

TRUE NORTH

TRUE NORTH

4" HDPE WATERLINE.
SEE PLAN & PROFILE
SHEETS FOR APPROX.
ALIGNMENT, TYP.

- ① NEW EFFLUENT LINE
145 L.F. 6" PVC SCHD 80 EFFLUENT PIPE.
FOR PROFILE SEE, DETAIL SHT. A/C-6.1
- ② NEW HEADWALL FOR EFFLUENT PIPE AND
CONNECTION TO RESERVOIR LEVEL CONTROL.
SEE DETAIL B/C-6.1
- ③ NEW LEVEL CONTROL PIPING FOR RESERVOIR
EFFLUENT AT NEW 6" PVC SCHD 80
EFFLUENT PIPE, PER DETAIL SHT. C-7

HDPE LINER FOR
RESERVOIR.

STA. 81+00,
BASELINE
N = 9297.7121
E = -10058.7997

TRAV P-1
1/2" PIPE
ELEV=3874.62
N = 9478.6793
E = -10209.0583

TRAV P-5
1/2" PIPE
ELEV=3874.34
N = 9564.4766
E = -10321.6850

STA. 0+00
NEW LEVEL CONTROL FOR
RESERVOIR EFFLUENT AT
EXIST. 3" G.I. EFFLUENT PIPE.
PROVIDE ONLY ONE LEVEL
CONTROL FOR RESERVOIR.
N = 9624.8405
E = -10375.6951

EXIST. 3" G.I. PIPE FOR
EFFLUENT

INFLUENT PIPELINE
WITH CONCRETE
PEDESTAL PER
DETAIL B/C-32

TRAV PC-1
1/2" PIPE
ELEV=3887.54
N = 9781.4379
E = -10274.4177

STA. 121+40.63
N = 9783.5301
E = -10271.8544

TRAV P-3
1/2" PIPE
ELEV=3875.52
N = 9699.9077
E = -9973.0564

200 FEET MIN.
CLEAR RADIUS FOR
HELICOPTER ACCESS

HDPE LINER SAFETY LADDER. TYPICAL
FOR THREE LADDERS. CONFIRM
LOCATIONS WITH DOFAW STAFF PRIOR TO
INSTALLATION.

APPROX. LIMITS OF TREE REMOVAL AND
CLEARING FROM EMBANKMENTS FOR
RESERVOIR SAFETY, 75' FROM TOP EDGE OF
RESERVOIR, TYP. REMOVE TREES AND
BRUSH, ETC., TO PREVENT FROM FALLING
INTO RESERVOIR AND TO PROVIDE
HELICOPTER CLEAR AREA FOR DIPPING.
SEE VEGETATION REMOVAL NOTES SHT. C-10

PLAN
SCALE: 1"=30'

LINE	AZ.	DIST.
L77	177°00'00"	L=87.62'
L78	185°00'00"	L=765.31'
L101	165°00'00"	L=90.00'
L102	200°00'00"	L=119.78'
L103	172°00'00"	L=106.66'

FENCED AREA
OLD BITUMEN
CATCHMENT

4" HDPE WATERLINE.
SEE PLAN &
PROFILE SHEETS FOR
ALIGNMENT, TYP.

NOTES FOR RESERVOIR #1:

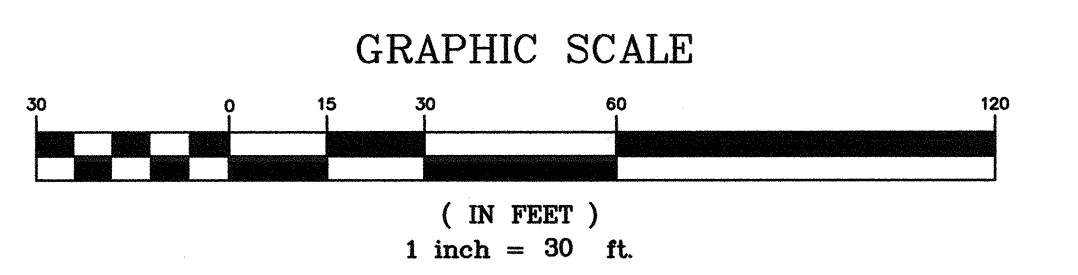
1. APPROX. 4.2 M.G. CAPACITY/12.9 ACRE-FT.
2. GENERAL SCOPE OF WORK IS TO RELINE THE EXISTING RESERVOIR WITH NEW 80 MIL HDPE LINER
3. EXISTING BUTYL LINER MAY BE USED AS A SUB-LINER UNDER THE NEW HDPE IF ACCEPTABLE TO NEW LINER MANUFACTURER TO MAINTAIN WARRANTY COVERAGE.
4. REMOVE SHRUBS, BRUSH AND TREES FROM ACTIVE RESERVOIR SURFACE AREA, EMBANKMENTS, AND MAUKA SIDE SLOPES.
5. REMOVE PINE TREES FROM MAUKA SIDE SLOPES TO PREVENT BRANCHES AND TREE TRUNKS FROM FALLING INTO RESERVOIR.
6. TREE REMOVAL SHALL PROVIDE A MINIMUM OF 200 FEET CLEAR RADIUS FROM APPROX. DEEPEST POINT OF RESERVOIR TO ALLOW FOR HELICOPTER DIPPING DURING FIRE FIGHTING OPERATIONS.
7. SEE ALSO, VEGETATION REMOVAL NOTES ON SHEET C-10.
8. FOR RESERVOIR EMBANKMENTS AND TRENCH BACKFILL SHALL BE COMPACTED TO NOT LESS THAN 90% OF MAXIMUM DENSITY. THE CONTRACTOR SHALL RETAIN A CERTIFIED INDEPENDENT TESTING LABORATORY TO TEST FOR COMPACTION COMPLIANCE.
9. ONE COMPACTION TEST SHALL BE TAKEN FOR EACH LIFT FOR EACH 100 LF OF TRENCH.

LEGEND:

- (SF) SILT FENCE
- (SCE) STABILIZED CONSTRUCTION ENTRANCE
- (PRB) PERMEABLE ROLL BARRIER
- (SS) SLOPE STABILIZATION
- (SBB) SAND BAG BARRIER
- (CA) CONTAINMENT AREA

SEE SHEET G-2 "WATER POLLUTION & EROSION CONTROL NOTES AND DETAILS".

1. THE CONTRACTOR SHALL MAKE NECESSARY SITE SPECIFIC ADJUSTMENTS TO EROSION CONTROL MEASURES TO PREVENT STORM WATER RUNOFF FROM THE WORK AREA.
2. THE CONTRACTOR SHALL INSTALL ADDITIONAL EROSION CONTROL MEASURES THAT MAY BE NECESSARY AS THE WORK PROGRESSES AND GROUND CONDITIONS CHANGE DUE TO EARTHWORK ACTIVITIES.



REVISION NO.	SYM.	DESCRIPTION	SHT/OF	DATE	APPROVED

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Jason K. Inaba
INABA ENGINEERING, INC.
EI #15015 FB #

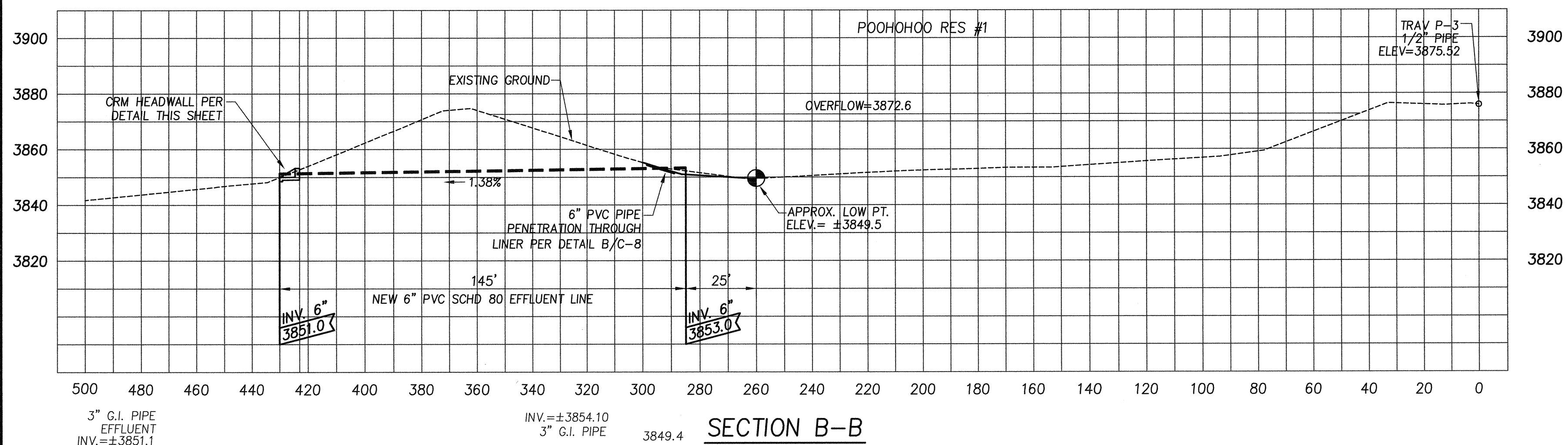
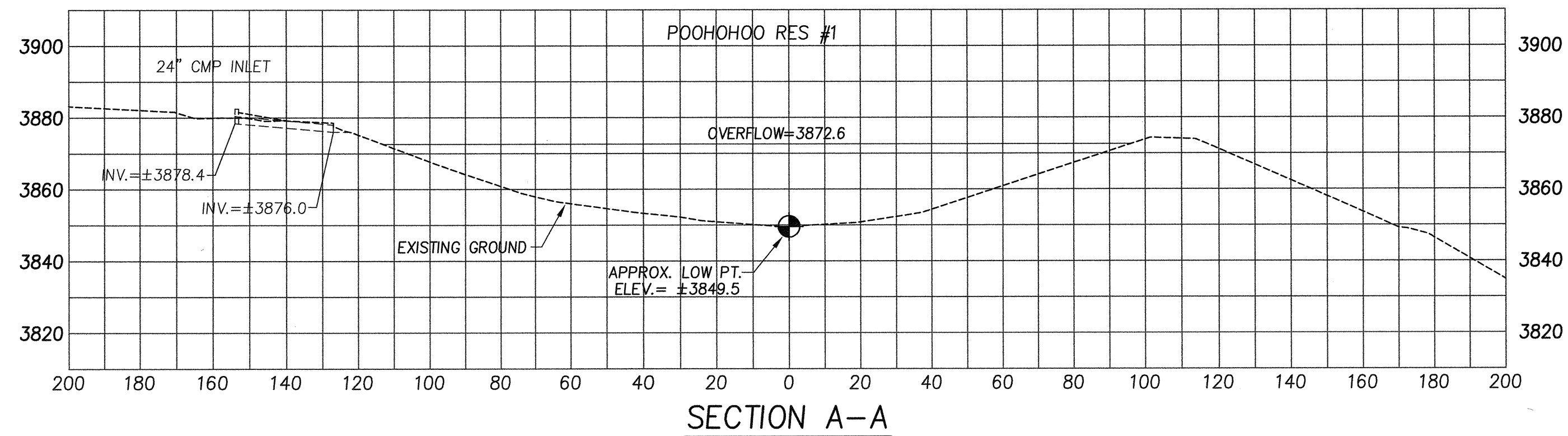
STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

PUU WAAWAA
STRUCTURE IMPROVEMENTS
AND DAM COMPLIANCE

POHOHOO RESERVOIR SITE
RESERVOIR #1 SITE PLAN

DESIGNED: JKI SUBMITTED: *[Signature]*
DRAWN: JKI DATE: MAY 6, 2016
CHECKED: JKI SCALE: As Noted
APPROVED: *[Signature]* MAY - 6 2016 DRAWING NO. C-6

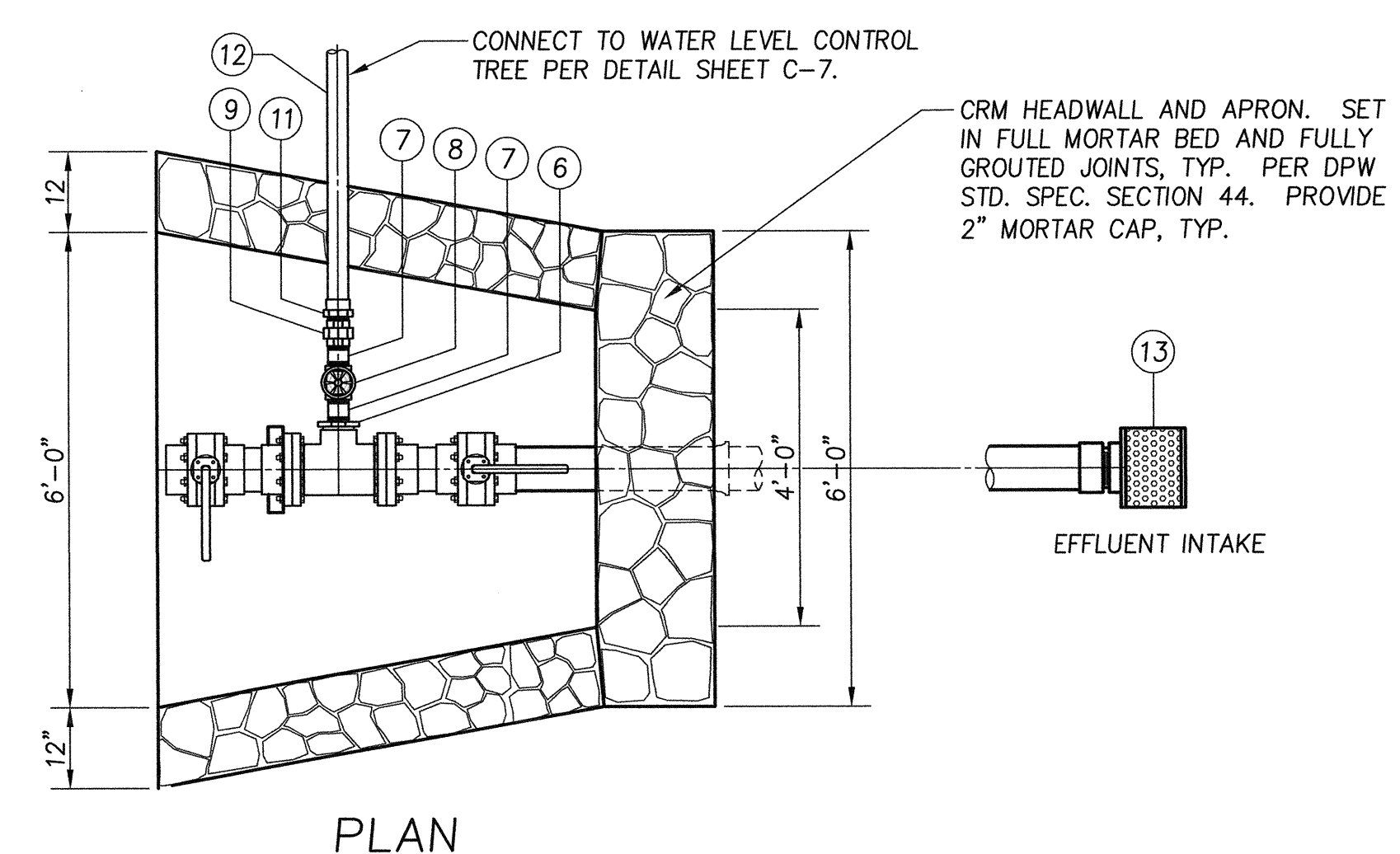
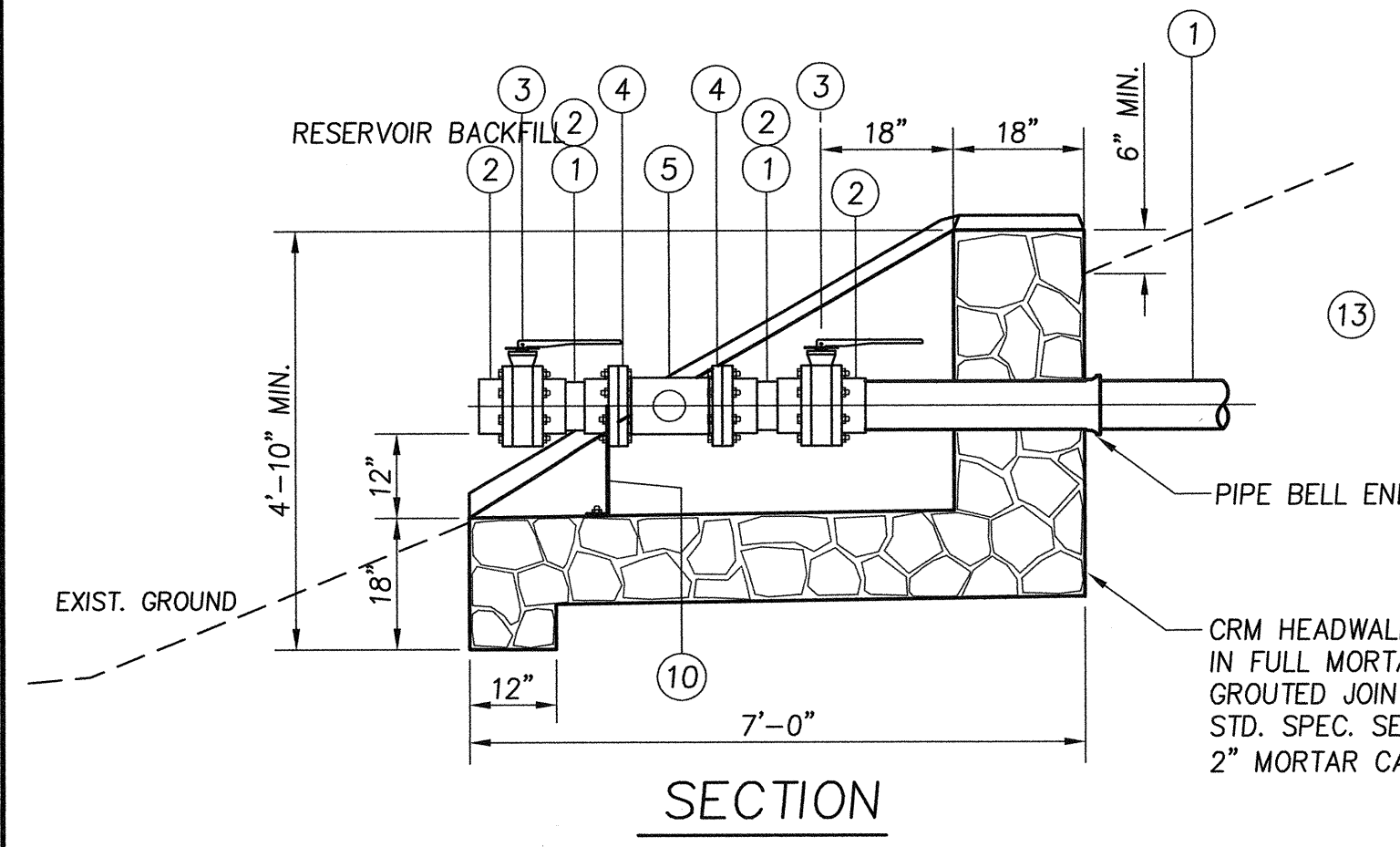
JOB NO. 500CH15A SHEET NO. 11 OF 38 SHEETS



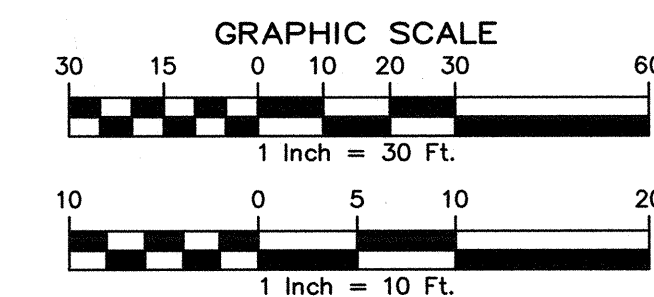
A POOHOOHOO RESERVOIR NO. 1 - SECTIONS
SCALE: 1"=30'

SCALE:
Horiz.: 1"=30'
Vert.: 1"=30'

MATERIAL SCHEDULE	
ITEM	DESCRIPTION
1	6" PVC PIPE & FITTINGS, SCHD. 80, TYP.
2	6" FLANGE, SOC., S.S. NUTS & BOLTS
3	6" PVC BUTTERFLY VALVE, FL, WITH HANDLE
4	6" VAN STONE SPIGOT FLANGE, SS. NUTS & BOLTS
5	6"x6"x4" PVC REDUCING TEE, SOC
6	4"x3" PVC FLUSH BUSHING, SPG X FPT
7	3" BRASS NIPPLE
8	3" BRONZE GATE VALVE, CL 150, RISING STEM, NPT
9	3" BRONZE UNION, NPT
10	S.S. PIPE FLANGE SUPPORT FOR 6" PVC
11	3" COPPER ADAPTER, MPT X C
12	3" COPPER PIPE
13	6" STAINLESS STEEL SUCTION STRAINER, FPT 6" PVC MALE ADAPTER, SOC X MPT

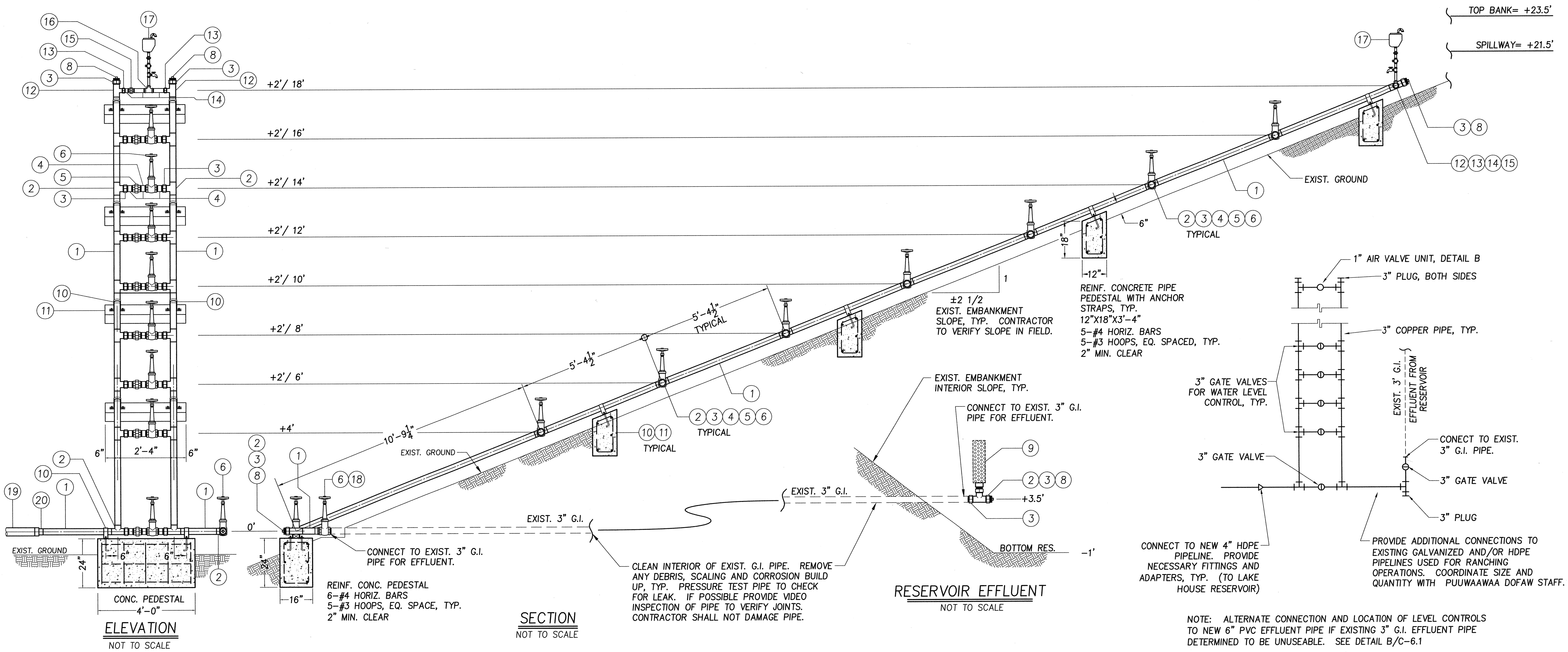


B CRM HEADWALL FOR EFFLUENT PIPE
SCALE: 1/2"=1'-0"



