



NEW MEXICO

Abandoned Mine Land Program

Project Manual
Including Plans and Specifications
for Construction of

RED HILL MINE SAFEGUARD PROJECT – PHASE I

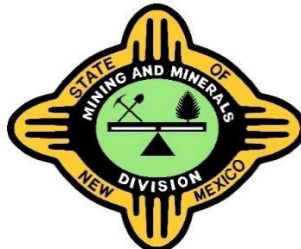
Garfield, New Mexico

PROJECT NO.
EMNRD-MMD-2024-03

AUTHORIZED BY:

ABANDONED MINE LAND PROGRAM
MINING and MINERALS DIVISION
STATE OF NEW MEXICO, ENERGY, MINERALS AND NATURAL
RESOURCES DEPARTMENT
(with reclamation fees paid by the New Mexico Coal Industry)

September 2024



00002 – CERTIFICATION PAGE

PROJECT NAME: RED HILL MINE SAFEGUARD PROJECT – PROJECT I

LOCATION: GARFIELD, NEW MEXICO

PROJECT NUMBER: EMNRD-MMD-2024-03

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The technical material and data contained in the specifications were prepared under the supervision and direction of the undersigned, whose seal as a Professional Engineer (P.E.), licensed to practice in the State of New Mexico, is affixed below.



DATE SIGNED: September 19, 2024

Michelle Lujan Grisham, Governor

All questions about the meaning or intent of these documents shall be submitted only to the General Services Department, State Purchasing Division Procurement Specialist, in writing.

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| 06 | 42” Ø BAT GATE IN ROCK BULKHEAD |
| 07 | 48” Ø BAT GATE IN ROCK BULKHEAD |
| 08 | PUF WITH WASTE ROCK COVER |
| 09 | 30” Ø CULVERT |
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DIVISION 1 – GENERAL REQUIREMENTS

The following sections describe the general requirements of this project.

01010 – SUMMARY OF WORK

The Red Hill Safeguard Project -Phase I is located approximately 3 miles northeast of Derry, New Mexico, in the Garfield and McLeod Tank U.S. Geological Survey 1:24k quadrangles. Site features are located on rugged, steep terrain.

This project involves the following on site safeguarding construction work of:

- 3 Horizontal Bat Gate on Shafts.
- 11 Culvert with Bat Gate in Rock Bulkhead and 1 Culvert with Bat Gate and Waste Rock Backfill, with different diameters, see Table I and Plan Set for more information.
- 1 30” Culvert closure.
- 1 Airflow Closure.
- 1 Rock Wall Along the Trench Edge.
- 3 Vertical Egress Gate Closures.
- 3 PUF with Waste Rock Cover.
- 1 Bat Cupola.
- 2 Shaft Backfills.

Table I, below, lists the mine features where safeguard improvements will be made along with approximate size of openings and an indication of the type of work to be accomplished. Note the time restrictions for closure of some of the mine features.

Demobilization shall be conducted in such a manner to ensure that the Contractor leaves all project areas in as good or better condition than before disturbance.

The approximate mine opening dimensions and mine fill volume estimates are provided only for the information of Potential Bidder. The Abandoned Mine Land Program makes absolutely no guarantee of their accuracy or precision. Volume estimates are of the material that may be required to fill the mine cavities and adjacent area as indicated, including all allowance for shrinkage, irregularities and known underground mine voids. All mine features are irregular in shape. Estimate fill volumes are generally not indicated at structural closures; excavation, fill and other earthmoving activities there are considered incidental to the work. Mine fill volume estimates are indicated at those structural closures with significant volumes of earthwork required.

To comply with wildlife restrictions, construction is limited to certain periods of the year. Should construction activities take place during the **migratory bird nesting season (February 15 – August 15)**, a pre-construction nesting bird survey will be completed by the AML Program or representative of the AML Program to locate any active nest that would need to be avoided. This survey should be conducted no more than 10 days prior to the start of construction. If occupied nests are found, they must be avoided until after the AML Program or representative of the AML Program has verified the young have fledged to comply with the requirements of the Migratory Bird Treaty Act (MBTA).

As it is likely the project area supports winter bat hibernation use, it is recommended to **avoid** any construction activities between **December 1 – February 28**. If any work is required within those specified periods, written permission from the Project Engineer will be required before work can commence.

Table I shows the summary of the project work, construction quantities estimation can be found at the quantities table provided with the Project Manual.

**TABLE I
PROJECT SUMMARY
INCLUDING APPROXIMATE MINE OPENING DIMENSIONS**

| TABLE I - MINING FEATURES SUMMARY | | | | |
|-----------------------------------|----------------------|-------------------------|--|----------------|
| AML NUMBER | TYPE OF MINE FEATURE | DIMENSIONS (FT) | SAFEGUARD TYPE | CLOSURE SEASON |
| AML 09_05 | Trench with Adit | 3'W x 4' H x 13' D | Boulders (approx. 24-36" diameter) placed every 5 feet along edge of road adjacent to feature (65 linear feet of road to be guarded) | Anytime |
| AML 15_01 | Shaft | 8'9" W x 10'5" L | Horizontal Bat Gate on Shaft | Anytime |
| AML 15_03 | Adit | 8' W x 7'9" H | 48in diam Culvert with Bat Gate in Rock Bulkhead | Anytime |
| AML 15_04 | Shaft | 6' W x 10'5" L x 5'D | Horizontal Bat Gate on Shaft | Anytime |
| AML 15_10 | Adit | 16' W x 4' H x 60' D | 36in diam Culvert with Bat Gate and Waste Rock Backfill | Anytime |
| AML 15_12 | Adit | 4' W x 5'8" H x 92' D | 42in diam Culvert with Bat Gate in Rock Bulkhead | Cold Season |
| AML 15_17 | Shaft | 4' W x 6' L x 11' D | Airflow Closure | Warm Season |
| AML 15_18 | Shaft with adit | 12' W x 17'5" L x 11' D | 30in diam Culvert | Warm Season |
| AML 15_20 | Shaft | 3' W x 3' L x 10' D | Horizontal Bat Gate on Shaft | Anytime |
| AML 15_21 | Adit | 7.5' W x 4' H | 42in diam Culvert with Bat Gate in Rock Bulkhead | Warm Season |
| AML 15_23 | Adit | 16'3"W x 8'H | Vertical Egrees Gate | Anytime |
| AML 15_24a | Adit | 25' W x 9' H | PUF with Waste Rock Cover | Cold Season |
| AML 15_24b | Adit | 11'W x 10'H | Vertical Egrees Gate | Cold Season |
| AML 15_25 | Adit | 19' Wx 8' H | Vertical Egrees Gate | Cold Season |
| AML 15_30 | Adit | 8.5' W x 3' H | 36in diam Culvert with Bat Gate in Rock Bulkhead | Anytime |
| AML 16_07 | Adit | 6' W x 4' H x 19' D | 24in diam Culvert with Bat Gate in Rock Bulkhead | Anytime |
| AML 16_11 | Shaft | 4'W x 7' L x 7' D | Shaft Backfill | Anytime |
| AML 22-04 | Shaft | 6' W x 7'L x 7' D | Shaft Backfill | Anytime |
| AML 22_05a | Adit | 7'5"W x 5'H | 36in diam Culvert with Bat Gate in Rock Bulkhead | Anytime |
| AML 22_05b | Adit | 5'W x 3.5'H | 36in diam Culvert with Bat Gate in Rock Bulkhead | Anytime |
| AML 22_05c | Adit | 4'5"W x 5'H | 30in diam Culvert with Bat Gate and Rock Fill | Anytime |
| AML 22_10 | Adit | 2'W x 4'H | 24in diam Culvert with Bat Gate in Rock Bulkhead | Anytime |
| AML 22_11 | Adit | 10'W x 5'H | 36in diam Culvert with Bat Gate in Rock Bulkhead | Cold Season |
| AML 22_12 | Shaft | 15'W x 15'L | Bat Cupola | Cold Season |
| AML 22_13 | Adit | 12'W x 35'L | 30in diam Decline Culvert with Bat Gate | Warm Season |
| AML 22_16 | Adit | 4.5'W x 4'H x 13'L | PUF with Waste Rock Cover | Anytime |
| AML 15_21a | Vent Hole | 3'W x 1'L x 8'D | PUF with Waste Rock Cover | Anytime |
| BCWS: 4/1 - 10/31 | | | | |
| BCCS: 10/1 - 4/30 | | | | |

L= Length; H = Height; W = Width; D = Depth. BCWS= Bat Compatible Warm Season; BCCS = Bat Compatible Cold Season

01011 – SUMMARY OF PROJECT AND CONSTRUCTION ACCESS

The project consists of 18 adits; 7 shafts; 1 trench with adit and 1 vent hole for a total of 27 mine features to be safeguarded. The methods and time restrictions for safeguarding are summarized in Table I.

Ground disturbance during construction shall be limited to a maximum perimeter of 20 feet from each mine feature. The Contractor shall use the access paths as delineated by AML staff and shall avoid any flagged archeological avoidance areas. Overland travel by equipment to the mine features from established roads shall be kept to a minimum and materials shall be hand carried when necessary to avoid excessive overland travel as directed by the Project Manager. The Contractor shall include descriptions of surface disturbance minimization measures in the appropriate bid item.

The Contractor shall take care in selecting appropriate equipment for each task. Excavator shall be no more than 20,000 pounds, and backhoes shall be no more than 15,000 pounds weight. The Contractor shall take care to stay clear of any known hazards that may be present, including “thin back” or “thin ceiling” areas in close proximity of mine features. Equipment and vehicle access to many safeguarding and reclamation locations is difficult and shall be limited to the access routes shown on the plans or as approved by the Project Manager.

Contractor shall provide submittals including specifications of equipment proposed for use on the Project prior to mobilization to the site. All heavy equipment shall be washed using a high pressure washer to remove any possible noxious weed seed prior to arrival in the project area. Written confirmation of washing shall be submitted to the Project Manager prior to mobilizing to the site.

The Contractor shall be responsible for thoroughly investigating site conditions prior to mobilizing any equipment to the Project or the commencement of construction activities, including but not limited to scheduling equipment, equipment operations, onsite personnel briefings, and discussing safety procedures to prevent accidents and injuries.

01012 – AVOIDANCE AREAS FOR PRESERVATION OF CULTURAL AND BIOLOGICAL RESOURCES

The Contractor shall avoid all designated cultural and biological resources including those discovered during construction. The contractor shall avoid these areas with all equipment, vehicles, foot traffic, and any other ground surface disturbing activities.

Avoidance areas will be flagged by the AML Program or by a representative of the AML Program and will extend up to 50 feet (15 meters) from the designated cultural and biological resources, unless otherwise indicated by the Project Manager. Where it is infeasible to complete construction activities without disturbing the designated avoidance areas, avoidance area distances and access to work areas may be adjusted, in coordination with the Project Manager, to accommodate construction activities and ensure that no resources are impacted. The Contractor

shall also coordinate with the Project Manager for any overland access routes around designated avoidance areas to access construction work sites. Construction disturbance adjacent to designated avoidance areas shall be minimized.

The Project Manager or Project Engineer may designate additional avoidance areas as deemed necessary. No construction disturbance including excavation, fill, stockpiling of construction materials, staging, etc. shall take place within designated avoidance areas.

When the Contractor is working near designated avoidance areas and where construction access routes pass adjacent to these locations, the Contractor shall place four-foot high, temporary, high-visibility barrier fencing (Hi-Vis, ADPI, or equivalent) around the features. Barrier fencing shall be removed upon completion of work.

The Contractor shall bear all direct, indirect, and consequential costs of mitigation or repairs due to unauthorized damage caused by the Contractor's operations to cultural or biological resources within designated avoidance areas. These costs shall include but are not limited to fees and charges of engineers, attorneys, and other professionals, made necessary thereby.

The Contractor shall cooperate fully to preserve archaeological and historic artifacts and any threatened or endangered species found within the project area. Moving, removal or collecting of archaeological or historic materials or biological specimens from the project area or vicinity is prohibited. If the Contractor encounters a previously unidentified archaeological site, historic site, artifacts, or species suspected to be listed as or proposed to be listed as threatened or endangered, the Contractor shall terminate all operations in that immediate area (100 foot radius, 30 meters) until the archaeological or biological preservation agencies have been notified and assessed the discovery site. This termination shall not preclude continuation of work in other areas nor shall it entitle the Contractor to additional payment in any form, other than an extension of time, unless the Contractor is substantially precluded from working on the entire project.

01013 – BACKGROUND AND SITE HISTORY

The proposed project area includes 796 acres of land administered by the BLM Las Cruces District Office (LCDO, 470 acres) and the New Mexico State Land Office (326 acres). The project area and surrounding vicinity of Sierra County are known historically for mining efforts during the late nineteenth and twentieth centuries; during that period, Sierra County was the third largest producer of mineral wealth in New Mexico.

Mineral prospecting in the Caballo Mountains began around 1883, but mining activity really began after gold was discovered in 1901 at the Shandon placers near the mouth of Apache Canyon. The project area is within the Caballo Mountains and Rincon Mining Districts. During the period of 1900-1901, several mines opened with production concentrated primarily on fluorspar mining; however, copper, vanadium, lead, gold, barite and manganese were also produced from these Districts. Mining efforts continued to focus on fluorspar throughout the 1950s and 1960s. The 1970s and 1980s saw a resurgence of mining activity, and five mineral claims from this era are found in the project area, including Alamo, Alvarez Claim, Jones-Reiland Claims, Manganese Hill and Southern Caballo Mountains Section 16 (USGS 2023).

01015 – CONTRACTOR'S USE OF THE PREMISES

The Contractor shall take reasonable measures to avoid equipment and vehicle traffic conflicts between the Contractor and private citizens who may also be in the area and to avoid overloading any driveways or roads. The Contractor shall limit the amount of individual pieces of equipment and trucks accessing and leaving the Project site and shall provide dust control measures, barriers or other forms of access protection for any improvements that may be necessary in areas where vehicles and other equipment must pass to reach the job sites. If heavy equipment or any other vehicles are operated or are in use on wet or soft roads that may cause rutting in excess of 2 inches, any resulting damage shall be repaired by the Contractor by regrading the road and any related disturbance upon completion of the work.

01025 – MEASUREMENT AND PAYMENT

The measurement for payment is as defined below. Payment shall be made based on the applicable unit price bid amount provided by the Contractor pursuant to the *Statewide Price Agreement Invitation to Bid No. 40-52100-23-06111: Construction Services for Abandoned Mine Lands*. The estimated quantities of materials and work required to complete the project are approximations only and are given as a basis for calculation upon which the contract award will be determined. All estimated quantities could vary considerably and will depend on the actual conditions encountered at the time the work is performed. AML reserves the right to decrease or increase any or all of the quantities of materials or work as may be deemed necessary during the project.

01027 – APPLICATIONS FOR PAYMENT

All Applications for Payment for work performed under this contract shall first be verified by the Project Manager before being submitted for review and payment to:

Livia de Viterbo, Staff Engineer
Mining and Minerals Division
Abandoned Mine Land Program
Energy, Minerals, and Natural Resources Department
State of New Mexico
1220 South St. Francis Drive
Santa Fe, New Mexico 87505
livia.ramos@emnrd.nm.gov

Applications for Payment shall include a breakdown of project costs per day, including all labor, equipment usage, materials, mileage, and a description of the work completed for the day. All Applications for Payment shall include appropriate backup, including mileage logs, daily field reports showing work start/stop times, and materials receipts. New Mexico Gross Receipts Tax shall be broken out separately on the Application for Payment.

01028 – PRICES

Payment shall be made based on the applicable unit price bid by the Contractor under the *Statewide Price Agreement Invitation to Bid No. 40-52100-23-06111: Construction Services for Abandoned Mine Lands*. **No payment markup may be added to materials or equipment rentals per the conditions of the Statewide Price Agreement.**

01030 – ALTERNATES

Whenever equipment or materials are specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular supplier, the naming of the item is intended to establish the type, function, and quality required. Unless the name is followed by words indicating that no substitution is permitted, the Project Engineer may accept equipment or materials of other suppliers if the Contractor submits sufficient information to allow for adequate determination that the equipment or materials proposed are equivalent or equal to that named.

01035 – MODIFICATION PROCEDURES

The following section describes procedures for making modifications to the contract by change orders. Modifications may involve changes in contract sum, contract time, and scope.

01036 – CHANGE ORDER PROCEDURES

The Contractor shall submit a request for any changes in the work under this contract, in writing, to the Project Engineer. No changes in work or quantities shown shall be authorized until a properly executed Change Order has been issued by AML. Any work performed outside the original quantities or scope of work, before the issuance of a properly executed Change Order, shall be done so at the Contractor's risk.

The Contract Time may only be changed by a Change Order. Any claim for an extension in the Contract Time shall be based on written notice delivered to the Project Engineer within fifteen (15) working days of the occurrence of the event causing the claim. The extent of the claim with supporting data shall be included unless the Project Engineer allows additional time to ascertain more accurate data. The Project Engineer shall determine all claims for adjustment in the Contract Time. Any change in the Contract Time resulting from any such claim shall be incorporated in a Change Order. The Contract Time will be extended in an amount equal to time lost due to delays beyond the control of the Contractor if a claim is made therefore as provided above. Such delays shall include, but may not be restricted to, acts or neglect beyond the Contractor's control, epidemics, fires, floods, labor disputes, abnormal weather conditions, or acts of nature. In the event delays in construction occur due to weather, the conditions as outlined above will be in effect. If the Contractor leaves the project area due to a weather delay, the Contractor shall be responsible for assuring that all areas are left in a clean and safe condition as approved and directed by the Project Manager. In case of any weather delays, compensation for additional Mobilization or Demobilization will not be made.

01040 – COORDINATION

The following sections define the parties responsible for coordination of the contract work at the project and job site levels.

01041 - PROJECT COORDINATION

The Project Engineer will send the Contractor Notices to Proceed, Change Orders, other contract documents and approvals on Applications for Payment. The Project Manager or Project Engineer may issue a Suspension of Work Notice if there is reasonable basis to believe that the Contractor is violating any condition or term of the contract or specifications, or that violations of health and safety standards will occur unless such notice is issued. No work shall proceed until the Suspension of Work Notice has been vacated.

01042 – MECHANICAL AND ELECTRICAL COORDINATION

The Contractor shall be responsible for the coordination of all mechanical and electrical aspects of the contract work. This includes overseeing of the general operation and maintenance of that equipment.

01043 – JOB SITE ADMINISTRATION

The Contractor shall be responsible for the administration of the contract work at the job site. This includes assuring that all equipment and materials used for the contract work meet the required specifications set forth and that all work is performed in a timely and orderly manner. The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs concerning the work. The Contractor shall designate a full time on-site superintendent or authorized representative who shall be present or can be contacted readily during project working hours. This person shall represent the Contractor in dealing with the Project Manager and shall insure adherence to these specifications and any other directives.

01050 – FIELD ENGINEERING

The Contractor shall be responsible for locating and avoiding all underground utilities at the contract work site. If damage to the utilities occurs during the contract work, the damage shall be repaired at the Contractor's expense.

The Contractor shall also be responsible for the proper setting and maintenance of all construction staking. The Contractor shall provide engineering surveys, maps and drawings for construction to establish reference points that are necessary to enable the Work to proceed. The Contractor shall be responsible for surveying and laying out the Work, shall protect and preserve any established reference points, and shall make no changes or relocations without the prior written approval of the Project Engineer. The Contractor shall report to the Project Engineer whenever any reference point is lost or destroyed or requires relocation because of necessary changes in grades or locations. The Contractor shall replace and accurately relocate all reference points so destroyed, lost, or moved. When it becomes necessary in the construction of public

works, to remove or obliterate any triangulation station, bench mark, corner monument, stake, witness mark, or other reference mark, it shall be the duty of the Contractor in charge of the work to cause to be established by a New Mexico registered land surveyor one or more permanent reference marks which shall be plainly marked as witness corners or reference marks, as near as practicable to the original mark, and to record a map, field notes, or both, with the county clerk and county surveyor of the county wherein located, showing clearly the position of the marks established with reference to the position of the original work. The surveys or measurements made to connect the reference marks with the original mark shall be of at least the same order of precision as the original survey.

01060 – REGULATORY REQUIREMENTS

The Contractor shall keep fully informed of all federal and state laws, all local laws, ordinances, and regulations, and all orders and decrees of bodies or tribunals having any jurisdiction or authority which in any manner affect those engaged or employed on the work or which in any way affect the conduct of the work. The Contractor shall at all times observe and comply with all such laws, ordinances, regulations, orders, and decrees and shall protect and indemnify the State of New Mexico and its representatives against any claim or liability arising from or based on the violation of any such law, ordinance, regulation, order, or decree, whether by the Contractor or any employees. The Contractor shall procure all permits and licenses, pay all charges, fees, royalties, and taxes, and give all notices necessary and incidental to the due and lawful prosecution of the work.

01090 – REFERENCES

Reference to standard specifications, manuals, or codes of any technical association, organization, or society, or to laws or regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest standard specification, manual, code, laws, or regulation in effect at the time of opening of Bids, except as may be otherwise specifically stated. However, no provision of any referenced standard specification, manual, or code (whether or not specifically incorporated by reference in the Contract Documents) shall be effective to change the duties and responsibilities of the Contractor.

01092 - ABBREVIATIONS

The following is an explanation of the abbreviations that may be used in the contract documents:

| | |
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| AASHTO | American Association of State Highway and Transportation Officials |
| ACI | American Concrete Institute |
| AML | Abandoned Mine Land Program of MMD |
| ANSI | American National Standards Institute |
| ASTM | American Society for Testing and Materials |
| ATSA | American Traffic Services Association |
| AWS | American Welding Society |
| BMP | Best Management Practices |

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| BLM | Bureau of Land Management |
| CFR | Code of Federal Regulations |
| CMP | Corrugated Metal Pipe |
| CO | Carbon Monoxide |
| CO ₂ | Carbon Dioxide |
| CPR | Cardiopulmonary Resuscitation |
| CRSI | Concrete Reinforcing Steel Institute |
| EMNRD | Energy, Minerals, and Natural Resources Department (state) |
| H ₂ S | Hydrogen Sulfide |
| HASP | Health and Safety Plan |
| MBTA | Migratory Bird Treaty Act |
| MMD | Mining and Minerals Division of EMNRD |
| NMAC | New Mexico Administrative Code |
| NMSA | New Mexico Statutes Annotated |
| NTP | Notice to Proceed |
| OSHA | Occupational Safety and Health Administration |
| OSMRE | Office of Surface Mining, Reclamation, and Enforcement (federal) |
| PLS | Pure Live Seed |
| PPE | Personal Protective Equipment |
| PUF | Polyurethane Foam |
| SAE | Society of Automotive Engineers |
| SDS | Safety Data Sheet |
| USFWS | United States Fish and Wildlife Service |

01094 – DEFINITIONS

The following is a definition of the terms that may be used in the contract documents (source: [A Dictionary of Mining, Mineral, and Related Terms](#), Paul W. Thrush, Bureau of Mines, Department of the Interior, Washington, D.C., 1968):

1. adit A horizontal or nearly horizontal passage driven from the surface for the working or dewatering of a mine.
2. back The roof or upper part in any underground mining cavity.
3. cribbing The close setting of timber supports when shaft sinking through loose ground.
4. collar Timbering or concrete around the mouth or top of a shaft; the junction of a mine shaft and the surface.
5. decline See “incline”.
6. drift A horizontal passage underground.
7. entry A haulage road, gangway, or airway to the surface.
8. incline A shaft not vertical; usually on the dip of a vein.
9. lagging Planks, slabs, or small timbers placed over the caps or behind the posts of the timbering, not to carry the main weight, but to form a ceiling or a wall, preventing fragments or rock from falling through.

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| 10. lining | The brick, concrete, cast iron, or steel casing placed around a tunnel or shaft as a support. |
| 11. loading chute | A three-sided tray for loading or for transfer of material from one transport unit to another. |
| 12. portal | Any entrance to a mine. |
| 13. shaft | An excavation of limited area compared with its depth, made for finding or mining ore or coal, raising water, ore, rock, or coal, hoisting and lowering personnel and material, or ventilating underground workings. |
| 14. spoil | The overburden or on-ore material removed in gaining access to the ore or mineral material in surface mining. |
| 15. stope | An excavation in which ore has been excavated in a series of steps. |
| 16. stull | A timber prop set between the walls of a stope, or supporting the mine roof. |
| 17. subsidence | A sinking down of a part of the earth's crust. |
| 18. talus | A heap of coarse rock waste at the foot of a cliff. |
| 19. tipple | Originally the place where the mine cars were tipped and emptied of their ore, and still used in that sense, although now more generally applied to the surface structures of a mine, including the preparation plant and loading tracks. |
| 20. winze | Interior mine shaft. |

01100 – SPECIAL PROJECT PROCEDURES

The following section describes special procedures that may be necessary for work suspension, alteration, preservation, security, hazardous materials, and other situations demanding unique procedures.

01120 – SUSPENSION OF WORK DURING WEEKENDS

An AML representative shall be on site at all times when work is in progress at any location on site other than designated staging areas and upon designated project access roads. An AML representative will arrive at the site at noon on Mondays and will leave the project site at noon on Fridays. During weekends, with the approval of the Project Manager or Project Engineer, the Contractor may stage equipment and materials at staging areas and along roads designated by the Project Manager or complete pre-fabrication work at designated staging areas without an AML representative present.

01135 - HAZARDOUS AND CONFINED AREA PROCEDURES

This project requires construction work around and over hazardous and unprotected mine shafts, stopes, adits, and other openings which may be open to the surface or hidden from view by vegetation, trash, debris, or thin and unstable layers of surface materials or rock. The Contractor shall be responsible for thoroughly investigating the site conditions and scheduling equipment, equipment operations, personnel, and safety procedures to prevent accidents and injuries in accordance with the Project HASP.

The Contractor shall follow appropriate procedures in accordance with applicable OSHA construction industry regulations, including 29 CFR Part 1926 – Safety and Health Regulations for Construction (latest revision). The Contractor shall designate a site safety officer for each work shift. The site safety officer shall be present on-site at all times while any work is being performed. The site safety officer shall be CPR/First Aid trained and certified by an accredited institution e.g. American Red Cross, and shall conduct daily safety tailgate meetings at the start of each shift. In accordance with the Project HASP, any accidents or safety incidents shall be reported immediately to the Project Manager or as soon as practicable.

The Contractor is fully responsible for construction safety and shall keep the Project Manager informed of any hazardous areas, conditions or safety procedures that may be necessary or are applicable to specific work areas. The following provides an outline of some commonly encountered abandoned mine hazards and appropriate procedures to be followed:

I. Bad Air

Miners use the term "bad air" to describe an atmosphere that will not support life. The poor air circulation in some mine openings can allow carbon dioxide (CO₂), carbon monoxide (CO), methane, hydrogen sulfide (H₂S), or radon gas to accumulate. These gases are treacherous inside mine openings and even experienced miners have been killed or harmed by entering areas containing them. Carbon monoxide is odorless, cannot be readily detected and is lethal in very small amounts. The Contractor shall not allow entry of personnel into any mine opening.

II. Adit Cave-ins

Cave-ins are a danger in any abandoned mine. Disturbances such as vibrations caused by walking, speaking, blasting, hammering, percussion drilling, or construction equipment may cause a cave-in inside an inactive mine. The Contractor shall follow appropriate adit cave-in protection procedures, including scaling and barring of loose rock before beginning work in an area, shoring of decayed or weak timber framing, and shoring, jacking, or rock bolting of materials in the back (roof) and sides (ribs) of the adits.

III. Collar Cave-ins

The collar or top of a shaft, stope, or subsidence often contains decomposed rock, decayed timbers, and other conditions that allow for rapid disintegration at the opening. With the

additional weight and vibration of construction machinery, workers, and backfilling operations near the mine opening, the area around the collar can slide into the opening, along with nearby machinery and laborers. Backfilling operations can tear loose cribbing or lining in a shaft leading to collapse at the collar. The Contractor shall follow appropriate collar cave-in protection procedures.

IV. Falling

Because a shaft or stope has little light, the feeling of height and normal reaction to "pull back" is not evident to most persons. Many abandoned mine shafts, stopes, and winzes are deep enough to cause injury or death to persons entering these features. Rescue operations of a fallen person can also be extremely hazardous. Work above the highwall also presents fall hazards including unstable edges, poor footing, and/or trip hazards.

The Contractor shall follow appropriate hazardous fall protection procedures. This includes but is not limited to use of proper lighting, barricades, fences, personal fall arrest systems, guardrails, covers, safety net systems, safety monitoring systems, and other protection as suitable for the conditions. Fall protection shall be in accordance with OSHA regulations regarding construction fall protection (OSHA 29 CFR Subpart M). These regulations establish a six-foot threshold for the height at which fall protection is required, require employers to provide training for each employee who might be exposed to a fall hazard, and prohibit the use of body belts for fall protection and the use of non-locking snap hooks.

The Contractor is responsible for ensuring adequate fall protection and tie-off points are maintained at remote mine features that are not accessible by heavy equipment. Details specifying fall protection measures shall be included in the Contractor's HASP.

V. Loose Rock

Highwalls are a dominant mine feature at the work site and typically consist of vertical to near-vertical faces of weathered Paleozoic sedimentary rocks (limestone, dolomite). On average, the height of the highwall features at the site varies, and the size of rock that could fall ranges from small to many cubic feet in size. Any falling rock has the potential to injure or kill, and there is no way to predict when a rock fall will occur. Certain construction activities may promote rock fall including those that require vibration, shock, or removing material that may be supporting loose rocks. In accordance with the Project HASP, the Contractor shall require workers to use appropriate PPE and implement measures to protect workers from loose, falling materials (e.g. shields, scaling loose rocks, etc.)

A mineshaft or open stope will weather in much the same way as a cliff. Loose rocks are always found on timbers or on the walls. A small rock that falls a sufficient distance can penetrate a person's skull. The Contractor shall incorporate within the Project HASP, requirements for appropriate hazardous loose rock protection procedures, including but not limited to scaling of loose rock, construction of shields or other barriers, and wearing appropriate head, eye, foot and hand protection.

01170 - INDUSTRIAL WASTES AND TOXIC SUBSTANCES

The Contractor shall comply with all applicable laws and regulations, existing or hereafter enacted, or promulgated, regarding industrial wastes and toxic substances. In any event, the Contractor shall comply with the Toxic Substances Control Act of 1976, as amended (15 U.S.C. 2601, et seq.) regarding any toxic substances that are used, generated by or stored at the project site pursuant to 40 CFR, Part 702799. Additionally, any release of toxic substances (leaks, spills, etc.) greater than the reportable quantity established by 40 CFR, Part 117, shall be reported as required by the Comprehensive Environmental Response, Compensation and Liability Act of 1980, Section 102b. A copy of any report required or requested by any federal or state agency because of a reportable release or spill of any toxic substances shall be furnished to the Project Engineer concurrent with the filing of the reports to the involved federal or state agency.

01200 – PROJECT MEETINGS

The following sections describe the required project meetings that the Contractor is expected to attend.

01210 - PRECONSTRUCTION CONFERENCES

Before starting work at the site, a conference will be held to review the construction schedules; to establish procedures for handling documents, drawings, other submissions, and for processing Applications for Payment; and to establish a working understanding between the parties as to the nature of the Project. Present at the conference will be the Project Manager, the Project Engineer, the Contractor, the Contractor's superintendent, and other persons as appropriate. The Contractor shall present a work progress schedule at the preconstruction conference as specified in Section 01310, in addition to a fire prevention and awareness plan as specified in Section 01565.

01220 - PROGRESS MEETINGS

Progress meetings may be held during construction for purposes of scheduling and coordination of work. Throughout the life of the project, the Contractor shall keep the Project Manager and Project Engineer well informed of the schedule of work.

01300 – SUBMITTALS

The following sections describe the required documents and reports to be submitted by the Contractor during the contract work.

01310 - PROGRESS SCHEDULES

The Contractor shall provide a detailed progress schedule to be followed during completion of the work. This schedule shall be submitted to the Project Engineer in writing at the preconstruction conference and shall indicate the anticipated timeframe required by the

Contractor to complete each item of work as specified in the Bid Form. Progress schedules may be presented as a horizontal bar chart with a separate bar showing each major portion of work or operations to be completed weekly, and identifying the first and last workday of each week. Any proposed deviations from the Progress Schedule shall be submitted to the Project Engineer in writing for review and approval.

01320 - PROGRESS REPORTS

The Contractor shall submit daily progress reports to the Project Manager. The reports shall include but are not limited to work accomplished, quantities of unit price bid items installed, including load tickets as appropriate, records of any complaints including corrective actions taken, records of visitors to the site, and records of any personal injury or property damage incidents. The Contractor's authorized representative shall meet the Project Manager a minimum of once each week to verify and sign-off on all payable units of work performed during that week. Each authorized representative in addition to one alternate authorized representative from both parties shall be designated at the start of the project during the preconstruction conference.

01330 – HEALTH AND SAFETY PLAN (HASP)

The Contractor shall prepare a HASP detailing site-specific hazards and safety precautions associated with site work and the Project in general. The HASP shall comply with OSHA standards (29 CFR Part 1926 – Safety and Health Regulations for Construction, latest revision) and shall include but not be limited to a list of emergency contact information for responsible on- and off-site personnel, hazard identification, hazard controls and safe practices, emergency and accident response, employee training requirements, required personal protective equipment (PPE), SDS, and communication information and procedures.

The HASP shall include the Contractor's Infections Disease Preparedness and Response Plan, which shall include but not be limited to:

- Non-occupational risk factors at home and in community settings.
- Workers' individual risk factors (e.g., older age; presence of chronic medical conditions, including immunocompromising conditions; pregnancy).
- Controls necessary to address these risks.
- Basic infection prevention measures.
- Policies and procedures for prompt identification and isolation of sick people.
- Workplace controls for reducing the risk of communicable diseases spread in the workplace.

The Contractor shall submit a draft of the HASP to the Project Engineer for review and comment a minimum of one month before mobilization to the site. The Contractor shall finalize

the HASP and submit a final copy to the Project Engineer prior to beginning work on the project site.

01340 - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

The Contractor shall submit shop drawings, product data, and samples to the Project Engineer as required in the construction and design specifications. Submittals shall be organized such that each covers items from no more than one specification section. The Contractor shall allow a minimum of 21 calendar days for the Project Engineer's review the Project Engineer may be able to accommodate shorter review periods but will require working closely with the Contractor. The Contractor shall allow acceptable time for the entire review process including transmittal, initial Project Engineer's review, correction and resubmission, final review, and distribution.

Engineering data and shop drawings covering all equipment and fabricated materials shall be submitted to the Project Engineer for review and comments. These data shall include detailed and precise drawings and other descriptive information in sufficient detail to show the type, size, arrangement, and operation of component materials and devices; the external connections, anchorages, and supports required; and performance characteristics and dimensions needed for installation and correlation with other materials and equipment. Data submitted shall include detailed and precise drawings showing essential details of any changes proposed by the Contractor.

It shall be the duty of the Contractor to check all data and shop drawings for completeness before submittal for Project Engineer's review. Each drawing or data sheet shall have indicated there on the proposed use of the item as it pertains to the Work. Catalog cuts, pages, or copies submitted for review shall have items proposed for use in the Work clearly marked and identified. The current catalog number, date, and revision and drawing number (if applicable) shall be included.

Deviations from the drawings or design specifications shall be identified on each submittal and shall be referenced in the Contractor's transmittal letter. The submittal for any such deviations in the Work or design shall also include specific details of changes proposed and modifications required for all affected portions of the Work.

Shop drawings and other review data shall be submitted to the Project Engineer only from the Contractor. Submittals from Subcontractors will not be accepted.

The Contractor's submittal of shop drawings and other review material shall represent that the Contractor has reviewed the details and requirements of the Contract Documents, has coordinated the subject of the submittal with other portions of the Work, and has verified dimensions, quantities, construction details, materials, and installation criteria, as applicable for the Work. The Contractor shall accept full responsibility for the completeness of each submittal and, for re-submittals, verify that exceptions noted on the previous submittal have been accounted for.

Any requirement for more than one resubmission or delay in obtaining Project Engineer's review of submittals will not entitle the Contractor to an extension of Contract Time unless authorized by Change Order.

The Project Engineer's review of drawings and data submitted by the Contractor will cover only general conformity to the drawings and specifications, external connections, and dimensions that affect the plans and layout. The Project Engineer's disposition of submittals will not constitute a blanket approval of all dimensions, quantities, and details of the material, equipment, or item shown. Regardless of the corrections made in, or disposition given to, such drawings and data by the Project Engineer, the Contractor shall be responsible for the accuracy of such drawings and data and for their conformity and compliance with all contract documents.

No work shall be performed in connection with the fabrication or manufacture of materials and equipment, nor shall any material, accessory, or appurtenance be purchased until the drawings and data therefor have been reviewed.

A copy of each drawing and necessary data shall be submitted to the Project Engineer. Each drawing or data sheet shall be clearly marked as instructed above. Submittals will be accepted only from the Contractor.

When the drawings and data are returned NOT APPROVED or RETURNED FOR CORRECTION, corrections shall be made as noted by the Project Engineer and four corrected copies resubmitted as instructed above.

When drawings and data are returned marked NO EXCEPTIONS NOTED, EXCEPTIONS NOTED, or RECORD COPY, no additional copies need be submitted.

The Project Engineer will return a copy with comments to the Contractor. The Contractor shall send additional copies with the original submittal if the Contractor requires more than two copies.

All drawings and data, after final processing by the Project Engineer, shall become a part of the contract documents and the work shown or described thereby shall be performed in conformity therewith unless otherwise required by the Project Engineer.

01380 - CONSTRUCTION PHOTOGRAPHS

At the request of the AML Program, the Contractor shall provide routine periodic construction photographs to support Applications for Payment and to supplement Project Record Documents.

01400 – QUALITY CONTROL

The following sections outline the duties, responsibilities, and qualifications of inspectors, testing laboratories, and the Contractor's quality control requirements required to perform the contract work.

01405 - CONTRACT QUALITY CONTROL

The Contractor shall be responsible for the maintenance of quality control throughout the period of the contract work. This includes making periodic spot checks to assure that equipment, materials, and construction quality, meet the contract specifications.

01410 - TESTING LABORATORY SERVICES

Independent commercial testing laboratories shall perform all tests required by the contract documents to determine compliance with the specifications. The testing laboratories shall be acceptable to the Project Engineer. The laboratories shall be in the regular business of testing services in accordance with the specifications for which tests are required, and shall be staffed with trained and experienced technicians, equipped properly, and fully qualified to perform the specified tests in accordance with reference standards.

All testing services for tests of materials required by the contract documents shall be the responsibility of the Contractor. The Project Engineer shall review all sources of materials before delivery of the materials to the job site. Before the performance of any testing, the Contractor shall obtain the concurrence of the Project Engineer for the laboratory or laboratories selected by the Contractor.

The Contractor shall require the producer or manufacturer of materials, for which the specifications require inspection or testing services during the production or manufacturing process, to arrange for and pay an independent organization to perform the specified services.

The Project Manager will determine the exact time and location of field sampling and testing. The Project Manager or Project Engineer may require additional sampling and testing as necessary to assure that materials conform to the contract documents. The Contractor shall pay the costs of any retesting or re-sampling required when initial tests or samples fail to meet the specified requirements.

Written reports of tests furnished by the Contractor for the Project Engineer's review shall be submitted in conformance to the procedures set forth in Section 01340.

01500 – CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

The following sections specify the types of construction facilities and temporary controls the Contractor shall provide for completion of the contract work.

01505 – MOBILIZATION

The Contractor shall furnish and mobilize all specified construction facilities, temporary controls, equipment, labor, materials, power, supervision, and supplies to the site and commence work within 30 working days after receipt of the Notice to Proceed. Mobilization includes everything necessary to complete the required contract work. The Contractor shall inform the Project Manager of plans and schedules to move all equipment, machinery, and supplies to the

job site. The Contractor shall locate and position the staging area including field offices, parking, storage, and support facilities as directed and approved by the Project Manager. All equipment and machinery shall be moved onto the job site in conformance with previously approved plans and schedules. It is the Contractor's responsibility to arrange for storage facilities for equipment and materials. City, state, federal, or other public or private property shall not be used as temporary storage or parking areas for any equipment or materials unless written permission is obtained by the Contractor from the appropriate public officials or private individuals and proof of permission is provided to the Project Engineer. The Contractor must be prepared to move all necessary equipment to each construction site within the project area.

01510 - TEMPORARY UTILITIES

The following sections describe temporary utilities, controls, facilities, and construction aids required during construction, including requirements for installation, maintenance, and removal.

01516 - TEMPORARY SANITARY FACILITIES

The Contractor shall provide temporary sanitation facilities during the contract work, and made available to AML personnel. The facility shall be installed on the project site prior to the start of work in a designated staging area approved by the Project Manager and Project Engineer. Sanitation facilities (portable toilet units) shall include a handwash station or hand sanitizer. Sanitation unit(s) shall be staked down or otherwise secured to prevent tipping from wildlife, livestock or high winds. The facility shall be locked to prevent unauthorized access during times when work is not being conducted.

Sanitation facilities shall be maintained and serviced at least once a week, unless more frequent service is necessary as determined by the Project Manager or the Contractor. The Contractor shall remove the facility upon completion of the contract work and restore any damage evident to the area, or areas, in which the facilities have been installed and used.

01530 – BARRIERS AND ENCLOSURES

The Contractor shall provide barricades with blinking markers for all equipment on roadways and pedestrian walkways. The barricades shall be no less than twenty feet from the front and rear of any equipment in the described rights-of-way. Traffic control devices shall conform with *The American Traffic Services Association (ATSA) Guide for Work Area Traffic Control*. The Contractor shall remove the barricades upon completion of the contract work.

01533 - TREE, PLANT AND WILDLIFE PROTECTION

I. Tree and Plant Protection

Environmental disturbance throughout the Project Area shall be kept to a practical minimum.

In steep areas and around vegetation, the Contractor shall, before beginning work, discuss the planned extent and nature of disturbance with the Project Manager. Existing plants and trees shall be protected from damage or injury resulting from the Contractor's operations. Damaged trees and shrubs shall be trimmed to remove broken limbs where minor damage has occurred. Where any limbs must be removed the Contractor shall cut branches away from the bole to avoid damage to the branch collar.

II. Wildlife Protection

All area wildlife, including bats and owls, that may use the mine features are protected, and this safeguard project shall not adversely affect them. Refer to Table I for designated periods of the year in which work restrictions shall be implemented to protect wildlife. Shooting at, chasing or otherwise harassing wildlife in the Project Area is prohibited.

During or before the preconstruction conference, the Contractor shall submit a construction schedule, which includes anticipated dates of closure of specified mine features, in accordance with Section 01310. Based on this schedule the AML Project Manager may give written or verbal authorization to proceed on closure of any specific mine features that require netting or trapping or other means necessary to allow escape and to exclude animals prior to closure. It is solely the Contractor's responsibility to obtain this authorization. Typically, within a minimum of one week, written notice including the proposed dates of closure is required for submittal from the Contractor to the AML Project Manager. After approval of the schedule, any need for changes shall be coordinated with the Project Manager a minimum of 48 hours before closure of the features. The Contractor's failure to follow this procedure may result in stoppage of the construction activity at the Contractor's expense until the biological staff can schedule any required exclusion measures such as netting and tarping of the specified features.

The Contractor shall aid AML staff to expel remaining bats or other wildlife before backfilling or closing any mine features, by covering the entrances of designated mine features with netting, tarps or other barricades after the animals have exited and to also aid in removing any barricades following closure. The Contractor shall provide sufficient quantities and sizes of netting, tarps, polyethylene sheets or other suitable wildlife exclusion measures for this purpose.

All mine openings, except those whose workings can be fully visually checked by the Project Manager and those which are safeguarded by the construction of bat closures, airflow closures or high-strength steel mesh, shall be tarped or netted (one-inch mesh material, e.g., chicken wire, polypropylene or similar material) 72 hours before closure and require agreement on the dates and timeframes for maintaining them in place.

During construction of bat-compatible closures, the Contractor shall schedule activities so the bats can readily pass through the partially completed closures from one hour before sunset until sunrise. In addition, during construction of bat closures at shafts, the Contractor shall take measures to reduce any loose rock and other material that may drop into those mine features.

Internal combustion engines, including those used for generators and on air compressors, shall be situated in such a way that any exhaust emissions from the engine are not drawn into the mine openings.

01535 - PROTECTION OF INSTALLED WORK

The Contractor shall protect installed work and control traffic in the immediate area to prevent damage from subsequent operations.

01540 – SECURITY

The Contractor shall act to assure the protection of the contract work and equipment at the contract work site. The Contractor shall furnish, install, and maintain safety fences around any hazardous or high-voltage equipment at the site for the duration of the project. Where appropriate, the Contractor shall restrict access to the project site by barricading access roads during off-hours and by posting "No Admittance" and "Hard Hat Area" signs. Security guard services may be included for site security with permission from the Project Manager.

01550 – ACCESS ROADS, PARKING AREAS AND STAGING AREAS

Surface disturbance caused by the project's activities shall be minimized to the maximum extent practicable. Unless otherwise indicated, all Contractor personnel and equipment shall enter and leave the project site via existing roads and trails. Upon completion of regrading, recontouring, or following reclamation of any part of the site, further vehicular use in those areas shall be limited within the reclaimed area to the extent possible and as necessary to complete the Work. Any access routes that are determined necessary by the Project Manager to remain and be maintained throughout the duration of the project shall be left in as good or better condition than the condition prior to the start of the project. Existing roads and trails shall be used whenever possible. Overland travel and trips to and from the staging area and work sites shall be minimized to the maximum extent practicable.

Any equipment requiring to be "walked" or operated cross-country during overland travel to work sites where roads do not exist or where road conditions preclude access by equipment trailers, shall exclusively follow an access path designed by the Project Manager in consultation with the Project Engineer and the Contractor. No equipment or vehicles shall be operated off of any existing access roads during the period starting at noon on Friday and extending to noon on Monday unless the Project Manager is present. No new access roads or pathways used for overland travel to work sites shall be bladed or otherwise improved. The Contractor shall advise the Project Manager and obtain prior approval if any road blading, clearing, or dozing is required for access to work sites. Any topsoil present at work sites should be stripped and salvaged for later use in topdressing the reclaimed area and shall be stockpiled, protected from erosion using best management practices and maintained in the immediate area prior to blading as directed by the Project Manager.

All surface disturbance created through use of temporary overland access routes to work sites shall be roughened by equipment and/or hand tools and seeded and mulched with the approved seed mix within 24 hours of completion of construction. Overland equipment trips to the mine features and work sites from established roads shall be kept to an absolute minimum and, in some cases, certain construction materials may require to be hand-carried to avoid excessive surface disturbance by off-road traffic. Any unauthorized access roads, trails, or travel routes created by the Contractor for construction purposes shall be regraded to approximate

original contours, reclaimed, and reseeded, as necessary, in conformance with the project specifications herein at no additional cost to AML. Where directed by the Project Manager, the Contractor shall build earthen berms or placement of large boulders to discourage and impede unauthorized vehicular traffic and to control erosion and sediment loss on reclaimed and closed temporary construction access roads.

01560 – TEMPORARY CONTROLS

The Contractor shall take all reasonable steps to reduce or avoid any inconvenience and disruption to the public as a result of this project. The Contractor shall implement the following temporary controls for the duration of the contract work:

01561 - CONSTRUCTION CLEANING

The Contractor shall keep the contract work area, equipment, and adjacent areas free from spillages of construction and maintenance materials used during the contract work. The Contractor shall also provide for the containment of any solid waste and debris created by unpackaging construction materials and waste from meals and water consumed at the contract work site. The Contractor shall ensure that the cleanup and removal of all spillages, solid waste and debris is removed from the work site and taken to an approved disposal site at the end of each contract workday.

01562 - DUST CONTROL

The Contractor shall take all necessary measures to control dust emanations from vehicles and construction equipment on access roads and at work sites. The Contractor shall ensure that any equipment used in the contract work is fitted with standard dust control devices. To maintain the health and safety of project personnel, dust control measures at the site shall comply with all local, state, and federal health and safety regulations. The Contractor shall be prepared to initiate dust control measures at any time at the request of the Project Manager. Water for use during dust control measures shall be distributed in sufficient quantity and at proper intervals by water truck(s) equipped with spray bars, cannons, and hoses (of sufficient lengths) and approved by the Project Manager. The quantity of water required and the frequency of watering intervals shall be determined by the Project Manager and are dependent upon the weather and the site's surface conditions and may vary throughout the project duration.

There is no source of water on site for dust suppression. The contractor shall be responsible for identifying a reliable and consistent source for obtaining water in sufficient quantities and for providing water for dust suppression measures at no additional cost to the project.

01564 - NOISE CONTROL

The Contractor shall ensure that all equipment used in the contract work is fitted with standard noise suppression devices.

