



April 8, 2015

Tom Henderson
Montana Department of Environmental Quality
P.O. Box 200901
Helena, MT 59620

**RE: Final Annual Construction Completion Report for the McLaren Tailings
Abandoned Mine Site Reclamation Project**

Dear Tom,

Please find enclosed four copies of the Final Construction Completion Report for the McLaren Tailings Abandoned Mine Site Reclamation Project. An electronic PDF version of the report has been included with each copy of the document. Also as outlined in the Task Order, I have provided one USB containing the electronic Word, Excel, and CADD files for the report. If you have any questions or concerns, please do not hesitate to contact me.

Sincerely,

Joseph S. McElroy, P.E.
Project Manager

Enclosures

Final Construction Completion Report for the McLaren Tailings Abandoned Mine Site



Prepared for:
Mr. Tom Henderson
Montana Department of Environmental Quality/
Mine Waste Cleanup Bureau
P.O. Box 200901
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April 8, 2015

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List of Acronyms

AMRB	Abandoned Mine Reclamation Bureau
amsl	above mean sea level
bcy	bank cubic yards
BMPs	Best Management Practices
BP	bypass (location)
CCR	Construction Completion Report
CHL5	Storm Water Channel 5
COCs	Contaminants of Concern
cy	cubic yards
DAC	Data Acquisition Control
DCB	Dewatering Control Building
DEQ	Montana Department of Environmental Quality
DOJ	U.S. Department of Justice
DSL	Department of State Lands
DTI	Dosing Tank Inlet
EEE/CA	Expanded Engineering Evaluation/Cost Analysis
EPA	U.S. Environmental Protection Agency
gpm	gallons per minute
GSM	Golden Sunlight Mine
HDPE	high-density polyethylene
hp	horsepower
Knife River	Knife River-Yellowstone Division
lb	pound
MCC	Motor Control Center
mg/L	milligrams/Liter
MSE	Mechanically Stabilized Earth
MWCB	Mine Waste Cleanup Bureau
oz	ounce
P.O.	Post Office
Pioneer	Pioneer Technical Services, Inc.
PVC	polyvinyl chloride
QA	quality assurance
QC	quality control
RCTS	Rotating-Cylinder Treatment System
Site	McLaren Tailings Abandoned Mine Site
SPO	Sediment Pond Outlet
sy	square yards
TMDL	Total Maximum Daily Limit
U.S.	United States
USFS	United States Forest Service

1.0 INTRODUCTION

This construction completion report (CCR) for the McLaren Tailings Abandoned Mine Site (Site) Reclamation Project documents the construction activities completed from June 1, 2010, to October 8, 2014, and depicts the final as-built conditions at the Site at the completion of the project. Due to the length of the reclamation project, annual CCRs were completed for the 2010, 2011, and 2012 construction seasons. These annual reports depict the as-built conditions at the completion of each construction season. Detailed descriptions of the 2010, 2011, and 2012 construction seasons are provided in the Montana Department of Environmental Quality/Mine Waste Cleanup Bureau (DEQ/MWCB) final CCRs for those years (DEQ/MWCB-Pioneer, 2011a; DEQ/MWCB-Pioneer, 2012a; and DEQ/MWCB-Pioneer, 2013a). An annual CCR was not completed for the 2013 construction season. The CCRs are posted at the following internet address: <http://www.deq.mt.gov/abandonedmines/mclaren.mcp>.

1.1 Project Description

The McLaren Site is an abandoned hard rock mine/mill site listed on the Montana DEQ/MWCB Priority Sites List (the DEQ/MWCB was formally the Department of State Lands/Abandoned Mine Reclamation Bureau [DSL/AMRB]). The Site is adjacent to Soda Butte Creek and Cooke City, Montana, at an elevation of 7,500 above mean sea level (amsl), and upstream of the Lamar River in Yellowstone National Park. From 1934-1953 the mill dumped tailings into Soda Butte Creek. By 1960, Soda Butte Creek was one of the most contaminated streams entering any national park. The contaminants of concern (COCs) included aluminum, arsenic, barium, cadmium, chromium, copper, mercury, iron, lead, manganese, nickel, and zinc. Soda Butte Creek from the McLaren Site to the Montana/Wyoming border was identified as a 303(d) Impaired Waterbody during the 2000 reporting year. This stream segment (MT43B002_031) was impaired by metals including copper, iron, lead, and manganese (DEQ, 2002). Because of the location and potential impacts to surface waters entering Yellowstone National Park, the work required close coordination between the National Park Service, U.S. Forest Service, DEQ, the Beartooth Alliance, and representatives from Cooke City.

The primary objective of this reclamation project was to limit human and environmental exposure to the COCs, reduce the mobility and migration of the COCs, and mitigate impacts to the local surface water and groundwater. The reclamation project involved the removal of waste materials from designated areas and placement of the stabilized tailings and mine wastes in an on-site repository.

Because of the short construction seasons at the Site and the large volume of mine wastes present, the reclamation project was designed and scheduled to be completed over a 6-year period between 2010 and 2015 (1,963 consecutive calendar days). Construction activities for the project began on June 1, 2010, and were completed on October 8, 2014 (1,590 consecutive calendar days), 1 year ahead of schedule.

1.2 Location and Access

The Site is located in Park County in Section 25 of Township 9 South, Range 14 East of the Montana Principal Meridian. Vehicle access to the Site is via Montana Highway 212 approximately one quarter mile east of Cooke City. The Site is located less than 500 feet south of the highway and encompasses approximately 20 acres.

1.3 Land Ownership

The Site is owned by the DEQ under an agreement between U.S. Department of Justice (DOJ), U.S. Environmental Protection Agency (EPA), and DEQ (Appendix A-1).

1.4 Site History

Initial reclamation work at the Site was conducted by Bearcreek Mining in 1969, and included covering the eroding tailings with soil, demolishing buildings at the site, and excavating a new channel for Soda Butte Creek along the north side of the tailings impoundment. Numerous investigations of the tailings impoundment, dam stability, and contamination to Soda Butte Creek were conducted by State and Federal agencies over the next 30 years. Following the Yellowstone fires of 1988, the EPA directed work to protect the impoundment from flooding, divert shallow groundwater entering the impoundment, and improve the stability of the dam. A water quality investigation of Soda Butte Creek conducted by the U.S. Geological Survey in 1999 indicated that the highest concentrations of total recoverable aluminum (122 milligrams per liter [mg/L]), cadmium (0.063 mg/L), copper (6.08 mg/L), iron (418 mg/L), nickel (0.20 mg/L), lead (0.603 mg/L), and zinc (0.772 mg/L) were all detected in a sample collected downgradient of the McLaren tailings impoundment (Boughton, 2001).

An Expanded Engineering Evaluation/Cost Analysis (EEE/CA) completed in 2002 describes the results of environmental and engineering investigations and interim reclamation measures performed prior to 2002. The *Draft Final Expanded Engineering Evaluation/Cost Analysis for the McLaren Tailings Site, Cooke City, Montana* (DEQ/MWCB-Pioneer, 2002) summarizes the results. The preferred reclamation alternative was Alternative 5b: *On-Site Disposal in an Un-Lined Repository with a Multi-Layered Cap*. All mine waste materials currently located at the Site (tailings impoundment and dam, waste rock dump, and contaminated materials within the old stream channel) were to be excavated and disposed of in an on-site repository constructed on the elevated bench located southwest of the tailings impoundment. The multi-layered cap installed on the repository was to consist of an impermeable liner, a drainage layer, and the vegetated cover component of the cap, which would be a minimum of two feet thick.

Additional investigations were completed in September 2008 to support the reclamation design. The field work included investigating available cover soils, the proposed repository location, waste volumes and characteristics, the groundwater within the tailings area, stream channel characterization and surface water sampling, a geotechnical investigation of lime stabilization of tailings materials, seismic stability analysis, and haul route analysis. The reclamation design investigations determined that the majority of the tailings impoundment was saturated throughout the year with metals contaminated groundwater, making water management and

treatment a fundamental component of the mine reclamation project. The stabilization of tailings using quicklime was identified as the preferred method to facilitate the construction of a seismically stable repository. A detailed description of the results can be found in the *Final Reclamation Design Report for the McLaren Tailings Abandoned Mine Site Cooke City, Montana* (DEQ/MWCB-Pioneer, 2009). The results of these investigations were used to develop the final reclamation design and construction bid package completed in October 2009.

During the final design phase it was determined that it would be advantageous to install the construction dewatering wells during the fall of 2009 to confirm the site groundwater characteristics and expedite construction activities in 2010. The work included drilling, development, and aquifer testing of 17 dewatering wells. The dewatering system was designed to intercept uncontaminated groundwater at the margins of the tailings impoundment while 3 dewatering wells were constructed to extract water from the alluvial aquifer underlying the tailings impoundment. The wells were installed and tested from September 10 through October 27, 2009, under DEQ Contract #410006. This work is summarized in the *Construction Completion Report for the McLaren Tailings Abandoned Mine Site Pumping Well Installation, Development, And Testing* (DEQ/MWCB-Pioneer, 2010).

On April 2, 2010, the DEQ executed an agreement with Knife River to implement the McLaren Tailings Abandoned Mine Site Reclamation Project under DEQ Contract #410010. On October 8, 2014, the Substantial Completion inspection was completed and the Substantial Completion Certificate was signed by Knife River, DEQ, and the Engineer, Pioneer Technical Services, Inc. (Pioneer) (Appendix A-13).

2 RESPONSIBLE PARTIES

2.1 Montana Department of Environmental Quality/Mine Waste Cleanup Bureau

The DEQ/MWCB is the official *Owner* of the project. From 2008 through 2014, the DEQ/MWCB Project Manager, Mr. Tom Henderson, Reclamation Specialist, coordinated the project planning phases, provided technical and regulatory review during the design process, managed the development of the construction bid package and bidding processes, provided regulatory oversight, and coordinated implementing the construction project. Project Manager's address and telephone number:

Mr. Tom Henderson
Montana Department of Environmental Quality
Mine Waste Cleanup Bureau
P.O. Box 200901
Helena, Montana 59620
Telephone: 406-444-6492

2.2 Knife River-Yellowstone Division

The *Contractor* for the project was Knife River – Yellowstone Division (Knife River). Contractor’s address and telephone number:

Knife River – Yellowstone Division
1375 4th Ave. North, Suite C
P.O. Box 1498
Billings, Montana 59101
Telephone: 406-651-2520

Mr. Van Hildreth served as Knife River’s Project Manager and Mr. Tom Lester and Mr. Jason Flug served as Knife River’s Project Superintendents.

2.3 Pioneer Technical Services, Inc.

Under contract with the DEQ/MWCB, Pioneer was the *Engineer* for the project. Pioneer provided Site characterization, design, construction management, administration, and oversight services for the project. In providing these services, Pioneer provided the required technical support, documentation, and decision making tools for the DEQ, the many stakeholders, and the Contractor to implement the full-scale reclamation of the Site. Engineer’s address and telephone number:

Pioneer Technical Services, Inc.
P.O. Box 3445
1101 South Montana
Butte, Montana 59702
Telephone: 406-782-5177

2.4 Construction Monitoring and Quality Assurance

Pioneer performed the quality assurance (QA) inspection for the project. Mr. Doug Richmond and Mr. Ted Decker functioned as the full-time, on-site inspectors. Mr. Joe McElroy, Mr. Will Goldberg, and Mr. Marty Bennett functioned as the design engineers and part-time, on-site inspectors. Mr. McElroy functioned as the Project Manager and Engineer of Record.

3 CHRONOLOGICAL LISTING OF EVENTS

3.1 Pre-Bid Conference

A pre-bid conference held at the project Site on October 28, 2009, was attended by 50 contractors. The pre-bid conference notes are included in Appendix A-2 (Pre-Bid Conference Minutes).

3.2 Golden Sunlight Mine Site Visit

The bid documents included three alternatives, two of which (A-2 and A-3) included transportation of stabilized tailings to the Golden Sunlight Mine (GSM) facility located in Whitehall, Montana. On February 2, 2010, a site visit held at the GSM facility was attended by eight contractors. Notes from the GSM visit are included in Appendix A-3.

3.3 Bid Date

The bid opening date for the project was February 18, 2010, at 2:00 p.m., at the DEQ/MWCB office, which was located at 1100 North Last Chance Gulch in Helena, Montana.

3.4 Bid Opening

Three qualified bidders responded with bids. The bid results and the engineer's estimate are summarized and located in Appendix A-4. The DEQ evaluated each bidder's response to the three alternatives (A-1, A-2, and A-3), and selected Alternative A-2 as the preferred alternative. The DEQ then evaluated each bidder's specific response to Alternative A-2.

3.5 Contract Award

Contract #410010 was awarded to Knife River, the lowest bidder for Bid Alternative A-2. A pre-award conference was held on March 23, 2010, at the DEQ/MWCB office, and attended by representatives from Knife River, Pioneer, and DEQ/MWCB. The Knife River bid was discussed, along with their ability to complete the project on time. Knife River affirmed that they could complete the project for the amount bid, in the time frame specified (1,963 consecutive calendar days), and with the equipment listed. Knife River also indicated that the subcontracted portion of their bid did not exceed 50% of the contract amount. Pioneer's analysis, performed on March 25, 2010, indicated that approximately 37 percent of the work was anticipated to be performed by subcontractors. Other items discussed included project organization, Site conditions and constraints, submittals, sequencing, equipment, and subcontractors. The DEQ/MWCB sent the Notice of Award to Knife River on April 2, 2010 (Appendix A-5).

3.6 Contract Agreement

The Contract Agreement with Knife River was executed on April 16, 2010. The Notice to Proceed was issued on May 5, 2010, with a start date no later than June 1, 2010. The original contract time was 1,963 consecutive calendar days, which was not increased during the project. The anticipated completion date for the project was October 15, 2015. The Contract Agreement and Notice to Proceed are provided in Appendix A-6 and A-7.

3.7 Construction Start-Up

Pre-construction meetings were held at the beginning of each summer construction season at Montana Tech in Butte, Montana (Appendix A-8). Participants in these meetings discussed the proposed Knife River construction schedule and sequencing, the Health and Safety Plan, Quality

Control Plan, dust control, Traffic Control Plan, numerous material submittals, surveying needs, submittal and pay request processes, and the fuel adjustment submittal. Knife River stated that their normal work week would consist of five 10-hour days. Knife River mobilized equipment to the Site on June 1, 2010, and began work on June 2, 2010.

3.8 Contract Time

The reclamation project was scheduled to be completed over a 6-year period beginning in 2010 and ending in 2015 (1,963 consecutive calendar days). The project began on June 1, 2010, and was completed on October 8, 2014 (1,590 consecutive calendar days). No additional contract days were added to the construction schedule due to weather or work stoppages. Typically, 2 to 4 days were lost each construction season because of late spring or early fall snow storms at the Site.

3.9 Project Submittals

Prior to starting construction, Knife River provided the required submittals as specified in the pre-construction meeting and the Special Provisions of the contract. The submittal process was ongoing throughout the project. Prior to starting a project task, Knife River submitted the required materials submittals, plans, and certifications to the Engineer for approval. The reviewed and approved project submittals for the project are in Appendix A-9.

3.10 Construction Overview

Knife River started work on June 2, 2010, and completed all construction activities on October 8, 2014. The work was completed over 5 construction seasons, 1 year ahead of schedule. Winter shutdowns typically were from mid-October to June 15 of each year. Tailings were stabilized using quicklime mixed *in-situ* using an ALLU mixing system and through a surface tilling process. The construction dewatering system intercepted water from the 14 perimeter wells and 3 wells constructed within the impoundment footprint. The contaminated water was treated using hydrated lime, active aeration using a rotating cylinder treatment system (RCTS), and clarification in a constructed sediment detention pond. During winter months, water from selected perimeter wells was pumped through the Water Treatment Building and sediment detention pond. The water quality in the pumped wells met DEQ-7 water quality standards and no treatment of the water was conducted during winter operations. During 2011 and 2012, the winter operations of the Water Treatment Building typically began in mid-October and ran until construction resumed in June of the following year.

At the end of each construction season, an interim liner was installed over the tailings placed in the repository to minimize soil erosion, water infiltration, and runoff of contaminated water from the tailings. Additional seasonal shutdown Best Management Practices (BMPs) included hydromulching stockpiled soils and steep slope areas, site grading for water control, and installation of sediment control measures. The sections below list the major construction milestones for each construction season.

2010 Construction Season

Knife River started the 2010 summer construction season work on June 2, 2010, and completed all 2010 construction activities on October 28, 2010. Details are provided in the field notes (Appendix D), construction daily activity reports (Appendix H), Knife River quality control (QC) reports (Appendix I), and in the 2010 Construction Completion Report (DEQ/MWCB-Pioneer, 2011a). Major construction milestones for 2010 included the following:

- Construction of access road from Highway 212 into Site.
- Installation of BMPs.
- Installation of 2 modular bridges over Soda Butte Creek.
- Construction of storm water channels #4 and #5.
- Construction of the Dewatering Control Building (DCB).
- Clearing and grubbing of timber at repository site.
- Partial excavation of repository.
- Stabilization and placement of 11,000 cubic yards (cy) of tailings in the repository.
- Installation of interim cap (8-mil liner) over tailings in repository.
- Fertilizing, seeding, and placing of mulch on southeast slope.
- Placement of hydromulch on cover soil stockpiles.

2011 Construction Season

Knife River started the 2011 summer construction season work on June 13, 2011, and completed all 2011 construction activities on October 20, 2011. A detailed summary of the work is provided in the 2011 Construction Completion Report (DEQ/MWCB-Pioneer, 2012a). Major construction milestones for 2011 included the following:

- Repaired/replaced existing BMPs.
- Installed electrical and plumbing components in DCB.
- Excavated 23,600 bank cubic yards (bcy) from the repository for cover soil and structural fill materials.
- Salvaged 12,620 bcy of cover soil from the sediment detention pond excavation area.
- Implemented initial construction dewatering.
- Provided, stored, and handled 3,205 tons of quick lime.
- Stabilized 38,000 bcy of tailings from the sediment detention pond excavation area.
- Excavated, loaded, hauled, and placed 55,781 bcy of stabilized tailings, mine wastes, and impacted soils in repository.
- Backfilled sediment detention pond excavation area with structural fill materials to achieve the designed subgrade elevations.
- Provided and installed perimeter well pumps.
- Provided and installed inlets and stop-log outlet for sediment detention pond.
- Provided and installed 36-mil reinforced polypropylene sediment detention pond liner.
- Installed interim cap (8-mil liner) over stabilized tailings in repository.

- Installed wildlife exclusion fence around perimeter of sediment detention pond.
- Hydromulched cover soil stockpiles.

To protect the liner of the constructed sediment detention pond and reduce groundwater elevations at the Site, groundwater from the perimeter wells was pumped through the DCB and the sediment detention pond. Winter operations of the Water Treatment Building began October 20, 2011, and continued to May 30, 2012.

2012 Construction Season

Knife River started the 2012 summer construction season work on May 17, 2012, and completed all 2012 summer construction activities on October 10, 2012. A detailed summary of the work is provided in the 2012 Construction Completion Report (DEQ/MWCB-Pioneer, 2013a). Major construction milestones for 2012 included the following:

- Repaired/replaced existing BMPs.
- Completed plumbing and electrical work in DCB.
- Provided, stored, and handled 23.14 tons of hydrated lime for water treatment.
- Provided, stored, and handled 5 drums of anionic flocculant.
- Stripped, loaded, hauled, and stockpiled 46,682 cy of cover soils.
- Excavated 11,470 bcy from the repository for cover soil and structural fill materials.
- Implemented construction dewatering and water treatment.
- Provided, stored, and handled 8,791 tons of quick lime.
- Stabilized 169,536 bcy of tailings.
- Excavated, loaded, hauled, and placed 156,077 bcy of stabilized tailings, mine wastes, and impacted soils in repository.
- Installed 25,534 square yards (sy) of interim cap over stabilized tailings in repository.
- Hydromulched 5.1 acres of cover soil stockpiles and disturbed areas.

Summer water treatment operations began June 8, 2012. On September 19, active water treatment ceased for the 2012 construction season. Knife River and their subcontractor COP Construction began preparing the DCB and Site for winter operations, which began on October 10, 2012.

2013 Construction Season

Knife River started the 2013 summer construction season work on June 3, 2013, and completed all 2013 summer construction activities on October 11, 2013. Major construction milestones for 2013 included the following:

- Repaired/replaced existing BMPs.
- Implemented construction dewatering and water treatment.
- Provided, stored, and handled 2 drums of anionic flocculant.
- Stripped, loaded, hauled, and stockpiled 12,016 cy of cover soils.
- Provided, stored, and handled 902 tons of quick lime.

- Stabilized 29,158 bcy of tailings.
- Excavated, loaded, hauled, and placed 26,742 bcy of stabilized tailings, mine wastes, and impacted soils in repository.
- Decommissioned/removed 17 dewatering wells.
- Dismantled/removed DCB.
- Provided and mixed 243 dry tons of compost.
- Backfilled 182 cy of amended cover soils in excavation areas.
- Constructed 1,317 linear feet of Soda Butte Creek.
- Constructed 467 linear feet of Miller Creek.
- Fertilized and seeded 0.5 acres of streambank.
- Constructed 87 linear feet of Type 3 riprap channel.
- Removed West Bridge from Site.
- Relocated East Bridge to its final position over the constructed channel of Soda Butte Creek.
- Provided and installed 23,588 sy of geocushion repository cap liner.
- Provided and installed 23,588 sy of high-density polyethylene (HDPE) repository cap liner.
- Fertilized and seeded 0.4 acres of upland areas.
- Hydromulched 2.8 acres of cover soil stockpiles and disturbed areas.

Soda Butte Creek was diverted into its constructed channel in stages on August 29 and 30, 2013. Final excavation of tailings was completed on September 7, and Miller Creek was diverted into its constructed channel on September 12. The installation of the HDPE liner repository cap liner was completed on October 2, 2013.

2014 Construction Season

Knife River started the 2014 summer construction season work on June 5, 2014, and completed all construction activities on October 8, 2014. Major construction milestones for 2014 included the following:

- Repaired/replaced existing BMPs.
- Provided and mixed 4,292 dry tons of compost with stockpiled cover soils.
- Spread 35,400 cy of compost-amended cover soils in excavation areas.
- Backfilled former Soda Butte Creek channel around the tailings impoundment.
- Provided and installed 23,733 sy of Geonet Drainage repository cap liner over the HDPE liner.
- Placed 28,175 cy of compost-amended cover over the repository cap liner system.
- Fertilized and seeded 0.3 acres of riparian areas.
- Planted 360 Aspen tubelings.
- Planted 100 Thimbleberry tubelings.
- Planted 360 Douglas fir tubelings.
- Constructed 710 linear feet of repository-grouted riprap-lined channel.
- Constructed 65 linear feet of riprap-lined channel.

- Constructed 664 linear feet of grass-lined channel.
- Constructed 503 linear feet of turf-reinforcement mat-lined channel.
- Constructed various features to address springs and wet areas.
- Fertilized and seeded 22 acres of upland areas.
- Hydromulched 4 acres of disturbed and wet areas.
- Straw mulched 22.5 acres of disturbed areas.

The substantial completion inspection was conducted on October 8, 2014.

3.11 Substitution Requests

The substitution process was ongoing throughout the project. If Knife River could not obtain the specified material or part, due to discontinuation or time restraints (primarily due to the length of the contract from the time of design to the actual installation), they would specify and request approval to use a substitution. The reviewed and approved project substitutions for the project are provided in Appendix A-12.

3.12 Work Directive Changes

Over the duration of the project, 44 Work Directive Changes were executed. Table 3-1 provides a summary of the Work Directives Changes. Appendix A-10 contains the Work Directive Changes.

Table 3-1. Work Directive Changes Summary

Work Directive Change #	Date	Descriptions	Additional Cost Required
1	6/22/2010	Changed fabric on stream protection structure to include 4" X 2" x14 gauge wire.	NA
2	6/22/2010	Provided revised excavation quantities for repository.	NA
3	6/22/2010	Provided updated/revised plan, profile, and cross sections for West Bridge abutments.	\$10,000
4	6/22/2010	Provided estimated tailings excavation boundary.	NA
5	8/3/2010	Provided updated elevations for 30-inch drop structure.	NA
6	8/3/2010	Provided the specified mixer with the specified lime slurry, dosing, and flocculant tanks.	NA
7	8/3/2010	Provided correct 200 gallon flocculant tank on Sheet GWD-30.	NA
8	8/3/2010	Provided the correct pipe and pitless adaptor size for Well C3-10.	NA
9	8/16/2010	Provided ALLU lime stabilization grid to Contractor.	NA
10	8/16/2010	Revised Dosing tank mixer stand.	NA
11	8/16/2010	Allowed propane line to be stubbed through wall instead of floor.	NA
12	9/13/2010	C3-series wells piping alignment and winterization plumbing.	\$7,750.68
13	9/13/2010	Modification of surface casing for C3-9 pumping well.	\$1,098.24
14	9/13/2010	Directed use of on-site rock for Types 1 and 3 riprap.	NA
15	9/13/2010	Increased the drop tube size in C3-1, C3-3, C3-9, C2-1, C2-2, C2-3 wells.	\$1,645.22
16	11/30/2010	Provided alternate Channel #5 construction.	NA
17	11/30/2010	Modified upland seed mix.	NA
18	1/17/2011	Directed the installation of a French Drain and piping system to remove accumulating water on southeast corner of DCB.	\$1,890.00
19	2/16/2011	Provide clarification to the Contractor on the fabrication of sediment detention pond outlet structure.	NA
20	8/5/2011	Directed Contractor to install correctly sized flow meter at C3-3 well.	NA
21	8/5/2011	Directed Contractor to install the Appcor mixer for the flocculant tank system.	\$1,645.00

Work Directive Change #	Date	Descriptions	Additional Cost Required
22	8/5/2011	Relocate the emergency generator, automatic transfer switch, and meter base panel.	\$8,922.49
23	8/5/2011	Provide Contractor direction on the installation of bollards for pumping wells C3-1 to C3-10.	NA
24	8/8/2011	Direct the Contractor to provide and install pipe support stands for the piping manifold system in the dewatering control building.	\$10,190.00
25	1/4/2012	Direct the Contractor to construct earthen pad to obtain the required height need to convey lime from the lime silo to the horizontal screw auger inlet.	NA
26	9/21/2011	Directed contractor to install drainage pipe to remove groundwater from along south embankment slope of sediment detention pond.	\$23,400
27	11/9/2011	Direct the Contractor to provide the required pressure transducers.	NA
28	-	Work directive Number 28 was combined with Work Directive number 30.	
29	9/12/2012	Directed Contractor to lower steel casings of C-2 series pumping wells for continued site dewatering.	\$7,782.28
30	9/10/2012	Directed Contractor to repair east side of sediment detention pond liner, and install French drain system.	\$16,914.00
31	8/27/2012	Directed Contractor to place additional structural fill along north embankment of sediment detention pond to prevent potential slope failure.	\$12,550.00
32	6/6/2013	Provide pump for dewatering the excavated area and repair pumping well C2-3.	NA
33	7/21/2013	Prevent storm water from ponding on the SE corner of the repository and alleviate a 5 foot elevation difference between the SE corner of the repository and storm water channel #5.	\$14,000
34	6/6/2013	Dewatering the excavated area and repair pumping well C2-2.	\$4,571.00
35	7/31/2013	Directed contractor to reduce repository west abutment slope from 2.5: to 4:1 to help ensure long-term stability of the west abutment. This resulted in encroachment onto USFS property.	NA
36	8/16/2013	Construct/place Type 3 riprap instead of grass lined in Storm Water Channel #5 to Soda Butte Creek to provide long-term stability of the channel due to steeper grades.	\$2,000
37	8/16/2013	Remove and dispose of sediment pond liner materials from site to provide long term slope stability and maintain free flowing groundwater conditions along the south slope of the site.	\$21,600

Work Directive Change #	Date	Descriptions	Additional Cost Required
38	10/7/2013	Provide and install additional BMP's to minimize the transport of sediment from the site to the newly constructed Soda Butte and Miller Creeks.	\$22,593.00
39	10/10/2013	Transport and properly dispose of the 55 gallon drum of unknown white material found during excavation activities.	\$679
40	8/7/2014	Provide and plant Aspen and Thimbleberry tubelings/seedlings.	\$20
41	7/17/2014	Construct grass-lined channel on south side of former sediment detention pond to prevent ponding and over saturation of backfill materials.	\$20,000
42	8/7/2014	Place Type 3 riprap in Soda Butte Creek below the north edge of the repository to provide long-term stability of the natural slope.	\$30,885.00
43	7/17/2014	Provide constructible run-off channel on the south edge of the repository.	NA
44	8/7/2014	Construct various water-features site wide to minimized sediment transport into Soda Butte Creek.	Included in Work Directive Change #42

3.13 Change Orders

Ten change orders were issued for the project. Copies of the change orders are included in Appendix B. Change Orders 1 through 10 decreased the total contract amount by \$2,346,482.95 and 365 days. The following is a brief overview of each change order by year issued.

2010 Change Orders

One change order was issued for the project during the 2010 construction season. A copy of the change order is included in Appendix B. Change Order #1 increased the total contract amount by \$24,912.60. The following is a summary of Change Order #1.

- Installed additional mechanically stabilized earth (MSE) materials at West Bridge (+\$10,512.00).
- Increased Phase I dewatering piping system pipe size (+\$1,788.57).
- Increased drop pipe size in perimeter wells (+\$1,645.22).
- Installed drain back valves, air fittings, and other piping fittings to specified perimeter wells (+\$7,750.68).
- Installed larger steel well casing at well C3-9 (+\$1,098.24).
- Installed larger stand to support mixer for the dosing tank (+\$2,117.89).

2011 Change Orders

Five change orders (Change Order #2 through #6) were issued for the project during the 2011 construction season. A copy of each change order is in Appendix B. The change orders (#2 through #6) decreased the total contract amount by \$3,993,717.51. The sections below summarize the change orders #2 through #6.

Change Order #2

Change Order #2 was issued on January 14, 2011, and removed bid items from the Contract that were associated with the transportation of stabilized tailings to the GSM for reprocessing. This change was required after new requirements and restrictions were imposed by the Wyoming Department of Transportation and the Shoshone National Forest on transporting stabilized tailings on Wyoming Highway 296. Change Order #2 changed the following:

- Decreased the total contract amount by \$4,120,450.00.
- Deleted the following bid items from the Contract:
 - Bid Item A-2a – Provide, Install and Remove Truck Scale; and
 - Bid Item A-2b – Excavate, Load Haul, Stockpile, Scale, and Transport Stabilized Tailings Materials to Off-Site Processing Facility.
- Left the following bid items unchanged:
 - Bid Item A-2c – Excavate, Load, Haul, Place and Compact Stabilized Tailings, Mine Wastes and Impacted Soils in Repository; and
 - Bid Item A-2d – Excavate Repository and Stockpile Soils.

Change Order #3

Change Order #3 was issued on January 17, 2011, and increased the amount by \$1,890.00.

- Installed a French drain and piping system beginning at the southeast corner of the DCB.

Change Order #4

Change Order #4 was issued on July 12, 2011, and increased the amount by \$8,922.49.

- Moved the automatic transfer switch, electric meter base, and backup generator from the east side of the DCB to the north side of the building.

Change Order #5

Change Order #5 was issued on October 16, 2011, and increased the amount by \$23,400.00.

- Installed two 4-inch perforated drain pipes along the south side of the sediment detention pond.

Change Order #6

Change Order #6 was issued on October 16, 2011, and increased the amount by \$92,520.00.

- Placed additional structural fill along north embankment of sediment detention pond.

2012 Change Orders

Two change orders (Change Order #7 and #8) were issued during the 2012 construction season. Appendix B contains a copy of each change order with justification. The two change orders increased the total contract amount by \$451,350.39.

Change Order #7

Change Order #7 was issued on February 13, 2012, with the following changes.

- Change Order #7 increased the total contract amount by \$55,684.07.
- Installed an additional mixer stand for the flocculant tank (+\$1,400.00).
- Provided labor and materials to install power supply to lime silo unit (+\$4,465.00).
- Installed power supply to second motor on RCTS unit (+\$4,543.00).
- Installed power supply to flocculant mixer (+\$3,114.05).
- Installed electrical breaker for 10 horsepower (hp) motor on horizontal screw auger (+\$1,226.66).
- Installed starters and breakers for C3-1 and C3-3 in Motor Control Center (MCC) (+\$2,392.71).
- Installed supplemental waterline from C3-10 and safety ladder (+\$6,329.03).
- Installed additional piping in DCB (+\$8,866.52).
- Installed revised 3-inch, 4-inch, and 8-inch pipe supports in DCB (+\$10,190.00).
- Installed BW5200 relays for high/low probes (+\$4,922.79).

- Installed longer APPCOR mixer shafts and 4-inch butterfly valves on dosing tank. (+\$8,234.31).

Change Order #8

Change Order #8 was issued on December 11, 2012, with the following changes.

- Change Order #8 increased the total contract amount by \$395,666.32.
- Installed higher amperage overload heaters to dewatering wells (+\$1,923.08).
- Installed reverse control switch for horizontal screw auger (+\$1,457.53).
- Provided labor and materials to lower C2 series well casings (+\$7,782.28).
- Provided labor and materials to repair sediment detention pond liner (+\$16,914.00).
- Placed additional structural fill on north embankment of sediment detention pond (+\$12,550.00).
- Increased total contract cost to include fuel adjustment costs from 2010 through December 2012 (+\$355,039.43).

2013 Change Orders

One change order (Change Order #9) was issued for the project during the 2013 construction season. Appendix B contains a copy of the change order with justification. The change order increased the total contract amount by \$104,980.64. Change Order #9 was issued on December 17, 2013, with the following changes:

- Removed and disposed of the sediment detention pond liner to a permitted landfill (+\$21,600.00).
- Installed additional BMPs Site wide: silt fence, straw wattles, sediment traps, and temporary liner on west dam abutment (+\$22,593.00).
- Transported and properly disposed of a 55-gallon drum of unknown white material to the Park County Landfill (+\$679.00). Laboratory analytical results are presented in Appendix E-13.
- Increased total contract cost to include fuel adjustment costs from January through December 2013 (+\$60,108.64).

2014 Change Orders

One change order (Change Order 10) was issued for the project during the 2014 construction season. Appendix B contains a copy of the change order with justification. Change Order #10 was issued on October 10, 2014, to reconcile the final Contract quantities at the end of the 2014 construction season. This change order increased the Contract amount by \$1,065,990.93.

3.14 Work Stoppages

There were no official work stoppages during the reclamation construction project.

3.15 Weather Days

During the project, the Site work would be briefly shut down due to weather. These shut-down days typically occurred during late spring and early fall snow storms when the weather would not allow work at the Site. Several bad-weather days also occurred during the summer from heavy or prolonged rainstorm events. No weather days were added to the contract days.

3.16 Requests for Payment

Knife River issued 41 Requests for Payment for work performed from 2010 through 2014. A summary of the pay requests is presented in Table 3-2. Appendix C contains the payment requests.

Table 3-2. Pay Request Summary

Payment Request	Date	Earned	Retainage Withheld*	Gross Payment	Tax 1%	Net Payment
1	6/30/2010	\$1,607,217.40	\$ 81,360.87	\$ 1,525,856.53	\$ 15,258.57	\$ 1,510,597.96
2	7/30/2010	\$ 658,755.50	\$ 32,937.78	\$ 625,817.72	\$ 6,258.18	\$ 619,559.54
3	8/31/2010	\$ 393,175.46	\$ 19,658.77	\$ 373,516.69	\$ 3,735.17	\$ 369,781.52
4	9/30/2010	\$ 901,781.41	\$ 45,089.07	\$ 856,692.34	\$ 8,566.92	\$ 848,125.42
5	10/31/2010	\$ 344,462.08	\$ 17,223.10	\$ 327,238.98	\$ 3,272.39	\$ 323,966.59
6	2/1/2011	\$ 65,613.49	\$ 3,280.67	\$ 62,332.82	\$ 623.33	\$ 61,709.49
7	6/30/2011	\$ 627,062.67	\$ 31,353.13	\$ 595,709.54	\$ 5,957.10	\$ 589,752.44
8	7/30/2011	\$1,165,769.48	\$ 58,288.47	\$ 1,107,481.01	\$ 11,074.81	\$ 1,096,406.20
9	8/31/2011	\$ 897,395.35	\$ 44,869.77	\$ 852,525.58	\$ 8,525.26	\$ 844,000.32
10	9/30/2011	\$ 871,658.93	\$ 43,582.95	\$ 828,075.98	\$ 8,280.76	\$ 819,795.22
11	11/1/2011	\$ 346,712.00	\$ 17,335.60	\$ 329,376.40	\$ 3,293.76	\$ 326,082.64
12	11/30/2011	\$ 33,402.49	\$ 1,670.12	\$ 31,732.37	\$ 317.32	\$ 31,415.05
13	1/4/2012	\$ 25,050.00	\$ 1,252.50	\$ 23,797.50	\$ 237.98	\$ 23,559.52
14	1/31/2012	\$ 141,730.00	\$ 7,086.50	\$ 134,643.50	\$ 1,346.44	\$ 133,297.06
15	2/29/2012	\$ 80,544.07	\$ 4,027.20	\$ 76,516.87	\$ 765.17	\$ 75,751.70
16	3/31/2012	\$ 27,140.00	\$ 1,357.00	\$ 25,783.00	\$ 257.83	\$ 25,525.17
17	4/30/2012	\$ 24,290.00	\$ 1,214.50	\$ 23,075.50	\$ 230.76	\$ 22,844.74
18	5/31/2012	\$ 237,162.24	\$ 11,858.11	\$ 225,304.13	\$ 2,253.04	\$ 223,051.09
19	6/30/2012	\$ 898,348.90	\$ 44,917.45	\$ 853,431.45	\$ 8,534.31	\$ 844,897.14
20	7/31/2012	\$2,378,420.83	\$ 118,921.04	\$ 2,259,499.79	\$ 22,595.00	\$ 2,236,904.79
21	8/31/2012	\$2,907,503.70	\$ 145,375.19	\$ 2,762,128.51	\$ 27,621.29	\$ 2,734,507.22
22	9/30/2012	\$1,402,009.00	\$ 70,100.45	\$ 1,331,908.55	\$ 13,319.09	\$ 1,318,589.46

Payment Request	Date	Earned	Retainage Withheld*	Gross Payment	Tax 1%	Net Payment
23	10/31/2012	\$ 411,707.75	\$ 20,585.39	\$ 391,122.36	\$ 3,911.22	\$ 387,211.14
24	11/4/2012	\$ 25,050.00	\$ 1,252.50	\$ 23,797.50	\$ 237.98	\$ 23,559.52
25	12/31/2012	\$ 65,866.89	\$ 3,293.34	\$ 62,573.55	\$ 625.74	\$ 61,947.81
26	1/31/2013	\$ 25,050.00	\$ 1,252.50	\$ 23,797.50	\$ 237.98	\$ 23,559.52
27	2/28/2013	\$ 25,240.00	\$ 1,262.00	\$ 23,978.00	\$ 239.78	\$ 23,738.22
28	3/31/2013	\$ 25,240.00	\$ 1,262.00	\$ 23,978.00	\$ 239.78	\$ 23,738.22
29	4/30/2013	\$ 24,860.00	\$ 1,243.00	\$ 23,617.00	\$ 236.17	\$ 23,380.83
30	5/31/2013	\$ 24,100.00	\$ 1,205.00	\$ 22,895.00	\$ 228.95	\$ 22,666.05
31	6/31/13	\$1,061,213.52	\$ 53,060.68	\$ 1,008,152.84	\$ 10,081.53	\$ 998,071.31
32	7/31/2013	\$ 472,122.45	\$ 23,606.12	\$ 448,516.33	\$ 4,485.16	\$ 444,031.17
33	8/31/2013	\$ 575,017.63	\$ 28,750.88	\$ 546,266.75	\$ 5,462.67	\$ 540,804.08
34	9/30/2013	\$ 621,360.16	\$ 31,068.01	\$ 590,292.15	\$ 5,902.92	\$ 584,389.23
35	10/31/2013	\$ 240,769.54	\$ 12,038.48	\$ 228,731.06	\$ 2,287.31	\$ 226,443.75
36	1/22/2013	\$ 44,872.00	\$ 2,243.60	\$ 42,628.40	\$ 426.28	\$ 42,202.12
37	6/27/2014	\$ 245,430.80	\$ 12,271.54	\$ 233,159.26	\$ 2,331.59	\$ 230,827.67
38	7/31/2014	\$ 540,199.00	\$ 27,009.95	\$ 513,189.05	\$ 5,131.89	\$ 508,057.16
39	9/4/2014	\$ 778,993.96	\$ 38,949.70	\$ 740,044.26	\$ 7,400.44	\$ 732,643.82
40	10/2/2014	\$ 269,133.43	\$ 13,456.67	\$ 255,676.76	\$ 2,556.77	\$ 253,119.99
41	11/12/2014	\$ 385,816.42	\$ 19,290.82	\$ 366,525.60	\$ 3,665.26	\$ 362,860.34
	11/12/2014	Retainage Released	\$ 964,957.85			\$ 964,957.85
TOTAL		\$21,897,248.55	\$ 130,904.57	\$ 20,801,386.13	\$ 208,013.90	\$ 21,558,330.08

3.17 Summer Water Treatment Operations

During summer operations, groundwater was pumped from the perimeter of the tailings boundary and from the center wells within the tailing impoundment to facilitate excavation of the tailings. Summer operations occurred during the 2012 and 2013 construction seasons. Depending on the water quality of each well, the water was classified either as bypass or process water. Water from the bypass wells was pumped to the DCB and diverted around the sediment detention pond through the 18-inch HDPE line installed on the south side of the sediment detention pond. This water then discharged into the head of Storm Water Channel 5, and flowed into Soda Butte Creek below the Site.

The following wells were bypassed as part of the summer operations:

- All four C1 series wells located south of the impoundment (C1-1 through C1-4); and
- C3-1, C3-2, C3-3, C3-9, and C3-10, located north and east of the impoundment.

Flow rates of the bypass wells ranged from 228 to 420 gallons per minute (gpm). As expected, the highest flows occurred in late spring, early summer with flows gradually tapering off in late summer, early fall as the groundwater table was lowered. Pumping well flow rates were collected daily and the data are in Appendix E-11. Field and laboratory water quality monitoring data from the bypass wells are also included in Appendix E-9 and E-10. Transducer data and static water level data for the wells are included in Appendix E-8.

Process water was actively treated through the addition of hydrated lime to raise the pH and precipitate dissolved metals present in the water. Process water was pumped to the lime dosing tank, where lime slurry from the slurry tanks was added based on the incoming pH of the water. The treated water then gravity flowed from the discharge port to the RCTS for additional aeration to increase the overall efficiency of the neutralization reaction. Treated water passed through the entire length of the clockwise-rotating RCTS, then discharged into an open floor drain in the DCB floor. Chemical flocculant was added to the treated water flow prior to it entering the sediment detention pond. Water flowed through the sediment detention pond before being discharged to Soda Butte Creek via the stop log structure and Storm Water Channel 5 located at the west end of the pond.

By contract, during summer operations Contractor personnel were dedicated full time to the DCB operations—a minimum of 10 hours per day, 7 days per week. Operators managed the entire treatment system including the operation and maintenance of the lime system, RCTS unit, flocculant system, sediment detention pond, and ancillary devices required to make the system function as outlined in the *McLaren Tailings Abandoned Mine Site Reclamation Project Summer 2012-2015 Operations and Maintenance* (DEQ/MWCB-Pioneer, 2012b). The operators also completed daily sampling and field analysis for the following parameters: pH, temperature, total dissolved solids, total suspended solids, specific conductance, turbidity, field iron, and field manganese.

Along with daily sampling and field analysis, operators performed the following tasks:

- Collected, prepared, and shipped water samples for laboratory analysis on a weekly basis.
- Monitored pump flow rates and performance.
- Monitored pH levels in the dosing and at the 30-inch drop structure, prior to the discharge to the sediment detention pond.
- Responded to all alarms 24 hours per day, 7 days a week.
- Completed general maintenance of the DCB.

Groundwater from the following wells was treated as part of the summer operations:

- C2 series (C2-1 through C2-3) located in the footprint of the tailings impoundment; and
- C3-4, C3-5, C3-6, C3-7, and C3-8 located along the north side of the tailings impoundment.

Flow rates of the process wells ranged from 149 to 310 gpm. As expected, the highest flows occurred late in spring, early summer with flows gradually tapering off in late summer, early fall as the groundwater table was lowered. Field water quality monitoring, laboratory data, and system flow rates are provided in Appendix E-9, E-10, and E-11. Transducer data and static water level data for the wells are included in Appendix E-8.

3.18 Summer Water Quality

Part of the QA for water treatment at the McLaren Site required daily collection of field measurements. Additionally, technicians collected, prepared, and shipped samples to an analytical laboratory on a weekly basis. Field and laboratory sampling results are provided in Appendix E-9 and E-10. Technicians collected samples from the following four locations:

- Dosing Tank Inlet (DTI) – this sample was a base line for the process water prior to the addition of lime.
- Bypass (BP) – this sample confirmed that water being bypassed met DEQ-7 water quality standards.
- Sediment Pond Outlet (SPO) – this sample depicted the water quality after lime and flocculant addition and residence time within the sediment detention pond prior to discharge to Storm Water Channel 5.
- Storm Water Channel 5 (CHL5) – this sample, collected downgradient of the bypass and sediment pond outlets, depicted the overall water quality after both discharges had mixed prior to entering Soda Butte Creek.

Analytical results provided in Appendix E-10 indicate the water treatment system was effective at meeting DEQ-7 water quality standards. Monitoring results indicated a significant improvement in groundwater quality occurred as the tailings were removed and placed in the repository.

3.19 Winter Shutdown Inspection

At the conclusion of the summer construction season, typically at the end of September early October and prior to demobilizing equipment and personnel from the Site, Knife River completed all winter shutdown punch-list items. These items consisted primarily of reinforcing storm water runoff controls, minor Site grading, and marking all potential hazards to the snow plow and other vehicles. Water Treatment Building items included cleaning and flushing all lines, lime slurry pumps, lime slurry tanks, and the flocculant system; removing and storing pH probes; and winterizing wells C2-1, C2-2, C2-3, C3-4, C3-5, C3-6, C3-7, and C3-8 by pulling up pitless adaptor and blowing water from the lines using compressed air and removing the iron scale from the RCTS unit. Knife River would install the repository interim liner and complete hydromulching of soil stockpiles at this time.

Details of the inspections and meetings can be found on the completed project daily inspection logs/field notes provided in Appendix D and Appendix H.

3.20 Winter Operations Overview

Winter operations occurred following the 2011 and 2012 summer construction seasons. Winter operations typically began in mid-October and continued until approximately late May. Groundwater was pumped from the C1 series perimeter wells (C1-1 through C1-4) and from C3-1, C3-2, C3-3, C3-4, and C3-9.

All water during winter operations was pumped to the DCB and into the sediment detention pond. Pumped water was not treated with lime addition during winter operations because the water quality met DEQ-7 water quality standards. Water flowed through the sediment detention pond before being discharged to Soda Butte Creek via the stop log structure and into Storm Water Channel 5 located at the west end of the pond.

During winter operations, groundwater was pumped and processed through the sediment detention pond for the following reasons:

- To intercept groundwater before it entered the tailings impoundment area on the Site;
- To keep water within the sediment detention pond from completely freezing; and
- To prevent the flotation of the sediment detention pond liner during spring runoff and the associated rise in groundwater level at the Site.

During winter operations the pumping system was inspected by Contractor personnel a minimum of twice per day (during morning and afternoon hours), seven days per week as outlined in the *Final Winter 2011-2012 Operations and Maintenance for the McLaren Tailings Abandoned Mine Site Cooke City, Montana* (DEQ/MWCB-Pioneer, 2011b). Operators also performed daily sampling and field analysis for the following parameters: pH, temperature, total dissolved solids, total suspended solids, specific conductance, turbidity, field iron, and field manganese.

In addition to daily sampling and field analysis, operators performed the following tasks:

- Collected, prepared, and shipped water samples for laboratory analysis on a monthly basis.
- Monitored flow rates and performance of wells.
- Responded to all alarms 24 hours per day, 7 days a week.
- Monitored and coordinated delivery of propane for the heating system.
- Monitored and coordinated delivery of diesel for the backup generator.
- Maintained building power and heating systems.
- Removed snow and conducted Site access maintenance.

3.21 McLaren Water Treatment Summary

The Site dewatering system, which included 17 pumping wells, the DCB, and sediment detention pond, was completed and became operational in the fall of 2011 and remained operational until August of 2013. During this time, approximately 320 million gallons of water were processed through the construction dewatering system and water treatment plant. Of these 320 million gallons of water, 210 million gallons of water were pumped from the perimeter wells and bypassed either through the bypass piping system or sediment detention pond during winter operations. The remaining 110 million gallons of water were pumped from the interior of the tailings impoundment to support tailings stabilization and excavation efforts.

During the water treatment operation, water quality was monitored daily in the field for field parameters and field iron and manganese concentrations, and sampled weekly during summer operation and monthly during winter operations. There were 28 weekly sampling events between June 13 and October 10, 2012, and from June 5 to August 7, 2013. During these sampling events, the results showed that antimony, arsenic, barium, chromium, lead, mercury, nickel, and silver were not detected in the system discharge. Iron, manganese, aluminum, copper, cadmium, and zinc were detected in the discharge. Table 3-3 summarizes the system discharge for the aforementioned COCs and shows a comparison to DEQ water quality standards. There is currently no DEQ-7 water quality standard for manganese. Analytical results are in Appendix E-10.

At the completion of water treatment, the sediment detention pond was drained and the accumulated precipitates and sludge were removed and hauled to the repository and stabilized with quick lime prior to the installation of the final repository cap. The final system water quality sample was collected August 21, 2013, during the draining of the sediment pond. Upon removal of the precipitates and sludge, the liner in the sediment detention pond was removed and hauled to the Park County Landfill located in Cody, Wyoming. Sediment pond sludge sampling results are presented in Appendix E-14.

Table 3-3. System Discharge vs. DEQ Water Quality Standards

Chemical	DEQ Standard	2012 Maximum	2012 Average	2013 Maximum	2013 Average
Iron	1.0	1.2	0.50	0.60	0.34
Manganese	(0.050)	0.096	0.028	0.14	0.059
Aluminum	0.087	<0.03	<0.03	0.050	<0.03
Copper	0.012	<0.005	<0.005	0.018	0.0053
Cadmium	0.00033	0.002	<0.00008	0.00008	<0.00008
Zinc	0.15	<0.01	<0.01	0.01	<0.01

4 CONSTRUCTION

4.1 Major Equipment List

Table 4-1 on the next page lists the major pieces of equipment used for this project. All equipment delivered to the project site was thoroughly cleaned and inspected prior to delivery to the Site. Documentation of the equipment inspections throughout the project are provided in Appendix A-11.

4.2 Contractor Employees

The Contractor used 3 to 14 employees on the project Site at various times. The majority of the labor involved 5 to 8 equipment operators, with the remaining personnel serving in a supervisory capacity.

Table 4-1 . Equipment Used at the Site

TYPE	MAKE/MODEL	SIZE/CAPACITY
Lime Storage Guppy		
Semi-Tractor		Lime Pup
Track Excavator	CAT 336D	ALLU Mixing Head
PF 7+7 Pressure Feeder	ALLU	14 cubic meters
Off-Road Trucks (2 each)	CAT 740C	35 tons
Off Road Truck	Case 340B	35 tons
Track Excavator	John Deere 450C	5 cy
Track Excavator	Cat 345B	2.5 cy
Track Excavator	Cat 320E w/thumb	2.5cy
Track Bulldozer	John Deere 850J	
Track Bulldozer	John Deere 750k (LGP)	
Front End Loader	John Deere 644K	3 cy
Front End Loader	Cat 966K	3 cy
Front End Loader	Cat 980K	5 cy
Semi-Tractor On-highway	Side Dump	12 cy
Blade	CAT 140H	12-foot blade
Water Truck	CAT Articulating	4,000 gallons
Compactor	Hamm 3625	Smooth Drum Roller
Skidsteer	Case 1845C	
Skidsteer	Bobcat T650	
Man Lift	Genie S-80	
Crane	Grove RT700E	60 tons
Fuel Truck		2,500 gallons
Lime Spreader	Stoltz Site Spreader	
Agricultural Tractor	CAT Challenger	Rubber Tracked
Agricultural Disk		12 inches
Mechanics Service Truck		
Utility Terrain Vehicle (UTV)	Polaris Ranger XP UTV	

cy – cubic yards

4.3 Subcontractors

During the implementation of the project, Knife River used the following subcontractors to complete specific project tasks.

Northwest Linings & Geotextile Products, Inc.

21000 77th Avenue

Kent, Washington 98032

Phone: (253) 872-0244

Project Tasks: Installed interim cap on stabilized tailings located in repository, installed and repaired sediment detention pond liner, and installed permanent geocushion, 60-mil HPDE liner and geocomposite liner on repository.

COP Construction

242 South 64th Street West

Billings, Montana 59106

Phone: (406) 656-4632

Fax: (406) 656-4808

Project Tasks: Constructed DCB, installed DCB piping, and performed winter and summer operations and maintenance duties at the DCB. Dismantled and removed DCB and West Bridge from Site. Installed and relocated East Bridge at the Site.

Advantage Electric Plus Inc.

3505 1st Avenue South

Billings, Montana 59101

Phone: (406) 256-7446

Fax: (406) 256-7458

Project Tasks: Performed all electrical work for the DCB and perimeter wells.

Quality Landscape and Seeding

191 Lower Lynch Creek Road

Plains, Montana 59859-9556

Phone: (406) 826-7300

Project Tasks: Performed hydromulching of soil stockpiles and fertilized and seeded all disturbed areas. Completed final hydromulching of areas inaccessible to straw mulching equipment.

Marchant Reclamation

784 Shoshone Avenue

Lovell, Wyoming 82431

Phone: (307) 548-6464

Project Task: Performed final straw mulching of all disturbed area.

Northern Industrial Hygiene

201 South 30th Street

Billings, Montana 59101

Phone: (406) 245-7766

Project Tasks: Provided health and safety services for Knife River.

Dick Irvin Trucking

575 Wilson

Box 950

Shelby, Montana 59474

Phone: (406) 434-5583

Project Tasks: Transported quick lime and hydrated lime to the project Site.

Cross Country Pipeline Supply

2420 Uravan Street

Aurora, Colorado 80011-3535

Phone: (303) 361-6797

Project Tasks: Provided lime mixing equipment including the ALLU System for tailings stabilization.

TW Enterprises, Inc.

636 Logan Lane

Billings, Montana 59105

Phone: (406) 245-4600 Ext 16

Project Tasks: Provided backup generator service and repair.

Industrial Automation Consulting

123 Main Street

Three forks, Montana 59752

Phone: (406) 285-4627 Ext 120

Project Tasks: Provided DCB alarm and call out service and repair.

4.4 Major Suppliers

During the project, Knife River used the following material suppliers to complete specific project tasks.

Graymont

450 Indian Creek Road

Townsend, Montana 59644

Phone: (406) 266-5221

Provided quick lime and hydrated lime to the project Site.

Pete Lien and Sons

3292 Lien Street

Rapid City, South Dakota 57701

Phone: (605) 342-7241

Provided quick lime and hydrated lime to the project Site.

EKO Compost

1125 Clark Fork Lane
Missoula, Montana 59808
Phone: (406) 721-1423
Provided compost for soil amendment.

Rocky Mountain Compost

3060 Farley Lane
Billings, Montana 59101
Phone: (406) 690-4451
Provided compost for soil amendment.

4.5 Repository Material Analytical Results Report

In August 2013, DEQ directed Pioneer to collect additional metallurgical data from the stabilized tailings at the Site prior to placing the final cap system on the repository. This metallurgical investigation, along with the previously collected metallurgical data, was used to characterize the concentrations and amounts of select economic metals in the constructed on-site mine waste repository. The primary purpose of the investigation was to minimize the potential of damage to the repository cap resulting from future efforts to assess precious metals content of the repository. Investigation results were presented in the Final Repository Material Analytical Results report (DEQ/MWCB-Pioneer, 2013b).

Continuous core samples were collected using a 66DT Geoprobe[®] equipped with a DT22 Soil Sampling System. The core samples were then analyzed for the metallurgical, environmental, and engineering parameters below:

Metallurgical – gold (Au), silver (Ag), and copper (Cu) concentrations.

Environmental – pH, organic matter content, and the metal concentrations for antimony (Sb), aluminum (Al), arsenic (As), barium (Ba), cadmium (Cd), cobalt (Co), chromium (Cr), copper (Cu), iron (Fe), lead (Pb), manganese (Mn), mercury (Hg), nickel (Ni), and zinc (Zn).

Engineering - Particle size gradation, in-place/natural moisture, and density of the compacted tailings/mine wastes in the repository.

The amount of gold contained within the tailings ranged from a maximum of 35,159 troy ounces (oz) to a minimum of 16,965 troy oz with an average of 25,291 troy oz. Silver ranged from a maximum of 106,831 troy oz to a low of 80,122 troy oz with an average of 93,845 troy oz present in the tailings. Copper values ranged from a maximum of 1,897,372 pounds (lbs) to a minimum of 1,202,873 lbs with an average of 1,561,047 lbs.

4.6 Construction Activities

4.6.1 Project Oversight

During construction, Pioneer provided project oversight. The responsibility of the oversight personnel was to ensure that the Contractor was implementing the work as specified in DEQ Contract #410010 and communicate discrepancies to the Engineer, Owner, and Contractor. Also, oversight personnel documented the project activities by completing daily field notes (Appendix D) and Construction Daily Activity Reports (Appendix H).

4.6.2 Quality Assurance

During the construction activities, QA measures occurred daily to ensure the project activities were completed as specified in DEQ Contract #410010. These QA measures at the Site consisted of sampling amended cover soils for organic matter content, sampling compost for moisture content, sampling soil for geotechnical parameters (soil proctors), compaction testing of the structural fill and repository materials, and sampling concrete, on-site riprap, and surface water. Laboratory data sheets and results of the QA sampling and testing conducted during the construction activities at the Site are in Appendix E.

4.6.3 Project Information

Additional information collected to document the project included quick lime scale tickets and lime usage printouts from the ALLU Data Acquisition Controller (DAC), geosynthetic certifications, compost scale tickets, seed tickets, fertilizer tickets, and straw weed free certifications. These documents are included in Appendix F.

4.6.4 Bi-Weekly Progress Meetings

During the project, bi-weekly progress meetings were held at Pioneer's field office in Cooke City, Montana. The dates and location of the weekly progress meeting were mutually agreed upon by the Contractor, Owner, and Engineer and were typically held at 8:00 a.m. on every other Wednesday during the project. Knife River prepared an agenda and conducted each bi-weekly progress meeting. The meetings identified decisions required, scheduling, milestones accomplished, opportunities, problems, and corrective actions. Each meeting included a discussion of the work to be performed in the two weeks following the meeting (two-week look-ahead tasks). Field visits were conducted after each progress meeting. The bi-weekly progress meeting agenda and meeting notes are provided in Appendix G.

4.6.5 Daily Activities

Detailed descriptions of the daily construction activities observed by the Pioneer oversight personnel are in the Construction Daily Activity Reports provided in Appendix H. Knife River's quality control reports are provided in Appendix I.

4.6.6 Construction Photographs

Pioneer oversight personnel took daily construction photos to document construction activities and the implementation of project tasks. The photographs were assembled into daily photo logs

and are in Appendix J. Additional photographs are included in the construction daily activity reports (Appendix H).

5 QUANTITIES USED

5.1 Project Summary

The project was completed in 1,590 consecutive calendar days and was 1 year ahead of schedule. The shortened project schedule was largely due to the flexibility of the design, the effectiveness of the construction dewatering system, and the successful execution of the lime stabilization process. Table 5-1 summarizes the estimated and final quantities and costs associated with each pay item. The table also lists the Change Orders (modifications) that were not part of the original contract.

Table 5-1 Final Construction Quantities and Costs

Pay Item No.	ITEM DESCRIPTION	UNIT	EST. QNTY	UNIT BID PRICE	FINAL QNTY	FINAL TOTAL COST
	BASE BID SCHEDULE*					
1. Mobilization, Demobilization, Bonding, and Insurance						
	Mobilization, Demobilization, Bonding, and Insurance	L.S.	1	\$ 1,900,000.00	1.00	\$1,900,000.00
2						
a	Provide and Install West Bridge	L.S.	1	\$ 500,000.00	1.00	\$500,000.00
b	Provide and Install East Bridge	L.S.	1	\$ 285,250.00	1.00	\$285,250.00
c	Construct Temporary Haul Roads	L.F.	3,600	\$ 35.00	1,500.00	\$52,500.00
d	Maintain and Obliterate Temporary Haul Roads	L.S.	1	\$ 120,900.00	1.000	\$120,900.00
e	Clear, Grub and Timber Removal	L.S.	1	\$ 150,000.00	1.00	\$150,000.00
f	Provide, Install and Remove Jersey Barriers	E.A.	48	\$ 673.00	40.00	\$26,920.00
3	Provide and Install Electrical Systems					
a (S)	Provide and Install Electrical Systems	L.S.	1	\$ 508,000.00	1.000	\$508,000.00
4	Well Abandonment					
a	Well Abandonment	E.A.	20	\$ 1,067.00	18.00	\$19,206.00
5	Initial Construction Dewatering System					
a	Install Temporary Submersible Pump	E.A.	4	\$ 5,000.00	4.00	\$20,000.00
b	Provide and Install Temporary Piping System to Storm Water Channel #5	L.S.	1	\$ 15,200.00	1.25	\$19,000.00
c	Initial Start Up, Monthly Operation, and Maintenance of Initial Construction Dewatering System	MONTH	5	\$ 5,000.00	1.90	\$9,500.00
d	Disassemble Initial Construction Dewatering System	L.S.	1	\$ 1,000.00	1.00	\$1,000.00
6	Dewatering Control Building					
a	Grade and Install 6 inch Base Course Building Pad	L.S.	1	\$ 148,900.00	1.00	\$148,900.00
b	Install Concrete Footings and Concrete Slabs	L.S.	1	\$ 95,200.00	1.00	\$95,200.00
c	Provide and Install Dewatering Control Building	L.S.	1	\$ 158,700.00	1.00	\$158,700.00
d	Provide and Install Insulation	L.S.	1	\$ 38,100.00	1.00	\$38,100.00
e	Provide and Install Heating System	L.S.	1	\$ 31,700.00	1.00	\$31,700.00

Pay Item No.	ITEM DESCRIPTION	UNIT	EST. QNTY	UNIT BID PRICE	FINAL QNTY	FINAL TOTAL COST
f	Remove Dewatering Control Building	L.S.	1	\$ 12,700.00	1.00	\$12,700.00
7	Sediment Pond Construction					
a	Construct Sediment Detention Pond	L.S.	1	\$ 190,000.00	1.00	\$190,000.00
b	Provide and Install Sediment Detention Pond Inlet #1	L.S.	1	\$ 7,110.00	1.00	\$7,110.00
c	Provide and Install Sediment Detention Pond Inlet #2	L.S.	1	\$ 4,950.00	1.00	\$4,950.00
d	Provide and Install Perimeter Water Bypass	L.S.	1	\$ 5,841.00	1.00	\$5,841.00
e	Provide and Install Sediment Detention Pond Outlet Structure	L.S.	1	\$ 35,000.00	1.00	\$35,000.00
f	Provide and Install Sediment Detention Pond Liner	SY	6,896	\$ 10.50	6,501.00	\$68,260.50
g (S)	Provide, Install and Remove Gunderbooms	E.A.	2	\$ 53,200.00	2.00	\$106,400.00
h	Provide, Install and Remove Wildlife Exclusion Fence	L.F.	1,660	\$ 26.50	1,512.00	\$40,068.00
i	Remove Sediment Detention Pond	L.S.	1	\$ 10,000.00	1.00	\$10,000.00
8	Phase I Dewatering System Installation					
a	Phase I Dewatering System Installation	L.S.	1	\$ 175,000.00	1.00	\$175,000.00
b	Miscellaneous Phase I Dewatering Equipment and Operation	Cnstr. on Schedule	3	\$27,900.00	3.40	\$94,860.00
9	Dewatering Control Building Piping, Valves, and Instrumentation					
a	Provide and Install 2 inch Schedule 40 PVC Pipe	L.F.	240	\$ 21.50	180.00	\$3,870.00
b	Provide and Install 3 inch Schedule 40 PVC Pipe	L.F.	100	\$ 23.00	128.00	\$2,944.00
c	Provide and Install 4 inch Schedule 40 PVC Pipe	L.F.	100	\$ 33.00	79.00	\$2,607.00
d	Provide and Install 6 inch Schedule 40 PVC Pipe	L.F.	10	\$ 39.50	22.00	\$869.00
e	Provide and Install 8 inch Schedule 40 PVC Pipe	L.F.	140	\$ 51.00	114.00	\$5,814.00
f	Provide and Install 8 inch Schedule 40 PVC Pipe Coupling	E.A.	1	\$ 330.00	1.00	\$330.00
g	Provide and Install 2-inch 90 degree Schedule 40 PVC Elbow	E.A.	17	\$ 108.00	13.00	\$1,404.00
h	Provide and Install 3-inch 90 degree Schedule 40 PVC Elbow	E.A.	4	\$ 152.00	9.00	\$1,368.00
i	Provide and Install 4-inch 90 degree Schedule 40 PVC Elbow	E.A.	10	\$ 165.00	14.00	\$2,310.00
j	Provide and Install 6-inch 90 degree Schedule 40 PVC Elbow	E.A.	1	\$ 190.00	3.00	\$570.00
k	Provide and Install 8-inch 90 degree Schedule 40 PVC Elbow	E.A.	8	\$ 254.00	9.00	\$2,286.00
l	Provide and Install 8-inch X 8-inch x 6-inch 45 degree Schedule 40 PVC Reducing Wye	E.A.	1	\$ 787.00	1.00	\$787.00
m	Provide and Install 2-inch X 2-inch X 2-inch Schedule 40 PVC Pipe Tee	E.A.	28	\$ 110.00	21.00	\$2,310.00
n	Provide and Install 3-inch X 3-inch X 3-inch Schedule 40 PVC Pipe Tee	E.A.	6	\$ 116.00	10.00	\$1,160.00
o	Provide and Install 4-inch X 4-inch X 4-inch Schedule 40 PVC Pipe Tee	E.A.	2	\$ 178.00	3.00	\$534.00
p	Provide and Install 8-inch X 8-inch X 8-inch Schedule 40 PVC Pipe Tee	E.A.	2	\$ 444.00	2.00	\$888.00
q	Provide and Install 2-inch Schedule 40 PVC Pipe End Cap	E.A.	14	\$ 109.00	0.00	\$0.00
r	Provide and Install 3-inch Schedule 40 PVC Pipe End Cap	E.A.	3	\$ 105.00	3.00	\$315.00
s	Provide and Install 4-inch Schedule 40 PVC Pipe End Cap	E.A.	1	\$ 152.00	0.00	\$0.00

Pay Item No.	ITEM DESCRIPTION	UNIT	EST. QNTY	UNIT BID PRICE	FINAL QNTY	FINAL TOTAL COST
t	Provide and Install 8-inch Schedule 40 PVC Pipe End Cap	E.A.	4	\$ 203.00	3.00	\$609.00
u	Provide and Install 8-inch X 2-inch Schedule 40 PVC Clamp on Saddle	E.A.	27	\$ 241.00	20.00	\$4,820.00
v	Provide and Install 8-inch X 3-inch Schedule 40 PVC Saddle	E.A.	6	\$ 254.00	10.00	\$2,540.00
w	Provide and Install 8-inch X 4-inch Schedule 40 PVC Saddle	E.A.	3	\$ 406.00	4.00	\$1,624.00
x	Provide and Install 4-inch X 2-inch Schedule 40 PVC Reducer	E.A.	6	\$ 165.00	4.00	\$660.00
y	Provide and Install 3-inch X 2-inch Schedule 40 PVC Reducer	E.A.	8	\$ 165.00	8.00	\$1,320.00
z	Provide and Install 4-inch Schedule 40 PVC Check Valve	E.A.	2	\$ 2,158.00	2.00	\$4,316.00
aa	Provide and Install 2-Inch Air Relief Valve	E.A.	17	\$ 279.00	17.00	\$4,743.00
ab	Provide and Install 3-Inch Pipe Hangers	E.A.	3	\$ 343.00	2.00	\$686.00
ac	Provide and Install 8-Inch Pipe Hangers	E.A.	10	\$ 406.00	0.00	\$0.00
ad	Provide and Install 2-inch Flow Meter	E.A.	12	\$ 2,412.00	12.00	\$28,944.00
ae	Provide and Install 8-inch Flow Meter	E.A.	1	\$ 6,602.00	1.00	\$6,602.00
af	Provide and Install 2-inch Gate Valve	E.A.	13	\$ 203.00	11.00	\$2,233.00
ag	Provide and Install 3-inch Gate Valve	E.A.	4	\$ 267.00	6.00	\$1,602.00
ah	Provide and Install 4-inch Gate Valve	E.A.	1	\$ 508.00	1.00	\$508.00
ai	Provide and Install 6-inch Lever Handle Type Butterfly Valve	E.A.	1	\$ 533.00	0.00	\$0.00
aj	Provide and Install 8-inch Lever Handle Type Butterfly Valve	E.A.	3	\$ 736.00	3.00	\$2,208.00
ak	Provide and Install 6-inch ANSI PVC Flange for 6" Butterfly Valve	E.A.	2	\$ 203.00	0.00	\$0.00
al	Provide and Install 8-inch ANSI PVC Flange	E.A.	8	\$ 241.00	8.00	\$1,928.00
am	Provide and Install 2-inch PVC Ball Valve	E.A.	26	\$ 178.00	27.00	\$4,806.00
an	Provide and Install 3-inch PVC Ball Valve	E.A.	8	\$ 216.00	11.00	\$2,376.00
ao	Provide and Install 4-inch PVC Ball Valve	E.A.	8	\$ 279.00	8.00	\$2,232.00
ap	Provide and Install 2-inch Unistrut Clamp	E.A.	42	\$ 165.00	32.00	\$5,280.00
aq	Provide and Install 3-inch Unistrut Clamp	E.A.	12	\$ 190.00	29.00	\$5,510.00
ar	Provide and Install 4-inch Unistrut Clamp	E.A.	7	\$ 216.00	12.00	\$2,592.00
as	Provide and Install 8-inch Unistrut Clamp	E.A.	11	\$ 203.00	11.00	\$2,233.00
at	Provide and Install Unistrut "L" Bracket	E.A.	4	\$ 305.00	3.00	\$915.00
au	Provide and Install Unistrut Channel	L.F.	126	\$ 33.00	184.00	\$6,072.00
av	Provide and Install 2-inch Female Cam-Lok	E.A.	5	\$ 203.00	2.00	\$406.00
aw	Provide and Install 2-inch Male Cam-Lok	E.A.	5	\$ 190.00	4.00	\$760.00
ax	Provide and Install 4-inch Female Cam-Lok	E.A.	9	\$ 203.00	7.00	\$1,421.00
ay	Provide and Install 4-inch Male Cam-Lok	E.A.	11	\$ 203.00	9.00	\$1,827.00
az	Provide and Install 4-inch Cam-Lok Protective Cover	E.A.	2	\$ 330.00	2.00	\$660.00
ba	Provide and Install 8-inch Male Cam-Lok	E.A.	1	\$ 432.00	1.00	\$432.00
bb	Provide and Install 8-inch Cam-Lok Protective Cover	E.A.	1	\$ 432.00	1.00	\$432.00
bc	Provide and Install 3-inch Poly Tank Fitting (Bulkhead)	E.A.	2	\$ 279.00	0.00	\$0.00
bd	Provide and Install 4-inch Poly Tank Fitting (Bulkhead)	E.A.	7	\$ 394.00	0.00	\$0.00

Pay Item No.	ITEM DESCRIPTION	UNIT	EST. QNTY	UNIT BID PRICE	FINAL QNTY	FINAL TOTAL COST
be	Provide and Install 6-inch Poly Tank Fitting (Bulkhead)	E.A.	2	\$ 597.00	0.00	\$0.00
bf	Provide and Install 2-inch Schedule 40 PVC Union	E.A.	30	\$ 165.00	14.00	\$2,310.00
bg	Provide and Install 4-inch Pipe Penetration Boot	E.A.	2	\$ 368.00	0.00	\$0.00
bh	Provide and Install 8-inch Pipe Penetration Boot	E.A.	1	\$ 521.00	0.00	\$0.00
bi	Provide and Install 2-Inch Flex Hose	L.F.	32	\$ 14.00	18.00	\$252.00
bj	Provide and Install 4-Inch Flex Hose	L.F.	32	\$ 20.50	36.00	\$738.00
bk	Provide and Install Eye Wash Station	E.A.	2	\$ 648.00	2.00	\$1,296.00
bl	Provide and Install 4-Inch Female Thread Adaptor to Threaded Male Cam-Lock to PVC	E.A.	11	\$ 190.00	16.00	\$3,040.00
bm	Provide and Install 2-Inch Female Thread Adaptor to Threaded Male Cam-Lock to PVC	E.A.	5	\$ 190.00	34.00	\$6,460.00
bn	Provide and Install 3/4-Inch Petcocks Brass	E.A.	6	\$ 178.00	2.00	\$356.00
bo	Provide and Install 8-Inch by 3/4-Inch PVC Tapping Saddle	E.A.	6	\$ 254.00	2.00	\$508.00
bp	Provide and Install 3-inch Flow Meter	E.A.	5	\$ 1,778.00	5.00	\$8,890.00
bq	Provide and Install 4-inch Flow Meter	E.A.	1	\$ 2,285.00	1.00	\$2,285.00
br	Provide and Install 3-inch ANSI PVC Flange	E.A.	10	\$ 178.00	10.00	\$1,780.00
bs	Provide and Install 4-inch ANSI PVC Flange	E.A.	2	\$ 178.00	10.00	\$1,780.00
10	Provide and Install Water Treatment System					
a	Provide and Install Horizontal Screw Conveyor	L.S.	1	\$ 38,100.00	1.00	\$38,100.00
b	Provide and Install 600 Gallon Lime Slurry Tanks	E.A.	2	\$ 25,400.00	2.00	\$50,800.00
c	Provide and Install 3/4 HP Lime Slurry Mixers	E.A.	2	\$ 12,700.00	2.00	\$25,400.00
d	Provide and Install Tank Level Indicator	E.A.	1	\$ 12,700.00	1.00	\$12,700.00
e	Provide and Install Air Actuated Knife Valves	E.A.	2	\$ 6,348.00	2.00	\$12,696.00
f	Provide and Install 3-Gallon Air Compressor	L.S.	1	\$ 2,539.00	1.00	\$2,539.00
g	Provide and Install 2 HP Lime Slurry Pump	E.A.	1	\$ 31,700.00	1.00	\$31,700.00
h	Provide and Install Dosing Tank and Stand	E.A.	1	\$ 15,200.00	1.00	\$15,200.00
i	Provide and Install Dosing Tank Mixer	E.A.	1	\$ 12,700.00	1.00	\$12,700.00
j	Provide and Install pH Probe and Controller	E.A.	4	\$ 2,500.00	4.00	\$10,000.00
k (S)	Provide and Install RCTS-60HS	E.A.	1	\$ 190,500.00	1.00	\$190,500.00
l	Provide and Install Lime Silo	L.S.	1	\$ 76,200.00	1.00	\$76,200.00
m	Provide and Install Staircase and Platform	L.S.	1	\$ 31,700.00	1.00	\$31,700.00
11	Flocculant System					
a	Provide and Install 200 Gallon Flocculant Mixing Tank	E.A.	1	\$ 11,400.00	1.00	\$11,400.00
b	Provide and Install 3/4 HP mixer	E.A.	1	\$ 12,700.00	1.00	\$12,700.00
c	Provide and Install Peristaltic Pump, Tubing, and PVC Pipe	L.S.	1	\$ 11,400.00	2.00	\$22,800.00
12	Water Treatment System Operation, Maintenance and Monitoring					
a	Summer Operation, Maintenance, and Monitoring	30 Calendar Days	15	\$ 22,900.00	7.35	\$168,315.00
b	Winter Operation, Maintenance, and Monitoring	30 Calendar Days	21	\$ 24,100.00	15.00	\$361,500.00
c	Snow Removal	E.A.	148	\$ 190.00	69.00	\$13,110.00

Pay Item No.	ITEM DESCRIPTION	UNIT	EST. QNTY	UNIT BID PRICE	FINAL QNTY	FINAL TOTAL COST
d	Provide, Store, and Handle Anionic Flocculant	55-gallon drums	6	\$ 2,539.00	7.00	\$17,773.00
e	Provide, Store, and Handle Hydrated Lime Product	Tons	198	\$ 216.00	23.14	\$4,998.24
13	Maintenance of Major Equipment					
a	Lime Screw Conveyor Shear Pins/Flex Coupling	E.A.	1	\$ 8,634.00	0.00	\$0.00
b	Lime Screw Conveyor Motor	E.A.	1	\$ 3,047.00	0.00	\$0.00
c	Lime Slurry and Dosing Tank Mixers	E.A.	1	\$ 6,095.00	0.00	\$0.00
d	Flocculant Tank Mixer	E.A.	1	\$ 6,095.00	0.00	\$0.00
e	Lime Slurry Pump	E.A.	1	\$ 14,100.00	0.00	\$0.00
f	Peristaltic Pump	E.A.	1	\$ 4,825.00	0.00	\$0.00
g	Peristaltic Pump Head Assembly	E.A.	1	\$ 2,412.00	1.00	\$2,412.00
h	Tank Level Indicators	E.A.	1	\$ 6,095.00	0.00	\$0.00
i	Influent Line 8" Flow Meter	E.A.	1	\$ 7,491.00	0.00	\$0.00
j	pH Probe and Controller	E.A.	1	\$ 6,095.00	0.00	\$0.00
k	RCTS-60 Motor	E.A.	1	\$ 2,793.00	0.00	\$0.00
l	5-HP Submersible Pump	E.A.	1	\$ 4,571.00	2.50	\$11,427.50
m	7-HP Submersible Pump	E.A.	1	\$ 5,079.00	0.00	\$0.00
n	1-HP Submersible Pump	E.A.	1	\$ 3,047.00	0.00	\$0.00
o	1.5-HP Submersible Pump	E.A.	1	\$ 3,047.00	0.00	\$0.00
p	2-inch Flow Meter	E.A.	1	\$ 3,809.00	0.00	\$0.00
q	3-inch Flow Meter	E.A.	1	\$ 3,174.00	0.00	\$0.00
r	4-inch Flow Meter	E.A.	1	\$ 3,682.00	0.00	\$0.00
s	Sediment Pond Sludge Removal	E.A.	6	\$ 44,400.00	1.00	\$44,400.00
t	Cleaning of IWT RCTS-60HS Unit	E.A.	3	\$ 1,905.00	2.00	\$3,810.00
14	Construct, Operate and Maintain Phase II Dewatering System					
a	Construct, Operate, and Maintain Phase II Dewatering System	L.S.	1	\$ 23,800.00	0.00	\$0.00
15	Stabilization /Dehydration of Mine Wastes					
a	Strip, load, Haul and Stockpile Cover Soils	CY	48,128	\$ 7.00	83,700.00	\$585,900.00
b	Provide, Store, and Handle Quick Lime Product	TON	13,400	\$ 260.00	13,268.53	\$3,449,817.80
c	Stabilization of Tailings and Other Saturated Mine Wastes/Impacted Soils	BCY	168,915	\$ 22.50	247,848.00	\$5,576,580.00
16	Excavate Repository and Stockpile Soil					
a	Excavate Repository and Stockpile Soil	BCY	60,400	\$ 5.00	82,666.00	\$413,330.00
b	Construct Earthen Dams	L.S.	1	\$ 20,300.00	1.00	\$20,300.00
c	Partially Backfill Existing Dry Channel	L.S.	1	\$ 35,800.00	1.00	\$35,800.00
17	Install Repository Cap					
a	Provide and Install Interim Cap	SY	43,750	\$ 7.00	43,511.00	\$304,577.00
b (S)	Provide and Install Geocushion	SY	26,500	\$ 3.10	23,588.00	\$73,122.80
c (S)	Provide and Install HDPE Cap Liner	SY	26,500	\$ 14.50	23,588.00	\$342,026.00
d (S)	Provide and Install Geocomposite Drainage Material	SY	26,500	\$ 5.40	23,733.60	\$128,161.44
e	Install Repository Cover Soil Cap	CY	25,000	\$ 9.80	28,175.00	\$276,115.00
18	Organic Amendment					
a	Organic Amendment	Dry Tons	6,818	\$ 144.00	4,757.50	\$685,080.00
19	Backfill Excavated Areas with Amended Cover Soil					

Pay Item No.	ITEM DESCRIPTION	UNIT	EST. QNTY	UNIT BID PRICE	FINAL QNTY	FINAL TOTAL COST
a	Backfill Excavated Areas with Amended Cover Soil	L.CY	43,560	\$ 10.00	35,550.00	\$355,500.00
20	Stream Reconstruction					
a	Soda Butte Creek Reconstruction	L.F.	1,475	\$ 300.00	1,317.00	\$395,100.00
b	Miller Creek Reconstruction	L.F.	525	\$ 300.00	467.00	\$140,100.00
c	Soda Butte Creek Grade Control Structures	E.A.	32	\$ 4,004.00	32.00	\$128,128.00
d	Miller Creek Grade Control Structures	E.A.	14	\$ 4,200.00	10.00	\$42,000.00
e	Install Isolation Cofferdams	E.A.	3	\$ 8,533.00	1.00	\$8,533.00
f	Install Willow Fascines	L.F.	400	\$ 14.00	400.00	\$5,600.00
g	Install Willow Brush Layer	L.F.	1,300	\$ 12.50	1,259.00	\$15,737.50
h	Install Tree Boles with Root Wads	L.S.	1	\$ 4,292.00	1.00	\$4,292.00
i	Install Log Grade Control Structures	E.A.	2	\$ 1,682.00	3.00	\$5,046.00
j	Install Log Wing Deflectors	E.A.	3	\$ 1,082.00	2.00	\$2,164.00
k	Backfill and Grade Former Soda Butte Creek Channel	L.S.	1	\$ 21,900.00	1.00	\$21,900.00
l	Relocate East Bridge	L.S.	1	\$ 44,400.00	1.00	\$44,400.00
m	Remove and Dispose of West Bridge	L.S.	1	\$ 31,700.00	1.00	\$31,700.00
21	Storm Water Control Systems					
a	Construct Type 1 Grass Lined Channel	L.F.	700	\$ 65.00	711.00	\$46,215.00
b	Construct Type 2 Grass Lined Channel	L.F.	380	\$ 80.50	0.00	\$0.00
c	Construct Type 3 Grass Lined Channel	L.F.	400	\$ 59.50	400.00	\$23,800.00
d	Construct Type 3 Riprap Channel	L.F.	10	\$ 247.00	122.00	\$30,134.00
e	Construct Grouted Riprap Channel	L.F.	120	\$ 179.00	785.00	\$140,515.00
f	Construct Storm Water Drain System	L.F.	720	\$ 63.00	718.00	\$45,234.00
g	Construct Repository Grouted Riprap Lined V-Channel	L.F.	710	\$ 196.00	0.00	\$0.00
h	Construct RPP Lined Channel	L.F.	190	\$ 39.50	160.00	\$6,320.00
i	Install 36" HDPE Culvert	L.S.	1	\$ 6,873.00	1.00	\$6,873.00
j	Install 24" HDPE Culvert	L.S.	1	\$ 2,167.00	1.00	\$2,167.00
k	Install 36" inch Temporary HDPE/CMP Culvert	L.S.	1	\$ 7,387.00	0.00	\$0.00
22	Install Erosion Control Mat					
a	Install Erosion Control Mat	SY	8,100	\$ 4.40	6,461.00	\$28,428.40
23	Fertilize and Seed					
a	Upland Areas	AC	31	\$ 1,320.00	26.65	\$35,178.00
b	Riparian Areas (Stream banks)	AC	0.8	\$ 8,100.00	0.80	\$6,480.00
24	Mulch					
a	Straw Mulch	AC	26	\$ 3,335.00	17.80	\$59,363.00
b	Hydromulch	AC	5	\$ 4,099.00	17.50	\$71,732.50
25	Plant Tree and Shrub Tubelings					
a	Plant Russet Buffaloberry Shrub Tubelings	E.A.	600	\$ 14.00	600.00	\$8,400.00
b	Plant Douglas-Fir Tree Seedlings	E.A.	400	\$ 14.00	400.00	\$5,600.00
26	Install Construction BMPs					
a (S)	Install Compost Filter Sox	L.F.	1,800	\$ 9.90	2,026.00	\$20,057.40
b	Install Stream Protection Structures	L.F.	1,040	\$ 12.00	936.00	\$11,232.00
c	Install Stone Check Dams	E.A.	6	\$ 443.00	6.00	\$2,658.00
A-2	Excavate, Load, Haul, Stockpile, Scale and Transport Stabilized Tailings Materials to Off-Site Processing Facility					\$0.00

Pay Item No.	ITEM DESCRIPTION	UNIT	EST. QNTY	UNIT BID PRICE	FINAL QNTY	FINAL TOTAL COST
A-2a	Provide, Install and Remove Truck Scale	Cnstr. on Schedule	1	\$ 100,000.00	0.00	\$0.00
A-2b	Excavate, Load, Haul, Stockpile, and Transport Stabilized Tailings Materials to Off-Site Processing Facility	Ton	68,700	\$ 63.50	0.00	\$0.00
A-2c	Excavate, Load, Haul, Place and Compact Stabilized Tailings, Mine Wastes and Impacted Soils in the Repository	CY	148,800	\$ 5.00	243,150.00	\$1,215,750.00
SUBTOTAL AMOUNT						\$21,040,452.08
CHANGE ORDERS						
1	Change Order #1	L.S.	1	\$ 24,912.60	1.00	\$24,912.60
2	Change Order #2 - adjusted in 16, A2a, A2b, A2c					
2	Adjustment in QTY for Bid Item 16	CY	27,400	\$ 5.00		
2	Adjustment in QTY for Bid Item A-2a	Cnstr Schedule	-1	\$ 100,000.00		
2	Adjustment in QTY for Bid Item A-2b	Ton	-68,700	\$ 63.50		
2	Adjustment in QTY for Bid Item A-2c	CY	41,000	\$ 5.00		
3	Change Order #3	L.S.	1	\$ 1,890.00	1.00	\$1,890.00
4	Change Order #4	L.S.	1	\$ 8,922.49	1.00	\$8,922.49
5	Change Order \$5 - Work Directive 26 - Sub Drain	L.S.	1	\$ 23,400.00	1.00	\$23,400.00
6	Change Order #6 - Additional Sed pond Embankment	L.S.	1	\$ 92,520.00	1.00	\$92,520.00
7	Change Order #7 - Treatment Building adds (COP COR 11 - 21)	L.S.	1	\$ 55,684.07	1.00	\$55,684.07
8	Change Order #8 - Wells, Building, Sed Pond (w/o fuel adjustment)	L.S.	1	\$ 395,666.32	1.00	\$395,666.32
9	Change Order #9 - Liner Remove, BMP, Drum, 2013 Fuel adjust	L.S.	1	\$ 104,980.64	1.00	\$104,980.64
10	Change Order #10 - WCD #42 and #44	L.S.	1	\$ 30,885.00	1.00	\$30,885.00
	Change Order #10 - Fuel Adjustments 2014 (previously paid)	L.S.	1	\$ 117,935.95	1.00	\$117,935.95
	Change Order #10 - Overbilled Fuel Adjustment Compared to CO	L.S.	1	\$ (0.60)	1.00	(\$0.60)
	Change Order #10 - Final Over/Underruns (for contract column only, already accounted for in progress columns)					
99	Rounding Error Amount To Match Project Completion					
TOTAL CHANGE ORDER AMOUNT						\$856,796.47
TOTAL PROJECT COST						\$21,897,248.55

Legend: AC: acreage. BCY: bank cubic yards CY: cubic yards. E.A.: each.
L.CY: Loose cubic yards L.F.: linear feet. L.S.: lump sum. PVC: polyvinyl chloride
SY: square yards.

6 TOTAL PROJECT COSTS

The total construction cost for the McLaren Tailings Abandoned Mine Site Reclamation Project was \$21,897,248.55. Knife River's original bid was \$24,243,731.50; 10 change orders were issued resulting in a decrease of \$2,346,482.95.

Site characterization and environmental investigation and preparation of the *Draft Final Expanded Engineering Evaluation/Cost Analysis for the McLaren Tailings Abandoned Site, Cook City, Montana* (DEQ/MWCB-Pioneer, 2002) costs were \$90,821.29. Reclamation design investigation costs were \$221,608.60. Costs for engineering design and bid specification preparation were \$491,565.84. Electrical design and installation oversight was performed by MSE Technology Applications, Inc. for \$25,538.99. Construction inspection and management costs were \$1,445,464.72.

Installation and testing of the construction dewatering wells was performed by O'Keefe Drilling under DEQ Contract #410006. Construction costs were \$262,757.50. Total engineering costs for bid specification development and construction oversight were \$37,541.68 for a total cost of \$300,299.18 (DEQ/MWCB-Pioneer, 2010).

Table 6-1 lists the Site characterization, engineering, and construction costs for the project. The total project cost was \$24,472,547.17. The percent of total project characterization, engineering, and management costs compared to total project construction costs was 10.4%.

Table 6-1. Analysis of Engineering and Construction Costs

SITE CHARACTERIZATION AND ENGINEERING SERVICES	AMOUNT
Site Investigation and EEE/CA Preparation	\$90,821.29
Reclamation Design Investigation and Report	\$221,608.60
Dewatering Wells Bid Specifications, Development, and Oversight	\$37,541.68
Engineering Design and Bid Specification Preparation	\$491,565.84
Electrical Design, Bid Specifications, and Oversight (MSE Technologies Applications Inc.)	\$25,538.99
Construction Inspection and Management	\$1,445,464.72
Total Engineering Costs	\$2,312,541.12
CONSTRUCTION SERVICES	
Installation and Testing of Construction Dewatering Wells 2009 (O'Keefe Drilling) DEQ Contract #410006	\$262,757.50
Knife River Original Contract (DEQ Contract #410010)	\$24,243,731.50
Change Orders	(\$2,346,482.95)
Total Construction Costs	\$22,160,006.05
TOTAL PROJECT COST (Engineering and Construction)	
	\$24,472,547.17
Planning-Characterization/Construction Cost	1.4%
Engineering Design/Construction Cost	2.5%
Construction Management/Construction Cost	6.5%
Total Engineering Cost/Construction Cost	10.4%
Total Engineering Cost/Total Project Cost	9.4%

7 POST CONSTRUCTION

7.1 Site Conditions after Completion

The McLaren Tailings Abandoned Mine Site Reclamation Project is 100% complete. The tailings and waste rock sources that were responsible for negatively impacting Soda Butte Creek and Miller Creek have been removed and placed in an on-site repository. Soda Butte and Miller creeks have been reconstructed as functional, stable land forms. A final Site inspection will be conducted in the summer of 2015.

Water quality in the constructed channel of Soda Butte was sampled 4 times in 2013 and twice in 2014. The 2013 sampling was conducted at the downstream (west) end of Soda Butte Creek on July 24, August 21, September 4, and October 4. The measured iron concentration on August 21 (1.43 mg/L) exceeded the DEQ-7 water quality standard (1.0 mg/L). This sampling event

occurred during Site work that included the draining of the sediment detention pond. The measured copper concentrations on August 21 and October 4 were equal to the DEQ-7 standard (0.013 mg/L for 150 mg/L hardness). The 2014 sampling was conducted on August 6 and September 17 at 3 locations along Soda Butte Creek: the upstream end, the junction of Soda Butte Creek and Miller Creek near the center of the Site, and at the downstream end of the constructed creek channel. All COCs were below DEQ-7 water quality criteria at the 3 sampling locations during both sampling events. Laboratory analytical reports are included in Appendix E.

7.2 Maintenance or Follow-Up

Follow-up or Site maintenance will be determined based on the findings of the warranty inspection and post-reclamation monitoring.

7.3 As-Built Drawings

Pioneer prepared the As-Built Drawings based on field survey data and field notes. The As-Built Drawings represent the Site conditions after completion of construction activity. The As-Built Drawings are provided in Appendix K.

8 REFERENCES

- Boughton, G. K., 2001. Metal Loading in Soda Butte Creek Upstream of Yellowstone National Park, Montana and Wyoming: A Retrospective Analysis of Previous Research; and Quantification of Metal Loading, August 1999, U.S. Geological Survey Water-Resources Investigations Report 01-4170.
- DEQ, 2002. Water Quality Restoration Plan for the Cooke City TMDL Planning Area, September 23, 2002.
- DEQ/MWCB-Pioneer, 2002. Draft Final Expanded Engineering Evaluation/Cost Analysis for the McLaren Tailings Abandoned Mine Site, Cook City, Montana. Montana Department of Environmental Quality, Mine Waste Cleanup Bureau, Pioneer Technical Services, Inc., May 2002.
- DEQ/MWCB-Pioneer, 2009. Final Reclamation Design Report for the McLaren Tailings Abandoned Mine Site Cooke City, Montana. Montana Department of Environmental Quality, Mine Waste Cleanup Bureau, Pioneer Technical Services, Inc., April 2009.
- DEQ/MWCB-Pioneer, 2010. Construction Completion Report for the McLaren Tailings Abandoned Mine Site Pumping Well Installation, Development, And Testing, DEQ Contract No. 410006. Pioneer Technical Services, Inc., Dec 23, 2009.
- DEQ/MWCB-Pioneer, 2011a. [2010] Final Construction Completion Report for the McLaren Tailings Abandoned Mine Site Reclamation Project, DEQ Contract No., 41001. Montana Department of Environmental Quality, Mine Waste Cleanup Bureau, Pioneer Technical Services, Inc., February 18, 2011.
- DEQ/MWCB-Pioneer, 2011b. Final Winter 2011-2012 Operations and Maintenance for the McLaren Tailings Abandoned Mine Site Cooke City, Montana. Montana Department of Environmental Quality, Mine Waste Cleanup Bureau, Pioneer Technical Services, Inc. November 2011.
- DEQ/MWCB-Pioneer, 2012a. [2011] Final Construction Completion Report for the McLaren Tailings Abandoned Mine Site Reclamation Project, DEQ Contract No., 41001. Montana Department of Environmental Quality, Mine Waste Cleanup Bureau, Pioneer Technical Services, Inc., April 30, 2012.
- DEQ/MWCB-Pioneer, 2012b. McLaren Tailings Abandoned Mine Site Reclamation Project Summer 2012- 2015 Operations and Maintenance. Montana Department of Environmental Quality, Mine Waste Cleanup Bureau, Pioneer Technical Services, Inc. April 2012.
- DEQ/MWCB-Pioneer, 2013a. Final 2012 Construction Completion Report for the McLaren Tailings Abandoned Mine Site. Montana Department of Environmental Quality, Mine Waste Cleanup Bureau, Pioneer Technical Services, Inc., April 26, 2013.
- DEQ/MWCB-Pioneer, 2013b. Final Repository Material Analytical Results for the McLaren Tailings Abandoned Mine Site. Montana Department of Environmental Quality, Mine Waste Cleanup Bureau, Pioneer Technical Services, Inc., January 29, 2014.

Appendix A-J

(Available separately in electronic format)

Appendix A	Project Correspondence
Appendix A-1	Department of Justice/Environmental Protection Agency/State of Montana Agreement
Appendix A-2	Pre-Bid Conference Minutes
Appendix A-3	Golden Sunlight Mine Site Visit
Appendix A-4	Bid Results
Appendix A-5	Notice of Award
Appendix A-6	DEQ Agreement
Appendix A-7	Notice to Proceed
Appendix A-8	Pre-Construction Meeting Minutes
Appendix A-9	Project Submittals
Appendix A-10	Work Directive Changes
Appendix A-11	Equipment Inspections
Appendix A-12	Substitutions
Appendix A-13	Substantial Completion Certificate
Appendix B	Contract Change Orders
Appendix C	Payment Requests
Appendix D	Daily Field Notes
Appendix E	Laboratory Data
Appendix E-1	Cover Soil Results
Appendix E-2	Amended Soil Results
Appendix E-3	Compost Organic Carbon and Moisture Results
Appendix E-4	Soil Proctor Results
Appendix E-5	Compaction Results
Appendix E-6	Concrete Testing Results
Appendix E-7	Stabilized Tailings Moisture Results
Appendix E-8	Well Transducer Results
Appendix E-9	Field Water Quality Results
Appendix E-10	Laboratory Water Quality Results
Appendix E-11	Well Flow Results
Appendix E-12	Upland Seed Mix Analysis
Appendix E-13	Unknown Drum Results
Appendix E-14	Sediment Pond Sludge Results
Appendix F	Project Information
Appendix F-1	Compost Scale Tickets
Appendix F-2	Hydrated Lime Delivery Tickets
Appendix F-3	Quick Lime Scale Tickets
Appendix F-4	ALLU Data Acquisition Controller (DAC)
Appendix F-5	Seed Tickets
Appendix F-6	Weed Seed Free Straw Certificates
Appendix F-7	Fertilizer Blend Tickets
Appendix G	Bi-Weekly Construction Progress Meeting Minutes
Appendix H	Construction Daily Activity Reports
Appendix I	Knife River Quality Control Reports Construction
Appendix J	Photographs

Appendix K
2014 As-Built Drawings

FINAL AS-BUILTS MCLAREN TAILINGS ABANDONED MINE SITE RECLAMATION PROJECT COOKE CITY, MONTANA



PREPARED FOR

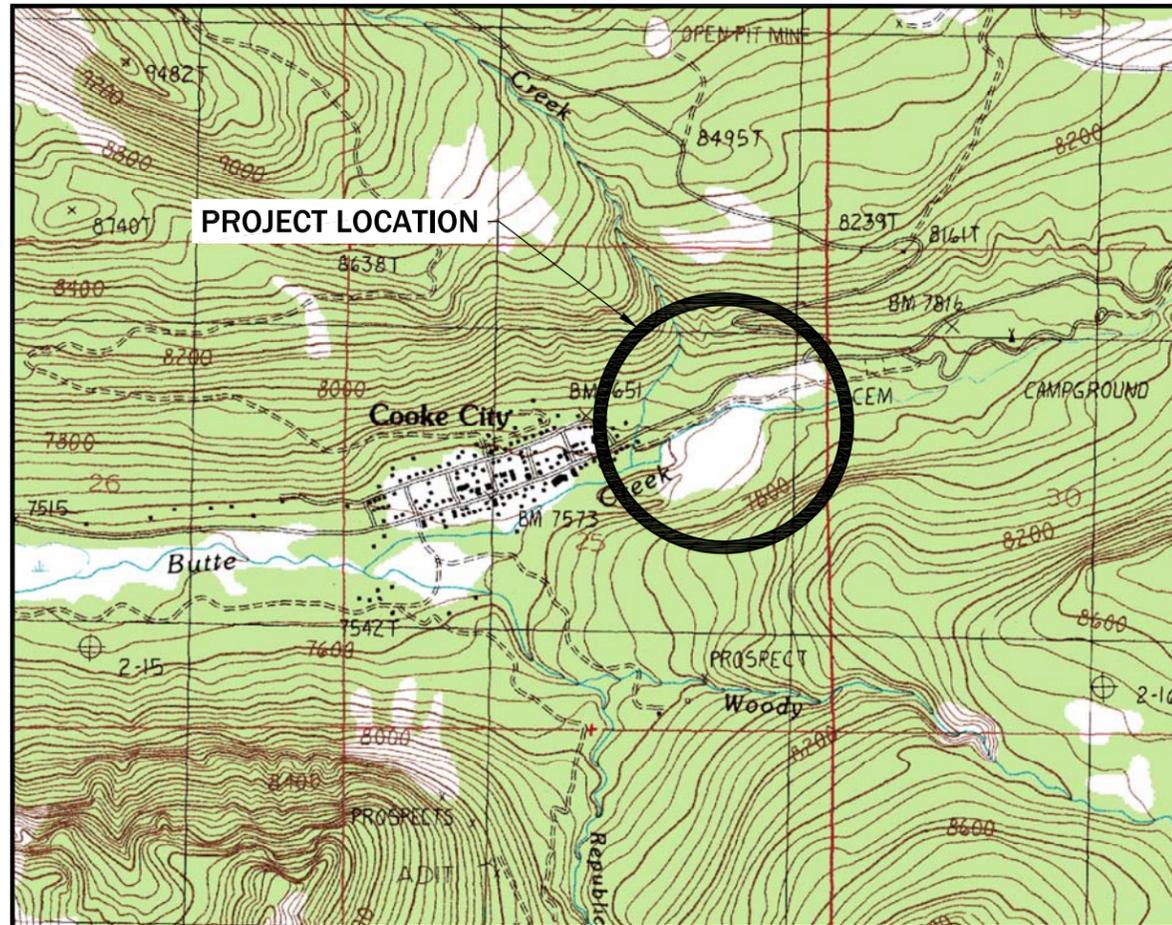
MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY MINE WASTE CLEANUP



PREPARED BY

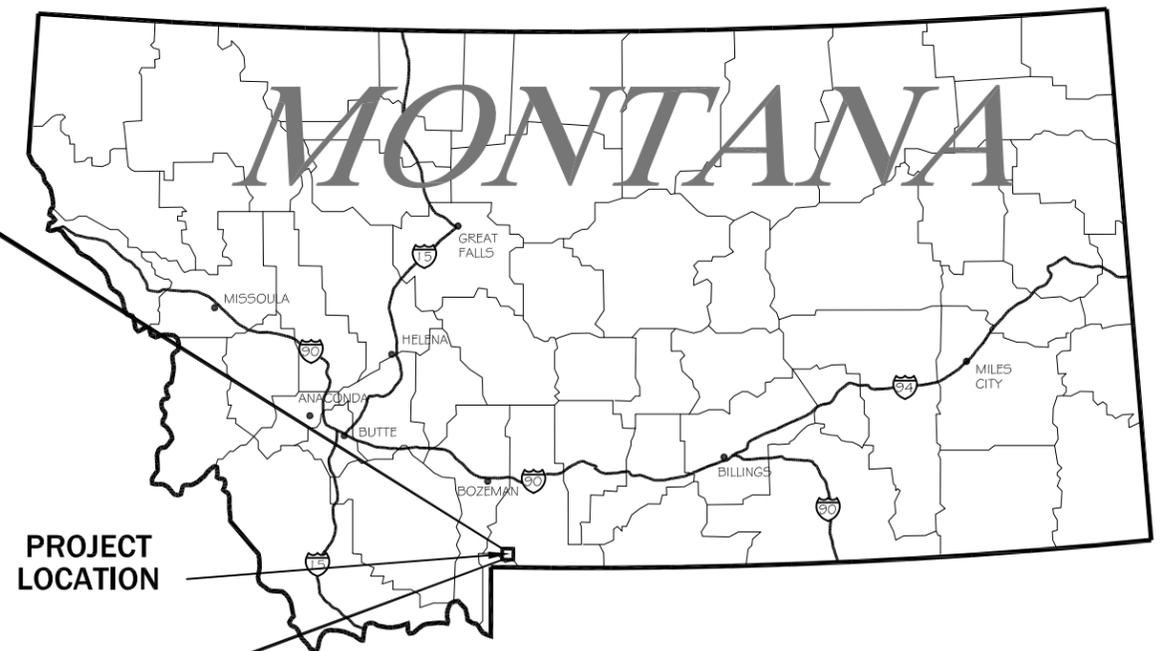
PIONEER TECHNICAL SERVICES, INC.

APRIL 8, 2015



SITE VICINITY MAP

SOURCE: 7.5 MINUTE USGS QUADS



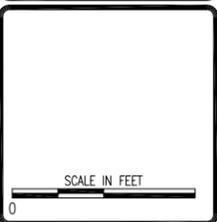
SHEET INDEX

SHEET NO.	DESCRIPTION	SHEET NO.	DESCRIPTION	SHEET NO.	DESCRIPTION
G-1AB	COVER	SW-1AB	STORM WATER CONTROLS PLAN VIEW	FD-1AB	WEST BRIDGE ABUTMENT DETAILS
G-2AB	LEGEND	SW-2AB	CHANNEL #1 PLAN AND PROFILE	FD-2AB	STRUCTURAL REINFORCED EMBANKMENT DETAILS
G-3AB	SHEET INDEX	SW-3AB	CHANNEL #2 PLAN AND PROFILE	FD-3AB	EAST BRIDGE ABUTMENT DETAILS
G-4AB	SITE VICINITY MAP	SW-4AB	CHANNEL #3 PLAN AND PROFILE	FD-4AB	HAUL ROAD DETAIL
G-5AB	PROJECT OVERVIEW	SW-5AB	CHANNEL #4 PLAN AND PROFILE	FD-5AB	JERSEY BARRIER DETAILS
F-1AB	PROJECT FACILITIES PLAN VIEW	SW-6AB	CHANNEL #5 PLAN AND PROFILE	FD-6AB	WILDLIFE EXCLUSION FENCE DETAIL
F-2AB	WEST BRIDGE PLAN AND PROFILE	SW-7AB	STORM WATER DRAIN PLAN AND PROFILE	FD-7AB	WILDLIFE EXCLUSION FENCE DETAILS
F-3AB	EAST BRIDGE PLAN AND PROFILE	SW-8AB	REPOSITORY STORM WATER RUN-ON CONTROL CHANNEL PLAN AND PROFILE STA 0+00 TO 8+00	FD-8AB	WEST BRIDGE PROFILE SECTION VIEW
F-4AB	HAUL ROAD PLAN VIEW	SW-9AB	REPOSITORY STORM WATER RUN-ON CONTROL CHANNEL PLAN AND PROFILE STA 8+00 TO 13+31	FD-9AB	WEST BRIDGE CROSS SECTION STA 1+25 TO 2+20
F-5AB	CLEAR, GRUB, AND TIMBER REMOVAL PLAN VIEW	SW-11AB	SOUTHSIDE SWALE		
F-6AB	TRAFFIC CONTROL SIGNAGE PLAN				
WRE-1AB	WASTE ROCK EXCAVATION PLAN VIEW	STR-1AB	STREAM RECONSTRUCTION PLAN VIEW	GWD-1AB	TYPICAL 30 TO 120 GPM PUMPING WELL DETAIL
WRE-2AB	WASTE ROCK EXCAVATION CROSS SECTIONS STA 0+00 TO 4+50	STR-2AB	SODA BUTTE CREEK PLAN AND PROFILE STA 0+00 TO 6+50	GWD-2AB	TYPICAL 100 TO 200 GPM PUMPING WELL DETAIL
WRE-3AB	WASTE ROCK EXCAVATION CROSS SECTIONS STA 5+00 TO 5+50	STR-3AB	SODA BUTTE CREEK PLAN AND PROFILE STA 6+50 TO 14+75	GWD-3AB	SEDIMENT DETENTION POND DETAILS
		STR-4AB	MILLER CREEK PLAN AND PROFILE STA 0+00 TO 5+25	GWD-4AB	OUTLET STRUCTURE DETAILS
				GWD-5AB	OUTLET STRUCTURE DETAILS
TE-1AB	TAILINGS EXCAVATION AND SEQUENCE	C-1AB	REVEGETATION PLAN	GWD-6AB	LINER DETAILS
TE-2AB	TAILINGS EXCAVATION CROSS SECTIONS STA 2+00 TO 6+00			GWD-7AB	PIPING DETAILS
TE-3AB	TAILINGS EXCAVATION CROSS SECTIONS STA 6+50 TO 9+00			GWD-8AB	30" DROP STRUCTURE DETAILS
TE-4AB	TAILINGS EXCAVATION CROSS SECTIONS STA 9+50 TO 12+50			GWD-9AB	DEWATERING CONTROL BUILDING DETAILS
TE-5AB	TAILINGS EXCAVATION CROSS SECTIONS STA 13+00 TO 15+50			GWD-10AB	DEWATERING CONTROL BUILDING DETAILS
TE-6AB	TAILINGS EXCAVATION VOLUMES			GWD-11AB	DEWATERING CONTROL BUILDING DETAILS
				GWD-12AB	DEWATERING CONTROL BUILDING DETAILS
GW-1AB	INITIAL CONSTRUCTION DEWATERING LAYOUT			GWD-13AB	DEWATERING CONTROL BUILDING DETAILS
GW-2AB	PHASE I DEWATERING SYSTEM LAYOUT			GWD-14AB	DEWATERING CONTROL BUILDING DETAILS
GW-3AB	PHASE I DEWATERING SYSTEM AND PUMPING WELL LOCATIONS			GWD-15AB	DEWATERING CONTROL BUILDING DETAILS
GW-4AB	PHASE I DEWATERING SYSTEM AND PUMPING WELL LOCATIONS			GWD-16AB	DEWATERING CONTROL BUILDING DETAILS
GW-5AB	DEWATERING CONTROL BUILDING PLAN VIEW			GWD-17AB	DEWATERING CONTROL BUILDING DETAILS
GW-6AB	WATER TREATMENT SYSTEM			GWD-18AB	DEWATERING CONTROL BUILDING DETAILS
GW-7AB	DEWATERING CONTROL BUILDING INSTRUMENTATION PLAN VIEW			GWD-19AB	DEWATERING CONTROL BUILDING DETAILS
GW-8AB	SEDIMENT POND PLAN VIEW			GWD-20AB	DEWATERING CONTROL BUILDING DETAILS
GW-9AB	SEDIMENT POND CROSS SECTIONS STA 0+00 TO 2+25			GWD-21AB	DEWATERING CONTROL BUILDING DETAILS
GW-10AB	SEDIMENT POND CROSS SECTIONS STA 2+50 TO 3+25			GWD-22AB	DEWATERING CONTROL BUILDING FOOTING DETAIL
GW-11AB	SEDIMENT POND CROSS SECTIONS STA 3+50 TO 4+50			GWD-23AB	DEWATERING CONTROL BUILDING FOUNDATION WALL DETAIL
GW-12AB	SEDIMENT POND CROSS SECTION STA 4+75 TO 5+75			GWD-24AB	DEWATERING CONTROL BUILDING SLAB CONTROL JOINTS DETAIL
GW-13AB	SEDIMENT POND CROSS SECTION STA 6+00 TO 6+75			GWD-25AB	DEWATERING CONTROL BUILDING COLUMN FOOTING DETAILS
GW-14AB	BUILDING PAD CROSS SECTIONS STA 7+00 TO 7+75			GWD-26AB	PHASE II DEWATERING SYSTEM
GW-15AB	BUILDING PAD CROSS SECTIONS STA 8+00 TO 8+50			GWD-27AB	INITIAL CONSTRUCTION DEWATERING DETAILS
GW-16AB	SEDIMENT POND CONSTRUCTION VOLUMES			GWD-28AB	RCTS-60HS DETAIL
GW-19AB	SEDIMENT DETENTION POND INLETS & PERIMETER WATER BYPASS			GWD-29AB	FLOCCULANT SYSTEM LAYOUT
GW-20AB	SEDIMENT DETENTION POND OUTLET			GWD-30AB	FLOCCULANT TANK DETAIL
GW-21AB	PHASE II DEWATERING LAYOUT			GWD-31AB	DOSING TANK DETAIL
GW-22AB	DEWATERING CONTROL BUILDING PIPING OVERVIEW			GWD-32AB	DOSING TANK STAND
GW-23AB	DEWATERING CONTROL BUILDING SOUTH WALL			GWD-33AB	FLOCCULANT TANK MIXER DETAILS
GW-24AB	DEWATERING CONTROL BUILDING EAST WALL			GWD-34AB	LIME SLURRY TANK MIXER DETAILS
				GWD-35AB	DOSING TANK MIXER DETAILS
				GWD-36AB	LIME SILO AND AUGER SYSTEM DETAILS
R-1AB	REPOSITORY AREA CLEARING LIMITS			RD-1AB	REPOSITORY DETAILS
R-2AB	FINAL REPOSITORY EXCAVATION PLAN				
R-3AB	FINAL REPOSITORY GRADING PLAN			SWD-1AB	STORM WATER CHANNEL DETAILS
R-4AB	REPOSITORY CROSS SECTIONS STA 0+00 TO 0+60			SWD-2AB	STORM WATER CHANNEL DETAILS
R-5AB	REPOSITORY CROSS SECTIONS STA 0+80 TO 1+40			SWD-3AB	REPOSITORY STORM WATER RUN-ON CHANNEL DETAILS
R-6AB	REPOSITORY CROSS SECTIONS STA 1+60 TO 2+20			SWD-4AB	CULVERT AND RIPRAP APRON INSTALLATION DETAILS
R-7AB	REPOSITORY CROSS SECTIONS STA 2+40 TO 3+00			SWD-5AB	STORM WATER DRAIN SYSTEM AND GROUTED RIPRAP CHANNEL INLET DETAIL
R-8AB	REPOSITORY CROSS SECTIONS STA 3+20 TO 3+80			SWD-6AB	CHANNEL #5 DETAILS STATION 3+32 TO 4+81
R-9AB	REPOSITORY CROSS SECTIONS STA 4+00 TO 4+60				
R-10AB	REPOSITORY CROSS SECTIONS STA 4+80 TO 5+40			STRD-1AB	STREAM RECONSTRUCTION DETAILS
R-11AB	REPOSITORY CROSS SECTIONS STA 5+60 TO 6+20			STRD-2AB	STREAM RECONSTRUCTION DETAILS
R-12AB	REPOSITORY VOLUMES			STRD-3AB	STREAM RECONSTRUCTION DETAILS
				STRD-4AB	STREAM RECONSTRUCTION PLAN LAYOUT
				STRD-5AB	MILLER CREEK RECONSTRUCTION DETAILS
				STRD-6AB	SODA BUTTE CREEK ISOLATION COFFERDAM DETAILS
				STRD-7AB	STREAM RECONSTRUCTION DETAILS
				STRD-8AB	STREAM RECONSTRUCTION DETAILS
				STRD-9AB	STREAM 8+25 TO 8+80 ROOT WAD INSTALLATION DETAILS
				BMPD-1AB	STREAM PROTECTION DETAILS
				BMPD-2AB	BMP'S DETAILS
				BMPD-3AB	NORTH AMERICAN GREEN SLOPE INSTALLATION DETAIL

REVISION:	DATE:	BY:	DESC:

DRAWN BY:	CLA
DESIGNED BY:	JSM/MWB/MCB
CHECKED BY:	JSM/MWB/MCB
APPROVED BY:	JSM
PROJECT NO.:	10140
DATE:	2/24/15

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COORD SYS/ZONE:	NA
DATUM:	NA
UNITS:	NA
SOURCE:	PIONEER

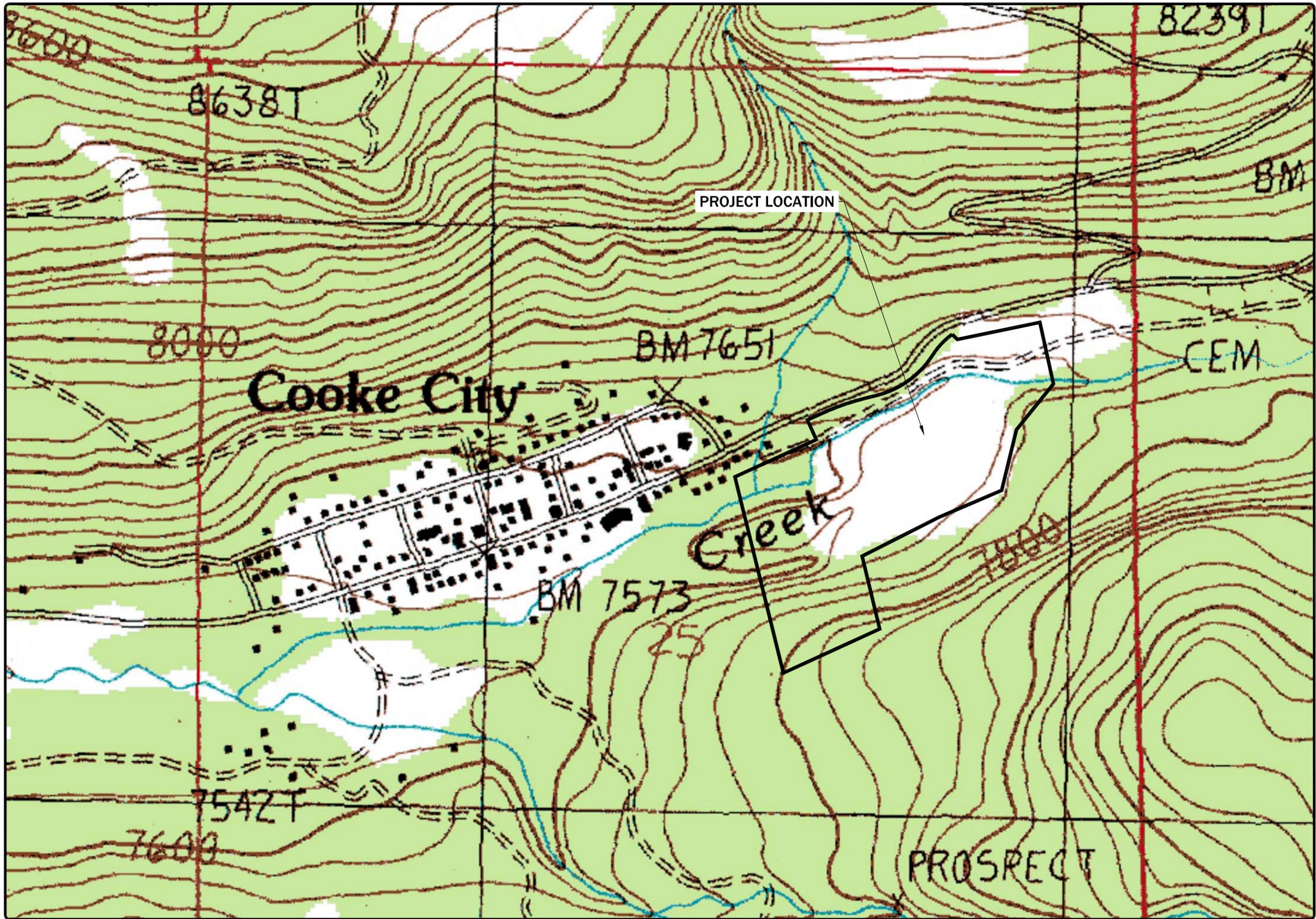


MDEQ/MWCB
MCLAREN TAILINGS ABANDONED
MINE SITE RECLAMATION PROJECT
FINAL AS-BUILT DRAWINGS

SHEET INDEX



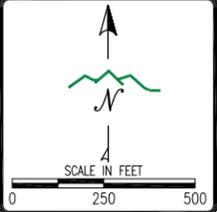
SHEET
G-3AB



REVISION	DATE	BY	DESC.

