



July 27, 2010

Tom Shelley
Freeport McMoRan, Tyrone Inc.
P.O. Box 571
Tyrone, New Mexico 88065

Subject: Tyrone Stockpile Interior Area Cost Estimate Summary

Dear Mr. Shelley:

The cost estimate presented herein is one part of the justification that Freeport McMoRan, Tyrone Inc. (Tyrone) is assembling for the surface water containment zone interior slope reclamation waiver. This letter presents a summary of the Tyrone stockpile interior outslope area cost estimate along with a concise explanation of the underlying assumptions. This work was completed in coordination with MWH who developed the reclamation designs and the quantity take-offs based on September 2009 topography. Telesto developed the unit costs and compiled the cost estimate. The estimate includes costs for reclamation earthwork and 100 years of post reclamation water management and monitoring. The interior area reclamation and water management costs are summarized in Table A-1. Additional detail is provided in Tables A-2 and A-3. Detailed cost estimate summaries and interior slope regrade plan view (Drawing A-1) and cross-sections (Drawings A-2 and A-3) are attached to the end of this document.

Earthwork Cost Estimate

The earthwork reclamation portion of the cost estimate has been developed based on a template created by the New Mexico Energy, Minerals and Natural Resources Department, Mining and Minerals Division (MMD). The cost estimate is based on 2010 unit costs and is consistent with the cost estimation method used for the Tyrone Mine Closure/Closeout Plan Update (Golder, 2007). The earthwork reclamation cost estimate summary is presented in Table A-1.

The areas under consideration herein are located between the current and proposed waiver areas and include: 1A and 1B Leach Stockpile outslopes; 2A Leach Stockpile outslope; 6B / 6C Leach Stockpiles outslopes; 3B Waste Stockpile outslope; 4A Leach / 2B Leach / 2C Leach / 7B Waste Stockpiles outslopes; 5A Overburden Stockpile outslope; and Copper Mountain Pit outslope.

The main activities that will occur in reclaiming the stockpiles include: regrading top surfaces and outslopes; hauling and grading cover material; ripping and revegetation of covered areas; and completing surface water channels to route storm water.

The major assumptions for the earthwork reclamation cost estimate include:

- **Engineering:** overall outslope gradient of 3.5:1 with an interbench slope of 3:1, approximate 25-foot wide terrace benches, maximum 160-foot inter-bench slope lengths, and 1.0% minimum top surface slope.
- **Cover:** 36" cover thickness – tops and outslopes.
- **Pullback:** Trucks and loaders with dozer assist perform required pullback of stockpile material.
- **Cover Placement:** Trucks and loaders with dozer assist perform all cover loading and distribution. The economic optimum number of trucks per loader is used for each haul route.
- **Ripping:** Ripping (scarifying) of the final surface is performed at the same time as the revegetation and is included in the revegetation quote.
- **Dust Suppression/Road Maintenance:** Full-time water truck and motor grader during reclamation.
- **Channels:** In order to make the environmental result for the reclamation of interior and exterior slopes comparable, all interior surface water runoff will be captured and pumped to an external drainage.

Water Management Cost Estimate

The water management portion of the cost estimate includes 100 years of operations and maintenance (O&M). The cost estimate summary is presented in Table A-1. Water management costs were estimated by: (1) establishing the quantity of water to be managed, (2) identifying collection and conveyance system infrastructure requirements, (3) estimating infrastructure replacement frequency, and (4) estimating costs of infrastructure construction, O&M, and removal.

The water management cost estimate is divided into six components: (1) ponds, (2) pumps, (3) pipelines, (4) electrical infrastructure, (5) water quality monitoring, and (6) channels. Each component includes any infrastructure required during post-reclamation. Costs are included for construction, equipment replacement and removal (as needed). The major assumptions for the water management cost estimate include:

- **Water Quantity:** The average annual storm water runoff from reclaimed top and outslope areas was estimated using the SCS Curve Number Method (USDA, 2004a) applied to 100 years of daily data with 16 inches of average annual precipitation.
- **Water Quality:** Captured surface water will meet applicable standards and will not require treatment.
- **Infrastructure:** Infrastructure will be built during reclamation.
- **New / Replacements Costs:** New and replacement costs were taken from R.S. Means (2010).
- **Life Expectancy:** Ponds 30 yrs; Pumps 20 yrs; Pipelines 100 yrs (replace at 85 yrs) ; Electrical 100 yrs; and Channels 100 yrs.

- **Annual O&M cost (% of replacement costs):** Ponds 2%; Pumps 5%; Pipelines 1%; Electrical 1%; and Channels 15.39% (same as earthwork estimate).
- **Electricity Costs:** \$0.06/kWh.
- **Pipelines:** Chezy head loss coefficient for all pipelines is 150.
- **Pumps:** Average pump/motor efficiency is 70 percent.
- **Water Quality Monitoring:** Quarterly for years 1-12; semi-annual for years 13-20; and annually for years 21-100. It is assumed that the sampling will be a routine duty for site personnel.
- **Analytical costs:** Based on laboratory pricing guide (Energy Laboratories Inc., 2009) and includes packaging, handling, shipping, QA/QC, and lab result report preparation.

The water management cost estimate reflects the cost to construct, operate, and maintain the interior area water management system during the post-reclamation period. Annual costs for each subsystem were summed to generate a total cost for operational years 1 through 100.

Summary

This letter presents the reclamation earthwork and water management cost estimate for reclaiming the Tyrone stockpile interior outslope areas. The estimate includes costs for reclamation earthwork and 100 years of post reclamation water management and monitoring. The method used for cost estimation is consistent with the method used for the Tyrone Mine Closure/Closeout Plan Update (Golder, 2007) and includes 2010 unit costs.

Sincerely,

Telesto Solutions, Inc.