REVISION NO.	SYM.	DESCRIPTION	SHT/OF	DATE	APPROVED
STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION					
PUU WAAWAA STRUCTURE IMPROVEMENTS AND DAM COMPLIANCE					
POOHOOHOO RESERVOIR SITE RESERVOIR #1 - SECTIONS					
DESIGNED: JKI	SUBMITTED: <i>[Signature]</i>				
DRAWN: JKI	DATE: MAY 6, 2016				
CHECKED: JKI	SCALE: As Noted				
APPROVED: <i>[Signature]</i>	DATE: MAY - 6 2016		DRAWING NO. C-6.1		
IEI #15015	FB #	CHIEF ENGINEER	DATE		

\\DLNR\15015-Puuwaa\01-Drawings\10-Base-Poohoo01r2_AdjustElev 1=30



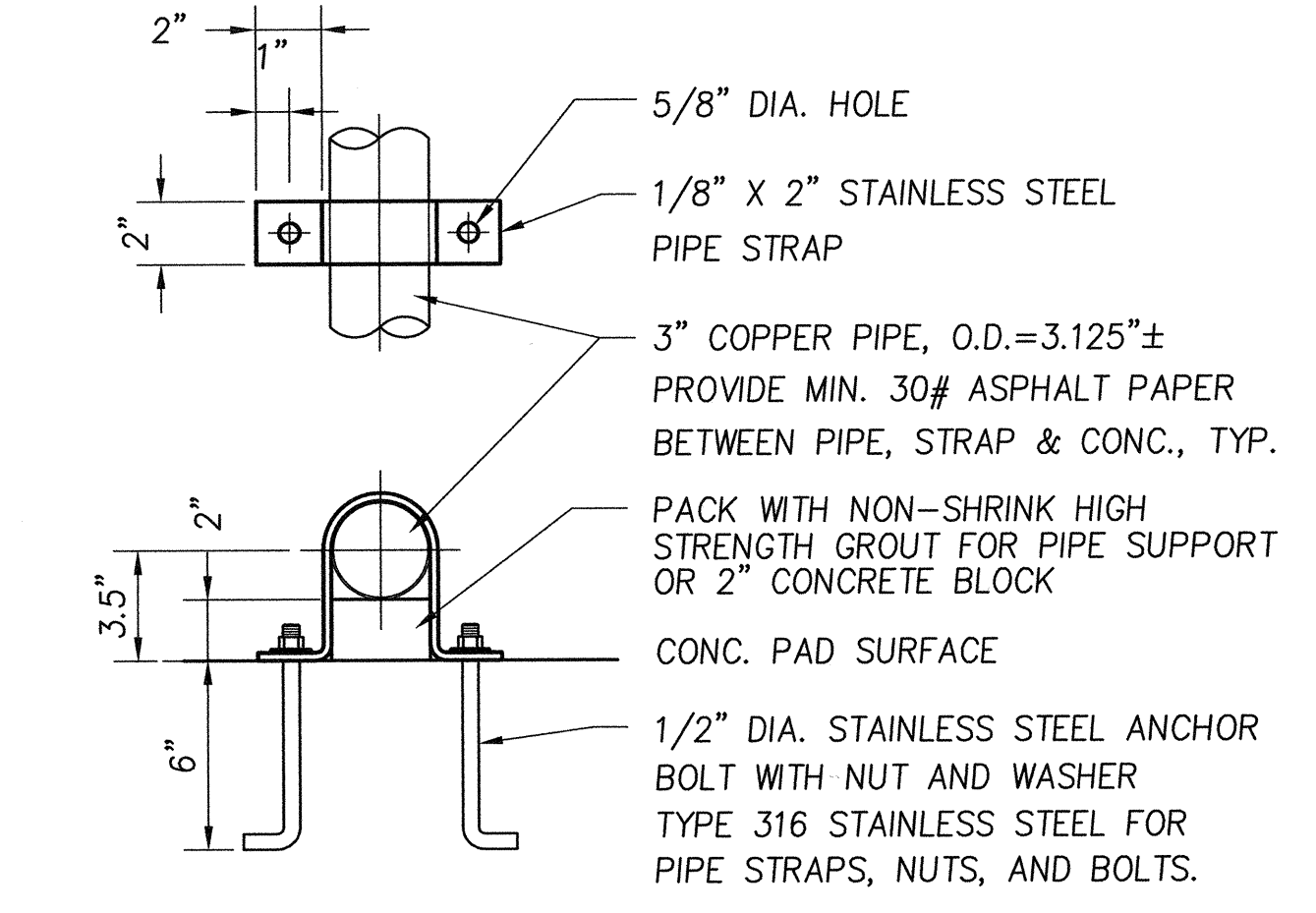
ELEVATION
NOT TO SCALE

SECTION
NOT TO SCALE

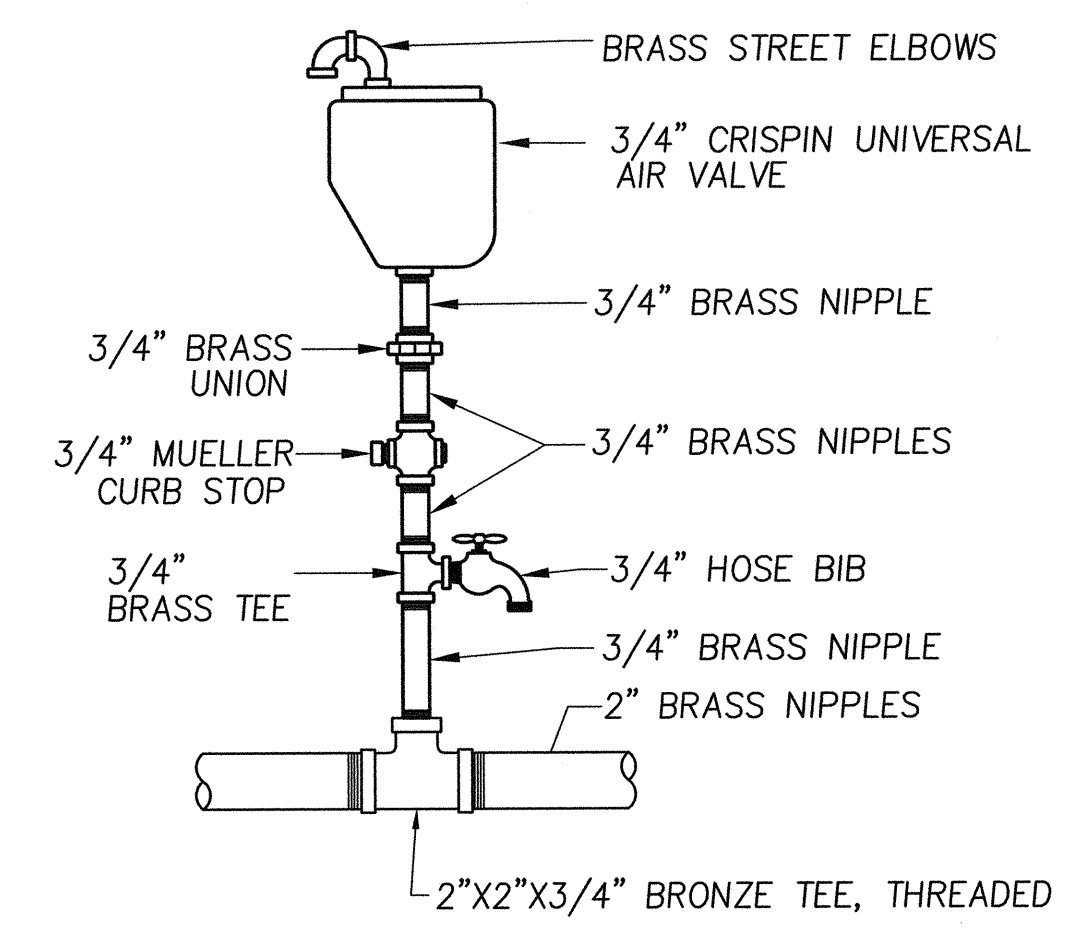
RESERVOIR EFFLUENT
NOT TO SCALE

PLAN
NOT TO SCALE

MATERIAL SCHEDULE	
ITEM	DESCRIPTION
1	3" COPPER PIPE
2	3" COPPER TEE, FTG
3	3" COPPER ADAPTER, FTG x F
4	3" BRASS NIPPLES
5	3" BRONZE UNION, THREADED
6	3" BRONZE GATE VALVE, CL 150, RISING STEM, THREADED
7	3" COPPER 90° BEND, FTG
8	3" BRASS SOLID PLUG, THREADED
9	STAINLESS STEEL LONG SUCTION STRAINER, 3" THREADED 3" COPPER ADAPTER, FTG X M
10	STAINLESS STEEL PIPE STRAP PER DETAIL A.
11	CONCRETE PIPE PEDESTAL
12	3X3X2" COPPER TEE, FTG
13	2" COPPER ADAPTER, FTG x F
14	2" BRASS NIPPLES
15	2" BRONZE UNION, THREADED
16	2X2X1" BRONZE TEE, THREADED
17	1" AIR VALVE UNIT PER DETAIL B
18	3" COPPER ADAPTER, C x M
19	4" HDPE PIPE AND FITTINGS
20	PROVIDE CONNECTION, 3" COPPER TO 4" HDPE WATERLINE PROVIDE ALL NECESSARY FITTINGS AND ADAPTERS AS REQUIRED.



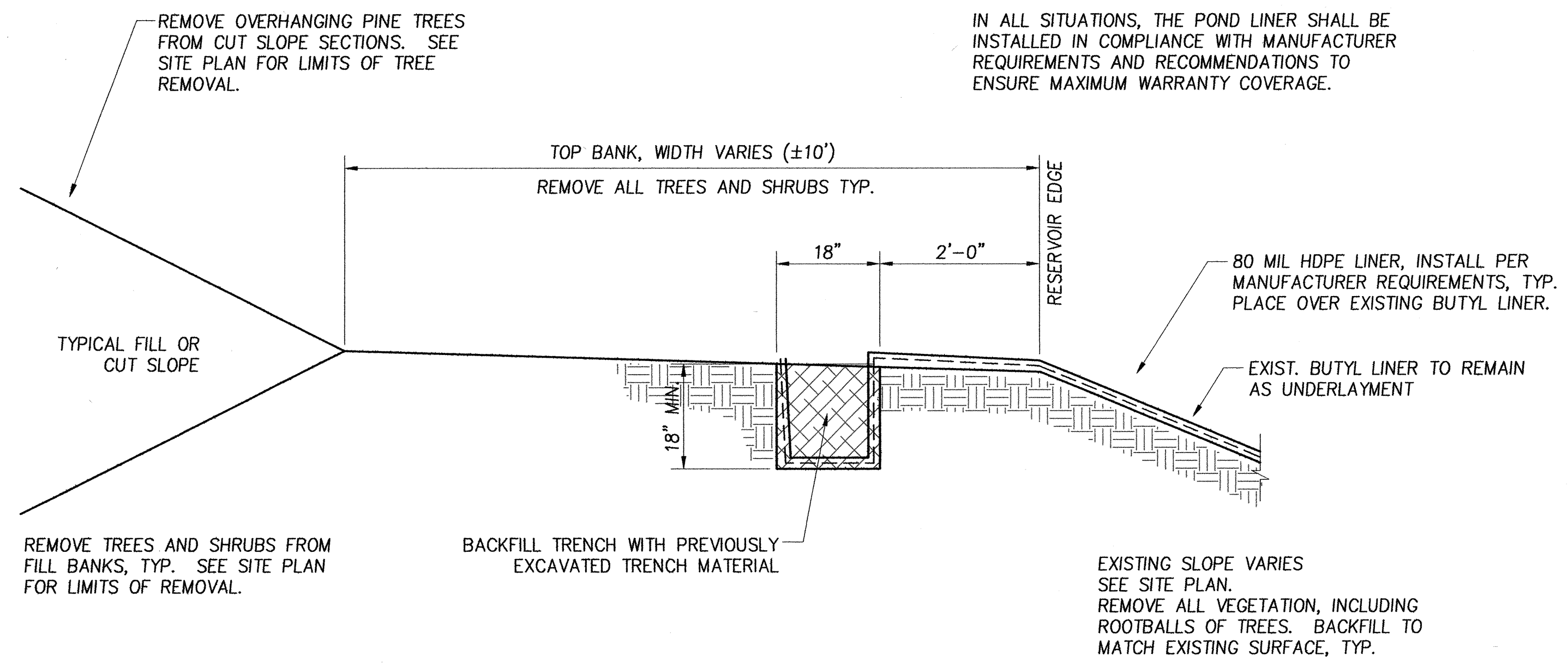
A STRAP FOR 3" COPPER PIPE
NOT TO SCALE



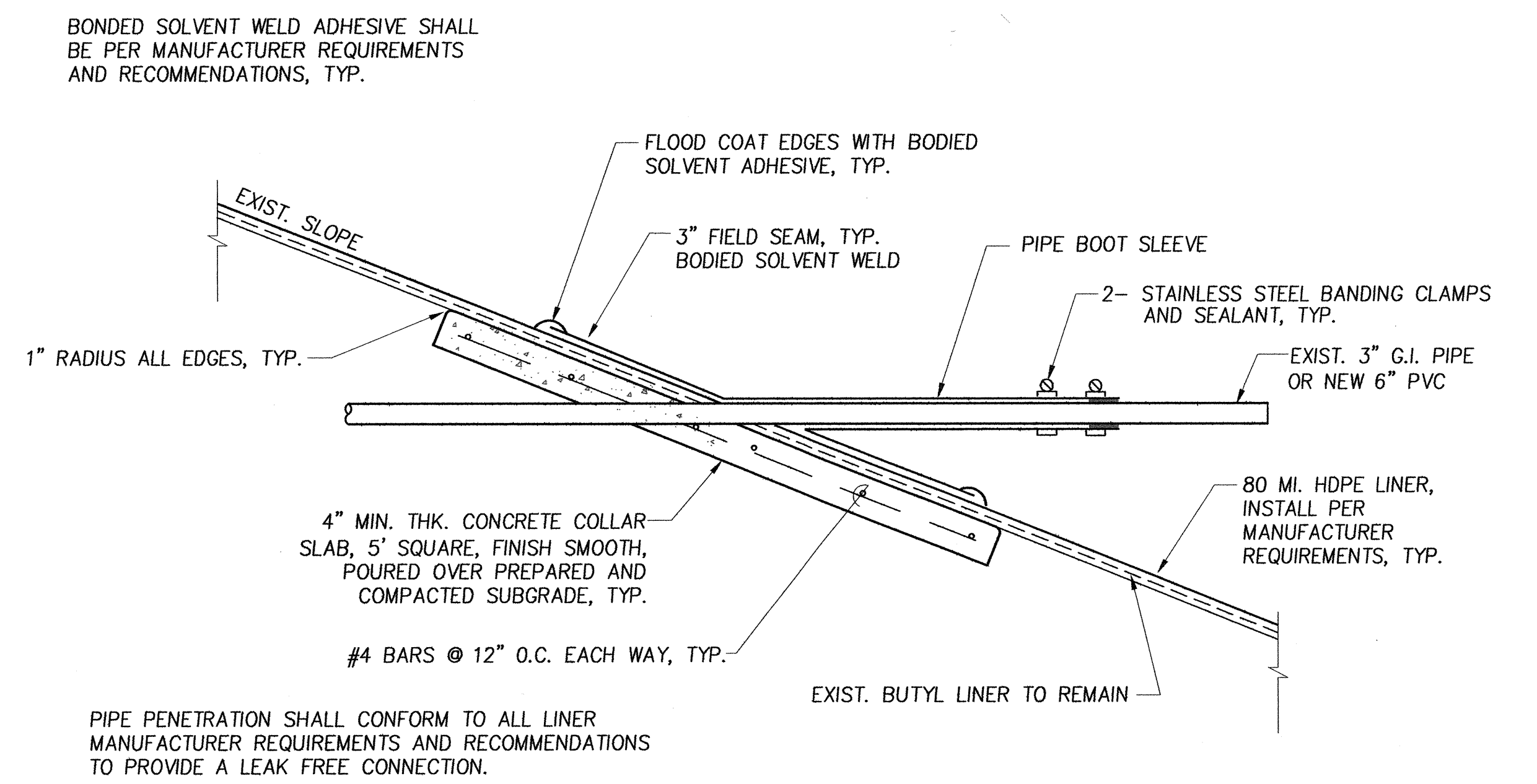
B AIR RELIEF VALVE UNIT
NOT TO SCALE

REVISION NO.	SYM.	DESCRIPTION	SHT/OF	DATE	APPROVED
STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION PUU WAAWA STRUCTURE IMPROVEMENTS AND DAM COMPLIANCE POOHOOO RESERVOIR #1 WATER LEVEL CONTROLS					
		DESIGNED: JKI DRAWN: JKI CHECKED: JKI APPROVED: <i>[Signature]</i> INABA ENGINEERING, INC. CHIEF ENGINEER			
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.		SUBMITTED: <i>[Signature]</i> DATE: MAY 6, 2016 SCALE: As Noted DATE: MAY - 6 2016 DRAWING NO. C-7			
JOB NO. 500CH15A		SHEET NO. 13 OF 38 SHEETS			

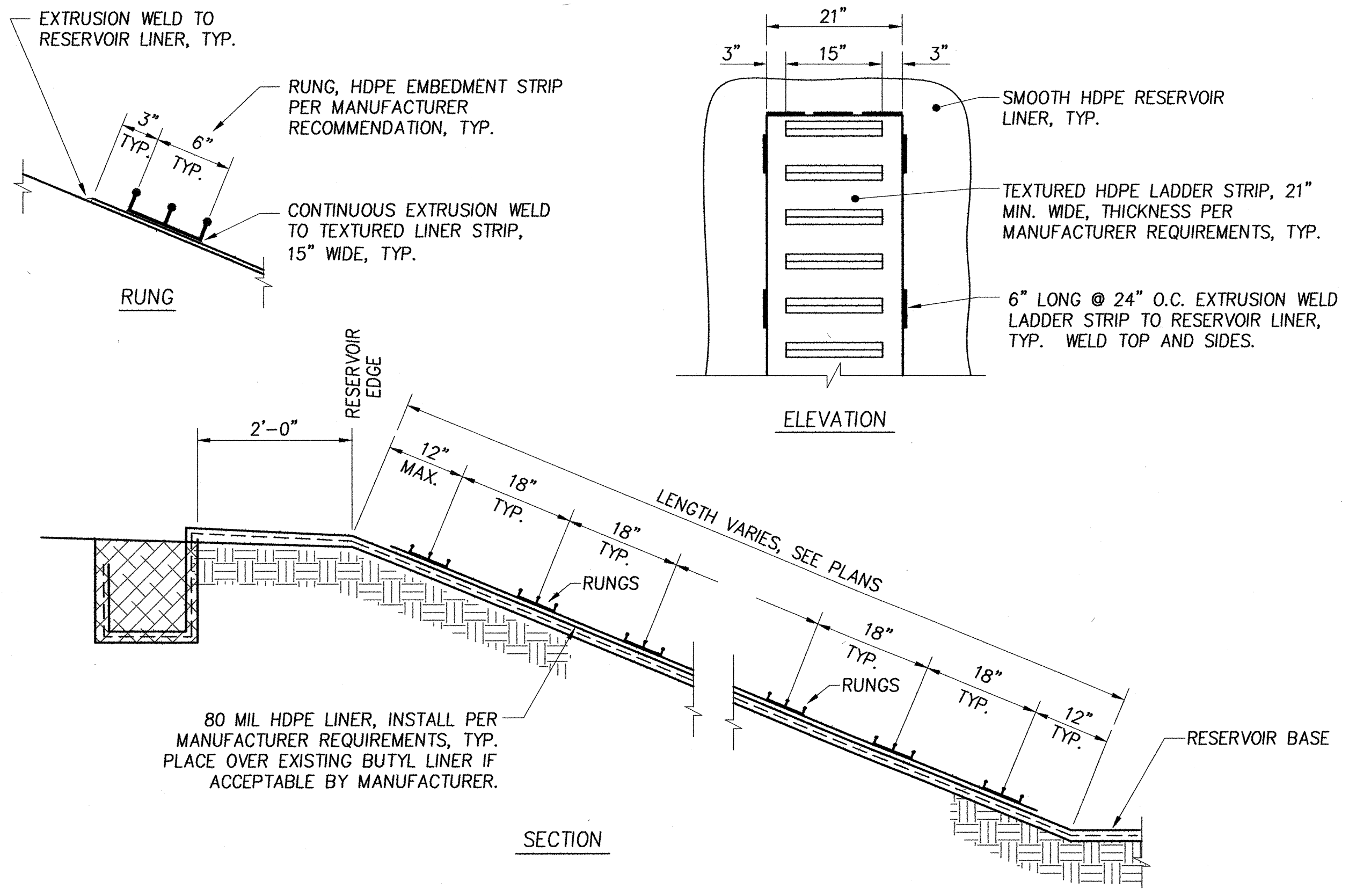
DLNR/15015-Puuwaawaa/01-Drawings/13-PoolLevelControl



A TYPICAL RESERVOIR SECTION – HDPE LINER
NOT TO SCALE



B TYPICAL PIPE PENETRATION THRU LINER
NOT TO SCALE



C TYPICAL HDPE LINER SAFETY LADDER
NOT TO SCALE

REVISION NO.	SYM.	DESCRIPTION	SHT/OF	DATE	APPROVED
STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION					
PUU WAAWAA STRUCTURE IMPROVEMENTS AND DAM COMPLIANCE					
DETAILS HDPE RESERVOIR LINER					
DESIGNED: JKI		SUBMITTED: <i>[Signature]</i>			
DRAWN: JKI		DATE: MAY 6, 2016			
CHECKED: JKI		SCALE: As Noted			
APPROVED: <i>[Signature]</i>		DRAWING NO. C-8			
INABA ENGINEERING, INC.		MAY - 6 2016			
IEI #15015		DATE			
		JOB NO. 500CH15A			
		SHEET NO. 14 OF 38 SHEETS			

DLNR\15015-Puuwaawaa\01-Drawings\05-PoolDetails

T.M.K. 7-1-001: 003
 OWNER: Rogers, Henk Brouwer
 Rogers, Akemi Matsumoto

TRV. HT-1
 1 1/2" PIPE
 ELEV.= 4626.87
 N -12266.4031
 E -19365.6489

CP09
 N -12251.16
 E -19330.59

TRV. HC-1
 HUB
 ELEV.= 4614.66
 N -12259.8138
 E -19028.9351

PRIVATE EXIST. METAL ROOF CATCHMENT
 (NOT IN CONTRACT)

RENOVATE STEEL TANK, SAND
 BLAST AND PAINT. SEE DETAIL
 SHEETS C-14 TO C-16.

CLEARING AROUND STEEL TANK.
 SEE VEGETATION REMOVAL
 NOTES ON SHEET C-10

REPAIR FLUME INTO
 STEEL TANK, 54 L.F.

CONNECTION TO FLUME
 CMU/CONCRETE INTAKE

PRIVATE
 EXIST. METAL ROOF
 CATCHMENT
 (NOT IN CONTRACT)

30' MIN. VEGETATION
 CLEAR ZONE PER
 VEGETATION REMOVAL
 NOTES ON SHT.
 C-10, TYP.

