STATE OF HAWAII

DEPARTMENT OF HAWAIIAN HOME LANDS
91-5420 Kapolei Parkway,
Kapolei, HI. 96707

PLANS

FOR

FURNISHING LABOR AND MATERIALS FOR

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS

NĀNĀKULI, WAIʻANAE, ISLAND OF OAHU, HAWAIʻI

TMK: (1) 8-9-001: 004

IFB No.: IFB-25-HHL-014

November 2024

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS

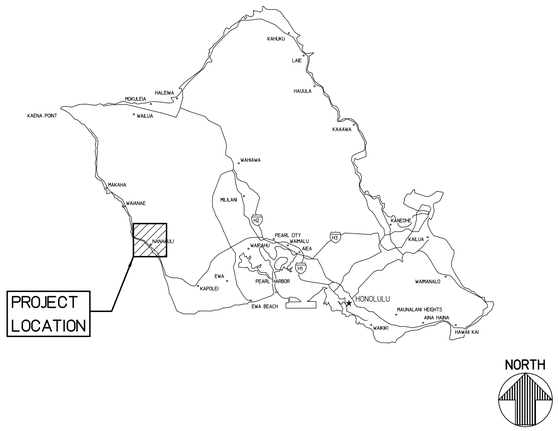
IFB-25-HHL-014

NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

PREPARED BY:
HAWAII ENGINEERING GROUP, INC.
1088 BISHOP STREET #2506, HONOLULU, HI 96813

TAX MAP KEY: 8-9-002:035, 037, 040-044, 061, 066 & 069
8-9-004:015, 020, 021, 045, 046, 053, 079, 137 & 158
8-9-007:011
8-9-009:090-092
8-9-012:061
8-9-013:011-023
8-9-014:034

ISLAND MAP



LOCATION MAP

INDEX TO DRAWINGS

COUNT	SHEET NUMBER	SHEET TITLE
GENERAL		
1	001	TITLE SHEET
2	002	BMP NOTES AND DETAILS
CIVIL		
3	C000	OVERALL SITE PLAN
4	C100	CHANNEL SEGMENT 1 PLAN
5	C101	CHANNEL SEGMENT 1.1 REPAIR PLAN (STA 0+00 TO 2+75)
6	C102	CHANNEL SEGMENT 1.2 REPAIR PLAN (STA 2+75 TO 5+75)
7	C103	CHANNEL SEGMENT 1.3 REPAIR PLAN (STA 5+75 TO 8+75)
8	C104	CHANNEL SEGMENT 1.4 REPAIR PLAN (STA 8+75 TO 11+75)
9	C105	CHANNEL SEGMENT 1.5 REPAIR PLAN (STA 11+75 TO 14+75)
10	C106	CHANNEL SEGMENT 1.6 REPAIR PLAN (STA 14+75 TO 17+25)
11	C107	CHANNEL SEGMENT 1.7 REPAIR PLAN (STA 17+25 TO 18+97.53)
12	C108	CHANNEL SEGMENT 1 REPAIR PHOTOS
13	C109	CHANNEL SEGMENT 1 REPAIR PHOTOS
14	C110	CHANNEL SEGMENT 1 REPAIR PHOTOS
15	C200	CHANNEL SEGMENT 2 PLAN
16	C201	CHANNEL SEGMENT 2.1 REPAIR PLAN (STA 0+00 TO 1+50)
17	C202	CHANNEL SEGMENT 2.2 REPAIR PLAN (STA 1+50 TO 4+50)
18	C203	CHANNEL SEGMENT 2.3 REPAIR PLAN (STA 4+50 TO 7+31.68)
19	C204	CHANNEL SEGMENT 2 REPAIR PHOTOS
20	C205	CHANNEL SEGMENT 2 REPAIR PHOTOS
21	C206	CHANNEL SEGMENT 2 REPAIR PHOTOS
22	C207	CHANNEL SEGMENT 2 REPAIR PHOTOS
23	C300	CHANNEL SEGMENT 3 PLAN
24	C301	CHANNEL SEGMENT 3.1 REPAIR PLAN (STA 0+00 TO 2+25)
25	C302	CHANNEL SEGMENT 3.2 REPAIR PLAN (STA 2+25 TO 4+37.54)
26	C303	CHANNEL SEGMENT 3 REPAIR PHOTOS
27	C304	CHANNEL SEGMENT 3 REPAIR PHOTOS
28	C400	CHANNEL SEGMENT 4 PLAN
29	C401	CHANNEL SEGMENT 4 REPAIR PHOTOS
30	C500	CHANNEL SEGMENT 5 PLAN
31	C501	CHANNEL SEGMENT 5.1 REPAIR PLAN (STA 0+00 TO 2+25)
32	C502	CHANNEL SEGMENT 5.2 REPAIR PLAN (STA 2+25 TO 4+51.70)
33	C503	CHANNEL SEGMENT 5 REPAIR PHOTOS
34	C504	CHANNEL SEGMENT 5 REPAIR PHOTOS
35	C505	CHANNEL SEGMENT 5 REPAIR PHOTOS
36	C600	CHANNEL SEGMENT 6 PLAN
37	C601	CHANNEL SEGMENT 6.1 REPAIR PLAN (STA 0+00 TO 2+00)
38	C602	CHANNEL SEGMENT 6.2 REPAIR PLAN (STA 2+00 TO 4+00)
39	C603	CHANNEL SEGMENT 6.3 REPAIR PLAN (STA 4+00 TO 6+06.36)
40	C604	CHANNEL SEGMENT 6 REPAIR PHOTOS
41	C605	CHANNEL SEGMENT 6 REPAIR PHOTOS
42	C700	CHANNEL SEGMENT 7 PLAN
43	C701	CHANNEL SEGMENT 7.1 REPAIR PLAN (STA 0+00 TO 3+00)
44	C702	CHANNEL SEGMENT 7.2 REPAIR PLAN (STA 3+00 TO 6+00)
45	C703	CHANNEL SEGMENT 7.3 REPAIR PLAN (STA 6+00 TO 9+00)
46	C704	CHANNEL SEGMENT 7.4 REPAIR PLAN (STA 9+00 TO 12+00)
47	C705	CHANNEL SEGMENT 7.5 REPAIR PLAN (STA 12+00 TO 15+00)
48	C706	CHANNEL SEGMENT 7.6 REPAIR PLAN (STA 15+00 TO 17+50)
49	C707	CHANNEL SEGMENT 7.7 REPAIR PLAN (STA 17+50 TO 20+25)
50	C708	CHANNEL SEGMENT 7.8 REPAIR PLAN (STA 20+25 TO 23+25)
51	C709	CHANNEL SEGMENT 7.9 REPAIR PLAN (STA 23+25 TO 26+00)
52	C710	CHANNEL SEGMENT 7.10 REPAIR PLAN (STA 26+00 TO 30+00)
53	C711	CHANNEL SEGMENT 7.11 REPAIR PLAN (STA 30+00 TO 32+90.80)
54	C712	CHANNEL SEGMENT 7 REPAIR PHOTOS
55	C713	CHANNEL SEGMENT 7 REPAIR PHOTOS
56	C714	CHANNEL SEGMENT 7 REPAIR PHOTOS
57	C715	CHANNEL SEGMENT 7 REPAIR PHOTOS
58	C800	CHANNEL SEGMENT 8 PLAN
59	C801	CHANNEL SEGMENT 8.1 REPAIR PLAN (STA 0+00 TO 3+25)
60	C802	CHANNEL SEGMENT 8.2 REPAIR PLAN (STA 3+25 TO 6+75)
61	C803	CHANNEL SEGMENT 8.3 REPAIR PLAN (STA 6+75 TO 10+00)
62	C804	CHANNEL SEGMENT 8.4 REPAIR PLAN (STA 10+00 TO 12+98.10)
63	C805	CHANNEL SEGMENT 8 REPAIR PHOTOS
64	C806	CHANNEL SEGMENT 8 REPAIR PHOTOS
65	C807	CHANNEL SEGMENT 8 REPAIR PHOTOS
66	C808	CHANNEL SEGMENT 8 REPAIR PHOTOS
67	C809	CHANNEL SEGMENT 8 REPAIR PHOTOS
68	C810	CHANNEL SEGMENT 8 REPAIR PHOTOS
69	C811	CHANNEL SEGMENT 8 REPAIR PHOTOS
70	C900	CHANNEL SEGMENT 9 PLAN
71	C901	CHANNEL SEGMENT 9 REPAIR PHOTOS
STRUCTURAL		
72	S001	SURFACE REPAIR NOTES AND DETAILS
73	S002	CHAINLINK FENCE REPAIR NOTES AND DETAILS
74	S003	CHAINLINK FENCE REPAIR NOTES AND DETAILS

APPROVALS

PREPARED FOR

DEPARTMENT OF HAWAIIAN HOME LANDS, STATE OF HAWAII

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DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS
NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

TITLE SHEET

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

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JOB NO.

SHEET 001
1 OF 74 SHTS

FILE ___ DRAWER ___ ___ FOLDER ___ ___

Plot date: 18-Sep-2024
Full Size Plot

BEST MANAGEMENT PRACTICES (BMPs) - DURING WORK IN THE RIGHT-OF-WAY:

1. ALL BEST MANAGEMENT PRACTICES (BMPs) TO BE INSTALLED PRIOR TO THE START OF CONSTRUCTION AND BE MAINTAINED UNTIL COMPLETION OF THE PROJECT.

2. THE CONTRACTOR SHALL OBSERVE AND COMPLY WITH ALL FEDERAL, STATE, AND LOCAL LAWS REQUIRED FOR THE PROTECTION OF PUBLIC HEALTH, SAFETY, AND ENVIRONMENTAL QUALITY.

3. STREET SWEEPING AND VACUUMING. ALL POLLUTANTS DISCHARGED FROM A CONSTRUCTION SITE TO OFF-SITE AREAS MUST BE SWEPT OR VACUUMED EACH DAY BEFORE LEAVING THE JOB SITE.

4. TRACKING CONTROL

* MINIMIZE SEDIMENT TRACK-OUT ONTO OFF-SITE STREETS, OTHER PAVED AREAS, AND SIDEWALKS FROM VEHICLES EXITING THE CONSTRU CTION SITE BY RESTRICTING VEHICLE TRAFFIC TO PROPERLY DESIGNATED AREAS AND USING ADDITIONAL CONTROLS TO REMOVE SEDIMENT FROM VEHICLE TIRES PRIOR TO EXITING THE SITE.

* VEHICULAR PARKING AND MOVEMENTS ON PROJECT SITES MUST BE CONFINED TO PAVED SURFACES OR PREDEFINED PARKING AREAS AND VEHICLE PATHS, WHICH SHALL BE MARKED WITH FLAGS OR BOUNDARY FENCING.

* ALL POLLUTANTS AND MATERIALS THAT ARE DROPPED, WASHED, TRACKED, SPILLED, OR OTHERWISE DISCHARGED FROM A PROJECT SITE TO OFF-SITE STREETS, OTHER PAVED AREAS, SIDEWALKS OR THE MS4 MUST BE CLEANED USING DRY METHODS SUCH AS SWEEPING OR VACUUMING.

* WASHING POLLUTANTS AND MATERIALS THAT ARE DISCHARGED FROM THE PROJECT SITE TO THE MS4 INTO DRAIN INLETS OR CATCH BASINS IS PROHIBITED UNLESS THE MATERIAL IS SEDIMENT AND THE INLETS ARE DIRECTED TO A SEDIMENT BASIN OR SEDIMENT TRAP.

EROSION AND TEMPORARY DUST CONTROL:

1. FOR DRAIN INLETS OUTSIDE OF THE ROADWAY, USE FILTER SOCKS FOR SEDIMENT PROTECTION. FOR DRAIN INLETS WITHIN THE ROADWAY, USE ULTRA DRAIN GUARD WITH OVERFLOW BYPASS, OR EQUIVALENT.

2. DURING CONSTRUCTION, PREVENTATIVE MEASURES SHALL BE USED TO CONTROL FORESEEABLE DUST, EROSION OR SEDIMENTATION PROBLEMS WHICH MAY ARISE AS THE JOB PROGRESSES. DAILY STREET SWEEPING OR VACUUMING IS REQUIRED TO PREVENT TRACKING ON THE STREET.

3. FUGITIVE DUST AND SOLID WASTE DISPOSAL DURING GRUBBING AND GRADING ACTIVITIES SHALL MEET REQUIREMENTS OF ADMINISTRATIVE RULES, TITLE II, CHAPTER 60, AIR POLLUTION CONTROL AND CHAPTER 58, SOLID WASTE MANAGEMENT CONTROL.

4. THE CONTRACTOR, AT HIS OWN EXPENSE, SHALL KEEP THE PROJECT AREA AND SURROUNDING AREA FREE FROM DUST NUISANCE. THE WORK SHALL BE IN CONFORMANCE WITH THE AIR POLLUTION CONTROL STANDARDS AND REGULATIONS OF THE STATE DEPARTMENT OF HEALTH.

ADDITIONAL EROSION CONTROL/BEST MANAGEMENT PRACTICES NOTES:

° EROSION CONTROL MEASURES TO BE INSTALLED PRIOR TO START OF PROJECT AND BE MAINTAINED UNTIL COMPLETION OF PROJECT.

° CONTRACTOR TO PERIODICALLY INSPECT SILT FENCE, STABILIZED CONSTRUCTION ENTRANCE, CATCH BASIN AND INLET FILTERS ESPECIALLY DURING HEAVY RAINFALL. CONTRACTOR SHALL ALSO ENSURE DRAINAGE THROUGH FILTER MATERIAL IS MAINTAINED.

° THE FINAL LIFT OF EACH DAY'S WORK SHALL BE COMPACTED TO PREVENT EROSION OF FILL MATERIAL.

° GOOD HOUSEKEEPING SHALL BE UTILIZED TO ENSURE PROTECTION OF ROADWAYS FROM MUD, DIRT, AND DEBRIS.

° THE CONTRACTOR SHALL ENSURE THAT ALL TIRES OF CONSTRUCTION VEHICLES ARE SUFFICIENTLY CLEANED OFF SO THAT DIRT OR DEBRIS IS NOT TRACKEDD OFF THE CONSTRUCTION SITE. WASHING OFF TIRES WITH WATER WILL NOT BE ACCEPTABLE UNLESS THE RUNOFF IS CONTAINED AND DOES NOT ENTER THE STORM DRAIN SYSTEM OR ONTO THE STATE'S ROW.

° AT THE END OF GRADING OPERATIONS AND AT THE COMPLETION OF PROJECT, CONTRACTOR SHALL INSPECT ALL CATCH BASIN, DRAIN INLET AND DRAIN MANHOLEE SURROUNDING THE PROJECT SITE. ANY ACCUMULATED SEDIMENT AND DEBRIS FOUND IN THE STORM DRAIN STRUCTURES SHALL BE REMOVED. PLEASE NOTE THAT FLUSHING INTO THE DRAIN STRUCTURES ARE PROHIBITED.

° ANY DIRT OR GRASSED AREA DISTURBED SHALL BE RESTORED BY RE-GRASSING THE AREA OR BY SEEDED HYDROMULCH. THE GRASS SHALL BE FULLY ESTABLISHED AT COMPLETION OF PROJECT.

GOOD HOUSEKEEPING BMPS:

1. STREET SWEEPING AND VACUUMING. ALL POLLUTANTS DISCHARGED FROM A CONSTRUCTION SITE TO OFF-SITE AREAS MUST BE SWEPT OR VACUUMED EACH DAY BEFORE LEAVING THE JOB SITE.

2. MATERIALS DELIVERY, STORAGE AND USE MANAGEMENT. PREVENT, REDUCE, OR ELIMINATE THE DISCHARGE OF POLLUTANTS FROM MATERIAL DELIVERY, STORAGE, OTHER SOURCES OF POLLUTION SHALL NOT BE STORED IN BUFFER AREAS, NEAR AREAS OF CONCENTRATED FLOW, OR AREAS ABUTTING THE MS4, RECEIVING WATERS, OR DRAINAGE IMPROVEMENTS THAT DISCHARGE OFF-SITE. PRIMARY AND SECONDARY CONTAINMENT CONTROLS AND COVERS SHALL BE IMPLEMENTED TO THE MEP.

3. SPILL PREVENTION AND CONTROL. PROJECTS SHALL CREATE AND IMPLEMENT SPILL PREVENTION AND RESPONSE PLANS TO ELIMINATE AND MINIMIZE THE DISCHARGE OF POLLUTANTS TO THE MS4 AND RECEIVING WATERS FROM LEAKS AND SPILLS BY REDUCING THE CHANCE FOR SPILLS, ABSORBING, CONTAINING, AND CLEANING UP SPILLS AND PROPERLY DISPOSING OF SPILL MATERIALS. AT A MINIMUM, ALL PROJECTS SHALL CLEANUP ALL LEAKS AND SPILLS IMMEDIATELY.

4. HAZARDOUS MATERIALS. PREVENT OR REDUCE THE DISCHARGE OF POLLUTANTS TO STORM WATER FROM HAZARDOUS WASTE THROUGH PROPER MATERIAL USE AND WASTE DISPOSAL. IN THE EVENT THAT HAZARDOUS MATERIALS ARE DISCHARGED TO THE MS4, THE PROPERTY OWNER OR ESCP COORDINATOR SHALL IMMEDIATELY NOTIFY THE DEPARTMENT OF FACILITIES MAINTENANCE, HONOLULU FIRE DEPARTMENT, AND HONOLULU POLICE DEPARTMENT OF THE DISCHARGE BY TELEPHONE. A WRITTEN REPORT DESCRIBING THE POLLUTANTS THAT WERE DISCHARGED, THE REASONS FOR THE DISCHARGE, AND THE MEASURES THAT HAVE BEEN TAKEN OR WILL BE TAKEN TO PREVENT A REOCCURRENCE OF THE DISCHARGE SHALL BE SUBMITTED TO THE DIRECTOR NO LESS THAN 3 DAYS AFTER NOTIFICATION BY PHONE.

5. NONHAZARDOUS MATERIALS. IN THE EVENT THAT NONHAZARDOUS MATERIALS ARE DISCHARGED TO THE MS4, THE PROPERTY OWNER OR ESCP COORDINATOR SHALL NOTIFY THE CITY DEPARTMENT OF FACILITIES MAINTENANCE BY TELEPHONE NO LATER THAN THE NEXT BUSINESS DAY. A WRITTEN REPORT DESCRIBING THE POLLUTANTS THAT WERE DISCHARGED, THE REASONS FOR THE DISCHARGE, AND THE MEASURES THAT HAVE BEEN TAKEN OR WILL BE TAKEN TO PREVENT A REOCCURRENCE OF THE DISCHARGE SHALL BE SUBMITTED TO THE DIRECTOR NO LESS THAN 3 DAYS AFTER NOTIFICATION BY PHONE.

6. VEHICLE AND EQUIPMENT CLEANING. ELIMINATE AND MINIMIZE THE DISCHARGE OF POLLUTANTS TO STORM WATER FROM VEHICLE AND EQUIPMENT CLEANING OPERATIONS BY USING OFF-SITE FACILITIES WHEN FEASIBLE, WASHING IN DESIGNATED, CONTAINED AREAS ONLY, AND ELIMINATING DISCHARGES TO THE STORM DRAIN SYSTEM BY EVAPORATING AND/OR TREATING WASH WATER, AS APPROPRIATE OR INFILTRATING WASH WATER FOR EXTERIOR CLEANING ACTIVITIES THAT USE WATER ONLY.

7. VEHICLE AND EQUIPMENT FUELING. PREVENT FUEL SPILLS AND LEAKS BY USING OFF-SITE FACILITIES, FUELING ONLY IN DESIGNATED AREAS, ENCLOSING OR COVERING STORED FUEL, AND IMPLEMENTING SPILL CONTROLS SUCH AS SECONDARY CONTAINMENT AND ACTIVE MEASURES USING SPILL RESPONSE KITS.

8. VEHICLE AND EQUIPMENT MAINTENANCE. ELIMINATE AND MINIMIZE THE DISCHARGE OF POLLUTANTS TO STORM WATER FROM VEHICLE AND EQUIPMENT MAINTENANCE OPERATIONS BY USING OFF-SITE FACILITIES WHEN FEASIBLE. PERFORMING WORK IN DESIGNATED AREAS ONLY, USING SPILL PADS UNDER VEHICLES AND EQUIPMENT, CHECKING FOR LEAKS AND SPILLS, AND CONTAINING AND CLEANING UP SPILLS IMMEDIATELY.

9. SOLID WASTE MANAGEMENT. PREVENT OR REDUCE DISCHARGE OF POLLUTANTS TO THE LAND, GROUNDWATER, AND IN STORM WATER FROM SOLID WASTE OR CONSTRUCTION AND DEMOLITION WASTE BY PROVIDING DESIGNATED WASTE COLLECTION AREAS, COLLECT SITE TRASH DAILY, AND ENSURING THAT CONSTRUCTION WASTE IS COLLECTED, REMOVED, AND DISPOSED OF ONLY AT AUTHORIZED DISPOSAL AREAS.

10. SANITARY/SEPTIC WASTE MANAGEMENT. TEMPORARY AND PORTABLE SANITARY AND SEPTIC WASTE SYSTEMS SHALL BE MOUNTED OR STAKED IN, WELL-MAINTAINED AND SCHEDULED FOR REGULAR WASTE DISPOSAL AND SERVICING. SOURCES OF SANITARY AND/OR SEPTIC WASTE SHALL NOT BE STORED NEAR THE MS4 OR RECEIVING WATERS.

11. STOCKPILE MANAGEMENT. STOCKPILES SHALL NOT BE LOCATED IN DRAINAGE WAYS, WITHIN 50 FEET FROM AREAS OF CONCENTRATED FLOWS, AND ARE NOT ALLOWED IN THE CITY RIGHT-OF-WAY. SEDIMENT BARRIERS OR SILT FENCES SHALL BE USED AROUND THE BASE OF ALL STOCKPILES. STOCKPILES SHALL NOT EXCEED 15 FEET IN HEIGHT. STOCKPILES GREATER THAN 15 FEET IN HEIGHT SHALL REQUIRE 8-FOOT WIDE BENCHING IN ACCORDANCE WITH ROH CHAPTER 14, ARTICLE 15. STOCKPILES MUST BE COVERED WITH PLASTIC SHEETING OR A COMPARABLE MATERIAL IF THEY WILL NOT BE ACTIVELY USED WITHIN 7 DAYS.

12. LIQUID WASTE MANAGEMENT. LIQUID WASTE SHALL BE CONTAINED IN A CONTROLLED AREA SUCH AS A HOLDING PIT, SEDIMENT BASIN, ROLL-OFF BIN, OR PORTABLE TANK OF SUFFICIENT VOLUME AND TO CONTAIN THE LIQUID WASTES GENERATED. CONTAINMENT AREAS OR DEVICES MUST BE IMPERMEABLE AND LEAK FREE AND SHOULD NOT BE LOCATED WHERE ACCIDENTAL RELEASE OF THE CONTAINED LIQUID CAN DISCHARGE TO WATER BODIES, CHANNELS, OR STORM DRAINS.

13. CONCRETE WASTE MANAGEMENT. PREVENT OR REDUCE THE DISCHARGE OF POLLUTANTS TO STORM WATER FROM CONCRETE WASTE BY CONDUCTING WASHOUT OFFSITE OR PERFORMING ONSITE WASHOUT IN A DESIGNATED AREA CONSTRUCTED AND MAINTAINED IN SUFFICIENT QUANTITY AND SIZE TO CONTAIN ALL LIQUID AND CONCRETE WASTE GENERATED BY WASHOUT OPERATIONS. PLASTIC LINING MATERIAL SHOULD BE A MINIMUM OF 10-MILLIMETER POLYETHYLENE SHEETING AND SHOULD BE FREE OF HOLES, TEARS, OR OTHER DEFECTS THAT COMPROMISE THE IMPERMEABILITY OF THE MATERIAL. CONTAINMENT AREAS OR DEVICES SHOULD NOT BE LOCATED WHERE ACCIDENTAL RELEASE OF THE CONTAINED LIQUID CAN DISCHARGE TO WATER BODIES, CHANNELS, OR STORM DRAINS. WASHOUT FACILITIES MUST BE CLEANED, OR NEW FACILITIES MUST BE CONSTRUCTED AND READY FOR USE ONCE THE WASHOUT IS 75 PERCENT FULL. ONCE CONCRETE WASTES ARE WASHED INTO THE DESIGNATED AREA AND ALLOWED TO HARDEN, THE CONCRETE SHOULD BE BROKEN UP, REMOVED, AND DISPOSED OF AS SOLID WASTES.

14. CONTAMINATED SOIL MANAGEMENT. AT MINIMUM CONTAIN CONTAMINATED MATERIAL SOIL BY SURROUNDING WITH IMPERMEABLE LINED BERMS OR COVER EXPOSED CONTAMINATED MATERIAL WITH PLASTIC SHEETING. CONTAMINATED SOIL SHOULD BE DISPOSED OF PROPERLY IN ACCORDANCE WITH ALL APPLICABLE REGULATIONS.

REVISION NO.	DATE	REVISIONS	BY

ATHER R. DAR
LICENSED PROFESSIONAL ENGINEER
No. 7808-S
HAWAII U.S.A.
Exp. Date: 4-30-24

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DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS
NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

BMP NOTES AND DETAILS

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

HAWAII ENGINEERING GROUP, Inc.
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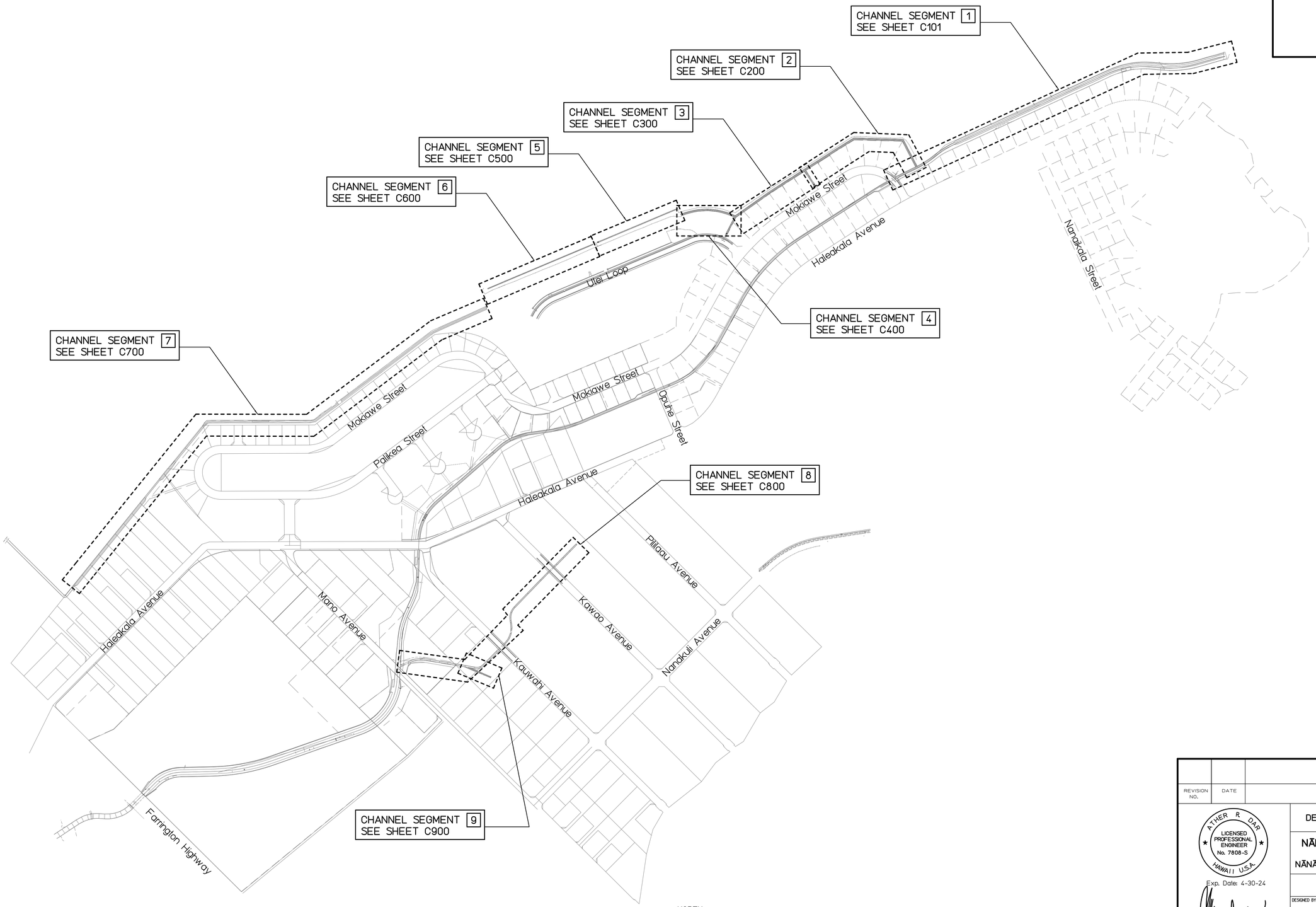
JOB NO.

SHEET 002
2 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

Plot date: 14-Nov-2023

J:/2020 Projects/20-066 DHHL PS-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/002



OVERALL SITE PLAN

NOT TO SCALE

NORTH

REVISION NO.	DATE	REVISIONS	BY

ATHER R. DAR
LICENSED PROFESSIONAL ENGINEER
No. 7808-S
HAWAII U.S.A.

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DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS

NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

OVERALL SITE PLAN

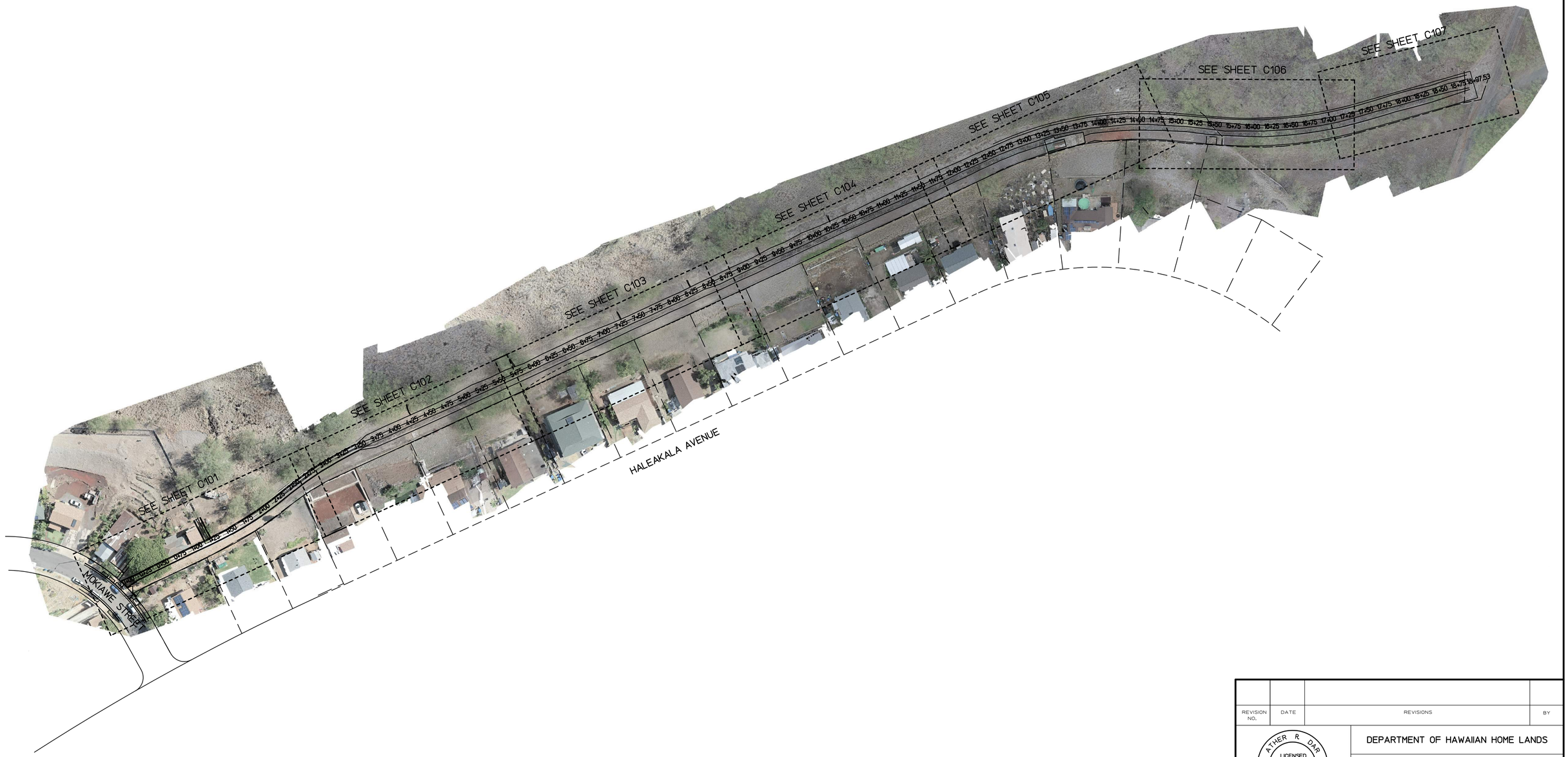
DESIGNED BY: AD	HAWAII ENGINEERING GROUP, Inc. Civil & Structural Engineers	JOB NO.
DRAWN BY: AK, AP, DL		
CHECKED BY: AD	1088 BISHOP STREET #2506 HONOLULU, HI 96813 Tel: 808-533-2092	SHEET C000
SUPV:		
DATE: 10/16/2023		3 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

Plot date: 14-Nov-2023

J:/2020 Projects/20-066 DHHL PS-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/C000

Plot date: 14-Nov-2023
J:/2020 Projects/20-066 DHHL PS-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/C100



CHANNEL SEGMENT 1 PLAN

SCALE: 1" = 60'

NORTH

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HAWAII U.S.A.

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NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS

NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 1 REPAIR PLAN

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

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JOB NO.

SHEET C100

4 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

Plot date: 14-Nov-2023
Jr/2020 Projects/20-066 DHHL PS-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/C101

LEGEND:

2	CRACK REPAIR TYPE, SEE DETAIL 1/S001 AND 2/S001
3	SPALL REPAIR TYPE, SEE DETAIL 3/S001
G	CHAINLINK FENCE REPAIR TYPE, SEE SHEETS S002 AND S003
C-X	CRACK REPAIR MARK
SP-X	SPALL REPAIR MARK
CF-X	CHAINLINK FENCE REPAIR MARK
CS-X	CONCRETE SEALER REPAIR MARK, SEE DETAIL 4/S001
PX	PHOTO REFERENCE, SEE SHEETS C108 TO C110

DEMOLITION AND REPAIR NOTES:

A	ADD MORTAR CAP ON WALL TOP
B	REGROUT WALL
C	REMOVE TREE
D	REMOVE TREE STUMP
E	REMOVE BOULDERS
F	REMOVE DEBRIS ALONG CHANNEL FLOOR
G	REMOVE DEBRIS ALONG CHANNEL WALL
H	DEMOLISH AND CONSTRUCT NEW WALL, SEE DETAIL 5/S001

CHANNEL SEGMENT 1.1 REPAIR PLAN (STA 0+00 TO 2+75)

SCALE: 1" = 10'

NORTH

STATIONING	SURFACE LOCATION	MARK	REPAIR TYPE	DIMENSION L(ft)	W(in)	D(in)	PHOTO REFERENCE
0+00 TO 0+50	FLOOR		F	50			P1
0+07 TO 0+13	SOUTH WALL	C-1	2	6			P2
0+08	SOUTH WALL	SP-1	3				
0+08 TO 0+35	NORTH WALL		G	27			P3
0+52 TO 0+68	NORTH WALL		G	16			P4
1+78	NORTH WALL	C-2	2	4			P5
2+25	NORTH WALL	C-3	2	4			P6

REVISION NO.	DATE	REVISIONS	BY

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HAWAII U.S.A.
Exp. Date: 4-30-24

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DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS
NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 1.1 REPAIR PLAN
(STA 0+00 TO 2+75)

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

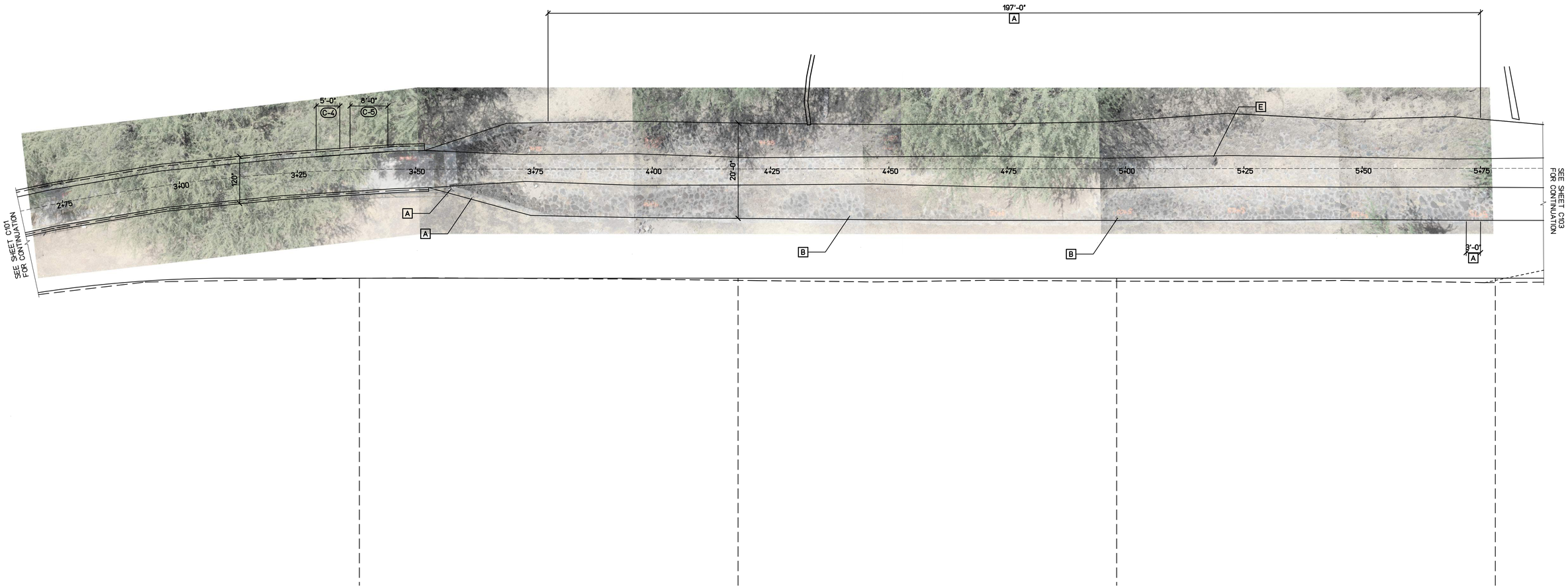
HAWAII ENGINEERING GROUP, Inc.
Civil & Structural Engineers
1088 BISHOP STREET #2506
HONOLULU, HI 96813
Tel: 808-533-2092

JOB NO.

