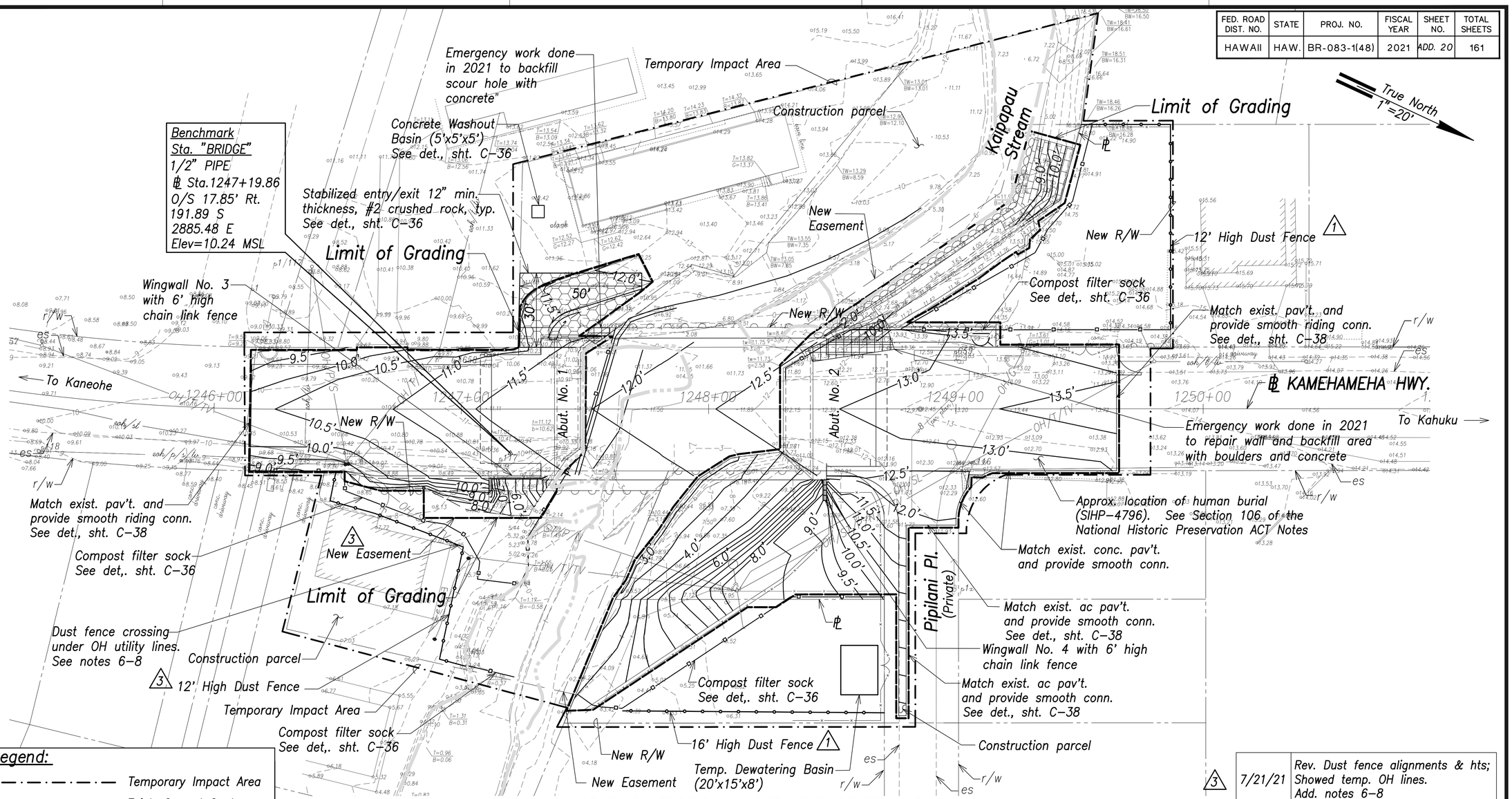
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	ADD. 20	161



Legend:

- Temporary Impact Area
- 10 Exist. Ground Contour
- 10 Finished Grade Contour
- Limit of Grading
- Dust Fence
- Compost Filter Sock
- Top of Bank
- Bottom of Bank

Fill Condition Cut Condition

- Drainage Flow Direction
- Stabilized Entry/Exit

Notes:

1. For additional finished grade elevations, see sht. C-20.
2. For bridge deck elevations, see structural drawings.
3. For grading work under bridge, see sht. C-19.
4. The contractor shall be responsible for obtaining grading permit from the City and County of Honolulu, Department of Planning and Permitting.
5. Sediment and Erosion Control BMP measures shown in the Contract Documents are minimum BMPs requirements and do not constitute an acceptable and/or complete Sediment and Erosion Control Plan. The Contractor shall incorporate additional BMPs based upon their means and methods considering site conditions and construction sequence in accordance with the Contract Documents including applicable permit document requirements. Cost shall be included in Pay Item 209.0100, "Installation, Maintenance, Monitoring, and Removal of BMP."
6. Minimum clearance of overhead utility lines to the fence shall be 3 feet. (3)
7. Fence post locations shall be coordinated to avoid impact to the existing and proposed ductlines to the houses on TMK 5-4-11:4.
8. If any part of the fence is constructed of metal, the fence shall be properly grounded.

ROADWAY GRADING, EROSION & SEDIMENT CONTROL PLAN

Scale: 1"=20'

Graphic Scale: 1" = 20' — 20' 10' 0 20' 40' — Scale in Feet

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

3	7/21/21	Rev. Dust fence alignments & hts; Showed temp. OH lines. Add. notes 6-8
1	7/7/21	Rev. Dust fence heights
	DATE	REVISION

WALTER G. C. CHONG
LICENSED PROFESSIONAL ENGINEERS
No. 8982-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. "OBSERVATION OF CONSTRUCTION" IS DEFINED IN CHAPTER 16-115, HAWAII ADMINISTRATIVE RULES, ENTITLED "PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS AND LANDSCAPE ARCHITECTS."

SIGNATURE 4/30/22 LIC. EXPIRATION

R. M. TOWILL CORPORATION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY GRADING, EROSION & SEDIMENT CONTROL PLAN

Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)

