

**Rock Cut Slopes
Portsmouth Bypass
Project SCI-823-0.00
Phase 3 – Stage I
Scioto County, Ohio**

VOLUME 1 OF 2

November 16, 2007



Report of:

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PID 77366

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Prepared by:



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PHASE 3 – STAGE I
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1.0 INTRODUCTION

This report presents the methodologies and findings of the cut slope design performed by DLZ Ohio, Inc. (DLZ) for the Phase 3 portion of the SCI-823-0.00 Portsmouth Bypass project located in Scioto County, Ohio. The Phase 3 portion of the project will begin at Station 0+00 and ends at Station 353+00. The proposed alignment will extend in a north/northwesterly direction for approximately 6.7 miles from existing US 52 north to a point approximately 0.5 mile north of Blake Hollow Road and 0.25 mile west of US 235. The proposed alignment is illustrated on the general location map in Appendix A.

Based on the site plans included in Appendix A, rock cut slope design was required in certain areas of the proposed alignment between Station 40+00 and Station 352+00. In considering the rock cut slopes, the areas requiring rock cut design were divided into eleven cut sections, namely, Rock Cuts #1 through #11. Rock cuts will also be located on two ramp alignments. These are State Route 140 and US Route 52. Rock cut design for Rock Cuts #11(north half) through #32 are presented in separate reports for project Phases 1 and 3. The areas requiring rock cut slope design and their corresponding station ranges are shown in the following table. The stationing for the rock cuts are approximate and are based on roadway alignment and elevation information available at the time of this report.

Rock Cut	Station Range
US 52 Ramps A&B 1	40+50 – 54+00 & 54+00 – 61+25
2	77+00 – 106+25
3	138+75 – 173+25
4	177+75 – 207+25
5	212+25 – 228+00
6	257+75 – 268+25

Rock Cut	Station Range
7	269+75 – 290+25
8	305+75 – 317+25
9	322+75 – 328+25
10	329+25 – 343+75
11	347+25 – 351+50
SR 140 Ramp A	77+00 – 105+50
SR 140 Ramp B	60+92 – 77+95

A subsurface exploration program was conducted for the proposed alignment. The purpose of the subsurface exploration was to: 1) determine the subsurface conditions to the depths of the borings, 2) evaluate the engineering characteristics of the subsurface materials, and 3) provide information to assist in designing the cut slopes, roadway embankments and pavements.

This report pertains to the rock cut slope design only. The findings of the roadway embankment and pavement evaluation are presented in separate documents. Note that information specific to soil cut slopes is also present in their respective roadway embankment reports.

The geotechnical engineer has planned and supervised the performance of the geotechnical engineering services, has considered the findings, and has prepared this report in accordance with generally accepted geotechnical engineering practices. No other warranties, either expressed or implied, are made as to the professional advice included in this report.

2.0 PHYSICAL SETTING

The project is located in the Shawnee-Mississippian Plateau of the unglaciated portion of the Appalachian Plateau Physiographic Region. This area is not highly developed and contains limited secondary roadways. The area is characterized by rough, steep, broken, and severely dissected topography. The natural slopes are generally very steep, rising abruptly from the valley bottoms. The maximum topographic relief along project centerline is on the order of 275 feet and occurs between a high point at approximate Station 523+70 (approximate elevation 890 feet) and a low point near Station 353+80 (approximate elevation 615 feet). The maximum vertical relief along the proposed finished grade is approximately 130 feet, with the highest point at approximate Station 352+00 (elevation 645 feet) and the lowest point near Station 519+30 (elevation 775 feet).

3.0 GEOLOGICAL CONSIDERATIONS

3.1 Site Geology

The lithology of the project area is primarily composed of Pennsylvanian and Upper Mississippian age rocks including shale, siltstone, and sandstone.

The Pennsylvanian age rocks in the project area are in the Pottsville Group and mapped as the Pennsylvanian Breathitt Formation according to the bedrock geology maps prepared by the Ohio Department of Natural Resources' Division of Geologic Survey (ODNR-DGS). The Breathitt Formation is found as thin bands generally following the topographic contours of the higher ridgelines. Due to the regional dips, this rock formation generally exists above elevations between 760 and 850 feet in the project area. The Breathitt Formation consists of conglomerate, coal, shale, thin limestone, sandstone, and ironstone. Generally, shale and sandstone are the dominant lithologies with occasional thin, bony coal beds or blossoms.

The predominant marker beds found with the Breathitt Formation are the Harrison Ore, located immediately above the Mississippian age Maxville Limestone, the Sciotoville Clay, the Sharon Ore, and the Anthony Coal. Of these members, the Harrison Ore is the only marker bed that is relatively continuous within the project area.

The Upper Mississippian age rocks from the Waverly Series, Logan, and Cuyahoga Formations generally exist below the Pennsylvanian age Breathitt Formation. However, the Maxville Limestone, overlying the Logan Formation, marks the contact with the Breathitt Formation. The Maxville Limestone consists of isolated, discontinuous pockets of limestone. The discontinuous nature is due to an erosional unconformity at the upper

surface. Where the Maxville Limestone is absent, the Logan Formation marks the upper contact with the Breathitt Formation.

The Logan Formation varies in thickness in part due to the erosional unconformity at its upper boundary and consists primarily of gray to brown fine-grained sandstone, siltstone, and sandy shale. However, the Logan Formation is characterized by the dominance of sandstone. Three members of the Logan are identified within the project area, namely, the Byer Sandstone, the Allensville Conglomerate, and the Vinton Sandstone. Occasional iron bearing zones, identified as ironstones and ferric bands, are present within the Logan Formation, but are usually thin, isolated, and nodular. Generally, the Vinton member is a fine-grained sandstone which can be finely interbedded with sandy shale and often contains zones of fossils and ironstone concretions. The Byer member is generally a fine-grained sandstone which can be finely interbedded with sandy shale or massive sandstone. The Allensville member is a fine-grained sandstone which can be finely interbedded with sandy shale with small pebbles beds (1 to 2 inches) throughout. This member is not easily distinguishable from the Byer member and is often missing within the sequence.

The Logan Formation is the dominant rock stratum found within the project area with the exception of the Pennsylvanian Breathitt Formation capping the higher ridgelines in some areas.

Soils found within the study corridor can be divided into three groups; residual and colluvial soils derived from weathering of underlying rock and downslope transport; lacustrine and outwash deposits of glacial origin; and recent alluvial deposits. The residual and colluvial soils are found along the ridge tops and hillsides; glacial soils are typically found within the major stream valley and their tributaries; and recent alluvial deposits are found along and within stream channels and valleys.

Within the project area, residual and colluvial soils are generally thin to moderately deep, covering moderate to very steep slopes. Residual and colluvial soils on the hillsides are prone to landslides.

The two types of glacial soils encountered within the study corridor are lacustrine deposits and glacial outwash deposits. The lacustrine soils are commonly known as the 'Minford Silts' or the Minford Complex. The Minford Complex soils are generally found between elevations 650 and 780 feet. The thickness of the Minford Complex soils varies considerably throughout the project area, partially due to the nature of original deposition and geological changes since the time of formation. When present, these materials usually lie on or near bedrock. The Minford Complex soils have no regular succession. Typically sands and sandy silts are found near the bedrock and fine laminated silts and clays are found at the higher levels of the sequence. Occasionally, the Minford Complex contains sandstone cobbles and boulders or chert and quartz pebbles in the lower parts of the sequence. These cobbles, boulders and pebbles within the sequence are believed to be of local origin. The glacial deposits are late Wisconsinan in age and consist of sand

and gravel deposits with small isolated peat deposits. Generally, these deposits are saturated at shallow depths with high recharge rates.

Alluvial soils, to some extent, are found along all of the creeks and rivers within the project area. Generally alluvial deposits range from silty clay to coarse sand. Where bedrock is shallow, alluvial deposits may contain coarse sand, gravel, and cobbles.

3.2 Landslide Susceptibility

The dominant rock type along the proposed alignment is sandstone of the Mississippian aged Logan Formation. Siltstone and shale are commonly found interbedded with the sandstone. These siltstones and shales generally weather to clay with low shear strength over time. The steeper slopes are prone to gradual movement known as soil creep. The low shear strength of the residual and colluvial soils combined with the steep topography makes some of the hillsides within the proposed limits of construction prone to shallow surficial landslides and soil creep. Generally these conditions are easily corrected by removal of the unstable slope materials. No deep-seated landslides were observed along the proposed Phase 3 alignment.

In the steep terrain of Scioto County, soil creep is common. Areas of slope instability were first identified using survey data and aerial photography and then verified during the fieldwork. Three areas showed indications of significant instability near or within the limits of construction. Most slope instability appeared to be relatively shallow soil creep contained within the overburden. In most cases, these areas of slope instability were less than 10 feet deep even though drilling in several of these landslide areas indicated significantly deeper overburden. These areas of slope instability are shown on the field notes and proposed centerline in Appendix A of the *Report of Geology and Field Reconnaissance for Project SCI-823-6.81, Phase 3-Stage 1, dated November 16, 2007*. The following is a summary of those findings.

Station 136+25 to Station 137+50

This area includes the northern shore of the Little Scioto River to the edge of SR 335. Pavement cracking along the shoulder of SR 335 and displaced trees, which appeared to be indicative of recent movement, were observed. Slope movement in this area appeared to be the result of soil saturation and rapid drawdown during flood events.

Station 138+50 to Station 146+50

Mapping and field work revealed signs of a past, possibly massive landslide in this area. The slopes in this hollow are generally 1H: 1V or steeper. The terrain was hummocky and a perennial stream had eroded the lower portions of the slopes in the hollow. Bedrock was exposed in the lower portions of the hollow towards the Little Scioto River.

Station 319+75 to Station 323+75

This appeared to be a shallow landslide that might have occurred as a result of logging activities. There was a wet area at the toe of the slope and several logging roads had been cut into the slope at varying elevations.

3.3 Mining Activities

Scioto County has been mined extensively for a variety of materials including sand and gravel, sandstone, clay, and coal. However, neither large sand and gravel operations nor large clay pits were reported within the project area.

Strip and drift mining for coal are common within the Pennsylvanian rocks along the far eastern portions of the county in Bloom, Vernon, and Green Townships outside of the project area. Coal seams do not appear in significant enough thickness or quality within the study corridor to have warranted extensive mining. Small-scale local coal mining operations are suspected to have occurred historically within the Pennsylvanian Breathitt Formation found in the project area.

Quarries are found throughout Scioto County for mining dimension blocks of sandstone and limestone for aggregate or flux. However, the sandstones of the Mississippian Logan Formation, the dominant rock in the study corridor, are unsuitable for dimension stone. Consequently, quarries for sandstone or limestone were not reported or observed within the project area.

Iron deposits are found throughout the region and were reported to have been locally mined within Scioto County. The extent of ore mining within the project area is unknown, but estimated to be very small.

3.4 Seismic Considerations

Compared to seismically active areas of the United States (California or Alaska), Ohio has relatively few earthquakes. The most frequent and damaging earthquakes in the state of Ohio originated from the City of Anna, Shelby County, in the vicinity of western Ohio. During the last 100 years this area has experienced more than 30 earthquakes with the decade of the 1930's being the most active period. Among these 30 earthquakes, only 23 events were recorded, including the most severe shock ever recorded in Ohio. This severe earthquake, occurred on March 9, 1937, had a reported intensity of VIII on the modified Mercalli scale (5.4 on the Richter scale) and was felt over an area of 150,000 square miles. Considerable damage to windows and walls and extensive cracking of masonry occurred in several large buildings in Anna and nearby communities.

Earthquakes were also reported in northeastern, southeastern, and other western portions of Ohio. One earthquake, measured between 4.0 and 4.9 on the Richter scale, reportedly centered near Portsmouth, Ohio in 1901. Lesser magnitude quakes have been recorded in southern Ohio, outside of Scioto County. These earthquakes were of minor intensity (<3.9 magnitude), causing little or no damage.

This project is located in excess of 200 miles away from the City of Anna and any of the above-mentioned areas of historical earthquakes. It is estimated that the levels of seismic acceleration from any of the previous earthquake locations would be small and that the effect of seismic loadings, if any, due to the potential earthquakes from these areas can be considered minimal on the design of rock cut slope design.

3.5 Existing Cut Slope Features in the Region

Existing rock cut slopes are present along the CSX Railroad line, existing roadways, and in isolated locations of the project area. The field observations of the rock cut slopes within the project area are presented in the following paragraphs.

A large cut exists in the northwestern portion of the proposed Portsmouth Bypass corridor on Fairground Road behind M&J Welding, a moderately-sized industrial facility. The base of the cut is at an approximate elevation of 620 feet. The property behind and adjacent to the M&J Welding main building appears to be in the preliminary stages of development for an industrial park. The approximately lower two-thirds of the hillside behind the building is composed of the Portsmouth Shale member of the Cuyahoga Formation while the remaining one-third is composed of sandstone of the Logan Formation. The cut directly behind the building appears to be entirely within the Portsmouth Shale at approximately 1.5H:1V to 2H:1V slope. It is uncertain whether the cut was made for original construction of the building or to mitigate a landslide that might have developed after the building was constructed since the cut appears to be recent. The shale exposed in the cut showed evidence of moderate erosion and softening and appeared to be weathering quickly to clay. Road construction leading to a residence on the ridge top had exposed shale in the ditches that had become soft and plastic upon exposure. A prominent cut in the sandstone of the Logan Formation is present along the residential driveway at an approximate elevation of 820 feet. The sandstone exposed in this location was cut nearly vertical. Two prominent joint sets were observed in the rock cut, both nearly vertical with one trending approximately east-west and the other trending approximately north-south. The cut appeared to be performing well; however, it is suspected that the cut might have been recently constructed.

Large road cuts are present east and west of State Route 140, near the intersection of US 52. The cut to the west of State Route 140 is heavily vegetated with little rock exposure while the cut located east of State Route 140 is a sparsely vegetated slope consisting of mixed material ranging from shale to sandstone in thin to medium beds at an approximate roadway elevation of 560 feet. The rock strata in this cut belong to the Mississippian aged Logan Formation. The cut is approximately 1,500 feet long and 150 feet high, with a slope of approximately 1H:1V. A 20-foot wide horizontal bench was cut approximately 100 feet above SCI-CR503 and US 52 (Service Road Y on 1961 SCI-52-25.62 plans) and the other 20-foot wide horizontal bench at the base of the cut. At the time of the field observation, the slope appeared to be performing well with minor amounts of rock fall at the base. However, the bench at the base of the cut appeared to have been recently cleaned.

A large rock cut is also present along State Route 335 between Swauger Valley Road and the CSXT Rail Bridge over the Little Scioto River. The cut is on the north side of the road at an approximate roadway elevation of 660 feet. The exposed rock is a hard sandstone that is pitted and black in appearance overlying a medium hard siltstone layer which is just above the road elevation at the east end of the cut. The sandstone is jointed and is believed to be the Byer Member of the Logan Formation. The major joint set is trending east-west, parallel with the cut face. The cut appeared to be sloped at approximately 1/2H:1V. Overall, the cut appeared to be stable producing only occasional rockfall. At some locations the rock face appeared to slough off in large sheets probably due to freeze thaw action within the joints over time. At the intersection of Swauger Valley Road and State Route 335 the west face had been recently cut back with a high cut at an approximate roadway elevation of 530 feet. The cut appeared to be over 100 feet high consisting primarily of sandstone. A weak zone approximately 20 feet thick was evident about 40 feet above the base of the cut. The cut appeared to be approximately 1/2H:1V to 1/3H:1V with a bench approximately 40 to 50 feet wide at the base of the cut. Several large blocks of rock were present on the bench at the time of the field observation and were likely rock fall.

Along State Route 335, south of Wheelers Mill Road, a small cut was observed on the western side of the roadway around a bend at an approximate roadway elevation of 560 feet. This cut is a mixed slope of interbedded sandstone, siltstone and minor shale with a 1/2H:1V slope. The slope appeared to be performing poorly with large amounts of sloughed rock accumulating at the base of the cut.

Along State Route 139 between Minford and Clarktown, two rock cuts was observed along the north side of the roadway at an approximate roadway elevation of 640 feet. These rock cuts were at approximate mile markers 9.8 and 9.9 and were approximately 10 to 20 feet high with near vertical slopes in massive sandstone of the Logan Formation. The cuts appeared to be old with minimal or no recent maintenance. However, the cuts appeared to be performing well with very minimal rock fall along the base of the cuts.

4.0 FIELD EXPLORATION

DLZ personnel conducted an initial field reconnaissance and reviews of published data in February 2002. The results were compiled in a report titled *Phase I Subsurface Investigation, Portsmouth Bypass Transportation Study, Geotechnical Literature Review and Field Reconnaissance, SCI-823-0.00*, dated February 25, 2002.

A preliminary geotechnical investigation was performed by DLZ Ohio, Inc. as part of the Portsmouth Bypass Transportation Study. A total of twenty-one borings were drilled throughout the study corridor to develop preliminary geotechnical information to aid in the selection of feasible alternative alignments. A summary of the preliminary geotechnical investigation was presented in DLZ Ohio, Inc.'s report titled *Phase I-Stage II Subsurface Investigation, Portsmouth Bypass Transportation Study, Preliminary Boring Program, SCI-823-0.00*, dated June 21, 2002.

Using the information collected during the geotechnical overview and the Phase 1-Stage II subsurface investigation, and upon review of preliminary plans, profiles and cross-sections, DLZ prepared a boring plan for geotechnical exploration. Upon review and approval of the boring plan by ODOT Office of Geotechnical Engineering (OGE) personnel, DLZ personnel performed the subsurface exploration between April 28, 2004 and September 1, 2006. The subsurface exploration consisted of drilling 530 mainline roadway borings, R-15 through R-2676, using both truck-mounted and ATV-mounted, rotary-type drill rigs. Drilling efforts included auger borings, sample borings, and rock core borings. The borings were generally spaced 300 to 600 feet apart and were advanced to depths between 15 and 230 feet. The borings generally were drilled a minimum of 10 feet below the anticipated finished grade of the roadway.

5.0 DESIGN PROCEDURE FOR CUT SLOPE RECOMMENDATIONS

On January 13, 2006, ODOT issued the Geotechnical Bulletin GB-3 “Rock Cut Slope & Catchment Design” to provide guidance on the design of rock cut slopes, rockfall catchment, and rockfall controls. During the February 3, 2006 project meeting with ODOT, an alternate roadside ditch design was selected to be used. The alternate road side ditch design does not strictly adhere to the GB-3 requirements but reduces the width of proposed rock cuts and lessens the amount of property to be taken by the cut excavations than the standard designs would require. As a result, the design of rock cut slopes for the Phase 3 of the Portsmouth Bypass project slightly deviate from the GB-3.

Note that information specific to soil cuts are presented in their respective roadway embankment report.

In general, the approach to the design of cut slopes consisted of four phases. The details of each of the design phases are discussed in the following sections.

5.1 Existing Data Evaluation

The first phase involved evaluations of available geologic data, which included surface mapping, data and information gathered from USGS, ODNR, and other relevant resources, and field reconnaissance. A summary of the existing data evaluation is presented in Section 3 of the report.

5.2 Field Investigation and Laboratory Testing

The second phase involved subsurface exploration, which included soil and rock sampling and laboratory testing of selected samples. Geotechnical information including, but not limited to, soil strength, rock structure, rock hardness, degree of weathering, and rock fabric were developed by visual descriptions of soil and rock cores, and hand penetration tests of soil samples. Slake durability tests (ASTM D4644) and point load strength index tests (ASTM D5731) were also performed on selected rock cores. Note that a factor of 21 was applied to the point load test result of a rock core to determine the equivalent uniaxial compressive strength of the rock core. According to a study, titled

Using the Point Load Test to Determine the Uniaxial Compressive Strength of Coal Measure Rock, performed by Mr. John Rusnak of the Peabody Group for the National Institute for Occupational Safety and Health, the conversion factor of 21 worked well for a variety of rock types and geographic regions.

5.3 Slope Evaluation, Design, and Layout

The third phase was to determine the cut slope configuration based on the information gathered from the first two phases of the design procedure. In designing the rock cut slope configurations, significant consideration was given to the point load strength, rock quality designation (RQD) values, rock structure and hardness, degree of weathering, and slake durability test, if available.

Cut slope benches were provided according to the following guidelines:

1. Soil overburden benches: Slopes in the soil overburden zone (where the zone is over 10 feet thick) typically had a slope of 2H:1V. At the interface between soil overburden and bedrock, a 10-foot wide bench was provided. If the overburden zone was less than 10 feet thick or the natural slope was 1H:1V or steeper, rounding of the top of the cut to blend into the natural slope was considered.
2. Geotechnical benches: These benches, generally 10-foot wide, were placed at locations where a competent lithologic rock overlies an incompetent/weathered rock. The slope of these benches longitudinally followed the base of the competent rock with an outslope having positive drainage at a maximum grade of 10%, and a minimum grade of 3%. Note that geotechnical benching must be field adjusted during construction to follow any changes in bedding surface.
3. Construction benches: For slopes steeper than 1H:1V, 5-foot wide horizontal construction benches were placed at a maximum of 30-foot vertical intervals of a rock cut slope where no geotechnical benches were required.

Note that variations in the actual construction bench widths are expected. Bench widths may need to be modified to maintain a temporary working bench, accommodate relief in the existing sloping face and overburden thickness, and minimize the amount of water flow across the cut slope face.

5.4 Quantitative Analysis of Rock Cut Slopes

The fourth phase was to evaluate the failure potential of the cut slope configuration using the Colorado Rockfall Simulation Program (CSRP), Version 4.0. This program uses slope and rock geometry and material properties to calculate falling rock bounce height, velocity and travel distance. Results of the CSRP analyses were used to verify the appropriateness of the cut slope configuration break in slope angles, and catchment ditch geometry. Based on the CSRP analysis, barriers were recommended in some areas to provide the necessary rockfall mitigation measure. Given the existing site conditions and

the results of the preliminary CSR analysis, it appears that a minimum slope height of 80 feet is necessary for any falling rock to reach beyond the catchment ditch. Consequently, the CSR analysis was performed only for the cut slopes 80 feet or higher.

6.0 SUBSURFACE CONDITIONS

The following sections present the generalized subsurface conditions encountered by the borings. For more detailed information, refer to the Rock Cut Boring Location Plans in Appendix A and the Boring Logs presented in Appendix B. Laboratory test results including the slake durability indices and uniaxial compressive strengths are shown on the Boring Logs and also included in Appendix B.

The overburden encountered in the borings primarily consisted of varying thicknesses of cohesive soils including Sandy Silt (A-4a), Silt (A-4b), Silt and Clay (A-6a), Silty Clay (A-6b), and Clay (A-7-6). Occasionally, granular materials consisting of Coarse and Fine Sand (A-3a), Gravel with Sand (A-1-b) and Gravel with Sand and Silt (A-2-4), and Gravel with Sand, Silt and Clay (A-2-6) were also encountered.

Bedrock encountered in the borings correlates well with the available geologic references. The cores obtained consisted primarily of sandstone and occasionally shale, siltstone, clayshale and coal with varying degrees of weathering and different amounts of fracturing. During the rock coring operation, some water was lost into the voids in the rock. The final water levels in the borings varied widely at the completion of rock coring.

Based on the site plans provided, rock cut slope is only required in certain areas of the proposed alignment between Station 40+00 and Station 351+50. In considering the rock cut slopes, these areas were divided into eleven cut sections, namely Rock Cuts #1 through #11, as shown in the table in Section 1.0 of this report. In addition, rock cut slopes are also necessary along the US Route 52 Ramps A and B, Rock Cut SR 140 Ramp A and Cut SR 140 Ramp B.

The sections that follow present the generalized subsurface conditions encountered by the borings within the anticipated rock cut sections, which was used to construct the rock cut profiles for the sections. For detailed information, refer to the boring logs in Appendix B. The boring logs are separated by divider tabs according to the associated rock cut number.

6.1 Rock Cut US Route 52 Ramps A and B (Station 40+50 to Station 54+00) and Rock Cut #1 (Station 54+00 to Station 61+25)

The subsurface conditions generally consisted of less than 8 inches of topsoil underlain by soils including Silt (A-4b), Silt and Clay (A-6a), Sandy Silt (A-4a), Gravel and Stone Fragments with Sand and Silt (A-2-4), and Sandy Silt (A-4a) and Fine Sand (A-3). Silt (A-4b), Silt and Clay (A-6a) and Sandy Silt (A-4a) were the most common soil types encountered. Soil overburden thickness generally ranged from less than 1 foot to 19 feet.

Below the topsoil and soils, a layer of severely weathered argillaceous sandstone, between 1 and 5 feet thick, was encountered in most of the borings. Generally the

severely weathered rock was similar to the type of intact bedrock encountered immediately below it. The competent bedrock generally consisted of sandstone.

Bedrock was confirmed by coring in all borings. Bedrock primarily consisted of medium hard to hard, very fine to fine-grained sandstone. Sandstone containing varying amounts of siltstone and shale were also encountered. The ranges of Rock Quality Designation (RQD) values, point load strengths, uniaxial compressive strengths, and slake durability indices (SDI) of the rock cores are summarized in the table below.

Wet conditions were encountered during the drilling of Boring R-2014; however, seepage was not observed in the overburden. Prior to coring, 8.1 feet of water was observed in the borehole. Groundwater and seepages were not encountered in any other boreholes drilled for these rock cuts prior to coring. Noted that the water levels at completion, recorded on the boring logs, included the water used for coring.

Dominant Rock Types	RQD, %	Point Load Strengths*, psi	Equivalent Compressive Strengths*, psi	Uniaxial Compressive Strengths**, psi	SDI, %
Sandstone	24 – 100	76-3,678	1,596– 77,238	1,621-13,958	4.1-99.8
Sandstone and Shale with varying amounts of interbedding	66-91	361-728	7,581-15,288	4,352-12,960	64.9-89.8

*Point Load Strength (psi) times 21 = Equivalent Compressive Strength, psi.

**Uniaxial Compressive Strengths of selected rock cores by ASTM (D7012-04).

6.2 Rock Cut #2 (Station 77+00 to Station 106+25)

Generally, the near-surface conditions consisted of a veneer of topsoil overlying the soil. Topsoil thicknesses were typically less than 0.5 foot while the underlying soils ranged in thickness from 3.0 to 10 feet. Soils including Sandy Silt (A-4a), Silty Clay (A-6b), Silt and Clay (A-6a), Silt (A-4b), Fine to Coarse Sand (A-3a) and Gravel and Stone Fragments with Sand and Silt (A-2-4) were encountered.

Below the topsoil and soil overburden, a layer of severely weathered rock was encountered in most of the borings, ranging in thickness between 1.5 and 9.5 feet. The severely weathered rock, primarily consisted of weathered sandstone, weathered shale and siltstone were also encountered. The highly weathered bedrock generally was similar to the type of intact bedrock encountered immediately below it.

Bedrock was confirmed by coring in all borings. Bedrock primarily consisted of medium hard to hard, very fine to fine-grained sandstone. Occasionally, argillaceous laminations and finer grained zones were interspersed with the sandstone. Shale was also encountered in several borings. Additionally, several borings encountered some interbedded zones consisting of varying amounts of shale, siltstone and sandstone. The ranges of Rock Quality Designation (RQD) values, point load strengths, uniaxial compressive strengths, and slake durability indices (SDI) of the rock cores are summarized in the table below.

Seepage was noted at depth of 1.0 foot in Borings R-34 and no appreciable amount of water was present in the borings prior to coring. Groundwater and seepage were not encountered in any other boreholes prior to coring drilled for this rock cut.

Rock Types	RQD, %	Point Load Strengths*, psi	Equivalent Compressive Strengths*, psi	Uniaxial Compressive Strengths**, psi	SDI, %
Sandstone	8-100	43-2,042	903-42,882	2,629-13,945	39.4-99.0
Sandstone, Siltstone and Shale with varying amounts of interbedding	33-100	40-468	840-9,828	5,662-12,415	74.2-93.2
Shale	57-97	17-500	357-10,500	2332	11.7

*Point Load Strength (psi) times 21 = Equivalent Compressive Strength, psi.

**Uniaxial Compressive Strengths of selected rock cores by ASTM (D7012-04).

6.3 Rock Cut #3 (Station 138+75 to Station 173+25)

The subsurface soil conditions consisted of thin topsoil layer, typically less than 8 inches, followed by up to 8 feet of soil or highly weathered bedrock. Sandy Silt (A-4a) was the most prevalent soil type identified. Silt and Clay (A-6a), Silty Clay (A-6b), Fine to Coarse Sand (A-3a) and Clay (A-7-6) were also noted. Soil thickness was generally less than ten feet with few exceptions. Boring R-72 has a soil thickness of 25 feet and Boring R-85 had a thickness of 14 feet.

The bedrock encountered by the borings was primarily very fine to fine-grained sandstone. A layer of severely weathered sandstone was mostly encountered in the upper 1 to 2 feet of the bedrock strata. However, severely weathered bedrock layers of up to 7.5 feet thick were occasionally encountered. Below the severely weathered layer, the sandstone was mostly medium hard to hard sandstone. Shales and mixtures of siltstone, shale, sandstone and coal were found in rock strata between elevation 805 and 850. The ranges of Rock Quality Designation (RQD) values, point load strengths, uniaxial compressive strengths, and slake durability indices (SDI) of the sandstone cores are summarized in the table below.

Seepage was encountered in Borings R-81 and R-87 approximately one foot below ground surface and in Boring R-85 at a depth of 6 feet. None of the borings contained appreciable water amounts of water prior to coring. The other borings reviewed for this rock cut did not encounter any water seepage or measurable water levels prior to rock coring.

Rock Types	RQD, %	Point Load Strengths*, psi	Equivalent Compressive Strengths*, psi	Uniaxial Compressive Strengths**, psi	SDI, %
Sandstone	0-100	16-1,758	336-36,918	7,492-14,941	83.5-98.3
Sandstone with varying amounts of interbedding	30-100	10-516	210-10,836	2,173-7,923	3.3-76.5
Shale	0-100	12-376	252-7,896	252-7,896	0-58.4
Siltstone	58-94	133-549	2,793-11,529	3,758	41.5-93.5

*Point Load Strength (psi) times 21 = Equivalent Compressive Strength, psi.

**Uniaxial Compressive Strengths of selected rock cores by ASTM (D7012-04).

6.4 Rock Cut #4 (Station 177+75 to Station 207+25)

The subsurface conditions generally consisted of less than 0.5 foot of topsoil overlying the soil. Silt and Clay (A-6a), Sandy Silt (A-4a) and Silt (A-4b) were the most prominent soil types identified in the soil overburden. Soil thicknesses varied and generally ranged from 3 to 12 feet. However, soil thicknesses were up to 37.5 feet in some areas. Severely weathered sandstone was encountered in SPT samples collected in the bedrock. These severely weathered samples were similar to the underlying competent rock and were thin, typically less than 4 feet thick.

The bedrock encountered by the borings was primarily very fine to fine-grained sandstone. Below the highly weathered layer, the sandstone was mostly medium hard to hard. The ranges of Rock Quality Designation (RQD) values, point load strengths, uniaxial compressive strengths, and slake durability indices (SDI) of the sandstone are summarized in the table below.

Most of the borings did not encounter any seepage prior to rock coring. However, seepage was encountered in Boring R-102 at depths of 8.5 and 35 feet, Boring R-103 at a depth of 2.5 feet and at depths of between 11.0 and 21.0, and Boring R-104 at depths of between 16.0 and 30.0 feet. Wet soils were noted in Boring R-140 between the depths of 18 and 20 feet. However, no measurable water levels were present in any of the borings drilled for this rock cut prior to rock coring.

Rock Types	RQD, %	Point Load Strengths*, psi	Equivalent Compressive Strengths*, psi	Uniaxial Compressive Strengths**, psi	SDI, %
Sandstone	0-100	127-2,225	2,667 – 46,725	3,201 – 12,131	97.5- 98.2

*Point Load Strength (psi) times 21 = Equivalent Compressive Strength, psi.

**Uniaxial Compressive Strengths of selected rock cores by ASTM (D7012-04).

6.5 Rock Cut #5 (Station 212+25 to Station 228+00)

The subsurface conditions generally consisted of less than 4 inches of topsoil underlain by soils including Silty Clay (A-6b), Silt and Clay (A-6a) and Silt (A-4b). Overburden was generally less than 3.5 feet to as much as 8.5 feet thick.

Severely weathered sandstone and shale were mostly encountered in the upper 2 to 5 feet of the bedrock strata. The bedrock encountered by the borings was primarily very fine to fine-grained sandstone. However, shale, claystone, siltstone and coal were encountered between elevations 796 and 837. All borings were completed at least 10 feet into bedrock. Generally, the sandstone bedrock was mostly medium hard to hard. Shale, claystone, siltstone and coal bedrock were typically weaker and less durable than the sandstone. The ranges of Rock Quality Designation (RQD) values, point load strengths, uniaxial compressive strengths, and slake durability indices (SDI) of the sandstone cores are summarized in the table below.

The borings did not encounter any water seepage or measurable water levels prior to rock coring.

Rock Types	RQD, %	Point Load Strengths*, psi	Equivalent Compressive Strengths*, psi	Uniaxial Compressive Strengths**, psi	SDI, %
Sandstone	30-100	25-553	525-11,613	1,918-11,696	4.9-97.6
Varying amounts of Shale, Siltstone, Sandstone and Coal interbedded	37-100	116-285	2,436-5,985	NM	NM
Shale	88-100	37-118	777-2,478	2,101	1.7-10.2
Siltstone	88-100	43-433	903-9,093	987-4,920	19.4-49

*Point Load Strength (psi) times 21 = Equivalent Compressive Strength, psi.

**Uniaxial Compressive Strengths of selected rock cores by ASTM (D7012-04).

NM = not measured.

6.6 Rock Cut #6 (Station 257+75 to Station 268+25)

Topsoil was not encountered in any of the borings drilled for this rock cut area. The overburden was typically 3 to 13 feet thick. Silt and Clay (A-6a) and Sandy Silt (A-4a) were the majority of the soil types encountered although smaller amounts of Silty Clay (A-6b) and Clay (A-7-6) were also encountered.

A layer of severely weathered rock was encountered below the soils. This layer of severely weathered rock was only a few feet thick and rapidly gave way to the more competent rock below. The primary bedrock in the area was medium hard to hard sandstone. However, shale and mixes of shale, sandstone siltstone and coal were located between elevation 830 and 886. Very fine to fine grained sandstone was generally encountered at approximate elevation 830. The ranges of Rock Quality Designation (RQD) values, point load strengths, uniaxial compressive strengths, and slake durability indices (SDI) of the sandstone cores are summarized in the table below.

The borings did not encounter any water seepage or measurable water levels prior to rock coring.

Rock Types	RQD, %	Point Load Strengths*, psi	Equivalent Compressive Strengths*, psi	Uniaxial Compressive Strengths**, psi	SDI, %
Sandstone	0-100	21-778	411-16,338	2,324-11,150	67-93.6
Varying amounts of Shale, Siltstone, Sandstone and Coal interbedded	53-87	59-490	1,239-10,290	NM	3.1
Shale	22-94	25-296	525-6,216	703	11.4-45.2

*Point Load Strength (psi) times 21 = Equivalent Compressive Strength, psi.

**Uniaxial Compressive Strengths of selected rock cores by ASTM (D7012-04).

NM = not measured.

6.7 Rock Cut #7 (Station 269+75 to Station 290+25)

Generally less than one foot of topsoil was encountered in this cut section area. Below the topsoil, the soils were between less than one foot and 24.5 feet thick. Soils were typically Silt and Clay (A-6a), Clay (A-7-6) and Sandy Silt (A-4a). Smaller amounts of Silty Clay (A-6b) were also encountered. Generally, finer grained clay soils were more prevalent where soils were thicker and silts were more prevalent where the overburden was thinner. Up to 9 feet of severely weathered bedrock was encountered below the soil layer.

With few exceptions, all borings encountered bedrock consisting of medium hard to hard sandstone below elevation 809. Soft shale, coal and siltstone were encountered in several borings above elevation 809. Interbedded sandstone and siltstone were also encountered sporadically across the stratigraphic column. The ranges of Rock Quality Designation (RQD) values, point load strengths, uniaxial compressive strengths, and slake durability indices (SDI) of the sandstone cores are summarized in the table below.

Seepage was encountered in Borings R-150 and R-154 at depths of 5 feet and 9 feet, respectively. However, no appreciable amount of water was encountered in any of these borings prior to coring. The other borings reviewed for this cut did not encounter any water seepage or measurable water levels prior to rock coring.

Rock Types	RQD, %	Point Load Strengths*, psi	Equivalent Compressive Strengths*, psi	Uniaxial Compressive Strengths**, psi	SDI, %
Sandstone	16-100	18-1,636	378-34,356	2,974-11,269	80.9-81.1
Varying amounts of Shale, Siltstone, Sandstone and Coal interbedded	67-100	26-395	756-8,295	2,270-9,960	1.4-18.7
Shale	27-100	28-369	588-7,749	699-5,348	14.6-64.2

*Point Load Strength (psi) times 21 = Equivalent Compressive Strength, psi.

**Uniaxial Compressive Strengths of selected rock cores by ASTM (D7012-04).

NM = not measured.

6.8 Rock Cut #8 (Station 305+75 to Station 317+25)

Typical topsoil thicknesses were between 1 to 4 inches. Below the topsoil, borings encountered 5 to 21 feet of native soil. Sandy Silt (A-4a) was the most common soil encountered. Clay (A-7-6), Silt and Clay (A-6a) and Silt (A-4b) were also encountered but were about half common as Sandy Silt. (A-4b). Single occurrences of Silty Clay (A-6b) and Gravel and Stone Fragments with Sand and Silt (A-2-4) were encountered in the borings drilled for this rock cut. All of these soils appeared to be derived from the bedrock. Soil thicknesses varied widely across the rock cut area and ranged from 0 to 14.5 feet.

The severely weathered bedrock located beneath the soil was similar to the underlying rock. The severely weathered rock was typically less than 9 feet thick. Generally the principal bedrock type encountered in the area was sandstone. The ranges of Rock Quality Designation (RQD) values, point load strengths, uniaxial compressive strengths, and slake durability indices (SDI) of the sandstone cores are summarized in the table below.

Seepage was not encountered in any of the borings. However, wet soil conditions were reported in two borings, R-177 and R-178, at depths of at 5 feet and 2.5 feet, respectively. No measurable water levels were present in any of the borings prior to rock coring.

Rock Types	RQD, %	Point Load Strengths*, psi	Equivalent Compressive Strengths*, psi	Uniaxial Compressive Strengths**, psi	SDI, %
Sandstone	51-100	189-2,071	3,969-43,491	5,323-8,478	NM

*Point Load Strength (psi) times 21 = Equivalent Compressive Strength, psi.

**Uniaxial Compressive Strengths of selected rock cores by ASTM (D7012-04).

6.9 Rock Cut #9 (Station 322+75 to Station 328+25)

Borings located between stations 322+75 and 328+25 report a little to no topsoil. The thicknesses of the soils were found to be a maximum of 15 feet. Silt and Clay (A-6a), Clay (A-7-6), and Silt (A-4b) are the primary soil types encountered in the borings. Below the soil was a layer of severely weathered rock. The thicknesses of the severely weathered rock ranged from approximately 0 to 5 feet.

The bedrock was typically medium hard to hard, very fine to fine grained sandstone with occasional zones containing varying amounts of argillaceous laminations. The ranges of Rock Quality Designation (RQD) values, point load strengths, uniaxial compressive strengths, and slake durability indices (SDI) of the sandstone cores are summarized in the table below.

The borings did not encounter any water seepage or measurable water levels prior to rock coring.

Rock Types	RQD, %	Point Load Strengths*, psi	Equivalent Compressive Strengths*, psi	Uniaxial Compressive Strengths**, psi	SDI, %
Sandstone	14-100	19-1,633	399-34,293	4,621-8,880	89.2-97.6

*Point Load Strength (psi) times 21 = Equivalent Compressive Strength, psi.

**Uniaxial Compressive Strengths of selected rock cores by ASTM (D7012-04).

NM = not measured.

6.10 Rock Cut #10 (Station 329+25 to Station 343+75)

Generally, less than 5 inches of topsoil was encountered in this rock cut area. Soil encountered by the boreholes mainly included Sandy Silt (A-4a) Silt and Clay (A-6a) and Clay (A-7-6). However, lesser amounts of Silty Clay (A-6b) and Gravel and Stone Fragments with Sand and Silt (A-2-4) were also encountered. The soil thicknesses were typically less than 6 feet. However, Boring R-199 encountered approximately 26 feet of soil. Severely weathered bedrock, approximately 0 to 15 feet thick, was encountered beneath the soils. The severely weathered bedrock consisted mostly of sandstone but siltstone and shale were also noted.

Bedrock generally consisted of medium hard to hard, very fine to fine sandstone or sandstone with varying amounts of shale interbedding or argillaceous laminations. Interbedded bedrock and shale typically appeared to be most prominent above elevation 760. The ranges of Rock Quality Designation (RQD) values, point load strengths, uniaxial compressive strengths, and slake durability indices (SDI) of the sandstone cores are summarized in the table below.

The borings did not encounter any water seepage or measurable water levels prior to rock coring.

Rock Types	RQD, %	Point Load Strengths*, psi	Equivalent Compressive Strengths*, psi	Uniaxial Compressive Strengths**, psi	SDI, %
Sandstone	0-100	215-2,016	4,515-42,336	1,701-12,224	63.5-98.1
Sandstone and Shale interbedded	0-100	76-507	1,596-10,647	NM	18.6

*Point Load Strength (psi) times 21 = Equivalent Compressive Strength, psi.

**Uniaxial Compressive Strengths of selected rock cores by ASTM (D7012-04).

NM = not measured.

6.11 Rock Cut #11 (Station 347+25 to Station 351+50)

Rock Cut 11 is one of the shortest and shallowest cuts along the proposed Phase 3 alignment. It will be about 425 feet in length with a typical cut depth of less than 20 feet. Two borings drilled for this rock cut indicate that the area was covered with approximately 11.5 to 23 feet of soil. No topsoil was encountered in either boring. The soil types identified included Sandy Silt (A-4a), Clay (A-7-6) and Silt and Clay (A-6a). One sample of Silt (A-4b) was encountered in Boring R-206 between elevation 658.9 and

661.4. Below these soils, 8 to 10 feet of severely weathered sandstone and shale were encountered in these borings.

The two borings were cored ten feet into rock. The recovered samples consisted of moderately to highly weathered sandstone. Testing was not performed on the rock cores collected from these borings for point load strengths, uniaxial compressive strengths, and slake durability indices (SDI). Rock Quality Designation (RQD) values of the sandstone cores are summarized in the table below.

Wet soil conditions were reported at a depth of 21 feet in Boring R-206; however, this boring did not encounter any water seepage. Prior to coring, seepage and measurable water levels were not present in any of the borings drilled in this rock cut area.

Rock Types	RQD, %	Point Load Strengths, psi	Equivalent Compressive Strengths, psi	Uniaxial Compressive Strengths, psi	SDI, %
Sandstone	78-91	NM	NM	NM	NM

NM = not measured.

6.12 Rock Cut SR 140 Ramp A (Station 77+00 to Station 105+50)

In general, the topsoil thicknesses found in the borehole locations were less than 6 inches. Silt (A-4b) and Sandy Silt (A-4a) were the most common soil types found overlying the bedrock. A small amount of Silt and Clay (A-6a) was also encountered. Soil thicknesses found in the borings were generally between 4 and 15 feet. However, boring B-1408 encountered a soil thickness of approximately 1.5 feet. Generally severely weathered bedrock underlying the soils was less than 3 feet thick. However, boring R-30 encountered a decomposed rock thickness of 8.5 feet.

The dominant rock type in this rock cut was sandstone. However, Boring R-30 encountered a layer of shale just below the severely weathered zone. The ranges of Rock Quality Designation (RQD) values, point load strengths, uniaxial compressive strengths, and slake durability indices (SDI) of the sandstone cores are summarized in the table below.

The borings did not encounter any water seepage or measurable water levels prior to rock coring.

Rock Types	RQD, %	Point Load Strengths*, psi	Equivalent Compressive Strengths*, psi	Uniaxial Compressive Strengths**, psi	SDI, %
Sandstone	61-100	228-454	4,788-9,534	7,841-13,025	93.2-97.8
Shale	21	38	798	NM	NM

*Point Load Strength (psi) times 21 = Equivalent Compressive Strength, psi.

**Uniaxial Compressive Strengths of selected rock cores by ASTM (D7012-04).

NM = not measured.

6.13 Rock Cut SR 140 Ramp B (Station 60+92 to Station 77+95)

The borings encountered less than 6 inches of topsoil in this cut area. The overburden soils were generally thin, less than 15 feet thick. These soils were mostly Silt (A-4b) although smaller amounts of Silt and Clay (A-6a) and Sandy Silt (A-4a) were also encountered. Severely weathered sandstone was located below the soil layer. The severely weathered bedrock was generally less than 5 feet in thick.

With the exception of Boring R-30, which contained a layer of shale below the severely weathered zone, the competent bedrock encountered below the severely weathered zone was mostly fine to very fine grained sandstone. The ranges of Rock Quality Designation (RQD) values, point load strengths, uniaxial compressive strengths, and slake durability indices (SDI) of the rock cores are summarized in the table below.

The borings did not encounter any water seepage or measurable water levels prior to rock coring.

Rock Types	RQD, %	Point Load Strengths*, psi	Equivalent Compressive Strengths*, psi	Uniaxial Compressive Strengths**, psi	SDI, %
Sandstone	44-100	106-601	2,226-12,621	8,887	91.5
Shale	21	38	798	NM	NM

*Point Load Strength (psi) times 21 = Equivalent Compressive Strength, psi.

**Uniaxial Compressive Strengths of selected rock cores by ASTM (D7012-04).

NM = not measured.

7.0 ROCK EXCAVATION AND CUT SLOPE RECOMMENDATIONS

7.1 Rock Excavation Recommendations

The rippability of the bedrock is estimated to be fair to good for the upper 10 to 15 feet due to its weathered condition. Below the upper 10 to 15 feet of weathered material the rippability is estimated to be poor to fair and rock blasting will be required to achieve the roadway template. Blasting efforts should conform to Item 208 of the current CMS. All blasting operations should also be performed in accordance with applicable federal, state, and local laws and regulations.

7.2 Cut Slope Recommendations

Cut slope recommendations were based upon visual observations of the rock cores obtained, the presence and angles of joints and/or fractures within the cores, depths to bedrock, point load strengths, uniaxial compressive strengths, laboratory SDI, regional and local lithology, results of the field reconnaissance, and DLZ's past experiences. In general, DLZ reviewed the profile and cross-section views of the cuts to determine the likely positions/elevations for bench locations. Benches were typically placed at lithology breaks where a more durable rock overlies a weaker rock unit. Upon identifying the bench positions, the lift height between benches was evaluated and

additional benching used, if considered to be appropriate. The details of the cut slope design procedure are presented in Section 5.0 of this report.

In general, sandstone slope angles are recommended to be cut on 0.5H:1V slopes. Severely weathered sandstone should be cut on 1.5H:1V or flatter slopes. Shales, siltstones, clayshales, claystones, and siltshales were typically soft, severely to highly weathered and prone to rapid weathering once exposed and were typically recommended to be cut on 2H:1V slopes.

Specific recommended cut slope configurations are included in Appendix D of this report.

7.3 Groundwater Considerations

Generally, groundwater was not encountered in the unconsolidated materials or severely weathered bedrock along the project alignment except in a few locations. Seepage was generally encountered in thin zones less than 2 to 3 feet thick at the time of the investigation. As a result, significant yields of groundwater would not be anticipated in the overburden. The amount seepage in the bedrock could not be readily determined because water was added to core the bedrock. Final water levels reported in the borings reflect water added for coring and are not indicative of the actual groundwater levels. It should be noted that groundwater conditions can change with time, seasonal changes and precipitation. The reported findings represent only the conditions encountered at the time of drilling and may not be indicative of the long-term groundwater conditions. The contractor should be prepared to perform dewatering to maintain reasonably dry excavations and prepared to deal with unexpected seepage and precipitation entering any excavations. A summary of the groundwater findings is presented below.

Rock Cut US Route 52 Ramps A and B (Station 40+50 to Station 54+00) and Rock Cut #1 (Station 54+00 to Station 61+25)

Seepage was encountered in Boring R-23 at a depth of 20.7 feet (approximate elevation 751 at Station 58+17.3, 191.2' RT). At the completion of drilling, five feet of water was present in the borehole. Note that no water was added to the boring. Although the boring was located outside the rock cut and on a flank of a hillside away from the rock cut, there is a possibility that similar groundwater bearing strata could be encountered within the proposed rock cut. Seepage was not encountered in the soil strata in Boring R-2014 (Station 46+43.1, 25.4' LT) but 9.4 feet of water was present in the borehole prior to coring. This boring was located in the area that will have significant excavation. Any seepage zones within the soil will likely be completely removed prior to rock excavation. Depending on the field conditions during construction, special sloping and benching may be necessary to control and direct runoff during and after construction.

Rock Cut #2 (Station 77+00 to Station 106+25)

Seepage was noted at a depth of 1.0 foot in Boring R-34. However, no appreciable amount of water was present prior to coring. On the basis of the field observations, the low level of seepage is not anticipated to affect the ground conditions during construction.

Rock Cut #3 (Station 103+75 to Station 173+25)

Seepage was noted at a depth of 1.0 foot in Borings R-81 and R-87 and at a depth of 6 feet in Boring R-85. However, no appreciable amount of water was present prior to coring. On the basis of the field observations, the low level of seepage is not anticipated to affect the ground conditions during construction.

Rock Cut #4 (Station 177+75 to Station 207+25)

Wet conditions were encountered in a Clay (A-7-6), between the depths of 18.0 and 20.0 feet (elevation 589.8 and 892.3), in Boring R-104. Additionally, groundwater seepage was noted in Boring R-102 between depths of 8.5 and 35.0 feet and in Boring R-103 at a depth of 2.5 feet and between the depths of 11.0 and 21.0 feet. However, none of these borings had appreciable amount of water present prior to coring. On the basis of the field observations, the low level of seepage is not anticipated to affect the ground conditions during construction.

Rock Cut #5 (Station 212+25 to Station 228+00)

The borings did not encounter any water seepage or measurable water levels prior to rock coring.

Rock Cut #6 (Station 257+75 to Station 268+25)

The borings did not encounter any water seepage or measurable water levels prior to rock coring.

