Submittal Review Response

Project Name:	***Hilo WWTP Rehabilitation and Replacement Project Phase 1***
Submittal No.:	***05500-001.0***
Date:	***9/10/2025***

Client:	County of Hawai‘i	**Carollo Project No.:**	203975
Contractor:	Nan, Inc.		
Submittal Name:	Basin Grating Support - Shop Drawings		
Reviewed By:	Marissa Kurniawan, Hipom Caleb Che		

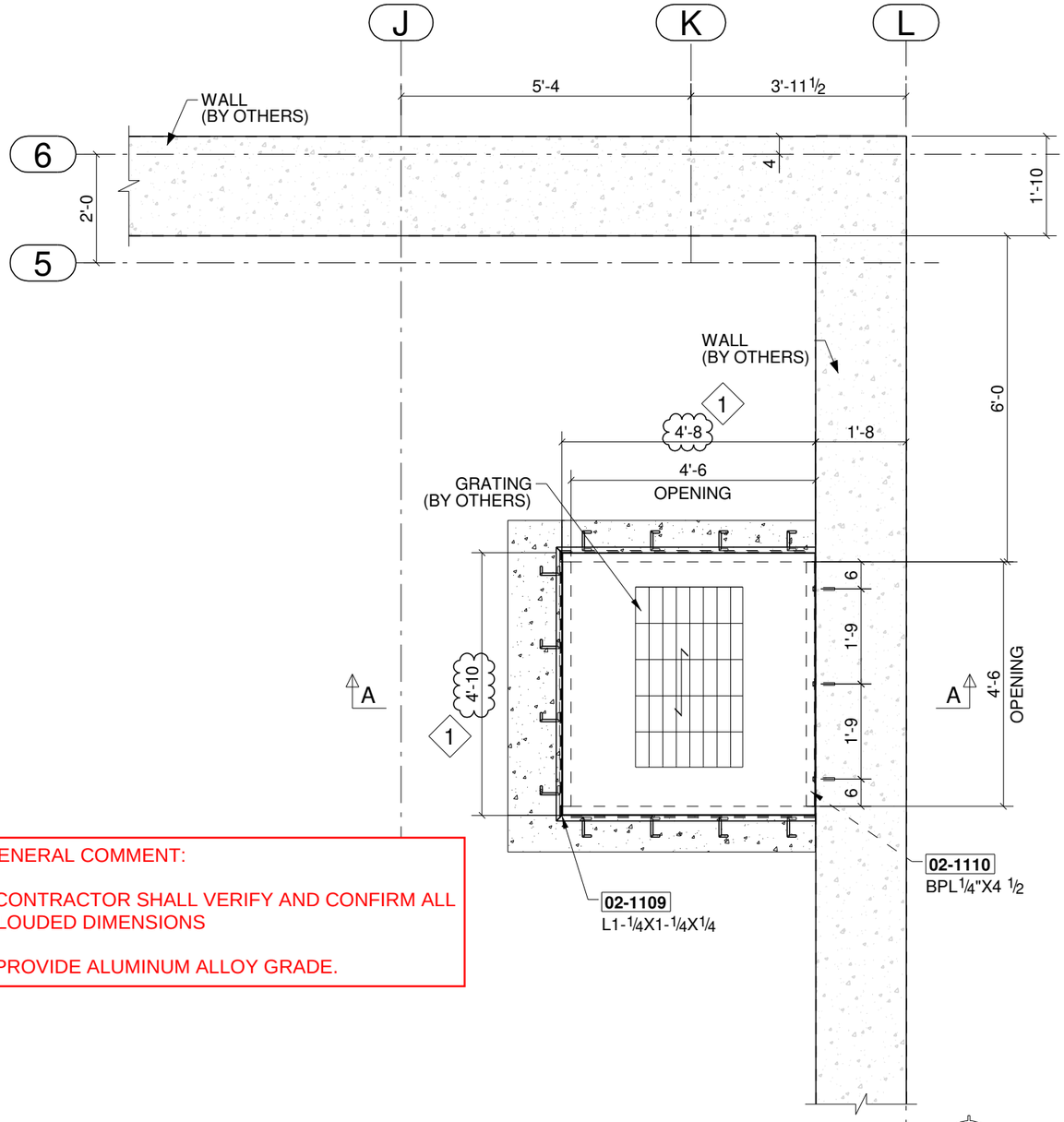
SUBMITTAL REVIEW

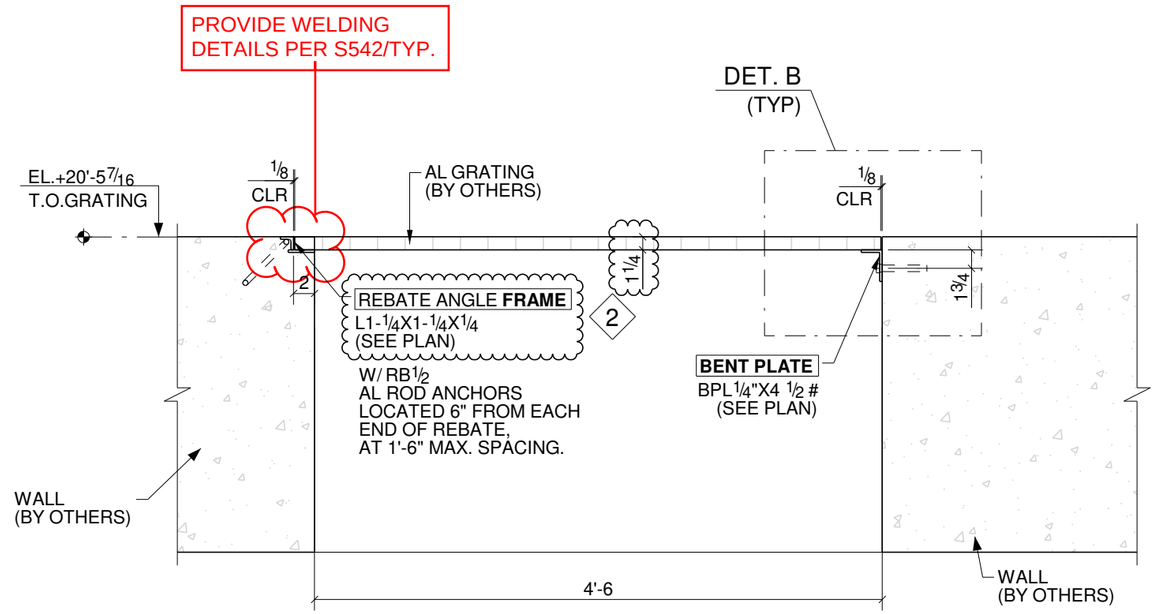
Review is for general compliance with contract documents. No responsibility is assumed by Carollo for correctness of quantities, dimensions, and details. No deviation or variation is approved unless specifically addressed in these review comments. Refer to Section 01330 for additional requirements. The Contractor shall assume full responsibility for coordination with all other trades and deviations from contract requirements.