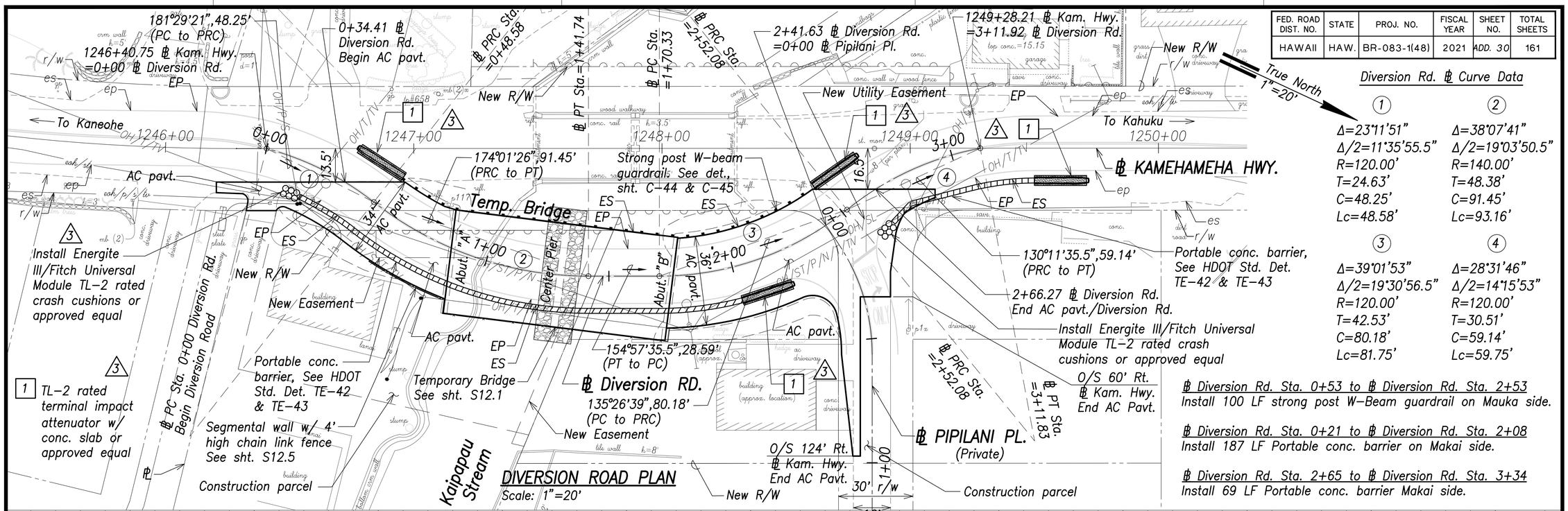
Scale: As Noted Date: February 2021

SHEET No. C-18 OF SHEETS

RMTC JOB NO. : 1-19548-0E

ADD. 20

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	ADD. 30	161



Diversion Rd. ℄ Curve Data

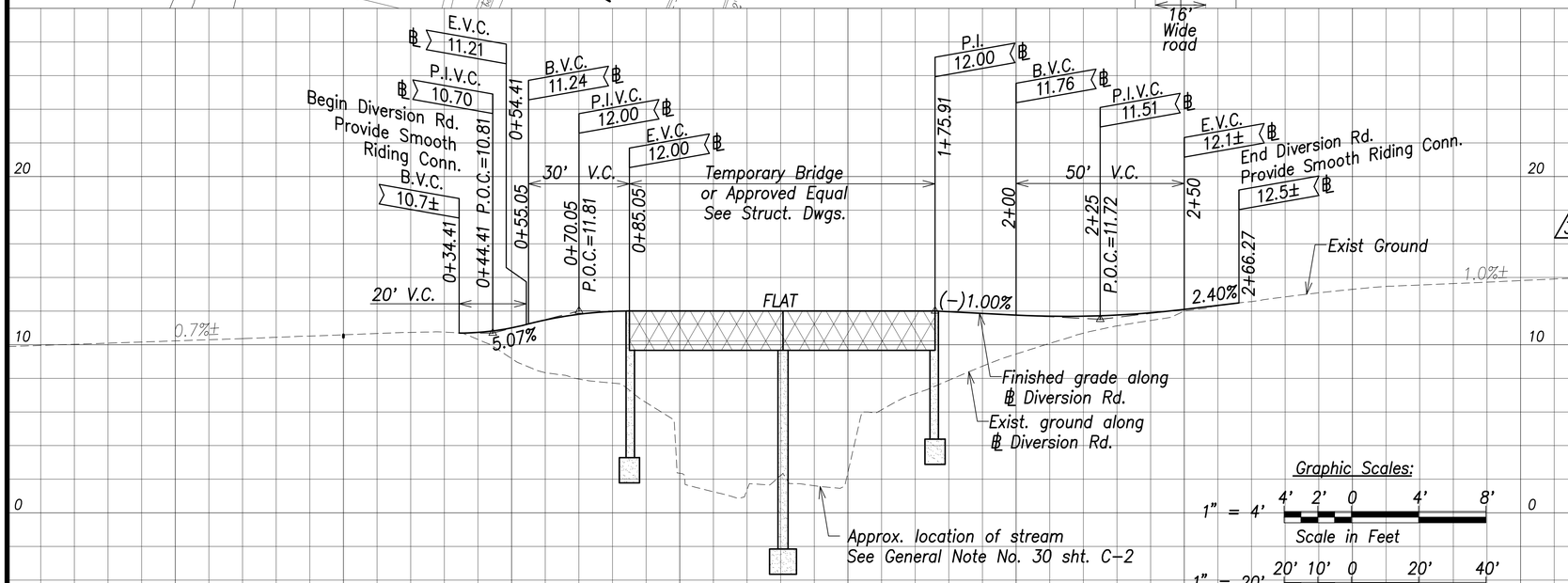
①	②
Δ=23°11'51"	Δ=38°07'41"
Δ/2=11°35'55.5"	Δ/2=19°03'50.5"
R=120.00'	R=140.00'
T=24.63'	T=48.38'
C=48.25'	C=91.45'
Lc=48.58'	Lc=93.16'

③	④
Δ=39°01'53"	Δ=28°31'46"
Δ/2=19°30'56.5"	Δ/2=14°15'53"
R=120.00'	R=120.00'
T=42.53'	T=30.51'
C=80.18'	C=59.14'
Lc=81.75'	Lc=59.75'

℄ Diversion Rd. Sta. 0+53 to ℄ Diversion Rd. Sta. 2+53
Install 100 LF strong post W-Beam guardrail on Mauka side.

℄ Diversion Rd. Sta. 0+21 to ℄ Diversion Rd. Sta. 2+08
Install 187 LF Portable conc. barrier on Makai side.

℄ Diversion Rd. Sta. 2+65 to ℄ Diversion Rd. Sta. 3+34
Install 69 LF Portable conc. barrier Makai side.



DIVERSION ROAD PROFILE
Scales: 1"=20' Horiz.
1"=4' Vert.