Rock Cut #7 (Station 269+75 to Station 290+25)

Seepage was encountered in Boring R-150 at a depth of 5 feet but no measurable water was present in the boring prior to coring. Seepage was also encountered in Boring R-2154 at a depth of 8 feet (286+03.1, 117.5' LT at elevation 778.9). This seepage zone was within the sandstone that will be cut. Seepage through joints or seams in this type of rock formation is not uncommon. Depending on the field conditions during construction, special sloping and benching may be necessary to control and direct runoff during and after construction.

Rock Cut #8 (Station 305+75 to Station 3170+25)

Seepage was noted at a depth of 2.5 feet in Boring R-178 and at a depth of 5 feet in Boring R-177. However, no appreciable amount of water was present prior to coring. On the basis of the field observations, the low level of seepage is not anticipated to affect the ground conditions during construction.

Rock Cut #9 (Station 322+75 to Station 328+25)

The borings did not encounter any water seepage or measurable water levels prior to rock coring.

Rock Cut #10 (Station 329+25 to Station 343+75)

The borings did not encounter any water seepage or measurable water levels prior to rock coring.

Rock Cut #11(Station 347+25 to Station 351+50)

Seepage was encountered in Boring R-206 at a depth of 21.0 feet. However, no appreciable amount of water was present prior to coring. On the basis of the field observations, this low level of seepage is not anticipated to affect the ground conditions during construction.

Rock Cut SR 140 Ramp A (Station 77+00 to Station 105+50)

The borings did not encounter any water seepage or measurable water levels prior to rock coring.

Rock Cut SR 140 Ramp B (Station 60+92 to Station 77+95)

The borings did not encounter any water seepage or measurable water levels prior to rock coring.

8.0 COLORADO ROCKFALL SIMULATION PROGRAM (CRSP) ANALYSES

The CRSP requires the input of a number of coefficients concerning the slope geometry, slope material properties, rock material properties and the assumption of rock geometry. In general, the ODOT Geotechnical Bulletin GB-3 “Rock Cut Slope & Catchment Design” was used as a guide for input data and catchment ditch configuration. Input data was also based on field observations and measurements of the existing rock cuts described in Section 3.5 of this report. The number of rocks simulated for the analyses was 500 and the shape of rock was assumed to be discoidal. Note that rounded rocks generally result in greater amounts of rock reaching the roadway since rounded rocks rolling gather a great deal more energy than angular blocks sliding. Based on the observations of the rock cores obtained, it is our opinion that the discoidal rocks can better describe the types of rocks encountered in the borings. The average rock size used in the analyses was a 1-foot tall and 1-foot diameter discoidal rock, while the maximum size used in the analyses was a 1.5-foot tall and 1.5-foot diameter discoidal rock. A summary of the input data for the CRSP analyses is presented in the following table.

Input Data for End of Construction Conditions

Rock Type	Rock Thickness	Rock Diameter	Surface Roughness (S.R.)	Tangential Coefficient (Rt)	Normal Coefficient (Rn)	Rock Density
Hard Sandstone and Siltstone	1.5	1.5	0.15	0.85	0.2	155
Shale	1.5	1.5	0.3	0.75	0.18	140
Sandstone with Shale interbeds	1.5	1.5	0.25	0.75	0.18	145
Hard Sandstone and Siltstone	1	1	0.12	0.85	0.2	155
Shale	1	1	0.15	0.75	0.18	140
Sandstone with Shale interbeds	1	1	0.14	0.75	0.18	145

Input Data for Long-term Conditions

Rock Type	Rock Thickness	Rock Diameter	Surface Roughness (S.R.)	Tangential Coefficient (Rt)	Normal Coefficient (Rn)	Rock Density
Hard Sandstone and Siltstone	1.5	1.5	0.3	0.8	0.18	155
Shale	1.5	1.5	0.5	0.68	0.15	140
Sandstone with Shale interbeds	1.5	1.5	0.6	0.6	0.15	145
Hard Sandstone and Siltstone	1	1	0.21	0.8	0.18	155
Shale	1	1	0.3	0.68	0.15	140
Sandstone with Shale interbeds	1	1	0.28	0.6	0.15	145

Given the existing site conditions and the results of the preliminary CSR analysis, it appears that a minimum slope height of 80 feet is necessary for any falling rock to reach beyond the catchment ditch. Consequently, the CSR analysis was performed only for the cut slope of 80 feet or higher along the proposed alignment. A summary of the CSR analysis results is presented in the following table. The output of the CSR analyses is included in Appendix B.

Rock Cut #	Stations	Left Slope	Right Slope
US 52 Ramps A&B 1	40+50 – 54+00 & 54+00 – 61+25	Failed**	Passed*
2	77+00 – 106+25	Passed	Not Run, < 80'
3	138+75 – 173+25	Passed	Passed
4	177+75 – 207+25	Not Run, < 80'	Passed
5	212+25 – 228+00	Not Run, < 80'	Not Run, < 80'
6	257+75 – 268+25	Not Run, < 80'	Not Run, < 80'
7	269+75 – 290+25	Not Run, < 80'	Not Run, < 80'
8	305+75 – 317+25	Not Run, < 80'	Not Run, < 80'
9	322+75 – 328+25	Not Run, < 80'	Not Run, < 80'
10	329+25 – 343+75	Passed	Not Run, < 80'
11	347+25 – 351+50	Not Run, < 80'	Not Run, < 80'
SR 140 Ramp A	77+00 – 105+50	Not Run, < 80'	Not Run, < 80'
SR 140 Ramp B	60+92 – 77+95	Not Run, < 80'	Not Run, < 80'

*Passed = Greater than or equal to 95% rockfall catchment achieved at analysis point 2.

**Failed = Less than 95% rockfall catchment achieved at analysis point 2.

Based on the results of the CRSP analyses, a Type D barrier placed at the edge of the catchment ditch is recommended as a rockfall mitigation measure for the failure area in rock cut #1. The proposed location of the barrier is the left side of the cut between stations 52+50 and 54+50. The CRSP analyses did not identify other areas requiring rockfall mitigation measures.

9.0 ODOT GENERAL EARTHWORK DESIGN CHECKLIST

The ODOT General Earthwork Design Checklist – Centerline Cuts Checklist is included in Appendix C of this report.

10.0 CLOSING REMARKS

We appreciate having the opportunity to be of service to you on this project. Please do not hesitate to call if you have any questions concerning this report.

Respectfully submitted,

DLZ OHIO, INC.

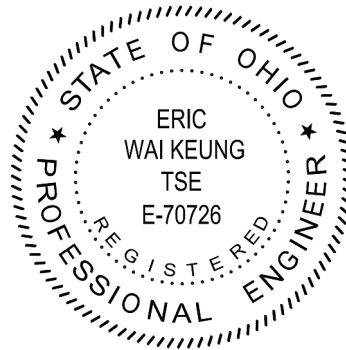
Eric W. Tse, P.E.
Senior Geotechnical Engineer

Andrew Jalbrzikowski
Geologist

Brian E. Mott
Senior Geologist, P.G.

BEM/aj/ewt

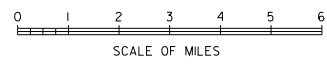
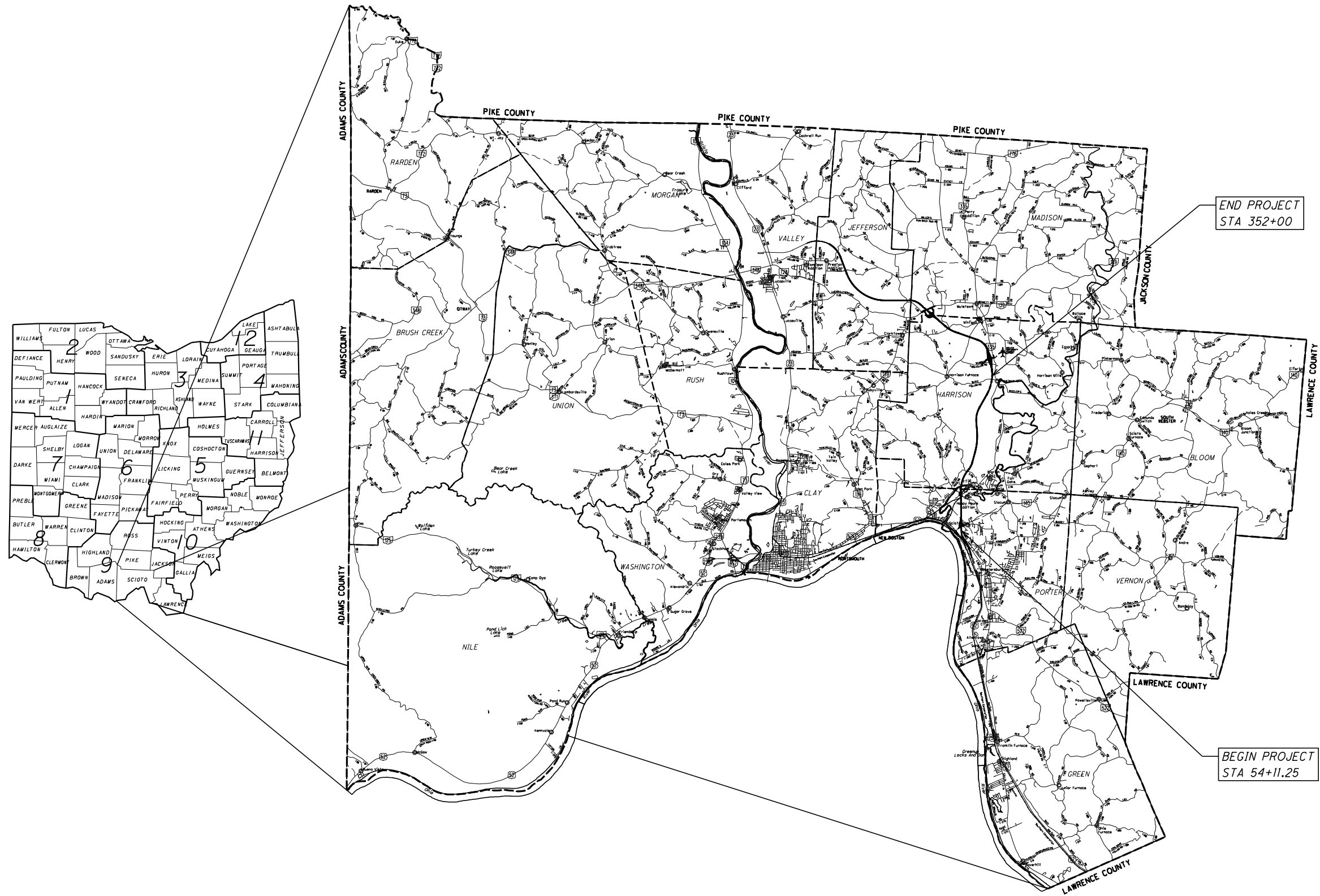
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APPENDIX A

Project Location Map
Project Alignment and Boring Plan

Project Location Map



END PROJECT
STA 352+00

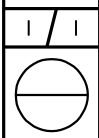
BEGIN PROJECT
STA 54+11.25



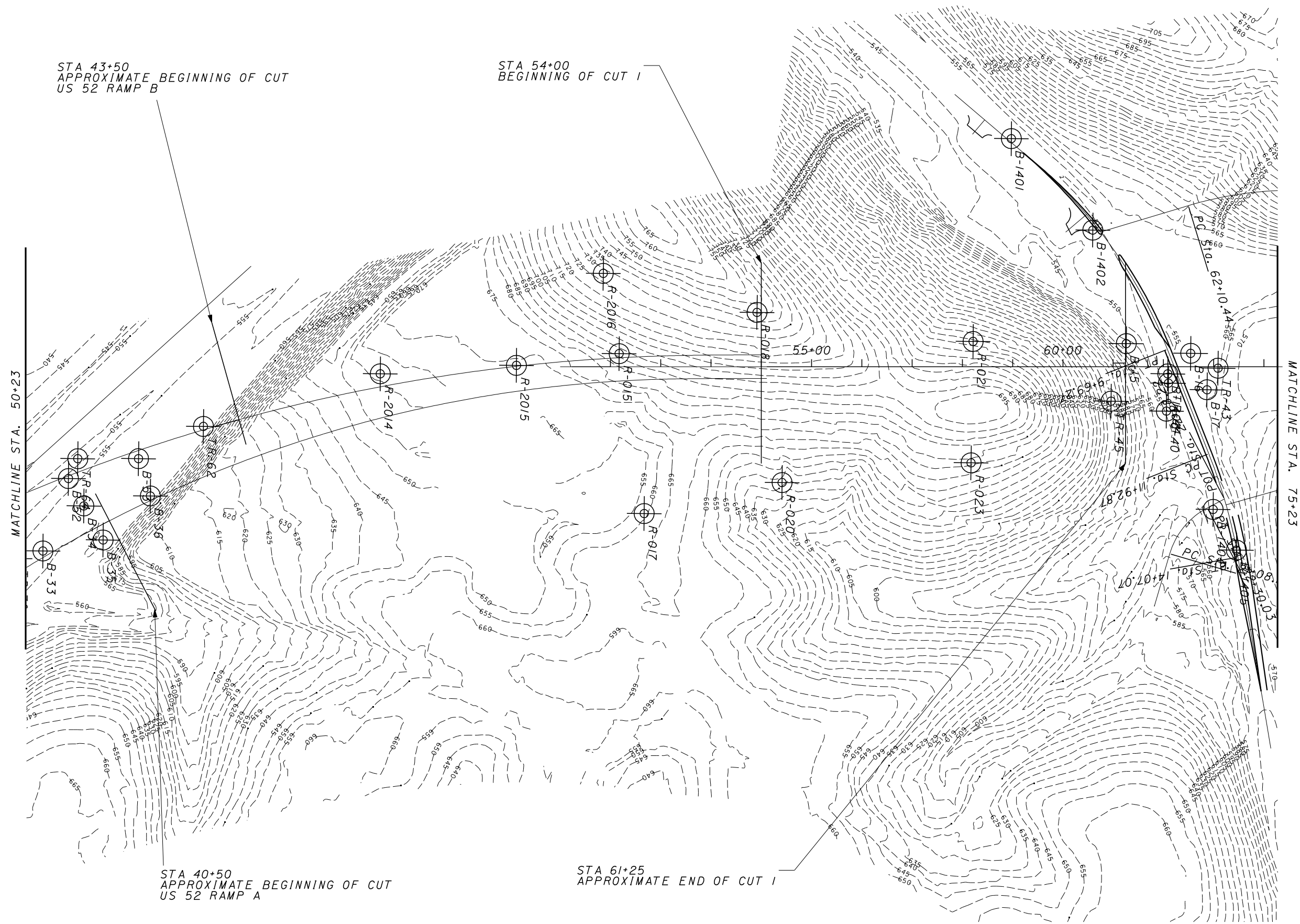
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AM J
CHECKED

LOCATION MAP
PORTSMOUTH BYPASS PHASE 3

SCI-823-00.0



Project Alignment and Boring Plan



DRAWN: RLS
 CHECKED: AMJ

ROCK CUT BORING PLAN

SCI-823-0.00

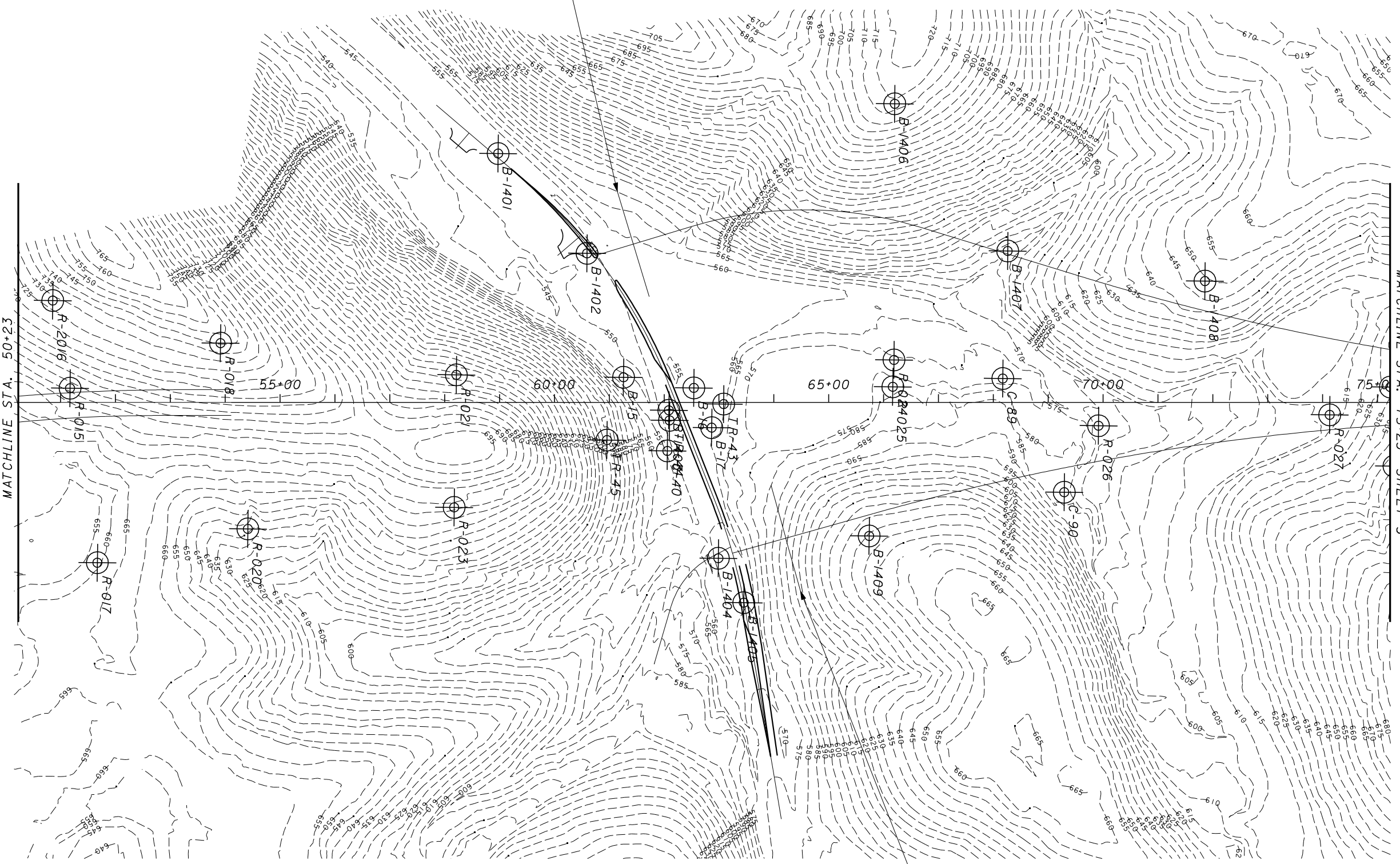


MATCHLINE STA. 50+23

MATCHLINE STA. 75+23 SHEET 3

STA 61+00
APPROXIMATE BEGINNING OF
SR 140 RAMP B CUT

STA 64+00
APPROXIMATE BEGINNING OF
SR 140 RAMP A CUT

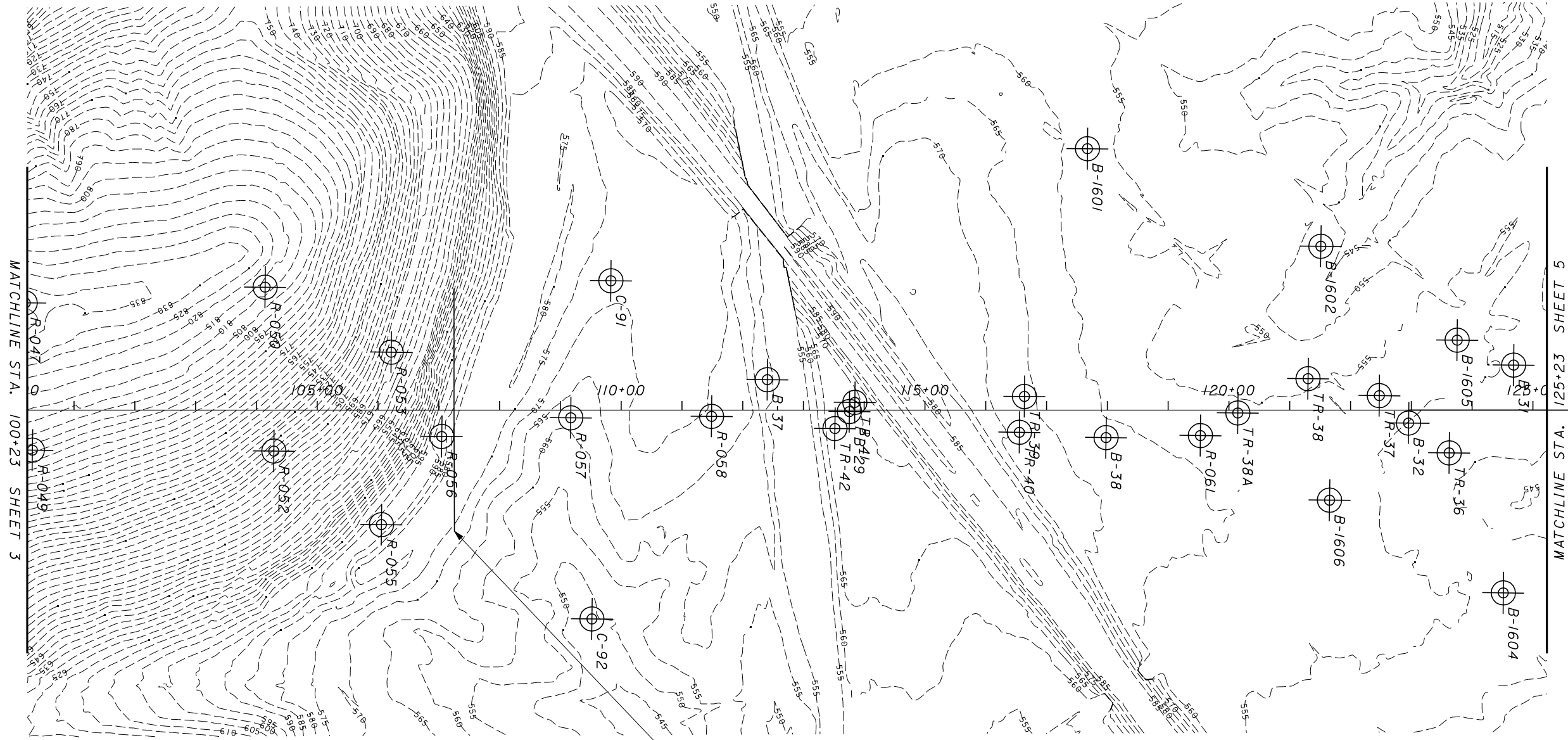


0 100 200
HORIZONTAL
SCALE IN FEET

DRAWN RLS
CHECKED AMJ

ROCK CUT BORING PLAN

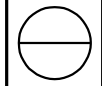
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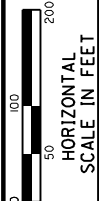
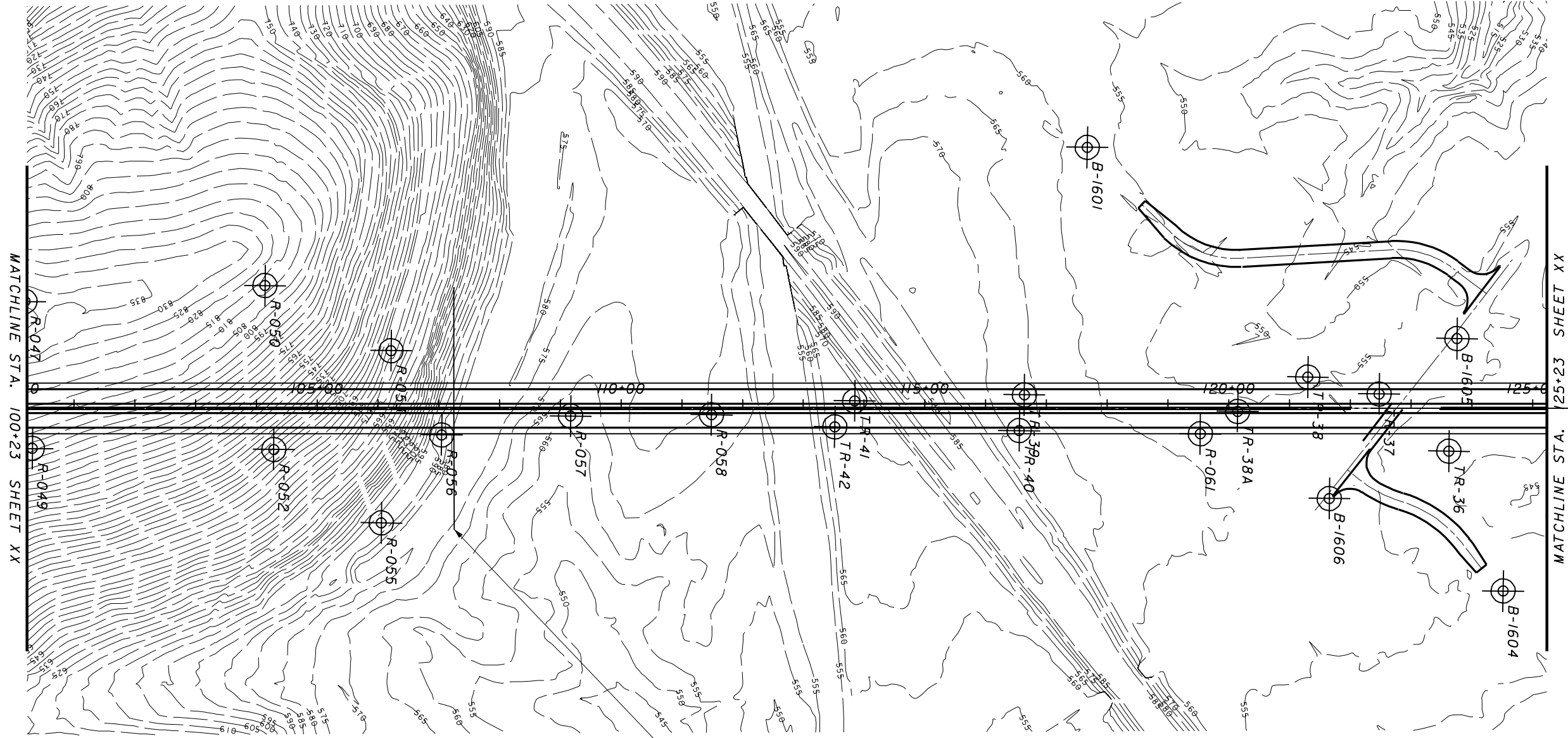


STA 106+25
APPROXIMATE END OF ROCK CUT 2

ROCK CUT BORING PLAN

SCI-823-0.00





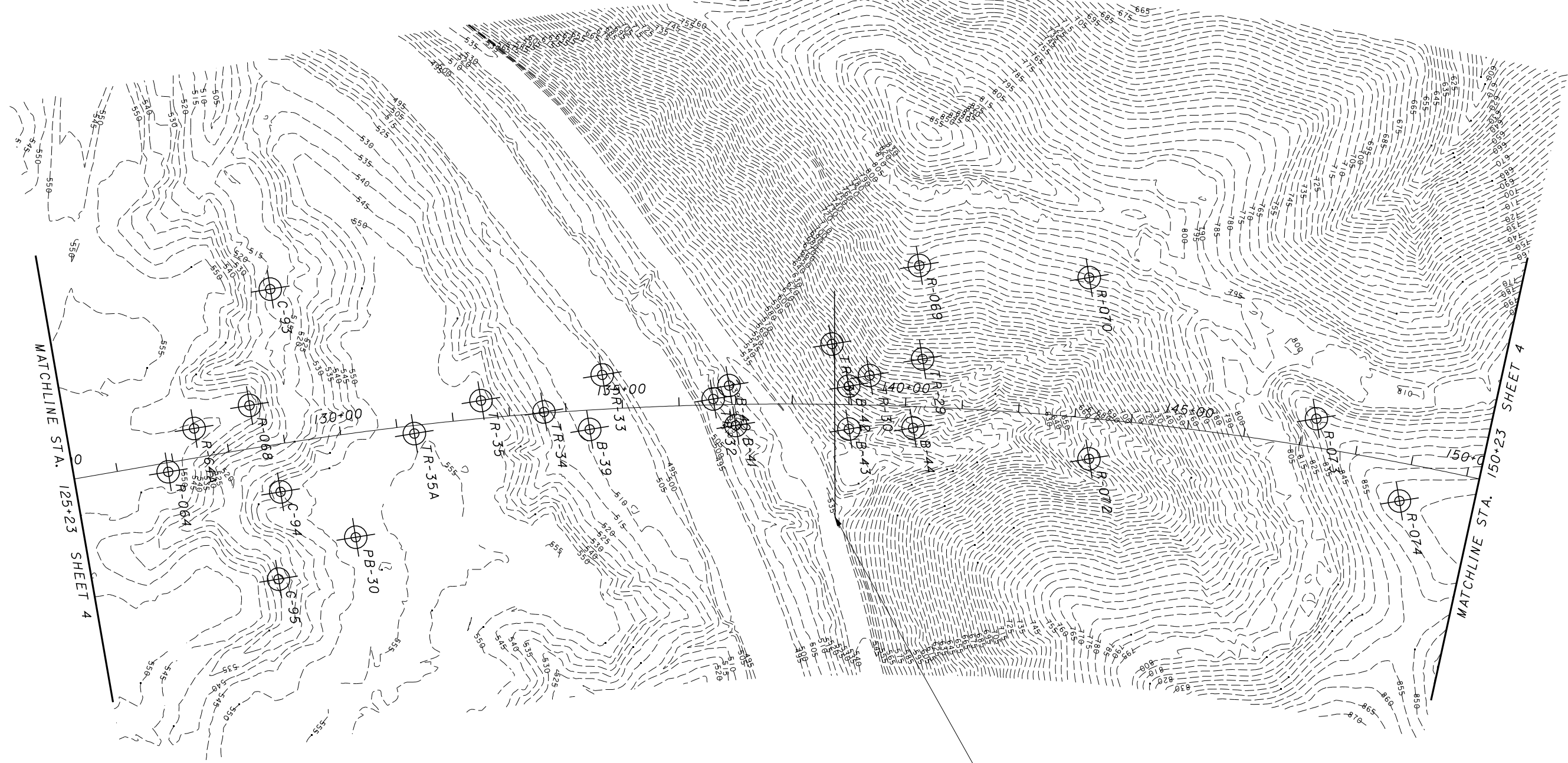
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HORIZONTAL
SCALE IN FEET

DRANN
RLS
CHECKED
AMJ

DRAFT ROCK CUT BORING PLAN

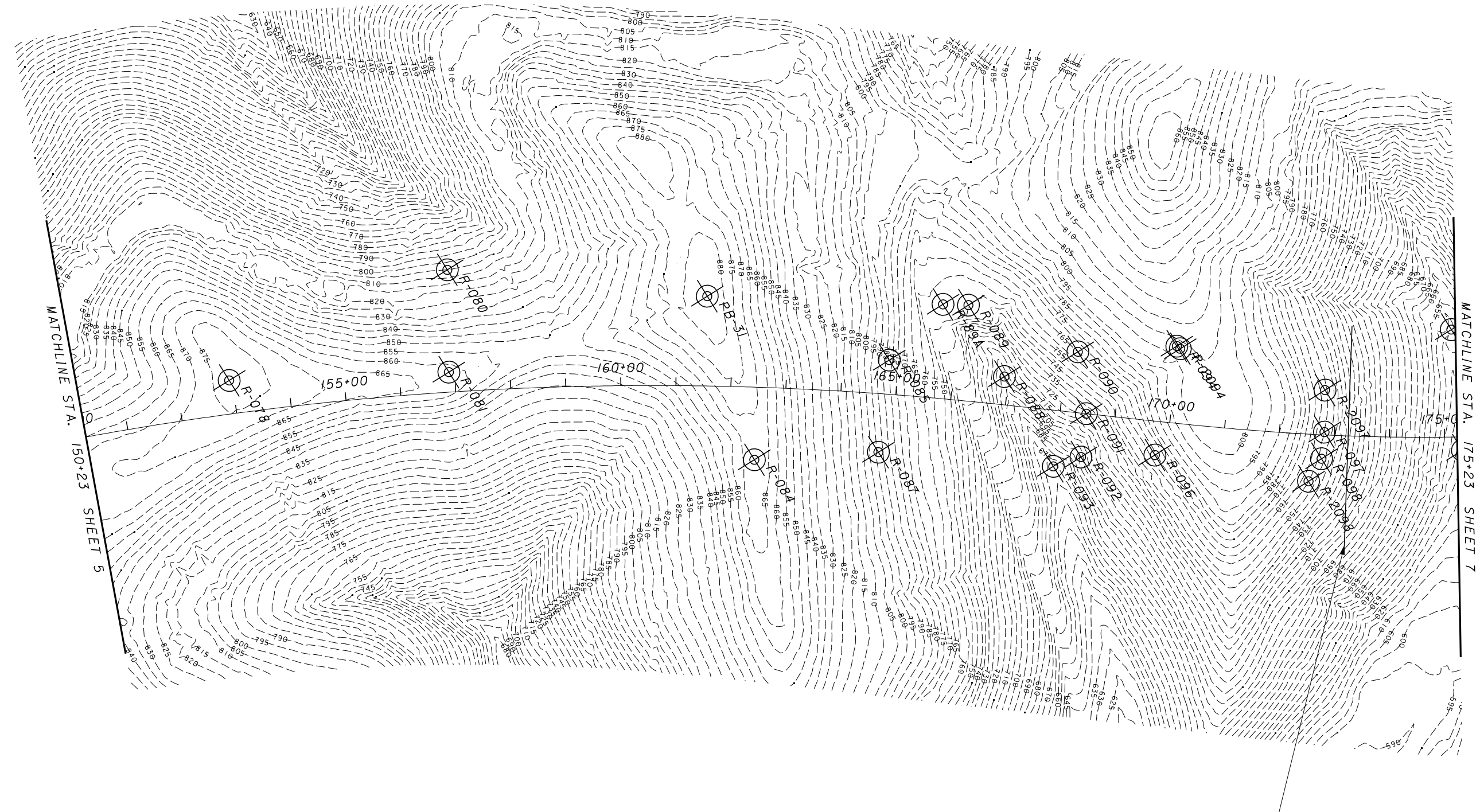
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STA 138+75
APPROXIMATE BEGINNING OF
CUT 3





STA 173+25
APPROXIMATE END OF
ROCK CUT 3

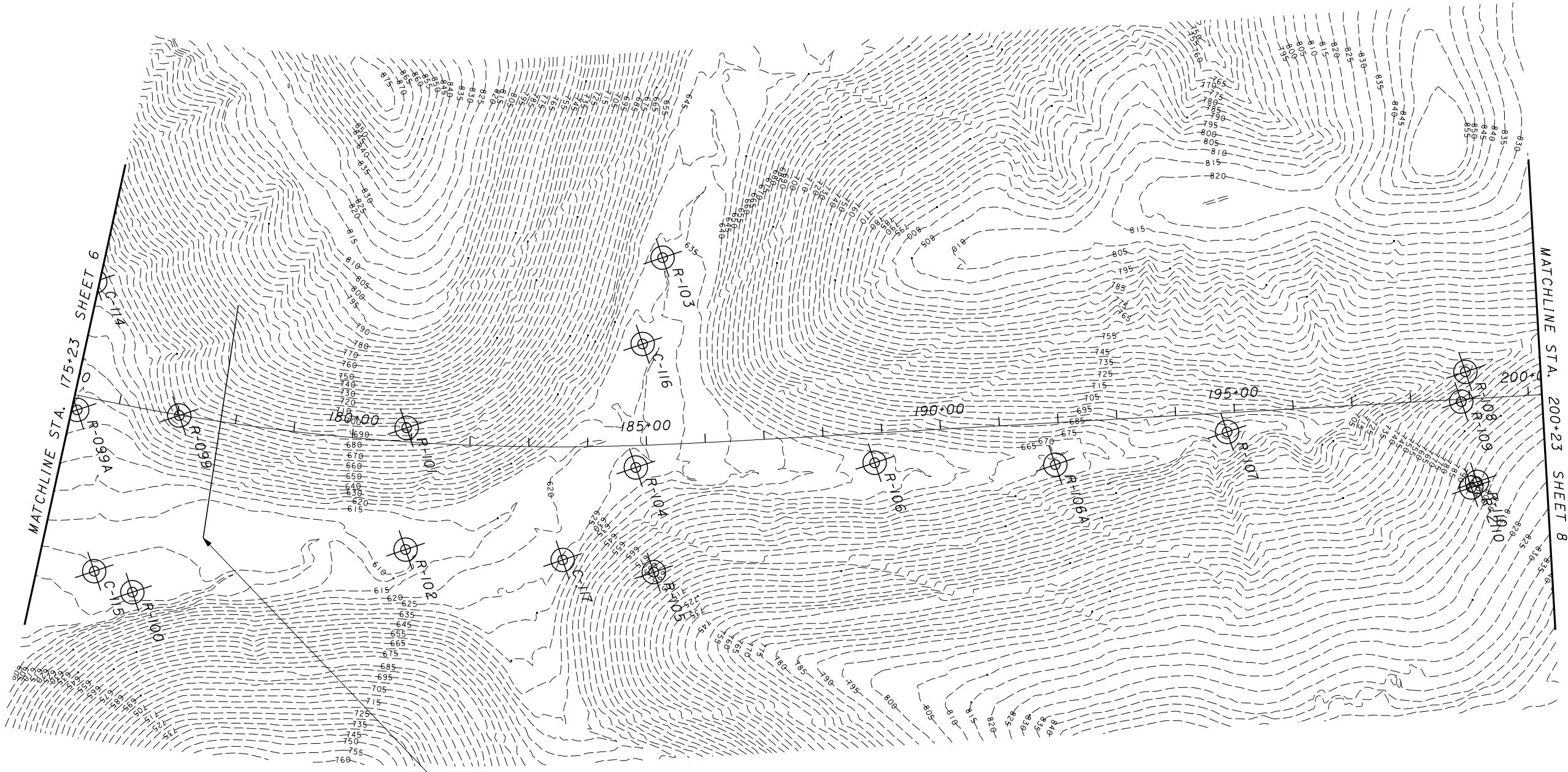


DRAWN
RLS
CHECKED
AMJ

ROCK CUT BORING PLAN

SCI-823-0.00





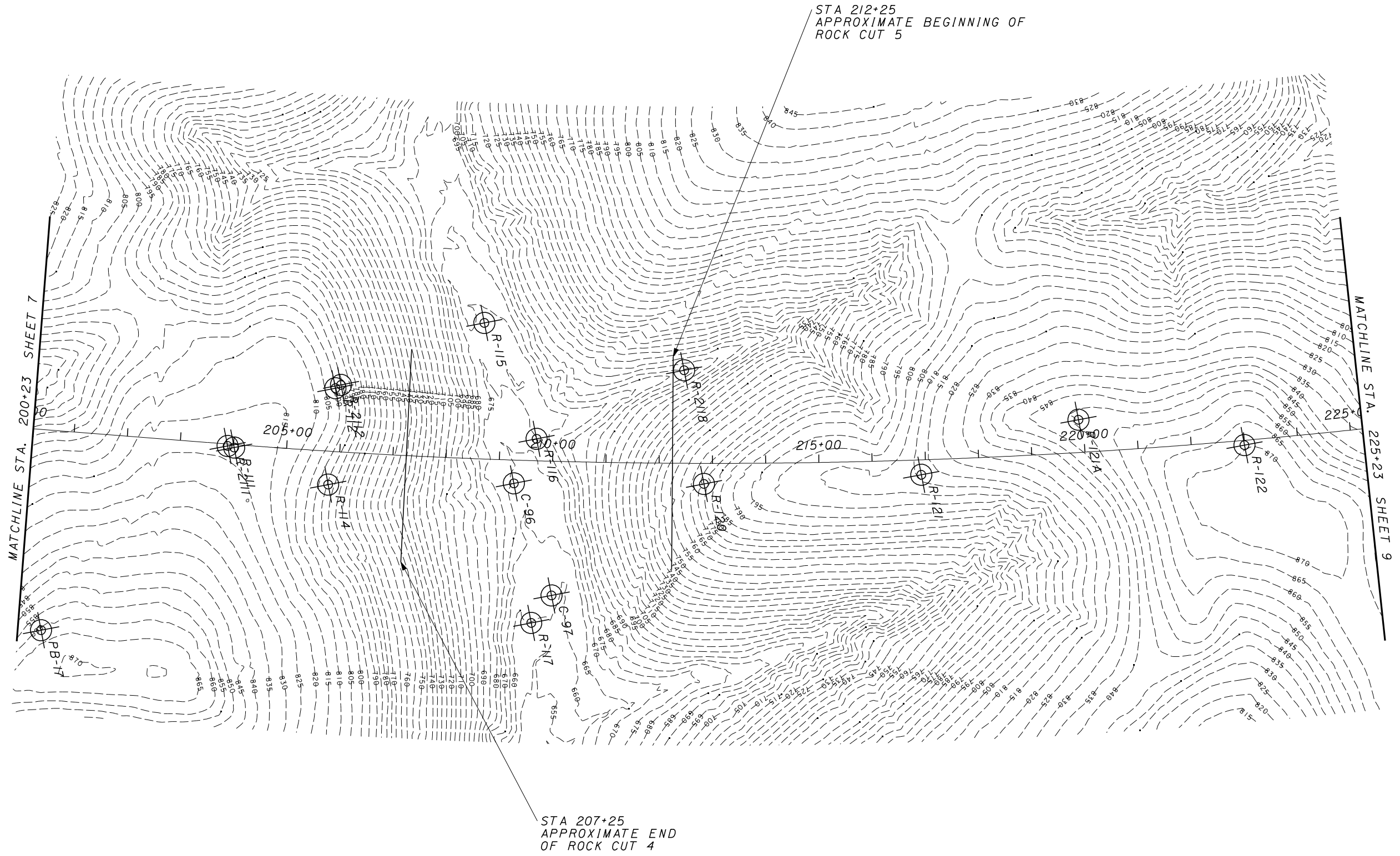
STA 177+75
APPROXIMATE BEGINNING OF
ROCK CUT 4

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HORIZONTAL
SCALE IN FEET

DRANN
RLS
CHECKED
AMJ

ROCK CUT BORING PLAN

SCI-823-0.00

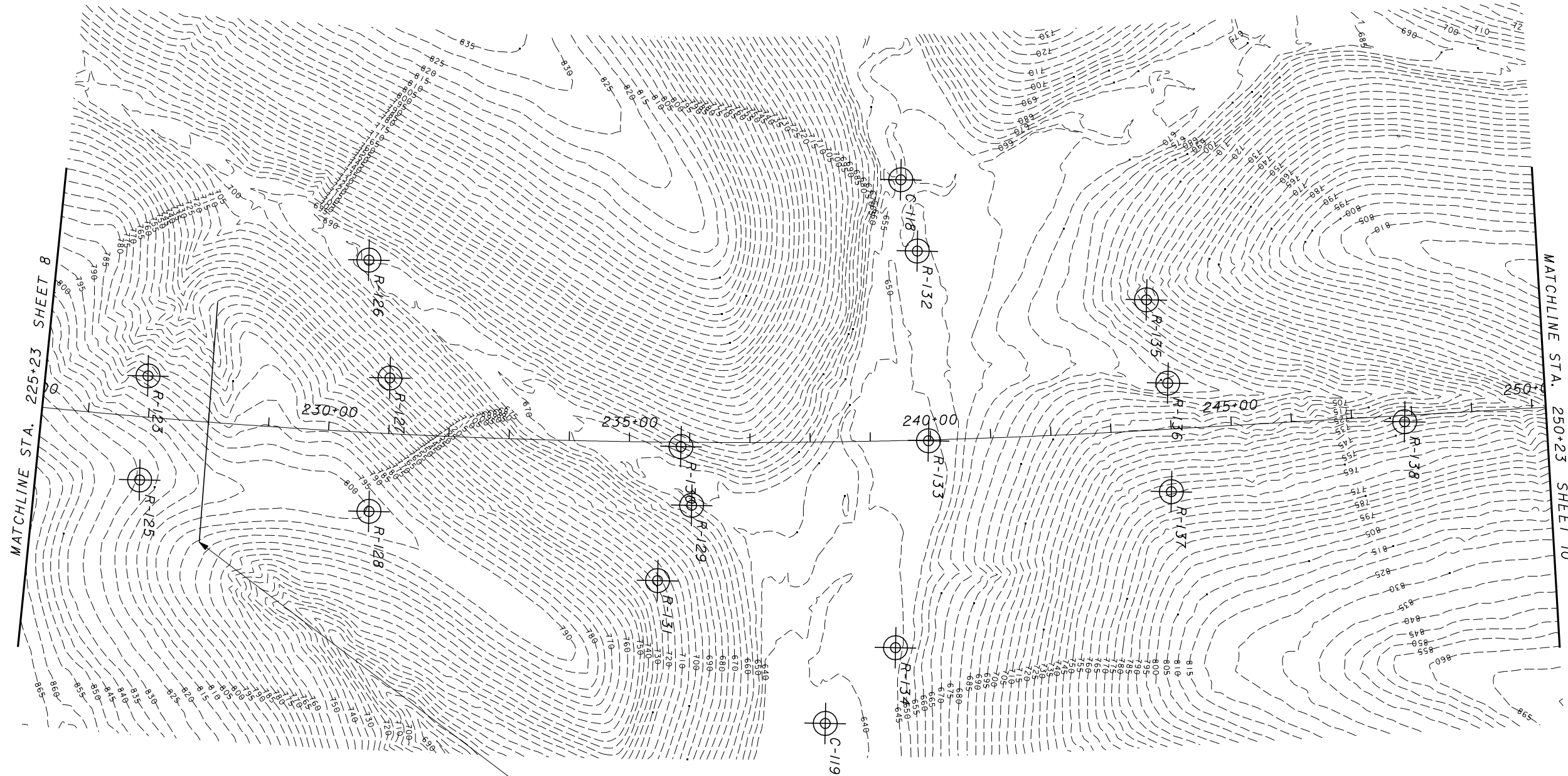


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HORIZONTAL SCALE IN FEET

DRAWN
RLS
CHECKED
AMJ

ROCK CUT BORING PLAN

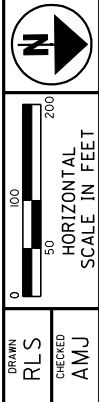
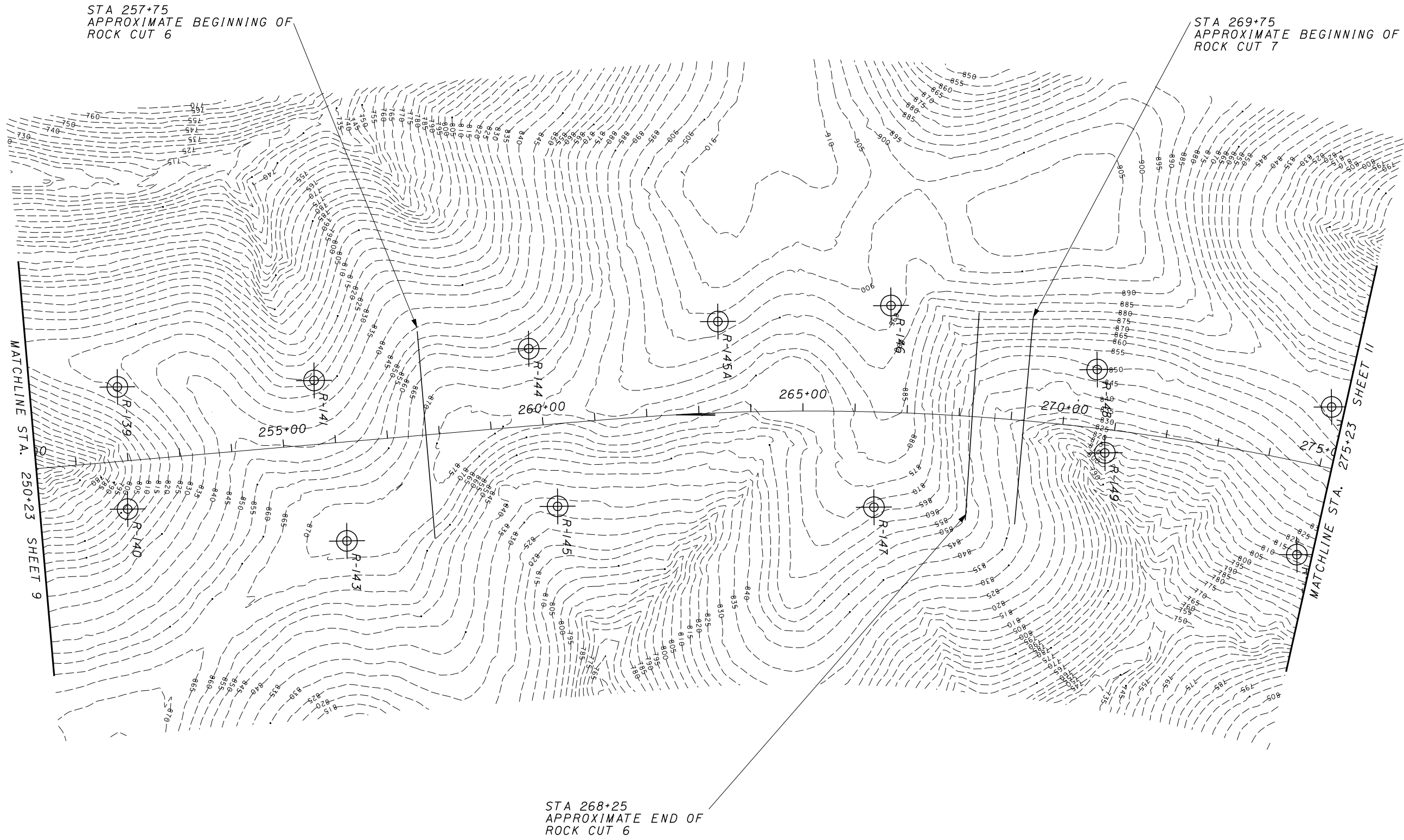
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0	100	200
HORIZONTAL SCALE IN FEET		
DRAWN	RLS	CHECKED
	AMJ	

