Climax Molybdenum
A Freeport-McMoRan Company

Climax Mine
Highway 91 - Fremont Pass
Climax, CO 80429
Phone (719) 486-7718
Fax (719) 486-2251

May 22, 2019

Mr. Eric Scott
Environmental Protection Specialist
Division of Reclamation, Mining and Safety
Department of Natural Resources
1313 Sherman St. Room 215
Denver, Colorado 80203

RE: Climax Mine, Permit No. M-1977-493, Technical Revision 29 – Adequacy Review Response

Dear Mr. Scott,

Climax Molybdenum Company – Climax Mine (Climax) has prepared a response to the item raised in the April 2, 2018 Adequacy Review letter in regard to Technical Revision 29. DRMS comments are in italics font, followed by the Climax response.

Comment #1: These proposed modifications will be conducted on facilities that are considered Environmental Protection Facilities (EPFs) by the Division. As such, DRMS will require that the provided design drawings be signed and stamped by the Engineer of Record (EOR) for the facilities to be modified, as well as a commitment to submit similarly certified as-built reports upon completion. DRMS also will require notice when construction is to commence for the proposed work, so that in process inspections may take place.

Response: Climax has attached stamped/signed construction drawings for the Mayflower Flood Bypass Tunnel – Phase II and soil excavation and stabilization for the future riser structure titled "Mayflower Flood Bypass Tunnel System, Phase II Tunnel – Construction Drawings" and "Mayflower Flood Bypass Tunnel, Phase II Vertical Intake Structure, Portal Construction Plans". TR-29 referred to a tower riser structure; however, construction drawings for that facility are not available at this point in time so those drawings will be submitted as a separate Technical Revision in early 2020. Once Phase II of the tunnel is complete, Climax will submit a certification for this facility from the EOR.

Climax has also attached a memo titled "REV 0 – Mayflower Tailings Storage Facility Leadoff Clarification, Climax Mine, Permit No. M-1977-493" from the tailings EOR clarifying that the addition of a fourth leadoff on the Mayflower Tailings Storage Facility (TSF) was always part of the planned development of the TSF, along with additional leadoffs in the future. Each year, Climax submits a certification for the TSF from the EOR for the previous year's construction and the additional leadoff will be included in the certification submitted for 2019.

In the most recent EPP update (TR-28) Climax described the clean water interceptor system in Section T-5 as follows:

"Climax recognizes their importance to the overall water management system, but notes that the clean water interceptors do not appear to meet the definition of an EPF since they carry only un-impacted water around the site and do not contain or control designated chemicals or process solutions. As agreed upon with DRMS, although these systems are considered to be pre-EPF systems and do not contain or control designated chemicals or process solutions, they will be managed by Climax as internal EPFs. The interceptor systems are closely monitored, inspected and maintained as part of routine site monitoring activities. Other than repair and maintenance/upgrades, any future expansion or modifications of the interceptors will be subject to review by DRMS, consistent with Section 6.4.21(10)(a)(ii) of the Rules."

In accordance with TR-28, Climax is providing stamped/signed construction drawings for the West Interceptor Phase D improvement project titled "Interceptor Rehabilitation Project, West Interceptor Culvert Replacement (Phase D) Downstream of Searle Gulch". Once construction is complete, Climax will submit a certification for this facility from the EOR.

The Division also verbally asked a question about the hydraulic capacity of the West Interceptor once the Phase D improvements were complete as it relates to the evaluation that Climax completed in 2014 as requested as part of TR-18. The Division originally requested that Climax complete a hydrologic analysis to determine if the interceptor systems could safety pass a 10-yr/24-hr rainfall event and it was determined that there were portions of the West Interceptor that could not pass this size event. A 10-yr/24-hr rainfall event for the West Interceptor System at Searle Gulch is estimated to be about 145cfs. After the Phase D improvements are made to the West Interceptor, the overall capacity will increase to 106cfs from the current 86cfs for the section downstream of Searle Gulch. Additional improvements downstream from Phase D are planned for the future that will pass 145cfs; in the meantime, a gate will be used at the upstream end of Phase D to limit the flow to 106cfs.

Please contact Raymond Lazuk at 719-486-7584 or me at 719-486-7525 if you need additional information.

Sincerely,

Diana Kelts

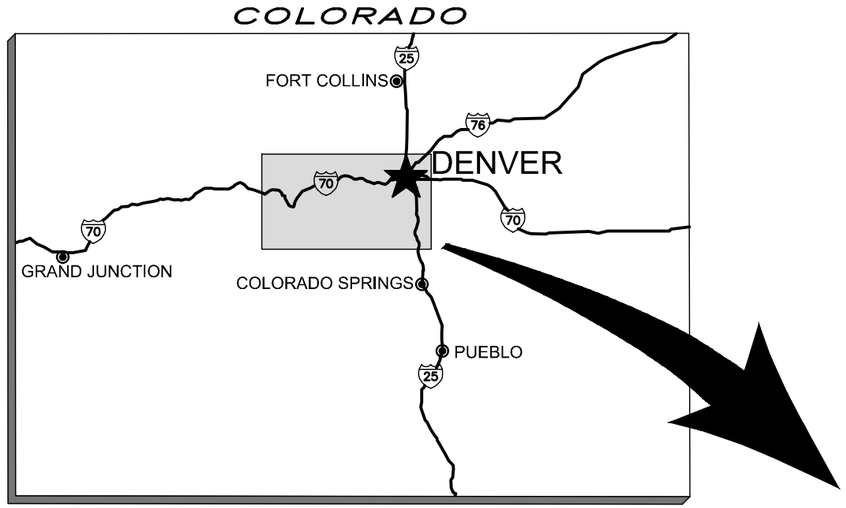
Diana Kelts
Chief Environmental Scientist

MAYFLOWER FLOOD BYPASS TUNNEL SYSTEM
PHASE II TUNNEL - CONSTRUCTION DRAWINGS

APRIL 2019

REVISION - 2

ISSUED FOR CONSTRUCTION



N

Not to Scale

CLIMAX MINE

DRAWING INDEX	
TUNNEL CONSTRUCTION DRAWINGS	
DRAWING No.	**DRAWING TITLE**
MFT-C-01	COVER SHEET / PROJECT LOCATION MAP
MFT-C-02	LEGEND AND GENERAL NOTES
MFT-C-03	EXISTING PHASE I TUNNEL ALIGNMENT AND TUNNEL STAGING AREAS
MFT-C-04	EXISTING PHASE I TUNNEL AS-BUILT PROFILE
MFT-C-05	PHASE I TUNNEL TYPICAL CROSS-SECTION
MFT-C-06	EXISTING OUTLET PORTAL FACILITIES AND PROPOSED CAMP AREA
MFT-C-07	PROPOSED PHASE II TUNNEL EXTENSION ALIGNMENTS AND STAGING AREAS
MFT-C-08	PROPOSED PHASE II MAIN TUNNEL EXTENSION PROFILE
MFT-C-09	PROPOSED NO. 2, NO. 3 AND NO. 4 SPUR PROFILES
MFT-C-10	TYPICAL GROUND SUPPORT DETAILS RMR CLASS I & II GROUND
MFT-C-11	TYPICAL GROUND SUPPORT DETAILS RMR CLASS III GROUND
MFT-C-12	TYPICAL GROUND SUPPORT DETAILS RMR CLASS IV GROUND
MFT-C-13	TYPICAL GROUND SUPPORT DETAILS RMR CLASS V GROUND
MFT-C-14	TYPICAL GROUND SUPPORT DETAILS RMR CLASS VI GROUND
MFT-C-15	TYPICAL GROUND SUPPORT DETAILS RMR CLASS I-II GROUND 12-20 FT WIDE
MFT-C-16	TYPICAL GROUND SUPPORT DETAILS RMR CLASS III GROUND 12-20 FT WIDE
MFT-C-17	TYPICAL GROUND SUPPORT DETAILS 3-WAY TUNNEL INTERSECTION RMR CLASS I-III
MFT-C-18	TYPICAL TUNNEL INTERSECTION DETAILS FUTURE SPUR INTERSECTIONS
MFT-C-19	TYPICAL TUNNEL CUTOUT DETAILS ELECTRICAL SUBSTATION
MFT-C-20	TYPICAL TUNNEL CUTOUT DETAILS SAFETY BAY
MFT-C-21	TYPICAL PROBE HOLE AND GROUT HOLE GEOMETRY

COLORADO LICENSED
ANDREW JOHN HARVEY
4/5/19
43648
PROFESSIONAL ENGINEER

REV	DESCRIPTION OF REVISION	BY	DATE
2	ISSUED FOR CONSTRUCTION	RLM	4/19
1	ISSUED FOR BID	RLM	10/18
0	ISSUED FOR CLIENT REVIEW	RLM	9/18

AutoCAD FILE: MFT Stage II Construction

Climax Molybdenum
A Freeport–McMoRan Company

AJAX
PROJECT & CONSTRUCTION MANAGEMENT
ENGINEERING, GEOLOGY, SURVEYING

WARNING
0 0.5 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED	VARIOUS
DRAWN	RLM
CHECKED	AJH
REVIEWED	DL
CLIENT	MM/RV
DATE	4/5/19

CLIMAX MINE

MAYFLOWER FLOOD BYPASS TUNNEL SYSTEM

COVER SHEET / PROJECT LOCATION MAP

REVISION 2

PROJECT NO. 12235

DRAWING MFT-C-01

SHEET 1 OF 1

NOTES

GENERAL NOTES:

1. THIS DRAWING SET IS BASED ON INFORMATION PROVIDED BY OTHERS. ALL LOCATIONS ARE BELIEVED TO BE ACCURATE. AJAX IS NOT RESPONSIBLE FOR THE ACCURACY OF THE DRAWINGS OR THE DESIGN CALCULATIONS USED TO SUPPORT THE DESIGNS CONTAINED HEREIN.
2. BASE TOPOGRAPHY PROVIDED BY FMI-CLIMAX. TOPOGRAPHY INSIDE DASH-DOT LINE FROM 2016 AERIAL. TOPOGRAPHY OUTSIDE DASH-DOT LINE FROM 2006 AERIAL.
3. HISTORIC MINING ACTIVITY LOCATIONS PROVIDED BY AECOM (legacy URS) 3/25/13. LOCATIONS ARE APPROXIMATE AND FIELD SURVEY HAS NOT BEEN PROVIDED FOR VERIFICATION OF MINING ACTIVITY.
4. BEDROCK STRUCTURE AND SURFACE GEOLOGY INTERPRETED BY AECOM (legacy URS).
5. MASTER SURVEY PLAT OVERLAY IS AN APPROXIMATE LOCATION AND FIELD SURVEY HAS NOT BEEN PROVIDED FOR VERIFICATION OF LOCATION OF MINING CLAIM OR MINING ACTIVITY.
6. NOTES FOR THE HISTORIC MINING CLAIMS DEPICTED ON THE MASTER SURVEY PLAT WERE PROVIDED BY THE BLM TO AECOM (legacy URS) OCTOBER, 2011.
7. REVISED GROUND REINFORCEMENT PLANS, DETAILS AND ENGINEERING CALCULATIONS FOR GROUND SUPPORT CLASSIFICATIONS PROVIDED BY LANGSTON & ASSOCIATES TO CLIMAX AND HENDERSON DURING PHASE I TUNNELING OPERATIONS. REFINEMENTS TO THE GROUND SUPPORT PLANS AND DETAILS ARE REQUIREMENTS OF CLIMAX MOLYBDENUM CORPORATION.

LEGEND

- PROPERTY BOUNDARY
- TOPOGRAPHY BOUNDARY
- EXISTING TOPOGRAPHY
- PAVED ROAD
- UNPAVED ROAD
- TRAIL
- FENCE LINE
- NATURAL DRAINAGE
- EXISTING LAKE/POND
- ONSITE DRAINAGE
- PROCESS WATER POND
- DRAINAGE DITCH
- CULVERT
- BUILDINGS/STRUCTURES
- POWER POLE
- BOLLARD
- PHASE 1 TUNNEL (COMPLETE)
- PHASE 2 TUNNEL ALIGNMENT
- PHASE 3 TUNNEL ALIGNMENT
- HAUL ROUTE (VARIOUS)
- EX. MUCK DISPOSAL LOCATION
- OE — ACTIVE OVERHEAD ELECTRIC
- UE — ACTIVE BURIED ELECTRIC
- GAS — ACTIVE BURIED NATURAL GAS
- OT — ACTIVE OVERHEAD COMM.
- UT — ACTIVE BURIED COMM.
- FO — ACTIVE BURIED FIBER OPTIC
- SPILING PROFILE
- WELDED WIRE MESH
- TUNNEL ROCK (TYPICAL)
- TUNNEL SHOTCRETE LINING
- WOOD BLOCKS/CRIBBING
- SPLIT SET BOLT- 7 FT
- INFLATABLE BOLT - 7 FT
- INFLATABLE BOLT - 12 FT
- APPROXIMATE LOCATION OF HISTORIC SHAFT OR CUT BASED ON BLM FIELD NOTES
- APPROXIMATE LOCATION OF TUNNEL
- TH-10 — APPROXIMATE LOCATION OF VERTICAL TEST HOLE (AECOM, 2011)
- TH -12a — APPROXIMATE LOCATION OF INCLINED TEST HOLE (AECOM, 2011)
- TP01 — APPROXIMATE LOCATION OF TEST PIT (AECOM, 2011)
- MGM 12-02 — APPROXIMATE LOCATION OF INCLINED TEST HOLE (HENDERSON, 2012)
- MGM 12-01 — APPROXIMATE LOCATION OF VERTICAL TEST HOLE (HENDERSON, 2012)

GEOLOGIC LEGEND

- Ti — INTRUSIVE QUARTZ MONZONITE PORPHYRY OR SIMILAR ROCK; SILLS INTRUDED INTO PALEOZOIC SEDIMENTS ARE THE MOST COMMON FORM OF OCCURRENCE.
- Ppm — MINTURN FORMATION; PREDOMINANTLY THICK SEQUENCES OF ARKOSIC SANDSTONE LOCALLY METAMORPHOSED TO QUARTZITE NEAR INTRUSIVE QUARTZ MONZONITE PORPHYRY.
- Ti/Ppm — MIXED FACE: INCLUDES BOTH QUARTZ MONZONITE AND PRECAMBRIAN QUARTZITE OR HORNFELS DEPOSITS;
- Qatc — UNDIFFERENTIATED QUATERNARY ALLUVIUM, TILL, AND COLLUVIUM.
- APPROXIMATE FAULT LOCATION
- PROJECTED FAULT AREA

RMR LEGEND

- RMR - CLASS I
- RMR - CLASS II
- RMR - CLASS III
- RMR - CLASS IV
- RMR - CLASS V
- RMR - CLASS VI

NOTES:

1. TUNNEL PROFILE VERTICAL SCALE EXAGGERATED.
2. GEOLOGIC CONTACTS AND FAULT LOCATIONS ARE APPROXIMATE

COLORADO LICENSED
ANDREW JOHN HARRIS
4/5/19
43648
PROFESSIONAL ENGINEER

REV	DESCRIPTION OF REVISION	BY	DATE
2	ISSUED FOR CONSTRUCTION	RLM	4/19
1	ISSUED FOR BID	RLM	10/18
0	ISSUED FOR CLIENT REVIEW	RLM	9/18

Climax Molybdenum
A Freeport-McMoRan Company

AJAX
PROJECT & CONSTRUCTION MANAGEMENT
ENGINEERING, GEOLOGY, SURVEYING

WARNING
0 0.5 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED	VARIOUS
DRAWN	RLM
CHECKED	AJH
REVIEWED	DL
CLIENT	MM/RV
DATE	4/5/19

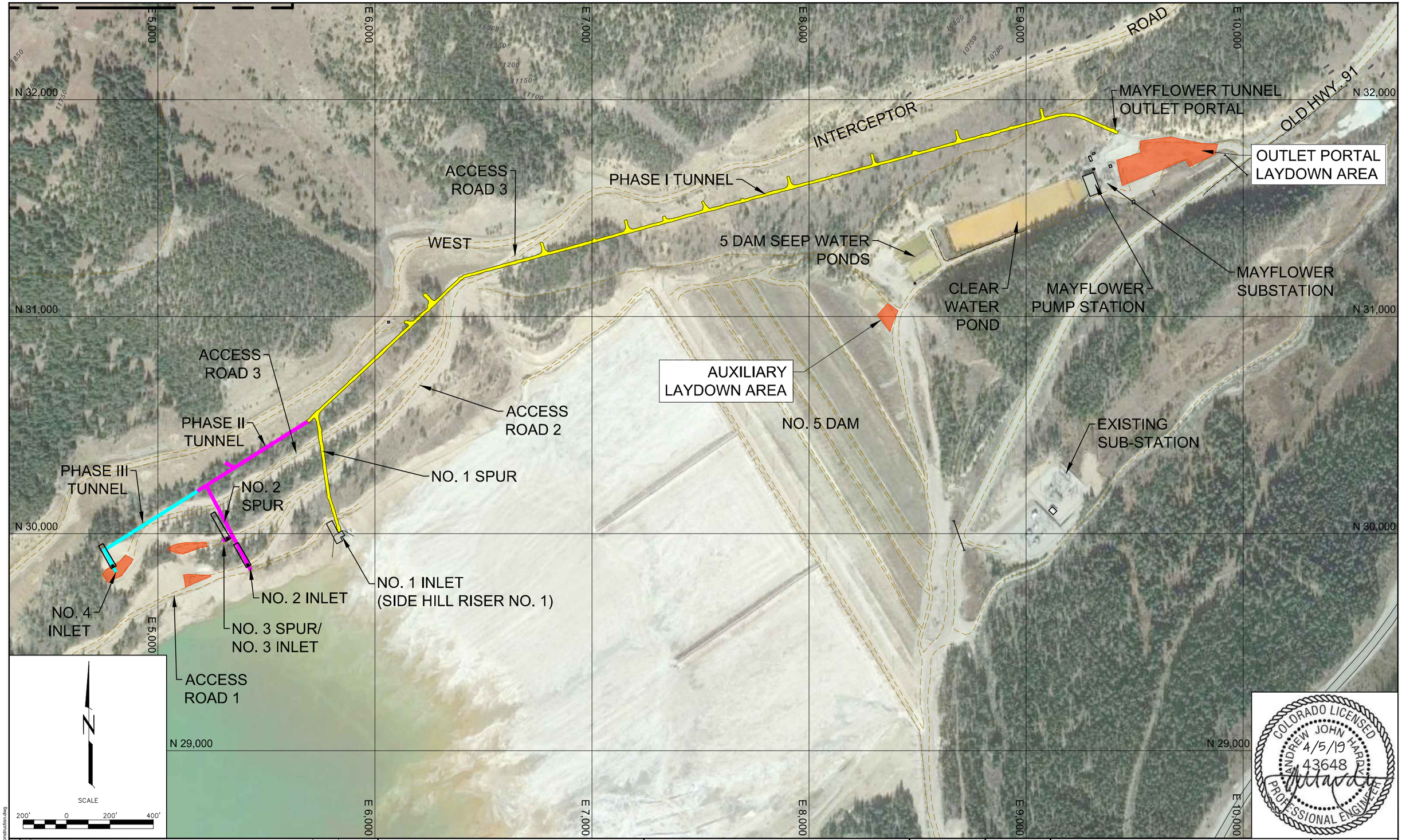
CLIMAX MINE

MAYFLOWER FLOOD BYPASS TUNNEL SYSTEM

LEGEND AND GENERAL NOTES

REVISION 2
PROJECT NO. 12235
DRAWING MFT-C-02
SHEET 1 OF 1

AutoCAD FILE: MFT Stage II Construction



COLORADO LICENSED
ANDREW JOHN HARDY
4/5/19
43648
PROFESSIONAL ENGINEER

REV	DESCRIPTION OF REVISION	BY	DATE
2	ISSUED FOR CONSTRUCTION	RLM	4/19
1	ISSUED FOR BID	RLM	10/18
0	ISSUED FOR CLIENT REVIEW	RLM	9/18

AutoCAD FILE: MFT Stage II Construction.dwg

Climax Molybdenum
A Freeport-McMoRan Company

AJAX
PROJECT & CONSTRUCTION MANAGEMENT
ENGINEERING, GEOLOGY, SURVEYING

WARNING
0 0.5 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

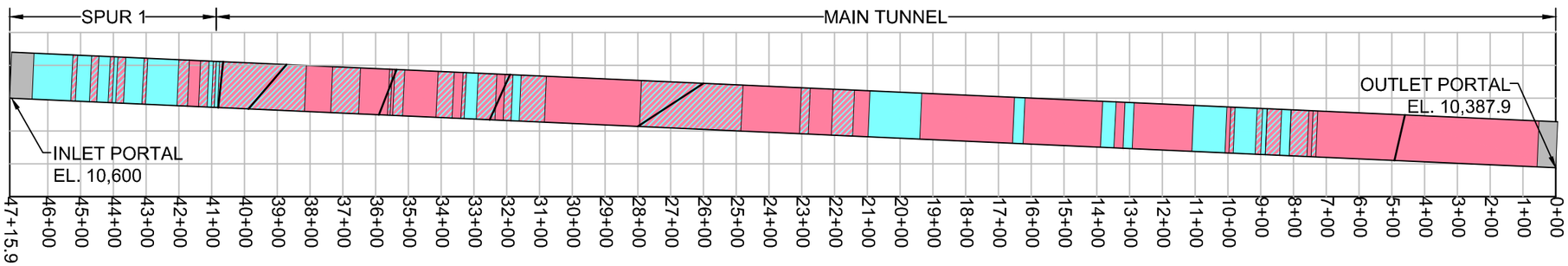
DESIGNED	VARIOUS
DRAWN	RLM
CHECKED	AJH
REVIEWED	DL
CLIENT	MM/RV
DATE	4/5/19

CLIMAX MINE

MAYFLOWER FLOOD BYPASS TUNNEL SYSTEM

EXISTING PHASE I TUNNEL ALIGNMENT AND TUNNEL STAGING AREAS

REVISION 2
PROJECT NO. 12235
DRAWING MFT-C-03
SHEET 1 OF 1

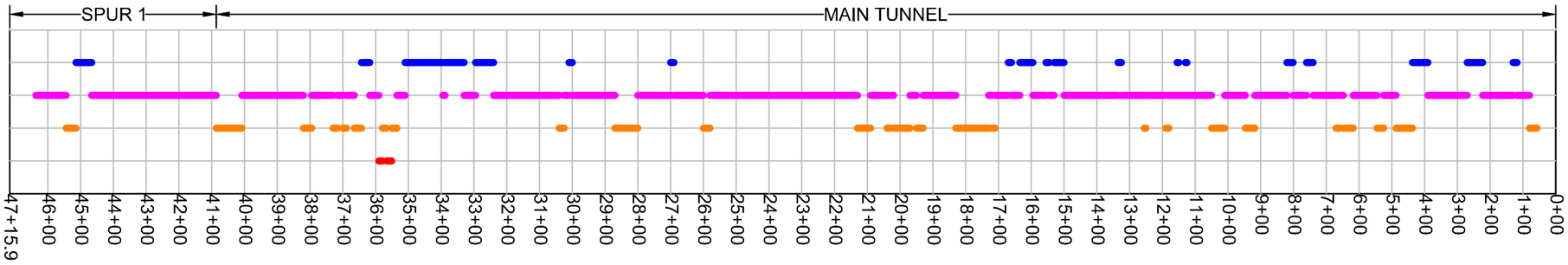


GEOLOGIC PROFILE - PHASE I

(N.T.S.)

GEOLOGIC LEGEND

Ti	INTRUSIVE QUARTZ MONZONITE PORPHYRY OR SIMILAR ROCK; SILLS INTRUDED INTO PALEOZOIC SEDIMENTS ARE THE MOST COMMON FORM OF OCCURRENCE.
Ppm	MINTURN FORMATION; PREDOMINANTLY THICK SEQUENCES OF ARKOSIC SANDSTONE LOCALLY METAMORPHOSED TO QUARTZITE NEAR INTRUSIVE QUARTZ MONZONITE PORPHYRY.
Ti/Ppm	MIXED FACE: INCLUDES BOTH QUARTZ MONZONITE AND PRECAMBRIAN QUARTZITE OR HORNFELS DEPOSITS;
Qatc	UNDIFFERENTIATED QUATERNARY ALLUVIUM, TILL, AND COLLUVIUM.
	APPROXIMATE FAULT LOCATION

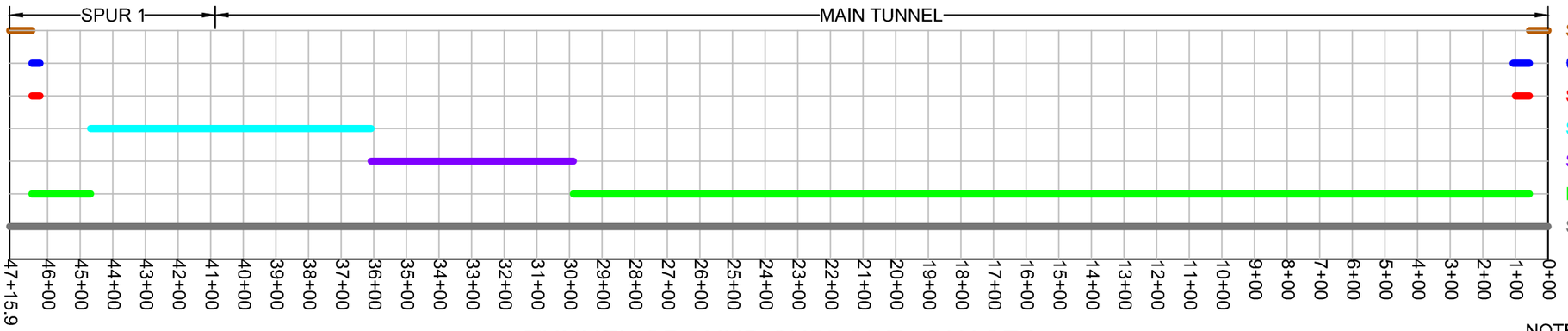


RMR LEGEND

RMR 1	RMR - CLASS I
RMR 2	RMR - CLASS II
RMR 3	RMR - CLASS III
RMR 4	RMR - CLASS IV
RMR 5	RMR - CLASS V
RMR 6	RMR - CLASS VI

ROCK MASS RATING (RMR) - PHASE I

(N.T.S.)



SOIL NAILS
CONCRETE
STEELSET
SPLITSET BOLTS
SWELLEX BOLTS
EPOXY BOLTS
SHOTCRETE

TUNNEL GROUND SUPPORT - PHASE I

(N.T.S.)

NOTES:

1. TUNNEL PROFILE VERTICAL SCALE EXAGGERATED.
2. GEOLOGIC CONTACTS AND FAULT LOCATIONS ARE APPROXIMATE

COLORADO LICENSED
ANDREW JOHN HARDY
4/5/19
43648
PROFESSIONAL ENGINEER

AutoCAD FILE: MFT Stage II Construction

REV	DESCRIPTION OF REVISION	BY	DATE
3			
2			
1			
0	ISSUED FOR CONSTRUCTION	RLM	4/19
	ISSUED FOR BID	RLM	10/18
	ISSUED FOR CLIENT REVIW	RLM	9/18

Climax Molybdenum
A Freeport-McMoRan Company

AJAX
PROJECT & CONSTRUCTION MANAGEMENT
ENGINEERING, GEOLOGY, SURVEYING

WARNING
0 0.5 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

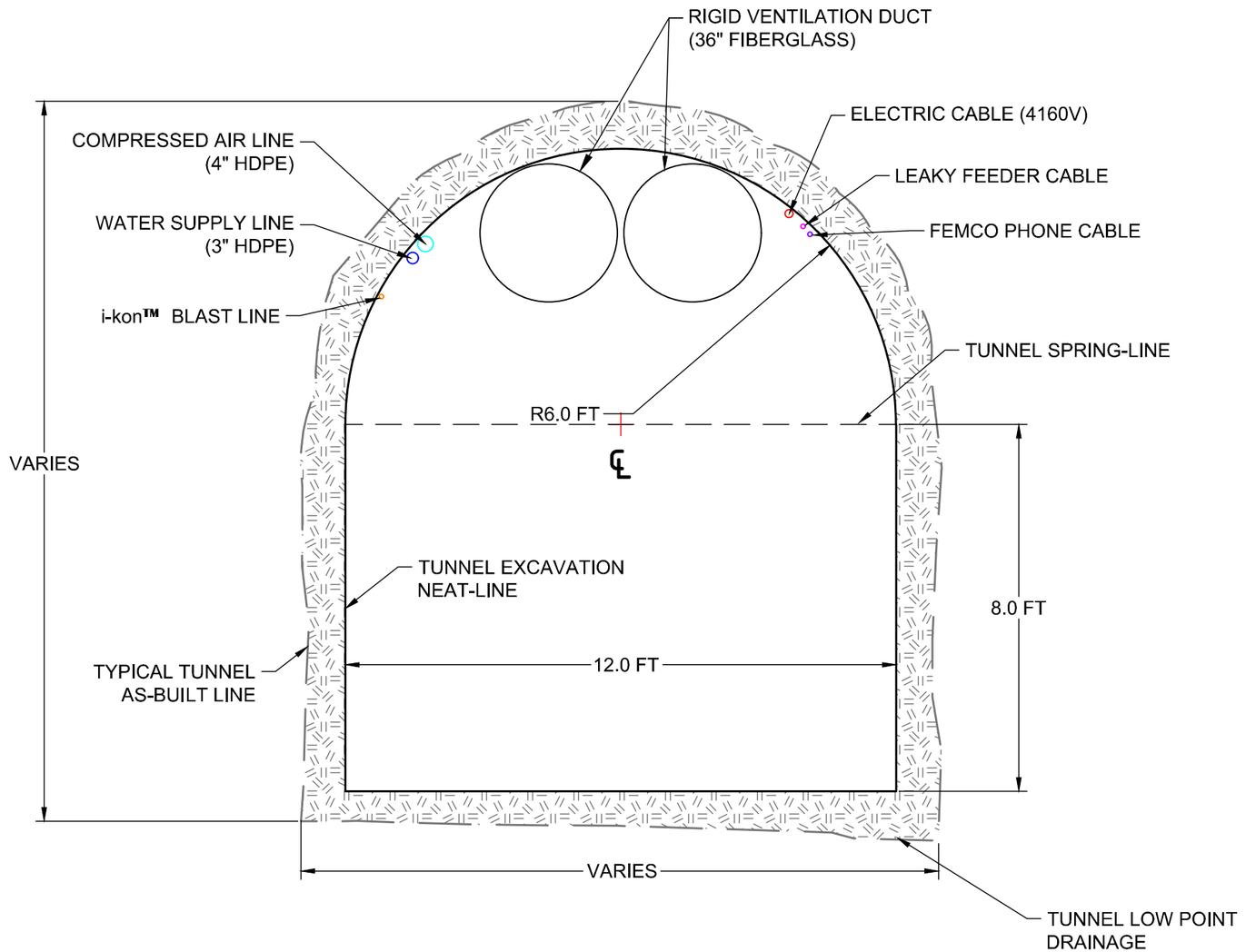
DESIGNED	VARIOUS
DRAWN	RLM
CHECKED	AJH
REVIEWED	DL
CLIENT	MM/RV
DATE	4/5/19

CLIMAX MINE

MAYFLOWER FLOOD BYPASS TUNNEL SYSTEM

EXISTING PHASE I TUNNEL
AS-BUILT PROFILE

REVISION 2
PROJECT NO. 12235
DRAWING MFT-C-04
SHEET 1 OF 1



TYPICAL TUNNEL CROSS-SECTION GEOMETRY

NOT TO SCALE

COLORADO LICENSED
ANDREW JOHN HARDY
4/5/19
43648
PROFESSIONAL ENGINEER

AutoCAD FILE: MFT Stage II Construction

REV	DESCRIPTION OF REVISION	BY	DATE
3			
2			
1			
2	ISSUED FOR CONSTRUCTION	RLM	4/19
1	ISSUED FOR BID	RLM	10/18
0	ISSUED FOR CLIENT REVIEW	RLM	9/18

Climax Molybdenum
A Freeport-McMoRan Company

AJAX
PROJECT & CONSTRUCTION MANAGEMENT
ENGINEERING, GEOLOGY, SURVEYING

WARNING
0 0.5 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

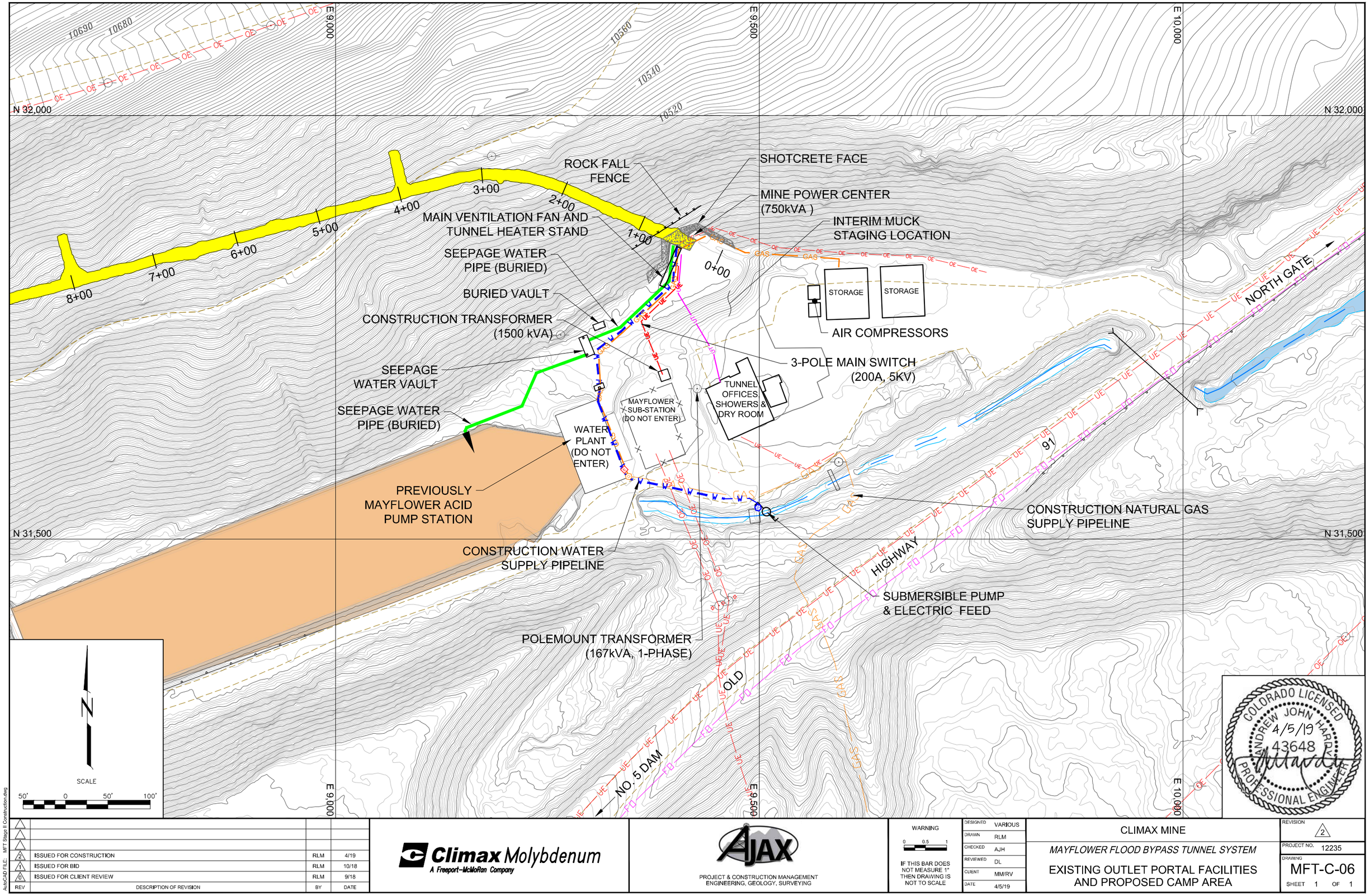
DESIGNED	VARIOUS
DRAWN	RLM
CHECKED	AJH
REVIEWED	DL
CLIENT	MM/RV
DATE	4/5/19

CLIMAX MINE

MAYFLOWER FLOOD BYPASS TUNNEL SYSTEM

PHASE I TUNNEL
TYPICAL CROSS-SECTION

REVISION 2
PROJECT NO. 12235
DRAWING MFT-C-05
SHEET 1 OF 1



COLORADO LICENSED
ANDREW JOHN HARDY
4/5/19
43648
PROFESSIONAL ENGINEER

REV	DESCRIPTION OF REVISION	BY	DATE
3			
2	ISSUED FOR CONSTRUCTION	RLM	4/19
1	ISSUED FOR BID	RLM	10/18
0	ISSUED FOR CLIENT REVIEW	RLM	9/18

AutoCAD FILE: MFT Stage II Construction.dwg

Climax Molybdenum
A Freeport-McMoRan Company

AJAX
PROJECT & CONSTRUCTION MANAGEMENT
ENGINEERING, GEOLOGY, SURVEYING

WARNING
0 0.5 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED	VARIOUS
DRAWN	RLM
CHECKED	AJH
REVIEWED	DL
CLIENT	MM/RV
DATE	4/5/19

