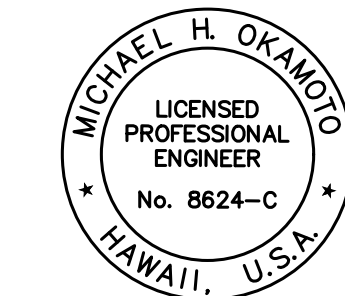
20. Cleaning shall be by the use of "pigs" introduced into the pipeline and run acompletey through all installed pipelines and all branch lines for fire hydrants. "Pigging" of service laterals is not required. Bare foam "pigs" shall be used to swab piping clean as each length of the pipeline is installed. Each "pig" shall consist of a cylindrical piece of polyurethane foam with a density of 3-7 pounds per cubic foot and a vinyl-coated nose. Outside diameter of the "pig" shall be equal to 1-1/4 to 1-1/2 times the inside diameter of the pipe being installed. The length of the "pig" shall be 1-1/2 to 2 times its diameter. Prior to use, the "pig shall be submerged in a chlorine solution of 1 oz. of 5% chlorine bleach in 5 gallons of water. "Pigging" of the pipeline shall be considered incidental to the installation of the new pipeline.

21. Ball corp and ball stop shall be used in lieu of a corporation stop and stopcock, respectively.

22. For cut-in connections, cut & plug work:
The Contractor shall coordinate the securing of the existing water system with the BWS prior to excavating behind or removing any existing thrust blocks, structural struts or reaction beams, or any fittings such as tees, plugs, caps, bends, offsets, and valves, or any other pipeline appurtenance. The Contractor shall be responsible for all associated damages resulting from failure to adequately secure the existing system.

APPROVED:

Manager and Chief Engineer, Date
Board of Water Supply
(For work affecting BWS facilities in City/State
R/W and easements only)



THIS WORK WAS PREPARED BY ME
OR UNDER MY SUPERVISION AND
CONSTRUCTION OF THIS PROJECT
WILL BE UNDER MY OBSERVATION.

Michael H. Okamoto April 30, 2022
SIGNATURE EXPIRATION DATE
OF THE LICENSE

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(20)	2020	ADD.12	168

23. For cut-in connections to existing:
All waterline construction requiring shutdown connection shall be scheduled for normal working hours at six (6) hours maximum downtime.
24. The Contractor shall verify all existing service lateral locations whether shown or not shown on plans prior to commencing with any of the work and shall not assume that where no services are shown, none exist.
25. The Contractor shall adjust all manhole frames/valve boxes/meter boxes within the resurfaced area. The Contractor shall be responsible for "referencing" these manholes/valve boxes/meter boxes to facilitate the adjustments.
26. Maintain 3'-0" minimum cover for all existing waterlines (18" minimum for service laterals) from new finish grade. The Contractor shall probe the waterline and service laterals and submit the probing data to BWS capital projects division, construction section.
27. Two-way blue reflective hydrant markers type DB shall be installed at all new fire hydrant installations. Contractor shall verify the exact locations of hydrant markers with the nearest Honolulu Fire Department Battalion Chief.
28. Any adjustments to the existing water system required during construction to meet the requirements of BWS standards, whether shown on the plans or not, shall be done by the contractor at no cost to the Board.

11/18/20	Revised Notes
Date	Description
<div>STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION</div> <div>CONSTRUCTION NOTES – 7</div> <div>FARRINGTON HIGHWAY Replacement of Makaha Bridge No. 3 and Makaha Bridge 3A F. A. Project No. BR-093-1(20)</div> <div>Scale: None Date: July 2020</div> <div>SHEET No. 00.11 OF 168 SHEETS</div>	

WATER NOTES (Cont.)

28. The following chlorination and water sample collection procedure shall apply to all water pipeline projects (all work to be coordinated through BWS inspector):

A. Chlorination of Water Systems

- (1.) The Contractor shall provide a 4 week advance notice, in writing, to the Officer-In-Charge for proposed flushing, filling and bacterial testing of the new pipline.

(2.) The Contractor shall hire a State of Hawaii – Department of Health certified laboratory to provide water sampling services and to deliver water samples to the Micro Lab for analysis. Water samples for bacterial testing shall be delivered no later than 2:30pm, on the day the samples are taken to the BWS Microlab located at 630 S. Beretania St., Honolulu, HI 96843. The Micro Lab shall perform analysis and provide their results to the Officer-In-Charge by 4:30pm on the following day (in some cases, final results notification may take up to 48 hours).

(3.) Water mains shall be disinfected in accordance with the Honolulu Board of Water Supply Water System Standards (2002), as amended.

(4.) Liquid chlorine, chlorine based liquid disinfectants or calcium hypochlorite that has been tested and certified as meeting the specifications of ANSI/NSF Standard 60, Drinking Water Treatment Chemicals – Health Effects, shall be used for the chlorination of the water mains.

(5.) Prior to chlorination, the water mains shall be thoroughly flushed.

(6.) The interior surfaces of the water mains shall be exposed to the chlorinating solution by completely filling the main remove air pockets, for a minimum of 24-hours and the free chlorine residual shall not be less than 10 ppm after such time.

(7.) Should the calcium hypochlorite be used, no solid and/or undissolved portion of the compound shall be introduced into any section of the water mains to be chlorinated.

(8.) At the end of the 24-hour disinfection period, representative samples shall be taken and analyzed to assure a free chlorine residual of at least 10 ppm.

(9.) Should the free chlorine residual results indicate adequate chlorination, the water mains shall be thoroughly flushed and filled with water from the existing system and again tested for free chlorine residual. The flushing shall be considered adequate if the free chlorine residual test results indicate that the water in the water mains has a comparable chlorine residual as the water in the existing system.

(10.) The Contractor shall be responsible for the proper disposal of chlorinated water to safeguard public health and the environment in accordance with applicable State of Hawaii Department of Health requirements. A neutralizing chemical shall be applied to the water to be disposed to thoroughly neutralize the chlorine residual remaining in the water in accordance with Honolulu Board of Water Supply Water System Standards (2002), as amended.

(11.) The Contractor shall be responsible for obtaining a National Pollutant Discharge Eliminating System (NPDES) Permit from the Department of Health, Clean Water Branch prior to the start of Construction, for the disposal of water used for hydro testing and chlorination, as required by the contract documents.

(12.) Following the acceptable flushing of the water mains, three (3) consecutive days of acceptable samples, taken at least 24-hours apart, from the representative points shall be taken and subjected to microbiological tests. For water lines, at least one set of samples shall be collected from every 1,200 feet of the new water main, plus one from the end of the line and at least one set from each branch. Positive or Invalid test results will not be acceptable and the process will be repeated.

- (13.) All measurements for chlorine residual shall be analyzed using E.P.A., approved methods for drinking water.

(14.) All microbiological tests shall be performed by a laboratory approved by the Department of Health, State of Hawaii and the Water Quality Division of the Honolulu Board of Water Supply.

(15.) The Contractor shall be responsible for all costs associated with all of the foregoing.

(16.) Cleaning and Swabbing procedures shall be in accordance with Honolulu Board of Water Supply Water System Standards (2002), as amended.

All materials in direct contact with the potable water shall have National Sanitation Foundations (NSF) approvals. The Contractor shall submit these approvals to the Board of Water Supply for information only prior to its application.

29. Install 4 mil thick, non-metallic, blue colored, 6 inches wide warning tape over centerline of the pipe and below the base course along the entire length of trench. Tape should be marked with "caution water line buried below".

30. Prior to any excavating, the Contractor shall verify in the field the location of existing water mains and appurtenances.

31. All sections of the water main requiring reinforced concrete jacketing shall be ductile iron pipe class 53 with ductile iron fittings.

32. The Contractor shall install electronic markers to all mains and test the electronic markers prior to installations to verify proper operation. BWS personnel shall verify the number and locations of placed electronic markers before final paving of the project.

33. The Contractor shall have existing water mains toned before construction of work in vicinity of water mains, call the investigation section at 748-5381 for toning services. Guardrail post locations are to be kept to a minimum clear distance of 18 inches to any 2 1/2 inch meter lines and meter boxes. no post driving will be allowed when post is to be installed closer than 3 feet from water main. Excavated areas shall be restored to their original conditions.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(20)	2020	ADD.13	168

SURVEY PLOTTED BY	DATE
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ORIGINAL PLAN	
NOTE BOOK	
No.	

APPROVED:

Manager and Chief Engineer, Board of Water Supply (For work affecting BWS facilities in City/State R/W and easements only)



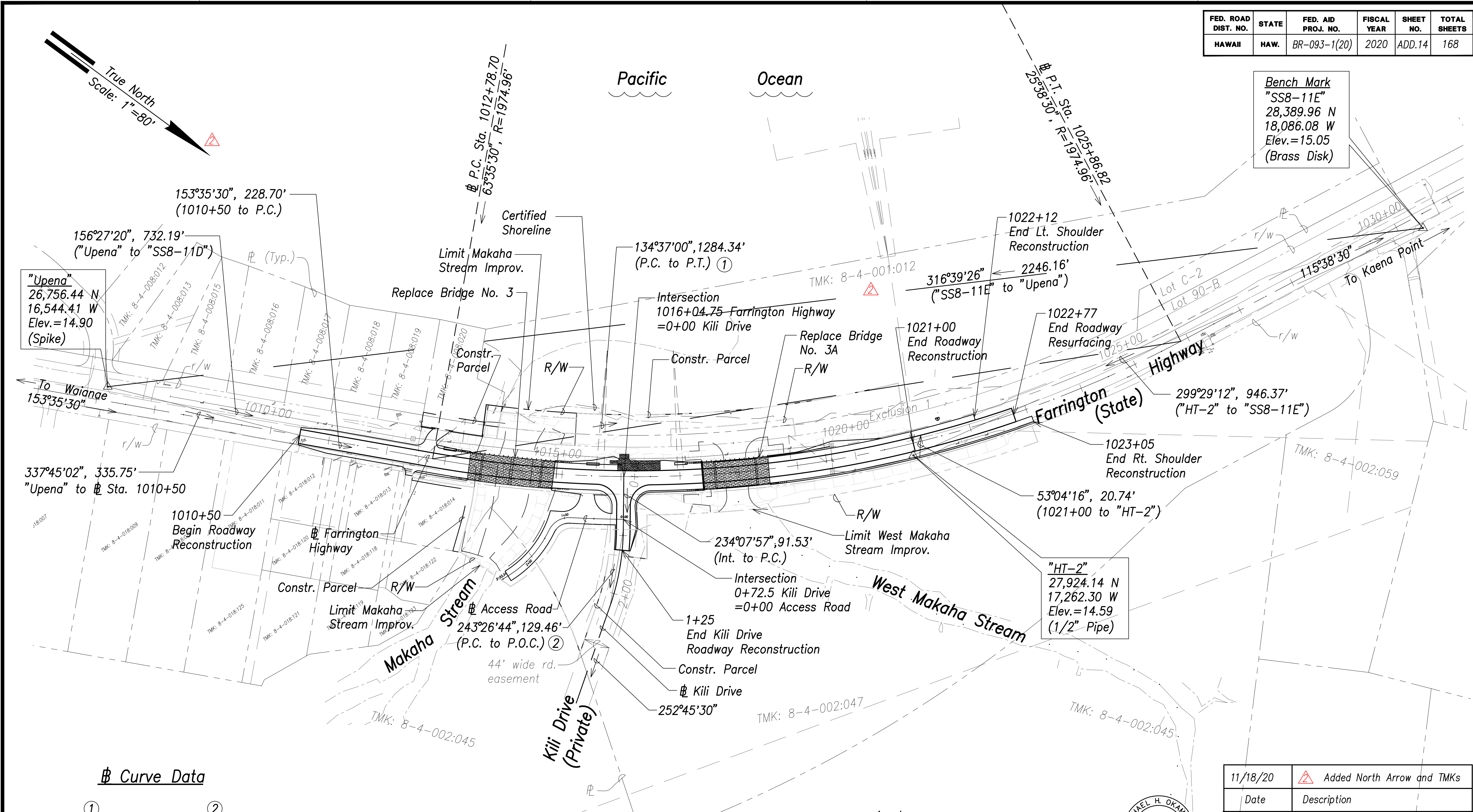
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Michael H. Okamoto April 30, 2022 SIGNATURE EXPIRATION DATE OF THE LICENSE

11/18/20	Revised Notes
Date	Description
<div>STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION</div> <div>CONSTRUCTION NOTES – 8</div> <div>FARRINGTON HIGHWAY Replacement of Makaha Bridge No. 3 and Makaha Bridge 3A F. A. Project No. BR-093-1(20)</div> <div>Scale: None Date: July 2020</div> <div>SHEET No. 00.12 OF 168 SHEETS</div>	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(20)	2020	ADD.14	168

Bench Mark
"SS8-11E"
28,389.96 N
18,086.08 W
Elev.=15.05
(Brass Disk)



Curve Data

①	②
⊙ Farrington P.C. to P.T.	⊙ Kili Drive P.C. to P.T.
$\Delta = 37^{\circ}57'00''$	$\Delta = 18^{\circ}37'33''$
$\Delta/2 = 18^{\circ}58'30''$	$\Delta/2 = 9^{\circ}18'46''$
$R = 1974.96'$	$R = 400.00'$
$T = 679.07'$	$T = 65.59'$
$C = 1284.34'$	$C = 129.46'$
$Lc = 1308.12'$	$Lc = 130.03'$

Approved:

Manager and Chief Engineer, B.W.S.
(For work affecting BWS facilities in City/State
R/W and easements only)



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Graphic Scale

1" = 80' 80' 40' 0 80' 160'

11/18/20	Added North Arrow and TMKs
Date	Description

DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GENERAL PLAN

FARRINGTON HIGHWAY

Replacement of Makaha Bridge

No. 3 and Makaha Bridge 3A

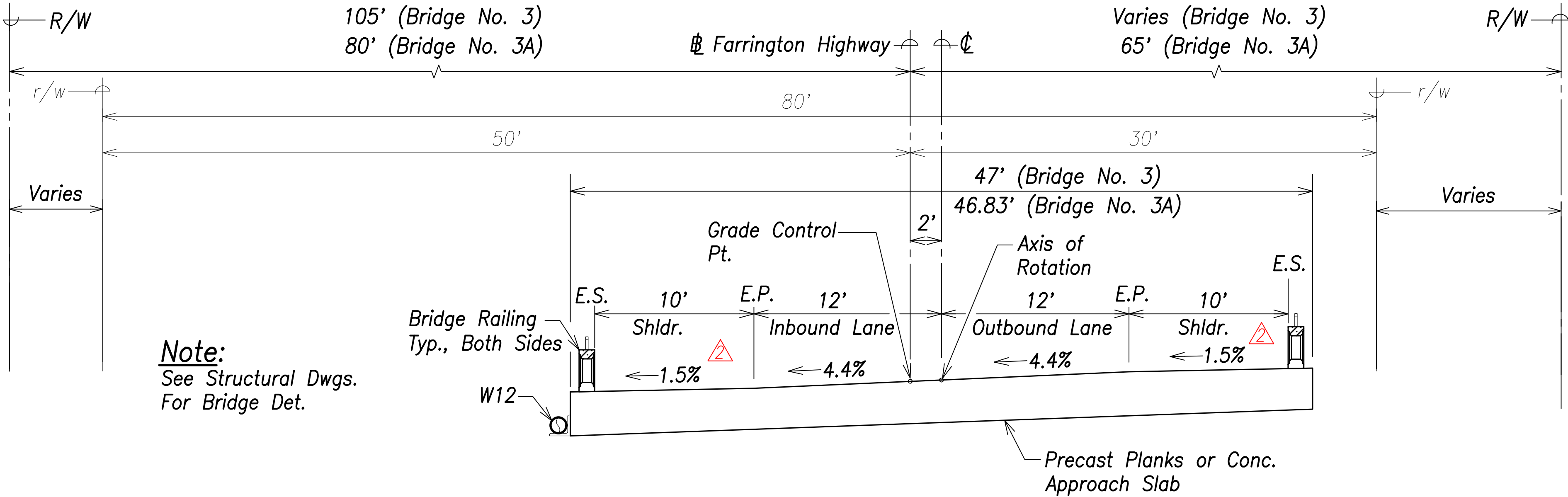
F. A. Project No. BR-093-1(20)

Scale: 1" = 80' Date: July 2020

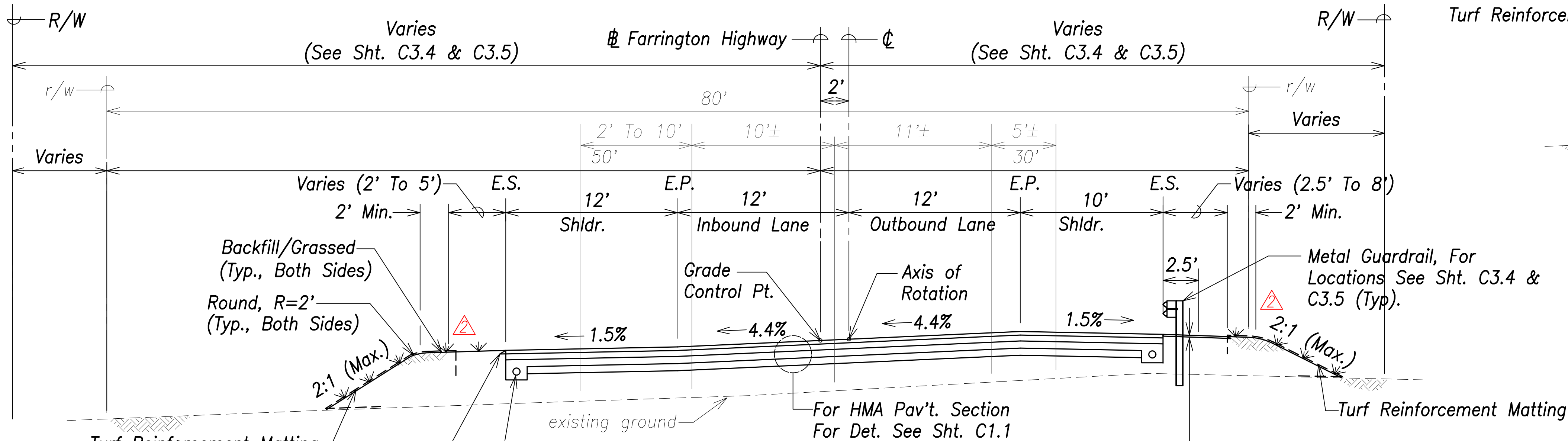
SHEET No. C0.14 OF 168 SHEETS

ADD.14

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(20)	2020	ADD.16	168

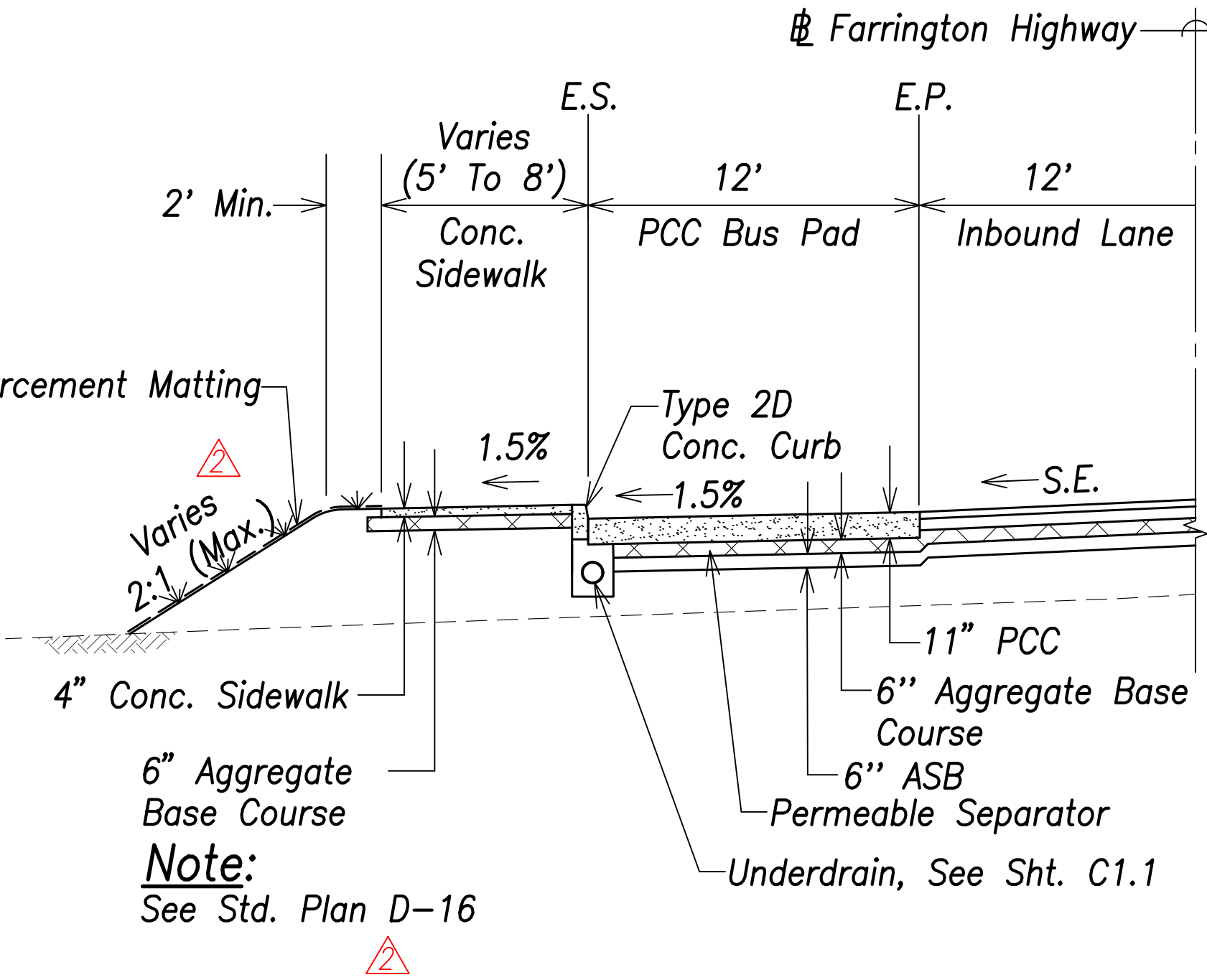


TYPICAL SECTION - BRIDGE NO. 3 & 3A
Scale: 1"=5'



TYPICAL SECTION - FARRINGTON HIGHWAY
Sta. 1014+85.61 TO Sta. 1017+38.74
Scale: 1"=5'

- Notes:**
- See Sht. C8.5 for Guardrail Installation Det.
 - Locations of existing facilities are approximate. Contractor shall verify existence & size of facilities.



TYPICAL SECTION - FARRINGTON HIGHWAY
PCC BUS PAD
Scale: 1"=5'

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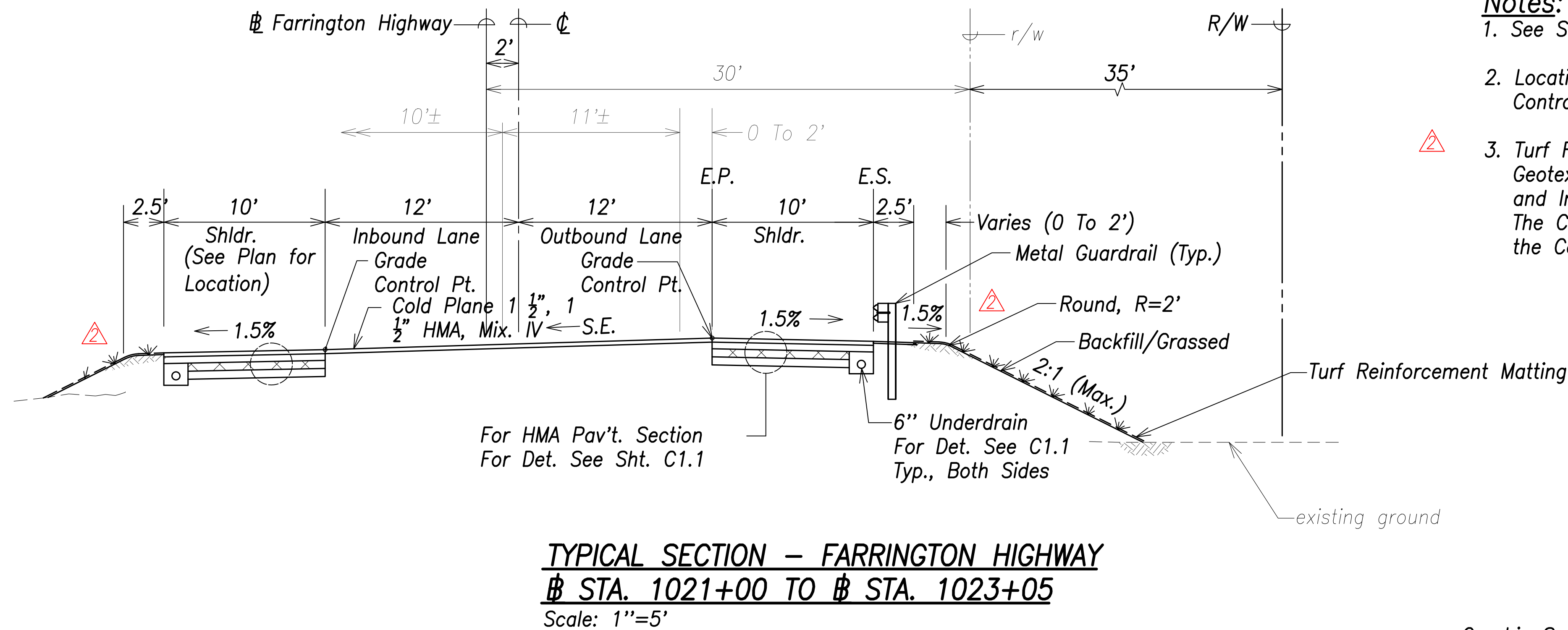
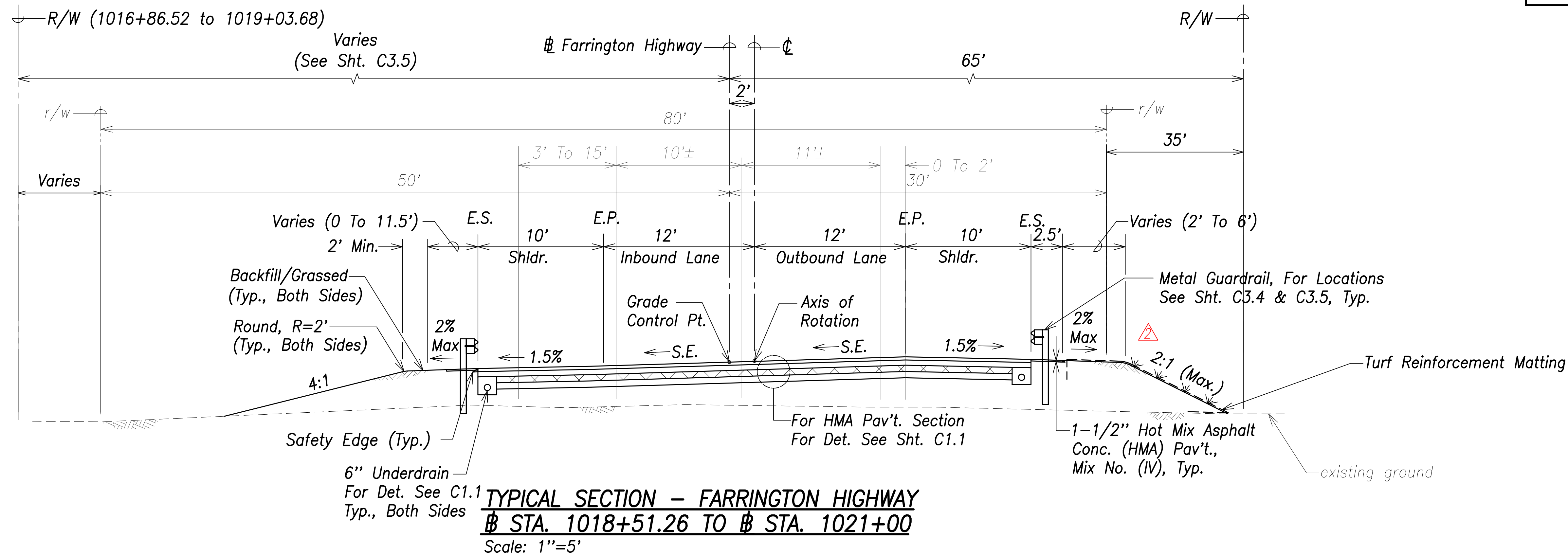


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11/18/20	Revised Callouts
Date	Description
DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION TYPICAL SECTION - 2 FARRINGTON HIGHWAY Replacement of Makaha Bridge No. 3 and Makaha Bridge 3A F. A. Project No. BR-093-1(20) Scale: 1" = 5' Date: July 2020	
SHEET No. C1.2 OF 168 SHEETS	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(20)	2020	ADD.17	168



Notes:

1. See Sht. C8.5 for Guardrail Installation Det.
2. Locations of existing facilities are approximate. Contractor shall verify existence & size of facilities.
3. Turf Reinforcement Matting Shall Comply with 716.07 Geotextile for Permanent Erosion Control Applications and Installed Per Manufacturer's Recommendations. The Cost of Turf Reinforcement Matting is Included in the Contract Price of Other Pay Items.