Terence M. Fairbanks
Senior Hydrologist

TF:at
Enclosure

TABLES

Table A-1 Cost Estimate Summary

Item	Subtotal, Direct Costs	Subtotal, Indirect Costs 39.6%	Total Current Dollar Cost
EARTHWORK			
1A and 1B Leach Interior Slope	\$1,500,266	\$594,105	\$2,094,371
2A Leach Interior Slope	\$5,313,500	\$2,104,146	\$7,417,646
3B Stockpile Interior Slope	\$2,304,194	\$912,461	\$3,216,655
4A, 2B, 2C, 7B Leach Interior Slope	\$10,188,894	\$4,034,802	\$14,223,696
5A Interior Slope	\$1,055,905	\$418,138	\$1,474,043
Copper Mountain Interior Slope	\$1,226,921	\$485,861	\$1,712,782
6B, 6C Leach Interior Slope	\$7,695,549	\$3,047,437	\$10,742,986
Total Capital Earthwork	\$29,285,229	\$11,596,950	\$40,882,179
Total Earthwork Operations and Maintenance	\$4,506,997	\$1,784,771	\$6,291,767
Total Earthwork	\$33,792,225	\$13,381,721	\$47,173,946
WATER MANAGEMENT			
Ponds			
Capital Costs	\$456,413	\$180,740	\$637,153
Replacement Costs	\$1,369,239	\$542,219	\$1,911,458
Operations & Maintenance	\$912,826	\$361,479	\$1,274,305
Total Ponds	\$2,738,479	\$1,084,437	\$3,822,916
Pumps			
Capital Costs	\$184,326	\$72,993	\$257,319
Replacement Costs	\$585,816	\$231,983	\$817,799
Operations & Maintenance	\$1,929,497	\$764,081	\$2,693,577
Total Pumps	\$2,699,639	\$1,069,057	\$3,768,695
Pipelines			
Capital Costs	\$580,214	\$229,765	\$809,979
Cost Removal and Replacement	\$684,887	\$271,215	\$956,102
Operations & Maintenance	\$1,265,101	\$500,980	\$1,766,082
Total Pipelines	\$2,530,203	\$1,001,960	\$3,532,163
Electrical Infrastructure			
Capital Costs	\$876,300	\$347,015	\$1,223,315
Cost Removal and Replacement	\$0	\$0	\$0
Operations & Maintenance	\$876,300	\$347,015	\$1,223,315
Total Electrical Infrastructure	\$1,752,601	\$694,030	\$2,446,631
Environmental Sampling	\$193,400	\$0	\$193,400
Channels			
Construction	\$1,837,503	\$727,651	\$2,565,154
Maintenance	\$282,792	\$111,986	\$394,777
Total Channels	\$2,120,295	\$839,637	\$2,959,932
Total Capital Water Management	\$3,934,757	\$1,558,164	\$5,492,921
Total Replacement and Maintenance	\$8,099,858	\$3,130,958	\$11,230,816
Total Water Management	\$12,034,616	\$4,689,121	\$16,723,737
Total	\$45,826,841	\$18,070,842	\$63,897,683

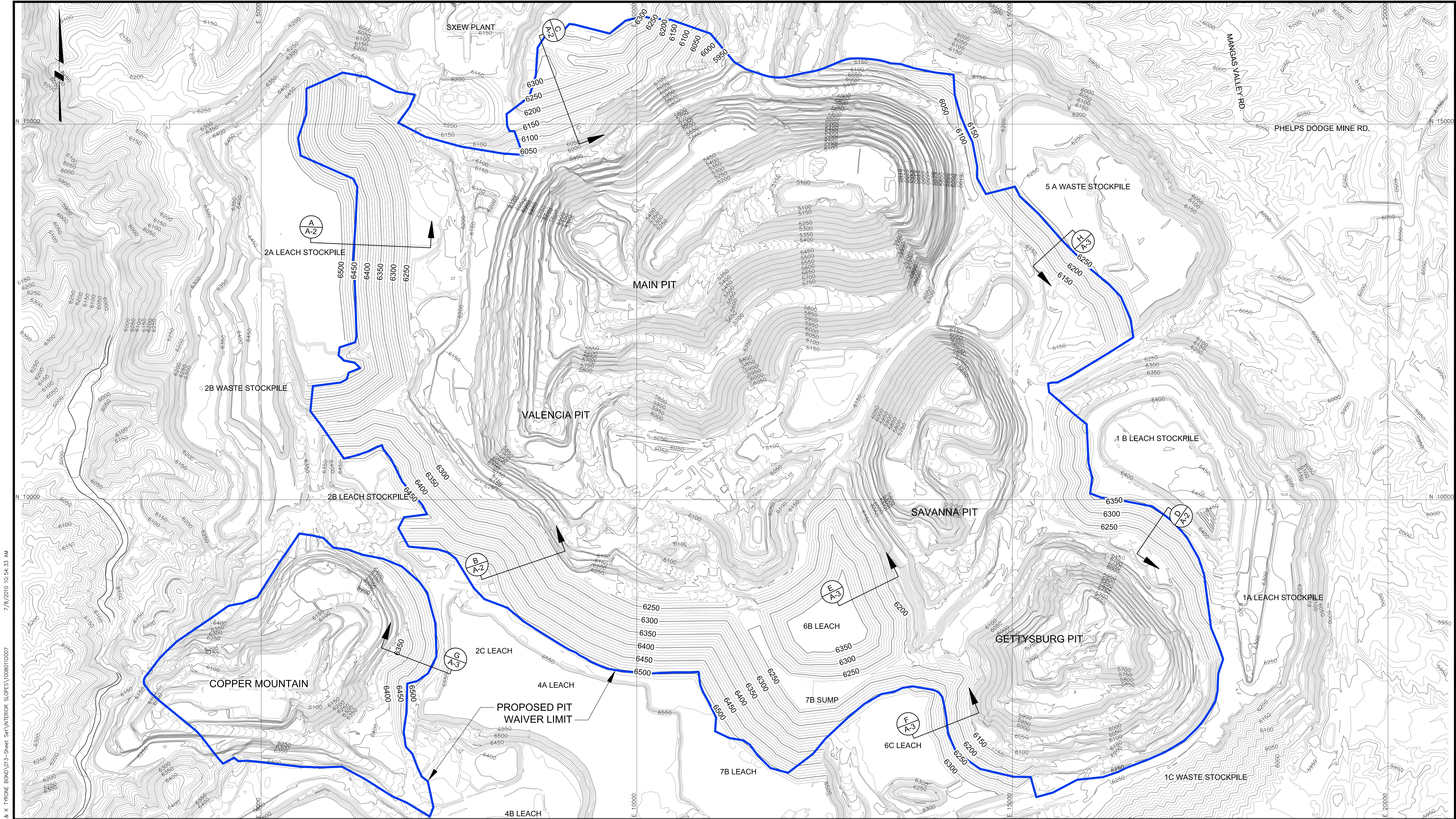
Table A-2 Water Management Summary

Water Management Area	Capital Costs	Cost Removal and Replacement	Operations & Maintenance	Water Sampling	Subtotal, Direct Costs
1A and 1B Leach Interior Slope, % of Lube Shop Area Flat	\$501,557	\$288,035	\$497,855	\$21,489	\$1,308,936
2A Leach Flat, 2A Leach Interior Slope	\$342,939	\$318,631	\$565,809	\$12,632	\$1,240,012
3B Interior Slope	\$180,501	\$258,540	\$513,651	\$38,680	\$991,371
4A, 2B, 2C, 7B Interior Slope	\$707,122	\$657,001	\$1,166,669	\$26,048	\$2,556,839
5A Interior Slope, % of Lube Shop Area Flat	\$401,245	\$230,428	\$398,284	\$17,191	\$1,047,149
Copper Mountain Interior Slope	\$582,564	\$363,919	\$874,154	\$38,680	\$1,859,317
6B and 6C Leach Interior Slope, 6B Flat	\$1,218,830	\$523,388	\$1,250,094	\$38,680	\$3,030,992
Totals	\$3,934,757	\$2,639,942	\$5,266,516	\$193,400	\$12,034,616