CLIMAX MINE

MAYFLOWER FLOOD BYPASS TUNNEL SYSTEM

EXISTING OUTLET PORTAL FACILITIES AND PROPOSED CAMP AREA

REVISION 2
PROJECT NO. 12235
DRAWING MFT-C-06
SHEET 1 OF 1

E 5,000

E 6,000

N 30,000

ROAD

EXISTING PHASE I TUNNEL

INTERCEPTOR

PHASE II TUNNEL

WEST

FUTURE MUCK BAY /TRANSFORMER BAY NO. 4

0+40

0+00

S 57°43'03" W

45+00

40+00

47+52.5

0+00

FUTURE MUCK BAY

1+00

S 27°43'17" E

PHASE III TUNNEL

S 57°43'03" W

50+00

SIDE HILL RISER NO. 3

0+44.1

0+00

2+00

NO. 2 SPUR

NO. 1 SPUR

52+65

S 27°43'17" E

NO. 4 SPUR

NO. 4 INLET

1+08

1+00

3+00

NO. 3 SPUR/ NO. 3 INLET

4+00

4+33

NO. 2 INLET

NO. 1 INLET (SIDE HILL RISER NO. 1)

STAGING AREAS

SIDE HILL RISER NO. 2

MAYFLOWER TAILING POND

N

SCALE

60' 0 60' 120'

COLORADO LICENSED
ANDREW JOHN HARRIS
4/5/19
43648
PROFESSIONAL ENGINEER

REV	DESCRIPTION OF REVISION	BY	DATE
2	ISSUED FOR CONSTRUCTION	RLM	4/19
1	ISSUED FOR BID	RLM	10/18
0	ISSUED FOR CLIENT REVIEW	RLM	9/18

Climax Molybdenum
A Freeport–McMoRan Company

AJAX
PROJECT & CONSTRUCTION MANAGEMENT
ENGINEERING, GEOLOGY, SURVEYING

WARNING
0 0.5 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED	VARIOUS
DRAWN	RLM
CHECKED	AJH
REVIEWED	DL
CLIENT	MM/RV
DATE	4/5/19

CLIMAX MINE

MAYFLOWER FLOOD BYPASS TUNNEL SYSTEM

PROPOSED STAGE II TUNNEL EXTENSION ALIGNMENTS AND STAGING AREAS

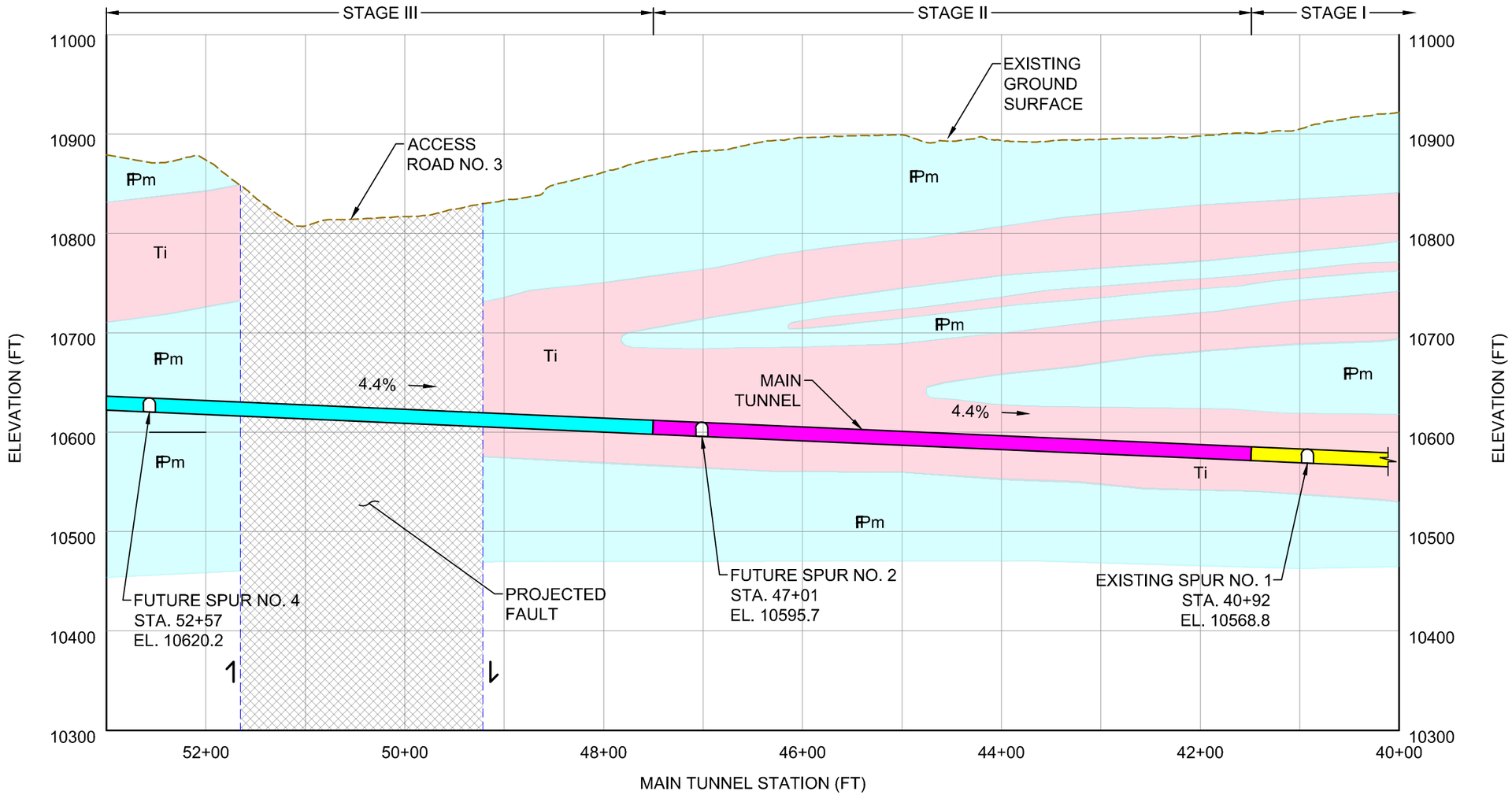
REVISION 2

PROJECT NO. 12235

DRAWING MFT-C-07

SHEET 1 OF 1

AutoCAD FILE: MFT Stage II Construction.dwg



MAIN TUNNEL PROFILE - PHASE II

SCALE
60' 0 60' 120'

COLORADO LICENSED
ANDREW JOHN HARDY
4/5/19
43648
PROFESSIONAL ENGINEER

REV	DESCRIPTION OF REVISION	BY	DATE
2	ISSUED FOR CONSTRUCTION	RLM	4/19
1	ISSUED FOR BID	RLM	10/18
0	ISSUED FOR CLIENT REVIEW	RLM	9/18

Climax Molybdenum
A Freeport-McMoRan Company

AJAX
PROJECT & CONSTRUCTION MANAGEMENT
ENGINEERING, GEOLOGY, SURVEYING

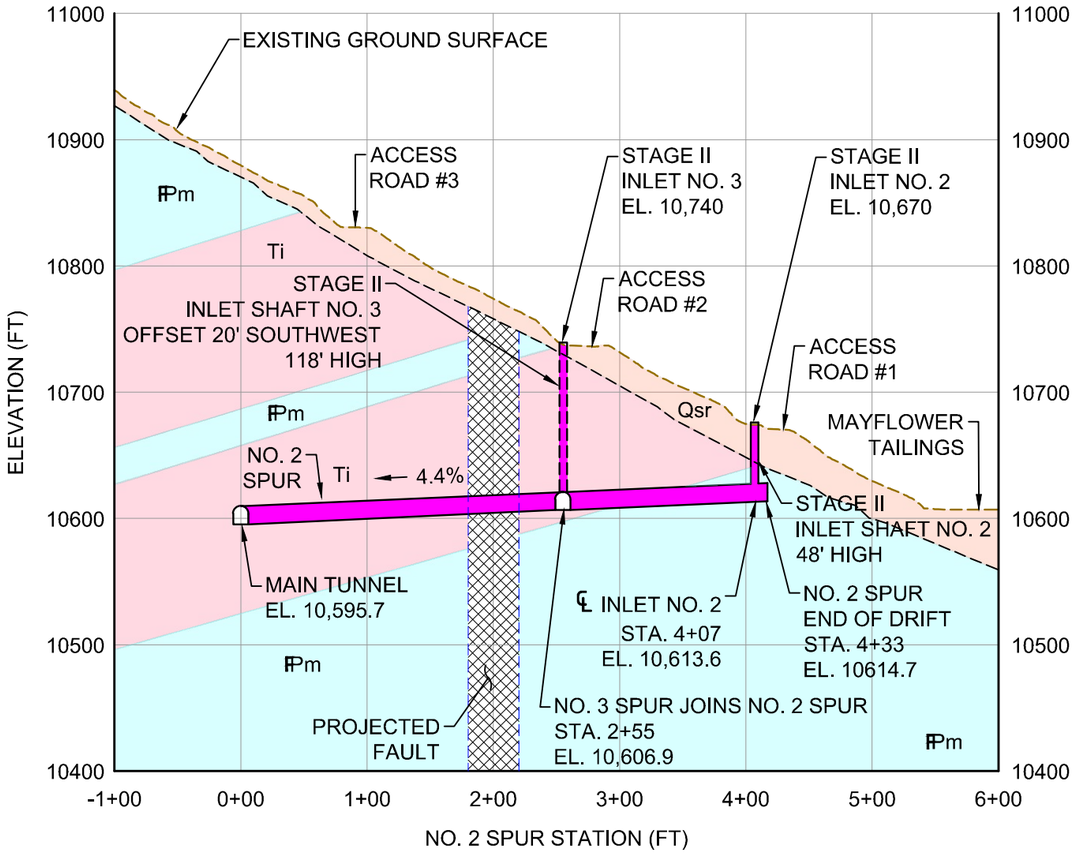
WARNING
0 0.5 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED	VARIOUS
DRAWN	RLM
CHECKED	AJH
REVIEWED	DL
CLIENT	MM/RV
DATE	4/5/19

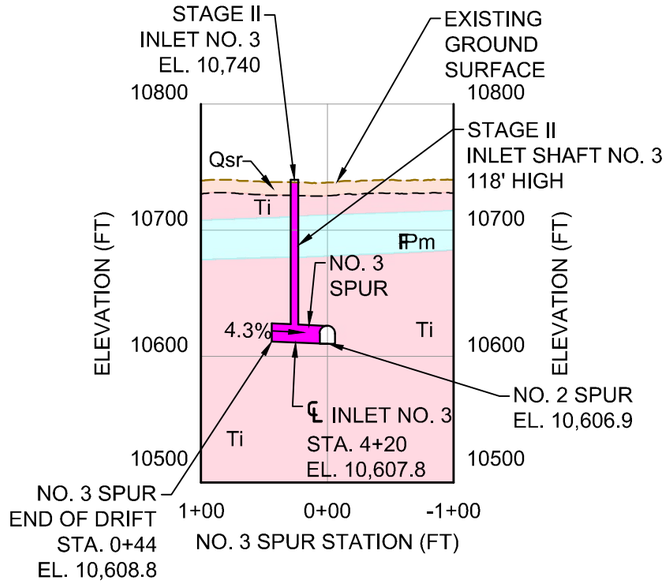
CLIMAX MINE
MAYFLOWER FLOOD BYPASS TUNNEL SYSTEM
PROPOSED STAGE II
MAIN TUNNEL EXTENSION PROFILE

REVISION 2
PROJECT NO. 12235
DRAWING MFT-C-08
SHEET 1 OF 1

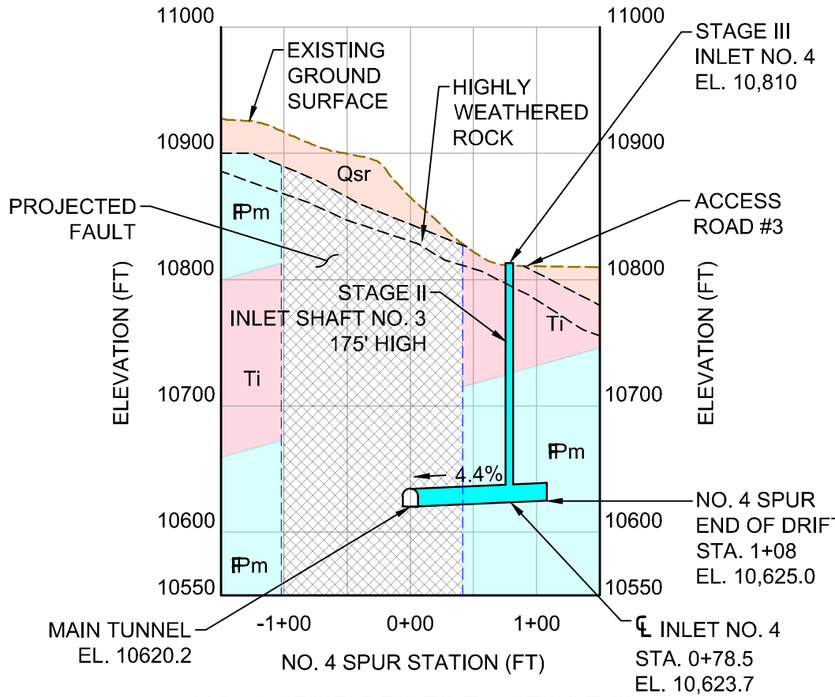
AutoCAD FILE: MFT Stage II Construction.dwg



NO. 2 SPUR PROFILE - STAGE II



NO. 3 SPUR PROFILE - STAGE II



NO. 4 SPUR PROFILE - STAGE III

COLORADO LICENSED
ANDREW JOHN HARDY
4/5/19
43648
PROFESSIONAL ENGINEER

SCALE
60' 0 60' 120'

REV	DESCRIPTION OF REVISION	BY	DATE
2	ISSUED FOR CONSTRUCTION	RLM	4/19
1	ISSUED FOR BID	RLM	10/18
0	ISSUED FOR CLIENT REVIEW	RLM	9/18

Climax Molybdenum
A Freeport-McMoRan Company

AJAX
PROJECT & CONSTRUCTION MANAGEMENT
ENGINEERING, GEOLOGY, SURVEYING

WARNING
0 0.5 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED	VARIOUS
DRAWN	RLM
CHECKED	AJH
REVIEWED	DL
CLIENT	MM/RV
DATE	4/5/19

CLIMAX MINE

MAYFLOWER FLOOD BYPASS TUNNEL SYSTEM

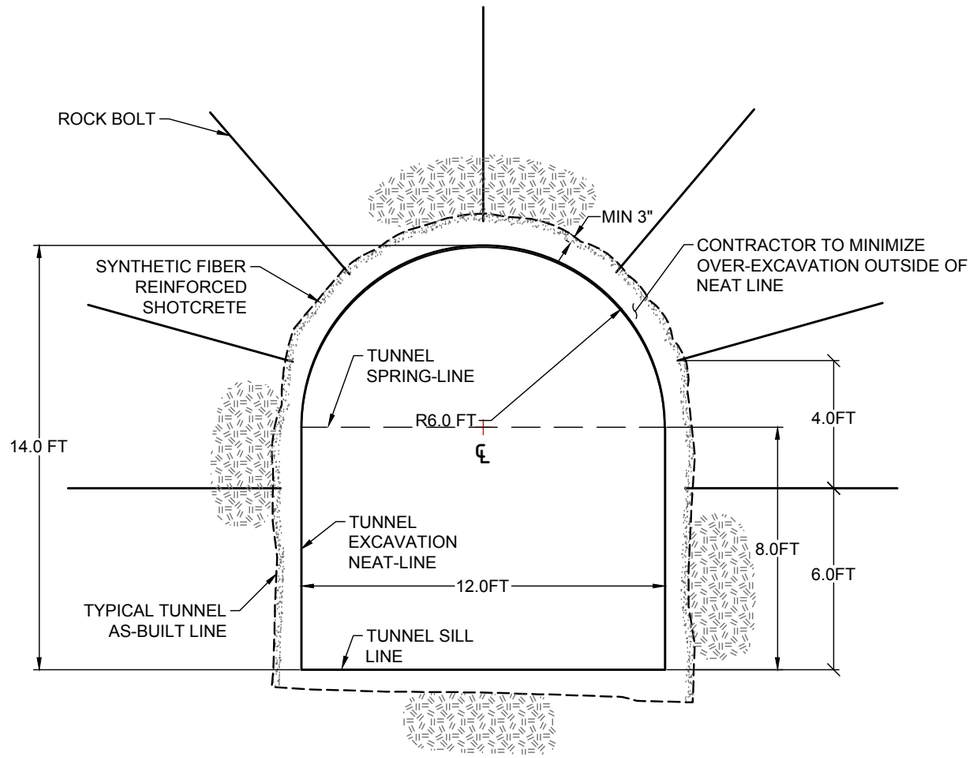
PROPOSED NO. 2, NO. 3 AND NO. 4 SPUR PROFILES

REVISION 2
PROJECT NO. 12235
DRAWING MFT-C-09
SHEET 1 OF 1

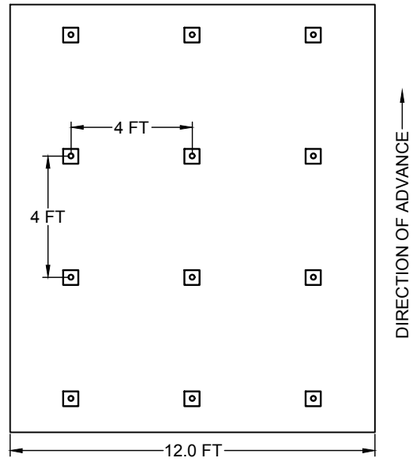
AutoCAD FILE: MFT Stage II Construction.dwg

THIS DESIGN, IN IT'S ENTIRETY, INCLUDING GROUND REINFORCEMENT PLANS, DETAILS AND ENGINEERING CALCULATIONS FOR GROUND SUPPORT CLASSIFICATIONS PROVIDED BY LANGSTON & ASSOCIATES TO CLIMAX AND HENDERSON DURING PHASE I TUNNELING OPERATIONS. REFINEMENTS TO THE GROUND SUPPORT PLANS AND DETAILS ARE REQUIREMENTS OF CLIMAX MOLYBDENUM CORPORATION.

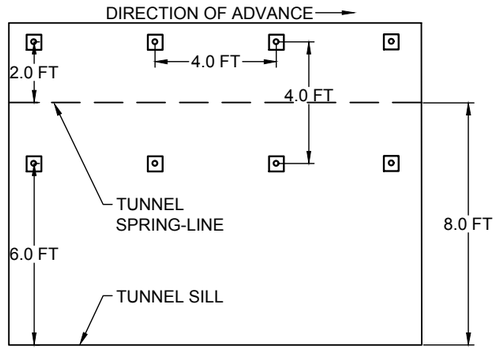
RMR CLASS I & II GROUND SUPPORT
GOOD GROUND UP TO 12□WIDE



TUNNEL CROSS-SECTION VIEW



PLAN VIEW OF BACK



LONG SECTION VIEW OF RIBS

ROCK REINFORCEMENT IN BACK

-7 FT, 46mm GALVANIZED SPLIT SET BOLTS ON A SYSTEMATIC 4 FT GRID

SURFACE SUPPORT

-MINIMUM 3 IN SHOTCRETE APPLIED PRIOR TO ROCK REINFORCEMENT

RIB SUPPORT

-TWO ROWS 6 FT ROCK REINFORCEMENT

□□□*ER ROWS*□ BOLTS INSTALLED 2 FT ABOVE 8 FT SPRING LINE

□*OWER ROWS*□ BOLTS INSTALLED 6 FT OFF SILL

7 FT, 46mm GALVANIZED SPLIT SET BOLT WITH PLATE

□*OTE*□ □ □*T CO*□*TED* □□*T I*□□□□*T*□□□*E* □*O*□*TS M*□□ □*E S*□□*STIT*□*TED I*□ □□*TTER*□

SCALE

2.5' 0 2.5' 5'

REV	DESCRIPTION OF REVISION	BY	DATE
2	ISSUED FOR CONSTRUCTION	RLM	4/19
1	ISSUED FOR BID	RLM	10/18
0	ISSUED FOR CLIENT REVIEW	RLM	9/18

Climax Molybdenum
A Freeport-McMoRan Company

AJAX
PROJECT & CONSTRUCTION MANAGEMENT
ENGINEERING, GEOLOGY, SURVEYING

WARNING
0 0.5 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED	VARIOUS
DRAWN	RLM
CHECKED	AJH
REVIEWED	DL
CLIENT	MM/RV
DATE	4/5/19

CLIMAX MINE

MAYFLOWER FLOOD BYPASS TUNNEL SYSTEM

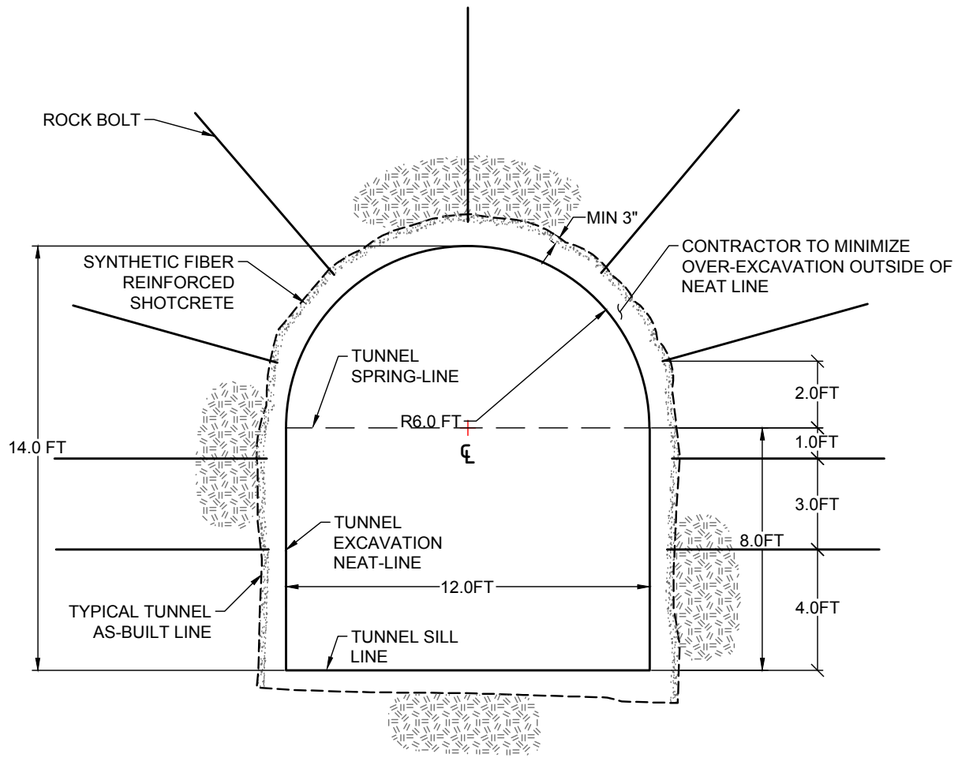
TYPICAL GROUND SUPPORT DETAILS
RMR CLASS I & II GROUND

REVISION 2
PROJECT NO. 12235
DRAWING MFT-C-10
SHEET 1 OF 1

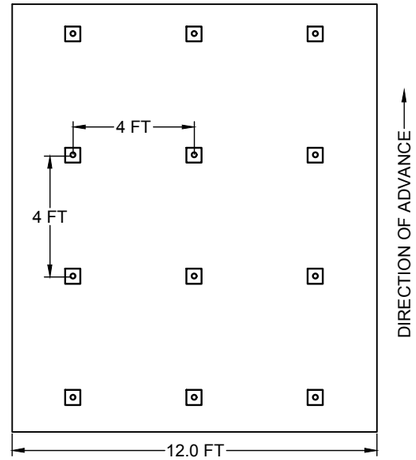
AutoCAD FILE: MFT Stage II Construction d: g

THIS DESIGN, IN IT□S ENTIRETY, INCLUDING GROUND REINFORCEMENT PLANS, DETAILS AND ENGINEERING CALCULATIONS FOR GROUND SUPPORT CLASSIFICATIONS PROVIDED BY LANGSTON & ASSOCIATES TO CLIMAX AND HENDERSON DURING PHASE I TUNNELING OPERATIONS. REFINEMENTS TO THE GROUND SUPPORT PLANS AND DETAILS ARE REQUIREMENTS OF CLIMAX MOLYBDENUM CORPORATION.

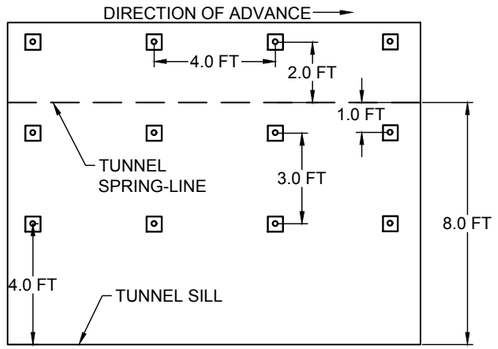
RMR CLASS III GROUND SUPPORT
FAIR GROUND UP TO 12□WIDE



TUNNEL CROSS-SECTION VIEW



PLAN VIEW OF BACK



LONG SECTION VIEW OF RIBS

ROCK REINFORCEMENT IN BACK

-7 FT, 46mm GALVANIZED SPLIT SET BOLTS ON A SYSTEMATIC 4 FT GRID

SURFACE SUPPORT

-MINIMUM 3 IN SHOTCRETE APPLIED PRIOR TO ROCK REINFORCEMENT ON ENTIRE EXCAVATION PERIMETER

RIB SUPPORT

-THREE ROWS 7 FT ROCK REINFORCEMENT

□□□*ER ROWS*□ BOLTS INSTALLED 2 FT ABOVE 8 FT SPRING LINE

MID ROWS□ BOLTS INSTALLED 1 FT BELOW 8 FT SPRING LINE

□*OWER ROWS*□ BOLTS INSTALLED 4 FT OFF SILL.

⊡ 7 FT, 46mm GALVANIZED SPLIT SET BOLT WITH PLATE

□*OTE*□ □ □*T CO*□*TED* □□*T I*□□□□*T*□□□*E* □*O*□*TS M*□□ □*E S*□□*STIT*□*TED I*□ □□*TTER*□

SCALE
2.5' 0 2.5' 5'

REV	DESCRIPTION OF REVISION	BY	DATE
2	ISSUED FOR CONSTRUCTION	RLM	4/19
1	ISSUED FOR BID	RLM	10/18
0	ISSUED FOR CLIENT REVIEW	RLM	9/18

Climax Molybdenum
A Freeport-McMoRan Company

AJAX
PROJECT & CONSTRUCTION MANAGEMENT
ENGINEERING, GEOLOGY, SURVEYING

WARNING
0 0.5 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED	VARIOUS
DRAWN	RLM
CHECKED	AJH
REVIEWED	DL
CLIENT	MM/RV
DATE	4/5/19

CLIMAX MINE

MAYFLOWER FLOOD BYPASS TUNNEL SYSTEM

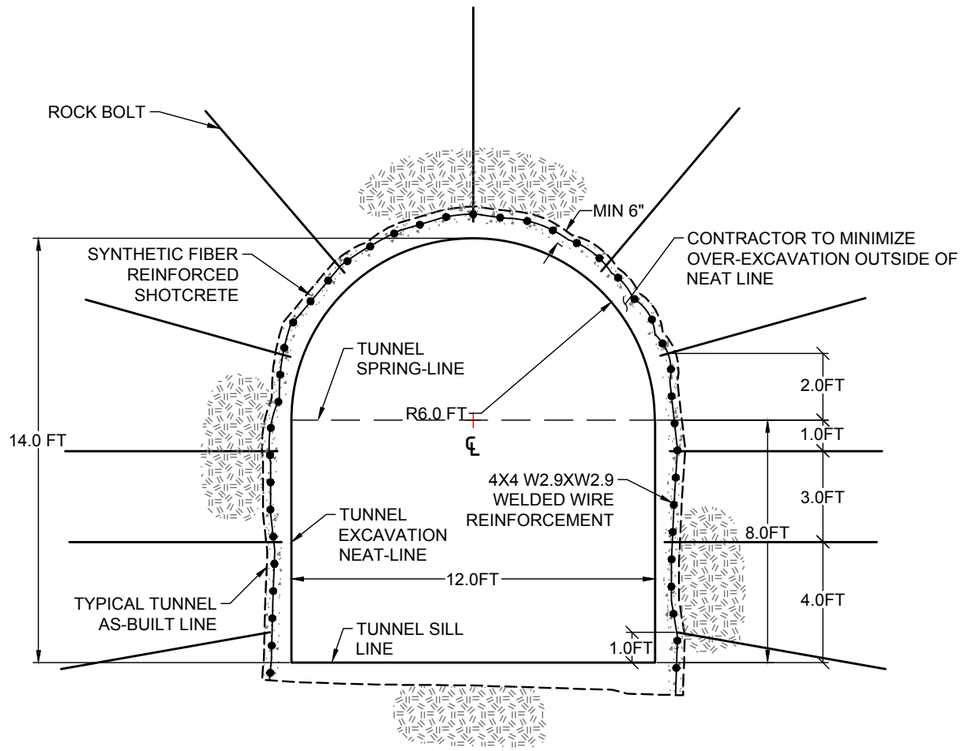
TYPICAL GROUND SUPPORT DETAILS
RMR CLASS III GROUND

REVISION 2
PROJECT NO. 12235
DRAWING MFT-C-11
SHEET 1 OF 1

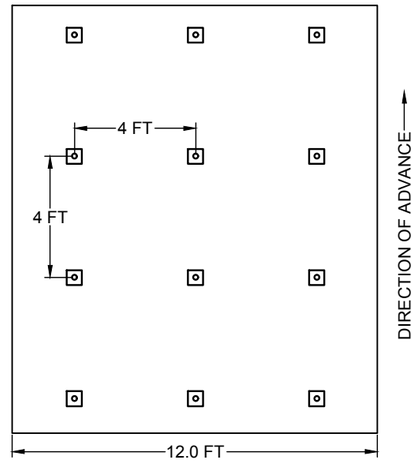
AutoCAD FILE: MFT Stage II Construction.dwg

THIS DESIGN, IN IT□S ENTIRETY, INCLUDING GROUND REINFORCEMENT PLANS, DETAILS AND ENGINEERING CALCULATIONS FOR GROUND SUPPORT CLASSIFICATIONS PROVIDED BY LANGSTON & ASSOCIATES TO CLIMAX AND HENDERSON DURING PHASE I TUNNELING OPERATIONS. REFINEMENTS TO THE GROUND SUPPORT PLANS AND DETAILS ARE REQUIREMENTS OF CLIMAX MOLYBDENUM CORPORATION.

RMR CLASS IV GROUND SUPPORT
POOR GROUND UP TO 12□WIDE



TUNNEL CROSS-SECTION VIEW



PLAN VIEW OF BACK

RIB SUPPORT

-FOUR ROWS 7 FT ROCK REINFORCEMENT

□□□*ER ROW*□ BOLTS INSTALLED 2 FT ABOVE 8 FT SPRING LINE

MID ROW□ BOLTS INSTALLED 1 FT BELOW 8 FT SPRING LINE

□*OWER ROW*□ BOLTS INSTALLED 4 FT OFF SILL

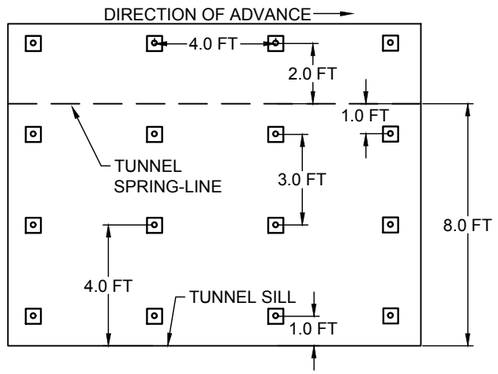
BOTTOM ROW: BOLTS INSTALLED 1 FT OFF SILL TO SECURE WWM

PRE-SUPPORT ON ADVANCE MAY BE REQUIRED DEPENDING ON CONDITIONS

-INSTALL 12 FT □9 THREADBAR SPILING ON 12 IN CENTERS AROUND EXCAVATION PERIMETER

-6 FT MAXIMUM ROUND LENGTH ON ADVANCE THEN INSTALL ANOTHER ROUND OF SPILING.

□OTE□□□ □T □O□□OW I□□ECTIO□ □□C□OR S□I□I□G O□ □□ I□ CE□TERS M□□ □E S□□STIT□TED I□ □□TTER□



LONG SECTION VIEW OF RIBS

1) INITIAL ROCK REINFORCEMENT
-7 FT, 46mm SPLIT SET BOLTS ON A SYSTEMATIC 4 FT GRID WITH WELDED WIRE REINFORCEMENT INSTALLED UPON INITIAL EXCAVATION.

□OTE□□□ TO□□E CO□TED SWE□□E□ M□□ □E S□□STIT□TED I□ □□TTER□

2) INITIAL SURFACE SUPPORT
-MINIMUM 3 IN SHOTCRETE APPLIED PRIOR TO FINAL ROCK REINFORCEMENT ON ENTIRE EXCAVATION PERIMETER.

3) FINAL ROCK REINFORCEMENT
-INSTALL 7 FT, 46mm GALVANIZED SPLIT SET BOLTS ON A SYSTEMATIC 4 FT GRID BETWEEN SHOTCRETE LAYERS AS SHOWN.

□OTE□□□ TO□□E CO□TED SWE□□E□ M□□ □E S□□STIT□TED I□ □□TTER□

4) FINAL SURFACE SUPPORT
-MINIMUM 3 IN SHOTCRETE APPLIED AFTER FINAL ROCK REINFORCEMENT ON ENTIRE EXCAVATION PERIMETER.

⊡ 7 FT, 46mm GALVANIZED SPLIT SET BOLT WITH PLATE

SCALE
2.5' 0 2.5' 5'

REV	DESCRIPTION OF REVISION	BY	DATE
2	ISSUED FOR CONSTRUCTION	RLM	4/19
1	ISSUED FOR BID	RLM	10/18
0	ISSUED FOR CLIENT REVIEW	RLM	9/18

Climax Molybdenum
A Freeport-McMoRan Company

AJAX
PROJECT & CONSTRUCTION MANAGEMENT
ENGINEERING, GEOLOGY, SURVEYING

WARNING
0 0.5 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED	VARIOUS
DRAWN	RLM
CHECKED	AJH
REVIEWED	DL
CLIENT	MM/RV
DATE	4/5/19

CLIMAX MINE

MAYFLOWER FLOOD BYPASS TUNNEL SYSTEM

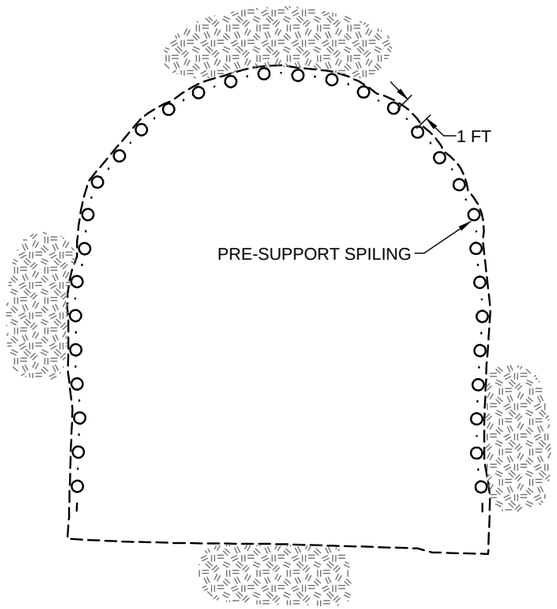
TYPICAL GROUND SUPPORT DETAILS
RMR CLASS IV GROUND

REVISION 2
PROJECT NO. 12235
DRAWING MFT-C-12
SHEET 1 OF 1

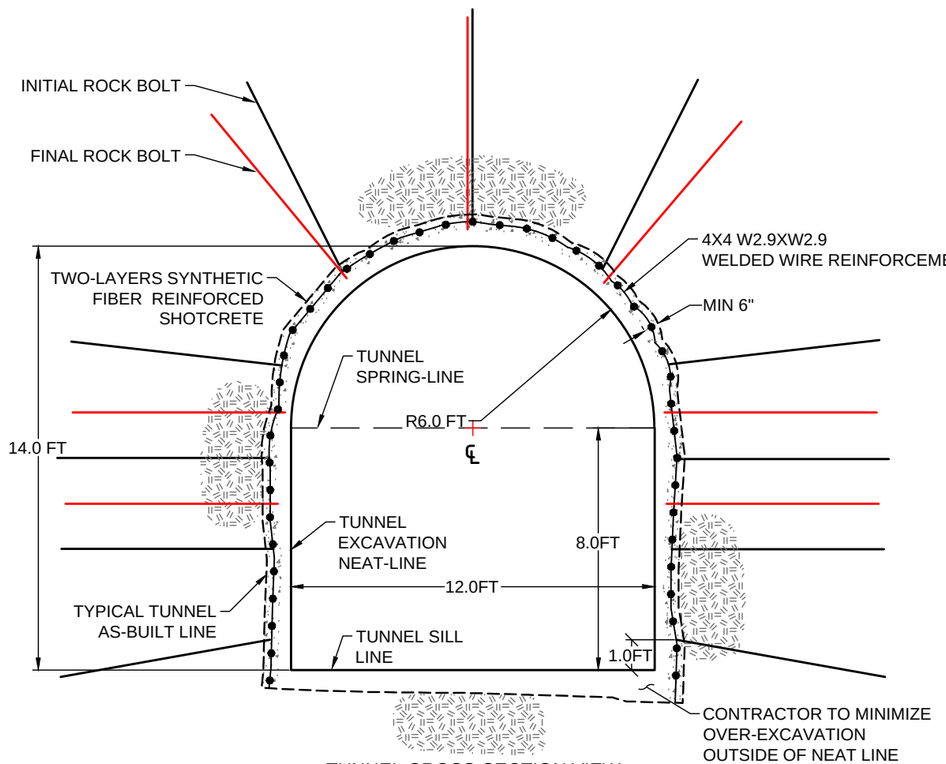
AutoCAD FILE: MFT Stage II Construction.dwg

THIS DESIGN, IN IT'S ENTIRETY, INCLUDING GROUND REINFORCEMENT PLANS, DETAILS AND ENGINEERING CALCULATIONS FOR GROUND SUPPORT CLASSIFICATIONS PROVIDED BY LANGSTON & ASSOCIATES TO CLIMAX AND HENDERSON DURING PHASE I TUNNELING OPERATIONS. REFINEMENTS TO THE GROUND SUPPORT PLANS AND DETAILS ARE REQUIREMENTS OF CLIMAX MOLYBDENUM CORPORATION.