Graphic Scales:
1" = 4' 4' 2' 0 4' 8' Scale in Feet
1" = 20' 20' 10' 0 20' 40' Scale in Feet

Notes:

1. The contractor shall adjust the tops of all existing boxes and structures as required to construct the Diversion Road. Adjustment of boxes and structures shall be considered incidental to the various items of work.
2. Portable concrete barriers shall be anchored to protect the temporary waterline. Contractor to provide shop drawings for anchoring the portable concrete barriers on the temporary bridge.
3. Contractor to provide shop drawings for terminal impact attenuators and crash cushions.
4. Diversion road design shown in the contract documents are for bidding purposes. The contractor shall be responsible for the diversion road design based upon their means and methods and construction sequence taking into consideration the existing site conditions.

DATE	REVISION
7/21/21	Rev. Callouts for Quadguards to "terminal impact attenuators w/conc. slab. or approved equal". Add. notes 3 & 4

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

WALTER G. C. CHONG
LICENSED PROFESSIONAL ENGINEERS
No. 8982-C
HAWAII, U.S.A.

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Walter G. C. Chong 4/30/22
SIGNATURE LIC. EXPIRATION
R. M. TOWILL CORPORATION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DIVERSION ROAD PLAN & PROFILE

Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)

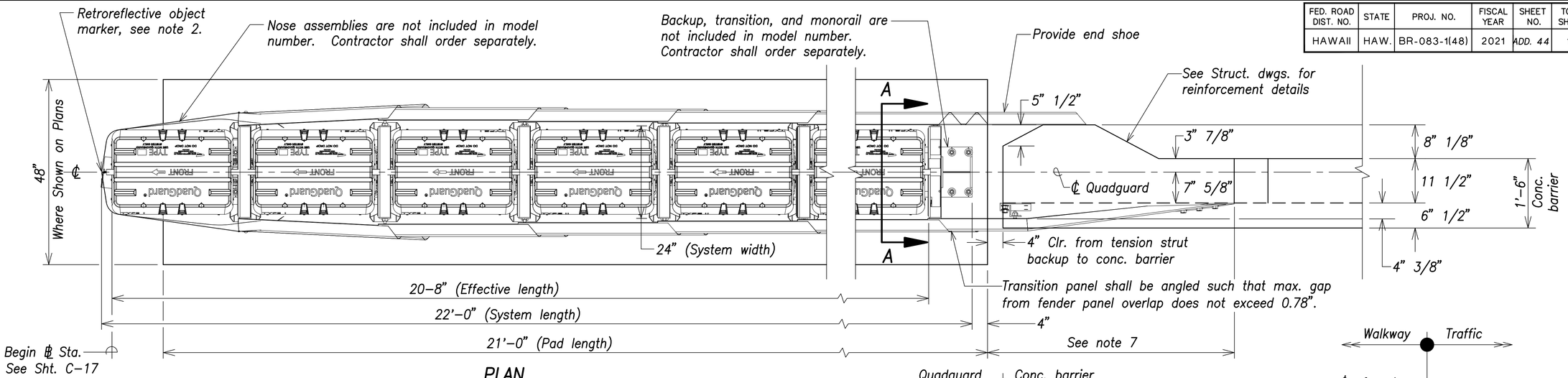
Scale: As Noted Date: February 2021

SHEET No. C-28 OF SHEETS

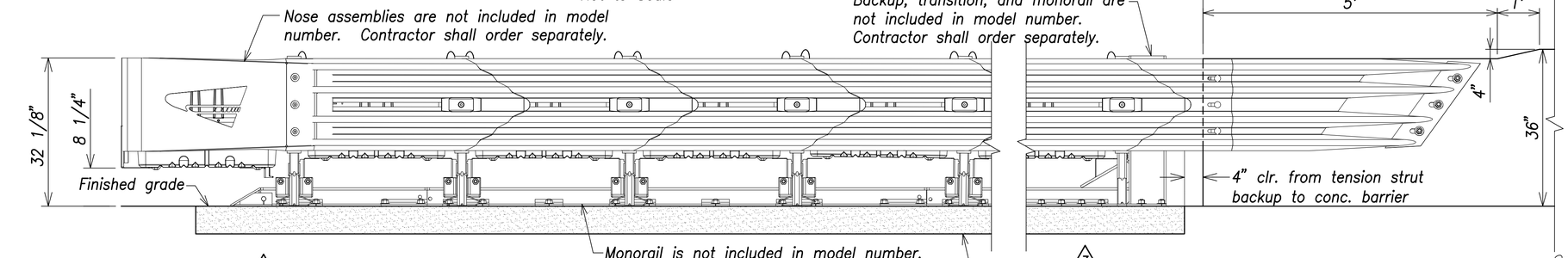
RMTC JOB NO. : 1-19548-0E

ADD. 30

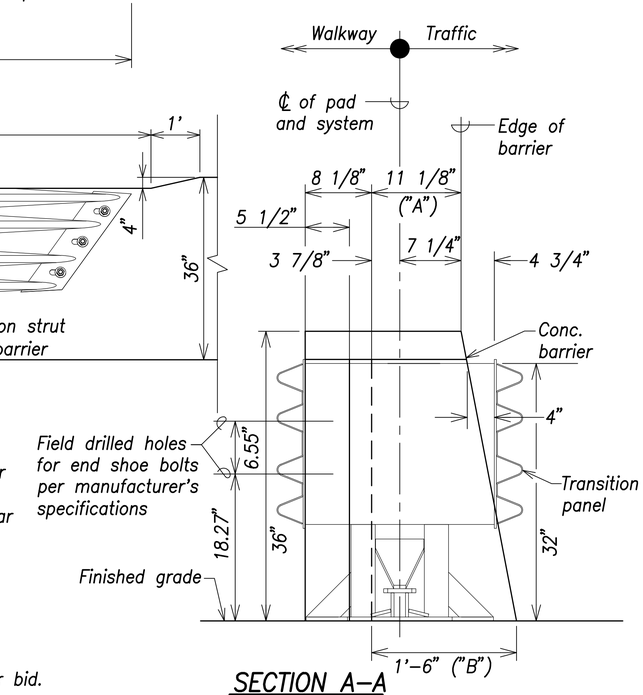
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	ADD. 44	161



PLAN
Not to Scale



ELEVATION (RIGHT SIDE)
Not to Scale



SECTION A-A
Not to Scale