Approved	☐	No Exceptions
	☐	Make Corrections Noted - See Comments
	☐	Make Corrections Noted - Confirm
Not Approved	☒	Correct and Resubmit
	☐	Rejected - See Remarks
Receipt Acknowledged	☐	Filed for Record
	☐	With Comments - Resubmit

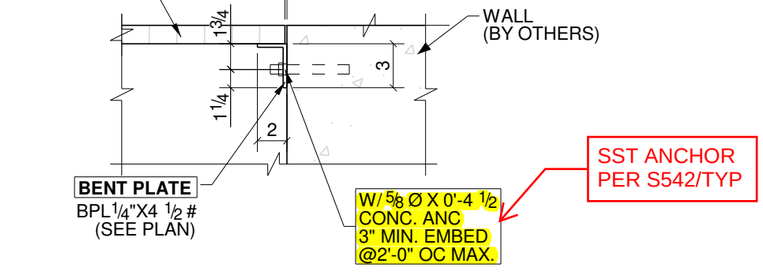
Review Comments:

1. Refer to attached PDF for comments. Verify and address all comments.
2. Contractor to verify and confirm all clouded dimensions.
3. Per specification 05500-3.02.A.2., Contractor shall coat all aluminum surfaces in contact with concrete.
4. The submitted shop drawing appears to not specify aluminum alloy grade. Provide 6061-T6 or 6063-T6 per specification 05500-2.02.H.2.
5. Do not use bent plates for aluminum ledger support. Bending of aluminum plate may lead to cracking and breaking. Provide AL L3x2x1/4 per Detail S542/Typ for the ledger support.
6. Ledger angle concrete anchors shall be Type 316 SST per S542/TYP.
7. Provide welding details of rebate per S542/TYP.





A - A
(REF.DWG.NO: D/02-S-01-301)



DETAIL B
(REF.DWG.NO: S542/00-T-03-713)

GENERAL COMMENT:

- CONTRACTOR SHALL VERIFY AND CONFIRM ALL CLOUDED DIMENSIONS

- PROVIDE ALUMINUM ALLOY GRADE.

ALUMINUM GRATING SUPPORT FRAME PLAN
REF.DWG.=02-S-01-105

PLAN NORTH TRUE NORTH

APPROVER NOTES:

1. PLEASE CONFRIM CLODUED DIM
2. PLEASE CONFIRM CLOUDED REF SIZE & GRATING THICKNESS.

DO NOT USE BENT PLATE, IT MAY BE DIFFICULT TO BEND PLATE AT HARDENED AND TEMPERED STATE, WHICH CAN LEAD TO CRACKING AND BREAKING. PROVIDE AL L 3 x 2 x 1/4 PER DETAIL S542/TYP.

GENERAL NOTE:

L3X2X1/4 = MADE FROM 1/4" THICK BENT PLATE

THIS LOCATION

HEADWORKS

REF. DWGS. : 02-S-01-105

GC NOTE:

ALL DIMENSIONS NEEDS TO BE FIELD VERIFIED PRIOR TO FABRICATION.

DETAILER	ABM	CHECKER	KAR
WELDS	1/4 U.N.O	HOLES	13/16 Ø U.N.O
SURF PREP			
PAINT			

REVISIONS

No	DATE	BY	DESCRIPTION
A	06/30/2025	MKV	FOR APPROVAL

CODY
SPECIALTY METALS FABRICATION
12003 N. LAMAR BLVD. AUSTIN, TEXAS 78753
WWW.CODYBUILDERSSUPPLY.COM
(512) 339-9834

DETAILS OF	ALUMINUM GRATING SUPPORT FRAME PLAN	JOB No.	23240832
CUSTOMER	COUNTRY OF HAWAII		
PROJECT	HILO WWTP REHABILITATION	DRAWING No.	02-E139
LOCATION	HILO, HAWAII		
ENGINEER	BRIAN F. FUNAI		

☑ High Priority

CONTRACTOR SUBMITTAL TRANSMITTAL FORM REV. A

Owner:	County of Hawaii		
Contractor:	Nan, Inc.	**Project No.:**	WW-4705R
Project Name:	Hilo WWTP Phase 1	**Submittal Number:**	05500 - 001.0
Submittal Title:	Grating Support in Grit Basin - Shop Drawing	☐ For Information Only	
TO:	County		
From:	Nan Inc.		

Specification No. and Subject of Submittal / Equipment Supplier			
Spec: 05500	**Paragraph:** 1.04, 2.02		
Authored By:	Cody Builders	**Date Submitted:**	09/08/2025

Submittal Certification

Check Either (A) or (B):

☑ (A) We have verified that the equipment or material contained in this submittal meets all the requirements specified in the project manual or shown on the contract drawings with no exceptions.

☐ (B) We have verified that the equipment or material contained in this submittal meets all the requirements specified in the project manual or shown on the contract drawings except for the deviations listed.

Certification Statement: By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data, and I have checked and coordinated each item with other applicable approved shop drawings and all Contract requirements.

General Contractor's Reviewer's Signature: Jyun-Cheng Jhuo

Printed Name and Title: Jyun-Cheng Jhuo, Project Engineer

In the event, Contractor believes the Submittal response does or will cause a change to the requirements of the Contract, Contractor shall immediately give written notice stating that Contractor considers the response to be a Change Order.

Firm: **Signature:** **Date Returned:**

PM/CM Office Use

Date Received GC to PM/CM:

Date Received PM/CM to Reviewer:

Date Received Reviewer to PM/CM:

Date Sent PM/CM to GC:

Nan, Inc

PROJECT: HILO WWTP REHABILITATION AND REPLACEMENT PROJECT - PHASE 1

JOB NO. WW-4705R

THIS SUBMITTAL HAS BEEN CHECKED BY THIS CONTRACTOR. IT IS CERTIFIED CORRECT, COMPLETE, AND IN COMPLIANCE WITH CONTRACT DRAWINGS AND SPECIFICATIONS. ALL AFFECTED CONTRACTORS AND SUPPLIERS ARE AWARE OF, AND WILL INTEGRATE THIS SUBMITTAL (UPON APPROVAL) INTO THEIR OWN WORK.

DATE RECEIVED 9/8/2025
SPECIFICATION SECTION # 05500
SPECIFICATION Grating Support in Grit Basin
PARAGRAPH 1.04, 2.02
DRAWING Cody Builders
SUBCONTRACTOR na
SUPPLIER Cody Builders
MANUFACTURER Cody Builders

CERTIFIED BY CQCM or Designee :

SECTION 05500

METAL FABRICATIONS

PART 1 GENERAL

1.01 SUMMARY

A. Section includes:
   1. Aluminum grating stair tread.
   2. Aluminum stair nosing.
   3. Cast iron stop plank grooves.
   4. Concrete inserts.
   5. Handrails and guardrails.
   6. Ladders.
   7. Manhole frames and covers.
   8. Metal gratings.
   9. Metal tread plate.
   10. Preformed channel pipe supports.
   11. Stairs.
   12. Miscellaneous metals.
   13. Associated accessories to the above items.