DRAWN BY: _CLA
 DESIGNED BY: JSA
 CHECKED BY: MCB
 APPROVED BY: JSA
 PROJECT NO: 10149
 DATE: 2/24/15

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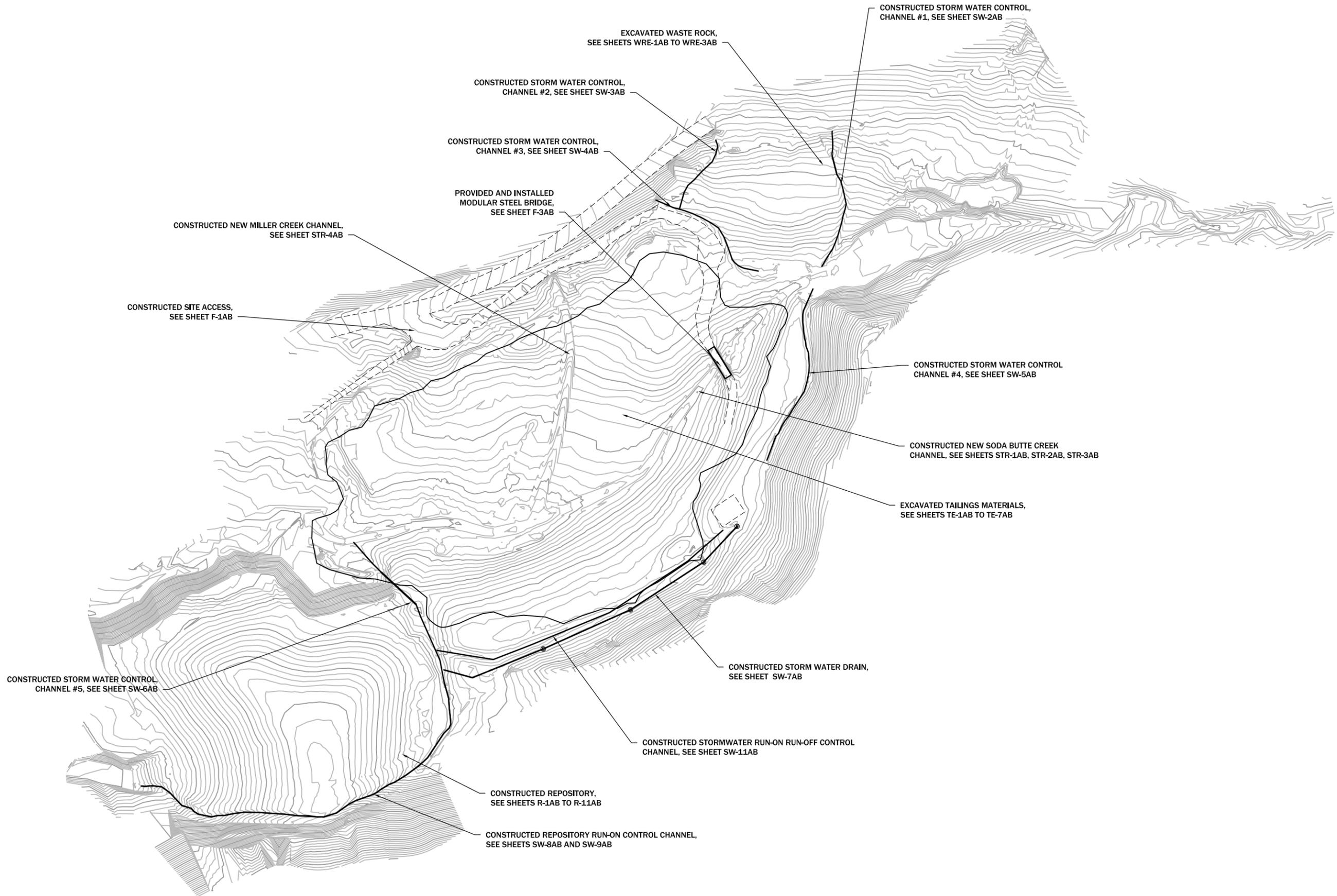


MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

SITE
 VICINITY
 MAP

PIONEER
 TECHNICAL SERVICES, INC.
 1101 SOUTH MONTANA
 BUTTE, MONTANA 59701
 (406) 782-5177

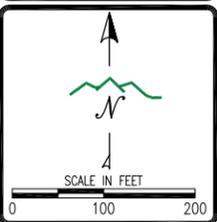
SHEET
 G-4AB



REVISION:	DATE:	BY:	DESC:

DRAWN BY: _CLA
 DESIGNED BY: _JSA
 CHECKED BY: _MCB
 APPROVED BY: _JSA
 PROJECT NO: 10140
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: MSP
 DATUM: NAD83
 UNITS: FEET
 SOURCE: PIONEER

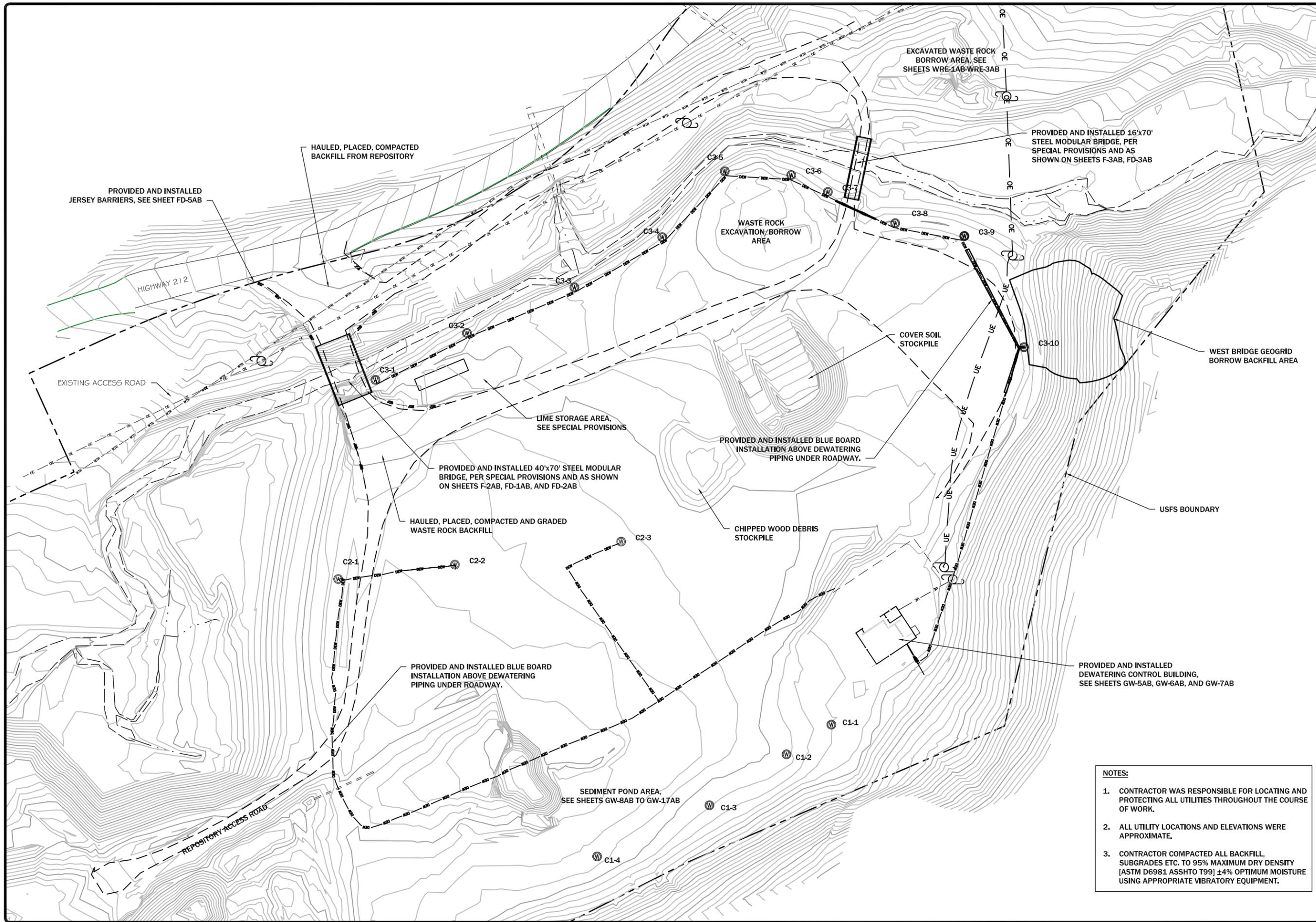


MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

PROJECT
 OVERVIEW



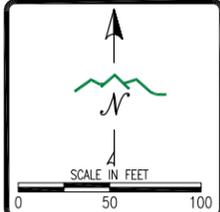
SHEET
 G-5AB



REVISION:	DATE:	BY:	DESC:

DRAWN BY: CLC
 DESIGNED BY: JSA
 CHECKED BY: JCB
 APPROVED BY: JSA
 PROJECT NO: 10140
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: MSP
 DATUM: NAD83
 UNITS: FEET
 SOURCE: PIONEER



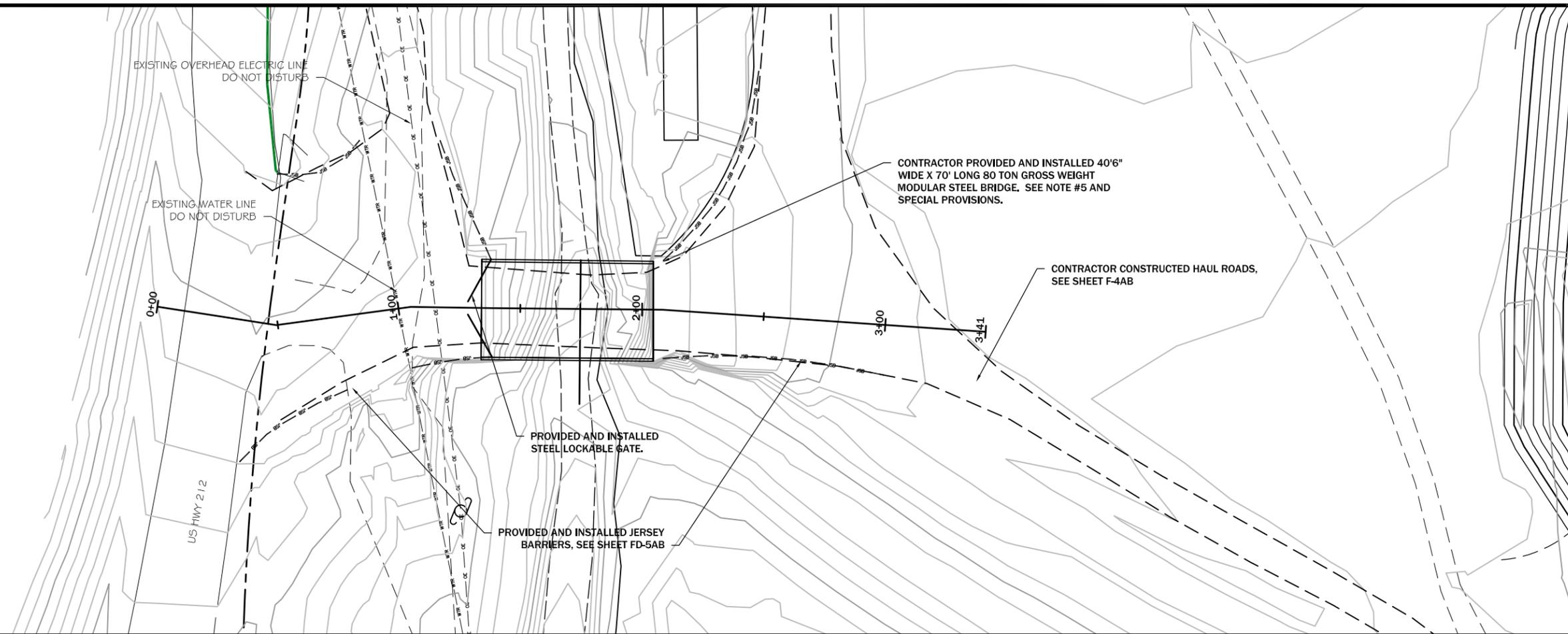
MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

PROJECT
 FACILITIES
 PLAN
 VIEW



SHEET
 F-1AB

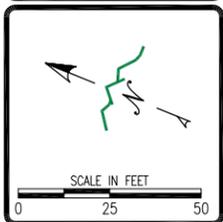
- NOTES:**
1. CONTRACTOR WAS RESPONSIBLE FOR LOCATING AND PROTECTING ALL UTILITIES THROUGHOUT THE COURSE OF WORK.
 2. ALL UTILITY LOCATIONS AND ELEVATIONS WERE APPROXIMATE.
 3. CONTRACTOR COMPACTED ALL BACKFILL, SUBGRADES ETC. TO 95% MAXIMUM DRY DENSITY [ASTM D6981 ASSHTO T99] ±4% OPTIMUM MOISTURE USING APPROPRIATE VIBRATORY EQUIPMENT.



REVISION:	DATE:	BY:	DESC:
1	2/2/09	JSM	GROSS WT OF BRIDGE

DRAWN BY: CLA
 DESIGNED BY: MCB
 CHECKED BY: JSA
 APPROVED BY: JSA
 PROJECT NO: 10140
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: MSP
 DATUM: NAD83
 UNITS: FEET
 SOURCE: PIONEER

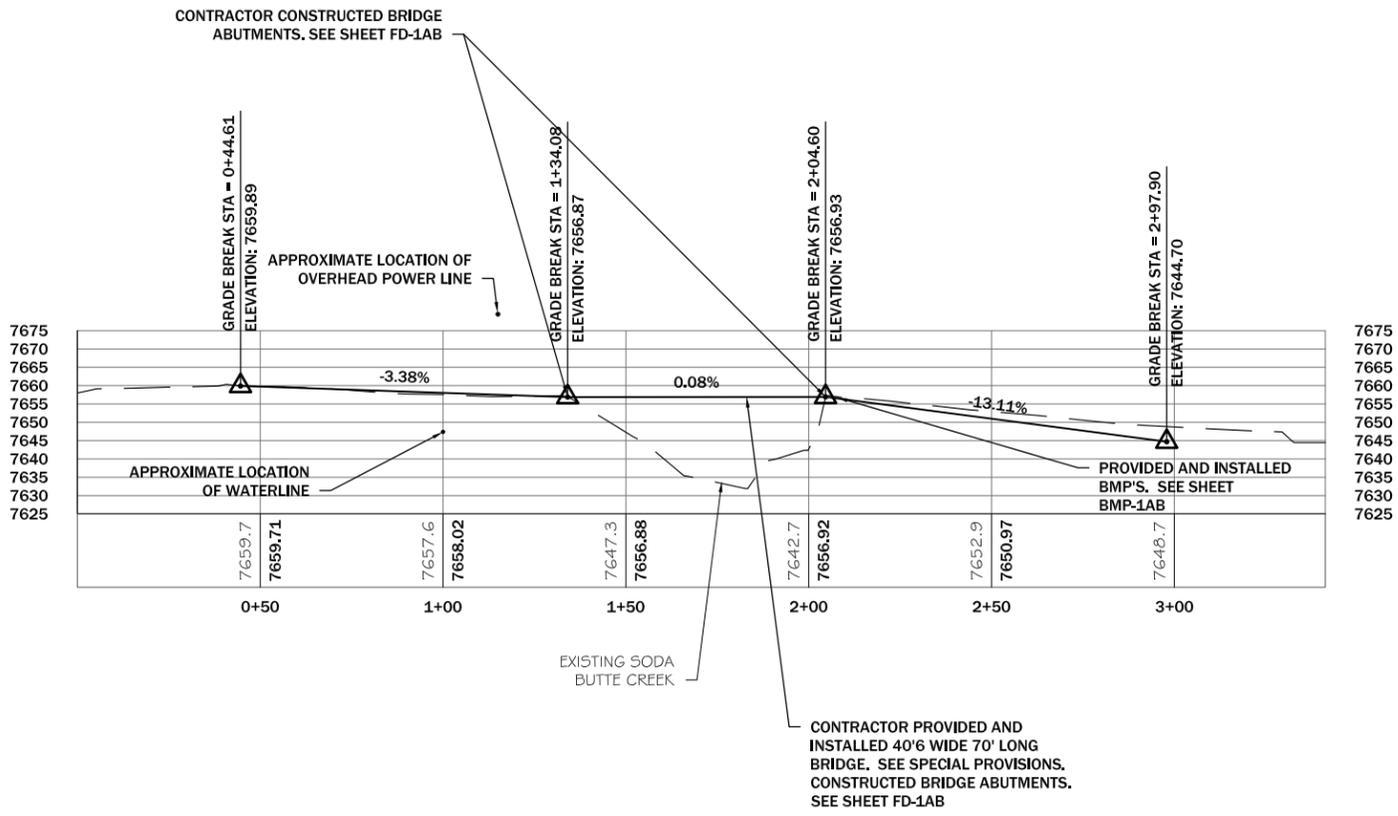


MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

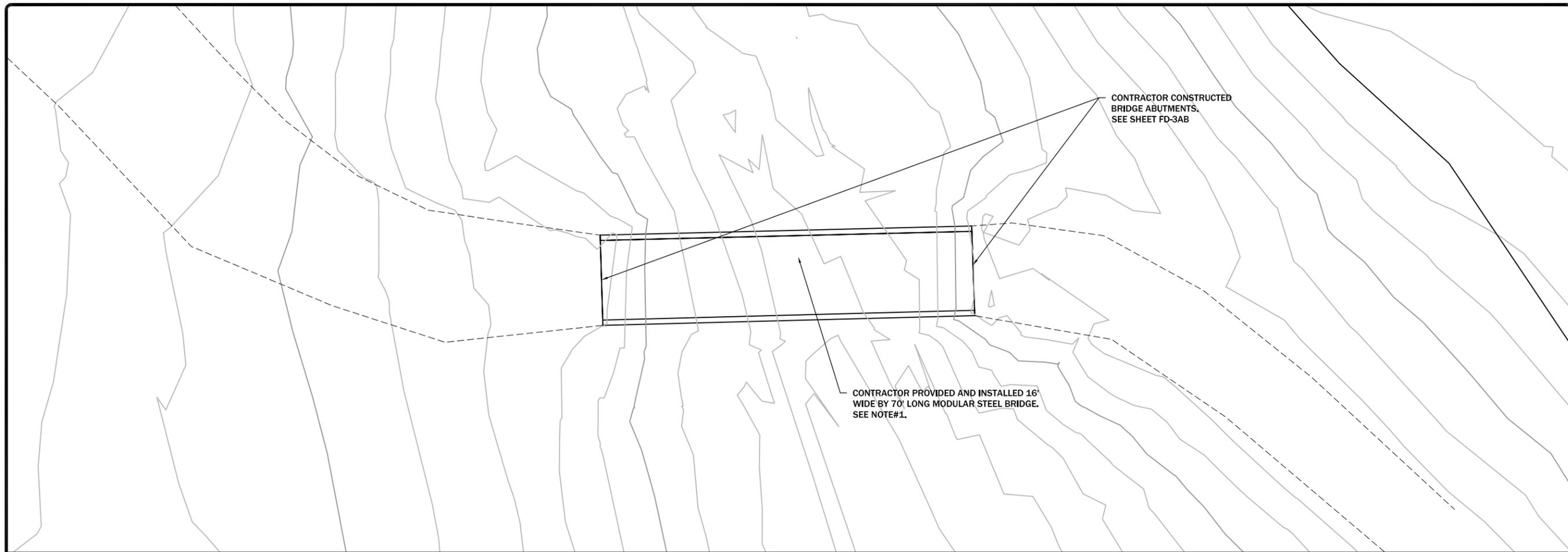
WEST BRIDGE
 PLAN
 AND
 PROFILE

PIONEER
 TECHNICAL SERVICES, INC.
 1101 SOUTH MONTANA
 BUTTE, MONTANA 59701
 (406) 782-5177

SHEET
 F-2AB



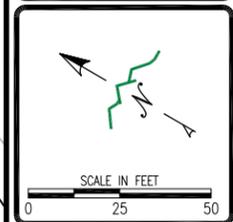
- NOTES:**
- CONTRACTOR WAS RESPONSIBLE FOR LOCATING AND PROTECTING ALL UTILITIES THROUGHOUT THE COURSE OF WORK.
 - UTILITY LOCATIONS AND ELEVATIONS SHOWN ON DRAWINGS ARE APPROXIMATE.
 - CONTRACTOR COORDINATED WITH UTILITY COMPANIES PRIOR TO COMPLETING EARTH WORK WITHIN 15 FEET OF ALL OVERHEAD POLES.
 - CONTRACTOR WAS RESPONSIBLE FOR HAVING UTILITY OWNER INSTALL POLE WRAPS ON UTILITY POLES WHEN REQUIRED BY UTILITY OWNER.
 - CONTRACTOR PROVIDED AND INSTALLED (1) 40'x70' LONG MODULAR STEEL BRIDGE AS DESCRIBED IN SECTION III OF THE SPECIAL PROVISIONS AND AS SPECIFIED BY MANUFACTURER AND AS SHOWN ON SHEETS FD-1AB AND FD-2AB.
 - CONTRACTOR WAS RESPONSIBLE FOR PROPERLY INSTALLING AND MAINTAINING BMP'S THROUGHOUT THE COURSE OF WORK AND AS DIRECTED BY ENGINEER.



REVISION:	DATE:	BY:	DESC:

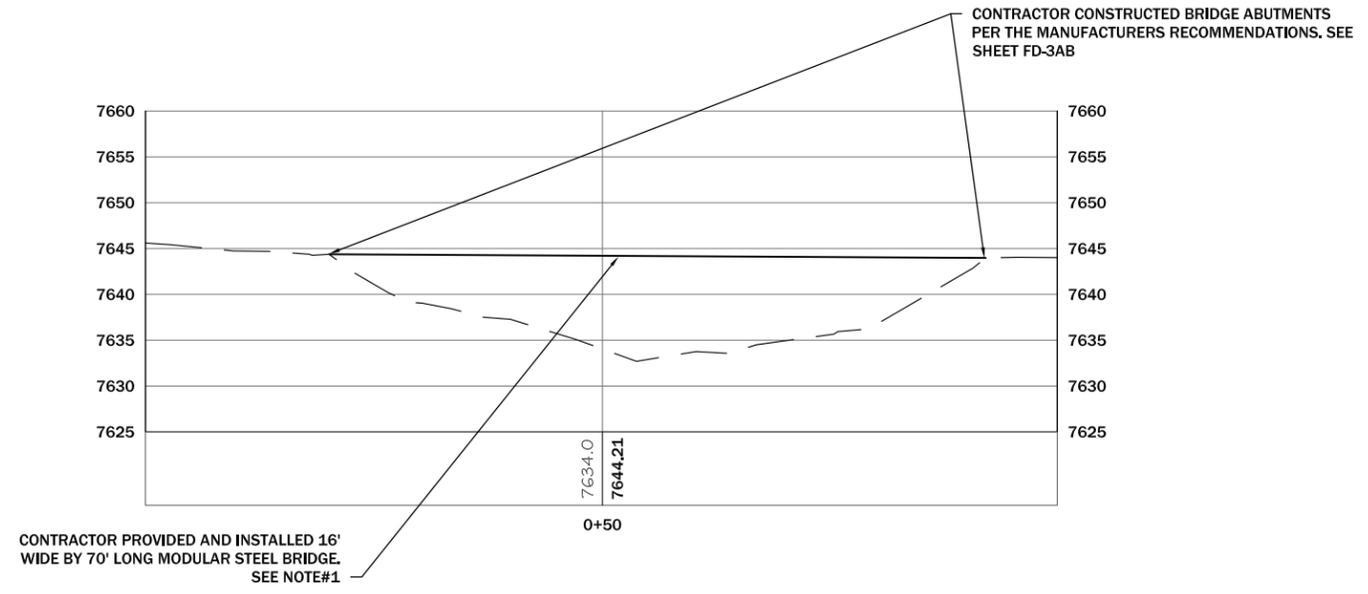
DRAWN BY: CLA
 DESIGNED BY: JCB
 CHECKED BY: JSA
 APPROVED BY: JSA
 PROJECT NO: 10140
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: MSP
 DATUM: NAD83
 UNITS: FEET
 SOURCE: PIONEER



MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

- NOTES:**
1. CONTRACTOR PROVIDED AND INSTALLED (1) 16' WIDE BY 70' LONG MODULAR STEEL BRIDGE AS SPECIFIED BY MANUFACTURER AND AS SHOWN ON SHEET FD-3.
 2. CONTRACTOR WAS RESPONSIBLE FOR LOCATING AND PROTECTING ALL UTILITIES THROUGHOUT THE COURSE OF WORK.
 3. CONTRACTOR PROVIDED, INSTALLED AND MAINTAINED BMP'S THROUGHOUT THE COURSE OF WORK AND AS DIRECTED BY ENGINEER.

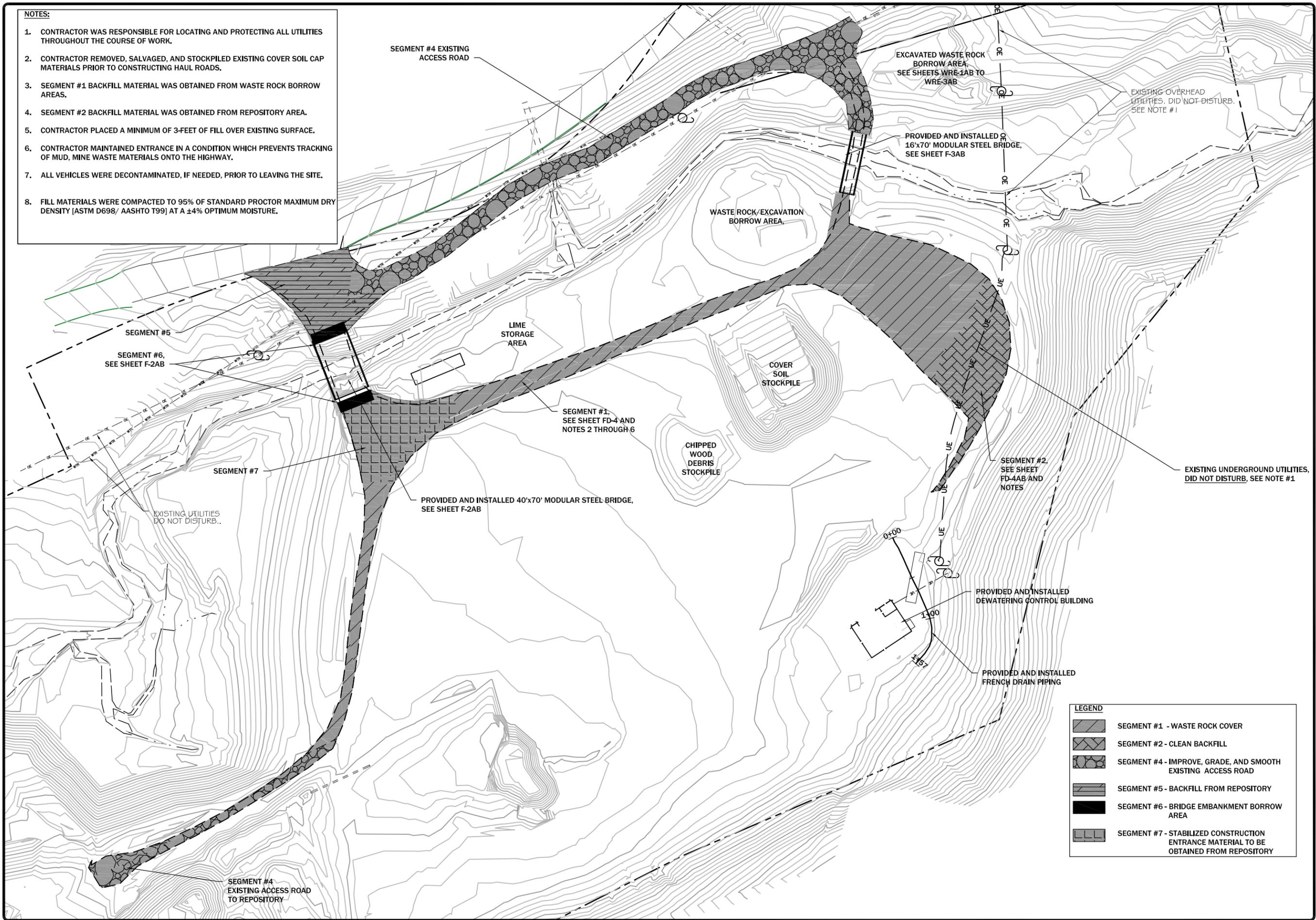


EAST BRIDGE
 PLAN
 AND
 PROFILE



SHEET
 F-3AB

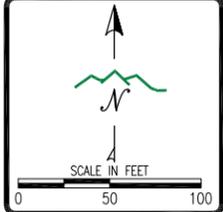
- NOTES:**
1. CONTRACTOR WAS RESPONSIBLE FOR LOCATING AND PROTECTING ALL UTILITIES THROUGHOUT THE COURSE OF WORK.
 2. CONTRACTOR REMOVED, SALVAGED, AND STOCKPILED EXISTING COVER SOIL CAP MATERIALS PRIOR TO CONSTRUCTING HAUL ROADS.
 3. SEGMENT #1 BACKFILL MATERIAL WAS OBTAINED FROM WASTE ROCK BORROW AREAS.
 4. SEGMENT #2 BACKFILL MATERIAL WAS OBTAINED FROM REPOSITORY AREA.
 5. CONTRACTOR PLACED A MINIMUM OF 3-FEET OF FILL OVER EXISTING SURFACE.
 6. CONTRACTOR MAINTAINED ENTRANCE IN A CONDITION WHICH PREVENTS TRACKING OF MUD, MINE WASTE MATERIALS ONTO THE HIGHWAY.
 7. ALL VEHICLES WERE DECONTAMINATED, IF NEEDED, PRIOR TO LEAVING THE SITE.
 8. FILL MATERIALS WERE COMPACTED TO 95% OF STANDARD PROCTOR MAXIMUM DRY DENSITY [ASTM D698/ AASHTO T99] AT A ±4% OPTIMUM MOISTURE.



REVISION:	DATE:	BY:	DESC:

DRAWN BY: CLC
 DESIGNED BY: JMCB
 CHECKED BY: JSA
 APPROVED BY: JSA
 PROJECT NO: 10140
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: MSP
 DATUM: NAD83
 UNITS: FEET
 SOURCE: PIONEER



MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

HAUL
 ROAD
 PLAN
 VIEW

PIONEER
 TECHNICAL SERVICES, INC.
 1101 SOUTH MONTANA
 BUTTE, MONTANA 59701
 (406) 782-5177

SHEET
F-4AB

LEGEND

	SEGMENT #1 - WASTE ROCK COVER
	SEGMENT #2 - CLEAN BACKFILL
	SEGMENT #4 - IMPROVE, GRADE, AND SMOOTH EXISTING ACCESS ROAD
	SEGMENT #5 - BACKFILL FROM REPOSITORY
	SEGMENT #6 - BRIDGE EMBANKMENT BORROW AREA
	SEGMENT #7 - STABILIZED CONSTRUCTION ENTRANCE MATERIAL TO BE OBTAINED FROM REPOSITORY

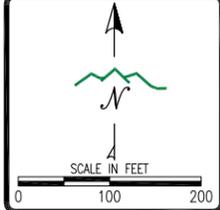


- NOTES:**
1. CONTRACTOR CLEARED, GRUBBED VEGETATION, AND REMOVED TIMBER FROM THE DESIGNATED WORK AREAS.
 2. CONTRACTOR DISPOSED OF GRUBBED MATERIAL AS SPECIFIED IN SPECIAL PROVISIONS.
 3. CONTRACTOR OBTAINED ALL NECESSARY PERMITS AND COMPLIED WITH ALL APPLICABLE BURNING REQUIREMENTS.
 4. CONTRACTOR SALVAGED SUFFICIENT TIMBER LOGS SPECIFIED IN SPECIAL PROVISIONS UNDER STREAM RECONSTRUCTION.

REVISION:	DATE:	BY:	DESC:

DRAWN BY: _CLA
 DESIGNED BY: _MJB
 CHECKED BY: _JSA
 APPROVED BY: _JSA
 PROJECT NO: 10140
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: MSP
 DATUM: NAD83
 UNITS: FEET
 SOURCE: PIONEER

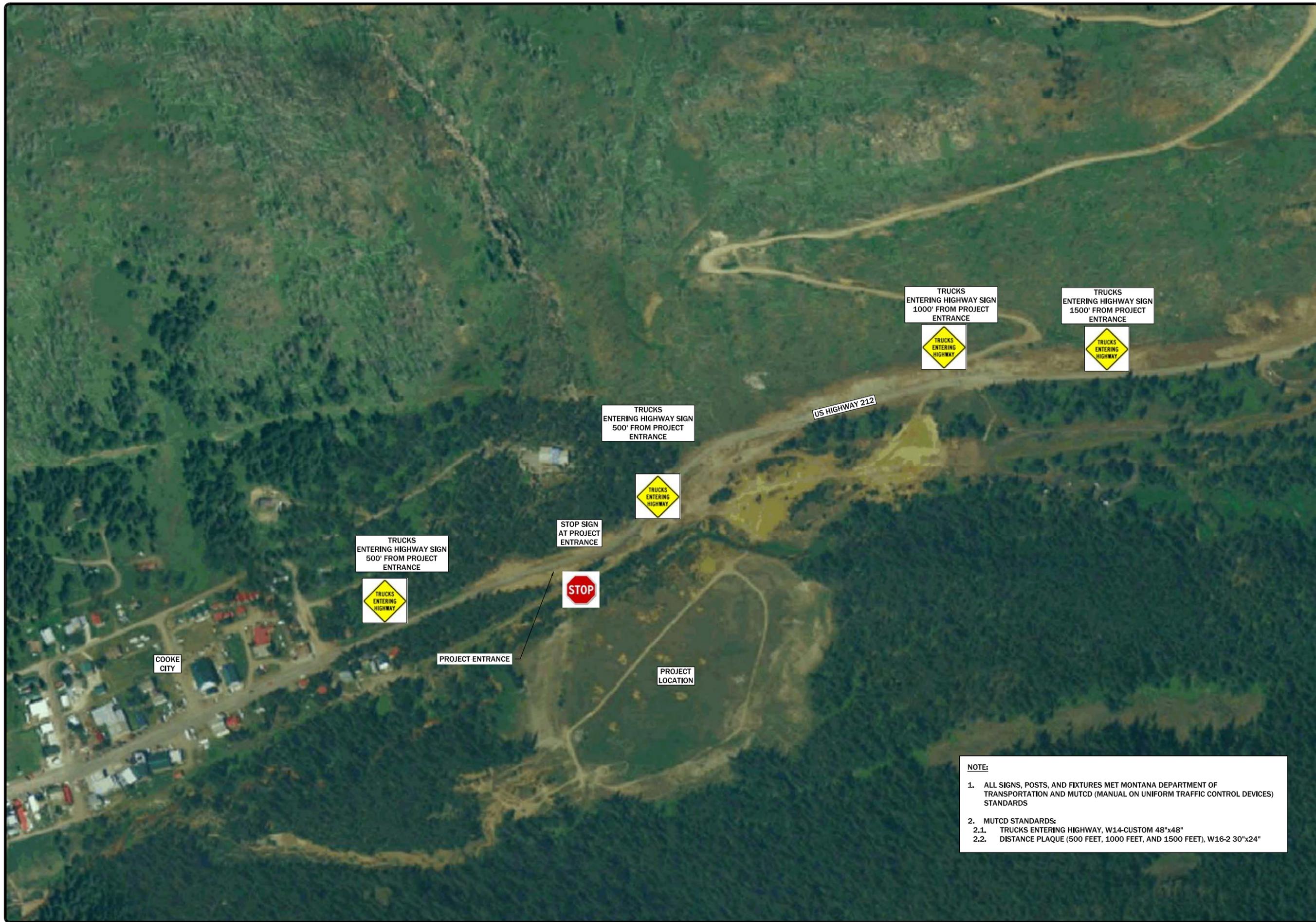


MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

CLEAR, GRUB, AND
 TIMBER REMOVAL
 PLAN VIEW



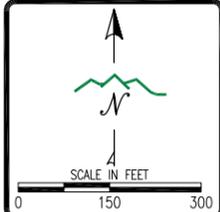
SHEET
 F-5AB



REVISION:	DATE:	BY:	DESC:

DRAWN BY: CLC
 DESIGNED BY: BOB ABLINE
 CHECKED BY: MCB
 APPROVED BY: JSA
 PROJECT NO: 10140
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: MSP
 DATUM: NAD83
 UNITS: FEET
 SOURCE: 2005 NAIP AERIAL



MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED MINE
 SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

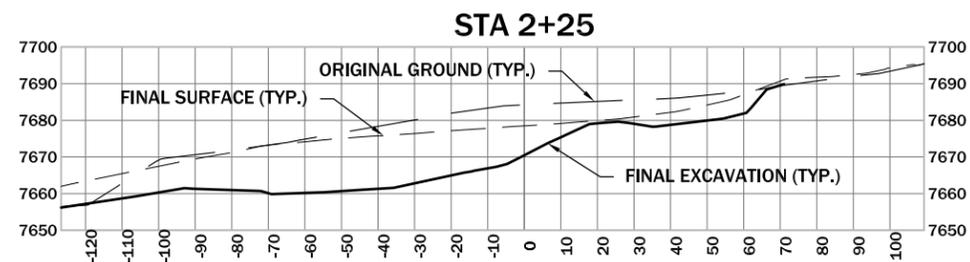
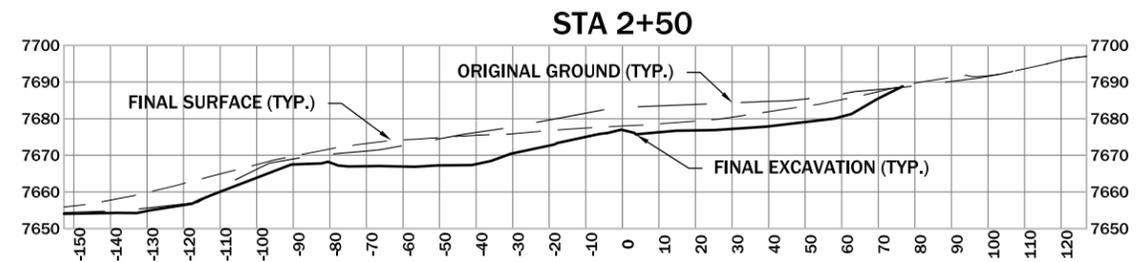
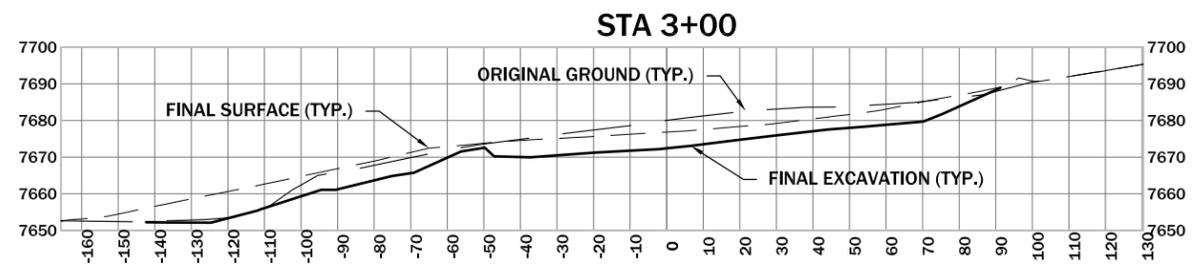
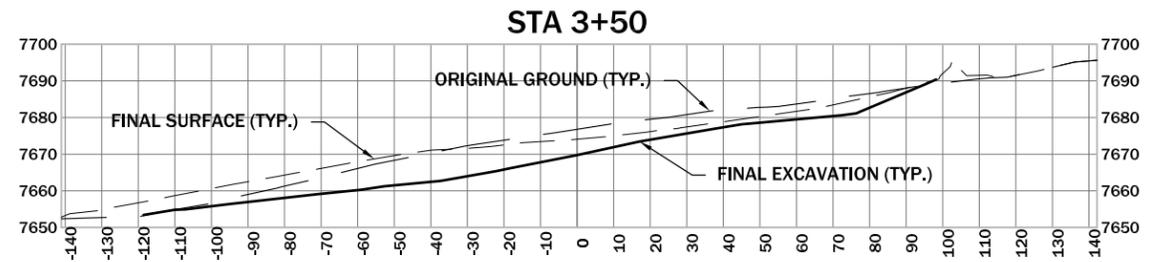
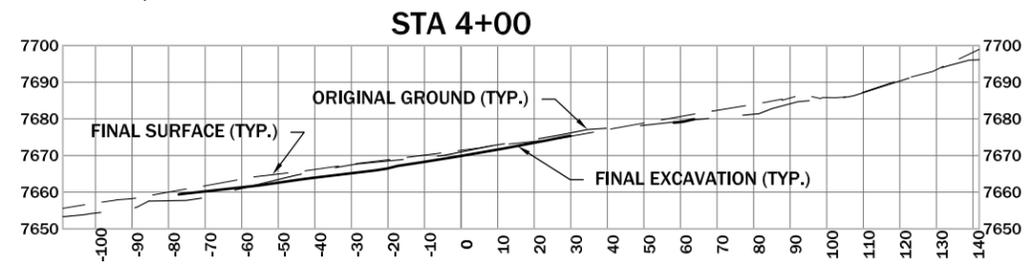
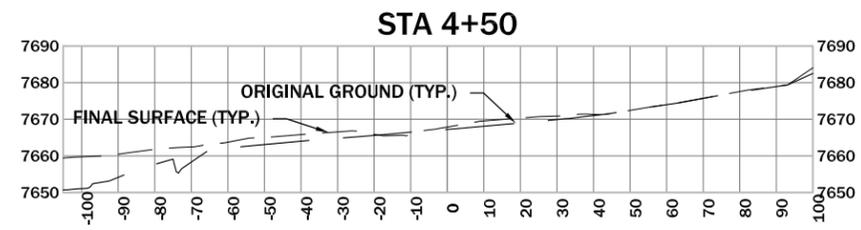
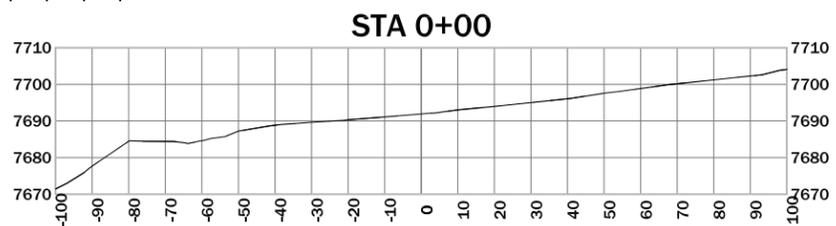
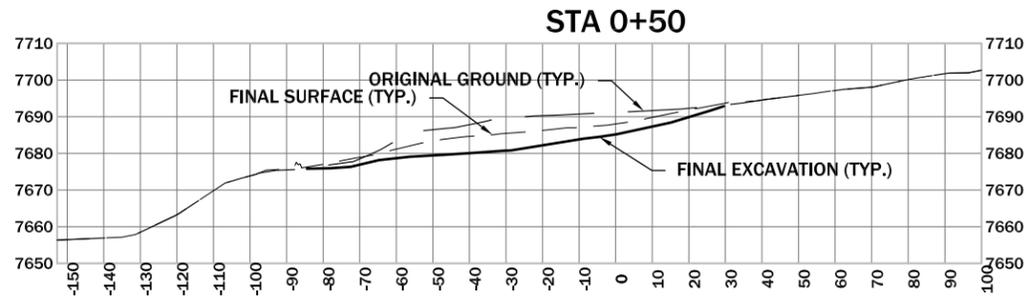
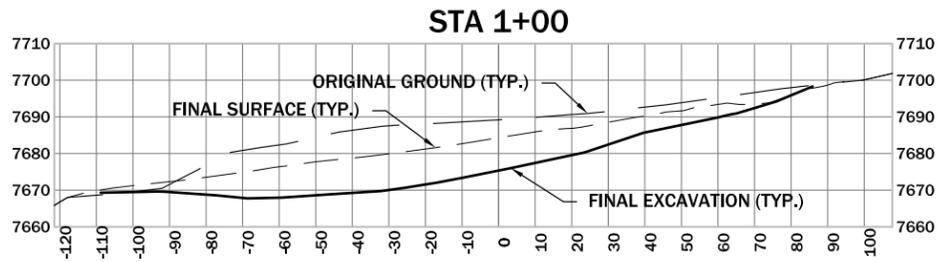
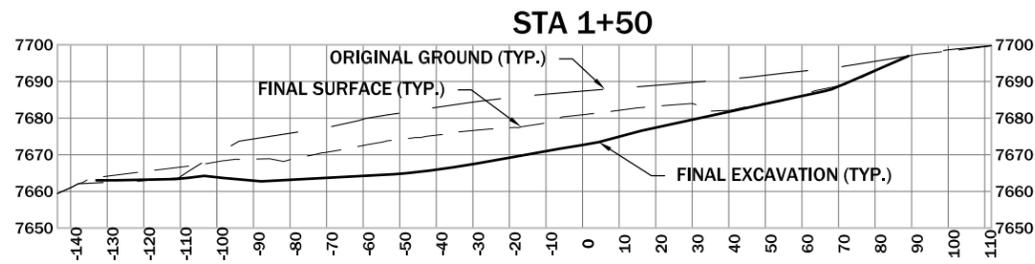
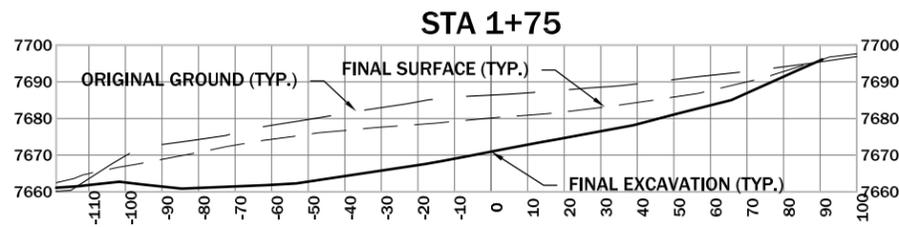
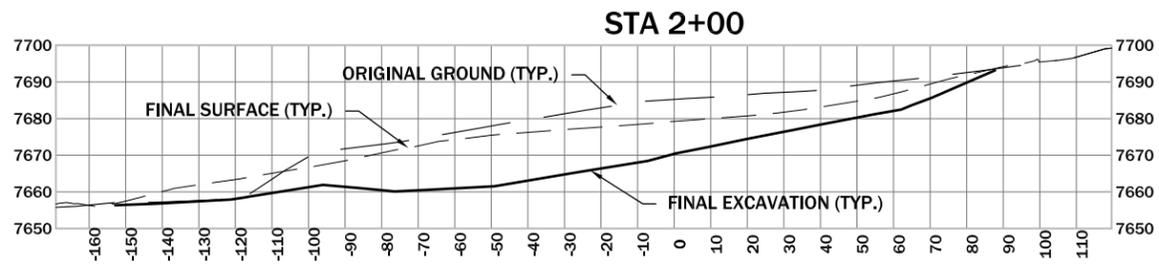
TRAFFIC
 CONTROL
 SIGNAGE PLAN

PIONEER
 TECHNICAL SERVICES, INC.
 1101 SOUTH MONTANA
 BUTTE, MONTANA 59701
 (406) 782-5177

SHEET
 F-6AB

NOTE:

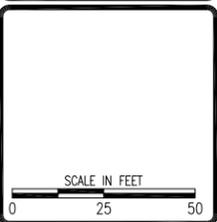
1. ALL SIGNS, POSTS, AND FIXTURES MET MONTANA DEPARTMENT OF TRANSPORTATION AND MUTCD (MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES) STANDARDS
2. MUTCD STANDARDS:
 - 2.1 TRUCKS ENTERING HIGHWAY, W14-CUSTOM 48"x48"
 - 2.2 DISTANCE PLAQUE (500 FEET, 1000 FEET, AND 1500 FEET), W16-2 30"x24"



REVISION	DATE	BY	DESC.

DRAWN BY: CLA
 DESIGNED BY: JMCB
 CHECKED BY: JSA
 APPROVED BY: JSA
 PROJECT NO: 10160
 DATE: 4/24/12

DISPLAYED AS:
 COORD SYS/ZONE: NA
 DATUM: NA
 UNITS: FEET
 SOURCE: PIONEER



MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

WASTE ROCK
 EXCAVATION
 CROSS SECTIONS
 STA 0+00 TO 4+50

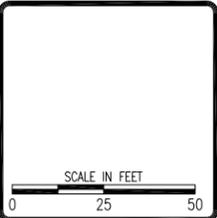


SHEET
 WRE-2AB

REVISION:	DATE:	BY:	DESC:

DRAWN BY: CLA
 DESIGNED BY: MCB
 CHECKED BY: JSA
 APPROVED BY: JSA
 PROJECT NO: 10160
 DATE: 4/24/12

DISPLAYED AS:
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 DATUM: NA
 UNITS: FEET
 SOURCE: PIONEER



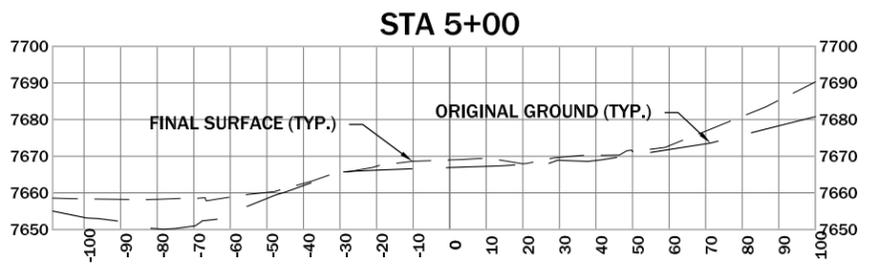
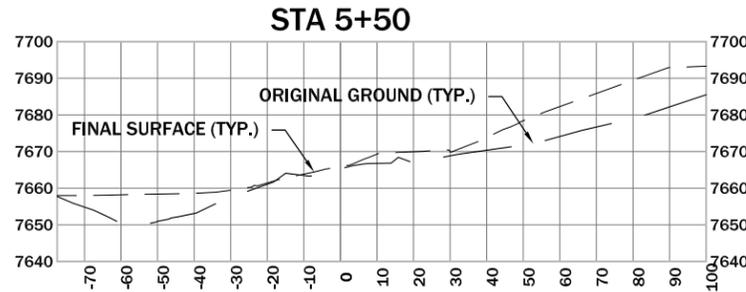
**TOTAL REMOVED
 WASTE ROCK/BORROW MATERIAL**
 19,350 CUBIC YARDS

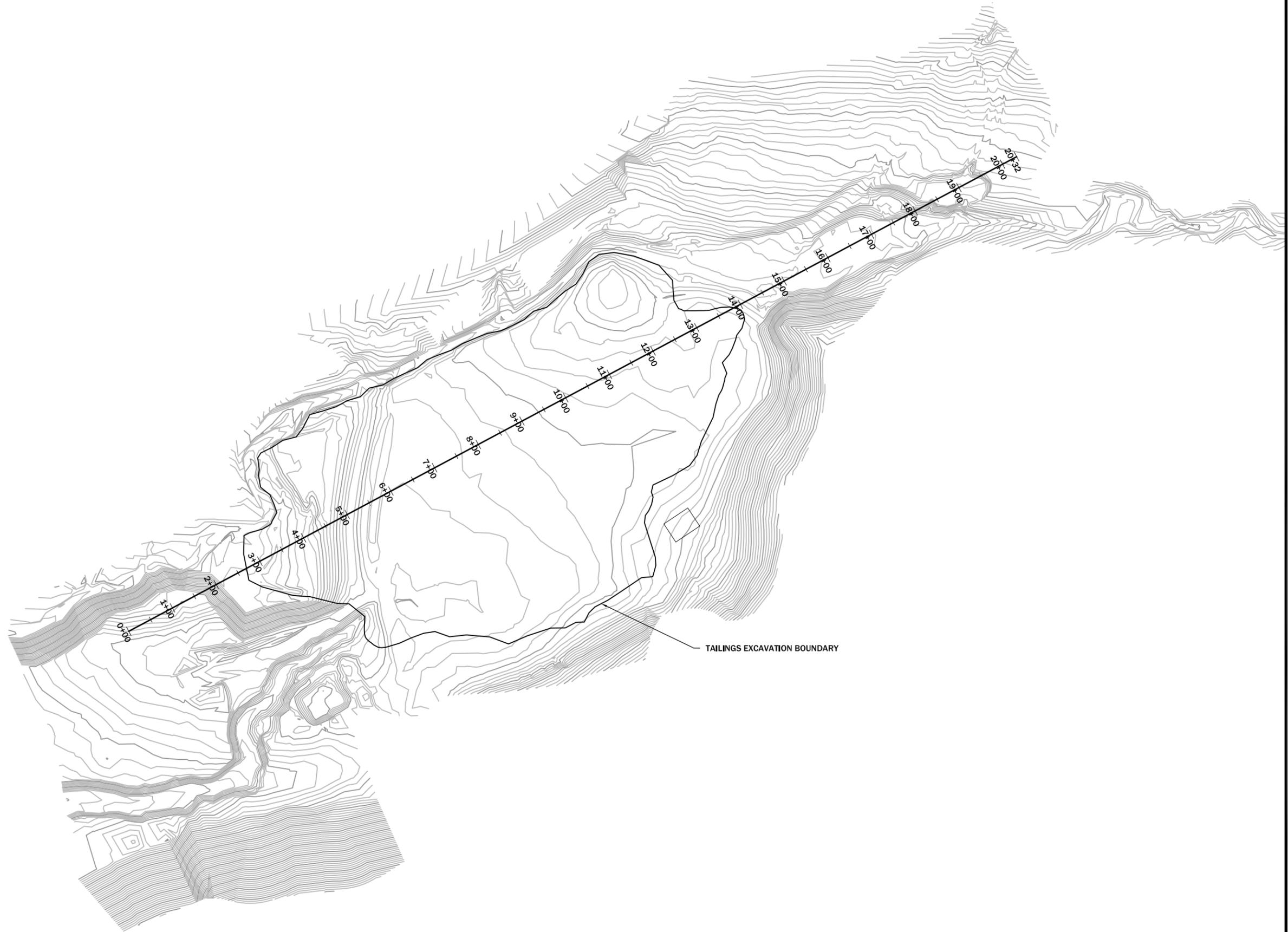
MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

WASTE ROCK
 EXCAVATION
 CROSS SECTIONS
 STA 5+00 TO 5+50



SHEET
 WRE-3AB



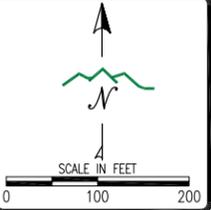


TAILINGS EXCAVATION BOUNDARY

REVISION:	DATE:	BY:	DESC:

DRAWN BY: CL
 DESIGNED BY: JCB
 CHECKED BY: JSA
 APPROVED BY: JSA
 PROJECT NO: 10140
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: MSP
 DATUM: NAD83
 UNITS: FEET
 SOURCE: PIONEER



MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

TAILINGS
 EXCAVATION

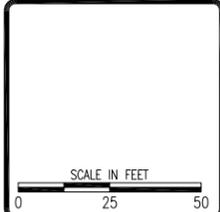

PIONEER
 TECHNICAL SERVICES, INC.
 1101 SOUTH MONTANA
 BUTTE, MONTANA 59701
 (406) 782-5177

SHEET
 TE-1AB

REVISION:	DATE:	BY:	DESC:

DRAWN BY: CLM
 DESIGNED BY: JCB
 CHECKED BY: JSA
 APPROVED BY: JSA
 PROJECT NO: 10140
 DATE: 2/24/15

DISPLAYED AS:
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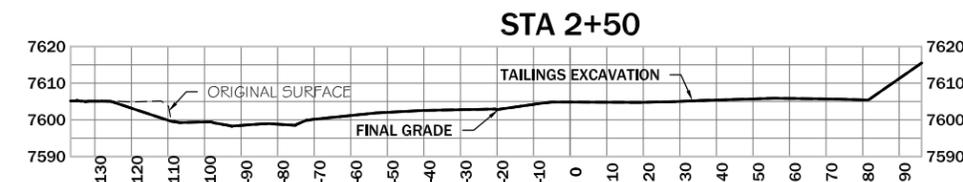
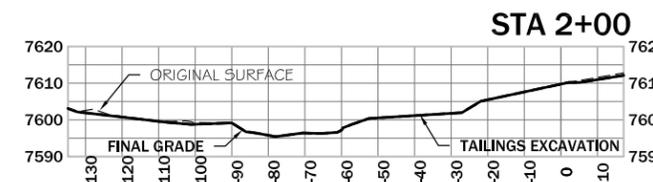
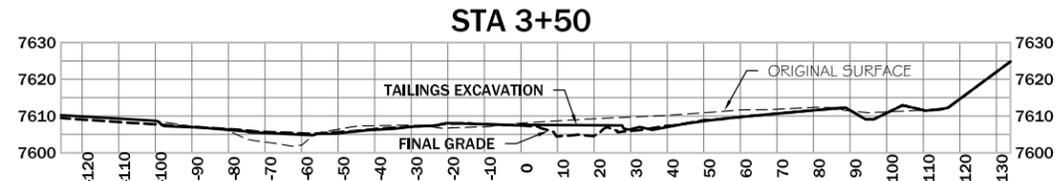
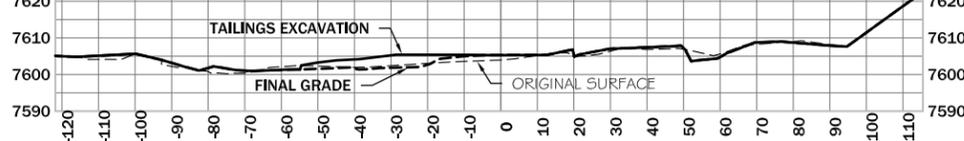
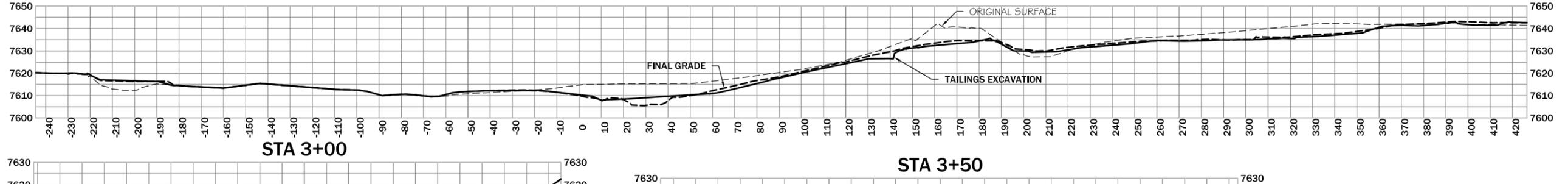
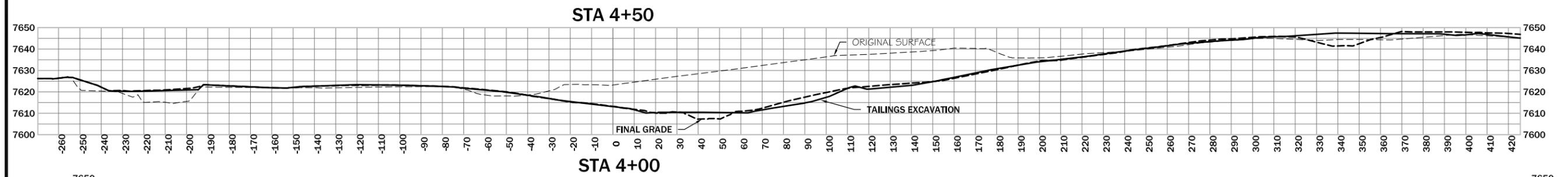
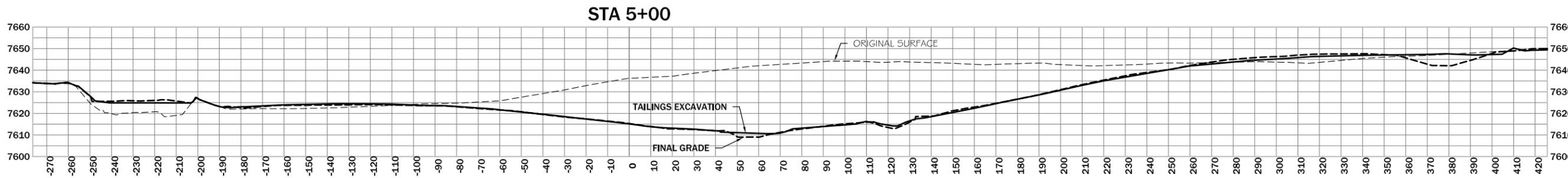
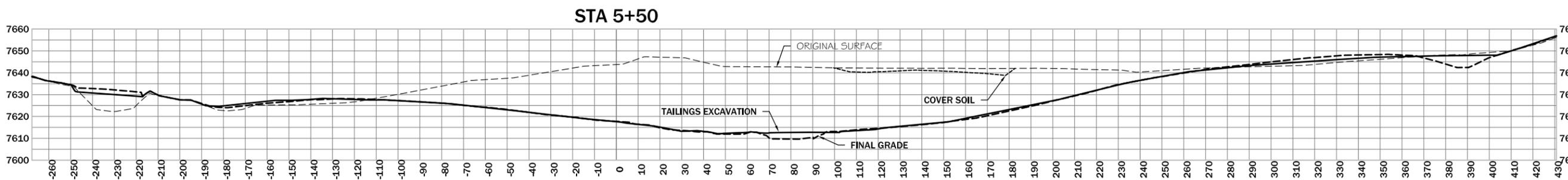
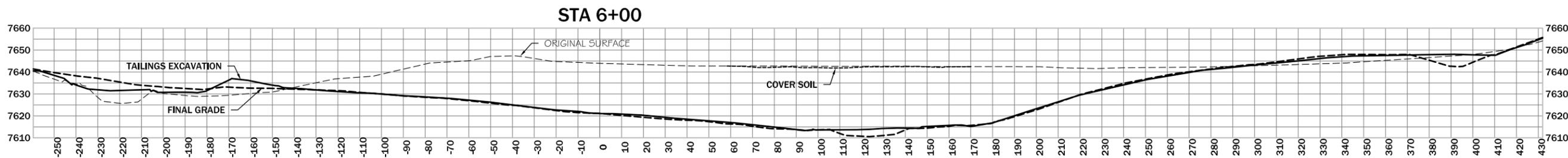


MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

TAILINGS EXCAVATION
 CROSS SECTIONS
 STA 2+00 TO 6+00



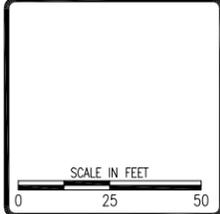
SHEET
 TE-2AB



REVISION	DATE	BY	DESC

DRAWN BY: CLC
 DESIGNED BY: JMCB
 CHECKED BY: JSA
 APPROVED BY: JSA
 PROJECT NO: 10140
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE, NA
 DATUM: NAD83
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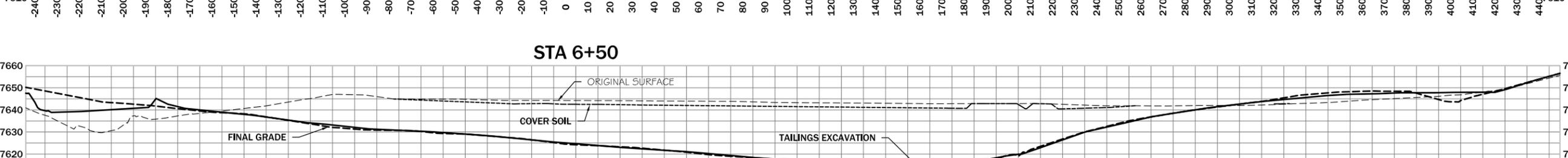
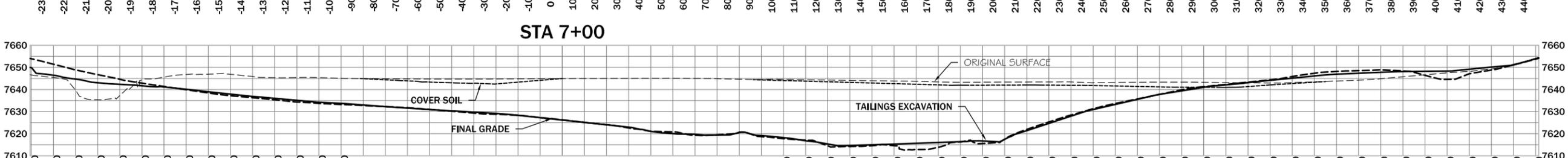
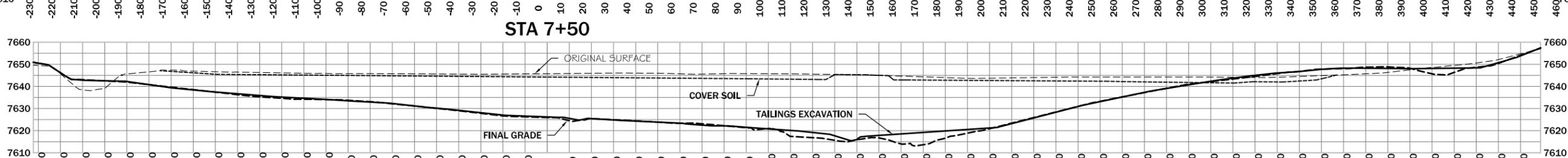
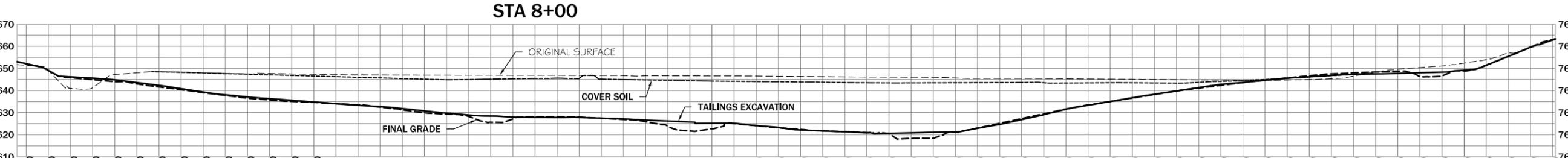
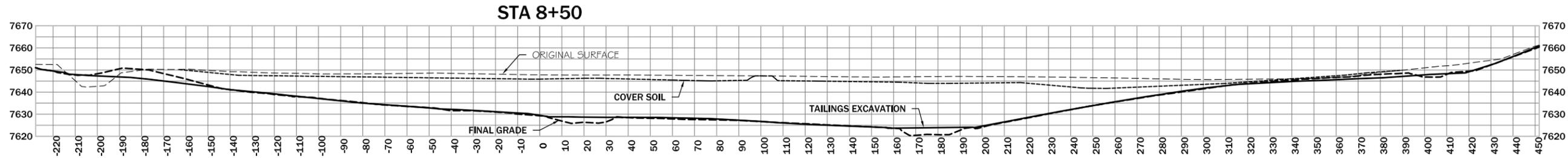
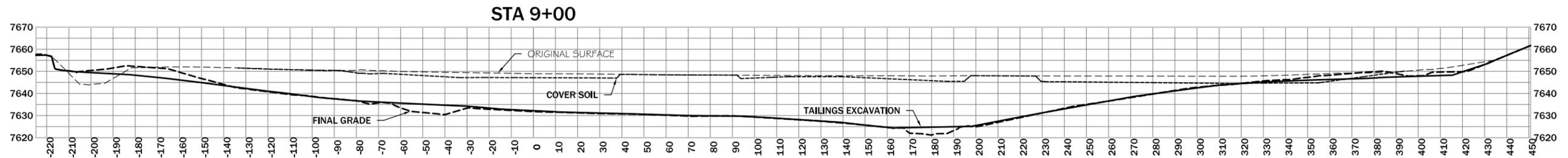


MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

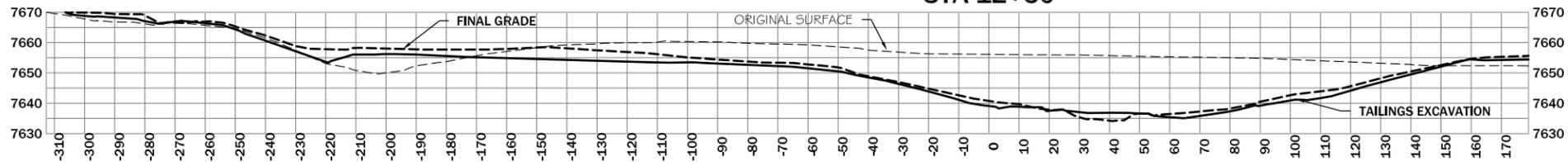
TAILINGS EXCAVATION
 CROSS SECTIONS
 STA 6+50 TO 9+00

PIONEER
 TECHNICAL SERVICES, INC.
 1101 SOUTH MONTANA
 BUTTE, MONTANA 59701
 (406) 782-5177

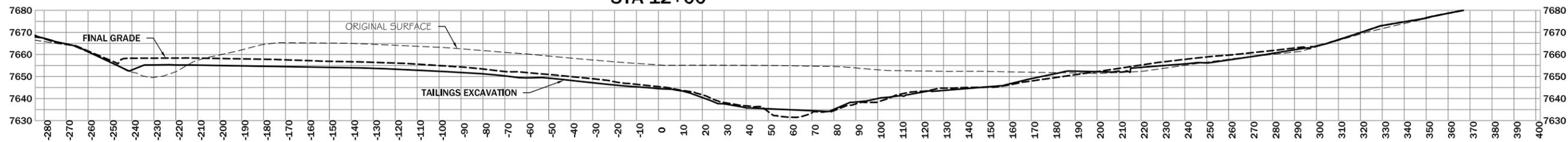
SHEET
 TE-3AB



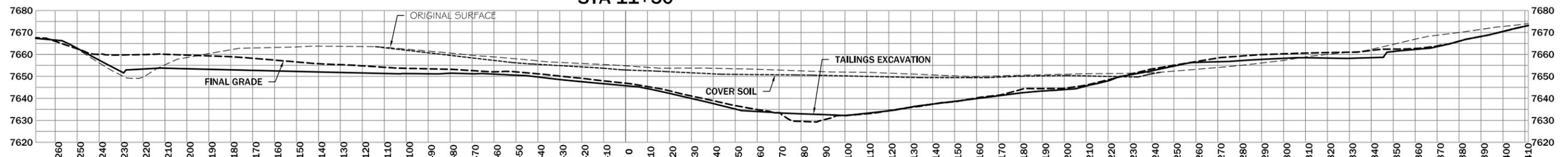
STA 12+50



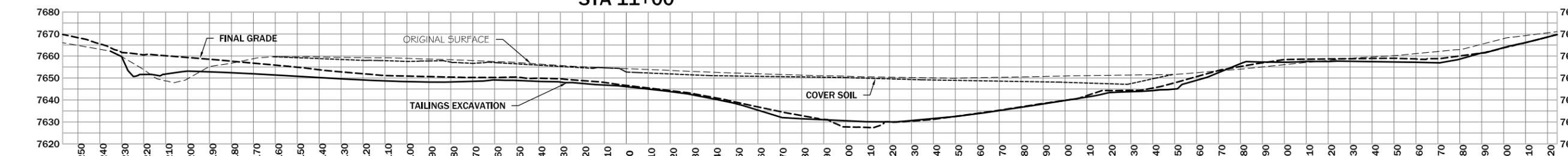
STA 12+00



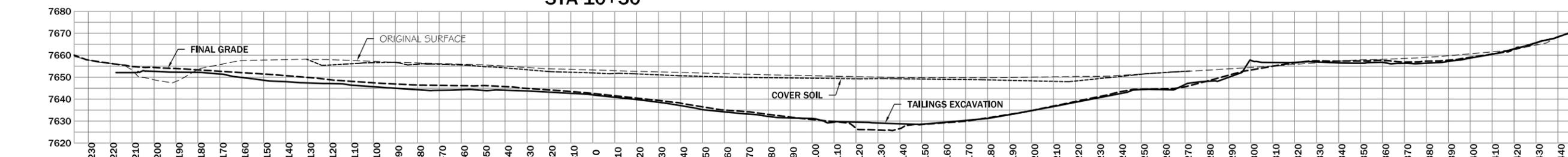
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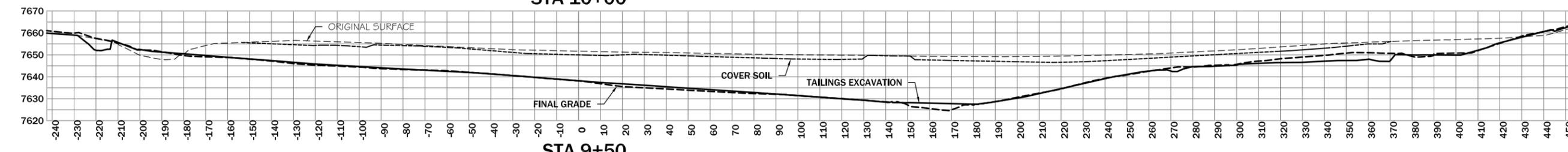
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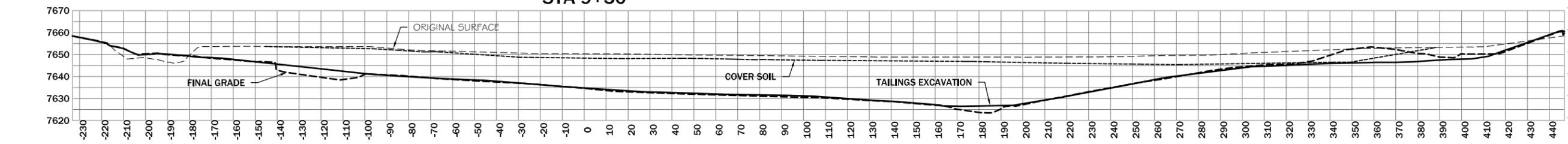
STA 10+50



STA 10+00



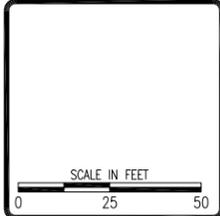
STA 9+50



REVISION	DATE	BY	DESC

DRAWN BY: CLJ
 DESIGNED BY: JCB
 CHECKED BY: JSA
 APPROVED BY: JSA
 PROJECT NO: 10140
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: NA
 DATUM: NA
 UNITS: FEET
 SOURCE: PIONEER



MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

TAILINGS EXCAVATION
 CROSS SECTIONS
 STA 9+50 TO 12+50

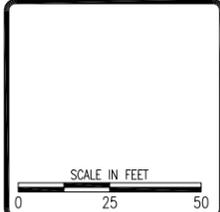


SHEET
 TE-4AB

REVISION	DATE	BY	DESC.

DRAWN BY: CLA
 DESIGNED BY: JMCB
 CHECKED BY: JSA
 APPROVED BY: JSA
 PROJECT NO: 10140
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: NA
 DATUM: NA
 UNITS: FEET
 SOURCE: PIONEER

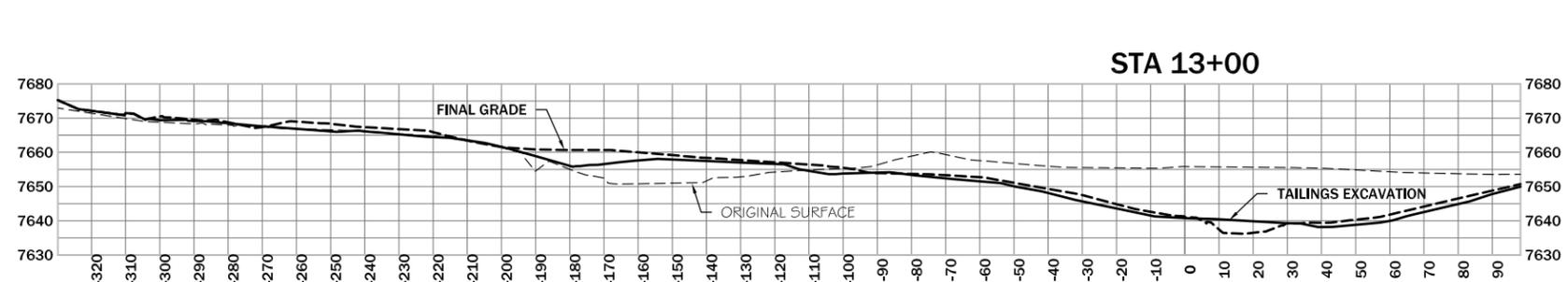
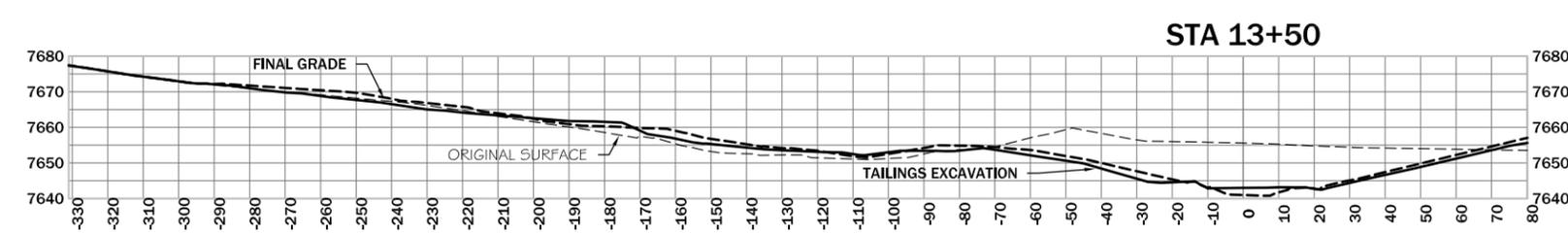
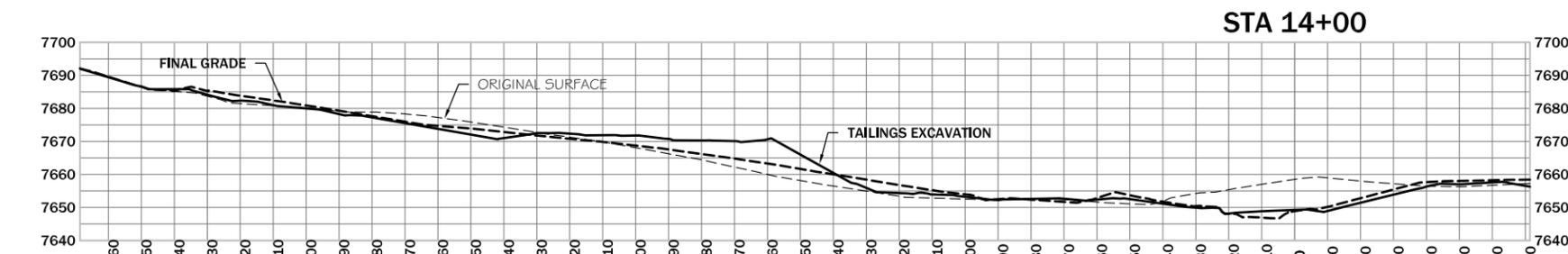
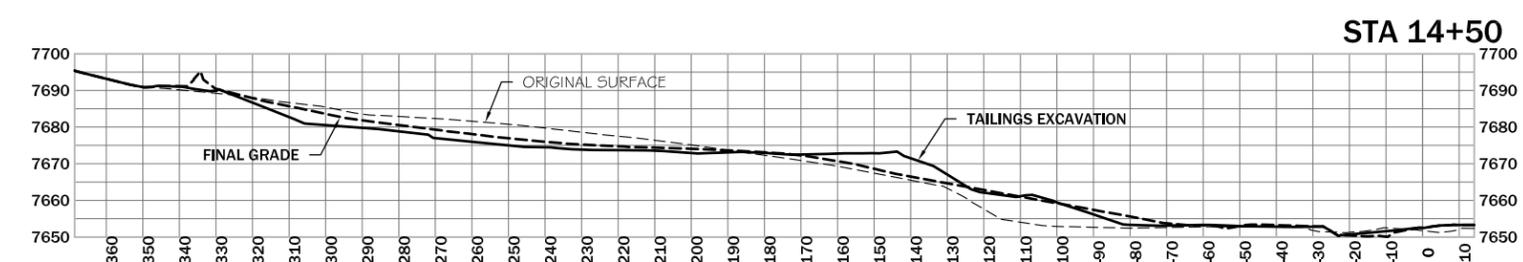
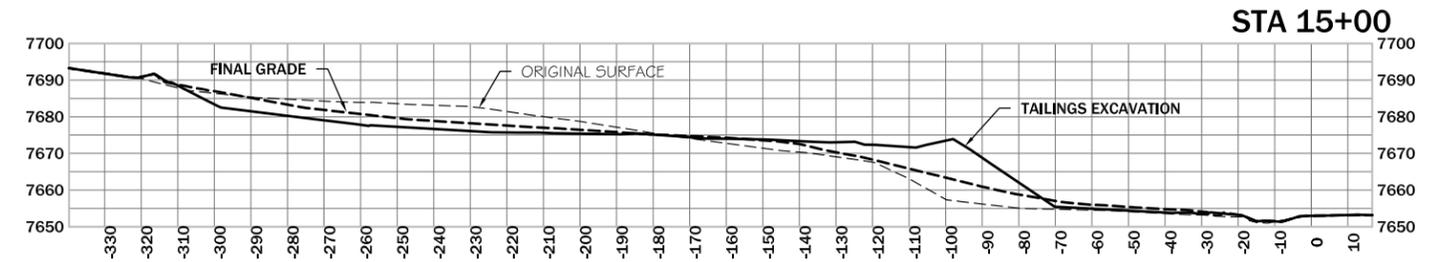
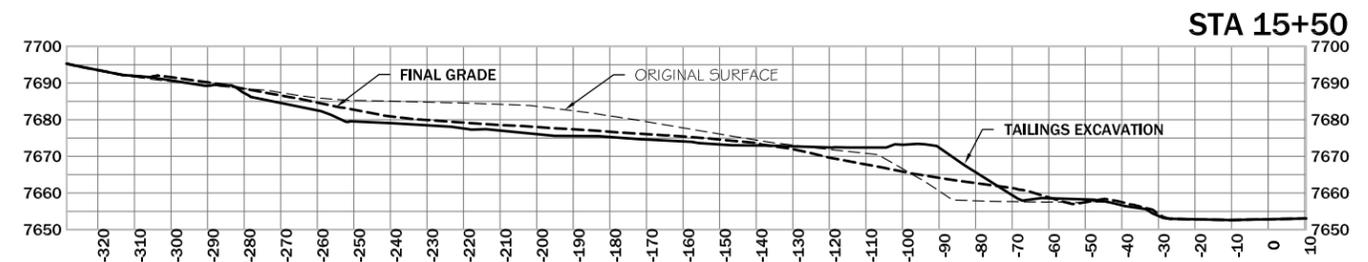


MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

TAILINGS EXCAVATION
 CROSS SECTIONS
 STA 13+00 TO 15+50



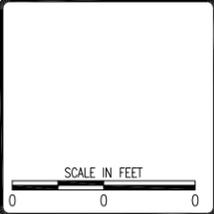
SHEET
 TE-5AB



REVISION:	DATE:	BY:	DESC:

DRAWN BY: CLJ
DESIGNED BY: JMCB
CHECKED BY: JSA
APPROVED BY: JSA
PROJECT NO: 10140
DATE: 2/24/15

DISPLAYED AS:
COORD SYS/ZONE: NA
DATUM: NA
UNITS: FEET
SOURCE: PIONEER



MDEQ/MWCB
MCLAREN TAILINGS ABANDONED
MINE SITE RECLAMATION PROJECT
FINAL AS-BUILT DRAWINGS

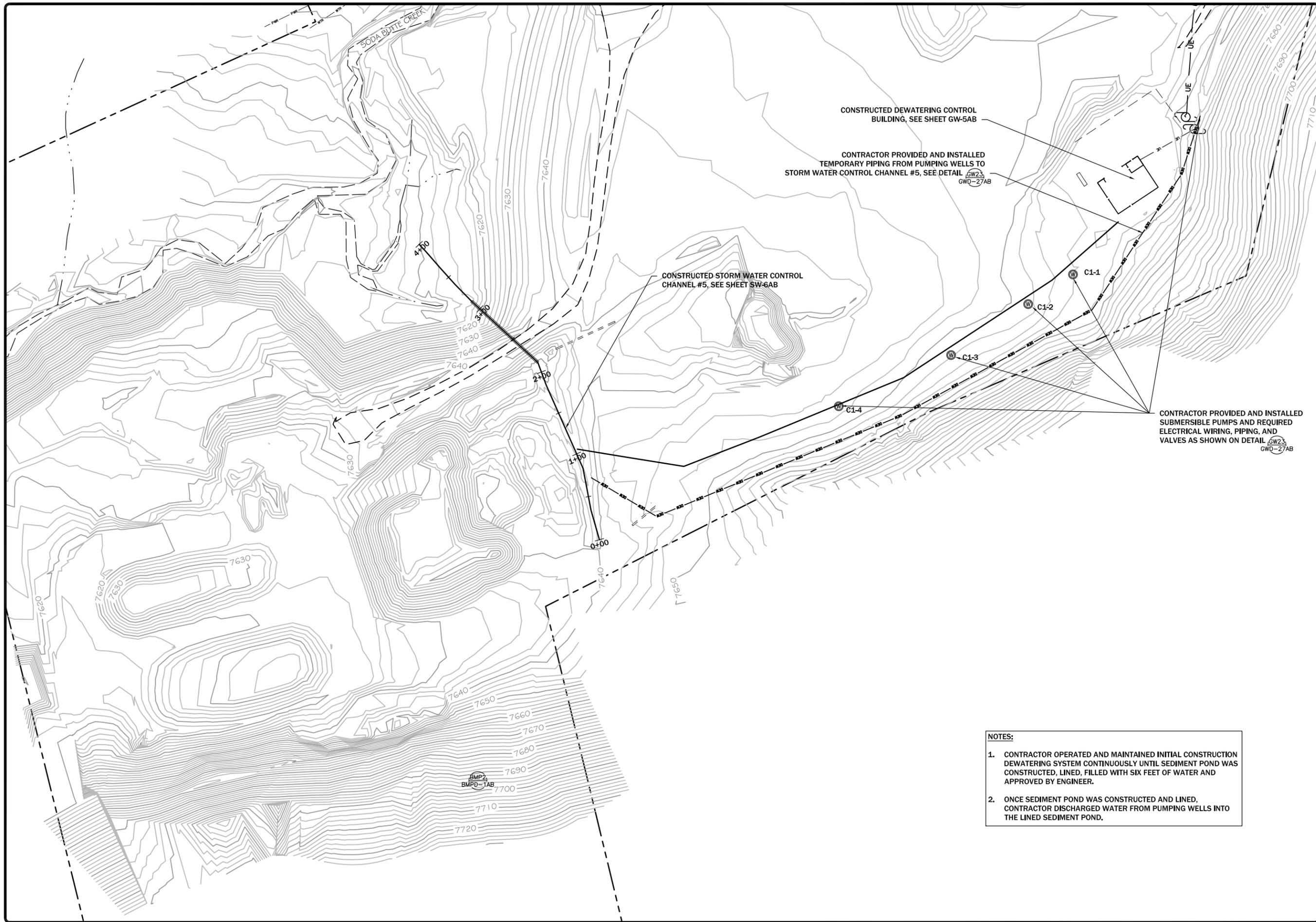
TAILINGS EXCAVATION
VOLUMES



SHEET
TE-6AB

Total Tailings Excavated Volume Table						
Station	Fill Area	Cut Area	Fill Volume	Cut Volume	Cumulative Fill Vol	Cumulative Cut Vol
2+00.00	0.00	0.00	0.00	0.00	0.00	0.00
2+50.00	0.00	0.00	0.00	0.00	0.00	0.00
3+00.00	134.06	24.87	124.13	23.03	124.13	23.03
3+50.00	24.48	193.49	146.79	202.18	270.92	225.21
4+00.00	32.68	438.80	52.93	585.45	323.85	810.67
4+50.00	480.79	3349.71	475.44	3507.88	799.28	4318.54
5+00.00	200.91	6297.05	631.20	8932.18	1430.48	13250.73
5+50.00	224.63	7598.22	394.01	12866.00	1824.49	26116.72
6+00.00	245.30	7979.57	435.12	14423.88	2259.61	40540.60
6+50.00	304.60	9324.24	509.17	16022.04	2768.78	56562.65
7+00.00	27.08	11821.99	307.11	19579.85	3075.89	76142.49
7+50.00	10.15	12088.31	34.47	22139.17	3110.36	98281.66
8+00.00	12.24	11452.72	20.73	21797.25	3131.09	120078.92
8+50.00	4.10	10116.19	15.13	19971.22	3146.22	140050.14
9+00.00	18.45	9591.66	20.88	18248.01	3167.10	158298.14
9+50.00	1.87	8501.63	18.81	16753.05	3185.91	175051.19
10+00.00	6.31	6514.12	7.58	13903.47	3193.49	188954.66
10+50.00	0.00	5922.28	5.85	11515.18	3199.34	200469.84
11+00.00	0.65	6193.80	0.61	11218.59	3199.94	211688.44
11+50.00	0.00	5736.78	0.61	11046.83	3200.55	222735.27
12+00.00	27.00	3899.79	25.00	8922.75	3225.55	231658.02
12+50.00	36.94	2995.75	59.20	6384.76	3284.75	238042.78
13+00.00	1.33	1653.27	35.44	4304.64	3320.19	242347.42
13+50.00	0.00	805.49	1.24	2276.63	3321.43	244624.05
14+00.00	0.00	0.00	0.00	745.83	3321.43	245369.87
14+50.00	0.00	0.00	0.00	0.00	3321.43	245369.87
15+00.00	0.00	0.00	0.00	0.00	3321.43	245369.87
15+50.00	0.00	0.00	0.00	0.00	3321.43	245369.87
16+00.00	0.00	0.00	0.00	0.00	3321.43	245369.87
16+50.00	0.00	0.00	0.00	0.00	3321.43	245369.87
17+00.00	0.00	0.00	0.00	0.00	3321.43	245369.87
17+50.00	0.00	0.00	0.00	0.00	3321.43	245369.87

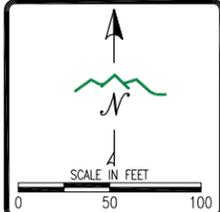
Total Cover Soil Excavated from Tailings Area Volume Table						
Station	Fill Area	Cut Area	Fill Volume	Cut Volume	Cumulative Fill Vol	Cumulative Cut Vol
2+00.00	0.18	22.83	0.00	0.00	0.00	0.00
2+50.00	0.74	42.15	0.85	60.17	0.85	60.17
3+00.00	19.04	0.00	18.31	39.03	19.16	99.20
3+50.00	0.00	0.00	17.63	0.00	36.79	99.20
4+00.00	6.88	227.81	6.37	210.94	43.16	310.13
4+50.00	12.40	1215.71	17.85	1336.59	61.01	1646.72
5+00.00	0.61	1453.21	12.05	2471.22	73.06	4117.94
5+50.00	3.91	1259.02	4.19	2511.32	77.25	6629.26
6+00.00	14.68	1088.29	17.21	2173.44	94.46	8802.70
6+50.00	57.51	1097.64	66.84	2024.01	161.31	10826.71
7+00.00	23.15	1090.50	74.69	2026.06	236.00	12852.76
7+50.00	18.56	979.93	38.62	1917.07	274.62	14769.84
8+00.00	56.18	1146.86	69.20	1969.25	343.82	16739.09
8+50.00	25.98	1307.08	76.07	2272.16	419.89	19011.25
9+00.00	5.72	1087.19	29.35	2216.91	449.24	21228.16
9+50.00	10.42	1552.36	14.94	2444.02	464.18	23672.18
10+00.00	0.40	1228.51	10.02	2574.88	474.20	26247.06
10+50.00	9.18	562.73	8.87	1658.56	483.08	27905.61
11+00.00	0.19	605.40	8.68	1081.61	491.75	28987.22
11+50.00	0.24	1065.30	0.39	1546.95	492.15	30534.16
12+00.00	35.16	1287.23	32.77	2178.27	524.92	32712.43
12+50.00	118.47	416.07	142.25	1577.13	667.16	34289.56
13+00.00	74.70	84.61	178.86	463.59	846.02	34753.15
13+50.00	1.85	8.53	70.88	86.23	916.90	34839.39
14+00.00	0.05	1.60	1.76	9.38	918.65	34848.76
14+50.00	0.00	0.00	0.05	1.48	918.70	34850.25
15+00.00	0.00	0.00	0.00	0.00	918.70	34850.25
15+50.00	0.00	0.00	0.00	0.00	918.70	34850.25
16+00.00	0.00	0.00	0.00	0.00	918.70	34850.25
16+50.00	0.00	0.00	0.00	0.00	918.70	34850.25
17+00.00	0.00	0.00	0.00	0.00	918.70	34850.25
17+50.00	0.00	0.00	0.00	0.00	918.70	34850.25



REVISION:	DATE:	BY:	DESC:

DRAWN BY: CLJ
 DESIGNED BY: JMW/B
 CHECKED BY: JCB
 APPROVED BY: JSA
 PROJECT NO: 10140
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: MSP
 DATUM: NAD83
 UNITS: FEET
 SOURCE: UNITS



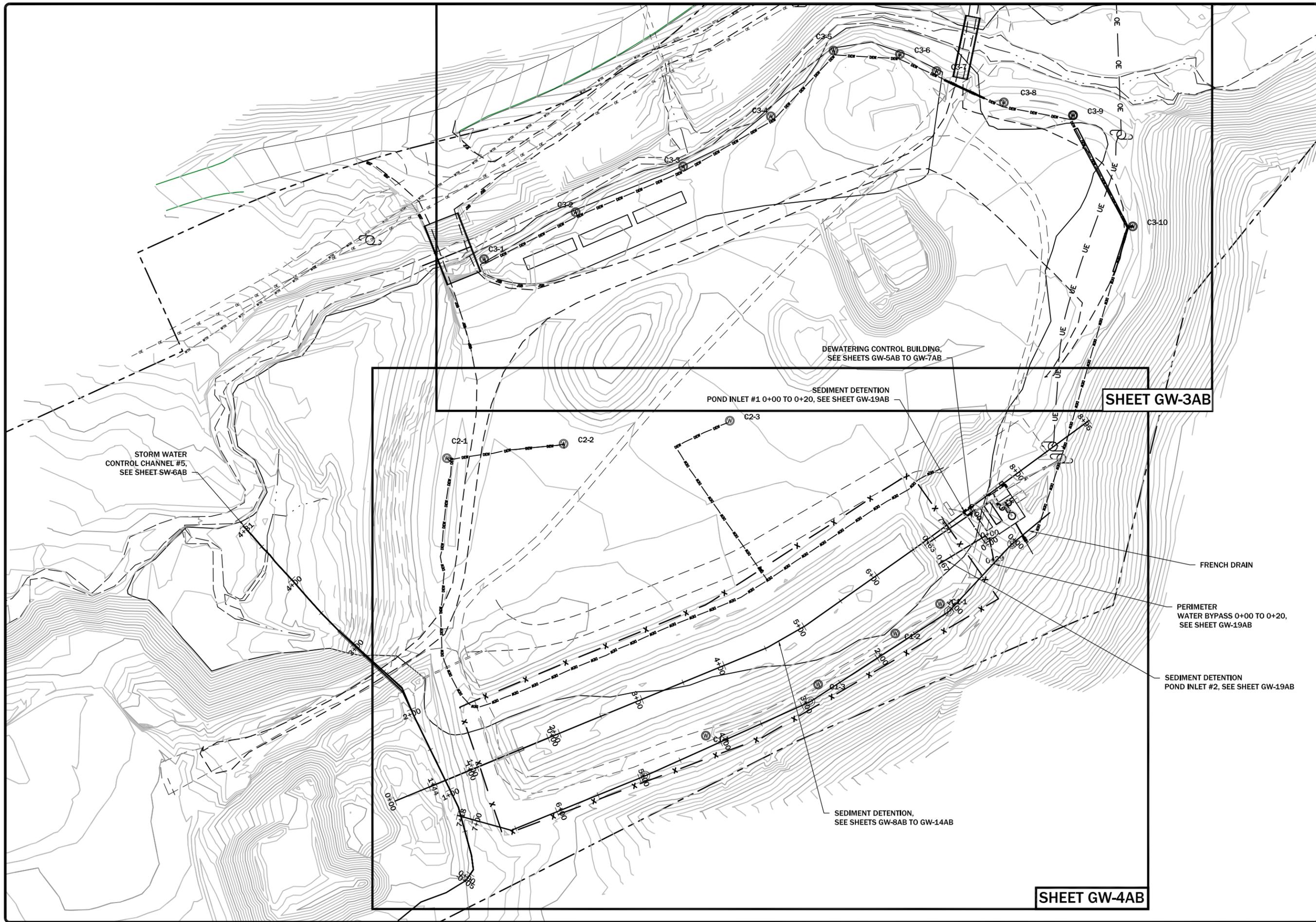
MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

INITIAL
 CONSTRUCTION
 DEWATERING
 LAYOUT

PIONEER
 TECHNICAL SERVICES, INC.
 1101 SOUTH MONTANA
 BUTTE, MONTANA 59701
 (406) 782-5177

SHEET
 GW-1AB

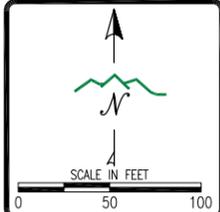
- NOTES:**
1. CONTRACTOR OPERATED AND MAINTAINED INITIAL CONSTRUCTION DEWATERING SYSTEM CONTINUOUSLY UNTIL SEDIMENT POND WAS CONSTRUCTED, LINED, FILLED WITH SIX FEET OF WATER AND APPROVED BY ENGINEER.
 2. ONCE SEDIMENT POND WAS CONSTRUCTED AND LINED, CONTRACTOR DISCHARGED WATER FROM PUMPING WELLS INTO THE LINED SEDIMENT POND.



REVISION	DATE	BY	DESC.

DRAWN BY: CLJ
 DESIGNED BY: JMW/B
 CHECKED BY: JSA
 APPROVED BY: JMW/B
 PROJECT NO: 10160
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: MSP
 DATUM: NAD83
 UNITS: FEET
 SOURCE: PIONEER



MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

PHASE I
 DEWATERING
 SYSTEM
 LAYOUT



SHEET
 GW-2AB

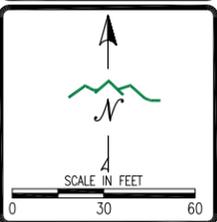
NOTES:

1. CONTRACTOR PROVIDED AND INSTALLED DESIGNATED SIZE PIPE FROM EACH C-3 SERIES PUMPING WELLS TO DEWATERING CONTROL BUILDING, SEE SHEETS GWD-1AB AND GWD-2AB.
2. CONTRACTOR PROVIDED AND INSTALLED SUBMERSIBLE PUMP, DROP PIPE, AND FIXTURES AS SHOWN ON SHEETS GWD-1AB AND GWD-2AB.

REVISION:	DATE:	BY:	DESC:

DRAWN BY: CLC
 DESIGNED BY: JMW/B
 CHECKED BY: JCB
 APPROVED BY: JSA
 PROJECT NO: 10160
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: MSP
 DATUM: NAD83
 UNITS: FEET
 SOURCE: PIONEER

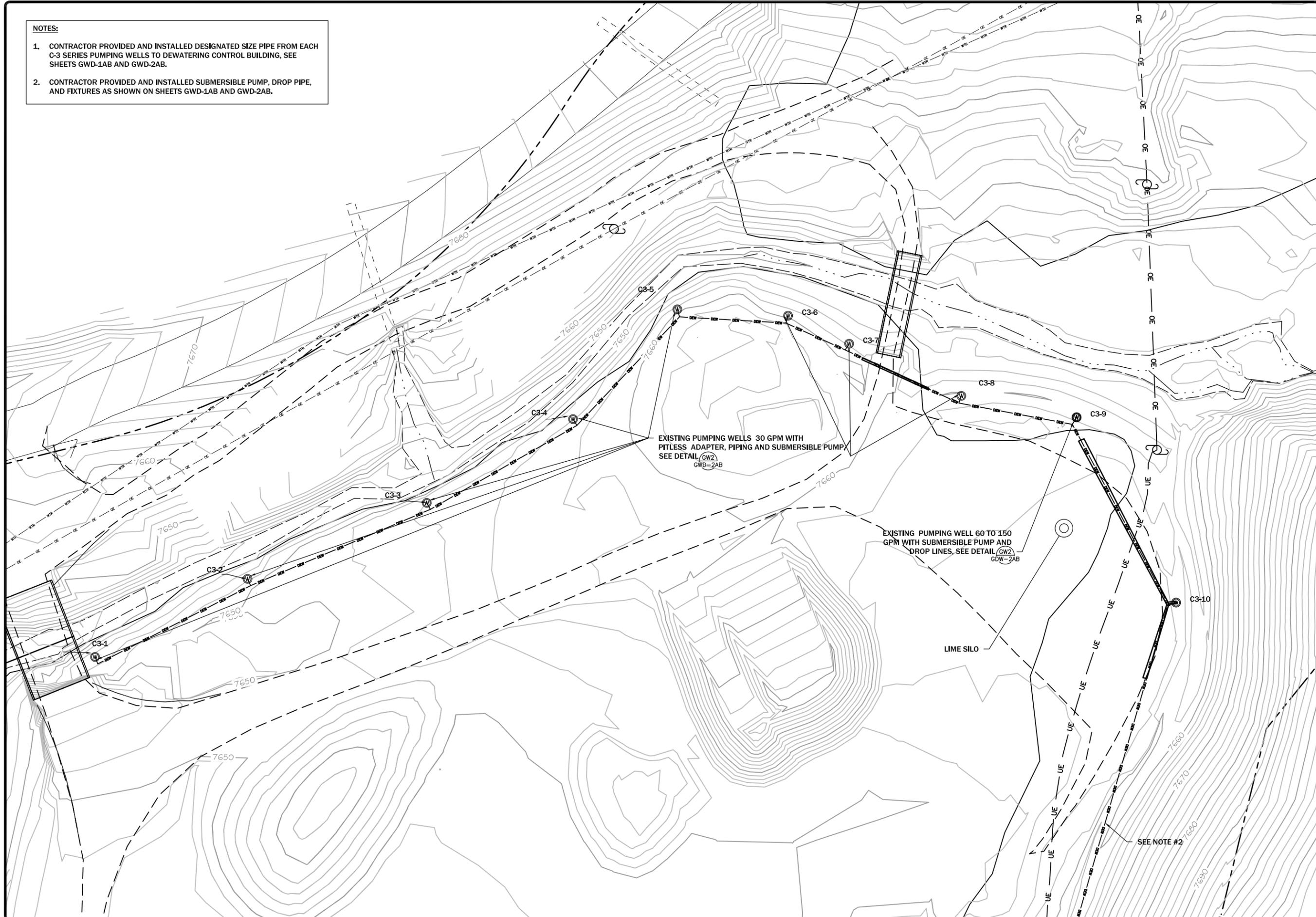


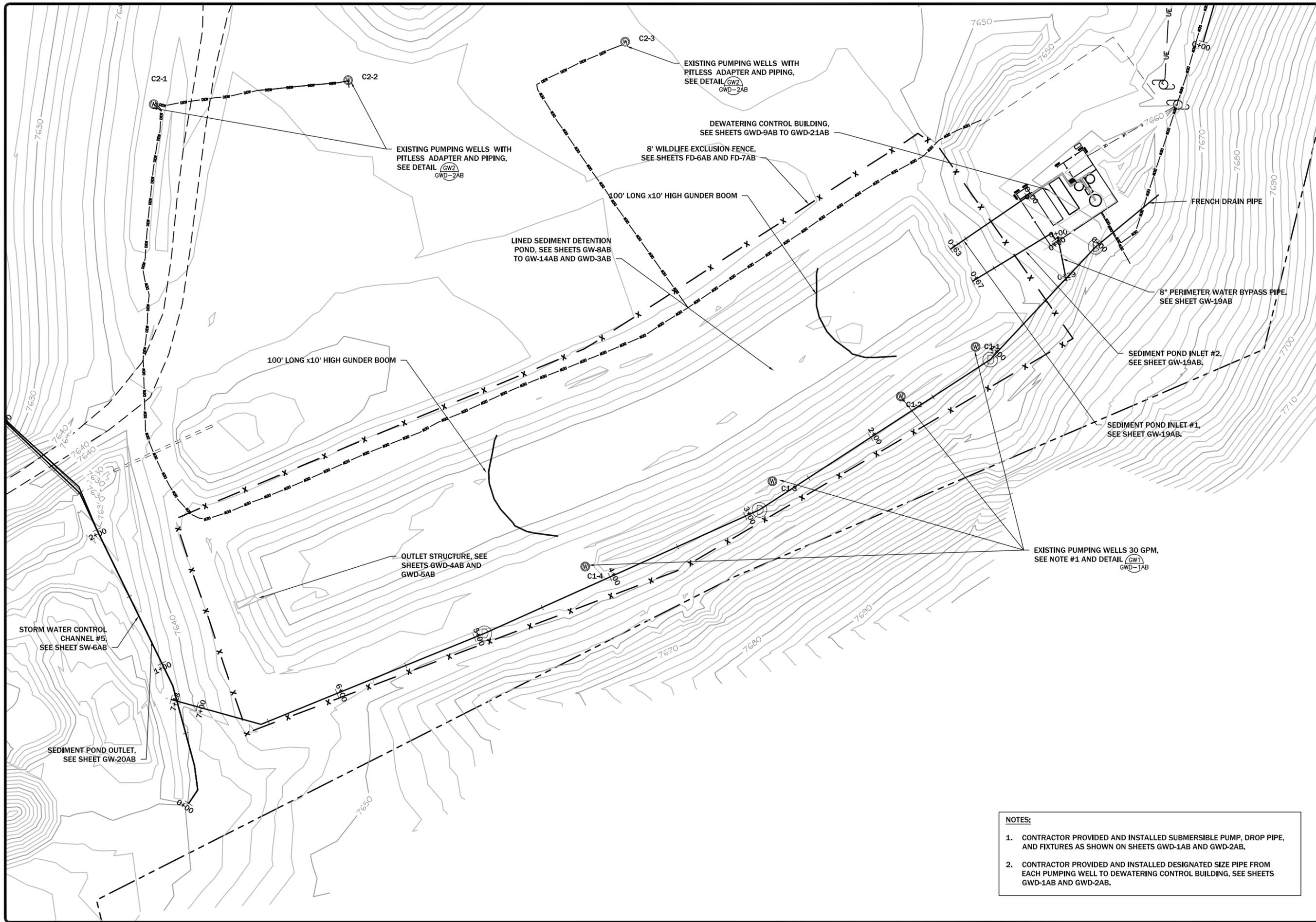
MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

PHASE I
 DEWATERING SYSTEM
 AND PUMPING
 WELL LOCATIONS



SHEET
 GW-3AB

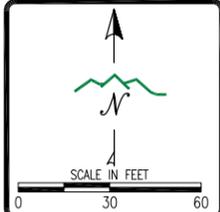




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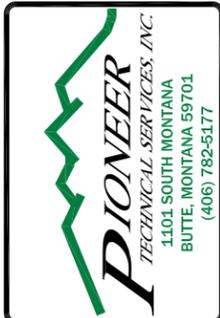
DRAWN BY: CL
 DESIGNED BY: JMW
 CHECKED BY: JMC
 APPROVED BY: JSA
 PROJECT NO: 10160
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: MSP
 DATUM: NAD83
 UNITS: FEET
 SOURCE: UNITS



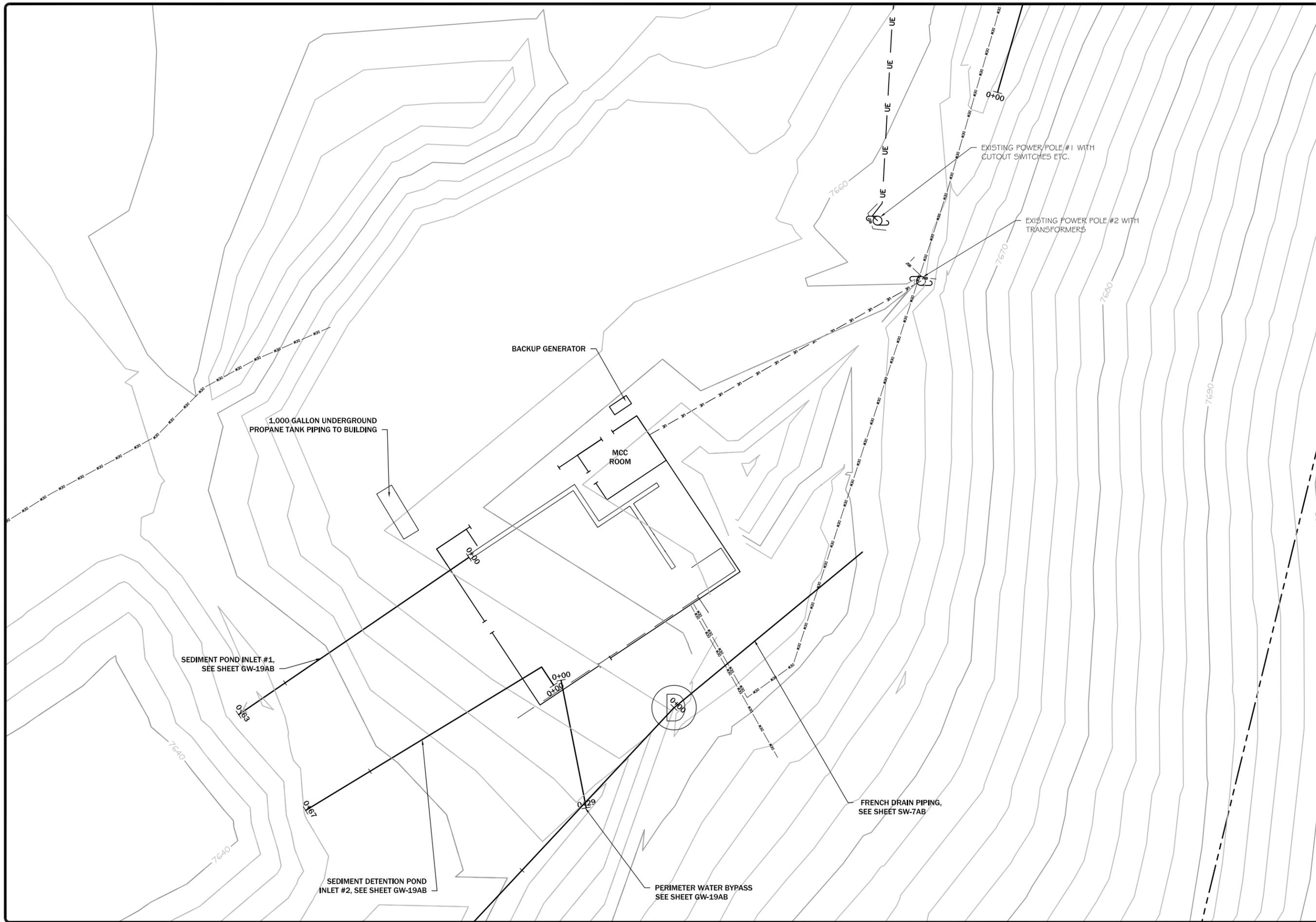
MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

PHASE I
 DEWATERING SYSTEM
 AND PUMPING
 WELL LOCATIONS



SHEET
 GW-4AB

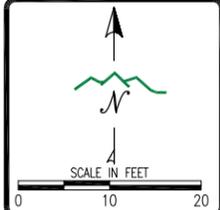
- NOTES:**
- CONTRACTOR PROVIDED AND INSTALLED SUBMERSIBLE PUMP, DROP PIPE, AND FIXTURES AS SHOWN ON SHEETS GWD-1AB AND GWD-2AB.
 - CONTRACTOR PROVIDED AND INSTALLED DESIGNATED SIZE PIPE FROM EACH PUMPING WELL TO DEWATERING CONTROL BUILDING, SEE SHEETS GWD-1AB AND GWD-2AB.



REVISION:	DATE:	BY:	DESC:

DRAWN BY: CLM
 DESIGNED BY: JSA
 CHECKED BY: MCB
 APPROVED BY: JSA
 PROJECT NO: 10160
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: MSP
 DATUM: NAD83
 UNITS: FEET
 SOURCE: PIONEER

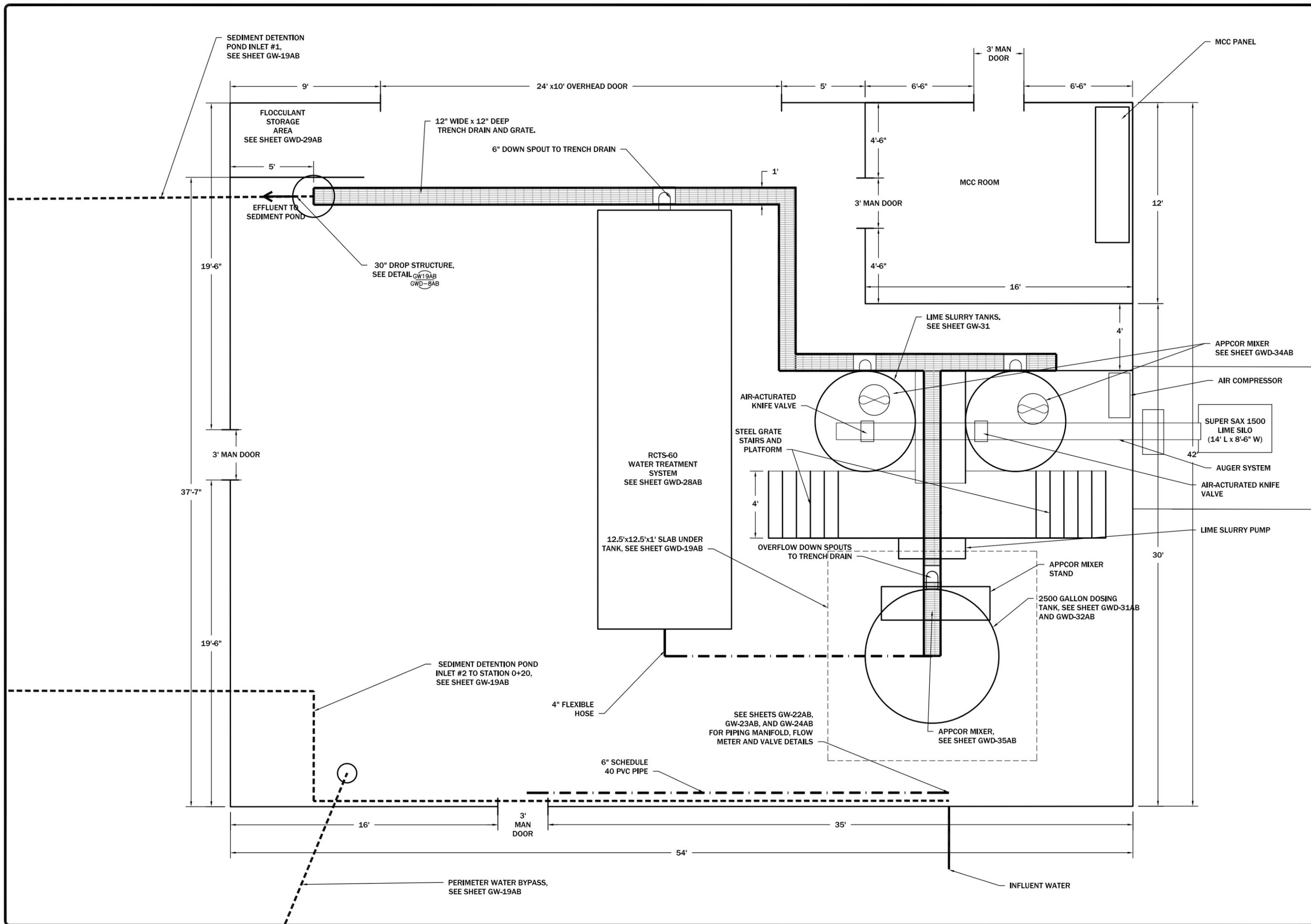


MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

DEWATERING
 CONTROL BUILDING
 PLAN VIEW



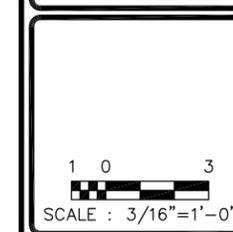
SHEET
 GW-5AB



REVISION	DATE	BY	DESC.