Table A-3 Earthwork, Operations and Maintenance and Water Management Cost Summary

Interior Slopes	Pre-Reclamation Area (acres)	Earthwork Direct Cost	Earthwork Operations and Maintenance	Direct Water Management Cost	Total Directs	Total Indirect Costs* (39.6%)	Total	Total \$/acre (rounded)
1A and 1B Leach	46	\$1,500,266	\$230,891	\$1,308,936	\$3,040,093	\$1,195,367	\$4,235,460	\$92,700
2A Leach	84	\$5,313,500	\$817,748	\$1,240,012	\$7,371,260	\$2,914,016	\$10,285,276	\$122,900
3B	60	\$2,304,194	\$354,615	\$991,371	\$3,650,180	\$1,430,154	\$5,080,334	\$84,700
4A, 2B, 2C,7C	177	\$10,188,894	\$1,568,071	\$2,556,839	\$14,313,803	\$5,657,951	\$19,971,755	\$112,600
5A	32	\$1,055,905	\$162,504	\$1,047,149	\$2,265,558	\$890,353	\$3,155,911	\$97,400
Copper Mountain	32	\$1,226,921	\$188,823	\$1,859,317	\$3,275,061	\$1,281,607	\$4,556,668	\$142,400
6B, 6C	31	\$7,695,549	\$1,184,345	\$3,030,992	\$11,910,886	\$4,701,394	\$16,612,280	\$532,400
Total	462	\$29,285,229	\$4,506,997	\$12,034,616	\$45,826,841	\$18,070,843	\$63,897,684	\$138,217