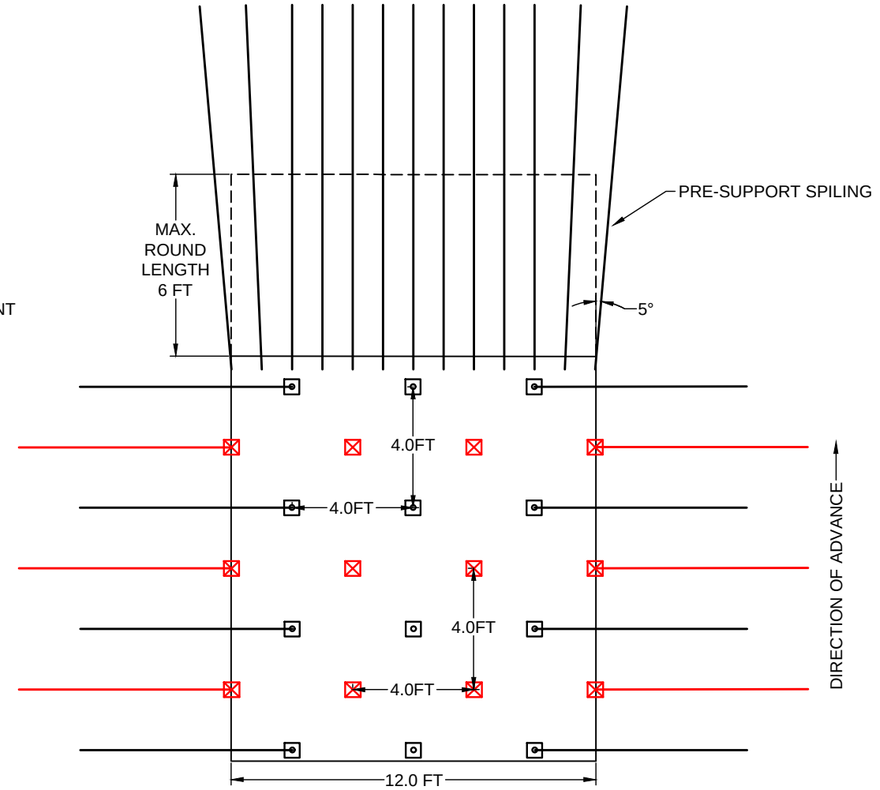
RMR CLASS V GROUND SUPPORT
VERY POOR GROUND UP TO 12' WIDE



TUNNEL CROSS-SECTION SPILING DETAIL



TUNNEL CROSS-SECTION VIEW



PLAN VIEW OF BACK

RIB SUPPORT

-FOUR ROWS 7 FT ROCK REINFORCEMENT

□□□*ER ROWS*□ BOLTS INSTALLED 2 FT ABOVE 8 FT SPRING LINE

MID ROWS□ BOLTS INSTALLED 1 FT BELOW 8 FT SPRING LINE

□*OWER ROWS*□ BOLTS INSTALLED 4 FT OFF SILL

BOTTOM ROWS: BOLTS INSTALLED 1 FT OFF SILL TO SECURE WWM

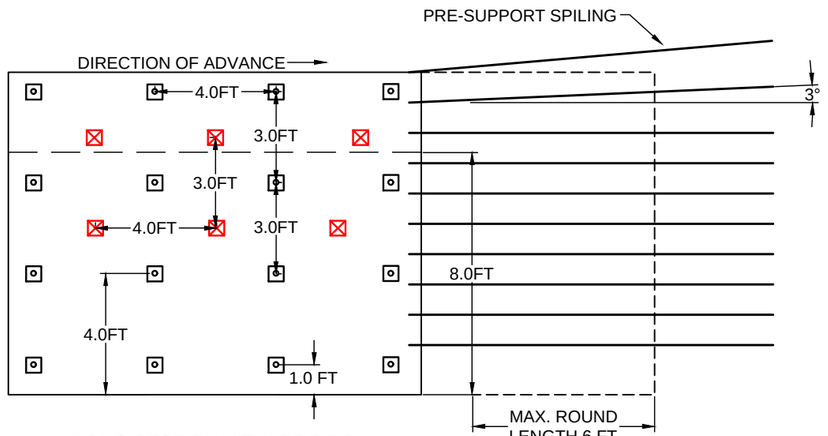
TWO ROWS: 7 FT, 24 TONNE SWELLEX BOLTS AS SHOWN

PRE-SUPPORT ON ADVANCE

-INSTALL 12 FT #9 THREADBAR SPILING ON 12 IN CENTERS AROUND PERIMETER AS SHOWN

-6 FT MAXIMUM ROUND LENGTH ON ADVANCE THEN INSTALL ANOTHER ROUND OF SPILING.

□*OTE*□□□ □*T* □*O*□□*OW I*□□*ECTIO*□ □□*C*□*OR S*□*I*□*I*□*G O*□ □□*I*□ *CE*□*TERS M*□□ □*E S*□□*STIT*□*TED I*□ □□*TTER*□



LONG SECTION VIEW OF RIBS

1) INITIAL ROCK REINFORCEMENT

-7 FT, 39mm SPLIT SET BOLTS ON A SYSTEMATIC 4 FT GRID WITH WELDED WIRE REINFORCEMENT INSTALLED UPON INITIAL EXCAVATION.

□*OTE*□□□ *TO*□□*E CO*□*TED SWE*□□*E*□ *M*□□ □*E S*□□*STIT*□*TED I*□ □□*TTER*□

2) INITIAL SURFACE SUPPORT

-MINIMUM 3 IN SHOTCRETE APPLIED PRIOR TO FINAL ROCK REINFORCEMENT ON ENTIRE EXCAVATION PERIMETER.

3) FINAL ROCK REINFORCEMENT

-INSTALL 7 FT, 24 TONNE COATED SWELLEX BOLTS ON A SYSTEMATIC 4 FT GRID BETWEEN SHOTCRETE LAYERS AS SHOWN.

4) FINAL SURFACE SUPPORT

-MINIMUM 3 IN SHOTCRETE APPLIED AFTER FINAL ROCK REINFORCEMENT ON ENTIRE EXCAVATION PERIMETER.

⊡ 7 FT, 39mm SPLIT SET BOLT WITH PLATE

⊠ 7 FT, 24 TONNE COATED SWELLEX BOLT WITH PLATE

SCALE 2.5' 0 2.5' 5'

REV	DESCRIPTION OF REVISION	BY	DATE
2	ISSUED FOR CONSTRUCTION	RLM	4/19
1	ISSUED FOR BID	RLM	10/18
0	ISSUED FOR CLIENT REVIEW	RLM	9/18

Climax Molybdenum
A Freeport-McMoRan Company

AJAX
PROJECT & CONSTRUCTION MANAGEMENT
ENGINEERING, GEOLOGY, SURVEYING

WARNING
0 0.5 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED	VARIOUS
DRAWN	RLM
CHECKED	AJH
REVIEWED	DL
CLIENT	MM/RV
DATE	4/5/19

CLIMAX MINE

MAYFLOWER FLOOD BYPASS TUNNEL SYSTEM

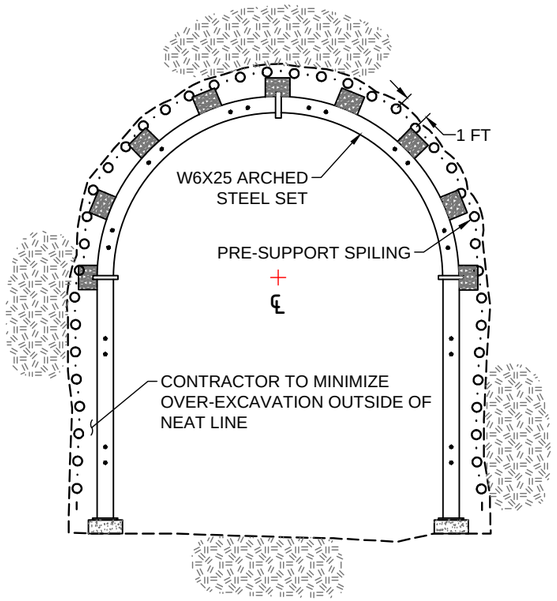
TYPICAL GROUND SUPPORT DETAILS
RMR CLASS V GROUND

REVISION 2
PROJECT NO. 12235
DRAWING MFT-C-13
SHEET 1 OF 1

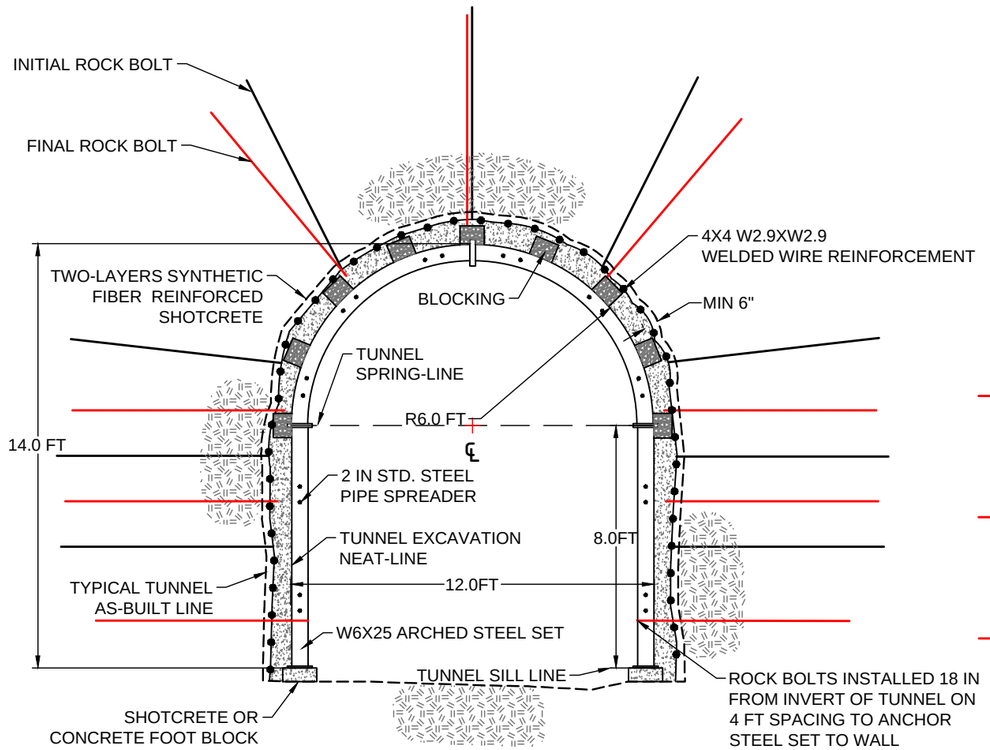
AutoCAD FILE: MFT Stage II Construction.dwg

RMR CLASS VI GROUND SUPPORT
EXTREMELY POOR GROUND UP TO 12' WIDE

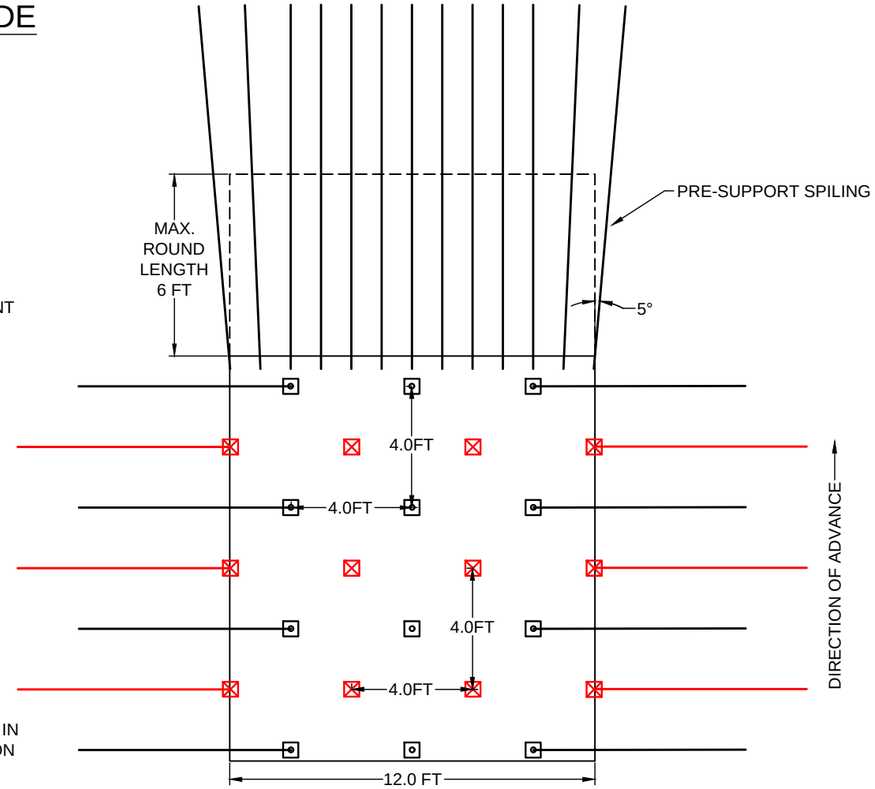
THIS DESIGN, IN IT'S ENTIRETY, INCLUDING GROUND REINFORCEMENT PLANS, DETAILS AND ENGINEERING CALCULATIONS FOR GROUND SUPPORT CLASSIFICATIONS PROVIDED BY LANGSTON & ASSOCIATES TO CLIMAX AND HENDERSON DURING PHASE I TUNNELING OPERATIONS. REFINEMENTS TO THE GROUND SUPPORT PLANS AND DETAILS ARE REQUIREMENTS OF CLIMAX MOLYBDENUM CORPORATION.



TUNNEL CROSS-SECTION SPILING DETAIL



TUNNEL CROSS-SECTION VIEW



PLAN VIEW OF BACK

RIB SUPPORT

-THREE ROWS 7 FT ROCK REINFORCEMENT

□□□*ER ROWS*□ BOLTS INSTALLED 2 FT ABOVE 8 FT SPRING LINE

MID ROWS□ BOLTS INSTALLED 1 FT BELOW 8 FT SPRING LINE

□*OWER ROWS*□ BOLTS INSTALLED 4 FT OFF SILL

□*OWEST ROW*□ BOLTS INSTALLED 18 IN FROM SILL TO ANCHOR STEEL SETS

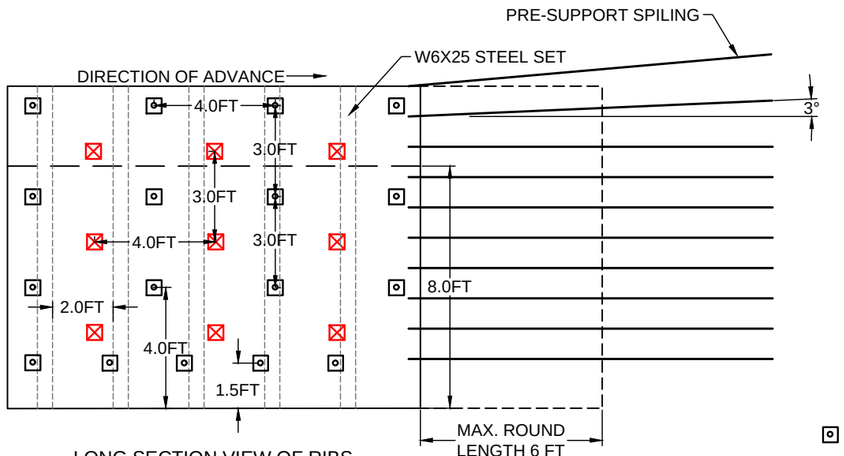
THREE ROWS: 7 FT, 24 TONNE SWELLEX BOLTS AS SHOWN

PRE-SUPPORT ON ADVANCE

-INSTALL 12 FT #9 THREADBAR SPILING ON 12 IN CENTERS AROUND PERIMETER AS SHOWN

-6 FT MAXIMUM ROUND LENGTH ON ADVANCE THEN INSTALL ANOTHER ROUND OF SPILING AND ARCHED STEEL SETS

□*OTE*□ □□□ □*T* □*O*□□*OW I*□□*ECTIO*□ □□*C*□*OR S*□*I*□*I*□*G O*□ □□ *I*□ *CE*□*TERS M*□□ □*E S*□□*STIT*□*TED I*□ □□*TTER*□



LONG SECTION VIEW OF RIBS

1) INITIAL ROCK REINFORCEMENT

-7 FT, 39mm SPLIT SET BOLTS ON A SYSTEMATIC 4 FT GRID WITH WELDED WIRE REINFORCEMENT INSTALLED UPON INITIAL EXCAVATION.

2) INITIAL SURFACE SUPPORT

-MINIMUM 3 IN SHOTCRETE APPLIED PRIOR TO FINAL ROCK REINFORCEMENT ON ENTIRE EXCAVATION PERIMETER.

3) FINAL ROCK REINFORCEMENT

-INSTALL 7 FT, 24 TONNE SWELLEX BOLTS ON A SYSTEMATIC 4 FT GRID BETWEEN SHOTCRETE LAYERS AS SHOWN.

-INSTALL W6X25 ARCHED STEELS SETS ON 2 FT CENTERS AS SHOWN.

NOTE: RRS ARCHES MAY BE SUBSTITUTED WITH DESIGN SUBMITTAL APPROVAL.

4) FINAL SURFACE SUPPORT

-MINIMUM 3 IN SHOTCRETE APPLIED AFTER FINAL ROCK REINFORCEMENT ON ENTIRE EXCAVATION PERIMETER.

⊡ 7 FT, 39mm SPLIT SET BOLT WITH PLATE

⊠ 7 FT, 24 TONNE SWELLEX BOLT WITH PLATE

SCALE 2.5' 0 2.5' 5'

REV	DESCRIPTION OF REVISION	BY	DATE
2	ISSUED FOR CONSTRUCTION	RLM	4/19
1	ISSUED FOR BID	RLM	10/18
0	ISSUED FOR CLIENT REVIEW	RLM	9/18

Climax Molybdenum
A Freeport-McMoRan Company

AJAX
PROJECT & CONSTRUCTION MANAGEMENT
ENGINEERING, GEOLOGY, SURVEYING

WARNING
0 0.5 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED	VARIOUS
DRAWN	RLM
CHECKED	AJH
REVIEWED	DL
CLIENT	MM/RV
DATE	4/5/19

CLIMAX MINE

MAYFLOWER FLOOD BYPASS TUNNEL SYSTEM

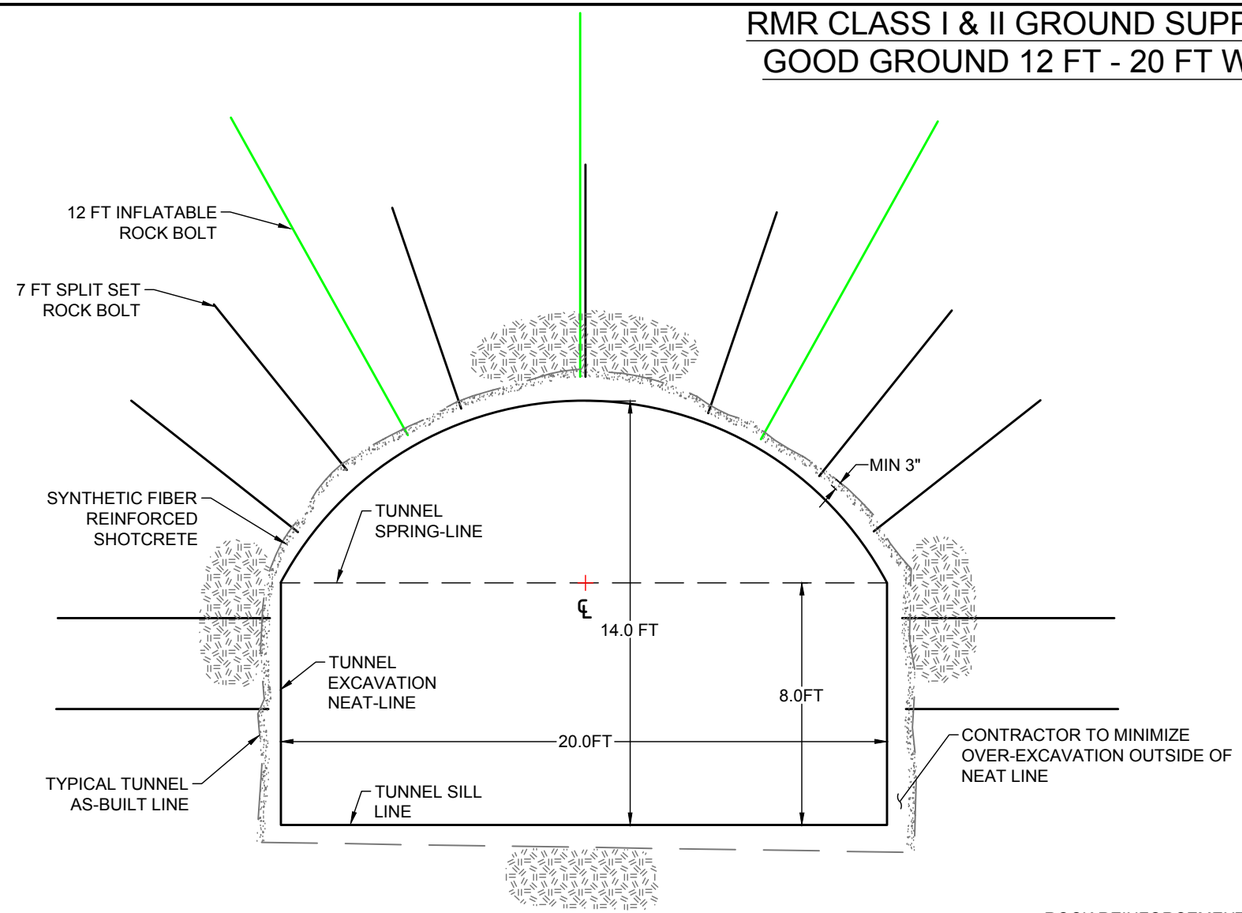
TYPICAL GROUND SUPPORT DETAILS
RMR CLASS VI GROUND

REVISION 2
PROJECT NO. 12235
DRAWING MFT-C-14
SHEET 1 OF 1

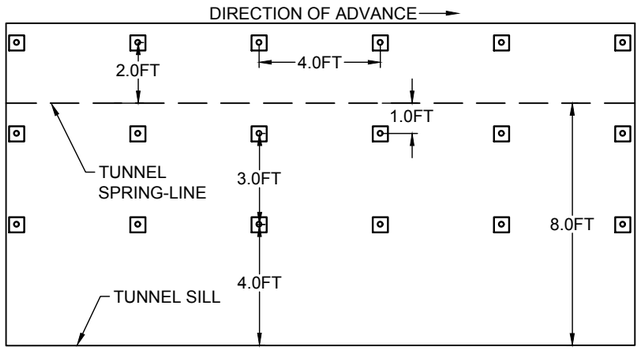
AutoCAD FILE: MFT Stage II Construction.dwg

RMR CLASS I & II GROUND SUPPORT
GOOD GROUND 12 FT - 20 FT WIDE

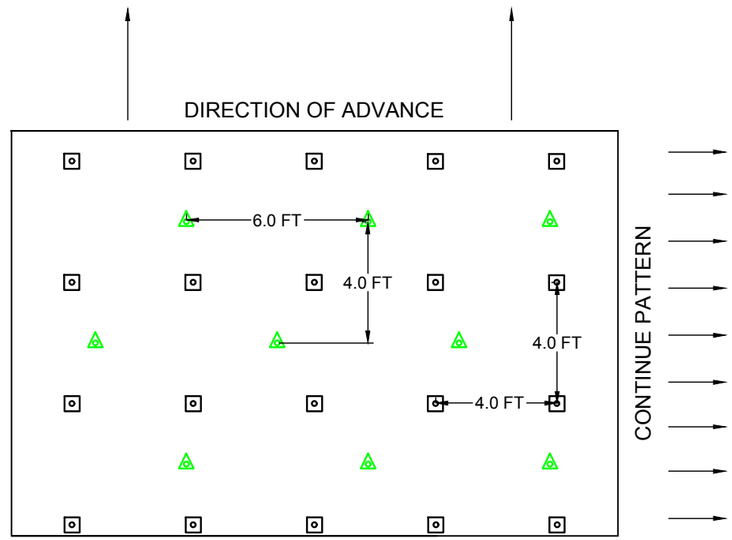
THIS DESIGN, IN IT'S ENTIRETY, INCLUDING GROUND REINFORCEMENT PLANS, DETAILS AND ENGINEERING CALCULATIONS FOR GROUND SUPPORT CLASSIFICATIONS PROVIDED BY LANGSTON & ASSOCIATES TO CLIMAX AND HENDERSON DURING PHASE I TUNNELING OPERATIONS. REFINEMENTS TO THE GROUND SUPPORT PLANS AND DETAILS ARE REQUIREMENTS OF CLIMAX MOLYBDENUM CORPORATION.



TUNNEL CROSS-SECTION VIEW



LONG SECTION VIEW OF RIBS



PLAN VIEW OF BACK

ROCK REINFORCEMENT IN BACK

- 12 FT COATED 24T INFLATABLE BOLTS ACROSS ENTIRE SPAN IN BACK ON A 6 FT X 4 FT STAGGERED GRID AS SHOWN
- 7 FT, 46mm GALVANIZED SPLIT SET BOLTS ON A SYSTEMATIC 4 FT GRID

□*OTE*□ SPANS WIDER THAN 20 FT MAY REQUIRE CABLE BOLTS

SURFACE SUPPORT

- MINIMUM 3 IN SHOTCRETE APPLIED TO ENTIRE EXCAVATION PRIOR TO ROCK REINFORCEMENT

RIB SUPPORT

-THREE ROWS 7 FT ROCK REINFORCEMENT

□□□*ER ROWS*□ BOLTS INSTALLED 2 FT ABOVE 8 FT SPRING LINE

MID ROWS□ BOLTS INSTALLED 1 FT BELOW 8 FT SPRING LINE

□*OWER ROWS*□ BOLTS INSTALLED 4 FT OFF SILL.

⊡ 7 FT, 46mm GALVANIZED SPLIT SET BOLT WITH PLATE

□*OTE*□ □ □*T CO*□*TED* □□*T I*□□□□*T*□□□*E* □*O*□*TS M*□□ □*E S*□□*STIT*□*TED I*□ □□*TTER*□

△ 12 FT COATED 24T INFLATABLE BOLT WITH PLATE

SCALE
2.5' 0 2.5' 5'

REV	DESCRIPTION OF REVISION	BY	DATE
2	ISSUED FOR CONSTRUCTION	RLM	4/19
1	ISSUED FOR BID	RLM	10/18
0	ISSUED FOR CLIENT REVIEW	RLM	9/18

Climax Molybdenum
A Freeport-McMoRan Company

AJAX
PROJECT & CONSTRUCTION MANAGEMENT
ENGINEERING, GEOLOGY, SURVEYING

WARNING
0 0.5 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED	VARIOUS
DRAWN	RLM
CHECKED	AJH
REVIEWED	DL
CLIENT	MM/RV
DATE	4/5/19

CLIMAX MINE

MAYFLOWER FLOOD BYPASS TUNNEL SYSTEM

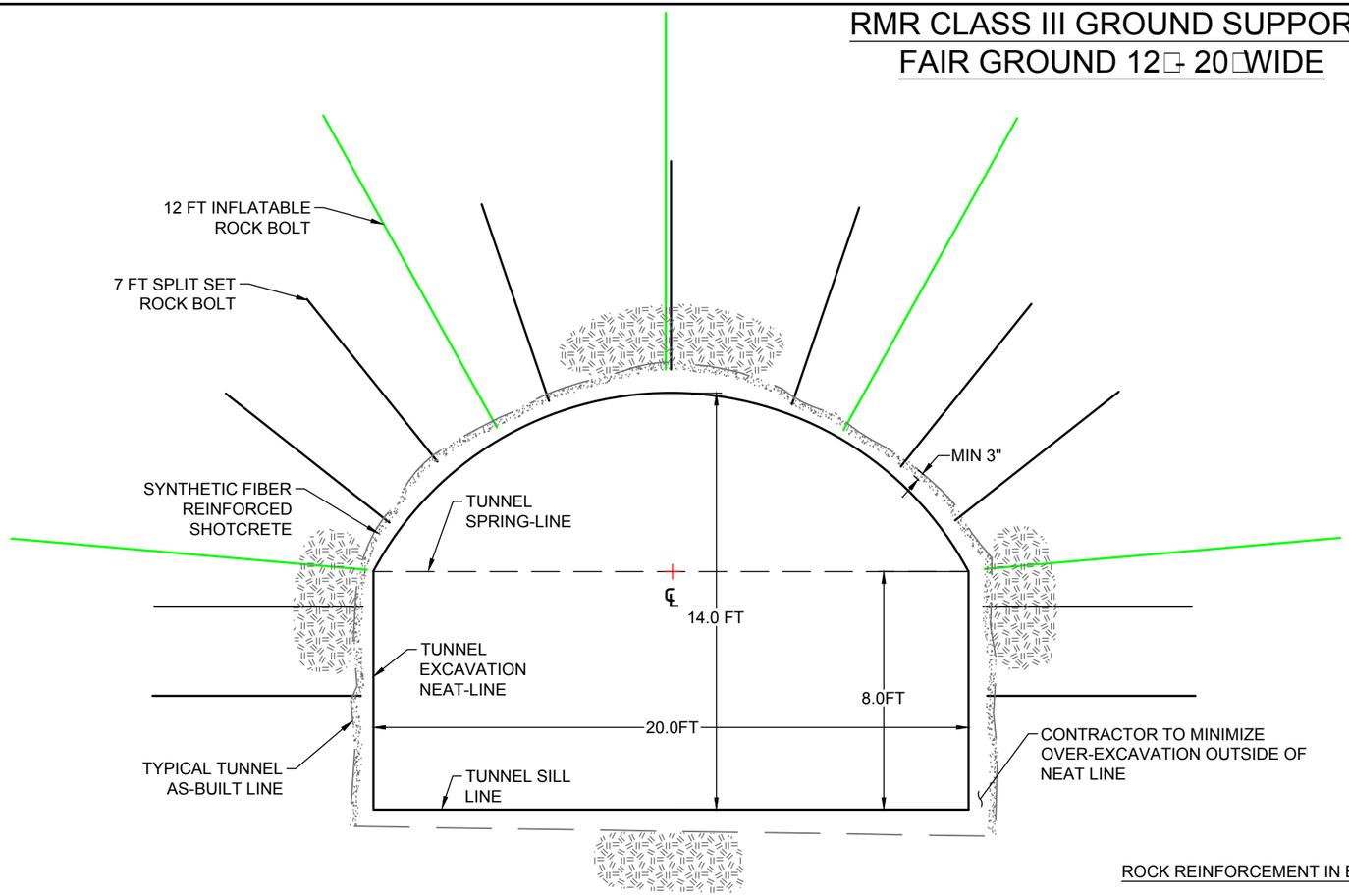
TYPICAL GROUND SUPPORT DETAILS
RMR CLASS I-II GROUND 12-20 FT WIDE

REVISION 2
PROJECT NO. 12235
DRAWING MFT-C-15
SHEET 1 OF 1

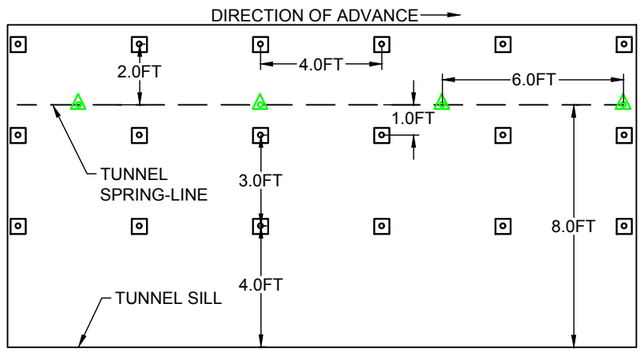
AutoCAD FILE: MFT Stage II Construction.dwg

RMR CLASS III GROUND SUPPORT
FAIR GROUND 12□- 20□WIDE

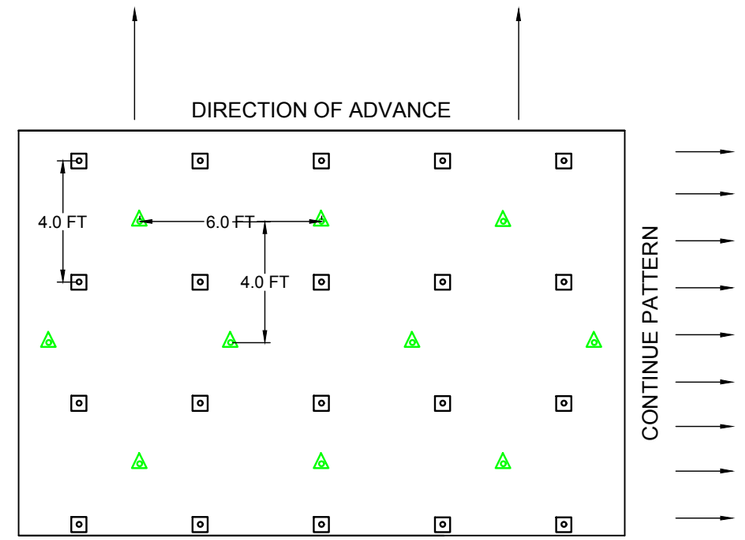
THIS DESIGN, IN IT□S ENTIRETY, INCLUDING GROUND REINFORCEMENT PLANS, DETAILS AND ENGINEERING CALCULATIONS FOR GROUND SUPPORT CLASSIFICATIONS PROVIDED BY LANGSTON & ASSOCIATES TO CLIMAX AND HENDERSON DURING PHASE I TUNNELING OPERATIONS. REFINEMENTS TO THE GROUND SUPPORT PLANS AND DETAILS ARE REQUIREMENTS OF CLIMAX MOLYBDENUM CORPORATION.