ROCK CUT BORING PLAN

SCI-823-0.00
9/13

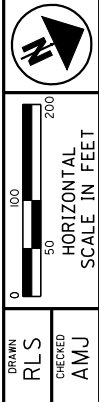
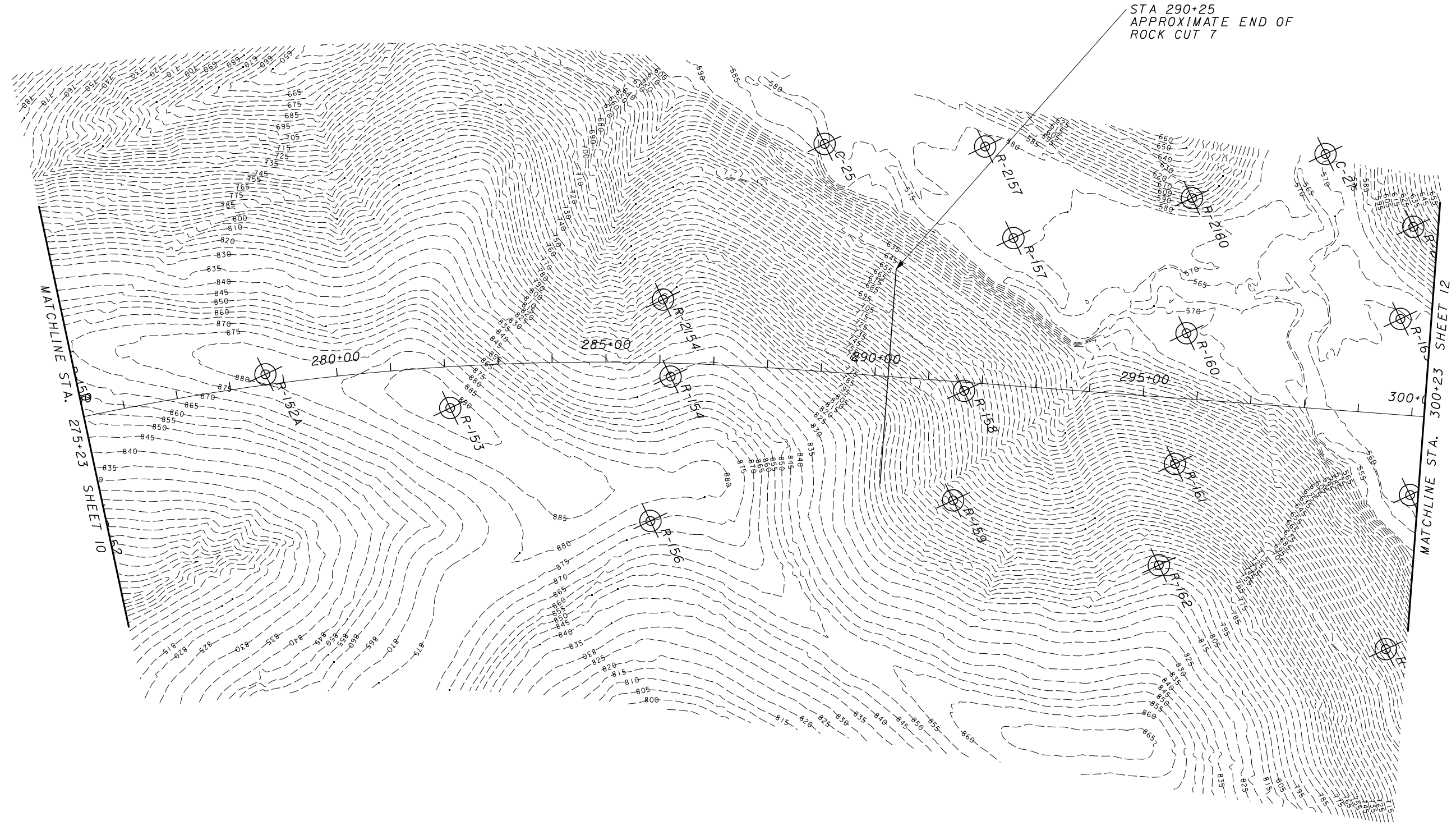


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RLS
CHECKED
AMJ

ROCK CUT BORING PLAN

SCI-823-0.00





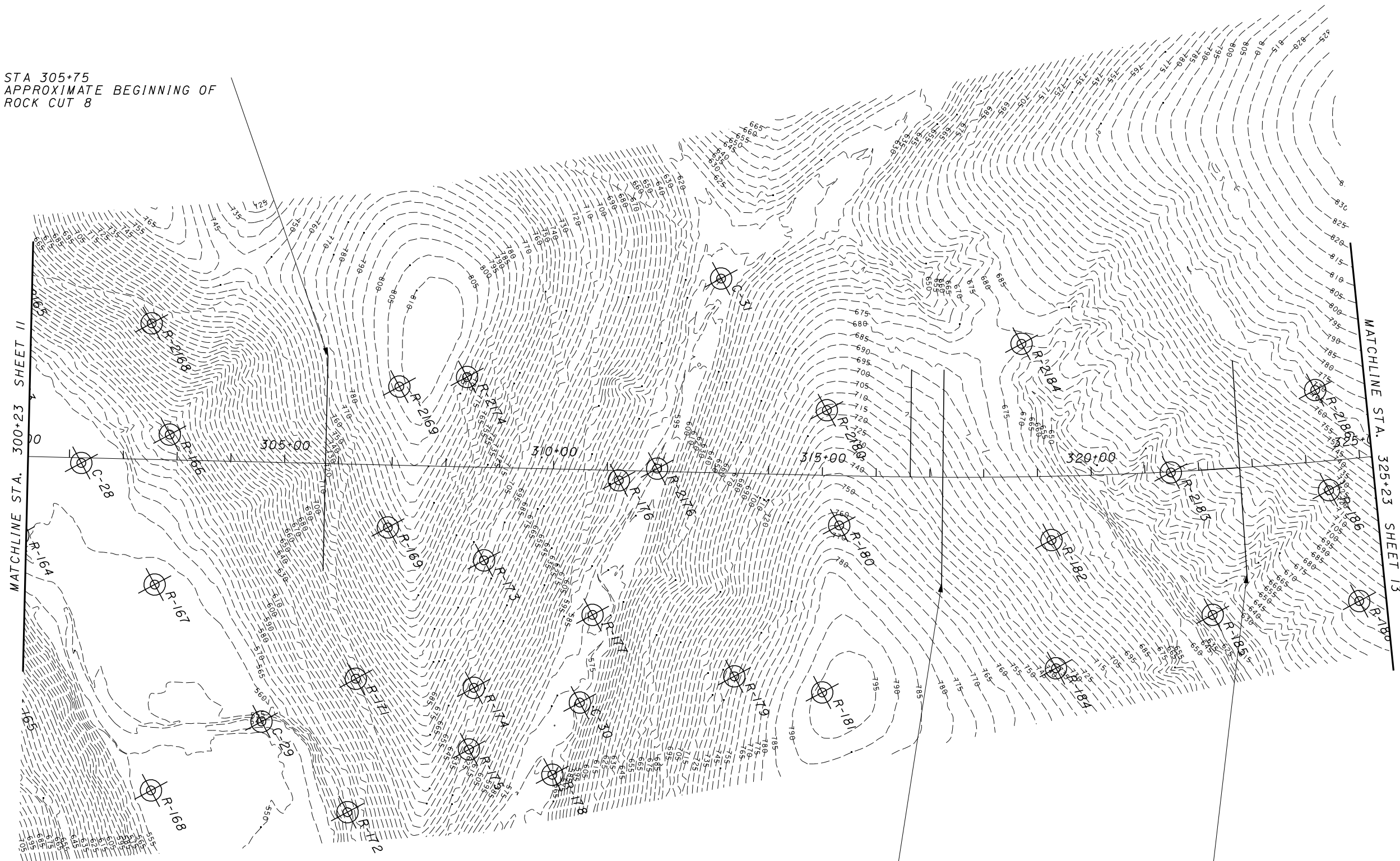
DRAWN RLS
CHECKED AMJ

ROCK CUT BORING PLAN

SCI-823-0.00



STA 305+75
APPROXIMATE BEGINNING OF
ROCK CUT 8



STA 317+25
APPROXIMATE END OF
ROCK CUT 8

STA 322+75
APPROXIMATE BEGINNING OF
ROCK CUT 9



DRAWN
RLS
CHECKED
AMJ

ROCK CUT BORING PLAN

SCI-823-0.00





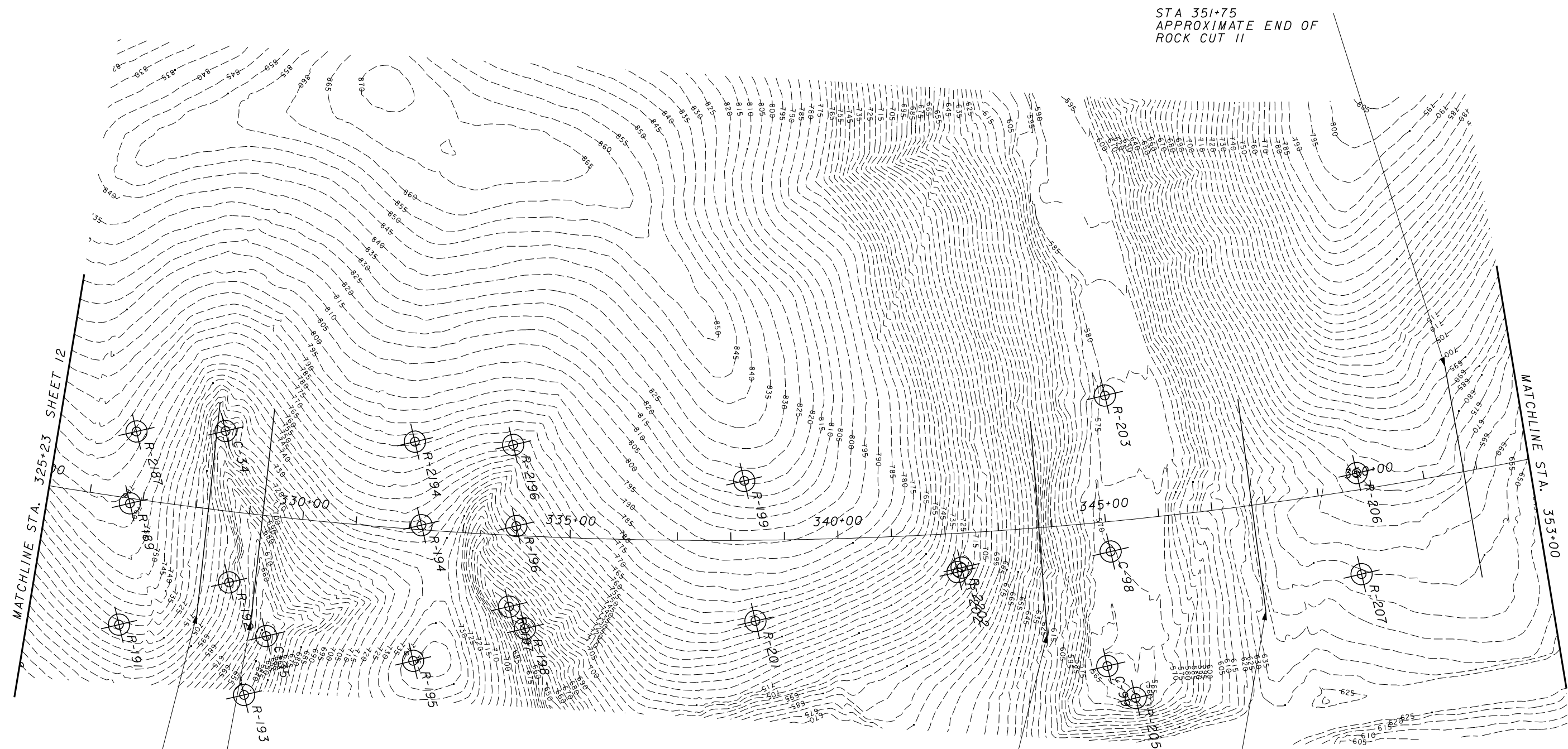
DRAWN
RLS
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AMJ

ROCK CUT BORING PLAN

SCI-823-0.00



STA 351+75
APPROXIMATE END OF
ROCK CUT II



STA 328+25
APPROXIMATE END OF
ROCK CUT 9

329+25
APPROXIMATE BEGINNING OF
ROCK CUT 10

STA 347+25
APPROXIMATE BEGINNING OF
ROCK CUT II

STA 343+75
APPROXIMATE END OF
ROCK CUT 10

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APPENDIX B

Boring Logs

Results of Slake Durability Index and Uniaxial Compressive Tests

Cut Slope Cross Sections

Colorado Rock Fall Simulation Analysis

Boring Logs

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring B-15

Location: Sta. 61+26.0, 45.9 ft. LT of SR 823 CL

Date Drilled: 9/20/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: Not reported	GRADATION						STANDARD PENETRATION (N)					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40					
0.2	551.8																		
	551.6	4					Topsoil - 2"												
		9 15	10			1	Medium dense brown SILT (A-4b), little clay, trace to little fine sand, trace to little coarse sand, little gravel; dry to damp.	12	9	--	9	55	15	●					Non-Plastic
3.0	548.8	50/2	2			2	Severely weathered brown SILTSTONE, arenaceous.												
4.5	547.3	Core 30"	Rec 29"			RQD 87%	Medium hard to hard gray SANDSTONE, fine to medium grained, moderately to slightly weathered, medium to thickly bedded, slightly fractured. @ 4.5'-4.7', brown. @ 4.9', 5.1', 5.2', 8.1', argillaceous, low angle fractures. @ 5.7'-6.1', qu=12,960 psi, Er=2,626,964 psi. @ 8.6'-8.8', high angle fracture, brown.												
		Core 60"	Rec 60"			RQD 97%													
10						R-2													
10.7	541.1	Core 30"	Rec 30"			RQD 80%	Medium hard to hard gray SANDSTONE interbedded with SILTSTONE; very fine to fine grained, moderately weathered, medium bedded, highly to moderately fractured. @ 11.4', 11.9', 13.3', 13.6', argillaceous, low angle fractures. @ 12.1'-12.3', high angle fracture. @ 14.1'-14.5', qu=13,299 psi.												
14.5	537.3						Bottom of Boring - 14.5'												
15																			
20																			
25																			
30																			

FILE: 0121-3070-03 [11/8/2007 4:10 PM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-15

Location: Sta. 51+17.4, 25.9 ft. LT of SR 823 CL

Date Drilled: 4/13/05 to 4/14/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 5.5' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay							
0	692.2																			
0.7	691.5						Topsoil - 8"													
		3					Very stiff to hard brown SILT AND CLAY (A-6a), little fine to coarse sand, trace gravel; damp.													
		4	7	18	1	3.0														
		5																		
		8	10	18	2	4.5+			5	5	--	7	51	32						
5		5																		
		10	14	18	3	4.5+														
		5																		
8.0	684.2						Hard brown SILT (A-4b), some clay, little fine to coarse sand; contains sandstone fragments; damp.													
		6																		
		16	49	18	4	4.5+														
10		12																		
		16	25	18	5	4.5+			0	5	--	8	56	31						
		8																		
		12	19	18	6	4.0														
15		11																		
		13	14	18	7	4.5+														
		9																		
19.0	673.2						Severely weathered brown SANDSTONE, argillaceous.													
		25																		
		32																		
20		18																		
		38																		
		50/3	15																	
22.0	670.2						Soft to medium hard brown and gray SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, micaceous, thinly bedded to thickly bedded, highly fractured to broken, with typical low angle iron stained fractures.													
		Core 120"	Rec 120"	RQD 74%	R-1	*297														
25																				
28.7	663.5						Soft to medium hard brownish gray SANDSTONE.													
30																				

FILE: 0121-3070-03 [11/8/2007 4:10 PM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-15

Location: Sta. 51+17.4, 25.9 ft. LT of SR 823 CL

Date Drilled: 4/13/05 to 4/14/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 5.5' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay							
30	662.2						Soft to medium hard brownish gray SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, micaceous, thinly bedded, highly fractured, with typical low angle clay filled fractures. Medium hard to hard gray SANDSTONE; very fine to fine grained, micaceous, argillaceous, thinly bedded to thickly bedded, highly to moderately fractured, with typical low angle clay filled fractures; contains few to moderate argillaceous laminations in lenses. @ 36.0'-36.2', IRON STONE. @ 44.6'-44.7', decomposed argillaceous lens. @ 45.5'-46.5', SDI = 98.1%. @ 46.6'-47.0', qu = 1,911 psi. @ 50.8'-50.9', 55.5'-55.6', argillaceous zones. @ 56.3'-57.2', contains moderate to abundant argillaceous laminations.													
33.4	658.8																			
35		Core 120"	Rec 120"	RQD 93%	R-2	*394														
45		Core 120"	Rec 120"	RQD 88%	R-3	*382														
55		Core 120"	Rec 120"	RQD 88%	R-4	*434														
60																				

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-15

Location: Sta. 51+17.4, 25.9 ft. LT of SR 823 CL

Date Drilled: 4/13/05 to 4/14/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / *Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 5.5' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)				
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○				
60	632.2																	
63.8	628.4						Medium hard to hard gray SANDSTONE; very fine to fine grained, micaceous, argillaceous, thinly bedded to thickly bedded, moderately fractured, with typical low angle clay filled fractures.											
65		Core 120"	Rec 120"	RQD 91%	R-5	*361	Hard gray SILTSTONE interbedded with SANDSTONE; slightly weathered, argillaceous, micaceous, thinly laminated to thinly bedded, moderately fractured, with typical low angle clay filled fractures, friable. @ 66.3'-66.7', qu = 4,352 psi. @ 68.0'-68.7', SDI = 89.8%.											
70							@ 72.7', 78.1', low angle clay filled fractures.											
72.9	619.3						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured.											
75		Core 120"	Rec 120"	RQD 100%	R-6	*473												
80																		
85		Core 120"	Rec 120"	RQD 100%	R-7	*501	@ 86.5' pyritic inclusions											
90																		

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-15

Location: Sta. 51+17.4, 25.9 ft. LT of SR 823 CL

Date Drilled: 4/13/05 to 4/14/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 5.5' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40					
90	602.2						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured, pyritic.												
95		Core 120"	Rec 120"	RQD 100%	R-8	*511													
100																			
105		Core 120"	Rec 120"	RQD 100%	R-9	*537													
110																			
115		Core 96"	Rec 96"	RQD 100%	R10	*649													
120.0	572.2						Bottom of Boring - 120.0'												

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-17

Location: Sta. 51+67.2, 292.1 ft. RT of SR 823 CL

Date Drilled: 4/14/05 to 4/15/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 5.5' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
0	659.2																		
-0.4	658.8						Topsoil - 5"												
		1 3 5	18			1.0	Very stiff to hard brown SILT AND CLAY (A-6a), some fine to coarse sand, little gravel; damp to moist.												
		5 12 18	18			4.5+		12	5	--	20	39	24						
5		8 19 28	18			4.0													
-8.0	651.2						Dense orangeish brown FINE SAND (A-3), little silt, trace clay; dry to damp.												
		11 17 24	18				Severely weathered orangeish brown SANDSTONE.												
-10.0	649.2																		
		30 50/3	9				Hard gray SANDSTONE; very fine to fine grained, decomposed, argillaceous, micaceous, thinly bedded to thinly bedded.												
-12.0	647.2						@ 12.9'-13.1', 14.0'-14.3', high angle iron stained fractures.												
-14.5	644.7						Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, moderately fractured, contains few argillaceous laminations.												
15		Core 120"	Rec 120"	RQD 76%	R-1	*402	@ 15.0', 17.4', 18.5', low angle clay filled fractures. @ 17.5', 17.6', 17.7', low angle iron stained fractures. @ 18.6', 18.7', 20.9', low angle clay filled fractures. @ 19.0'-19.3', broken zone.												
20							@ 22.6', 23.2', 23.3', low angle clay filled fractures.												
25		Core 120"	Rec 120"	RQD 98%	R-2	*425	@ 26.2', 29.9', 30.3', low angle clay filled fractures.												
30																			

FILE: 0121-3070-03 [11/8/2007 4:10 PM]

Client: TranSystems, Inc.		Project: SCI-823-0.00		Job No. 0121-3070.03																
LOG OF: Boring R-17			Location: Sta. 51+67.2, 292.1 ft. RT of SR 823 CL			Date Drilled: 4/14/05 to 4/15/05														
Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 5.5' (includes drilling water)	GRADATION												
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay							
DESCRIPTION							STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40													
30	629.2																			
32.0	627.2						Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, moderately to slightly fractured; contains few argillaceous laminations. Soft to medium hard gray SANDSTONE interbedded with SILTSTONE; highly weathered to decomposed, argillaceous, micaceous, thinly laminated to thinly bedded, highly fractured, with typical low angle clay filled fractures.													
35		Core 120"	Rec 120"	RQD 63%	R-3	*476														
38.4	620.8						Hard gray SANDSTONE; very fine to fine grained, moderately to slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured to unfractured. @ 38.6', 39.8', 40.0', low angle fractures. @ 40.7', 41.3', 42.5', low angle fractures. @ 44.8', 45.5', 50.7', low angle fractures.													
40		Core 120"	Rec 120"	RQD 100%	R-4	*319														
45																				
50							@ 52.1', 52.9', low angle fractures.													
55		Core 120"	Rec 120"	RQD 100%	R-5	*559														
60							58.2', IRON STONE band.													

FILE: 0121-3070-03 [11/8/2007 4:10 PM]

LOG OF: Boring R-17 Location: Sta. 51+67.2, 292.1 ft. RT of SR 823 CL Date Drilled: 4/14/05 to 4/15/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 5.5' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)				
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ●				
													PL ----- LL					
													Blows per foot - ○					
60	599.2						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded. @ 60.8', 61.8', low angle fractures. @ 62.0'-63.0', SDI = 98.4%. @ 65.0'-65.4', qu = 9,419 psi.											
		Core 120"	Rec 120"	RQD 100%	R-6	*607												
65																		
		Core 120"	Rec 120"	RQD 100%	R-7	*599												
70																		
75																		
		Core 120"	Rec 120"	RQD 100%	R-8	*457												
80																		
85																		
90																		

FILE: 0121-3070-03 [11/8/2007 4:10 PM]

Client: TranSystems, Inc. Project: SCI-823-0.00 Job No. 0121-3070.03

LOG OF: Boring R-17 Location: Sta. 51+67.2, 292.1 ft. RT of SR 823 CL Date Drilled: 4/14/05 to 4/15/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 5.5' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40						
90	569.2						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded.													
		Core 36"	Rec 36"	RQD 100%	R-9	*518														
95.0	564.2						Bottom of Boring - 95.0'													
100																				
105																				
110																				
115																				
120																				

FILE: 0121-3070-03 [11/8/2007 4:10 PM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-18

Location: Sta. 53+91.6, 108.0 ft. LT of SR 823 CL

Date Drilled: 4/13/05 to 4/14/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 40.3' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay							
0	741.2																			
-0.5	740.7						Topsoil - 6"													
		3				1	Very stiff to hard brown SANDY SILT (A-4a), little clay, trace gravel; damp to moist.													
		5	5	8		2.5														
-3.5	737.7					2	Severely weathered brown SANDSTONE.													
		10	18	22	13															
5						3	Medium hard to hard brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, highly fractured, with typical low angle iron stained fractures. @ 7.0'-7.6', broken zone. @ 7.9'-8.4', high angle iron stained fracture. @ 10.8'-11.0', 12.7'-12.8', 12.9'-13.0', high angle iron stained fractures. @ 13.9'-15.7', 16.3'-16.8', 19.1'-20.0', high angle iron stained fractures. @ 21.4'-28.6' few to moderate argillaceous laminations. @ 20.6'-20.7', 21.1'-21.2', 21.8'-22.2', high angle iron stained fractures. @ 22.5'-22.8', 23.0'-23.2', 23.3'-23.4', high angle iron stained fractures. @ 24.0'-24.1', 24.2'-24.3', 26.1'-26.3', high angle iron stained fractures. @ 26.5'-27.5', SDI = 17.6%. @ 27.3'-28.0', high angle iron stained fracture. @ 29.0'-29.5', qu = 3,484 psi.													
-7.0	734.2	25	50/5	11																
		Core 36"	Rec 30"		RQD 33%	R-1	*241													
10																				
		Core 120"	Rec 120"		RQD 29%	R-2	*179													
15																				
		Core 120"	Rec 120"		RQD 48%	R-3	*336													
25																				
30																				

FILE: 0121-3070-03 [11/8/2007 4:10 PM]

Client: TranSystems, Inc. Project: SCI-823-0.00 Job No. 0121-3070.03

LOG OF: Boring R-18 Location: Sta. 53+91.6, 108.0 ft. LT of SR 823 CL Date Drilled: 4/13/05 to 4/14/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 40.3' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40								
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay									
30	711.2						Medium hard to hard brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, highly fractured, with typical low angle iron stained fractures.															
32.0	709.2							Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured to unfractured; contains few argillaceous laminations in lenses or inclusions.														
35		Core 120"	Rec 119"	RQD 98%	R-4	*191																
40																						
45		Core 120"	Rec 120"	RQD 100%	R-5	*352	@ 42.8'-43.7', SDI = 99.8%. @ 44.0'-45.0', SDI = 84.5%.															
50							@ 47.5'-48.0', qu = 10,993 psi.															
55		Core 120"	Rec 120"	RQD 100%	R-6	*552																
60																						

FILE: 0121-3070-03 [11/8/2007 4:10 PM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-18

Location: Sta. 53+91.6, 108.0 ft. LT of SR 823 CL

Date Drilled: 4/13/05 to 4/14/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 40.3' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ———— LL Blows per foot - ○ 10 20 30 40						
60	681.2						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured to unfractured; contains few argillaceous laminations in lenses or inclusions. @ 68.0'-68.2', argillaceous lenses. @ 70.0'-70.2', IRON STONE band. @ 70.2'-70.5', very fine grade zone. @ 72.5'-72.6', 72.8'-72.9', 73.4'-73.7', argillaceous, very fine grained SANDSTONE lenses. @ 75.4'-76.3', turbidity zone with few argillaceous laminations.													
65		Core 120"	Rec 120"	RQD 100%	R-7	*436														
70																				
75		Core 120"	Rec 120"	RQD 100%	R-8	*369														
80																				
85		Core 120"	Rec 120"	RQD 100%	R-9	*610														
90																				

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-18

Location: Sta. 53+91.6, 108.0 ft. LT of SR 823 CL

Date Drilled: 4/13/05

to 4/14/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 40.3' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)							
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40							
90	651.2						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured to unfractured, turbidity bedded.														
95		Core 120"	Rec 120"	RQD 100%	R10	*488															
100																					
105		Core 120"	Rec 120"	RQD 100%	R11	*332	@ 110.5'-110.9', qu = 10,588 psi. @ 111.3'-118.8', contains moderate to abundant argillaceous laminations, friable zones.														
110																					
115		Core 120"	Rec 120"	RQD 100%	R12	*542															
120							@ 116.6', low angle clay filled fracture. @ 117.8'-118.8', SDI = 92.4%. @ 119.0'-119.4', qu = 3,044 psi.														

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-18

Location: Sta. 53+91.6, 108.0 ft. LT of SR 823 CL

Date Drilled: 4/13/05 to 4/14/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 40.3' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)							
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40							
120	621.2						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded (contains turbidity bedding). @ 126.1'-126.6', calcareous zone. @ 140.0', pyritic.														
125		Core 120"	Rec 120"	RQD 100%	R13	*483															
130																					
135		Core 120"	Rec 116"	RQD 95%	R14	*571															
140																					
145		Core 120"	Rec 120"	RQD 100%	R15	*531															
150																					

FILE: 0121-3070-03 [11/8/2007 4:10 PM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-18

Location: Sta. 53+91.6, 108.0 ft. LT of SR 823 CL

Date Drilled: 4/13/05 to 4/14/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 40.3' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)			
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40			
150	591.2						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, pyritic, thinly bedded to thickly bedded (contains turbidity bedding), slightly fractured to unfractured. @ 150.0'-151.0', SDI = 97.5%. @ 151.1'-151.5', qu = 10,810 psi.										
155		Core 120"	Rec 117"	RQD 98%	R16	*476											
160																	
165		Core 120"	Rec 120"	RQD 100%	R17	*435											
170																	
175.0	566.2	Core 60"	Rec 60"	RQD 100%	R18	*462											
		Bottom of Boring - 175.0'															
180																	

FILE: 0121-3070-03 [11/8/2007 4:10 PM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-20

Location: Sta. 54+41.5, 230.4 ft. RT of SR 823 CL

Date Drilled: 4/13/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 6.1' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40					
0	642.4																		
0.3	642.1						Topsoil - 4"												
		4					Very stiff brown SILT (A-4b), little fine to coarse sand, trace gravel; contains sandstone fragments; dry to damp.	1	6	--	12	66	15						
		10 12	18																
3.0	639.4						Severely weathered brown SANDSTONE argillaceous.												
		18																	
		36 50/4	16																
5.0	637.4						Soft to medium hard yellowish brown SANDSTONE; very fine to fine grained, highly weathered to decomposed, micaceous, argillaceous, laminated to thinly bedded, broken to highly fractured. @ 5.2'-5.5', decomposed zone. @ 5.9', decomposed shale, fractured. @ 7.8', low angle filled fracture. @ 8.5'-9.2' 10.5'- 10.7', 11.4'-11.8', high angle rust stained fractures. @ 12.9'-13.6', high angle fracture.												
				Core 84"	Rec 84"	RQD 49%		R-1											
14.3	628.1						Soft to medium hard gray SANDSTONE interbedded with SHALE; highly weathered to decomposed, laminated to thinly bedded, moderately fractured, friable and poorly cemented. @ 21.8', grades to SANDSTONE with moderate to abundant argillaceous laminations.												
15																			
				Core 120"	Rec 120"	RQD 73%		R-2											
22.9	619.5						Hard gray SANDSTONE; fine grained, moderately to highly weathered, argillaceous, micaceous, laminated to medium bedded. @ 27.0'-27.5', 29.1'-31.3', few to moderate argillaceous laminations. @ 27.7'-27.9', 28.7', 28.9'-29.1', calcareous zones. @ 29.3'-33.8', turbidity bedding. @ 29.1', 30.0', 31.6', shale laminations.												
25																			
				Core 120"	Rec 120"	RQD 84%		R-3	*304										
30																			

FILE: 0121-3070-03 [11/8/2007 4:10 PM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-20

Location: Sta. 54+41.5, 230.4 ft. RT of SR 823 CL

Date Drilled: 4/13/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 6.1' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)							
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40							
30	612.4						Hard gray SANDSTONE; very fine to fine grained, moderately to highly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, contains pyritic inclusions, moderately to slightly fractured. @ 33.8',34.8', low angle fractures with argillaceous laminations. @ 35.1',35.2',35.5', 35.9', low angle fractures with shale laminae. @ 36.0' slightly to unfractured.														
35				Core 120"	Rec 120"	RQD 93%		R-4	*424												
40																					
45				Core 120"	Rec 120"	RQD 100%	R-5	*510	@ 40.3',44.9',45.7', low angle fractures with argillaceous laminations. @ 40.5'-40.7', calcareous layer. @ 40.7'-41.1', 41.5'-41.7', turbidity bedding.												
50																					
55																					
60				Core 120"	Rec 120"	RQD 98%	R-6	*479	@ 57.1',57.2', calcareous laminae. @ 57.7',57.8', low angle fractures with argillaceous laminations.												

FILE: 0121-3070-03 [11/8/2007 4:10 PM]

Client: TranSystems, Inc. Project: SCI-823-0.00 Job No. 0121-3070.03

LOG OF: Boring R-20 Location: Sta. 54+41.5, 230.4 ft. RT of SR 823 CL Date Drilled: 4/13/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 6.1' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40									
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay										
60	582.4						@ 57.8'-58.4', 59.9'-60.5', siltstone inclusions. Hard gray SANDSTONE; very fine to fine grained, moderately to highly weathered, argillaceous, micaceous, thinly bedded to massive, contains pyritic inclusions, slightly fractured to unfractured. @ 67.8'-68.1', calcareous zone.																
65		Core 96"	Rec 96"	RQD 100%	R-7	*482																	
70.0	572.4						Bottom of Boring - 70.0'																
75																							
80																							
85																							
90																							

FILE: 0121-3070-03 [11/8/2007 4:10 PM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-21

Location: Sta. 58+21.4, 50.3 ft. LT of SR 823 CL

Date Drilled: 4/12/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 9.8' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ─────────── LL Blows per foot - ○ 10 20 30 40						
0.2	656.3 656.1	2					Topsoil - 2" Severely weathered brown SANDSTONE.													
		36 15	18			1														
		10				2														
5.0	651.3	49 50/1	13				Soft to medium hard brown SANDSTONE; very fine to fine grained, decomposed to highly weathered, argillaceous, highly fractured to broken; contains moderate argillaceous laminations. @ 5.2',11.5',12.0',16.4',19.0', high angle fractures.													
				Core 84"	Rec 84"	RQD 73%	R-1	*191												
10							@ 10.5'-11.0',11.7'-11.9',12.2'- 12.6', broken zones.													
							@ 12.6', moderately to highly weathered.													
15							@ 17.0'-17.5', gray.													
				Core 120"	Rec 120"	RQD 51%	R-2	*76												
20							@ 18.5', hard. @ 19.2'-20.8', broken zone rust staining.													
							@ 21.0', high angle fracture, gray.													
22.6	633.7						Medium hard gray SANDSTONE very fine to fine grained, interbedded with SHALE, highly weathered, micaceous, highly fractured, poorly laminated. @ 22.6'-23.6', brown, broken zone, shale interbeds. @ 23.6'-25.3', gray, broken zone, shale interbeds. @ 25.6', clay filled fracture, highly weathered. @ 26.2', high angle fracture, rust stained fractures, silt interbeds, argillaceous.													
25				Core 120"	Rec 120"	RQD 66%	R-3													
30																				

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-21

Location: Sta. 58+21.4, 50.3 ft. LT of SR 823 CL

Date Drilled: 4/12/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 9.8' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)								
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40								
30.0	626.3						Soft to medium hard brown SANDSTONE; fine grained, highly weathered, argillaceous, highly fractured.															
33.5	622.8							Medium hard gray SANDSTONE; fine grained, moderately to highly weathered, micaceous, argillaceous, moderately fractured; contains turbidity bedding, few to moderate argillaceous laminations.														
35		Core 120"	Rec 120"	RQD 70%	R-4	*550																
40									@ 40.4', high angle fracture.													
45							@ 44.8', pyritic.															
47.7	608.6						@ 47.4', high angle fracture, rust stained.															
50		Core 120"	Rec 120"	RQD 84%	R-5	*297	Hard gray and brown SANDSTONE , very fine to fine grained, moderate to highly weathered, micaceous, argillaceous, pyritic, unfractured to moderately fractured. @ 47.7'-48.7', 48.9'-49.8', light brown, highly weathered. @ 48.1'-48.2', clay filled fracture. @ 49.8'-51.1', highly fractured. @ 52.5', high angle fracture, rust staining.															
55								@ 55.5', 58.9', clay filled fractures.														
60		Core 120"	Rec 120"	RQD 80%	R-6	*289		@ 59.0', slightly to moderately weathered.														

FILE: 0121-3070-03 [11/8/2007 4:10 PM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-23

Location: Sta. 58+17.3, 191.2 ft. RT of SR 823 CL

Date Drilled: 4/12/05 to 4/13/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 25.4' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay							
0	671.8																			
0.3	671.5						Topsoil - 4"													
		WOH 1				1	Stiff brown SILT (A-4b), little fine to coarse sand, little clay; damp to moist.	0	3	--	10	68	19							
		2				2	@ 3.5'-12.5', very stiff to hard.													
5		4	9	16																
		6	8	15		3														
		4	14	18		4		0	6	--	20	54	20							
10		4	10	17		5														
12.5	659.3						Severly weathered SANDSTONE.													
		16	50/5	11		6														
15.0	656.8						Medium hard brown SANDSTONE; very fine to fine grained, moderately to highly weathered, micaceous, argillaceous, highly to moderately fractured; contains few argillaceous laminations. @ 16.6'-16.9', high angle fracture.													
		Core 48"	Rec 48"	RQD 52%	R-1	*273														
20							@ 21.9', high angle fracture. @ 22.2'-24.6', gray and brown mixed with silt interbeds.													
		Core 120"	Rec 120"	RQD 90%	R-2	*149	@ 24.6', brown.													
25							@ 26.1'-26.5', qu = 1,621 psi. @ 26.9'-27.9', SDI = 98.2%.													
							@ 27.9', clay filled fracture. @ 28.8'-29.7', mottled gray and brown. @ 29.7', brown with rust staining.													
30																				

FILE: 0121-3070-03 [11/8/2007 4:10 PM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-23

Location: Sta. 58+17.3, 191.2 ft. RT of SR 823 CL

Date Drilled: 4/12/05 to 4/13/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / *Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 25.4' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40									
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay										
30	641.8						*171 Medium hard brown SANDSTONE; very fine to fine grained, moderately to highly weathered, micaceous, argillaceous, highly to moderately fractured; contains few argillaceous laminations. @ 30.4', 30.9'-31.5', high angle fracture, rust staining. @ 30.5'-31.5', SDI = 4.1%. @ 31.5'-31.9', broken zone. @ 31.9'-33.0', clay filled fracture.																
33.2	638.6	Core 120"	Rec 120"	RQD 92%	R-3			Medium hard to hard gray SANDSTONE; very fine to fine grained, highly to moderately weathered, micaceous, moderately to slightly fractured; contains few to moderate argillaceous laminations. @ 33.2'-52.7', siltstone interbeds, thinly laminated. @ 41.1'-42.5', brown. @ 43.5'-48.9', moderate to abundant argillaceous laminations, poorly to moderately cemented.															
35								@ 43.9'-44.1', high angle fracture.															
40																							
45		Core 120"	Rec 120"	RQD 73%	R-4	*294																	
50																							
51.3	620.5																						
55		Core 120"	Rec 120"	RQD 93%	R-5	*389		Hard gray very fine to fine grained SANDSTONE, moderately to slightly weathered, micaceous, argillaceous, slightly fractured to unfractured; contains turbidity beds, few argillaceous laminations. @ 57.8', moderately to highly fractured. @ 59.4', high angle fracture.															
60																							

FILE: 0121-3070-03 [11/8/2007 4:10 PM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-23

Location: Sta. 58+17.3, 191.2 ft. RT of SR 823 CL

Date Drilled: 4/12/05 to 4/13/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 25.4' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40		
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay			
60	611.8						Hard gray very fine to fine grained SANDSTONE, moderately to slightly weathered, micacious, argillaceous, slightly fractured to unfractured; contains turbidity beds, few argillaceous laminations. @ 63.8'-64.3', calcareous zone. @ 69.3, pyritic. @ 70.2', silt filled fracture. @ 76.6', slightly to moderately fractured. @ 89.0', high angle fracture.									
65		Core 120"	Rec 116"	RQD 94%	R-6	*467										
70																
75		Core 120"	Rec 120"	RQD 100%	R-7	*512										
80																
85		Core 120"	Rec 120"	RQD 100%	R-8	*437										
90																

FILE: 0121-3070-03 [11/8/2007 4:10 PM]

Client: TranSystems, Inc. Project: SCI-823-0.00 Job No. 0121-3070.03

LOG OF: Boring R-23 Location: Sta. 58+17.3, 191.2 ft. RT of SR 823 CL Date Drilled: 4/12/05 to 4/13/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 25.4' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40					
90	581.8						Hard gray very fine to fine grained SANDSTONE, moderately to slightly weathered, micacious, argillaceous, slightly fractured to unfractured; contains turbidity beds, few argillaceous laminations. @ 93.1', high angle fracture.												
		Core 120"	Rec 120"	RQD 100%	R-9	*555													
100.0	571.8	Core 12"	Rec 12"	RQD 100%	R10	*333	Bottom of Boring - 100.0'												
105																			
110																			
115																			
120																			

FILE: 0121-3070-03 [11/8/2007 4:10 PM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-2014

Location: Sta. 46+43.1, 25.4 ft. LT of US 52 Ramp B BL

Date Drilled: 1/12/06 to 1/16/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 8.1' (prior to coring) 16.8' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40			
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay				
0	662.2																
0.3	661.9						Topsoil - 3"										
		8				1	4.5+										
		8	10	13			Hard gray SANDY SILT (A-4a), little clay, trace to little gravel; contains sandstone fragments; dry to damp. @ 1.0'-2.5' contains organics.										
		10															
		6	8	11		2	4.5+										
5																	
5.5	656.7						Very stiff to hard brown SILT (A-4b), some fine to coarse sand, little clay; trace gravel; dry to damp.	9	16	--	9	51	15				
		6															
		8	14	13		3	4.5+										
		12															
		12	12	15		4	4.5+										
10																	
		7															
		8	8	10		5	4.0										
		8					@ 13.5', trace fine to coarse sand.										
		9	11	15		6	3.5										
15																	
		13					@ 16.0' contains sandstone fragments.										
		33															
17.5	644.7	50/2		17		7	4.5+	1	2	--	8	73	16				
							Soft to medium hard light brown SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, massive, highly fractured to broken. @ 18.1'-18.3', 19.0'-19.5', 20.3'-21.3', broken.										
20		Core 78"	Rec 59"	RQD 18%	R1	*151	@ 22.7'-24.0', broken and decomposed.										
							@ 26.1'-26.2', high angle fracture. @ 26.3'-29.6', 31.0'-31.5', lost recovery likely due to decomposed/poor rock quality.										
25																	
		Core 120"	Rec 71"	RQD 45%	R2	*299											
30																	

FILE: 0121-3070-03 [11/8/2007 4:10 PM]

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / *Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 8.1' (prior to coring) 16.8' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40	
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay		
30	632.2						<p>DESCRIPTION</p> <p>Soft to medium hard light brown SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, massive, highly fractured to broken. @ 31.5'-32.7', SDI = 37.6%. @ 32.8'-33.0', broken zone.</p> <hr/> <p>Soft to medium hard gray SANDSTONE interbedded with SHALE; very fine to fine grained, moderately to highly weathered, argillaceous, laminated to thinly bedded, moderately to highly fractured. @ 36.5'-36.7', broken zone. @ 36.8'-36.9', high angle fracture.</p> <hr/> <p>@ 42.4'-43.7', qu = 10,425 psi SDI = 64.9%.</p> <hr/> <p>Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, pyritic, micaceous, massive, unfractured to slightly fractured. @ 44.3', 44.9', 45.3', low angle fractures. @ 45.4'-45.6', broken zone, decomposed to highly weathered. @ 45.5'-46.3', iron stained. @ 46.0'-46.5', 49.2'-50.1', 50.8'-51.1', calcareous.</p> <hr/> <p>@ 54.5'-55.9', qu = 7,447 psi SDI = 96.1%.</p>								
35 35.5	626.7														
40		Core 120"	Rec 120"	RQD 66%	R3	*728									
43.3	618.9														
45		Core 120"	Rec 120"	RQD 98%	R4	*1404									
50															
55															
60		Core 120"	Rec 120"	RQD 100%	R5	*1691									

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-2014

Location: Sta. 46+43.1, 25.4 ft. LT of US 52 Ramp B BL

Date Drilled: 1/12/06

to 1/16/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 8.1' (prior to coring) 16.8' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)							
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○							
60	602.2						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, pyritic, micaceous, massive, unfractured to slightly fractured. @ 64.3'-65.7', qu = 13,985 psi SDI = 98.7%.														
65																					
70		Core 120"	Rec 120"	RQD 100%	R6	*1944															
75																					
80		Core 120"	Rec 120"	RQD 100%	R7	*1694															
85																					
90		Core 120"	Rec 120"	RQD 100%	R8	*2060															

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-2014

Location: Sta. 46+43.1, 25.4 ft. LT of US 52 Ramp B BL

Date Drilled: 1/12/06 to 1/16/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 8.1' (prior to coring) 16.8' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ———— LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
90	572.2						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, pyritic, micaceous, massive, unfractured to slightly fractured.												
95		Core 72"	Rec 72"	RQD 100%	R9	*1497													
100.0	562.2						Bottom of Boring - 100.0'												
105																			
110																			
115																			
120																			

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-2015

Location: Sta. 49+12.5, 1.8 ft. LT of US 52 Ramp B BL

Date Drilled: 1/16/06 to 1/17/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 27.4' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)			
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ———— LL Blows per foot - ○ 10 20 30 40			
0.2	669.6 669.4						Topsoil - 2"										
3.0	666.6	8 19 8	10	1			Loose to medium dense gray SANDY SILT (A-4a), trace clay; contains sandstone fragments; damp.										
5		4 4 5	7	2			Loose to medium dense gray GRAVEL WITH SAND AND SILT (A-2-4), trace clay; damp.	40	19	--	7	28	6				Non-Plastic
8.0	661.6	7 4 8	8	3													
10		5 4 4	9	4		--	Medium stiff brown and gray SILT AND CLAY (A-6a), little fine to coarse sand, little gravel; ; damp.	20	11	--	7	42	20				
13.0	656.6	3 3 4	8	5		--											
15		7 12 15	18	6		4.25	Hard reddish brown SILT AND CLAY (A-6a), some fine to coarse sand, trace gravel; damp to moist.	7	12	--	9	47	25				
17.0	652.6	9 22 50/5	18	7a 7b		4.5											
18.0	651.6						Severely weathered light brown and gray SANDSTONE, argillaceous.										
20		Core 78"	Rec 77"	RQD 52%	R1	*145	Hard light brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, medium bedded, highly fractured to broken.										50+
25							@ 27.0'-27.5', 26.1'-26.6', gray.										
30		Core	Rec	RQD	R2	*632	@ 29.8'-29.9', 30.2'-30.3', clayey.										

FILE: 0121-3070-03 [11/8/2007 4:10 PM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-2015

Location: Sta. 49+12.5, 1.8 ft. LT of US 52 Ramp B BL

Date Drilled: 1/16/06 to 1/17/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 27.4' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ———— LL Blows per foot - ○ 10 20 30 40						
30	639.6	120"	120"	85%			Hard light brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, medium bedded, highly fractured to broken. @ 30.7'-40.0', broken zone, high angle fracture. Medium hard to hard dark gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, laminated to medium bedded, highly fractured to moderately fractured, contains few argillaceous laminations. @ 41.1'-41.4', 42.0'-42.9', rust stained broken zones. @ 41.7'-42.0', argillaceous zone. @ 42.9'-43.2', clay filled fracture, broken zone. @ 43.8'-43.9', high angle fracture. @ 44.6'-48.6', contains moderate to abundant argillaceous laminations.													
32.3	637.3																			
35																				
40		Core 120"	Rec 115"	RQD 88%	R3	*609														
45																				
48.6	621.0	Core 120"	Rec 120"	RQD 100%	R4	*638	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, calcareous, massive, slightly fractured to unfractured, slightly pyritic. @ 56.8'-56.9', 57.0'-57.3', 57.9'-58.4', 64.0', 64.4', calcareous zones.													
50																				
55																				
60		Core	Rec	RQD	R5	*1358														

FILE: 0121-3070-03 [11/8/2007 4:10 PM]

Client: TranSystems, Inc. Project: SCI-823-0.00 Job No. 0121-3070.03

LOG OF: Boring R-2015 Location: Sta. 49+12.5, 1.8 ft. LT of US 52 Ramp B BL Date Drilled: 1/16/06 to 1/17/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 27.4' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40				
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay					
60.0	609.6	120"	120"	100%														
	609.6																	
65																		
70		Core 120"	Rec 120"	RQD 100%	R6	*2062												
						@ 70.1'-70.3', calcareous.												
75																		
80		Core 120"	Rec 119"	RQD 99%	R7	*1471												
85																		
90		Core	Rec	RQD	R8	*3678												
						@ 89.2'-89.5', 91.6'-92.0', 92.0'-93.2', 94.3'-94.5, calcareous.												

FILE: 0121-3070-03 [11/8/2007 4:10 PM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-2015

Location: Sta. 49+12.5, 1.8 ft. LT of US 52 Ramp B BL

Date Drilled: 1/16/06 to 1/17/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 27.4' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40						
90	579.6	120"	114"	95%			Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, slightly pyritic, slightly fractured to unfractured. @ 94.5'-95.3', high angle fracture. @ 94.5'-95.3', calcareous.													
95		Core 66"	Rec 66"	RQD 100%	R9	*1735														
100.0	569.6						Bottom of Boring - 100.0'													
105																				
110																				
115																				
120																				

FILE: 0121-3070-03 [11/8/2007 4:10 PM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-2016

Location: Sta. 50+85.9, 181.6 ft. LT of SR 823 CL

Date Drilled: 1/18/06 to 1/19/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 7.9' (inside hollowstem augers)	GRADATION						STANDARD PENETRATION (N)						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ———— LL Blows per foot - ○ 10 20 30 40						
0	727.6																			
0.3	727.3						Topsoil - 4"													
		1					Loose to medium dense light brown SILT (A-4b), some clay, trace fine to coarse sand; contains sandstone fragments; dry to damp. @ 0.3'-3.0', little fine to coarse sand, trace clay, little gravel.													
		2	3		1															
		12					@ 6.0', very dense, contains sandstone boulders.													
		12	15		2															
5		14																		
		26																		
		49																		
		50/1	16		3															
		26																		
		20																		
10		22	18		4															
10.5	717.1						Hard brown and gray SILT AND CLAY (A-6a), trace gravel, little fine to coarse sand; damp.													
		9																		
		13																		
		15	17		5	4.5+														
		10																		
		13																		
15		18	14		6	4.5+														
16.0	711.6						Severely weathered brown SANDSTONE, argillaceous.													
		11																		
		50/2	15		7															
17.5	710.1						Hard brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, massive, moderately fractured. @ 17.7', 18.6', 19.0', 20.5', 21.0', 21.5', 21.6', low angle fractures.													
20																				
21.6	706.0	Core 91"	Rec 91"		RQD 89%	R1	*1186													
							Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, unfractured to slightly fractured.													
							@ 26.6'-28.1', qu = 8,879 psi SDI = 98.3%. @ 27.1', 27.2', low angle fractures.													
25																				
30																				

FILE: 0121-3070-03 [11/8/2007 4:10 PM]

Client: TranSystems, Inc. Project: SCI-823-0.00 Job No. 0121-3070.03

LOG OF: Boring R-2016 Location: Sta. 50+85.9, 181.6 ft. LT of SR 823 CL Date Drilled: 1/18/06 to 1/19/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 7.9' (inside hollowstem augers)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40							
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay								
30	697.6	Core 120"	Rec 120"	RQD 99%	R2	*1540	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, unfractured to slightly fractured. @ 38.2'-40.0', qu = 9,626 psi SDI = 98.4%. @ 55.4'-57.0', qu = 12,576 psi SDI = 96.6%. @ 58.0', low angle fracture.														
35																					
40		Core 120"	Rec 120"	RQD 100%	R3	*1413															
45																					
50		Core 120"	Rec 120"	RQD 100%	R4	*1549															
55																					
60																					

FILE: 0121-3070-03 [11/8/2007 4:10 PM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-2016

Location: Sta. 50+85.9, 181.6 ft. LT of SR 823 CL

Date Drilled: 1/18/06 to 1/19/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 7.9' (inside hollowstem augers)	GRADATION						STANDARD PENETRATION (N)						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ———— LL Blows per foot - ○ 10 20 30 40						
60	667.6	Core 120"	Rec 120"	RQD 98%	R5	*487	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, unfractured to slightly fractured. @ 60.0'-60.1', broken zone. @ 61.2', 62.8', 62.9', low angle fracture. @ 63.4', 64.0', low angle fracture in highly weathered to decomposed argillaceous zones.													
65																				
70		Core 120"	Rec 120"	RQD 100%	R6	*1523														
75																				
80		Core 120"	Rec 120"	RQD 100%	R7	*1482														
85																				
90																				

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-2016

Location: Sta. 50+85.9, 181.6 ft. LT of SR 823 CL

Date Drilled: 1/18/06 to 1/19/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 7.9' (inside hollowstem augers)	GRADATION						STANDARD PENETRATION (N)						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40						
90	637.6			RQD 100%	R8	*1706	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, unfractured to slightly fractured.													
95																				
99.7	627.9			RQD 100%	R9	*1092		Medium hard to hard gray SANDSTONE; very fine grained, slightly weathered, micaceous, argillaceous, laminated to thinly bedded, unfractured to slightly fractured. @ 100.0'-100.2', calcareous.												
105																				
109.0	618.6			RQD 99%	R10	*1375	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, micaceous, argillaceous, pyritic, massive, slightly fractured. @ 113.6'-113.9', calcareous. @ 114.9'-115.3', vertical fracture. @ 115.1'-115.3', calcareous. @ 118.0'-118.2', high angle fracture.													
110																				
115																				
120																				

FILE: 0121-3070-03 [11/8/2007 4:10 PM]

Client: TranSystems, Inc. Project: SCI-823-0.00 Job No. 0121-3070.03

LOG OF: Boring R-2016 Location: Sta. 50+85.9, 181.6 ft. LT of SR 823 CL Date Drilled: 1/18/06 to 1/19/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 7.9' (inside hollowstem augers)	GRADATION						STANDARD PENETRATION (N)				
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ─── LL Blows per foot - ○				
120	607.6	Core 120"	Rec 120"	RQD R11		*2306	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, micaceous, argillaceous, pyritic, massive, slightly fractured. @ 121.1', 121.2', low angle fractures. @ 121.3'-121.8', calcareous.											
125																		
130		Core 120"	Rec 119"	RQD R12		*2097		@ 131.2', low angle fracture.										
135																		
140		Core 120"	Rec 120"	RQD R-13		*1996												
145																		
150							@ 149.4'-150.5', vertical fracture.											