01565 - FIRE PREVENTION AND SAFETY AWARENESS

The Contractor shall develop an emergency plan outlining precautionary fire prevention measures and that also identifies initial attack resources and procedures for fire suppression in the event of a fire incident occurring in the Project Area as a result of project related activities. This plan will be submitted to the Project Manager for review at the Pre-Construction meeting and the Project Manager will provide any feedback or suggestions about the plan and approve it for use during the contract period. The Contractor shall provide a copy of the fire emergency plan to all individuals working on this project during daily pre-work safety meetings.

Examples of precautionary measures may include but are not limited to:

1. Daily inspection of all motorized and mechanized equipment to insure mufflers and spark arresters are installed and operating properly.
2. Ensure that all personnel working on site are properly trained in the safe use of welding torches, arc welders, generators, power saws and grinders, chainsaws, and other tools and are also familiar with the potential of this equipment to create hot sparks and ignite fires.
3. Avoid welding or cutting in areas adjacent to or above flammable materials or during windy conditions. This precaution pertains to welding or cutting materials inside of the mine as well as outside the mine opening. Welding shall not take place within 25 feet of any exposed PUF either during or after its application. Following application, welding shall not take place above any PUF installation without first covering the PUF surface with 6" minimum of fill material or soil cover.
4. Hot work (welding, cutting, grinding, etc.) may be suspended by the Project Manager on days with a Red Flag Warning as issued by the National Weather Service. These warnings indicate an increased risk of wildfires.

Examples of fire suppression resources and procedures may include but are not limited to:

1. Maintain an adequate number of fire extinguishers that are fully charged and in good working order, water tanks, sprayers, buckets, shovels, welding blankets and other equipment at the work site that would enable personnel to immediately extinguish any accidental ignition.
2. Have lookout personnel observe the work area and require welders to utilize protective welding blankets, where applicable and while welders are operating (welders cannot see where the sparks are falling when the welder is under the welding hood).
3. Assign an individual or other lookout personnel to be responsible for inspecting the work area and to verify that it is "safe" (no hot sparks or spot fires, iron is cold) before leaving the work site.

4. Create a list of local, nearby emergency fire departments or other agencies in the area to contact and will quickly respond during any emergency. Develop an emergency notification procedure that the Contractor and AML staff are aware of for contacting nearby local or regional fire suppression support in the event that the fire incident is out of control, threatening people or equipment or appears to be reaching an out-of-control status.

The Contractor shall obey all fire restrictions declared by the landowner(s) and/or adjoining land and property management agencies (i.e. University of New Mexico, U.S. Forest Service, and/or Bureau of Land Management).

01566 – PUBLIC SAFETY

Efforts to protect visitors from injury due to execution of the work shall be taken wherever practical. Examples of procedures that shall be followed may include but are not limited to:

1. Use of caution flagging tape or signage.
2. Maintaining cleared unimpeded access to staging area or vehicle parking areas.
3. Maintaining at least one cleared pedestrian access route to primary mine features at all times.
4. Securing of unused or staged materials and temporarily parked equipment.
5. Cordon off active work areas using flagging (12-inch by 9-inch orange triangles, minimum) and/or construction barriers and temporary fencing to restrict access.

01570 – TRAFFIC REGULATION

The Contractor shall take the following measures for regulation and control of traffic ingress and egress at the contract work site.

01572 – FLAGGERS

The Contractor shall post flaggers during the off-loading and on-loading of equipment or materials in roadways at the contract work site access road entrance and/or during cleaning of the highway surface. The flaggers shall halt traffic during the off-loading or on-loading process or direct traffic to an alternate route.

01574 - HAUL ROUTES

The Contractor shall consult with the land managing agency or other authority having jurisdiction in establishing public thoroughfares to be used for haul routes and site access. Any damage to the site access road from driving on wet/muddy surface and leaving ruts in excess of

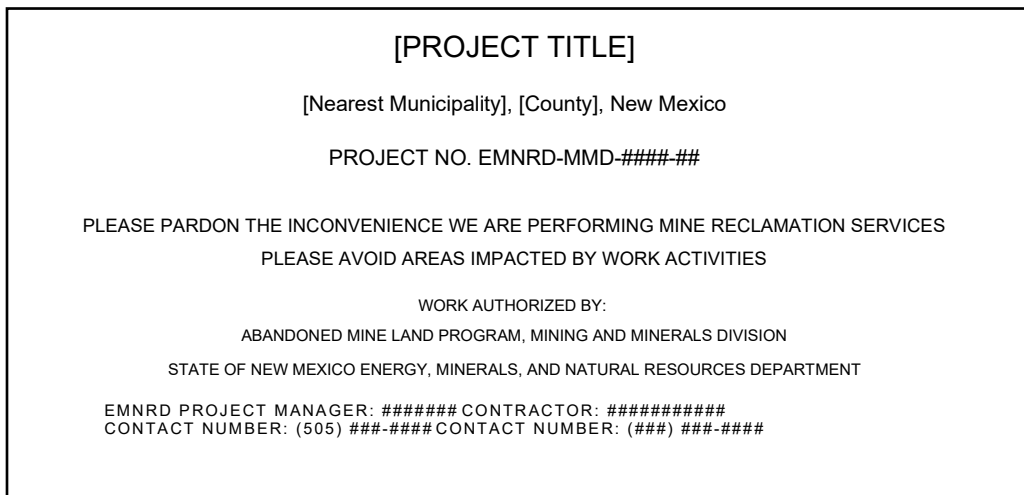
2” shall be repaired at the end of the project, or as directed by the Project Manager to maintain public access to the site.

01580 – PROJECT IDENTIFICATION AND SIGNS

At least one temporary project sign shall be furnished and erected by the Contractor at the most convenient point of public access to the project site. The proposed sign location, message content, and font size shall be preapproved by contractor submittal, including sign mockup, prior to installation. The project identification sign shall be installed within ten (10) working days after the receipt via certified mail of the NTP or within five days after the Contractor initially mobilizes to the project site, whichever happens first. The sign is to be a minimum of four feet by eight feet by three quarter inch (4' x 8' x 3/4") exterior grade plywood and shall provide the project title, project number, and other data within the box as appearing on the Title Page of this document. The lettering shall be a minimum of two-inch tall Tahoma font, with project name shown in bold font, and with capitalization and word organization as shown on the Title Page of this document. Exterior quality paint in contrasting colors shall be used. The Contractor shall remove sign, framing, supports, and foundations at completion of Project and restore the area. Any costs connected to the construction, painting, erection, and later removal of the sign should be covered under Bid Item No. 1, Mobilization, on the Bid Form.

Portable A-frame folding construction-warning signs shall be provided by the Project Manager and erected on vehicular access routes and hiking trails to the project site. The Contractor shall provide sandbags for ballast to stabilize the signs against high winds. Folding signs shall be returned to the Project Manager upon completion of the project. Sample of portable folding signs:

Sample of Sign:



Sample of portable folding signs:



01590 – FIELD OFFICES AND SHEDS

Portable or mobile buildings, or buildings constructed with floors raised above ground, may be provided by the Contractor in locations approved by the Project Manager and the landowner. Following completion of work, the Contractor shall remove all buildings, foundations, utility services, and debris and restore areas.

01600 – MATERIALS AND EQUIPMENT

All materials and equipment required to complete the work shall be as specified. Any substitution to the specified products requires prior approval by the Project Engineer.

01700 – CONTRACT CLOSEOUT

The following sections specify the duties and responsibilities of the Contractor to close out the contract.

01701 - CONTRACT CLOSEOUT PROCEDURES

When work is completed, the Contractor shall submit project record documents to the Project Manager.

01702 - FINAL INSPECTION

Upon written notice from the Contractor that the entire Work or an agreed portion thereof is complete, the Project Engineer will make a final inspection with the Project Manager and Contractor and following inspection, will notify the Contractor in writing, within 10 days of any particulars in which this inspection reveals that the Work is either incomplete and/or defective. The Contractor shall immediately undertake any such measures as are required to remedy any identified deficiencies within 10 days of being notified.

01710 - FINAL CLEANING

After completion of all work, the Contractor shall demobilize and remove all equipment, any temporary buildings or shed, materials, spills, supplies, and trash from the project site and shall reclaim all areas disturbed by the Contractor's activities. Unless otherwise specified, developed, maintained roads that existed prior to commencement of the Contractor's activities need not be reclaimed, but must be left in a condition equal to or better than what existed prior to the Contractor's activities began. Fences, gates, plants, stockpiled soil or rock and other surface materials disrupted by these operations shall be removed, replaced or restored to original or better conditions immediately upon completion of work at the site. Other damage to private or public property shall be immediately repaired within 10 days of discovery. All such cleanup, repair, removal or replacement work shall be done at the Contractor's expense and to the satisfaction of the Project Manager pending approval of the appropriate public officials, property owners or land management agencies. Payment for Demobilization shall be covered under Bid Item No. 1, Mobilization, on the Bid Form.

01720 – PROJECT RECORD DOCUMENTS

The Contractor shall prepare final Project Record Documents providing information regarding all aspects of the completed Work, both concealed and visible, to enable future modification of the Work to proceed without lengthy and expensive site measurement, investigation, and examination. At Contract closeout, the Contractor shall deliver Project Record Documents and samples under provisions of Section 01701.

END OF DIVISION 1

DIVISION 2 – SITEWORK

The following sections describe the sitework to be performed under this contract.

Prior to initiating any disturbance of the mine features, the Contractor shall provide tarps and one-inch mesh material (poultry netting, polypropylene, or similar material) and assist AML staff or its consultants in excluding wildlife and other animals from the features to be closed. Refer to the requirements in Section 01533.

Use of brand names is for the purpose of describing the standard of quality, performance and characteristics desired and is not intended to limit or restrict competition.

02050 – DEMOLITION

The following section describes selective demolition to be performed under this contract.

02070 - SELECTIVE DEMOLITION

Certain mine features may require removal of debris materials and other trash such as boards, signs, timbers, wire, temporary fencing, etcetera. Salvageable materials (e.g. T-posts and temporary chain link fencing) shall be neatly stacked on the site or staging area, while any materials considered to be trash shall be properly disposed of at the Contractor's expense at an appropriate licensed landfill. All fasteners (e.g. nails, screws, wire) shall be removed from lumber and timbers and properly disposed of or recycled. Any specified or established avoidance areas shall be flagged and avoided by equipment, vehicle and foot traffic and the recommendations of the archaeological report and the State Historic Preservation Office (SHPO) shall be strictly adhered to.

Other debris and materials that may be present within certain mine features and that may cause bridging of backfill material during emplacement or otherwise create voids and interfere with construction shall be removed from the feature prior to closure and properly disposed of as directed by the Project Manager.

02100 – SITE PREPARATION

02110 - SITE CLEARING

This work shall consist of trimming, removing, and disposing of vegetation and debris in accordance with these specifications, except those items designated to remain. This work shall also include implementation of protective measures to ensure the preservation from damage or defacement of vegetation and other natural resources that are designated to remain intact.

Within construction limits and constraints on borrowing backfill material from onsite sources, all surface debris, roots, stumps, trees, and other objectionable protruding obstructions shall be cleared or removed with the Project Manager's concurrence.

02200 – EARTHWORK

The following sections describe the earthwork to be performed under this contract.

02210 - GRADING

The following sections describe the grading to be performed under this contract.

02211 - ROUGH GRADING

Unless otherwise specified or indicated, all cut and fill slopes shall be rough graded so that slopes are not steeper than three horizontals to one vertical (3h:1v) in earth, two horizontals to one vertical (2h:1v) in incompetent rock and very rocky soils, and one half horizontal to one vertical (0.5h:1v) in competent rock. Where specified and as directed by the Project Manager, the Contractor shall grade sites and construct drainage ditches around safeguarded mine features to divert storm water away from those features.

Where cut slopes in competent rock are steeper than one and a half horizontal to one vertical (1.5h:1v), the maximum uninterrupted vertical height of the slopes shall be no more than ten feet. A series of slopes, each at between one half horizontal to one vertical (0.5h:1v) and one and a half horizontal to one vertical (1.5h:1v), may be constructed in competent rock if horizontal benches or terraces a minimum of six feet wide, within slopes of at least 4 percent, are built at a vertical spacing of no more than ten feet.

02212 - DECOMPACTION

Before construction demobilization and following the need for any construction access to each mine feature, the Contractor shall decompact areas compacted by construction activity, including temporary work areas and access trails, and staging, storage and parking areas. Areas where more than four feet of overburden material has been removed shall also be decompact. Decompaction shall be performed to the satisfaction of the Project Manager.

Where bedrock is exposed at the surface, such decompaction will not be required. Decompaction methods shall be effective at reducing soil density to a minimum depth of twelve inches (except where bedrock is closer to the surface) and shall be accomplished without inverting the soil layers. Where practicable, ripping shall be done along the contour. Alternatives to ripping or auguring for decompaction shall be acceptable to the Project Engineer.

02216 - ACCESS ROAD/ROUTE CLOSURES

Before construction demobilization and following the need for any construction access, the Contractor shall close temporary construction access roads/routes as specified and as directed by the Project Manager. The Contractor shall out slope the road surface and remove all berms along the outer edge of the road to facilitate drainage. By grading material toward the cut bank, the Contractor shall take care not to spill graded material over the fill slope. The out slope shall be enough to divert water over the bank at approximately four to eight percent.

The Contractor shall construct berms and cross-ditches or install large boulders as directed by the Project Manager, to restrict vehicular access and control erosion.

In addition, cross-drains shall be located to divert water where the road traverses a ridge, above and below road junctions, above steep incurves to prevent bank cutting and to keep road surface water from entering a draw, below sharp incurves to prevent water from a draw from coursing down the road, and below seeps and springs.

Construction access routes with minimal disturbance shall be raked out and roughened to the satisfaction of the Project Manager and seeded as specified in Section 02900 – Landscaping.

02218 – LANDSCAPE GRADING

Following feature closure, backfilling, and rough grading, disturbed sites shall be graded to blend them with the surrounding landscape to reduce excessively steep areas and to reduce channelized surface water as directed by the Project Manager. Except in areas to be drill seeded, the soil surface shall be finished as rough as possible, by ripping, using the teeth of an excavator bucket, or similar methods to slow the velocity of erosive overland flows and to create small pockets and furrows to trap seed and water to create favorable microclimates to enhance seed germination for optimal plant growth. Where done by hand, this roughening can be done by shovel or mattock, creating many, closely spaced depressions and pits two to six inches deep. Wherever possible chiseling, ripping, and similar operations shall be done along the contour. The actual final topography shall be determined by consulting with and obtaining the approval of the Project Manager.

02220 - EXCAVATING, BACKFILLING, AND COMPACTING

The following sections describe the excavating, backfilling and compacting to be performed under this contract.

02222 - EXCAVATION

The Contractor shall reopen as necessary the adits that may be partially closed, by mucking out the debris, earth, and rock blocking or partially plugging them. Before removing any backfill or borrow, the Contractor shall discuss with the Project Manager where material shall be excavated and the quantity to be stored, and shall obtain the Project Manager's approval of the excavation plan for the proposed borrow area.

I02223 – BACKFILLING OF MINE OPENINGS

This work shall consist of backfilling mine opening with onsite or imported fill materials as designated in the specifications or as directed by the Project Manager.

I. General

Before backfilling mine openings, the Contractor shall remove cribbing, garbage, wood and other materials as specified and as directed by the Project Manager. All trash debris shall be hauled to a permitted landfill or transfer station.

Backfill material shall be free of snow, ice, frozen lumps, logs, timbers, significant amounts of woody or vegetative debris, other deleterious materials of such size and shape that they may bridge or create voids within the opening being filled.

Hand backfilling is an option if the site is difficult for equipment access or too steep to operate equipment safely.

II. Shaft, Pit, and Open Stope Backfilling

Shafts, pits, stopes, declines, and trenches shall be backfilled completely from the bottom of the feature to the specified minimum distance above or below the surface.

In shafts and stopes with intact or partially intact cribbing or lining to remain, the maximum size of backfill material shall have no dimension exceeding twelve inches. Care shall be taken during backfilling to reduce damage to the cribbing or lining to prevent bridging of fill materials on collapsed timbers and to minimize potential for voids or collapse of the collar.

Where judged to be feasible by the Project Manager, the Contractor may break collapsed timbers deeper than can practicably be removed by using other methods, including dropping heavy rock, boulders, or broken concrete during the initial stages of backfill.

Wherever practicable, at least 80 percent by weight of fill material shall be larger than $\frac{3}{4}$ inch. In shafts, stopes and declines, the coarsest available backfill material shall be used from the bottom of each drift level to a minimum height of five times the diameter or diagonal dimension of the shaft above the drift floor level.

III. Materials

Contractor shall provide a submittal providing material specifications of all imported fill materials before delivery to the site. The Project Manager may request a sample of the material in addition to product specification data.

1. Imported Granular Fill: naturally occurring granular material free from wood vegetation, or other deleterious matter. Fill shall contain sufficient sand or filler to permit compaction. Materials including well-sorted sands and gravels, very fine sand,

shale, clayey soil, contaminated soil, or soil that will not support plant growth shall not be used.

2. Riprap: Angular rock or stone free of seams, fractures, and coatings; and of such characteristics that will not disintegrate when subject to the action of flowing water. The minimum specific gravity of the rock or stone shall be 2.65 as determined in accordance with ASTM C127, latest edition. The maximum resistance to abrasion shall be fifty (50) percent determined in accordance with the requirements of ASTM C535, latest edition. The riprap shall have a maximum to minimum dimension ratio not more than 3:1. Allowable gradations shall be:

| Maximum dimension (inches) | % Smaller |
|-------------------------------|-----------|
| 12 | 100 |
| 9 | 50-70 |
| 6 | 35-55 |
| 3 | 10 |

3. Water: Soil conditioning shall be performed using uncontaminated water provided by the Contractor. There is no source of water available on site or in the immediate vicinity of the site. Sourcing and transportation of water shall be the responsibility of the Contractor at no additional cost to the unit price provided for executing closure or safeguard construction.

4. Scoria Fill:

Scoria fill shall be clean, crushed scoria (or other approved equivalent lightweight aggregate) with a dry unit weight of no more than 46 pounds per cubic foot and with not less than 95% passing a 1 ½” sieve and with not less than 90 percent retained on a #4 sieve.

Scoria fill shall be placed in uncompacted layers of eight inches or less and compacted by slicing with a shovel or vibrating.

IV. Final Layer of Fill

Wherever practicable, the final eight- to twelve-inch layer of the fill at mine openings shall be soil of comparable composition and quality to that of the undisturbed native soil surrounding the backfilled feature. Note the topdressing requirements of section 02921.

02224 - BORROW

Except where otherwise specified or indicated herein, fill material shall come from the areas immediately at and/or surrounding the mine features or from nearby mine waste piles as directed by the Project Manager. Preferentially, mine waste material from onsite source(s) shall be used; however, borrow material may also be excavated and taken from other approved areas as required and as directed by the Project Manager.

As indicated for specified mine openings and as required, fill material shall be taken only from designated borrow source areas as indicated in the maps or drawings. Any other non-designated borrow sources shall be approved by the Project Manager prior to use and in consultation with AML cultural resources staff and, for borrow sites located on nearby BLM lands, approved by the Bureau of Land Management. Any topsoil present at onsite borrow areas shall be stripped and stockpiled for later use as topdressing prior to commencing borrow material excavation and removal operations. Haul routes for borrow material shall be approved by the Project Manager prior to commencement of removal or hauling from its source.

Except as otherwise noted or approved by the Project Manager, the Contractor shall not use any mine waste material from within designated avoidance areas, shall avoid undermining the cultural features within avoidance areas during borrow material excavation and removal operations, and shall not leave disturbed slopes in the mine waste steeper than two horizontal to one vertical (2h:1v) outside of avoidance areas.

02229 - COMPACTION

Material used for fill shall be compacted whenever possible using multiple passes with available heavy equipment. The fill shall obtain a compaction density not less than what the equipment can reasonably obtain to the satisfaction of the Project Manager. Fill material shall be moisture conditioned prior to compaction at the discretion of the Project Engineer.

Where vibratory compaction equipment is used, it shall be the Contractor's responsibility to insure that vibrations do not damage nearby cultural resources, structures or underground mine voids.

02230 – EMBANKMENTS

Any berms that are necessary for material or stormwater control or otherwise required to be constructed in the Project Area will use unclassified fill obtained from stockpiled excavation materials. Native onsite soils excavated for this project may be used for earthwork. If on-site soil quantities are insufficient for backfill, imported non-organic general fill may be used with approval by the Project Engineer. The fill source shall be identified and imported by the Contractor. Excess soil remaining after earthwork is completed shall be spread uniformly at areas designated by the Project Manager. The fill shall obtain a compaction density not less than what the equipment can reasonably obtain to the satisfaction of the Project Manager. Wheel rolling to achieve compaction is prohibited to prevent damage to nearby structures or collapse of underground mine voids.

02600 – PIPED UTILITY MATERIALS

The following sections describe piped utility materials to be installed under this Contract.

02613 - CORRUGATED METAL PIPE

CMP and connectors shall be made from galvanized steel in conformance with the applicable requirements of AASHTO M218 or ASTM A929. CMP shall be manufactured in the U.S.A. and certified as being in conformance with the requirements of AASHTO M36 and as hereinafter specified. The size of the CMP shall be nominal 18-inch diameter. Nominal diameter or dimensions as referred to in AASHTO M36 shall be defined as the minimum inside dimension of the CMP.

Materials for CMP and appurtenances shall be as specified in AASHTO M36. Any CMP in which the seams indicate slippage or are unraveling will be rejected. Sawed ends and vent notches on pipes will be permitted provided all burrs are removed. Spelter coating damaged by welding, grinding or fabrication shall be repaired and recoated in accordance with AASHTO M36.

Unless otherwise indicated, CMP shall be Type I and consist of 14- or 16-gauge galvanized steel with helical corrugations. Any CMP used for the Project shall be new, free of rust, gaps in seams, holes in the wall, and deformations that reduce the inside diameter by more than two inches.

Bands for connecting helically corrugated pipe shall conform to the requirements of AASHTO M36. Coupling bands shall be a minimum of 18 gauge and made of the same base metal and coating as the CMP. Coupling bands shall lap equally on each of the CMP being connected to form a tightly closed joint after installation. Use of flange bands will not be permitted.

Submittal approval by the Project Engineer for CMP and appurtenances is required prior to delivery to the work site.

02800 - SITE IMPROVEMENTS

Cattle guards, fences, gates, and other road or improvements that are disturbed, destroyed, removed, or damaged during construction shall be replaced with the same type and dimensions of units removed and shall be equal to, and consistent with, the undisturbed portions of the improvements as existing prior to the disturbance or removal.

02830 - FENCES

Fencing Specifications shall conform to the requirements set forth in AASHTO M181, the New Mexico Standard for Public Works Construction, Section 410 and NMSA 1978, Sections 77-16-1 through 77-16-18, as modified below.

I. General

The Contractor shall submit one test certificate each to the Project Engineer certifying that the fencing materials conform to the requirements herein provided. When the locations of manufacturing plants allow, the plants may be inspected for compliance with specified manufacturing methods and material samples will be obtained for laboratory testing for compliance with material quality requirements. This can be the basis for acceptance of manufacturing lots as to quality. All materials will be subject to inspection for acceptance as to condition to check for compliance before or during incorporation of materials in the Work. All fences shall be installed in the locations specified and as directed by the Project Manager.

II. Wire Fence

This work shall consist of the construction of fence in substantial compliance with the specifications, lines and grades shown on the plans or established by the Project Engineer.

A. Wire

All fences shall consist of six wires spaced as indicates.

Barbed wire shall conform to ASTM A121 Class 1 or 3 coating and shall consist of two strands of nominal 12 gauge (0.099-inch) coated diameter with either 2-point, fourteen gauge (0.080-inch) diameter barbs spaced approximately four inches apart or 4-point, 14 gauge (0.080-inch) barbs spaced approximately five inches apart. The shape of barbs may be flat, half-round, or round. Instead of galvanizing, the wire may be coated with aluminum alloy at the rate of not less than 0.30 ounces per square foot of wire surface and the barbs at the rate of not less than 0.25 ounces per square foot of wire surface.

Tie wire for fastening barbed wire to steel posts shall be not less than thirteen gauge (0.109-inch) coated diameter and galvanized conforming to ASTM A1 12. Eleven gauge (0.120-inch) coated diameter or heavier wire fasteners or metal clamps may be used instead of tie wires when approved in advance by the Project Engineer.

Stays for wire fences shall be not less than 9 gauge (0.142-inch) coated diameter galvanized wire conforming with ASTM A1 16 and of length and spacing shown on the plans.

B. Brace Panels and Posts

Intermediate brace, gate brace and corner panels shall be prefabricated assemblies, “Easy Fence” by D-C Industries (Blackfoot, ID, tel. 208.782.1177) or approved equivalent, which require no concrete footings. They shall be installed following the manufacturer’s recommendations.

Line posts shall be metal. All posts shall be of the type, size and length shown on the plans and as herein provided.

Metal posts shall be fabricated from rail, billet, or commercial grade steel conforming to ASTM A702 and shall be galvanized or painted green as required. All metal posts throughout the project shall be either galvanized or painted the same color green. Galvanizing shall conform to ASTM A123. When painted green, the posts shall be cleaned of all loose scale before finishing and painted with one or more coats of weather resistant, air baking or drying, green paint or enamel.

Metal line posts shall consist of heavy-duty steel spaced sixteen and one-half foot apart. Metal line posts shall have a minimum weight of 1.33 pounds per foot exclusive of anchor plates. A minus tolerance not to exceed 5 percent of the minimum weight of each post will be permitted. A plus tolerance of two inches and a minus tolerance of one inch in the length of each post will be permitted. Metal line posts may be I-beam, T-beam, U-beam, Y-beam, or H-column section.

Line posts shall be provided with corrugations, lugs, ribs, or notches spaced approximately one inch on centers to engage the required fence wire in designated spaces. Posts with punched tabs to be crimped around the wire will not be accepted. Anchor plates shall be an area of not less than eighteen square inches, shall weigh not less than 0.67 pound each and shall be securely welded, bradded, swaged, or riveted to each line post in a way that prevents displacement when the posts are driven.

C. Fittings

All fittings, hardware and appurtenances for fences shall be commercial quality steel, malleable iron, or wrought iron and shall be galvanized in accordance with the requirements of ASTM A153. Fittings shall be black PVC-coated with ultraviolet-resistant coating.

D. Gates

Gate construction shall be as indicated on the Drawings. Posts, gate frame and fencing hardware shall meet requirements of the “Chain Link Fence Manufactures Institute Product Manual” and ASTM F900.

The base material of the gate frame shall be round tubular members, welded at all corners or assembled with corner fittings. Gate fabric shall be the same type as used in adjacent fence construction.

The gate frame shall be designed and built so that the outer members do not sag in excess of the lesser of one percent of the gate leaf width or two inches. Hinges shall be structurally capable of supporting the gate leaf and allow the gate to open and close without binding. The hinges shall be so designed to permit the gate to swing a full 180°.

III. Construction

The Contractor shall perform such clearing and grubbing as may be necessary to construct the fence to the required grade and alignment. At locations where fence runs are

completed, appropriate adjustment in post spacing shall be made to conform to the requirements for the type of closure indicated.

The tops of all posts shall be set to the required depth and alignment. Cutting off the tops of posts shall be allowed only with the approval of the Project Manager and under the conditions specified. Wire or fencing of the size and type required shall be firmly attached to the posts and braced in the manner indicated. All wire shall be stretched tautly and shall be installed to the required elevations. At each location where an electric transmission, distribution, or secondary line crosses any of the fences covered by these specifications, the Contractor shall furnish and install a ground conforming to National Electrical Code requirements if conditions warrant such installation.

Wire fences shall be constructed in conformity with the details and at locations shown on the plans or staked by the Project Manager. All posts shall be set plumb and to the depth and spacing shown on the plans. Excavations for footings and anchors shall be to dimensions shown on plans or established by the Project Engineer. Metal line posts may be hand or mechanically driven. Posthole backfill shall be placed in thin layers and each layer solidly compacted. Posts set in rock shall be placed as directed by the Project Manager.

Mechanical stretcher or other device designated for such use shall stretch fence wire and welded wire fabric. Stretching by motor vehicle will not be permitted. The length between pull posts shall not exceed 990 feet for barbed wire fence.

Intermediate braces shall be placed at intervals not to exceed nine hundred ninety feet and shall be spaced evenly between corner posts.

Corner posts and braces shall be placed at appropriate fence angles or bends.

Fence materials of the same manufacturer, type, or process, conforming to the specifications and details shown on the plans, shall be used throughout the work unless otherwise authorized in writing by the Project Engineer.

Contractor personnel shall follow site HASP requirements and use of PPE. Installation of fencing within 10 feet of the top edge of highwalls or near vertical slopes shall be executed while wearing and maintaining fall protection equipment.

02890 – SURVEY MARKERS

The survey marker designating the name and tracking number of each mine feature shall be installed in a location provided by the Project Manager. The Contractor shall install a survey marker, provided by the Project Manager, into the concrete foundation of all bat gates requiring concrete foundations and into the grouted annulus of the bat gate constructed inside a corrugated metal pipe. Otherwise, a new six-foot long nominal 3 ½ -inch inside diameter galvanized steel pipe (4.0" O.D., minimum 9.1 lbs./ft.) shall be installed in front of backfilled and safeguarded mine features as indicated in the plan set. The lower two feet of pipe shall be set in concrete a minimum of one foot in diameter and the upper twelve inches of pipe shall extend above grade. The Contractor shall grout a survey marker, provided by the Project Manager, into the pipe using

a non-shrink grout, such as Quikrete Non-Shrink General Purpose Grout, or approved equivalent. Alternately, where the Project Manager concurs, the Contractor may drill and grout a survey marker into undisturbed, competent bedrock or concrete immediately adjacent to each specified feature.

02900 - LANDSCAPING

The following sections describe revegetation to be performed under this contract. Revegetation shall be required at areas disturbed during construction and as specified by the AML Project Manager.

02920 – SOIL PREPARATION / SURFACE ROUGHENING

Prior to seedbed preparation, the Contractor shall grade all disturbed areas as described, decompact those areas specified above, and roughen the surface as specified below. Disturbed areas may include but are not limited to the mine backfill borrow areas, depressions and mounds at safeguarded shafts, filled areas at adits, temporary overland access and haul routes, areas stripped of native vegetation and any other surface disturbance areas, except as otherwise specified.

On slopes up to 1.5h:1v, the soil surface in areas to be seeded shall be prepared to be continuously rough and hummocky. This shall be accomplished by using an excavator bucket, or other acceptable methods that produce similar results, to create small pockets and furrows to trap water and create favorable microclimates promoting seed germination and plant growth.

After roughening, seed shall be broadcast by hand or hydroseeded as specified below. In areas with extremely dry and loose soil, the Project Manager may require the Contractor to wait until the soil has settled before seeding.

Large and small boulders may be left exposed on site prior to seeding, either singularly or amongst groupings that blend with the natural surroundings, as directed by the Project Manager. The Project Manager may require that additional boulders be placed on site to permanently block site access, enhance visual variation and provide diversity in wildlife habitat.

Unless the soil is severely compacted or as otherwise noted and approved by the Project Manager, soil preparation will not be required for discontinuous, isolated areas of disturbance less than 0.05 acres (approximately 2,500 square feet or 50 feet by 50 feet), such as areas around mine portal closures.

The extent of seedbed preparation disturbance shall not exceed the total size of an area upon which the entire seeding operation can be applied. Seed shall be applied before soil surface crusting occurs. Loss of seed and mulch materials due to stormwater or wind erosion shall be prevented from occurring and installation of silt fencing, straw wattling or other stormwater and erosion control BMP's may be required by the Project Manager. If crusting or erosion occurs, the entire area affected shall be reworked beginning with seedbed preparation.

02921 - TOPDRESSING

As specified, on construction sites, mined areas, and other critical areas where the existing surface material is either chemically or physically unsuited to support adequate vegetation, the best available soil material as determined by the Project Manager shall be evenly spread on the surface in sufficient depths to maintain plant growth. Available topdressing excavated from areas to be disturbed shall be accomplished without inverting the soil layers, set aside and protected from erosion prior to deeper soil disturbance for excavation, mine feature backfilling and access road blading.

Topdressing shall be applied without inverting the soil layers and generally along the contour, but if hazardous conditions arise, the application may be in another direction. In all cases, placement shall be such that erosion is kept to a minimum. All top-dressed slopes shall be prepared by surface roughening before planting to reduce erosion.

02930 - GRASSES

The following section describes the seeding to be conducted under this contract.

02933 - SEEDING

Following completion of seedbed preparation, the Contractor shall seed areas according to the Specifications and as follows:

I. Seeding Timeframe

Seeding shall be accomplished between June 15 and August 31 of each year, unless specific permission in writing is issued by the Project Engineer to allow seeding before or after these dates. Seeding shall not be done during windy conditions or when the soil is too wet, too dry, or otherwise untiltable as determined by the Project Manager.

II. Seed Species and Mixtures

To ensure that the seed purchased exhibits the required characteristics associated with the given variety, and that the seed is certified to be genetically pure, the Contractor shall provide AML with proof of certification for any seed varieties, or their alternate species, to be used in the seed mix as prescribed for the Project and shall be approved by the Project Manager prior to purchase. All varieties of seed prescribed in the approved seed mix shall be obtained by the Contractor from a source in New Mexico that is adapted to the local climate and soil in which it is being sown; that is, a similar land resource area which is not more than approximately three hundred miles south or about two hundred miles east, north or west of the Project. The percentage of each species comprising seed mixtures for application is outlined below. The mixture is to be used for revegetation of areas defined above in Section 02920. Seed species and varieties, which are well adapted to the soil, climate, and topography of the disturbed areas, shall be used in revegetation and are discussed below.

III. Seeding Methods

A. Hand-Broadcasting/Hydroseeding

The seed shall be hand-broadcast or hydroseeded. When hand-broadcast seeding, passes shall be made over the site to be seeded such that an even distribution of seed is obtained. Hand-broadcast seeding shall take place immediately following the completion of final soil preparation. Hand-broadcast seeding shall not be conducted when wind velocities would prohibit an even seed distribution as determined by the Project Manager. Hand-broadcast seeding shall be followed by hand raking, manual use of a drag chain, or sweeping with sturdy tree or shrub branches to cover seed. This shall be done over the entire seeded area but shall not be so extreme as to reduce the extent of soil relief.

Broadcast seeding of large areas may also be accomplished using hand-operated “cyclone-type” mechanical seeders. All mechanical seeding equipment used shall be equipped with a metering device set to the appropriate seeding rate.

Broadcast seeding of small areas of disturbance, less than 0.05 acres (approximately 2500 square feet or 50 feet by 50 feet) may be done by hand scattering. Ranking of small areas is not necessary if there is sufficient surface roughness to ensure that seed will fall in crevices and other micro-topographic depressions such that weather and gravity will cause them to be covered and stay in place.

Following hand-broadcast seeding and seed covering, organic debris such as logs, tree stumps and grubbed vegetation shall be randomly redistributed across the sites. This shall be done at the Project Manager’s direction for the purpose of creating visual variation, ground shading, protection from seed predation and production of wildlife habitat. Care shall be taken to avoid leveling the soil surface.

B. Completion

If the Contractor is scheduled to close the project outside the specified seeding timeframe when seeding is the only incomplete item, the Contractor shall complete only seed bed preparation and 75 percent of the lump sum bid price for seeding will be retained. Then the job shall be held open for seeding during the next seeding season with the remainder of the bid price being paid upon completion and acceptance of seeding.

If all of the work required by the contract, except seeding, is completed before seeding is accomplished because of seasonal limitations, partial acceptance of the work will be made with final acceptance delayed until seeding has been accomplished in accordance with these specifications. Liquidated damages will not be assessed against the Contractor during the interim period between the dates of partial acceptance and final acceptance if such delay is the result of seasonal limitations.

C. Seeding Rates

Seeding rates are given in Table II. Pure Live Seed (PLS) expresses seed quality. PLS is a percentage of pure, viable seed in a particular lot of seed. PLS is calculated by multiplying the percent total germination by the percent purity and dividing by one hundred (100):

$$\text{Percent PLS} = \frac{\text{Purity} \times \text{Germination}}{100}$$

TABLE II: SEED MIX

| Class | Plant Species (Common Name/Scientific Name) | Pure Live Seed (pounds per acre) |
|------------|---|-------------------------------------|
| Graminoids | Indian Ricegrass (<i>Achnatherum hymenoides</i>) | 2.50 |
| | Sideoats Grama (<i>Bouteloua curtipendula</i>) | 4.00 |
| | Blue Grama (<i>Bouteloua gracilis</i>) | 2.00 |
| | Sand Dropseed (<i>Sporobolus cryptandrus</i>) | 2.50 |
| | Galleta (<i>Pleuraphis jamesii</i>) | 2.00 |
| Forbs | Evening Primrose (<i>Oenothera Caespitosa</i>) | 1.00 |
| | Desert Marigold (<i>Baileya multiradiata</i>) | 1.00 |
| | Mexican Hat (<i>Ratibida columnifera</i>) | 1.00 |
| | Texas Bluebonnet (<i>Lupinus texensis</i>) | 1.00 |
| | Scarlet Globemallow (<i>Sphaeralcea coccinea</i>) | 1.50 |

All seed shall be certified as in compliance with NMSA 1978, Sections 76-10-11 through -22 and 21.18.4 NMAC, Seed Standards and Classifications. All seed certifications, invoices or bag labels providing proof of purity and germination rate shall be provided to the Project Manager prior to seeding.

The Contractor shall provide protection and care for seeded areas until final acceptance of the work and shall repair any damage occurring to seeded areas that may be caused by stormwater erosion events, pedestrian or vehicular traffic at no additional cost. AML suggests that the Contractor purchase seeds for this Project from Curtis and Curtis, Inc., in Clovis, New Mexico (tel. (575.762.4759)). If seed availability becomes an issue, the Contractor shall contact the Project Manager for a suitable alternative species list.

02940 – MULCHING

The Contractor shall apply mulch to all seeded areas. Mulching is not permitted when wind velocity exceeds fifteen miles per hour. The mulch type shall be coarse bark and/or wood-strand, chips or chunks, pecan shells, or other approved equivalent. Materials shall be wind resistant. No more than 15 percent, by loose volume, shall pass through a 0.25-inch sieve. The

mulch shall not contain recycled lumber, resin, tannin, or other compounds in quantities that would be detrimental to plant life. Sawdust or materials with noxious seed or plants will not be acceptable. If shredded yard waste is used, the Contractor shall use thoroughly composted material with no viable noxious weed seed.

The mulch shall be spread uniformly over the prepared area either by hand or with a mechanical mulch spreader. Mulch shall be applied by the Contractor to all seeded areas immediately after seeds are planted to provide suitable surface litter for improvement of soil moisture conditions and to reduce the potential for damaging erosion or soil blowing which might occur before or during plant establishment.

02941 – HYDRAULIC MULCHING

Tackifier shall consist of a biodegradable organic formulation processed specifically for the adhesive binding of mulch. Organic soil and mulch tackifier for use in hydraulically planting of grass seeds, flowers, or woody tree seeds, or stolon, either alone or in combination with fertilizer, wood fiber mulch, and other approved additives, shall consist of specifically blended compatible hydrocolloids. Use of starch-based tackifiers will not be permitted. The Contractor shall supply soil and mulch tackifier in packages containing 5, 20, or 40 pounds of material having an equilibrium air dry moisture content at time of manufacture of 8% ($\pm 2\%$), and a minimum water holding capacity of 6-1/2 times by weight of dry material or as approved by the Project Engineer.

Tackifier shall uniformly disperse when mixed with water and not be detrimental to the homogeneous properties of the mulch slurry. Organic soil and mulch tackifier shall have the additional characteristics of hydrating and dispersing in circulating water to form a homogeneous slurry and remain in such a state in the hydraulic mulching unit, or adequate equal, with the specified, or other approved materials. When applied, the organic soil and mulch tackifier shall form a loose chain-like protective film, but not a plant inhibiting membrane. This film will allow materials to the soil surface during germination and initial seedling growth, after which the organic soil and mulch tackifier will breakdown by microbial action. Any tackifier which has been damaged by moisture or other means will be rejected. Tackifier may be added either during the manufacturing of the mulch or incorporated during mulch application. Dye shall be nontoxic, water-activated, green in color, and pre-packaged in water dissolvable packets in the hydraulic mulch.

02955 – SALVAGE OF NATIVE PLANTS

Before any area is disturbed for access, borrow, fill or other construction activities, the Contractor shall thoroughly scout the area with the Project Manager for presence of native plant species. Any significant plants shall be avoided wherever practicable. Of those that need to be disturbed, the Contractor shall salvage those that can be replanted, as the Project Manager directs and as specified below. Species that shall be salvaged may include but are not limited to prickly pears (*Opuntia spp.*), barrel cactus (*Ferocactus spp.*) and other species of cacti, including pincushion types (*Mammillaria spp.*).

Plants to be salvaged shall be dug from the soil before commencing earthmoving operations, preserving as many roots and as much of the soil around the roots as practicable. The south side of the plant and the soil line shall be marked with paint or marking crayons. When transplanted the plant shall be placed in the same orientation it was exposed to before harvesting.

The top half of prickly pear pads shall be cut from the mother plant. Before replanting cactus roots on the mother plant and the cut prickly pear pads shall be allowed to dry in a shaded, ventilated location for at least two weeks but no more than six weeks. Any Cacti of other species as well as any other salvaged plants shall be planted as soon as practicable but no later than one week after harvest.

Salvaged plants shall be placed into well-drained soil, preferably in areas that have been disturbed by construction activities and along closed access roads. The soil in planting areas shall be tested before planting by filling a planting hole with water. If the water drains within four hours, the site is suitable.

Cacti shall be placed into the planting hole at their original orientation and planting height to avoid sunburn and stem decay. The bottom one-third of the cut prickly pear pads shall be covered with soil, with the pads oriented so that their broad sides face east and west. The planting holes shall be backfilled with native, unamended soil and the air in the soil worked out by gently moving the soil with a rod or pole. The plants shall be watered in at the time of planting; no further watering is required. Larger specimens shall be staked as necessary as determined by the Project Manager.

02990 - SUBMITTALS

Complete data and specifications for the following items shall be submitted in accordance with the procedure set forth in Section 01340.

- Materials:
 - Fill materials
 - Scoria
 - Corrugated metal pipe
 - Fencing and accessories
 - Signs
 - Signposts
 - Sign fasteners
 - Identification Markers

- Seed mix
- Mulch
- Excavation Plan (Section 02222)
- Borrow Source Identification Plan (if applicable)

END OF DIVISION 2

DIVISION 3 – CONCRETE, GROUT AND MORTAR

This work shall consist of foundation supports for metal grate shaft, adit, and stope closures; foundations for metal barrier fences; waste rock and mortar surrounds for egress closures; and concrete and grouted anchor supports for horizontal and vertical metal grate closure, as indicated on the drawings. Unless otherwise specified all grouting shall be done with non-shrink grout. This work includes any excavation for base of bulkheads and furnishing and installation of forms and reinforcing steel.

Use of brand names is for the purpose of describing the standard of quality, performance and characteristics desired and is not intended to limit or restrict competition.

03001 – GENERAL REQUIREMENTS

All cast-in-place grout shall be accurately and properly placed and finished as indicated on the drawings and as specified in this section.

At least forty-eight (48) hours in advance, the Contractor shall inform the Project Manager and Project Engineer of the times and places at which the Contractor intends to place concrete and grout. No grout shall be placed without prior examination of the bedrock, anchor conditions, formwork, and reinforcing steel by the Project Manager or Project Engineer.

All grout work shall conform to appropriate requirements of ACI 301, Specifications for Structural Concrete for Buildings, except as modified by the requirements below.

03010 - CONCRETE MATERIALS

I. Materials

A. Cement

All cement used in concrete shall be Portland cement conforming to all requirements of ASTM C150, Type II, low alkali. High-early-strength Type III Portland cement may be used in concrete at the Contractor's option. When Portland cement is delivered in packages, the name and brand of the manufacturer and the type shall be plainly identified thereon. When cement is delivered in bulk, the same information shall be contained in the shipping invoices accompanying the shipment. A bag shall contain 94 pounds net weight and will be considered equal to one cubic foot. A barrel shall consist of 376 pounds net weight and will be considered equal to four cubic feet. The Contractor shall obtain from the manufacturer and furnish a certificate of compliance stating that the cement delivered to the work complies with the requirements herein provided. To prevent deterioration after delivery, cement and aggregates shall be protected from weather and properly stored or covered as to prevent intrusion of water or foreign matter. Any material that has deteriorated or has been contaminated shall not be used for concrete.

B. Admixtures

Admixtures shall conform to ASTM C494. Sugar, calcium chloride, or admixtures containing chloride from other than impurities from admixture ingredients will not be permitted. Air entraining admixtures shall be required and shall conform to ASTM C260. Water reducing admixtures may be used and shall conform to ASTM C494 or ASTM C1017.

C. Curing Compounds

Liquid membrane-forming compounds for curing concrete shall conform to the requirements of ASTM C309.

D. Water

Water for concrete shall be clean and free from harmful amounts of acids, alkalis, oils, organic materials, salts, sand, sewage, or other deleterious substances and shall be furnished by the Contractor. Water shall be potable and shall have a pH value of not less than 4.5 nor more than 8.5 as determined by AASHTO T26 before its use. The sulfate content as SO₄ shall not exceed one thousand parts per million (1,000 ppm).

E. Fine Aggregate

1. General Characteristics. Fine aggregate shall consist of natural sand, manufactured sand, or a combination thereof, or other accepted inert materials as approved by the Project Engineer and composed of clean, durable, hard, uncoated, well-rounded grains.

2. Grading. Fine aggregate shall be well graded and, when tested by standard laboratory sieves, shall conform to the following:

| Sieve (ASTM E11) | Percent Passing by Weight |
|------------------|---------------------------|
| 3/8-in. | 100 |
| No. 4 | 95 to 100 |

The fine aggregate shall have not more than 45 percent passing any sieve and retained on the next consecutive sieve of those shown above, and its fineness modulus shall be not less than 2.3 nor more than 3.1.

3. Deleterious Substances. The maximum percentage of deleterious substances shall not exceed the following limits:

| | |
|-----------------------------------|----------------|
| Clay lumps | 3.0% by weight |
| Material finer than No. 200 sieve | 3.0% by weight |
| Coal and lignite | 1.0% by weight |

Other deleterious substances 1.0% by weight

All fine aggregate shall be free from harmful amounts of alkali and organic impurities.

4. Soundness. Fine aggregate shall conform to the requirements of magnesium sulfate soundness of ASTM C33. The maximum loss in five (5) cycles shall not exceed 12 percent by weight.

F. Coarse Aggregate

1. General Characteristics. Coarse aggregate shall consist of natural gravel, crushed gravel, crushed stone, or crushed hydraulic-cement concrete, or a combination thereof, or other accepted inert materials having clean durable, hard, strong pieces; free from adherent coatings; and conforming to the requirements of these Specifications. Fifty percent by weight of the minus $\frac{3}{4}$ inch sieve size particles shall have a minimum of two fractured faces.

2. Grading. Coarse aggregate shall be well graded between the limits specified and shall conform to the following requirements:

| Sieve | Percent Passing by Weight |
|--------------------|---------------------------|
| 1-in. | 100 |
| $\frac{3}{4}$ -in. | 95 to 100 |

3. Deleterious Substances. The maximum allowable percentage of deleterious substances and physical properties shall not exceed the following limits:

| | |
|-----------------------------------|-----------------|
| Soft fragments | 2.0% by weight |
| Clay lumps | 0.25% by weight |
| Material finer than No. 200 sieve | 1.0% by weight |
| Coal and lignite | 0.25% by weight |

4. Sampling and Testing. Methods of sampling and testing the coarse and fine aggregate shall be in accordance with ASTM C33.

G. Bagged Concrete Mixes

1. General Characteristics. Bagged, premixed concrete products such as Sackrete or Quikrete shall consist of a uniformly blended mixture of stone/gravel, sand, and Portland cement packaged in multi-walled $\frac{2}{3}$ cubic feet (80lbs) paper bags. The concrete mix shall meet or exceed the minimum physical requirements of ASTM C387.

H. Mortar (Mason's Mix)

1. General Characteristics. Water Resistant Type S Mortar Mix Bags shall

consist of a uniformly blended mixture of stone/gravel, sand, and Portland cement packaged in multi-walled 2/3 cubic foot feet (80lbs) paper bags. The mortar mix shall meet or exceed the minimum physical requirements of ASTM C387. The minimum compressive strength shall be 1,800 psi at 28 days.

II. Concrete Mix Design

Structural concrete for concrete footings and collars for steel bat cupolas and for other bat-compatible shaft, adit, and airflow closures shall be made using aggregates and cement conforming to a minimum compressive strength of 3,500 pounds per square inch (psi) after 28 days. The concrete shall contain a minimum of 611 pounds of cement (6.5 bags) per cubic yard and a maximum water/cement ratio of 0.49. Fine aggregate shall be not less than 38 percent or more than 42 percent by weight of the mix.