TUNNEL CROSS-SECTION VIEW



LONG SECTION VIEW OF RIBS



PLAN VIEW OF BACK

ROCK REINFORCEMENT IN BACK

- 12 FT COATED 24T INFLATABLE BOLTS ACROSS ENTIRE SPAN IN BACK ON A 6 FT X 4 FT STAGGERED GRID AS SHOWN
- 7 FT, 46mm GALVANIZED SPLIT SET BOLTS ON A SYSTEMATIC 4 FT GRID

□*OTE*□ SPANS WIDER THAN 20 FT MAY REQUIRE CABLE BOLTS

SURFACE SUPPORT

- MINIMUM 3 IN SHOTCRETE APPLIED TO ENTIRE EXCAVATION PRIOR TO ROCK REINFORCEMENT

RIB SUPPORT

-THREE ROWS 7 FT ROCK REINFORCEMENT, 1 ROW 12 FT ROCK REINFORCEMENT AS SHOWN ABOVE

□□□*ER ROWS*□ BOLTS INSTALLED 2 FT ABOVE 8 FT SPRING LINE

MID ROWS□ BOLTS INSTALLED 1 FT BELOW 8 FT SPRING LINE
8 FT COATED INFLATABLE BOLTS INSTALLED AT SPRING LINE

□*OWER ROWS*□ BOLTS INSTALLED 4 FT OFF SILL

⊡ 7 FT, 46mm GALVANIZED SPLIT SET BOLT WITH PLATE

□*OTE*□ □□*T CO*□*TED* □□*T I*□□□□*T*□□□*E* □*O*□*TS M*□□ □*E S*□□*STIT*□*TED I*□ □□*TTER*□

SCALE
2.5' 0 2.5' 5'

△ 12 FT COATED 24T INFLATABLE BOLT WITH PLATE

REV	DESCRIPTION OF REVISION	BY	DATE
2	ISSUED FOR CONSTRUCTION	RLM	4/19
1	ISSUED FOR BID	RLM	10/18
0	ISSUED FOR CLIENT REVIEW	RLM	9/18

Climax Molybdenum
A Freeport-McMoRan Company

AJAX
PROJECT & CONSTRUCTION MANAGEMENT
ENGINEERING, GEOLOGY, SURVEYING

WARNING
0 0.5 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED	VARIOUS
DRAWN	RLM
CHECKED	AJH
REVIEWED	DL
CLIENT	MM/RV
DATE	4/5/19

CLIMAX MINE

MAYFLOWER FLOOD BYPASS TUNNEL SYSTEM

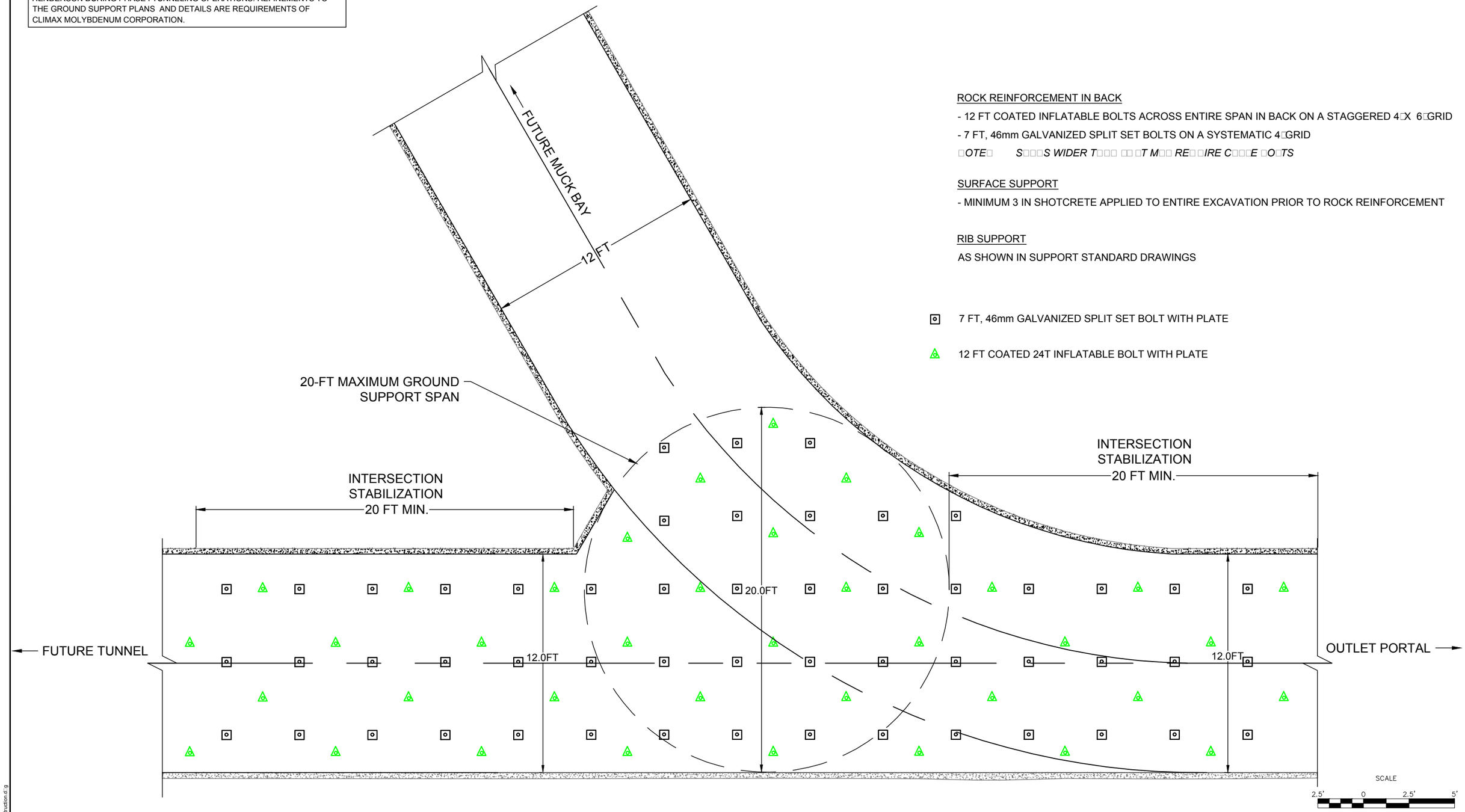
TYPICAL GROUND SUPPORT DETAILS
RMR CLASS III GROUND 12-20 FT WIDE

REVISION 2
PROJECT NO. 12235
DRAWING MFT-C-16
SHEET 1 OF 1

AutoCAD FILE: MFT Stage II Construction.dwg

THIS DESIGN, IN IT'S ENTIRETY, INCLUDING GROUND REINFORCEMENT PLANS, DETAILS AND ENGINEERING CALCULATIONS FOR GROUND SUPPORT CLASSIFICATIONS PROVIDED BY LANGSTON & ASSOCIATES TO CLIMAX AND HENDERSON DURING PHASE I TUNNELING OPERATIONS. REFINEMENTS TO THE GROUND SUPPORT PLANS AND DETAILS ARE REQUIREMENTS OF CLIMAX MOLYBDENUM CORPORATION.

THREE WAY INTERSECTION GROUND SUPPORT
RMR GROUND CLASS I - III



ROCK REINFORCEMENT IN BACK

- 12 FT COATED INFLATABLE BOLTS ACROSS ENTIRE SPAN IN BACK ON A STAGGERED 4□X 6□GRID
- 7 FT, 46mm GALVANIZED SPLIT SET BOLTS ON A SYSTEMATIC 4□GRID

□OTE□ S□□□S WIDER T□□□ □□ □T M□□ RE□ □IRE C□□□E □O□TS

SURFACE SUPPORT

- MINIMUM 3 IN SHOTCRETE APPLIED TO ENTIRE EXCAVATION PRIOR TO ROCK REINFORCEMENT

RIB SUPPORT

AS SHOWN IN SUPPORT STANDARD DRAWINGS

7 FT, 46mm GALVANIZED SPLIT SET BOLT WITH PLATE

12 FT COATED 24T INFLATABLE BOLT WITH PLATE

AutoCAD FILE: MFT Stage II Construction.dwg

REV	DESCRIPTION OF REVISION	BY	DATE
2	ISSUED FOR CONSTRUCTION	RLM	4/19
1	ISSUED FOR BID	RLM	10/18
0	ISSUED FOR CLIENT REVIEW	RLM	9/18

Climax Molybdenum
A Freeport-McMoRan Company

AJAX
PROJECT & CONSTRUCTION MANAGEMENT
ENGINEERING, GEOLOGY, SURVEYING

WARNING
0 0.5 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

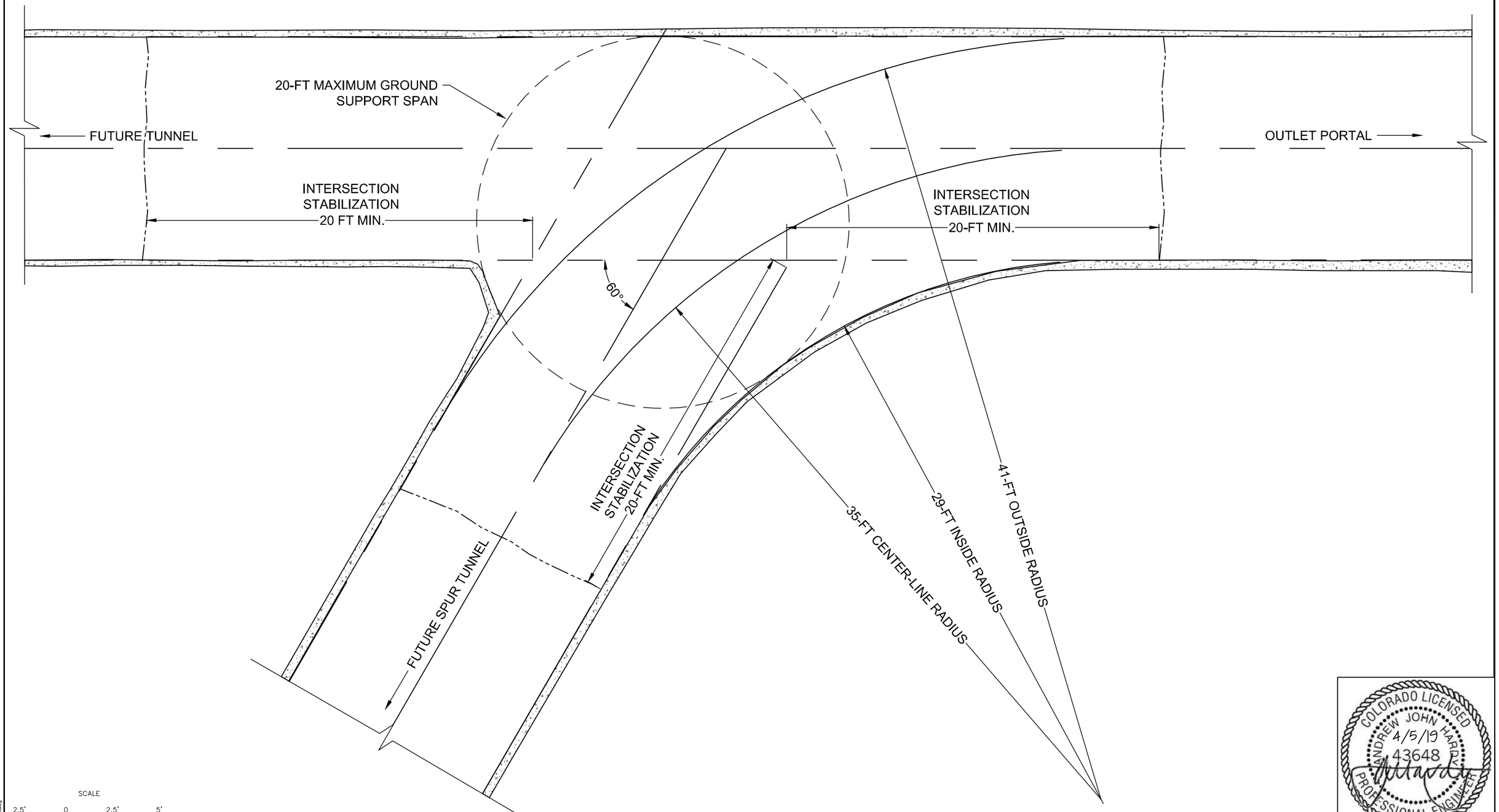
DESIGNED	VARIOUS
DRAWN	RLM
CHECKED	AJH
REVIEWED	DL
CLIENT	MM/RV
DATE	4/5/19

CLIMAX MINE

MAYFLOWER FLOOD BYPASS TUNNEL SYSTEM

TYPICAL GROUND SUPPORT DETAILS
3-WAY TUNNEL INTERSECTION RMR CLASS I-III

REVISION 2
PROJECT NO. 12235
DRAWING MFT-C-17
SHEET 1 OF 1



SCALE
2.5' 0 2.5' 5'

COLORADO LICENSED
ANDREW JOHN HARDY
4/5/19
43648
PROFESSIONAL ENGINEER

REV	DESCRIPTION OF REVISION	BY	DATE
3			
2			
2	ISSUED FOR CONSTRUCTION	RLM	4/19
1	ISSUED FOR BID	RLM	10/18
0	ISSUED FOR CLIENT REVIEW	RLM	9/18

Climax Molybdenum
A Freeport–McMoRan Company

AJAX
PROJECT & CONSTRUCTION MANAGEMENT
ENGINEERING, GEOLOGY, SURVEYING

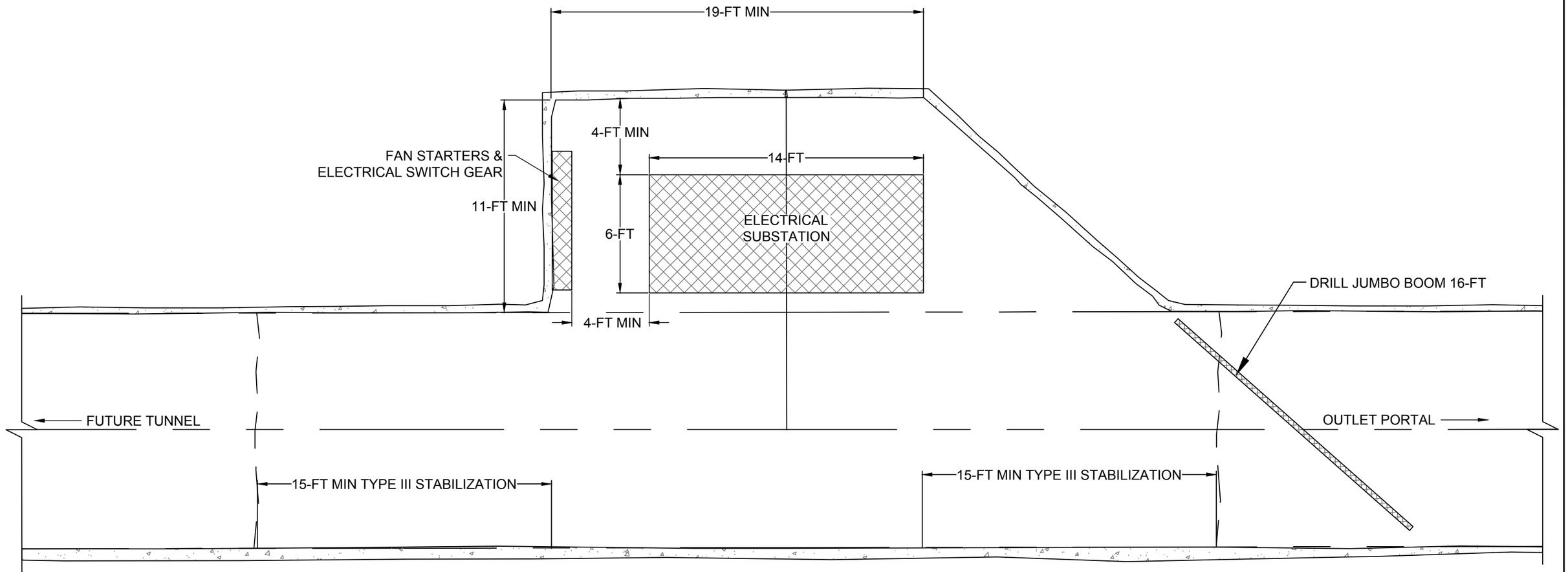
WARNING
0 0.5 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED	VARIOUS
DRAWN	RLM
CHECKED	AJH
REVIEWED	DL
CLIENT	MM/RV
DATE	4/5/19

CLIMAX MINE
MAYFLOWER FLOOD BYPASS TUNNEL SYSTEM
TYPICAL TUNNEL INTERSECTION DETAILS
FUTURE SPUR INTERSECTIONS

REVISION 2
PROJECT NO. 12235
DRAWING MFT-C-18
SHEET 1 OF 1

AutoCAD FILE: MFT Stage II Construction.dwg



SCALE
2.5' 0 2.5' 5'

COLORADO LICENSED
ANDREW JOHN HARDY
4/5/19
43648
PROFESSIONAL ENGINEER

AutoCAD FILE: MFT Stage II Construction.dwg

REV	DESCRIPTION OF REVISION	BY	DATE
2	ISSUED FOR CONSTRUCTION	RLM	4/19
1	ISSUED FOR BID	RLM	10/18
0	ISSUED FOR CLIENT REVIEW	RLM	9/18

Climax Molybdenum
A Freeport–McMoRan Company

AJAX
PROJECT & CONSTRUCTION MANAGEMENT
ENGINEERING, GEOLOGY, SURVEYING

WARNING
0 0.5 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

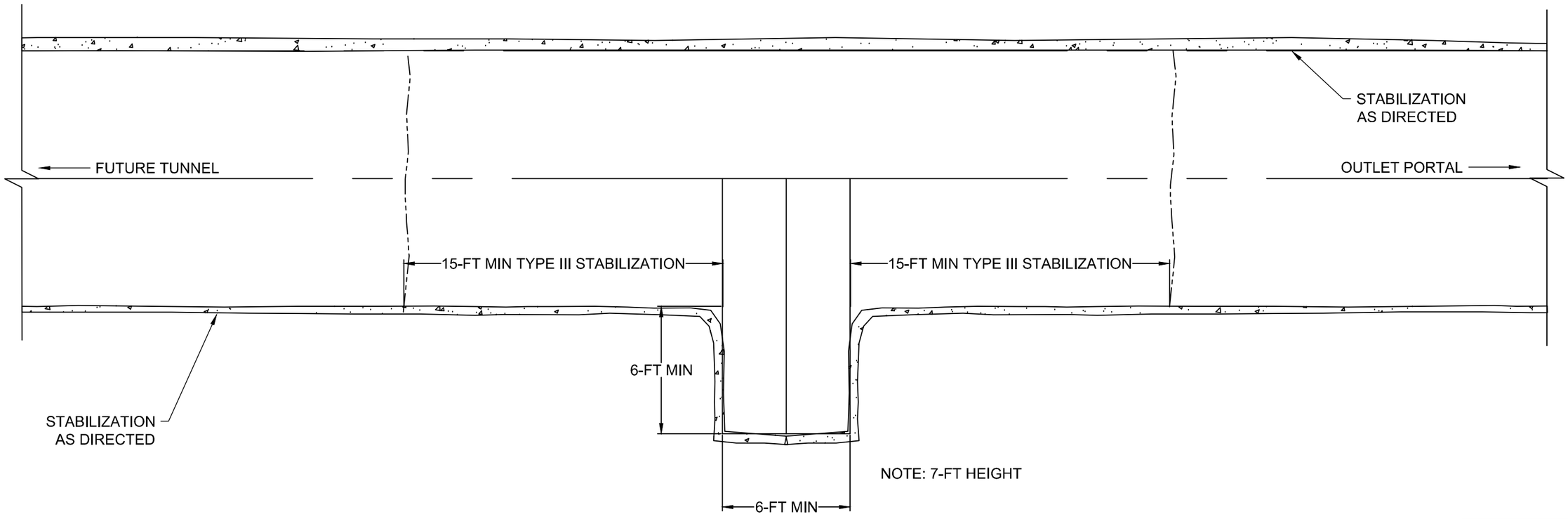
DESIGNED	VARIOUS
DRAWN	RLM
CHECKED	AJH
REVIEWED	DL
CLIENT	MM/RV
DATE	4/5/19

CLIMAX MINE

MAYFLOWER FLOOD BYPASS TUNNEL SYSTEM

TYPICAL TUNNEL CUTOUT DETAILS
ELECTRICAL SUBSTATION

REVISION 2
PROJECT NO. 12235
DRAWING MFT-C-19
SHEET 1 OF 1



NOTE: 7-FT HEIGHT

SCALE
2.5' 0 2.5' 5'

COLORADO LICENSED
ANDREW JOHN HARDT
4/5/19
43648
PROFESSIONAL ENGINEER

REV	DESCRIPTION OF REVISION	BY	DATE
2	ISSUED FOR CONSTRUCTION	RLM	4/19
1	ISSUED FOR BID	RLM	10/18
0	ISSUED FOR CLIENT REVIEW	RLM	9/18

Climax Molybdenum
A Freeport-McMoRan Company

AJAX
PROJECT & CONSTRUCTION MANAGEMENT
ENGINEERING, GEOLOGY, SURVEYING

WARNING
0 0.5 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED	VARIOUS
DRAWN	RLM
CHECKED	AJH
REVIEWED	DL
CLIENT	MM/RV
DATE	4/5/19

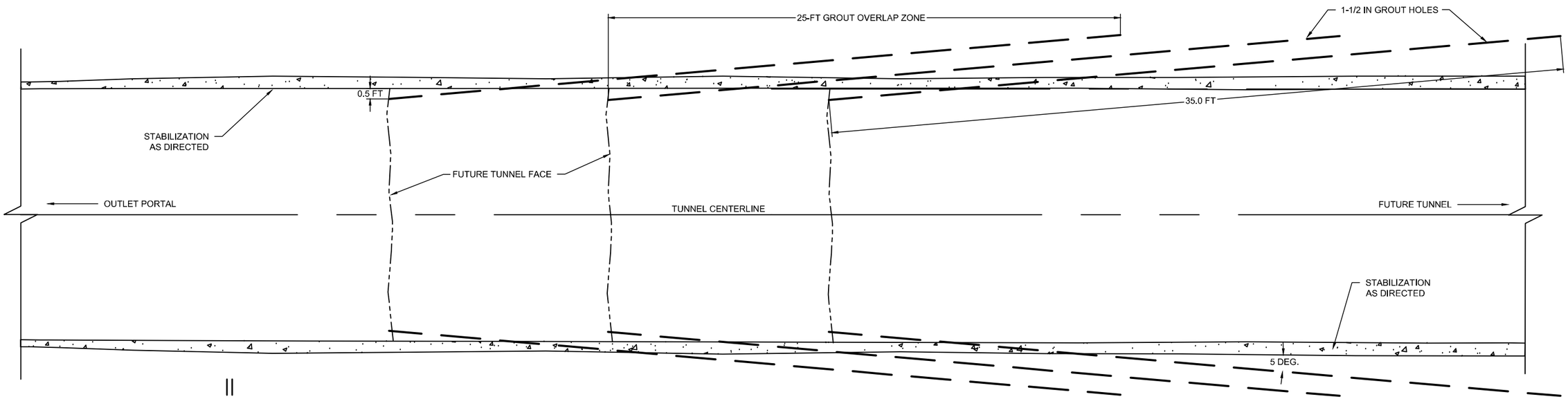
CLIMAX MINE

MAYFLOWER FLOOD BYPASS TUNNEL SYSTEM

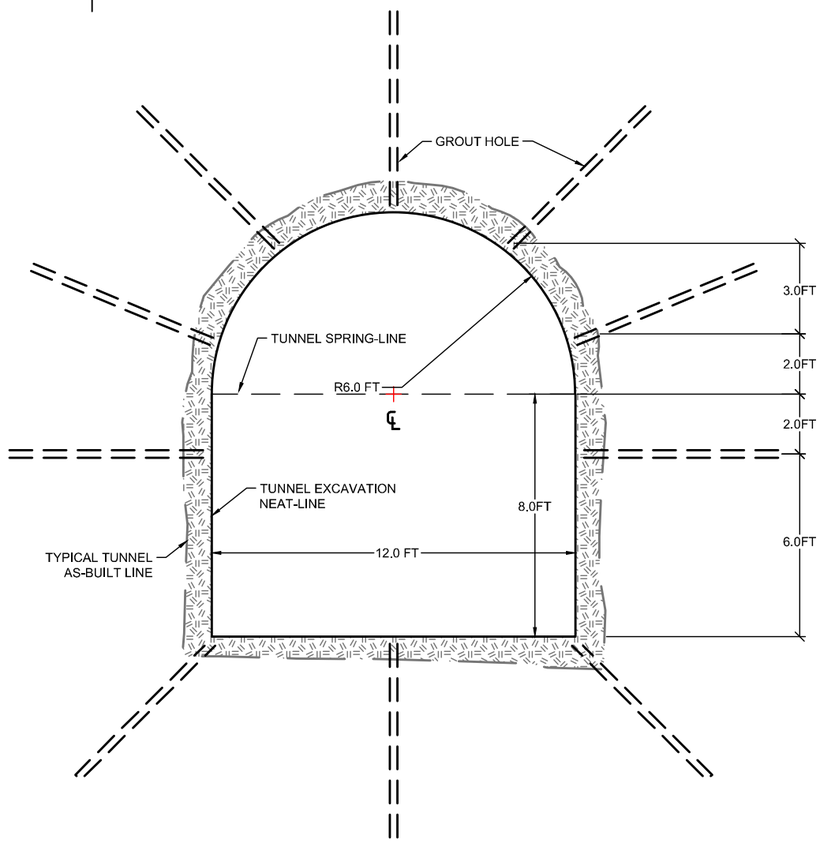
TYPICAL TUNNEL CUTOUT DETAILS
SAFETY BAY

REVISION 2
PROJECT NO. 12235
DRAWING MFT-C-20
SHEET 1 OF 1

AutoCAD FILE: MFT Stage II Construction.dwg



TYPICAL GROUT HOLE PROFILE



TYPICAL PROBE/GROUT HOLE CROSS-SECTION GEOMETRY

SCALE

2.5' 0 2.5' 5'

COLORADO LICENSED
ANDREW JOHN HARDY
4/5/19
43648
PROFESSIONAL ENGINEER

AutoCAD FILE: MFT Stage II Construction.dwg

REV	DESCRIPTION OF REVISION	BY	DATE
3			
2			
1			
0			
2	ISSUED FOR CONSTRUCTION	RLM	4/19
1	ISSUED FOR BID	RLM	10/18
0	ISSUED FOR CLIENT REVIEW	RLM	9/18

Climax Molybdenum
A Freeport-McMoRan Company

AJAX
PROJECT & CONSTRUCTION MANAGEMENT
ENGINEERING, GEOLOGY, SURVEYING

WARNING
0 0.5 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED	VARIOUS
DRAWN	RLM
CHECKED	AJH
REVIEWED	DL
CLIENT	MM/RV
DATE	4/5/19

CLIMAX MINE

MAYFLOWER FLOOD BYPASS TUNNEL SYSTEM

TYPICAL PROBE HOLE
AND GROUT HOLE GEOMETRY

REVISION 2

PROJECT NO. 12235

DRAWING MFT-C-21

SHEET 1 OF 1

MAYFLOWER FLOOD BYPASS TUNNEL
PHASE II VERTICAL INTAKE STRUCTURE

GROUND STABILIZATION CONSTRUCTION PLANS

CLIMAX, COLORADO

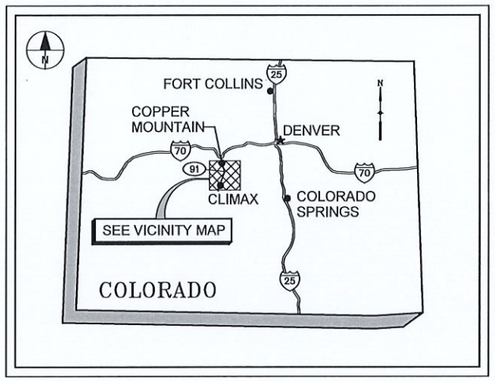
PREPARED FOR

CLIMAX MOLYBDENUM COMPANY

PREPARED BY

AECOM

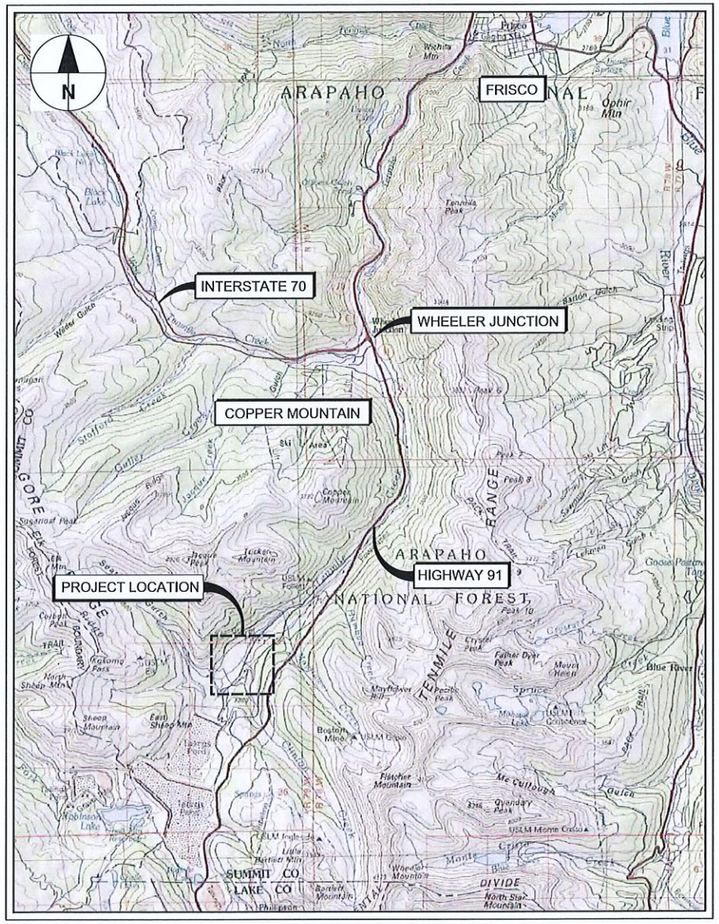
MAY 2019



STATE MAP
NOT TO SCALE

PROJECT DESIGN TEAM APPROVALS

AECOM PROJECT MANAGER DESIGN	John Sikora, P.E.	05/20/2019 DATE
CLIMAX PROJECT MANAGER CONSTRUCTION OVERSIGHT	Miles McElhinney, P.E.	5/20/19 DATE



VICINITY MAP
NOT TO SCALE

SHEET INDEX	
DRAWING NO.	DESCRIPTION
G-01	COVER SHEET WITH VICINITY MAP, PROJECT LOCATION AND DRAWING INDEX
G-02	GENERAL NOTES, LEGEND AND ABBREVIATIONS
C-02	PROPOSED ALIGNMENTS AND STAGING AREAS
C-03	VERTICAL TOWER INTAKE PLAN
C-04	VERTICAL TOWER INTAKE PROFILE
C-05	VERTICAL TOWER INTAKE WALL SECTIONS
C-06	STABILIZATION AND FOUNDATION EXCAVATION
C-07	STABILIZATION DETAILS
C-08	DRAINAGE DETAILS

AECOM

PROJECT
PHASE II VERTICAL INTAKE STRUCTURE

CLIENT
Climax Molybdenum
A Freeport-McMoRan Company

CONSULTANT
AECOM
804 COLORADO AVE.
Suite 201
GLENWOOD SPRINGS, CO. 81601

www.aecom.com

CONSULTANTS

REGISTRATION

COLORADO LICENSED
John Sikora
30358
PROFESSIONAL ENGINEER

KEY PLAN

PROJECT NUMBER
60591226

SHEET TITLE
COVER SHEET

SHEET NUMBER
G-01

ABBREVIATIONS

APPROX.	APPROXIMATE	N	NORTHING
AC-FT	ACRE - FEET	NO.	NUMBER
BOH	BOTTOM OF HOLE	NA	NOT APPLICABLE
BOW	BOTTOM OF WALL	O.C.	ON CENTER
CFS	CUBIC FEET PER SECOND	O.W.	OUTLET WORKS
℄	CENTERLINE	PC	POINT OF CURVATURE
DIA.	DIAMETER	Pm	MINTURN FORMATION
D/S	DOWNSTREAM	PT	POINT OF TANGENCY
E	EASTING	PVI	POINT OF VERTICAL INTERSECTION
EA.	EACH	Qal	ALLUVIUM
ELEV, EL.	ELEVATION	Qm	MORAINE
EOC	EDGE OF CONCRETE	R	RADIUS
EST.	ESTIMATED	S	SLOPE, FT./FT.
EX.	EXAMPLE	STA.	STATION
EXIST.	EXISTING	STD	STANDARD
FT.	FEET	Ti	INTRUSIVE COMPLEX
FTG.	FOOTING	TH	TEST HOLE
GDR	GEOTECHNICAL DATA REPORT	TOW	TOP OF WALL
GBR	GEOTECHNICAL BASELINE REPORT	TP	TEST PIT
H, HORI□	HORI□ONTAL	TYP.	TYPICAL
IN.	INCHES	U/S	UPSTREAM
INV.	INVERT	V, VERT	VERTICAL
L_d	DEVELOPMENT LENGTH	WL	WATER LEVEL
MAX.	MAXIMUM	WS	WATERSTOP
MIN.	MINIMUM	WSE	WATER SERVICE ELEVATION
M.E.	MATCH EXISTING		

GENERAL NOTES:

1. GROUND SURFACE TOPOGRAPHY COMPILED FROM 2010 URS SURVEY (SEPTEMBER 2010) MERGED WITH 2006 AND 2013 BASE TOPOGRAPHY PROVIDED BY CLIMAX.
2. GEOLOGY HAS BEEN INTERPRETED USING PUBLISHED REPORTS AND MAPS, AND DATE COLLECTED FROM VARIOUS FIELD INVESTIGATIONS. SURFACE AND BEDROCK GEOLOGY MAY VARY DURING EXCAVATION AND CONSTRUCTION. SEE MAYFLOWER TUNNEL GDR AND GBR (URS 2012) FOR ADDITIONAL INFORMATION.
3. ALL TUNNEL CONSTRUCTION ACTIVITIES MUST COMPLY WITH THE STORM WATER MANAGEMENT PLAN "MAYFLOWER FLOOD BYPASS TUNNEL SYSTEM STORM WATER MANAGEMENT PLAN", DRAWING NOS. SWMP-01, SWMP-02, SWMP-03, AND SWMP-04.

LEGEND

EXISTING UTILITY POLE

TH-10 — APPROXIMATE LOCATION OF VERTICAL TEST HOLE (URS, 2011)

TH -12a — APPROXIMATE LOCATION OF INCLINED TEST HOLE (URS, 2011)

TP01 — APPROXIMATE LOCATION OF TEST PIT (URS, 2011)

SL1 — SEISMIC LINE SL1

MGM 12-02 — VERTICAL TEST HOLE BY HENDERSON, 2012

TH14 — HORI□ONTAL TEST HOLE BY URS, 2012

B / C-02 — INDICATES CROSS SECTION LOCATION. B REFERS TO THE CROSS SECTION DESIGNATION. C-02 REFERS TO THE DRAWING NUMBER WHERE THE SECTION IS SHOWN. WHEN SHOWN ON THE SECTION LABEL, THIS NUMBER REFERS TO THE DRAWING NUMBER WHERE THE SECTION IS CUT.

SEE DETAIL 1 / C-04 — INDICATES DETAIL LOCATION. 1 REFERS TO THE DETAIL DESIGNATION. C-04 REFERS TO THE DRAWING NUMBER WHERE THE DETAIL IS SHOWN. WHEN SHOWN ON THE DETAIL, THIS NUMBER REFERS TO THE DRAWING NUMBER WHERE THE DETAIL IS TAKEN.