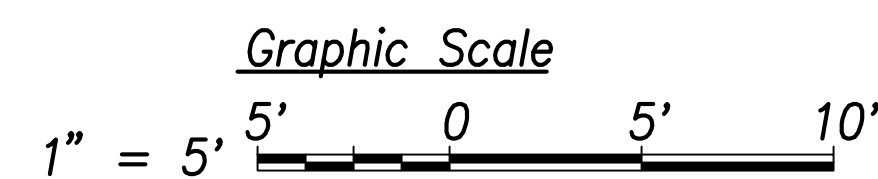
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NOTE BOOK	
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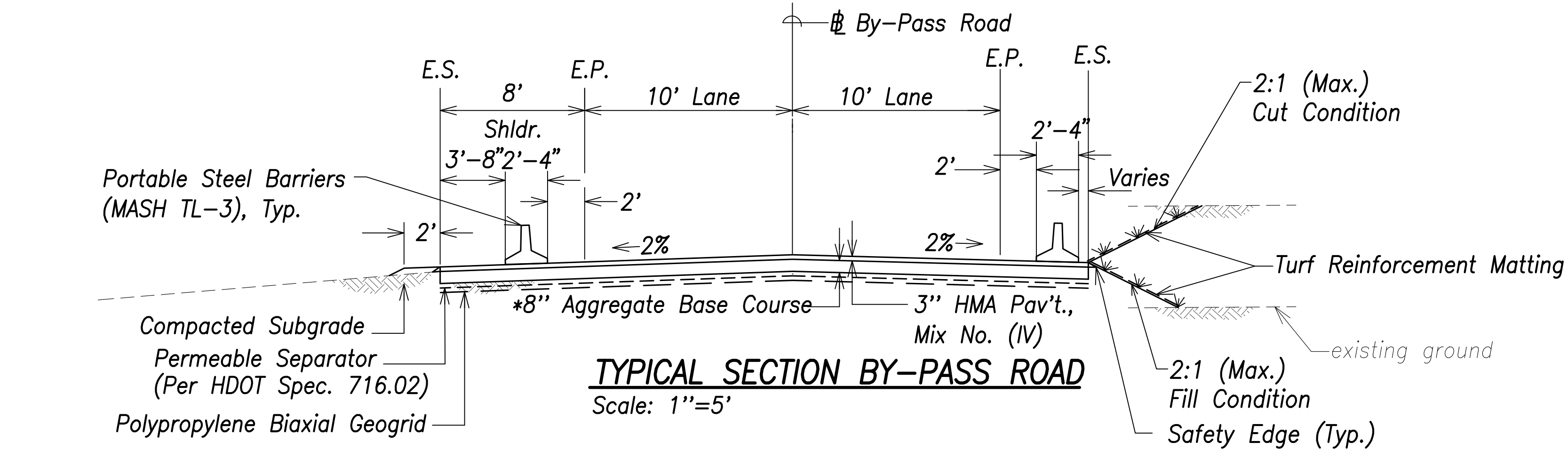
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EXPIRATION DATE OF THE LICENSE

11/18/20	Revised Callouts
Date	Description
DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
TYPICAL SECTION - 3	
FARRINGTON HIGHWAY	
Replacement of Makaha Bridge	
No. 3 and Makaha Bridge 3A	
F. A. Project No. BR-093-1(20)	
Scale: 1" = 5'	Date: July 2020
SHEET No. C1.3 OF 168 SHEETS	

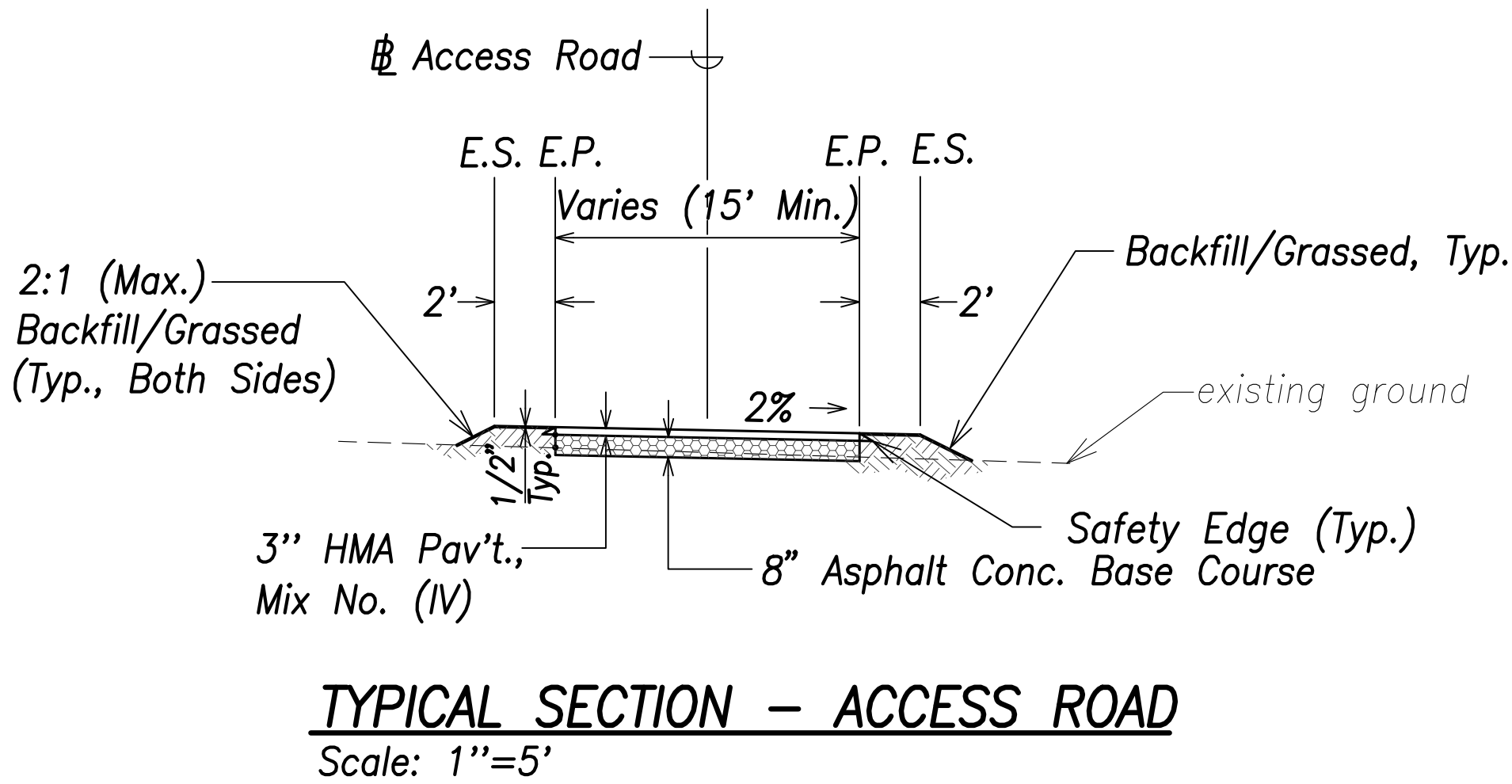
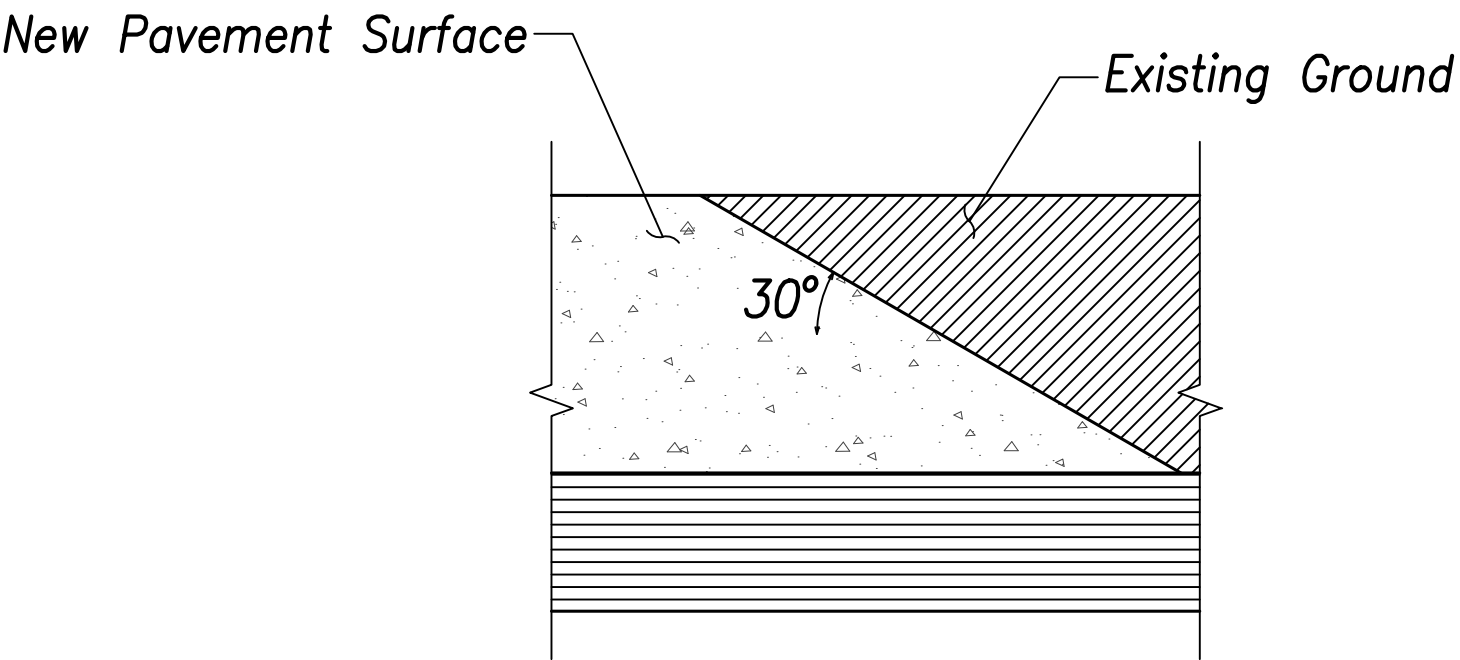
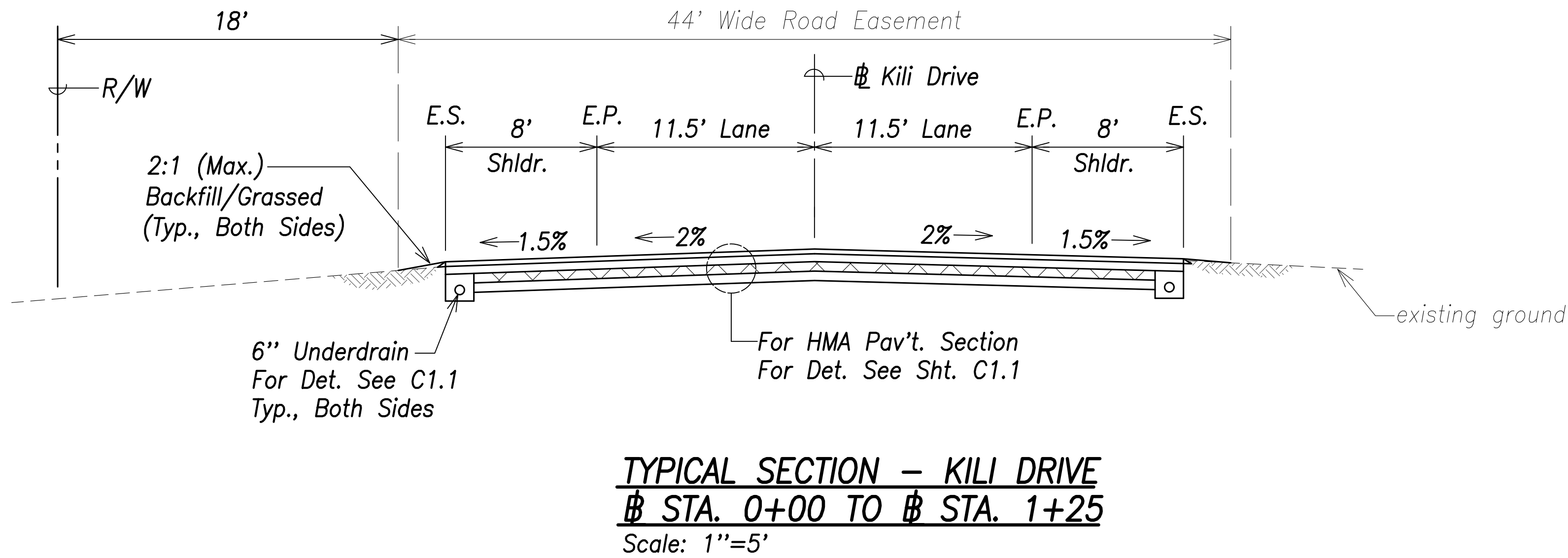


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(20)	2020	ADD.18	168

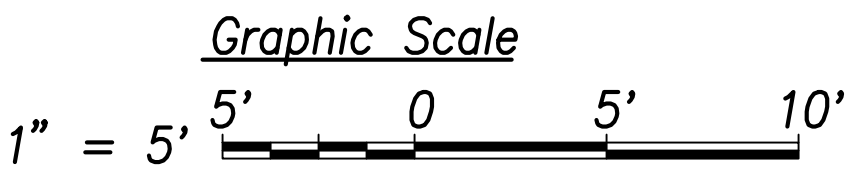


NOTE:

- *1. 8" Aggregate Base Course Shall Be Compacted in Two Equal Lifts. Bottom Lift Shall Be Compacted to 90% Relative Compaction. Upper Lift Shall Be Compacted to 95% Relative Compaction.
2. Turf Reinforcement Matting Shall Comply with 716.07 Geotextile for Permanent Erosion Control Applications and Installed Per Manufacturer's Recommendations. The Cost of Turf Reinforcement Matting is Included in the Contract Price of Other Pay Items.



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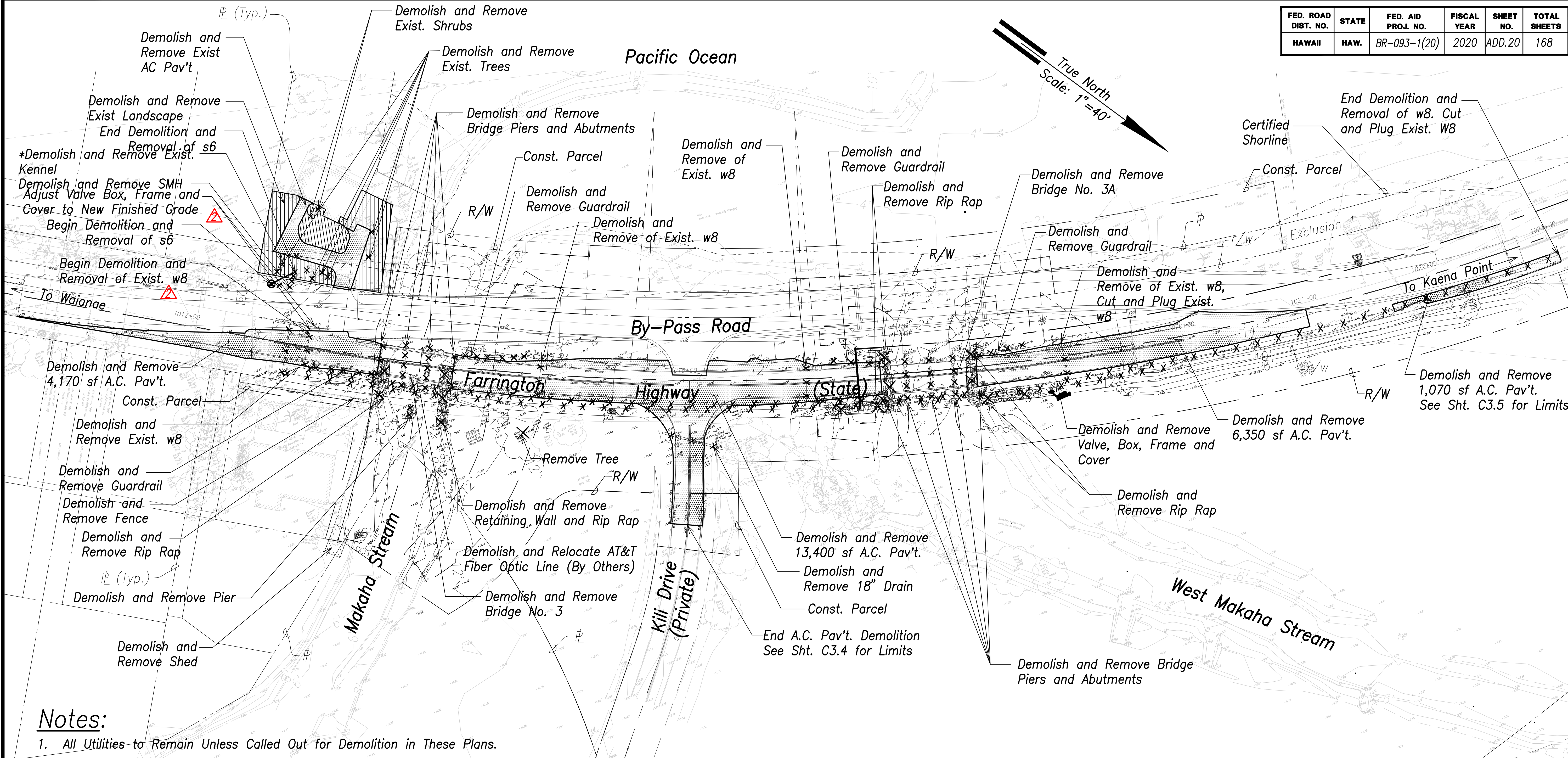


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Michael H. Okamoto
SIGNATURE EXPIRATION DATE OF THE LICENSE

11/18/20	Added Note
Date	Description
DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION TYPICAL SECTION - 4 FARRINGTON HIGHWAY Replacement of Makaha Bridge No. 3 and Makaha Bridge 3A F. A. Project No. BR-093-1(20) Scale: 1" = 1'-0" Date: July 2020	
SHEET No. C1.4 OF 168 SHEETS	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(20)	2020	ADD.20	168



Notes:

1. All Utilities to Remain Unless Called Out for Demolition in These Plans.
2. See Electrical Drawings for Electrical Demolition Work
3. The Contractor Shall Remove all Pavement, Concrete and Utilities Required to Reconstruct Bridge No. 3, Bridge No. 3A and Farrington Highway.
4. See sheets C6.3 to C6.8 for Additional Information Regarding the Sequence of Work.
5. The Contractor Shall Provide All Required Temporary A.C. Pavement Transitions Between Existing and Proposed Pavement Required for a Smooth Riding Connection.
6. Portion of Exist. Waterline (Abandoned) Utilized by SIC. Contractor Shall Verify Location of Exist. SIC Fiber Optic Cable Prior to Removal of Existing Waterline.
- *7. Demolition and Removal of Exist. Kennel Includes Installation of 5, Temp. Kennls (Lucky Dog Uptown, 6'x4'x8' or Approved Equal. Cost shall be included with the Cost of Removal of Kennel.

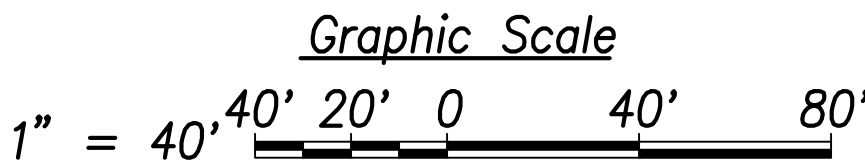
Approved:

Manager and Chief Engineer, B.W.S. Date
(For work affecting BWS facilities in City/State
R/W and easements only)



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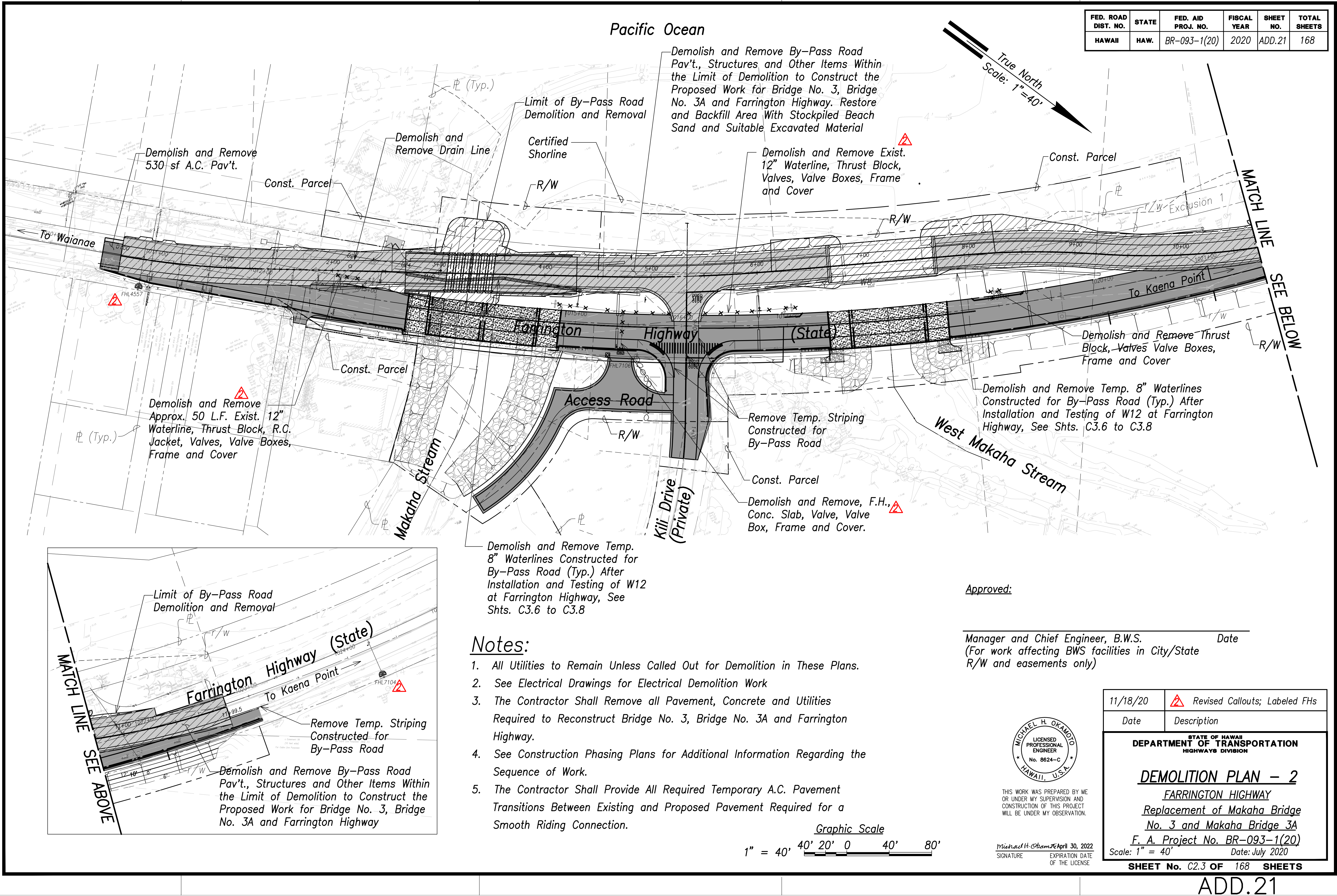
Michael H. Okamoto April 30, 2022
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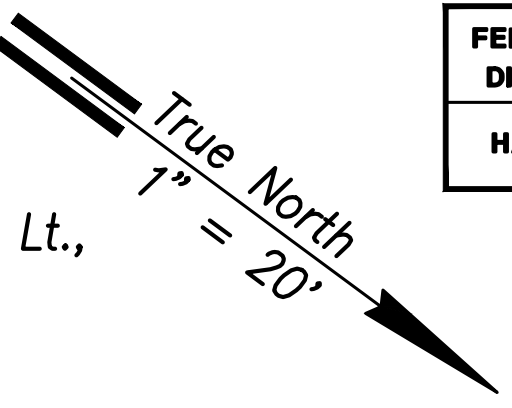
11/18/20	Revised Callouts
Date	Description
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
DEMOLITION PLAN - 1	
FARRINGTON HIGHWAY	
Replacement of Makaha Bridge	
No. 3 and Makaha Bridge 3A	
F. A. Project No. BR-093-1(20)	
Scale: 1" = 40'	Date: July 2020
SHEET No. C2.2 OF 168 SHEETS	

FILE: K:\Civil\19969 Makaha Bridges\Drawings\Construction Drawings\1.dwg (C2.3 Demolition Plan - 2.dwg) saved November 18, 2020

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
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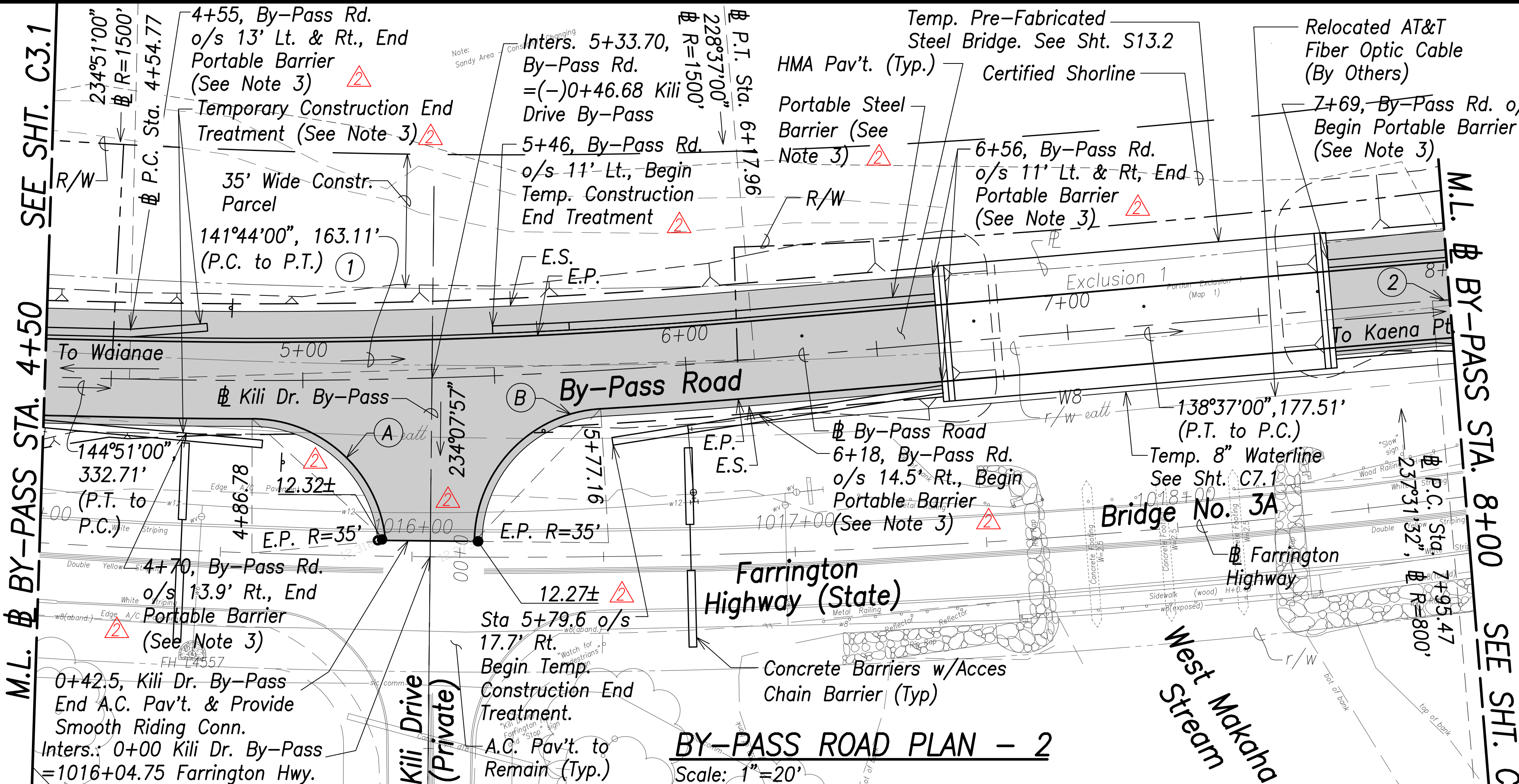


By-Pass Road # Curve Data

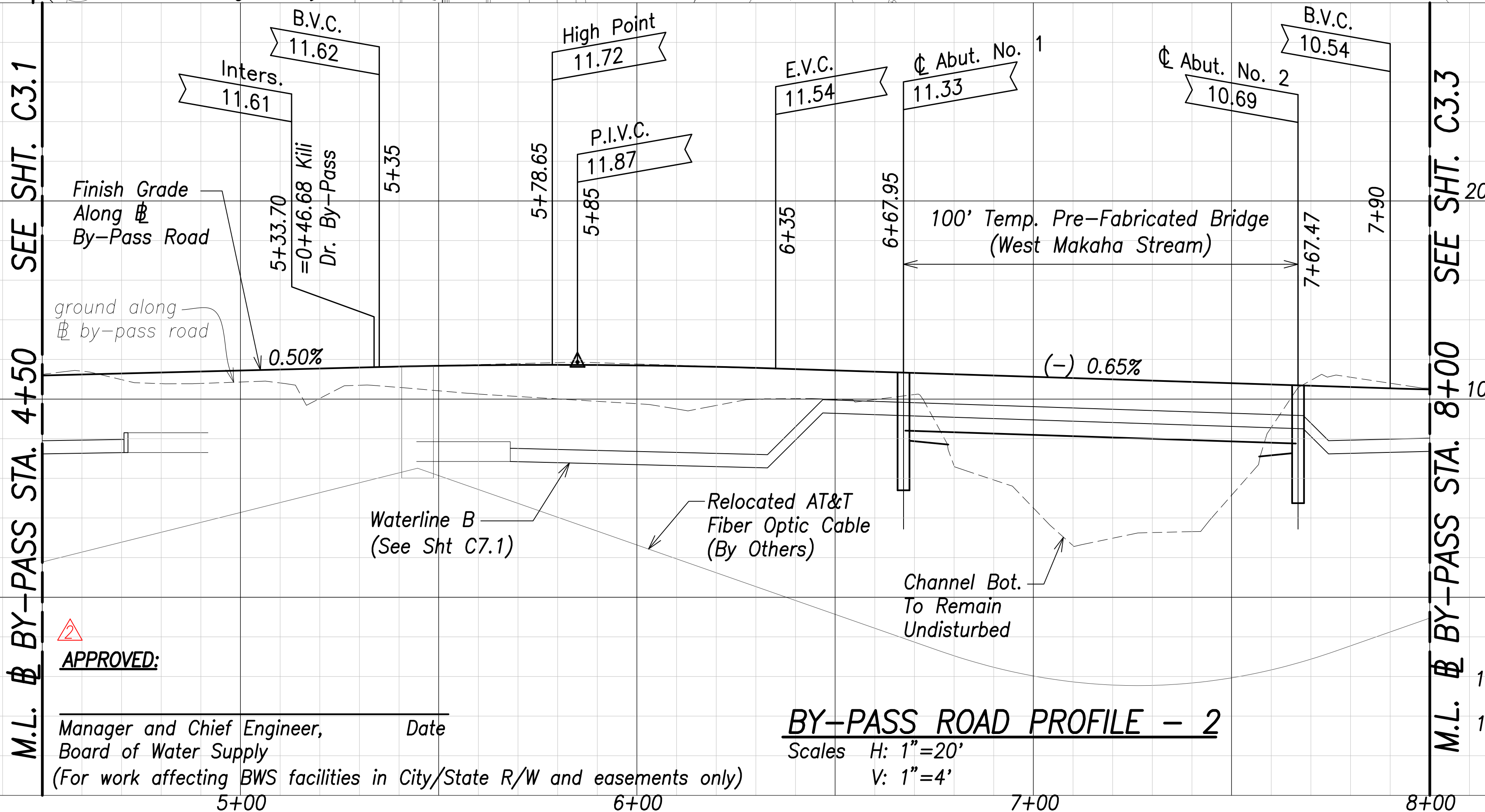
①	②
(P.C. Sta. 4+54.77 to P.T. Sta. 6+17.96)	(P.C. Sta. 7+95.47 to P.R.C. Sta. 9+19.86)
$\Delta = 06^{\circ}14'00''$	$\Delta = 8^{\circ}54'32''$
$\Delta/2 = 03^{\circ}07'00''$	$\Delta/2 = 4^{\circ}27'16''$
$R = 1500.00'$	$R = 800.00'$
$T = 81.67'$	$T = 62.32'$
$C = 163.11'$	$C = 124.27'$
$Lc = 163.19'$	$Lc = 124.39'$

Curve Return Data

A	B
$\Delta = 84^{\circ}12'04''$	$\Delta = 86^{\circ}02'34''$
$\Delta/2 = 42^{\circ}06'02''$	$\Delta/2 = 43^{\circ}01'17''$
$R = 33.00'$	$R = 33.00'$
$T = 29.82'$	$T = 30.80'$
$C = 44.25'$	$C = 45.03'$
$Lc = 48.50'$	$Lc = 49.56'$



BY-PASS ROAD PLAN - 2
Scale: 1"=20'



BY-PASS ROAD PROFILE - 2
Scales H: 1"=20'
V: 1"=4'

Notes:

- See Sht. C1.4 for By-Pass Road Typical Section.
- Temporary Construction End Treatment shall be installed per manufacturer's Recommendations.
- Temporary Work Zone Devices, Including Portable Barriers, Manufactured After December 31, 2019, Must Be Successfully Tested To The 2016 Edition of MASH. Devices Manufactured on or Prior to This Date and Successfully Tested to NCHRP Report 350 or the 2009 Edition of MASH, May be Used for Temporary Work Zone Devices Provided the Device is Within Their Normal Serviceable Life.