FILE: 0121-3070-03 [11/8/2007 4:10 PM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-2016

Location: Sta. 50+85.9, 181.6 ft. LT of SR 823 CL

Date Drilled: 1/18/06 to 1/19/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 7.9' (inside hollowstem augers)	GRADATION						STANDARD PENETRATION (N)							
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○							
150	577.6	Core 120"	Rec 120"	RQD 100%	R-14	*1584	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, micaceous, argillaceous, pyritic, massive, slightly fractured.														
155		Core 59"	Rec 59"	RQD 100%	R-15	*1761															
160.0	567.6	Bottom of Boring - 160.0'																			
165																					
170																					
175																					
180																					

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring B-1406

Location: Sta. 65+47.9, 207.9 ft. LT of SR 140 Ramp B BL

Date Drilled: 1/17/06

to 1/19/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 42.2' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40			
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay				
0	708.6	50/2	2	1			No topsoil/6.0' soil removed before drilling Severely weathered brown SANDSTONE.										
4.0	704.6					R-1	Medium hard to hard light brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, massive, highly to moderately fractured. @ 4.0'-4.3', 4.8'-5.3', 5.6' -5.9' 6.2'-6.5', broken zones. @ 8.0', 8.4', 9.2', 10.5', 10.6, 12.0', 13.3', 14.8', 15.5', low angle fractures.										
5		Core 78"	Rec 76"	RQD 72%			@ 12.0'-13.9', qu = 7,841 psi SDI = 96.8%.										
15		Core 120"	Rec 120"	RQD 93%		R-2	@ 14.4'-14.6', 15.1'-15.4', gray. @ 15.9', 17.3', 22.7', 22.8', 23.2', 24.0', low angle rust stained fractures.										
20							@ 20.2'-22.0', high angle rust stained fracture.										
20.5	688.1						Medium hard to hard gray SANDSTONE; very fine to fine grained, moderately to slightly weathered, argillaceous, micaceous, massive, slightly fractured. @ 22.4'-22.7' high angle rust stained fracture.										
25		Core 120"	Rec 120"	RQD 83%		R-3											
30																	

Client: TranSystems, Inc.			Project: SCI-823-0.00				Job No. 0121-3070.03									
LOG OF: Boring B-1406			Location: Sta. 65+47.9, 207.9 ft. LT of SR 140 Ramp B BL				Date Drilled: 1/17/06 to 1/19/06									
Depth (ft)	Elev. (ft)	Blows per 6" Recovery (in)	Sample No.		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 42.2' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)			
			Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ●			
DESCRIPTION												PL ----- LL				
30	678.6															
35		Core 120"	Rec 120"	RQD 98%	R-4	*228	Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, massive, highly fractured, contains few argillaceous laminations in bands. @ 30.5'-31.5', SDI = 93.2%. @ 32.1'-32.6', qu = 10,114 psi.									
40						@ 40.0'-40.3' vuggy zone, contains fossils. @ 40.5'-43.6', rust stained.										
45		Core 120"	Rec 120"	RQD 100%	R-5											
50																
55		Core 120"	Rec 120"	RQD 100%	R-6											
60																

Client: TranSystems, Inc. *Project:* SCI-823-0.00 *Job No.* 0121-3070.03

LOG OF: Boring B-1406 *Location:* Sta. 65+47.9, 207.9 ft. LT of SR 140 Ramp B BL *Date Drilled:* 1/17/06 to 1/19/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / *Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 42.2' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40						
60	648.6																			
60.5	648.1																			
65		Core 120"	Rec 120"	RQD 100%	R-7	*284	Very hard gray SANDSTONE; fine grained, slightly weathered, argillaceous, micaceous, massive, slightly fractured to unfractured, burrows. @ 60.7'-63.3' iron stained. @ 61.9'-63.0', high angle fracture. @ 64.5'-66.2', qu = 9,236 psi, SDI = 97.8%. @ 73.7'-74.3',76.0'-76.3', calcareous. @ 75.0'-80.5' few to moderate argillaceous laminations.													
70																				
75		Core 120"	Rec 120"	RQD 100%	R-8															
80																				
85		Core 120"	Rec 120"	RQD 100%	R-9															
90																				

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring B-1406

Location: Sta. 65+47.9, 207.9 ft. LT of SR 140 Ramp B BL

Date Drilled: 1/17/06

to 1/19/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 42.2' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ----- LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
90	618.6																		
90.5	618.1						@ 90.4'-90.5', calcareous zone. Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, slightly fractured to unfractured. @ 90.8'-91.1', 95.3'-95.5', calcareous.												
95		Core 120"	Rec 120"	RQD 100%	R-10														
105		Core 120"	Rec 116"	RQD 97%	R-11		@ 101.5'-102.0', calcareous. @ 108.3', pyritic												
110.5	598.1						Bottom of Boring - 110.5'												
115																			
120																			

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring B-1407

Location: Sta. 67+98.8, 5.4 ft. LT of SR 140 Ramp B BL

Date Drilled: 01/16/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None (Prior to coring) Water level at completion: 17.0' (Includes drilling water)	GRADATION						STANDARD PENETRATION (N)						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○						
0	582.6																			
-0.4	582.2						Topsoil - 5"													
		3					Very stiff brown and gray SANDY SILT (A-4a), some gravel, trace to little clay; damp.													
		4	9	16	1	4.0														
		8	18	21	20	3.5														
5							@ 7.5', contains sandstone fragments.													
		7	12	18	18	2.0														
-10.0	572.6	50/3	2		4		Medium hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, massive, moderately fractured. @ 11.5', 15.7', 16.9', 18.4', low angle fractures. @ 13.6'-14.6', highly fractured to broken. @ 14.4'-14.6', brown, decomposed to highly weathered.													
15		Core 120"	Rec 118"		RQD 86%	R-1														
20.0	562.6																			
							Bottom of Boring - 20.0'													
25																				
30																				

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring B-1408

Location: Sta. 71+61.3, 52.4 ft. LT of SR 140 Ramp B BL

Date Drilled: 1/16/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 54.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40						
0	648.6																			
0.3	648.3						Topsoil - 4"													
5		6 10 12	13			1	Medium dense to dense brown SANDY SILT (A-4a), some gravel, little clay; contains sandstone fragments; dry to damp.													
		7 13 17	18			2			27	21	--	12	28	12						
		5 12 24	16			3														
10		10 32 31	15			4														
12.0	636.6						Hard brown SILTY CLAY (A-6b), little fine to coarse sand, trace gravel; contains sandstone fragments; damp.													
		5 11 21	18			5		2	6	--	7	56	29							
14.5	634.1						Severely weathered brownish gray SANDSTONE, argillaceous.													
15		30 50/4	11			6														
16.0	632.6						Soft to medium hard brown SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, thinly bedded to massive, highly fractured. @ 16.0'-16.8', decomposed. @ 16.5'-16.6', broken zone. @ 19.5'-19.6', iron staining.													
20		Core 120"	Rec 118"			RQD 73%														
21.6	627.0					R-1	Medium hard to hard brown and gray SANDSTONE; slightly weathered, argillaceous, micaceous, pyritic, massive, slightly to moderately fractured.													
25							@ 26.6'-27.5', iron staining, calcareous. @ 26.6', 26.8', low angle fractures. @ 26.8'-27.5', 26.6'-27.0', 30.2'-30.4', high angle fractures.													
30																				

LOG OF: Boring B-1408 Location: Sta. 71+61.3, 52.4 ft. LT of SR 140 Ramp B BL Date Drilled: 1/16/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 54.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ----- LL Blows per foot - ○ 10 20 30 40				
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay					
30	618.6	Core 120"	Rec 119"	RQD 88%	R-2	*277	MEDIUM HARD TO HARD BROWN AND GRAY SANDSTONE; SLIGHTLY WEATHERED, ARGILLACEOUS, MICACEOUS, PYRITIC, MASSIVE, SLIGHTLY TO MODERATELY FRACTURED. @ 31.8'-33.5', qu = 11,233 psi, SDI = 96.9%. @ 34.6'-34.8', brown, highly weathered to decomposed. @ 39.3'-40.7', calcareous. @ 40.1'-40.2', 41.6'-42.0', high angle fractures. @ 40.6'-40.7', 41.1'-41.6', iron staining. @ 40.6'-40.7', 41.1'-41.6', broken.											
35		Core 120"	Rec 120"	RQD 91%	R-3													
40		Core 120"	Rec 120"	RQD 91%	R-3													
45		Core 120"	Rec 119"	RQD 88%	R-4	*264												
50		Core 120"	Rec 119"	RQD 88%	R-4	*264	@ 46.8'-48.1', qu = 13,025 psi, SDI = 97.8%. @ 50.0'-50.1', 54.2'-54.3', argillaceous, decomposed.											
55		Core 120"	Rec 119"	RQD 88%	R-4		@ 56.6'-56.9', argillaceous, decomposed, broken.											
60		Core 63"	Rec 63"	RQD 75%	R-5		@ 59.5'-59.8'; decomposed.											

FILE: 0121-3070-03 [11/7/2007 10:41 AM]

Client: TranSystems, Inc. Project: SCI-823-0.00 Job No. 0121-3070.03

LOG OF: Boring B-1408 Location: Sta. 71+61.3, 52.4 ft. LT of SR 140 Ramp B BL Date Drilled: 1/16/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 54.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ●		Blows per foot - ○				
60	588.6																			
61.3	587.3						Medium hard to hard brown and gray SANDSTONE; slightly weathered, argillaceous, micaceous, pyritic, massive, slightly to moderately fractured.													
Bottom of Boring - 61.3'																				
65																				
70																				
75																				
80																				
85																				
90																				

FILE: 0121-3070-03 [11/7/2007 10:41 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring B-1409

Location: Sta. 65+47.3, 37.2 ft. RT of SR 140 Ramp A BL

Date Drilled: 1/25/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 28.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
0	636.2																		
0.3	635.9						Topsoil - 4"												
		4				2.5	Very stiff to hard brown SILT (A-4b), trace to little clay, trace fine to coarse sand; dry to damp.												
		7	19		1														
4.5	631.7					4.5+	Hard brown SILT AND CLAY (A-6a), trace fine to coarse sand, trace gravel; dry to damp.	5	1	--	3	47	44						
		14			2														
		13	20																
		15																	
		5			3	4.5+													
		10	19																
		14																	
10.0	626.2					4	Severely weathered brown SANDSTONE argillaceous, micaceous.												
11.0	625.2						Medium hard brown SANDSTONE; fine grained, highly weathered, argillaceous, thinly bedded to massive, highly fractured.												
		13	12				@ 14.7'-14.9', 15.2'-15.5', 19.5'-20.0', 20.3'-20.4', high angle fractures.												
		50/5					@ 16.2'-16.5', core loss, decomposed rock and fracture suspected.												
							@ 17.9'-18.1', 18.3'-18.5', 18.5'-19.1', 20.0'-20.3', 20.6'-20.7', broken zones, iron stains throughout.												
		Core 120"	Rec 113"		RQD 52%	R1													
15																			
21.0	615.2						Hard gray SANDSTONE; very fine grained, slightly to highly weathered, argillaceous, micaceous, pyritic, massive, slightly fractured.												
							@ 21.2'-21.3', 23.9'-24.2', multiple high angle fractures.												
		Core 120"	Rec 120"		RQD 93%	R2													
25							@ 26.0'-29.1', qu = 8,887 psi, SDI = 97.8%.												
							@ 26.0'-26.2', broken zone.												
							@ 29.1'-29.3', high angle fracture.												
30																			

FILE: 0121-3070-03 [11/7/2007 10:41 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring B-1409

Location: Sta. 65+47.3, 37.2 ft. RT of SR 140 Ramp A BL

Date Drilled: 1/25/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 28.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ———— LL Blows per foot - ○										
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	10	20	30	40							
30	606.2																							
31.0	605.2																							
35		Core 120"	Rec 119"	RQD 79%	R3		Hard gray SANDSTONE; very fine grained, moderately weathered, argillaceous, pyritic, massive, moderately fractured. @ 31.2'-31.9', weathered and iron stained. @ 31.3'-32.9', 39.8'-39.9', high angle fractures.																	
40							@ 41.1', 48.3', 49.2', low angle fractures.																	
45		Core 120"	Rec 120"	RQD 100%	R4	*192	@ 46.7'-48.2', qu = 10,867 psi, SDI = 91.5%.																	
50							@ 52.5'-52.6', 54.3'-54.6', 56.3'-56.8', calcareous.																	
55		Core 120"	Rec 120"	RQD 100%	R5																			
60							@ 59.2', low angle fracture.																	

Client: TranSystems, Inc.	Project: SCI-823-0.00	Job No. 0121-3070.03
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LOG OF: Boring B-1409 Location: Sta. 65+47.3, 37.2 ft. RT of SR 140 Ramp A BL Date Drilled: 1/25/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 28.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)											
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Blows per foot - ○ Natural Moisture Content, % - ● PL ——— LL											
60	576.2																								
61.0	575.2							Bottom of Boring - 61.0'																	
65																									
70																									
75																									
80																									
85																									
90																									

FILE: 0121-3070-03 [11/7/2007 10:41 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-26

Location: Sta. 66+91.6, 42.4 ft. RT of SR 823 CL

Date Drilled: 05/18/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 6.0' Water level at completion: None (prior to coring) 3.5' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay							
0.3	577.1																			
	576.8						Topsoil - 3"													
		1 2	7				Loose to medium dense brown SANDY SILT (A-4a), little clay, trace to little gravel; damp to moist.	10	22	--	11	46	11							
		2 11	6	10																
5																				
		WOH 1																		
		6																		
8.0	569.1						Very stiff gray and brown SILT (A-4b), some clay, little fine to coarse sand; damp to moist.	0	1	--	14	63	22							
		9 9		16																
		3 4					@ 11.0', contains sandstone fragments.													
		7 15																		
13.5	563.6						Severely weathered gray SANDSTONE, argillaceous, micaceous.													
		12 24 16		18																
		50/5		4																
17.0	560.1						Medium hard to hard gray SANDSTONE; very fine grained, highly to moderately weathered, argillaceous, micaceous, thinly bedded to medium bedded, moderately fractured. @ 17.5'-17.9', clay filled fractures.													
		Core 60"	Rec 58"		RQD 77%	R-1														
22.0	555.1						Bottom of Boring - 22.0'													
25																				
30																				

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-28

Location: Sta. 75+23.5, 28.0 ft. LT of SR 823 CL

Date Drilled: 4/11/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 6.8' (including drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
0	628.6																		
-0.4	628.2						Topsoil - 5"												
		3				1	1.25		1	9	--	10	57	23					
		10	18				Stiff brown SILT (A-4b), some clay, little fine to coarse sand, trace gravel; contains sandstone fragments; moist.												
-3.5	625.1	15				2	4.5		8	8	--	18	48	18					
		25	18				Very stiff to hard brown SANDY SILT (A-4a), little clay, trace gravel; contains sandstone fragments; damp to moist.												
		14																	
		7				3	3.75												
		7	18																
		10				4	3.5												
		11	18																
		8				5	4.5												
		10																	
		11	18																
		8				6	4.5+												
-15.0	613.6	12																	
		50/5	17																
-16.1	612.5						Medium hard brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, thinly bedded to thickly bedded, slightly fractured. @ 15.0'-15.1', broken zone. @ 15.2', low angle clay filled fracture.												
							Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, pyritic, thinly bedded to thickly bedded, slightly fractured. @ 16.4', 18.5', 22.2', low angle clay filled fractures. @ 23.3', 24.3', low angle clay filled fractures.												
20		Core 120"	Rec 120"			RQD 93%													
						R-1													
-25.0	603.6						Bottom of Boring - 25.0'												
30																			

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-29

Location: Sta. 75+30.1, 115.9 ft. RT of SR 823 CL

Date Drilled: 04/11/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 10.0' (Prior to coring) 2.5' (Includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40								
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay									
0.3	649.8																					
0.3	649.5	1	13	1		1.25	Topsoil - 4" Stiff to very stiff brown SILT (A-4b), little fine to coarse sand, trace to little gravel; damp to moist.	10	11	--	7	52	20									
5		3	18	2		3.5																
6.0	643.8	22	16	3			Severely weathered brown SANDSTONE, fine grained, argillaceous.															
		31																				
		50/4																				
		17	9	4																		
		50/3																				
10.0	639.8						Medium hard brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, thinly bedded to medium bedded, highly fractured. @ 10.1'-10.2', 12.7'-12.9', high angle fractures. @ 12.2'-13.2', 14.3'-15.4', broken, decomposed zone contains moderate argillaceous zone.															
15		Core 120"	Rec 112"	RQD 44%	R-1	*166																
15.4	634.4						Medium hard gray SANDSTONE interbedded with SHALE, very fine to fine grained, highly weathered, thinly bedded, moderately fractured. @ 15.6'-15.9', high angle fracture.															
20.0	629.8						Bottom of Boring - 20.0'															
25																						
30																						

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-30

Location: Sta 76+18.6, 34.4 ft. LT of SR 823 CL

Date Drilled: 4/8/05 to 4/11/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 9.8' (prior to coring) 5.5' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
0	643.5																		
0.3	643.2						Topsoil - 4"												
		2 3 3	9			1	0.5	Soft grayish brown SILT (A-4b), little fine to coarse sand, little clay, trace gravel; organic, contains roots and sandstone fragments; moist.	8	10	--	8	56	18	Non-Plastic	●			
3.5	640.0	5 6 6	18			2	2.0	Very stiff brown SANDY SILT (A-4a), little clay, little gravel; contains sandstone fragments; damp.	12	15	--	12	44	17		●			
5		9 11 22	18			3	2.0												
8.5	635.0	30 36 50/4	16			4		Severely weathered brown SANDSTONE, fine grained, argillaceous.											
10.0	633.5	Core 24"	Rec 24"	RQD 21%	R-1	*38		Soft brown SHALE, decomposed to highly weathered, arenaceous, highly fractured.											
13.2	630.3							Medium hard to hard gray SANDSTONE; very fine to fine grained, highly to moderately weathered, argillaceous, highly to moderately fractured, contains few argillaceous laminations.											
15		Core 120"	Rec 120"	RQD 80%	R-2	*395		@ 13.8', gray with siltstone interbeds. @ 13.8'-14.0' argillaceous zone											
20								@ 19.3'-19.4', 19.6'-19.7', calcareous. @ 20.1', moderately fractured. @ 20.1'-20.9', 22.5'-22.8', calcareous.											
25.0	618.5	Core 36"	Rec 36"	RQD 61%	R-3	*454		@ 22.8'-25.0', SANDSTONE interbedded with SILTSTONE, highly fractured.											
								Bottom of Boring - 25.0'											

FILE: 0121-3070-03 [11/7/2007 10:41 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-31

Location: Sta. 76+08.3, 123.6 ft. RT of SR 823 CL

Date Drilled: 4/11/05 to 4/12/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 19.5' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay							
0	671.8																			
0.3	671.5						Topsoil - 4'													
		2 4	15			1	Loose brown SILT (A-4b), little to some clay, trace fine to coarse sand, trace gravel; contains sandstone fragments; damp.													
3.5	668.3	14 46	13			2	Severely weathered brown SANDSTONE, fine grained, argillaceous.													
5.0	666.8	50/1					Medium hard to hard brown SANDSTONE; fine grained, highly weathered, micaceous, highly to moderately fractured. @ 5.0'-6.2', broken. @ 6.2', 8.4', high angle fractures. @ 8.0', rust stained fracture.													
		Core 48"	Rec 48"	RQD 46%	R-1	*187														
10																				
		Core 120"	Rec 120"	RQD 80%	R-2	*131	@ 13.4'-18.0', brownish gray. @ 16.0', high angle fracture.													
15																				
18.0	653.8						Hard gray SANDSTONE; fine grained, slightly to moderately weathered, micaceous, moderately fractured.													
20							@ 19.3', rust stained fracture.													
		Core 120"	Rec 120"	RQD 88%	R-3	*396														
25							@ 26.8'-27.0', argillaceous zone.													
30							@ 29.2'-29.8', thinly laminated siltstone/sandstone layers.													

FILE: 0121-3070-03 [11/7/2007 10:41 AM]

Client: TranSystems, Inc. Project: SCI-823-0.00 Job No. 0121-3070.03

LOG OF: Boring R-31 Location: Sta. 76+08.3, 123.6 ft. RT of SR 823 CL Date Drilled: 4/11/05 to 4/12/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 19.5' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay							
30	641.8						Hard gray SANDSTONE; fine grained, slightly to moderately weathered, micaceous, moderately fractured; contains few argillaceous laminations. @ 35.9'-36.1', argillaceous zone. @ 37.7'-41.8', moderate to abundant argillaceous laminations, highly weathered. @ 41.8', slightly weathered, moderately fractured.													
35		Core 120"	Rec 115"	RQD 74%	R-4	*399														
40																				
45		Core 120"	Rec 119"	RQD 76%	R-5	*601														
50.0	621.8	Core 12"	Rec 12"	RQD 100%	R-6	*473														
55								Bottom of Boring - 50.0'												
60																				

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-32

Location: Sta. 80+19.3, 34.5 ft. LT of SR 823 CL

Date Drilled: 4/7/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 10.9' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
0	698.0																		
-0.4	697.6						Topsoil - 5" / 6" soil removed before drilling												
		3					Loose brown SILT (A-4b), little fine to coarse sand, trace gravel; contains sandstone fragments; damp.	9	4	--	12	59	16	Non-Plastic: ●	○				
		4	12	1															
3.0	695.0						Hard brown SANDY SILT (A-4a), little clay, trace gravel; contains sandstone fragments; damp.								○				
		4	18	2															
5		11	18			4.5+													
6.0	692.0	50/4	4				Severely weathered brown SANDSTONE, fine grained, argillaceous.												
7.5	690.5						Soft brown SANDSTONE; fine grained, highly weathered, micaceous, highly fractured. @ 8.5', medium hard. @ 9.7', high angle fracture. @ 11.0', carbonaceous seam.												
		Core 54"	Rec 54"	RQD 65%	R-1	*53													
10							@ 12.8'-13.4', clay filled fractures. @ 14.1', high angle fracture, rust staining. @ 14.7', decomposed SHALE interbeds.												
15.7	682.3						Medium hard gray SANDSTONE; fine grained, moderately weathered, micaceous, highly fractured, contains clay filled fractures. @ 17.4'-22.0', abundant argillaceous, interbedded with SHALE.												
		Core 120"	Rec 120"	RQD 57%	R-2	*208													
20							@ 22.0', gray. @ 23.8', fossiliferous. @ 24.5', moderately weathered, moderately fractured.												
25																			
		Core 120"	Rec 120"	RQD 88%	R-3	*382													
30																			

FILE: 0121-3070-03 [11/7/2007 9:49 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-32

Location: Sta. 80+19.3, 34.5 ft. LT of SR 823 CL

Date Drilled: 4/7/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 10.9' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40			
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay				
30	668.0																
35																	
		Core 120"	Rec 120"	RQD 100%	R-4	*381											
							@ 37.6', high angle fracture.										
							@ 38.9',41.8',46.0', clay filled seams.										
		Core 96"	Rec 96"	RQD 100%	R-5	*438											
							@ 44.4', clay filled fracture.										
50.0	648.0						Bottom of Boring - 50.0'										
55																	
60																	

FILE: 0121-3070-03 [11/7/2007 9:49 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-34

Location: Sta. 80+35.5, 180.0 ft. RT of SR 823 CL

Date Drilled: 4/7/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 1.0' Water level at completion: 7.0' (prior to coring) 37.1' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ———— LL Blows per foot - ○ 10 20 30 40						
0	748.1																			
-0.4	747.7						Topsoil - 5"													
		1				3.0	Very stiff brown SANDY SILT (A-4a), little fine to coarse sand, little gravel; contains sandstone fragments; damp.	18	7	--	8	45	22							
		2	14																	
-3.5	744.6	5					Severely weathered brown and gray SANDSTONE, argillaceous.													
5		12	18			2														
		16					Soft to medium hard brown SANDSTONE interbedded with SILTSTONE; fine grained, highly weathered, argillaceous, medium bedded, highly fractured, with typical low angle iron stained fractures. @ 7.1'-7.3', 9.7'-9.9', 13.5'- 13.6', high angle rust stained fractures. @ 7.4'-8.0', broken zone. @ 14.5'-15.0', core loss. @ 15.0'-15.1', 16.8'-17.0', 22.8'-23.0', high angle rust stained fractures.													
-7.0	741.1	50/5	11			3														
10		Core 96"	Rec 89"	RQD 71%	R-1	*157														
15																				
20		Core 120"	Rec 120"	RQD 88%	R-2	*172														
25																				
-25.3	722.8						Soft to medium hard grayish brown SHALE interbedded with SANDSTONE; highly weathered to decomposed, argillaceous, micaceous, thinly laminated to thinly bedded, highly fractured, with typical low angle clay filled fractures. @ 29.7'-30.0', broken zone.													
30		Core 120"	Rec 120"	RQD 57%	R-3															

FILE: 0121-3070-03 [11/7/2007 9:49 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-34

Location: Sta. 80+35.5, 180.0 ft. RT of SR 823 CL

Date Drilled: 4/7/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 1.0' Water level at completion: 7.0' (prior to coring) 37.1' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ———— LL Blows per foot - ○ 10 20 30 40						
30.0	718.1 718.1					*401	Hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured to unfractured. @ 38.0'-38.1', argillaceous zone with low angle fractures. @ 40.1', low angle fracture. @ 57.4'-57.9', few to moderate argillaceous laminations.													
35																				
40		Core 120"	Rec 120"	RQD 100%	R-4	*529														
45																				
50		Core 120"	Rec 120"	RQD 100%	R-5	*473														
55																				
60		Core 120"	Rec 120"	RQD 100%	R-6															

FILE: 0121-3070-03 [11/7/2007 9:49 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-34

Location: Sta. 80+35.5, 180.0 ft. RT of SR 823 CL

Date Drilled: 4/7/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 1.0' Water level at completion: 7.0' (prior to coring) 37.1' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ———— LL Blows per foot - ○ 10 20 30 40						
90	658.1					*523	Hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured to unfractured; contains few argillaceous laminations, turbidity bedded. @ 92.5', contains few argillaceous laminations, turbidity.													
95																				
100		Core 120"	Rec 120"	RQD 100%	R10	*402														
105.0	643.1						Bottom of Boring - 105.0'													
110																				
115																				
120																				

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-35

Location: Sta. 84+27.1, 49.2 ft. LT of SR 823 CL

Date Drilled: 4/7/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 6.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay							
0	720.2																			
0.3	719.9						Topsoil - 3"													
		4				2.25	Very stiff brown SILT (A-4b), some fine to coarse sand, some clay, trace gravel; damp. @ 1.0'-2.5', contains roots.	5	6	--	15	52	22							
		4	18																	
		9				2.5	Severely weathered brown fine grained SANDSTONE, argillaceous.													
4.1	716.1	50/2	8		2a 2b		Medium hard brown SANDSTONE; fine grained, highly weathered, highly fractured. @ 5.0'-5.9', broken, clay interbeds, thinly laminated. @ 6.7', rust stained fracture. @ 7.1'- 7.5', broken. @ 7.5'-8.0', rust staining. @ 8.0'-10.8', grayish brown, rust staining.													
5.0	715.2																			
		Core 84"	Rec 84"		RQD 64%	R-1	*338													
10																				
10.8	709.4						Medium hard to hard gray SANDSTONE; fine grained, moderately weathered, micaceous, moderately fractured. @ 12.0'-16.3', rust stained fractures. @ 12.3', high angle fracture.													
		Core 120"	Rec 120"		RQD 93%	R-2	*368													
15																				
		Core 120"	Rec 120"		RQD 100%	R-3	*443													
20							@ 22.0', moderately fractured. @ 23.3', clay filled fracture.													
25																				
30																				

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-35

Location: Sta. 84+27.1, 49.2 ft. LT of SR 823 CL

Date Drilled: 4/7/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 6.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40		
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay			
30	690.2						<p>DESCRIPTION</p> <p>Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, micaceous, slightly to moderately fractured.</p> <p>@ 41.2'-41.5', broken sandstone. @ 41.5'-42.0', possible core loss.</p> <p>@ 44.2', clay filled fracture.</p>									
		Core 120"	Rec 120"	RQD 92%	R-4	*494										
		Core 120"	Rec 120"	RQD 99%	R-5	*400										
		Core 120"	Rec 120"	RQD 100%	R-6	*527										
60																

Client: **TranSystems, Inc.** Project: **SCI-823-0.00** Job No. **0121-3070.03**

LOG OF: Boring R-35 Location: **Sta. 84+27.1, 49.2 ft. LT of SR 823 CL** Date Drilled: **4/7/05**

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / *Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 6.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
60	660.2						<i>DESCRIPTION</i> Medium hard gray SANDSTONE; fine grained, slightly to moderately weathered, micaceous, slightly fractured; contains few argillaceous laminations.												
		Core 36"	Rec 36"	RQD 100%	R-7	*152													
65.0	655.2						Bottom of Boring - 65.0'												
70																			
75																			
80																			
85																			
90																			

FILE: 0121-3070-03 [11/7/2007 9:49 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-37

Location: Sta. 84+54.5, 169.3 ft. RT of SR 823 CL

Date Drilled: 4/6/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 2.3' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40					
0	761.1																		
0.3	760.8	2				0.5	Topsoil - 3"												
		2 1	18				Soft to medium stiff brown and gray SILT AND CLAY (A-6a), little fine to coarse sand, trace gravel; contains roots; moist.												
3.5	757.6	8 50/4	10				Very dense brown SANDY SILT (A-4a), some gravel, little clay; contains sandstone fragments; damp.	27	15	--	12	33	13						
6.0	755.1	14 35 50/2	14				Severely weathered brown fine grained SANDSTONE, argillaceous.												
9.0	752.1	50/2	2				Medium hard brown SANDSTONE interbedded with SILTSTONE; very fine to fine grained, highly weathered, argillaceous, thinly bedded to thickly bedded, highly fractured, with low angle iron stained fractures.. @ 9.0'-9.2', 11.5'-11.8', 13.4'-13.7', broken zone. @ 9.5-9.6', 9.9'-10.0', high angle iron stained fractures.												
		Core 60"	Rec 56"	RQD 67%	R-1														
15		Core 60"	Rec 60"	RQD 100%	R-2	*157													
20							@ 19.2'-19.3', 26.6'-26.8', broken zones. @ 19.5'-19.7, 21.8'-21.9', 24. 6'-25.0', 26.0'-26.5', high angle iron stained fractures.												
25		Core 120"	Rec 120"	RQD 64%	R-3	*141													
27.0	734.1						Soft to medium hard gray SHALE interbedded with SANDSTONE; highly weathered to decomposed, micaceous, thinly laminated to thinly bedded, moderately fractured.												
30																			

FILE: 0121-3070-03 [11/7/2007 9:49 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-37

Location: Sta. 84+54.5, 169.3 ft. RT of SR 823 CL

Date Drilled: 4/6/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 2.3' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ──── LL Blows per foot - ○					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	10	20	30	40		
30	731.1						<p>DESCRIPTION</p> <p>Soft to medium hard gray SHALE interbedded with SANDSTONE; highly weathered to decomposed, micaceous, thinly laminated to thinly bedded, moderately fractured, with low angle clay filled fractures. @ 30.6', low angle iron stained fracture.</p> <p>@ 36.3'-36.7', clay filled zone.</p> <p>Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded.</p>												
35		Core 120"	Rec 117"	RQD 97%	R-4	*500													
36.7	724.4																		
40																			
45		Core 120"	Rec 120"	RQD 100%	R-5	*477													
50																			
55		Core 120"	Rec 119"	RQD 99%	R-6	*366													
60																			

Client: TranSystems, Inc.	Project: SCI-823-0.00	Job No. 0121-3070.03
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LOG OF: Boring R-37	Location: Sta. 84+54.5, 169.3 ft. RT of SR 823 CL	Date Drilled: 4/6/05
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Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 2.3' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)									
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40									
60.0	701.1						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded.																
	701.1																						
65		Core 120"	Rec 120"	RQD 100%	R-7	*285																	
70																							
75		Core 120"	Rec 120"	RQD 100%	R-8	*420																	
80																							
80.5	680.6	Core 18"	Rec 18"	RQD 100%	R-9	*420																	
							Bottom of Boring - 80.5'																
85																							
90																							

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-38

Location: Sta. 88+08.9, 35.1 ft. LT of SR 823 CL

Date Drilled: 4/5/05 to 4/6/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 6.6' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
0	750.6																		
0.3	750.3						Topsoil - 4"												
		3				2.75	Very stiff brown SANDY SILT (A-4a), some clay, trace gravel; moist.	0	2	--	26	46	26						
		4																	
		5	18																
		5				2.0	@ 3.5', damp.												
		8																	
		14	18																
5																			
5.5	745.1						Severely weathered brown SANDSTONE, fine grained, argillaceous.												
		21																	
		25																	
		19	18																
		50/4	2																
10.0	740.6						Soft brown SANDSTONE interbedded with SHALE; very fine grained to fine grained, highly weathered to decomposed, argillaceous, micaceous, highly fractured. @ 11.9', 12.9', 14.1', high angle fractures. @ 12.3'-12.5', 13.5'-13.8', broken zones.												
		Core 24"	Rec 24"		RQD 63%	R-1													
15							@ 16.6', broken zone. @ 17.6'-19.5', possible core loss.												
		Core 120"	Rec 97"		RQD 46%	R-2													
20							@ 20.2', high angle fracture.												
22.0	728.6						@ 21.8'-22.0', broken zone. Soft to medium hard gray SHALE; arenaceous, highly weathered, highly fractured.												
24.7	725.9						Medium hard to hard gray SANDSTONE; very fine to fine grained, highly to moderately weathered, micaceous, moderately fractured. @ 27.6', low angle fracture.												
		Core 120"	Rec 120"		RQD 93%	R-3													
30																			

FILE: 0121-3070-03 [11/7/2007 9:49 AM]

Client: TranSystems, Inc. Project: SCI-823-0.00 Job No. 0121-3070.03

LOG OF: Boring R-38 Location: Sta. 88+08.9, 35.1 ft. LT of SR 823 CL Date Drilled: 4/5/05 to 4/6/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 6.6' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40					
30	720.6																		
							Medium hard to hard gray SANDSTONE; very fine to fine grained, moderately to slightly weathered, micaceous, moderately to slightly fractured. @ 30.7', clay filled fracture. @ 33.1'-33.3',35.2', clay filled fractures.												
35							@ 36.5', low angle fracture.												
		Core 120"	Rec 120"	RQD 98%	R-4	*570													
45							@ 43.6', high angle fracture.												
		Core 120"	Rec 120"	RQD 100%	R-5	*488	@ 46.8', clay filled fracture.												
55																			
		Core 120"	Rec 120"	RQD 100%	R-6	*486													
60																			

FILE: 0121-3070-03 [11/7/2007 9:49 AM]

Client: TranSystems, Inc. Project: SCI-823-0.00 Job No. 0121-3070.03

LOG OF: Boring R-38 Location: Sta. 88+08.9, 35.1 ft. LT of SR 823 CL Date Drilled: 4/5/05 to 4/6/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 6.6' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)				
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○				
60	690.6																	
							Medium hard to hard gray SANDSTONE; very fine to fine grained, moderately weathered, micaceous, fractured; contains few argillaceous laminations.											
65							@ 62.4', contains few argillaceous laminations.											
		Core 120"	Rec 120"	RQD 100%	R-7	*485	@ 65.2'-65.8', very fine grained with few to moderate argillaceous laminations.											
70							@ 69.1'- 70.2', 70.9'-72.0', very fine grained, moderate to abundant argillaceous laminations.											
							@ 74.3'-74.6', few to moderate argillaceous laminations.											
75		Core 96"	Rec 96"	RQD 100%	R-8	*428	@ 73.1'-74.5', low angle fractures.											
80.0	670.6						Bottom of Boring - 80.0'											
85																		
90																		

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-40

Location: Sta. 88+41.6, 204.8 ft. RT of SR 823 CL

Date Drilled: 4/4/05 to 4/5/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 6.5' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay							
0	807.0																			
0.3	806.7						Topsoil - 7"													
		3				4.25	Hard brown and reddish brown SILTY CLAY (A-6b), trace fine to coarse sand, trace gravel; dry to damp.													
		4	8	13																
		4				4.5+	@ 3.5'-5.0', gray.													
		6	7	13				5	3	-	2	38	52							
6.0	801.0						Severely weathered brown and dark gray SHALE.													
		7																		
		12		12																
		12																		
		30																		
		49		18																
		25					@ 11.0'-12.5', arenaceous.													
		49																		
12.5	794.5						Soft brown SHALE; highly weathered to decomposed, argillaceous, micaceous, highly fractured.													
		50/2		14																
							@ 15.7'-18.7', core loss due to poor rock.													
		Core 120"	Rec 82"		RQD 57%															
					R-1															
21.1	785.9						Soft to medium hard gray SHALE; highly weathered to decomposed, arenaceous, micaceous, carbonaceous, highly fractured; contains moderate arenaceous laminations.													
							@ 23.6'-25.0', possible core loss.													
		Core 120"	Rec 104"		RQD 81%															
					R-2															
30																				

FILE: 0121-3070-03 [11/7/2007 9:49 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-40

Location: Sta. 88+41.6, 204.8 ft. RT of SR 823 CL

Date Drilled: 4/4/05

to 4/5/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 6.5' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40							
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay								
30	777.0						DESCRIPTION														
32.5	774.5							Soft to medium hard gray SHALE; highly weathered to decomposed, arenaceous, micaceous, carbonaceous, highly fractured; contains moderate arenaceous laminations.													
35								Soft to medium hard gray SANDSTONE interbedded with SHALE; highly weathered, arenaceous, micaceous, argillaceous, highly fractured.													
40		Core 120"	Rec 120"	RQD 89%	R-3			@ 41.1'-42.0', broken.													
45								@ 44.6', gray.													
50		Core 120"	Rec 120"	RQD 81%	R-4		@ 46.6'-46.9', broken zone.														
55							@ 54.4'-55.3', broken.														
55.7	751.3						Medium hard black SHALE; highly weathered, micaceous, carbonaceous, highly fractured to broken; contains COAL blossom.														
58.1	748.9	Core 120"	Rec 120"	RQD 79%	R-5	*257		Medium hard to hard light gray SANDSTONE.													
60																					

FILE: 0121-3070-03 [11/7/2007 9:49 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-40

Location: Sta. 88+41.6, 204.8 ft. RT of SR 823 CL

Date Drilled: 4/4/05 to 4/5/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 6.5' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	
60	747.0						DESCRIPTION Medium hard to hard light gray SANDSTONE; fine grained, highly weathered, moderately to highly fractured. Soft to medium hard gray SHALE, highly weathered, arenaceous, moderately fractured. @ 62.3'-71.9', siltstone interbeds. @ 71.7'-71.9', very fine grained SANDSTONE layers. @ 72.7'-72.8', 73.0', 73.2'-73.4', 73.7'-74.6', 76.0'-76.1', SANDSTONE layers. @ 78.4', medium hard. Hard gray SANDSTONE; fine grained, moderately weathered, micaceous, moderately fractured. @ 84.2'-84.9', argillaceous zone. @ 87.8', fine to medium grained. @ 87.8', high angle fracture.							
62.3	744.7													
65		Core 120"	Rec 120"	RQD 92%	R-6	*61								
70														
75		Core 120"	Rec 120"	RQD 83%	R-7	*473								
80														
82.2	724.8													
85		Core 120"	Rec 120"	RQD 100%	R-8	*488								
90														

FILE: 0121-3070-03 [11/7/2007 9:49 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-40

Location: Sta. 88+41.6, 204.8 ft. RT of SR 823 CL

Date Drilled: 4/4/05 to 4/5/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 6.5' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Blows per foot - ○					
90.0	717.0																		
	717.0						Medium hard gray SANDSTONE; fine grained, moderately weathered, micaceous, moderately to slightly fractured.												
							@ 93.0', high angle fracture.												
95																			
		Core 120"	Rec 120"	RQD 100%	R-9	*503													
100																			
		Core 120"	Rec 120"	RQD 100%	R10	*569													
105																			
110																			
		Core 120"	Rec 120"	RQD 100%	R11	*580	@ 115.3'-115.4', brown, fine to medium grained.												
115																			
120																			

FILE: 0121-3070-03 [11/7/2007 9:49 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-40

Location: Sta. 88+41.6, 204.8 ft. RT of SR 823 CL

Date Drilled: 4/4/05 to 4/5/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 6.5' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)				
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40				
120	687.0						Medium hard gray SANDSTONE; fine grained, slightly weathered, micaceous, moderately fractured. @ 123.2', 124.8', argillaceous laminations, low angle fractures. @ 128.5', 128.6', argillaceous laminations. @ 133.6, high angle fracture. Bottom of Boring - 135.0'											
		Core 120"	Rec 120"	RQD 100%	R12	*361												
125																		
130		Core 30"	Rec 30"	RQD 100%	R13	*484												
135.0	672.0																	
140																		
145																		
150																		

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-41

Location: Sta. 92+20.4, 115.9 ft. LT of SR 823 CL

Date Drilled: 4/5/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 29.4' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40						
0.2	777.7																			
	777.5						Topsoil - 2"													
		WOH 2				1.5	Stiff brown SILT AND CLAY (A-6a), little to some fine to coarse sand, some gravel; contains roots; damp.	24	7	--	13	33	23							
		5				4.5+	@ 3.5'-5.0', hard, contains sandstone fragments.													
		11																		
		31	13																	
5																				
6.0	771.7	50/5	5				Severely weathered brown fine grained SANDSTONE, argillaceous.													
		50/5	5																	
10.0	767.7						Soft to medium hard brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, thinly bedded to thickly bedded, highly fractured, with typical low angle iron stained fractures. @ 10.0'-10.3', 10.5'-10.7', 13.8'-13.9', 17.8'-17.9', 19.1'-19.4', broken zones. @ 10.7'-11.2', 14.5'-14.6', high angle iron stained fractures.													
		Core 108"	Rec 108"		RQD 63%	R-1	*197													
15																				
							@ 19.0'-19.5', 19.7'-19.9', high angle iron stained fractures.													
							@ 21.0'-21.2', 22.0'-22.7', high angle iron stained fractures. @ 21.3'-21.5', 21.6'-21.8', broken zones.													
20																				
23.0	754.7						Medium hard to hard brownish gray SANDSTONE interbedded with SILTSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded, contains few argillaceous laminations. @ 25.2'-25.3', broken zone. @ 27.5', 28.6', low angle fractures.													
		Core 120"	Rec 120"		RQD 68%	R-2	*314													
25																				
30																				

FILE: 0121-3070-03 [11/7/2007 9:49 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-41

Location: Sta. 92+20.4, 115.9 ft. LT of SR 823 CL

Date Drilled: 4/5/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 29.4' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40							
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay								
30	747.7																				
		Core 120"	Rec 102"	RQD 80%	R-3	*206	<p>Medium hard to hard brownish gray SANDSTONE interbedded with SILTSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded. @ 30.1'-30.5', high angle iron stained fracture. @ 31.0'-32.0', 34.3, low angle fractures. @ 31.5', 32.1', 33.1'-33.4', 33.6'-34.4', 35.0'-35.1', 35.3'-36.0', contains moderate to abundant argillaceous laminations. @ 35.2', 35.8', 39.3', low angle fractures.</p> <p>@ 39.7'-41.5', contains moderate to abundant argillaceous laminations. @ 41.5'-41.9', high angle iron stained fracture.</p>														
41.9	735.8																				
		Core 120"	Rec 120"	RQD 91%	R-4	*259	<p>Medium hard to hard gray SHALE interbedded with very fine grained SANDSTONE; highly weathered, micaceous, thinly laminated to thinly bedded. @ 46.5'-47.2', very fine SANDSTONE. @ 47.9', 48.1', 48.6', low angle fractures.</p>														
48.8	728.9																				
		Core 120"	Rec 120"	RQD 100%	R-5	*515	<p>Hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, thickly bedded to massive, slightly fractured to unfractured. @ 55.4', argillaceous laminations.</p>														
60																					

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-41

Location: Sta. 92+20.4, 115.9 ft. LT of SR 823 CL

Date Drilled: 4/5/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 29.4' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40					
60	717.7						Hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, thickly bedded to massive, slightly fractured to unfractured.												
65		Core 120"	Rec 120"	RQD 100%	R-6	*554													
70																			
75		Core 120"	Rec 120"	RQD 100%	R-7	*483													
80																			
85		Core 120"	Rec 120"	RQD 100%	R-8	*452													
90																			

FILE: 0121-3070-03 [11/7/2007 9:49 AM]

Client: TranSystems, Inc. Project: SCI-823-0.00 Job No. 0121-3070.03

LOG OF: Boring R-41 Location: Sta. 92+20.4, 115.9 ft. LT of SR 823 CL Date Drilled: 4/5/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 29.4' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40												
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay													
90	687.7						Hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, thickly to massive, slightly fractured to unfractured.																			
		Core 120"	Rec 120"	RQD 100%	R-9	*139																				
100.0	677.7	Core 12"	Rec 12"	RQD 100%	R10	*139	Bottom of Boring - 100.0'																			
105																										
110																										
115																										
120																										

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-43

Location: Sta. 92+21.9, 189.4 ft. RT of SR 823 CL

Date Drilled: 03/31/05 to 04/01/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 7.6' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
0	806.0																		
-0.4	805.6						Topsoil - 5"												
		4				1	Very stiff to hard light reddish brown SILTY CLAY (A-6b), some fine to coarse sand, trace gravel; damp.												
		4	7	18															
		7				2													
		9	10	18															
5																			
		7				3	@ 6.0', brown.												
		12	14	18															
		8				4													
		25	32	18															
-10.0	796.0						Severely weathered brownish gray SHALE, contains interbedded sand seams.												
		18				5													
		27	50/5	17															
-13.0	793.0						Soft to medium hard grayish brown SHALE; decomposed, arenaceous, thinly bedded, highly fractured.												
							@ 13.6'-14.3', lost recovery.												
							@ 14.3'-14.6', 14.9-15.1', 22. 5'-23.0', 23.0'-23.4', broken zones.												
							@ 16.6'-17.6', 24.5'-24.7', high angle iron stained fractures.												
							@ 18.4'-18.6', coal seam.												
							@ 23.0'-23.3', highly weathered.												
		Core 120"	Rec 112"		RQD 58%	R-1	*17												
-24.7	781.3						Soft to medium hard gray SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, micaceous, thinly bedded, highly fractured, with typical low angle clay filled fractures; contains moderate to abundant argillaceous laminations.												
							@ 28.6'-30.3', qu = 10,909 psi SDI = 39.4%.												
		Core 120"	Rec 120"		RQD 73%	R-2													
30																			

FILE: 0121-3070-03 [11/7/2007 9:49 AM]

Client: TranSystems, Inc.	Project: SCI-823-0.00	Job No. 0121-3070.03
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LOG OF: Boring R-43	Location: Sta. 92+21.9, 189.4 ft. RT of SR 823 CL	Date Drilled: 03/31/05 to 04/01/05
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Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 7.6' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)				
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ●		Blows per foot - ○		
30	776.0						DESCRIPTION Soft to medium hard gray SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, micaceous, thinly bedded, highly fractured, with typical low angle clay filled fractures. Medium hard gray SANDSTONE; very fine to fine grained, highly weathered, micaceous, thinly bedded to thickly bedded, moderately weathered, contains few to moderate argillaceous laminations. @ 45.8'-47.1', SHALE bed. @ 48.0'-49.5', qu = 11,468 psi SDI = 96.0%. @ 50.2'-52.1', argillaceous broken zone.											
40		Core 120"	Rec 120"	RQD 60%	R-3	*396												
40.5	765.5																	
45		Core 120"	Rec 120"	RQD 78%	R-4	*405												
50																		
55		Core 120"	Rec 120"	RQD 92%	R-5	*468												
59.4	746.6																	