10600 — INDEX CONTOURS (10□INTERVAL)

10602 — INTERMEDIATE CONTOURS (2□INTERVAL)

10610 — FINAL GRADING CONTOURS (10□INTERVAL)

10612 — FINAL GRADING CONTOURS (2□INTERVAL)

FLOW — INDICATES DIRECTION OF FLOW

EXISTING FENCE

WATER SURFACE

PROPOSED SURVEY BENCHMARK

EXISTING HOUSE OR STRUCTURE

CULVERT

TREE LINE/SHRUB

GM — GAS METER

FILL SLOPE

CUT SLOPE

GW — GUY WIRE

PP — POWER POLE

UMKR — UTILITY MARKER

TRB — TELEPHONE RISER BOX

UE — UNDERGROUND ELECTRIC LINE

FO — UNDERGROUND FIBER OPTIC LINE

OT — UNDERGROUND TELEPHONE LINE

OHE — OVERHEAD ELECTRIC LINE

EXISTING SOIL OR GRADE

LIMIT OF SOIL EXCAVATION

ESTIMATED BEDROCK SURFACE

CONCRETE

AECOM

PROJECT

PHASE II VERTICAL INTAKE STRUCTURE

CLIENT

Climax Molybdenum
A Freeport-McMoRan Company

CONSULTANT

AECOM
804 COLORADO AVE.
Suite 201
GLENWOOD SPRINGS, CO. 81601

□□□.aecom.com

CONSULTANTS

REGISTRATION

COLORADO LICENSED
JOHN STADEL
30358
PROFESSIONAL ENGINEER

□E□ PLAN

PROJECT NUMBER

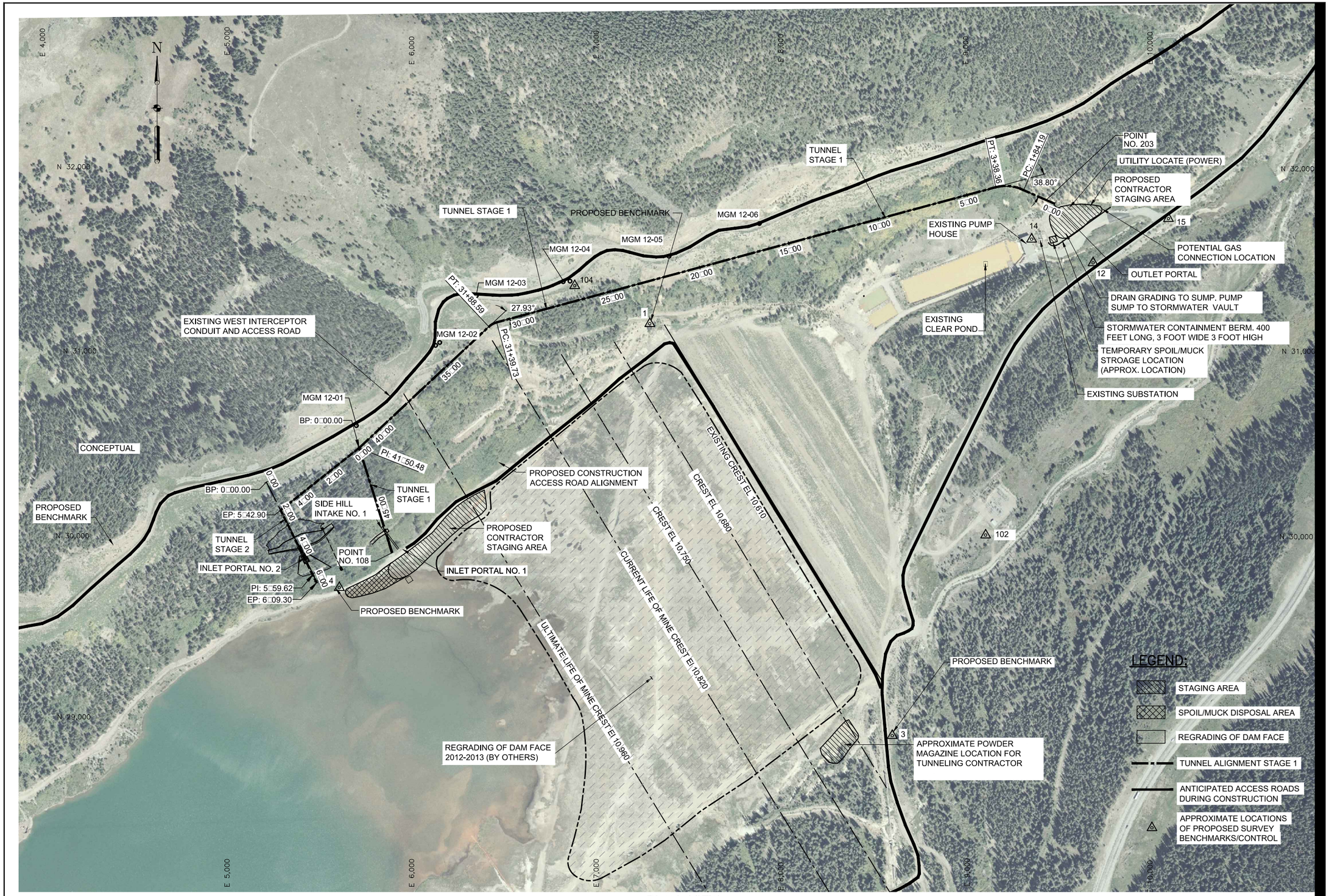
60591226

SHEET TITLE

GENERAL NOTES, LEGEND AND ABBREVIATIONS

SHEET NUMBER

G-02



PLAN VIEW

0 250 500 750

SCALE IN FEET

AECOM

PROJECT

PHASE II VERTICAL INTAKE STRUCTURE

CLIENT

Climax Molybdenum
A Freeport-McMoRan Company

CONSULTANT

AECOM
804 COLORADO AVE.
Suite 201
GLENWOOD SPRINGS, CO. 81601

□□□.aecom.com

CONSULTANTS

REGISTRATION

COLORADO LICENSED JOHN STROM 30358 PROFESSIONAL ENGINEER

□E□ PLAN

PROJECT NUMBER

60591226

SHEET TITLE

PROPOSED ALIGNMENTS AND STAGING AREAS

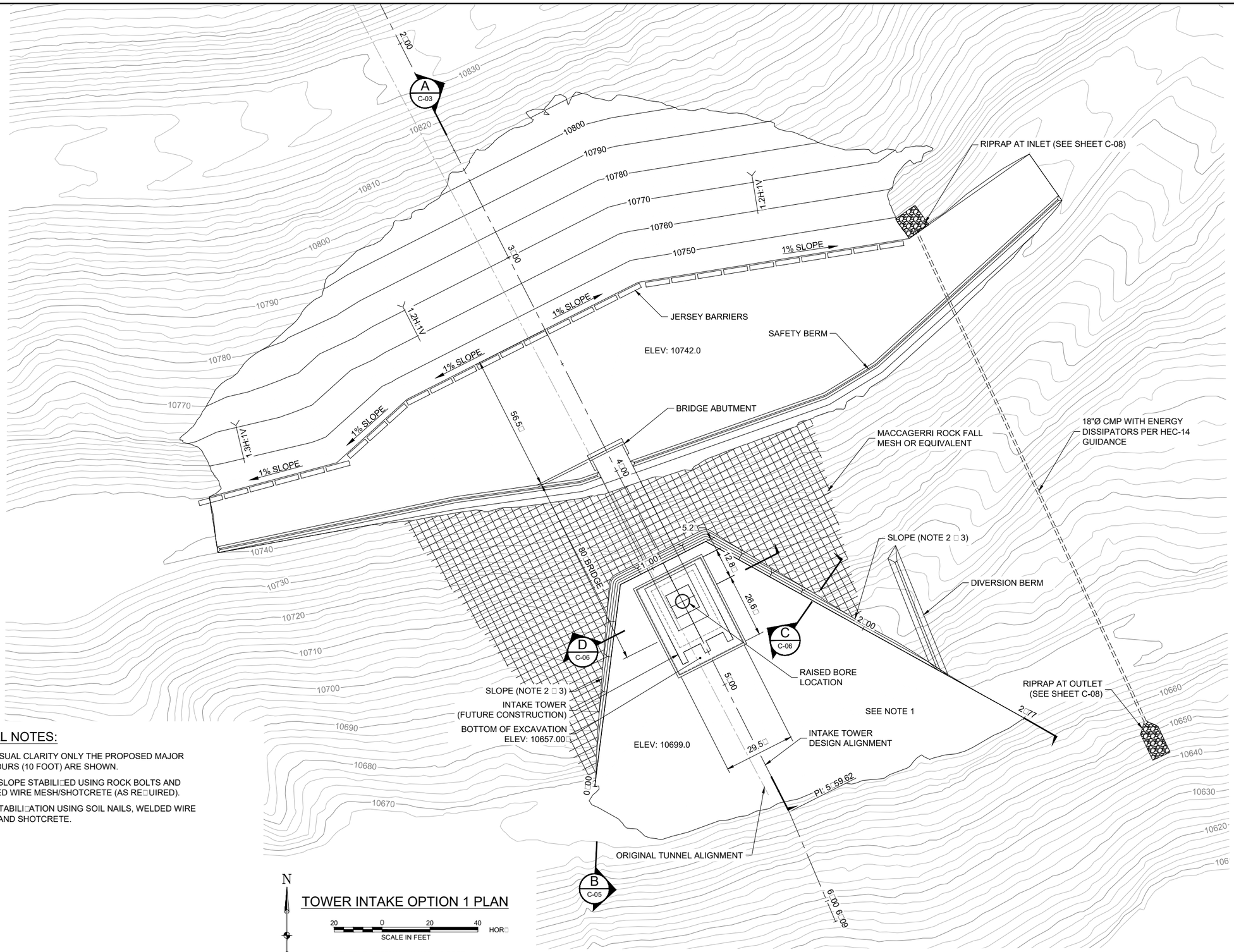
SHEET NUMBER

C-02

Project Management Initials: Designer: ____ Checked: ____ Approved: ____ ANSI D 22" x 34"

Last saved by: MICHAEL.RAU (2019-06-20) Last Plotted: 2019-05-20
Filename: M:\DCS\PROJECTS\WTR\60591226_CLAIMAT2\900_CAD_GIS\910_CAD\20-SHEETS\C-02 PROPOSED ALIGNMENTS AND STAGING AREAS.DWG

Printed on ___% Post-Consumer Recycled Content Paper



GENERAL NOTES:

1. FOR VISUAL CLARITY ONLY THE PROPOSED MAJOR CONTOURS (10 FOOT) ARE SHOWN.
2. ROCK SLOPE STABILI□ED USING ROCK BOLTS AND WELDED WIRE MESH/SHOTCRETE (AS RE□UIRED).
3. SOIL STABILI□ATION USING SOIL NAILS, WELDED WIRE MESH AND SHOTCRETE.

N

TOWER INTAKE OPTION 1 PLAN

20 0 20 40 HOR□
SCALE IN FEET

CONTOUR INTERVAL: MINOR 1 FOOT
MAJOR 5 FOOT

AECOM

PROJECT

PHASE II VERTICAL INTAKE STRUCTURE

CLIENT

Climax Molybdenum
A Freeport-McMoRan Company

CONSULTANT

AECOM
804 COLORADO AVE.
Suite 201
GLENWOOD SPRINGS, CO. 81601

□□□.aecom.com

CONSULTANTS

REGISTRATION

COLORADO LICENSED
JOHN STADEL
30358
PROFESSIONAL ENGINEER

□E□ PLAN

PROJECT NUMBER

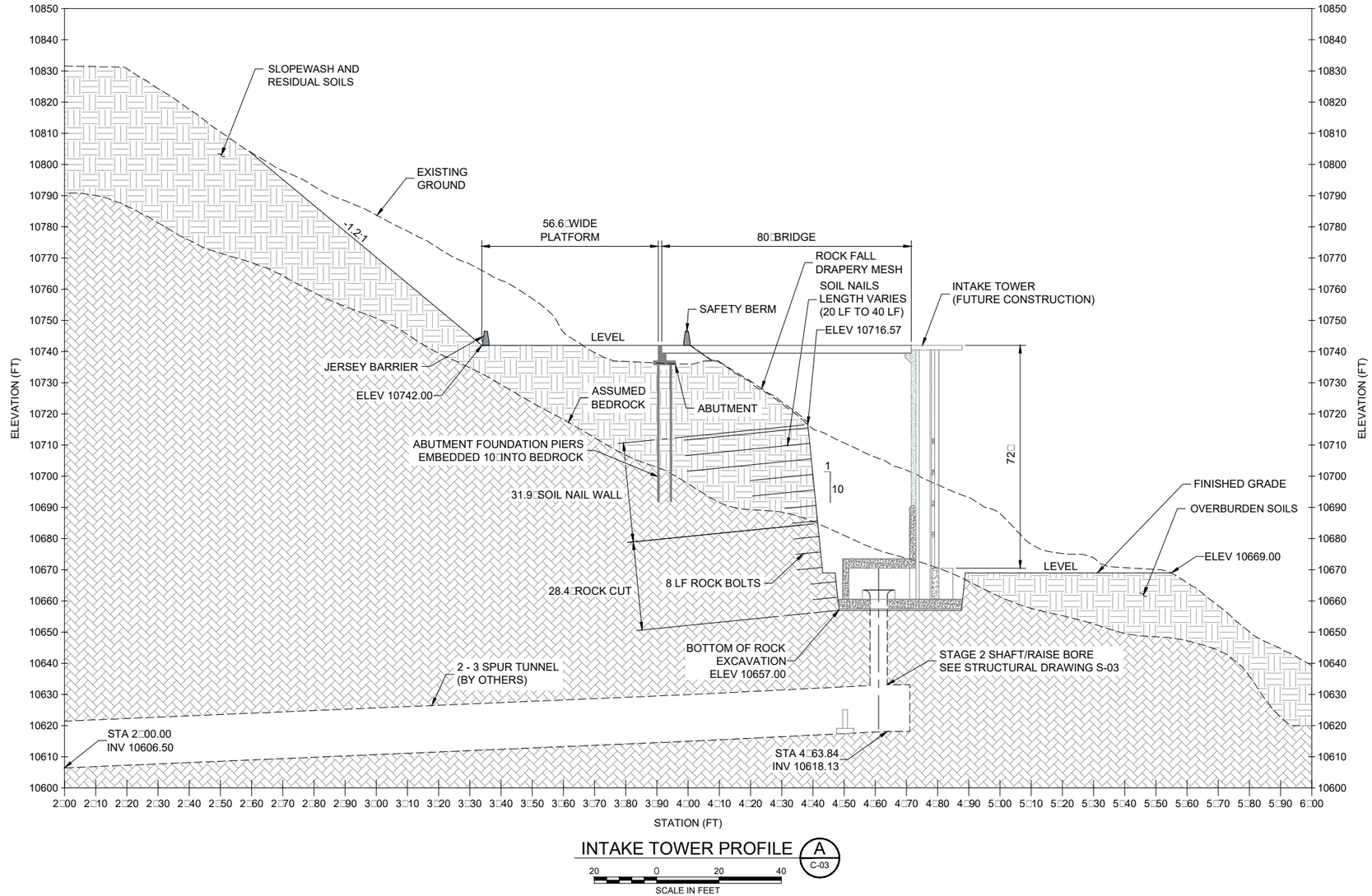
60591226

SHEET TITLE

VERTICAL TOWER INTAKE PLAN

SHEET

C-03



INTAKE TOWER PROFILE (A / C-03)

20 0 20 40
SCALE IN FEET

GENERAL NOTES:

1. ROCK SLOPE AND SOIL NAIL SHORING WALL BATTER APPROXIMATELY 1H:10V.
2. REINFORCED SHOTCRETE FACING USING WELDED WIRE MESH, STRIP DRAINS ON 4□ CENTERS, 6" SHOTCRETE THICKNESS.
3. SOIL NAILS - NO. 8 WILLIAMS THREADBAR, FULLY GROUTED AND CENTRALI□ED, 15-DEG. INCLINATION FROM HORI□ONTAL, 5□X5□STAGGERED PATTERN FIRST ROW OF NAILS 1-FT. BELOW BROW, SEE DETAIL C-06.

AECOM

PROJECT

PHASE II VERTICAL INTAKE STRUCTURE

CLIENT

Climax Molybdenum
A Freeport-McMoRan Company

CONSULTANT

AECOM
804 COLORADO AVE.
Suite 201
GLENWOOD SPRINGS, CO. 81601

□□□.aecom.com

CONSULTANTS

REGISTRATION

COLORADO LICENSED JOHN STORM 30358 PROFESSIONAL ENGINEER

□E□ PLAN

PROJECT NUMBER

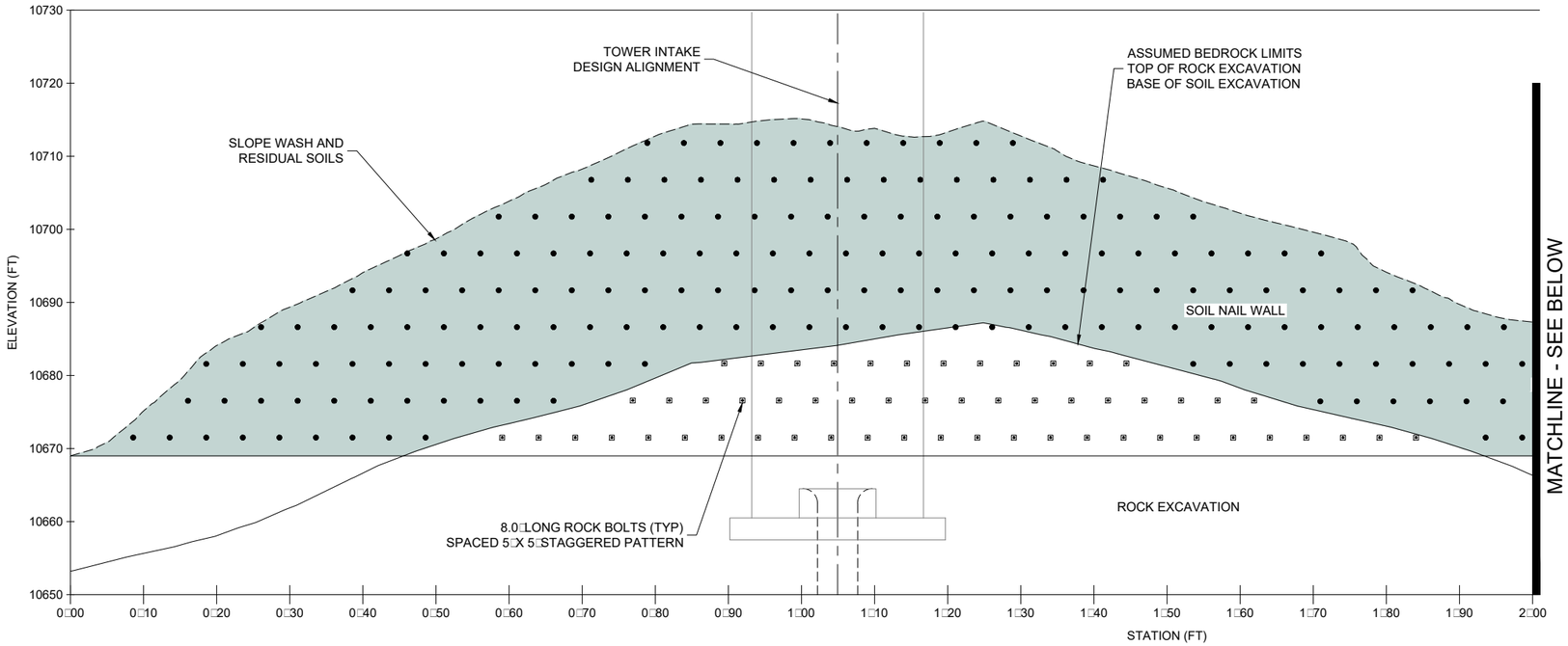
60591226

SHEET TITLE

VERTICAL TOWER INTAKE PROFILE

SHEET

C-04

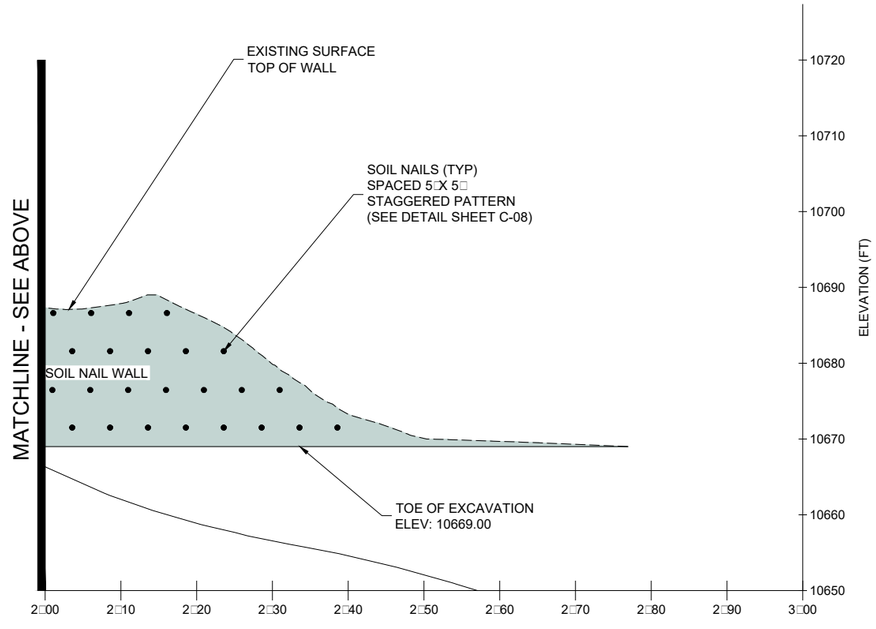


GENERAL NOTES:

1. ROCK SLOPE AND SOIL NAIL SHORING WALL BATTER APPROXIMATELY 1H:10V.
2. REINFORCED SHOTCRETE FACING USING WELDED WIRE MESH, STRIP DRAINS ON 4□ CENTERS, 6" SHOTCRETE THICKNESS.
3. SOIL NAILS - NO. 8 WILLIAMS THREADBAR, FULLY GROUTED AND CENTRALI□ED, 15-DEG. INCLINATION FROM HORI□ONTAL, 5X5□STAGGERED PATTERN FIRST ROW OF NAILS 1-FT. BELOW BROW, SEE DETAIL C-06.

TOWER INTAKE SOIL NAIL WALL
AND ROCK BOLT WALL PROFILE B C-03

10 0 10 20
SCALE IN FEET



AECOM

PROJECT

PHASE II VERTICAL
INTAKE STRUCTURE

CLIENT

Climax Molybdenum
A Freeport-McMoRan Company

CONSULTANT

AECOM
804 COLORADO AVE.
Suite 201
GLENWOOD SPRINGS, CO. 81601

□□□.aecom.com

CONSULTANTS

REGISTRATION

COLORADO LICENSED
JOHN S KOMA
30358
PROFESSIONAL ENGINEER

□E□ PLAN

PROJECT NUMBER

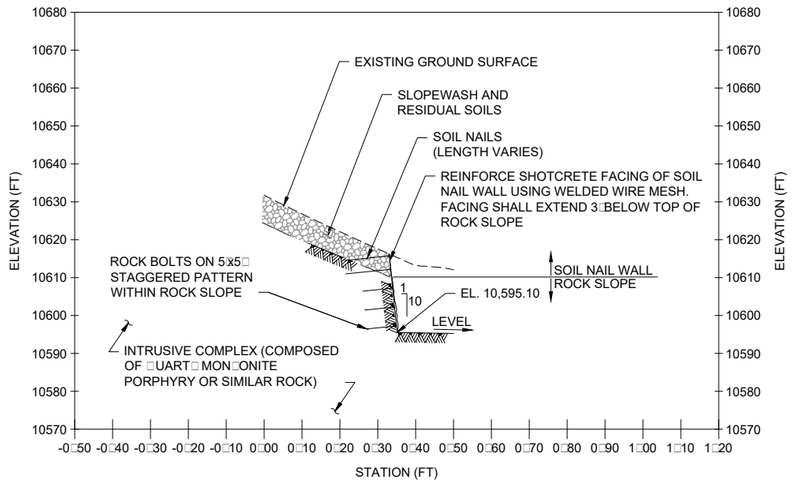
60591226

SHEET TITLE

TOWER INTAKE WALL PROFILE

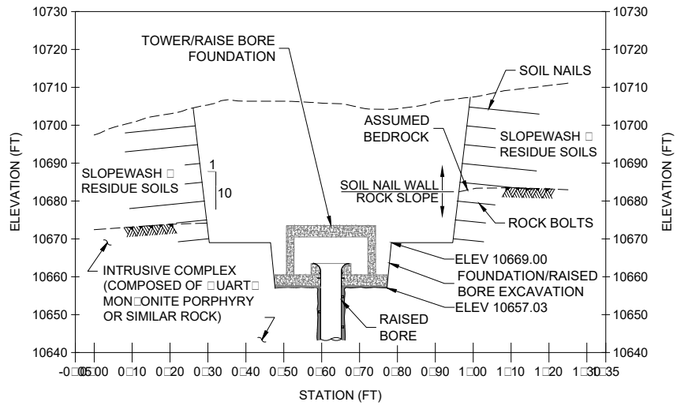
SHEET

C-05



RAISED BORE FOUNDATION C C-03

20 0 20 40
SCALE IN FEET



TOWER/RAISED BORE FOUNDATION D C-03

20 0 20 40
SCALE IN FEET

GENERAL NOTES:

1. ROCK SLOPE AND SOIL NAIL SHORING WALL BATTER APPROXIMATELY 1H:10V.
2. REINFORCED SHOTCRETE FACING USING WELDED WIRE MESH, STRIP DRAINS ON 4□ CENTERS, 6" SHOTCRETE THICKNESS.
3. SOIL NAILS - NO. 8 WILLIAMS THREADBAR, FULLY GROUTED AND CENTRALI□ED, 15-DEG. INCLINATION FROM HORI□ONTAL, 5X5□STAGGERED PATTERN FIRST ROW OF NAILS 1-FT. BELOW BROW, SEE DETAIL C-06.

AECOM

PROJECT

PHASE II VERTICAL INTAKE STRUCTURE

CLIENT

Climax Molybdenum
A Freeport-McMoRan Company

CONSULTANT

AECOM
804 COLORADO AVE.
Suite 201
GLENWOOD SPRINGS, CO. 81601

□□□.aecom.com

CONSULTANTS

REGISTRATION

COLORADO LICENSED JOHN SIKORA 30358 PROFESSIONAL ENGINEER

□E□ PLAN

PROJECT NUMBER

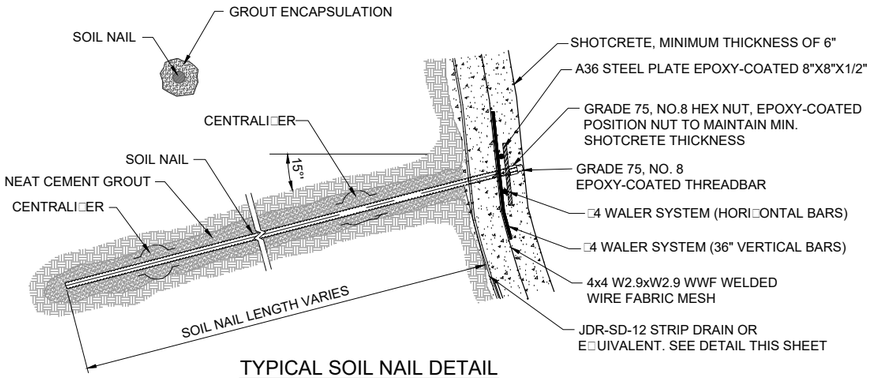
60591226

SHEET TITLE

STABILI□ATION AND FOUNDATION EXCAVATION

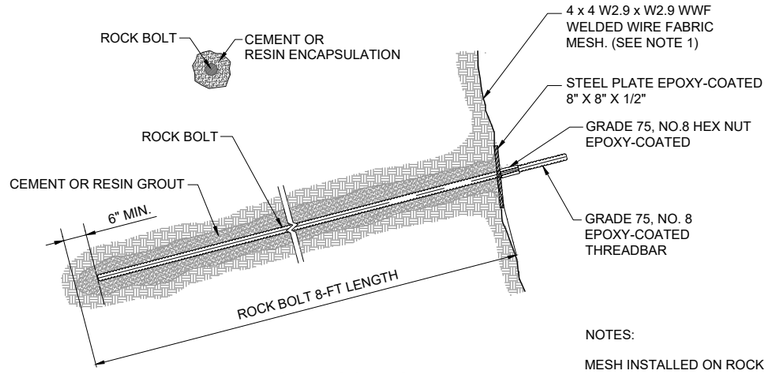
SHEET

C-06



TYPICAL SOIL NAIL DETAIL

NOT TO SCALE

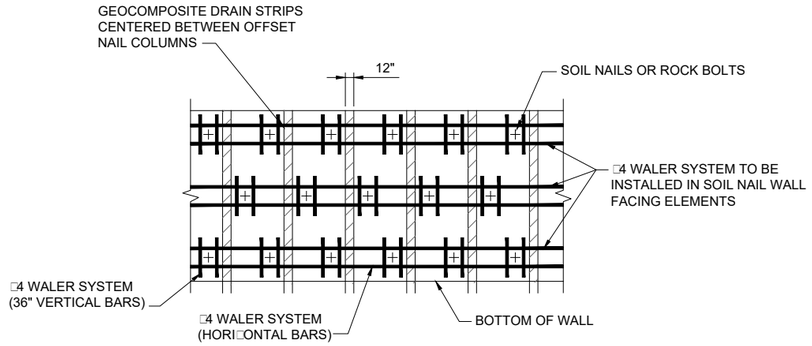


TYPICAL ROCK BOLT DETAIL

NOT TO SCALE

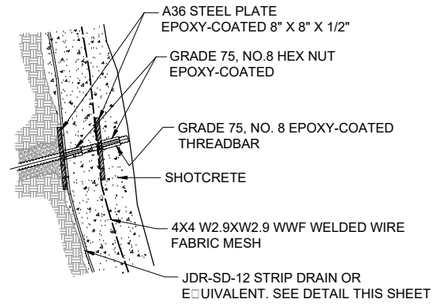
NOTES:

MESH INSTALLED ON ROCK CUT OF INLET PORTAL AS DIRECTED BY ENGINEER.



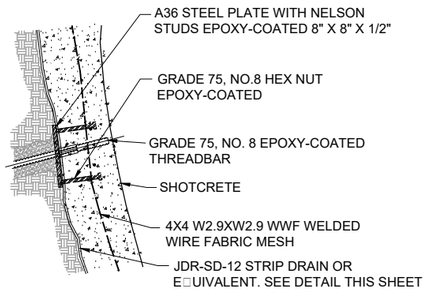
GEOCOMPOSITE STRIP DRAINAGE DETAIL

SOIL NAIL WALL, TUNNEL LINER AND ROCK SLOPE STABILI□ATION
NOT TO SCALE



TYPICAL ROCK BOLT/SHOTCRETE ANCHORAGE DETAIL

OPTION A - DOUBLE NUT □ PLATE
NOT TO SCALE



TYPICAL ROCK BOLT/SHOTCRETE ANCHORAGE DETAIL

OPTION B - NELSON STUD PLATES
NOT TO SCALE

VERIFICATION TEST SCHEDULE

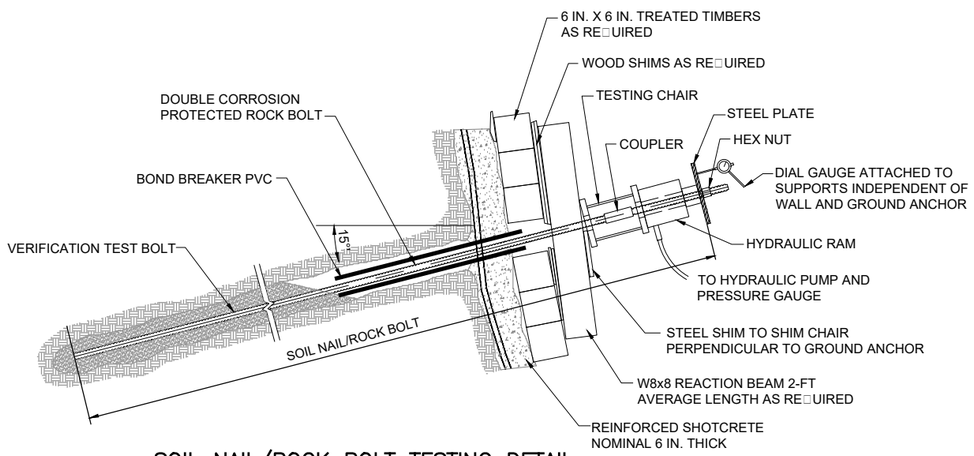
Load	Hold Time
AL(.05 DL max)	1 Minute
0.25DL	10 Minute
0.50DL	10 Minute
0.75DL	10 Minute
1.00DL	10 Minute
1.25DL	10 Minute
1.50DL (creep test)	60 Minute
1.75DL	10 Minute
2.00DL (max. test load)	10 Minute

AL - alignment load
DL - ground nail design load

PROOF TEST SCHEDULE

Load	Hold Time
AL(.05 DL max)	Until Stable
0.25DL	Until Stable
0.50DL	Until Stable
0.75DL	Until Stable
1.00DL	Until Stable
1.25DL	Until Stable
1.33DL(max. test load)	10 Minute

AL - alignment load
DL - ground nail design load



SOIL NAIL/ROCK BOLT TESTING DETAIL

NOT TO SCALE

AECOM

PROJECT

PHASE II VERTICAL INTAKE STRUCTURE

CLIENT

Climax Molybdenum
A Freeport-McMoRan Company

CONSULTANT

AECOM
804 COLORADO AVE.
Suite 201
GLENWOOD SPRINGS, CO. 81601

□□□.aecom.com

CONSULTANTS

REGISTRATION

COLORADO LICENSED
JOHN S FIORE
30358
PROFESSIONAL ENGINEER

□E□ PLAN

PROJECT NUMBER

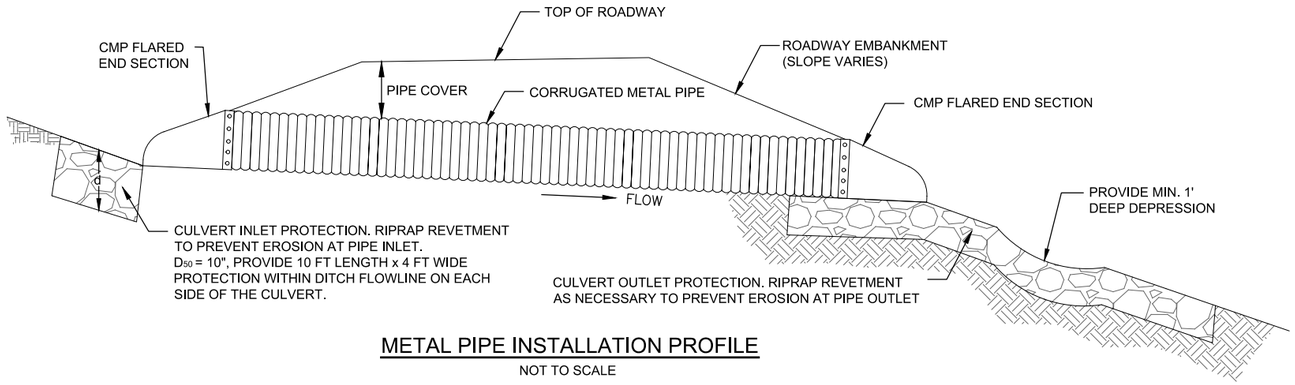
60591226

SHEET TITLE

SIDE HILL INTAKE SOIL STABILI□ATION DETAILS

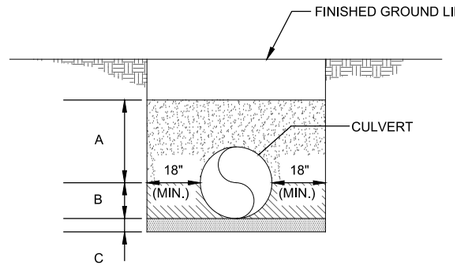
SHEET NUMBER

C-07



METAL PIPE INSTALLATION PROFILE

NOT TO SCALE



A = ON SITE STRUCTURAL BACKFILL, PLACED TO AT LEAST 12 INCHES ABOVE TOP OF PIPE.

B = COMPACTED STRUCTURAL BACK FILL PLACED TO AT LEAST THE CULVERT SPRING LINE

C = 3 INCHES (IN SOIL) OR 12 INCHES (IN ROCK) BELOW THE BOTTOM OF THE PIPE OF LOOSE STRUCTURAL BACK FILL.

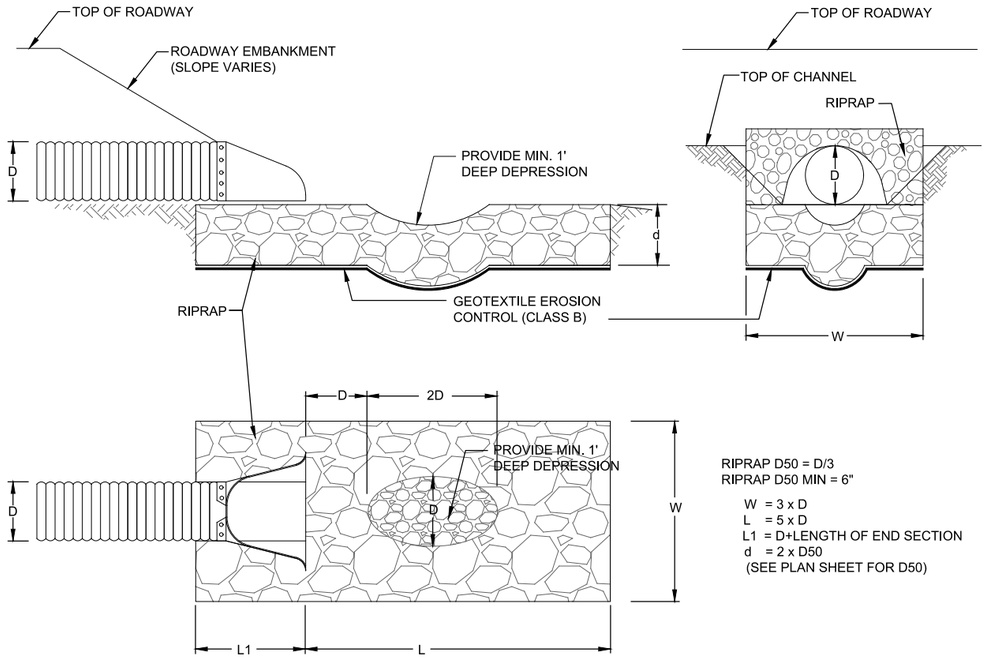
PIPE TRENCHING DETAIL

NOT TO SCALE

RIP-RAP APRON SIZING DIMENSIONS - INLET AND OUTLET							
PIPE DIA. (ID)	RIP-RAP D50 (D/3)	END SECTION LENGTH	L1	LENGTH (L)	WIDTH (W)	d (2 x D50)	DEPRESSION DIM.
18"	8"	32"	98"	120"	72"	16"	24"x48"x12"
24"	8"	36"	102"	120"	72"	16"	24"x48"x12"
30"	10"	58"	126"	150"	90"	20"	30"x60"x12"
36"	12"	58"	132"	180"	108"	24"	36"x72"x12"

CONSTRUCTION SPECIFICATIONS:

1. CULVERT PIPE SIZING VARIES, SEE PLANS FOR LENGTH AND DIAMETER.
2. PIPE SLOPE: MINIMUM SLOPE => 0.5%, MAXIMUM SLOPE => 10%.
3. MINIMUM PIPE COVER IS TWO FEET. MAXIMUM PIPE COVER IS FIFTEEN FEET OR MANUFACTURER'S RECOMMENDED VALUES.
4. STRUCTURE BACKFILL SHALL BE COMPOSED OF SUITABLE MATERIALS DEVELOPED ON THE PROJECT. TO BE SUITABLE FOR USE UNDER THIS CLASSIFICATION, BACKFILL SHALL BE FREE OF FROZEN LUMPS, WOOD, OR OTHER ORGANIC MATERIAL. IF THE MATERIAL CONTAINS ROCK FRAGMENTS THAT, IN THE OPINION OF THE ENGINEER, WILL BE INJURIOUS TO THE STRUCTURE, THE NATIVE MATERIAL SHALL NOT BE USED FOR BACKFILLING AND IMPORTED STRUCTURE BACKFILL SHALL BE USED.
5. CONNECT END SECTION TO PIPE AS RECOMMENDED BY THE MANUFACTURER.



RIPRAP D50 = D/3
RIPRAP D50 MIN = 6"

W = 3 x D
L = 5 x D
L1 = D+LENGTH OF END SECTION
d = 2 x D50
(SEE PLAN SHEET FOR D50)

CULVERT OUTLET PROTECTION DETAIL

NOT TO SCALE

AECOM

PROJECT

PHASE II VERTICAL INTAKE STRUCTURE

CLIENT

Climax Molybdenum
A Freeport-McMoRan Company

CONSULTANT

AECOM
804 COLORADO AVE.
Suite 201
GLENWOOD SPRINGS, CO. 81601

□□□.aecom.com

CONSULTANTS

REGISTRATION

COLORADO LICENSED
JOHN SIKORA
30358
PROFESSIONAL ENGINEER

□E□ PLAN

PROJECT NUMBER

60591226

SHEET TITLE

DRAINAGE DETAILS

SHEET NUMBER

C-08

AECOM
6200 S Quebec St
Greenwood Village, CO 80111
www.aecom.com

303-694 2770 tel
303 694 3946 fax

April 18, 2019

Ms. Diana Kelts
Climax Molybdenum Company- Climax Mine
Highway 91 – Fremont Pass
Climax, CO 80429

Subject: REV 0 – Mayflower Tailings Storage Facility Leadoff Clarification, Climax Mine, Permit No. M-1977-493

Dear Ms. Kelts:

AECOM, through its legacy company URS Corporation, serves as the Engineer of Record (EOR) for the Mayflower Tailings Storage Facility (TSF) at the Climax Mine, located near Fremont Pass Colorado. It is our understanding that DRMS has requested clarification on the number of leadoffs required following a submittal by Climax showing the proposed 5 Dam crest raise configuration prepared by W. W. Wheeler & Associates, Inc. (Wheeler). On this drawing it showed increasing the number of leadoffs from three to four.