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Michael H. Okamoto April 30, 2022
SIGNATURE EXPIRATION DATE OF THE LICENSE

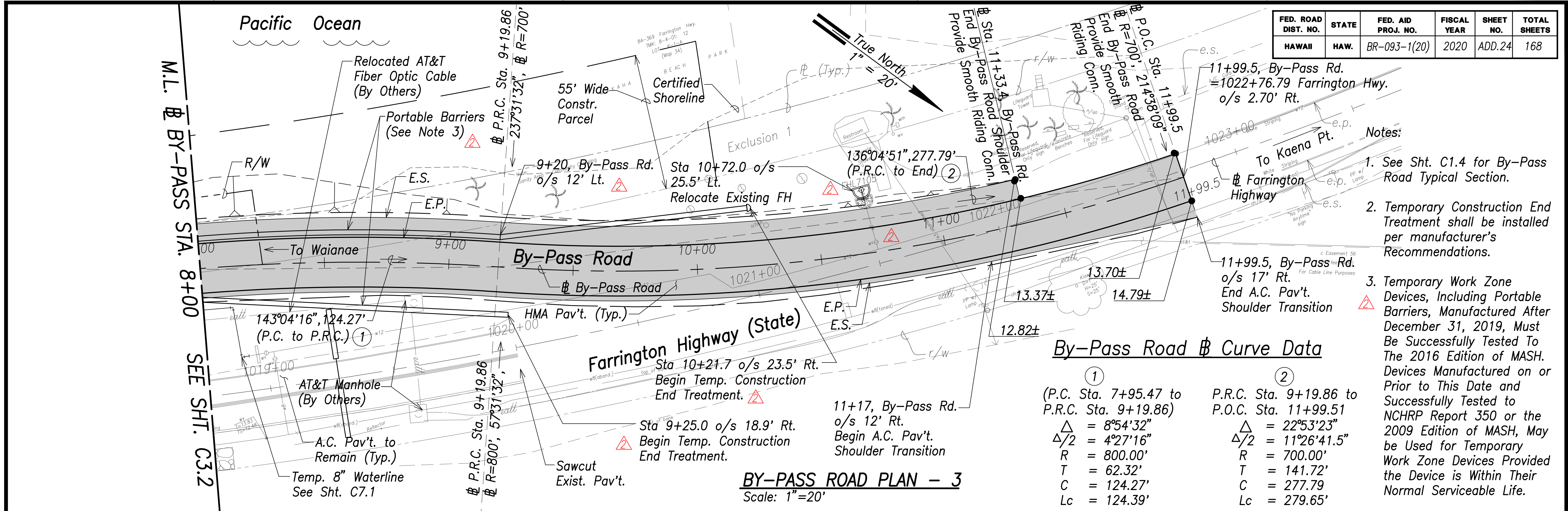
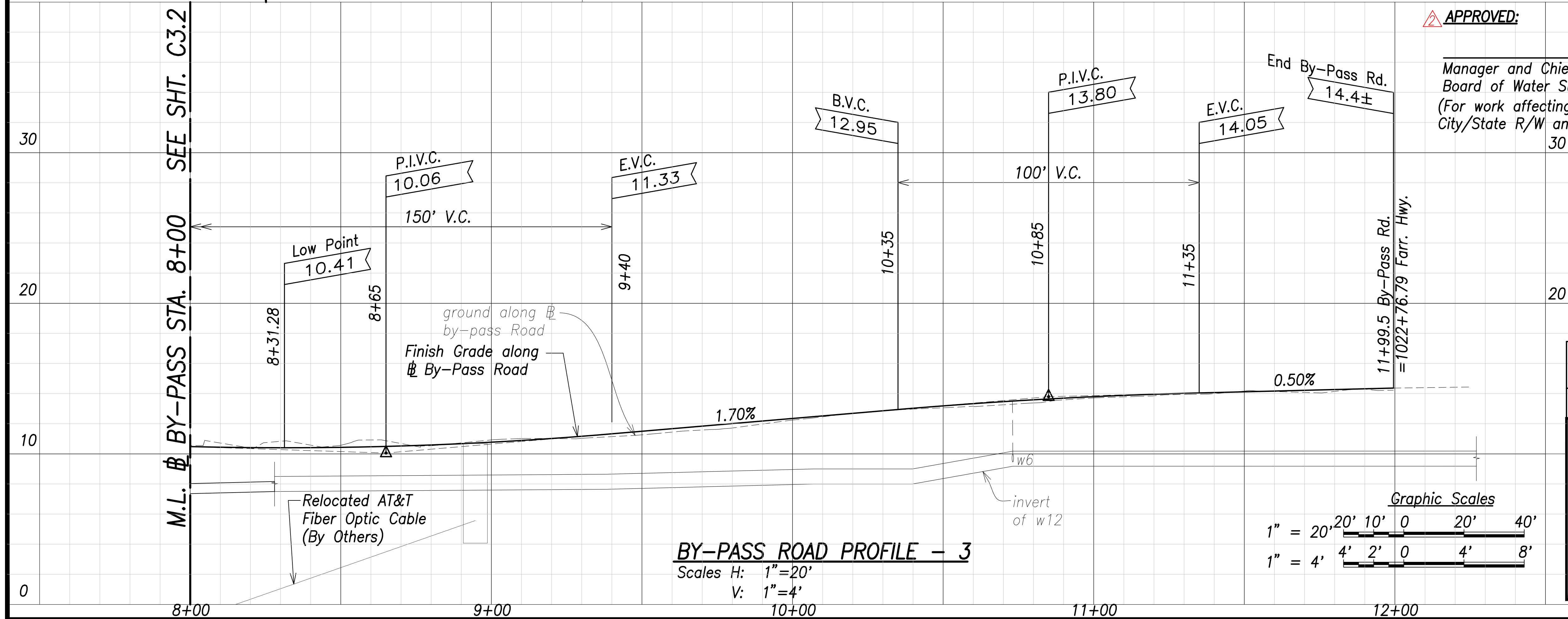
11/18/20	Revised Temp. Work Zone Devices Added Approval Block
Date	Description

DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
BYPASS ROAD PLAN & PROFILE - 2
FARRINGTON HIGHWAY
Replacement of Makaha Bridge No. 3 and Makaha Bridge 3A
F. A. Project No. BR-093-1(20)
Scale: As Shown Date: July 2020

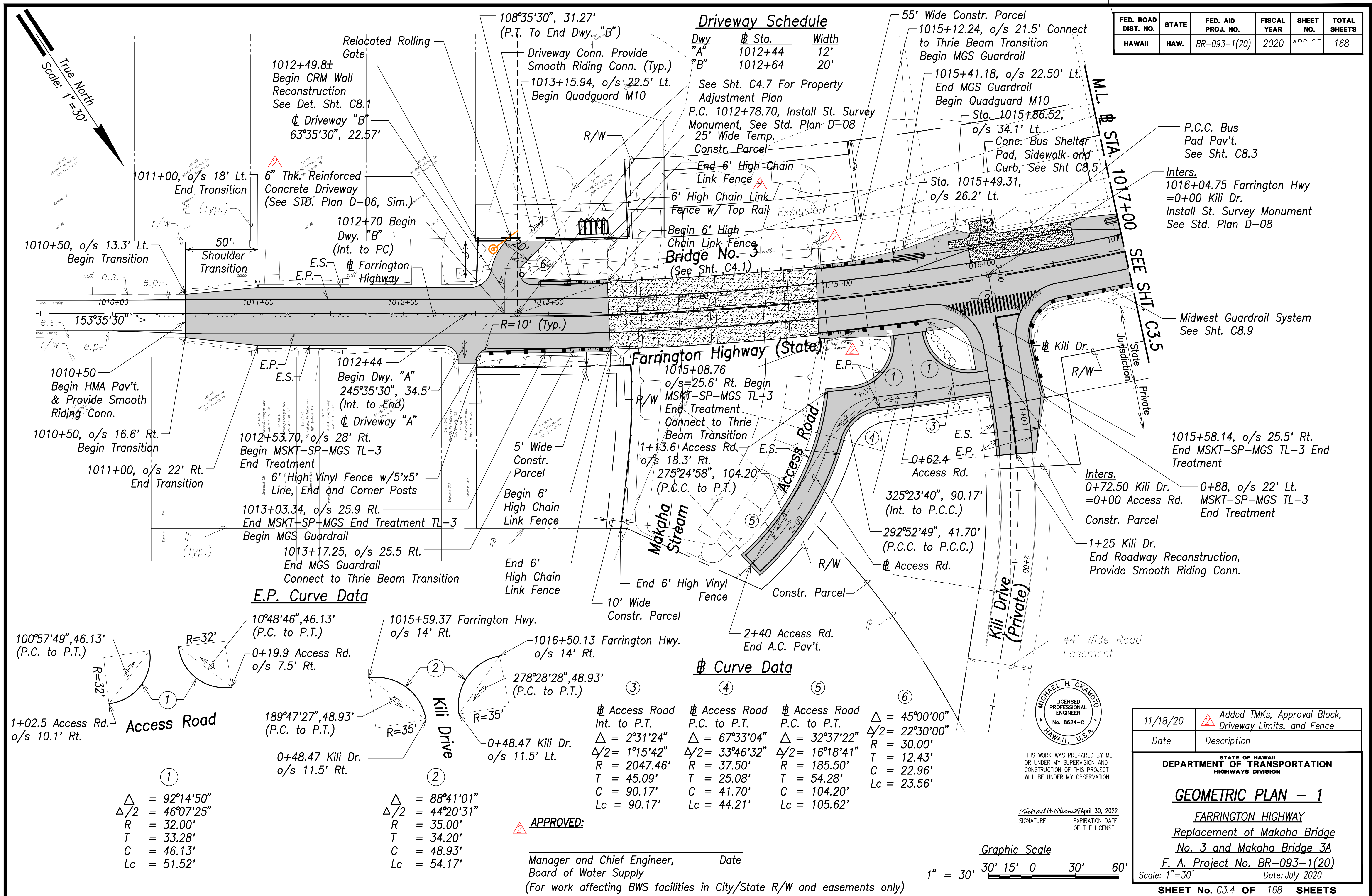
SURVEY PLOTTED BY	DATE
DRAWN BY	
TRACED BY	
QUANTITIES BY	
CHECKED BY	
ORIGINAL PLAN	NOTE BOOK
No.	

FILE: K:\Civil\19989 Makaha Bridges\Drawings\Construction Drawings\ADD. 24\Bypass Road Plan - 3.dwg saved November 17, 2020

SURVEY PLOTTED BY	DATE
DRAWN BY	
TRACED BY	
CHECKED BY	
NOTE BOOK	
QUANTITIES BY	
CHECKED BY	

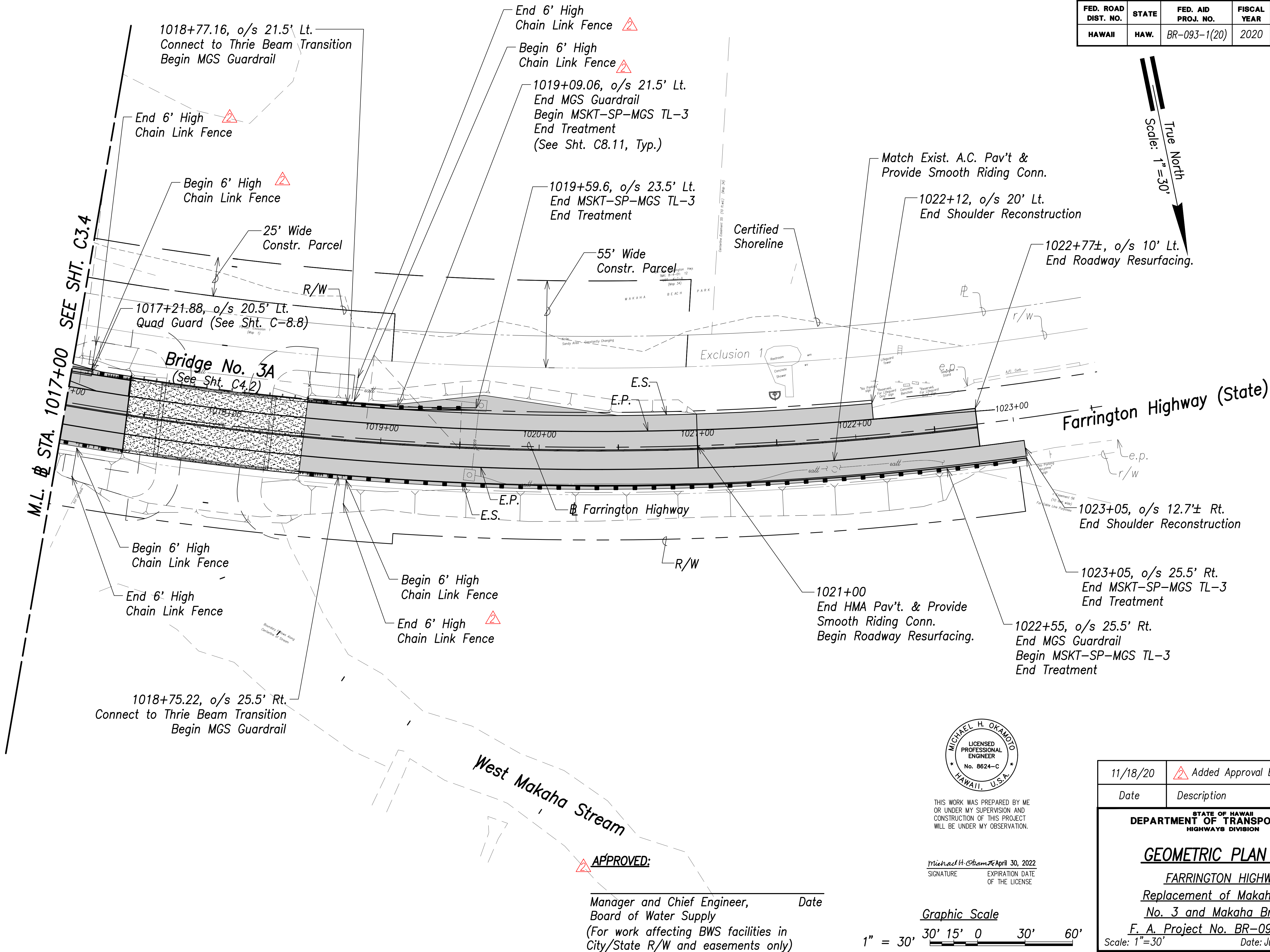


FILE: K:\Civil\19969 Makaha Bridges\Drawings\Construction Drawings\ADD.25_Geometric Plan - 1.dwg saved November 18, 2020



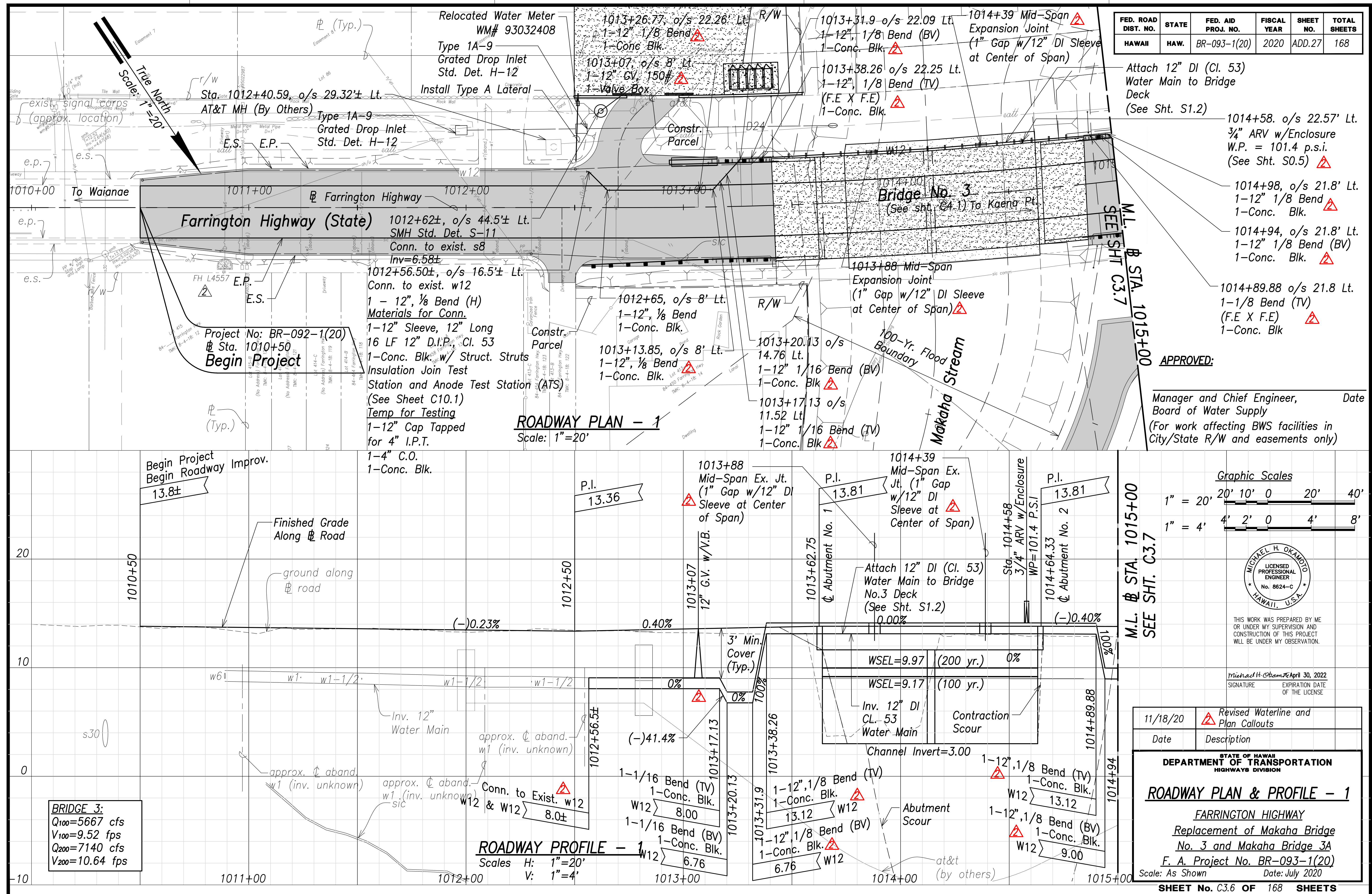
FILE: K:\Civil\19869 Makaha Bridges\Draw\Construction Draw\ADD. 1.dwg (C:\3.5_Geometric Plan - 2.dwg saved November 17, 2020)

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



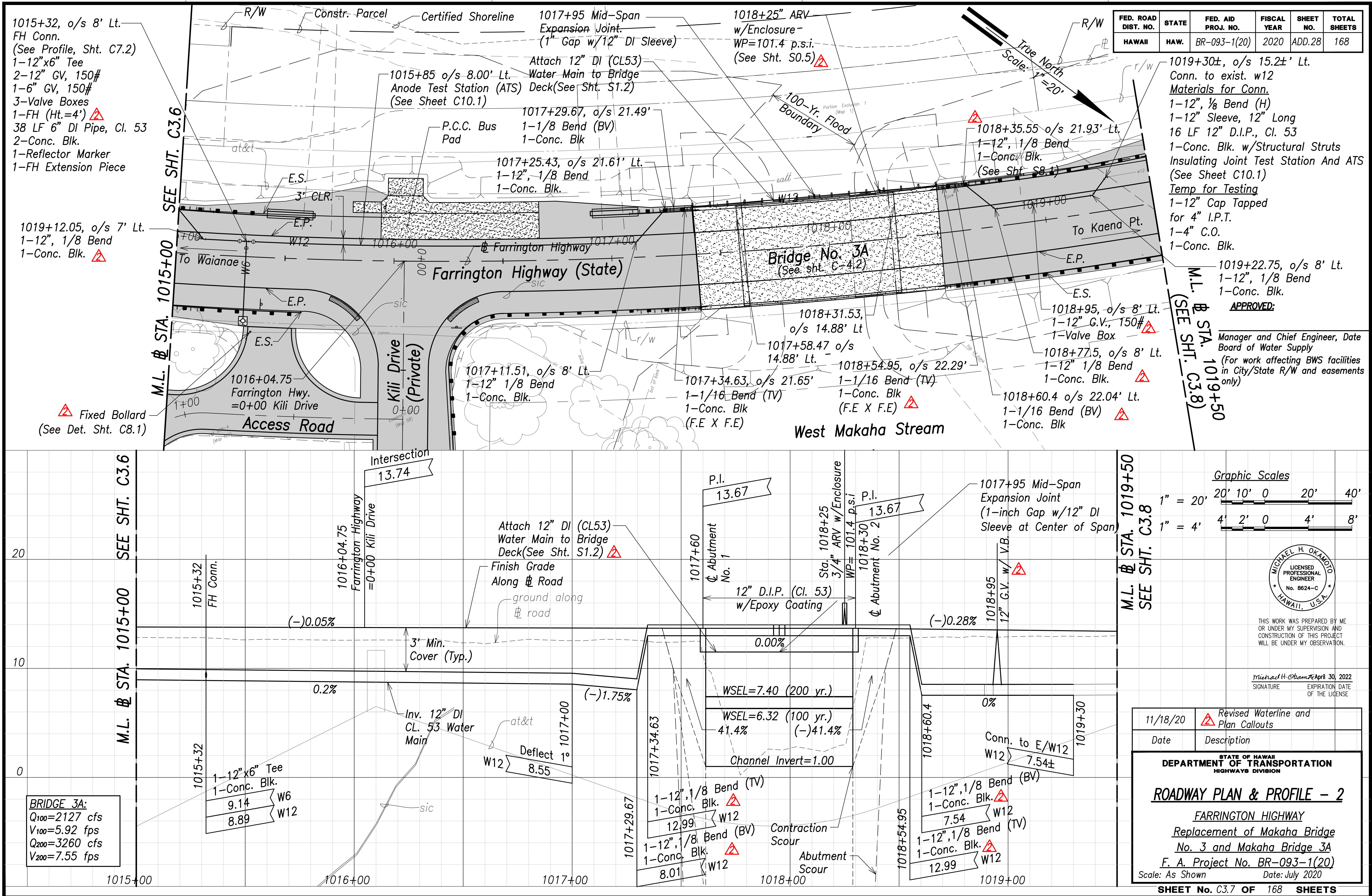
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(20)	2020	ADD.26	168

11/18/20	Added Approval Block and Fence
Date	Description
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
GEOMETRIC PLAN - 2	
FARRINGTON HIGHWAY	
Replacement of Makaha Bridge	
No. 3 and Makaha Bridge 3A	
F. A. Project No. BR-093-1(20)	
Scale: 1"=30'	Date: July 2020
SHEET No. C3.5 OF 168 SHEETS	



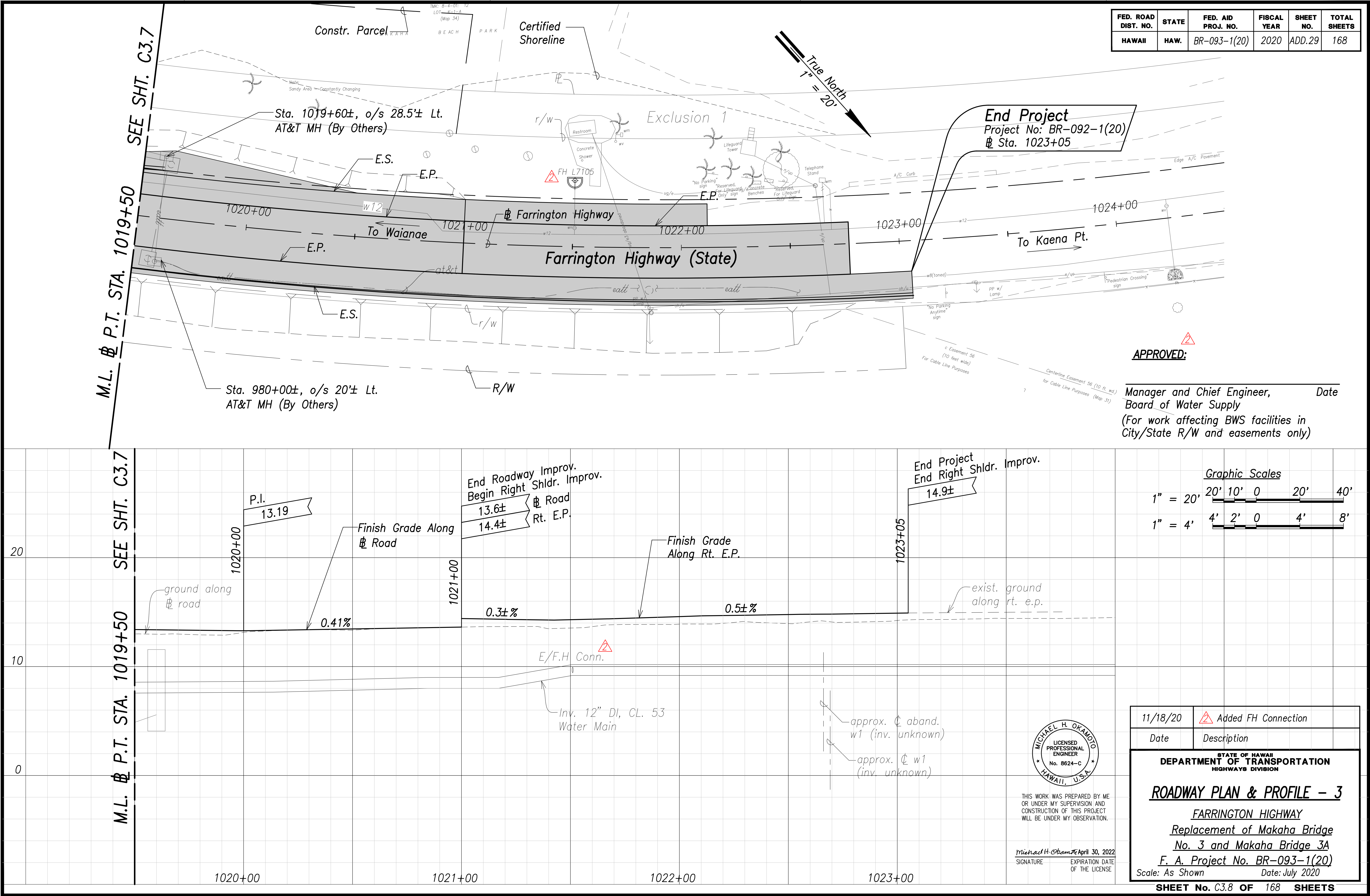
FILE: K:\Civil\19969 Makaha Bridges\Eng\Construction Draw\ADD. 1.dwg(C3.7 - Roadway P&P - 2.dwg saved November 18, 2020

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

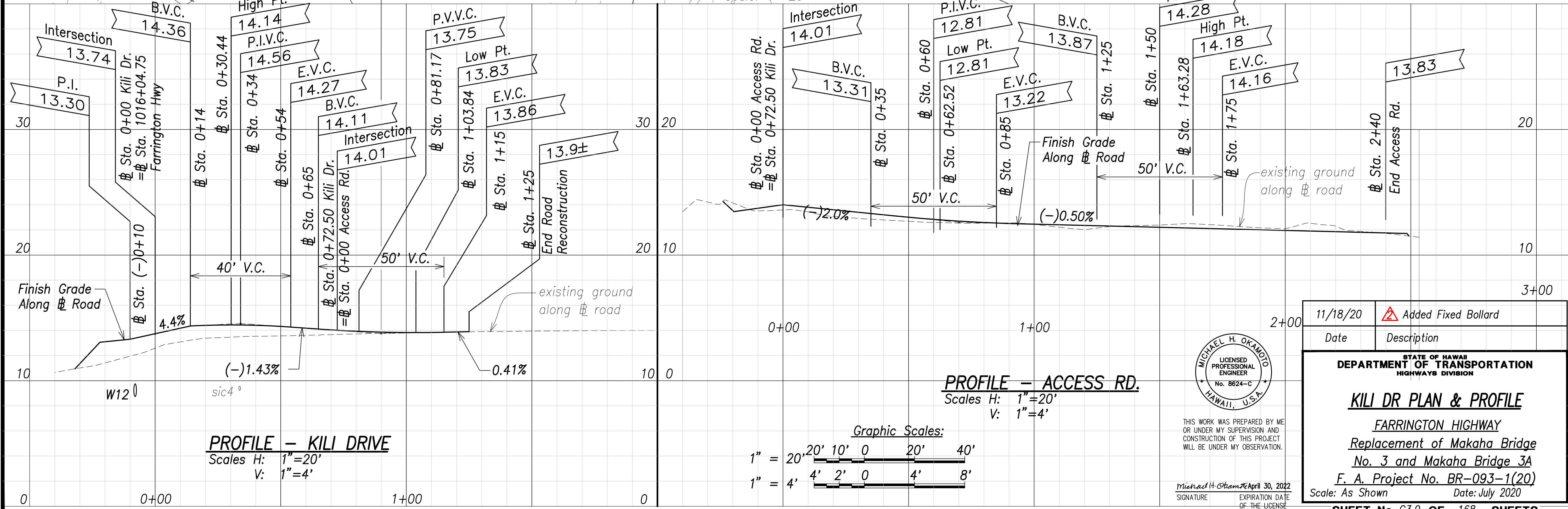
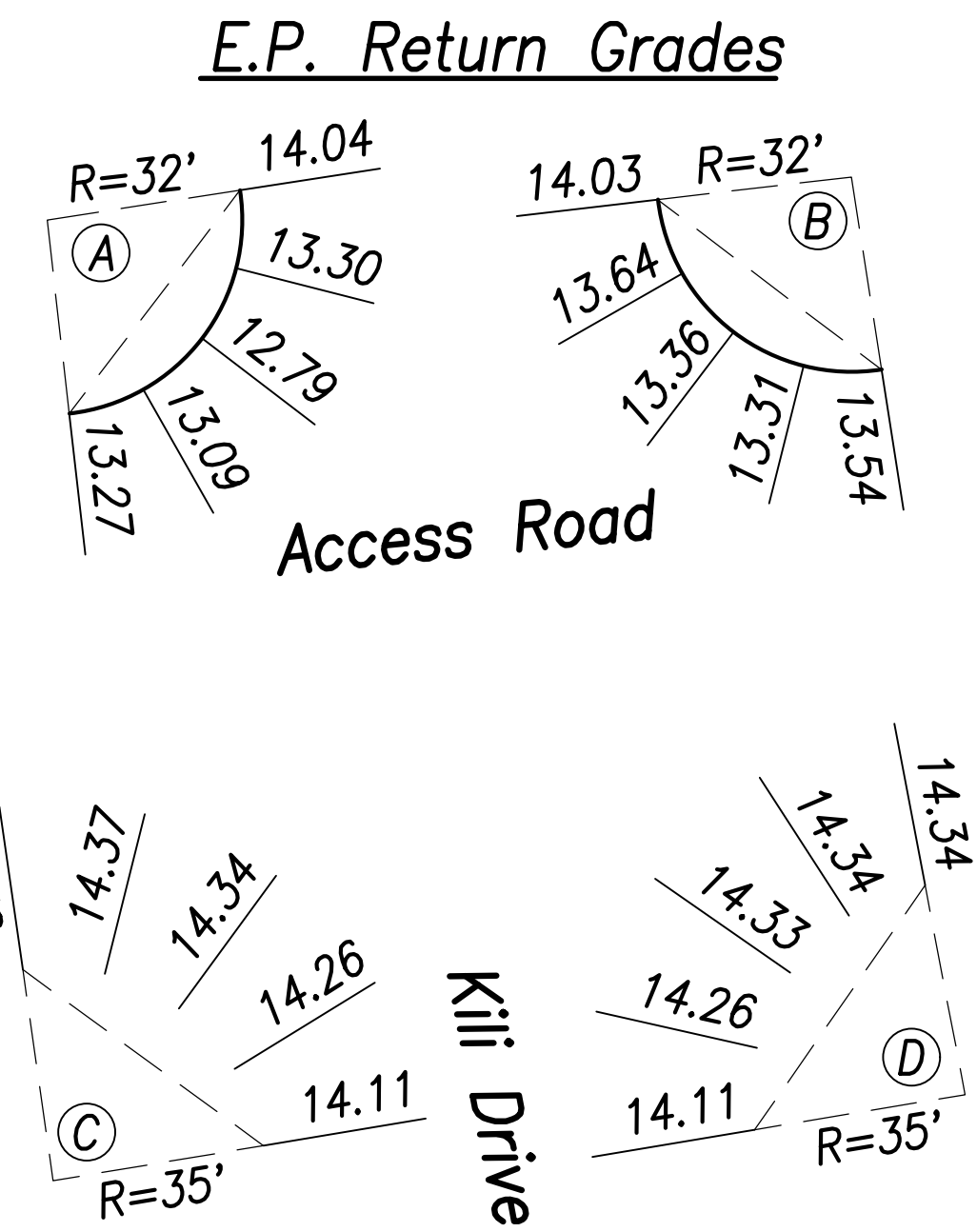
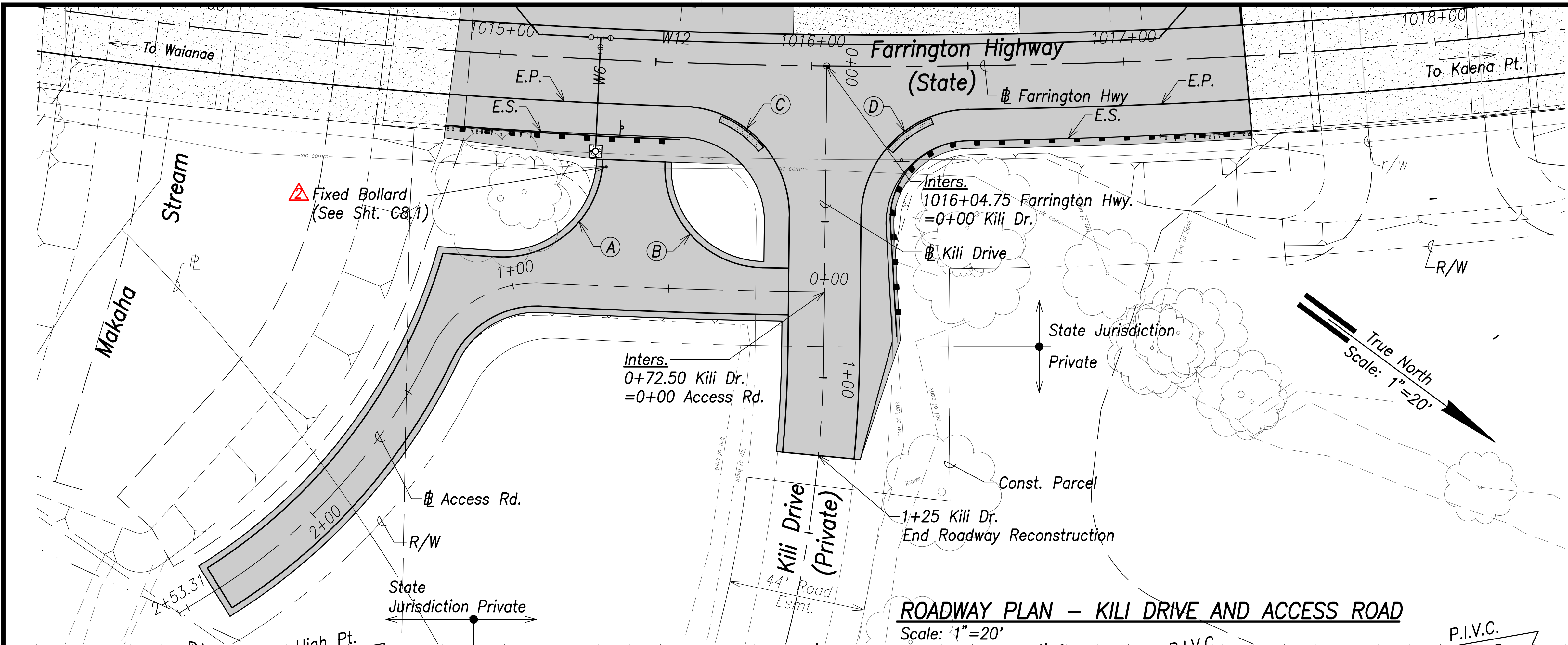