TRV. H-3
 1 1/2" PIPE
 ELEV.= 4700.83
 N -12504.4146
 E -19670.5964

PROVIDE SMOOTH CONNECTION TO
 EXISTING HDPE LINER AND WELD EDGES
 TO BE WATERPROOF AND FLOW INTO
 NEW CONCRETE GUTTER, TYP.

EXIST. HDPE LINER
 AREA= ±172,580 SF (1.67 ACRES)

CATCHMENT AREA 2A

CATCHMENT AREA 2B

INSTALL NEW 80 MIL HDPE LINER
 WITH GEOTEXTILE UNDERLAYMENT
 FOR SURFACE CATCHMENT.
 APPROX. 61,740 S.F. (1.42 ACRES)

CATCHMENT AREA 1

EXIST. BITUMINOUS SURFACE
 AREA= ±89,200 SF (2.05 ACS)

INSTALL NEW 80 MIL HDPE TEXTURED
 LINER WITH GEOTEXTILE UNDERLAYMENT
 FOR SURFACE CATCHMENT. APPROX.
 124,300 S.F. (2.85 ACRES)

PROVIDE SMOOTH CONNECTION
 WITH CONCRETE APRON INTO
 EXIST. CMU/CONCRETE INTAKE
 BOX PER DETAIL

30' MIN. VEGETATION
 CLEAR ZONE PER
 VEGETATION REMOVAL
 NOTES ON SHT. C-10, TYP.

NEW HDPE LINER FOLLOWS
 C-11 ALONG TOP OF BANK, TYP.

SF
 440 L.F.

CATCHMENT SURFACE AREA SUMMARY (HDPE)

TANK 2:	EXIST.	72,600 S.F.	1.67 ACS.
	NEW	61,800 S.F.	1.42 ACS.
TOTAL		134,400 S.F.	3.09 ACS.
TANK 1:	NEW	124,300 S.F.	2.85 ACS.
TOTAL CATCHMENT:		±259,100 S.F.	±5.94 ACS.

EXISTING METAL ROOFING, GUTTER, FLUME AND WOOD
 FRAMING. APPROX. 81,700 S.F. REMOVE AND PROPERLY
 DISPOSE OF OFF SITE. SALVAGE CONCRETE BLOCK WEIGHTS
 FOR REUSE ON HDPE LINER. REMOVE ALL VEGETATION
 GRADE AND COMPACT SMOOTH FOR HDPE LINER.

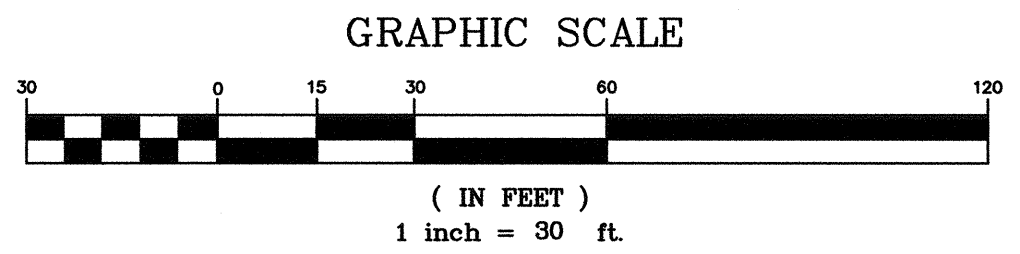
LEGEND:

- (SF) SILT FENCE
- (PRB) PERMEABLE ROLL BARRIER
- (SS) SLOPE STABILIZATION
- (SBB) SAND BAG BARRIER
- (CA) CONTAINMENT AREA

SEE SHEET G-2 "WATER POLLUTION & EROSION CONTROL
 NOTES AND DETAILS".

1. THE CONTRACTOR SHALL MAKE NECESSARY SITE SPECIFIC
 ADJUSTMENTS TO EROSION CONTROL MEASURES TO
 PREVENT STORM WATER RUNOFF FROM THE WORK AREA.
2. THE CONTRACTOR SHALL INSTALL ADDITIONAL EROSION
 CONTROL MEASURES THAT MAY BE NECESSARY AS THE
 WORK PROGRESSES AND GROUND CONDITIONS CHANGE
 DUE TO EARTHWORK ACTIVITIES.

REVISION NO.	SYM.	DESCRIPTION	SHT/OF	DATE	APPROVED
STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION PUU WAAWAA STRUCTURE IMPROVEMENTS AND DAM COMPLIANCE HALE PIULA CATCHMENT SITE PLAN					
		DESIGNED: JKI DRAWN: JKI CHECKED: JKI APPROVED: <i>[Signature]</i> INABA ENGINEERING, INC. CHIEF ENGINEER			
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.		SUBMITTED: 6/2/16 DATE: MAY 6, 2016 SCALE: As Noted		DRAWING NO. C-9	
JOB NO. 509CH15A SHEET NO. 15 OF 38 SHEETS					



EXISTING METAL ROOFING, GUTTER, FLUME AND WOOD
 FRAMING. APPROX. 81,700 S.F. REMOVE AND PROPERLY
 DISPOSE OF OFF SITE. SALVAGE CONCRETE BLOCK WEIGHTS
 FOR REUSE ON HDPE LINER. REMOVE ALL VEGETATION,
 GRADE, AND COMPACT SMOOTH FOR HDPE LINER.

\\D:\NR\15015-Puuwaawaa\01-Drawings\15-Base-HalePiula01_AdjustElev.dwg

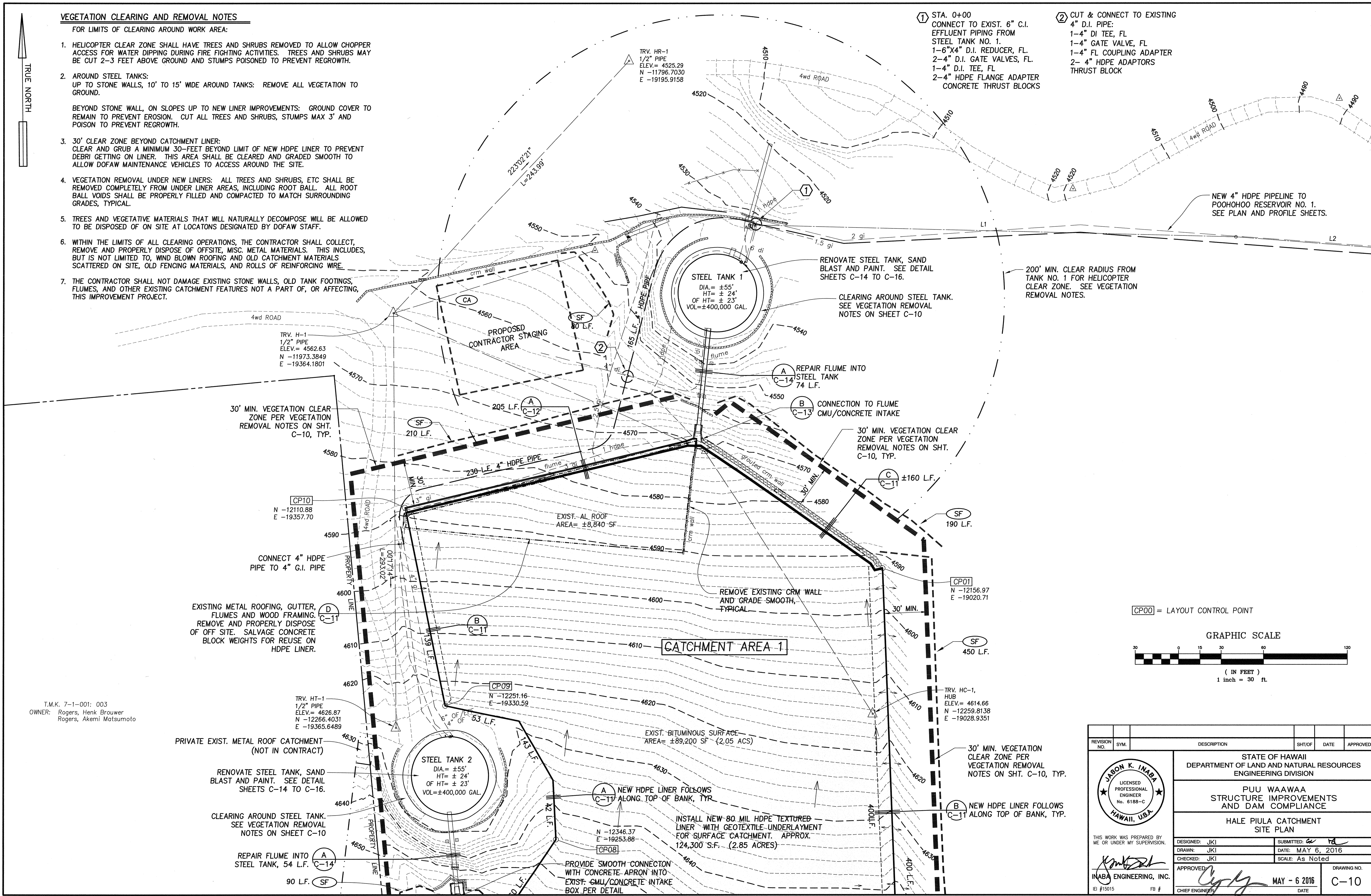
VEGETATION CLEARING AND REMOVAL NOTES

FOR LIMITS OF CLEARING AROUND WORK AREA:

- HELICOPTER CLEAR ZONE SHALL HAVE TREES AND SHRUBS REMOVED TO ALLOW CHOPPER ACCESS FOR WATER DIPPING DURING FIRE FIGHTING ACTIVITIES. TREES AND SHRUBS MAY BE CUT 2-3 FEET ABOVE GROUND AND STUMPS POISONED TO PREVENT REGROWTH.
- AROUND STEEL TANKS:
UP TO STONE WALLS, 10' TO 15' WIDE AROUND TANKS: REMOVE ALL VEGETATION TO GROUND.
BEYOND STONE WALL, ON SLOPES UP TO NEW LINER IMPROVEMENTS: GROUND COVER TO REMAIN TO PREVENT EROSION. CUT ALL TREES AND SHRUBS, STUMPS MAX 3' AND POISON TO PREVENT REGROWTH.
- 30' CLEAR ZONE BEYOND CATCHMENT LINER:
CLEAR AND GRUB A MINIMUM 30- FEET BEYOND LIMIT OF NEW HDPE LINER TO PREVENT DEBRI GETTING ON LINER. THIS AREA SHALL BE CLEARED AND GRADED SMOOTH TO ALLOW DOFAW MAINTENANCE VEHICLES TO ACCESS AROUND THE SITE.
- VEGETATION REMOVAL UNDER NEW LINERS: ALL TREES AND SHRUBS, ETC SHALL BE REMOVED COMPLETELY FROM UNDER LINER AREAS, INCLUDING ROOT BALL. ALL ROOT BALL VOIDS SHALL BE PROPERLY FILLED AND COMPACTED TO MATCH SURROUNDING GRADES, TYPICAL.
- TREES AND VEGETATIVE MATERIALS THAT WILL NATURALLY DECOMPOSE WILL BE ALLOWED TO BE DISPOSED OF ON SITE AT LOCATIONS DESIGNATED BY DOFAW STAFF.
- WITHIN THE LIMITS OF ALL CLEARING OPERATIONS, THE CONTRACTOR SHALL COLLECT, REMOVE AND PROPERLY DISPOSE OF OFFSITE, MISC. METAL MATERIALS. THIS INCLUDES, BUT IS NOT LIMITED TO, WIND BLOWN ROOFING AND OLD CATCHMENT MATERIALS SCATTERED ON SITE, OLD FENCING MATERIALS, AND ROLLS OF REINFORCING WIRE.
- THE CONTRACTOR SHALL NOT DAMAGE EXISTING STONE WALLS, OLD TANK FOOTINGS, FLUMES, AND OTHER EXISTING CATCHMENT FEATURES NOT A PART OF, OR AFFECTING, THIS IMPROVEMENT PROJECT.

① STA. 0+00
CONNECT TO EXIST. 6" C.I.
EFFLUENT PIPING FROM
STEEL TANK NO. 1.
1-6"x4" D.I. REDUCER, FL.
2-4" D.I. GATE VALVES, FL.
1-4" D.I. TEE, FL
2-4" HDPE FLANGE ADAPTER
CONCRETE THRUST BLOCKS

② CUT & CONNECT TO EXISTING
4" D.I. PIPE:
1-4" DI TEE, FL
1-4" GATE VALVE, FL
1-4" FL COUPLING ADAPTER
2- 4" HDPE ADAPTORS
THRUST BLOCK



NEW 4" HDPE PIPELINE TO
POOHOOHO RESERVOIR NO. 1.
SEE PLAN AND PROFILE SHEETS.

200' MIN. CLEAR RADIUS FROM
TANK NO. 1 FOR HELICOPTER
CLEAR ZONE. SEE VEGETATION
REMOVAL NOTES.

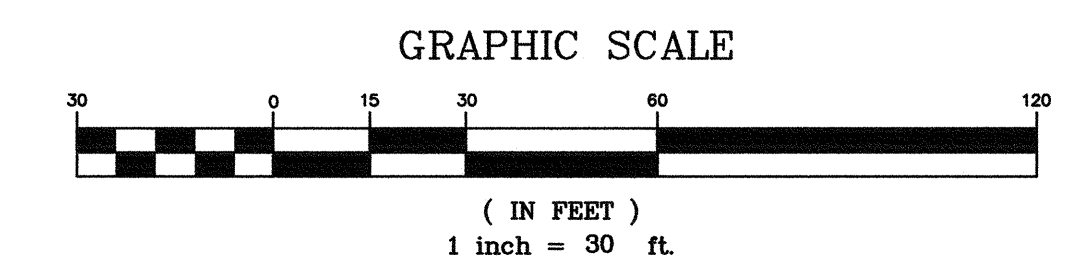
30' MIN. VEGETATION CLEAR
ZONE PER VEGETATION
REMOVAL NOTES ON SHT.
C-10, TYP.

30' MIN. VEGETATION CLEAR
ZONE PER VEGETATION
REMOVAL NOTES ON SHT.
C-10, TYP.

EXISTING METAL ROOFING, GUTTER,
FLUMES AND WOOD FRAMING.
REMOVE AND PROPERLY DISPOSE
OF OFF SITE. SALVAGE CONCRETE
BLOCK WEIGHTS FOR REUSE ON
HDPE LINER.

REMOVE EXISTING CRM WALL
AND GRADE SMOOTH,
TYPICAL

CP00 = LAYOUT CONTROL POINT



T.M.K. 7-1-001: 003
OWNER: Rogers, Henk Brouwer
Rogers, Akemi Matsumoto

TRV. HT-1
1/2" PIPE
ELEV.= 4626.87
N -12266.4031
E -19365.6489

TRV. HC-1,
HUB
ELEV.= 4614.66
N -12259.8138
E -19028.9351

REVISION NO.	SYM.	DESCRIPTION	SHT/OF	DATE	APPROVED

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

INABA ENGINEERING, INC.
ID #15015 FB #

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

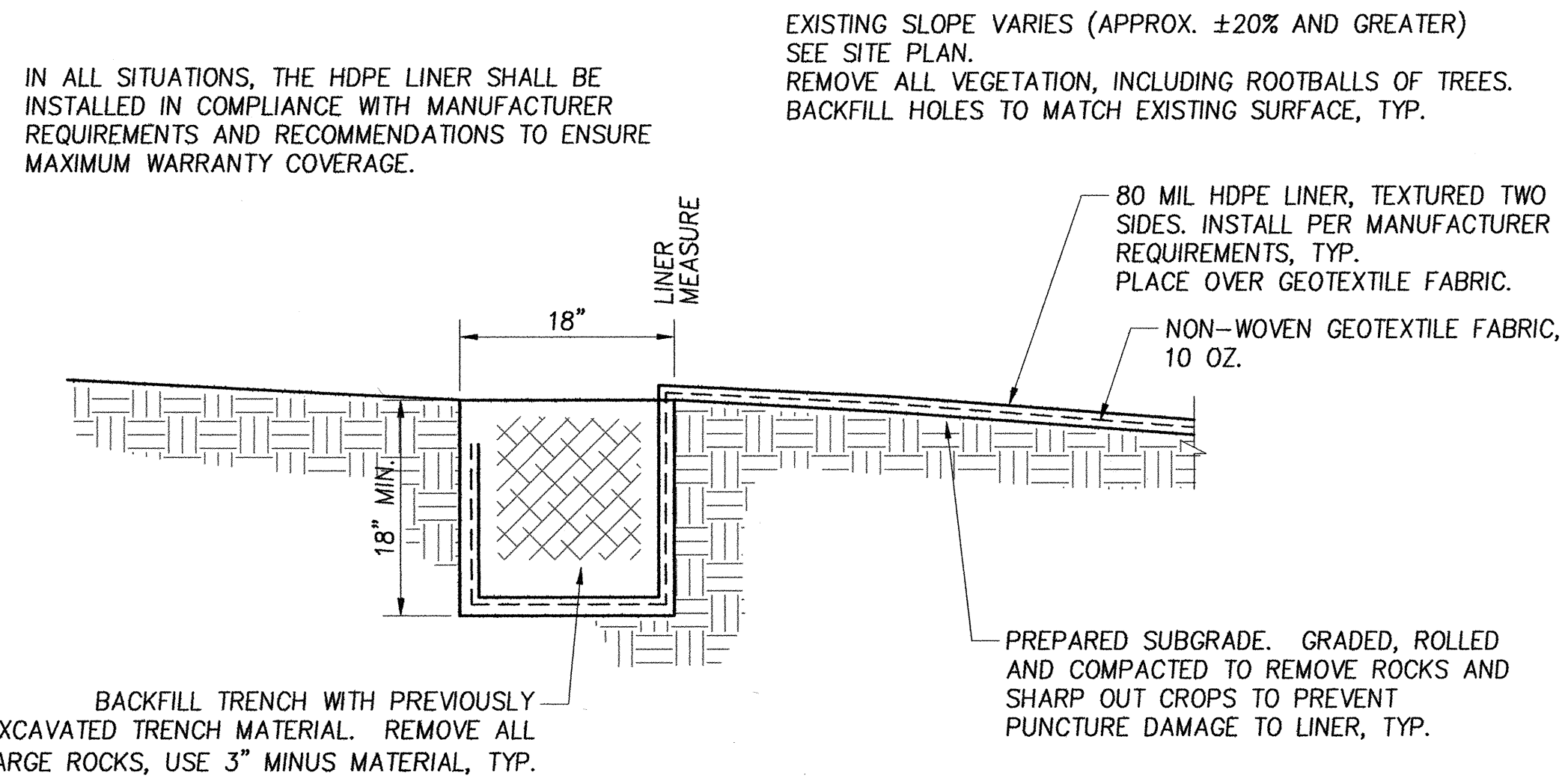
PUU WAAWAA
STRUCTURE IMPROVEMENTS
AND DAM COMPLIANCE

HALE PIULA CATCHMENT
SITE PLAN

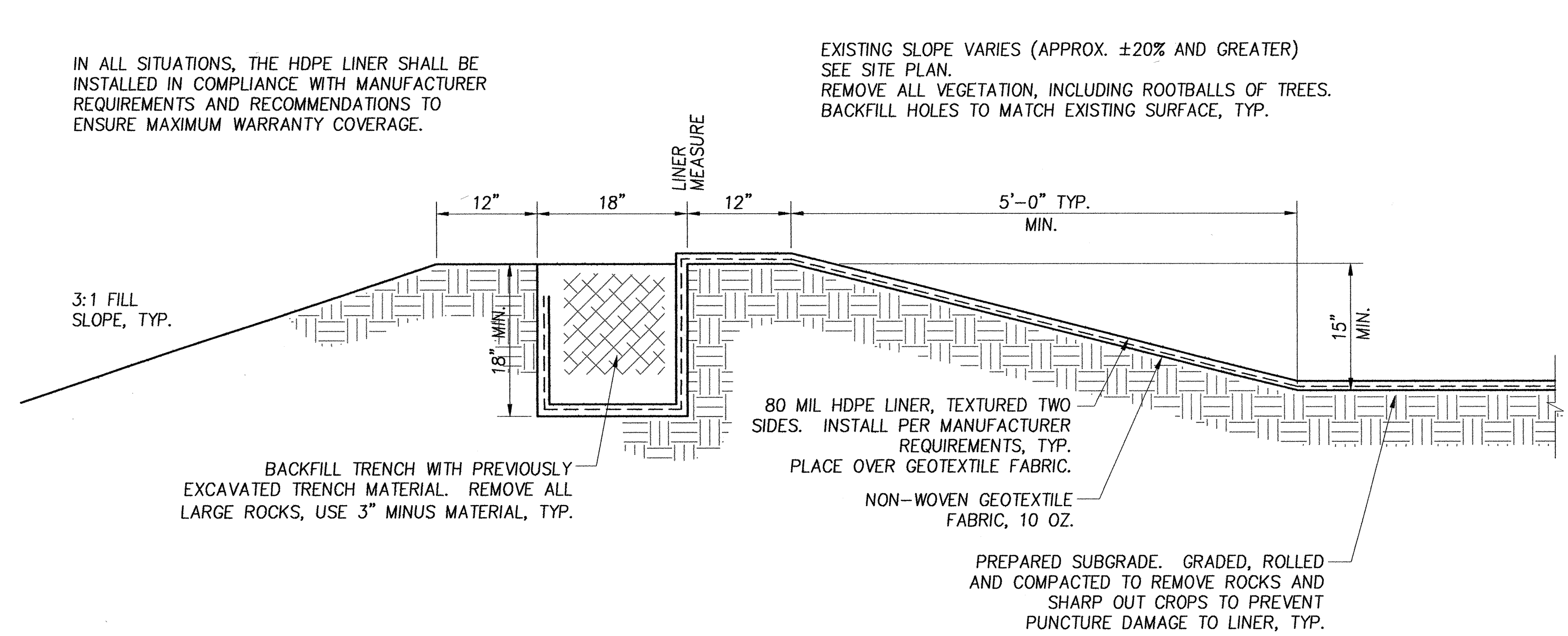
DESIGNED: JKI SUBMITTED: *td*
DRAWN: JKI DATE: MAY 6, 2016
CHECKED: JKI SCALE: As Noted

