3.0 RULE 6.3.3: EXHIBIT C–PROCESS FACILITY OPERATING PLAN

3.1 DESIGN CRITERIA

Design criteria used to develop the flowsheet, operating parameters, and equipment sizes are based on metallurgical test work and engineering designs. Key design criteria are summarized in **Table 3-1**.

TABLE 3-1: MILL DESIGN CRITERIA

No.	Parameter	Value	Unit
1	Plant Capacity	200	tpd
2	Plant Availability	90%	-
3	Operating Hours	24	hr/day
4	Feed Rate	9.26	tph
5	Ball Mill Feed, F80	12,500	micron
6	Ball Mill Product, P80	104	micron
7	BWi	15.45	kWh/t
8	Ball Mill Discharge	65%	solids
9	Cyclone Feed	50%	solids
10	Circulating Load	250%	-
11	Cyclone O/F	30%	solids
12	Cyclone U/F	50%	solids
13	Thickener U/F	35%	solids
14	Flotation Feed	35%	solids
15	Rougher Flotation Residence	22.5	minutes
16	Rougher Concentrate	15%	solids
	Mass Pull	**6%**	
17	Rougher Tailings	44.2%	solids
18	Cleaner Flotation 1	15	minutes
19	Cleaner Flotation 2	15	minutes
20	Concentrate Thickener		
	Settling Rate	11	ft2/tpd
	Feed	15%	solids
	Thickener U/F	50%	solids
21	Concentrate Filter		
	Filtration Rate Rate	100	lbs/hr/ft2
	Area Required	8	ft2
22	Tailings Thickener	8	ft-diameter
23	Tailings Filter	40	ft2

3.1.1 AREA 100 CRUSHING CIRCUIT

The crushing circuit design is based on the ability of the crusher to:

- Produce a consistent P_{80} -18mm (≈11/16") product for the ball mill, as shown in **Table 3-2**. Testing shows that this can be accomplished with a single short-head cone crusher. However, the flowsheet provisions the future addition of a primary jaw crusher preceding the cone crusher.

TABLE 3-2: CRUSHER PERFORMANCE CRITERIA

Equipment Performance	Value	Unit
Primary Crusher		
Feed	57	stph
F_{80}	50	mm
P_{80}	18	mm
Screen Aperture	18	mm

- Operate only during day shift.
- Control dust emissions.
- Operate below county noise limit of 75dBA.
- Maintain low seismicity

3.1.2 AREA 200 GRINDING CIRCUIT

The grinding circuit design is based the ball mill's ability to produce 200tpd of P_{80} 104 (140mesh) material for leaching. Metallurgical test work has determined that the existing Marcy No. 54 (5'-diameter by 4' length) will meet this criterion.

Grinding circuit equipment performance criteria are shown in **Table 3-3**.

TABLE 3-3: GRINDING & GRAVITY PERFORMANCE CRITERIA

Equipment Performance	Value	Unit
Fine MDM Bin Capacity	250	st
Ball Mill		
F_{80}	12,500	micron
P_{80}	104	micron
BWI	15.45	-
Operating Hours	20	hr/day
Horsepower	40	hp
Horsepower Max	50	hp
Ball Mill Sump		
Flowrate	600	gpm
Residue Time	4	min
Sump Capacity (@90% capacity)	2,670	gal

Cyclone		
Operating Units	1	units
Standby Units	1	units
Flowrate, total	300	gpm
Flowrate, per unit	300	gpm
Gravity Concentrator		
Feed	30%	solids
Capacity	18	tph
MDM Thickener		
Feed	30%	Solids
Dimension	11ftD x 8ftH	-
Volume	760	ft^3

3.1.3 AREA 300 FLOTATION, THICKENING & FILTRATION

Flotation & gravity performance is determined by metallurgical testing which included determining optimum grind size (for ball mill sizing and retention time, as well as flotation retention time.

Tailings are filtered to reduce water content to approximately 25% by weight prior to stacking in FTL facility. Filtered tailings are deposited at a rate of 9.0tph, using conventional filter technology and flocculants to minimize tailings moisture content.

Flotation performance criteria determined in metallurgic testing are shown in **Table 3-4**.

TABLE 3-4: FLOTATION PERFORMANCE CRITERIA

Area	Value	Units
Rougher Flotation Cells		
Feed	35	% solids
No. of tanks	3	units
Tank Dimension (each)	7ftD x 9ftH	-
Total Volume	1,039	ft^3
Cleaner Flotation Cells		
Feed	15	% solids
No. of tanks	4	units
Tank Dimension (each)	3.5ftD x 9ftH	-
Total Volume	346	ft^3
Concentrate Thickener		
Feed	15%	solids
Dimension	3ftD x 7ftH	-
Volume	1132	ft3
Concentrate Filter		
Feed	60%	solid
Settling Rate	11	ft^2/tpd
Filtration Rate	100	lb/ft^2-hr
Area Required	12	ft^2

Tailings Thickener		
Feed	44%	Solids
Dimension	8ftD x 7ftH	-
Volume	352	ft^3
Tailings Filter		
Feed	60%	solid
Settling Rate	11	ft^2/tpd
Filtration Rate	100	lb/ft^2-hr
Area Required	40	ft^2

3.1.4 AREA 700 UTILITIES

The Mill is an existing facility constructed circa 1990, and improvements were made during 2009-2012 as well as 2021-2022. Requisite utilities and services are in place and functional.

Electrical & Instrumentation.

- Switchgear is in place within the mill building and is suitable for equipment.
- A new transformer was installed in 2022.
- The Crusher Building (Area 100), and Mill Building containing the Grinding & Gravity (Area 200), and Flotation (Area 300) will be connected to the existing power supply by licensed electrical contractors.
- Instrumentation. The process facility is operated by manual observation and control of process through installed sensors and instruments. There is no Programmable Logic Controller (PLC) system.

Water & Sanitation.

- Process and potable water is provided by Parkville Water District via a connection to the Leadville Sanitation water line. Potable water is stored in separate, stand-alone stainless steel tanks.
- Employees and guests have accessed to hot and cold bottled drinking water.
- Fire water is provided by a hydrant from the process water line.
- The facility is connected to the Leadville Sanitation sewer line, which runs through the property.

Communication.

- Communication is via wireless service providers.

Mobile Equipment.

- Skid Steer

- ¾-ton 4x4 pickup

3.1.5 AREA 800 REAGENTS

Reagent Handling.

- Manually load bulk reagents into hoppers or mix tanks to make reagent solution.
- Pump reagent solutions to reaction vessels.

Reagent Management.

Reagent Requirement is discussed in **Section 3.3.6**.

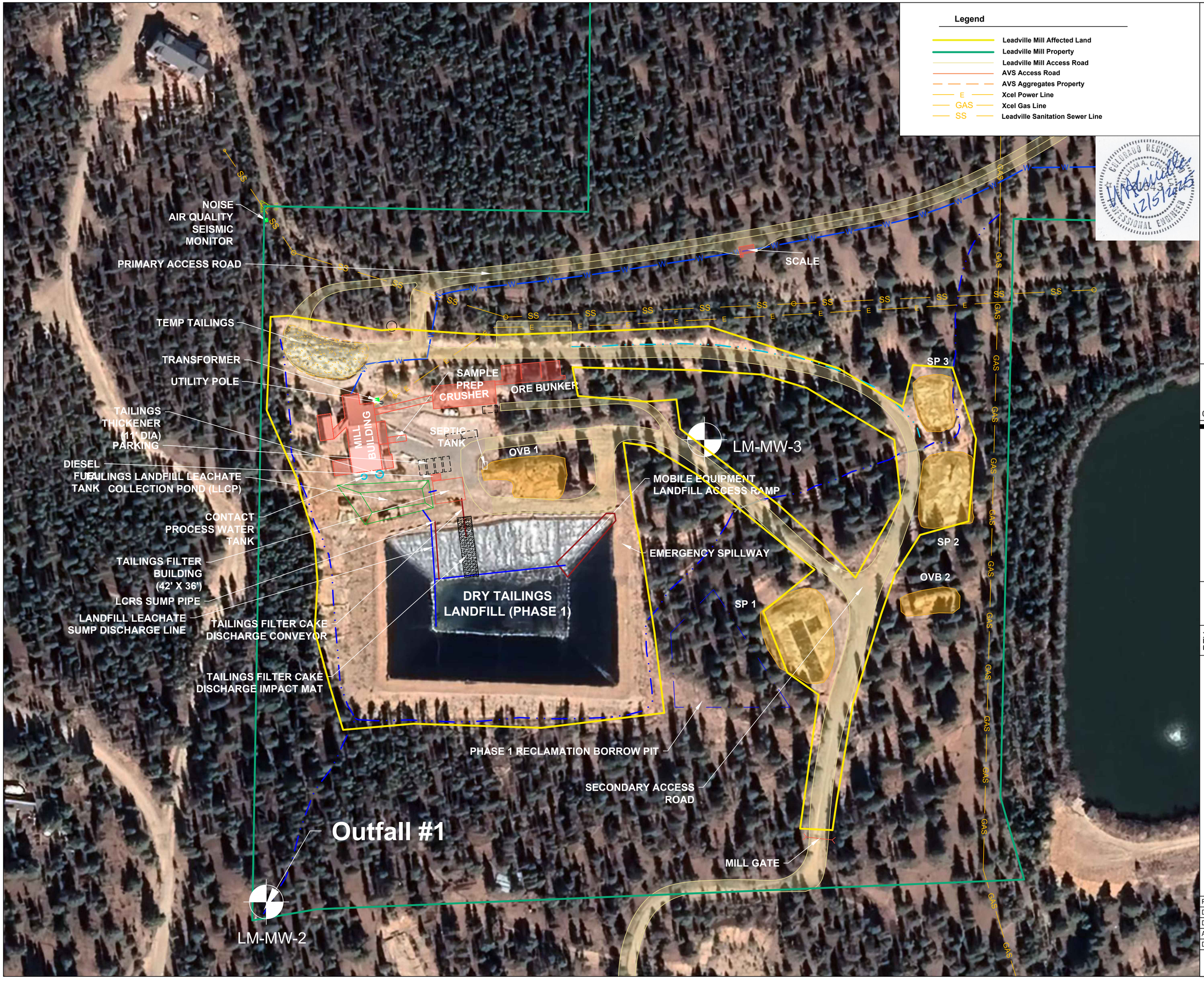
3.2 MILL SITE & PROCESS PLANT OVERVIEW

The plant has been designed to operate at a nominal rate of 9.3tph ore throughput using 3 8-hr shifts per day for a 20-shift cycle, with the 21st shift reserved for maintenance. Annual production will be a nominal 70,000 tons, operating 350 days per year. It is estimated that the plant will be down 15 days per year for maintenance, and unplanned events.

The process is described as conventional flotation and gravity concentration to produce a gold-silver concentrate which will be shipped to a smelter/refining facility. Tailings from the operation will be filter and disposed in the **Filtered Tailings Landfill (FTL)**.

The plant is designed to be zero discharge, and is protected by the freeboard in the (already constructed) FTL.

This permit amendment application considers the processing of approximately 500,000 tons of historic **Mine Dump Material (MDM)** from the historic Penn Group Mines. The plant general arrangement is shown in **Figure 3-1**.



AEC AMERICAN ENVIRONMENTAL CONSULTING, LLC.
8191 Southpark Lane, Suite 107, Littleton, CO 80120
phone 303-948-7733 fax 303-948-7739

0 80'

REV. NO.	DATE	REVISION DESCRIPTION
0	12/6/2023	ISSUED FOR CLIENT REVIEW
1	12/02/2025	ISSUED FOR CLIENT REVIEW

REVISIONS

SITE GENERAL ARRANGEMENT

LEADVILL MILL PERMIT APPLICATION

LEADVILLE, COLORADO

FIGURES BASE REV 12.4.2025.dwg

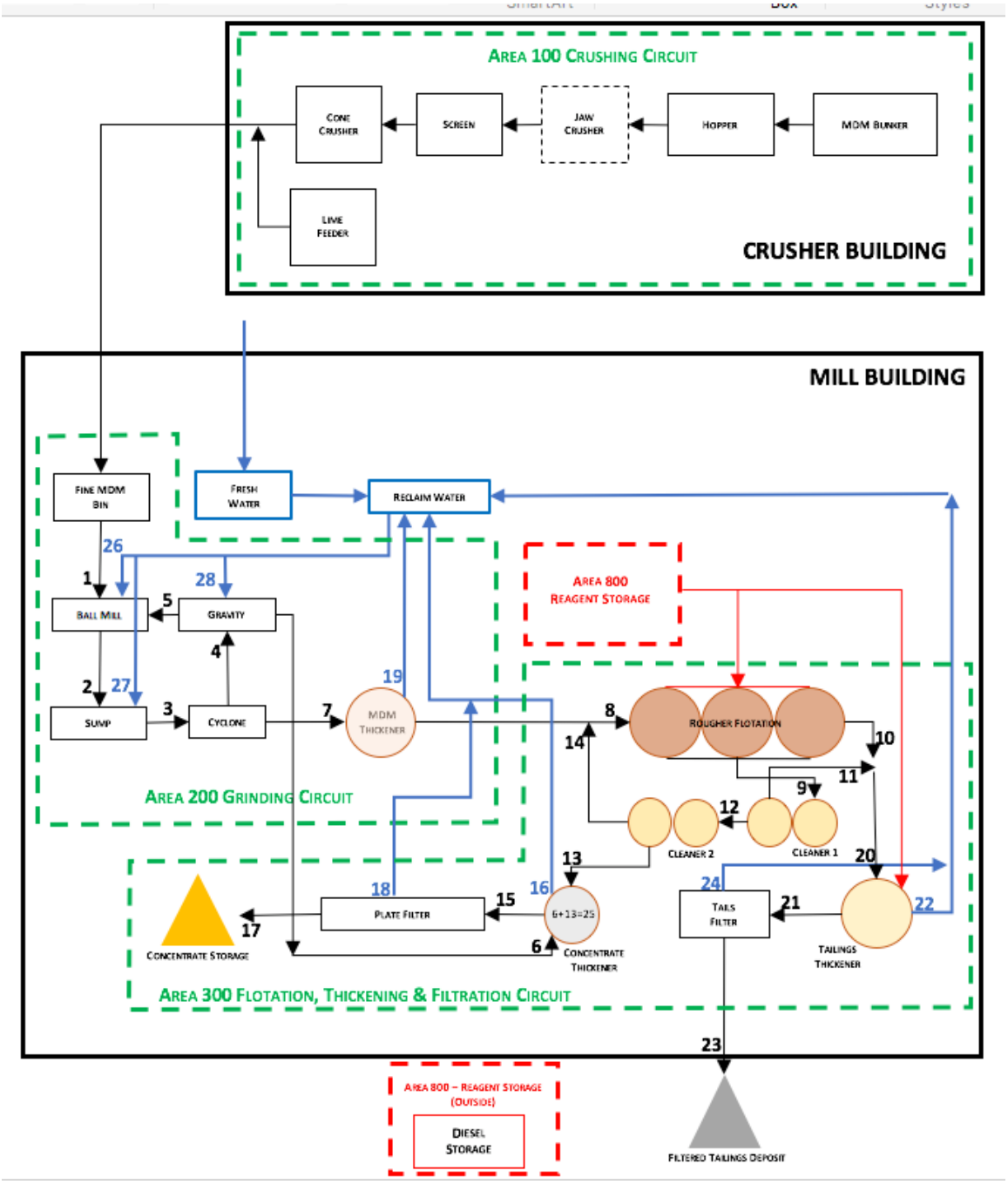
PROJECT NO:	--
DESIGNED BY:	MBT
DRAWN BY:	MBT
APPROVED BY:	WC
DATE:	12/6/2023

FIGURE
3-1 OF 1

3.2.1 -PROCESS FLOWSHEET, MATERIAL BALANCE & PLANT CAPACITIES

The metallurgical process uses time-tested gravity and bulk flotation to make a gold-silver concentrate that will be shipped to a 3rd-party smelter/refinery. A simplified process flowsheet is shown below. The process detailed in **Section 3.3**.

SIMPLIFIED PROCESS FLOWSHEET



MATERIAL BALANCE

Table 3-5 shows the process material balance with corresponding process streams depicted in a simplified process flowsheet.

TABLE 3-5: PROCESS MATERIAL BALANCE

Flow Sheet Stream	Description	Solids	Flow Rate (tph)		Slurry
		%	Solids	Water	(gpm)
1	Crushed Ore	96.0%	9.26	0.39	-
2	Ball Mill Discharge	57.0%	23.15	17.46	104.6
3	Cyclone Feed	39.5%	23.15	35.50	175.9
4	Cyclone Underflow	50.0%	3.89	13.89	76.5
7	Cylcone Overflow	30.0%	9.26	21.61	100.7
28	Process Water to Gravity	-	-	27.78	-
6	Gravity Concentrate	90.0%	0.14	0.02	0.3
5	Gravity Tailing	33.1%	13.75	27.76	132.7
26	Process Water to Mill	-	-	10.69	44.9
27	Water to Sump	-	-	8.04	75.7
8	Thickener Underflow	35.0%	9.26	17.20	82.9
19	Thickener Overflow	-	-	0.84	3.5
9	Rougher Flotation Concentrate	15.0%	1.85	10.48	44.9
10	Rougher Flotation Tailing	44.2%	7.41	9.34	49.0
12	Cleaner 1 Concentrate	15.0%	0.37	2.10	9.0
11	Cleaner 1 Tailing	14.2%	1.48	8.88	38.7
13	Cleaner 2 Concentrate	15.0%	0.09	0.51	2.2
14	Cleaner 2 Tailing	15.0%	0.28	1.59	6.8
20	Combined Tailing	32.8%	8.89	18.22	85.8
21	Tailing Thickener Underflow	60.0%	8.89	5.92	36.5
23	Filtered Tailing	80.0%	8.89	2.22	22.1
22	Thickener Overflow	-	-	12.30	51.6
24	Filtrate	-	-	3.70	15.5
25	Concentrate Thickener Feed	30.3%	0.23	0.53	2.5
15	Concentrate Thickener U/F	60.0%	0.23	0.13	1.0
16	Concentrate Thickener O/F	-	-	0.40	1.7
17	Final Concentrate	80.0%	0.23	0.06	0.6
18	Concentrate Filtrate	-	-	0.07	0.3

PLANT MATERIAL CAPACITIES

Plant material capacities, including reagents are shown in **Table 3-6**. A detailed discussion of plant operations is provided in **Section 3.3**.

TABLE 3-6: PLANT MATERIAL CAPACITIES

Mech Equip No	Flow Sheet Ref	Process Equipment	Solid: Soln Ratio	% solids	Total Volume (ft3)	Ton Solids	Ton Water	Gal Water	Lime (lbs)	AP 3418A (lbs)	AP 404 (lbs)	AF 65 (lbs)	Percol 351 (lbs)
1	1	MDM Bin	2.70	96%	2,968	240	10	2,397	1,920	0	0	0	0
1	1-2	Ball Mill	0.31	77%	31	0.2	1	180	2	0	0	0	0
2	3-4-7	Cyclone	1.51	40%	-	-	-	-	-	-	-	-	-
3	4-5	Gravity Concentrator	1.41	42%	-	-	-	-	-	-	-	-	-
4	7-8	Feed Thickener Tank	2.08	33%	760	16	8	1,847	128	0	0	0	0
5	8	Conditioner Tank	1.86	35%	75	2	1	197	12	0.16	0.16	0.07	0.05
6	8-10	Rougher Flotation Tanks	1.51	40%	1,039	19	13	3,096	156	2.09	2.09	0.83	0.63
7	9-13-14	Cleaner Flotation Tanks	5.67	15%	346	9	2	388	73	0.98	0.98	0.39	0.29
8	13-15	Concentrate Thickener	1.67	38%	113	2	1	317	18	0.24	0.24	0.09	0.07
9	15-17	Concentrate Filter	0.43	70%	12	0	0	65	1	0.01	0.01	0.00	0.00
10	20-21	Tailings Thickener Tank	1.16	46%	352	6	5	1,221	47	0.63	0.63	0.25	0.19
11	21-23	Tailings Filter	0.43	70%	372	3	8	1,947	28	0.37	0.37	0.15	0.11
12	15-17	Concentrate Filter	0.43	70%	37	0	1	194	3	0.04	0.04	0.01	0.01
13	26-28	Reclaim Water Tank	-	0%	545	0	17	4,075	0	0.00	0.00	0.00	0.00
14	-	Fresh Water Tanks	-	0%	1,378	0	43	10,303	0	0.00	0.00	0.00	0.00
		TOTAL			**8,029**	**298**	**109**	**26,227**	**2,388**	**4.52**	**4.52**	**1.81**	**1.36**

Process water consumption is shown in **Table 3-7**. Approximately 110-tons of water is in the system during steady state operation. About 27,000-gallons per hour of water is circulating at any given time, of which about 2-tons per hour reports to tailings, and so is made up with fresh water.

Make-up is purchased from Parkville water and delivered via pipeline.

TABLE 3-7: PROCESS WATER REQUIREMENT

Process Water	Water (tph)	Slurry (gpm)
Tank Inflow	27.16	114.0
Water Required	24.98	94.3
Make-Up Water	**2.18**	**19.7**

Reagent consumption is discussed in **Section 3.3.5**.

3.3 PLANT OPERATION

Plant operations are as follows.

3.3.1 AREA 000 RECEIVING MINE DUMP MATERIAL (MDM)

Battery Limits: Haul road at AVS-Mill property boundary to dumping at the **MDM Bunker**.

Equipment: Hauling operations have been identified as an area of concern by Lake County, and will be addressed during the **CUP** process. As such, CJK is considering the use of 2 haul truck types.

Remediation material will be delivered using either 18-ton tandem dump trucks or 21-ton semi tractor-trailer trucks. Initially, the plant will be constructed to accommodate tandem trucks. The process can be easily modified to accommodate semi tractor-trailers, as described below.

Nominally, there will be about 10 to 15 truck trips per day, assuming the planned 7-day per week operation. It is anticipated that hauling will only be allowed during daylight hours.

Reagents: Water will be used for dust suppression on the haul road. Consumption is weather dependent and it is anticipated will vary from approximately 0 to 500 gallons per day (gpd).

Operation: The haul road is approximately 4,100ft in length, and 25ft wide. Curves have a radius to accommodate semi-tractor trailer trucks, and are of sufficient width to allow trucks to pass at a slow speed. Approximately 2,500ft of the road is on the AVS Project property and 1,600ft on the Mill property. The scale is located on the AVS Property and is shared with the CJK Aggregates facility.

- Haul trucks enter the Mill via the AVS Slag Project entrance and road off of **US Highway 24 (US-24)**. This entrance is located at the intersection of US-24 and County Road 23A. Then,
- Travel approximately 900ft to weigh-in at scales at AVS property. The scale may be covered for protection from the weather. The truck is identified by a unique transponder and the information is electronically recorded on the Mill data logger. Then,
- Travel approximately 3,200ft to unload into the MDM Bunker. There is a staging (wide) area on the road, just north of the Mill building where trucks can wait if a truck is unloading. Then,
- Trucks will back into MDM Bunker to unload. Then,

- Trucks will exit the MDM Bunker area via a short road connecting to the main haul road that is located in front of the staging area. Then,
- The truck transponder also transmits the tare weight to determine the net weight of delivered material.

Engineering

- The haul road will be an extension of the AVS haul road. When approved, this activity will require clearing trees, grading in the road, and placing an aggregate surface. No engineering is required.

3.3.2 AREA 100 CRUSHING CIRCUIT

PLANNED OPERATION

Battery Limits: MDM Bunker to the **Fine Ore MDM Bin (MDM Bin)**.

Equipment: Equipment and infrastructure associated with the crushing circuit is shown in **Table 3-8**.

TABLE 3-8: CRUSHER CIRCUIT EQUIPMENT

Equipment Number	Flow Sheet	Equipment Description	Size
-	-	Crusher Metal Building	30' x 84'
-	-	Crusher Bunker	800t
100-BN-001	1	Feed Hopper	2t
100-FD-004	1	Belt Feeder w/ VFD Drive	3'x5'
100-MG-001	1	Tramp Metal Magnet	-
100-SC-000	1	Triple Deck Screen	4'x10'
100-SC- 001	1	Single Deck Screen	3'x5'
100-CV-009	1	Screen Under- size conveyor	18"x5'
100-CV-010	2	MDM Bin Feed conveyor	18"x120'
100-CR-002	1	Short-Head Cone Crusher	22"
100-CV-004	1	Screen Over-size Conveyor to Cone	18" x 16'
	1	Cone Discharge Conveyor	18" x 6'
100-CV-005	1	Cone Transverse Conveyor # 1	18" x 6'
	1	Cone Transverse Conveyor # 2	18" x 22'
100-CV-007	1	Cone Transverse Conveyor # 3- to Screen	18" x 8'
700-BN-001	1	Lime Feed Hopper / Bag Breaker	-
700-SF-001	1	Lime Screw Feeder - VFD	7stph
-	-	Front-End Loader	2yd^3
-	-	Bag House & Ventilation Ducting	-

Operation: Reference the following.

- **Figure 3-2**, Crusher Circuit PFD,
- **Figures 3-3A, 3-3B** Crusher Building General Arrangement, and
- **Figure 3-4 S1 to 3-4 S7** Crusher Building Engineering Drawings.

The Operation is described as follows:

Crushing Circuit PFD (Figure 3-2)

- The MDM Bunker is a 3-compartment concrete structure with a total capacity of 200-tons. Water sprays will be available and will operate as required to control dust.
- A $2yd^3$ loader reclaims material from the bunker and feeds it into a 2-ton crusher feed hopper. Maximum loader feed rate as required by the process is 30 tons per hour.
- The feed hopper is located in front of a 30' x 84' crushing and screening building. The building is insulated to retain heat and noise, and properly rated for snow loads.
- A tramp iron magnet captures iron from the crusher feed conveyor. Periodically, iron is removed from the magnet, and placed in a barrel. Tramp iron is recycled at local (or regional) recycler.
- Material is crushed in a 22-inch short-head cone crusher. Nominal required crushing capacity is 57 tons per hour.
- Material is screened to specification. Spec material is conveyed to the MDM Bin, and oversize material – about 20% of feed is recirculated back to the crusher.
- A lime feeder applies lime onto the crushed material at a rate of 8lb-$Ca(OH)_2$/t-material as it is conveyed to the MDM Bin Conveyor.
- Dust collectors capture dust at all transfer points.
- The circuit has a provision for adding a jaw crusher to the process facility. A technical Revision to the permit application will be presented to CDRMS if this is required.

Crushing Bldg. Engineering (Figures 3.3A-3.3B and Figures 3.4(S1) to 3.4(S2)

- The crushing building and MDM receiving concrete bunkers are constructed as designed by Kerrigan engineers.
- The concrete bunkers are covered to mitigate noise and dust.
- The building is a steel structure 27ft x 84ft and placed on an ICF foundation. It houses the cone crusher, lime system and plant-wide dust collector. Also, the inside is insulated for sound.
- A 18in x 120ft conveyor transfers MDM from the crusher building to the MDM bin inside the Mill Building.