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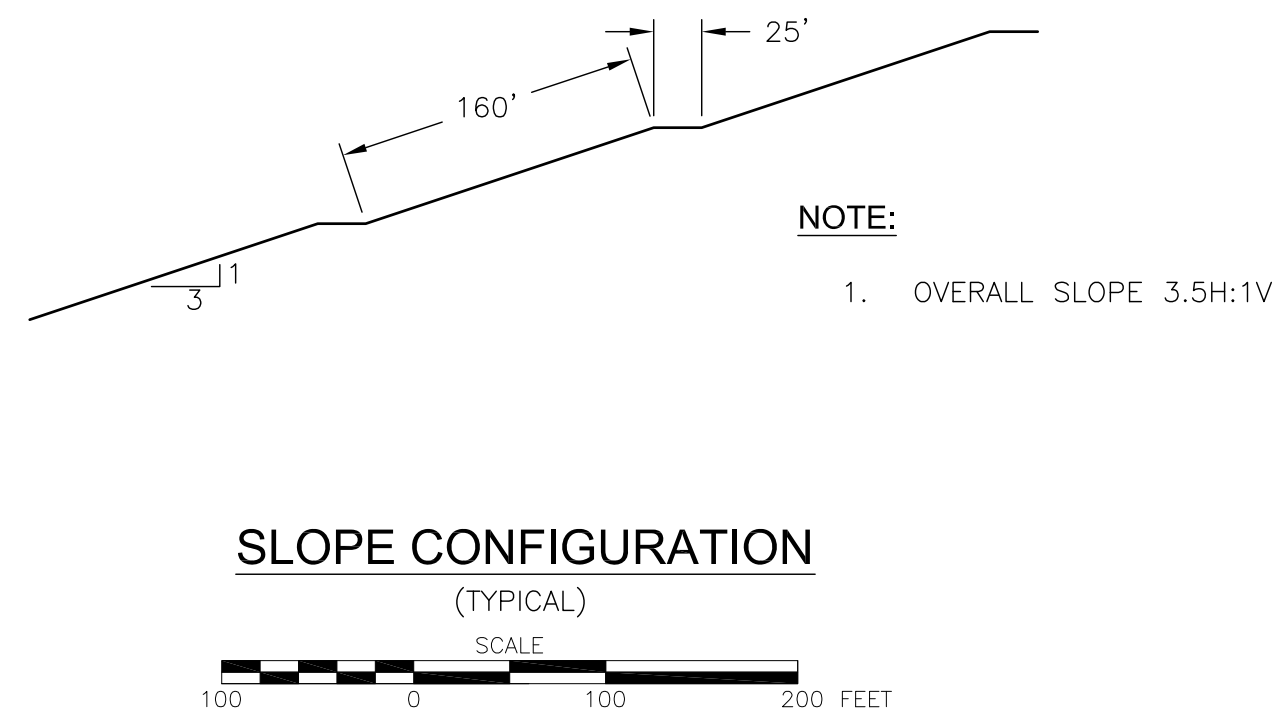
