



Henderson Operations Blue Stake Program

1.0 Program

Purpose: Due to the high level of risk during excavations and penetrations of building surfaces, this Program has been developed to minimize risk for injuries, harm to the environment and production losses during such work.

Scope: All Freeport-McMoRan employees and contractors shall follow this Program.

2.0 Procedures

2.1 General

Blue Staking is the act of identifying and marking utilities such as electric, gas, water, telephone, fiber optic, etc., so that they do not pose a risk of injury to workers or a risk of being damaged during penetration, excavation, trenching, or digging activities in buildings, surface excavations and underground workings.

Blue Stake Representative: A Blue Stake Representative is an engineer, technician, or other qualified individual that has the ability to review drawings or prints and mark out utilities and pipelines accordingly.

Underground Utility Work: Unless noted otherwise within this document and/or appendices, underground utilities are in reference to buried utilities for both the surface and underground workings. When installing, rerouting or repairing an underground utility the work must comply with local and regional buried utility/new installation requirements.

Underground Mine Inter-Drift Drilling: Drilling which is planned to break through into underground mine drifting requires blue stake from the Mine Engineering Department. Please reference Appendix E.

Hand Digging/Pot Holing: Hand-digging/pot-holing will be done when working within 24 inches (24") of known utilities. Potholing is recommended when any person involved in the excavation is uncertain about the utility locate, the location of utilities, or excavation is high risk (high number of utilities in the excavation, gas, electrical, chemicals). Always Stop Work if potholing does not locate expected utilities and verify location. Potholing includes hand excavation or hydro excavation to positively identify utilities even if they are located below the intended bottom of excavation.

Broken/Ruptured Utility Occurs: If a utility is ruptured or broken during an excavation, the requestor or party performing the excavation must notify a Blue Stake Representative and project manager immediately. It is best to wait for the utility owner/operator to conduct shut-off. For project planning, best practice is to know where utility shut-offs are and train excavation personnel to their locations.

Unidentified Utility Discovered: If an unidentified utility is discovered, the requestor or party performing the excavation must immediately notify a Blue Stake Representative(s) and the Project Manager and stop work immediately. If a utility is not in the excavation as expected, call for a re-locate.

Excavations Requirement: All excavations must comply with the federal, state, local or county excavation and trenching requirements.

Environmental/Safety Issues: If at any time during the process of digging a safety and/or environmental concern arises, the work must stop. The individual(s) recognizing the concern will immediately contact their supervisor. The concern must be addressed prior to continuing with the excavation.

Exemptions – Do not Require Blue Stake Permit: The following do not require a Blue Stake Permit:

- A. Emergency Procedure - In the event that an excavation must commence due to a safety, environmental or facility operation emergency, the area supervisor shall visit the site and determine if the problem is an immediate hazard. If determined to be an emergency, a Blue Stake Representative(s) or a manager must be notified. These persons may authorize the area supervisor to proceed with the emergency excavation. If there is any doubt, the job must be stopped immediately.
- B. Native ground, top surface of active leach and waste stock piles, active mining areas where utilities have never been present. Blue Stakes are not required in the Henderson Topsoil reclamation stockpiles or within the boundary of the hydraulic deposited tailing material. A Tailing Engineer should always be consulted before determining a Blue Stake is not needed within the Tailing Storage Facility due to extensive utilities buried at depth.
- C. Residential and commercial lessees of Freeport-McMoRan owned town sites will not be issued a Freeport-McMoRan Blue Stake Permit. These individuals must contact the appropriate entities per the lease agreement and in accordance with local laws.

2.2 Blue Stake Permit

The Blue Stake Representative(s) will determine the necessity for a permit.

Purpose: Completing a permit signifies that, to the best of the Blue Stake Representative's knowledge, inspection and information available, all known utilities have been identified and marked in the designated area.

Initiating: The permit requestor is responsible for initiating the permit process. The permit requestor must give advance notification of the Blue Stake. A minimum of 3 days prior to work starting is best to allow for proper investigation. If an external utility locate is needed (roadway right-of-way, easements, non-owned utilities), advanced notification of 7 days must be given.

Issuing: Only a Blue Stake Representative(s) can issue a Blue Stake Permit. A permit may not be required upon consensus of the Blue Stake Representative(s), the requestor, the area General Supervisor/Superintendent, and/or the person(s) performing the excavating (i.e., hand digging to expose a valve or pipeline for repair, etc.). If it is determined a permit is not required, the Blue Stake Representative(s) will document the request.

Review Requirements: A Blue Stake Representative(s) must review the Blue Stake Permit on site with the permit requestor and/or individual performing the work. The supervisor and Blue Stake Representative(s) will determine the need for additional site visits if conditions change or if the operator performing the excavation changes.

Permits Needed: Each excavation area in a project scope must have an individual permit for that location.

Numbering: Each Blue Stake Permit shall be uniquely numbered.

Expiration: Once approved, the Blue Stake Permit will be valid for 30 days from the date of issue. If a Blue Stake Permit expires before the renewal is granted, the work must stop until a new blue stake permit is issued or renewed.

Extensions: If the duration of the excavation requires more than 30 days, it is the responsibility of the requestor to contact the Blue Stake Representative(s) for an additional 30-day extension. The Blue Stake Representative(s) may require the area to be resurveyed if an extension of the permit is requested. NOTE: This does not apply to Long-term Agreements. (i.e. road grading).