SHEET C101
5 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

J:/2020 Projects/20-066 DHHL PS-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/C102
Plot date: 14-Nov-2023



LEGEND:

2	CRACK REPAIR TYPE, SEE DETAIL 1/S001 AND 2/S001
3	SPALL REPAIR TYPE, SEE DETAIL 3/S001
G	CHAINLINK FENCE REPAIR TYPE, SEE SHEETS S002 AND S003
C-X	CRACK REPAIR MARK
SP-X	SPALL REPAIR MARK
CF-X	CHAINLINK FENCE REPAIR MARK
CS-X	CONCRETE SEALER REPAIR MARK, SEE DETAIL 4/S001
PX	PHOTO REFERENCE, SEE SHEETS C108 TO C110

DEMOLITION AND REPAIR NOTES:

A	ADD MORTAR CAP ON WALL TOP
B	REGROUT WALL
C	REMOVE TREE
D	REMOVE TREE STUMP
E	REMOVE BOULDERS
F	REMOVE DEBRIS ALONG CHANNEL FLOOR
G	REMOVE DEBRIS ALONG CHANNEL WALL
H	DEMOLISH AND CONSTRUCT NEW WALL, SEE DETAIL 5/S001

CHANNEL SEGMENT 1.2 REPAIR PLAN (STA 2+75 TO 5+75)

SCALE: 1" = 10'

NORTH

STATIONING	SURFACE LOCATION	MARK	REPAIR TYPE	DIMENSION L(ft)	DIMENSION W(in)	DIMENSION D(in)	PHOTO REFERENCE
3+29 TO 3+34	NORTH WALL	C-4	2	5			P7
3+36 TO 3+44	NORTH WALL	C-5	2	8			P8
3+56	SOUTH WALL		A	2	12		P9
3+60	SOUTH WALL		A	2	12		P10
3+78 TO 5+75	NORTH WALL		A	197	12		P11
4+42	SOUTH WALL		B				P12
4+98	SOUTH WALL		B				P13
5+19	FLOOR		E			24	P14
5+72 TO 5+75	SOUTH WALL		A	3	12		P15

REVISION NO.	DATE	REVISIONS	BY

ATHER R. DAR
LICENSED PROFESSIONAL ENGINEER
No. 7808-S
HAWAII U.S.A.
Exp. Date: 4-30-24

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DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS
NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 1.2 REPAIR PLAN
(STA 2+75 TO 5+75)

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

HAWAII ENGINEERING GROUP, Inc.
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1088 BISHOP STREET #2506
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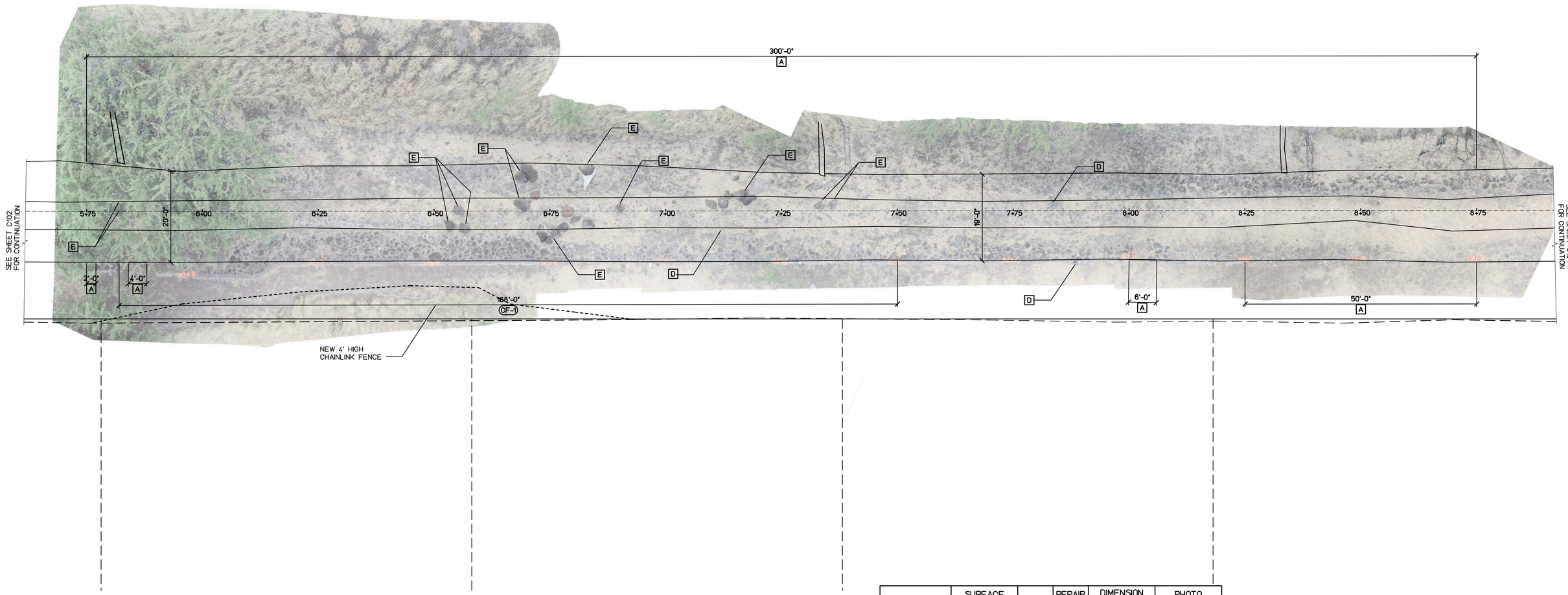
Tel: 808-533-2092

JOB NO.

SHEET C102
6 OF 74 SHTS

FILE ___ DRAWER ___ ___ FOLDER ___ ___



STATIONING	SURFACE LOCATION	MARK	REPAIR TYPE	DIMENSION L(ft)	DIMENSION W(in)	DIMENSION D(in)	PHOTO REFERENCE
5+75 TO 5+77	SOUTH WALL		A	2	12		P15
5+75 TO 8+75	NORTH WALL		A	300	12		P16
5+82 TO 7+50	SOUTH WALL	CF-1	G	168			P17
5+84	FLOOR		E			24	P18
	NORTH WALL		E			24	
5+84 TO 5+88	SOUTH WALL		A	4	12		P19
6+55	FLOOR		E				P20
6+69	FLOOR		E				P21
	NORTH WALL		E				
6+75 TO 6+85	FLOOR		E	10	24		P22
6+83	NORTH WALL		E				P23
6+90	FLOOR		E				P24
7+14	FLOOR		E	9	36		P25
	NORTH WALL		D				
7+33	FLOOR		E				P26
7+84	FLOOR		D				P27
7+89	SOUTH WALL		D				P28
8+00 TO 8+06	SOUTH WALL		A	6	12		P29
8+25 TO 8+75	SOUTH WALL		A	50	12		P30

LEGEND:

2	CRACK REPAIR TYPE, SEE DETAIL 1/S001 AND 2/S001
3	SPALL REPAIR TYPE, SEE DETAIL 3/S001
G	CHAINLINK FENCE REPAIR TYPE, SEE SHEETS S002 AND S003
C-X	CRACK REPAIR MARK
SP-X	SPALL REPAIR MARK
CF-X	CHAINLINK FENCE REPAIR MARK
CS-X	CONCRETE SEALER REPAIR MARK, SEE DETAIL 4/S001
PX	PHOTO REFERENCE, SEE SHEETS C108 TO C110

DEMOLITION AND REPAIR NOTES:

A	ADD MORTAR CAP ON WALL TOP
B	REGROUT WALL
C	REMOVE TREE
D	REMOVE TREE STUMP
E	REMOVE BOULDERS
F	REMOVE DEBRIS ALONG CHANNEL FLOOR
G	REMOVE DEBRIS ALONG CHANNEL WALL
H	DEMOLISH AND CONSTRUCT NEW WALL, SEE DETAIL 5/S001

CHANNEL SEGMENT 1.3 REPAIR PLAN (STA 5+75 TO 8+75)

SCALE: 1" = 10'

NORTH

REVISION NO.	DATE	REVISIONS	BY

ATHER R. DAR
LICENSED PROFESSIONAL ENGINEER
No. 7808-S
HAWAII U.S.A.
Exp. Date: 4-30-24

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NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS

NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 1.3 REPAIR PLAN (STA 5+75 TO 8+75)

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

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JOB NO.

SHEET C103
7 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

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Plot date: 14-Nov-2023

J:/2020 Projects/20-066 DHHL PS-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/C104 Plot date: 14-Nov-2023

LEGEND:

2	CRACK REPAIR TYPE, SEE DETAIL 1/S001 AND 2/S001
3	SPALL REPAIR TYPE, SEE DETAIL 3/S001
G	CHAINLINK FENCE REPAIR TYPE, SEE SHEETS S002 AND S003
C-X	CRACK REPAIR MARK
SP-X	SPALL REPAIR MARK
CF-X	CHAINLINK FENCE REPAIR MARK
CS-X	CONCRETE SEALER REPAIR MARK, SEE DETAIL 4/S001
PX	PHOTO REFERENCE, SEE SHEETS C108 TO C110

DEMOLITION AND REPAIR NOTES:

A	ADD MORTAR CAP ON WALL TOP
B	REGROUT WALL
C	REMOVE TREE
D	REMOVE TREE STUMP
E	REMOVE BOULDERS
F	REMOVE DEBRIS ALONG CHANNEL FLOOR
G	REMOVE DEBRIS ALONG CHANNEL WALL
H	DEMOLISH AND CONSTRUCT NEW WALL, SEE DETAIL 5/S001

STATIONING	SURFACE LOCATION	MARK	REPAIR TYPE	DIMENSION			PHOTO REFERENCE
				L(ft)	W(in)	D(in)	
8+75 TO 9+68	SOUTH WALL		A	93	12		P31
8+75 TO 11+75	NORTH WALL		A	300	12		P32
9+17	FLOOR		E				P33
9+25	FLOOR		E				

CHANNEL SEGMENT 1.4 REPAIR PLAN (STA 8+75 TO 11+75)

SCALE: 1" = 10'

NORTH

REVISION NO.	DATE	REVISIONS	BY

ATHER R. DAR
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No. 7808-S
HAWAII U.S.A.
Exp. Date: 4-30-24

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NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS

NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 1.4 REPAIR PLAN (STA 8+75 TO 11+75)

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CHECKED BY: AD
SUPV:
DATE: 10/16/2023

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Tel: 808-533-2092

JOB NO.

SHEET C104

8 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

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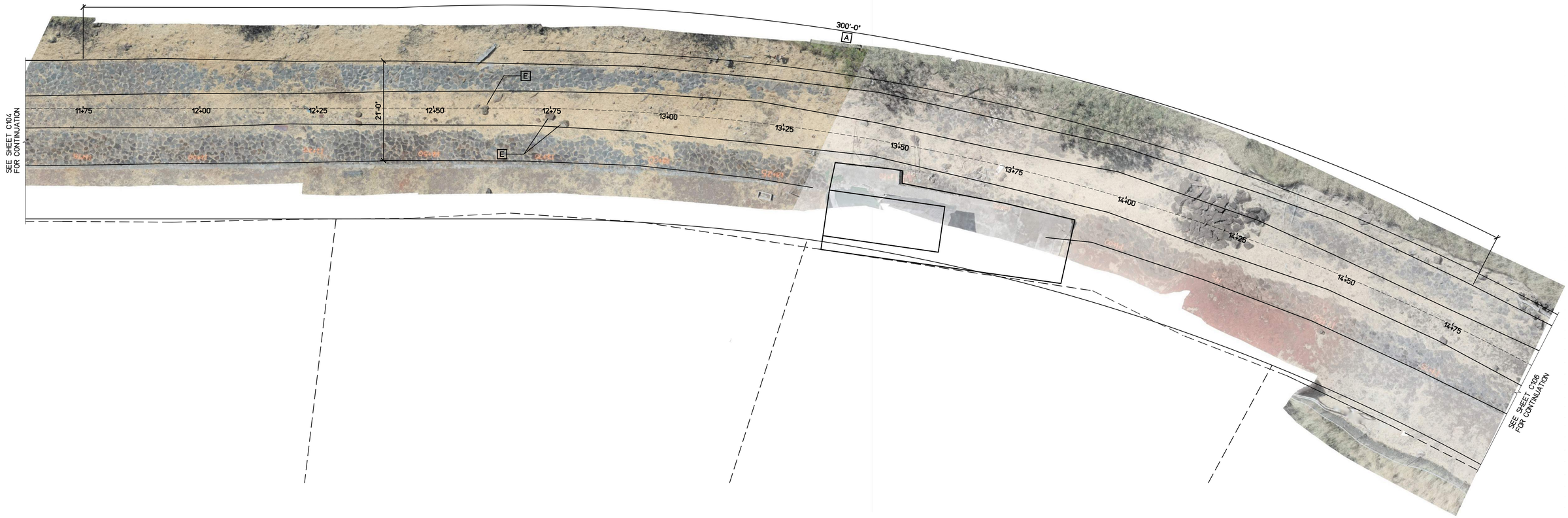

LEGEND:	
(2)	CRACK REPAIR TYPE, SEE DETAIL 1/S001 AND 2/S001
(3)	SPALL REPAIR TYPE, SEE DETAIL 3/S001
(G)	CHAINLINK FENCE REPAIR TYPE, SEE SHEETS S002 AND S003
(C-X)	CRACK REPAIR MARK
(SP-X)	SPALL REPAIR MARK
(CF-X)	CHAINLINK FENCE REPAIR MARK
(CS-X)	CONCRETE SEALER REPAIR MARK, SEE DETAIL 4/S001
PX	PHOTO REFERENCE, SEE SHEETS C108 TO C110

DEMOLITION AND REPAIR NOTES:	
A	ADD MORTAR CAP ON WALL TOP
B	REGROUT WALL
C	REMOVE TREE
D	REMOVE TREE STUMP
E	REMOVE BOULDERS
F	REMOVE DEBRIS ALONG CHANNEL FLOOR
G	REMOVE DEBRIS ALONG CHANNEL WALL
H	DEMOLISH AND CONSTRUCT NEW WALL, SEE DETAIL 5/S001

CHANNEL SEGMENT 1.5 REPAIR PLAN (STA 11+75 TO 14+75)

SCALE: 1" = 10'

NORTH

STATIONING	SURFACE LOCATION	MARK	REPAIR TYPE	DIMENSION			PHOTO REFERENCE
				L(ft)	W(in)	D(in)	
11+75 TO 14+75	NORTH WALL		A	300	12		P34
12+61	FLOOR		E				P35
12+75	FLOOR		E				P36

REVISION NO.	DATE	REVISIONS	BY

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DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS

NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 1.5 REPAIR PLAN (STA 11+75 TO 14+75)

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

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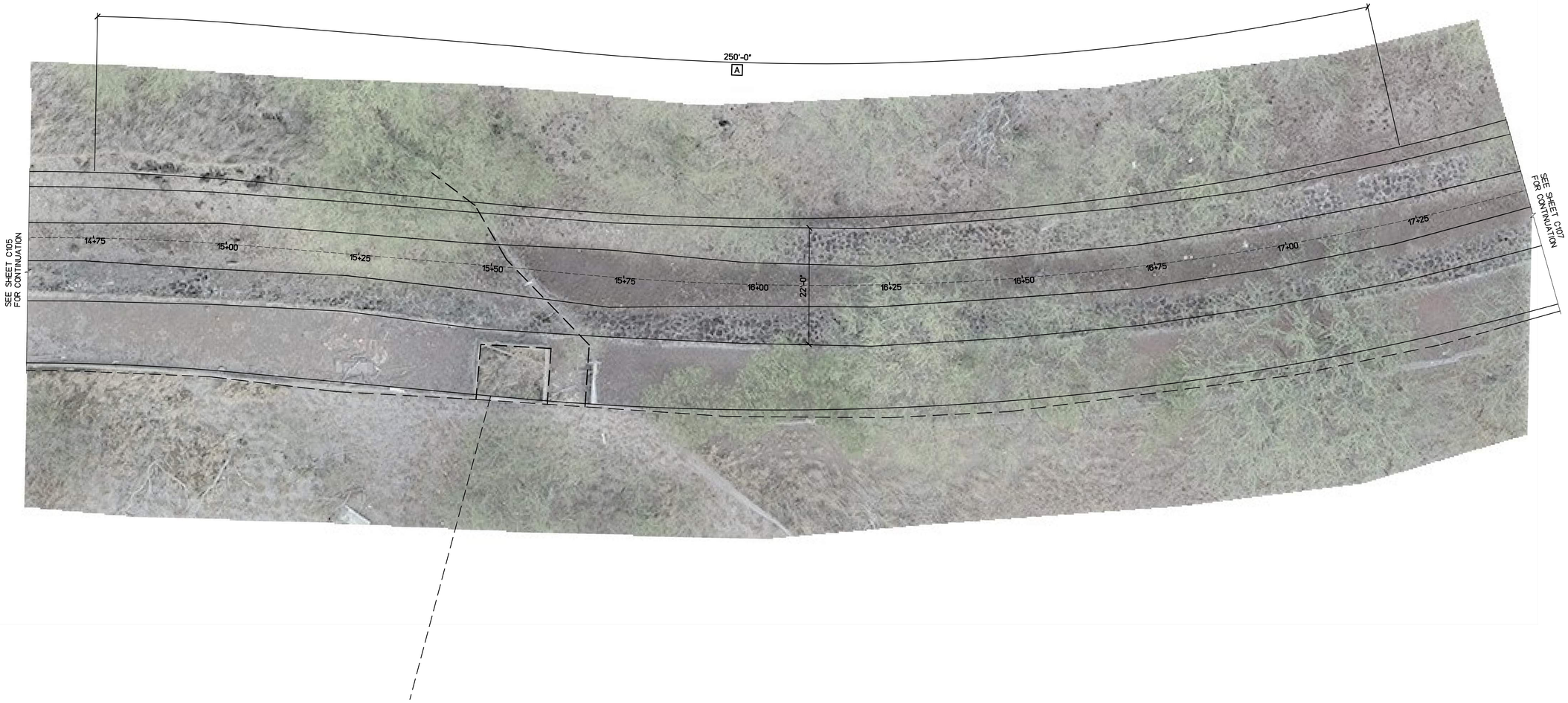
HONOLULU, HI 96813
Tel: 808-533-2092

JOB NO.

SHEET C105
9 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

Plot date: 14-Nov-2023
J:/2020 Projects/20-066 DHHL PS-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/C106



LEGEND:	
2	CRACK REPAIR TYPE, SEE DETAIL 1/S001 AND 2/S001
3	SPALL REPAIR TYPE, SEE DETAIL 3/S001
G	CHAINLINK FENCE REPAIR TYPE, SEE SHEETS S002 AND S003
C-X	CRACK REPAIR MARK
SP-X	SPALL REPAIR MARK
CF-X	CHAINLINK FENCE REPAIR MARK
CS-X	CONCRETE SEALER REPAIR MARK, SEE DETAIL 4/S001
PX	PHOTO REFERENCE, SEE SHEETS C108 TO C110

DEMOLITION AND REPAIR NOTES:	
A	ADD MORTAR CAP ON WALL TOP
B	REGROUT WALL
C	REMOVE TREE
D	REMOVE TREE STUMP
E	REMOVE BOULDERS
F	REMOVE DEBRIS ALONG CHANNEL FLOOR
G	REMOVE DEBRIS ALONG CHANNEL WALL
H	DEMOLISH AND CONSTRUCT NEW WALL, SEE DETAIL 5/S001

STATIONING	SURFACE LOCATION	MARK	REPAIR TYPE	DIMENSION			PHOTO REFERENCE
				L(ft)	W(in)	D(in)	
14+75 TO 17+25	NORTH WALL		A	250	12		P37

CHANNEL SEGMENT 1.6 REPAIR PLAN (STA 14+75 TO 17+25)

SCALE: 1" = 10'

NORTH

REVISION NO.	DATE	REVISIONS	BY

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LICENSED PROFESSIONAL ENGINEER
No. 7808-S
HAWAII U.S.A.
Exp. Date: 4-30-24

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DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS
NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 1.6 REPAIR PLAN
(STA 14+75 TO 17+25)

DESIGNED BY: AD
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CHECKED BY: AD
SUPV:
DATE: 10/16/2023

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JOB NO.

SHEET C106
10 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

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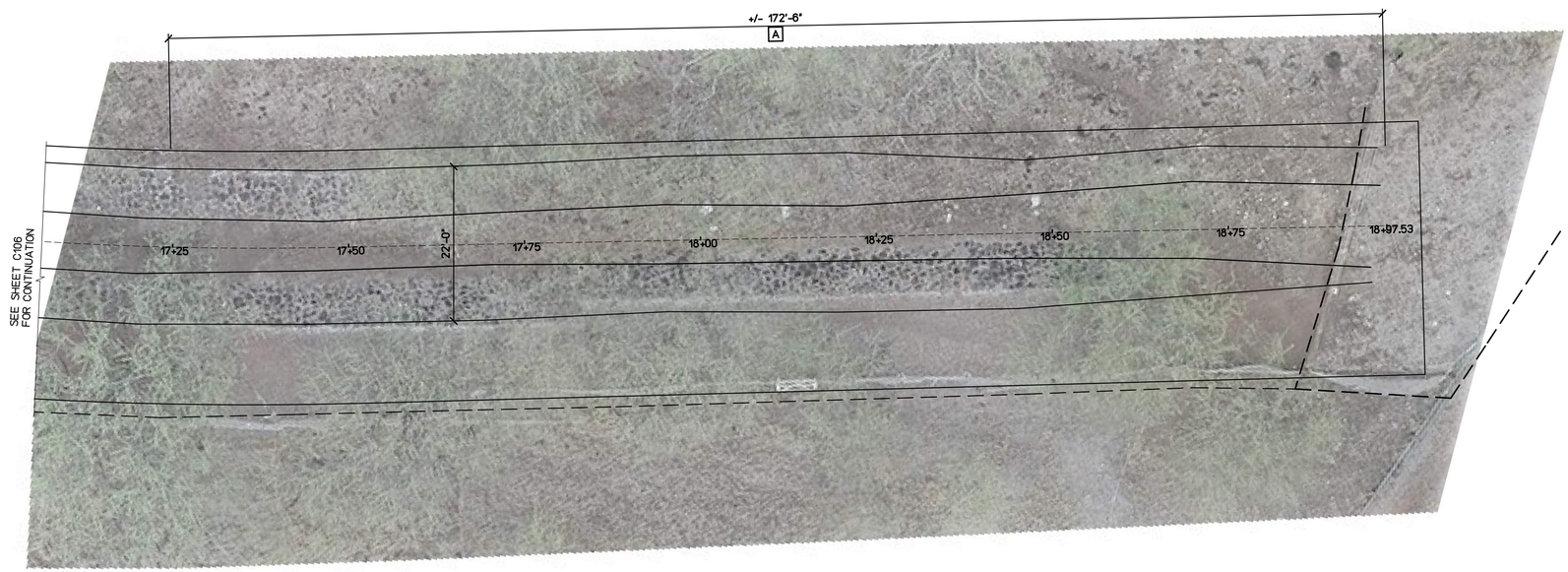

LEGEND:	
2	CRACK REPAIR TYPE, SEE DETAIL 1/S001 AND 2/S001
3	SPALL REPAIR TYPE, SEE DETAIL 3/S001
G	CHAINLINK FENCE REPAIR TYPE, SEE SHEETS S002 AND S003
C-X	CRACK REPAIR MARK
SP-X	SPALL REPAIR MARK
CF-X	CHAINLINK FENCE REPAIR MARK
CS-X	CONCRETE SEALER REPAIR MARK, SEE DETAIL 4/S001
PX	PHOTO REFERENCE, SEE SHEETS C108 TO C110

DEMOLITION AND REPAIR NOTES:	
A	ADD MORTAR CAP ON WALL TOP
B	REGROUT WALL
C	REMOVE TREE
D	REMOVE TREE STUMP
E	REMOVE BOULDERS
F	REMOVE DEBRIS ALONG CHANNEL FLOOR
G	REMOVE DEBRIS ALONG CHANNEL WALL
H	DEMOLISH AND CONSTRUCT NEW WALL, SEE DETAIL 5/S001

CHANNEL SEGMENT 1.7 REPAIR PLAN (STA 17+25 TO 18+97.53)

SCALE: 1" = 10'

NORTH

STATIONING	SURFACE LOCATION	MARK	REPAIR TYPE	DIMENSION			PHOTO REFERENCE
				L(ft)	W(in)	D(in)	
17+25 TO 18+97.53	NORTH WALL		A	172.53	12		P38

REVISION NO.	DATE	REVISIONS	BY

ATHER R. DAR
LICENSED PROFESSIONAL ENGINEER
No. 7808-S
HAWAII U.S.A.
Exp. Date: 4-30-24

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DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS

NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 1.7 REPAIR PLAN (STA 17+25 TO 18+97.53)

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

HAWAII ENGINEERING GROUP, Inc.
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HONOLULU, HI 96813
Tel: 808-533-2092

JOB NO.

SHEET C107
11 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

P15 ADD MORTAR CAP ON WALL TOP TO RESTORE ITS ORIGINAL CONDITION.

P16 ADD MORTAR CAP ON WALL TOP TO RESTORE ITS ORIGINAL CONDITION.

P17 CONSTRUCT NEW CHAINLINK FENCE TO MATCH EXISTING, SEE DETAIL A/S002.

P18 REMOVE BOULDERS ON CHANNEL FLOOR AND WALL.

P10 ADD MORTAR CAP ON WALL TOP TO RESTORE ITS ORIGINAL CONDITION.

P11 ADD MORTAR CAP ON WALL TOP TO RESTORE ITS ORIGINAL CONDITION.

P12 REPLACE MISSING STONE AND FILL MORTAR JOINTS ON WALL TO RESTORE ITS ORIGINAL CONDITION.

P13 REPLACE MISSING STONE AND FILL MORTAR JOINTS ON WALL TO RESTORE ITS ORIGINAL CONDITION.

P14 REMOVE BOULDER ON CHANNEL FLOOR.

P5 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P6 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P7 REPAIR HORIZONTAL CRACK ON WALL, SEE DETAIL 2/S001.

P8 REPAIR HORIZONTAL CRACK ON WALL, SEE DETAIL 2/S001.

P9 ADD MORTAR CAP ON WALL TOP TO RESTORE ITS ORIGINAL CONDITION.

P1 REMOVE DEBRIS ON CHANNEL FLOOR.

P2 1. REPAIR HORIZONTAL CRACK ON WALL, SEE DETAIL 2/S001.
2. REPAIR CONCRETE SPALL AT TOP OF WALL, SEE DETAIL 3/S001.

P3 REMOVE DEBRIS ALONG FENCE.

P4 REMOVE DEBRIS ALONG FENCE.

REVISION NO.	DATE	REVISIONS	BY

ATHER R. DAR
LICENSED PROFESSIONAL ENGINEER
No. 7808-S
HAWAII U.S.A.

Exp. Date: 4-30-24

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DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS
NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 1.0 REPAIR PHOTOS

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
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SUPV:
DATE: 10/16/2023

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Tel: 808-533-2092

JOB NO.

SHEET C108
12 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

Plot date: 14-Nov-2023

J:/2020 Projects/20-066 DHHL P5-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/C108

P33 REMOVE BOULDERS ON CHANNEL FLOOR.

P34 ADD MORTAR CAP ON WALL TOP TO RESTORE ITS ORIGINAL CONDITION.

P35 REMOVE BOULDER ON CHANNEL FLOOR.

P36 REMOVE BOULDERS ON CHANNEL FLOOR.

P28 REMOVE TREE STUMP ON CHANNEL WALL.

P29 ADD MORTAR CAP ON WALL TOP TO RESTORE ITS ORIGINAL CONDITION.

P30 ADD MORTAR CAP ON WALL TOP TO RESTORE ITS ORIGINAL CONDITION.

P31 ADD MORTAR CAP ON WALL TOP TO RESTORE ITS ORIGINAL CONDITION.

P32 ADD MORTAR CAP ON WALL TOP TO RESTORE ITS ORIGINAL CONDITION.

P23 REMOVE BOULDER ON CHANNEL WALL.

P24 REMOVE BOULDER ON CHANNEL FLOOR.

P25 1. REMOVE BOULDERS ON CHANNEL FLOOR.
2. REMOVE TREE STUMP ON WALL.

P26 REMOVE BOULDERS ON CHANNEL FLOOR.

P27 REMOVE TREE STUMP ON CHANNEL FLOOR.

P19 ADD MORTAR CAP ON WALL TOP TO RESTORE ITS ORIGINAL CONDITION.

P20 REMOVE BOULDERS ON CHANNEL FLOOR.

P21 REMOVE BOULDERS ON CHANNEL FLOOR AND WALL.

P22 REMOVE BOULDERS ON CHANNEL FLOOR.

REVISION NO.	DATE	REVISIONS	BY

ATHER R. DAR
LICENSED PROFESSIONAL ENGINEER
No. 7808-S
HAWAII U.S.A.

Exp. Date: 4-30-24

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DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS
NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 1.0 REPAIR PHOTOS

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CHECKED BY: AD
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Tel: 808-533-2092

JOB NO.

SHEET C109
13 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

Plot date: 14-Nov-2023

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Plot date: 14-Nov-2023

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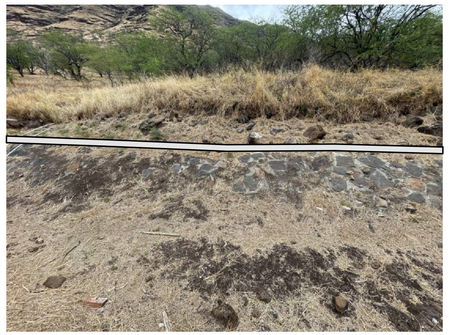

P37 ADD MORTAR CAP ON WALL TOP TO RESTORE ITS ORIGINAL CONDITION.

P38 ADD MORTAR CAP ON WALL TOP TO RESTORE ITS ORIGINAL CONDITION.

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BLANK

REVISION NO.	DATE	REVISIONS	BY

ATHER R. DAR
LICENSED PROFESSIONAL ENGINEER
No. 7808-S
HAWAII U.S.A.

Exp. Date: 4-30-24

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NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS
NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 1.0 REPAIR PHOTOS

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DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

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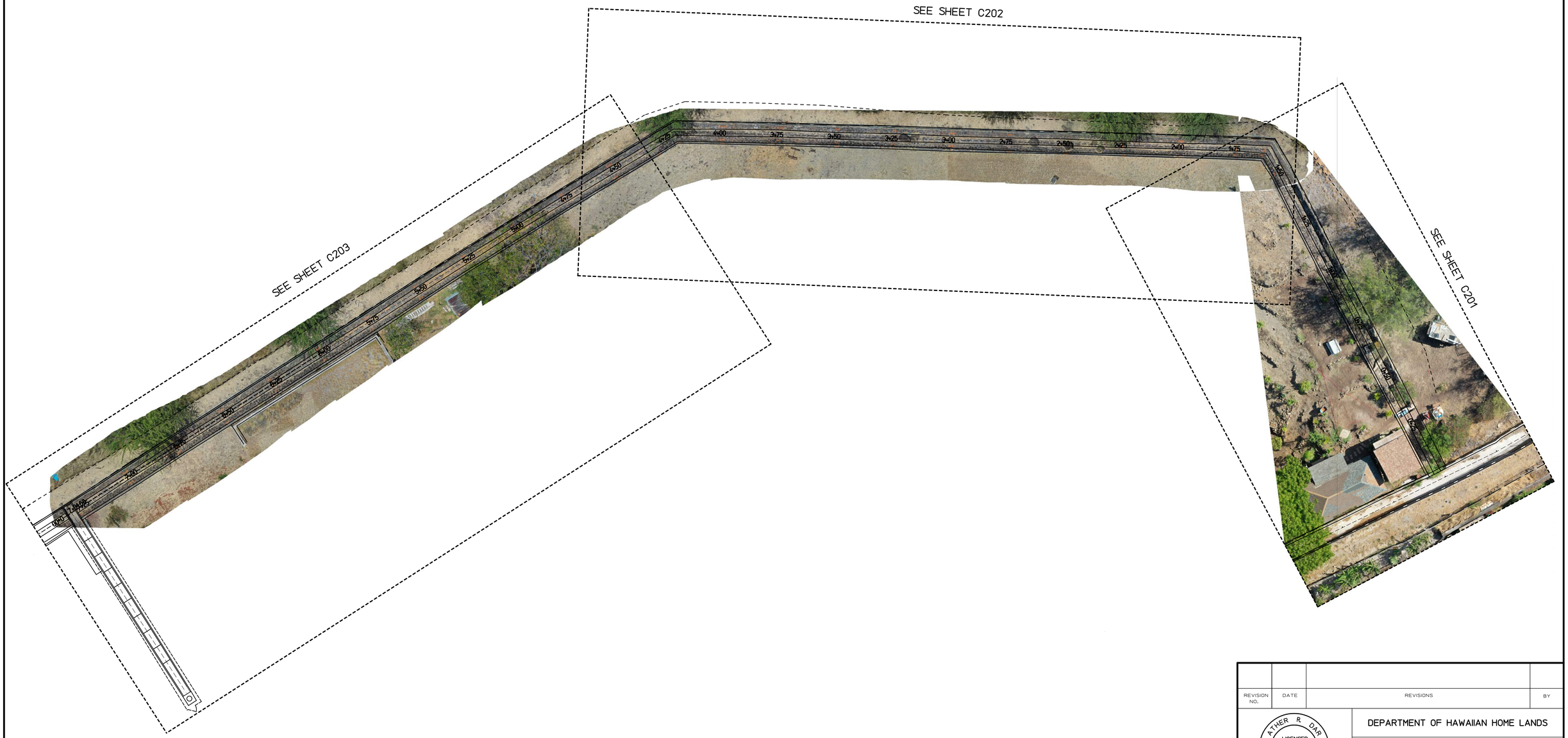
Civil & Structural Engineers
1088 BISHOP STREET #2506
HONOLULU, HI 96813
Tel: 808-533-2092

JOB NO.

SHEET C110
14 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

J:/2020 Projects/20-066 DHHL PS-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/C200
Plot date: 14-Nov-2023



CHANNEL SEGMENT 2 PLAN

SCALE: 1" = 20'

NORTH

REVISION NO.	DATE	REVISIONS	BY

ATHER R. DAR
LICENSED PROFESSIONAL ENGINEER
No. 7808-S
HAWAII U.S.A.

Exp. Date: 4-30-24

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

DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS

NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 2 REPAIR PLAN

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

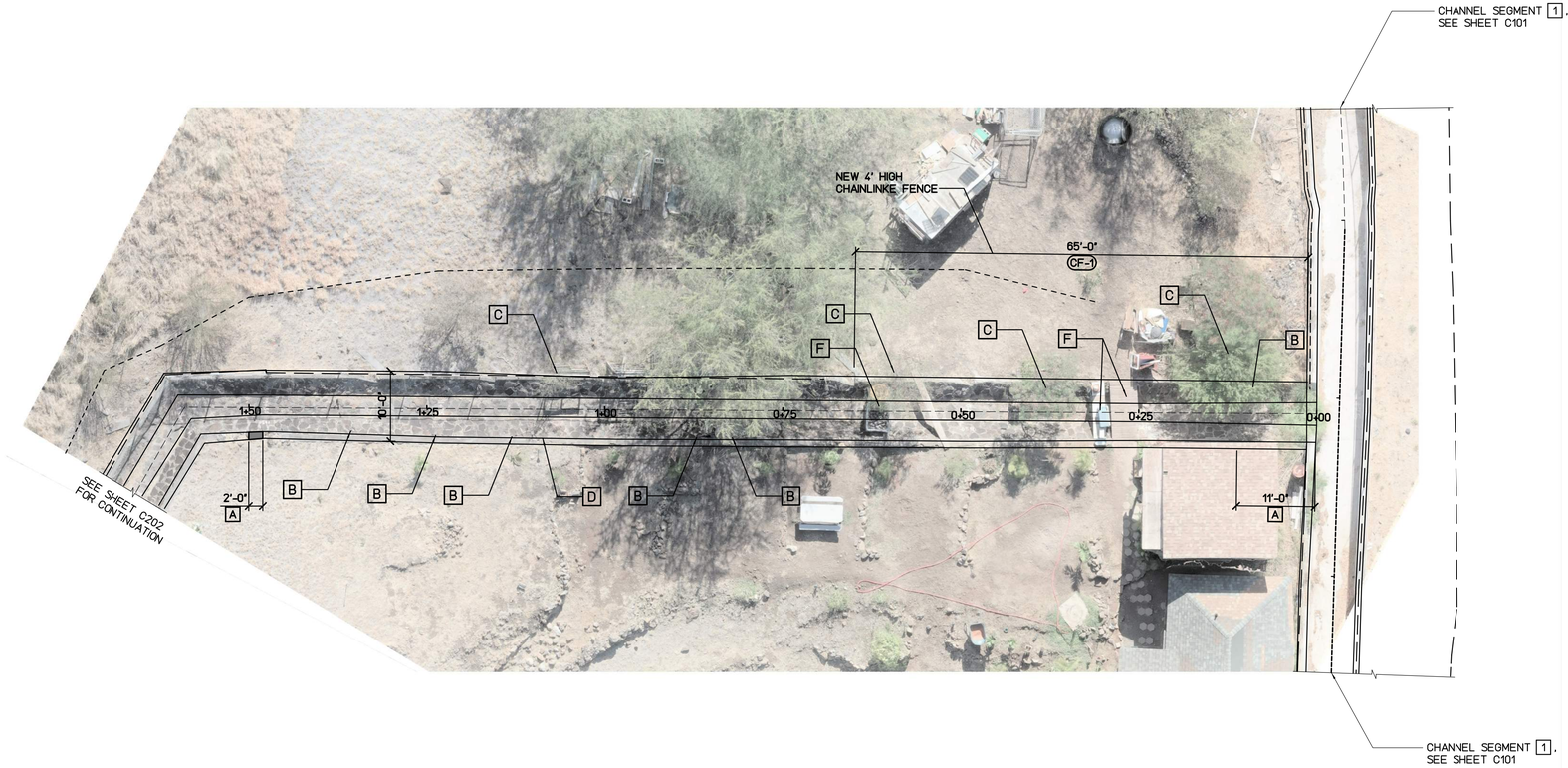
HAWAII ENGINEERING GROUP, Inc.
Civil & Structural Engineers
1088 BISHOP STREET #2506
HONOLULU, HI 96813
Tel: 808-533-2092

JOB NO.

SHEET C200
15 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

Plot date: 14-Nov-2023
Jr/2020 Projects/20-066 DHHL PS-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/C201



LEGEND:	
2	CRACK REPAIR TYPE, SEE DETAIL 1/S001 AND 2/S001
3	SPALL REPAIR TYPE, SEE DETAIL 3/S001
a	CHAINLINK FENCE REPAIR TYPE, SEE SHEETS S002 AND S003
C-X	CRACK REPAIR MARK
SP-X	SPALL REPAIR MARK
CF-X	CHAINLINK FENCE REPAIR MARK
CS-X	CONCRETE SEALER REPAIR MARK, SEE DETAIL 4/S001
PX	PHOTO REFERENCE, SEE SHEETS C204 AND C207

DEMOLITION AND REPAIR NOTES:	
A	ADD MORTAR CAP ON WALL TOP
B	REGROUT WALL
C	REMOVE TREE
D	REMOVE TREE STUMP
E	REMOVE BOULDERS
F	REMOVE DEBRIS ALONG CHANNEL FLOOR
G	REMOVE DEBRIS ALONG CHANNEL WALL
H	DEMOLISH AND CONSTRUCT NEW WALL, SEE DETAIL 5/S001

CHANNEL SEGMENT 2.1 REPAIR PLAN (STA 0+00 TO 1+50)

SCALE: 1" = 10'

NORTH

STATIONING	SURFACE LOCATION	MARK	REPAIR TYPE	DIMENSION L(ft)	DIMENSION W(in)	DIMENSION D(in)	PHOTO REFERENCE
0+00 TO 0+11	WEST WALL		A	11	12		P1
0+00 TO 0+65	EAST WALL	CF-1	a	65			P2
0+09	EAST WALL		B	2	12		P3
0+14	EAST WALL		C				P4
0+26 TO 0+32	EAST/WEST WALL		G	6			P5
0+41	EAST WALL		C				P6
0+61	EAST WALL		C				P7
0+61.5 TO 0+64.5	EAST/WEST WALL		G	3			P8
0+82	WEST WALL		B	1	12		P9
0+87	WEST WALL		B	1	12		P10
1+08	WEST WALL		D				P11
1+09	EAST WALL		C				P12
1+12	WEST WALL		B	1	12		P11
1+25	WEST WALL		B	1	12		P13
1+38	WEST WALL		B	1	12		P14
1+48 TO 1+50	WEST WALL		A	2	12		P15

REVISION NO.	DATE	REVISIONS	BY

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DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS
NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 2.1 REPAIR PLAN
(STA 0+00 TO 1+50)

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

HAWAII ENGINEERING GROUP, Inc.
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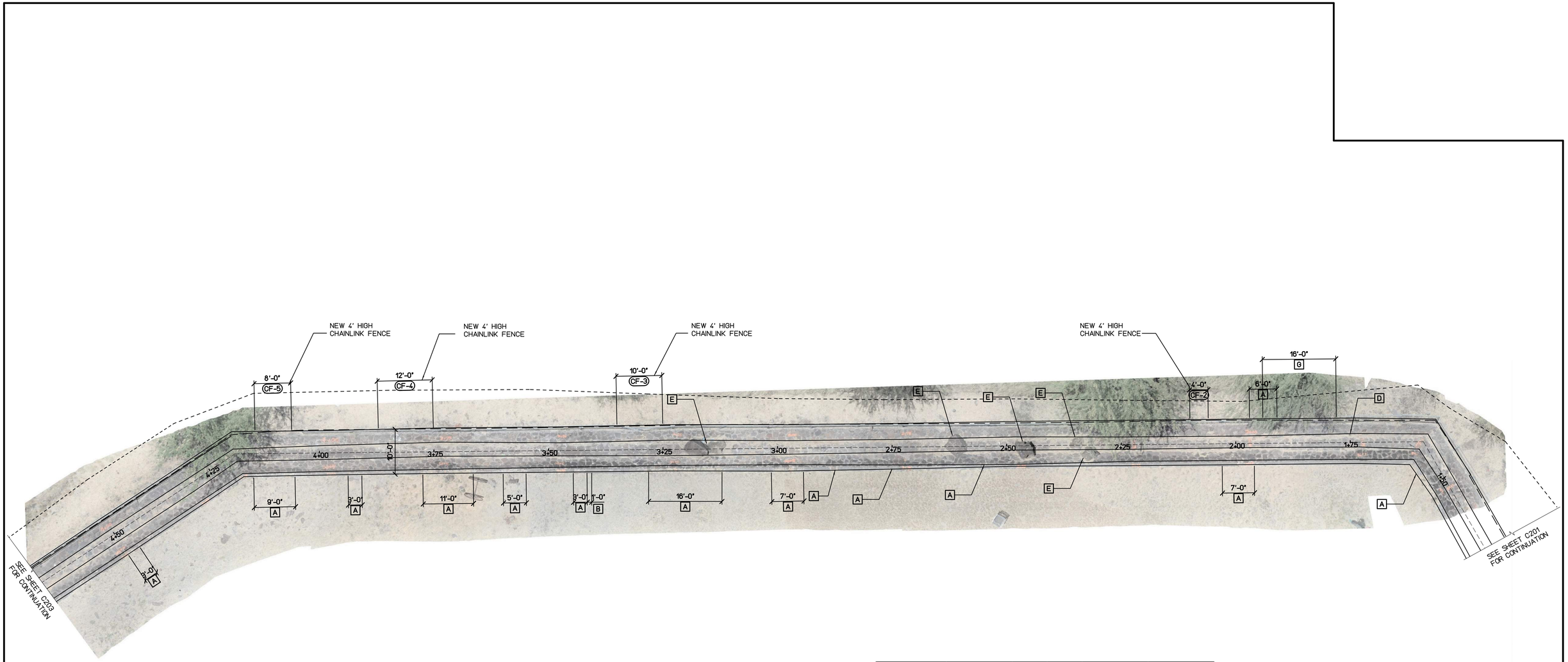
Tel: 808-533-2092

JOB NO.