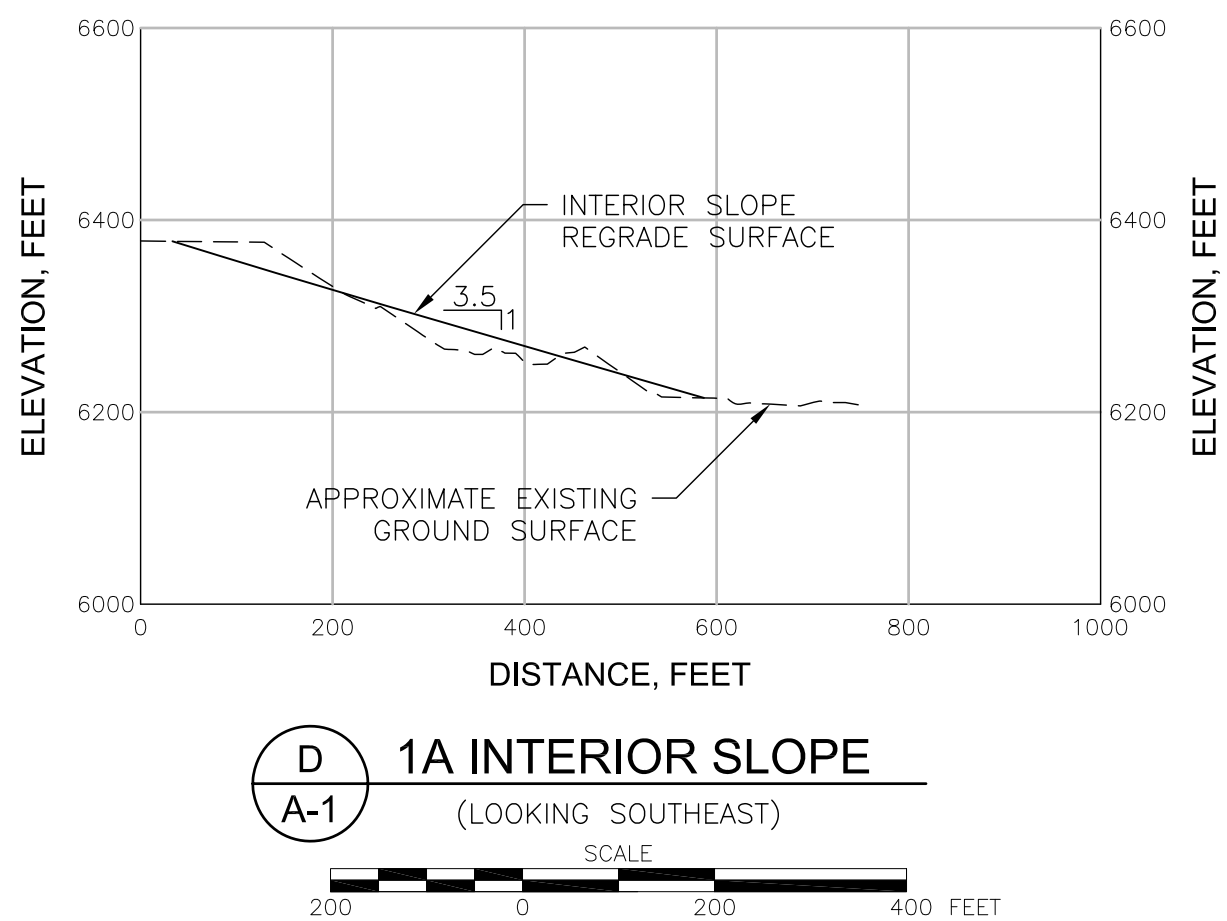
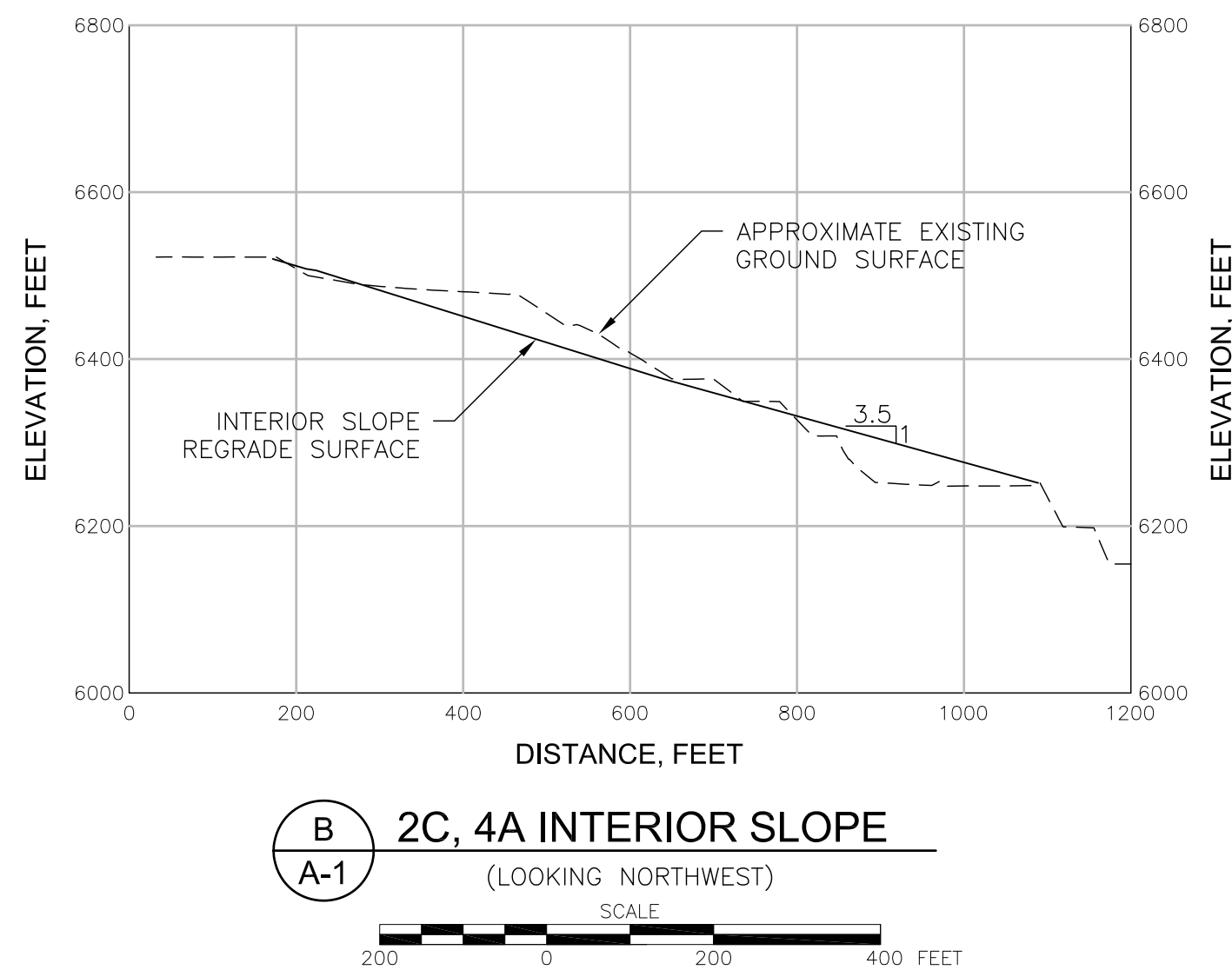
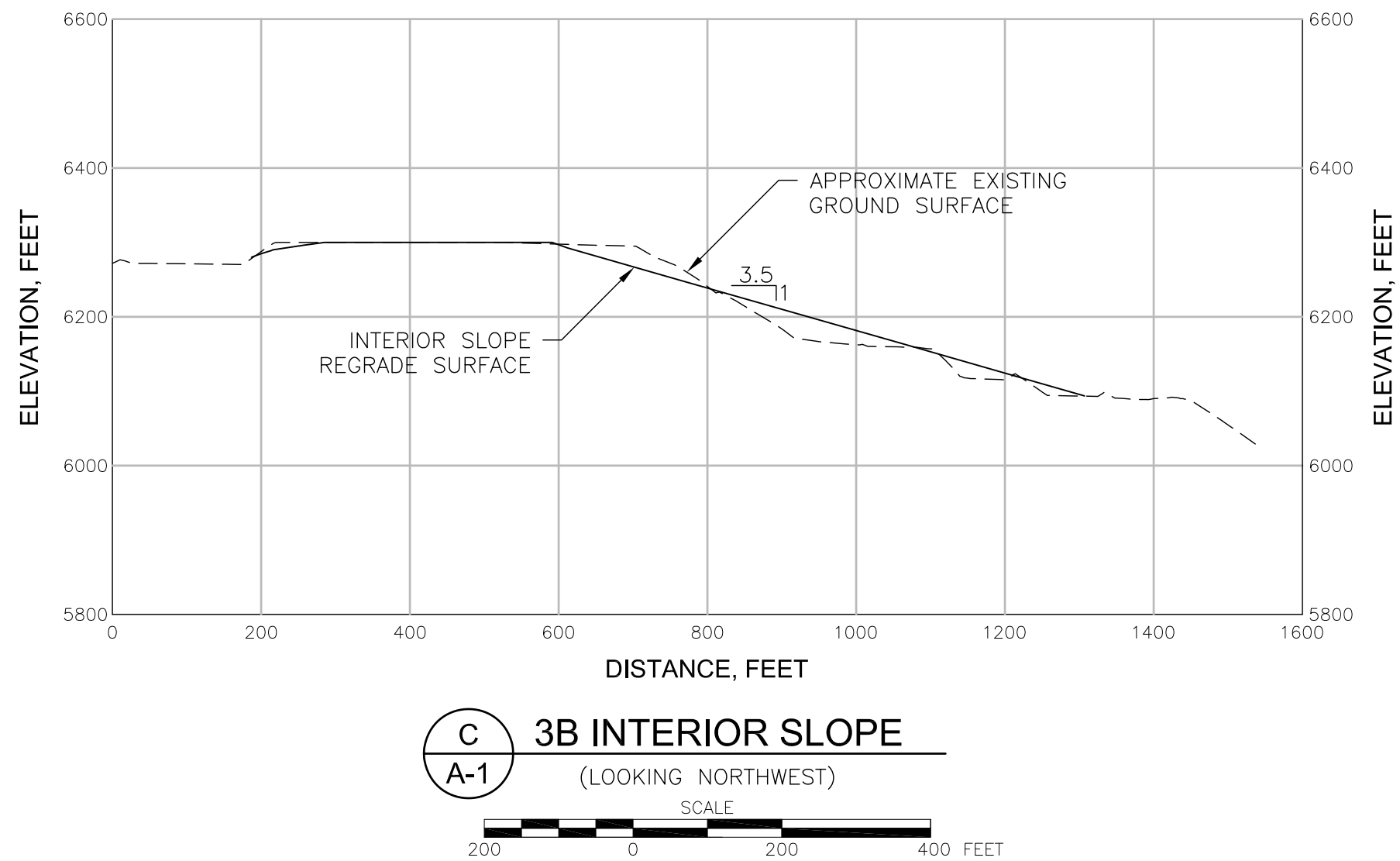