Long-term Permits: Long-term Blue Stake Permits may be issued for one year. Excavations in these areas are unlimited based on the restrictions of the permit but must be performed by the designated operator(s).

The operator(s) must be listed on the Long-term Permit at the time of initial request or renewal and a copy of the permit must be with the operator while the work is being performed.

Changes/Deviations: If the conditions or the scope of the excavation expands a new permit must be requested. Any deviations, additions or changes to the Blue Stake Permit must be approved by the Blue Stake Representative(s).

Location of Permit While Work is Performed: The approved Blue Stake Permit must stay on site while the work is being performed.

Location of Permit when Work is Completed: Once the work is completed, the permit must be returned to the Safety Department.

File Retention: The Blue Stake Permit, with any attached drawing/documents, will be filed according to the FCX – Records Retention Policy.

2.3 Procedure for Floor, Roof, Ceiling and Wall Penetrations

This Program is the minimum standard and does not preclude a person from utilizing the full process at any time anyone is not comfortable in proceeding without a full investigation.

Less than one-inch Penetration: If the depth of the penetration is one inch (1") or less, a Blue Stake Permit is not required.

Greater than one-inch Penetration: Contact the site environmental representatives prior to penetration greater than one inch (1") in any surface.

Asbestos: Contact the site environmental and/or industrial hygiene representative if materials are uncovered that are suspected to contain asbestos.

Hazard Review: Perform a review of all known utilities, gas, water, air, sewer, or communications lines. Examine both sides of wall surfaces and ceilings, when possible, to see if there are any utilities that have been installed in the wall joints or studs without making wall penetrations.

Renovations/Demolitions: Renovation or demolition projects require coordination with site environmental at least 30 days in advance of the start of the project so that proper testing of materials can be done.

Sawing Into Floors: Sawing into floors requires a permit at all times.

Drawing/Print Requirements: Drawings or prints applicable to the work areas will be obtained when doubt exists concerning the location of utilities within structures. The use of drawings or prints does not take the place of a reasonable and personal assessment by all employees.

Marking Proposed Area: Persons requesting a digging permit will outline the area of proposed excavation with white paint prior to scheduling representative(s) to check the area or will review the area with the representative(s) during the permit approval process. More permanent markers such as whiskers or flags can be requested through utility locates or blue stake process.

Paint Colors for Marking: When the Blue Stake Representative marks the area, colors other than white shall be used and typically the color will be relative to the utilities. The following color-coded marking of underground utilities and proposed excavations shall be utilized for ground marking paint, whiskers and flags.

- RED - Electrical Power
- YELLOW - Gas-Oil-Product, and Air Lines
- ORANGE - Communication Cable
- BLUE - Water Systems
- GREEN - Sanitary Sewer Systems, Drains
- PURPLE – Reclaimed Water, Irrigation and Slurry Lines
- Perimeter of Excavation/Boundary
- PINK – Temporary Survey Markings

Marking Underground Utilities: All underground utilities, in use or abandoned, will be marked.

Marking Utilities/Content: The name of the identified utility or content, if known, will be written along the painted lines.

Marking Absence of Utilities: If it is determined there are no utilities in the proposed area of excavation, the word "OK" will be written in white paint inside the area.

3.0 Revision History

November 2017 Rev 1	Henderson Mill tailings waste stockpile exemption map added to Appendix B
2022 Rev 2	Added to language to 2.1: Hand Digging/Pot Holing, Broken/Ruptured Utility Occurs, Unidentified Utility Discovered, Exemptions – Do not Require Blue Stake Permit, 2.2: Initiating, 2.3 Marking Proposed Area, and Procedures and Trenching and Excavation sections for lessons learned during gas line damage event in Oct. 2021. Added Appendix C for Utility Owner contact information

2025
Rev 3

Updated language in 2.0 General: 2.1 Procedures.

Added to language:

Underground Utility Work: Unless noted otherwise within this document and/or appendices, underground utilities are in reference to buried utilities for both the surface and underground workings.

Added:

Underground Mine Inter-Drift Drilling: Drilling which is planned to break through into underground mine drifting requires blue stake from the Mine Engineering Department. Please reference Appendix E.

Updated language in Appendix A : Underground Utility Requirements to align with FMI BS Policy.

Added:

* A **New Utility Installation Checklist** is required to be completed and attached/filed with Blue Stake Permit, please reference Appendix D

Reworded:

6. All U.G. electrical installations are to be encased in red dyed concrete and a red 6" foil backed caution tape will be installed above the installation according to the specific site instructions. For instruction on any buried electrical lines, please reference Appendix D, if not contact an Electrical Engineer in the Plant Engineering Dept.

Added Appendix D- Henderson Operations - New Utility Installation Check List

Added Appendix E- Henderson Mine Underground Inter-Level Drilling Blue Stake Procedure

Appendix A – Forms and Permits

Henderson Operations Blue Stake Permit

Permit Number: _____

Date Issued: _____

Expiration Date: _____

Requester: _____

Phone: _____

Division/Department: _____

Location: _____

Short Description of the Project:

Detailed Scope of Work (use added sheet if needed):

Cautions/Markings:

	Check One	YES	NO
Is this excavation for a new installation?			
Is this excavation to repair an existing buried line?			
Is a site investigation required?			
Do outside utilities need to be contacted? (UNCC / Colorado 811 Notification 800-922-1987)			
Explosives to be used in excavation? (if yes, site specific blasting procedures need to be developed and approved by the site manager)			
Mine Only: Is inter-level drilling involved? (if yes, verify utilities on connecting levels)			
Are copies of applicable drawings and prints attached?			
Is a Confined Space Entry Permit Required? (If yes, requestor attach signed copy) To be determined by Requestor			
Is a Hot Work Permit Required? (If yes, requestor attach signed copy) To be determined by Requestor			
Is a LOTOTO procedure required?			