ALTERNATIVE OPTION

Battery Limits: An alternative option would use the existing crusher facility. Existing **Grizzly to the Fine Ore MDM Bin (MDM Bin)**.

Equipment: **Table 3-9** shows all the equipment currently in place in the existing crusher building. Existing and new equipment that will used, as described below is shown in bold text. Existing equipment that will not be used will be removed from the building and sold.

TABLE 3-9: CRUSHER CIRCUIT EQUIPMENT(EXISTING)

Equipment Number	Flow Sheet	Equipment Description	Size
-	-	**Grizzly (Existing)**	**8”**
-	-	**Crushed MDM Bin (Existing)**	**50t**
-	-	Screen (removed)	3/4-inch
-	-	Jaw Crusher (removed)	14-inch
-	-	Roll Crusher (removed)	12-incu
-	-	Conveyor (removed)	10-ft
-	-	Bucket Conveyor (removed)	25-ft
	-	**Ore Feeder (New)**	**2t**
	-	**Cleat Conveyor (New)**	**12in x 20ft**
-	-	**Tramp Metal Magnet (New)**	-
-	-	**Conveyor to MDM Bin (Existing)**	**12in x 35-ft**
-	-	**Dust Collection Ductwork**	-

Reagents: No reagents are added in the alternative crushing option. In this instance, MDM would be crushed, and lime added as required, at the Penn Mine and then transported to the Mill. This will require a Technical Revision (subject to approval) to the Penn Mine Reclamation permit.

Operation: The alternative crushing option will use the existing crushing circuit to transfer MDM material – that was crushed at the Penn Mine – to the **MDM Bin**.

- Trucks will deliver crushed MDM and dump the material through a grizzly with 8” spacing into the 50t Crushed MDM Bin.
- Material greater that 8-in will be removed from the grizzly and manually crushed the material with a sledge hammer. The crusher and power screen at the Penn mine is designed to crush ore to minus 1/2-inch. It is not anticipated that +8-in MDM will arrive at the mill.
- MDM will flow through the crushed MDM Bin at a rate of 20tph to the conveyor to the (new) ore feeder and onto a cleat conveyor and onto the conveyor to the MDM bin.

- A tramp iron magnet will capture iron on this conveyor. Periodically, iron is removed from the magnet, and placed in a barrel. Tramp iron is manually recovered and recycled at local (or regional) recycler(s).

- Dust collectors will capture dust at all transfer points.

Engineering

- The existing crusher building is in place and does not require construction.
- The existing screen, jaw and roll crushers, bucket elevator feed conveyor and buck elevator will be removed and sold.
- A new conveyor feed chute and cleat conveyor will take the place of the removed equipment and will feed the historic bucket elevator to MDM conveyor. This conveyor was removed, but will be reinstalled.

OUTSIDE PLANT

INSIDE BUILDING

100–CV–001 NOT SHOWN

STOCK PILE AT MINE

BY LOADER

FEED HOPPER
01–BN–*

BELT FEEDER
*

CONVEYOR
*

3–DECK SCREEN
01–SC–*

+1 / 2"

FEED HOPPER
01–BN–*

CONVEYOR OR FEEDER
100–CV–002

*

BELT SCALE
100–BS–002
OPTIONAL

"FUTURE" JAW
CRUSHER (OPTIONAL)
100–CR–001

OPTIONAL

*

CONVEYOR
100–CV–008

SCREEN
100–SC–001

CONVEYOR
100–CV–003

BY TRUCK TO MILL

AT DUMP SITE

RUN OF MINE ORE

GRIZZLY

+6"
REJECT

STOCKPILE

+2"
REJECT

BELT FEEDER

-2"
PRODUCT

MAGNET
–

SCREEN O-SIZE

CONVEYOR
100–CV–004

CONVEYOR
100–CV–007

-1 / 2" PRODUCT

SCREEN U-SIZE

CONVEYOR
100–CV–009

CONE
CRUSHER
100–CR–002

CONVEYOR
100–CV–006

CONVEYOR
100–CV–005

-1 / 2" PRODUCT

LIME
F–007

SEE DRAWING F-007

LIME

FINE ORE BIN
F–002

BALL MILL OR SUMP
F–002

FLOOR
SUMP PUMP
100–SP–001

LEGEND

INTERMITTENT FLOW

ALTERNATIVE FLOW

FIGURE 3-2

ENGINEER	K. SMITH	18–FEB–2021
DRAWN BY	F. SMALDINO	11–FEB–2021
P.M. CHECK	K. SMITH	02–FEB–2022
PROCESS CHECK		
MECH. CHECK.		
STRUCT. CHECK		
ELECT. CHECK		
INST. CHECK		
CLIENT APPROVAL		

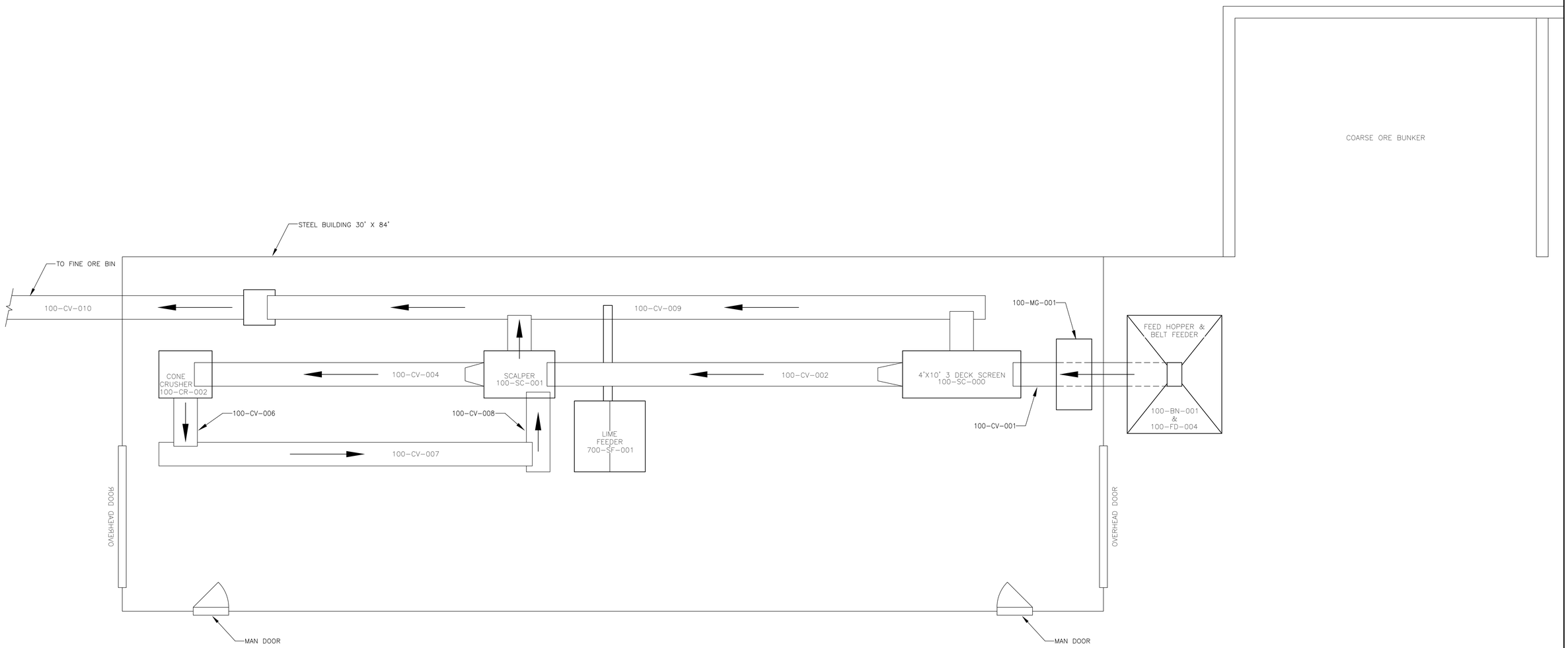
LEADVILLE MILL

CRUSHING OPTION
PROCESS FLOW SHEET

NOTED SCALES ARE BASED ON A FULL SIZED SHEET OF 22"x34" DRAWING IS NOT TO BE SCALED

DRAWING NO. F-001

REV. 0



CRUSHER BUILDING PLAN VIEW

Project:	CJK MILLING MILL FACILITY DESIGN
Title:	CRUSHER BUILDING GENERAL ARRANGEMENT
Location:	LAKE COUNTY, CO
Date:	09/16/2023
Project no.:	
Exhibit:	X
A	REVISION

CJK MILLING
REMOVE ▲ REUSE ▲ RESTORE

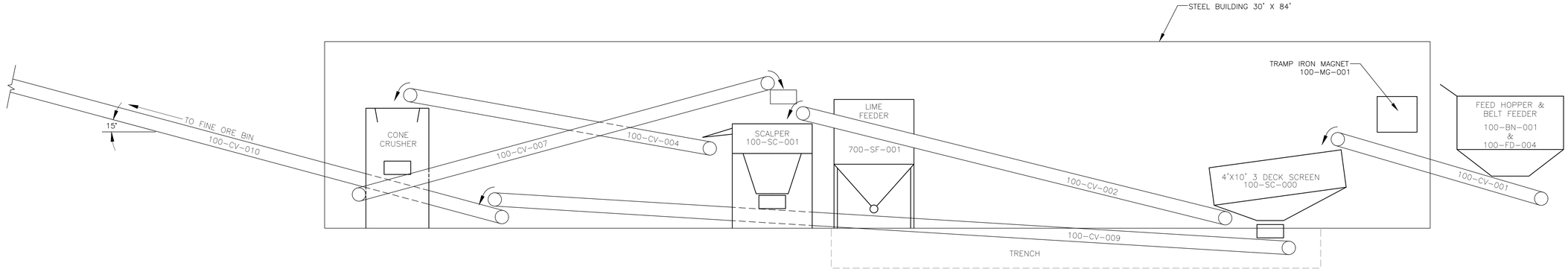
N

0 4 8

1/4"=1'-0"

FIGURE 3-3 (A)

D:\000SRV\MC\CLIENTS\UMC\LEADVILLE-MILL\112D-PERMITTING-2022\BUILDING-ARRANGE\CRUSHER-BLDG\LVM-GA-CRUSHER-BUILDING.DWG 10/17/2022



CRUSHER BUILDING ELEVATION VIEW

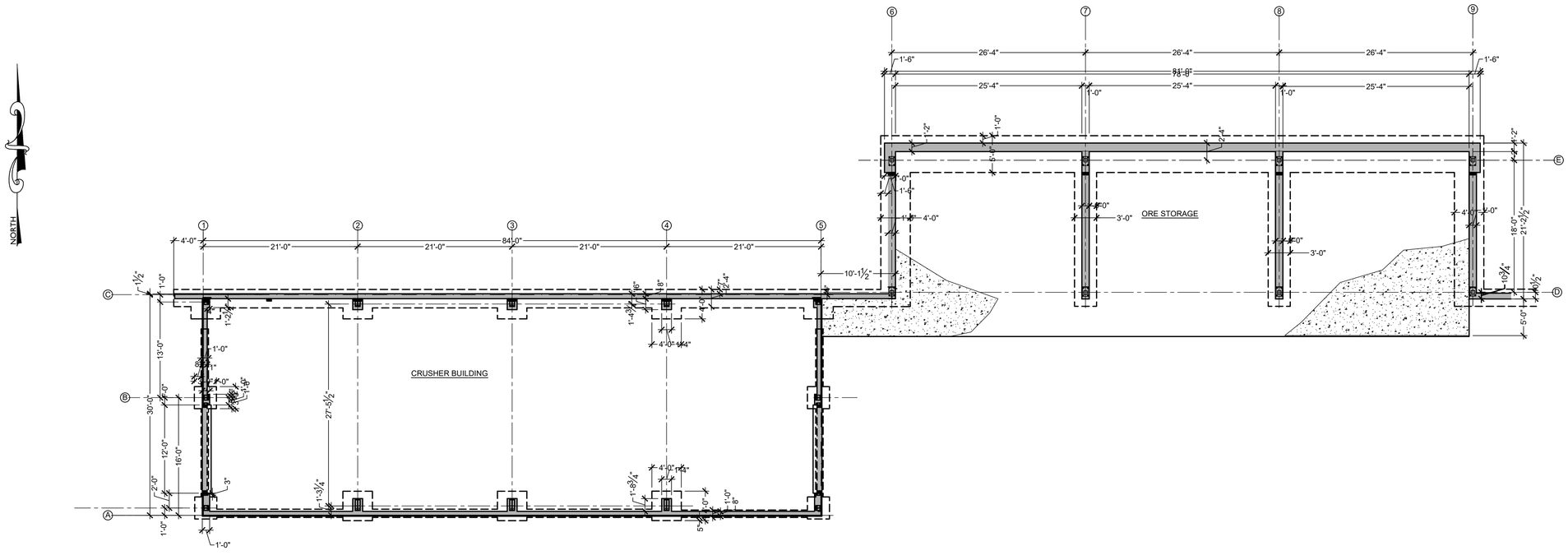
Project: CJK MILLING MILL FACILITY DESIGN			
Title: CRUSHER BUILDING GENERAL ARRANGEMENT			
Location: LAKE COUNTY, CO		Exhibit: X	A REVISION
Date: 09/16/2023	Project no.:		

CJK MILLING
REMOVE ▲ REUSE ▲ RESTORE

0 4 8
1/4"=1'-0"

FIGURE 3-3 (B)

D:\005RV\M\CLIENTS\UMC\LEADVILLE-MILL\112D-PERMITTING-2022\BUILDING-ARRANGE\CRUSHER-BLDG\LVM-GA-CRUSHER-BUILDING.DWG 10/17/2022



CRUSHER FACILITY FOUNDATION - GENERAL ARRANGEMENT PLAN

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

Design Criteria:

Code Edition: 2012 IBC

Roof Live Loads:
Snow 90 psf (ground snow load)
65 psf (based on 8:12 roof slope reduction)

Roof Dead Loads:
Structure Self Weight 8 psf
Collateral Load (lights, conduit, etc.) 7 psf

Lateral Loads:
Basic Wind Speed: 90 mph (3 second gust)
Exposure: C
Seismic Site Class: D
Seismic Design Category B

General Requirements:

A. Structural erection and bracing: The structural drawings illustrate the completed structure with all elements in their final positions supported and braced. The contractor, in the proper sequence, shall provide shoring and bracing as may be required during construction to achieve the final completed structure. Contact engineer for consultation (not in contract) as required.
B. Shop drawings: Submit shop and erection drawings for all structural steel, miscellaneous steel, and steel deck to structural engineer for review prior to fabrication. This review is for general compliance with the intent of the structural design. The manufacturing or fabrication of any items prior to written review of the shop drawings will be at the risk of the contractor. The Contractor are responsible for checking quantities, dimensions and coordination with other trades.
C. Existing structures: If construction adjoins an existing structure, the contractor shall be responsible for verifying dimensions, elevations, framing, foundation and anything else that may affect the work shown on the structural plans. Under pinning, shoring and bracing of the existing structure shall be the sole responsibility of the contractor.
D. Dimensions: Check all dimensions against field and architectural drawings prior to construction. Do not scale drawings.
E. Construction practices: The general contractor is responsible for means, methods, techniques, sequences and procedures for construction of this project. Notify structural engineer of omissions or conflicts between the working drawings and existing conditions.
F. Coordinate requirements for mechanical/electrical/plumbing penetrations through structural elements with structural engineer. Prior to installation of such equipment or other items to be attached to the structure, the contractor shall obtain approval for connections and support. Contractor shall furnish required hangers, connections, etc. required for installation of such items, unless specifically noted on plans.
G. Jobsite safety is the sole responsibility of the contractor. All methods used for construction shall be in accordance with the latest edition of the IBC.
H. The structural engineer may make periodic observation visits to the jobsite for determination of general conformance with the construction documents. Such observation visits shall not replace required inspections by the governing authorities or serve as "special inspections" as may be required by Section 17 of the International Building Code.
I. Though every effort has been made to provide a complete and clear set of construction documents, discrepancies or omissions may occur. Release of these drawings anticipates cooperation and continued communication between the contractor, architect and engineer to provide the best possible structure. These drawings have been prepared for the use of a qualified contractor experienced in the construction techniques and systems depicted.

Foundations:

A. Design is based upon values found in report for project No. DN45,584-125 by CTL Thompson, dated 07/25/2011. Foundation construction may not proceed without verification of these values. If discrepancies exist in actual site conditions and the soils described and classified in the report, notify EOR for review.
B. Continuous concrete footings and foundations are based upon a maximum allowable design soil bearing pressure of 3000 psf (dead load plus full live load).
C. Foundations and retaining walls have been designed using an active lateral pressure of 50 pcf and a passive lateral pressure of 250 pcf.
D. All footings shall bear on firm, undisturbed natural soil or properly compacted structural fill in accordance with the recommendations of the geotechnical engineer including proof-rolling and over-excavation as required.
E. Avoid excessive wetting or drying of the excavations, keeping the excavation reasonably free from water during placement of concrete. Provide continuous perimeter drains around the base of foundation and retaining walls. Refer to geotechnical report for specific under-drain system requirements.
F. Backfill shall be compacted to meet a 90% minimum standard Proctor density unless otherwise noted in the geotechnical report. Backfill shall be placed in 8" vertical lifts or as detailed in the soils report and shall be free of deleterious material and compacted in a manner that does not damage the foundation, waterproofing or damp-proofing material. If soft spots are encountered contractor shall remove material and re-compact w/ approved material (RE: soils report) Finished grading shall drain away from the foundation wall at a minimum of 5%.
G. Do not backfill against lower level walls or walls in retaining until all supporting elements are in place and properly anchored or adequate shoring is installed. Concrete slabs shall be properly cured.
H. Contractor shall retain a licensed geotechnical engineer to verify soils conditions during excavation. Verify any discrepancies from the original report values in writing to structural engineer for re-evaluation of the foundation design.

Reinforced Concrete:

A. All structural concrete had been designed in accordance with ACI 318-99. All structural concrete construction work shall conform to ACI 301-99 (or latest edition) unless noted otherwise.
B. Cast in place concrete shall be made with type I/II sulfate-resistant cement to maintain the following requirements, admixtures containing chloride salts shall not be used.

Element:	F'c Mix Type	Max W/C Ratio	% Air
Foundations & Footings	3000 psi	----	----
Interior Slabs on Grade	5000 psi	0.5	----
Exterior Slabs on Grade	5000 psi	0.45	6-8%

C. Concrete coverage for reinforcing steel shall provide the following:
1. Concrete poured permanently against earth: 3"
2. Concrete poured in forms (exposed to weather or earth): 2"
3. Concrete (not exposed to weather or earth)
- Slabs and walls 3/4"
- Beams and columns 1 1/2"

D. Concrete slabs on grade shall have sawn or trowel cut control joints at a maximum spacing of 12'-0" in each direction or 144 sq-ft within 12 hours of pouring. Carry reinforcement through joints and locate isolation joints around columns at exterior wall. Consult engineer prior to connecting the slab on grade to other portions of the superstructure.
E. Hot and cold weather concreting procedures shall conform to the recommendations in the ACI Manual of Concrete Practice.
F. Anchor bolts in wood sill plates shall be spaced at a maximum of 36" on center, unless noted otherwise on shear wall schedule, with one anchor at 12" from each end or corner and a minimum of two anchors per piece. Bolts for beam and column bearing plates shall be set with templates.
G. Expansion bolts shall be placed a minimum of 6 bolt diameters from concrete edge and maintain a 10 bolt diameter in spacing, unless noted otherwise.
H. Any stop in concrete work must be made at third point of span with verticcal bulkheads and horizontal shear keys, unless noted otherwise. Slabs, footings, beams and walls shall not have joints in a horizontal plane.

Grout:

A. All grout beneath column plates and steel beams at bearing shall be non-shrink, non-metallic type grout.
B. Grout shall have a minimum compressive strength of 4500 psi.

Reinforcing Steel:

A. All reinforcement detailing, fabrication and placement shall conform to the ACI Details and Detailing of Reinforcement (ACI 315-99).
B. All reinforcing shall be of high grade deformed bars conforming to ASTM A615, grade 60, except ties and anchors which shall conform to ASTM A615, grade 40 or ASTM A706, grade 60.
C. Welded wire fabric shall conform to ASTM A185, grade 60 and be lapped a minimum of one full mesh plus two inches at side and end splices and be wired together.
D. Lap splices of reinforcement, where permitted, shall be a minimum of 48 bar diameters for #6 bar and smaller and 80 bar diameters for #7 and #8 bar, unless noted otherwise. Contact engineer for splicing recommendations prior to construction where not specifically detailed or noted. Do not weld or use mechanical splicing.
E. Continuous top bars shall be spliced at mid-span and continuous bottom bars over supports.
F. At corners make bar continuous through discontinuity or provide corner bars. Corner bars to extend 3'-0" each side of corner. Place two #5's (per 8" of thickness) to extend a minimum of 2'-6" around all openings/steps in walls, slabs and beams. Provide #5 x 5'-0" diagonal at all openings/steps in walls, slabs and beams.
G. Contractor shall place (2)-#5's vertically full height of wall at high side of all wall steps higher that 4'-0" in addition to wall reinforcing shown otherwise.
H. Extend reinforcing steel a minimum of 2'-6" through cold joints and coordinate cold joint locations with structural engineer.

Steel Deck:

A. Steel roof and floor deck shall be the depth, gauge and rib type indicated on the plans and fabricated from sheet steel conforming to ASTM A.611 or A.446 having a minimum yield strength of 33 ksi. If substitutions are desired, contact structural engineer.
B. Decking shall be manufactured and erected in accordance with the standard recommendations of the Steel Deck Institute with welding patterns and details as indicated in the manufacturer's shop drawings.
C. Decking shall be finished by phosphatizing and painting with a baked-on acrylic primer. Decking used as a concrete form shall be phosphatized but not painted on the side in contact with the concrete.
D. Decking shall be installed and all openings in deck, cut and reinforced in accordance with manufactureres standard details and specifications, unless noted otherwise.
E. Welding washers shall be used for decking with a thickness less than 18 gauge.
F. Decking shall be a 2-Span condition, minimum.
G. Welding requirements shall be as follows, unless noted otherwise.
1. Attach roof deck to support beams, steels joists or plates with 5/8" puddle welds at 6" o.c. (7-Welds per Sheet Min.)
2. Longitudinal joints between adjacent roof deck units (Side Laps) shall be welded per manufacturer recommendations at __ locations per span.
3. Attach roof deck to beams or plates parallel to deck with 5/8" puddle welds at 12" o.c.
4. Attach floor deck to each support at 12 inches and to each intermediate support at side laps plus one intermediate point with 5/8" puddle welds. Provide weld washers as required.
5. Longitudinal joists between adjacent floor deck units shall be fastened together at 36" o.c. (Maximum Spacing) with 5/8" puddle welds (Screws or Button Punching). Fasten floor deck to parralel and perimeter beams at 12" o.c.
6. Headed Anchor studs shall be welded directly to steel beams through the decking.

Structural Steel:

A. Structural steel shall be detailed, fabricated and erected in accordance with the latest provisions of AISC "Manual of Steel Construction".
B. All structural steel rolled shapes, including plates and angles, shall conform to ASTM A36. Tube shapes shall conform to ASTM A500 Grade B. Pipe columns shall conform to ASTM A53. The latest editions of these requirements shall be used. Steel supplier may optionally provide ASTM Grade 50.
C. All structural bolts used in steel framing shall be A325-N, installed to a minimum snug nut condition. All anchor bolts shall be of ASTM A307.
D. Typical Framed beam connections with steel bolts shall use the maximum number of bolts per AISC "Manual of Steel Construction" Table IIA and/or AISC "Simple Shear Connection Manual" with A325-N bolts.
E. All welding shall be performed by an AWS qualified welder.
F. Delay painting within 3" of field welds until welds are completed.

Special Inspections:

A. The Structural Engineer may make periodic observations of the construction; such observations will not replace required inspections by the Governing Authorites or serve as "Special Inspections" that may be required by Chapter 17 of the International Building Code.
B. Contractor shall submit a list of Special Inspectors that he intends to use for this project, to the Engineer and Governing Authorities. Submit all inspection reports and test results to the same.
C. The following work shall be inspected by a Certified Special Inspector, unless specifically waived by the Building Official:

1. Soil Preparation
- Earthwork excavation, placement and compaction of fill and in-place dry density of the compacted fill for conformance with the approved report.

2. Concrete Construction
- Periodic inspection of reinforcing steel
- Continuous inspection of bolts to be installed in concrete prior to and during placement of concrete
- Periodic verification of use of required design mix
- Continuous inspection at the time fresh concrete is sampled to fabricate specimens for strength tests, perform slump and air content tests and determine the temperature of concrete
- Periodic inspection of the maintenance of specified curing temperature and techniques.

3. Steel Construction
- All welding shall receive continuous special inspection except welding done in an approved fabricator's shop in accordance with IBC Section 1704.3.
- The special inspector need not be continuously present during the welding of the following items, provided the materials welding procedure and qualifications of welders are verified prior to the start of work:
  - Single pass fillet welds not exceeding 5/16" in size
  - Floor and roof deck welding
  - Welded sheet steel for cold formed steel framing members such as studs
  - Welding of stairs and railing systems.
- Verify weld filler materials conform to AWS Specifications and Manufacturer's certificate of complience is required.
- Periodic Inspection of the steel frames shall be performed to verify compliance with the details shown on the approved constuction documents such as bracing, stiffening, member locations and proper application of joint details at connections.
- Special inspection of moment resistant high strength bolted connections verifying bolts are pretensioned in accordance with AISC Specifications for Structural Joints using ASTM A325 or A490 Bolts, Section 8, Installiong and Tightening.
- Verify structural steel material conforms to ASTM Standards specified in the Approved Construction Documents and Manufacturer's certified test reports.
- Periodic inspection of high strength bolts, nuts and washers for conformance to ASTM Standards specified in the Approved Construction Documents and Manufacturer's certificate of compliance.