1.02 REFERENCES

A. Aluminum Association (AA):
   1. DAF-45: Designations from Start to Finish.
      a. M12-C22-A41.

B. American Association of State Highway and Transportation Officials (AASHTO):
   1. Standard Specifications for Highway Bridges.

C. ASTM International (ASTM):
   1. A36 - Standard Specification for Carbon Structural Steel.
   2. A48 - Standard Specification for Gray Iron Castings.
   3. A53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded, and Seamless.
   4. A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
   5. A240 - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels for General Applications.
   6. A276 - Standard Specification for Stainless Steel Bars and Shapes.
   7. A307 - Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
   8. A380 - Standard Practice for Cleaning, Descaling, and Passivation of Stainless Steel Parts, Equipment, and Systems.
   9. A489 - Standard Specification for Carbon Steel Lifting Eyes.
   10. A500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.

11. A501 - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
12. A635 - Standard Specification for Steel, Sheet and Strip, Heavy-Thickness Coils, Hot-Rolled, Alloy, Carbon, Structural, High-Strength Low-Alloy, and High-Strength Low-Alloy with Improved Formability, General Requirements for.
13. A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
14. A992 - Standard Specification for Structural Steel Shapes.
15. B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
16. B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
17. B308 - Standard Specification for Aluminum-Alloy 6061-T6 Standard Structural Profiles.
18. B429 - Standard Specification for Aluminum-Alloy Extruded Structural Pipe and Tube.
19. F593 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws and Studs.
20. F3125 - Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi and 150 ksi Minimum Tensile Strength.

D. American Welding Society (AWS):
   1. A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination.

E. National Association of Architectural Metal Manufacturers (NAAMM):
   1. Metal Finishes Manual.

F. Occupational Safety and Health Administration (OSHA).

G. Hawaii Occupational Safety and Health (HIOSH).

1.03 DEFINITIONS

A. Passivation: Removal of exogenous iron or iron compounds from the surface of a stainless steel by means of chemical dissolution resulting from treatment with an acid solution that removes the surface contamination but does not significantly affect the stainless steel itself.

1.04 SUBMITTALS

A. Product Data:
   1. Aluminum grating stair tread.
   2. Aluminum stair nosing.
   3. Cast iron stop plank grooves.
   4. Handrails and guardrails.
   5. Manhole frames and covers.
   6. Metal grating.

B. Shop drawings:
   1. Handrails and guardrails:
      a. Including details on connection attachments, gates, kick plates, ladders, and angles.
      b. Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories.
      c. Include erection drawings, elevations, and details where applicable.
      d. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
   2. Ladders.
   3. Metal grating.
   4. Metal tread plate.
   5. Stairs.
   6. Miscellaneous metals.

C. Samples:
   1. Guardrails with specified finishes.

D. Quality control submittals:
   1. Design data.
   2. Test reports:
      a. Guardrails: 3 copies of certified tests performed by an independent testing laboratory certifying that guardrails meet current State, OSHA and HIOSH strength requirements.
      b. Gratings:
         1) Grating manufacturers' calculations showing that gratings will meet specified design load, stress, and deflection requirements for each size grating for each span.
         2) Reports of tests performed.
      c. Planks:
         1) Plank manufacturers' calculations showing that planks will meet specified load-bearing and deflection requirements for each size plank for each span.
         2) Reports of tests performed.

PART 2 PRODUCTS

2.01 MATERIALS

A. General: Unless otherwise specified or indicated on the Drawings, structural and miscellaneous metals in accordance with the standards of the ASTM, including the following:

Item	ASTM Standard No.	Class, Grade Type or Alloy No.
Cast Iron		
Cast Iron	A48	Class 40B
Steel		
Galvanized sheet iron or steel	A653	Coating G90
Coil (plate)	A635	--
Structural plate, bars, rolled shapes, and miscellaneous items (except W shapes).	A36	--
Rolled W shapes	A992	Grade 50
Standard bolts, nuts, and washers	A307	--
High strength bolts, nuts, and hardened flat washers	F3125, Grade A325	--
Eyebolts	A489	Type 1
Tubing, cold-formed	A500	--
Tubing, hot-formed	A501	--
Steel pipe	A53	Grade B
Stainless Steel		
Plate, sheet, and strip	A240	Type 304* or 316**
Bars and shapes	A276	Type 304* or 316**
Bolts (Type 304)	F593	Group 1 Condition CW
Bolts (Type 316)	F593	Group 2 Condition CW
Aluminum		
Flashing sheet aluminum	B209	Alloy 5005-H14, 0.032 inches minimum thickness
Structural sheet aluminum-	B209	Alloy 6061-T6
Structural aluminum	B209 B308	Alloy 6061-T6
Extruded aluminum	B221	Alloy 6063-T42
* Use Type 304L if material will be welded. ** Use Type 316L if material will be welded.		

1. Stainless steels are designated by type or series defined by ASTM.
2. Where stainless steel is welded, use low-carbon stainless steel.

2.02 MANUFACTURED UNITS

A. Aluminum grating stair tread:
   1. Manufacturers: One of the following or equal:
      a. Harsco Industrial IKG, Aluminum Grating Stair Tread with Mebac® nosing.
      b. McNichols Co., Type A-Standard with Corrugated Angle Nosing.
   2. Material: Welded aluminum grating tread with non-slip nosing and integral end plates for bolt on attachment to stair stringers.
   3. Size:
      a. Tread width: To equal tread spacing plus 1 inch minimum.
      b. Tread length: Length to suit stringer-to-stringer dimension on the Drawings.
      c. Depth: 1-3/4 inches.
   4. Bolts: Type 316 stainless steel.

B. Aluminum stair nosing:
   1. Manufacturers: One of the following or equal:
      a. Wooster Products, Inc., Type 101 Nosing.
      b. American Safety Tread Co., Inc., Style 801 Nosing.
   2. Material: Cast aluminum abrasive nosings with aluminum oxide granules integrally cast into metal, forming permanent, nonslip, long-wearing surface.
   3. For installation in cast-in-place stairs.
   4. Configuration: 4 inches wide, fabricated with integrally cast stainless steel anchors at approximately 12-inch centers. Length to extend within 3 inches of stair edge on each side.

C. Cast iron stop plank grooves:
   1. Manufacturers: One of the following or equal:
      a. Neenah Foundry Co., R-7500 Series, Type A.
      b. McKinley Iron Works, Type L.
   2. Size: 2-inch wide groove opening by 1-1/2 inch deep, unless otherwise indicated on the Drawings.
   3. Recess groove with the cast iron surface of the groove set flush with the concrete surface.

D. Concrete inserts:
   1. Concrete inserts for supporting pipe and other applications are specified in Section 15061 - Pipe Supports.

E. Handrails and guardrails:
   1. General:
      a. Design and fabricate assemblies to conform to current local, State, OSHA and HIOSH standards and requirements.
      b. Coordinate layout of assemblies and post spacings to avoid conflicts with equipment and equipment operators:
         1) Indicate on the shop drawings locations of such equipment.
         2) Highlight locations where railings cannot be made continuous, and obtain Engineer’s directions on how to proceed before fabricating or installing railings.