Bays	24" width Model no.	System length	Effective length	Pad length	Max. design speed	No. of cartridges Type I	No. of cartridges Type II
6	QM10024	22'-0"	20'-8"	21'-0"	62 mph	3	3

Notes:

3 1. Install MASH Test Level 3 Quadgurd Teminal Impact Attenuator or approved equal per manufacturer's recommendations. Bidders to use manufacturer's drawings as basis for bid.

2. The contractor shall order crash cushion object marker from the Quadguard manufacturer and install on the nose of the Quadguard per the manufacturer's specifications. Object marker shall be considered incidental to the Quadguard attenuator.

3. In compliance with the AASHTO 2011 Roadside Design Guide, manufacturer recommends removal of all curbs and islands to ensure proper impact performance.

4. Provision shall be made for rear fender panels to slide reward upon impact 30 inches, min.

3 5. 8" min. reinforced 4,000 PSI PC concrete pad or 8" min. non-reinforced 4,000 PSI concrete roadway, measuring at least 12'-0" wide by 50'-0" long.

6. See the "Quadguard M10 System Product Manual" for a description of its impact performance characteristics and design limitations before placing a system at a given site.

7. Where necessary, the customer shall supply an adequate transition from the Quadguard M10 system to the object being shielded.

8. Backup, monorail, and nose assemblies are not included in model number, order separately.

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

	DATE	REVISION
3	7/21/21	Rev. Conc pad. Rev. notes 1 & 5

WALTER G. C. CHONG
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No. 8982-C
HAWAII, U.S.A.

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Walter G. C. Chong 4/30/22
SIGNATURE LIC. EXPIRATION
R. M. TOWILL CORPORATION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

QUADGUARD DETAILS

Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)