FIGURE 3-4 (S1)

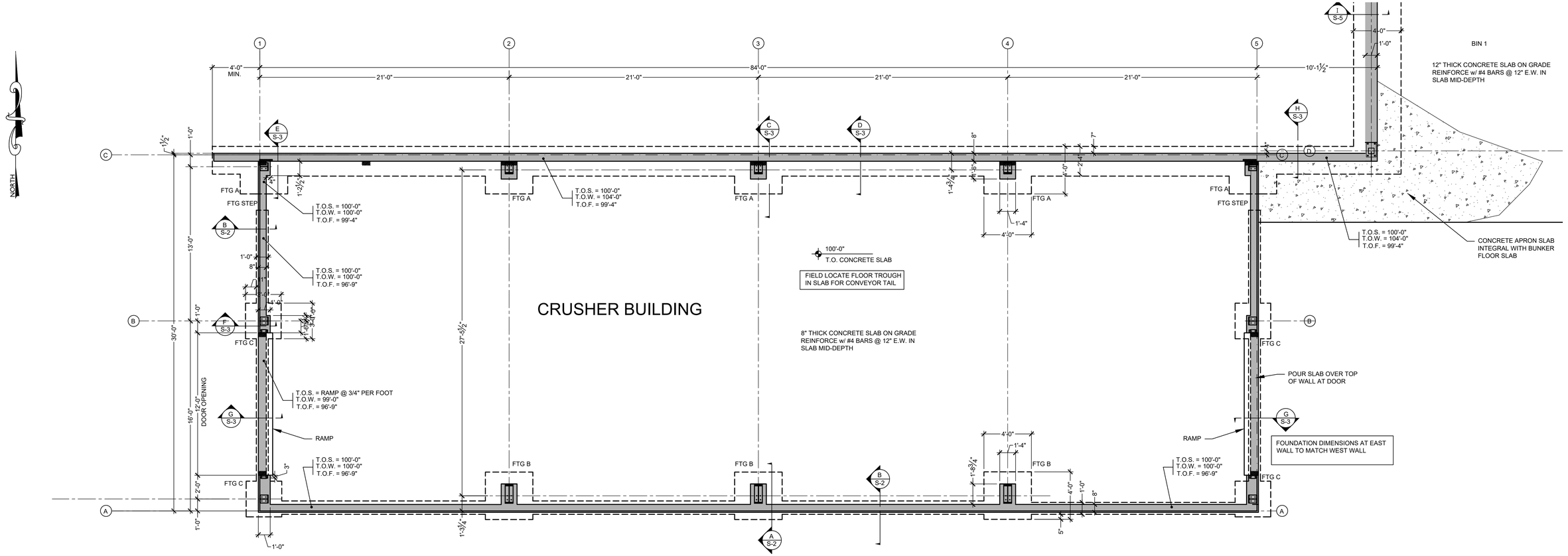
COLORADO REGISTERED PROFESSIONAL ENGINEER
JEAN KERRIGAN
35088
9.23.22021

KERRIGAN engineering
P.O. Box 3032 • Eagle, Colorado 81631

PROJECT:	JURISDICTION:	SHEET NO.
CJK MILLING Co. CRUSHER FACILITY FOUNDATION GENERAL ARRANGEMENT	LAKE COUNTY, CO	S-1

ISSUE NO.	DATE	REASON FOR ISSUING THIS DRAWING
0	9.23.2021	ISSUED FOR PERMIT

JOB NO. 20037



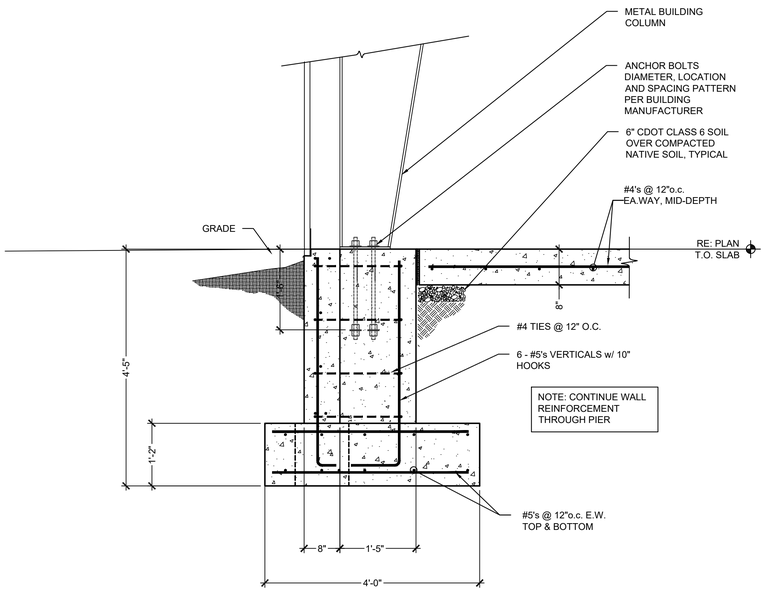
CRUSHER BUILDING FOUNDATION PLAN
SCALE: 1/4"=1'-0"

FOUNDATION PLAN

1/4" = 1'-0"

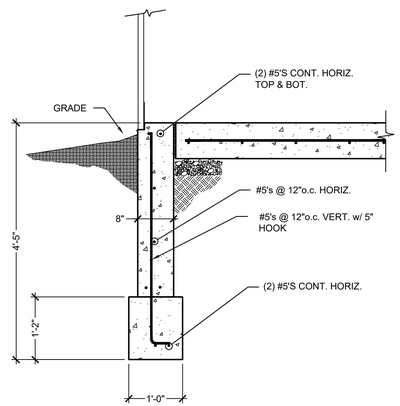
PLAN NOTES:

1. ELEVATIONS ARE BASED ON DATUM 100'-0" = MAIN LEVEL TOP OF CONCRETE SLAB. THIS ELEVATION EQUALS ACTUAL SITE ELEVATION 9743' BASED ON SITE PLAN.
2. FOOTING ELEVATIONS SHOWN HEREIN ARE BASED ON FINDING ADEQUATE SOIL CONDITIONS AS DETAILED IN THE SOIL EVALUATION. IF SOIL CONDITIONS ARE OTHERWISE, CONTACT ENGINEER FOR OVEREXCAVATION REQUIREMENTS.
3. CONTRACTOR SHALL PLACE (2)-#5's VERTICALLY FULL HEIGHT OF WALL AT HIGH SIDE OF ALL WALL STEPS HIGHER THAN 4'-0" IN ADDITION TO WALL REINFORCING SHOWN OTHERWISE.
4. SLAB ON GRADE SHALL BE THICKNESS AS SPECIFIED ON PLAN. PLACE CONCRETE SLAB ON 6" GRAVEL BASE IN ACCORDANCE WITH CDOT CLASS 6 MATERIAL PLACED ON UNDISTURBED GRADE OR COMPACTED STRUCTURAL FILL PER SOILS ENGINEER. REINFORCE SLAB WITH STANDARD DEFORMED REBAR AS SPECIFIED. PROVIDE 3/8" DEEP SAWN OR TROWELED CONTROL JOINTS AT 16'-0" MAXIMUM SPACING (144 SQFT.) EACH WAY. SEAL JOINTS FLUSH WITH ELASTOMERIC SEALANT.
5. COORDINATE ALL DIMENSIONS AND DETAILS WITH METAL BUILDING MANUFACTURER'S DRAWINGS. DO NOT SCALE DRAWINGS.
6. CONTRACTOR SHALL COORDINATE FOUNDATION PLACEMENT WITH AN APPROVED SITE PLAN. PLACEMENT INCLUDES ORIENTATION WITHIN THE BUILDING ENVELOPE/SETBACK AND VERIFICATION/SETTING OF FOUNDATION WALL ELEVATIONS.
7. COORDINATE THE LOCATION OF UTILITY PENETRATIONS WITH MECHANICAL. PROVIDE A 1" THICK VOID FORM MATERIAL AROUND PLUMBING AT FOUNDATION WALL PENETRATION.



A S-2

SCALE: ¾"=1'-0



B S-2

SCALE: ¾"=1'-0

FIGURE 3-4 (S2)

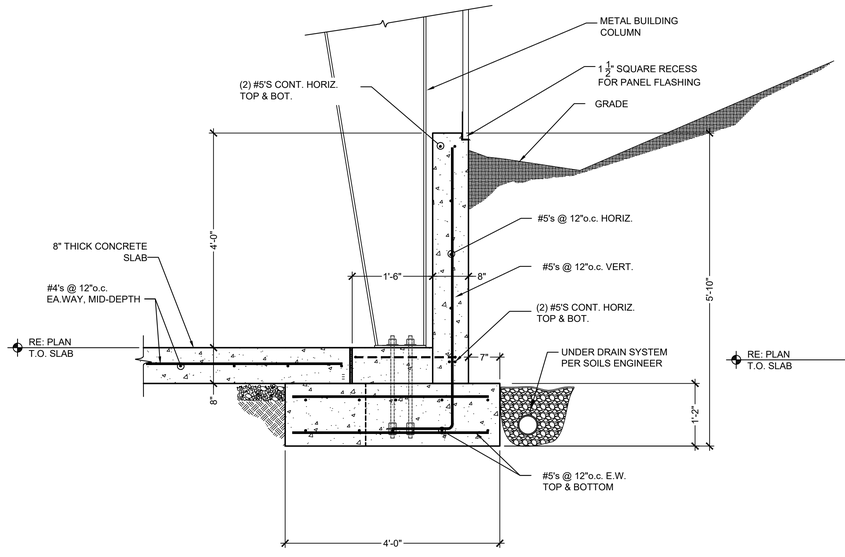
COLORADO REGISTERED SEAN KERRIGAN 35084 PROFESSIONAL ENGINEER 9.23.2021

KERRIGAN engineering
P.O. Box 3032 • Eagle, Colorado 81631

PROJECT:	JURISDICTION:	SHEET NO.
CJK MILLING Co. CRUSHER FACILITY FOUNDATION PLAN AND DETAILS	LAKE COUNTY, CO	S-2

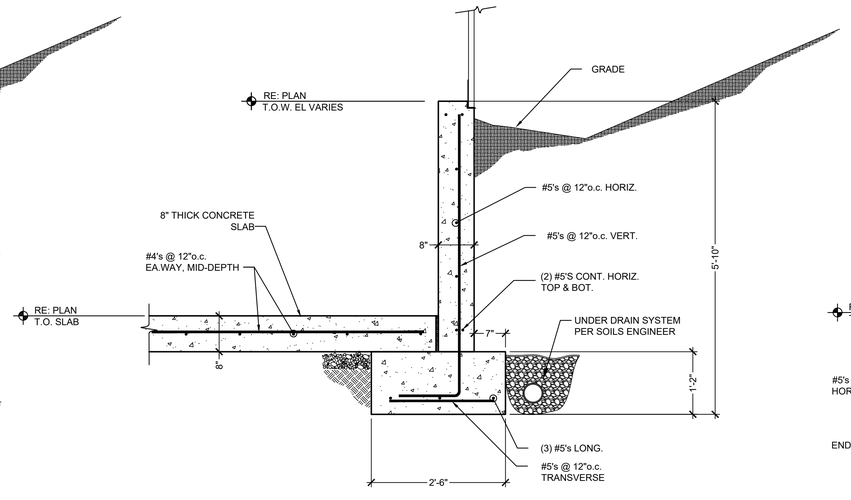
ISSUE NO.	DATE	REASON FOR ISSUING THIS DRAWING
0	9.23.2021	ISSUED FOR PERMIT

JOB NO. 20037



C
S-3

SCALE: 3/4"=1'-0



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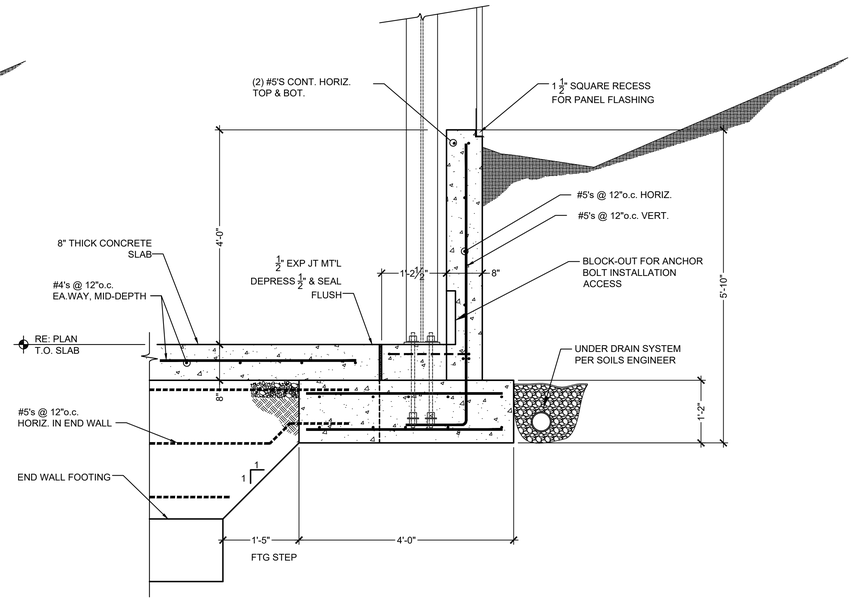
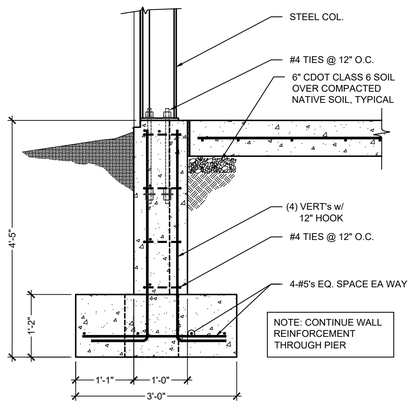
S-3

SCALE: 3/4"=1'-0



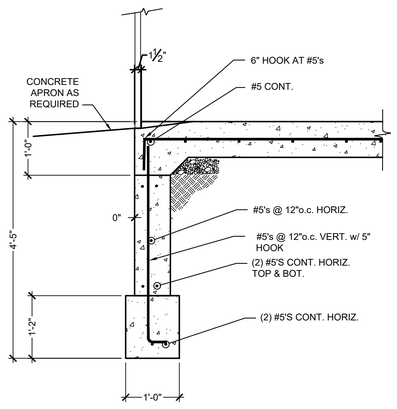
E
S-3

SCALE: 3/4"=1'-0



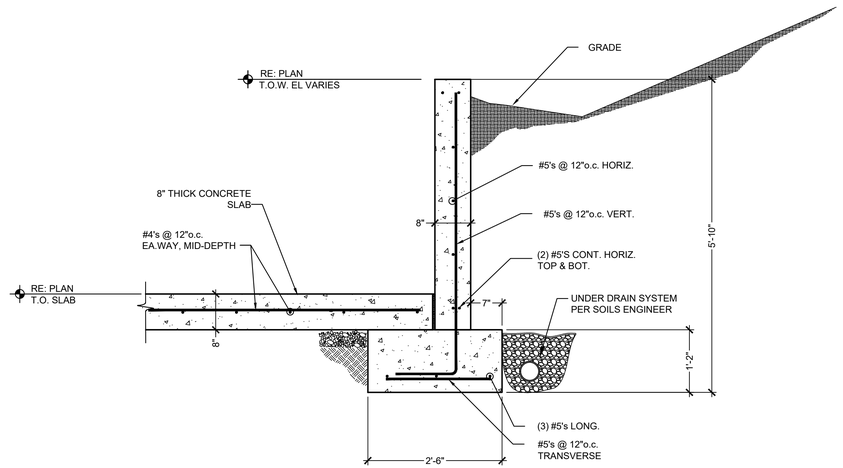
F
S-3

SCALE: 3/4"=1'-0



G
S-3

SCALE: 3/4"=1'-0



H
S-3

SCALE: 3/4"=1'-0

FIGURE 3-4 (S3)

COLORADO REGISTERED PROFESSIONAL ENGINEER
SEAN KERRIGAN
35084
9.23.2021

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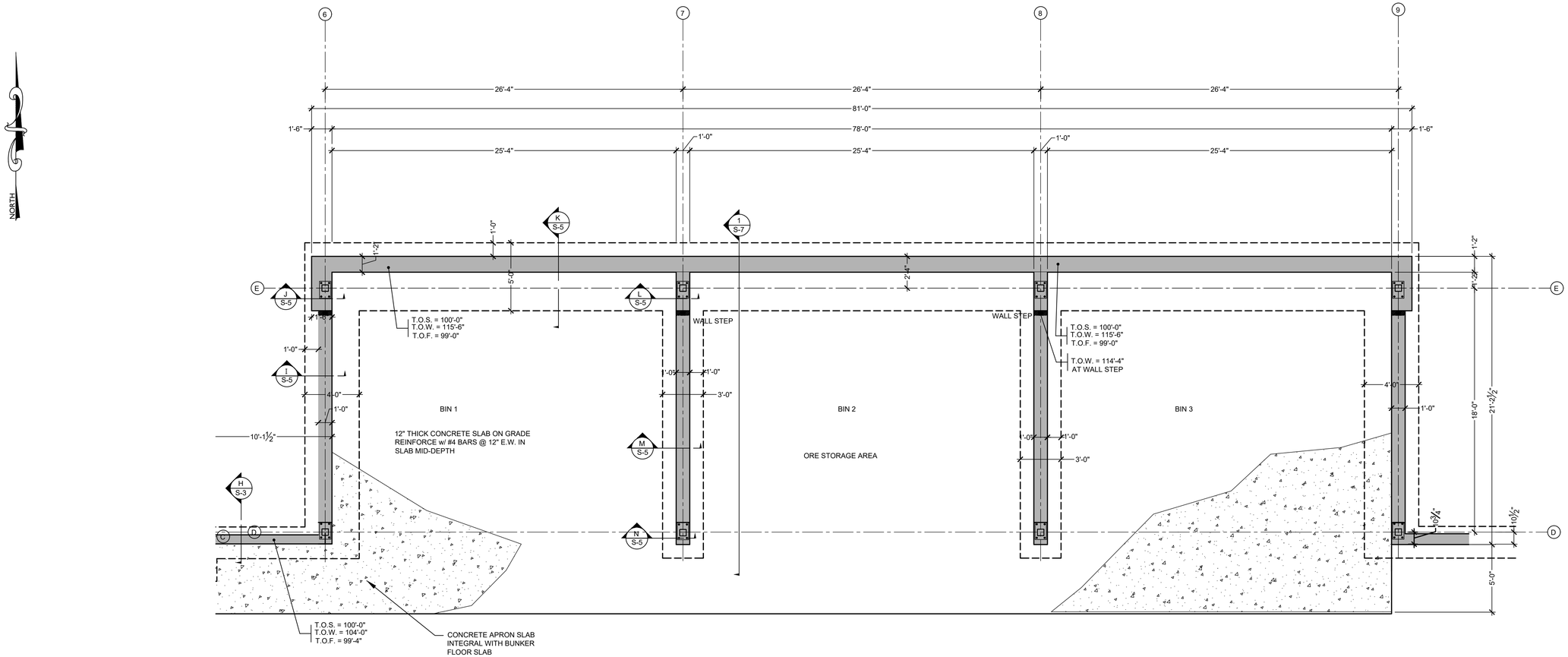
P.O. Box 3032 • Eagle, Colorado 81631

PROJECT:	JURISDICTION:	SHEET NO.
CJK MILLING Co. CRUSHER FACILITY FOUNDATION DETAILS	LAKE COUNTY, CO	S-3

ISSUE NO.	DATE	REASON FOR ISSUING THIS DRAWING
0	9.23.2021	ISSUED FOR PERMIT

JOB NO. 20037



ORE STORAGE AREA FOUNDATION PLAN
SCALE: 1/4"=1'-0"

ABBREVIATION LIST

A.B.	ANCHOR BOLT	DBL.	DOUBLE	INT.	INTERIOR	SCHED.	SCHEDULE
ANCH.	ANCHOR	DWL.	DOWEL	JST.	JOIST	SECT.	SECTION
APPROX.	APPROXIMATELY	DWG.	DRAWING	LONGIT.	LONGITUDINAL	SIM.	SIMILAR
ARCH.	ARCHITECT	EA.	EACH	LVL	LAMINATED VENEER LUMBER	SPEC.	SPECIFICATION
BLDG.	BUILDING	ELEV.	ELEVATION	LSL	LAMINATED STRAND LUMBER	STD.	STANDARD
BLKG.	BLOCKING	ENG.	ENGINEER	MAX.	MAXIMUM	STRUCT.	STRUCTURAL
BM.	BEAM	E.O.R.	ENGINEER OF RECORD	MECH.	MECHANICAL	T&G	TONGUE & GROOVE
BOT.	BOTTOM	EQUIV.	EQUIVALENT	MAT'L	MATERIAL	T.O.F.	TOP OF FOOTING
B.O.W.	BOTTOM OF WALL	EXSTG.	EXISTING	MANUF.	MANUFACTURER	T.O.S.	TOP OF STEEL
BRG.	BEARING	EXP.	EXPANSION	MIN.	MINIMUM	T.O.W.	TOP OF WALL
CANT.	CANTILEVER	EXT.	EXTERIOR	NOM.	NOMINAL	THRU	THROUGH
℄	CENTERLINE	FDN.	FOUNDATION	O.C.	ON CENTER	TRANSV.	TRANSVERSE
CLR.	CLEARANCE	FLR.	FLOOR	OSB	ORIENTED STRAND BOARD	TYP.	TYPICAL
COL.	COLUMN	FTG.	FOOTING	ℙ	PLATE	U.N.O.	UNLESS NOTED OTHERWISE
CONC.	CONCRETE	GA.	GAUGE	PLYWD.	PLYWOOD	VERT.	VERTICAL
CONN.	CONNECTION	GEN.	GENERAL	RE:	REFERENCE	W.W.F.	WELDED WIRE FABRIC
CONT.	CONTINUOUS	G.L.	GLUE-LAM	REINF.	REINFORCE/REINFORCEMENT	W/	WITH
CONST.	CONSTRUCTION	GYP.	GYPSUM/GYPCRETE	REQ'D	REQUIRED	W/O	WITHOUT
		HDR.	HEADER	REV.	REVISION		
		HORIZ.	HORIZONTAL				
		HT.	HEIGHT				

FOUNDATION PLAN

1/4" = 1'-0"

PLAN NOTES:

1. ELEVATIONS ARE BASED ON DATUM 100'-0" = MAIN LEVEL TOP OF CONCRETE SLAB. THIS ELEVATION EQUALS ACTUAL SITE ELEVATION 9743' BASED ON SITE PLAN.
2. FOOTING ELEVATIONS SHOWN HEREIN ARE BASED ON FINDING ADEQUATE SOIL CONDITIONS AS DETAILED IN THE SOIL EVALUATION. IF SOIL CONDITIONS ARE OTHERWISE, CONTACT ENGINEER FOR OVEREXCAVATION REQUIREMENTS.
3. CONTRACTOR SHALL PLACE (2)-#5's VERTICALLY FULL HEIGHT OF WALL AT HIGH SIDE OF ALL WALL STEPS HIGHER THAN 4'-0" IN ADDITION TO WALL REINFORCING SHOWN OTHERWISE.
4. SLAB ON GRADE SHALL BE THICKNESS AS SPECIFIED ON PLAN. PLACE CONCRETE SLAB ON 6" GRAVEL BASE IN ACCORDANCE WITH CDOT CLASS 6 MATERIAL PLACED ON UNDISTURBED GRADE OR COMPACTED STRUCTURAL FILL PER SOILS ENGINEER. REINFORCE SLAB WITH STANDARD DEFORMED REBAR AS SPECIFIED. PROVIDE 3/8" DEEP SAWN OR TROWELED CONTROL JOINTS AT 16'-0" MAXIMUM SPACING (144 SQFT.) EACH WAY. SEAL JOINTS FLUSH WITH ELASTOMERIC SEALANT.
5. COORDINATE ALL DIMENSIONS AND DETAILS WITH METAL BUILDING MANUFACTURER'S DRAWINGS. DO NOT SCALE DRAWINGS.
6. CONTRACTOR SHALL COORDINATE FOUNDATION PLACEMENT WITH AN APPROVED SITE PLAN. PLACEMENT INCLUDES ORIENTATION WITHIN THE BUILDING ENVELOPE/SETBACK AND VERIFICATION/SETTING OF FOUNDATION WALL ELEVATIONS.
7. COORDINATE THE LOCATION OF UTILITY PENETRATIONS WITH MECHANICAL. PROVIDE A 1" THICK VOID FORM MATERIAL AROUND PLUMBING AT FOUNDATION WALL PENETRATION.