FILE: K:\Civil\19989 Makaha Bridges\Draw\ADD.29 Roadway P&P - 3.dwg saved November 18, 2020

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



FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(20)	2020	ADD.30	168



SURVEY PLOTTED BY	DATE
DRAWN BY	
TRACED BY	
QUANTITIES BY	
CHECKED BY	

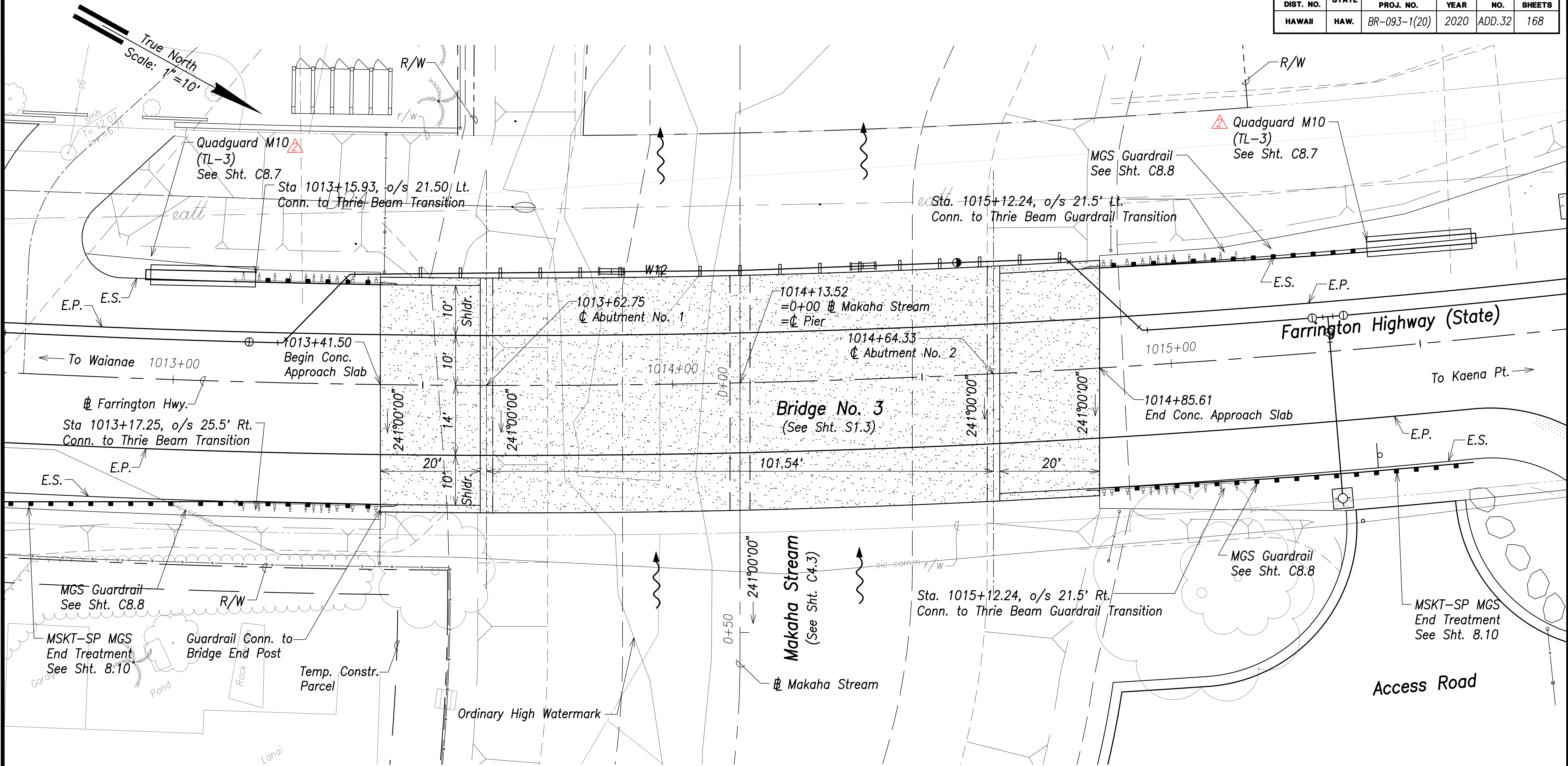


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Michael H. Okamoto
Signature
April 30, 2022
Expiration Date of the License

11/18/20	Added Fixed Bollard
Date	Description
DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
KILI DR PLAN & PROFILE	
FARRINGTON HIGHWAY	
Replacement of Makaha Bridge No. 3 and Makaha Bridge 3A	
F. A. Project No. BR-093-1(20)	
Scale: As Shown	Date: July 2020

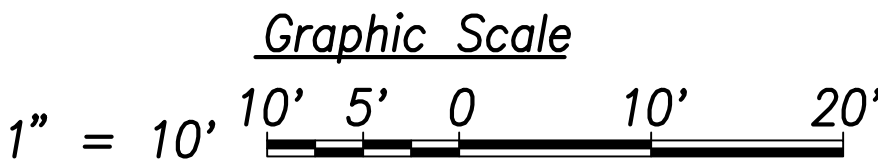
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(20)	2020	ADD.32	168



Makaha Bridge No. 3 Plan
Scale: 1"=10'

APPROVED:

Manager and Chief Engineer,
Board of Water Supply
(For work affecting BWS facilities in
City/State R/W and easements only)

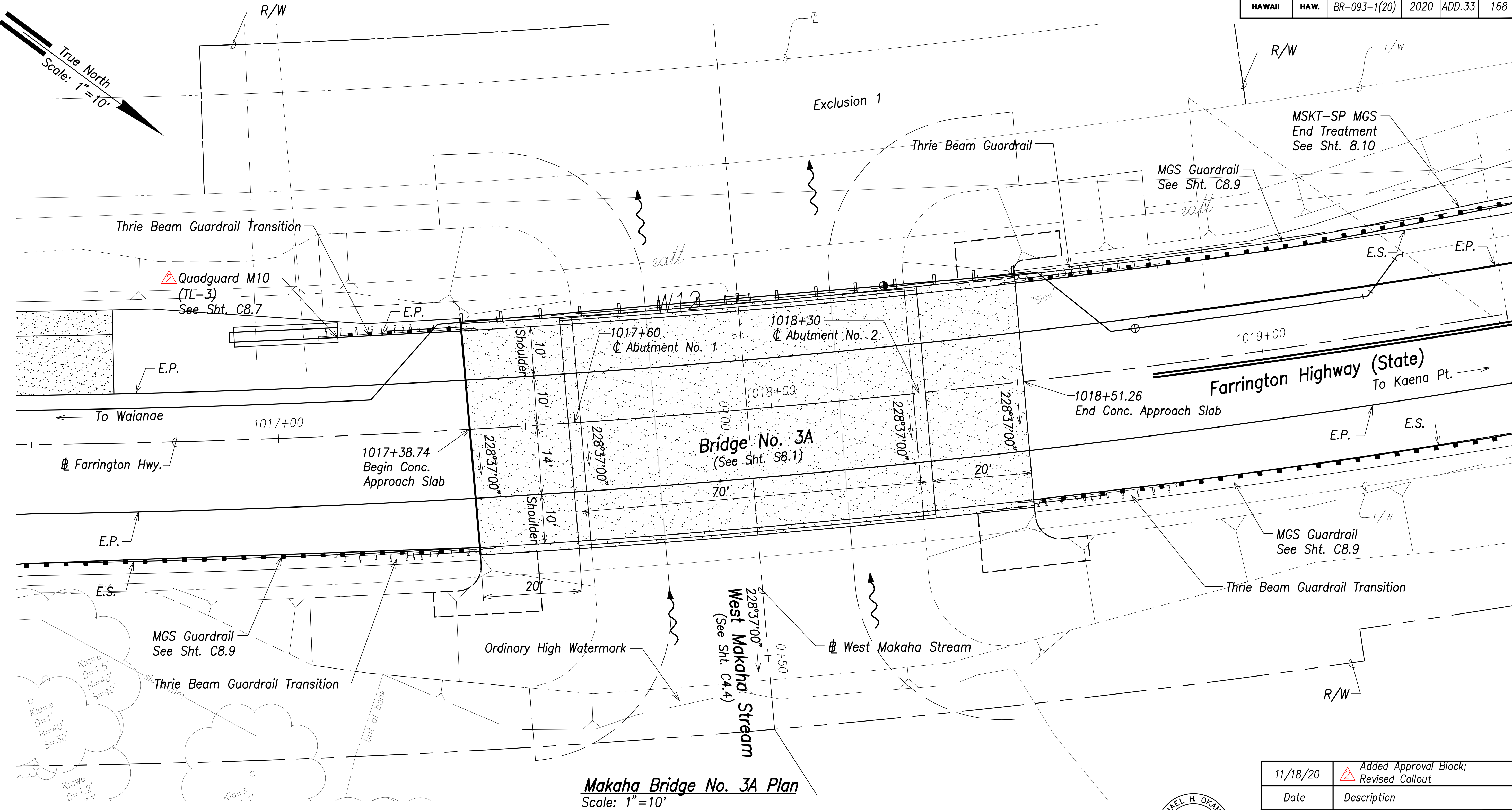


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OR UNDER MY SUPERVISION AND
CONSTRUCTION OF THIS PROJECT
WILL BE UNDER MY OBSERVATION.

Michael H. Okamoto
SIGNATURE EXPIRATION DATE
OF THE LICENSE

11/18/20	Added Approval Block, Revised Callout
Date	Description
DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
BRIDGE NO. 3 PLAN	
FARRINGTON HIGHWAY	
Replacement of Makaha Bridge	
No. 3 and Makaha Bridge 3A	
F. A. Project No. BR-093-1(20)	
Scale: 1" = 10'	Date: July 2020
SHEET No. C4.1 OF 168 SHEETS	

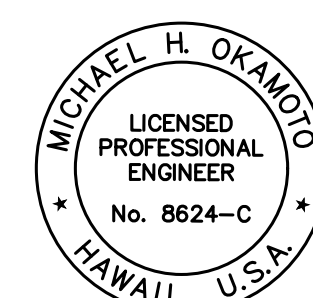
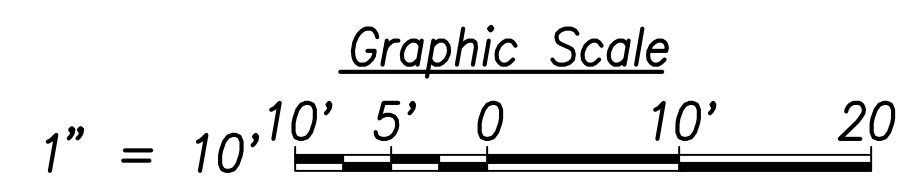
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(20)	2020	ADD.33	168



Makaha Bridge No. 3A Plan
Scale: 1"=10'

APPROVED:

Manager and Chief Engineer,
Board of Water Supply
(For work affecting BWS facilities in
City/State R/W and easements only)



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CONSTRUCTION OF THIS PROJECT
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Michael H. Okamoto
SIGNATURE EXPIRATION DATE
OF THE LICENSE

11/18/20	Added Approval Block; Revised Callout
Date	Description

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BRIDGE NO. 3A PLAN

FARRINGTON HIGHWAY
Replacement of Makaha Bridge
No. 3 and Makaha Bridge 3A
F. A. Project No. BR-093-1(20)

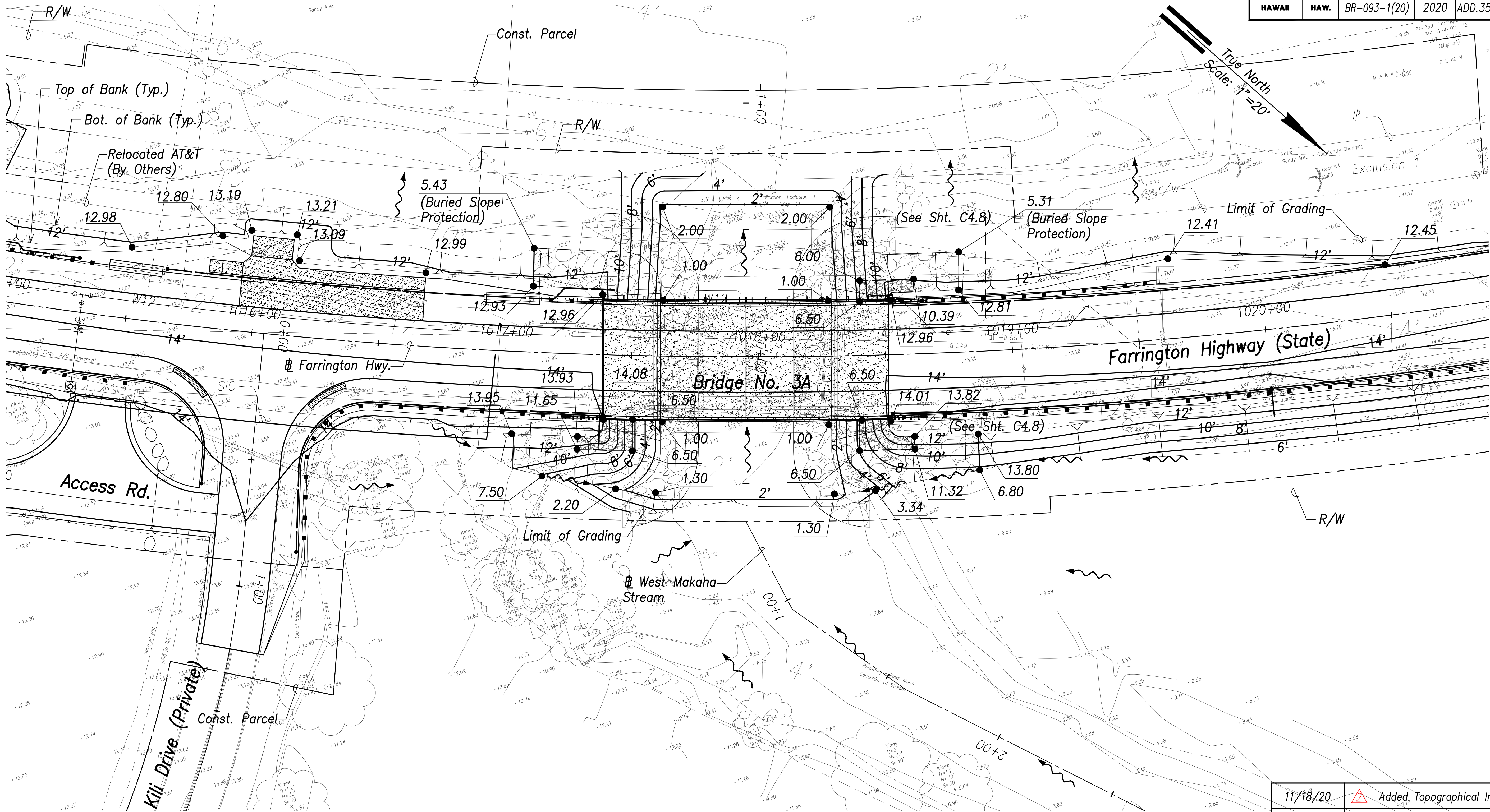
Scale: 1" = 10' Date: July 2020

SHEET No. C4.2 OF 168 SHEETS

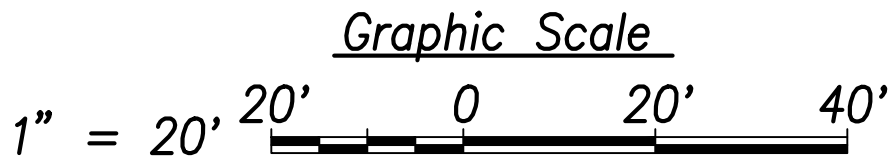
DATE	_____
SURVEY PLOTTED BY	_____
DRAWN BY	_____
TRACED BY	_____
QUANTITIES BY	_____
CHECKED BY	_____
ORIGINAL PLAN	_____
NOTE BOOK	_____
No.	_____

FILE: K:\civil\19869 Makaha Bridges\Wg\Construction Draw\ADD. 1.dwg\C4.2.Bridge No.3A Plan.dwg saved November 18, 2020

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(20)	2020	ADD.35	168



WEST MAKAHA GRADING AND DRAINAGE PLAN
Scale: 1"=20'

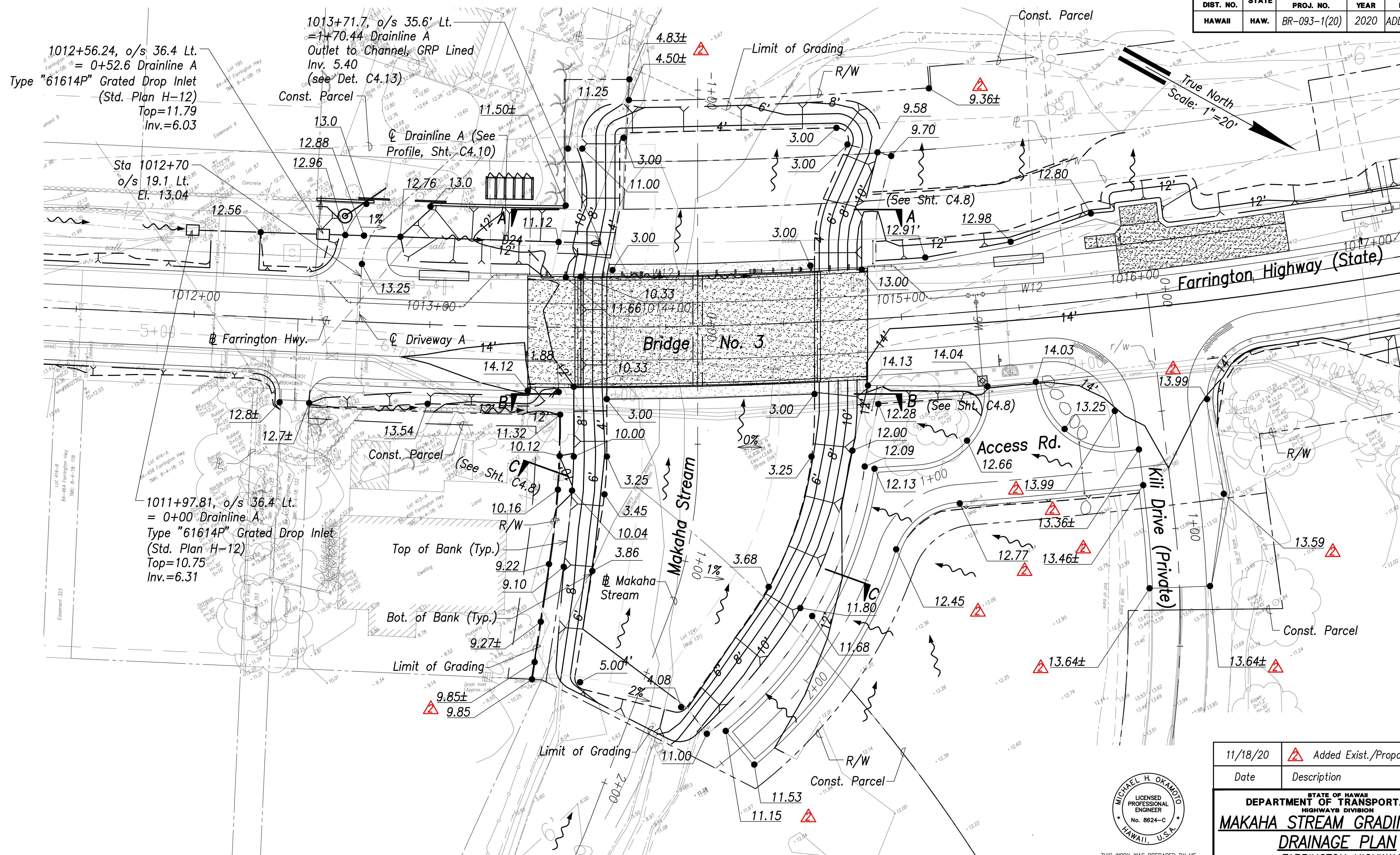


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Michael H. Okamoto
Signature
April 30, 2022
Expiration Date
of the License

11/18/20	Added Topographical Info
Date	Description
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION WEST MAKAHA GRADING AND DRAINAGE PLAN FARRINGTON HIGHWAY Replacement of Makaha Bridge No. 3 and Makaha Bridge 3A F. A. Project No. BR-093-1(20) Scale: 1"=20' Date: July 2020	
SHEET No. C4.6 OF 168 SHEETS	


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(20)	2020	ADD.36	168



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WILL BE UNDER MY OBSERVATION.

Michael H. Oram April 30, 2022

SIGNATURE	EXPIRATION DATE OF THE LICENSE
-----------	-----------------------------------

11/18/20	 Added Exist./Proposed Elev.
<i>Date</i>	<i>Description</i>

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
MAKAHA STREAM GRADING AND
DRAINAGE PLAN
FARRINGTON HIGHWAY

Replacement of Makaha Bridge

No. 3 and Makaha Bridge 3A

F. A. Project No. BR-093-1(20)

scale: 1"=20' Date: July 2020

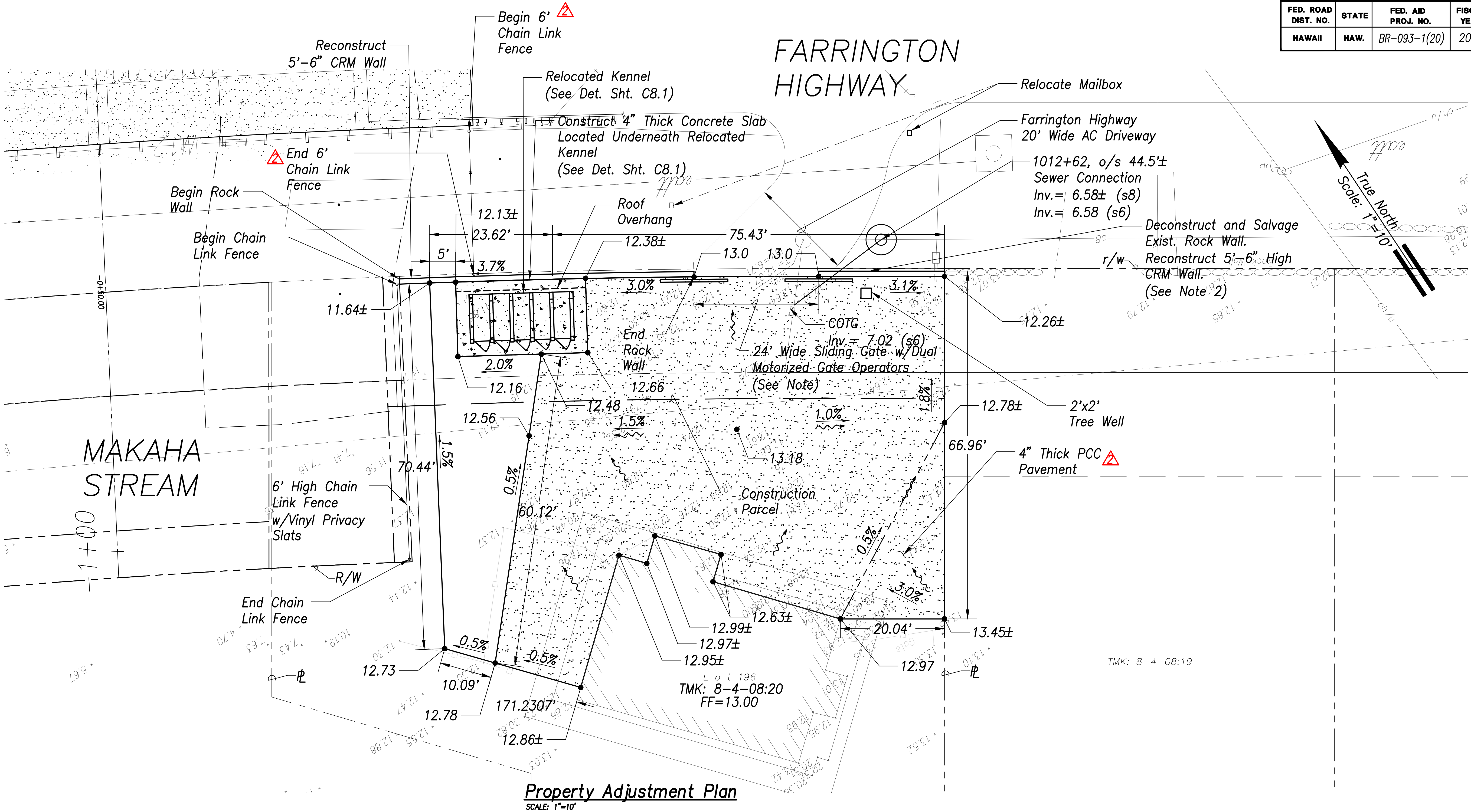
SHEET No. C4.5 OF 168 SHEETS

ADD.36

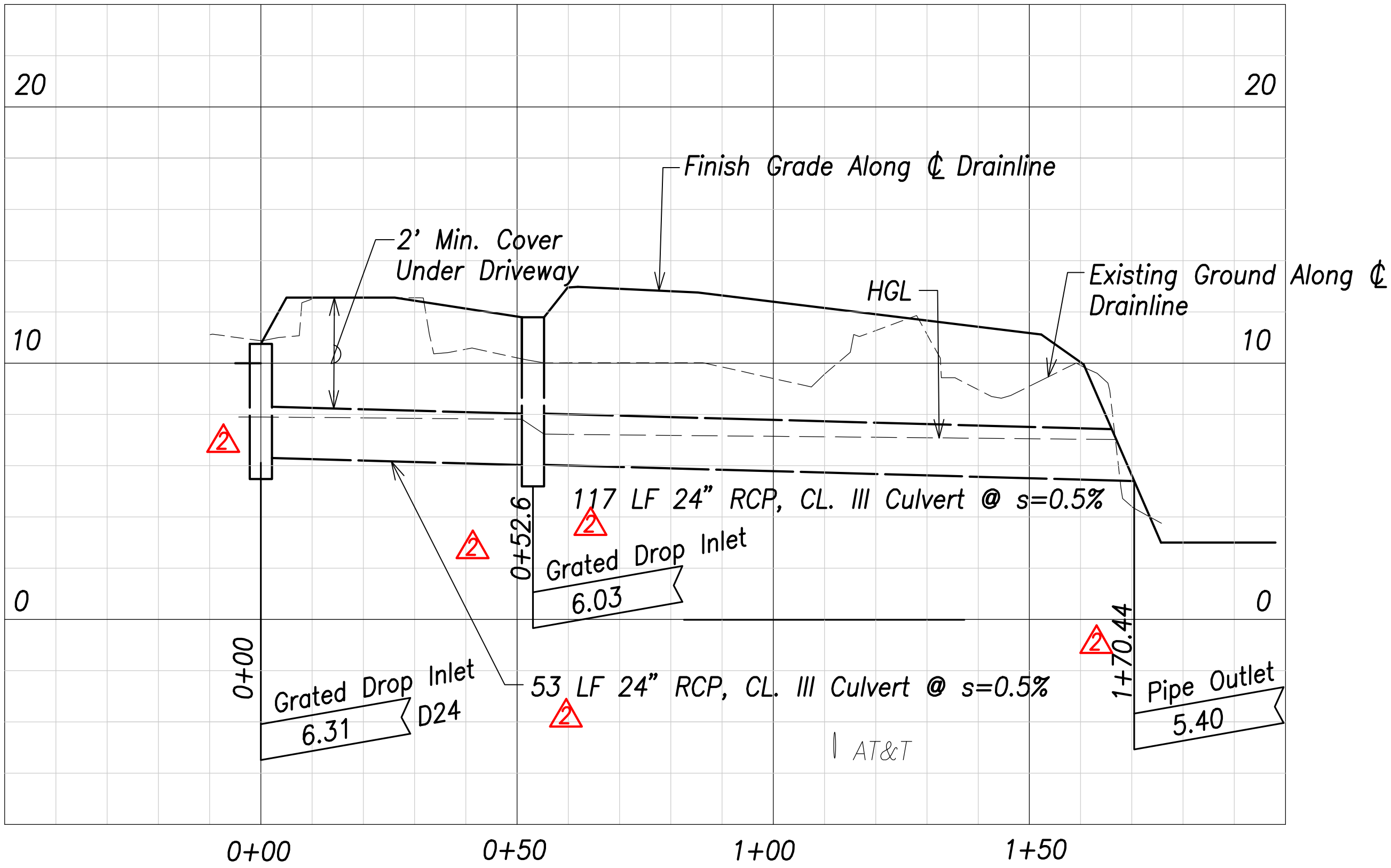
ORIGINAL PLAN	SURVEY PLOTTED BY _____ DATE _____
NOTE BOOK	DRAWN BY _____
	TRACED BY _____
	DESIGNED BY _____
	QUANTITIES BY _____
No. _____	CHECKED BY _____

FILE: K:\civil\19969 Makaha Bridges\DWG\Construction Dwg\ADD. 1 dwgs\C4.5_Makaha Stream Grading and Drainage Plan.dwg saved November 20, 2020

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(20)	2020	ADD.38	168

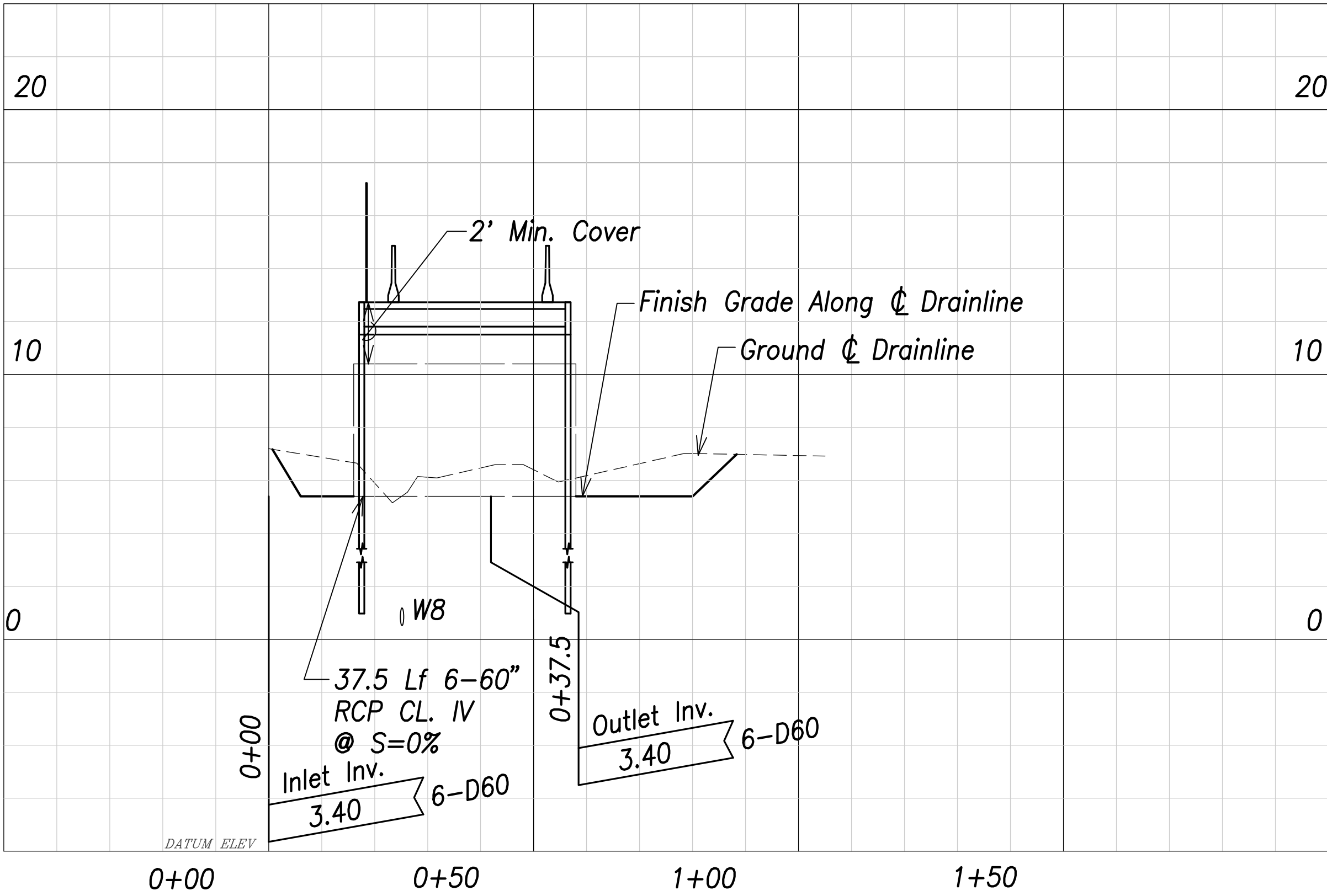


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(20)	2020	ADD.42	168



PROFILE - DRAINLINE A

SCALES H: 1"=20'
V: 1"=4'