APPROVED: *[Signature]* DRAWING NO. C-10
MAY - 6 2016

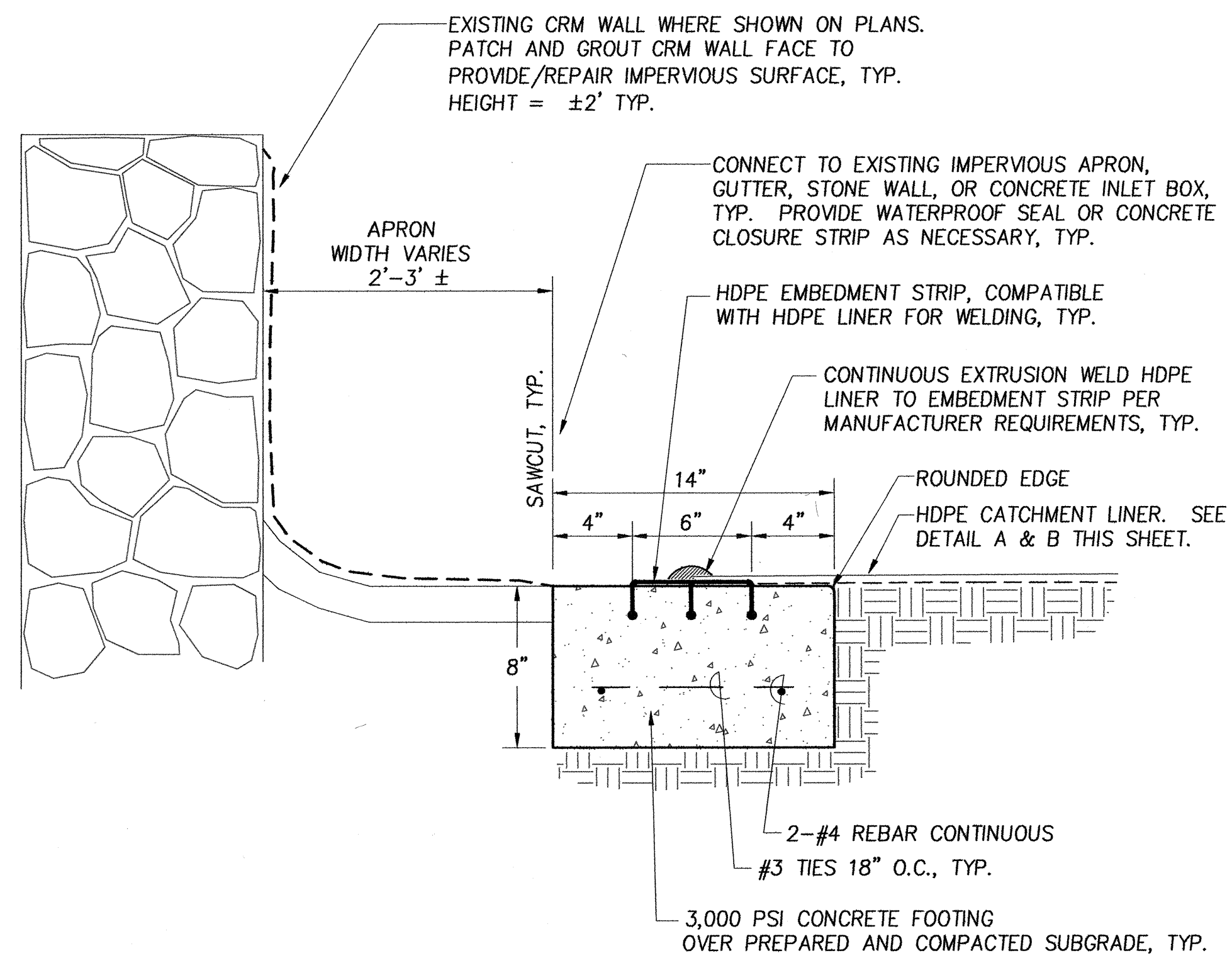
JOB NO. 500CH15A SHEET NO. 16 OF 38 SHEETS



A TYPICAL CATCHMENT LINER ANCHOR SECTION
NOT TO SCALE



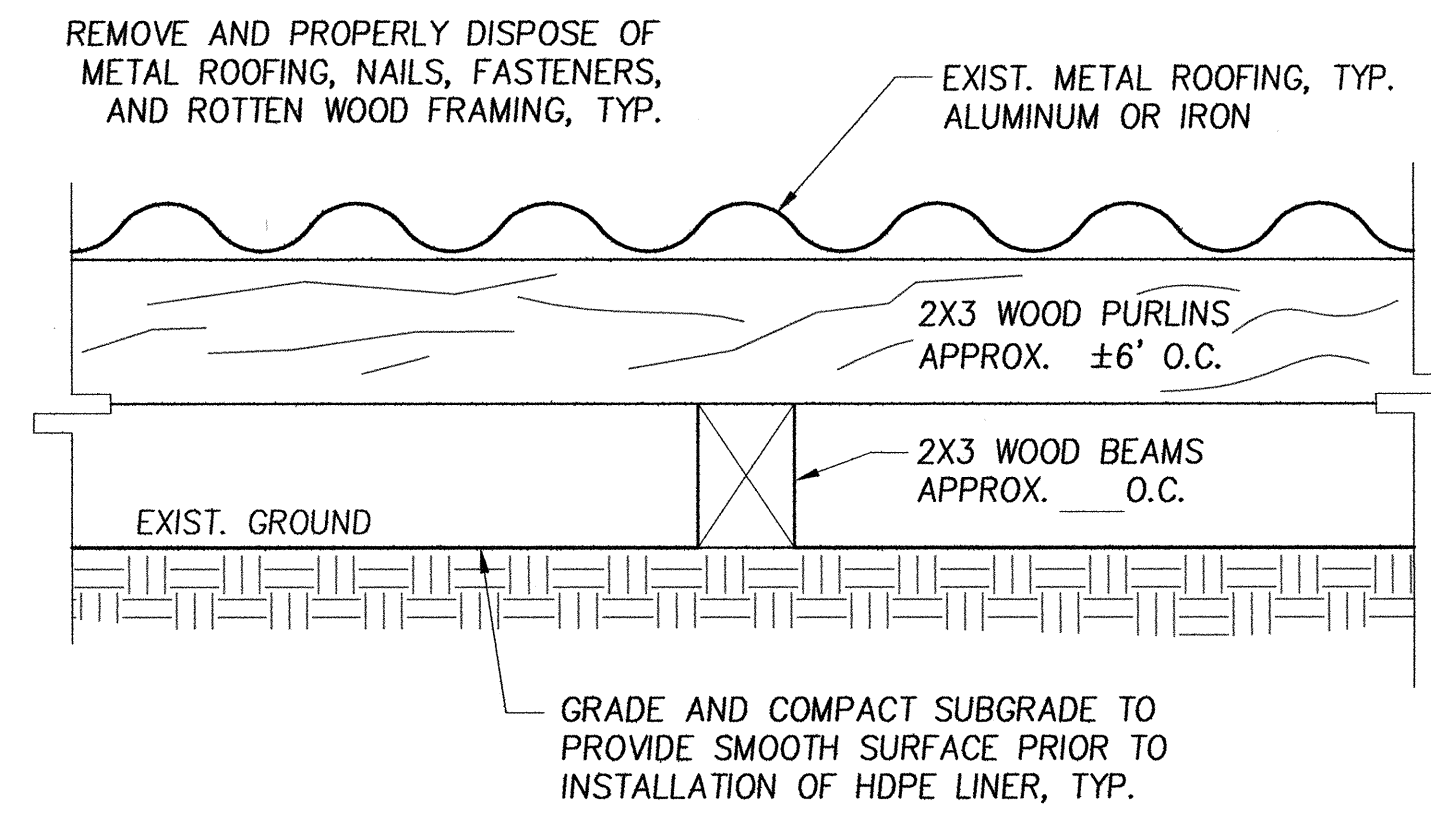
B TYPICAL CATCHMENT LINER ANCHOR SECTION (RAISED)
NOT TO SCALE



NOTES:

1. HDPE EMBEDMENT STRIP SHALL BE PREMANUFACTURED AND SUPPLIED OR RECOMMENDED BY LINER MANUFACTURER.
2. EMBEDMENT STRIP SHALL BE INSTALLED PER MANUFACTURER INSTALLATION REQUIREMENTS AND SPECIFICATIONS.
3. EMBEDMENT STRIPS SHALL BE FULLY EMBEDDED INTO THE CONCRETE WITH NO GAPS BETWEEN ENDS OF STRIPS. STRIPS SHALL BE MITERED AT BENDS, TYPICAL.

C CONCRETE ANCHOR FOOTING FOR HDPE LINER
SCALE: 2" = 1'-0"

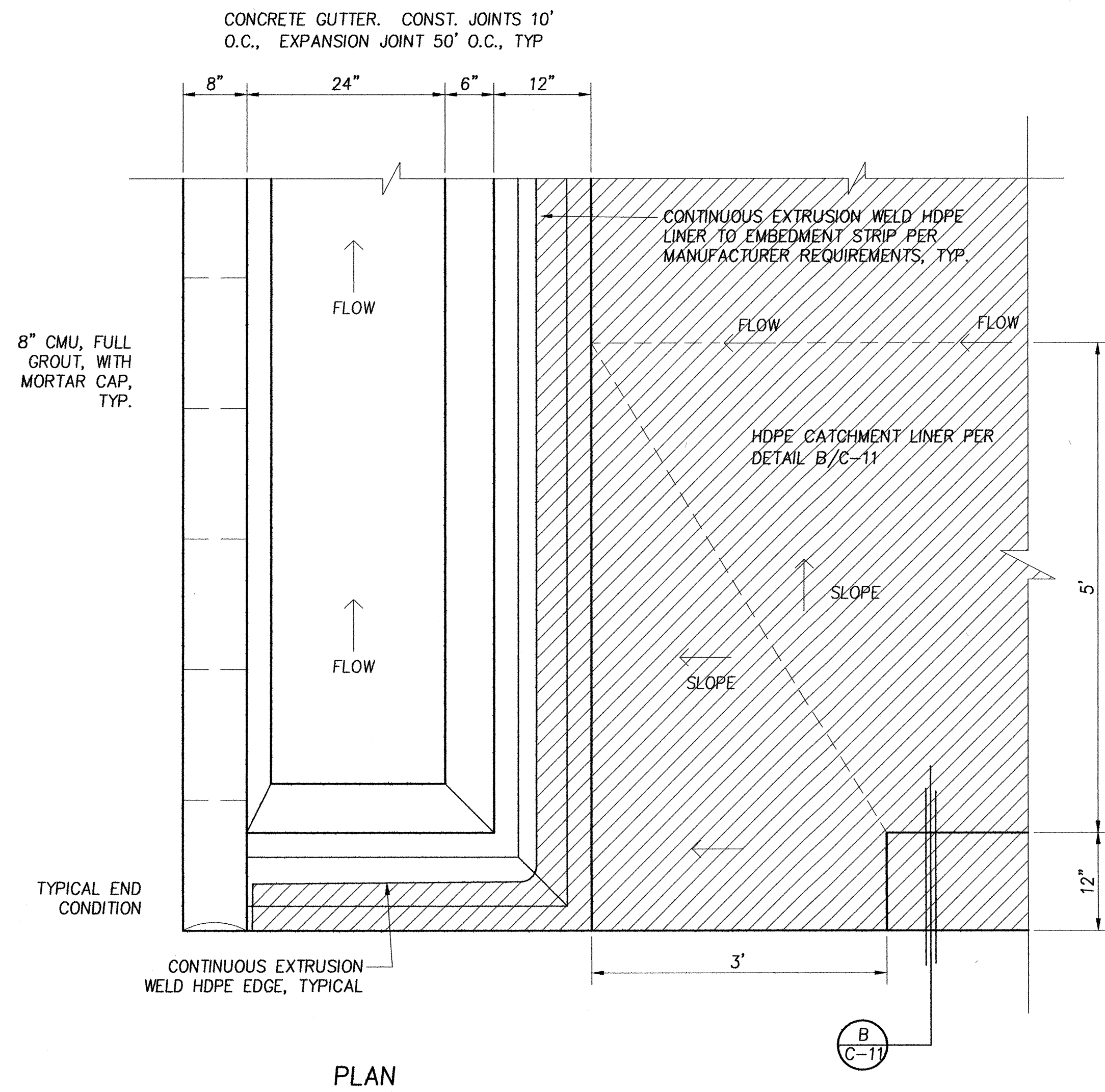


NOTES:

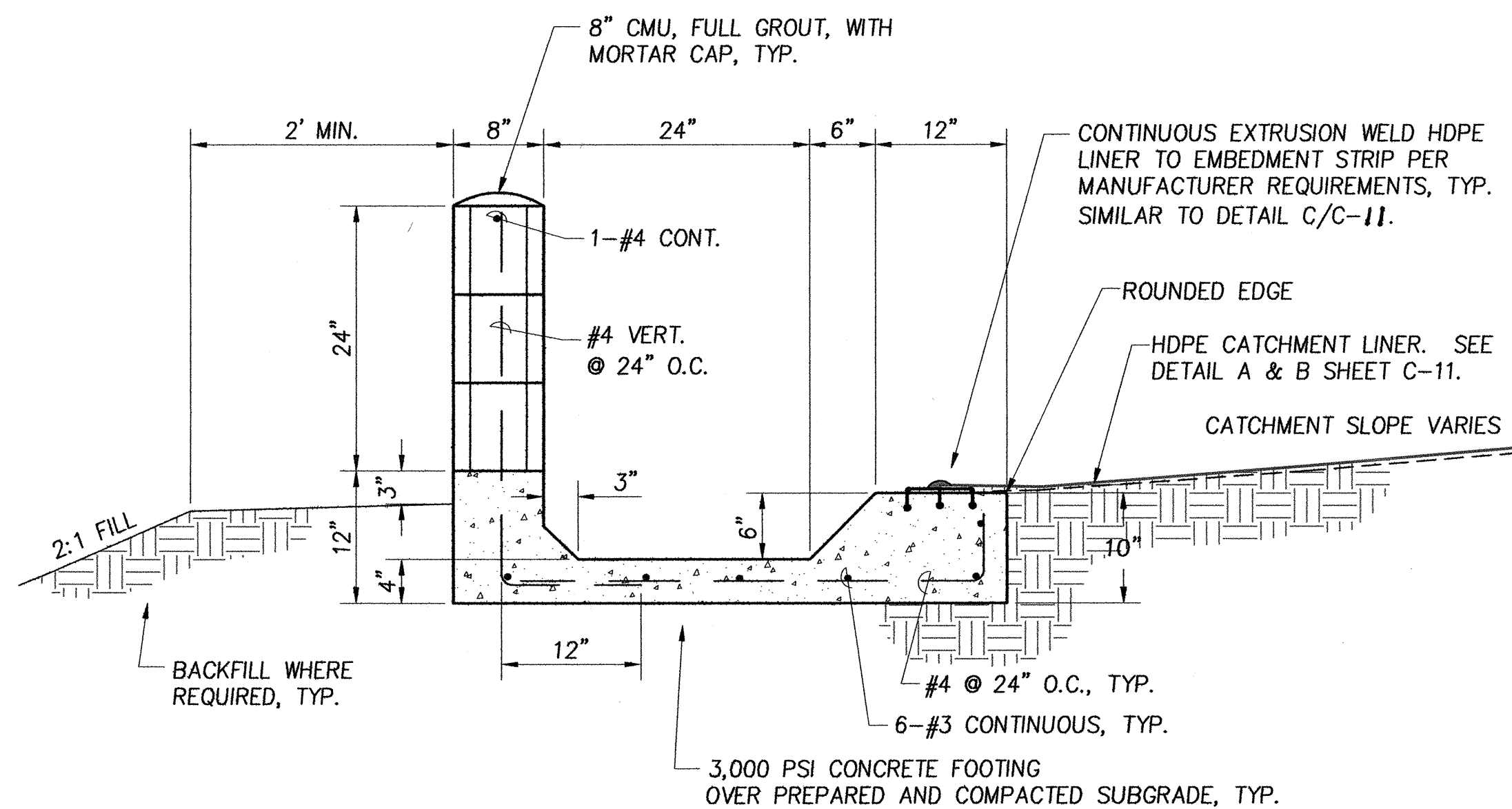
1. CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS IN THE FIELD.
2. REMOVE AND PROPERLY DISPOSE OF ALL MATERIALS OFF-SITE. THE CONTRACTOR SHALL MAKE ATTEMPTS TO RECYCLE AS MUCH MATERIAL AS POSSIBLE.
3. IF APPLICABLE, THE CONTRACTOR SHALL ALSO COORDINATE THE SALVAGING OF RE-USEABLE WOOD BEAMS AND PURLINS WITH DOFAW STAFF.
4. REMOVE ALL VEGETATION FROM EXISTING SURFACE CATCHMENT AREAS.
5. REMOVE ALL ROOT BALLS OF TREES AND SHRUBS. BACKFILL HOLES AND REGRADE AREAS DISTURBED TO PROVIDE SMOOTH SURFACE FOR HDPE LINER, TYP.
6. CONTRACTOR SHALL ALSO REMOVE AND PROPERLY DISPOSE METAL FLUMES AND GUTTERS NOT IN USE WITH NEW LINER.
7. CONTRACTOR SHALL PROPERLY PREPARE EXISTING GROUND SURFACE TO ACCEPT HDPE LINER.

D EXIST. METAL SURFACE CATCHMENT (TO BE REMOVED)
NOT TO SCALE

REVISION NO.	SYMBOL	DESCRIPTION	SHT/OF	DATE	APPROVED
<p>STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION</p> <p>PUU WAAWAA STRUCTURE IMPROVEMENTS AND DAM COMPLIANCE</p> <p>DETAILS HDPE SURFACE CATCHMENT</p>					
DESIGNED: JKI		SUBMITTED: <i>JKI</i>			
DRAWN: JKI		DATE: MAY 6, 2016			
CHECKED: JKI		SCALE: As Noted			
APPROVED: <i>JKI</i>		DATE: MAY - 6 2016		DRAWING NO. C-11	
INABA ENGINEERING, INC.		DATE		JOB NO. 506CH15A	
151 15015		FB #		SHEET NO. 17 OF 38 SHEETS	



PLAN



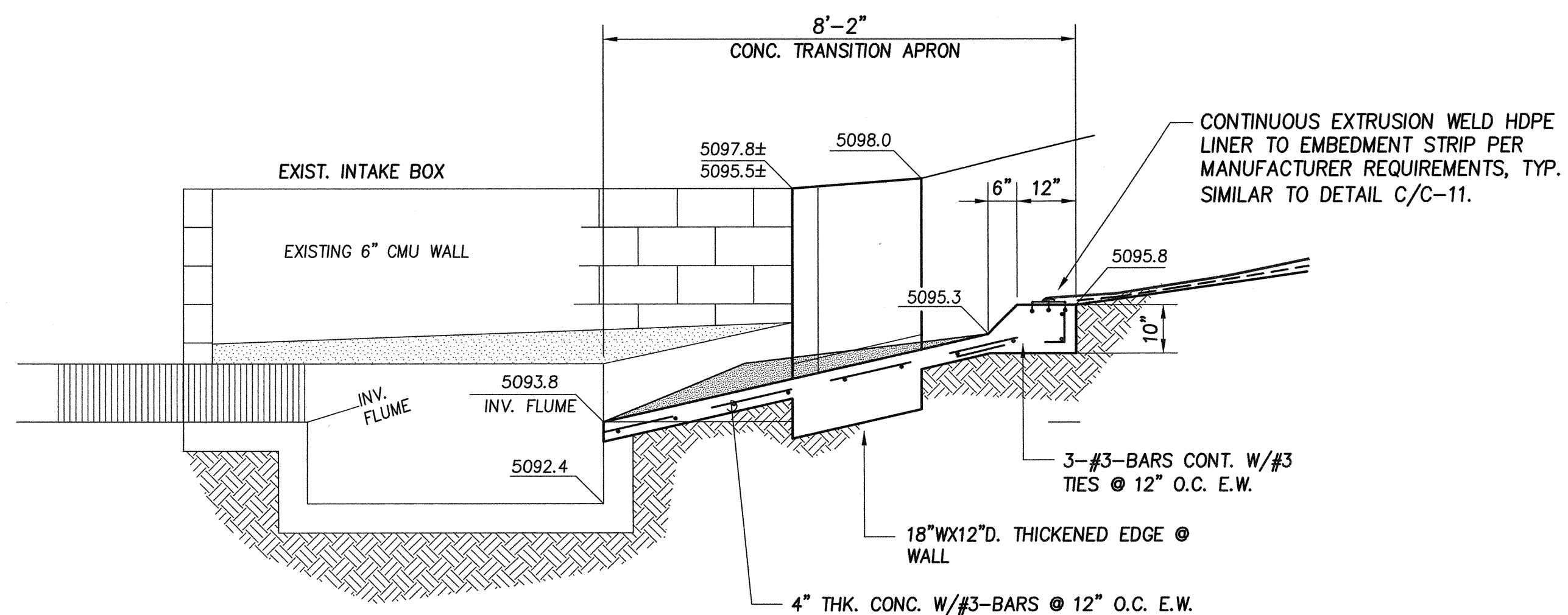
SECTION

A CMU AND CONCRETE CATCHMENT GUTTER

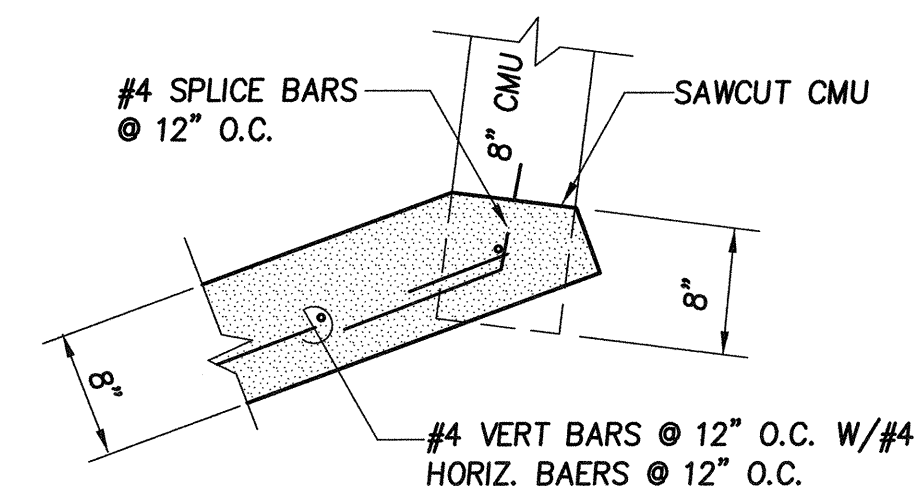
SCALE: 1" = 1'-0"

REVISION NO.	SYM.	DESCRIPTION	SHT/OF	DATE	APPROVED

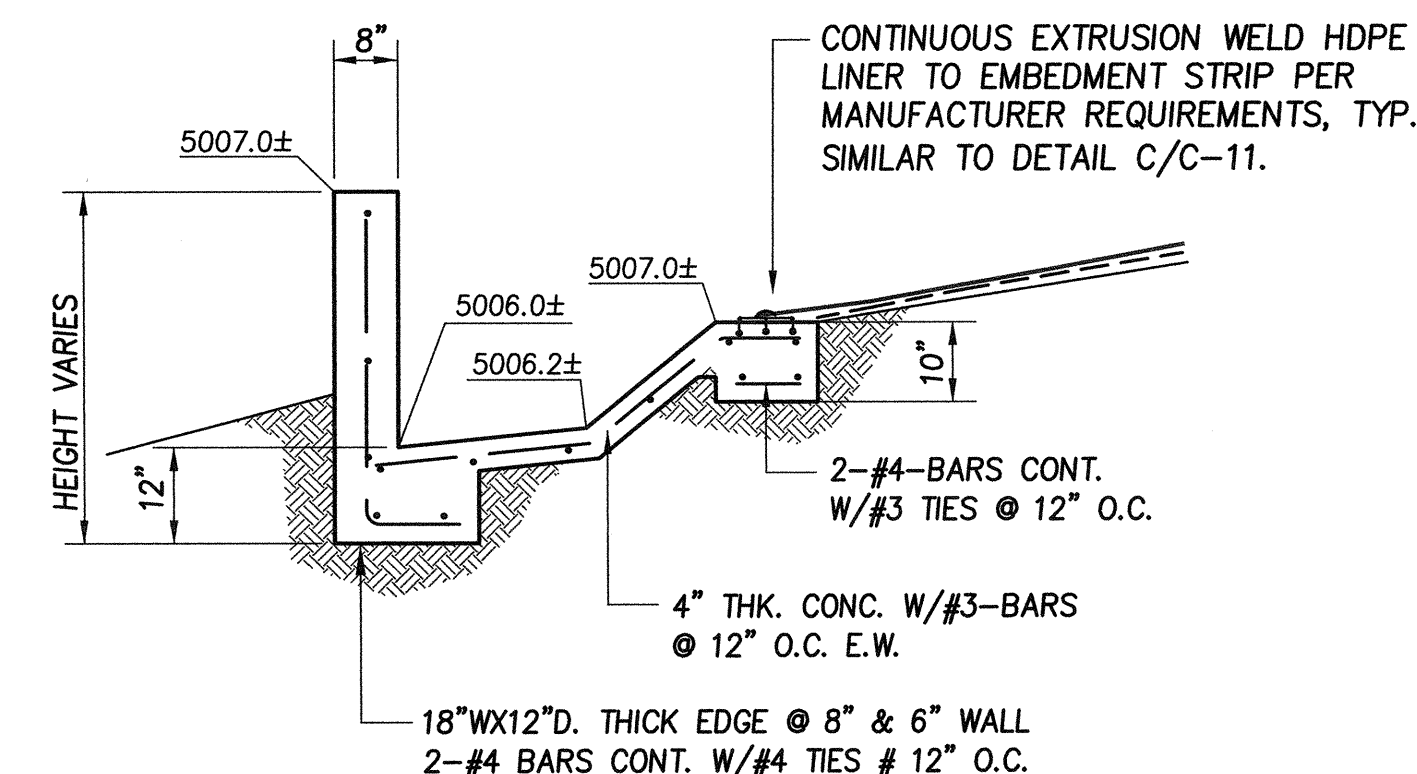
<p>THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.</p> <p>INABA ENGINEERING, INC. <small>IEI #15015 FB #</small></p>	<p>STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION</p>	
	<p>PUU WAAWAA STRUCTURE IMPROVEMENTS AND DAM COMPLIANCE</p>	
	<p>DETAILS HDPE SURFACE CATCHMENT</p>	
	<p>DESIGNED: JKI / MKI</p>	<p>DATE: MAY 6, 2016</p>
<p>DRAWN: JKI / MKI</p>	<p>CHECKED: JKI</p>	<p>SCALE: As Noted</p>
<p>APPROVED: <i>[Signature]</i></p>	<p>DATE: MAY - 6 2016</p>	<p>DRAWING NO. C-12</p>