Leadoff Clarification

The *Mayflower Tailings Storage Facility and 5 Dam Operations and Maintenance Manual (O&M), Revision 1.1 plan dated May 2014* discusses leadoffs and the use of leadoffs several times throughout the O&M manual. Leadoffs are used for winter deposition to fill in storage created during the summer months. One reference in the O&M manual under Section 4.5.2 discusses and shows in Figure 3-2 three leadoffs for the Mayflower TSF at startup.

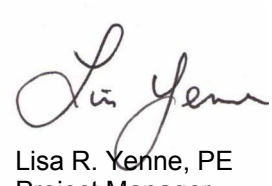
The three leadoffs referenced in the O&M manual depicts conditions at startup and was not meant to imply only three leadoffs should be used throughout the life of the TSF. As the dam is raised, the crest length will continue to increase and the number of leadoffs (plus location) will need to be adjusted to effectively fill the storage developed through the spigot season. The plan developed by Wheeler titled “2019 5 Dam Crest Line Raise, General Arrangement” dated 12/18 has increased the number of leadoffs to four leadoffs in accordance with this approach.

General information and Closing

AECOM represents that our services are performed within the limits prescribed by the Client in a manner consistent with the level and skill ordinarily exercised by other consultants under similar circumstances. No representation to the Client, expressed or implied, and no other warranty or guarantee is included or intended.

Please do not hesitate to call us with any questions or comments.

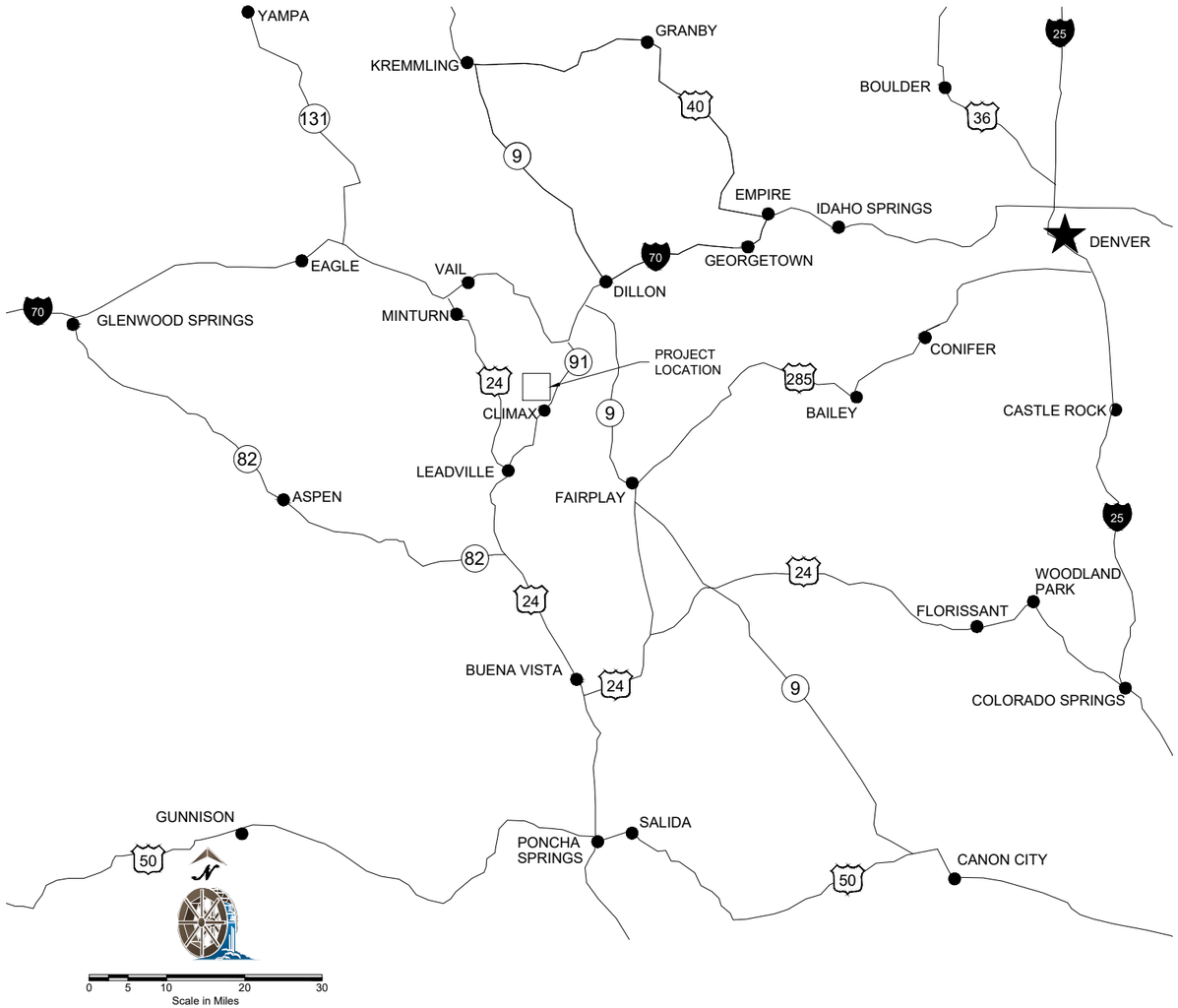
Sincerely,



Lisa R. Yenne, PE
Project Manager

Richard R. Davidson, PE
Senior Principal Engineer

INTERCEPTOR REHABILITATION PROJECT
WEST INTERCEPTOR CULVERT REPLACEMENT (PHASE D)
DOWNSTREAM OF SEARLE GULCH
CLIMAX MINE
CLIMAX, CO



DRAWING INDEX	
DRAWING NO.	DRAWING TITLE
GENERAL	
3-520-00401	COVER SHEET, DRAWING INDEX, AND LOCATION MAP
3-520-00402	WEST INTERCEPTOR - GENERAL ARRANGEMENT - SITE PLAN
CIVIL	
3-520-00403	CHDPE CULVERT - PLAN & PROFILE - STA. 160+00 TO 169+00
3-520-00404	CHDPE CULVERT - PLAN & PROFILE - STA. 169+00 TO 178+00
3-520-00405	CHDPE CULVERT - PLAN & PROFILE - STA. 178+00 TO 187+00
3-520-00406	CHDPE CULVERT - PLAN & PROFILE - STA. 187+00 TO 196+00
3-520-00407	CHDPE CULVERT - PLAN & PROFILE - STA. 196+00 TO END
3-520-00408	CULVERT TRENCH & SEEPAGE BARRIER - PLANS, SECTIONS, & DETAILS
3-520-00409	CULVERT INLET STRUCTURE - CIVIL PLANS, SECTIONS, & DETAILS
3-520-00410	TRANSITION STRUCTURE - CIVIL PLANS, SECTIONS, & DETAILS
3-520-00411	DRAINAGE INLETS & GABIONS - TYPICAL PLAN, SECTIONS, & DETAIL
STRUCTURAL	
3-520-00412	CULVERT DRAINAGE INLETS - STRUCTURAL PLAN, SECTIONS, & DETAILS
3-520-00413	CULVERT INLET STRUCTURE - STRUCTURAL PLANS, SECTIONS, & DETAILS
3-520-00414	TRANSITION STRUCTURE - STRUCTURAL PLANS, SECTIONS, & DETAILS
3-520-00415	TRANSITION STEEL REDUCER DETAILS
3-520-00416	MISCELLANEOUS STRUCTURAL DETAILS

COLORADO LICENSED
STEVEN M. MALY
29123
PROFESSIONAL ENGINEER

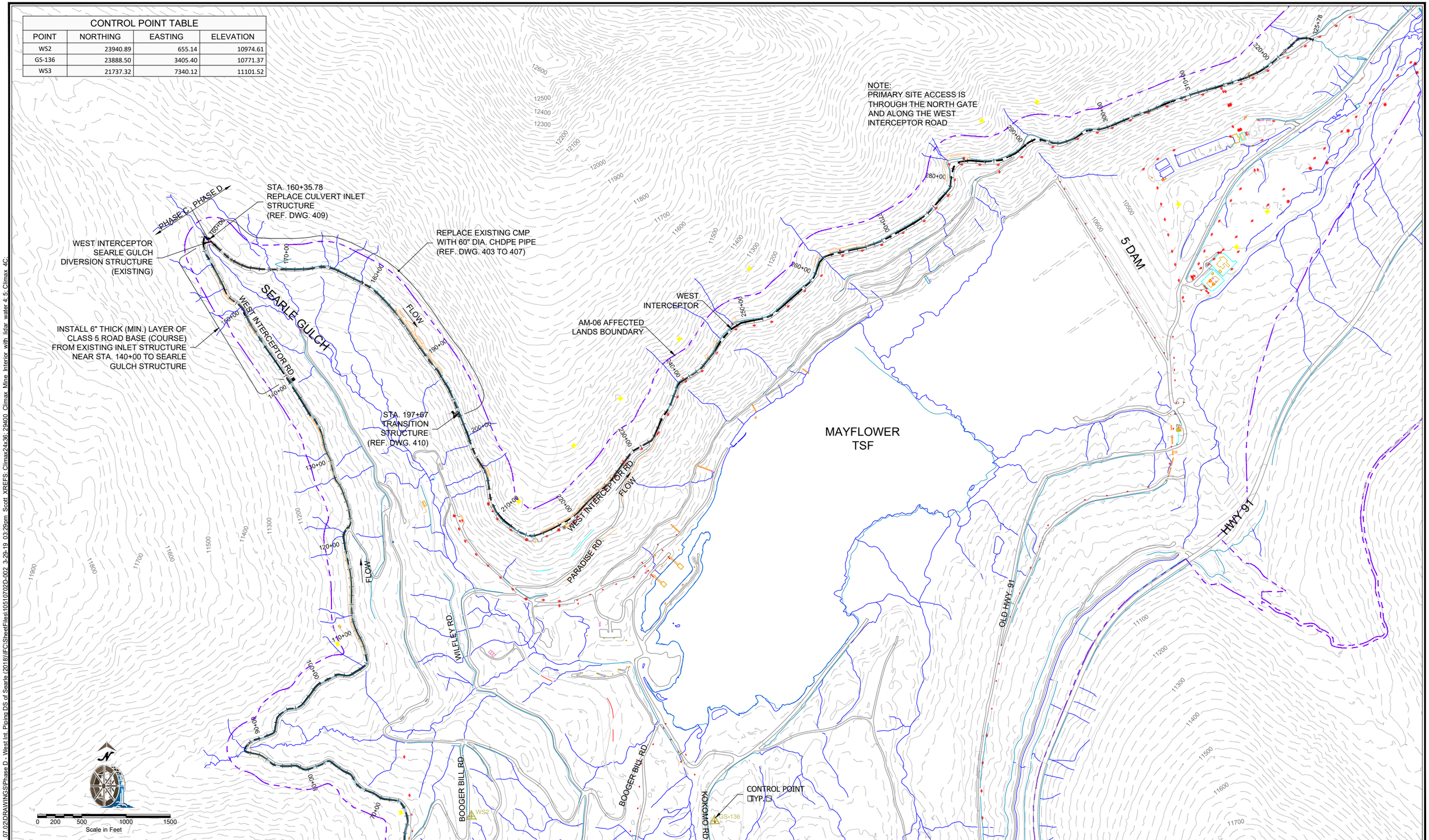
REVISIONS NO.	DATE	MADE BY	CKD. BY	REMARKS
2	05/18	TEM	SMM	ISSUED FOR BID
1	03/19	DCM	SMM	ISSUED FOR CONSTRUCTION

REFERENCE DWGS DRAWING NO.	REFERENCE

Climax Molybdenum
A Freeport-McMoRan Company
W. W. WHEELER & ASSOCIATES, INC
Water Resources Engineers
3700 S. Inca Street
Englewood, CO 80110-3405
303-761-4130
FAX 303-761-2802

INTERCEPTOR REHABILITATION PROJECT	Climax Molybdenum Climax Mine, Climax, CO		
WEST INTERCEPTOR CULVERT REPLACEMENT (PHASE D)	MADE BY: DCM	9/1/16	SCALE: As Noted
COVER SHEET	CHECKED BY: SMM	12/16/16	DRAWING NO.
DRAWING INDEX, LOCATION MAP	ACCEPTED BY: ...		3-520-00401 1

CONTROL POINT TABLE			
POINT	NORTHING	EASTING	ELEVATION
WS2	23940.89	655.14	10974.61
GS-136	23888.50	3405.40	10771.37
WS3	21737.32	7340.12	11101.52



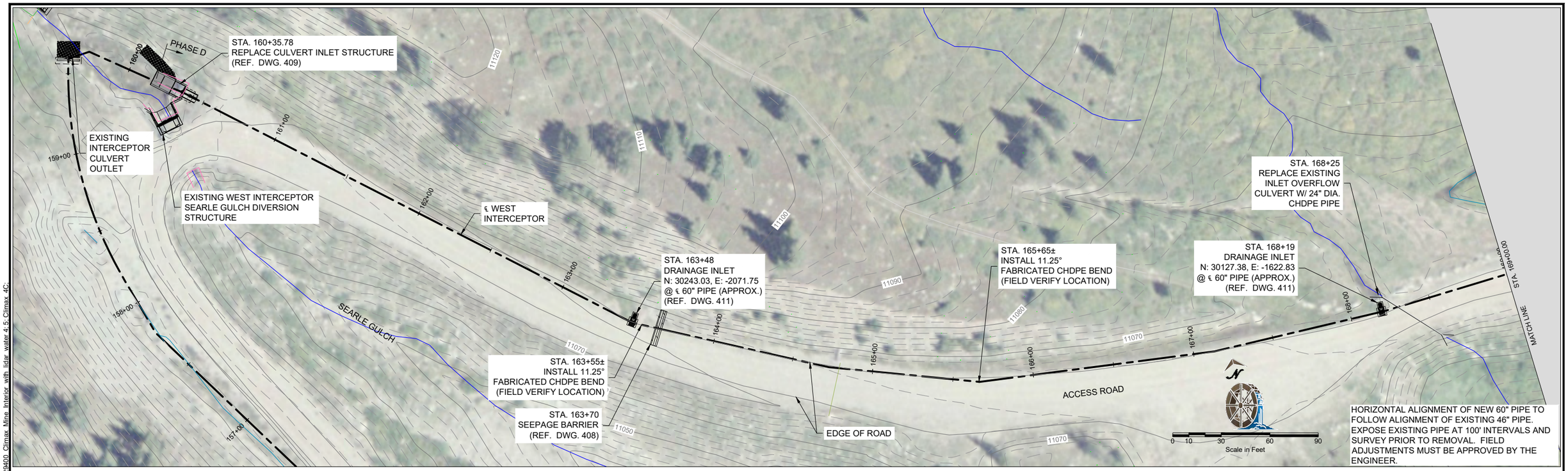
REVISIONS	NO.	DATE	MADE BY	CKD. BY	REMARKS
	1	05/18	TEM	SMM	ISSUED FOR BID
	2	03/19	DCM	SMM	ISSUED FOR CONSTRUCTION
	3				
	4				
	5				
	6				
	7				

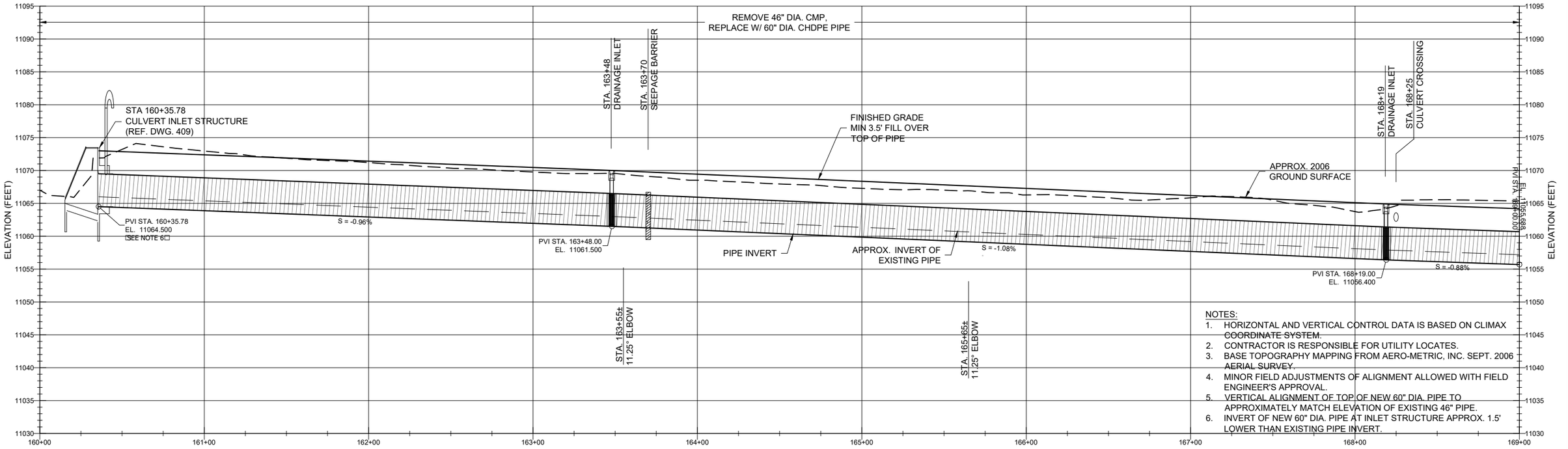
REFERENCE DWGS	DRAWING NO.	REFERENCE

Climax Molybdenum
A Freeport-McMoRan Company

W. W. WHEELER & ASSOCIATES, INC
Water Resources Engineers
3700 S. Inca Street
Englewood, CO 80110-3405
303-761-4130
Fax 303-761-2802

INTERCEPTOR REHABILITATION PROJECT	Climax Molybdenum Climax Mine, Climax, CO		
WEST INTERCEPTOR CULVERT REPLACEMENT (PHASE D)	MADE BY DCM	9/1/16	SCALE As Noted
GENERAL ARRANGEMENT	CHECKED BY SMM	12/1/16	DRAWING NO. 3-520-00402 1
SITE PLAN	ACCEPTED BY ...		





REVISIONS	NO.	DATE	MADE BY	CKD. BY	REMARKS
	1	05/18	TEM	SMM	ISSUED FOR BID
	2	03/19	DCM	SMM	ISSUED FOR CONSTRUCTION
	3				
	4				
	5				
	6				
	7				

REFERENCE DWGS	DRAWING NO.	REFERENCE

Climax Molybdenum
A Freeport-McMoRan Company

W. W. WHEELER & ASSOCIATES, INC
Water Resources Engineers
3700 S. Inca Street
Englewood, CO 80110-3405
303-761-4130
FAX 303-761-2802

INTERCEPTOR REHABILITATION PROJECT

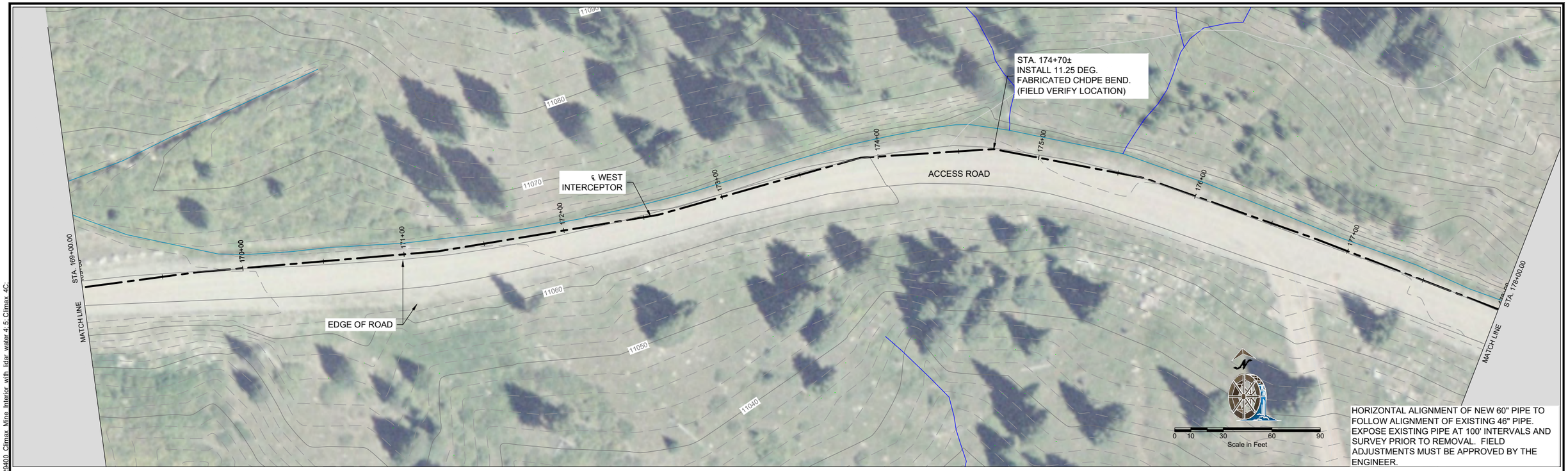
WEST INTERCEPTOR CULVERT REPLACEMENT (PHASE D)

PLAN AND PROFILE

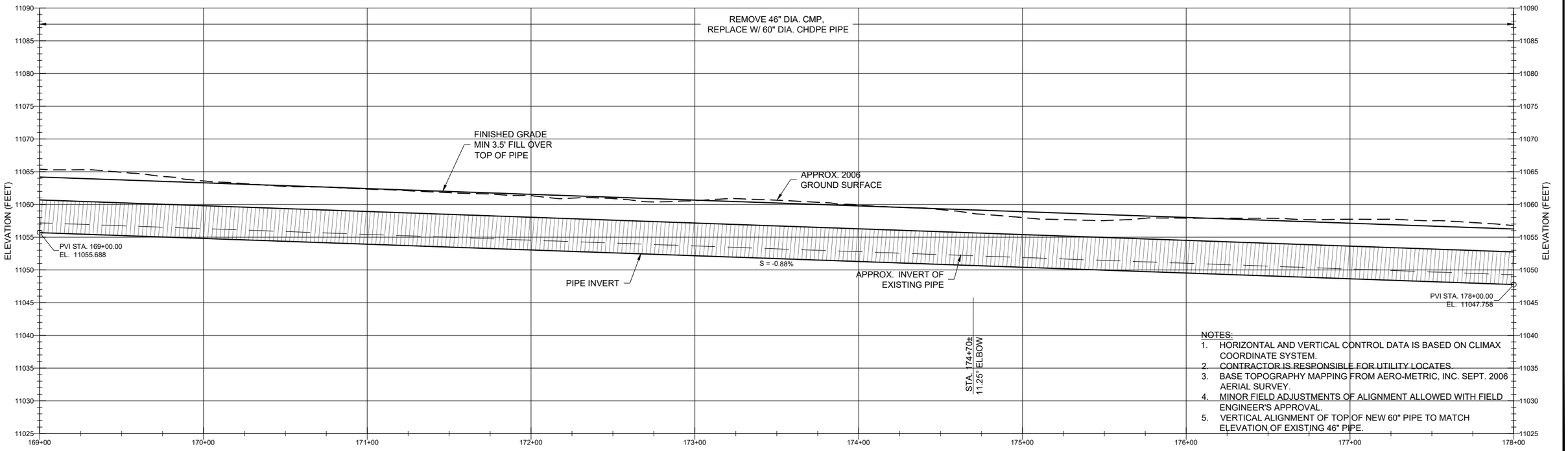
STA. 160+00 TO 169+00

Climax Molybdenum Climax Mine
Climax, CO

MADE BY	CHECKED BY	ACCEPTED BY	SCALE	DRAWING NO.
DCM	SMM	...	As Noted	3-520-00403 1
9/1/16	12/1/16			



HORIZONTAL ALIGNMENT OF NEW 60" PIPE TO FOLLOW ALIGNMENT OF EXISTING 46" PIPE. EXPOSE EXISTING PIPE AT 100' INTERVALS AND SURVEY PRIOR TO REMOVAL. FIELD ADJUSTMENTS MUST BE APPROVED BY THE ENGINEER.



NOTES:
1. HORIZONTAL AND VERTICAL CONTROL DATA IS BASED ON CLIMAX COORDINATE SYSTEM.
2. CONTRACTOR IS RESPONSIBLE FOR UTILITY LOCATES.
3. BASE TOPOGRAPHY MAPPING FROM AERO-METRIC, INC. SEPT. 2006 AERIAL SURVEY.
4. MINOR FIELD ADJUSTMENTS OF ALIGNMENT ALLOWED WITH FIELD ENGINEER'S APPROVAL.
5. VERTICAL ALIGNMENT OF TOP OF NEW 60" PIPE TO MATCH ELEVATION OF EXISTING 46" PIPE.

REVISIONS

NO.	DATE	MADE BY	CKD. BY	REMARKS
1	05/18	TEM	SMM	ISSUED FOR BID
2	03/19	DCM	SMM	ISSUED FOR CONSTRUCTION
3				
4				
5				
6				
7				

REFERENCE DWGS

DRAWING NO.	REFERENCE

Climax Molybdenum
A Freeport-McMoRan Company

W. W. WHEELER & ASSOCIATES, INC
Water Resources Engineers
3700 S. Inca Street
Englewood, CO 80110-3405
303-761-4130
FAX 303-761-2802

INTERCEPTOR REHABILITATION PROJECT

WEST INTERCEPTOR CULVERT REPLACEMENT (PHASE D)

PLAN AND PROFILE

STA. 169+00 TO 178+00

Climax Molybdenum Climax Mine
Climax, CO

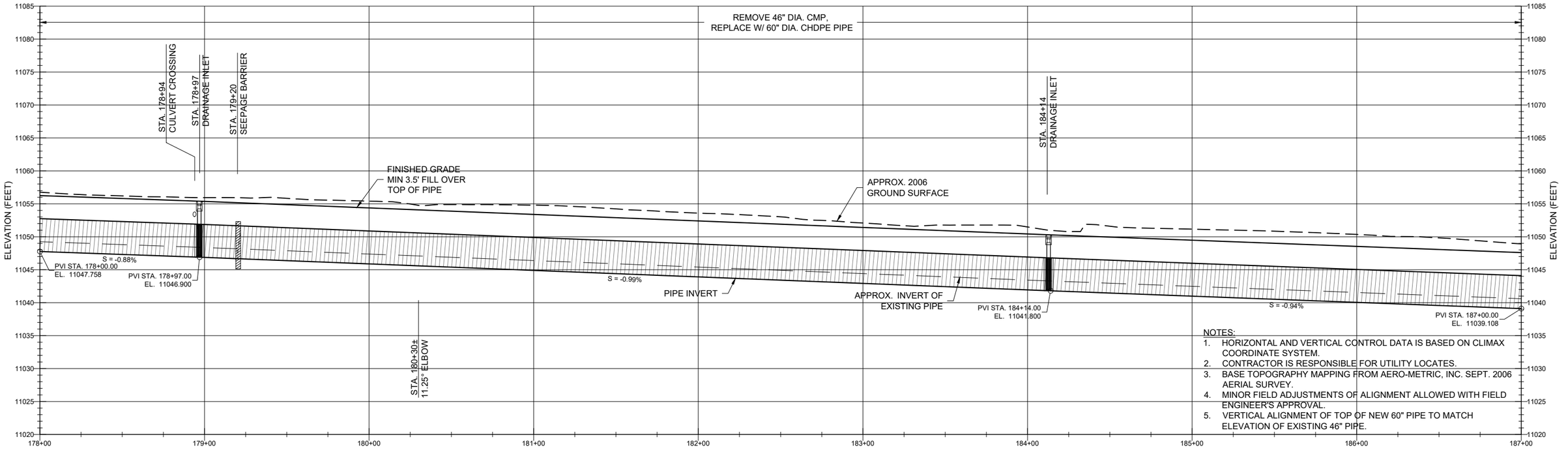
MADE BY	CHECKED BY	ACCEPTED BY
DCM	SMM	...

9/1/16

12/1/16

SCALE: As Noted

DRAWING NO. 3-520-00404 1



NOTES:
1. HORIZONTAL AND VERTICAL CONTROL DATA IS BASED ON CLIMAX COORDINATE SYSTEM.
2. CONTRACTOR IS RESPONSIBLE FOR UTILITY LOCATES.
3. BASE TOPOGRAPHY MAPPING FROM AERO-METRIC, INC. SEPT. 2006 AERIAL SURVEY.
4. MINOR FIELD ADJUSTMENTS OF ALIGNMENT ALLOWED WITH FIELD ENGINEER'S APPROVAL.
5. VERTICAL ALIGNMENT OF TOP OF NEW 60" PIPE TO MATCH ELEVATION OF EXISTING 46" PIPE.

REVISIONS

NO.	DATE	MADE BY	CKD. BY	REMARKS
1	05/18	TEM	SMM	ISSUED FOR BID
2	03/19	DCM	SMM	ISSUED FOR CONSTRUCTION
3				
4				
5				
6				
7				

REFERENCE DWGS

DRAWING NO.	REFERENCE

Climax Molybdenum
A Freeport-McMoRan Company

W. W. WHEELER & ASSOCIATES, INC
Water Resources Engineers
3700 S. Inca Street
Englewood, CO 80110-3405
303-761-4130
Fax 303-761-2802

INTERCEPTOR REHABILITATION PROJECT

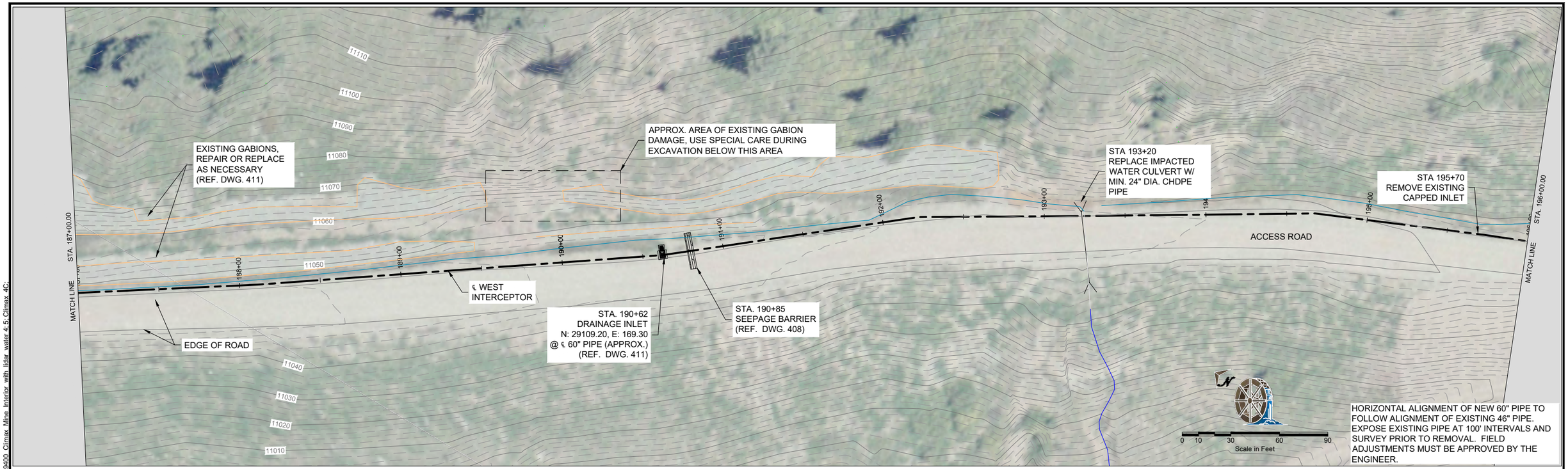
WEST INTERCEPTOR CULVERT REPLACEMENT (PHASE D)

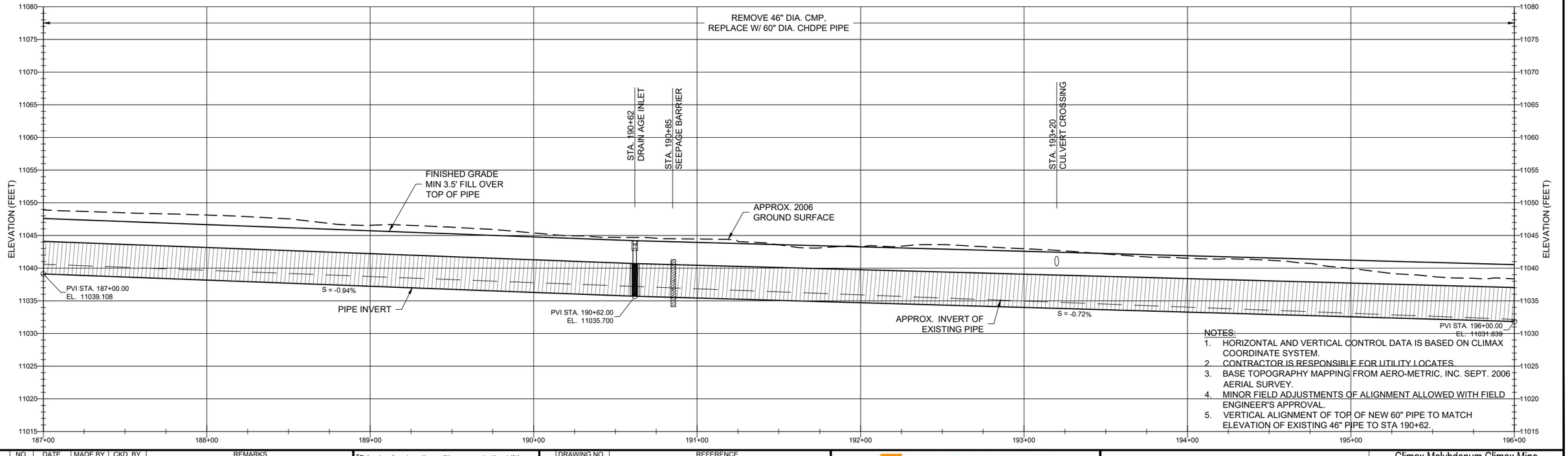
PLAN AND PROFILE

STA. 178+00 TO 187+00

Climax Molybdenum Climax Mine
Climax, CO

MADE BY		SCALE
DCM	9/1/16	As Noted
CHECKED BY	12/1/16	DRAWING NO.
SMM		3-520-00405 1
ACCEPTED BY		
...		





NOTES:
1. HORIZONTAL AND VERTICAL CONTROL DATA IS BASED ON CLIMAX COORDINATE SYSTEM.
2. CONTRACTOR IS RESPONSIBLE FOR UTILITY LOCATES.
3. BASE TOPOGRAPHY MAPPING FROM AERO-METRIC, INC. SEPT. 2006 AERIAL SURVEY.
4. MINOR FIELD ADJUSTMENTS OF ALIGNMENT ALLOWED WITH FIELD ENGINEER'S APPROVAL.
5. VERTICAL ALIGNMENT OF TOP OF NEW 60" PIPE TO MATCH ELEVATION OF EXISTING 46" PIPE TO STA 190+62.