2. Aluminum handrails and guardrails (nonwelded pipe):
    a. Rails, posts, and fitting-assembly spacers:
        1) In accordance with ASTM B429, 6005, 6063 or 6105, minimum Schedule 40, extruded aluminum pipe of minimum 1.89-inch outside diameter and 0.14-inch wall thickness.
    b. Kick plates: 6061 or 6105 aluminum alloy.
    c. Fastenings and fasteners: As recommended or furnished by the manufacturer.
    d. Other parts: 6063 extruded aluminum, or F214 or F514.0 aluminum castings:
        1) Fabrications: In accordance with ASTM B209 or ASTM B221 extruded bars:
            a) Bases: 6061 or 6063 extruded aluminum alloy.
        2) Plug screws or blind rivets: Type 305 stainless steel.
            a) Other parts: Type 300 series stainless steel.
    e. Finish of aluminum components:
        1) Anodized finish, 0.7 mil thick, applied to exposed surfaces after cutting. Aluminum Association Specification M12-C22-A41, mechanical finish non specular as fabricated, chemical finish-medium matte, anodic coating-clear Class I Architectural.
        2) Pretreat aluminum for cleaning and removing markings before anodizing.
    f. Fabrication and assembly:
        1) Fabricate posts in single, unspliced pipe length.
        2) Perform without welding.
        3) Do not epoxy bond the parts.
        4) Maximum clear opening between assembled railing components as indicated on the Drawings.
    g. Manufacturers: One of the following or equal:
        1) Moultrie Manufacturing Co., Wesrail.
        2) Golden Railings, Riveted System.
        3) Craneveyor Corp. Enerco Metals, C-V Rail.
3. Guardrail gates:
    a. Supplied by guardrail manufacturer:
        1) Of same material, quality, and workmanship as specified for guardrail system in which they will be installed.
        2) Of design similar to that of handrail or railing system in which they will be installed.
    b. Components: Gate frame, stainless steel self-closing device, hinges, gate stops, and durable self-locking type latch. Fabricate components in conformance with OSHA and HIOSH minimum strength requirements.
4. Fastenings and fasteners: As recommended or furnished by guardrail manufacturer for use with this system.

F. Ladders:
    1. General:
        a. Type: Safety type conforming to local, State, OSHA and HIOSH standards as minimum. Furnish guards for ladder wells.
        b. Size: 18 inches wide between side rails of length, size, shape, detail, and location indicated on the Drawings.

2. Aluminum ladders:
    a. Materials: 6063-T5 aluminum alloy.
    b. Rungs:
        1) 1-inch minimum solid square bar with 1/8-inch grooves in top and deeply serrated on all sides.
        2) Capable of withstanding 1,000 pound load without failure.
    c. Side rails: Minimum 4-inch by 1/2-inch flat bars.
    d. Finish of aluminum components:
        1) Anodized finish, 0.7 mil thick, applied to exposed surfaces after cutting. Aluminum Association Specification M12-C22-A41, mechanical finish non specular as fabricated, chemical finish-medium matte, anodic coating-clear Class I Architectural.
        2) Pretreat aluminum for cleaning and removing markings before anodizing.
    e. Fabrication:
        1) Welded construction, of size, shape, location, and details indicated on the Drawings.
        2) For ladders over 6 feet high, furnish fall prevention system designed in accordance with State, OSHA and HIOSH requirements.
    f. Fall prevention system: Include but not limit to railing, brackets, clamps, 2 sleeves, and 2 belts, satisfying OSHA and HIOSH safe climbing requirements:
        1) Manufacturers: One of the following or equal:
            a) North Consumer Products, Saf-T-Climb.
            b) Swager Communications, Climbers Buddy System.

G. Manhole frames and covers:
1. Material: Gray iron castings, in accordance with ASTM A48, Class 30-B.
2. Type: Heavy-duty traffic type, with combined minimum set weight of 265 pounds.
3. Machine horizontal and vertical bearing surfaces to fit neatly, with easily removable cover bearing firmly in frame without rocking.
4. Frame:
    a. Bottom flange type.
    b. Approximately 4-1/2 inches frame height.
    c. Dimensions as indicated on the Drawings:
        1) Minimum inside clear dimension may not be smaller than nominal diameter minus 2 inches.
5. Cover:
    a. Skid-resistant grid pattern design stamped with name of utility service provided by manhole, such as "ELECTRICAL," "SEWER," "TELEPHONE," or "WATER."
    b. Solid type without ventilation holes.
6. Finish: Unpainted.

H. Metal gratings:
1. General:
    a. Fabricate grating to cover areas indicated on the Drawings.
    b. Unless otherwise indicated on the Drawings, grating over an opening shall cover entire opening.

c. Make cutouts in grating where required for equipment access or protrusion, including valve operators or stems, and gate frames.
d. Band ends of grating and edges of cutouts in grating:
   1) End banding: 1/4 inch less than height of grating, with top of grating and top edge of banding flush.
   2) Cutout banding: Full-height of grating.
   3) Use banding of same material as grating.
   4) Panel layout: Enable installation and subsequent removal of grating around protrusions or piping.
   5) Openings 6 inches and larger: Lay out grating panels with edges of 2 adjacent panels located on centerline of opening.
   6) Openings smaller than 6 inches: Locate opening at edge of single panel.
   7) Where an area requires more than 1 grating section to cover area, clamp adjacent grating sections together at 1/4-points with fasteners acceptable to Engineer.
   8) Fabricate steel grating sections in units weighing not more than 50 pounds each.
   9) Fabricate aluminum grating sections in units of weighing not more than 50 pounds each.
   10) Gaps between adjacent grating sections shall not be more than the clear spacing between bearing bars.
e. When requested by Engineer, test 1 section of each size grating for each span length involved on the job under full load:
   1) Furnish a suitable dial gauge for measuring deflections.
f. Grating shall be aluminum, unless otherwise specified or indicated on the Drawings.

Not include in this submittals. Will cover in the next one.

2. Aluminum grating:
   a. Material for gratings, shelf angles, and rebates: 6061-T6 or 6063-T6 aluminum alloy, except crossbars may be 6063-T5 aluminum alloy.
   b. Shelf angle concrete anchors: Type 304 or Type 316 stainless steel.
   c. Grating rebate rod anchors: 6061-T6 or 6063-T6 aluminum alloy.
   d. Bar size and spacing: As determined by manufacturer to enable grating to support design load.
   e. Design live load: A minimum of 100 pounds per square foot uniform live load on entire grating area, but not less than the live load indicated on the Drawings for the area where grating is located.
   f. Maximum fiber stress for design load: 12,000 pounds per square inch.
   g. Maximum deflection due to design load: 1/240 of grating clear span.
   h. Maximum spacing of main grating bars: 1-1/8 inches clear between bars.
   i. Minimum grating height: 1-1/2 inches.
   j. Manufacturers: The following or equal:
      1) Harsco Industrial IKG, Swaged Aluminum I-Bar with striated finish.
3. Steel gratings:
   a. Hot-dip galvanized in accordance with ASTM A123.
   b. Bar size and spacing: As determined by the manufacturer to support design load.
   c. Design live load: A minimum of 100 pounds per square foot uniform live load on the entire area of the grating area, but not less than the live load indicated on the Drawings for the area where the grating is located.

d. Maximum fiber stress for design load: 18,000 pounds per square inch.
e. Maximum deflection under design load: 1/240 of grating clear span.
f. Bar spacing: Maximum of 1-1/8 inches clear between bars.
g. Manufacturers: The following or equal:
1) Harsco Industrial IKG, IKG Weldforged.