All other concrete, including concrete for unreinforced cast-in-place plugs and hollow core plugs, shall conform to a minimum of 3,000 psi after 28 days.

All concrete shall have an entrained air content between 4 percent and 8 percent by volume when determined with the requirements of ASTM C231.

III. Mixing Concrete

If the concrete is mixed on the site, equipment and mixing procedures shall conform to ACI 301. All concrete shall be thoroughly mixed in a batch mixer of an accepted type and capacity for not less than two minutes after all the materials including water have been placed in the drum. During mixing, the drum shall be operated at the speed specified by the manufacturer of the equipment. The entire contents of the mixer shall be discharged before being recharged, and the mixer shall be cleaned frequently. The concrete shall be mixed only in such quantities as are required for immediate use. No retempering of concrete will be permitted. Hand mixed concrete will not be permitted except by special acceptance of the Project Engineer.

IV. Ready-Mix Concrete

At the option of the Contractor, ready-mixed concrete may be used instead of concrete mixed at the job site. Ready-mixed concrete shall conform to all requirements of ASTM C94 and these Specifications as to grading of aggregates, strengths, consistency, and so on. The Project Manager shall have free access to the mixing plant at all times. Ready-mixed concrete shall be continuously mixed from the time the water is added until the time of use. Concrete shall be delivered to the site of the work and discharged from the truck mixer or truck agitator shall be completed within one hour after the cement contacts the mixing water or with aggregates that are surface wet. The organization supplying ready-mixed concrete shall have sufficient plant and transportation facilities to assure continuous delivery of concrete at the required rate.

V. Proportioning

The proper proportioning of aggregates and cement will be determined by an acceptable independent testing laboratory at the expense of the Contractor. The proportioning of aggregates will be the most suitable combination of aggregates that will give the necessary workability and desired consistency when mixed with water and cement as specified. The ratio of cement to dry, fine aggregate shall be that necessary to provide the maximum amount of density of the mixture when used with the minimum amount of water required to produce the specified slump in the resulting concrete. This determination of the proper ratio shall be made by testing laboratory, at the expense of the Contractor, using representative samples of the aggregates which will be used, and before use shall be reviewed by the Project Engineer. The batch proportions used shall be such that full bags of cement are used in each batch.

VI. Consistency

The consistency for concrete shall be kept uniform for each class of work and shall be checked by means of slump tests. The slump for concrete shall be not less than two (2) inches and not more than (4) four inches. The consistency of the concrete shall be varied as directed by the Project Engineer or Project Manager. If through accident, intention, or error in mixing, any concrete that is too wet shall not be incorporated in the work, but shall be discarded as waste material at an accepted disposal area.

VII. Placing Concrete

Where indicated, mine openings to be closed using cast-in-place footings for steel structures or cast-in-place concrete caps shall be excavated to competent bedrock or founded on clean, durable existing concrete. The Contractor is responsible for site inspections, testing or exploration necessary to ensure that the bid adequately reflects excavation conditions including any hand trimming and leveling that may be required.

The surface of hardened concrete upon which fresh concrete is to be placed shall be rough, clean, sound, and damp. The hardened surface shall be cleaned of all laitance, foreign substances (including curing compound), washed with clean water, and wetted thoroughly preceding placement of fresh concrete.

Concrete shall be handled from the mixer to the place of final deposit as rapidly as possible by methods that prevent separation or loss of ingredients. It shall be deposited as nearly as practicable in its final position to avoid rehandling. It shall be deposited in continuous layers, the thickness of which generally shall not exceed 12 inches.

The rate of depositing concrete in forms shall be controlled to prevent deflection of the form panels. The concrete shall be thoroughly compacted by means of a suitable mechanical vibrator. Vibrating shall be supplemented with hand spading to situate the concrete within the forms and around the reinforcing steel.

The Contractor is cautioned that cold weather protection for concrete may be required should concrete be placed during the winter months. If cold weather concreting is done, it shall conform to the requirements of ACI 306R. No concrete shall be placed or be allowed to cure without protection in any weather where the temperature falls below forty degrees Fahrenheit (40° F) at any time during the daily 24-hour period. The period of time such protection shall be maintained shall be not less than seven days.

Concrete shall have a temperature of at least 50°F and not more than 80°F at the time of placing. At no time during placement or curing shall the concrete surface temperature be allowed to fall below 40°F. Concrete shall not be placed on frozen ground. Frozen aggregate shall not be used in concrete.

Finishes of concrete work shall be as specified in ACI 301.

VIII. Concrete Equipment

All concrete equipment used shall be of a type, capacity, and mechanical condition suitable for accomplishing all requirements of this work and must comply with all applicable local, state, and federal codes and regulations, both safety and otherwise. Equipment shall be regularly maintained and in good operating condition at all times. Concrete equipment may include a mixer equipped with a mechanically operated paddle type agitator or equivalent. This may be accomplished by using a single drum mixer or multiple batch bin system.

IX. Tests

For each 10 cubic yards of concrete or portion thereof placed, one sampling for compressive strength, consisting of a minimum of four cylinders shall be taken and paid for by the Contractor. Bagged concrete mix such as Quikrete® pre-approved by the Project Engineer is excluded from this requirement. All sample cylinders shall be taken at the same time, and four cylinders shall be taken per sampling event. Following standard lab curing, one cylinder shall be used for a seven-day test, two cylinders for 28-day test, and one cylinder for an extra sample to be used as required. The Project Manager may require additional random samples, which will be done at AML's expense.

An independent testing laboratory accepted by the Project Engineer shall make all tests of aggregates, cement, and concrete. Samples of concrete for specimens shall be taken at the mixer, or in the case of ready-mixed concrete, from the transportation vehicle during discharge in accordance with ASTM C172. Test cylinders shall be made and cured in accordance with ASTM C31. The test specimens shall be molded immediately after the sample is taken and then placed in a protected spot and kept under curing conditions similar to the conditions under which the concrete they represent is being cured. They shall be removed to the testing laboratory not sooner than six days after casting.

The testing of cylinders shall be in accordance with ASTM C39. A slump test shall be made of each 25 cubic yards or fraction thereof, of concrete placed, or at the direction of the

Project Manager. Slump tests shall be in accordance with ASTM C143 and shall be paid for by the Contractor.

03100 - CONCRETE FORMWORK

Concrete structures shall be cast in place with proper formwork. The Contractor shall be fully responsible for reinstallation of concrete structures should forming materials and methods fail to adequately support the concrete. All cast-in-place concrete structures shall meet the tolerances for formed surfaces specified in ACI 301.

03200 - CONCRETE REINFORCEMENT

03210 - REINFORCING STEEL

I. Bars

Reinforcing steel bars shall be new billet steel conforming to ASTM A615, Grade 60.

II. Placing Reinforcing Steel

Reinforcing steel, before being placed, shall be thoroughly cleaned of heavy rust, scale or other coatings that will destroy or reduce the bond. A slight coating of rust will not be considered objectionable. Reinforcement shall be carefully formed to the dimensions indicated. It shall not be bent or straightened in a manner that will injure the material, including heating by a torch. Bars with kinks or bends shall not be used. Reinforcing steel shall be accurately placed and secured against displacement by using annealed iron wire of not less than No. 18 gauge or by using an equivalent wire clip. The reinforcing steel shall be supported using bar supports to support the steel the proper distance above the bottom of the footings. For #5 rebar or smaller a minimum of 1.5 inches of concrete cover is required, while for #6 rebar and larger a minimum of 2 inches of concrete cover is required.

03250 - CONCRETE ACCESSORIES

A survey marker supplied by the Project Manager shall be permanently set in each exposed structure or in the rock adjacent to the structure as approved by the Project Manager. At the location indicated by the Project Manager, the survey marker shall be cast in the structure or grouted by drilling a hole and grouting the cap in place using a non-shrink grout such as Quikrete Non- Shrink General Purpose Grout, or approved equivalent. Alternately the survey marker may be fixed in the concrete structure using epoxy grout. For backfilled features, a pipe monument as specified in Section 02890 and as shown on the drawings shall be installed on those features as directed in Table I.

03300 - CAST-IN-PLACE CONCRETE

03370 - CONCRETE CURING

All concrete, regardless of temperature, weather, or season, shall be allowed to cure (kept moist) for a period of not less than seven days after the concrete is poured. Alternatives to 7 days of wet curing shall be submitted to the Project Engineer for review. Wet curing will not be required for longer than 72 hours if high-early-strength concrete (Type III) is used.

The concrete used in structure closures shall reach a minimum compressive strength of 3,000 psi before attachment of the steel structures or backfilling can occur, except for backfilling shallow edges of concrete caps. Backfill material shall be placed in maximum two-foot lifts and shall be placed in a manner which will prevent damage to the structures and which will allow these structures to assume the load from the fill gradually and uniformly. The material shall be compacted to a density of no less than what the backfill equipment is reasonably capable of obtaining to the satisfaction of the Project Manager.

03600 – GROUTS AND MORTARS

This section specifies grouting as indicated on the drawings.

03610 – GROUT AND MORTAR MATERIALS

| | |
|------------------|---|
| Non-shrink grout | QUIKRETE® “Non-Shrink General Purpose Grout”, L&M Construction Chemicals “Crystex” or “Premier” or “Duragrout”, Master Builders “Masterflow 713 Plus” or “Masterflow 928” or “Set Grout”, Euclid “Hi-Flow Grout” or “N-S Grout”, “Five Star Grout”, or approved equivalent ² , meeting the requirements of ASTM C1107, Grade C |
| Mortar | QUIKRETE® Mortar Mix (No. 1102) Type N, S, M |
| Water | Clean and free from deleterious substances |

03620 – NON-SHRINK GROUT AND MORTAR

Non-shrink grout and mortar shall be furnished factory premixed so only water is added at the job site. Grout and mortar shall be mixed in a mechanical mixer. No more water shall be used than is necessary to produce a flowable mix. Grout shall meet strength requirements of $f_c = 5,000$ psi at 28 days. Mortar shall be type S and shall meet strength requirements of $f_c = 1,800$ psi at 28 days.

Concrete foundations to receive non-shrink grout and/or mortar shall be saturated with water for 24 hours prior to grouting.

Grout and mortar shall be placed in strict accordance with the manufacturer's directions, so all spaces and cavities are filled without voids. Forms shall be provided where structural components will not confine the grout/mortar. The grout/mortar shall be finished smooth in all locations where the edge of the grout/mortar will be exposed to view after it has reached its initial set.

Non-shrink grout and mortar shall be protected against rapid loss of moisture by covering with wet rags or polyethylene sheets. After edge finishing is completed, the grout/mortar shall be wet cured for at least seven days. Alternatives to 7 days of wet curing shall be submitted to the Project Engineer for review.

03990 - SUBMITTALS

Submittals shall include the following information:

1. Slump on which design is based;
2. Total gallons of water per cubic yard;
3. Brand, type, composition and quantity of cement;
4. Specific gravity, source and gradation of each aggregate;
5. Ratio of fine to total aggregate;
6. Surface dry weight of each aggregate per cubic yard;
7. Brand, type, ASTM designation, active chemical ingredients, and quantity of each admixture;
8. Compressive strength based on 7-day and 28-day compression tests; and
9. Other submittals shall be made as required by ACI 301.

The Contractor shall submit the following information for both concrete, grout, and mortar:

1. Manufacturer's data or catalog information, including placing and finishing recommendations, wet-curing method, and weather protection method for the cementitious materials and any curing compounds.
2. A proposed wet-curing method for review by the Project Engineer.
3. A cold weather and/or hot weather concreting plan, as applicable, for review by the Project Engineer.

Submittals shall be made in accordance with the procedure set forth in Section 01340.

END OF DIVISION 3

DIVISION 5 – METALS

The following section specifies all items fabricated from metal shapes, plates, sheets, rods, bars, or castings, and all wrought or cast metal items. Fabricated metal items that are detailed in the contract documents but not mentioned specifically herein shall be fabricated in accordance with the applicable requirements of this section.

Use of brand names is for the purpose of describing the standard of quality, performance and characteristics desired and is not intended to limit or restrict competition.

05010 – METAL MATERIALS

All materials shall be new and undamaged and shall conform to pertinent ASTM or other industry standard specifications including the following

I. Steel

Shapes, Plates, and Bars (including
Concrete imbedded items other
than reinforcing steel)

ASTM A588 or ASTM A242 (weathering)

Structural Tubing

ASTM A847 or ASTM A606, Type 4 (weathering)

Grating

A606, Type 4 (weathering) or AISI 304/316
(stainless steel)

Bolts and Nuts

ASTM F593 and F594, (stainless steel grade 18.8 or
316) or ASTM A325, Type 3 (weathering) and
A563, grade C3 or DH3 (weathering).

Flat Washers

ANSI B27.2, of the same material as bolts and nuts

Bat gate closures shall be fabricated from high strength ($F_y=50,000$ psi), self-weathering, low alloy, atmospheric corrosion resistant steel as specified above.

05030 – METAL FINISHES

Specified hereunder are shop-applied coatings. It is the intent of these specifications to use atmospheric corrosion resistance structural steel (weathering steel), grating and appurtenances to the fullest extent practicable. This section specifies the required shop coatings for metal services where it is not practicable to use a corrosion resistant material.

05031 – SHOP COATING

I. Materials

Unless otherwise authorized, shop applied prime coatings shall be: Zinc-rich Urethane Primer Tnemec "90-97 Tnemec-Zinc" or DuPont "Imron 62 ZF", or approved equivalent³.

For repair of hot-dip galvanized surfaces and to rustproof welds, field applied coatings shall be: Cold Galvanizing Compound Z.R.C. Cold Galvanizing Compound, or approved equivalent⁴.

II. Cleaning

Surfaces shall be dry and of a proper temperature when coated, and free of grease, oil, dirt, dust, grit, rust, loose mill scale, weld flux, slag, weld spatter, or other objectionable substances. Articles to be galvanized shall be pickled before galvanizing. All other ferrous metal surfaces shall be cleaned by high power wire brushing or by sandblasting. Welds shall be scraped, chipped, and brushed as necessary to remove all weld spatter.

III. Galvanizing

All galvanizing shall be done after fabrication by the hot-dip process in conformity with requirements of ASTM A123, A153 and A385.

IV. Steel

Unless otherwise specified and if such an occasion shall occur, all ungalvanized structural and miscellaneous steel shall be given an anticorrosion prime coat in the shop after fabrication. Steel surfaces shall be prime coated as soon as practicable after cleaning. All painting shall be done in a heated structure if the outside air temperature is below 50 degrees Fahrenheit. Steel shall not be moved or handled until the shop coat is dry and hard.

Plates shapes, and bars of weathering steel shall not be shop or field primed or painted, except as noted.

V. Aluminum

All surfaces of aluminum that will be in contact with concrete, mortar, or similar metals shall be given a heavy coat of coal tar paint.

VI. Other Surfaces

No shop coating will be required for zinc-coated steel, stainless steel, or brass surfaces.

VII. Film Thickness

The dry film thickness of the shop coating shall be at least 2.5 mil for the zinc-rich urethane primer.

05500 – METAL FABRICATIONS

Structural steel and miscellaneous metals shall be erected in accordance with drawings that are a part of the contract documents. The Contractor shall verify all dimensions prior to fabrication. All bolt holes shall be drilled. Torch cutting/burning of bolt holes will not be permitted.

Non-corrosion resistant structural steel members shall be cleaned, prepared, and shop primed, unless otherwise specified. Surfaces to be field welded or in contact with concrete shall not be primed.

05501 – FIELD ERECTION

Structural steel and miscellaneous metals shall be erected in accordance with drawings that are a part of the contract documents.

Structural steel and miscellaneous metal shall be stored on wood pallets, blocking, or dunnage so that no metal touches the ground and water cannot collect on the material. The material shall be protected against bending under its own weight or superimposed loads. Care shall be taken in handling steel and miscellaneous metals to avoid unsightly gouges and scrapes.

The Contractor shall make adequate provisions for all erection loads and for sufficient temporary bracing to maintain the structure safe, plumb and in true alignment until completion of erection and installation of necessary permanent bracing.

Before assembly, surfaces to be in contact with each other shall be thoroughly cleaned. All parts shall be assembled accurately as shown on the drawings. Light drifting will be permitted to draw parts together, but drifting to match unfair holes will not be permitted. Any enlargement of holes necessary to make connections in the field shall be done by reaming with twist drills. Enlarging holes by burning is absolutely prohibited.

After erection, all welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete, shall be primed, unless the steel is weathering steel. The primer shall be consistent with the shop prime coat.

Weathering steel shall be kept as clean and free as possible from mud, grease, oil, paint, concrete or mortar splatter, and other foreign substances to minimize on-the-job cleaning. Paint or crayon identification marks shall be made in locations not visible on the finished structure; otherwise, these marks must be removed from the visible surfaces during the final cleaning operation. Objectionable substances on weathering steel, especially on highly visible exterior surfaces and including mill scale on the surfaces visible from the mine opening, shall be removed

by solvents, high-speed power brushing, scraping, sand or grit blast cleaning, or other suitable methods. Surfaces of welds shall be given special treatment by scraping and wire brushing as necessary to remove all slag and weld spatter. Tools that produce excessive roughness shall not be used.

Welders certified in accordance with AWS specifications for the intended work shall do all welding. A copy of welder certifications shall be furnished to the Project Manager. All welding shall be consistent with the requirements of AWS D1.1, "Structural Welding Code," including adequate edge preparation and preheating and the selection of proper flux (when applicable).

For weathering steel, the use of properly dried, low-hydrogen electrodes and fluxes are specified by the AWS and shall be used. The capping runs of multi-run fillet and butt welds shall have strength, corrosion resistance, and weathered appearance similar to that of the base metal by use of appropriate alloy electrodes for the final two exposed top layers with the weld composition for weathering steel matching the base metal. Conventional electrodes may be used for the body of such welds. Conventional electrodes may also be used for butt welds with a single run each side and for single run fillet welds of up to 5/16-inch leg length.

All joints shall be welded unless otherwise indicated. Weathering steel fabrications shall be welded to eliminate surfaces on which moisture accumulation can occur and joints shall be tight to so that moisture cannot enter between plies of material. All joints in weathering steel, including fillet welds, shall be continuously welded to avoid moisture and corrosion traps such as crevices.

An oxygen meter shall be used to test air before and during field erection and welding of metal fabrications or any other work more than 10 feet inside mine openings. The oxygen meter shall be a National Mine Service (NMS) OX231 oxygen meter or equivalent. The oxygen meter shall continuously monitor oxygen levels and have an audible warning. If the oxygen level falls below 19 percent, all personnel shall withdraw from the working area in the mine until the oxygen content increases to safe levels.

Any remedy for increasing oxygen content of the working area or providing ventilation from the surface shall be determined in consultation with the Project Manager.

05530 – GRATING

Specified hereunder is all steel grating, including accessories.

05531 – FABRICATION

The Contractor shall verify all dimensions that affect grating prior to fabrication. Serrated grating shall be provided for all exterior applications and plain grating for all interior applications, unless otherwise noted on the drawings.

Unless otherwise noted on the drawings, grating shall be of the welded or pressure locked

steel type with bearing bars at 13/16 inches on center and cross bars spaced at 4 inches on center. Bearing bars shall be at least 3/16 inch thick. Bearing bar depth shall be as noted on the drawings. All grating shall be full depth banded, and bands shall be 3/16 inch thick. Bands shall be welded to first, last, and every fourth intermediate bar. All grating shall be fabricated from weathering steel (i.e. Corten).

Cross bars and edge bars or adjacent grating panels shall align. Grating shall be fabricated to fit with no more than 1/4-inch clearance between panels. All bearing bars shall be parallel. All grating shall be fabricated to lie flat with no tendency to rock. Poorly fitting or damaged grating will be rejected.

05532 – INSTALLATION

Metal grating units and accessories shall be installed in accordance with specifications, drawings that are a part of the contract documents and shop drawings reviewed by the Project Engineer.

Grating shall be positioned on supports and the final positions adjusted and accurately aligned before being permanently fastened by welding. Grating units shall be placed flat and square and secured to supports without warp or deflection or tendency to rock after installation. No more than 1/4- inch clearance between panels will be permitted. The first, last, and every fourth bearing bar shall be welded to the supports with a 3/16-inch fillet weld 3/4-inch long. All field welds and repairs to hot-dip galvanized surfaces shall be painted with a minimum of two coats of cold galvanizing compound. Slag shall be chipped or wire brushed and completely removed prior to paint application.

Weathering steel frames shall not be painted but shall be cleaned as specified above for weathering steel.

05990 – SUBMITTALS

Complete data, detailed drawings, and setting or erection drawings covering all structural and miscellaneous metal items, including security bolts and nuts, shall be submitted in accordance with the procedure set forth in Section 01340. A detailed description of welding processes to be utilized (including electrode classification) and the American Welding Society certifications shall also be submitted.

END OF DIVISION 5

DIVISION 13 – SPECIAL CONSTRUCTION

The following sections describe the special construction to be performed under this contract.

13050 - POLYURETHANE FOAM CLOSURES

The following section describes the PUF closures to be installed in the specified mine features. The work consists of installing a bottom form (as needed), installing PUF to specifications, backfilling over the PUF to the specified level, and, where required, installing corrugated steel riser pipes with steel grates.

The Contractor shall inform the Project Engineer and Project Manager of the times and places at which PUF is to be placed at least (3) three working days in advance.

Use of brand names is for the purpose of describing the standard of quality, performance and characteristics desired and is not intended to limit or restrict competition.

13051 - MATERIALS AND EQUIPMENT

Unless otherwise specified, PUF shall have a minimum installed density of 1.85 pounds per cubic foot (pcf). Machine-applied or poured-in-place PUF shall be equivalent to SWD Urethane Co. "SWD 425," North Carolina Foam Inc. "NCFI-811," Foam Concepts LLC, "EFS Equipment-less Foam Sealant", Mine Seal, LLC, "PUF-Seal" or Urethane Contractors Supply and Consulting "SES III 2.0 Pour." Bagged PUF shall be equivalent to Foam Concepts Inc. "EFS Equipment-less Foam Sealant" or Mine Seal, LLC "PUF-Seal," or approved equal.

PUF characteristics shall conform to the following standards:

| PUF CHARACTERISTIC | STANDARD | SPECIFICATION |
|--------------------------|-----------------------------|---------------|
| Density | As specified | ASTM D1622 |
| Closed Cell Content | >85% | ASTM D6226 |
| Compressive Strength | 25 psi minimum | ASTM D1621 |
| Water Absorption | 0.2 lbs./sq. ft. maximum | ASTM D2842 |
| Exothermic Reaction Rate | Low | - |
| Fire Resistance | High | - |

PUF used in mine closures shall not contain chlorinated fluorocarbons (CFC's) or hydrochlorofluorocarbons (HCFC's).

The proportioning unit shall be capable of attaining a minimum temperature of 125°F and shall be a Gusmer Model H-11 or equivalent. For remote project locations, or with the approval of the Project Manager, smaller capacity proportioners will be acceptable. In this event the proportioner shall be the Gusmer FF or equivalent.

Minimum heated hose length from proportioner to gun shall be 80 feet. The hose shall maintain or increase component temperature from the proportioner. Longer heated hose lengths may be required depending upon the distance from the proportioning unit to the reclamation site. Approval of the Project Manager is required for the use of any length of unheated hose on a PUF closure.

If the Contractor specifies the use of an application gun, it shall be capable of mixing plural components in the proper ratio at the minimum acceptable output of (4) four pounds per minute. The gun shall be a Gusmer AR mechanically self-cleaning design or equivalent. Application guns constructed by individuals or manufacturers not typically used in the PUF industry may be used if warranted by the PUF supplier or manufacturer.

For poured foam, separate component measuring and mixing containers shall be used. Each component shall be assigned a specific measuring container, each marked with a predetermined volume level corresponding to the required mix ratio. The components shall always be measured in the same quantities, the components added in a separate container, and thoroughly mixed using an appropriate mixing device. In all cases, measuring and mixing of poured PUF shall be done in strict accordance with manufacturer's recommendations, including maintenance of recommended temperatures of the components for mixing and placement. The Contractor shall supply a proper thermometer and use it to check each mixed batch.

The manufacturer shall package bagged foam with pre-measured amounts of each component. Foam shall be used prior to the end of the manufacturer's designated shelf life.

13052 - MATERIAL SAFETY, HANDLING AND TRANSPORT

Materials shall be stored in accordance with the manufacturer's recommendations. All safety precautions outlined by the Polyurethane Division of the Society of Plastics Industries, NFPA, OSHA, EPA, and the manufacturer's SDS shall be observed. SDS and technical data sheets shall be on-site and available at all times.

There shall be no welding, smoking, or open flames within 25 feet of PUF application. A minimum 15-pound, class ABC, fire extinguisher shall be on site during foam application.

Workers wearing organic respirator masks and safety glasses or goggles shall apply PUF. State or federal regulations requiring additional safety equipment shall supersede these requirements. Workers wearing respirator masks shall follow the training, fit testing, medical surveillance, and other relevant requirements specified in 29 CFR 1910.134.

The Contractor shall follow all applicable state and local regulations for the transport and use of PUF and chemicals required for cleanup. The Contractor shall obtain any required permits

for transportation. In the event of a component leak or spill, the Contractor shall notify the appropriate agencies and jurisdictions.

An oxygen meter shall be used to test air before and during installation of the bottom forms or any other work more than 10 feet inside a mine opening. The oxygen meter shall be a National Mine Service (NMS) OX231 oxygen meter or equivalent. The oxygen meter shall continuously monitor oxygen levels and have an audible warning. If the oxygen level falls below 19 percent, all personnel shall withdraw from the working area in the mine until the oxygen content increases to safe levels.

Any remedy for increasing oxygen content of the working area or providing ventilation from the surface shall be determined in consultation with the Project Manager.

13055 - EXECUTION

Debris, soil, and loose rock in each of the subsidence features shall be cleared wherever PUF will be installed. A reasonable effort shall be made to excavate any soils down to bedrock or based upon the limitation of the equipment used and safe equipment travel.

I. Formwork

The bottom form and cross members may consist of any commonly available building materials capable of sustaining an initial lift of two to four feet of PUF. Acceptable cross member materials include, but are not limited to, reinforcing steel, 2x4's, dowels, cardboard tubes, and fabric air-inflated plugs. Acceptable bottom form materials include, but are not limited to, foam that has been poured and allowed to cure, wire sheeting (e.g., poultry netting, hog wire) affixed to a flat material, plywood, cardboard, paneling, and carpeting. Any combination of the above materials will be acceptable. Alternate bottom forms shall be reviewed with the Project Engineer prior to use.

The formwork shall be installed at that level specified in the closure drawings or as directed by the Project Engineer following uncovering by the Contractor of the existing conditions within the mine opening. Unless otherwise indicated, cross members may be placed at an angle no greater than 20 degrees from the horizontal as long as both ends are seated in competent rock. The bottom form shall be set over the cross members.

All bottom forms shall be completed prior to the application of any polyurethane foam. The Contractor shall provide the Project Manager with a list of installed depth to bottom forms for polyurethane foam closures. Any breach in the bottom form caused by rock fall or other reason shall be repaired prior to the arrival of PUF applicators at that site. The Contractor shall be responsible for the integrity of the bottom form and the loss of any polyurethane should it fail.

II. Ventilation/Drainage Pipe and Corrugated Steel Pipe

The ventilation/drainage pipe shall consist of a six-inch diameter Schedule 40 PVC or similar gauge HDPE pipe. The ventilation/drainage pipe shall be cut with a hacksaw across the

circumference to create slits no longer than three inches and no less than ¼-inch wide at six-inch increments. Only the portions of the pipe exposed to common fill, granular fill, and lightweight aggregate fill shall be slit.

Four to twelve inches of the ventilation/drainage pipe shall extend above the finish grade, except where otherwise indicated. The six-inch PVC or HDPE pipe shall be encased in an eight-inch steel sleeve in the portion exposed above grade and for two feet below grade, except where otherwise indicated. The annular area shall be filled with concrete or grout.

The ventilation/drainage pipe and corrugated steel pipe for access shall be placed over a portion of the bottom form unobstructed by cross members. In shafts with more than one compartment, the access pipe shall be placed in one of the outside compartments, or as directed by the Project Manager. Both pipes shall be open to the underlying mine void after installation of the foam and shall be supported by a tripod or other load-bearing device such that the load is not placed on the bottom form. Any welding that takes place above the PUF closure shall take place prior to placement of PUF in the mine opening or after installation of the backfill. Under no circumstances shall welding take place over exposed PUF.

The slits made for drainage in the ventilation/drainage pipe shall be covered with visqueen or polyethylene tape during foam application. After application of PUF the visqueen or tape shall be removed exposing the slits. Any foam covering the slits shall be removed to allow an unobstructed flow of water into the pipe.

The corrugated steel pipe shall have PUF covering the outside of the pipe at least two inches thick in the common fill section of the PUF plug. Polyurethane foam may be draped or splashed against the culvert during foam installation to achieve this coverage.

Steel strap with a width greater than two inches shall be welded to the steel sleeve across the opening of the ventilation/drainage pipe in such a manner as to prevent rocks with a dimension greater than two inches from being dropped down the pipe. As an alternative, steel grating as specified in Division 5 may be cut to fit the opening across the ventilation/drainage pipe and welded in place.

III. Polyurethane Foam (PUF)

The depth of polyurethane foam installed to plug a feature opening shall be as specified or indicated in the project drawings.

In large pours, PUF can get hot enough to actually melt and even burn. This may leave a hollowed out plug or “eggshell” that has very little strength. The remaining foam will be cracked and discolored, very similar to severe UV damage.

PUF shall be installed in lifts with a maximum rise of 18 inches. The lifts shall be installed no sooner than 20 minutes apart (and no sooner than 30 minutes apart for ambient air temperatures above 84°F) and have a maximum lift height of three vertical feet per hour. Installed PUF lifts shall

pass through the tack free stage before applying the next lift. At no time shall sprayed or poured PUF cut into the rising foam. The PUF shall be applied in such a manner that the entire void is filled, that shadow zones or voids are not created during PUF application, and that temperatures are not raised to unsafe levels.

The Project Manager may use an infrared non-contact thermometer to monitor exothermic generation. If the ambient air temperature is below 60°F, extra time will be required to allow the PUF to fully expand and may prevent each lift from reaching a full height of 18 inches. Every degree of ambient air temperature over 65°F adds at least two degrees to the temperature of the rising foam. Ambient air temperatures above 90°F can cause problems with PUF formation. PUF application shall cease if heating or off-ratio foam is observed. The Contractor shall remedy off-ratio foam and demonstrate proper quality PUF to the Project Manager before application resumes. The surface temperature should reach a plateau and start to drop before resuming foam installation. If using bulk foam, reduce the quantity per bucket as the day heats up.

Bagged or poured-in-place PUF shall be placed in strict accordance with the manufacturer's recommendations, including the need for thorough mixing of components. If required by the Project Engineer, the manufacturer of bagged or poured-in-place polyurethane foam shall provide a certified representative experienced in the placement of their product for a minimum of one eight-hour day. This representative will direct field operations and instruct the Contractor in the proper mixing, placement, and safety procedures for bagged or poured-in-place PUF.

The surfaces of the void to be filled shall be as free as possible of grease and standing water. PUF shall not be applied to surfaces with running water. Remedial action for such situations shall be reviewed with the Project Manager. PUF shall not be applied directly to a debris plug, but shall be applied to a bottom form of known physical and chemical properties. PUF shall not be applied during rain unless the foam is fully protected from interaction with water by a physical barrier.

If off-ratio PUF is observed, the applicator must stop, correct the imbalance, and continue application with the proper ratio PUF. Correction and determination of the foam ratio shall be done on a plastic sheet away from the work area. Any lift of off-ratio PUF comprising over two percent of the intended PUF column heights shall be removed. An amount of off-ratio PUF less than two percent of the specified volume may remain if allowed to cool and if the outer perimeter of off-ratio PUF is removed. If off-ratio foam comprises more than 10% of the specified PUF volume, five percent of the price bid for the site will be deducted as a penalty.

The Contractor shall be responsible for lost or damaged equipment. Damages or claims arising from PUF overspray shall be the responsibility of the Contractor. Under no circumstances shall foreign material be placed in the PUF material unless specifically specified or authorized by the Project Manager. Non-PUF materials shall be non-toxic and non-hazardous and shall not compromise the strength or water saturation characteristics of the PUF.

Upon reaching the specified grade level for application of PUF, the Contractor shall undertake cleanup of PUF operations.

IV. Field Quality Control

The Project Manager will make periodic checks of the quality of PUF applied. The principal check on quality will be visual. Acceptable PUF shall be tan-white to buff in color with no vesicles and a smooth to coarse orange peel surface. Any one of the following conditions shall cause PUF application to cease and efforts to correct the off-ratio condition begun.

| <u>Condition</u> | <u>Possible Cause</u> |
|---|-----------------------------------|
| Dark PUF color Smooth and Glassy Friable or Brittle PUF Improper Density | Excess A Component |
| Light in Color to White Bad Cell Structure Mottled Appearance Blowholes or Pinholes | Excess B Component |
| Slow Rise Poor Cell Structure Frequent Equipment Clogging Slow Curing Poor Physical Properties | Bad Material |
| Air Bubbles on Surface Tension Cracks on Surface Excessive Air Bubbles | Pouring Too Fast Between Lifts |

At any time during PUF application the Project Manager may call for a density test. The Contractor shall provide and fill a container for this purpose and the sample will be tested for density. The density of the sample shall be within the range of 1.85 to 3.00 pounds per cubic foot. Density tests indicating that PUF installed is not within the minimum specified range shall cause corrective action resulting in PUF within the acceptable nominal range, less deviation due to barometric pressure changes from Standard Temperature and Pressure.

The Contractor shall conduct density tests of PUF at no additional expense to AML. At the discretion of the Project Manager, density tests showing PUF in the acceptable range will be taken in the center of the cavity to which PUF is being applied. A sampling box constructed of sheet aluminum and lined with polyethylene shall be lowered into the cavity to take a representative sample of PUF just above the level of installed polyurethane.

At the option of the Project Manager, up to three one-cubic-foot samples of PUF may be taken from the job site for density analysis at the Contractor's expense. In addition, at the option of the Project Manager, up to three samples of up to 100 cubic inches in volume may be taken for on-site tensile strength testing at the Contractor's expense. PUF shall be provided for the samples at no additional cost to AML.

V. Backfilling

To protect the PUF from vandalism if the site is to be left unattended, two to six inches of fill shall be uniformly shoveled over the foam as soon as possible after the last layer of PUF has solidified. No sooner than 24 hours after PUF application, the remaining void above the PUF plug shall be backfilled. The first two-foot lift of fill shall be placed by hand, bucket, or chute to lower the velocity of impact against the PUF. With approval of the Project Manager, this fill may be placed by streaming from heavy equipment such as a loader bucket. The depths and types of fill over the PUF shall be as indicated or specified in the contract documents or as directed by the Project Manager. Unless otherwise indicated, the minimum cover shall be 36 inches of common fill.

Unless otherwise specified or directed by the Project Manager, common fill above polyurethane foam closures shall be nearby cohesionless material with no pieces larger than six inches in diameter, free of debris or trash, and containing no materials classified as toxic or hazardous. The unit weight of the fill material shall be less than 130 lb/cu. Ft.

Fill above the polyurethane foam closures shall be placed in a manner that will prevent damage to the polyurethane foam plug and riser pipes and will allow these structures to assume the load from the fill gradually and uniformly.

The use of riding vibratory compaction equipment shall be prohibited above polyurethane foam closures and vibrations due to other construction equipment operations shall be kept to a minimum in these areas. With care and for the minimum acceptable period of time, small walk-behind compaction equipment, such as rammer tampers, may be used in these areas.

VI. Survey Markers

As described in Division 2, a steel pipe with grouted survey cap shall be installed near the ventilation/drainage pipe. Where the PUF/interface is less than five feet below finish grade, the pipe shall be set in a concrete footing, which shall be at least one foot in diameter and extend from the PUF/fill interface to a height of two feet. The upper six inches to one foot of pipe shall extend above grade. Where the PUF/fill interface is more than five feet below the finish grade, a six-foot long pipe shall be used. The lower two feet of pipe shall be set in concrete a minimum of one foot in diameter and the upper six inches to one foot of pipe shall extend above grade.

Alternately, the Contractor may drill and grout the cap in undisturbed, competent rock or concrete at or immediately adjacent to the feature.

VII. Cleanup

The Contractor shall clean the site of all PUF fragments and overspray. PUF overspray greater than 1/8-inch thick on timbers or historic materials shall be scraped or ablated to 1/8 inch minus to permit ultraviolet degradation of over sprayed polyurethane. Tools and equipment shall be cleaned in such a manner as to avoid injury to vegetation or wildlife. Handling of chemicals used in cleanup, and their disposal, shall comply with all applicable local, State and Federal regulations.

13990 - SUBMITTALS

Complete data covering polyurethane foam and accessories along with ventilation/drainage pipe shall be submitted in accordance with the procedure set forth in Section 01340.

END OF DIVISION 13



RED HILL MINE SAFEGUARD PROJECT PHASE I GARFIELD, NEW MEXICO PROJECT NO. EMNRD-MMD-2024-03



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Meghan J. McDonald, P.E.

PROJECT CONTACT

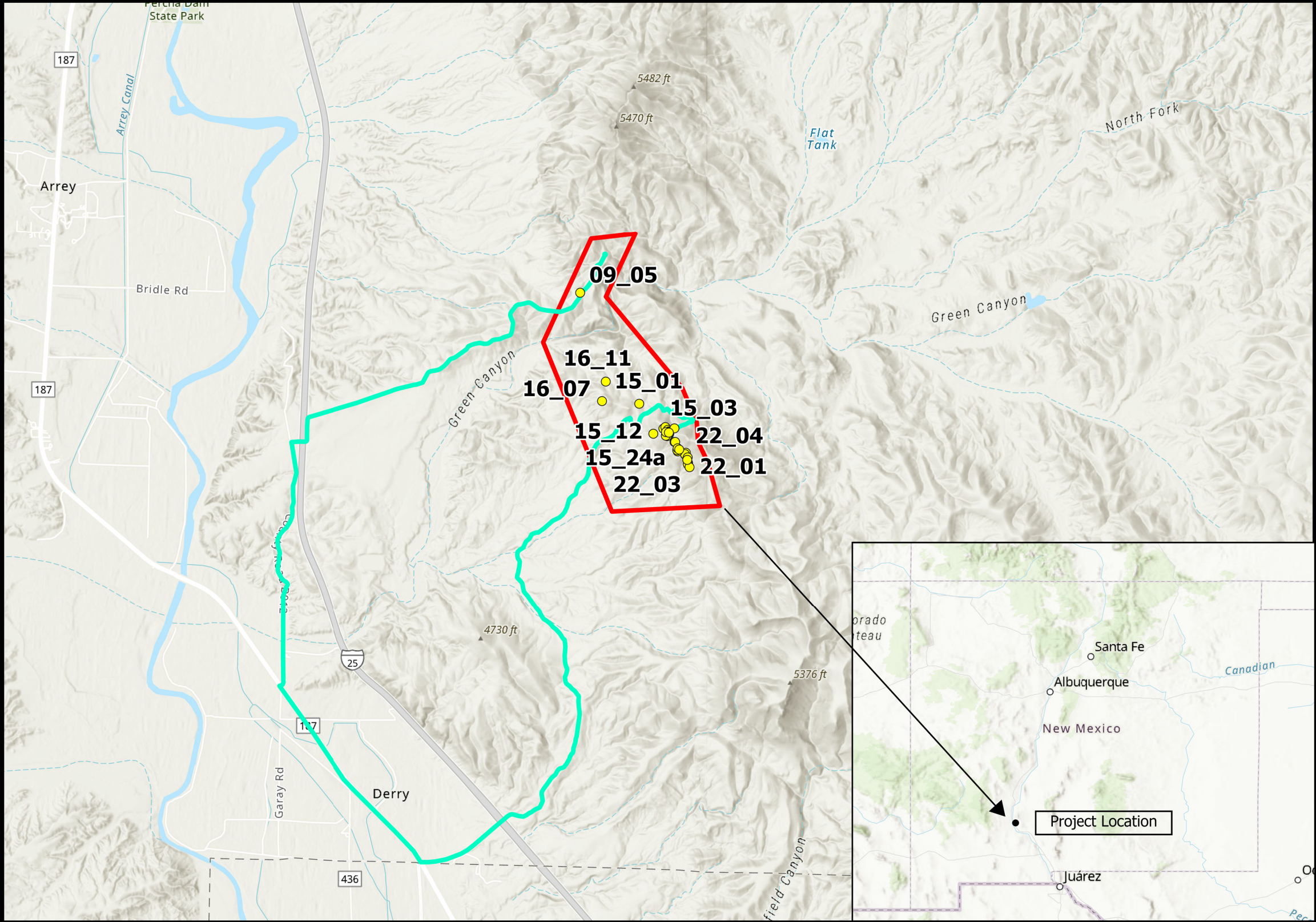
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I, MEGHAN MCDONALD HEREBY STATE TO THE BEST OF MY KNOWLEDGE AND UNDERSTANDING THAT THIS DESIGN AND ACCOMPANYING DRAWINGS HAVE BEEN PREPARED BY ME OR UNDER MY DIRECT SUPERVISION IN ACCORDANCE WITH STANDARD AND GENERALLY ACCEPTED ENGINEERING PRACTICES AND PROCEDURES IN EFFECT AT THE TIME.

CAUTION - THIS PROJECT REQUIRES CONSTRUCTION WORK IN, AROUND, AND OVER HAZARDOUS AND UNPROTECTED MINE SHAFTS, STOPS, ADITS, AND OTHER OPENINGS WHICH MAY BE OPEN TO THE SURFACE OR HIDDEN FROM VIEW BY TRASH, DEBRIS, OR THIN AND UNSTABLE LAYERS OF SURFACE MATERIALS OR ROCK. THE CONSTRUCTOR SHALL BE RESPONSIBLE FOR THOROUGHLY INVESTIGATING THE SITE CONDITIONS AND SCHEDULING EQUIPMENT, EQUIPMENT OPERATIONS, PERSONNEL AND SAFETY PROCEDURES TO PREVENT ACCIDENTS AND INJURIES.

| | | | |
|---|---|-----------------|--|
| ABANDONED MINE LAND PROGRAM MINING AND MINERALS DIVISION NEW MEXICO ENERGY, MINERALS, AND NATURAL RESOURCES DEPARTMENT | | | |
| SCALE: AS SHOWN | Project Cover Sheet | DRAWN BY: MJM | |
| DATE: 05/13/2024 | | REVISED BY: LDV | |
| EMNRD-MMD-2024-03 | | | |
| FILE: | RED HILL MINE SAFEGUARD PROJECT PHASE I | FIGURE: 1 | |

Figure 2 - Project Area Map



Map Legend

- Area of Potential Effects (APE)
 - Access Routes
 - Red Hill Safeguarding Locations

Red Hill Mine Safeguarding Project Phase I

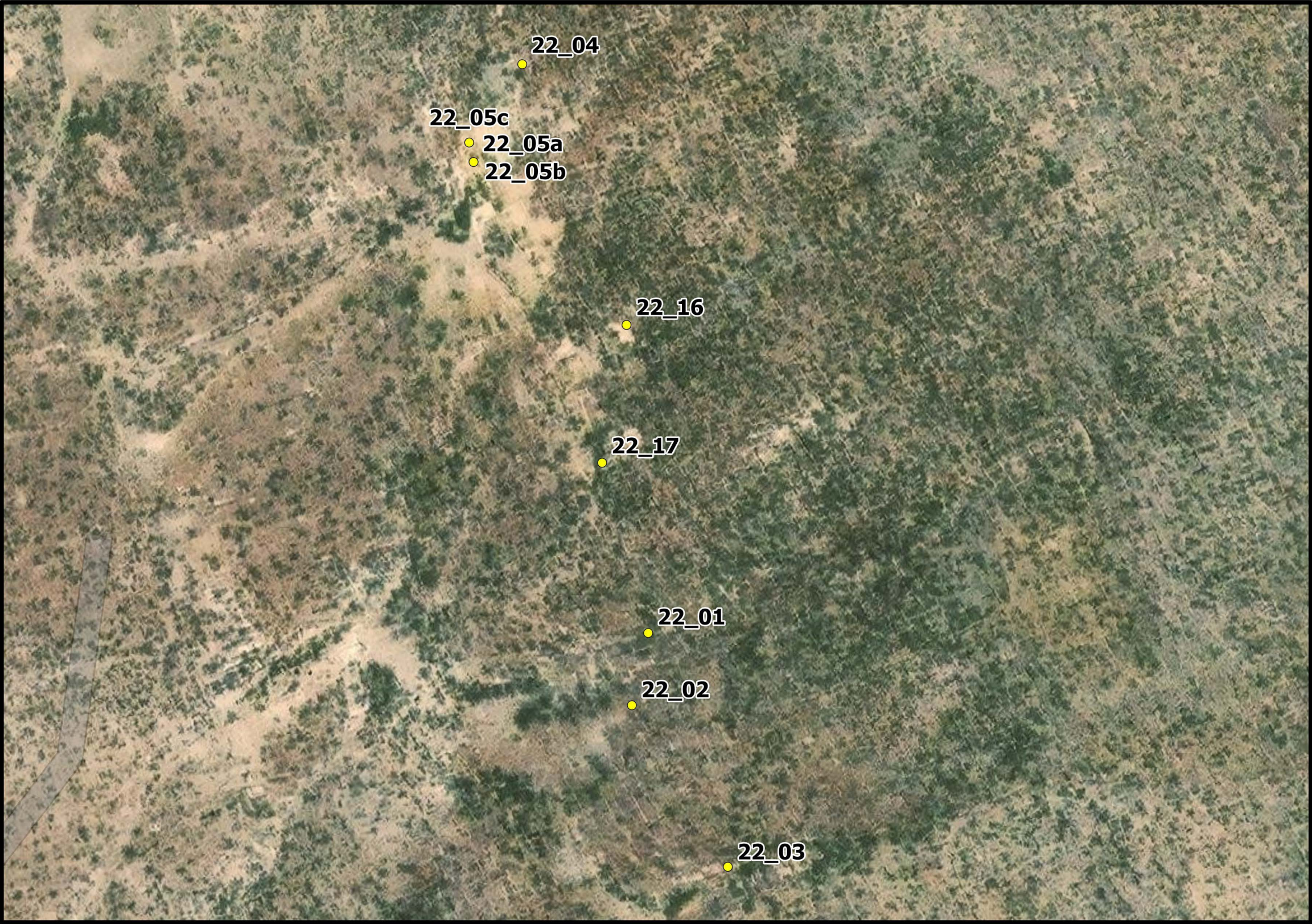
Map Credit: MF Peralta
 Spatial Reference
 Name: NAD 1983 UTM Zone 13N



Scale: 1:49,129



Figure 2a - Project Area Map



Map Legend

- Area of Potential Effects (APE)
- Access Routes
- Red Hill Safeguarding Locations

Red Hill Mine Safeguarding Project Phase I

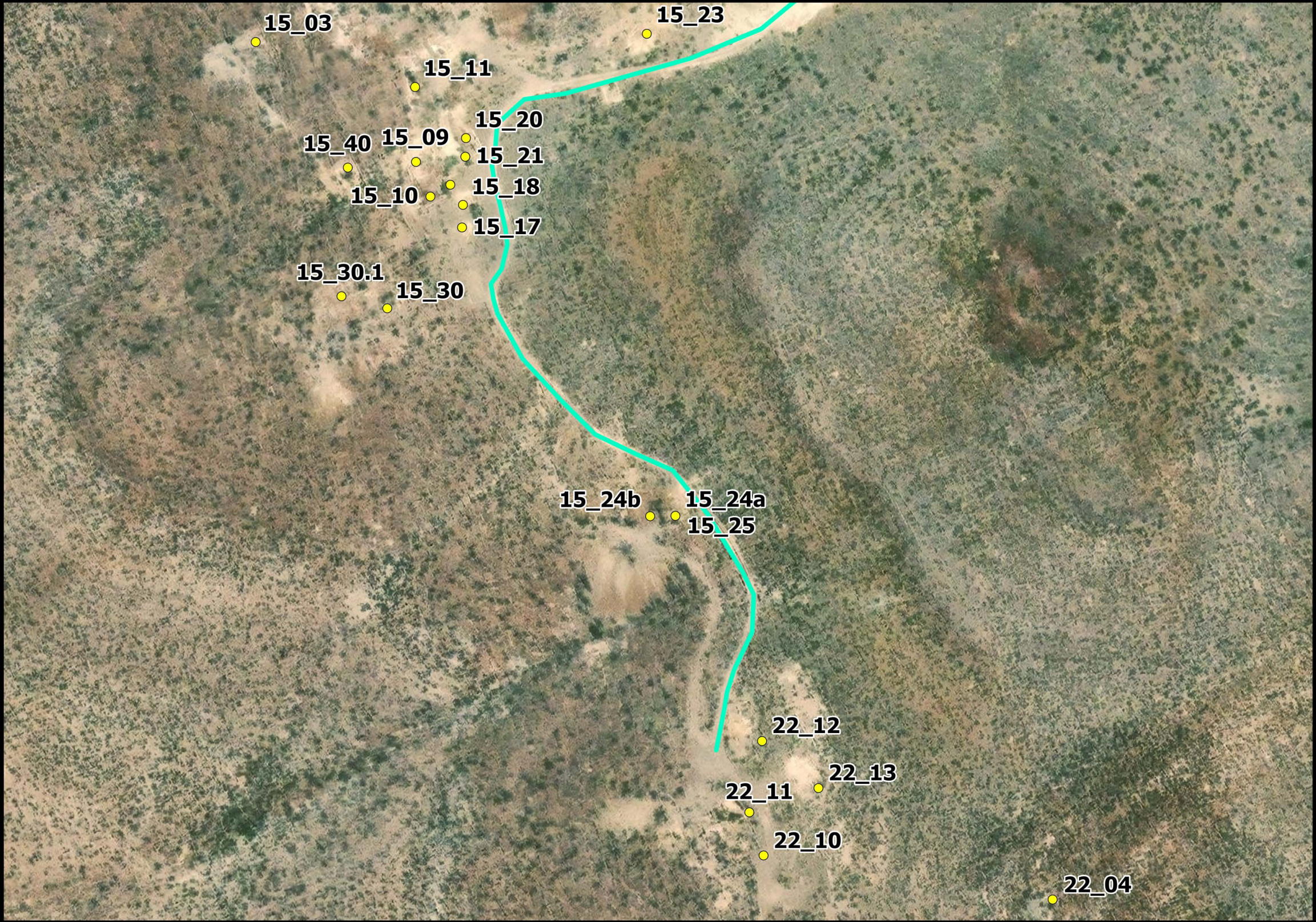
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Spatial Reference
Name: NAD 1983 UTM Zone 13N