SHEET C201
16 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

J:/2020 Projects/20-066 DHHL PS-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/C202
Plot date: 14-Nov-2023



LEGEND:	
2	CRACK REPAIR TYPE, SEE DETAIL 1/S001 AND 2/S001
3	SPALL REPAIR TYPE, SEE DETAIL 3/S001
G	CHAINLINK FENCE REPAIR TYPE, SEE SHEETS S002 AND S003
C-X	CRACK REPAIR MARK
SP-X	SPALL REPAIR MARK
CF-X	CHAINLINK FENCE REPAIR MARK
CS-X	CONCRETE SEALER REPAIR MARK, SEE DETAIL 4/S001
PX	PHOTO REFERENCE, SEE SHEETS C204 AND C207

DEMOLITION AND REPAIR NOTES:	
A	ADD MORTAR CAP ON WALL TOP
B	REGROUT WALL
C	REMOVE TREE
D	REMOVE TREE STUMP
E	REMOVE BOULDERS
F	REMOVE DEBRIS ALONG CHANNEL FLOOR
G	REMOVE DEBRIS ALONG CHANNEL WALL
H	DEMOLISH AND CONSTRUCT NEW WALL, SEE DETAIL 5/S001

CHANNEL SEGMENT 2.2 REPAIR PLAN (STA 1+50 TO 4+50)

SCALE: 1" = 10'

NORTH

STATIONING	SURFACE LOCATION	MARK	REPAIR TYPE	DIMENSION L(ft)	DIMENSION W(in)	DIMENSION D(in)	PHOTO REFERENCE
1+50 TO 1+57	WEST WALL		A	7	12		P16
1+78	FLOOR		D				P17
1+78 TO 1+94	NORTH WALL		G	16			P18
1+91 TO 1+97	NORTH WALL		A	6	12		P19
1+96 TO 2+03	SOUTH WALL		A	7	12		P20
2+06 TO 2+10	NORTH WALL	CF-2	G	4			P21
2+34.5	SOUTH WALL		E				P22
2+38	FLOOR		E				
2+49	FLOOR		E				P23
2+55.5	SOUTH WALL		A	1	12		P24
2+64	FLOOR		E				P25
2+75	SOUTH WALL		A	1	12		P26
2+90	SOUTH WALL		A	1	12		P27
2+97 TO 3+04	SOUTH WALL		A	7	12		P28
3+14 TO 3+22	FLOOR		E	8			P29
3+14 TO 3+30	SOUTH WALL		A	16	12		P30
3+25 TO 3+35	NORTH WALL	CF-3	G	10			P31
3+44 TO 3+45	SOUTH WALL		B	1	12		P32
3+45 TO 3+48	SOUTH WALL		A	3	12		
3+58 TO 3+63	SOUTH WALL		A	5	12		P33
3+69 TO 3+80	SOUTH WALL		A	11	12		P34
3+75 TO 3+87	NORTH WALL	CF-4	G	12			P35
3+92 TO 3+95	SOUTH WALL		A	3	12		P36
4+06 TO 4+14	NORTH WALL	CF-5	G	8			P37
4+06 TO 4+15	SOUTH WALL		A	9	12		P38
4+47 TO 4+50	SOUTH WALL		A	3	12		P39

REVISION NO.	DATE	REVISIONS	BY

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HAWAII U.S.A.
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DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS
NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 2.2 REPAIR PLAN (STA 1+50 TO 4+50)

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

HAWAII ENGINEERING GROUP, Inc.
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Tel: 808-533-2092

JOB NO.

SHEET C202
17 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

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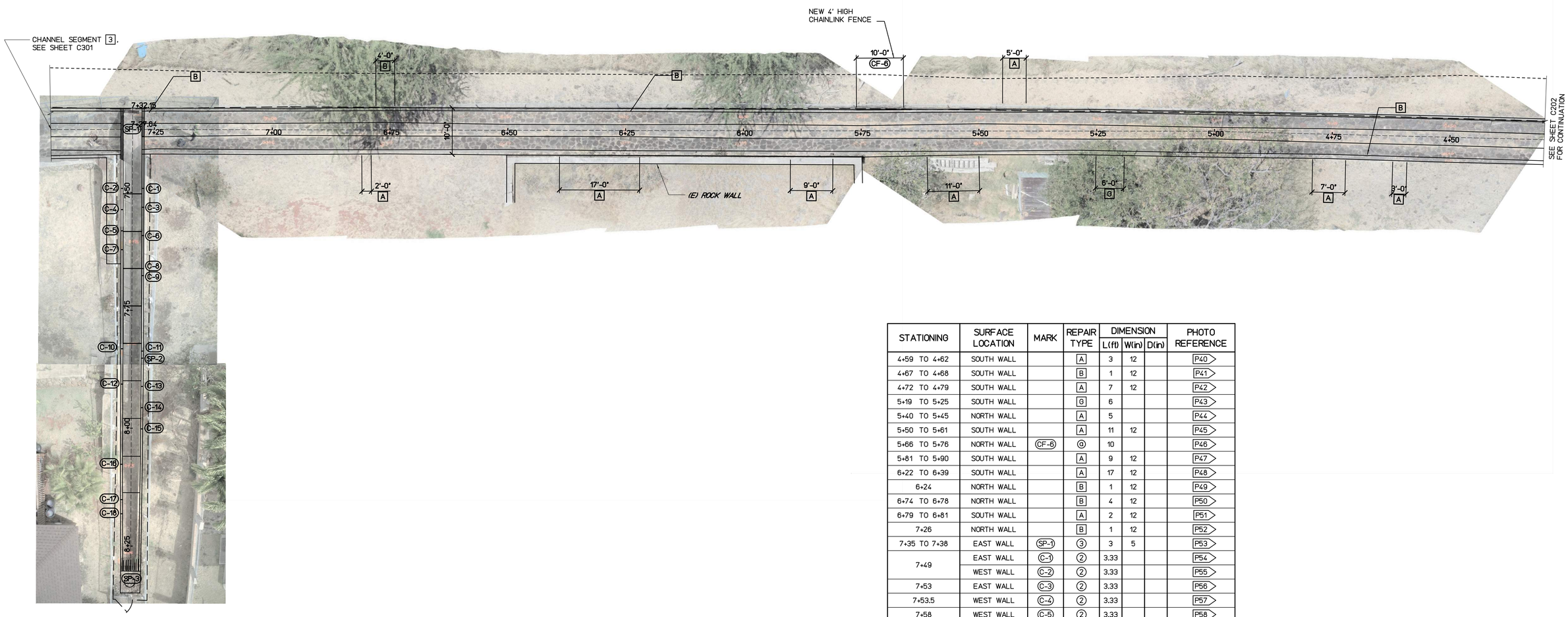

STATIONING	SURFACE LOCATION	MARK	REPAIR TYPE	DIMENSION L(ft)	DIMENSION W(in)	DIMENSION D(in)	PHOTO REFERENCE
4+59 TO 4+62	SOUTH WALL		A	3	12		P40
4+67 TO 4+68	SOUTH WALL		B	1	12		P41
4+72 TO 4+79	SOUTH WALL		A	7	12		P42
5+19 TO 5+25	SOUTH WALL		G	6			P43
5+40 TO 5+45	NORTH WALL		A	5			P44
5+50 TO 5+61	SOUTH WALL		A	11	12		P45
5+66 TO 5+76	NORTH WALL	CF-6	⊙	10			P46
5+81 TO 5+90	SOUTH WALL		A	9	12		P47
6+22 TO 6+39	SOUTH WALL		A	17	12		P48
6+24	NORTH WALL		B	1	12		P49
6+74 TO 6+78	NORTH WALL		B	4	12		P50
6+79 TO 6+81	SOUTH WALL		A	2	12		P51
7+26	NORTH WALL		B	1	12		P52
7+35 TO 7+38	EAST WALL	SP-1	3	3	5		P53
7+49	EAST WALL	C-1	2	3.33			P54
	WEST WALL	C-2	2	3.33			P55
7+53	EAST WALL	C-3	2	3.33			P56
7+53.5	WEST WALL	C-4	2	3.33			P57
7+58	WEST WALL	C-5	2	3.33			P58
7+59	EAST WALL	C-6	2	3.33			P59
7+62	WEST WALL	C-7	2	3.33			P60
7+66	EAST WALL	C-8	2	3.33			P61
7+67.5	EAST WALL	C-9	2	3.33			P62
7+83	WEST WALL	C-10	2	3.33			P63
7+83.5	EAST WALL	C-11	2	3.33			P64
7+85	EAST WALL	SP-2	3	3.58	4		P65
7+90.5	WEST WALL	C-12	2	3.33			P66
7+91	EAST WALL	C-13	2	3.33			P67
7+95.5	EAST WALL	C-14	2	3.33			P68
8+00	EAST WALL	C-15	2	3.33			
8+07.5	WEST WALL	C-16	2	3.33			P69
8+15	WEST WALL	C-17	2	3.33			P70
8+18	WEST WALL	C-18	2	3.33			
8+31	DRAIN INLET	SP-3	3	3.33			P71

LEGEND:

2	CRACK REPAIR TYPE, SEE DETAIL 1/S001 AND 2/S001
3	SPALL REPAIR TYPE, SEE DETAIL 3/S001
⊙	CHAINLINK FENCE REPAIR TYPE, SEE SHEETS S002 AND S003
C-X	CRACK REPAIR MARK
SP-X	SPALL REPAIR MARK
CF-X	CHAINLINK FENCE REPAIR MARK
CS-X	CONCRETE SEALER REPAIR MARK, SEE DETAIL 4/S001
PX	PHOTO REFERENCE, SEE SHEETS C204 AND C207

DEMOLITION AND REPAIR NOTES:

A	ADD MORTAR CAP ON WALL TOP
B	REGROUT WALL
C	REMOVE TREE
D	REMOVE TREE STUMP
E	REMOVE BOULDERS
F	REMOVE DEBRIS ALONG CHANNEL FLOOR
G	REMOVE DEBRIS ALONG CHANNEL WALL
H	DEMOLISH AND CONSTRUCT NEW WALL, SEE DETAIL 5/S001

CHANNEL SEGMENT 2.3 REPAIR PLAN (STA 4+50 TO 7+31.68)

SCALE: 1" = 10'

NORTH

REVISION NO.	DATE	REVISIONS	BY

ATHER R. DAR
LICENSED PROFESSIONAL ENGINEER
No. 7808-S
HAWAII U.S.A.
Exp. Date: 4-30-24

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DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS

NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 2.3 REPAIR PLAN (STA 4+50 TO 7+31.68)

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

HAWAII ENGINEERING GROUP, Inc.
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HONOLULU, HI 96813
Tel: 808-533-2092

JOB NO.

SHEET C203
18 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

P15 1. RESTORE DAMAGED CRM WALL TO ITS ORIGINAL CONDITION.
2. ADD MORTAR CAP ON WALL TOP TO MATCH EXISTING.

P16 1. RESTORE DAMAGED CRM WALL TO ITS ORIGINAL CONDITION.
2. ADD MORTAR CAP ON WALL TOP TO MATCH EXISTING.

P17 REMOVE TREE STUMP ON CRM WALL.

P18 REMOVE DEBRIS ALONG CHANNEL WALL TOP.

P10 REPLACE MISSING ROCKS AND FILL MORTAR JOINTS ON WALL TO RESTORE ITS ORIGINAL CONDITION.

P11 1. REMOVE TREE STUMP NEAR CRM WALL.
2. REGROUT LOOSED ROCKS AND FILL THE MORTAR JOINTS.

P12 REMOVE TREE ON TOP OF CRM WALL.

P13 REGROUT LOOSED ROCKS AND FILL THE MORTAR JOINTS.

P14 REGROUT LOOSED ROCKS AND FILL THE MORTAR JOINTS.

P5 REMOVE WOODEN BRIDGE AND STORED ITEMS ON TOP OF CRM WALL.

P6 REMOVE TREE NEAR CRM WALL.

P7 REMOVE TREE NEAR CRM WALL.

P8 REMOVE STORED ITEMS ON TOP OF CRM WALL.

P9 REPLACE MISSING ROCKS AND FILL MORTAR JOINTS ON WALL TO RESTORE ITS ORIGINAL CONDITION.

P1 1. RESTORE DAMAGED CRM WALL TO ITS ORIGINAL CONDITION.
2. ADD MORTAR CAP ON WALL TOP TO MATCH EXISTING.

P2 CONSTRUCT NEW CHAINLINK FENCE, SEE DETAIL A/S002.

P3 1. RESTORE DAMAGED CRM WALL TO ITS ORIGINAL CONDITION.
2. ADD MORTAR CAP ON WALL TOP TO MATCH EXISTING.

P4 REMOVE TREE NEAR CRM WALL.

REVISION NO.	DATE	REVISIONS	BY

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HAWAII U.S.A.
Exp. Date: 4-30-24

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DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS
NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 2.0 REPAIR PHOTOS

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

HAWAII ENGINEERING GROUP, Inc.
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1088 BISHOP STREET #2506
HONOLULU, HI 96813
Tel: 808-533-2092

JOB NO.

SHEET C204
19 OF 74 SHTS

FILE ___ DRAWER ___ ___ FOLDER ___ ___

Plot date: 14-Nov-2023

J:/2020 Projects/20-066 DHHL PS-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/C204.

P33 1. REGROUT LOOSED ROCKS AND FILL THE MORTAR JOINTS.
2. ADD MORTAR CAP ON WALL TOP TO MATCH EXISTING.

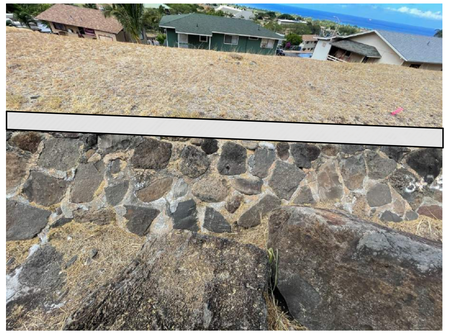
P34 1. REGROUT LOOSED ROCKS AND FILL THE MORTAR JOINTS.
2. ADD MORTAR CAP ON WALL TOP TO MATCH EXISTING.

P35 CONSTRUCT NEW CHAINLINK FENCE, SEE DETAIL A/S002.

P36 ADD MORTAR CAP ON WALL TOP TO RESTORE ITS ORIGINAL CONDITION.

P28 1. REGROUT LOOSED ROCKS AND FILL THE MORTAR JOINTS.
2. ADD MORTAR CAP ON WALL TOP TO MATCH EXISTING.

P29 REMOVE BOULDER ON CHANNEL FLOOR.



P30 ADD MORTAR CAP ON WALL TOP TO RESTORE ITS ORIGINAL CONDITION.

P31 CONSTRUCT NEW CHAINLINK FENCE, SEE DETAIL A/S002.

P32 1. REGROUT LOOSED ROCKS AND FILL THE MORTAR JOINTS.
2. ADD MORTAR CAP ON WALL TOP TO MATCH EXISTING.

P23 REMOVE BOULDER ON CHANNEL WALL.

P24 ADD MORTAR CAP ON WALL TOP TO RESTORE ITS ORIGINAL CONDITION.

P25 REMOVE BOULDER ON CHANNEL FLOOR.

P26 1. REGROUT LOOSED ROCKS AND FILL THE MORTAR JOINTS.
2. ADD MORTAR CAP ON WALL TOP TO MATCH EXISTING.

P27 ADD MORTAR CAP ON WALL TOP TO RESTORE ITS ORIGINAL CONDITION.

P19 ADD MORTAR CAP ON WALL TOP TO RESTORE ITS ORIGINAL CONDITION.

P20 1. REGROUT LOOSED ROCKS AND FILL THE MORTAR JOINTS.
2. ADD MORTAR CAP ON WALL TOP TO MATCH EXISTING.

P21 REMOVE EXISTING FENCE AND CONSTRUCT NEW CHAINLINK FENCE SEE DETAIL A/S002.

P22 REMOVE BOULDERS ON CHANNEL FLOOR AND WALL.

REVISION NO.	DATE	REVISIONS	BY

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No. 7808-S
HAWAII U.S.A.
Exp. Date: 4-30-24

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DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS
NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 2.0 REPAIR PHOTOS

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

HAWAII ENGINEERING GROUP, Inc.
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Tel: 808-533-2092

JOB NO.

SHEET C205
20 OF 74 SHTS

FILE ___ DRAWER ___ ___ FOLDER ___ ___

Plot date: 14-Nov-2023

J:/2020 Projects/20-066 DHHL PS-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/C205

P51 ADD MORTAR CAP ON WALL TOP TO RESTORE ITS ORIGINAL CONDITION.

P52 1. REGROUT LOOSED ROCKS AND FILL THE MORTAR JOINTS.
2. ADD MORTAR CAP ON WALL TOP TO MATCH EXISTING.

P53 REPAIR CONCRETE SPALL AT INVERT OF CRM WALL, SEE DETAIL 3/S001.

P54 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P46 CONSTRUCT NEW 4' HIGH CHAINLINK FENCE, SEE DETAIL A/S002.

P47 ADD MORTAR CAP ON WALL TOP TO RESTORE ITS ORIGINAL CONDITION.

P48 ADD MORTAR CAP ON WALL TOP TO RESTORE ITS ORIGINAL CONDITION.

P49 REPLACE MISSING ROCKS ON CRM WALL AND FILL THE MORTAR JOINTS.

P50 REGROUT LOOSED ROCKS AND FILL THE MORTAR JOINTS.

P41 REPLACE MISSING ROCKS ON CRM WALL AND FILL THE MORTAR JOINTS.

P42 ADD MORTAR CAP ON WALL TOP TO RESTORE ITS ORIGINAL CONDITION.

P43 REMOVE WOODEN BOX ON TOP OF CRM WALL.

P44 1. REGROUT LOOSED ROCKS AND FILL THE MORTAR JOINTS.
2. ADD MORTAR CAP ON WALL TOP TO MATCH EXISTING.

P45 1. REGROUT LOOSED ROCKS AND FILL THE MORTAR JOINTS.
2. ADD MORTAR CAP ON WALL TOP TO MATCH EXISTING.

P37 CONSTRUCT NEW CHAINLINK FENCE, SEE DETAIL A/S002.

P38 ADD MORTAR CAP ON WALL TOP TO RESTORE ITS ORIGINAL CONDITION.

P39 1. REPLACE MISSING ROCKS AND FILL THE MORTAR JOINTS.
2. ADD MORTAR CAP ON WALL TOP TO MATCH EXISTING.

P40 ADD MORTAR CAP ON WALL TOP TO RESTORE ITS ORIGINAL CONDITION.

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HAWAII U.S.A.
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NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS
NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 2.0 REPAIR PHOTOS

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

HAWAII ENGINEERING GROUP, Inc.
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HONOLULU, HI 96813
Tel: 808-533-2092

JOB NO.

SHEET C206
21 OF 74 SHTS

FILE ___ DRAWER ___ ___ FOLDER ___ ___

Plot date: 14-Nov-2023

J:/2020 Projects/20-066 DHHL P5-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/C206

P69 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P70 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P71 REPAIR CONCRETE SPALL ON TOP OF DRAIN INLET. SEE DETAIL 3/S001.

BLANK

P64 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P65 REPAIR VERTICAL SPALL ON WALL, SEE DETAIL 2/S001.

P66 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P67 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P68 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P59 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P60 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P61 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P62 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P63 REPAIR CONCRETE SPALL ON WALL, SEE DETAIL 3/S001.

P55 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P56 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P57 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P58 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

REVISION NO.	DATE	REVISIONS	BY

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DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS

NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 2.0 REPAIR PHOTOS

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

HAWAII ENGINEERING GROUP, Inc.
Civil & Structural Engineers
1088 BISHOP STREET #2506
HONOLULU, HI 96813
Tel: 808-533-2092

JOB NO.

SHEET C207

22 OF 74 SHTS

FILE ___ DRAWER ___ ___ FOLDER ___ ___

Plot date: 14-Nov-2023

J:/2020 Projects/20-066 DHHL P5-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/C207

J:/2020 Projects/20-066 DHHL PS-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/C300
Plot date: 14-Nov-2023

CHANNEL SEGMENT 3 PLAN

SCALE: 1" = 20'

NORTH

REVISION NO.	DATE	REVISIONS	BY

ATHER R. DAR
LICENSED PROFESSIONAL ENGINEER
No. 7808-S
HAWAII U.S.A.

Exp. Date: 4-30-24

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

DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS

NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 3 REPAIR PLAN

DESIGNED BY:	AD
DRAWN BY:	AK, AP, DL
CHECKED BY:	AD
SUPV:	
DATE:	10/16/2023

HAWAII ENGINEERING GROUP, Inc.
Civil & Structural Engineers
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Tel: 808-533-2092

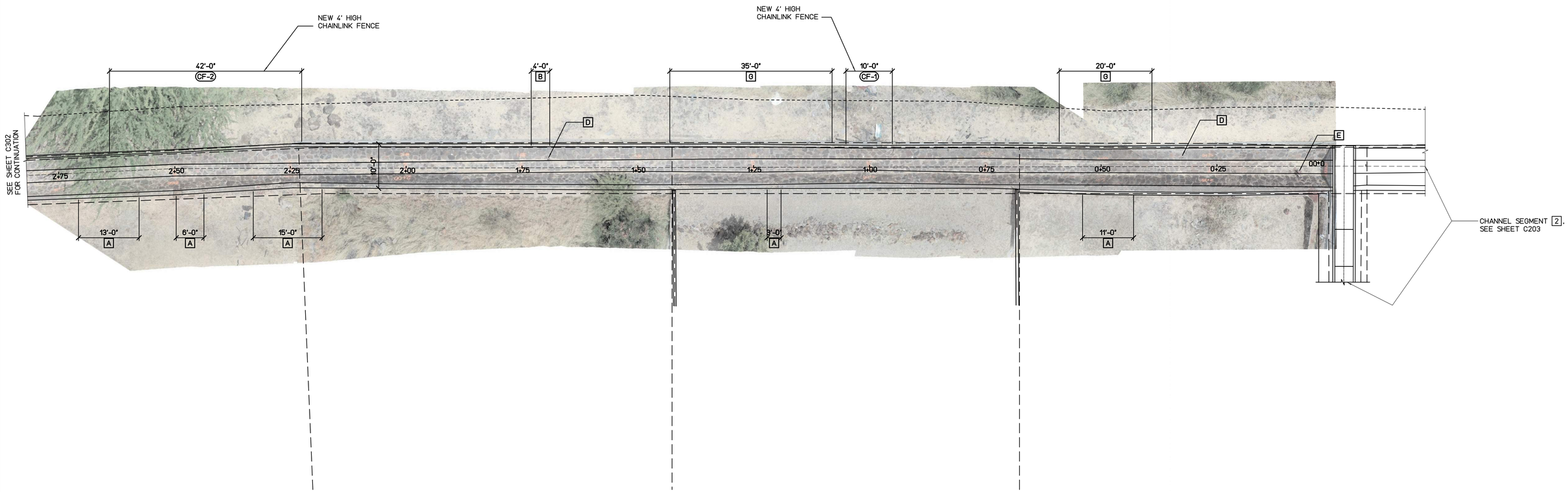
JOB NO.

SHEET C300

23 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

Plot date: 14-Nov-2023
J:/2020 Projects/20-066 DHHL PS-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/C301



LEGEND:	
2	CRACK REPAIR TYPE, SEE DETAIL 1/S001 AND 2/S001
3	SPALL REPAIR TYPE, SEE DETAIL 3/S001
G	CHAINLINK FENCE REPAIR TYPE, SEE SHEETS S002 AND S003
C-X	CRACK REPAIR MARK
SP-X	SPALL REPAIR MARK
CF-X	CHAINLINK FENCE REPAIR MARK
CS-X	CONCRETE SEALER REPAIR MARK, SEE DETAIL 4/S001
PX	PHOTO REFERENCE, SEE SHEETS C303 AND C304

DEMOLITION AND REPAIR NOTES:	
A	ADD MORTAR CAP ON WALL TOP
B	REGROUT WALL
C	REMOVE TREE
D	REMOVE TREE STUMP
E	REMOVE BOULDERS
F	REMOVE DEBRIS ALONG CHANNEL FLOOR
G	REMOVE DEBRIS ALONG CHANNEL WALL
H	DEMOLISH AND CONSTRUCT NEW WALL, SEE DETAIL 5/S001

CHANNEL SEGMENT 3.1 REPAIR PLAN (STA 0+00 TO 2+25)

SCALE: 1" = 10'

NORTH

STATIONING	SURFACE LOCATION	MARK	REPAIR TYPE	DIMENSION L(ft)	DIMENSION W(in)	DIMENSION D(in)	PHOTO REFERENCE
0+05	FLOOR		E				P1
0+31	NORTH WALL		D				P2
0+39 TO 0+59	NORTH WALL		G	20			P3
0+43 TO 0+54	SOUTH WALL		A	11	12		P4
0+95 TO 1+05	NORTH WALL	CF-1	G	10			P5
1+08 TO 1+43	NORTH WALL		G	35			P6
1+19 TO 1+22	SOUTH WALL		A	3	12		P7
1+69	NORTH WALL		D				P8
1+69 TO 1+73	NORTH WALL		B	4	12		
2+18 TO 2+33	SOUTH WALL		A	15	12		P9
2+22 TO 2+64	NORTH WALL	CF-2	G	42			P10
2+44 TO 2+50	SOUTH WALL		A	6	12		P11
2+58 TO 2+71	SOUTH WALL		A	13	12		P12

REVISION NO.	DATE	REVISIONS	BY

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No. 7808-S
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Exp. Date: 4-30-24

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DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS
NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 3.1 REPAIR PLAN (STA 0+00 TO 2+25)

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

HAWAII ENGINEERING GROUP, Inc.
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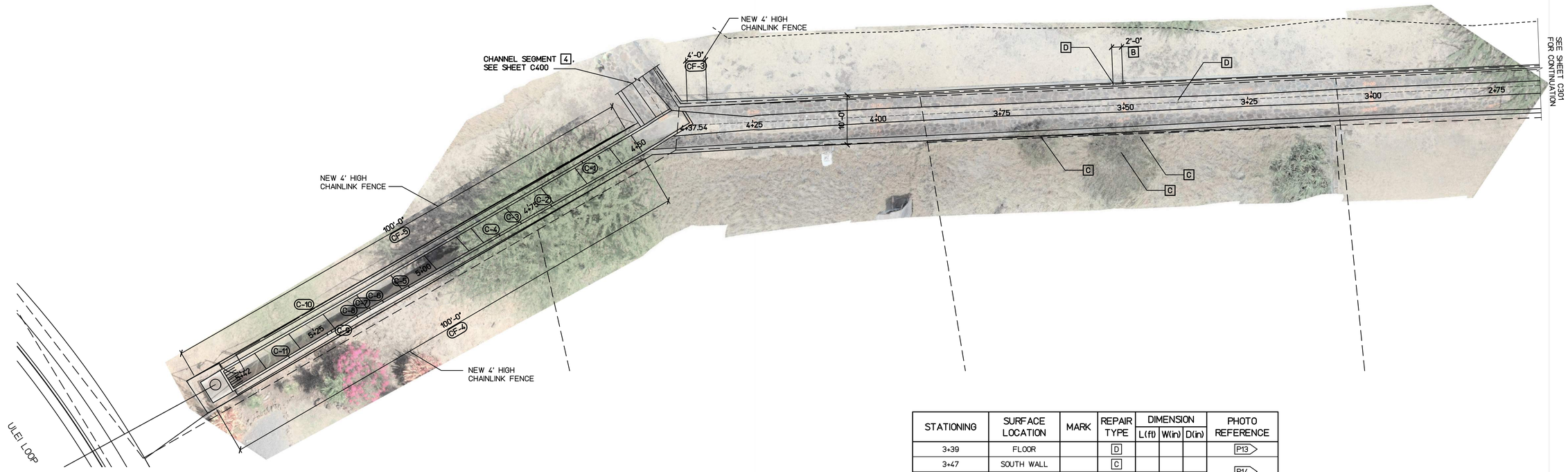
JOB NO.

SHEET C301
24 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

J:/2020 Projects/20-066 DHHL PS-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/C302
Plot date: 14-Nov-2023



STATIONING	SURFACE LOCATION	MARK	REPAIR TYPE	DIMENSION L(ft)	DIMENSION W(in)	DIMENSION D(in)	PHOTO REFERENCE
3+39	FLOOR		D				P13
3+47	SOUTH WALL		C				P14
3+50	SOUTH WALL		C				
3+50 TO 3+52	NORTH WALL		B	2	12		P15
3+51	NORTH WALL		D				
3+67	SOUTH WALL		C				P16
4+34 TO 4+38	NORTH WALL	CF-3	ⓖ	4			P17
4+50 TO 5+50	EAST WALL	CF-4	ⓖ	100			P18
	WEST WALL	CF-5	ⓖ	100			P19
4+61	WEST WALL	C-1	②	3	.25		P20
4+71	EAST WALL	C-2	②	3	.50		P21
4+78	EAST WALL	C-3	②	3	.25		P22
4+83	EAST WALL	C-4	②	3	.25		P23
5+04	EAST WALL	C-5	②	3	.25		P24
5+10	EAST WALL	C-6	②	3			P25
5+13	EAST WALL	C-7	②	3			P26
5+16	EAST WALL	C-8	②	3			P27
5+22	EAST WALL	C-9	②	3			P28
5+23	WEST WALL	C-10	②	3			P29
5+32	EAST WALL	C-11	②	3			P30

LEGEND:

- ② CRACK REPAIR TYPE, SEE DETAIL 1/S001 AND 2/S001
- ③ SPALL REPAIR TYPE, SEE DETAIL 3/S001
- ⓖ CHAINLINK FENCE REPAIR TYPE, SEE SHEETS S002 AND S003
- C-X CRACK REPAIR MARK
- SP-X SPALL REPAIR MARK
- CF-X CHAINLINK FENCE REPAIR MARK
- CS-X CONCRETE SEALER REPAIR MARK, SEE DETAIL 4/S001
- PX PHOTO REFERENCE, SEE SHEETS C303 AND C304

DEMOLITION AND REPAIR NOTES:

- A ADD MORTAR CAP ON WALL TOP
- B REGROUT WALL
- C REMOVE TREE
- D REMOVE TREE STUMP
- E REMOVE BOULDERS
- F REMOVE DEBRIS ALONG CHANNEL FLOOR
- G REMOVE DEBRIS ALONG CHANNEL WALL
- H DEMOLISH AND CONSTRUCT NEW WALL, SEE DETAIL 5/S001

CHANNEL SEGMENT 3.2 REPAIR PLAN (STA 2+25 TO 4+37.54)

SCALE: 1" = 10'

NORTH

REVISION NO.	DATE	REVISIONS	BY

ATHER R. DAR
LICENSED PROFESSIONAL ENGINEER
No. 7808-S
HAWAII U.S.A.
Exp. Date: 4-30-24

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DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS

NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 3.2 REPAIR PLAN (STA 2+25 TO 4+37.54

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

HAWAII ENGINEERING GROUP, Inc.
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HONOLULU, HI 96813
Tel: 808-533-2092

JOB NO.

SHEET C302
25 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

P15 1. REMOVE TREE STUMP ON TOP OF CRM WALL.
2. REGROUT LOOSED ROCKS AND FILL THE MORTAR JOINTS.

P16 REMOVE TREE NEAR CRM WALL.

P17 REMOVE DAMAGED FENCE AND CONSTRUCT NEW 4' HIGH CHAINLINK FENCE, SEE A/S002.

P18 REMOVE DAMAGED FENCE AND CONSTRUCT NEW 4' HIGH CHAINLINK FENCE, SEE A/S002.

P10 REMOVE DAMAGED FENCE AND CONSTRUCT NEW 4' HIGH CHAINLINK FENCE, SEE A/S002.

P11 ADD MORTAR CAP ON WALL TOP TO RESTORE ITS ORIGINAL CONDITION.

P12 1. RESTORE DAMAGED CRM WALL TO ITS ORIGINAL CONDITION.
2. ADD MORTAR CAP ON WALL TOP TO MATCH EXISTING.

P13 REMOVE TREE STUMP ON CHANNEL FLOOR.

P14 REMOVE TREE NEAR CRM WALL.

P5 1. REMOVE DAMAGED FENCE AND DEBRIS.
2. CONSTRUCT NEW 4' HIGH CHAINLINK FENCE, SEE A/S002.

P6 REMOVE DEBRIS ALONG CHANNEL WALL TOP.

P7 ADD MORTAR CAP ON WALL TOP TO RESTORE ITS ORIGINAL CONDITION.

P8 1. REMOVE TREE STUMP ON CRM WALL.
2. FILL LOOSED ROCKS ON CRM WALL WITH FRESH MORTAR.

P9 1. RESTORE DAMAGED CRM WALL TO ITS ORIGINAL CONDITION.
2. ADD MORTAR CAP ON WALL TOP TO MATCH EXISTING.

P1 REMOVE BOULDER ON CHANNEL FLOOR.

P2 REMOVE TREE STUMP ON CRM WALL.

P3 REMOVE DEBRIS ALONG CHANNEL WALL TOP.

P4 ADD MORTAR CAP ON WALL TOP TO RESTORE ITS ORIGINAL CONDITION.

REVISION NO.	DATE	REVISIONS	BY

ATHER R. DAR
LICENSED PROFESSIONAL ENGINEER
No. 7808-S
HAWAII U.S.A.
Exp. Date: 4-30-24

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DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS
NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 3.0 REPAIR PHOTOS

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

HAWAII ENGINEERING GROUP, Inc.
Civil & Structural Engineers
1088 BISHOP STREET #2506
HONOLULU, HI 96813
Tel: 808-533-2092

JOB NO.

SHEET C303
26 OF 74 SHTS

FILE ___ DRAWER ___ ___ FOLDER ___ ___

Plot date: 14-Nov-2023

J:/2020 Projects/20-066 DHHL PS-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/C303

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P28 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P29 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P30 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

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P23 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P24 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P25 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P26 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P27 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P19 REMOVE DAMAGED FENCE AND CONSTRUCT NEW 4' HIGH CHAINLINK FENCE, SEE A/S002.

P20 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P21 REPAIR VERTICAL AND HORIZONTAL CRACKS ON WALL, SEE DETAIL 2/S001.

P22 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

REVISION NO.	DATE	REVISIONS	BY

ATHER R. DAR
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No. 7808-S
HAWAII U.S.A.

Exp. Date: 4-30-24

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DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS

NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 3.0 REPAIR PHOTOS

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

HAWAII ENGINEERING GROUP, Inc.
Civil & Structural Engineers
1088 BISHOP STREET #2506
HONOLULU, HI 96813
Tel: 808-533-2092

JOB NO.

SHEET C304

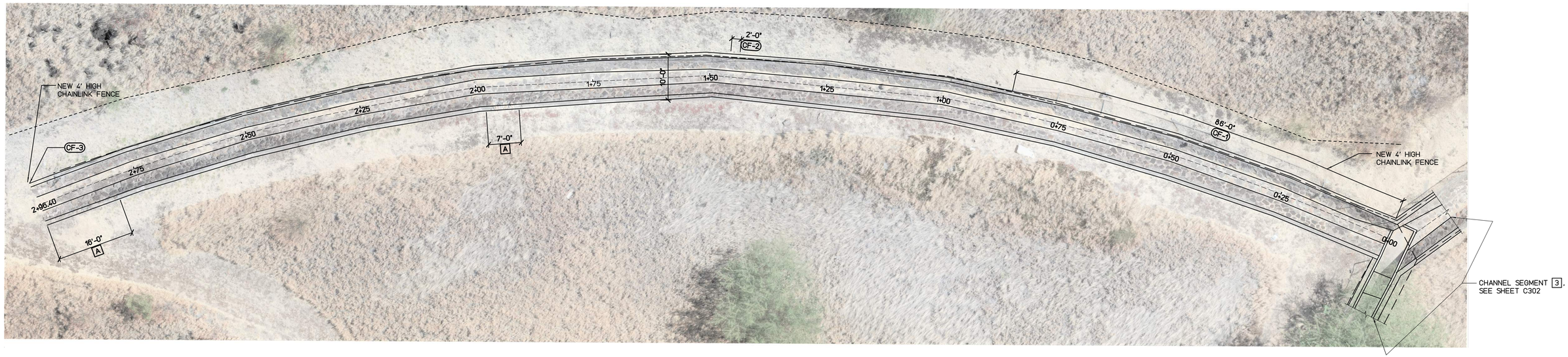
27 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

Plot date: 14-Nov-2023

J:/2020 Projects/20-066 DHHL PS-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/C304

J:/2020 Projects/20-066 DHHL PS-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/C400
Plot date: 14-Nov-2023



LEGEND:

2	CRACK REPAIR TYPE, SEE DETAIL 1/S001 AND 2/S001
3	SPALL REPAIR TYPE, SEE DETAIL 3/S001
G	CHAINLINK FENCE REPAIR TYPE, SEE SHEETS S002 AND S003
C-X	CRACK REPAIR MARK
SP-X	SPALL REPAIR MARK
CF-X	CHAINLINK FENCE REPAIR MARK
CS-X	CONCRETE SEALER REPAIR MARK, SEE DETAIL 4/S001
PX	PHOTO REFERENCE, SEE SHEETS C401

DEMOLITION AND REPAIR NOTES:

A	ADD MORTAR CAP ON WALL TOP
B	REGROUT WALL
C	REMOVE TREE
D	REMOVE TREE STUMP
E	REMOVE BOULDERS
F	REMOVE DEBRIS ALONG CHANNEL FLOOR
G	REMOVE DEBRIS ALONG CHANNEL WALL
H	DEMOLISH AND CONSTRUCT NEW WALL, SEE DETAIL 5/S001

CHANNEL SEGMENT 4 PLAN

SCALE: 1" = 10'

NORTH

STATIONING	SURFACE LOCATION	MARK	REPAIR TYPE	DIMENSION L(ft)	DIMENSION W(in)	DIMENSION D(in)	PHOTO REFERENCE
0+00 TO 0+86	NORTH WALL	CF-1	G	86			P1
1+44 TO 1+46	NORTH WALL	CF-2	I	2			P2
1+91 TO 1+98	SOUTH WALL		A B	7	12		P3
2+80 TO 2+96	SOUTH WALL		A B	16	12		P4
2+96	NORTH WALL	CF-3	G				P5

REVISION NO.	DATE	REVISIONS	BY

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LICENSED PROFESSIONAL ENGINEER
No. 7808-S
HAWAII U.S.A.
Exp. Date: 4-30-24

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DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS

NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 4 REPAIR PLAN

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

HAWAII ENGINEERING GROUP, Inc.
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Tel: 808-533-2092

JOB NO.

SHEET C400
28 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

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Plot date: 14-Nov-2023

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P5 REMOVE AND REPLACE CHAINLINK FENCE POST, SEE DETAIL G/S003.

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P1 CONSTRUCT NEW 4' HIGH CHAINLINK FENCE, SEE DETAIL A/S002.

P2 REPAIR CHAINLINK FENCE TOP RAIL, SEE DETAIL I/S003.

P3
1. RESTORE DAMAGED CRM WALL TO ITS ORIGINAL CONDITION.
2. ADD MORTAR CAP ON WALL TOP TO MATCH EXISTING.