PROFILE - 6-60" TEMPORARY CULVERTS

SCALES H: 1"=20'
V: 1"=4'

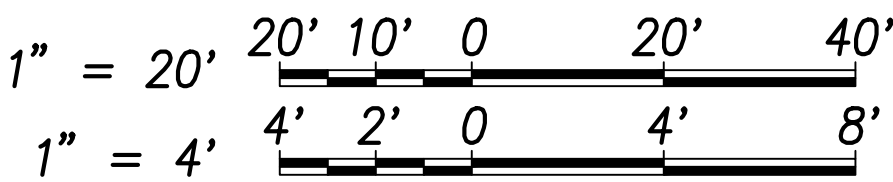


APPROVED:

Manager and Chief Engineer, Board of Water Supply
(For work affecting BWS facilities in City/State R/W and easements only)

Date

Graphic Scales



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Michael H. Okamoto April 30, 2022
SIGNATURE EXPIRATION DATE OF THE LICENSE

11/18/20	Added Approval Block; Adjusted Profile
Date	Description

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINLINE PROFILES

FARRINGTON HIGHWAY

Replacement of Makaha Bridge

No. 3 and Makaha Bridge 3A

F. A. Project No. BR-093-1(20)

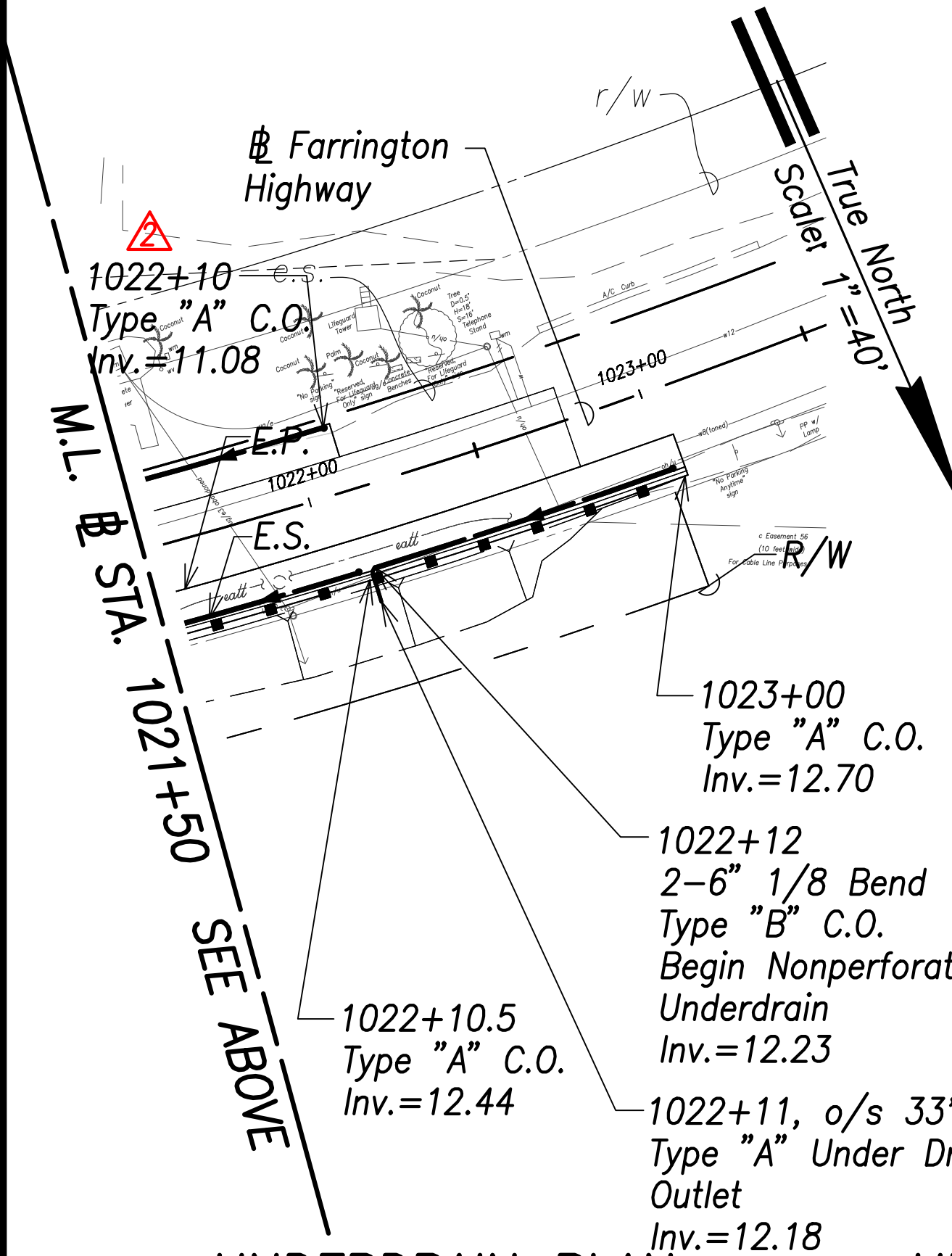
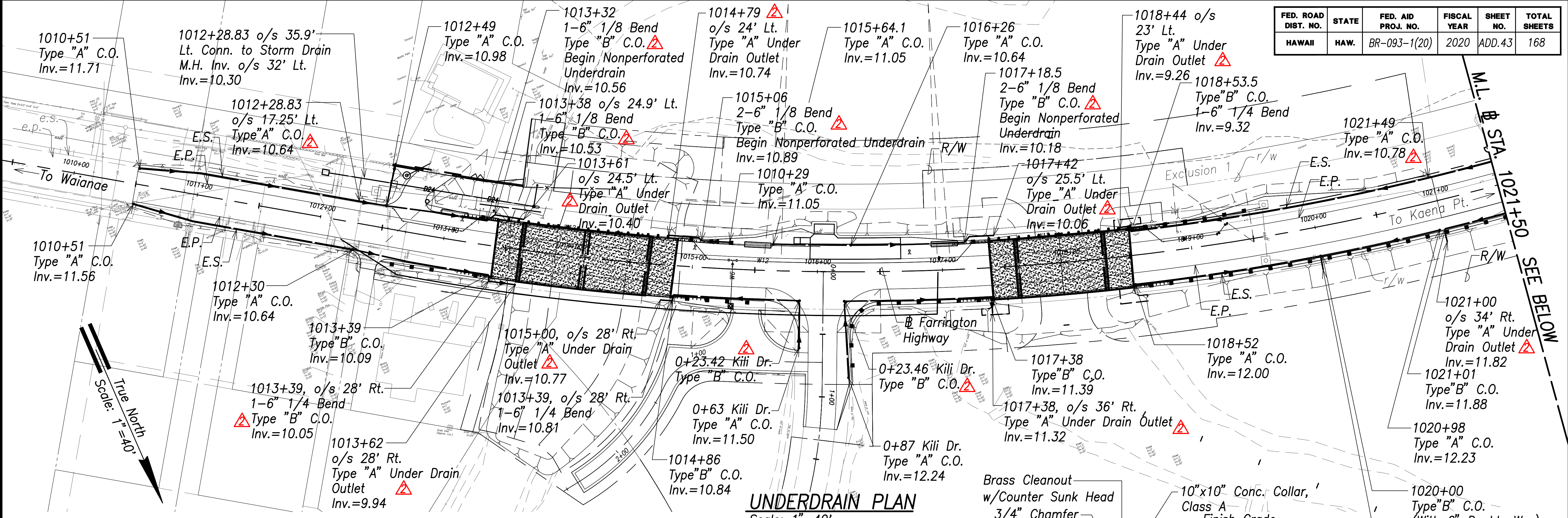
Scale: As Shown Date: July 2020

SHEET No. C4.11 OF 168 SHEETS

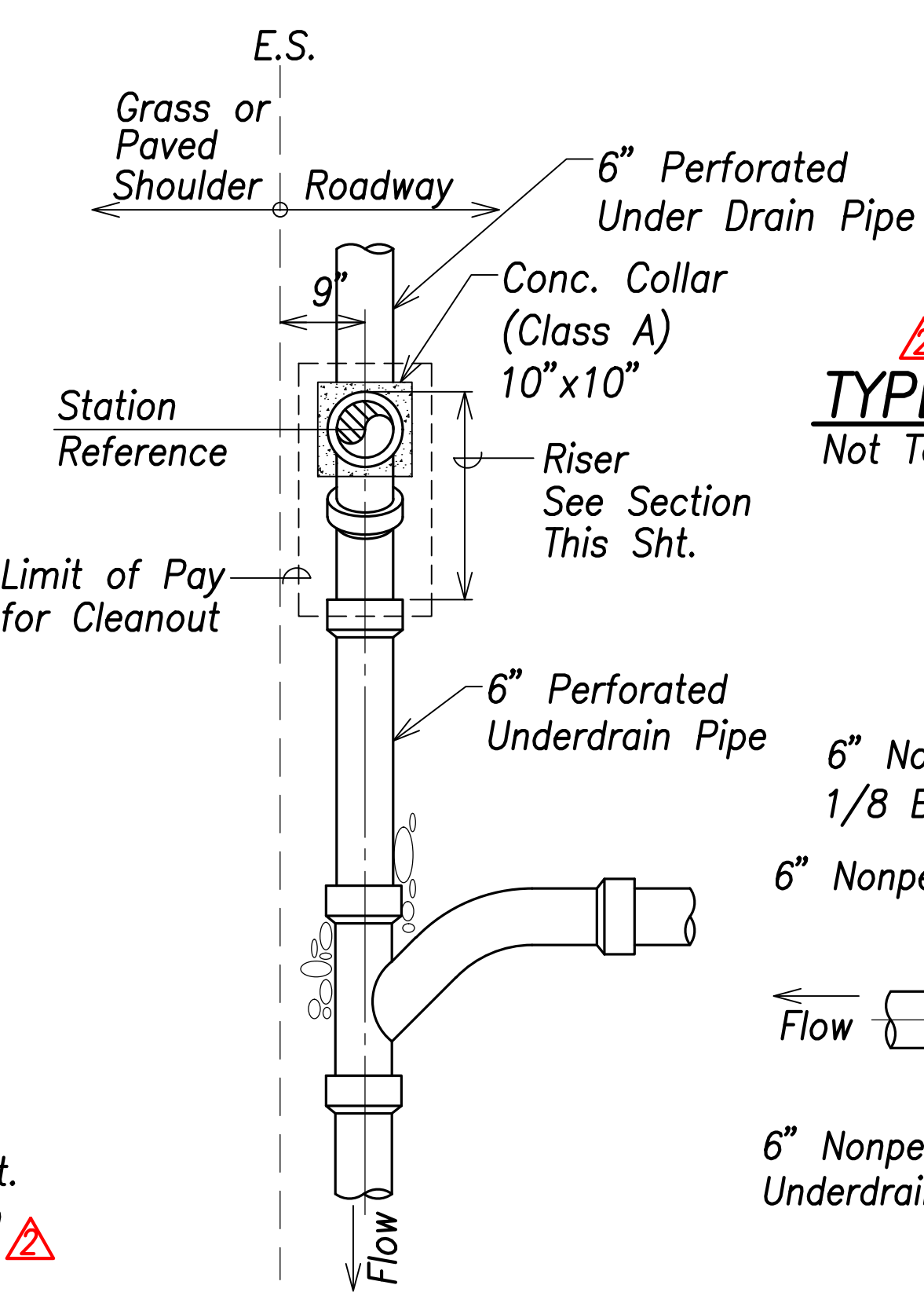
ADD.42

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

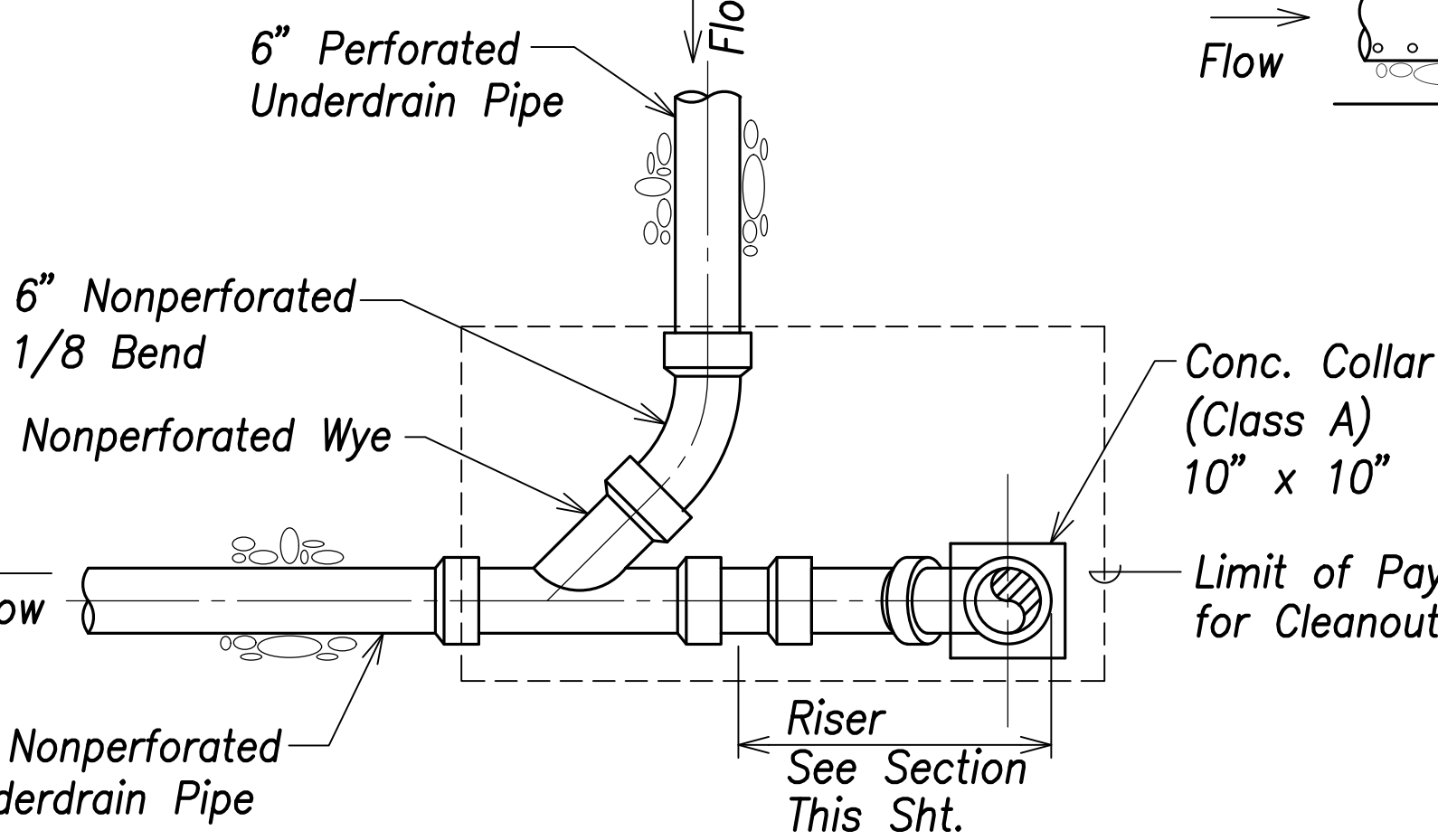
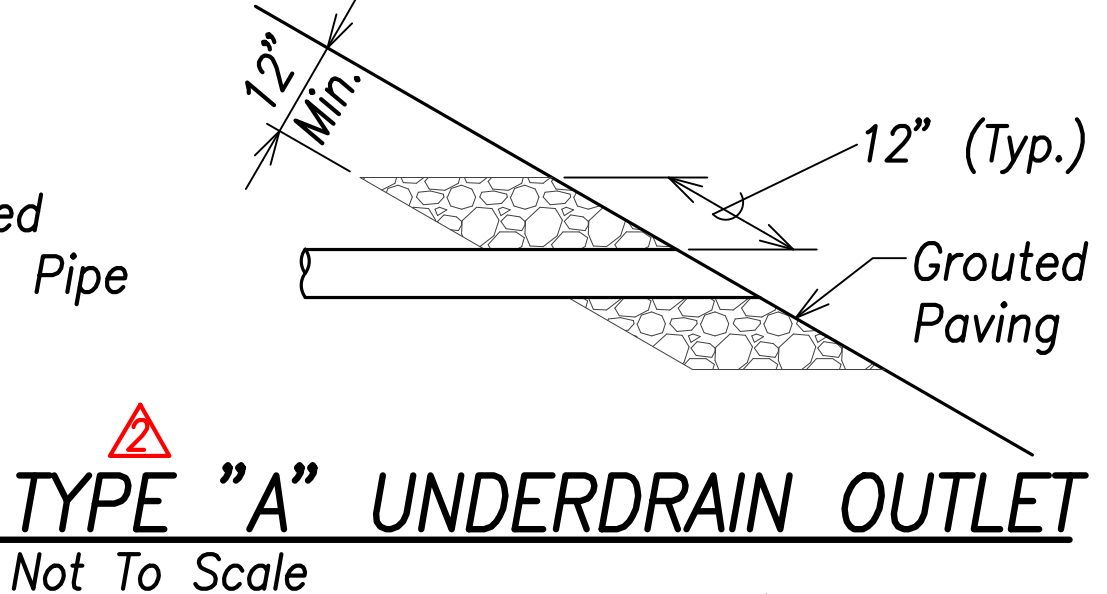
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(20)	2020	ADD.43	168



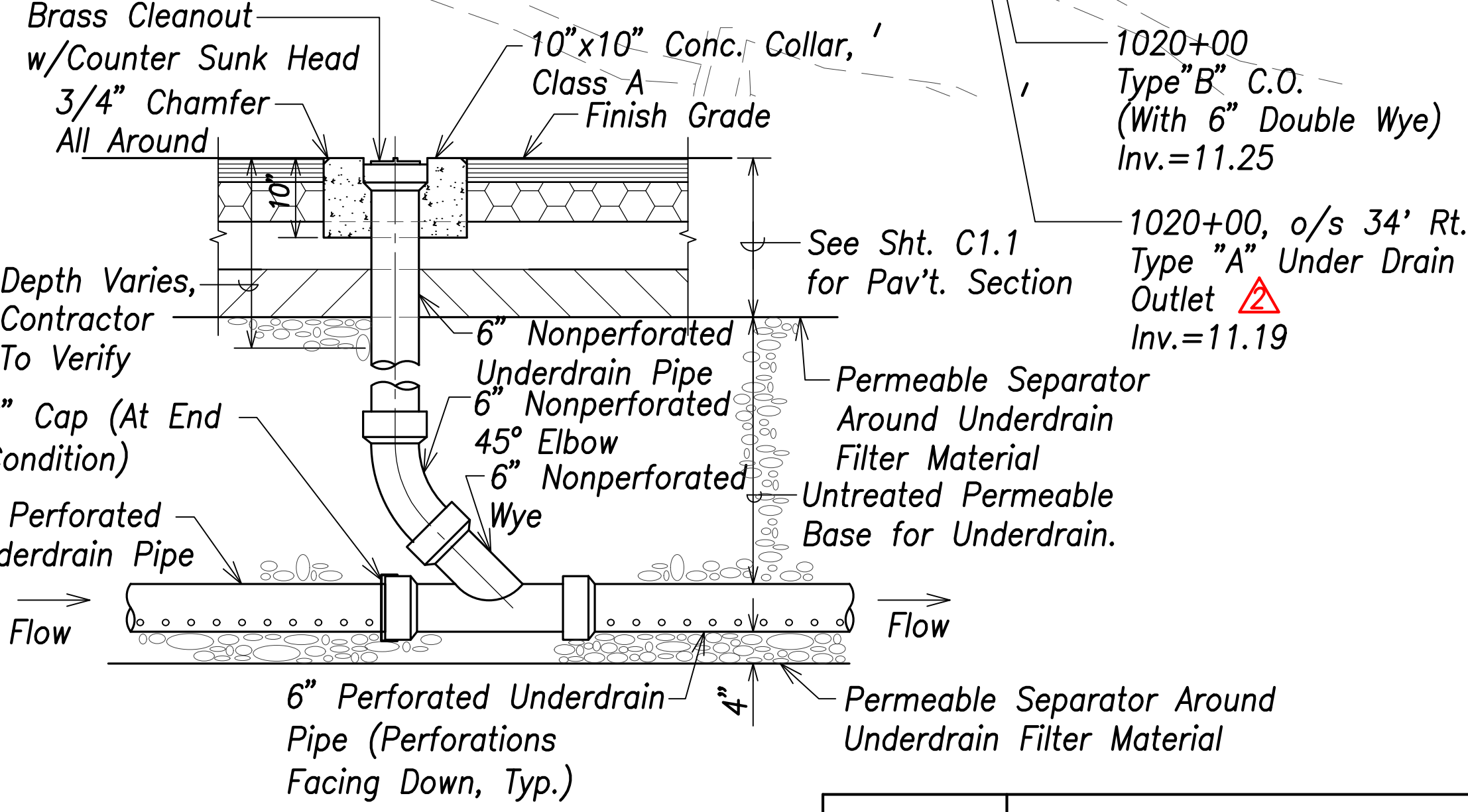
UNDERDRAIN PLAN
Scale: 1"=40'



UNDERDRAIN CLEANOUT TYPE "A"
Not To Scale



UNDERDRAIN CLEANOUT TYPE "B"
Not To Scale



RISER SECTION
Not To Scale



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Signature: Michael H. Okamoto
Date: April 30, 2022
Expiration Date of License

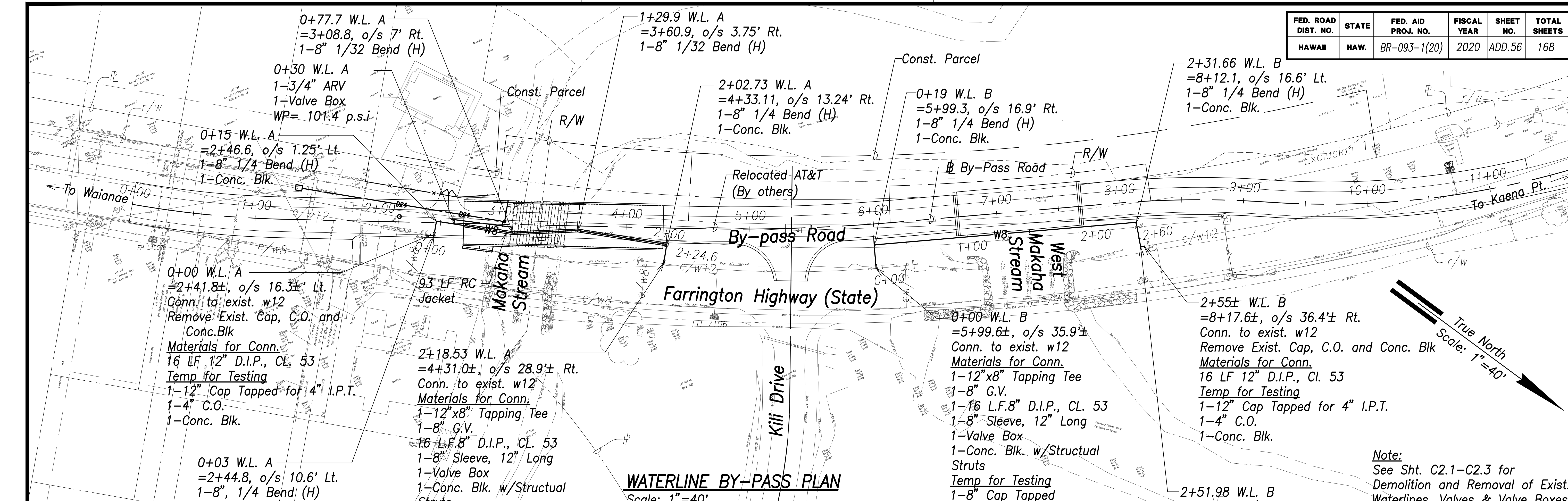
11/18/20	Added Underdrain and Cleanouts; Revised Outlet Structures
Date	Description

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UNDERDRAIN PLAN AND DETAILS
FARRINGTON HIGHWAY
Replacement of Makaha Bridge No. 3 and Makaha Bridge 3A
F. A. Project No. BR-093-1(20)
Scale: 1" = 40' Date: July 2020

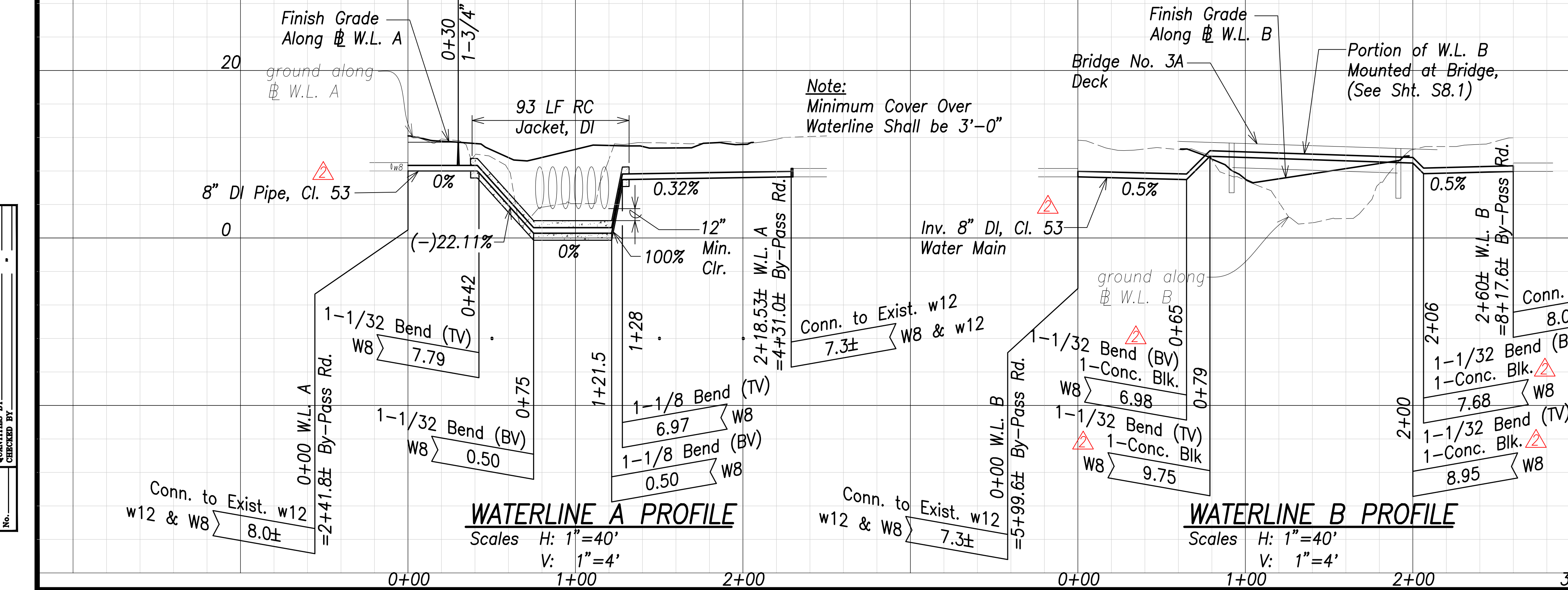
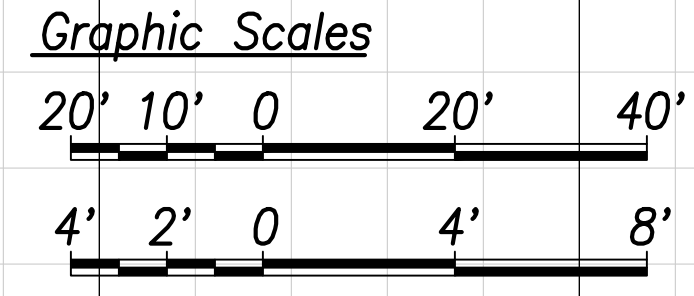
SHEET No. C4.12 OF 168 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(20)	2020	ADD.56	168



Note:
Minimum Cover Over
Waterline Shall be 3'-0"

Note:
See Sht. C2.1-C2.3 for
Demolition and Removal of Exist.
Waterlines, Valves & Valve Boxes



Approved:

Manager and Chief Engineer, B.W.S. Date
(For work affecting BWS facilities in City/State
R/W and easements only)



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OR UNDER MY SUPERVISION AND
CONSTRUCTION OF THIS PROJECT
WILL BE UNDER MY OBSERVATION.

Signature: Michael H. Okamoto
Date: April 30, 2022
Expiration Date of License

11/18/20	Added Conc. Blocks Revised Callouts
Date	Description

**STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION**

**WATERLINE BYPASS
PLAN & PROFILE
FARRINGTON HIGHWAY**

Replacement of Makaha Bridge
No. 3 and Makaha Bridge 3A
F. A. Project No. BR-093-1(20)
Scale: 1" = 40' Date: July 2020

SHEET No. C7.1 OF 168 SHEETS

SURVEY PLOTTED BY	DATE
DRAWN BY	
CHECKED BY	
NOTED BY	
QUANTITIES BY	
CHECKED BY	

FILE: K:\Civ\19969 Makaha Bridges\Draws\Construction Draw\ADD. 1.dwg\07.1 Waterline Bypass PAP.dwg saved November 18, 2020

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(20)	2020	ADD.57	168

NOTES:

- Provide a Minimum 36" Cover.
- 12" of Cushion Material For Pipes 16" or Larger. 6" Cushion Material for Pipes 12" or Smaller at Locations Where Invert is Above 4-Foot Elevation. 12" of Cushion Material for All Pipe Sizes at Locations Where the Invert is at or Below the 4-Foot Elevation.
- Install 4 Mil. Thick, Non-Metallic, Blue Colored, 6" Wide Warning Tape Over Centerline of the Pipe and Below the Base Course Along the Entire Length of Trench. Tape Should be Marked with "Caution Water Line Buried Below." Payment for the Furnishing and Installation of the Warning Tape Shall be Incidental to the Unit Price Bid for the Pipe.