Approval	Name	Signature	Date
Responsible Area or Project Supervisor			
Supervisor of Equipment Operator(s)			
Equipment Operator (s)			
Contractor Representative (if required)			
Others			
Freeport-McMoRan Blue Stake Representative			

Underground Utility Requirements

These specifications apply to all repaired, rerouted and newly installed underground utilities. (Note: A Blue Stake Team member may waive the requirement for these standards. Explain below)

* A **New Utility Installation Checklist** is required to be completed and attached/filed with Blue Stake Permit, please reference Appendix D

UG Requirements shall be completed by the person(s) installing the line unless otherwise specified by Requestor:
Location:
Type of Utility to be Installed:

Circle items that must be accomplished to complete this job:

1. Survey: Location by Surveyor for mapping and future location references
2. Visual markers for Buried Utilities
 - Buried or covered pipelines running along or under a roadway may require visible pipe location markers at the time of installation.
 - Pipe location markers may consist of 4" HDPE, or commercial markers. Markers will be approximately 10' tall in large equipment traffic areas.
 - Enter and exit points for buried lines under roadways shall be at least 6 ft. outside designated roadway to allow for required depth under roadway.
3. Tracer wire installation
 - All new underground utilities must have a tracer wire buried with utility line during installation.
 - Tracer wire must be an 14 gauge or greater insulated wire.
 - If a tracer wire must be spliced, the splice must assure an uninterrupted circuit along the entire length of the tracer wire. The wire must be properly insulated from the ground by being wrapped or sealed to make it water tight.
 - Tracer wire shall extend at least three feet beyond the exit point of line and be attached vertically, to the pipe location marker, or the utility line itself, if exposed, to assure future accessibility.
4. Underground Caution Tapes
 - All gas lines will have yellow caution tape laid in three inches of sand, twelve inches above line.
 - All communication/fiber optic lines will have an orange caution tape twelve inches above line.
 - Buried acid lines will have yellow caution tape installed twelve inches above line.
5. Depth Requirements: Specific burial depths according to the pipe diameter may be obtained from the Mine or Plant Engineering Department
 - Three foot from top of pipe for normal vehicular traffic and six to eight foot from top of pipe for heavy equipment or haul truck traffic.
 - Gas lines must have a minimum of 36" of fill from top of pipe to grade
 - Communications cables shall be a minimum of 36" of fill from cable to grade.
 - Gas lines and communication /fiber optic lines will be bedded within 12 inches of washed sand, or other approved fines material.
6. All Underground electrical installations are to be encased in red dyed concrete and a red 6" foil backed caution tape will be installed above the installation according to the specific site instructions. For instruction on any buried electrical lines, please reference Appendix D, if not contact an Electrical Engineer in the Plant Engineering Dept.

* PLEASE NOTE:

Please be advised that these specifications do not alleviate compliance with any State, Federal or site specific regulations. If minimum requirements cannot be met, clear with a Blue Stake team member.

All excavations for underground utility installations/repairs must be left open until line has been inspected and located (which may include activation of line). This form must be signed by a Surveyor from Plant Engineering, Mine Engineering, or a Blue Stake Team member before excavation is covered.

Specifications meet:

Date:

Trenching and Excavation

HAZARDS:

1. Cave in/burial.
2. Buried Utilities.
3. Hazardous atmosphere.
4. Slips/falls/sprains/strains.
5. Moving equipment.

PROCEDURES AND PRECAUTIONS:

1. Before performing any type of excavation, make sure you have a Henderson Operations Blue Stake permit.
2. Always take pre-excavation pictures to document current conditions and locations of the locate.
3. **Do not** enter an excavation over four feet deep, unless it has been properly benched/sloped/shored and/or a shield is in use and a competent person has done a site inspection. Refer to OSHA guidelines for trench sloping and shoring. (§1926.651 Subpart P – <http://www.osha.gov>)
4. A “competent person” means one who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them. This competency can be gained through training or experience.
5. When employees are required to be in excavations or trenches 4 feet deep or more, an adequate means of exit such as a ladder or steps, shall be located within 25 feet of lateral travel.
6. Before any work is done in a trench, a competent person will do a daily site inspection and safety briefing. Fill out the “Trench Inspection Form” every time a trench is inspected. Re-inspections shall be made after every rainstorm, or other hazard increasing occurrence (condition that causes the ground to shift or vibrate).
7. When an employee finds evidence of a possible cave-in, failure of protective systems or other hazardous conditions, employees will clear the area until the necessary corrective steps have been taken.
8. At any time during an excavation, any employee has the right to call for an inspection of the site by a Technical Services Representative, a Health and Safety professional or other qualified person. There is always the option for asking the utility owner standing watch during the excavation. See Appendix C for contact information. For Xcel, the best contact is the Contract Service Center Rep for the Mountain Division.
9. If you smell gas or any unusual odor while in a trench, immediately evacuate the area and contact your supervisor.
10. If a caution tape or any buried concrete is encountered, stop digging and contact excavation supervisor. Any time a utility is exposed or contact of an object is made that was not specified on the permit, stop digging and contact Technical Services.