DRAWN BY: CLM
 DESIGNED BY: JSM
 CHECKED BY: MCB
 APPROVED BY: JSM
 PROJECT NO: 10160
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: NA
 DATUM: NA
 UNITS: FEET
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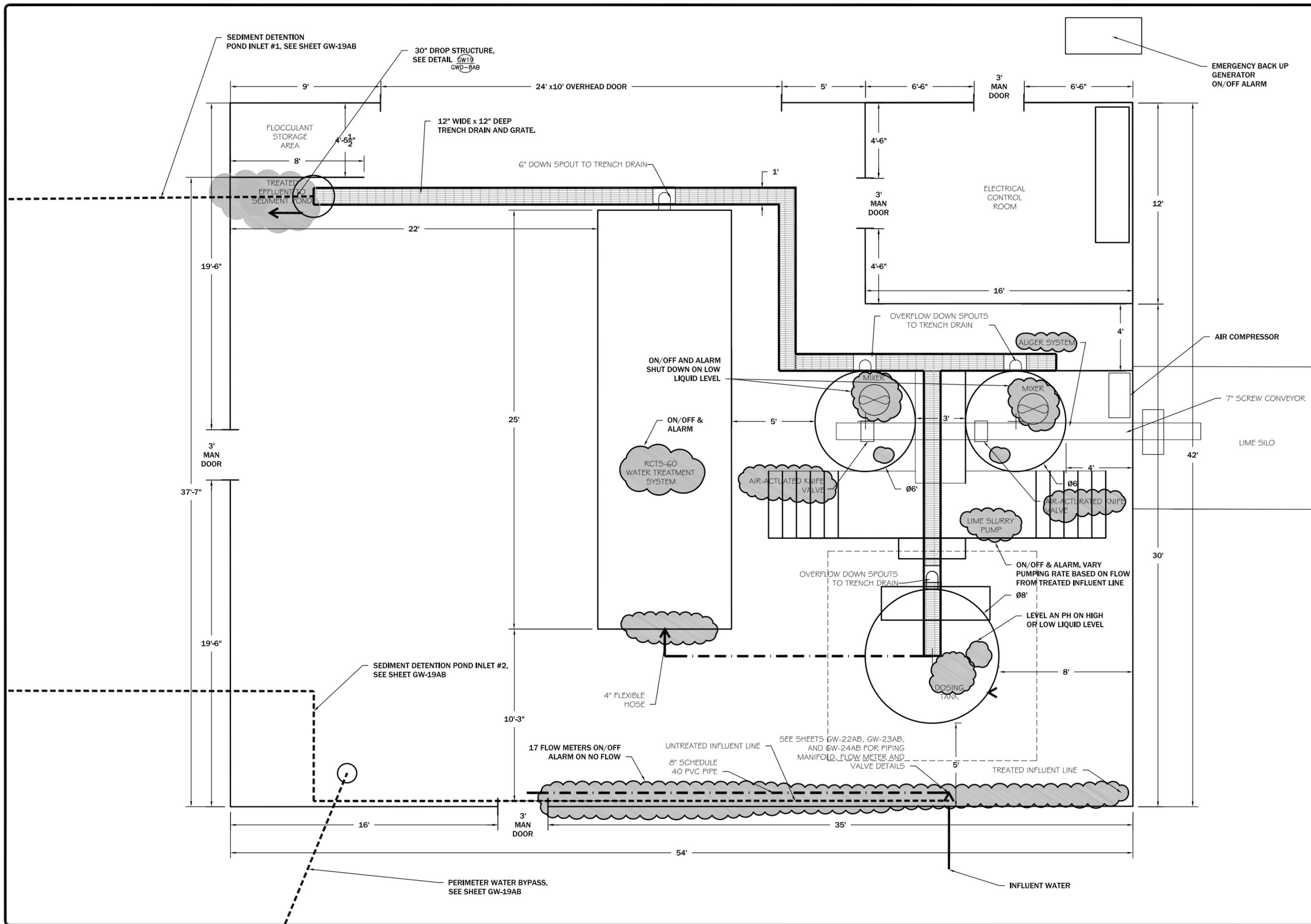


MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILTS DRAWINGS

WATER TREATMENT
 SYSTEM



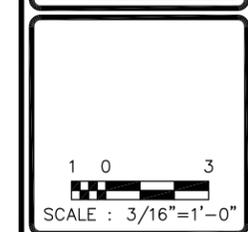
SHEET
 GW-6AB



REVISION	DATE	BY	DESC.

DRAWN BY: CLC
 DESIGNED BY: JMW/B
 CHECKED BY: JCB
 APPROVED BY: JSA
 PROJECT NO: 10160
 DATE: 4/24/12

DISPLAYED AS:
 COORD SYS/ZONE/NA
 DATUM: NA
 UNITS: FEET
 SOURCE: PIONEER

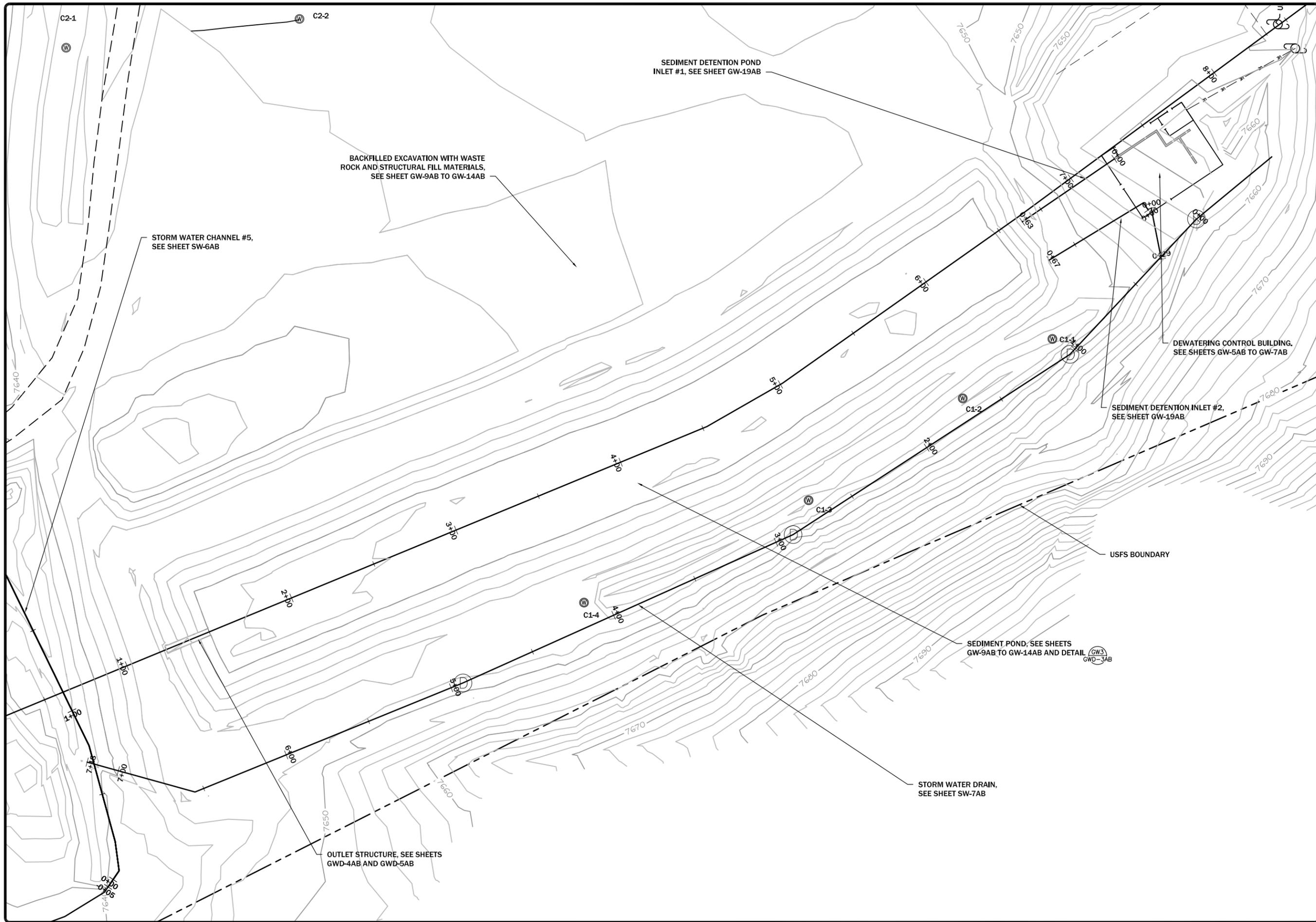


MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILTS

DEWATERING
 CONTROL BUILDING
 INSTRUMENTATION
 PLAN VIEW



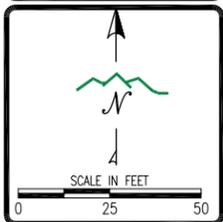
SHEET
 GW-7AB



REVISION	DATE	BY	DESC.

DRAWN BY: CLM
 DESIGNED BY: JSM
 CHECKED BY: JCB
 APPROVED BY: JSM
 PROJECT NO: 10160
 DATE: 4/24/12

DISPLAYED AS:
 COORD SYS/ZONE: MSP
 DATUM: NAD83
 UNITS: FEET
 SOURCE: PIONEER

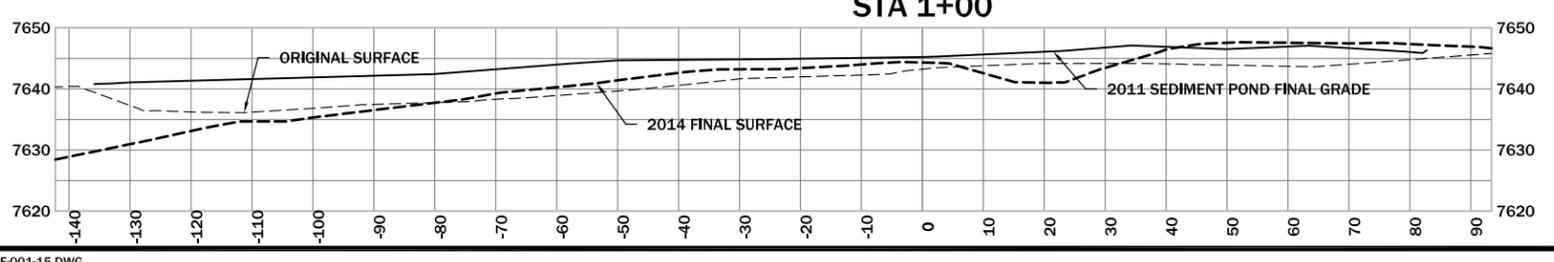
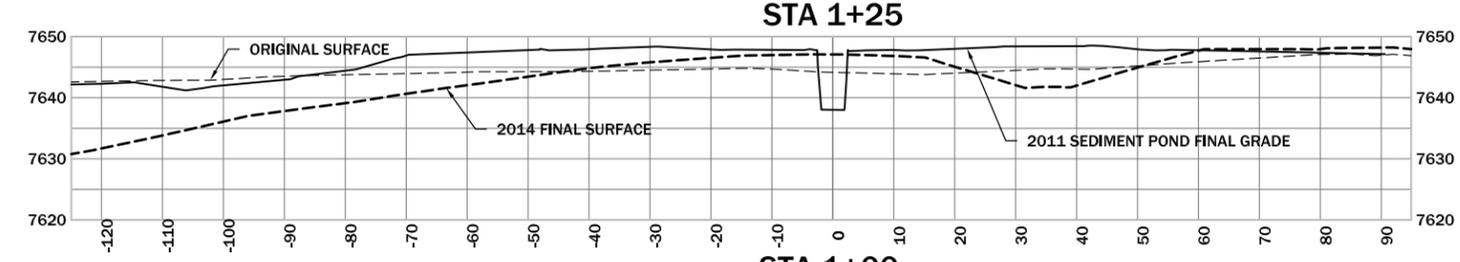
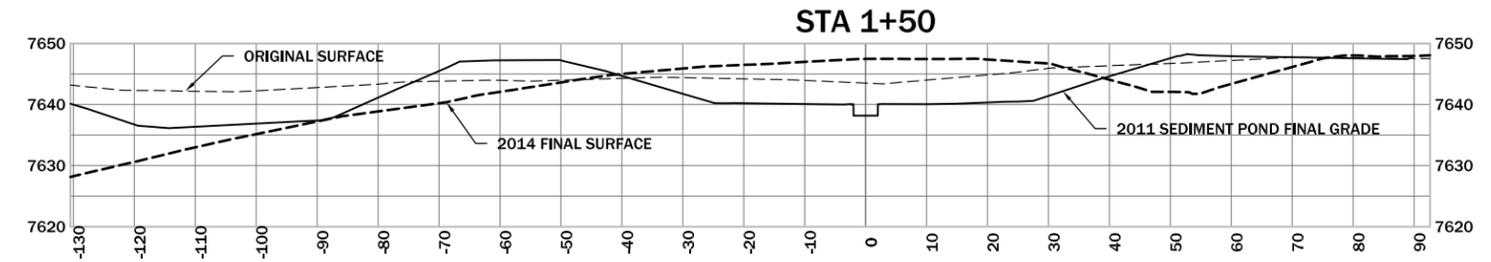
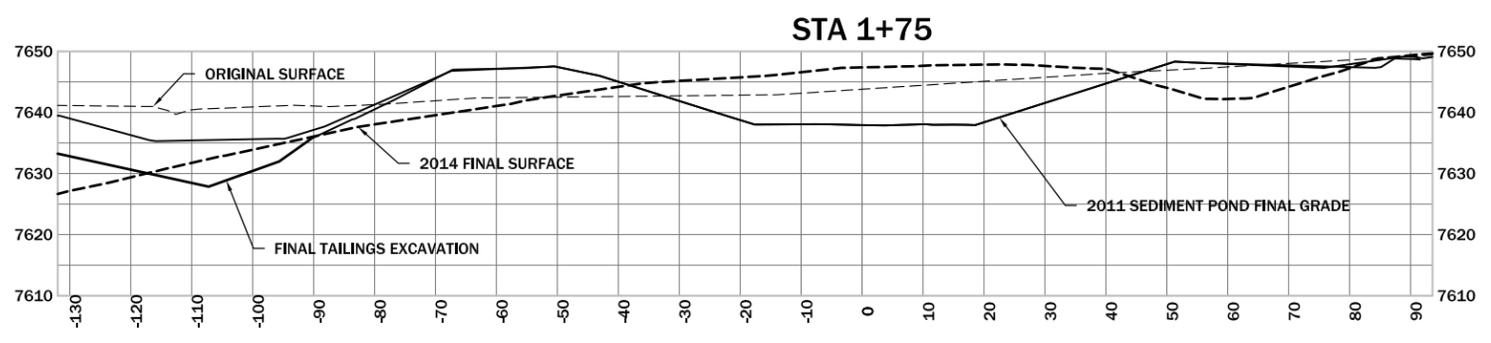
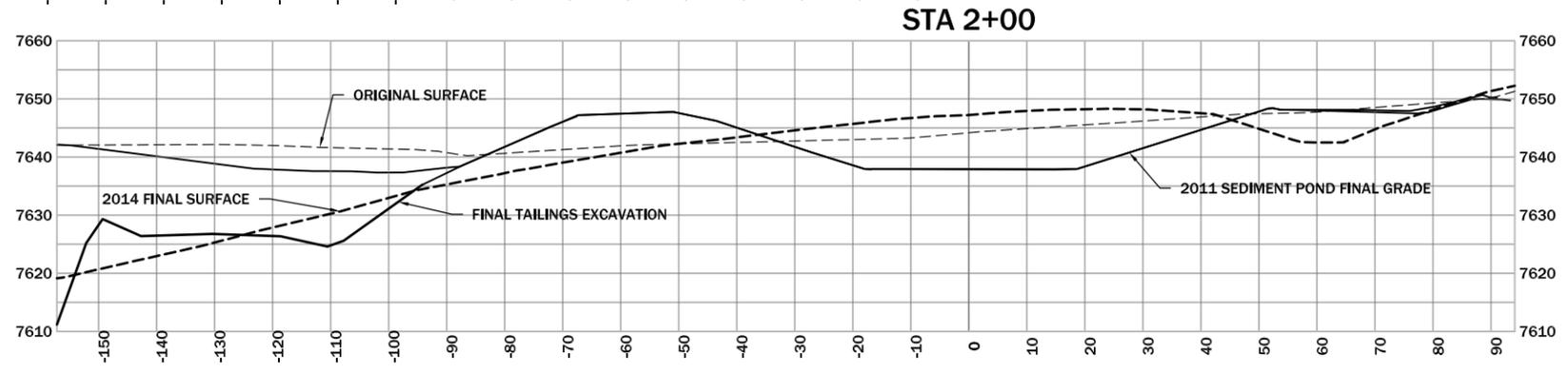
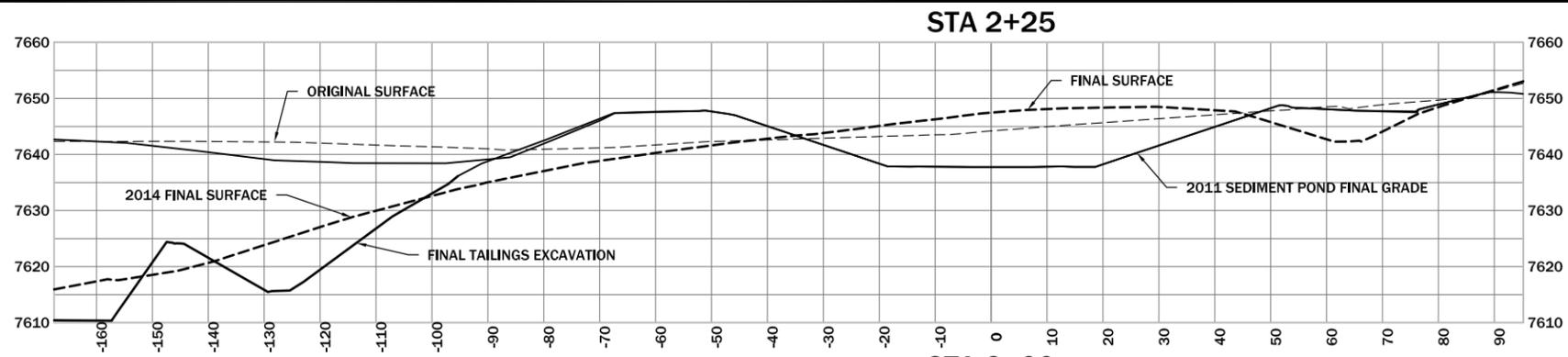


MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

SEDIMENT POND
 PLAN VIEW



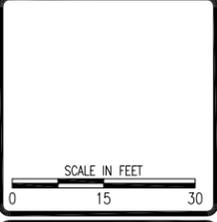
SHEET
 GW-8AB



REVISION	DATE	BY	DESC.

DRAWN BY: CLA
 DESIGNED BY: JSA
 CHECKED BY: MCB
 APPROVED BY: JSA
 PROJECT NO: 10160
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: NA
 DATUM: NA
 UNITS: FEET
 SOURCE: PIONEER

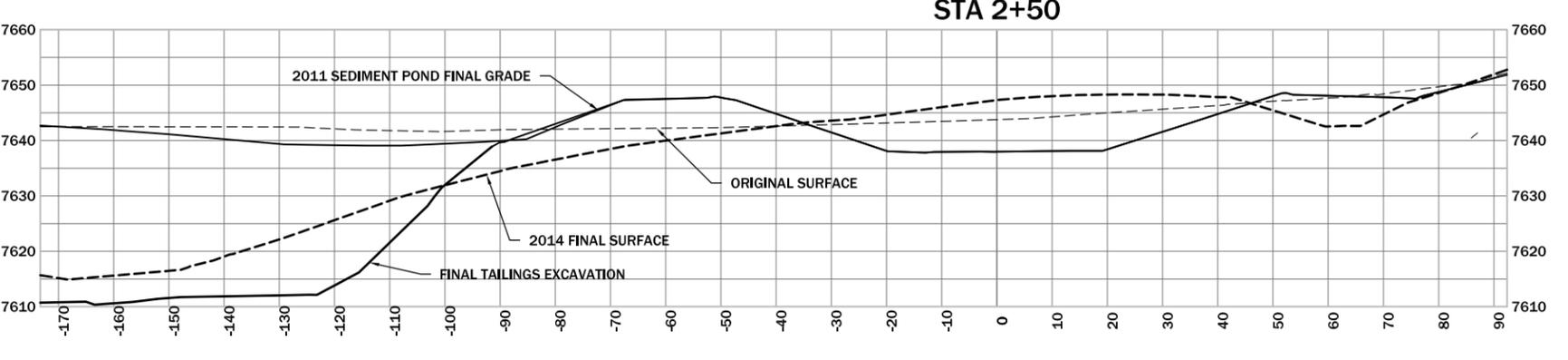
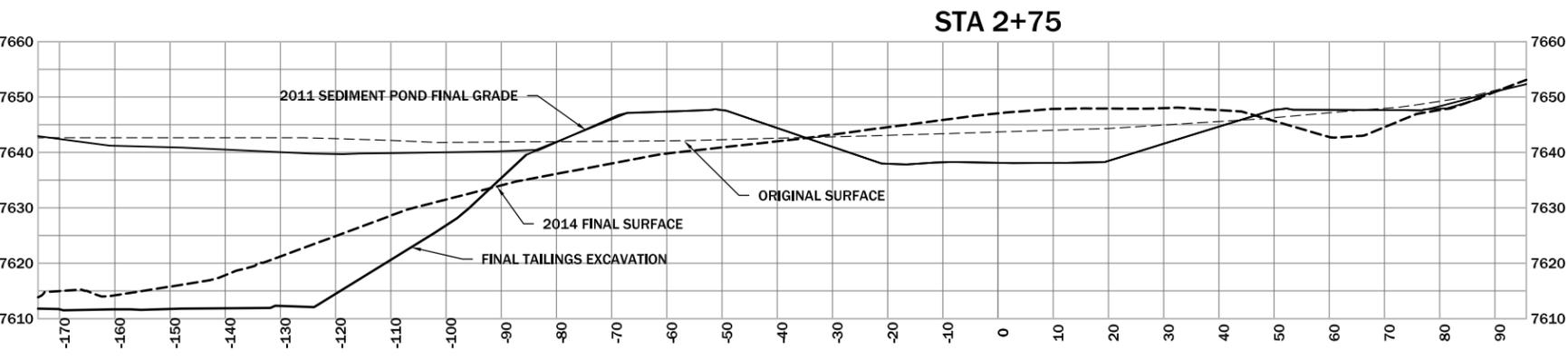
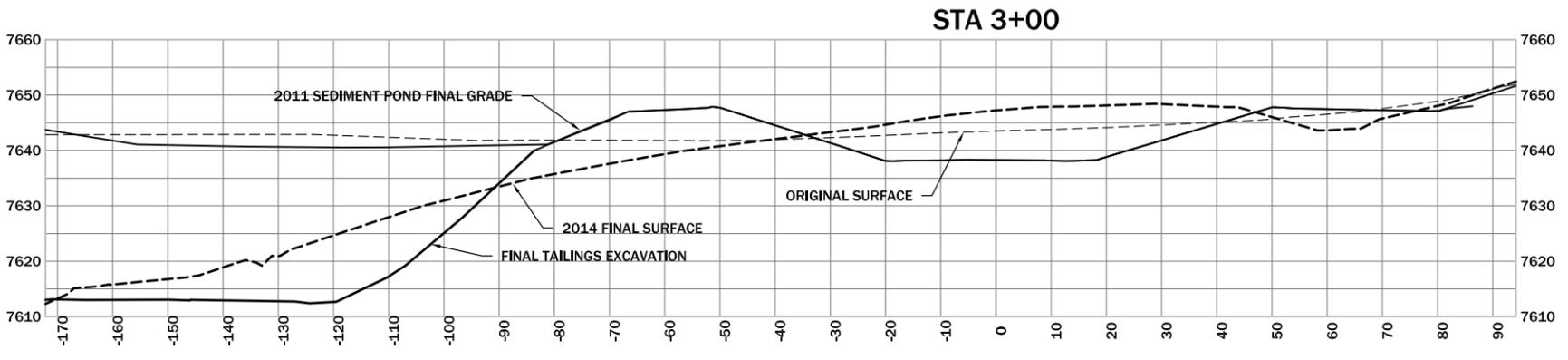
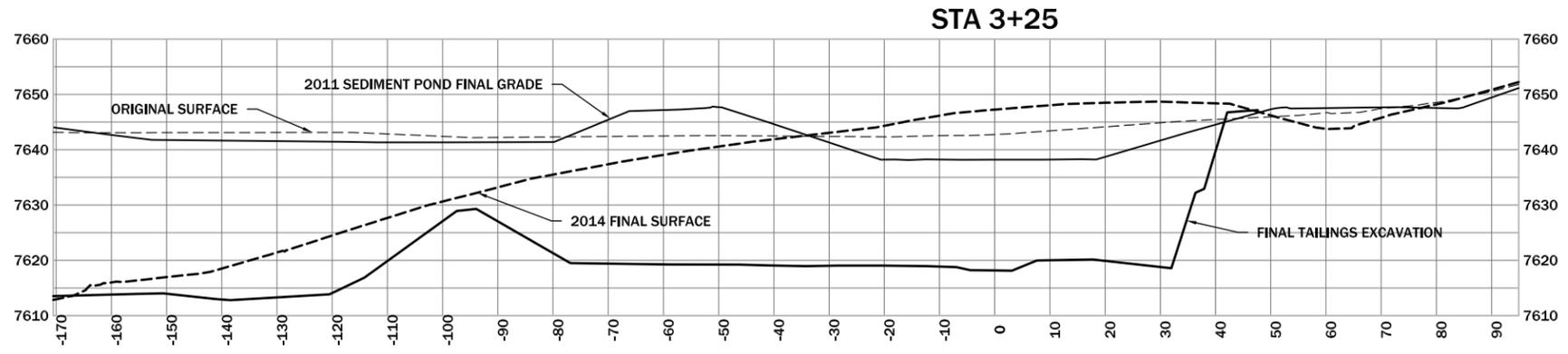


MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

SEDIMENT POND
 CROSS SECTIONS
 STA 1+00 TO 2+25



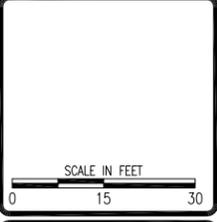
SHEET
 GW-9AB



REVISION	DATE	BY	DESC.

DRAWN BY: CLJ
 DESIGNED BY: JSA
 CHECKED BY: MCB
 APPROVED BY: JSA
 PROJECT NO: 10160
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: NA
 DATUM: NA
 UNITS: FEET
 SOURCE: PIONEER

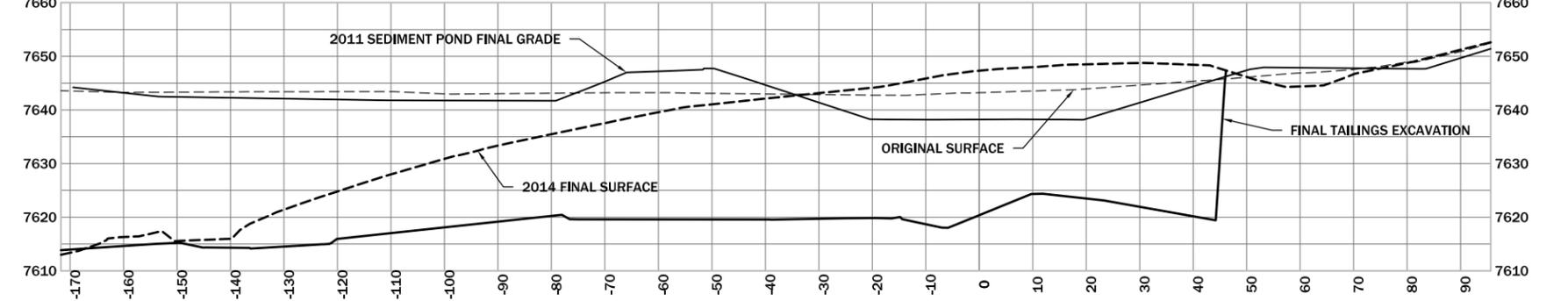
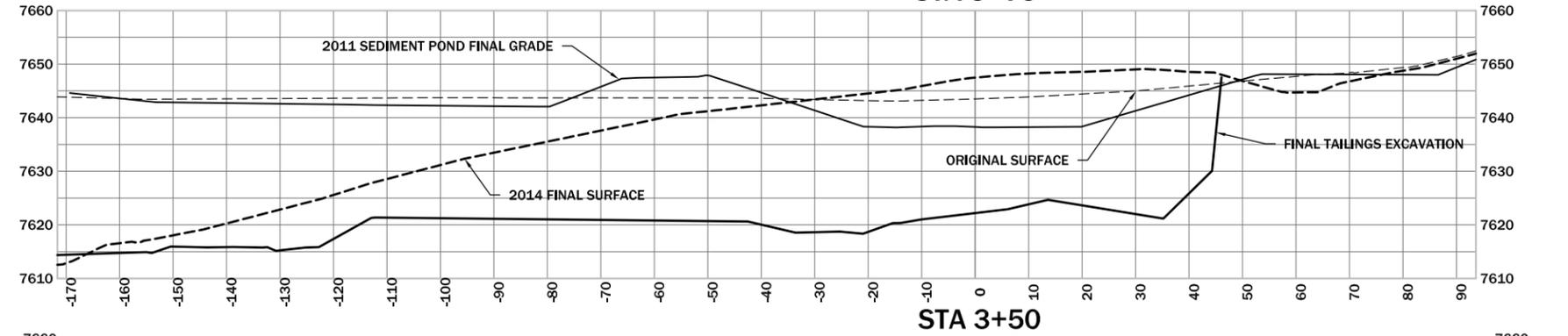
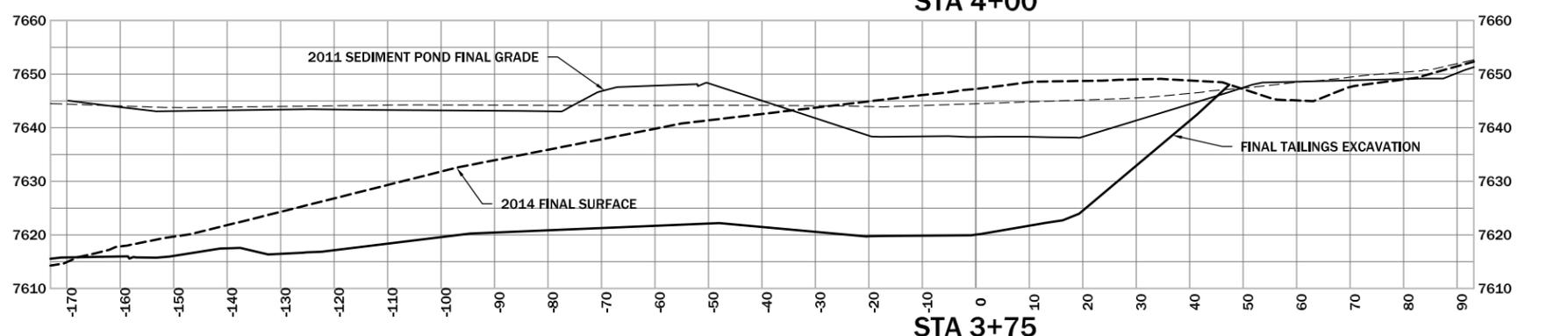
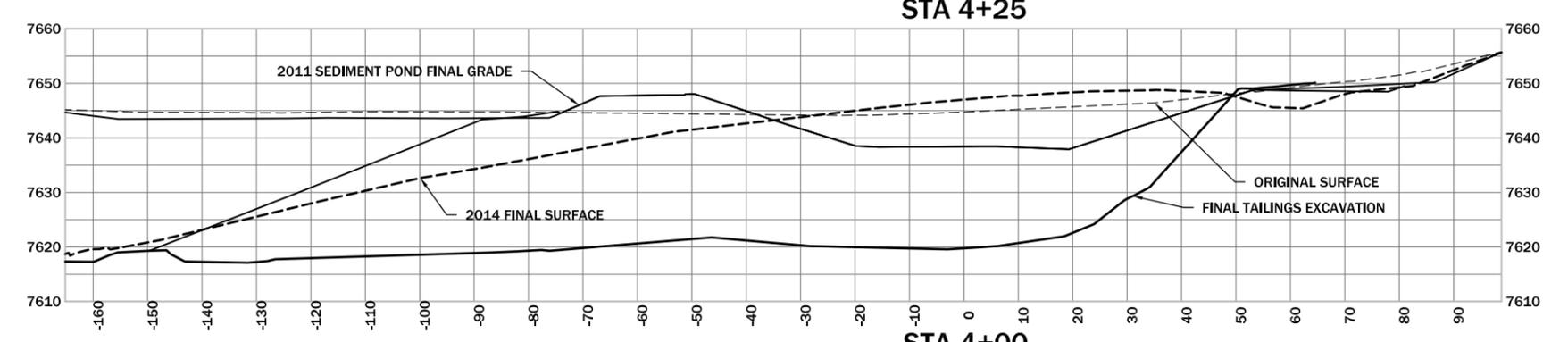
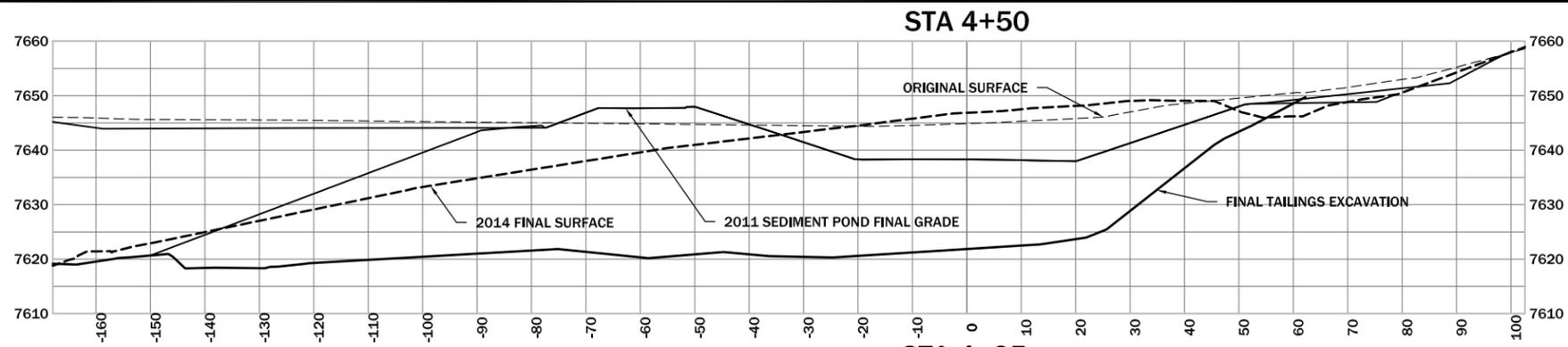


MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

SEDIMENT POND
 CROSS SECTIONS
 STA 2+50 TO 3+25



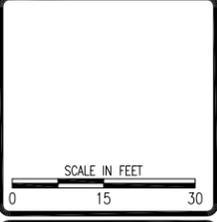
SHEET
 GW-10AB



REVISION	DATE	BY	DESC.

DRAWN BY: CLJ
 DESIGNED BY: JSA
 CHECKED BY: MCB
 APPROVED BY: JSA
 PROJECT NO: 10160
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: NA
 DATUM: NA
 UNITS: FEET
 SOURCE: PIONEER

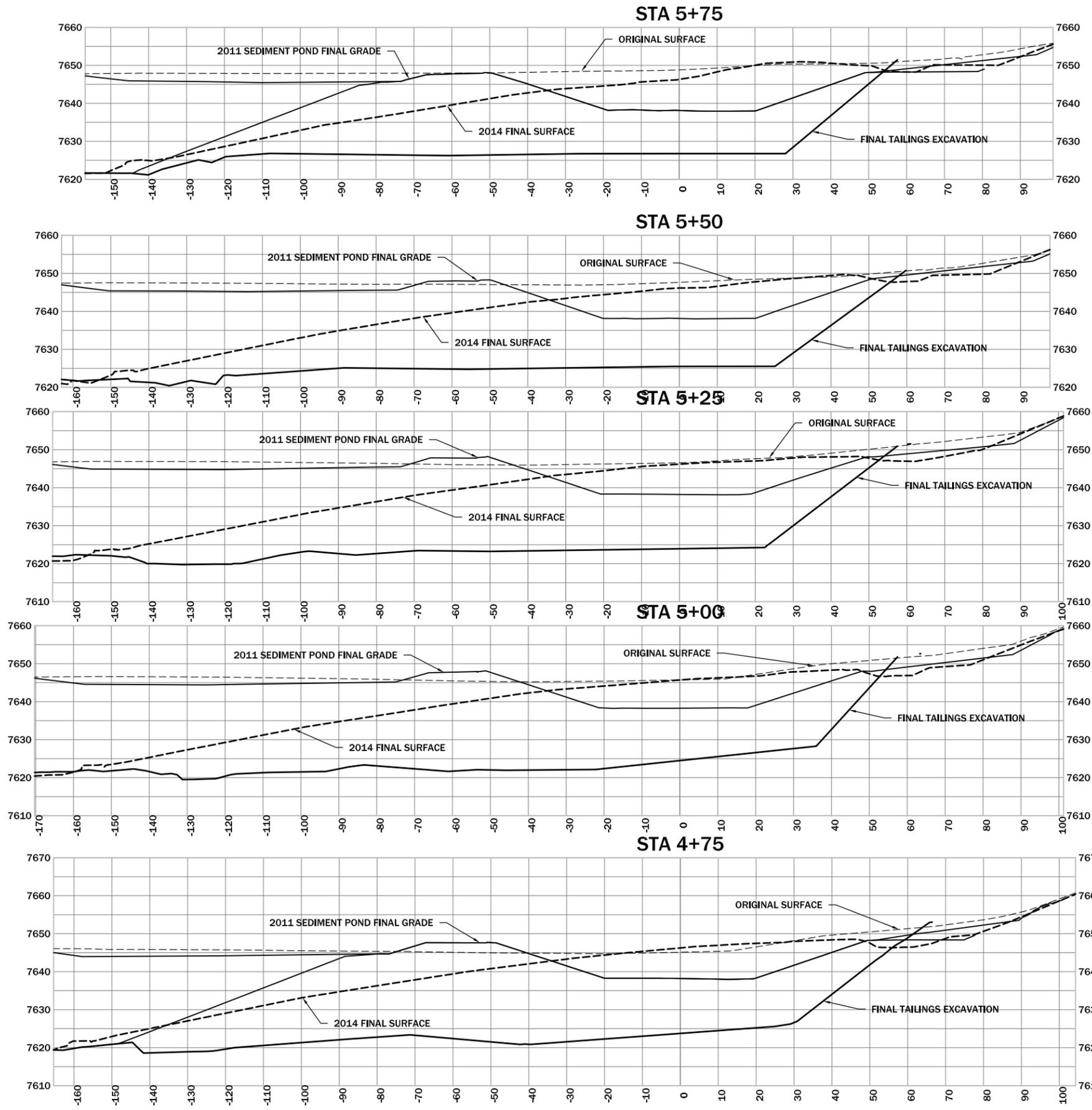


MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

SEDIMENT POND
 CROSS SECTIONS
 STA 3+50 TO 4+50



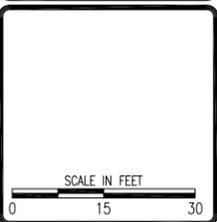
SHEET
 GW-11AB



REVISION	DATE	BY	DESC.

DRAWN BY: JCLA
 DESIGNED BY: JSM
 CHECKED BY: MCB
 APPROVED BY: JSM
 PROJECT NO: 10160
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: NA
 DATUM: NA
 UNITS: FEET
 SOURCE: PIONEER

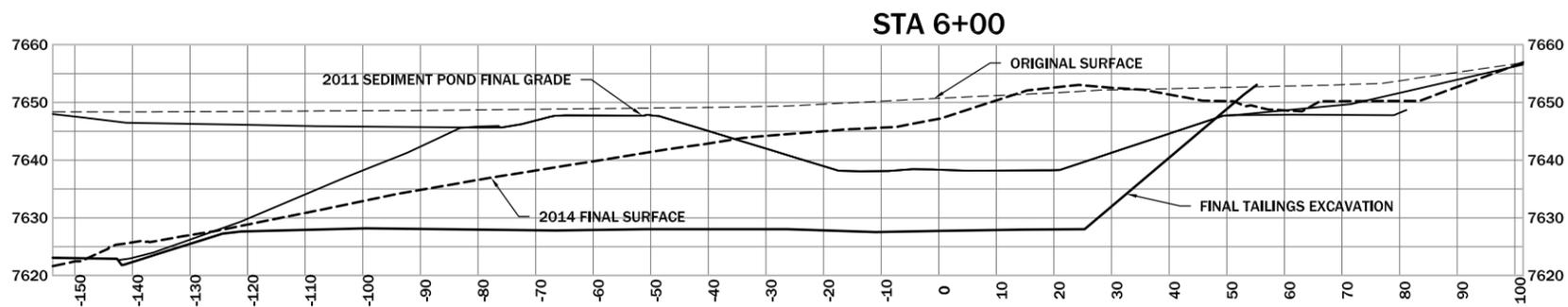
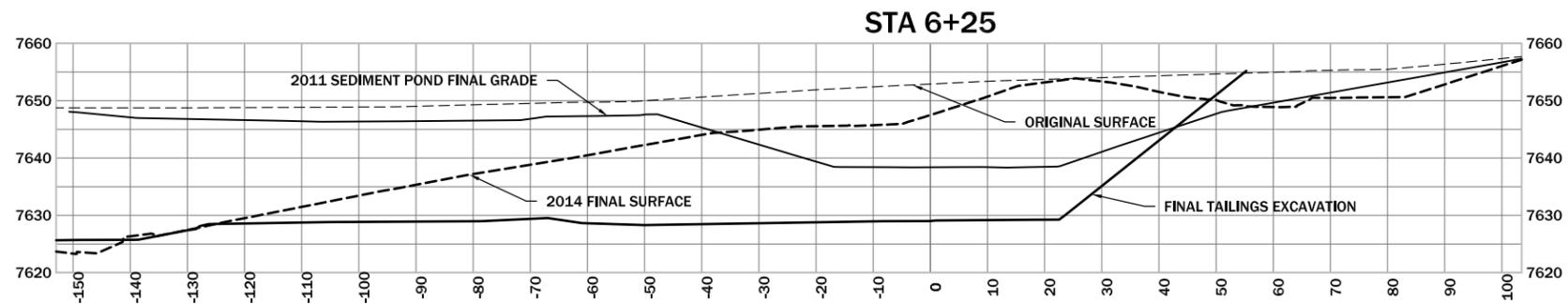
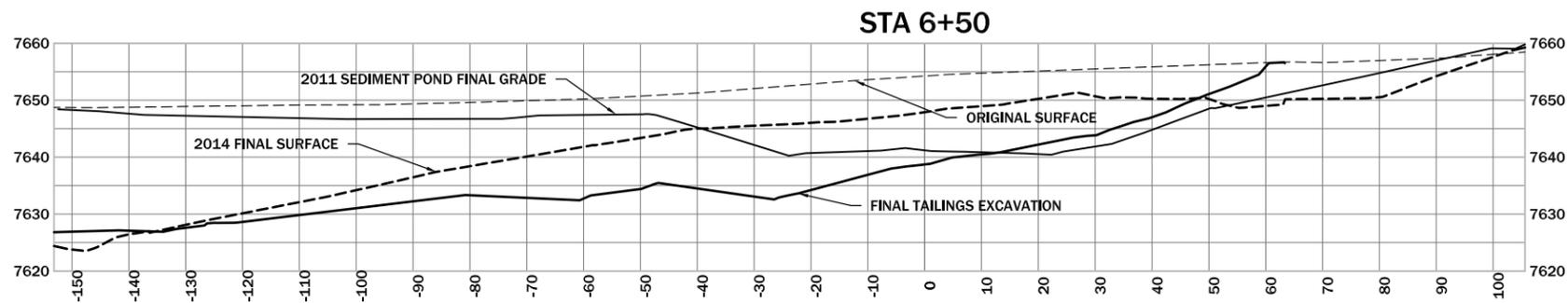
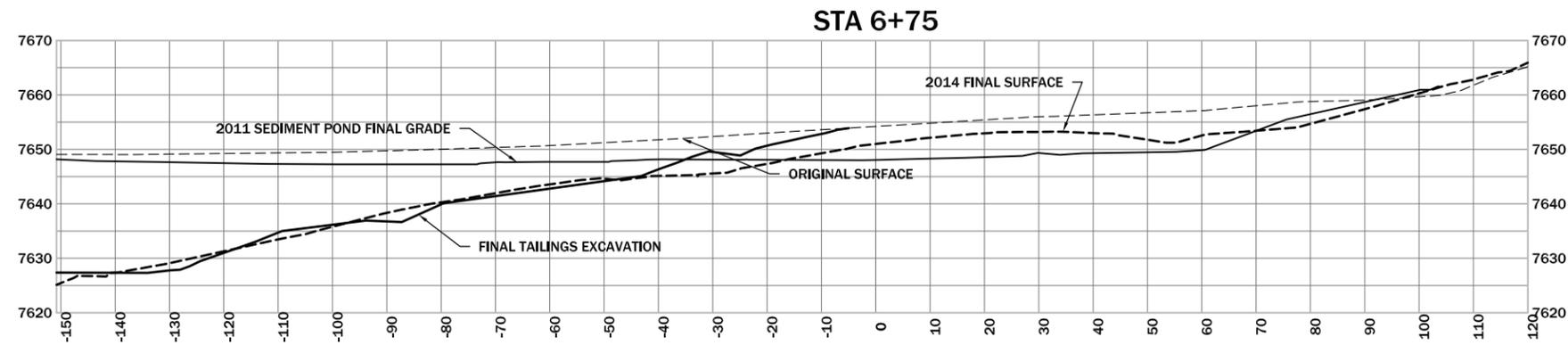


MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

SEDIMENT POND
 CROSS SECTIONS
 STA 4+75 TO 5+75



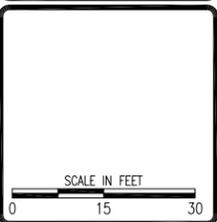
SHEET
 GW-12AB



REVISION	DATE	BY	DESC.

DRAWN BY: CLJ
 DESIGNED BY: JSA
 CHECKED BY: MCB
 APPROVED BY: JSA
 PROJECT NO: 10160
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: NA
 DATUM: NA
 UNITS: FEET
 SOURCE: PIONEER

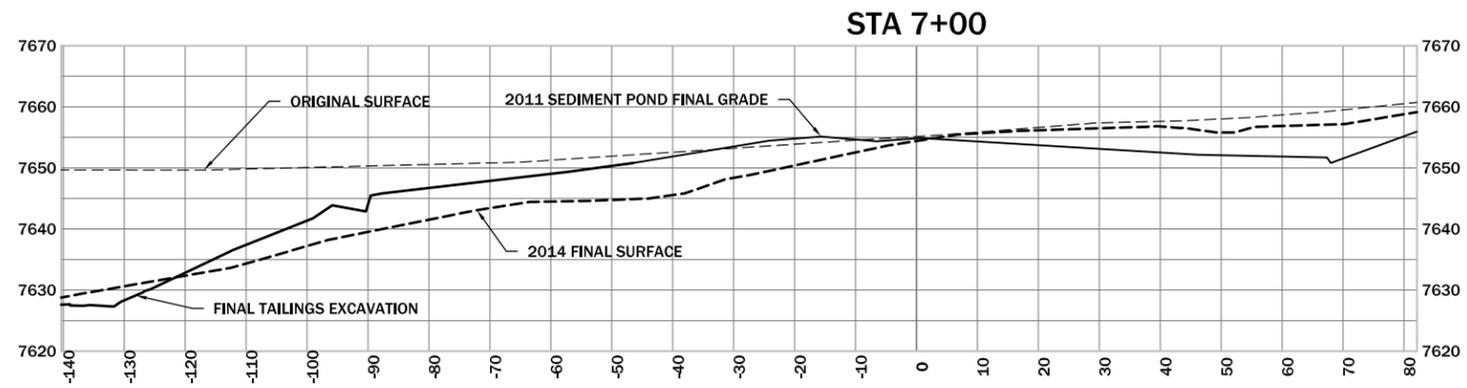
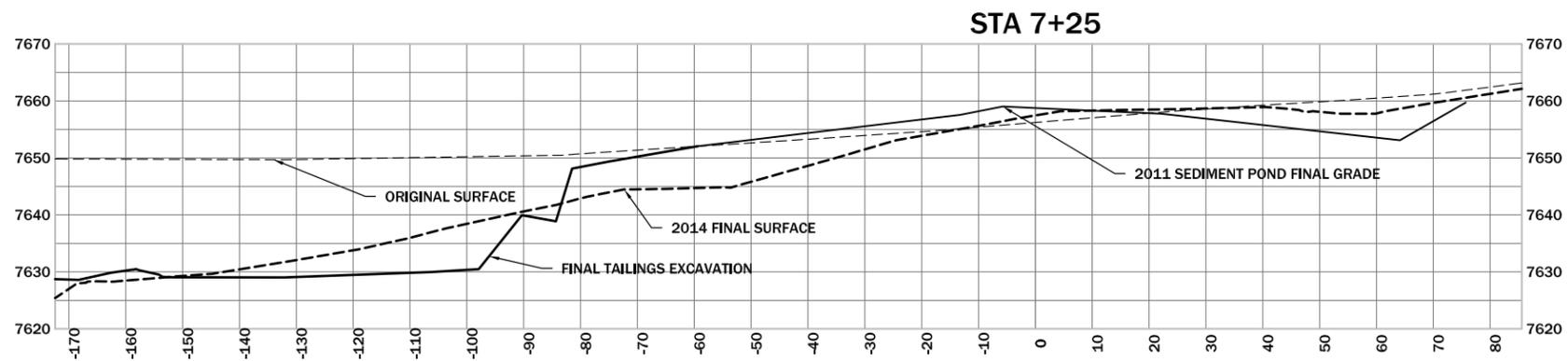
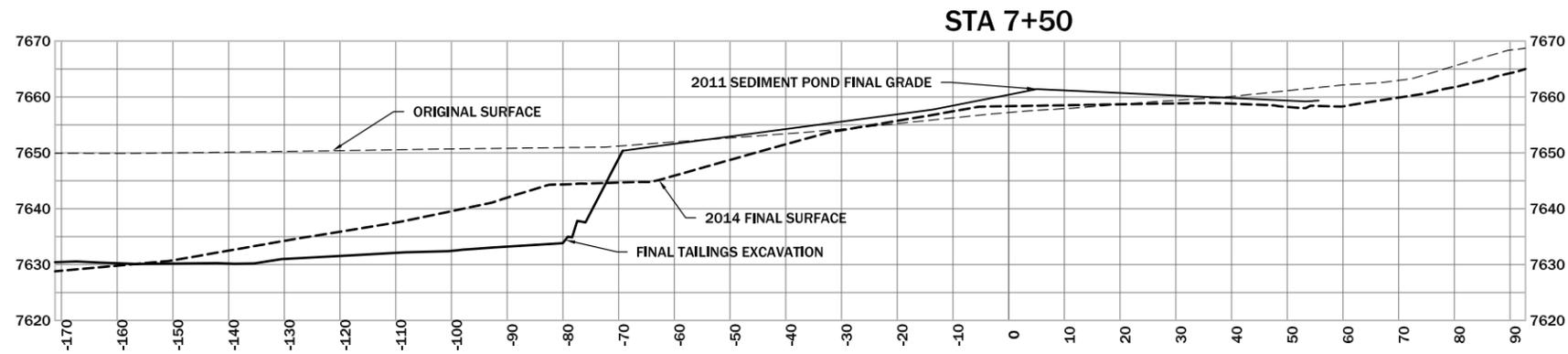
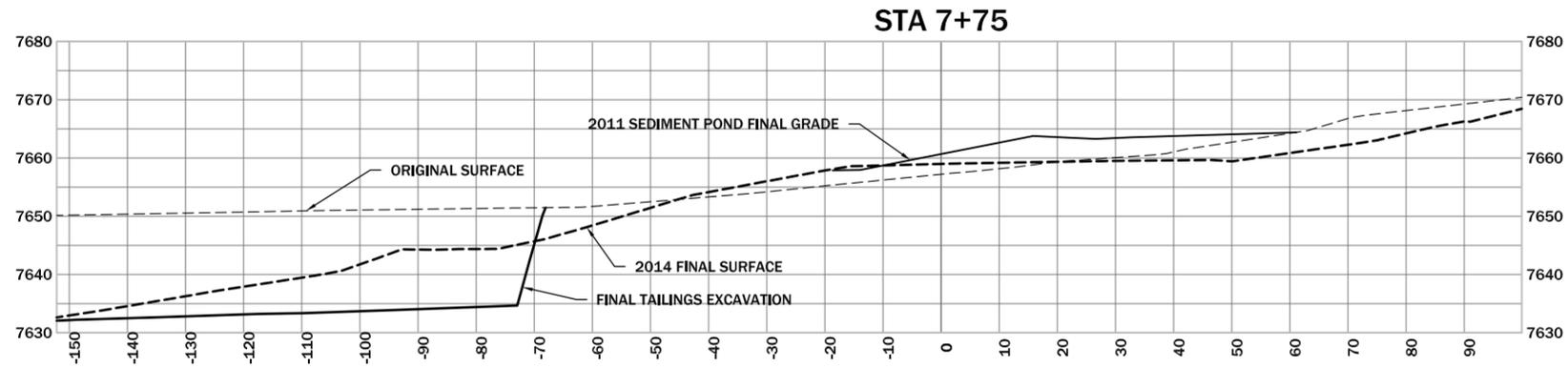


MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

SEDIMENT POND
 CROSS SECTIONS
 STA 6+00 TO 6+75



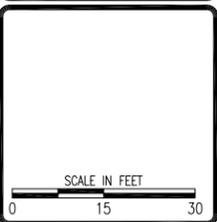
SHEET
 GW-13AB



REVISION	DATE	BY	DESC.

DRAWN BY: CLA
 DESIGNED BY: JSA
 CHECKED BY: MCB
 APPROVED BY: JSA
 PROJECT NO: 10160
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: NA
 DATUM: NA
 UNITS: FEET
 SOURCE: PIONEER



MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

BUILDING PAD
 CROSS SECTIONS
 STA 7+00 TO 7+75

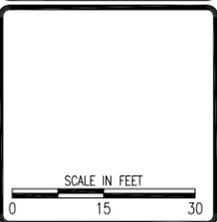


SHEET
 GW-14AB

REVISION	DATE	BY	DESC.

DRAWN BY: CL
 DESIGNED BY: JSM
 CHECKED BY: MCB
 APPROVED BY: JSM
 PROJECT NO: 10160
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: NA
 DATUM: NA
 UNITS: FEET
 SOURCE: PIONEER



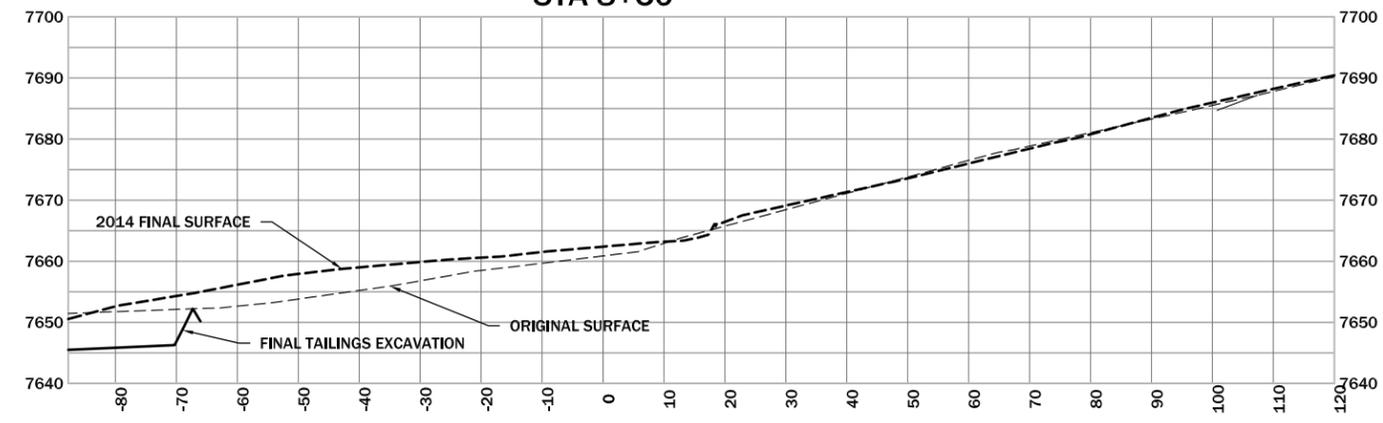
MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

BUILDING PAD
 CROSS SECTIONS
 STA 8+00 TO 8+50

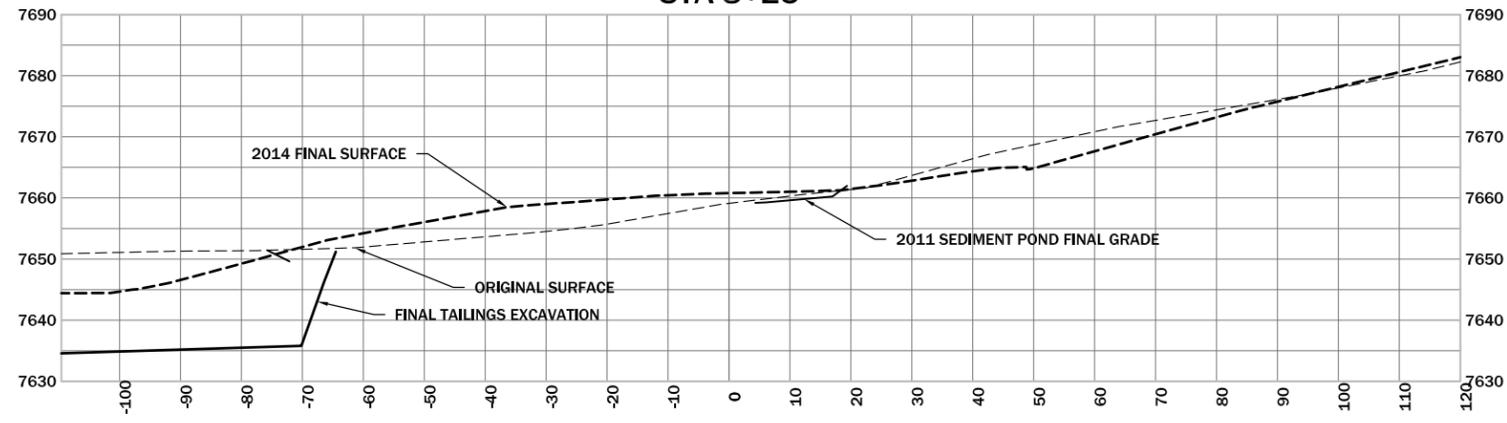


SHEET
GW-15AB

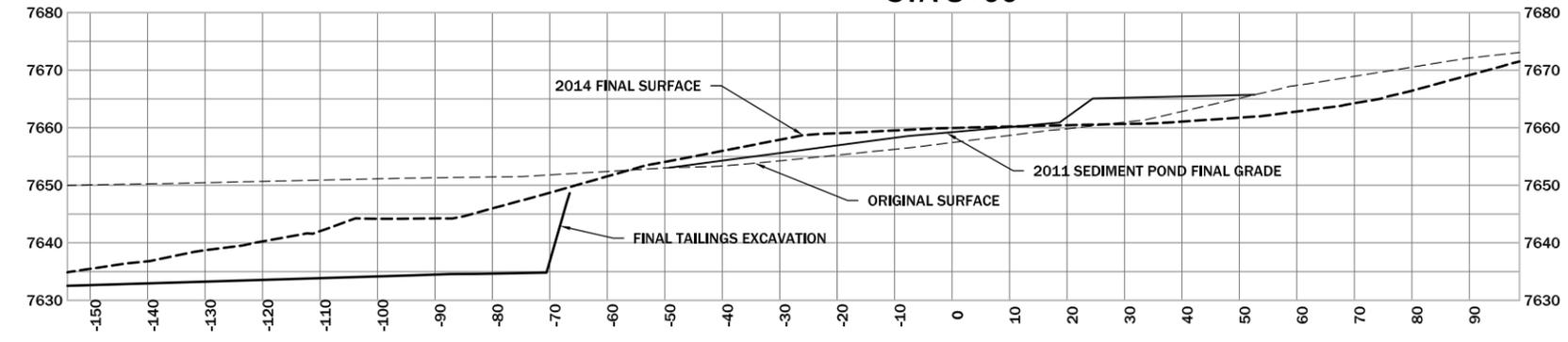
STA 8+50



STA 8+25



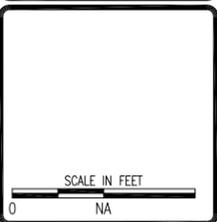
STA 8+00



REVISION:	DATE:	BY:	DESC:

DRAWN BY: CLA
 DESIGNED BY: JSM
 CHECKED BY: MCS
 APPROVED BY: JSM
 PROJECT NO: 10160
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: NA
 DATUM: NA
 UNITS: NA
 SOURCE: PIONEER



MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

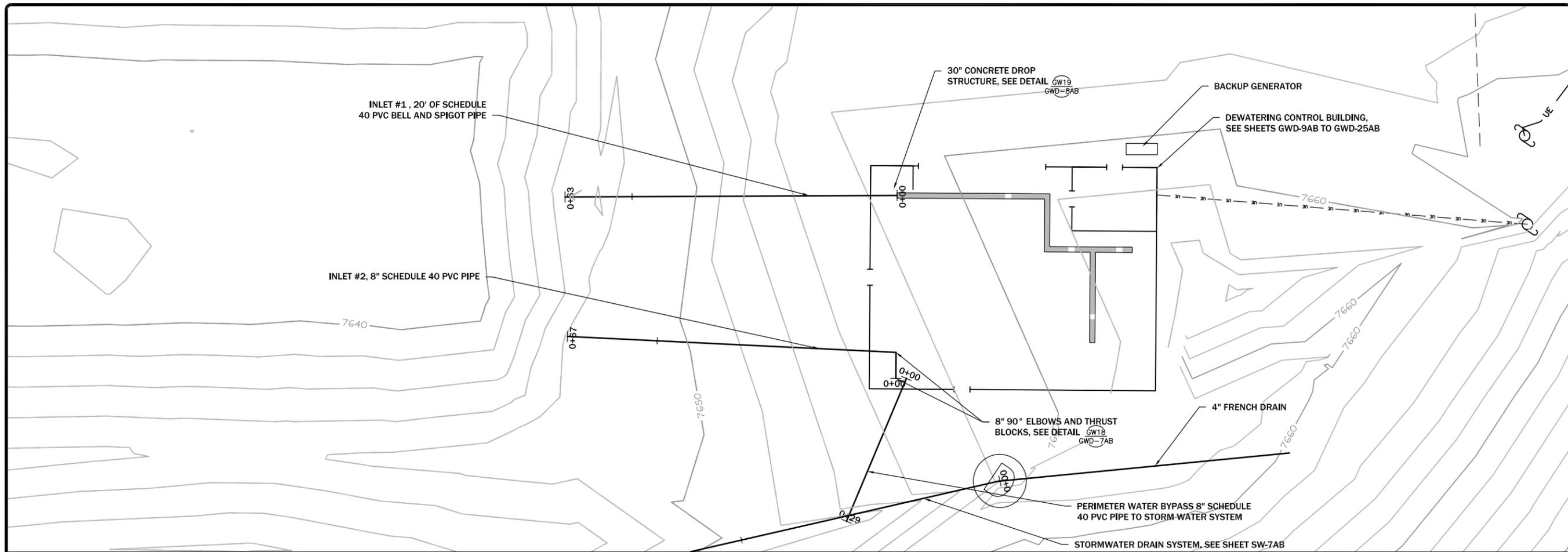
SEDIMENT POND
 CONSTRUCTION
 VOLUMES



SHEET
GW-16AB

SEDIMENT POND VOLUMES				
Station	Fill Volume (BCY)	Cut Volume (BCY)	Cumulative Fill Vol (BCY)	Cumulative Cut Vol (BCY)
0+00.00	0.00	0.00	0.00	0.00
0+25.00	0.00	0.00	0.00	0.00
0+50.00	0.00	0.00	0.00	0.00
0+75.00	0.00	0.00	0.00	0.00
1+00.00	0.00	0.00	0.00	0.00
1+25.00	0.00	0.00	0.00	0.00
1+50.00	0.00	27.12	0.00	27.12
1+75.00	4.76	123.20	4.76	150.32
2+00.00	20.41	170.91	25.17	321.23
2+25.00	56.55	91.23	81.71	412.47
2+50.00	181.24	16.40	262.96	428.86
2+75.00	312.08	0.00	575.03	428.86
3+00.00	393.43	0.00	968.47	428.86
3+25.00	1745.86	2.95	2714.33	431.81
3+50.00	3156.16	3.14	5870.49	434.95
3+75.00	3199.77	0.45	9070.26	435.40
4+00.00	3094.46	1.67	12164.73	437.07
4+25.00	3141.86	9.35	15306.58	446.42
4+50.00	3190.62	10.36	18497.20	456.78
4+75.00	2320.26	12.75	20817.46	469.53
5+00.00	2988.92	13.84	23806.38	483.37
5+25.00	2362.40	8.56	26168.78	491.93
5+50.00	2674.92	5.19	28843.70	497.12
5+75.00	2400.19	4.42	31243.89	501.54
6+00.00	2090.14	11.15	33334.02	512.69
6+25.00	1835.21	27.82	35169.23	540.51
6+50.00	1390.02	86.95	36559.25	627.45
6+75.00	635.95	160.78	37195.21	788.24
7+00.00	165.32	117.11	37360.53	905.35
7+25.00	11.41	25.48	37371.94	930.83
7+50.00	0.00	0.00	37371.94	930.83
7+75.00	0.00	0.00	37371.94	930.83
8+00.00	0.00	0.00	37371.94	930.83
8+25.00	0.00	0.00	37371.94	930.83
8+50.00	0.00	0.00	37371.94	930.83
8+75.00	0.00	0.00	37371.94	930.83

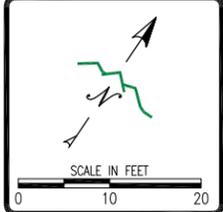
NOTE:
ALL CUT/ FILL VOLUMES ARE CALCULATED AS BANK CUBIC YARDS (BCY)



REVISION	DATE	BY	DESC.

DRAWN BY: CLM
 DESIGNED BY: JSM
 CHECKED BY: MCB
 APPROVED BY: JSM
 PROJECT NO: 10160
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE_MSP
 DATUM: NAD83
 UNITS: FEET
 SOURCE: PIONEER

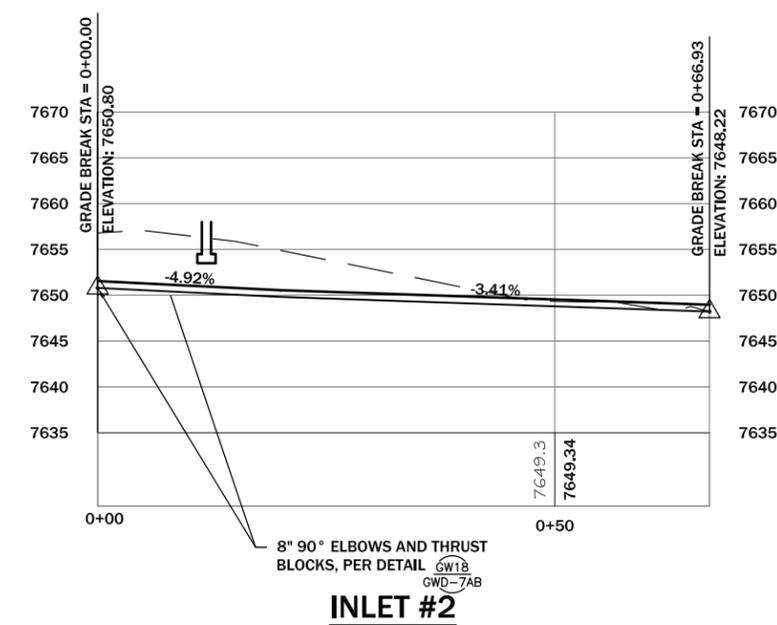
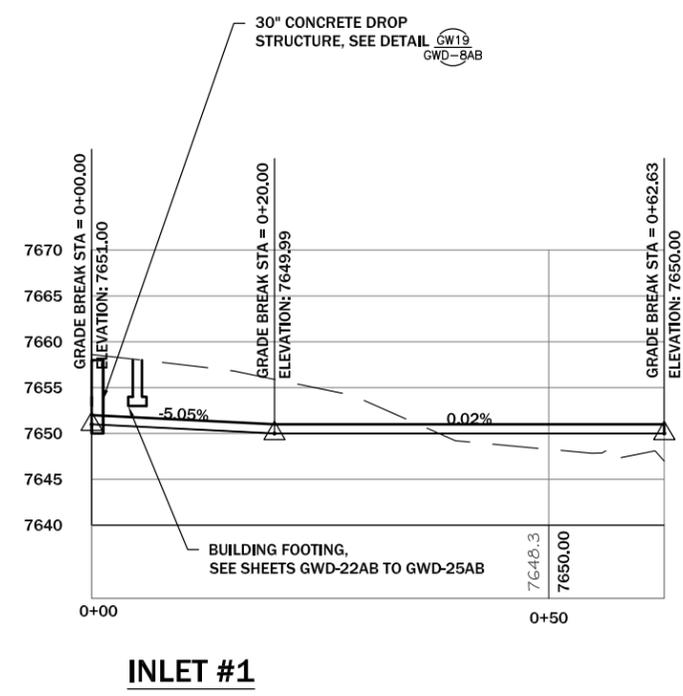
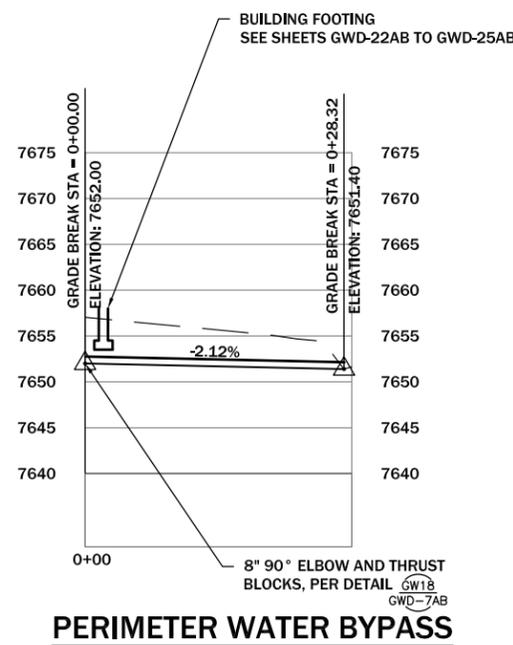


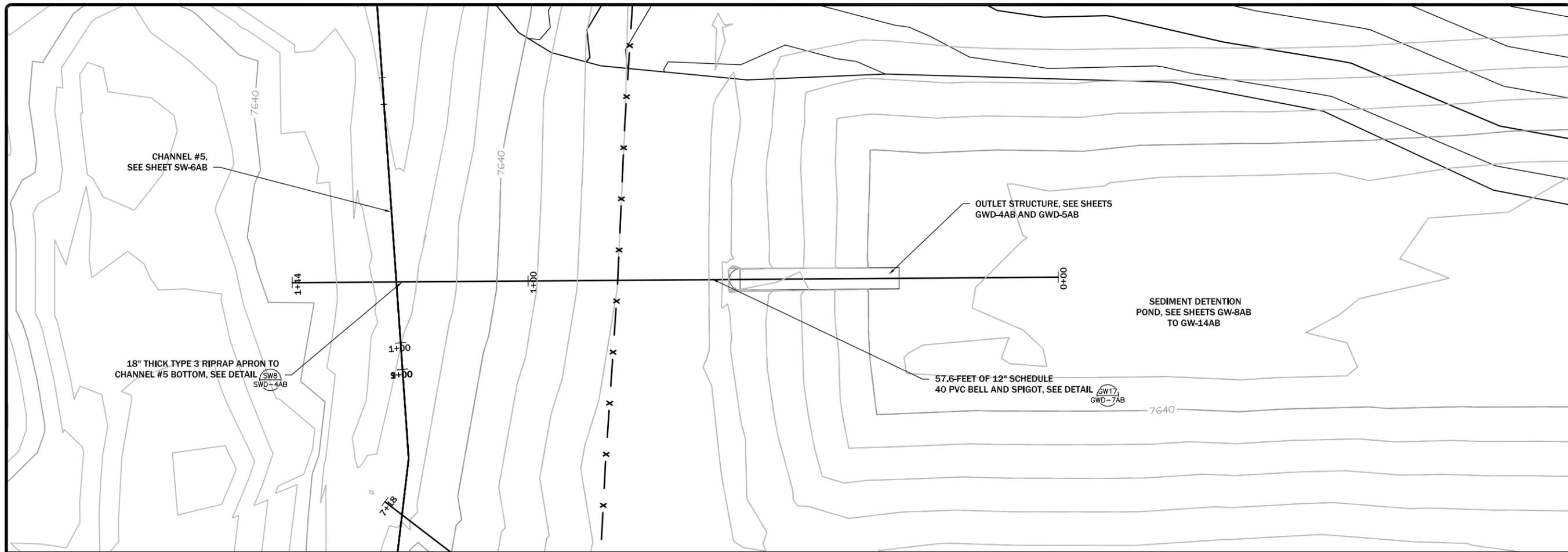
MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

SEDIMENT DETENTION
 POND INLETS
 AND PERIMETER
 WATER BYPASS



SHEET
 GW-19AB

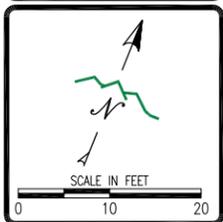




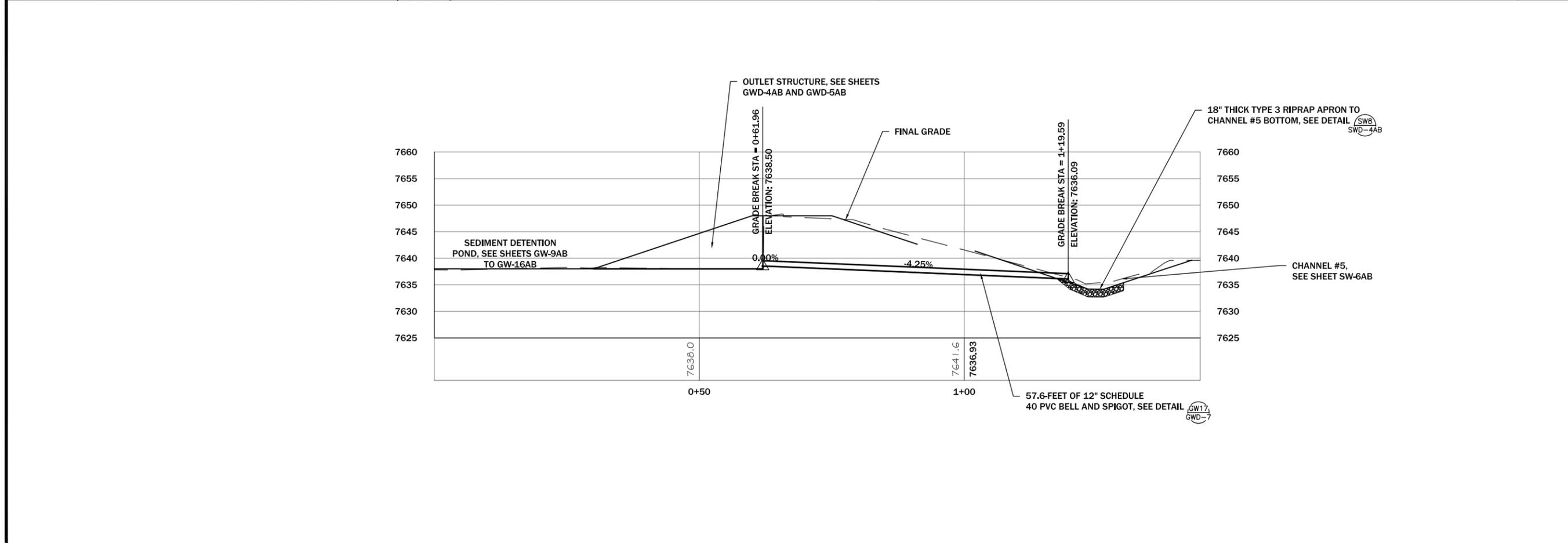
REVISION	DATE	BY	DESC.

DRAWN BY: CLM
 DESIGNED BY: JSA
 CHECKED BY: MCB
 APPROVED BY: JSA
 PROJECT NO: 10160
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: MSP
 DATUM: NAD83
 UNITS: FEET
 SOURCE: PIONEER



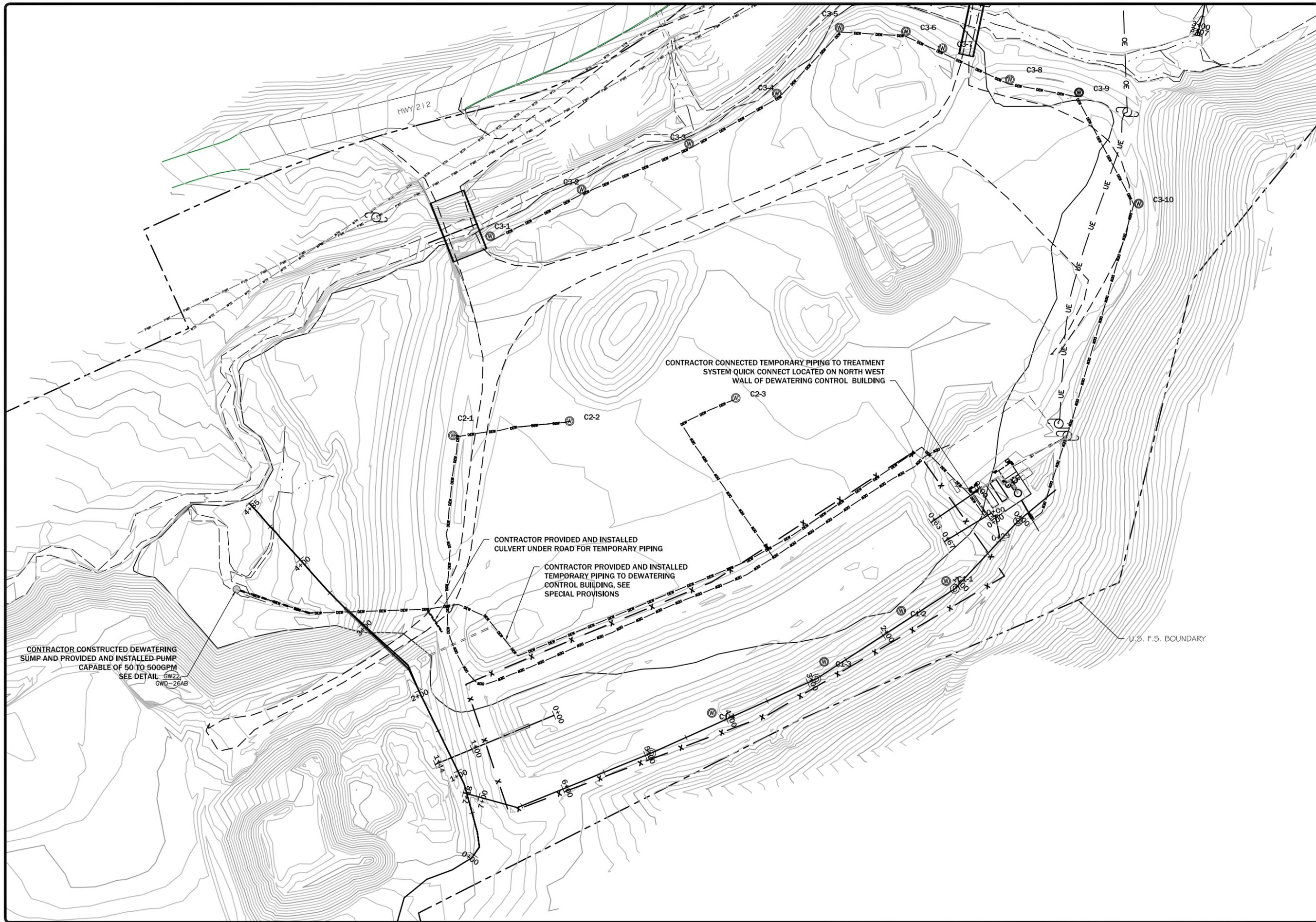
MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS



SEDIMENT
 DETENTION POND
 OUTLET



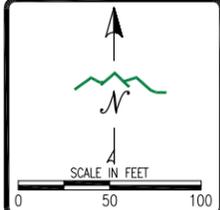
SHEET
 GW-20AB



REVISION	DATE	BY	DESC.

DRAWN BY: CLJ
 DESIGNED BY: JSA
 CHECKED BY: JCB
 APPROVED BY: JSA
 PROJECT NO: 10140
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE, STATE PLANE
 DATUM: NAD83
 UNITS: FEET
 SOURCE: PIONEER

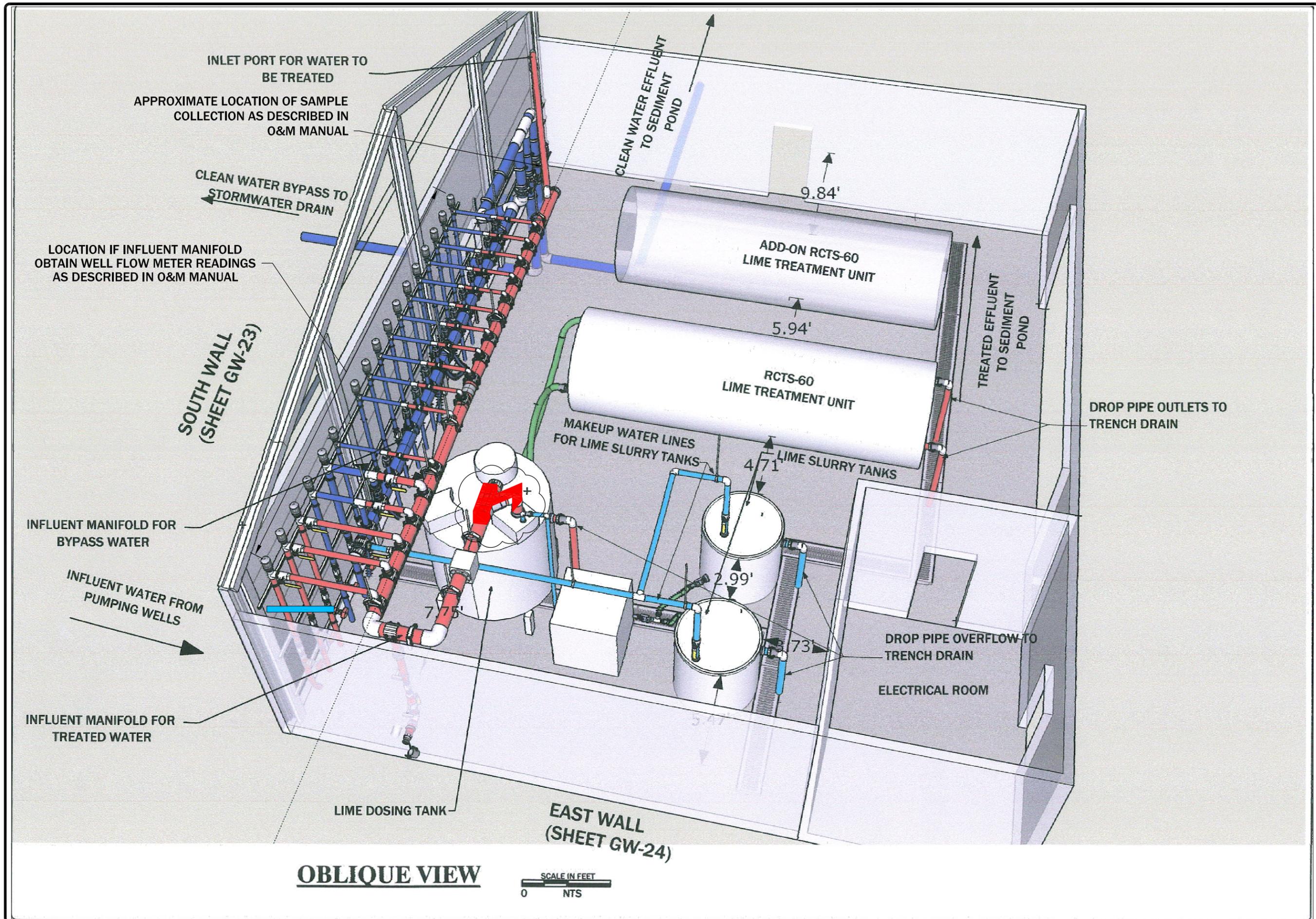


MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

PHASE II
 DEWATERING
 LAYOUT



SHEET
 GW-21AB



OBLIQUE VIEW

SCALE IN FEET
0 NTS

REVISION	DATE	BY	DESC.

DRAWN BY: JMW/B
 DESIGNED BY: JMW/B
 CHECKED BY: JSM/MCB
 APPROVED BY: JMW/B
 PROJECT NO: 10160
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: NA
 DATUM: NA
 UNITS: FEET
 SOURCE: PIONEER

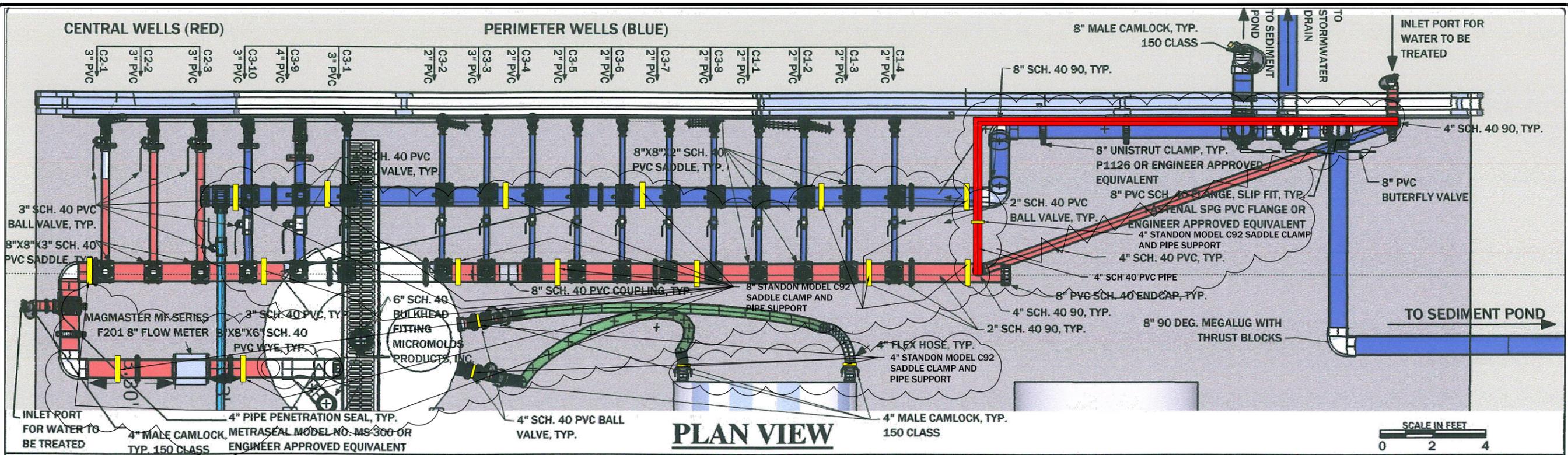
SCALE IN FEET
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MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

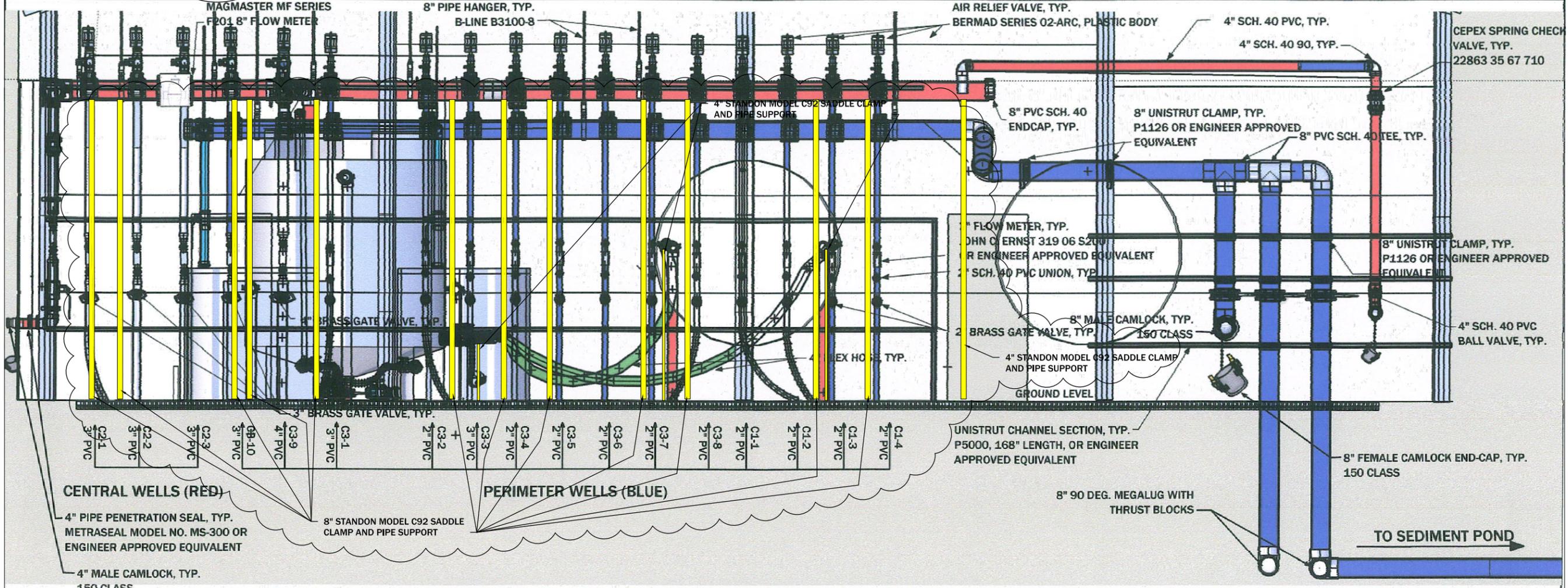
DEWATERING
 CONTROL BUILDING
 PIPING OVERVIEW

PIONEER
 TECHNICAL SERVICES, INC.
 1101 SOUTH MONTANA
 BUTTE, MONTANA 59701
 (406) 782-5177

SHEET
 GW-22AB



PLAN VIEW



ELEVATION VIEW

REVISION:	DATE:	BY:	DESC:

DRAWN BY:	MWB
DESIGNED BY:	JSM/MCB
CHECKED BY:	MWB
APPROVED BY:	MWB
PROJECT NO.:	10160
DATE:	2/24/15

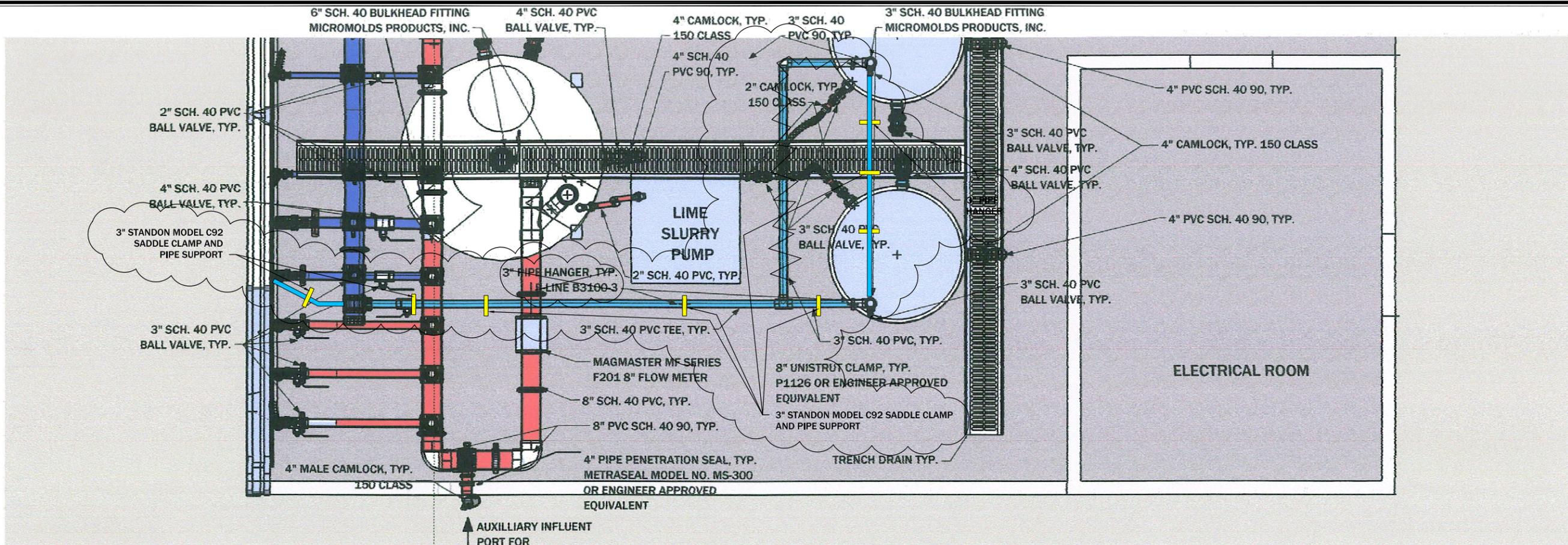
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DATUM:	
UNITS:	FEET
SOURCE:	PIONEER

MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

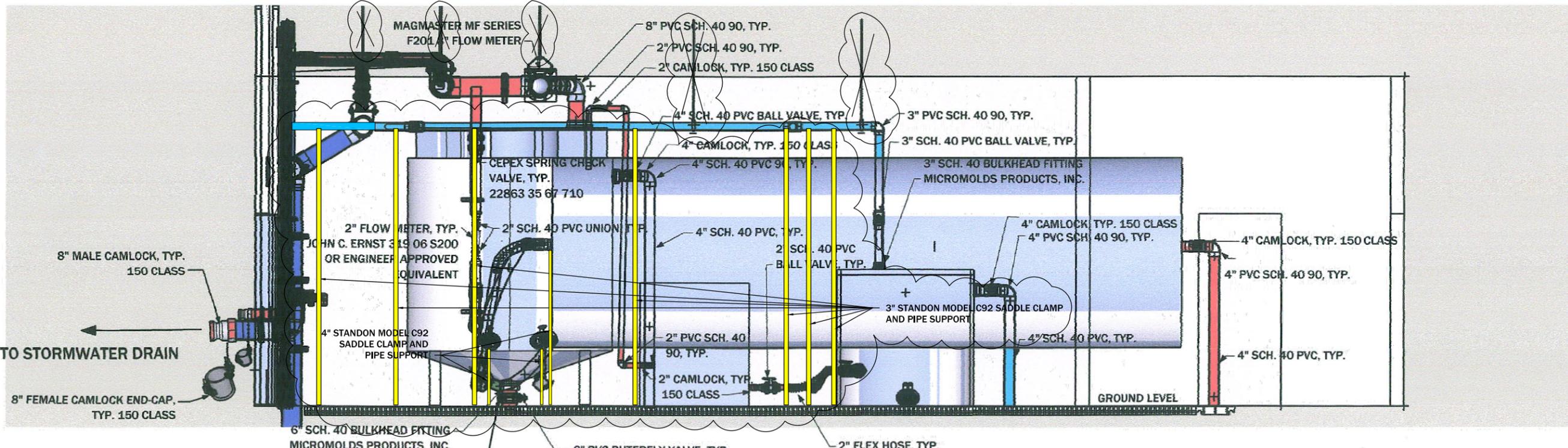
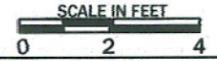
DEWATERING
 CONTROL BUILDING
 SOUTH WALL



SHEET
GW-23AB



PLAN VIEW



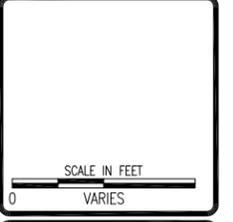
ELEVATION VIEW



REVISION	DATE	BY	DESC.

DRAWN BY: JMW/B
 DESIGNED BY: JMW/MCB
 CHECKED BY: JSM/MCB
 APPROVED BY: JMW/B
 PROJECT NO.: 10160
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE, NA
 DATUM: NA
 UNITS: FEET
 SOURCE: PIONEER

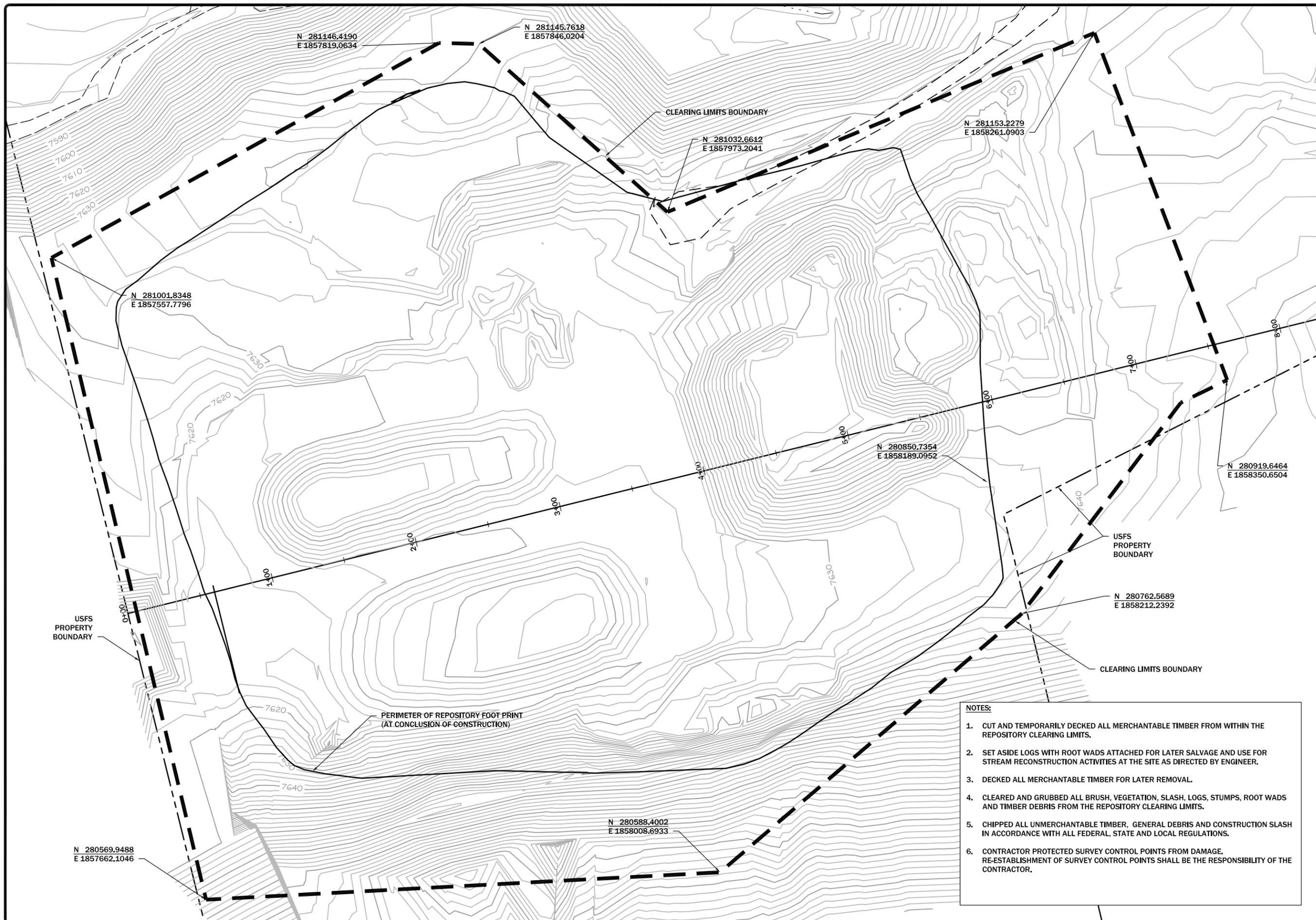


MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

DEWATERING
 CONTROL BUILDING
 EAST WALL



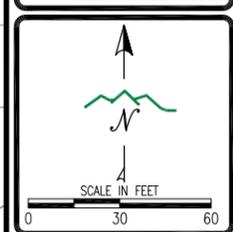
SHEET
 GW-24AB



REVISION:	DATE:	BY:	DESC:

DRAWN BY: _CLA
 DESIGNED BY: _SDB
 CHECKED BY: _MCS
 APPROVED BY: _JSA
 PROJECT NO: 10140
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: MSP
 DATUM: NAD83
 UNITS: FEET
 SOURCE: PIONEER



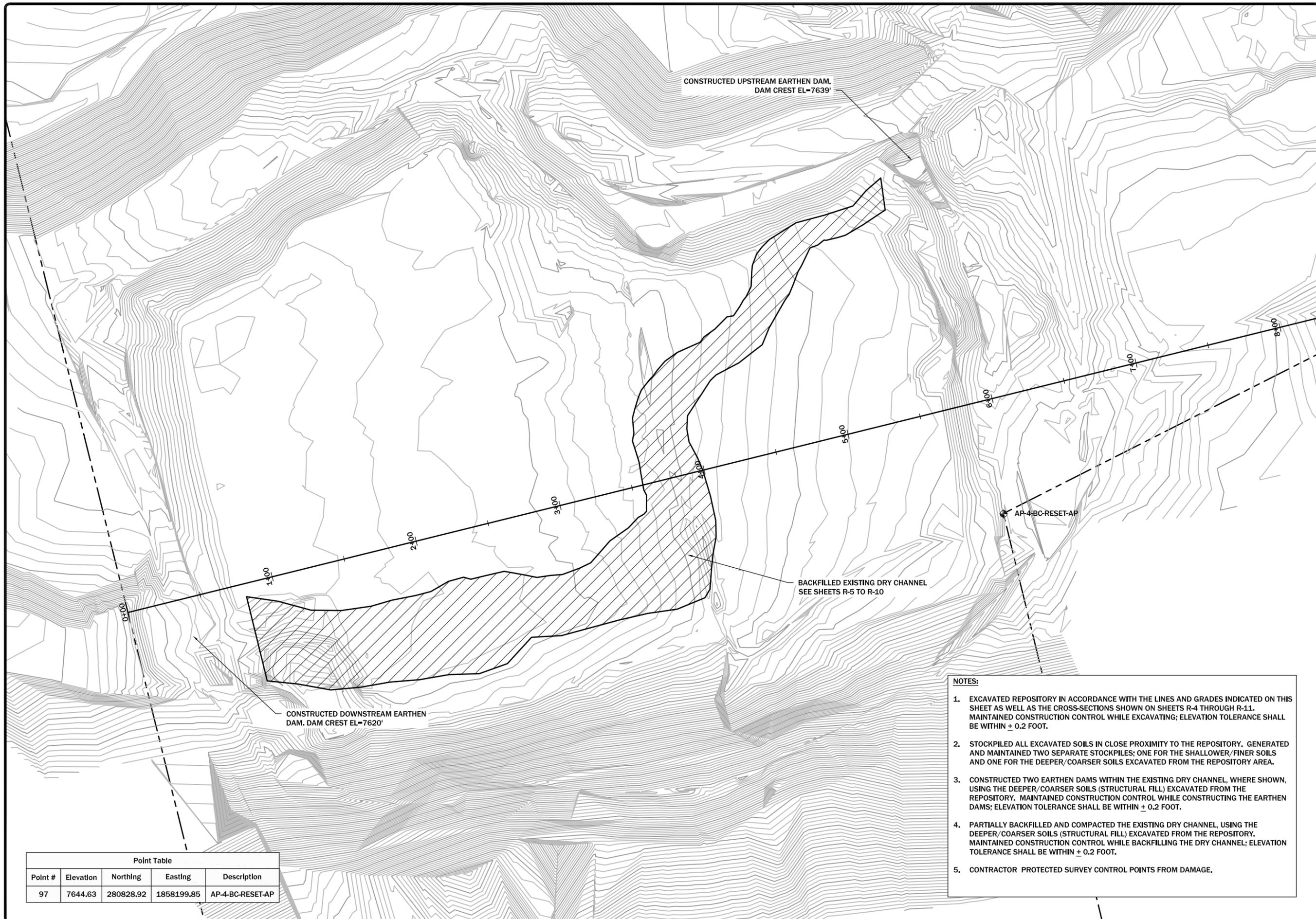
MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

REPOSITORY AREA
 CLEARING
 LIMITS



SHEET
 R-1AB

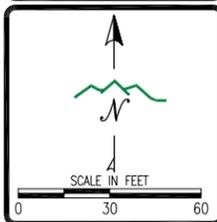
- NOTES:**
1. CUT AND TEMPORARILY DECKED ALL MERCHANTABLE TIMBER FROM WITHIN THE REPOSITORY CLEARING LIMITS.
 2. SET ASIDE LOGS WITH ROOT WADS ATTACHED FOR LATER SALVAGE AND USE FOR STREAM RECONSTRUCTION ACTIVITIES AT THE SITE AS DIRECTED BY ENGINEER.
 3. DECKED ALL MERCHANTABLE TIMBER FOR LATER REMOVAL.
 4. CLEARED AND GRUBBED ALL BRUSH, VEGETATION, SLASH, LOGS, STUMPS, ROOT WADS AND TIMBER DEBRIS FROM THE REPOSITORY CLEARING LIMITS.
 5. CHIPPED ALL UNMERCHANTABLE TIMBER, GENERAL DEBRIS AND CONSTRUCTION SLASH IN ACCORDANCE WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS.
 6. CONTRACTOR PROTECTED SURVEY CONTROL POINTS FROM DAMAGE. RE-ESTABLISHMENT OF SURVEY CONTROL POINTS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.



REVISION:	DATE:	BY:	DESC:

DRAWN BY: _CLA
 DESIGNED BY: _SDB
 CHECKED BY: _MCB
 APPROVED BY: _JSA
 PROJECT NO: 10140
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: MSP
 DATUM: NAD83
 UNITS: FEET
 SOURCE: PIONEER



MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

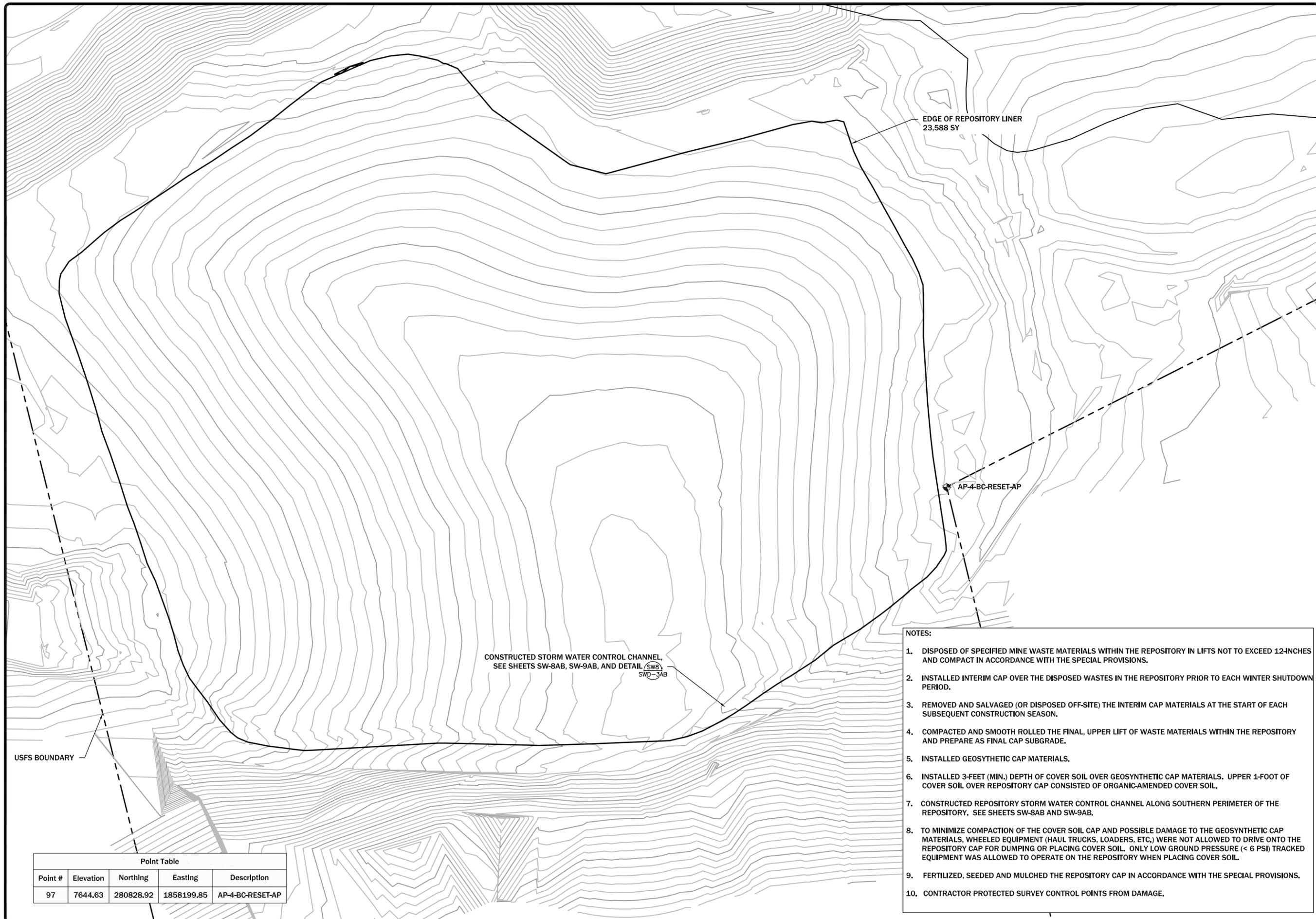
FINAL REPOSITORY
 EXCAVATION
 PLAN



SHEET
 R-2AB

Point #	Elevation	Northing	Easting	Description
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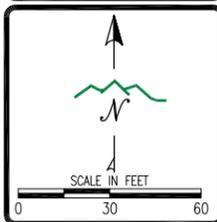
- NOTES:**
- EXCAVATED REPOSITORY IN ACCORDANCE WITH THE LINES AND GRADES INDICATED ON THIS SHEET AS WELL AS THE CROSS-SECTIONS SHOWN ON SHEETS R-4 THROUGH R-11. MAINTAINED CONSTRUCTION CONTROL WHILE EXCAVATING; ELEVATION TOLERANCE SHALL BE WITHIN ± 0.2 FOOT.
 - STOCKPILED ALL EXCAVATED SOILS IN CLOSE PROXIMITY TO THE REPOSITORY. GENERATED AND MAINTAINED TWO SEPARATE STOCKPILES; ONE FOR THE SHALLOWER/FINER SOILS AND ONE FOR THE DEEPER/COARSER SOILS EXCAVATED FROM THE REPOSITORY AREA.
 - CONSTRUCTED TWO EARTHEN DAMS WITHIN THE EXISTING DRY CHANNEL, WHERE SHOWN, USING THE DEEPER/COARSER SOILS (STRUCTURAL FILL) EXCAVATED FROM THE REPOSITORY. MAINTAINED CONSTRUCTION CONTROL WHILE CONSTRUCTING THE EARTHEN DAMS; ELEVATION TOLERANCE SHALL BE WITHIN ± 0.2 FOOT.
 - PARTIALLY BACKFILLED AND COMPACTED THE EXISTING DRY CHANNEL, USING THE DEEPER/COARSER SOILS (STRUCTURAL FILL) EXCAVATED FROM THE REPOSITORY. MAINTAINED CONSTRUCTION CONTROL WHILE BACKFILLING THE DRY CHANNEL; ELEVATION TOLERANCE SHALL BE WITHIN ± 0.2 FOOT.
 - CONTRACTOR PROTECTED SURVEY CONTROL POINTS FROM DAMAGE.