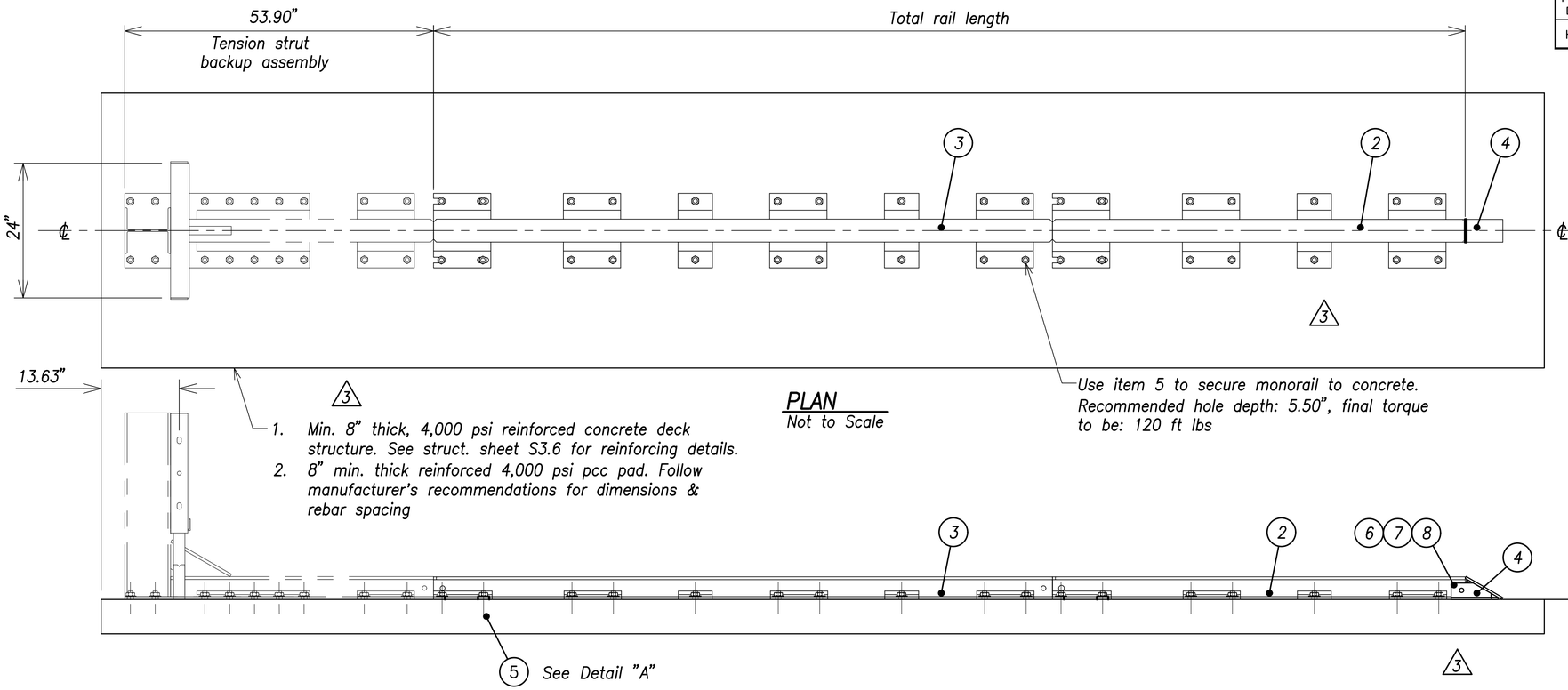
Scale: As Noted Date: February 2021

SHEET No. C-42 OF SHEETS

RMTC JOB NO. : 1-19548-0E

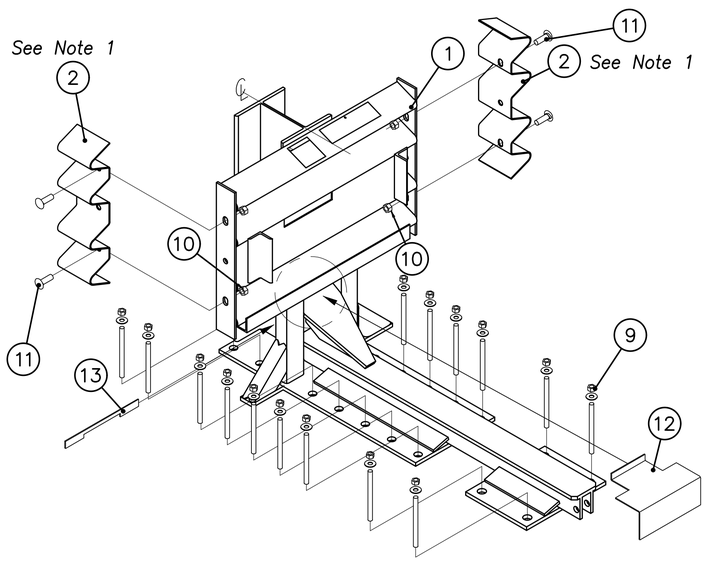
ADD. 44

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	ADD. 45	161

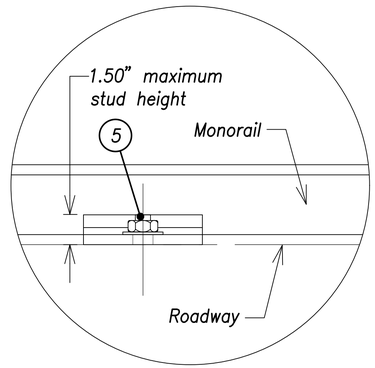


PLAN
Not to Scale

ELEVATION (W/ TENSION STRUT BACKUP)
Not to Scale



TENSION STRUT BACKUP
Not to Scale



DETAIL "A"
Not to Scale

Note:

Monorail & backup assembly must be straight to within 0.5".