11. If the excavation is located outside of the general mill area (tailings, C&C, etc..) a tailing engineer shall be consulted on the Blue Stake and required to sign off on the permit to confirm that the area is free of known utilities.
12. Foreman's Sketches or maps of utilities may be available from utility owners. An Engineering Ticket through UNCC can be submitted for an excavation area to research the availability of these resources.
13. There may be excavations where the requestor is unable to meet with the locator for public utilities. In these cases, it may be important to physically mark out excavation areas so that the public locator has a better understanding of where excavation boundaries are.

This document must be attached to the Excavation Request at all times during trenching activities

Daily Trench Inspection

A trench/excavation must be inspected daily by a competent person to insure the safety of the work area.

Date: / / Time :	Signature Required	Site Safety Check
Competent Person		Yes No
Area or Contractor Supervisor		Yes No

Date: / / Time :	Signature Required	Site Safety Check
Competent Person		Yes No
Area or Contractor Supervisor		Yes No

Date: / / Time :	Signature Required	Site Safety Check
Competent Person		Yes No
Area or Contractor Supervisor		Yes No

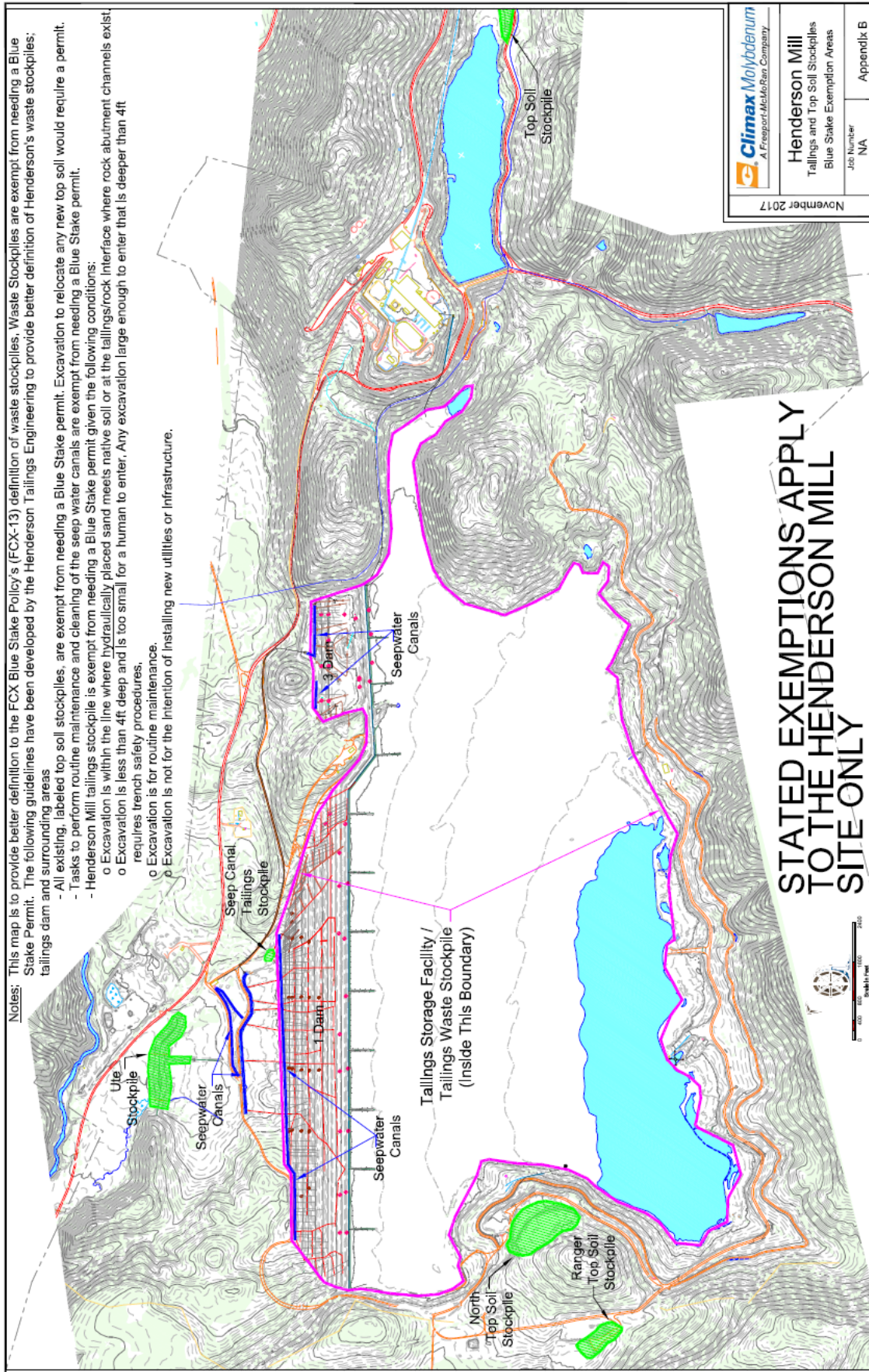
Date: / / Time :	Signature Required	Site Safety Check
Competent Person		Yes No
Area or Contractor Supervisor		Yes No

Date: / / Time :	Signature Required	Site Safety Check
Competent Person		Yes No
Area or Contractor Supervisor		Yes No

Date: / / Time :	Signature Required	Site Safety Check
Competent Person		Yes No
Area or Contractor Supervisor		Yes No

Appendix B

Henderson Mill Tailings Waste Stockpile Exemption Map



Appendix C

Utility Owner Contact Information

Calling *811 is always a good place to start for initiating contact with utility owners or during an emergency.