P4
1. RESTORE DAMAGED CRM WALL TO ITS ORIGINAL CONDITION.
2. ADD MORTAR CAP ON WALL TOP TO MATCH EXISTING.

REVISION NO.	DATE	REVISIONS	BY

ATHER R. DAR
LICENSED PROFESSIONAL ENGINEER
No. 7808-S
HAWAII U.S.A.
Exp. Date: 4-30-24

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DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS
NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 4.0 REPAIR PHOTOS

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

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HONOLULU, HI 96813
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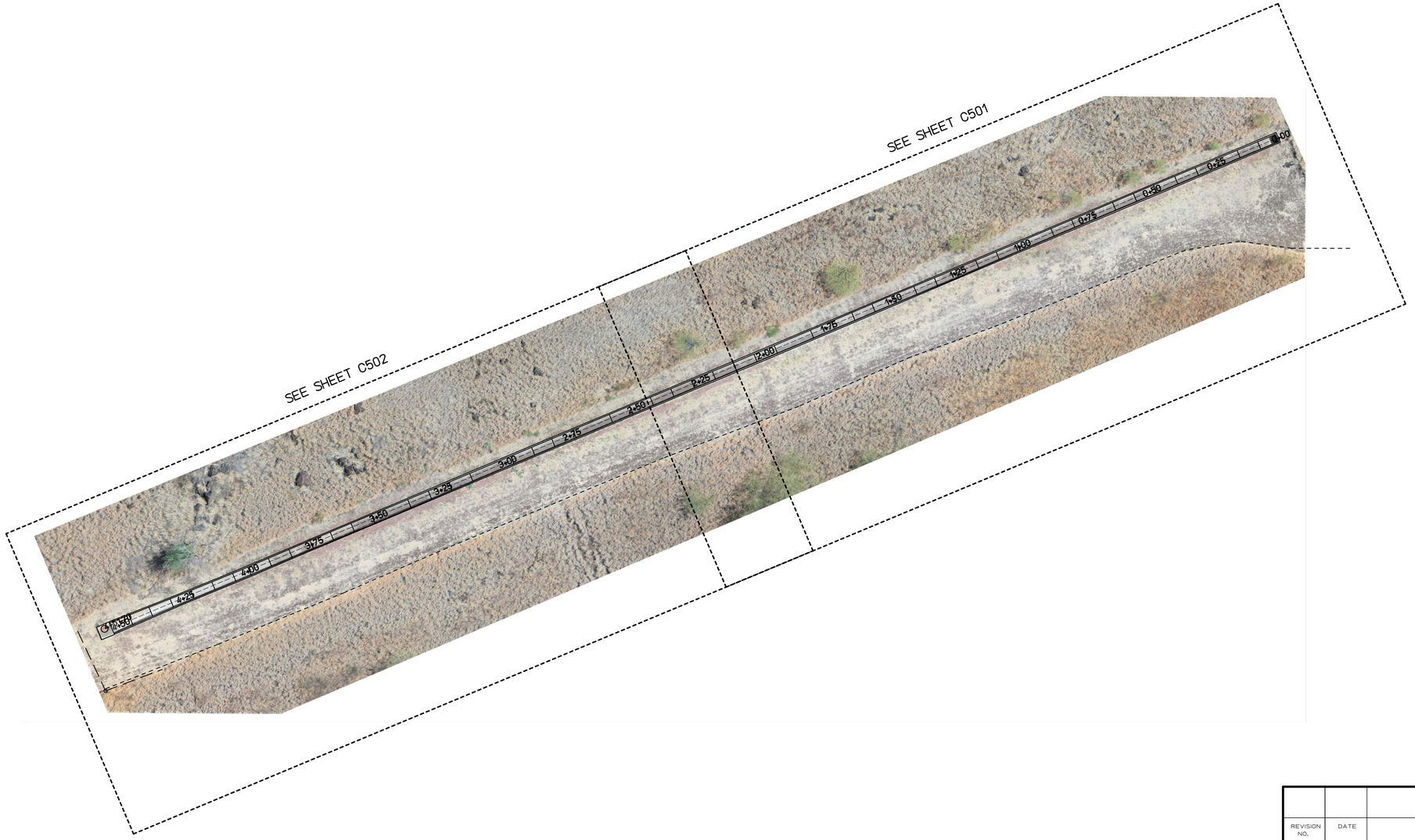
JOB NO.

SHEET C401
29 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

J:/2020 Projects/20-066 DHHL PS-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/C500
Plot date: 14-Nov-2023



CHANNEL SEGMENT 5 REPAIR PLAN

SCALE: 1" = 80'

NORTH

REVISION NO.	DATE	REVISIONS	BY

ATHER R. DAR
LICENSED PROFESSIONAL ENGINEER
No. 7808-S
HAWAII U.S.A.

Exp. Date: 4-30-24

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DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS

NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 5 REPAIR PLAN

DESIGNED BY:	AD
DRAWN BY:	AK, AP, DL
CHECKED BY:	AD
SUPV:	
DATE:	10/16/2023

HAWAII ENGINEERING GROUP, Inc.
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Tel: 808-533-2092

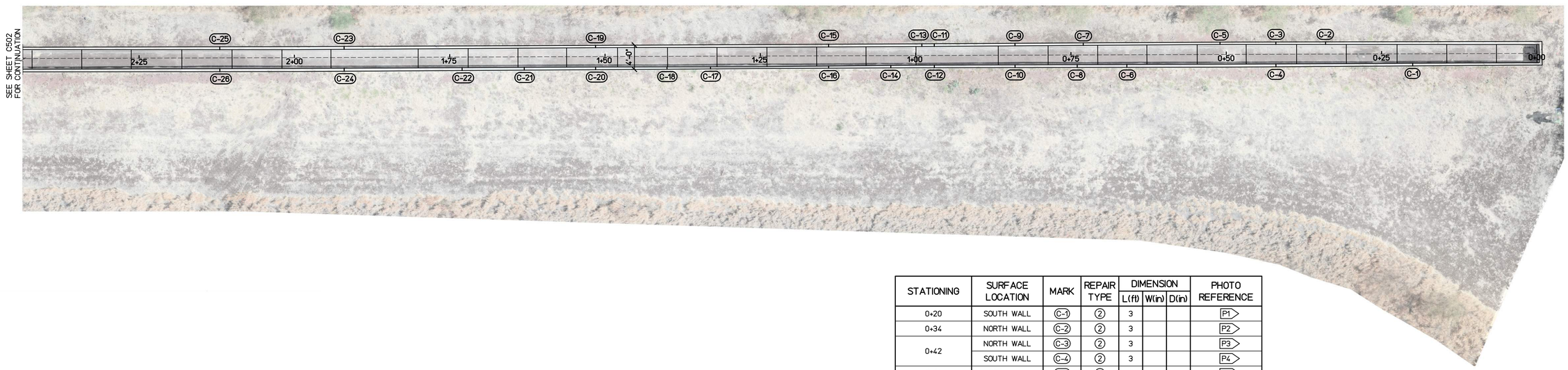
JOB NO.

SHEET C500

30 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

J:/2020 Projects/20-066 DHHL PS-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/C501
Plot date: 14-Nov-2023



STATIONING	SURFACE LOCATION	MARK	REPAIR TYPE	DIMENSION L(ft)	DIMENSION W(in)	DIMENSION D(in)	PHOTO REFERENCE
0+20	SOUTH WALL	C-1	2	3			P1
0+34	NORTH WALL	C-2	2	3			P2
0+42	NORTH WALL	C-3	2	3			P3
	SOUTH WALL	C-4	2	3			P4
0+51	NORTH WALL	C-5	2	3			P5
0+66	SOUTH WALL	C-6	2	3			P6
0+73	NORTH WALL	C-7	2	3			P7
0+74	SOUTH WALL	C-8	2	3			P8
0+84	NORTH WALL	C-9	2	3			P9
	SOUTH WALL	C-10	2	3			P10
0+97	NORTH WALL	C-11	2	3			P11
0+98	SOUTH WALL	C-12	2	3			P12
0+99	NORTH WALL	C-13	2	3			P13
1+04	SOUTH WALL	C-14	2	3			P14
1+14	NORTH WALL	C-15	2	3			P15
	SOUTH WALL	C-16	2	3			P16
1+33	SOUTH WALL	C-17	2	3			P17
1+40	SOUTH WALL	C-18	2	3			P18
1+53	NORTH WALL	C-19	2	3			P19
	SOUTH WALL	C-20	2	3			P20
1+63	SOUTH WALL	C-21	2	3			P21
1+73	SOUTH WALL	C-22	2	3			P22
1+92	NORTH WALL	C-23	2	3			P23
	SOUTH WALL	C-24	2	3			P24
2+12	NORTH WALL	C-25	2	3			P25
	SOUTH WALL	C-26	2	3			P26

LEGEND:

2	CRACK REPAIR TYPE, SEE DETAIL 1/S001 AND 2/S001
3	SPALL REPAIR TYPE, SEE DETAIL 3/S001
a	CHAINLINK FENCE REPAIR TYPE, SEE SHEETS S002 AND S003
C-X	CRACK REPAIR MARK
SP-X	SPALL REPAIR MARK
CF-X	CHAINLINK FENCE REPAIR MARK
CS-X	CONCRETE SEALER REPAIR MARK, SEE DETAIL 4/S001
PX	PHOTO REFERENCE, SEE SHEETS C503 AND C505

DEMOLITION AND REPAIR NOTES:

A	ADD MORTAR CAP ON WALL TOP
B	REGROUT WALL
C	REMOVE TREE
D	REMOVE TREE STUMP
E	REMOVE BOULDERS
F	REMOVE DEBRIS ALONG CHANNEL FLOOR
G	REMOVE DEBRIS ALONG CHANNEL WALL
H	DEMOLISH AND CONSTRUCT NEW WALL, SEE DETAIL 5/S001

CHANNEL SEGMENT 1.1 REPAIR PLAN (STA 0+00 TO 2+75)

SCALE: 1" = 10'

NORTH

REVISION NO.	DATE	REVISIONS	BY

ATHER R. DAR
LICENSED PROFESSIONAL ENGINEER
No. 7808-S
HAWAII U.S.A.
Exp. Date: 4-30-24

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DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS
NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 5.1 REPAIR PLAN
(STA 00+00 TO 02+25)

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

HAWAII ENGINEERING GROUP, Inc.
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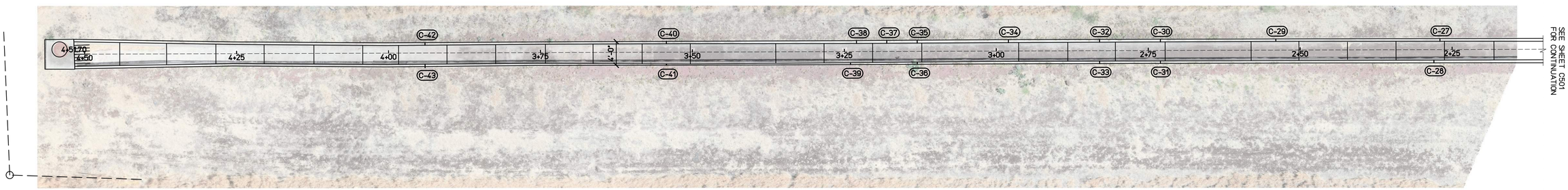
HONOLULU, HI 96813
Tel: 808-533-2092

JOB NO.

SHEET C501
31 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

J:/2020 Projects/20-066 DHHL PS-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/C502
Plot date: 14-Nov-2023



LEGEND:	
2	CRACK REPAIR TYPE, SEE DETAIL 1/S001 AND 2/S001
3	SPALL REPAIR TYPE, SEE DETAIL 3/S001
G	CHAINLINK FENCE REPAIR TYPE, SEE SHEETS S002 AND S003
C-X	CRACK REPAIR MARK
SP-X	SPALL REPAIR MARK
CF-X	CHAINLINK FENCE REPAIR MARK
CS-X	CONCRETE SEALER REPAIR MARK, SEE DETAIL 4/S001
PX	PHOTO REFERENCE, SEE SHEETS C503 AND C505

DEMOLITION AND REPAIR NOTES:	
A	ADD MORTAR CAP ON WALL TOP
B	REGROUT WALL
C	REMOVE TREE
D	REMOVE TREE STUMP
E	REMOVE BOULDERS
F	REMOVE DEBRIS ALONG CHANNEL FLOOR
G	REMOVE DEBRIS ALONG CHANNEL WALL
H	DEMOLISH AND CONSTRUCT NEW WALL, SEE DETAIL 5/S001

CHANNEL SEGMENT 5.2 REPAIR PLAN (STA 02+25 TO 04+51.70)

SCALE: 1" = 10'

NORTH

STATIONING	SURFACE LOCATION	MARK	REPAIR TYPE	DIMENSION L(ft)	DIMENSION W(in)	DIMENSION D(in)	PHOTO REFERENCE
2+27	NORTH WALL	C-27	2	3			P27
2+28	SOUTH WALL	C-28	2	3			P28
2+54	NORTH WALL	C-29	2	3			P29
2+73	NORTH WALL	C-30	2	3			P30
	SOUTH WALL	C-31	2	3			P31
2+83	NORTH WALL	C-32	2	3			P32
	SOUTH WALL	C-33	2	3			P33
2+98	NORTH WALL	C-34	2	3			P34
3+13	NORTH WALL	C-35	2	3			P35
	SOUTH WALL	C-36	2	3			P36
3+18	NORTH WALL	C-37	2	3			P37
3+23	NORTH WALL	C-38	2	3			P38
3+24	SOUTH WALL	C-39	2	3			P39
3+54	NORTH WALL	C-40	2	3			P40
	SOUTH WALL	C-41	2	3			P41
3+94	NORTH WALL	C-42	2	3			P42
	SOUTH WALL	C-43	2	3			P43

REVISION NO.	DATE	REVISIONS	BY

ATHER R. DAR
LICENSED PROFESSIONAL ENGINEER
No. 7808-S
HAWAII U.S.A.
Exp. Date: 4-30-24

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

DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS
NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 5.2 REPAIR PLAN
(STA 02+25 TO 04+51.70)

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

HAWAII ENGINEERING GROUP, Inc.
Civil & Structural Engineers
1088 BISHOP STREET #2506
HONOLULU, HI 96813
Tel: 808-533-2092

JOB NO.

SHEET C502
32 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

P15 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P16 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P17 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P18 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S00.1.

P10 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P11 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P12 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P13 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P14 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P5 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P6 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P7 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P8 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P9 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P1 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P2 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P3 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P4 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

REVISION NO.	DATE	REVISIONS	BY

ATHER R. DAR
LICENSED PROFESSIONAL ENGINEER
No. 7808-S
HAWAII U.S.A.
Exp. Date: 4-30-24

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DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS
NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 5.0 REPAIR PHOTOS

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

HAWAII ENGINEERING GROUP, Inc.
Civil & Structural Engineers
1088 BISHOP STREET #2506
HONOLULU, HI 96813
Tel: 808-533-2092

JOB NO.

SHEET C503
33 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

Plot date: 14-Nov-2023

J:/2020 Projects/20-066 DHHL PS-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/C503

P33 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P34 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P35 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P36 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P28 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P29 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P30 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P31 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P32 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P23 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P24 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P25 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P26 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P27 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P19 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S00.1.

P20 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P21 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P22 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

REVISION NO.	DATE	REVISIONS	BY

ATHER R. DAR
LICENSED PROFESSIONAL ENGINEER
No. 7808-S
HAWAII U.S.A.

Exp. Date: 4-30-24

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DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS

NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 5.0 REPAIR PHOTOS

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

HAWAII ENGINEERING GROUP, Inc.
Civil & Structural Engineers
1088 BISHOP STREET #2506
HONOLULU, HI 96813
Tel: 808-533-2092

JOB NO.

SHEET C504
34 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

Plot date: 14-Nov-2023

J:/2020 Projects/20-066 DHHL PS-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/C504.

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P41 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P42 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P43 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

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P37 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P38 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P39 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P40 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

REVISION NO.	DATE	REVISIONS	BY

ATHER R. DAR
LICENSED PROFESSIONAL ENGINEER
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HAWAII U.S.A.

Exp. Date: 4-30-24

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DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS

NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 5.0 REPAIR PHOTOS

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

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Civil & Structural Engineers
1088 BISHOP STREET #2506
HONOLULU, HI 96813
Tel: 808-533-2092

JOB NO.

SHEET C505

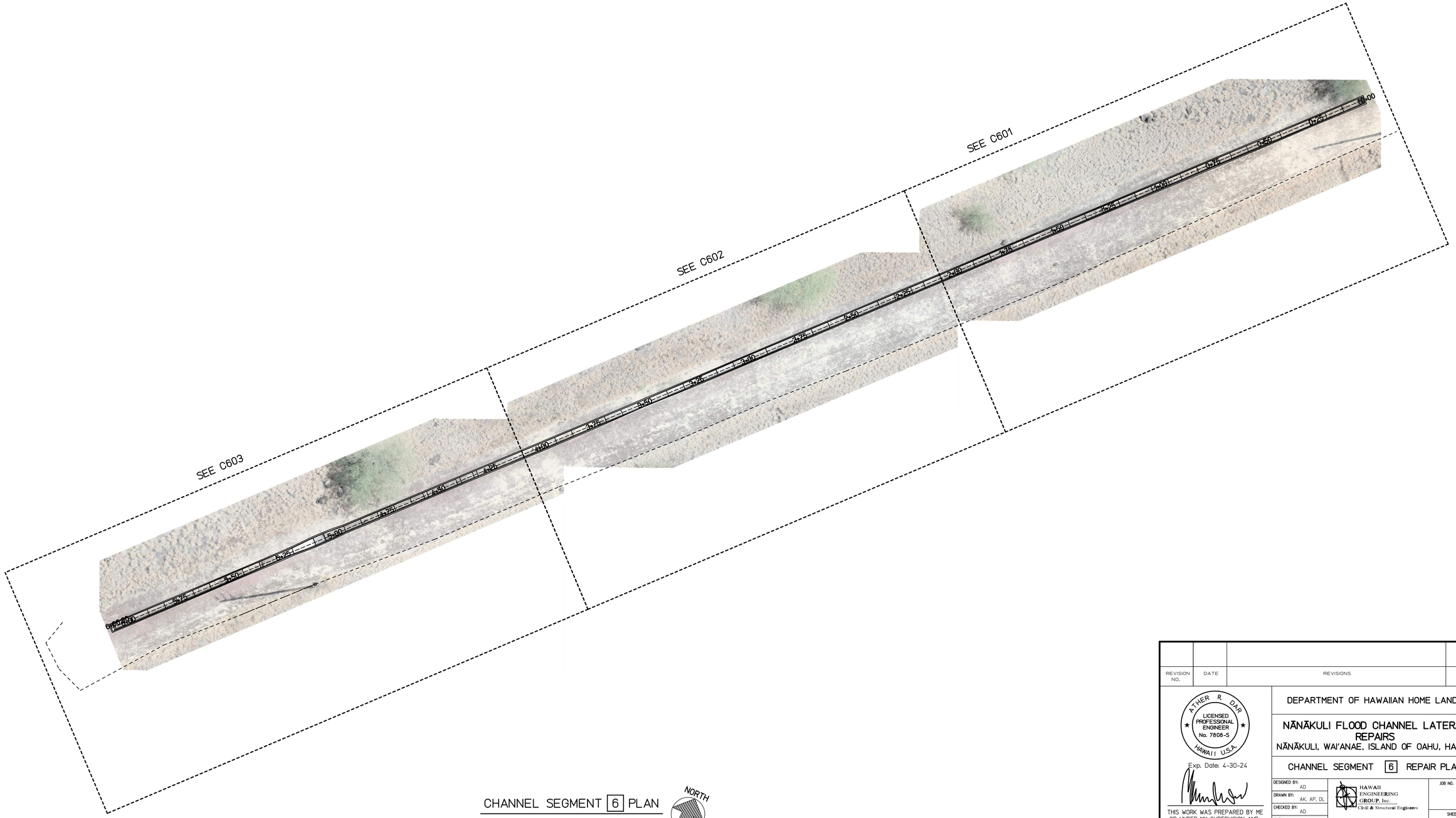
35 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

Plot date: 14-Nov-2023

J:/2020 Projects/20-066 DHHL P5-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/C505

J:/2020 Projects/20-066 DHHL PS-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/C600
Plot date: 14-Nov-2023



CHANNEL SEGMENT 6 PLAN

SCALE: 1" = 20'

NORTH

REVISION NO.	DATE	REVISIONS	BY

ATHER R. DAR
LICENSED PROFESSIONAL ENGINEER
No. 7808-S
HAWAII U.S.A.

Exp. Date: 4-30-24

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DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS

NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 6 REPAIR PLAN

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

HAWAII ENGINEERING GROUP, Inc.
Civil & Structural Engineers
1088 BISHOP STREET #2506
HONOLULU, HI 96813
Tel: 808-533-2092

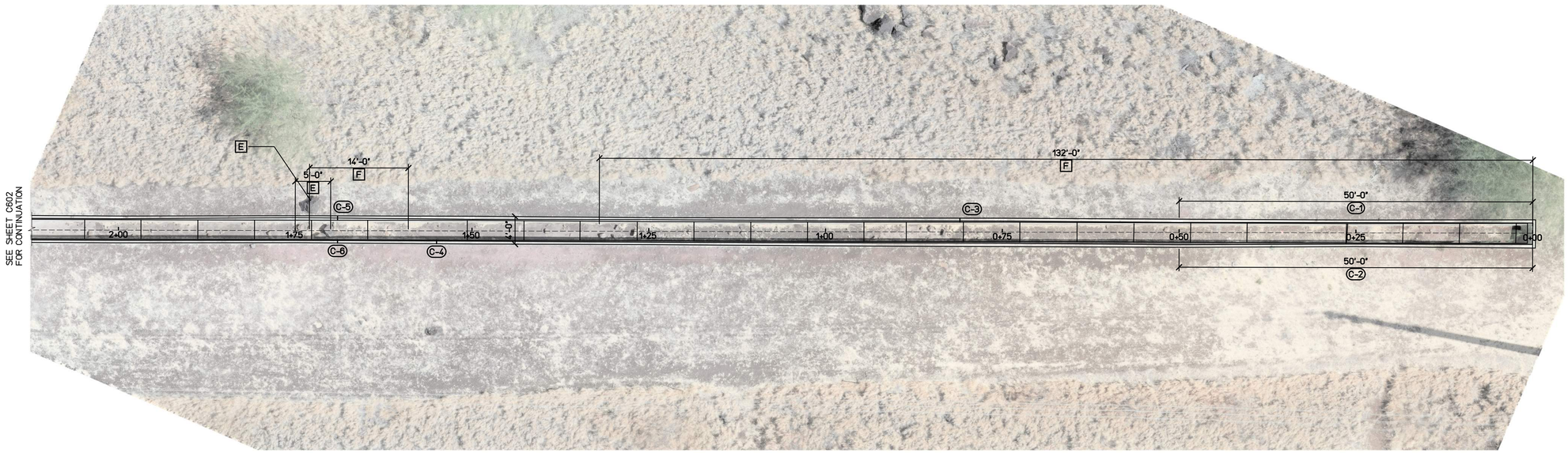
JOB NO.

SHEET C600

36 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

J:/2020 Projects/20-066 DHHL PS-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/C601
Plot date: 14-Nov-2023



LEGEND:	
2	CRACK REPAIR TYPE, SEE DETAIL 1/S001 AND 2/S001
3	SPALL REPAIR TYPE, SEE DETAIL 3/S001
G	CHAINLINK FENCE REPAIR TYPE, SEE SHEETS S002 AND S003
C-X	CRACK REPAIR MARK
SP-X	SPALL REPAIR MARK
CF-X	CHAINLINK FENCE REPAIR MARK
CS-X	CONCRETE SEALER REPAIR MARK, SEE DETAIL 4/S001
PX	PHOTO REFERENCE, SEE SHEETS C604 AND C605

DEMOLITION AND REPAIR NOTES:	
A	ADD MORTAR CAP ON WALL TOP
B	REGROUT WALL
C	REMOVE TREE
D	REMOVE TREE STUMP
E	REMOVE BOULDERS
F	REMOVE DEBRIS ALONG CHANNEL FLOOR
G	REMOVE DEBRIS ALONG CHANNEL WALL
H	DEMOLISH AND CONSTRUCT NEW WALL, SEE DETAIL 5/S001

CHANNEL SEGMENT 6.1 REPAIR PLAN (STA 0+00 TO 2+00)

SCALE: 1" = 10'

NORTH

STATIONING	SURFACE LOCATION	MARK	REPAIR TYPE	DIMENSION L(ft)	DIMENSION W(in)	DIMENSION D(in)	PHOTO REFERENCE
0+00 TO 0+50	NORTH WALL	C-1	2	50			P1
	SOUTH WALL	C-2	2	50			P2
0+00 TO 1+32	FLOOR		F	132			P3
0+81	NORTH WALL	C-3	2	5			P4
1+55	SOUTH WALL	C-4	2	5			P5
1+59 TO 1+73	FLOOR		F	14			P6
1+69	NORTH WALL	C-5	2	5	1		P7
	SOUTH WALL	C-6	2	5	1		P8
1+70 TO 1+75	FLOOR		E	5			P9
1+73	NORTH WALL		E				

REVISION NO.	DATE	REVISIONS	BY

ATHER R. DAR
LICENSED PROFESSIONAL ENGINEER
No. 7808-S
HAWAII U.S.A.
Exp. Date: 4-30-24

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DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS
NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 6.1 REPAIR PLAN
(STA 0+00 TO 3+00)

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

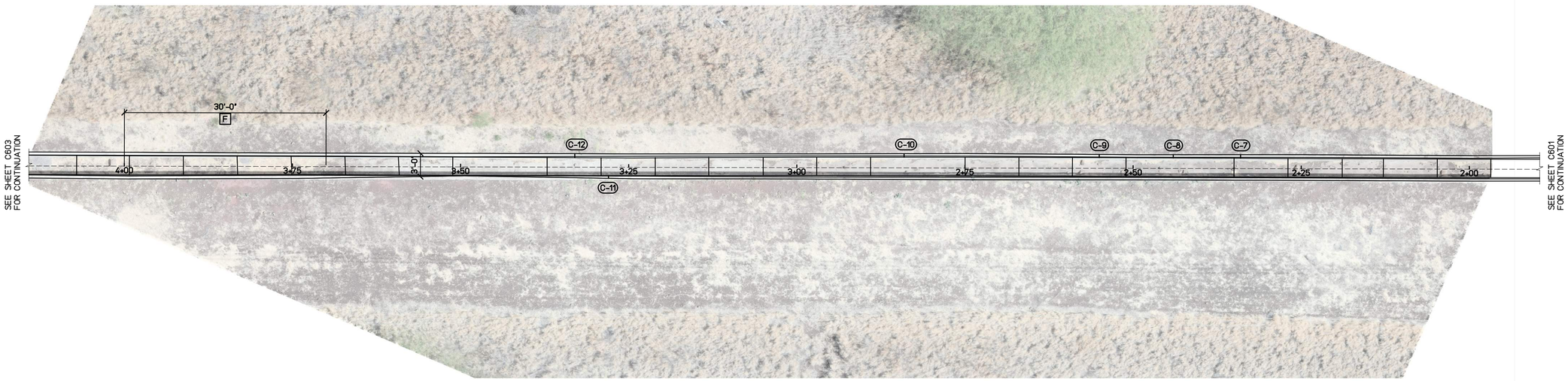
HAWAII ENGINEERING GROUP, Inc.
Civil & Structural Engineers
1088 BISHOP STREET #2506
HONOLULU, HI 96813
Tel: 808-533-2092

JOB NO.

SHEET C601
37 OF 74 SHTS

FILE ___ DRAWER ___ ___ FOLDER ___ ___

J:/2020 Projects/20-066 DHHL PS-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/C602
Plot date: 14-Nov-2023



LEGEND:	
2	CRACK REPAIR TYPE, SEE DETAIL 1/S001 AND 2/S001
3	SPALL REPAIR TYPE, SEE DETAIL 3/S001
a	CHAINLINK FENCE REPAIR TYPE, SEE SHEETS S002 AND S003
C-X	CRACK REPAIR MARK
SP-X	SPALL REPAIR MARK
CF-X	CHAINLINK FENCE REPAIR MARK
CS-X	CONCRETE SEALER REPAIR MARK, SEE DETAIL 4/S001
PX	PHOTO REFERENCE, SEE SHEETS C604 AND C605

DEMOLITION AND REPAIR NOTES:	
A	ADD MORTAR CAP ON WALL TOP
B	REGROUT WALL
C	REMOVE TREE
D	REMOVE TREE STUMP
E	REMOVE BOULDERS
F	REMOVE DEBRIS ALONG CHANNEL FLOOR
G	REMOVE DEBRIS ALONG CHANNEL WALL
H	DEMOLISH AND CONSTRUCT NEW WALL, SEE DETAIL 5/S001

CHANNEL SEGMENT 6.2 REPAIR PLAN (STA 2+00 TO 4+00)

SCALE: 1" = 10'

NORTH

STATIONING	SURFACE LOCATION	MARK	REPAIR TYPE	DIMENSION			PHOTO REFERENCE
				L(ft)	W(in)	D(in)	
2+34	NORTH WALL	C-7	2	5			P10
2+44	NORTH WALL	C-8	2	5			P11
2+55	NORTH WALL	C-9	2	5			P12
2+84	NORTH WALL	C-10	2	5			P13
3+28	SOUTH WALL	C-11	2	5			P14
3+33	NORTH WALL	C-12	2	5			P15
3+70 TO 4+00	FLOOR		F	30			P16

REVISION NO.	DATE	REVISIONS	BY

ATHER R. DAR
LICENSED PROFESSIONAL ENGINEER
No. 7808-S
HAWAII U.S.A.
Exp. Date: 4-30-24

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DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS
NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 6.2 REPAIR PLAN
(STA 0+00 TO 6+06.36)

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

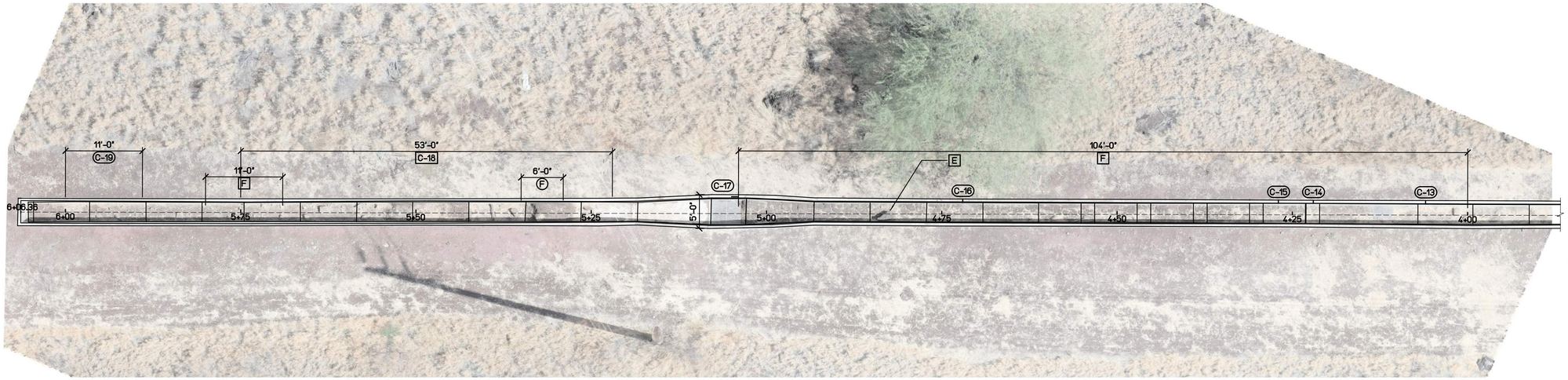
HAWAII ENGINEERING GROUP, Inc.
Civil & Structural Engineers
1088 BISHOP STREET #2506
HONOLULU, HI 96813
Tel: 808-533-2092

JOB NO.

SHEET C602
38 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

J:/2020 Projects/20-066 DHHL PS-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/C603 Plot date: 14-Nov-2023



LEGEND:

(2)	CRACK REPAIR TYPE, SEE DETAIL 1/S001 AND 2/S001
(3)	SPALL REPAIR TYPE, SEE DETAIL 3/S001
(G)	CHAINLINK FENCE REPAIR TYPE, SEE SHEETS S002 AND S003
(C-X)	CRACK REPAIR MARK
(SP-X)	SPALL REPAIR MARK
(CF-X)	CHAINLINK FENCE REPAIR MARK
(CS-X)	CONCRETE SEALER REPAIR MARK, SEE DETAIL 4/S001
PX>	PHOTO REFERENCE, SEE SHEETS C604 AND C605

DEMOLITION AND REPAIR NOTES:

A	ADD MORTAR CAP ON WALL TOP
B	REGROUT WALL
C	REMOVE TREE
D	REMOVE TREE STUMP
E	REMOVE BOULDERS
F	REMOVE DEBRIS ALONG CHANNEL FLOOR
G	REMOVE DEBRIS ALONG CHANNEL WALL
H	DEMOLISH AND CONSTRUCT NEW WALL, SEE DETAIL 5/S001

STATIONING	SURFACE LOCATION	MARK	REPAIR TYPE	DIMENSION			PHOTO REFERENCE
				L(ft)	W(in)	D(in)	
4+00 TO 5+04	FLOOR		F	104			P17>
4+06	NORTH WALL	(C-13)	(2)	5			P18>
4+22	NORTH WALL	(C-14)	(2)	5			P19>
4+27	NORTH WALL	(C-15)	(2)	5			P20>
4+72	NORTH WALL	(C-16)	(2)	5			P21>
4+83	FLOOR		E				P22>
5+04 TO 5+05	NORTH WALL	(C-17)	(2)	1	.5		P23>
5+22 TO 5+75	NORTH WALL	(C-18)	(2)	53			P24>
5+29 TO 5+35	FLOOR		F	6			P25>
5+69 TO 5+80	FLOOR		F	11			P26>
5+89 TO 6+00	NORTH WALL	(C-19)	(2)	11			P27>

CHANNEL SEGMENT 6.3 REPAIR PLAN (STA 4+00 TO 6+06.36)

SCALE: 1/8" = 1'-0"

NORTH

REVISION NO.	DATE	REVISIONS	BY

ATHER R. DAR
LICENSED PROFESSIONAL ENGINEER
No. 7808-S
HAWAII U.S.A.
Exp. Date: 4-30-24

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DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS

NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 6.3 REPAIR PLAN (STA 4+00 TO 6+06.36)

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

HAWAII ENGINEERING GROUP, Inc.
Civil & Structural Engineers
1088 BISHOP STREET #2506
HONOLULU, HI 96813
Tel: 808-533-2092

JOB NO.

SHEET C603
39 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

P15 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P16 REMOVE DEBRIS ON CHANNEL FLOOR.

P17 REMOVE DEBRIS ON CHANNEL FLOOR.

P18 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P10 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P11 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P12 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P13 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P14 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P5 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P6 REMOVE DEBRIS ON CHANNEL FLOOR.

P7 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P8 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P9 REMOVE BOULDERS ON CHANNEL FLOOR AND ON TOP OF WALL.

P1 REPAIR HORIZONTAL CRACK ON WALL, SEE DETAIL 2/S001.

P2 REPAIR HORIZONTAL CRACK ON WALL, SEE DETAIL 2/S001.

P3 REMOVE DEBRIS ON CHANNEL FLOOR.

P4 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

REVISION NO.	DATE	REVISIONS	BY

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LICENSED PROFESSIONAL ENGINEER
No. 7808-S
HAWAII U.S.A.

Exp. Date: 4-30-24

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DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS

NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 6.0 REPAIR PHOTOS

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

HAWAII ENGINEERING GROUP, Inc.
Civil & Structural Engineers
1088 BISHOP STREET #2506
HONOLULU, HI 96813
Tel: 808-533-2092

JOB NO.

SHEET C604

40 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

Plot date: 14-Nov-2023

J:/2020 Projects/20-066 DHHL PS-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/C604.

J:/2020 Projects/20-066 DHHL P5-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/C605
Plot date: 14-Nov-2023

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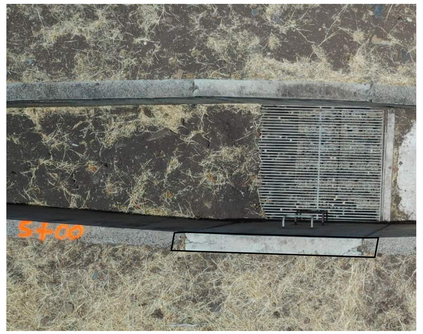


P23 REPAIR CRACK ON TOP OF WALL, SEE DETAIL 2/S001.

P24 REPAIR HORIZONTAL CRACK ON WALL, SEE DETAIL 2/S001.

P25 REMOVE DEBRIS ON CHANNEL FLOOR.

P26 REMOVE DEBRIS ON CHANNEL FLOOR.

P27 REPAIR HORIZONTAL CRACK ON WALL, SEE DETAIL 2/S001.

P19 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P20 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P21 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P22 REMOVE BOULDERS ON CHANNEL FLOOR.

REVISION NO.	DATE	REVISIONS	BY

ATHER R. DAR
LICENSED PROFESSIONAL ENGINEER
No. 7808-S
HAWAII U.S.A.
Exp. Date: 4-30-24

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

DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS
NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 6.0 REPAIR PHOTOS

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

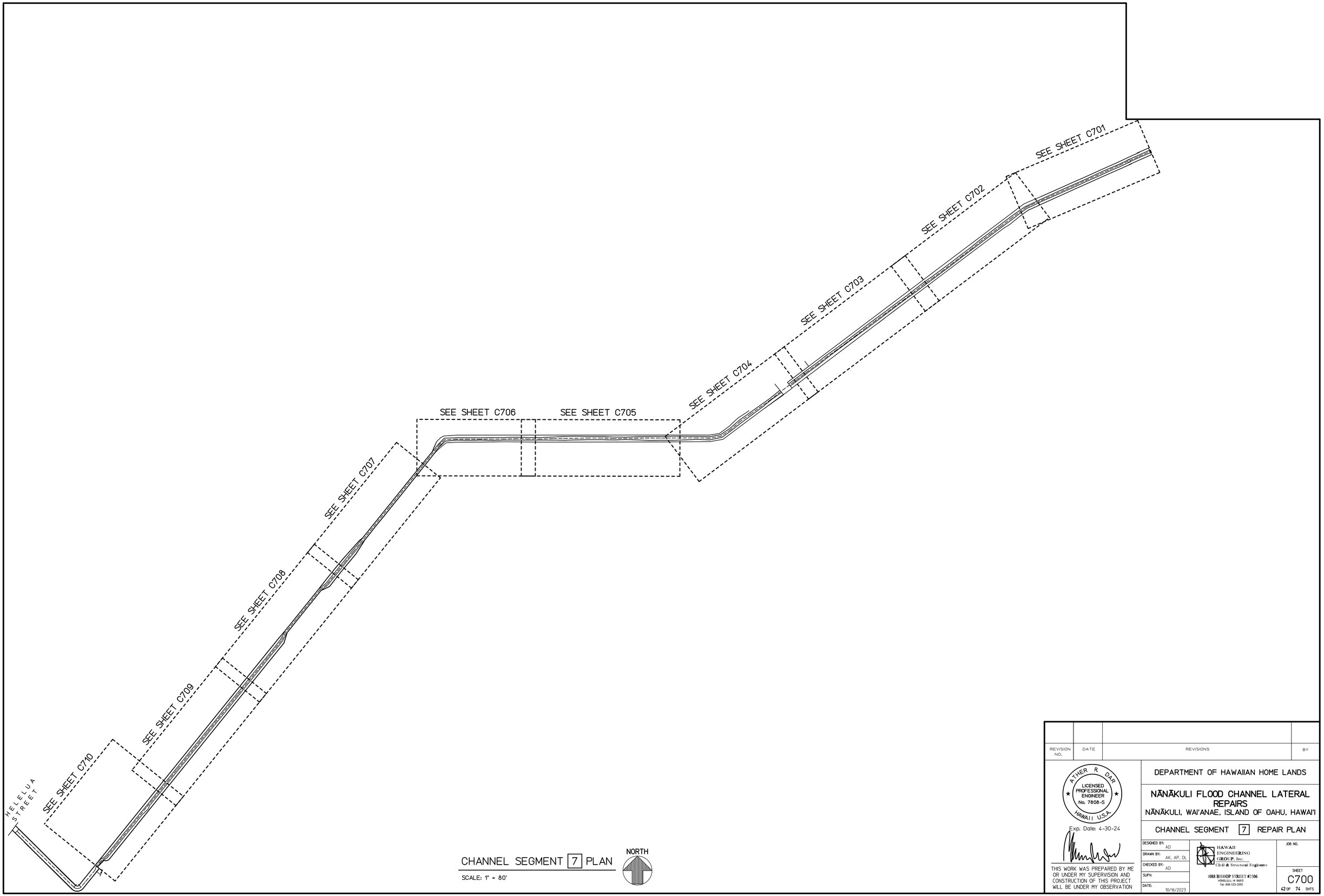
HAWAII ENGINEERING GROUP, Inc.
Civil & Structural Engineers
1088 BISHOP STREET #2506
HONOLULU, HI 96813
Tel: 808-533-2092

JOB NO.