FILE: 0121-3070-03 [11/7/2007 9:49 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-43

Location: Sta. 92+21.9, 189.4 ft. RT of SR 823 CL

Date Drilled: 03/31/05 to 04/01/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 7.6' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)								
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○								
60	746.0																					
							Soft to medium hard gray SHALE interbedded with SANDSTONE; highly, arenaceous, micaceous, thinly laminated to thinly bedded, highly fractured, with typical low angle clay filled fractures.															
65							@ 64.0'-67.2', 68.0'-68.9', highly weathered to decomposed.															
		Core 120"	Rec 120"	RQD 62%	R-6	*84																
70							@ 69.5'-70.8', qu = 12,415 psi SDI = 74.2%. @ 70.8'-77.6', dark gray.															
75																						
77.6	728.4	Core 120"	Rec 120"	RQD 83%	R-7	*435	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded; contains few argillaceous laminations.															
80																						
85							@ 83.8'-85.4', qu = 11,340 psi SDI = 98.2%.															
		Core 120"	Rec 120"	RQD 100%	R-8	*474																
90																						

FILE: 0121-3070-03 [11/7/2007 9:49 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-43

Location: Sta. 92+21.9, 189.4 ft. RT of SR 823 CL

Date Drilled: 03/31/05 to 04/01/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 7.6' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ———— LL Blows per foot - ○ 10 20 30 40						
90	716.0						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured to unfractured. @ 96.2', 96.6', 96.7', 100.0', 100.1', low angle fractures.													
		Core 120"	Rec 120"	RQD 98%	R-9	*792														
		Core 120"	Rec 120"	RQD 100%	R10	*612														
		Core 120"	Rec 120"	RQD 100%	R11	*448														
117.8	688.2						Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous.													
120																				

FILE: 0121-3070-03 [11/7/2007 9:49 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-43

Location: Sta. 92+21.9, 189.4 ft. RT of SR 823 CL

Date Drilled: 03/31/05

to 04/01/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 7.6' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○						
120	686.0																			
				Core 84"	Rec 84"	RQD 100%	R12	*443	Medium hard to hard gray SANDSTONE; very fine to fine grained, lightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded; contains few to moderate argillaceous laminations.											
130.0	676.0							Bottom of Boring - 130.0'												
135																				
140																				
145																				
150																				

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-44

Location: Sta. 96+33.4, 121.5 ft. LT of SR 823 CL

Date Drilled: 3/31/05

to 4/4/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 46.3' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
0.2	812.7																		
0.2	812.5						Topsoil - 2"												
		2				1.75	Stiff brown SILTY CLAY (A-6b), little fine to coarse sand, trace gravel; moist.	5	5	--	8	36	46						
		2	18																
		2	18																
3.5	809.2	6				4.5+	Hard grayish brown SILTY CLAY (A-6b), trace fine to coarse sand, trace gravel; possible decomposed shale; dry to damp.												
		13																	
		20	18																
		9				4.5+													
		19																	
		22	18																
		8				4.5+													
		15																	
		18	18																
10																			
10.5	802.2	7				5	Severely weathered brownish gray SHALE, contains rust stains and sulphur precipitate. @ 11.0'-12.0', 16.0'-17.5', black, carbonaceous.												
		11																	
		31	18																
		11				6													
		17																	
		24	18																
		18				7													
		23																	
		19	14																
18.5	794.2	50/3	3			8	Severely weathered brownish gray fine grained SANDSTONE fragments, argillaceous.												
20.0	792.7						Medium hard to hard gray SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured. @ 20.3', 20.5', 21.9', low angle fractures.												
25		Core 120"	Rec 120"	RQD 96%	R-1	*271	@ 24.2', 25.1', 26.5', low angle fractures.												
30																			

FILE: 0121-3070-03 [11/7/2007 9:49 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-44

Location: Sta. 96+33.4, 121.5 ft. LT of SR 823 CL

Date Drilled: 3/31/05 to 4/4/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 46.3' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40					
30	782.7						Medium hard to hard gray SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured.												
35		Core 120"	Rec 120"	RQD 96%	R-2	*410													
45		Core 120"	Rec 120"	RQD 100%	R-3	*479													
50.0	762.7						Hard gray very fine to fine grained SANDSTONE, moderately to slightly weathered, argillaceous, micaceous, massively bedded, slightly fractured; contains few argillaceous laminations.												
55		Core 120"	Rec 120"	RQD 100%	R-4	*444													
60																			

FILE: 0121-3070-03 [11/7/2007 9:49 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-44

Location: Sta. 96+33.4, 121.5 ft. LT of SR 823 CL

Date Drilled: 3/31/05 to 4/4/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 46.3' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40					
60	752.7						Hard gray very fine to fine grained SANDSTONE, moderately to slightly weathered, argillaceous, micaceous, massively bedded, slightly fractured; contains few argillaceous laminations. @ 67.2'-67.5' very fine grained. Medium hard very fine grained SANDSTONE; argillaceous, micaceous, thinly bedded to massive, slightly fractured; contains few argillaceous laminations. @ 80.0', becomes SILTSHALE like. Hard gray very fine to fine grained SANDSTONE; moderately weathered to slightly weathered, argillaceous, micaceous, massive, slightly to unfractured.												
65		Core 120"	Rec 120"	RQD 100%	R-5	*427													
68.0	744.7																		
70																			
75		Core 120"	Rec 120"	RQD 100%	R-6	*124													
80																			
81.3	731.4																		
85		Core 120"	Rec 120"	RQD 100%	R-7	*482													
90																			

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-44

Location: Sta. 96+33.4, 121.5 ft. LT of SR 823 CL

Date Drilled: 3/31/05 to 4/4/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 46.3' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)							
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Blows per foot - ○							
												Natural Moisture Content, % - ●									
												PL ─────────────────── LL									
												10 20 30 40									
90.0	722.7 722.7-						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, pyritic, thinly bedded to thickly bedded.														
95		Core 120"	Rec 120"	RQD 100%	R-8	*471															
105		Core 120"	Rec 120"	RQD 100%	R-9	*440															
115		Core 120"	Rec 120"	RQD 100%	R10	*455															
120																					

FILE: 0121-3070-03 [11/7/2007 9:49 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-44

Location: Sta. 96+33.4, 121.5 ft. LT of SR 823 CL

Date Drilled: 3/31/05 to 4/4/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 46.3' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)			
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40			
120	692.7						DESCRIPTION Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, pyritic, thinly bedded to thickly bedded. @ 122.8'-123.1', iron stained zone.										
125		Core 120"	Rec 120"	RQD 100%	R11	*629											
130		Core 60"	Rec 60"	RQD 100%	R12	*507											
135.0	677.7						Bottom of Boring - 135.0'										
140																	
145																	
150																	

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-46

Location: Sta. 96+23.1, 84.5 ft. RT of SR 823 CL

Date Drilled: 03/30/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 14.5' (3/28/05 AM) 18.4' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay							
0	793.8																			
0.7	793.1	4				3.75	Topsoil - 8"													
		4	18				Stiff to very stiff light brown SILTY CLAY (A-6b), some fine to coarse sand, trace gravel; damp to moist.													
		5				1.25														
		6	18				Severely weathered gray SANDSTONE, argillaceous, rust stained.													
5		9																		
6.0	787.8	16	18																	
		20					Soft to medium hard brownish gray SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, thinly bedded, broken to highly fractured . @ 10.0'-10.4', 12.3'-12.5', 12.8'-13.0', broken zones. @ 10.4'-10.9', lost recovery. @ 11.7', 11.9', low angle clay filled fractures. @ 12.1'-12.3', 15.9'-16.0', 16.8'-17.0', high angle iron stained fractures.													
		31																		
		50/1	1																	
10.0	783.8						Soft to medium hard gray SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, massively bedded, moderately fractured, with typical low angle clay filled fractures. @ 23.4'-25.0', 25.5'-26.0, contains poorly cemented argillaceous zones.													
		Core 36"	Rec 30"	RQD 28%	R-1	*401														
18.1	775.7						Soft to medium hard gray SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, massively bedded, moderately fractured, with typical low angle clay filled fractures. @ 23.4'-25.0', 25.5'-26.0, contains poorly cemented argillaceous zones.													
		Core 120"	Rec 120"	RQD 91%	R-2	*401														
20							Soft to medium hard gray SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, massively bedded, moderately fractured, with typical low angle clay filled fractures. @ 23.4'-25.0', 25.5'-26.0, contains poorly cemented argillaceous zones.													
		Core 120"	Rec 120"	RQD 84%	R-3	*351														
25							Soft to medium hard gray SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, massively bedded, moderately fractured, with typical low angle clay filled fractures. @ 23.4'-25.0', 25.5'-26.0, contains poorly cemented argillaceous zones.													
		Core 120"	Rec 120"	RQD 84%	R-3	*351														
30																				

FILE: 0121-3070-03 [11/7/2007 9:49 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-46

Location: Sta. 96+23.1, 84.5 ft. RT of SR 823 CL

Date Drilled: 03/30/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 14.5' (3/28/05 AM) 18.4' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)							
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40							
30	763.8																				
							Soft to medium hard gray SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, massively bedded, moderately fractured, with typical low angle clay filled fractures. @ 31.9'-33.1' contains poorly cemented argillaceous zones.														
							@ 35.5'-42.4' few to moderate argillaceous laminations.														
		Core 120"	Rec 120"	RQD 85%	R-4	*203															
							@ 42.4'-43.0', argillaceous broken zone.														
							@ 45.0'-45.2', 48.5'-48.7', argillaceous broken zones.														
		Core 120"	Rec 120"	RQD 90%	R-5	*314															
50	50.5						Soft to medium hard gray SANDSTONE interbedded with SHALE; fine to very fine grain, decomposed to highly weathered, thinly laminated to thinly bedded, highly fractured.														
		Core 120"	Rec 120"	RQD 85%	R-6	*109	Soft to medium hard gray SANDSTONE; very fine to fine grained, moderately weathered, thinly laminated to thinly bedded, highly to moderately fractured.														
55	55.7																				
		Core 120"	Rec 120"	RQD 85%	R-6	*109															
60																					

FILE: 0121-3070-03 [11/7/2007 9:49 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-46

Location: Sta. 96+23.1, 84.5 ft. RT of SR 823 CL

Date Drilled: 03/30/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 14.5' (3/28/05 AM) 18.4' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)							
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ———— LL Blows per foot - ○ 10 20 30 40							
60	733.8						Soft to medium hard gray SANDSTONE; very fine to fine grained, moderately weathered, thinly laminated to thinly bedded, highly to moderately fractured. @ 62.2'-63.5' gravel to SILTSTONE/ SILT to SHALE, highly fractured to broken. Hard gray SANDSTONE; very fine to fine grained, argillaceous, micaceous, thinly bedded to thickly bedded, moderately to slightly fractured. @ 64.1', low angle clay filled fractures. @ 65.9', 66.1', 66.2', 66.4', low angle clay filled fractures.														
63.5	730.3																				
65		Core 120"	Rec 120"	RQD 91%	R-7	*464															
70																					
75		Core 120"	Rec 120"	RQD 100%	R-8	*547															
80																					
85		Core 120"	Rec 120"	RQD 100%	R-9	*779															
90																					

Client: TranSystems, Inc. Project: SCI-823-0.00 Job No. 0121-3070.03

LOG OF: Boring R-46 Location: Sta. 96+23.1, 84.5 ft. RT of SR 823 CL Date Drilled: 03/30/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 14.5' (3/28/05 AM) 18.4' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)			
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ●		PL ————— LL	
90	703.8						Hard gray SANDSTONE; very fine to fine grained, argillaceous, micaceous, thinly bedded to thickly bedded, moderately to slightly fractured. @ 96.3',97.4',98.5', low angle clay filled fractures.										
95		Core 84"	Rec 84"	RQD 100%	R-10	*470											
100.0	693.8						Bottom of Boring - 100.0'										
105																	
110																	
115																	
120																	

FILE: 0121-3070-03 [11/7/2007 9:49 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-47

Location: Sta. 100+19.8, 176.4 ft. LT of SR 823 CL

Date Drilled: 03/24/05 to 03/30/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 14.8' (3/30/35 am)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
0	838.6																		
0.3	838.3						Topsoil - 4"												
		WOH 2					Very stiff brown SILT AND CLAY (A-6a), little fine to coarse sand; damp.												
		6	16			1		3.0											
4.0	834.6	9					Severely weathered brown SANDSTONE, rust stained.												
		30						2											
5.0	833.6	50/0	12				Medium hard reddish brown SANDSTONE; very fine to fine grained, highly weathered, broken; contains breccia. @ 5.0'-5.1', 5.8'-10.0', relithified sediments.												
		Core 60"	Rec 35"			RQD 8%		R-1											
10.0	828.6						Hard brown SANDSTONE; fine to medium grained, moderately weathered, medium bedded to thickly bedded with cross bedding, highly fractured with high angle fractures.												
		Core 120"	Rec 120"			RQD 58%		R-2											
15							@ 24.5'-25.9', qu = 2,629 psi. @ 26.0'-26.6', contains gray decomposed, argillaceous laminations. @ 26.0'-27.0', SDI = 80.1%.												
		Core 120"	Rec 90"			RQD 34%		R-3											
25																			
30																			

Client: TranSystems, Inc.	Project: SCI-823-0.00	Job No. 0121-3070.03
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LOG OF: Boring R-47	Location: Sta. 100+19.8, 176.4 ft. LT of SR 823 CL	Date Drilled: 03/24/05	to 03/30/05
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Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 14.8' (3/30/35 am)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40				
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay					
30	808.6						DESCRIPTION Hard brown SANDSTONE; fine to medium grained, highly weathered, medium bedded to thickly bedded with cross bedding, moderately fractured, contains rust staining. @ 30.0'-32.5', contains high angle fractures with sandy silt infilling. @ 41.6'-42.7', decomposed SILTSTONE.											
35		Core 120"	Rec 120"	RQD 86%	R-4	*162												
42.7	795.9							Medium hard dark gray SHALE; carbonaceous, highly to moderately weathered, thinly bedded, arenaceous, moderately fractured. @ 45.5'-46.9', qu = 2,332 psi, SDI = 11.7%. @ 48.5', coal stringer.										
45		Core 120"	Rec 120"	RQD 58%	R-5	*187												
53.4	785.2						Hard light gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, thinly bedded to medium bedded. @ 53.4'-55.3', red and gray gradational zone with shale and siltstone clasts. @ 58.5'-59.3', contains moderate argillaceous laminations.											
55		Core 120"	Rec 120"	RQD 91%	R-6	*362												
60																		

FILE: 0121-3070-03 [11/7/2007 9:49 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-47

Location: Sta. 100+19.8, 176.4 ft. LT of SR 823 CL

Date Drilled: 03/24/05

to 03/30/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 14.8' (3/30/35 am)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40											
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay												
60	778.6						Hard light gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, medium to massively bedded, slightly fractured to unfractured, contains occasional siltstone or shale clast. @ 60.8'-61.8', SDI = 84.5%. @ 62.0'-62.4', qu = 5,340 psi. @ 62.7', 67.7', 68.2', argillaceous laminations. @ 62.7', 67.2', low angle fractures. @ 70.0', 70.3', argillaceous laminations.																		
65		Core 120"	Rec 120"	RQD 100%	R-7	*350																			
75		Core 120"	Rec 120"	RQD 100%	R-8	*454																			
82.5	756.1						Hard gray SANDSTONE; very fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to medium bedded.																		
85		Core 120"	Rec 120"	RQD 100%	R-9	*799																			
90																									

FILE: 0121-3070-03 [11/7/2007 9:49 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-47

Location: Sta. 100+19.8, 176.4 ft. LT of SR 823 CL

Date Drilled: 03/24/05 to 03/30/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 14.8' (3/30/35 am)	GRADATION						STANDARD PENETRATION (N)						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40						
90.0	748.6 748.6						Hard to very hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, medium bedded to massive, slightly fractured to unfractured. @ 98.6'-99.3', 99.8'-107.3', very fine SANDSTONE with few argillaceous laminations. @ 107.3'-107.8', contains moderate to abundant argillaceous laminations.													
95		Core 120"	Rec 120"	RQD 100%	R10	*353														
105		Core 120"	Rec 120"	RQD 100%	R11	*613														
115		Core 120"	Rec 120"	RQD 100%	R12	*553														

FILE: 0121-3070-03 [11/7/2007 9:49 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-47

Location: Sta. 100+19.8, 176.4 ft. LT of SR 823 CL

Date Drilled: 03/24/05 to 03/30/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 14.8' (3/30/35 am)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
718.6																			
120							Hard to very hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, medium bedded to massive, slightly fractured to unfractured.												
125		Core 120"	Rec 120"	RQD 99%	R13	*421													
130																			
135		Core 120"	Rec 120"	RQD 100%	R14	*405	@ 134.0'-135.0', SDI = 98.7%. @ 135.2'-135.6', qu = 12,216 psi.												
140																			
145		Core 120"	Rec 120"	RQD 100%	R15	*406													
150																			

FILE: 0121-3070-03 [11/7/2007 9:49 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-47

Location: Sta. 100+19.8, 176.4 ft. LT of SR 823 CL

Date Drilled: 03/24/05 to 03/30/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 14.8' (3/30/35 am)	GRADATION						STANDARD PENETRATION (N)							
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ──── LL Blows per foot - ○ 10 20 30 40							
150	688.6						Hard to very hard gray SANDSTONE; very fine grained, slightly weathered, argillaceous, micaceous, medium bedded to massive, slightly fractured to unfractured, contains few argillaceous laminations .														
155		Core 120"	Rec 120"	RQD 100%	R16	*303															
160																					
165		Core 120"	Rec 120"	RQD 98%	R17	*411															
170																					
175		Core 120"	Rec 120"	RQD 100%	R18	*543															
180.0	658.6						Bottom of Boring - 180.0'														

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-49

Location: Sta. 100+31.5, 65.8 ft. RT of SR 823 CL

Date Drilled: 03/22/05 to 03/24/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 22.1' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40							
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay								
0	792.2																				
0.3	791.9						Topsoil - 3"														
		WOH 1				2.75	Very stiff brown SANDY SILT (A-4a), little to some clay, little gravel; contains sandstone fragments; damp.	12	12	--	29	27	20								
		2	10																		
		3				2.0															
		10																			
5		11	18																		
6.0	786.2						Severely weathered brown SANDSTONE fine grained, argillaceous. @ 8.5'-10.0', contains vertical seam of gray siltstone.														
		12																			
		33																			
		50/3	15																		
		18																			
		39																			
		50/4	14																		
10																					
		10																			
		34																			
		33	17																		
		8																			
		50/5	11																		
15																					
15.5	776.7	50/4	4				Hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, thinly bedded to medium bedded, moderately fractured. @ 15.5'-18.0', broken, highly weathered with core loss.														
							@ 18.3'-18.6', high angle fracture.														
							@ 21.7'-22.2', high angle fracture.														
20		Core 114"	Rec 111"		RQD 67%	R-1	*211														
25																					
30		Core 120"	Rec 120"		RQD 96%	R-2															

FILE: 0121-3070-03 [11/7/2007 9:49 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-49

Location: Sta. 100+31.5, 65.8 ft. RT of SR 823 CL

Date Drilled: 03/22/05 to 03/24/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 22.1' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ———— LL Blows per foot - ○ 10 20 30 40					
30	762.2																		
						*405	Hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, thinly bedded to medium bedded, moderately fractured. @ 33.1'-34.1', moderate argillaceous laminations.												
35																			
40		Core 120"	Rec 120"	RQD 100%	R-3	*347													
45																			
50		Core 120"	Rec 120"	RQD 98%	R-4	*501	@ 47.2'-47.4', moderate to abundant argillaceous laminations, moderately to highly weathered. @ 52.7'-55.0', contains moderate argillaceous laminations, moderately to highly weathered. @ 53.3'-53.9', high angle fracture.												
55							@ 55.0'-57.7', 58.5'-60.0', 62.0'-62.1', contains few argillaceous laminations. @ 58.5'-65.0', very fine grained.												
60		Core 120"	Rec 120"	RQD 100%	R-5														

FILE: 0121-3070-03 [11/7/2007 9:49 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-49

Location: Sta. 100+31.5, 65.8 ft. RT of SR 823 CL

Date Drilled: 03/22/05

to

03/24/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 22.1' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40					
60	732.2																		
						*651													
							Hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, moderately bedded to massive, slightly fractured.												
65																			
70		Core 120"	Rec 120"	RQD 100%	R-6	*560													
75																			
80		Core 120"	Rec 120"	RQD 100%	R-7	*523													
85																			
90		Core 120"	Rec 120"	RQD 98%	R-8		@ 87.4'-88.4', SDI = 99.4%.												

FILE: 0121-3070-03 [11/7/2007 9:49 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-49

Location: Sta. 100+31.5, 65.8 ft. RT of SR 823 CL

Date Drilled: 03/22/05 to 03/24/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 22.1' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○							
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	10	20	30	40				
90	702.2					*578	Hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, moderately bedded to massive, slightly fractured.														
95																					
100		Core 120"	Rec 120"	RQD 96%	R-9	*480															
105							@ 115.0'-115.2', fossiliferous zone.														
110		Core 120"	Rec 120"	RQD 100%	R10	*527															
115																					
120		Core 60"	Rec 60"	RQD 100%	R11	*375															

FILE: 0121-3070-03 [11/7/2007 9:49 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-49

Location: Sta. 100+31.5, 65.8 ft. RT of SR 823 CL

Date Drilled: 03/22/05 to 03/24/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 22.1' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)								
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ----- LL Blows per foot - ○ 10 20 30 40								
120	672.2						Hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, moderately bedded to massive, slightly fractured.															
125		Core 120"	Rec 120"	RQD 100%	R12	*426																
130.0	662.2						Bottom of Boring - 130.0'															
135																						
140																						
145																						
150																						

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-50

Location: Sta 104+14.4, 202.2 ft. LT of SR 823 CL

Date Drilled: 03/24/05 to 03/28/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 2.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ———— LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
0	812.1																		
-0.5	811.6						Topsoil - 6"												
		3 5	5	18		1	3.5 Very stiff light reddish brown SILT AND CLAY (A-6a), little fine sand; damp.												
-3.5	808.6	14	16	18		2	Severely weathered gray SANDSTONE, fine grained, argillaceous.												
		12	50/5	11		3													
		39	25	16		4													
-10.0	802.1	Core 12"	50/4	Rec 12"		RQD 83%	R-1 Hard gray and light brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, thinly bedded, highly fractured with low to high angle fractures with clay infilling, contains decomposed zones, argillaceous.												
-15.6	796.5	Core 120"		Rec 120"		RQD 69%	R-2 *255 Medium hard to hard light gray and light brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thinly laminated to medium bedded, moderately fractured with low to high angle fractures with clay infilling.												
-26.6	785.5	Core 120"		Rec 120"		RQD 78%	R-3 *256 Soft to hard gray SANDSTONE; very fine to medium grained, interbedded with SHALE, micaceous, decomposed to moderately weathered, shale zones typically highly weathered to decomposed.												

FILE: 0121-3070-03 [11/7/2007 9:49 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-50

Location: Sta 104+14.4, 202.2 ft. LT of SR 823 CL

Date Drilled: 03/24/05 to 03/28/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 2.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	PL	LL	Blows per foot -				
30	782.1																			
36.0	776.1	Core 120"	Rec 120"	RQD 88%	R-4	*221	Soft to hard gray SANDSTONE, very fine to medium grained, interbedded with SHALE, micaceous, decomposed to moderately weathered, shale zones typically highly weathered to decomposed.													
36.0							Hard light gray SANDSTONE; very fine grained to fine grained, highly weathered to moderately weathered, moderately fractured to unfractured, contains few argillaceous laminations. @ 43.9', 44.5', 52.1', low angle fractures. @ 38.6'-38.7', 48.2'-49.1', argillaceous zones.													
45		Core 120"	Rec 120"	RQD 100%	R-5	*237														
50							@ 55.6'-55.7', argillaceous zone fracture.													
55		Core 120"	Rec 120"	RQD 89%	R-6	*237	@ 56.8', 57.0', 57.7', 58.0', argillaceous laminations with low angle fractures.													
60																				

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-50

Location: Sta 104+14.4, 202.2 ft. LT of SR 823 CL

Date Drilled: 03/24/05 to 03/28/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 2.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	
60	752.1						DESCRIPTION Hard light gray SANDSTONE; very fine to fine grained, highly to moderately weathered, pyritic, moderately fractured to unfractured, contains argillaceous laminations. @ 60.4', 60.7', 60.8' , argillaceous laminations with low angle fractures. @ 63.0', 63.1', argillaceous laminations with fractures. @ 64.6'-70.9', contains moderate to abundant argillaceous laminations.							
65		Core 120"	Rec 120"	RQD 100%	R-7	*672								
70.9	741.2							Soft to medium hard SHALE, highly weathered, arenaceous, thinly laminated to thinly bedded, moderately fractured.						
75		Core 120"	Rec 120"	RQD 90%	R-8		@ 71.8'-71.9', 72.9'-73.3', 80.1'-80.3', SANDSTONE layers.							
80.4	731.7							Hard gray SANDSTONE; very fine to fine grained, moderately to slightly weathered, argillaceous, micaceous, thickly bedded to massive, slightly fractured.						
85		Core 120"	Rec 120"	RQD 100%	R-9	*362								
90														

Client: TranSystems, Inc. Project: SCI-823-0.00 Job No. 0121-3070.03

LOG OF: Boring R-50 Location: Sta 104+14.4, 202.2 ft. LT of SR 823 CL Date Drilled: 03/24/05 to 03/28/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 2.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay							
72.1																				
90							Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thickly bedded to massive, slightly fractured to unfractured.													
		Core 120"	Rec 120"	RQD 100%	R10	*546														
95																				
		Core 120"	Rec 120"	RQD 100%	R11	*417														
100																				
105																				
		Core 120"	Rec 120"	RQD 100%	R12	*316														
110																				
115																				
		Core 120"	Rec 120"	RQD 100%																
120																				

FILE: 0121-3070-03 [11/7/2007 9:49 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-50

Location: Sta 104+14.4, 202.2 ft. LT of SR 823 CL

Date Drilled: 03/24/05 to 03/28/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 2.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)				
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ●				
	692.1						DESCRIPTION											
120								Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thickly bedded to massive, slightly fractured.										
125		Core 120"	Rec 120"	RQD 100%	R13	*410		@ 124.4'-125.1', very fine grained SANDSTONE with moderate argillaceous laminations. @ 128.5'-129.2', few to moderate argillaceous laminations. @ 130.3', argillaceous laminations.										
130																		
135		Core 120"	Rec 120"	RQD 100%	R14	*317												
140																		
145		Core 120"	Rec 120"	RQD 100%	R15	*422	@ 145.7'-147.9', contains few argillaceous laminations.											
150																		

Client: TranSystems, Inc. Project: SCI-823-0.00 Job No. 0121-3070.03

LOG OF: Boring R-50 Location: Sta 104+14.4, 202.2 ft. LT of SR 823 CL Date Drilled: 03/24/05 to 03/28/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / *Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 2.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40											
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay												
150	662.1																								
155		Core 120"	Rec 120"	RQD 100%	R16	*426																			
160							@ 159.9'- 161.0', argillaceous lamination.																		
161.0	651.1						Bottom of Boring - 161.0'																		
165																									
170																									
175																									
180																									

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-52

Location: Sta 104+28.8, 67.4 ft. RT of SR 823 CL

Date Drilled: 03/29/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 14.1' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
0	711.6																		
-0.5	711.1						Topsoil - 6"												
		4 8 10	18			1	Very stiff brown SANDY SILT (A-4a), "and" gravel, little clay; contains sandstone fragments; damp.												
		8 14 17	18			2				41	13	--	8	26	12				
5		9 10 12	18			3													
-8.5	703.1						Severely weathered brown SANDSTONE, argillaceous.												
		3 5 6	1			4													
10		50/1	1			5													
-13.0	698.6						Medium hard brown SANDSTONE; fine grained, moderately to highly weathered, micaceous, highly fractured. @ 13.0'-13.4', broken. @ 15.8'-18.0', possible core loss.												
15																			
		Core 120"	Rec 95"		RQD 51%	R-1	*425												
							@ 18.7',19.2',20.0', clay filled fractures. @ 18.8', high angle fracture. @ 19.2'-19.8', gray. @ 20.5'-24.9', argillaceous, with rust staining, highly weathered.												
-24.9	686.7						Medium hard to hard gray SANDSTONE; fine grained, moderately weathered, micaceous, highly fractured. @ 23.6'-23.9', broken zone, possible core loss. @ 25.8',27.1', clay filled fractures. @ 28.5'-28.7', moderate argillaceous laminations.												
20		Core 120"	Rec 114"		RQD 79%	R-2		*173											
24.9																			
30																			

FILE: 0121-3070-03 [11/7/2007 9:49 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-52

Location: Sta 104+28.8, 67.4 ft. RT of SR 823 CL

Date Drilled: 03/29/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 14.1' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40					
30	681.6						<p>Medium hard to hard gray SANDSTONE; fine grained, moderately weathered, micaceous, moderately to slightly fractured.</p> <p>@ 30.5', clay filled fracture.</p> <p>@ 31.1'-32.7', moderate interbedded clay/shale layers.</p> <p>@ 32.4'-32.7', broken zone.</p> <p>@ 33.5', fine to medium grained, moderately fractured, slightly to moderately weathered.</p> <p>@ 41.1',41.9', clay filled fractures.</p>												
35																			
40		Core 120"	Rec 120"	RQD 100%	R-3	*453													
45																			
50		Core 120"	Rec 120"	RQD 100%	R-4	*451													
55																			
60		Core 120"	Rec 120"	RQD 100%	R-5	*483													

FILE: 0121-3070-03 [11/7/2007 9:49 AM]

Client: TranSystems, Inc. Project: SCI-823-0.00 Job No. 0121-3070.03

LOG OF: Boring R-52 Location: Sta 104+28.8, 67.4 ft. RT of SR 823 CL Date Drilled: 03/29/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 14.1' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)			
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40			
60	651.6						Medium hard to hard gray SANDSTONE; fine grained, moderately weathered, micaceous, moderately to slightly fractured. @ 62.3', contains argillaceous laminations, moderately to highly weathered.										
		Core 24"	Rec 24"	RQD 100%	R-6	*374											
65.0	646.6						Bottom of Boring - 65.0'										
70																	
75																	
80																	
85																	
90																	

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-53

Location: Sta. 106+21.7, 95.2 ft. LT of SR 823 CL

Date Drilled: 03/22/05 to 03/23/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 9.1' (3/23/05 am) 8.6' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40		
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay			
0	680.5						<p>DESCRIPTION</p> <p>Topsoil - 5"</p> <p>Medium dense brown SANDY SILT (A-4a), "and" gravel, little clay; contains sandstone fragments; damp.</p>									
-0.4	680.1	4	7	18	1											
3.5	677.0	39	27	9	1	2		Severely weathered brown SANDSTONE, argillaceous.								
5		6	8	17	18	3										
10.0	670.5	25 28 50/3	15 Rec 12"	15 Rec 12"	RQD 33%	R-1	<p>Medium hard to hard gray and brown SANDSTONE interbedded with SILTSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, broken with low to high angle fractures with clay infilling; contains argillaceous decomposed zones, few to moderate argillaceous laminations.</p> <p>@ 13.0'-14.0', argillaceous zone.</p> <p>@ 15.3'-15.7', 16.9'-17.7', high angle rust stained fractures.</p> <p>@ 17.7'-19.0', argillaceous zone.</p>									
15		Core 120"	Rec 120"	RQD 31%	R-2	*256										
19.0	661.5						<p>Medium hard to hard gray and brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, thinly bedded to medium bedded, broken to highly fractured, contains low angle fractures with clay infilling; contains few to moderate argillaceous laminations.</p> <p>@ 22.5'-23.5', broken zone.</p>									
25		Core 120"	Rec 120"	RQD 78%	R-3	*306	<p>@ 27.0', 27.2'-27.8', 28.1'-28.2', 29.3'-30.1' moderate to abundant argillaceous laminations.</p>									
30																

FILE: 0121-3070-03 [11/7/2007 9:49 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-53

Location: Sta. 106+21.7, 95.2 ft. LT of SR 823 CL

Date Drilled: 03/22/05 to 03/23/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 9.1' (3/23/05 am) 8.6' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)									
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ———— LL Blows per foot - ○ 10 20 30 40									
30	650.5						Medium hard to hard gray and brown SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, thinly bedded to medium bedded, highly fractured to broken, with low angle fractures, contains clay infilling; contains moderate argillaceous laminations. Soft to medium hard SANDSTONE interbedded with SHALE; fine grained to very fine grained, decomposed to highly weathered, thinly laminated to thinly bedded. @ 33.2'-34.9', broken, decomposed zone.																
33.2	647.3																						
35		Core 120"	Rec 120"	RQD 48%	R-4	*253																	
40.3	640.2						Hard gray SANDSTONE; very fine to fine grained, highly weathered to moderately weathered, argillaceous, highly fractured to moderately fractured.																
45.0	635.5	Core 48"	Rec 48"	RQD 92%	R-5	*339																	
							Bottom of Boring - 45.0'																
50																							
55																							
60																							

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-55

Location: Sta. 106+05.7, 188.4 ft. RT of SR 823 CL

Date Drilled: 5/11/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 2.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ----- LL Blows per foot - ○ 10 20 30 40								
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay									
0	591.7						No Topsoil / 2"-4" soil removed before drilling Severely weathered brown SANDSTONE, argillaceous.															
		15 27 50/3	11			1																
		36 50/3	7			2																50+
6.0	585.7						Hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, medium bedded, moderately fractured, discolored infilling. @ 9.1'-9.3', high angle fracture.															
		Core 60"	Rec 60"			RQD 63% R-1																
11.0	580.7						Bottom of Boring - 11.0'															
15																						
20																						
25																						
30																						

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-2037

Location: Sta. 84+54.5, 169.3 ft. RT of SR 823 CL

Date Drilled: 1/19/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring 34.6' (includes drilling water))	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
0.1	761.1																		
	761.0	8					Topsoil - 1"												
		17 27	12			1	Dense to very dense gray and brown COARSE AND FINE SAND (A-3a), some gravel; contains sandstone fragments; dry to damp.												
		13 35 43	13			2													
5	755.6	50/5	4			3	Severely weathered brown SANDSTONE, argillaceous.												
		37 50/1	6			4													
10.0	751.1	Core 30"	Rec 27"	RQD 60%	R-1	*145	Medium hard pinkish brown SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, thinly bedded to thickly bedded, moderately fractured to broken. @ 13.0'-13.6', broken.												
13.6	747.5	Core 120"	Rec 120"	RQD 78%	R-2	*299	Medium hard light brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, massive, moderately fractured. @ 14.5',15.9',17.0',17.3',20.0' 21.3',21.5', low angle rust stained fractures. @ 17.4'-17.5', decomposed zone. @ 18.5'-18.7', high angle fracture. @ 19.4'-21.3', qu = 2,969 psi SDI = 88.4%.												
		Core 120"	Rec 120"	RQD 78%	R-3	*513	@ 25.2', decomposed zone. @ 25.3'-26.8', very fine to medium grained sandstone. @ 26.8'-30.2', contains moderate argillaceous laminations.												
30																			

FILE: 0121-3070-03 [11/7/2007 9:49 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-2037

Location: Sta. 84+54.5, 169.3 ft. RT of SR 823 CL

Date Drilled: 1/19/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring 34.6' (includes drilling water))	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
30	731.1																		
32.4	728.7						Medium hard light brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, massive, moderately fractured. @ 30.2'-30.4', ferric band. @ 31.7'-32.1', near vertical fracture with iron staining.												
35.1	726.0	Core 120"	Rec 120"	RQD 78%	R-4	*116	Soft to hard gray and brown SHALE interbedded with SANDSTONE; moderately to highly weathered, micaceous, argillaceous, arenaceous, laminated to medium bedded, moderately to highly fractured. Soft to medium hard gray to dark gray SHALE; moderately weathered, thinly laminated, slightly fractured.												
41.4	719.7						@ 41.0'-42.5', qu = 5,662 psi SDI = 93.2%. Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, unfractured to slightly fractured.												
45		Core 120"	Rec 120"	RQD 100%	R-5	*867													
55		Core 120"	Rec 120"	RQD 100%	R-6	*2042	@ 56.5'-57.9', qu = 13,945 psi SDI = 99.0%.												
60																			

FILE: 0121-3070-03 [11/7/2007 9:49 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-2037

Location: Sta. 84+54.5, 169.3 ft. RT of SR 823 CL

Date Drilled: 1/19/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring 34.6' (includes drilling water))	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
60	701.1																		
		Core 120"	Rec 120"	RQD 100%	R-7	*1630													
65																			
		Core 120"	Rec 120"	RQD 100%	R-8	*1764	@ 77.5'-79.1', qu = 10,425 psi SDI = 97.8%.												
70																			
		Core 120"	Rec 120"	RQD 100%	R-9	*1555	@ 88.6', argillaceous band with low angle fracture.												
75																			
		Core 120"	Rec 120"	RQD 100%															
80																			
85																			
		Core 120"	Rec 120"	RQD 100%															
90																			

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-2037

Location: Sta. 84+54.5, 169.3 ft. RT of SR 823 CL

Date Drilled: 1/19/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / *Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring 34.6' (includes drilling water))	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
90	671.1																		
		Core 120"	Rec 120"	RQD 100%	R10	*1810	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, unfractured to slightly fractured. @ 92.0'-92.1', calcareous.												
95																			
100																			
105		Core 120"	Rec 120"	RQD 100%	R-11	*1065													
110							@ 111.0'-112.0', low angle fracture.												
112.5	648.6						Bottom of Boring - 112.5'												
115																			
120																			

Client: TranSystems, Inc. Project: SCI-823-0.00 Job No. 0121-3070.03

LOG OF: Boring PB-31 Location: Sta. 161+54.3, 163.1 ft. LT of SR 823 CL Date Drilled: 7/17/03 to 7/24/03

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 30.3' (includes drilling water, 7/23/03)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay							
0	881.9																			
-0.4	881.5	50/4	4	1			Topsoil - 5"													
		50/4	4	2			Very dense brown and light brown SANDY SILT (A-4a); damp. (decomposed sandstone)													
4.1	877.8																			
5		Core 66"	Rec 66"	RQD 74%	R-1		Soft to medium hard light brown, brown and light gray SANDSTONE; fine to coarse grained, thinly to medium bedded, poorly cemented, micaceous, moderately weathered, broken.													
10							@ 9.6'-19.9', very broken.													
15		Core 120"	Rec 114"	RQD 20%	R-2															
20																				
25		Core 120"	Rec 110"	RQD 88%	R-3		@ 22.6'-23.5', very broken.													
30							@ 29.6', argillaceous.													

FILE: 0121-3070-03 [11/7/2007 9:55 AM]

Client: TranSystems, Inc. Project: SCI-823-0.00 Job No. 0121-3070.03

LOG OF: Boring PB-31 Location: Sta. 161+54.3, 163.1 ft. LT of SR 823 CL Date Drilled: 7/17/03 to 7/24/03

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 30.3' (includes drilling water, 7/23/03)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40								
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay									
30	851.9						Soft to medium hard light brown, brown and light gray SANDSTONE; fine to coarse grained, thinly to medium bedded, poorly cemented, micaceous, moderately weathered, broken. Medium hard gray SHALE; thinly bedded to laminated, micaceous, slightly to moderately weathered, contains thin sandstone laminations. @ 45.0', interbedded shale and sandstone. Medium hard gray interbedded SHALE and SANDSTONE; thinly bedded to laminated, micaceous, moderately weathered. Soft dark gray to black SHALE; very thinly bedded to laminated, carbonaceous, broken, moderately to severely weathered, contains smooth polished fractures. Medium hard to hard gray and brown SANDSTONE; fine grained, micaceous, moderately weathered. Soft gray to black SHALE.															
35.2	846.7	Core 120"	Rec 103"	RQD 63%	R-4																	
45		Core 120"	Rec 120"	RQD 100%	R-5																	
50.0	831.9																					
54.3	827.6	Core 120"	Rec 109"	RQD 50%	R-6																	
55																						
57.4	824.5																					
58.5	823.4																					
60																						

FILE: 0121-3070-03 [11/7/2007 9:55 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring PB-31

Location: Sta. 161+54.3, 163.1 ft. LT of SR 823 CL

Date Drilled: 7/17/03 to 7/24/03

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 30.3' (includes drilling water, 7/23/03)	GRADATION						STANDARD PENETRATION (N)						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40						
60	821.9						Soft dark gray to black SHALE, very thinly bedded to laminated, carbonaceous, broken, moderately to severely weathered, contains smooth polished fractures. Medium hard light gray LIMESTONE; thinly to thickly bedded, slightly leached, mechanically broken. @ 69.6'-70.4', high angle clean fracture. @ 71.0'-71.3', black shale layer. Hard to very hard light gray SANDSTONE; fine grained, thinly to thickly bedded, unweathered to slightly weathered, contains argillaceous layers. @ 76.1', 77.0', low angle clean fractures. @ 78.9', clean, well cemented. @ 81.8', contains small brown grains and occasional small iron and pyrite inclusions. @ 85.1'-88.1', slightly argillaceous.													
		Core 60"	Rec 32"	RQD 20%	R-7															
65		Core 60"	Rec 30"	RQD 0%	R-8															
69.0	812.9																			
70		Core 60"	Rec 57"	RQD 62%	R-9															
72.5	809.4																			
75		Core 60"	Rec 60"	RQD 100%	R10															
80																				
85		Core 120"	Rec 116"	RQD 97%	R11															
90																				

FILE: 0121-3070-03 [11/7/2007 9:55 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring PB-31

Location: Sta. 161+54.3, 163.1 ft. LT of SR 823 CL

Date Drilled: 7/17/03 to 7/24/03

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 30.3' (includes drilling water, 7/23/03)	GRADATION						STANDARD PENETRATION (N)					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40					
90	791.9						Hard to very hard light gray SANDSTONE; fine grained, thinly to thickly bedded, unweathered to slightly weathered, contains argillaceous layers. @ 89.3'-94.4', slightly argillaceous. @ 101.0', contains small iron pyrite inclusions. @ 105.8'-106.1', high angle fracture. @ 106.1', near horizontal clay filled fracture. @ 111.9'-113.1', high angle fracture with small pyrite crystals.												
95		Core 120"	Rec 120"	RQD 100%	R-12														
105		Core 120"	Rec 116"	RQD 97%	R13														
115		Core 120"	Rec 118"	RQD 88%	R14														
120																			

FILE: 0121-3070-03 [11/7/2007 9:55 AM]

Client: TranSystems, Inc. Project: SCI-823-0.00 Job No. 0121-3070.03

LOG OF: Boring PB-31 Location: Sta. 161+54.3, 163.1 ft. LT of SR 823 CL Date Drilled: 7/17/03 to 7/24/03

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 30.3' (includes drilling water, 7/23/03)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40			
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay				
120	761.9																
125		Core 120"	Rec 120"	RQD 100%	R15		Hard to very hard light gray SANDSTONE; fine grained, thinly to thickly bedded, unweathered to slightly weathered, contains small iron pyrite inclusions.										
129.7	752.2						Medium hard to hard interbedded SHALE, SILTSTONE and SANDSTONE, very thin to thinly bedded, slightly to moderately weathered. @ 135.8'-136.0', contains limestone clasts. @ 136.0'-136.2', leached limestone layer.										
135		Core 120"	Rec 120"	RQD 100%	R16												
136.2	745.7						Hard gray SANDSTONE, fine grained, thinly to thickly bedded, unweathered to slightly weathered, contains occasional argillaceous clasts and laminations.										
140																	
145		Core 120"	Rec 120"	RQD 100%	R17												
150																	

FILE: 0121-3070-03 [11/7/2007 9:55 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring PB-31

Location: Sta. 161+54.3, 163.1 ft. LT of SR 823 CL

Date Drilled: 7/17/03

to 7/24/03

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 30.3' (includes drilling water, 7/23/03)	GRADATION						STANDARD PENETRATION (N)							
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40							
150	731.9						Hard gray SANDSTONE, fine grained, thinly to thickly bedded, unweathered to slightly weathered, contains occasional argillaceous clasts and laminations.														
155		Core 120"	Rec 120"	RQD 100%	R18																
160																					
165		Core 120"	Rec 120"	RQD 100%	R19																
170																					
175		Core 120"	Rec 120"	RQD 100%	R20		@ 173.1'-173.4', ironstone.														
180																					

FILE: 0121-3070-03 [11/7/2007 9:55 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring PB-31

Location: Sta. 161+54.3, 163.1 ft. LT of SR 823 CL

Date Drilled: 7/17/03 to 7/24/03

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 30.3' (includes drilling water, 7/23/03)	GRADATION						STANDARD PENETRATION (N)							
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40							
180	701.9						Hard gray SANDSTONE, fine grained, thinly to thickly bedded, unweathered to slightly weathered, contains occasional argillaceous clasts and laminations.														
185		Core 120"	Rec 120"	RQD 100%	R21																
190		Core 19"	Rec 19"	RQD 100%	R22																
191.2	690.7						Bottom of Boring - 191.2'														
195																					
200																					
205																					
210																					

FILE: 0121-3070-03 [11/7/2007 9:55 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-70

Location: Sta. 143+03.0, 247.2 ft. LT of SR 823 CL

Date Drilled: 3/4/05 to 3/7/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 21.1' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40				
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay					
0	767.5																	
0.6	766.9						Topsoil - 7"											
		5 8 11	18			1	4.5+											
		6 6 9	18			2	4.5+											
5		15 21 28	18			3	4.5+											
9.0	758.5	21 50/4	10			4	4.5+											
10							Severely weathered SANDSTONE.											
11.5	756.0	Core 30"	Rec 30"		RQD 72%	R-1	*16											
							Medium hard brown SANDSTONE; fine grained, highly weathered, argillaceous, micaceous, highly fractured, moderate to abundant argillaceous laminations.											
15																		
		Core 120"	Rec 120"		RQD 92%	R-2	*561											
							@ 17.7', interbedded with SILTSTONE and CLAYSTONE.											
20							@ 21.9'-22.2', decomposed CLAYSTONE.											
							@ 22.0', high angle fracture. @ 22.2'-22.5', broken zone. @ 23.0'-23.6', rust staining.											
23.6	743.9																	
25							Medium hard to hard gray SANDSTONE; fine grained, moderately weathered, micaceous, moderately fractured low angle fractures, contains few argillaceous laminations.											
		Core 120"	Rec 120"		RQD 85%	R-3	*317											
							@ 26.9'-27.3', low angle fracture.											
30																		

FILE: 0121-3070-03 [11/7/2007 9:55 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-70

Location: Sta. 143+03.0, 247.2 ft. LT of SR 823 CL

Date Drilled: 3/4/05 to 3/7/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 21.1' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	10	20	30	40		
30	737.5																		
							Hard gray SANDSTONE; very fine to fine grained, slightly weathered, micaceous, slightly fractured to unfractured, contains few argillaceous laminations.												
35																			
		Core 120"	Rec 120"	RQD 100%	R-4	*458													
40							@ 43.0'-45.5', slightly fractured with fractures low angle.												
45																			
		Core 120"	Rec 120"	RQD 100%	R-5	*354	@ 46.7', silty seam.												
50							@ 48.1'-48.4', IRONSTONE												
55																			
		Core 120"	Rec 120"	RQD 100%	R-6	*308													
60																			

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-70

Location: Sta. 143+03.0, 247.2 ft. LT of SR 823 CL

Date Drilled: 3/4/05 to 3/7/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 21.1' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
90	677.5																		
							Medium hard to hard gray SANDSTONE; fine grained, slightly weathered, micaceous, slightly fractured. @ 91.3', silt and clay filled low angle fracture.												
95							@ 95.9'-96.2', thinly laminated SHALE interbeds.												
		Core 120"	Rec 120"	RQD 100%	R10	*477	@ 98.0'-98.4', contains abundant argillaceous laminations.												
100							@ 102.6', high angle fracture.												
105		Core 120"	Rec 120"	RQD 98%	R11	*216	@ 106.0'-106.3', high angle fracture. @ 106.3'-111.6, contains moderate to abundant argillaceous laminations turbidity bedded.												
110							@ 109.5'-111.0', $q_u = 7,588$ psi, $SDI = 89.0\%$.												
115		Core 120"	Rec 120"	RQD 100%	R12	*351	@ 114.4'-115.8', contains moderate argillaceous laminations.												
120																			

Client: TranSystems, Inc. Project: SCI-823-0.00 Job No. 0121-3070.03

LOG OF: Boring R-70 Location: Sta. 143+03.0, 247.2 ft. LT of SR 823 CL Date Drilled: 3/4/05 to 3/7/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 21.1' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)										
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40										
120	647.5																							
		Core 120"	Rec 120"	RQD 100%	R13	*645																		
						@ 130.5'-131.1', qu = 9,892 psi.																		
		Core 120"	Rec 120"	RQD 100%	R14	*504																		
		Core 84"	Rec 84"	RQD 100%	R15	*615																		
150.0	617.5					Bottom of Boring - 150.0'																		

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-72

Location: Sta. 143+31.6, 71.5 ft. RT of SR 823 CL

Date Drilled: 3/10/05 to 3/10/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 21.5' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
0	664.3																		
0.3	664.0						Topsoil - 4"												
		4				4.5	Hard brown SANDY SILT (A-4a), little clay, little gravel; damp.												
		4	3	13															
3.0	661.3					4.5+	Very stiff to hard brown SILTY CLAY (A-6b), some fine to coarse sand, little gravel; contains rock fragments; damp. @ 3.5'-5.0', reddish brown.												
		3	4	18															
		5																	
		3	5	18		2.25													
		6																	
		7	12	18		4.5+													
10.0	654.3					4.5+	Very stiff to hard brown and gray SANDY SILT (A-4a), some clay, trace gravel; contains sandstone fragments; damp.	1	14	--	38	25	22						
		9	11	18															
		6	7	18		2.75													
		8	10	18		2.25													
		11	6	18		2.5													
		8	9	18		4.5													
		7	8	18		4.5+													
25.0	639.3						Soft to medium hard brownish gray SANDSTONE; very fine to fine grained, decomposed, argillaceous, thinly bedded, broken, contains clay filled fractures. @ 26.0'-31.6', lost recovery.												
		Core 96"	Rec 29"	RQD 16%	R-1														
30																			

FILE: 0121-3070-03 [11/7/2007 9:55 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-72

Location: Sta. 143+31.6, 71.5 ft. RT of SR 823 CL

Date Drilled: 3/10/05 to 3/10/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 21.5' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)								
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ———— LL Blows per foot - ○ 10 20 30 40								
30	634.3						Soft to medium hard brownish gray SANDSTONE; very fine to fine grained, decomposed, argillaceous, thinly bedded, broken, contains clay filled fractures. @ 33.6'-37.1', lost recovery. Medium hard brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, highly fractured, with low angle clay filled fractures. @ 37.5'-37.9', broken zones. Hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured. @ 43.0'-43.2', broken zones.															
37.1	627.2	Core 120"	Rec 79"	RQD 27%	R-2	*492																
39.1	625.2																					
40																						
45		Core 120"	Rec 120"	RQD 98%	R-3	*409																
50																						
55.0	609.3	Core 24"	Rec 24"	RQD 100%	R-4	*617																
							Bottom of Boring - 55.0'															
60																						

FILE: 0121-3070-03 [11/7/2007 9:55 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-73

Location: Sta. 147+21.6, 50.4 ft. LT of SR 823 CL

Date Drilled: 3/2/05 to 3/3/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 42.8' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40				
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay					
0	837.5						Topsoil - 3"											
0.3	837.2	5						Medium dense to dense reddish brown and gray SANDY SILT (A-4a), little gravel; contains sandstone fragments; relic rock structure; damp.										
		8 15	18			1												
3.5	834.0	47				2	Severely weathered SANDSTONE.											
		34 50/4	16															
5	832.0						Soft to medium hard light brown SANDSTONE; very fine to fine grained, highly weathered to decomposed, broken to highly fractured with typical low angle fracture. @ 5.5'-6.1', broken zone. @ 7.2'-7.4', high angle fracture. @ 8.6'-8.8', high angle fracture with clay fill. @ 10.1'-10.2', high angle fracture with clay fill.											
5.5				Core 90"	Rec 90"	RQD 41%		R-1	*222									
10																		
15							@ 14.0'-14.2', broken zone.											
				Core 120"	Rec 120"	RQD 38%	R-2	*167										
20							@ 16.4'-16.5', high angle fracture, iron staining. @ 17.0'-17.6', broken zone.											
23.2	814.3						@ 22.2'-22.4', high angle fracture, iron staining.											
24.1	813.4						Soft brownish gray SILTSTONE; decomposed.											
25							Soft dark gray to black SHALE; highly weathered to decomposed, arenaceous, carbonaceous, highly fractured.											
				Core 120"	Rec 120"	RQD 100%	R-3	*57										
30							@ 28.3'-28.7', qu = 1,402 psi.											