FIGURE 3-4 (S4)

COLORADO REGISTERED PROFESSIONAL ENGINEER
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9.23.22021

KERRIGAN engineering
P.O. Box 3032 • Eagle, Colorado 81631

PROJECT:	JURISDICTION:	SHEET NO.
CJK MILLING Co. CRUSHER FACILITY ORE STORAGE AREA FOUNDATION PLAN	LAKE COUNTY, CO	S-4

ISSUE NO.	DATE	REASON FOR ISSUING THIS DRAWING
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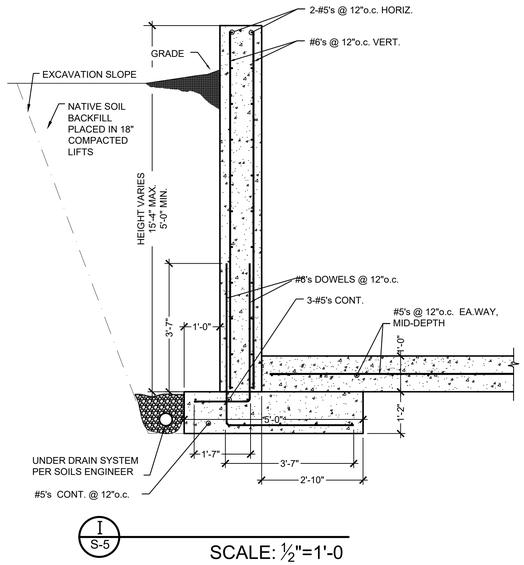
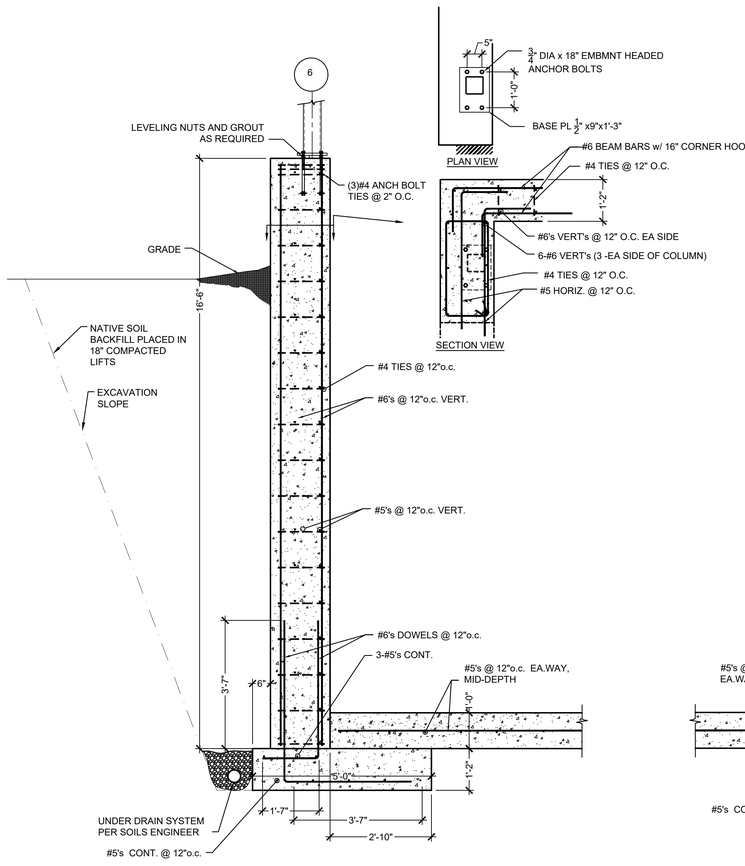
JOB NO. 20037



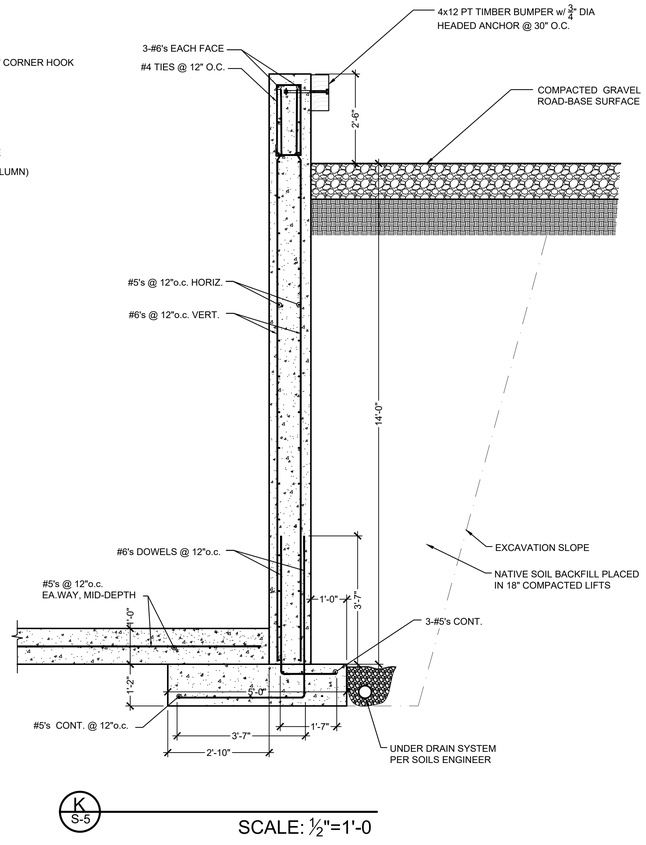
I S-5

SCALE: ½"=1'-0



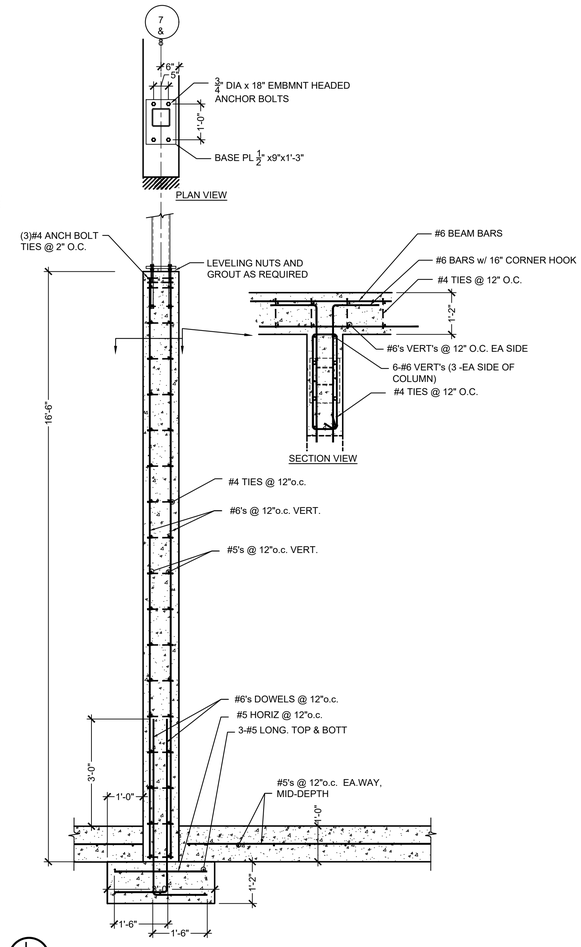
J S-5

SCALE: ½"=1'-0



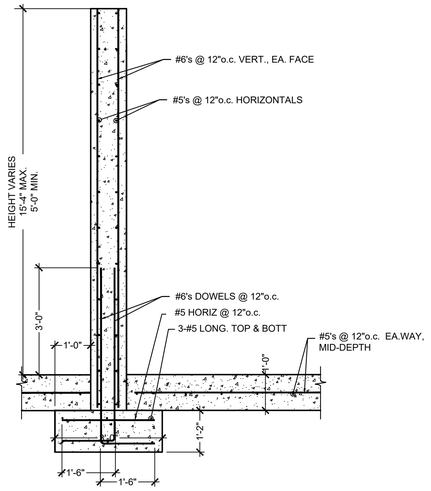
K S-5

SCALE: ½"=1'-0



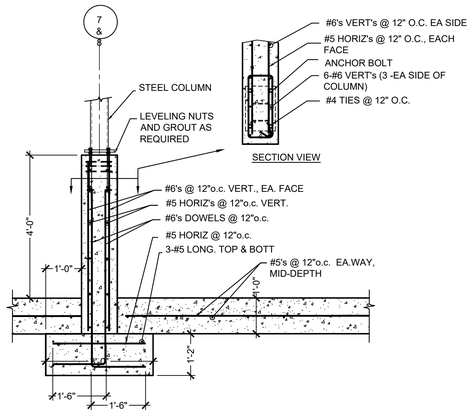
L S-5

SCALE: ½"=1'-0



M S-5

SCALE: ½"=1'-0



N S-5

SCALE: ½"=1'-0

FIGURE 3-4 (S5)

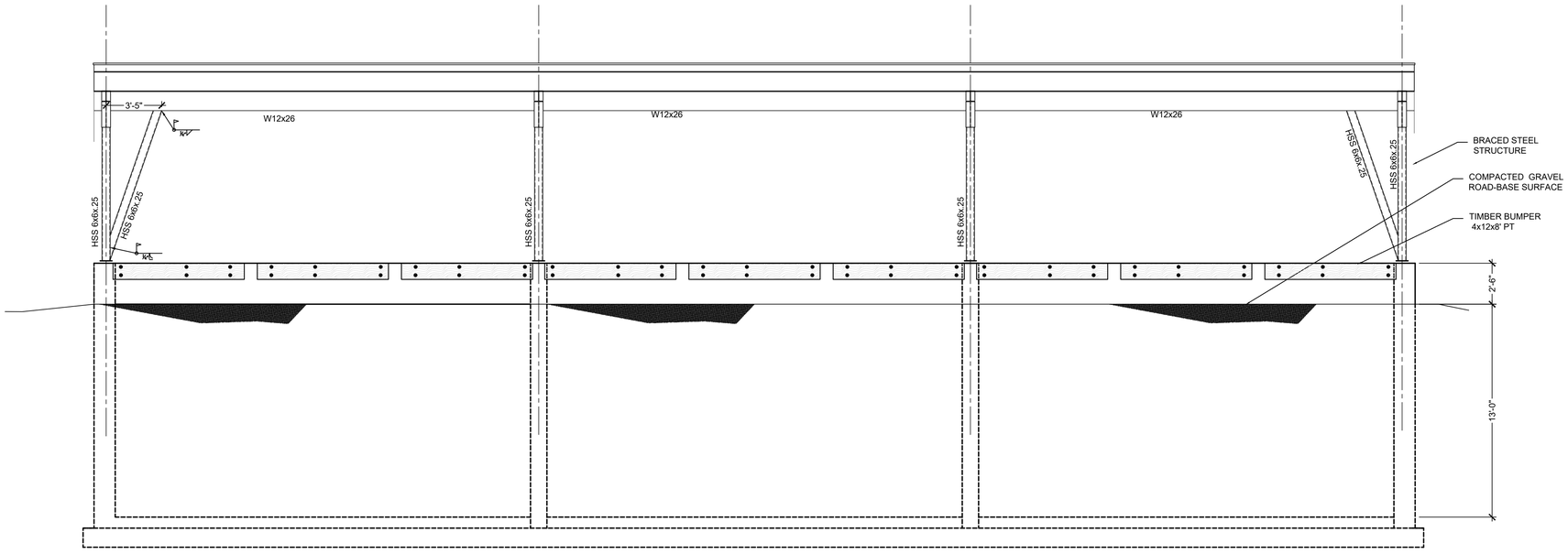
COLORADO REGISTERED PROFESSIONAL ENGINEER
DEAN KERRIGAN
35084
07.23.2021

KERRIGAN engineering
P.O. Box 3032 • Eagle, Colorado 81631

PROJECT:	JURISDICTION:	SHEET NO.
CJK MILLING Co. CRUSHER FACILITY ORE STORAGE AREA FOUNDATION DETAILS	LAKE COUNTY, CO	S-5

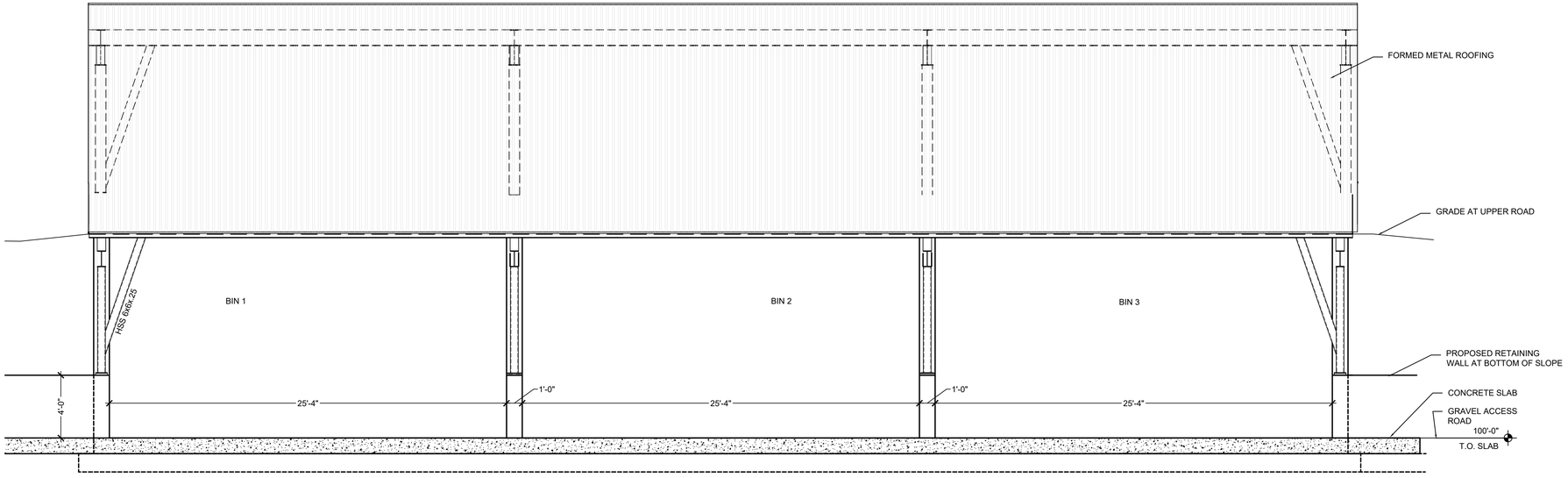
ISSUE NO.	DATE	REASON FOR ISSUING THIS DRAWING
0	09.23.2021	ISSUED FOR PERMIT

JOB NO. 20037

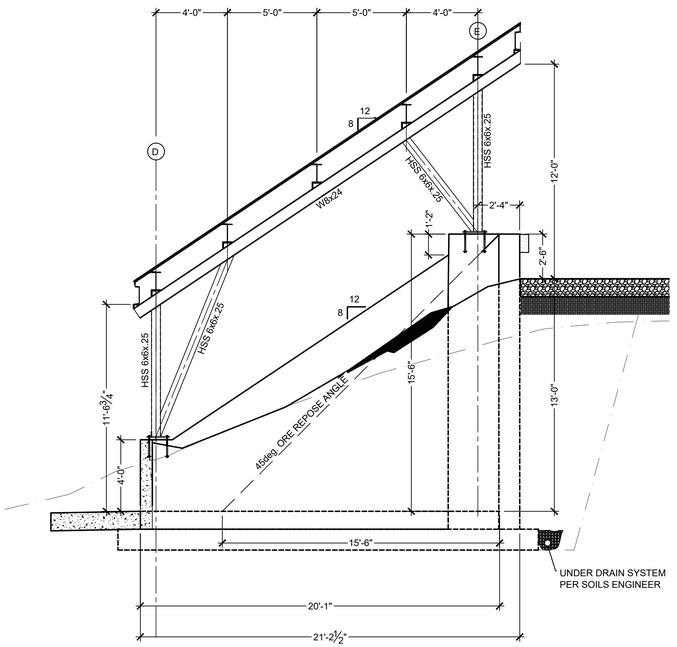


ORE STORAGE - NORTH ELEVATION

ORE VOLUME CALCULATION:
Bin Cross Section Area = 15.5' x15.5' /2 = 120.1 S.FT.
Volume Required = 400 tons per day
STORAGE = 400 tons x2000 lbs/ton x 2 days = 1,600,000 lbs Ore
Ore Density = 62.4 lbs/CF x 2.8 = 174.7 PCF
Storage Volume = 1,600,000 lbs/ 174.7 PCF = 9,157.5 cubic feet
Storage Bin length Required = 9157.5 cubic feet / 120.1 s.ft. = 76.2'
Say 76' storage length



ORE STORAGE - SOUTH ELEVATION



ORE STORAGE - EAST ELEVATION

1/4" = 1'-0"

FIGURE 3-4 (S6)

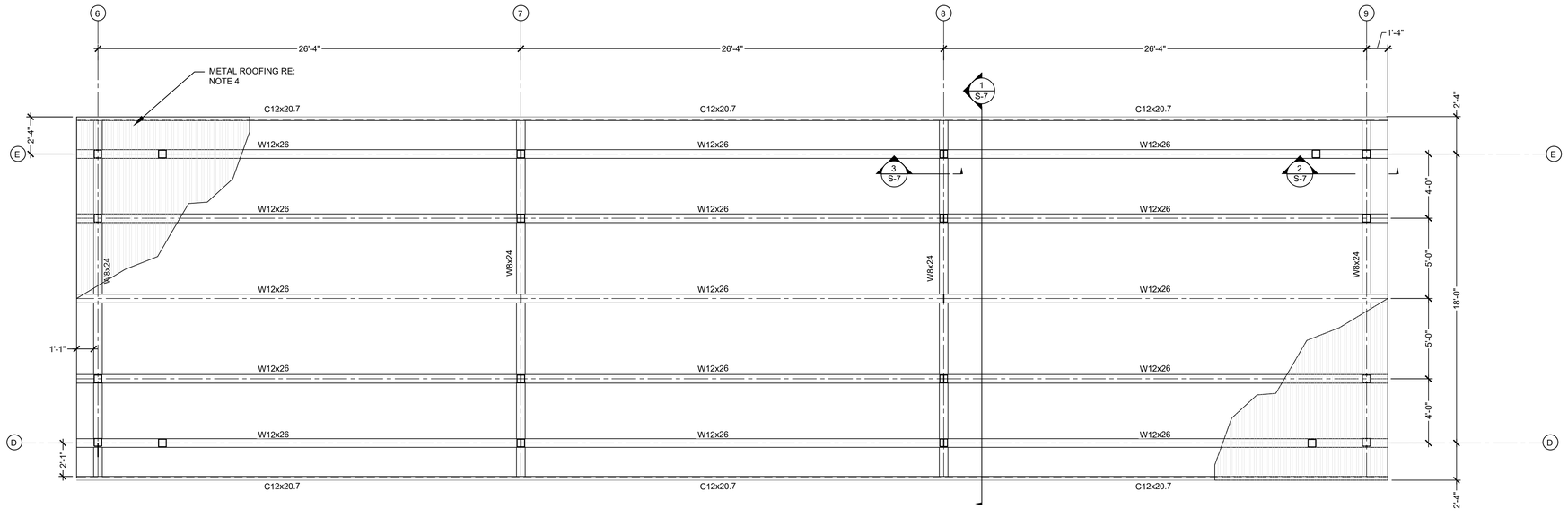
COLORADO REGISTERED PROFESSIONAL ENGINEER
JEAN KERRIGAN
35084
9.23.2021

KERRIGAN engineering
P.O. Box 3032 • Eagle, Colorado 81631

PROJECT:	JURISDICTION:	SHEET NO.
CJK MILLING Co. CRUSHER FACILITY ORE STORAGE GENERAL ARRANGEMENT ELEVATIONS	LAKE COUNTY, CO	S-6

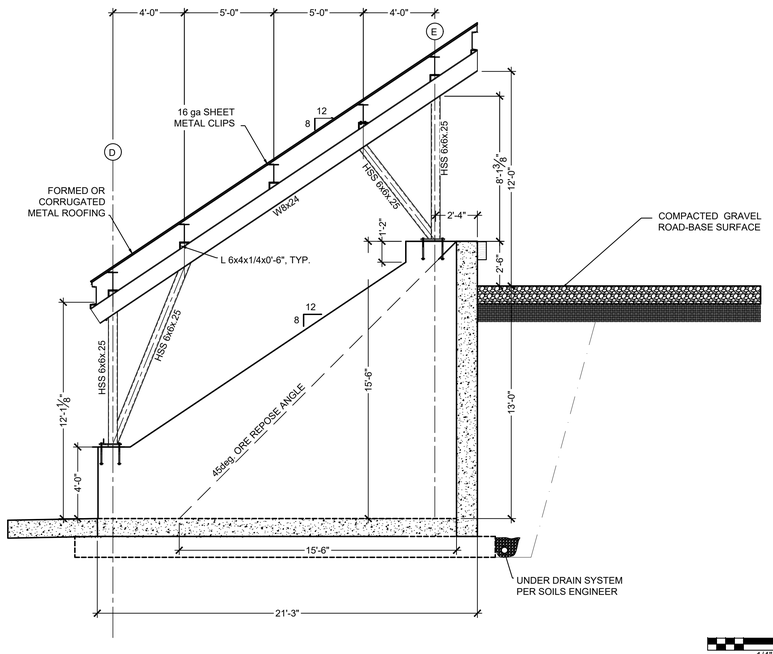
ISSUE NO.	DATE	REASON FOR ISSUING THIS DRAWING
0	09.23.2021	ISSUED FOR PERMIT

JOB NO. 20037



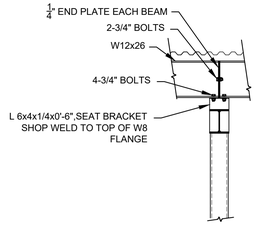
ORE BUNKER ROOF FRAMING PLAN

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



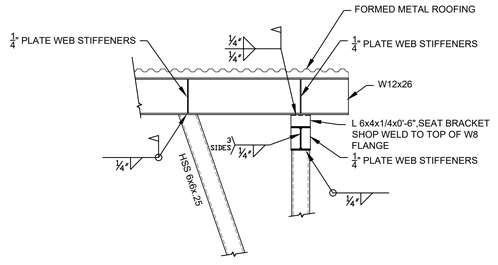
1/4" = 1'-0"

1 S-7 ORE BUNKER - SECTION



3 S-5 FEILD BOLTED CONNECTION OPTION

SCALE: ½"=1'-0



2 S-5 FEILD WELDED CONNECTION OPTION

SCALE: ½"=1'-0

FRAME FABRICATION AND ERECTION NOTES:

1. The frames at Grid lines 6 thru 9 are intended to be shop fabricated, welded, and prime painted. The knee braces at grid lines D and E shall be field welded to the column and roof purlin.
2. Steel angle roof purlin seat brackets shall be shop welded to top of main frame beams. Purlins shall be field welded or bolted to seat brackets. Use either (4) $\frac{3}{4}$" bolts or $\frac{1}{4}$" fillet weld each side of flange bottom edge.
3. Field touch-up primer paint after field welds are made.
4. Roofing shall be $\frac{7}{8}$" minimum profile depth x 24 gage minimum, with galv-alum finish. Color per Owner selection. Choose metal roofing manufacturer's product that meets roof live load criteria with spans provided. Provide flashing and sheet metal connects that are integrated with metal roofing system chosen.

FIGURE 3-4 (S7)

COLORADO REGISTERED SEAN KERRIGAN 35084 8.23.2021 PROFESSIONAL ENGINEER

KERRIGAN engineering
P.O. Box 3032 • Eagle, Colorado 81631

PROJECT:	JURISDICTION:	SHEET NO.
CJK MILLING Co. CRUSHER FACILITY ORE STORAGE FRAMING PLAN	LAKE COUNTY, CO	S-7

ISSUE NO.	DATE	REASON FOR ISSUING THIS DRAWING
0	09.23.2021	ISSUED FOR PERMIT

JOB NO. 20037

3.3.3 AREA 200 GRINDING CIRCUIT

Battery Limits: MDM Bin to **MDM Thickener**.

Equipment: Equipment required for grinding is shown in **Table 3-10**.

TABLE 3-10: GRINDING CIRCUIT EQUIPMENT

Equipment Number	Flow Sheet	Equipment Description	Size
200-BN-002	2	MDM Bin	250st
200-FD-002	2	Belt Feeder w/ VFD Drive	3'x5'
200-BS-002	2	Belt Scale - See Instrumentation	-
-	2	Ball Mill Feed Chute	-
200-SC-002	2	Ball Mill Discharge Trommel	-
200-TK-002	2	Ball Mill Sump	$30ft^3$
200-PP-002	2	Cyclone Feed Pump (Slurry) VFD	20gpm
-	-	Gravity Concentrator	12-in
200-CY-001-003	2	Cyclone Cluster	6"
-	2	Cyclone Tower	-
200-TK-002	2	Pre-Leach Thickener	14'
200-TK-001	2	Thickener Feed Tank	-
200-TK-004	2	Thickener Overflow Tank	-
200-PP-004	2	Overflow Tank Pump	250gpm
200-PP-006	2	Underflow pump (feed to leach)	250gpm
-	-	Overhead Hoist	10st

Operation: Reference the following:

- **Figure 3-5** Grinding Circuit PFD, and
- **Figure 3-6A&B** Mill Building General Arrangement and Elevation.

The operation is described as follows.

Grinding Circuit PFD (Figure 3-5)

The Grinding Circuit is located inside the Mill Building.

- Material is received from the Crusher Building at a rate of up to 57tph, plus lime at up to 456lb/hr. Lime is applied to increase pH in the MDM.
- Material from the MDM Bin is fed onto a Variable Feed Drive (VFD) belt feeder at a nominal rate of up to 9.26tph. Maximum feed can be up to 20tph.
    - The maximum capacity of the MDM Bin is 250t (wet). Operating capacity will vary from 0 tons to 250t.
- Process plant production rate is manually controlled by the plant operator by adjusting the VFD as material passes over the belt scale, which is installed on the ball mill feed conveyor belt. There is a balance of ball mill feed from the

MDM Bin and the recirculating load from the cyclone. This is manually balanced by the VFD.

- Material enters the ball mill at a rate of 9.26tph solids and 0.39tph water. Process water is added at 10.69tph (44.9gpm) to achieve 57% solids for optimal grinding.
    - Water is sourced from the reclaim water tank.
    - The recirculating load in the ball mill is approximately 250%.
- Ball Mill discharge is at 23.15tph solids and 17.46tph water at a rate of 104.6gpm through a trash trommel.
    - The trommel primarily separates used grinding balls from the ground material.
    - Grinding ball consumption is approximately 0.2lb grinding balls per 1 ton-material. Grinding balls are manually fed into the ball mill from the feed area.
- Material passes through the trommel into the ball mill sump.
    - Process water is added in the sump at 8.04tph (75.7gpm)
    - The volume of the sump is 51ft^3 and holds approximately 1.5 ball mill volume.
- The cyclone feed pump takes material from the ball mill sump at 23.15tph solids and 35.5tph water at a rate of 175.9gpm through a cyclone classifier.
- Any water that may spill within the facility will report to the sump which is then reclaimed into the reclaim water tanks.

    Gravity Concentrator

    - Prior to reaching the cyclone, stream from this cyclone feed pump at 0.14tph solids and 0.02tph water at a rate of 0.3gpm goes through the Knelson concentrator. Water is added to the gravity concentrator at 27.78tph. This is a gravity separator the recovers gold concentrate, and does not use reagents. Gold concentrate – process underflow - is manually recovered approximately once every 5 to 10 hours as required. This material is collected in a 5-gallon bucket. Gravity concentrate is 90% solids.
    - Process overflow from the gravity concentrator reports directly to the ball mill at 13.75tph solid and 27.76tph water at a rate of 132.7gpm. It does not go through the cyclone.

- Cyclone underflow is recirculated back into the ball mill at 9.26tph solids and 21.61tph water at a rate of 100.7gpm.
- Cyclone overflow reports to the MDM Thickener at 3.89tph solids and 13.89tph water at a rate pf 76.5gpm, where slurry is thickened to 30% solids, as required for the leach circuit.
- Any water that may spill within the facility will report to the sump which is then reclaimed into the reclaim water tanks.

Engineering (Figure 3-5)

- The grinding circuit is essentially in place and does not require construction.
- The MDM bin, ball mill (and sump), and MDM thickener are already in place.
- The cyclone stand and is also in place but may need to be slightly re-positioned to accommodate placement of the gravity concentrator. These are small units and are easily installed.