SHEET C605
41 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

J:/2020 Projects/20-066 DHHL PS-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/C700
Plot date: 14-Nov-2023



CHANNEL SEGMENT 7 PLAN

SCALE: 1" = 80'

REVISION NO.	DATE	REVISIONS	BY

ATHER R. DAR
LICENSED PROFESSIONAL ENGINEER
No. 7808-S
HAWAII U.S.A.

Exp. Date: 4-30-24

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DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS

NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 7 REPAIR PLAN

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

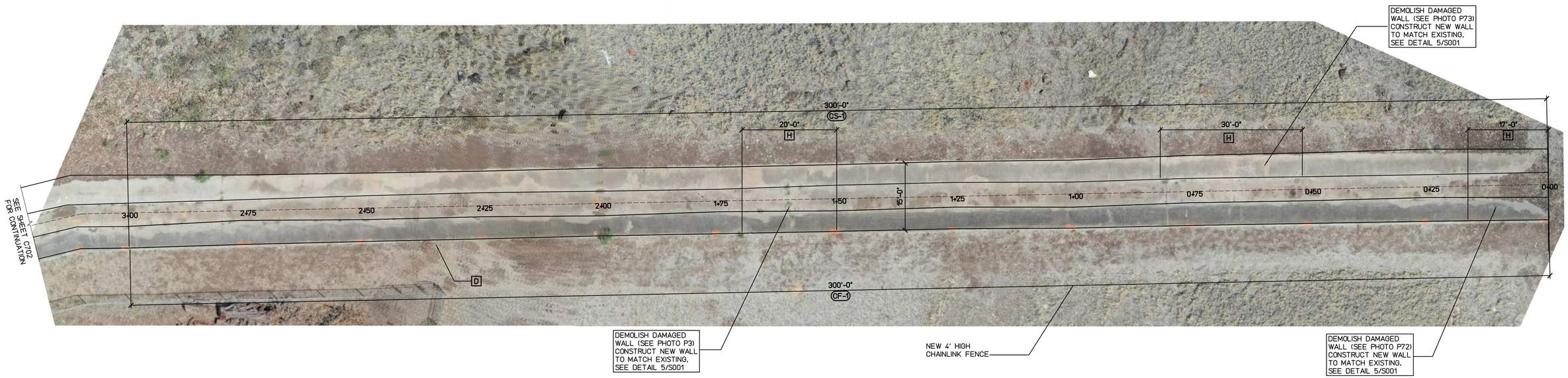
HAWAII ENGINEERING GROUP, Inc.
Civil & Structural Engineers
1088 BISHOP STREET #2506
HONOLULU, HI 96813
Tel: 808-533-2092

JOB NO.

SHEET C700
42 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

Plot date: 14-Nov-2023
J:/2020 Projects/20-066 DHHL PS-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/C701



LEGEND:

2	CRACK REPAIR TYPE, SEE DETAIL 1/S001 AND 2/S001
3	SPALL REPAIR TYPE, SEE DETAIL 3/S001
G	CHAINLINK FENCE REPAIR TYPE, SEE SHEETS S002 AND S003
C-X	CRACK REPAIR MARK
SP-X	SPALL REPAIR MARK
CF-X	CHAINLINK FENCE REPAIR MARK
CS-X	CONCRETE SEALER REPAIR MARK, SEE DETAIL 4/S001
PX	PHOTO REFERENCE, SEE SHEETS C711 AND C715

DEMOLITION AND REPAIR NOTES:

A	ADD MORTAR CAP ON WALL TOP
B	REGROUT WALL
C	REMOVE TREE
D	REMOVE TREE STUMP
E	REMOVE BOULDERS
F	REMOVE DEBRIS ALONG CHANNEL FLOOR
G	REMOVE DEBRIS ALONG CHANNEL WALL
H	DEMOLISH AND CONSTRUCT NEW WALL, SEE DETAIL 5/S001

CHANNEL SEGMENT 7.1 REPAIR PLAN (STA 0+00 TO 3+00)

SCALE: 1" = 10'

NORTH

STATIONING	SURFACE LOCATION	MARK	REPAIR TYPE	DIMENSION L(ft)	W(in)	D(in)	PHOTO REFERENCE
0+00 TO 0+17	NORTH WALL		H	17			P72
	FLOOR						
	SOUTH WALL						
0+00 TO 3+00	SOUTH WALL	CF-1	G	300			P1
0+17 TO 3+00	NORTH WALL	CS-1		300	180		P2
	SOUTH WALL						
0+52 TO 0+82	NORTH WALL		H	30			P73
1+50 TO 1+70	NORTH WALL		H	20			P3
	FLOOR						
	SOUTH WALL						
2+35	SOUTH WALL		D				P1

REVISION NO.	DATE	REVISIONS	BY

ATHER R. DAR
LICENSED PROFESSIONAL ENGINEER
No. 7808-S
HAWAII U.S.A.
Exp. Date: 4-30-24

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DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS

NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 7.1 REPAIR PLAN (STA 0+00 TO 3+00)

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

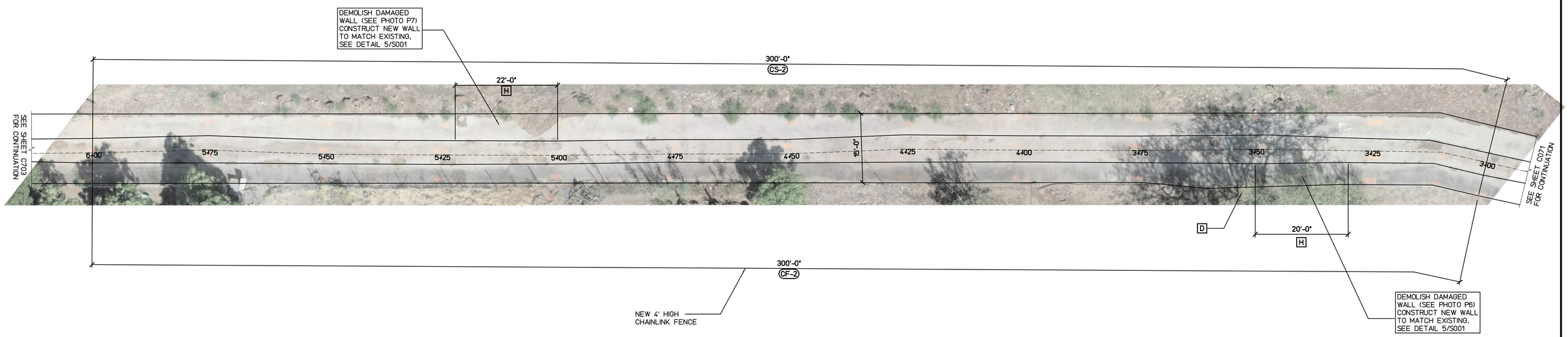
HAWAII ENGINEERING GROUP, Inc.
Civil & Structural Engineers
1088 BISHOP STREET #2506
HONOLULU, HI 96813
Tel: 808-533-2092

JOB NO.

SHEET C701
43 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

J:/2020 Projects/20-066 DHHL PS-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/C702
Plot date: 14-Nov-2023



LEGEND:

2	CRACK REPAIR TYPE, SEE DETAIL 1/S001 AND 2/S001
3	SPALL REPAIR TYPE, SEE DETAIL 3/S001
G	CHAINLINK FENCE REPAIR TYPE, SEE SHEETS S002 AND S003
C-X	CRACK REPAIR MARK
SP-X	SPALL REPAIR MARK
CF-X	CHAINLINK FENCE REPAIR MARK
CS-X	CONCRETE SEALER REPAIR MARK, SEE DETAIL 4/S001
PX	PHOTO REFERENCE, SEE SHEETS C711 AND C715

DEMOLITION AND REPAIR NOTES:

A	ADD MORTAR CAP ON WALL TOP
B	REGROUT WALL
C	REMOVE TREE
D	REMOVE TREE STUMP
E	REMOVE BOULDERS
F	REMOVE DEBRIS ALONG CHANNEL FLOOR
G	REMOVE DEBRIS ALONG CHANNEL WALL
H	DEMOLISH AND CONSTRUCT NEW WALL, SEE DETAIL 5/S001

STATIONING	SURFACE LOCATION	MARK	REPAIR TYPE	DIMENSION L(ft)	DIMENSION W(in)	DIMENSION D(in)	PHOTO REFERENCE
3+00 TO 6+00	NORTH WALL	CS-2		300	180		P4
	SOUTH WALL						
3+00 TO 6+00	SOUTH WALL	CF-2	G	300			P5
3+53	SOUTH WALL		D				P6
3+30 TO 3+50	SOUTH WALL		H	20			P6
5+00 TO 5+22	NORTH WALL		H	22			P7

CHANNEL SEGMENT 7.2 REPAIR PLAN (STA 3+00 TO 6+00)

SCALE: 1" = 10'

NORTH

REVISION NO.	DATE	REVISIONS	BY

ATHER R. DAR
LICENSED PROFESSIONAL ENGINEER
No. 7808-S
HAWAII U.S.A.
Exp. Date: 4-30-24

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DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS
NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 7.2 REPAIR PLAN (STA 3+00 TO 6+00)

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

HAWAII ENGINEERING GROUP, Inc.
Civil & Structural Engineers
1088 BISHOP STREET #2506
HONOLULU, HI 96813
Tel: 808-533-2092

JOB NO.

SHEET C702
44 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

J:/2020 Projects/20-066 DHHL PS-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/C703
Plot date: 14-Nov-2023

LEGEND:	
2	CRACK REPAIR TYPE, SEE DETAIL 1/S001 AND 2/S001
3	SPALL REPAIR TYPE, SEE DETAIL 3/S001
G	CHAINLINK FENCE REPAIR TYPE, SEE SHEETS S002 AND S003
C-X	CRACK REPAIR MARK
SP-X	SPALL REPAIR MARK
CF-X	CHAINLINK FENCE REPAIR MARK
CS-X	CONCRETE SEALER REPAIR MARK, SEE DETAIL 4/S001
PX	PHOTO REFERENCE, SEE SHEETS C711 AND C715

DEMOLITION AND REPAIR NOTES:	
A	ADD MORTAR CAP ON WALL TOP
B	REGROUT WALL
C	REMOVE TREE
D	REMOVE TREE STUMP
E	REMOVE BOULDERS
F	REMOVE DEBRIS ALONG CHANNEL FLOOR
G	REMOVE DEBRIS ALONG CHANNEL WALL
H	DEMOLISH AND CONSTRUCT NEW WALL, SEE DETAIL 5/S001

CHANNEL SEGMENT 7.3 REPAIR PLAN (STA 6+00 TO 9+00)

SCALE: 1" = 10'

NORTH

STATIONING	SURFACE LOCATION	MARK	REPAIR TYPE	DIMENSION L(ft)	DIMENSION W(in)	DIMENSION D(in)	PHOTO REFERENCE
6+00 TO 9+00	NORTH WALL	CS-3		300	180		P8
	SOUTH WALL						
6+00 TO 9+00	SOUTH WALL	CF-3	G	300			P9
8+22	FLOOR		F		24		P10
8+75 TO 9+00	FLOOR		F	25			P11
	NORTH WALL		G	25			P12

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ATHER R. DAR
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No. 7808-S
HAWAII U.S.A.
Exp. Date: 4-30-24

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DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS
NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 7.3 REPAIR PLAN
(STA 6+00 TO 9+00)

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

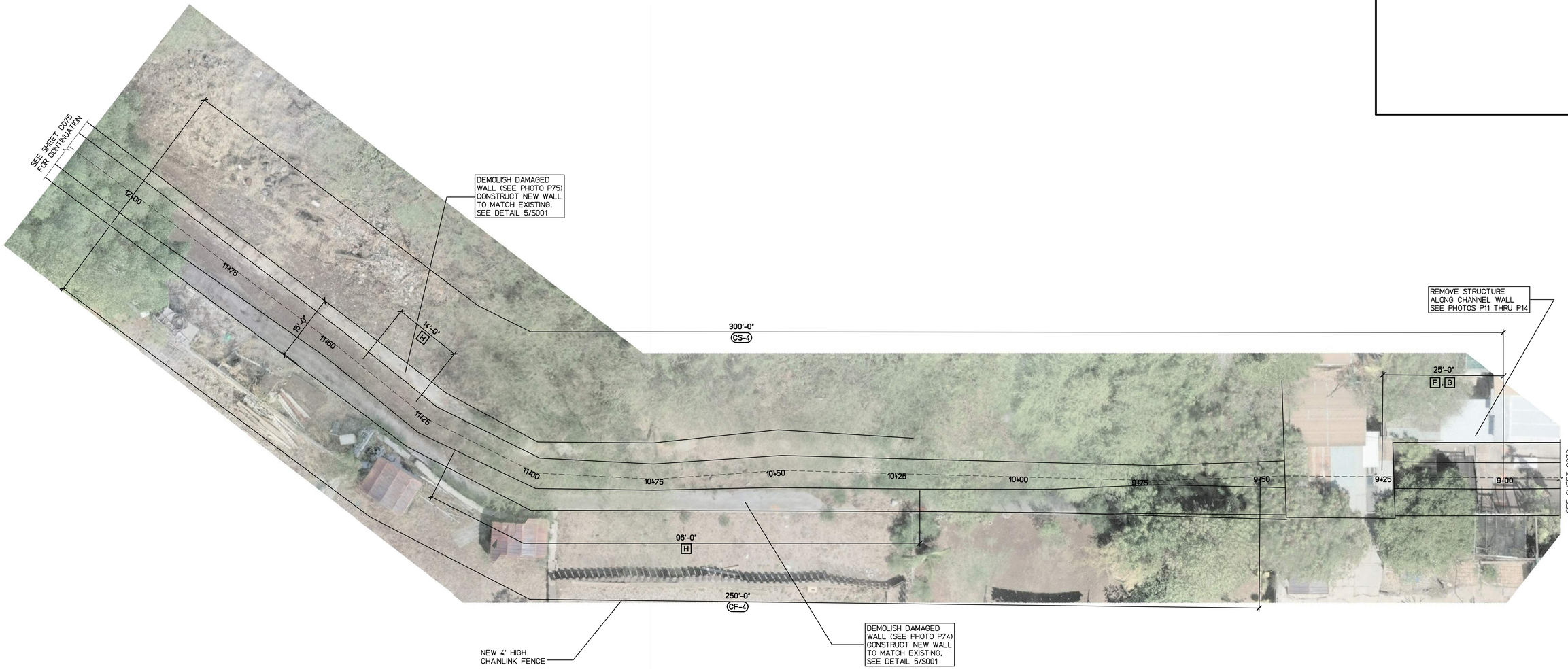
HAWAII ENGINEERING GROUP, Inc.
Civil & Structural Engineers
1088 BISHOP STREET #2506
HONOLULU, HI 96813
Tel: 808-533-2092

JOB NO.

SHEET C703
45 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

J:/2020 Projects/20-066 DHHL PS-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/C704
Plot date: 14-Nov-2023



LEGEND:

2	CRACK REPAIR TYPE, SEE DETAIL 1/S001 AND 2/S001
3	SPALL REPAIR TYPE, SEE DETAIL 3/S001
G	CHAINLINK FENCE REPAIR TYPE, SEE SHEETS S002 AND S003
C-X	CRACK REPAIR MARK
SP-X	SPALL REPAIR MARK
CF-X	CHAINLINK FENCE REPAIR MARK
CS-X	CONCRETE SEALER REPAIR MARK, SEE DETAIL 4/S001
PX	PHOTO REFERENCE, SEE SHEETS C711 AND C715

DEMOLITION AND REPAIR NOTES:

A	ADD MORTAR CAP ON WALL TOP
B	REGROUT WALL
C	REMOVE TREE
D	REMOVE TREE STUMP
E	REMOVE BOULDERS
F	REMOVE DEBRIS ALONG CHANNEL FLOOR
G	REMOVE DEBRIS ALONG CHANNEL WALL
H	DEMOLISH AND CONSTRUCT NEW WALL, SEE DETAIL 5/S001

STATIONING	SURFACE LOCATION	MARK	REPAIR TYPE	DIMENSION L(ft)	W(in)	D(in)	PHOTO REFERENCE
9+00 TO 9+25	FLOOR		F	25			P13
	NORTH WALL		G	25			P14
9+00 TO 12+00	NORTH WALL	CS-4		300	180		P74
	SOUTH WALL						
9+50 TO 12+00	SOUTH WALL	CF-4	G	250			P16
10+20 TO 11+16	SOUTH WALL		H	96			P15
11+28 TO 11+42	NORTH WALL		H	14			P75

CHANNEL SEGMENT 7.4 REPAIR PLAN (STA 9+00 TO 12+00)

SCALE: 1" = 10'

NORTH

REVISION NO.	DATE	REVISIONS	BY

ATHER R. DAR
LICENSED PROFESSIONAL ENGINEER
No. 7808-S
HAWAII U.S.A.
Exp. Date: 4-30-24

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DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS
NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 7.4 REPAIR PLAN (STA 9+00 TO 12+00)

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

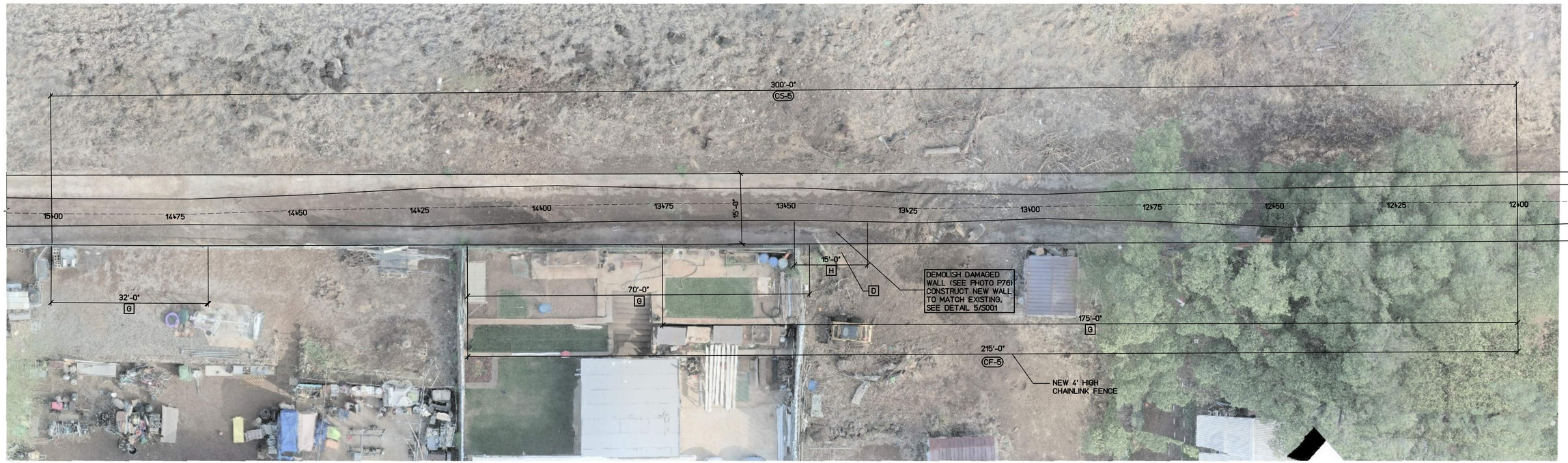
HAWAII ENGINEERING GROUP, Inc.
Civil & Structural Engineers
1088 BISHOP STREET #2506
HONOLULU, HI 96813
Tel: 808-533-2092

JOB NO.

SHEET C704
45 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

Plot date: 14-Nov-2023
J:/2020 Projects/20-066 DHHL PS-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/C705



LEGEND:

2	CRACK REPAIR TYPE, SEE DETAIL 1/S001 AND 2/S001
3	SPALL REPAIR TYPE, SEE DETAIL 3/S001
G	CHAINLINK FENCE REPAIR TYPE, SEE SHEETS S002 AND S003
C-X	CRACK REPAIR MARK
SP-X	SPALL REPAIR MARK
CF-X	CHAINLINK FENCE REPAIR MARK
CS-X	CONCRETE SEALER REPAIR MARK, SEE DETAIL 4/S001
PX	PHOTO REFERENCE, SEE SHEETS C711 AND C715

DEMOLITION AND REPAIR NOTES:

A	ADD MORTAR CAP ON WALL TOP
B	REGROUT WALL
C	REMOVE TREE
D	REMOVE TREE STUMP
E	REMOVE BOULDERS
F	REMOVE DEBRIS ALONG CHANNEL FLOOR
G	REMOVE DEBRIS ALONG CHANNEL WALL
H	DEMOLISH AND CONSTRUCT NEW WALL, SEE DETAIL 5/S001

CHANNEL SEGMENT 7.5 REPAIR PLAN (STA 12+00 TO 15+00)

SCALE: 1" = 10'

NORTH

STATIONING	SURFACE LOCATION	MARK	REPAIR TYPE	DIMENSION L(ft)	DIMENSION W(in)	DIMENSION D(in)	PHOTO REFERENCE
12+00 TO 13+75	SOUTH WALL	G		175			P17
12+00 TO 14+15	SOUTH WALL	CF-5	G	215			P18
12+00 TO 15+00	NORTH WALL	CS-5		300	180		P19
	SOUTH WALL						
13+33 TO 13+48	SOUTH WALL		H	15			P76
13+38	SOUTH WALL		D				
13+45 TO 14+15	SOUTH WALL		G	70			P20
14+68 TO 15+00	SOUTH WALL		G	32			P21

REVISION NO.	DATE	REVISIONS	BY

ATHER R DAR
LICENSED PROFESSIONAL ENGINEER
No. 7808-S
HAWAII U.S.A.
Exp. Date: 4-30-24

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DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS
NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 7.5 REPAIR PLAN (STA 12+00 TO 15+00)

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

HAWAII ENGINEERING GROUP, Inc.
Civil & Structural Engineers
1088 BISHOP STREET #2506
HONOLULU, HI 96813
Tel: 808-533-2092

JOB NO.

SHEET C705
47 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

J:/2020 Projects/20-066 DHHL PS-20-LD0-012 T02 Nanakuli Laterals/Drawings/Civil/C706 Plot date: 14-Nov-2023

LEGEND:

2	CRACK REPAIR TYPE, SEE DETAIL 1/S001 AND 2/S001
3	SPALL REPAIR TYPE, SEE DETAIL 3/S001
G	CHAINLINK FENCE REPAIR TYPE, SEE SHEETS S002 AND S003
C-X	CRACK REPAIR MARK
SP-X	SPALL REPAIR MARK
CF-X	CHAINLINK FENCE REPAIR MARK
CS-X	CONCRETE SEALER REPAIR MARK, SEE DETAIL 4/S001
PX	PHOTO REFERENCE, SEE SHEETS C711 AND C715

DEMOLITION AND REPAIR NOTES:

A	ADD MORTAR CAP ON WALL TOP
B	REGROUT WALL
C	REMOVE TREE
D	REMOVE TREE STUMP
E	REMOVE BOULDERS
F	REMOVE DEBRIS ALONG CHANNEL FLOOR
G	REMOVE DEBRIS ALONG CHANNEL WALL
H	DEMOLISH AND CONSTRUCT NEW WALL, SEE DETAIL 5/S001

STATIONING	SURFACE LOCATION	MARK	REPAIR TYPE	DIMENSION L(ft)	W(in)	D(in)	PHOTO REFERENCE
15+00 TO 15+19	SOUTH WALL		G	19			P21
15+00 TO 17+25	NORTH WALL	CS-6		225	180		P22
	SOUTH WALL						
15+00 TO 17+50	SOUTH WALL	CF-6	G	250			P23
15+38 TO 15+53	SOUTH WALL		H				P24
15+51	SOUTH WALL		D				P24
16+75	NORTH WALL		C				P25
16+97 TO 17+01	SOUTH WALL	SP-1		4			P26
17+05	SOUTH WALL		D				P27
17+10	SOUTH WALL		D				
17+26	SOUTH WALL		D				P28
17+29	SOUTH WALL		D				
17+32	SOUTH WALL		D				
17+47	SOUTH WALL	C-1	2	5			P29
17+47 TO 17+50	SOUTH WALL	C-2	2	3			

CHANNEL SEGMENT 7.6 REPAIR PLAN (STA 15+00 TO 17+50)

SCALE: 1" = 10'

NORTH

REVISION NO.	DATE	REVISIONS	BY

ATHER R. DAR
LICENSED PROFESSIONAL ENGINEER
No. 7808-S
HAWAII U.S.A.
Exp. Date: 4-30-24

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DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS

NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 7.6 REPAIR PLAN (STA 15+00 TO 17+50)

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

HAWAII ENGINEERING GROUP, Inc.
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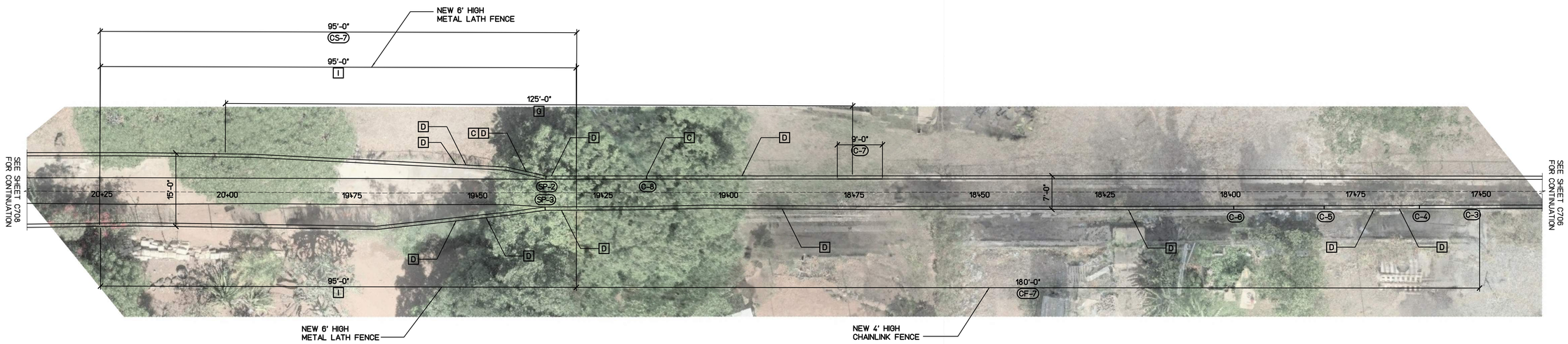
HONOLULU, HI 96813
Tel: 808-533-2092

JOB NO.

SHEET C706
48 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

Plot date: 14-Nov-2023
J:/2020 Projects/20-066 DHHL PS-20-DD-012 T02 Nanakuli Laterals/Drawings/Civil/C707



STATIONING	SURFACE LOCATION	MARK	REPAIR TYPE	DIMENSION L(ft)	DIMENSION W(in)	DIMENSION D(in)	PHOTO REFERENCE
17+50 TO 17+53	SOUTH WALL	C-3	2	3			P29
17+50 TO 19+30	SOUTH WALL	CF-7	G	180			P30
17+62	SOUTH WALL	C-4	2	5			
17+66	SOUTH WALL		D				P31
17+71	SOUTH WALL		D				
17+81	SOUTH WALL	C-5	2	6			P32
17+99	SOUTH WALL	C-6	2	7			P33
18+20	SOUTH WALL		D				P33
18+69 TO 18+78	NORTH WALL	C-7	2	9			P34
18+75 TO 20+00	SOUTH WALL		G	125			P35
18+89	SOUTH WALL NORTH WALL		D				P36
18+97			D				P37
19+16	NORTH WALL	C-8	2		0.25		P38
			C				
19+30 TO 20+25	NORTH WALL	CS-7		95	180		P39
	SOUTH WALL						
19+30 TO 20+25	NORTH WALL		I	95			P40
	SOUTH WALL		I	95			
19+33	SOUTH WALL		D				P41
19+35	NORTH WALL		D				P42
19+36	NORTH WALL	SP-2		4			
	SOUTH WALL	SP-3		4			P41
19+40	NORTH WALL		C, D				P42
19+48	SOUTH WALL		D				P43
19+52	NORTH WALL		D				P44
19+54	NORTH WALL		D				P45
	SOUTH WALL						P46

LEGEND:

- 2 — CRACK REPAIR TYPE, SEE DETAIL 1/S001 AND 2/S001
- 3 — SPALL REPAIR TYPE, SEE DETAIL 3/S001
- G — CHAINLINK FENCE REPAIR TYPE, SEE SHEETS S002 AND S003
- C-X — CRACK REPAIR MARK
- SP-X — SPALL REPAIR MARK
- CF-X — CHAINLINK FENCE REPAIR MARK
- CS-X — CONCRETE SEALER REPAIR MARK, SEE DETAIL 4/S001
- PX — PHOTO REFERENCE, SEE SHEETS C711 AND C715

DEMOLITION AND REPAIR NOTES:

- A — ADD MORTAR CAP ON WALL TOP
- B — REGROUT WALL
- C — REMOVE TREE
- D — REMOVE TREE STUMP
- E — REMOVE BOULDERS
- F — REMOVE DEBRIS ALONG CHANNEL FLOOR
- G — REMOVE DEBRIS ALONG CHANNEL WALL
- H — DEMOLISH AND CONSTRUCT NEW WALL, SEE DETAIL 5/S001
- I — CONSTRUCT NEW METAL LATH FENCE, SEE DETAIL L/S003

CHANNEL SEGMENT 7.7 REPAIR PLAN (STA 17+50 TO 20+25)

SCALE: 1" = 10'

NORTH

REVISION NO.	DATE	REVISIONS	BY

ATHER R. DAR
LICENSED PROFESSIONAL ENGINEER
No. 7808-S
HAWAII U.S.A.
Exp. Date: 4-30-24

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DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS
NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 7.7 REPAIR PLAN
(STA 17+50 TO 20+25)

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

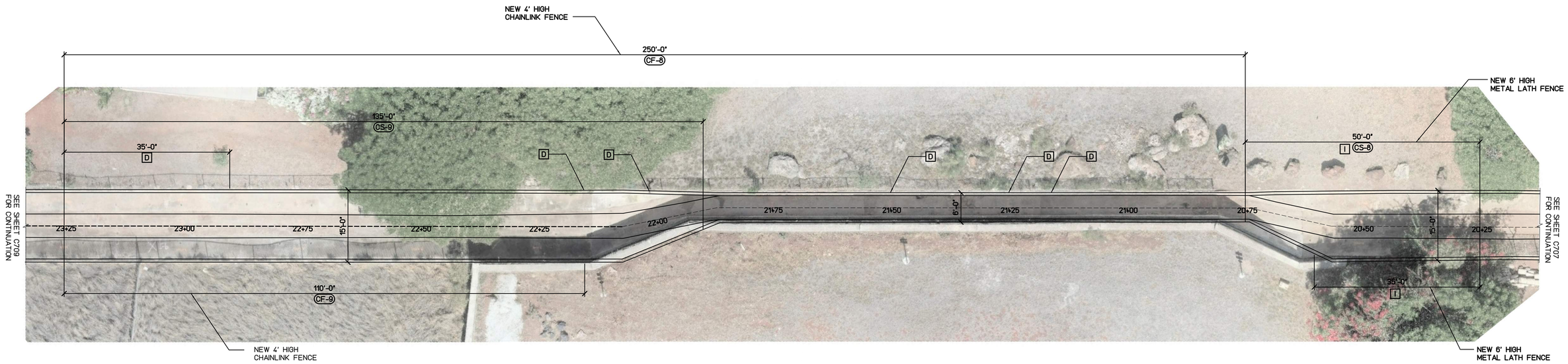
HAWAII ENGINEERING GROUP, Inc.
Civil & Structural Engineers
1088 BISHOP STREET #2506
HONOLULU, HI 96813
Tel: 808-533-2092

JOB NO.

SHEET C707
49 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

J:/2020 Projects/20-066 DHHL PS-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/C708
Plot date: 14-Nov-2023



LEGEND:

(2)	CRACK REPAIR TYPE, SEE DETAIL 1/S001 AND 2/S001
(3)	SPALL REPAIR TYPE, SEE DETAIL 3/S001
(G)	CHAINLINK FENCE REPAIR TYPE, SEE SHEETS S002 AND S003
(C-X)	CRACK REPAIR MARK
(SP-X)	SPALL REPAIR MARK
(CF-X)	CHAINLINK FENCE REPAIR MARK
(CS-X)	CONCRETE SEALER REPAIR MARK, SEE DETAIL 4/S001
PX>	PHOTO REFERENCE, SEE SHEETS C711 AND C715

DEMOLITION AND REPAIR NOTES:

A	ADD MORTAR CAP ON WALL TOP
B	REGROUT WALL
C	REMOVE TREE
D	REMOVE TREE STUMP
E	REMOVE BOULDERS
F	REMOVE DEBRIS ALONG CHANNEL FLOOR
G	REMOVE DEBRIS ALONG CHANNEL WALL
H	DEMOLISH AND CONSTRUCT NEW WALL, SEE DETAIL 5/S001
I	CONSTRUCT NEW METAL LATH FENCE, SEE DETAIL L/S003

CHANNEL SEGMENT 7.8 REPAIR PLAN (STA 20+25 TO 23+25)

SCALE: 1" = 10'

NORTH

STATIONING	SURFACE LOCATION	MARK	REPAIR TYPE	DIMENSION L(ft)	DIMENSION W(in)	DIMENSION D(in)	PHOTO REFERENCE
20+25 TO 20+75	NORTH WALL	CS-8		50	180		P47>
	SOUTH WALL						
20+25 TO 20+75	NORTH WALL		I	50			P48>
20+25 TO 20+60	SOUTH WALL		I	35			
20+75 TO 23+25	NORTH WALL	CF-8	G	250			P49>
21+16	NORTH WALL		D				P50>
21+25	NORTH WALL		D				P51>
21+50	NORTH WALL		D				P52>
21+90 TO 23+25	NORTH WALL	CS-9		135	180		P53>
	SOUTH WALL						
22+00	NORTH WALL		D				P54>
22+15	NORTH WALL		D				P55>
22+15 TO 23+25	SOUTH WALL	CF-9	G	110			P56>
22+90 TO 23+25	NORTH WALL		D	35			P57>

REVISION NO.	DATE	REVISIONS	BY

ATHER R. DAR
LICENSED PROFESSIONAL ENGINEER
No. 7808-S
HAWAII U.S.A.
Exp. Date: 4-30-24

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

DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS

NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 7.8 REPAIR PLAN (STA 20+25 TO 23+25)

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

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JOB NO.

SHEET C708
50 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

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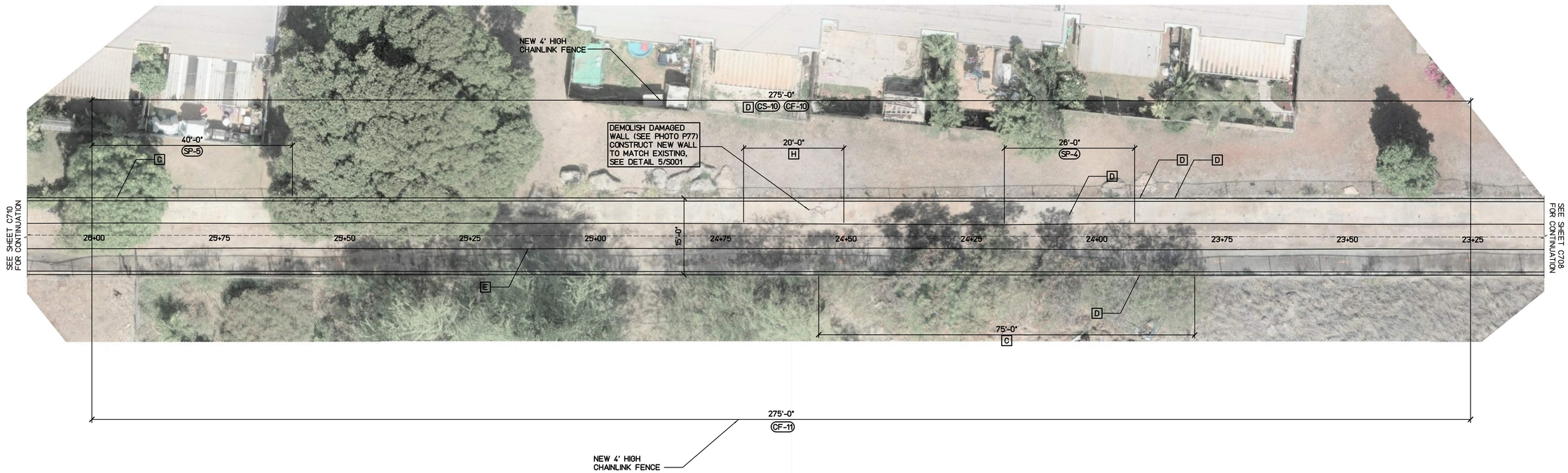
Plot date: 14-Nov-2023



LEGEND:

2	CRACK REPAIR TYPE, SEE DETAIL 1/S001 AND 2/S001
3	SPALL REPAIR TYPE, SEE DETAIL 3/S001
G	CHAINLINK FENCE REPAIR TYPE, SEE SHEETS S002 AND S003
C-X	CRACK REPAIR MARK
SP-X	SPALL REPAIR MARK
CF-X	CHAINLINK FENCE REPAIR MARK
CS-X	CONCRETE SEALER REPAIR MARK, SEE DETAIL 4/S001
PX	PHOTO REFERENCE, SEE SHEETS C711 AND C715

DEMOLITION AND REPAIR NOTES:

A	ADD MORTAR CAP ON WALL TOP
B	REGROUT WALL
C	REMOVE TREE
D	REMOVE TREE STUMP
E	REMOVE BOULDERS
F	REMOVE DEBRIS ALONG CHANNEL FLOOR
G	REMOVE DEBRIS ALONG CHANNEL WALL
H	DEMOLISH AND CONSTRUCT NEW WALL, SEE DETAIL 5/S001

STATIONING	SURFACE LOCATION	MARK	REPAIR TYPE	DIMENSION L(ft)	DIMENSION W(in)	DIMENSION D(in)	PHOTO REFERENCE
23+25 TO 26+00	NORTH WALL	CS-10		275	180		P58
	SOUTH WALL						
23+25 TO 26+00	NORTH WALL	CF-10	G	275			
	SOUTH WALL	CF-11	G	275			
23+25 TO 26+00	NORTH WALL		D	275			P59
23+80 TO 24+55	SOUTH WALL		C	75			P60
23+84	NORTH WALL		D				P61
23+91	NORTH WALL		D				P62
	SOUTH WALL						P60
23+92 TO 24+18	NORTH WALL	SP-4		26			P63
24+05	NORTH WALL		D				P63
24+50 TO 24+70	NORTH WALL		H	20			P77
25+13	FLOOR		E				P64
25+60 TO 26+00	NORTH WALL	SP-5		40			P78
25+95	NORTH WALL		C				P65

CHANNEL SEGMENT 7.9 REPAIR PLAN (STA 23+25 to 26+00)

SCALE: 1" = 10'

NORTH

REVISION NO.	DATE	REVISIONS	BY

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NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS

NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 7.9 REPAIR PLAN (STA 23+25 TO 26+00)

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SUPV:
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JOB NO.