Damage Prevention

THE COLORADO DAMAGE PREVENTION DEPARTMENT CONTACT INFORMATION

Name	Contact Details	Role
ESTHER WILLIAMS Senior Operations Manager	Office: 303-716-2037 Cell: 720-320-8502 Email: esther.i.williams@xcelenergy.com	Manages the Damage Prevention Program for Xcel Energy
HEATH BUSTER Contract Resource Coordinator	Office: 303-716-2032 Cell: 720-253-9506 Email: heath.buster@xcelenergy.com	Directs the Damage Prevention Service Center Reps and Auditors
ERIC LARSON Facility Damage Analyst	Office: 303-716-2041 Cell: 303-802-7960 Email: eric.l.larson@xcelenergy.com	Oversees the Damage Investigation Process and Regulatory Reporting
AMY ODUM Business Process Analysis Supervisor	Office: 303-716-2028 Cell: 720-273-7219 Email: amy.odum@xcelenergy.com	Provides supervisory direction to administrative contract resources, tracks and reports operational performance
CHRIS HENDRIX Contract Foreman	Cell: 303-356-8816 Email: christopher.hendrix@xcelenergy.com	Oversees Service Center Reps and Auditors
PAUL HAUCK Contract Foreman	Cell: 303-502-0597 Email: paul.a.hauck@xcelenergy.com	Oversees Service Center Reps and Auditors
BRAD YENTER Contract Service Center Rep	Cell: 970-216-9921 Email: brad.o.yenter@xcelenergy.com	Western Slope and San Luis Valley – Liaison to Excavation Community
CASEY HOFFERBER Contract Service Center Rep	Cell: 720-445-1588 Email: casey.hofferber@xcelenergy.com	Northern Colorado and Brighton – Liaison to Excavation Community
CHRIS JEFFREY Contract Service Center Rep	Cell: 720-237-7566 Email: christopher.jeffrey@xcelenergy.com	Mountain Areas – Liaison to Excavation Community and Locator Field Assessments
DONNIE ROSE Contract Outreach Specialist	Cell: 303-895-5252 Email: donald.g.rose@xcelenergy.com	Excavator and Public Outreach
TIM BUTCHER Contract Service Center Rep	Cell: 720-346-0902 Email: timothy.w.butcher@xcelenergy.com	Denver Metro, South Denver, Gateway and Pueblo – Liaison to Excavation Community
GREG JOHNSON Contract Service Center Rep	Cell: 720-281-6881 Email: gregory.p.johnson@xcelenergy.com	Boulder County and Northwest Denver – Liaison to Excavation Community
CURTIS CLARK Contract Quality Auditor	Cell: 303-503-1470 Email: curtis.d.clark@xcelenergy.com	Northern Colorado Field Audits/Fiber Projects
CRAIG CANZONERI Contract Quality Auditor	Cell: 303-704-3341 Email: craig.s.canzoneri@xcelenergy.com	Northern Colorado Field Audits/Fiber Projects
JOHN COPELAND Contract Quality Auditor	Cell: 720-403-3289 Email: john.b.copeland@xcelenergy.com	Denver Metro Field Audits/Fiber Projects
MARVIN SIMS Contract Quality Auditor	Cell: 303-919-1445 Email: marvin.e.sims@xcelenergy.com	Denver Metro Field Audits/Fiber Projects
MARQUIS SIMS Contract Quality Auditor	Cell: 720-376-9556 Email: marquis.r.sims@xcelenergy.com	Denver Metro Field Audits/Fiber Projects
AFTER HOURS	Phone: 303-716-2030	To reach Damage Prevention staff during non-business hours

Appendix D

Henderson Operations New Utility Installation Checklist



FREEPORT-McMORAN

Henderson OPERATIONS

BLUE STAKE

New Utility Installation Checklist

REQUESTOR:	DEPARTMENT:	ISSUE DATE:
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AREA OF WORK:

Blue Stake Permit No. (BSP):