Scale: 1:885



Figure 2b - Project Area Map



Map Legend

- Area of Potential Effects (APE)
- Access Routes
- Red Hill Safeguarding Locations

Red Hill Mine Safeguarding Project Phase I

Map Credit: MF Peralta
 Spatial Reference
 Name: NAD 1983 UTM Zone 13N



Scale: 1:1,383



Figure 2c - Project Area Map

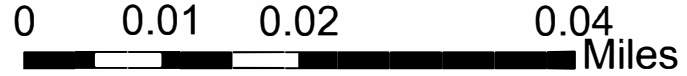


Map Legend

- Area of Potential Effects (APE)
- Access Routes
- Red Hill Safeguarding Locations

Red Hill Mine Safeguarding Project Phase I

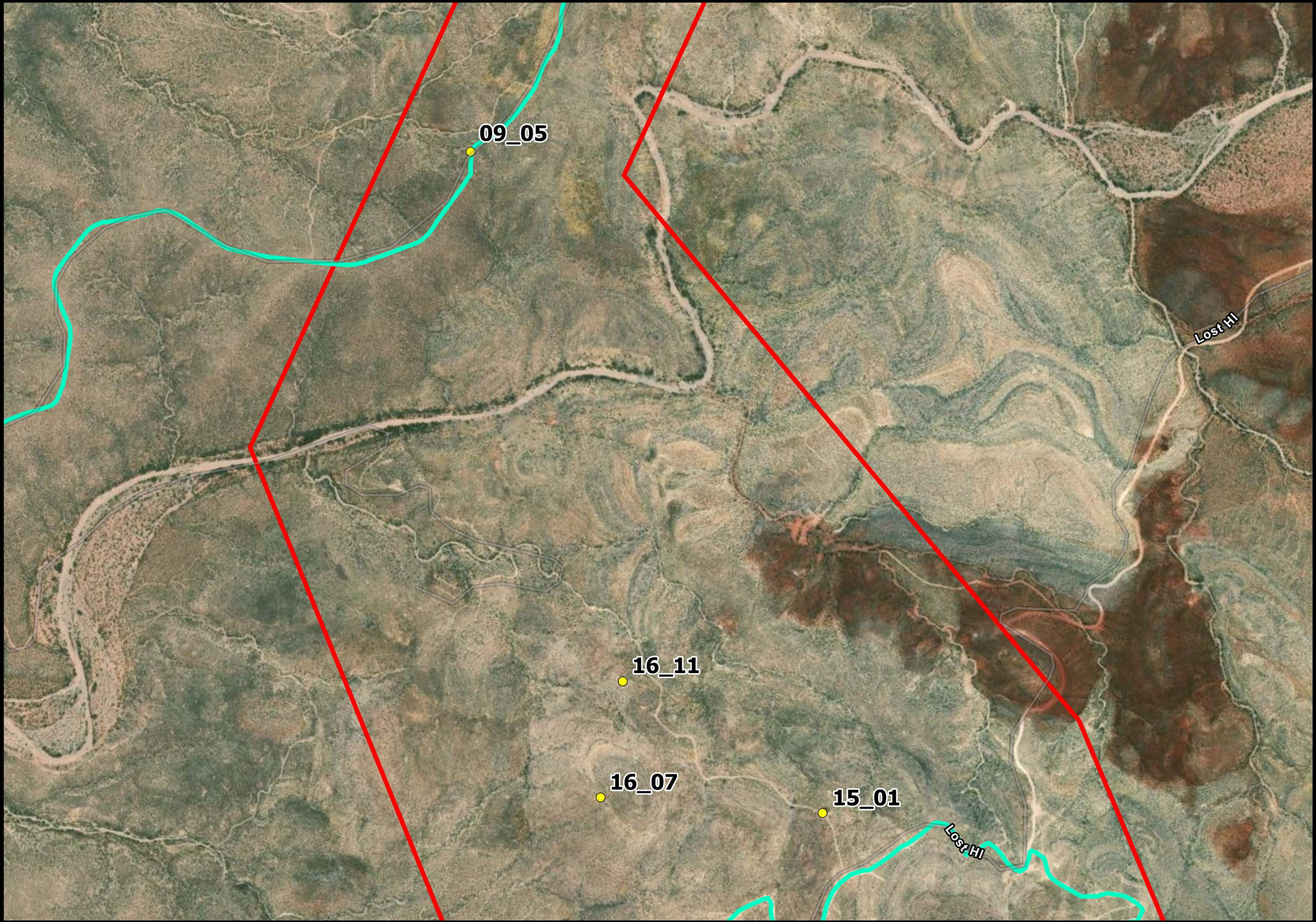
Map Credit: MF Peralta
Spatial Reference
Name: NAD 1983 UTM Zone 13N



Scale: 1:885



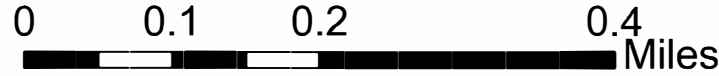
Figure 2d - Project Area Map



- ### Map Legend
- Area of Potential Effects (APE)
 - Access Routes
 - Red Hill Safeguarding Locations

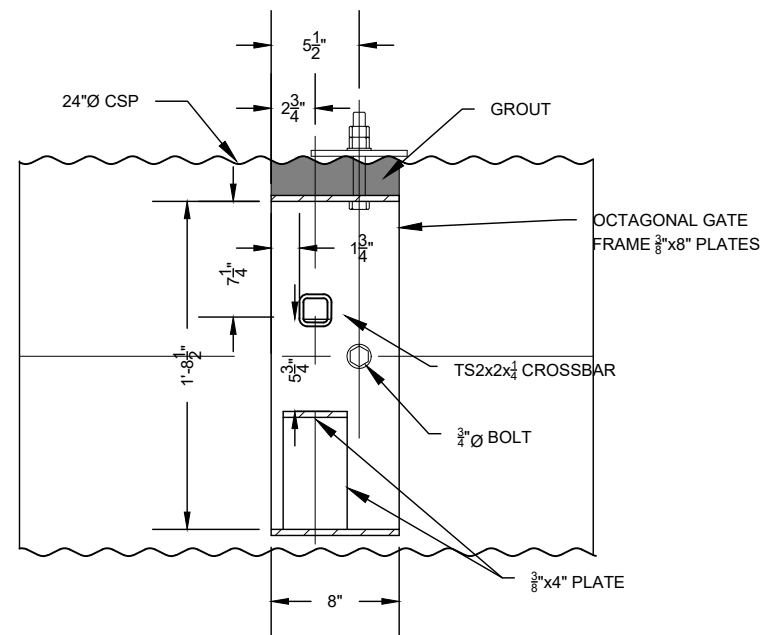
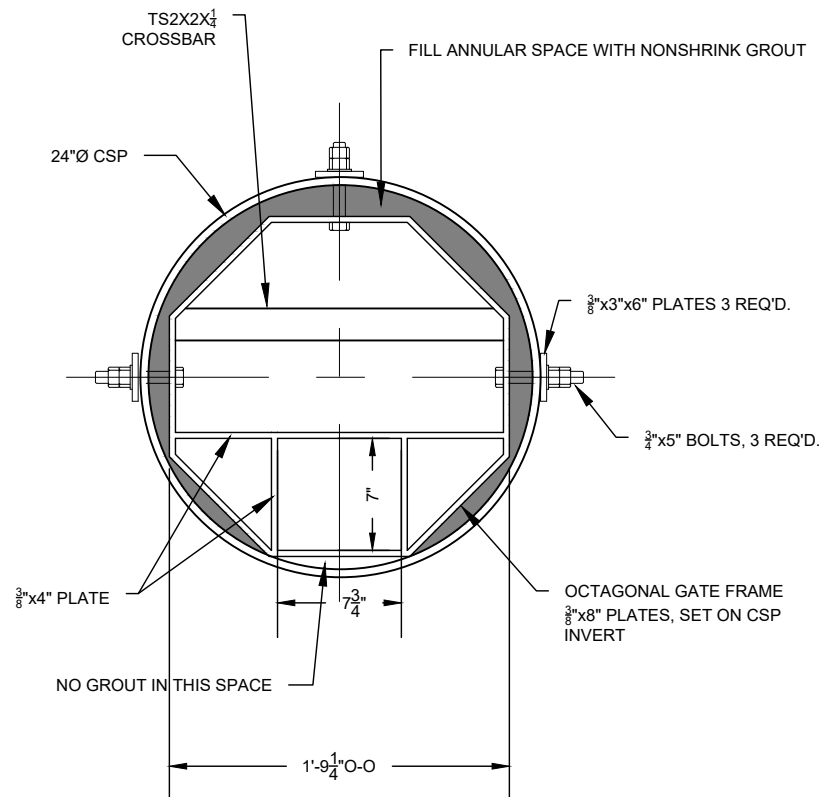
Red Hill Mine Safeguarding Project Phase I

Map Credit: MF Peralta
Spatial Reference
Name: NAD 1983 UTM Zone 13N

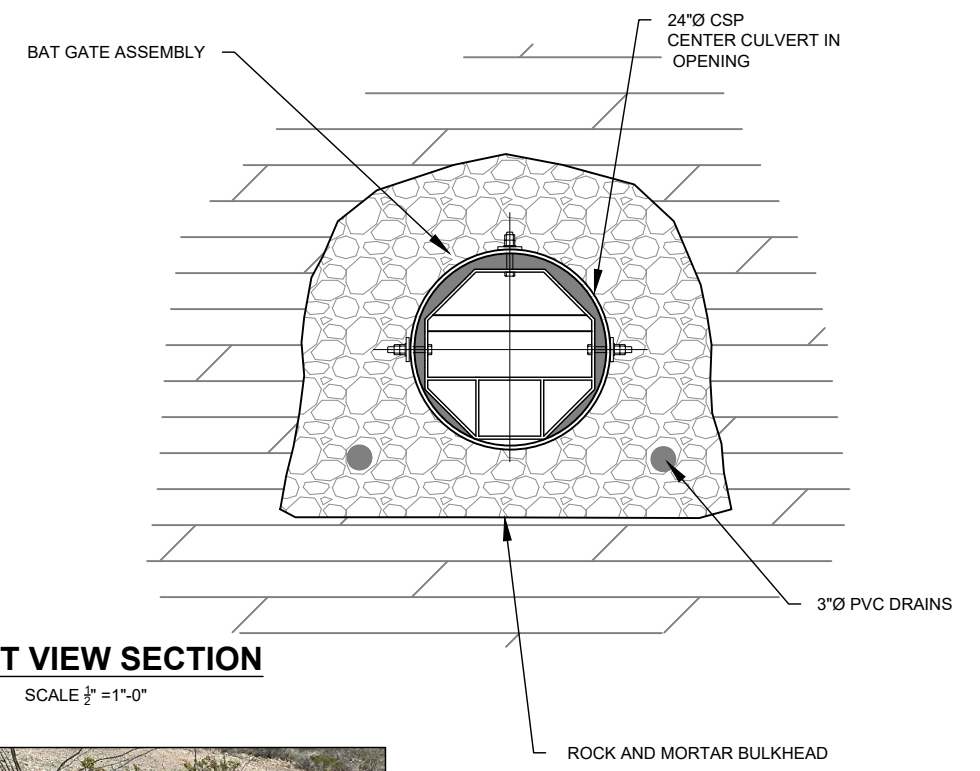


Scale: 1:8,242





BAT GATE ASSEMBLY
 SCALE 1"=1'-0"



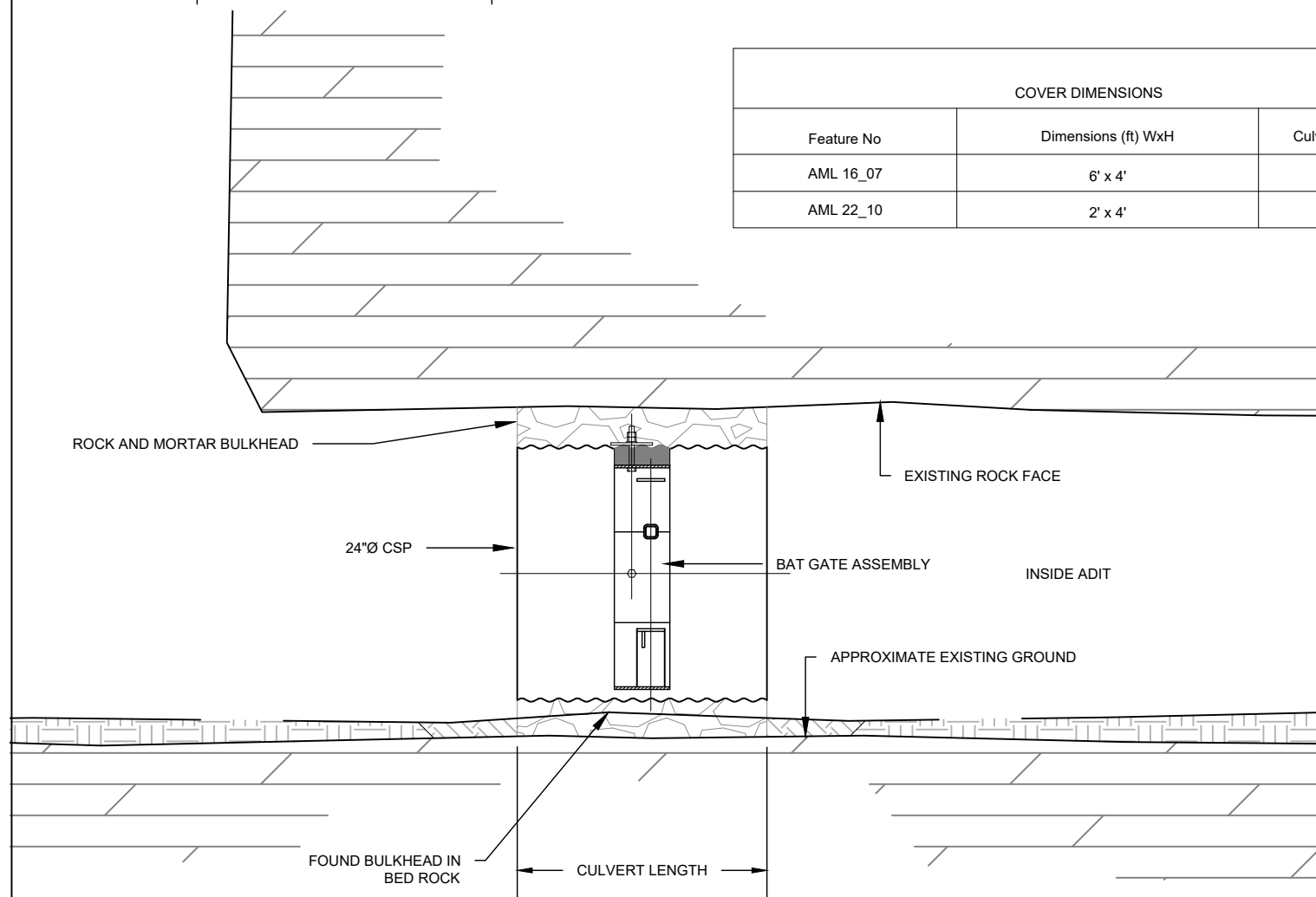
FRONT VIEW SECTION
 SCALE $\frac{1}{2}$ "=1'-0"

| COVER DIMENSIONS | | |
|------------------|---------------------|---------------------|
| Feature No | Dimensions (ft) WxH | Culvert Length (ft) |
| AML 16_07 | 6' x 4' | 2 |
| AML 22_10 | 2' x 4' | 3 |



- GENERAL NOTES:**
1. THE SHAPE AND DIMENSIONS SHOWN FOR THE EXISTING ADIT OPENINGS ARE APPROXIMATE. FIELD VERIFY ALL DIMENSIONS BEFORE FABRICATION.
 2. STEEL PLATES AND SHAPES SHALL BE WEATHERING STEEL. WELD ALL JOINTS. CONSTRUCT THE BAT GATE TO ELIMINATE SURFACES ON WHICH MOISTURE OR DEBRIS CAN BE TRAPPED. ALL TUBULAR MEMBERS SHALL BE HERMETICALLY SEALED TO PREVENT THE INCURSION OF MOISTURE, EXCEPT AS OTHERWISE NOTED. ROUND OR CHAMFER ALL EXPOSED SHARP CORNERS AND EDGES.
 3. DOUBLE-NUT ALL BOLTS.
 4. THE CONTRACTOR HAS THE OPTION OF USING 8" STEEL PLATE WHERE 4" STEEL PLATE IS SHOWN IN THE DRAWINGS.
 5. VERIFY THAT THE OPENINGS OF THE CSP ARE NOT OBSTRUCTED BY FILL OR ROCK.
 6. THE FINISH GRADE ON THE OUTSIDE OF THE CULVERT SHALL HAVE POSITIVE DRAINAGE AWAY FROM THE STRUCTURE.
 7. NATINA STAIN EXPOSED CULVERT AT DIRECTION OF PROJECT MANAGER.
 8. UP TO THREE PVC DRAINS TO BE INSTALLED AT LOCATION DETERMINED BY PROJECT MANAGER.
 9. WEATHERING STEEL SHALL BE USED FOR ALL STEEL TUBING AND PLATING.
 10. INSTALL SURVEY MARKER (SUPPLIED BY AML PROGRAM) INTO ADJACENT COMPETENT ROCK AS DIRECTED BY THE PROJECT MANAGER.

CAUTION - THIS PROJECT REQUIRES CONSTRUCTION WORK IN, AROUND, AND OVER HAZARDOUS AND UNPROTECTED MINE SHAFTS, STOPES, ADITS, AND OTHER OPENINGS WHICH MAY BE OPEN TO THE SURFACE OR HIDDEN FROM VIEW BY TRASH, DEBRIS, OR THIN AND UNSTABLE LAYERS OF SURFACE MATERIALS OR ROCK. THE CONSTRUCTOR SHALL BE RESPONSIBLE FOR THOROUGHLY INVESTIGATING THE SITE CONDITIONS AND SCHEDULING EQUIPMENT, EQUIPMENT OPERATIONS, PERSONNEL AND SAFETY PROCEDURES TO PREVENT ACCIDENTS AND INJURIES.



PROFILE VIEW
 SCALE $\frac{1}{2}$ "=1'-0"



AML 16_07

ABANDONED MINE LAND PROGRAM
 MINING AND MINERALS DIVISION
 NEW MEXICO ENERGY, MINERALS, AND NATURAL RESOURCES DEPARTMENT

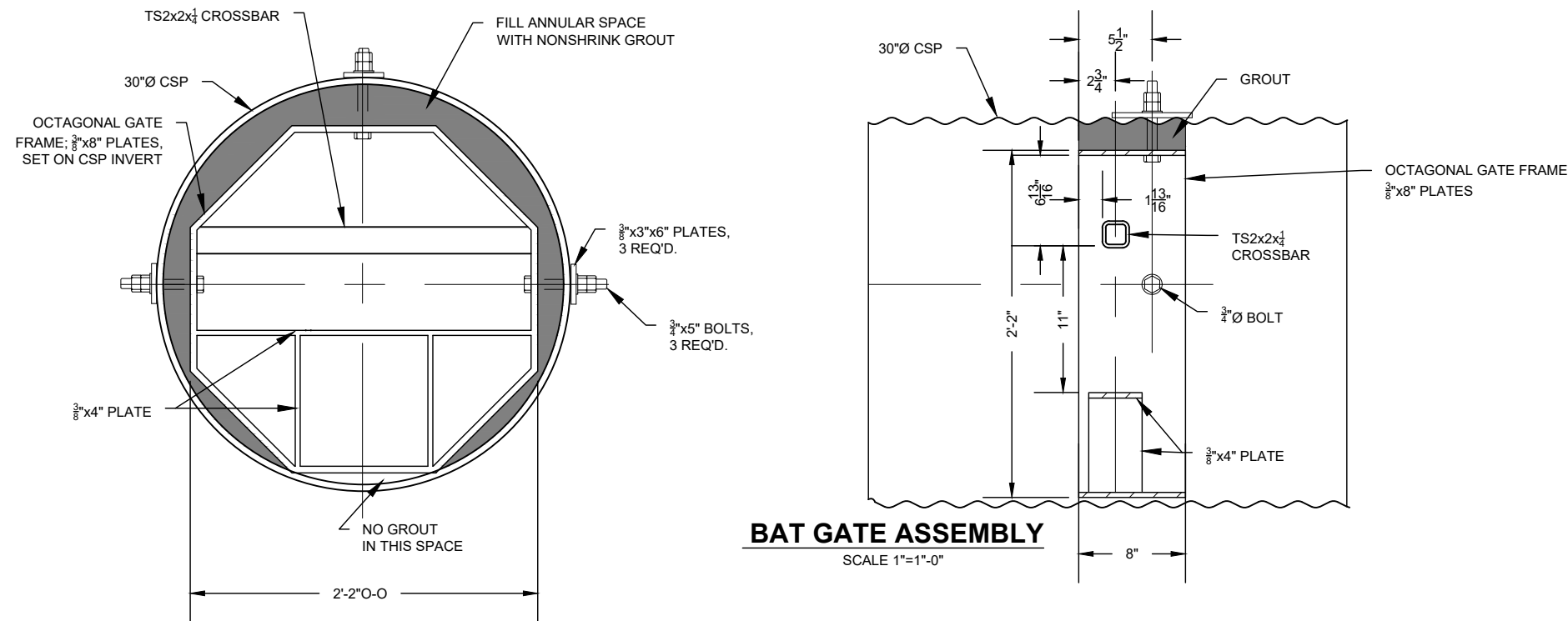
SCALE: AS SHOWN
 DATE: 05/15/2024

AML22_10, 16_07

DRAWN BY: MWT
 REVISED BY: LDV

24"Ø BAT GATE IN ROCK BULKHEAD

FILE: RED HILL MINE SAFEGUARD PROJECT PHASE I
 FIGURE: 3

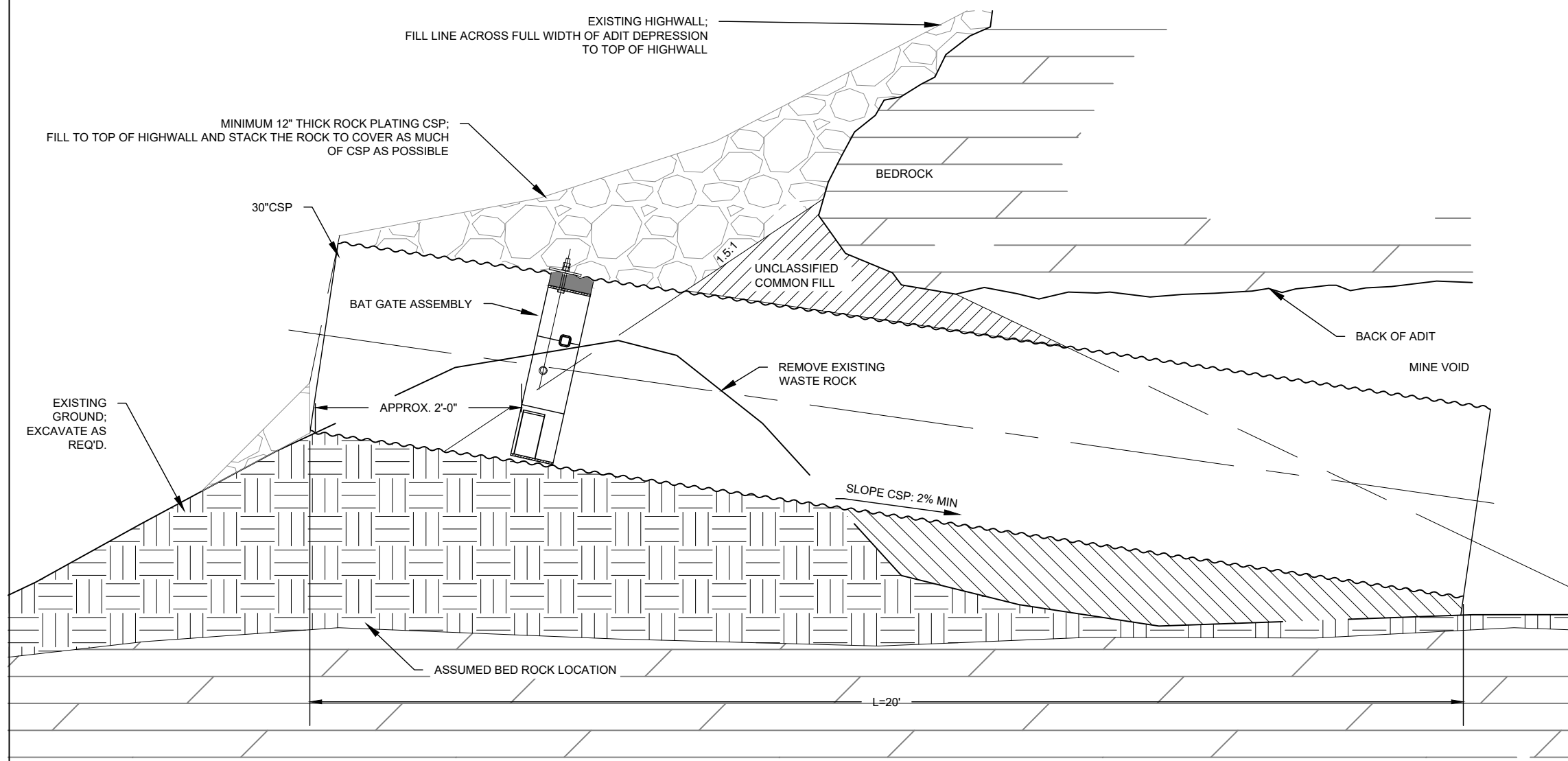


BAT GATE ASSEMBLY
SCALE 1"=1'-0"



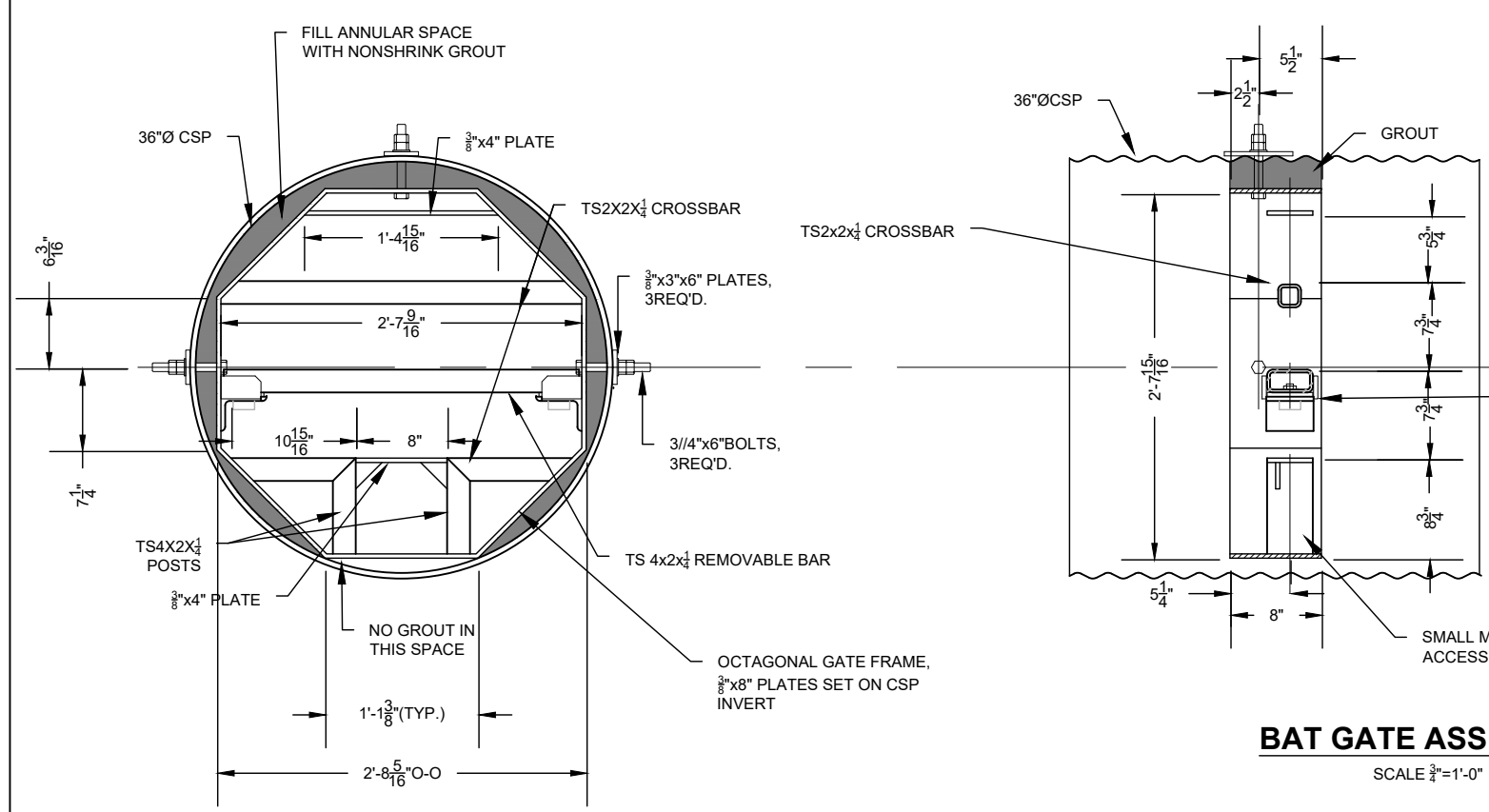
GENERAL NOTES:

1. THE SHAPE AND DIMENSIONS SHOWN FOR THE EXISTING ADIT OPENINGS ARE APPROXIMATE. FIELD VERIFY ALL DIMENSIONS BEFORE FABRICATION.
2. STEEL PLATES AND SHAPES SHALL BE WEATHERING STEEL. WELD ALL JOINTS. CONSTRUCT THE BAT GATE TO ELIMINATE SURFACES ON WHICH MOISTURE OR DEBRIS CAN BE TRAPPED. ALL TUBULAR MEMBERS SHALL BE HERMETICALLY SEALED TO PREVENT THE INCURSION OF MOISTURE, EXCEPT AS OTHERWISE NOTED. ROUND OR CHAMFER ALL EXPOSED SHARP CORNERS AND EDGES.
3. DOUBLE-NUT ALL BOLTS.
4. THE CONTRACTOR HAS THE OPTION OF USING 8" STEEL PLATE WHERE 4" STEEL PLATE IS SHOWN IN THE DRAWINGS.
5. VERIFY THAT THE OPENINGS OF THE CSP ARE NOT OBSTRUCTED BY FILL OR ROCK.
6. THE FINISH GRADE ON THE OUTSIDE OF THE CULVERT SHALL HAVE POSITIVE DRAINAGE AWAY FROM THE STRUCTURE.
7. NATINA STAIN EXPOSED CULVERT AT DIRECTION OF PROJECT MANAGER.
8. ADD ROCK BERM AND FILL ON SLOPE ABOVE AML 22_05c TO DIRECT STORMWATER SOUTHWARDS AWAY FROM TOP OF THE FEATURE.
9. UP TO THREE PVC DRAINS TO BE INSTALLED AT LOCATION DETERMINED BY PROJECT MANAGER.
10. WEATHERING STEEL SHALL BE USED FOR ALL STEEL TUBING AND PLATING.
11. MINE OPENING DIMENSIONS 4'5" WIDE BY 5' HIGH AND 20' CULVERT LENGTH.
12. INSTALL SURVEY MARKER (SUPPLIED BY AML PROGRAM) INTO ADJACENT COMPETENT ROCK AS DIRECTED BY THE AML PROJECT MANAGER.

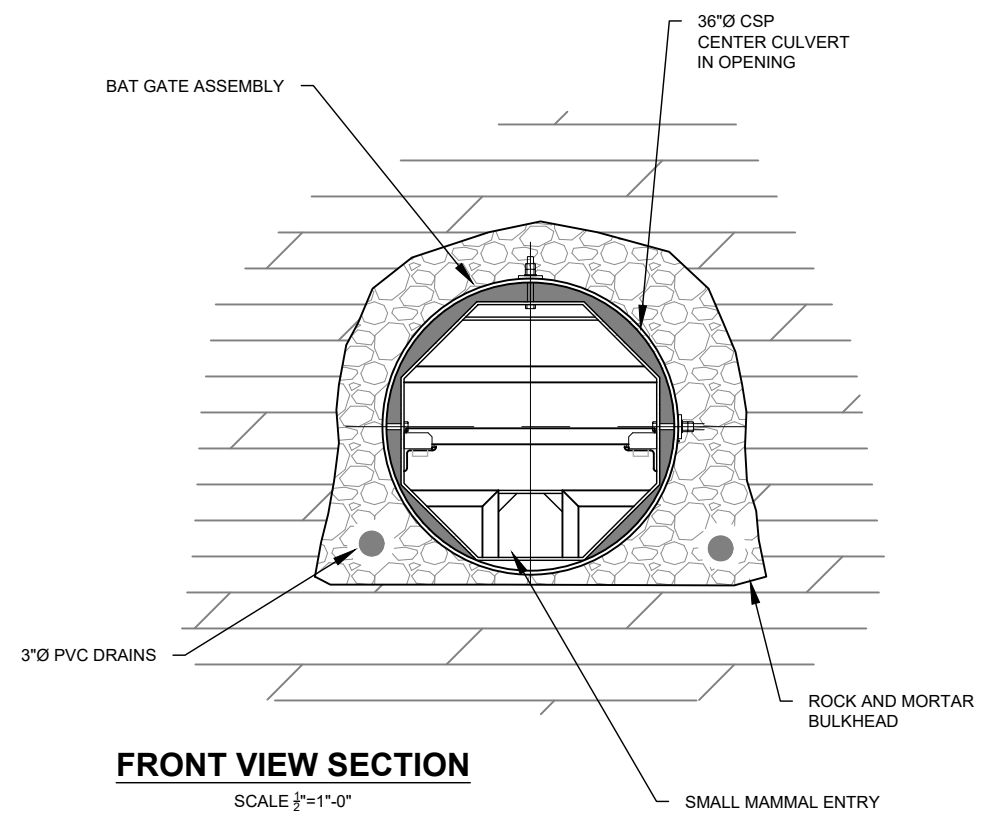


CAUTION - THIS PROJECT REQUIRES CONSTRUCTION WORK IN, AROUND, AND OVER HAZARDOUS AND UNPROTECTED MINE SHAFTS, STOPES, ADITS, AND OTHER OPENINGS WHICH MAY BE OPEN TO THE SURFACE OR HIDDEN FROM VIEW BY TRASH, DEBRIS, OR THIN AND UNSTABLE LAYERS OF SURFACE MATERIALS OR ROCK. THE CONSTRUCTOR SHALL BE RESPONSIBLE FOR THOROUGHLY INVESTIGATING THE SITE CONDITIONS AND SCHEDULING EQUIPMENT, EQUIPMENT OPERATIONS, PERSONNEL AND SAFETY PROCEDURES TO PREVENT ACCIDENTS AND INJURIES.

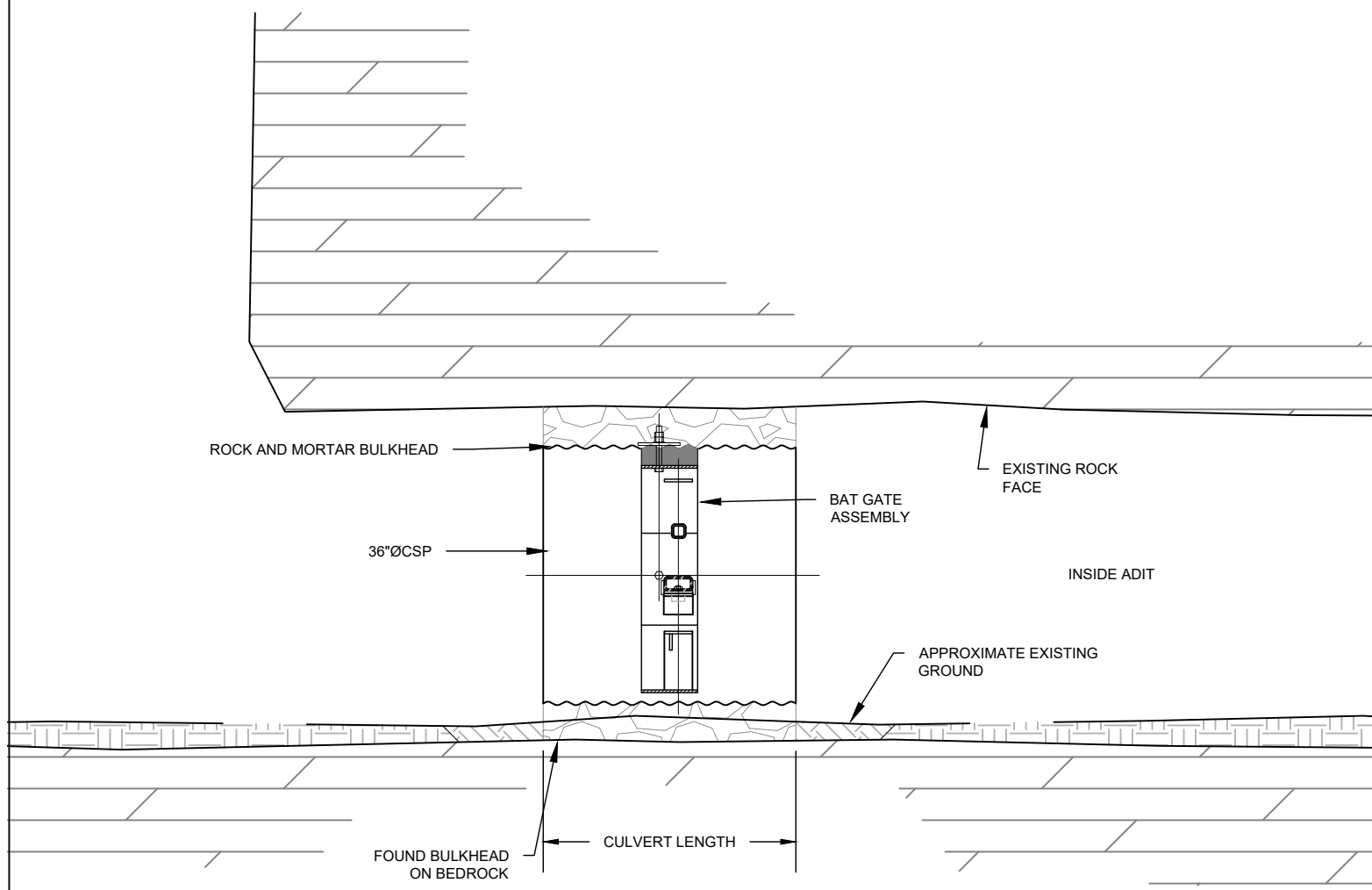
| | | | |
|---|---|-----------------|--|
| ABANDONED MINE LAND PROGRAM MINING AND MINERALS DIVISION NEW MEXICO ENERGY, MINERALS, AND NATURAL RESOURCES DEPARTMENT | | | |
| SCALE: AS SHOWN | AML22_05c | DRAWN BY: MWT | |
| DATE: 05/15/2024 | | REVISED BY: LDV | |
| 30"Ø BAT GATE IN ROCK FILL | | | |
| FILE: | RED HILL MINE SAFEGUARD PROJECT PHASE I | FIGURE: 4 | |



BAT GATE ASSEMBLY
SCALE 3/4"=1'-0"



FRONT VIEW SECTION
SCALE 1/2"=1'-0"



PROFILE VIEW
SCALE 1/2"=1'-0"

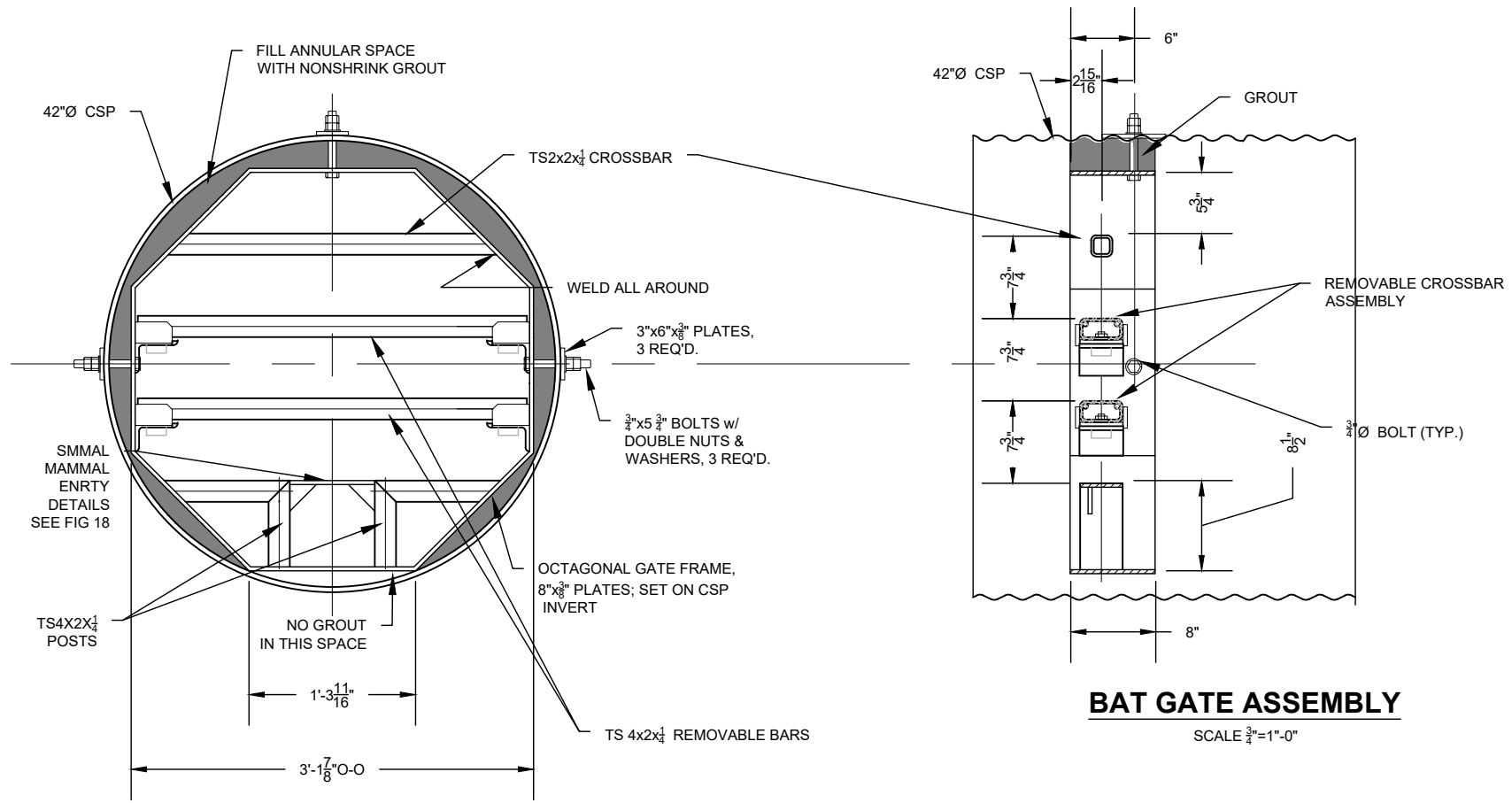
| Feature No | COVER DIMENSIONS | |
|------------|---------------------|---------------------|
| | Dimensions (ft) WxH | Culvert Length (ft) |
| AML_15_10 | 16 x 4 | 14 |
| AML_15_30 | 8.5' x 3' | 3 |
| AML_22_05a | 7'5" x 5' | 20 |
| AML_22_05b | 5' x 3.5' | 20 |
| AML_22_11 | 10' x 5' | 3 |

GENERAL NOTES:

1. THE SHAPE AND DIMENSIONS SHOWN FOR THE EXISTING ADIT OPENINGS ARE APPROXIMATE. FIELD VERIFY ALL DIMENSIONS BEFORE FABRICATION.
2. STEEL PLATES AND SHAPES SHALL BE WEATHERING STEEL. WELD ALL JOINTS. CONSTRUCT THE BAT GATE TO ELIMINATE SURFACES ON WHICH MOISTURE OR DEBRIS CAN BE TRAPPED. ALL TUBULAR MEMBERS SHALL BE HERMETICALLY SEALED TO PREVENT THE INCURSION OF MOISTURE, EXCEPT AS OTHERWISE NOTED. ROUND OR CHAMFER ALL EXPOSED SHARP CORNERS AND EDGES.
3. DOUBLE-NUT ALL BOLTS.
4. THE CONTRACTOR HAS THE OPTION OF USING 8" STEEL PLATE WHERE 4" STEEL PLATE IS SHOWN IN THE DRAWINGS.
5. VERIFY THAT THE OPENINGS OF THE CSP ARE NOT OBSTRUCTED BY FILL OR ROCK.
6. THE FINISH GRADE ON THE OUTSIDE OF THE CULVERT SHALL HAVE POSITIVE DRAINAGE AWAY FROM THE STRUCTURE.
7. NATINA STAIN EXPOSED CULVERT AT DIRECTION OF PROJECT MANAGER.
8. UP TO THREE PVC DRAINS TO BE INSTALLED AT LOCATION DETERMINED BY PROJECT MANAGER.
9. WEATHERING STEEL SHALL BE USED FOR ALL STEEL TUBING AND PLATING.
10. INSTALL SURVEY MARKER (SUPPLIED BY AML PROGRAM) INTO ADJACENT COMPETENT ROCK AS DIRECTED BY PROJECT MANAGER.