4. Heavy-duty steel grating:
a. Heavy-duty type, fabricated from structural steel and designed in accordance with AASHTO Standard Specifications for Highway Bridges, using H-20 loading.
b. Hot-dip galvanized after fabrication in accordance with ASTM A123.
c. Manufacturers: One of the following or equal:
1) Reliance Steel Products Co., Heavy-Duty Steel Grating.
2) Seidelhuber Metal Products, Inc., equivalent product.

I. Metal tread plate:
1. Plate having a raised figured pattern on 1 surface to provide improved traction.

J. Preformed channel pipe supports:
1. Preformed channel pipe supports for pipe supports and other applications are specified in Section 15062 - Preformed Channel Pipe Support System.

K. Stairs:
1. Aluminum stairs:
a. Stringers: 6061-T6 aluminum alloy.
b. Stair treads:
1) Aluminum of same type specified under Aluminum Grating.
2) Of sizes indicated on the Drawings, and 1-3/4 inch minimum depth with cast abrasive type safety nosings.
c. Provide a vertical close piece between each riser. Fabricate, install, and fasten close pieces as indicated on the Drawings.
d. Handrails and guardrails: Aluminum pipe specified under Aluminum Handrails and Guardrails (Nonwelded Pipe).
e. Fasteners: Type 304 or Type 316 stainless steel.

L. Miscellaneous aluminum:
1. Fabricate aluminum products, not covered separately in this Section, in accordance with the best practices of the trade and field assemble by riveting or bolting.
2. Do not weld or flame cut.

M. Miscellaneous cast iron:
1. General:
a. Tough, gray iron, free from cracks, holes, swells, and cold shuts.
b. Quality such that hammer blow will produce indentation on rectangular edge of casting without flaking metal.
c. Before leaving the foundry, clean castings and apply 16-mil dry film thickness coating of coal-tar epoxy, unless otherwise specified or indicated on the Drawings.

N. Miscellaneous stainless steel:
    1. Provide miscellaneous stainless steel items not specified in this Section as indicated on the Drawings or specified elsewhere:
        a. Fabricate and install in accordance with the best practices of the trade.
    2. Cleaning and passivation:
        a. Following shop fabrication of stainless steel members, clean and passivate fabrications.
        b. Finish requirements: Remove free iron, heat tint oxides, weld scale and other impurities, and obtain a passive finished surface.
        c. Provide quality control testing to verify effectiveness of cleaning agents and procedures and to confirm that finished surfaces are clean and passivated:
            1) Conduct sample runs using test specimens with proposed cleaning agents and procedures as required to avoid adverse effects on surface finishes and base materials.
        d. Pre-clean, chemically descale (pickle), and final clean fabrications in accordance with the requirements of ASTM A380 to remove deposited contaminants before shipping:
            1) Passivation by citric acid treatment is not allowed.
                a) If degreasing is required before cleaning to remove scale or iron oxide, cleaning (pickling) treatments with citric acid are permissible; however, these treatments shall be followed by inorganic cleaners such as nitric-hydrofluoric acid.
            2) Provide acid descaling (pickling) in accordance with Table A1.1 of Annex A1 of ASTM A380.
            3) After pickling, final cleaning of stainless steel shall conform to Part II of Table A2.1 of Annex A2 of ASTM A380.
        e. After cleaning, inspect using methods specified for “gross inspection” in ASTM A380.
        f. Improperly or poorly cleaned and passivated materials shall not be shipped and will not be accepted at the job site.

O. Miscellaneous structural steel:
    1. Provide miscellaneous steel items not specified in this Section as indicated on the Drawings or specified elsewhere:
        a. Fabricate and install in accordance with the best practices of the trade.

P. Isolating sleeves and washers:
    1. As indicated on the Drawings and as specified in Section 05190 - Mechanical Anchoring and Fastening to Concrete and Masonry.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of conditions:
    1. Examine work in place to verify that it is satisfactory to receive the work of this Section.
    2. If unsatisfactory conditions exist, do not begin this work until such conditions have been corrected.

3.02 INSTALLATION

A. General:
   1. Install products as indicated on the Drawings, and in accordance with shop drawings and manufacturer's printed instructions, as applicable except where specified otherwise.
   2. Interface between materials:
      a. Dissimilar metals: Where steel comes in contact with dissimilar metals (aluminum, stainless steel, etc.), separate or isolate the dissimilar metals:
         1) Make application so that the isolating or protective barrier is not visible in the completed construction.
         2) Isolating sleeves and washers: As specified in Section 05190 - Mechanical Anchoring and Fastening to Concrete and Masonry.
      b. Aluminum in contact with concrete or masonry: Coat aluminum surfaces as specified in Section 09960 - High Performance Coatings.
      c. Aluminum in contact with concrete or masonry.

B. Aluminum stair nosing:
   1. Install stair nosings on treads of concrete stairs, including top tread on upper concrete slab.
   2. Omit stair nosings where concrete is submerged.
   3. Cast stair nosings in fresh concrete, flush with tread and riser faces. Install nosing in center of step.

C. Cast iron stop plank grooves:
   1. Recess stop plank grooves with cast iron surfaces of groove set flush with concrete surface.

D. Handrails and guardrails:
   1. General:
      a. Fasten pipe rails to fittings with Series 300 stainless steel pop rivets or flush set screws.
      b. Make pipe cuts clean and straight, free of burrs and nicks, and square and accurate for minimum joint-gap.
      c. Drill and countersink holes to proper size, as required for a tight flush fit of screws and other component parts.
      d. Space attachment brackets as indicated in the manufacturer's instructions.
   2. Aluminum pipe handrails and guardrails:
      a. During construction, keep exterior surfaces of handrails and guardrails covered with minimum 0.4 millimeters of heat shrink polyethylene film.
      b. Do not remove protective film before handrails and guardrails have been accepted by Engineer nor before other work in proximity of handrails and guardrails has been completed.
      c. Discontinue handrails and guardrails at lighting fixtures.
      d. Provide 1/8-inch diameter weep hole at base of each post.
      e. Space posts as indicated on the Drawings.
      f. Anchor posts into concrete by grouting posts into formed holes in concrete, into stainless steel sleeves cast in concrete; or bracket mount to face of concrete surfaces as specified and indicated on the Drawings.
      g. Space rails as indicated on the Drawings.

h. Make adequate provision for expansion and contraction of kick plates and rails:
    1) Make provisions for removable sections where indicated on the Drawings.
i. Make lower rails a single, unspliced length between posts, or continuous.
j. Make top rails continuous whenever possible, and attach single, unspliced lengths to 3 posts minimum.
k. Draw up fasteners tight with hand wrench or screw driver.
l. Space attachment brackets as indicated on shop drawings or in manufacturer's installation instructions.
m. Completed installation shall have handrails and railings rigid and free of play at joints and attachments.
n. Protect handrail and guardrail finish from scratches, gouges, dents, stains, and other damage.
o. Replace damaged or disfigured handrails and guardrails with new.
p. Shortly before final acceptance of the work, and after removal of protective polyethylene film, clean handrails and guardrails with mild detergent or with soap and water:
    1) After cleaning, thoroughly rinse handrails and guardrails and wipe with soft cloth.
q. Erect guardrail straight, level, plumb, and true to the positions as indicated on the Drawings. Correct deviations from true line of grade, which are visible to the eye.