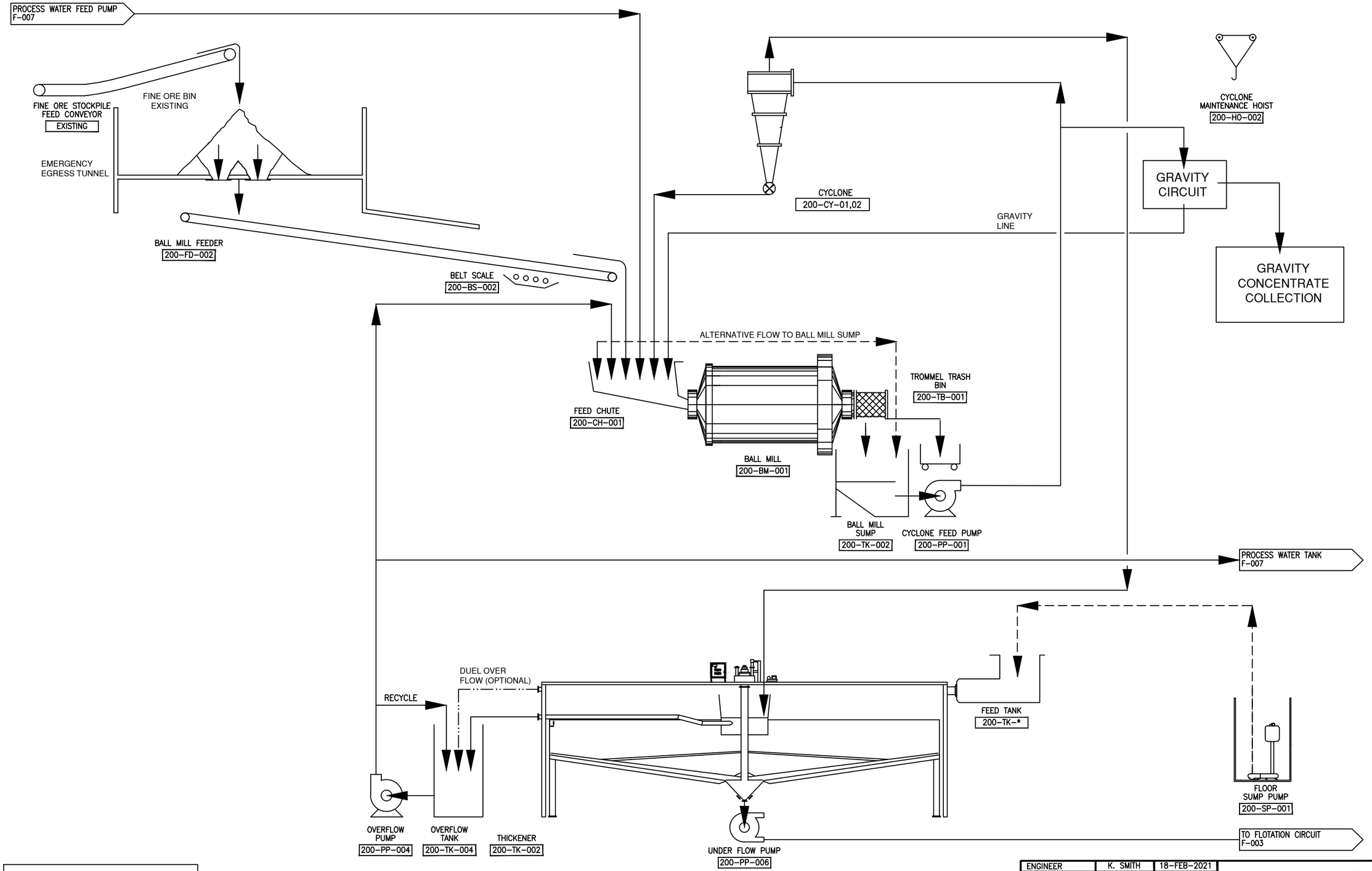


FIGURE 3-5

LEGEND

INTERMITTENT FLOW

ALTERNATIVE FLOW

ENGINEER	K. SMITH	18-FEB-2021
DRAWN BY	F. SMALDINO	11-FEB-2021
P.M. CHECK	K. SMITH	02-FEB-2022
PROCESS CHECK		
MECH. CHECK.		
STRUCT. CHECK		
ELECT. CHECK		
INST. CHECK		
CLIENT APPROVAL		

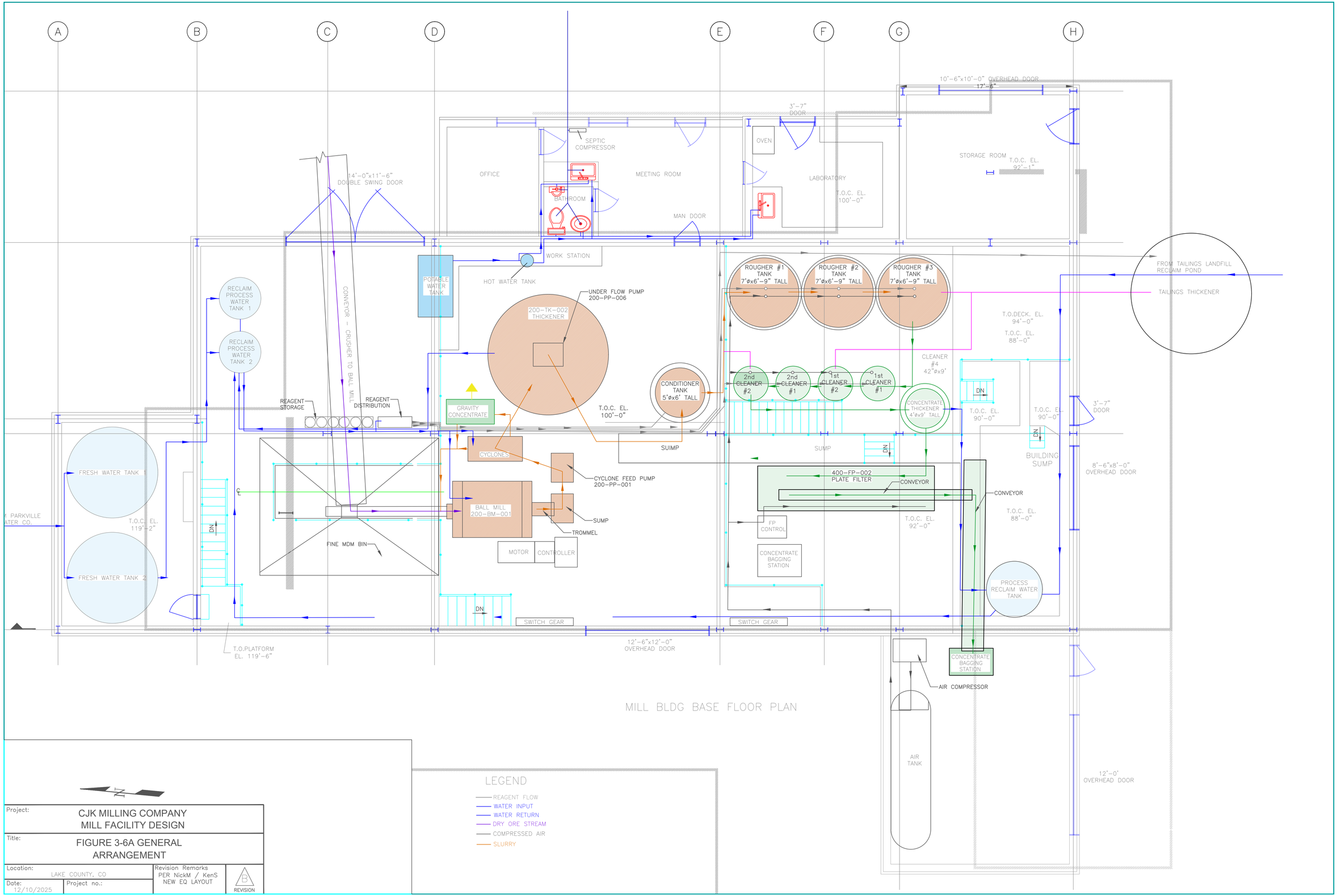
LEADVILLE MILL

GRINDING CIRCUIT
PROCESS FLOW SHEET

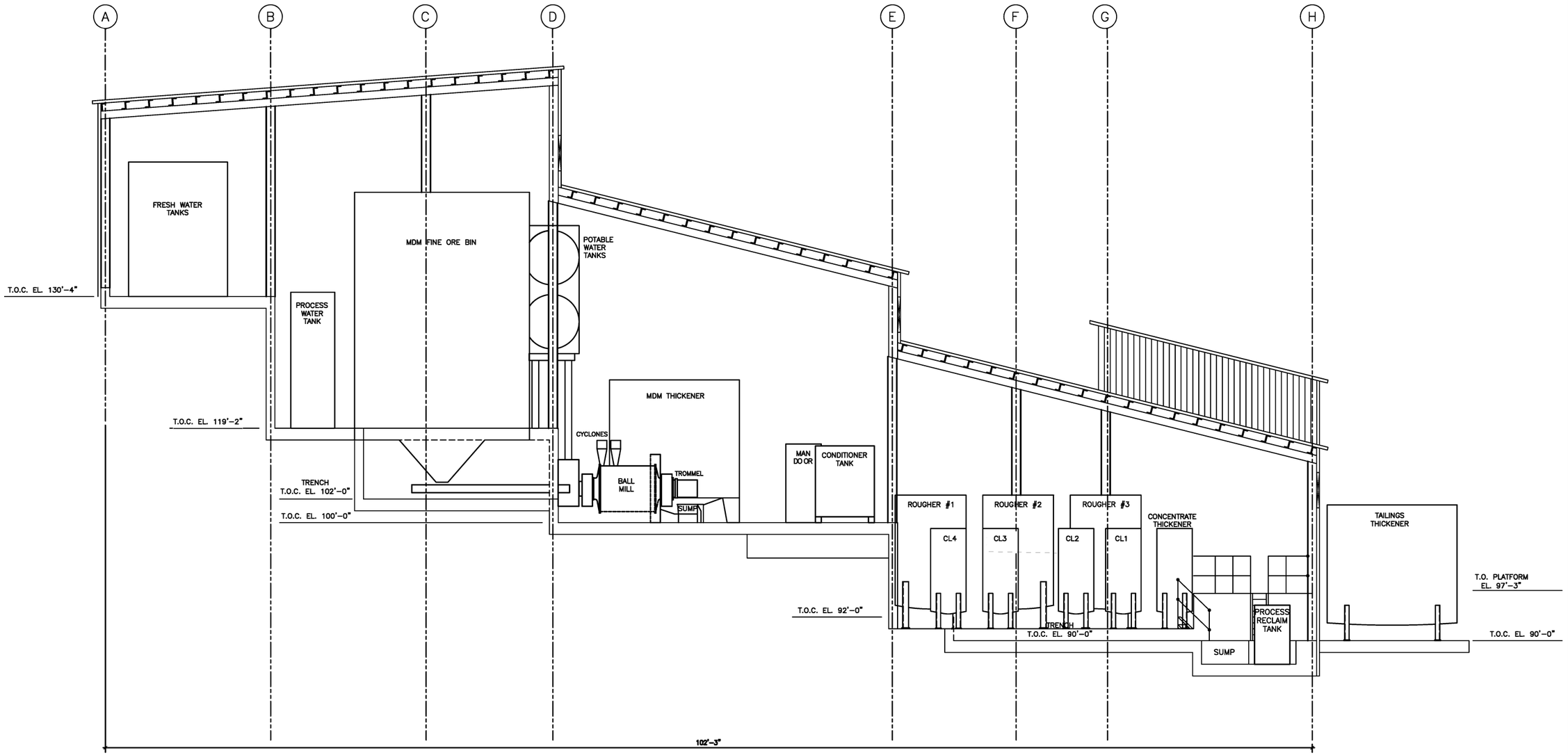
NOTED SCALES ARE BASED ON A FULL SIZED SHEET OF 22"x34" DRAWING IS NOT TO BE SCALED

DRAWING NO. F-002

REV. 0



Project:	CJK MILLING COMPANY MILL FACILITY DESIGN
Title:	FIGURE 3-6A GENERAL ARRANGEMENT
Location:	LAKE COUNTY, CO
Date:	12/10/2025
Project no.:	
Revision Remarks	PER NickM / KenS NEW EQ LAYOUT
B	REVISION



SECTION A – LOOKING EAST

FIGURE 3-6 (B)

Project:	THE UNION MILLING COMPANY MILL FACILITY DESIGN
Title:	GENERAL ARRANGEMENT LONGITUDINAL SECTION "A"
Location: LAKE COUNTY, CO	Revision Remarks: PER NickM / KenS NEW EQ LAYOUT
Date: 11/05/2025	Project no.:
	B REVISION

3.3.4 AREA 300 FLOTATION, THICKENING & FILTRATION

Battery Limits: **MDM Thickener** to;

- **Tailings Thickener, Filter & FTL, and**
- **Concentrate Thickener, Filter, & Bagging & Storage**

Equipment: Equipment required for the agitated leach circuit is shown in **Table 3-11**

TABLE 3-11: FLOTATION, THICKENING & FILTRATION CIRCUIT EQUIPMENT

Equipment Number	Flow Sheet	Equipment Description	Size
200-FD-002	2	Ball Mill Feeder	12-inch
200-BS-002	2	Belt Scale	-
200-CH-001	2	Feed Chute	-
200-BW-001	2	Ball Mill	5ft x 4ft
200-TB-001	2	Trommel Trash Bin	-
200-TK-002	2	Ball Mill Sump	-
200-PP-001	2	Cyclone Feed Pump	-
200-CY-01,02	2	Cyclone	4-inch
200-HO-002	2	Cyclone Maintenance Hoist	1-ton
-	2	Gravity Concentrator	12-inch
200-TK-002	2	MDM Thickener	352ft3
200-TK-004	2	Overflow Tank	100gal
200-PP-004	2	Overflow Pump	-
200-PP-008	2	Underflow Pump	-
200-TK-xxx	2	Feed Tanks	50gal
200-SP-001	2	Floor Sump & Pump	500gal
300-AG-000	3	Rougher Flotation Conditioning Agitator	-
300-TK-100	3	Rougher Flotation Conditioning Tanks	100gal
300-FL-01-03	3	Rougher flotation Bank	346ft3
300-TK-000	3	Rougher Froth Sump	50gal
300-PP-000	3	Rougher froth Pump	-
400-FL-000	4	1ST Cleaner Flotation Bank	45ft3
400-FL-000	4	2nd Cleaner Flotation Bank	45ft3
400-TK-000	4	1st Cleaner Froth Sump	50gal
400-PP-000	4	1st Cleaner Froth Pump	-
400-TK-000	4	2nd Cleaner Concentrate Sump	50gal
400-PP-000	4	2nd Cleaner Concentrate Pump	-
400-TK-000	4	1st Cleaner Tailings Sump	50gal
400-PP-000	4	1st Cleaner Tailings Pump	-
400-SA-000	4	Metallurgical Sampler	-
400-TH-000	4	Concentrate Thickener	113ft3
400SU-000	4	Concentrate Thickener O/F Sump	50gal
400-PP-000	4	Concentrate Thickener O'F Pump	-
400-PP-000	4	Thickener U/F Pump	-
400-FP-000	4	Concentrate Filter Press (Existing)	8ft2
500-TH-000	4	Tailings Thickener	352ft3
500S-U-000	5	Tailings Thickener O/F Sump	50gal
500-PP-000	5	Tailings Thickener O/F Pump	-
500-DF-000	5	Tailings Drum	100ft2
500-CV-000	5	Conveyor to FTL	12-in

Operation: Reference the following:

- **Figures 3-6A & 3-6B**, Mill Building GA and Elevation
- **Figure 3-7**, Rougher Flotation PFD,
- **Figure 3-8**, Cleaner Flotation, Thickening and Filtration PFD,
- **Figure 3-9**, Tailings Thickener and Filtration PFD, and
- **Figure 3-10**, Tailings Thickener and Filtration Building GA.

The operation is described as follows:

MDM Thickener & Conditioner (Figure 3-5)

The MDM Thickener has a capacity of 760ft^3.

- Underflow from the MDM Thickener flows at 9.26tph solids and 17.2tph water in a slurry running at 82.9gpm to the rougher flotation conditioning tank.
- MDM Thickener overflow (water) is reclaimed to the mill building sump at a rate of 0.84tph at 3.5gpm then pumped to the process water tank.

The Conditioning Tank has a capacity of 118ft^3.

  - Promoters and frothers are added in the conditioning tank.

- The conditioned slurry then flows at 9.26tph solids and 17.2tph water in a slurry running at 82.9gpm to the rougher flotation cells.

Rougher Flotation (Figure 3-7)

There are 3 rougher cells, each with a capacity 346ft^3, totaling 1,38ft^3. The cells operate in series.

- Rougher concentrate then flows at 1.85tph solids and 10.48tph water in a slurry running at 44.9gpm to the 1st Cleaners.
- Rougher tails flow at 7.41tph solids and 9.34tph water in a slurry running 49gpm to the Tailings thickener. The tails thickener (and filter) are located in the Tailings Filter Building (**Figure 3-10**).

Cleaner Flotation, Concentrate Thickening, Filter & Bagging (Figure 3-8)

There are 4 cleaner cells, each with a capacity of 87ft^3, totalling 346ft^3. The cells operate in series.

- 1st Cleaner concentrates flow at 0.37tph solids and 2.10tph water at a rate of 9gpm and report to 2nd Cleaner.
- 1st Cleaner tails flow at 1.48tph solids and 8.88tph water at a rate of 38.7gpm and report to Tailings Thickener.

- 2nd Cleaner concentrates flow at 0.09tph solids and 0.51tph water at a rate of 2.2gpm and report to the concentrate thickener.
- 2nd Cleaner tails flow at 0.28tph solids and 1.59tph water at a rate of 6.8gpm and report to the Tailings Thickener.

The Concentrate Thickener has a capacity of 113ft^3.

- Concentrates enter the Concentrate Thickener from the 2nd Cleaners and the Gravity Concentrator. Combined, tails flow in at 0.23tph solids and 0.53tph water at a rate of 2.5gpm.
- Concentrate Thickener U/F flows at 0.23tph solids and 0.13tph water at a rate of 1.0gpm to the tails filter.
- Concentrate Thickener overflow (water) is reclaimed to the mill building sump at a rate of 0.4ph at 1.7gpm then pumped to the process water tank.

The Concentrate Plate Filter has a capacity of 8ft^2.

- **Concentrate (80% solids) flows at 0.23tph solids and 0.06tph water at a rate of 0.6gpm.**

- Filtrate (water) from the plate filter is reclaimed to the mill building sump at a rate of 0.7tph at 0.3gpm then pumped to the process water tank.
- Any water that may spill within the facility will report to the sump which is then reclaimed into the reclaim water tanks.

Tailings Thickener & Filtration Building (Figure 3-9)

The Tailings Thickener has a capacity of 352ft^3.

- Tails enter the Tailings Thickener from the Roughers and the 1st Cleaners. Combined, tails flow in at 8.89tph solids and 18.22tph water at a rate of 85.8gpm.
- Tailings Thickener U/F flows at 8.89tph solids and 5.92tph water at a rate of 36.5gpm to the tails filter.
- Tailings Thickener overflow (water) is reclaimed to the mill building sump at a rate of 12.3tph at 51.6gpm then pumped to the process water tank.

The Tailings Drum Filter has a capacity of 8ft^2.

- **Filtered tailings (80% solids) flows at 8.89tph solids and 2.22tph water at a rate of 15.5gpm.**

- Filtrate (water) from the drum filter is reclaimed to the mill building sump at a rate of 3.7tph at 15.5gpm then pumped to the process water tank.
- Any water that may spill within the facility will report to the sump which is then reclaimed into the event pond.

Engineering (Figure 3-10)

- This facility is located in a separate, stand-alone building proximate to the FTL. The facility will be a 42ft x 36ft (1,512ft^2) structure.
- The foundation and structure design is shown in **Figure 3-10**.

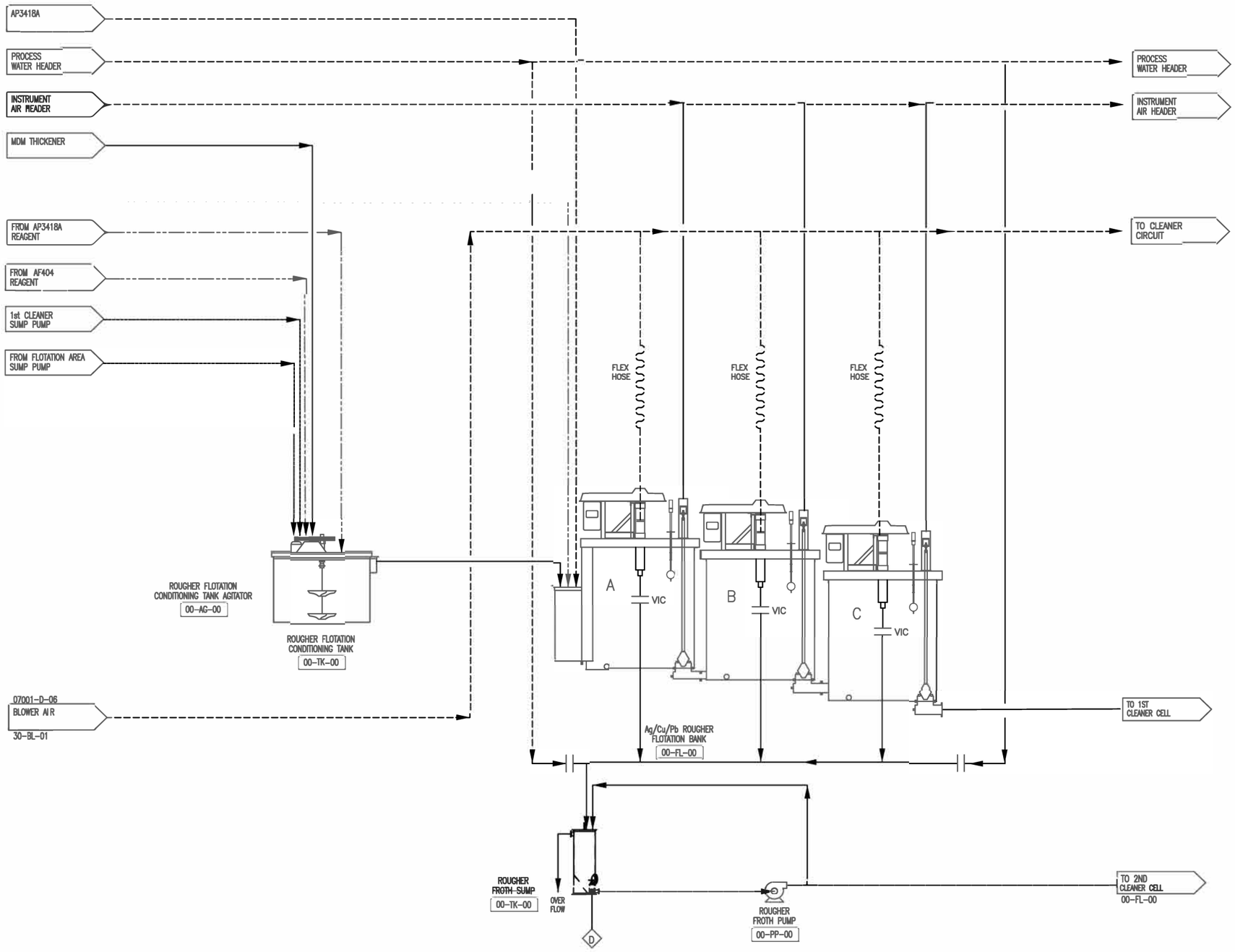


FIGURE 3-7

LEGEND

INTERMITTENT FLOW ----------

ALTERNATIVE FLOW ----—--—---

ENGINEER	K. SMITH	25-SEPT-2025
DRAWN BY	F. SMALDINO	25-SEPT-2025
P.M. CHECK	K. SMITH	25-SEPT-2025
PROCESS CHECK		
MECH. CHECK.		
STRUCT. CHECK		
ELECT. CHECK		
INST. CHECK		
CLIENT APPROVAL		

LEADVILLE MILL

ROUGHER FLOTATION CIRCUIT
PROCESS FLOW SHEET

NOTED SCALES ARE BASED ON A FULL SIZED SHEET OF 22"x34" DRAWING IS NOT TO BE SCALED

DRAWING NO. F-003

REV. 0

ROUGHER TAILS PUMP

RECLAIMED PROCESS WATER

METERING PUMP

METERING PUMP

METERING PUMP

CONCENTRATE

(OPTIONAL)

CONDITIONER TANK AGITATOR
000–AG–00

CONDITIONER TANK
000–TK–00
(OPTIONAL)

2nd CLEANER CONCENTRATE PUMP
000–PP–00

2nd CLEANER FLOTATION ONE CELL
000–FL–00

2ND CLEANER
000–FL–00

1ST CLEANER
000–FL–00

TAILINGS PUMP
000–PP–00

TO TAILINGS DEWATERING
F–005

AIR SUPPLY
000–AR–00

METALLURGICAL SAMPLER
000–SA–00

RECLAIMED PROCESS WATER PUMP
000–PP–00

PERCO1 351

THICKENER MECHANISM
00–TM–00

BY GRAVITY

CONDITIONER TANK
F–003

CONCENTRATE THICKENER AREA SUMP PUMP
000–PP–00

THICKENER
000–TH–00

THICKENER UNDERFLOW PUMP
000–PP–00

FILTER
000–FP–00

DRAINAGE TROUGH

THICKENER OVERFLOW PUMP
000–PP–00

THICKENER OVERFLOW
000–TH–00

CONCENTRATE STORAGE

THICKENERS OVERFLOW COLLECTION SUMP
000–SU–00

CONCENTRATE THICKENERS OVERFLOW PUMP
000–PP–00

RECLAIMED PROCESS WATER TANK
000–TK–00

LEGEND
INTERMITTENT FLOW
ALTERNATIVE FLOW

FIGURE 3-8

ENGINEER	K. SMITH	25–SEPT–2025
DRAWN BY	F. SMALDINO	25–SEPT–2025
P.M. CHECK	K. SMITH	25–SEPT–2025
PROCESS CHECK		
MECH. CHECK.		
STRUCT. CHECK		
ELECT. CHECK		
INST. CHECK		
CLIENT APPROVAL		

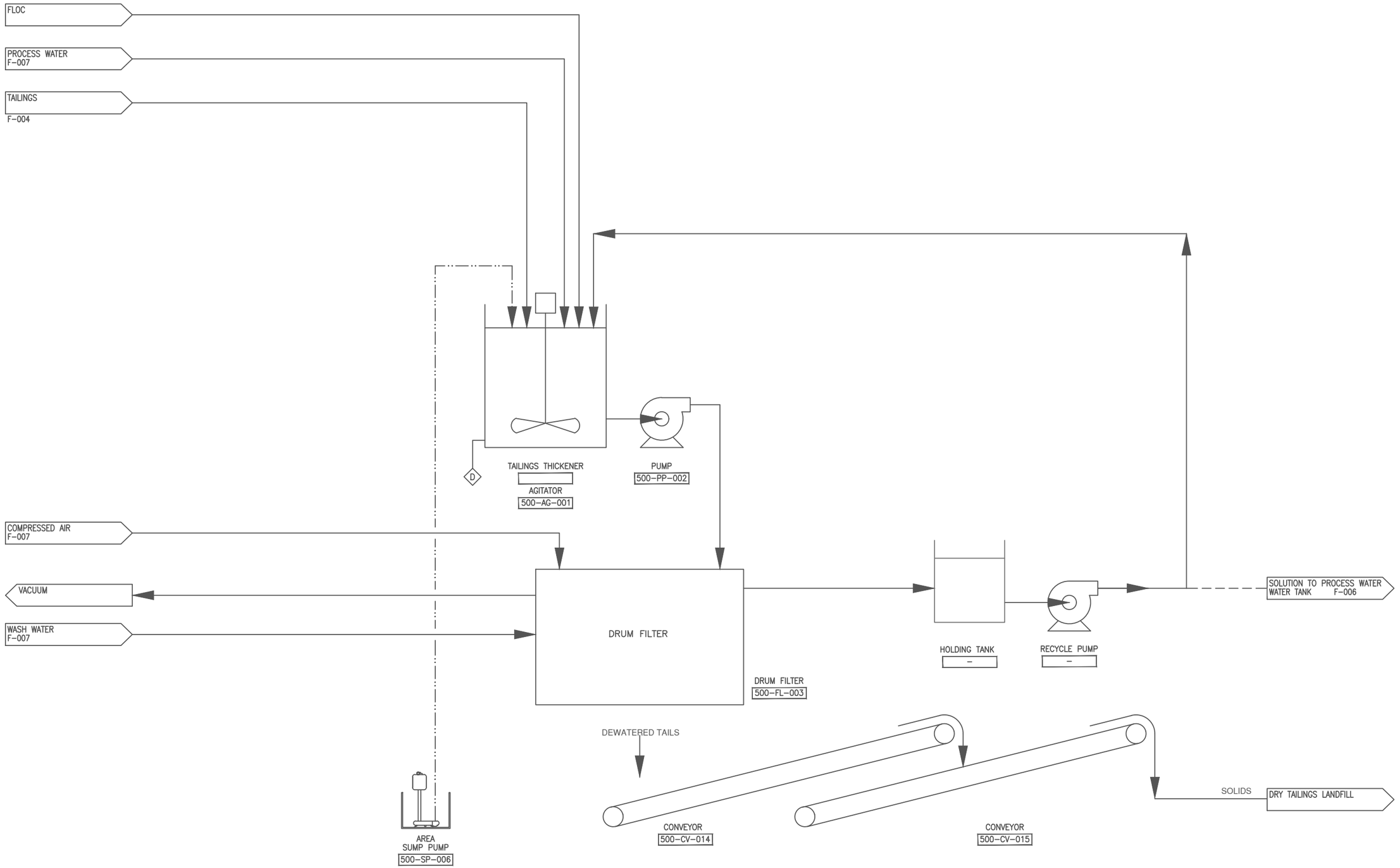
LEADVILLE MILL

CLEANER FLOTATION & THICKENING CIRCUIT PROCESS FLOW SHEET

NOTED SCALES ARE BASED ON A FULL SIZED SHEET OF 22"x34" DRAWING IS NOT TO BE SCALED

DRAWING NO. F-004

REV. 0



LEGEND

INTERMITTENT FLOW —··—··—··—

ALTERNATIVE FLOW — — — — —

FIGURE 3-9

ENGINEER	K. SMITH	18-FEB-2021
DRAWN BY	F. SMALDINO	11-FEB-2021
P.M. CHECK	K. SMITH	02-FEB-2022
PROCESS CHECK		
MECH. CHECK.		
STRUCT. CHECK		
ELECT. CHECK		
INST. CHECK		
CLIENT APPROVAL		