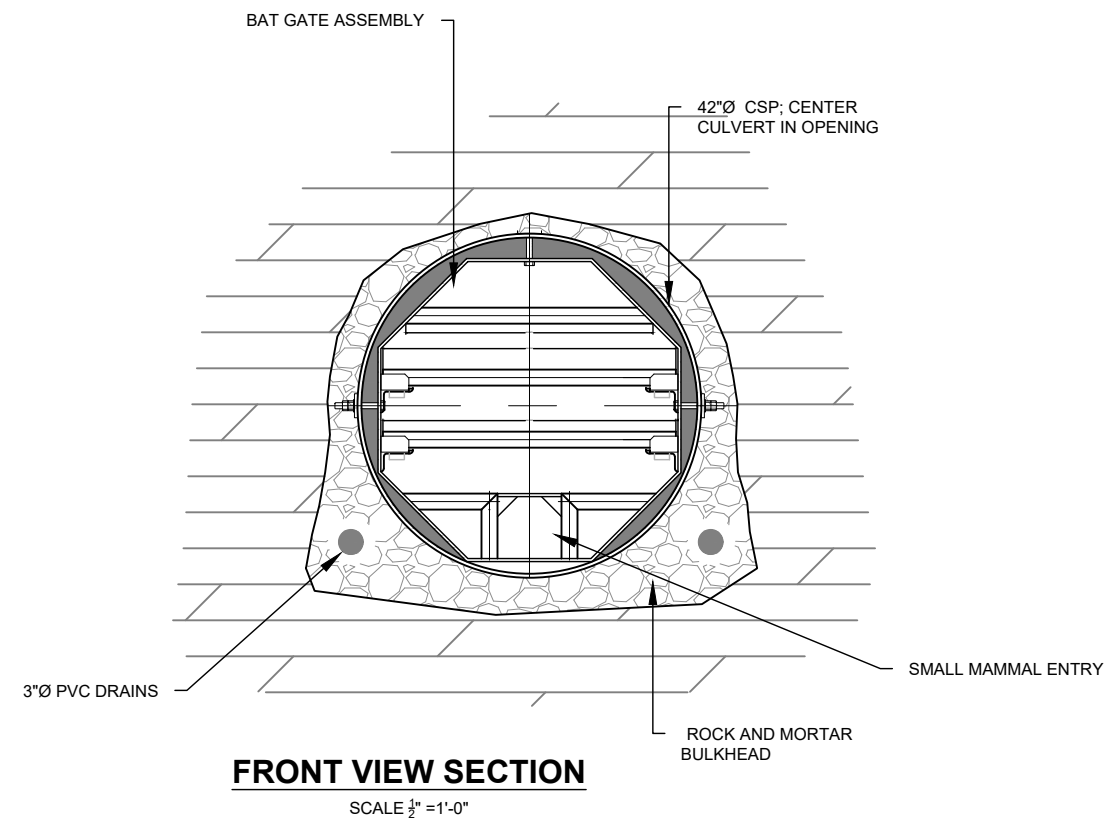
CAUTION - THIS PROJECT REQUIRES CONSTRUCTION WORK IN, AROUND, AND OVER HAZARDOUS AND UNPROTECTED MINE SHAFTS, STOPES, ADITS, AND OTHER OPENINGS WHICH MAY BE OPEN TO THE SURFACE OR HIDDEN FROM VIEW BY TRASH, DEBRIS, OR THIN AND UNSTABLE LAYERS OF SURFACE MATERIALS OR ROCK. THE CONSTRUCTOR SHALL BE RESPONSIBLE FOR THOROUGHLY INVESTIGATING THE SITE CONDITIONS AND SCHEDULING EQUIPMENT, EQUIPMENT OPERATIONS, PERSONNEL AND SAFETY PROCEDURES TO PREVENT ACCIDENTS AND INJURIES.

| | | |
|---|---|-----------------|
| ABANDONED MINE LAND PROGRAM | | |
| MINING AND MINERALS DIVISION | | |
| NEW MEXICO ENERGY, MINERALS, AND NATURAL RESOURCES DEPARTMENT | | |
| SCALE: AS SHOWN | VARIOUS LOCATIONS | DRAWN BY: MWT |
| DATE: 05/15/2024 | | REVISED BY: LDV |
| 36" Ø BAT GATE IN ROCK BULKHEAD | | |
| FILE: | RED HILL MINE SAFEGUARD PROJECT PHASE I | FIGURE: 5 |



BAT GATE ASSEMBLY

SCALE 3/8"=1'-0"



FRONT VIEW SECTION

SCALE 1/2"=1'-0"

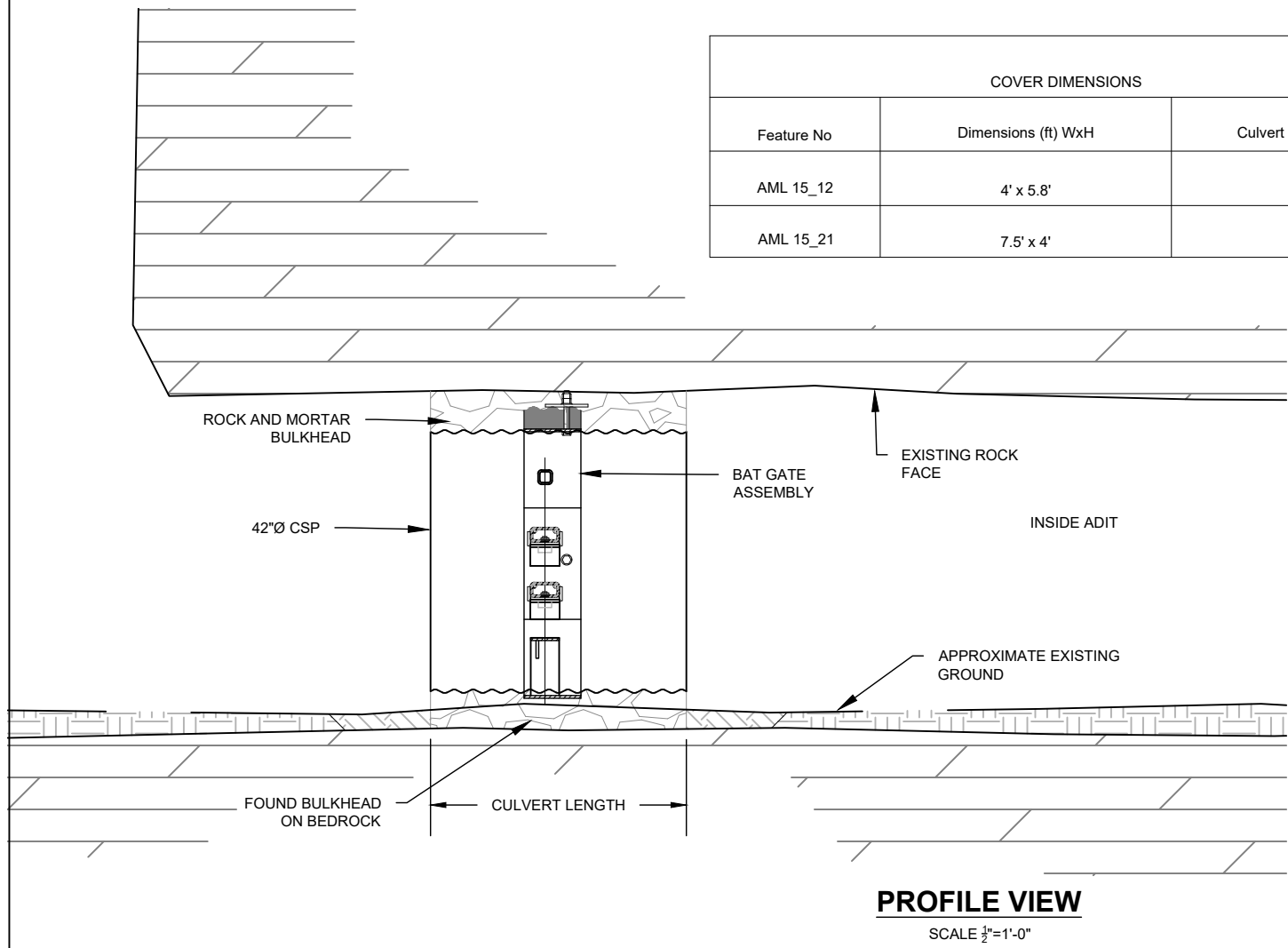
| COVER DIMENSIONS | | |
|------------------|---------------------|---------------------|
| Feature No | Dimensions (ft) WxH | Culvert Length (ft) |
| AML 15_12 | 4' x 5.8' | 3 |
| AML 15_21 | 7.5' x 4' | 4 |



GENERAL NOTES:

1. THE SHAPE AND DIMENSIONS SHOWN FOR THE EXISTING ADIT OPENINGS ARE APPROXIMATE. FIELD VERIFY ALL DIMENSIONS BEFORE FABRICATION.
2. STEEL PLATES AND SHAPES SHALL BE WEATHERING STEEL. WELD ALL JOINTS. CONSTRUCT THE BAT GATE TO ELIMINATE SURFACES ON WHICH MOISTURE OR DEBRIS CAN BE TRAPPED. ALL TUBULAR MEMBERS SHALL BE HERMETICALLY SEALED TO PREVENT THE INCURSION OF MOISTURE, EXCEPT AS OTHERWISE NOTED. ROUND OR CHAMFER ALL EXPOSED SHARP CORNERS AND EDGES.
3. DOUBLE-NUT ALL BOLTS.
4. THE CONTRACTOR HAS THE OPTION OF USING 8" STEEL PLATE WHERE 4" STEEL PLATE IS SHOWN IN THE DRAWINGS.
5. VERIFY THAT THE OPENINGS OF THE CSP ARE NOT OBSTRUCTED BY FILL OR ROCK.
6. THE FINISH GRADE ON THE OUTSIDE OF THE CULVERT SHALL HAVE POSITIVE DRAINAGE AWAY FROM THE STRUCTURE.
7. NATINA STAIN EXPOSED CULVERT AT DIRECTION OF PROJECT MANAGER.
8. UP TO THREE PVC DRAINS TO BE INSTALLED AT LOCATION DETERMINED BY PROJECT MANAGER.
9. WEATHERING STEEL SHALL BE USED FOR ALL STEEL TUBING AND PLATING.
10. INSTALL SURVEY MARKER (SUPPLIED BY AML PROGRAM) INTO ADJACENT COMPETENT ROCK AS DIRECTED BY THE PROJECT MANAGER.

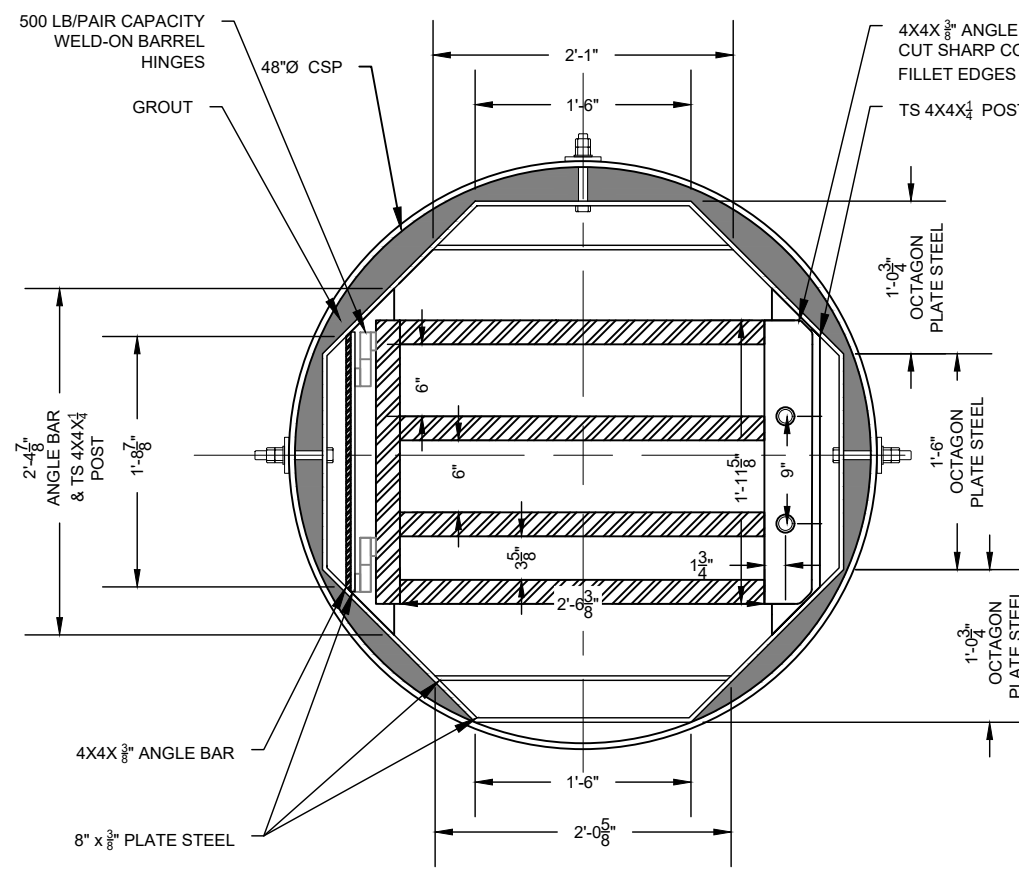
CAUTION - THIS PROJECT REQUIRES CONSTRUCTION WORK IN, AROUND, AND OVER HAZARDOUS AND UNPROTECTED MINE SHAFTS, STOPES, ADITS, AND OTHER OPENINGS WHICH MAY BE OPEN TO THE SURFACE OR HIDDEN FROM VIEW BY TRASH, DEBRIS, OR THIN AND UNSTABLE LAYERS OF SURFACE MATERIALS OR ROCK. THE CONSTRUCTOR SHALL BE RESPONSIBLE FOR THOROUGHLY INVESTIGATING THE SITE CONDITIONS AND SCHEDULING EQUIPMENT, EQUIPMENT OPERATIONS, PERSONNEL AND SAFETY PROCEDURES TO PREVENT ACCIDENTS AND INJURIES.



PROFILE VIEW

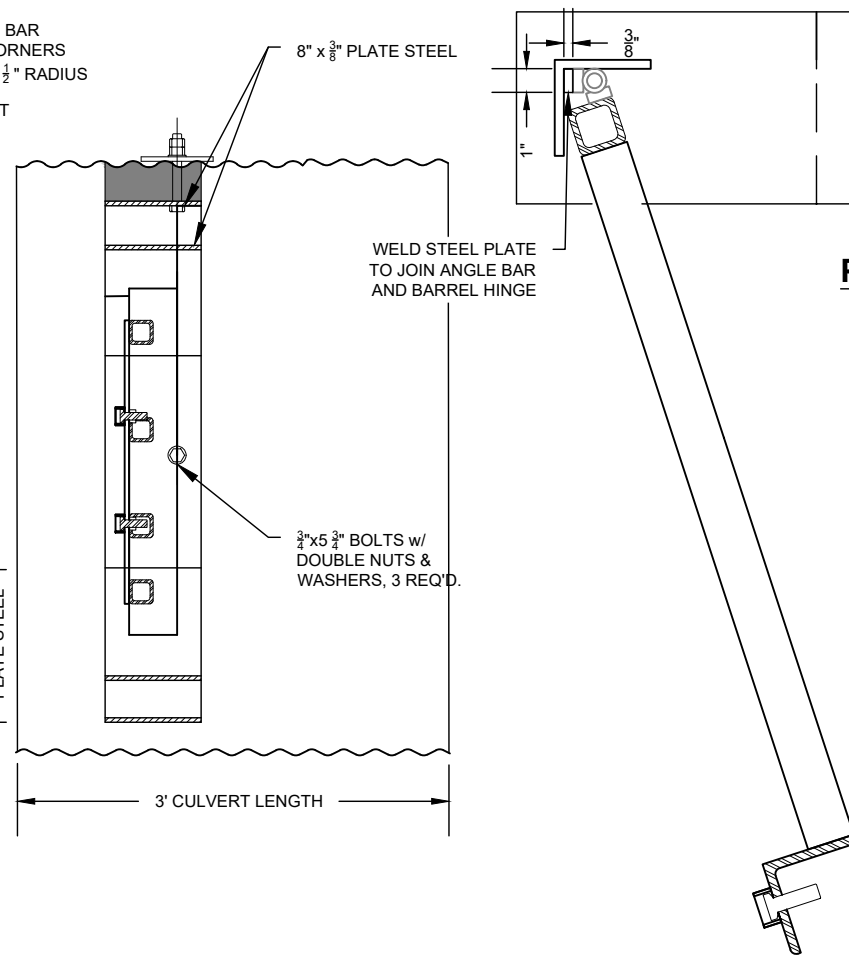
SCALE 3/8"=1'-0"

| | | |
|---|---|-----------------|
| ABANDONED MINE LAND PROGRAM | | |
| MINING AND MINERALS DIVISION | | |
| NEW MEXICO ENERGY, MINERALS, AND NATURAL RESOURCES DEPARTMENT | | |
| SCALE: AS SHOWN | AML15_12 ,15_21 | DRAWN BY: MWT |
| DATE: 05/15/2024 | | REVISED BY: LDV |
| 42"Ø BAT GATE IN ROCK BULKHEAD | | |
| FILE: | RED HILL MINE SAFEGUARD PROJECT PHASE I | FIGURE: 6 |



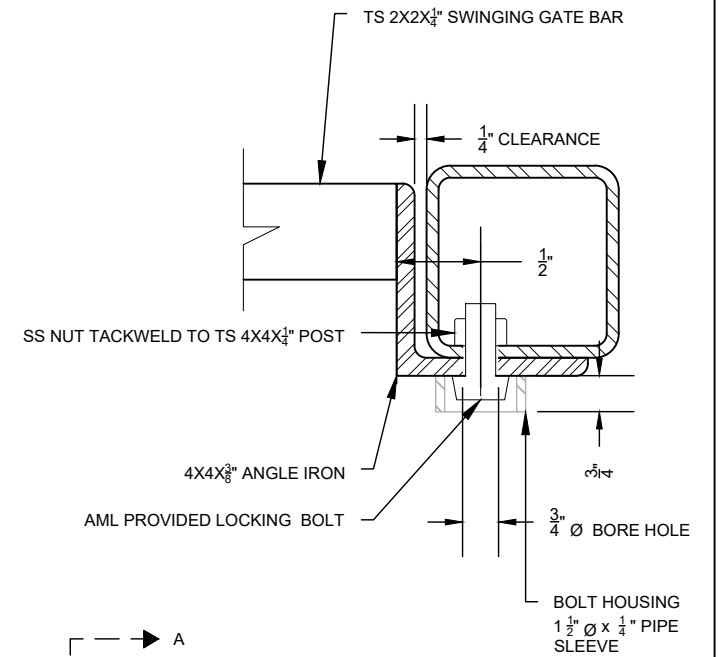
BAT GATE ASSEMBLY

SCALE 3/4"=1'-0"



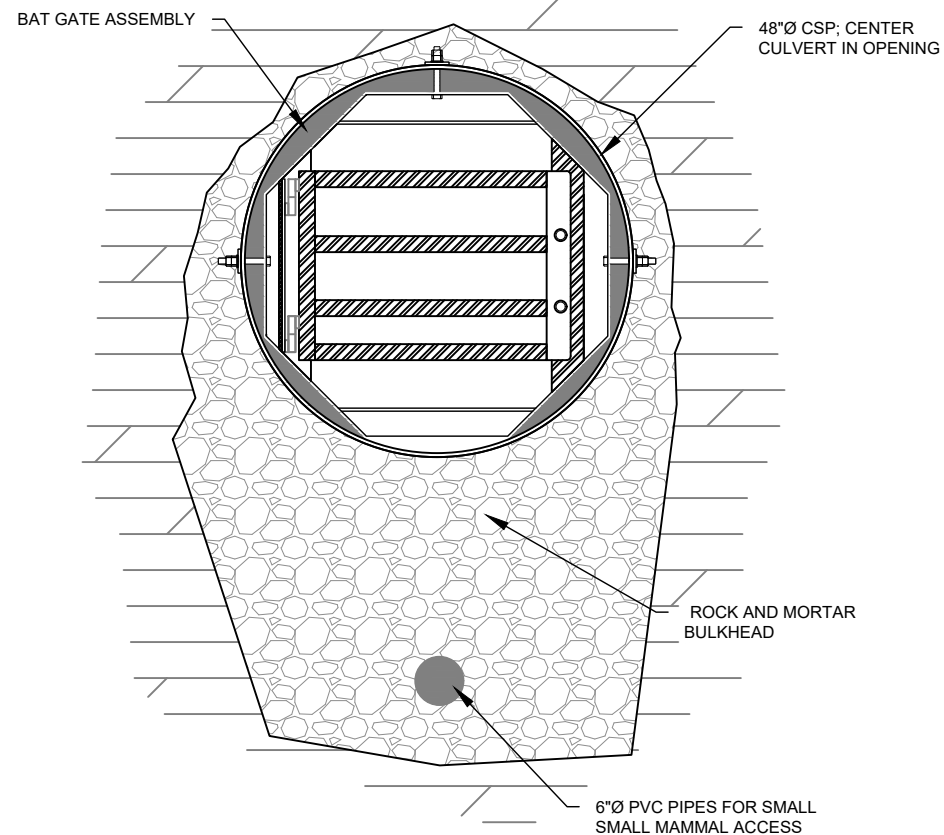
PLAN VIEW- GATE OPEN

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



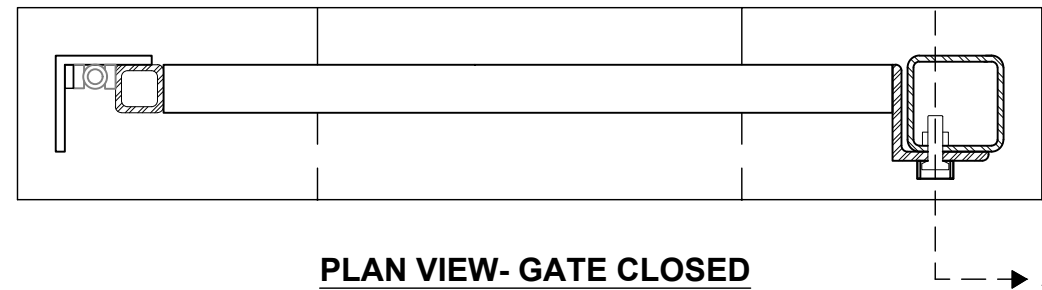
SECTION A-A

SCALE 3"=1'-0"



FRONT VIEW SECTION

SCALE 3/4"=1'-0"



PLAN VIEW- GATE CLOSED

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

GENERAL NOTES:

1. THE SHAPE AND DIMENSIONS SHOWN FOR THE EXISTING ADIT OPENINGS ARE APPROXIMATE. FIELD VERIFY ALL DIMENSIONS BEFORE FABRICATION.
2. STEEL PLATES AND SHAPES SHALL BE WEATHERING STEEL. WELD ALL JOINTS. CONSTRUCT THE BAT GATE TO ELIMINATE SURFACES ON WHICH MOISTURE OR DEBRIS CAN BE TRAPPED. ALL TUBULAR MEMBERS SHALL BE HERMETICALLY SEALED TO PREVENT THE INCURSION OF MOISTURE, EXCEPT AS OTHERWISE NOTED. ROUND OR CHAMFER ALL EXPOSED SHARP CORNERS AND EDGES.
3. DOUBLE-NUT ALL STEEL FRAME CULVERT BOLTS.
4. THE CONSTRUCTOR SHALL PROVIDE THE NUTS (3/8" Ø-11 UNC CLASS 2A THREAD.) THE PROJECT MANAGER WILL SUPPLY THE LOCKING BOLTS.
5. COAT THE THREADS OF THE LOCKING BOLTS WITH LPS1 LUBRICANT AND INSTALL FIRMLY WITH 50 TO 75 POUNDS OF TORQUE.
6. THE CONTRACTOR HAS THE OPTION OF USING 8" STEEL PLATE WHERE 4" STEEL PLATE IS SHOWN IN THE DRAWINGS.
7. VERIFY THAT THE OPENINGS OF THE CSP ARE NOT OBSTRUCTED BY FILL OR ROCK.
8. THE FINISH GRADE ON THE OUTSIDE OF THE CULVERT SHALL HAVE POSITIVE DRAINAGE AWAY FROM THE STRUCTURE.
9. NATINA STAIN EXPOSED CULVERT AT DIRECTION OF PROJECT MANAGER.
10. PLACE CULVERT BEHIND HISTORIC TIMBER AT ELEVATION 3' ABOVE GROUND (AT LEVEL OF LARGER BOULDER).
11. UP TO THREE PVC DRAINS TO BE INSTALLED AT LOCATION DETERMINED BY PROJECT MANAGER.
12. WEATHERING STEEL SHALL BE USED FOR ALL THE STEEL TUBING AND PLATING.
13. INSTALL SURVEY MARKER (SUPPLIED BY AML PROGRAM) INTO ADJACENT COMPETENT ROCK AS DIRECTED BY PROJECT MANAGER.
14. MINE OPENING DIMENSIONS 8' WIDE X 7'9" HIGH AND 3' CULVERT LENGTH.



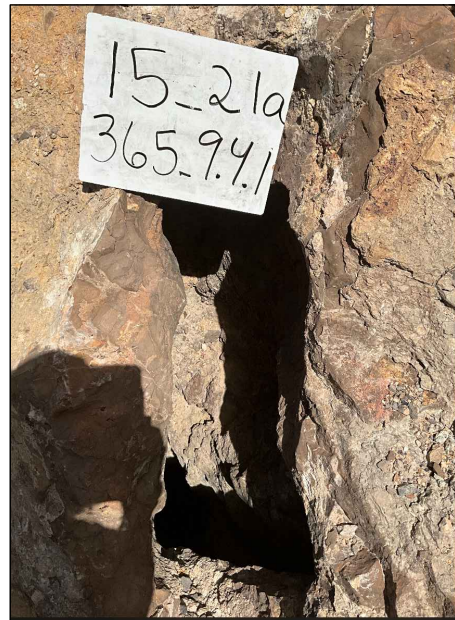
CAUTION - THIS PROJECT REQUIRES CONSTRUCTION WORK IN, AROUND AND OVER
 UNSTABLE SURFACES. UNSTABLE SURFACES, UNSTABLE SOILS, UNSTABLE
 ROCKS, UNSTABLE SANDS, UNSTABLE GRAVELS, UNSTABLE CLAYS, UNSTABLE
 WHICH MAY BE OPEN TO THE SURFACE OR HIDDEN FROM VIEW BY TRASH, DEBRIS, OR
 THINK AND UNSTABLE LAYERS OF SURFACE MATERIALS OR ROCK. THE CONSTRUCTOR
 SHALL BE RESPONSIBLE FOR THOROUGHLY INVESTIGATING THE SITE CONDITIONS AND
 SCHEDULING EQUIPMENT, EQUIPMENT OPERATIONS, PERSONNEL AND SAFETY PROCEDURES
 TO PREVENT ACCIDENTS AND INJURIES.

| | | |
|---|---|-----------------|
| ABANDONED MINE LAND PROGRAM | | |
| MINING AND MINERALS DIVISION | | |
| NEW MEXICO ENERGY, MINERALS, AND NATURAL RESOURCES DEPARTMENT | | |
| SCALE: AS SHOWN | AML15_03 | DRAWN BY: MWT |
| DATE: 05/15/2024 | | REVISED BY: LDV |
| 48" Ø BAT GATE IN ROCK BULKHEAD | | |
| FILE: | RED HILL MINE SAFEGUARD PROJECT PHASE I | FIGURE: 7 |

GENERAL NOTES:

1. THE SHAPE AND DIMENSIONS SHOWN FOR THE ADIT OPENING ARE APPROXIMATE.
2. FILL MATERIAL SHALL BE TAKEN FROM AN AREA AS DESIGNATED BY THE PROJECT MANAGER.
3. THE FINISH GRADE ON THE OUTSIDE SHALL HAVE POSITIVE DRAINAGE AWAY FROM THE ADIT.
4. MATERIAL SHALL BE LAID AT ANGLE OF REPOSE.
5. PROTECT HISTORIC TIMBER STRUCTURE AT 15_24a AND INSTALL AT LEAST 2' OF ROCK COVER.
6. INSTALL SURVEY MARKER (SUPPLIED BY AML PROGRAM) INTO ADJACENT COMPETENT ROCK AS DIRECTED BY PROJECT MANAGER.

| PUF DIMENSIONS | | |
|----------------|-------------------|--------------|
| Feature No | Dimensions (ft) | Volume (yd3) |
| AML 15_21a | 1'W x 3'L x 2'T | 0.22 |
| AML 15_24a | 10'W x 30'L x 9'T | 100 |
| AML 22_16 | 4.5'W x 4'H x 3'T | 2 |



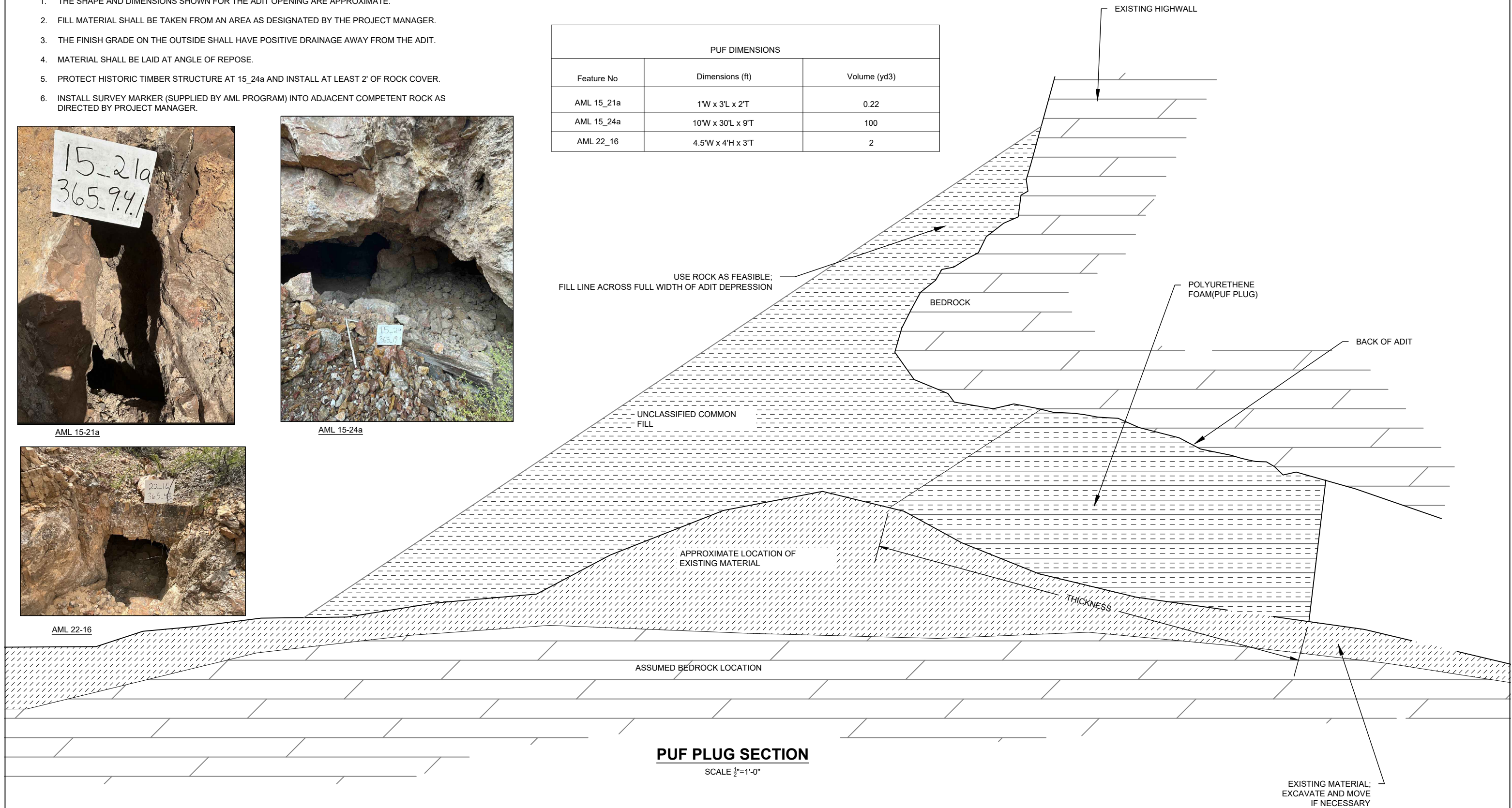
AML 15-21a



AML 15-24a



AML 22-16



PUF PLUG SECTION

SCALE 1/2"=1'-0"

CAUTION - THIS PROJECT REQUIRES CONSTRUCTION WORK IN, AROUND, AND OVER HAZARDOUS AND UNPROTECTED MINE SHAFTS, STOPES, ADITS, AND OTHER OPENINGS WHICH MAY BE OPEN TO THE SURFACE OR HIDDEN FROM VIEW BY TRASH, DEBRIS, OR THIN AND UNSTABLE LAYERS OF SURFACE MATERIALS OR ROCK. THE CONSTRUCTOR SHALL BE RESPONSIBLE FOR THOROUGHLY INVESTIGATING THE SITE CONDITIONS AND SCHEDULING EQUIPMENT, EQUIPMENT OPERATIONS, PERSONNEL AND SAFETY PROCEDURES TO PREVENT ACCIDENTS AND INJURIES.

| | | | |
|---|---|-----------------|--|
| ABANDONED MINE LAND PROGRAM | | | |
| MINING AND MINERALS DIVISION NEW MEXICO ENERGY, MINERALS, AND NATURAL RESOURCES DEPARTMENT | | | |
| SCALE: AS SHOWN | AML 15_24a, 15_21a, 22_16 | DRAWN BY: MWT | |
| DATE: 05/15/2024 | | REVISED BY: LDV | |
| PUF WITH WASTE ROCK COVER | | | |
| FILE: | RED HILL MINE SAFEGUARD PROJECT PHASE I | FIGURE: 8 | |

GENERAL NOTES:

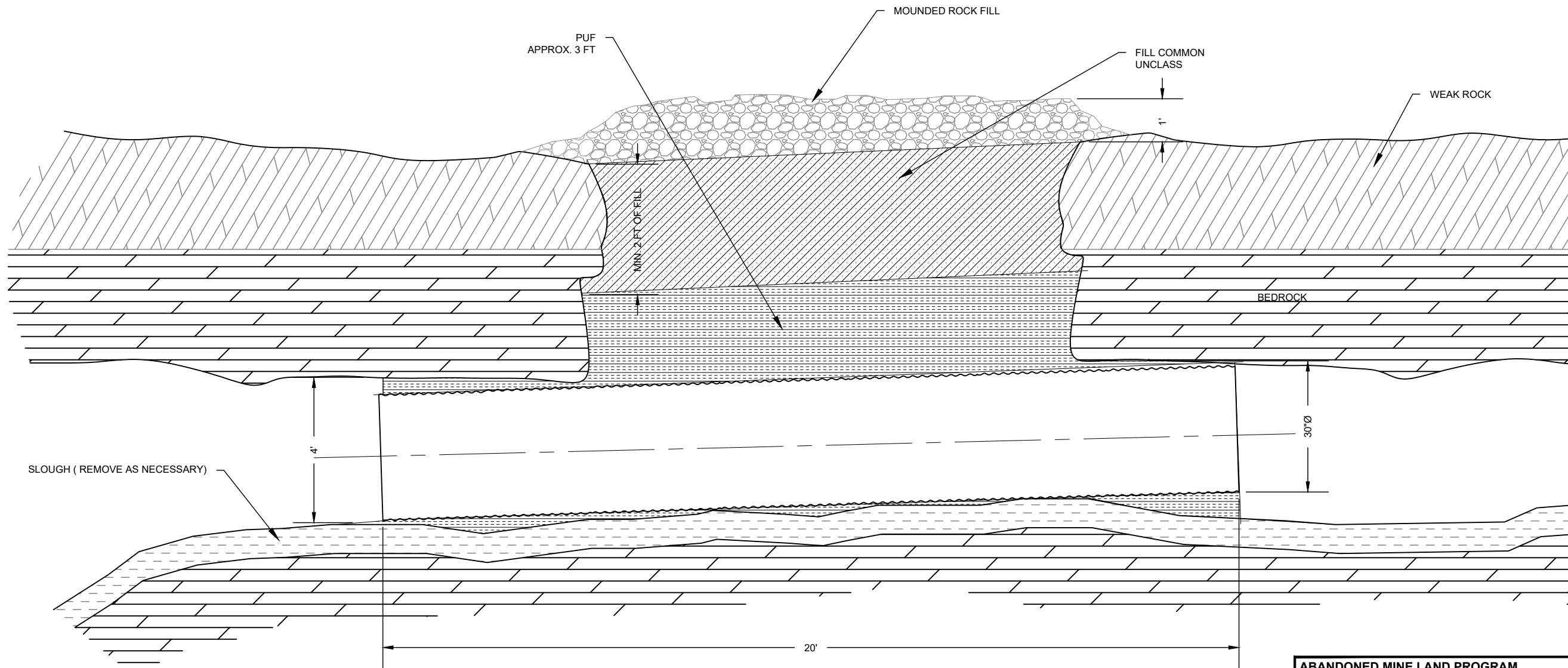
1. THE SHAPE AND DIMENSIONS SHOWN FOR THE EXISTING ADIT IN SHAFT OPENINGS ARE APPROXIMATE. FIELD VERIFY ALL DIMENSIONS BEFORE FABRICATION.
2. CULVERT MAY BE INSTALLED FROM ADIT NEAR MINE FEATURE.
3. SECTIONS OF CULVERT SHALL BE BANDED TOGETHER PER PROJECT SPECIFICATIONS.
4. VERIFY THAT THE OPENINGS OF THE CSP ARE NOT OBSTRUCTED BY FILL OR ROCK.
5. THE FINISH GRADE ON THE MOUNDED ROCK FILL SHALL HAVE POSITIVE DRAINAGE AWAY FROM THE STRUCTURE.
6. PLACE ROCK ON TOP OF COVER FILL.
7. INSTALL SURVEY MARKER (SUPPLIED BY AML PROGRAM) INTO ADJACENT COMPETENT ROCK AS DIRECTED BY PROJECT MANAGER.



AML 15_18 VIEW 2



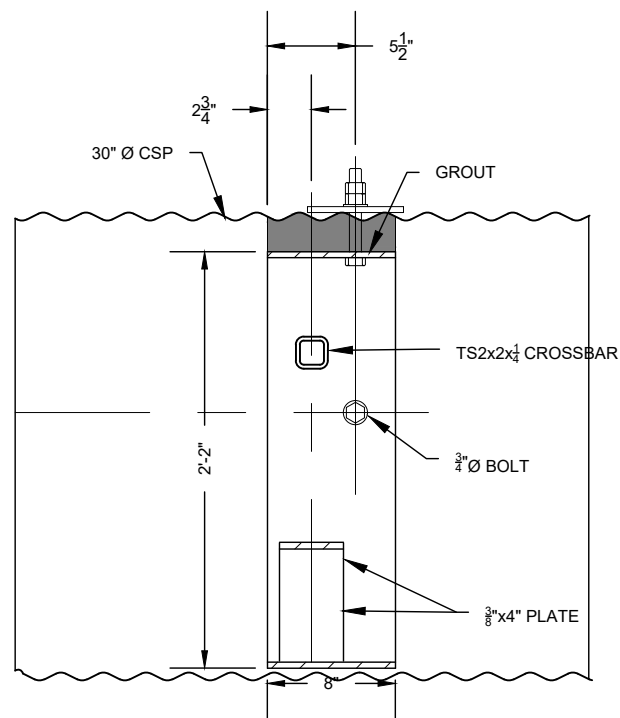
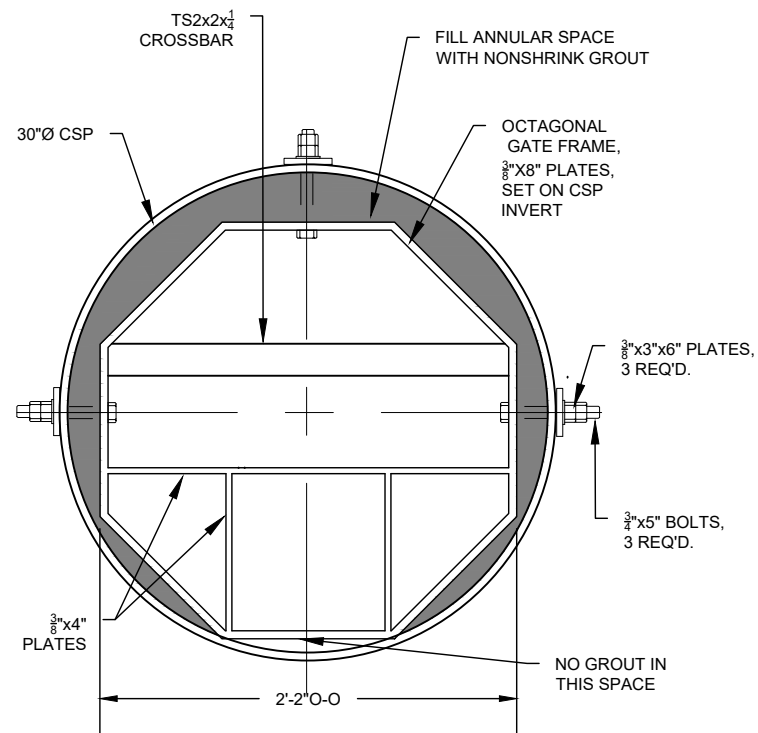
AML 15_18 VIEW 1



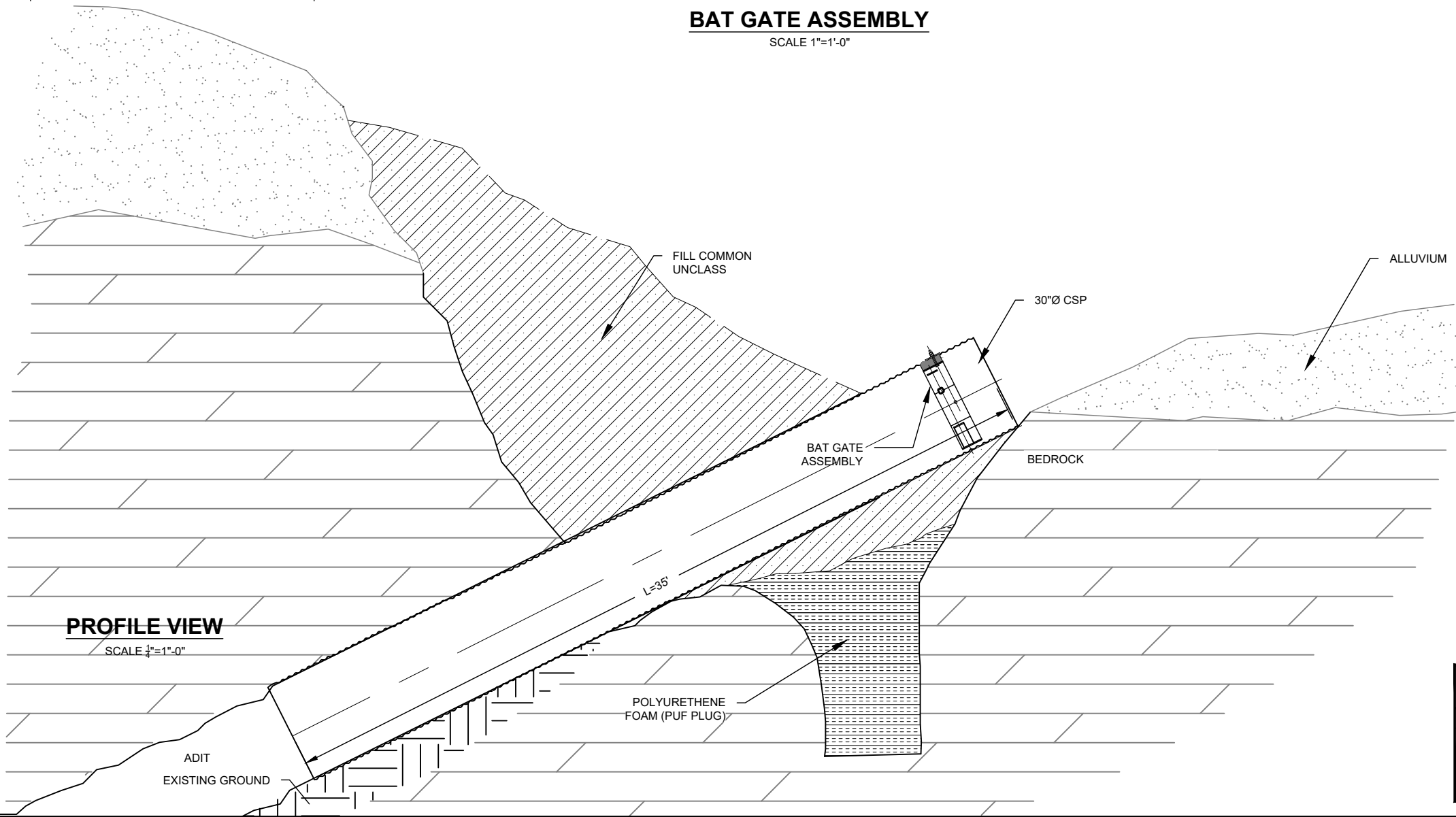
PROFILE VIEW
SCALE 3/8"=1'-0"

CAUTION - THIS PROJECT REQUIRES CONSTRUCTION WORK IN, AROUND, AND OVER HAZARDOUS AND UNPROTECTED MINE SHAFTS, STOPS, ADITS, AND OTHER OPENINGS WHICH MAY BE OPEN TO THE SURFACE OR HIDDEN FROM VIEW BY TRASH, DEBRIS, OR OTHER MATERIALS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THOROUGHLY INVESTIGATING THE CONDITIONS AND SCHEDULING EQUIPMENT, OPERATIONS, PERSONNEL AND SAFETY PROCEDURES TO PREVENT ACCIDENTS AND INJURIES.

| | | |
|---|---|-----------------|
| ABANDONED MINE LAND PROGRAM | | |
| MINING AND MINERALS DIVISION | | |
| NEW MEXICO ENERGY, MINERALS, AND NATURAL RESOURCES DEPARTMENT | | |
| SCALE: AS SHOWN | AML15_18 | DRAWN BY: MWT |
| DATE: 05/15/2024 | | REVISED BY: LDV |
| 30"Ø CULVERT | | |
| FILE: | RED HILL MINE SAFEGUARD PROJECT PHASE I | FIGURE: 9 |



BAT GATE ASSEMBLY
SCALE 1"=1'-0"



PROFILE VIEW
SCALE 1/4"=1'-0"

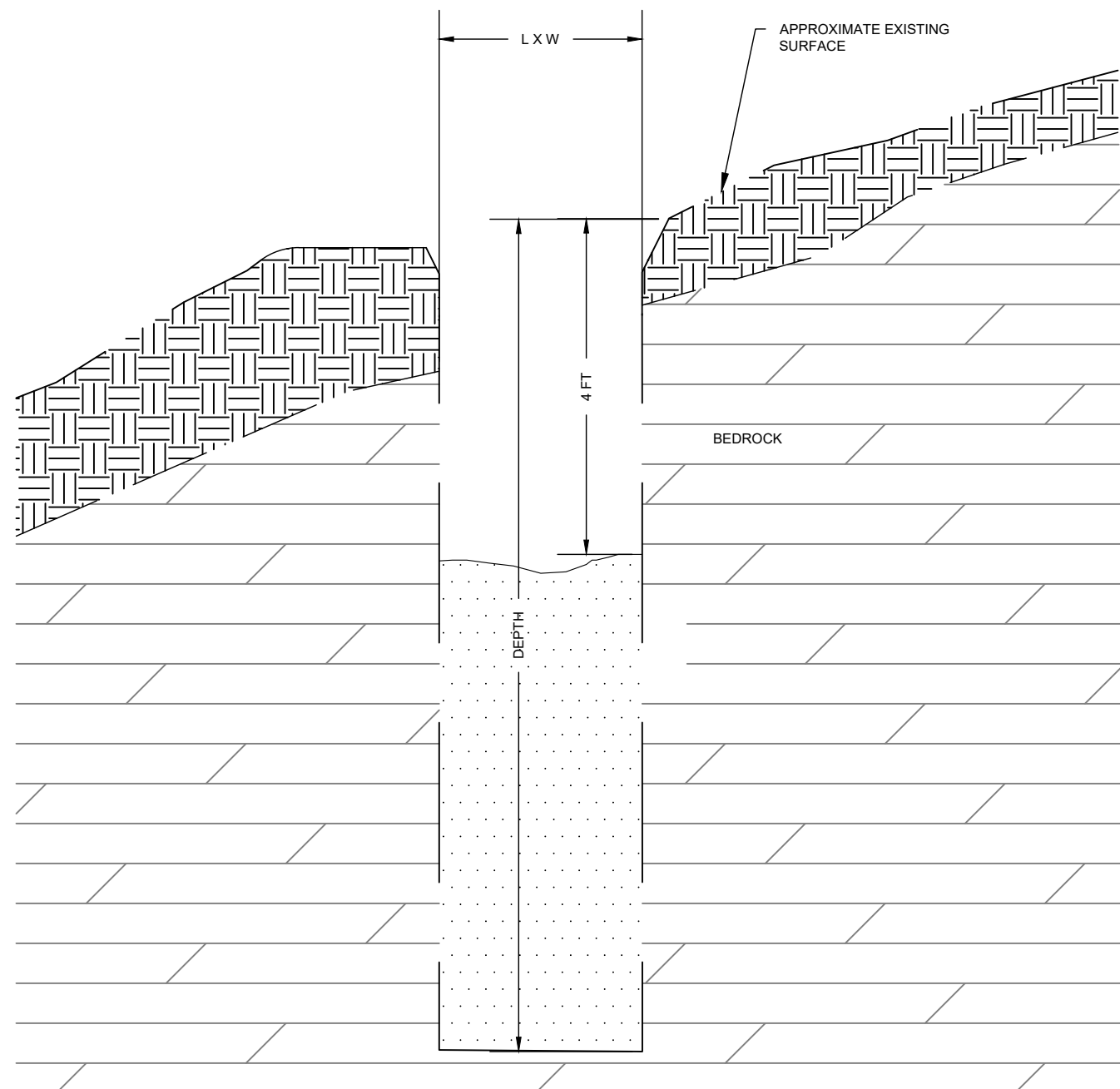
GENERAL NOTES:

1. THE SHAPE AND DIMENSIONS SHOWN FOR THE EXISTING ADIT OPENINGS ARE APPROXIMATE. FIELD VERIFY ALL DIMENSIONS BEFORE FABRICATION.
2. STEEL PLATES AND SHAPES SHALL BE WEATHERING STEEL. WELD ALL JOINTS. CONSTRUCT THE BAT GATE TO ELIMINATE SURFACES ON WHICH MOISTURE OR DEBRIS CAN BE TRAPPED. ALL TUBULAR MEMBERS SHALL BE HERMETICALLY SEALED TO PREVENT THE INCURSION OF MOISTURE, EXCEPT AS OTHERWISE NOTED. ROUND OR CHAMFER ALL EXPOSED SHARP CORNERS AND EDGES.
3. DOUBLE-NUT ALL BOLTS.
4. THE CONTRACTOR HAS THE OPTION OF USING 8" STEEL PLATE WHERE 4" STEEL PLATE IS SHOWN IN THE DRAWINGS.
5. VERIFY THAT THE OPENINGS OF THE CSP ARE NOT OBSTRUCTED BY FILL OR ROCK.
6. THE FINISH GRADE ON THE OUTSIDE OF THE CULVERT SHALL HAVE POSITIVE DRAINAGE AWAY FROM THE STRUCTURE.
7. BAND CULVERT SECTIONS TOGETHER.
8. GRADE CONSTRUCT HALF-MOON-SHAPED COMMON FILL FEATURE TO DIRECT UPHILL WATER AWAY FROM MINE FEATURE.
9. WEATHERING STEEL SHALL BE USED FOR ALL STEEL TUBING AND PLATING.
10. INSTALL SURVEY MARKER (SUPPLIED BY AML PROGRAM) INTO ADJACENT COMPETENT ROCK AS DIRECTED BY PROJECT MANAGER.