SHEET C709
51 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

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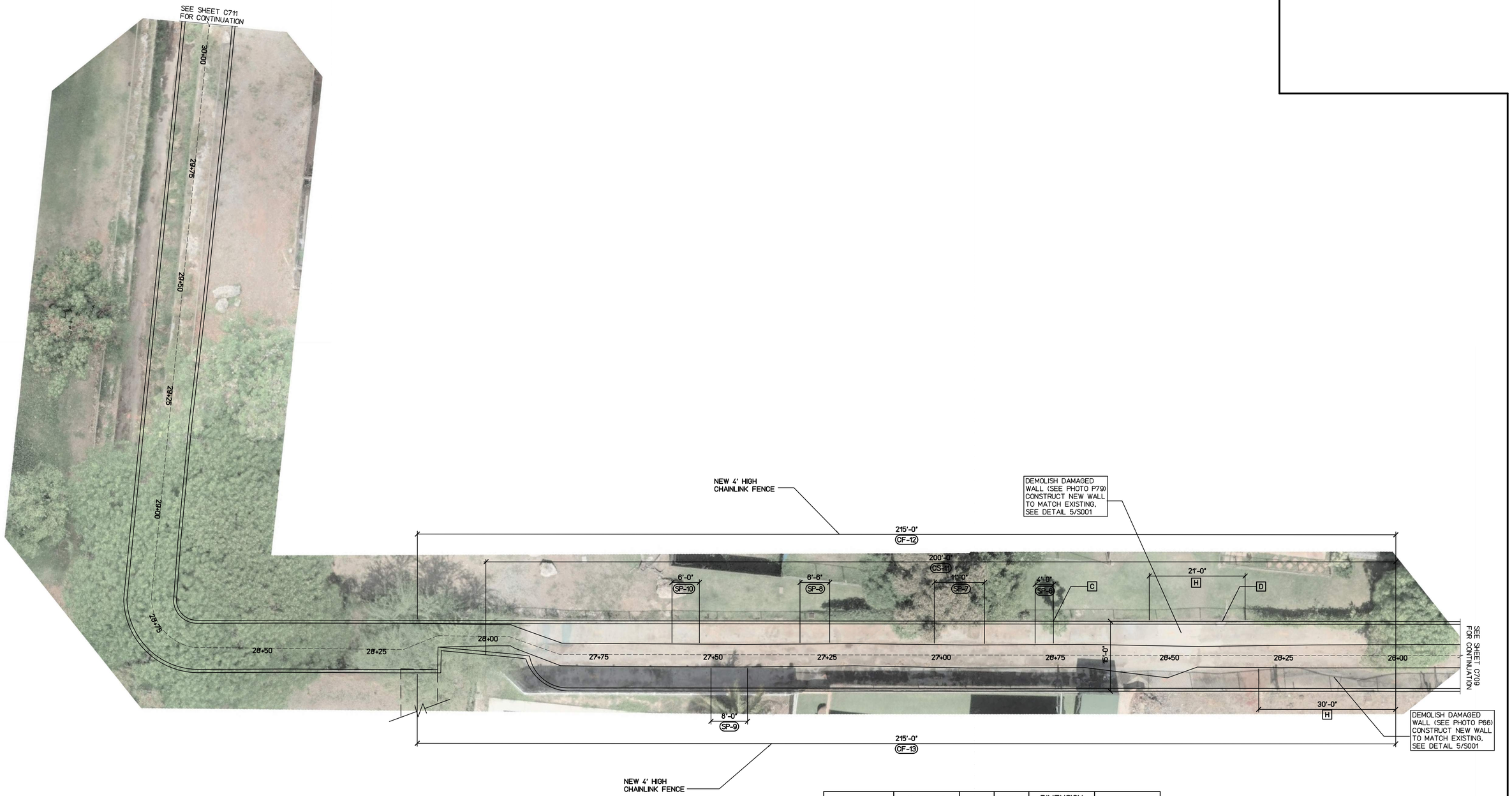
Plot date: 14-Nov-2023



LEGEND:

2	CRACK REPAIR TYPE, SEE DETAIL 1/S001 AND 2/S001
3	SPALL REPAIR TYPE, SEE DETAIL 3/S001
G	CHAINLINK FENCE REPAIR TYPE, SEE SHEETS S002 AND S003
C-X	CRACK REPAIR MARK
SP-X	SPALL REPAIR MARK
CF-X	CHAINLINK FENCE REPAIR MARK
CS-X	CONCRETE SEALER REPAIR MARK, SEE DETAIL 4/S001
PX	PHOTO REFERENCE, SEE SHEETS C711 AND C715

DEMOLITION AND REPAIR NOTES:

A	ADD MORTAR CAP ON WALL TOP
B	REGROUT WALL
C	REMOVE TREE
D	REMOVE TREE STUMP
E	REMOVE BOULDERS
F	REMOVE DEBRIS ALONG CHANNEL FLOOR
G	REMOVE DEBRIS ALONG CHANNEL WALL
H	DEMOLISH AND CONSTRUCT NEW WALL, SEE DETAIL 5/S001

STATIONING	SURFACE LOCATION	MARK	REPAIR TYPE	DIMENSION L(ft)	W(in)	D(in)	PHOTO REFERENCE
26+00 TO 26+30	SOUTH WALL		H	30	180		P66
26+00 TO 28+00	NORTH WALL	CS-11		200	180		P67
	SOUTH WALL						
26+00 TO 28+15	NORTH WALL	CF-12	G	215			P68
	SOUTH WALL	CF-13	G	215			P69
26+33 TO 26+54	NORTH WALL		H	21			P79
26+38	NORTH WALL		D	52			P70
26+75	NORTH WALL		C				P71
26+75 TO 26+79	NORTH WALL	SP-6		4	48		P71
26+90 TO 27+01	NORTH WALL	SP-7		11	66		P80
26+24 TO 27+31	NORTH WALL	SP-8		7	66		P81
27+42 TO 27+50	SOUTH WALL	SP-9		8	66		P82
27+52 TO 27+58	NORTH WALL	SP-10		6	66		P68

CHANNEL SEGMENT 7.10 REPAIR PLAN (STA 26+00 TO 30+00)

SCALE: 1" = 10'

NORTH

REVISION NO.	DATE	REVISIONS	BY

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Exp. Date: 4-30-24

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DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS

NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 7.10 REPAIR PLAN (STA 26+00 TO 30+00)

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Tel: 808-533-2092

JOB NO.

SHEET C710

52 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

P15 SPRAY EXISTING WALL W/ CONCRETE SEALER. SEE DETAIL 4/S001.

P16 INSTALL NEW 4' HIGH CHAINLINK FENCE, SEE DETAIL A/S003.

P17 REMOVE DEBRIS ALONG CHANNEL WALL.

P18 INSTALL NEW 4' HIGH CHAINLINK FENCE, SEE DETAIL A/S003.

P10 REMOVE WOODEN BRIDGE ALONG CHANNEL FLOOR.

P11 REMOVE DEBRIS ALONG CHANNEL FLOOR.

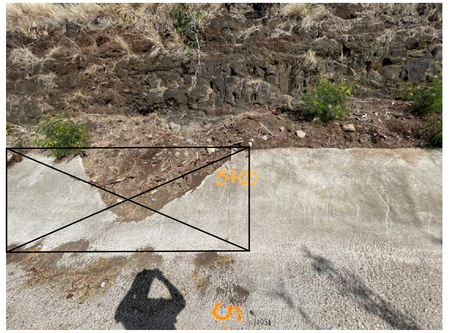
P12 REMOVE STRUCTURE ALONG CHANNEL WALL.

P13 REMOVE WOODEN BRIDGE ALONG CHANNEL FLOOR.

P14 REMOVE STRUCTURE ALONG CHANNEL WALL.

P5 INSTALL NEW 4' HIGH CHAINLINK FENCE, SEE DETAIL A/S003.

P6
1. REMOVE TREE STUMP ON TOP OF WALL.
2. DEMOLISH DAMAGED WALL AND CONSTRUCT NEW WALL TO MATCH EXISTING, SEE DETAIL 5/S001.



P7 DEMOLISH DAMAGED WALL AND CONSTRUCT NEW WALL TO MATCH EXISTING, SEE DETAIL 5/S001.

P8 SPRAY EXISTING WALL W/ CONCRETE SEALER. SEE DETAIL 4/S001.

P9 INSTALL NEW 4' HIGH CHAINLINK FENCE, SEE DETAIL A/S003.

P1
1. INSTALL NEW 4' HIGH CHAINLINK FENCE, SEE DETAIL A/S003.
2. REMOVE TREE STUMP ON TOP OF WALL.

P2 SPRAY EXISTING WALL W/ CONCRETE SEALER. SEE DETAIL 4/S001.

P3 DEMOLISH DAMAGED WALL AND CONSTRUCT NEW WALL TO MATCH EXISTING, SEE DETAIL 5/S001.

P4 SPRAY EXISTING WALL W/ CONCRETE SEALER. SEE DETAIL 4/S001

REVISION NO.	DATE	REVISIONS	BY

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HAWAII U.S.A.

Exp. Date: 4-30-24

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DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS
NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 7.0 REPAIR PHOTOS

DESIGNED BY: AD
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JOB NO.

SHEET C711
53 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

Plot date: 14-Nov-2023

J:/2020 Projects/20-066 DHHL PS-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/C711

P33 1. REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.
2. REMOVE TREE STUMP ON TOP OF CHANNEL WALL.

P34 REPAIR HORIZONTAL CRACK ON WALL, SEE DETAIL 2/S001.

P35 REMOVE DEBRIS ALONG CHANNEL WALL.

P36 REMOVE TREE STUMP ON TOP OF CHANNEL WALL.

P28 REMOVE TREE STUMPS ON TOP OF CHANNEL WALL.

P29 REPAIR HORIZONTAL CRACKS ON WALL, SEE DETAIL 2/S001.

P30 REMOVE EXISTING FENCE AND INSTALL NEW 4' HIGH CHAINLINK FENCE, SEE DETAIL A/S003.

P31 1. REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.
2. REMOVE TREE STUMP ON TOP OF CHANNEL WALL.

P32 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P23 INSTALL NEW 4' HIGH CHAINLINK FENCE, SEE DETAIL A/S003.

P24 1. REMOVE TREE STUMP ON TOP OF WALL.
2. DEMOLISH AND CONSTRUCT NEW WALL. SEE DETAIL 5/S001

P25 REMOVE TREE ON TOP OF WALL.

P26 EPAIR CONCRETE SPALL ON WALL, SEE DETAIL 3/S001.

P27 REMOVE TREE STUMPS ON TOP OF CHANNEL WALL.

P19 SPRAY EXISTING WALL W/ CONCRETE SEALER.
SEE DETAIL 4/S001.

P20 REMOVE DEBRIS ALONG CHANNEL WALL.

P21 REMOVE DEBRIS ALONG CHANNEL WALL.

P22 SPRAY EXISTING WALL W/ CONCRETE SEALER.
SEE DETAIL 4/S001.

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NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 7.0 REPAIR PHOTOS

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JOB NO.

SHEET C712
54 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

Plot date: 14-Nov-2023

J:/2020 Projects/20-066 DHHL PS-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/C712

P51 REMOVE TREE STUMP ON TOP OF CHANNEL WALL.

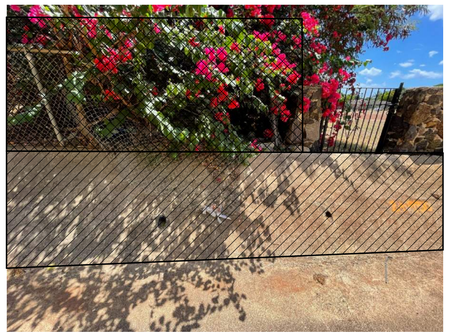
P52 REMOVE TREE STUMP ON TOP OF CHANNEL WALL.

P53 SPRAY EXISTING WALL W/ CONCRETE SEALER,SEE DETAIL 4/S001.

P54 REMOVE TREE STUMP ON TOP OF CHANNEL WALL.

P46 REMOVE TREE STUMP ON TOP OF CHANNEL WALL.

P47
1. SPRAY EXISTING WALL W/ CONCRETE SEALER, SEE DETAIL 4/S001.
2. INSTALL NEW 6' HIGH METAL LATH FENCE, SEE DETAIL L/S003.



P48
1. SPRAY EXISTING WALL W/ CONCRETE SEALER, SEE DETAIL 4/S001.
2. INSTALL NEW 6' HIGH METAL LATH FENCE, SEE DETAIL L/S003.

P49 INSTALL NEW 4' CHAINLINK FENCE, SEE DETAIL A/S003.

P50 REMOVE TREE STUMP ON TOP OF CHANNEL WALL.

P41
1. REMOVE TREE STUMP ON TOP OF CHANNEL WALL.
2. REPAIR CONCRETE SPALL ON WALL, SEE DETAIL 3/S001.

P42
1. REMOVE TREE AND TREE STUMP ON TOP OF CHANNEL WALL.
2. REPAIR CONCRETE SPALL ON WALL, SEE DETAIL 3/S001.

P43 REMOVE TREE STUMP ON TOP OF CHANNEL WALL.

P44 REMOVE TREE STUMP ON TOP OF CHANNEL WALL.

P45 REMOVE TREE STUMP ON TOP OF CHANNEL WALL.

P37 REMOVE TREE STUMP ON TOP OF CHANNEL WALL.

P38
1. REMOVE TREE ON TOP OF CHANNEL WALL.
2. REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P39
1. SPRAY EXISTING WALL W/ CONCRETE SEALER, SEE DETAIL 4/S001.
2. INSTALL NEW 6' HIGH METAL LATH FENCE, SEE DETAIL L/S003.

P40
1. SPRAY EXISTING WALL W/ CONC SEALER, SEE DETAIL 4/S001.
2. INSTALL NEW 6' HIGH METAL LATH FENCE, SEE DETAIL L/S003.

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NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS
NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 7.0 REPAIR PHOTOS

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JOB NO.

SHEET C713
55 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

Plot date: 14-Nov-2023

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P69 1. SPRAY EXISTING WALL W/ CONCRETE SEALER, SEE DETAIL 4/S001.
2. INSTALL NEW CHAINLINK FENCE, SEE DETAIL A/S003.

P70 REMOVE TREE STUMP ON TOP OF WALL.

P71 1. REMOVE TREE ON TOP OF CHANNEL WALL.
2. REPAIR CONCRETE SPALL ON WALL, SEE DETAIL 3/S001.

P72 DEMOLISH DAMAGED WALL AND FLOOR. CONSTRUCT NEW WALL TO MATCH EXISTING SEE DETAIL 5/S001.

P64 REMOVE BOULDERS ON CHANNEL FLOOR.

P65 REMOVE TREE ON TOP OF CHANNEL WALL.

P66 DEMOLISH DAMAGED WALL AND CONSTRUCT NEW WALL TO MATCH EXISTING, SEE DETAIL 5/S001.

P67 SPRAY EXISTING WALL W/ CONCRETE SEALER, SEE DETAIL 4/S001.

P68 1. INSTALL NEW CHAINLINK FENCE, SEE DETAIL A/S003.
2. REPAIR CONCRETE SPALL ON WALL, SEE DETAIL 3/S001.

P59 REMOVE TREE STUMPS ON TOP OF WALL.

P60 REMOVE TREES AND TREE STUMPS ON TOP OF WALL.

P61 REMOVE TREE STUMPS ON TOP OF WALL.

P62 REMOVE TREE STUMPS ON TOP OF WALL.

P63 REMOVE TREE STUMPS ON TOP OF WALL.

P55 REMOVE TREE STUMP ON TOP OF CHANNEL WALL.

P56 INSTALL NEW 4' CHAINLINK FENCE, SEE DETAIL A/S003.

P57 REMOVE TREE STUMPS ON TOP OF WALL.

P58 1. SPRAY EXISTING WALL W/ CONC SEALER, SEE DETAIL 4/S001.
2. INSTALL NEW 4' CHAINLINK FENCE, SEE DETAIL A/S003.

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JOB NO.

SHEET C714
56 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

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J:/2020 Projects/20-066 DHHL PS-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/C715

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P82 REPAIR CONCRETE SPALL ON WALL. SEE DETAIL 3/S001

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P77 DEMOLISH DAMAGED WALL AND CONSTRUCT NEW WALL TO MATCH EXISTING DETAIL 5/S001.

P78 REPAIR CONCRETE SPALL ON WALL. SEE DETAIL 3/S001

P79 DEMOLISH DAMAGED WALL AND CONSTRUCT NEW WALL TO MATCH EXISTING DETAIL 5/S001.

P80 REPAIR CONCRETE SPALL ON WALL. SEE DETAIL 3/S001

P81 REPAIR CONCRETE SPALL ON WALL. SEE DETAIL 3/S001

P73 DEMOLISH DAMAGED WALL AND CONSTRUCT NEW WALL TO MATCH EXISTING SEE DETAIL 5/S001.

P74 DEMOLISH DAMAGED WALL AND CONSTRUCT NEW WALL TO MATCH EXISTING SEE DETAIL 5/S001.

P75 DEMOLISH DAMAGED WALL AND CONSTRUCT NEW WALL TO MATCH EXISTING SEE DETAIL 5/S001.

P76
1. DEMOLISH AND CONSTRUCT NEW WALL. SEE DETAIL 5/S001
2. REMOVE TREE STUMP ON TOP OF WALL

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SHEET C715
57 OF 74 SHTS

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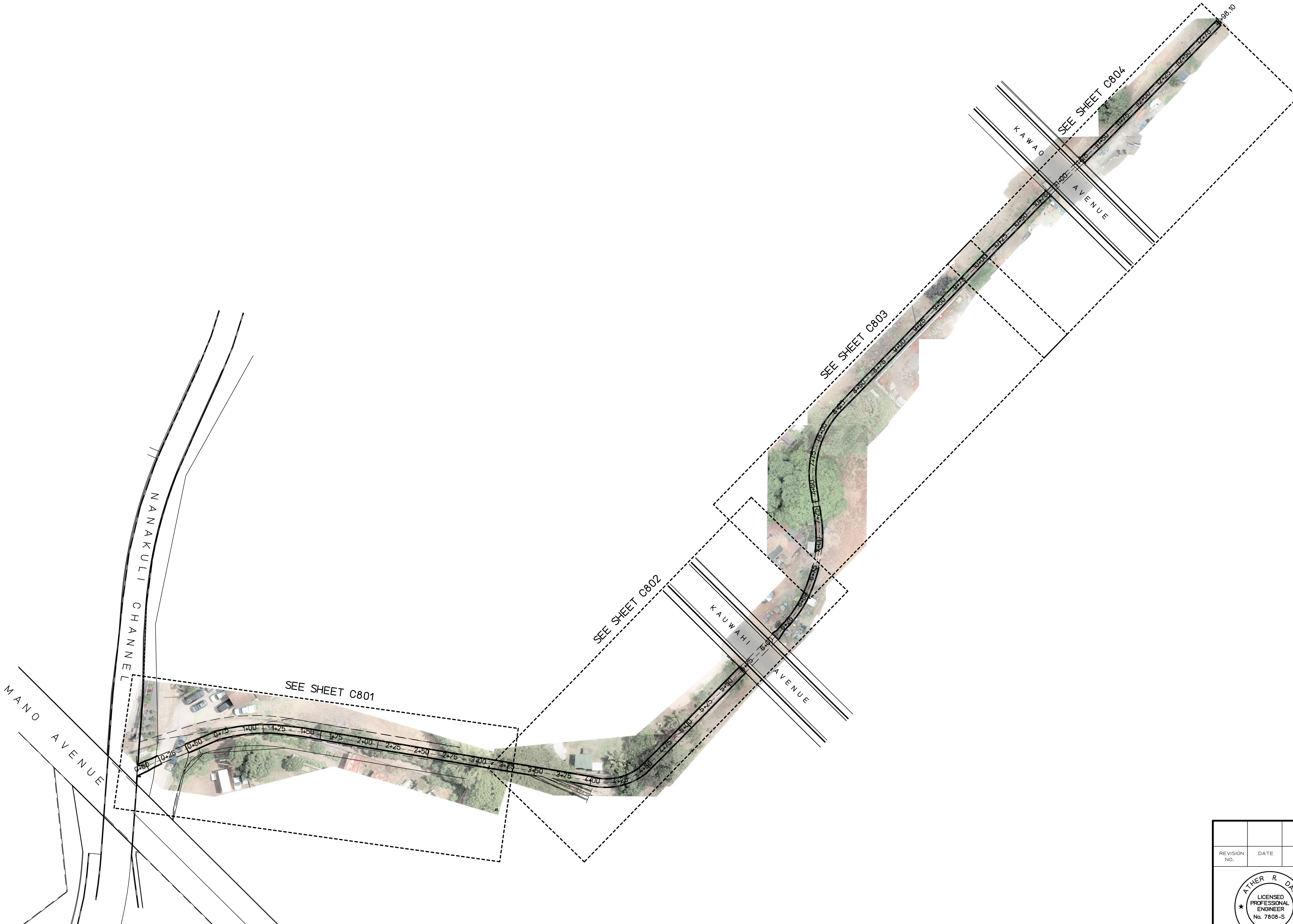
Plot date: 14-Nov-2023
J:/2020 Projects/20-066 DHHL PS-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/C800



CHANNEL SEGMENT 8 PLAN

SCALE: 1" = 40'

NORTH

REVISION NO.	DATE	REVISIONS	BY

ATHER R. DAR
LICENSED PROFESSIONAL ENGINEER
No. 7808-S
HAWAII U.S.A.

Exp. Date: 4-30-24

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

DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS
NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 8 REPAIR PLAN

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

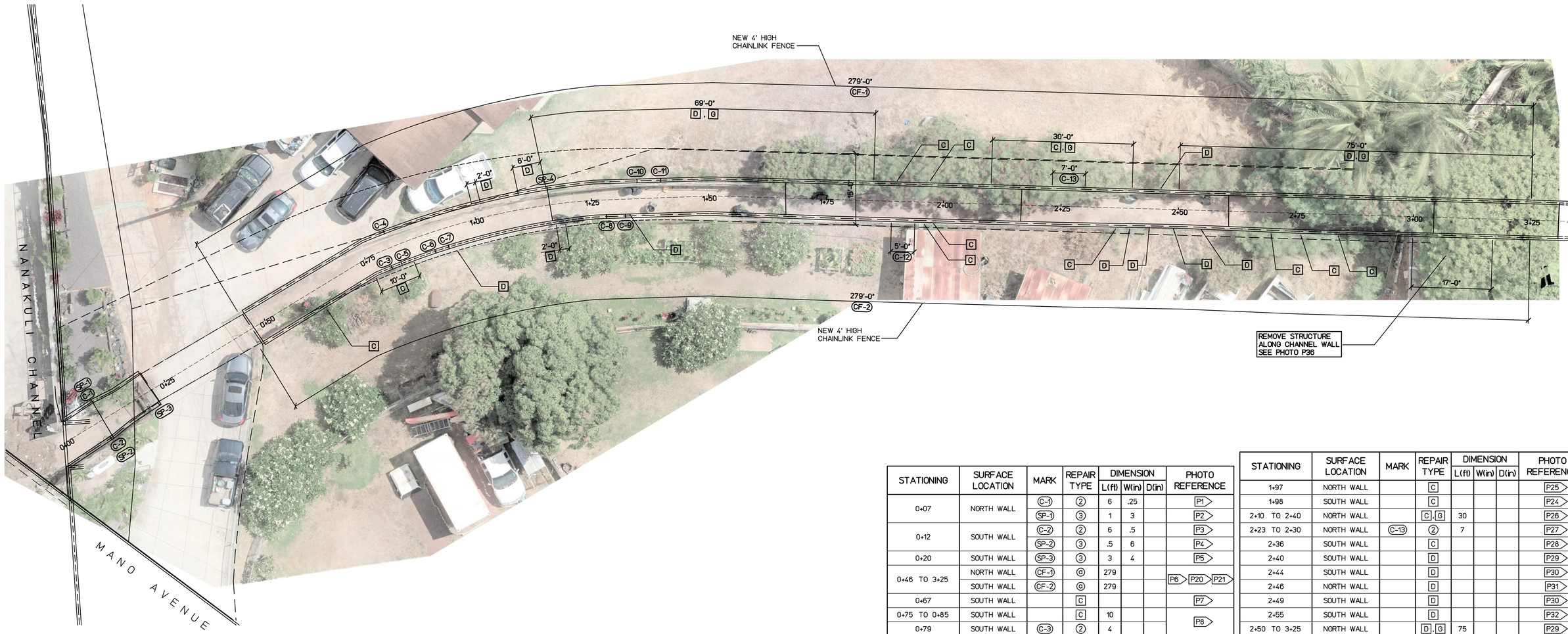
HAWAII ENGINEERING GROUP, Inc.
Civil & Structural Engineers
1088 BISHOP STREET #2506
HONOLULU, HI 96813
Tel: 808-533-2092

JOB NO.

SHEET
C800
58 OF 74 SHTS

FILE ___ ___ DRAWER ___ ___ ___ FOLDER ___ ___

Plot date: 14-Nov-2023
J:/2020 Projects/20-066 DHHL PS-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/C801



STATIONING	SURFACE LOCATION	MARK	REPAIR TYPE	DIMENSION L(ft)	DIMENSION W(in)	DIMENSION D(in)	PHOTO REFERENCE
0+07	NORTH WALL	C-1	2	6	.25		P1
		SP-1	3	1	3		P2
0+12	SOUTH WALL	C-2	2	6	.5		P3
		SP-2	3	.5	6		P4
0+20	SOUTH WALL	SP-3	3	3	4		P5
0+46 TO 3+25	NORTH WALL	CF-1	G	279			P6 P20 P21
	SOUTH WALL	CF-2	G	279			
0+67	SOUTH WALL		C				P7
0+75 TO 0+85	SOUTH WALL		C	10			P8
0+79	SOUTH WALL	C-3	2	4			
0+80	NORTH WALL	C-4	2	4			P9
0+81	SOUTH WALL	C-5	2	4			P8
0+90	SOUTH WALL	C-6	2	4			P10
0+93	SOUTH WALL	C-7	2	4			
0+94	SOUTH WALL		D				
1+00 TO 1+02	NORTH WALL		D	2			P11
1+09	SOUTH WALL		C				P12
1+15	NORTH WALL	SP-4	3	4	6		P13
1+16 TO 1+85	NORTH WALL		D, G	69			P14 P15 P16
1+17 TO 1+19	SOUTH WALL		D	2			P17
1+22	SOUTH WALL		C				
1+28	SOUTH WALL	C-8	2	4			P18
1+32	SOUTH WALL	C-9	2	4			
1+33	SOUTH WALL		C				P19
1+35	NORTH WALL	C-10	2	4			P15
1+40	NORTH WALL	C-11	2	4			P15
1+89 TO 1+94	SOUTH WALL	C-12	2	5	.5		P22
1+90	NORTH WALL		C				P23
1+96	SOUTH WALL		C				P24

STATIONING	SURFACE LOCATION	MARK	REPAIR TYPE	DIMENSION L(ft)	DIMENSION W(in)	DIMENSION D(in)	PHOTO REFERENCE
1+97	NORTH WALL		C				P25
1+98	SOUTH WALL		C				P24
2+10 TO 2+40	NORTH WALL		C, G	30			P26
2+23 TO 2+30	NORTH WALL	C-13	2	7			P27
2+36	SOUTH WALL		C				P28
2+40	SOUTH WALL		D				P29
2+44	SOUTH WALL		D				P30
2+46	NORTH WALL		D				P31
2+49	SOUTH WALL		D				P30
2+55	SOUTH WALL		D				P32
2+50 TO 3+25	NORTH WALL		D, G	75			P29
2+70	SOUTH WALL		C				P33
2+76	SOUTH WALL		C				P34
2+84	SOUTH WALL		C				P35
3+00 TO 3+17	SOUTH WALL	See demo plan note		17			P36

LEGEND:

- 2 — CRACK REPAIR TYPE, SEE DETAIL 1/S001 AND 2/S001
- 3 — SPALL REPAIR TYPE, SEE DETAIL 3/S001
- G — CHAINLINK FENCE REPAIR TYPE, SEE SHEETS S002 AND S003
- C-X — CRACK REPAIR MARK
- SP-X — SPALL REPAIR MARK
- CF-X — CHAINLINK FENCE REPAIR MARK
- CS-X — CONCRETE SEALER REPAIR MARK, SEE DETAIL 4/S001
- PX — PHOTO REFERENCE, SEE SHEETS C805 AND C811

DEMOLITION AND REPAIR NOTES:

- A — ADD MORTAR CAP ON WALL TOP
- B — REGROUT WALL
- C — REMOVE TREE
- D — REMOVE TREE STUMP
- E — REMOVE BOULDERS
- F — REMOVE DEBRIS ALONG CHANNEL FLOOR
- G — REMOVE DEBRIS ALONG CHANNEL WALL
- H — DEMOLISH AND CONSTRUCT NEW WALL, SEE DETAIL 5/S001

CHANNEL SEGMENT 8.1 REPAIR PLAN (STA 0+00 TO 3+25)

SCALE: 1" = 10'

NORTH

REVISION NO.	DATE	REVISIONS	BY

ATHER R. DAR
LICENSED PROFESSIONAL ENGINEER
No. 7808-S
HAWAII U.S.A.
Exp. Date: 4-30-24

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DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS

NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 8.1 REPAIR PLAN (STA 0+00 TO 3+25)

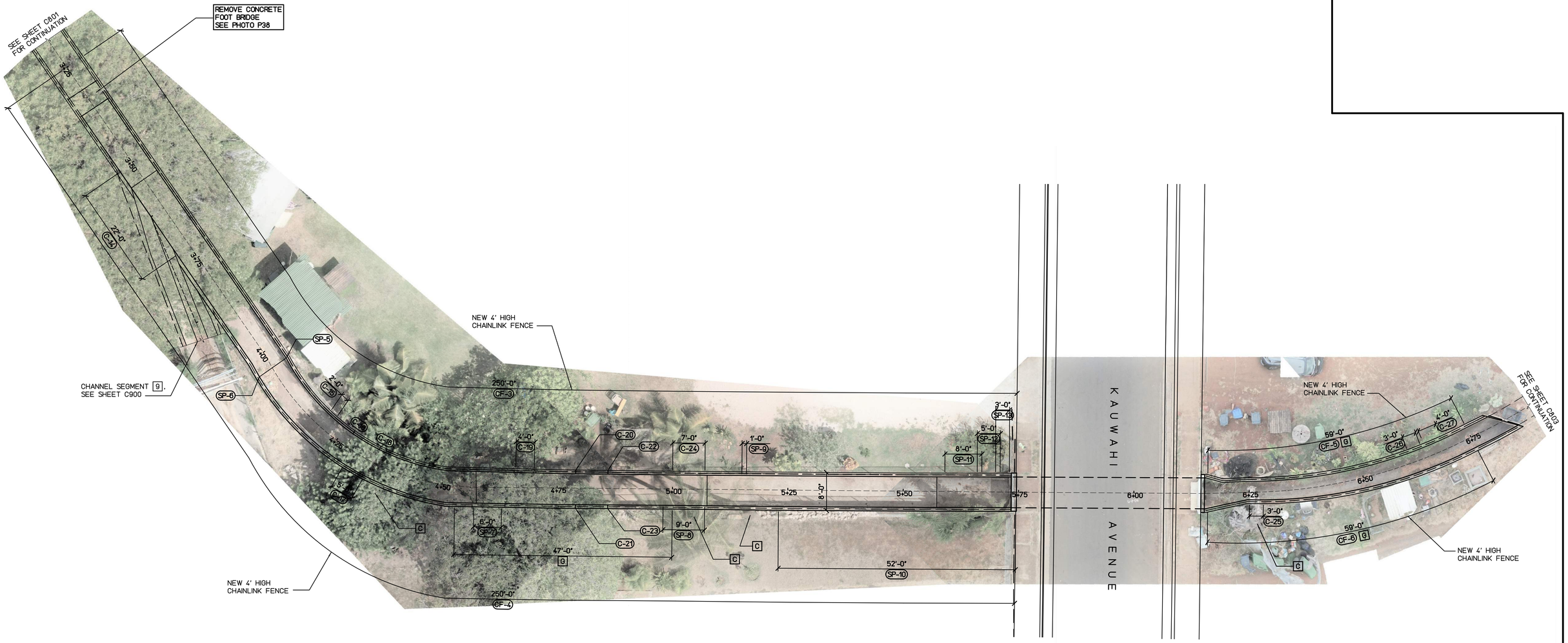
DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

HAWAII ENGINEERING GROUP, Inc.
Civil & Structural Engineers
1088 BISHOP STREET #2506
HONOLULU, HI 96813
Tel: 808-533-2092

JOB NO.

SHEET C801
59 OF 74 SHTS

FILE ___ DRAWER ___ ___ FOLDER ___ ___



LEGEND:

2	CRACK REPAIR TYPE, SEE DETAIL 1/S001 AND 2/S001
3	SPALL REPAIR TYPE, SEE DETAIL 3/S001
G	CHAINLINK FENCE REPAIR TYPE, SEE SHEETS S002 AND S003
C-X	CRACK REPAIR MARK
SP-X	SPALL REPAIR MARK
CF-X	CHAINLINK FENCE REPAIR MARK
CS-X	CONCRETE SEALER REPAIR MARK, SEE DETAIL 4/S001
PX	PHOTO REFERENCE, SEE SHEETS C805 AND C811

DEMOLITION AND REPAIR NOTES:

A	ADD MORTAR CAP ON WALL TOP
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C	REMOVE TREE
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F	REMOVE DEBRIS ALONG CHANNEL FLOOR
G	REMOVE DEBRIS ALONG CHANNEL WALL
H	DEMOLISH AND CONSTRUCT NEW WALL, SEE DETAIL 5/S001

STATIONING	SURFACE LOCATION	MARK	REPAIR TYPE	DIMENSION L(ft)	W(in)	D(in)	PHOTO REFERENCE
3+25 TO 5+75	NORTH WALL	CF-3	G	250			P37
	SOUTH WALL	CF-4	G	250			
3+31 TO 3+35	FOOTBRIDGE		See demo plan note	4			P38
3+50 TO 3+72	SOUTH WALL	C-14	2	22	.25		P39
4+03	SOUTH WALL	SP-5	3	1.5	3		P40
	NORTH WALL	SP-6	3	2	.25		P41
4+19 TO 4+21	NORTH WALL	C-15	2	2			P42
4+27	NORTH WALL	C-16	2	4			P43
4+29 TO 4+34	SOUTH WALL	C-17	2	5	.25		P44
4+34	NORTH WALL	C-18	2	4			P45
4+37	SOUTH WALL		C				P46
4+53 TO 5+00	SOUTH WALL		G	47	24		P47 P48
4+57 TO 4+63	SOUTH WALL	SP-7	3	6	.25		P49
4+66 TO 4+70	NORTH WALL	C-19	2	4			P50
4+79	NORTH WALL	C-20	2	4			P51
	SOUTH WALL	C-21	2	4			P52

STATIONING	SURFACE LOCATION	MARK	REPAIR TYPE	DIMENSION L(ft)	W(in)	D(in)	PHOTO REFERENCE
4+86	NORTH WALL	C-22	2	4			P53
	SOUTH WALL	C-23	2	4			P54
4+98 TO 5+07	SOUTH WALL	SP-8	3	9			P55
5+00 TO 5+07	NORTH WALL	C-24	2	7			P56
5+04	SOUTH WALL		C				P55
5+15 TO 5+16	NORTH WALL	SP-9	3	1	4		P57
5+17	SOUTH WALL		C				P58
5+23 TO 5+75	SOUTH WALL	SP-10	3	52	.25		P59 P60
5+59 TO 5+67	NORTH WALL	SP-11	3	8	.25		P61
5+66 TO 5+71	NORTH WALL	SP-12	3	5	2		P62
5+70 TO 5+73	NORTH WALL	SP-13	3	3	.25		
6+16 TO 6+75	SOUTH WALL	CF-5	G	59			P63
			G	59	36		P64
	NORTH WALL	CF-6	G	59			P63
			G	59	36		P65
6+25	SOUTH WALL		C				P66
6+25 TO 6+28	SOUTH WALL	C-25	2	3			P67
6+61 TO 6+64	NORTH WALL	C-26	2	3			P68
6+65 TO 6+69	NORTH WALL	C-27	2	4			P69

CHANNEL SEGMENT 8.2 REPAIR PLAN (STA 3+25 TO 6+75)

SCALE: 1" = 10'

NORTH

REVISION NO.	DATE	REVISIONS	BY

ATHER R. DAR
LICENSED PROFESSIONAL ENGINEER
No. 7808-S
HAWAII U.S.A.
Exp. Date: 4-30-24

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DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS

NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 8.2 REPAIR PLAN (STA 3+25 TO 6+75)

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

HAWAII ENGINEERING GROUP, Inc.
Civil & Structural Engineers
1088 BISHOP STREET #2506
HONOLULU, HI 96813
Tel: 808-533-2092

JOB NO.