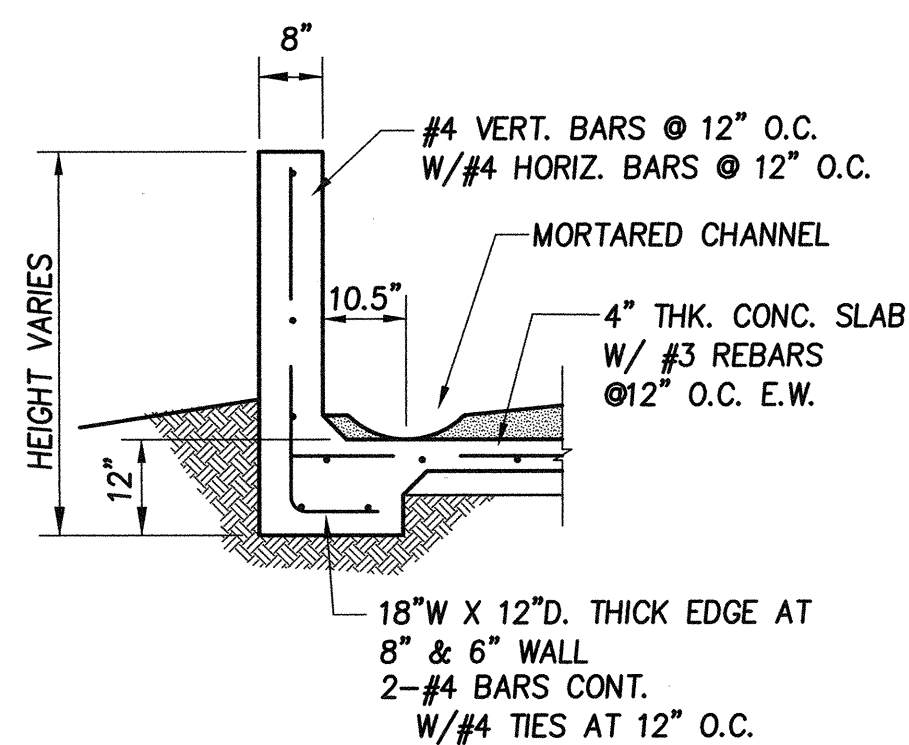
SECTION A



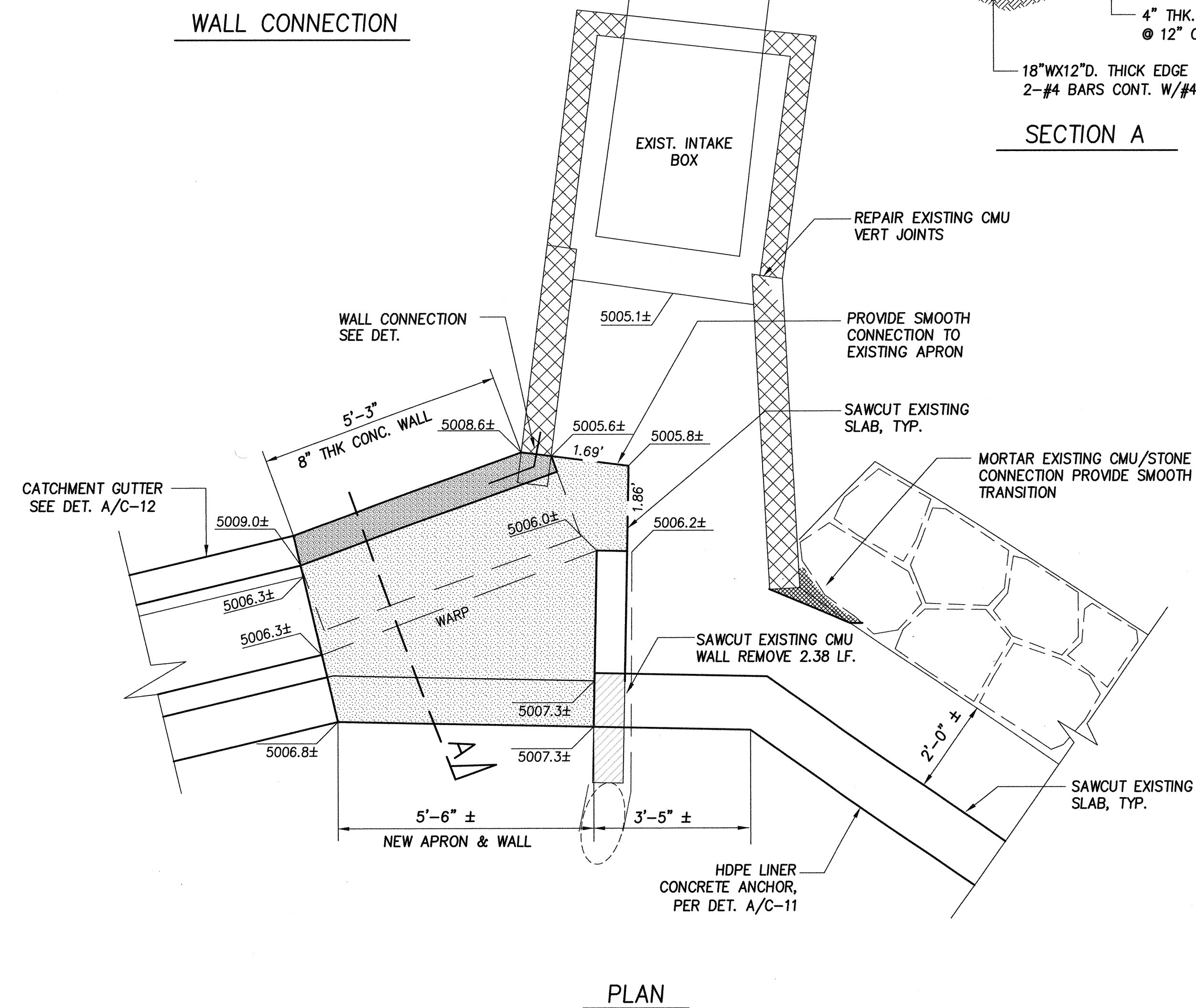
WALL CONNECTION



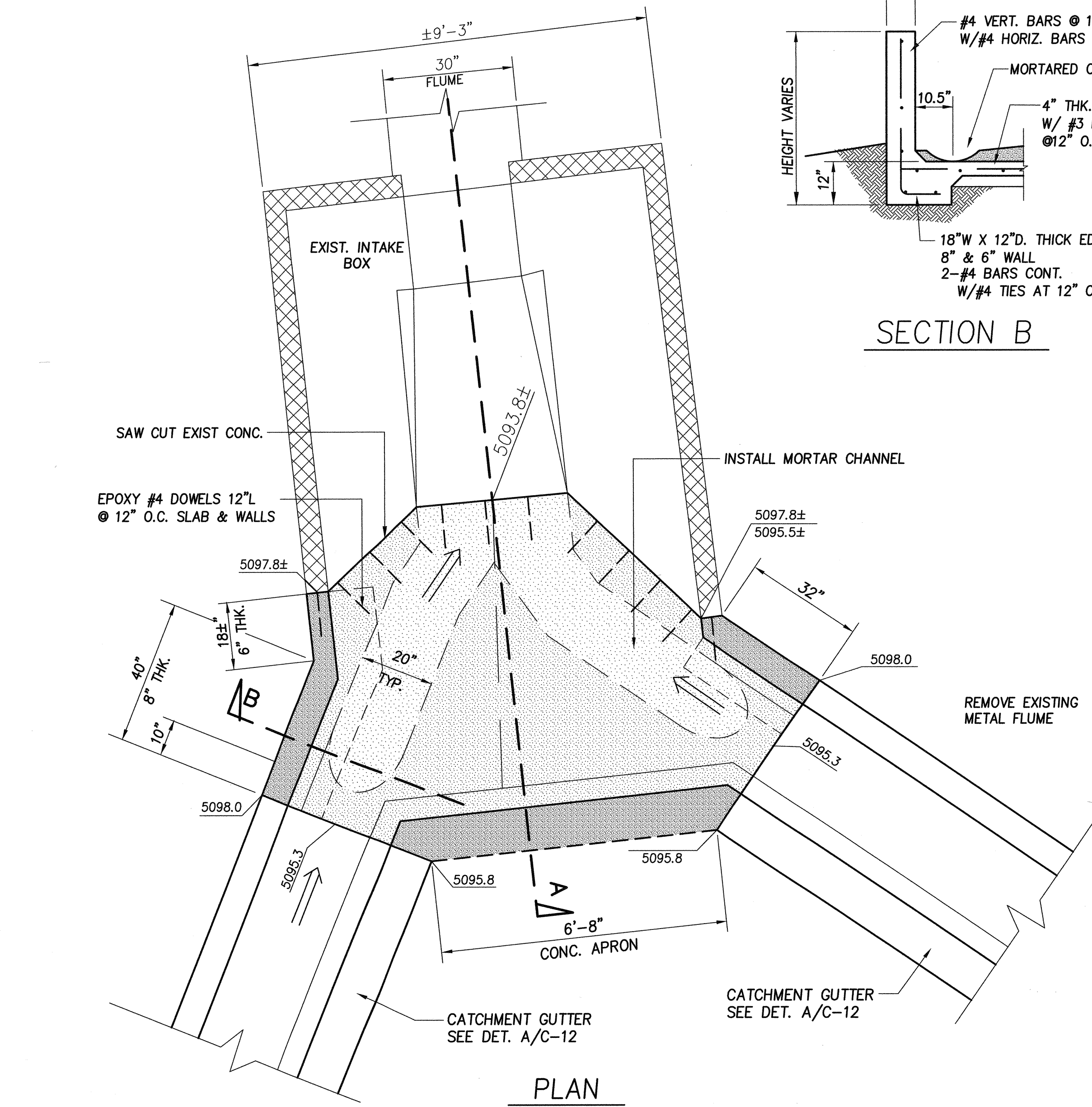
SECTION A



SECTION B



PLAN



PLAN

A FLUME INTAKE BOX CONNECTION DETAIL - STEEL TANK NO. 2
SCALE: 1/2" = 1'-0"

B FLUME INTAKE BOX CONNECTION DETAIL - STEEL TANK NO. 1
SCALE: 1/2" = 1'-0"

NOTE:
SPOT ELEVATIONS ASSUMED.
PROJECT ELEVATION = -437.37'
TO ELEVATIONS SHOWN.

REVISION NO.	SYM.	DESCRIPTION	SHT/OF	DATE	APPROVED

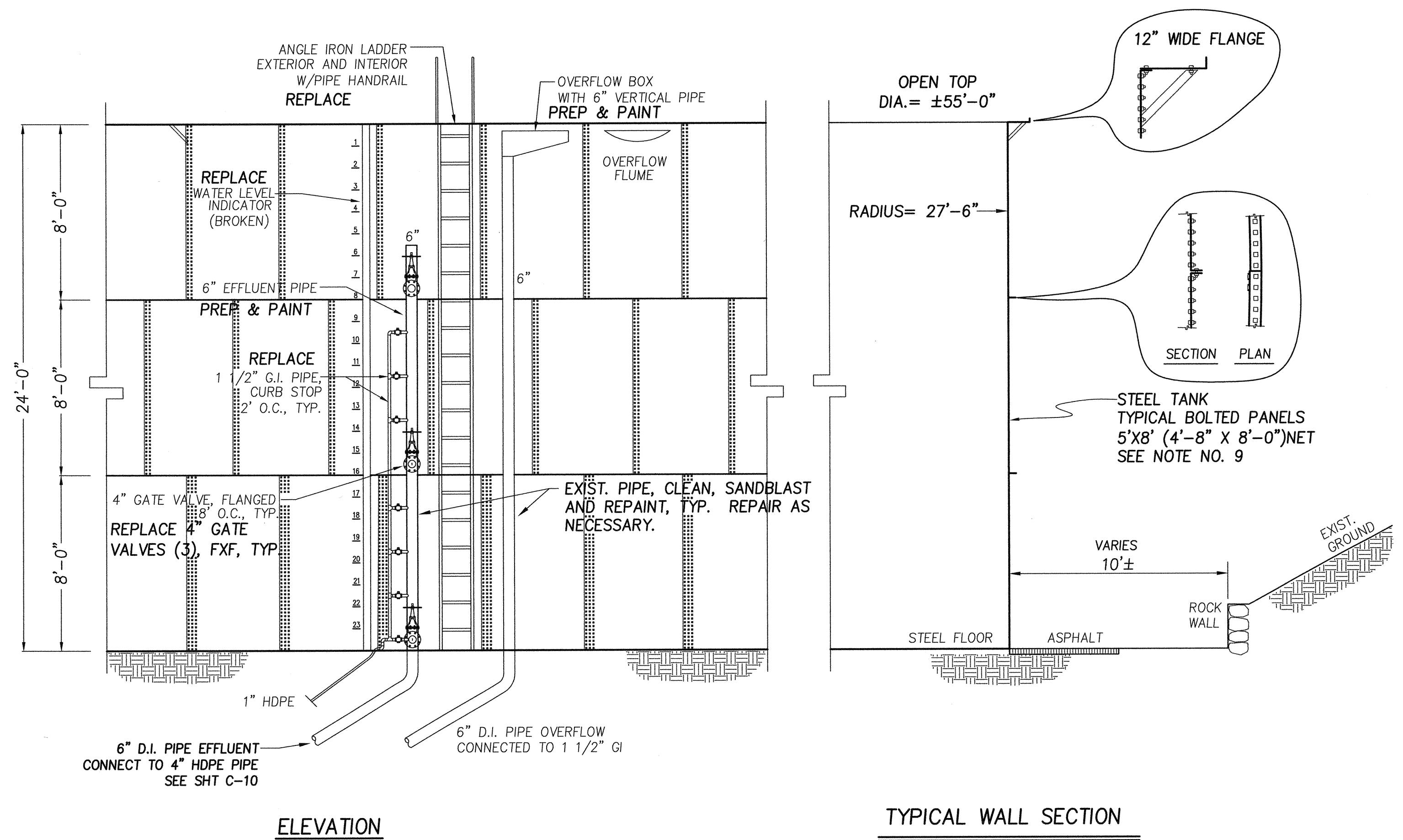
MELVIN K. INABA
LICENSED PROFESSIONAL ENGINEER
No. 6625-C
HAWAII, U.S.A.

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

PUU WAAWAA
STRUCTURE IMPROVEMENTS
AND DAM COMPLIANCE

DETAILS
HDPE SURFACE CATCHMENT

DESIGNED: MKI	SUBMITTED: [Signature]
DRAWN: MKI	DATE: MAY 6, 2016
CHECKED: MKI	SCALE: As Noted
APPROVED: [Signature]	DRAWING NO. C-13
INABA ENGINEERING, INC. ID #15015 FB #	MAY - 6 2016 DATE



ELEVATION

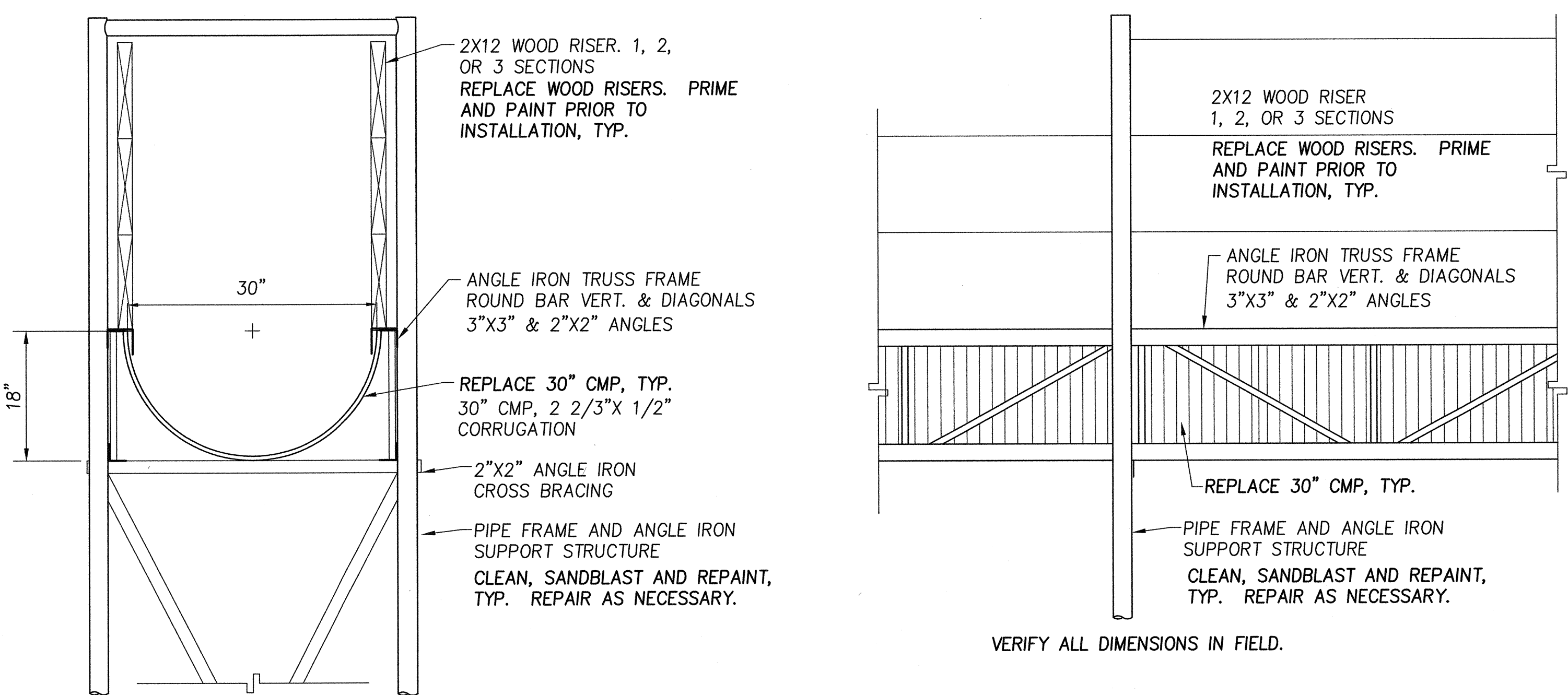
TYPICAL WALL SECTION

STEEL TANK RESTORATION NOTES
TYPICAL FOR TWO TANKS

1. THE CONTRACTOR SHALL COORDINATE THE DRAINING AND RESTORATION OF THE STEEL TANKS WITH PUU WAAWAA DOFAW STAFF AND PASTURE LESSEE REGARDING WATER SUPPLY AND DISTRIBUTION DURING CONSTRUCTION.
2. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, PIPING LAYOUTS AND CONDITION OF STEEL TANKS PRIOR TO BIDDING.
3. THE CONTRACTOR IS BEING MADE AWARE THAT THE STEEL TANKS HAVE LEAD CONTAINING PAINT AND SHALL FOLLOW ALL FEDERAL, STATE, AND COUNTY RULES & REGULATIONS REGARDING REMOVAL, DISPOSAL, AND CLEAN-UP.
4. REPAIR AND RESTORE/REPLACE WATER LEVEL INDICATORS.
5. INSTALL NEW EXTERIOR AND INTERIOR ACCESS LADDERS. PROVIDE LANDING, HANDRAILS, PLATFORMS, AND SAFE-T CLIMB APPARATUS.
6. CLEAN AND PREPARE STEEL SURFACES FOR INTERIOR AND EXTERIOR PROTECTIVE PAINT COATINGS PER PAINT MANUFACTURER RECOMMENDATIONS AND REQUIREMENTS.
 - A. HAND TOOL CLEANING; HAND TOOL CLEANING REMOVES ALL LOOSE MILL SCALE, LOOSE RUST, AND OTHER DETRIMENTAL FOREIGN MATTER. IT IS NOT INTENDED THAT ADHERENT MILL SCALE, RUST, AND PAINT BE REMOVED BY THIS PROCESS. MILL SCALE, RUST, AND PAINT ARE CONSIDERED ADHERENT IS THEY CANNOT BE REMOVED BY LIFTING WITH A DULL PUTTY KNIFE. BEFORE HAND TOOL CLEANING, REMOVE VISIBLE OIL, GREASE, SOLUBLE RESIDUES, AND SALTS BY THE METHODS OUTLINED IN SSPC-SP1. FOR COMPLETE INSTRUCTIONS, REFER TO STEEL STRUCTURES PAINT COUNCIL SURFACE PREPARATION SPECIFICATION NO. 2 (SSPC-SP2)
 - B. NEAR-WHITE BLAST CLEANING: A NEAR-WHITE BLAST CLEANED SURFACE, WHEN VIEWED WITHOUT MAGNIFICATION, SHALL BE FREE OF ALL VISIBLE OIL, GREASE, DIRT, MILL SCALE, RUST, PAINT, OXIDES, CORROSION PRODUCTS, AND OTHER FOREIGN MATTER, EXCEPT FOR STAINING. STAINING SHALL BE LIMITED TO NO MORE THAN 5 PERCENT OF EACH SQUARE INCH OF SURFACE AREA AND MAY CONSIST OF LIGHT SHADOWS, SLIGHT STEAKS, OR MINOR DISCOLORATION CAUSED BY STAINS OF RUST, STAINS OF MILL SCALE, OR STAINS OF PREVIOUSLY APPLIED PAINT. BEFORE BLAST CLEANING, VISIBLE DEPOSITS OF OIL OR GREASE SHALL BE REMOVED BY ANY OF THE METHODS SPECIFIED IN SSPC-SP1 OR OTHER AGREED UPON METHODS. FOR COMPLETE INSTRUCTIONS, REFER TO JOINT SURFACE PREPARATION STANDARD (SSPC-SP10/NACE NO.2)
7. PATCH AND REPAIR STEEL PANELS AND APPURTENANCES AS MAY BE NECESSARY AND/OR REQUIRED TO PROPERLY PAINT AND SEAL TANKS.
8. REPLACE ALL VALVES AND CURB STOPS, TYPICAL FOR BOTH TANKS..
9. RESTORE ALL GALVANIZED IRON, STEEL, CAST IRON, AND DUCTILE IRON PIPE AND FITTINGS, REPLACE WHERE NECESSARY, TYPICAL FOR BOTH TANKS.
10. TANK PLATE BOLTS: SHOULD THE TANK PLATE NUTS AND/OR BOLTS BE 50% RUSTED THROUGH OR AT THE DISCRETION OF THE ENGINEER THE CONTRACTOR SHALL REPLACE RUSTED NUTS AND BOLTS WITH NEW HOT DIPPED GALVANIZED NUTS & BOLTS.
11. THE CONTRACTOR SHALL RESTORE EXISTING CONNECTIONS AT TANK EFFLUENT TO SERVICE EXISTING WATER SYSTEM LINES CURRENTLY SERVICED AT EACH TANK. THE CONTRACTOR SHALL COORDINATE THIS WORK WITH PUU WAAWAA D.O.F.A.W. STAFF AND PASTURE LESSEE TO DETERMINE EXISTING CONNECTIONS TO BE RESTORED.
12. THE CONTRACTOR MAY SUBMIT FOR APPROVAL ALTERNATE PRE-MANUFACTURED FIXED LADDERS FOR REPLACEMENT OF EXISTING INTERIOR AND EXTERIOR STEEL TANK LADDERS. LADDERS SHALL CONTAIN; TOP PLATFORMS, VALVE PLATFORMS, RAILINGS, METHOD OF ATTACHMENT, SAFETY CLIMB DEVICE, AND LADDER GUARD. ALL LADDER AND PLATFORM MATERIALS SHALL BE HOT DIPPED GALVANIZED.