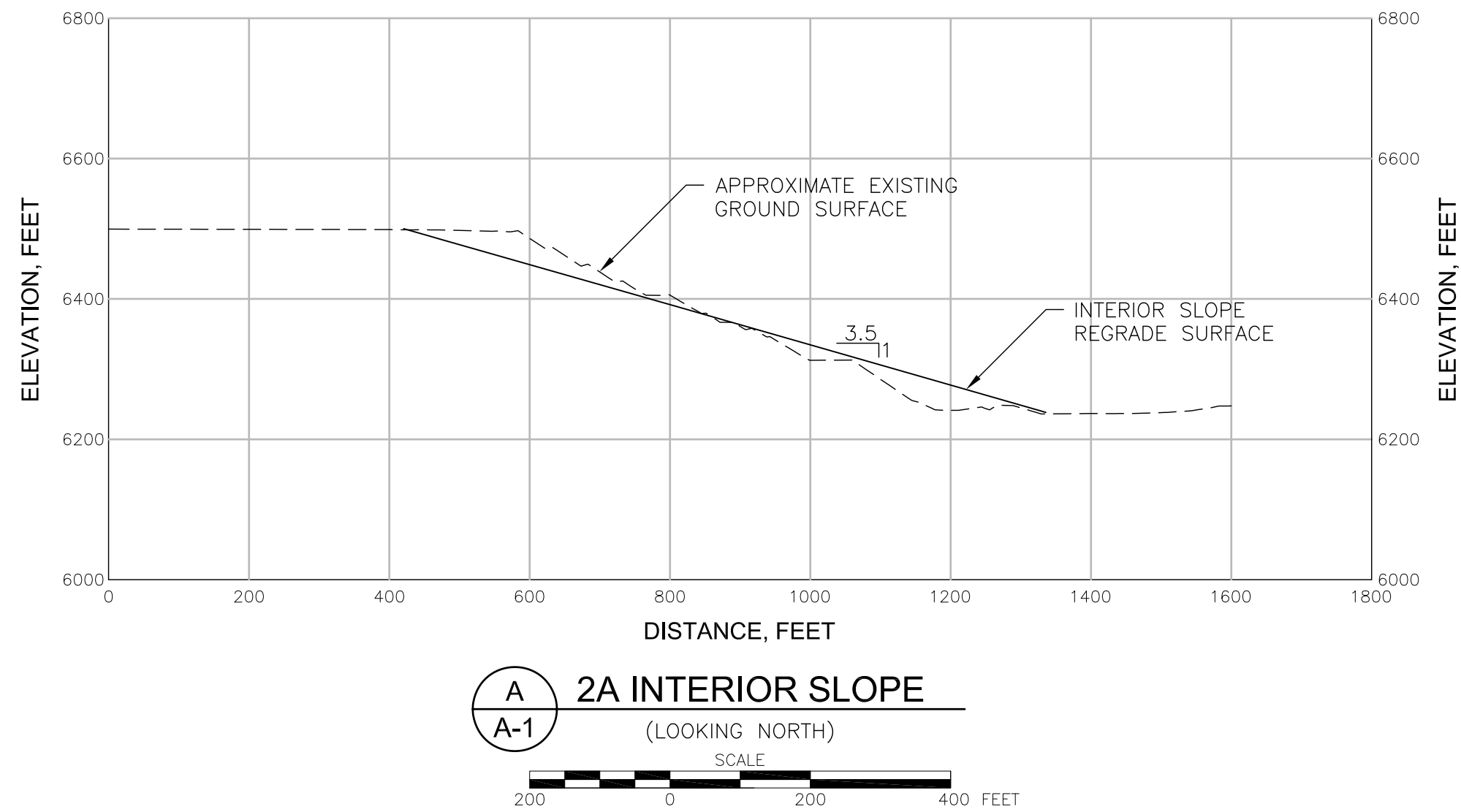
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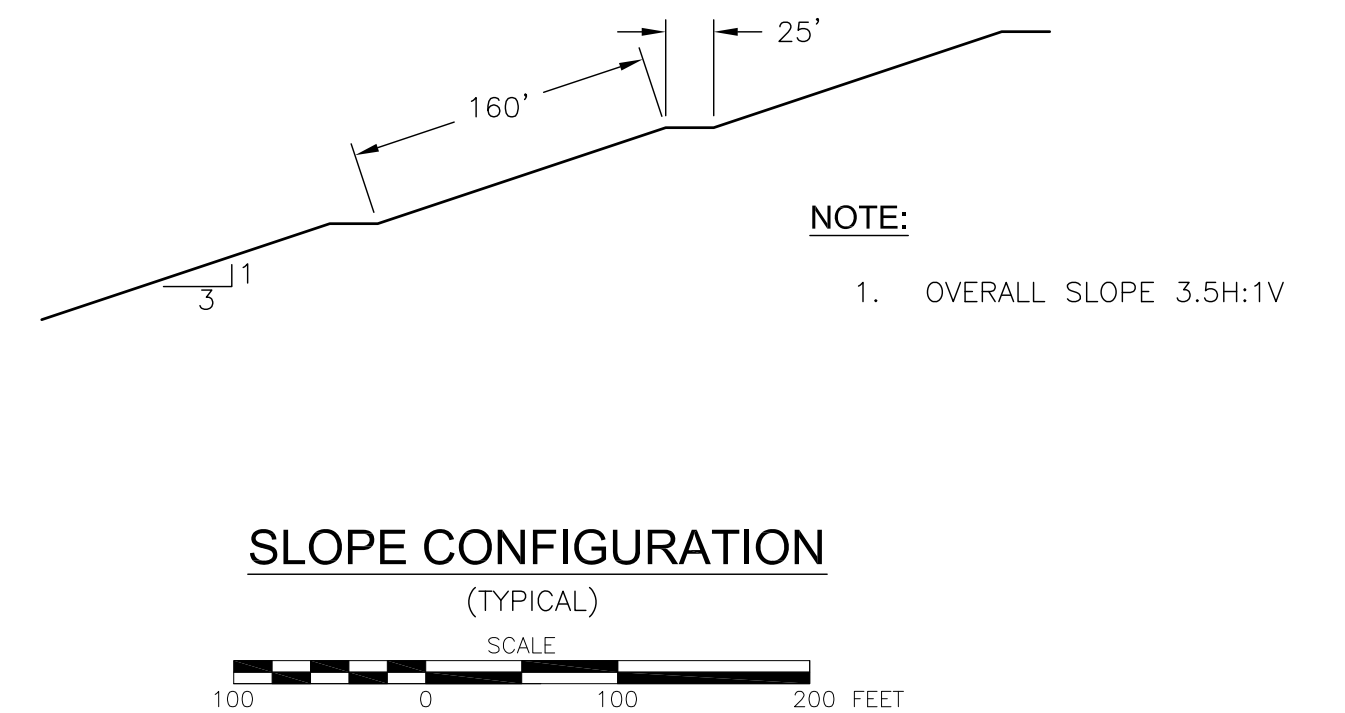