FILE: 0121-3070-03 [11/7/2007 9:55 AM]

Client: TranSystems, Inc. Project: SCI-823-0.00 Job No. 0121-3070.03

LOG OF: Boring R-73 Location: Sta. 147+21.6, 50.4 ft. LT of SR 823 CL Date Drilled: 3/2/05 to 3/3/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 42.8' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)									
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40									
30	807.5						DESCRIPTION																
35.3	802.2							Soft dark gray to black SHALE; highly weathered to decomposed, arenaceous, carbonaceous, highly fractured. @ 30.5'-31.5', SDI = 4.1%. @ 33.0', gray. @ 34.0', gray, decomposed. @ 35.1', black, carbonaceous.															
41.1	796.4							Soft light gray SHALE; highly weathered to decomposed, arenaceous, highly fractured. @ 36.4', carbonaceous layer. @ 37.0'-38.0', occasional iron staining. @ 39.9'-40.8', coal blossom.															
42.3	795.2							Medium hard gray SILTSTONE; highly weathered, arenaceous, highly fractured.															
43.0	794.5							Soft light gray SHALE; highly weathered to decomposed, arenaceous, highly fractured.															
45								Medium hard light gray SANDSTONE; medium to fine grained, highly weathered, moderately to highly fractured. @ 45.3', argillaceous, grayish brown.															
50								@ 48.8', gray, medium hard to hard. @ 50.1', light gray sandstone with IRON STONE inclusion, occasional carbonaceous interbeds. @ 52.5', light gray with carbonaceous interbeds.															
55																							
56.1	781.4							Soft dark gray SHALE; decomposed to highly weathered, carbonaceous, highly fractured. @ 58.2'-59.0', SDI = 0.0%.															
60																							

FILE: 0121-3070-03 [11/7/2007 9:55 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-73

Location: Sta. 147+21.6, 50.4 ft. LT of SR 823 CL

Date Drilled: 3/2/05 to 3/3/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 42.8' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ———— LL Blows per foot - ○ 10 20 30 40						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay							
60	777.5						DESCRIPTION													
60.8	776.7							Soft grayish brown SILTSTONE; highly weathered, argillaceous, contains moderate to abundant argillaceous laminations. @ 64.3', low angle fracture.												
64.3 65	773.2							Hard gray SANDSTONE; argillaceous, moderately to highly weathered, contains turbidity bedding, slightly fractured, contains few argillaceous interbedded.												
70		Core 120"	Rec 120"	RQD 100%	R-7	*376	@ 75.7', 80.5'-85.5' moderate to few argillaceous laminations. @ 85.5'-92.7' moderate to abundant argillaceous.													
75		Core 120"	Rec 120"	RQD 100%	R-8	*460	@ 78.5', clay seam low angle fracture.													
80							@ 84.5'-85.5', SDI = 83.5%.													
85		Core 120"	Rec 120"	RQD 95%	R-9	*561	@ 86.5', 86.7', 86.9', 87.0', clay filled fracture. @ 89.0'-89.2', iron stained.													
90																				

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-73

Location: Sta. 147+21.6, 50.4 ft. LT of SR 823 CL

Date Drilled: 3/2/05 to 3/3/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 42.8' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40					
90.0	747.5																		
92.1	745.4						Medium hard to hard gray SILTSTONE interbedded with very fine grain SANDSTONE; highly weathered, highly fractured. @ 91.5'-91.9', qu = 9,309 psi.												
95							Hard gray SANDSTONE; very fine to fine grained, slightly weathered, micaceous, argillaceous, thinly bedded to thickly bedded, contains few argillaceous laminations, slightly fractured to unfractured.												
100		Core 120"	Rec 120"	RQD 100%	R10	*623													
105		Core 120"	Rec 120"	RQD 100%	R11	*501													
110		Core 120"	Rec 120"	RQD 100%	R12	*483													
115		Core 120"	Rec 120"	RQD 100%															
120		Core 120"	Rec 120"	RQD 100%															

FILE: 0121-3070-03 [11/7/2007 9:55 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-73

Location: Sta. 147+21.6, 50.4 ft. LT of SR 823 CL

Date Drilled: 3/2/05 to 3/3/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 42.8' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40			
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay				
120	717.5						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, micaceous, argillaceous, thinly bedded to thickly bedded, slightly fractured to unfractured, contains few argillaceous laminations. @ 125.0'-125.4', qu = 8,085 psi. @ 130.5', turbidity bedded, moderate to few argillaceous laminations. @ 143.5'-144.1', argillaceous very fine grained zone.										
125																	
130		Core 120"	Rec 120"	RQD 100%	R13	*460											
135		Core 120"	Rec 120"	RQD 100%	R14	*592											
140		Core 120"	Rec 120"	RQD 100%	R15	*423											
145		Core 120"	Rec 120"	RQD 100%													
150																	

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-73

Location: Sta. 147+21.6, 50.4 ft. LT of SR 823 CL

Date Drilled: 3/2/05 to 3/3/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 42.8' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ─────────── LL Blows per foot - ○ 10 20 30 40							
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay								
150	687.5						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, micaceous, argillaceous, thinly bedded to thickly bedded, slightly fractured, contains few argillaceous laminations.														
		Core 120"	Rec 120"	RQD 100%	R16	*539															
155																					
160							Hard gray SANDSTONE; argillaceous, micaceous, slightly fractured, contains turbidity bedding, moderate argillaceous interbedding.														
		Core 120"	Rec 120"	RQD 100%	R17	*490															
165																					
170							Hard gray SANDSTONE; argillaceous, micaceous, slightly fractured, contains turbidity bedding, moderate argillaceous interbedding.														
		Core 120"	Rec 120"	RQD 100%	R18	*345															
175																					
177.3	660.2																				
180																					

FILE: 0121-3070-03 [11/7/2007 9:55 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-73

Location: Sta. 147+21.6, 50.4 ft. LT of SR 823 CL

Date Drilled: 3/2/05 to 3/3/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 42.8' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)							
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40							
180	657.5						DESCRIPTION														
								Hard gray SANDSTONE; slightly fractured, argillaceous, micaceous, contains turbidity bedding and moderate argillaceous interbedding.													
185.0	652.5			Core 120"	Rec 120"	RQD 100%		*263													
							Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured.														
190																					
				Core 24"	Rec 24"	RQD 100%	*558														
195.0	642.5						Bottom of Boring - 195.0'														
200																					
205																					
210																					

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-74

Location: Sta. 148+91.8, 66.8 ft. RT of SR 823 CL

Date Drilled: 03/01/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 57.8' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40			
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay				
0	862.3																
0.3	862.0	2				2.5	Topsol - 4"										
		6	18				Very stiff light brown SILT AND CLAY (A-6a), little to some fine to coarse sand; damp.										
3.5	858.8	40	6			2	Very dense light brown COARSE AND FINE SAND (A-3a), little clay; contains roots; dry to damp.										
		50/1															
6.5	855.8					*30	Soft to medium hard brown SANDSTONE; fine grained, highly weathered to decomposed, argillaceous, micaceous, thinly bedded to thickly bedded, highly fractured, with typically low angle rust stained fractures.										
		Core 42"	Rec 27"	RQD 0%	R1		@ 10.0'-10.8', broken zone.										
15		Core 120"	Rec 73"	RQD 28%	R2	*21											
18.2	844.1						Soft to medium hard brown and gray SANDSTONE interbedded with SHALE; very fine grained, highly weathered to decomposed, argillaceous, thinly bedded, highly fractured, with typically low angle clay filled fractures.										
25		Core 120"	Rec 120"	RQD 39%	R3	*219											
30																	

FILE: 0121-3070-03 [11/7/2007 9:55 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-74

Location: Sta. 148+91.8, 66.8 ft. RT of SR 823 CL

Date Drilled: 03/01/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 57.8' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40		
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay			
30	832.3						<p><i>DESCRIPTION</i></p> <p>Soft to medium hard brown and gray SANDSTONE interbedded with SHALE; very fine grained, highly weathered to decomposed, argillaceous, thinly bedded, highly fractured, with typically low angle clay filled fractures.</p> <p>@ 32.6'-34.3' brown fine grained SANDSTONE bed.</p> <p>@ 33.1'-34.3', high angle rust stained fracture.</p>									
35		Core 120"	Rec 120"	RQD 53%	R4	*124										
40.0	822.3							<p>Soft to medium hard gray SHALE; highly weathered to decomposed, argillaceous.</p> <p>@ 40.0'-41.0', broken zone.</p> <p>@ 42.5'-42.8', high angle rust stained fracture.</p>								
45		Core 120"	Rec 120"	RQD 80%	R5	*48										
46.5	815.8						<p>Medium hard gray SHALE; moderately to highly weathered, micaceous, carbonaceous, thinly laminated to thinly bedded.</p> <p>@ 46.7'-47.1', qu = 1,911 psi.</p> <p>@ 48.3'-48.7', high angle rust stained fracture.</p> <p>@ 49.0'-50.0', SDI = 5.6%.</p> <p>@ 50.3'-52.7', contains abundant arenaceous laminations.</p>									
50																
52.7	809.6						<p>Medium hard dark gray SANDSTONE; very fine to fine grained, moderately weathered, micaceous, argillaceous, thinly bedded to thickly bedded, contains abundant argillaceous laminations.</p> <p>@ 52.5'-53.2', 56.2'-56.4', high angle rust stained fractures.</p> <p>@ 58.8'-59.4' carbonaceous SHALE bed.</p>									
55		Core 120"	Rec 106"	RQD 76%	R6	*258										
59.4	802.9															

FILE: 0121-3070-03 [11/7/2007 9:55 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-74

Location: Sta. 148+91.8, 66.8 ft. RT of SR 823 CL

Date Drilled: 03/01/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 57.8' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay							
60	802.3						Soft to medium hard gray SILTSTONE; highly weathered to decomposed, argillaceous.													
63.3	799.0							Medium hard gray SANDSTONE; fine grained, moderately weathered, argillaceous, thinly bedded to thickly bedded, occasional COAL stringers. @ 59.4'-60.0',60.0'-60.2',61.0'- 63.0',70.0'-70.8', broken zones. @ 60.7'-60.8',65.6'-66.0',67.0', high angle fractures.												
65		Core 120"	Rec 120"	RQD 53%	R7															
70								@ 64.8'-66.0', moderate to abundant argillaceous zones. @ 72.5'-72.8', high angle fracture. @ 70.0'-70.9', decomposed zone. @ 75.9'-76.2', broken zone. @ 78.9'-80.7', argillaceous zone, broken.												
75		Core 120"	Rec 120"	RQD 59%	R8															
80							Soft gray SHALE and SILTSTONE; decomposed, argillaceous, carbonaceous. @ 81.4'-81.9', broken zones.													
80.7	781.6																			
85		Core 120"	Rec 111"	RQD 71%	R9		@ 83.4'-83.6', coal blossoms.													
86.3	776.0						Hard gray SANDSTONE; very fine to fine grained, highly to moderately weathered, micaceous, argillaceous, thinly to thickly bedded, moderately to slightly fractured.													
90																				

FILE: 0121-3070-03 [11/7/2007 9:55 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-74

Location: Sta. 148+91.8, 66.8 ft. RT of SR 823 CL

Date Drilled: 03/01/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 57.8' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ●					
							DESCRIPTION						PL ————— LL						
													Blows per foot - ○						
													10	20	30	40			
90	772.3						Hard gray SANDSTONE; very fine to fine grained, moderately weathered, micaceous, argillaceous, thinly to thickly bedded.												
95		Core 120"	Rec 120"	RQD 88%	R10		@ 95.6', low angle clay filled fracture.												
100																			
105		Core 120"	Rec 120"	RQD 100%	R11														
110																			
110.5	751.8						Hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, micaceous, argillaceous, thinly laminated to thinly bedded, moderately fractured, with typically low angle clay filled fractures, contains moderate argillaceous laminations.												
115		Core 120"	Rec 120"	RQD 85%	R12		@ 116.1'-118.0', fine to coarse grained.												
118.0	744.3																		
120							Hard gray SANDSTONE, very fine to fine grained. @ 119.5', 119.7', low angle clay filled fractures.												

FILE: 0121-3070-03 [11/7/2007 9:55 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-74

Location: Sta. 148+91.8, 66.8 ft. RT of SR 823 CL

Date Drilled: 03/01/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 57.8' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)				
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ———— LL Blows per foot - ○ 10 20 30 40				
120	742.3						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, micaceous, argillaceous, massive to thickly bedded, slightly fractured to unfractured. @ 143.3', contains few argillaceous laminations. @ 143.7',143.8',143.9', low angle fractures.											
125		Core 120"	Rec 120"	RQD 94%	R13													
130		Core 60"	Rec 60"	RQD 100%	R14													
135		Core 84"	Rec 84"	RQD 100%	R15	*475												
140																		
145		Core 120"	Rec 120"	RQD 98%	R16	*525												
150																		

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-74

Location: Sta. 148+91.8, 66.8 ft. RT of SR 823 CL

Date Drilled: 03/01/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 57.8' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40												
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay													
150	712.3						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, micaceous, argillaceous, thinly bedded to thickly bedded.																			
		Core 120"	Rec 120"	RQD 100%	R17	*546																				
		Core 120"	Rec 120"	RQD 100%	R18	*630																				
		Core 120"	Rec 120"	RQD 100%	R19	*497																				

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-74

Location: Sta. 148+91.8, 66.8 ft. RT of SR 823 CL

Date Drilled: 03/01/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 57.8' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)							
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40							
180	682.3						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, micaceous, argillaceous, thinly bedded to thickly bedded. @ 192.8'-194.0', 194.7'-195.8', 199.9'-205.0', contains moderate argillaceous laminations.														
		Core 120"	Rec 120"	RQD 100%	R20	*236															
		Core 120"	Rec 120"	RQD 100%	R21	*486															
		Core 36"	Rec 36"	RQD 100%	R22																
205.0	657.3						Bottom of Boring - 205.0'														
210																					

FILE: 0121-3070-03 [11/7/2007 9:55 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-78

Location: Sta. 152+94.6, 60.7 ft. LT of SR 823 CL

Date Drilled: 11/17/04 to 11/22/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay							
0.2	877.1																			
	876.9						Topsoil - 2"													
		1				1.0	Medium stiff brown SILT AND CLAY (A-6a), trace fine to coarse sand; contains roots; moist.													
		2	18																	
3.0	874.1						Severely weathered SANDSTONE.													
		7																		
		12																		
		18	18			2														
5																				
		9																		
		50/5	6			3														
		50/2	0			4														
10.0	867.1						Medium hard brown SANDSTONE; fine to coarse grained, highly weathered, poorly cemented, argillaceous, micaceous, thinly bedded to thickly bedded, moderately fractured, with typically low angle rust stained fractures.													
		Core 120"	Rec 100"	RQD 78%	R-1	*118	@ 10.0'-10.2',20.0'-20.3', broken zones.													
							@ 11.4'-11.5',21.8'-21.9', high angle fractures.													
15																				
20																				
21.9	855.2						Soft to medium hard gray SHALE interbedded with SANDSTONE; very fine to fine grained, highly weathered, mostly weathered SHALE turbidity interbedded, argillaceous, thinly bedded, moderately fractured, with typically low angle clay filled fractures.													
		Core 120"	Rec 120"	RQD 85%	R-2		@ 27.0'-27.5', qu = 533 psi.													
							@ 28.2'-29.2', SDI = 58.4%.													
25																				
30																				

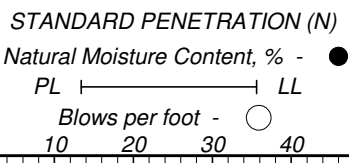
FILE: 0121-3070-03 [11/17/2007 9:55 AM]

Client: TranSystems, Inc.				Project: SCI-823-0.00				Job No. 0121-3070.03											
LOG OF: Boring R-78				Location: Sta. 152+94.6, 60.7 ft. LT of SR 823 CL				Date Drilled: 11/17/04 to 11/22/04											
Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / *Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (includes drilling water)	GRADATION											
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
DESCRIPTION							STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ─────────── LL Blows per foot - ○ 10 20 30 40												
30	847.1						Soft to medium hard gray SHALE interbedded with SANDSTONE; very fine to fine grained, highly weathered, mostly weathered SHALE turbidity interbedded, argillaceous, thinly bedded, moderately fractured, with typically low angle clay filled fractures.												
35		Core 120"	Rec 120"	RQD 59%	R-3	*98													
40.3	836.8						Soft to medium hard gray SANDSTONE; very fine to fine grained, highly weathered, argillaceous, thinly bedded, moderately fractured, with typically low angle clay filled fractures. @ 42.8', turbidity interbeds diminish (light grey fine grained SANDSTONE). @ 40.3'-42.7', abundant argillaceous laminations. @ 45.2'-45.6', qu = 7,568 psi. @ 42.7', moderate to few argillaceous laminations.												
45		Core 120"	Rec 120"	RQD 95%	R-4	*276													
49.5	827.6						COAL Soft to medium hard gray SHALE; highly weathered to decomposed, argillaceous, highly fractured, with typically low angle clay filled fractures. @ 51.1'-51.5', broken zone.												
50.3	826.8																		
54.8	822.3	Core 120"	Rec 120"	RQD 74%	R-5	*55	Medium hard gray SANDSTONE interbedded with SILTSTONE; very fine to medium grained, moderately to highly weathered, argillaceous, thinly bedded, moderately fractured, with typically low angle fractures. Medium hard gray to reddish gray SANDSTONE; fine grained, highly weathered, argillaceous, thickly bedded.												
56.7	820.4																		
59.5	817.6																		

FILE: 0121-3070-03 [11/17/2007 9:55 AM]

Client: TranSystems, Inc.		Project: SCI-823-0.00					Job No. 0121-3070.03													
LOG OF: Boring R-78				Location: Sta. 152+94.6, 60.7 ft. LT of SR 823 CL					Date Drilled: 11/17/04 to 11/22/04											
Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / *Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (includes drilling water)	GRADATION												
				Drive	Press / Core			DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
60	817.1																			
63.1	814.0																			
65		Core 120"	Rec 109"	RQD 58%	R-6	*385	Medium hard to hard dark gray to black SHALE; very fine to fine grained, moderately weathered, argillaceous, carbonaceous, thinly laminated.													
65							Soft to medium hard gray and red SILTSTONE; moderately to highly weathered, argillaceous, contains slickensides in high angle fractures.													
65							@ 63.2'-64.2', SDI = 93.5%.													
65							@ 66.1'-66.8', broken zone.													
65							@ 69.1'-70.0', lost recovery.													
65							@ 70.0'-74.0', medium bedded, slightly fractured.													
74.0	803.1																			
75		Core 120"	Rec 120"	RQD 91%	R-7	*369	Medium hard red and grey SILTSTONE interbedded with CLAYSTONE; moderately to highly weathered, very arenaceous, turbid, with slicken sides on high angle fractures.													
75							@ 75.0'-75.5', qu = 7,932 psi.													
75							@ 75.6'-75.8', 76.7'-76.9', high angle fractures.													
75							@ 77.0'-77.5', qu = 6,413 psi.													
75							@ 77.5'-77.8', 79.0'-79.3', broken zones.													
75							@ 70.0'-73.0' light brown very fine grained SANDSTONE, SILTSTONE lenses													
75							@ 80.0'-90.0', SDI = 53.0%.													
85		Core 120"	Rec 120"	RQD 94%	R-8	*516	@ 80.7'-80.8', 82.3'-82.7', 85.3' high angle fractures.													
90																				

FILE: 0121-3070-03 [11/17/2007 9:55 AM]



Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-78

Location: Sta. 152+94.6, 60.7 ft. LT of SR 823 CL

Date Drilled: 11/17/04 to 11/22/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (includes drilling water)	GRADATION						STANDARD PENETRATION (N)					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ●		Blows per foot - ○			
															10	20	30	40	
90	787.1																		
91.8	785.3						Medium hard red and grey SILTSTONE interbedded with CLAYSTONE; turbid, arenaceous.												
95		Core 120"	Rec 120"	RQD 94%	R-9	*280	Hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded.												
96.4	780.7						Medium hard red SILTSTONE; highly weathered, arenaceous, slickensides. @ 96.4'-96.6', 97.3'-97.6', high angle fractures.												
98.9	778.2						Medium hard gray SANDSTONE; fine to medium grained, highly weathered, highly argillaceous, calcareous, thinly bedded to massive, highly fractured, poorly cemented, with typical low angle fractures.												
103.7	773.4						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded.												
105		Core 120"	Rec 120"	RQD 87%	R10	*631													
110																			
115		Core 120"	Rec 120"	RQD 100%	R11	*467													
120																			

FILE: 0121-3070-03 [11/17/2007 9:55 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-78

Location: Sta. 152+94.6, 60.7 ft. LT of SR 823 CL

Date Drilled: 11/17/04 to 11/22/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (includes drilling water)	GRADATION						STANDARD PENETRATION (N)							
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40							
120	757.1																				
		Core 120"	Rec 120"	RQD 100%	R12	*351	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded. @ 120.0'-129.3' very fine grained, argillaceous. @ 129.3'-130.5' SHALE like lamination														
130.5	746.6																				
		Core 120"	Rec 120"	RQD 100%	R13	*600	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive to thickly bedded, slightly fractured to unfractured, contains few argillaceous laminations.														
145		Core 120"	Rec 120"	RQD 100%	R14	*646															

FILE: 0121-3070-03 [11/17/2007 9:55 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-78

Location: Sta. 152+94.6, 60.7 ft. LT of SR 823 CL

Date Drilled: 11/17/04

to 11/22/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ----- LL Blows per foot - ○																	
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	10	20	30	40														
150	727.1																														
155		Core 120"	Rec 120"	RQD 100%	R15	*513																									
160																															
165		Core 120"	Rec 120"	RQD 100%	R16	*641																									
170							@ 169.0'-169.6', qu = 10,461 psi.																								
175		Core 120"	Rec 120"	RQD 100%	R17	*430																									
180																															

FILE: 0121-3070-03 [11/17/2007 9:55 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-78

Location: Sta. 152+94.6, 60.7 ft. LT of SR 823 CL

Date Drilled: 11/17/04

to

11/22/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (includes drilling water)	GRADATION						STANDARD PENETRATION (N)					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ─────────────────── LL Blows per foot - ○					
180	697.1																		
185		Core 120"	Rec 120"	RQD 100%	R18	*467	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive to thickly bedded, slightly fractured to unfractured, contains few argillaceous laminations. @ 180.9'-181.1', 181.4' argillaceous zone.												
190																			
195		Core 120"	Rec 120"	RQD 100%	R19	*451													
200																			
205		Core 120"	Rec 120"	RQD 100%	R20	*467													
210																			

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-78

Location: Sta. 152+94.6, 60.7 ft. LT of SR 823 CL

Date Drilled: 11/17/04

to 11/22/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / *Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○										
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	10	20	30	40							
210.0	667.1 667.1				RQD 100%	R21	*561																	
		Core 60"	Rec 60"																					
215.0	662.1																							
							Bottom of Boring - 215.0'																	
220																								
225																								
230																								
235																								
240																								

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-80

Location: Sta. 156+98.7, 222.0 ft. LT of SR 823 CL

Date Drilled: 11/11/04 to 11/15/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 8.3' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay							
0	804.4																			
0.3	804.1						Topsoil - 4"													
		2 4 6	18	1		2.5	Very stiff light brown SANDY SILT (A-4a), some gravel, trace clay; contains sandstone fragments; damp.													
4.0	800.4	9 37 31	18	2			Severely weathered SANDSTONE.													
5		12 50/2	6	3																
6.5	797.9						Soft to medium hard brown SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, thinly bedded to thickly bedded, highly fractured, with typically low angle rust stained fractures. @ 7.0'-9.0', 11.0'-11.5', argillaceous zone (decomposed Shale). @ 10.9'-11.2', 12.0'-12.1', high angle rust stained fractures.													
10		Core 48"	Rec 48"		RQD 69%	R1	*19													
13.6	790.8						Hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured. @ 16.6', 17.7', 17.8', argillaceous zones with low angle rust stained fractures. @ 18.2', 19.6', 24.9', argillaceous zones with low angle clay filled fractures.													
15		Core 120"	Rec 120"		RQD 87%	R2	*394													
20																				
25		Core 120"	Rec 120"		RQD 100%	R3	*445													
30							@ 23.4'-24.2', broken zone containing abundant argillaceous laminations.													

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-80

Location: Sta. 156+98.7, 222.0 ft. LT of SR 823 CL

Date Drilled: 11/11/04

to 11/15/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 8.3' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○						
30.0	774.4 774.4																			
35		Core 120"	Rec 120"	RQD 100%	R4	*576	Hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured.													
40							@ 45.5'-47.0', contains very fine grained zone with moderate argillaceous laminations. @ 49.7'-50.0', contains very fine grain zone with moderate argillaceous laminations.													
45		Core 120"	Rec 120"	RQD 100%	R5	*631														
50.0	754.4						Hard gray SANDSTONE; very fine grained, slightly weathered, argillaceous, micaceous, thinly laminated to thinly bedded, slightly fractured, contains abundant to moderate argillaceous (SILTSTONE) laminations.													
55		Core 120"	Rec 120"	RQD 100%	R6	*445	@ 53.8'-54.2', qu = 7,492 psi. @ 56.5', low angle clay filled fracture.													
56.9	747.5						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly to thickly bedded, slightly fractured.													
60							@ 59.5'-60.5', SDI = 1.7%.													

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-80

Location: Sta. 156+98.7, 222.0 ft. LT of SR 823 CL

Date Drilled: 11/11/04 to 11/15/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / *Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 8.3' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ———— LL Blows per foot - ○ 10 20 30 40						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay							
90	714.4																			
95		Core 120"	Rec 120"	RQD 97%	R10	*628														
100							@ 98.2'-98.6', qu = 10,939 psi.													
105		Core 120"	Rec 120"	RQD 100%	R11	*443														
110																				
115		Core 114"	Rec 114"	RQD 100%	R12	*435														
120.0	684.4						Bottom of Boring - 120.0'													

FILE: 0121-3070-03 [11/7/2007 9:55 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-81

Location: Sta. 156+89.8, 36.4 ft. LT of SR 823 CL

Date Drilled: 11/16/04

to 11/17/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 1.0' Water level at completion: 6.4' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
0.3	862.3						Topsoil - 3" Very stiff brown SILT AND CLAY (A-6a); moist.												
	862.0	1 3	18			2.5													
3.0	859.3	1 5	18				Medium dense brown COARSE AND FINE SAND (A-3a), trace clay; possible weathered sandstone; damp.												
5		5 7	18																
		12 13	18																
10		10																	
11.5	850.8	17 44	16				Severely weathered SANDSTONE.												
		50/5																	
15		28 40	14				Soft to medium hard gray SHALE interbedded with SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, thinly bedded, highly fractured, with typical low angle clay filled fractures, turbidity interbedded with silt and clay size grains, poorly cemented orange/grey. @ 20.0'-30.0', SDI = 76.5%.												
		50/5																	
17.0	845.3	30 50/1	6																
20		Core 36"	Rec 36"		RQD 42%	R1													
25		Core 120"	Rec 120"		RQD 57%	R2		*338											
26.5	835.8						Hard gray SANDSTONE; fine to medium grained, highly weathered, argillaceous, medium bedded, highly fractured to broken, turbidity bedding.												
30																			

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-81

Location: Sta. 156+89.8, 36.4 ft. LT of SR 823 CL

Date Drilled: 11/16/04 to 11/17/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 1.0' Water level at completion: 6.4' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40					
30.0	832.3 832.3-																		
35		Core 120"	Rec 120"	RQD 54%	R3	*96	Soft to medium hard gray and brown SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, thinly bedded, highly fractured, with typically low angle clay filled fractures, turbidity interbedded with argillaceous laminations, poorly cemented SILT. @ 34.6'-35.7', silt seam. @ 35.7'-36.6', light gray, moderately weathered, thickly bedded. @ 36.6'-37.6', CLAYSTONE seam. @ 37.6'-43.7', fine to medium grained, massive. @ 38.9'-39.3', broken zone.												
43.7 44.2	818.6 818.1	Core 120"	Rec 120"	RQD 30%	R4	*46	Medium hard black COAL; highly weathered, thinly bedded. Soft to medium hard gray and red SILTSTONE; highly weathered to decomposed, argillaceous, shaley zones laminated to thinly bedded. @ 48.0'-48.3', broken zone.												
50.3	812.0																		
55		Core 120"	Rec 120"	RQD 93%	R5	*658	Medium hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded. @ 50.3'-60.0', SDI = 87.6%. @ 50.5', 50.6', 51.2', low angle clay filled fractures. @ 50.7'-50.9', CLAYSTONE interbedded, contains poorly cemented, medium grained interbeds. @ 59.0'-59.4', qu = 14,914 psi.												
60																			

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-81

Location: Sta. 156+89.8, 36.4 ft. LT of SR 823 CL

Date Drilled: 11/16/04 to 11/17/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 1.0' Water level at completion: 6.4' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ———— LL Blows per foot - ○ 10 20 30 40						
60	802.3						Medium hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded, moderately fractured. @ 65.6'-67.7', abundant argillaceous laminations. @ 66.8',74.0', low angle clay filled fractures. @ 69.8'-70.8', abundant to moderate argillaceous laminations. @ 73.5', argillaceous laminations.													
65		Core 120"	Rec 120"	RQD 97%	R6	*571														
70																				
74.0	788.3						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured. @ 78.7'-79.1', abundant argillaceous laminations. @ 80.1'-80.9', 85.5'-85.8', very fine grained.													
75		Core 120"	Rec 120"	RQD 100%	R7	*595														
80																				
85		Core 120"	Rec 120"	RQD 100%	R8	*515														
90																				

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-81

Location: Sta. 156+89.8, 36.4 ft. LT of SR 823 CL

Date Drilled: 11/16/04 to 11/17/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 1.0' Water level at completion: 6.4' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)			
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ———— LL Blows per foot - ○ 10 20 30 40			
90	772.3						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured. @ 93.0'-93.4', qu = 10,067 psi.										
95		Core 120"	Rec 120"	RQD 100%	R9	*546											
100																	
105		Core 120"	Rec 120"	RQD 100%	R10	*285											
109.7	752.6						Hard gray SANDSTONE; very fine grained, slightly weathered, argillaceous, micaceous, thinly laminated to thinly bedded, slightly fractured. @ 116.3',116.5', low angle clay filled fractures.										
115		Core 120"	Rec 120"	RQD 100%	R11	*419											
116.6	745.7						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thickly bedded to massive, slightly fractured, contains few argillaceous laminations.										
120																	

FILE: 0121-3070-03 [11/17/2007 9:55 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-81

Location: Sta. 156+89.8, 36.4 ft. LT of SR 823 CL

Date Drilled: 11/16/04 to 11/17/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 1.0' Water level at completion: 6.4' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)								
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40								
120	742.3						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly to unfractured, contains few argillaceous laminations.															
125		Core 120"	Rec 120"	RQD 53%	R12	*560																
130																						
135		Core 120"	Rec 120"	RQD 100%	R13	*694																
140																						
145		Core 120"	Rec 120"	RQD 100%	R14	*564																
150																						

FILE: 0121-3070-03 [11/17/2007 9:55 AM]

Client: TranSystems, Inc. Project: SCI-823-0.00 Job No. 0121-3070.03

LOG OF: Boring R-81 Location: Sta. 156+89.8, 36.4 ft. LT of SR 823 CL Date Drilled: 11/16/04 to 11/17/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 1.0' Water level at completion: 6.4' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)								
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40								
DESCRIPTION																						
150	712.3						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thickly bedded to massive, slightly fractured, contains few argillaceous laminations.															
155		Core 120"	Rec 120"	RQD 100%	R15	*709																
160																						
165		Core 120"	Rec 120"	RQD 100%	R16	*708																
170																						
175		Core 120"	Rec 120"	RQD 100%	R17	*554																
180.0	682.3						Bottom of Boring - 180.0'															

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-84

Location: Sta. 162+46.9, 131.9 ft. RT of SR 823 CL

Date Drilled: 11/09/04 to 11/10/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 27.5' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40							
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay								
0.2	868.3 868.1																				
2		6	12	18		1	Topsoil - 2"														
5		9	22	34	18	2	Medium dense to dense brown COARSE AND FINE SAND (A-3a), trace clay; possible decomposed sandstone; damp.														
		17	50/5	8		3	@ 6.0', contains weathered micaceous sandstone fragments.														
		30	50/4	8		4															
10.0	858.3						Soft to medium hard brown SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, micaceous, thinly bedded to thickly bedded, highly fractured, with typically low angle rust stained fractures.														
15		Core 120"	Rec 73"	RQD 40%	R-1	*10															
20							@ 18.0'-18.6', 19.3'- 21.4', 22.5'-23.0', broken zones.														
							@ 23.9'-24.7', argillaceous zone.														
24.6	843.7						Medium hard gray SHALE; highly to moderately weathered, arenaceous, micaceous, thinly to thickly bedded, moderately fractured, contains abundant arenaceous laminations.														
25		Core 102"	Rec 77"	RQD 46%	R-2	*26															
30		Core 18"	Rec 18"	RQD 100%	R-3	*150															

FILE: 0121-3070-03 [11/7/2007 9:55 AM]

Client: TranSystems, Inc. Project: SCI-823-0.00 Job No. 0121-3070.03

LOG OF: Boring R-84 Location: Sta. 162+46.9, 131.9 ft. RT of SR 823 CL Date Drilled: 11/09/04 to 11/10/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 27.5' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)				
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40				
30.0	838.3 838.3						<p>DESCRIPTION</p> <p>Medium hard gray SANDSTONE interbedded with SHALE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded, moderately fractured, with typically low angle fractures. @ 30.5'-35.0', qu = 2,801 psi, SDI = 3.3%.</p> <p>@ 35.0'-35.8', sandstone bed.</p> <p>Soft to medium hard gray SHALE; highly weathered to decomposed, argillaceous, carbonaceous, bedding weathered out. @ 35.8'-39.7', qu = 2,173 psi, SDI = 56.7%. @ 38.0',38.2', low angle clay filled fractures.</p> <p>Medium hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded, moderately fractured, contains coal stringers. @ 42.2'-43.0',45.0'-45.6', high angle fractures.</p> <p>Medium hard black COAL; slightly weathered, thinly bedded.</p> <p>Soft to medium hard gray and red SILTSTONE interbedded with SHALE; highly weathered, argillaceous, thinly bedded, moderately fractured, with typically high angle slickensided fractures. @ 47.7'-47.9', arenaceous zone. @ 50.0'-58.3', SDI = 41.5%. @ 52.0', red interbeds.</p> <p>@ 54.1'-54.5', qu = 3,758 psi.</p> <p>Medium hard gray SANDSTONE interbedded with SILTSTONE.</p>											
35		Core 120"	Rec 120"	RQD 90%	R-4	*151												
35.8	832.5																	
40.3	828.0																	
45		Core 120"	Rec 120"	RQD 86%	R-5	*328												
46.0	822.3																	
46.8	821.5																	
50																		
55		Core 120"	Rec 120"	RQD 85%	R-6	*133												
58.3	810.0																	
60																		

FILE: 0121-3070-03 [11/7/2007 9:55 AM]

Client: **TranSystems, Inc.** Project: **SCI-823-0.00** Job No. **0121-3070.03**

LOG OF: Boring R-84 Location: **Sta. 162+46.9, 131.9 ft. RT of SR 823 CL** Date Drilled: **11/09/04** to **11/10/04**

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 27.5' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)								
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ──── LL Blows per foot - ○ 10 20 30 40								
60.0	808.3						Medium hard light gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, massive, slightly fractured, contains few argillaceous laminations and medium grained iron stained sandstone. @ 77.3'-78.4', contains interbedded shale. @ 87.5'-88.4', high angle rust stained fracture.															
	808.3-																					
65		Core 120"	Rec 120"	RQD 100%	R-7	*417																
70																						
75		Core 120"	Rec 120"	RQD 98%	R-8	*355																
80																						
85		Core 120"	Rec 120"	RQD 100%	R-9	*154																
90																						

FILE: 0121-3070-03 [11/7/2007 9:55 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-84

Location: Sta. 162+46.9, 131.9 ft. RT of SR 823 CL

Date Drilled: 11/09/04 to 11/10/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 27.5' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40					
90	778.3																		
94.2	774.1																		
95		Core 120"	Rec 120"	RQD 100%	R10	*398	Medium hard light gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, massive, slightly fractured, contains few argillaceous laminations and medium grained iron stained sandstone.												
105		Core 120"	Rec 120"	RQD 100%	R11	*474	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, unfractured to slightly fractured.												
115		Core 120"	Rec 120"	RQD 100%	R12	*647													
117.0	751.3						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly laminated to thinly bedded, unfractured to slightly fractured.												
120																			

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-84

Location: Sta. 162+46.9, 131.9 ft. RT of SR 823 CL

Date Drilled: 11/09/04 to 11/10/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 27.5' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
120	748.3						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly laminated to thinly bedded, unfractured to slightly fractured. @ 120.0'-124.1', becomes fissile under dessication.												
125		Core 120"	Rec 120"	RQD 100%	R13	*397													
130																			
135		Core 120"	Rec 120"	RQD 100%	R14	*419													
140																			
145		Core 120"	Rec 120"	RQD 100%	R15	*393													
150																			

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-84

Location: Sta. 162+46.9, 131.9 ft. RT of SR 823 CL

Date Drilled: 11/09/04 to 11/10/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 27.5' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○											
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	10	20	30	40								
150	718.3						DESCRIPTION Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, unfractured to slightly fractured.																		
155		Core 120"	Rec 120"	RQD 100%	R16	*490																			
160.0	708.3						Bottom of Boring - 160.0'																		
165																									
170																									
175																									
180																									

FILE: 0121-3070-03 [11/7/2007 9:55 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-85

Location: Sta. 164+83.3, 62.1 ft. LT of SR 823 CL

Date Drilled: 11/4/04 to 11/4/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 6.0' Water level at completion: 11.2' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay							
0.3	783.3																			
	783.0	2				1.5	Topsoil - 4"/2" soil removed before drilling													
		2	18				Stiff reddish brown SILTY CLAY (A-6b), trace fine to coarse sand, trace gravel; damp.													
		3				4.0	@ 3.5'-7.5', hard.	5	2	--	5	52	36							
		4	18																	
		7				4.5+														
		9	18																	
		11																		
8.0	775.3	7					Medium dense brown and gray SANDY SILT (A-4a), trace fine sand, trace clay possible decomposed sandstone; dry to damp.													
		13	18																	
		11																		
		38					@ 11.0'-13.8', very dense.	38	12	--	14	36								
		50/4	8																	
		50/3	3																	
14.5	768.8						Medium hard gray and brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thickly bedded, highly fractured, with typical low angle fractures.													
		Core 60"	Rec 60"	RQD 90%	R-1	*229	@ 15.5'-15.7', 17.1'-17.8', 19.0'-19.2', 21.4'-21.7', rust stained high angle fractures.													
21.7	761.6						Medium hard brown SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded, moderately fractured, with typical low angle fractures.													
		Core 120"	Rec 120"	RQD 79%	R-2	*38	@ 24.2'-27.9', contains few argillaceous laminations.													
							@ 27.9'-29.6', abundant to moderate argillaceous laminations.													
30																				

FILE: 0121-3070-03 [11/7/2007 9:55 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-85

Location: Sta. 164+83.3, 62.1 ft. LT of SR 823 CL

Date Drilled: 11/4/04 to 11/4/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 6.0' Water level at completion: 11.2' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)				
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40				
30	753.3						MEDIUM HARD GRAY SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded, moderately fractured, with typical low angle fractures. @ 32.6'-34.0', high angle clay filled fracture. @ 34.5'-34.8', 37.0'-37.3', 38.6'-39.1', argillaceous zones.											
35		Core 120"	Rec 120"	RQD 73%	R-3													
39.5	743.8							HARD GRAY SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured to unfractured, contains few argillaceous laminations.										
40																		
45		Core 120"	Rec 117"	RQD 96%	R-4	*750												
50																		
55		Core 120"	Rec 120"	RQD 100%	R-5	*707												
60																		

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-85

Location: Sta. 164+83.3, 62.1 ft. LT of SR 823 CL

Date Drilled: 11/4/04 to 11/4/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 6.0' Water level at completion: 11.2' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40							
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay								
60	723.3																				
		Core 72"	Rec 72"	RQD 100%	R-6	*790															
65.5	717.8						Bottom of Boring - 65.5'														
70																					
75																					
80																					
85																					
90																					

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-87

Location: Sta. 164+75.9, 106.3 ft. RT of SR 823 CL

Date Drilled: 11/5/04 to 11/9/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 1.0' Water level at completion: 16.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay							
0.2	792.8																			
	792.6						Topsoil - 2"/1.5' soil removed before drilling													
		2	1	3		1	Very stiff to hard reddish brown SILT AND CLAY (A-6a), trace fine to coarse sand, trace gravel; damp.													
		4	7	12	18	2	4.5+													
5																				
5.5	787.3						Severely weathered CLAYSTONE.													
		13	39	48	16	3														
8.0	784.8	50/5	5			4	Severely weathered SANDSTONE.													
8.5	784.3						Soft to medium hard brown SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, thinly bedded to thickly bedded, highly fractured, with typically high angle rust stained fractures. @ 10.6'-11.2',12.3'-13.3',14.7', decomposed zones.													
10		Core 90"	Rec 90"	RQD 21%	R-1	*162														
15																				
19.9	772.9	Core 120"	Rec 120"	RQD 81%	R-2	*313	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thickly bedded, slightly fractured. @ 25.3',25.7',26.4', low angle clay filled fractures.													
25																				
30																				

FILE: 0121-3070-03 [11/7/2007 9:55 AM]

Client: TranSystems, Inc.			Project: SCI-823-0.00					Job No. 0121-3070.03												
LOG OF: Boring R-87			Location: Sta. 164+75.9, 106.3 ft. RT of SR 823 CL					Date Drilled: 11/5/04 to 11/9/04												
Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 1.0' Water level at completion: 16.0' (includes drilling water)	GRADATION												
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay							
							STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ———— LL Blows per foot - ○ 10 20 30 40													
30	762.8	Core 120"	Rec 120"	RQD 98%	R-3	*269	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thickly bedded, slightly fractured.													
35							@ 37.0',39.2', low angle clay filled fractures.													
40		Core 120"	Rec 120"	RQD 95%	R-4	*363	Hard gray SANDSTONE; very fine grained, moderately weathered, argillaceous, micaceous, thinly laminated to thinly bedded, contains abundant to moderate argillaceous laminations.													
41.2	751.6						@ 44.1',49.1', low angle clay filled fractures.													
45							@ 48.2'-49.0', highly weathered.													
49.2	743.6	Core 120"	Rec 120"	RQD 100%	R-5	*374	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thickly bedded, slightly fractured to unfractured.													
50																				
55																				
60																				

FILE: 0121-3070-03 [11/7/2007 9:55 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-87

Location: Sta. 164+75.9, 106.3 ft. RT of SR 823 CL

Date Drilled: 11/5/04 to 11/9/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 1.0' Water level at completion: 16.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)				
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○				
60	732.8	Core 120"	Rec 120"	RQD 98%	R-6	*382	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded.											
65																		
70		Core 120"	Rec 120"	RQD 98%	R-7	*552												
75																		
80		Core 120"	Rec 120"	RQD 100%	R-8	*558												
85																		
86.0	706.8						Bottom of Boring - 86.0'											
90																		

FILE: 0121-3070-03 [11/7/2007 9:55 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-88

Location: Sta. 166+92.7, 51.3 ft. LT of SR 823 CL

Date Drilled: 11/2/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 5.6' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
0	699.7																		
0.3	699.4	50/2	2	1			Topsoil - 3"												
2.0	697.7						Severely weathered brown SANDSTONE, argillaceous.												
5		Core 120"	Rec 57"	RQD 0%	R-1		Soft to medium hard gray and brown SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, thinly bedded to thickly bedded, broken, contains large filled fractures.												
13.7	686.0						Medium hard gray and brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, moderately fractured, with typically low angle fractures, contains few argillaceous laminations.												
15		Core 120"	Rec 120"	RQD 78%	R-2	*578													
20																			
25.0	674.7	Core 36"	Rec 36"	RQD 100%	R-3	*667													
25.0							Bottom of Boring - 25.0'												
30																			

FILE: 0121-3070-03 [11/7/2007 9:55 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-90

Location: Sta. 168+20.2, 110.2 ft. LT of SR 823 CL

Date Drilled: 10/28/04 to 10/29/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 7.7' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40				
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay					
0	764.1						Topsoil - 6"											
-0.5	763.6	5				4.5+		Hard brown SANDY SILT (A-4a), trace clay; contains sandstone fragments; damp.										
		6 12	18															
-4.0	760.1	16 26 40	18			2	Severely weathered SANDSTONE.											
-5.5	758.6						Soft gray and brown SILTSTONE; highly weathered, argillaceous, highly fractured, with typical low angle fractures.											
10		Core 90"	Rec 90"	RQD 69%	R-1													
-17.5	746.6	Core 120"	Rec 120"	RQD 91%	R-2	*549	Medium hard to hard gray and brown SANDSTONE; very fine to fine grained, moderately to highly weathered, argillaceous, micaceous, thickly bedded to massive, moderately to highly fractured with typical low angle clay filled fractures.											
20																		
-24.6	739.5	Core 120"	Rec 120"	RQD 100%	R-3	*595	Hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, thickly bedded to massive, slightly fractured.											
30																		

FILE: 0121-3070-03 [11/7/2007 9:55 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-90

Location: Sta. 168+20.2, 110.2 ft. LT of SR 823 CL

Date Drilled: 10/28/04 to 10/29/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 7.7' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40					
30	734.1						DESCRIPTION Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded.												
		Core 24"	Rec 24"	RQD 100%	R-4	*622													
35.0	729.1						Bottom of Boring - 35.0'												
40																			
45																			
50																			
55																			
60																			

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-91

Location: Sta. 168+47.7, on CL SR 823

Date Drilled: 11/1/04 to 11/1/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 2.6 (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay							
0	728.9																			
0.3	728.6	50/4	3	1			Topsoil - 4"													
2.0	726.9						Severely weathered SANDSTONE.													
5							Hard to very hard brown and gray SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, highly fractured with typically low angle clay filled fractures.													
		Core 120"	Rec 120"		RQD 70%	R-1	*1023	@ 2.0'-2.4', 2.6'-2.8', 3.0'-3.4', 8.7'-9.0', broken zones.												
							@ 6.5'-6.6', 7.3'-7.4', high angle fractures.													
13.3	715.6						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded.													
		Core 120"	Rec 120"		RQD 92%	R-2	*583	@ 12.0'-12.1', 13.5'-13.9', high angle rust stained fractures.												
		Core 36"	Rec 36"		RQD 100%	R-3	*617	@ 24.0'-24.3', argillaceous zone.												
25.0	703.9						Bottom of Boring - 25.0'													
30																				

FILE: 0121-3070-03 [11/7/2007 9:55 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-92

Location: Sta. 168+46.5, 79.3 ft. RT of SR 823 CL

Date Drilled: 11/2/04 to 11/2/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 9.8' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
0	697.2																		
-0.4	696.8						Topsoil - 5"/2.5' soil removed before drilling												
2.0	695.2	27 50/1	7	1			Severely weathered brown SANDSTONE, argillaceous.												
5							Medium hard gray and brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, moderately fractured, with typical low angle clay filled fractures.												
8.1	689.1	Core 120"	Rec 120"	RQD 96%	R1	*311	Hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded.												
15		Core 120"	Rec 120"	RQD 100%	R2	*519	@ 11.2', low angle rust stained fracture.												
20							@ 20.0'-20.1', 20.9'-21.0', arenaceous zones.												
25		Core 96"	Rec 96"	RQD 100%	R3	*96	@ 24.0', 24.7', 25.3', low angle fractures. @ 24.0'-25.3', contains moderate to few argillaceous laminations.												
30.0	667.2						Bottom of Boring - 30.0'												

FILE: 0121-3070-03 [11/7/2007 9:55 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-94