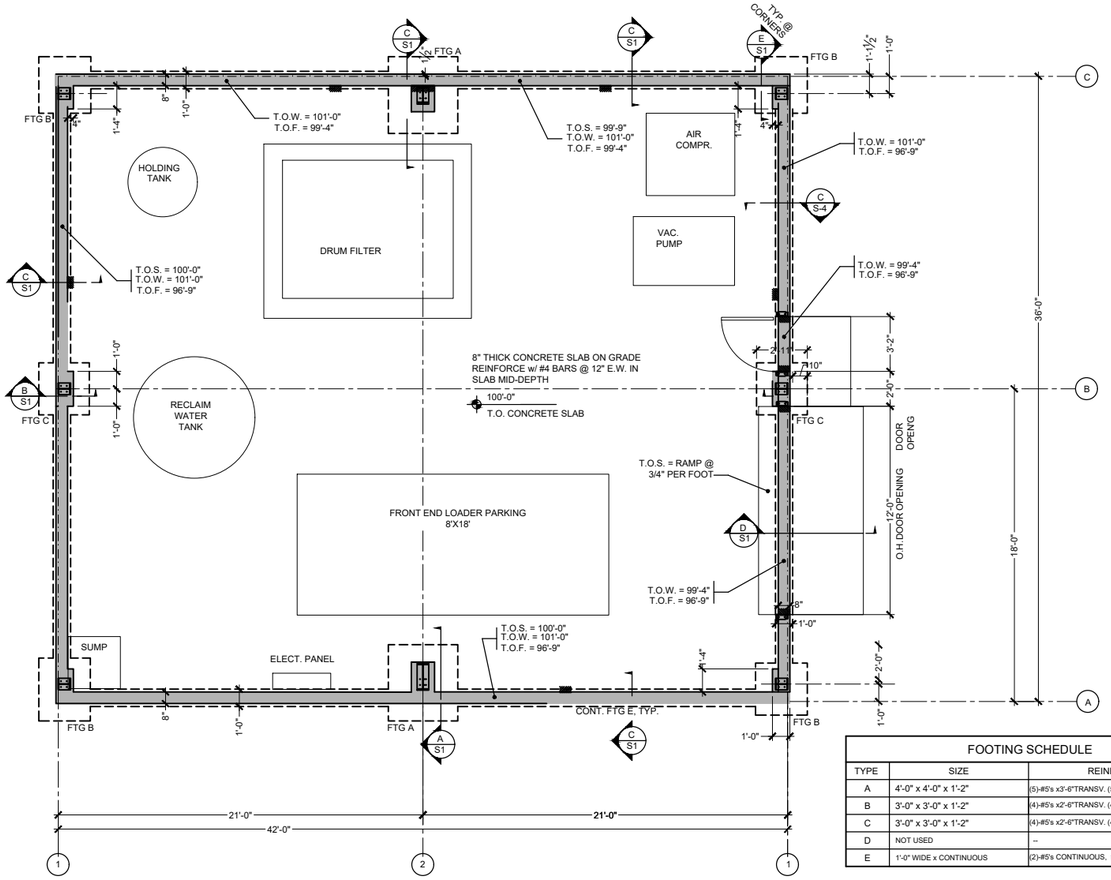
LEADVILLE MILL

TAILINGS DEWATERING CIRCUIT
PROCESS FLOW SHEET

NOTED SCALES ARE BASED ON A FULL SIZED SHEET OF 22"x34" DRAWING IS NOT TO BE SCALED

DRAWING NO. F-005

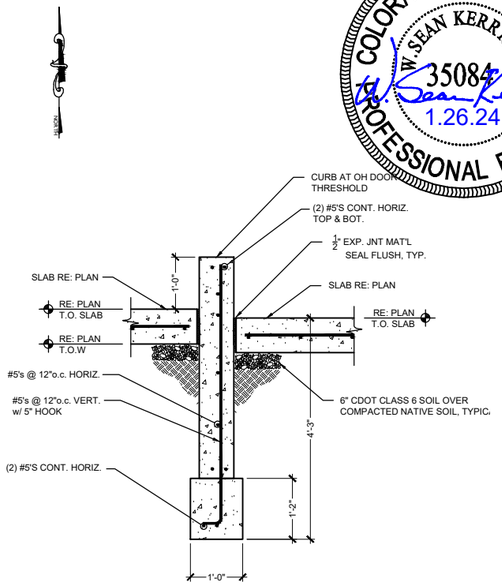
REV. 0



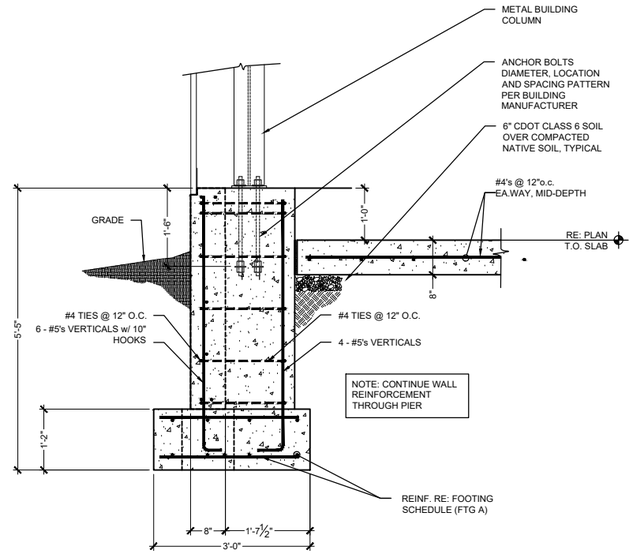
Tailings Filter Building Foundation Plan

1/4" = 1'-0"

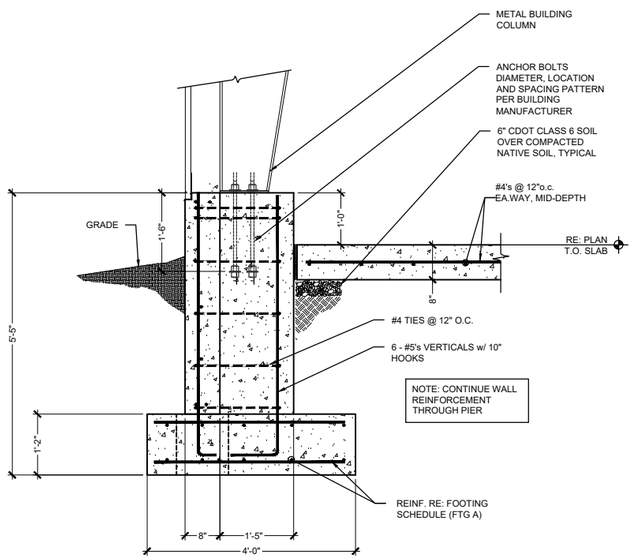
FOOTING SCHEDULE		
TYPE	SIZE	REINFORCING
A	4'-0" x 4'-0" x 1'-2"	(5)-#5's x3'-6"TRANSV. (5)-#5's x3'-6" LONG., TOP & BOTT
B	3'-0" x 3'-0" x 1'-2"	(4)-#5's x2'-6"TRANSV. (4)-#5's x2'-6" LONG., TOP & BOTT
C	3'-0" x 3'-0" x 1'-2"	(4)-#5's x2'-6"TRANSV. (4)-#5's x2'-6" LONG.
D	NOT USED	--
E	1'-0" WIDE x CONTINUOUS	(2)-#5's CONTINUOUS, #4 TRANSV. @ 12" O.C.



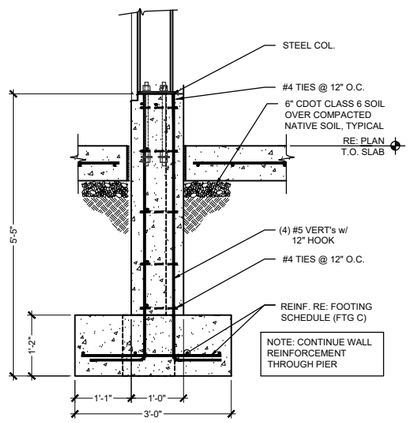
D S1 SCALE: 3/4"=1'-0



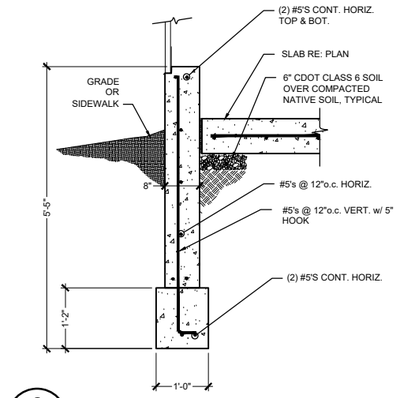
E S1 SCALE: 3/4"=1'-0



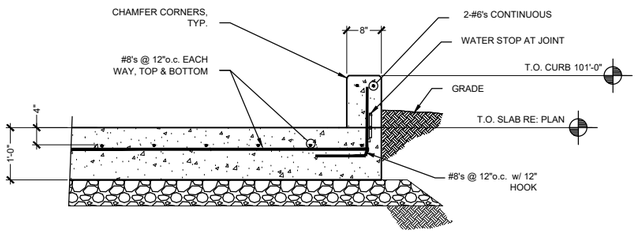
A S1 SCALE: 3/4"=1'-0



B S1 SCALE: 3/4"=1'-0



C S1 SCALE: 3/4"=1'-0



F S1 SCALE: 3/4"=1'-0

COLORADO REGISTERED W. SEAN KERRIGAN 35084 PROFESSIONAL ENGINEER 1.26.24

PLAN NOTES:

1. ELEVATIONS ARE BASED ON DATUM 100'-0" = MAIN LEVEL TOP OF CONCRETE SLAB. THIS ELEVATION EQUALS ACTUAL SITE ELEVATION 97xx' BASED ON SITE PLAN.
2. FOOTING ELEVATIONS SHOWN HEREIN ARE BASED ON FINDING ADEQUATE SOIL CONDITIONS AS DETAILED IN THE SOIL EVALUATION. IF SOIL CONDITIONS ARE OTHERWISE, CONTACT ENGINEER FOR OVEREXCAVATION REQUIREMENTS.
3. REFER TO SHEET S-1 FOR GENERAL NOTES AND FOUNDATION CONSTRUCTION SPECIFICATIONS.
4. SLAB ON GRADE SHALL BE THICKNESS AS SPECIFIED ON PLAN. PLACE CONCRETE SLAB ON 6" GRAVEL BASE IN ACCORDANCE WITH CDOT CLASS 6 MATERIAL PLACED ON UNDISTURBED GRADE OR COMPACTED STRUCTURAL FILL PER SOILS ENGINEER. REINFORCE SLAB WITH STANDARD DEFORMED REBAR AS SPECIFIED. PROVIDE 3/8" DEEP SAWN OR TROWELED CONTROL JOINTS AT 16'-0" MAXIMUM SPACING (144 SQFT.) EACH WAY. SEAL JOINTS FLUSH WITH ELASTOMERIC SEALANT.
5. FOUNDATION DESIGN PRECEEDS MANUFACTURED METAL BUILDING DESIGN. FOOTINGS, FOUNDATION WALLS, PIERS ANCHOR BOLT DESIGN SHALL BE REVIEWED AND CONFIRMED AFTER RECIEPT OF FINAL METAL BUILDING DRAWINGS AND COLUMN REACTIONS ARE RECEIVED. COORDINATE ALL DIMENSIONS AND DETAILS WITH METAL BUILDING MANUFACTURER'S DRAWINGS. DO NOT SCALE DRAWINGS.
6. CONTRACTOR SHALL COORDINATE FOUNDATION PLACEMENT WITH AN APPROVED SITE PLAN. PLACEMENT INCLUDES ORIENTATION WITHIN THE BUILDING ENVELOPE/SETBACK AND VERIFICATION/SETTING OF FOUNDATION WALL ELEVATIONS.
7. COORDINATE THE LOCATION OF UTILITY PENETRATIONS WITH MECHANICAL. PROVIDE A 1" THICK VOID FORM MATERIAL AROUND PLUMBING AT FOUNDATION WALL PENETRATION.

1/4" = 1'-0"

NOTE: FOR CORRECT SCALE, CONSTRUCTION DRAWING IS INTENDED TO BE PRINTED ON 24"x36" SHEET

KERRIGAN engineering
P.O. Box 3032 • Eagle, Colorado 81631

PROJECT: CJK MILLING COMPANY
13815 US HWY 24
TAILINGS FILTER BUILDING
FOUNDATION PLAN, NOTES AND DETAILS

JURISDICTION: LAKE COUNTY, CO

SHEET NO. Fig. 3-10

JOB NO. 23002

ISSUE NO.	DATE	REASON FOR ISSUING THIS DRAWING
C	01.26.2024	ISSUED FOR STATE PERMIT

3.3.5 AREA 800 REAGENT MANAGEMENT

REAGENT EQUIPMENT

Primary reagent equipment is shown in **Table 3-12**

TABLE 3-12: REAGENT EQUIPMENT

Equipment Description	Size
Air compressor & Receiver tank	-
Water Line	2”
Vault	4’x4’
Pump @ Vault	2hp
Pump @ FTL	2.5hp
Heat Trace	240V
Bulk Lime hopper	-
Lime Feeder / Screw Feeder	-
Reagent Metering Pumps	
Floc Mix tank	-
Feed funnel - syphon cone	-
Floc Mix tank agitator	-
Floc Mix tank transfer pump -	-
Floc Day / Dilution tank	-
Floc metering pumps	-

REAGENT DELIVERY

All reagents are delivered to site on trucks. Trucks will enter the site from either the secondary mill entrance off of US Highway 24 (just West of the Leadville Sanitation facility) or from the primary mill haul road via the AVS Aggregates Property.

Delivery trucks will make their way to the receiving area located to the East of the Mill Building. This is an (approximately 5,000ft2) area which allows for safe unloading (and loading) of reagents and other supplies. A Cat 277B skid steer will unload and load trucks.

REAGENT CONSUMPTION

Reagent consumption rates shown in **Table 3-13** are determined by metallurgical testing. The SDS sheets for these reagents is provided in Exhibit U.

TABLE 3-13: REAGENT USAGE RATES

Reagent	Function	Usage Rate (lbs/ton)	Daily Use (lbs)	Monthly Use (tons)
Lime (Ca(OH)2	pH Control	8.0	1,600	24
Aerophine (AP) 3418A	Promoter	0.11	21	0.32
Aerofloat 404, aqueous	Promoter	0.11	21	0.32
Aerofroth 65	Frother	0.04	9	0.13
Percol 351	Flocculent	0.03	6	0.10
Diesel Fuel	Equipment	-	-	1000-gal

Ph Control

- Lime is introduced the crusher conveyor in the Mill Building to MDM Bin conveyor to pre-condition the MDM prior to the addition of flotation reagents.
- Lime is required to maintain proper pH for the process. Very limited use of lime is anticipated. Testing has determined that in limited instances, up to 8lb/t or lime will be required.

Promotors & Frothers

- Promoters and frothers are introduced in the conditioning tank ahead of flotation.
- Promoters are reagents that increase the floatability of valuable minerals by making their surfaces more water-repellent, allowing them to attach to air bubbles.
- Frothers stabilize the air bubbles in a flotation cell, creating a persistent froth that carries valuable minerals to the surface for collection.

Flocculants

- Flocculants are introduced in the concentrate and tailings thickeners
- Flocculants aggregate fine particles into larger, heavier clumps (flocs) that are more easily separated from the water through settling or filtration.

ON-SITE INVENTORY

On-site reagent inventory is shown in **Table 3-14**. Lime will be stored in the Crusher Building. All other reagents will be stored in overpack containers in the Mill Building Reagent area. Diesel Fuel will be stored in a doubled-lined tank on South side of Mill Building. Lubricants will be stored in flame-protected metal cabinets.

TABLE 3-14: REAGENT INVENTORY

Reagent	Chemical Formula	State	Inventory tons	Duration days	Molar Mass g/mol	Density g/cm3	Melting Point ℃	Boiling Point ℃	Solubility g/100ml
Lime (Ca(OH)2	Ca(OH)2	solid	12	15	74.093	2.211	580	-	1.89
Aerophine (AP) 3418A	C8H18NaO2PS2	liquid	0.32	30	264.3	1.1	-	100	-
Aerofloat 404, aqueous	C8H19O2PS2	liquid	0.32	30	242.3	1.1	-7	104	1000
Aerofroth 65	C19.5H41O7.5	liquid	0.13	30	102	1.009	-	133	infinite
Percol 351	(C3H5NO)n	powder	0.10	30	High	-	-	-	-
Diesel Fuel	C8H18	liquid	3.51	30	2.82	0.72kg/l	-	-	0.91

Lime:

- 12 tons of lime is delivered bi-weekly in 1-ton super sacks. The skid steer moves the lime to the Crusher Building (Area 100) reagent area where it is stored.
- A crane or fork lift is used to fill a 2-ton feed bin with Lime. The bin will nominally receive 1-ton, or 2-tons one time per day, as required.
- A screw feeder places lime onto the MDM Bin conveyor at a rate of 282lb/hr.
- This is a dry process. Spills, if they occur, are swept up and placed in the feed bin.

Promoters and Frothers:

- These are AP3418A, AF404, and Aerofroth 65.
- These are all liquids and arrive in 200kg barrels. Two barrels each of AP3418A and AF404, and one barrel of Aerofroth 65 representing a 30-day inventory will be kept on-site.
- Barrels arrive on site monthly. The skid steer moves the reagent to the upper level of the Mill Building Reagent area where they are stored in overpack containers.
- Reagents are metered into the conditioning tank during operation.

Flocculent:

- Flocculent is delivered in 55-lb bags on a wooden pallet. The skit steer moves the reagent to the upper level of the Mill Building Reagent area where they are stored in overpack containers.
- Reagents are metered into the conditioning tank during operation.

LABORATORY

Laboratory reagents are discussed in **Section 3.3.6**.

OTHER REAGENTS

- Diesel fuel is used by the front-end loader at the FTL, the front-end loader at the crusher hopper, and the utility skid steer. 1,000 gallons is stored in a double-lined storage tank located on the South side of the Mill Building
- Gasoline will be used by the ¾-ton utility pick-up truck/snow plow. Extra fuel is stored on a 100-gallon tank mounted on the bed of the ¾-ton utility truck/snow plow. The utility pickup truck will be fuelled at a local gas station.

3.3.6 LABORATORY

The Laboratory is in the Mill Building and is accessed from the mill office area. The primary purpose of the Laboratory is to support mill operations. Activities are:

- pH monitoring
- Sample Preparation.
- MDM Analysis
    - Particle Size Analysis (PSA)
    - Bond Work Index (BWi)
    - Slurry Analysis

EQUIPMENT

Conventional laboratory equipment is used. Laboratory equipment is shown in **Table 3-15.**

TABLE 3-15: LABORATORY EQUIPMENT

Item	Description	Size	Power
1	Jaw Crusher	5” x 6”	3kW
2	Roll Crusher	10” x 6”	1kW
3	Pulveriser	¼”	3kW
4	Vibrating Screen & Screens	12” x 24”	0.3kW
5	Sample Splitter	10” x 18”	-
6	Laboratory Scale	-	-
7	Glass Measuring Cylinders	1-set	-
8	Vacuum Pump & Filters	12”	-
9	Pressure Pump w/ Flask Receiver	4L	-
10	Sample Drier Oven	-	0.25kW
11	Sieve Shaker & Sieves	-	0.25kW
12	Hot Plate	-	0.25kW
13	Meker Burner	-	-

14	AA Spectrograph & Testing Equipment	-	-
15	Vent Hood for AA sample prep and AA machine	-	0.25kW
16	Marcy Bulk Density Scale	-	-
17	pH Meter	-	-
18	Reagent Cabinet	-	-
19	Miscellaneous Laboratory supplies	-	-

REAGENTS

Laboratory reagents are required for AA assays. These are shown in **Table 3-16**.

TABLE 3-16: REAGENT CONSUMPTION, LABORATORY

No.	Reagent	Lab Inventory
2	Hydrochloric Acid (HCl)	2L
3	Deionized (DI) Water	20L
5	Distilled Water	8L

Hydrochloric Acid: Hydrochloric acid, also known as muriatic acid or spirits of salt, is an aqueous solution of hydrogen chloride (HCl). It is a colorless solution with a distinctive pungent smell. It is classified as a strong acid. It is a component of the gastric acid in the digestive systems of most animal species, including humans. Hydrochloric acid is an important laboratory reagent and industrial chemical.

Deionized Water: Deionized water, DI water, or demineralized water — is water that has had ions removed. Ions are molecules with a positive or negative electrical charge. In water, they appear as dissolved mineral salts.

Distilled Water: Distilled water is water that has been boiled into vapor and condensed back into liquid in a separate container. Impurities in the original water that do not boil below or near the boiling point of water remain in the original container. Thus, distilled water is a type of purified water.

LABORATORY OPERATION

Operating Philosophy:

The on-site laboratory is for plant operations only, and no regional or expletory samples are processed.

Sample Types:

- Hard Rock (mill feed)

- Slurry (Ball mill / Cyclones / Flotation circuit)
- Solution Samples

Operating Procedure:

The plant operates as conventional flotation system. No Fire Assay, Acid digestions or other techniques will be used.

Hourly grab samples are adequate for initial plant operations. Advanced or automated devices will be considered for future expansions or controls.

All samples are properly labeled and delivered to the laboratory or the **Sample Preparation Area (SPA)**.

Hourly Sampling will occur at the following locations:

- **Plant Feed** – cross belt samples are taken by shutting off the conveyor momentarily, to take a 8-10" "Cut" across the belt. This approximates 1-2 shovels full of material per hour per 12-hour shift, resulting in 12 samples per shift, which in turn will be composited to create a representative sample. This will result in two (2) ore samples that represent the plant's daily "Head Grade" or grade of the ore being feed to the plant.

  The conveyor belt (100-CV-09) crushed feed to the Fine MDM Bin is the sampling point. The composite sampling period is adjusted to the desired frequency.

- **Ball Mill** - Slurry exiting the ball mill is checked for particle size and proper grind size via sieve screen, as well as a Marcy pulp scale test to confirm percent solids. Additionally, the pressure gauge on the cyclone is checked to confirm that it is operating at the correct pressure.

- **Flotation Circuit Feed** – Rougher and Cleaner cells have a small slurry sample, ±100ml dipped from the tank. The sample is filtered and the solids dried and eventually assayed for metals content.

Plant Mass Balance (Metals Recovery)

Crushing & Flotation

- The analysis of the plant feed Head grade is the value of the material entering the plant.
- The analysis of the slurry (dried solids) the Rougher cells is the tails exiting the plant.

Subtracting the Head by the Tails equals metals recovered from the MDM (Plant feed).

Daily Sampling

Hard Rock (mill feed)	2 – 5-gallon buckets
Slurry-Ball Mill/Cyclone	24
Concentrate	48

This is for plant operations only, pH, lime, and percent solids are in addition to the above.

SAMPLE PREPARATION & TESTING

Samples are prepared in the Sample Preparation Area located on the East side of the Mill Building.

Samples are:

1) Delivered in 5-gal buckets and stored in the sample preparation Conex located outside of the laboratory. Samples are dry (≈4% moisture).
2) Emptied on the floor of the Conex for compositing but mixing them with a shovel.

Preparation Procedure:

1) If the sample is too wet, empty the sample directly into the pan and dry thoroughly.
2) Dry any sample that appears too wet for the jaw crusher.
3) Samples that contain any +⅛" material must be jaw crushed first before splitting. NOTE: Clean jaw crusher thoroughly before and after use. If fine adjustment -⅛" cannot be obtained, clean out material behind the faceplates.
4) Split 100% of the sample from the pans until an approximate 500 grams split sample is obtained.
5) Remainder or reject of the sample is placed into its original sample bag after splitting or into the reject barrel unless otherwise indicated by Laboratory Manger.
6) Put pans containing samples in drying oven and heat at 450° F. for one (1) hour. After samples are dry, remove from oven and cool.
7) Pulverize the entire 500gram sample. Feel the sample coarseness. If it is not smooth powder, brush down the pulverizer to get the entire sample, and run it right back through again (adding it gradually). Repeat until a good grind is obtained.

8) Hand -roll the entire pulverized 500-gram sample 50 times minimum.

9) Place the entire prepared sample into a plastic lined bag and label as to it's contents.

10) Arrange the samples in proper numerical sequence on the pulp room counter.

11) Transfer the samples to the Assayer.

The Conex is swept after each sample preparation. Sweepings are introduced into the process in the Ball Mill Sump.

pH Monitoring

pH is a measure of hydrogen ion concentration. It is important that a high pH is maintained to maintain safety when CN is in solution. pH must be above 8 at all times.

A pH probe will be used. The glass probe of the pH meter contains two electrodes:

- Reference Electrode. The reference electrode never comes into contact with the test solutions. It has a stable and constant electrical potential.
- Conductor Electrode. The conductor electrode is immersed in saturated (3M) potassium chloride. It does come into contact with our test solutions through a porous membrane in which it is housed.

Also:

- The potassium chloride solution is conductive and has a neutral pH (7.0).
- The porous membrane is selective towards hydrogen ions.

Probe Operation

When the conductor electrode is dipped into our test solution, ion exchange takes place through the porous membrane. Since the test solution and the saturated potassium chloride have a different pH, and because the porous membrane permits the passage of hydrogen ions through it, hydrogen ions move to or from the test solution until equilibrium is achieved.