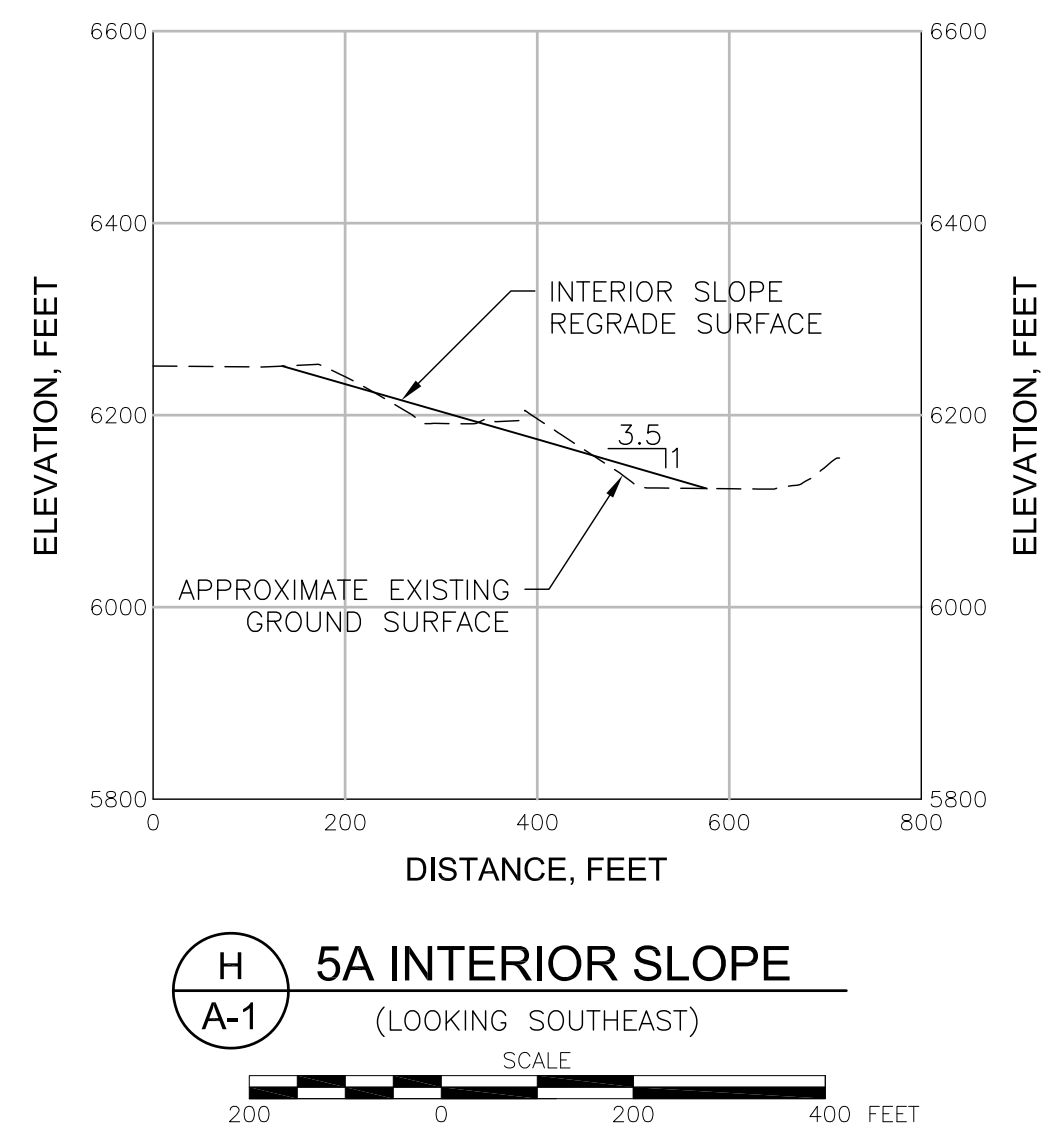
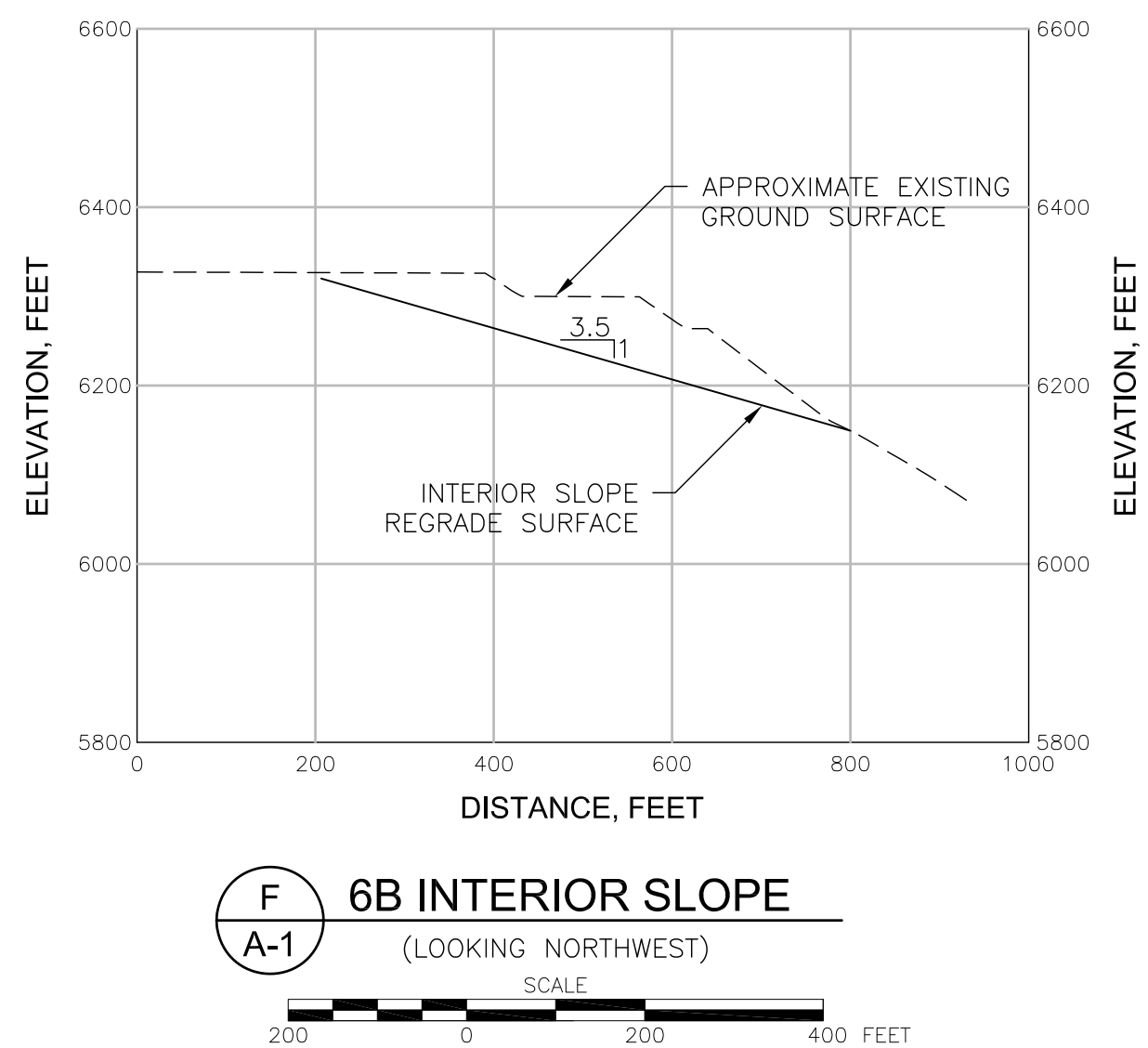
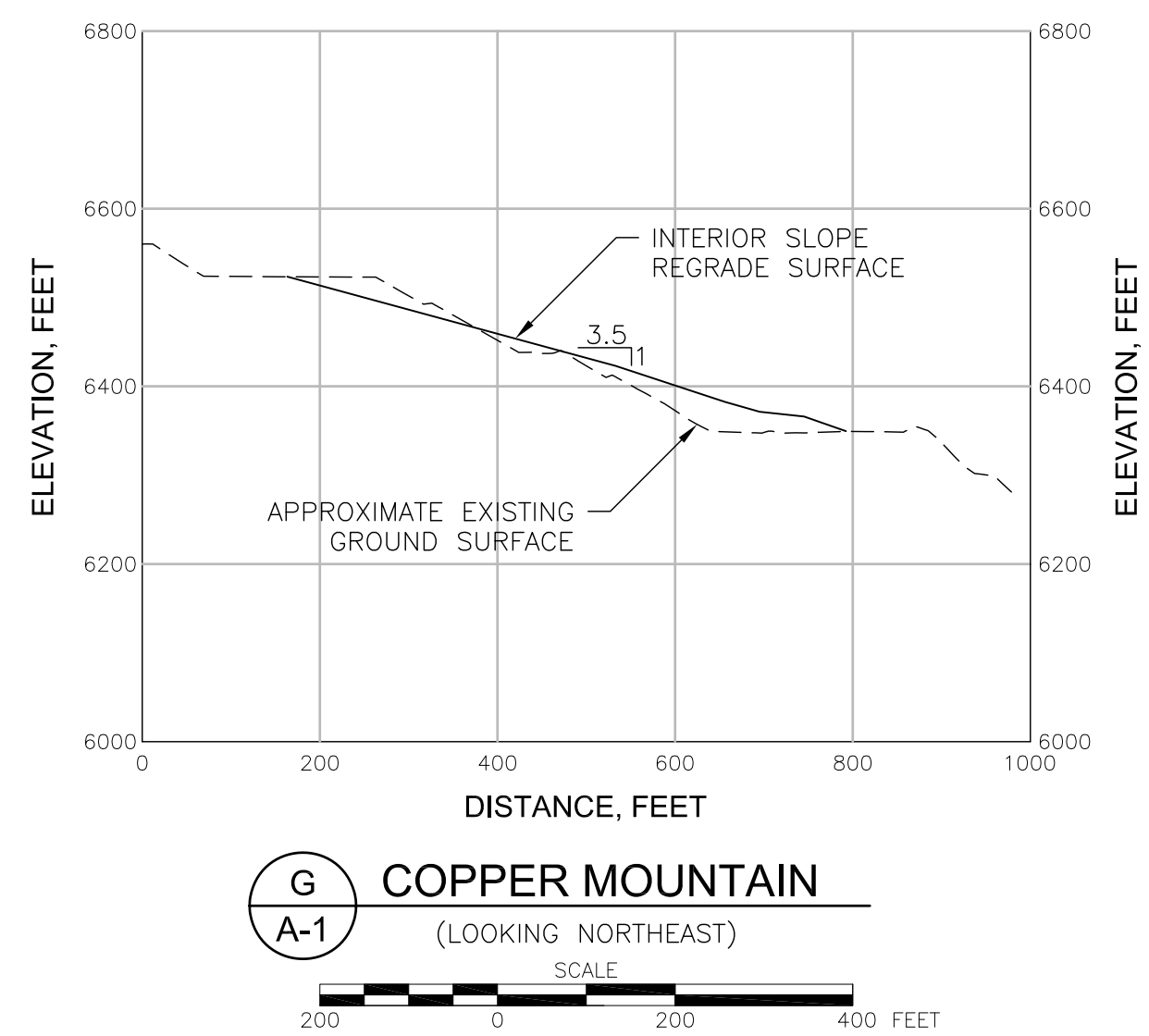