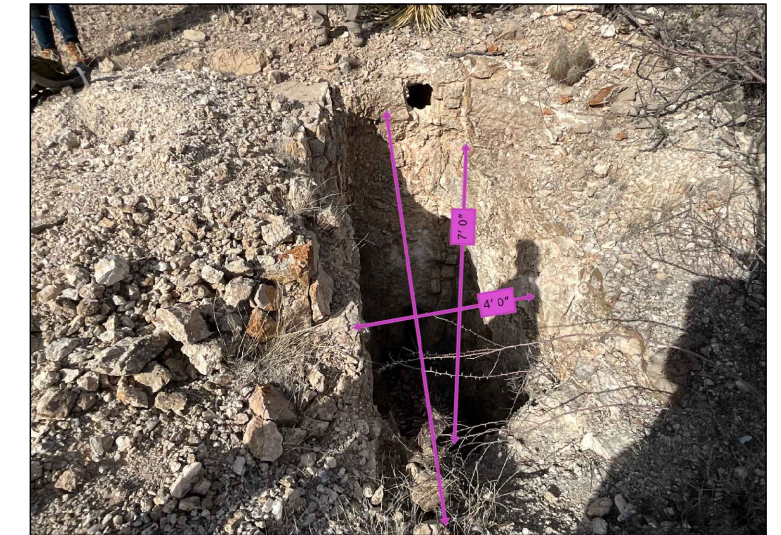
CAUTION - THIS PROJECT REQUIRES CONSTRUCTION WORK IN, AROUND, AND OVER HAZARDOUS AND UNPROTECTED MINE SHAFTS, STOPES, ADITS, AND OTHER OPENINGS WHICH MAY BE OPEN TO THE SURFACE OR HIDDEN FROM VIEW BY TRASH, DEBRIS, OR THIN AND UNSTABLE LAYERS OF SURFACE MATERIALS OR ROCK. THE CONSTRUCTOR SHALL BE RESPONSIBLE FOR THOROUGHLY INVESTIGATING THE SITE CONDITIONS AND SCHEDULING EQUIPMENT, EQUIPMENT OPERATIONS, PERSONNEL AND SAFETY PROCEDURES TO PREVENT ACCIDENTS AND INJURIES.

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| ABANDONED MINE LAND PROGRAM | | |
| MINING AND MINERALS DIVISION | | |
| NEW MEXICO ENERGY, MINERALS, AND NATURAL RESOURCES DEPARTMENT | | |
| SCALE: AS SHOWN | AML22_13 | DRAWN BY: MWT |
| DATE: 05/15/2024 | | REVISED BY: LDV |
| 30"Ø DECLINE CULVERT WITH BAT GATE | | |
| FILE: | RED HILL MINE SAFEGUARD PROJECT PHASE I | FIGURE: 10 |



SHAFT BACKFILL SECTION
SCALE 1"=0"=1"-0"

| SHAFT DIMENSIONS | |
|------------------|---------------------------|
| Feature No | Dimensions (ft) W x L x D |
| AML 16_11 | 4' x 7' x 7' |
| AML 15_24a | 6' x 7' x 7' |



AML 16-11



AML 22-04

GENERAL NOTES:

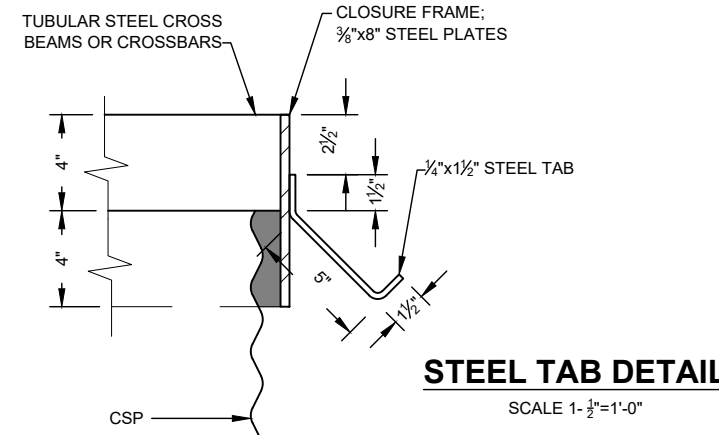
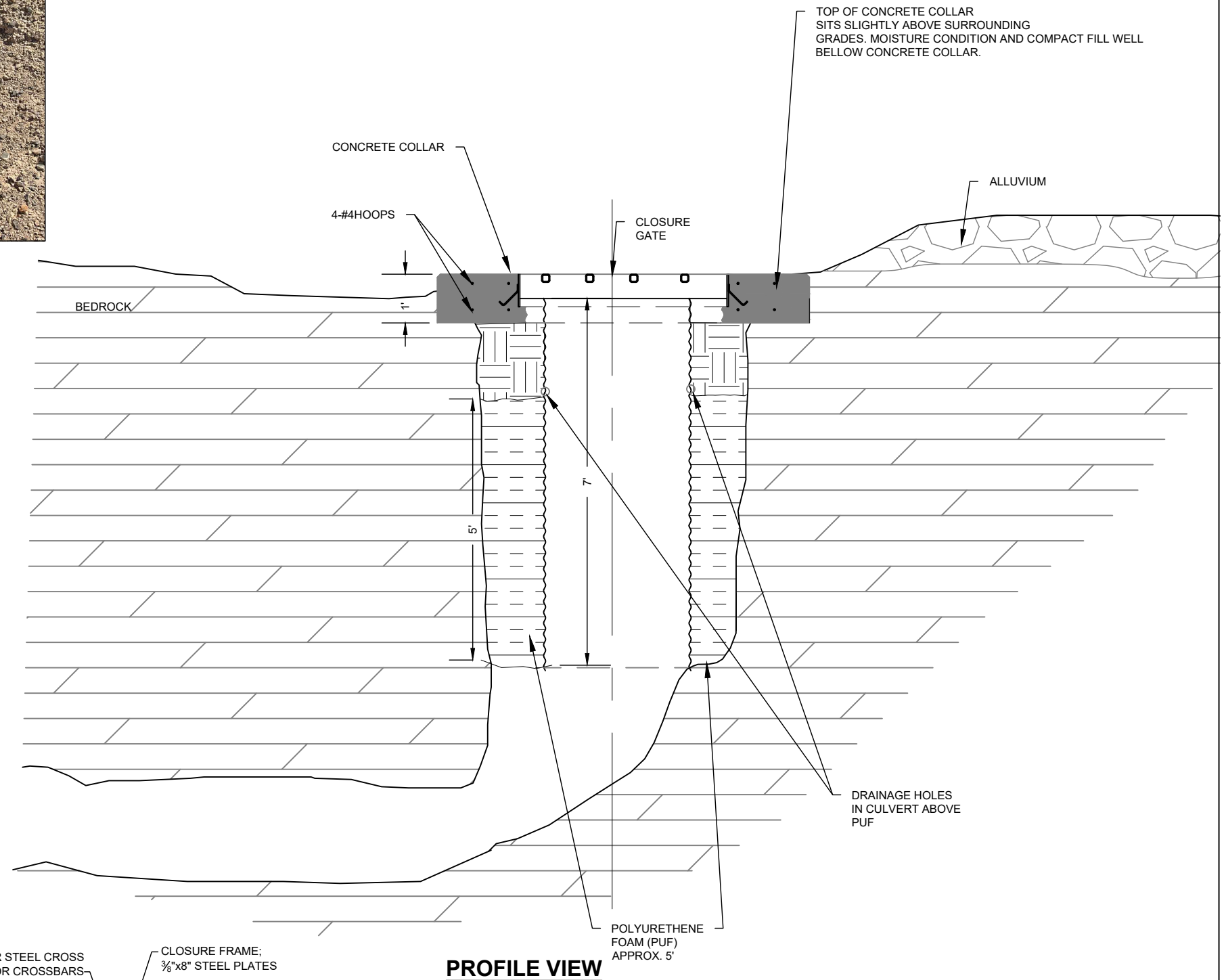
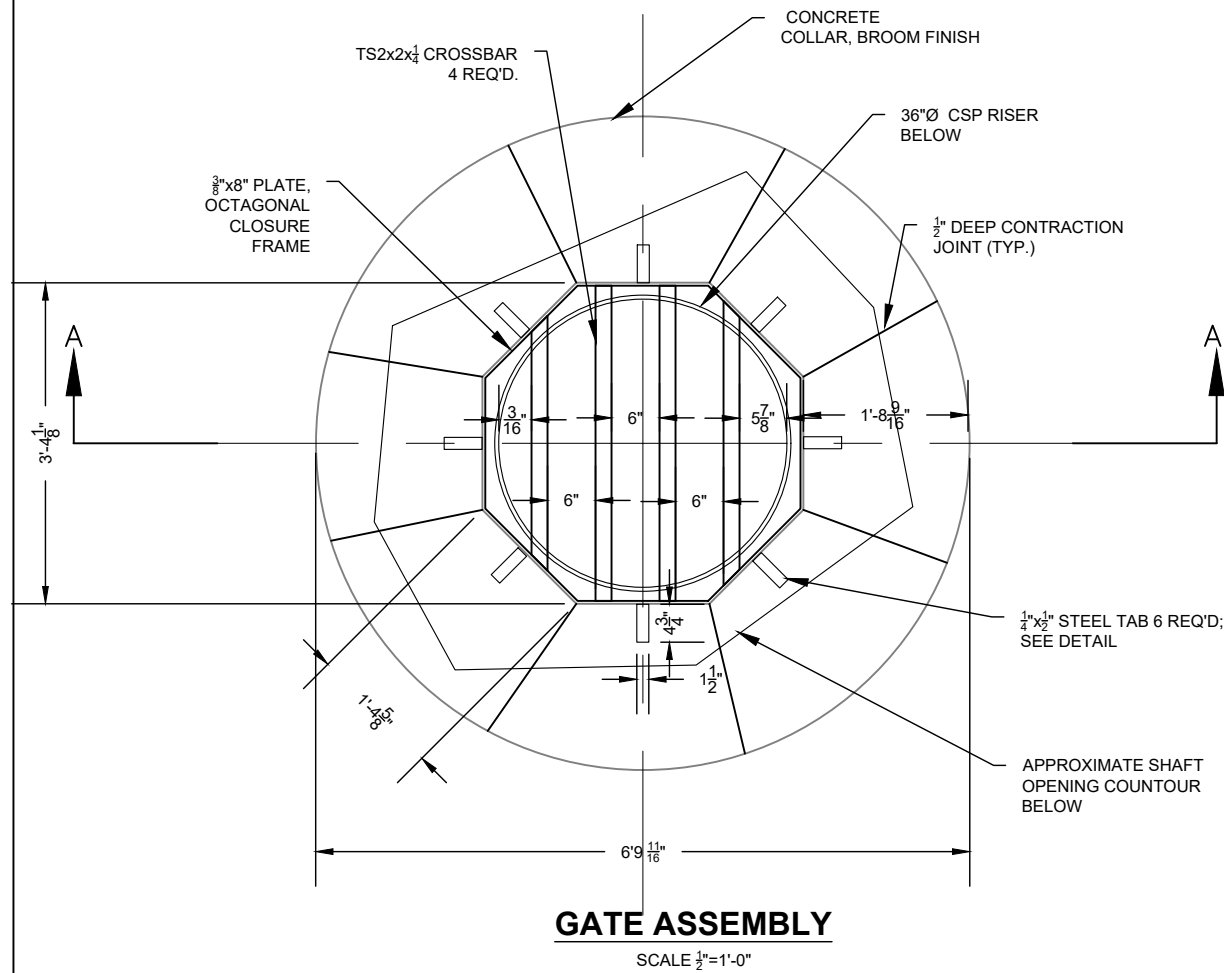
1. THE FILL AT AND ABOVE DRIFT LEVELS SHALL CONSIST OF THE COARSEST MATERIAL AVAILABLE. SMALLER MATERIAL MAY BE USED ELSEWHERE. SEE THE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
2. AS PRACTICABLE, SHAPE THE REMAINING MINE WASTE MATERIAL TO RESEMBLE UNDISTURBED MINE WASTE PILES.
3. THE LENGTH AND WIDTH OF THE TOP OF THE MOUND SHALL BE EQUAL TO OR GREATER THAN THE INTERNAL SHAFT LENGTH AND WIDTH RESPECTIVELY.
4. FEATURE 22_04 ADD 3' OF HAND BACKFILL. PULL MATERIAL FROM WASTE PILE BELOW THE FEATURE.
5. FEATURE 16_11 HAND BACKFILL WITHIN 4FT OF COLLAR OF FEATURE.
6. LEAVE TIMBER IN PLACE AT FEATURE 22_04.
7. INSTALL SURVEY MARKER (SUPPLIED BY AML PROGRAM) INTO ADJACENT COMPETENT ROCK AS DIRECTED BY PROJECT MANAGER.

CAUTION - THIS PROJECT REQUIRES CONSTRUCTION WORK IN, AROUND, AND OVER HAZARDOUS AND UNPROTECTED MINE SHAFTS, STOPES, ADITS, AND OTHER OPENINGS WHICH MAY BE OPEN TO THE SURFACE OR HIDDEN FROM VIEW BY TRASH, DEBRIS, OR THIN AND UNSTABLE LAYERS OF SURFACE MATERIALS OR ROCK. THE CONSTRUCTOR SHALL BE RESPONSIBLE FOR THOROUGHLY INVESTIGATING THE SITE CONDITIONS AND SCHEDULING EQUIPMENT, EQUIPMENT OPERATIONS, PERSONNEL AND SAFETY PROCEDURES TO PREVENT ACCIDENTS AND INJURIES.

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| ABANDONED MINE LAND PROGRAM | | | |
| MINING AND MINERALS DIVISION NEW MEXICO ENERGY, MINERALS, AND NATURAL RESOURCES DEPARTMENT | | | |
| SCALE: AS SHOWN | AML16_11, 22_04 | DRAWN BY: MWT | |
| DATE: 05/15/2024 | | REVISED BY: LDV | |
| SHAFT BACKFILL | | | |
| FILE: | RED HILL MINE SAFEGUARD PROJECT PHASE I | FIGURE: 11 | |

GENERAL NOTES:

1. THE SHAPE AND DIMENSIONS SHOWN FOR THE EXISTING ADIT OPENINGS ARE APPROXIMATE. FIELD VERIFY ALL DIMENSIONS BEFORE FABRICATION.
2. STEEL PLATES AND SHAPES SHALL BE WEATHERING STEEL. WELD ALL JOINTS. CONSTRUCT THE BAT GATE TO ELIMINATE SURFACES ON WHICH MOISTURE OR DEBRIS CAN BE TRAPPED. ALL TUBULAR MEMBERS SHALL BE HERMETICALLY SEALED TO PREVENT THE INCURSION OF MOISTURE, EXCEPT AS OTHERWISE NOTED. ROUND OR CHAMFER ALL EXPOSED SHARP CORNERS AND EDGES.
3. VERIFY THAT THE OPENING OF THE CSP ARE NOT OBSTRUCTED BY FILL OR ROCK.
4. THE FINISH GRADE ON THE OUTSIDE OF THE CULVERT SHALL HAVE POSITIVE DRAINAGE AWAY FROM THE STRUCTURE.
5. WEATHERING STEEL SHALL BE USED FOR ALL THE STEEL TUBING AND PLATING.
6. INSTALL SURVEY MARKER (SUPPLIED BY AML PROGRAM) INTO ADJACENT COMPETENT ROCK AS DIRECTED BY PROJECT MANAGER.



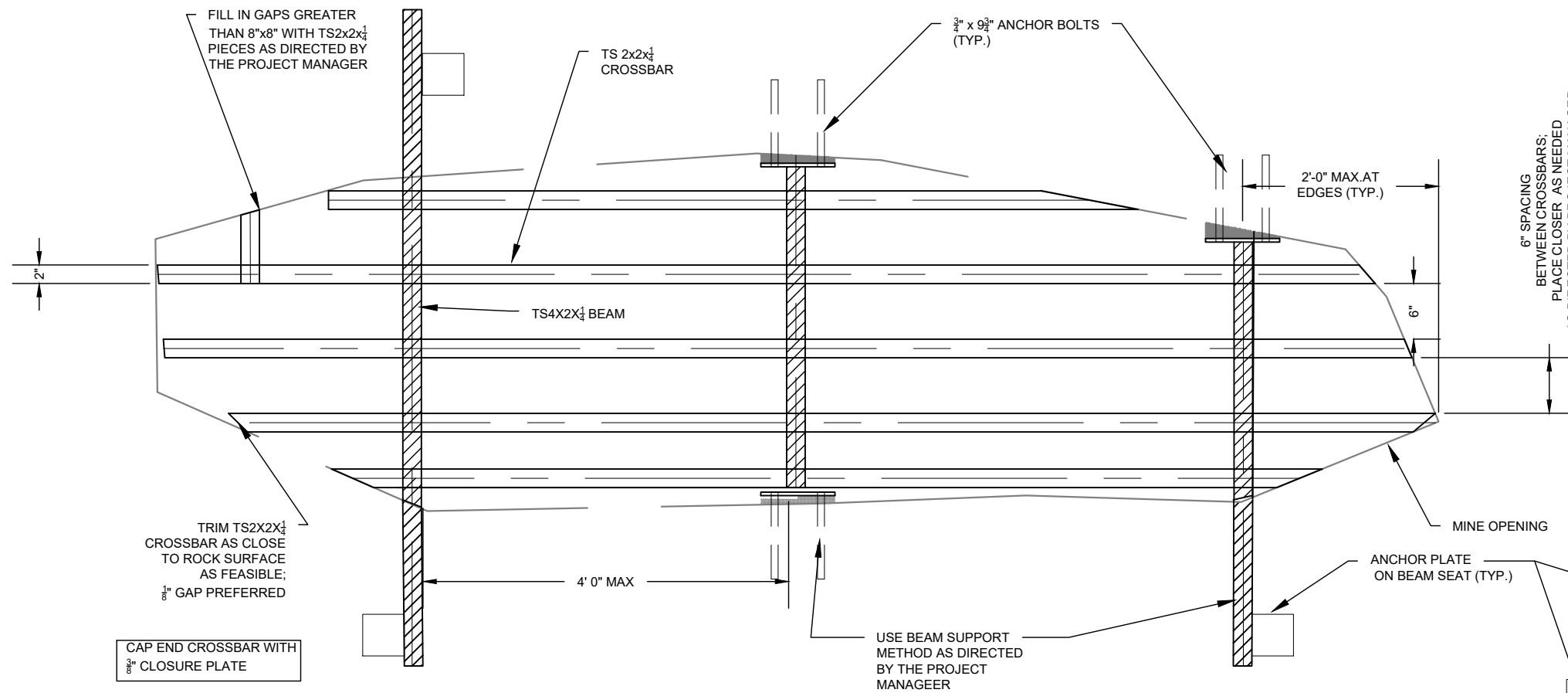
CAUTION - THIS PROJECT REQUIRES CONSTRUCTION WORK IN, AROUND, AND OVER HAZARDOUS AND UNPROTECTED MINE SHAFTS, STOPES, ADITS, AND OTHER OPENINGS WHICH MAY BE OPEN TO THE SURFACE OR HIDDEN FROM VIEW BY TRASH, DEBRIS, OR THIN AND UNSTABLE LAYERS OF SURFACE MATERIALS OR ROCK. THE CONSTRUCTOR SHALL BE RESPONSIBLE FOR THOROUGHLY INVESTIGATING THE SITE CONDITIONS AND SCHEDULING EQUIPMENT, EQUIPMENT OPERATIONS, PERSONNEL AND SAFETY PROCEDURES TO PREVENT ACCIDENTS AND INJURIES.

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| ABANDONED MINE LAND PROGRAM MINING AND MINERALS DIVISION NEW MEXICO ENERGY, MINERALS, AND NATURAL RESOURCES DEPARTMENT | | | |
| SCALE: AS SHOWN DATE: 05/15/2024 | AML15_17 | DRAWN BY: MWT REVISED BY: LDV | |
| AIRFLOW CLOSURE | | | |
| FILE: | RED HILL MINE SAFEGUARD PROJECT PHASE I | FIGURE: 12 | |

CAUTION - THIS PROJECT REQUIRES CONSTRUCTION WORK IN, AROUND, AND OVER HAZARDOUS AND UNPROTECTED MINE SHAFTS, STOPS, ADITS, AND OTHER OPENINGS WHICH MAY BE OPEN TO THE SURFACE OR HIDDEN FROM VIEW BY TRASH, DEBRIS, OR THIN AND UNSTABLE LAYERS OF SURFACE MATERIALS OR ROCK. THE CONSTRUCTOR SHALL BE RESPONSIBLE FOR THOROUGHLY INVESTIGATING THE SITE CONDITIONS AND SCHEDULING EQUIPMENT, EQUIPMENT OPERATIONS, PERSONNEL AND SAFETY PROCEDURES TO PREVENT ACCIDENTS AND INJURIES.

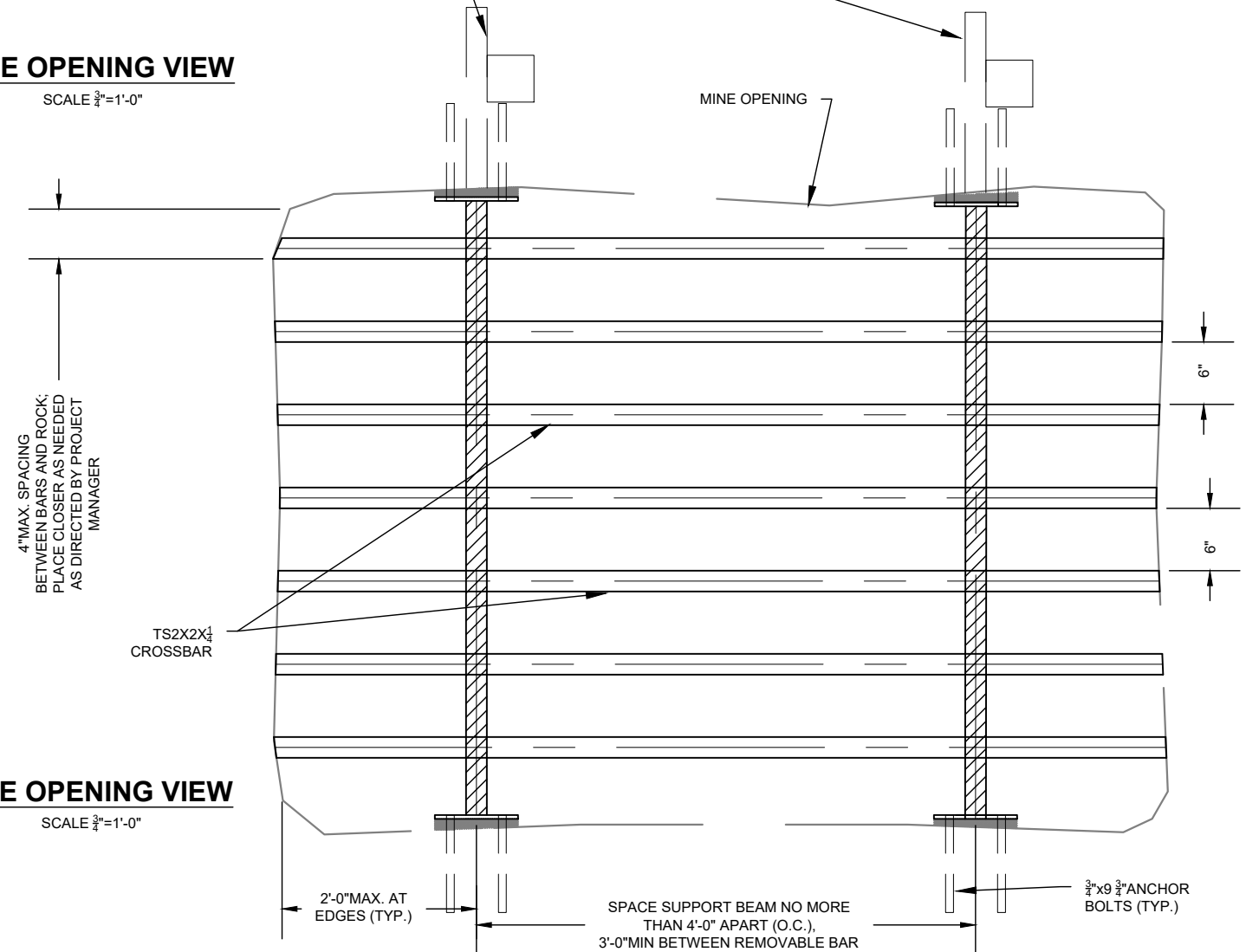
GENERAL NOTES:

1. THIS DRAWING SHOWS TWO EXAMPLE MINE OPENINGS AND THE CORRESPONDING LAYOUTS OF THE STEEL CLOSURE. THE DRAWING SHALL BE USED AS A GUIDE FOR FIELD LAYOUT. DETERMINE THE ACTUAL LAYOUTS AND DIMENSIONS OF THE CLOSURES IN THE FIELD PRIOR TO FABRICATION.
2. INSTALL HORIZONTAL BAT GATES AS CLOSE TO THE TOP OF THE SHAFT OPENINGS AS POSSIBLE, WHERE THE ROCK AT THE GATE LOCATIONS IS FULLY COMPETENT.
3. REMOVE LOOSE ROCK AT CLOSURES PRIOR TO FABRICATION AND FIELD ERECTION OF THE CLOSURES. MINIMIZE THE AMOUNT OF ROCK AND OTHER DEBRIS THAT FALL INTO THE MINE OPENINGS DURING CONSTRUCTION. PULL LOOSE MATERIAL UP AND AWAY FROM THE MINE AREA.
4. USE BEAM SUPPORTS OR BEAM SEATS, AT CONTRACTOR'S DIRECTION AND APPROVAL FROM THE PROJECT MANAGER, TO FASTEN BEAM ENDS TO COMPETENT ROCK.
5. UNLESS OTHERWISE ACCEPTED BY THE PROJECT ENGINEER, PLACE TS BEAMS ACROSS THE SPAN (WIDTH) OF THE SHAFT OPENING.
6. INSTALL SURVEY MARKER (SUPPLIED BY AML PROGRAM) INTO CONCRETE OR ADJACENT COMPETENT ROCK AS DIRECTED BY THE PROJECT MANAGER.
7. FOR AML 15_01 UTILIZE SONOTUBE FOOTERS ON NORTHERN SIDE OF FEATURE ADJACENT TO ACCESS ROAD.
8. WEATHERING STEEL SHALL BE USED FOR ALL STEEL TUBING AND PLATING.
9. INSTALL SURVEY MARKER (SUPPLIED BY AML PROGRAM) INTO ADJACENT COMPETENT ROCK AS DIRECTED BY PROJECT MANAGER.



MINE OPENING VIEW

SCALE 3/4"=1'-0"



AML 15-01

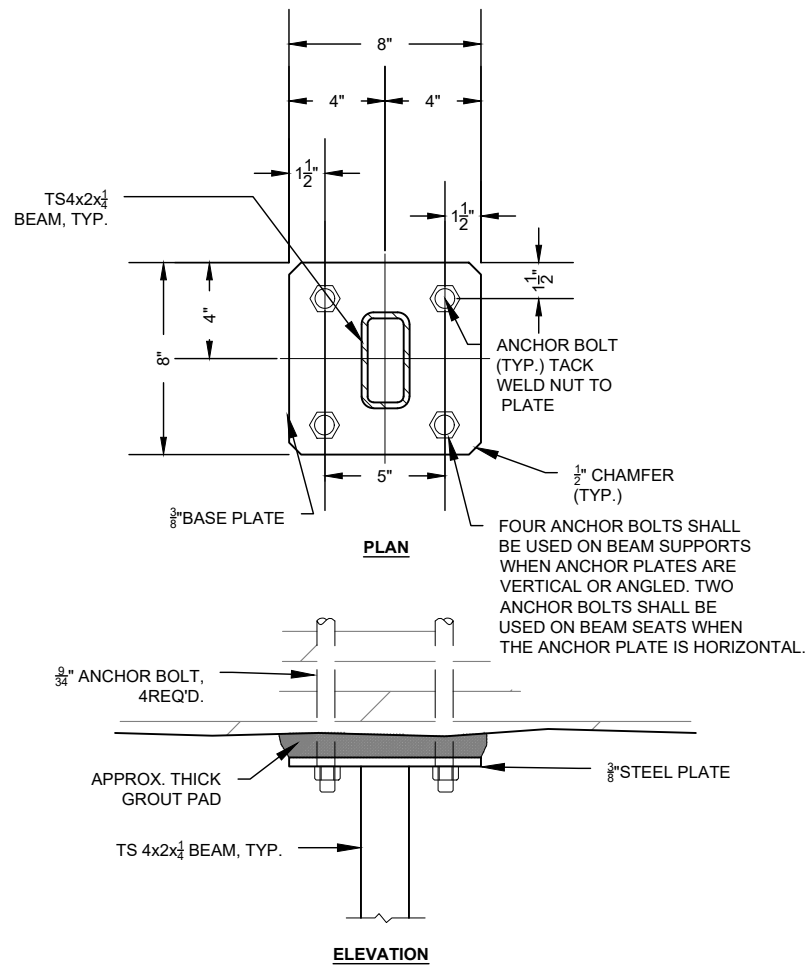


AML 15-04

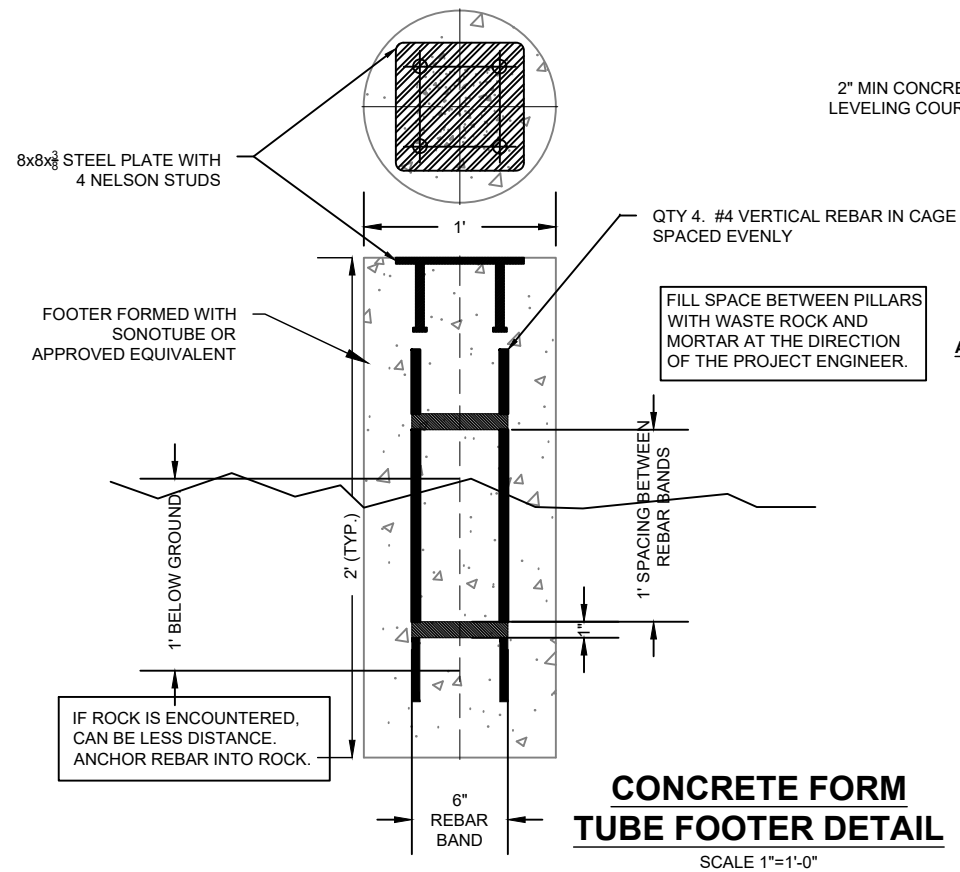


AML 15-20

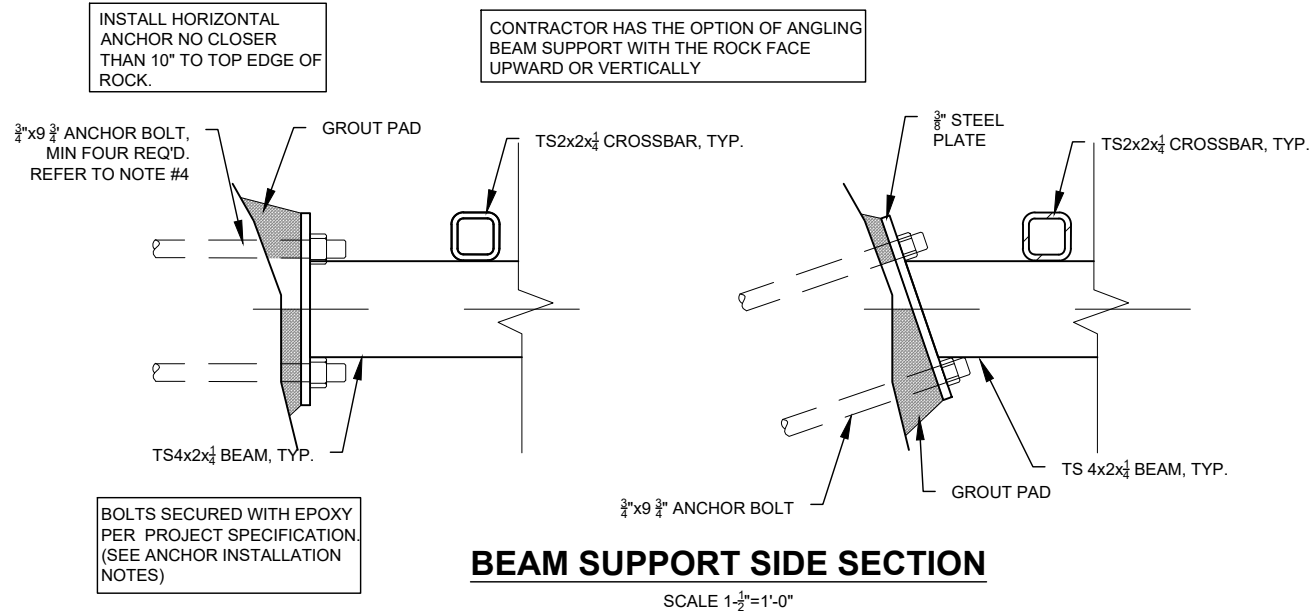
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|---|---|-----------------|
| ABANDONED MINE LAND PROGRAM | | |
| MINING AND MINERALS DIVISION | | |
| NEW MEXICO ENERGY, MINERALS, AND NATURAL RESOURCES DEPARTMENT | | |
| SCALE: AS SHOWN | AML15_01, 15_04, 15_20 | DRAWN BY: MWT |
| DATE: 05/15/2024 | | REVISED BY: LDV |
| HORIZONTAL BAT GATE ON SHAFT | | |
| FILE: | RED HILL MINE SAFEGUARD PROJECT PHASE I | FIGURE: 13 |



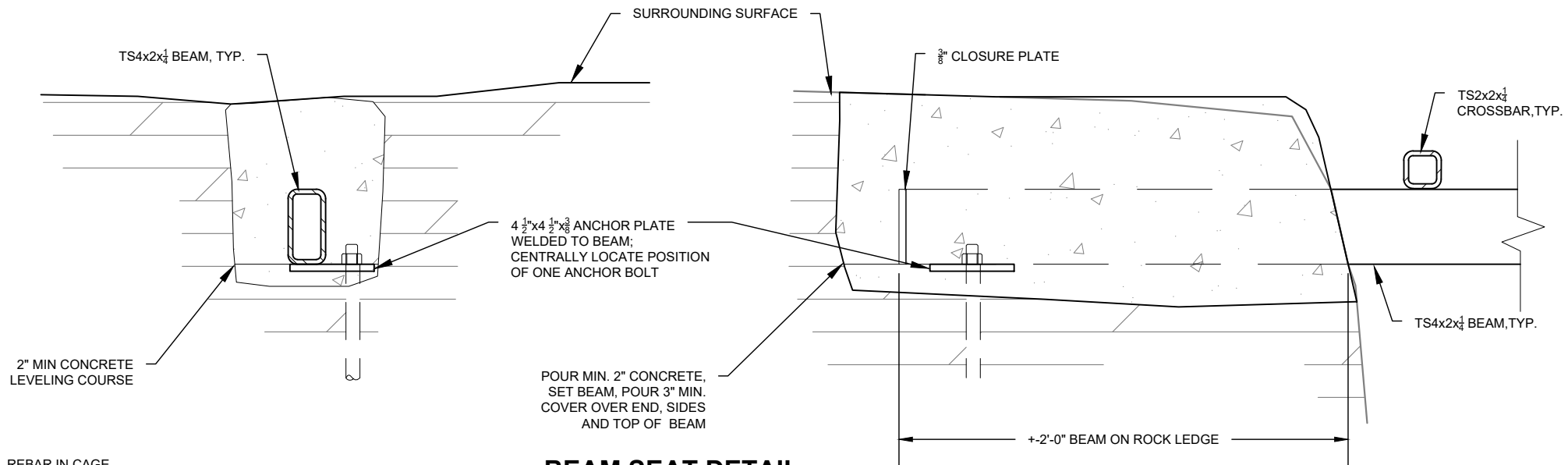
FOUR ANCHOR BOLTS SHALL BE USED ON BEAM SUPPORTS WHEN ANCHOR PLATES ARE VERTICAL OR ANGLED. TWO ANCHOR BOLTS SHALL BE USED ON BEAM SEATS WHEN THE ANCHOR PLATE IS HORIZONTAL.



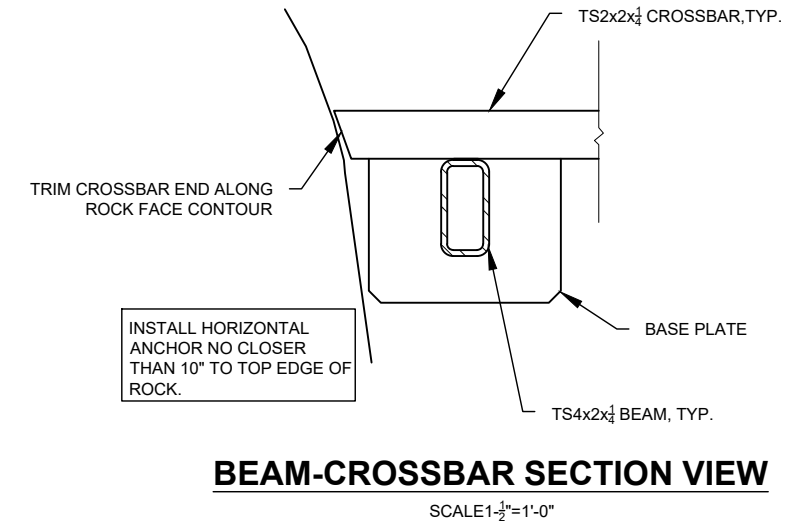
CONCRETE FORM TUBE FOOTER DETAIL
SCALE 1"=1'-0"



BEAM SUPPORT SIDE SECTION
SCALE 1 1/2"=1'-0"



BEAM SEAT DETAIL
SCALE 1 1/2"=1'-0"



BEAM-CROSSBAR SECTION VIEW
SCALE 1 1/2"=1'-0"

CAUTION - THIS PROJECT REQUIRES CONSTRUCTION WORK IN, AROUND AND OVER UNSTABLE MATERIALS AND/OR UNSTABLE SURFACES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THOROUGHLY INVESTIGATING THE SITE CONDITIONS AND SCHEDULING EQUIPMENT, PERSONNEL AND SAFETY PROCEDURES TO PREVENT ACCIDENTS AND INJURIES.

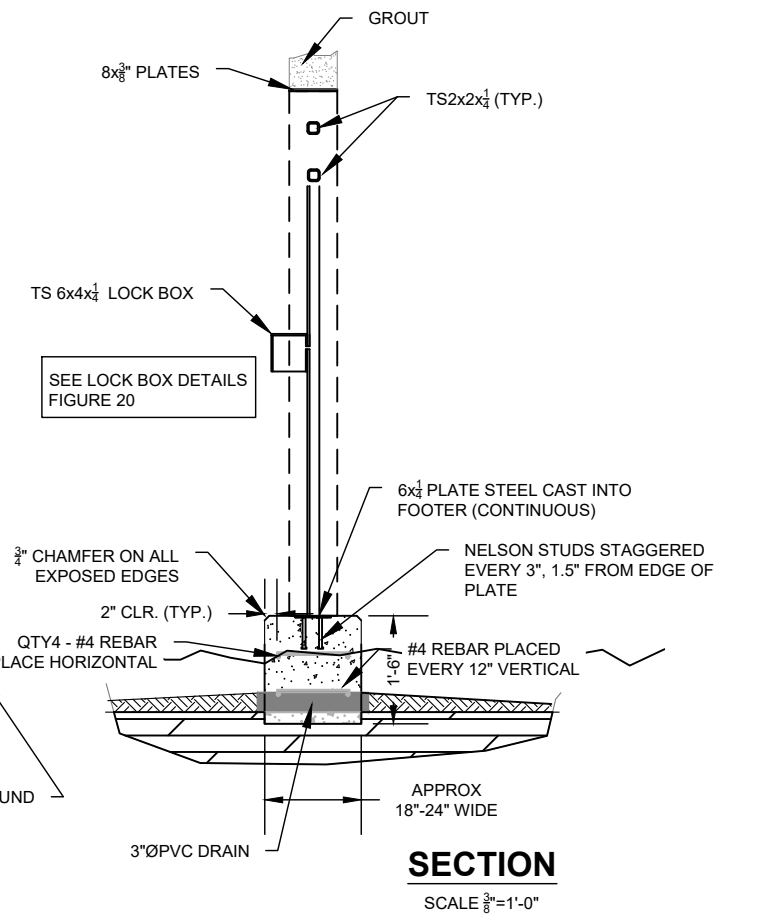
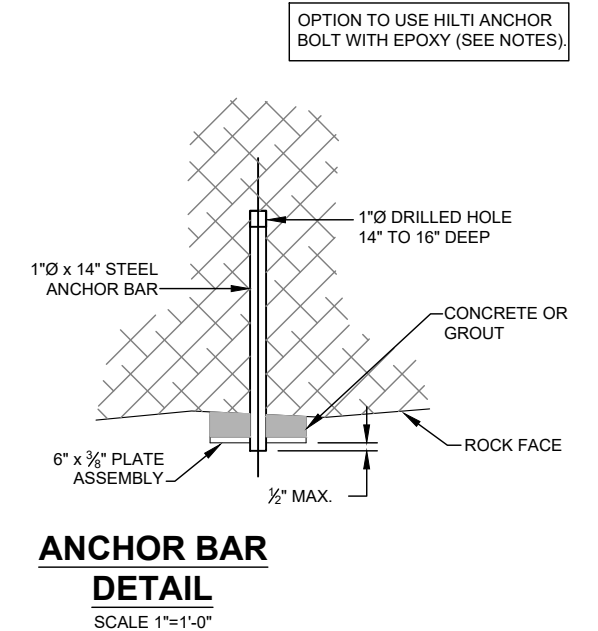
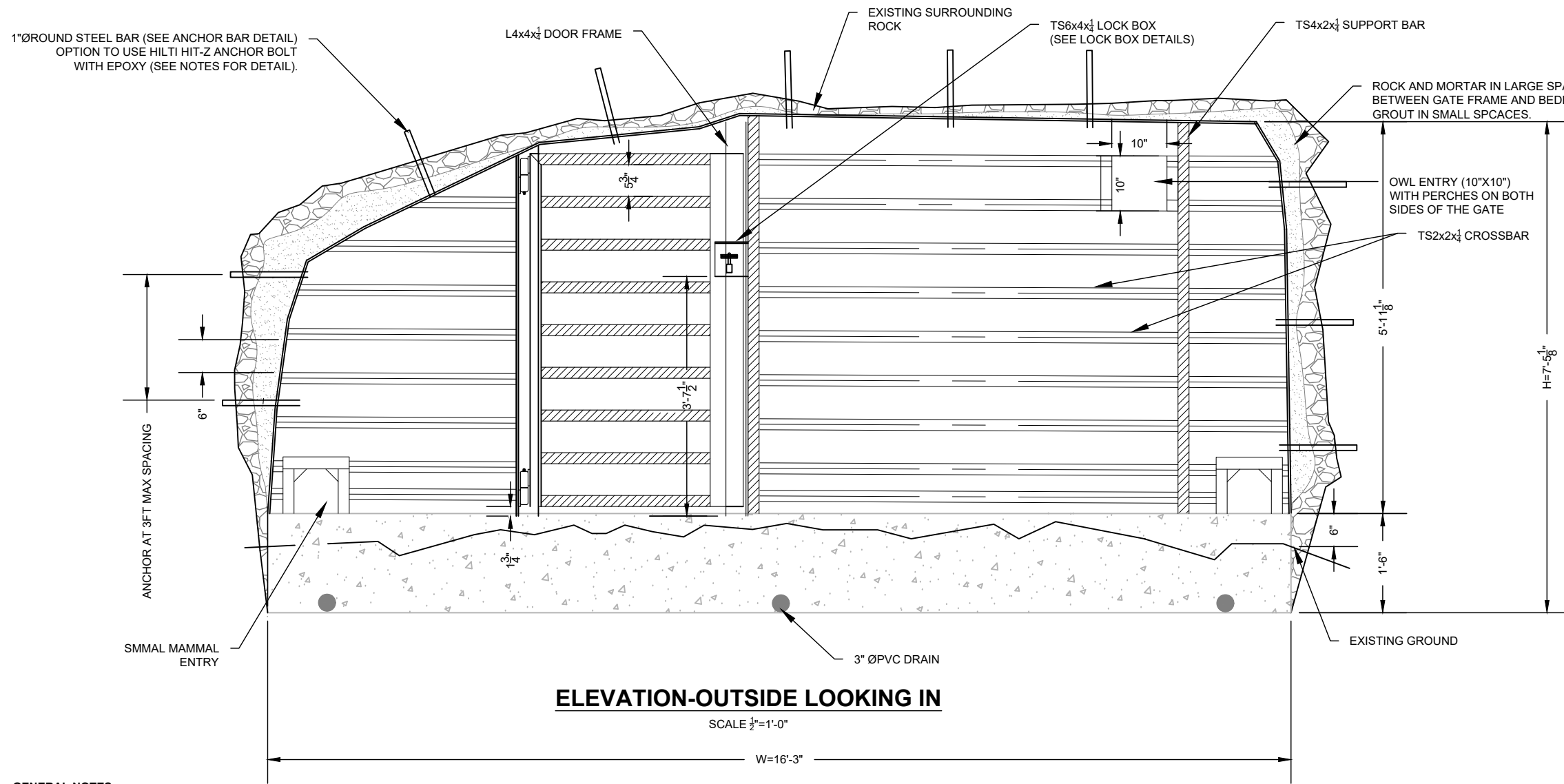
GENERAL NOTES:

1. POSITION CLOSURE AT THE TOP OF THE SHAFT AT A STABLE LOCATION AS DIRECTED BY THE PROJECT MANAGER. IF THERE IS POTENTIAL FOR ROCK ACCUMULATION FROM ABOVE, STRUCTURE SHOULD BE ANGLED DOWNHILL IF POSSIBLE TO ALLOW THE ROCKS TO SLIDE OFF.
2. MINIMIZE THE AMOUNT OF ROCK AND OTHER DEBRIS THAT FALL INTO THE MINE OPENINGS DURING CONSTRUCTION. PULL LOOSE MATERIAL UP AND AWAY FROM THE MINE AREA.
3. USE BEAM SUPPORTS, BEAM SEATS OR CONCRETE FORM TUBE FOOTERS AT CONTRACTOR'S OPTION WITH CONCURRENCE FROM THE PROJECT MANAGER, TO FASTEN BEAM ENDS TO COMPETENT ROCK.
4. USE 2 ANCHOR BOLTS WHEN SUPPORT BEAMS ARE FIXED ONTO GROUND OUTSIDE OF MINE FEATURE. USE 4 ANCHOR BOLTS WHEN SUPPORT BEAMS ARE FIXED WITHIN THE INTERIOR WALLS OF THE MINE FEATURE.
5. STEEL SHAPES, PLATES AND BARS SHALL BE WEATHERING OR STAINLESS STEEL.
6. PUT 1/2 inch CHAMFER ON ANY CONCRETE EDGES.
7. ANCHOR BOLTS SHALL BE ZINC-PLATED HILTI HIT ADHESIVE ANCHORS OR APPROVED EQUIVALENT. FOLLOW MANUFACTURER'S RECOMMENDATIONS REGARDING INSTALLATION.
8. DO NOT FILL BEAMS WITH CONCRETE OR GROUT.
9. CAP ENDS OF OPEN TUBULAR STEEL WITH 3/8 inch PLATE.
10. INSTALL SURVEY MARKER (SUPPLIED BY AML PROGRAM) INTO ADJACENT COMPETENT ROCK AS DIRECTED BY THE PROJECT MANAGER.