A TANK 1 PIPING SCHEMATIC (LOWER TANK)

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

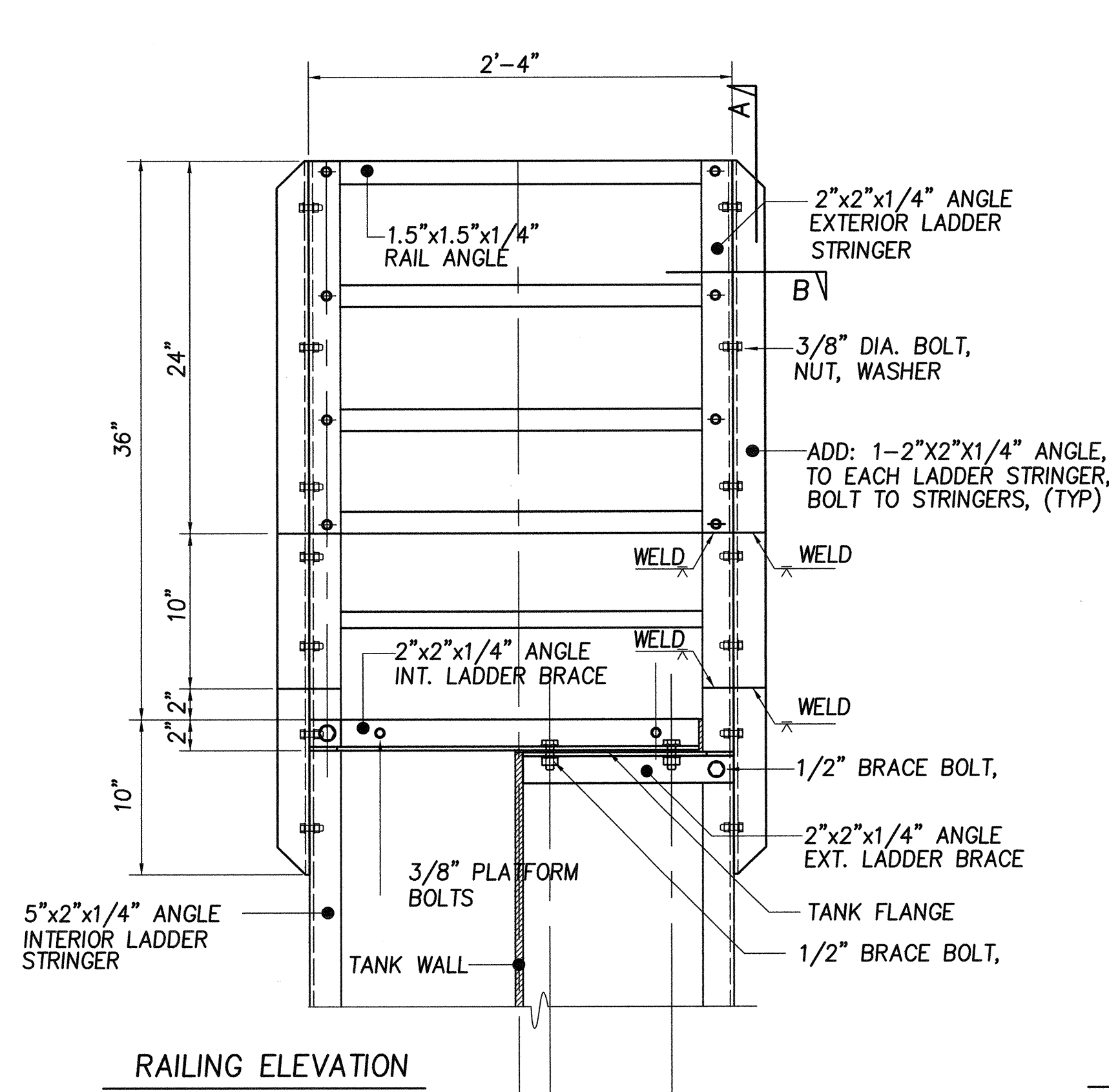


B INLET FLUME TYPICAL SECTION

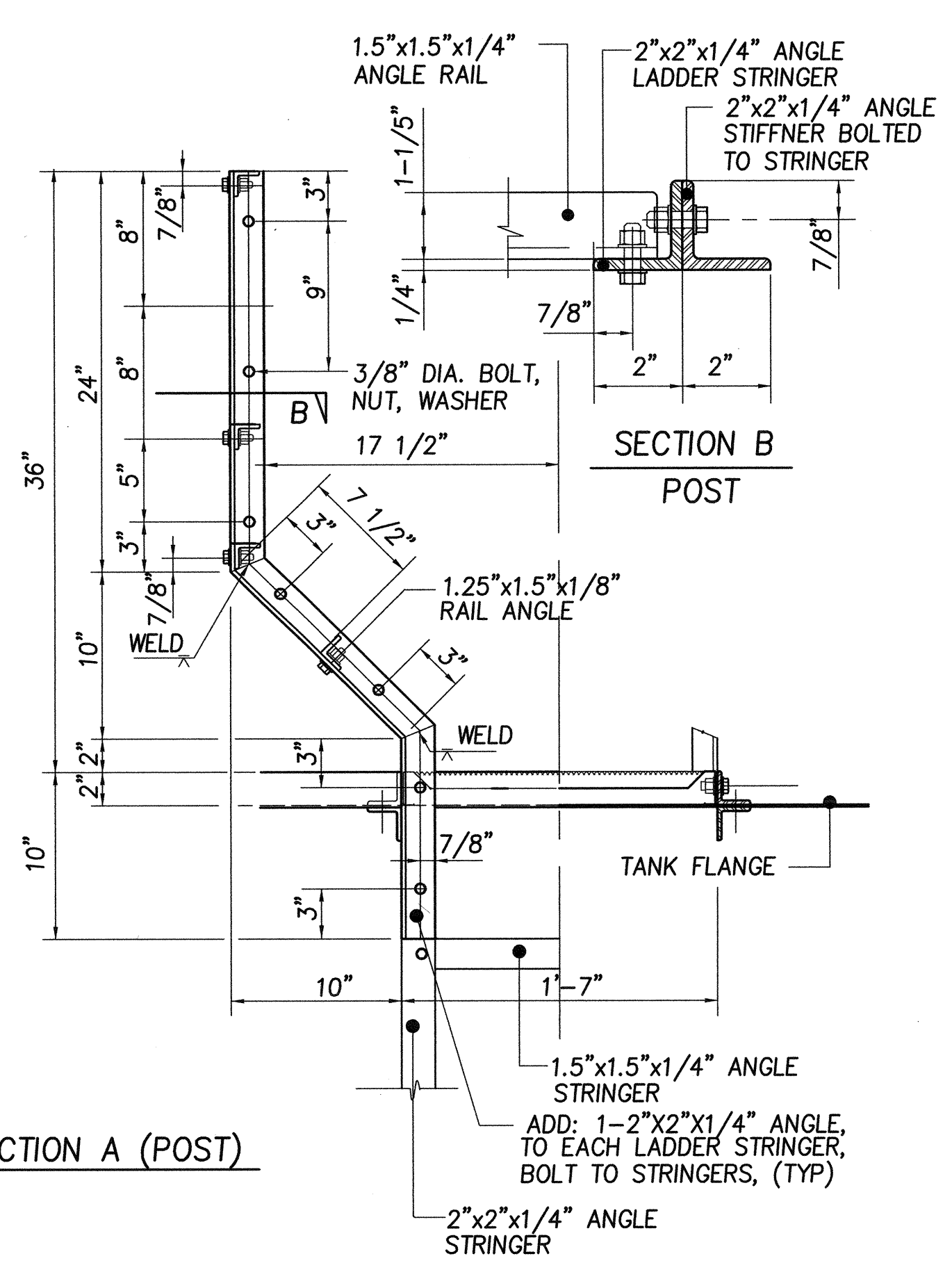
NOT TO SCALE

REVISION NO.	SYM.	DESCRIPTION	SHT/OF	DATE	APPROVED
STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION					
PUU WAAWAA STRUCTURE IMPROVEMENTS AND DAM COMPLIANCE					
HALE PIULA SITE STEEL TANK 1 & 2					
DESIGNED: MKI	SUBMITTED: <i>[Signature]</i>				
DRAWN: MKI	DATE: MAY 6, 2016				
CHECKED: MKI	SCALE: As Noted				
APPROVED: <i>[Signature]</i>	DATE: MAY - 6 2016		DRAWING NO. C-14		
IEI #15015	FB #	CHIEF ENGINEER			

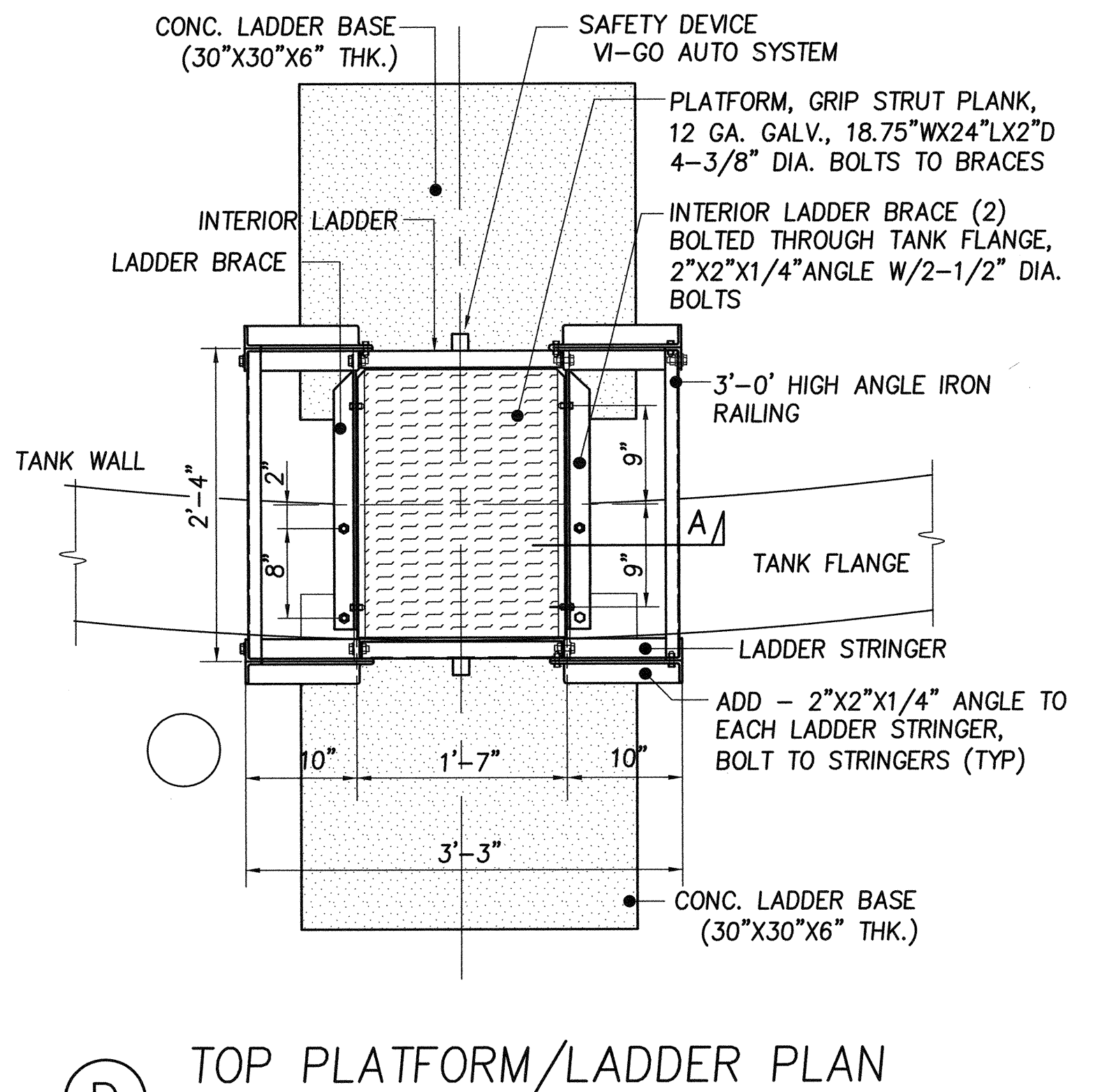
DLNR/15015-Puuwaa/01-Drawings/13-SteelTanks-PipeDetails



RAILING ELEVATION

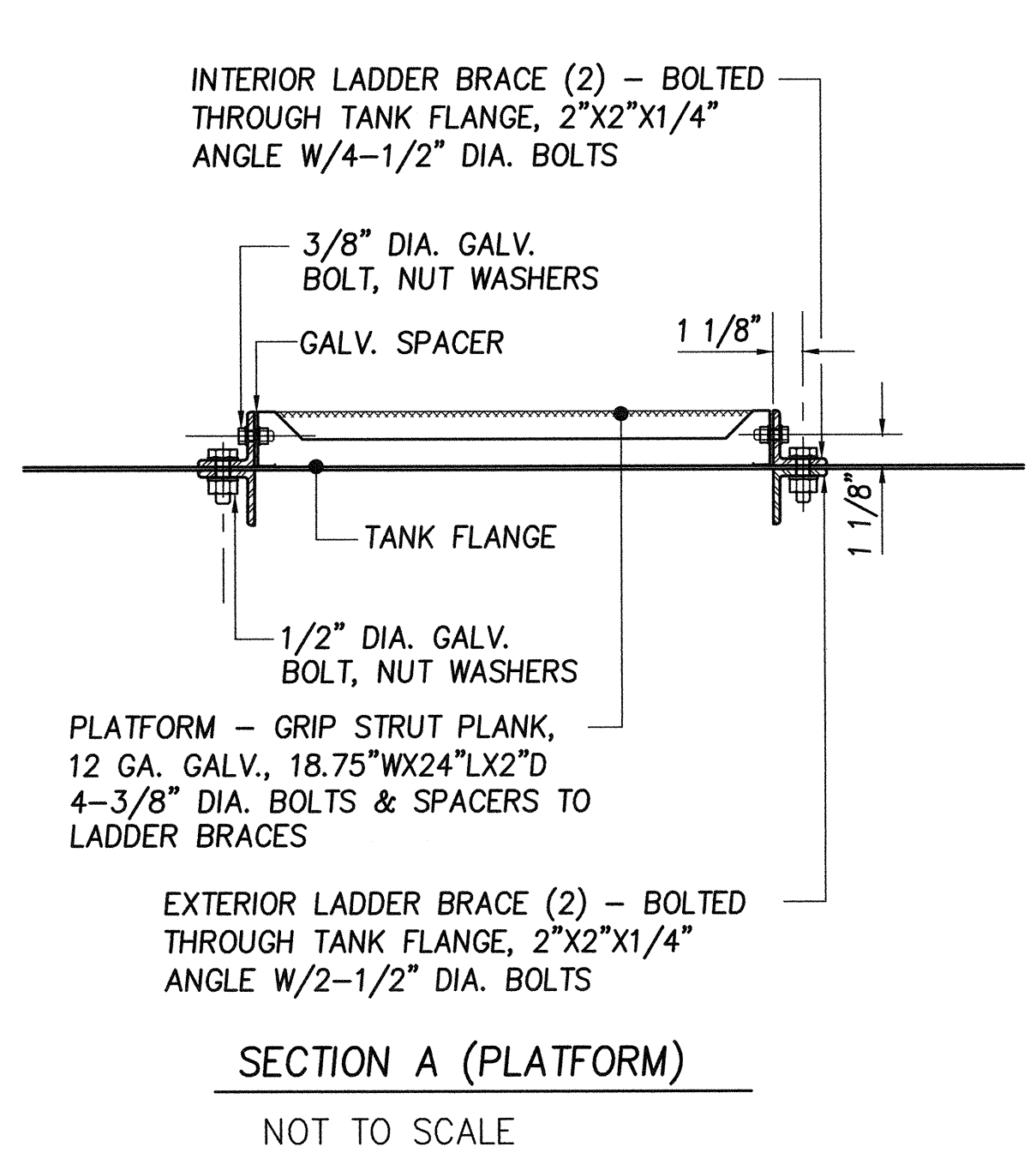


SECTION A (POST)



TOP PLATFORM/LADDER PLAN

SCALE: 1" = 1'-0"

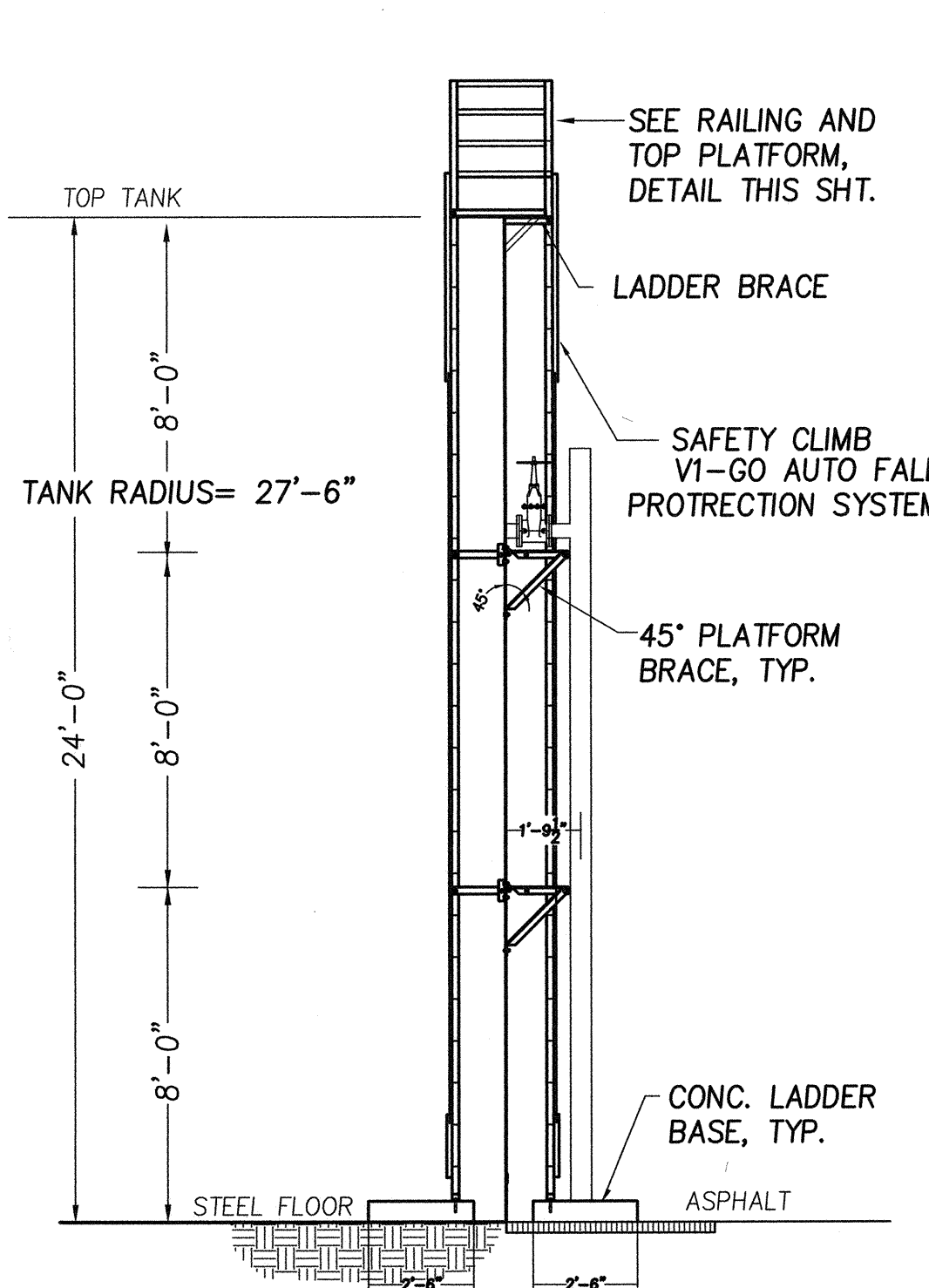


SECTION A (PLATFORM)

NOT TO SCALE

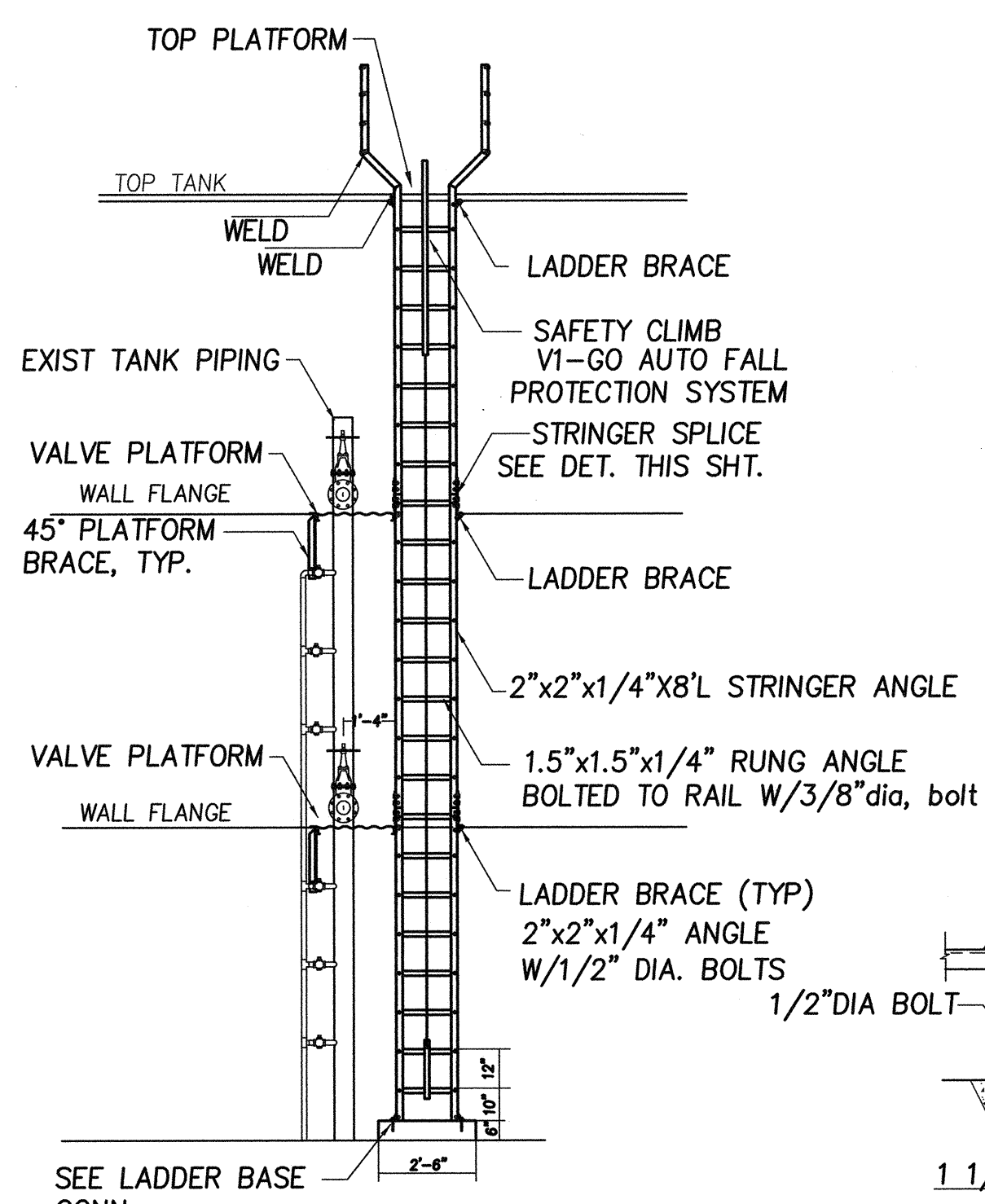
B RAILING DETAIL

SCALE: 1 1/2" = 1'-0"