3. Guardrail gates:
    a. Install gate to be a vertical plane with the guardrail when in the closed position.
    b. Install hinges so that each gate can swing 180 degrees from the closed position to the fully open position.
    c. Install so that the gates swing to the walkway side of the guardrail only:
        1) Install gate stops on the stationary railing posts to prohibit gates from swinging in the wrong direction.
    d. Install gate frames, hinges, stops, and latches in conformance with OSHA and HIOSH minimum strength requirements.

E. Ladders:
1. Secure to supporting surface with bent plate clips providing minimum 8 inches between supporting surface and center of rungs.
2. Where exit from ladder is forward over top rung, extend side rails 3 feet 3 inches minimum above landing, and return the rails with a radius bend to the landing.
3. Where exit from ladder is to side, extend ladder 5 feet 6 inches minimum above landing and rigidly secure at top.
4. Erect rail straight, level, plumb, and true to position indicated on the Drawings:
    a. Correct deviations from true line or grade which are visible to the eye.

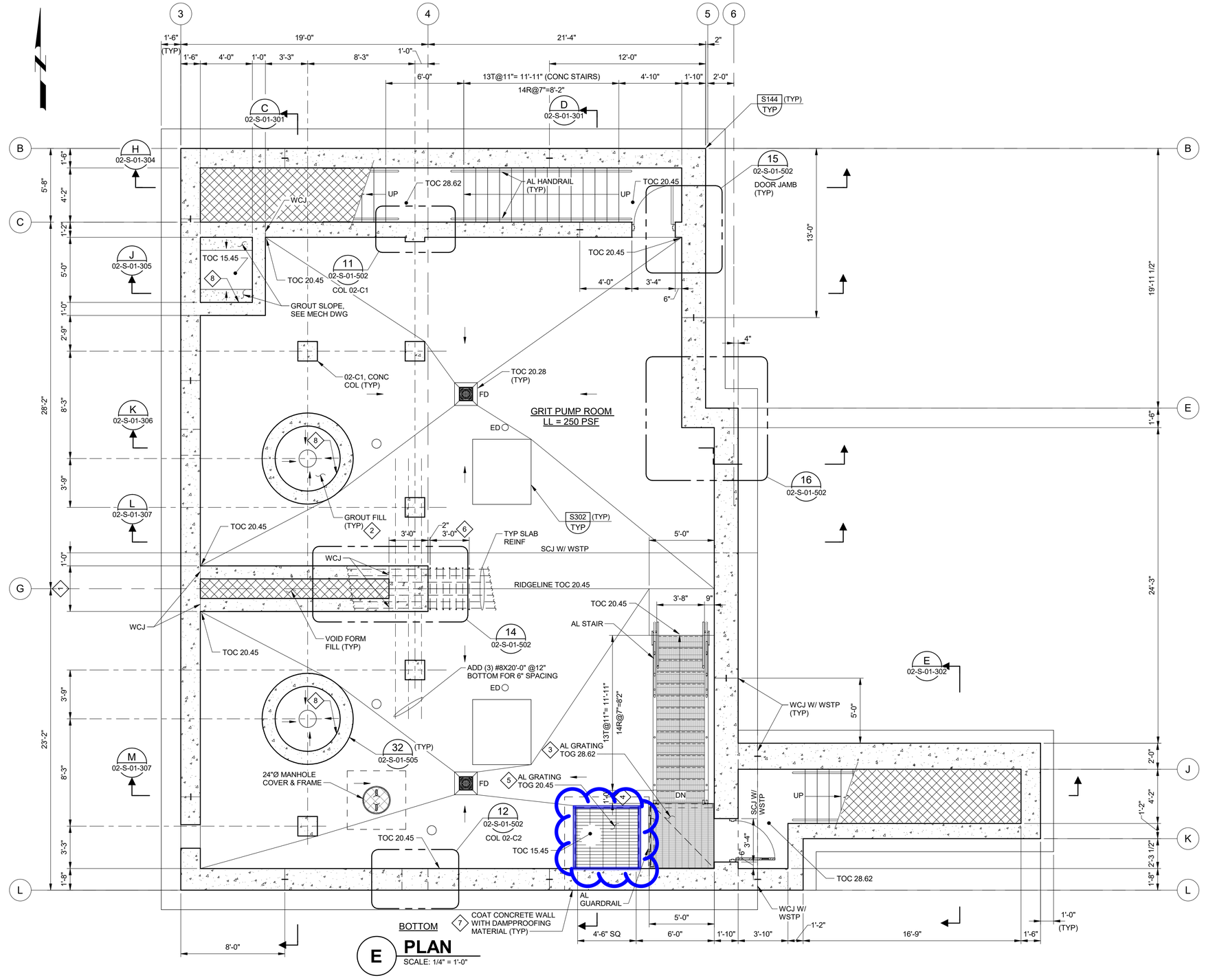
F. Manhole frames and covers:
1. Installation: As recommended by Manufacturer.

G. Metal gratings:
    1. General:
        a. Allow 1/8-inch maximum clearance between ends of grating and inside face of vertical leg of shelf angles.
        b. Horizontal bearing leg of shelf angles shall be 2 inches minimum.
        c. Install aluminum plate or angles where necessary to fill openings at changes in elevation and at openings between equipment and grating.
        d. Install angle stops at ends of grating.
        e. Installed grating shall not slide out of rebate or off support.
        f. Weld stops in place, unless otherwise specified or indicated on the Drawings.
        g. Top surfaces of grating sections adjacent to each other shall lie in same plane.
    2. Aluminum grating:
        a. Aluminum grating: Support on aluminum shelf angles or rebates.
    3. Steel grating:
        a. Support on hot-dip galvanized structural steel shelf angles or rebates.
    4. Heavy-duty steel grating:
        a. Support on hot-dip galvanized structural steel rebates embedded and anchored in concrete.
        b. Use for roadways, traffic areas, and where indicated on the Drawings.

H. Stairs:
    1. General:
        a. Install guard railings around stair wells as indicated on the Drawings or specified.