APPROVED:

Manager and Chief Engineer, Date
Board of Water Supply
(For work affecting BWS facilities in
City/State R/W and easements only)

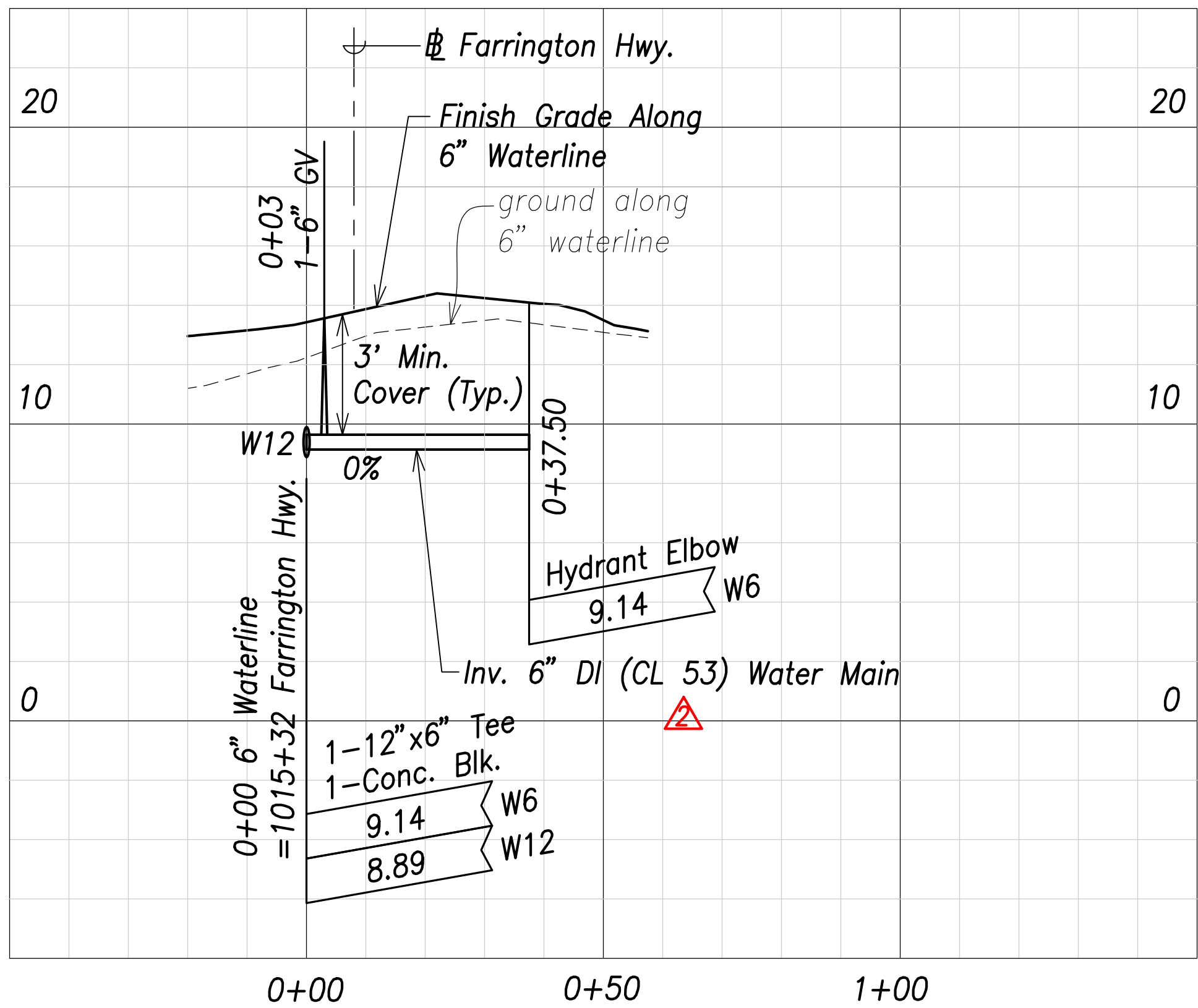
NOTES:

- Install Electronic Marker Over Center Line of Pipe at a Minimum Depth of 2 Feet and a Maximum Depth of 3 Feet From Finish Grade.
- Install Trench Backfill and Pipe Cushion Material in Accordance to the Plans and Specifications.
- Install Electronic Marker at a Minimum Clearance of 6-Inches Above the Pipe or Conc. Jacket.

Graphic Scales

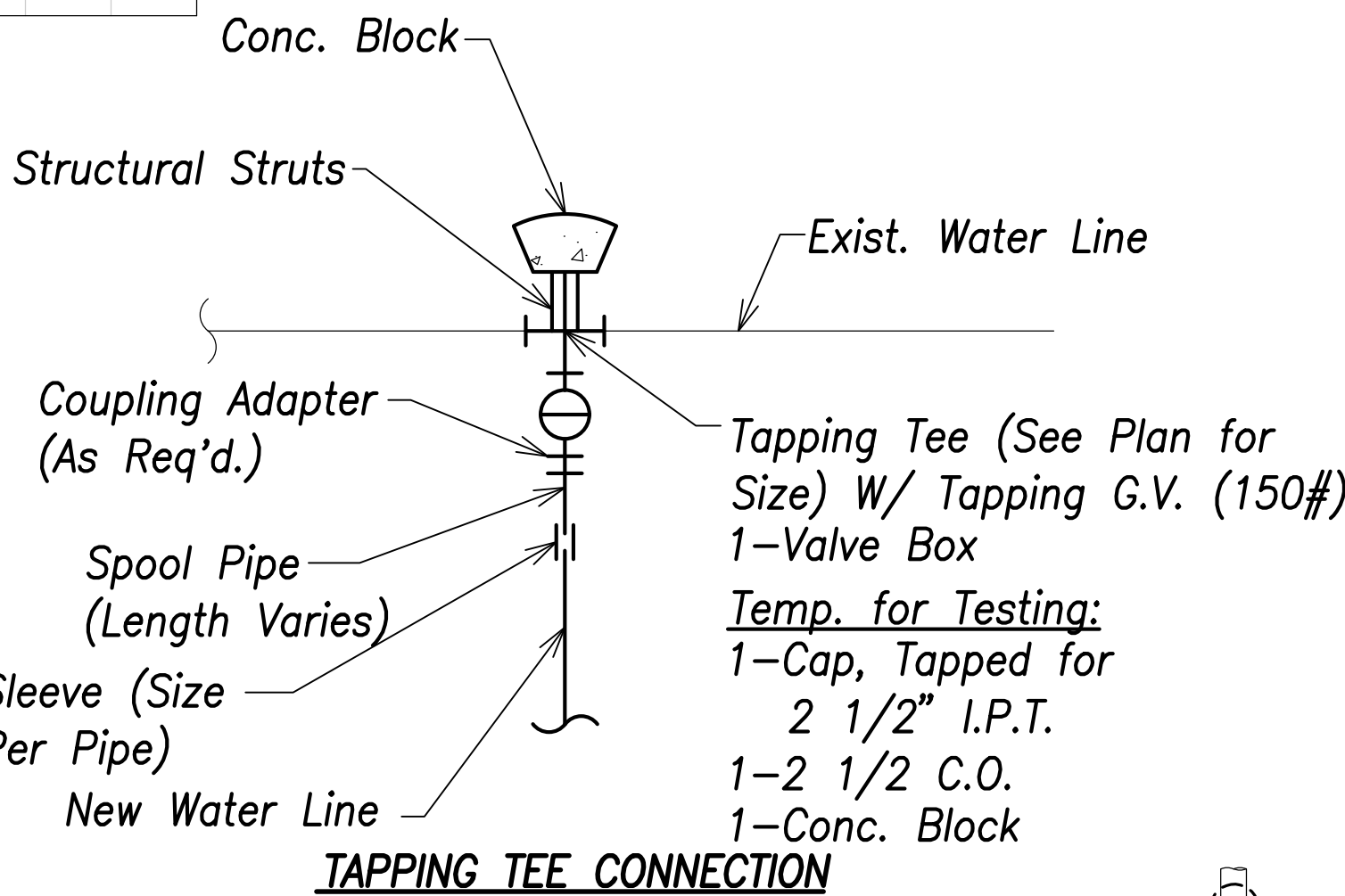
1" = 20' 20' 10' 0 20' 40'
1" = 4' 4' 2' 0 4' 8'

11/18/20	Added Approval Block; Revised Notes/Details/Profile
Date	Description
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
WATERLINE PROFILES	
FARRINGTON HIGHWAY	
Replacement of Makaha Bridge	
No. 3 and Makaha Bridge 3A	
F. A. Project No. BR-093-1(20)	
Scale: 1" = 40'	Date: July 2020
SHEET No. C7.2 OF 168 SHEETS	



PROFILE - F.H. CONNECTION

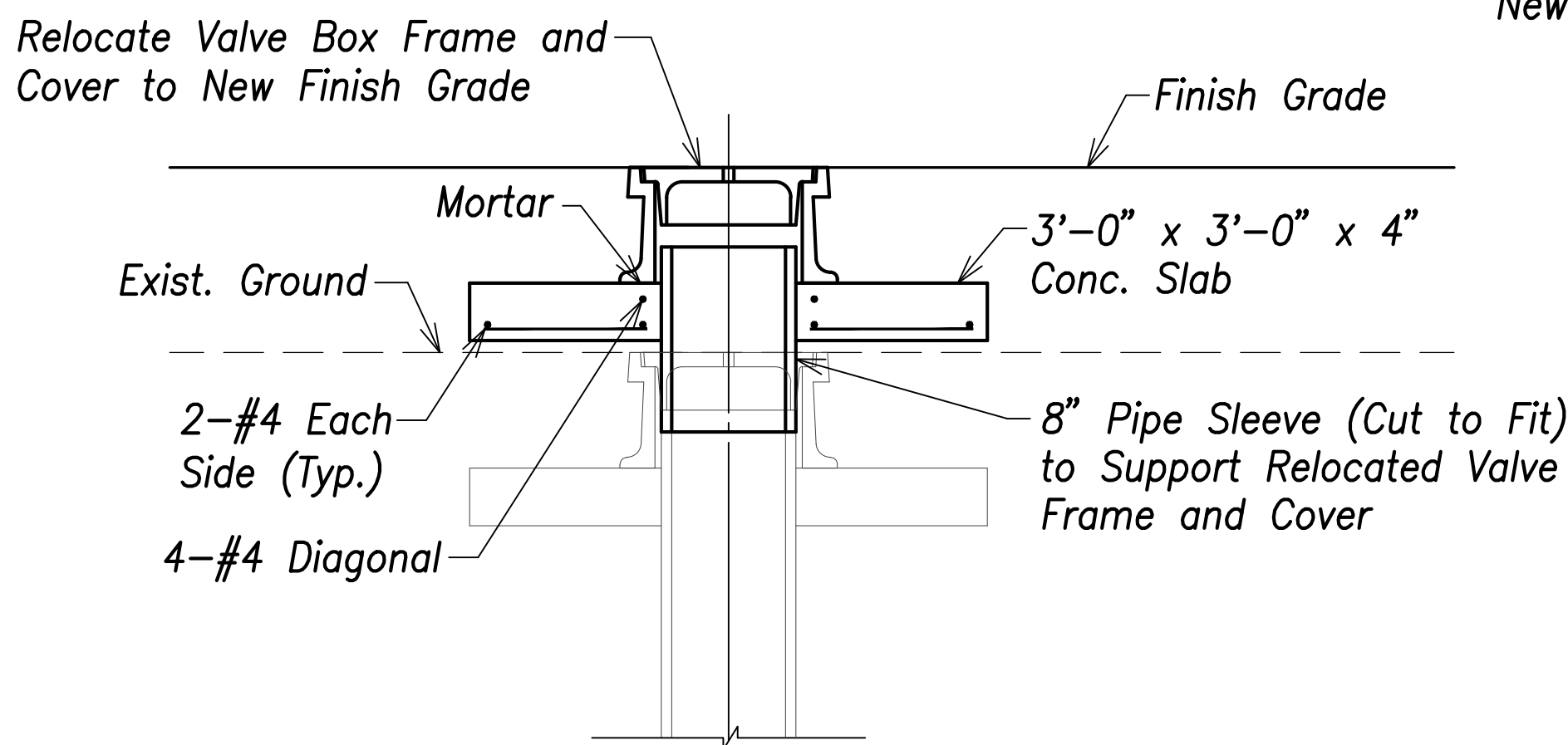
SCALES H: 1"=20'
V: 1"=4'



TAPPING TEE CONNECTION

TYPICAL WATER JUNCTION

Not to Scale

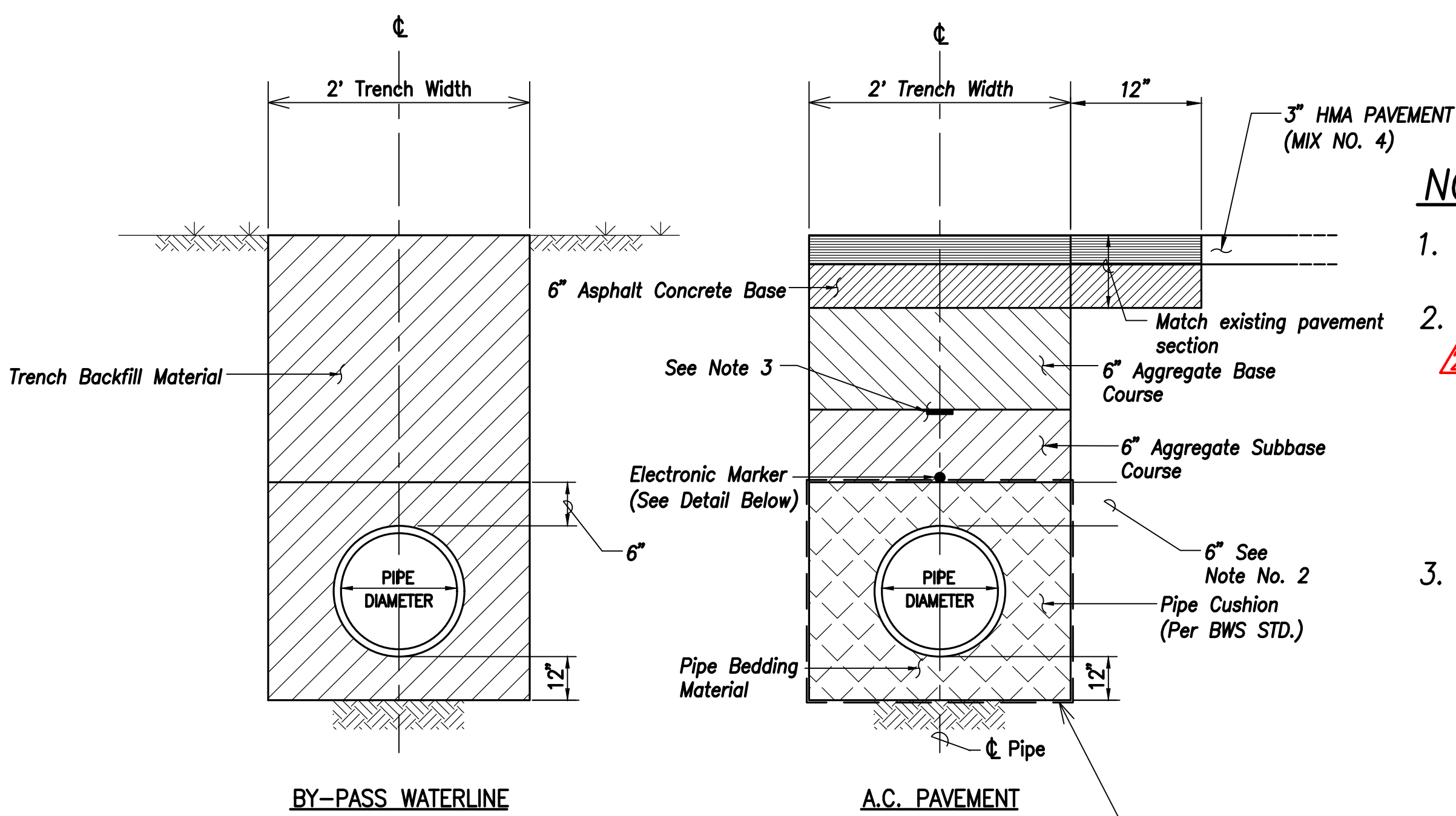


Note:

Construct Conc. Slab Only for Raising Exist. Valve Box Frame and Cover by More Than 6". For Raising Exist. Valve Box Frame and Cover by Less Than 6", Thicken Exist. Conc. Slab.

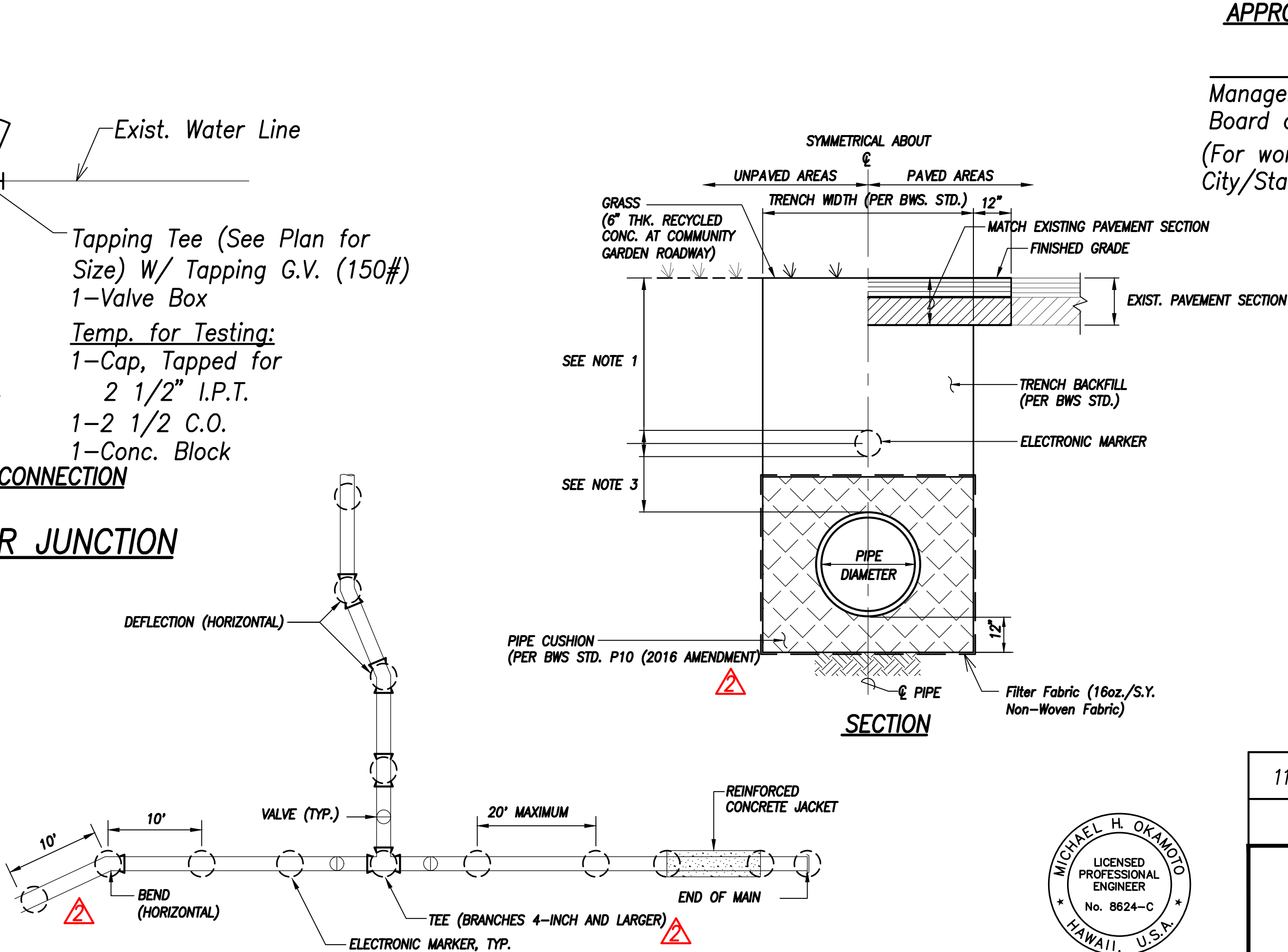
ADJUSTMENT OF VALVE BOX (RAISING)

Not to Scale



TYPICAL TRENCH RESTORATION DETAIL

NOT TO SCALE



PLAN

NOTE: Reaction Blocks not shown for clarity.

TYPICAL ELECTRONIC MARKER INSTALLATION

Not to Scale

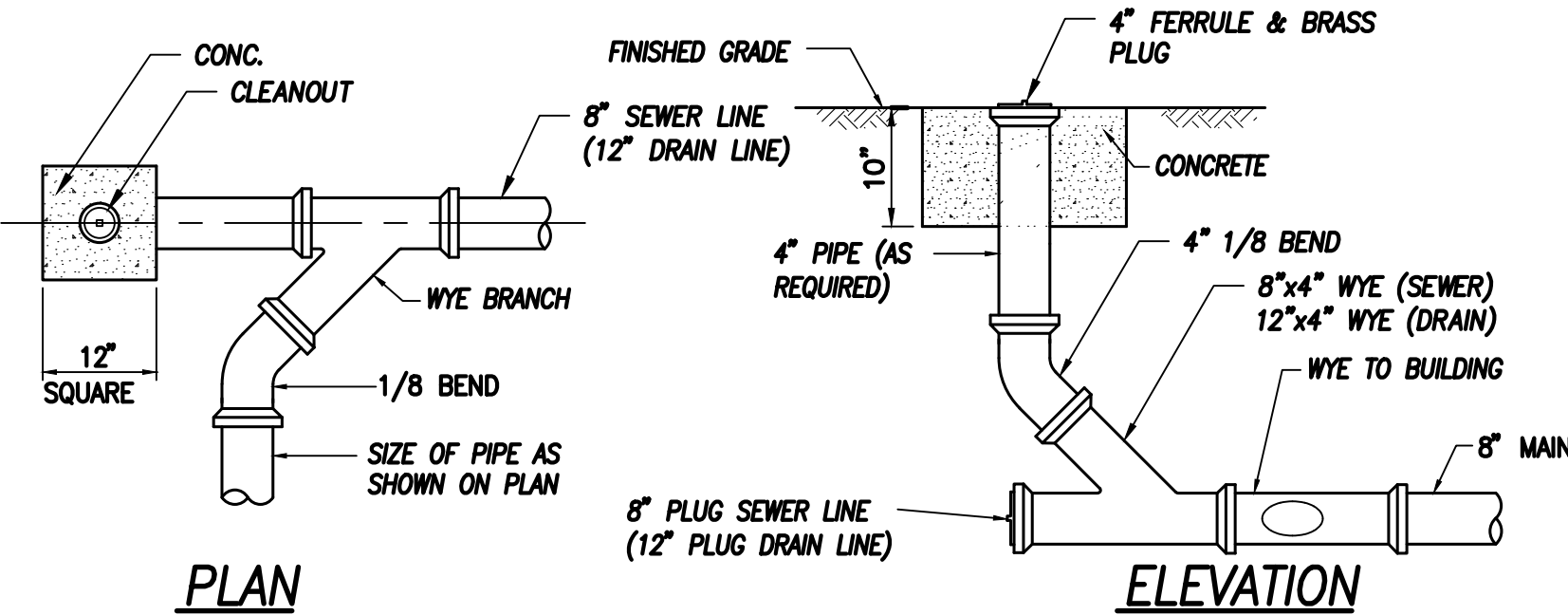
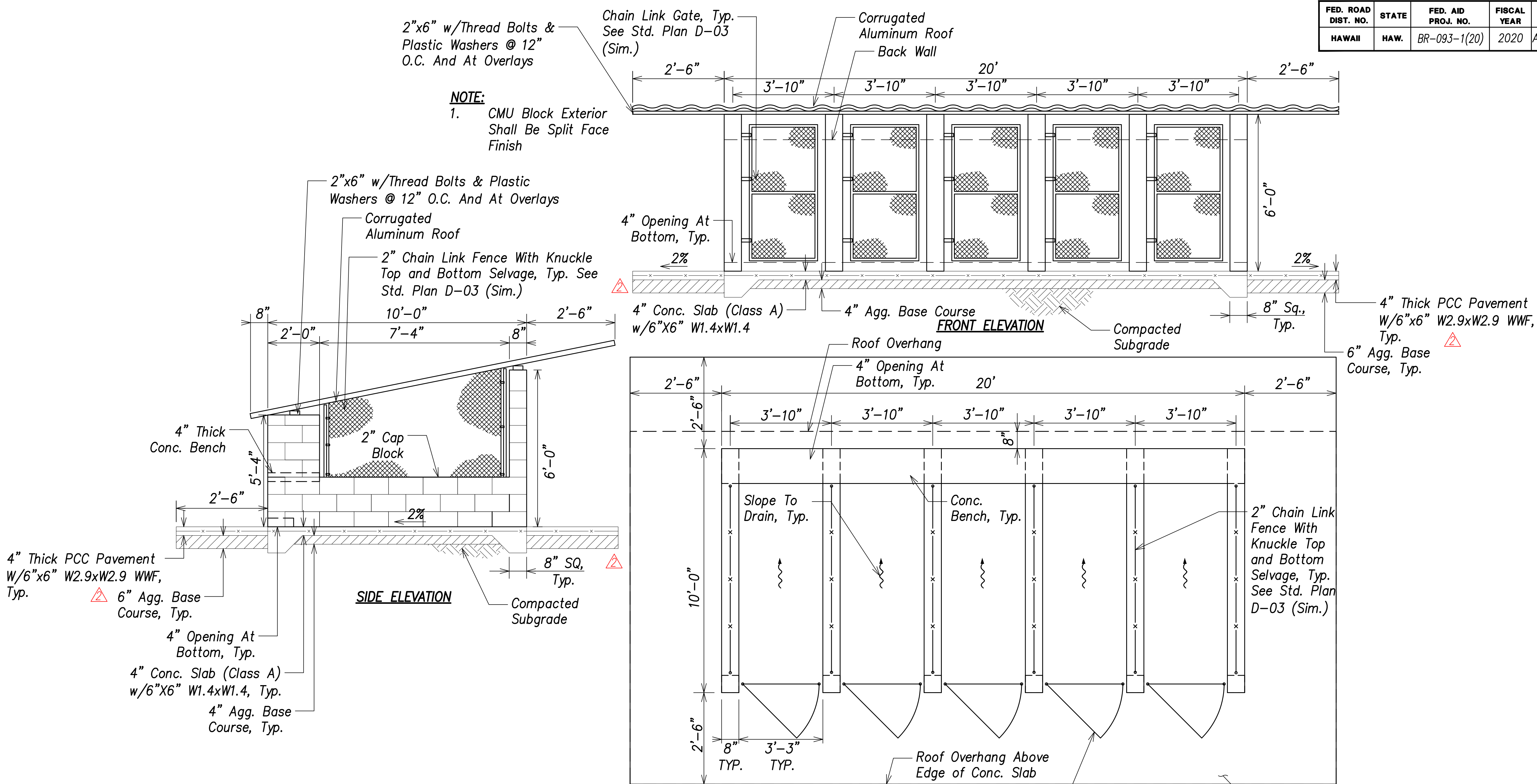


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CONSTRUCTION OF THIS PROJECT
WILL BE UNDER MY OBSERVATION.

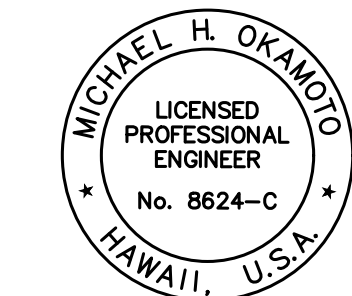
Signature: Michael H. Okamoto
Date: April 30, 2022
Expiration Date: OF THE LICENSE

SURVEY PLOTTED BY	DATE
DRAWN BY	
CHECKED BY	
NOTED BY	
NO.	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(20)	2020	ADD.59	168



SURVEY PLOTTED BY	DATE
DRAWN BY	
TRACED BY	
NOTED BY	
CHECKED BY	
ORIGINAL PLAN	
NOTE BOOK	
No.	



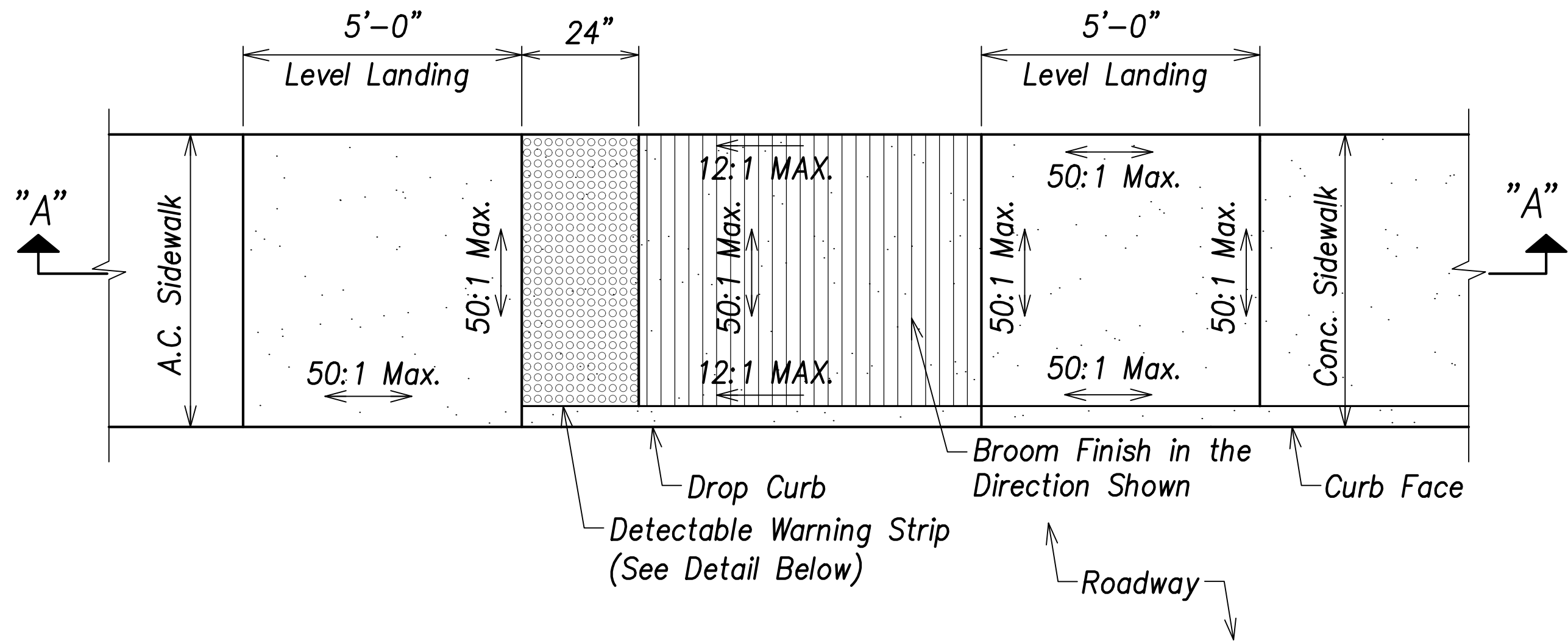
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Michael H. Okamoto April 30, 2022
SIGNATURE EXPIRATION DATE OF THE LICENSE

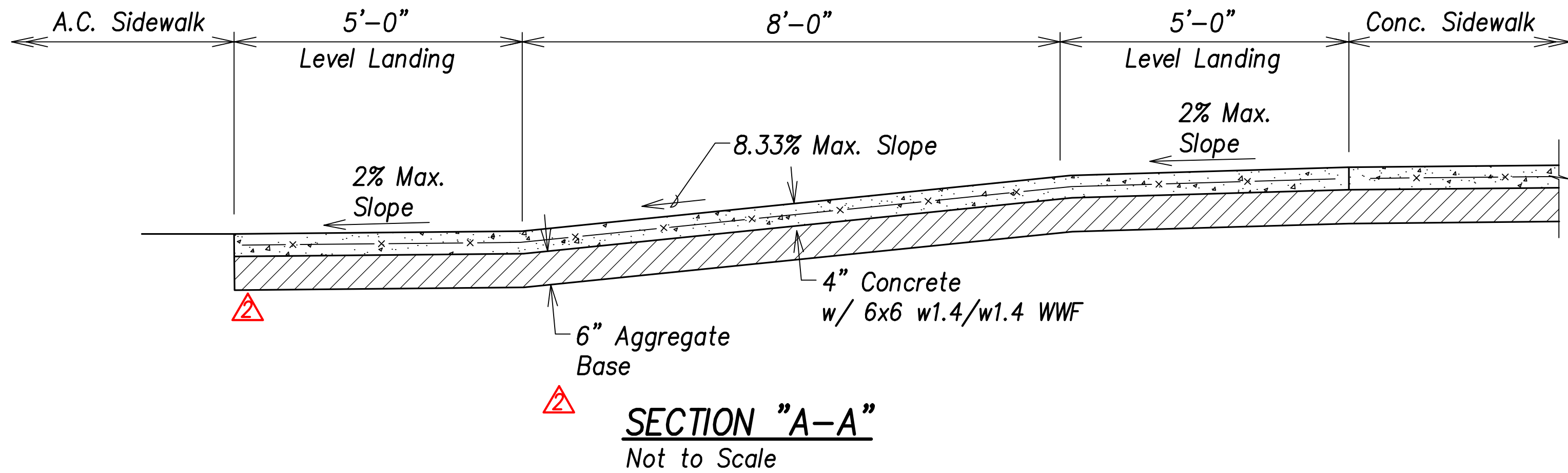
11/18/20	Revised PCC Pav't Section
Date	Description

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
MISCELLANEOUS DETAILS - 2	
FARRINGTON HIGHWAY	
Replacement of Makaha Bridge No. 3 and Makaha Bridge 3A	
F. A. Project No. BR-093-1(20)	
Scale: As Shown	Date: July 2020
SHEET No. 08.2 OF 168 SHEETS	

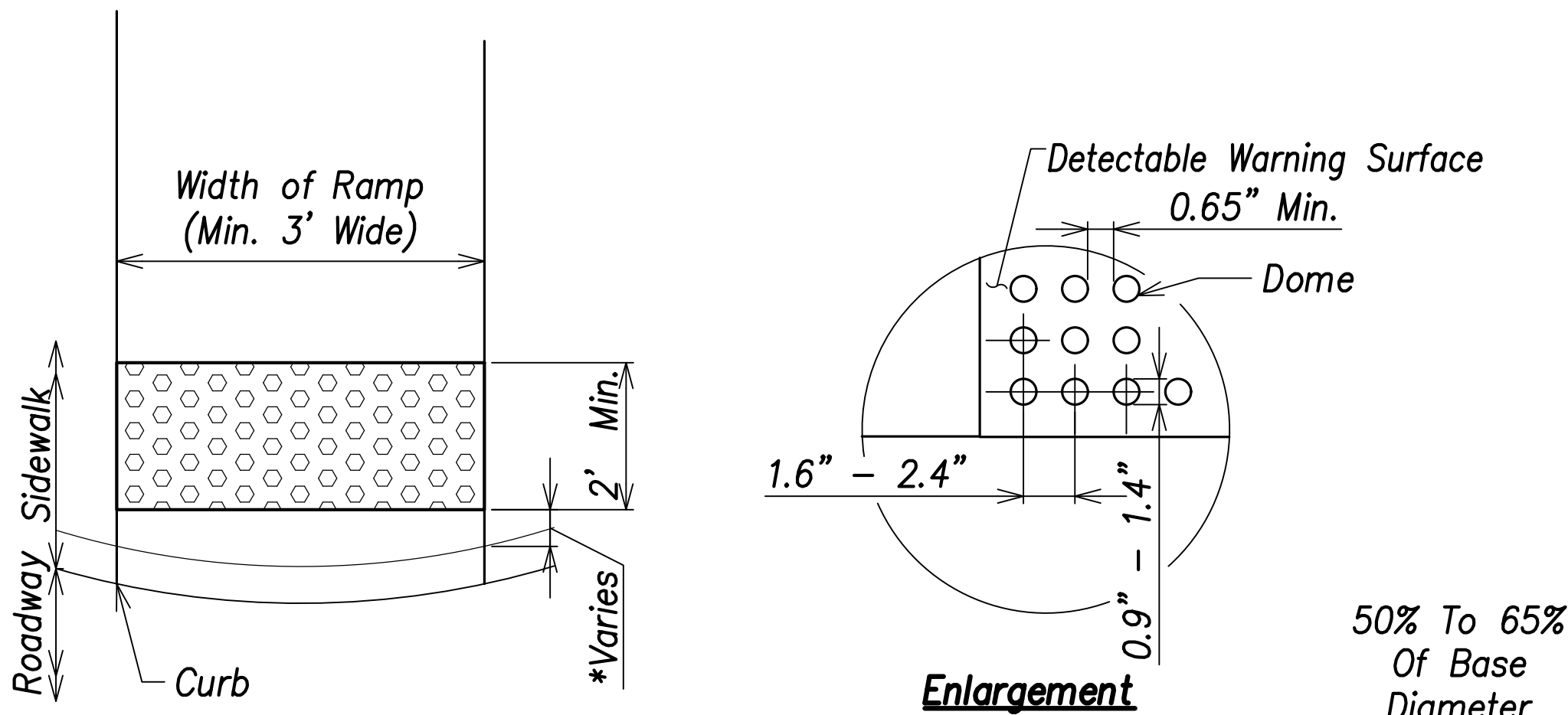
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(20)	2020	ADD.60	168



MODIFIED CURB RAMP
Not to Scale



SECTION "A-A"
Not to Scale



Plan

Enlargement

Dome Section

Note:

1. The Detectable Warning Surface May Be Offset from Roadway in order to Provide a 3' Min. Width.
2. The Detectable Warning Surface Shall Extend the Full Width of the Curb Ramp.