REVISIONS

NO.	DATE	MADE BY	CKD. BY	REMARKS
2	05/18	TEM	SMM	ISSUED FOR BID
1	03/19	DCM	SMM	ISSUED FOR CONSTRUCTION

REFERENCE DWGS

DRAWING NO.	REFERENCE

Climax Molybdenum
A Freeport-McMoRan Company

W. W. WHEELER & ASSOCIATES, INC
Water Resources Engineers
3700 S. Inca Street
Englewood, CO 80110-3405
303-761-4130
FAX 303-761-2802

INTERCEPTOR REHABILITATION PROJECT

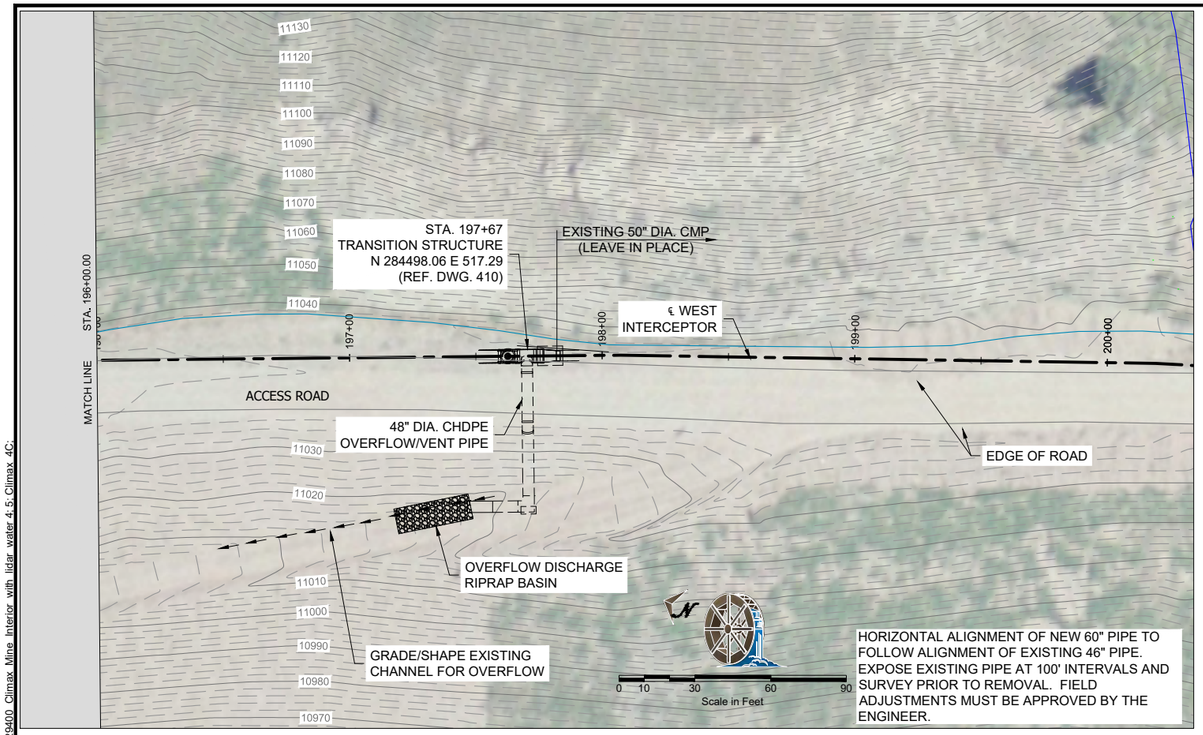
WEST INTERCEPTOR CULVERT REPLACEMENT (PHASE D)

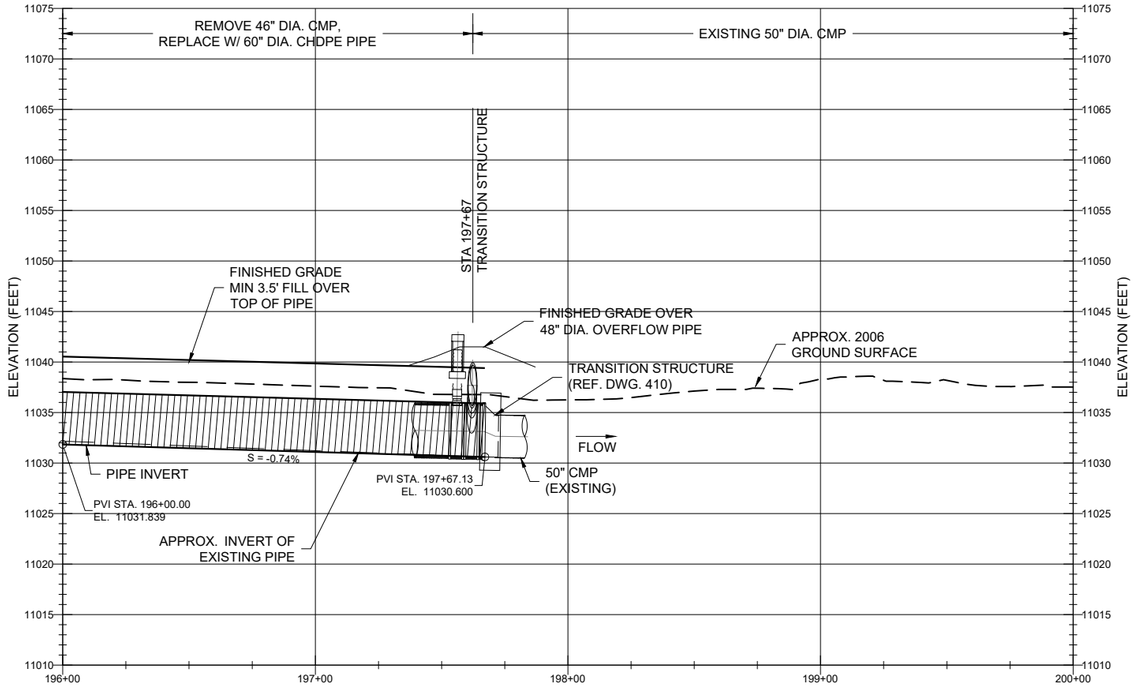
PLAN AND PROFILE

STA. 187+00 TO 196+00

Climax Molybdenum Climax Mine
Climax, CO

MADE BY	DATE	SCALE
DCM	9/1/16	As Noted
CHECKED BY	12/1/16	DRAWING NO.
SMM		3-520-00406
ACCEPTED BY		1
...		





NOTES:
1. HORIZONTAL AND VERTICAL CONTROL DATA IS BASED ON CLIMAX COORDINATE SYSTEM.
2. CONTRACTOR IS RESPONSIBLE FOR UTILITY LOCATES.
3. BASE TOPOGRAPHY MAPPING FROM AERO-METRIC, INC. SEPT. 2006 AERIAL SURVEY.
4. MINOR FIELD ADJUSTMENTS OF ALIGNMENT ALLOWED WITH FIELD ENGINEER'S APPROVAL.
5. VERTICAL ALIGNMENT OF INVERT OF NEW 60" PIPE TO MATCH ELEVATION OF EXISTING 50" PIPE AT TRANSITION.

REVISIONS

NO.	DATE	MADE BY	CKD. BY	REMARKS
2	05/18	TEM	SMM	ISSUED FOR BID
1	03/19	DCM	SMM	ISSUED FOR CONSTRUCTION

REFERENCE DWGS

DRAWING NO.	REFERENCE

Climax Molybdenum
A Freeport-McMoRan Company

W. W. WHEELER & ASSOCIATES, INC
Water Resources Engineers
3700 S. Inca Street
Englewood, CO 80110-3405
303-761-4130
Fax 303-761-2802

INTERCEPTOR REHABILITATION PROJECT

WEST INTERCEPTOR CULVERT REPLACEMENT (PHASE D)

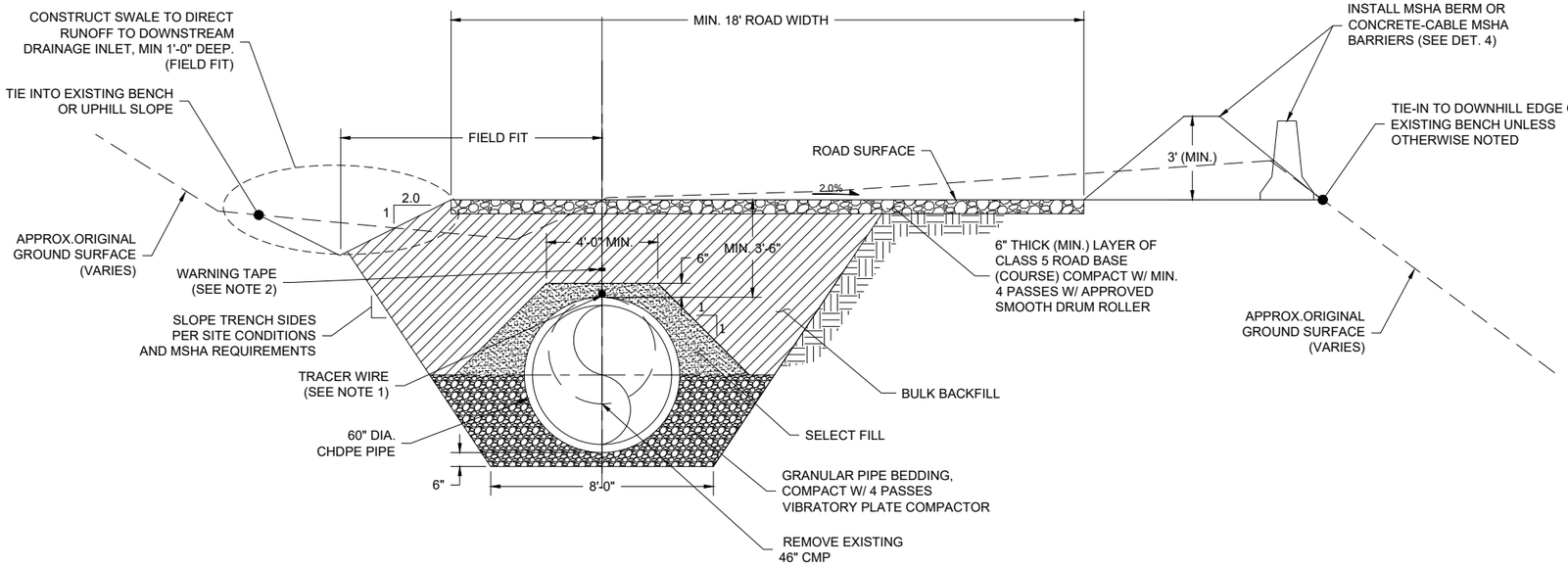
PLAN AND PROFILE

STA. 196+00 TO END

Climax Molybdenum Climax Mine
Climax, CO

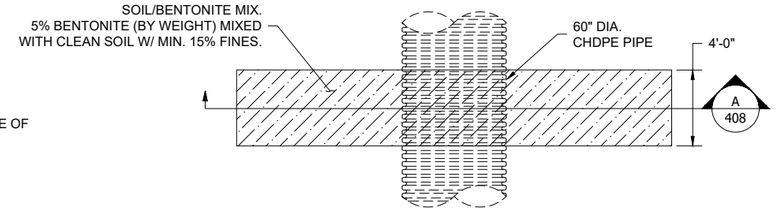
MADE BY	CHECKED BY	ACCEPTED BY	DATE	SCALE
DCM	SMM	...	9/1/16	As Noted

DRAWING NO. 3-520-00407 1



1 CULVERT TRENCH - STA. 160+35 TO 183+90, 192+75 TO END

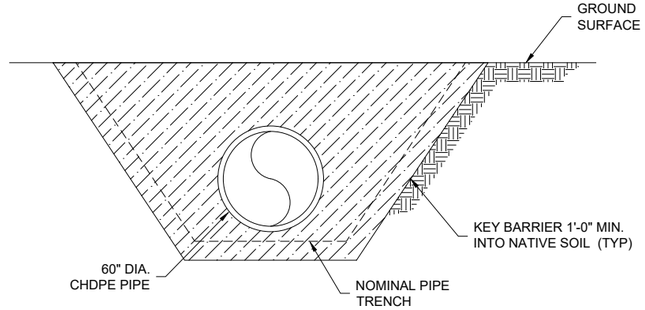
TYPICAL SECTION ☐N.T.S.☐



3 CULVERT SEEPAGE BARRIER

PLAN VIEW

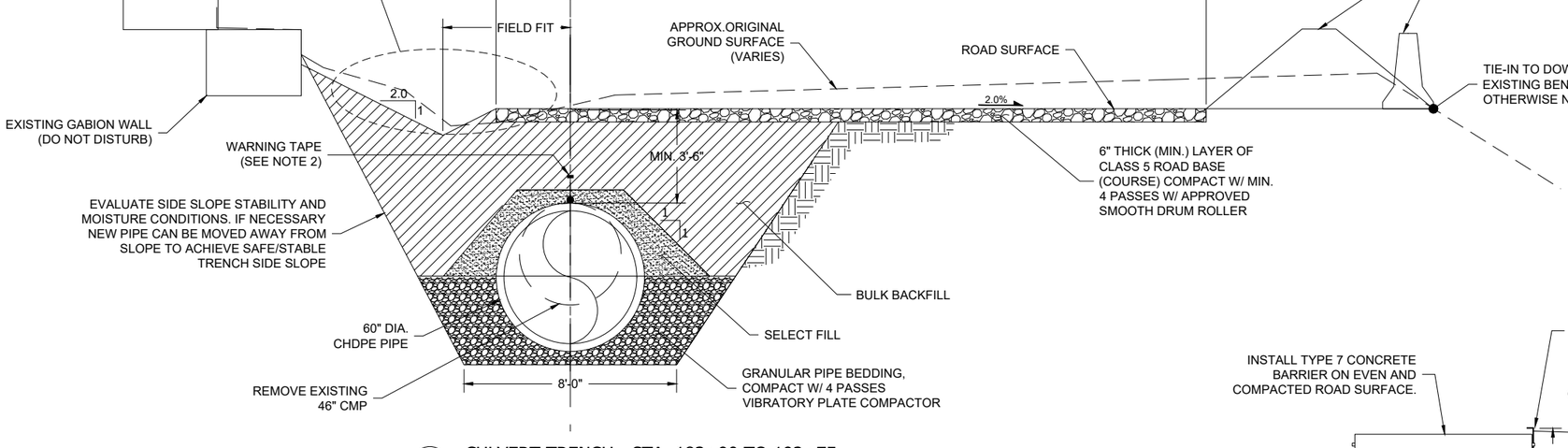
Scale in Feet



CULVERT SEEPAGE BARRIER A 408

SECTION

Scale in Feet

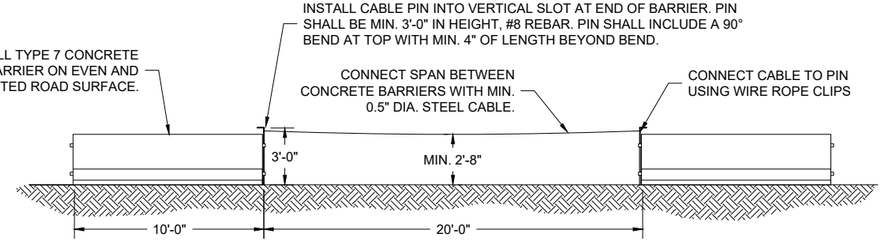


2 CULVERT TRENCH - STA. 183+90 TO 192+75

TYPICAL SECTION ☐N.T.S.☐

NOTES:

1. INSTALL 12 GAGE LOCATING (TRACER) WIRE ON TOP OF ALL CHDPE PIPE. DAYLIGHT MIN. 6' AT EACH END AND AT EACH INLET.
2. INSTALL WARNING TAPE ABOVE PIPE, 12" BELOW GROUND SURFACE.
3. BED PIPE PER PROJECT SPECIFICATION 2330: EARTHWORK.
4. ACCESS ROAD POSITION RELATIVE TO THE CULVERT VARIES WITH STATION. ACCESS ROAD MUST REMAIN OUTSIDE OF THE MIN. LIMITS OF FINISH GRADE AROUND PIPE.



4 TYPICAL CONCRETE-CABLE MSHA BARRIER

SECTION ☐N.T.S.☐

R:\10001\10511\051\07\02\DRAWINGS\Phase D - West Int. Piping DS of Searle (2016)\IFC\SheetFiles\10510702D-003_3-29-19 03:35pm Scott XREFS: Climax24x36 2016 July 20 053, SEARLE, Climax 4C.

REVISIONS

NO.	DATE	MADE BY	CKD. BY	REMARKS
2	05/18	TEM	SMM	ISSUED FOR BID
1	03/19	DCM	SMM	ISSUED FOR CONSTRUCTION

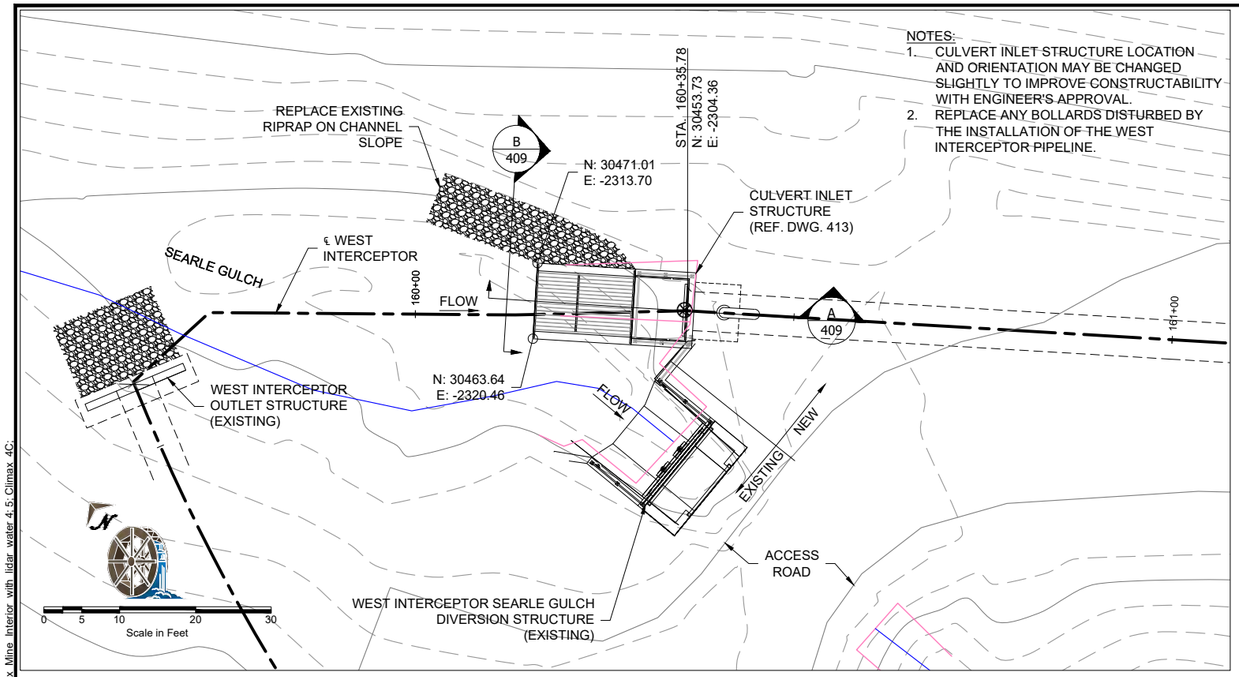
REFERENCE DWGS

DRAWING NO.	REFERENCE

Climax Molybdenum
A Freeport-McMoRan Company

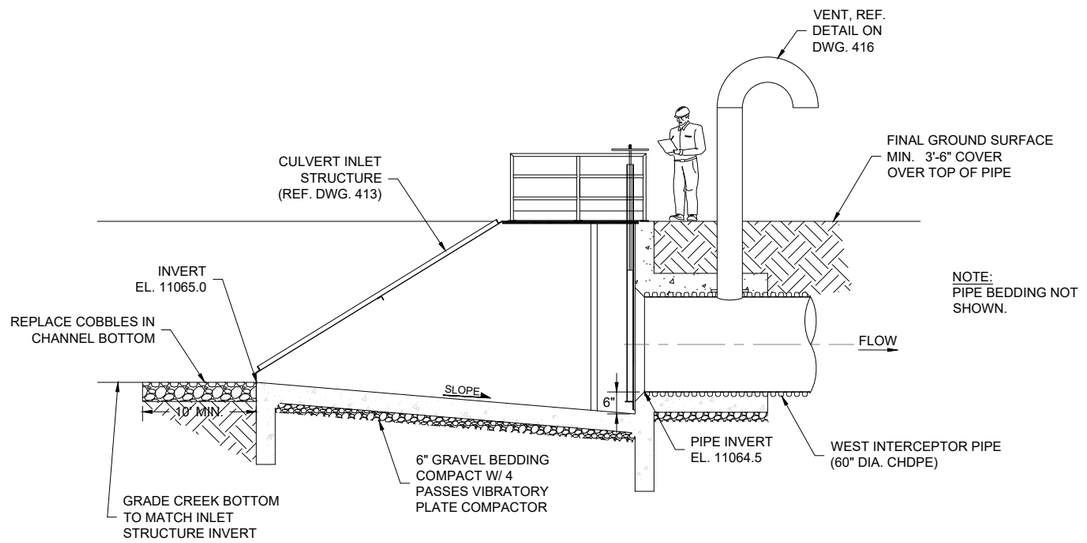
W. W. WHEELER & ASSOCIATES, INC
Water Resources Engineers
3700 S. Inca Street
Englewood, CO 80110-3405
303-761-4130
FAX 303-761-2802

INTERCEPTOR REHABILITATION PROJECT	Climax Molybdenum Climax Mine, Climax, CO		
WEST INTERCEPTOR CULVERT REPLACEMENT (PHASE D)	MADE BY DCM	9/1/16	SCALE As Noted
CULVERT TRENCH AND SEEPAGE BARRIER	CHECKED BY SMM	12/1/16	DRAWING NO. 3-520-00408 1
CIVIL PLANS, SECTIONS, AND DETAILS	ACCEPTED BY ...		



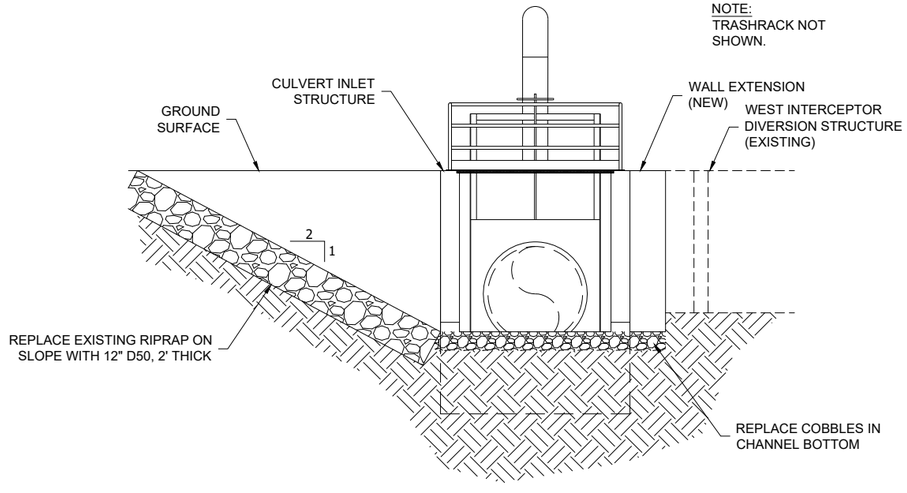
1 CULVERT INLET STRUCTURE
PLAN VIEW

0 5 10 20 30
Scale in Feet



CULVERT INLET STRUCTURE
SECTION A 409

0 2 4 8 12
Scale in Feet



CULVERT INLET STRUCTURE
SECTION B 409

0 2 4 8 12
Scale in Feet

REVISIONS	NO.	DATE	MADE BY	CKD. BY	REMARKS
	2	05/18	TEM	SMM	ISSUED FOR BID
	1	03/19	DCM	SMM	ISSUED FOR CONSTRUCTION

REFERENCE DWGS	DRAWING NO.	REFERENCE

Climax Molybdenum
A Freeport-McMoRan Company

W. W. WHEELER & ASSOCIATES, INC
Water Resources Engineers
3700 S. Inca Street
Englewood, CO 80110-3405
303-761-4130
FAX 303-761-2802

INTERCEPTOR REHABILITATION PROJECT

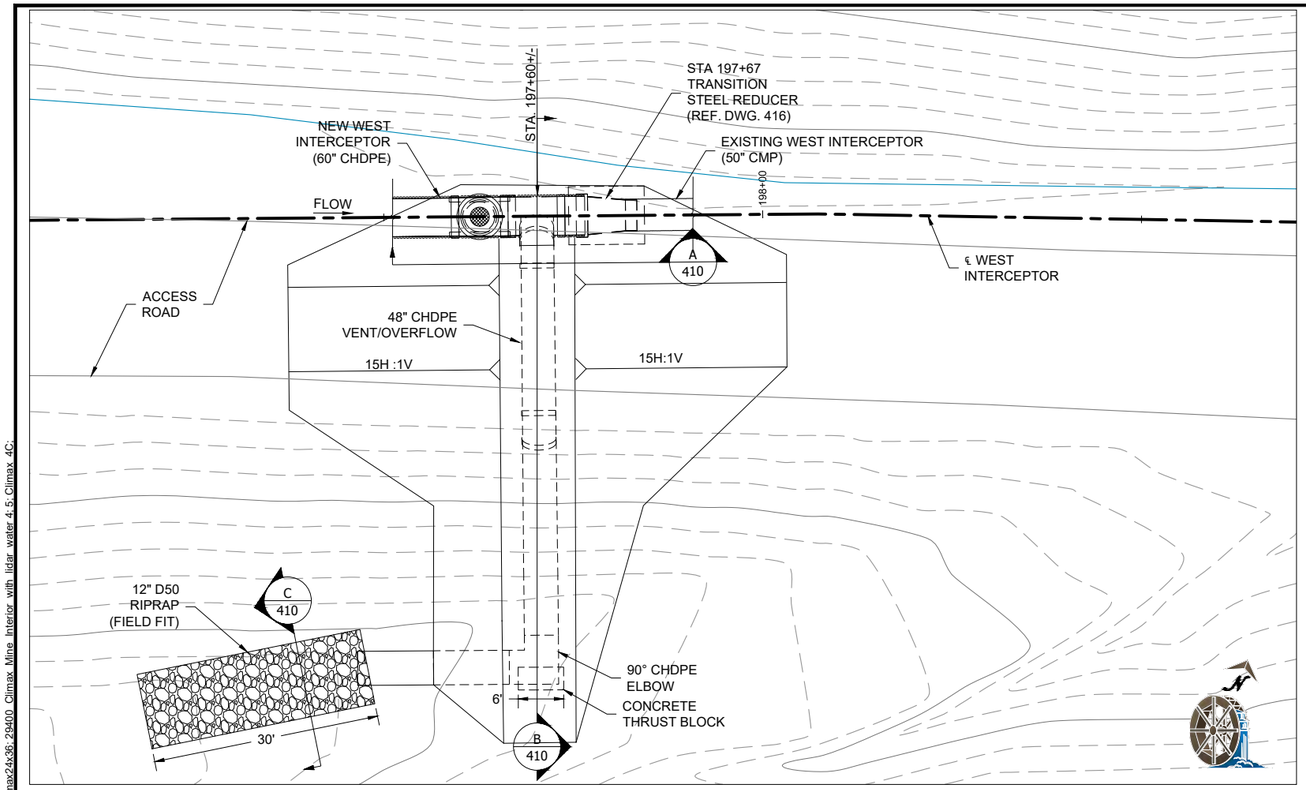
WEST INTERCEPTOR CULVERT REPLACEMENT (PHASE D)

CULVERT INLET STRUCTURE

CIVIL PLANS, SECTIONS, AND DETAILS

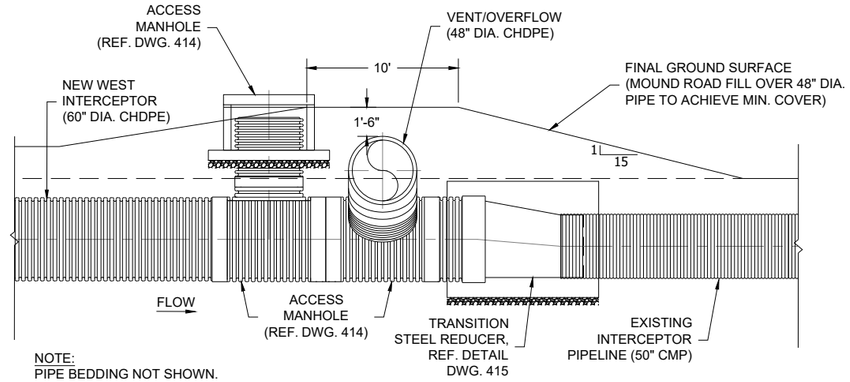
Climax Molybdenum Climax Mine
Climax, CO

MADE BY	CHECKED BY	ACCEPTED BY	DATE	SCALE
DCM	SMM	...	9/1/16	As Noted
			12/1/16	DRAWING NO. 3-520-00409 1



1 TRANSITION STRUCTURE
PLAN VIEW

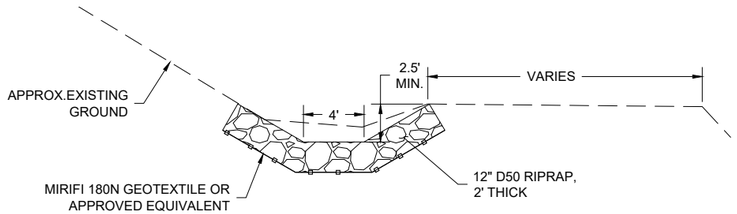
0 5 10 20 30
Scale in Feet



NOTE:
PIPE BEDDING NOT SHOWN.

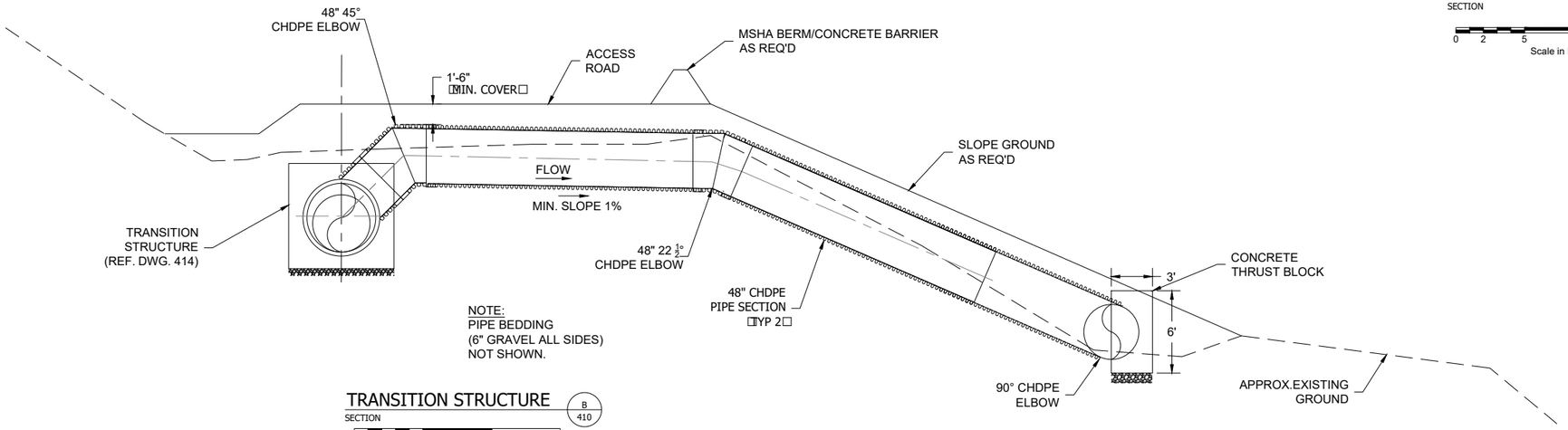
TRANSITION STRUCTURE
SECTION — A 410

0 2 5 10 15
Scale in Feet



OVERFLOW OUTFALL
SECTION — C 410

0 2 5 10 15
Scale in Feet



NOTE:
PIPE BEDDING
(6" GRAVEL ALL SIDES)
NOT SHOWN.

TRANSITION STRUCTURE
SECTION — B 410

0 2 5 10 15
Scale in Feet

REVISIONS NO.	DATE	MADE BY	CKD. BY	REMARKS
2	05/18	TEM	SMM	ISSUED FOR BID
1	03/19	DCM	SMM	ISSUED FOR CONSTRUCTION

REFERENCE DWGS DRAWING NO.	REFERENCE

Climax Molybdenum
A Freeport-McMoRan Company

W. W. WHEELER & ASSOCIATES, INC
Water Resources Engineers
3700 S. Inca Street
Englewood, CO 80110-3405
303-761-4130
FAX 303-761-2802

INTERCEPTOR REHABILITATION PROJECT

WEST INTERCEPTOR CULVERT REPLACEMENT (PHASE D)

TRANSITION STRUCTURE

CIVIL PLANS, SECTIONS, AND DETAILS

Climax Molybdenum Climax Mine
Climax, CO

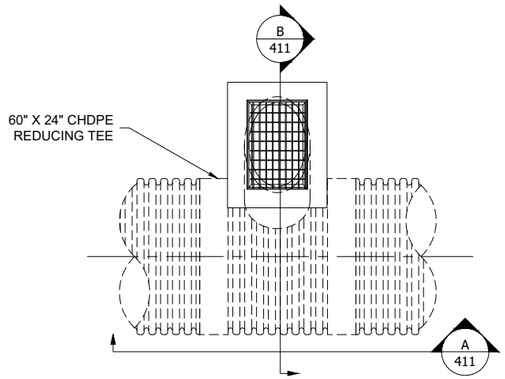
MADE BY		SCALE
DCM	9/1/16	As Noted
CHECKED BY		DRAWING NO.
SMM	12/1/16	3-520-00410 1
ACCEPTED BY		
...		

EXAMPLE OF GABIONS IN ADEQUATE CONDITIONS (NO REPAIR NEEDED)

EXAMPLE OF GABIONS IN DISREPAIR. RESHAPE AND REINFORCE STEEL BASKET.

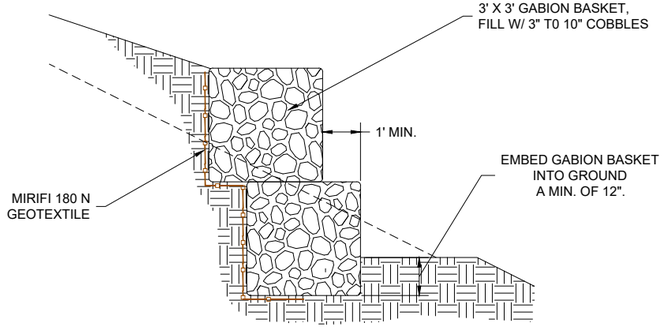
1 GABION WALL REPAIR

NOTES:
1. REPAIR OR REPLACE GABION BASKETS AS DIRECTED BY ENGINEER.
2. GABION SECTIONS HAVE 1 TO 4 LEVELS.

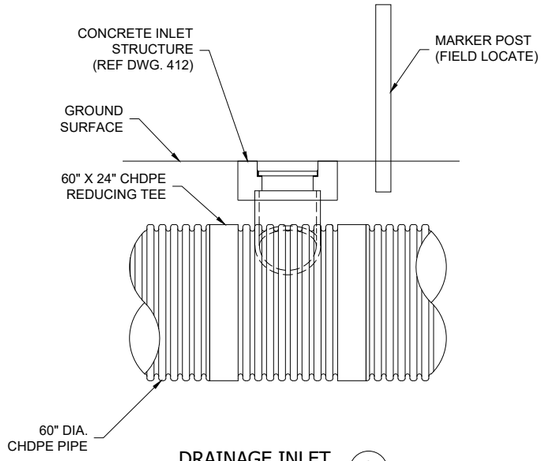


3 DRAINAGE INLET
PLAN VIEW
0 2 4 6 8
Scale in Feet

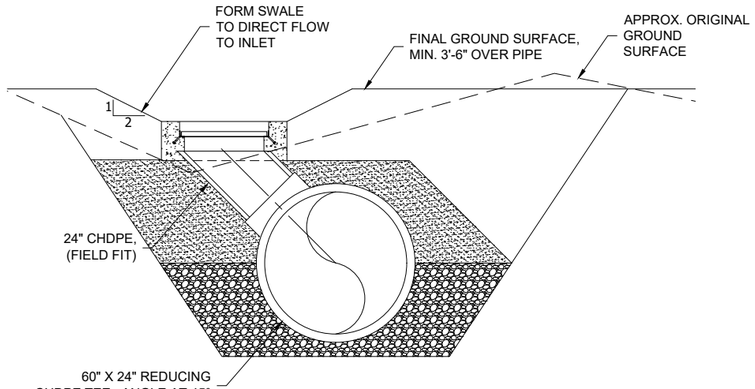
DRAINAGE INLET LOCATIONS	
NUMBER	STATION
1	163+48
2	168+19
3	178+97
4	184+14
5	190+62



2 GABION WALL COMPLETE REPLACEMENT
TYPICAL SECTION
0 1 2 4 6
Scale in Feet



DRAINAGE INLET
SECTION
A
411
0 2 4 6 8
Scale in Feet



DRAINAGE INLET
SECTION
B
411
0 2 4 6 8
Scale in Feet

R:\1000\1051\1051 07\1051 07.02\DRAWINGS\Phase D - West Int. Piping DS of Searle (2018)\IFC\SheetFiles\105107D2D-003 3-29-19 03:39pm Scott XREFS: Climax 24x36 2016 July 20 053, SEARLE: Climax 4C:

REVISIONS

NO.	DATE	MADE BY	CKD. BY	REMARKS
2	05/18	TEM	SMM	ISSUED FOR BID
1	03/19	DCM	SMM	ISSUED FOR CONSTRUCTION

REFERENCE DWGS

DRAWING NO.	REFERENCE

Climax Molybdenum
A Freeport-McMoRan Company

W. W. WHEELER & ASSOCIATES, INC
Water Resources Engineers
3700 S. Inca Street
Englewood, CO 80110-3405
303-761-4130
FAX 303-761-2802

INTERCEPTOR REHABILITATION PROJECT

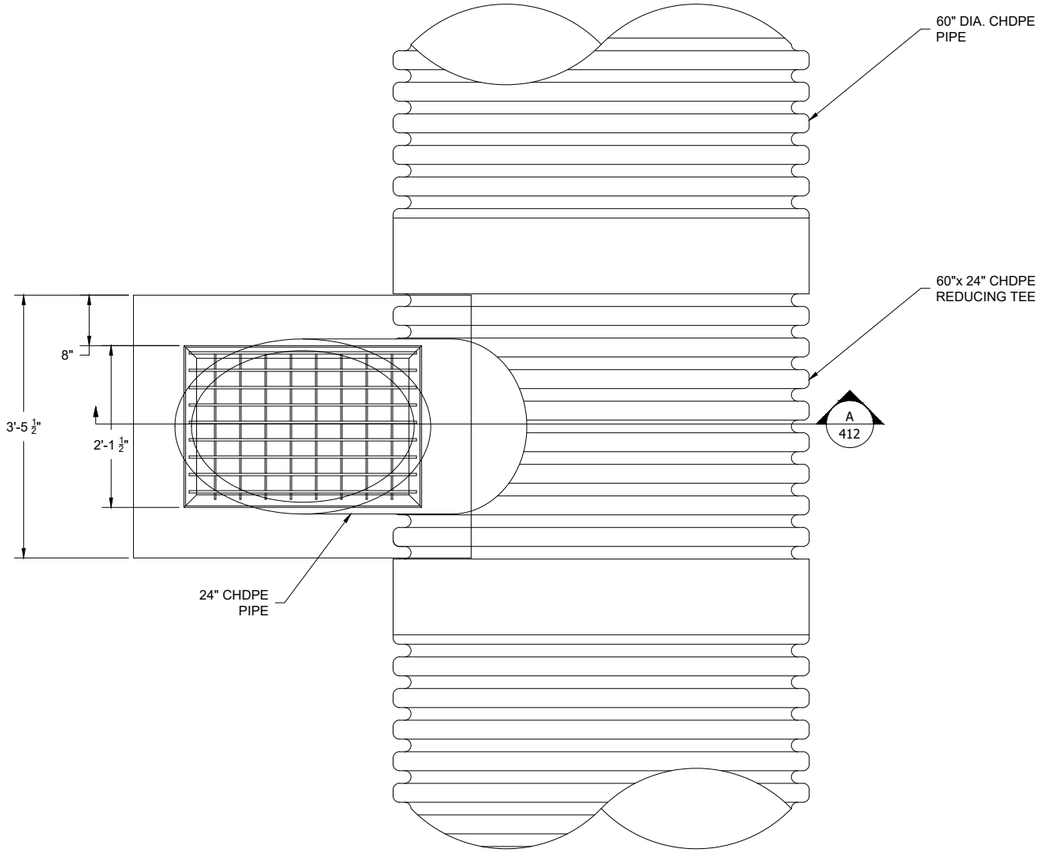
WEST INTERCEPTOR CULVERT REPLACEMENT (PHASE D)

DRAINAGE INLETS AND GABIONS

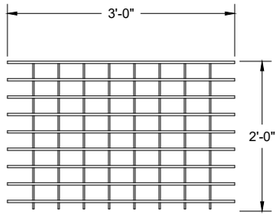
TYPICAL PLANS, SECTIONS, AND DETAILS

Climax Molybdenum Climax Mine
Climax, CO

MADE BY	CHECKED BY	ACCEPTED BY	SCALE	DRAWING NO.
DCM	SMM	...	As Noted	3-520-00411 1
9/1/16	12/1/16			



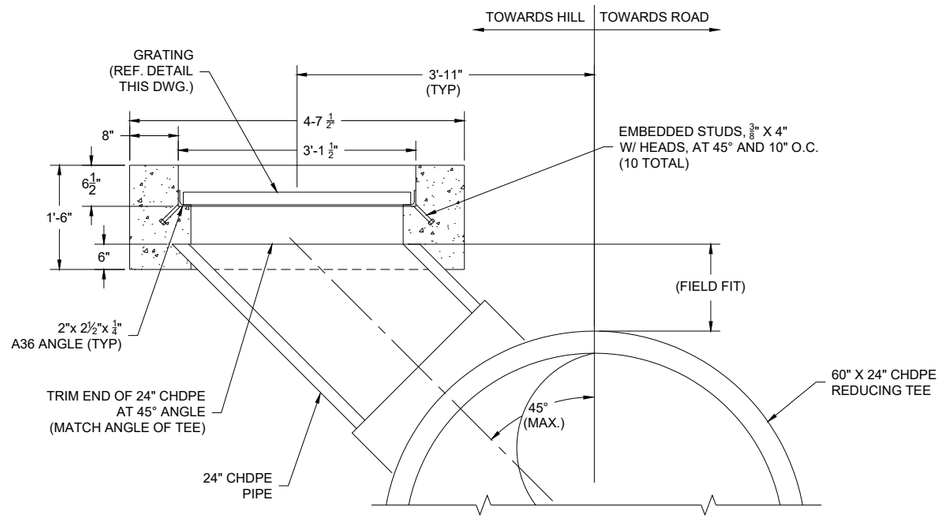
1 DRAIN INLET CONCRETE
PLAN VIEW
0 ½ 1 2 3
Scale in Feet



38-W-4 GRATING
2" X 3/8" BARS (2-3/8" C-C)
HOT-DIP GALVANIZED

2 GRATING
DETAIL

N.T.S.