REVISION:	DATE:	BY:	DESC:

DRAWN BY: _CLA
 DESIGNED BY: _SDB
 CHECKED BY: _MCR
 APPROVED BY: _JSA
 PROJECT NO: 10140
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: MSP
 DATUM: NAD83
 UNITS: FEET
 SOURCE: PIONEER



MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

FINAL REPOSITORY
 GRADING
 PLAN

PIONEER
 TECHNICAL SERVICES, INC.
 1101 SOUTH MONTANA
 BUTTE, MONTANA 59701
 (406) 782-5177

SHEET
 R-3AB

EDGE OF REPOSITORY LINER
23,588 SY

AP-4-BC-RESET-AP

CONSTRUCTED STORM WATER CONTROL CHANNEL,
SEE SHEETS SW-8AB, SW-9AB, AND DETAIL  SW-3AB

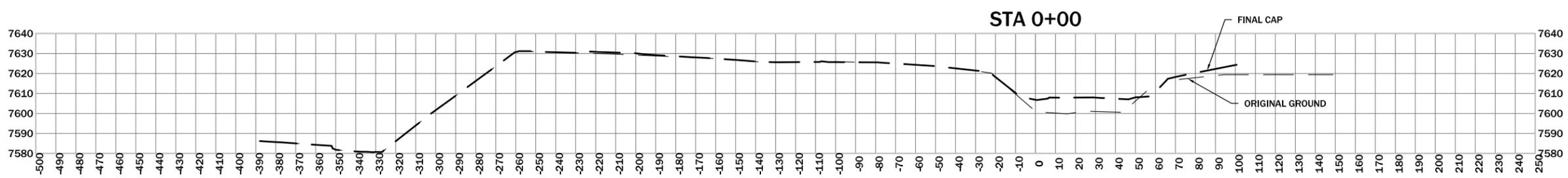
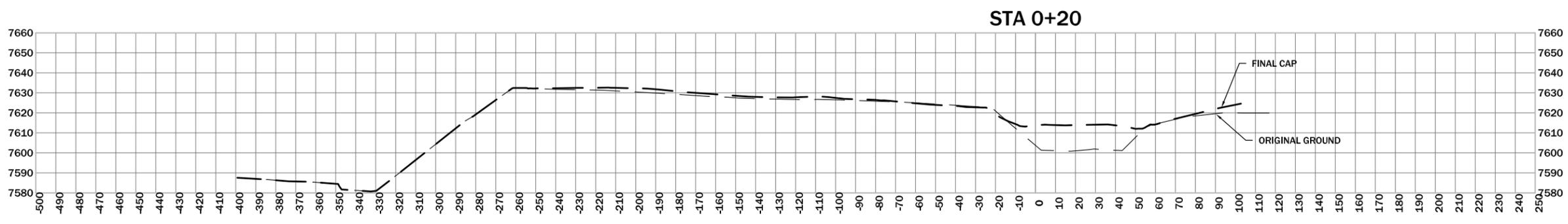
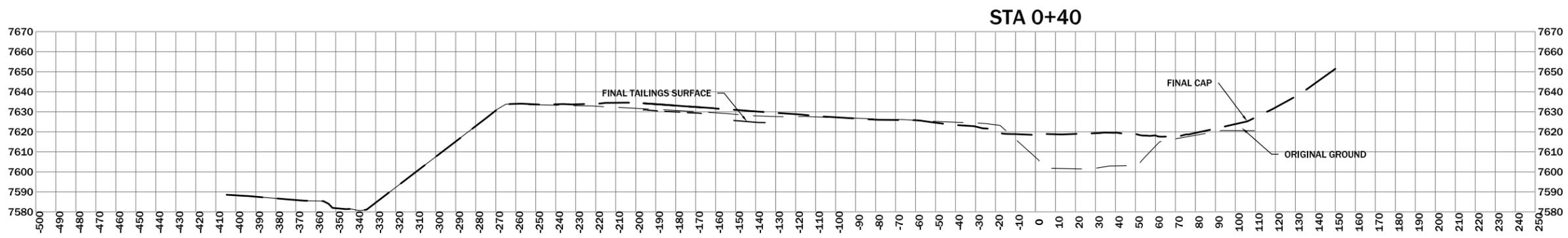
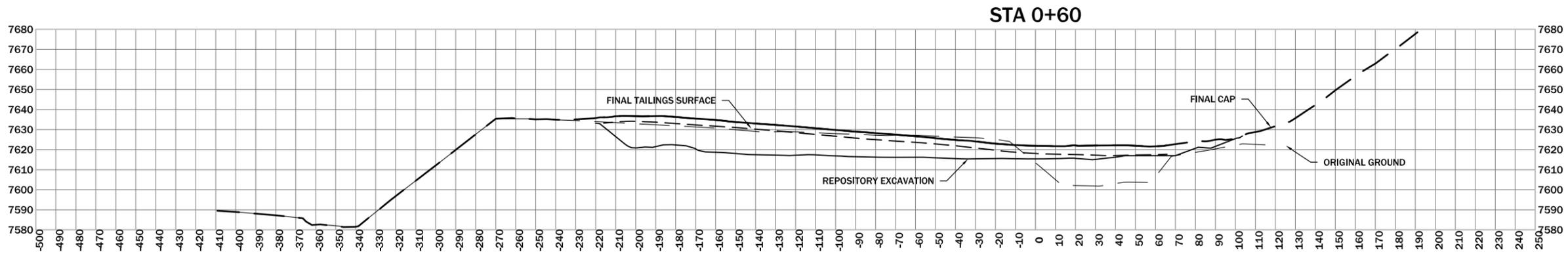
USFS BOUNDARY

NOTES:

1. DISPOSED OF SPECIFIED MINE WASTE MATERIALS WITHIN THE REPOSITORY IN LIFTS NOT TO EXCEED 12-INCHES AND COMPACT IN ACCORDANCE WITH THE SPECIAL PROVISIONS.
2. INSTALLED INTERIM CAP OVER THE DISPOSED WASTES IN THE REPOSITORY PRIOR TO EACH WINTER SHUTDOWN PERIOD.
3. REMOVED AND SALVAGED (OR DISPOSED OFF-SITE) THE INTERIM CAP MATERIALS AT THE START OF EACH SUBSEQUENT CONSTRUCTION SEASON.
4. COMPACTED AND SMOOTH ROLLED THE FINAL, UPPER LIFT OF WASTE MATERIALS WITHIN THE REPOSITORY AND PREPARE AS FINAL CAP SUBGRADE.
5. INSTALLED GEOSYNTHETIC CAP MATERIALS.
6. INSTALLED 3-FEET (MIN.) DEPTH OF COVER SOIL OVER GEOSYNTHETIC CAP MATERIALS. UPPER 1-FOOT OF COVER SOIL OVER REPOSITORY CAP CONSISTED OF ORGANIC-AMENDED COVER SOIL.
7. CONSTRUCTED REPOSITORY STORM WATER CONTROL CHANNEL ALONG SOUTHERN PERIMETER OF THE REPOSITORY. SEE SHEETS SW-8AB AND SW-9AB.
8. TO MINIMIZE COMPACTION OF THE COVER SOIL CAP AND POSSIBLE DAMAGE TO THE GEOSYNTHETIC CAP MATERIALS, WHEELED EQUIPMENT (HAUL TRUCKS, LOADERS, ETC.) WERE NOT ALLOWED TO DRIVE ONTO THE REPOSITORY CAP FOR DUMPING OR PLACING COVER SOIL. ONLY LOW GROUND PRESSURE (< 6 PSI) TRACKED EQUIPMENT WAS ALLOWED TO OPERATE ON THE REPOSITORY WHEN PLACING COVER SOIL.
9. FERTILIZED, SEEDED AND MULCHED THE REPOSITORY CAP IN ACCORDANCE WITH THE SPECIAL PROVISIONS.
10. CONTRACTOR PROTECTED SURVEY CONTROL POINTS FROM DAMAGE.

Point Table

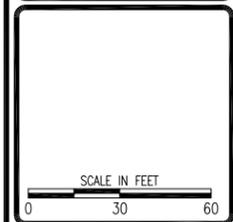
Point #	Elevation	Northing	Easting	Description
97	7644.63	280828.92	1858199.85	AP-4-BC-RESET-AP



REVISION	DATE	BY	DESC.

DRAWN BY: CLA
 DESIGNED BY: SD8
 CHECKED BY: MCB
 APPROVED BY: JSA
 PROJECT NO: 10140
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: NA
 DATUM: NA
 UNITS: FEET
 SOURCE: PIONEER



MDEQ/MWCB
MCLAREN TAILINGS ABANDONED
MINE SITE RECLAMATION PROJECT
FINAL AS-BUILT DRAWINGS

REPOSITORY
CROSS
SECTIONS
STA 0+00 TO 0+60

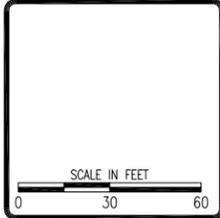


SHEET
R-4AB

REVISION:	DATE:	BY:	DESC:

DRAWN BY: CLA
 DESIGNED BY: SDB
 CHECKED BY: MCB
 APPROVED BY: JSA
 PROJECT NO: 10140
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: NA
 DATUM: NA
 UNITS: FEET
 SOURCE: PIONEER



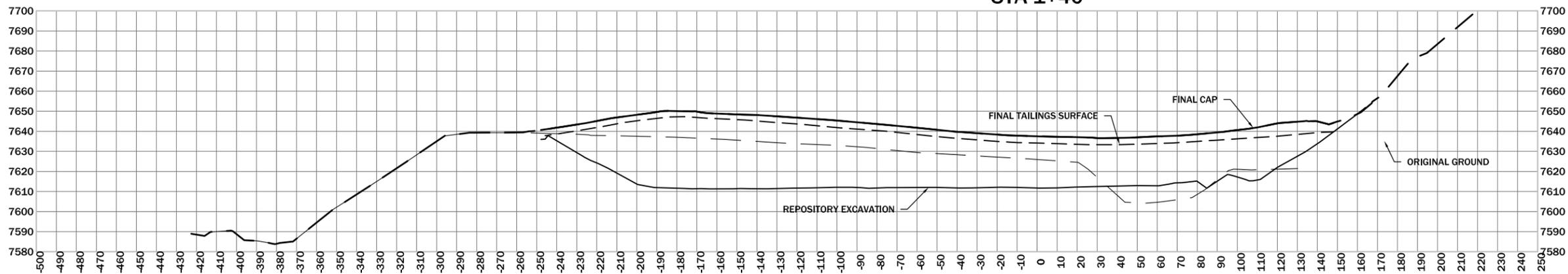
MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

REPOSITORY
 CROSS
 SECTIONS
 STA 0+80 TO 1+40

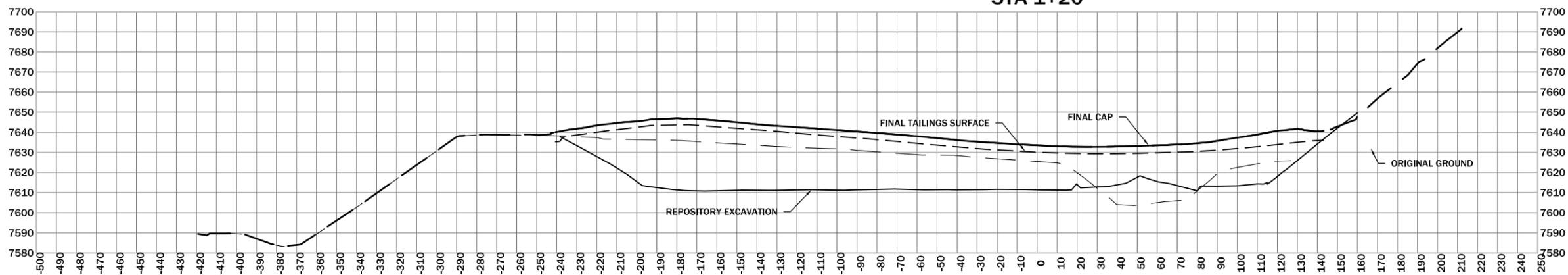


SHEET
 R-5AB

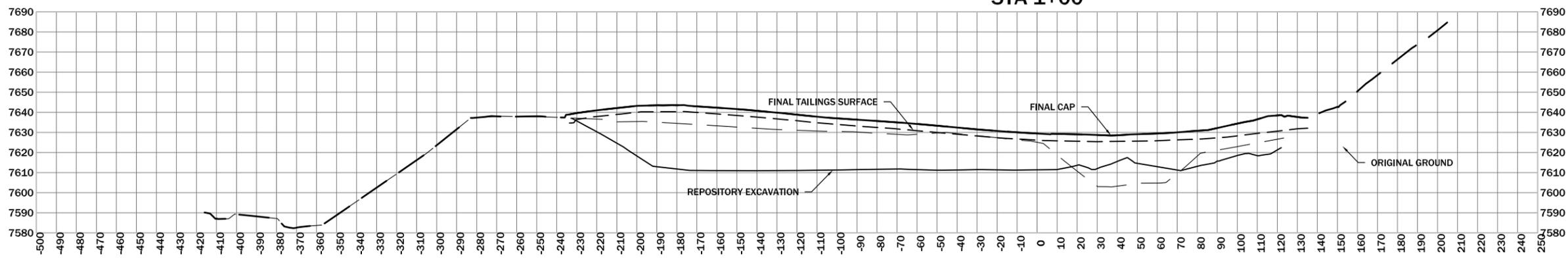
STA 1+40



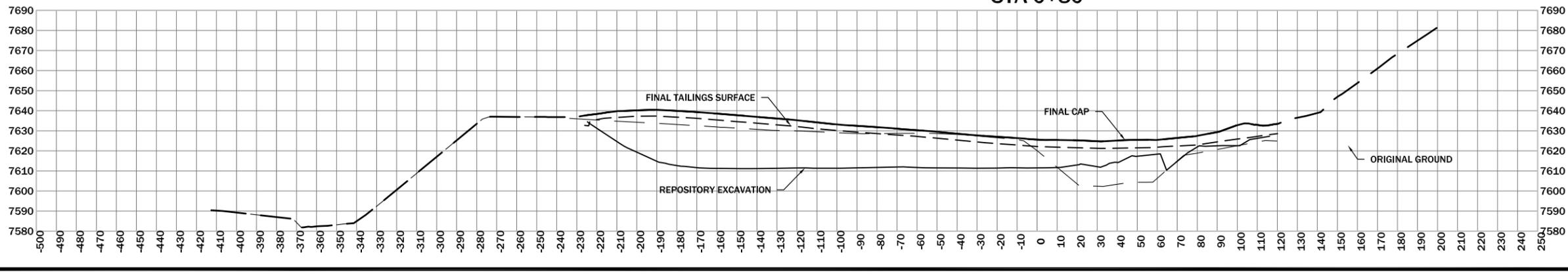
STA 1+20



STA 1+00



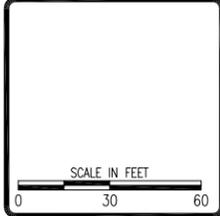
STA 0+80



REVISION	DATE	BY	DESC.

DRAWN BY: CLA
 DESIGNED BY: SD8
 CHECKED BY: MCB
 APPROVED BY: JSA
 PROJECT NO: 10140
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: NA
 DATUM: NA
 UNITS: FEET
 SOURCE: PIONEER

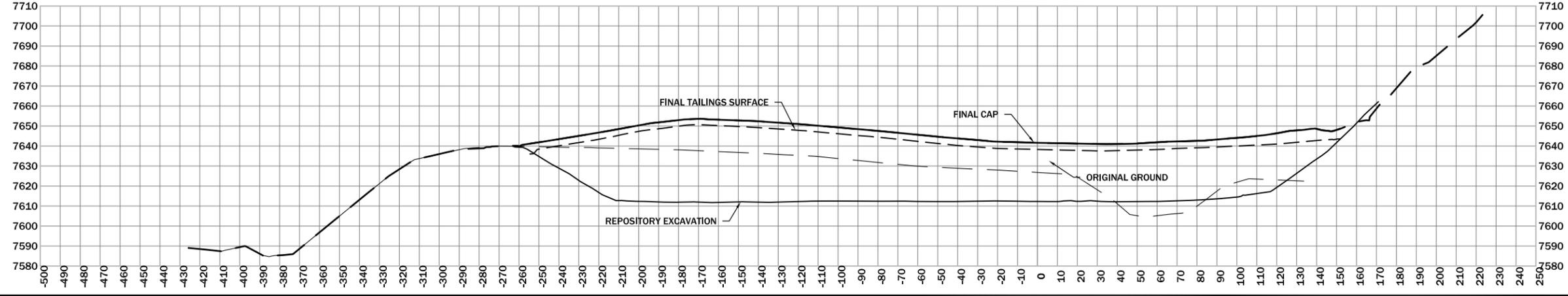
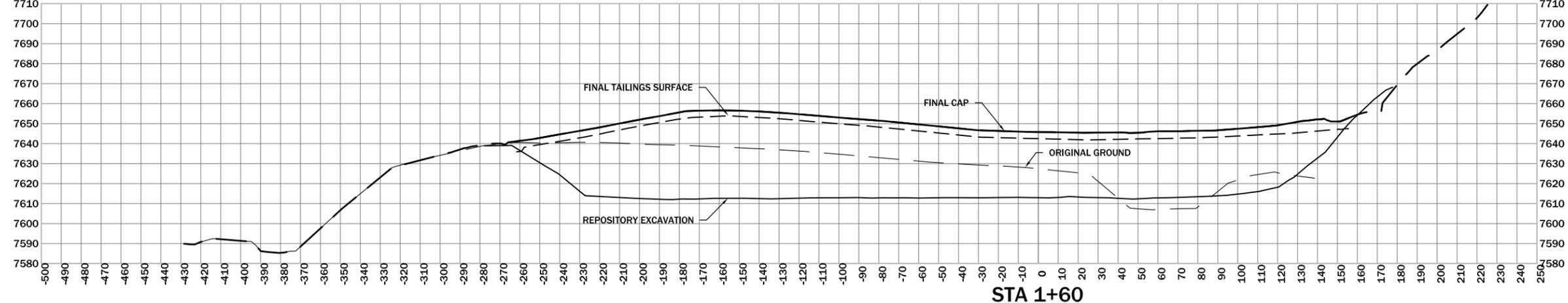
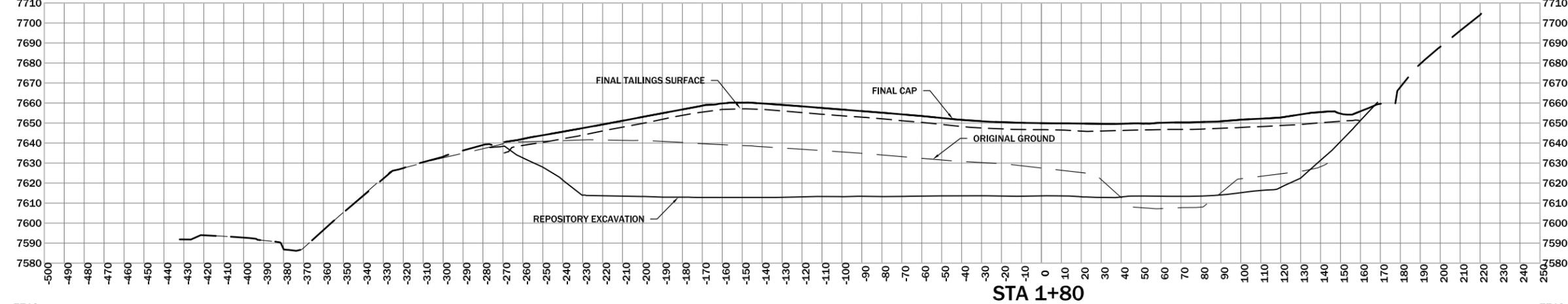
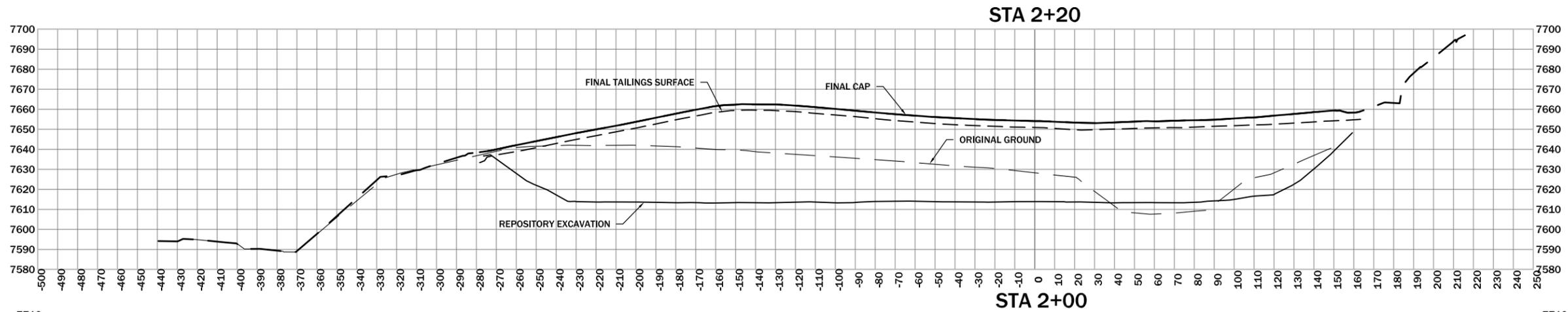


MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

REPOSITORY
 CROSS
 SECTIONS
 STA 1+60 TO 2+20



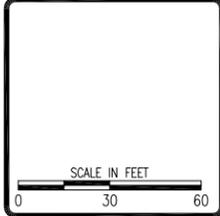
SHEET
 R-6AB



REVISION:	DATE:	BY:	DESC:

DRAWN BY: CLA
 DESIGNED BY: SDS
 CHECKED BY: MCB
 APPROVED BY: JSA
 PROJECT NO: 10140
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: NA
 DATUM: NA
 UNITS: FEET
 SOURCE: PIONEER

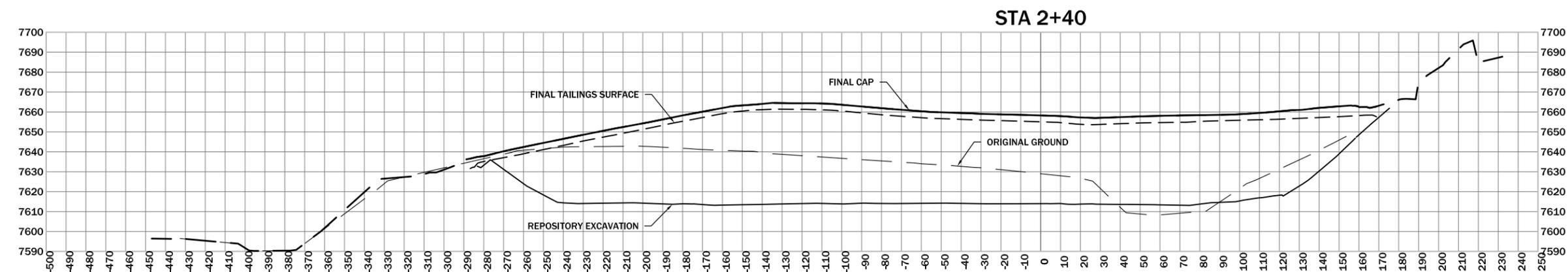
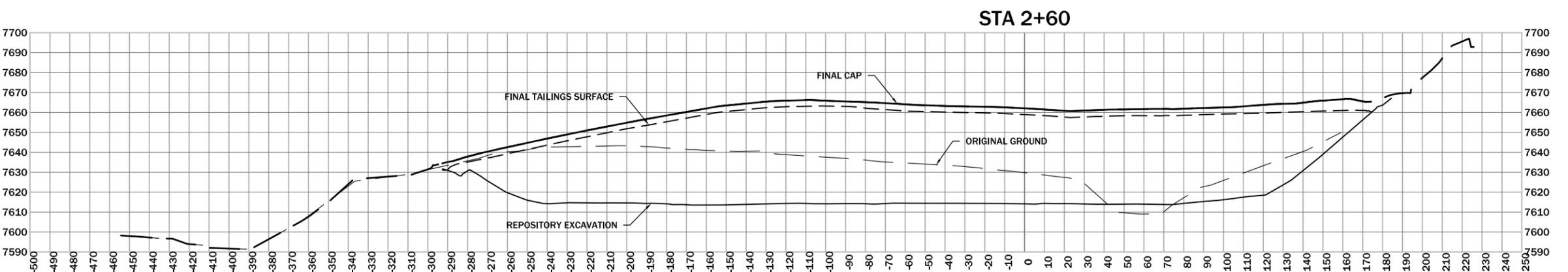
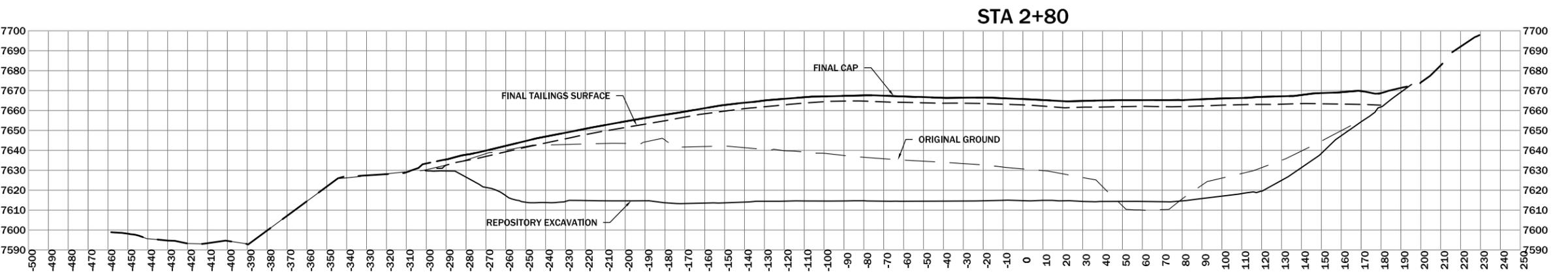
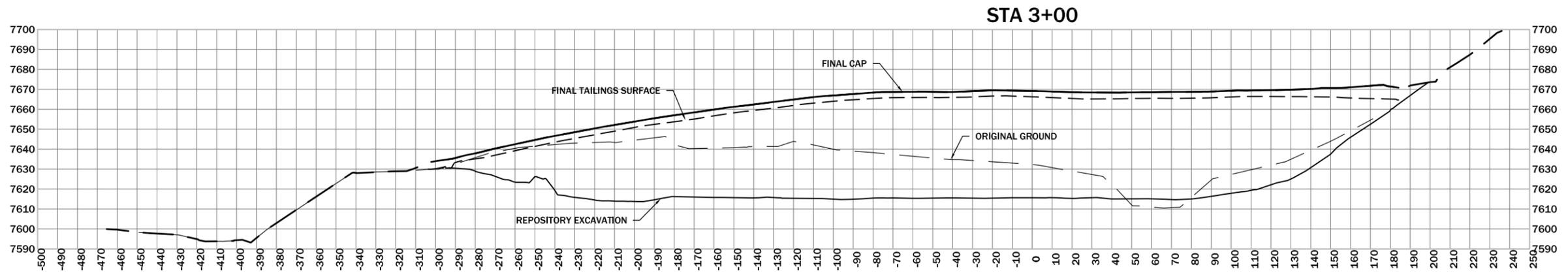


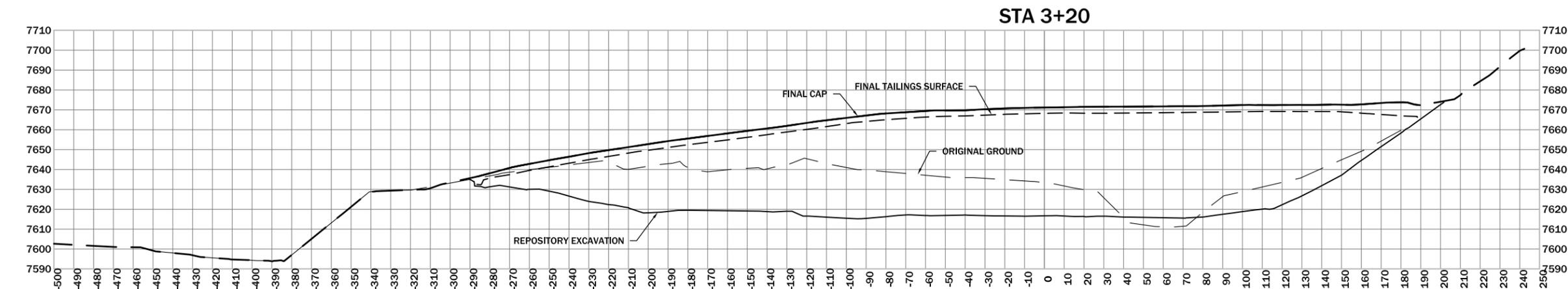
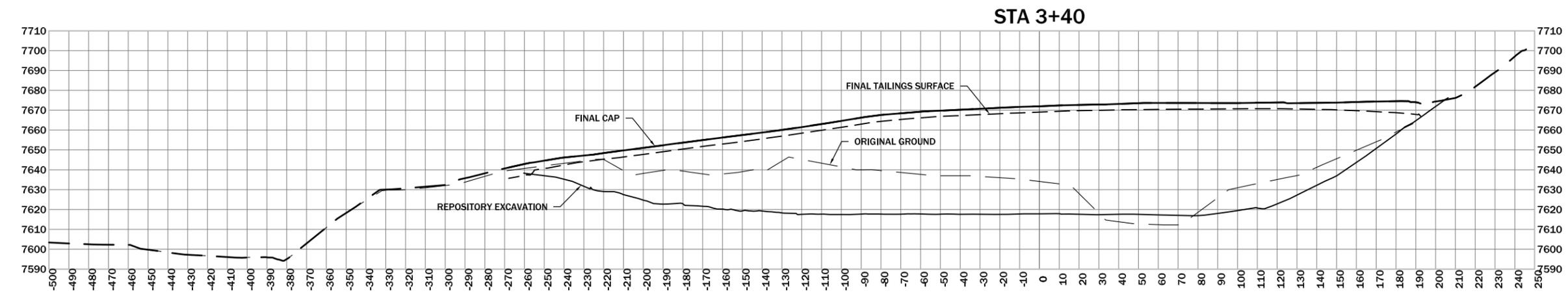
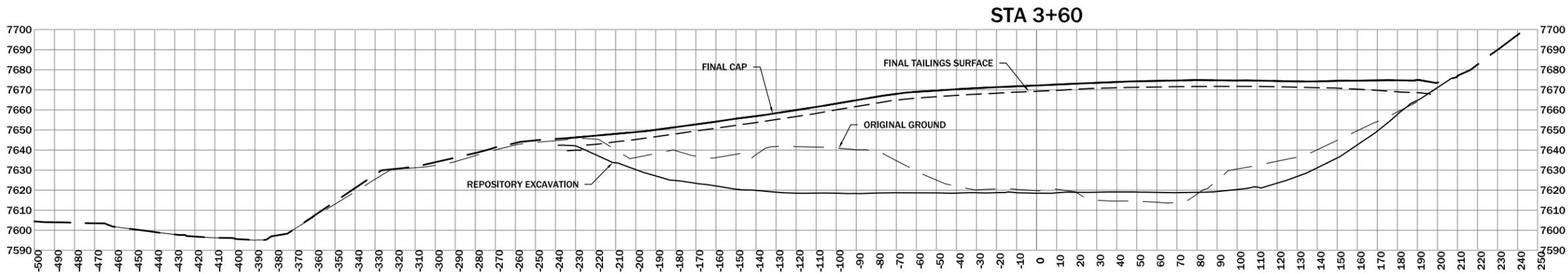
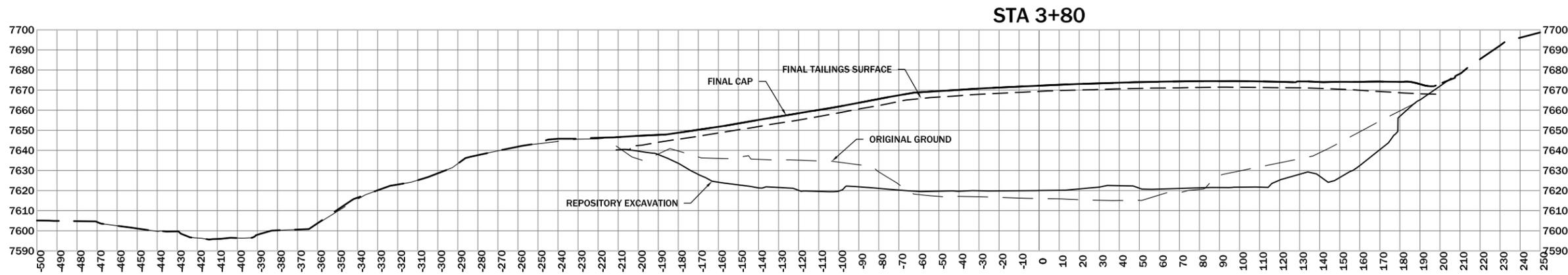
MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

REPOSITORY
 CROSS
 SECTIONS
 STA 2+40 TO 3+00



SHEET
 R-7AB

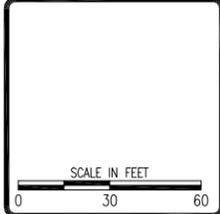




REVISION	DATE	BY	DESC.

DRAWN BY: CLA
 DESIGNED BY: SD8
 CHECKED BY: MCB
 APPROVED BY: JSA
 PROJECT NO: 10140
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: NA
 DATUM: NA
 UNITS: FEET
 SOURCE: PIONEER

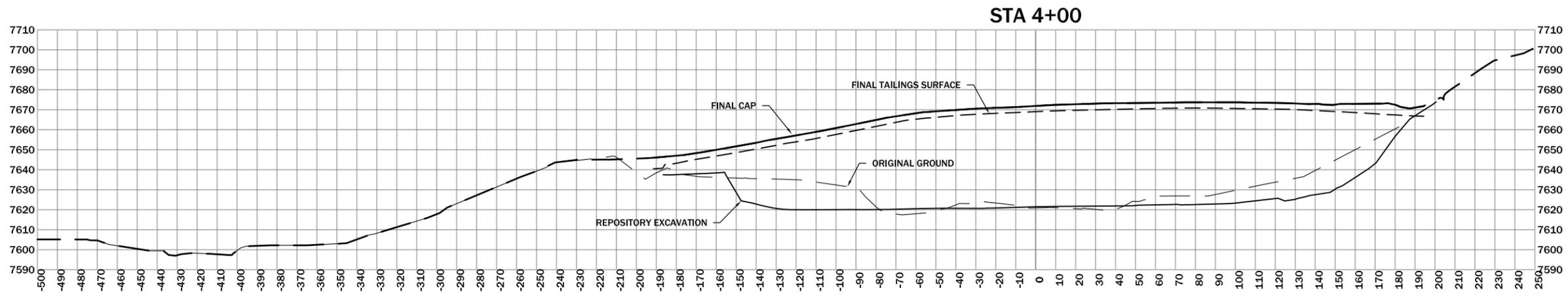
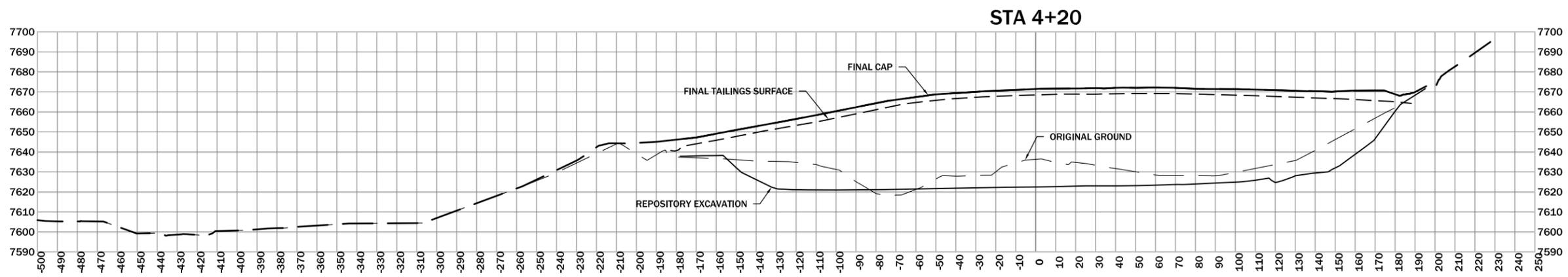
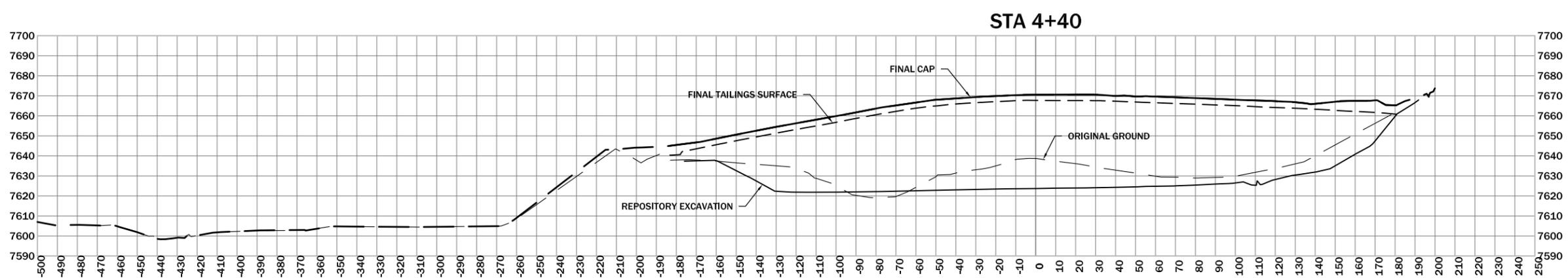
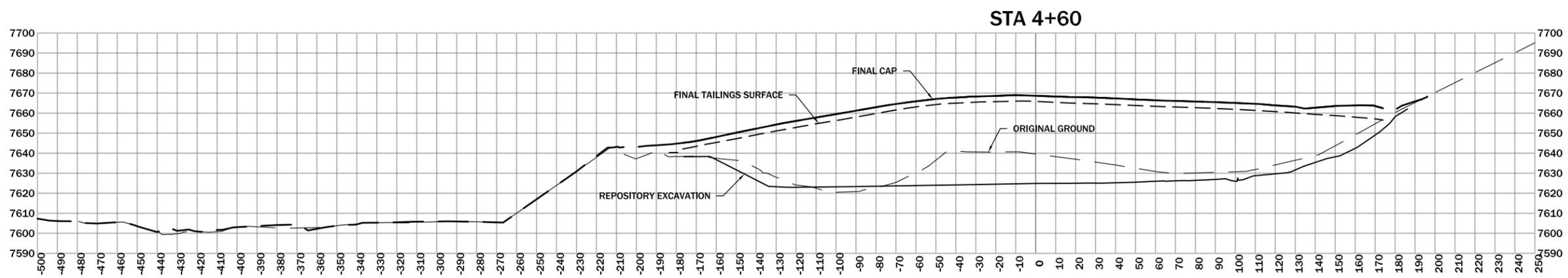


MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

REPOSITORY
 CROSS
 SECTIONS
 STA 3+20 TO 3+80

PIONEER
 TECHNICAL SERVICES, INC.
 1101 SOUTH MONTANA
 BUTTE, MONTANA 59701
 (406) 782-5177

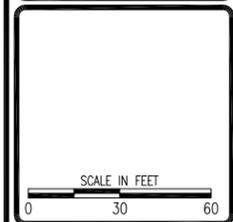
SHEET
 R-8AB



REVISION	DATE	BY	DESC.

DRAWN BY: CLA
 DESIGNED BY: SD8
 CHECKED BY: MCB
 APPROVED BY: JSA
 PROJECT NO: 10140
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: NA
 DATUM: NA
 UNITS: FEET
 SOURCE: PIONEER

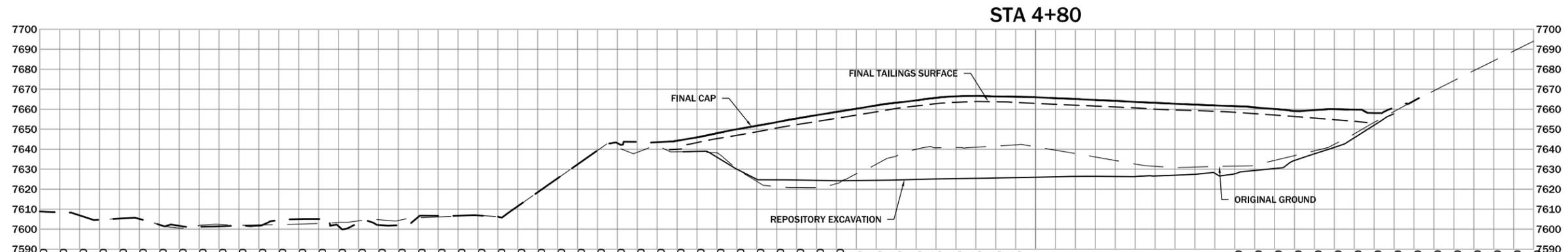
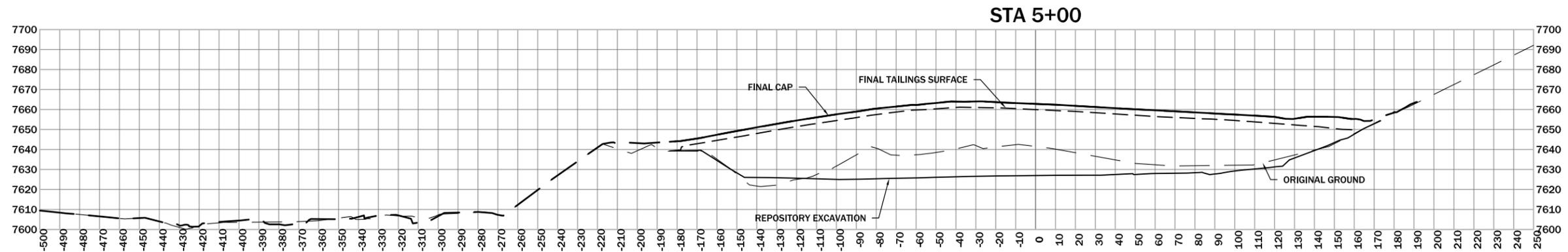
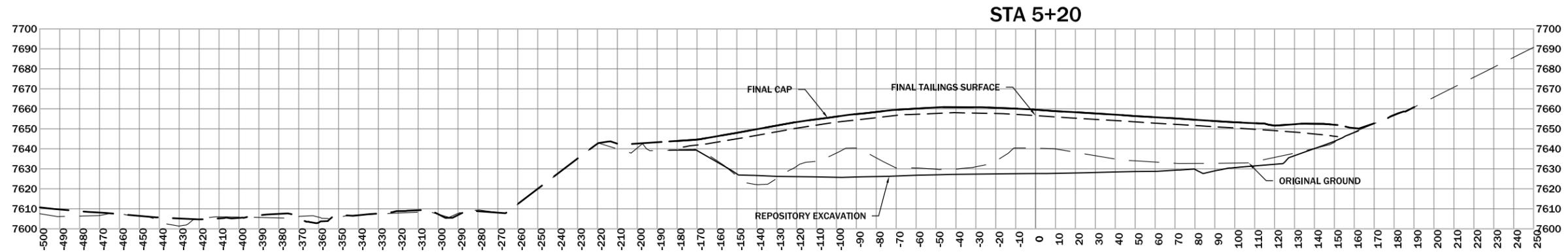
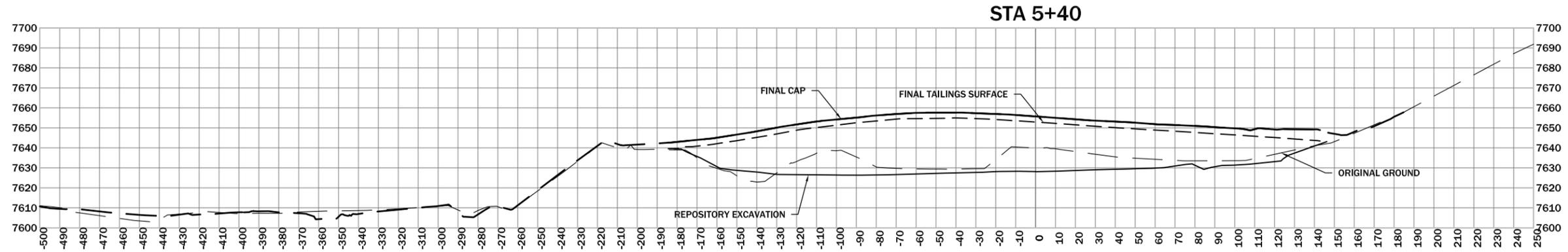


MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

REPOSITORY
 CROSS
 SECTIONS
 STA 4+00 TO 4+60



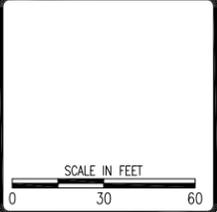
SHEET
R-9AB



REVISION	DATE	BY	DESC.

DRAWN BY: CLM
 DESIGNED BY: SDB
 CHECKED BY: MCB
 APPROVED BY: JSA
 PROJECT NO: 10140
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: NA
 DATUM: NA
 UNITS: FEET
 SOURCE: PIONEER

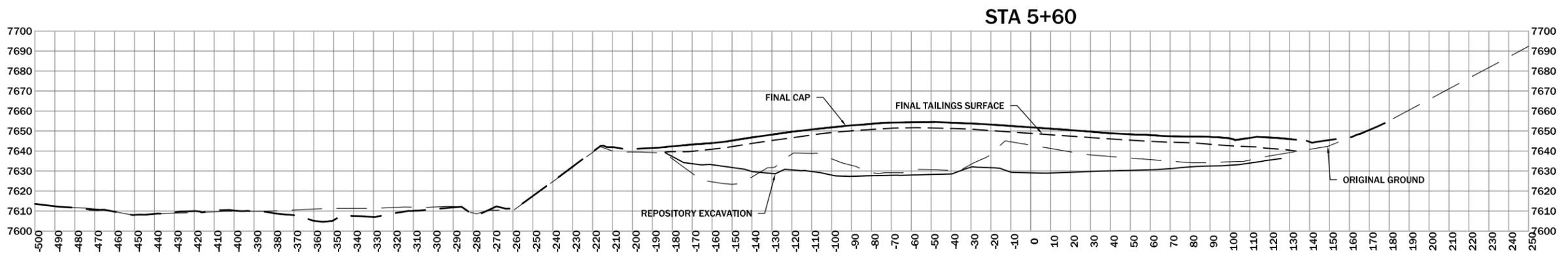
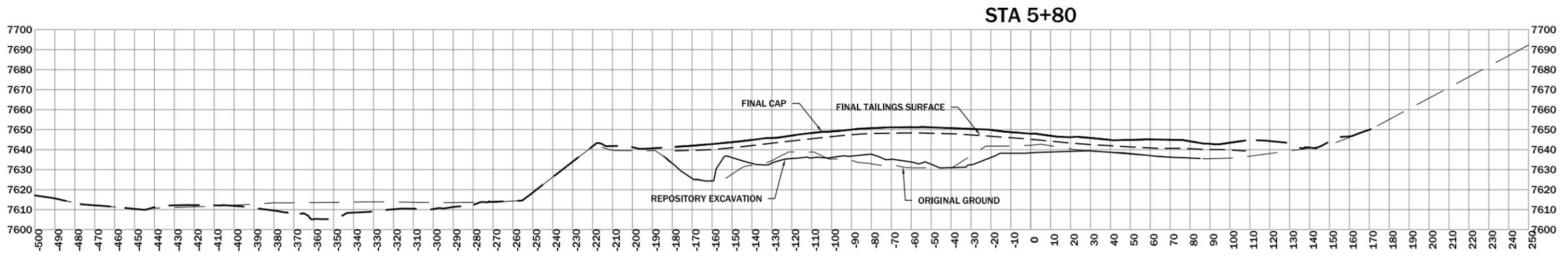
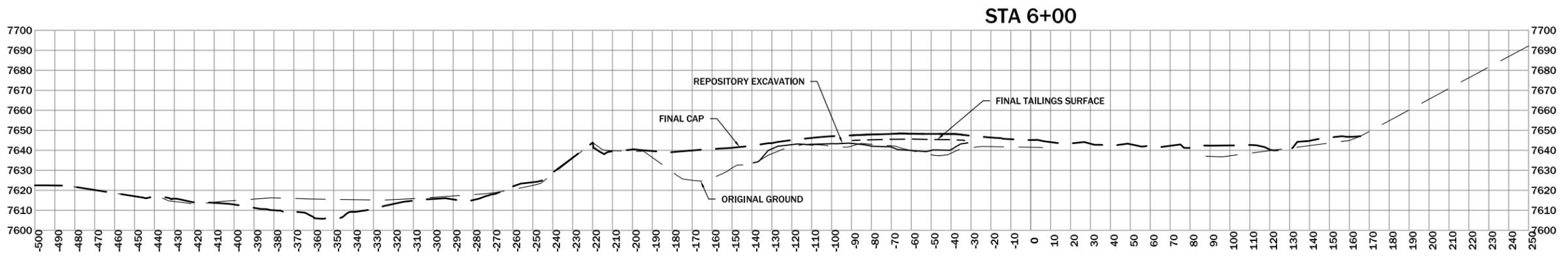
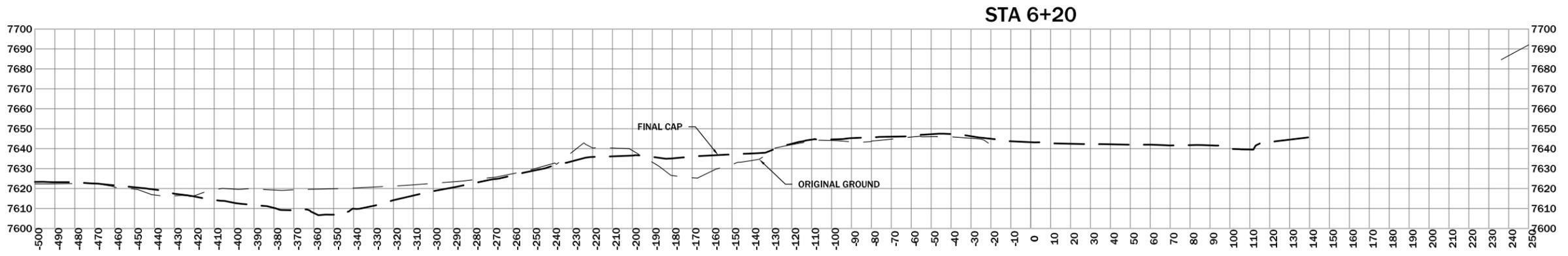


MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

REPOSITORY
 CROSS
 SECTIONS
 STA 4+80 TO 5+40



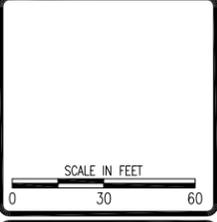
SHEET
 R-10AB



REVISION	DATE	BY	DESC.

DRAWN BY: CLA
 DESIGNED BY: SD8
 CHECKED BY: MCB
 APPROVED BY: JSA
 PROJECT NO: 10140
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: NA
 DATUM: NA
 UNITS: FEET
 SOURCE: PIONEER



MDEQ/MWCB
MCLAREN TAILINGS ABANDONED
MINE SITE RECLAMATION PROJECT
FINAL AS-BUILT DRAWINGS

REPOSITORY
CROSS
SECTIONS
STA 5+60 TO 6+20



SHEET
R-11AB

VOLUME CALCULATION METHOD - AVERAGE END AREA

Total Repository Volume Table		
Station	Fill Volume	Cumulative Fill Vol
0+00.00	0.00	0.00
0+20.00	0.00	0.00
0+40.00	15.56	15.56
0+60.00	784.13	799.69
0+80.00	2460.67	3260.36
1+00.00	4058.65	7319.01
1+20.00	5307.87	12626.88
1+40.00	6403.21	19030.09
1+60.00	7580.50	26610.59
1+80.00	8784.43	35395.02
2+00.00	9854.97	45249.99
2+20.00	10895.44	56145.43
2+40.00	11879.09	68024.52
2+60.00	12759.94	80784.46
2+80.00	13510.69	94295.15
3+00.00	13876.08	108171.23
3+20.00	13684.63	121855.87
3+40.00	13110.93	134966.80
3+60.00	12406.91	147373.71
3+80.00	11690.61	159064.32
4+00.00	10945.28	170009.60
4+20.00	10183.05	180192.65
4+40.00	9418.54	189611.20
4+60.00	8623.11	198234.31
4+80.00	7769.04	206003.35
5+00.00	6882.56	212885.92
5+20.00	6000.25	218886.16
5+40.00	5138.05	224024.21
5+60.00	4167.77	228191.98
5+80.00	2721.25	230913.23
6+00.00	998.00	231911.24
6+20.00	88.32	231999.56
6+40.00	0.00	231999.56
6+60.00	0.00	231999.56
6+80.00	0.00	231999.56
7+00.00	0.00	231999.56
7+20.00	0.00	231999.56
7+40.00	0.00	231999.56
7+60.00	0.00	231999.56
7+80.00	0.00	231999.56
8+00.00	0.00	231999.56
8+20.00	0.00	231999.56
8+40.00	0.00	231999.56
8+60.00	0.00	231999.56
8+80.00	0.00	231999.56
9+00.00	0.00	231999.56
9+20.00	0.00	231999.56
9+40.00	0.00	231999.56
9+60.00	0.00	231999.56
9+80.00	0.00	231999.56
9+81.57	0.00	231999.56

Total Repository Cap Volume Table		
Station	Fill Volume	Cumulative Fill Vol
0+00.00	0.00	0.00
0+20.00	0.00	0.00
0+40.00	34.22	34.22
0+60.00	390.33	424.55
0+80.00	816.10	1240.66
1+00.00	964.05	2204.71
1+20.00	1027.01	3231.72
1+40.00	1043.73	4275.45
1+60.00	1052.85	5328.29
1+80.00	1070.02	6398.31
2+00.00	1084.49	7482.80
2+20.00	1096.10	8578.90
2+40.00	1111.58	9690.48
2+60.00	1138.92	10829.40
2+80.00	1157.90	11987.30
3+00.00	1162.96	13150.25
3+20.00	1166.80	14317.05
3+40.00	1163.73	15480.78
3+60.00	1125.64	16606.43
3+80.00	1059.40	17665.83
4+00.00	978.44	18644.27
4+20.00	906.61	19550.88
4+40.00	873.02	20423.90
4+60.00	864.25	21288.15
4+80.00	847.69	22135.84
5+00.00	814.46	22950.30
5+20.00	783.84	23734.14
5+40.00	761.65	24495.79
5+60.00	749.03	25244.82
5+80.00	691.80	25936.63
6+00.00	117.58	26054.21
6+20.00	57.21	26111.42
6+40.00	0.00	26111.42
6+60.00	0.00	26111.42
6+80.00	0.00	26111.42
7+00.00	0.00	26111.42
7+20.00	0.00	26111.42
7+40.00	0.00	26111.42
7+60.00	0.00	26111.42
7+80.00	0.00	26111.42
8+00.00	0.00	26111.42
8+20.00	0.00	26111.42
8+40.00	0.00	26111.42
8+60.00	0.00	26111.42
8+80.00	0.00	26111.42
9+00.00	0.00	26111.42
9+20.00	0.00	26111.42
9+40.00	0.00	26111.42
9+60.00	0.00	26111.42
9+80.00	0.00	26111.42
9+81.57	0.00	26111.42

Total Repository Excavation Volume Table				
Station	Fill Volume	Cumulative Fill Vol	Cut Volume	Cumulative Cut Vol
0+00.00	0.00	0.00	0.00	0.00
0+20.00	0.00	0.00	0.00	0.00
0+40.00	0.00	0.00	18.38	18.38
0+60.00	304.99	304.99	846.73	865.11
0+80.00	531.44	836.43	2231.41	3096.52
1+00.00	389.68	1226.11	3066.84	6163.36
1+20.00	463.81	1689.91	3510.73	9674.09
1+40.00	634.70	2324.62	3745.66	13419.74
1+60.00	698.77	3023.38	4023.74	17443.48
1+80.00	776.97	3800.35	4421.75	21865.24
2+00.00	613.29	4413.64	4682.20	26547.43
2+20.00	293.82	4707.46	4935.24	31482.67
2+40.00	171.82	4879.27	5279.17	36761.84
2+60.00	140.76	5020.03	5626.06	42387.90
2+80.00	120.46	5140.49	5878.66	48266.56
3+00.00	110.27	5250.76	5847.41	54113.97
3+20.00	105.26	5356.03	5397.53	59511.49
3+40.00	139.73	5495.75	4700.84	64212.33
3+60.00	193.07	5688.82	3543.83	67756.17
3+80.00	341.70	6030.52	2269.49	70025.66
4+00.00	301.38	6331.90	1650.30	71675.96
4+20.00	98.32	6430.22	1727.47	73403.42
4+40.00	57.73	6487.95	1869.94	75273.37
4+60.00	50.86	6538.81	1739.19	77012.56
4+80.00	77.07	6615.88	1654.05	78666.62
5+00.00	89.43	6705.31	1625.47	80292.08
5+20.00	67.34	6772.65	1429.39	81721.47
5+40.00	69.18	6841.83	1168.44	82889.91
5+60.00	133.82	6975.65	1075.59	83965.50
5+80.00	196.47	7172.13	633.82	84599.32
6+00.00	143.50	7315.63	116.35	84715.67
6+20.00	41.87	7357.49	6.86	84722.53
6+40.00	0.00	7357.49	0.00	84722.53
6+60.00	0.00	7357.49	0.00	84722.53
6+80.00	0.00	7357.49	0.00	84722.53
7+00.00	0.00	7357.49	0.00	84722.53
7+20.00	0.00	7357.49	0.00	84722.53
7+40.00	0.00	7357.49	0.00	84722.53
7+60.00	0.00	7357.49	0.00	84722.53
7+80.00	0.00	7357.49	0.00	84722.53
8+00.00	0.00	7357.49	0.00	84722.53
8+20.00	0.00	7357.49	0.00	84722.53
8+40.00	0.00	7357.49	0.00	84722.53
8+60.00	0.00	7357.49	0.00	84722.53
8+80.00	0.00	7357.49	0.00	84722.53
9+00.00	0.00	7357.49	0.00	84722.53
9+20.00	0.00	7357.49	0.00	84722.53
9+40.00	0.00	7357.49	0.00	84722.53
9+60.00	0.00	7357.49	0.00	84722.53
9+80.00	0.00	7357.49	0.00	84722.53
9+81.57	0.00	7357.49	0.00	84722.53

VOLUME CALCULATION METHOD - COMPOSITE VOLUME

Cut/Fill Summary

Name	2d Area	Fill	Net
Repository Volume	212217.13 Sq. Ft.	231951.96 Cu. Yd.	231951.96 Cu. Yd. <Fill>

Cut/Fill Summary

Name	2d Area	Fill	Net
Repository Cap Volume	212217.13 Sq. Ft.	26315.57 Cu. Yd.	26315.57 Cu. Yd.<Fill>

Cut/Fill Summary

Name	2d Area	Cut	Fill	Net
Repository Excavation	218194.78 Sq. Ft.	84997.92 Cu. Yd.	7113.59 Cu. Yd.	77884.32 Cu. Yd.<Cut>
Totals	218194.78 Sq. Ft.	84997.92 Cu. Yd.	7113.59 Cu. Yd.	77884.32 Cu. Yd.<Cut>

REVISION:	DATE:	BY:	DESC:

DRAWN BY:	CLA
DESIGNED BY:	SDB
CHECKED BY:	MCB
APPROVED BY:	JSA
PROJECT NO.:	10140
DATE:	10/09/09

DISPLAYED AS:	
COORD SYS/ZONE:	NA
DATUM:	NA
UNITS:	FEET
SOURCE:	PIONEER

SCALE IN FEET

0 N.T.S.

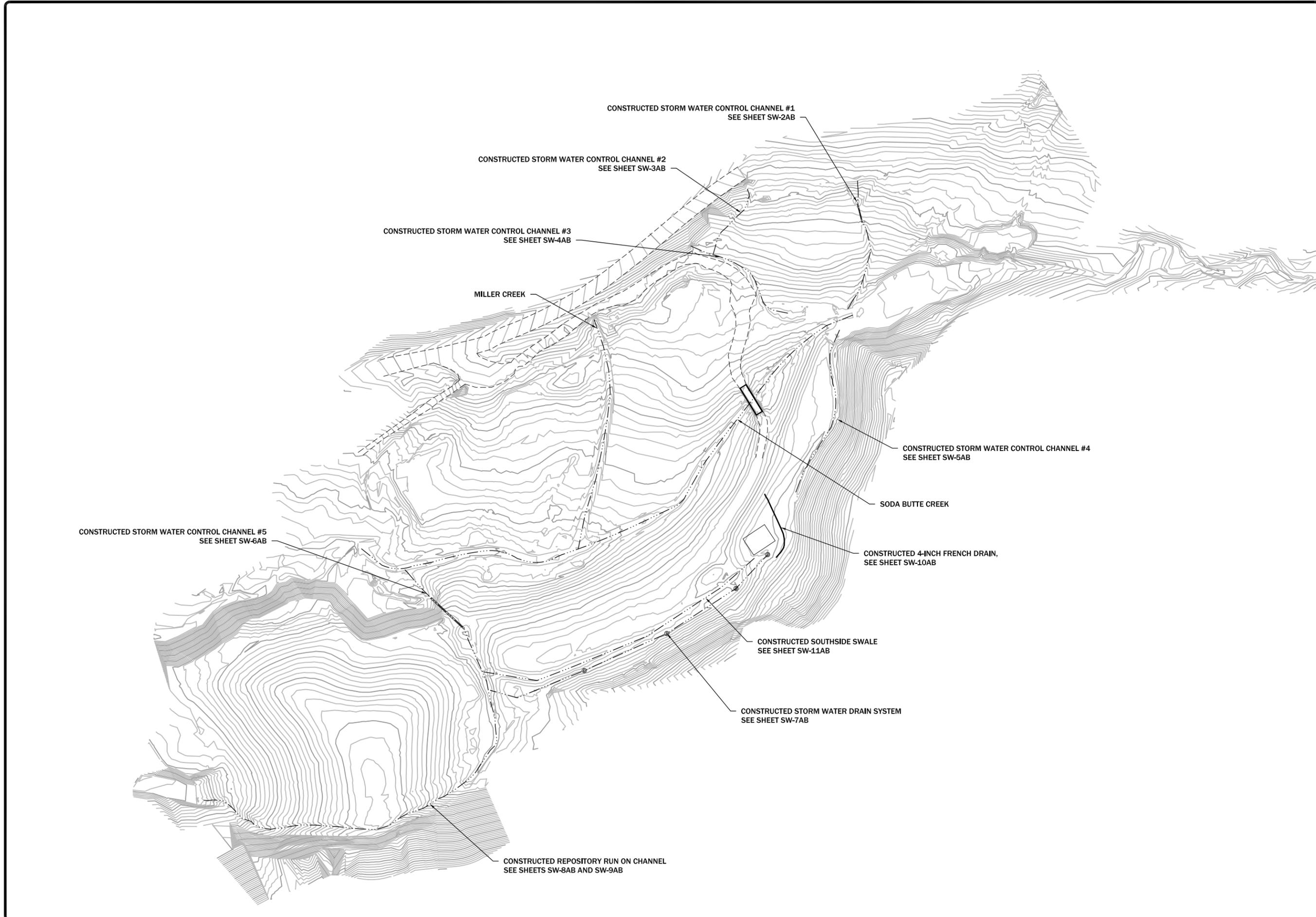
MDEQ/MWCB
MCLAREN TAILINGS ABANDONED
MINE SITE RECLAMATION PROJECT
FINAL AS-BUILT DRAWINGS

REPOSITORY
CROSS
SECTION
VOLUME TABLE

PIONEER
TECHNICAL SERVICES, INC.
1101 SOUTH MONTANA
BUTTE, MONTANA 59701
(406)-782-5177

NOTES:
1. ALL PAY QUANTITIES WERE BASED ON COMPOSITE VOLUMES.

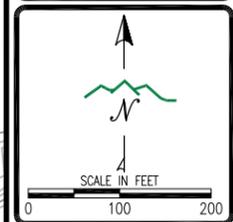
SHEET
R-12AB



REVISION	DATE	BY	DESC.

DRAWN BY: CL
 DESIGNED BY: JSM
 CHECKED BY: MCB
 APPROVED BY: JSM
 PROJECT NO: 10140
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: MSP
 DATUM: NAD83
 UNITS: FEET
 SOURCE: PIONEER

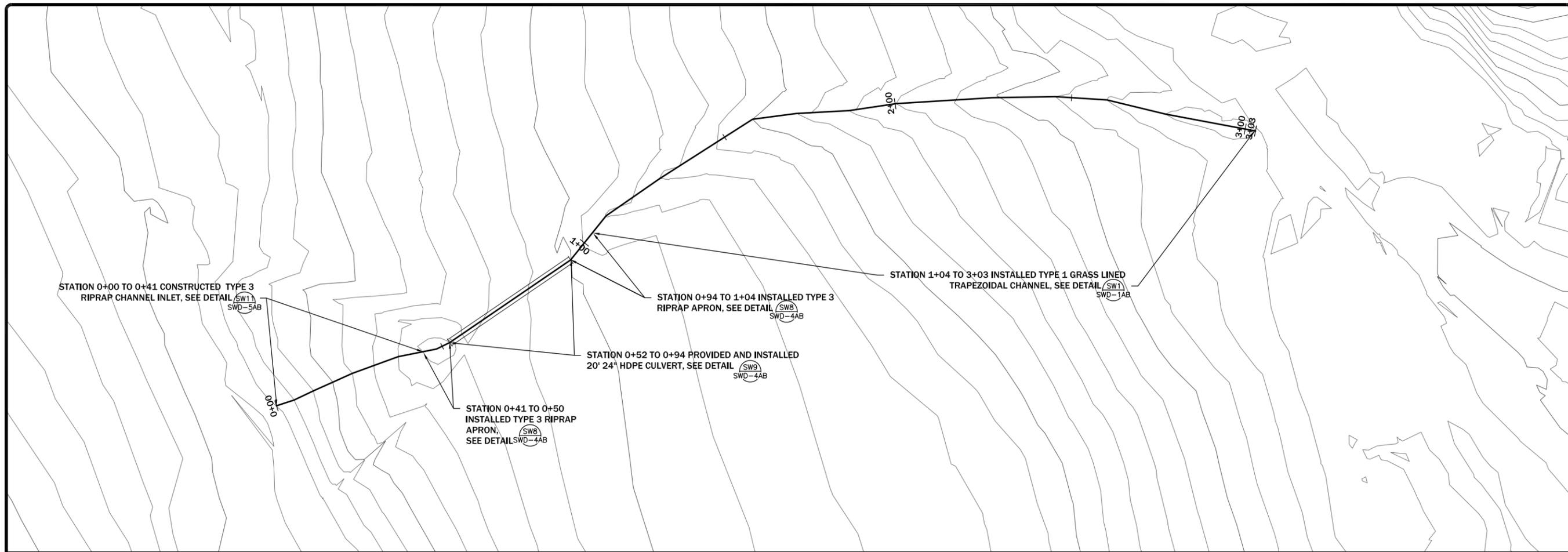


MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

STORM WATER
 CONTROLS
 PLAN
 VIEW



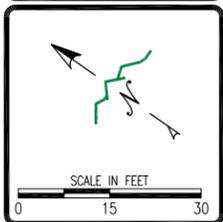
SHEET
 SW-1AB



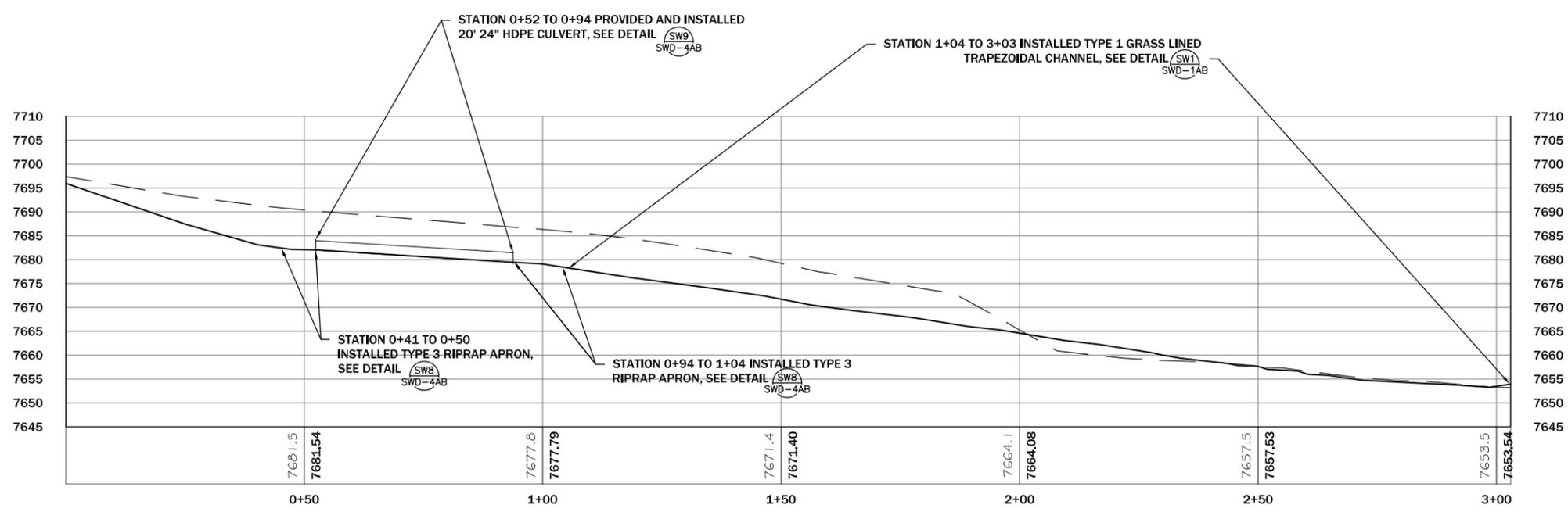
REVISION:	DATE:	BY:	DESC:

DRAWN BY: CLM
 DESIGNED BY: BKH
 CHECKED BY: JCB
 APPROVED BY: JSA
 PROJECT NO: 10140
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE, STATE PLANE
 DATUM: NAD83
 UNITS: FEET
 SOURCE: PIONEER



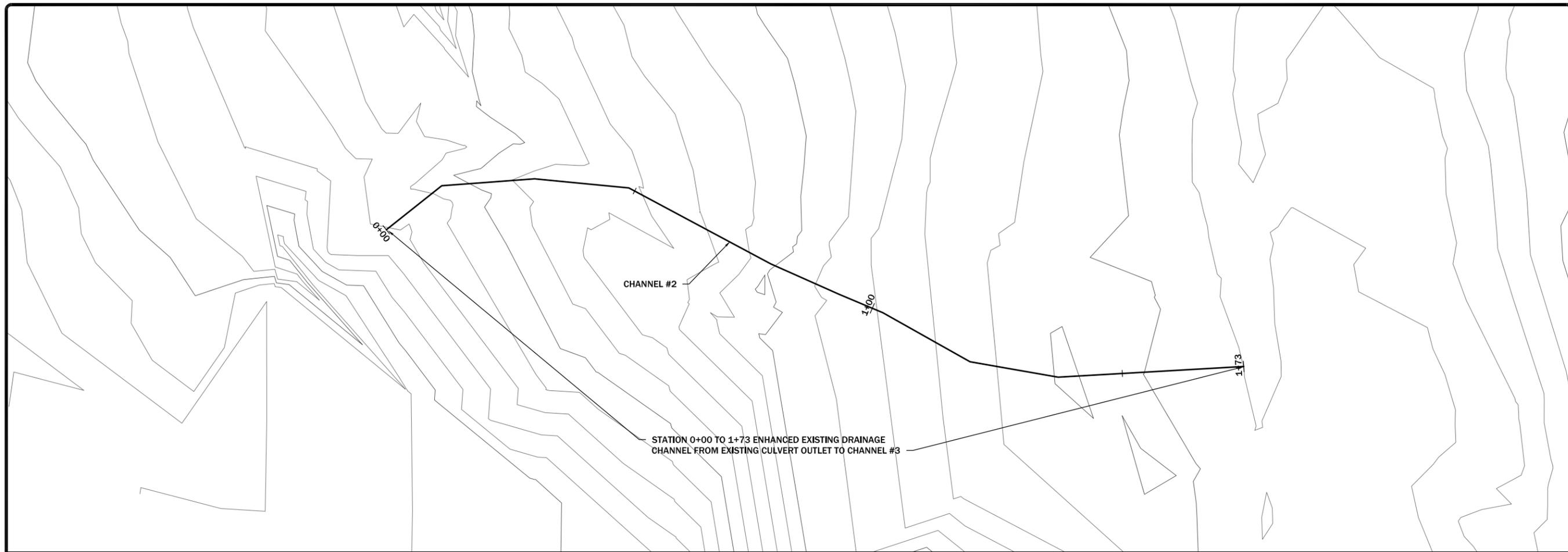
MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS



CHANNEL #1
 PLAN AND
 PROFILE



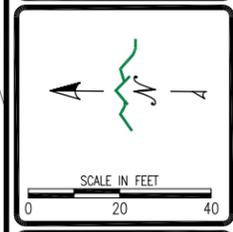
SHEET
 SW-2AB



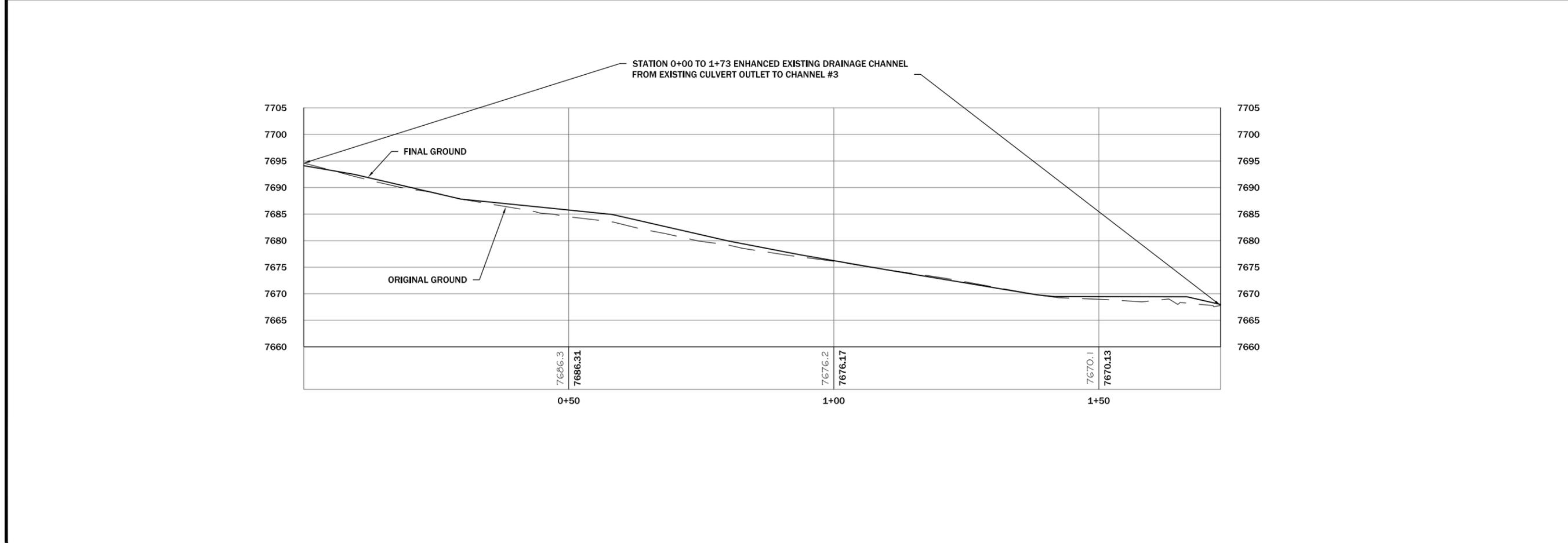
REVISION:	DATE:	BY:	DESC:

DRAWN BY: CL
 DESIGNED BY: BKH
 CHECKED BY: JSA
 APPROVED BY: JSA
 PROJECT NO: 10140
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE, STATE PLANE
 DATUM: NAD83
 UNITS: FEET
 SOURCE: PIONEER



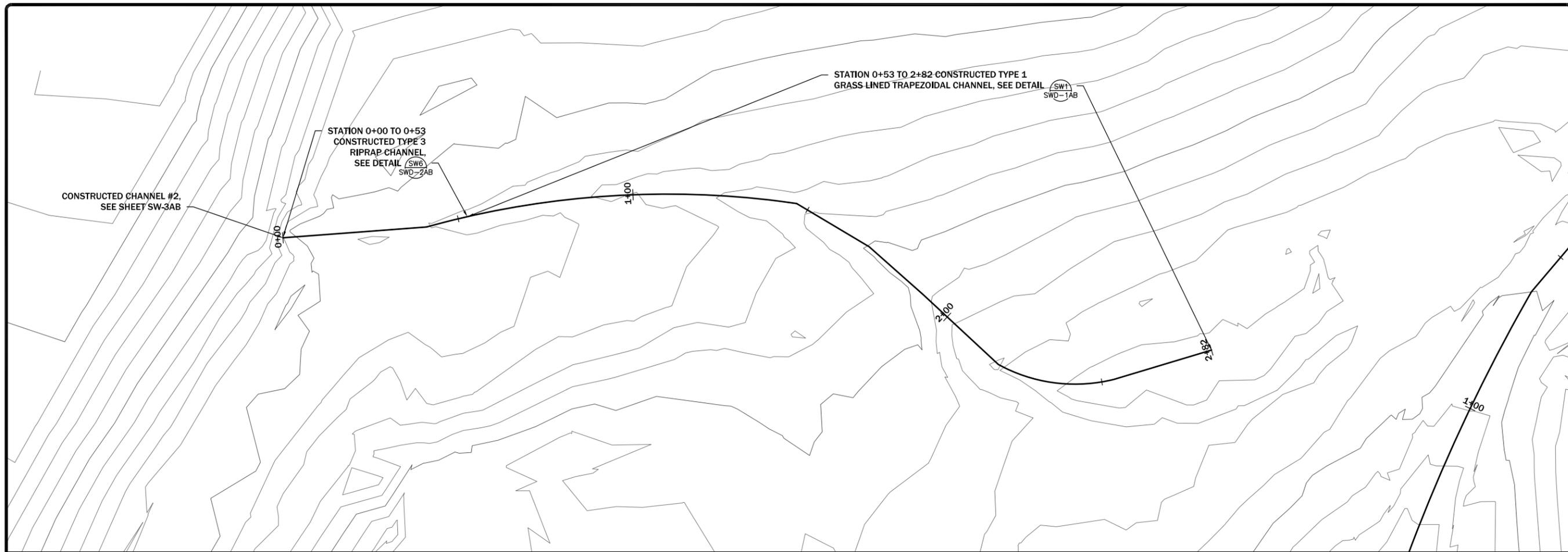
MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS



CHANNEL #2
 PLAN AND
 PROFILE



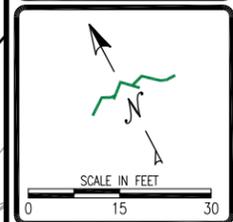
SHEET
 SW-3AB



REVISION:	DATE:	BY:	DESC:

DRAWN BY: CLA
 DESIGNED BY: BKH
 CHECKED BY: JCB
 APPROVED BY: JSA
 PROJECT NO: 10140
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: MSP
 DATUM: NAD83
 UNITS: FEET
 SOURCE: PIONEER

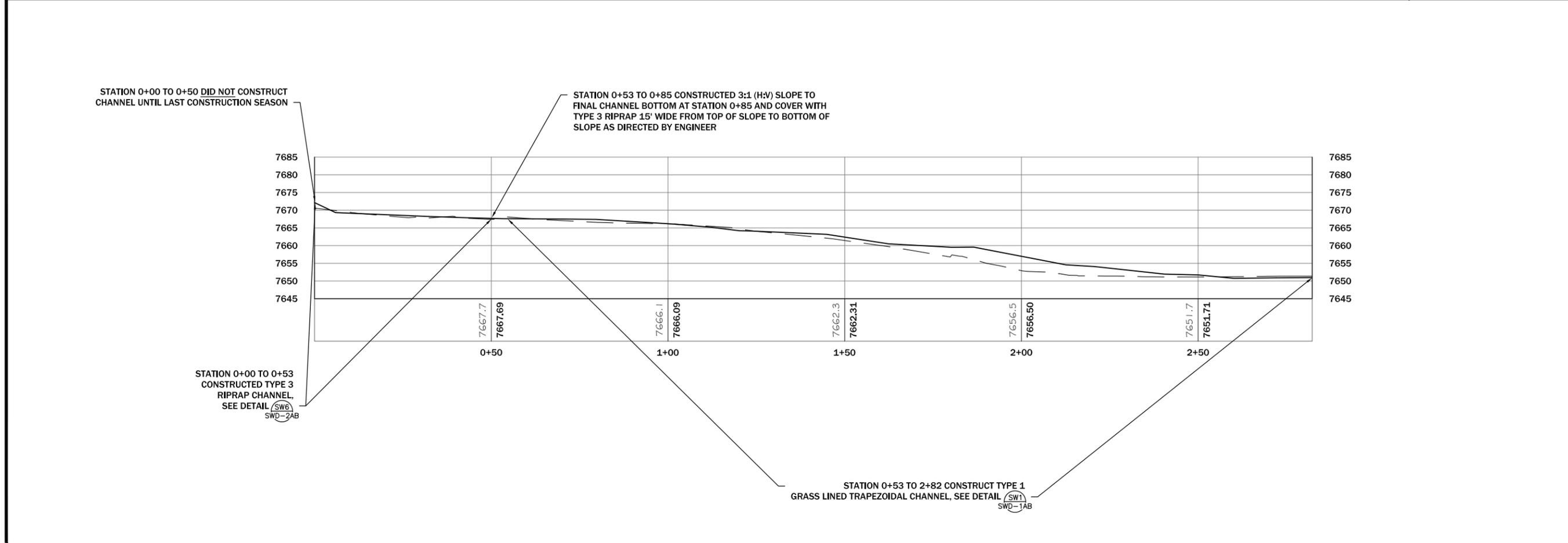


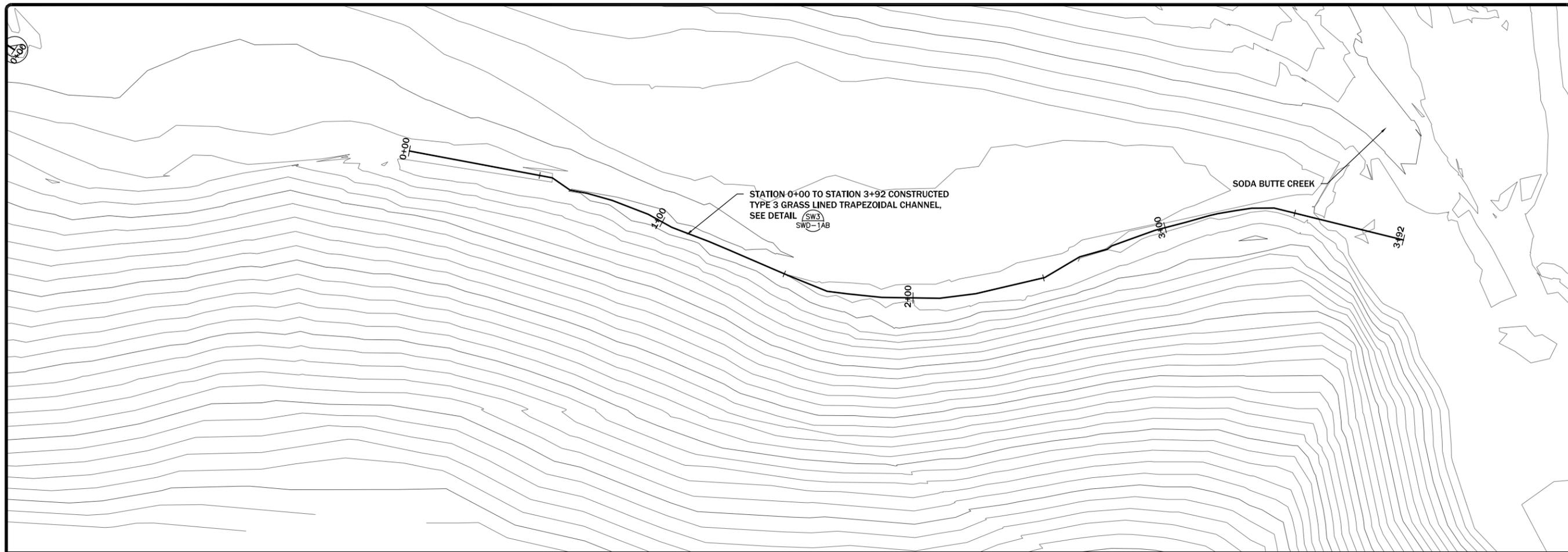
MDEQ/MWCB
MCLAREN TAILINGS ABANDONED
MINE SITE RECLAMATION PROJECT
FINAL AS-BUILT DRAWINGS

CHANNEL #3
PLAN AND
PROFILE



SHEET
SW-4AB

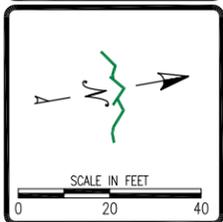




REVISION	DATE	BY	DESC.

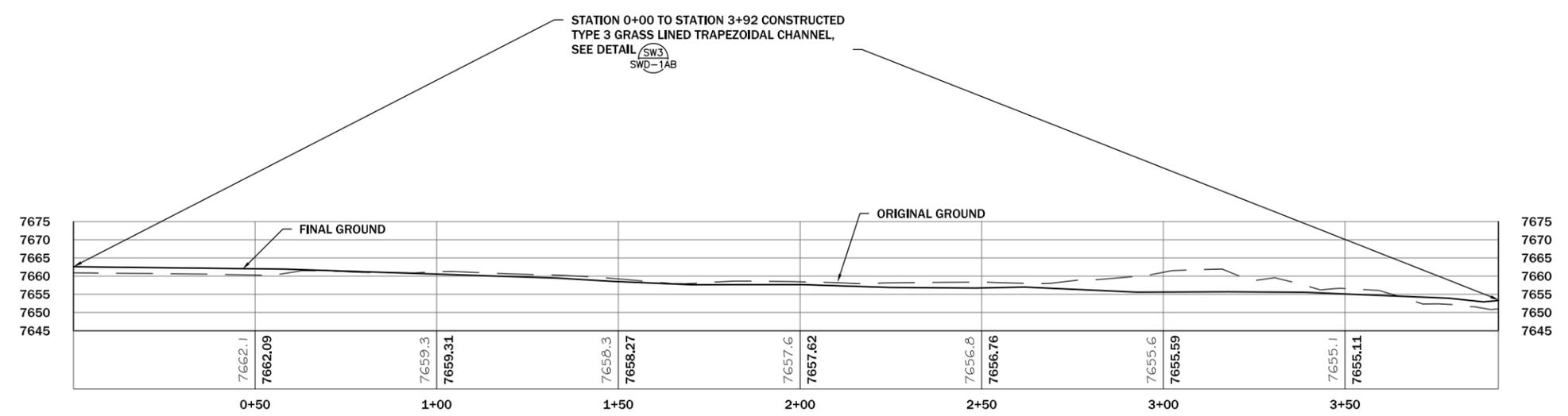
DRAWN BY: CLJ
 DESIGNED BY: JSM
 CHECKED BY: MCB
 APPROVED BY: JSM
 PROJECT NO: 10140
 DATE: 2/24/15

DISPLAYED AS:
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 DATUM: NAD83
 UNITS: FEET
 SOURCE: PIONEER

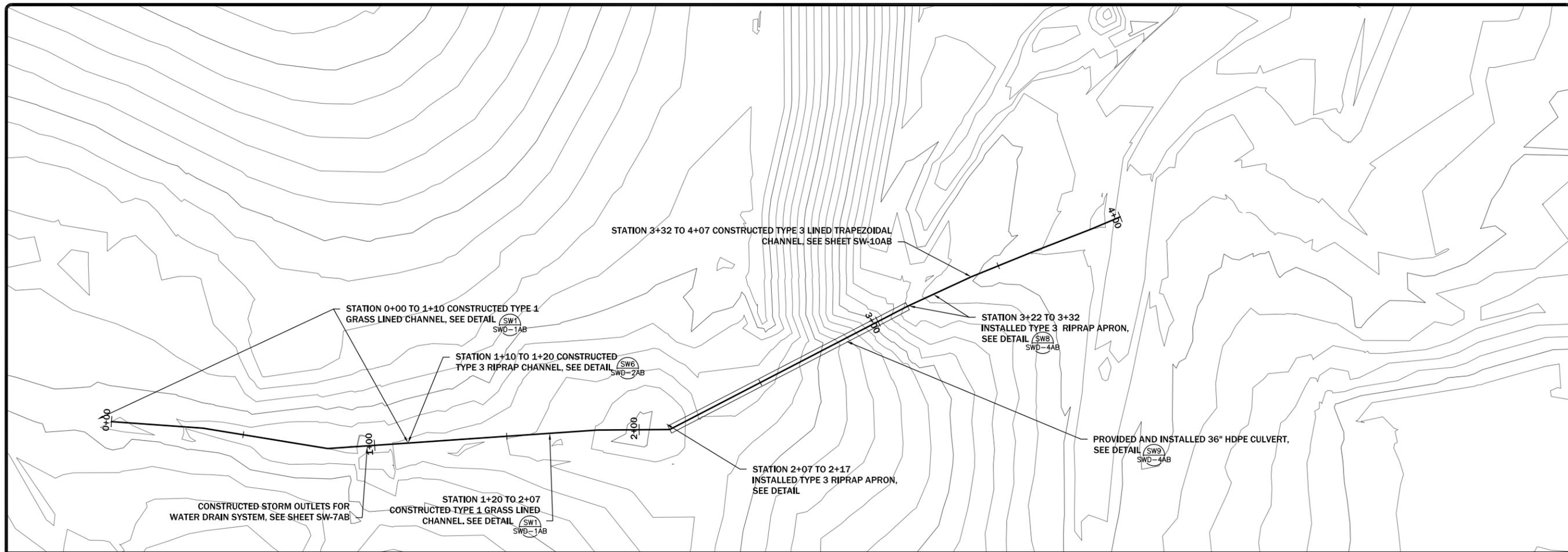


MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

CHANNEL #4
 PLAN AND
 PROFILE



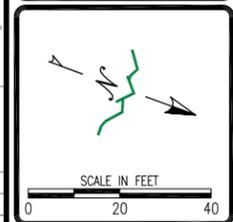
SHEET
 SW-5AB



REVISION	DATE	BY	DESC.

DRAWN BY: CLJ
 DESIGNED BY: JSA
 CHECKED BY: MCB
 APPROVED BY: JSA
 PROJECT NO: 10140
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: MSP
 DATUM: NAD83
 UNITS: FEET
 SOURCE: PIONEER

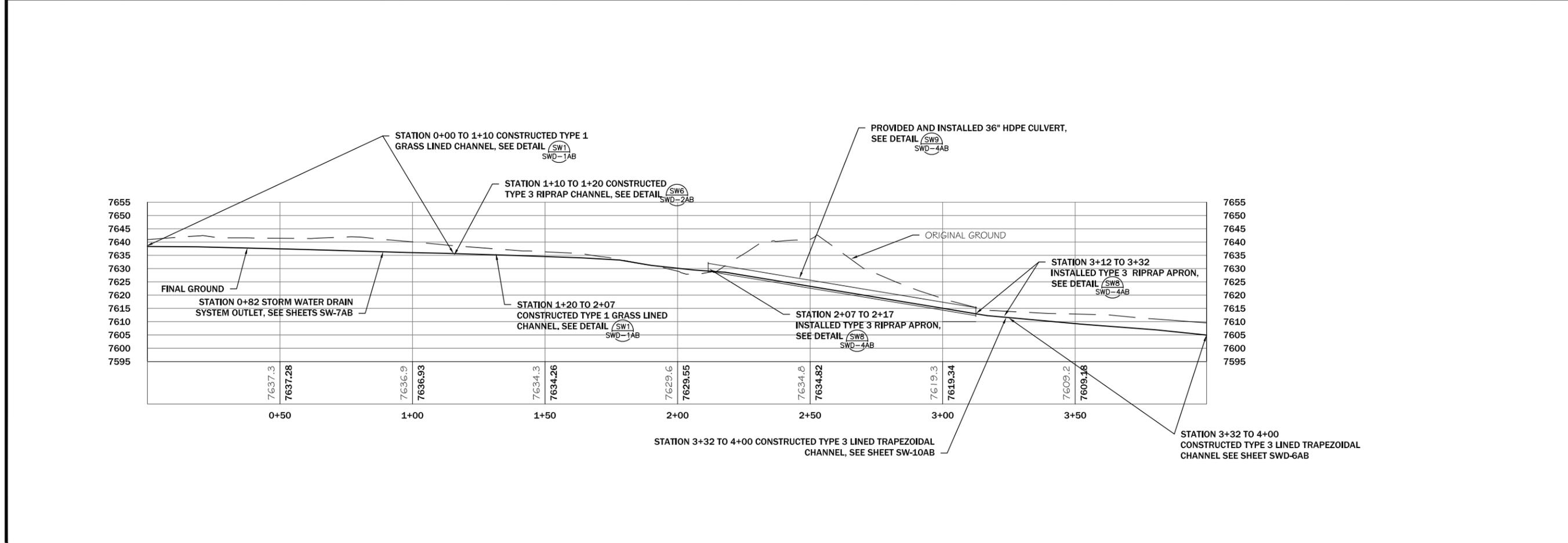


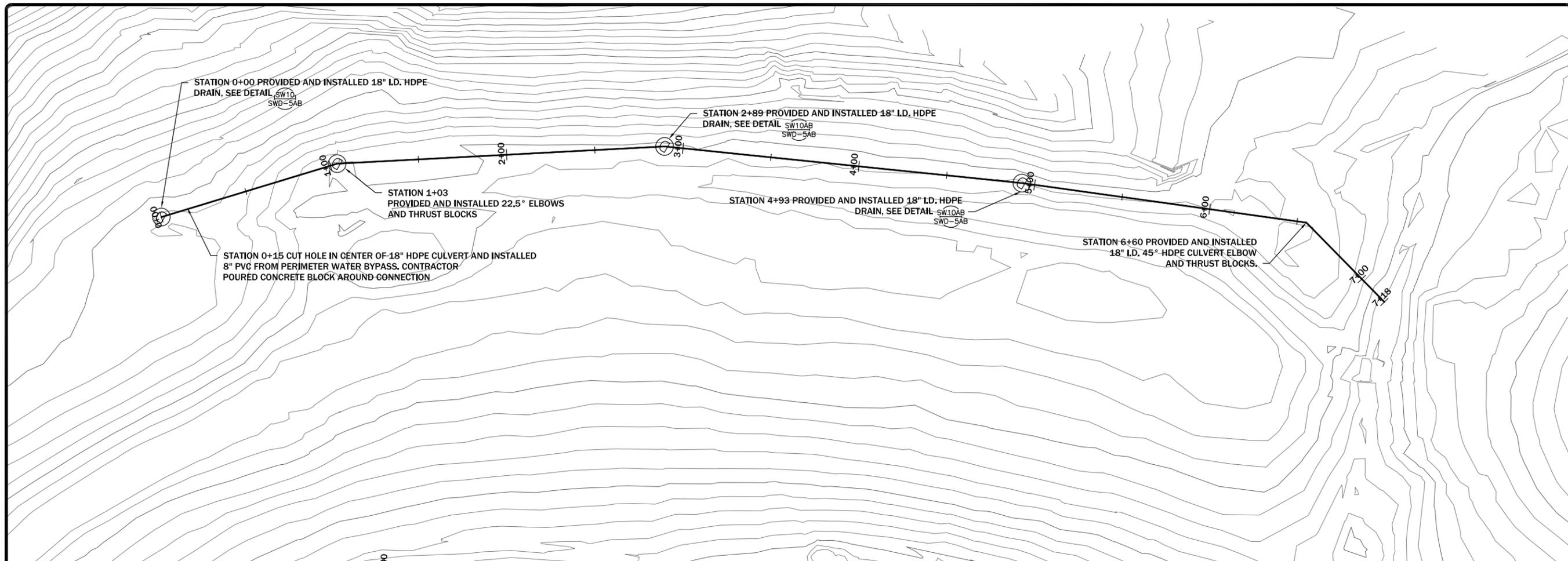
MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

CHANNEL #5
 PLAN AND
 PROFILE



SHEET
 SW-6AB

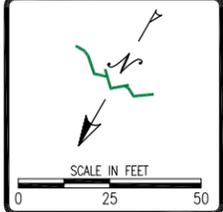




REVISION:	BY:	DESC:

DRAWN BY: CLJ
 DESIGNED BY: JSA
 CHECKED BY: MCB
 APPROVED BY: JSA
 PROJECT NO: 10140
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: MSP
 DATUM: NAD 83
 UNITS: FEET
 SOURCE: PIONEER

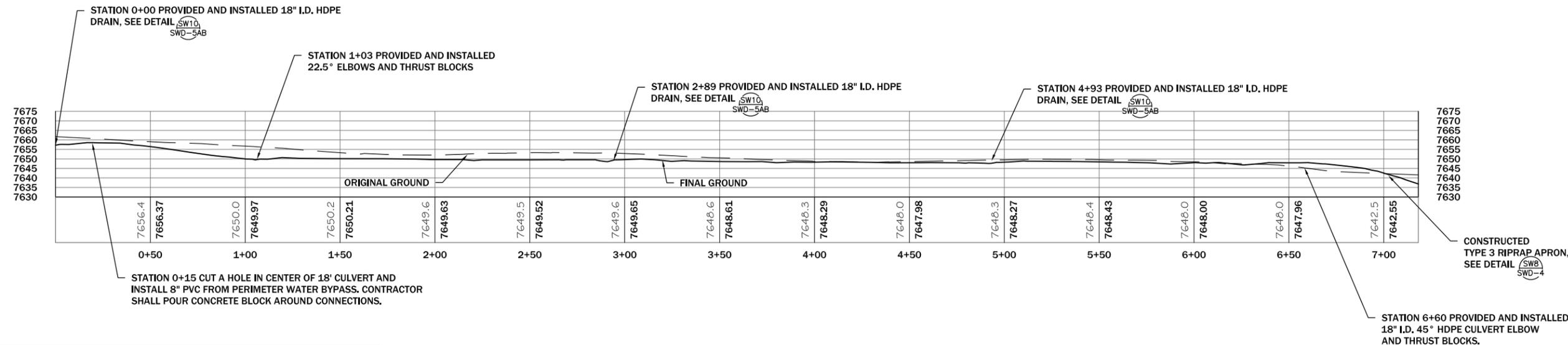


MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

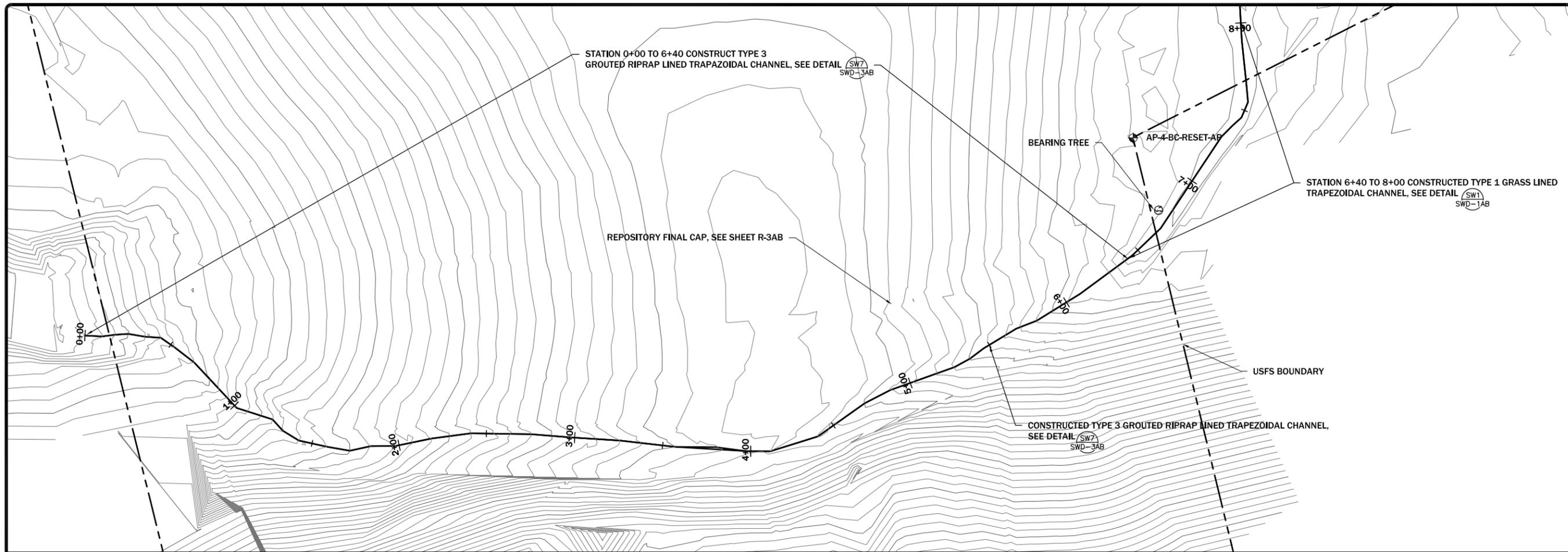
STORM WATER
 DRAIN
 PLAN AND
 PROFILE



SHEET
 SW-7AB



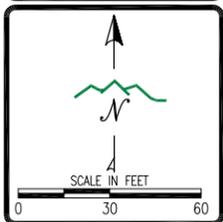
- NOTES:**
- 18" HDPE CULVERT HAS CORRUGATED EXTERIOR AND SMOOTH INTERIOR.
 - CONTRACTOR INSTALLED 18" I.D. HDPE PER MANUFACTURERS SPECIFICATIONS.
 - CONTRACTOR COMPACTED BACKFILL AROUND 18" HDPE CULVERT AND DRAINS TO 95% STANDARD PROCTOR (ASTM 698) AND ±4% MOISTURE CONTENT.



REVISION:	DATE:	BY:	DESC:

DRAWN BY: CL
 DESIGNED BY: BCH
 CHECKED BY: JCB
 APPROVED BY: JSA
 PROJECT NO: 10140
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: MSP
 DATUM: NAD83
 UNITS: FEET
 SOURCE: PIONEER

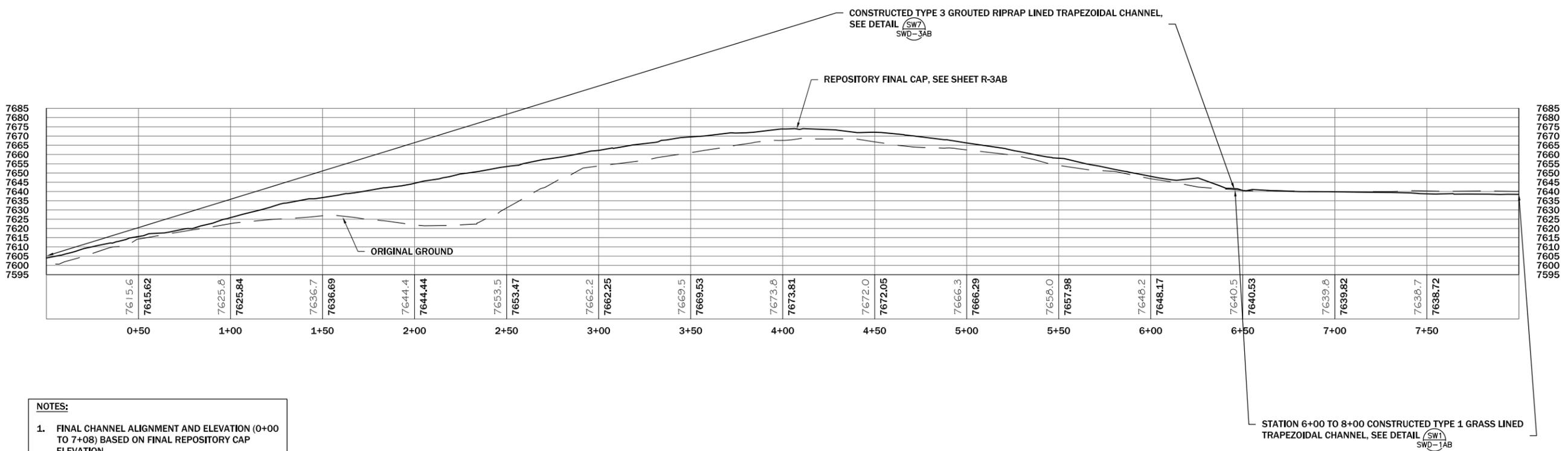


MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

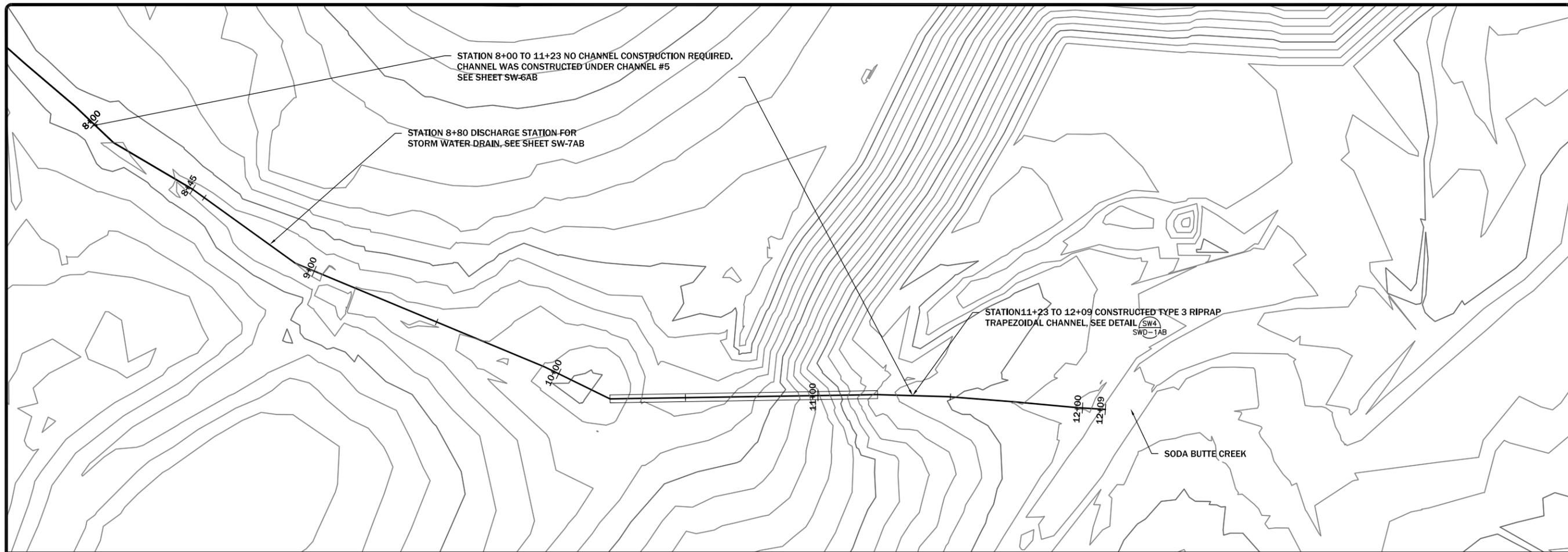
REPOSITORY STORM WATER
 RUN-ON CHANNEL
 PLAN AND PROFILE
 STA 0+00 TO 8+00



SHEET
 SW-8AB



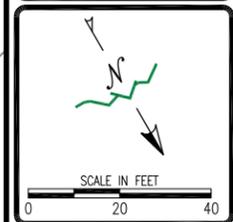
NOTES:
 1. FINAL CHANNEL ALIGNMENT AND ELEVATION (0+00 TO 7+08) BASED ON FINAL REPOSITORY CAP ELEVATION



REVISION:	DATE:	BY:	DESC:

DRAWN BY: CLJ
 DESIGNED BY: JSA
 CHECKED BY: MCB
 APPROVED BY: JSA
 PROJECT NO: 10140
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: MSP
 DATUM: NAD83
 UNITS: FEET
 SOURCE: PIONEER

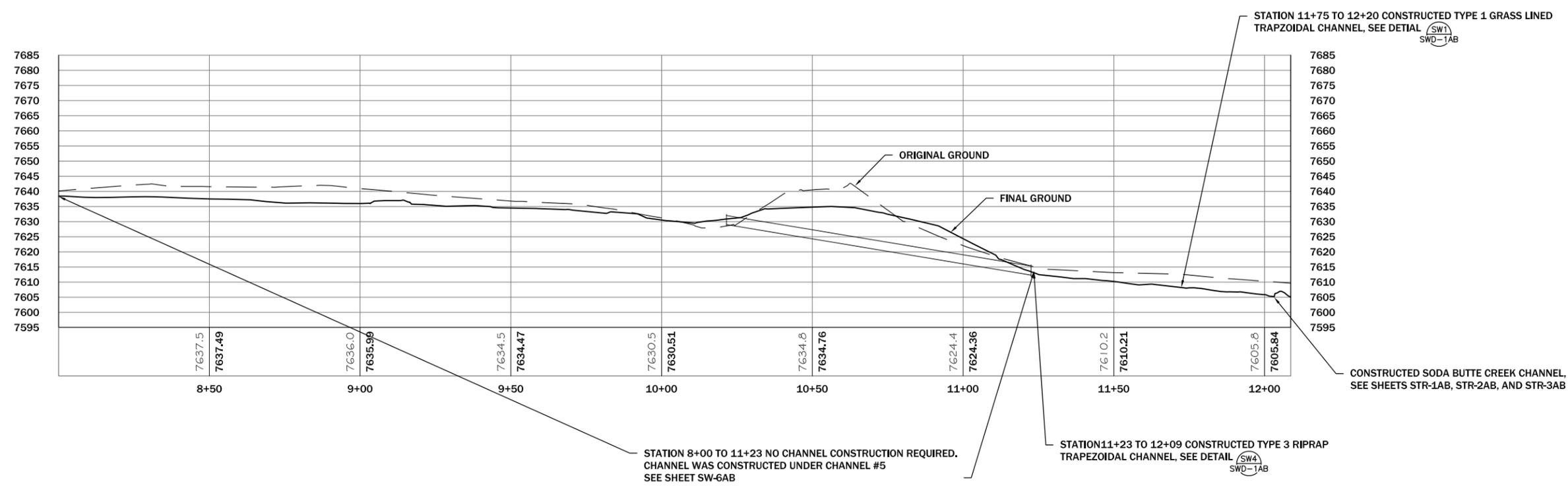


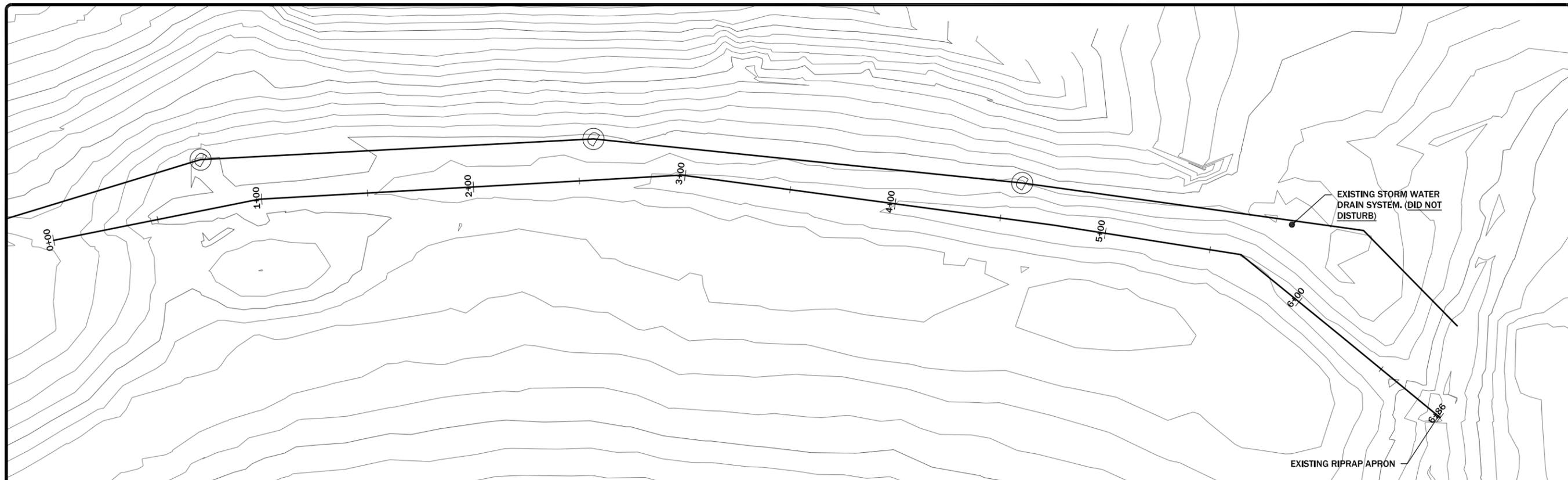
MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

REPOSITORY STORM WATER
 RUN-ON CHANNEL
 PLAN AND PROFILE
 STA 8+00 TO 12+09



SHEET
 SW-9AB

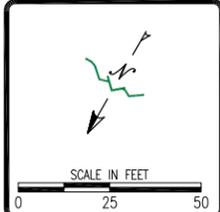




REVISION:	DATE:	BY:	DESC:

DRAWN BY: CL
 DESIGNED BY: JSA
 CHECKED BY: MCB
 APPROVED BY: JSA
 PROJECT NO: 10160
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: MSP
 DATUM: NAD83
 UNITS: FEET
 SOURCE: PIONEER

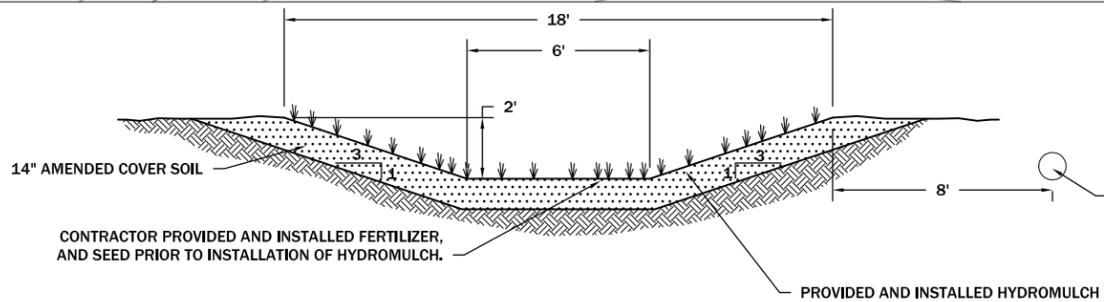


MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

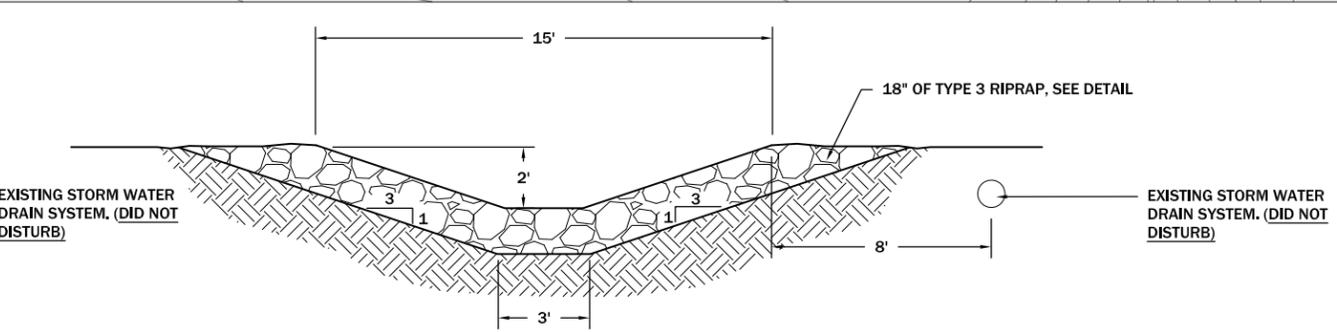
SOUTHSIDE
 SWALE

PIONEER
 TECHNICAL SERVICES, INC.
 1101 SOUTH MONTANA
 BUTTE, MONTANA 59701
 (406) 782-5177

SHEET
 SW-11AB



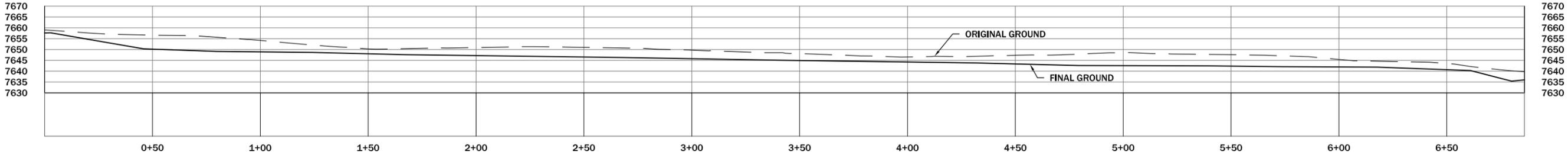
GRASS LINED TRAPEZOIDAL CHANNEL DETAIL
 N.T.S.



TYPE 3 RIPRAP LINED TRAPEZOIDAL CHANNEL DETAIL
 N.T.S.

CONSTRUCTED
 TYPE 3 RIPRAP
 LINED
 TRAPEZOIDAL
 CHANNEL
 SEE DETAIL

CONSTRUCTED
 GRASS LINED
 TRAPEZOIDAL
 CHANNEL
 SEE DETAIL



NOTES:

1. CONTRACTOR CONSTRUCTED THE APPROPRIATE SODA BUTTE AND MILLER CREEK CHANNEL SECTIONS AS SHOWN ON SHEETS STRD-8AB AND STRD-9AB AND AS DIRECTED BY ENGINEER.
2. CONTRACTOR INSTALLED LARGE WOODY MATERIALS AS SHOWN ON SHEETS STRD-8AB AND STRD-9AB AS DIRECTED BY ENGINEER.
3. ACTUAL STREAM LOCATION WAS DETERMINED AFTER TAILINGS AND WASTE REMOVAL.

NOT CONSTRUCTED

CONTRACTOR SHALL INSTALL ISOLATION COFFER DAM. SEE DETAILS STRD-6 AND STRD-6AB STRD-6AB STRD-6AB

FORMER SODA BUTTE STREAM CHANNEL.