PRE-INSTALLATION PROCEDURE

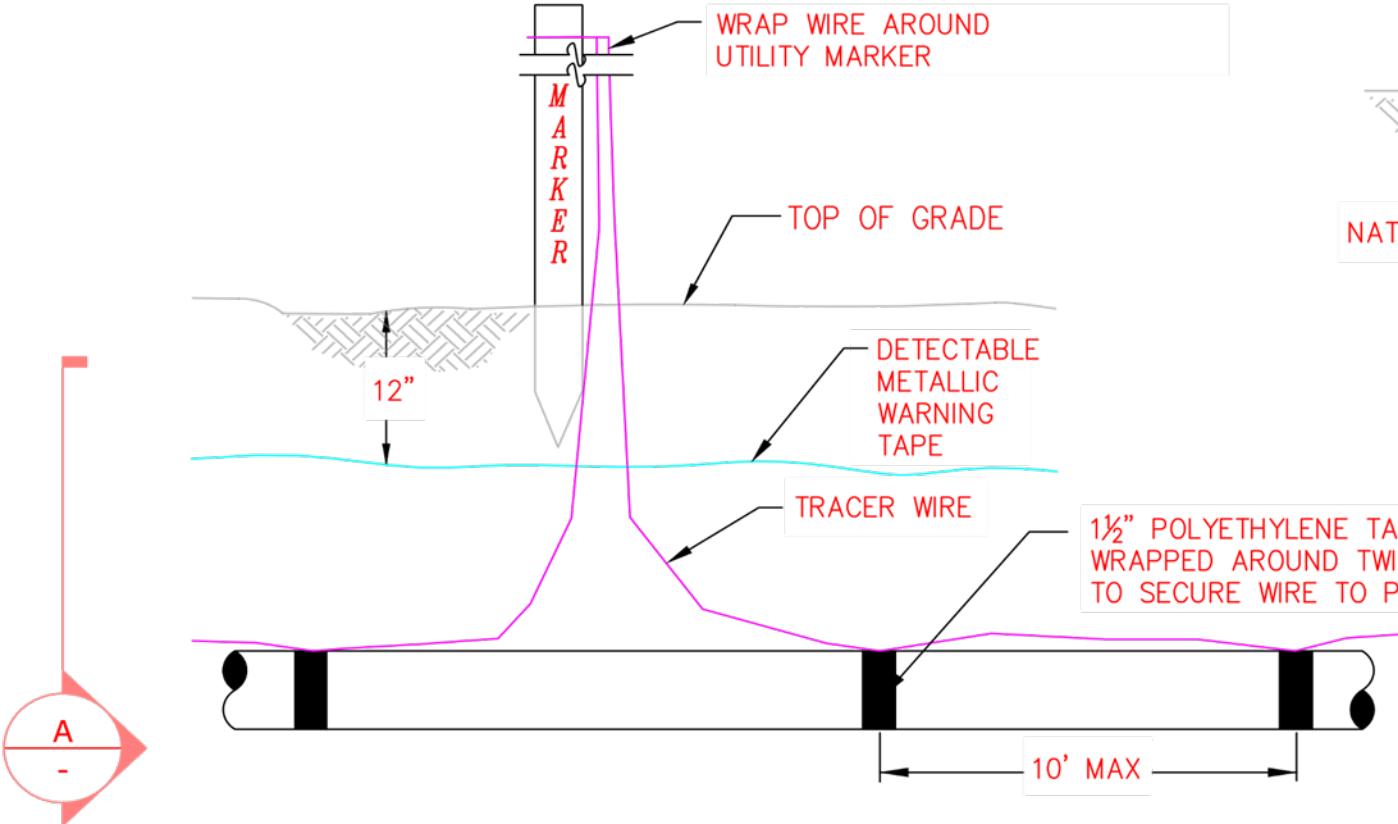
Notes:

1. ALL NEW UTILITY INSTALLATIONS REQUIRE TRACER WIRE AND MAGNETIC LOCATOR TAPE. THE TRACER WIRE SHALL BE 14 AWG SOLID UL/UF OR GREATER AND RUN ALONG THE TOP OF THE UTILITY IN A CONTINUOUS LENGTH (SEE DETAIL, PAGE 2). THE TRACER WIRE SHALL BE SECURED TO THE UTILITY IN INTERVALS OF 10' MAXIMUM WITH WIRE OR TAPE. MAGNETIC LOCATOR TAPE TO BE INSTALLED PER DETAIL ON PAGE 2.
2. TRACER WIRE INSTALLATION SHALL BE PERFORMED IN SUCH A MANNER THAT ALLOWS PROPER ACCESS FOR CONNECTION OF LINE TRACING EQUIPMENT. TRACER WIRE INSTALLATION MUST INCLUDED A MINIMUM OF 2' OF EXCESS/SLACK AT TERMINATION POINTS AND ATTACHED TO A UTILITY MARKER OR "T" POST IN INTERVALS OF NO MORE THAN 500' FEET.
3. TRACER WIRE SYSTEMS MUST BE INSTALLED AS A SINGLE CONTINUOUS WIRE, EXCEPT WHERE USING PROPER CONNECTORS.
4. SPLICES IN THE TRACER WIRE SHALL BE PERFORMED AS FOLLOWS, OR BY ANOTHER APPROVED METHOD.
 - STRIP THE INSULATION FROM THE WIRE LONG ENOUGH FOR THE WIRE TO EXTEND APPROXIMATELY 1/2" BEYOND THE END OF THE COPPER SLEEVE.
 - CRIMP THE SLEEVE ON THE WIRE WITH A CRIMPING TOOL A MINIMUM OF 4 TIMES PRIOR TO BENDING THE WIRE OVER THE SLEEVE.
 - CLEAN AND DRY THE EXPOSED SECTION OF WIRE SLEEVE.
 - WRAP THE CONNECTION WITH VINYL ELECTRICAL TAPE.
5. THE NEW UTILITY INSTALLATION MAY NOT BE BACKFILLED UNTIL THE INSTALLATION HAS BEEN VERIFIED BY A MEMBER OF THE BLUE STAKE TEAM AND DOCUMENTED WITH PICTURES.
 - NEW UTILITY OR RELOCATE REQUIRES SURVEYING LOCATE AND UPDATING ANY SITE UTILITY MAP(S)
6. THIS CHECKLIST IS TO BE FILLED OUT BY THE SUPERVISOR OF DIGGING CREW OR THE EQUIPMENT OPERATOR AND TURNED INTO A BLUE STAKE REPRESENTATIVE AT THE COMPLETION OF THE PROJECT.