Notes:

1. Use monorail(s) (items 1, 2 and 3) as template(s) to locate mp-3 anchor bolts (item 5) and install per manufacturer's directions.
2. Cross slope of pad shall not exceed 2% in any direction.
3. Units of measurement are inches unless otherwise noted.
4. Every stud must be embedded to a depth of 5.50-inches. If rebar is encountered in a pcc pad, drill through it. If rebar is encountered on a deck structure, ask the engineer for direction.

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

3	7/21/21	REV. CONC PAD
	DATE	REVISION

WALTER G. C. CHONG
LICENSED PROFESSIONAL ENGINEERS
No. 8582-C
HAWAII, U.S.A.

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Walter G. C. 4/30/22
SIGNATURE LIC. EXPIRATION
R. M. TOWILL CORPORATION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

QUADGUARD DETAILS

Kamehameha Highway
Kaipapau Stream Bridge Replacement
Federal Aid Project No. BR-083-1(48)

Scale: As Noted Date: February 2021

SHEET No. C-43 OF SHEETS

RMTC JOB NO. : 1-19548-0E

ADD. 45

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-083-1(48)	2021	ADD. 65	161

STRUCTURAL GENERAL NOTES

1. GENERAL SPECIFICATIONS:

(A) Hawaii Department of Transportation, Hawaii Standard Specifications for Road and Bridge Construction, 2005, together with Special Provisions prepared for this Contract.

2. DESIGN SPECIFICATIONS:

(A) AASHTO 2012 LRFD Bridge Design Specifications (Sixth Edition) and its subsequent interim specifications with interim supplements and modifications by the HDOT Highways Division.

(B) HDOT Document dated March 1, 2013 with subject title "Design Criteria for Bridges and Structures"

(C) AASHTO 2013 Standard Specifications for structural supports for Highways, Signs, Luminaires, and Traffic Signals (Sixth Edition) and its subsequent interim specifications with interim supplements and modifications by the HDOT Highways Division.

3. LOADS:

(A) Dead Load: A 25 psf allowance for future wearing surface of asphalt concrete has been included in Dead Load calculations. Concrete unit weight of 160 pcf has been assumed for Dead Load calculations. A future utilities load on each side of the Bridge of 150 plf has been included.

(B) Live Load: HL-93 Service and Strength Limit States

(C) Seismic: In accordance with AASHTO LRFD Bridge Design Specifications, 6th Edition, 2012:

Peak Ground Acceleration (PGA = 0.18g), modified by the Site Coefficient (F_{PGA} = 1.44) to give a spectrum acceleration, A_S = 0.26g

Short period acceleration at 0.2 seconds (S_S = 0.40g) modified by the Site Coefficient (F_a = 1.48) to give the short period spectrum acceleration, S_{DS} = 0.592g

Long Period acceleration at 1.0 seconds (S_1 = 0.11g) modified by the Site Coefficient (F_v = 2.36) to give the long period spectrum acceleration, S_{D1} = 0.260g

Site Class = D
Seismic Zone = 2
Operational Category = Essential

(D) Federal Emergency Management Agency (FEMA) -Flood Hazard Designation:

Zone: _____ AE
Base Flood Elevation: _____ El. = 14 (Upstream of Bridge)
Non-Bore Tsunami Run up: ____ El. = 10

3. LOADS (Cont):

(E) Combined Scour Elevations:

Abutment No. 1: _____ 100 year Scour El. = -8.0

Abutment No. 2: _____ 100 year Scour El. = -8.0

(F) Railing Test Level TL-3

(G) Seismic Parameters for Segmental Retaining Wall - Refer to S12.5.