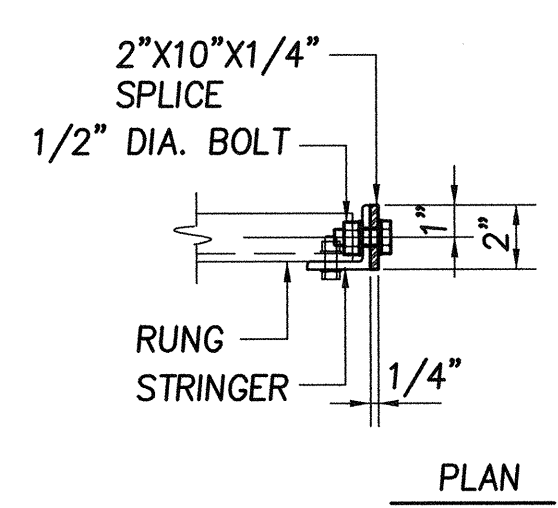
WALL SECTION

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



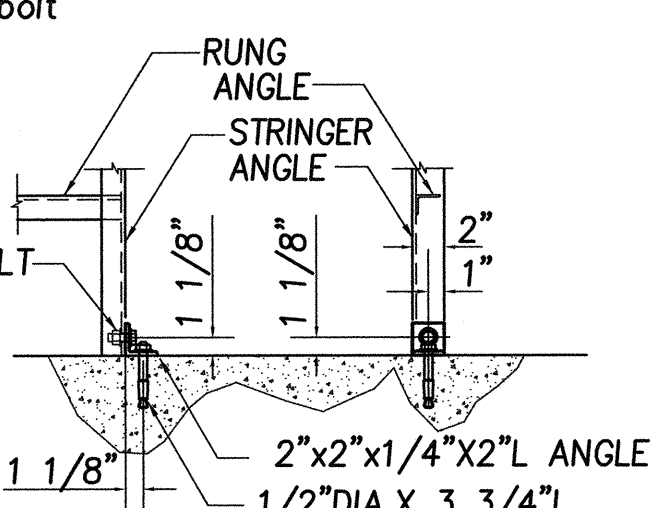
ELEVATION

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



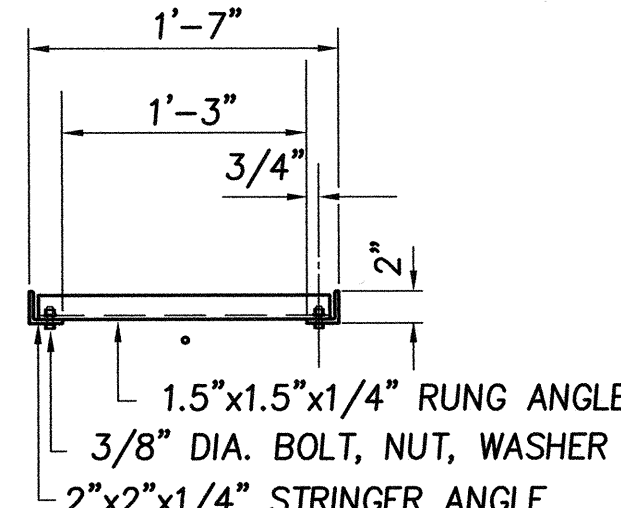
LADDER STRINGER SPLICE

NOT TO SCALE



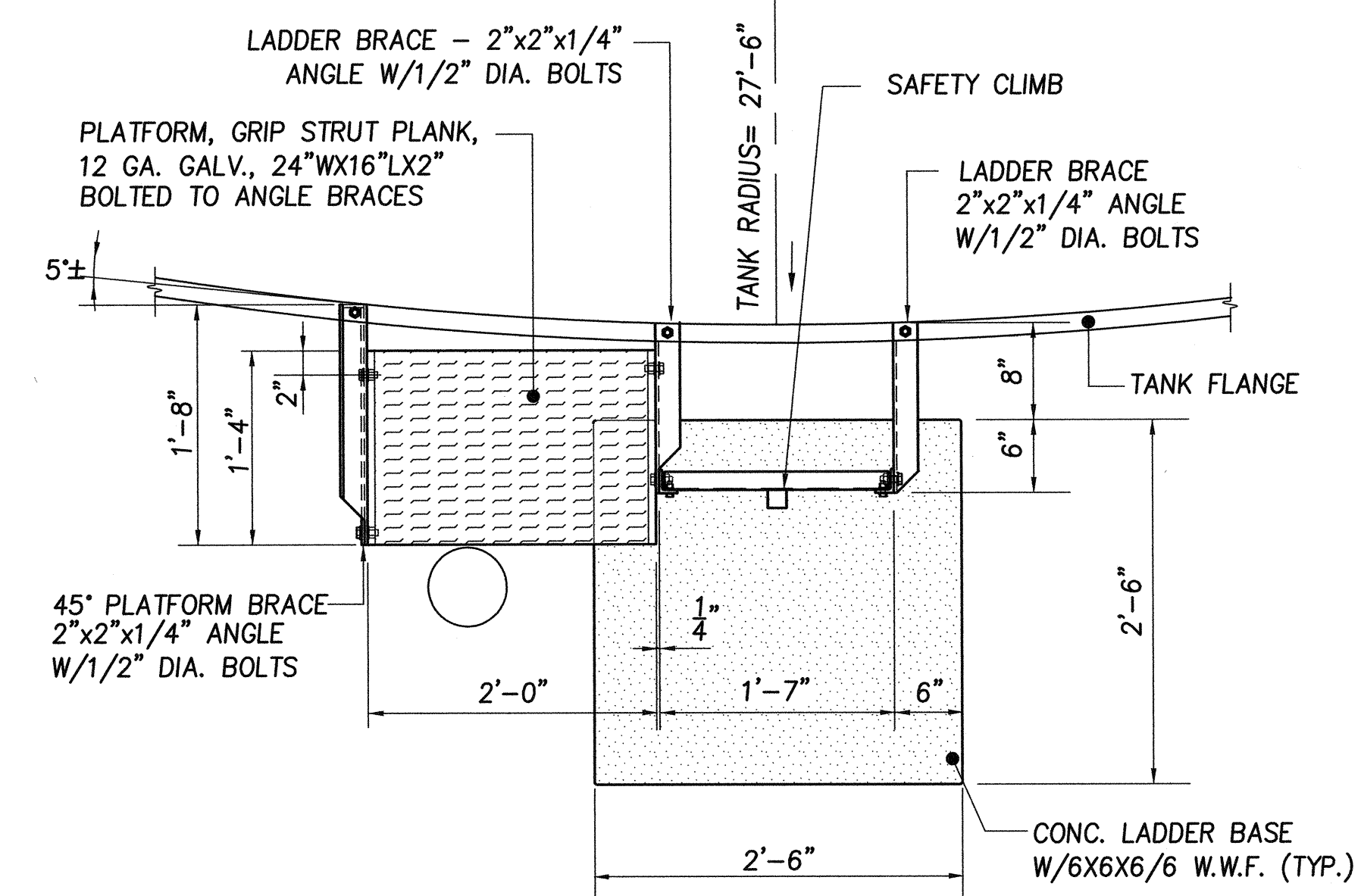
LADDER BASE CONN.

SCALE: 1" = 1'-0"



TYPICAL RUNG

SCALE: 1" = 1'-0"



VALVE PLATFORM/LADDER PLAN

SCALE: 1" = 1'-0"

A LADDER DETAIL, TANK 1 (LOWER)

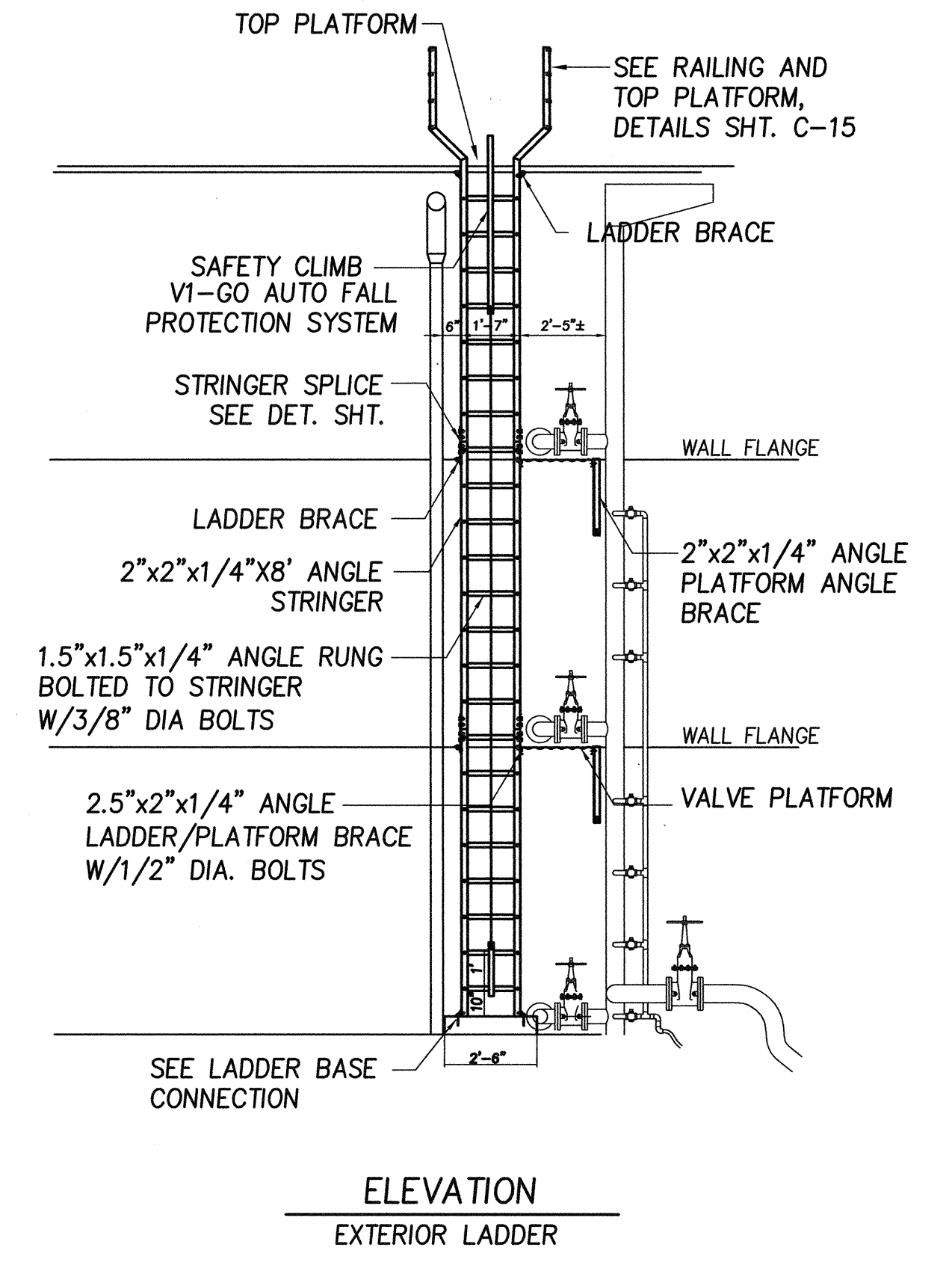
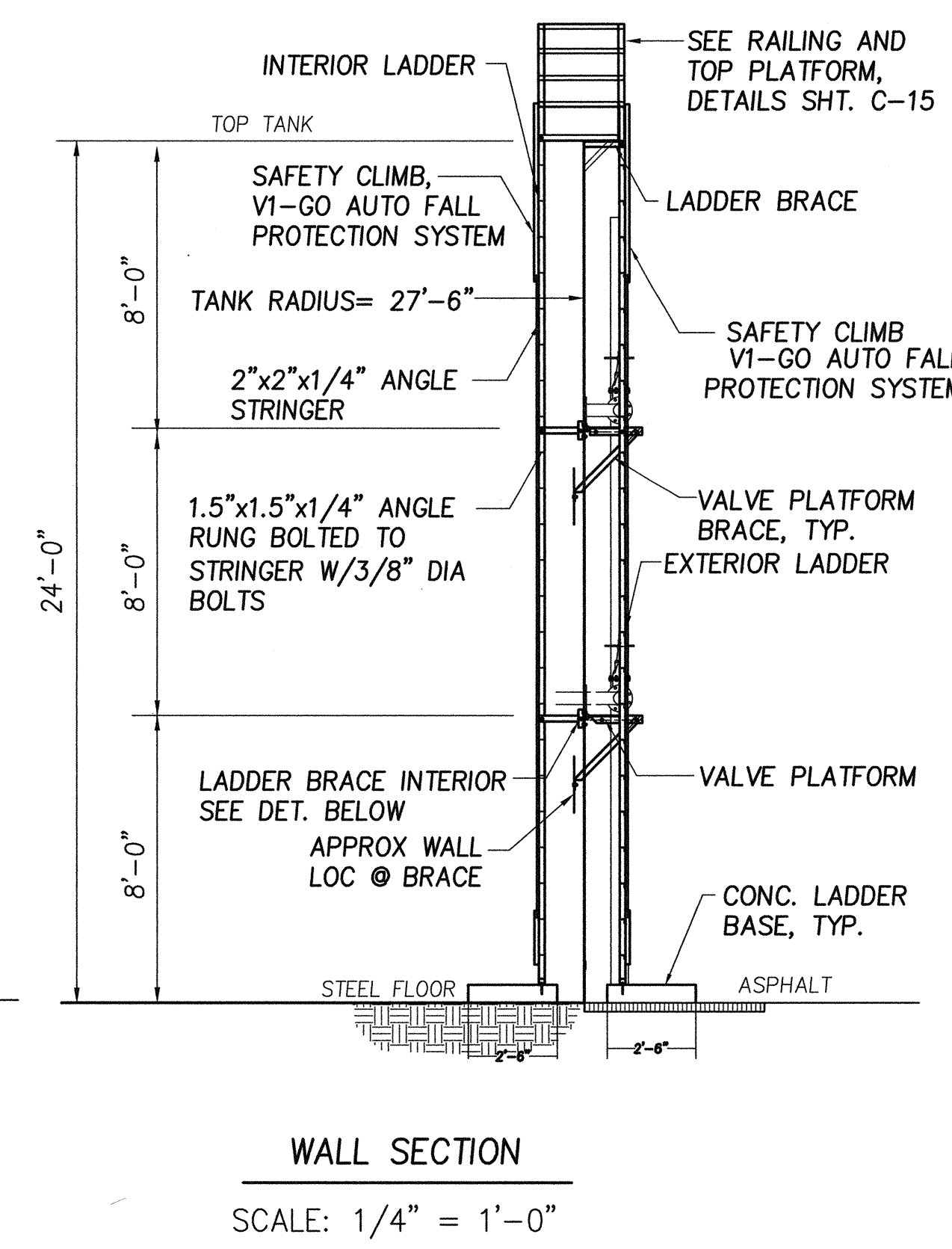
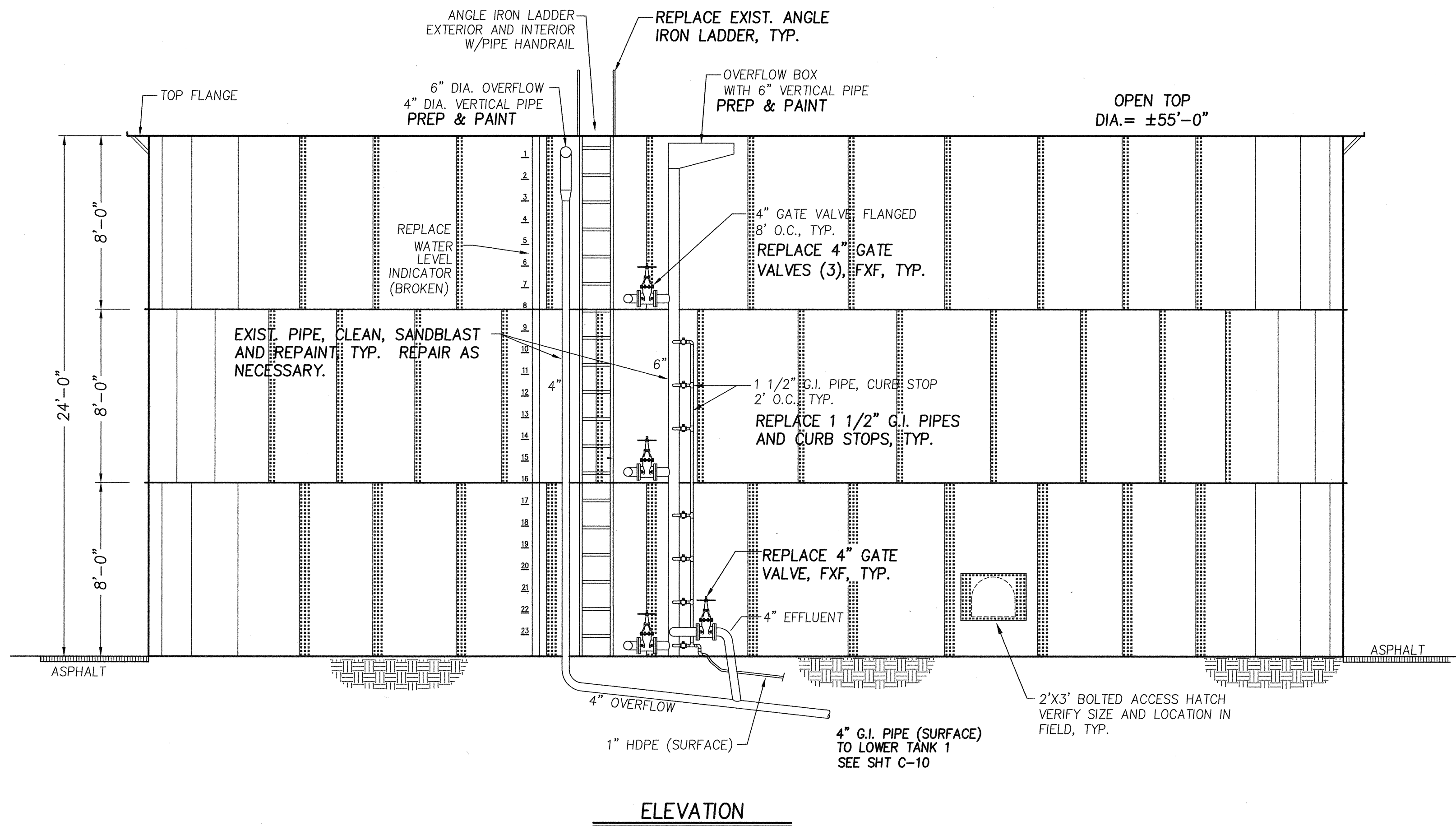
SCALE AS NOTED

ALL ANGLES, NUTS BOLTS & WASHERS SHALL BE HOT DIPPED GALVANIZED.

CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND PROVIDE SHOP DRAWINGS FOR LADDER AND PLATFORM WORK.