I. Stainless Steel:
    1. Welding:
        a. Passivate field-welded surfaces:
            1) Provide cleaning, pickling and passivating as specified in this Section.
            2) Clean using Derustit Stainless Steel Cleaner, or equal.

END OF SECTION



BOTTOM

E PLAN

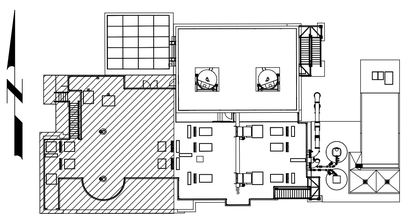
SCALE: 1/4" = 1'-0"

GENERAL NOTES:

1. FOR GENERAL STRUCTURAL NOTES SEE DRAWING 00-S-01-001.
2. FOR STRUCTURAL TYPICAL SECTION SUBGRADE DETAILS SEE DRAWING 00-S-01-002.
3. 02-C#: FOR CONCRETE COLUMN SCHEDULE SEE DRAWING 00-S-01-005.
4. NOT ALL STRUCTURAL PENETRATIONS ARE SHOWN AND/OR DIMENSIONED. COORDINATE ALL PENETRATIONS AND/OR CONNECTIONS WITH MECHANICAL DRAWINGS. PROVIDE ADDITIONAL REINFORCING BARS PER S180/TYP & S181/TYP.
5. SEE ELECTRICAL, HVAC, AND MECHANICAL DRAWINGS FOR LOCATION AND SIZE OF EQUIPMENT PADS. CONTRACTOR SHALL COORDINATE WITH EQUIPMENT MANUFACTURER FOR EXACT LOCATION AND SIZES OF EQUIPMENT PADS. PROVIDE EQUIPMENT PADS PER S302/TYP, UNLESS NOTED OTHERWISE.
6. FOR DOOR SCHEDULE SEE ARCHITECTURAL DRAWINGS.
7. CONCRETE JOINTS ARE DESIGNATED AS FOLLOWS:
   - EXP JT = EXPANSION JOINT, SEE S130/TYP.
   - SCJ = SLAB CONSTRUCTION JOINT, SEE S110/TYP.
   - WCJ = WALL CONSTRUCTION JOINT, SEE S110/TYP.
   - CONSTRUCTION JOINTS SHALL BE ROUGHENED TO 1/4" AMPLITUDE.
   - REINFORCING BAR LAP SPLICING LOCATIONS SHALL CLEAR CONSTRUCTION JOINTS.
8. VOID FORM FILL PER SPECIFICATION 03111.
9. FOR ALUMINUM GUARDRAIL/HANDRAIL SEE DETAILS AC500/TYP, AC504/TYP & AC510/TYP. PROVIDE WITH EMBEDDED POST.
10. FOR ALUMINUM STAIR SEE DETAIL AC101/TYP. STAIR TREAD RISERS SHALL BE AT EQUAL SPACING.
11. CONCRETE STEPS PER AC146/TYP. STEP RISERS SHALL BE AT EQUAL SPACING.
12. FD: INDICATES HEAVY DUTY FLOOR DRAIN, SEE MECHANICAL DRAWINGS.

KEY NOTES:

1. FOR CONCRETE THICKNESS SEE DRAWING 02-S-01-106.
2. PROVIDE GROUT FILL AS REQUIRED BY GRIT BASIN MANUFACTURER. GRIT BASIN MANUFACTURE TO PROVIDE ELEVATION OF GRIT HOPPER BOTTOM BASED ON GRIT PUMP SUCTION PIPE ELEVATION.
3. GRATING SUPPORT ALUMINUM BEAMS AND BRACES PER AC130/TYP. PROVIDE CAST-IN-PLACE ANCHOR BOLTS WITH 8" MINIMUM EMBEDMENT.
4. STAIR TOP TREAD.
5. PROVIDE GRATING REBATE PER S542/TYP.
6. ADD (7) #4 STIRRUPS AT 6" SPACING, SEE DETAIL 54/02-S-01-511.
7. COAT EXTERIOR FACE OF CONCRETE WALLS BELOW EL 40.00 WITH DAMPPROOFING MATERIAL IN ACCORDANCE WITH SPECIFICATION 07110.
8. COAT ALL EXPOSED INTERIOR CONCRETE SURFACES OF THE HEADWORKS CHANNELS & GRIT TANKS, EXCEPT FLOORS, WITH ELASTOMERIC POLYURETHANE COATING "POL-C-1-BSC" IN ACCORDANCE WITH SPECIFICATION 09960. THE EXPOSED INTERIOR CONCRETE SURFACES INCLUDE THE BOTTOM SIDE OF THE TOP SLAB, THE WALLS AND THE SIDES OF OPENINGS THAT PENETRATE THE TOP SLABS AND WALLS.



KEY PLAN

REV	DATE	BY	DESCRIPTION

DESIGNED HCC
DRAWN TVN
CHECKED JAD
DATE APR 2024

MICHAEL E. DADIK — LICENSED PROFESSIONAL ENGINEER — No. 17908-S — HAWAII — 4/12/2024 — PAGES OR SHEETS COVERED BY THIS SEAL — 20/12/2025 EXPIRATION DATE OF THIS LICENSE