This accumulation or vacation of hydrogen ions from the conductor electrode changes its chemical potential. The chemical potential of the conductor electrode is measured and compared to the chemical potential of the reference electrode. The difference in chemical potential between the two electrodes is called their potential difference. And the probe converts the potential difference to pH using the Nernst equation.

Probe User Requirements

- Probe Maintenance.

- The pH meter probe should never dry out. Keep the pH meter probe filled probe with saturated potassium chloride.
- The probe should be stored in a solution of 3M potassium chloride (KCl).

- Calibrate Daily.
  - Use standard solution provided by the independent laboratory.
  - Do not store in H_2O, and especially not distilled H_2O, to maintain conductive KCl solution.
- Use Probe as Directed by Manufacturer
  - Keep the probe submerged in your solution during pH measuring process.
  - Take the probe out, wash it in deionized water, blot it with paper, put it in the storage solution, and wash again before putting it back into your solution.

3.3.7 DUST CONTROL

Dust at the MDM bunker is managed, as required, with water sprays.

Dust control within the Crusher and Mill Buildings is accomplished utilizing a 4,000cfm UAS Dust Hawg® horizontal cartridge dust collector. The dust collector is located in the Crusher Building, where virtually all dust is collected.

Dust is contained within the enclosed crusher building. Inside the crusher building, dust managed by use of a ducted exhaust air system which draws air from all transfer points. Dust from the screening, primary and secondary crushing circuits, conveyance systems, is limited to fugitive particulate matter. Negative pressure ventilation will direct venting to the dust collector to control the flow of fugitive particulate matter during screening and crushing operations.

Dust in the Mill building is limited to fugitive particulate matter. Negative pressure ventilation will direct venting of the dust collector at the head of the conveyor going into the Fine MDM bin.

The unit is estimated to operate at air velocities of 3,500-4,000fpm based on demand and manual control dampers at each collection point. The dust collector is rated at 4,000cfm and upgradable to 6,000cfm.

The dust control unit is designed to capture 28.2tpy crushed ore fugitive particulate matter and an additional 0.4tpy reagent fugitive particulate matter for a combined 165lb/day at a 99.8% at 0.5µm published design efficiency. The captured dust will be

pulse-cleaned off the filters in the dirty air plenum and collected in drums and returned to the material flow in the grinding circuit.

3.4 SOLUTIONS MANAGEMENT

Water and solution management for the FTL is presented in Section 3.5.

3.4.1 PROCESS WATER

The process plant-wide water balance, shown in **Table 3-5**, operates at a 19.7gpm (0.04cfs) deficit. The deficit is primarily due to water lost in the filtered tailings and in the concentrate that is shipped to the smelter. Some loss is due to evaporation. The plant is zero-discharge, thus produces no effluent.

At the planned steady state production rate of 200 tons/day, the process plant contains approximately 27,000 gallons of water. This water contains approximately 2,400-lbs of lime, 4.5-lbs of AP3418A promoter, 4.5-lbs of AP404 promoter, 1.8-lbs AF65 frother, and 1.4-lbs of Percol 351 flocculent. Note that these values represent the quantum of reagent added and do not consider their consumption in the process. The instantaneous water and reagents in the process facility is summarized in **Table 3-17**.

TABLE 3-17: INSTANTANEOUS WATER & REAGENTS

Mech Equip No	Flow Sheet Ref	Process Equipment	Solid: Soln Ratio	% solids	Total Volume (ft3)	Ton Solids	Ton Water	Gal Water	Lime (lbs)	AP 3418A (lbs)	AP 404 (lbs)	AF 65 (lbs)	Percol 351 (lbs)
1	1	MDM Bin	2.70	96%	2,968	240	10	2,397	1,920	0	0	0	0
1	1-2	Ball Mill	0.31	77%	31	0.2	1	180	2	0	0	0	0
2	3-4-7	Cyclone	1.51	40%	-	-	-	-	-	-	-	-	-
3	4-5	Gravity Concentrator	1.41	42%	-	-	-	-	-	-	-	-	-
4	7-8	Feed Thickener Tank	2.08	33%	760	16	8	1,847	128	0	0	0	0
5	8	Conditioner Tank	1.86	35%	75	2	1	197	12	0.16	0.16	0.07	0.05
6	8-10	Rougher Flotation Tanks	1.51	40%	1,039	19	13	3,096	156	2.09	2.09	0.83	0.63
7	9-13-14	Cleaner Flotation Tanks	5.67	15%	346	9	2	388	73	0.98	0.98	0.39	0.29
8	13-15	Concentrate Thickener	1.67	38%	113	2	1	317	18	0.24	0.24	0.09	0.07
9	15-17	Concentrate Filter	0.43	70%	12	0	0	65	1	0.01	0.01	0.00	0.00
10	20-21	Tailings Thickener Tank	1.16	46%	352	6	5	1,221	47	0.63	0.63	0.25	0.19
11	21-23	Tailings Filter	0.43	70%	372	3	8	1,947	28	0.37	0.37	0.15	0.11
12	15-17	Concentrate Filter	0.43	70%	37	0	1	194	3	0.04	0.04	0.01	0.01
13	26-28	Reclaim Water Tank	-	0%	545	0	17	4,075	0	0.00	0.00	0.00	0.00
14	-	Fresh Water Tanks	-	0%	1,378	0	43	10,303	0	0.00	0.00	0.00	0.00
		TOTAL			**8,029**	**298**	**109**	**26,227**	**2,388**	**4.52**	**4.52**	**1.81**	**1.36**

- Make-up water is supplied by Parkville Water District and is partially delivered to site using a water line owned by Leadville Sanitation.

  Makeup water originates from:

  - Fresh water tanks at 6.67tph (26.6gpm). This water is contained in 2 fresh-water tanks having a total capacity of about 10,000 gallons.
  - The Landfill Leachate Collection Pond (LLCP) will nominally contain a de minimis amount of water. When available, this water displaces the fresh make-up water in the process water balance. The LLCP occupies an area of approximately 5,000ft^2 and has a volume of approximately 27,000ft^3, or about 200,000 gallons.
  - FTL. Meteoric water that is captured in the FTL will be released back into the environment as discussed in Section 2.4.

- Reclaim water originates from:
  - MDM Thickener at 0.84tph (3.5gpm), **Figure 3-5, Stream 19**,
  - FTL Thickener at 12.3tph (51.6gpm), **Figure 3-5, Stream 22**
  - FTL Filter at 3.7tph (15.5gpm), **Figure 3-5, Stream 24**,
  - Concentrate Thickener at 0.4tph (1.7gpm), **Figure 3-5, Stream 16,**
  - Concentrate Filter at 0.07tph (0.3gpm), **Figure 3-5, Stream 18,** and
  - Waste water from the laboratory, di minimus amount.

3.4.2 FIRE WATER

Fire Water is supplied from a 12,000-gallon water tank and hydrant located on the North side of the upper facility area haul road approximately 110-ft from the Mill Building. This tank is accessible by the fire department via the mill access road as well as the truck haul road. This tank is dedicated for fire protection and is not plumbed to supply process water to the facility.

Water to the tank is supplied by Parkville Water District and is piped in from the same water line used for process make-up water.

The existing Leadville Mill CUP (Lake County File 11-11) mandates a 10,000-gallon fire water tank.

3.4.3 POTABLE WATER

There are 2-500-gallon stainless steel water tanks in the Mill Building. These exclusively store potable water. There is also a hot water tank. Hot and cold water is available for use in the rest-room and kitchen. Water for these tanks is supplied by

Parkville Water District and is piped in from the same water line used for process make-up water.

Bottled water is provided for employee and visitor consumption.

The existing Leadville Mill CUP (Lake County File 11-07) mandates 1,000-gallons of potable water storage at the plant.

3.4.4 WASTE WATER

The Mill Building is connected to the Leadville Sanitation District sewer line. This line runs directly through the property about 150-feet north of the Mill Building. Waste water from the lavatory and sink report to the sewer line.

Waste water from the laboratory is reclaimed in the process plant.

3.4.5 SPILL CONTAINMENT

Mill plant facilities have primary containment and sumps. In the event of a catastrophic failure involving these sumps being breached, solution will report – via gravity – to the LLCP.

CRUSHER BUILDING

Area 100 consists of the Crusher Building. There are no solutions in the Crusher Building.

MILL BUILDING

The Mill Building consists of Area 200-Grinding Circuit, Area 300-Flotation Thickening and Filtration Circuit, and Area 800-Reagent Storage.

For security, the Concentrate Room contains the concentrate bagging machine and concentrate super sacks awaiting shipment to the smelter. There are no solutions in the Concentrate Room.

All spills report to the Mill Building sump. Spill containment measures within the Mill Building are:

- Curbing. Curbs are constructed at the;
  - Man-doors at the mill office and West wall, and
  - Overhead doors, upper level on East side, and main level on West side.
- Sealant. Mill Building floors are sealed.
- Sumps. If they occur, Mill Building spills will report to the;
  - Solutions in Main Building. At steady state there are approximately 25,000 gallons of solution within the Mill building.
  - Primary Sump. The primary sump is the entire South side of the Mill Building, which is the lowest elevation. Spills will report to the primary sump via gravity. The primary sump capacity is 5,000 gallons which is approximately 20% of solutions within the Mill Building. Solutions reporting to the primary sump will be pumped into the MDM Thickener (Area 200).
  - Tailings thickener. The tailings thickener containing approximately 1,200 gallons of solution (inclusive of the overall plant solution inventory) is located outside of the Mill Building (South side). The thickener is connected to the LLCP with a lined concrete trough. Any spills will flow via gravity into the LLCP.
  - Secondary Sump. If the primary sump overfills, solution will report via gravity to the LLCP. The capacity is approximately 200,000 gallons or 7.5x of all process plant solutions. Since the LLCP is a sump it is almost certain that process plant solutions will not breach this facility.

- FTL. In the highly unlikely event that the LLCP is breached solution will report to the FTL where freeboard capacity will more than accommodate the volume.

TAILINGS FILTER BUILDING

The Tailings Filter Building houses the Head Tank and Drum Filter. Similar to the Mill Building the building itself serves as primary containment.

Spill containment includes:

- Curbing.
  - The foundations include curbed concrete.
- Sealant. All concrete is sealed.
- Sumps. If they occur, spills will report to the;
  - Primary Sump. A 18ft^3 sump located within the FTD Filter Building. The capacity is 135 gallons. Solutions reporting to the sump will be pumped into the Drum Filter Head Tank, and
  - Secondary Sump. The LLCP via gravity in a concrete lined trough.

LANDFILL LEACHATE CONTAINMENT POND

The LLCP design and is discussed in Section 3.5. Design criteria include:

- Facility is a sump with enough capacity to contain all solutions accosiated with plant operations.
- Pond excavation limited to 8ft with 2:1 depth and does not impact aquifers at 80-100ft depth below the surface.
- Embankment construction using available onsite soils borrowed from the containment site area as outlined by CTL Thompson, Inc., Permeability Study, April 10, 1990, and Slope Stability Evaluation, July 8, 2011.
- Compaction during construction.
- Zero-discharge facility.
- Observation well down gradient from FTL is maintained in its current location and monitored.
- Geosynthetic clay liner of 1 x 10^{-6}cm/sec permeability (or less), or equivalent material liner.
- Synthetic pond liner of 90-mil HDPE.
- Compaction testing during construction.

3.5 DRY TAILINGS LANDFILL (DTL) & LANDFILL LEACHATE COLLECTION POND (LLCP) DESIGN AND OPERATION

3.5.1 TAILINGS CHARACTERIZATION

Tailings in slurry form are produced in the flotation and gravity circuits after gold and silver concentrates are produced by conventional methods as the saleable products from the metal recovery operations. Tailings slurry with solids content (by mass) of between 30% and 40% is pumped to the filter/dewatering plant. Dewatering is accomplished by a disk filter that yields a nominal 20-mm-thick cake of between 75% and 80% solids (25% to 20% water content by mass). Water recovered via filtration (filtrate) flows via gravity into the LCCP for recycling back into the process in a closed loop. The filter cake produced by the drum filter drops onto a discharge conveyor that discharges into a stockpile inside of the adjacent Dry Tailings Landfill (DTL). The DTL is a retro-fit of the existing hydraulic slurry impoundment (pond/dam) to function essentially as an industrial solid waste landfill where the dewatered tailings filter cake can be mechanically placed within the lined containment of the original double synthetic lined tailings pond. This transition in form and function requires the placement of a drainage blanket at the base of the pond, which provides a mechanism for the continuous drainage of the deposit to maintain unsaturated and stable conditions. These conditions are required in order to satisfy two main design objectives: to allow mechanical placement and handling of dry tailings using low-ground-pressure mobile earth moving equipment; and more importantly to transform the structure from a hydraulic impoundment to an engineered fill to contain the stable and dewatered tailings filter cake on all sides on a consistent basis and thus eliminate the development of hydraulic pressure at the base of the deposit through continuous removal of leachate and infiltrating meteoric waters and snowmelt. The design features of the DTL transformation are discussed in greater detail later in this section.

For its original intended purpose as a tailings impoundment, the characterization of the tailings solids was necessarily focused on its geotechnical properties, with their geochemical characterization being of secondary importance as the design incorporated a double synthetic lined concept suitable for any type of waste containment including those characterized as hazardous. With the transformation of the pond from hydraulic structure to a simple earth material repository, the geotechnical characteristics of the anticipated tailings filter cake are only of consequence once the level of the filling extends over the rim elevation of the pond as the dewatered solids (filter cake) is contained on all four sides of the facility. Regardless of the minimal design and operational impact of the mechanical and geochemical quality of the anticipated flotation tailings filter cake, process simulations at laboratory scale were carried out to generate representative tailings samples using feed composites assembled from both

drilling and bulk samples of Penn Group dump material. Simulations included all anticipated process steps, including crushing, grinding, gravity and flotation concentrate production, as well as liquid solid separation and filtration of a final (reject) tailings slurry, which constitutes approximately 85% of the original feed ore mass. These tailings were then prepared for a battery of characterization tests that were specifically designed to yield important information about their geochemistry, physical and geotechnical properties, and more importantly, their potential to generate acid, dissolved metals, and other potentially toxic substances during the flotation and gravity concentrate production processes. **Table 3-18** below outlines the tests and methods applied during this evaluation, which at the time of this reporting, were still in progress.

TABLE 3-18: TAILINGS CHARACTERIZATION TESTING OUTLINE

Test	Method
Total Sulfur	Sobek 3.2.4
Neutralization Potential	Sobek 3.2.3
Moisture	ASTM D2216
Paint Filter	9095A
Paste pH	USDA60
Gross Alpha	EPA900.0
Gama Spectroscopy	EPA901.1
SPLP CDPHE1 Metals and GPV analytes	6020/7470

[1] CDPHE Groundwater Protection Values (GPV)

The SPLP testing program included all of the required elements in the approved surface and groundwater sampling and analysis plan, in strict accordance with CDRMS guidance. The basic objective of this element of the characterization plan was to ensure that the quality of the contact solutions and filtrate could be applied as guidance in the future should any of the baseline constituents be detected during future routine groundwater and surface water monitoring testing. A more detailed discussion of the surface and groundwater sampling and analysis methods and protocols are provided in Exhibit U.

As mentioned previously, due to the general nature of the retro-fit tailings management system design to transition to a below-grade solid-waste storage repository, the additional tests outlined provide important information about the potential character of the anticipated tailings filter cake and have been included for completeness sake. Extensive prior testing of tailings residues produced from various leaching process alternatives provide some general guidance on the anticipated character of the tailings solids and leachates but are not applicable to the current process included in this permit amendment. However, the geochemistry of the existing on-site covered ore and tailings stockpiles (see **Figure 5-4** for location and relative sizes) has been addressed using SPLP leachability standards as requested by CDRMS. These materials are planned for processing or alternatively, off-site disposal to remove them from the permit affected

area during start-up process operations as they may contain economic levels of precious metals. These results are presented in Exhibit U.

Table 3-18 provides a summary of test performance data from the drum filtration tests carried out on representative tailings slurry samples from earlier work at laboratory scale and are presented as a general example of expected filtration effectiveness. These data are considered to remain valid as the particle size distribution of the final tailings solids are not expected to substantially different from earlier tests as the grinding circuit has remained essentially identical. The design target water content of between 20% and 30% will yield physical properties that allow for mechanical handling and placement of the tailings in the DTL. Optimization of the filtration plant design, including the utilization of advanced flocculants for more rapid and consistent filtration performance are ongoing. The samples included in this early round of filtrations tests also contained a relatively high percentage of clay-sized particles than might typically be encountered in the Penn Dump material, and therefore the results are conservative from the perspective of anticipated drum filter performance.

TABLE 3-19: FILTRATION DATA

Sample Test	Cake Thickness (mm)	Filter Cake (% Solids)	Filtration Rate (lbs_{dry}/ft^2-hr)
1 (Vacuum)	9.0	73.1%	97.0
2 (Vacuum)	20.0	71.4%	29.6
3 (Vacuum)	9.0	75.6%	56.9
4 (Vacuum)	19.0	75.2%	22.4
5 (Pressure)	8.0	80.6%	448.2
6 (Pressure)	8.0	82.2%	544.4
7 (Vacuum)	4.8	75.4%	91.7
8 (Vacuum)	22.0	71.5%	155.4
9 (Vacuum)	22.0	71.5%	421.5

3.5.2 DTL DESIGN & OPERATIONS

FACILITY GENERAL ARRANGEMENT

Figure 3-1 and **Figure 3-11** illustrate the general location and geometry of the existing lined impoundment that will be retro-fitted as a solid waste landfill, now referred to as the Dry Tailings Landfill (DTL). The DTL being proposed under this permit amendment is intended to provide interim, start-up storage capacity to accommodate approximately 12 to 15 months of initial plant operations. Once full capacity has been reached, it is anticipated that a larger surface landfill will have been permitted and in operation, and that the Phase 1 DTL can be subsequently decommissioned and reclaimed per the approved plan as described under Section 4.

The transition from hydraulic impoundment to DTL requires the installation of several key operational features:

1. The installation of a geocomposite drainage layer, which also serves as a protective barrier for the existing underlying synthetic liner system;
2. The placement of a 2-ft.-thick operations layer (Detail 5, **Figure 3-12**), consisting of fine slag form the adjacent AVS property. This layer is also highly permeable and with function both as a protective layer, and as an additional drainage blanket zone at the Base of the DTL;
3. The construction of an access ramp (Detail 6, **Figure 3-12**) in the northeast corner of the DTL that will be constructed with a combination of fine slag placed over a layer of geocomposite, and a top working surface constructed from Geoweb (cellular confinement subsystem) mat that will be fill with compacted aggregate, also sourced form coarser slag from the AVS property. Both the Geoweb and the geocomposite will be anchored in a separate trench located outboard from the existing anchor trench for the geosynthetic liner system (Detail 2, **Figure 3-12**); and
4. Installation of a perimeter collector perforated piping system (**Figure 3-11**), encased on coarse aggregate and wrapped in geotextile that will lead to a collection sump equipped with a sump riser and fitted with a submersible leachate pump (Detail 7, **Figure 3-12**; **Figure 3-13**). Collected leachate and infiltrating precipitation and snowmelt that flows through the pipe system to the sump will be continuously removed and directed via a discharge pipe into the Landfill Leachate Collection Pond (LLCP) and eventually back into the process as make-up water.

The design features are detailed on **Figure 3-11** through **Figure 3-13** in both plan and section, which also include references to general material specifications. These design features provide for a practical transition to dry tailings storage within the previously established hydraulic impoundment. The main objectives, as stated earlier, are to provide for continuous underdrainage of the placed dry tailings filter cake to maintain fully unsaturated conditions, and allow for mechanical placement and handling with light earth moving equipment. The new design also guarantees that no surface waters will be impounded, and the access ramp will provide an additional margin of safety for general access as well as protection against unwanted entrapment of wildlife or waterfowl.

PROPOSED FACILITY OPERATIONS & CONTROLS

Overview of Basic Unit Operations

The dewatered tailings filter cake from the filter plant will be transported via a small, covered overland conveyor section to a 15-ft. long discharge conveyor located at the

northern edge of the DTL as illustrated on **Figure 5-4** and **Figure 3-11**. Filter cake will drop vertically into the DTL on to a protective apron of geocomposite and geonet to form a stockpile cone of material. From the inside of the DTL, light earth moving equipment (skid steer) will access the edge of the stockpile (skid steer will use the access ramp to for ingress and egress from the bottom of the DTL) and spread the dry filter cake as required to maintain a general slope toward the access ramp to promote shedding of direct precipitation and runoff through the ramp into the underlying drainage pipework and eventually into the collection sump. Snow will be regularly plowed to a convenient area where it can be managed to maximize melting and drainage into the underdrainage collection system.

Once a sufficient layer of tailings filter cake has been placed to totally cover the operations layer and consistently graded, it is anticipated that the majority of the precipitation runoff and snowmelt can be diverted directly into the underdrainage system, as the compacted tailings will be of lower permeability and therefore promote runoff to the edge sections of the DTL and ramp areas rather than infiltration. Filling of the DTL will proceed under this general methodology until the limit of waste (Detail 1, **Figure 3-12**) is being approached on the perimeter areas of the deposit.

Once the perimeter limit of waste has been reached (see Detail 1 on **Figure 3-12**) the process of building a general 4:1 interior slope with the dry tailings will commence. This will occur near the end of the facility working storage capacity and will generally be part of the final surface reshaping operations that will precede capping and final reclamation. Through this process, the perimeter limit of waste will be consistently maintained to avoid any placement of tailings outside of the lined areas of the DTL. This approach will also provide surplus stage capacity and allow for continued operations prior to permitting and commissioning of a new landfill as part of the second phase of project development beyond the 110 permit restrictions.

Placement of dry tailings above the designated interior limit of waste elevation (approx. 9690.00 ft. elevation) will be carried out using a different protocol. Tailings will be spread in 6-in. lifts and compacted to 90% of optimum Standard Proctor density and within ± 5% of optimum moisture. A Construction Quality Assurance (CQA) plan will be developed and approved by CDRMS prior to commencement of any waste placement activities that occur above the maximum vertical limit of waste elevation defined in this application (minimum 2 ft. below crest of existing liner exterior berm). This process will create a final waste surface profile that will be guarantee long-term stability and allow for successful placement of the approved final reclamation cover system. **Figure 3-14** provides a conceptual design plan showing the proposed top of waste contours and details of the reclamation cover system components. **Figure 3-15** provides a cross section of the DTL illustrating the final waste and component cover elements that form the basis of the final reclamation plan described in Section 4.

RISER TERMINATION DETAILS 1-8
(FIGURE 3-13)

EXISTING LCRS SUMP RISER

LEACHATE SUMP RISER

LANDFILL LEACHATE COLLECTION
POND (LLCP)

FILTER CAKE DISCHARGE MAT

EQUIPMENT ACCESS RAMP

DRY TAILINGS LANDFILL (DTL)
(PHASE 1)

UNDERDRAIN COLLECTOR LATERALS

1 3-12

2 3-12

3 3-12

6 3-12

7 3-12

1 3-12

1 3-12

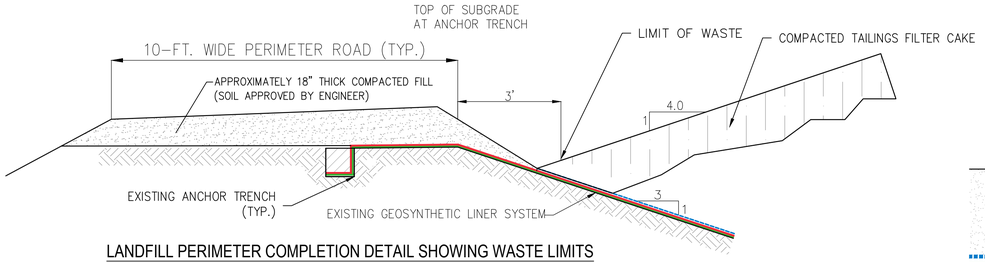
1 3-14

1 3-12

FIGURE 3-11
TAILINGS LANDFILL PLAN AND LEACHATE COLLECTION SYSTEM PIPING
LEADVILLE MILL 110 PERMIT AMENDMENT
LAKE COUNTY, COLORADO

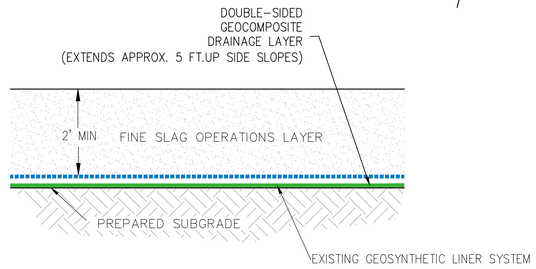
CLIENT: UNION MILLING	
PROJECT: LEADVILLE MILL TAILINGS LANDFILL DESIGN	
PROJECT NO:	DATE COMPLETED: 11/24/2025
DESIGNED BY: AEC	APPROVED BY:
DRAWN BY: WAC	DWG NAME:TD SECTIONS AND DETAILS
REVISION:	REVISED BY: DATE:
1 ISSUED FOR REVIEW	
ISSUED FOR CLIENT REVIEW	

AEC AMERICAN ENVIRONMENTAL CONSULTING, LLC.



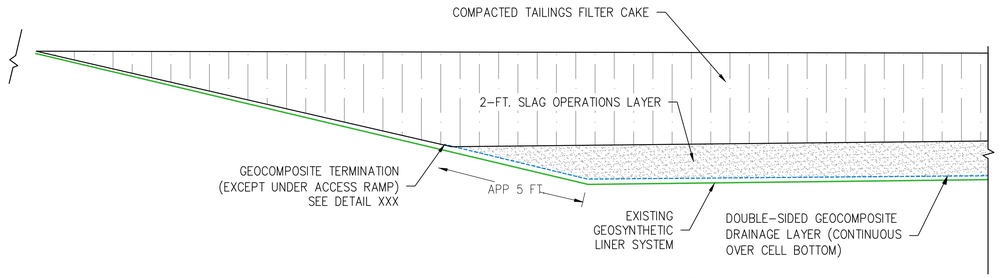
LANDFILL PERIMETER COMPLETION DETAIL SHOWING WASTE LIMITS

DETAIL 1 / 3-11
SCALE: N.T.S.



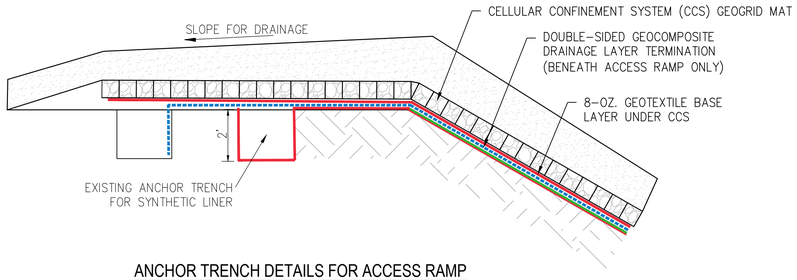
SECTION THROUGH BOTTOM OF LANDFILL CELL (TYP.)