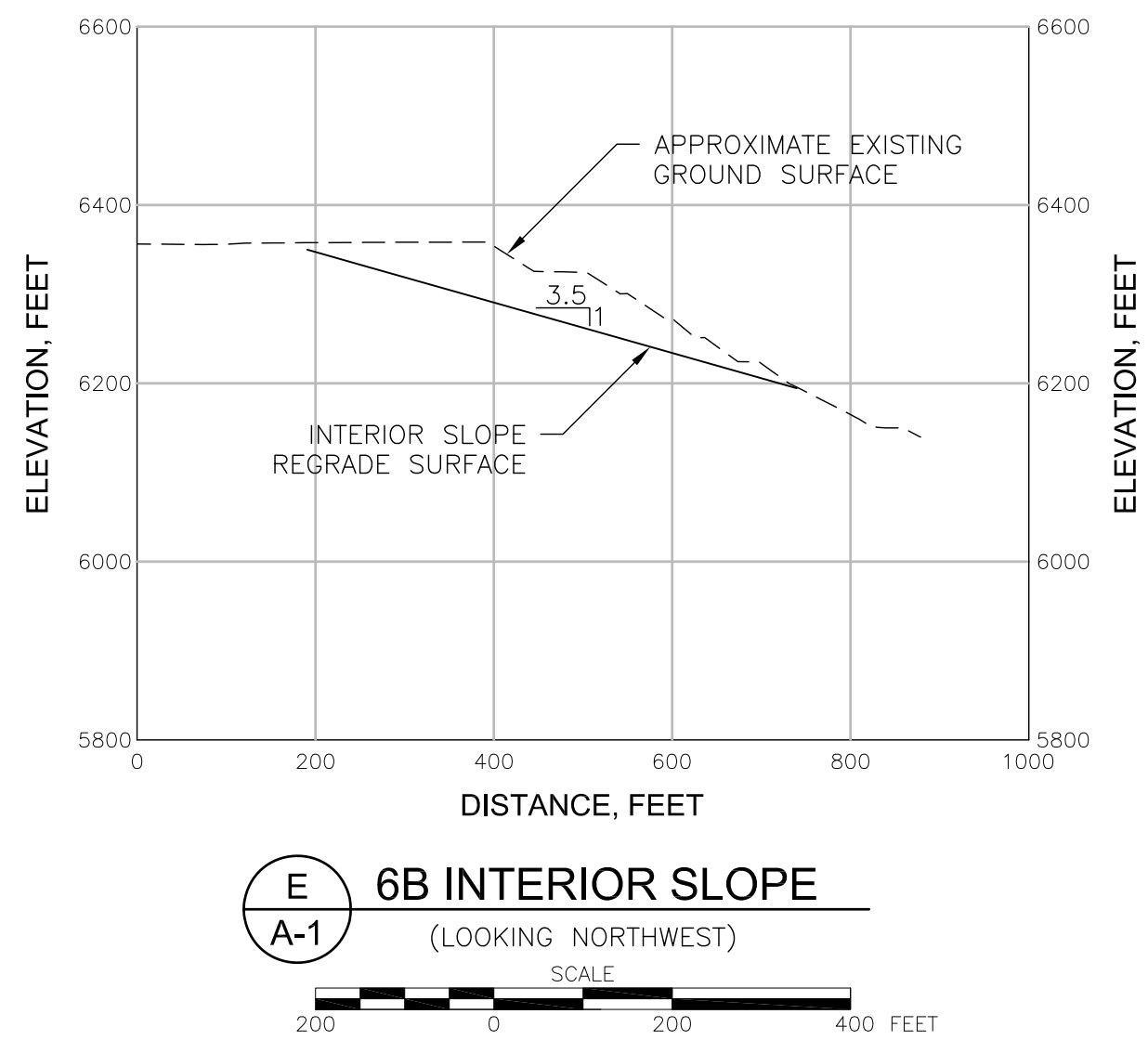
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