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

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

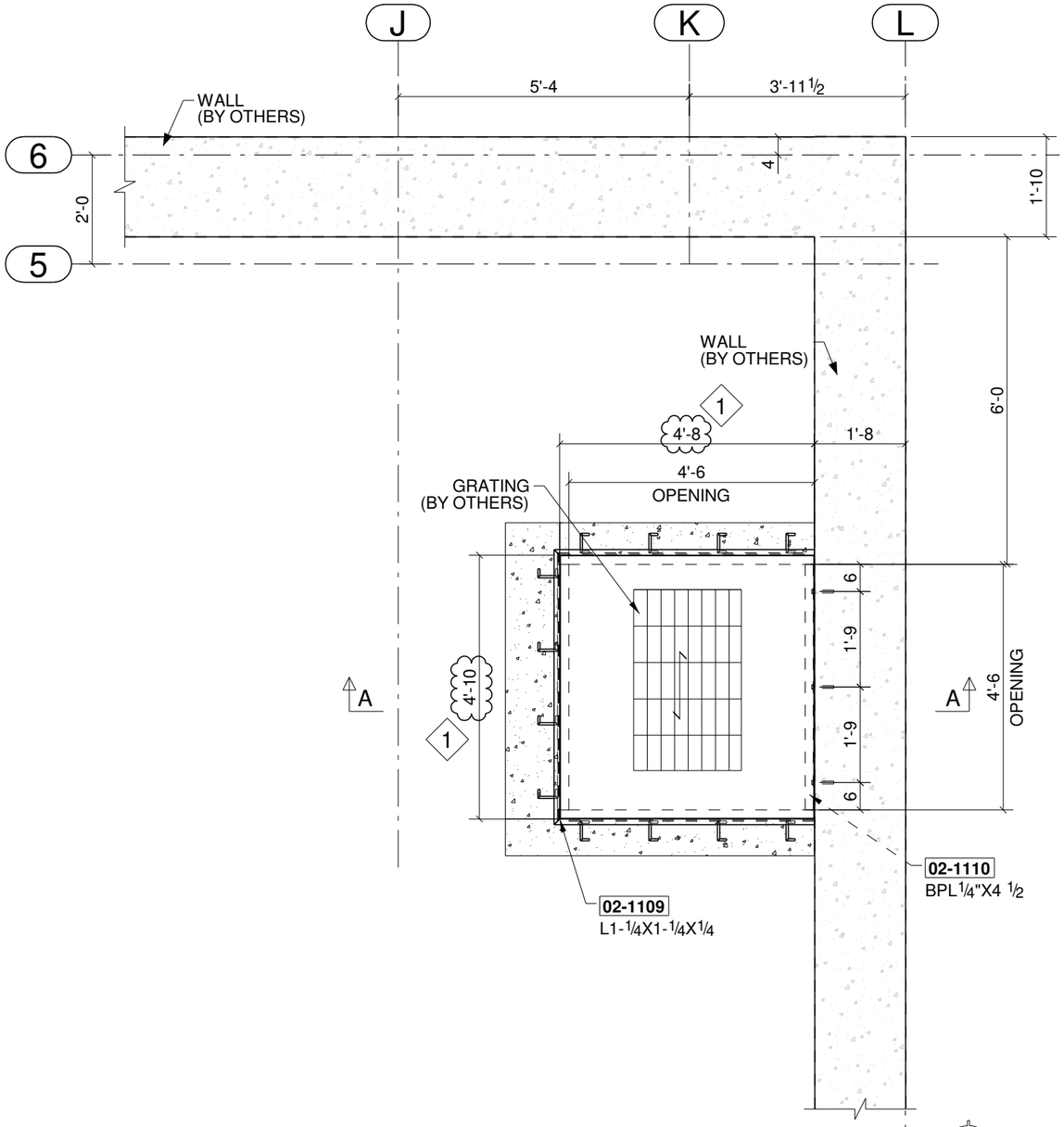
carollo

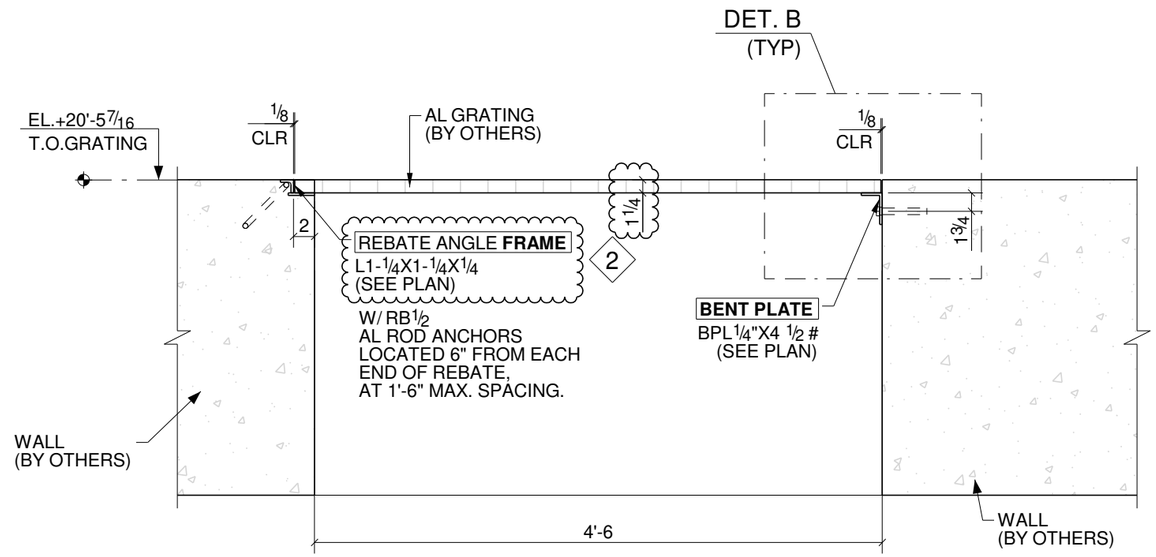
COUNTY OF HAWAII
HILO WWTP REHABILITATION AND REPLACEMENT PROJECT PHASE 1
STRUCTURAL
GRIT BASINS BOTTOM PLAN

JOB NO. 201400
DRAWING NO. 02-S-01-105
SHEET NO. 238 of 1000

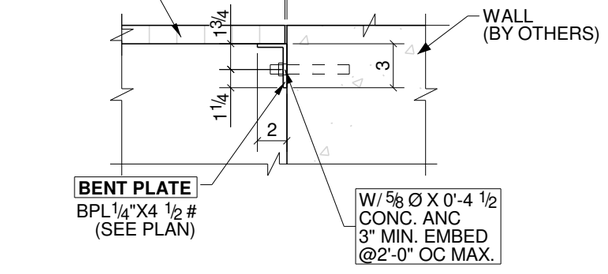
PLOT DATE: 3/19/2024 8:14:08 AM

FILE NAME: R:\d1361567\201400_02S0801.rvt





A - A
(REF.DWG.NO: D/02-S-01-301)



DETAIL B
(REF.DWG.NO: S542/00-T-03-713)

ALUMINUM GRATING SUPPORT FRAME PLAN
REF.DWG.=02-S-01-105

PLAN NORTH TRUE NORTH

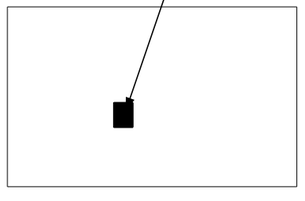
APPROVER NOTES:

1. PLEASE CONFRIM CLODUED DIMENSIONS.
2. PLEASE CONFIRM CLOUDED REBATE ANGLE SIZE & GRATING THICKNESS.

GENERAL NOTE:

L3X2X1/4 = MADE FROM 1/4" THICK BENT PLATE

THIS LOCATION



HEADWORKS

REF. DWGS. : 02-S-01-105

GC NOTE:

ALL DIMENSIONS NEEDS TO BE FIELD VERIFIED PRIOR TO FABRICATION.

DETAILER	ABM	CHECKER	KAR
WELDS	1/4 U.N.O	HOLES	13/16 Ø U.N.O
SURF PREP			
PAINT			

REVISIONS

No	DATE	BY	DESCRIPTION
A	06/30/2025	MKV	FOR APPROVAL

CODY
SPECIALTY METALS FABRICATION
12003 N. LAMAR BLVD. AUSTIN, TEXAS 78753
WWW.CODYBUILDERSSUPPLY.COM
(512) 339-9834

DETAILS OF	ALUMINUM GRATING SUPPORT FRAME PLAN	JOB No. 23240832
CUSTOMER	COUNTRY OF HAWAII	
PROJECT	HILO WWTP REHABILITATION	DRAWING No. 02-E139
LOCATION	HILO, HAWAII	
ENGINEER	BRIAN F. FUNAI	