CONTRACTOR INSTALLED ISOLATION COFFER DAM PER DETAILS STRD-6 AND STRD-6AB STRD-6AB STRD-6AB

MATCHED EXISTING CHANNEL ALIGNMENT AND ELEVATION 7653.9

EAST BRIDGE: CONTRACTOR REMOVED AND REINSTALLED.

CONTRACTOR INSTALLED GRADE CONTROL STRUCTURES PER DETAIL STRD-3AB STRD-3AB

LOG GRADE CONTROL STRUCTURE, (TYP.)

CONTRACTOR BACKFILLED AND GRADED AS SHOWN ON DRAWINGS ONCE SODA BUTTE CREEK WAS FULLY RETURNED INTO NEW CHANNEL

CONTRACTOR INSTALLED EAST BRIDGE AND ABUTMENTS AS SHOWN ON SHEETS F-3AB AND FD-3AB AS SPECIFIED IN SPECIAL PROVISIONS AND AS DIRECTED BY ENGINEER. CONTRACTOR COORDINATED BRIDGE INSTALLATION WITH STREAM RECONSTRUCTION ACTIVITIES - FINAL LOCATION OF BRIDGE WAS DETERMINED IN THE FIELD BASED UPON EXCAVATION AND NEW SODA BUTTE STREAM CHANNEL CONFIGURATION.

LOG GRADE CONTROL STRUCTURE. SEE SHEET STRD-8

CONSTRUCTED MILLER CREEK STREAM CHANNEL PER SHEET STRD-5AB.

LOG GRADE CONTROL STRUCTURE, (TYP.)

CONTRACTOR REGRADED FLOODPLAIN AREA INCLUDING EXCESS MATERIAL FROM STREAM CHANNEL EXCAVATION TO MATCH ADJACENT TOPOGRAPHY. AS SPECIFIED IN SPECIAL PROVISIONS AND AS DIRECTED BY ENGINEER

WEST BRIDGE CONTRACTOR REMOVED AND DISPOSED AFTER SODA BUTTE CREEK WAS FULLY RETURNED INTO NEW CHANNEL

NEW SODA BUTTE CREEK STREAM CHANNEL

CHANNEL ALIGNMENT MOVED TIE-IN NOT CONSTRUCTED

CONTRACTOR SHALL TIE-IN STORM WATER CHANNEL TO MATCH INVERTS TO STREAM CHANNEL. AS DIRECTED BY ENGINEER.

NOT CONSTRUCTED

CONTRACTOR SHALL INSTALL ISOLATION COFFER DAM. SEE DETAILS STRD-6 AND STRD-6AB STRD-6 STRD-6

GRADE CONTROL STRUCTURE (TYP.)

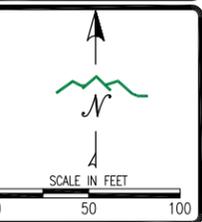
WATER TREATMENT BUILDING CONCRETE WAS BACKFILLED/ COVER WITH SOIL FERTILIZED, SEEDED AND MULCHED.

CONTRACTOR INSTALLED ROOT WADS FROM STA. 7+60 TO 8+05 SEE SHEET STRD-9AB.

REVISION:	DATE:	BY:	DESC:

DRAWN BY: CLC
 DESIGNED BY: JMCB
 CHECKED BY: JSA
 APPROVED BY: JSA
 PROJECT NO: 10140
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE, STATE PLANE
 DATUM: NAD83
 UNITS: FEET
 SOURCE: PIONEER

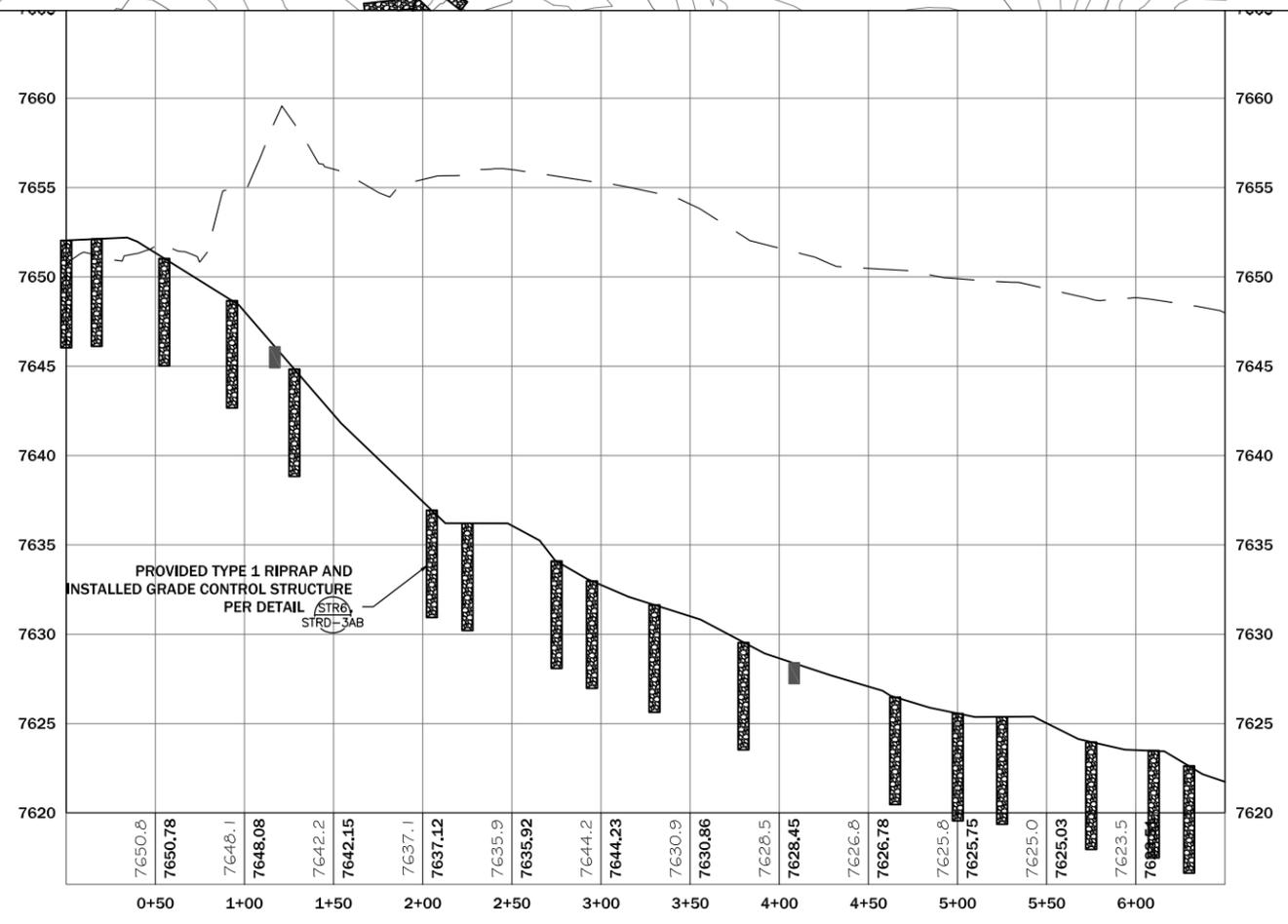
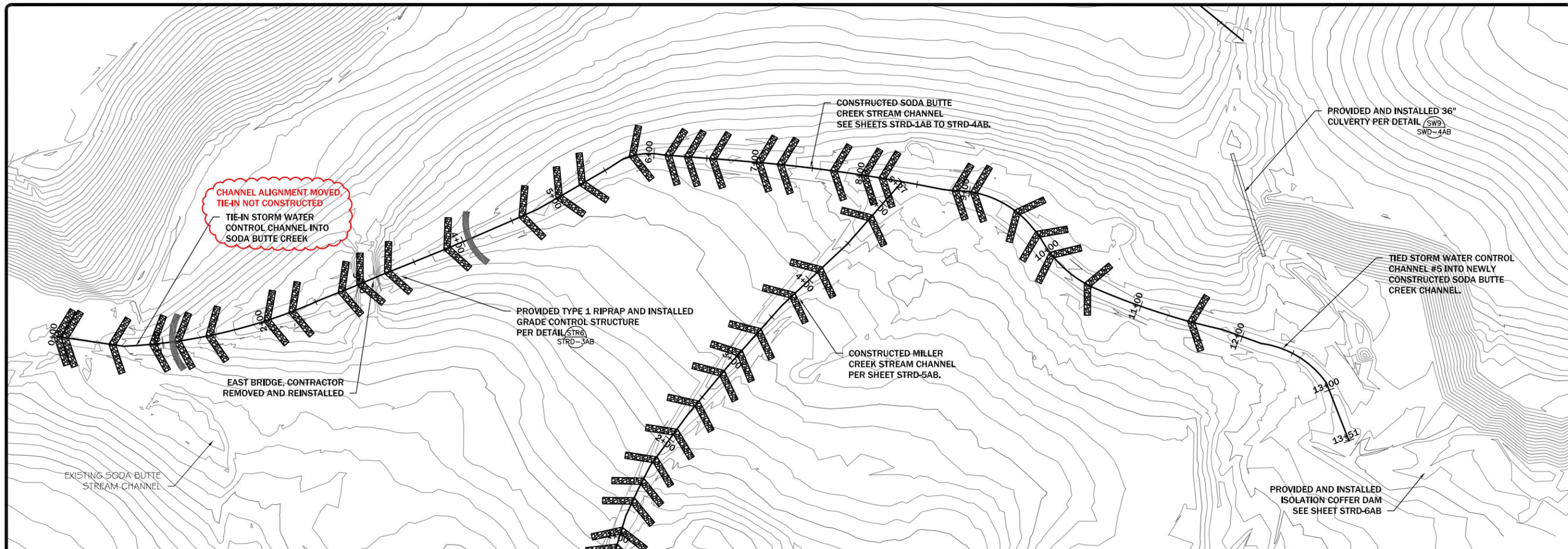


MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 2015 AS-BUILT DRAWINGS

STREAM
 RECONSTRUCTION
 PLAN VIEW

PIONEER
 TECHNICAL SERVICES, INC.
 1101 SOUTH MONTANA
 BUTTE, MONTANA 59701
 (406) 782-5177

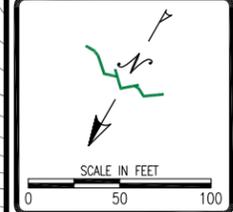
SHEET
 STR-1AB



REVISION:	DATE:	BY:	DESC:

DRAWN BY: CLA
 DESIGNED BY: MCB
 CHECKED BY: JSA
 APPROVED BY: JSA
 PROJECT NO: 10140
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE, STATE PLANE
 DATUM: NAD83
 UNITS: FEET
 SOURCE: PIONEER



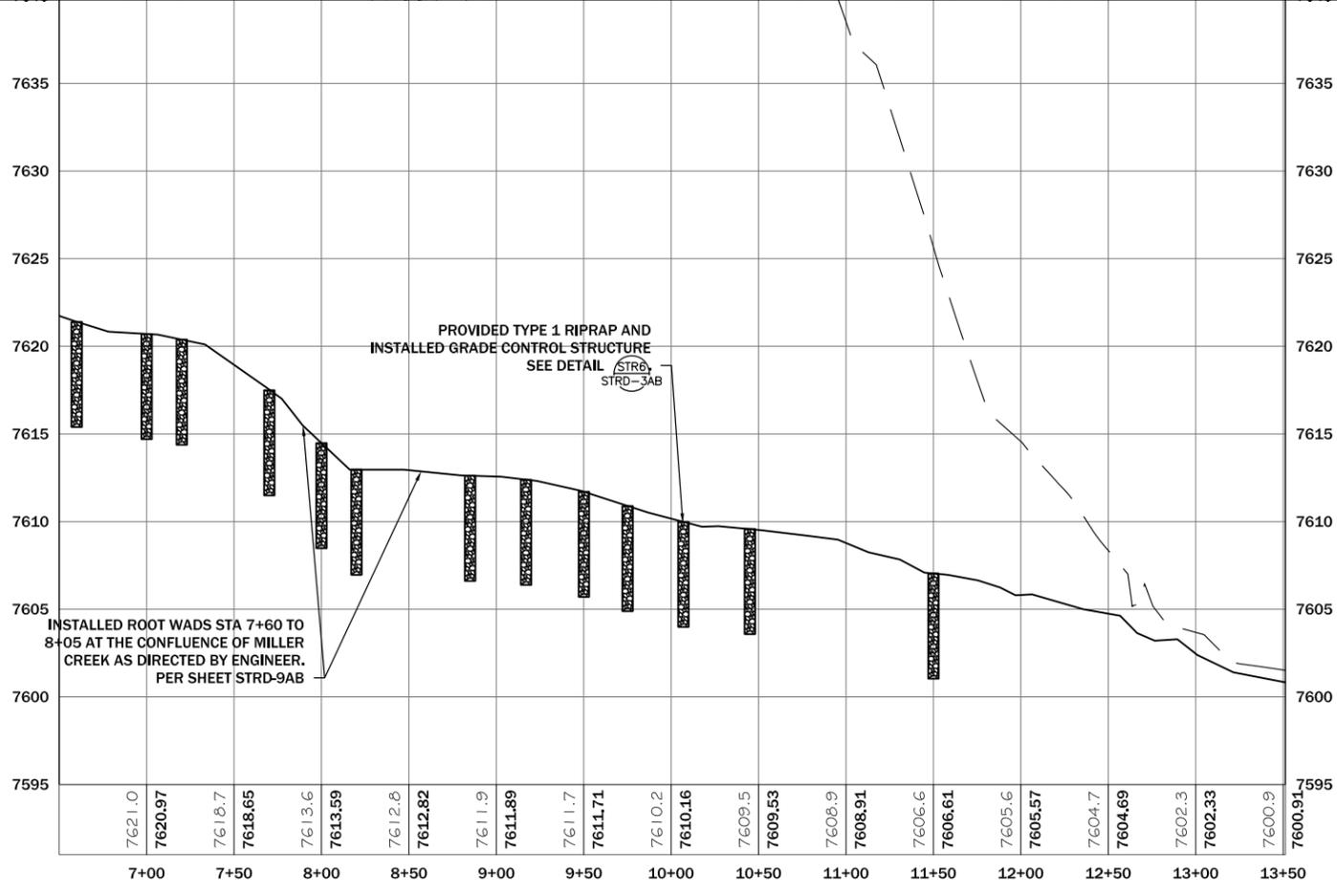
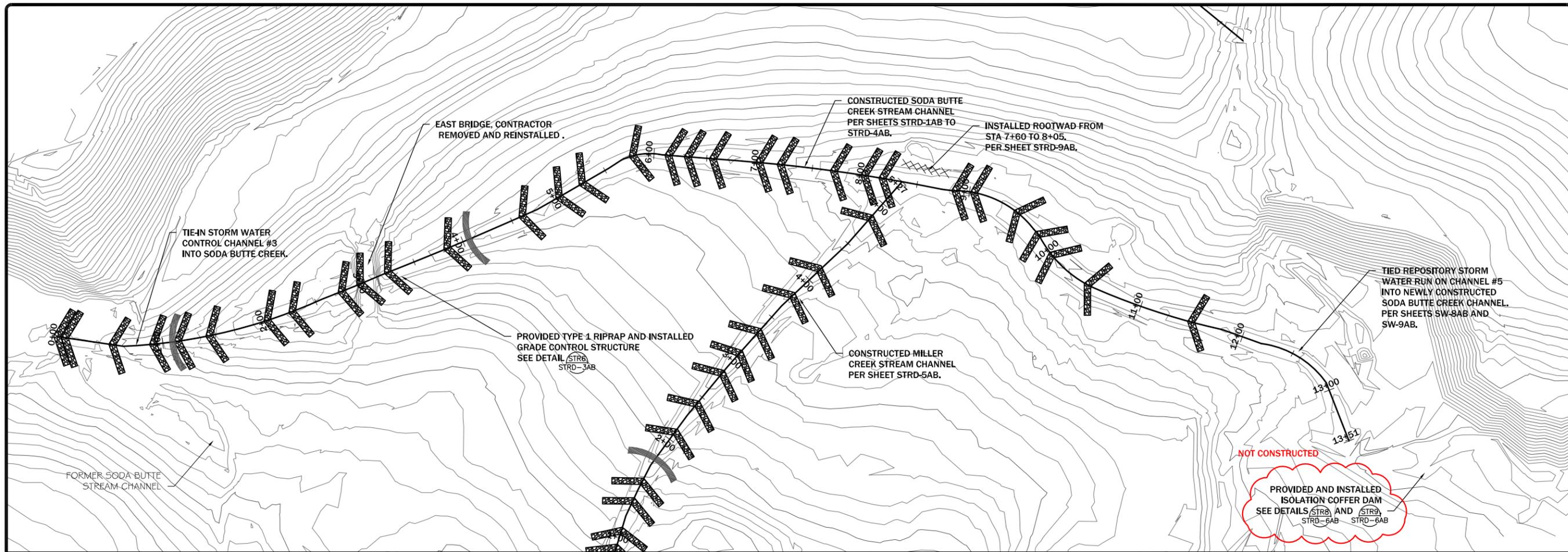
MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

SODA BUTTE CREEK
 PLAN AND PROFILE
 STA 0+00 TO 6+50



SHEET
 STR-2AB

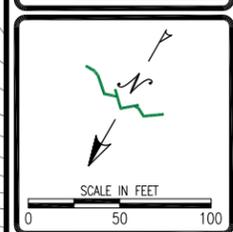
VERTICAL EXAGGERATION = 1' = 10'



REVISION	DATE	BY	DESC.

DRAWN BY: CLC
 DESIGNED BY: JMCB
 CHECKED BY: JSA
 APPROVED BY: JSA
 PROJECT NO: 10140
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: MSP
 DATUM: NAD83
 UNITS: FEET
 SOURCE: PIONEER



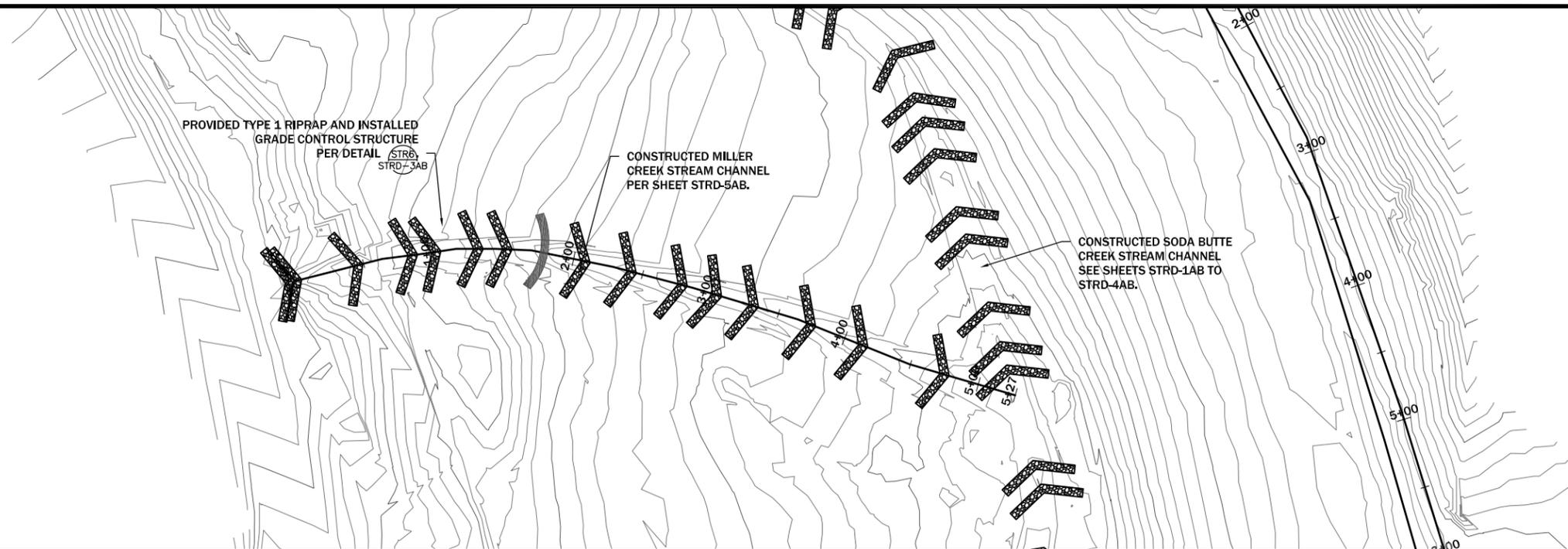
MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

SODA BUTTE CREEK
 PLAN AND PROFILE
 STA 6+50 TO 13+51



SHEET
 STR-3AB

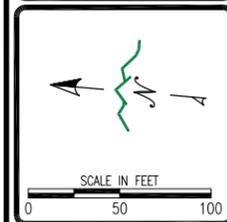
VERTICAL EXAGGERATION = 1"=10'



REVISION:	DATE:	BY:	DESC:

DRAWN BY: CLC
 DESIGNED BY: JCB
 CHECKED BY: JSA
 APPROVED BY: JSA
 PROJECT NO: 10140
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS / ZONE, STATE PLANE
 DATUM: NAD83
 UNITS: FEET
 SOURCE: PIONEER

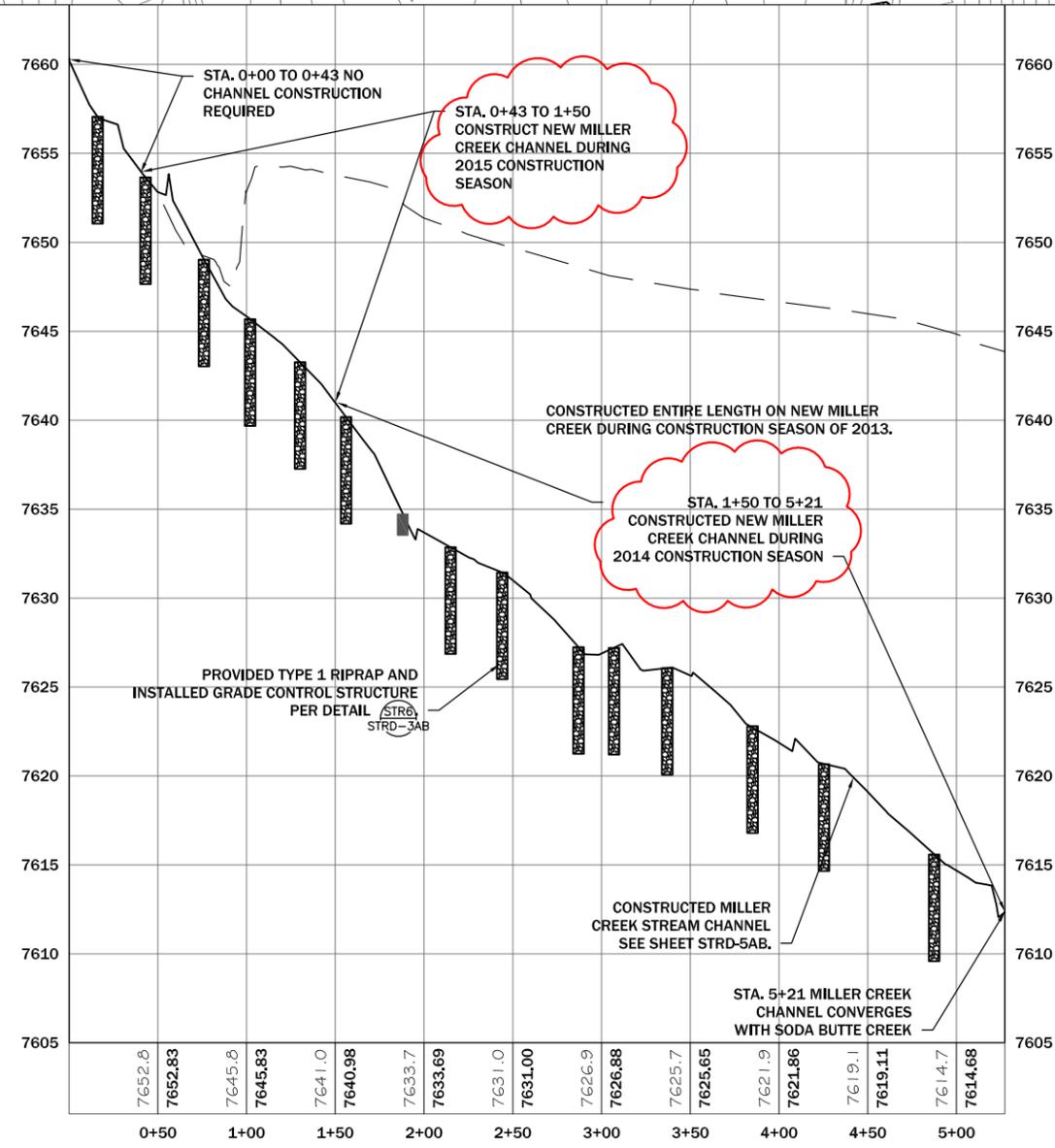


MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

MILLER CREEK
 PLAN AND PROFILE
 STA 0+00 TO 5+25

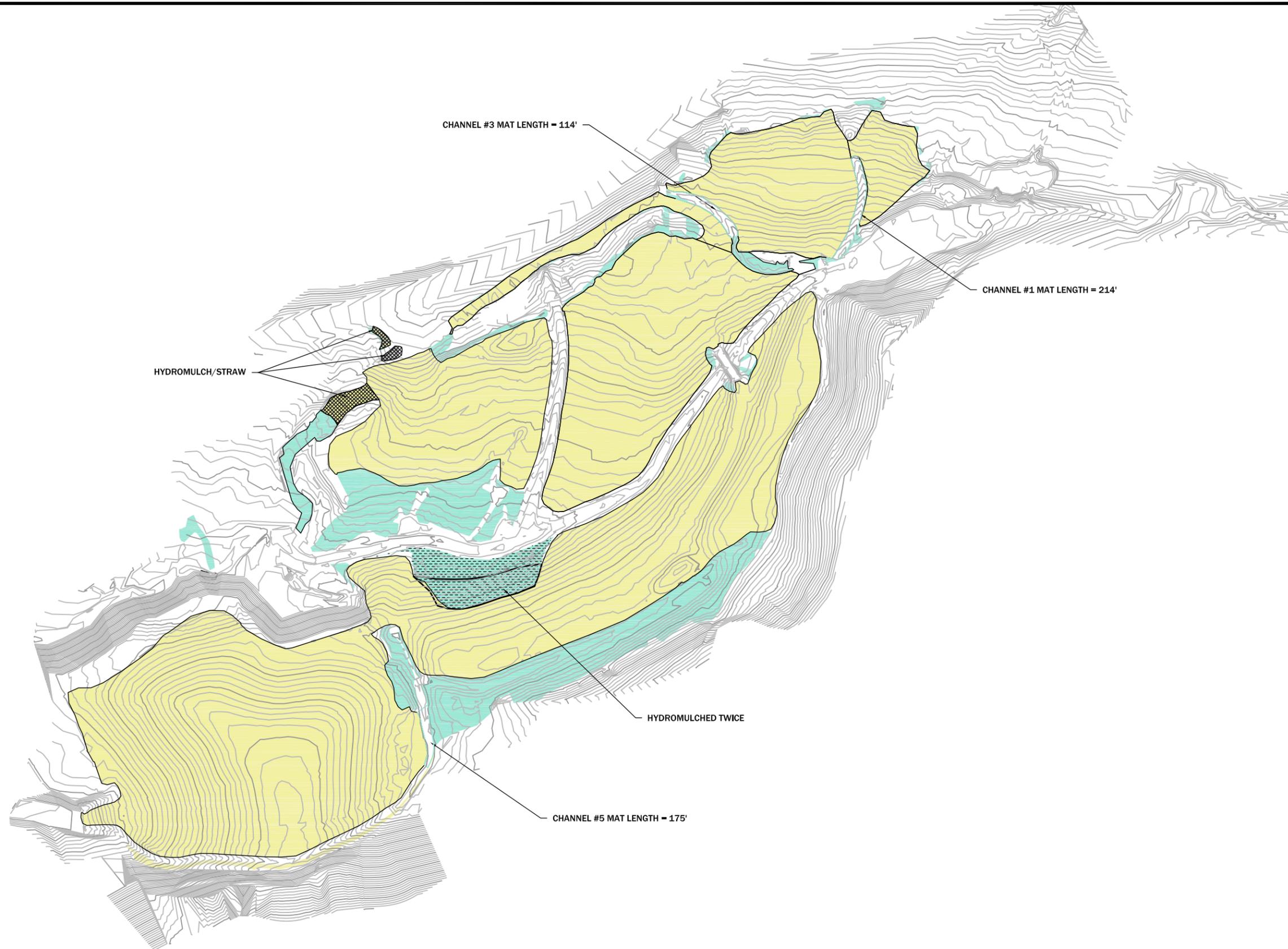


SHEET
 STR-4AB



NOTES:
 1. CONTRACTOR CONSTRUCTED MILLER CREEK CHANNEL FROM STA. 0+00 TO CONVERGENCE WITH SODA BUTTE CREEK DURING 2013 CONSTRUCTION SEASON.

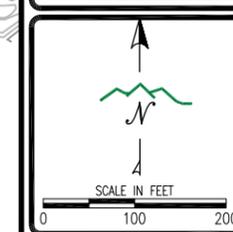
VERTICAL EXAGGERATION = 1"=10'



REVISION	DATE	BY	DESC.

DRAWN BY: _CLA
 DESIGNED BY: _JSA
 CHECKED BY: _MJB
 APPROVED BY: _JSA
 PROJECT NO: 10140
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: MSP
 DATUM: NAD83
 UNITS: FEET
 SOURCE: PIONEER



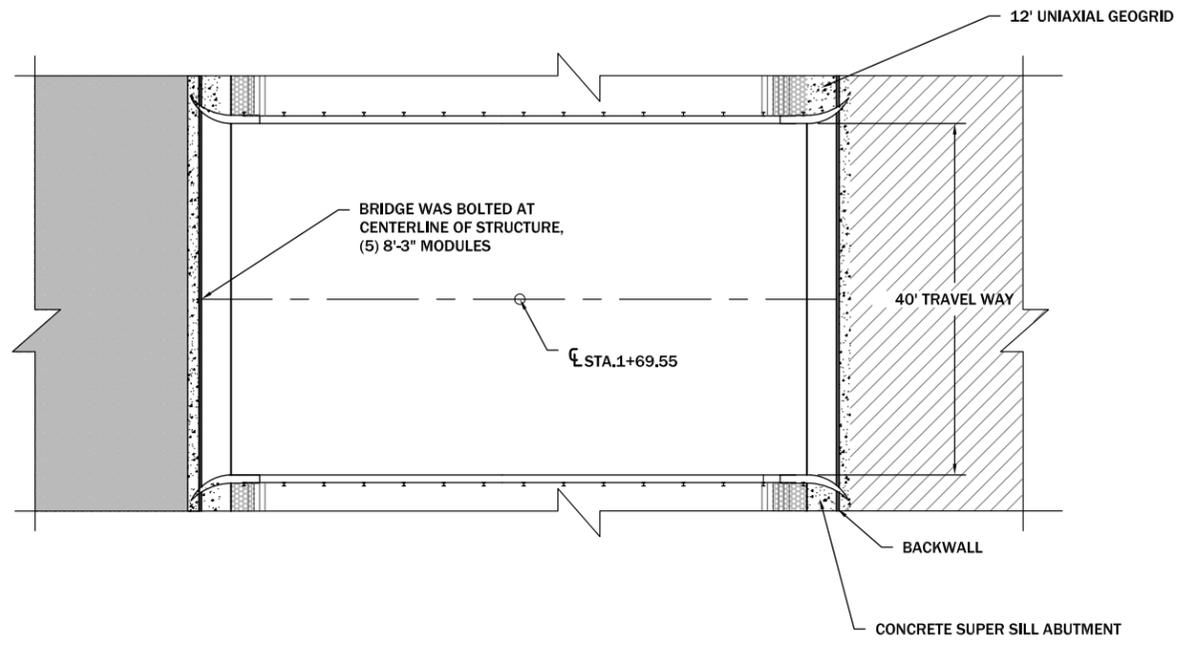
MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

REVEGETATION
 PLAN

PIONEER
 TECHNICAL SERVICES, INC.
 1101 SOUTH MONTANA
 BUTTE, MONTANA 59701
 (406) 782-5177

SHEET
 C-1AB

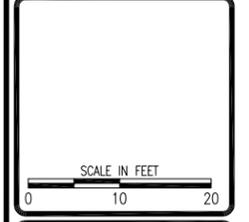
- NOTES:**
- COORDINATED BRIDGE INSTALLATION WITH OTHER CONSTRUCTION ACTIVITIES.
 - INSTALLED MODULAR STEEL BRIDGE AT LOCATION SHOWN ON SHEET F-1AB PER MANUFACTURES RECOMMENDATIONS.
 - THE ABUTMENT AND BACKWALLS WERE DESIGNED AND SUPPLIED BY BRIDGE MANUFACTURER TO ENSURE CONFORMANCE WITH DESIGN PARAMETERS, LOAD-RATING, AND APPROPRIATE FIT-UP. IN ALL CASES, ABUTMENTS AND BACKWALLS WERE DESIGNED AND STAMPED BY A MONTANA REGISTERED PROFESSIONAL ENGINEER.
 - CONTRACTOR WAS RESPONSIBLE FOR LOCATING AND PROTECTING ALL UTILITIES THROUGHOUT THE COURSE OF WORK.
 - UTILITY LOCATIONS AND ELEVATIONS SHOWN ARE APPROXIMATE. CONTRACTOR COORDINATED WITH UTILITIES PRIOR TO BEGINNING ANY EARTHWORK.
 - CONTRACTOR CONSTRUCTED EMBANKMENT USING MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALL USING A UNIAXIAL TENSAR GEOGRID AND SOIL RETENTION FABRIC. BACKFILL FOR UNIAXIAL GEOGRID WAS OBTAINED FROM THE SPECIFIED BORROW AREA, SEE SHEET F-1AB.
 - ALL FILL MATERIALS WERE COMPACTED TO 95% OF STANDARD PROCTOR MAXIMUM DRY DENSITY [ASTM D698/AASHTO T99] AT ±2% OPTIMUM MOISTURE.
 - CONTRACTOR PROVIDED, INSTALLED AND MAINTAINED BMP'S THROUGHOUT COURSE OF WORK.



REVISION:	DATE:	BY:	DESC:
6/18/10	JSM	JSM	MODIFIED EMBANKMENT

DRAWN BY:	JGB
DESIGNED BY:	JMCB
CHECKED BY:	JSA
APPROVED BY:	JCB
PROJECT NO.:	10140
DATE:	2/24/13

DISPLAYED AS:	
COORD SYS/ZONE:	MSP
DATUM:	NAD 83
UNITS:	FEET
SOURCE:	PIONEER

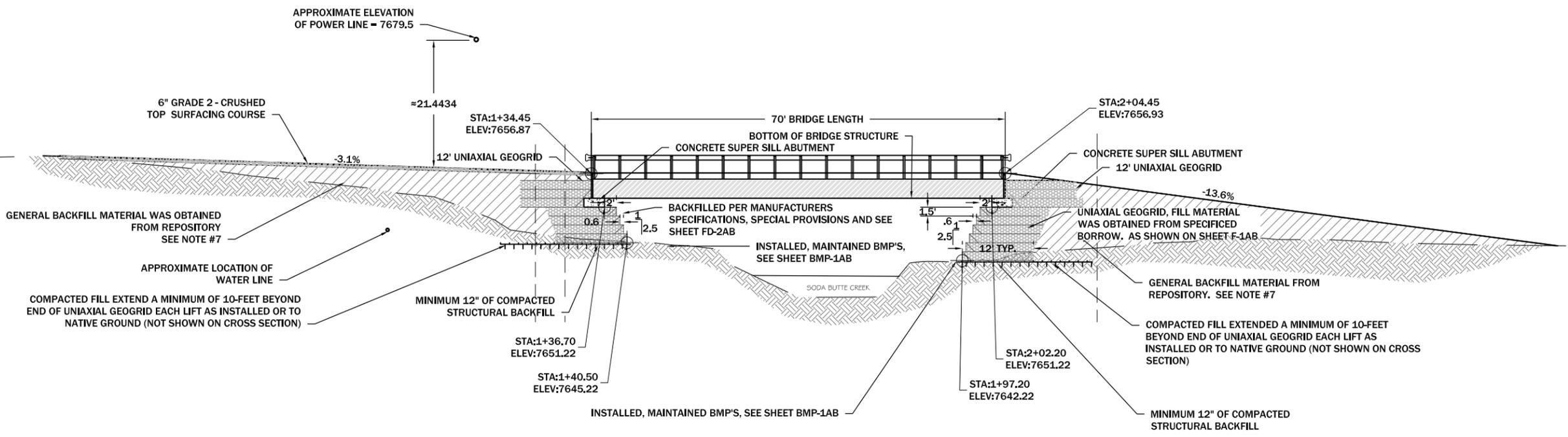


MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 2015 AS-BUILT DRAWINGS

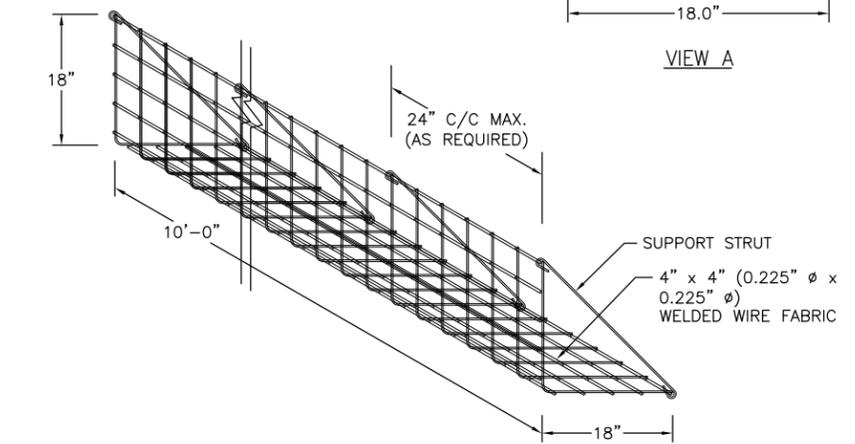
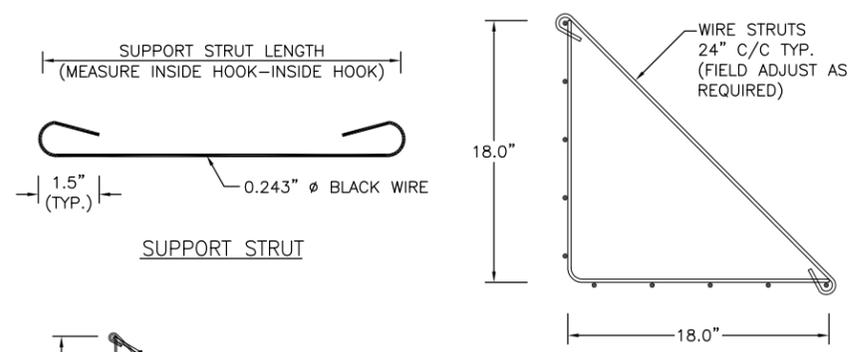
WEST
 BRIDGE
 ABUTMENT
 DETAILS



SHEET
FD-1AB

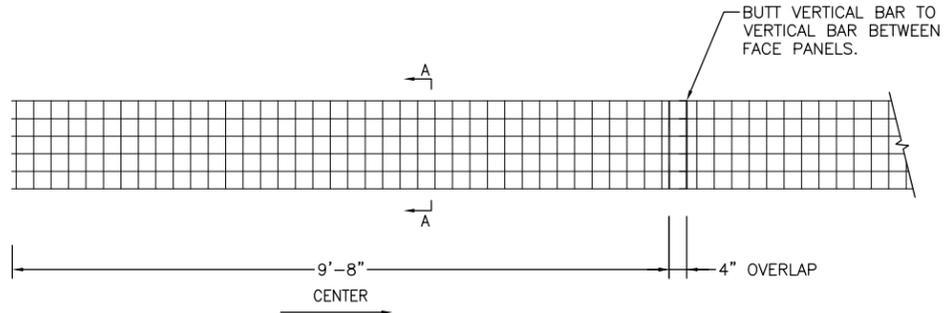


THIS STRUCTURE WAS PROVIDED AND INSTALLED IN 2010 AND WAS UTILIZED FROM 2010 TO 2013 WHEN IT WAS REMOVED FROM THE SITE.

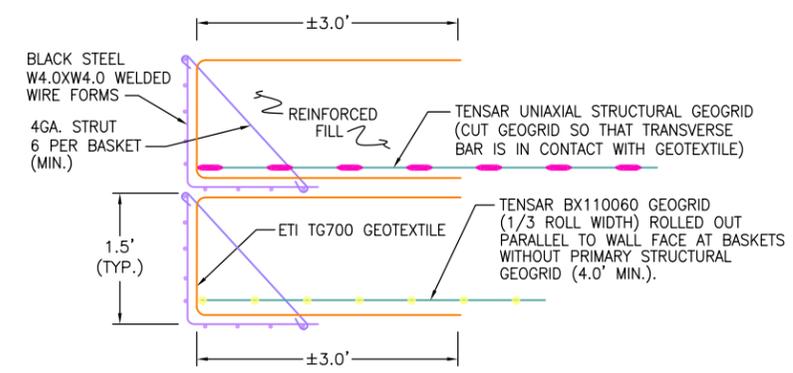


NOTES:

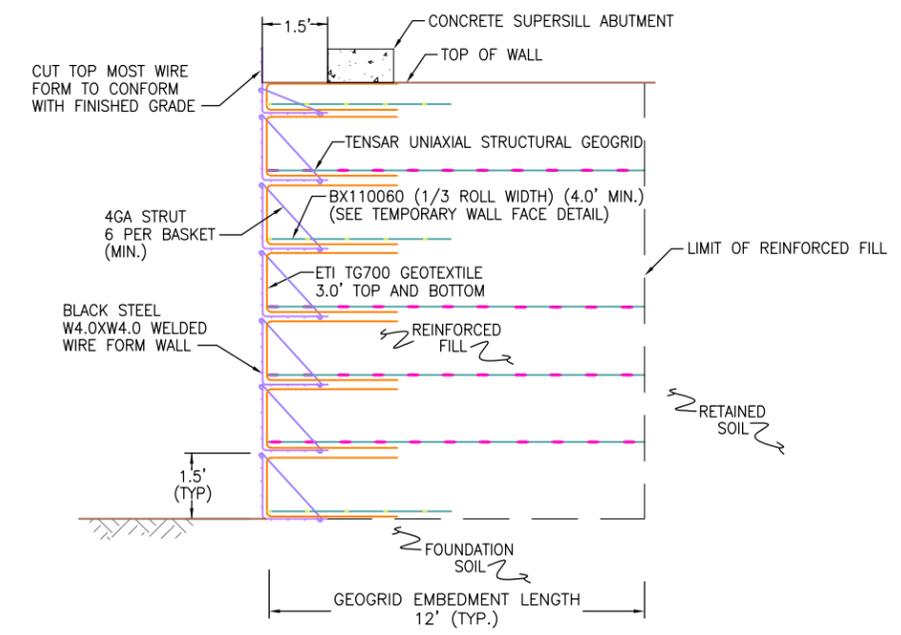
1. FACING TO CONSIST OF PREFABRICATED WWF 4" x 4" (0.225" ϕ x 0.225" ϕ) FORMS.
2. ALL FORMS AND STRUTS WILL BE FABRICATED WITH BLACK WIRE.
3. OVERALL LENGTH OF WIRE FORMS IS 10'-0". EFFECTIVE CONSTRUCTED WIDTH IS 9'-8" WITH 4" OVER LAPPING AT ENDS.



WELDED WIRE FORM FACING UNIT
NOT TO SCALE

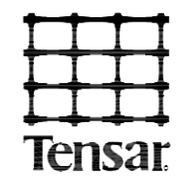


TEMPORARY WALL FACE DETAIL
NOT TO SCALE



TYPICAL TEMPORARY WALL CROSS-SECTION

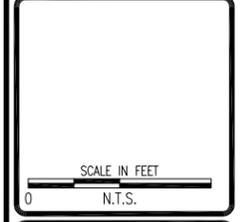
THIS STRUCTURE WAS PROVIDED AND INSTALLED IN 2010 AND WAS UTILIZED FROM 2010 TO 2013 WHEN IT WAS REMOVED FROM SITE



REVISION	DATE	BY	DESC.

DRAWN BY: TENSAR®
DESIGNED BY: WGC
CHECKED BY: JSA
APPROVED BY: WGC
PROJECT NO: 10140
DATE: 2/24/15

DISPLAYED AS:
COORD SYS/ZONE: NA
DATUM: NA
UNITS: NA
SOURCE: TENSAR®



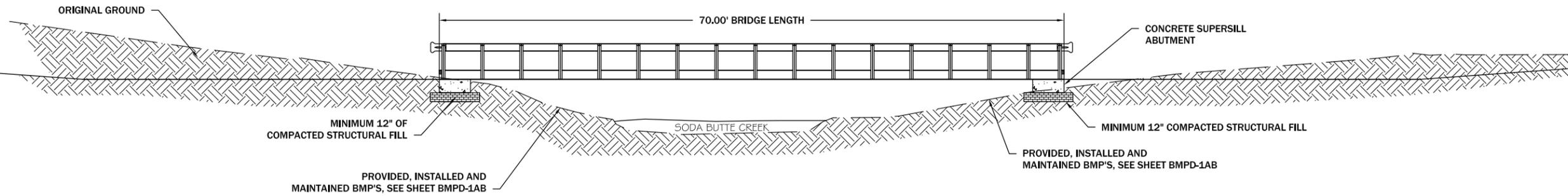
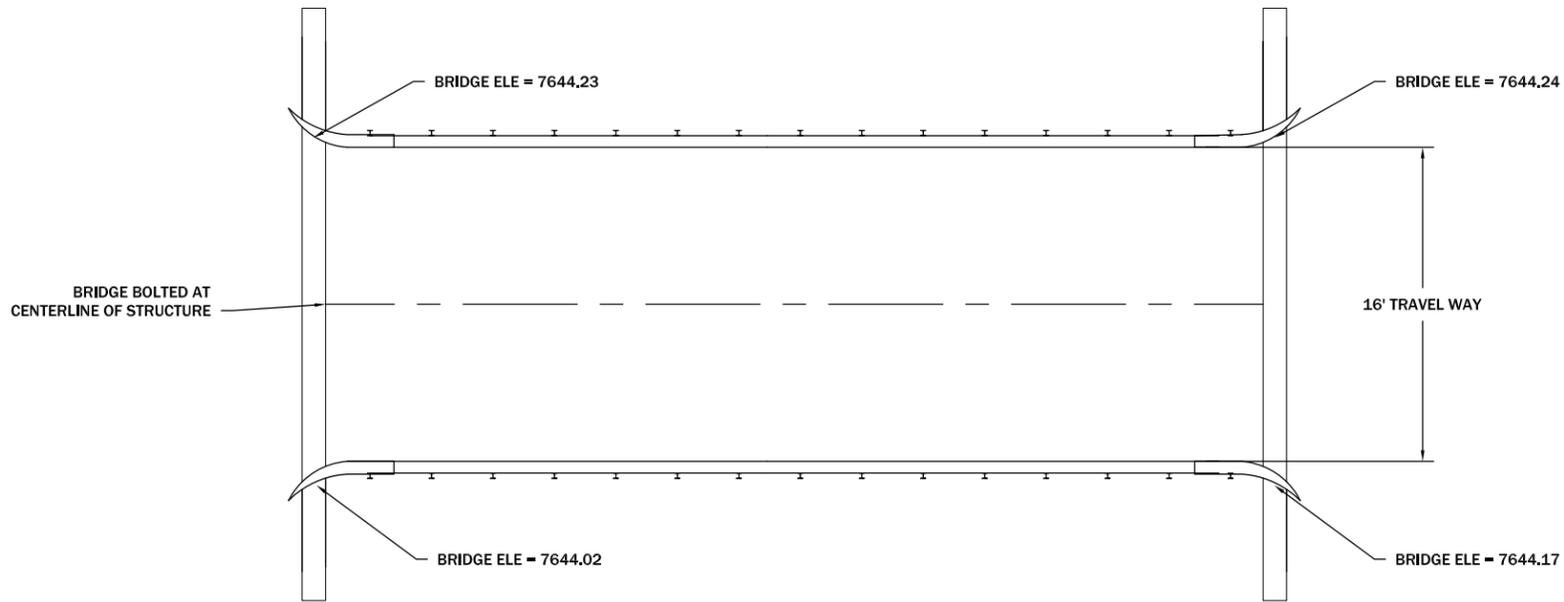
MDEQ/MWCB
MCLAREN TAILINGS ABANDONED
MINE SITE RECLAMATION PROJECT
FINAL AS-BUILT DRAWINGS

STRUCTURAL
REINFORCED
EMBANKMENT
DETAILS

PIONEER
TECHNICAL SERVICES, INC.
1101 SOUTH MONTANA
BUTTE, MONTANA 59701
(406) 782-5177

SHEET
FD-2AB

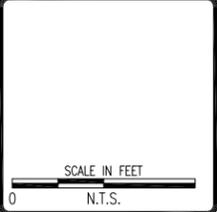
- NOTES:**
1. COORDINATED BRIDGE INSTALLATION WITH OTHER CONSTRUCTION ACTIVITIES.
 2. PROVIDED AND INSTALLED MODULAR STEEL BRIDGE AT LOCATION SHOWN ON SHEET F-1AB PER MANUFACTURES RECOMMENDATIONS.
 3. THE ABUTMENT AND BACKWALLS WERE DESIGNED AND SUPPLIED BY BRIDGE MANUFACTURER TO ENSURE CONFORMANCE WITH DESIGN PARAMETERS, LOAD-RATING, AND APPROPRIATE FIT-UP. IN ALL CASES, ABUTMENTS AND BACKWALLS WERE DESIGNED AND STAMPED BY A REGISTERED MONTANA PROFESSIONAL ENGINEER.
 4. ALL FILL, SUBGRADE AND ROADWAY SURFACES WERE COMPACTED TO 95% OF STANDARD PROCTOR MAXIMUM DRY DENSITY [ASTM D698/ASSHTO T99] AT ±4% OPTIMUM MOISTURE.
 5. CONTRACTOR PROVIDED, INSTALLED AND MAINTAINED BMP'S THROUGHOUT THE COURSE OF WORK



REVISION:	DATE:	BY:	DESC:

DRAWN BY: CLA
 DESIGNED BY: WGC
 CHECKED BY: MGB
 APPROVED BY: JSA
 PROJECT NO: 10140
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: NA
 DATUM: NA
 UNITS: FEET
 SOURCE: PIONEER



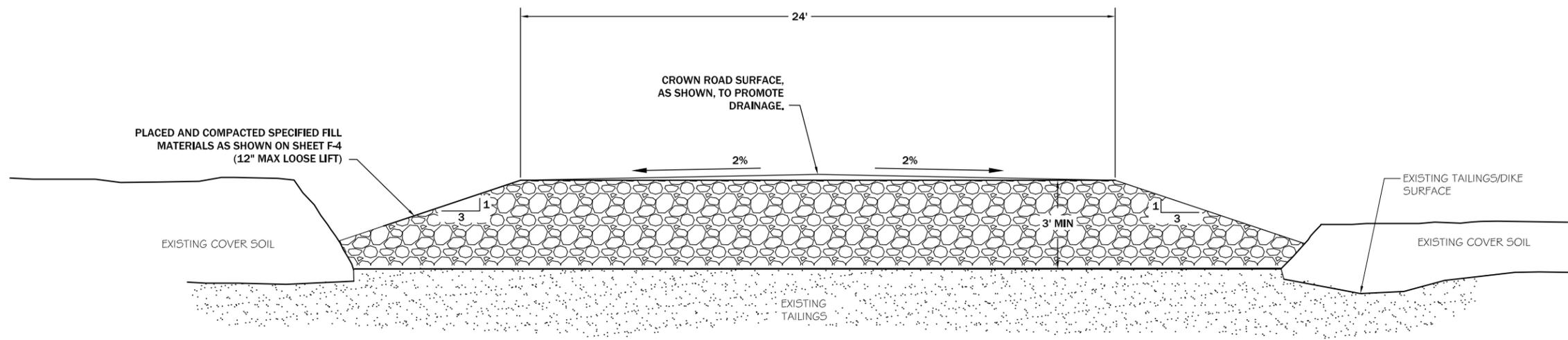
MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 2015 AS-BUILT DRAWINGS

EAST
 BRIDGE
 ABUTMENT
 DETAILS

PIONEER
 TECHNICAL SERVICES, INC.
 1101 SOUTH MONTANA
 BUTTE, MONTANA 59701
 (406) 782-5177

SHEET
 FD-3AB

- NOTES:**
- HAUL ROADS WERE CONSTRUCTED ON THE ALIGNMENTS SHOWN ON SHEET F4AB.
 - HAUL ROADS WERE CONSTRUCTED WITH SPECIFIED MATERIAL OBTAINED FROM THE WASTE ROCK AREA AND OR REPOSITORY. HAUL ROADS WERE CONSTRUCTED TO ADEQUATELY AND SAFELY SUPPORT EQUIPMENT OVER TAILINGS SUBGRADE.
 - CONTRACTOR SALVAGED EXCAVATED COVER SOIL AND STOCKPILED, PRIOR TO PLACEMENT OF SPECIFIED FILL MATERIALS AS DIRECTED BY ENGINEER.
 - ALL FILL MATERIALS WERE COMPACTED TO 95% OF STANDARD PROCTOR MAXIMUM DRY DENSITY [ASTM D698/AASHTO T99] AT A ± 4% OPTIMUM MOISTURE.



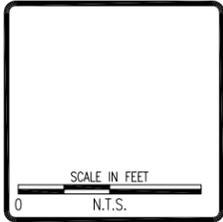
HAUL ROAD DETAIL (F1)

HAUL ROADS WERE CONSTRUCTED TO SUPPORT CONSTRUCTION ACTIVITIES FROM 2010 TO 2013. THE ABOVE DEPICTS TYPICAL HAUL ROAD CONSTRUCTION. ALL HAUL ROADS WERE TEMPORARY AND NO LONGER EXIST AT SITE.

REVISION:	DATE:	BY:	DESC:

DRAWN BY: SKL
DESIGNED BY: MCB
CHECKED BY: JSA
APPROVED BY: JSA
PROJECT NO: 10140
DATE: 2/24/13

DISPLAYED AS:
COORD SYS/ZONE: NA
DATUM: NA
UNITS: FEET
SOURCE: PIONEER



MDEQ/MWCB
MCLAREN TAILINGS ABANDONED
MINESITE RECLAMATION PROJECT
FINAL AS-BUILT DRAWINGS

HAUL ROAD
DETAIL



SHEET
FD-4AB

REVISION:	BY:	DESC:
7/10	JSM	NEW MDT JERSEY BARRIER

DRAWN BY: MDT
DESIGNED BY: MDT
CHECKED BY: MDT
APPROVED BY: MDT
PROJECT NO: 10140
DATE: 2/24/13

DISPLAYED AS:
COORD SYS/ZONE: NA
DATUM: NA
UNITS: FEET
SOURCE: MDT

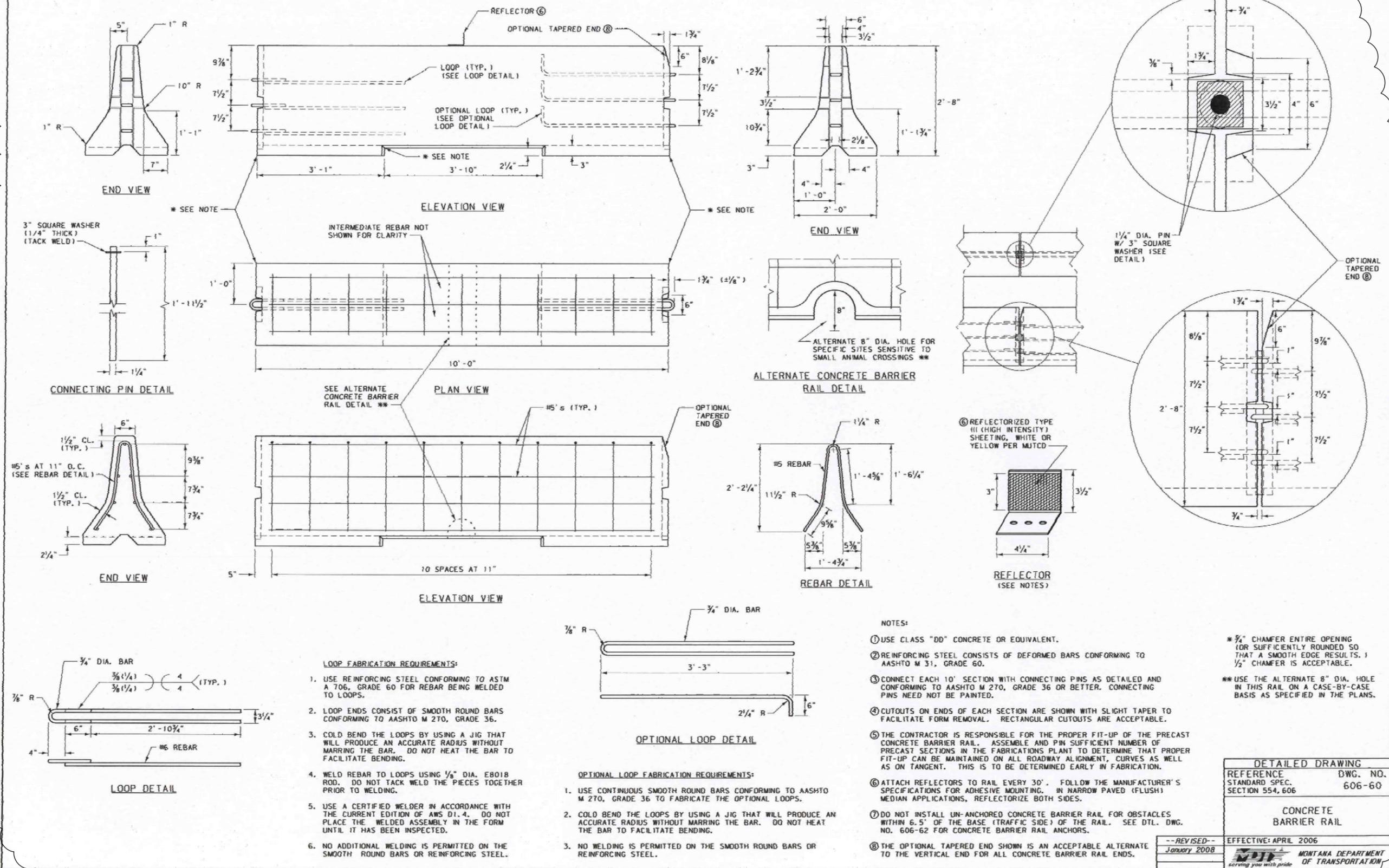
SCALE IN FEET
0 N.T.S.

MDEQ/MWCB
MCLAREN TAILINGS ABANDONED
MINE SITE RECLAMATION PROJECT
FINAL AS-BUILT DRAWINGS

JERSEY
BARRIER
DETAILS

PIONEER
TECHNICAL SERVICES, INC.
1101 SOUTH MONTANA
BUTTE, MONTANA 59701
(406) 782-5177

SHEET
FD-5AB



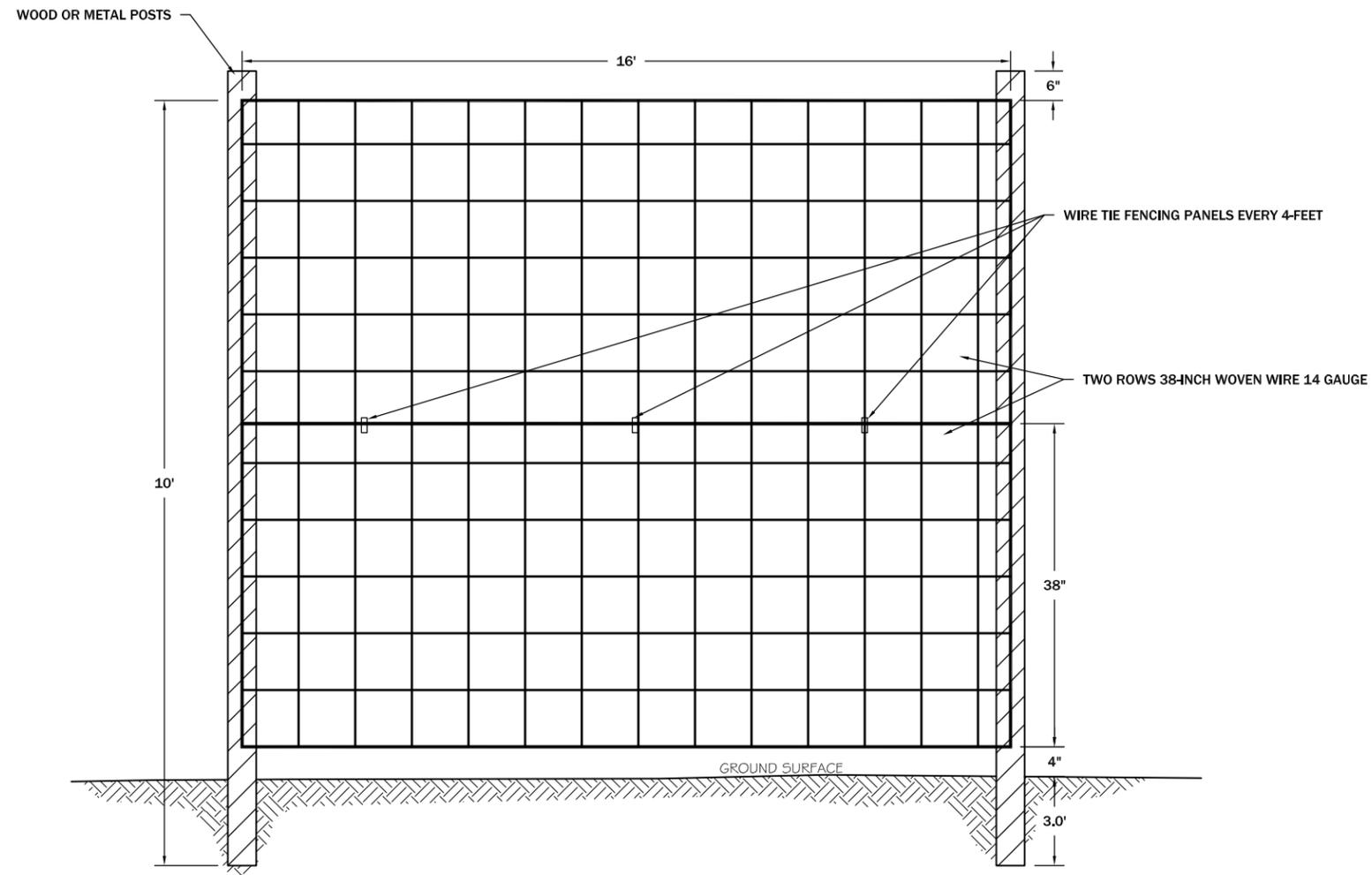
- LOOP FABRICATION REQUIREMENTS:**
1. USE REINFORCING STEEL CONFORMING TO ASTM A 706, GRADE 60 FOR REBAR BEING WELDED TO LOOPS.
 2. LOOP ENDS CONSIST OF SMOOTH ROUND BARS CONFORMING TO AASHTO M 270, GRADE 36.
 3. COLD BEND THE LOOPS BY USING A JIG THAT WILL PRODUCE AN ACCURATE RADIUS WITHOUT MARRING THE BAR. DO NOT HEAT THE BAR TO FACILITATE BENDING.
 4. WELD REBAR TO LOOPS USING 1/8" DIA. E8018 ROD. DO NOT TACK WELD THE PIECES TOGETHER PRIOR TO WELDING.
 5. USE A CERTIFIED WELDER IN ACCORDANCE WITH THE CURRENT EDITION OF AWS D1.4. DO NOT PLACE THE WELDED ASSEMBLY IN THE FORM UNTIL IT HAS BEEN INSPECTED.
 6. NO ADDITIONAL WELDING IS PERMITTED ON THE SMOOTH ROUND BARS OR REINFORCING STEEL.

- OPTIONAL LOOP FABRICATION REQUIREMENTS:**
1. USE CONTINUOUS SMOOTH ROUND BARS CONFORMING TO AASHTO M 270, GRADE 36 TO FABRICATE THE OPTIONAL LOOPS.
 2. COLD BEND THE LOOPS BY USING A JIG THAT WILL PRODUCE AN ACCURATE RADIUS WITHOUT MARRING THE BAR. DO NOT HEAT THE BAR TO FACILITATE BENDING.
 3. NO WELDING IS PERMITTED ON THE SMOOTH ROUND BARS OR REINFORCING STEEL.

- NOTES:**
- ① USE CLASS "DD" CONCRETE OR EQUIVALENT.
 - ② REINFORCING STEEL CONSISTS OF DEFORMED BARS CONFORMING TO AASHTO M 31, GRADE 60.
 - ③ CONNECT EACH 10' SECTION WITH CONNECTING PINS AS DETAILED AND CONFORMING TO AASHTO M 270, GRADE 36 OR BETTER. CONNECTING PINS NEED NOT BE PAINTED.
 - ④ CUTOUTS ON ENDS OF EACH SECTION ARE SHOWN WITH SLIGHT TAPER TO FACILITATE FORM REMOVAL. RECTANGULAR CUTOUTS ARE ACCEPTABLE.
 - ⑤ THE CONTRACTOR IS RESPONSIBLE FOR THE PROPER FIT-UP OF THE PRECAST CONCRETE BARRIER RAIL. ASSEMBLE AND PIN SUFFICIENT NUMBER OF PRECAST SECTIONS IN THE FABRICATIONS PLANT TO DETERMINE THAT PROPER FIT-UP CAN BE MAINTAINED ON ALL ROADWAY ALIGNMENT, CURVES AS WELL AS ON TANGENT. THIS IS TO BE DETERMINED EARLY IN FABRICATION.
 - ⑥ ATTACH REFLECTORS TO RAIL EVERY 30'. FOLLOW THE MANUFACTURER'S SPECIFICATIONS FOR ADHESIVE MOUNTING. IN NARROW PAVED (FLUSH) MEDIAN APPLICATIONS, REFLECTORIZE BOTH SIDES.
 - ⑦ DO NOT INSTALL UN-ANCHORED CONCRETE BARRIER RAIL FOR OBSTACLES WITHIN 6.5' OF THE BASE (TRAFFIC SIDE) OF THE RAIL. SEE DTL. DWG. NO. 606-62 FOR CONCRETE BARRIER RAIL ANCHORS.
 - ⑧ THE OPTIONAL TAPERED END SHOWN IS AN ACCEPTABLE ALTERNATE TO THE VERTICAL END FOR ALL CONCRETE BARRIER RAIL ENDS.

DETAILED DRAWING	
REFERENCE STANDARD SPEC. SECTION 554.606	DWG. NO. 606-60
CONCRETE BARRIER RAIL	
--REVISED-- January 2008	
EFFECTIVE: APRIL 2006	
MONTANA DEPARTMENT OF TRANSPORTATION <i>serving you with pride</i>	

JERSEY BARRIERS WERE UTILIZED AT SITE FROM 2010 TO 2014. THEY HAVE BEEN REMOVED AND REPLACED WITH ROCK BARRICADE.



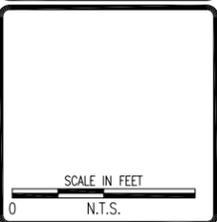
WILDLIFE EXCLUSION FENCE DETAIL (F3)
N.T.S.

THE WILDLIFE EXCLUSION FENCE WAS PROVIDED AND INSTALLED TO SECURE THE SEDIMENT DETENTION POND FROM 2011 TO 2013. THE FENCING HAS BEEN REMOVED AND NO LONGER EXISTS AT SITE.

REVISION:	DATE:	BY:	DESC:

DRAWN BY: CLM
 DESIGNED BY: JCB
 CHECKED BY: JSA
 APPROVED BY: JSA
 PROJECT NO: 10160
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: NA
 DATUM: NA
 UNITS: FEET
 SOURCE: PIONEER



MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 2015 AS-BUILT DRAWINGS

WILDLIFE
 EXCLUSION
 FENCE
 DETAIL

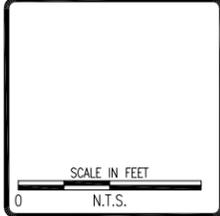
PIONEER
 TECHNICAL SERVICES, INC.
 1101 SOUTH MONTANA
 BUTTE, MONTANA 59701
 (406) 782-5177

SHEET
 FD-6AB

REVISION:	BY:	DESC:

DRAWN BY: CLA
DESIGNED BY: MCB
CHECKED BY: JSA
APPROVED BY: JSA
PROJECT NO: 10160
DATE: 2/24/15

DISPLAYED AS:
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DATUM: NA
UNITS: NA
SOURCE: PIONEER

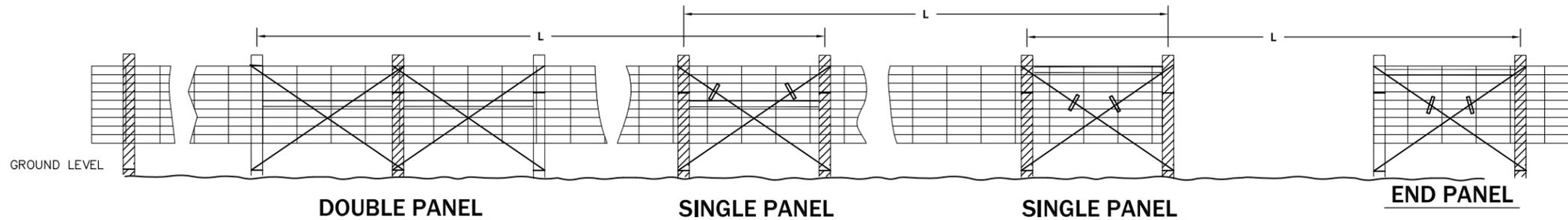
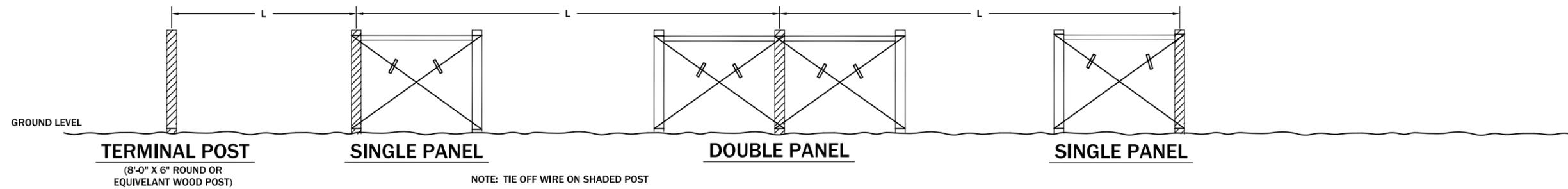


MDEQ/MWCB
MCLAREN TAILINGS ABANDONED
MINE SITE RECLAMATION PROJECT
FINAL AS-BUILT DRAWINGS

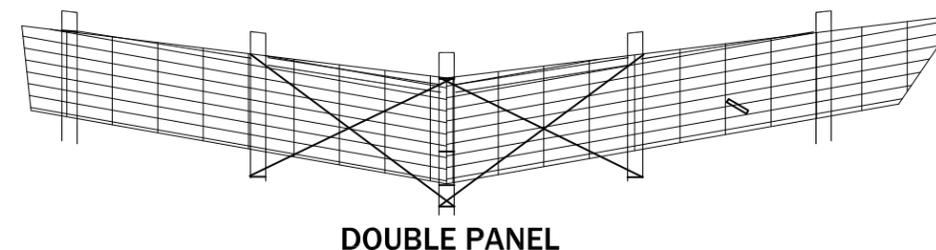
WILDLIFE EXCLUSION
FENCE
DETAILS

PIONEER
TECHNICAL SERVICES, INC.
1101 SOUTH MONTANA
BUTTE, MONTANA 59701
(406) 782-5177

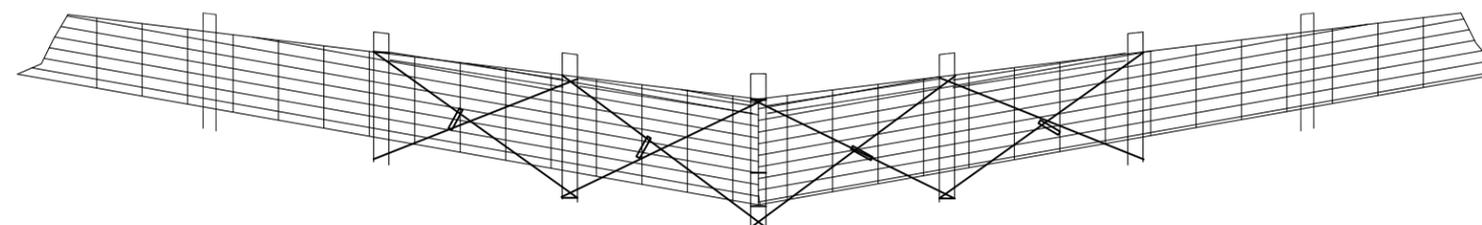
SHEET
FD-7AB



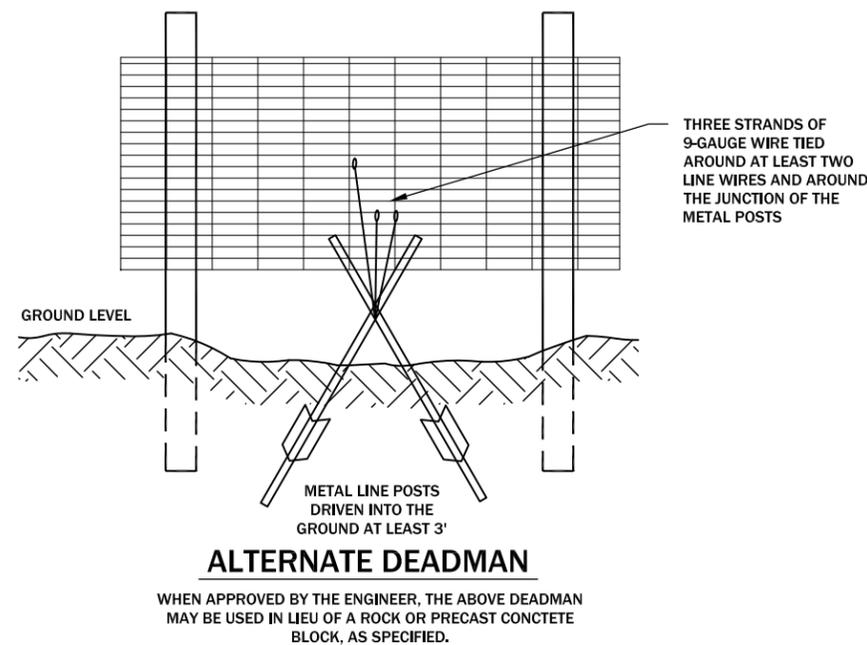
FENCE TYPE	RUN = L	PANELS REQUIRED
38-INCH WOVEN WIRE 14 GAUGE	66' OR LESS	TERMINAL POST
	66' - 660'	SINGLE
	OVER 660' TO MAX. 990'	DOUBLE



DOUBLE PANEL
USE WHERE RUNS ARE LESS THAN 660 FEET OR
WHERE CHANGES IN HORIZONTAL ALIGNMENT
ARE GREATER THAN 14°



CORNER PANEL
(FOR ANGLES GREATER THAN 30° AND
WHERE RUNS ARE 660 FEET TO 990 FEET)



THE WILDLIFE EXCLUSION FENCE WAS PROVIDED AND INSTALLED TO SECURE THE SEDIMENT DETENTION POND FROM 2011 TO 2013. THE FENCING HAS BEEN REMOVED AND NO LONGER EXISTS AT SITE.

WILDLIFE EXCLUSION FENCE DETAIL F4

FENCE PANEL TYPES

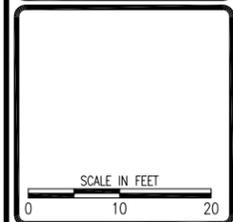
- NOTES:**
- COORDINATED BRIDGE INSTALLATION WITH OTHER CONSTRUCTION ACTIVITIES.
 - INSTALLED MODULAR STEEL BRIDGE AT LOCATION SHOWN ON SHEET F-1AB PER MANUFACTURES RECOMMENDATIONS.
 - THE ABUTMENT AND BACKWALLS WERE DESIGNED AND SUPPLIED BY BRIDGE MANUFACTURER TO ENSURE CONFORMANCE WITH DESIGN PARAMETERS, LOAD-RATING, AND APPROPRIATE FIT-UP. IN ALL CASES, ABUTMENTS AND BACKWALLS WERE DESIGNED AND STAMPED BY A MONTANA REGISTERED PROFESSIONAL ENGINEER.
 - CONTRACTOR WAS RESPONSIBLE FOR LOCATING AND PROTECTING ALL UTILITIES THROUGHOUT THE COURSE OF WORK.
 - UTILITY LOCATIONS AND ELEVATIONS SHOWN ARE APPROXIMATE. CONTRACTOR COORDINATED WITH UTILITIES PRIOR TO BEGINNING ANY EARTHWORK.
 - CONTRACTOR CONSTRUCTED EMBANKMENT USING MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALL USING A UNIAXIAL TENSAR GEOGRID AND SOIL RETENTION FABRIC. BACKFILL FOR UNIAXIAL GEOGRID WAS OBTAINED FROM THE SPECIFIED BORROW AREA, SEE SHEET F-1AB.
 - ALL FILL MATERIALS WERE COMPACTED TO 95% OF STANDARD PROCTOR MAXIMUM DRY DENSITY [ASTM D698/AASHTO T99] AT ±2% OPTIMUM MOISTURE.
 - CONTRACTOR PROVIDED, INSTALLED AND MAINTAINED BMP'S THROUGHOUT COURSE OF WORK.

THIS STRUCTURE WAS PROVIDED AND INSTALLED IN 2010 AND WAS UTILIZED FROM 2010 TO 2013 WHEN IT WAS REMOVED FROM THE SITE.

REVISION:	DATE:	BY:	DESC:
6/18/10	JSM		MODIFIED EMBANKMENT

DRAWN BY:	JGB
DESIGNED BY:	JCB
CHECKED BY:	JSA
APPROVED BY:	WCB
PROJECT NO.:	10140
DATE:	2/24/13

DISPLAYED AS:	
COORD SYS/ZONE:	NAD 83
DATUM:	NAD 83
UNITS:	FEET
SOURCE:	PIONEER

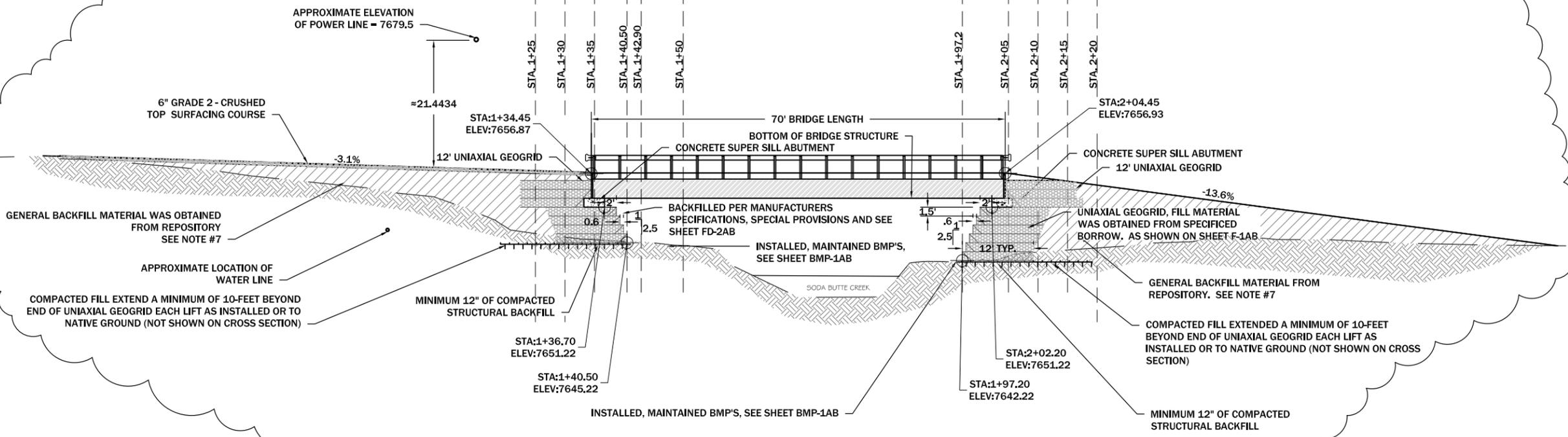
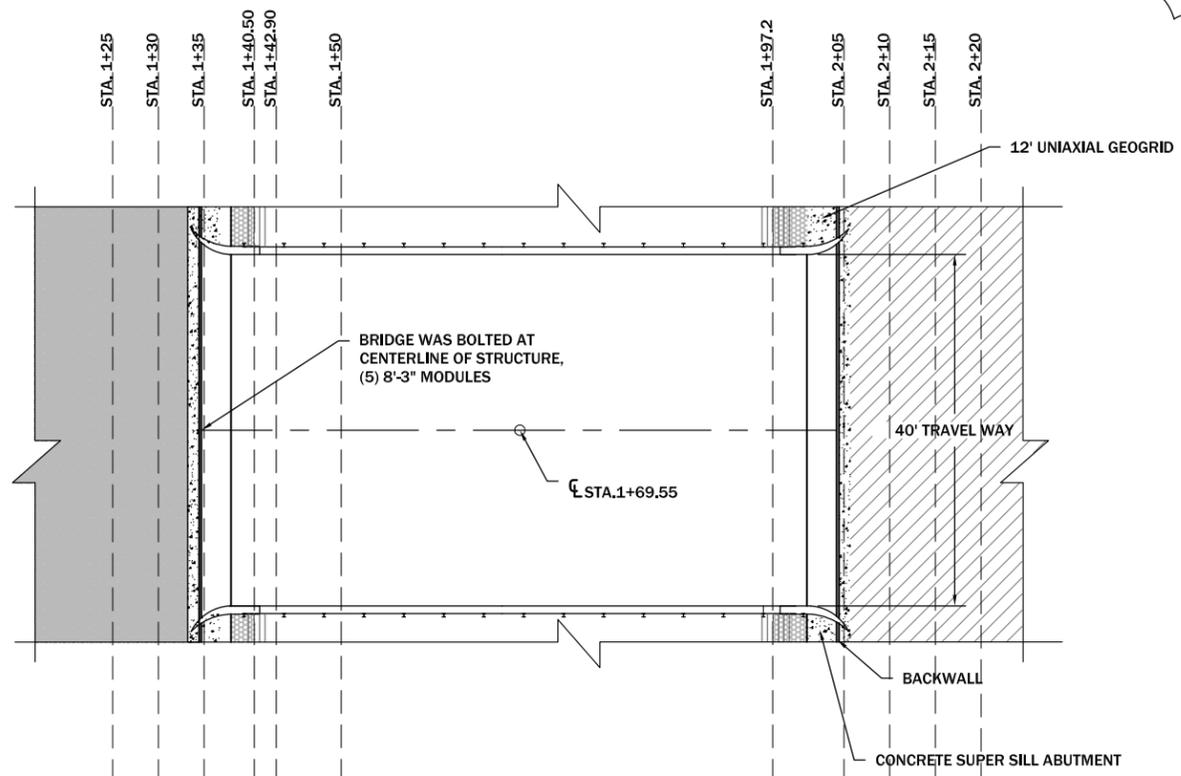


MDEQ/MWCB
MCLAREN TAILINGS ABANDONED
MINE SITE RECLAMATION PROJECT
FINAL AS-BUILT DRAWINGS

WEST BRIDGE
PROFILE SECTION
VIEW



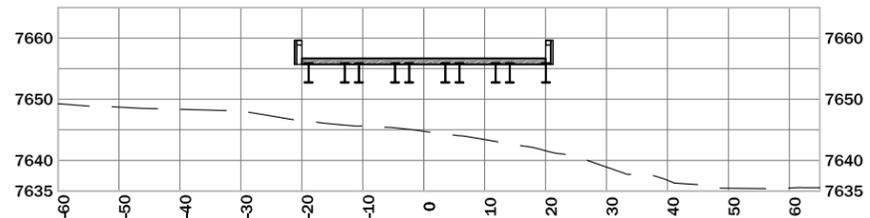
SHEET
FD-8AB



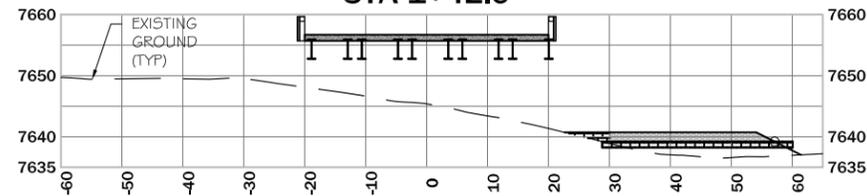
UPSTREAM

DOWNSTREAM

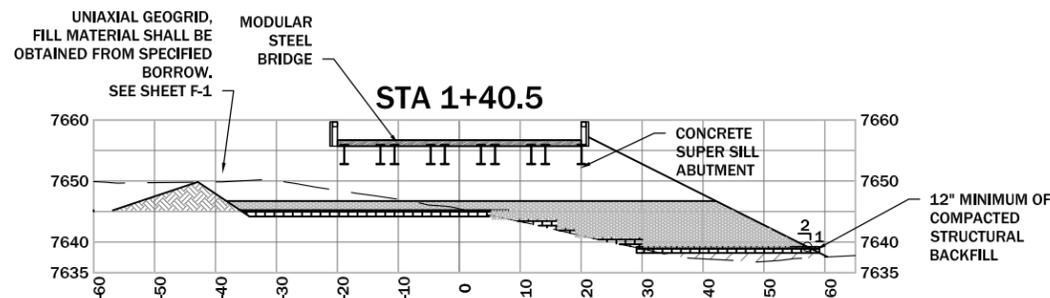
STA 1+50



STA 1+42.9

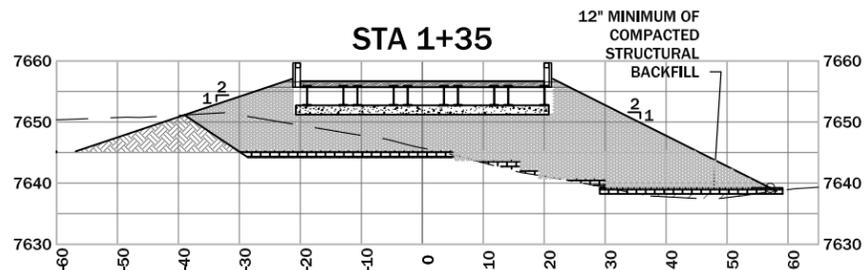


STA 1+40.5

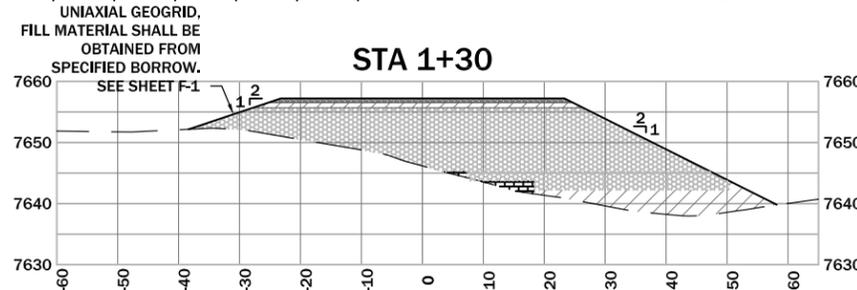


12" MINIMUM OF COMPACTED STRUCTURAL BACKFILL

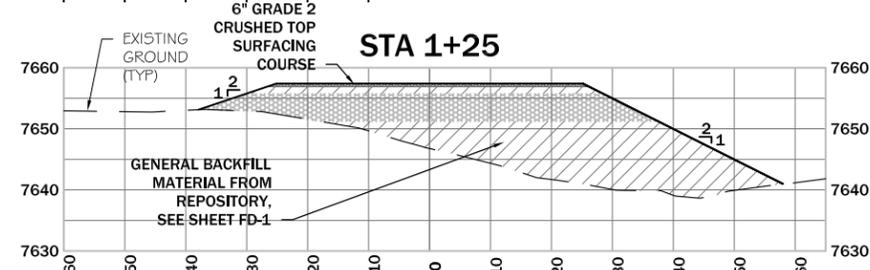
STA 1+35



STA 1+30



STA 1+25

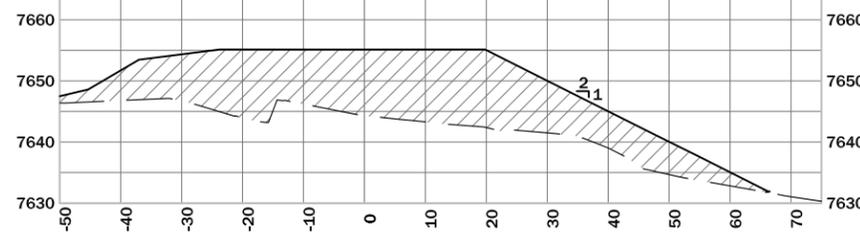


THIS STRUCTURE WAS PROVIDED AND INSTALLED IN 2010 AND WAS UTILIZED FROM 2010 TO 2013 WHEN IT WAS REMOVED FROM THE SITE.

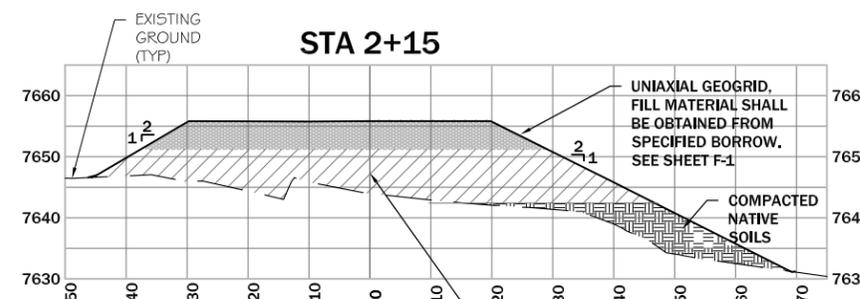
UPSTREAM

DOWNSTREAM

STA 2+20

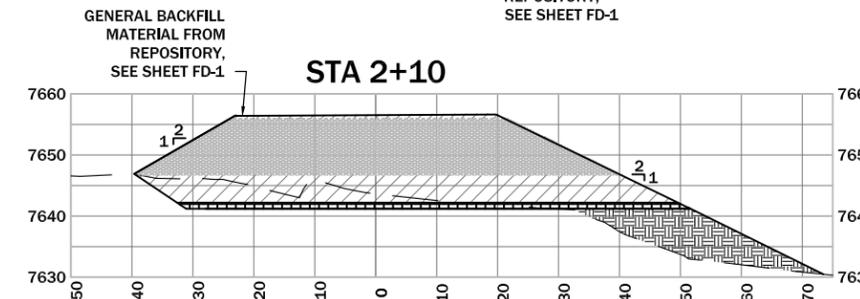


STA 2+15

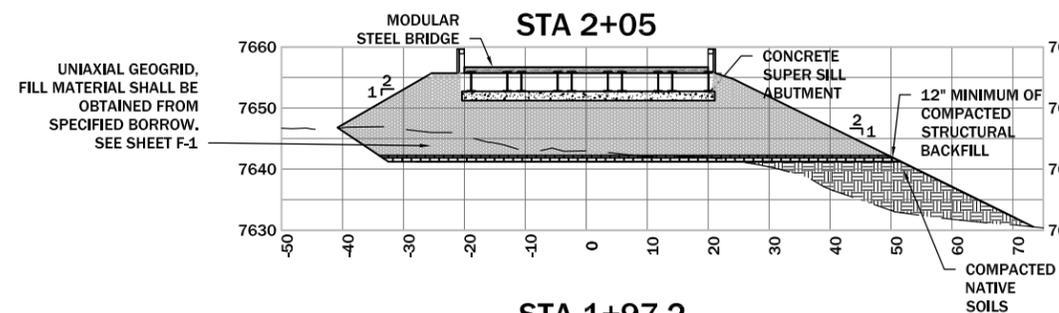


GENERAL BACKFILL MATERIAL FROM REPOSITORY, SEE SHEET FD-1

STA 2+10

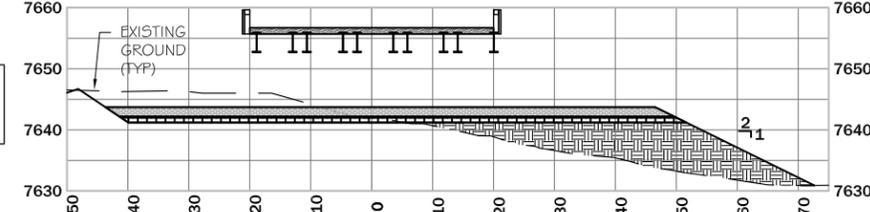


STA 2+05



COMPACTED NATIVE SOILS

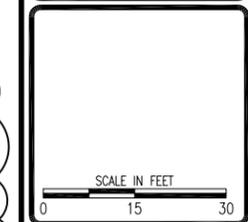
STA 1+97.2



REVISION	DATE	BY	DESC.
1	5/18/10	JSM	MODIFIED EMBANKMENT

DRAWN BY:	JGB
DESIGNED BY:	JCB
CHECKED BY:	JSA
APPROVED BY:	WCB
PROJECT NO.:	10140
DATE:	2/24/13

DISPLAYED AS:	
COORD SYS/ZONE, MSP	
DATUM:	NAD 83
UNITS:	FEET
SOURCE:	PIONEER



MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

WEST BRIDGE
 CROSS SECTIONS
 STA 1+25 TO 2+20

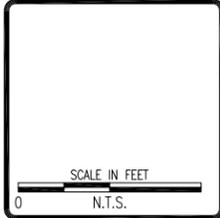


SHEET
 FD-9AB

REVISION:	DATE:	BY:	DESC:
	8/3/10	JSM	PIPE SIZE C3-10

DRAWN BY: SKL
DESIGNED BY: JMW/B
CHECKED BY: JSM
APPROVED BY: JMW/B
PROJECT NO: 10160
DATE: 2/24/15

DISPLAYED AS:
COORD SYS/ZONE: NA
DATUM: NA
UNITS: FEET
SOURCE: PIONEER



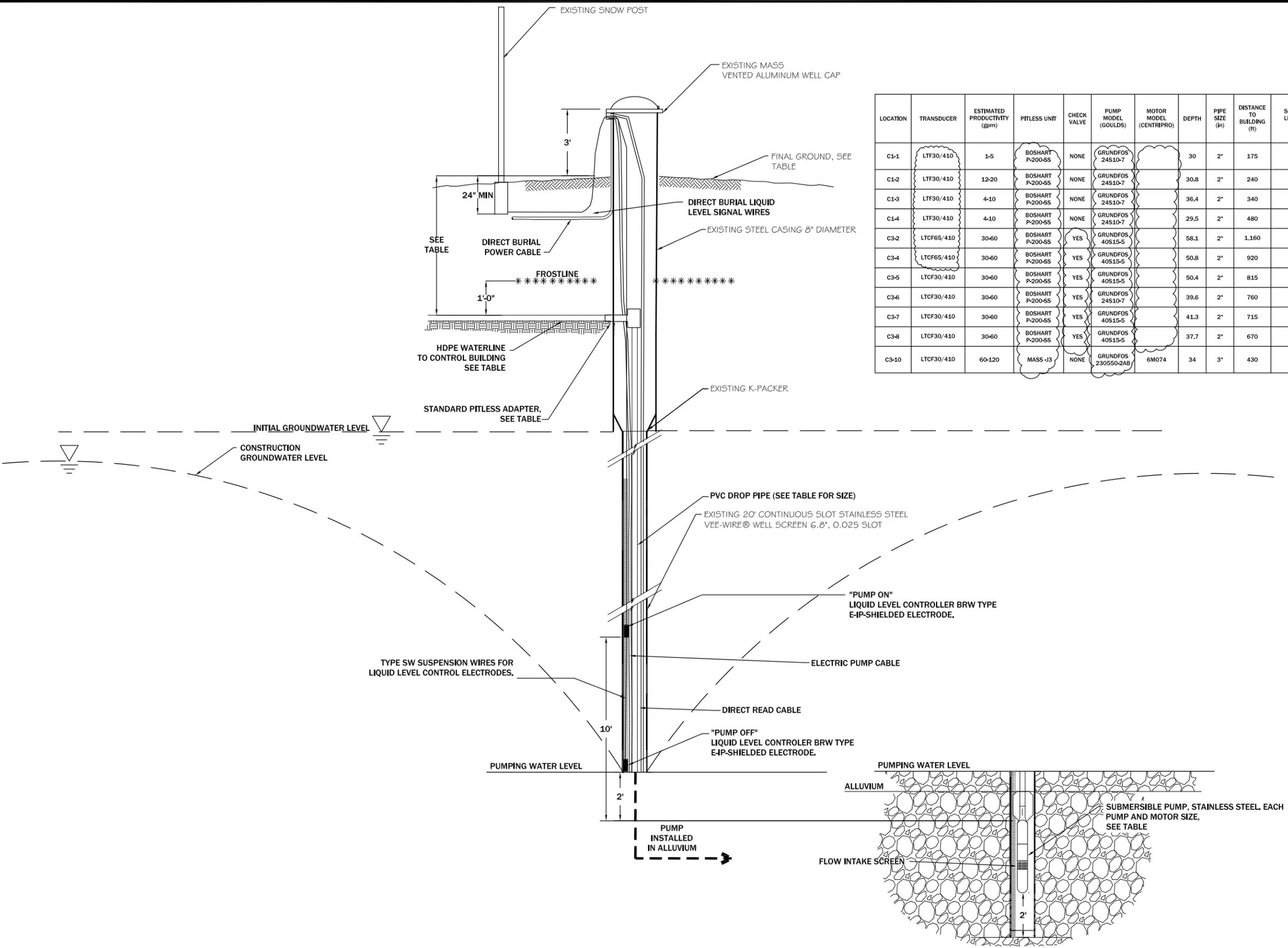
MDEQ/MWCB
MCLAREN TAILINGS ABANDONED
MINE SITE RECLAMATION PROJECT
FINAL AS-BUILT DRAWINGS

TYPICAL 5 TO 120 GPM
PUMPING WELL
DETAILS

PIONEER
TECHNICAL SERVICES, INC.
1101 SOUTH MONTANA
BUTTE, MONTANA 59701
(406) 782-5177

SHEET
GWD-1AB

LOCATION	TRANSDUCER	ESTIMATED PRODUCTIVITY (gpm)	PITLESS UNIT	CHECK VALVE	PUMP MODEL (GOULDS)	MOTOR MODEL (CENTRIPRO)	DEPTH	PIPE SIZE (in)	DISTANCE TO BUILDING (ft)	SCREEN LENGTH (ft)	DEPTH TO PITLESS FROM FINAL GROUND (ft)
C1-1	LTF30/410	1-5	BOSHART P-200-SS	NONE	GRUNDFOS 24S10-7		30	2"	175	20	6
C1-2	LTF30/410	12-20	BOSHART P-200-SS	NONE	GRUNDFOS 24S10-7		30.8	2"	240	20	6
C1-3	LTF30/410	4-10	BOSHART P-200-SS	NONE	GRUNDFOS 24S10-7		36.4	2"	340	20	6
C1-4	LTF30/410	4-10	BOSHART P-200-SS	NONE	GRUNDFOS 24S10-7		29.5	2"	480	20	6
C3-2	LTCF65/410	30-60	BOSHART P-200-SS	YES	GRUNDFOS 40S15-5		58.1	2"	1,160	20	6
C3-4	LTCF65/410	30-60	BOSHART P-200-SS	YES	GRUNDFOS 40S15-5		50.8	2"	920	20	6
C3-5	LTCF30/410	30-60	BOSHART P-200-SS	YES	GRUNDFOS 40S15-5		50.4	2"	815	20	6
C3-6	LTCF30/410	30-60	BOSHART P-200-SS	YES	GRUNDFOS 24S10-7		39.6	2"	760	20	6
C3-7	LTCF30/410	30-60	BOSHART P-200-SS	YES	GRUNDFOS 40S15-5		41.3	2"	715	20	6
C3-8	LTCF30/410	30-60	BOSHART P-200-SS	YES	GRUNDFOS 40S15-5		37.7	2"	670	20	6
C3-10	LTCF30/410	60-120	MASS-J3	NONE	GRUNDFOS 230550-2AB	6M074	34	3"	430	20	6

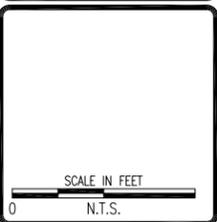


30 TO 120 GPM WELL INSTALLATION DETAIL GW1
N.T.S.

REVISION:	DATE:	BY:	DESC:

DRAWN BY: SKL
DESIGNED BY: JMW/B
CHECKED BY: JSA
APPROVED BY: JMW/B
PROJECT NO: 10160
DATE: 2/24/15

DISPLAYED AS:
COORD SYS/ZONE: NA
DATUM: NA
UNITS: FEET
SOURCE: PIONEER



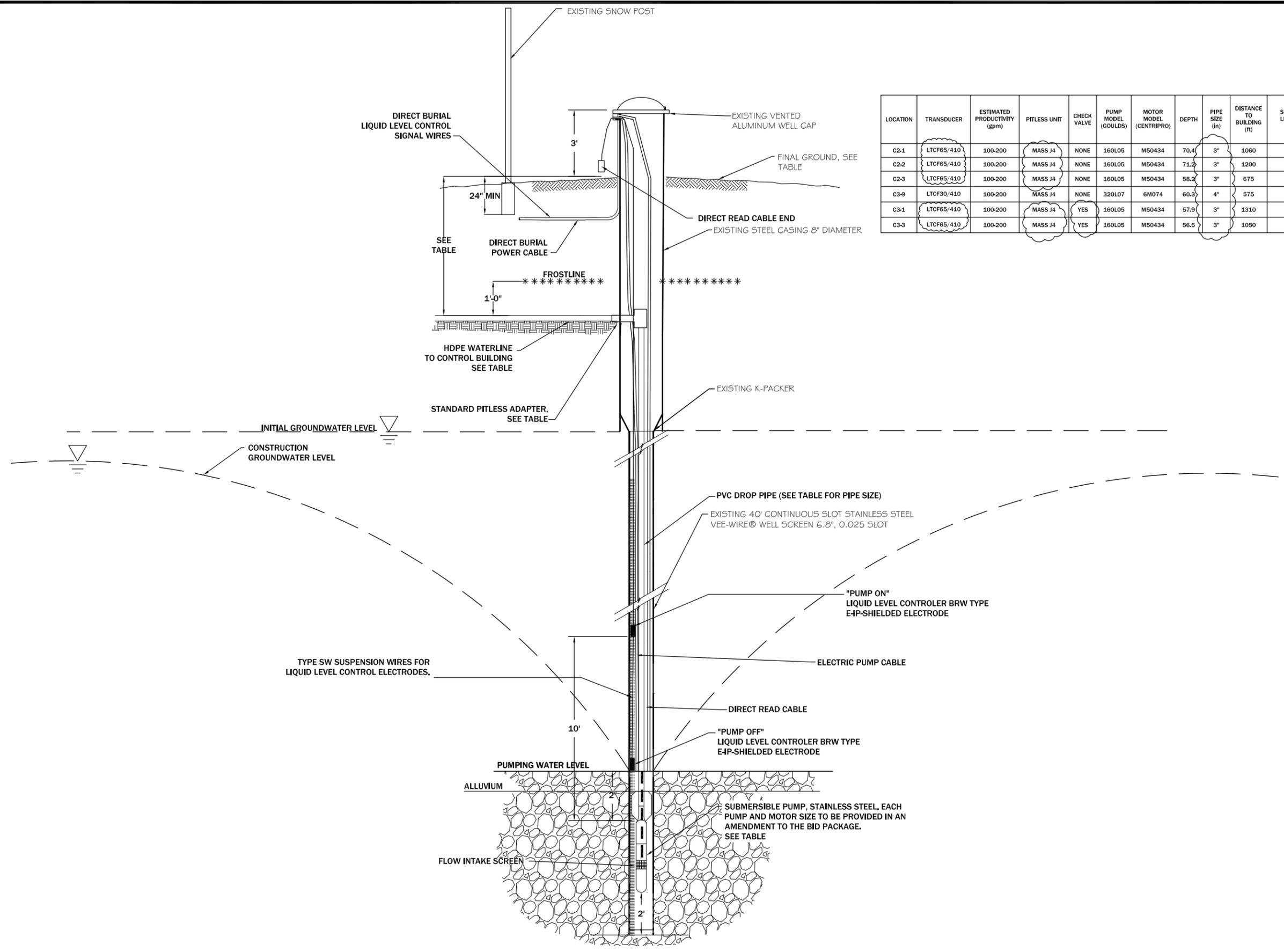
MDEQ/MWCB
MCLAREN TAILINGS ABANDONED
MINE SITE RECLAMATION PROJECT
FINAL AS-BUILT DRAWINGS

TYPICAL 100 TO 300 GPM
PUMPING WELL
DETAILS



SHEET
GWD-2AB

LOCATION	TRANSDUCER	ESTIMATED PRODUCTIVITY (gpm)	PITLESS UNIT	CHECK VALVE	PUMP MODEL (GOULDS)	MOTOR MODEL (CENTRIPRO)	DEPTH	PIPE SIZE (in)	DISTANCE TO BUILDING (ft)	SCREEN LENGTH (ft)	DEPTH TO PITLESS FROM FINAL GROUND (ft)
C2-1	LTCF65/410	100-200	MASS J4	NONE	160L05	M50434	70.4	3"	1060	40	6
C2-2	LTCF65/410	100-200	MASS J4	NONE	160L05	M50434	71.2	3"	1200	40	6
C2-3	LTCF65/410	100-200	MASS J4	NONE	160L05	M50434	58.2	3"	675	40	6
C3-9	LTCF30/410	100-200	MASS J4	NONE	320L07	6M074	60.3	4"	575	40	6
C3-1	LTCF65/410	100-200	MASS J4	YES	160L05	M50434	57.9	3"	1310	20	6
C3-3	LTCF65/410	100-200	MASS J4	YES	160L05	M50434	56.5	3"	1050	20	6

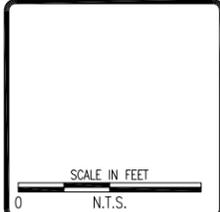


100 TO 300 GPM WELL INSTALLATION DETAIL (GW2)
N.T.S.

REVISION:	DATE:	BY:	DESC:

DRAWN BY: SKL
 DESIGNED BY: JSA
 CHECKED BY: JCB
 APPROVED BY: JSA
 PROJECT NO: 10160
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: NA
 DATUM: NA
 UNITS: FEET
 SOURCE: PIONEER



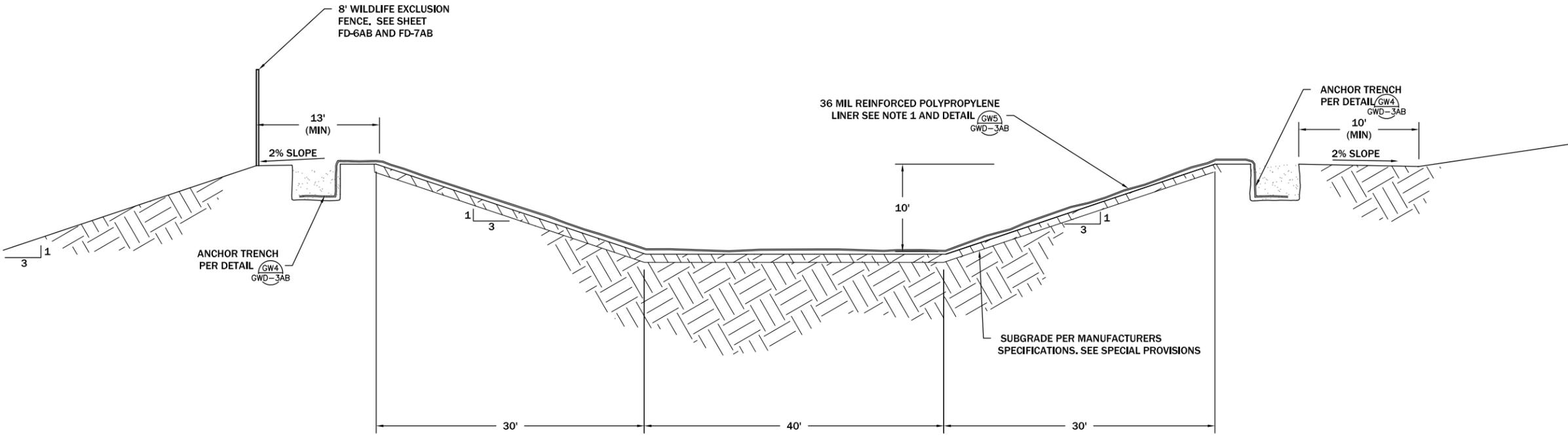
MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

SEDIMENT
 DETENTION
 POND DETAILS

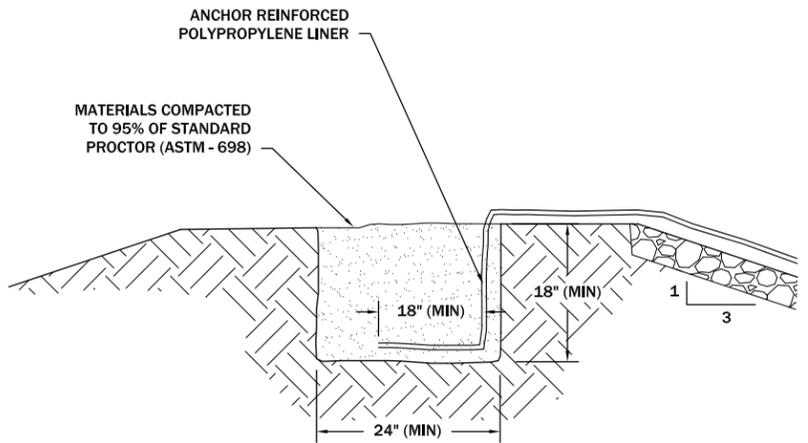
PIONEER
 TECHNICAL SERVICES, INC.
 1101 SOUTH MONTANA
 BUTTE, MONTANA 59701
 (406) 782-5177

SHEET
 GWD-3AB

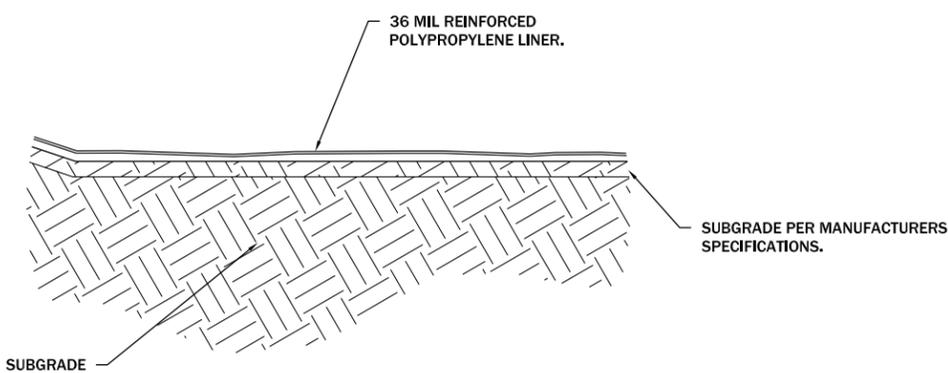
NOTE 1: LINER WAS SEAMED PER MANUFACTURES SPECIFICATIONS.