Detectable Warning Surface
Not To Scale

SURVEY PLOTTED BY	DATE
DRAWN BY	
TRACED BY	
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ORIGINAL PLAN	
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Michael H. Okamoto
SIGNATURE
April 30, 2022
EXPIRATION DATE OF THE LICENSE

11/18/20	Added Agg. Base
Date	Description

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CURB RAMP DETAILS

FARRINGTON HIGHWAY

Replacement of Makaha Bridge

No. 3 and Makaha Bridge 3A

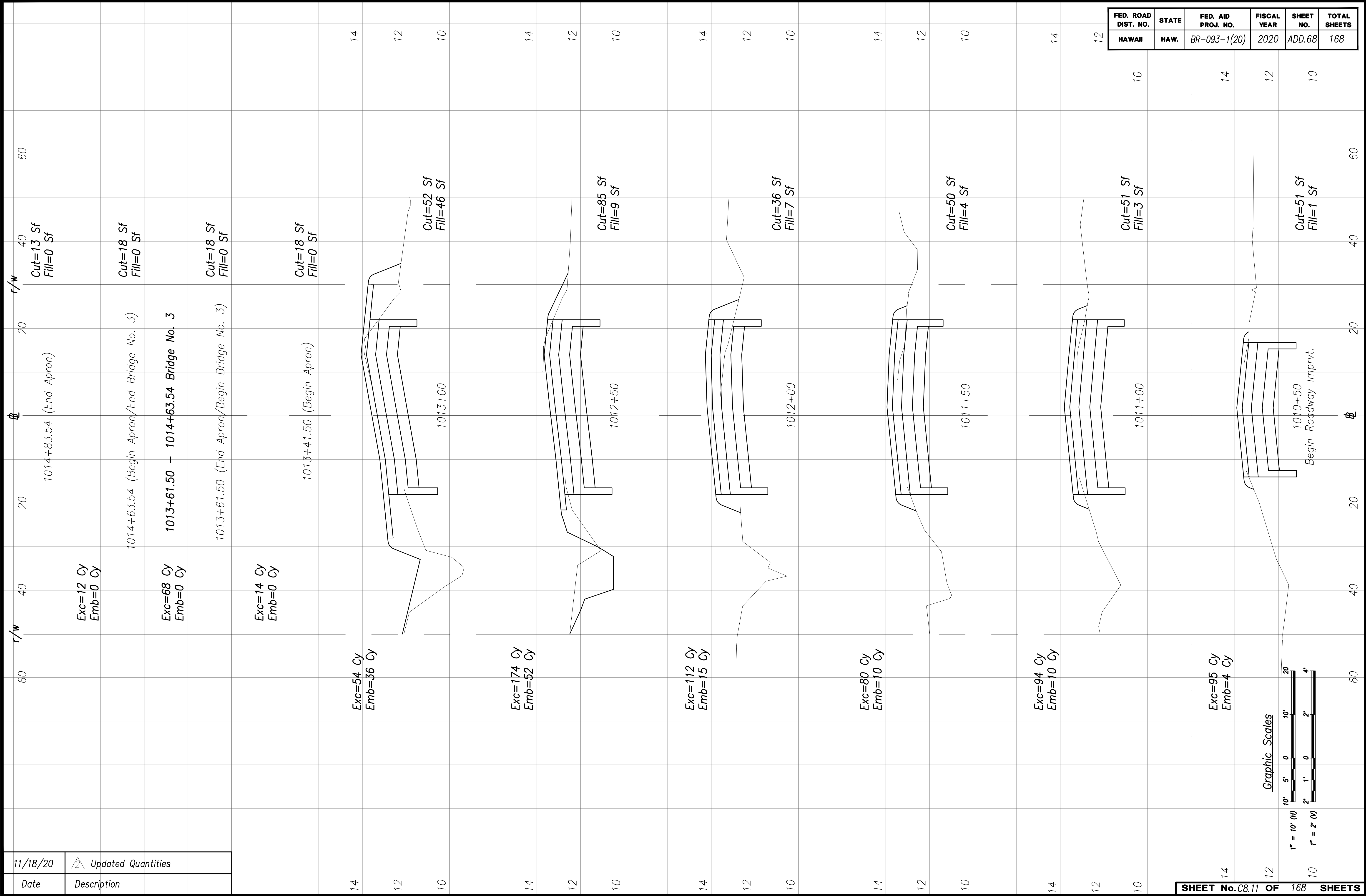
F. A. Project No. BR-093-1(20)

Scale: As Shown Date: July 2020

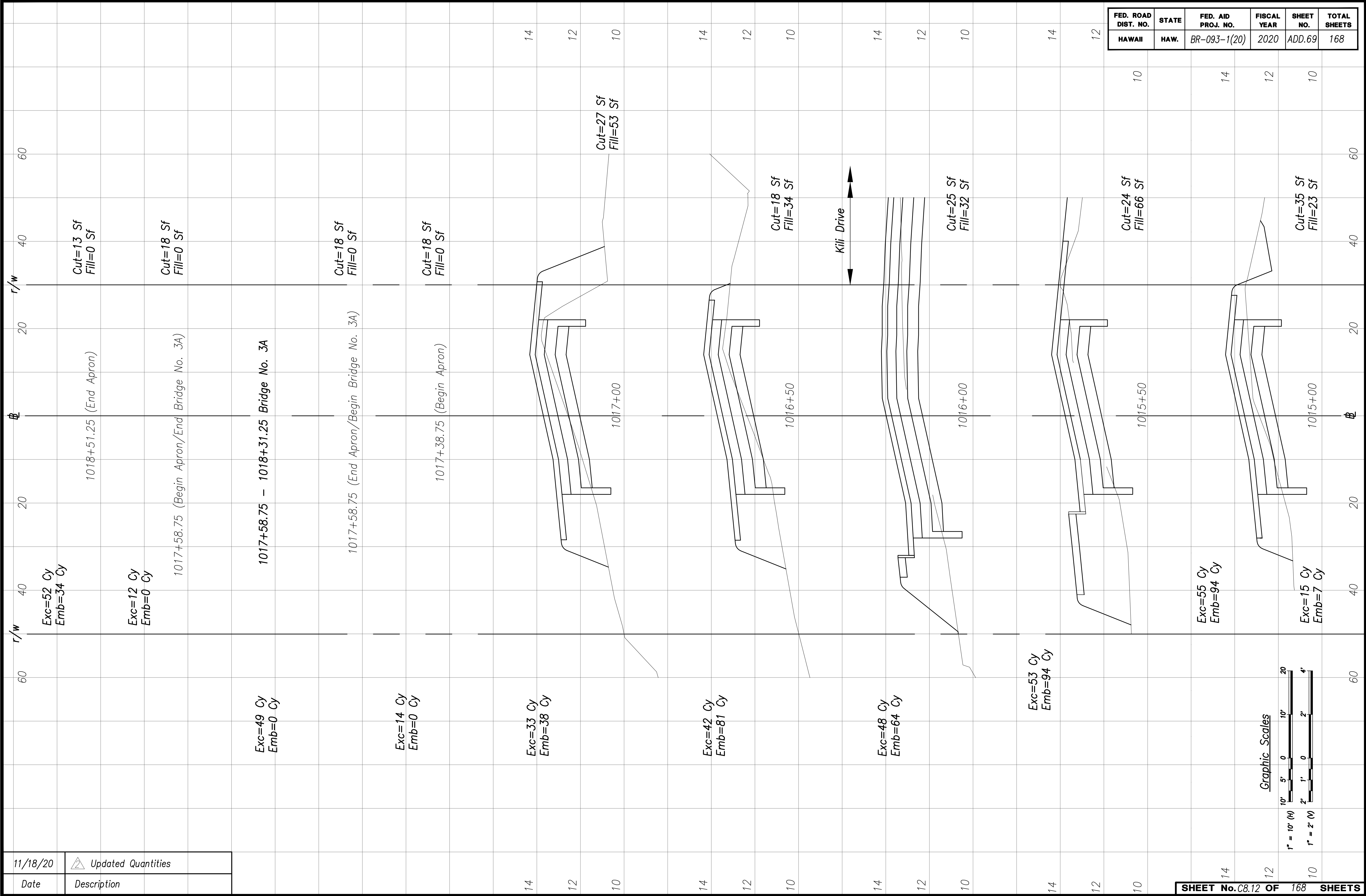
SHEET No. C8.3 OF 168 SHEETS

ADD.60

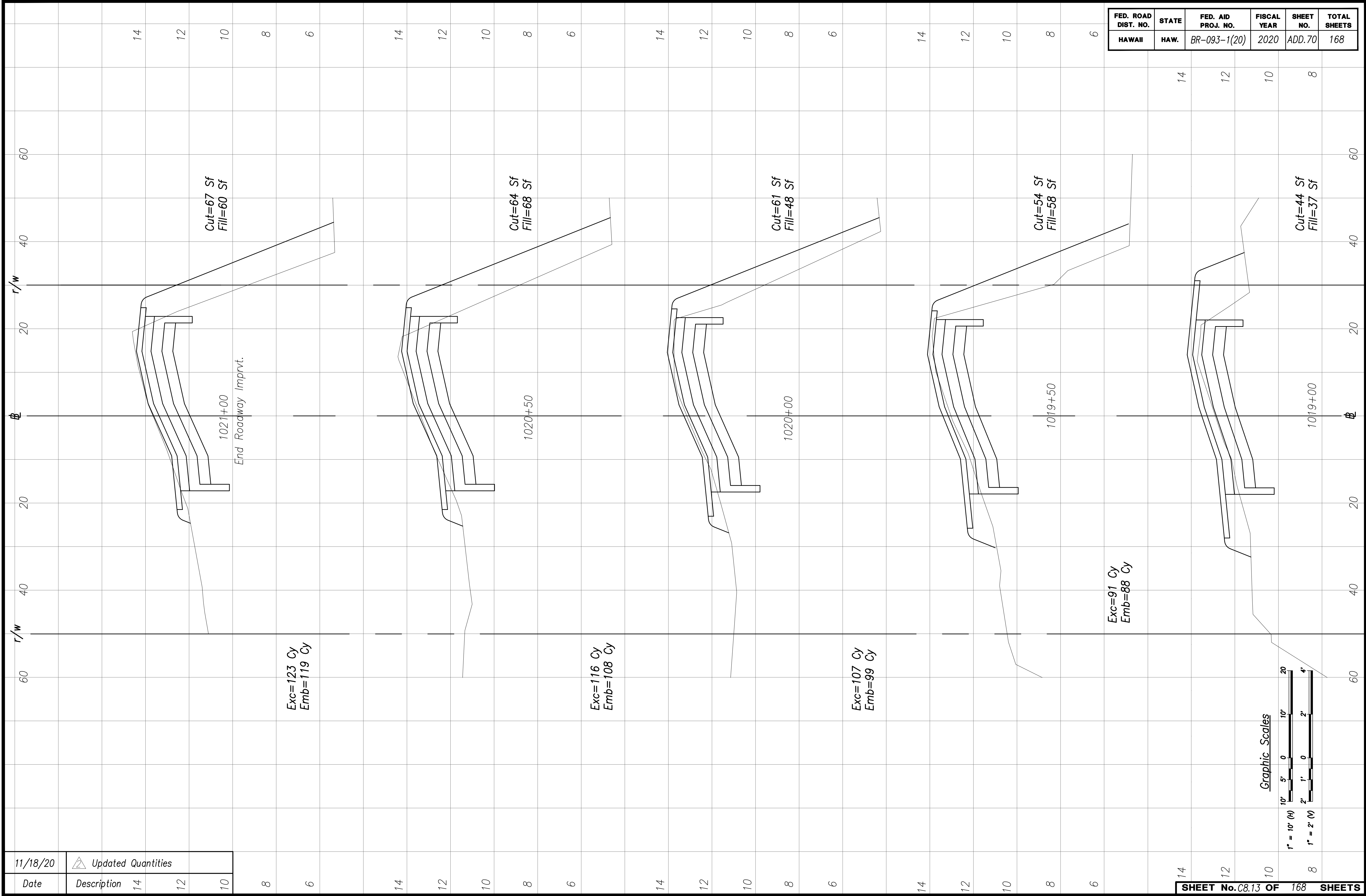
ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
	DESIGNED BY	
	NOTED BY	
NOTE BOOK	QUANTITIES BY	
	CHECKED BY	
No.		



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



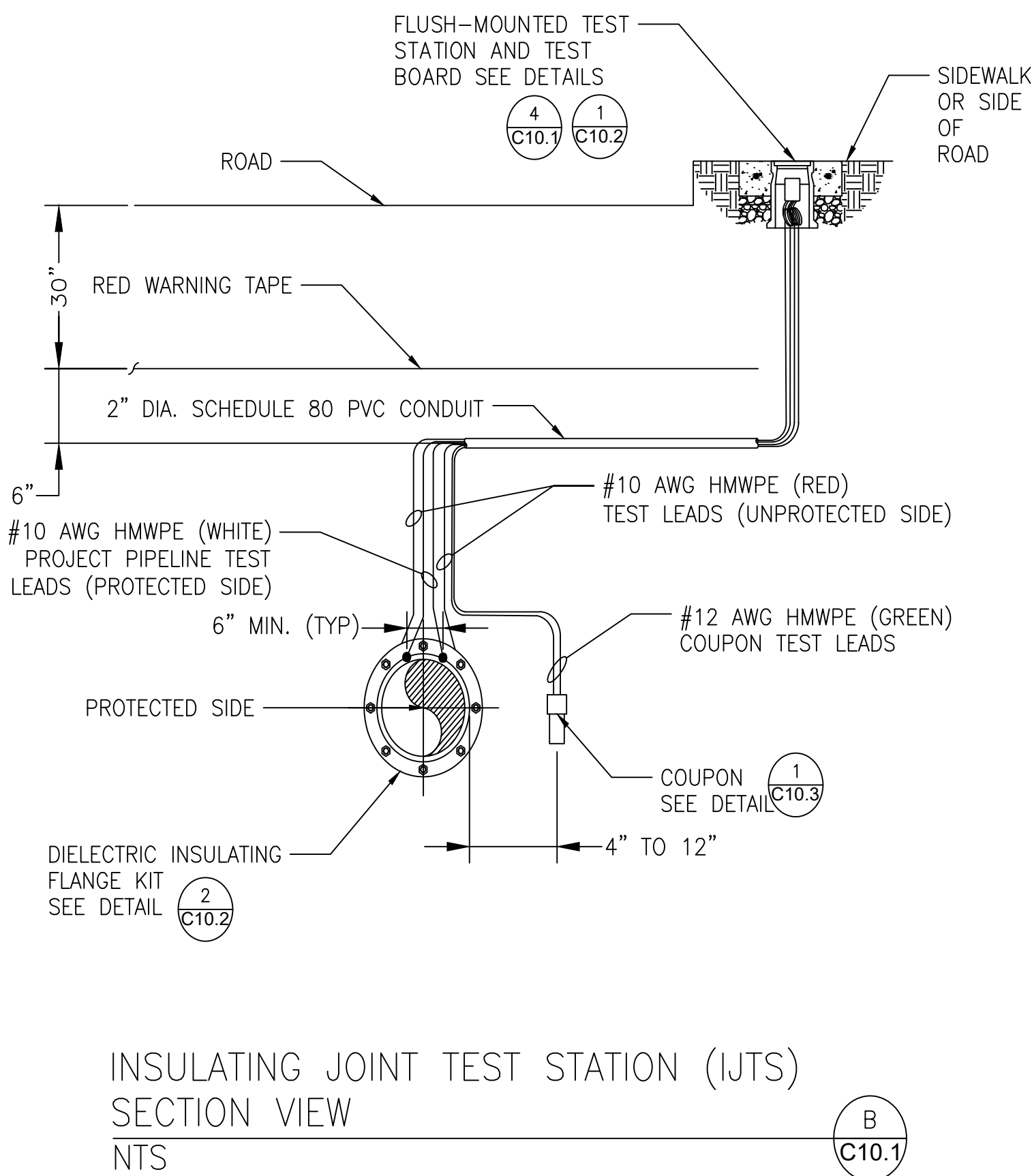
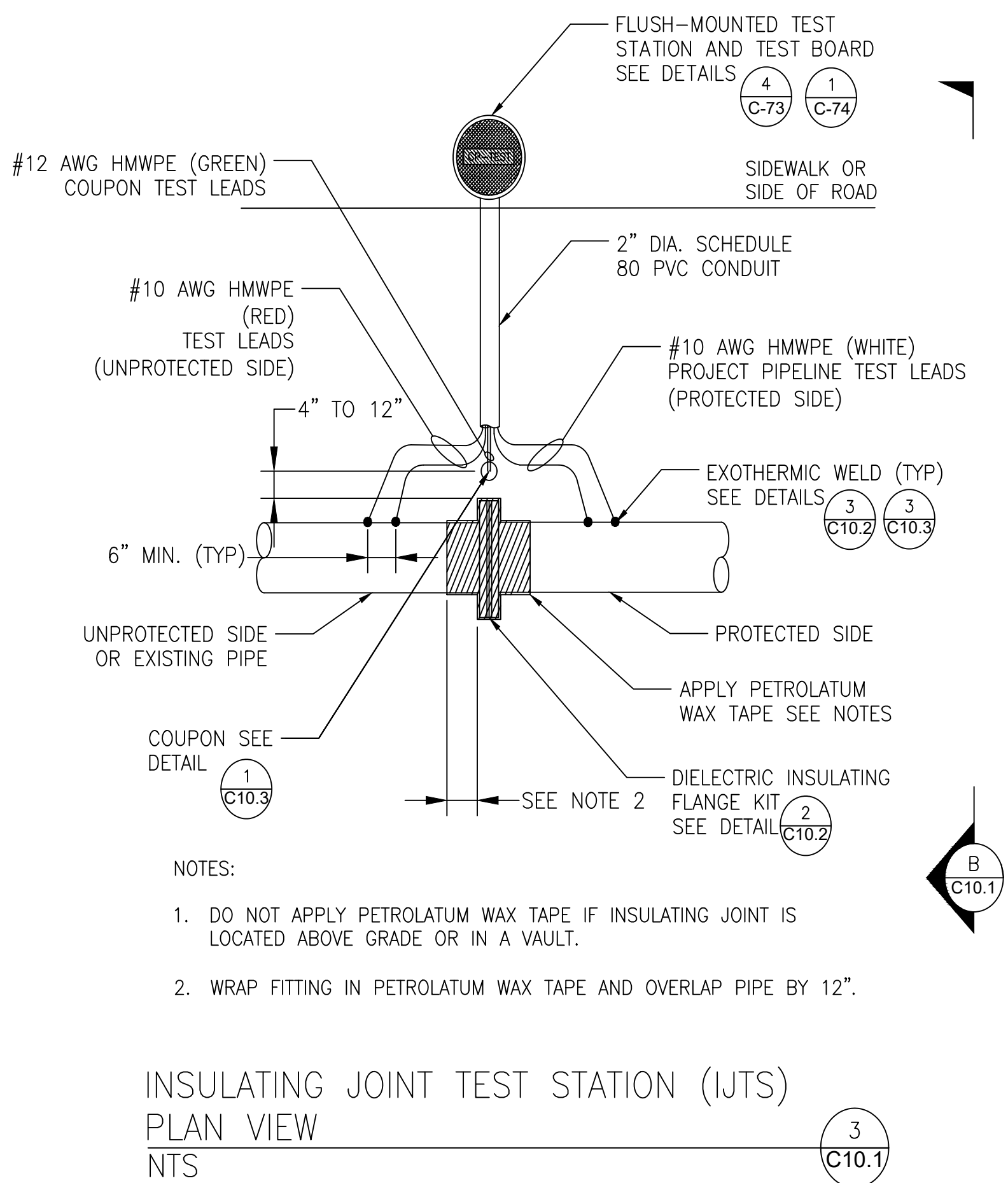
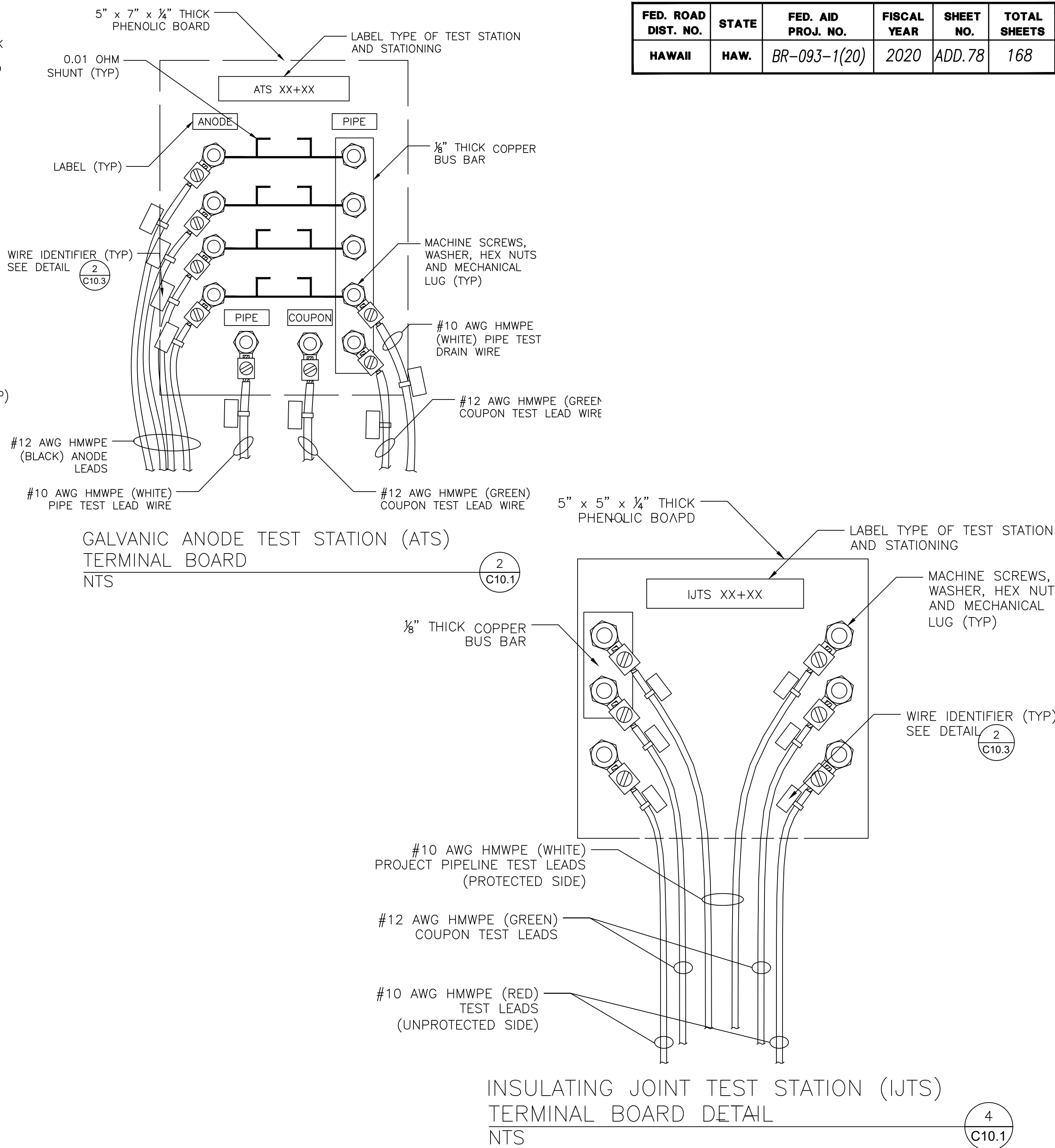
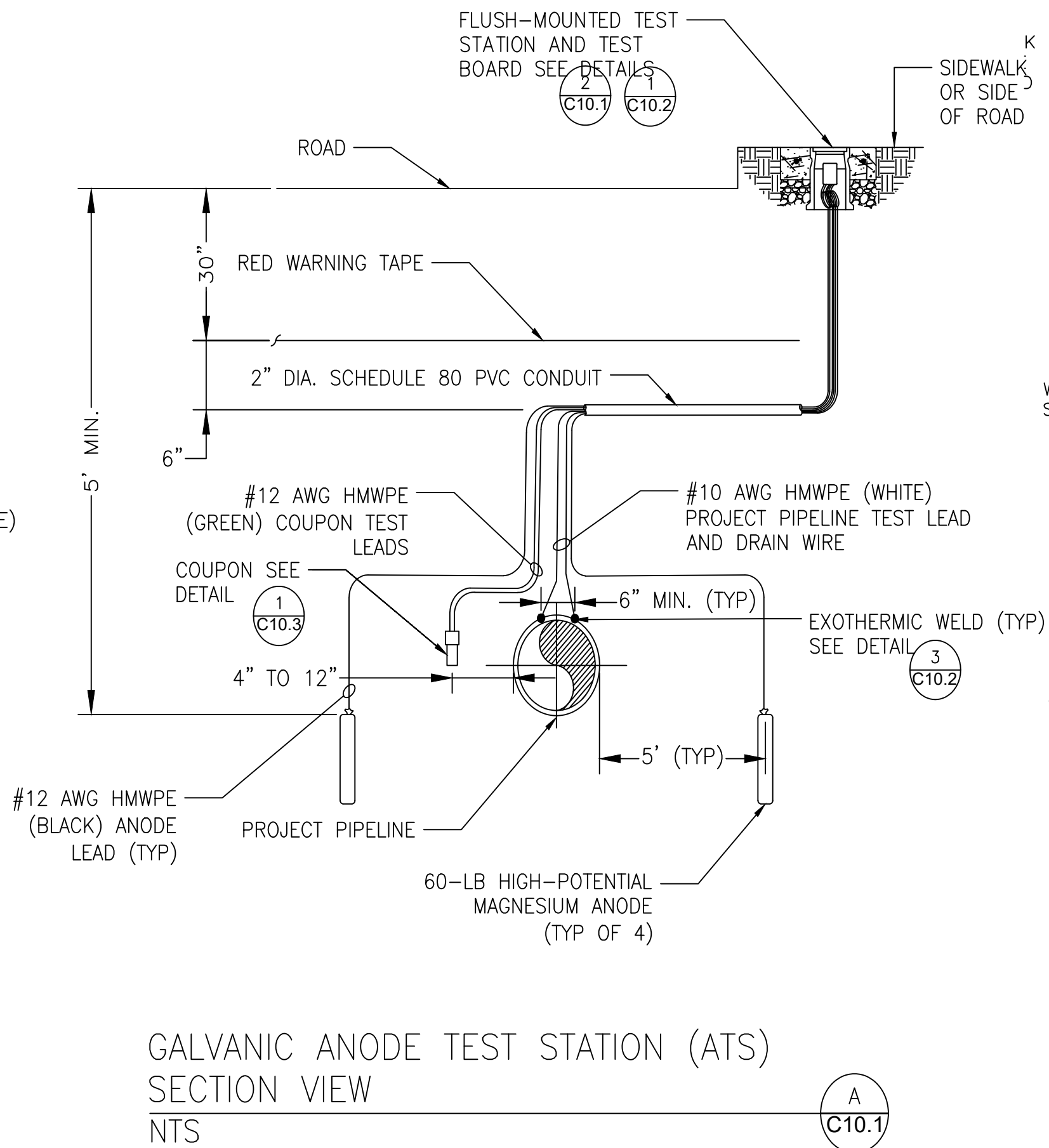
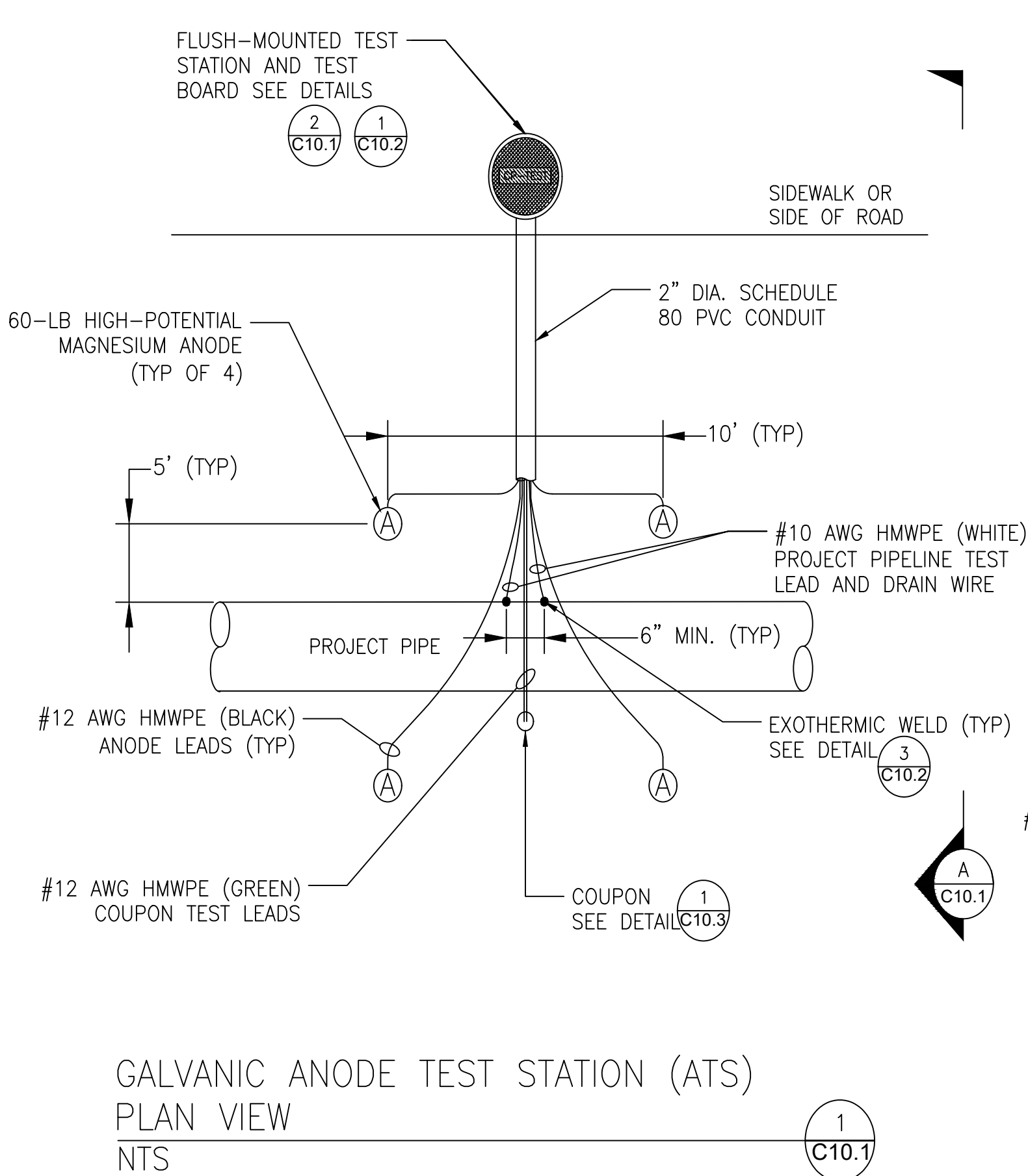
ORIGINAL PLAN NOTE BOOK No.	SURVEY PLOTTED BY	DATE
	DRAWN BY	
	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	