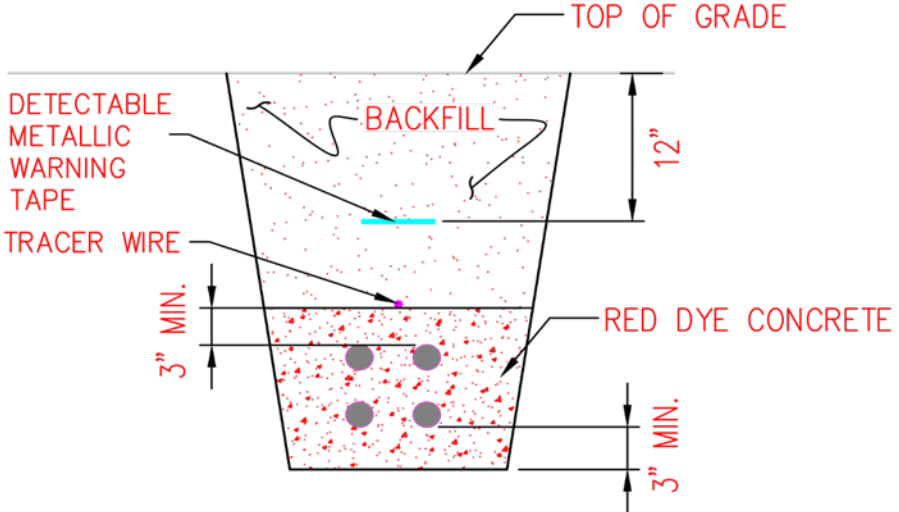
POST INSTALLATION PROCEDURE

UTILITIES INSTALLED	Tracer Wire	Magnetic Tape	COMMENTS
WATER			
ELECTRIC			
SEWER			
COMMUNICATION			
GAS/PROPANE			
OTHER (PROCESS/AIR/HDPE/ETC.)			

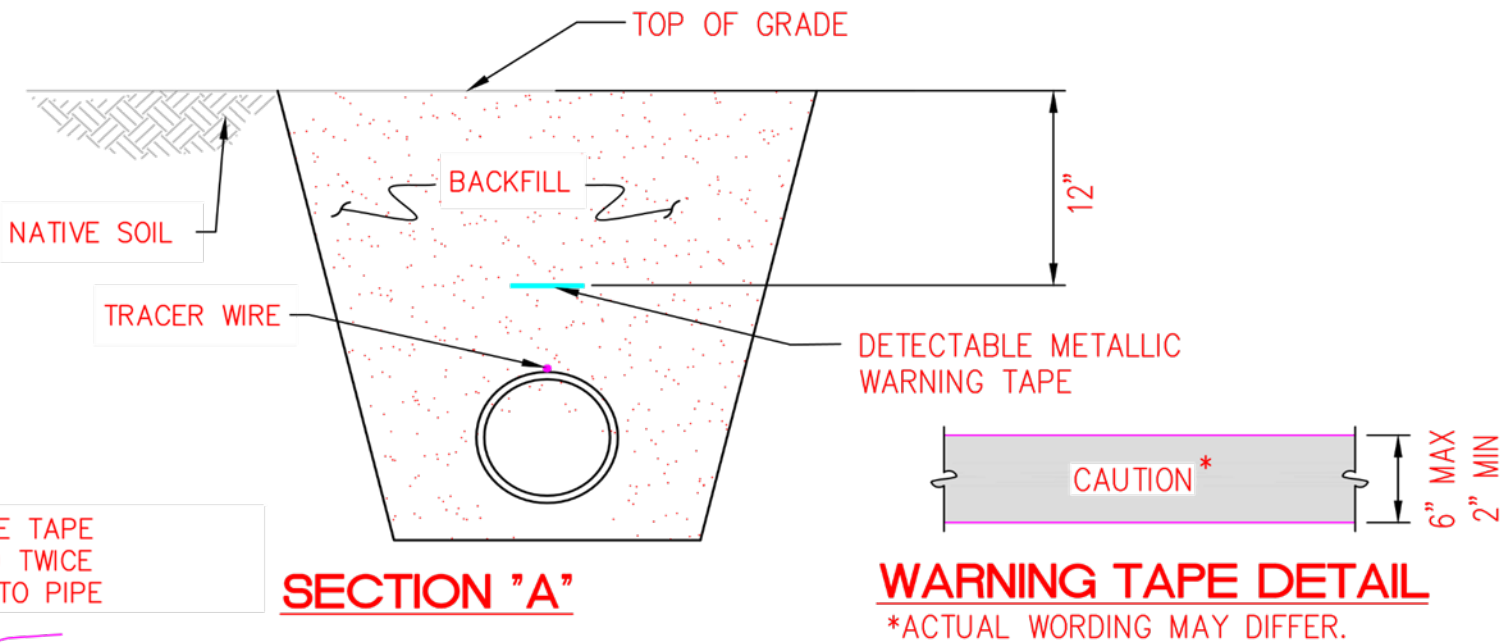
POST INSTALLATION SIGNATURES	NAME/SIGNATURES	DATE
SUPERVISOR OF DIGGING CREW		
EQUIPMENT OPERATOR/DIGGING CREW		
CONTRACTOR REPRESENTATIVE (IF APPLICABLE)		
BLUE STAKE TEAM MEMBER		