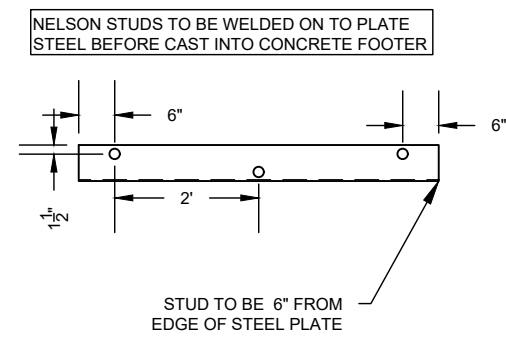
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|---|---|-----------------|
| ABANDONED MINE LAND PROGRAM | | |
| MINING AND MINERALS DIVISION NEW MEXICO ENERGY, MINERALS, AND NATURAL RESOURCES DEPARTMENT | | |
| SCALE: AS SHOWN | AML15_01, 15_04, 15_20 | DRAWN BY: MWT |
| DATE: 05/15/2024 | | REVISED BY: LDV |
| HORIZONTAL BAT GATE ON SHAFT DETAILS | | |
| FILE: | RED HILL MINE SAFEGUARD PROJECT PHASE I | FIGURE: 14 |

ANCHOR INSTALLATION NOTES:

1. SUPPORT BEAMS FOR HORIZONTAL BAT GATES SHALL BE ATTACHED TO THE SURROUNDING ROCK USING HILTI HIT-HY 200 ADHESIVE ANCHORING SYSTEM OR AN APPROVED EQUIVALENT.
2. HILTI HIT-HY 200 ADHESIVE IS AVAILABLE IN TWO OPTIONS, HILTI HIT-HY 200-A, AND HILTI HIT-HY 200-R. BOTH OPTIONS UTILIZE THE SAME TECHNICAL DATA. HILTI HIT-HY 200-A WILL HAVE SHORTER WORKING TIMES AND CURING TIMES THAN HILTI HIT-HY 200-R. THE PACKING FOR EACH IS DIFFERENT WHICH HELPS THE USER DISTINGUISH BETWEEN THE TWO ADHESIVES.
3. INJECTABLE ADHESIVE SHALL BE USED FOR INSTALLATION OF THREADED RODS (REBAR) (INSERTS) INTO EXISTING CONCRETE. ADHESIVE SHALL BE FURNISHED IN CONTAINERS WHICH KEEP COMPONENT A AND COMPONENT B SEPARATE. CONTAINERS SHALL BE DESIGNED TO ACCEPT STATIC MIXING NOZZLE WHICH THOROUGHLY BLENDS COMPONENT A AND COMPONENT B AND ALLOWS INJECTION OF THE MIXED ADHESIVE DIRECTLY INTO THE DRILLED HOLE.
4. ONLY INJECTION TOOLS AND STATIC MIXING NOZZLES SUPPLIED BY THE MANUFACTURER MAY BE USED. INJECTION ADHESIVE SHALL BE FORMULATED TO INCLUDE THE RESIN AND HARDENER TO PROVIDE OPTIMAL CURING SPEED, HIGH STRENGTH AND STIFFNESS. INJECTION ADHESIVE ANCHOR SYSTEM SHALL BE HILTI HIT-HY 200 INSTALLED USING HILTI SAFE SET TECHNOLOGY. HIT-HY 200 SYSTEM SHALL BE SUPPLIED BY HILTI.
5. THE ANCHORS SHALL BE HILTI HIT-Z-R ANCHORS ROD 3/4 DIAMETER X 9 3/4 LENGTH. DRILL HOLE LENGTH SHALL BE A 8 1/2 IN LENGTH AND THE DIAMETER SHALL BE 5/8.
6. WHEN USING HILTI HIT-Z-R ANCHOR RODS, DRILLING DUST DOES NOT NEED TO BE REMOVED FOR OPTIMUM CAPACITY WHEN BASE MATERIAL TEMPERATURES ARE GREATER THAN 41°F (5°C) AND A HAMMER DRILL WITH A CARBIDE TIPPED DRILL BIT IS USED. HOWEVER, THE HOLE SHALL BE CLEANED IF ANY OTHER TYPE OF DRILLING METHOD IS USED.
7. THE BOLT SHALL BE TORQUED TO 110FT-LB.
8. INSTALLATION OF EACH BOLT SHALL UTILIZE TWO WASHERS AND AT LEAST ONE NUT. TAKE MEASURES TO MAKE ALL NUTS UNREMOVABLE SUCH AS DESTROYING THE THREADS OR TACK WELDED.



- GENERAL NOTES:**
1. THIS DRAWING SHOWS THE GENERAL SHAPE AND APPROXIMATE PROFILE OF THE EGRESS ADIT AT THE INTENDED LOCATION OF THE CLOSURE. USE THE DRAWING AS A GUIDE FOR FIELD LAYOUT OF THE CLOSURE. FIELD VERIFY DIMENSIONS PRIOR TO FABRICATION.
 2. TUBULAR STEEL PLATES, AND SHAPES SHALL BE WEATHERING STEEL AS SPECIFIED. WELD ALL JOINTS. JOINTS SHALL BE TIGHT SO THAT MOISTURE CANNOT ENTER BETWEEN PILES OF MATERIAL. ROUND OR CHAMFER ALL SHARP EDGES AND CORNERS.
 3. PRIOR TO CONSTRUCTING THE FOOTER, REMOVE RUBBLE AND LEVEL THE FLOOR IN THE AREA OF THE CLOSURE AS SHOWN IN THE DRAWING AND AS DIRECTED BY THE AML PROGRAM MANAGER. COMPACT THE FOOTER BASE TO THE SATISFACTION OF THE PROJECT MANAGER, PRIOR TO POURING CONCRETE FOOTER.
 4. INSTALL HEAVY DUTY BARREL WELD-ON PIVOT HINGES (1,000lb/PAIR CAPACITY) AS SHOWN AND AS SPECIFIED. BOTH HINGES SHALL BE INSTALLED TO SUPPORT THE DOOR AND SHALL BE IN-LINE AND OPERATE SMOOTHLY WHEN THE DOOR IS HUNG.
 5. CONSTRUCT AND INSTALL THE DOOR AND DOOR FRAME TRUE, SQUARE AND PLUMB. THE DOOR SHALL CLOSE SNUGGLY AGAINST THE FRONT FACE OF THE DOOR FRAME WITH NO MORE THAN A $\frac{3}{8}$ " GAP AT ANY POINT ALONG THE FRONT FACE OF BOTH SIDES OF THE DOOR AND FRAME WHEN THE DOOR IS CLOSED.
 6. GROUT AND MORTAR SHALL BE CONSTRUCTION GRADE.
 7. PLACE A $\frac{3}{8}$ " CHAMFER ON ALL EXPOSED EDGES OF CONCRETE FOOTER.
 8. TOLERANCE ON THE CENTER-TO-CENTER DIMENSIONS BETWEEN POSTS SHALL BE $\pm \frac{1}{16}$ ".
 9. PLACE A SURVEY MARKER, PROVIDED BY AML PROGRAM, INTO ADJACENT COMPETENT ROCK AS DIRECTED BY PROJECT MANAGER.
 10. ROCK AND MORTAR LARGE GAPS AROUND GATE FRAME.
 11. REMOVE WASTE ROCK IN FRONT OF FEATURE.
 12. INSTALL TS 2X2X $\frac{1}{4}$ " CLOSURE BARS ON GAPS BETWEEN ROCK AND PLATE STEEL.
 13. WEATHERING STEEL SHALL BE USED FOR ALL THE STEEL TUBING AND PLATING.
 14. GATES SHALL BE SECURED IN PLACE WITH 1" DIAMETER ROUND STEEL BAR DRIVEN INTO 1" DIAMETER HOLE (SEE ANCHOR BAR DETAIL). CONTRACTOR HAS OPTION TO USE $\frac{3}{4}$ " x 9 $\frac{3}{4}$ " HILTI HIT-Z ANCHOR BOLT WITH EPOXY OR APPROVED EQUIVALENT IN PLACE OF ROUND STEEL BAR. FOR WEAK ROCK AND WITH APPROVAL OF PROJECT ENGINEER, CONTRACTOR HAS OPTION TO USE $\frac{1}{2}$ " x 7 $\frac{3}{4}$ " HILTI HIT-Z ANCHOR BOLT WITH EPOXY OR APPROVED EQUIVALENT. DRILL HOLE FOR HILTI ANCHORS SHALL BE $\frac{1}{8}$ " INCH LARGER THAN ANCHOR DIAMETER.



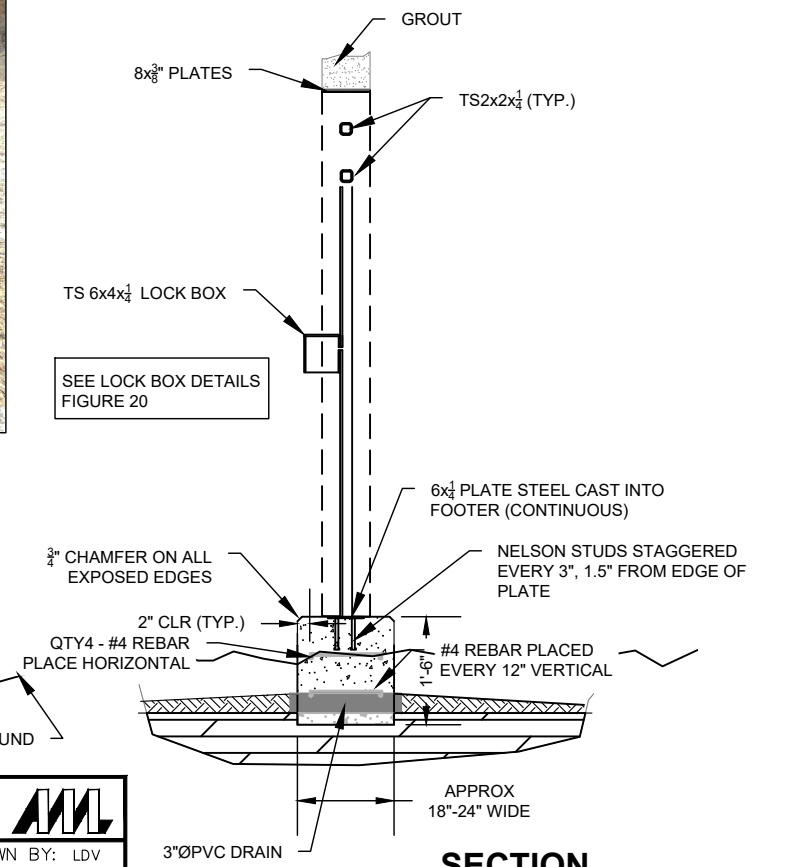
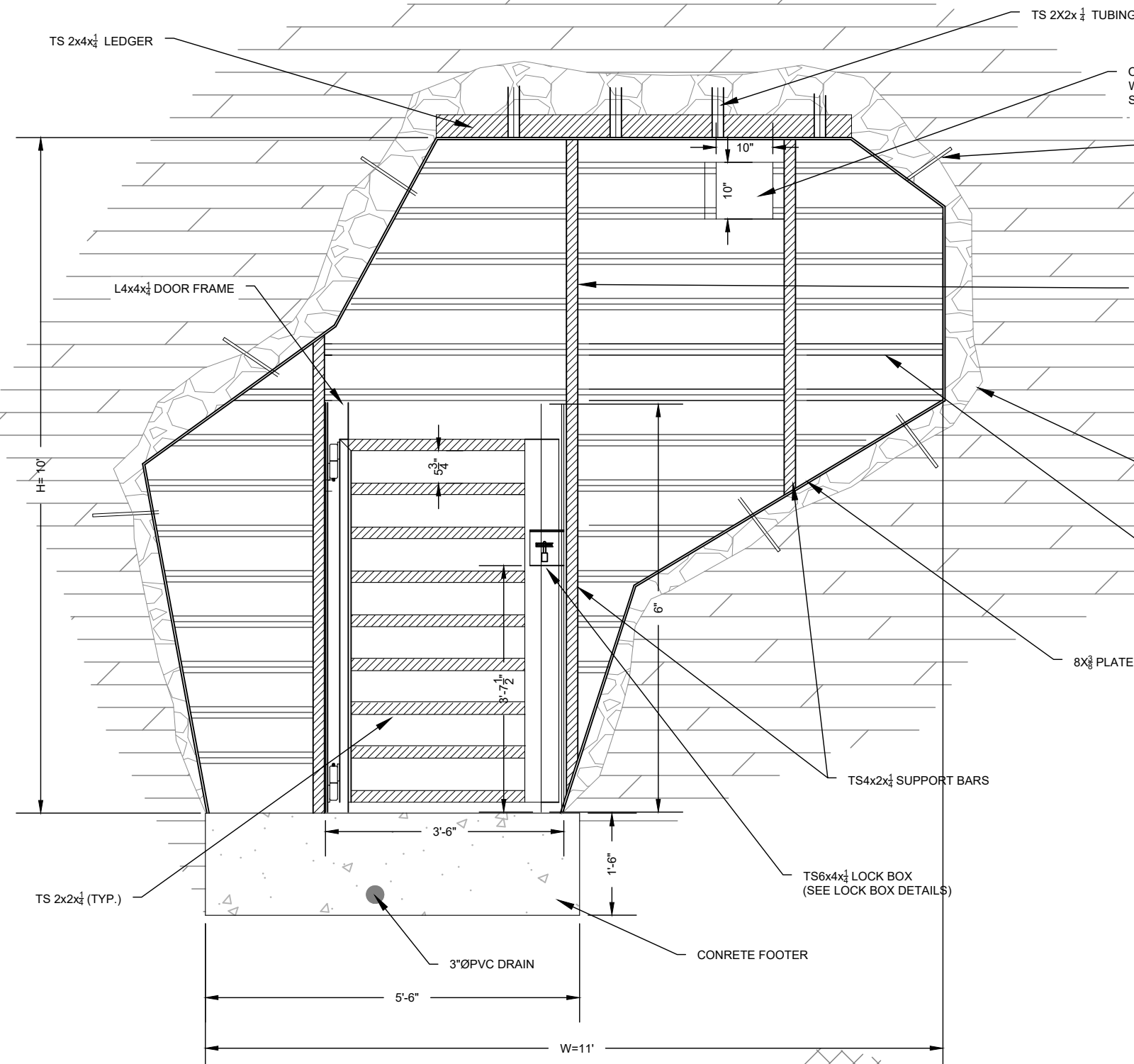
CAUTION - THIS PROJECT REQUIRES CONSTRUCTION WORK IN, AROUND, AND OVER HAZARDOUS AND UNPROTECTED MINE SHAFTS, STOPES, ADITS, AND OTHER OPENINGS WHICH MAY BE OPEN TO THE SURFACE OR HIDDEN FROM VIEW BY TRASH, DEBRIS, OR THIN AND UNSTABLE LAYERS OF SURFACE MATERIALS OR ROCK. THE CONSTRUCTOR SHALL BE RESPONSIBLE FOR THOROUGHLY INVESTIGATING THE SITE CONDITIONS AND SCHEDULING EQUIPMENT, EQUIPMENT OPERATIONS, PERSONNEL AND SAFETY PROCEDURES TO PREVENT ACCIDENTS AND INJURIES.

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| ABANDONED MINE LAND PROGRAM MINING AND MINERALS DIVISION NEW MEXICO ENERGY, MINERALS, AND NATURAL RESOURCES DEPARTMENT | | |
| SCALE: AS SHOWN | AML 15_23 | DRAWN BY: MWT |
| DATE: 05/15/2024 | | REVISED BY: LDV |
| VERTICAL EGRESS CLOSURE ON ADIT | | |
| FILE: | RED HILL MINE SAFEGUARD PROJECT PHASE I | FIGURE: 15 |

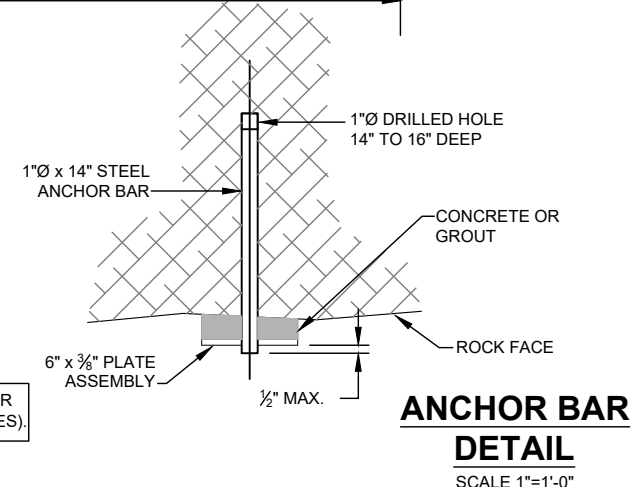
CAUTION - THIS PROJECT REQUIRES CONSTRUCTION WORK IN, AROUND, AND OVER HAZARDOUS AND UNPROTECTED MINE SHAFTS, STOPS, ADITS, AND OTHER OPENINGS WHICH MAY BE OPEN TO THE SURFACE OR HIDDEN FROM VIEW BY TRASH, DEBRIS, OR THIN AND UNSTABLE LAYERS OF SURFACE MATERIALS OR ROCK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THOROUGHLY INVESTIGATING THE SITE CONDITIONS AND SCHEDULING EQUIPMENT, EQUIPMENT OPERATIONS, PERSONNEL AND SAFETY PROCEDURES TO PREVENT ACCIDENTS AND INJURIES.

GENERAL NOTES:

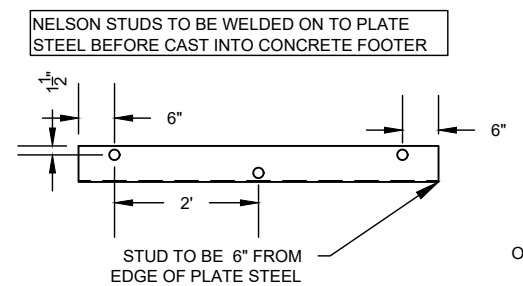
1. THIS DRAWING SHOWS THE GENERAL SHAPE AND APPROXIMATE PROFILE OF THE EGRESS ADIT AT THE INTENDED LOCATION OF THE CLOSURE. USE THE DRAWING AS A GUIDE FOR FIELD LAYOUT OF THE CLOSURE. FIELD VERIFY DIMENSIONS PRIOR TO FABRICATION.
2. TUBULAR STEEL PLATES, AND SHAPES SHALL BE WEATHERING STEEL AS SPECIFIED. WELD ALL JOINTS. JOINTS SHALL BE TIGHT SO THAT MOISTURE CANNOT ENTER BETWEEN PILES OF MATERIAL. ROUND OR CHAMFER ALL SHARP EDGES AND CORNERS.
3. PRIOR TO CONSTRUCTING THE FOOTER, REMOVE RUBBLE AND LEVEL THE FLOOR IN THE AREA OF THE CLOSURE AS SHOWN IN THE DRAWING AND AS DIRECTED BY THE AML PROGRAM MANAGER. COMPACT THE FOOTER BASE TO THE SATISFACTION OF THE PROJECT MANAGER, PRIOR TO POURING CONCRETE FOOTER.
4. INSTALL HEAVY DUTY BARREL WELD-ON PIVOT HINGES (1,000lb/PAIR CAPACITY) AS SHOWN AND AS SPECIFIED. BOTH HINGES SHALL BE INSTALLED TO SUPPORT THE DOOR AND SHALL BE IN-LINE AND OPERATE SMOOTHLY WHEN THE DOOR IS HUNG.
5. CONSTRUCT AND INSTALL THE DOOR AND DOOR FRAME TRUE, SQUARE AND PLUMB. THE DOOR SHALL CLOSE SNUGGLY AGAINST THE FRONT FACE OF THE DOOR FRAME WITH NO MORE THAN A 3/8" GAP AT ANY POINT ALONG THE FRONT FACE OF BOTH SIDES OF THE DOOR AND FRAME WHEN THE DOOR IS CLOSED.
6. GROUT AND MORTAR SHALL BE CONSTRUCTION GRADE.
7. PLACE A 3/8" CHAMFER ON ALL EXPOSED EDGES OF CONCRETE FOOTER.
8. TOLERANCE ON THE CENTER-TO-CENTER DIMENSIONS BETWEEN POSTS SHALL BE +/- 1/16".
9. PLACE A SURVEY MARKER, PROVIDED BY AML PROGRAM, INTO THE ADJACENT COMPETENT ROCK AS DIRECTED BY PROJECT MANAGER.
10. ROCK AND MORTAR LARGE GAPS AROUND GATE FRAME.
11. INSTALL ANGLED SUPPORT 12-14'.
12. INSTALL TS 2X2X1/4 CLOSURE BARS ON GAPS BETWEEN ROCK AND STEEL PLATE.
13. WEATHERING STEEL SHALL BE USED FOR ALL THE STEEL TUBING AND PLATING.
14. GATES SHALL BE SECURED IN PLACE WITH 1" DIAMETER ROUND STEEL BAR DRIVEN INTO 1" DIAMETER HOLE (SEE ANCHOR BAR DETAIL). CONTRACTOR HAS OPTION TO USE 3/4" x 9 3/4" HILTI HIT-Z ANCHOR BOLT WITH EPOXY OR APPROVED EQUIVALENT IN PLACE OF ROUND STEEL BAR. FOR WEAK ROCK AND WITH APPROVAL OF PROJECT ENGINEER, CONTRACTOR HAS OPTION TO USE 3/4" x 7 3/4" HILTI HIT-Z ANCHOR BOLT WITH EPOXY OR APPROVED EQUIVALENT. DRILL HOLE FOR HILTI ANCHORS SHALL BE 1/8" INCH LARGER THAN ANCHOR DIAMETER.



ELEVATION-OUTSIDE LOOKING IN
SCALE 1/2\"/>

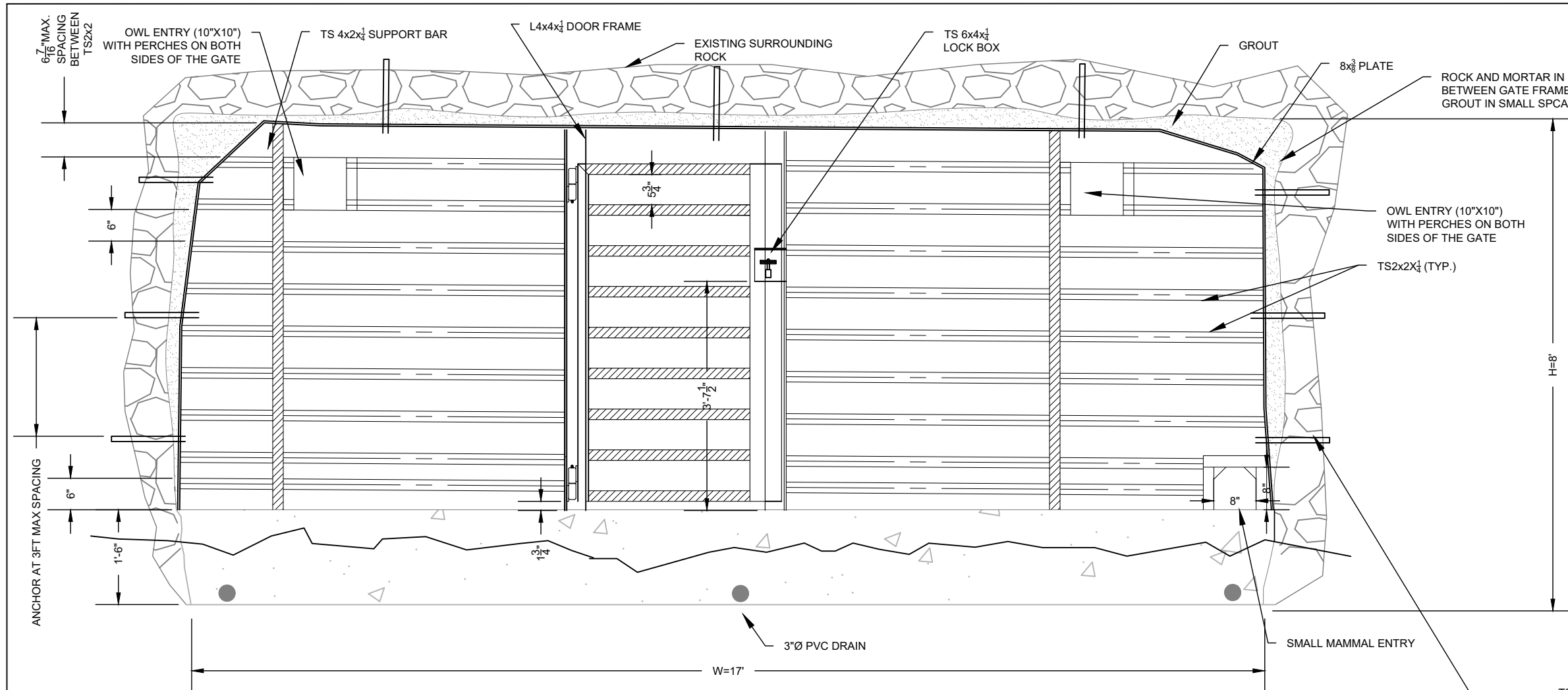


ANCHOR BAR DETAIL
SCALE 1\"/>

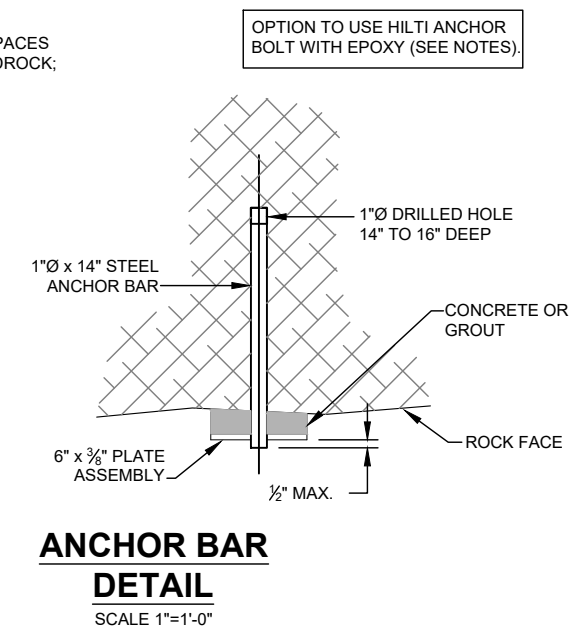


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|---|---|---------------|
| ABANDONED MINE LAND PROGRAM | | |
| MINING AND MINERALS DIVISION | | |
| NEW MEXICO ENERGY, MINERALS, AND NATURAL RESOURCES DEPARTMENT | | |
| SCALE: AS SHOWN | AML 15_24b | DRAWN BY: LDV |
| DATE: 05/15/2024 | | REVISED BY: |
| VERTICAL EGRESS CLOSURE ON ADIT | | |
| FILE: 15 | RED HILL MINE SAFEGUARD PROJECT PHASE I | FIGURE: 16 |

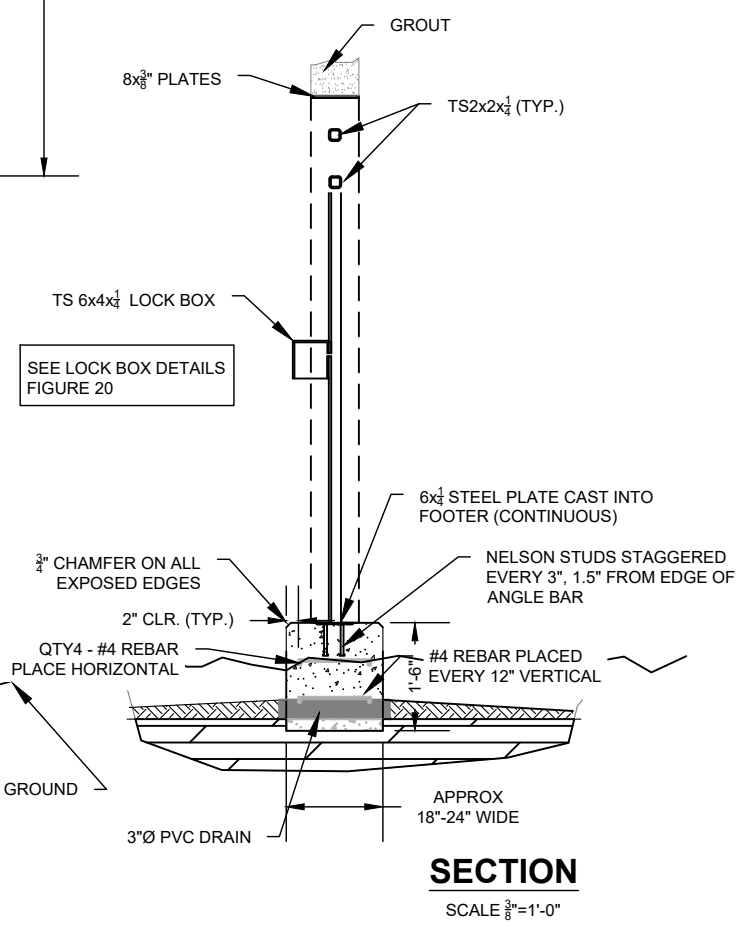
SECTION
SCALE 3/8\"/>



ELEVATION-OUTSIDE LOOKING IN
SCALE 1/2"=1'-0"

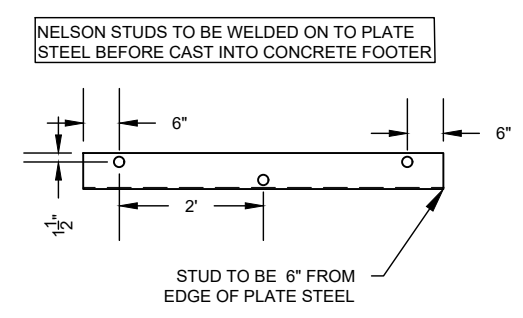
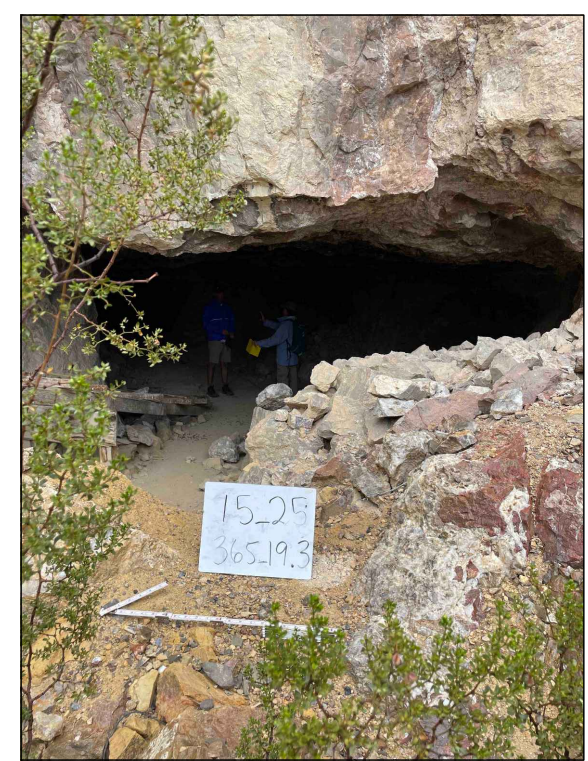


**ANCHOR BAR
DETAIL**
SCALE 1"=1'-0"



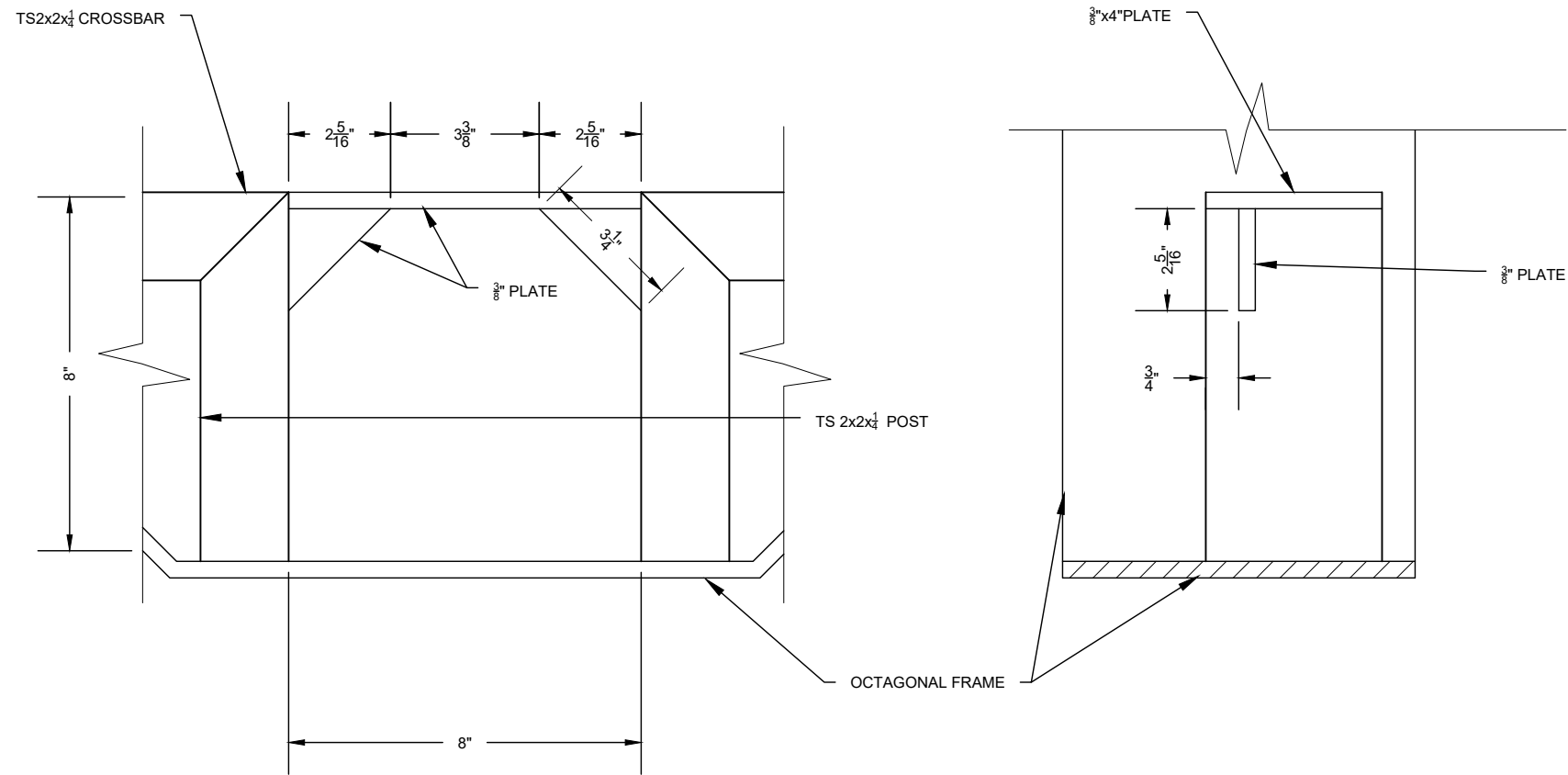
SECTION
SCALE 3/8"=1'-0"

- GENERAL NOTES:**
- THIS DRAWING SHOWS THE GENERAL SHAPE AND APPROXIMATE PROFILE OF THE EGRESS ADIT AT THE INTENDED LOCATION OF THE CLOSURE. USE THE DRAWING AS A GUIDE FOR FIELD LAYOUT OF THE CLOSURE. FIELD VERIFY DIMENSIONS PRIOR TO FABRICATION.
 - TUBULAR STEEL PLATES, AND SHAPES SHALL BE WEATHERING STEEL AS SPECIFIED. WELD ALL JOINTS. JOINTS SHALL BE TIGHT SO THAT MOISTURE CANNOT ENTER BETWEEN PILES OF MATERIAL. ROUND OR CHAMFER ALL SHARP EDGES AND CORNERS.
 - PRIOR TO CONSTRUCTING THE FOOTER, REMOVE RUBBLE AND LEVEL THE FLOOR IN THE AREA OF THE CLOSURE AS SHOWN IN THE DRAWING AND AS DIRECTED BY THE AML PROGRAM MANAGER. COMPACT THE FOOTER BASE TO THE SATISFACTION OF THE PROJECT MANAGER, PRIOR TO POURING CONCRETE FOOTER.
 - INSTALL HEAVY DUTY BARREL WELD-ON PIVOT HINGES (1,000lb/PAIR CAPACITY) AS SHOWN AND AS SPECIFIED. BOTH HINGES SHALL BE INSTALLED TO SUPPORT THE DOOR AND SHALL BE IN-LINE AND OPERATE SMOOTHLY WHEN THE DOOR IS HUNG.
 - CONSTRUCT AND INSTALL THE DOOR AND DOOR FRAME TRUE, SQUARE AND PLUMB. THE DOOR SHALL CLOSE SNUGGLY AGAINST THE FRONT FACE OF THE DOOR FRAME WITH NO MORE THAN A 3/8" GAP AT ANY POINT ALONG THE FRONT FACE OF BOTH SIDES OF THE DOOR AND FRAME WHEN THE DOOR IS CLOSED.
 - GROUT AND MORTAR SHALL BE CONSTRUCTION GRADE.
 - PLACE A 3/4" CHAMFER ON ALL EXPOSED EDGES OF CONCRETE FOOTER.
 - TOLERANCE ON THE CENTER-TO-CENTER DIMENSIONS BETWEEN POSTS SHALL BE + 1/16".
 - PLACE A SURVEY MARKER, PROVIDED BY AML PROGRAM, INTO ADJACENT COMPETENT ROCK AS DIRECTED BY PROJECT MANAGER.
 - ROCK AND MORTAR LARGE GAPS AROUND GATE FRAME
 - GATE RECESSED 20' INTO MINE ADIT PAST TIMBER STRUCTURE.
 - INSTALL TS2X2X1/4 CLOSURE BARS ON GAPS BETWEEN ROCK AND STEEL PLATE.
 - WEATHERING STEEL SHALL BE USED FOR ALL STEEL TUBING AND PLATING.
 - GATES SHALL BE SECURED IN PLACE WITH 1" DIAMETER ROUND STEEL BAR DRIVEN INTO 1" DIAMETER HOLE (SEE ANCHOR BAR DETAIL). CONTRACTOR HAS OPTION TO USE 3/4" x 9 3/4" HILTI HIT-Z ANCHOR BOLT WITH EPOXY OR APPROVED EQUIVALENT IN PLACE OF ROUND STEEL BAR. FOR WEAK ROCK AND WITH APPROVAL OF PROJECT ENGINEER, CONTRACTOR HAS OPTION TO USE 1/2" x 7 3/4" HILTI HIT-Z ANCHOR BOLT WITH EPOXY OR APPROVED EQUIVALENT. DRILL HOLE FOR HILTI ANCHORS SHALL BE 1/8" INCH LARGER THAN ANCHOR DIAMETER.



CAUTION - THIS PROJECT REQUIRES CONSTRUCTION WORK IN, AROUND, AND OVER HAZARDOUS AND UNPROTECTED MINE SHAFTS, STOPES, ADITS, AND OTHER OPENINGS WHICH MAY BE OPEN TO THE SURFACE OR HIDDEN FROM VIEW BY TRASH, DEBRIS, OR THIN AND UNSTABLE LAYERS OF SURFACE MATERIALS OR ROCK. THE CONSTRUCTOR SHALL BE RESPONSIBLE FOR THOROUGHLY INVESTIGATING THE SITE CONDITIONS AND SCHEDULING EQUIPMENT, EQUIPMENT OPERATIONS, PERSONNEL AND SAFETY PROCEDURES TO PREVENT ACCIDENTS AND INJURIES.

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| ABANDONED MINE LAND PROGRAM | | | |
| MINING AND MINERALS DIVISION NEW MEXICO ENERGY, MINERALS, AND NATURAL RESOURCES DEPARTMENT | | | |
| SCALE: AS SHOWN | AML 15_25 | DRAWN BY: MWT | |
| DATE: 05/15/2024 | | REVISED BY: LDV | |
| VERTICAL EGRESS CLOSURE ON ADIT | | | |
| FILE: 15 | RED HILL MINE SAFEGUARD PROJECT PHASE I | FIGURE: 17 | |



SMALL MAMMAL ENTRY DETAILS

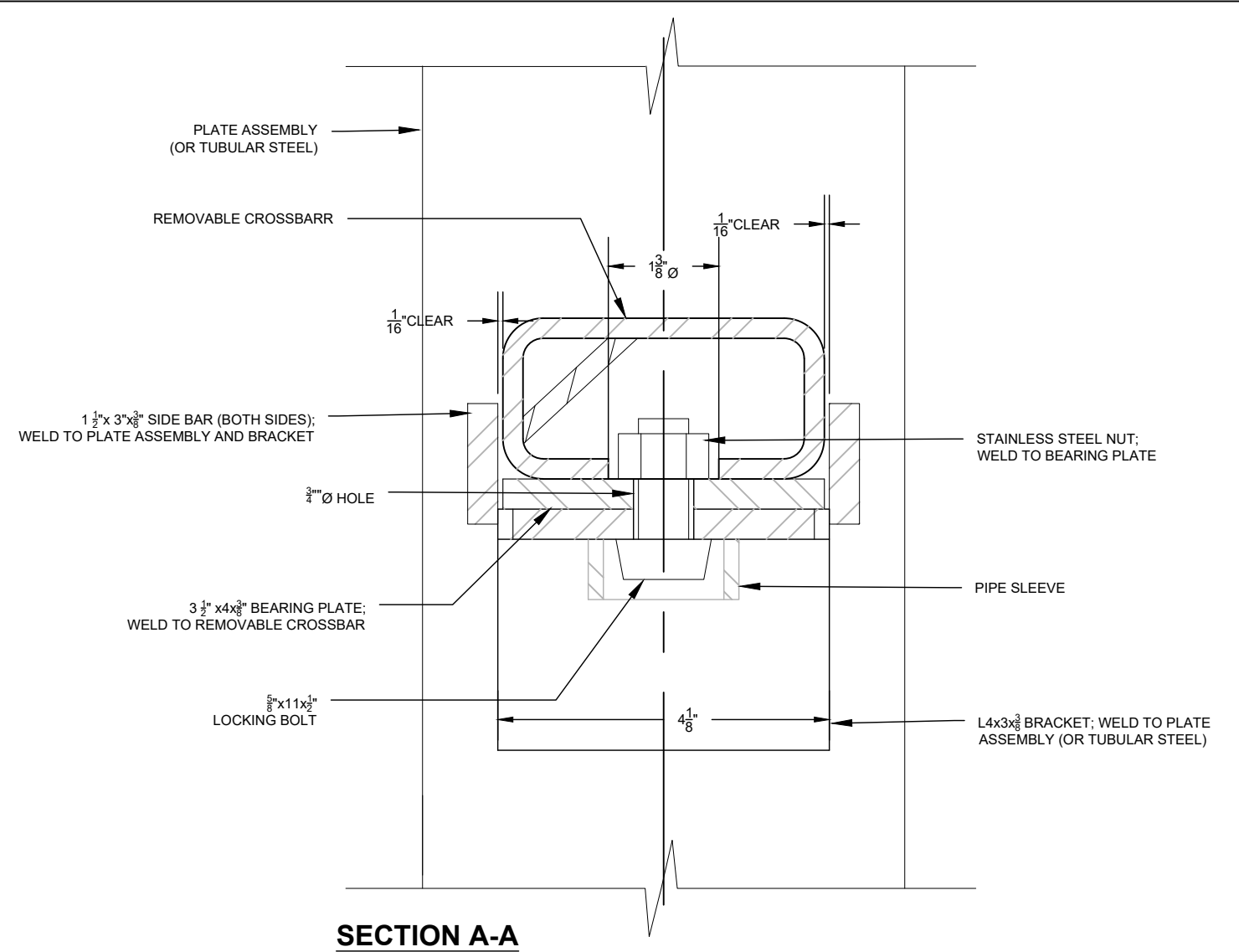
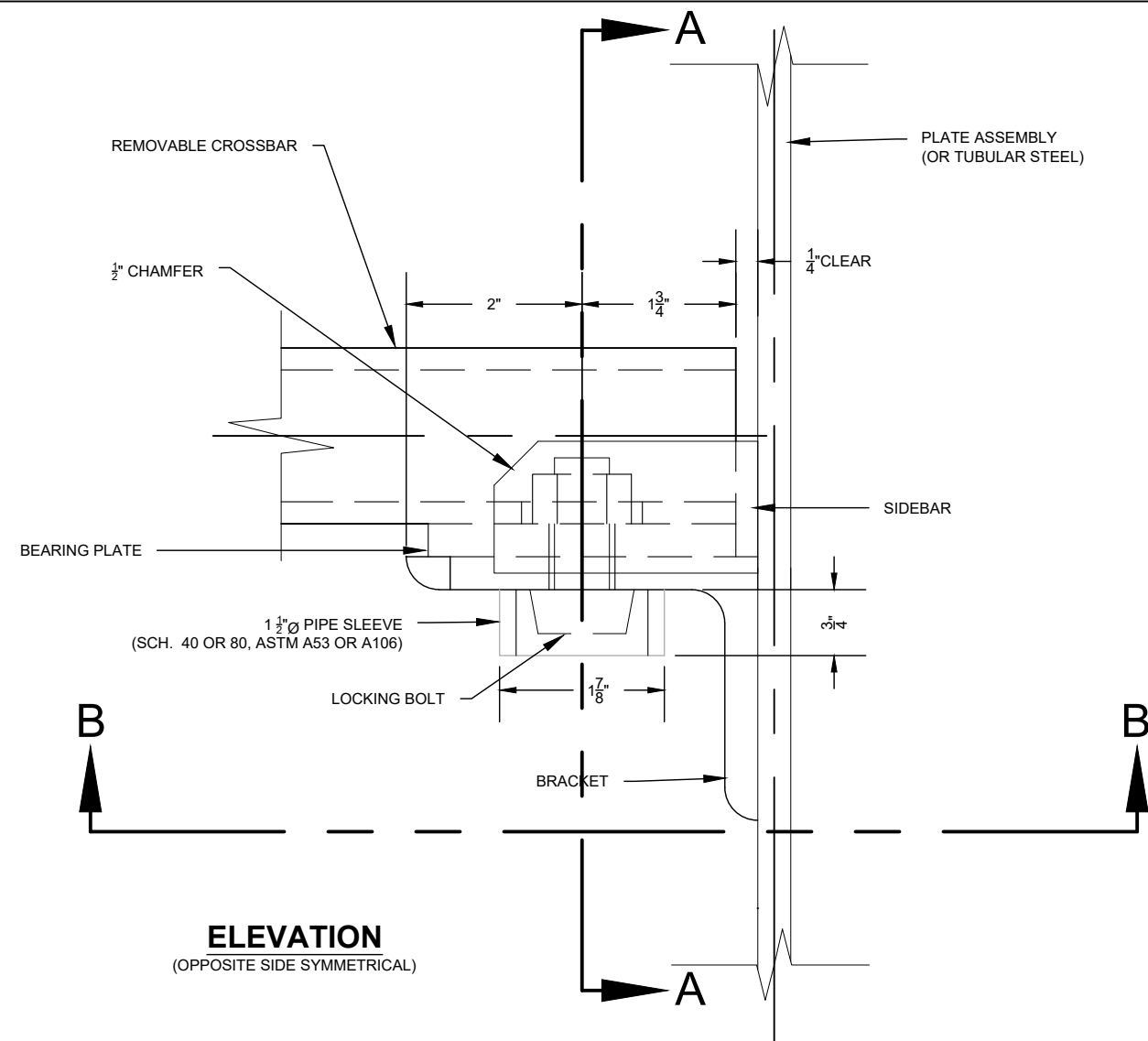
SCALE 3"=1'-0"

GENERAL NOTES:

1. THE SHAPE AND DIMENSIONS SHOWN FOR THE EXISTING ADIT OPENINGS ARE APPROXIMATE. FIELD VERIFY ALL DIMENSIONS BEFORE FABRICATION.
2. STEEL PLATES AND SHAPES SHALL BE WEATHERING STEEL. WELD ALL JOINTS. CONSTRUCT THE BAT GATE TO ELIMINATE SURFACES ON WHICH MOISTURE OR DEBRIS CAN BE TRAPPED. ALL TUBULAR MEMBERS SHALL BE HERMETICALLY SEALED TO PREVENT THE INCURSION OF MOISTURE, EXCEPT AS OTHERWISE NOTED. ROUND OR CHAMFER ALL EXPOSED SHARP CORNERS AND EDGES.
3. DOUBLE-NUT ALL BOLTS.
4. THE CONTRACTOR HAS THE OPTION OF USING 8" STEEL PLATE WHERE 4" STEEL PLATE IS SHOWN IN THE DRAWINGS.
5. VERIFY THAT THE OPENINGS OF THE CSP ARE NOT OBSTRUCTED BY FILL OR ROCK.
6. THE FINISH GRADE ON THE OUTSIDE OF THE CULVERT SHALL HAVE POSITIVE DRAINAGE AWAY FROM THE STRUCTURE.
7. INSTALL SURVEY MARKER (SUPPLIED BY AML PROGRAM) INTO ADJACENT COMPETENT ROCK AS DIRECTED BY PROJECT MANAGER.