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

[illegible]

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(20)	2020	ADD.78	168



APPROVED:

Manager and Chief Engineer, Board of Water Supply
Date
(For work affecting BWS facilities in City/State R/W and easements only)



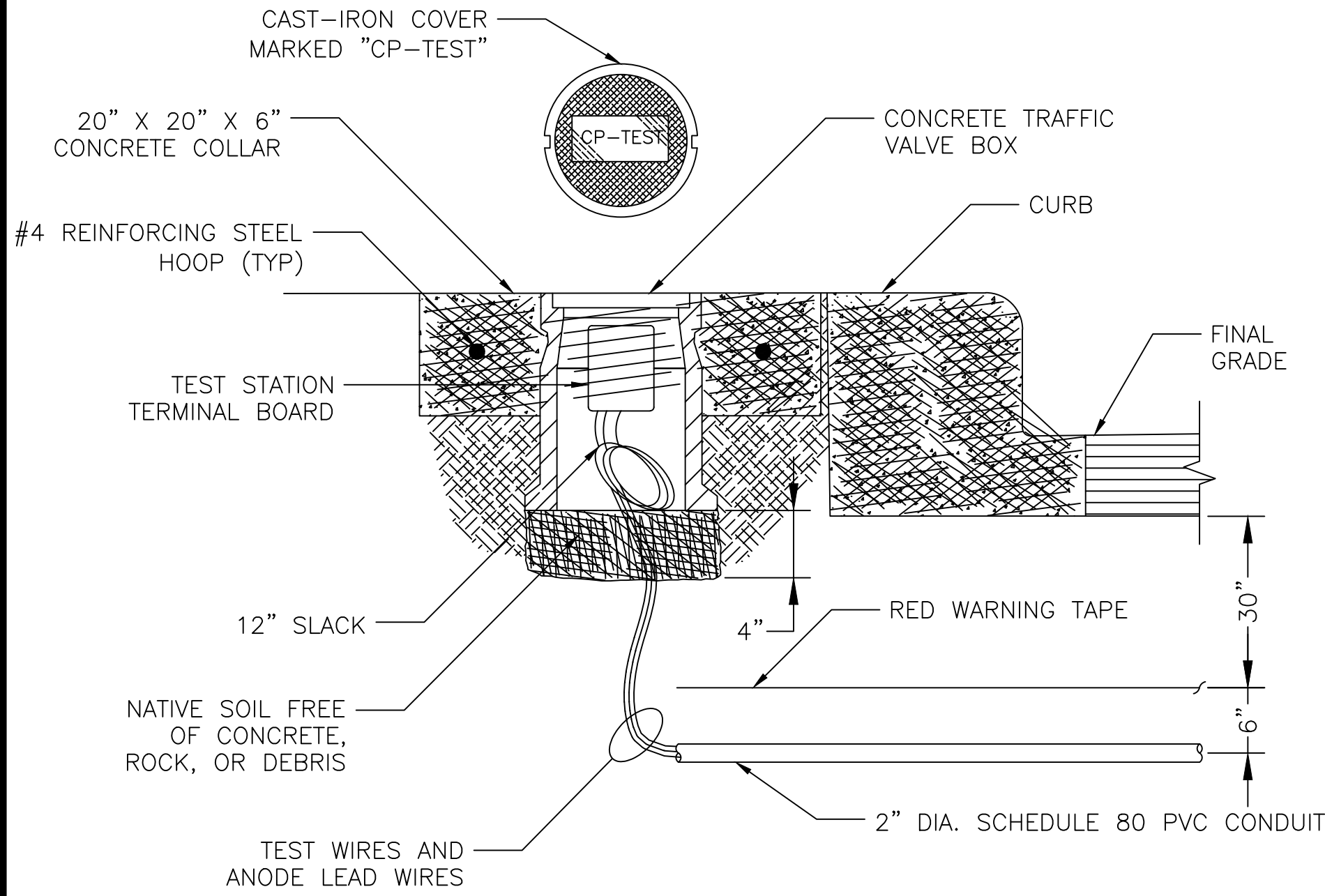
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Michael H. Okamoto April 30, 2022
SIGNATURE EXPIRATION DATE OF THE LICENSE

11/18/20	Added Approval Block
Date	Description
DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION CATHODIC PROTECTION DETAILS - 1 FARRINGTON HIGHWAY Replacement of Makaha Bridge No. 3 and Makaha Bridge 3A F. A. Project No. BR-093-1(20) Scale: As Shown Date: July 2020	
SHEET No. C10.1 OF 168 SHEETS	

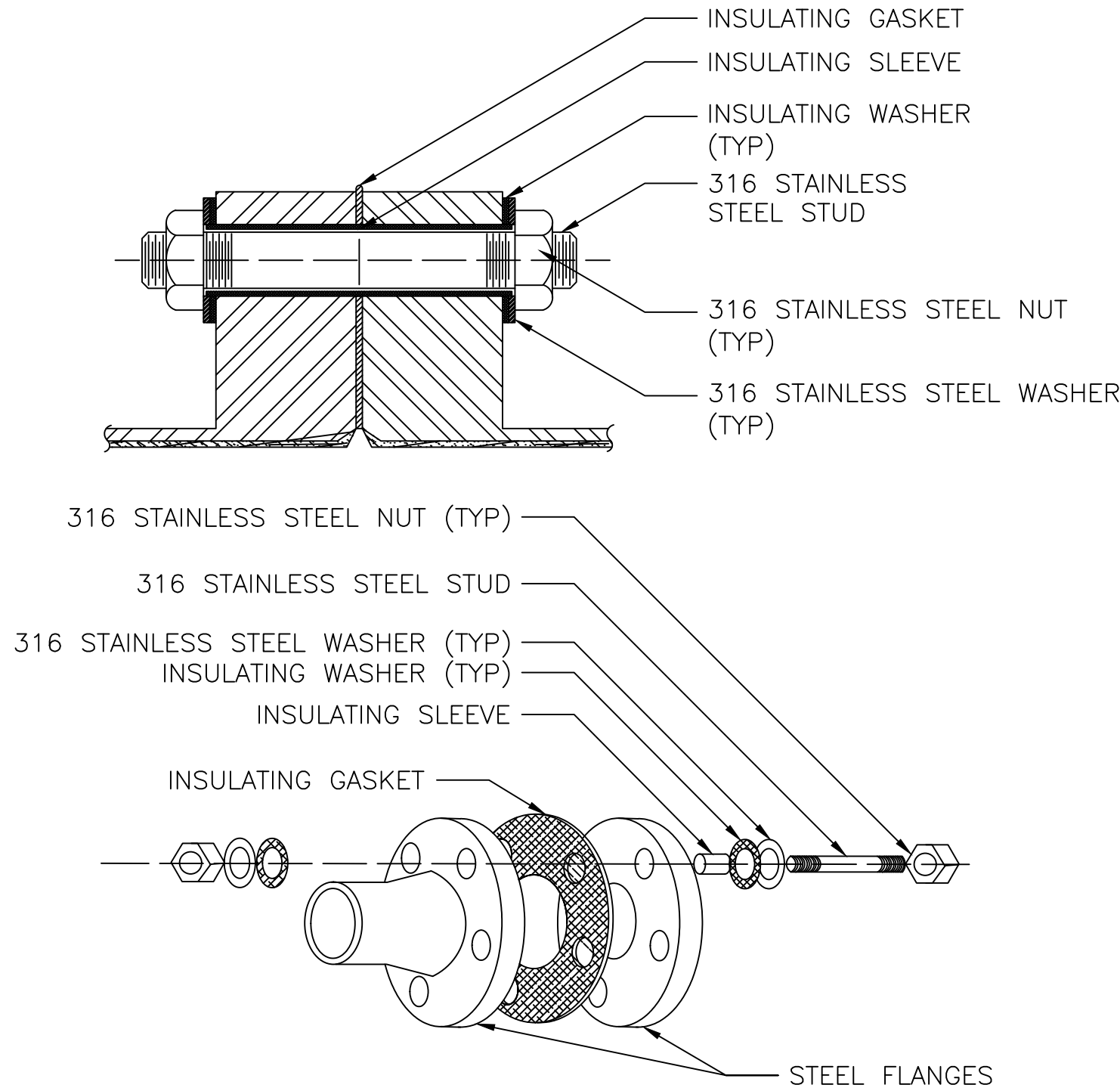
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(20)	2020	ADD.79	168

- ALL WELDS SHALL BE 6" APART AT MINIMUM.
- GRIND PIPE TO BARE METAL AND CLEAN SURFACE. GROUND AREA SHALL BE LARGE ENOUGH FOR EXOTHERMIC WELD AND SMALL ENOUGH TO BE COMPLETELY COVERED BY WELD CAP.
- STRIP INSULATION FROM WIRE AND ATTACH SLEEVE.
- HOLD MOLD FIRMLY WITH OPENING AWAY FROM OPERATOR. IGNITE WITH FLINT GUN. REMOVE SLAG FROM CONNECTION WITH CHIPPING HAMMER. TEST WELD WITH 22 OZ HAMMER.
- COVER CONNECTION WITH WELD CAP WITH INTEGRATED PRIMER. REPAIR ALL DAMAGE TO COATING AND LINING IN ACCORDANCE WITH COATING AND LINING MFG RECOMMENDATIONS.



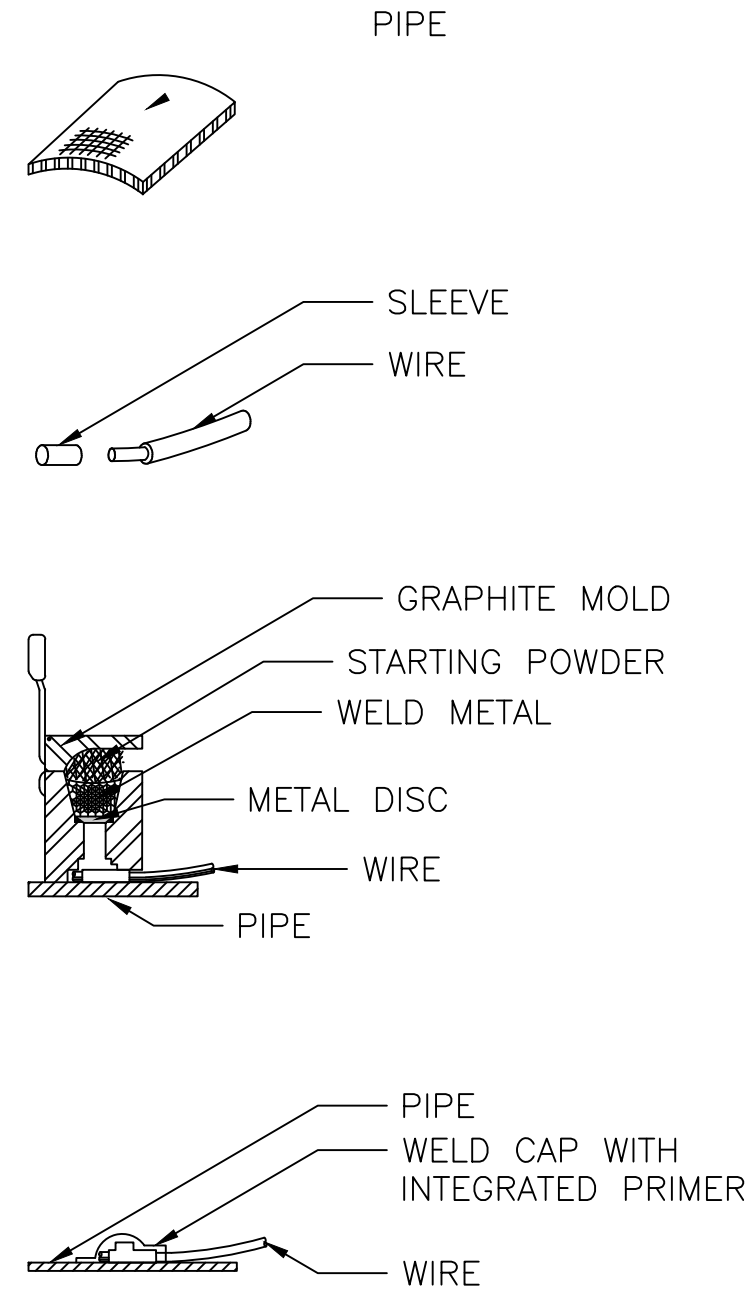
FLUSH-MOUNTED TEST STATION
DETAIL
NTS

1
C10.2



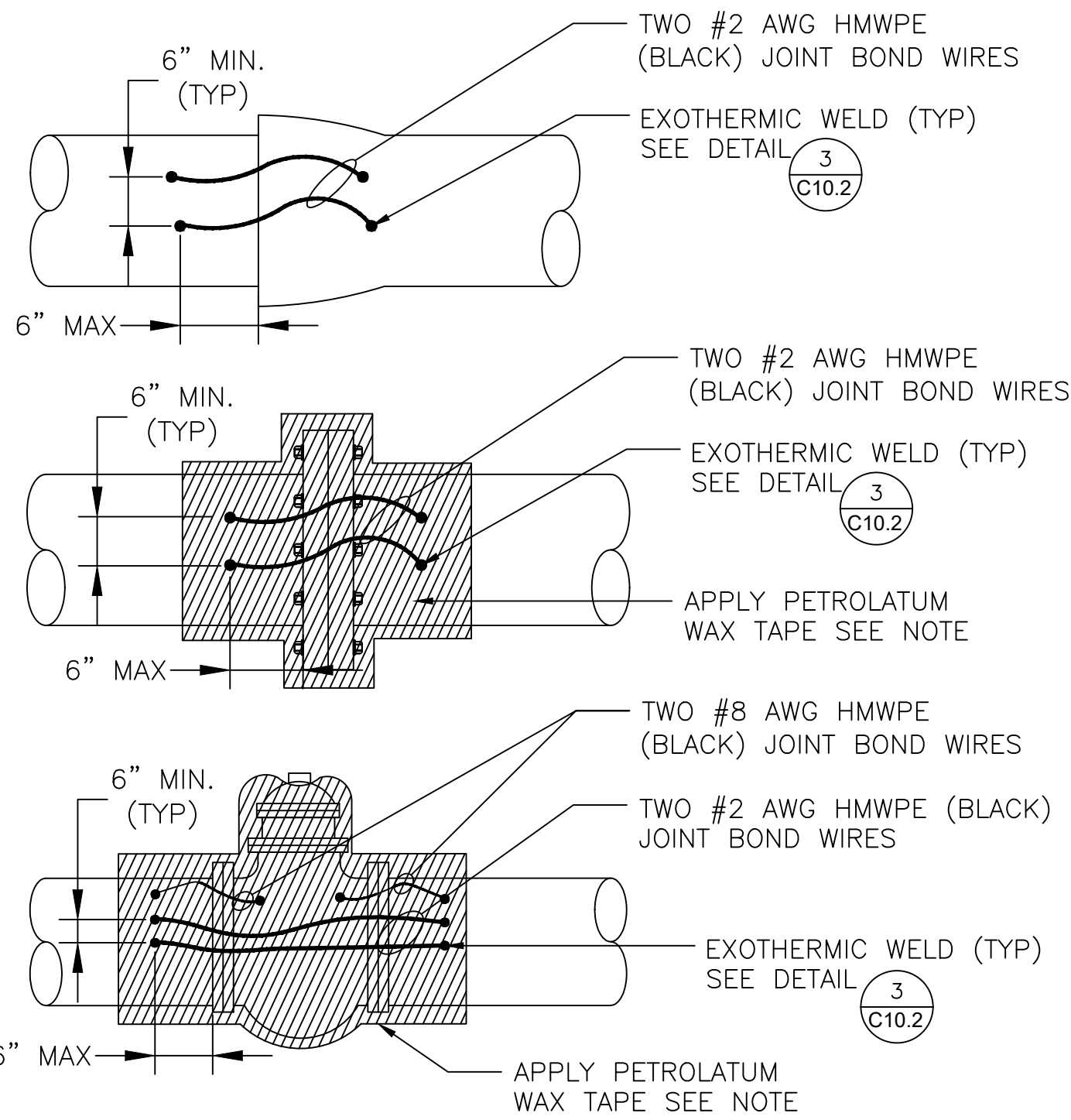
DIELECTRIC INSULATING FLANGE KIT
DETAIL WITH SECTION VIEW
NTS

2
C10.2



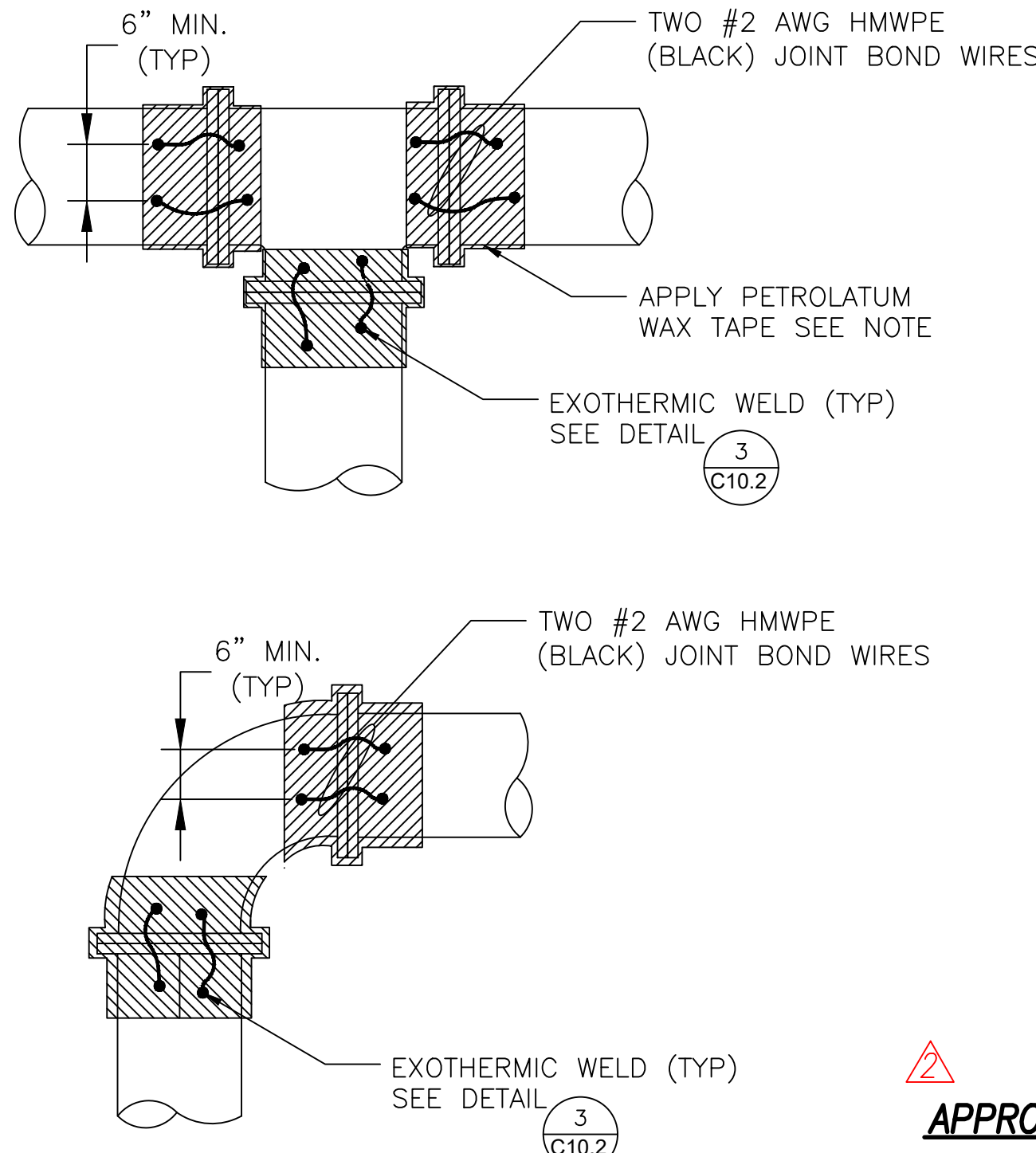
EXOTHERMIC WELD DETAIL FOR
DUCTILE IRON PIPE
NTS

3
C10.2



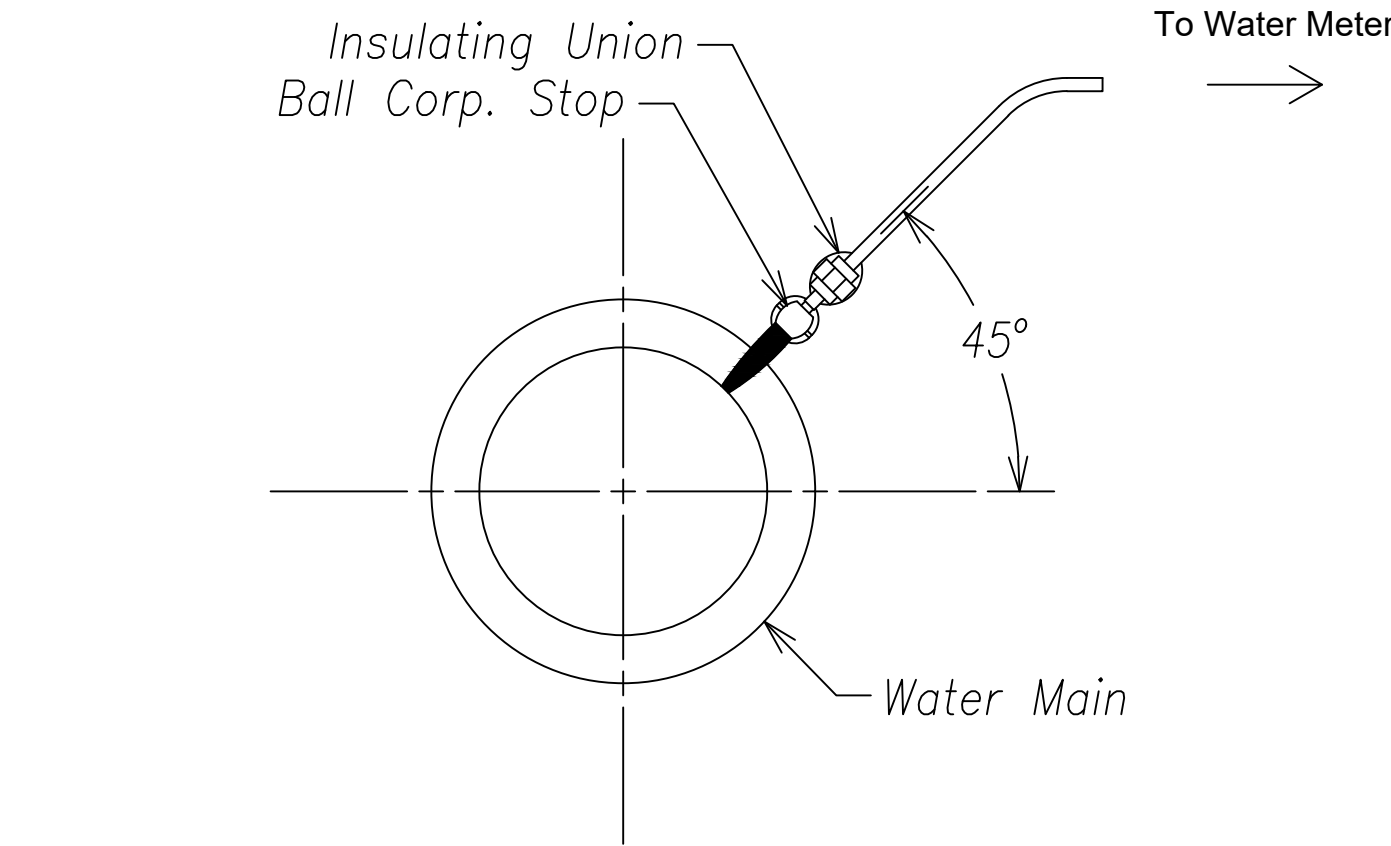
PIPE JOINT BONDING DETAILS FOR
NON-INSULATED JOINTS
NTS

4
C10.2



PIPE JOINT BONDING DETAILS FOR
NON-INSULATED JOINTS
NTS

5
C10.2



LATERAL CONNECTION DETAIL
NTS

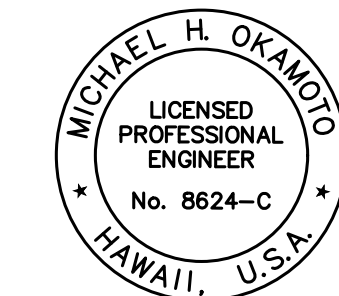
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C10.2

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APPROVED:

Manager and Chief Engineer,
Board of Water Supply
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Date

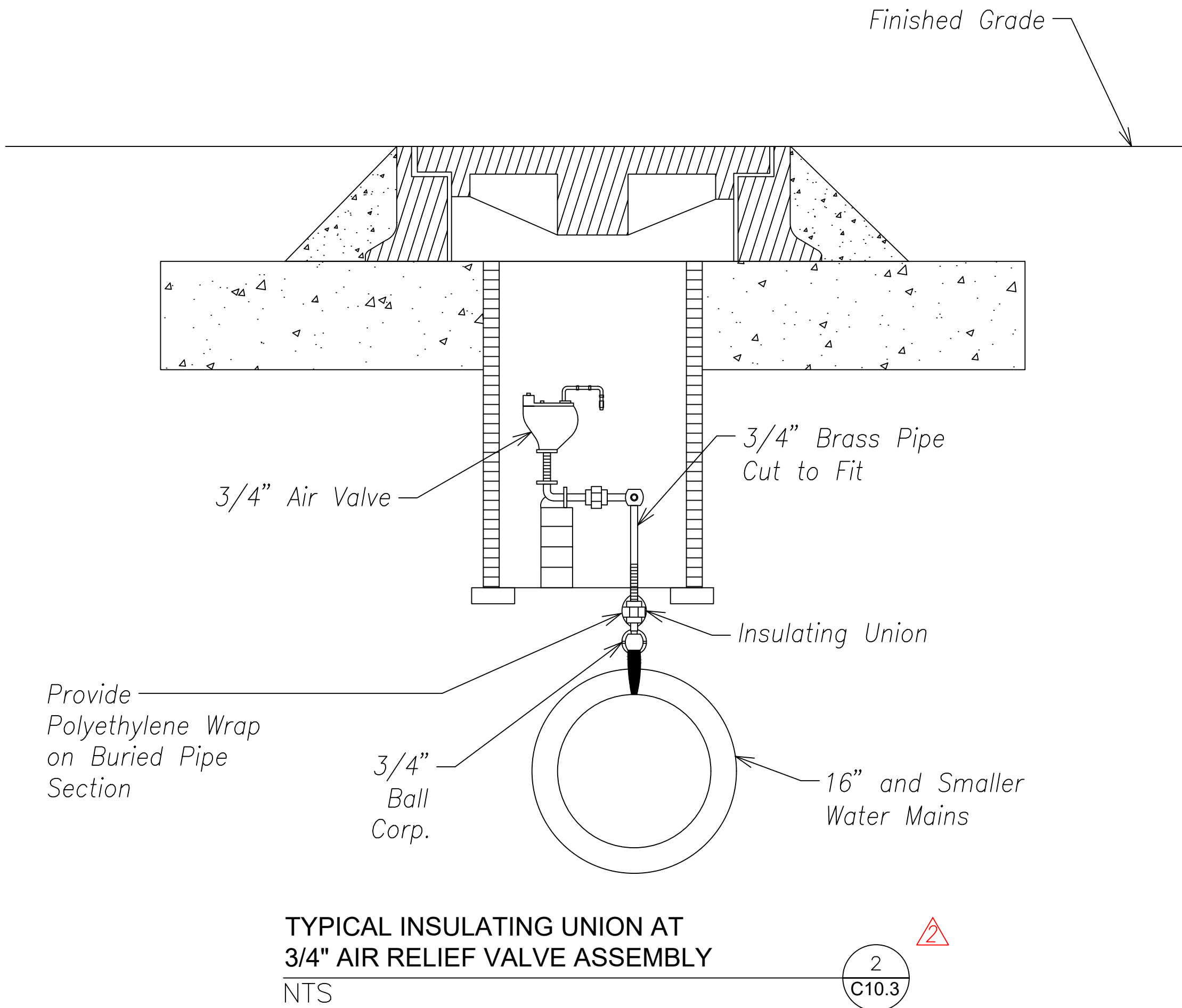
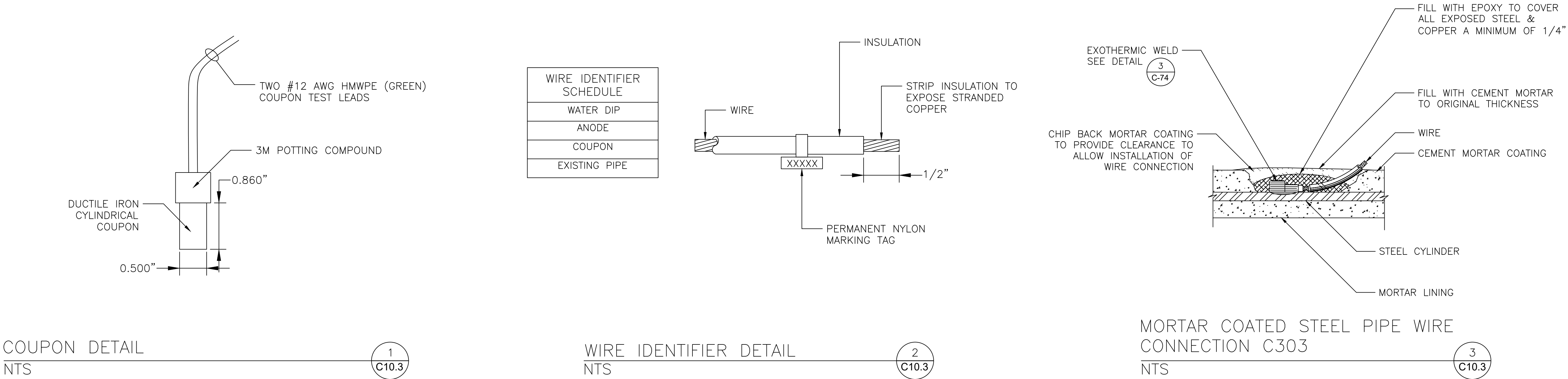


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Michael H. Okamoto April 30, 2022
SIGNATURE EXPIRATION DATE
OF THE LICENSE

11/18/20	Added Approval Block & ARV Detail
Date	Description
DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION CATHODIC PROTECTION DETAILS - 2 FARRINGTON HIGHWAY Replacement of Makaha Bridge No. 3 and Makaha Bridge 3A F. A. Project No. BR-093-1(20) Scale: As Shown Date: July 2020	
SHEET No. C10.2 OF 168 SHEETS	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-093-1(20)	2020	ADD.80	168

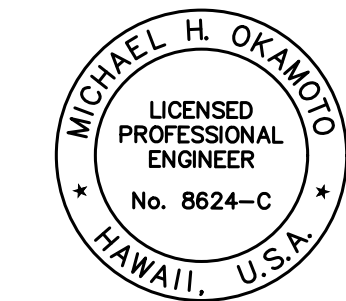


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11/18/20	Added Approval Block & ARV Detail
Date	Description
DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION CATHODIC PROTECTION DETAILS - 3 FARRINGTON HIGHWAY Replacement of Makaha Bridge No. 3 and Makaha Bridge 3A F. A. Project No. BR-093-1(20)	
Scale:	Date: July 2020
SHEET No. C10.3 OF 168 SHEETS	

ADD.80