CONCRETE COLLAR
SECTION
A
412
0 ½ 1 2 3
Scale in Feet

NOTES:
1. REINFORCE WITH 6x6xW4xW4 WIRE FABRIC IN WALLS (NOT SHOWN).
2. ANGLE OF 42"x 24" REDUCING CHDPE TEE MAY BE VARIED AS REQUIRED, 45° MAX.
3. CHAMFER EXPOSED CORNERS OF CONCRETE ¾" (NOT SHOWN)

R:\10001\105\11\051 07\1051 07 02\DRAWINGS\Phase D - West Int. Piping DS of Seattle (2018)\IFC\SheetFiles\105107202D-003 3-29-19 03:39pm Scott XREFS: Climax24x36 2016 July 20 053, SEARLE, Climax 4C:

REVISIONS NO.	DATE	MADE BY	CKD. BY	REMARKS
2	05/18	TEM	SMM	ISSUED FOR BID
1	03/19	DCM	SMM	ISSUED FOR CONSTRUCTION

REFERENCE DWGS DRAWING NO.	REFERENCE

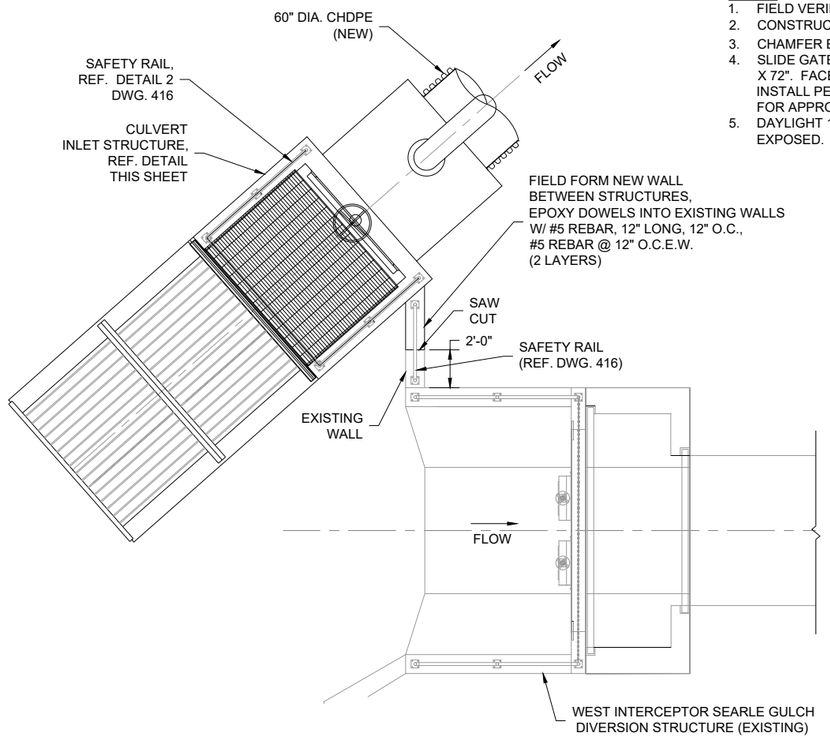
Climax Molybdenum
A Freeport-McMoRan Company
W. W. WHEELER & ASSOCIATES, INC
Water Resources Engineers
3700 S. Inca Street
Englewood, CO 80110-3405
303-761-4130
FAX 303-761-2802

INTERCEPTOR REHABILITATION PROJECT
WEST INTERCEPTOR CULVERT REPLACEMENT (PHASE D)
CULVERT DRAINAGE INLETS
STRUCTURAL PLANS, SECTIONS, AND DETAILS

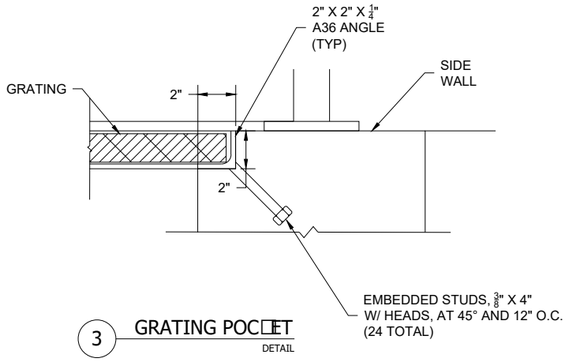
Climax Molybdenum Climax Mine
Climax, CO

MADE BY		SCALE
DCM	4/1/16	As Noted
CHECKED BY	4/1/16	DRAWING NO.
SMM		3-520-00412 1
ACCEPTED BY		
...		

NOTES:
1. FIELD VERIFY LOCATION AND POSITION OF INLET STRUCTURE.
2. CONSTRUCT PER SPECIFICATION 03300: CAST-IN-PLACE CONCRETE.
3. CHAMFER EXPOSED CONCRETE CORNERS ¾" (NOT SHOWN).
4. SLIDE GATE TO BE HYDROGATE SELF-CONTAINED HEAVY DUTY SLIDE GATE, 72" X 72". FACE MOUNT. 9'-6" FRAME HEIGHT (FIELD VERIFY), WITH HANDWHEEL. INSTALL PER MANUFACTURER'S RECOMMENDATIONS. SUBMIT SHOP DRAWING FOR APPROVAL BEFORE ORDERING.
5. DAYLIGHT 12 G COPPER CHDPE LOCATING WIRE AT VENT PIPE. LEAVE MIN. 6' EXPOSED.

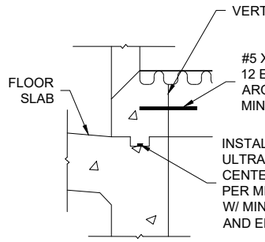


1 CULVERT INLET STRUCTURE
PLAN VIEW
Scale in Feet: 0 2 4 8 12



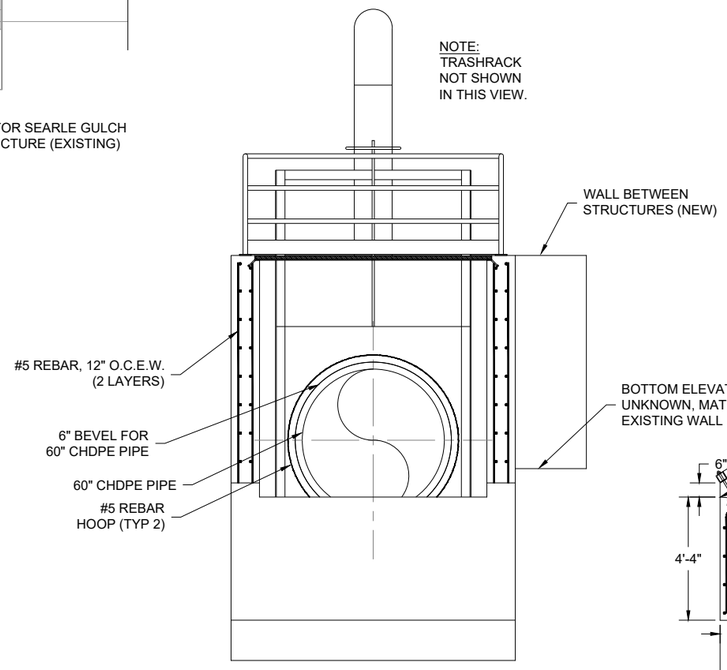
3 GRATING POCKET DETAIL

N.T.S.

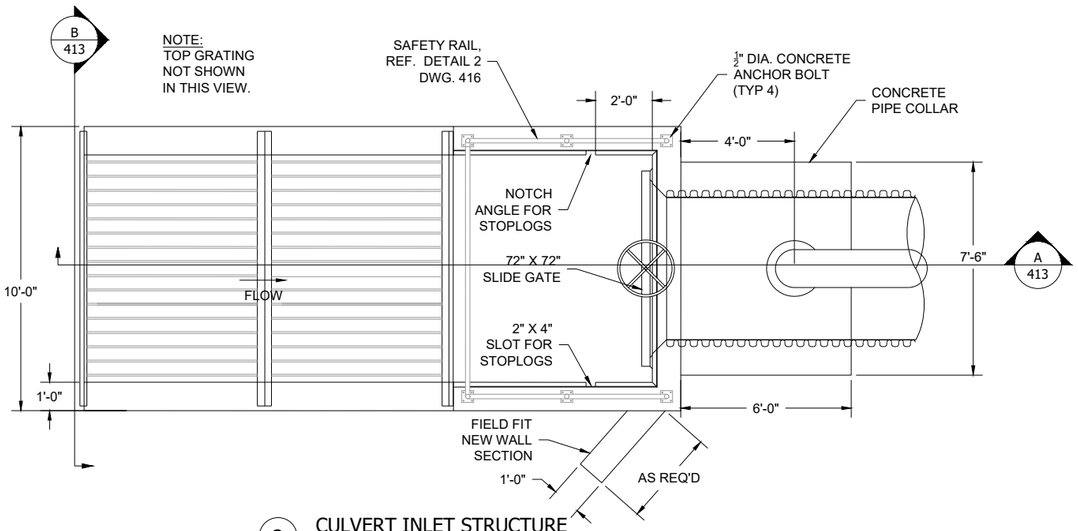


4 CONCRETE WALL KEY DETAIL

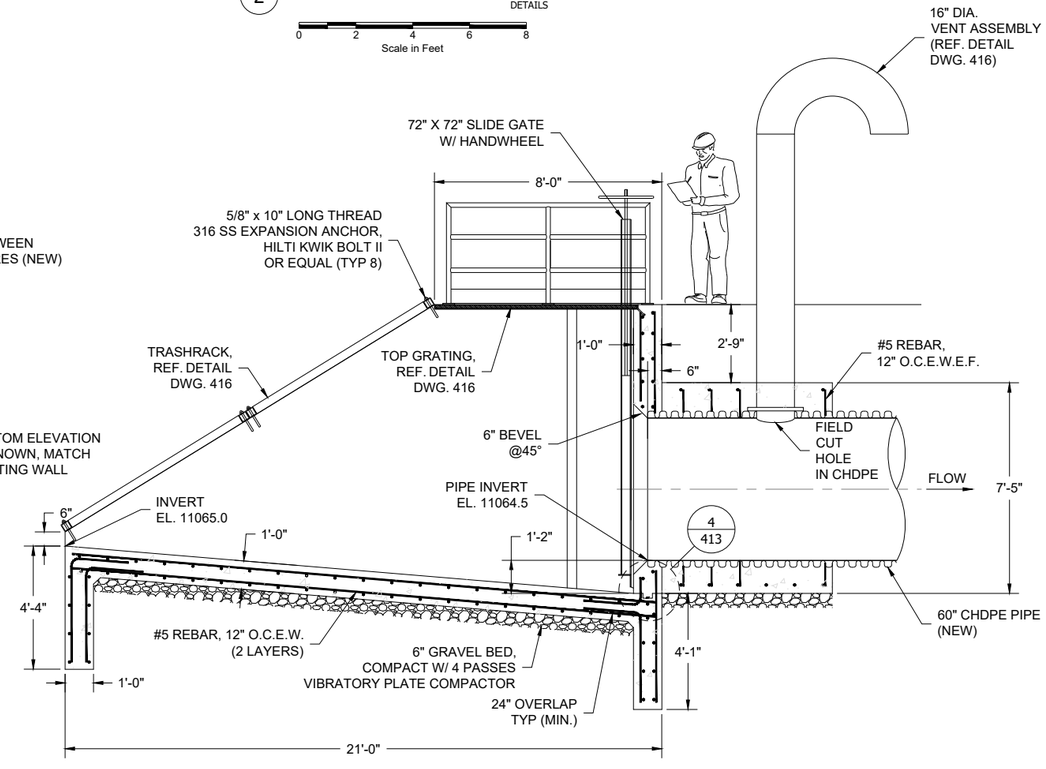
N.T.S.



CULVERT INLET STRUCTURE SECTION B/413
Scale in Feet: 0 2 4 6 8



2 CULVERT INLET STRUCTURE DETAILS
Scale in Feet: 0 2 4 6 8



CULVERT INLET STRUCTURE SECTION A/413
Scale in Feet: 0 2 4 6 8

REVISIONS NO.	DATE	MADE BY	CKD. BY	REMARKS
2	05/18	TEM	SMM	ISSUED FOR BID
1	03/19	DCM	SMM	ISSUED FOR CONSTRUCTION
0				
△				
△				
△				
△				

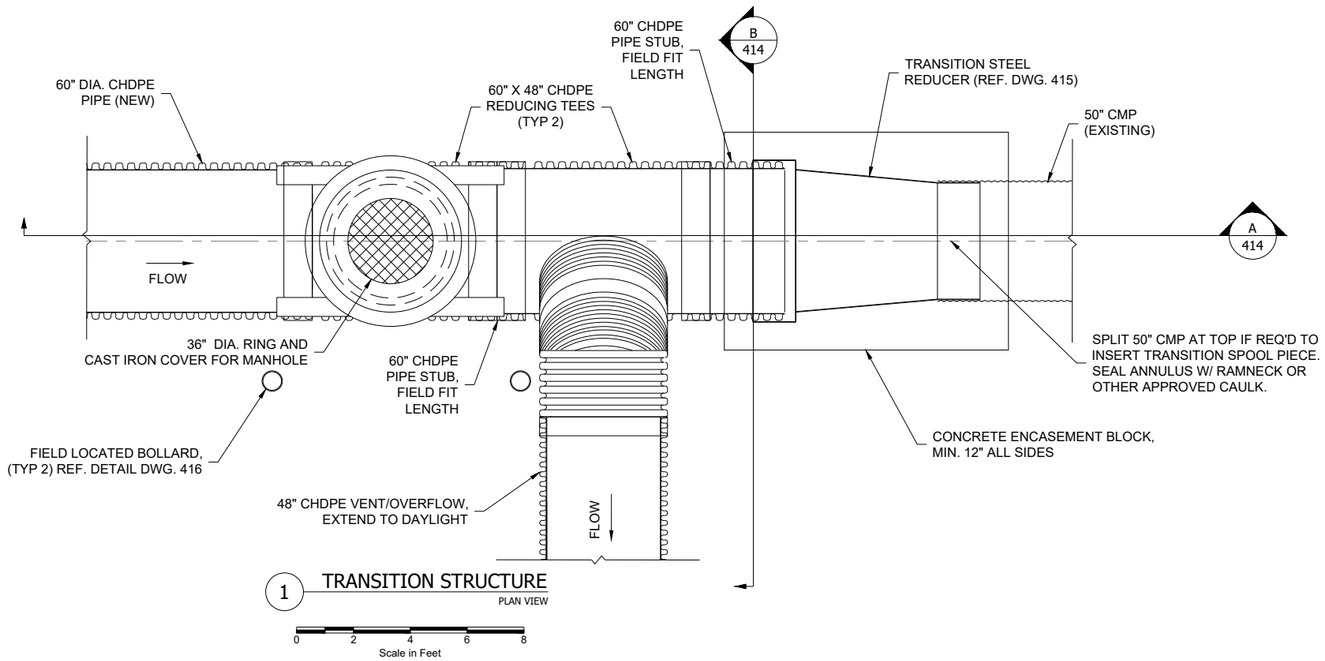
REFERENCE DWGS DRAWING NO.	REFERENCE

Climax Molybdenum
A Freeport-McMoRan Company
W. W. WHEELER & ASSOCIATES, INC
Water Resources Engineers
3700 S. Inca Street
Englewood, CO 80110-3405
303-761-4130
Fax 303-761-2802

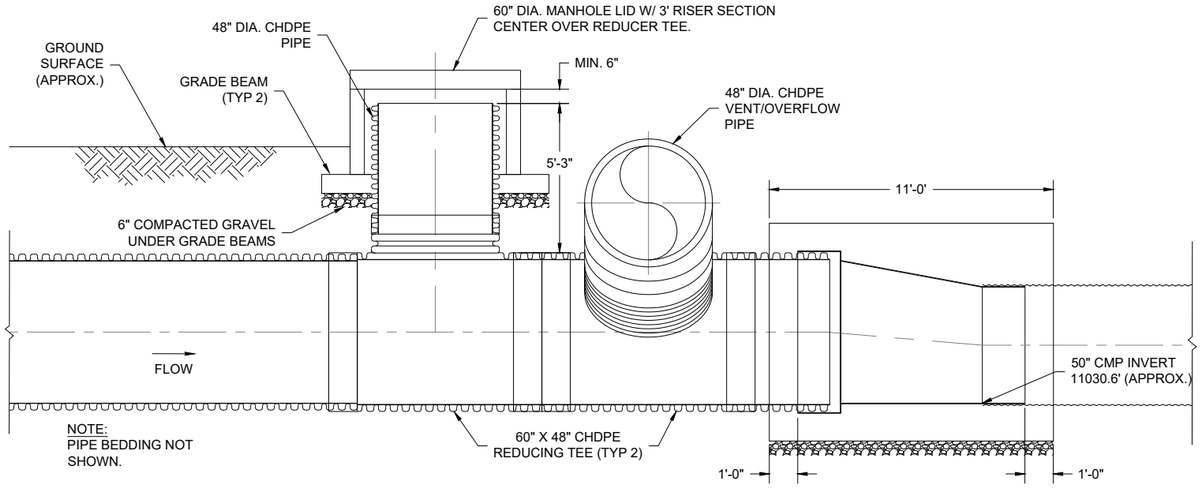
INTERCEPTOR REHABILITATION PROJECT
WEST INTERCEPTOR CULVERT REPLACEMENT (PHASE D)
CULVERT INLET STRUCTURE
STRUCTURAL PLANS, SECTIONS, AND DETAILS

Climax Molybdenum Climax Mine
Climax, CO

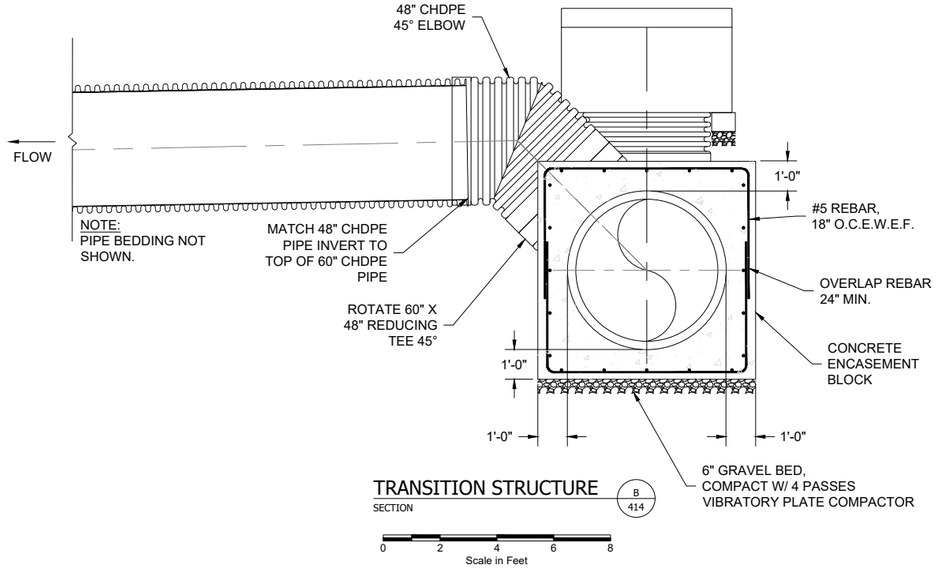
MADE BY	CHECKED BY	ACCEPTED BY	SCALE	DRAWING NO.
DCM	SMM	...	As Noted	3-520-00413 △1
9/1/16	12/1/16			



NOTES:
1. CONSTRUCT PER SPECIFICATION 03300: CAST-IN-PLACE CONCRETE.
2. CHAMFER EXPOSED CONCRETE CORNERS $\frac{3}{4}$" (NOT SHOWN).
3. DAYLIGHT 12 G COPPER HDPE LOCATING WIRE AT MANHOLE, LEAVE. MIN. 6' EXPOSED.



NOTE:
50" CMP INVERT ELEV. IS APPROXIMATE. SET 60" CHDPE INVERT AT EXISTING 50" CMP INVERT.

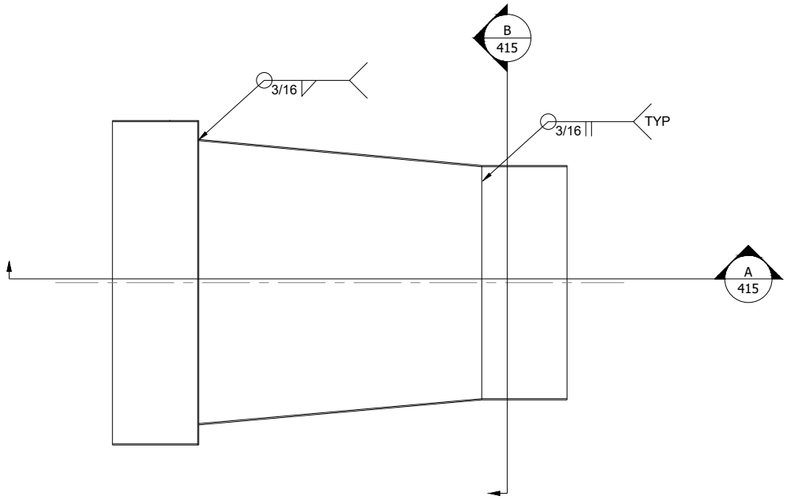


REVISIONS NO.	DATE	MADE BY	CKD. BY	REMARKS
2	05/18	TEM	SMM	ISSUED FOR BID
1	03/19	DCM	SMM	ISSUED FOR CONSTRUCTION

REFERENCE DWGS DRAWING NO.	REFERENCE

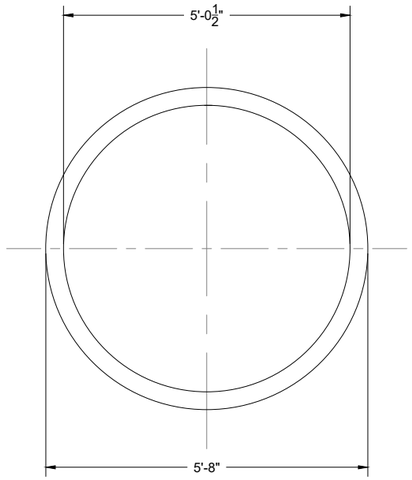
Climax Molybdenum
A Freeport-McMoRan Company
W. W. WHEELER & ASSOCIATES, INC
Water Resources Engineers
3700 S. Inca Street
Englewood, CO 80110-3405
303-761-4130
FAX 303-761-2802

INTERCEPTOR REHABILITATION PROJECT	Climax Molybdenum Climax Mine, Climax, CO		
WEST INTERCEPTOR CULVERT REPLACEMENT (PHASE D)	MADE BY DCM	9/1/16	SCALE As Noted
TRANSITION STRUCTURE	CHECKED BY SMM	12/1/16	DRAWING NO. 3-520-00414 1
STRUCTURAL PLANS, SECTIONS, AND DETAILS	ACCEPTED BY ...		



1 TRANSITION STEEL REDUCER
PLAN VIEW

0 1 2 3 4
Scale in Feet

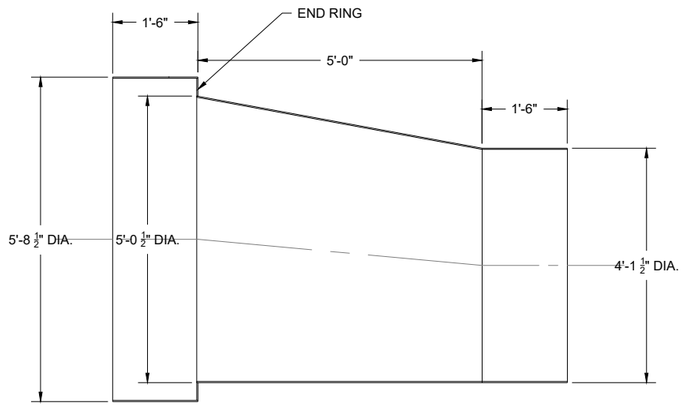


2 END RING
DETAIL

0 1 2 3 4
Scale in Feet

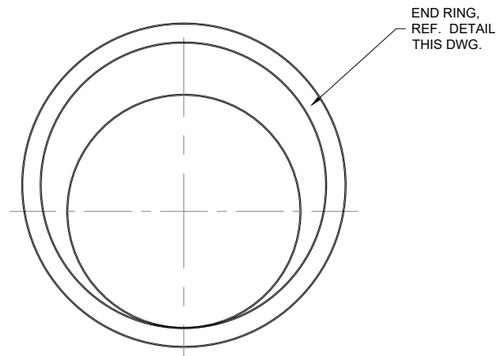
MAKE ONE EACH FROM
1/4" A36 PLATE

NOTES:
1. FABRICATED FROM $\frac{1}{4}$"-THICK A36 STEEL PLATE.
2. ALL WELDED CONSTRUCTION.
3. USE E70XX ELECTRODES.
4. PRIME AND PAINT PER SPECIFICATIONS.



TRANSITION STEEL REDUCER
SECTION
A
415

0 1 2 3 4
Scale in Feet



TRANSITION STEEL REDUCER
SECTION
B
415

0 1 2 3 4
Scale in Feet

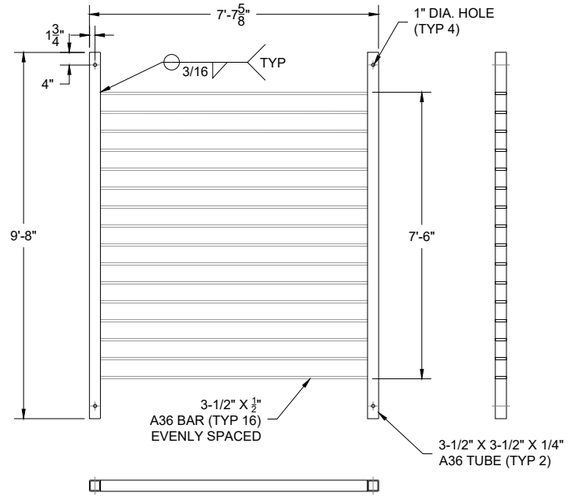
REVISIONS NO.	DATE	MADE BY	CKD. BY	REMARKS
2	05/18	TEM	SMM	ISSUED FOR BID
1	03/19	DCM	SMM	ISSUED FOR CONSTRUCTION

REFERENCE DWGS DRAWING NO.	REFERENCE

Climax Molybdenum
A Freeport-McMoRan Company

W. W. WHEELER & ASSOCIATES, INC
Water Resources Engineers
3700 S. Inca Street
Englewood, CO 80110-3405
303-761-4130
Fax 303-761-2802

INTERCEPTOR REHABILITATION PROJECT	Climax Molybdenum Climax Mine, Climax, CO		
WEST INTERCEPTOR CULVERT REPLACEMENT (PHASE D)	MADE BY DCM	9/1/16	SCALE As Noted
TRANSITION STEEL REDUCER	CHECKED BY SMM	12/1/16	DRAWING NO. 3-520-00415 1
STRUCTURAL DETAILS	ACCEPTED BY ...		

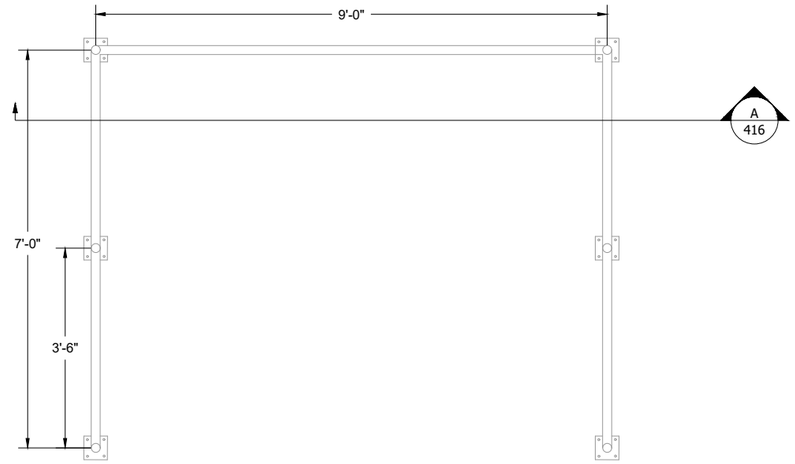


MAKE 2 EACH ASSEMBLY

1 TRASHRACK DETAILS

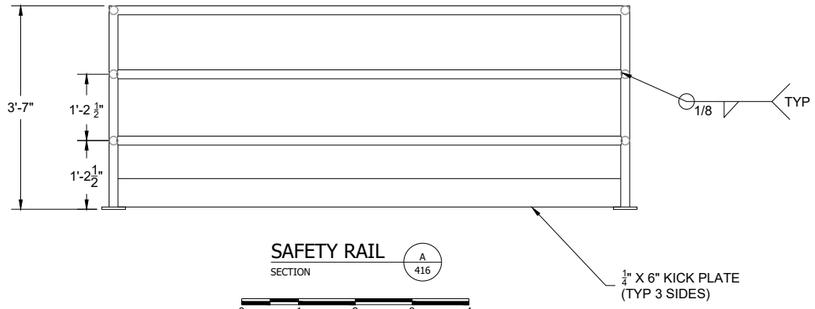
Scale in Feet: 0 1 2 4 6

NOTES:
1. FABRICATE SAFETY RAIL FROM 1-1/2" SCH 40 A53 PIPE.
2. ALL WELDED CONSTRUCTION.
3. USE E70XX ELECTRODES.
4. GRATING TO BE 1-1/2" X 3/8" 15-W-4 STEEL GRATING.
5. PAINT SAFETY RAILS AND VENT PIPE PER SPECIFICATION 05120: MISCELLANEOUS METALWORK.
6. TRASHRACK AND GRATING SECTION TO BE HOT-DIPPED GALVANIZED.



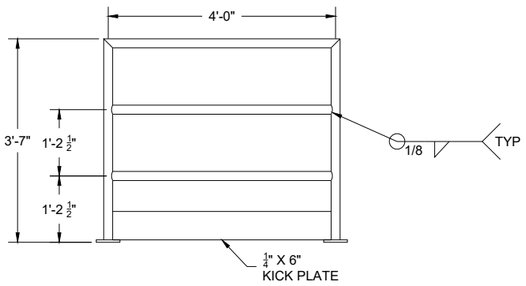
2 SAFETY RAIL PLAN VIEW

Scale in Feet: 0 1 2 3 4



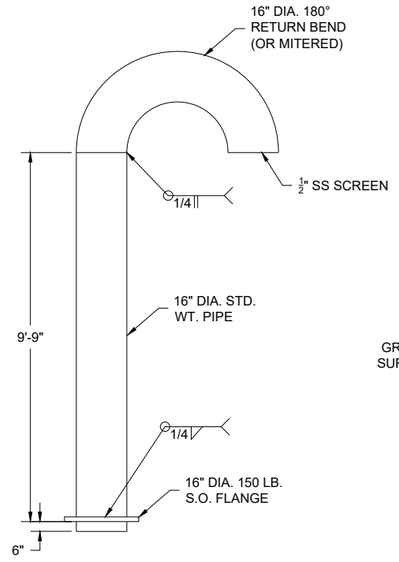
SAFETY RAIL SECTION (A 416)

Scale in Feet: 0 1 2 3 4



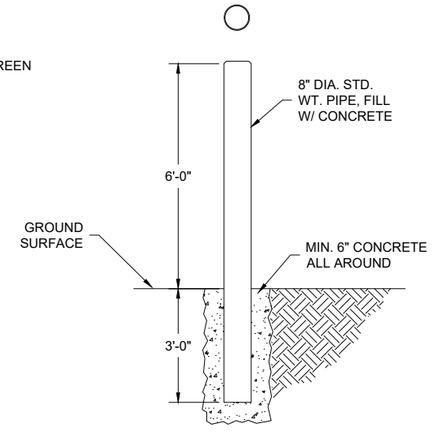
3 SAFETY RAIL DETAIL

Scale in Feet: 0 1 2 3 4



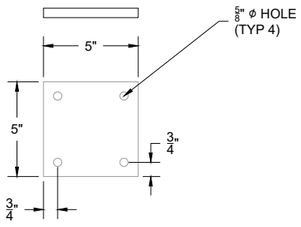
4 VENT PIPE DETAIL

Scale in Feet: 0 1 2 4 6



5 BOLLARD DETAIL

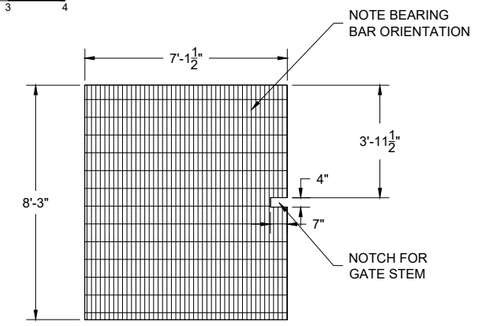
Scale in Feet: 0 1 2 4 6



MAKE FROM 1/2" A36 PLATE

6 MOUNTING PLATE DETAIL

N.T.S.



MAKE FROM 1-1/2" X 3/8"
15-W-4 STEEL GRATING

7 GRATING DETAIL

Scale in Feet: 0 2 4 6 8

REVISIONS NO.	DATE	MADE BY	CKD. BY	REMARKS
2	05/18	TEM	SMM	ISSUED FOR BID
3	03/19	DCM	SMM	ISSUED FOR CONSTRUCTION
4				
5				
6				
7				

REFERENCE DWGS DRAWING NO.	REFERENCE

Climax Molybdenum
A Freeport-McMoRan Company

W. W. WHEELER & ASSOCIATES, INC
Water Resources Engineers
3700 S. Inca Street
Englewood, CO 80110-3405
303-761-4130
Fax 303-761-2802

INTERCEPTOR REHABILITATION PROJECT

WEST INTERCEPTOR CULVERT REPLACEMENT (PHASE D)

MISCELLANEOUS

STRUCTURAL DETAILS

Climax Molybdenum Climax Mine
Climax, CO

MADE BY		SCALE
DCM	9/1/16	As Noted
CHECKED BY		DRAWING NO.
SMM	12/1/16	3-520-00416 1
ACCEPTED BY		
...		