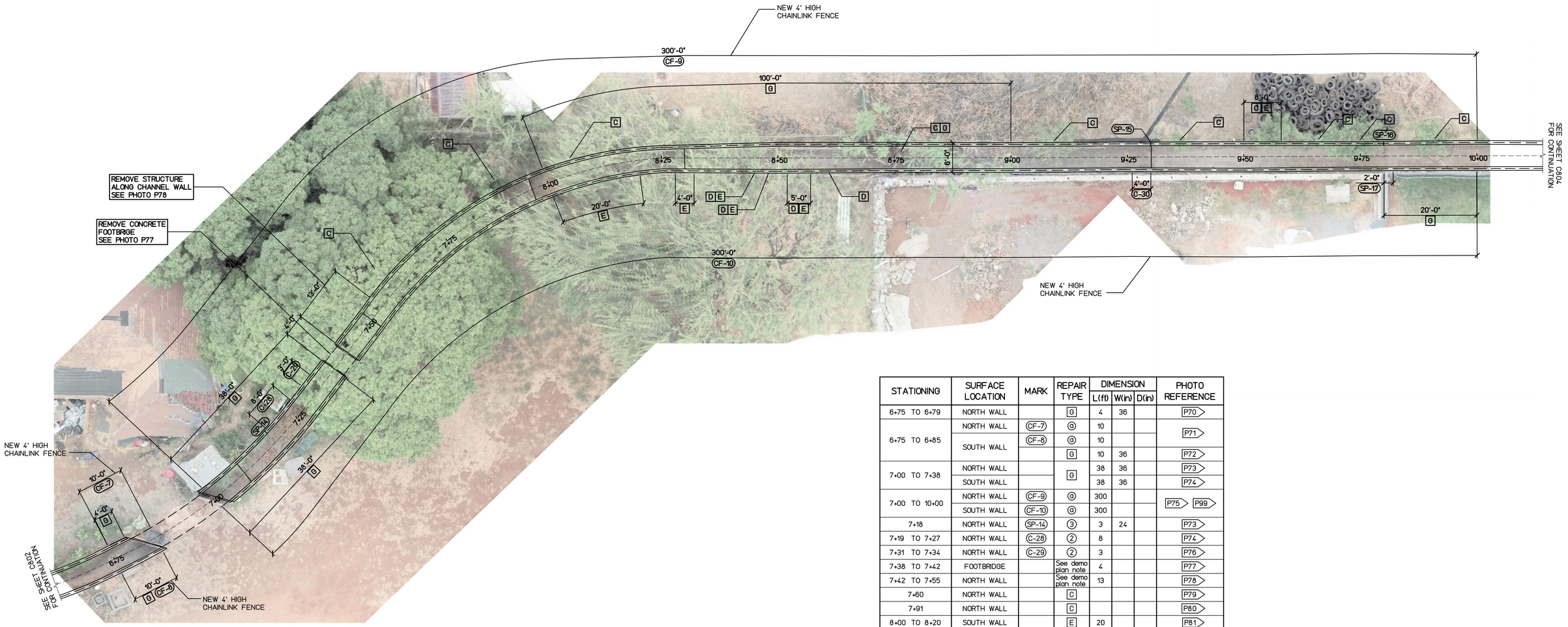
SHEET C802
60 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

J:/2020 Projects/20-066 DHHL PS-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/C802

Plot date: 14-Nov-2023

Plot date: 14-Nov-2023
J:/2020 Projects/20-066 DHHL PS-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/C803



STATIONING	SURFACE LOCATION	MARK	REPAIR TYPE	DIMENSION L(ft)	DIMENSION W(in)	DIMENSION D(in)	PHOTO REFERENCE
6+75 TO 6+79	NORTH WALL		G	4	36		P70
6+75 TO 6+85	NORTH WALL	CF-7	ⓐ	10			P71
	SOUTH WALL	CF-8	ⓐ	10			
			G	10	36		P72
7+00 TO 7+38	NORTH WALL		G	38	36		P73
	SOUTH WALL			38	36		P74
7+00 TO 10+00	NORTH WALL	CF-9	ⓐ	300			P75 P99
	SOUTH WALL	CF-10	ⓐ	300			
7+18	NORTH WALL	SP-14	③	3	24		P73
7+19 TO 7+27	NORTH WALL	C-28	②	8			P74
7+31 TO 7+34	NORTH WALL	C-29	②	3			P76
7+38 TO 7+42	FOOTBRIDGE		See demo plan note	4			P77
7+42 TO 7+55	NORTH WALL		See demo plan note	13			P78
7+60	NORTH WALL		C				P79
7+91	NORTH WALL		C				P80
8+00 TO 8+20	SOUTH WALL		E	20			P81
8+00 TO 9+00	NORTH WALL		G	100			P82
8+06	NORTH WALL		C				P83
8+28 TO 8+32	SOUTH WALL		E	4			P84
8+45	SOUTH WALL		D, E				P85
8+48	SOUTH WALL		D, E				
8+52 TO 8+57	SOUTH WALL		D, E	5			P86
8+61	SOUTH WALL		D				P87
8+78	NORTH WALL		C, G				P89
9+09	NORTH WALL		C				P90
9+26 TO 9+30	SOUTH WALL	C-30	②	4			P91
9+30	NORTH WALL	SP-15	③	3	1		P92
9+36	NORTH WALL		C				P93
9+50 TO 9+58	NORTH WALL		C, E	8			P94
9+66	NORTH WALL		C				P95
9+75	NORTH WALL		C				P96
9+80	NORTH WALL	SP-16	③	3	5		P97
9+80 TO 9+82	SOUTH WALL	SP-17	③	2	12		P98
9+80 TO 10+00	SOUTH WALL		G	20			P99
9+91	NORTH WALL		C				P100

LEGEND:

②	CRACK REPAIR TYPE, SEE DETAIL 1/S001 AND 2/S001
③	SPALL REPAIR TYPE, SEE DETAIL 3/S001
ⓐ	CHAINLINK FENCE REPAIR TYPE, SEE SHEETS S002 AND S003
C-X	CRACK REPAIR MARK
SP-X	SPALL REPAIR MARK
CF-X	CHAINLINK FENCE REPAIR MARK
CS-X	CONCRETE SEALER REPAIR MARK, SEE DETAIL 4/S001
PX	PHOTO REFERENCE, SEE SHEETS C805 AND C811

DEMOLITION AND REPAIR NOTES:

A	ADD MORTAR CAP ON WALL TOP
B	REGROUT WALL
C	REMOVE TREE
D	REMOVE TREE STUMP
E	REMOVE BOULDERS
F	REMOVE DEBRIS ALONG CHANNEL FLOOR
G	REMOVE DEBRIS ALONG CHANNEL WALL
H	DEMOLISH AND CONSTRUCT NEW WALL, SEE DETAIL 5/S001

CHANNEL SEGMENT 8.3 REPAIR PLAN (STA 6+75 TO 10+00)

SCALE: 1" = 10'

NORTH

REVISION NO.	DATE	REVISIONS	BY

ATHER R DAR
LICENSED PROFESSIONAL ENGINEER
No. 7808-S
HAWAII U.S.A.
Exp. Date: 4-30-24

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DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS

NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 8.3 REPAIR PLAN (STA 6+75 TO 10+00)

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

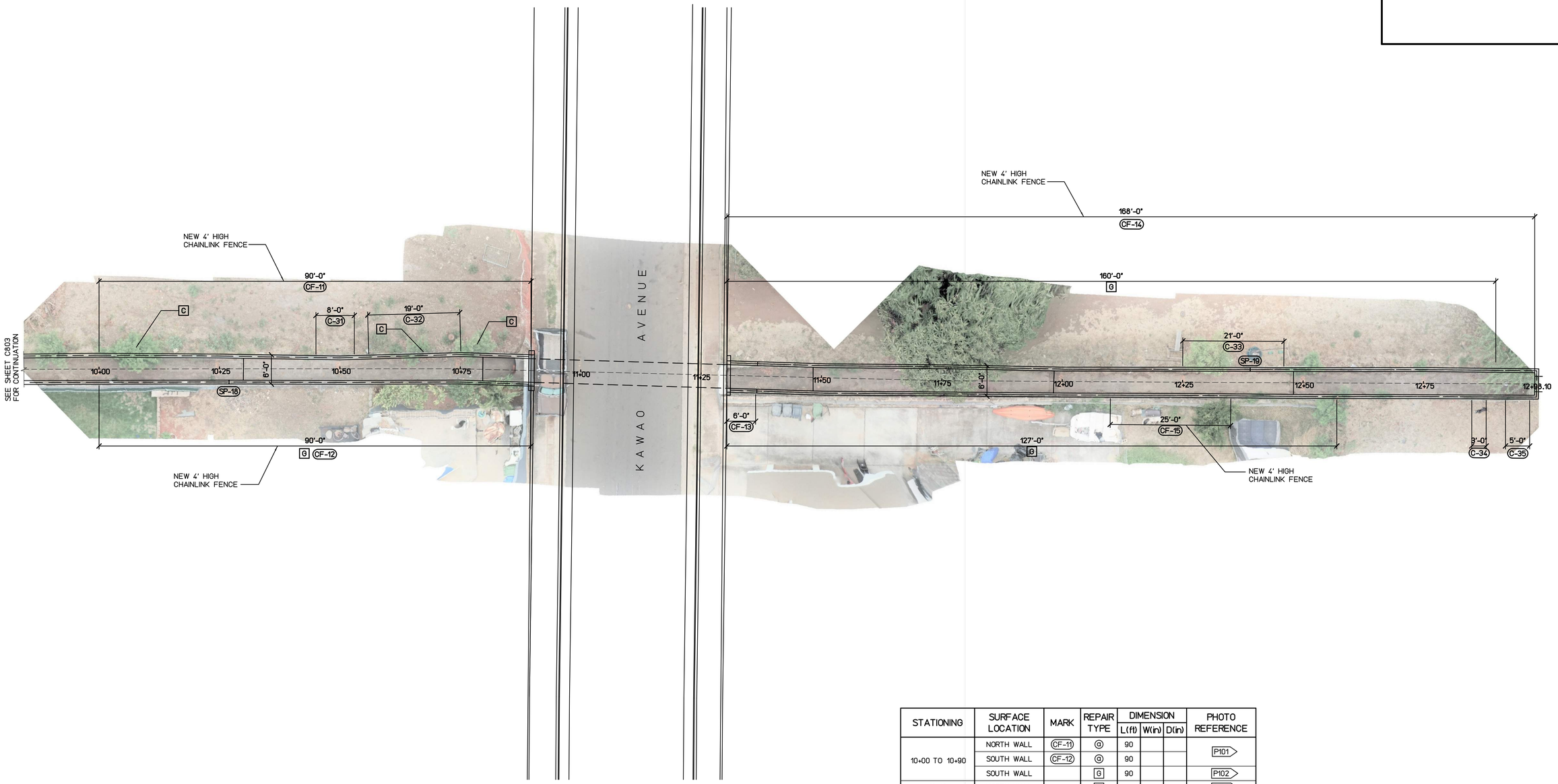
HAWAII ENGINEERING GROUP, Inc.
Civil & Structural Engineers
1088 BISHOP STREET #2506
HONOLULU, HI 96813
Tel: 808-533-2092

JOB NO.

SHEET C803
61 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

J:/2020 Projects/20-066 DHHL PS-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/C804
Plot date: 14-Nov-2023



STATIONING	SURFACE LOCATION	MARK	REPAIR TYPE	DIMENSION L(ft)	DIMENSION W(in)	DIMENSION D(in)	PHOTO REFERENCE
10+00 TO 10+90	NORTH WALL	CF-11	ⓖ	90			P101
	SOUTH WALL	CF-12	ⓖ	90			
	SOUTH WALL		G	90			P102
10+10	NORTH WALL		C				P103
10+30	SOUTH WALL	SP-18	③	3	4		P104
10+45 TO 10+53	NORTH WALL	C-31	②	8			P105
10+56 TO 10+75	NORTH WALL	C-32	②	19	.5		P106
10+68	NORTH WALL		C				
10+78	NORTH WALL		C				P107
11+30 TO 11+36	SOUTH WALL	CF-13	ⓘ	6			P108
11+30 TO 12+57	SOUTH WALL		G	127			P109
11+30 TO 12+90	NORTH WALL		G	160			P110 P111
11+30 TO 12+98	NORTH WALL	CF-14	ⓖ	168			P112
12+10 TO 12+35	SOUTH WALL	CF-15	ⓚ	25			P113
12+25 TO 12+46	NORTH WALL	C-33	②	21			P114
12+39	NORTH WALL	SP-19	③	.42	5		P115
12+85 TO 12+88	SOUTH WALL	C-34	②	3			P116
12+92 TO 12+97	SOUTH WALL	C-35	②	5			P117

LEGEND:

- ② CRACK REPAIR TYPE, SEE DETAIL 1/S001 AND 2/S001
- ③ SPALL REPAIR TYPE, SEE DETAIL 3/S001
- ⓖ CHAINLINK FENCE REPAIR TYPE, SEE SHEETS S002 AND S003
- C-X CRACK REPAIR MARK
- SP-X SPALL REPAIR MARK
- CF-X CHAINLINK FENCE REPAIR MARK
- CS-X CONCRETE SEALER REPAIR MARK, SEE DETAIL 4/S001
- PX PHOTO REFERENCE, SEE SHEETS C805 AND C811

DEMOLITION AND REPAIR NOTES:

- A ADD MORTAR CAP ON WALL TOP
- B REGROUT WALL
- C REMOVE TREE
- D REMOVE TREE STUMP
- E REMOVE BOULDERS
- F REMOVE DEBRIS ALONG CHANNEL FLOOR
- G REMOVE DEBRIS ALONG CHANNEL WALL
- H DEMOLISH AND CONSTRUCT NEW WALL, SEE DETAIL 5/S001

CHANNEL SEGMENT 8.4 REPAIR PLAN (STA 10+00 TO 12+98.10)

SCALE: 1" = 10'

NORTH

REVISION NO.	DATE	REVISIONS	BY

ATHER R. DAR
LICENSED PROFESSIONAL ENGINEER
No. 7808-S
HAWAII U.S.A.
Exp. Date: 4-30-24

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DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS
NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 8.4 REPAIR PLAN
(STA 10+00 TO 12+98.10)

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

HAWAII ENGINEERING GROUP, Inc.
Civil & Structural Engineers
1088 BISHOP STREET #2506
HONOLULU, HI 96813
Tel: 808-533-2092

JOB NO.

SHEET C804
62 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

P15 1. REMOVE TREE STUMPS AND DEBRIS ALONG CHANNEL WALL.
2. REPAIR VERTICAL CRACKS ON WALL, SEE DETAIL 2/S001.

P16 REMOVE TREE STUMPS AND DEBRIS ALONG CHANNEL WALL.

P17 REMOVE TREE STUMPS ON TOP OF WALL.

P18 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P10 1. REPAIR VERTICAL CRACKS ON WALL, SEE DETAIL 2/S001.
2. REMOVE TREE STUMP ON TOP OF WALL.

P11 REMOVE TREE STUMPS ON TOP OF WALL.

P12 REMOVE TREE STUMPS ON TOP OF WALL.

P13 1. REMOVE TREE STUMPS ON TOP OF WALL.
2. REPAIR CONCRETE SPALL ON WALL, SEE DETAIL 3/S001.

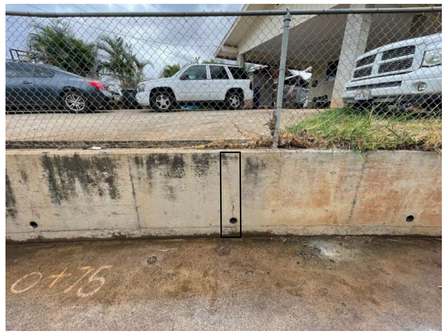
P14 REMOVE TREE STUMPS AND DEBRIS ALONG CHANNEL WALL.

P5 REPAIR CONCRETE SPALL ON WALL, SEE DETAIL 3/S001.

P6 REMOVE EXISTING FENCE AND INSTALL NEW 4' HIGH CHAINLINK FENCE, SEE DETAIL A/S002.

P7 REMOVE TREE ON TOP OF WALL.

P8 1. REMOVE TREES ON TOP OF WALL.
2. REPAIR VERTICAL CRACKS ON WALL, SEE DETAIL 2/S001.



P9 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P1 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P2 REPAIR CONCRETE SPALL ON WALL, SEE DETAIL 3/S001.

P3 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P4 REPAIR CONCRETE SPALL ON WALL, SEE DETAIL 3/S001.

REVISION NO.	DATE	REVISIONS	BY

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HAWAII U.S.A.
Exp. Date: 4-30-24

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NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 8.0 REPAIR PHOTOS

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

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Civil & Structural Engineers
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Tel: 808-533-2092

JOB NO.

SHEET C805
63 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

Plot date: 14-Nov-2023

J:/2020 Projects/20-066 DHHL PS-20-LDD-012 TO2 Nanakuli Laterals/Drawings/Civil/C805

P33 REMOVE TREES ON TOP OF WALL.

P34 REMOVE TREES ON TOP OF WALL.

P35 REMOVE TREES ON TOP OF WALL.

P36 REMOVE STRUCTURE ALONG CHANNEL WALL.

P28 REMOVE TREES ON TOP OF WALL.

P29 REMOVE TREE STUMPS ON TOP OF WALL.

P30 REMOVE TREE STUMPS ON TOP OF WALL.

P31 REMOVE TREE STUMPS ON TOP OF WALL.

P32 REMOVE TREE STUMPS ON TOP OF WALL.

P23 REMOVE TREE ON TOP OF WALL.

P24 REMOVE TREES ON TOP OF WALL.

P25 REMOVE TREE ON TOP OF WALL.

P26 REMOVE TREES AND DEBRIS ALONG CHANNEL WALL.

P27 REPAIR HORIZONTAL CRACK ON WALL, SEE DETAIL 2/S001.

P19 REMOVE TREE ON TOP OF CHANNEL WALL.

P20 REMOVE EXISTING FENCE AND INSTALL NEW 4' HIGH CHAINLINK FENCE, SEE DETAIL A/S002.

P21 REMOVE EXISTING FENCE AND INSTALL NEW 4' HIGH CHAINLINK FENCE, SEE DETAIL A/S002.

P22 REPAIR HORIZONTAL CRACK ON WALL, SEE DETAIL 2/S001.

REVISION NO.	DATE	REVISIONS	BY

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HAWAII U.S.A.

Exp. Date: 4-30-24

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DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS

NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHANNEL SEGMENT 8.0 REPAIR PHOTOS

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

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Tel: 808-533-2092

JOB NO.

SHEET C806

64 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

Plot date: 14-Nov-2023

J:/2020 Projects/20-066 DHHL PS-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/C806

P51 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P52 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P53 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P54 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P46 REMOVE TREE ON TOP OF CHANNEL WALL.

P47 REMOVE DEBRIS ALONG CHANNEL WALL.

P48 REMOVE DEBRIS ALONG CHANNEL WALL.

P49 1. REMOVE DEBRIS ALONG CHANNEL WALL.
2. REPAIR CONCRETE SPALL ON WALL, SEE DETAIL 3/S001.

P50 REPAIR HORIZONTAL CRACK ON WALL, SEE DETAIL 2/S001.

P41 REPAIR CONCRETE SPALL ON WALL, SEE DETAIL 3/S001.

P42 REPAIR HORIZONTAL CRACK ON WALL, SEE DETAIL 2/S001.

P43 REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.

P44 REPAIR HORIZONTAL CRACK ON WALL, SEE DETAIL 2/S001.

P45 1. REPAIR VERTICAL CRACK ON WALL, SEE DETAIL 2/S001.
2. REMOVE TREE NEAR CHANNEL WALL.

P37 INSTALL NEW 4' HIGH CHAINLINK FENCE, SEE DETAIL A/S002.

P38 REMOVE CONCRETE FOOT BRIDGE.

P39 REPAIR HORIZONTAL CRACK ON WALL, SEE DETAIL 2/S001.

P40 REPAIR CONCRETE SPALL ON WALL, SEE DETAIL 3/S001.

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SHEET C807
65 OF 74 SHTS

FILE ___ DRAWER ___ ___ FOLDER ___ ___

Plot date: 14-Nov-2023

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P69 REPAIR HORIZONTAL CRACK ON WALL, SEE DETAIL 2/S001.

P70 REMOVE DEBRIS ALONG CHANNEL WALL.

P71 REMOVE EXISTING FENCE AND INSTALL NEW 4' HIGH CHAINLINK FENCE, SEE DETAIL A/S002.

P72 REMOVE DEBRIS ALONG CHANNEL WALL.

P64 REMOVE DEBRIS ALONG CHANNEL WALL.

P65 REMOVE DEBRIS ALONG CHANNEL WALL.

P66 REMOVE TREE NEAR CHANNEL WALL.

P67 REPAIR HORIZONTAL CRACK ON WALL, SEE DETAIL 2/S001.

P68 REPAIR HORIZONTAL CRACK ON WALL, SEE DETAIL 2/S001.

P59 REPAIR CONCRETE SPALL ON WALL, SEE DETAIL 3/S001.

P60 REPAIR CONCRETE SPALL ON WALL, SEE DETAIL 3/S001.

P61 REPAIR CONCRETE SPALL ON WALL, SEE DETAIL 3/S001.

P62 REPAIR CONCRETE SPALL ON WALL, SEE DETAIL 3/S00.1.

P63 REMOVE EXISTING FENCE AND INSTALL NEW 4' HIGH CHAINLINK FENCE, SEE DETAIL A/S002.

P55
1. REPAIR CONCRETE SPALL ON WALL, SEE DETAIL 3/S001.
2. REMOVE TREE ON TOP OF CHANNEL WALL.

P56 REPAIR HORIZONTAL CRACK ON WALL, SEE DETAIL 2/S001.

P57 REPAIR CONCRETE SPALL ON WALL, SEE DETAIL 3/S001.

P58 REMOVE TREE ON TOP OF CHANNEL WALL.

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P87 REMOVE TREE STUMP ON TOP OF CHANNEL WALL.

P88 REMOVE EXISTING FENCE AND INSTALL NEW 4' HIGH CHAINLINK FENCE, SEE DETAIL A/S002.

P89 REMOVE MASSIVE TREE BRANCHES OVER CHANNEL AND ON CHANNEL FLOOR.

P90 REMOVE TREE ON TOP OF CHANNEL.

P82 REMOVE DEBRIS ALONG CHANNEL WALL.

P83 REMOVE TREE ON TOP OF CHANNEL WALL.

P84 REMOVE BOULDERS ON TOP OF CHANNEL WALL.

P85 1. REMOVE TREE STUMP ON TOP OF CHANNEL WALL.
2. REMOVE BOULDERS ON TOP OF CHANNEL WALL.

P86 1. REMOVE TREE STUMP ON TOP OF CHANNEL WALL.
2. REMOVE BOULDERS ON TOP OF CHANNEL WALL.

P77 REMOVE CONCRETE FOOT BRIDGE.

P78 REMOVE STRUCTURE ALONG CHANNEL WALL.

P79 REMOVE TREE ON TOP OF CHANNEL WALL.

P80 REMOVE TREE NEAR CHANNEL WALL.

P81 REMOVE BOULDERS ON TOP OF CHANNEL WALL.

P73 1. REMOVE DEBRIS ALONG CHANNEL WALL.
2. REPAIR CONCRETE SPALL ON WALL, SEE DETAIL 3/S001.

P74 1. REMOVE DEBRIS ALONG CHANNEL WALL.
2. REPAIR HORIZONTAL CRACK ON WALL, SEE DETAIL 2/S001.

P75 REMOVE EXISTING FENCE AND INSTALL NEW 4' HIGH CHAINLINK FENCE, SEE DETAIL A/S002.

P76 REPAIR HORIZONTAL CRACK ON WALL, SEE DETAIL 2/S001.

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JOB NO.

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67 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

P105 REPAIR HORIZONTAL CRACK ON WALL, SEE DETAIL 2/S001.

P106 1. REPAIR HORIZONTAL CRACK ON WALL, SEE DETAIL 2/S001.
2. REMOVE TREE ON TOP OF CHANNEL WALL.

P107 REMOVE TREE NEAR AND ON TOP OF CHANNEL WALL.

P108 REMOVE EXISTING FENCE AND INSTALL NEW 4' HIGH CHAINLINK FENCE, SEE DETAIL A/S002.

P100 REMOVE TREES ON TOP OF CHANNEL WALL.

P101 REMOVE EXISTING FENCE AND INSTALL NEW 4' HIGH CHAINLINK FENCE, SEE DETAIL A/S002.

P102 REMOVE DEBRIS ALONG CHANNEL WALL.

P103 REMOVE TREE NEAR CHANNEL WALL.

P104 REPAIR CONCRETE SPALL ON WALL, SEE DETAIL 3/S001.

P95 REMOVE TREE ON TOP OF CHANNEL WALL.

P96 REMOVE TREE ON TOP OF CHANNEL WALL.

P97 REPAIR CONCRETE SPALL ON WALL, SEE DETAIL 2/S001.

P98 RESTORE BROKEN WALL TO ITS ORIGINAL CONDITION.

P99 REMOVE EXISTING FENCE AND INSTALL NEW 4' HIGH CHAINLINK FENCE, SEE DETAIL A/S002.

P91 REPAIR HORIZONTAL CRACK ON WALL, SEE DETAIL 2/S001.

P92 REPAIR CONCRETE SPALL ON WALL, SEE DETAIL 2/S001.

P93 REMOVE TREE ON TOP OF CHANNEL WALL.

P94 1. REMOVE TREES ON TOP OF CHANNEL WALL.
2. REMOVE BOULDERS ON TOP OF CHANNEL WALL.

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JOB NO.

SHEET C810
68 OF 74 SHTS

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P113 REMOVE EXISTING FENCE AND INSTALL NEW 4' HIGH CHAINLINK FENCE, SEE DETAIL A/S002.

P114 REPAIR HORIZONTAL CRACK ON WALL, SEE DETAIL 2/S001.

P115 REPAIR CONCRETE SPALL ON WALL, SEE DETAIL 3/S001.

P116 REPAIR HORIZONTAL CRACK ON WALL, SEE DETAIL 2/S001.

P117 REPAIR HORIZONTAL CRACK ON WALL, SEE DETAIL 2/S001.

P109 REMOVE DEBRIS ALONG CHANNEL WALL.

P110 REMOVE DEBRIS ALONG CHANNEL WALL.

P111 REMOVE DEBRIS ALONG CHANNEL WALL.

P112 REMOVE EXISTING FENCE AND INSTALL NEW 4' HIGH CHAINLINK FENCE, SEE DETAIL A/S002.

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JOB NO.

SHEET C811

69 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

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Plot date: 14-Nov-2023
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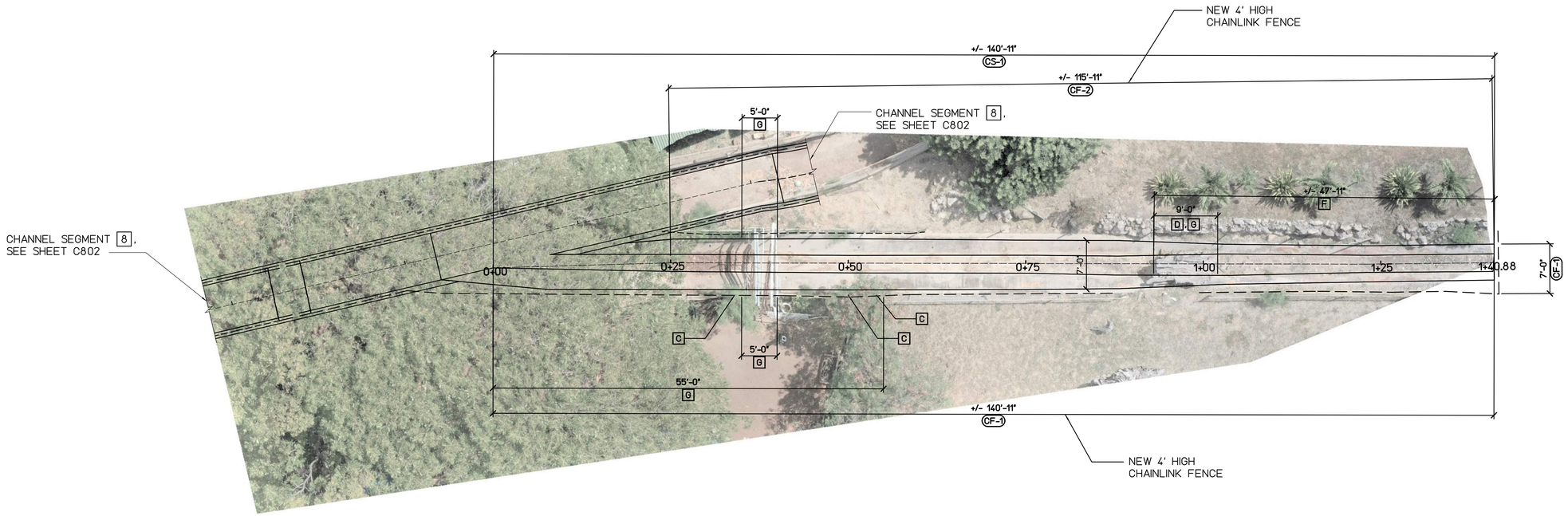

LEGEND:

2	CRACK REPAIR TYPE, SEE DETAIL 1/S001 AND 2/S001
3	SPALL REPAIR TYPE, SEE DETAIL 3/S001
G	CHAINLINK FENCE REPAIR TYPE, SEE SHEETS S002 AND S003
C-X	CRACK REPAIR MARK
SP-X	SPALL REPAIR MARK
CF-X	CHAINLINK FENCE REPAIR MARK
CS-X	CONCRETE SEALER REPAIR MARK, SEE DETAIL 4/S001
PX	PHOTO REFERENCE, SEE SHEETS C901

DEMOLITION AND REPAIR NOTES:

A	ADD MORTAR CAP ON WALL TOP
B	REGROUT WALL
C	REMOVE TREE
D	REMOVE TREE STUMP
E	REMOVE BOULDERS
F	REMOVE DEBRIS ALONG CHANNEL FLOOR
G	REMOVE DEBRIS ALONG CHANNEL WALL
H	DEMOLISH AND CONSTRUCT NEW WALL, SEE DETAIL 5/S001

STATIONING	SURFACE LOCATION	MARK	REPAIR TYPE	DIMENSION L(ft)	W(in)	D(in)	PHOTO REFERENCE
0+00 TO 0+55	SOUTH WALL		G	55			P1
0+00 TO 1+40.88	NORTH WALL	CS-1		140.88	84	7	P2
	FLOOR						
	SOUTH WALL						
0+00 TO 1+40.88	SOUTH WALL	CF-1	G	147.88			P2
0+25 TO 1+40.88	NORTH WALL	CF-2	G	115.88			P2
0+33	SOUTH WALL		C				P3
0+35 TO 0+40	NORTH WALL		G	5			P4
	SOUTH WALL		G	5			
0+50	SOUTH WALL		C				P5
0+54	SOUTH WALL		C				P6
0+93 TO 1+02	FLOOR		D, F	9			P7
0+93 TO 1+40.88	FLOOR		F	47.88			P8

CHANNEL SEGMENT 9 REPAIR PLAN (STA 0+00 TO 1+40.88)

SCALE: 1" = 10'

NORTH

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CHANNEL SEGMENT 9 REPAIR PLAN

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JOB NO.

SHEET C900
70 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

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P5 REMOVE TREE ON TOP OF WALL.

P6 REMOVE TREE ON TOP OF WALL.

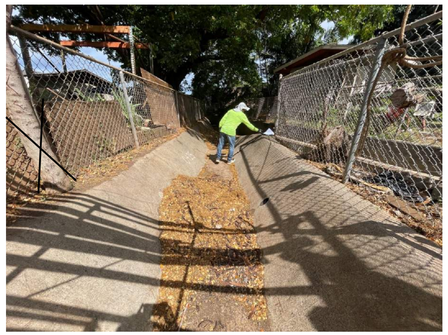
P7 REMOVE TREE STUMP AND DEBRIS ON CHANNEL FLOOR.

P8 REMOVE DEBRIS ON CHANNEL FLOOR.

BLANK

P1 REMOVE PLYWOOD ALONG CHANNEL WALL.

P2
1. SPRAY EXISTING WALL WITH CONCRETE SEALER, SEE DETAIL 4/S001.
2. REMOVE DAMAGED FENCE AND INSTALL NEW CHAINLINK FENCE, SEE A/S002.



P3 REMOVE TREE ON TOP OF WALL.

P4 REMOVE MATERIALS ON TOP ON FENCE.

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CHANNEL SEGMENT 9.0 REPAIR PHOTOS

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JOB NO.

SHEET C901
71 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

Plot date: 14-Nov-2023

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Plot date: 14-Nov-2023
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REPAIR NOTES:

A. CONCRETE MATERIALS:

1. POLYMER MODIFIED REPAIR MORTAR: FACTORY BLENDED CEMENTITIOUS MATERIAL COMBINED WITH A POLYMER TYPE ADMIXTURE AND CORROSION INHIBITOR ADMIXTURE HAVING A MINIMUM COMPRESSIVE STRENGTH OF 6,000 PSI AT 28 DAYS, AND SHALL BE USED FOR ALL SPALL REPAIRS 5 SQ. FT. OR LESS IN AREA AND WHERE FORMWORK IS NOT REQUIRED.

2. PORTLAND CEMENT CONCRETE: FLOWABLE (6" TO 8" SLUMP) PORTLAND CEMENT CONCRETE, WITH MAX. AGGREGATE SIZE OF 3/8", SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 6,000 PSI AT 28 DAYS, A WATER-CEMENT RATIO NOT EXCEEDING 0.45 BY WEIGHT, SHALL CONTAIN A LIQUID CORROSION INHIBITING ADMIXTURE AND SHALL BE USED FOR ALL REPAIRS WHERE THE SPALL REPAIR AREA EXCEEDS 5 SQ. FT. AND/OR WHERE FORMING IS REQUIRED.

3. FOR LARGE CONCRETE BATCH, A COMMERCIAL MIX OF 4,000 PSI CONCRETE BY A CONCRETE SUPPLIER IS ACCEPTABLE. SUBMIT CONCRETE MIX TO ENGINEER FOR REVIEW.

B. REBAR CORROSION PROBING:

PROBE ALL CRACKS FOR RUSTING OF UNDERLYING REBARS IN ACCORDANCE WITH 3/S001. PROBES SHALL BE LOCATED NOT MORE THAN 5' FROM EACH END OF A CRACK AND NOT MORE THAN 10' APART ALONG THE CRACK. IF RUST IS ENCOUNTERED EXTEND THE PROBE EACH WAY FOR 6" BEYOND THE LIMITS OF RUST. IF UPON PROBING CRACKS FOR RUSTED REBARS, THE CRACKS TURN OUT TO BE SHALLOW DELAMINATIONS CREATED BY CORROSION OF THE REBARS, THE REPAIR OF THESE SHALLOW DELAMINATIONS SHALL BE PERFORMED IN ACCORDANCE WITH DETAIL 2/S001 FOR THE PURPOSES OF THIS CONTRACT, THE TERMS "RUST" AND "CORROSION" OF REBARS MEAN THE SAME THING.

C. REPAIR PROCESSES:

THE CONCRETE REPAIR PROCESSES AND STEPS DESCRIBED HEREIN ARE RECOMMENDED AS A MINIMUM RESTORATION EFFORT. WHERE MANUFACTURER'S SPECIFICATIONS, DIRECTIONS, RECOMMENDATIONS ARE MORE EXTENSIVE OR PROVIDE CLARIFICATION TO MANUFACTURER'S REQUIREMENTS, ALL SUCH MANUFACTURER'S DIRECTIVES SHALL BE FOLLOWED.

1. THE CONTRACTOR SHALL PROVIDE A CATCHMENT/ CONTAINMENT DEVICE TO CATCH AND PREVENT ALL LOOSE CONCRETE, OIL, DIRT, COATINGS, TOOLS, ETC., AS A RESULT OF THIS PROJECT, FROM FALLING INTO THE STREAM CHANNEL.

2. BOTH SPALLS AND DELAMINATIONS ARE CALLED OUT AS SPALLS ON THE PLANS AND NO SEPARATE DISTINCTION IS MADE SINCE REPAIRS ARE THE SAME.

3. CHECK SURFACES TO ENSURE THAT IT IS FREE FROM LOOSE AGGREGATE OR ADDITIONAL DELAMINATIONS.

4. EDGES OF THE CHIPPED OUT AREA SHALL BE SQUARE CUT PERPENDICULAR TO THE CONCRETE SURFACE FOR A MINIMUM DEPTH OF 1 INCH UNLESS NOTED OTHERWISE. MAKE 1/4" MIN. TO 1/2" MAX DEEP SQUARE SAW-CUT ALONG STRAIGHT LINES AT 90° ANGLES AT THE CONCRETE SURFACE. USE CHIPPING GUN TO PRODUCE THE REMAINDER OF THE 1" MIN. SQUARE CUT. DO NOT SAW CUT THROUGH EXISTING REBARS. SHOULD ANY REBAR BE PARTIALLY CUT, REPAIR BY WELD SPLICING PER DETAIL 1/S001, IF THE EFFECTIVE SIZE OF THE REBAR IS LESS THAN THE ALLOWABLE SHOWN IN CHART A/S001.

5. REMOVE ALL DELAMINATED, LOOSE, SPALLED, HONEY COMBED, RUST-STAINED & OTHERWISE DEFECTIVE CONCRETE TO EXPOSE ALL SURFACES OF REINFORCING BARS TO A POINT AT A MINIMUM OF 3/4" BEHIND REINFORCING BARS UNTIL SOUND CONCRETE IS ENCOUNTERED. SOUND CONCRETE WILL BE SPALL FREE WITHOUT CRACKS, DELAMINATIONS, VOIDS, AND SHALL BE FIRMLY BONDED TO SURROUNDING CONCRETE. WHEN STRUCK WITH A HAMMER, SOUND CONCRETE WILL NOT PRODUCE A HOLLOW SOUND. CHIP CONCRETE TO OBTAIN A SURFACE PROFILE OF-1/16" IN DEPTH WITH A NEW FRACTURED AGGREGATE SURFACE. REMOVE LOOSE CONCRETE, DUST, OIL, GREASE, DIRT AND FOREIGN MATERIALS. SEE DETAIL 3/S001.

6. WHERE RUSTED REBARS ARE ENCOUNTERED, REMOVE ALL RUST FROM ALL AROUND THE BAR BY POWER TOOL CLEANING. AFTER THE BAR HAS BEEN CLEANED, MEASURE THE DIAMETER OF THE EXPOSED REINFORCING BARS AT THE EDGE OF THE CHIPPED OUT AREA TO DETERMINE THE ORIGINAL BAR SIZE. COMPARE THE BAR DIAMETER, WITHIN THE CHIPPED OUT AREA, WITH CHART A/S001.1 AND REPLACE BARS AS REQUIRED. PROVIDE SPLICE LENGTH AS SHOWN AND SPECIFIED TO PORTIONS OF EXISTING BARS THAT REMAIN. SEE DETAIL 1/S001.

7. CARE SHALL BE TAKEN TO AVOID DAMAGING SOUND CONCRETE AND REINFORCING. SURROUNDING AREAS SHALL BE SOUNDED WITH A SOUNDING DEVICE SUCH AS A METAL HAMMER TO VERIFY EXTENT OF DAMAGED CONCRETE.

8. COAT THE REINFORCING BARS AND CONCRETE SUBSTRATE WITH RUST INHIBITING 2-PART EPOXY BONDING COMPOUND. FOLLOW MANUFACTURER'S RECOMMENDATIONS FOR SURFACE PREPARATION.

9. CONCRETE, CORROSION RESIDUE, WATER AND OTHER BY- PRODUCTS OR DEMOLITION SHALL NOT BE ALLOWED TO ENTER THE WATER. THE CONTRACTOR SHALL SUBMIT ITS PROPOSED DEMOLITION PROCEDURES TO THE ENGINEER FOR APPROVAL.

10. SPALL REPAIRS 5 SQ. FT. OR LESS MAY BE ACCOMPLISHED WITHOUT FORM WORK BY USING A REPAIR MORTAR.

11. WHERE USED, FORM SHALL BE WATERTIGHT.

12. REMOVE EXCESS CEMENT AND PARTICULATE SLURRY BEFORE CURING.

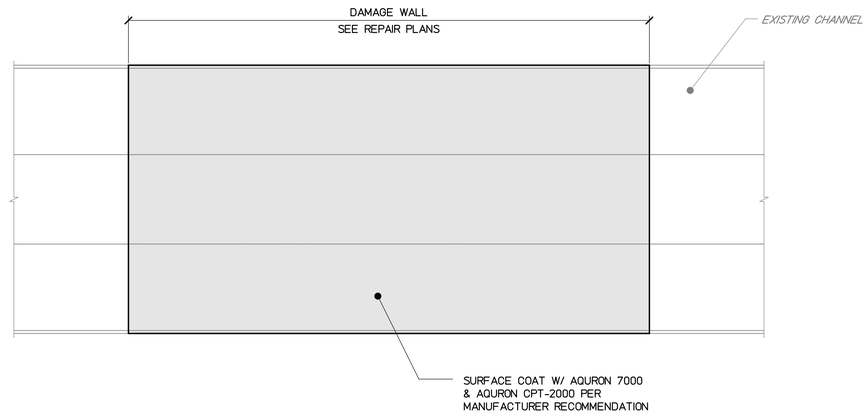
13. DO NOT FEATHER EDGES OF REPAIR.

14. AFTER REPAIRS HAVE BEEN CURED A MINIMUM OF 14 DAYS, THE REPAIRED AREAS SHALL BE CLEANED AND COATED WITH A CONCRETE SEALER. THE COATED AREA SHALL EXTEND A MINIMUM OF 6 INCHES ALL AROUND THE REPAIR AREA.

15. CONTRACTOR SHALL VERIFY WITH THE ENGINEER ALL REPAIR TYPES THAT DIFFER FROM THE CONTRACT DRAWINGS AND SHALL NOT PROCEED WITH WORK UNTIL APPROVED BY THE ENGINEER.

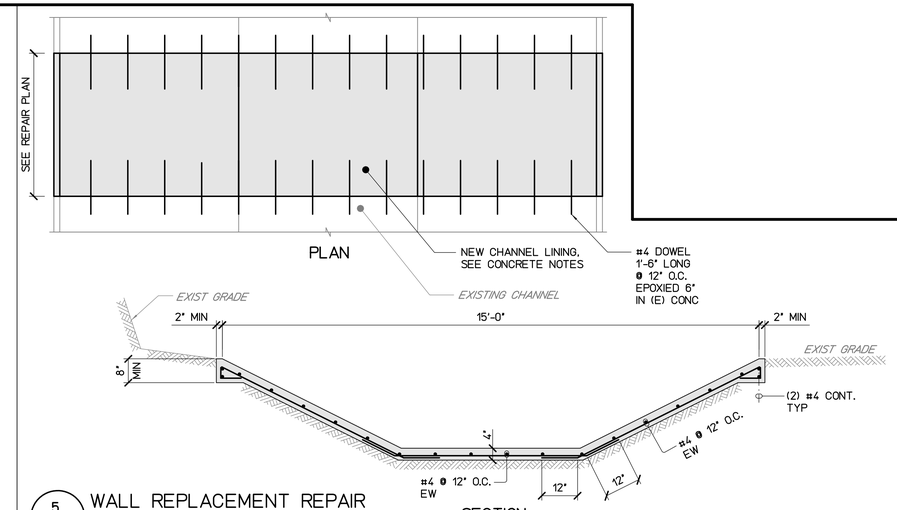
16. THE CONTRACTOR SHALL SOUND AND VERIFY THE LOCATIONS AND QUANTITIES OF THE VARIOUS TYPES OF REPAIRS PRIOR TO BEGINNING THE CONCRETE REPAIR WORK. NOTIFY THE ENGINEER OF THE RESULTS OF THE SOUNDING SURVEY. CONTRACTOR SHALL NOT PROCEED UNTIL THE RESULTS OF THE CONTRACTOR'S SOUNDING SURVEY IS COMPLETED AND QUANTITIES ARE APPROVED BY THE ENGINEER.

17. THE CONTRACTOR SHALL REPAINT ANY AREAS, INCLUDING THE ADJACENT AREAS, THAT ARE AFFECTED BY THE REPAIRS.



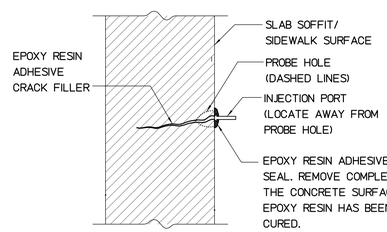
4 / S001 CONCRETE SEALER REPAIR

NOT TO SCALE



5 / S001 WALL REPLACEMENT REPAIR

NOT TO SCALE

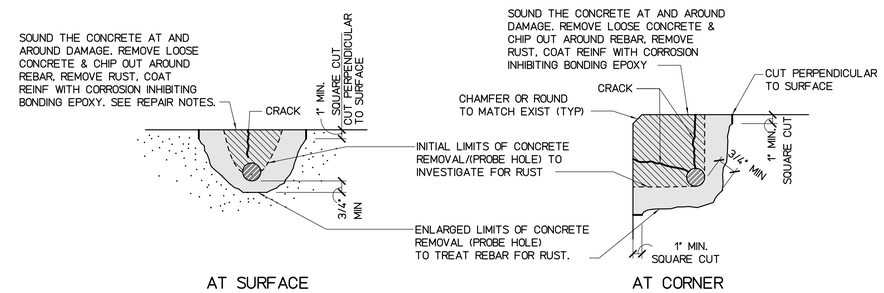


NOTES:

1. USE THIS DETAIL TO REPAIR CRACKS NOT CAUSED BY CORROSION OF THE UNDERLYING REBAR(S). IF REBARS ARE CORRODED SEE DETAIL A/S001.
2. REPAIR PROBE HOLES WITH POLYMER MODIFIED REPAIR MORTAR.
3. PROVIDE INJECTION PORTS ALONG CRACK AT MAXIMUM INTERVALS EQUAL TO THE WIDTH OR THICKNESS OF THE MEMBER BEING INJECTED.
4. APPLY EPOXY CRACK SURFACE SEAL OVER CRACK AFTER ENTRY PORTS HAVE BEEN INSTALLED, DO NOT PROCEED WITH EPOXY INJECTION UNTIL SURFACE SEAL HAS CURED.
5. INJECT EPOXY ACCORDING TO THE PROCEDURES DESCRIBED IN SP 70.8.C.2 OF SPECIAL PROVISIONS SECTION SP-70.
6. PERFORM EPOXY INJECTION IN ONE CONTINUOUS PROCESS.
7. USE HIGH-MODULUS, LOW VISCOSITY EPOXY FOR INJECTION.