Location: Sta. 169+98.5, 139.6 ft. LT of SR 823 CL

Date Drilled: 10/29/04 to 11/2/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 3.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay							
0	803.1																			
0.3	802.8						Topsoil - 3"													
2.0	801.1	3 9 25	18	1		4.5+	Hard brown SANDY SILT (A-4a); dry to damp. Severely weathered SANDSTONE.													
5		40 50/1	6	2																
7.0	796.1	50/2	2	3																
10		Core 42"	Rec 42"	RQD 52%	R-1	*291	Medium hard brown and gray SANDSTONE; very fine to fine grained, moderately to highly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, moderately fractured, with typical low angle rust stained fractures. @ 7.0'-7.3', 7.9'-8.1', 9.6'- 10.8', decomposed, broken.													
15		Core 120"	Rec 120"	RQD 72%	R-2	*149	@ 9.8'-10.1', 19.9'-21.0', high angle rust stained fractures. @ 11.4'-12.1', contains moderate argillaceous laminations. @ 18.1'-18.6', 25.1'-25.5', contains abundant to moderate argillaceous laminations. @ 24.0'-24.6', 29.8'-30.0', high angle rust stained fractures.													
25		Core 120"	Rec 120"	RQD 85%	R-3	*216	@ 25.5'-25.9', broken zone.													
30																				

FILE: 0121-3070-03 [11/7/2007 9:55 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-94

Location: Sta. 169+98.5, 139.6 ft. LT of SR 823 CL

Date Drilled: 10/29/04 to 11/2/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 3.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40									
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay										
30	773.1																						
							<p>DESCRIPTION</p> <p>Medium hard brown and gray SANDSTONE; very fine to fine grained, moderately to highly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, moderately fractured, with typical low angle rust stained fractures.</p>																
35		Core 120"	Rec 120"	RQD 95%	R-4	*325	<p>@ 41.8'-42.0', 42.4'-42.6', 42.0'-43.8', moderate argillaceous laminations.</p> <p>@ 48.4'-48.9', contains moderate argillaceous laminations.</p>																
40							<p>@ 42.4', 42.5', 42.6', low angle rust stained fractures.</p>																
45		Core 120"	Rec 120"	RQD 82%	R-5	*248	<p>@ 46.5', 46.6', 46.7', low angle clay filled fractures.</p>																
48.7	754.4						<p>Hard gray SANDSTONE; very fine grained, moderately weathered, argillaceous, micaceous, thinly laminated to thinly bedded, contains abundant argillaceous laminations.</p>																
50																							
55		Core 120"	Rec 120"	RQD 96%	R-6	*329	<p>@ 49.2', 52.3', low angle clay filled fractures.</p>																
57.1	746.0						<p>Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded.</p>																
60																							

FILE: 0121-3070-03 [11/7/2007 9:55 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-94

Location: Sta. 169+98.5, 139.6 ft. LT of SR 823 CL

Date Drilled: 10/29/04 to 11/2/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 3.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ─────────────────── LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
60	743.1						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured.												
65		Core 120"	Rec 120"	RQD 100%	R-7	*454													
70																			
75		Core 120"	Rec 120"	RQD 100%	R-8	*448													
80																			
80.5	722.6						Bottom of Boring - 80.5'												
85																			
90																			

FILE: 0121-3070-03 [11/7/2007 9:55 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-96

Location: Sta. 169.79.4, 61.3 ft. RT of SR 823 CL

Date Drilled: 11/2/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 7.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay							
0.2	763.1																			
	762.9	3					Topsoil - 2"													
		3	5	18		1	Loose to medium dense brown SANDY SILT (A-4a), trace clay; contains sandstone fragments; dry to damp.													
		5	9	12	18	2														
5.0	758.1						Soft to medium hard brown SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, thinly bedded to thickly bedded, broken.													
7.2	755.9						Soft to medium hard brown and gray SILTSTONE; highly weathered to decomposed, argillaceous.													
10		Core 120"	Rec 84"		RQD 20%	R-1	*33	@ 7.2'-9.7', 18.2'-18.5', decomposed, broken zones.												
15								@ 10.8', 10.9', 11.1', low angle clay filled fractures.												
18.5	744.6	Core 60"	Rec 60"		RQD 90%	R-2	*277													
20								Medium hard to hard brown and gray SANDSTONE; very fine to fine grained, moderately to highly weathered, argillaceous, micaceous, thinly to thickly bedded, slightly fractured.												
25		Core 120"	Rec 120"		RQD 100%	R-3	*450	@ 19.2', 28.4', low angle clay filled fractures.												
30																				

FILE: 0121-3070-03 [11/7/2007 9:55 AM]

Client: TranSystems, Inc. Project: SCI-823-0.00 Job No. 0121-3070.03

LOG OF: Boring R-96 Location: Sta. 169.79.4, 61.3 ft. RT of SR 823 CL Date Drilled: 11/2/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 7.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ———— LL Blows per foot - ○ 10 20 30 40					
30	733.1						Medium hard to hard brown and gray SANDSTONE; very fine to fine grained, moderately to highly weathered, argillaceous, micaceous, thinly to thickly bedded, slightly fractured. @ 31.3'-32.9', 46.0'-47.2', high angle rust stained fractures.												
35		Core 120"	Rec 120"	RQD 96%	R-4	*386													
45		Core 120"	Rec 120"	RQD 98%	R-5	*430													
50.0	713.1						Bottom of Boring - 50.0'												
55																			
60																			

FILE: 0121-3070-03 [11/7/2007 9:55 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-97

Location: Sta. 172+81.7, 5.1 ft. LT of SR 823 CL

Date Drilled: 10/28/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 8.5' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40				
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay					
0	755.0						Topsoil - 3"/6" soil removed before drilling Stiff to very stiff brown SANDY SILT (A-4a), trace gravel, trace clay; contains sandstone fragments; dry to damp.											
0.3	754.7	5				1		1.5										
		6	9	18														
		5	12	16	18	2		4.0										
5	749.5						Hard gray SILT AND CLAY (A-6a), trace fine to coarse sand; dry to damp.											
5.5		13	15	19	18	3		4.5+										
		35	50/4	10		4		4.5+										
10.0	745.0						Medium hard gray and brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thickly bedded, highly fractured, with typical low angle clay filled fractures.											
15		Core 120"	Rec 120"	RQD 85%	R-1			@ 10.0'-10.5', rust stained broken zone.										
16.4	738.6						Hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, thickly bedded weathered.											
20.0	735.0							Bottom of Boring - 20.0'										
25																		
30																		

FILE: 0121-3070-03 [11/7/2007 9:55 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-98

Location: Sta. 172+78.6, 43.4 ft. RT of SR 823 CL

Date Drilled: 10/28/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 8.9' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40							
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay								
0	752.3																				
0.3	752.0						Topsoil - 4"														
		4 6 9	3			1	Medium dense brown SILT AND CLAY (A-6a), trace fine to coarse sand; contains sandstone fragments; damp to moist.														
3.0	749.3					2	Severely weathered SANDSTONE.														
		16 27 40	18																		
5						3															
		22 29 50/2	14																		
7.5	744.8						Medium hard brown and gray SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thickly bedded, highly fractured, with typical low angle clay filled fractures.														
		Core 66"	Rec 66"	RQD 75%	R-1	*356	@ 7.7'-7.8', 8.9'-9.0', 10.9'-11.0', broken zones.														
14.8	737.5						Hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, thickly bedded, moderately fractured.														
		Core 84"	Rec 84"	RQD 100%	R-2	*496															
20.0	732.3						Bottom of Boring - 20.0'														
25																					
30																					

FILE: 0121-3070-03 [11/7/2007 9:55 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-2094

Location: Sta. 170+05.3, 135.6 ft. LT of SR 823 CL

Date Drilled: 1/16/06 to 1/17/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 5.4' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40						
0.2	803.0																			
	802.8	3	8	1		4.5+	Topsoil - 2"													
		3 23		1			Hard reddish brown CLAY (A-7-6), some silt, trace fine to coarse sand, trace gravel; moist.	6	3	--	3	29	59							
3.0	800.0	21 50/4	10	2			Severely weathered brown SANDSTONE, argillaceous.													
		27 50/3	9	3																
		35 50/2	8	4																
		50/4	3	5																
11.5	791.5						Medium hard to hard gray SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, laminated to medium bedded, highly fractured to broken. @ 12.3'-12.9', lost recovery, possible void. @ 11.5'-12.3', 15.1'-15.2', 19.0', broken zones. @ 17.2'-18.2', high angle fracture.													
		Core 120"	Rec 113"		RQD 59%	R1	*905													
19.2	783.8						Hard gray SANDSTONE; very fine to fine grained, moderately to highly weathered, argillaceous, micaceous, calcareous, laminated to thickly bedded, moderately fractured, contains few argillaceous laminations.													
		Core 120"	Rec 120"		RQD 100%	R2	*891													
							@ 25.5'-27.3', iron stained. @ 26.1', 26.2', 26.3', decomposed argillaceous zone. @ 27.3'-27.4', broken zone.													
30																				

FILE: 0121-3070-03 [11/7/2007 9:55 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-2094

Location: Sta. 170+05.3, 135.6 ft. LT of SR 823 CL

Date Drilled: 1/16/06 to 1/17/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 5.4' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)							
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40							
30.0	773.0						Hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, calcareous, massive, slightly fractured. @ 30.1', 30.7', 32.0', low angle fractures. @ 30.9'-31.5', calcareous. @ 31.0'-32.0', 35.8'-36.5', calcareous. @ 36.1'-36.5', vertical fracture. @ 36.5'-36.8', weathered, high angle fracture.														
	773.0																				
35		Core 120"	Rec 120"	RQD 93%	R3	*1186															
42.6	760.4						Medium hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, slightly fractured, contains few to abundant argillaceous laminations occurring in bands. @ 44.5'-44.6', ferric band, broken. @ 46.4', low angle fracture.														
45		Core 120"	Rec 120"	RQD 98%	R4	*200															
50																					
55		Core 120"	Rec 120"	RQD 100%	R5	*1012															
58.2	744.8						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, slightly fractured.														
60																					

FILE: 0121-3070-03 [11/7/2007 9:55 AM]

Client: TranSystems, Inc. Project: SCI-823-0.00 Job No. 0121-3070.03

LOG OF: Boring R-2094 Location: Sta. 170+05.3, 135.6 ft. LT of SR 823 CL Date Drilled: 1/16/06 to 1/17/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 5.4' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ──── LL Blows per foot - ○ 10 20 30 40				
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay					
60	743.0																	
61.5	741.5						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, slightly fractured.											
65		Core 120"	Rec 120"	RQD 100%	R6	*1630	Very hard gray SANDSTONE; fine grained, unweathered, argillaceous, thinly laminated to massive, slightly fractured, burrows, turbidity. @ 62.0', 63.4', 66.2', 67.0', 67.9', 68.2', low angle fractures.											
75		Core 120"	Rec 120"	RQD 100%	R7	*1610	@ 75.6', 76.3', 76.9', 78.0', low angle fractures.											
85		Core 120"	Rec 120"	RQD 100%	R8	*1720	@ 87.1', 88.3', 89.6', 91.1', low angle fractures.											
90																		

Client: TranSystems, Inc.	Project: SCI-823-0.00	Job No. 0121-3070.03
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LOG OF: Boring R-2094	Location: Sta. 170+05.3, 135.6 ft. LT of SR 823 CL	Date Drilled: 1/16/06 to 1/17/06
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Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 5.4' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ----- LL Blows per foot - ○ 10 20 30 40						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay							
90	713.0																			
95		Core 102"	Rec 102"	RQD 100%	R9	*1758	Very hard gray SANDSTONE; fine grained, unweathered, argillaceous, thinly laminated to massive, slightly fractured, burrows, turbidity. @ 91.7', 91.8', 93.4', 97.0', low angle fractures.													
100.0	703.0						Bottom of Boring - 100.0'													
105																				
110																				
115																				
120																				

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-2097

Location: Sta. 172+79.1, 81.4 ft. LT of SR 823 CL

Date Drilled: 1/18/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 7.8' (inside hollowstem augers)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40										
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay											
0	756.2																							
0.6	755.6						Topsoil - 7"/6" soil removed before drilling																	
		6	5				Medium dense brown SANDY SILT (A-4a), trace gravel, little clay; moist.	10	14	--	14	48	14											
3.0	753.2						Very stiff to hard grayish brown SILT AND CLAY (A-6a), little to some fine to coarse sand, trace gravel; contains sandstone fragments; damp.	3	15	--	7	47	28											
		6																						
		9	12																					
		12																						
		13																						
		15	14																					
		10																						
		25	15																					
10		20																						
10.5	745.7						Severely weathered brown SANDSTONE, argillaceous.																	
		50/5	5																					
13.5	742.7						Hard light brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, thinly bedded to massive, moderately fractured. @ 14.5'-14.7', broken. @ 14.7'-15.1', gray.																	
15																								
15.8	740.4						Very hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, massive, unfractured to slightly fractured.																	
		Core 78"	Rec 78"	RQD 100%	R1																			
20																								
25																								
		Core 120"	Rec 120"	RQD 100%	R2																			
30																								

FILE: 0121-3070-03 [11/7/2007 9:55 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-2097

Location: Sta. 172+79.1, 81.4 ft. LT of SR 823 CL

Date Drilled: 1/18/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 7.8' (inside hollowstem augers)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40							
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay								
30	726.2						Very hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, massive, unfractured to slightly fractured.														
35		Core 120"	Rec 120"	RQD 100%	R3	*1242															
45		Core 120"	Rec 120"	RQD 100%	R4	*1343															
55		Core 120"	Rec 116"	RQD 97%	R5	*1421															
60.0	696.2						@ 58.8',59.6', low angle fractures.														
							Bottom of Boring - 60.0'														

FILE: 0121-3070-03 [11/7/2007 9:55 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-2098

Location: Sta. 172+57.4, 85.5 ft. RT of SR 823 CL

Date Drilled: 1/18/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 53.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40							
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay								
0	754.6																				
0.3	754.3						Topsoil - 4"														
		3				4.5+	Hard brown and gray SILTY CLAY (A-6b), trace fine to coarse sand, trace gravel; contains sandstone fragments; damp.														
		5	13	1																	
		9																			
5		6				4.5+	Severely weathered brown SANDSTONE. Medium hard to hard gray SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thickly bedded, highly fractured to broken. @ 10.5'-11.6', decomposed. @ 10.7',10.8',10.9',11.1', 11.2',12.5',13.2',13.3', 13.7',13.8', 14.0',14.5', 14.9',16.4',17.2', low angle fractures. @ 11.5'-11.6', broken zones. Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, slightly fractured. @ 18.8'-18.9', clay filled fracture. @ 18.9'-19.4', 20.8'-21.0', broken zones. @ 21.6'-21.7', multiple low angle fractures. @ 23.9', 29.7', 29.9', low angle fractures.														
		9	14	2																	
		13																			
		4				4.5+	Severely weathered brown SANDSTONE. Medium hard to hard gray SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thickly bedded, highly fractured to broken. @ 10.5'-11.6', decomposed. @ 10.7',10.8',10.9',11.1', 11.2',12.5',13.2',13.3', 13.7',13.8', 14.0',14.5', 14.9',16.4',17.2', low angle fractures. @ 11.5'-11.6', broken zones. Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, slightly fractured. @ 18.8'-18.9', clay filled fracture. @ 18.9'-19.4', 20.8'-21.0', broken zones. @ 21.6'-21.7', multiple low angle fractures. @ 23.9', 29.7', 29.9', low angle fractures.														
		10	14	3																	
		12																			
10.0	744.6	50/5	3				Severely weathered brown SANDSTONE. Medium hard to hard gray SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thickly bedded, highly fractured to broken. @ 10.5'-11.6', decomposed. @ 10.7',10.8',10.9',11.1', 11.2',12.5',13.2',13.3', 13.7',13.8', 14.0',14.5', 14.9',16.4',17.2', low angle fractures. @ 11.5'-11.6', broken zones. Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, slightly fractured. @ 18.8'-18.9', clay filled fracture. @ 18.9'-19.4', 20.8'-21.0', broken zones. @ 21.6'-21.7', multiple low angle fractures. @ 23.9', 29.7', 29.9', low angle fractures.														
10.5	744.1			4																	
14.9	739.7	Core 120"	Rec 120"	RQD 82%	R-1	*1508	Severely weathered brown SANDSTONE. Medium hard to hard gray SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thickly bedded, highly fractured to broken. @ 10.5'-11.6', decomposed. @ 10.7',10.8',10.9',11.1', 11.2',12.5',13.2',13.3', 13.7',13.8', 14.0',14.5', 14.9',16.4',17.2', low angle fractures. @ 11.5'-11.6', broken zones. Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, slightly fractured. @ 18.8'-18.9', clay filled fracture. @ 18.9'-19.4', 20.8'-21.0', broken zones. @ 21.6'-21.7', multiple low angle fractures. @ 23.9', 29.7', 29.9', low angle fractures.														
20							Severely weathered brown SANDSTONE. Medium hard to hard gray SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thickly bedded, highly fractured to broken. @ 10.5'-11.6', decomposed. @ 10.7',10.8',10.9',11.1', 11.2',12.5',13.2',13.3', 13.7',13.8', 14.0',14.5', 14.9',16.4',17.2', low angle fractures. @ 11.5'-11.6', broken zones. Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, slightly fractured. @ 18.8'-18.9', clay filled fracture. @ 18.9'-19.4', 20.8'-21.0', broken zones. @ 21.6'-21.7', multiple low angle fractures. @ 23.9', 29.7', 29.9', low angle fractures.														
25		Core 120"	Rec 120"	RQD 96%	R-2	*1511	Severely weathered brown SANDSTONE. Medium hard to hard gray SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thickly bedded, highly fractured to broken. @ 10.5'-11.6', decomposed. @ 10.7',10.8',10.9',11.1', 11.2',12.5',13.2',13.3', 13.7',13.8', 14.0',14.5', 14.9',16.4',17.2', low angle fractures. @ 11.5'-11.6', broken zones. Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, slightly fractured. @ 18.8'-18.9', clay filled fracture. @ 18.9'-19.4', 20.8'-21.0', broken zones. @ 21.6'-21.7', multiple low angle fractures. @ 23.9', 29.7', 29.9', low angle fractures.														
30							Severely weathered brown SANDSTONE. Medium hard to hard gray SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thickly bedded, highly fractured to broken. @ 10.5'-11.6', decomposed. @ 10.7',10.8',10.9',11.1', 11.2',12.5',13.2',13.3', 13.7',13.8', 14.0',14.5', 14.9',16.4',17.2', low angle fractures. @ 11.5'-11.6', broken zones. Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, slightly fractured. @ 18.8'-18.9', clay filled fracture. @ 18.9'-19.4', 20.8'-21.0', broken zones. @ 21.6'-21.7', multiple low angle fractures. @ 23.9', 29.7', 29.9', low angle fractures.														

FILE: 0121-3070-03 [11/7/2007 9:55 AM]

Client: TranSystems, Inc. Project: SCI-823-0.00 Job No. 0121-3070.03

LOG OF: Boring R-2098 Location: Sta. 172+57.4, 85.5 ft. RT of SR 823 CL Date Drilled: 1/18/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 53.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)							
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ●		Blows per foot - ○					
30	724.6																				
35		Core 120"	Rec 120"	RQD 99%	R-3	*1143	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, unfractured to slightly fractured, burrows, turbidity. @ 33.8', thin argillaceous band with fracture.														
45		Core 120"	Rec 120"	RQD 100%	R-4	*1108															
50							@ 49.1'-49.2', shale bed.														
55		Core 120"	Rec 118"	RQD 93%	R-5	*1079	@ 56.5'-56.7', 57.8'-58.0', clay filled fractures.														
60																					

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-2098

Location: Sta. 172+57.4, 85.5 ft. RT of SR 823 CL

Date Drilled: 1/18/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 53.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40					
60	694.6																		
60.5	694.1						Bottom of Boring - 60.5'												
65																			
70																			
75																			
80																			
85																			
90																			

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring TR-29

Location: Sta. 140+26.7, 84.5 ft. LT of SR 823 CL

Date Drilled: 3/8/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 48.7' (after 48 hrs.)	GRADATION						STANDARD PENETRATION (N)					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40					
0	667.6																		
-0.4	667.2						Topsoil - 5" / 3.0' soil removed before drilling												
5		Core 120"	Rec 30"	RQD 0%	R-1		Soft gray SANDSTONE; very fine to fine grained, decomposed, argillaceous, thinly bedded, very broken. @ 1.9'-9.5', lost recovery due to decomposed rock.												
9.5	658.1	Core 36"	Rec 36"	RQD 64%	R-2		Soft to medium hard brown and gray SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, thinly to thickly bedded, highly fractured, with typically low angle clay filled fractures.												
15							@ 15.4' to 15.5', high angle rust stained fracture.												
15.5	652.1	Core 120"	Rec 120"	RQD 92%	R-3		Medium hard brown and gray SANDSTONE; very fine to fine grained, moderately to highly weathered, argillaceous, micaceous, thinly to thickly bedded, moderately fractured, contains few to moderate argillaceous laminations.												
20							@ 21.0',22.0',22.3', low angle clay filled fractures.												
25							@ 27.5'-28.1', high angle rust stained fracture.												
26.5	641.1	Core 120"	Rec 120"	RQD 92%	R-4		@ 28.2', low angle rust stained fracture.												
30							Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, massive, slightly fractured.												

FILE: 0121-3070-03 [11/7/2007 9:55 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring TR-29

Location: Sta. 140+26.7, 84.5 ft. LT of SR 823 CL

Date Drilled: 3/8/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 48.7' (after 48 hrs.)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40									
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay										
30	637.6						MEDIUM HARD TO HARD GRAY SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, massive, unfractured to slightly fractured. @ 34.0'-52.0', pyritic. @ 31.1',34.6',35.3', low angle clay filled fractures.																
				Core 120"	Rec 120"	RQD 100%		R-5															
35																							
				Core 120"	Rec 120"	RQD 100%		R-6															
40							@ 53.9'-54.4',58.2'-59.5', high angle rust stained fractures. @ 56.2',56.9', low angle rust stained fractures.																
				Core 120"	Rec 120"	RQD 100%		R-6															
45																							
				Core 120"	Rec 120"	RQD 82%		R-7															
50																							
55																							
				Core 120"	Rec 120"	RQD 82%	R-7																
59.6	608.0																						

Client: **TranSystems, Inc.** Project: **SCI-823-0.00** Job No. **0121-3070.03**

LOG OF: Boring TR-29 Location: **Sta. 140+26.7, 84.5 ft. LT of SR 823 CL** Date Drilled: **3/8/05**

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 48.7' (after 48 hrs.)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40				
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay					
60	607.6						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, unfractured to slightly fractured. @ 61.8'-62.4', qu = 13,956 psi.											
		Core 120"	Rec 120"	RQD 100%	R-8													
71.4	596.2						Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, slightly fractured, contains few argillaceous laminations. @ 80.9', contains few to moderate argillaceous laminations.											
		Core 120"	Rec 120"	RQD 100%	R-9													
85.0	582.6						Bottom of Boring - 85.0'											
		Core 24"	Rec 24"	RQD 100%	R10													
90																		

FILE: 0121-3070-03 [11/7/2007 9:55 AM]

Client: TranSystems, Inc. Project: SCI-823-0.00 Job No. 0121-3070.03

LOG OF: Boring TR-30 Location: Sta. 139+35.0, 52.3 ft. LT of SR 823 CL Date Drilled: 3/8/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 12.2' (Includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	
0	637.1						Topsoil - 5" / 3.2' soil removed before drilling Soft to medium hard gray and brown SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, thinly to thickly bedded, moderately fractured. @ 1.0'-1.3', 5.0'-5.1', broken zones. @ 3.6'-3.9', clay filled zone. @ 5.8'-6.4', qu = 5,441 psi. @ 3.9'-4.7', high angle clay filled fracture.							
-0.4	636.7													
5		Core 120"	Rec 120"			RQD 62%	R-1							
7.5	629.6													
10														
15		Core 120"	Rec 120"			RQD 100%	R-2							
20.0	617.1													
20.0							Bottom of Boring - 20.0'							
25														
30														

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring TR-31

Location: Sta. 138+68.7, 106.5 ft. LT of SR 823 CL

Date Drilled: 3/8/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / *Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 5.3' (Includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay							
0	621.4																			
-0.5	620.9						Topsoil - 6" / 4.0' soil removed before drilling													
5		Core 120"	Rec 110"	RQD 50%	R-1		Soft to medium hard brown SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, thinly to thickly bedded, highly fractured, with typically low angle clay filled fractures. @ 0.0'-0.9', lost recovery. @ 0.9'-2.0', broken zones. @ 5.1'-5.4', 6.8'-7.0', 7.7'-7.9' high angle clay filled fractures. @ 6.3'-6.7', qu = 1,254 psi.													
-7.9	613.5						@ 7.9'-9.8', iron staining.													
10							Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly to thickly bedded, unfractured to slightly fractured.													
15		Core 120"	Rec 116"	RQD 96%	R-2		@ 10.4'-10.5', broken zone. @ 11.0'-11.4', 11.9'- 12.1', 15.2', rust stained zones. @ 11.2', low angle rust stained fracture. @ 19.6'-20.0', lost recovery.													
20.0	601.4						Bottom of Boring - 20.0'													
25																				
30																				

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-101

Location: Sta. 180+90.9, 23.6 ft. LT of SR 823 CL

Date Drilled: 10/27/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 7.3' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40			
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay				
0.2	695.6						Topsoil - 2"										
	695.4						Loose brown SANDY SILT (A-4a), trace clay; contains sandstone fragments; damp.										
3.0	692.6						Severely weathered brown SANDSTONE.										
5																	
10																	
15							@ 13.5'-17.5', argillaceous.										
20.0	675.6						Medium hard to hard gray and brown SANDSTONE; very fine to fine grained, moderately to highly weathered, argillaceous, micaceous, thinly to thickly bedded, highly fractured, with typical high angle rust stained fractures.										
25		Core 120"	Rec 120"	RQD 33%	R-1	*499	@ 20.7'-21.5', 22.8'-23.9', 24.1'-25.2', high angle rust stained fractures. @ 25.3'-26.4', high angle fractures.										
30.0	665.6						@ 28.8'-29.3', contains carbonaceous laminations with turbidity beds.										
							Bottom of Boring - 30.0'										

FILE: 0121-3070-03 [11/7/2007 10:13 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-102

Location: Sta. 181+02.4, 182.6 ft. RT of SR 823 CL

Date Drilled: 10/27/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 8.5'-35.0' Water level at completion: 8.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ———— LL Blows per foot - ○ 10 20 30 40						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay							
0.2	612.8																			
	612.6						Topsoil - 2"													
		2					Loose to medium dense brown SANDY SILT (A-4a), little gravel, trace clay; contains sandstone fragments; damp.													
		2	3	18		1														
		4	5	8	18	2														
5																				
		13	16	13	18															
8.0	604.8						Stiff gray and brown SILT AND CLAY (A-6a), trace fine to coarse sand; damp to moist. @ 9.0', torvane = 0.7 tsf													
		3	5	4	18		Medium stiff to stiff gray SILT (A-4b), trace fine sand, some clay; moist to wet. @ 11.0', torvane = 0.2 tsf													
10						4														
10.5	602.3																			
		W	O				Loose gray and brown SILT (A-4b), some fine to coarse sand, trace gravel; contains sandstone fragments; moist.													
		H		18		5														
13.0	599.8																			
		W	O	H																
		2	2	18		6														
15																				
		W	O	H																
		2	3	18		7														
		4	2	3	18															
20																				
20.5	592.3						Medium dense gray and light brown FINE SAND (A-3), little silt; contains sandstone fragments; damp.													
		10	9	9	18		Medium dense gray SANDY SILT (A-4a), trace clay; contains sandstone fragments; damp to moist.													
23.0	589.8																			
		4	8	8	18															
25																				
		3	5	6	18															
		8	8	11	18															
30																				

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-102

Location: Sta. 181+02.4, 182.6 ft. RT of SR 823 CL

Date Drilled: 10/27/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 8.5'-35.0' Water level at completion: 8.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40				
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay					
30	582.8						Medium dense gray SANDY SILT (A-4a), trace clay; contains sandstone fragments; damp to moist.											
35		6 10 13	18			13												
36.0	576.8						Severely weathered gray SANDSTONE.											
		50/3	3			14												
39.0	573.8						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, pyritic, thickly bedded, slightly fractured.											
45		Core 120"	Rec 120"	RQD 100%	R-1	*678												
49.0	563.8						Bottom of Boring - 49.0'											
50																		
55																		
60																		

FILE: 0121-3070-03 [11/7/2007 10:13 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-103

Location: Sta. 185+41.0, 317.0 ft. LT of SR 823 CL

Date Drilled: 10/26/04 to 10/27/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 2.5', 11.0'-21.0' Water level at completion: 6.1' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40							
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay								
0	633.3																				
0.3	633.0						Topsoil - 4"														
		5				2.5	Very stiff brown SILT (A-4b), some clay, trace fine to coarse sand, trace gravel; contains sandstone fragments; damp to moist.														
		6	18	1																	
		3				3.0															
		5	13	2																	
		10				2.25	Very loose to loose brown and gray SILT (A-4b), some fine to coarse sand, little clay, trace gravel; contains sandstone fragments; damp.														
		11	18	3																	
		4				3.5															
		4	18	4																	
10	622.8						Very loose to loose brown and gray SILT (A-4b), some fine to coarse sand, little clay, trace gravel; contains sandstone fragments; damp. @ 18.5', moist.														
10.5		2																			
		3	18	5																	
		4																			
		3																			
		4	18	6																	
		1																			
		1	18	7																	
		4																			
		2	18	8																	
20		3																			
21.0	612.3	50	6	9			Severely weathered grayish brown SANDSTONE.														
21.5	611.8						Medium hard gray and brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thinly to thickly bedded, highly fractured, with typical low angle rust stained fractures.														
22.9	610.4						Hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, thinly to thickly bedded, moderately fractured, with typical low angle clay filled fractures.														
25		Core 120"	Rec 120"	RQD 88%	R-1	*274															
30																					

FILE: 0121-3070-03 [11/7/2007 10:13 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-103

Location: Sta. 185+41.0, 317.0 ft. LT of SR 823 CL

Date Drilled: 10/26/04 to 10/27/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 2.5', 11.0'-21.0' Water level at completion: 6.1' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40					
30	603.3						DESCRIPTION Hard gray SANDSTONE; very fine to fine grained.												
31.5	601.8							Bottom of Boring - 31.5'											
35																			
40																			
45																			
50																			
55																			
60																			

FILE: 0121-3070-03 [11/7/2007 10:13 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-104

Location: Sta. 184+80.6, 37.3 ft. RT of SR 823 CL

Date Drilled: 10/26/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 5.0', 16.0'-30.0' Water level at completion: 4.8' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay							
0	627.5																			
0.3	627.2						Topsoil - 3"													
		2 3 6 18				1	4.0													
		2 3 4 18				2	3.5													
5		2 5 10 18				3	3.0													
		11 12 13 18				4	3.25													
		4 9 8 18				5	4.0													
		3 3 4 18				6	3.5		20	5	--	11	44	20						
15		4 6 8 18				7	2.5													
18.0	609.5																			
		3 3 3 18				8	<0.25		0	2	--	9	31	58						
20																				
20.5	607.0																			
		5 6 6 18				9														
		2 4 6 18				10														
25																				
		3 4 4 18				11														
		3 4 7 18				12														
30																				

Client: TranSystems, Inc. Project: SCI-823-0.00 Job No. 0121-3070.03

LOG OF: Boring R-104 Location: Sta. 184+80.6, 37.3 ft. RT of SR 823 CL Date Drilled: 10/26/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 5.0', 16.0'-30.0' Water level at completion: 4.8' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay							
30.0	597.5						Severely weathered gray SANDSTONE, very fine to fine grained, argillaceous.													
34.0	593.5	50	5	13				Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly to thickly bedded, slightly to moderately fractured. @ 41.5'-43.0', argillaceous zone.												
35																				
40		Core 120"	Rec 120"	RQD 79%	R-1	*572														
44.0	583.5						Bottom of Boring - 44.0'													
45																				
50																				
55																				
60																				

FILE: 0121-3070-03 [11/7/2007 10:13 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-105

Location: Sta. 185+04.3, 215.9 ft. RT of SR 823 CL

Date Drilled: 10/27/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 6.7' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
0	684.5																		
0.3	684.2						Topsoil - 3"												
		5 9 12	18			1	Medium dense brown SILT (A-4b), some fine to coarse sand, little clay, trace gravel; contains sandstone fragments and roots; damp to moist.	9	16	--	10	54	11						
3.5	681.0	50/2	0			2	Severely weathered SANDSTONE.												
5.0	679.5						Medium hard gray and brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thinly to thickly bedded, highly fractured, with typical low angle fractures.												
10		Core 96"	Rec 96"	RQD 40%	R-1	*428	@ 9.0'-10.8', 12.5'-12.8', rust stained high angle fractures.												
12.8	671.7						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly to thickly bedded, slightly fractured to unfractured.												
15		Core 84"	Rec 84"	RQD 100%	R-2	*441													
20.0	664.5						Bottom of Boring - 20.0'												
25																			
30																			

FILE: 0121-3070-03 [11/7/2007 10:13 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-106

Location: Sta. 188+85.1, 50.5 ft. RT of SR 823 CL

Date Drilled: 10/26/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 9.9' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay							
0	647.4																			
0.3	647.1																			
		4																		
		4	6	18																
		4																		
		6	9	18																
5																				
5.5	641.9																			
		4																		
		6	7	18			0.25													
		12																		
		16																		
10																				
10.5	636.9																			
		12																		
		22																		
		29		18																
		12																		
		15																		
15.0	632.4																			
		12																		
		50/3		9																
17.0	630.4																			
		Core 72"	Rec 72"		RQD 22%	R-1	*609													
20																				
21.2	626.2																			
		Core 84"	Rec 84"		RQD 100%	R-2	*615													
25																				
30.0	617.4																			

Bottom of Boring - 30.0'

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-106A

Location: Sta. 191+91.1, 71.3 ft. RT of SR 823 CL

Date Drilled: 10/26/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 13.4' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
0	665.8						Topsoil - 4" Medium dense brown SANDY SILT (A-4a), little gravel, trace clay; contains sandstone fragments; damp.												
0.3	665.5	3				1													
		4	18																
		5																	
		9				2													
5		12	18																
		17																	
		16				3													
		22	18																
		29																	
8.0	657.8						Very soft to soft brown SANDSTONE; very fine to fine grained, decomposed, argillaceous, broken; contains gravel and other residual soil like materials. @ 9.1'-11.7', no recovery.												
10		Core 60"	Rec 32"	RQD 0%	R-1														
13.0	652.8						Medium hard to hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, thinly to thickly bedded, slightly to moderately fractured, with typical low angle fractures. @ 13.0'-13.8', brown highly weathered.												
15		Core 120"	Rec 120"	RQD 84%	R-2	*480													
20																			
25		Core 84"	Rec 84"	RQD 100%	R-3	*503													
30.0	635.8						Bottom of Boring - 30.0'												

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-107

Location: Sta. 194+85.7, 32.6 ft. RT of SR 823 CL

Date Drilled: 10/26/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 11.1' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
0	685.7																		
0.3	685.4						Topsoil - 3"/1.1' soil removed before drilling												
		3				0.25	Soft brown SILT AND CLAY (A-6a), some fine to coarse sand, trace to little gravel; contains sandstone fragments; damp to moist. @ 6.0', very stiff to hard.	4	5	--	16	46	29						
		6	18			1.0													
5		8																	
		11				3.5													
		15	18																
		10				2.5													
10		11																	
		12				4.5+													
		14	18																
13.0	672.7						Severely weathered brown and gray SANDSTONE.												
		19																	
		50/2	8																
15.0	670.7						Medium hard to hard gray SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thinly laminated to thickly bedded, slightly to highly fractured, with typically low angle fractures; contains few argillaceous laminations.												
		Core 96"	Rec 96"		RQD 76%	R-1	*477												
20							@ 20.6'-22.5', broken with clay filled fractures.												
							@ 22.5'-26.7', moderate to abundant argillaceous laminations, fissile.												
		Core 84"	Rec 84"		RQD 80%	R-2	*127												
25																			
30.0	655.7						Bottom of Boring - 30.0'												

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-108

Location: Sta. 198+95.5, 46.1 ft. LT of SR 823 CL

Date Drilled: 10/25/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 4.8' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○					
0	737.6																		
0.8	736.8	4					Topsoil - 9"												
		6	18			1	Medium dense reddish brown SANDY SILT (A-4a), little gravel, little clay; contains sandstone fragments; damp to moist. @ 3.5'-4.1', very dense.	18	7	--	16	38	21	●	○				
		9																	
		12	7			2													
		50/1																	
5.0	732.6						Medium hard brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, thinly to thickly bedded, highly fractured, with typical low angle rust stained fractures. @ 5.0'-5.3', high angle rust stained fracture.												
6.3	731.3						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured, contains few argillaceous laminations. @ 20.8', low angle fractures.												
		Core 96"	Rec 96"	RQD 85%	R-1	*494													
10																			
		Core 120"	Rec 120"	RQD 100%	R-2	*531													
15																			
		Core 84"	Rec 84"	RQD 100%	R-3	*592													
20																			
25																			
30.0	707.6						Bottom of Boring - 30.0'												

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-109

Location: Sta. 198+85.5, 3.9 ft. RT of SR 823 CL

Date Drilled: 10/25/04 to 10/26/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 5.7' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay							
0	755.0																			
-0.5	754.5						Topsoil - 6"													
		4					Very stiff to hard brown and gray SILT AND CLAY (A-6a), little fine to coarse sand; dry to damp.													
		5	8	18		1		3.5												
		9																		
		12	26	18		2	4.5+													
5																				
		18					Severely weathered dark brown SANDSTONE.													
	749.0	25	33	18		3														
		26																		
		50/3		9		4														
9.0	746.0						Medium hard to hard brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, highly fractured, with typical low angle rust stained fractures, contains moderate argillaceous laminations.													
		Core 45"	Rec 45"		RQD 79%	R-1		*226												
	743.3						Hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly to thickly bedded, slightly to moderately fractured, with typical high angle rust stained fractures, contains few argillaceous laminations. @ 14.5'-15.0', rust stained zone.													
		Core 84"	Rec 84"		RQD 88%	R-2		*514												
11.7																				
15																				
20.0	735.0						Bottom of Boring - 20.0'													
25																				
30																				

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-110

Location: Sta. 199+04.6, 141.4 ft. RT of SR 823 CL

Date Drilled: 10/25/04 to 10/26/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 15.9' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ———— LL Blows per foot - ○ 10 20 30 40						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay							
0	796.7																			
0.3	796.4						Topsoil - 3"													
		2					Very stiff brown and gray SILT AND CLAY (A-6a), trace fine to coarse sand; damp.													
		4	13	18		1														
4.0	792.7	14					Severely weathered brown SANDSTONE.													
		29	50/2	12		2														
5	791.2						Soft gray and brown SHALE; fine grained, decomposed, arenaceous, thinly laminated, highly fractured with typical low angle clay filled fractures, contains few arenaceous laminations.													
5.5	791.2																			
6.6	790.1	Core 54"	Rec 54"	RQD 31%	R-1	*392	Medium very hard to hard gray and brown SANDSTONE; fine grained, moderately to highly weathered, argillaceous, micaceous, thinly to thickly bedded, moderately to highly fractured, contains low angle clay filled fractures.													
10																				
15		Core 120"	Rec 120"	RQD 70%	R-2	*284	@ 7.3',8.4', low angle rust stained fractures. @ 12.8'-13.0', clay filled fractures. @ 13.0'-13.9', broken zone. @ 18.2'-20.1', abundant to moderate argillaceous laminations.													
20.2	776.5						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly to thickly bedded, few argillaceous laminations. @ 20.6', 28.7', low angle fractures.													
25		Core 120"	Rec 120"	RQD 98%	R-3	*470														
30																				

FILE: 0121-3070-03 [11/7/2007 10:13 AM]

Client: TranSystems, Inc. Project: SCI-823-0.00 Job No. 0121-3070.03

LOG OF: Boring R-110 Location: Sta. 199+04.6, 141.4 ft. RT of SR 823 CL Date Drilled: 10/25/04 to 10/26/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / *Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 15.9' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)												
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○												
30	766.7																									
35		Core 120"	Rec 120"	RQD 100%	R-4	*414	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly to thickly bedded. @ 36.4'-36.5', 38.6', 39.4', thin argillaceous bands.																			
40.0	756.7						Bottom of Boring - 40.0'																			
45																										
50																										
55																										
60																										

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-111

Location: Sta. 204+01.7, 5.7 ft. RT of SR 823 CL

Date Drilled: 10/21/04 to 10/22/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 2.2' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
0	817.4																		
0.3	817.1						Topsoil - 4"												
		2				1	2.0	5	6	--	13	47	29						
		4	18				Stiff to very stiff brown SILT AND CLAY (A-6a), little fine to coarse sand, trace gravel; moist.												
3.0	814.4					2	4.5+												
		13					Hard light brown CLAY (A-7-6), trace fine to coarse sand, trace gravel; dry to damp.												
		31	18																
5						3	4.5+												
		5					@ 6.0', brown and gray.												
		8	18					1	3	--	3	23	70						
		13																	
9.0	808.4					4													
		9					Severely weathered brown SANDSTONE.												
		24	12																
		50/2																	
10						5													
		16																	
		50/6	8																
12.5	804.9						Hard brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, thinly bedded to thickly bedded.												
13.8	803.6						@ 13.4', low angle rust stained fracture.												
15						R-1	Medium hard to hard gray SANDSTONE; very fine to fine grained, highly to moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded.												
		Core 96"	Rec 96"				@ 17.7'-18.7', SDI = 57.8%.												
							@ 18.0'-20.6', contains abundant to moderate argillaceous laminations.												
							@ 18.0', 18.3', 19.2', low angle clay filled fractures.												
							@ 19.4', 26.9', 27.0', low angle clay filled fractures.												
							@ 20.1'-20.5', qu = 12,399 psi.												
							@ 21.5'-23.0', contains moderate argillaceous laminations.												
							@ 26.4'-27.2', contains abundant to moderate argillaceous laminations.												
							@ 26.9'-27.2', broken.												
25						R-2													
		Core 120"	Rec 120"																
27.1	790.3						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly to thickly bedded.												
30																			

FILE: 0121-3070-03 [11/7/2007 10:13 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-111

Location: Sta. 204+01.7, 5.7 ft. RT of SR 823 CL

Date Drilled: 10/21/04 to 10/22/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 2.2' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40			
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay				
30	787.4																
35		Core 120"	Rec 120"	RQD 100%	R-3	*434	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly to thickly bedded, slightly fractured.										
40							@ 30.6'-30.8', 31.9'-32.3', 37.0'-39.0', contains moderate to abundant argillaceous laminations. @ 37.0'-38.0', SDI = 98.2%. @ 39.0'-39.7', qu = 11,352 psi. @ 40.0'-40.4', qu = 10,493 psi. @ 40.7'-41.1', qu = 3,201 psi.										
45		Core 120"	Rec 120"	RQD 100%	R-4	*409											
50																	
55		Core 120"	Rec 120"	RQD 100%	R-5	*508	@ 53.0'-53.4', qu = 12,131 psi. @ 53.6'-54.6', SDI = 97.5%. @ 57.8'-58.1', 58.4'-58.6', 58.9'-59.0', 60.1'-60.5', contains moderate argillaceous laminations.										
60																	

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-111

Location: Sta. 204+01.7, 5.7 ft. RT of SR 823 CL

Date Drilled: 10/21/04

to

10/22/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 2.2' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
60	757.4						DESCRIPTION Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly to thickly bedded. Bottom of Boring - 60.5'												
60.5	756.9																		
65																			
70																			
75																			
80																			
85																			
90																			

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-112

Location: Sta. 205+84.3, 118.9 ft. LT of SR 823 CL

Date Drilled: 10/22/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 4.6' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
0	799.4																		
0.3	799.1						Topsoil - 4"												
		5 6	18			2.0	Stiff to very stiff brown SILT AND CLAY (A-6a), little fine to coarse sand; damp.												
		6																	
3.5	795.9	17 50/4	10			2	Severely weathered brown SANDSTONE.												
5.0	794.4						Medium hard to very hard brown and gray SANDSTONE; very fine to fine grained, moderately to highly weathered, argillaceous, micaceous, thinly to thickly bedded, moderately to highly fractured, with typical high angle rust stained fractures, contains few to moderate argillaceous laminations.												
		Core 96"	Rec 85"	RQD 36%	R-1	*264	@ 7.1'-8.0', lost recovery.												
							@ 9.2'-9.6', broken zone.												
		Core 84"	Rec 84"	RQD 90%	R-2	*159	@ 12.2'-12.6', high angle clay filled fracture.												
							@ 19.5'-19.9', broken, poorly cemented.												
20.0	779.4						Bottom of Boring - 20.0'												
25																			
30																			

Client: TranSystems, Inc.			Project: SCI-823-0.00			Job No. 0121-3070.03												
LOG OF: Boring R-114			Location: Sta. 205+82.1, 62.6 ft. RT of SR 823 CL			Date Drilled: 10/20/04 to 10/21/04												
Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 11.5' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40				
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay					
0	789.5																	
0.3	789.2						Topsoil - 3"											
		1	12	1			Very loose dark brown SILT (A-4b), some clay, little fine to coarse sand; contains roots; moist.	8	8	--	7	54	23					
		2	18	2														
5		3	5															
6.0	783.5	9					Severely weathered brown SANDSTONE.											
7.5	782.0	20	50/5	16			Soft to medium hard brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thinly bedded, highly fractured, with typical low angle fractures. @ 9.7'-10.5', high angle rust stained fracture. @ 10.6'-11.0', 12.3'-12.5', broken zones.											
10		Core 90"	Rec 90"	RQD 73%	R-1	*255												
12.5	777.0						Medium hard gray SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thickly bedded, moderately fractured, with typical low angle fractures. @ 12.5'-13.4', 14.4'-15.3', 16.3'-17.1', 18.6'-18.8', 19.8'-20.5', rust stained.											
15																		
20		Core 120"	Rec 115"	RQD 92%	R-2	*495												
25.0	764.5						Bottom of Boring - 25.0'											
30																		

FILE: 0121-3070-03 [11/7/2007 10:13 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-2110

Location: Sta. 198+94.2, 150.5 ft. RT of SR 823 CL

Date Drilled: 01/24/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (Prior to coring) 90.0' (Includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
0	795.9						Topsoil - 3" Hard brown and gray SILT AND CLAY (A-6a), little fine to coarse sand; contains sandstone fragments; damp.												
0.3	795.6																		
		8				4.5+													
		9																	
		15	14																
5.0	790.9						Severely weathered brown SANDSTONE, argillaceous. Soft to medium hard brown SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, micaceous, laminated to massive, moderately to highly fractured, iron stained fractures. @ 5.5'-6.6', broken zone. @ 6.6'-7.6', lost recovery.												
5.5	790.4	24																	
		50/2	12																
10		Core 120"	Rec 109"		RQD 43%	R-1	*870												
15																			
16.0	779.9						Soft to medium hard brownish gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded. @ 16.3'-16.9', 21.0'-21.3', iron stained zones. @ 16.5'-16.8', 21.0'-21.3', argillaceous, decomposed, broken.												
20		Core 120"	Rec 119"		RQD 87%	R-2		*1120											
21.7	774.2						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, unfractured to slightly fractured. @ 22.2'-22.3', medium grained with low angle fracture.												
25																			
30							@ 26.6', low angle fracture.												