UTILITY INSTALLATION DETAIL
SCALE: NTS



DUCT BANK INSTALLATION DETAIL
SCALE: NTS



- NOTES:**
- ALL NEW UTILITY INSTALLATIONS REQUIRE TRACER WIRE AND DETECTABLE METALLIC WARNING TAPE. THE TRACER WIRE SHALL BE 14 AWG SOLID UL/UF OR GREATER AND RUN ALONG THE TOP OF THE UTILITY IN A CONTINUOUS LENGTH.
 - THE TRACER WIRE SHALL BE SECURED TO THE UTILITY IN INTERVALS OF 10' MAXIMUM WITH WIRE OR TAPE. DETECTABLE METALLIC WARNING TAPE TO BE INSTALLED 12" FROM TOP OF FINISHED GRADE.
 - TRACER WIRE INSTALLATION SHALL BE PERFORMED IN SUCH A MANNER THAT ALLOWS PROPER ACCESS FOR CONNECTION OF LINE TRACING EQUIPMENT. TRACER WIRE INSTALLATION MUST INCLUDED A MINIMUM OF 2 FEET OF EXCESS/SKACK AT TERMINATION POINTS AND ATTACHED TO A UTILITY MARKER OR "T" POST IN INTERVALS OF NO MORE THAN 500' FEET.
 - TRACER WIRE SYSTEMS MUST BE INSTALLED AS A SINGLE CONTINUOUS WIRE, EXCEPT WHERE USING PROPER CONNECTORS.
 - SPLICES IN THE TRACER WIRE SHALL BE PERFORMED AS FOLLOWS, OR BY ANOTHER APPROVED METHOD.
 - STRIP THE INSULATION FROM THE WIRE LONG ENOUGH FOR THE WIRE TO EXTEND APPROXIMATELY 1/2" BEYOND THE END OF THE COPPER SLEEVE.
 - CRIMP THE SLEEVE ON THE WIRE WITH A CRIMPING TOOL A MINIMUM OF 4 TIMES PRIOR TO BENDING THE WIRE OVER THE SLEEVE.
 - CLEAN AND DRY THE EXPOSED SECTION OF WIRE SLEEVE.
 - WRAP THE CONNECTION WITH VINYL ELECTRICAL TAPE.
 - ALL CONDUIT DUCT BANKS (EXCEPT THOSE IN FLOOR SLABS) SHALL BE ENCASED IN RED CONCRETE COLORED BY MIXING 10 POUNDS OF RED OXIDE PER CUBIC YARD OF CONCRETE. CONDUIT IN FLOOR SLABS TO BE APPROVED BY ENGINEER PRIOR TO CONSTRUCTION.
 - TOP OF CONCRETE ENCASEMENT SHALL BE NO LESS THAN 18" BELOW GRADE. PRIOR APPROVAL BY ENGINEER REQUIRED FOR A SHALLOWER DEPTH.

DWG. #	REFERENCE DRAWINGS	DESCRIPTION OF REVISION	DATE	BY	APPR	DEPARTMENT APPROVALS	ENGR:		
		Removed Minimum 480V Requirement & Updated Guage Requirement	4/3/2025	MJE			DRAWN BY:	3/27/2025	
							CHECKED BY:		
							APPROVED BY:		
							APPROVED BY:		
							SAFETY APP BY:		

SCALE: NTS

HENDERSON OPERATIONS

A Freeport-McMoRan Company
EMPIRE / PARSHALL, COLORADO
303-569-3221

PLANT ENGINEERING

UTILITY TRENCHING DETAILS

SHT 1 OF 1 REV.

Appendix E

Henderson Mine Underground Inter-Level Drilling Blue Stake Procedure

Henderson Mine Underground Inter-Level Drilling Blue Stake Procedure

1. The purpose of this procedure is to ensure the efficient and safe process of designing and drilling underground inter level utility holes.
2. A Technical Services representative will work with the requesters of the utility/drain hole to determine a final design to be approved and signed off by responsible parties of the affected areas.
3. Technical Services will distribute approved design drawings and physically mark appropriate azimuth, dip angle and breakthrough distance at hole collar. Hole breakthrough will be marked on appropriate level (when accessible).
4. Technical Services will investigate the drilling and breakthrough locations for potential hazardous energy sources. Any existing power cables or energy sources to be de-energized and any necessary LOTOTO will be noted on the Blue stake Permit.
5. When the Blue stake Permit is issued, all involved parties (Tech Services, Supervisor, Driller, etc) will discuss the identified potential energy sources and necessary actions. The Permit must be signed by the involved parties before drilling can occur.
6. A Technical Services Representative must approve any deviations, additions, or other changes to the drill design. The Driller, his Supervisor or Contract Drill Supervisor is responsible for correct drill set-up, dip angle and drill distance. Henderson Surveyors may provide checks of drill set-up and dip angles. For unique or long holes exceeding 200', best results will be achieved after the hole is collared in 2' before requesting survey check.
7. **Most importantly**, it is the Driller's responsibility to assure that the electrical power hazards have been **de-energized** before breakthrough. The LOTOTO procedure will be followed with the assistance of the Electrical Department. The Driller will place his personal lock-out lock on the electrical disconnects or the lock box for multiple power sources. Both parties signing the Blue stake Permit will confirm this communication between the driller and a representative of the Electrical Department performing the Henderson LOTOTO procedure.
8. The breakthrough location must be barricaded restricting entry. A physical guarding procedure may be prudent for long holes exceeding 200' which are within 50' of a intersecting level or nearby drifts.

Mine Technical Services Representative: Mine Chief Engineer or their delegate.