2 / S001 CRACK REPAIR TYPE 2 - EPOXY INJECTION

NOT TO SCALE



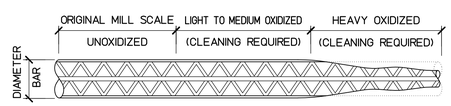
NOTE:

IF RUST CAUSES CROSS SECTIONAL AREA OF REBAR TO BE REDUCED BY LESS THAN THE MINIMUM INDICATED ON CHART A/S001 WELD SPLICE A NEW REBAR.

3 / S001 SPALL REPAIR - REMOVAL & REPATCH OF SPALLED CONCRETE

NOT TO SCALE

ALLOWABLE BAR SIZE CHART		
DESIGN BAR SIZE		ALLOWABLE REBAR DIAMETER WITHOUT REPAIR
SIZE #	DIAMETER	
#3	3/8" ø	5/16" ø
#4	1/2" ø	7/16" ø
#5	5/8" ø	9/16" ø
#6	3/4" ø	5/8" ø
#7	7/8" ø	3/4" ø
#9	1" ø	7/8" ø
#10	1 1/8" ø	1" ø
#11	1 1/4" ø	1 1/8" ø

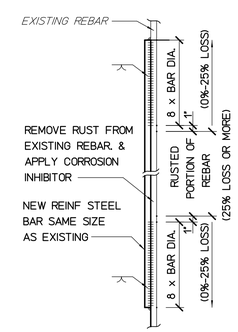


NOTES:

1. REMOVE ALL CORROSION AND SCALE BEFORE MEASURING EXISTING BAR DIAMETER
2. IF REINFORCING BAR DIAMETER, AFTER CLEANING, IS LESS THAN THE ALLOWABLE DIAMETER SHOWN IN BAR SIZE CHART, REPAIR PER 1/S001.

A / S001 ALLOWABLE BAR DIAMETER WITHOUT REPAIR CHART

NOT TO SCALE



SPLICE AT RUSTED BAR

1 / S001 CRACK REPAIR TYPE 1 - REBAR CORROSION REPAIR

NOT TO SCALE

REVISION NO.	DATE	REVISIONS	BY

ATHER R. DAR
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No. 7808-S
HAWAII U.S.A.
Exp. Date: 4-30-24

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

DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS

NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

SURFACE REPAIR NOTES & DETAILS

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

HAWAII ENGINEERING GROUP, Inc.
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1088 BISHOP STREET #2506
HONOLULU, HI 96813
Tel: 808-533-2092

JOB NO.

SHEET S001
72 OF 74 SHTS

FILE ___ DRAWER ___ ___ FOLDER ___ ___

CHAIN LINK - FENCE, WALK GATE & DOUBLE SWING GATE SPECIFICATIONS

1. FABRIC SHALL MEET THE GENERAL REQUIREMENTS FOR METALLIC-COATED STEEL CHAIN LINK FENCE FABRIC FOR INDUSTRIAL USAGE, AS COVERED BY ASTM A392. THE FABRIC SHALL BE OF A 2-INCH MESH WOVEN FROM A GOOD COMMERCIAL QUALITY STEEL WIRE OF NO. 9 GAUGE, 0.148 INCH NOMINAL DIAMETER BEFORE GALVANIZING. THE WIRE SHALL WITHSTAND A BREAKING LOAD OF 1,290 LBS. THE FABRIC SHALL BE HOT DIPPED GALVANIZED, NOT LESS THAN 1.2 OZ. OF ZINC PER SQUARE FOOT OF ACTUAL SURFACE COVERED, AFTER WEAVING AND FURNISHED WITH TOP AND BOTTOM SELVAGE KNUCKLE. THE FABRIC HEIGHT SHALL BE AS SHOWN ON THE PROJECT DRAWING.

2. POST SHALL BE HOT DIPPED GALVANIZED, INSIDE AND OUTSIDE, ROUND PIPE CONFORMING TO ASTM A120 STANDARD WEIGHT. ALL POSTS SHALL BE SET TRUE TO LINE AND GRADE AND EMBEDDED IN CONCRETE FOOTINGS. ORNAMENTAL TOPS SHALL BE PROVIDED WHEN NECESSARY.

   LINE POSTS SHALL BE 2-3/8 INCH O.D. PIPE, 3.65 LBS. PER LINEAL FOOT BEFORE GALVANIZING, SPACED NOT MORE THAN 10 FEET CENTER-TO-CENTER. FASTEN FABRIC TO LINE POSTS WITH GALVANIZED STEEL WIRE AT INTERVALS NOT EXCEEDING 15 INCHES. CORNER OR END POSTS SHALL BE 2-7/8 INCH O.D. PIPE 5.79 LBS. PER LINEAL FOOT BEFORE GALVANIZING.

   WALK GATE POSTS SHALL BE 2-7/8 INCH O.D. PIPE, 5.79 LBS. PER LINEAL FOOT BEFORE GALVANIZING, SPACED 4 FEET CENTER-TO-CENTER.

3. BRACING AND TOP RAIL SHALL BE HOT DIPPED GALVANIZED, INSIDE AND OUTSIDE, 1-5/8 INCH O.D. PIPE, 2.27 LBS. PER LINEAL FOOT. CONFORMING TO ASTM A120 STANDARD WEIGHT. INSTALL THE HORIZONTAL BRACE AT EACH CORNER, END, WALK GATE, AND DRIVE-GATE POSTS AT MID-HEIGHT OF THE FABRIC. EACH BRACE SHALL BE DIAGONALLY TRUSSED WITH A 3/8 INCH ROUND ROD, HOT DIPPED GALVANIZED, FROM THE LINE POST BACK TO THE CORNER, END, WALK GATE, OR DRIVE-GATE POST. EACH TRUSS ROD SHALL BE PROVIDED WITH A TURNBUCKLE, A HEAVY TRUSS TIGHTENER, AND BRACE END FITTINGS. FASTEN FABRIC TO BRACE RAIL WITH STEEL WIRE SPACED 24 INCHES O.C. ALL MATERIALS SHALL BE GALVANIZED.

4. GATES SHALL BE SWING TYPE, COMPLETE WITH LATCHES, STOPS, KEEPERS AND HINGES.

   GATE FRAMES SHALL BE CONSTRUCTED OF HOT DIPPED GALVANIZED, INSIDE AND OUTSIDE, 2 INCH O.D. PIPE, 2.72 LBS. PER LINEAL FOOT, CONFORMING TO ASTM A120 STANDARD WEIGHT. THE MEMBERS SHALL BE WELDED AT ALL CORNERS OR ASSEMBLED WITH FITTINGS AND RIGIDLY TRUSSED AND BRACED TO PREVENT SAG OR TWIST. WHERE WELDING IS DONE, CLEAN AND GRIND SMOOTH THE AREA BEFORE APPLYING AMERON "AMERCOAT 160" OR CARBOLINE "CARBOMASTIC 15" PER THE MANUFACTURE'S DIRECTION.

   GATE HINGES SHALL BE MALLEABLE INDUSTRIAL HINGES (90 DEGREES), GALVANIZED. THE HINGES SHALL BE OF ADEQUATE STRENGTH AND CAPABLE OF THE GATE BEING OPENED OR CLOSED EASILY BY ONE PERSON.

   GATE LATCHES, STOPS OR KEEPERS SHALL BE PROVIDED FOR ALL GATES. ALL DOUBLE SWING GATES SHALL HAVE A LATCH OF THE PLUNGER (DROP) ROD TYPE ARRANGED TO FULLY ENGAGE THE CENTER STOP. ALL SINGLE LEAF GATES SHALL BE EQUIPPED WITH A MALLEABLE FORK LATCH. ALL LATCHES SHALL BE ARRANGED FOR LOCKING (PAD LOCKS SHALL BE PROVIDED BY HAWAII ELECTRIC LIGHT COMPANY INC.). KEEPERS SHALL CONSIST OF A MECHANICAL DEVICE FOR SECURING THE FREE END OF THE GATE WHEN IN THE FULL OPEN POSITION. ALL MATERIALS SHALL BE GALVANIZED.

   GATE FABRIC SHALL BE THE SAME TYPE AS USED IN THE FENCE CONSTRUCTION. THE FABRIC SHALL BE ATTACHED SECURELY TO THE GATE FRAME AT INTERVALS NOT EXCEEDING 15 INCHES.

5. TENSION BARS AND BANDS SHALL BE PROVIDED AT ALL CORNER, END, AND GATE POSTS. TENSION BARS SHALL NOT BE LESS THAN 2 INCHES SHORTER THAN THE HEIGHT OF THE FABRIC WITH WHICH IT IS TO BE USED. TENSION BANDS SHALL BE OF ADEQUATE STRENGTH AND OF SUFFICIENT NUMBER TO ADEQUATELY FASTEN THE FABRIC AND TENSION BAR TO THE CORNER, END, OR GATE POSTS AT INTERVALS NOT EXCEEDING 15 INCHES. ALL MATERIALS SHALL BE GALVANIZED.

6. TENSION WIRE SHALL BE MARCELLED NO. 7 GAUGE, 0.177 INCH NOMINAL DIAMETER, GALVANIZED WIRE. THE TENSION WIRE SHALL BE FASTENED TO THE FABRIC AT INTERVALS NOT EXCEEDING 24 INCHES.

7. INSTALLATION OF FENCING, INCLUDING GATES, SHALL MEET THE REQUIREMENTS OF ASTM F567.

8. GALVANIZING OF ALL STEEL PARTS FOR THE FENCING AND GATES ABOVE AND BELOW GROUND SHALL BE BY THE HOT DIPPED PROCESS IN ACCORDANCE WITH THE ASTM DESIGNATION FOR THE PARTICULAR PART.

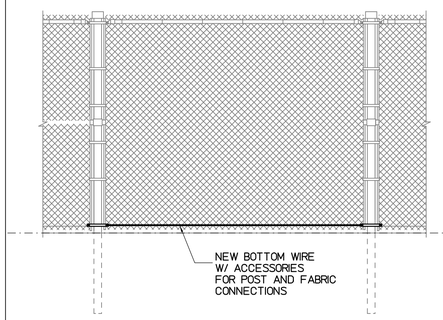
9. FENCE GROUND WIRE SHALL BE IN ACCORDANCE WITH THE PROJECT GROUNDING PLAN AND SPECIFICATIONS.

10. FOOTINGS SHALL BE CONSTRUCTED WITH REGULAR WEIGHT CONCRETE, DESIGNED IN ACCORDANCE WITH ACI 211.1, OF 2,500 PSI MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS. THE CONCRETE SHALL BE EITHER JOB MIXED (IF APPROVED BY THE ENGINEER), IN ACCORDANCE WITH ACI 304, OR PLANT MIXED, CONFORMING TO THE PROVISIONS OF ASTM C-94, IN AN APPROVED TYPE OF POWER OPERATED MIXER THAT WILL INSURE UNIFORMITY AND HOMOGENITY OF THE CONCRETE PRODUCED. HAND MIXING WILL NOT BE PERMITTED. CONCRETE THAT HAS STARTED TO HARDEN WILL NOT BE PERMITTED. ADDITION OF WATER IN ORDER TO MAINTAIN THE REQUIRED CONSISTANCY WILL NOT BE PERMITTED. THE TOP 6 INCHES OF ALL FOOTINGS SHALL BE FORMED. THE TOP OF ALL FOOTINGS SHALL BE TROWELLED SMOOTH AND CROWNED SLIGHTLY SO AS TO SHED WATER.

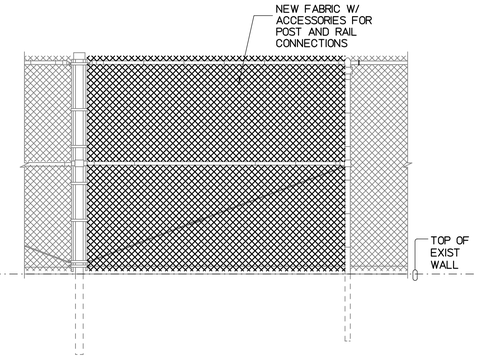
11. GENERALLY ALL MATERIALS SHALL BE NEW AND MANUFACTURED IN THE UNITED STATES OF AMERICA. THERE SHALL BE NO SPLICING OF PIPES AND RODS ALLOWED.

12. FENCE POST FOOTING SHALL BE INSPECTED BEFORE FILLING WITH CONCRETE. FOOTING HOLE SHALL BE SQUARED (NOT ROUND) AT BOTTOM.

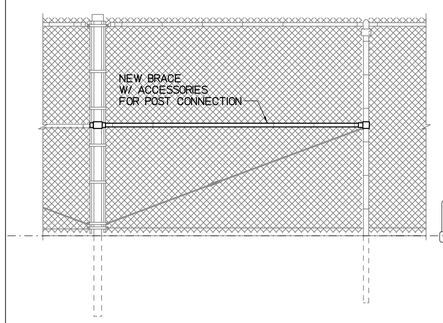
13. GATES SHALL BE PROVIDED WITH 1 INCH O.D. PIPE PLUNGER AS DROP ROD GUIDE AND LATCH ASSEMBLY. PROVIDE PER DETAILS. THIS SHEET. NO EXEPTIONS ALLOWED.



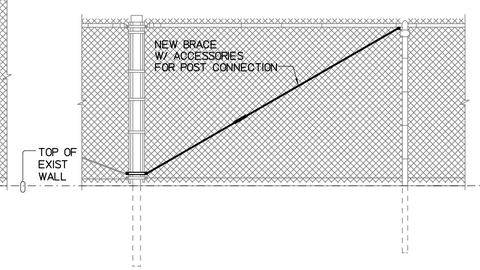
E S002 REPAIR TYPE (e) - NEW BOTTOM WIRE
NOT TO SCALE



F S002 REPAIR TYPE (f) - NEW FABRIC
NOT TO SCALE

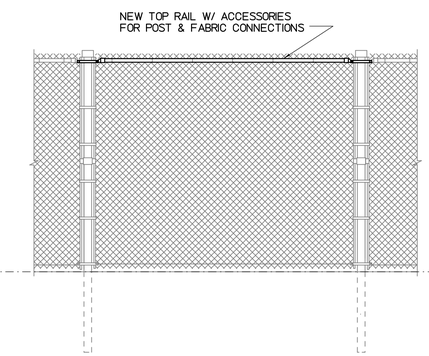


6' HIGH CHAINLINK FENCE

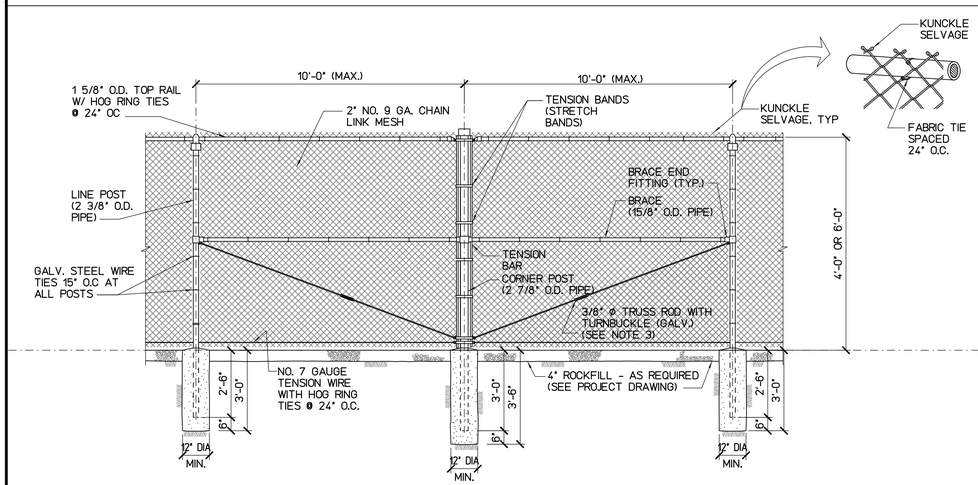


4' HIGH CHAINLINK FENCE

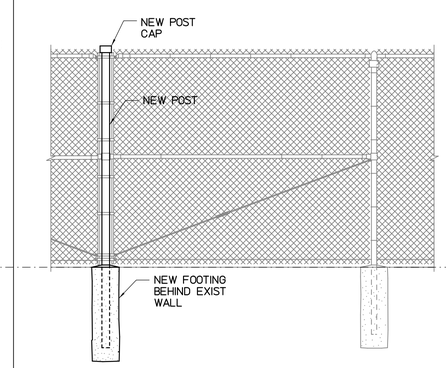
C S002 REPAIR TYPE (c) - NEW BRACE
NOT TO SCALE



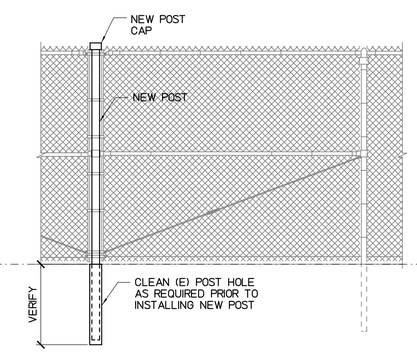
D S002 REPAIR TYPE (d) - NEW TOP RAIL
NOT TO SCALE



A S002 REPAIR TYPE (a) - NEW CHAINLINK FENCE
NOT TO SCALE



TYPICAL INSTALLATION BEHIND EXISTING WALL



ALTERNATE INSTALLATION @ EXISTING WALL

B S002 REPAIR TYPE (b) - NEW POST
NOT TO SCALE

REVISION NO.	DATE	REVISIONS	BY

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Exp. Date: 4-30-24

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DEPARTMENT OF HAWAIIAN HOME LANDS

NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS
NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHAINLINK FENCE REPAIR NOTES AND DETAILS

DESIGNED BY: AD
DRAWN BY: AK, AP, DL
CHECKED BY: AD
SUPV:
DATE: 10/16/2023

HAWAII ENGINEERING GROUP, Inc.
Civil & Structural Engineers
1088 BISHOP STREET #2506
HONOLULU, HI 96813
Tel: 808-533-2092

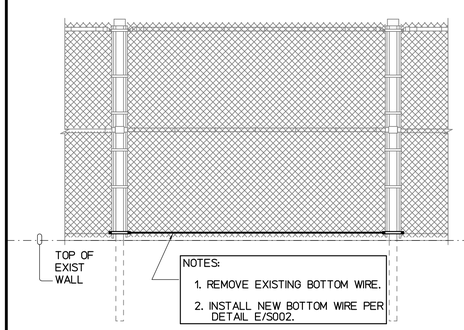
JOB NO.

SHEET S002
73 OF 74 SHTS

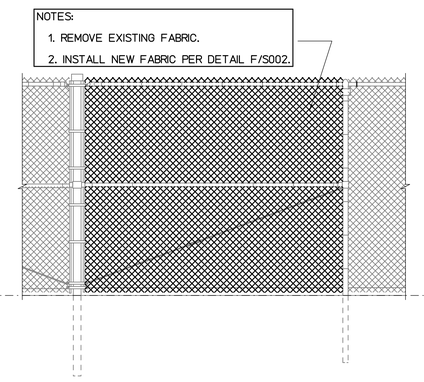
FILE ___ DRAWER ___ FOLDER ___

Plot date: 14-Nov-2023
J:/2020 Projects/20-066 DHHL PS-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/S002

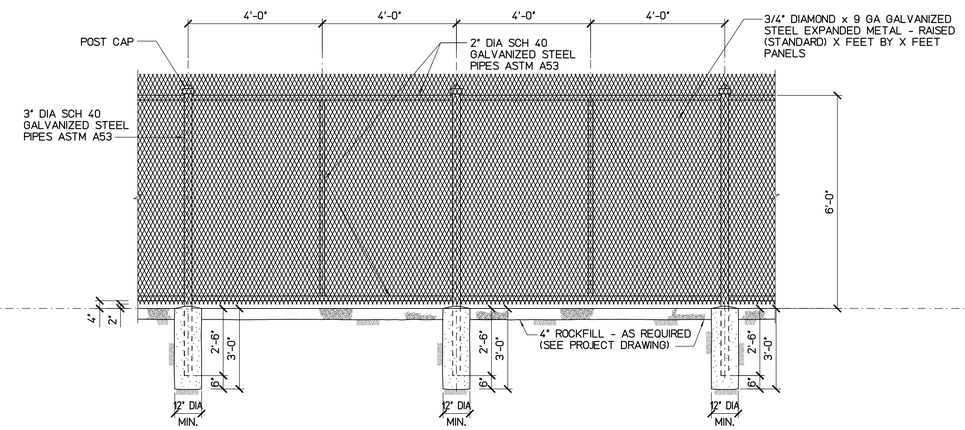
Plot date: 14-Nov-2023
J:/2020 Projects/20-066 DHHL PS-20-LDD-012 T02 Nanakuli Laterals/Drawings/Civil/S003



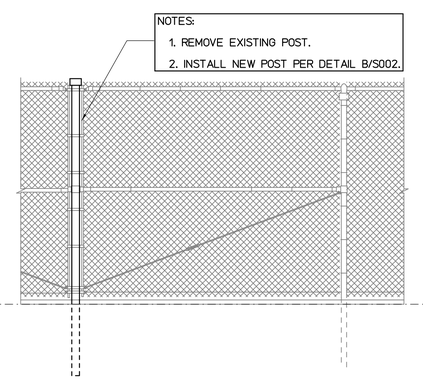
J / S003 REPAIR TYPE (j) - REPLACE BOTTOM WIRE
NOT TO SCALE



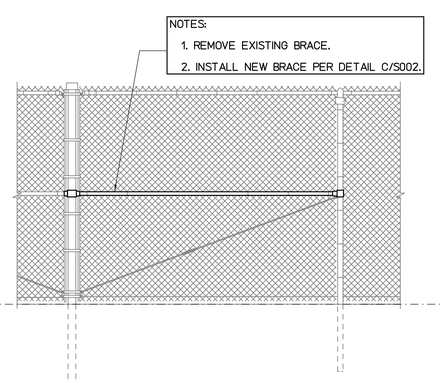
K / S003 REPAIR TYPE (k) - REPLACE FABRIC
NOT TO SCALE



L / S003 REPAIR TYPE [l] - NEW METAL LATH FENCE
NOT TO SCALE

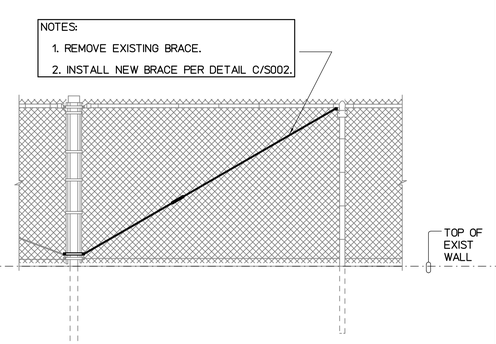


G / S003 REPAIR TYPE (g) - REPLACE POST
NOT TO SCALE

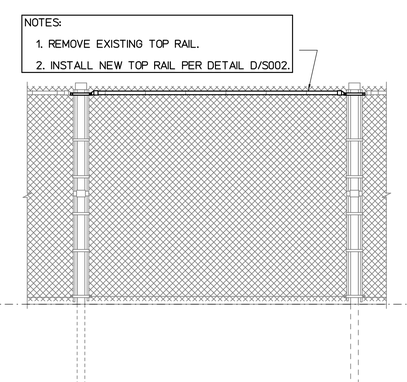


6' HIGH CHAINLINK FENCE

H / S003 REPAIR TYPE (h) - REPLACE BRACE
NOT TO SCALE



4' HIGH CHAINLINK FENCE



I / S003 REPAIR TYPE (i) - REPLACE TOP RAIL
NOT TO SCALE

REVISION NO.	DATE	REVISIONS	BY

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No. 7808-S
HAWAII U.S.A.
Exp. Date: 4-30-24

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NĀNĀKULI FLOOD CHANNEL LATERAL REPAIRS
NĀNĀKULI, WAI'ANAE, ISLAND OF OAHU, HAWAI'I

CHAINLINK FENCE REPAIR NOTES AND DETAILS

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SUPV:
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HAWAII ENGINEERING GROUP, Inc.
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Tel: 808-533-2092

JOB NO.

SHEET S003
74 OF 74 SHTS

FILE ___ DRAWER ___ FOLDER ___

as-noted

City and County of Honolulu

APPROVAL (for official use only)	
Approved by:	Franklin Lung
Date:	3/12/24
SWQR Job #:	SWQR2024-01-0055

Appendix B

Erosion and Sediment Control Plan Small Project Template for Categories 1A, 1B and 2

Construction Site Project Name: DHHL - Nanakuli Flood Channel Lateral Repairs

Physical Site Address: Nanakuli, Wai'anae, Hawaii 96792

Building Permit Application Number: A2023-11-0656

Disturbed Area (square-feet) *: 5,000 SF

*Disturbed area includes the project area, construction access on unpaved surfaces, and storage/ staging area(s).

Instructions:

Use this template to prepare an Erosion and Sediment Control Plan (ESCP) for projects under the City and County of Honolulu, Department of Planning and Permitting (DPP) Categories 1A, 1B, and 2. This ESCP may be prepared and must be signed by the property owner or an authorized agent designated by the owner. Submit a completed ESCP with the building permit application and always keep a copy of the approved ESCP on the job site.

Any changes to the approved ESCP must be approved by the DPP. Refer to the guidance booklet "How to Prepare Erosion and Sediment Control Plan for Small Construction Projects" available on DPP's Storm Water Quality (SWQ) website for more information on each BMP below.

PART 1: BMP Selection - Select the BMPs which will be used at the site and if not used, provide a brief explanation for why it is not needed or impracticable for the site.

I. EROSION PREVENTION BMPs: practices that prevent erosion from occurring.

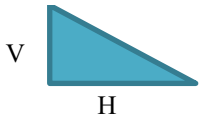
1. Permanent Stabilization (REQUIRED)

Prior to closing of any permit(s) permanent stabilization must be in place which includes the following requirements:

- All exposed disturbed areas must be permanently stabilized with ground covering such as vegetation, gravel, or pavers;
- Rain gutters, downspouts, and channelized flows must be installed and functioning as designed;
- In seeded areas, grass or vegetation must cover at least 90 percent of the disturbed soils or must be temporary stabilized while it is growing;
- Temporary measures, such as sediment barriers, should be removed when permanent measures are in place;
- All paved surfaces must be clean; and
- Storm drain inlet filters must be removed after all cleanup activities have been completed.

2. Slope Management and Protection (Category 1B and 2 only)

Areas disturbed on a slope greater than 15% must be protected when work is inactive for seven (7) days or more.



To find the slope, divide the vertical height of your slope by the horizontal length of your slope and multiply by 100. For example, if your slope measures 3 feet vertically, and 10 feet horizontally, your slope would be 3 / 10 X 100= 30%.

	Check if will be used:
1. Rolled erosion control products	☐
2. Hydraulic mulch or hydroseed	☐
3. Hydraulic or bonded fiber matrix	☐
4. Planting and/ or vegetation providing at least 70% surface cover	☐
5. Other: (please specify):	☐
Provide an explanation on the next page when this "will not use" is checked:	☒ Will not use

If Slope Management and Protection will not be used, provide brief explanation:

Within the disturbed area, there are no slopes greater than 15%.

3. Temporary Stabilization (Category 1B and 2 only)

Use one or more of the following to protect disturbed areas that will not be worked on within 14 days:

	Check if will be used:
1. Rolled erosion control products	☒
2. Hydraulic mulch or hydroseed	☐
3. Hydraulic or bonded fiber matrix	☐
4. Planting and/ or vegetation providing at least 70% surface cover	☐
5. Other: (please specify):	☐
	☐ Will not use

If Temporary Stabilization will not be used, provide brief explanation:

II. SEDIMENT CONTROL BMPs: **p**ractices to prevent soil and sediment from leaving the project site and entering storm drains during rain events.

1. Perimeter Controls

Sediment fences or barriers shall be used at the perimeter of all disturbed areas where there is potential for runoff to flow off the project site, Barriers may include gravel bags, sand bags, fiber rolls, silt fences, compost socks, or an equivalent BMP that intercepts runoff.

☒ Will Use
☐ Will Not Use

If this Perimeter Control will not be used, provide brief explanation:

2. Storm Drain Inlet Protection

Inlet protection is required over storm drains that may receive runoff from your site unless those inlets drain to a sediment basin or trap. Inlet protection should be removed during severe storm events to prevent flooding.

☒ Will Use
☐ Will Not Use

If this Storm Drain Inlet Protection will not be used, provide brief explanation:

III.GOOD HOUSEKEEPING BMPs: practices that prevent pollution by limiting or reducing potential pollutants at their source.

1. BMP and Site Maintenance (REQUIRED)

Regularly inspect and maintain BMPs to ensure continued performance.

2. Dust Control (REQUIRED FOR FULL OR PARTIAL DEMOLITION OF STRUCTURES)

Use one of the following to control dust:

	Check if will be used:
1. Mulching to a depth of one inch or more	☐
2. Sprinkling exposed soils with water to maintain moistness (Show temporary or permanent water sources on ESCP diagram. Indicate if water trucks will be on site.)	☐
3. Vertical dust barriers	☐
	☒ Will not Use

If Dust Control will not be used, provide brief explanation:

Will not generate dust.

3. Concrete Waste Management

Conduct washout off-site or perform onsite in a designated area, away from water bodies, channels, or storm drains. Construct and maintain washout to contain all liquid and concrete waste generated.

☐ Will Use
☐ Will Not Use

If Concrete Waste Management will not be used, provide brief explanation:

4. Stockpile Management

Locate stockpiles away from drainage ways or other areas of concentrated flows and within the property. Use a barrier around stockpiles and cover if they will not be actively used within seven (7) days.

☐ Will Use
☐ Will Not Use

If Stockpile Management will not be used, provide brief explanation:

5. Vehicle Tracking Control

Restrict vehicle traffic to properly designated areas and remove sediment from vehicle tires prior to exiting the project site. All sediments that are tracked or discharged off-site must be swept or vacuumed at the end of each day.

☐ Will Use
☐ Will Not Use

If Vehicle Tracking Control will not be used, provide brief explanation:

6. Material Delivery, Storage and Use Management

Minimize the storage of potential pollutants onsite, store materials in a designated area, and install secondary containment. Storage should be within the property. Do not store materials in buffer areas, near areas of concentrated flow, or areas abutting the City storm drainage system, receiving waters, or drainage improvements that discharge off-site.

☐ Will Use
☐ Will Not Use

If Material Delivery, Storage, and Use Management will not be used, provide brief explanation:

7. Spill Prevention and Control

Keep ample supply of cleanup materials onsite and within the property. Clean up spills immediately, using dry clean-up methods where possible, and dispose of used materials properly.

☐ Will Use
☐ Will Not Use

If Spill Prevention and Control will not be used, provide brief explanation:

8. Solid Waste Management

Provide designated waste collection areas for solid waste or construction and demolition waste, collect trash daily, and dispose at authorized disposal areas. Obtain street permit to locate outside property.

☐ Will Use
☐ Will Not Use

If Solid Waste Management will not be used, provide brief explanation:

9. Portable Toilets (Sanitary/ Septic Waste Management)

Temporary and portable sanitary and septic waste systems shall be mounted or staked in, well-maintained and scheduled for regular waste disposal and servicing. Place it within the property.

☐ Will Use
☐ Will Not Use

If Portable Toilets (Sanitary/ Septic Waste Management) will not be used, provide brief explanation:

10. Liquid Waste Management BMPs

Contain liquid wastes in a holding pit, sediment basin, roll-off bin, or portable tank of sufficient volume to contain the liquid wastes generated. Place liquid waste management within property.	☐Will Use ☒Will Not Use

If Liquid Waste Management will not be used, provide brief explanation:

Will not generate liquid waste.

11. Vehicle and Equipment Cleaning, Fueling, and Maintenance

Prevent pollutants in storm water from vehicle and equipment cleaning, fueling and maintenance by using off-site facilities when feasible, performing work in designated areas only, using spill pads under vehicles and equipment, checking for leaks and spills, and containing and cleaning up spills immediately.	☒Will Use ☐Will Not Use

If Vehicle and Equipment Cleaning, Fueling, and Maintenance will not be used, provide brief explanation:

12. Hazardous Waste Management

Prevent or reduce the discharge of pollutants to storm water from hazardous waste through proper material use and waste disposal.	☐Will Use ☒Will Not Use

If Hazardous Waste Management will not be used, provide brief explanation:

Will not generate hazardous waste.

13. Contaminated Soil Management

Contain contaminated material soil by surrounding with impermeable lined berms or cover exposed contaminated material with plastic sheets. Contaminated soil should be disposed of properly in accordance with all applicable regulations.	☐Will Use ☒Will Not Use

If Contaminated Soil Management will not be used, provide brief explanation:

No known contamination at site.

PART 2: ESCP Certification – Provide a wet signature to agree to the below. If the owner would like to designate an Authorized Agent, please provide the "Authorized Agent Designation Letter" with the submission of this Appendix/or ESCP. The letter is available on DPP's Storm Water Quality (SWQ) website.

ESCP CERTIFICATION

1) By signing, you acknowledge that erosion prevention, sediment control, and good housekeeping BMPs in this ESCP are mandatory conditions of your building and/or grading permit and are subject to inspection and enforcement by the Department of Planning and Permitting, in accordance with Section 20-3-7 of the Rules Related to Water Quality.

2) If the proposed land disturbing work will be performed in the city sidewalk or right-of-way and/or best management practices installed in the sidewalk area (area between the property line and edge of pavement), the owner is responsible for obtaining a Permit for Street Usage from the Department of Transportation Services, 650 S. King Street, 2nd Floor, Honolulu, Hawaii, 96813.

3) The owner is responsible for installing appropriate barricades, flashers, and signage for pedestrian and vehicular safety, and removing the inlet protection(s) before a storm event to prevent flooding of the road and after the project site is completely stabilized.

Richard A. Speer	Richard Speer	02/28/2024
Owner / Authorized Agent Name* *Provide Letter Authorizing Agent Form if different from the Owner	**Owner Signature**	**Date**

■ **Check this box to designate the person below to be the ESCP Coordinator. If this box is checked, do not submit Appendix A, unless revising or adding a new ESCP Coordinator to inspect this project.**

Delilah Mae B. Liccud		02/28/2024
ESCP Coordinator Name** ** Provide if the ESCP Coordinator is different from the Owner or Authorized Agent.	**ESCP Coordinator Signature**	**Date**

75896A958I9FBAB_28458	1088 BISHOP STREET
ESCP Coordinator Certification #	**Address Line 1 (Street address)**
delilah@hawaiiengineering.net	SUITE 2506
ESCP Coordinator Email	**Address Line 2 (Apartment, suite, unit, building, floor, etc.)**
(808) 533-2092 ext.115	HONOLULU, HAWAII 96813
ESCP Coordinator Phone #	**City, State, ZIP Code**

PART 3: Project Schedule - Use the table below or attach a separate project schedule to this ESCP. Project schedules must establish a sequence of all planned actions and activities on the project site, including, but not limited to, all land disturbing activities, the implementation of the BMPs identified in the project ESCP, scheduled inspections and maintenance of BMPs, and the removal of temporary BMPs. (i.e. install BMPs – 1 day, clear & grub - 2 days, construction – 2 weeks, stabilize disturbed areas – 1 day, remove BMPs – after vegetation is 90% establish.)

PROJECT SCHEDULE

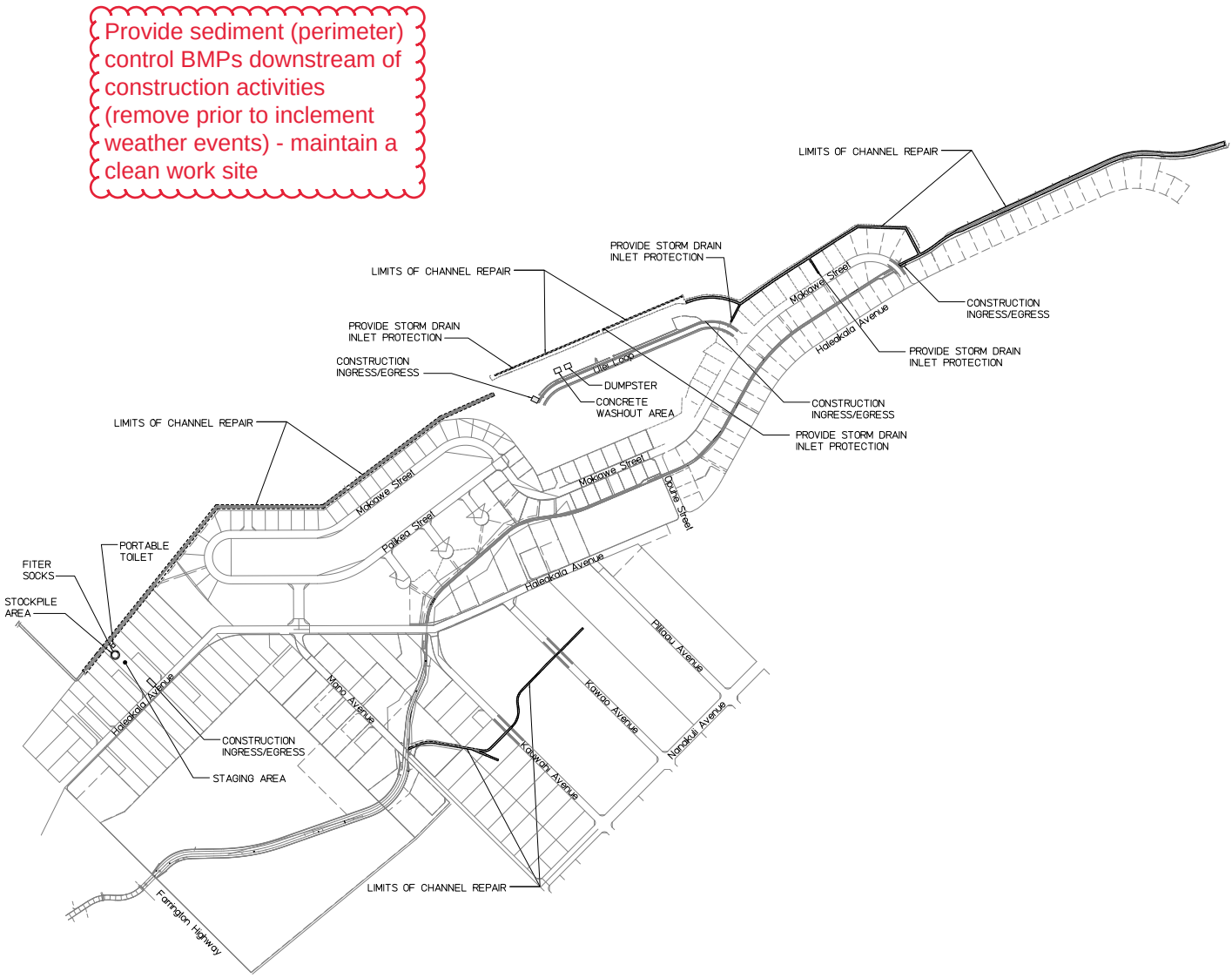
Actions	Timeline or Date
Notify the Department of Planning and Permitting of Project Start Date – Call **768-8132** or email dpp.npdes@honolulu.gov (Required)	2 weeks before starting work
Install BMPs	2 Days
Channel Lateral demolition and repairs	6 months
Remove BMPs	2 Days

RAIN RESPONSE PLAN

The following will be performed when severe rain is forecast:

- Temporarily suspend land disturbing activities including clearing, grubbing, grading and trenching.
- Inspect all BMPs and maintain as needed.
- Reinstall BMPs that were removed due to active work in the area.
- If a severe storm is expected, remove inlet protection devices to prevent flooding on surrounding streets.
- Cover or relocate material stockpiles and liquid material containers to avoid contact with rainwater.
- Place spill pans or oil-only spill pads under construction vehicles to prevent runoff from contacting any spilled petroleum products. Properly dispose of any accumulated oily water after the rain event.
- Re-inspect project site after the rain event and replace or maintain BMPs as needed.

Other: (please specify):

PART 4: Site Diagram - Provide a drawing of your site below or attach another map. Include the building outlines, property boundary or fence line, the limits of where your work will be located, flow arrows indicating direction of storm water runoff, location of BMPs, permanent or temporary water sources, and any storm drains within 50 feet of your property. All construction materials and equipment must be placed within the property, with the exception of dumpsters when a street usage permit is obtained.

SITE DIAGRAM