DETAIL 5 / X
SCALE: N.T.S.



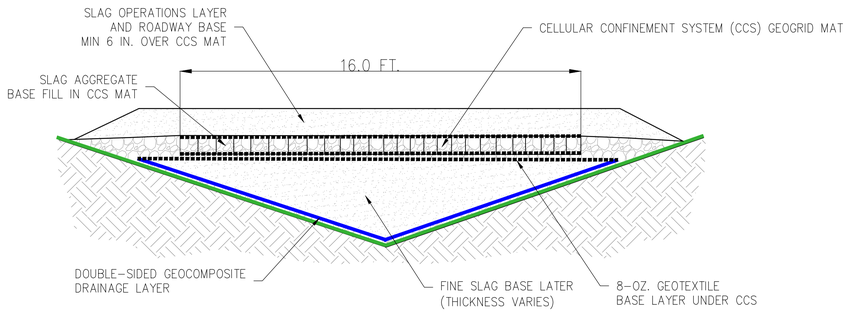
TYPICAL SECTION ALONG CELL BOTTOM

DETAIL 8 / X
SCALE: N.T.S.



ANCHOR TRENCH DETAILS FOR ACCESS RAMP

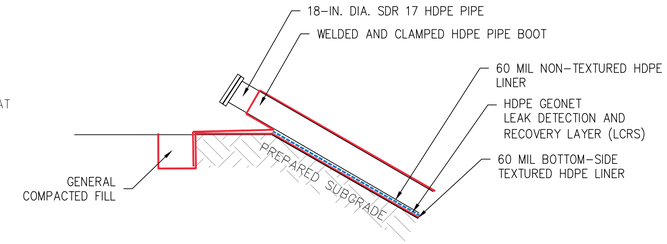
DETAIL 2 / X
SCALE: N.T.S.



NOTES:
1. GEOGRID MAT AND UNDERLYING GEOCOMPOSITE LAYER ANCHORED IN SEPARATE TRENCH 3 FEET OUTBOARD OF EXISTING LINER SYSTEM ANCHOR TRENCH
2. GEOGRID MAT EXTENDS APPROX. 10 FT. ON TO CELL BOTTOM AT BASE

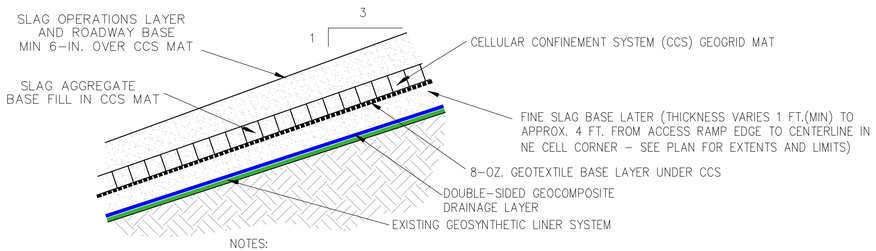
CENTERLINE SECTION THROUGH ACCESS RAMP

DETAIL 6 / X
SCALE: N.T.S.



SECTION THROUGH FILTRATE AND LEACHATE COLLECTION POND LCRS SUMP RISER

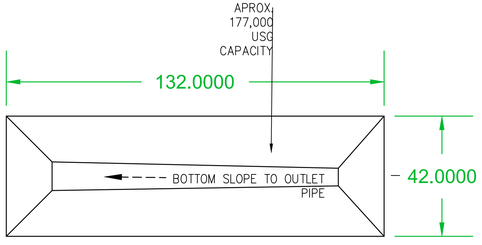
DETAIL 9 / X
SCALE: N.T.S.



NOTES:
1. GEOGRID MAT AND UNDERLYING GEOCOMPOSITE LAYER ANCHORED IN SEPARATE TRENCH 3 FEET OUTBOARD OF EXISTING LINER SYSTEM ANCHOR TRENCH
2. GEOGRID MAT EXTENDS APPROX. 10 FT. ON TO CELL BOTTOM AT BASE

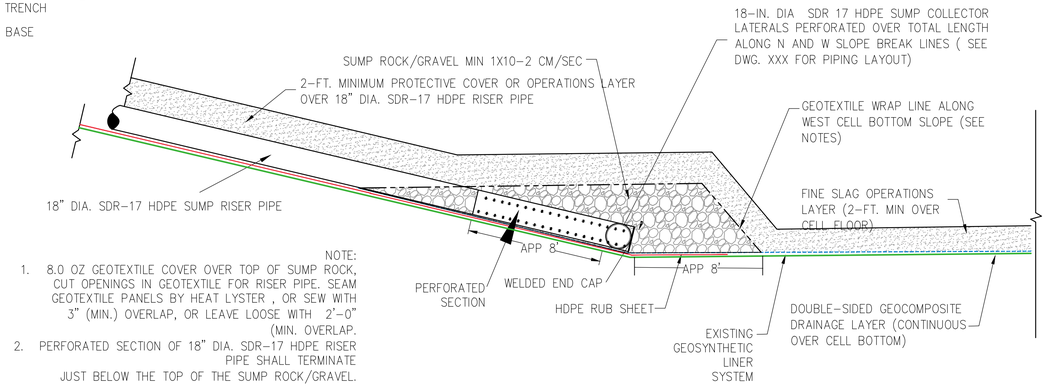
SECTION THROUGH MOBILE EQUIPMENT ACCESS RAMP

DETAIL 3 / X
SCALE: N.T.S.



SCHEMATIC PLAN VIEW OF DOUBLE-LINED FILTRATE AND LEACHATE COLLECTION POND

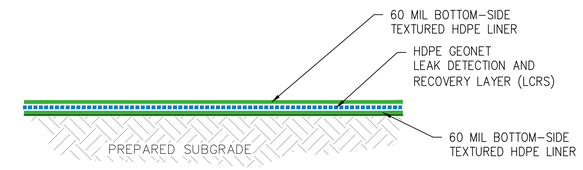
DETAIL 4 / X
SCALE: N.T.S.



NOTE:
1. 8.0 OZ GEOTEXTILE COVER OVER TOP OF SUMP ROCK, CUT OPENINGS IN GEOTEXTILE FOR RISER PIPE. SEAM GEOTEXTILE PANELS BY HEAT LYSTER , OR SEW WITH 3" (MIN.) OVERLAP, OR LEAVE LOOSE WITH 2'-0" (MIN. OVERLAP.
2. PERFORATED SECTION OF 18" DIA. SDR-17 HDPE RISER PIPE SHALL TERMINATE JUST BELOW THE TOP OF THE SUMP ROCK/GRAVEL.

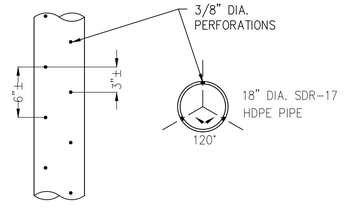
SECTION ALONG LANDFILL SUMP RISER

DETAIL 7 / X
SCALE: N.T.S.



SECTION THROUGH LINER ON BOTTOM OF FILTRATE AND LEACHATE COLLECTION POND

DETAIL 10 / X
SCALE: N.T.S.



COLECTOR SUMP LATERAL AND EMERGENCY RISER PIPE PERFORATION DETAIL

DETAIL 11 / X
SCALE: N.T.S.

FIGURE 3-12
TAILINGS LANDFILL AND LEACHATE COLLECTION POND SECTIONS AND DETAILS
LEADVILLE MILL 110 PERMIT AMENDMENT
LAKE COUNTY, COLORADO

CLIENT: UNION MILLING	
PROJECT: LEADVILLE MILL TAILINGS LANDFILL DESIGN	
PROJECT NO:	DATE COMPLETED: 11/21/2025
DESIGNED BY: AEC	APPROVED BY: WAC
DRAWN BY: WAC	DWG NAME:TAILINGS LANDFILL AND LEACHATE POND DETAILS.dwg
REVISION:	REVISED BY: DATE:
1 ISSUED FOR CLIENT REVIEW	
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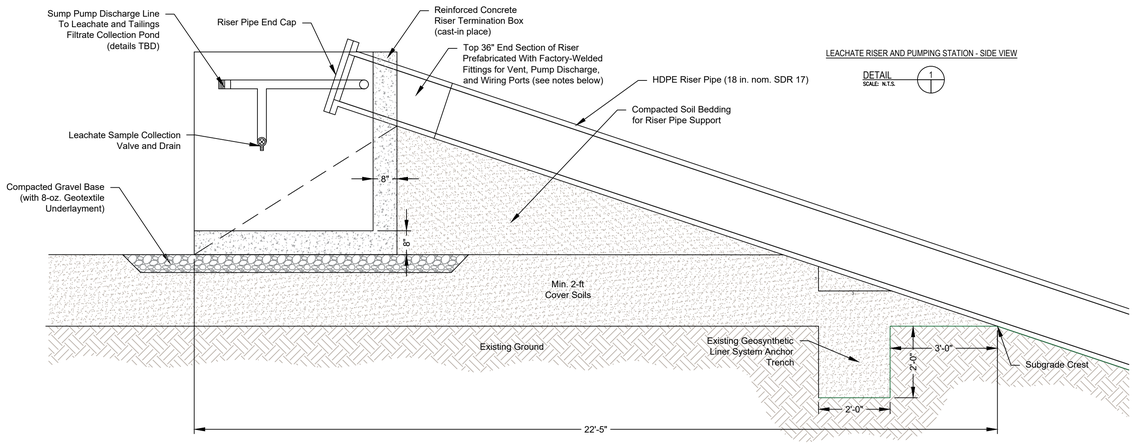
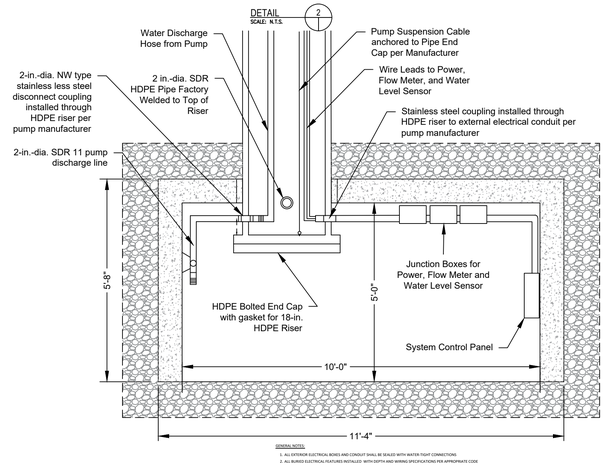
AEC AMERICAN ENVIRONMENTAL CONSULTING, LLC.

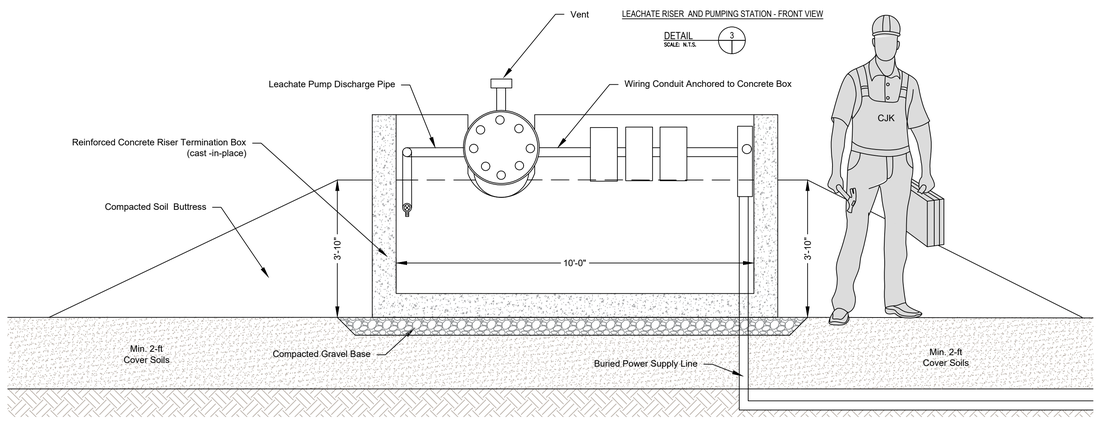


LEACHATE RISER AND PUMPING STATION - SIDE VIEW

DETAIL SCALE: N.T.S. 1

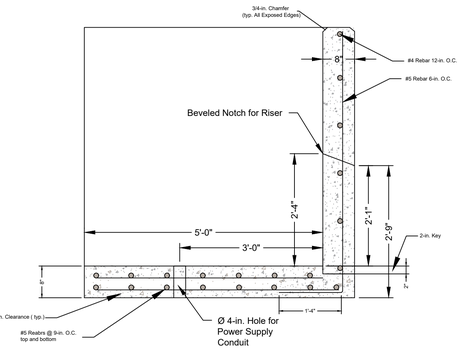


LEACHATE RISER AND PUMPING STATION - TOP VIEW



LEACHATE RISER AND PUMPING STATION - FRONT VIEW

DETAIL SCALE: N.T.S. 3



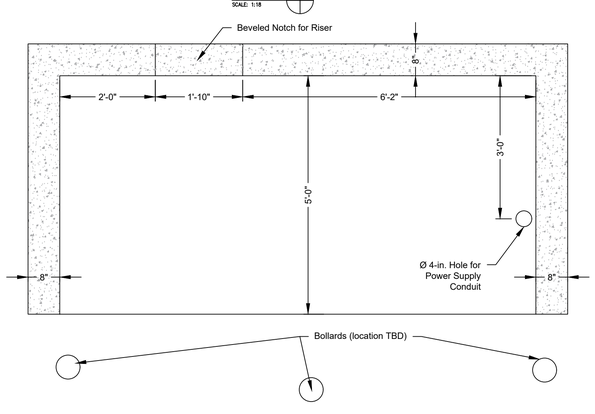
CONCRETE RISER TERMINATION BOX-SIDE VIEW AND REINFORCEMENT

DETAIL SCALE: 1:18 4

CONCRETE NOTES:
1. ALL CONCRETE SHALL BE 300 PSI TYPE 1 AT BREAK
2. ALL REBAR SHALL BE GRADE 60, ASTM A615
3. ALL EXPOSED CONCRETE SHALL BE MOISTURE-CURED FOR 7 DAYS OR HAVE A CURING COMPOUND APPLIED.
4. CONCRETE TO SUBMIT MIX DESIGN TO ENGINEER PRIOR TO USE
5. SLUMP SHALL NOT EXCEED 6". WATER SHALL NOT BE ADDED TO MIX ON SITE.
6. VIBRATORS SHALL BE USED TO CONSOLIDATE CONCRETE.
7. ALL WALLS SHALL HAVE A RUBBED FINISH AND SLABS SHALL HAVE A BROOM FINISH
8. PATCH ALL FORM HOLES AND HONEYCOMB AREAS.

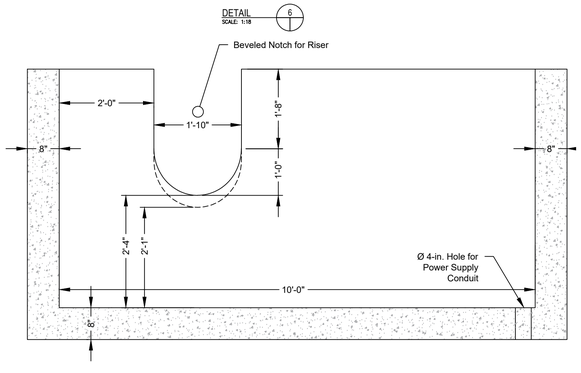
CONCRETE RISER TERMINATION BOX - TOP VIEW

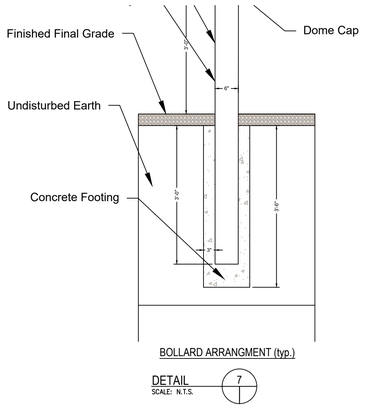
DETAIL SCALE: 1:18 5



CONCRETE RISER TERMINATION BOX - FRONT VIEW

DETAIL SCALE: 1:18 6





BOLLARD ARRANGMENT (typ.)

DETAIL SCALE: N.T.S. 7

LEACHATE COLLECTION PLUMBING AND WIRING SCHEMATIC PER MANUFACTURER

DETAIL SCALE: NTS 8

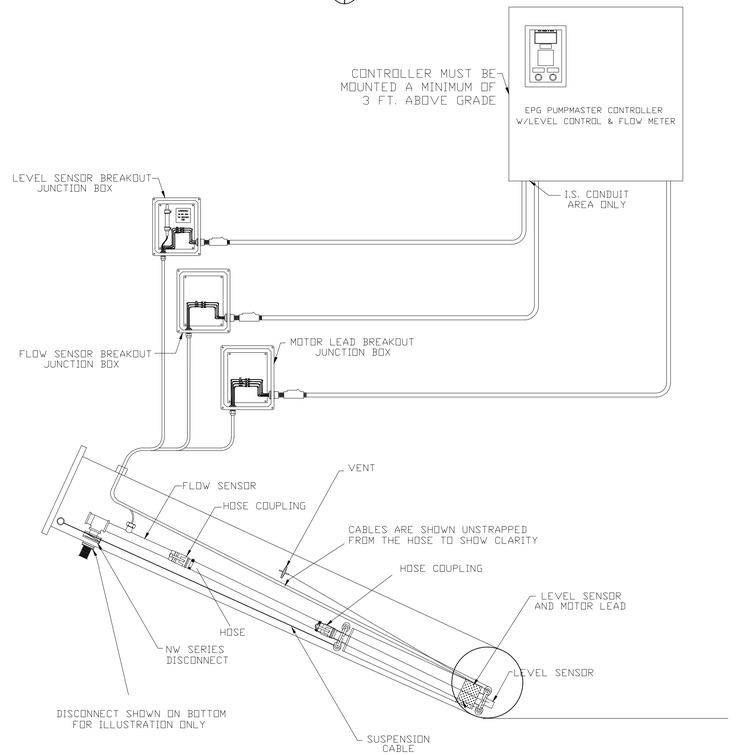


Figure 3-13
TAILINGS LANDFILL LEACHATE COLLECTION SUMP DETAILS
LEADVILLE MILL 110 PERMIT AMENDMENT
LAKE COUNTY, COLORADO

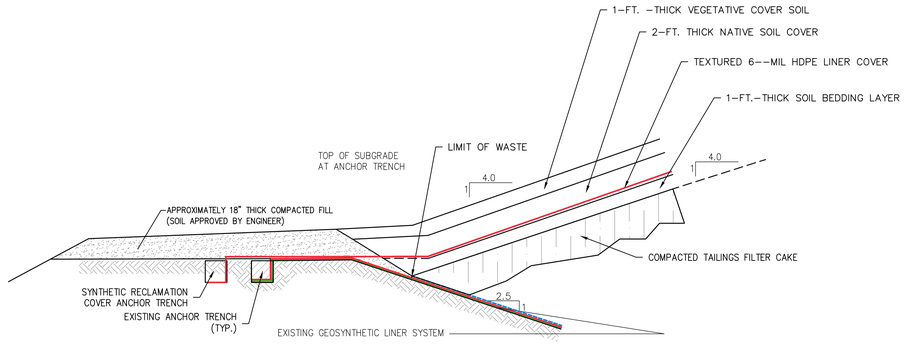
CLIENT: CJK MILLING	
PROJECT: 2025 110 MILL PERMIT AMENDMENT	
PROJECT NO:	DATE COMPLETED: 11/19/2025
DESIGNED BY: AEC	APPROVED BY: WAC
DRAWN BY: WAC	DWG NAME: ########
REVISION:	REVISED BY: DATE:
0 ISSUED FOR CLIENT REVIEW	

AEC AMERICAN ENVIRONMENTAL CONSULTING, LLC.

FIGURE 3-14
DTL FINAL TOP OF WASTE SURFACE
LEADVILLE MILL 110 PERMIT AMENDMENT
LAKE COUNTY, COLORADO

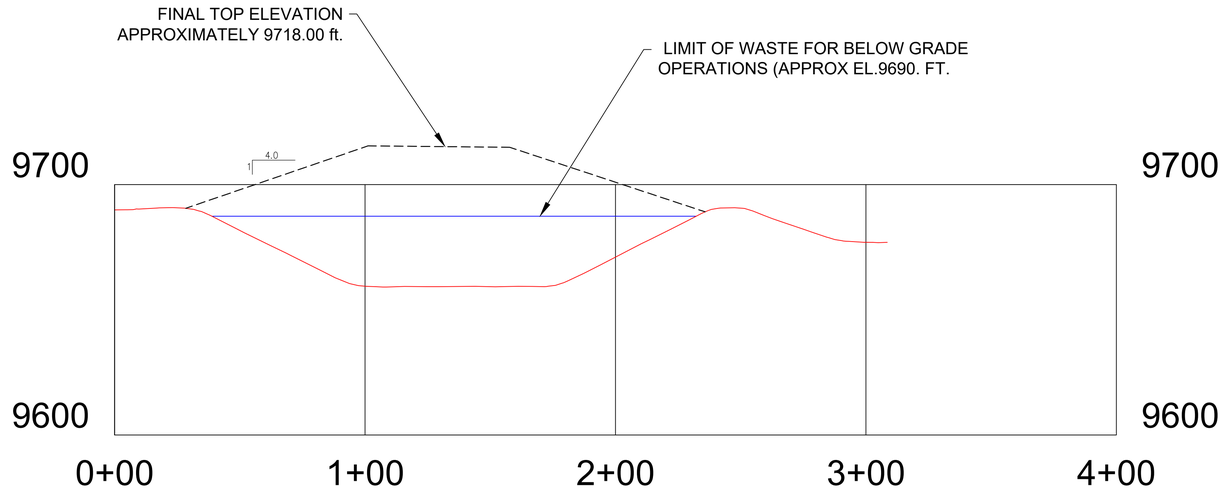
CLIENT: UNION MILLING	
PROJECT: LEADVILLE MILL TAILINGS LANDFILL DESIGN	
PROJECT NO:	DATE COMPLETED: 11/24/2025
DESIGNED BY: AEC	APPROVED BY:
DRAWN BY: WAC	DWG NAME: TD SECTIONS AND DETAILS
REVISION:	REVISED BY: DATE:
1 ISSUED FOR REVIEW	
ISSUED FOR CLIENT REVIEW	

AEC AMERICAN ENVIRONMENTAL CONSULTING, LLC.



SCHEMATIC SECTION AT PERIMETER OF DTL SHOWING FINAL WASTE AND COVER CONFIGURATION

DETAIL 2 / 3–14
SCALE: N.T.S.



SCHEMATIC SECTION LOOKING NORTH THROUGH DTL SHOWING FINAL CONFIGURATION AT RECLAMATION

DETAIL 1 / 3–14
SCALE: N.T.S.

FIGURE 3–15
SECTION AND DETAILS OF DTL AT FINAL RECLAMATION CONFIGURATION
CJK MILLING
LAKE COUNTY, COLORADO

CLIENT: UNION MILLING	
PROJECT: LEADVILLE MILL FTD	
PROJECT NO:	DATE COMPLETED: 12/2023
DESIGNED BY: AEC	APPROVED BY:
DRAWN BY: WAC/MBT	DWG NAME:TD SECTIONS AND DETAILS
REVISION:	REVISED BY: DATE:
1 ISSUED FOR REVIEW	
ISSUED FOR CLIENT REVIEW	

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General Operational Guidelines

The following points highlight important elements of dry tailings management that will be incorporated into the Facility Operations Manual.

1. Tailings should only be delivered to the DTL transfer conveyor when the drum filter is producing filter cake within 3% of the target acceptance lower limit of 75% solids (25% water content). Filter cake that has water content above this limit (i.e. >28%) could be acceptable for placement if it passes the Paint Filter Test and may be placed in the DTL stockpile on a temporary system upset basis and allowed to drain down to water content that allows for effective spreading and compaction. However, normal protocols would dictate returning out-of-specification (high water content) tailings to the agitated slurry receiving tank for repulping and re-filtration. The primary and ultimate acceptance criterion for filter cake into the FTD is passing the Paint Filter Test (no free water bleed). The operational target water content of 25% described above should ensure that both the Paint Filter criterion and that effective mechanical handling and mobile equipment operations can be consistently achieved.
2. If the material is within the limits described in No. 1 above, the material can be stockpiled and placed in the DTL.
3. One potential option for placement of under-specification filter cake is to provide a mechanism for blending with fine slag as a means of reducing relative water content and improving the strength of the delivered final waste stream to allow for mechanical handling and placement. This option should only be considered after other options for improving filtration plant effectiveness have been exhausted, as the slag admixture essentially consumes valuable lair space in the landfill, and increased management costs.
4. At the start-up of surface placement operations, a series of field trials will be carried out to allow for a method specification to be finalized that ensures general compliance with the field requirement of placed filter cake (visual capability of mechanical handling with light earth moving equipment from the internal delivery stockpile). This effort will be applied in the assembly of the final CQA plan for placement of waste above the maximum top of waste limit defined at the exterior boundaries of the existing DTL liner system (i.e., 2 ft. minimum below the crest of the existing exterior liner berm).

3.5.3 WATER AND SOLUTION MANAGEMENT

SOLUTION COLLECTION & MANAGEMENT

Solutions (filter cake drain down, direct precipitation runoff and snowmelt) that report to the DTL underdrain and collection sump are pumped into the LLCP for recycle to the process. The original leak collection and recovery system (LCRS) for the existing synthetic liner system will continue to function as designed and will be monitored regularly as an indicator and removal of any small leakage that could develop in the primary, inner geosynthetic liner layer. The LLCP is designed as a double, geosynthetic lined pond with leak detection. The configuration includes and inner 60-mil HDPE liner and an outer textured HDPE liner over a prepared subgrade. Sandwiched between the two layers is a HDPE geonet layer that functions as the LCRS. Fluids are recovered from the pond via a pump, installed inside of a pipe riser, or in a floating barge, the final configuration of which is still under consideration. The LLCP has a design capacity of approximately 200,000 USG plus 2 feet of freeboard. The pond is designed to hold a typical operating solution volume and will be operated to be able to contain 300% (about 30,000 USG) of all the solutions circulating in the plant in the event of a catastrophic failure of all containment systems.

The DTL leachate collection system design is consistent with current industrial practice for solid waste landfills in Colorado. The major difference in the operational strategy of the Leadville Mill DTL versus a typical solid waste landfill is that the leachate collected is completely recycled to the process as make-up solution. In the case of the typical solid waste landfill, these leachates are regularly reapplied to the surface of the landfill (via irrigation) to be lost through evaporation or for dust control in the active waste placement areas. This option could be implemented at Leadville prior to placement of the final reclamation cover until very small amounts of leachate are being recovered which would signal appropriate timing for the placement of the final cover.

The current water balance for the plant indicates a significant deficit that can be partially covered with the collective volumes being managed in the DTL as well as the filtrate from the dewatering of the tailings. Details of the water balance and process solution flow distributions are discussed in detail in Section 3.2.1.