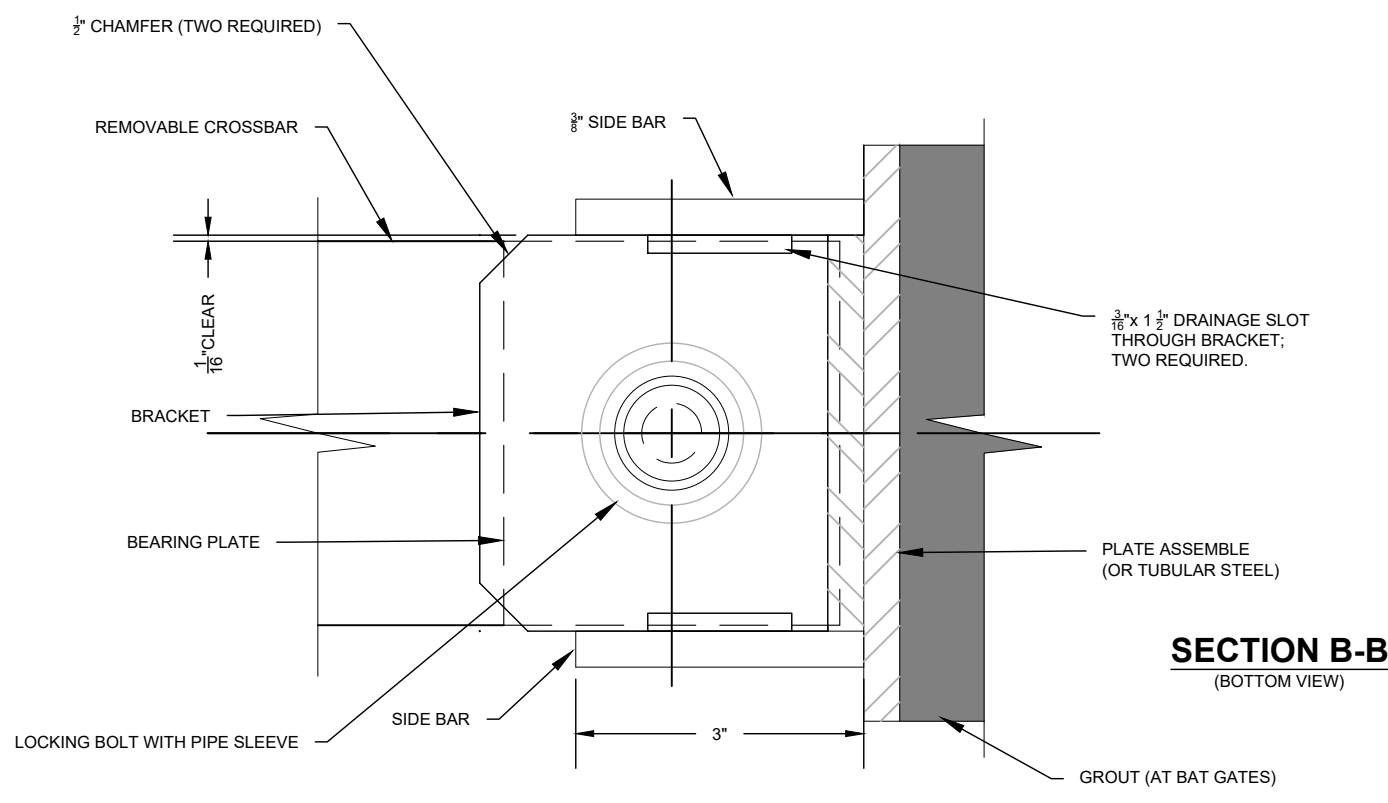
CAUTION - THIS PROJECT REQUIRES CONSTRUCTION WORK IN, AROUND, AND OVER HAZARDOUS AND UNPROTECTED MINE SHAFTS, STOPES, ADITS, AND OTHER OPENINGS WHICH MAY BE OPEN TO THE SURFACE OR HIDDEN FROM VIEW BY TRASH, DEBRIS, OR THIN AND UNSTABLE LAYERS OF SURFACE MATERIALS OR ROCK. THE CONSTRUCTOR SHALL BE RESPONSIBLE FOR THOROUGHLY INVESTIGATING THE SITE CONDITIONS AND SCHEDULING EQUIPMENT, EQUIPMENT OPERATIONS, PERSONNEL AND SAFETY PROCEDURES TO PREVENT ACCIDENTS AND INJURIES.

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|---|---|-----------------|
| ABANDONED MINE LAND PROGRAM | | |
| MINING AND MINERALS DIVISION | | |
| NEW MEXICO ENERGY, MINERALS, AND NATURAL RESOURCES DEPARTMENT | | |
| SCALE: AS SHOWN | VARIOUS LOCATION | DRAWN BY: MWT |
| DATE: 05/15/2024 | | REVISED BY: LDV |
| SMALL MAMMAL ENTRY DETAILS | | |
| FILE: | RED HILL MINE SAFEGUARD PROJECT PHASE I | FIGURE: 18 |



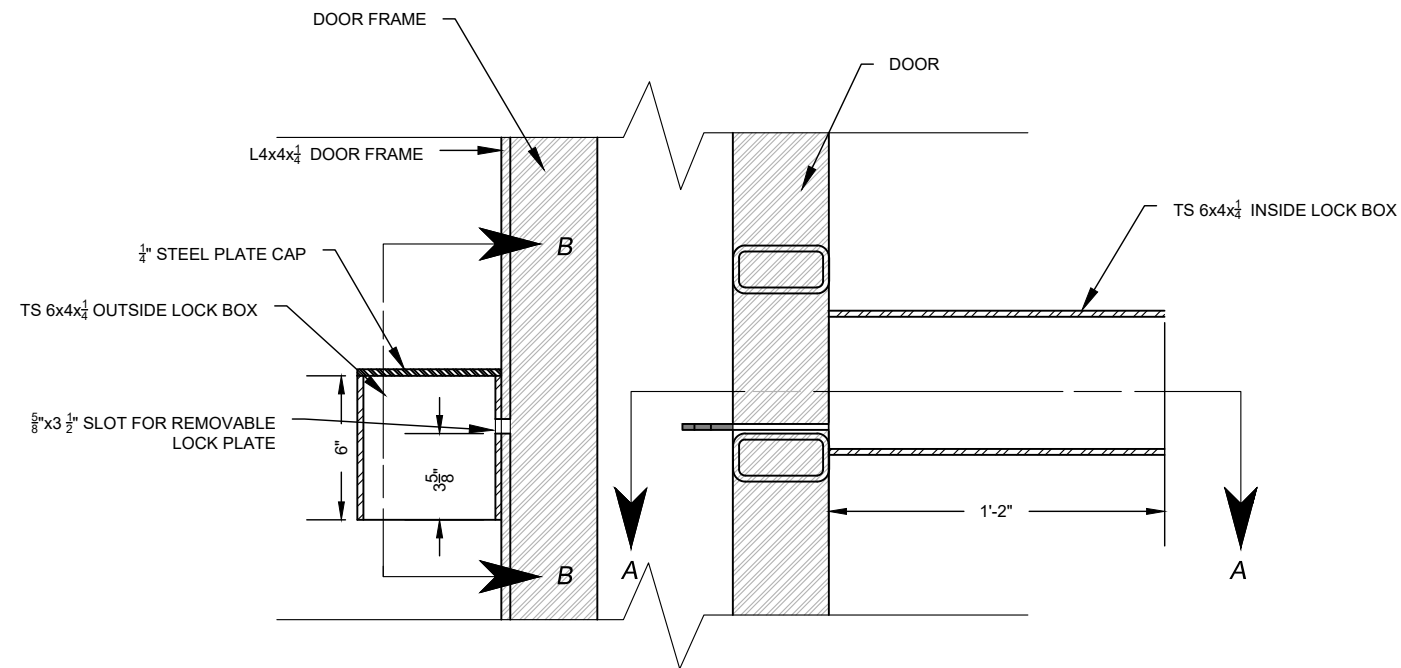
GENERAL NOTES:

1. STEEL PLATE AND SHAPES SHALL BE WEATHERING STEEL, WELD ALL JOINTS, EXCEPT AS OTHERWISE INDICATED. CONSTRUCT THE LOCK TO ELIMINATE SURFACES ON WHICH MOISTURE OR DEBRIS CAN BE TRAPPED. JOINTS SHALL BE TIGHT SO THAT MOISTURE CANNOT ENTER BETWEEN THE PLIES OF MATERIAL. ROUND OR CHAMFER ALL EXPOSED SHARP CORNERS AND EDGES.
2. ALONG THE BOTTOM OF EACH REMOVABLE CROSSBAR, DRILL 1/2" DIAMETER HOLES AT 1'-0" O.C.
3. THE CONTRACTOR SHALL PROVIDE THE NUTS (3/8" Ø -11 UNC CLASS 2A THREAD). THE PROJECT MANAGER WILL SUPPLY THE LOCKING BOLTS.
4. COAT THE THREADS OF THE LOCKING BOLTS WITH LPS1 LUBRICANT AND INSTALL FIRMLY WITH 50 TO 75 POUNDS OF TORQUE.
5. INSTALL SURVEY MARKER (SUPPLIED BY AML PROGRAM) INTO ADJACENT COMPETENT ROCK AS DIRECTED BY PROJECT MANAGER.



CAUTION - THIS PROJECT REQUIRES CONSTRUCTION WORK IN, AROUND, AND OVER HAZARDOUS AND UNPROTECTED MINE SHAFTS, STOPES, ADITS, AND OTHER OPENINGS WHICH MAY BE OPEN TO THE SURFACE OR HIDDEN FROM VIEW BY TRASH, DEBRIS, OR THIN AND UNSTABLE LAYERS OF SURFACE MATERIALS OR ROCK. THE CONSTRUCTOR SHALL BE RESPONSIBLE FOR THOROUGHLY INVESTIGATING THE SITE CONDITIONS AND SCHEDULING EQUIPMENT, EQUIPMENT OPERATIONS, PERSONNEL AND SAFETY PROCEDURES TO PREVENT ACCIDENTS AND INJURIES.

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| ABANDONED MINE LAND PROGRAM MINING AND MINERALS DIVISION NEW MEXICO ENERGY, MINERALS, AND NATURAL RESOURCES DEPARTMENT | | | |
| SCALE: 6"=1'-0" DATE: 05/15/2024 | VARIOUS LOCATION | DRAWN BY: MWT REVISED BY: LDV | |
| REMOVABLE CROSSBAR LOCK DETAIL | | | |
| FILE: | RED HILL MINE SAFEGUARD PROJECT PHASE I | FIGURE: 19 | |

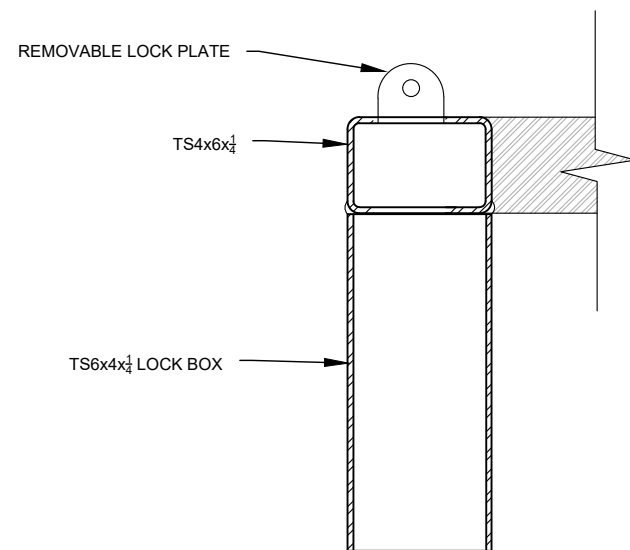


VERTICAL DOOR SECTION

(DOOR SLIGHTLY OPEN)
SCALE 1- $\frac{1}{2}$ "=1'-0"

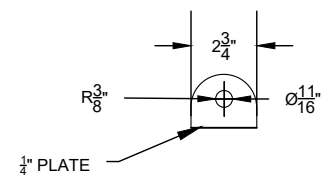
GENERAL NOTES LOCK BOX:

1. TUBULAR STEEL, STEEL PLATES, AND SHAPES SHALL BE WEATHERING STEEL AS SPECIFIED. WELD ALL JOINTS. JOINTS SHALL BE TIGHT SO THAT MOISTURE CANNOT ENTER BETWEEN PLIES OF MATERIAL. ROUND OR CHAMFER ALL SHARP EDGES AND CORNERS.
2. CONSTRUCT THE LOCKING MECHANISM SO THAT THE EXPOSED EDGES OF ALL PARTS ARE CHAMFERED AND OPERATE SMOOTHLY WITHOUT BINDING. WHEN CLOSING THE DOOR, THE REMOVABLE LOCK PLATE SHALL ENTER THE SLOT IN THE OUTSIDE LOCK BOX WITHOUT HITTING OR RUBBING THE EDGES OF THE SLOT.
3. LOCKS SHALL BE COMBINATION LOCKS. COMBINATION TO BE DETERMINED BY AML PROJECT MANAGER



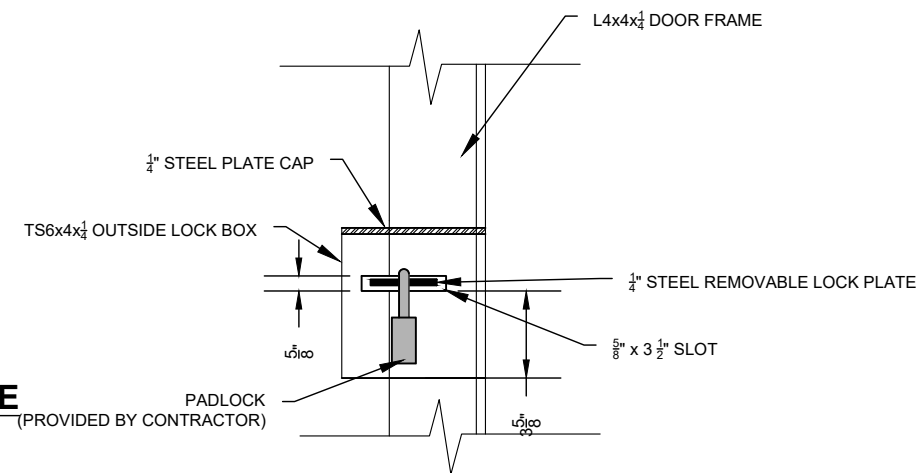
SECTION A-A

SCALE 1- $\frac{1}{2}$ "=1'-0"



REMOVABLE LOCK PLATE

($\frac{1}{4}$ " STEEL PLATE)
SCALE 1- $\frac{1}{2}$ "=1'-0"

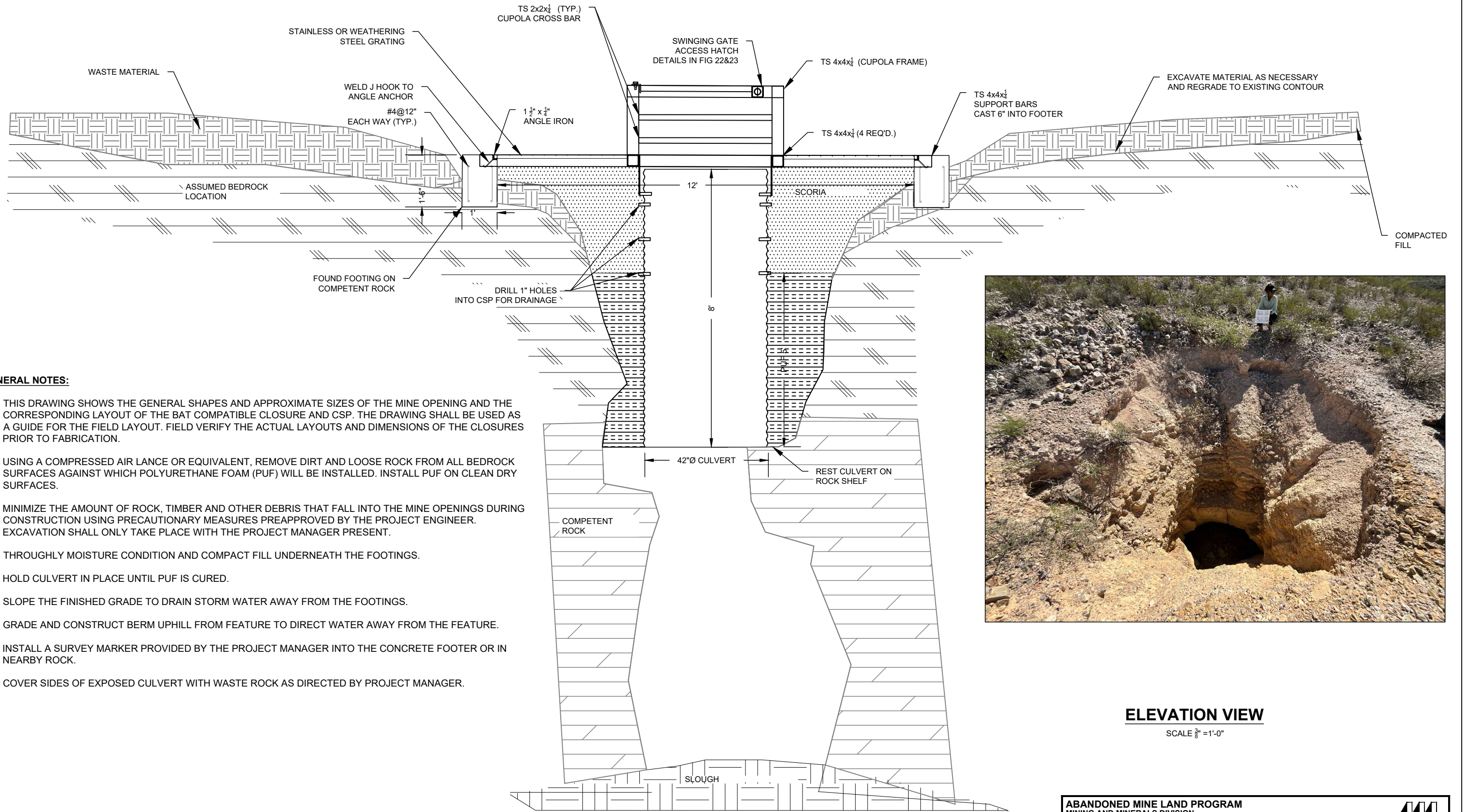


SECTION B-B

(WITH PADLOCK INSTALLED)
SCALE 1- $\frac{1}{2}$ "=1'-0"

CAUTION - THIS PROJECT REQUIRES CONSTRUCTION WORK IN, AROUND, AND OVER HAZARDOUS AND UNPROTECTED MINE SHAFTS, STOPES, ADITS, AND OTHER OPENINGS WHICH MAY BE OPEN TO THE SURFACE OR HIDDEN FROM VIEW BY TRASH, DEBRIS, OR THIN AND UNSTABLE LAYERS OF SURFACE MATERIALS OR ROCK. THE CONSTRUCTOR SHALL BE RESPONSIBLE FOR THOROUGHLY INVESTIGATING THE SITE CONDITIONS AND SCHEDULING EQUIPMENT, EQUIPMENT OPERATIONS, PERSONNEL AND SAFETY PROCEDURES TO PREVENT ACCIDENTS AND INJURIES.

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| ABANDONED MINE LAND PROGRAM MINING AND MINERALS DIVISION NEW MEXICO ENERGY, MINERALS, AND NATURAL RESOURCES DEPARTMENT | | | |
| SCALE: AS SHOWN | VARIOUS LOCATIONS | DRAWN BY: MWT | |
| DATE: 05/15/2024 | | REVISED BY: LDV | |
| LOCK BOX DETAILS | | | |
| FILE: 15 | RED HILL MINE SAFEGUARD PROJECT PHASE I | FIGURE: 20 | |



GENERAL NOTES:

1. THIS DRAWING SHOWS THE GENERAL SHAPES AND APPROXIMATE SIZES OF THE MINE OPENING AND THE CORRESPONDING LAYOUT OF THE BAT COMPATIBLE CLOSURE AND CSP. THE DRAWING SHALL BE USED AS A GUIDE FOR THE FIELD LAYOUT. FIELD VERIFY THE ACTUAL LAYOUTS AND DIMENSIONS OF THE CLOSURES PRIOR TO FABRICATION.
2. USING A COMPRESSED AIR LANCE OR EQUIVALENT, REMOVE DIRT AND LOOSE ROCK FROM ALL BEDROCK SURFACES AGAINST WHICH POLYURETHANE FOAM (PUF) WILL BE INSTALLED. INSTALL PUF ON CLEAN DRY SURFACES.
3. MINIMIZE THE AMOUNT OF ROCK, TIMBER AND OTHER DEBRIS THAT FALL INTO THE MINE OPENINGS DURING CONSTRUCTION USING PRECAUTIONARY MEASURES PREAPPROVED BY THE PROJECT ENGINEER. EXCAVATION SHALL ONLY TAKE PLACE WITH THE PROJECT MANAGER PRESENT.
4. THOROUGHLY MOISTURE CONDITION AND COMPACT FILL UNDERNEATH THE FOOTINGS.
5. HOLD CULVERT IN PLACE UNTIL PUF IS CURED.
6. SLOPE THE FINISHED GRADE TO DRAIN STORM WATER AWAY FROM THE FOOTINGS.
7. GRADE AND CONSTRUCT BERM UPHILL FROM FEATURE TO DIRECT WATER AWAY FROM THE FEATURE.
8. INSTALL A SURVEY MARKER PROVIDED BY THE PROJECT MANAGER INTO THE CONCRETE FOOTER OR IN NEARBY ROCK.
9. COVER SIDES OF EXPOSED CULVERT WITH WASTE ROCK AS DIRECTED BY PROJECT MANAGER.

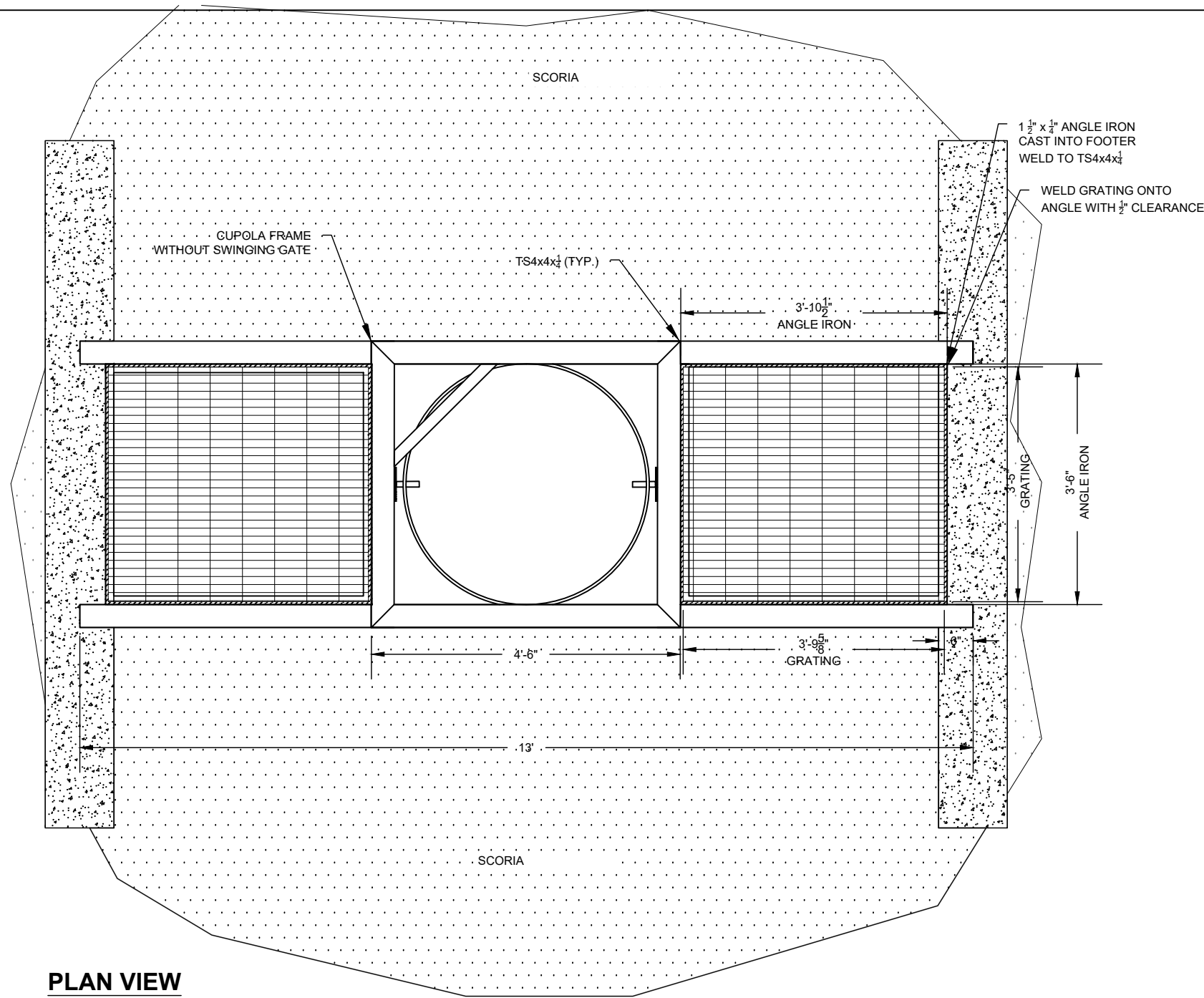
ELEVATION VIEW

SCALE: 3/8" = 1'-0"

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| ABANDONED MINE LAND PROGRAM MINING AND MINERALS DIVISION NEW MEXICO ENERGY, MINERALS, AND NATURAL RESOURCES DEPARTMENT | | | |
| SCALE: AS SHOWN DATE: 08/21/2024 | AML 22_12 | DRAWN BY: DMC REVISED BY: | |
| BAT CUPOLA | | | |
| FILE: | RED HILL MINE SAFEGUARD PROJECT PHASE I | FIGURE: 21 | |

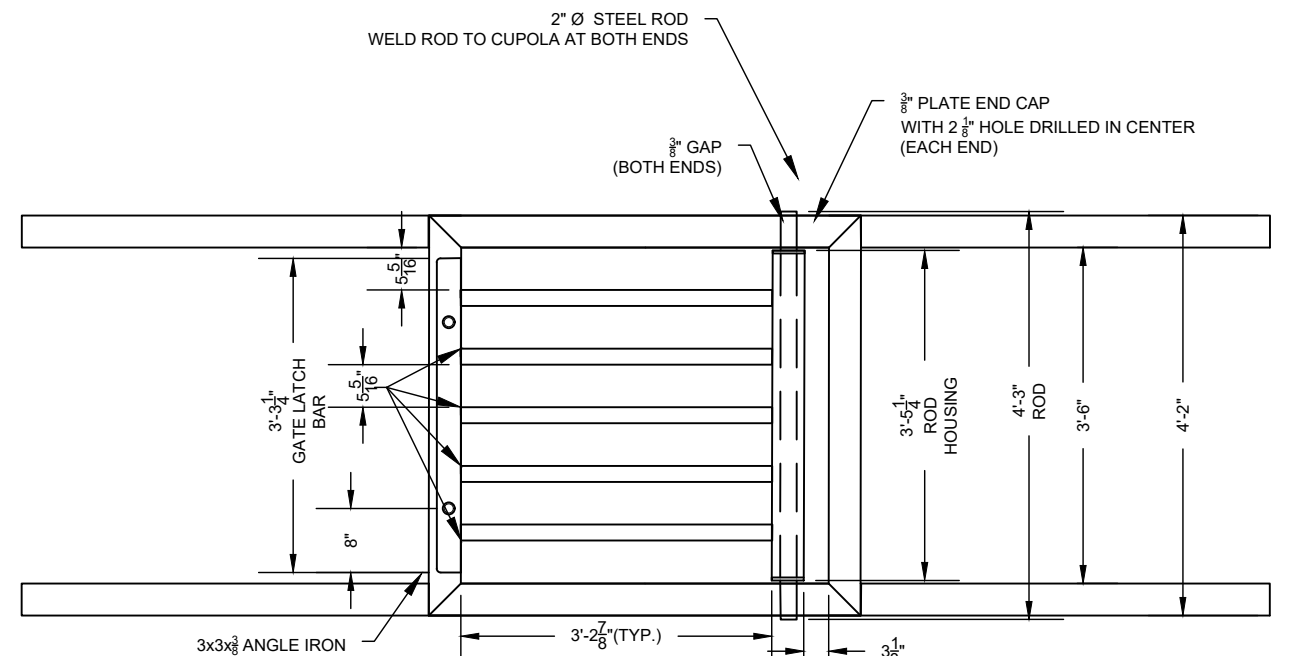
CAUTION - THIS PROJECT REQUIRES CONSTRUCTION WORK IN, AROUND, AND OVER HAZARDOUS AND UNPROTECTED MINE SHAFTS, STOPS, ADITS, AND OTHER OPENINGS WHICH MAY BE OPEN TO THE SURFACE OR HIDDEN FROM VIEW BY TRASH, DEBRIS, OR THIN AND UNSTABLE LAYERS OF SURFACE MATERIALS OR ROCK. THE CONSTRUCTOR SHALL BE RESPONSIBLE FOR THOROUGHLY INVESTIGATING THE SITE CONDITIONS AND SCHEDULING EQUIPMENT, EQUIPMENT OPERATIONS, PERSONNEL AND SAFETY PROCEDURES TO PREVENT ACCIDENTS AND INJURIES.

CUPOLA SWINGING GATE DETAILS



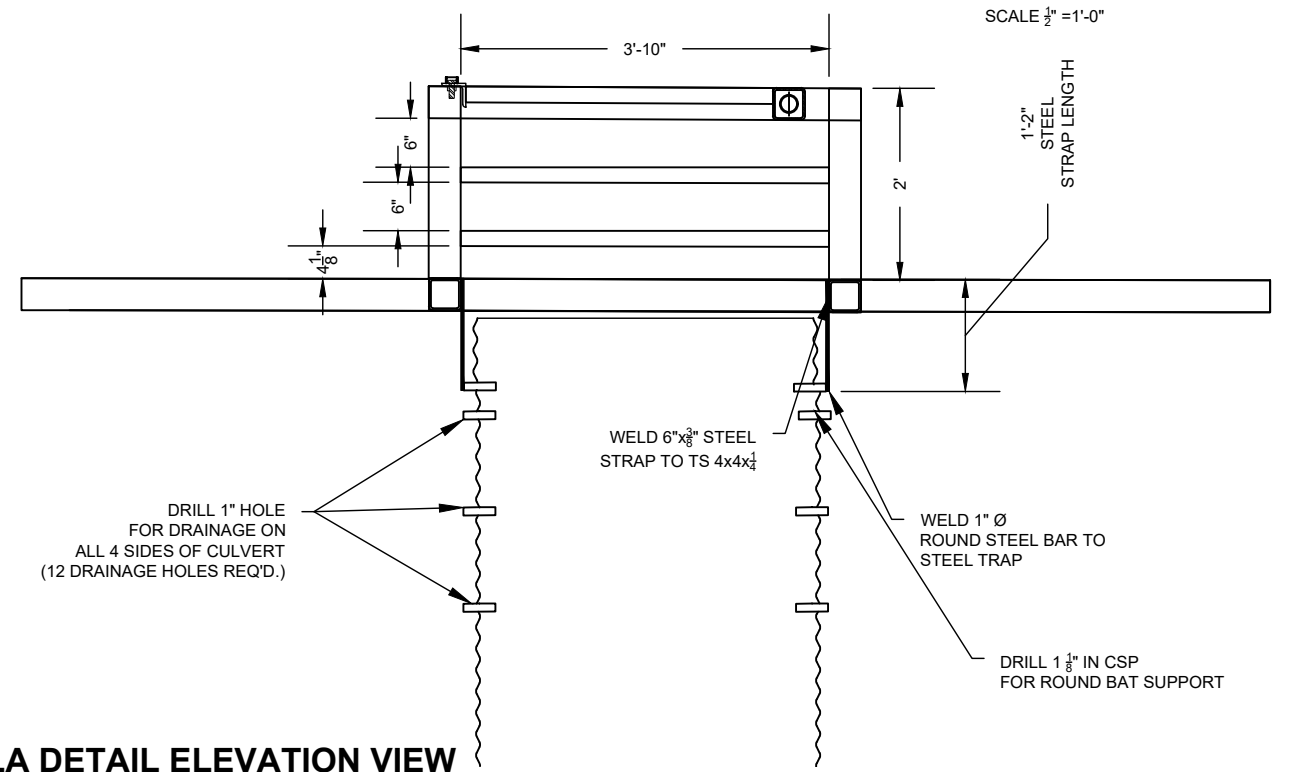
PLAN VIEW

SCALE 1/2" = 1'-0"



PLAN VIEW


SCALE 1/2" = 1'-0"

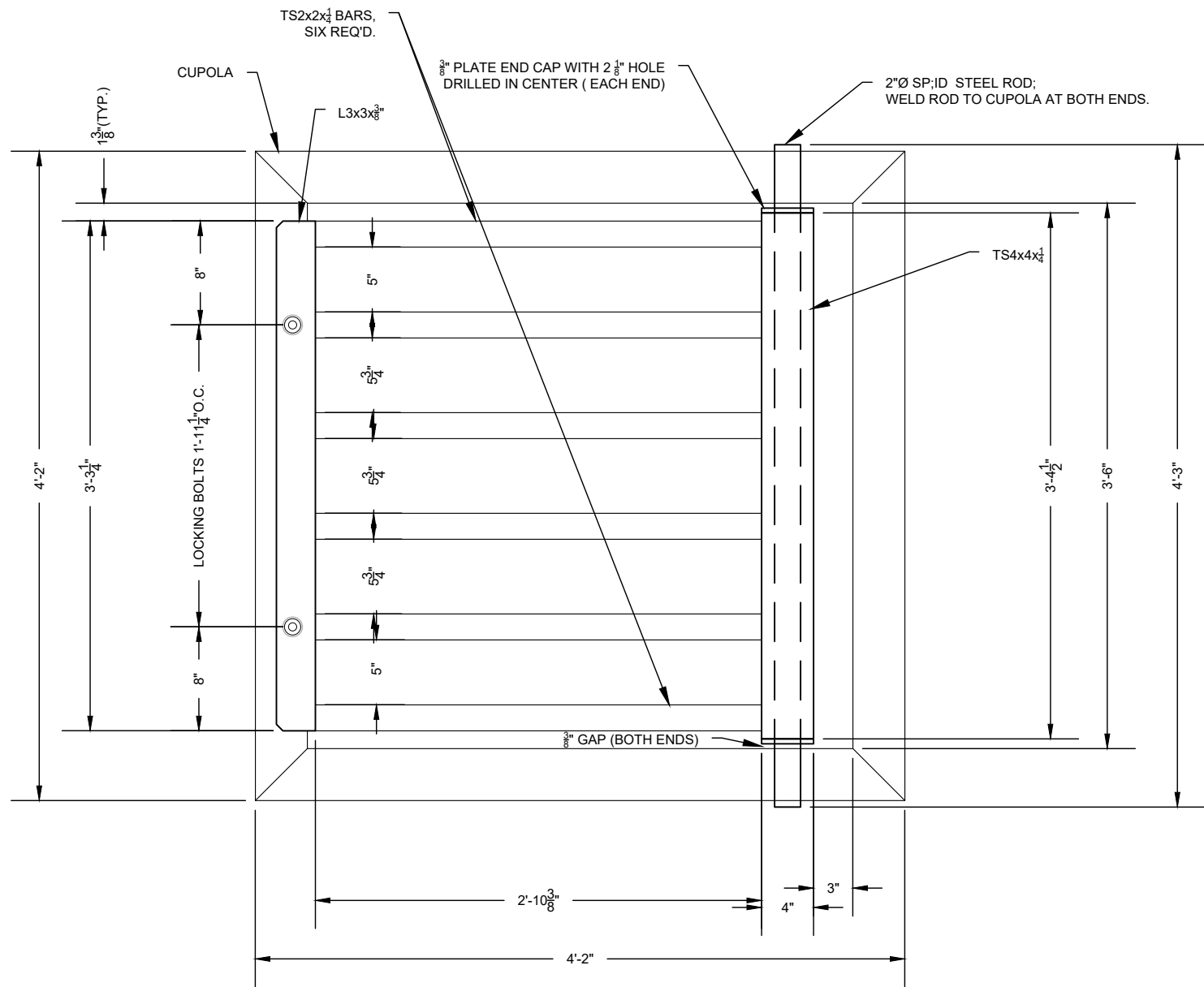


CUPOLA DETAIL ELEVATION VIEW

SCALE 1/2" = 1'-0"

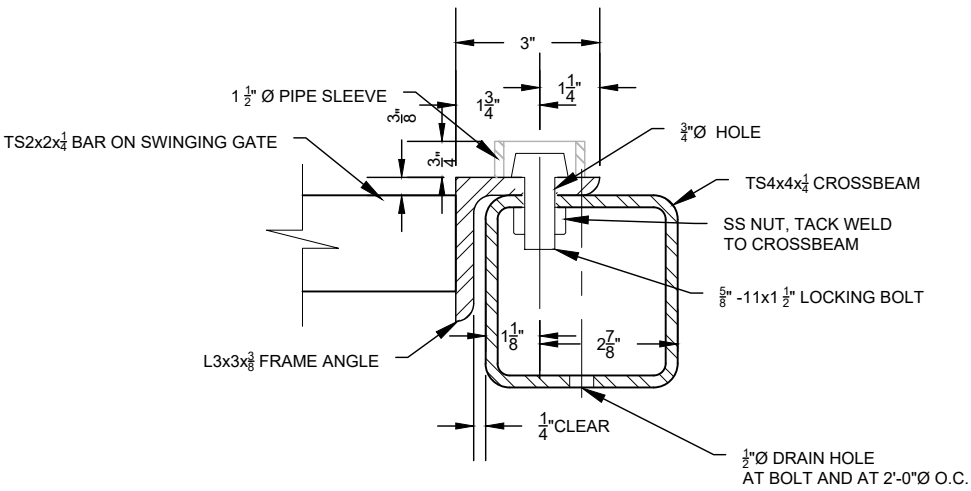
CAUTION - THIS PROJECT REQUIRES CONSTRUCTION WORK IN, AROUND, AND OVER HAZARDOUS AND UNPROTECTED MINE SHAFTS, STOPES, ADITS, AND OTHER OPENINGS WHICH MAY BE OPEN TO THE SURFACE OR HIDDEN FROM VIEW BY TRASH, DEBRIS, OR THIN AND UNSTABLE LAYERS OF SURFACE MATERIALS OR ROCK. THE CONSTRUCTOR SHALL BE RESPONSIBLE FOR THOROUGHLY INVESTIGATING THE SITE CONDITIONS AND SCHEDULING EQUIPMENT, EQUIPMENT OPERATIONS, PERSONNEL AND SAFETY PROCEDURES TO PREVENT ACCIDENTS AND INJURIES.

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| ABANDONED MINE LAND PROGRAM MINING AND MINERALS DIVISION NEW MEXICO ENERGY, MINERALS, AND NATURAL RESOURCES DEPARTMENT | | |  |
| SCALE: AS SHOWN DATE: 08/21/2024 | AML 22_12 | DRAWN BY: DMC REVISED BY: | |
| BAT CUPOLA DETAILS | | | |
| FILE: | RED HILL MINE SAFEGUARD PROJECT PHASE I | FIGURE: 22 | |



PLAN-FRAME FOR OPENABLE HATCH

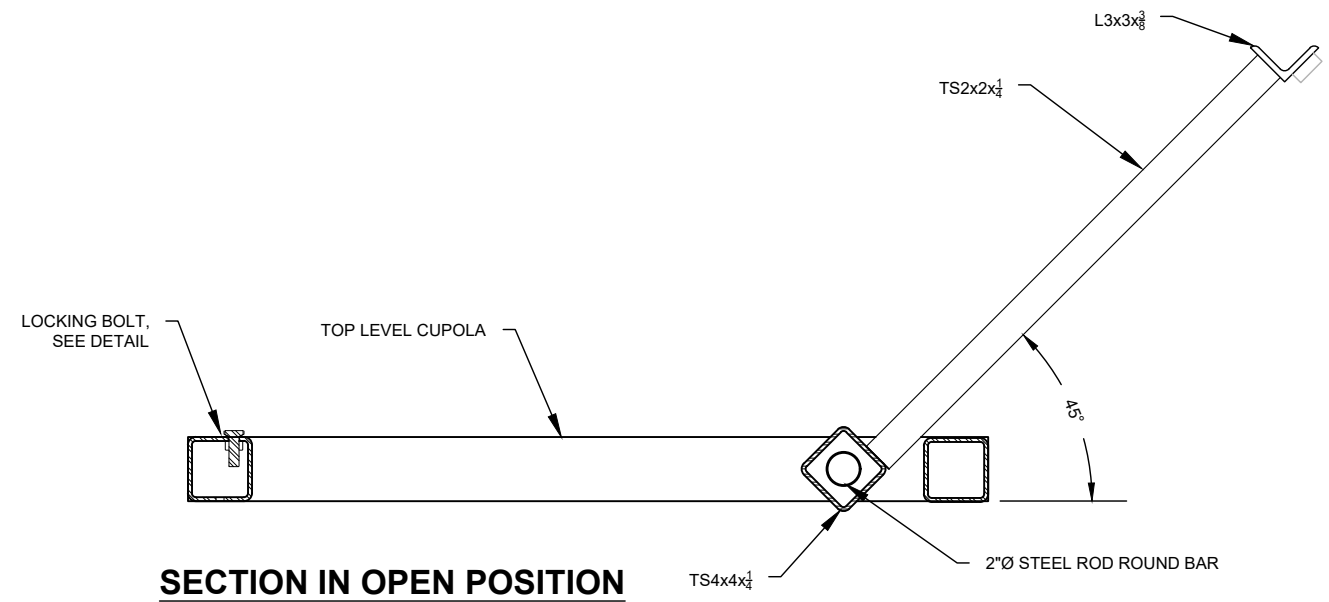
SCALE 1"=1'-0"



TYPICAL SECTION - LOCKING BOLT

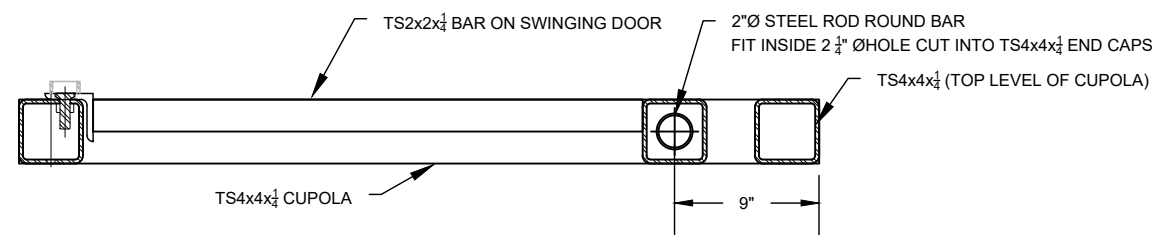
(ACCESS HOLE FOR NUT AND STEEL TAB NOT SHOWN)

SCALE 3"=1'-0"



SECTION IN OPEN POSITION

SCALE 1"=1'-0"



SECTION IN CLOSED POSITION

SCALE 1"=1'-0"

GENERAL NOTES:

1. STEEL PLATES AND SHAPES SHALL BE WEATHERING STEEL. WELD ALL JOINTS. CONSTRUCT THE CLOSURE FRAME AND SWINGING HATCH TO ELIMINATE SURFACES ON WHICH MOISTURE OR DEBRIS CAN BE TRAPPED. PLIES OF MATERIAL SHALL BE TIGHT TO PREVENT THE INCURSION OF MOISTURE. ALL TUBULAR MEMBERS SHALL BE HERMETICALLY SEALED TO PREVENT THE INCURSION OF MOISTURE, EXCEPT AS OTHERWISE NOTED. ROUND OR CHAMFER ALL EXPOSED SHARP CORNERS AND EDGES.
2. AT EACH OF THE TWO REMOVABLE BOLT LOCATIONS, CUT A SMALL ACCESS HOLE THROUGH THE INSIDE FACE OF THE CROSSBEAM TO PLACE AND TACK WELD THE NUT. FOR DRAINAGE DRILL A $\frac{1}{2}$ " \varnothing HOLE THROUGH THE BOTTOM CENTER OF THE CROSSBEAM AT EACH ACCESS HOLE AND AT 2'-0" O.C. ALONG THE FULL LENGTH OF THE BEAM. THE PROJECT MANAGER WILL PROVIDE THE LOCKING BOLTS. THE CONTRACTOR SHALL PROVIDE THE NUTS ($\frac{1}{2}$ " \varnothing -11 UNC CLASS 2A THREAD). NUTS SHALL BE STAINLESS STEEL.

CAUTION - THIS PROJECT REQUIRES CONSTRUCTION WORK IN, AROUND, AND OVER HAZARDOUS AND UNPROTECTED MINE SHAFTS, STOPES, ADITS, AND OTHER OPENINGS WHICH MAY BE OPEN TO THE SURFACE OR HIDDEN FROM VIEW BY TRASH, DEBRIS, OR THIN AND UNSTABLE LAYERS OF SURFACE MATERIALS OR ROCK. THE CONSTRUCTOR SHALL BE RESPONSIBLE FOR THOROUGHLY INVESTIGATING THE SITE CONDITIONS AND SCHEDULING EQUIPMENT, EQUIPMENT OPERATIONS, PERSONNEL AND SAFETY PROCEDURES TO PREVENT ACCIDENTS AND INJURIES.

NOTES FOR LOCKING BOLTS:

1. FIRST DRILL AN $\frac{1}{16}$ " HOLE THROUGH THE FRAME ANGLE.
2. THEN USE A 1 $\frac{1}{4}$ " DRILL BIT TO MAKE A COUNTERBORE INTO THE TOP OF THE FRAME ANGLE THAT WILL FORM A BEARING SURFACE FOR THE BOLT HEAD. DRILL TO A DEPTH OF $\frac{3}{16}$ " SO THAT THE TOP BOLT WILL BE SLIGHTLY ABOVE THE TOP OF THE ANGLE.
3. WHILE DRILLING THE COUNTERBORE, THE BIT SHALL NOT GO COMPLETELY THROUGH THE FRAME ANGLE. THE BOLT SEATING AREA SHALL BE ON THE ANGLE WHEN INSTALLED.
4. GREASE THREADS OF BOLTS AND INSTALL FIRMLY WITH 50 TO 75 POUNDS OF TORQUE.
5. THE PROJECT MANAGER WILL PROVIDE THE LOCKING BOLTS.

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| SCALE: AS SHOWN | AML 22_12 | DRAWN BY: MWT | |
| DATE: 05/15/2024 | | REVISED BY: LDV | |
| SWINGING HINGED HATCH DETAILS | | | |
| FILE: 15 | RED HILL SAFEGUARD PROJECT PHASE I | FIGURE: 23 | |