TYPICAL SEDIMENT DETENTION POND DETAIL (GW3)

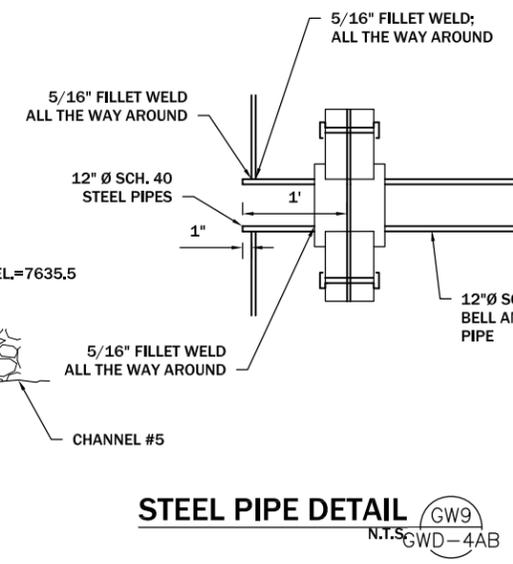
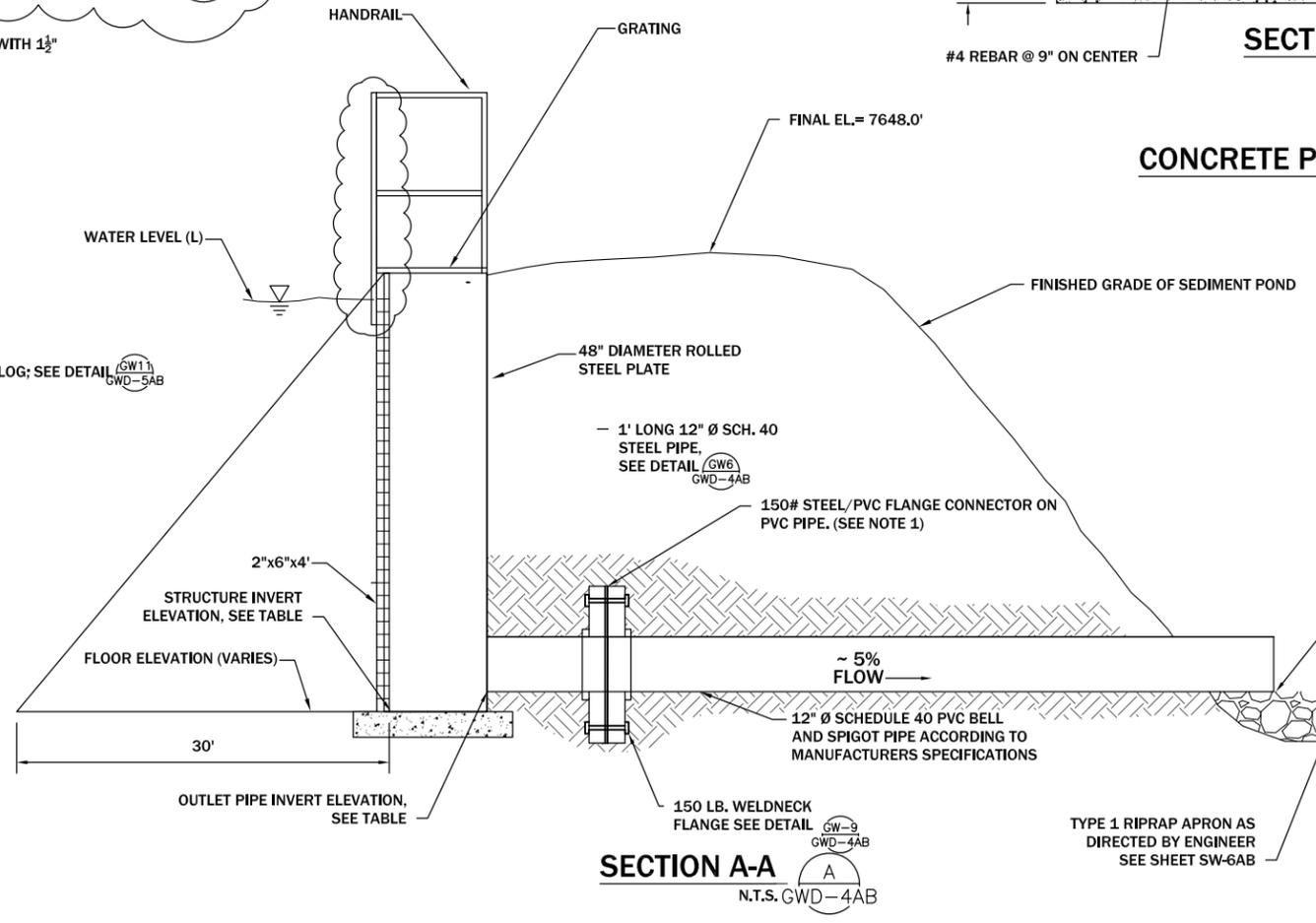
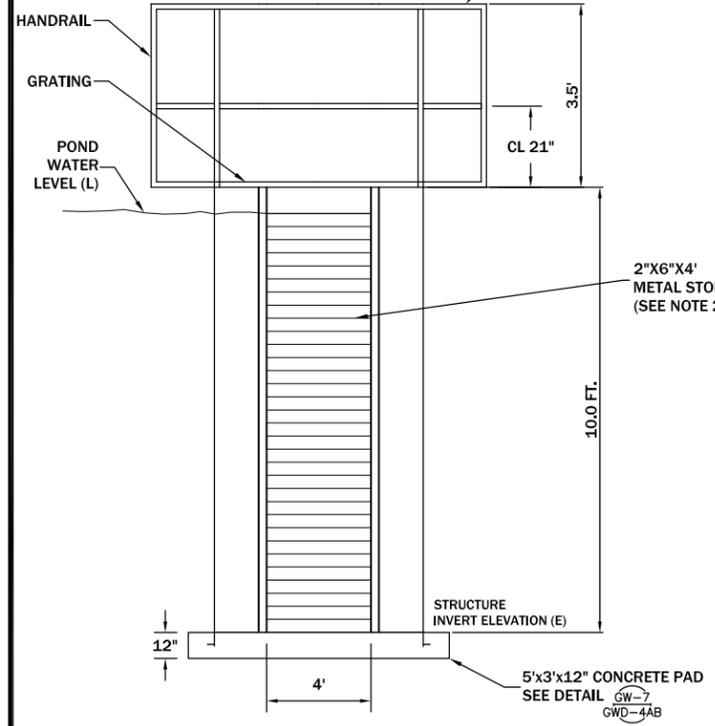
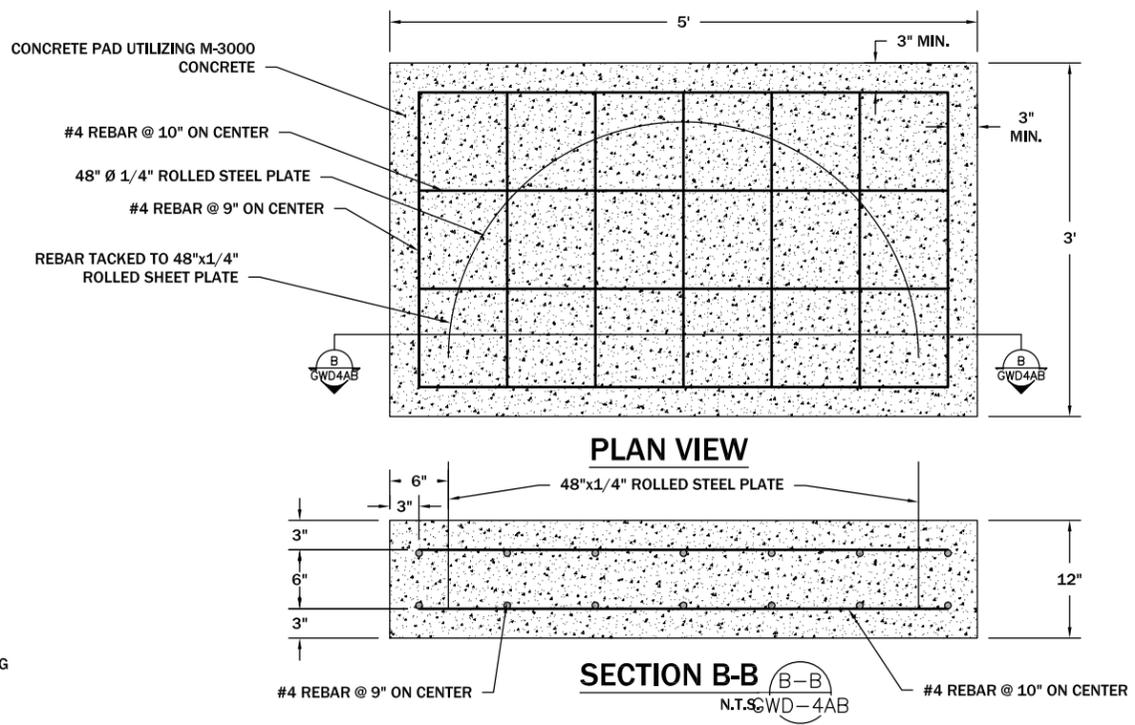
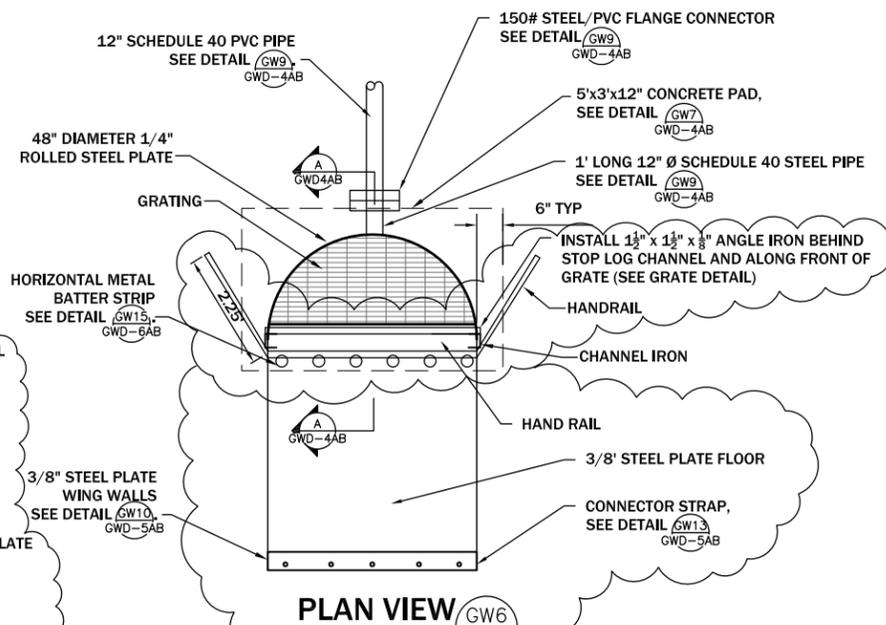
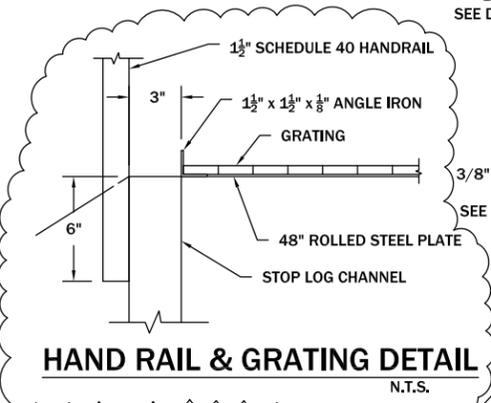


ANCHOR TRENCH DETAIL (GW4)



LINER DETAIL (GW5)
NOT TO SCALE

- NOTES**
1. FLANGE CONNECTOR ON PVC PIPE WAS COMPATIBLE WITH WELD NECK FLANGE ON STEEL PIPE. INSTALL FLANGE CONNECTOR, AND BOLT TO WELD NECK PER MANUFACTURERS SPECIFICATIONS.
 2. DRILLED 2 ONE-INCH DIAMETER HOLES ON ONE OF THE 2-INCH WIDE FACES OF EACH STOP LOG. POSITION ONE HOLE ON EITHER SIDE OF THE CENTER POINT OF THE SELECTED 2-INCH WIDE FACE.
 3. CONTRACTOR COMPACTED BACKFILL AROUND OUTLET STRUCTURE AND PIPING @95% OF STANDARD PROCTOR (ASTM698).



STRUCTURE NAME	STRUCTURE HEIGHT (H)	STRUCTURE INVERT ELEV. (E)	POND OPERATING RANGE (L)	STATUS	OUTLET LAYOUT	STOP LOG HEIGHT (S)	OUTLET PIPE INVERTS AND SIZES
OS1	8'	7638'	MIN. 7638.5' MAX. 7647.0'	NEW		9'	12" @ 7638.5'

REVISION	DATE	BY	DESC.
2/15/11	JSM	MODIFIED	HANDRAIL
			LOCATION

DRAWN BY: SKL
 DESIGNED BY: BJS
 CHECKED BY: JCB
 APPROVED BY: JSA
 PROJECT NO.: 10160
 DATE: 2/24/13

DISPLAYED AS:
 COORD SYS/ZONE: N/A
 DATUM: N/A
 UNITS: FEET
 SOURCE: PIONEER

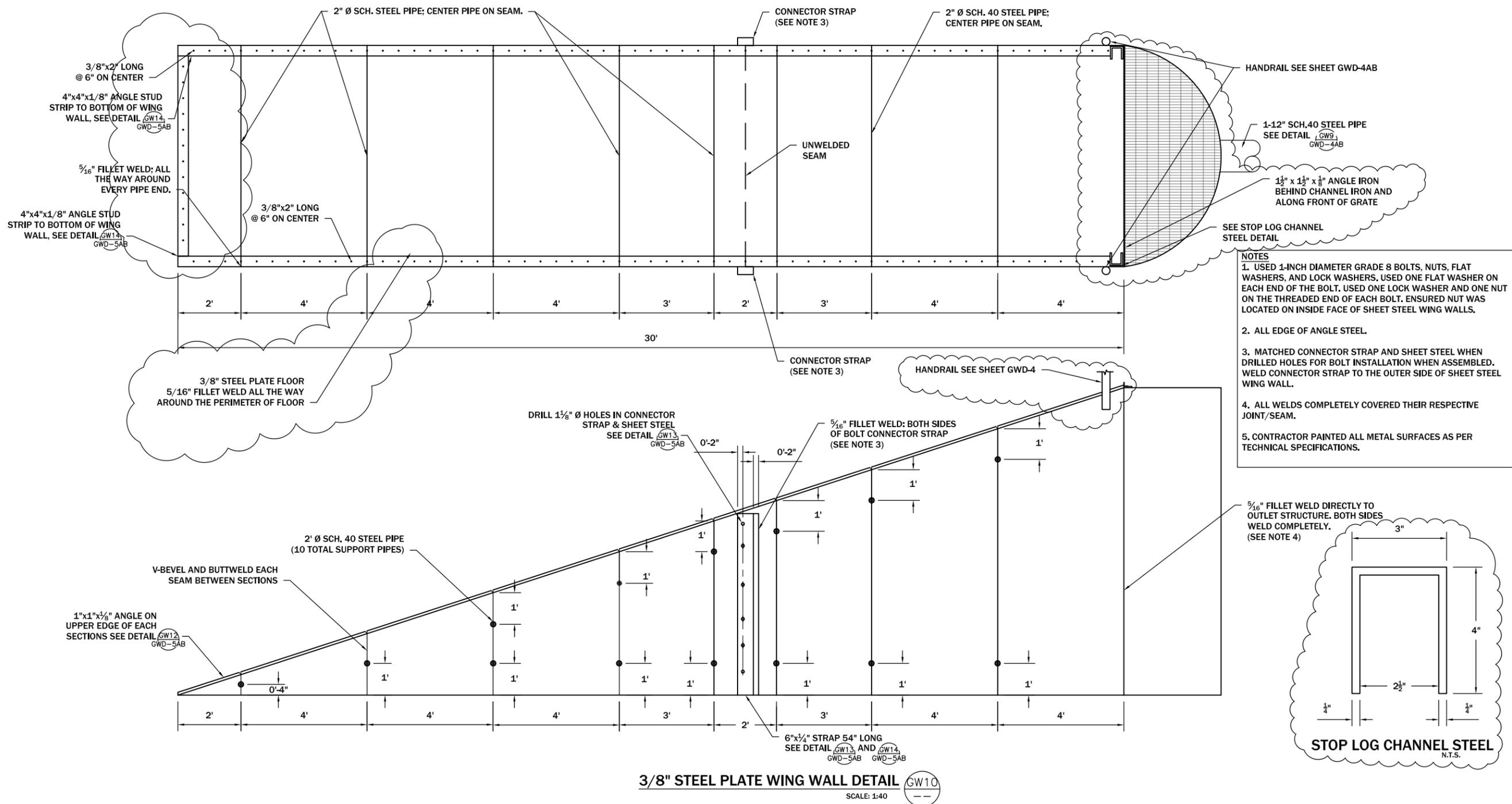
SCALE IN FEET
 0 N.T.S.

MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

OUTLET
 STRUCTURE
 DETAILS

PIONEER
 TECHNICAL SERVICES, INC.
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 BUTTE, MONTANA 59701
 (406) 782-5177

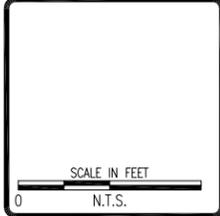
SHEET
 GWD-4AB



REVISION:	DATE:	BY:	DESC:
	2/15/11	JSM	MODIFIED HANDRAIL
			PLACEMENT & CLARIFIED DRAWING

DRAWN BY:	SKL
DESIGNED BY:	BJS
CHECKED BY:	JCB
APPROVED BY:	JSA
PROJECT NO.:	10160
DATE:	2/24/13

DISPLAYED AS:	
COORD SYS/ZONE:	NA
DATUM:	NA
UNITS:	FEET
SOURCE:	PIONEER

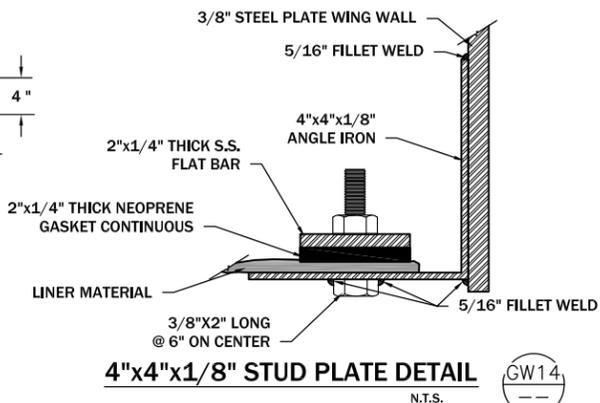
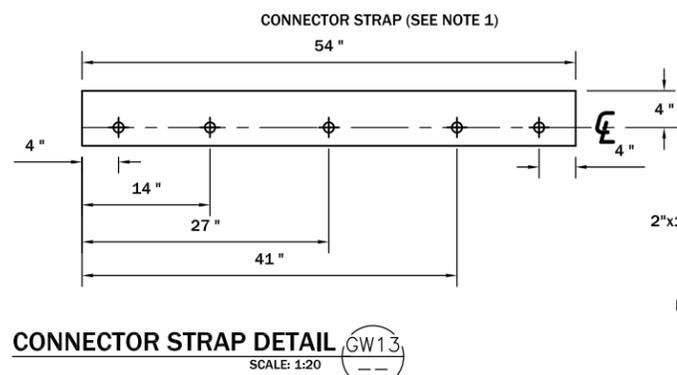
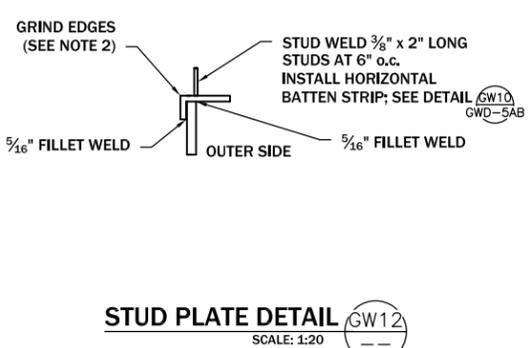
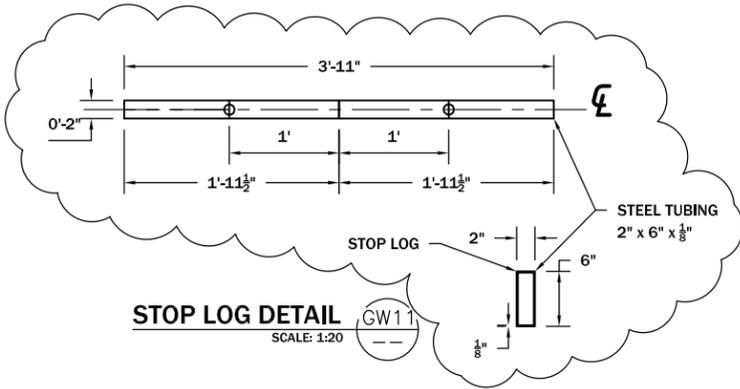


MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

OUTLET
 STRUCTURE
 DETAILS



SHEET
GWD-5AB



REVISION	DATE	BY	DESC.

DRAWN BY: NORTHWEST LININGS
DESIGNED BY: NORTHWEST LININGS
CHECKED BY: JSA
APPROVED BY: JSA
PROJECT NO: 10160
DATE: 2/24/15

DISPLAYED AS:
COORD SYS/ZONE:
DATUM:
UNITS:
SOURCE: NORTHWEST LININGS

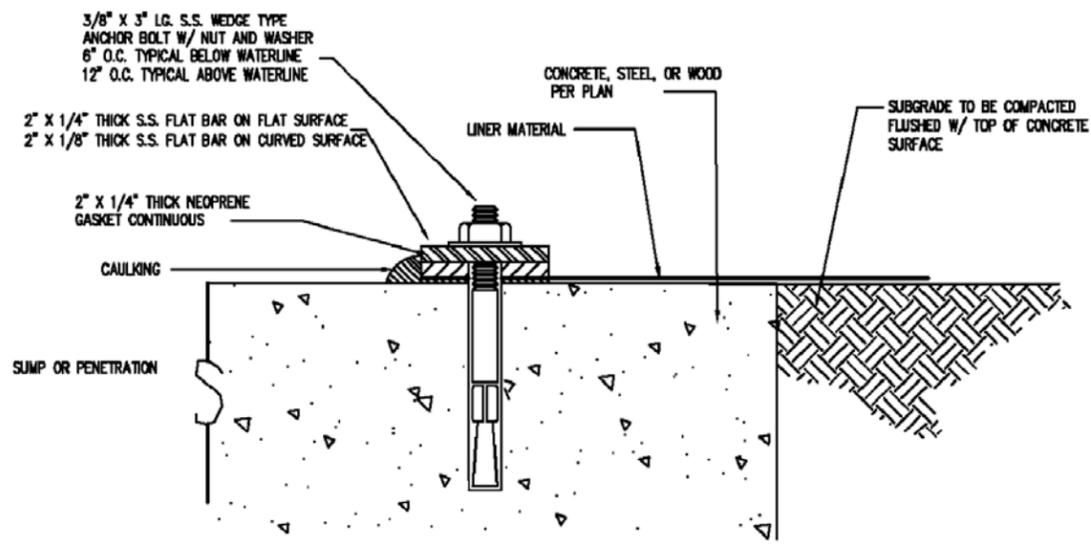
SCALE IN FEET
0 N.T.S.

MDEQ/MWCB
MCLAREN TAILINGS ABANDONED
MINESITE RECLAMATION PROJECT
FINAL AS-BUILT DRAWINGS

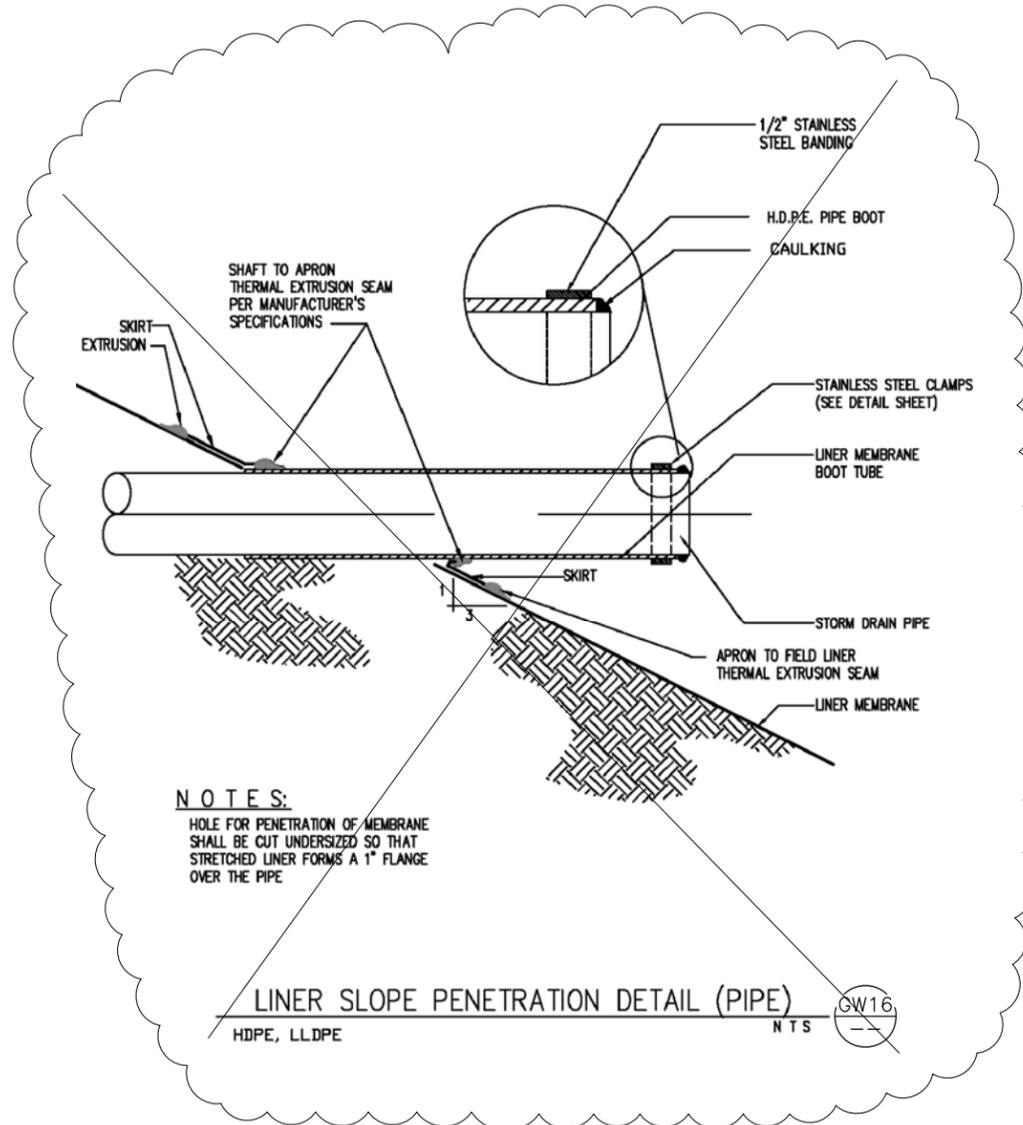
LINER
DETAILS

PIONEER
TECHNICAL SERVICES, INC.
1101 SOUTH MONTANA
BUTTE, MONTANA 59701
(406) 782-5177

SHEET
GWD-6AB



HORIZONTAL METAL BATTEN STRIP DETAIL (GW15)
12" O.C. TYPICAL-ABOVE WATERLINE
6" O.C. TYPICAL-BELOW WATERLINE
N T S

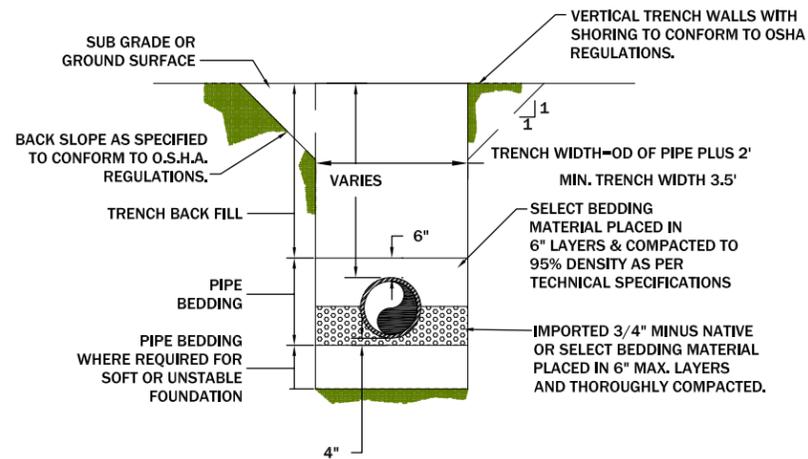


NOTES:
HOLE FOR PENETRATION OF MEMBRANE SHALL BE CUT UNDERSIZED SO THAT STRETCHED LINER FORMS A 1" FLANGE OVER THE PIPE

LINER SLOPE PENETRATION DETAIL (PIPE) (GW16)
HDPE, LLDPPE
N T S

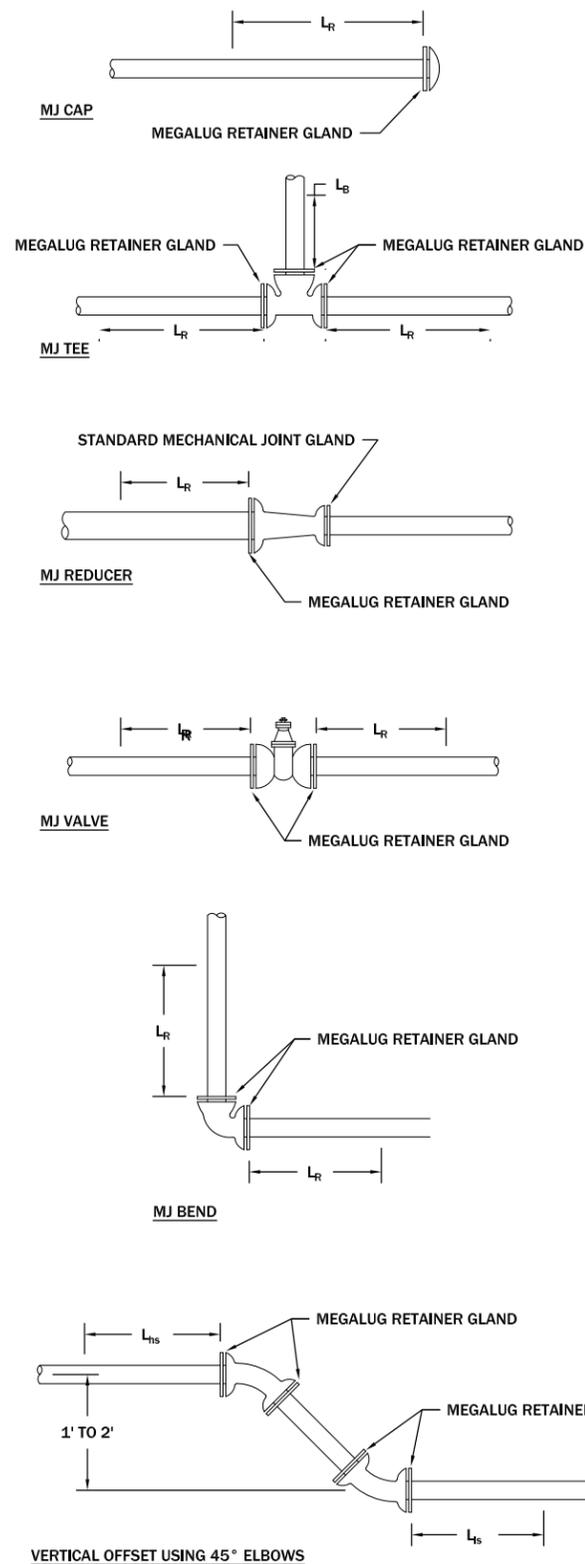
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TRENCH BACKFILL COMPLIED WITH TECHNICAL SPECIFICATIONS
 PIPE BEDDING COMPLIED WITH TECHNICAL SPECIFICATIONS

TYPICAL UTILITY TRENCH DETAILS GW17
 N.T.S.



THRUST RESTRAINT REQUIREMENT DETAIL GW18
 N.T.S.

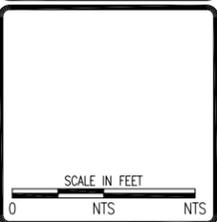
- NOTES:**
- THRUST RESTRAINT WAS PROVIDED AT ALL FITTINGS AND VALVES. THE THRUST RESTRAINT SYSTEM WAS A COMBINATION OF MEGALUG RETAINER GLANDS AND BELL RESTRAINTS (AS MANUFACTURED BY EBAA IRON, OR APPROVED EQUAL) AS SHOWN IN THIS DETAIL.
 - ANY REBAR HOOPS SUPPLIED FOR A CONVENTIONAL CONCRETE THRUST RESTRAINT SYSTEM SHALL BE EPOXY COATED.
 - L IS THE PIPE LENGTH THAT SHALL BE RESTRAINED BEFORE AND AFTER THE VALVE OR FITTING, AS SHOWN IN THE ADJACENT DRAWINGS. A BELL RESTRAINT SHALL BE INSTALLED WITH ANY JOINTS LOCATED WITHIN THE REQUIRED RESTRAINED LENGTH FROM THE VALVE OR FITTING. THIS APPLIES ONLY IF THE MEGALUG RESTRAINT SYSTEM IS UTILIZED. THE REQUIRED VALUES OF L ARE LISTED IN THE TABLE BELOW.
 - ALL MEGALUGS AND BELL RESTRAINTS SHALL BE POLYWRAPPED OR BITUMINOUS COATED TO PROTECT AGAINST CORROSION.
 - WHEN TWO FITTINGS ARE INSTALLED WITHIN THE RESTRAINED LENGTH OF ONE ANOTHER, THE RESTRAINED LENGTH MUST BE CALCULATED FOR THE COMBINATION OF THE TWO FITTINGS, NOT EACH FITTING INDIVIDUALLY.
 - WHEN A VALVE OR FITTING IS ADJACENT TO A CONNECTION BETWEEN NEW AND EXISTING PIPE (i.e. THE CONNECTION TO THE EXISTING PIPE IS WITHIN THE L_r LENGTH), CONVENTIONAL CONCRETE THRUST BLOCKS SHALL BE USED TO RESTRAIN THE VALVE OR FITTING.
 - L_r MAY BE INCREASED AT THE ENGINEER'S DISCRETION IF WEAK OR UNSTABLE SOILS ARE ENCOUNTERED.

REQUIRED LENGTH OF PIPE RESTRAINT (FEET)					
FITTING	PIPE DIAMETER	L _R	L _{hs}	L _{ls}	L
VALVE	6"	28			
	8"	37	NA	NA	NA
22.5° BEND	6"	2	NA	NA	NA
	8"	2			
45° BEND	6"	4	NA	NA	NA
	8"	5			
90° BEND	6"	9	NA	NA	NA
	8"	12			
REDUCER	8"x6"	15	NA	NA	NA
CAP	6"	28			
	8"	37	NA	NA	NA
VERTICAL OFFSET (1'-2') 45° ELBOWS	6"	NA	17	4	NA
	8"		23	5	
TEE	6"x6"x6"	10'			1'
	8"x8"x6"	10'	NA	NA	1'
	8"x8"x8"	10'			1'

REVISION	DATE	BY	DESC.

DRAWN BY: CLM
 DESIGNED BY: JSM
 CHECKED BY: MCB
 APPROVED BY: JSM
 PROJECT NO: 10160
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: NA
 DATUM: NA
 UNITS: NA
 SOURCE: PIONEER



MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

PIPING
 DETAILS

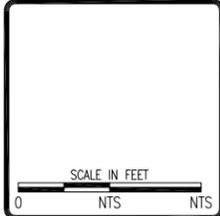
PIONEER
 TECHNICAL SERVICES, INC.
 1101 SOUTH MONTANA
 BUTTE, MONTANA 59701
 (406) 782-5177

SHEET
 GWD-7AB

REVISION:	DATE:	BY:	DESC:
7/30/10	JSM		30" DROP REVISED

DRAWN BY: CLA
 DESIGNED BY: JSM
 CHECKED BY: MCB
 APPROVED BY: JSM
 PROJECT NO: 10160
 DATE: 2/24/13

DISPLAYED AS:
 COORD SYS/ZONE: NA
 DATUM: NA
 UNITS: NA
 SOURCE: PIONEER

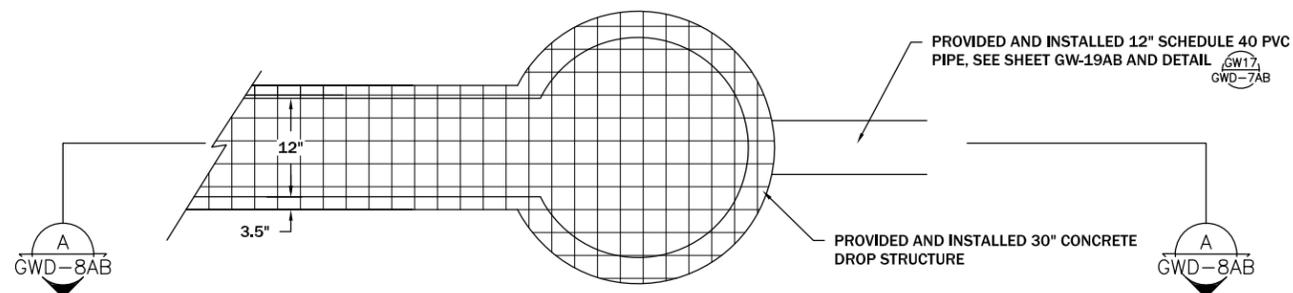


MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

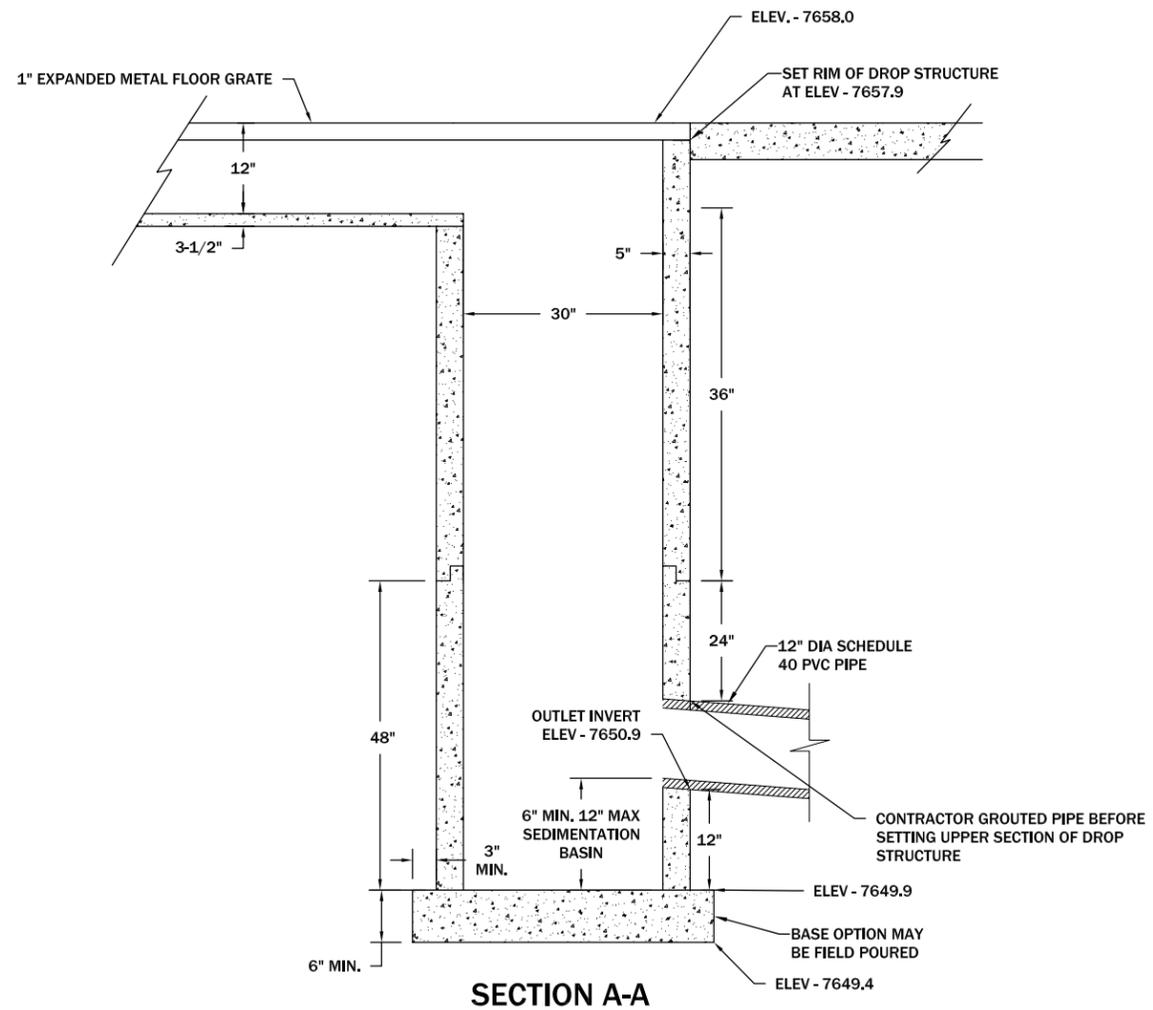
30" DROP STRUCTURE
 DETAILS

PIONEER
 TECHNICAL SERVICES, INC.
 1101 SOUTH MONTANA
 BUTTE, MONTANA 59701
 (406) 782-5177

SHEET
 GWD-8AB



PLAN



SECTION A-A

30" STANDARD DROP STRUCTURE GW19
 N.T.S.

HERITAGE BUILDING SYSTEMS

Established 1979



MEMBER



BUILDING SPECIFICATIONS

THE STRUCTURE UNDER THIS CONTRACT HAS BEEN DESIGNED AND DETAILED FOR THE LOADS AND CONDITIONS STIPULATED IN THE CONTRACT AND SHOWN ON THESE DRAWINGS. ANY ALTERATIONS TO THE STRUCTURAL SYSTEM OR REMOVAL OF ANY COMPONENT PARTS, OR THE ADDITION OF OTHER CONSTRUCTION MATERIALS OR LOADS MUST BE DONE UNDER THE ADVICE OF A REGISTERED ARCHITECT, CIVIL OR STRUCTURAL ENGINEER. HERITAGE BUILDING SYSTEMS WILL ASSUME NO RESPONSIBILITY FOR ANY LOADS NOT INDICATED.

THIS HERITAGE BUILDING SYSTEMS METAL BUILDING IS DESIGNED USING STANDARD DESIGN PRACTICES BASED ON PERTINENT PROCEDURES AND RECOMMENDATIONS OF THE FOLLOWING ORGANIZATIONS AND CODES.

AMERICAN INSTITUTE OF STEEL CONSTRUCTION: "SPECIFICATION FOR THE DESIGN, FABRICATION, AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS", 13TH EDITION.

AMERICAN IRON AND STEEL INSTITUTE: "NORTH AMERICAN SPECIFICATION FOR THE DESIGN OF COLD FORMED STEEL STRUCTURAL MEMBERS", 2001 EDITION (W/ 2004 SUPPLEMENT).

AMERICAN WELDING SOCIETY: "STRUCTURAL WELDING CODE"
AWS D1.1-2006: STEEL
AWS D1.3-98: SHEET STEEL

MBMA METAL BUILDING SYSTEMS MANUAL, 2002 ED. WITH 2004 UPDATE

MATERIAL PROPERTIES OF STEEL PLATE USED IN THE FABRICATION OF PRIMARY RIGID FRAMES AND OTHER PRIMARY STRUCTURAL, EXCLUSIVE OF COLD-FORMED SECTIONS, CONFORM TO ASTM A529 OR A572. FLANGES WITH THICKNESS OF 1" OR LESS AND WIDTH OF 12" OR LESS CONFORM TO ASTM A529-05 GRADE 55. FLANGES GREATER THAN 1" IN THICKNESS OR 12" IN WIDTH CONFORM TO ASTM A 572-06 GRADE 50. WEBS OF 3/16" OR LESS CONFORM TO ASTM A1011-06b GRADE 50 AND WEBS GREATER THAN 3/16" CONFORM TO ASTM A1018-06c GRADE 50 OR ASTM A572-06 GRADE 50.

MATERIAL PROPERTIES OF HOT ROLLED SECTIONS W8X10 THROUGH W24X76 CONFORM TO ASTM A572-06 GRADE 50 OR ASTM A992-04A GRADE 50. HOT ROLLED SECTIONS LARGER THAN W24X76 CONFORM TO ASTM A36-05.

MATERIAL PROPERTIES OF PIPE SECTIONS CONFORM TO ASTM A53-06a TYPE "E" GRADE "B", MINIMUM YIELD OF 35,000 PSI.

MATERIAL PROPERTIES OF HOLLOW STRUCTURAL SECTIONS CONFORM TO ASTM A500-03A GRADE "B", MINIMUM YIELD OF 42,000 PSI.

MATERIAL PROPERTIES OF COLD FORMED LIGHT GAGE STEEL MEMBERS CONFORM TO THE REQUIREMENTS OF ASTM A1011-06b GRADE 55 WITH A MINIMUM YIELD OF 55,000 PSI.

MATERIAL PROPERTIES OF CABLE BRACING CONFORM TO ASTM A475-03, CLASS A 7-STRAND WIRE. ROD BRACING CONFORMS TO ASTM A36-05.

HIGH STRENGTH BOLTS AND THEIR INSTALLATION SHALL CONFORM TO ASTM SPECIFICATIONS A-325 AND ARE DESIGNED AS BEARING TYPE CONNECTIONS WITH THREADS INCLUDED IN THE SHEAR PLANE. TIGHTENING OF THESE BOLTS IS RECOMMENDED BY THE "SNUG-TIGHTENED JOINTS" METHOD, PER 2002 RCSC "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR 490 BOLTS."

ALL STEEL MEMBERS EXCEPT BOLTS, FASTENERS, AND CABLE SHALL RECEIVE ONE SHOP COAT OF INHIBITIVE PRIMER, SSPC SPEC. #15, UNLESS STATED OTHERWISE IN THE CONTRACT.

SHOP AND FIELD INSPECTIONS AND ASSOCIATED FEES ARE THE RESPONSIBILITY OF THE OWNER, UNLESS STIPULATED OTHERWISE.

BUILDERS RESPONSIBILITIES

THE BUILDER MUST SECURE ALL REQUIRED APPROVALS AND PERMITS FROM THE APPROPRIATE AGENCY AS REQUIRED.

APPROVAL OF HERITAGE BUILDING SYSTEMS DRAWINGS AND CALCULATIONS INDICATES THAT HERITAGE HAS CORRECTLY INTERPRETED AND APPLIED THE REQUIREMENTS OF THE CONTRACT DRAWINGS AND SPECIFICATIONS. (SECT. 4.4.1 AISC CODE OF STANDARD PRACTICE, 13TH EDITION.)

WHERE DISCREPANCIES EXIST BETWEEN THE HERITAGE STRUCTURAL STEEL PLANS AND THE PLANS FOR OTHER TRADES, THE STRUCTURAL STEEL PLANS WILL GOVERN. (SECT. 3.3 AISC CODE OF STANDARD PRACTICE, 13TH EDITION.)

DESIGN CONSIDERATIONS OF ANY MATERIALS IN THE STRUCTURE WHICH ARE NOT FURNISHED BY HERITAGE ARE THE RESPONSIBILITY OF THE BUILDER AND ENGINEERS OTHER THAN HERITAGE ENGINEERING UNLESS SPECIFICALLY INDICATED.

THE BUILDER IS RESPONSIBLE FOR ALL ERECTION OF STEEL AND ASSOCIATED WORK IN COMPLIANCE WITH HERITAGE CONSTRUCTION DRAWINGS.

TEMPORARY SUPPORTS, SUCH AS TEMPORARY GUYS, BRACES, FALSEWORK OR OTHER ELEMENTS REQUIRED FOR ERECTION WILL BE DETERMINED, FURNISHED, AND INSTALLED BY THE BUILDER, (SECT 7.10 AISC CODE OF STANDARD PRACTICE, 13TH EDITION.)

IT IS THE BUILDERS RESPONSIBILITY TO APPLY AND OBSERVE ALL PERTINENT SAFETY RULES AND REGULATIONS, AND PER OSHA STANDARDS AS APPLICABLE.

THE BUILDER IS RESPONSIBLE FOR THE VERIFICATION OF ALL SHIPMENTS RECEIVED, AND MUST INVENTORY BUILDING AT TIME OF DELIVERY.

GENERAL NOTES

NO CHANGES SHOULD BE MADE TO THIS BUILDING SYSTEM UNLESS APPROVED IN WRITING BY THE MANUFACTURERS ENGINEERING DEPARTMENT.

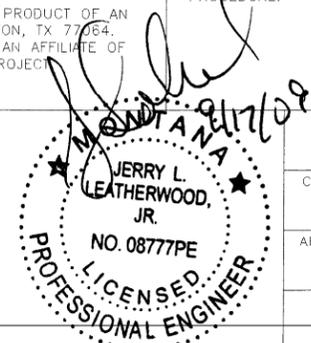
UNAPPROVED CHANGES COULD RESULT IN AN UNSAFE BUILDING DESIGN AND COULD ENDANGER PUBLIC SAFETY.

THIS BUILDINGS ANCHOR BOLTS ARE BY OTHERS. HERITAGE BUILDING SYSTEMS DOES NOT PROVIDE ANCHOR BOLTS.

ENGINEERING SEAL

THIS CERTIFICATION COVERS PARTS MANUFACTURED AND DELIVERED BY THE MANUFACTURER ONLY, AND EXCLUDES PARTS SUCH AS DOORS, WINDOWS, FOUNDATION DESIGN AND ERECTION OF THE BUILDING.

THESE DRAWINGS AND THE METAL BUILDING SYSTEM THEY REPRESENT ARE THE PRODUCT OF AN AFFILIATE OF NCI GROUP, INC. - 10943 N. SAM HOUSTON PARKWAY W., HOUSTON, TX 77064. THE PROFESSIONAL ENGINEER WHOSE SEAL APPEARS HEREON IS EMPLOYED BY AN AFFILIATE OF NCI GROUP, INC. AND IS NOT THE ENGINEER-OF-RECORD FOR THE OVERALL PROJECT.



DESIGN LOADING

THIS STRUCTURE IS DESIGNED UTILIZING THE LOADS INDICATED AND APPLIED AS REQUIRED BY:

IBC 06

THE BUILDER IS TO CONFIRM THAT THESE LOADS COMPLY WITH THE REQUIREMENTS OF THE LOCAL BUILDING DEPARTMENT.

FRAME / ROOF DEAD LOAD SUPERIMPOSED	2.000 PSF
COLLATERAL (LIGHTS)	1 PSF
FRAME / ROOF LIVE LOAD	20 / 20.00 PSF
SNOW LOAD	
GROUND SNOW LOAD (Pg)	178.0000 PSF
FLAT ROOF SNOW LOAD (Pf)	124.6 PSF
SNOW EXPOSURE FACTOR (Ce)	1.0
SNOW LOAD IMPORTANCE FACTOR (Is)	1.0000
THERMAL FACTOR (Ci)	1.00
WIND LOAD	
BASIC WIND SPEED	90 MPH
WIND IMPORTANCE FACTOR (Iw)	1.00
WIND EXPOSURE CATEGORY	C
TOPOGRAPHICAL FACTOR	1.0
SEISMIC LOAD	
OCCUPANCY CATEGORY	II - Normal
S _{DS}	0.5154
S _{D1}	0.2431
S _s	0.5780
S ₁	0.1730
SITE CLASS	D
SEISMIC DESIGN CATEGORY	D
SEISMIC IMPORTANCE FACTOR (I _e)	1.00
DESIGN BASE SHEAR (V)	12.06 KIPS
RAIN INTENSITY	
5-MINUTE DURATION, 5-YEAR RECURRENCE (I1)	4.0000 IN/HOUR
5-MINUTE DURATION, 25-YEAR RECURRENCE (I2)	6.0000 IN/HOUR

BASIC STRUCTURAL SYSTEM AND SEISMIC RESISTING SYSTEM = ORDINARY MOMENT FRAME OF STEEL.
R = 3.2500
ANALYSIS PROCEDURE IS EQUIVALENT LATERAL FORCE PROCEDURE.

DRAWING INDEX

ISSUE	PAGE	DESCRIPTION
A	L1 of 1	COVER SHEET
A	AB1	ANCHOR BOLT PLAN
A	AB2	ANCHOR BOLT REACTIONS
A	RFP	ROOF FRAMING PLAN
A	FCS	FRAME CROSS SECTION
A	LEW	LEFT ENDWALL
A	REW	RIGHT ENDWALL
A	FSW	FRONT SIDEWALL
A	BSW	BACK SIDEWALL
A	DET	GENERAL DETAILS

DRAWING STATUS

- FOR APPROVAL
THESE DRAWINGS, BEING FOR APPROVAL, ARE BY DEFINITION NOT FINAL, AND ARE FOR CONCEPTUAL REPRESENTATION ONLY. THEIR PURPOSE IS TO CONFIRM PROPER INTERPRETATION OF THE PROJECT DOCUMENTS. UNTIL DRAWINGS ISSUED "FOR CONSTRUCTION" CAN BE CONSIDERED AS COMPLETE.
- FOR PERMITS ONLY
THESE DRAWINGS, BEING FOR PERMIT, ARE BY DEFINITION NOT FINAL. ONLY DRAWINGS ISSUED "FOR CONSTRUCTION" CAN BE CONSIDERED AS COMPLETE.
- FOR CONSTRUCTION
FINAL DRAWINGS.

FOR QUESTIONS OR ASSISTANCE CONCERNING ERECTION OF HERITAGE BUILDINGS, CALL:
1.800.643.5555
MONDAY - FRIDAY 7:30AM TO 5:00PM
CENTRAL STANDARD TIME.

DRAWN	DATE	HERITAGE BUILDING SYSTEMS Established 1979	2612 GRIBBLE STREET NORTH LITTLE ROCK, AR 72114 800-643-5555	JOB NO.	
AKT	9/17/09			3319-245937	
CHECKED	DATE				
CM		CUSTOMER:			
APPROVED	DATE	S BAR S			
		COOKE CITY, MT 59020			
		BUILDING:		REV. NO.	SHEET NO.
		54'-0" x 42'-0" x 16'-0" 4.0:12		0	L1 of 1

NOTE:

PROVIDED AND INSTALLED 42'x54' STEEL FRAMED BUILDING FROM HERITAGE BUILDING SYSTEMS

REVISION	DATE	BY	DESC.

DRAWN BY: HERITAGE BUILDING
DESIGNED BY: HERITAGE BUILDING
CHECKED BY: HERITAGE BUILDING
APPROVED BY: JSL
PROJECT NO.: 10160
DATE: 2/24/13

DISPLAYED AS:
COORD SYS/ZONE, NA
DATUM: NA
UNITS: FEET
SOURCE: HERITAGE BUILDING

SCALE IN FEET
0 N.T.S.

MDEQ/MWCB
MCLAREN TAILINGS ABANDONED
MINE SITE RECLAMATION PROJECT
FINAL AS-BUILT DRAWINGS

DEWATERING
CONTROL
BUILDING
DETAILS

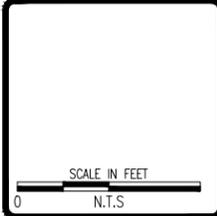
PIONEER
TECHNICAL SERVICES, INC.
1101 SOUTH MONTANA
BUTTE, MONTANA 59701
(406) 782-5177

SHEET
GWD-9AB

REVISION:	BY:	DESC:

DRAWN BY: HERITAGE BUILDING
DESIGNED BY: HERITAGE BUILDING
CHECKED BY: HERITAGE BUILDING
APPROVED BY: JSM
PROJECT NO: 10160
DATE: 2/24/15

DISPLAYED AS:
COORD SYS/ZONE: NA
DATUM: NA
UNITS: FEET
SOURCE: HERITAGE BUILDING

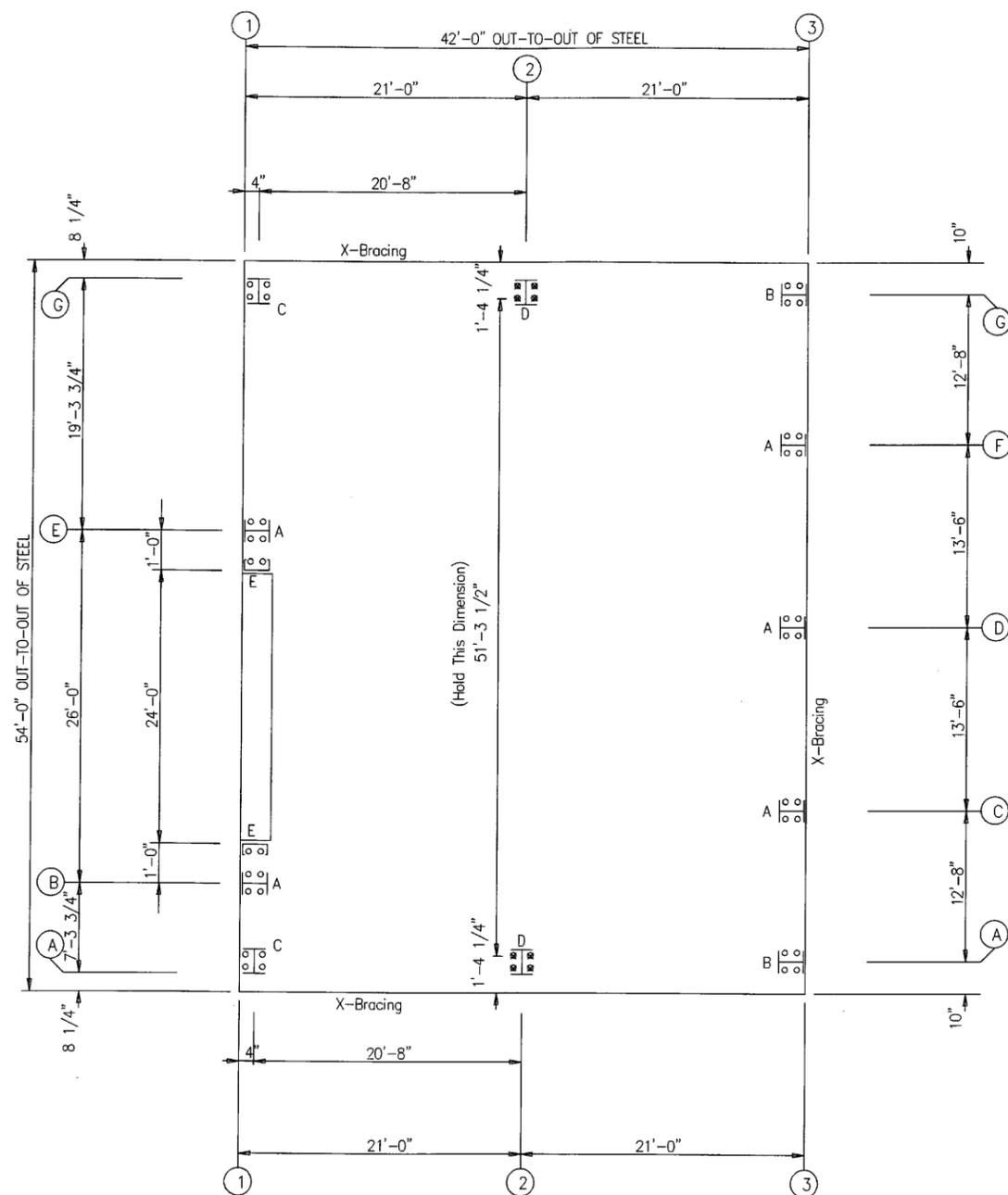


MDEQ/MWCB
MCLAREN TAILINGS ABANDONED
MINE SITE RECLAMATION PROJECT
FINAL AS-BUILT DRAWINGS

DEWATERING
CONTROL
BUILDING
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BUTTE, MONTANA 59701
(406) 782-5177

SHEET
GWD-10AB



○ Dia= 5/8"
⊗ Dia= 1 1/4"

ANCHOR BOLT PLAN

NOTE: ALL BASE PLATES @ 100.0' (U.N.)
ASSUMED FINISH FLOOR @ 100.0' (U.N.)

NOTE:
Anchor Bolts By Others!
HERITAGE BUILDING SYSTEMS
Does Not Provide Anchor Bolts.

NOTE: ALL WALKDOORS ARE FIELD
LOCATED, UNLESS NOTED.

NOTE:
PROVIDED AND INSTALLED 42'x54' STEEL FRAMED BUILDING
FROM HERITAGE BUILDING SYSTEMS

<p>2612 GRIBBLE STREET NORTH LITTLE ROCK, AR 72114 1-800-643-5555</p>	DESCRIPTION: ANCHOR BOLT PLAN		
	CUSTOMER: S BAR S		
	LOCATION: COOKE CITY, MT 59020		
	HERITAGE JOB # 3319-245937		
DRAWING BY: AKT	DATE: 9/17/09	LOADS: SEE COVER	SCALE: N.T.S.
CHECK BY: CM	TIME: 7:41 am	DRAWING #: AB1	REV #: 0

REVISION:	DATE:	BY:	DESC:

DRAWN BY: HERITAGE BUILDING
DESIGNED BY: HERITAGE BUILDING
CHECKED BY: HERITAGE BUILDING
APPROVED BY: JSM
PROJECT NO: 10160
DATE: 2/24/15

DISPLAYED AS:
COORD SYS/ZONE: NA
DATUM: NA
UNITS: FEET
SOURCE: HERITAGE BUILDING

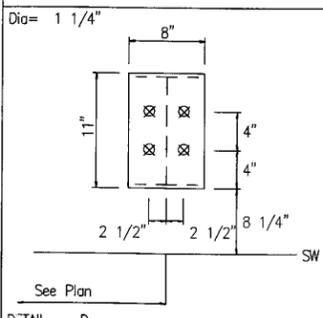
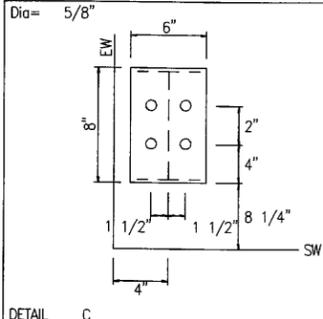
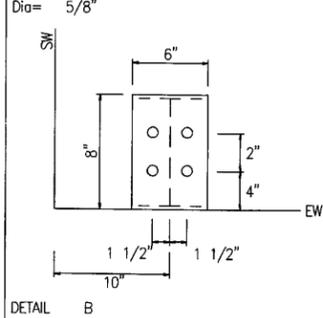
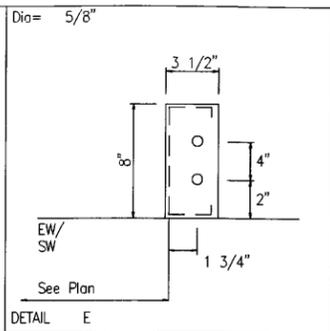
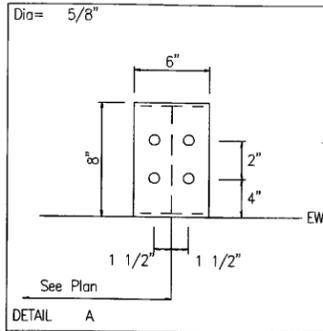
SCALE IN FEET
0 N.T.S.

MDEQ/MWCB
MCLAREN TAILINGS ABANDONED
MINE SITE RECLAMATION PROJECT
FINAL AS-BUILT DRAWINGS

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TECHNICAL SERVICES, INC.
1101 SOUTH MONTANA
BUTTE, MONTANA 59701
(406) 782-5177

SHEET
GWD-11AB



BRACING REACTIONS, PANEL SHEAR

Loc	Wall Line	Col Line	± Reactions (k)		Panel Shear (lb/ft)
			Wind	Seismic	
			Horz	Vert	
L_EW	1		3.4	2.2	5.7
F_SW	A	1.2	2.3	3.7	4.8
R_EW	3		3.4	2.2	5.7
B_SW	G	2.1	3.5	2.2	5.7

NOTES FOR REACTIONS

Building reactions are based on the following building data:

Width (ft)	= 54
Length (ft)	= 42
Eave Height (ft)	= 16 / 15
Roof Slope (rise/12)	= 4.0:12 / 4.0:12
Dead Load (psf)	= 2.000
Collateral Load (psf)	= 1
Roof Live Load (psf)	= 20.00
Frame Live Load (psf)	= 20
Roof Snow Load (psf)	= 124.6
Ground Snow Load (psf)	= 178.0000
Wind Speed (mph)	= 90
Wind Code	= IBC 06
Exposure	= C
Closed/Open	= Closed
Importance - Wind	= 1.00
Importance - Seismic	= 1.00
Seismic Zone	= D
Seismic coeff (Co)	= 0.773

ID Description

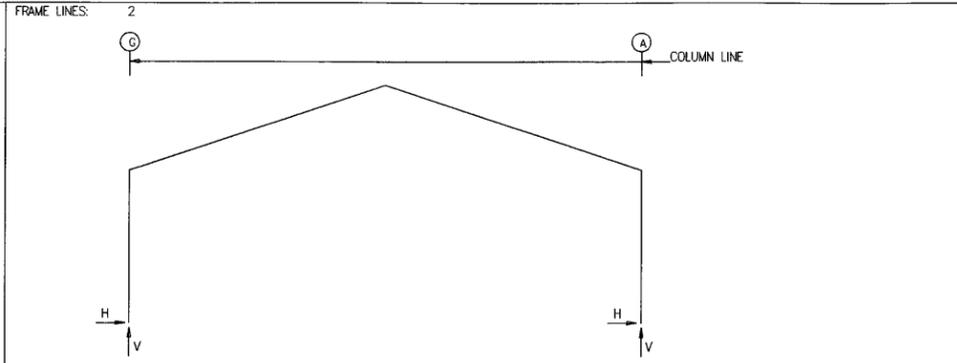
1	DL+CL+SL
2	DL+CL+SL+Slide
3	0.60DL+WL1
4	0.60DL+WR1
5	0.60DL+LnWind1+LWIND1_L2E
6	0.60DL+LnWind1+LWIND1_R2E
7	0.53DL-0.70SeisL
8	DL+CL+F1UNB_SL_L
9	DL+CL+F1UNB_SL_R
10	0.60DL+WL2+WS
11	DL+CL+E1UNB_SL_R
12	0.60DL+WP+LnWind1
13	DL+CL+E1UNB_SL_L
14	0.60DL+WR2+WS
15	DL+CL+0.75SL+0.75WR2+0.75WS+0.75Slide
16	DL+CL+E2UNB_SL_L
17	DL+CL+E2UNB_SL_R

ANCHOR BOLT SUMMARY

Qnt	Loc	Dia (in)	Type	Proj (in)
4	DJ	5/8"		
36	EW	5/8"		
8	RF	1 1/4"	A307	3.50

GENERAL NOTES

- THE METAL BUILDING MANUFACTURER IS RESPONSIBLE FOR THE DESIGN OF THE ANCHOR BOLT DIAMETER ONLY TO PERMIT THE TRANSFER OF FORCES BETWEEN THE BASE PLATE AND THE ANCHOR BOLT IN SHEAR, BEARING AND TENSION, BUT IS NOT RESPONSIBLE FOR THE ANCHOR BOLT EMBEDMENT FOR TRANSFER OF FORCES TO THE FOUNDATION.
- THE METAL BUILDING MANUFACTURER DOES NOT DESIGN AND IS NOT RESPONSIBLE FOR THE DESIGN, MATERIAL AND CONSTRUCTION OF THE FOUNDATION EMBEDMENTS. THE END USER CUSTOMER SHOULD ASSURE HIMSELF THAT ADEQUATE PROVISIONS ARE MADE IN THE FOUNDATION DESIGN FOR LOADS IMPOSED BY COLUMN REACTIONS OF THE BUILDING, OTHER IMPOSED LOADS, AND BEARING CAPACITY OF THE SOIL AND OTHER CONDITIONS OF THE BUILDING SITE. IT IS RECOMMENDED THAT THE ANCHORAGE AND FOUNDATION OF THE BUILDING BE DESIGNED BY A REGISTERED PROFESSIONAL ENGINEER EXPERIENCED IN THE DESIGN OF SUCH STRUCTURES, (SECTION A3, MEMA 2006 METAL BUILDING SYSTEMS MANUAL).
- BOTTOM OF ALL BASE PLATES ARE AT THE SAME ELEVATION. (UNLESS NOTED)



RIGID FRAME: MAXIMUM REACTIONS, ANCHOR BOLTS, & BASE PLATES

Frm Line	Col Line	Column Reactions (k)						Anc. Bolt No	D(in)	Base Plate (in)			
		Load Id	Hmax H	Vmax V	Load Id	Hmin H	Vmin V			Wid	Len	Thk	Grout (in)
2	G	1	48.1	92.3	3	-7.1	-8.6	4	1.250	8.000	11.000	0.625	0.0
		8	41.7	92.9	5	-1.2	-11.1						
2	A	4	7.1	-8.6	1	-48.1	92.6	4	1.250	8.000	11.000	0.625	0.0
		9	-41.7	92.9	6	1.2	-11.1						

ENDWALL COLUMN: MAXIMUM REACTIONS, ANCHOR BOLTS, & BASE PLATES

Frm Line	Col Line	Column Reactions (k)						Anc. Bolt No	D(in)	Base Plate (in)			
		Load Id	Hmax H	Vmax V	Load Id	Hmin H	Vmin V			Wid	Len	Thk	Grout (in)
1	G	10	0.0	-1.4	10	0.0	-1.4	4	0.625	6.000	8.000	0.250	0.0
		11	0.0	14.8									
1	E	10	3.9	-3.2	12	-3.5	-2.7	4	0.625	6.000	8.000	0.375	0.0
		13	0.0	38.5	10	3.9	-3.2						
1	B	14	2.3	-3.1	12	-2.1	-2.5	4	0.625	6.000	8.000	0.375	0.0
		11	0.0	42.8	14	2.3	-3.1						
1	A	2	0.0	-3.1	2	0.0	-3.1	4	0.625	6.000	8.000	0.250	0.0
		15	0.0	4.8									
3	A	10	0.0	-0.9	10	0.0	-0.9	4	0.625	6.000	8.000	0.250	0.0
		2	0.0	7.6									
3	C	10	2.0	-6.4	12	-1.8	-2.0	4	0.625	6.000	8.000	0.375	0.0
		16	0.0	27.4	10	2.0	-6.4						
3	D	14	2.6	-4.7	12	-2.3	-0.8	4	0.625	6.000	8.000	0.250	0.0
		2	0.0	18.7	7	0.0	-4.9						
3	F	14	2.0	-2.7	12	-1.8	-2.0	4	0.625	6.000	8.000	0.375	0.0
		17	0.0	27.4	14	2.0	-2.7						
3	G	14	0.0	-0.9	14	0.0	-0.9	4	0.625	6.000	8.000	0.250	0.0
		2	0.0	7.6									

NOTE:
Anchor Bolts By Others!
HERITAGE BUILDING SYSTEMS
Does Not Provide Anchor Bolts.

HERITAGE BUILDING SYSTEMS
Established 1979

2612 GRIBBLE STREET
NORTH LITTLE ROCK, AR 72114
1-800-643-5555

DESCRIPTION: ANCHOR BOLT REACTIONS
CUSTOMER: S BAR S
LOCATION: COOKE CITY, MT 59020
HERITAGE JOB # 3319-245937
DRAWING BY: AKT
DATE: 9/17/09
LOADS: SEE COVER
SCALE: N.T.S.
CHECK BY: CM
TIME: 7:41am
DRAWING # AB2
REV # 0

NOTE:
PROVIDED AND INSTALLED 42'x54' STEEL FRAMED BUILDING FROM HERITAGE BUILDING SYSTEMS

REVISION:	DATE:	BY:	DESC:

DRAWN BY: HERITAGE BUILDING
 DESIGNED BY: HERITAGE BUILDING
 CHECKED BY: HERITAGE BUILDING
 APPROVED BY: JSM
 PROJECT NO: 10160
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: NA
 DATUM: NA
 UNITS: FEET
 SOURCE: HERITAGE BUILDING

SCALE IN FEET
 0 N.T.S.

MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

DEWATERING
 CONTROL
 BUILDING
 DETAILS

PIONEER
 TECHNICAL SERVICES, INC.
 1101 SOUTH MONTANA
 BUTTE, MONTANA 59701
 (406) 782-5177

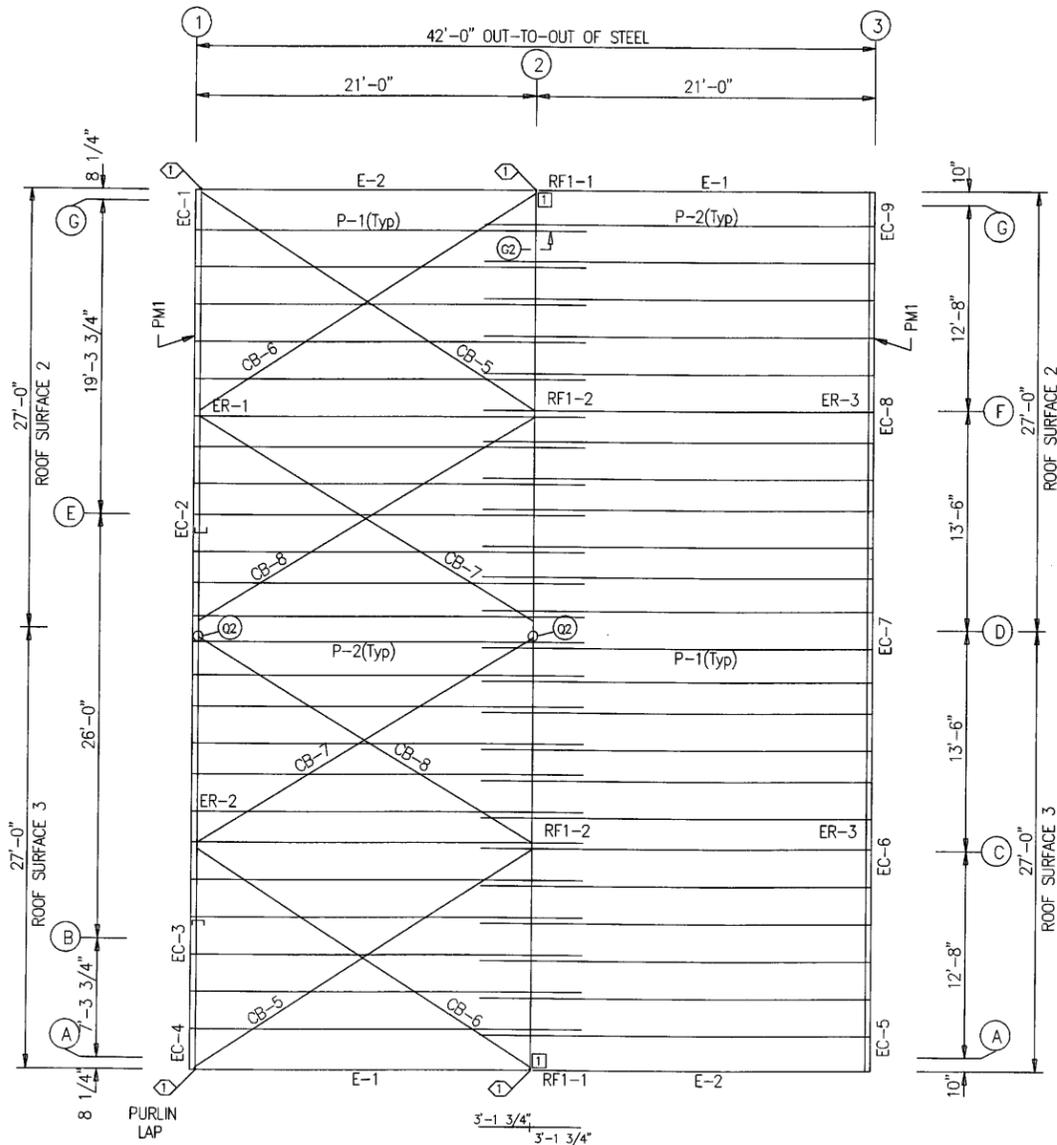
SHEET
 GWD-12AB

SPECIAL BOLTS					
ROOF PLAN					
Q ID	QUAN	TYPE	DIA	LENGTH	WASH
1	4	A325	1/2"	1 1/4"	2

MEMBER TABLE		
ROOF PLAN		
MARK	PART	LENGTH
P-1	10X25Z12	24'-1 1/2"
P-2	10X25Z12	24'-1 1/2"
E-1	10ES4L14	20'-11 1/2"
E-2	10ES4L14	20'-11 1/2"
CB-5	5/16" Dia.	25'-2"
CB-6	5/16" Dia.	25'-3"
CB-7	1/4" Dia.	25'-1"
CB-8	1/4" Dia.	25'-0"

TRIM TABLE	
FRAME LINE	
PART	DETAIL
FL-51	TRIM_60

CONNECTION PLATES	
ROOF PLAN	
Q ID	MARK/PART
1	SC17A



FL-51
(14)

27'-11 3/4"
(14)

27'-11 3/4"
(14)

ROOF SHEETING

PANELS: 26 Ga. PR - Galvalume

ROOF FRAMING PLAN

GENERAL NOTES:

- INSTALL ALL PURLIN AND FLANGE BRACES (FB) AS SHOWN.
- ROOF PANEL PROVIDES STRUCTURAL STABILITY TO THE BUILDING.
- STRUT PURLINS, IF PROVIDED, MUST BE INSTALLED AND FASTENED TO ROOF SHEETING PER "PBR" PANEL ROOF DETAIL.
- DO NOT ADD ANY ADDITIONAL ROOF OPENINGS WITHOUT BUILDING MANUFACTURER APPROVAL OR PROFESSIONAL ENGINEER APPROVAL.
- DO NOT STACK SHEET BUNDLES ON ROOF. ONLY RAISE INDIVIDUAL SHEETS AS NEEDED.
- AFTER INSTALLATION, WIPE ALL PANELS CLEAN OF METAL SHAVINGS CAUSED BY DRILLING.

NOTE:
 Alternate Arrows ▽-△
 Up And Down From Bay
 To Bay For Purlins To Lap.

NOTE:
 PROVIDED AND INSTALLED 42'x54' STEEL FRAMED BUILDING
 FROM HERITAGE BUILDING SYSTEMS.

HERITAGE BUILDING SYSTEMS
Established 1979
 2612 GRIBBLE STREET
 NORTH LITTLE ROCK, AR 72114
 1-800-643-5555

DESCRIPTION: ROOF FRAMING PLAN			
CUSTOMER: S BAR S			
LOCATION: COOKE CITY, MT 59020			
HERITAGE JOB # 3319-245937			
DRAWING BY: AKT	DATE: 9/17/09	LOADS: SEE COVER	SCALE: N.T.S.
CHECK BY: CM	TIME: 7:41am	DRAWING # RFP	REV # 0

REVISION:	DATE:	BY:	DESC:

DRAWN BY: HERITAGE BUILDING
 DESIGNED BY: HERITAGE BUILDING
 CHECKED BY: HERITAGE BUILDING
 APPROVED BY: JSM
 PROJECT NO: 10160
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: NA
 DATUM: NA
 UNITS: FEET
 SOURCE: HERITAGE BUILDING

SCALE IN FEET
 0 N.T.S.

MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 2015 AS-BUILT DRAWINGS

DEWATERING
 CONTROL
 BUILDING
 DETAILS

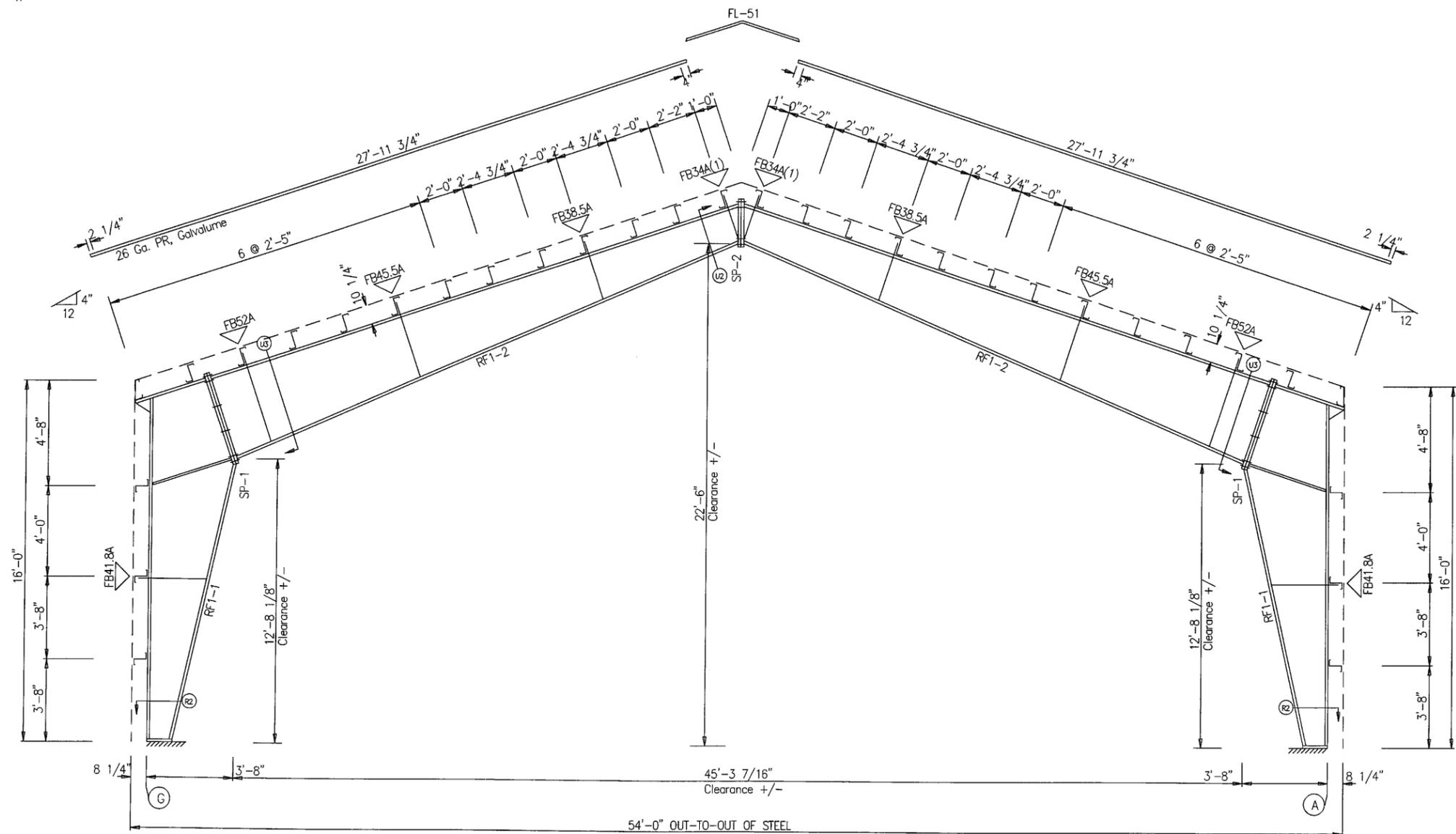
PIONEER
 TECHNICAL SERVICES, INC.
 1101 SOUTH MONTANA
 BUTTE, MONTANA 59701
 (406) 782-5177

SHEET
 GWD-13AB

SPLICE BOLTS						
Splice Mark	Quan Top	Bot	Int	Type	Bolt Dia	Length
SP-1	4	4	4	A325	1"	3 1/4"
SP-2	4	4	0	A325	3/4"	2"

MARK	WEB DEPTH		WEB PLATE		OUTSIDE FLANGE W x T x LENGTH	INSIDE FLANGE W x T x LENGTH
	START	END	THICK	LENGTH		
RF1-1	10.0	43.1	0.313	192.0	6 x 5/16" x 182.5 6 x 3/4" x 38.4 6 x 3/8" x 60.3 6 x 5/16" x 240.0	6 x 5/8" x 150.6 6 x 3/8" x 60.6 6 x 5/16" x 235.1
RF1-2	43.0	37.7	0.375	60.3	6 x 3/8" x 60.3 6 x 5/16" x 240.0	

FLANGE BRACES: Both Sides (Unless Noted)
 FBxx(A): xx=length(in)
 A - L2X2X14C

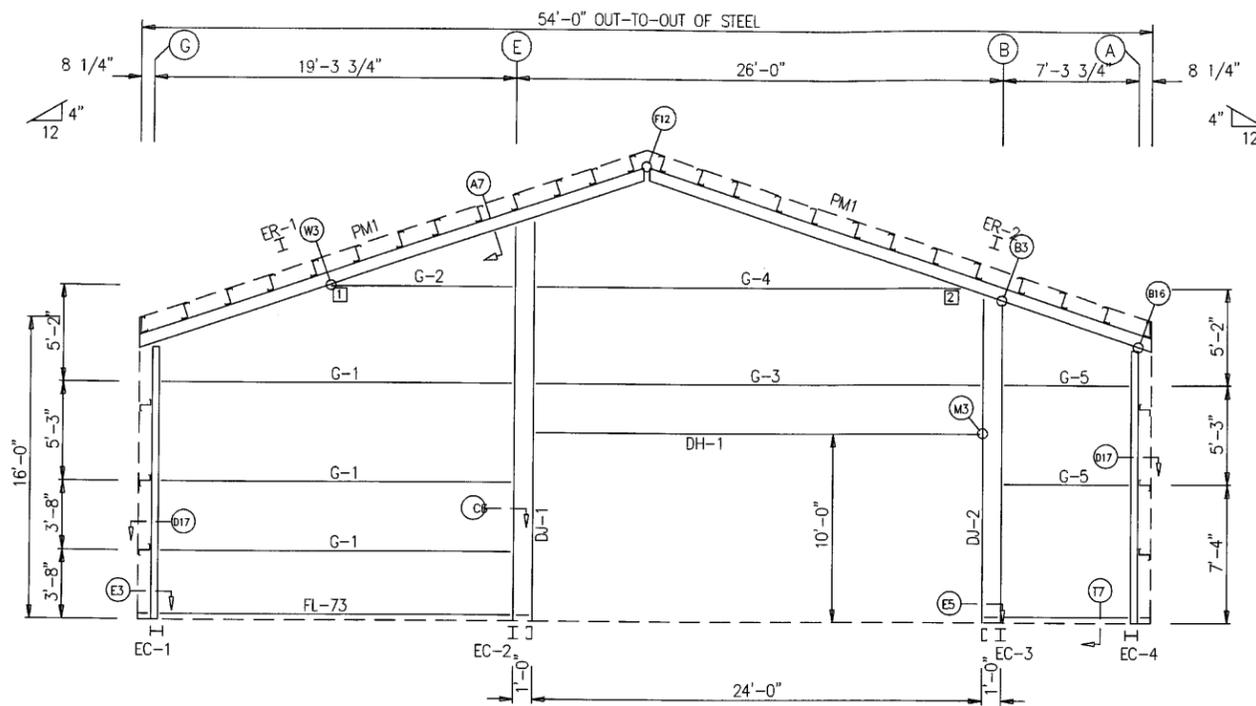


FRAME CROSS SECTION
 FOR FRAME LINE 2

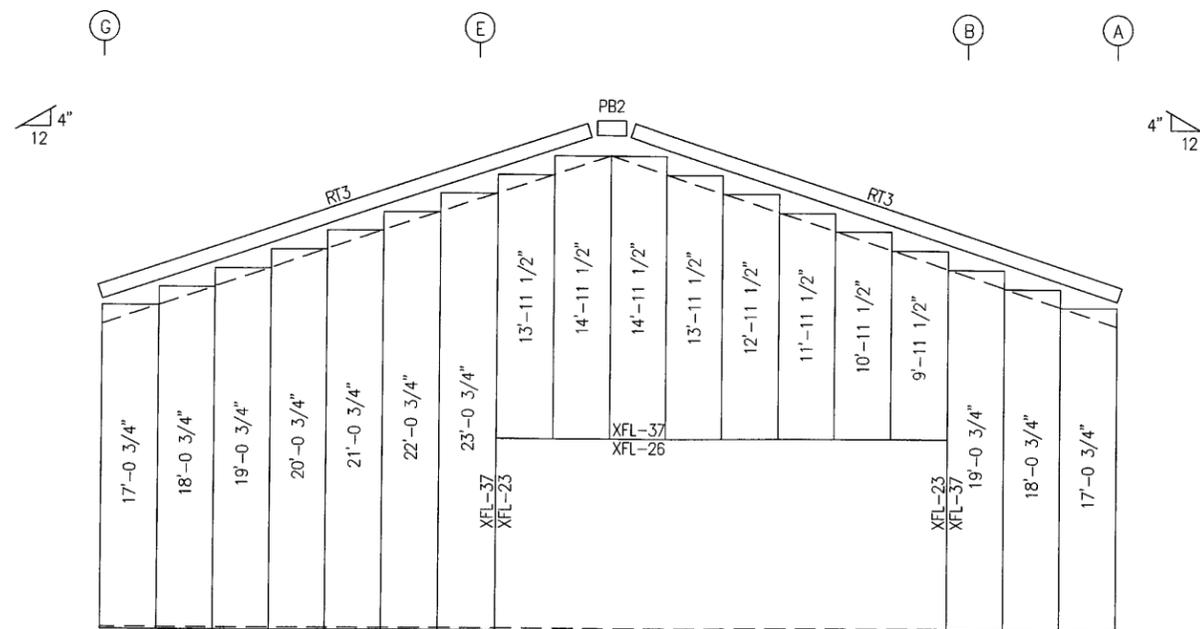
GENERAL NOTES:
 1. ALL FIELD CONNECTIONS OF PRIMARY FRAMING MEMBERS SHALL BE BOLTED WITH A325 H. S. BOLTS AND INSTALLED BY THE "SNUG-TIGHTENED JOINTS" METHOD.
 2. ALL FIELD CONNECTIONS OF SECONDARY FRAMING SHALL BE BOLTED WITH A307 MACHINE BOLTS.
 3. INSTALL ALL FLANGE BRACES ON COLUMN AND RAFTER AS SHOWN.

NOTE:
 PROVIDED AND INSTALLED 42'x54' STEEL FRAMED BUILDING FROM HERITAGE BUILDING SYSTEMS.

HERITAGE BUILDING SYSTEMS <small>Established 1979</small> 2612 GRIBBLE STREET NORTH LITTLE ROCK, AR 72114 1-800-643-5555	DESCRIPTION: FRAME CROSS SECTION		
	CUSTOMER: S BAR S		
	LOCATION: COOKE CITY, MT 59020		
	HERITAGE JOB # 3319-245937		
DRAWING BY: AKT	DATE: 9/17/09	LOADS: SEE COVER	SCALE: N.T.S.
CHECK BY: CM	TIME: 7:41am	DRAWING # FCS1	REV # 0



ENDWALL FRAMING: FRAME LINE 1



ENDWALL SHEETING & TRIM: FRAME LINE 1

PANELS: 26 Ga. PR - NEED COLOR

GENERAL NOTES:

1. INSTALL ALL GIRTS AND FLANGE BRACES (FB) AS SHOWN.
2. WALL PANEL PROVIDES STRUCTURAL STABILITY TO THE BUILDING.
3. OTHER THAN FOR WALK DOORS AND WINDOWS SHOWN ON THE CONTRACT, DO NOT ADD ADDITIONAL WALL OPENINGS WITHOUT APPROVAL OF BUILDING MANUFACTURER OR PROFESSIONAL ENGINEER.
4. AFTER INSTALLATION, WIPE ALL PANELS CLEAN OF METAL SHAVINGS CAUSED BY DRILLING.

NOTE:

PROVIDED AND INSTALLED 42'x54' STEEL FRAMED BUILDING FROM HERITAGE BUILDING SYSTEMS.

BOLT TABLE				
FRAME LINE 1				
LOCATION	QUAN	TYPE	DIA	LENGTH
ER-1/ER-2	8	A325	5/8"	1 3/4"
Columns/Raf	4	A325	1/2"	1 1/4"
Jamb	2	A325	1/2"	1 1/4"

MEMBER TABLE		
FRAME LINE 1		
MARK	PART	LENGTH
EC-1	W8X10	14'-4 1/16"
EC-2	W8X13	20'-7 3/8"
EC-3	W8X13	16'-7 3/8"
EC-4	W8X10	14'-4 1/16"
ER-1	W14X22	28'-5 1/4"
ER-2	W14X22	28'-5 1/4"
DJ-1	8F25C16	20'-9 3/4"
DJ-2	8F25C16	16'-9 3/4"
DH-1	8F25C16	24'-0"
G-1	8X35Z16	18'-3 3/8"
G-2	8X35Z16	8'-1 1/8"
G-3	8X35Z12	23'-11 1/2"
G-4	8X35Z12	21'-4 7/8"
G-5	8X25Z16	6'-3 3/8"

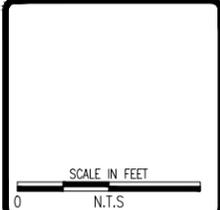
TRIM TABLE	
FRAME LINE 1	
PART	DETAIL
XFL-23	TRIM_5
XFL-26	TRIM_7
XFL-37	TRIM_5
XFL-37	TRIM_7
RT3	TRIM_4
PB2	

CONNECTION PLATES	
FRAME LINE 1	
ID	MARK/PART
1	b1
2	c1

REVISION:	DATE:	BY:	DESC:

DRAWN BY: HERITAGE BUILDING
 DESIGNED BY: HERITAGE BUILDING
 CHECKED BY: HERITAGE BUILDING
 APPROVED BY: JSM
 PROJECT NO: 10160
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: NA
 DATUM: NA
 UNITS: FEET
 SOURCE: HERITAGE BUILDING



MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 2015 AS-BUILT DRAWINGS

DEWATERING
 CONTROL
 BUILDING
 DETAILS



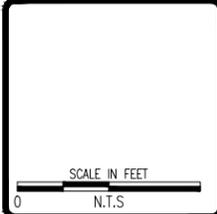
SHEET
 GWD-14AB

<p>2612 GRIBBLE STREET NORTH LITTLE ROCK, AR 72114 1-800-643-5555</p>	DESCRIPTION: LEFT ENDWALL	
	CUSTOMER: S BAR S	
LOCATION: COOKE CITY, MT 59020		
HERITAGE JOB # 3319-245937		
DRAWING BY: AKT	DATE: 9/17/09	LOADS: SEE COVER
CHECK BY: CM	TIME: 7:41am	DRAWING # LEW
SCALE: N.T.S.		REV # 0

REVISION:	DATE:	BY:	DESC:

DRAWN BY: HERITAGE BUILDING
 DESIGNED BY: HERITAGE BUILDING
 CHECKED BY: HERITAGE BUILDING
 APPROVED BY: JSM
 PROJECT NO: 10160
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: NA
 DATUM: NA
 UNITS: FEET
 SOURCE: HERITAGE BUILDING



MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

DEWATERING
 CONTROL
 BUILDING
 DETAILS

PIONEER
 TECHNICAL SERVICES, INC.
 1101 SOUTH MONTANA
 BUTTE, MONTANA 59701
 (406) 782-5177

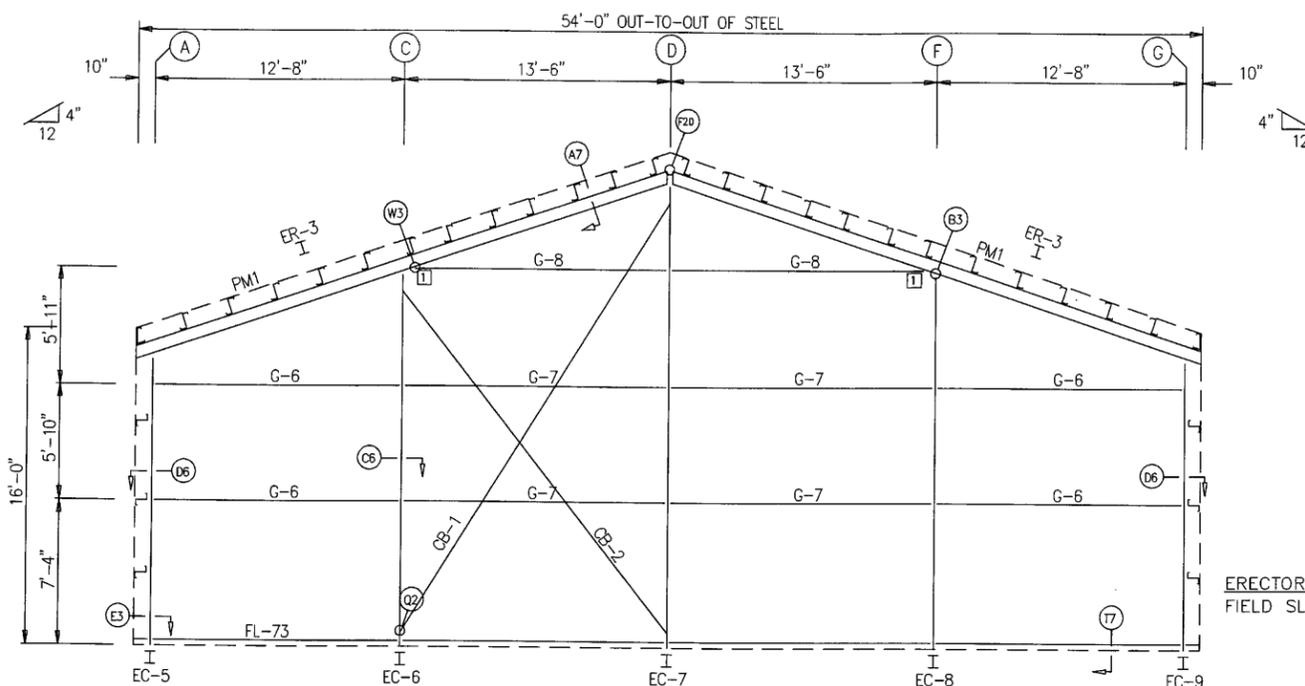
SHEET
 GWD-15AB

BOLT TABLE FRAME LINE 3				
LOCATION	QUAN	TYPE	DIA	LENGTH
ER-3/ER-3	6	A325	5/8"	1 3/4"
Columns/Raf	4	A325	1/2"	1 1/4"

MEMBER TABLE FRAME LINE 3		
MARK	PART	LENGTH
EC-5	W8X10	14'-4 5/8"
EC-6	W8X10	18'-7 5/16"
EC-7	W8X13	23'-0 5/8"
EC-8	W8X10	18'-7 5/16"
EC-9	W8X10	14'-4 5/8"
ER-3	W12X14	28'-5 1/4"
G-6	8X25Z16	12'-0"
G-7	8X25Z16	12'-10"
G-8	8X25Z16	11'-6 15/16"
CB-1	1/2" Dia.	26'-6"
CB-2	1/2" Dia.	22'-11"

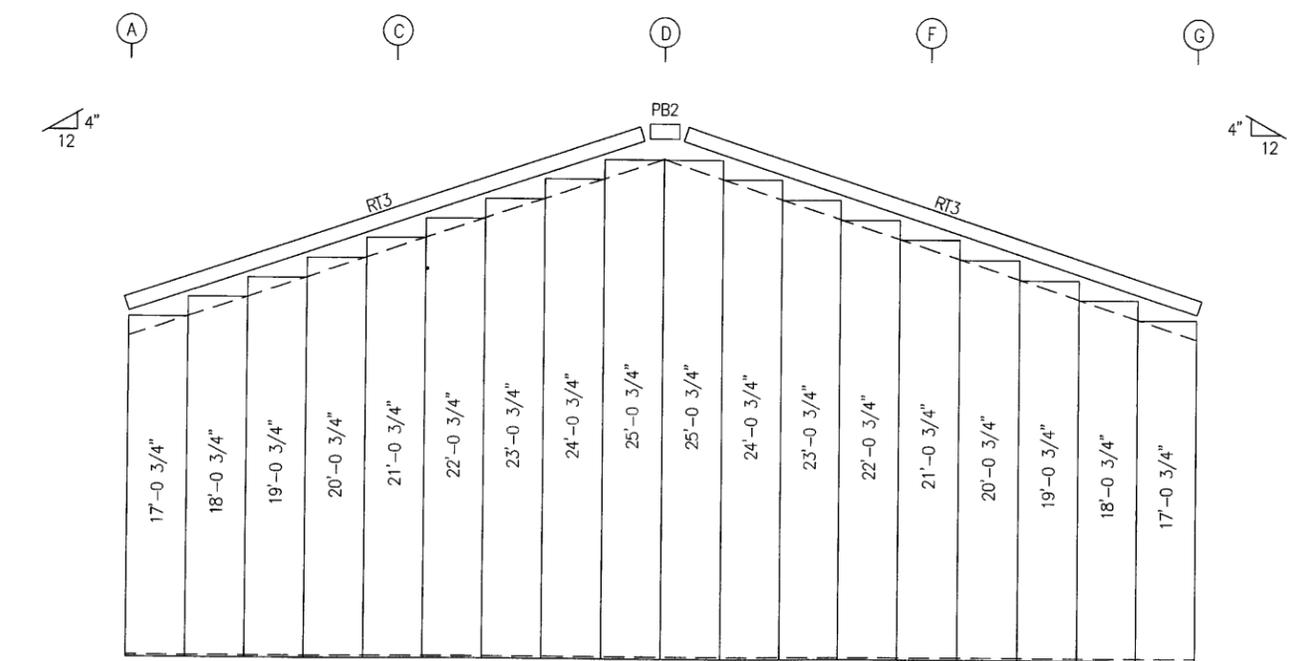
TRIM TABLE FRAME LINE 3	
PART	DETAIL
RT3	TRIM_4
PBE	

CONNECTION PLATES FRAME LINE 3	
ID	MARK/PART
1	b1



ERECTOR NOTE:
 FIELD SLOT GIRT FOR CABLE PASSAGE

ENDWALL FRAMING: FRAME LINE 3



ENDWALL SHEETING & TRIM: FRAME LINE 3
 PANELS: 26 Ga. PR - NEED COLOR

GENERAL NOTES:

1. INSTALL ALL GIRTS AND FLANGE BRACES (FB) AS SHOWN.
2. WALL PANEL PROVIDES STRUCTURAL STABILITY TO THE BUILDING.
3. OTHER THAN FOR WALK DOORS AND WINDOWS SHOWN ON THE CONTRACT, DO NOT ADD ADDITIONAL WALL OPENINGS WITHOUT APPROVAL OF BUILDING MANUFACTURER OR PROFESSIONAL ENGINEER.
4. AFTER INSTALLATION, WIPE ALL PANELS CLEAN OF METAL SHAVINGS CAUSED BY DRILLING.

NOTE:

PROVIDED AND INSTALLED 42'x54' STEEL FRAMED BUILDING FROM HERITAGE BUILDING SYSTEMS.

HERITAGE BUILDING SYSTEMS
Established 1979

2612 GRIBBLE STREET
 NORTH LITTLE ROCK, AR 72114
 1-800-643-5555

DESCRIPTION: RIGHT ENDWALL

CUSTOMER: S BAR S

LOCATION: COOKE CITY, MT 59020

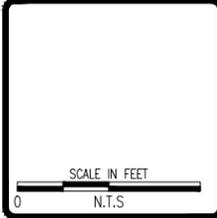
HERITAGE JOB # 3319-245937

DRAWING BY AKT	DATE 9/17/09	LOADS SEE COVER	SCALE N.T.S.
CHECK BY CM	TIME 7:41am	DRAWING # REW	REV # 0

REVISION:	DATE:	BY:	DESC:

DRAWN BY: HERITAGE BUILDING
 DESIGNED BY: HERITAGE BUILDING
 CHECKED BY: HERITAGE BUILDING
 APPROVED BY: JSM
 PROJECT NO: 10160
 DATE: 2/24/14

DISPLAYED AS:
 COORD SYS/ZONE: NA
 DATUM: NA
 UNITS: FEET
 SOURCE: HERITAGE BUILDING



MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

DEWATERING
 CONTROL
 BUILDING
 DETAILS



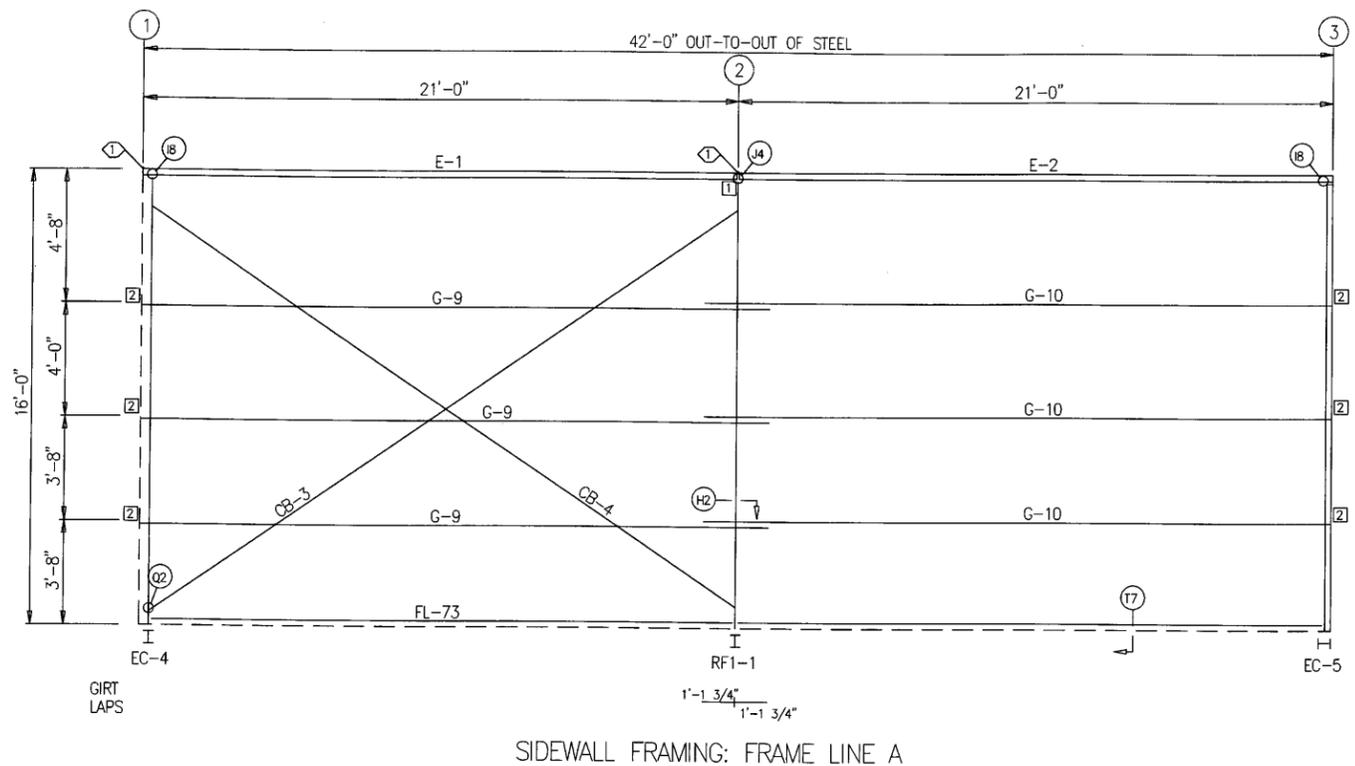
SHEET
 GWD-16AB

SPECIAL BOLTS	Q	U	A	T	D	L	W
ID	AN	TY	DI	LE	WA		
1	4	A325	1/2"	1 1/4"	2		

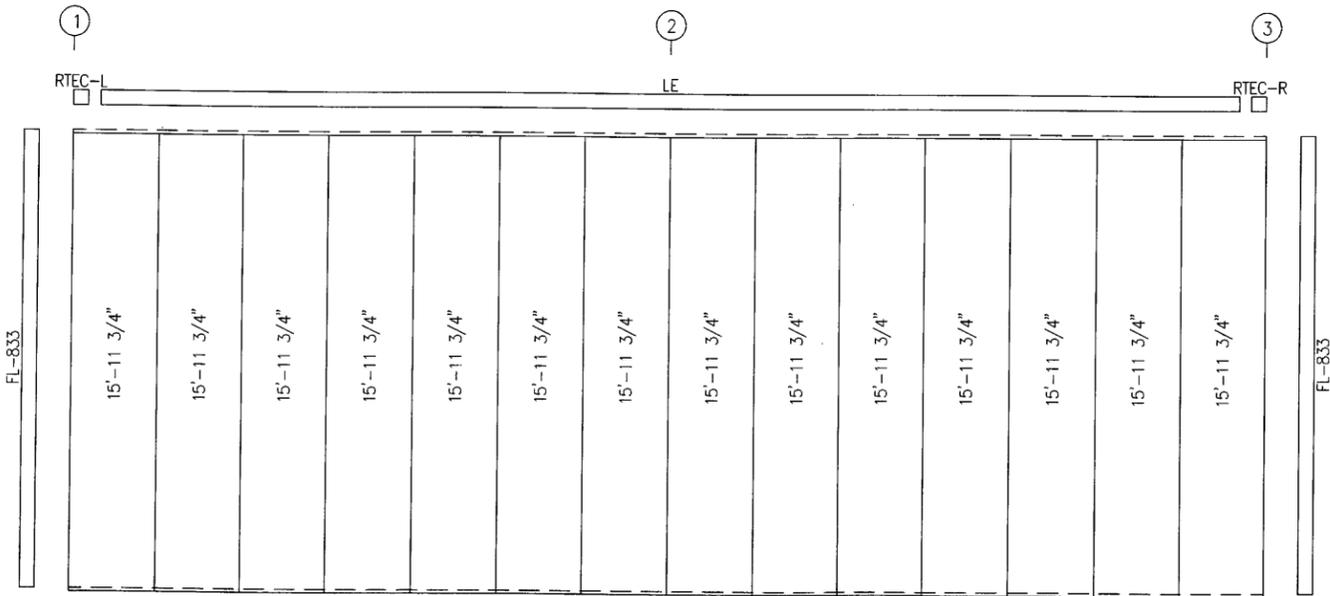
MEMBER TABLE FRAME LINE A		
MARK	PART	LENGTH
E-1	10ES4L14	20'-11 1/2"
E-2	10ES4L14	20'-11 1/2"
G-9	8X25Z16	22'-1 1/2"
G-10	8X25Z16	22'-1 1/2"
CB-3	1/2" Dia.	25'-11"
CB-4	1/2" Dia.	25'-4"

TRIM TABLE FRAME LINE A	
PART	DETAIL
LE	TRIM_3
RTEC-L	TRIM_3
RTEC-R	TRIM_3
FL-833	TRIM_9

CONNECTION PLATES FRAME LINE A	
ID	MARK/PART
1	SC17A
2	SC-5



SIDEWALL FRAMING: FRAME LINE A



SIDEWALL SHEETING & TRIM: FRAME LINE A
 PANELS: 26 Ga. PR - NEED COLOR

GENERAL NOTES:

- INSTALL ALL GIRTS AND FLANGE BRACES (FB) AS SHOWN.
- WALL PANEL PROVIDES STRUCTURAL STABILITY TO THE BUILDING.
- OTHER THAN FOR WALK DOORS AND WINDOWS SHOWN ON THE CONTRACT, DO NOT ADD ADDITIONAL WALL OPENINGS WITHOUT APPROVAL OF BUILDING MANUFACTURER OR PROFESSIONAL ENGINEER.
- AFTER INSTALLATION, WIPE ALL PANELS CLEAN OF METAL SHAVINGS CAUSED BY DRILLING.

NOTE:
 PROVIDED AND INSTALLED 42'x54' STEEL FRAMED BUILDING FROM HERITAGE BUILDING SYSTEMS.

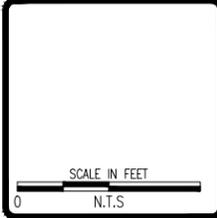
HERITAGE BUILDING SYSTEMS
Established 1979
 2612 GRIBBLE STREET
 NORTH LITTLE ROCK, AR 72114
 1-800-643-5555

DESCRIPTION: FRONT SIDEWALL			
CUSTOMER: S BAR S			
LOCATION: COOKE CITY, MT 59020			
HERITAGE JOB # 3319-245937			
DRAWING BY: AKT	DATE: 9/17/09	LOADS: SEE COVER	SCALE: N.T.S.
CHECK BY: CM	TIME: 7:41am	DRAWING # FSW	REV # 0

REVISION:	DATE:	BY:	DESC:

DRAWN BY: HERITAGE BUILDING
 DESIGNED BY: HERITAGE BUILDING
 CHECKED BY: HERITAGE BUILDING
 APPROVED BY: JSM
 PROJECT NO: 10160
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: NA
 DATUM: NA
 UNITS: FEET
 SOURCE: HERITAGE BUILDING



MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

DEWATERING
 CONTROL
 BUILDING
 DETAILS



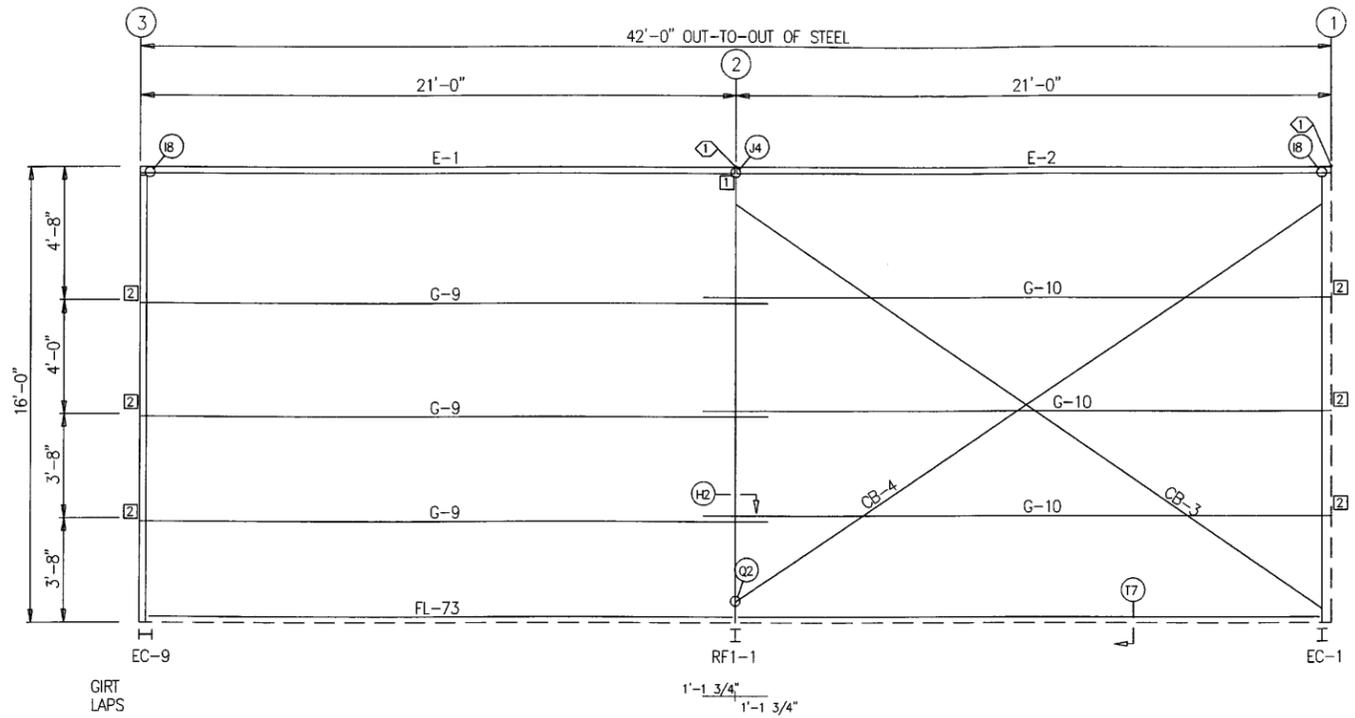
SHEET
GWD-17AB

SPECIAL BOLTS	ID	QUAN	TYPE	DIA	LENGTH	WASH
	1	4	A325	1/2"	1 1/4"	2

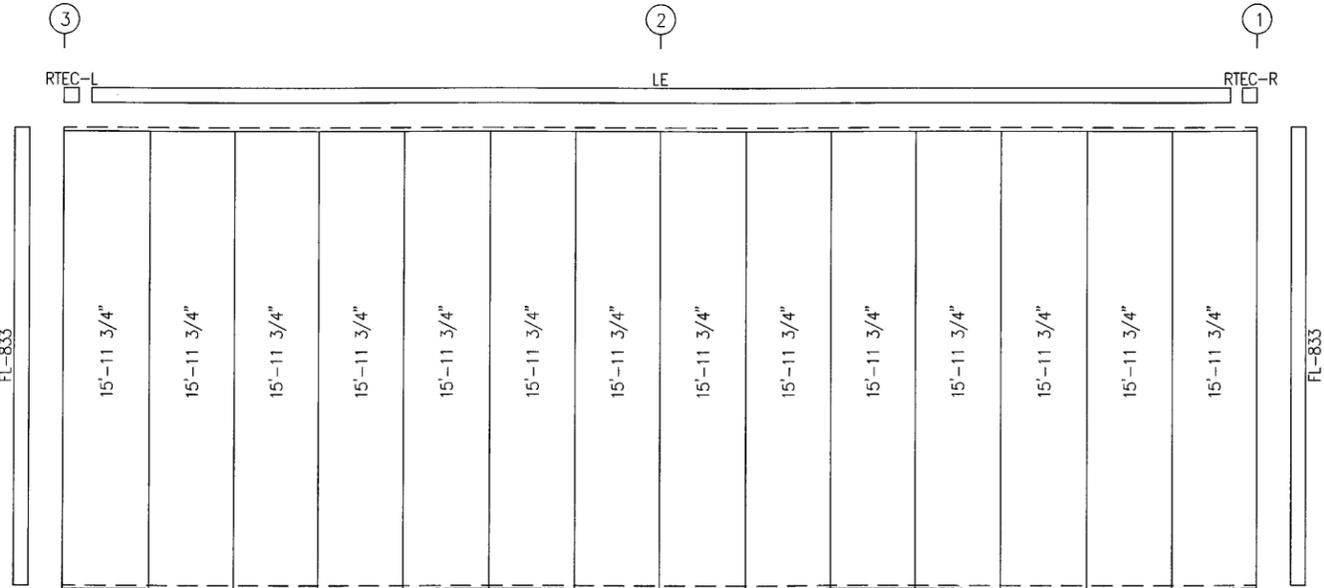
MEMBER TABLE		
FRAME LINE G		
MARK	PART	LENGTH
E-1	10ES4L14	20'-11 1/2"
E-2	10ES4L14	20'-11 1/2"
G-9	8X25Z16	22'-1 1/2"
G-10	8X25Z16	22'-1 1/2"
CB-3	1/2" Dia.	25'-11"
CB-4	1/2" Dia.	25'-4"

TRIM TABLE	
FRAME LINE G	
PART	DETAIL
LE	TRIM_3
RTEC-L	TRIM_3
RTEC-R	TRIM_3
FL-833	TRIM_9

CONNECTION PLATES	
FRAME LINE G	
ID	MARK/PART
1	SC17A
2	SC-5



SIDEWALL FRAMING: FRAME LINE G



SIDEWALL SHEETING & TRIM: FRAME LINE G

PANELS: 26 Ga. PR - NEED COLOR

- GENERAL NOTES:**
1. INSTALL ALL GIRTS AND FLANGE BRACES (FB) AS SHOWN.
 2. WALL PANEL PROVIDES STRUCTURAL STABILITY TO THE BUILDING.
 3. OTHER THAN FOR WALK DOORS AND WINDOWS SHOWN ON THE CONTRACT, DO NOT ADD ADDITIONAL WALL OPENINGS WITHOUT APPROVAL OF BUILDING MANUFACTURER OR PROFESSIONAL ENGINEER.
 4. AFTER INSTALLATION, WIPE ALL PANELS CLEAN OF METAL SHAVINGS CAUSED BY DRILLING.

NOTE:
 PROVIDED AND INSTALLED 42'x54' STEEL FRAMED BUILDING FROM HERITAGE BUILDING SYSTEMS.

HERITAGE BUILDING SYSTEMS
Established 1979
 2612 GRIBBLE STREET
 NORTH LITTLE ROCK, AR 72114
 1-800-643-5555

DESCRIPTION: BACK SIDEWALL			
CUSTOMER: S BAR S			
LOCATION: COOKE CITY, MT 59020			
HERITAGE JOB # 3319-245937			
DRAWING BY	DATE	LOADS	SCALE
AKT	9/17/09	SEE COVER	N.T.S.
CHECK BY	TIME	DRAWING #	REV #
CM	7:41am	BSW	0

REVISION:	DATE:	BY:	DESC:

DRAWN BY: HERITAGE BUILDING
DESIGNED BY: HERITAGE BUILDING
CHECKED BY: HERITAGE BUILDING
APPROVED BY: JSM
PROJECT NO: 10160
DATE: 2/24/15

DISPLAYED AS:
COORD SYS/ZONE: NA
DATUM: NA
UNITS: FEET
SOURCE: HERITAGE BUILDING

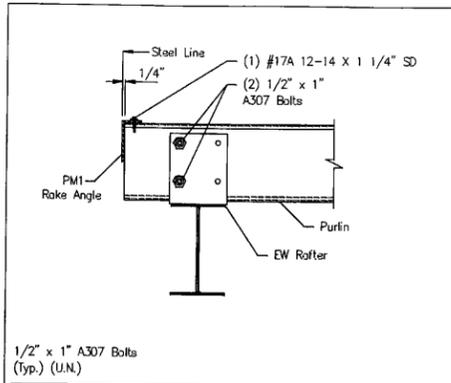
SCALE IN FEET
0 N.T.S.