4. MATERIALS:

(A) All concrete strengths shall be as noted below:

Item No.	Structural Parts	Compressive Strength f'c (28 Days)	Maximum Water Cement (W/C)	Maximum Cement Content (lbs/cyd)	Maximum Cementitious Material Content (lbs/cyd)
(1)	Drilled Shafts including Trial and Load Test Shafts See Note (E) in this section	4500 psi	0.45	720	720
(2)	Drilled Shaft Cap Beam, End Beam, Aesthetic Railing, End Post, Concrete Barrier, Corbel for Approach Slab, Corbel for Conc. Encased Ducts, Diaphragms, Girder Seats, Barrier Wall, Wing Walls and Wing Wall return See Notes (D), (E), and (F) in this section	5000 psi	0.40	670	670
(3)	Prestressed Girders See Note (E) in this section and Sheet S4.5	10000 psi (12000 psi at 56 days)	0.40	670	752
(4)	Precast Deck Form See Notes (D), (E) and (F)	6000 psi	0.40	670	670
(5)	Bridge Deck, Topping over End Beam, Approach Slabs, Concrete encasing ducts within bridge, and Sleeper Slab. See Notes (D), (E) and (F).	SBD (See Section 601)	--	--	--
(6)	Temporary Bridge Abutments, Piers, Footings, and Miscellaneous Concrete	4000 psi	0.45	670	670
(7)	Deck and End beam Closure Pours (Including Corbel), See Note (E)	VESLMC (See Section 540)	-	-	-
(8)	Concrete for Waterline:				
	a. Cradle See notes (D), (E), and (F)	5000 psi	0.40	670	670
	b. Curtain wall shall be light weight concrete (Density < 120 lbs/cu. ft.)	3000 psi (See Section 627)	-	-	-
(9)	All others, except as noted otherwise	4000 psi	0.45	670	670

4. MATERIALS (Cont.):

(B) Concrete mixes shall be designed to be pumpable and flowable with minimum segregation and separation.

(C) The use of calcium chloride in any concrete is prohibited.

(D) A shrinkage reducing admixture (SRA), such as Master Life SRA35 by BASF or Eclipse by W.R. Grace & Co., or accepted equal, shall be added to the concrete mix for Items No. (2), (4), (5) and (8)a, under note 4.(A). The minimum dosage requirement shall be 128 ounces per cubic yard of concrete. Include the weight of the SRA with the total water in computation of the Water to Cement Ratio.

(E) A migrating corrosion inhibitor amine carboxylate water-based admixture shall be added to the concrete mix for Item Nos. (1), (2), (3), (4), (5), (7) and (8). under Note 4.(A). The minimum dosage shall be 24 ounces per cubic yard of concrete.

(F) A 1 1/2" long macro synthetic fiber such as Forta Ferro, Strux 90/40, Max Matrix, or approved equal shall be added to the concrete mix for items No. (2), (4), (5) and (8)a. under note 4.(A). The minimum dosage shall be 7.5 pounds per cubic yard of concrete.

(G) Non-shrink Grout shall be a pre-mixed product consisting of non-staining, non-metallic aggregate cement, water reducing and plasticizing agents capable of developing a minimum compressive strength of 4000 psi in 3 days and 7000 psi in 28 days. The non-shrink grout shall contain at least 10 grams of migrating amine carboxylate corrosion inhibiting admixture per 0.4 to 0.5 cubic feet of non-shrink grout.

(H) Cure concrete as specified in the Contract documents. Remove curing that may affect binding from all areas requiring future bonding unless a curing agent such as SINAK Lithium Cure or accepted equal that does not affect bond and provide equal or better curing is used.

(I) All concrete shall include at least one of the three methods stated in Section 601 of the Special Provisions, or approved equal, to reduce the embodied carbon footprint in concrete.

DATE	REVISION
3 7/21/21	Revised Comp. Strength for Prestressed Girders

DENNIS K. MITSUNAGA LICENSED PROFESSIONAL ENGINEER No. 2422-S HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

SIGNATURE 4/30/22 LIC. EXPIRATION

MITSUNAGA & ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STRUCTURAL GENERAL NOTES

KAMEHAMEHA HIGHWAY
Kaipapau Stream Bridge Replacement
Federal Aid Proj. No. BR-083-1(48)

Scale: None Date: February 2021

SHEET No. S0.4 OF 12 SHEETS

ADD. 65

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

DRAWING NAME: T:\PROJECTS\1-ACTIVE FILES\913-01_KAIPAPAU BRIDGE\INCOMING\072121_FROM_CHAD\KSB-S004 REV NOTE DELTA 3.DWG PLOT TIME: 07-21-21, 9:21 AM)