REVISION NO.	SYM.	DESCRIPTION	SHT/OF	DATE	APPROVED
STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION PUU WAAWAA STRUCTURE IMPROVEMENTS AND DAM COMPLIANCE STEEL TANK 1 & 2 DETAILS					
DESIGNED: MKI DRAWN: MKI CHECKED: MKI		SUBMITTED: <i>[Signature]</i> DATE: MAY 6, 2016 SCALE: As Noted			
APPROVED: <i>[Signature]</i> INABA ENGINEERING, INC. ID #15015		DATE: MAY - 6 2016 DRAWING NO. C-15			

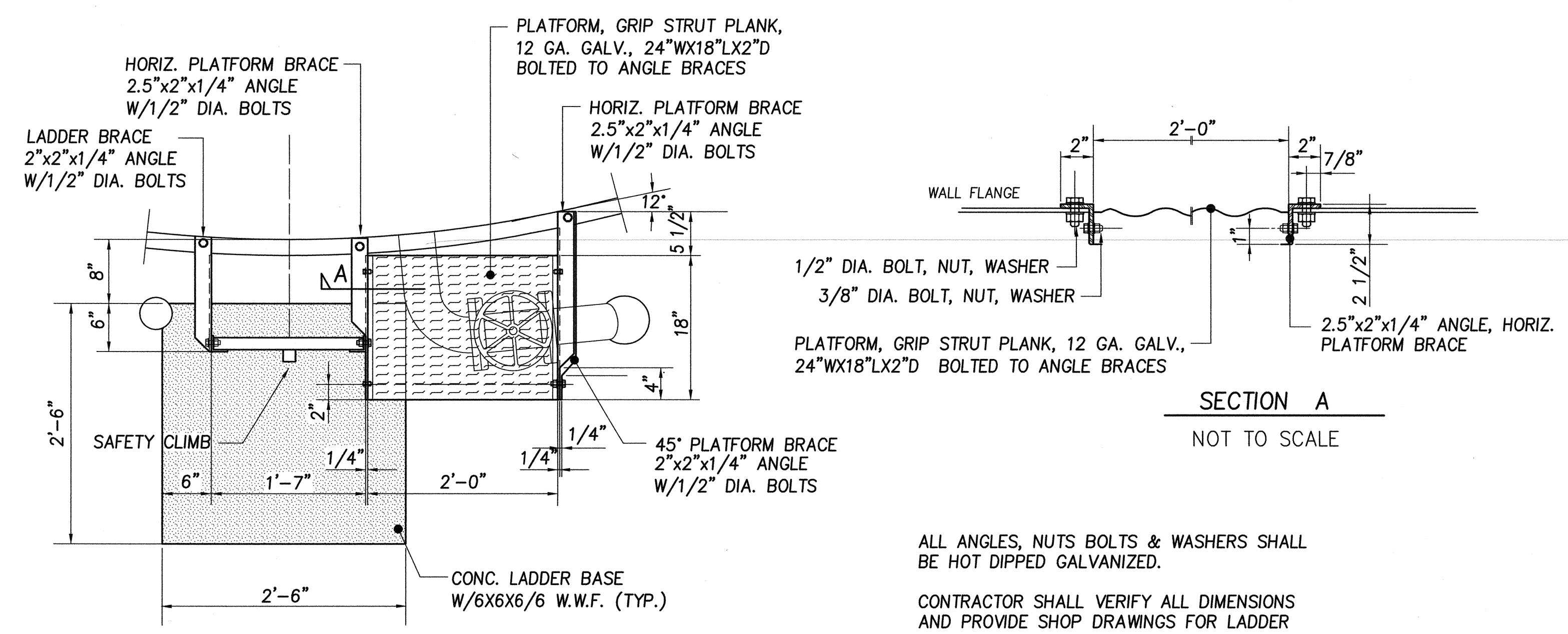
DLNR/15015-Puuwaawaa/01-Drawings/13-SteelTanks-PipeDetails



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

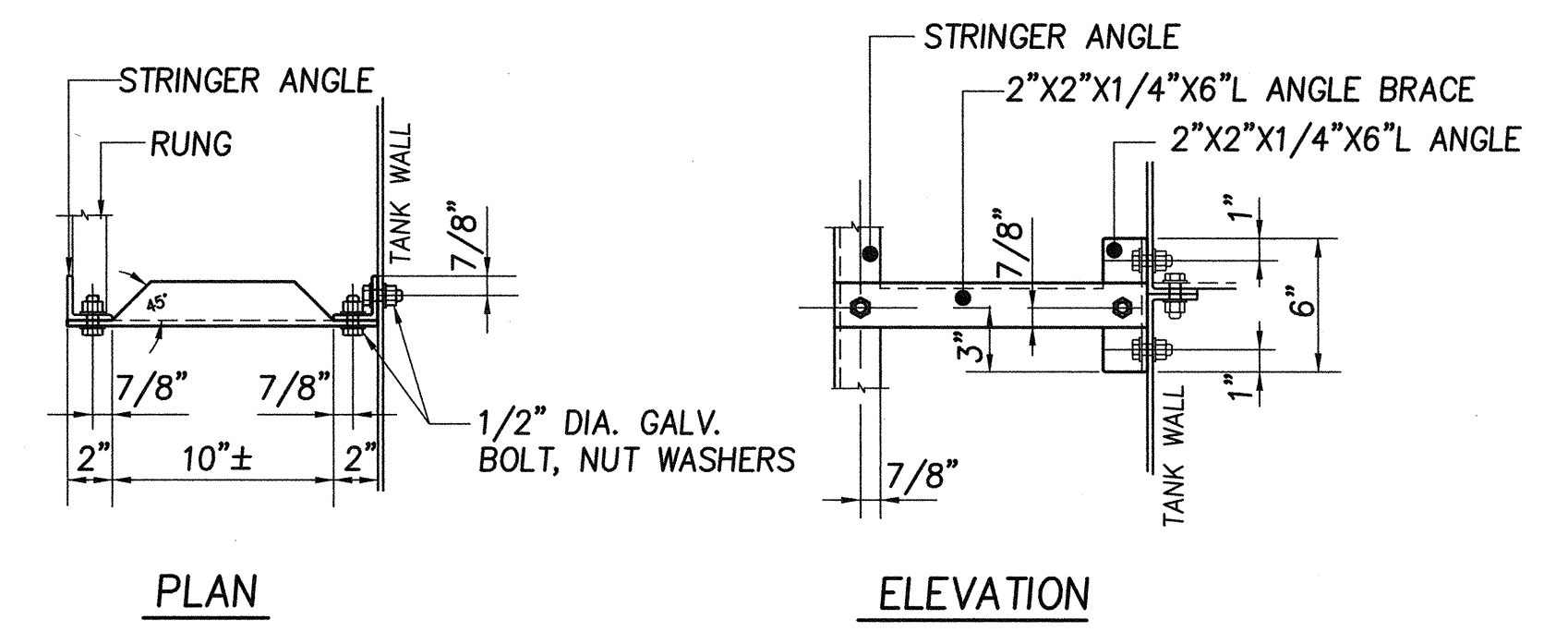
ELEVATION
EXTERIOR LADDER

A TANK 2 PIPING SCHEMATIC (UPPER TANK)
SCALE: 1/4" = 1'-0"



SECTION A
NOT TO SCALE

ALL ANGLES, NUTS BOLTS & WASHERS SHALL BE HOT DIPPED GALVANIZED.
CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND PROVIDE SHOP DRAWINGS FOR LADDER AND PLATFORM WORK.

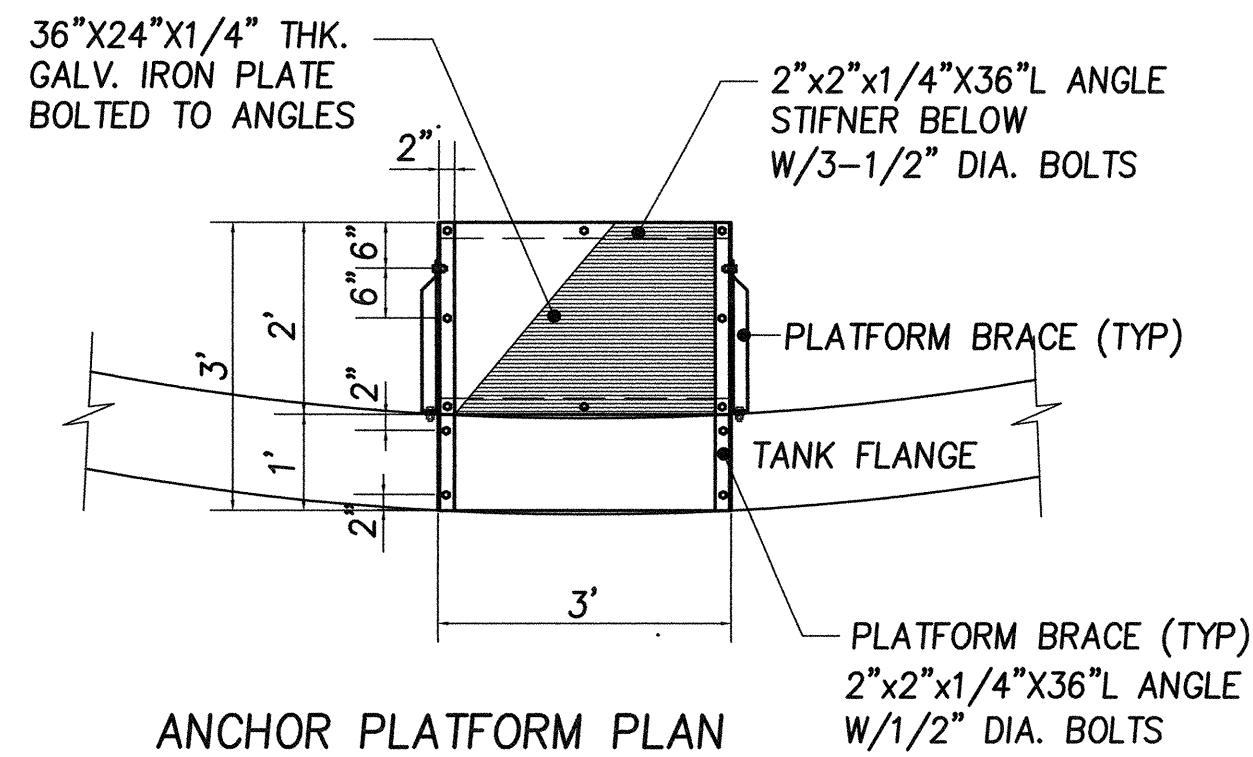


B LADDER BRACE (INTERIOR)
SCALE: 1 1/2" = 1'-0"

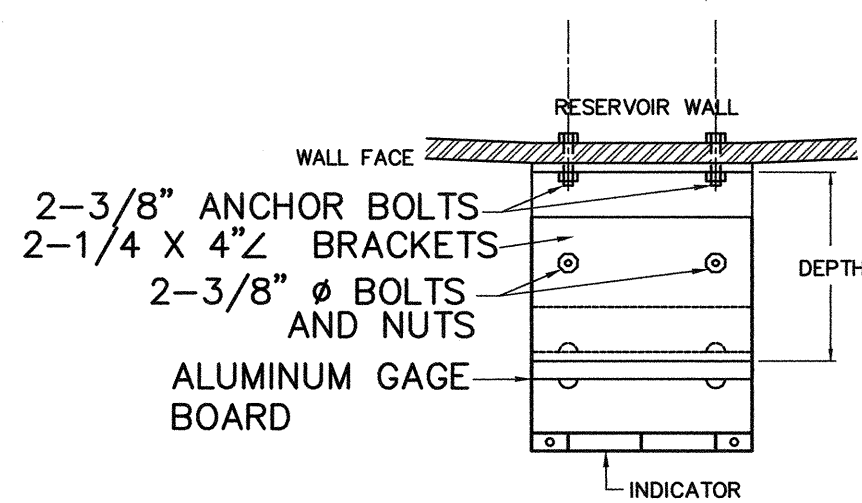
C TANK 2 - VALVE PLATFORM/EXTERIOR LADDER PLAN
SCALE: 1" = 1'-0"

REVISION NO.	SYM.	DESCRIPTION	SHT/OF	DATE	APPROVED
STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION					
PUU WAAWAA STRUCTURE IMPROVEMENTS AND DAM COMPLIANCE					
HALE PIULA SITE STEEL TANK 2					
DESIGNED: MKI	SUBMITTED: <i>[Signature]</i>				
DRAWN: MKI	DATE: MAY 6, 2016				
CHECKED: MKI	SCALE: As Noted				
APPROVED: <i>[Signature]</i>	DRAWING NO. C-16				
INABA ENGINEERING, INC.	MAY - 6 2016				
ID: #15015	FB #				

DLNR/15015-Puuwaawaa/01-Drawings/13-SteelTanks-PipeDetails



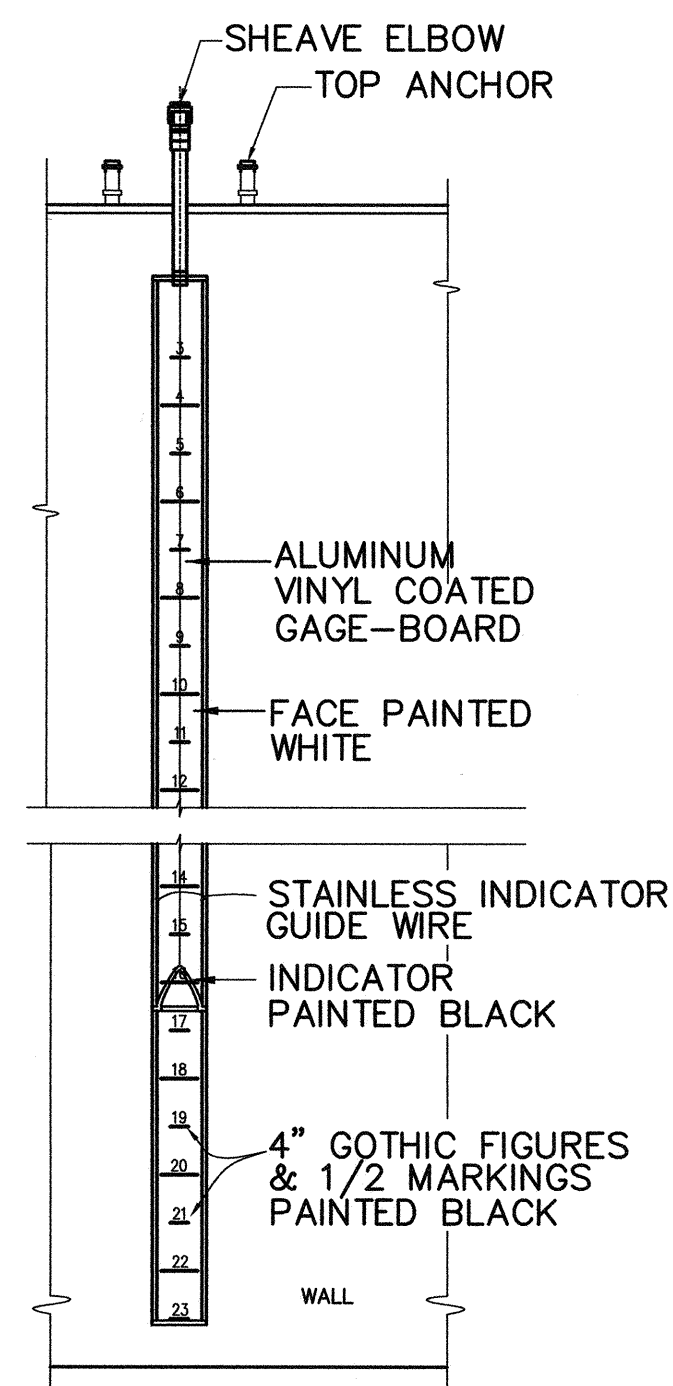
ANCHOR PLATFORM PLAN



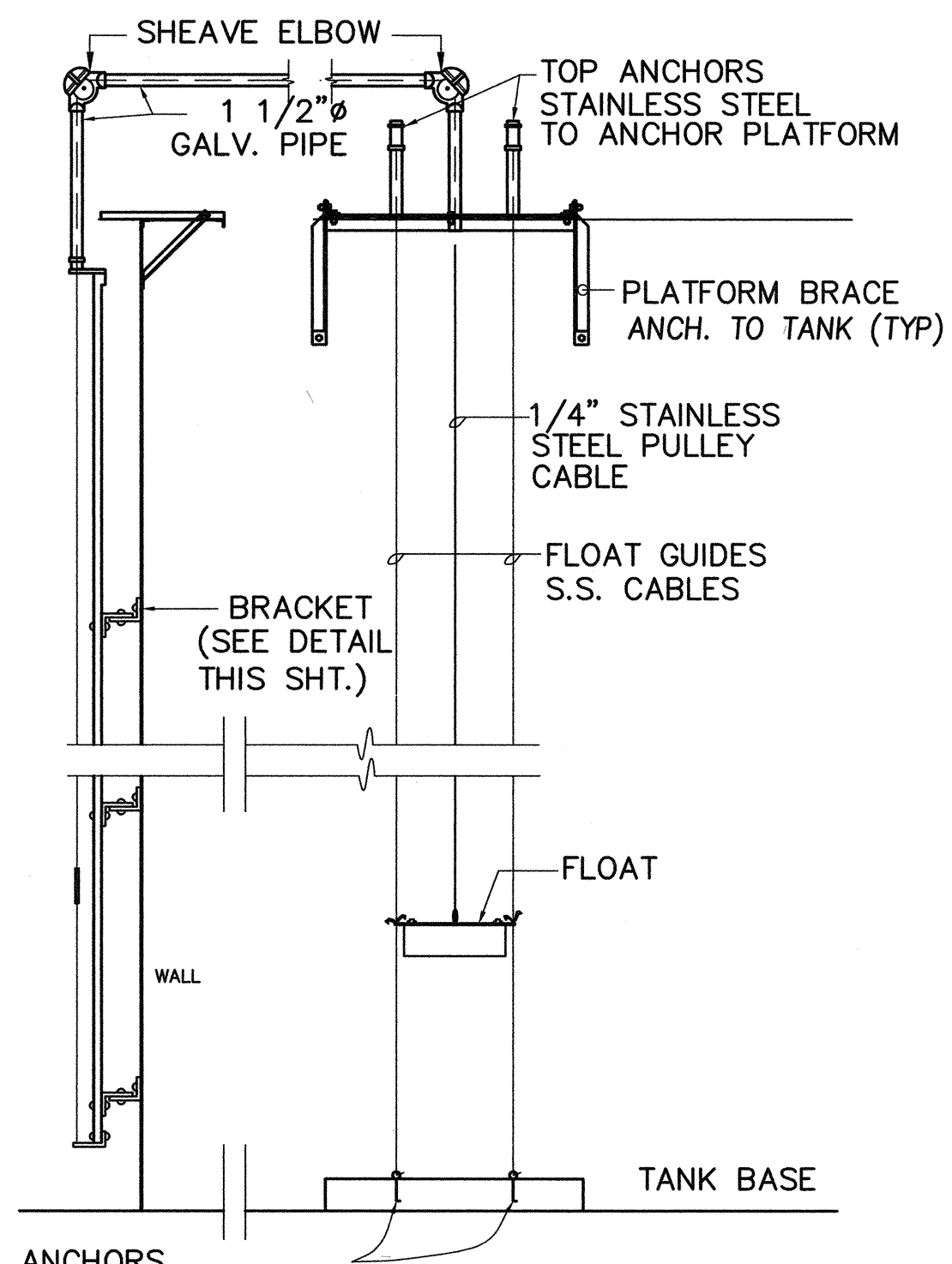
BRACKET DETAIL
SCALE: 3" = 1'-0"

NOTE:
FOR SIZE OF INDICATOR BOARD AND
BRACKET REQUIREMENTS, SEE
MANUFACTURER LITERATURE.

BRACKETS, ANCHORS, NUTS AND
BOLTS SHALL BE STAINLESS STEEL
(TYPICAL)



ELEVATION



STAINLESS STEEL ANCHORS
EMBED IN CONC. BASE
3'X3'X6" THK. CONC. BASE

A WATER LEVEL INDICATOR
NOT TO SCALE

REVISION NO.	SYM.	DESCRIPTION	SHT/OF	DATE	APPROVED
STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION PUU WAAWAA STRUCTURE IMPROVEMENTS AND DAM COMPLIANCE STEEL TANK 1 & 2 DETAILS					
DESIGNED: MKI DRAWN: MKI CHECKED: MKI		SUBMITTED: <i>al</i> DATE: MAY 6, 2016 SCALE: As Noted		APPROVED: <i>Cyly</i> INABA ENGINEERING, INC. CHIEF ENGINEER DATE: MAY - 6 2016	
I/EI #15015 FB #		JOB NO. 500CH15A		SHEET NO. 23 OF 38 SHEETS	

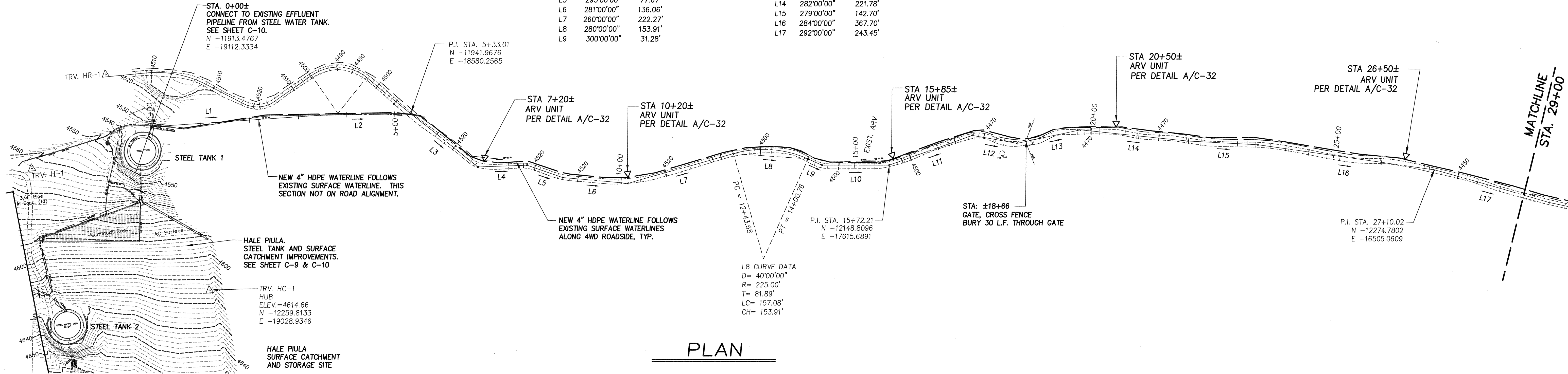
DLNR/15015--Puuhawaa/01--Drawings/13--SteelTanks--PipeDetails

TRV. H-1
1/2" PIPE
ELEV.=4562.63
N -11973.3849
E -19364.1801

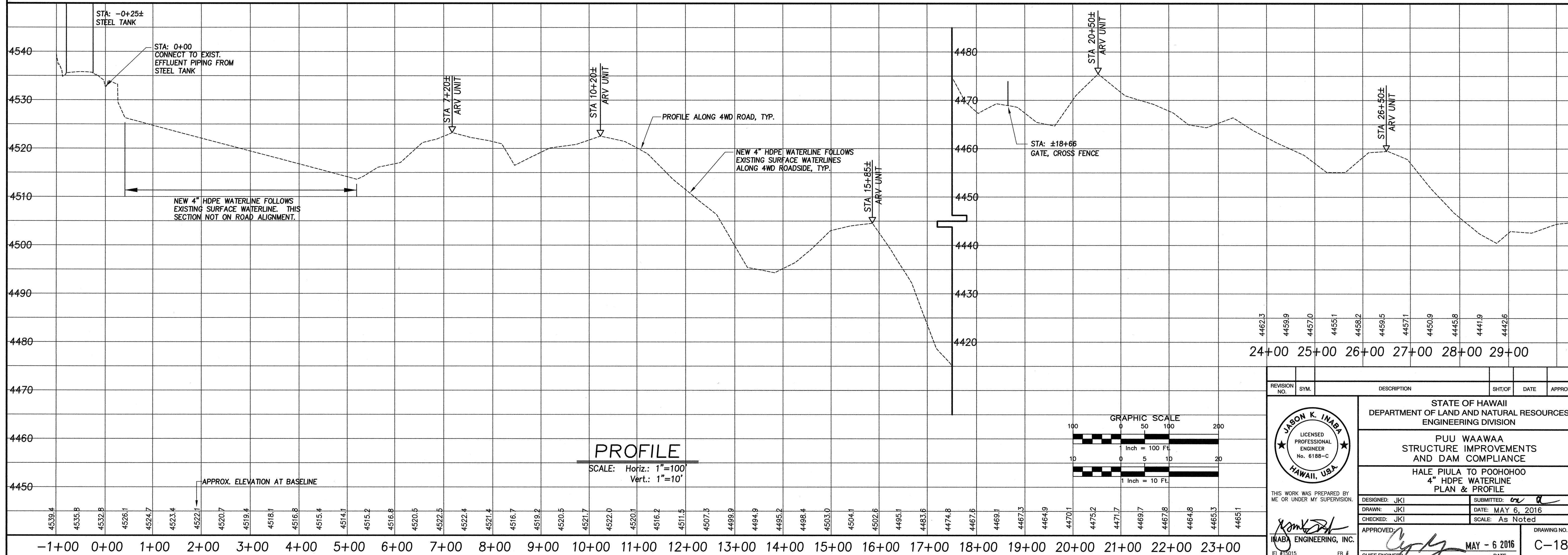
TRV. HR-1
1/2" PIPE
ELEV.=4525.29
N -11796.7027
E -19195.9160

LINE	AZ.	DIST.
L1	272°00'00"	343.76'
L2	275°00'00"	189.24'
L3	315°00'00"	173.33'
L4	274°00'00"	101.35'
L5	295°00'00"	77.67'
L6	281°00'00"	136.06'
L7	260°00'00"	222.27'
L8	280°00'00"	153.91'
L9	300°00'00"	31.28'

LINE	AZ.	DIST.
L10	276°00'00"	140.17'
L11	256°00'00"	178.54'
L12	286°00'00"	93.41'
L13	264°00'00"	133.67'
L14	282°00'00"	221.78'
L15	279°00'00"	142.70'
L16	284°00'00"	367.70'
L17	292°00'00"	243.45'



PLAN



PROFILE

REVISION NO.	SYM.	DESCRIPTION	SHT/OF	DATE	APPROVED

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

PUU WAAWAA
STRUCTURE IMPROVEMENTS
AND DAM COMPLIANCE

HAILE PIULA TO POOHOHOO
4" HDPE WATERLINE
PLAN & PROFILE

DESIGNED: JKI
DRAWN: JKI
CHECKED: JKI
APPROVED: *[Signature]*
DATE: MAY - 6 2016

SUBMITTED: *[Signature]*
DATE: MAY 6, 2016
SCALE: As Noted

DRAWING NO. C-18

JOB NO. 500CH15A SHEET NO. 24 OF 38 SHEETS

DATE: \20-WATERLINEPRO1.DWG