MDEQ/MWCB
MCLAREN TAILINGS ABANDONED
MINE SITE RECLAMATION PROJECT
FINAL AS-BUILT DRAWINGS

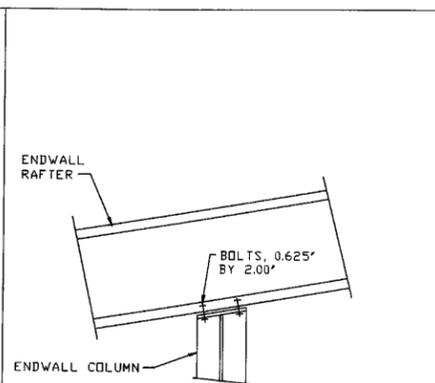
DEWATERING
CONTROL
BUILDING
DETAILS

PIONEER
TECHNICAL SERVICES, INC.
1101 SOUTH MONTANA
BUTTE, MONTANA 59701
(406) 782-5177

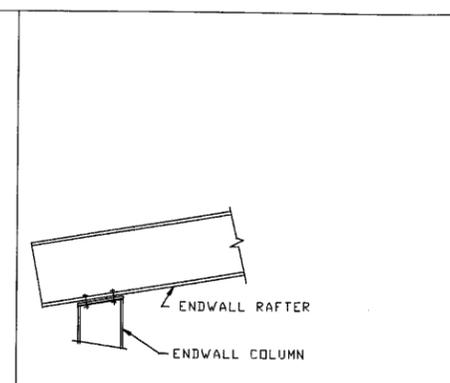
SHEET
GWD-18AB



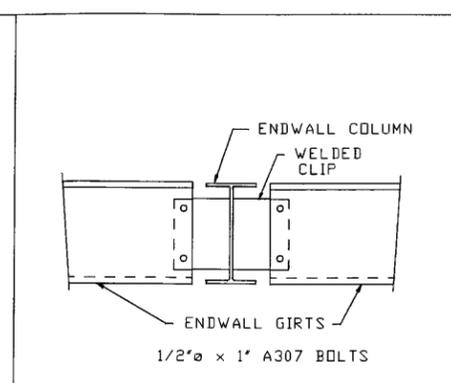
A7 SECTION THRU HOT ROLLED RAFTER



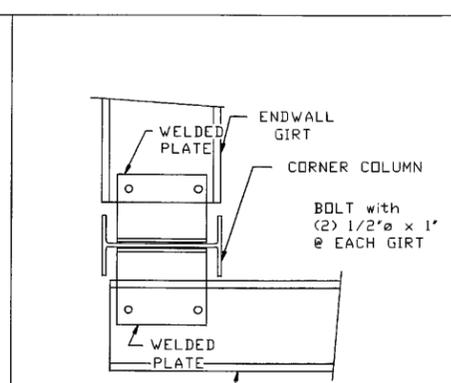
B3 ENDWALL RAFTER TO COLUMN



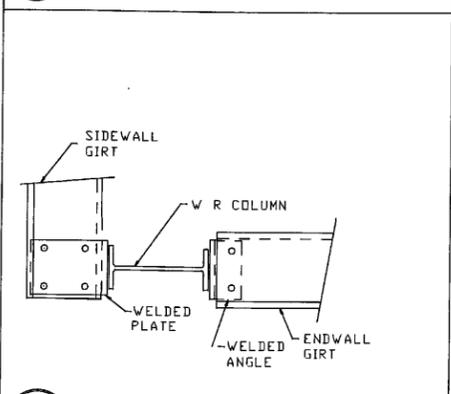
B16 CORNER COLUMN TO ENDWALL RAFTER



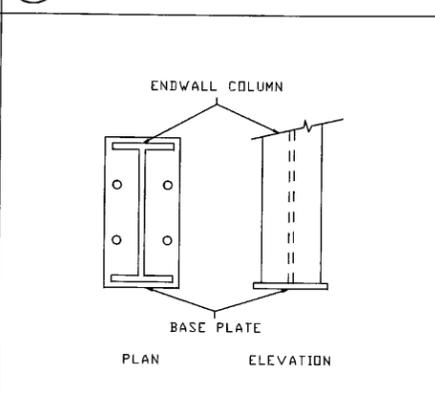
C6 ENDWALL COLUMN TO WALL GIRT



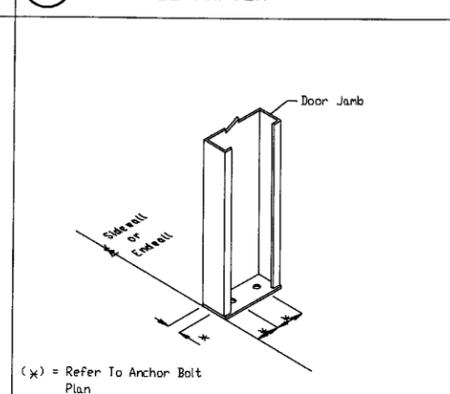
D6 CORNER COLUMN TO WALL GIRT



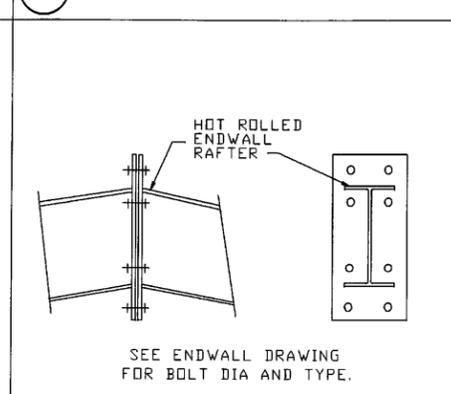
D17 CORNER COLUMN TO WALL GIRT



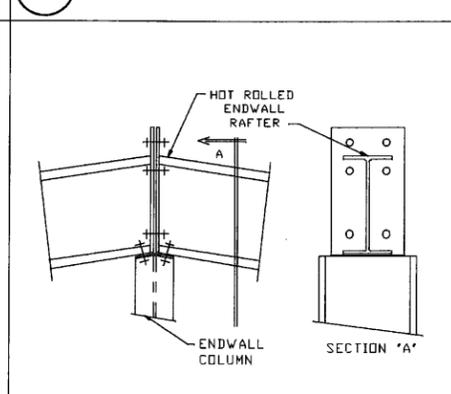
E3 BASE PLATE FOR ENDWALL COLUMN



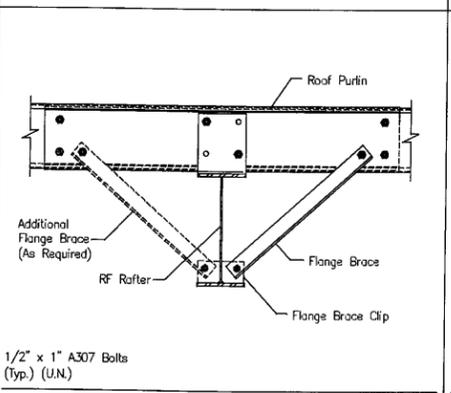
E5 BASE PLATE FOR DOOR JAMB



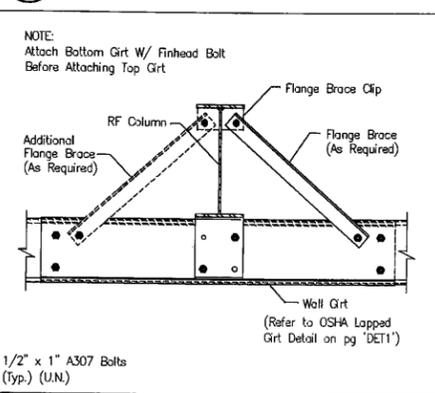
F12 RAFTER SPLICE AT SURFACE CHANGE



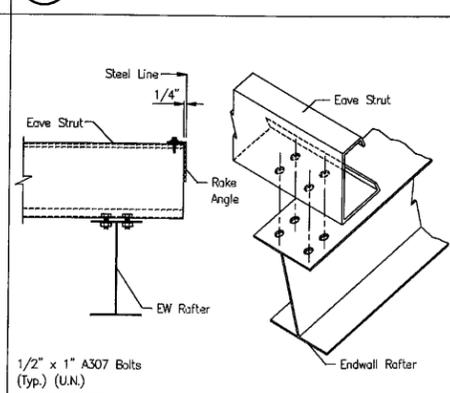
F20 RAFTER SPLICE AT SURFACE CHANGE



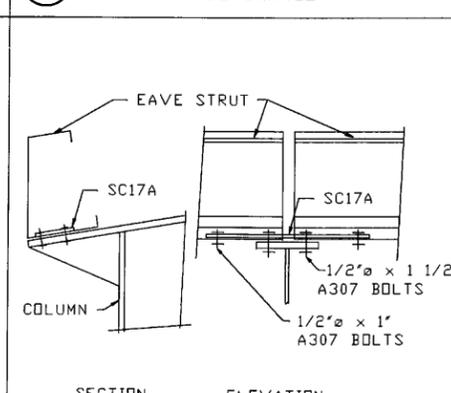
G2 ROOF PURLIN TO INTERIOR FRAME RAFTER



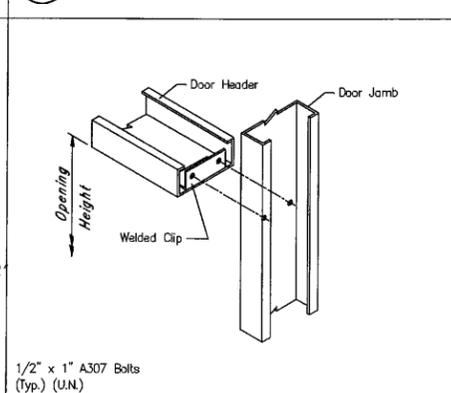
H2 WALL GIRT TO RIGID FRAME COLUMN



I8 LOW SIDE EAVE STRUT TO HOT ROLLED RAFTER



J4 EAVE STRUT TO RIGID FRAME



M3 DOOR HEADER TO DOOR JAMB

NOTE:
PROVIDED AND INSTALLED 42'x54' STEEL FRAMED BUILDING
FROM HERITAGE BUILDING SYSTEMS.

HERITAGE BUILDING SYSTEMS Established 1979 2612 GRIBBLE STREET NORTH LITTLE ROCK, AR 72114 1-800-643-5555	DESCRIPTION: DETAIL DRAWINGS
	CUSTOMER: S BAR S
	LOCATION: COOKE CITY, MT 59020
	HERITAGE JOB # 3319-245937
DRAWING BY: AKT	DATE: 9/17/09
CHECK BY: CM	TIME: 7:41am
LOADS: SEE COVER	SCALE: N.T.S.
DRAWING # DET1	REV # 0

REVISION:	DATE:	BY:	DESC:

DRAWN BY: HERITAGE BUILDING
DESIGNED BY: HERITAGE BUILDING
CHECKED BY: HERITAGE BUILDING
APPROVED BY: JSM
PROJECT NO: 10160
DATE: 2/24/15

DISPLAYED AS:
COORD SYS/ZONE: NA
DATUM: NA
UNITS: FEET
SOURCE: HERITAGE BUILDING

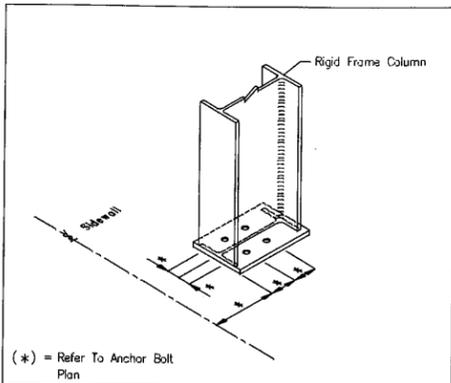
SCALE IN FEET
0 N.T.S.

MDEQ/MWCB
MCLAREN TAILINGS ABANDONED
MINE SITE RECLAMATION PROJECT
FINAL AS-BUILT DRAWINGS

DEWATERING
CONTROL
BUILDING
DETAILS

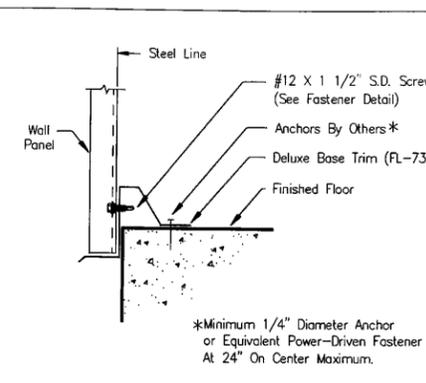
PIONEER
TECHNICAL SERVICES, INC.
1101 SOUTH MONTANA
BUTTE, MONTANA 59701
(406) 782-5177

SHEET
GWD-19AB



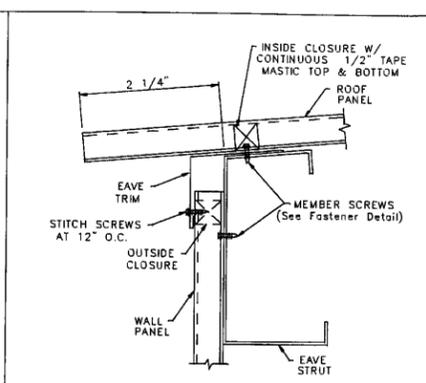
(*) = Refer To Anchor Bolt Plan

R2 ANCHOR BOLTS AT SIDEWALL COLUMNS

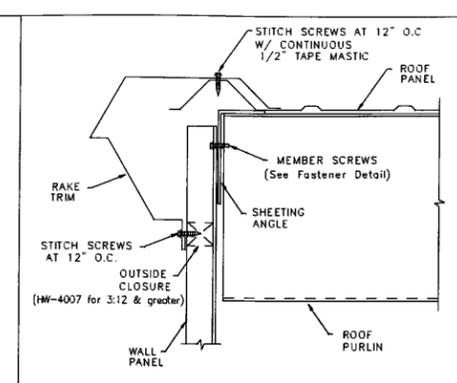


*Minimum 1/4" Diameter Anchor or Equivalent Power-Driven Fastener At 24" On Center Maximum.

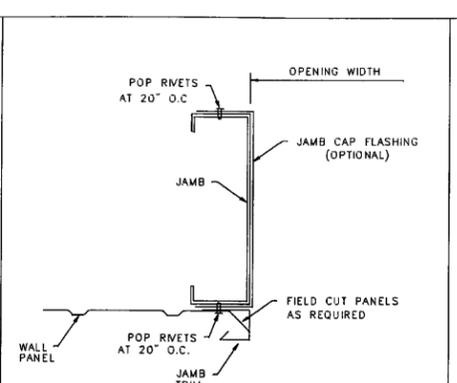
T7 SECTION THRU WALL PANEL AND CONCRETE FOUNDATION WITH DELUXE BASE TRIM



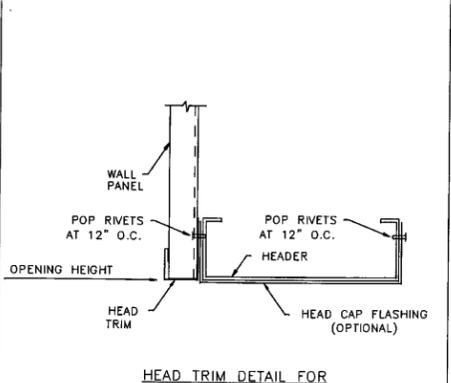
EAVE DETAIL WITH SIMPLE EAVE TRIM AND SHEETED WALL TRIM_3.DXF



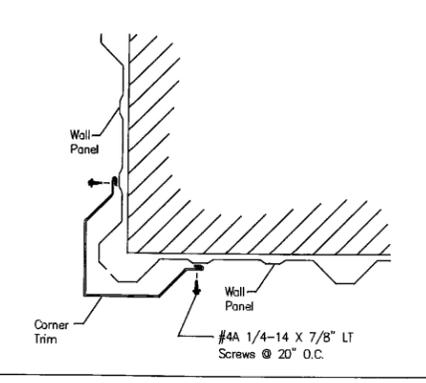
RAKE DETAIL WITH SHEETED WALL TRIM_4.DXF



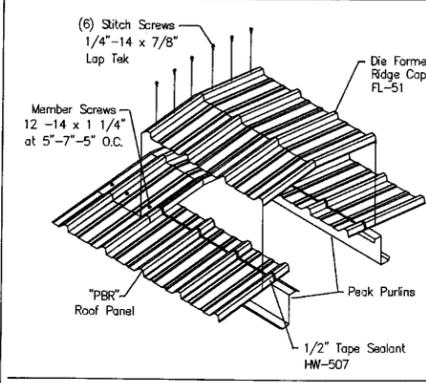
JAMB TRIM DETAIL FOR "R" PANEL TRIM_5



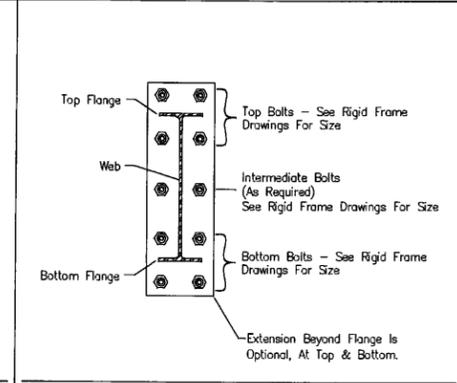
HEAD TRIM DETAIL FOR "R" & "A" PANEL TRIM_7



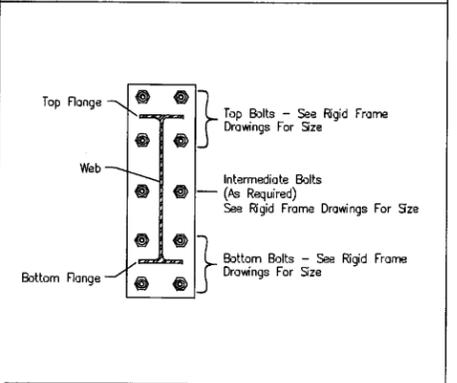
CORNER TRIM DETAIL FOR "R" PANEL Trim_9



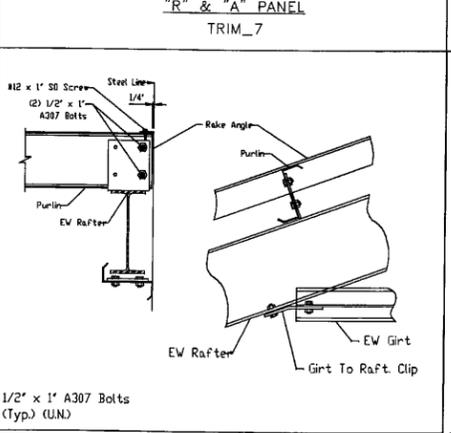
"PBR" ROOF FIXED RIDGE DETAIL Trim_80



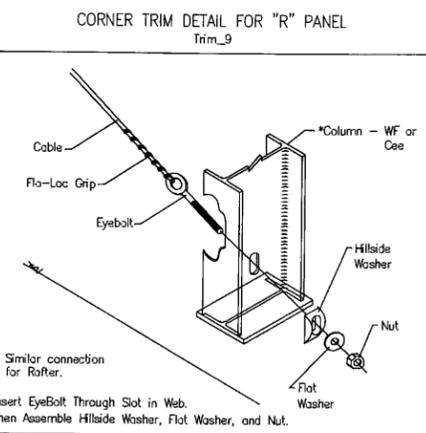
U2 BOLTS FOR RIGID FRAME RAFTER AT BUILDING PEAK



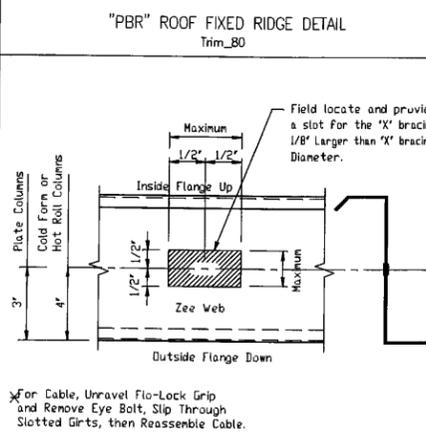
U3 BOLTS FOR RIGID FRAME RAFTER TO COLUMN CONNECTION



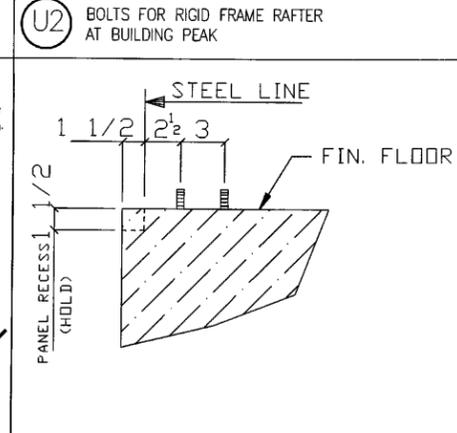
W3 ENDWALL GIRTS TO HOT ROLLED RAFTER CONNECTION



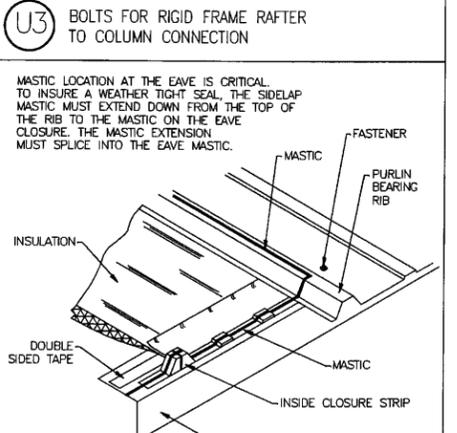
Q2 DIAGONAL CABLE, EYEBOLT END



NOTE:
For Cable, Unravel Flo-Lock Grip and Remove Eye Bolt, Slip Through Slotted Girts, then Reassemble Cable.



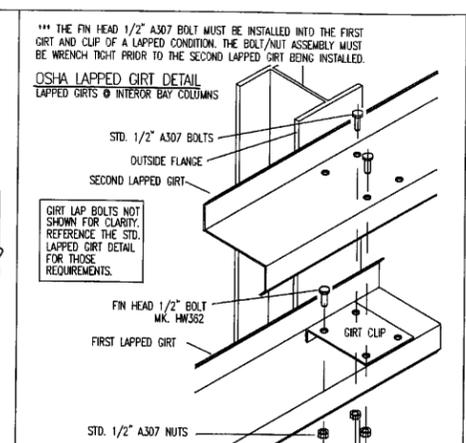
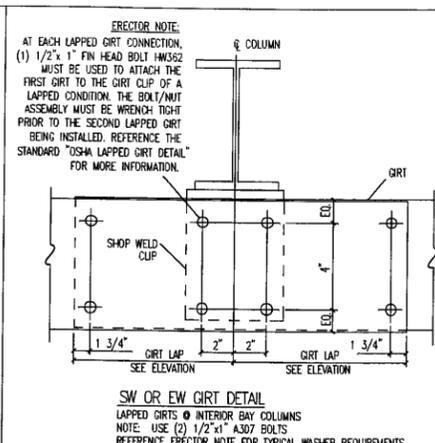
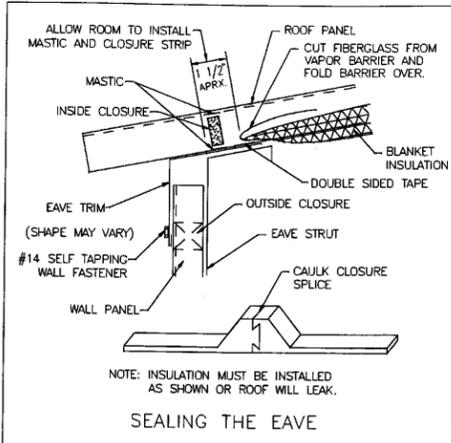
CONCRETE DETAIL FOR WALKDOOR



SEALING THE EAVE

HERITAGE BUILDING SYSTEMS <small>Established 1979</small> 2612 GRIBBLE STREET NORTH LITTLE ROCK, AR 72114 1-800-643-5555	DESCRIPTION: DETAIL DRAWINGS		
	CUSTOMER: S BAR S		
	LOCATION: COOKE CITY, MT 59020		
	HERITAGE JOB # 3319-245937		
DRAWING BY: AKT	DATE: 9/17/09	LOADS: SEE COVER	SCALE: N.T.S.
CHECK BY: CM	TIME: 7:41am	DRAWING # DET2	REV # 0

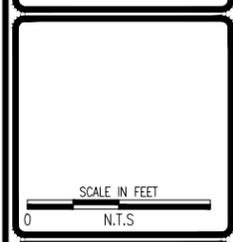
NOTE:
PROVIDED AND INSTALLED 42'x54' STEEL FRAMED BUILDING FROM HERITAGE BUILDING SYSTEMS.



REVISION:	BY:	DESC:

DRAWN BY: HERITAGE BUILDING
 DESIGNED BY: HERITAGE BUILDING
 CHECKED BY: HERITAGE BUILDING
 APPROVED BY: JSM
 PROJECT NO: 10160
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: NA
 DATUM: NA
 UNITS: FEET
 SOURCE: HERITAGE BUILDING



MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 2014 AS-BUILT DRAWINGS

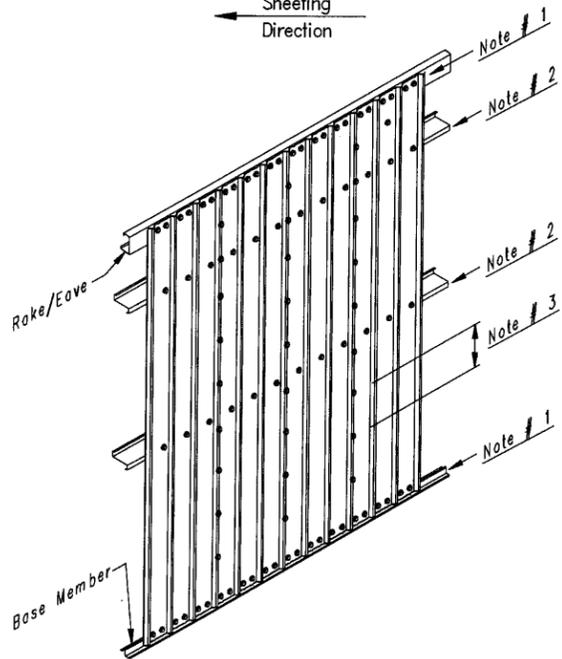
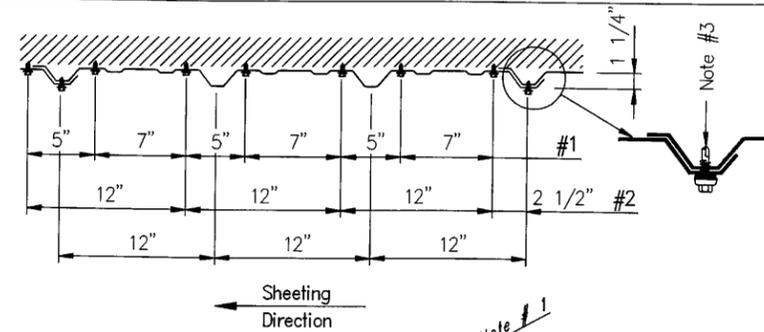
DEWATERING
 CONTROL
 BUILDING
 DETAILS



HERITAGE BUILDING SYSTEMS <small>Established 1979</small>			
2612 GRIBBLE STREET NORTH LITTLE ROCK, AR 72114 1-800-643-5555			
DESCRIPTION: DETAIL DRAWINGS		CUSTOMER: S BAR S	
LOCATION: COOKE CITY, MT 59020		HERITAGE JOB # 3319-245937	
DRAWING BY: AKT	DATE: 9/17/09	LOADS: SEE COVER	SCALE: N.T.S.
CHECK BY: CM	TIME: 7:41 am	DRAWING # DET3	REV # 0

NOTE:
 PROVIDED AND INSTALLED 42'x54' STEEL FRAMED BUILDING FROM HERITAGE BUILDING SYSTEMS.

NOTE: These drawings are intended to depict general installation of item(s) described below. Some item(s) may have been omitted for clarity of presentation. Consult your erection manual or additional Details for further guidelines and/or clarifications.



- Note # 1**
Member Fastener
12-14 x 1 1/4" at
5", 7", 5" pattern
- Note # 2**
Member Fastener
12-14 x 1 1/4" at
12" O.C.
- Note # 3**
Stitch Fastener
1/4-14 x 7/8" at
20" O.C.

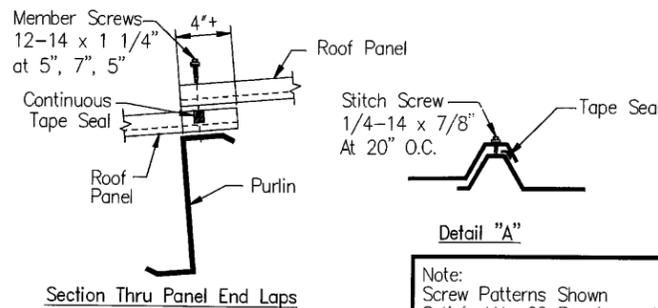
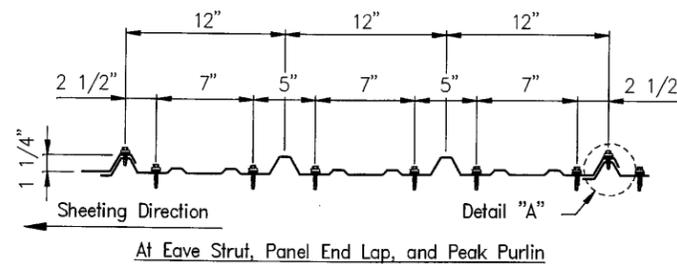
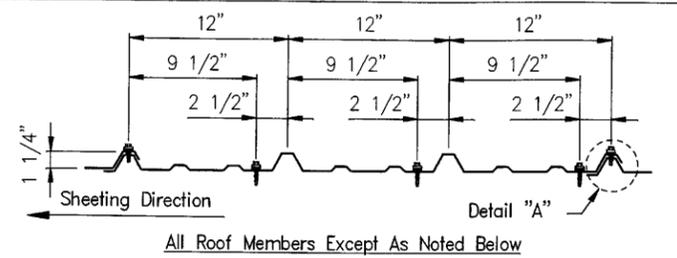
Fastener Location "PBR" Panel At Wall

DRAWING NO.

NS1

9/28/07

Created On: 09/15/02



Note:
Screw Patterns Shown
Satisfy U.L. 90 Requirements
For Roof

Fastener Location For "PBR" Roof Panel

DRAWING NO.

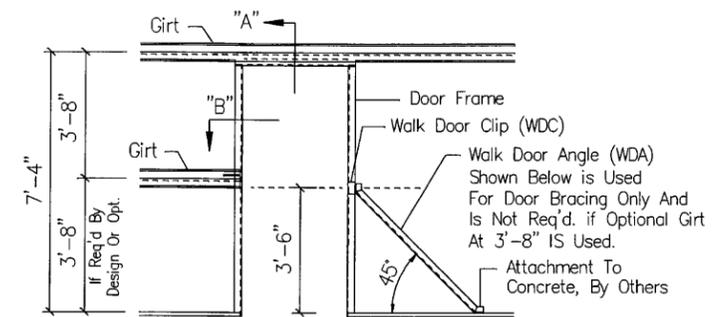
NS2

7-17-07

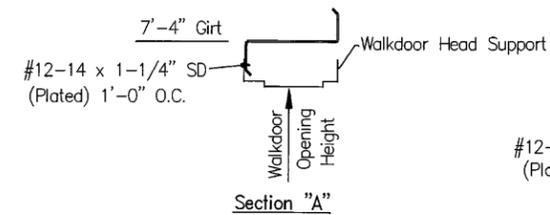
Created On: 04/15/01

NOTE:

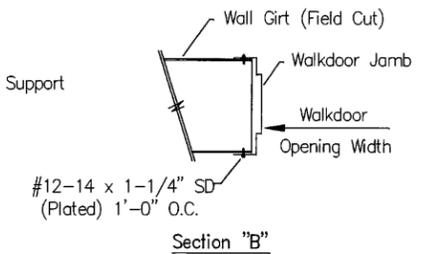
PROVIDED AND INSTALLED 42'x54' STEEL FRAMED BUILDING FROM HERITAGE BUILDING SYSTEMS.



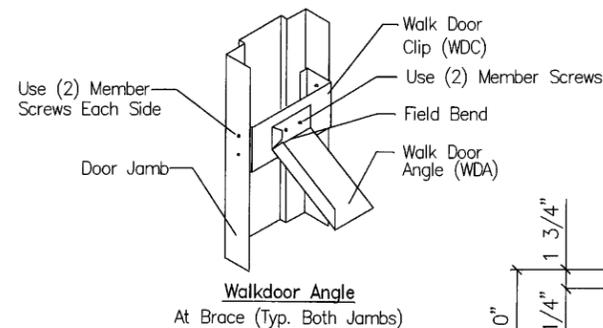
Walkdoor Detail



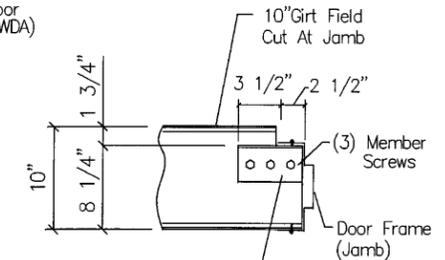
Section "A"



Section "B"



Walkdoor Angle At Brace (Typ. Both Jamb)



Section "B" @ 10" Girt

Walkdoor Details

ERECTOR NOTE: Field Cut Girts Below 7'-4" to Attach to the Walkdoor Jamb with #12-14 x 1-1/4" Self Driller Screws (2) Each Side as Per Section "B" above.

For Walkdoor with Framed Openings: First Install Walkdoor then Install F.O. Jamb and Header

HERITAGE BUILDING SYSTEMS
Established 1979

2612 GRIBBLE STREET
NORTH LITTLE ROCK, AR 72114
1-800-643-5555

DESCRIPTION: DETAIL DRAWINGS

CUSTOMER: S BAR S

LOCATION: COOKE CITY, MT 59020

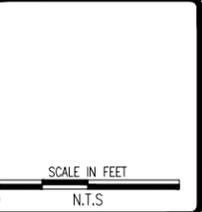
HERITAGE JOB # 3319-245937

DRAWING BY: AKT	DATE: 9/17/09	LOADS: SEE COVER	SCALE: N.T.S.
CHECK BY: CM	TIME: 7:41am	DRAWING #: DET4	REV #: 0

REVISION:	DATE:	BY:	DESC:

DRAWN BY: HERITAGE BUILDING
DESIGNED BY: HERITAGE BUILDING
CHECKED BY: HERITAGE BUILDING
APPROVED BY: JSM
PROJECT NO: 10160
DATE: 2/24/15

DISPLAYED AS:
COORD SYS/ZONE: NA
DATUM: NA
UNITS: FEET
SOURCE: HERITAGE BUILDING



MDEQ/MWCB
MCLAREN TAILINGS ABANDONED
MINE SITE RECLAMATION PROJECT
FINAL AS-BUILT DRAWINGS

4/24/12
CONTROL BUILDING
DETAILS

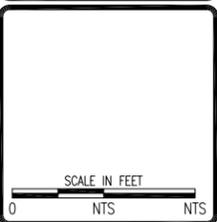
PIONEER
TECHNICAL SERVICES, INC.
1101 SOUTH MONTANA
BUTTE, MONTANA 59701
(406) 782-5177

SHEET
GWD-21AB

REVISION	DATE	BY	DESC.

DRAWN BY: JB
DESIGNED BY: JL
CHECKED BY: MCB
APPROVED BY: JSA
PROJECT NO: 10160
DATE: 2/24/13

DISPLAYED AS:
COORD SYS/ZONE: NA
DATUM: NA
UNITS: NA
SOURCE: PIONEER

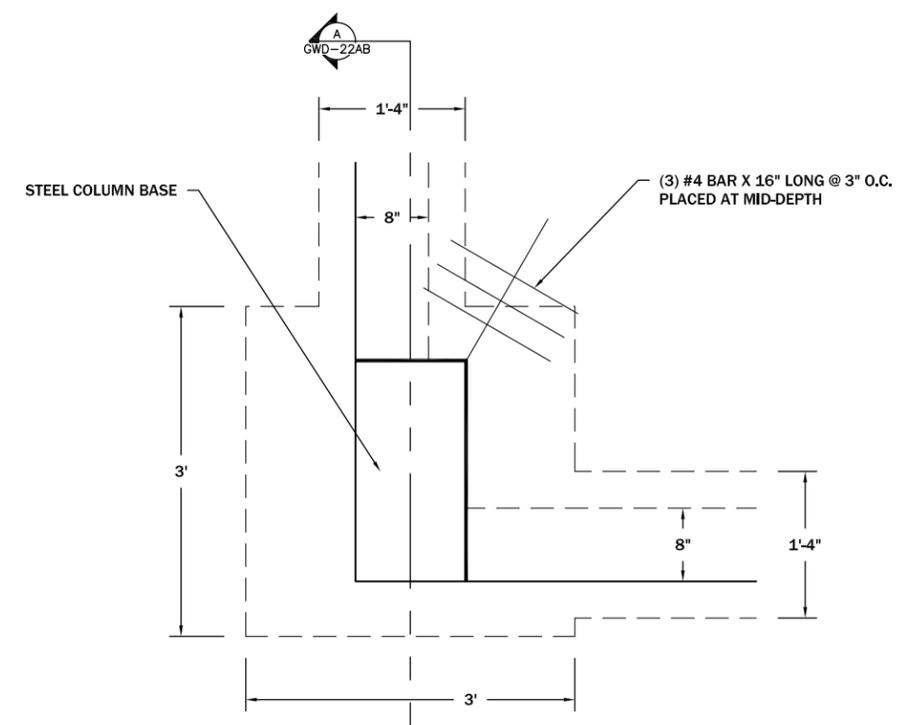


MDEQ/MWCB
MCLAREN TAILINGS ABANDONED
MINE SITE RECLAMATION PROJECT
FINAL AS-BUILT DRAWINGS

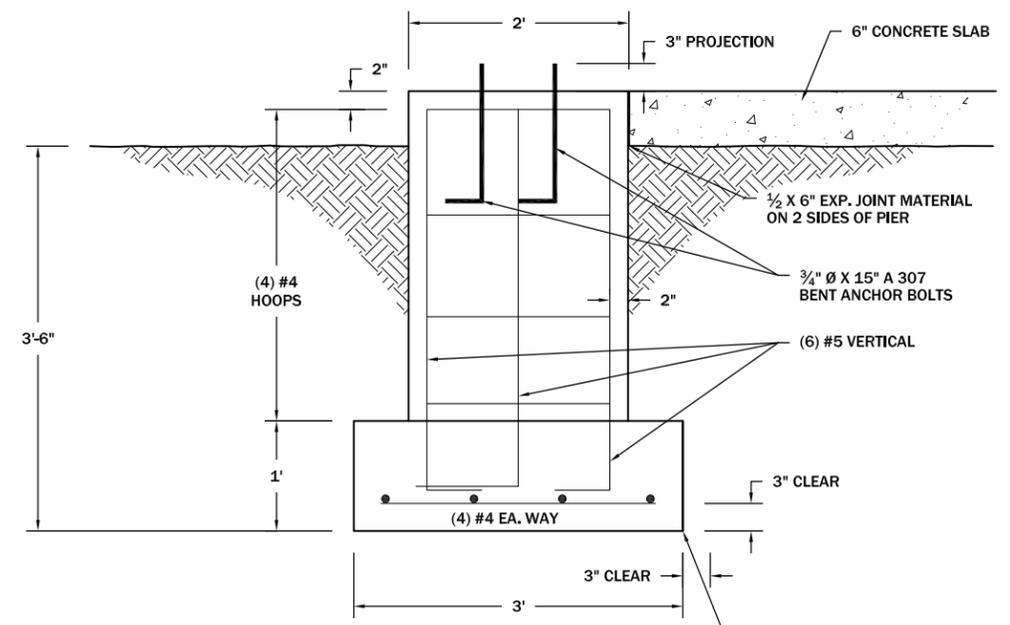
DEWATERING CONTROL
BUILDING
FOOTING
DETAIL



SHEET
GWD-22AB



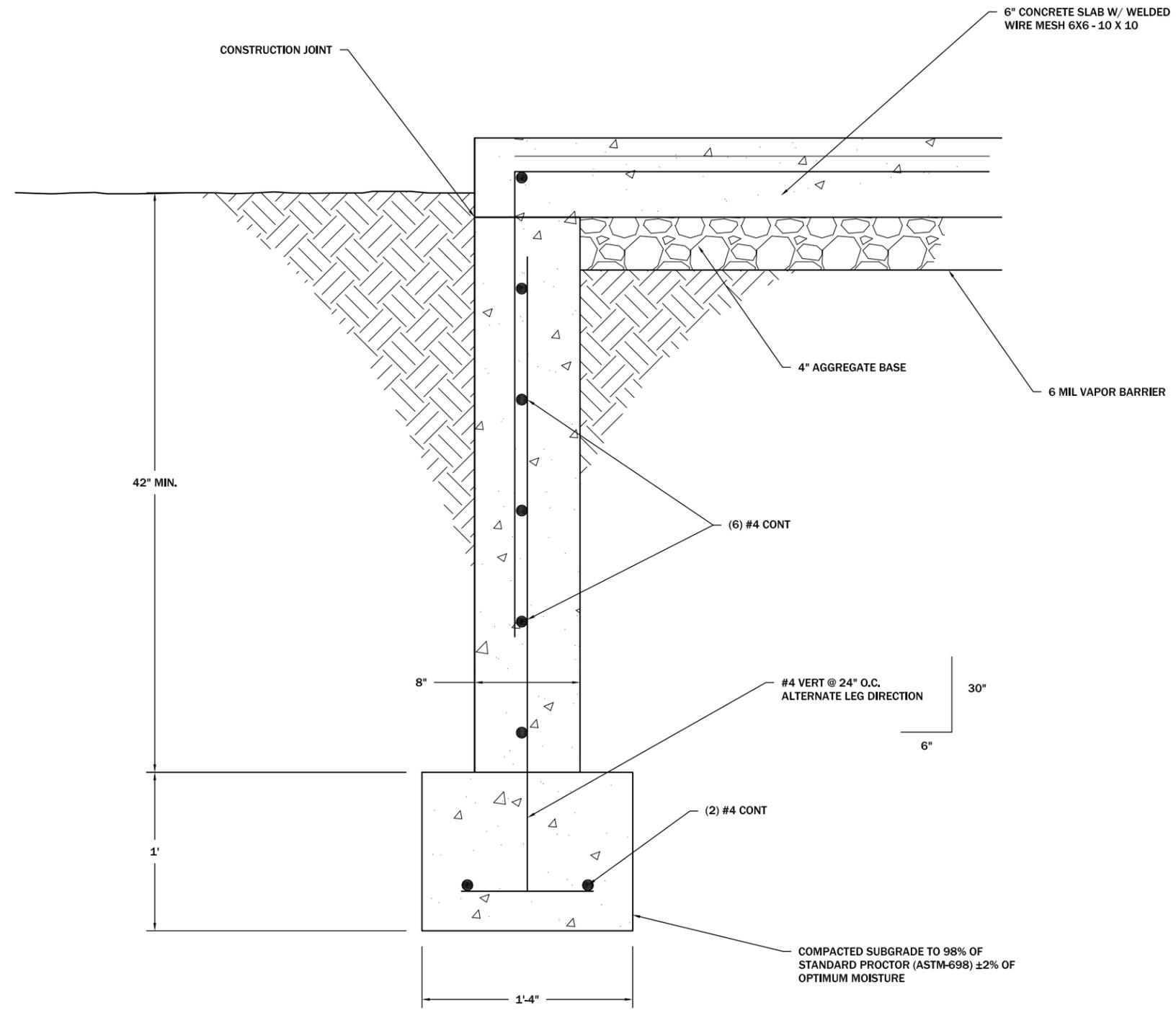
PLAN VIEW



SECTION A-A

COMPACTED
SUBGRADE TO 98%
OF STANDARD
PROCTOR (ASTM-698)
±2% OF OPTIMUM
MOISTURE

NOTE:
1. THIS STRUCTURE WAS PROVIDED AND INSTALLED IN 2010 AND WAS UTILIZED FROM 2010 TO 2013. IN 2014, THE FOOTINGS AND SLAB FOR THE BUILDING WAS COVERED WITH COVER SOILS.



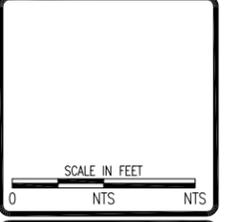
NOTE:

1. THIS STRUCTURE WAS PROVIDED AND INSTALLED IN 2010 AND WAS UTILIZED FROM 2010 TO 2013. IN 2014, THE FOOTINGS AND SLAB FOR THE BUILDING WAS COVERED WITH COVER SOILS.

REVISION	DATE	BY	DESC.

DRAWN BY: JB
 DESIGNED BY: JL
 CHECKED BY: HCB
 APPROVED BY: JSA
 PROJECT NO: 10160
 DATE: 2/24/13

DISPLAYED AS:
 COORD SYS/ZONE: NA
 DATUM: NA
 UNITS: NA
 SOURCE: PIONEER



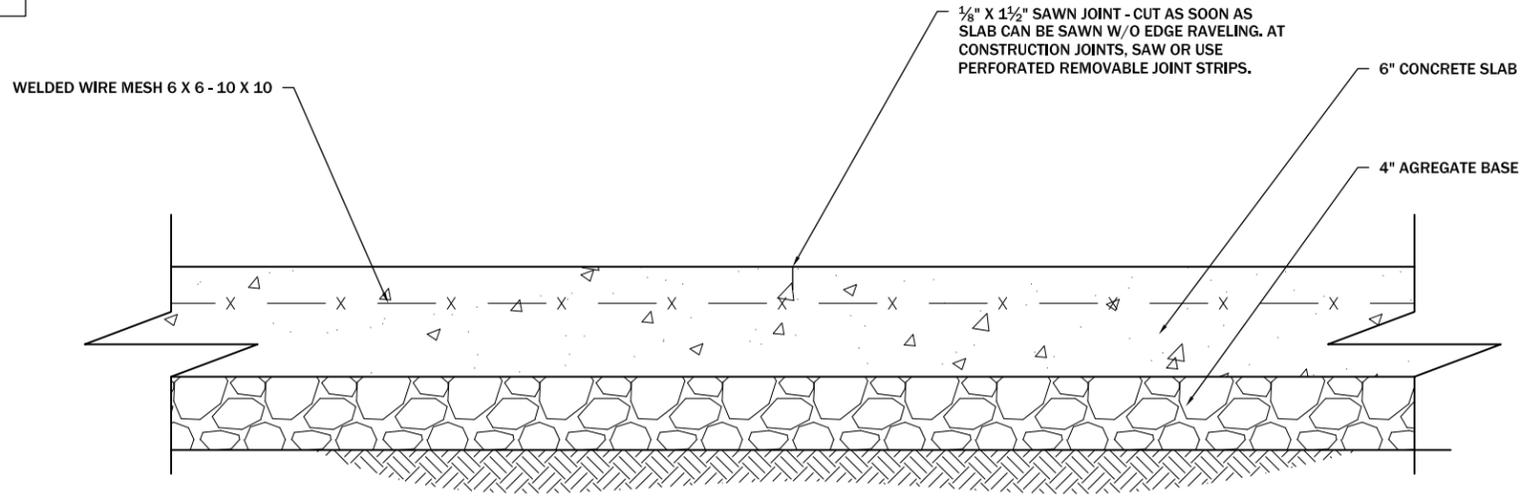
MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

DEWATERING CONTROL
 BUILDING
 FOUNDATION WALL
 DETAIL

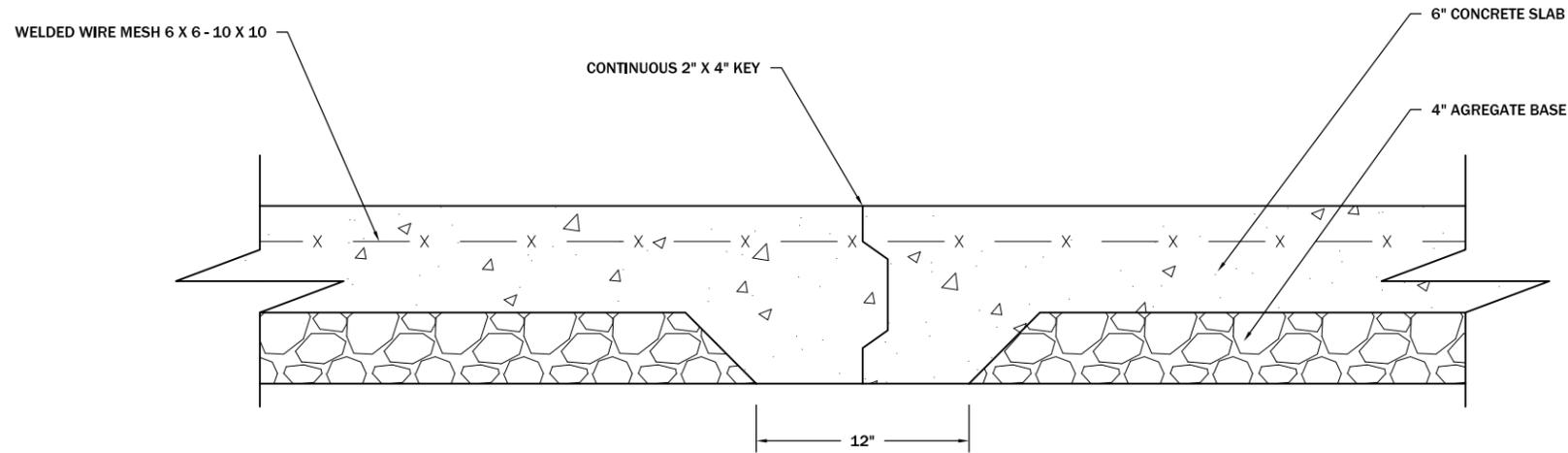


SHEET
 GWD-23AB

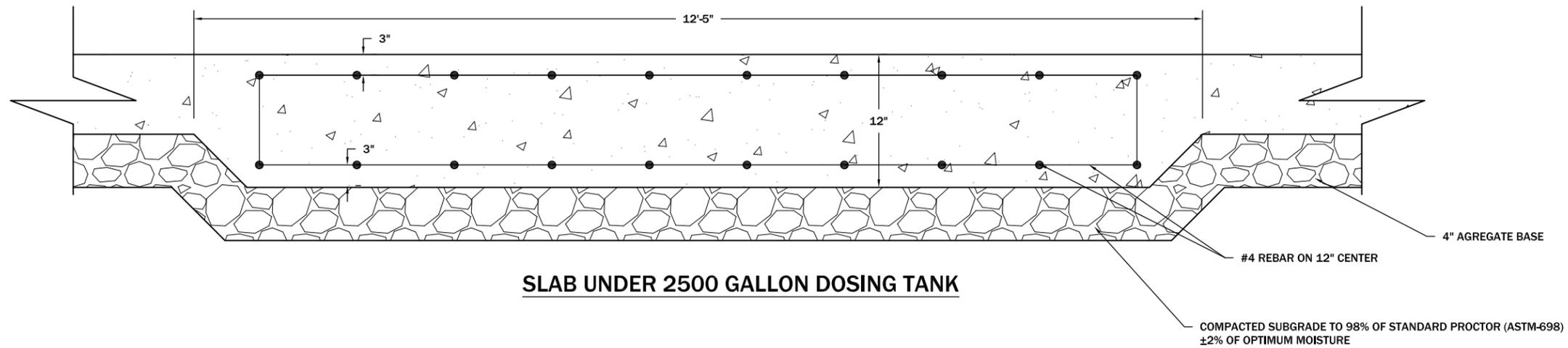
NOTE:
 1. THIS STRUCTURE WAS PROVIDED AND INSTALLED IN 2010 AND WAS UTILIZED FROM 2010 TO 2013. IN 2014 THE BUILDING SLAB FOR THE BUILDING WAS COVERED WITH COVER SOILS.



SLAB SAWN JOINT



SLAB CONTROL JOINT

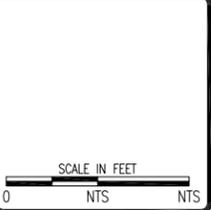


SLAB UNDER 2500 GALLON DOSING TANK

REVISION	DATE	BY	DESC.

DRAWN BY: JLB
 DESIGNED BY: JLB
 CHECKED BY: JCB
 APPROVED BY: JSA
 PROJECT NO: 10160
 DATE: 2/24/13

DISPLAYED AS:
 COORD SYS/ZONE: NA
 DATUM: NA
 UNITS: NA
 SOURCE: PIONEER

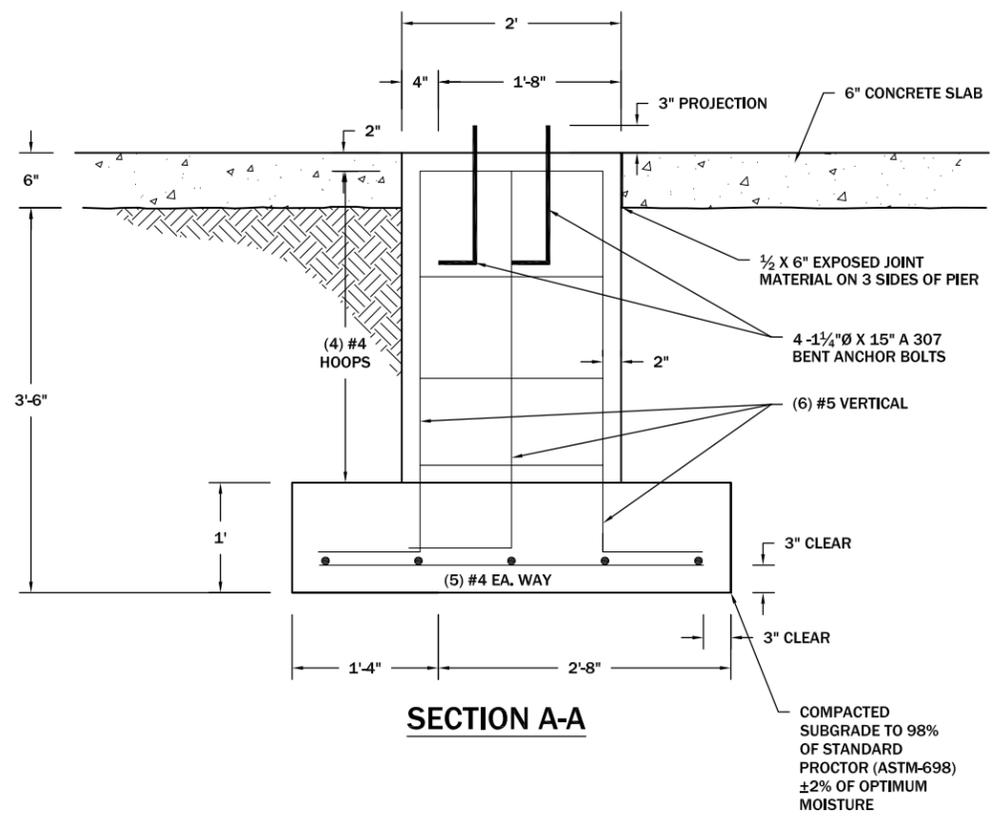
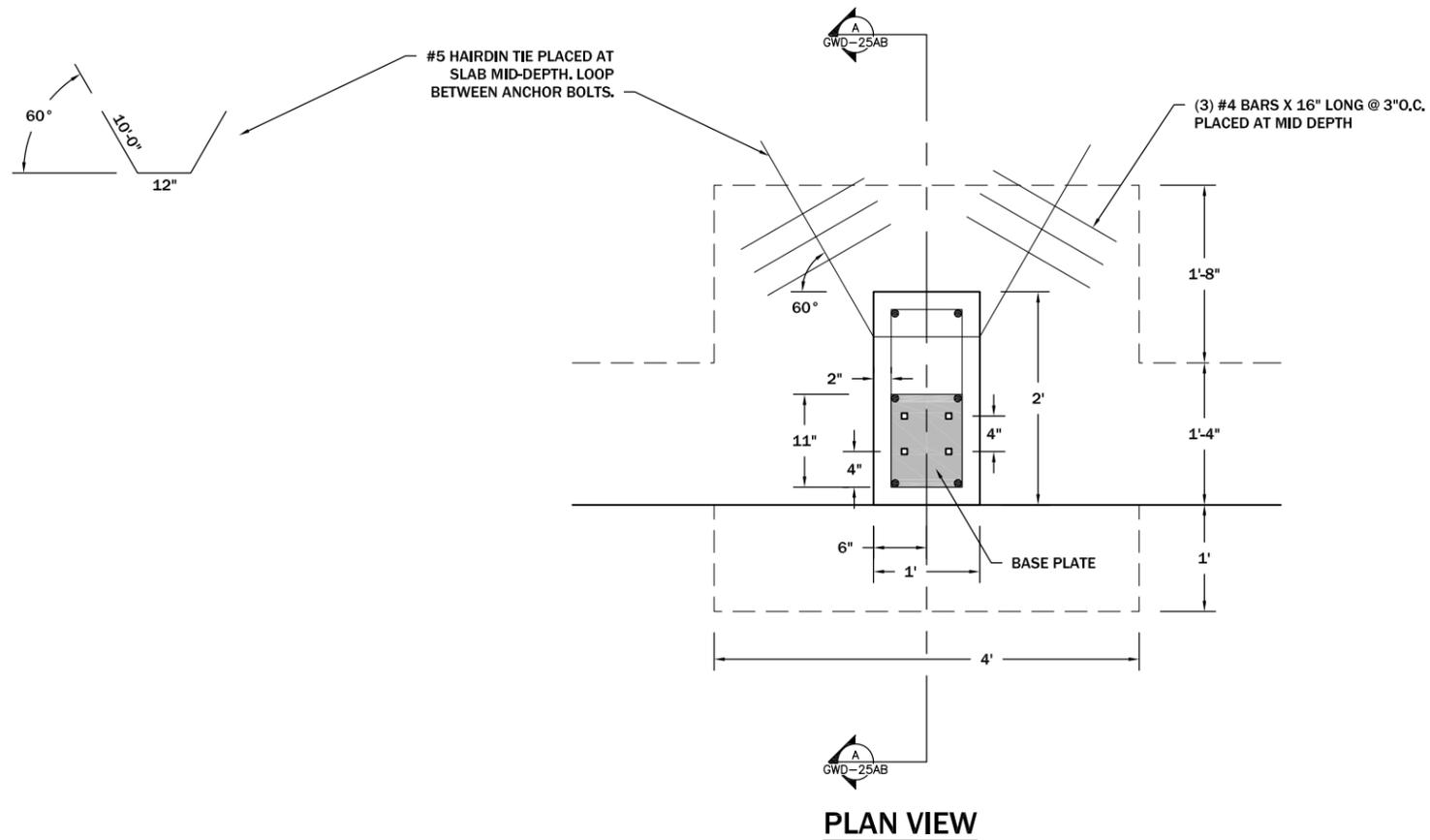


MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

DEWATERING CONTROL
 BUILDING
 SLAB CONTROL JOINTS
 DETAIL



SHEET
 GWD-24AB



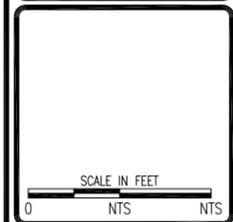
NOTE:

1. THIS STRUCTURE WAS PROVIDED AND INSTALLED IN 2010 AND WAS UTILIZED FROM 2010 TO 2013. IN 2014, THE FOOTINGS AND SLAB FOR THE BUILDING WAS COVERED WITH COVER SOILS.

REVISION	DATE	BY	DESC.

DRAWN BY: JLB
 DESIGNED BY: JL
 CHECKED BY: HCB
 APPROVED BY: JSA
 PROJECT NO: 10160
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: NA
 DATUM: NA
 UNITS: NA
 SOURCE: PIONEER



MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

DEWATERING CONTROL
 BUILDING
 COLUMN FOOTING
 DETAIL



SHEET
 GWD-25AB

REVISION:	DATE:	BY:	DESC:

DRAWN BY: CLA
 DESIGNED BY: JSM
 CHECKED BY: MCB
 APPROVED BY: JSM
 PROJECT NO: 10140
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: NA
 DATUM: NA
 UNITS: NA
 SOURCE: PIONEER

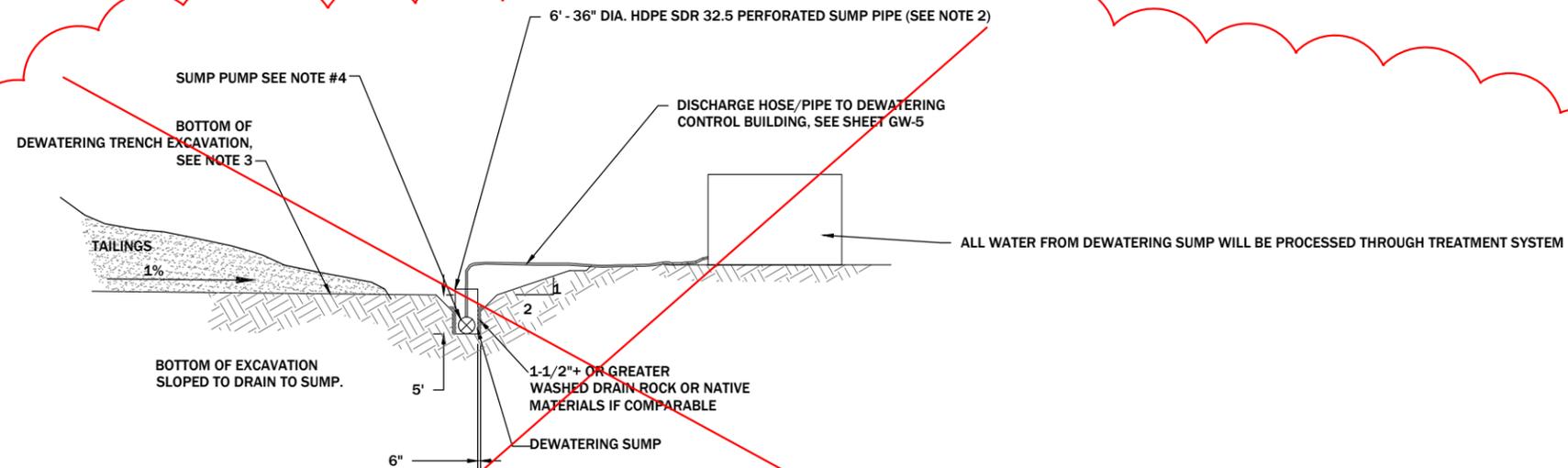
SCALE IN FEET
 0 N.T.S.

MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

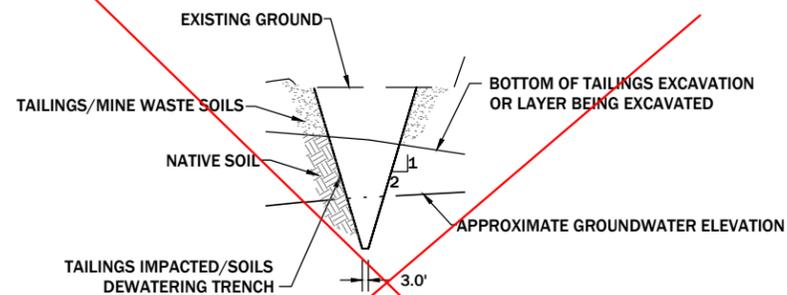
PHASE II
 DEWATERING
 SYSTEM
 DETAILS

PIONEER
 TECHNICAL SERVICES, INC.
 1101 SOUTH MONTANA
 BUTTE, MONTANA 59701
 (406) 782-5177

SHEET
 GWD-26AB

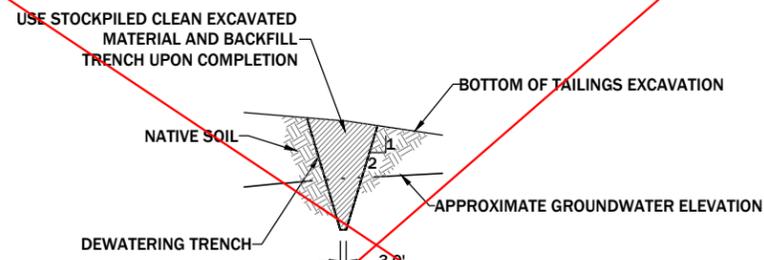


TYPICAL DEWATERING SUMP (GW20)
 NOT TO SCALE



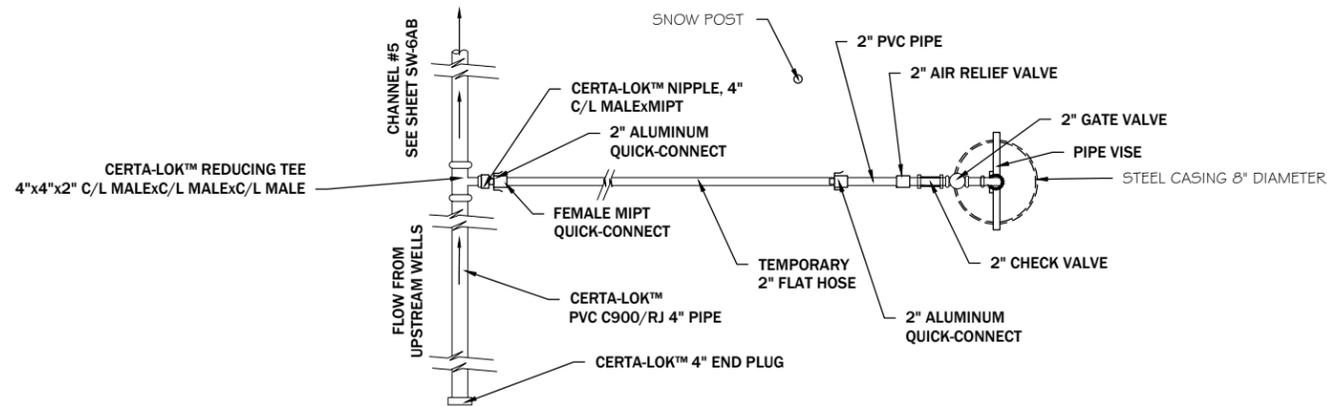
TYPICAL DEWATERING TRENCH EXCAVATION DETAIL (GW21)
 N.T.S.

PHASE II DEWATERING SYSTEM WAS NOT REQUIRED AS DESIGNED

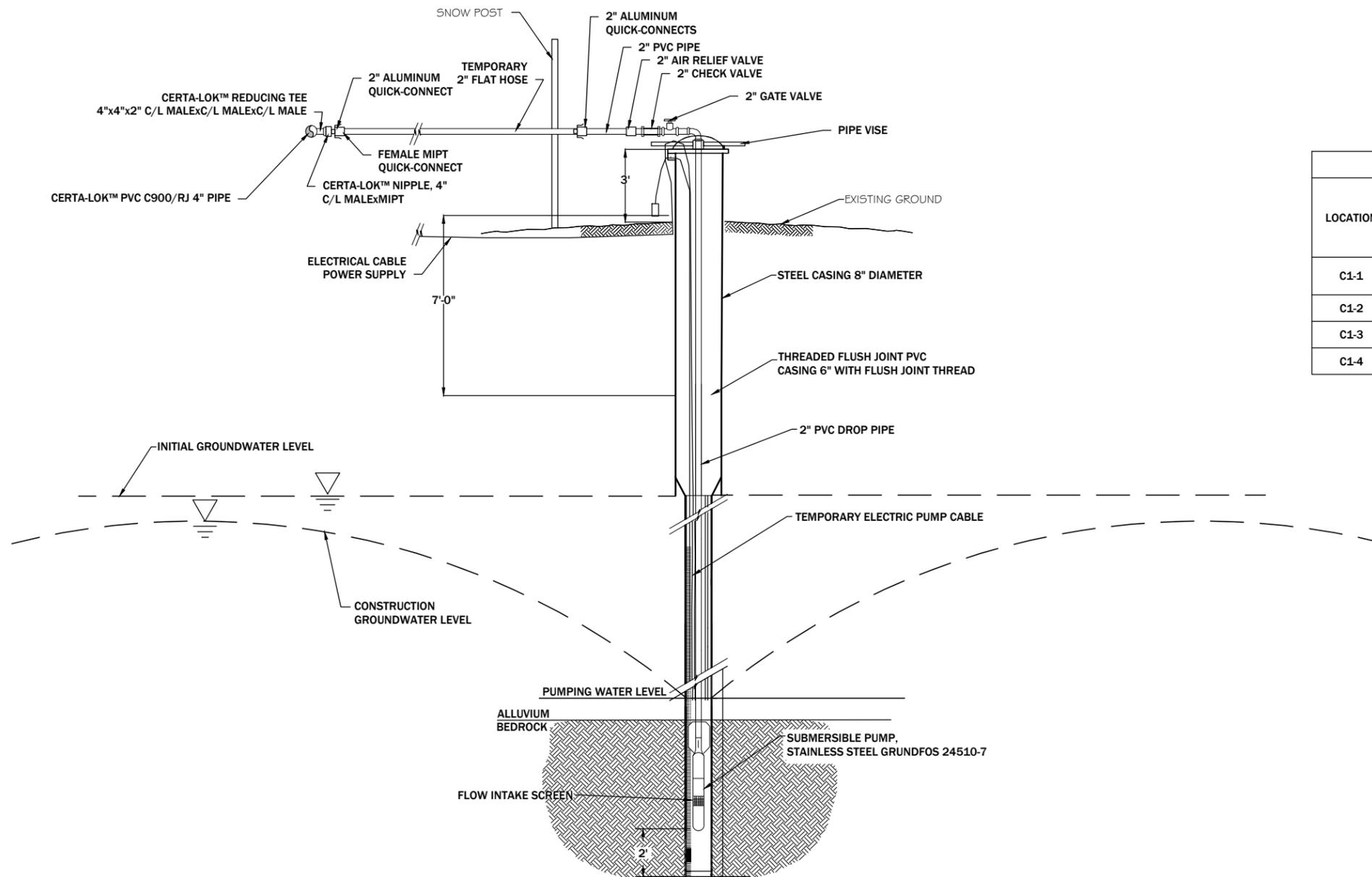


TYPICAL DEWATERING TRENCH OBLITERATION DETAIL (GW22)
 N.T.S.

- NOTES:
- EXCAVATE DEWATERING TRENCH FROM DOWNGRADIENT TO UPGRADIENT.
 - PROVIDE 6', 36" DIAMETER HDPE SDR 32.5 FOR THE SUMP PIPE. OPEN SPACE OF PERFORATIONS IN SUMP PIPE SHALL EXCEED 1,000 SQUARE INCHES.
 - SLOPE TRENCH TOWARD DOWNGRADIENT DEWATERING SUMP.
 - PROVIDE A DEWATERING SUMP PUMP WITH A VARIABLE CAPACITY FROM 50gpm TO 500gpm.



PLAN VIEW



ELEVATION VIEW

TEMPORARY INSTALLATION OF 1.0 HP PUMP DETAIL

GW23
N.T.S.

TABLE GWD-1		
LOCATION	ESTIMATED PRODUCTIVITY* (gpm)	DEPTH FROM GROUND SURFACE (ft)*
C1-1	1-5	30
C1-2	12-20	30.8
C1-3	4-10	36.9
C1-4	4-10	29.5

REVISION:	DATE:	BY:	DESC:

DRAWN BY:	SKL
DESIGNED BY:	MWB
CHECKED BY:	JSM
APPROVED BY:	MWB
PROJECT NO:	10140
DATE:	2/24/15

DISPLAYED AS:	
COORD SYS/ZONE/NA:	
DATUM:	NA
UNITS:	FEET
SOURCE:	PIONEER

SCALE IN FEET
0 N.T.S.

MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED MINE
 SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

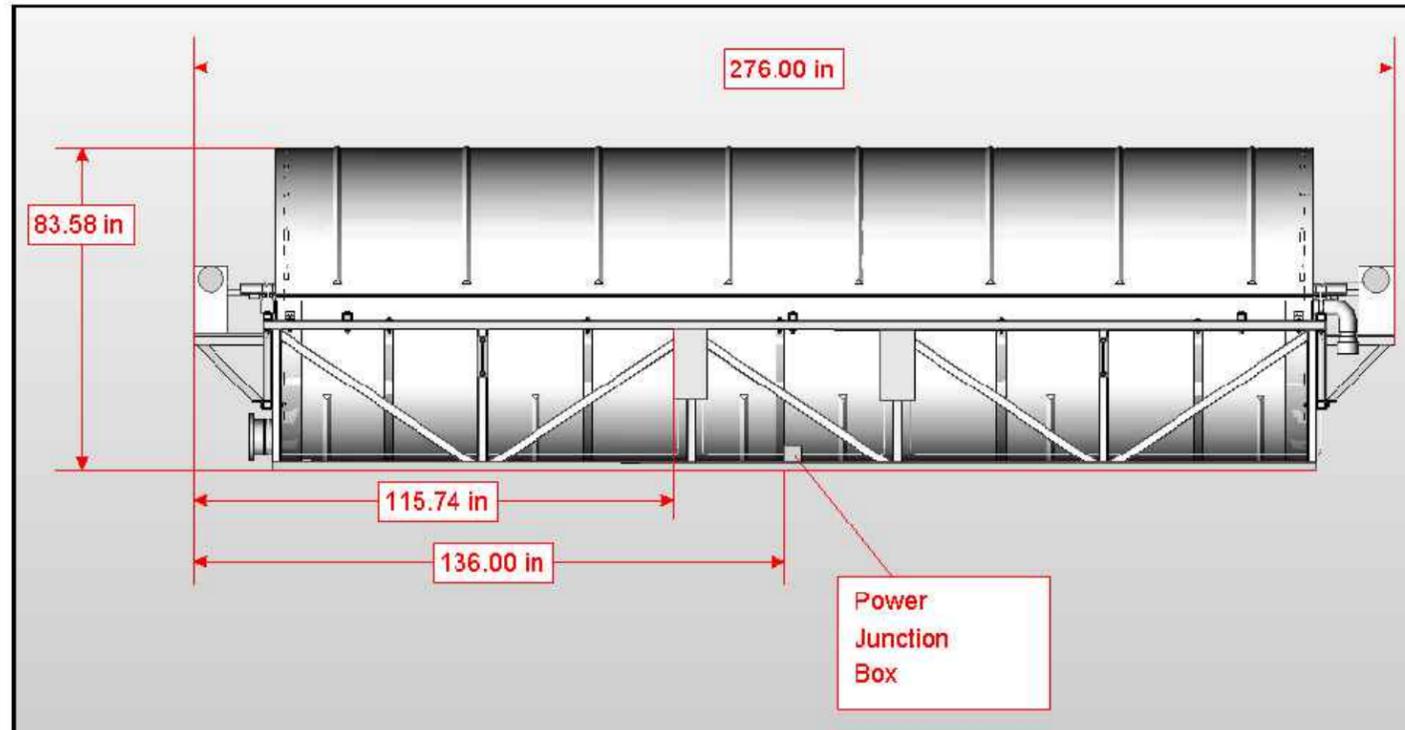
INITIAL CONSTRUCTION
 DEWATERING
 DETAILS

PIONEER
 TECHNICAL SERVICES, INC.
 1101 SOUTH MONTANA
 BUTTE, MONTANA 59701
 (406) 782-5177

SHEET
GWD-27AB

RCTS-60HS™

60" High Speed System



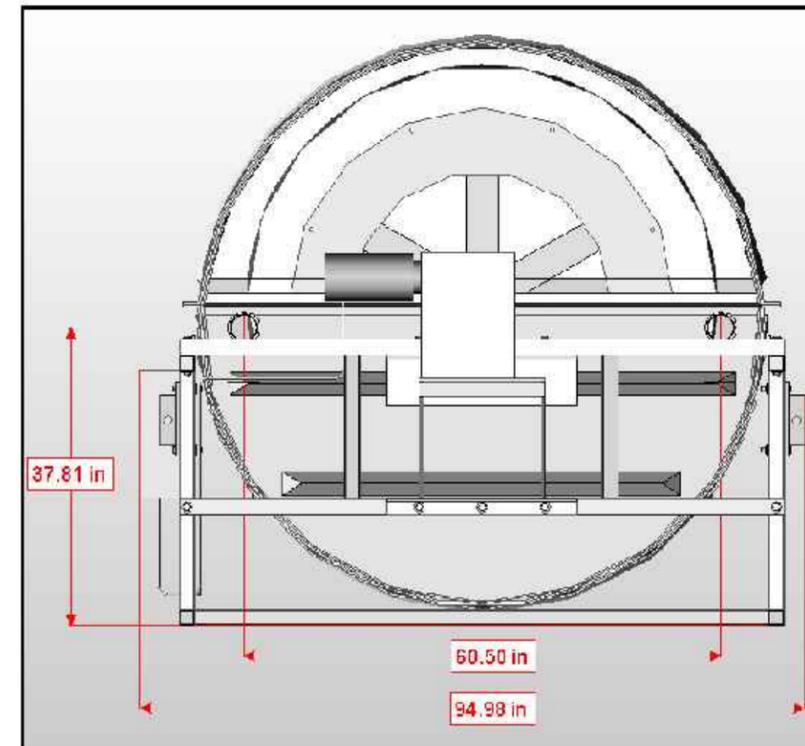
Side View – Power Disconnect Switch and Junction Box Layout

Motor WWE5.18.184TC	World Wide Electric
Gear Reduction Box 9032.1 180TC2	Nord
Flex Coupling QF25	Quick-Flex

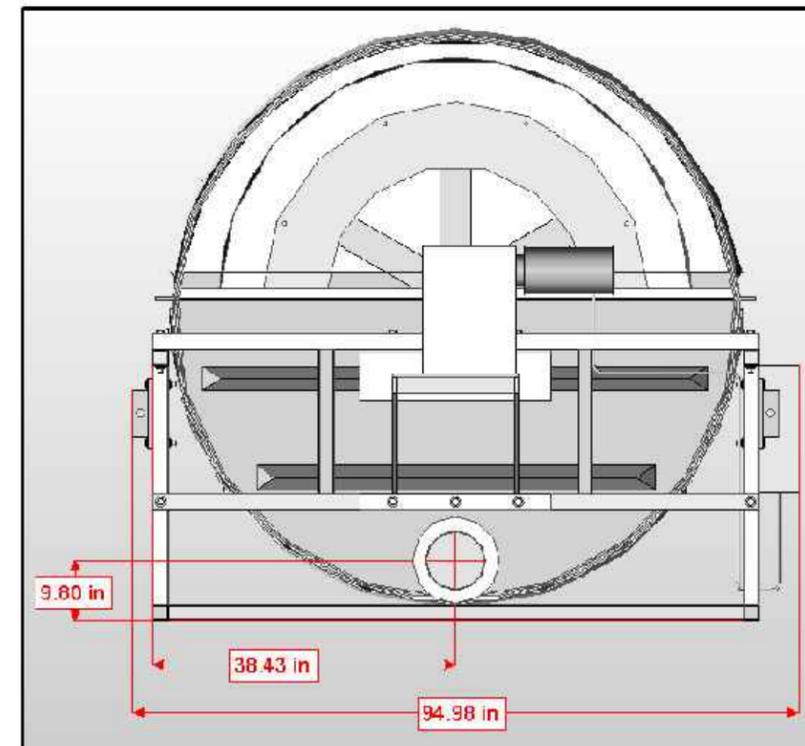
Weight	3000 lbs
Full Weight	7500 lbs
Max Flow	500 Gallons per Minute
Power Requirements	480 Volt 3 Phase

STANDARD SPECIFICATIONS

NOTE: CONTRACTOR SUPPLIED TRAILER MOUNTED UNIT TO FACILITATE CLEANING



Influent – (2) 3" Female Pipe Thread



Effluent – 6" Female PVC Slip fit

REVISION:	DATE:	BY:	DESC:

DRAWN BY:	IONIC
DESIGNED BY:	IONIC
CHECKED BY:	MCB
APPROVED BY:	JSM
PROJECT NO.:	10160
DATE:	2/24/15

DISPLAYED AS:	
COORD SYS / ZONE / NA:	
DATUM:	NA
UNITS:	FEET
SOURCE:	IONIC

SCALE IN FEET
0
N.T.S.

MDEQ/MWCB
MCLAREN TAILINGS ABANDONED
MINE SITE RECLAMATION PROJECT
FINAL AS-BUILT DRAWINGS

RCTS-60HS
DETAILS

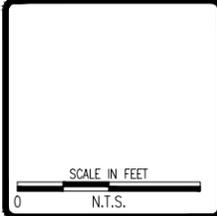


SHEET
GWD-28AB

REVISION:	DATE:	BY:	DESC:

DRAWN BY: CLA
 DESIGNED BY: SM
 CHECKED BY: MCB
 APPROVED BY: JSM
 PROJECT NO: 10160
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS / ZONE: NA
 DATUM: NA
 UNITS: FEET
 SOURCE: PIONEER

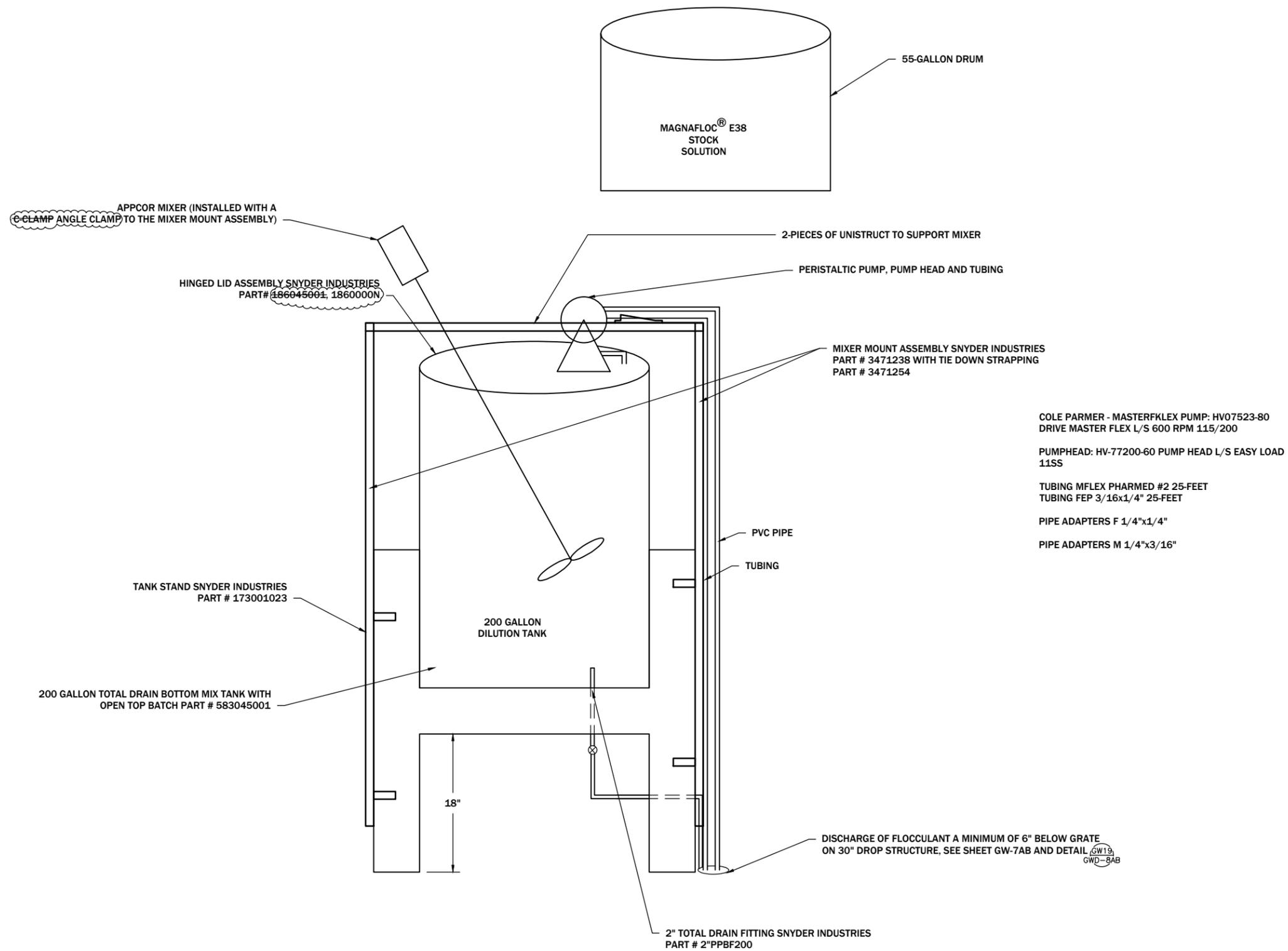


MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

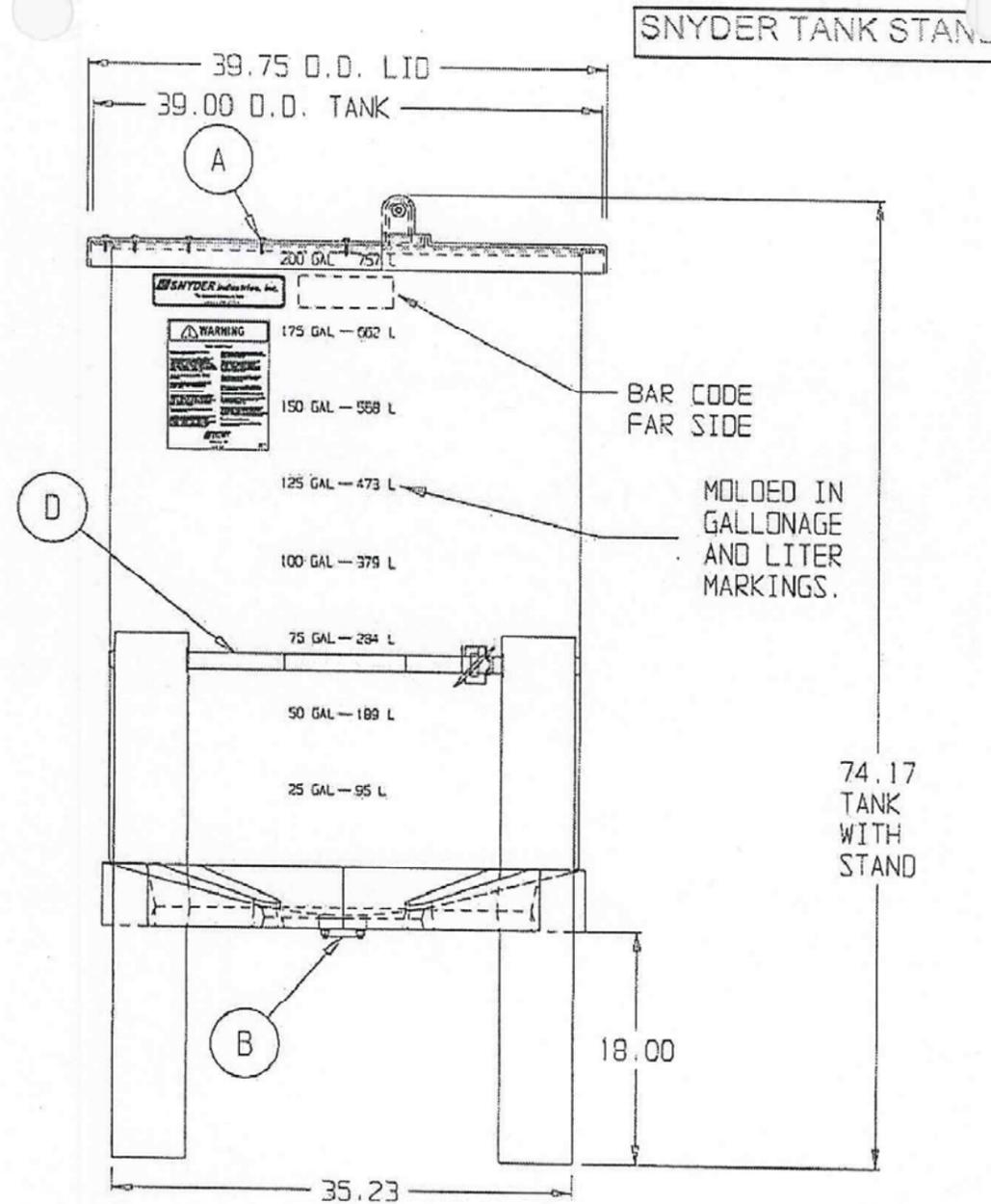
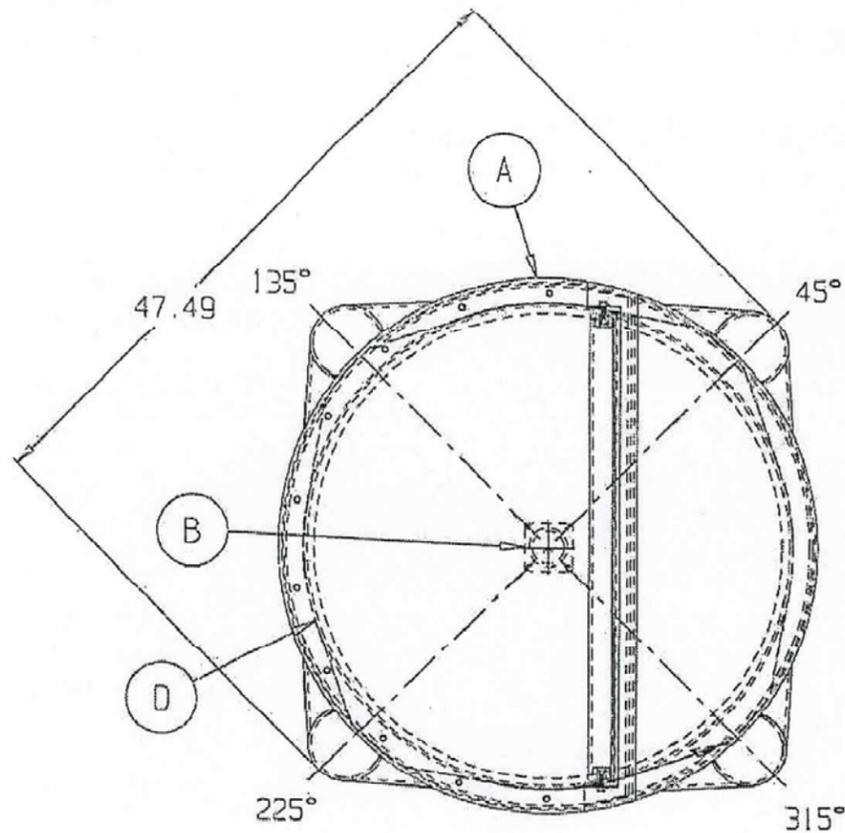
FLOCCULANT
 SYSTEM LAYOUT



SHEET
 GWD-29AB



HIP-SPD NE
PO #02156133



SNYDER TANK STAND

SNYDER INDUSTRIES INC.

NOTE:
ALL EXTERNAL PIPING MUST BE INDEPENDENTLY SUPPORTED.

- A. HINGED LID ASSY FOR 36" ϕ OPEN TOP TANKS [P/N 1860000N95401]
- B. 2" PP DBL FLANGED BOLTED BANJO BTM DRAIN FTG W/EPDM GASKETS & SS BOLTS [P/N 34100116]
- C. MIXER MOUNT ASSY FOR OPEN TOP TANKS [P/N 34701238] - NOT SHOWN
- D. TIE-DOWN BANDING SYSTEM FOR 36" ϕ OPEN TOP TANKS [P/N 34701254]
- E. PROTECTIVE PLASTIC PACKAGING, 200 - 850 GAL. [P/N 00000171] - NOT SHOWN

* BASE FITTINGS TO BE LEFT INSTALLED AT TIME OF SHIPMENT PER SII PROCEDURE
* Consult Snyder's Guidelines for Use and Installation prior to delivery.
* Available on-line at www.snydernet.com

APPROVED: _____

SIGNATURE: _____ DATE: _____
DRAWING NOT VALID UNLESS SIGNED
(all dimensions in inches)

PATENT #7,059,575

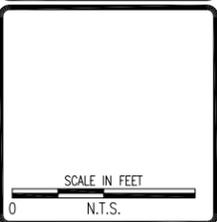
200 GALLON OPEN TOP TOTAL DRAIN TANK W/36" x 18" STAND

PART # TANK: 5830000N97201
HDLPE/NATURAL/1.9 SG
STAND: 1730001N97601
REF#: 24201 05/11/10

REVISION	DATE	BY	DESC.
7/30/10	JSM		RESIZED TO 200 GALLON

DRAWN BY: CLM
DESIGNED BY: SNYDER
CHECKED BY: MCB
APPROVED BY: JSM
PROJECT NO: 10160
DATE: 2/24/15

DISPLAYED AS:
COORD SYS/ZONE, NA
DATUM: NA
UNITS: FEET
SOURCE: SNYDER



MDEQ/MWCB
MCLAREN TAILINGS ABANDONED
MINE SITE RECLAMATION PROJECT
FINAL AS-BUILT DRAWINGS

FLOCCULANT
TANK
DETAIL



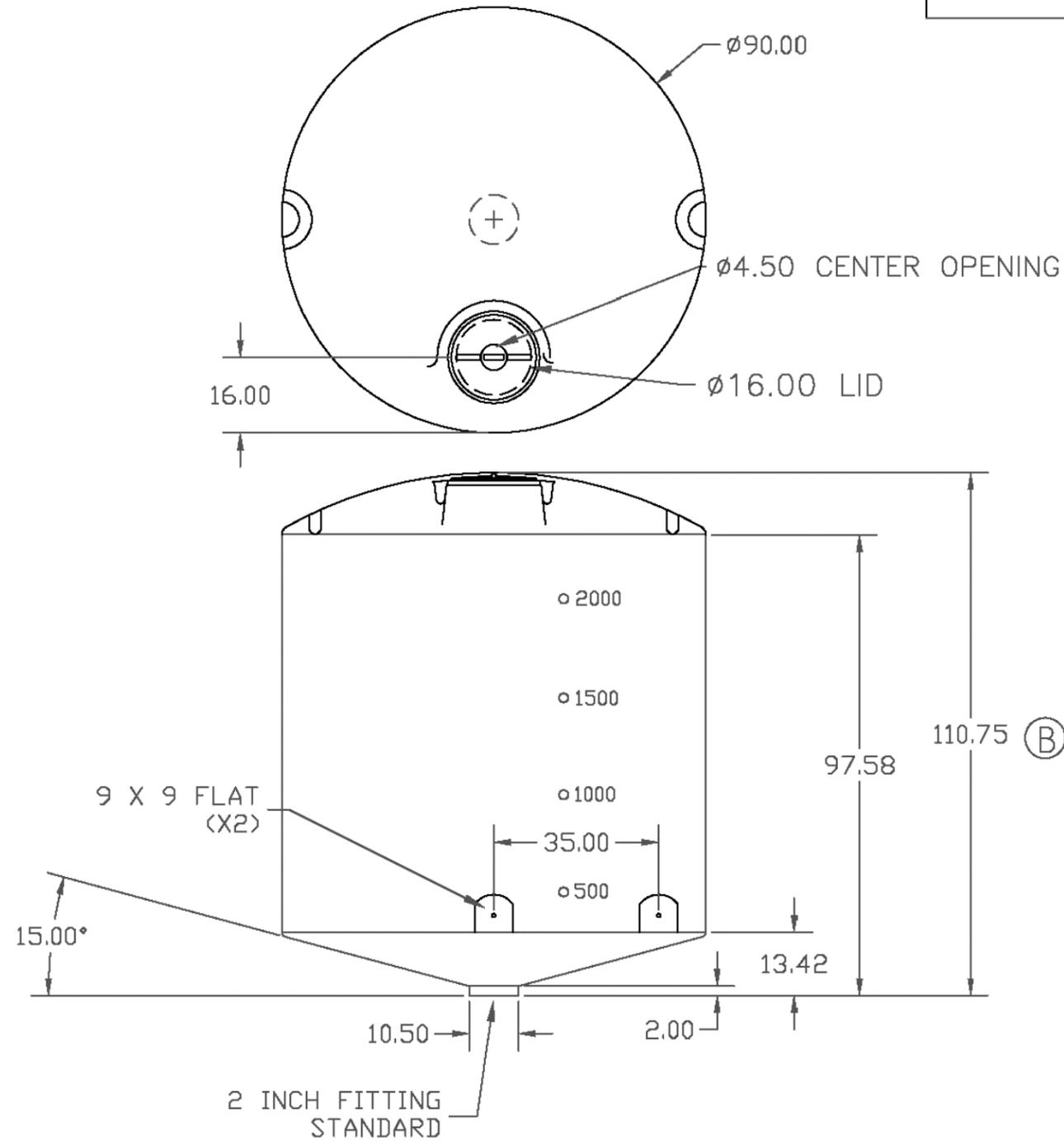
SHEET
GWD-30AB

PROPRIETARY DATA

PROPERTY OF DEN HARTOG INDUSTRIES, INC. INFORMATION FURNISHED HEREIN IS THE PROPERTY OF DEN HARTOG INDUSTRIES, INC. AND SHALL NOT BE USED, DISCLOSED TO OTHERS, OR COPIED WITHOUT THE EXPRESSED WRITTEN CONSENT OF DEN HARTOG INDUSTRIES, INC. ALL RIGHTS RESERVED.

CB2500-90

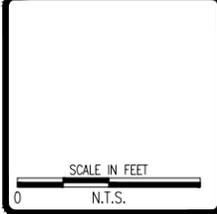
B



REVISION:	DATE:	BY:	DESC:

DRAWN BY:	CLA
DESIGNED BY:	ACE ROTO-MOLD
CHECKED BY:	MCB
APPROVED BY:	JSM
PROJECT NO.:	10160
DATE:	2/24/15

DISPLAYED AS:	
COORD SYS / ZONE / NA:	
DATUM:	NA
UNITS:	FEET
SOURCE:	ACE ROTO-MOLD



MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

DOSING
 TANK
 DETAIL



SHEET
GWD-31AB

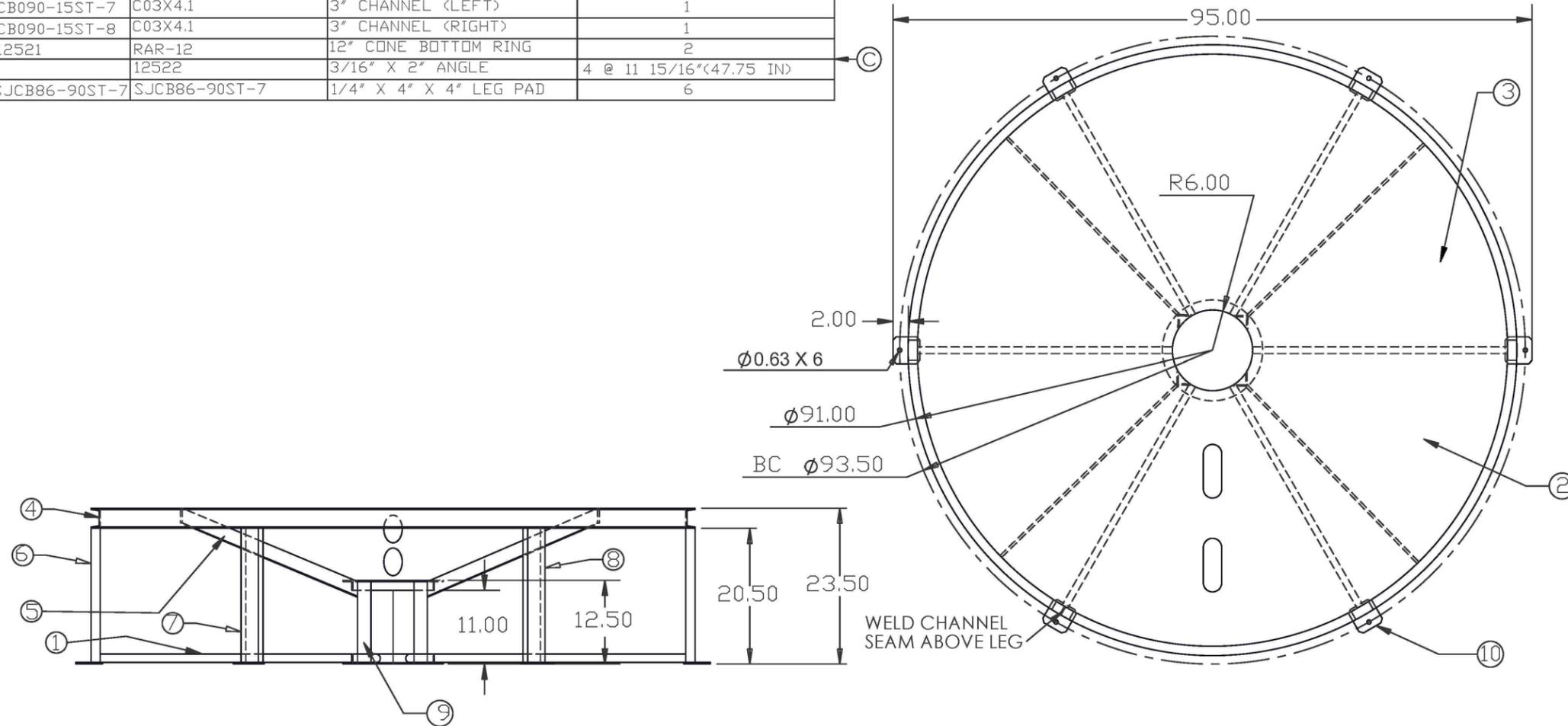
				DRAWN / DATE DHJ 10/7/04	MATERIAL	ACE ROTO-MOLD A DIVISION OF DEN HARTOG INDUSTRIES, INC. 4010 HWY. 60 BLVD., BOX 425, HOSPERS, IOWA 51238
B	HEIGHT WAS 108.75	6/28/06	NVE		HDPE OR EQUIVALENT REFERENCE MATERIAL DATA SHEET FOR SPECIFIC PROPERTIES.	
A	ISOLATED TANK FROM STAND	6/13/06	NVE	APPRD. / DATE REH 4/18/07		CLIENT / DESCRIPTION 2500 GALLON ϕ 90" 15° CONE BOTTOM TANK
REV	DESCRIPTION	DATE	APPRD			SCALE N.S.
					NOTES: 1. SHOT WEIGHT 435 LBS.	PART NO. CB2500-90
ALL DIMENSIONS ARE IN DECIMAL INCHES TOLERANCES UNLESS OTHERWISE SPECIFIED \pm 1% @ 68° F				THIRD ANGLE PROJECTION ANSI 14.5M 		

PROPRIETARY DATA

PROPERTY OF ACE ROTO-MOLD MFG., INC. INFORMATION FURNISHED HEREIN IS THE PROPERTY OF ACE ROTO-MOLD MFG., INC. AND SHALL NOT BE USED, DISCLOSED TO OTHERS, OR COPIED WITHOUT THE EXPRESSED WRITTEN CONSENT OF ACE ROTO-MOLD MFG., INC. ALL RIGHTS RESERVED.

CB090-15ST

KEY	PART NUMBER	MATERIAL	DESCRIPTION	QTY.
1	CB090-15ST-1	P10000	1" PIPE	6 @ 37.75 IN (226.5 IN)
2	CB090-15ST-2	S-14GA	14 GA SHEET STEEL(HOLES)	1
3	CB090-15ST-3	S-14GA	14 GA SHEET STEEL	2 @48" X 96" (9216 SI)
4	CB090-15ST-4	C03X4.1	3" CHANNEL	298 IN
5	CB090-15ST-5	B03750X20000	3/8" X 2" MILD STEEL FLAT	4 @ 38 IN (152 IN)
6	CB090-15ST-6	C03X4.1	3" CHANNEL	6 @ 20.50 IN (123 IN LEFT AND RIGHT LEGS INCLUDED)
7	CB090-15ST-7	C03X4.1	3" CHANNEL (LEFT)	1
8	CB090-15ST-8	C03X4.1	3" CHANNEL (RIGHT)	1
9	12521	RAR-12	12" CONE BOTTOM RING	2
		12522	3/16" X 2" ANGLE	4 @ 11 15/16" (47.75 IN)
10	SJCB86-90ST-7	SJCB86-90ST-7	1/4" X 4" X 4" LEG PAD	6



REVISION	DATE	BY	DESC.

DRAWN BY:	CLA
DESIGNED BY:	SM
CHECKED BY:	MCB
APPROVED BY:	JSM
PROJECT NO.:	10160
DATE:	2/24/15

DISPLAYED AS:	
COORD SYS / ZONE / NA:	
DATUM:	NA
UNITS:	FEET
SOURCE:	DEN HARTOG

SCALE IN FEET
0 N.T.S.

MDEQ/MWCB
MCLAREN TAILINGS ABANDONED
MINE SITE RECLAMATION PROJECT
FINAL AS-BUILT DRAWINGS

DOSING
TANK
STAND

REV	DESCRIPTION	BY / DATE	CCN	THIRD ANGLE PROJECTION ANSI 14.5M	NOTES:
C	12521 WAS SJCB85/90ST-2	ADH 12/7/07	1542		<p>ALL DIMENSIONS ARE IN DECIMAL INCHES TOLERANCES UNLESS OTHERWISE SPECIFIED</p> <p>DECIMAL ± .125" FRACTION ± 1/4" ANGLE ± 1°</p>
B	TOLERANCE WAS 1% @ 68°F	GWC 3/8/07			
A	ADDED COMPONENT MATERIALS	NVE 4/11/06			
<p>DRAWN / DATE: ADH 6/29/07</p> <p>APPRD. / DATE: REH 7/18/07</p>					

Den Hartog
INDUSTRIES, INC.

Ace Roto-Mold Injection Molding Blow Molding Sowjoy

4010 HOSPERS DRIVE S. BOX 425, HOSPERS, IOWA 51238-0421

DESCRIPTION: CONE BOTTOM STAND FOR Ø90 15° TANKS

SCALE: N.S. PART NO. CB090-15ST

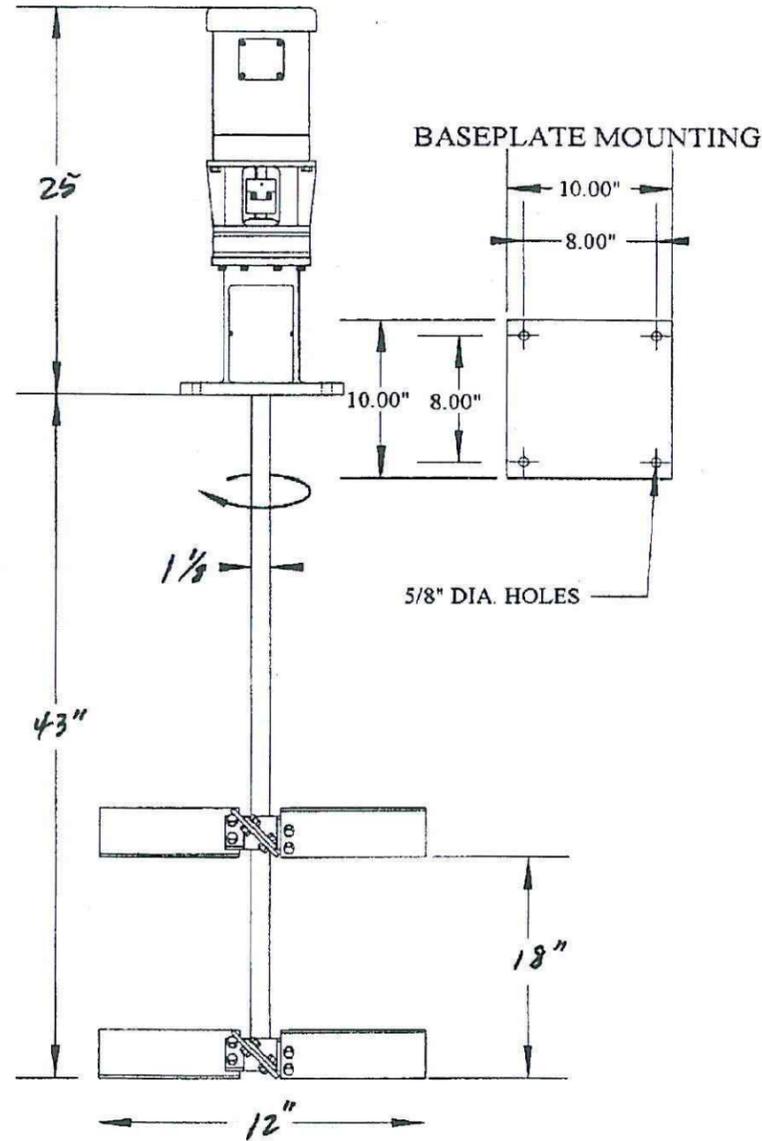
PIONEER
TECHNICAL SERVICES, INC.

1101 SOUTH MONTANA
BUTTE, MONTANA 59701
(406) 782-5177

SHEET
GWD-32AB

MODEL CYB APPCOR MIXER

Customer: *PIONEER TECH*
 Application: *FLOCCULANT MAKE-UP*



MODEL NUMBER: *CYB-75*
 HP: *3/4*
 WEIGHT: *89 LBS*
 RPM: *159*

MOTOR DATA:
 Manufacturer: *BALDOR*
 RPM: *1800*
 Type: *3/60/230/460, TEFC, 56C*
 By: *APPCOR*

TANK DATA:
 Size: *36" x 53" PLASTIC*
 Top: *CLOSED*
 Bottom: *FLAT*

BAFFLE RECOMMENDATIONS:
 Number: *NONE*
 Spacing, Degrees Apart:
 Width:
 Off-wall Clearance:

NOTES:
316 SS WETTED

McCLAREN
082791-3 8/27/09

APPCOR	Scale: NTS	Applications Corporation
	Date: 2/10/93	Model CYB Appcor Mixer
	Drawn By: JMZ	General Arrangement Drawing
	Dwg No.: CYBGAI125R1	Standard Base, Bolted Blade Turbine

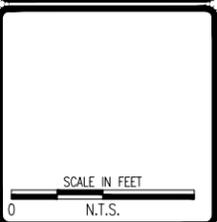
7 OF 7

p. 7 360-837-3171 HP LASERJET FAX Aug 31 2009 9:27AM

REVISION:	DATE:	BY:	DESC:
	7/21/10	JSM	CORRECT MIXER

DRAWN BY:	CLA
DESIGNED BY:	APPCOR
CHECKED BY:	MCB
APPROVED BY:	JSM
PROJECT NO.:	10160
DATE:	2/24/15

DISPLAYED AS:	
COORD SYS/ZONE, NA:	
DATUM:	NA
UNITS:	FEET
SOURCE:	APPCOR



MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

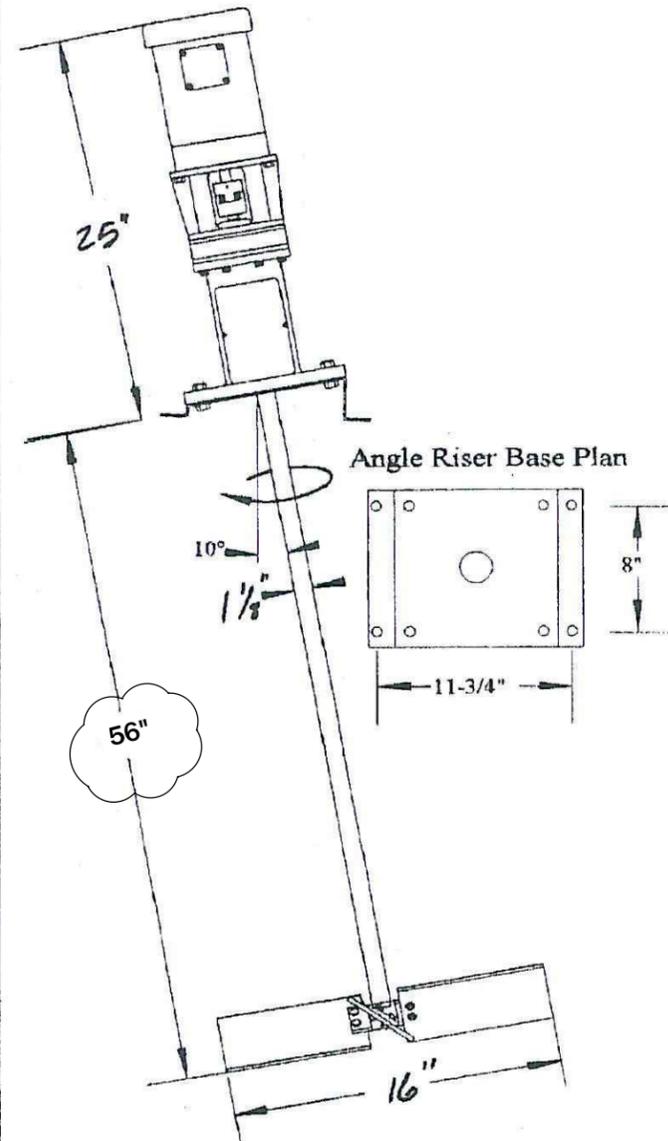
FLOCCULANT
 TANK
 MIXER
 DETAILS



SHEET
 GWD-33AB

MODEL CYB APPCOR MIXER

Customer: *PIONEER TECH*
 Application: *LIME MAKE-UP*



MODEL NUMBER: *CYBA-75*
 HP: *3/4*
 WEIGHT: *104 LBS*
 RPM: *159*

MOTOR DATA:
 Manufacturer: *BALDOR*
 RPM: *1800*
 Type: *3/60/230/460, TEFC, 56C*
 By: *APPCOR*

TANK DATA:
 Size: *60" x 60"*
 Top: *OPEN*
 Bottom: *FLAT*

BAFFLE RECOMMENDATIONS:
 Number: *NONE*
 Spacing, Degrees Apart:
 Width:
 Off-wall Clearance:

NOTES:
316 SS WETTED PARTS

McCLAIZEN
082791-1
8/27/09

APPCOR

Scale: NTS	Applications Corporation
Date: 7/11/94	Model CYB Appcor Mixer
Drawn By: JMZ	General Arrangement Drawing
File: CYBANGLE.CAD	Angle Riser Base, Bolted Blade Turbine

3 OF 7

p. 3

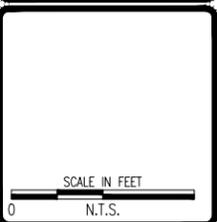
360-837-3171

HP LASERJET FAX 8/27/09 9:26AM

REVISION:	DATE:	BY:	DESC:
	7/22/10	JSM	CORRECT MIXER
	9/1/12	JSM	EXTENDED MIXER SHAFT

DRAWN BY:	CLA
DESIGNED BY:	APPCOR
CHECKED BY:	MCB
APPROVED BY:	JSM
PROJECT NO.:	10160
DATE:	2/24/15

DISPLAYED AS:	
COORD SYS/ZONE:	NA
DATUM:	NA
UNITS:	FEET
SOURCE:	APPCOR



MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

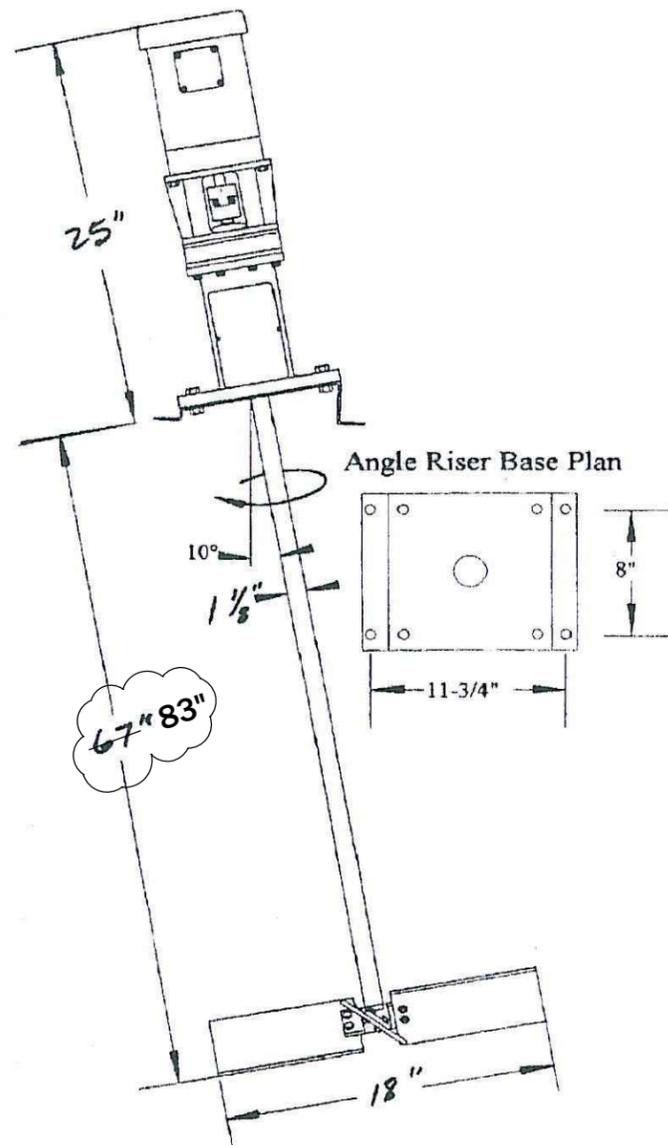
LIME SLURRY
 TANK
 MIXER
 DETAILS



SHEET
 GWD-34AB

MODEL CYB APPCOR MIXER

Customer: *PIONEER TECH*
 Application: *LIME STORAGE*



MODEL NUMBER: *CYBA-75*
 HP: *3/4*
 WEIGHT: *107 LBS*
 RPM: *159*

MOTOR DATA:
 Manufacturer: *BALDOR*
 RPM: *1800 700*
 Type: *3/60/230/460, TEFC, 56C*
 By: *APPCOR*

TANK DATA:
 Size: *89" DIA x 91" SIDEWALL*
 Top: *OPEN*
 Bottom: *CONE 25.7"*

BAFFLE RECOMMENDATIONS:
 Number: *NONE*
 Spacing, Degrees Apart:
 Width:
 Off-wall Clearance:

NOTES:
316 SS WETTED

McCLAREN
082791-2 *8/27/09*

APPCOR

Scale: NTS	Applications Corporation
Date: 7/11/94	Model CYB Appcor Mixer
Drawn By: JMZ	General Arrangement Drawing
File: CYBANGLE.CAD	Angle Riser Base, Bolted Blade Turbine

5 OF 7

s.d 360-837-3171 HP LASERJET FAX Aug 31 2009 9:26AM

REVISION:	DATE:	BY:	DESC:
	7/22/10	JSM	CORRECT MIXER

DRAWN BY:	CLA
DESIGNED BY:	APPCOR
CHECKED BY:	MCB
APPROVED BY:	JSM
PROJECT NO:	10160
DATE:	2/24/15

DISPLAYED AS:	
COORD SYS/ZONE/NA:	
DATUM:	NA
UNITS:	FEET
SOURCE:	APPCOR

SCALE IN FEET	
0	N.T.S.

MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

DOSING
 TANK
 MIXER
 DETAILS



SHEET
 GWD-35AB

REVISION:	BY:	DESC:

DRAWN BY:	CLA
DESIGNED BY:	DSS
CHECKED BY:	MCB
APPROVED BY:	JSM
PROJECT NO.:	10160
DATE:	2/24/15

DISPLAYED AS:	
COORD SYS / ZONE / NA:	
DATUM:	NA
UNITS:	FEET
SOURCE:	DSS

SCALE IN FEET

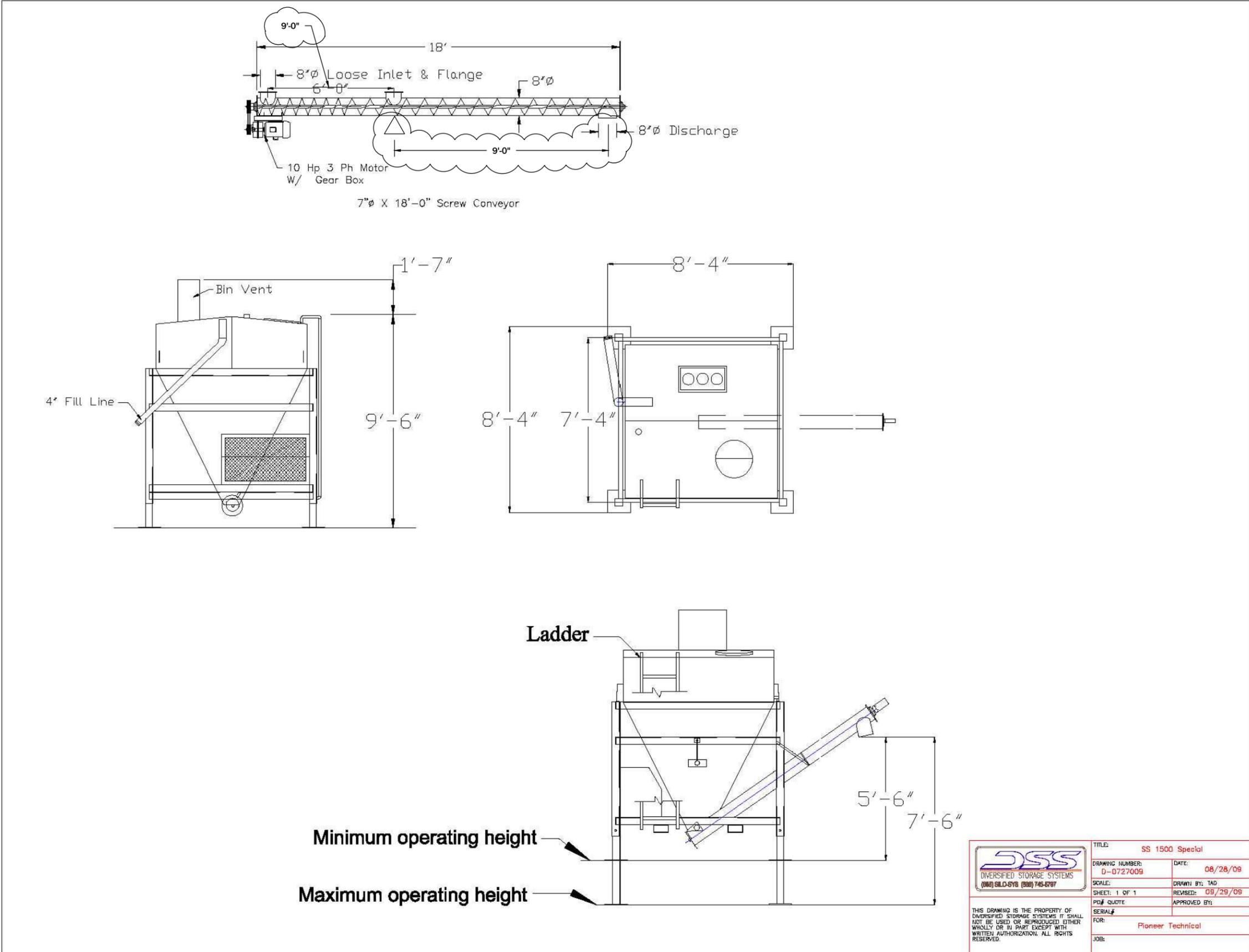
0 N.T.S.

MDEQ/MWCB
MCLAREN TAILINGS ABANDONED
MINE SITE RECLAMATION PROJECT
FINAL AS-BUILT DRAWINGS

LIME SILO
AND
AUGER SYSTEM
DETAILS

PIONEER
TECHNICAL SERVICES, INC.
1101 SOUTH MONTANA
BUTTE, MONTANA 59701
(406) 782-5177

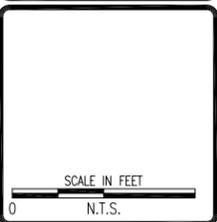
SHEET
GWD-36AB



REVISION	DATE	BY	DESC.

DRAWN BY: SKL
DESIGNED BY: SDB
CHECKED BY: MCB
APPROVED BY: JSA
PROJECT NO: 10140
DATE: 2/24/15

DISPLAYED AS:
COORD SYS/ZONE: NA
DATUM: NA
UNITS: FEET
SOURCE: PIONEER

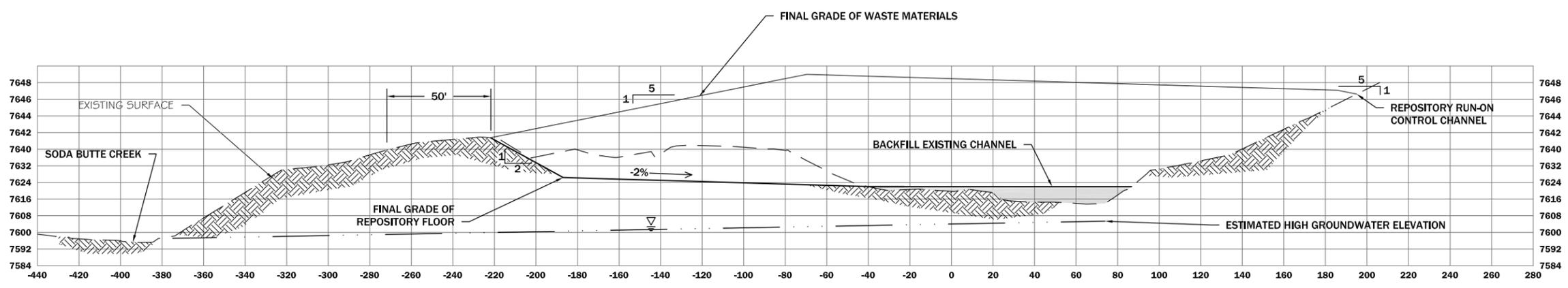


MDEQ/MWCB
MCLAREN TAILINGS ABANDONED
MINESITE RECLAMATION PROJECT
FINAL AS-BUILT DRAWINGS

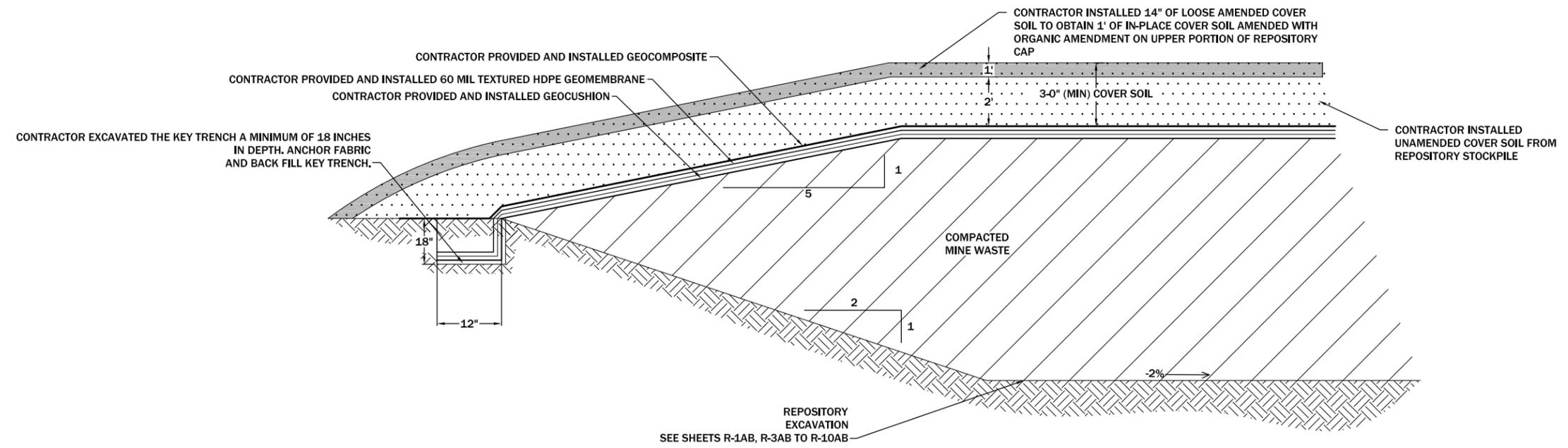
REPOSITORY
DETAILS

PIONEER
TECHNICAL SERVICES, INC.
1101 SOUTH MONTANA
BUTTE, MONTANA 59701
(406) 782-5177

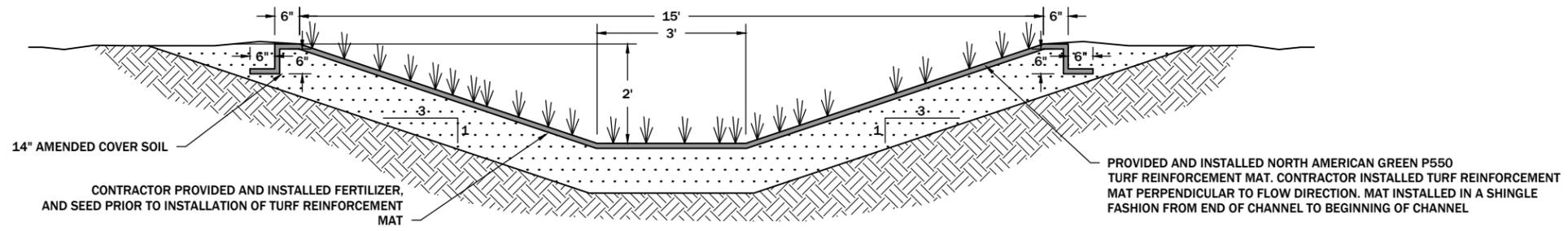
SHEET
RD-1AB



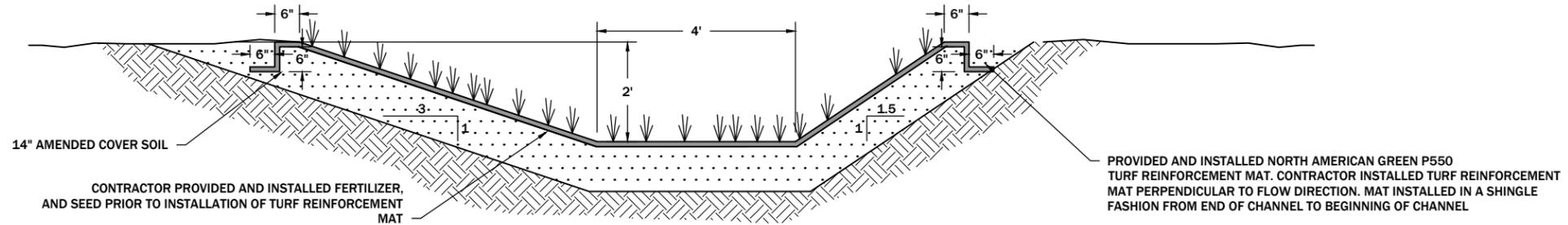
TYPICAL REPOSITORY CROSS SECTION R1



TYPICAL REPOSITORY LAYERING DETAIL R2



TYPE 1 GRASS LINED TRAPEZOIDAL CHANNEL DETAIL (SW1)
N.T.S.

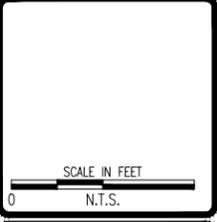


TYPE 3 GRASS LINED TRAPEZOIDAL CHANNEL DETAIL (SW3)
N.T.S.

REVISION:	DATE:	BY:	DESC:

DRAWN BY: CLA
 DESIGNED BY: RWH
 CHECKED BY: MCB
 APPROVED BY: JSM
 PROJECT NO: 10160
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: NA
 DATUM: NA
 UNITS: NA
 SOURCE: PIONEER



MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

STORM WATER
 CHANNEL
 DETAILS

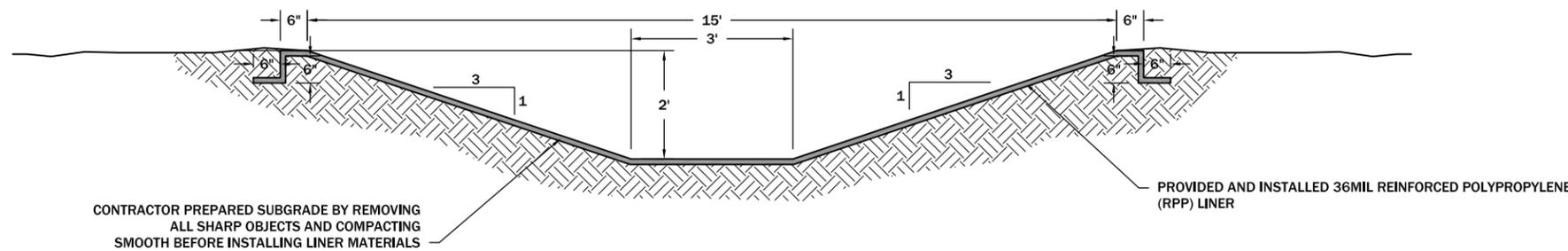
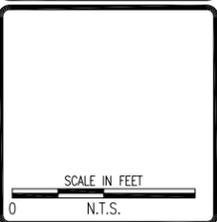


SHEET
 SWD-1AB

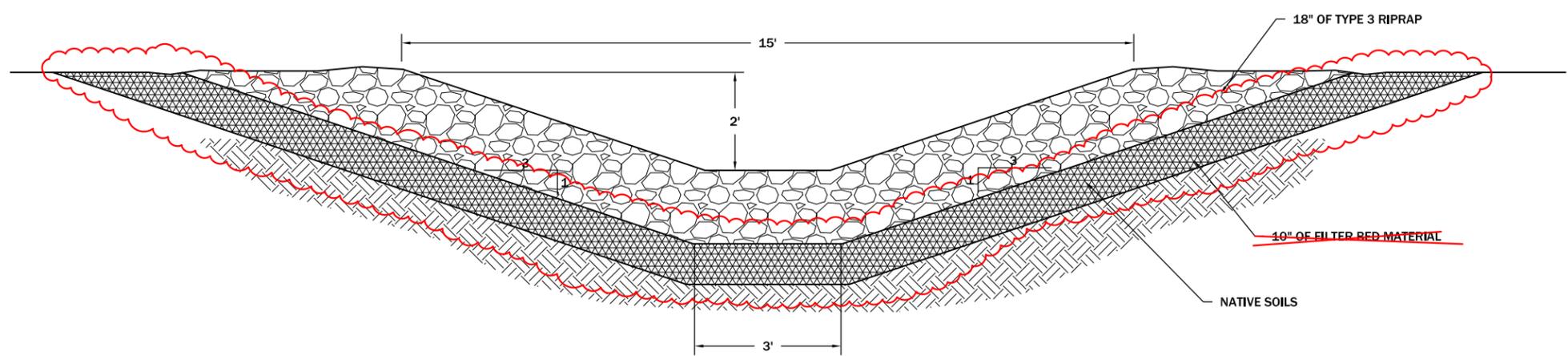
REVISION	DATE	BY	DESC.

DRAWN BY: CLA
 DESIGNED BY: RWH
 CHECKED BY: JCB
 APPROVED BY: JSA
 PROJECT NO: 10160
 DATE: 2/24/13

DISPLAYED AS:
 COORD SYS/ZONE: NA
 DATUM: NA
 UNITS: NA
 SOURCE: PIONEER



POLYPROPYLENE LINED TRAPEZOIDAL CHANNEL DETAIL (SW5)
N.T.S.



TYPE 3 RIPRAP LINED TRAPEZOIDAL CHANNEL DETAIL (SW6)
N.T.S.

MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

STORM WATER
 CHANNEL
 DETAILS

PIONEER
 TECHNICAL SERVICES, INC.
 1101 SOUTH MONTANA
 BUTTE, MONTANA 59701
 (406) 782-5177

SHEET
 SWD-2AB

REVISION	DATE	BY	DESC.

DRAWN BY: CLM
 DESIGNED BY: JSM
 CHECKED BY: JCB
 APPROVED BY: JSM
 PROJECT NO: 10140
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS / ZONE: NA
 DATUM: NA
 UNITS: NA
 SOURCE: PIONEER

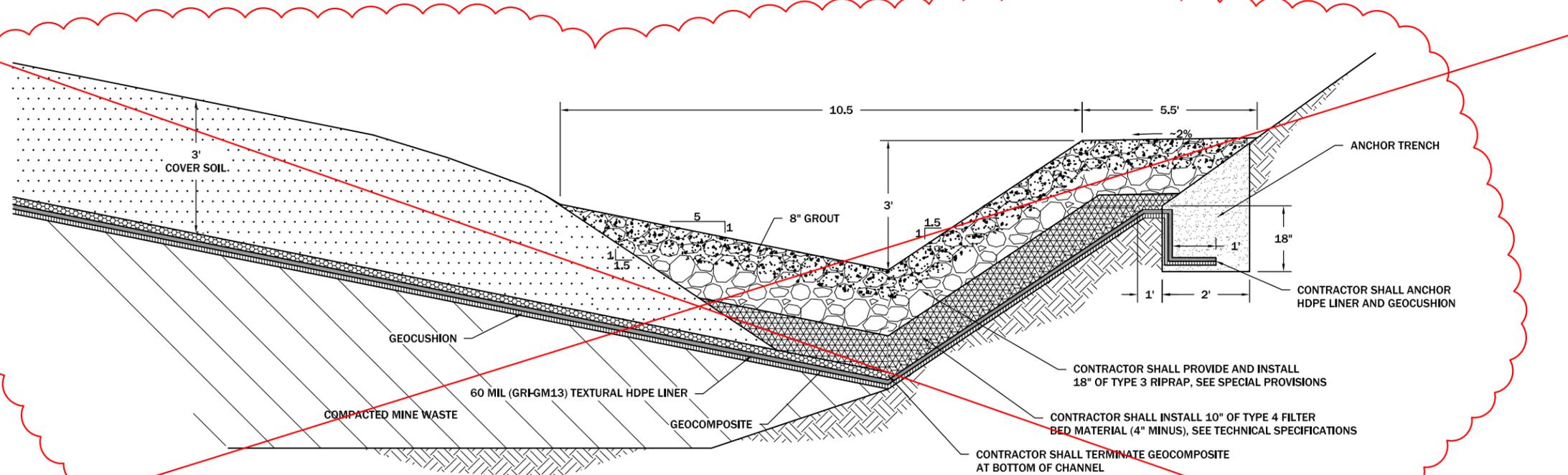
SCALE IN FEET
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MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

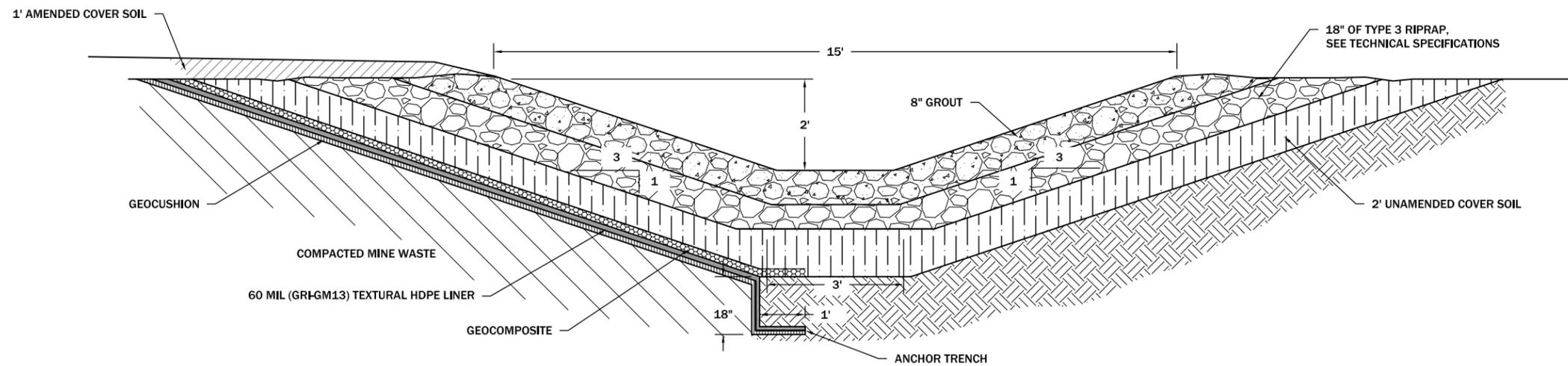
REPOSITORY
 STORM WATER
 RUN-ON CHANNEL
 DETAILS


PIONEER
 TECHNICAL SERVICES, INC.
 1101 SOUTH MONTANA
 BUTTE, MONTANA 59701
 (406) 782-5177

SHEET
 SWD-3AB



REPOSITORY TYPE 3 GROUTED RIPRAP LINED CHANNEL DETAIL (SW7)
 NOT TO SCALE



TYPE 3 GROUTED RIPRAP LINED TRAPEZOIDAL CHANNEL DETAIL (SW6)
 N.T.S.

REVISION:	DATE:	BY:	DESC:

DRAWN BY: JSA
 DESIGNED BY: JSA
 CHECKED BY: JCB
 APPROVED BY: JSA
 PROJECT NO: 10160
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE:
 DATUM:
 UNITS:
 SOURCE: PIONEER

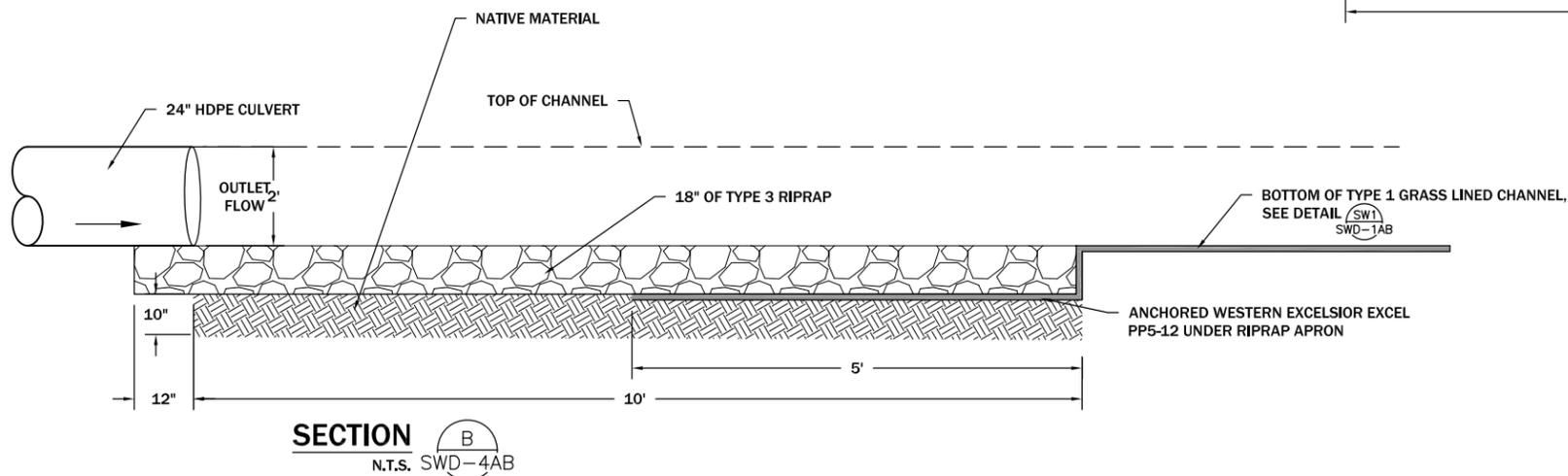
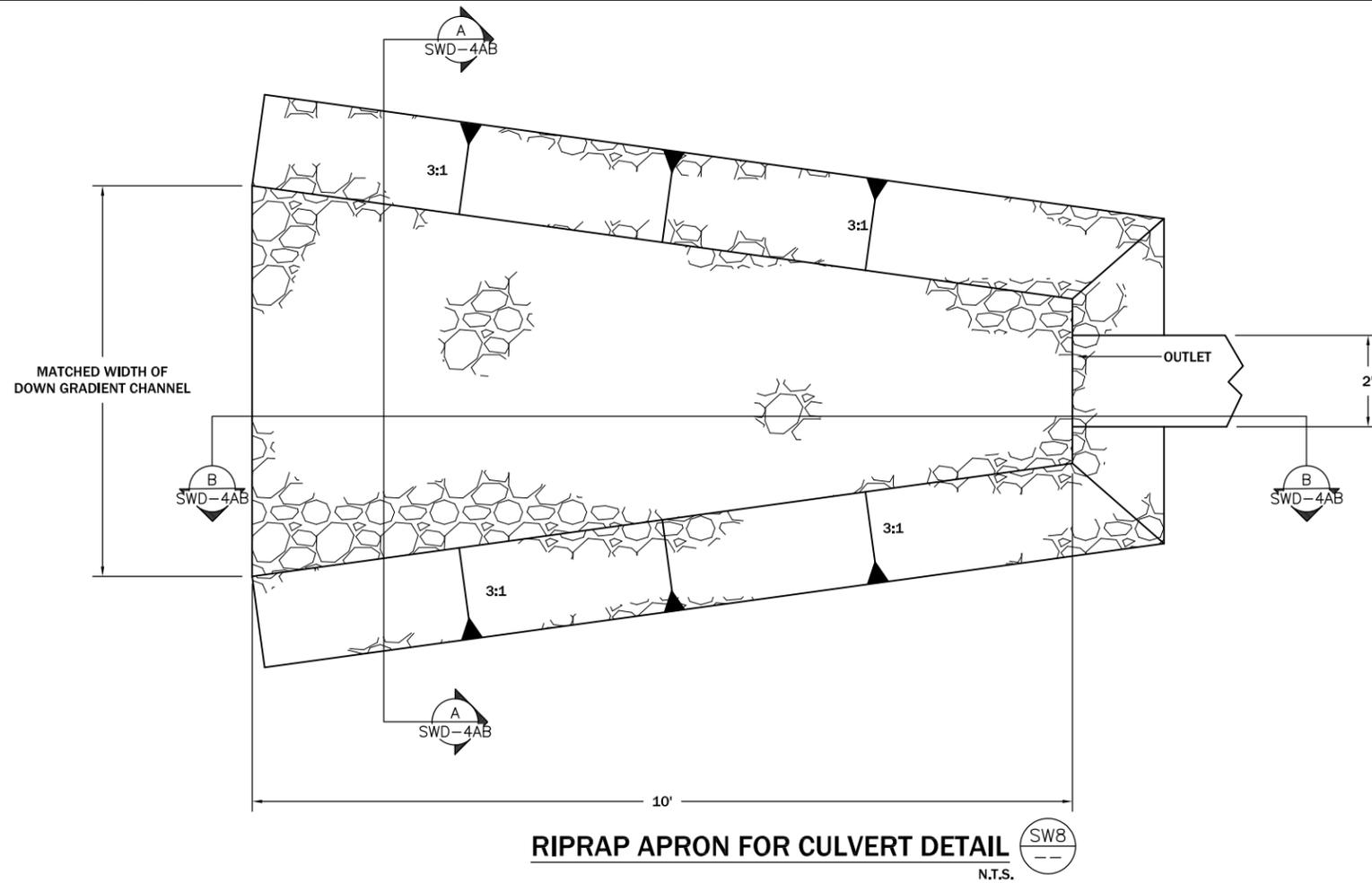
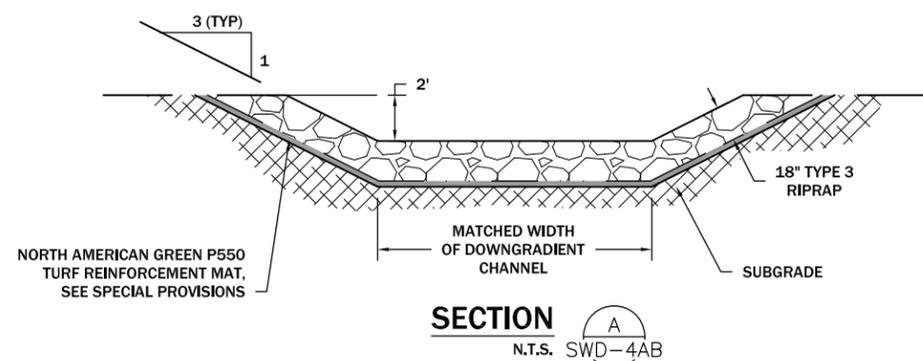
SCALE IN FEET
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MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

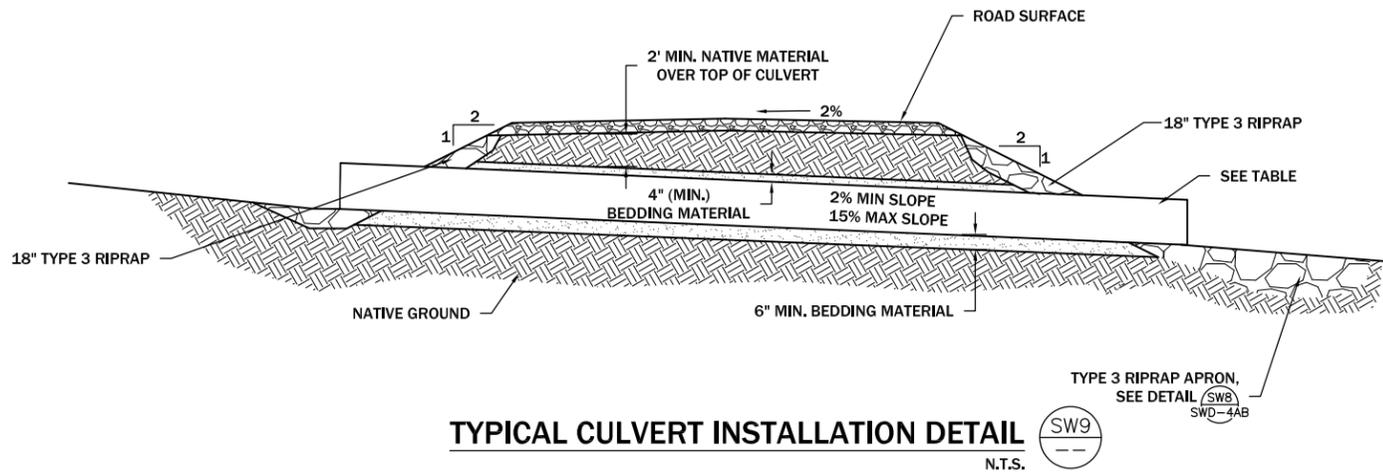
CULVERT AND
 RIPRAP APRON
 INSTALLATION
 DETAILS

PIONEER
 TECHNICAL SERVICES, INC.
 1101 SOUTH MONTANA
 BUTTE, MONTANA 59701
 (406) 782-5177

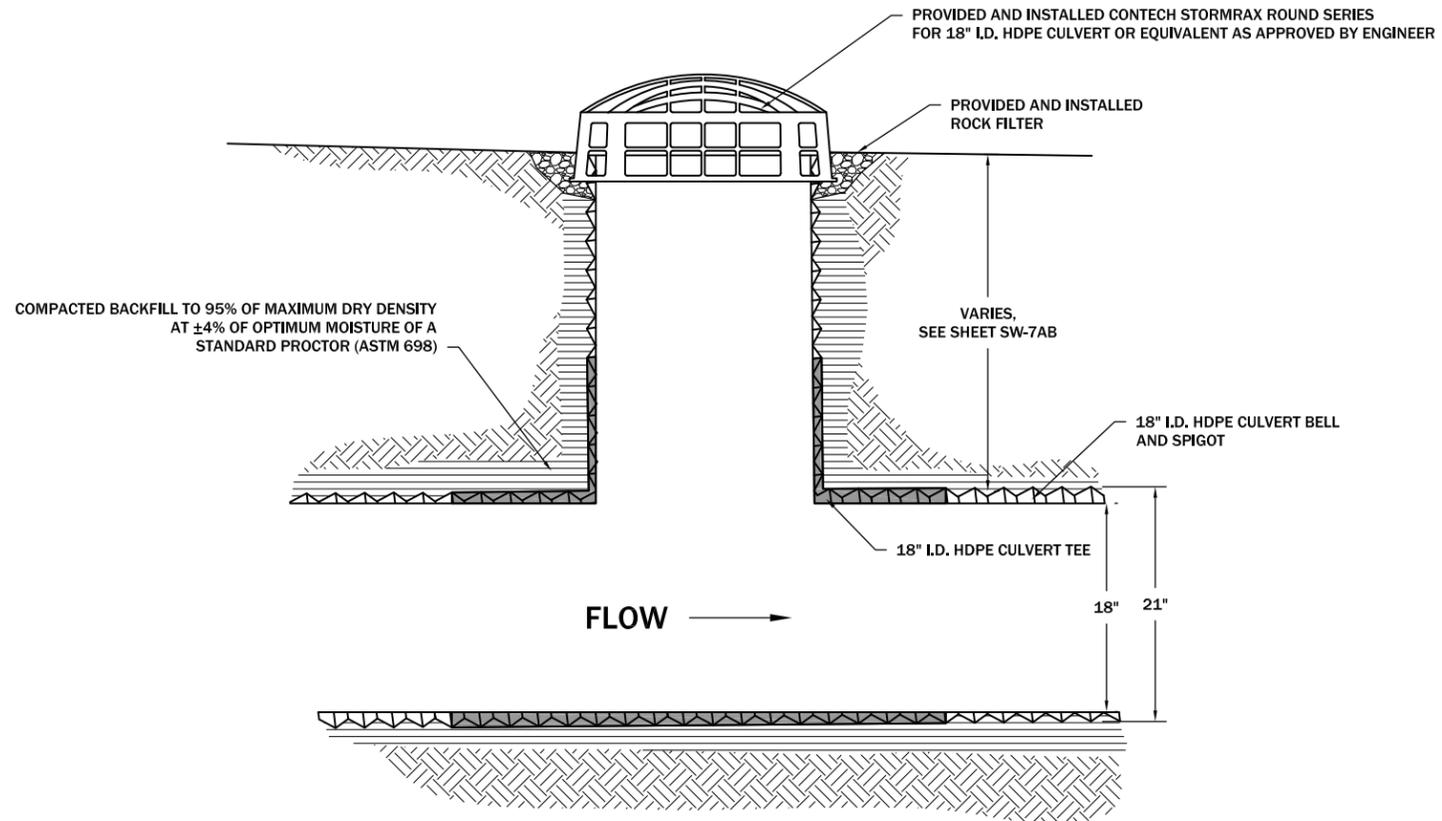
SHEET
 SWD-4AB



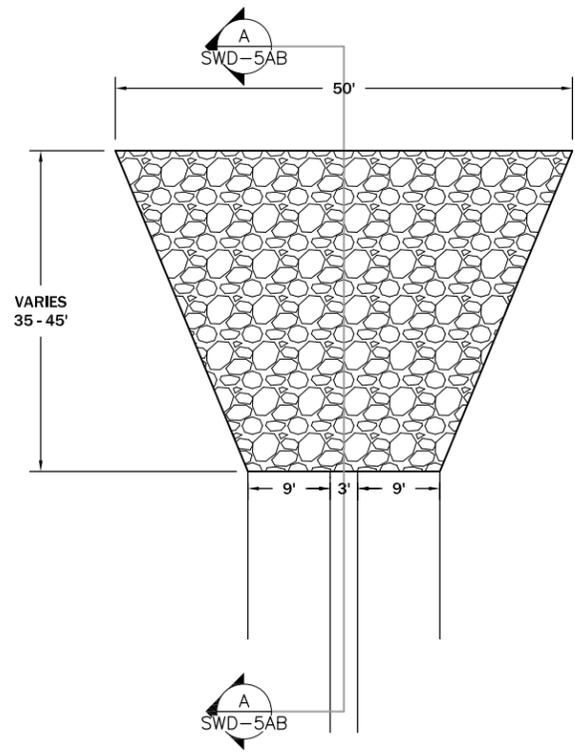
NOTE:
 1. INSTALLED CULVERT PER MANUFACTURER'S RECOMMENDATIONS.



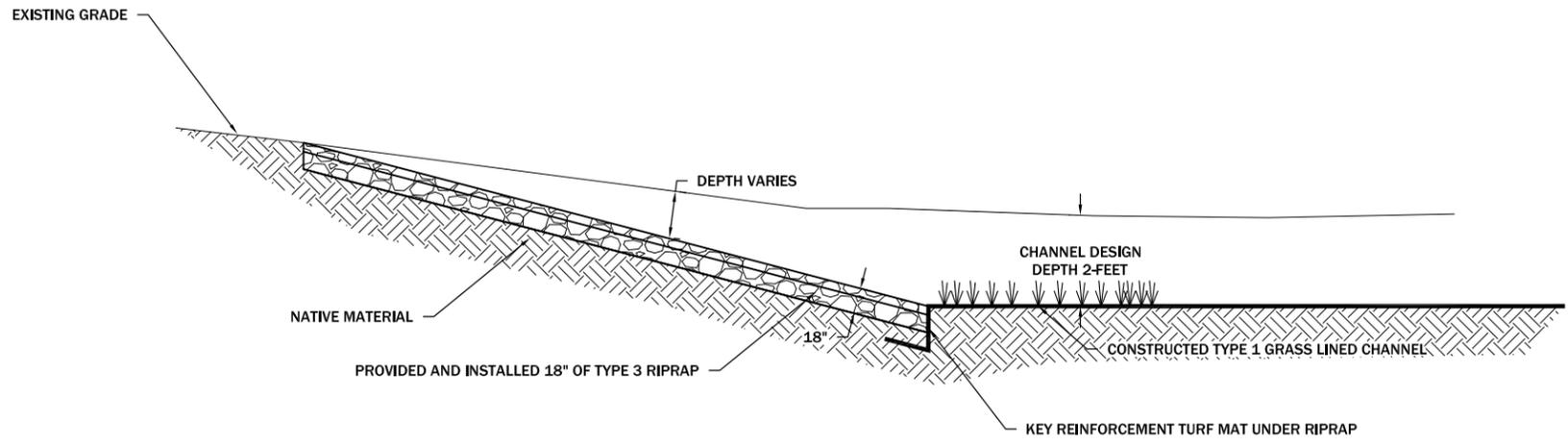
CULVERT TABLE					
CHANNEL #	SIZE	TYPE	LENGTH	LONG TERM	TEMPORARY
1	24"	HDPE	41	X	
5	36"	HDPE	102	X	
REPOSITORY-RUNOFF CHANNEL	36"	HDPE	102	X	



18" HDPE DRAIN DETAIL (SW10)
N.T.S.



TYPE 3 RIPRAP INLET CHANNEL DETAIL (SW11)
N.T.S.

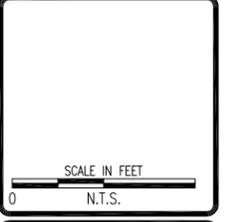


SECTION A-A
N.T.S.

REVISION	DATE	BY	DESC.

DRAWN BY: CLM
 DESIGNED BY: JSM
 CHECKED BY: MCB
 APPROVED BY: JSM
 PROJECT NO: 10160
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: NA
 DATUM: NA
 UNITS: FEET
 SOURCE: PIONEER



MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

STORM WATER
 DRAIN SYSTEM AND
 TYPE 3 GROUTED RIPRAP
 CHANNEL INLET DETAIL



SHEET
 SWD-5AB

REVISION:	DATE:	BY:	DESC:

DRAWN BY: CLA
DESIGNED BY: BS
CHECKED BY: MCB
APPROVED BY: JSA
PROJECT NO: 10152
DATE: 2/24/13

DISPLAYED AS:
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DATUM: NA
UNITS: FEET
SOURCE: PIONEER

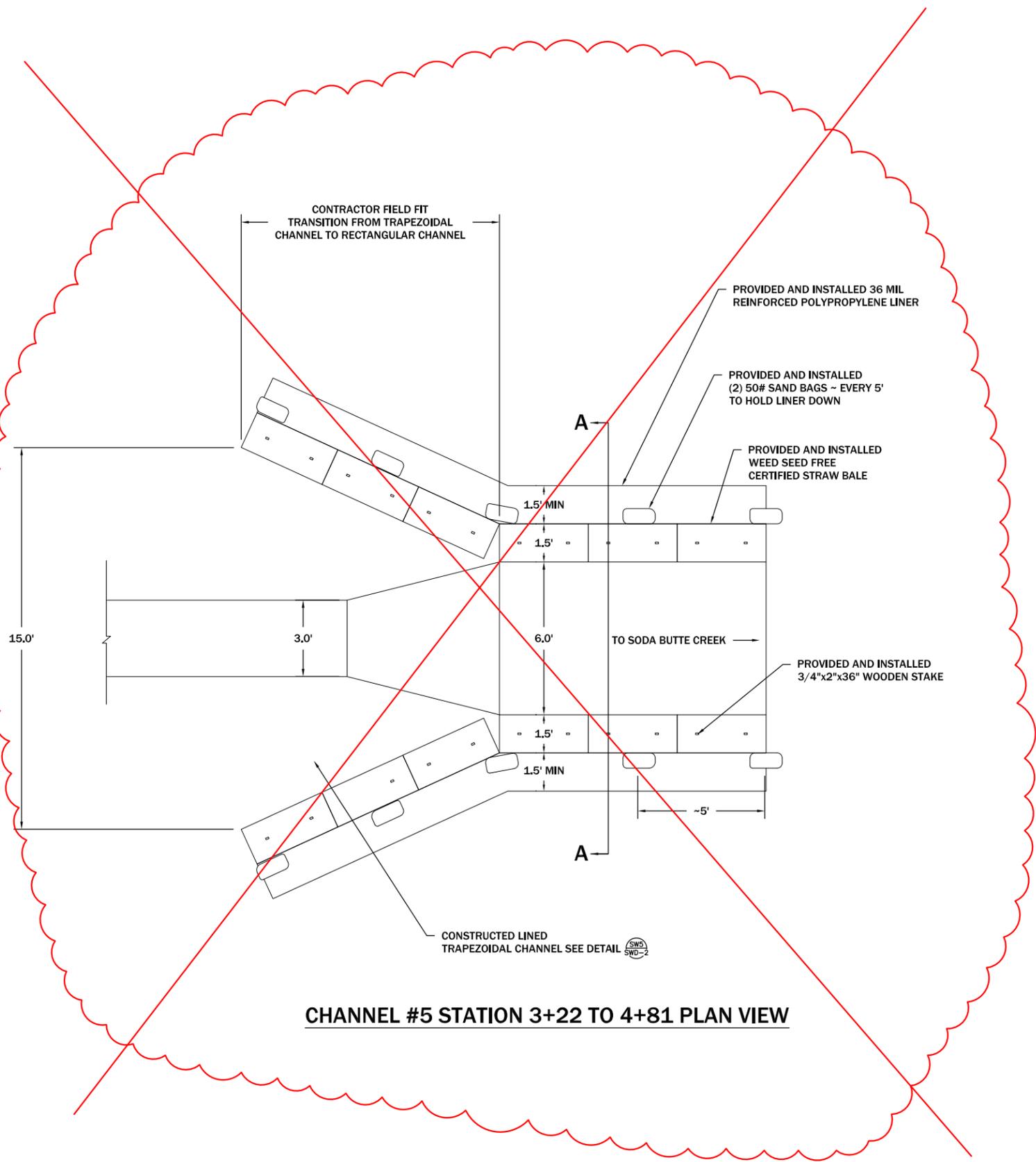
SCALE IN FEET
0 N.T.S.

MDEQ/MWCB
MCLAREN TAILINGS ABANDONED
MINE SITE RECLAMATION PROJECT
FINAL AS-BUILT DRAWINGS

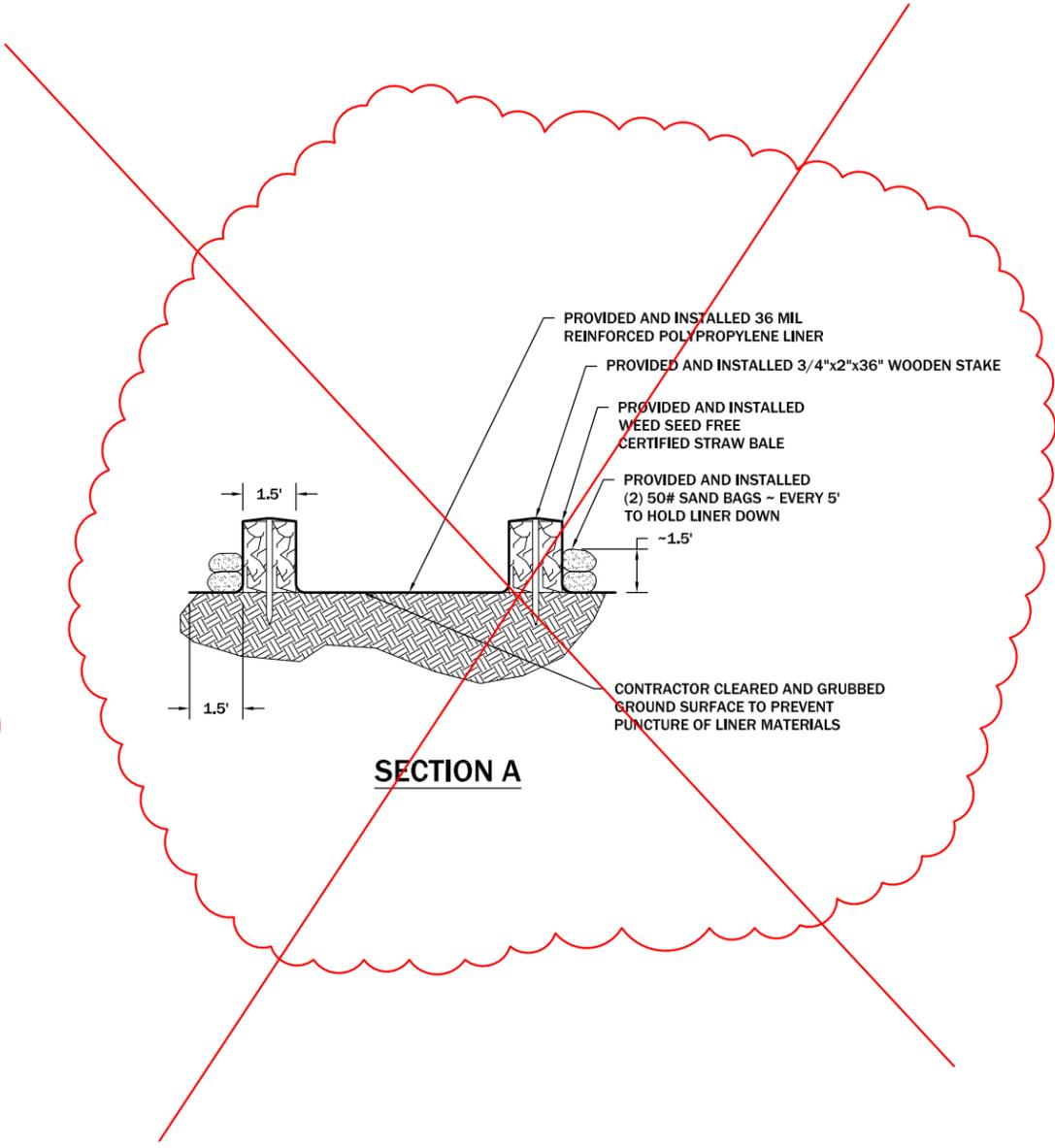
CHANNEL #5
DETAILS
STATION
3+32 TO 4+81

PIONEER
TECHNICAL SERVICES, INC.
1101 SOUTH MONTANA
BUTTE, MONTANA 59701
(406) 782-5177

SHEET
SWD-6AB



CHANNEL #5 STATION 3+22 TO 4+81 PLAN VIEW



SECTION A

NOTE:
1. THIS WAS TEMPORARY INSTALLATION TO MANAGE STORMWATER AT THE SITE FROM 2010 TO 2013. IT NO LONGER EXISTS AT SITE.

REVISION	DATE	BY	DESC.

DRAWN BY: CLC
 DESIGNED BY: JCB
 CHECKED BY: JSA
 APPROVED BY: JSA
 PROJECT NO: 10140
 DATE: 2/24/15

DISPLAYED AS:
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 DATUM: NA
 UNITS: FEET
 SOURCE: PIONEER

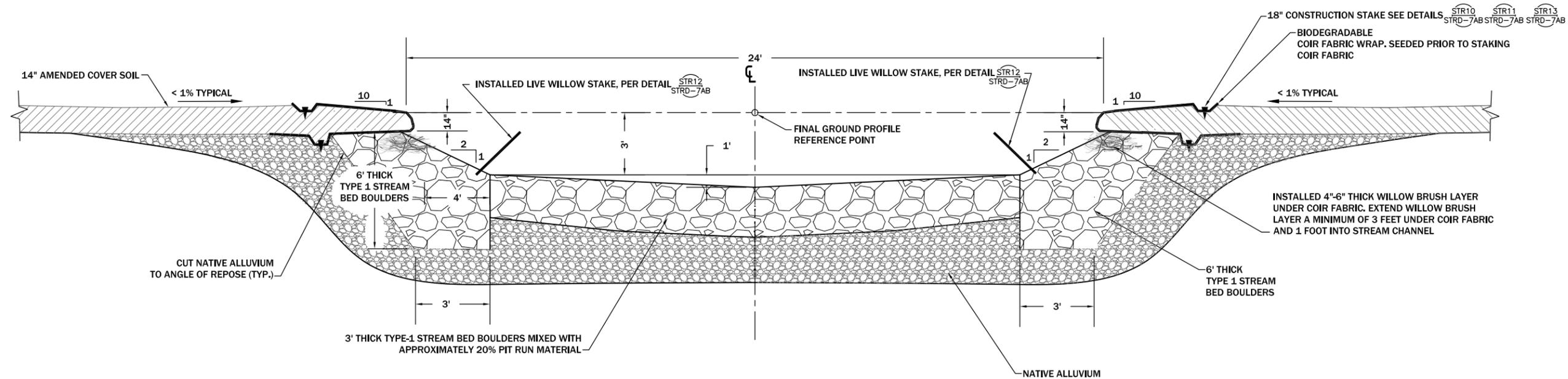
SCALE IN FEET
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MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

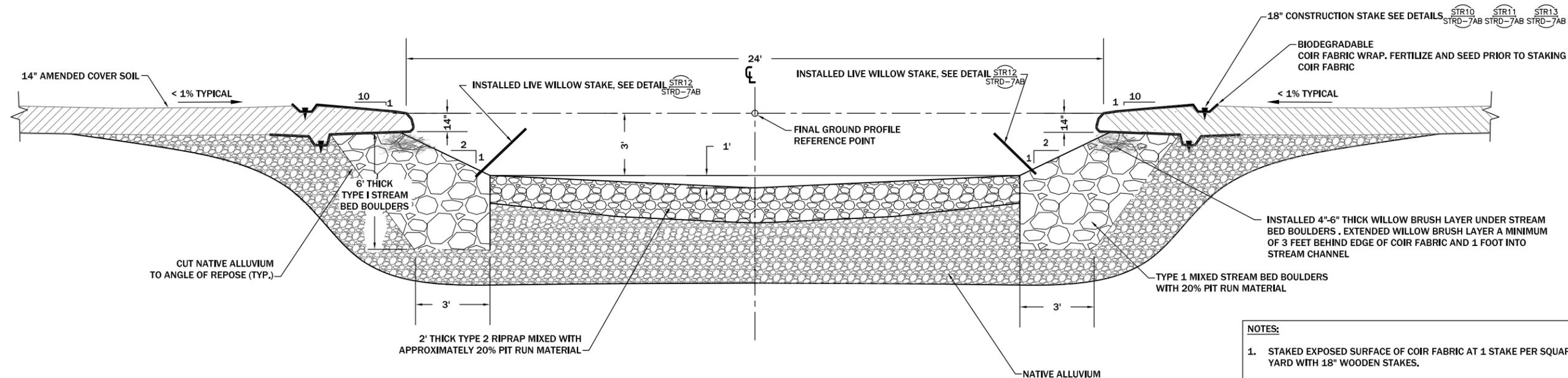
STREAM
 RECONSTRUCTION
 DETAILS

PIONEER
 TECHNICAL SERVICES, INC.
 1101 SOUTH MONTANA
 BUTTE, MONTANA 59701
 (406) 782-5177

SHEET
 STRD-1AB

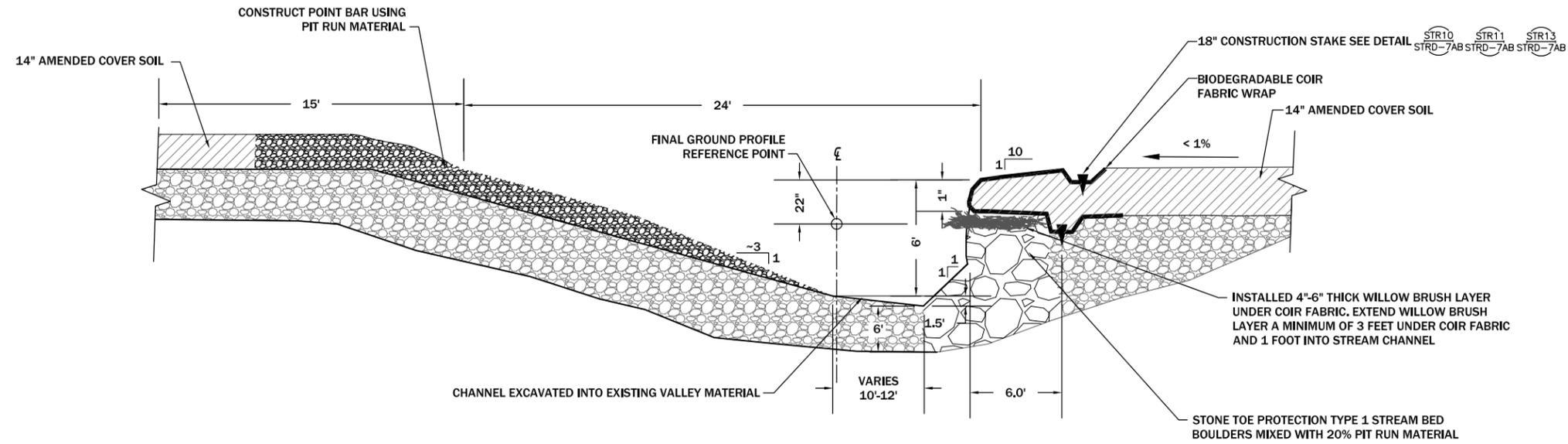


TYPE-A CHANNEL RUN CROSS SECTION (TYPICAL) STR1
 N.T.S.

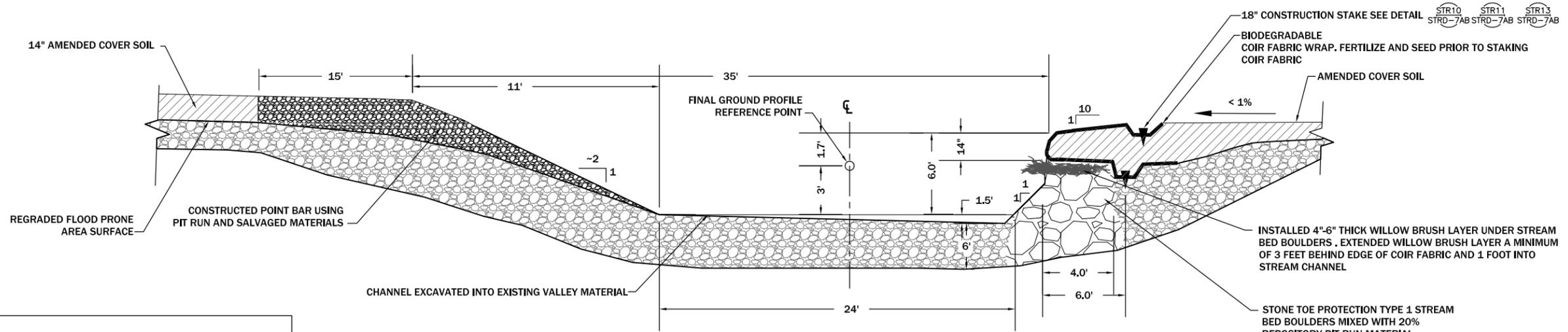


TYPE-B CHANNEL RUN CROSS SECTION (TYPICAL) STR2
 N.T.S.

- NOTES:**
1. STAKED EXPOSED SURFACE OF COIR FABRIC AT 1 STAKE PER SQUARE YARD WITH 18" WOODEN STAKES.
 2. TRANSITIONS WERE PERPENDICULAR OR TANGENTIAL TO FLOW DIRECTION AS DIRECTED BY ENGINEER.
 3. INSTALLED LIVE WILLOW STAKES AT 2' CENTERS ALONG STREAM BANK AS DIRECTED BY THE ENGINEER.
 4. INSTALLED WILLOW BRUSH LAYERS AT LOCATIONS SHOWN AND AS DIRECTED BY THE ENGINEER.
 5. MIXED APPROXIMATELY 20% OF PIT RUN MATERIAL WITH TYPE-1 AND/OR TYPE-2 STREAM SUBSTRATE, AS DIRECTED BY THE ENGINEER.
 6. PROVIDED AND INSTALLED BOULDERS IN STREAM CHANNEL AT THE DIRECTION OF THE ENGINEER.
 7. INSTALLED LARGE WOODY MATERIAL IN STREAM CHANNEL AT THE DIRECTION OF THE ENGINEER.



CHANNEL POOL CROSS SECTION (TYPICAL) (STR3)
N.T.S.



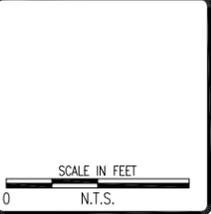
RIFLE POOL CROSS SECTION (TYPICAL) (STR4)
N.T.S.

- NOTES:**
1. STAKED EXPOSED SURFACE OF COIR FABRIC AT 1 STAKE PER SQUARE YARD WITH 18" WOODEN STAKES, PER SPECIAL PROVISIONS.
 2. TRANSITIONS WERE PERPENDICULAR OR TANGENTIAL TO FLOW DIRECTION AS DIRECTED BY ENGINEER.
 3. INSTALLED LIVE WILLOW STAKES AT 2' CENTERS ALONG STREAM BANK AS DIRECTED BY THE ENGINEER.
 4. INSTALLED WILLOW BRUSH LAYERS AT LOCATIONS SHOWN AND AS DIRECTED BY THE ENGINEER.
 5. MIXED APPROXIMATELY 20% OF PIT RUN MATERIAL WITH TYPE-1 AND/OR TYPE-2 STREAM SUBSTRATE, AS DIRECTED BY THE ENGINEER.
 6. PROVIDED AND INSTALLED BOULDERS IN STREAM CHANNEL AT THE DIRECTION OF THE ENGINEER.
 7. INSTALLED LARGE WOODY MATERIAL IN STREAM CHANNEL AT THE DIRECTION OF THE ENGINEER.

REVISION:	DATE:	BY:	DESC:

DRAWN BY: CLC
 DESIGNED BY: JMCB
 CHECKED BY: JSA
 APPROVED BY: JSA
 PROJECT NO: 10140
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: NA
 DATUM: NA
 UNITS: FEET
 SOURCE: PIONEER



MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

STREAM
 RECONSTRUCTION
 DETAILS



SHEET
STRD-2AB

Soda Butte Creek Reconstruction Plan Layout

Station 0+00 to 14+75 ~~13+51~~

Station Start	Station End	Typical Detail	Length (ft)
0+00	1+10	TYPE A CHANNEL RUN - DETAIL STR1 / STRD-1	110
1+10	1+60	TYPE B CHANNEL RUN - DETAIL STR2 / STRD-1	50
1+60	2+55	TYPE A CHANNEL RUN - DETAIL STR1 / STRD-1	95
2+55	3+10	TYPE B CHANNEL RUN - DETAIL STR2 / STRD-1	55
3+10	4+50	TYPE A CHANNEL RUN - DETAIL STR1 / STRD-1	140
4+50	5+40	CHANNEL POOL - DETAIL STR3 / STRD-2	90
5+40	5+70	RIFFLE POOL - DETAIL STR4 / STRD-2	30
5+70	6+90	CHANNEL POOL - DETAIL STR3 / STRD-2	120
6+90	9+20	TYPE B CHANNEL RUN - DETAIL STR2 / STRD-1	230
9+20	10+80	CHANNEL POOL - DETAIL STR3 / STRD-2	160
10+80	11+30	TYPE A CHANNEL RUN - DETAIL STR1 / STRD-1	50
11+30	12+50	CHANNEL POOL - DETAIL STR3 / STRD-2	120
12+50	13+10	TYPE A CHANNEL RUN - DETAIL STR1 / STRD-1	60
13+10	13+45	RIFFLE RUN - DETAIL STR5 / STRD-3	35
13+45	14+75	TYPE A CHANNEL RUN - DETAIL STR1 / STRD-1	130

NOTES:

1. STREAM SEGMENTS WERE MODIFIED IN THE FIELD BASED ON ACTUAL EXCAVATION AFTER WASTE REMOVAL.
2. SODA BUTTE AND MILLER CREEK WERE DESIGNED AND CONSTRUCTED TO BE DYNAMIC LANDFORMS THAT WILL ADJUST CONTINUOUSLY OVER TIME WITH RUNOFF EVENTS. THIS CONTINUOUS CHANGE RESULTS IN THE MOVEMENT OF GRAVELS AND FINES THROUGHOUT THE SYSTEM.

Soda Butte Creek Grade Control Structures

Installed Station	Type
0+00	Rock
0+17	Rock
0+55	Rock
0+93	Rock
1+17	Rock
1+28	Log
1+44	Rock
10+07	Rock
10+45	Rock
11+50	Rock
2+05	Rock
2+25	Rock
2+75	Rock
2+95	Rock
3+30	Rock
3+80	Rock
4+10	Log
4+65	Rock
5+00	Rock
5+25	Rock
5+75	Rock
6+10	Rock
6+30	Rock
6+60	Rock
7+00	Rock
7+20	Rock
7+70	Rock
8+00	Rock
8+20	Rock
8+85	Rock
9+17	Rock
9+50	Rock
9+75	Rock

Miller Creek Grade Control Structures

Installed Station	Type
-0+19	Rock
0+16	Rock
0+43	Rock
0+76	Rock
1+02	Rock
1+30	Rock
1+56	Rock
1+88	Log
2+15	Rock
2+44	Rock
2+87	Rock
3+07	Rock
3+37	Rock
7+50	Rock

REVISION:	DATE:	BY:	DESC:

DRAWN BY:	CLA
DESIGNED BY:	MCB
CHECKED BY:	JSM
APPROVED BY:	JSM
PROJECT NO.:	10140
DATE:	2/24/15

DISPLAYED AS:	
COORD SYS / ZONE:	NA
DATUM:	NA
UNITS:	NA
SOURCE:	PIONEER

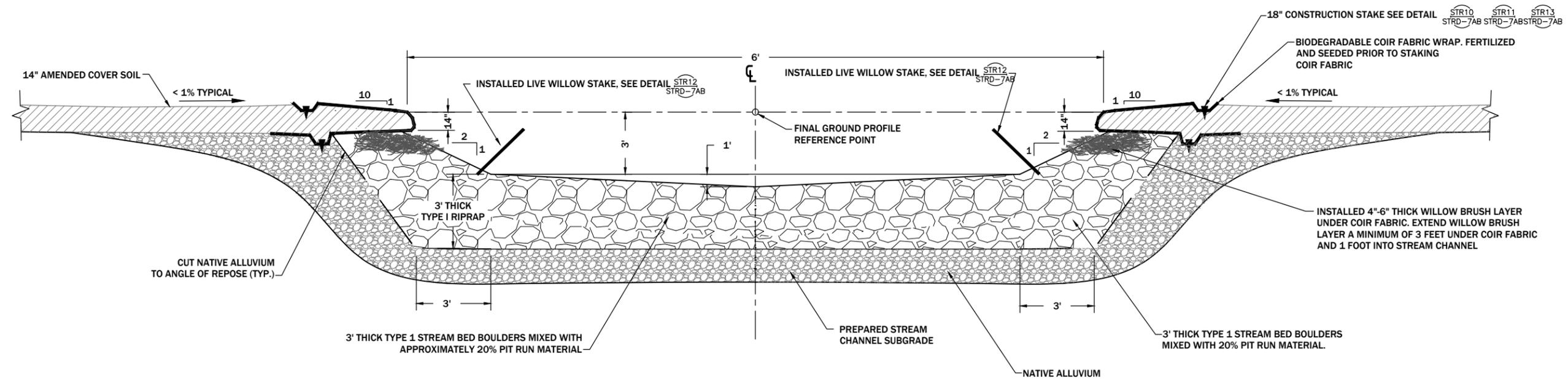
SCALE IN FEET
0 N.T.S.

MDEQ/MWCB
MCLAREN TAILINGS ABANDONED
MINE SITE RECLAMATION PROJECT
2015 AS-BUILT DRAWINGS

STREAM
RECONSTRUCTION
PLAN
LAYOUT



SHEET
STRD-4AB



MILLER CREEK CHANNEL CROSS SECTION (TYPICAL) (STR7)
 STATION 0+43 TO STATION 5+27
 N.T.S.

- NOTES:**
1. STAKED EXPOSED SURFACE OF COIR FABRIC AT 1 STAKE PER SQUARE YARD WITH 18" WOODEN STAKES.
 2. TRANSITIONS WERE PERPENDICULAR OR TANGENTIAL TO FLOW DIRECTION AS DIRECTED BY ENGINEER.
 3. INSTALLED LIVE WILLOW STAKES AT 2' CENTERS ALONG STREAM BANK AS DIRECTED BY THE ENGINEER.
 4. INSTALLED WILLOW BRUSH LAYERS AT LOCATIONS SHOWN AND AS DIRECTED BY THE ENGINEER.
 5. MIXED APPROXIMATELY 20% OF PIT RUN MATERIAL WITH TYPE-1 AND/OR TYPE-2 STREAM SUBSTRATE, AS DIRECTED BY THE ENGINEER.
 6. PROVIDED AND INSTALLED BOULDERS IN STREAM CHANNEL AT THE DIRECTION OF THE ENGINEER.
 7. INSTALLED LARGE WOODY MATERIAL IN STREAM CHANNEL AT THE DIRECTION OF THE ENGINEER.

REVISION:	DATE:	BY:	DESC:

DRAWN BY: CLA
 DESIGNED BY: MCB
 CHECKED BY: JSM
 APPROVED BY: JSM
 PROJECT NO: 10140
 DATE: 2/24/15

DISPLAYED AS:
 COORD SYS/ZONE: NA
 DATUM: NA
 UNITS: FEET
 SOURCE: PIONEER

SCALE IN FEET
 0 N.T.S.

MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

MILLER CREEK
 RECONSTRUCTION
 DETAILS

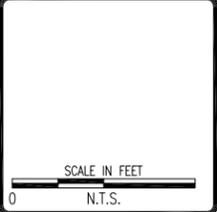


SHEET
 STRD-5AB

REVISION:	DATE:	BY:	DESC:

DRAWN BY: CLA
DESIGNED BY: JMCB
CHECKED BY: JSA
APPROVED BY: JSA
PROJECT NO: 10140
DATE: 2/24/13

DISPLAYED AS:
COORD SYS/ZONE: NA
DATUM: NA
UNITS: FEET
SOURCE: PIONEER

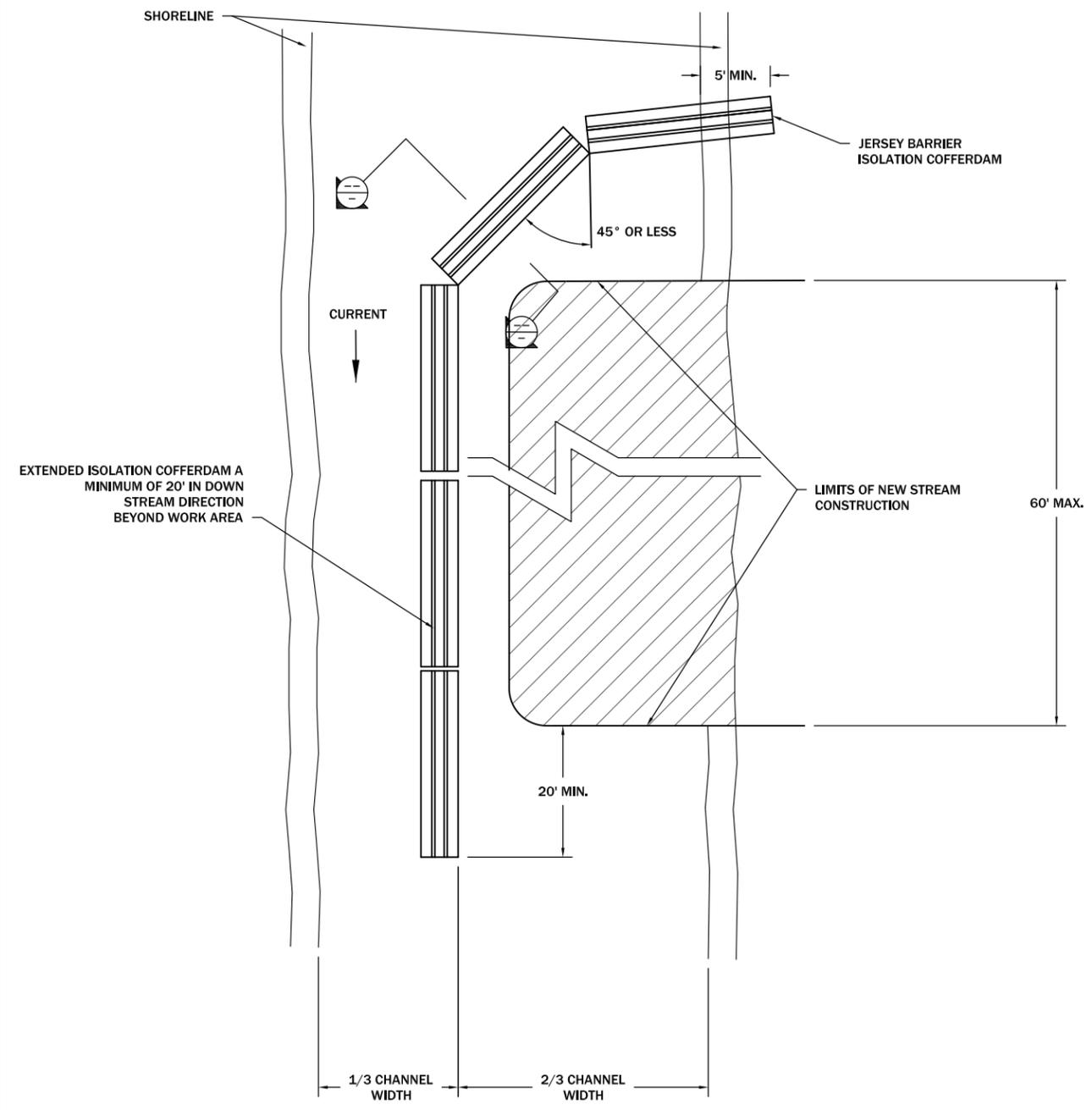


MDEQ/MWCB
MCLAREN TAILINGS ABANDONED
MINE SITE RECLAMATION PROJECT
FINAL AS-BUILT DRAWINGS

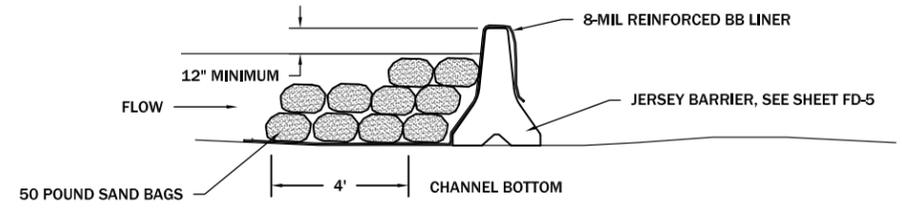
SODA BUTTE CREEK
ISOLATION
COFFERDAM
DETAILS

PIONEER
TECHNICAL SERVICES, INC.
1101 SOUTH MONTANA
BUTTE, MONTANA 59701
(406)-782-5177

SHEET
STRD-6AB



NOTES:
1. INSTALLED 50 POUND SANDBAGS ALONG TOE OF BERM AS NEEDED TO SECURE PVC GEOMEMBRANE LINER BARRIER TO BOTTOM OF STREAM CHANNEL.



ISOLATION COFFERDAM DETAIL (STR8)
N.T.S.

SECTION (STR9)
N.T.S.

REVISION:	DATE:	BY:	DESC:

DRAWN BY: CLC
DESIGNED BY: JCB
CHECKED BY: JSA
APPROVED BY: JSA
PROJECT NO: 10140
DATE: 2/24/15

DISPLAYED AS:
COORD SYS/ZONE:
DATUM:
UNITS:
SOURCE:

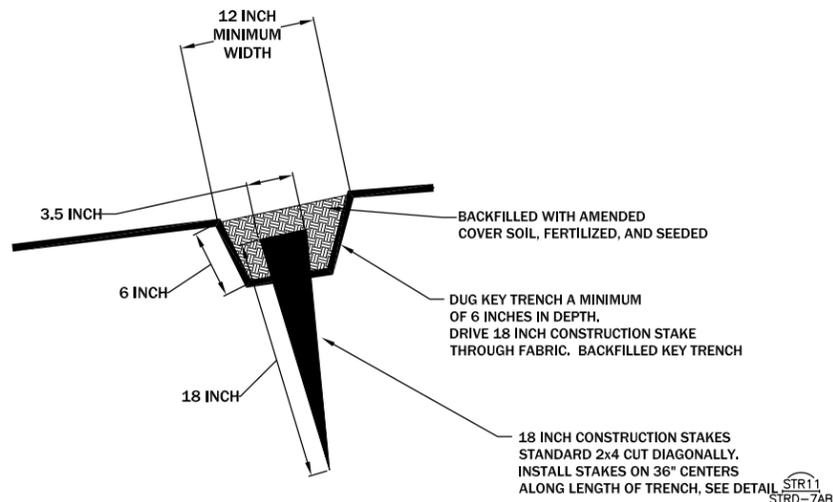
SCALE IN FEET
0 N.T.S.

MDEQ/MWCB
MCLAREN TAILINGS ABANDONED
MINESITE RECLAMATION PROJECT
FINAL AS-BUILT DRAWINGS

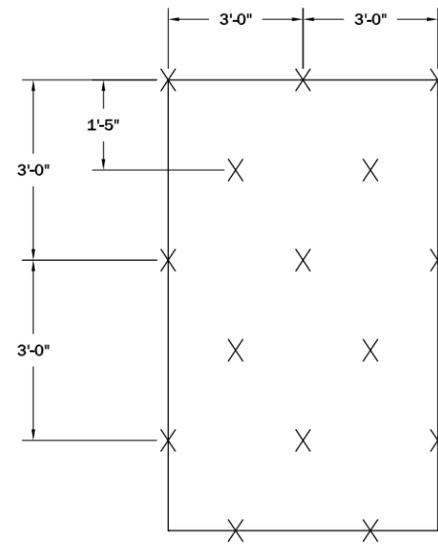
STREAM
RECONSTRUCTION
DETAILS

PIONEER
TECHNICAL SERVICES, INC.
1101 SOUTH MONTANA
BUTTE, MONTANA 59701
(406) 782-5177

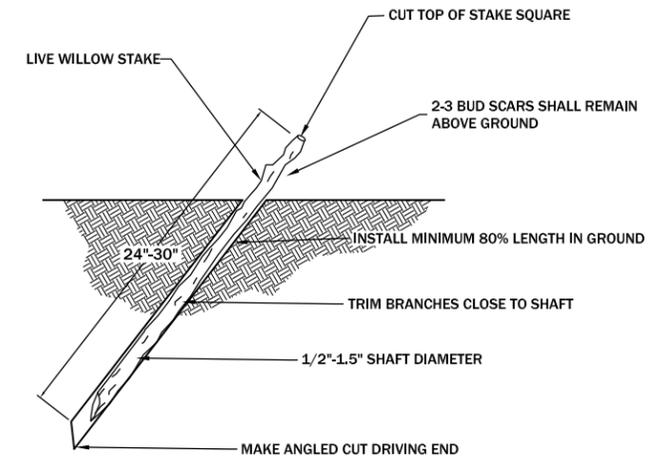
SHEET
STRD-7AB



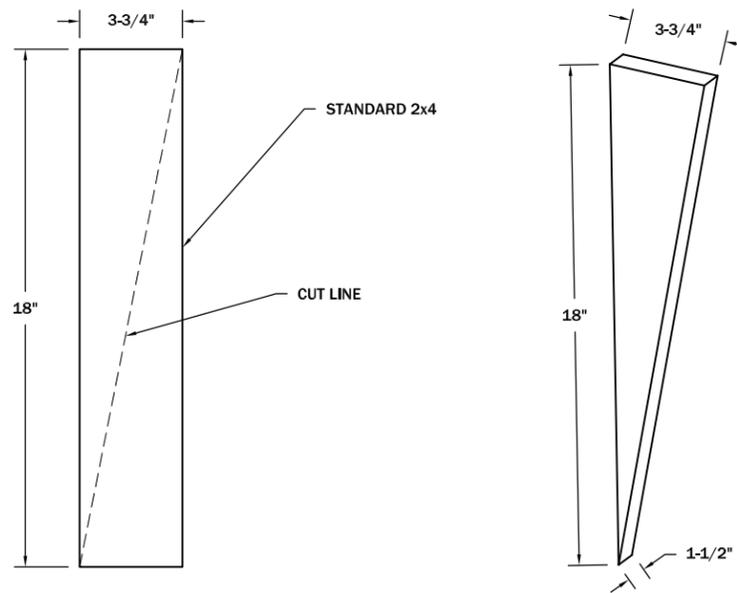
GEOTEXTILE FABRIC ANCHOR DETAIL STR10
N.T.S.



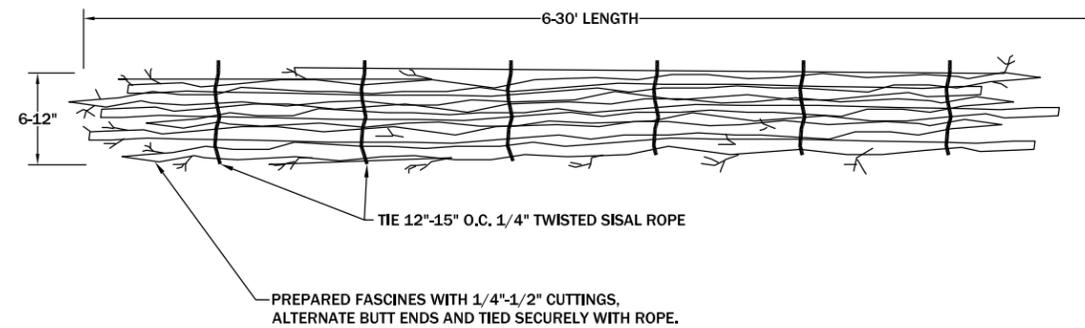
ONE (1) 18" CONSTRUCTION STAKE PER SQUARE YARD
18" CONSTRUCTION STAKE PATTERN DETAIL STR11
N.T.S.



LIVE WILLOW STAKES DETAIL STR12
N.T.S.



18-INCH CONSTRUCTION STAKE DETAIL STR13
N.T.S.



LIVE WILLOW FASCINE DETAIL STR14
N.T.S.

- NOTES:**
1. ALL WILLOW CUTTINGS WERE HARVESTED LOCALLY THAT ARE ADAPTED TO SITE CONDITIONS.
 2. ALL WILLOW CUTTINGS WERE SOAKED IN CLEAN WATER FOR A MINIMUM OF 24 HOURS PRIOR TO INSTALLATION.
 3. ALL WILLOW CUTTINGS WERE TAKEN FROM HEALTHY, LIVING STEMS OF MATURE PLANTS, ADAPTED TO THE CLIMATE OF THE PROJECT AREA.

REVISION	DATE	BY	DESC.

DRAWN BY: CLC
DESIGNED BY: JMCB
CHECKED BY: JSA
APPROVED BY: JSA
PROJECT NO: 10140
DATE: 2/24/15

DISPLAYED AS:
COORD SYS/ZONE: NA
DATUM: NA
UNITS: NA
SOURCE: PIONEER

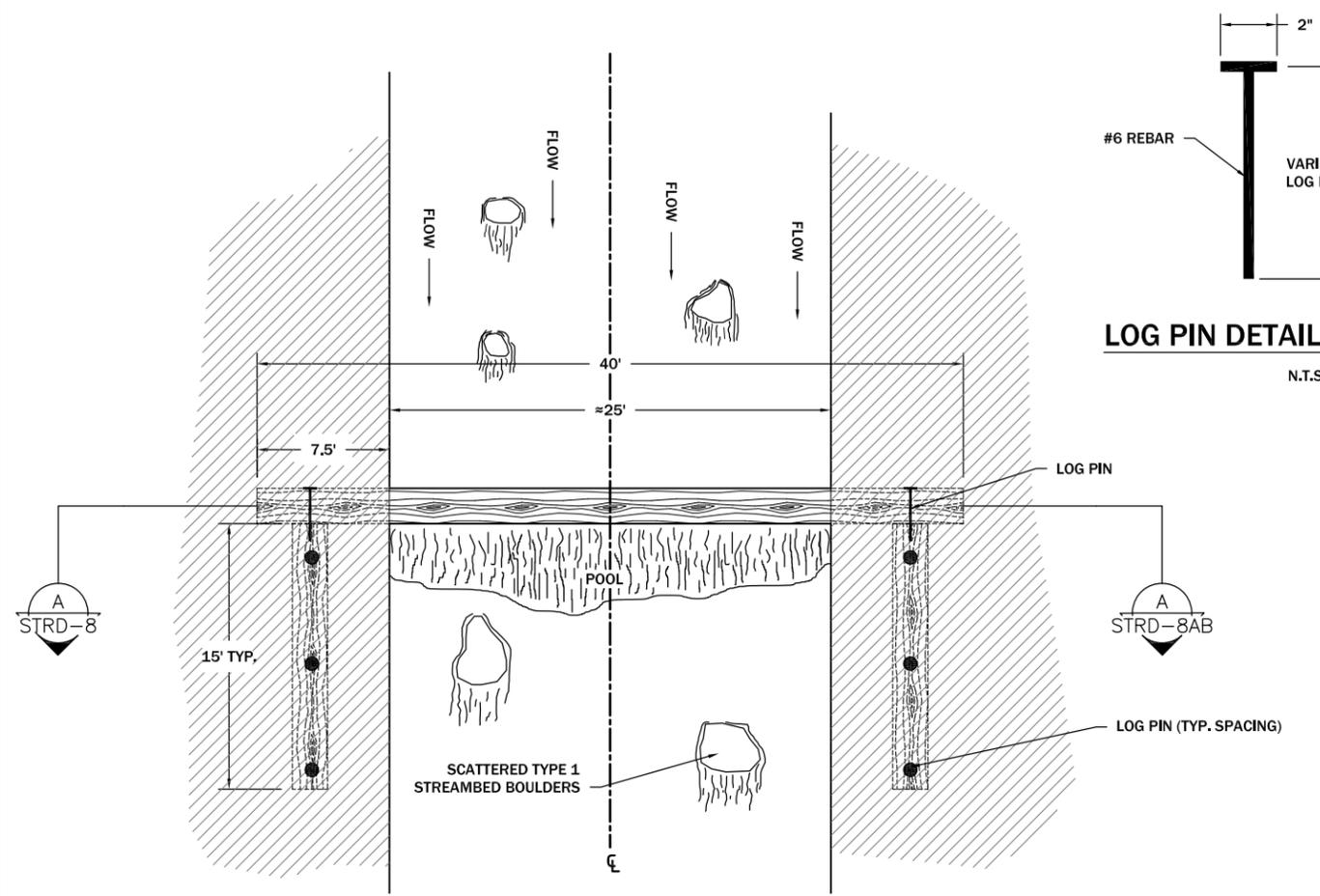
SCALE IN FEET
0 N.T.S.

MDEQ/MWCB
MCLAREN TAILINGS ABANDONED
MINE SITE RECLAMATION PROJECT
FINAL AS-BUILT DRAWINGS

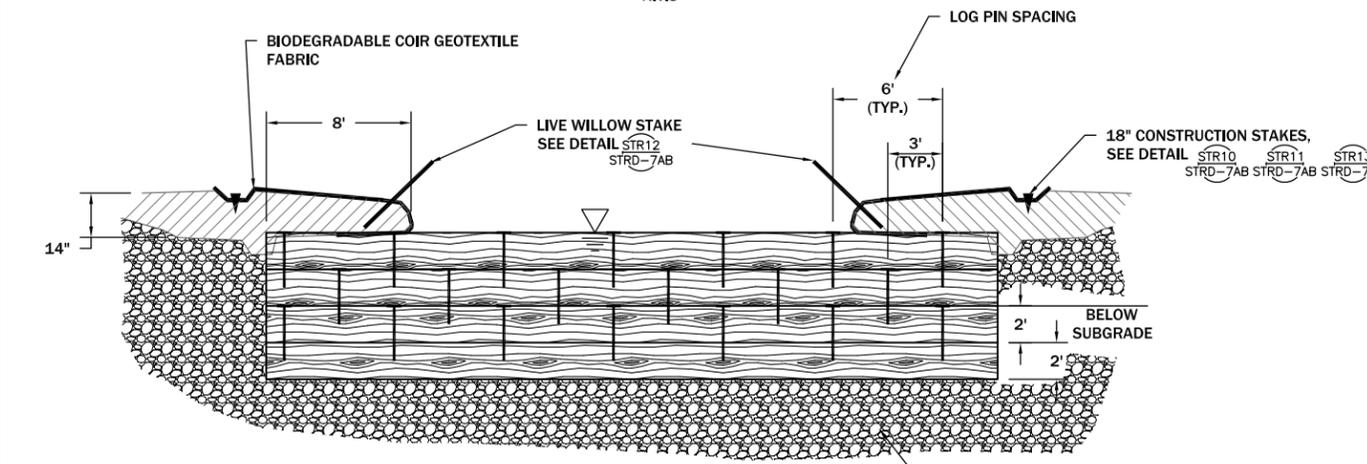
RECONSTRUCTION
DETAILS

PIONEER
TECHNICAL SERVICES, INC.
1101 SOUTH MONTANA
BUTTE, MONTANA 59701
(406) 782-5177

SHEET
STRD-8AB



PLAN VIEW
N.T.S.

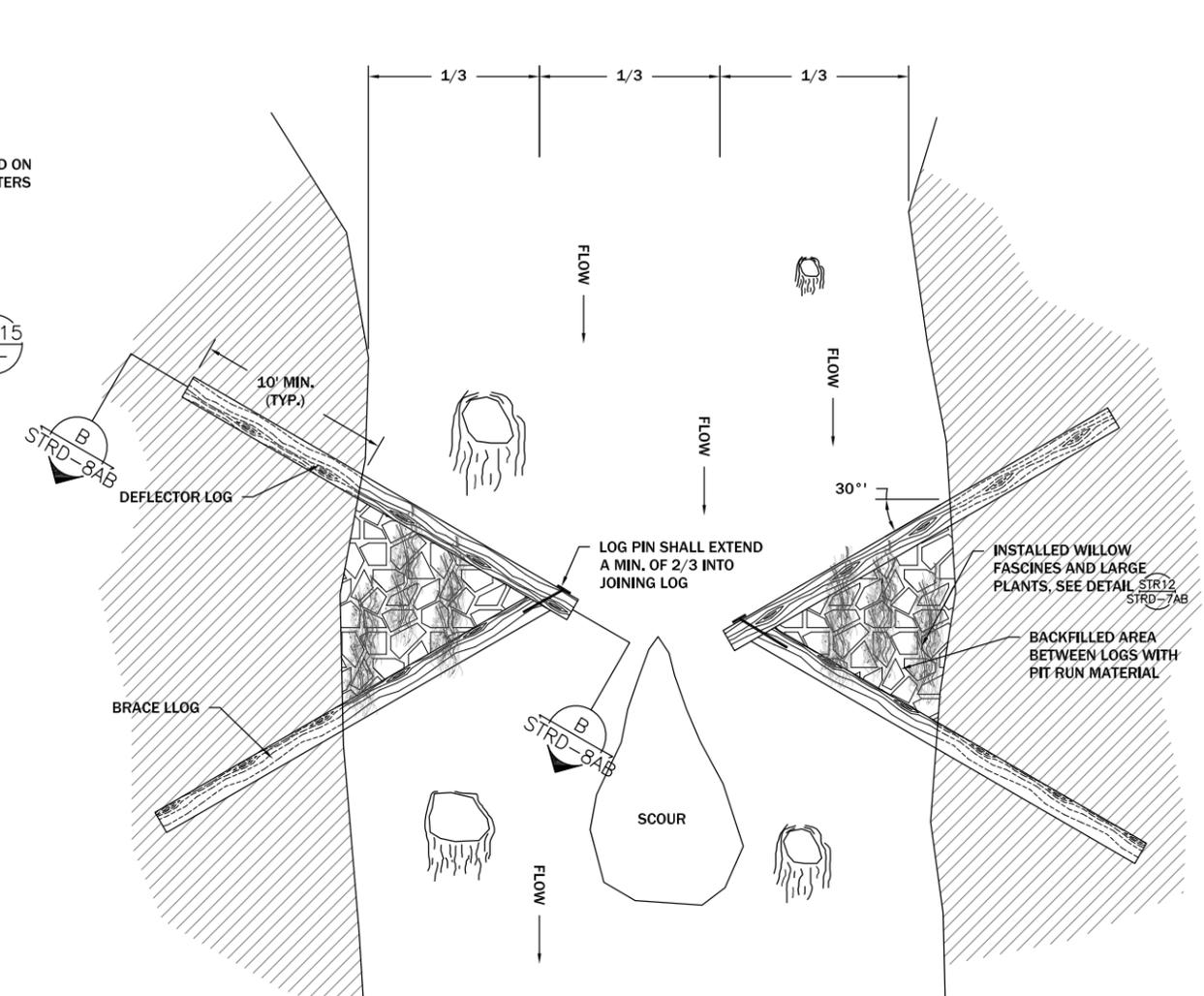


SECTION A-A
N.T.S.

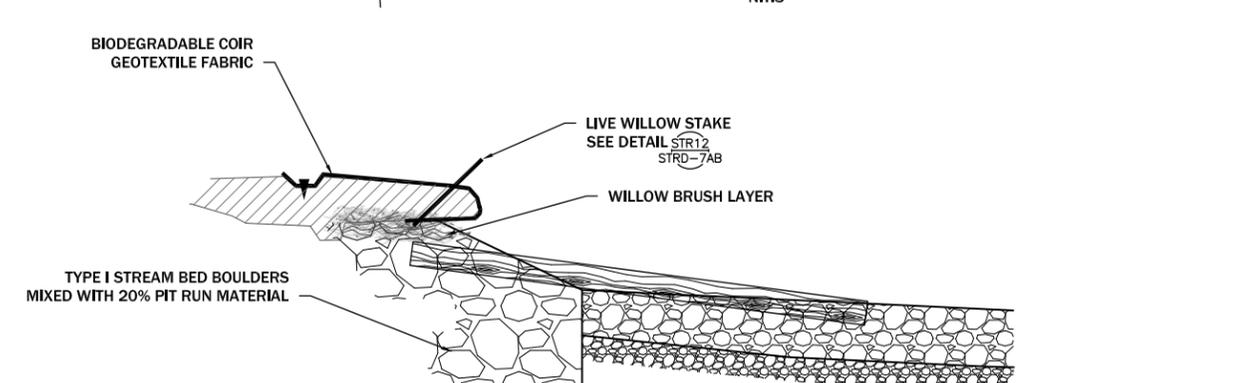
LOG GRADE CONTROL DETAIL
N.T.S.

- LOG DETAIL NOTES:**
1. ALL LOGS WERE FREE OF LIMBS, FREE OF CRACKS, AND SPLITS.
 2. PIN ALL LOGS AS SHOWN A MINIMUM OF 18" INTO LOWER LOG.

- WING DEFLECTOR NOTES:**
1. NOT MORE THAN 1/3 WIDTH OF CHANNEL.
 2. THE ELEVATION OF THE TIP OF THE DEFLECTOR DID NOT EXCEED 2 TIMES THE HEIGHT OF THE FLOW CHANNEL.
 3. TIP OF DEFLECTORS WERE ALSO IN-LINE WITH THE CENTER OF STRUCTURE ON OPPOSITE BANK.
 4. LOGS WERE TAPERED BACK TO BANK FULL ELEVATION.
 5. EXCAVATE/BURY MINIMUM 2-FEET BELOW LOW FLOW ELEVATION.
 6. PIN ALL LOGS A MINIMUM OF 18".



PLAN VIEW
N.T.S.



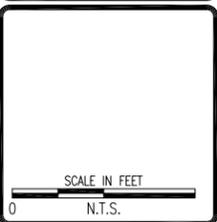
SECTION B-B
N.T.S.

WING DEFLECTOR DETAIL
N.T.S.

REVISION	DATE	BY	DESC.

DRAWN BY: CLA
 DESIGNED BY: JCB
 CHECKED BY: JSA
 APPROVED BY: JSA
 PROJECT NO: 10140
 DATE: 2/24/13

DISPLAYED AS:
 COORD SYS/ZONE: NA
 DATUM: NA
 UNITS: FEET
 SOURCE: PIONEER

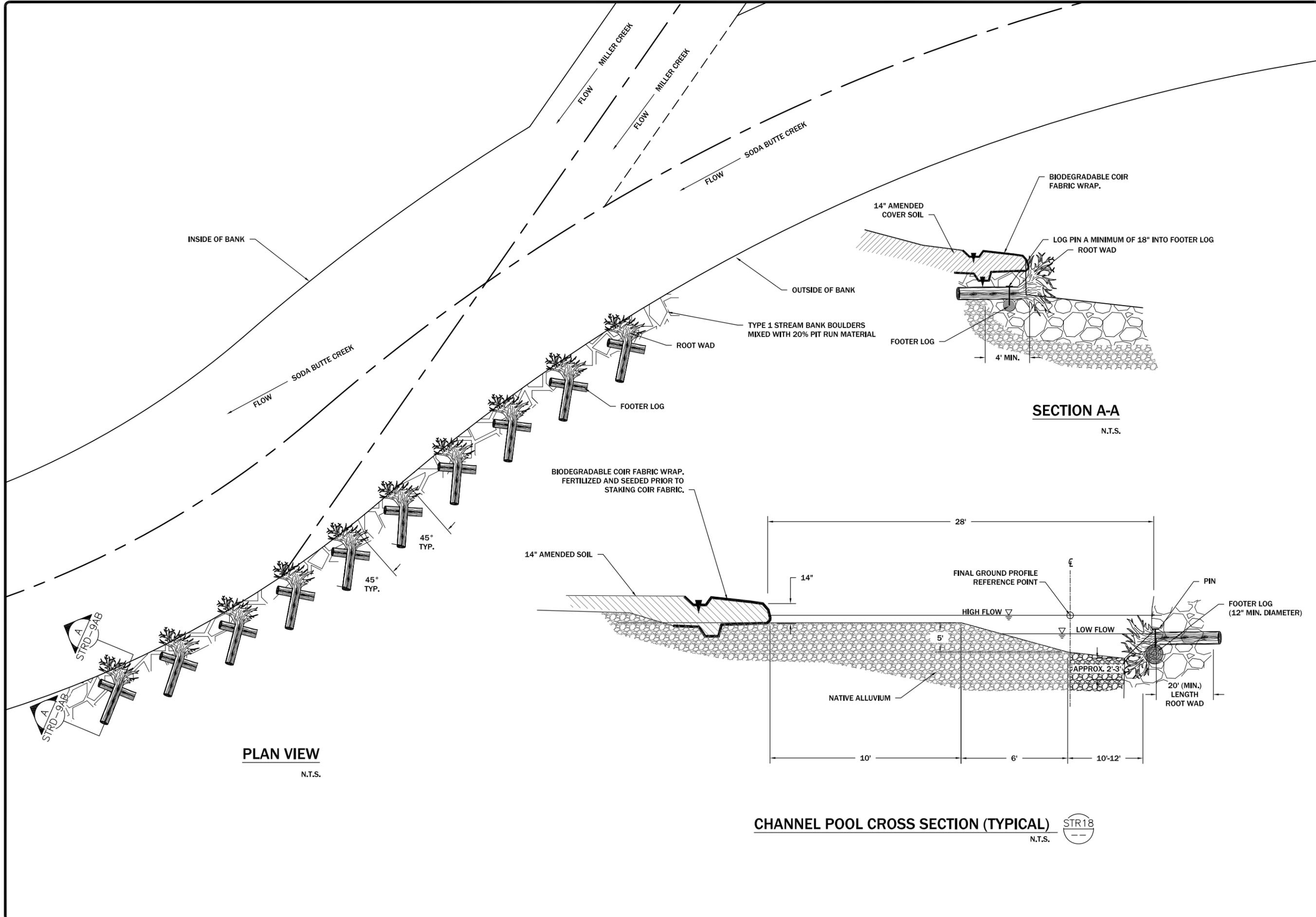


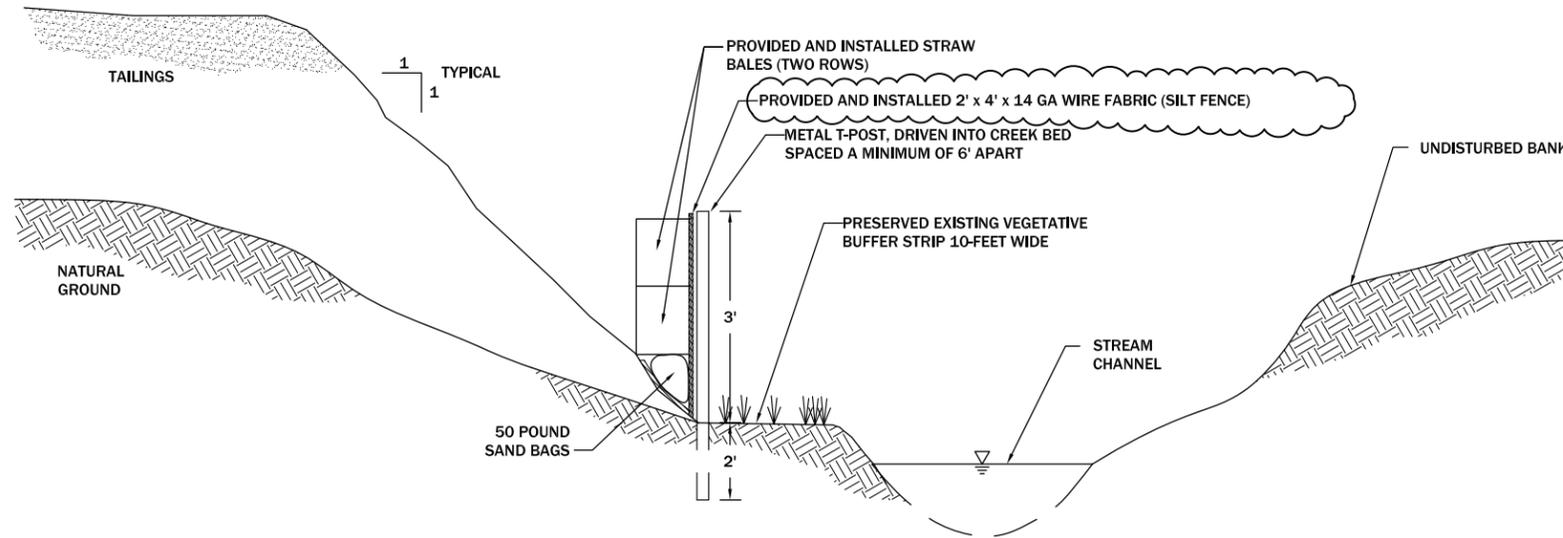
MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MINE SITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

STREAM 8+25 TO 8+80
 ROOT WAD
 INSTALLATION
 DETAILS

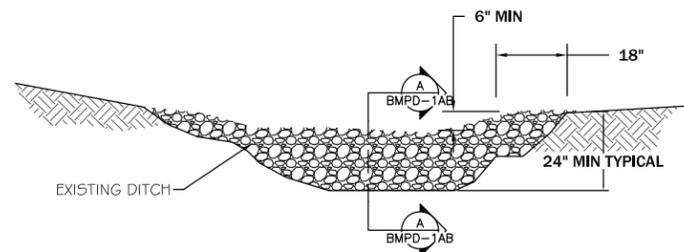
PIONEER
 TECHNICAL SERVICES, INC.
 1101 SOUTH MONTANA
 BUTTE, MONTANA 59701
 (406) 782-5177

SHEET
 STRD-9AB



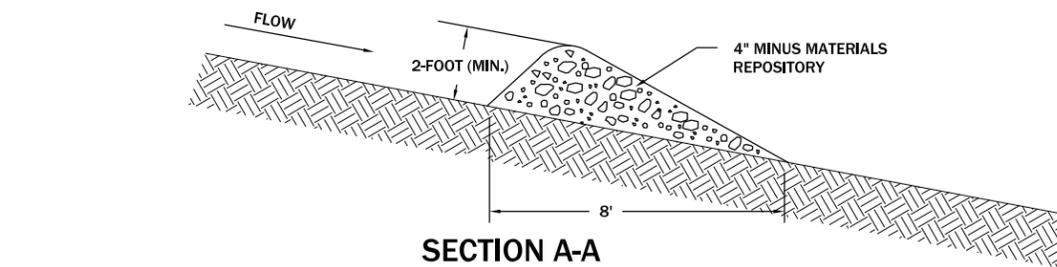


STREAM PROTECTION STRUCTURE DETAIL (BMP1)
N.T.S.

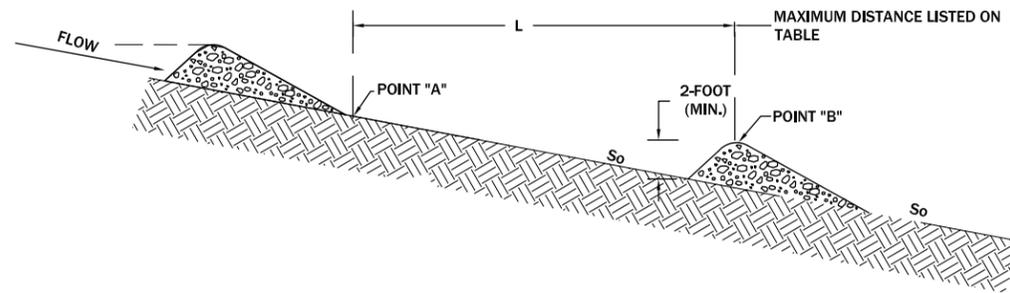


VIEW LOOKING UPSTREAM

SPACING BETWEEN CHECK DAMS		
Slope, So		Check Dam Spacing ("L")
%	ft/ft	L
1	0.01	667
2	0.02	333
3	0.03	222
4	0.04	167
5	0.05	133
6	0.06	111
7	0.07	95
8	0.08	83
9	0.09	74
10	0.10	40
11	0.11	36
12	0.12	33
13	0.13	31
14	0.14	29
15	0.15	27
>15	>0.15	25



SECTION A-A

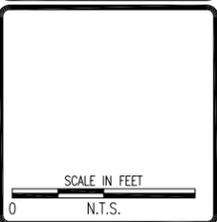


STONE CHECK DAM DETAIL (BMP2)

REVISION DATE	BY	DESC.
6/10/10	JSM	ADD 2'x4' x14 GAGE WIRE FABRIC

DRAWN BY: CLM
 DESIGNED BY: JMCB
 CHECKED BY: JSM
 APPROVED BY: JSM
 PROJECT NO: 10140
 DATE: 2/24/13

DISPLAYED AS:
 COORD SYS/ZONE: NA
 DATUM: NA
 UNITS: FEET
 SOURCE: PIONEER



MDEQ
 MCLAREN TAILINGS ABANDONED
 MINESITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

STREAM
 PROTECTION
 DETAILS

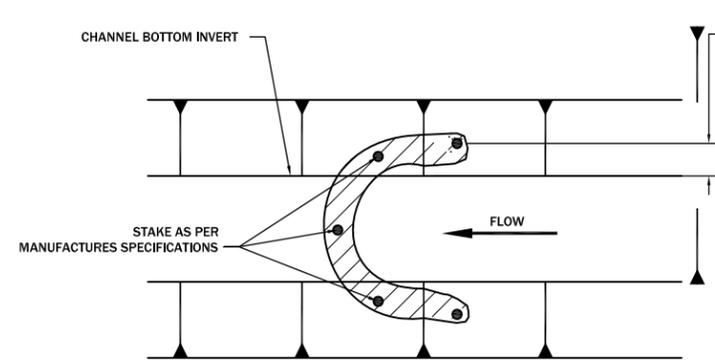
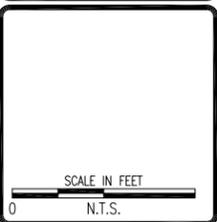
PIONEER
 TECHNICAL SERVICES, INC.
 1101 SOUTH MONTANA
 BUTTE, MONTANA 59701
 (406) 782-5177

SHEET
 BMPD-1AB

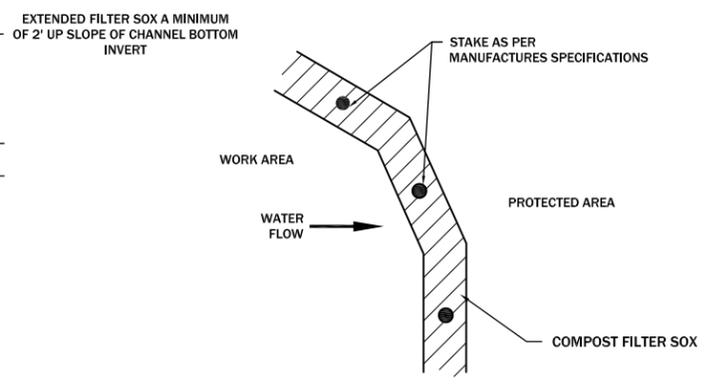
REVISION	DATE	BY	DESC.

DRAWN BY: SKL
 DESIGNED BY: MCB
 CHECKED BY: JSA
 APPROVED BY: JSA
 PROJECT NO: 10140
 DATE: 2/24/15

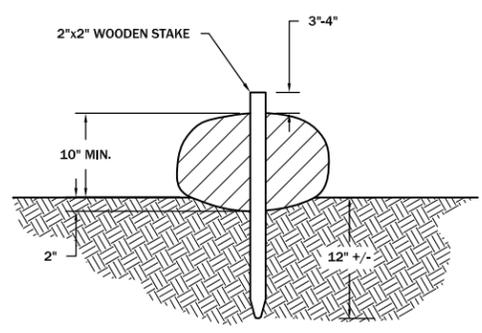
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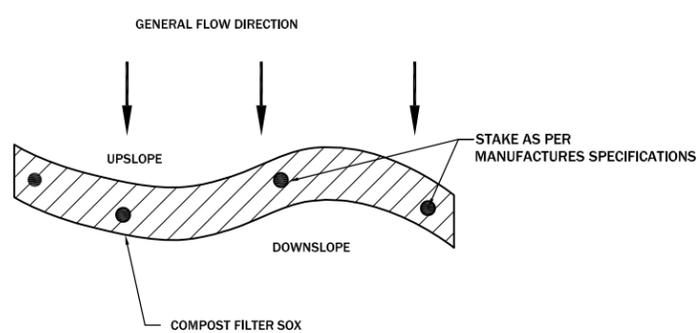
FILTER SOX CHECK DAM (BMP3)



FILTER SOX PLAN VIEW (BMP4)



FILTER SOX CROSS SECTION (TYPICAL) (BMP5)



FILTER SOX ON SIDE SLOPE PLAN VIEW (BMP6)

- NOTES:**
1. FILTER SOX FILLED WITH COMPOST AND UPLAND SEED MIX SPECIFIED IN SPECIAL PROVISIONS.
 2. COMPOST MATERIAL DISPERSED ON SITE, AS DETERMINED BY ENGINEER AFTER RECLAMATION WORK WAS COMPLETED.
 3. ALL FILTER SOX WAS KEYED INTO NATIVE SOILS A MINIMUM OF 2".

MDEQ/MWCB
 MCLAREN TAILINGS ABANDONED
 MIN ESITE RECLAMATION PROJECT
 FINAL AS-BUILT DRAWINGS

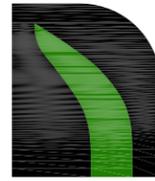
**BMP'S
DETAILS**

PIONEER
 TECHNICAL SERVICES, INC.
 1101 SOUTH MONTANA
 BUTTE, MONTANA 59701
 (406) 782-5177

SHEET
 BMPD-2AB

NOTES:

1. CONTRACTOR OVERLAPPED ROLLS ON DOWNHILL SIDE AND DOWNSTREAM DIRECTION AS REQUIRED BY SITE-SPECIFIC CONDITIONS
2. CONTRACTOR INSTALLED EROSION-CONTROL MAT FLAT AGAINST AMENDED COVER SOIL AVOIDING ALL WRINKLES AND TENTING.
3. CONTRACTOR FERTILIZED AND SEEDED PRIOR TO INSTALLING EROSION CONTROL MAT.

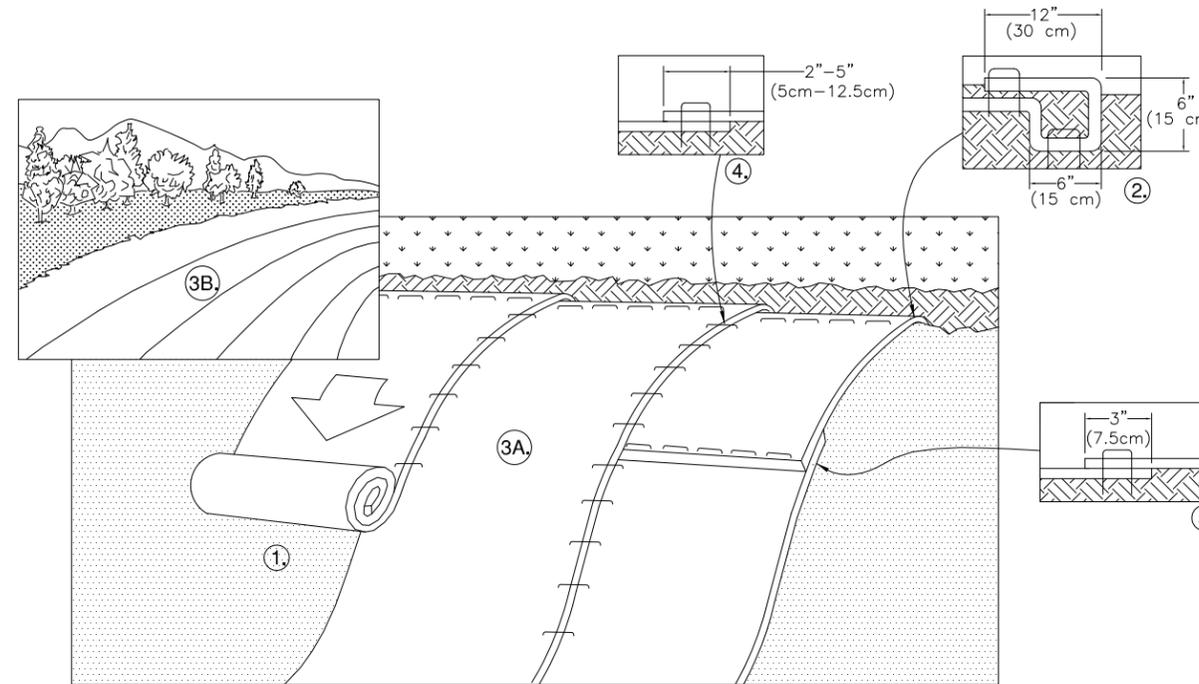


NORTH AMERICAN GREEN

EROSION CONTROL Products
Guaranteed SOLUTIONS

14649 HIGHWAY 41 NORTH
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**SLOPE INSTALLATION
APLICACIONES PARA TALUDES**



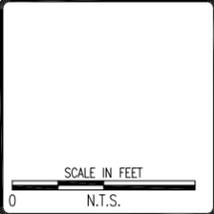
1. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECP's), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.
NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE RECP's IN A 6" (15 CM) DEEP X 6" (15 CM) WIDE TRENCH WITH APPROXIMATELY 12" (30cm) OF RECP's EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE RECP's WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30 CM) APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" (30 CM) PORTION OF RECP's BACK OVER SEED AND COMPACTED SOIL. SECURE RECP's OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" (30 CM) APART ACROSS THE WIDTH OF THE RECP's.
3. ROLL THE RECP's (A.) DOWN OR (B.) HORIZONTALLY ACROSS THE SLOPE. RECP's WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECP's MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING THE DOT SYSTEM™, STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. THE EDGES OF PARALLEL RECP's MUST BE STAPLED WITH APPROXIMATELY 2" - 5" (5 CM - 12.5 CM) OVERLAP DEPENDING ON RECP's TYPE.
5. CONSECUTIVE RECP's SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" (7.5 CM) OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" (30 CM) APART ACROSS ENTIRE RECP's WIDTH.
NOTE:
*IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15 CM) MAY BE NECESSARY TO PROPERLY SECURE THE RECP's.

REV. 01/05

REVISION:	DATE:	BY:	DESC:

DRAWN BY: NAG
DESIGNED BY: NAG
CHECKED BY: JSA
APPROVED BY: JSA
PROJECT NO: 10140
DATE: 2/24/15

DISPLAYED AS:
COORD SYS/ZONE: NA
DATUM: NA
UNITS: FEET
SOURCE: NAG



MDEQ
MCLAREN TAILINGS ABANDONED
MINE SITE RECLAMATION PROJECT
FINAL AS-BUILT DRAWINGS

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