FILE: 0121-3070-03 [11/7/2007 10:13 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-2110

Location: Sta. 198+94.2, 150.5 ft. RT of SR 823 CL

Date Drilled: 01/24/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (Prior to coring) 90.0' (Includes drilling water)	GRADATION						STANDARD PENETRATION (N)				
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Blows per foot - ○				
30	765.9	Core 120"	Rec 120"	RQD 100%	R-3	*1224	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, unfractured to slightly fractured. @ 30.1', low angle clay filled fracture.											
35																		
40		Core 120"	Rec 120"	RQD 100%	R-4	*1198												
45							@ 43.9',47.6',51.0', low angle clay filled fractures. @ 43.9'-53.4', thinly laminated to thinly bedded											
50		Core 120"	Rec 120"	RQD 100%	R-5	*1096												
55																		
60																		

Client: TranSystems, Inc. Project: SCI-823-0.00 Job No. 0121-3070.03

LOG OF: Boring R-2110 Location: Sta. 198+94.2, 150.5 ft. RT of SR 823 CL Date Drilled: 01/24/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (Prior to coring) 90.0' (Includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40													
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay														
60	735.9	Core 120"	Rec 120"	RQD 100%	R-6	*1535	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, unfractured to slightly fractured.																				
65																											
70		Core 120"	Rec 119"	RQD 99%	R-7	*1300																					
75																											
80		Core 120"	Rec 120"	RQD 100%	R-8	*1279																					
85																											
90																											

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-2110

Location: Sta. 198+94.2, 150.5 ft. RT of SR 823 CL

Date Drilled: 01/24/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (Prior to coring) 90.0' (Includes drilling water)	GRADATION						STANDARD PENETRATION (N)								
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ──── LL Blows per foot - ○ 10 20 30 40								
90	705.9	Core 120"	Rec 120"	RQD 100%	R-9	*1677	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, unfractured to slightly fractured.															
95		Core 60"	Rec 60"	RQD 100%	R-10	*1746																
100	695.4						Bottom of Boring - 100.5'															
100.5																						
105																						
110																						
115																						
120																						

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-2111

Location: Sta. 203+89.1, 3.8 ft. RT of SR 823 CL

Date Drilled: 1/23/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: Not reported Water level at completion: Not reported	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
0.2	817.8 817.6						Topsoil - 2"												
5		8 10 12				1	4.5+	Hard brown SILT AND CLAY (A-6a), some fine to coarse sand, trace gravel; damp to moist.	1	5	--	22	40	32					
5		6 7 9				2	4.5+	@ 5.0', contains rock fragments.											
7.5	810.3	4 13 21				3	4.5+	Hard brown CLAY (A-7-6), some silt, little fine to coarse sand, trace gravel; damp.	3	8	--	7	30	52					
10		17 24 50/2				4	4.5+	@ 10.0', contains sandstone fragments.											
11.6	806.2							Severely weathered brown SANDSTONE, argillaceous.											
13.8	804.0							@ 13.0'-13.4', coarse grained (conglomerate).											
15		Core 108"	Rec 105"	RQD 62%	R-1	*638		Medium hard to hard brown SANDSTONE; fine grained, highly weathered, argillaceous, micaceous, laminated to medium bedded, broken.											
20.6	797.2							Medium hard to hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, laminated to massive, moderately fractured, contains few to moderate argillaceous laminations.											
25		Core 120"	Rec 118"	RQD 98%	R-2	*470													
30																			

FILE: 0121-3070-03 [11/7/2007 10:13 AM]

Client: TranSystems, Inc.				Project: SCI-823-0.00				Job No. 0121-3070.03								
LOG OF: Boring R-2111				Location: Sta. 203+89.1, 3.8 ft. RT of SR 823 CL				Date Drilled: 1/23/06								
Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: Not reported Water level at completion: Not reported	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40		
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay			
30.0	787.8 787.8						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, massive, slightly fractured. @ 31.6'-31.9', argillaceous bands.									
35		Core 120"	Rec 117"	RQD 98%	R-3	*1099										
45		Core 120"	Rec 120"	RQD 100%	R-4	*1598										
55		Core 120"	Rec 120"	RQD 100%	R-5	*1247										
60																

FILE: 0121-3070-03 [11/7/2007 10:13 AM]

Client: TranSystems, Inc. Project: SCI-823-0.00 Job No. 0121-3070.03

LOG OF: Boring R-2111 Location: Sta. 203+89.1, 3.8 ft. RT of SR 823 CL Date Drilled: 1/23/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: Not reported Water level at completion: Not reported	GRADATION						STANDARD PENETRATION (N)					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40					
60.0	757.8																		
	757.8																		
65		Core 120"	Rec 120"	RQD 100%	R-6	*1038	Hard dark gray SANDSTONE; very fine grained, slightly weathered, argillaceous, massive, slightly fractured, with few argillaceous laminations, turbidity burrows.												
69.7	748.1						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, unfractured to slightly fractured, turbidity.												
75		Core 120"	Rec 119"	RQD 99%	R-7	*2225													
85		Core 120"	Rec 120"	RQD 100%	R-8	*2013													
90																			

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-2111

Location: Sta. 203+89.1, 3.8 ft. RT of SR 823 CL

Date Drilled: 1/23/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / *Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: Not reported Water level at completion: Not reported	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
90.0	727.8																		
	727.8																		
95		Core 120"	Rec 120"	RQD 100%	R-9	*1665													
100							@ 99.1'-99.2', calcareous.												
100.6	717.2						Bottom of Boring - 100.6'												
105																			
110																			
115																			
120																			

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-2112

Location: Sta. 205+94.6, 125.6 ft. LT of SR 823 CL

Date Drilled: 1/20/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 70.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40							
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay								
0	795.4																				
0.3	795.1						Topsoil - 3"														
							Very stiff brown SILT AND CLAY (A-6a), little fine to coarse sand; damp.														
		9																			
		7																			
4.0	791.4	8	16			1	Severely weathered brown SANDSTONE.														
5		50/6	0			2															
5.5	789.9						Hard brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, laminated to massive, broken to moderately fractured, iron stains. @ 5.5'-9.0', broken to highly fractured. @ 7.3'-7.8', high angle fracture.														
							@ 9.9'-10.5', core loss due to washout.														
10		Core 120"	Rec 116"		RQD 67%	R-1	*293														
							@ 14.8'-16.3', broken to highly fractured, contains argillaceous laminations.														
16.3	779.1						Medium hard to hard gray SANDSTONE; very fine to fine grained, moderately to slightly weathered, argillaceous, micaceous, massive, moderately fractured. @ 18.5'-18.6' shale bed. @ 18.7',19.1',20.8',22.0', 25.2', low angle fractures. @ 20.2'-23.0', iron stained. @ 20.8'-21.6', calcareous zone, abundant burrows throughout. @ 20.1'-20.2', high angle fracture.														
							@ 25.3'-26.0', iron stained vertical fracture														
							@ 27.5'-27.7', rust stained high angle fracture.														
							@ 26.7',27.3',30.0', low angle fractures, rust stained.														
20		Core 120"	Rec 120"		RQD 87%	R-2	*882														
25																					
30																					

Client: TranSystems, Inc. Project: SCI-823-0.00 Job No. 0121-3070.03

LOG OF: Boring R-2112 Location: Sta. 205+94.6, 125.6 ft. LT of SR 823 CL Date Drilled: 1/20/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 70.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ----- LL Blows per foot - ○ 10 20 30 40																												
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay																													
30	765.4			RQD 84%	R-3	*958																																				
37.7	757.7																																									
40				RQD 100%	R-4																																					
47.7	747.7																																									
50				RQD 100%	R-5	*1024																																				
55																																										
60																																										

FILE: 0121-3070-03 [11/7/2007 10:13 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-2112

Location: Sta. 205+94.6, 125.6 ft. LT of SR 823 CL

Date Drilled: 1/20/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 70.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)							
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40							
60	735.4	Core 120"	Rec 120"	RQD 100%	R-6	*1195	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, slightly fractured to unfractured.														
65																					
70		Core 120"	Rec 120"	RQD 100%	R-7	*1246															
75																					
80.0	715.4	Core 54"	Rec 54"	RQD 100%	R-8		Bottom of Boring - 80.0'														
85																					
90																					

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-120

Location: Sta. 212+84.2, 38.7 ft. RT of SR 823 CL

Date Drilled: 10/22/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 3.6' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay							
0	770.8																			
0.3	770.5						Topsoil - 4"													
		13 27 39	18			1	Severely weathered brown SANDSTONE.													
		50/4	4			2														
5																				
5.5	765.3						Soft to medium hard brown SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, thinly to thickly bedded, highly fractured, with typical low angle clay filled fractures.													
10		Core 114"	Rec 108"		RQD 58%	R-1	@ 5.5'-5.8', 6.9'-7.1', broken zones.													
							@ 14.5'-15.0', lost recovery.													
15.0	755.8						Bottom of Boring - 15.0'													
20																				
25																				
30																				

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 6.9' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ———— LL Blows per foot - ○ 10 20 30 40						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay							
0.2	811.1																			
	810.9	5				4.5+	Topsoil - 2" Hard brown and gray SILTY CLAY (A-6b); dry to damp.													
		10	18			1														
3.0	808.1						Severely weathered gray and light brown SANDSTONE, argillaceous.													
		27	10			2														
		50/4																		
5.5	805.6						Soft to medium hard gray and red SILTSTONE interbedded with SANDSTONE; highly weathered to decomposed, argillaceous, highly fractured.													
		Core 90"	Rec 90"	RQD 84%	R-1	*67														
10																				
15																				
20		Core 120"	Rec 120"	RQD 44%	R-2	*25	@ 20.6'-21.0', 23.6'-23.8', interbedded coal seams.													
25																				
26.5	784.6						Medium hard to hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, thinly to thickly bedded, moderately fractured. @ 26.9'-27.6', SDI = 5.6%.													
		Core 120"	Rec 120"	RQD 84%	R-3	*211														
30																				

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-121

Location: Sta. 216+91.4, 28.0 ft. RT of SR 823 CL

Date Drilled: 10/21/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 6.9' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	10	20	30	40			
30	781.1						<p><i>DESCRIPTION</i></p> <p>Medium hard to hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, thinly to thickly bedded, moderately fractured.</p> <p>@ 31.5'-32.2', interbedded with decomposed SHALE, highly fractured.</p> <p>Hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded, moderately to slightly fractured.</p> <p>@ 33.2',33.5',33.9', low angle clay filled fractures.</p> <p>@ 41.9'-43.0', high angle rust stained fracture.</p> <p>@ 49.3', interbedded to abundant SHALE laminations.</p> <p>@ 49.5'-50.0', lost recovery.</p>													
32.5	778.6																			
35		Core 120"	Rec 120"	RQD 88%	R-4	*496														
40																				
45		Core 84"	Rec 78"	RQD 89%	R-5	*553														
50.0	761.1						Bottom of Boring - 50.0'													
55																				
60																				

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-121A

Location: Sta. 219+91.4, 61.4 ft. LT of SR 823 CL

Date Drilled: 10/20/04 to 10/21/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 3.5' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay							
0	850.3																			
0.3	850.0	50/4	4	1		3.0	Topsoil - 3" Very stiff brown SILT AND CLAY (A-6a), little to some fine to coarse sand, trace gravel; contains sandstone fragments; damp.													
3.0	847.3						Soft to medium hard brown SANDSTONE; fine grained, broken to highly weathered to decomposed, argillaceous, thinly bedded, highly fractured, contains clay filled fractures. @ 3.0'-3.2', 4.4'-5.5', broken zones.													
5		Core 120"	Rec 120"		RQD 30%	R-1	*192													
10							@ 9.8'-11.9, broken zones.													
13.0	837.3						Soft to medium hard dark gray CLAYSTONE; highly weathered to decomposed, argillaceous, carbonaceous, thinly bedded, moderately fractured, with typically low angle fractures. @ 14.8'-15.4', coal seam.													
15.4	834.9						Medium hard to hard brown and gray SANDSTONE interbedded with SHALE; very fine to fine grained, highly weathered, argillaceous, micaceous, thinly bedded, highly fractured, with typical low angle clay filled fractures. @ 15.3'-15.5', 17.2'-17.7', 18.8'- 19.2', broken zones. @ 20.0'-21.9', lost recovery.													
15		Core 120"	Rec 97"		RQD 37%	R-2	*285													
20																				
23.0	827.3						Soft to medium hard dark gray SHALE; highly weathered to decomposed, argillaceous, carbonaceous, thinly laminated to thinly bedded, moderately fractured. @ 26.9'-27.8', coal blossom.													
25		Core 120"	Rec 120"		RQD 73%	R-3	*116													
29.0	821.3						Soft to medium hard gray SANDSTONE.													
30																				

FILE: 0121-3070-03 [11/7/2007 10:15 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-125

Location: Sta. 226+94.5, 105.0 ft. RT of SR 823 CL

Date Drilled: 10/13/04 to 10/14/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 5.8' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
0.3	824.4						Topsoil - 3"												
	824.1	3				4.5+	Hard brown SILTY CLAY (A-6b), trace fine to coarse sand, trace gravel; damp. @ 1.0'-2.5', contains roots.												
		7	18	1															
		5				4.5+													
5		9	18	2															
		12																	
		10				4.5+													
		16	18	3															
		24																	
8.0	816.4						Severely weathered brown SANDSTONE, argillaceous.												
		11																	
		22	13	4															
		50/5																	
10		10					@ 11.0'-12.5', gray.												
		24	16	5															
		40																	
		18																	
		33	16	6															
		50/4																	
15		33																	
		50/4																	
		33	7	7															
		50/3																	
		50/5	5	8															
19.0	805.4																		
19.6	804.8						Medium hard brown and gray SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thinly bedded, broken, with typical high angle rust stained fractures.												
20																			
21.2	803.2	Core 72"	Rec 67"	RQD 55%	R-1	*149	Medium hard brown and red SILTSTONE; highly weathered to decomposed, micaceous, highly fractured, with typical high angle fractures.												
							Medium hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, thinly bedded, moderately fractured, with typical low angle fractures, contains abundant to moderate argillaceous laminations.												
25																			
30		Core 120"	Rec 120"	RQD 90%	R-2		@ 25.5'-37.4', contains coal stringers.												

FILE: 0121-3070-03 [11/7/2007 10:15 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-125

Location: Sta. 226+94.5, 105.0 ft. RT of SR 823 CL

Date Drilled: 10/13/04 to 10/14/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 5.8' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ----- LL Blows per foot - ○ 10 20 30 40			
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay				
30	794.4					*244	Medium hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, thinly bedded, moderately fractured, contains abundant to moderate argillaceous laminations. @ 32.5'-33.7', contains BRECCIA.										
33.7	790.7							Medium hard gray SANDSTONE; very fine to fine grained, moderately to highly weathered, argillaceous, micaceous, thinly bedded to thickly bedded. @ 33.7'-34.8', high angle rust stained fracture. @ 39.2',39.6', low angle clay filled fractures. @ 45.6', 45.9, 49.0', argillaceous laminations. @ 40.0'-42.3', contains moderate to few argillaceous laminations.									
35						*373											
40		Core 120"	Rec 120"	RQD 98%	R-3	*373											
45						*282											
50		Core 120"	Rec 120"	RQD 100%	R-4	*282											
55.0	769.4						Bottom of Boring - 55.0'										
60																	

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-144

Location: Sta. 259+85.0, 148.2 ft. LT of SR 823 CL

Date Drilled: 10/6/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / *Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 4.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay							
0	860.0						4.0 No topsoil/4" soil removed before drilling Very stiff brown SANDY SILT (A-4a), trace clay; contains sandstone fragments; damp.													
3.0	857.0	3 20 7	13			1		Severely weathered brown and gray SANDSTONE, fine grained, argillaceous.												
5		19 24 21	16			2														
7.0	853.0	15 37 50/1	13			3	*208 Soft to medium hard brown SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, micaceous, thinly bedded, broken to highly fractured, with typical low angle clay filled fractures, contains moderate argillaceous laminations.													
10		Core 36"	Rec 18"	RQD 0%	R-1															
15		Core 120"	Rec 40"	RQD 1%	R-2															
18.8	841.2							Medium hard gray SANDSTONE, fine grained, highly weathered, argillaceous, micaceous, carbonaceous, contains carbonized plants.												
20																				
23.6	836.4						*201 Soft to medium hard dark gray and black CLAYSTONE; decomposed to highly weathered to decomposed, argillaceous, carbonaceous. Soft to medium hard gray and black SHALE; moderately weathered, carbonaceous, thinly laminated to thinly bedded. @ 26.7'-28.2', COAL blossom.													
25.2	834.8	Core 120"	Rec 93"	RQD 53%	R-3															
30																				

FILE: 0121-3070-03 [11/7/2007 10:17 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-144

Location: Sta. 259+85.0, 148.2 ft. LT of SR 823 CL

Date Drilled: 10/6/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 4.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)							
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40							
30	830.0						<p>DESCRIPTION</p> <p>Soft to medium hard gray SHALE; highly weathered to decomposed, carbonaceous, broken to highly fractured.</p>														
35.3	824.7	Core 120"	Rec 120"	RQD 76%	R-4	*490		<p>Hard to medium hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded, highly to slightly fractured, contains moderate to few argillaceous laminations.</p> <p>@ 38.0'-38.2', 38.7'-38.8', high angle clay filled fractures. @ 37.1'-38.1', 39.8'-39.2', abundant argillaceous zones. @ 40.4', 40.8', 42.8', 46.2', low angle fractures. @ 41.1'-41.7', broken to highly fractured.</p>													
45		Core 120"	Rec 120"	RQD 92%	R-5	*468		<p>@ 50.3'-52.2', interbedded SHALE.</p> <p>@ 52.8', clay filled fractures.</p> <p>@ 52.7'-52.9', abundant argillaceous laminations.</p>													
55		Core 120"	Rec 120"	RQD 100%	R-6	*71															
60																					

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-144

Location: Sta. 259+85.0, 148.2 ft. LT of SR 823 CL

Date Drilled: 10/6/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 4.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)			
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40			
60	800.0						DESCRIPTION Hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded. @ 67.0'-67.5', 58.1'-58.7', 71.4'-72.1', contains few to moderate argillaceous laminations.										
65		Core 120"	Rec 120"	RQD 96%	R-7	*465											
75		Core 120"	Rec 108"	RQD 87%	R-8	*684											
80.0	780.0						Bottom of Boring - 80.0'										
85																	
90																	

FILE: 0121-3070-03 [11/7/2007 10:17 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-145

Location: Sta. 260+14.3, 158.4 ft. RT of SR 823 CL

Date Drilled: 10/6/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 6.2' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
0	831.6																		
2.0		2 4 5 9				1	No topsoil/12" soil removed before drilling Very stiff dark brown SANDY SILT (A-4a), trace clay; damp.												
3.5		3 5 5 13				2													
5.5	826.1																		
2.25		2 3 4 9				3	Very stiff dark brown CLAY (A-7-6), "and" fine to coarse sand, trace gravel; damp.	1	8	--	28	29	34						
8.0	823.6																		
4.0		5 8 11 14				4	Very stiff to hard brown and gray SILTY CLAY (A-6b), little fine to coarse sand; moist.	0	5	--	7	27	61						
4.0		4 9 13 14				5													
13.0	818.6	50/3	3			6													
13.5	818.1	Core 18"	Rec 15"	RQD 28%	R-1	*557	Severely weathered gray SANDSTONE, argillaceous, micaceous.												
15							Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, highly fractured, with typically low angle clay filled fractures. @ 14.8', low angle rust stained fracture.												
20		Core 120"	Rec 120"	RQD 48%	R-2	*530	@ 19.8'-20.2', moderate to abundant argillaceous laminations, poorly cemented, decomposed zone. @ 22.5'-22.8', 23.8'-24.0', 24.7'- 25.0', broken zones. @ 22.5'-30.0', abundant argillaceous laminations, poorly cemented, decomposed zone. @ 27.9'-28.1', 30.4'-30.9', broken with typical low angle fractures. @ 26.9'-28.2', contains abundant to moderate argillaceous laminations, decomposed to highly weathered, highly fractured. @ 29.3', fractured, argillaceous lamination.												
25																			
30		Core 120"	Rec 120"	RQD 79%	R-3														

FILE: 0121-3070-03 [11/7/2007 10:17 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-145

Location: Sta. 260+14.3, 158.4 ft. RT of SR 823 CL

Date Drilled: 10/6/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 6.2' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ─────────── LL Blows per foot - ○ 10 20 30 40							
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay								
30	801.6					*456	<p>DESCRIPTION</p> <p>Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, highly fractured, with typical low angle clay filled fractures.</p> <p>@ 29.8'-31.8', moderate argillaceous laminations, decomposed to highly weathered.</p>														
35																					
40		Core 120"	Rec 120"	RQD 83%	R-4	*574		<p>@ 39.4'-39.7', 39.9'-40.0', 43.6'-44.5', contains moderate to abundant argillaceous laminations, poorly cemented, decomposed to highly weathered.</p> <p>@ 32.7', low angle clay filled fractures.</p>													
45.0	786.6						<p>DESCRIPTION</p> <p>Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded.</p> <p>@ 47.3', 51.9', 53.1', low angle fractures.</p> <p>@ 55.7',57.1',57.2', low angle fractures.</p>														
50		Core 120"	Rec 120"	RQD 100%	R-5	*538															
55																					
60.0	771.6	Core 60"	Rec 60"	RQD 80%	R-6	*500	Bottom of Boring - 60.0'														

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-145A

Location: Sta. 263+43.1, 175.4 ft. LT of SR 823 CL

Date Drilled: 10/7/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 27.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)				
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, %	Blows per foot			
0	898.4																	
0.3	898.1						Topsoil - 4"											
		4	8	9		1	2.5											
3.0	895.4					2	4.5											
		7	8	9	12		Very stiff to hard brown SILTY CLAY (A-6b), trace fine to coarse sand, trace gravel; damp.											
5						3	3.5											
		8	15	22	2		Hard gray SILT AND CLAY (A-6a), little fine to coarse sand, trace gravel; dry to damp.	0	7	--	6	52	35					
8.0	890.4					4	4.5+											
		19	31	43	18		Severely weathered gray SHALE.	1	11	--	7	51	30					
10	888.9																	
		18	34	50/5	16		Soft to medium hard gray and brown SHALE; highly weathered to decomposed, micaceous, arenaceous, thinly laminated to thinly bedded, highly fractured, with typical low angle rust stained fractures.											
12.5	885.9					5												
15																		
		Core 120"	Rec 120"	RQD 91%	R-1	*26	@ 14.7'-14.8', high angle rust stained fracture.											
20																		
23.7	874.7						Soft to medium hard gray SHALE; highly weathered to decomposed, arenaceous, thinly laminated to thinly bedded, highly fractured, with typical low angle clay filled fractures.											
25																		
		Core 120"	Rec 120"	RQD 29%	R-2		@ 29.8'-30.5', broken zone.											
30																		

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-145A

Location: Sta. 263+43.1, 175.4 ft. LT of SR 823 CL

Date Drilled: 10/7/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 27.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ———— LL Blows per foot - ○ 10 20 30 40						
90	808.4						<p>Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly to moderately fractured, with typically low angle clay filled fractures.</p> <p>@ 92.5'-97.4', contains few argillaceous laminations.</p> <p>@ 104.6'-104.9', 119.1'-119.6', contains few to moderate argillaceous laminations.</p> <p>@ 118.6', low angle fracture.</p>													
		Core 120"	Rec 120"	RQD 89%	R-9	*640														
		Core 120"	Rec 120"	RQD 93%	R10	*378														
		Core 30"	Rec 30"	RQD 100%	R11	*490														
115.0	783.4						Bottom of Boring - 115.0'													
120																				

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-147

Location: Sta. 266+41.3, 183.1 ft. RT of SR 823 CL

Date Drilled: 10/07/04 to 10/11/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 3.8' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40				
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay					
0	867.5						No topsoil Hard brown SILT AND CLAY (A-6a), trace fine to coarse sand; damp.											
		4 7 10	18			1		4.25										
		12 17 36	18			2		4.5+										
-5.0	862.5						Severely weathered brown SHALE, arenaceous, micaceous.											
		18 23 36	18			3												
-7.5	860.0						Medium hard to hard brown SHALE; decomposed, arenaceous, micaceous, thinly bedded to thinly laminated, contains moderate arenaceous laminations. @ 9.5',12.1',12.6',14.3',19.2', low angle fractures.											
10		Core 66"	Rec 66"	RQD 58%	R-1	*40												
15								@ 15.8'-17.6', SANDSTONE seam with few to moderate argillaceous laminations.										
-19.9	847.6						Medium hard to hard gray SHALE; highly weathered, moderately weathered, arenaceous, micaceous, thinly laminated to thinly bedded, highly fractured, contains moderate arenaceous laminations. @ 23.0'-25.5', black decomposed, carbonaceous.											
		Core 120"	Rec 120"	RQD 58%	R-2	*296												
25																		
-28.5	839.0						Soft to medium hard gray SANDSTONE, interbedded with											
		Core 120"	Rec 120"	RQD 67%	R-3													
30																		

FILE: 0121-3070-03 [11/7/2007 10:17 AM]

Client: TranSystems, Inc. Project: SCI-823-0.00 Job No. 0121-3070.03

LOG OF: Boring R-147 Location: Sta. 266+41.3, 183.1 ft. RT of SR 823 CL Date Drilled: 10/07/04 to 10/11/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 3.8' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ———— LL Blows per foot - ○ 10 20 30 40						
30	837.5																			
32.3	835.2						SHALE, decomposed to highly weathered. Soft to medium hard gray SANDSTONE, interbedded with SHALE, decomposed to highly weathered, argillaceous, arenaceous, moderately to poorly cemented, highly fractured to broken.													
35							Soft to medium hard gray to black SHALE; decomposed to highly weathered, contains few arenaceous laminations. @ 33.0'-43.0', SDI = 12.7%.													
40		Core 120"	Rec 120"	RQD 94%	R-4	*40	@ 41.0'-48.2', carbonaceous.													
48.2	819.3	Core 120"	Rec 120"	RQD 87%	R-5	*438	Hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded moderately to highly fractured. @ 48.2', 48.4', 49.3', 50.7', 51.8', 52.2', low angle fractures. @ 50.1'-50.4', broken zone. @ 53.1', 53.4', 53.5', 54.8', 54.9', 55.0, low angle fractures. @ 55.5'-56.0', broken zone, contains moderate argillaceous laminations. @ 57.5'-60.0', contains moderate argillaceous laminations. @ 57.6', 57.9', 59.0', 59.6', low angle fractures.													
55		Core 120"	Rec 120"	RQD 80%	R-6	*516														
60																				

FILE: 0121-3070-03 [11/7/2007 10:17 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-147

Location: Sta. 266+41.3, 183.1 ft. RT of SR 823 CL

Date Drilled: 10/07/04 to 10/11/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 3.8' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)							
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40							
60	807.5						Hard gray SANDSTONE; very fine grained, moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded. @ 60.0'-63.2', 64.7'-67.5', contains moderate argillaceous laminations. @ 60.2', 64.9', 65.2', 65.4', 65.7', 65.9', 66.4', 67.5', 68.3', 72.2', low angle fractures. @ 74.4', 76.0', 76.1', 80.8', 81.7', low angle fractures.														
65																					
70		Core 120"	Rec 120"	RQD 92%	R-7	*504															
75																					
80		Core 120"	Rec 120"	RQD 92%	R-8	*601															
85																					
90.0	777.5	Core 84"	Rec 84"	RQD 100%	R-9																
							Bottom of Boring - 90.0'														

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-148

Location: Sta. 270+53.0, 112.3 ft. LT of SR 823 CL

Date Drilled: 10/06/04 to 10/07/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 7.7' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40							
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay								
0.3	849.0						Topsoil - 3"														
0.3	848.7	4	18	1		4.0	Hard brown SILT AND CLAY (A-6a), trace fine to coarse sand, trace gravel; contains sandstone fragments; dry to damp.														
		4	18																		
		8	18	2		4.5+															
		11	18																		
		17	18	3		4.5+															
		20	18																		
8.0	841.0	6	18	4		4.5+		Hard brown and gray CLAY (A-7-6), trace fine to coarse sand, trace gravel; damp. @ 11.0'-15.0', contains coal fragments.													
		13	18																		
		8	18	5		4.5+															
		11	18																		
		12	18																		
		5	18	6		4.5+															
		10	18																		
		7	18	7		4.5+															
		9	18																		
		18	18	8		4.5+															
		11	18																		
		13	18																		
		7	18	9		4.5+															
		18	18																		
		27	18																		
24.5	824.5						Medium hard to hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded, moderately fractured, with typical low angle clay filled fractures. @ 26.4'-26.9', argillaceous, broken zone. @ 24.8', 27.5', 27.7', 28.8', low angle fractures.														
25		Core 66"	Rec 66"	RQD 88%	R-1	*489															
30																					

FILE: 0121-3070-03 [11/7/2007 10:19 AM]

Client: TranSystems, Inc.				Project: SCI-823-0.00				Job No. 0121-3070.03											
LOG OF: Boring R-148				Location: Sta. 270+53.0, 112.3 ft. LT of SR 823 CL				Date Drilled: 10/06/04 to 10/07/04											
Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 7.7' (includes drilling water)	GRADATION											
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
DESCRIPTION								STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ----- LL Blows per foot - ○ 10 20 30 40											
30.0	819.0																		
	819.0-						<p>Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded to massive, moderately fractured, with typical low angle clay filled fractures.</p> <p>@ 30.6', low angle clay filled fracture.</p> <p>@ 35.6'-36.0', broken zone.</p> <p>@ 35.6'-37.1', gray SHALE highly weathered.</p> <p>@ 32.5', 33.0', 35.3', 37.2', 39.7', low angle fractures.</p> <p>@ 40.4', 41.0', 42.5', 43.4', 45.5', low angle fractures.</p> <p>@ 45.6'-46.3', highly fractured.</p> <p>@ 41.0'-44.4', contains few argillaceous laminations.</p> <p>@ 46.0', slightly fractured.</p> <p>@ 56.5', 56.6', 56.8', low angle fractures.</p>												
35		Core 120"	Rec 120"	RQD 88%	R-2	*699													
40																			
45		Core 120"	Rec 120"	RQD 92%	R-3	*506													
50																			
55		Core 120"	Rec 120"	RQD 97%	R-4	*709													
60																			

FILE: 0121-3070-03 [11/7/2007 10:19 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-149

Location: Sta. 270+86.6, 45.0 ft. RT of SR 823 CL

Date Drilled: 10/07/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 7.5' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ———— LL Blows per foot - ○ 10 20 30 40													
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay														
0.2	809.5																										
	809.3						Topsoil - 2"																				
		7					Hard brown and gray SILT AND CLAY (A-6a), trace fine to coarse sand; contains sandstone fragments; damp.																				
		9	11	18	1	4.5+																					
		16	21	25	18	2		4.5+																			
5							Severely weathered brown and gray SANDSTONE, argillaceous.																				
		27	35	50/2	14	3																					
7.5	802.0						Soft to medium hard gray and brown SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, thinly bedded to thickly bedded, highly fractured, with typical low angle clay filled fractures, contains decomposed argillaceous zones. @ 7.8'-8.3',9.1'-9.3',10.9'-11.0 ', high angle rust stained fractures. @ 16.9'-17.1', high angle clay filled fracture.																				
10			Core 66"	Rec 66"	RQD 73%	R-1		*68																			
15			Core 84"	Rec 84"	RQD 83%	R-2		*514																			
18.2	791.3						Hard gray SANDSTONE; very fine to fine grained, moderately weathered, micaceous, argillaceous, thinly bedded to thickly bedded.																				
20.0	789.5																										
							Bottom of Boring - 20.0'																				

FILE: 0121-3070-03 [11/7/2007 10:19 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-150

Location: Sta. 274+98.0, 115.8 ft. LT of SR 823 CL

Date Drilled: 10/05/04 to 10/06/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 5.0' Water level at completion: None (prior to coring) 18.1' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay							
0.2	867.1						DESCRIPTION													
	866.9	4	7	9	18	1	4.5+	Topsoil - 2"												
		7	11	13	18	2	4.5+	Hard brown SANDY SILT (A-4a), trace clay, trace gravel; contains sandstone fragments; dry to damp.												
5																				
5.5	861.6	13	24	38	18	3	4.5+	Hard brown and gray CLAY (A-7-6), trace fine to coarse sand; dry to damp.												
8.0	859.1	50/2	2			4		Severely weathered brown SANDSTONE.												
10																				
10.5	856.6	Core 66"	Rec 66"	RQD 58%	R-1	*36		Soft to medium hard gray and brown SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, thinly bedded, highly fractured, with typical low angle clay filled fractures, contains moderate argillaceous laminations.												
15																				
16.3	850.8							Medium hard brown SANDSTONE; fine grained, highly weathered, argillaceous, micaceous, moderately to thinly bedded.												
20		Core 120"	Rec 120"	RQD 75%	R-2	*122		@ 14.5'-15.4', high angle rust stained fracture.												
23.5	843.6							Medium hard to very soft brown, black and gray SHALE; decomposed, arenaceous, carbonaceous, thinly laminated to thinly bedded, contains few arenaceous laminations.												
25								@ 28.4'-28.9', broken zone.												
30		Core 120"	Rec 120"	RQD 67%	R-3															

FILE: 0121-3070-03 [11/7/2007 10:19 AM]

Client: *TranSystems, Inc.* Project: *SCI-823-0.00* Job No. *0121-3070.03*

LOG OF: Boring R-150 Location: *Sta. 274+98.0, 115.8 ft. LT of SR 823 CL* Date Drilled: *10/05/04* to *10/06/04*

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 5.0' Water level at completion: None (prior to coring) 18.1' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ----- LL Blows per foot - ○ 10 20 30 40			
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay				
30	837.1																
35						*57	Medium hard to very soft brown, black and gray SHALE; decomposed, arenaceous, carbonaceous, thinly laminated to thinly bedded, contains few arenaceous laminations. @ 31.2'-31.7', COAL blossom. @ 34.0'-34.4', qu = 2,270 psi.										
40.3	826.8	Core 120"	Rec 120"	RQD 79%	R-4	*476	@ 40.2'-40.3', clay filled fracture. Hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded, moderately to slightly fractured.										
45							@ 42.4'-42.5', moderate argillaceous laminations.										
50		Core 120"	Rec 120"	RQD 88%	R-5	*302											
55							@ 54.7',55.7', low angle clay filled fractures.										
60		Core 120"	Rec 120"	RQD 94%	R-6												

Client: TranSystems, Inc. Project: SCI-823-0.00 Job No. 0121-3070.03

LOG OF: Boring R-150 Location: Sta. 274+98.0, 115.8 ft. LT of SR 823 CL Date Drilled: 10/05/04 to 10/06/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / *Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 5.0' Water level at completion: None (prior to coring) 18.1' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ———— LL Blows per foot - ○ 10 20 30 40						
60	807.1																			
						*347	Hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured. @ 61.1'-62.5', qu = 9,870 psi.													
65																				
70		Core 120"	Rec 120"	RQD 98%	R-7	*373														
75																				
80		Core 120"	Rec 120"	RQD 100%	R-8	*479														
85.0	782.1						Bottom of Boring - 85.0'													
90																				

FILE: 0121-3070-03 [11/7/2007 10:19 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-152

Location: Sta. 274+93.1, 175.7 ft. RT of SR 823 CL

Date Drilled: 10/7/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40				
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay					
0	813.3																	
0.3	813.0						Topsoil - 3"											
		7 8 12	8			4.25	Hard brown SANDY SILT (A-4a), trace clay; contains sandstone fragments; damp.											
3.5	809.8	17 50/3	9				Severely weathered brown SANDSTONE.											
		18 24 50/1	13				Medium hard to soft lt. brown SHALE, decomposed to highly weathered, arenaceous, highly fractured, thinly laminated to thinly bedded.											
10	805.8	Core 66"	Rec 66"	RQD 83%	R-1	*26												
11.9	801.4						Soft to medium hard gray and brown SANDSTONE; very fine to fine grained, highly weathered, micaceous, argillaceous, thinly bedded to thickly bedded, highly fractured, with typical low angle clay filled fractures, contains few argillaceous laminations.											
14.8	798.5						@ 13.0'-13.3', iron stained broken zone. @ 13.6', 13.9', low angle rust stained fractures.											
20		Core 120"	Rec 120"	RQD 84%	R-2	*384	Hard gray SANDSTONE; very fine to fine grained, moderately weathered, micaceous, argillaceous, thinly bedded to thickly bedded, moderately fractured, with typical low angle fractures.											
							@ 16.8'-17.1', 18.3'-20.0', contains moderate to abundant argillaceous laminations. @ 23.0'-24.4', contains moderate argillaceous laminations, broken.											
25							@ 24.3', 24.5', low angle clay filled fractures.											
		Core 120"	Rec 120"	RQD 87%	R-3	*421	@ 26.4', 27.1', 28.6', 28.7', 29.4', low angle fractures.											
30																		

FILE: 0121-3070-03 [11/7/2007 10:19 AM]

Client: TranSystems, Inc. Project: SCI-823-0.00 Job No. 0121-3070.03

LOG OF: Boring R-152 Location: Sta. 274+93.1, 175.7 ft. RT of SR 823 CL Date Drilled: 10/7/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 4.7'(includes drilling water)	GRADATION						STANDARD PENETRATION (N)							
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ───┬─── LL Blows per foot - ○ 10 20 30 40							
30	783.3						Hard gray SANDSTONE; very fine to fine grained, moderately weathered, micaceous, argillaceous, thinly bedded to thickly bedded, moderately fractured, with typical low angle fractures.														
		Core 24"	Rec 24"	RQD 100%	R-4	*390															
35.0	778.3						Bottom of Boring - 35.0'														
40																					
45																					
50																					
55																					
60																					

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-152A

Location: Sta. 278+68.2, 19.5 ft. LT of SR 823 CL

Date Drilled: 10/04/04

to 10/05/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 32.5' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ─────────── LL Blows per foot - ○ 10 20 30 40				
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay					
0	882.3						Topsoil - 3"											
0.3	882.0	4	18			1		4.5+										
		6 11																
		6	18			2	4.5+											
		13 15																
5	876.8						Severely weathered brown SANDSTONE.											
5.5		11	18			3												
		30 50/4																
7.5	874.8		12				Soft brown SHALE; very fine to fine grained, highly weathered, argillaceous, thinly laminated to thinly bedded, decomposed to highly fractured, with typical low angle clay filled fractures, contains moderate to few argillaceous laminations.											
10		Core 30"	Rec 30"			R-1												
		Core 120"	Rec 120"			R-2	@ 14.0'-18.1', dark gray to black, carbonaceous.											
15																		
20																		
20.5	861.8						Medium hard brown SANDSTONE; fine grained, highly weathered, argillaceous, micaceous, thinly bedded to thickly bedded.											
							@ 20.5'-23.4', contains moderate argillaceous laminations.											
							@ 25.3'-25.6', 27.8'-28.0', broken zones.											
25		Core 120"	Rec 120"			R-3												
30																		

Client: TranSystems, Inc. Project: SCI-823-0.00 Job No. 0121-3070.03

LOG OF: Boring R-152A Location: Sta. 278+68.2, 19.5 ft. LT of SR 823 CL Date Drilled: 10/04/04 to 10/05/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 32.5' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
30	852.3						<p>Medium hard to hard brown SANDSTONE; fine grained, highly weathered, argillaceous, micaceous, thinly bedded to thickly bedded.</p> <p>@ 35.4',41.6', low angle clay filled fractures.</p> <p>@ 41.2'-41.4',44.9'-45.0',48.2'- 48.4', high angle clay filled fractures.</p>												
35		Core 120"	Rec 120"	RQD 73%	R-4														
40																			
45		Core 120"	Rec 120"	RQD 93%	R-5														
48.4	833.9						<p>Medium hard dark gray SHALE; highly weathered, carbonaceous, thinly laminated to thinly laminated to thinly bedded, moderately fractured.</p> <p>@ 50.5'-50.9', COAL blossom.</p> <p>@ 50.9'-55.3', decomposed.</p>												
50																			
55		Core 120"	Rec 108"	RQD 27%	R-6														
60							<p>@ 55.3'-60.0', arenaceous, thinly bedded.</p> <p>@ 56.0'-56.2', decomposed.</p>												

FILE: 0121-3070-03 [11/7/2007 10:19 AM]

Client: TranSystems, Inc. Project: SCI-823-0.00 Job No. 0121-3070.03

LOG OF: Boring R-152A Location: Sta. 278+68.2, 19.5 ft. LT of SR 823 CL Date Drilled: 10/04/04 to 10/05/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 32.5' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
60	822.3						Medium hard dark gray to black SHALE; highly weathered, carbonaceous, thinly laminated to thinly bedded, moderately fractured. @ 61.7'-62.3', gray SILTSTONE seam. Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, moderately to slightly fractured. @ 63.6'-64.4', SDI = 18.7%. @ 64.5'-64.9', qu = 5,416 psi. @ 62.9'-66.2', 66.4'-67.9', decomposed, abundant argillaceous laminations.												
63.0	819.3																		
65		Core 120"	Rec 120"	RQD 97%	R-7														
70																			
75		Core 120"	Rec 120"	RQD 100%	R-8														
80																			
85		Core 120"	Rec 120"	RQD 100%	R-9														
90																			

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-152A

Location: Sta. 278+68.2, 19.5 ft. LT of SR 823 CL

Date Drilled: 10/04/04 to 10/05/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 32.5' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40								
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay									
90	792.3																					
95		Core 120"	Rec 120"	RQD 100%	R10		Hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured.															
100.0	782.3							Bottom of Boring - 100.0'														
105																						
110																						
115																						
120																						

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-153

Location: Sta. 282+05.8, 76.5 ft. RT of SR 823 CL

Date Drilled: 10/04/04 to 10/05/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 8.3' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40				
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay					
0	892.0						No topsoil											
		9 12 15	18			1	4.5+											
		15 17 21	18			2	4.5+											
		17 21 23	16			3	4.5+											
8.0	884.0	50/4	4			4	Severely weathered brown and gray SHALE, arenaceous.											
11.5	880.5	50/5 Core 18"	5 Rec 18"	5 RQD 100%	R-1	*50	Soft to medium hard brown and gray SHALE; highly weathered to decomposed, arenaceous.											
13.0	879.0						Soft to medium hard gray, black and brown SHALE; highly weathered to decomposed, micaceous, arenaceous, highly to moderately fractured, with typical low angle clay filled fractures, contains abundant to moderate arenaceous laminations.											
		Core 120"	Rec 120"	RQD 92%	R-2	*29	@ 20.6'-21.8', interbedded SANDSTONE and SHALE. @ 23.5',24.3',25.0', low angle iron stained fractures. @ 23.0'-24.5', qu = 699 psi, SDI = 14.6%.											
		Core 120"	Rec 120"	RQD 93%	R-3	*28	@ 26.2'-28.0', SDI = 64.2%.											

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-153

Location: Sta. 282+05.8, 76.5 ft. RT of SR 823 CL

Date Drilled: 10/04/04 to 10/05/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 8.3' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ———— LL Blows per foot - ○ 10 20 30 40						
60	832.0						Soft to medium hard black SHALE; highly weathered to decomposed, arenaceous, carbonaceous. @ 61.1'-61.2', 61.8'-62.0', SILTSTONE seams. Medium hard to hard dark gray to black SHALE; moderately weathered, arenaceous, carbonaceous, thinly bedded to thinly laminated, slightly fractured, with typical low angle clay filled fractures, contains moderate to few arenaceous laminations. @ 64.8'-65.8', SDI = 41.1%. @ 66.2'-66.7', qu = 1,891 psi. @ 71.9'-73.0', SDI = 38.8%. @ 71.9',73.9', low angle fractures. Soft to medium hard gray SHALE; highly weathered to decomposed. @ 77.0', low angle clay filled fracture. @ 81.3'-82.8', qu = 5,348 psi, SDI = 41.9%. Hard gray SANDSTONE; very fine to fine grained, moderately to highly weathered, micaceous, argillaceous, thinly bedded to thickly bedded, moderately fractured.													
63.0	829.0																			
65		Core 120"	Rec 120"	RQD 100%	R-7	*369														
70																				
74.9	817.1																			
80		Core 120"	Rec 120"	RQD 73%	R-8	*118														
85.1	806.9																			
90		Core 120"	Rec 120"	RQD 91%	R-9	*286														

FILE: 0121-3070-03 [11/7/2007 10:19 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-154

Location: Sta. 286+20.8, 25.0 ft. RT of SR 823 CL

Date Drilled: 10/01/04 to 10/04/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 8.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay							
0	836.2																			
0.3	835.9						Topsoil - 4"													
		2 3 4	18			1	2.75													
		4 4	18			2	4.5+													
5		10 13 15	18			3	4.5+													
8.0	828.2						Severely weathered gray and brown SHALE, arenaceous.													
		13 19 27	18			4														
		17 35 48	18			5														
		21 39 50/4	16			6														
15		23 35 50	15			7														
17.5	818.7						Soft to medium hard gray and brown SANDSTONE; fine grained, decomposed to highly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, highly fractured, with typical low angle rust stained fractures contains coarse grained sand, BRECCIA, CONGLOMERATE and decomposed shale lenses. @ 18.2'-18.3', coal seam. @ 20.3'-20.5', shale seam. @ 20.5'-20.6', conglomerate.													
20		Core 66"	Rec 66"	RQD 67%	R-1	*350														
20.6	815.6						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, micaceous, argillaceous, thinly bedded to thickly bedded, highly fractured. @ 22.0'-29.8', numerous low angle fractures. @ 25.0'-27.3', 28.7'-29.8', contains moderate argillaceous laminations.													
25		Core 120"	Rec 120"	RQD 93%	R-2	*426														
30																				

FILE: 0121-3070-03 [11/7/2007 10:19 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-154

Location: Sta. 286+20.8, 25.0 ft. RT of SR 823 CL

Date Drilled: 10/01/04 to 10/04/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 8.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ----- LL Blows per foot - ○ 10 20 30 40						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay							
30	806.2																			
							Hard gray SANDSTONE; very fine to fine grained, slightly weathered, micaceous, argillaceous, thinly bedded to thickly bedded, moderately to highly fractured.													
							@ 31.0'-31.1', argillaceous zone, broken.													
35							@ 35.7'-37.7', contains moderate argillaceous laminations.													
		Core 120"	Rec 120"	RQD 85%	R-3	*115	@ 37.1'-37.3', high angle fracture. @ 38.4'-38.5',39.7', contains moderate argillaceous laminations.													
40							@ 33.4',33.7',34.1',34.4', 34.9',35.1',35.2',36.2', 37.5',37.6', 39.7',42.3', low angle fractures. @ 40.0'-40.4', qu = 10,607 psi. @ 44.5', low angle fracture.													
							@ 45.3'-45.8', broken zone, argillaceous.													
45																				
		Core 120"	Rec 120"	RQD 84%	R-4	*432	@ 48.7'-49.5', high angle clay filled fracture.													
50																				
							@ 56.6'-56.8', high angle iron stained fracture.													
55																				
		Core 120"	Rec 120"	RQD 98%	R-5	*564														
60																				

FILE: 0121-3070-03 [11/7/2007 10:19 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-156

Location: Sta. 285+89.0, 293.9 ft. RT of SR 823 CL

Date Drilled: 9/30/04

to 10/04/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 22.2' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay							
0	874.4																			
0.3	874.1						Topsoil - 3"													
		2 4	18	1		4.5+	Very stiff to hard reddish brown CLAY (A-7-6), trace to little fine to coarse sand, trace gravel; damp.	0	4	--	5	37	54							54
		3 4	18	2		2.5		2	8	--	7	41	42							
5	868.9	5 6	18	3		4.5+	Hard brown SILT AND CLAY (A-6a), trace gravel, trace to little fine to coarse sand; contains shale fragments; dry to damp.	3	7	--	6	49	35							
5.5		5 21	18	4		4.5+														
		10 28	18	5		4.5+														54
		12 26	18	6		4.5+	Severely weathered dark brown SANDSTONE.													69
13.5	860.9	12 41	18	7		4.5+	Medium hard to hard light gray and dark gray SANDSTONE, interbedded with dark SHALE, highly weathered.													67
15		12 50/4	6			4.5+														50+
17.0	857.4																			
20.0	854.4						Medium hard to hard tan SANDSTONE, medium grained, highly weathered, argillaceous, thinly bedded, highly fractured. @ 20.0'-27.5', decomposed argillaceous zone.													
25		Core 120"	Rec 114"	RQD 20%	R-2	*136	@ 27.5'-28.2, broken.													
30																				

FILE: 0121-3070-03 [11/7/2007 10:19 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-156

Location: Sta. 285+89.0, 293.9 ft. RT of SR 823 CL

Date Drilled: 9/30/04 to 10/04/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 22.2' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)							
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ———— LL Blows per foot - ○ 10 20 30 40							
30.0	844.4																				
	844.4																				
35		Core 120"	Rec 114"	RQD 50%	R-3	*194															
38.5	835.9																				
40																					
45		Core 120"	Rec 116"	RQD 46%	R-4	*240															
50																					
55		Core 120"	Rec 120"	RQD 96%	R-5																
60																					

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-156

Location: Sta. 285+89.0, 293.9 ft. RT of SR 823 CL

Date Drilled: 9/30/04 to 10/04/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 22.2' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40						
60.0	814.4																			
64.5	809.9	Core 120"	Rec 120"	RQD 97%	R-6	*95	Medium hard dark gray to black SHALE, highly to moderately weathered, thinly laminated, slightly fractured. @ 62.5'-63.5', SDI = 61.3%.													
70							Medium hard light gray SILTSTONE, slightly to moderately weathered, arenaceous, slightly fractured. @ 67.0'-79.1', hard, dark and light gray, red, and brown, medium bedded. @ 64.0'-64.4', COAL blossom. @ 64.4', light gray.													
74.2	800.2	Core 120"	Rec 120"	RQD 90%	R-7	*248	Hard light and dark gray SANDSTONE, very fine to fine grained, slightly weathered, argillaceous, thick bedded, slightly fractured. @ 80.0'-82.8', contains carbonaceous laminations.													
85		Core 120"	Rec 120"	RQD 100%	R-8	*335														
90																				

FILE: 0121-3070-03 [11/7/2007 10:19 AM]

Client: TranSystems, Inc. Project: SCI-823-0.00 Job No. 0121-3070.03

LOG OF: Boring R-156 Location: Sta. 285+89.0, 293.9 ft. RT of SR 823 CL Date Drilled: 9/30/04 to 10/04/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 22.2' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)								
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40								
90	784.4						Hard light and dark gray SANDSTONE, fine grained, slightly weathered, highly argillaceous interbedding, thick bedded, slightly fractured, contains silty lenses. @ 100.0'-100.9', SDI = 91.1%. @ 101.1'-101.5', qu = 2,974 psi.															
95		Core 120"	Rec 120"	RQD 100%	R-9	492																
100																						
105		Core 120"	Rec 120"	RQD 100%	R10	*570																
110																						
115		Core 120"	Rec 118"	RQD 98%	R11	*344																
120.0	754.4						Bottom of Boring - 120.0'															

FILE: 0121-3070-03 [11/7/2007 10:19 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-2154

Location: Sta. 286+03.1, 117.5 ft. LT of SR 823 CL

Date Drilled: 1/11/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 9.0' Water level at completion: None (prior to coring) 20.7' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay							
0	787.9																			
0.8	787.1	20 13 17	12	1			Topsoil - 9"													
		50/5	5	2			Severely weathered brown SANDSTONE, argillaceous.													
5.0	782.9						Medium hard to hard grayish brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, massive, moderately to highly fractured. @ 5.0'-6.2', high angle, filled fracture.													
10		Core 103"	Rec 103"	RQD 77%	R-1	*658	@ 11.3'-11.6', high angle fracture. @ 13.2'-13.4', 14.2'-14.5', 16.1'-16.3', high angle iron stained fractures. @ 13.6'-14.0', broken zone.													
17.5	770.4						Soft to medium hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, thinly laminated to thinly bedded, moderately fractured, contains moderate to abundant argillaceous laminations. @ 17.7'-18.1', high angle, iron stained fracture. @ 22.1'-22.9', vertical fracture, iron stained.													
20		Core 120"	Rec 120"	RQD 63%	R-2	*278														
27.1	760.8						Medium hard to hard brown and gray SANDSTONE; very fine to fine grained, moderately to highly weathered, argillaceous, micaceous, massive, slightly fractured.													
30		Core 120"	Rec 120"	RQD 88%	R-3	*928														

FILE: 0121-3070-03 [11/7/2007 10:19 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-172

Location: Sta. 306+32.2, 647.2 ft. RT of SR 823 CL

Date Drilled: 9/15/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None	GRADATION						STANDARD PENETRATION (N)					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40					
0	569.3																		
0.3	569.0						Topsoil - 4"												
		5				1	2.25												
		7	18																
		12				2	3.0												
		14																	
		13	18																
5	563.8																		
5.5		30				3	Severely weathered brown and gray SANDSTONE, argillaceous.												
7.0	562.3	50/5	10				Soft to medium hard brown SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, micaceous, thinly bedded to thickly bedded, highly fractured, with typical high angle rust stained fractures.												
10		Core 72"	Rec 72"			RQD 14%	R-1												
13.0	556.3						Hard gray SANDSTONE; very fine to fine grained, moderately to highly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, moderately fractured, contains few argillaceous laminations.												
15		Core 84"	Rec 84"			RQD 90%	R-2	*612											
20.0	549.3						Bottom of Boring - 20.0'												
25																			
30																			

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-173

Location: Sta. 308+74.9, 173.1 ft. RT of SR 823 CL

Date Drilled: 9/14/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / *Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
0	696.8																		
0.3	696.5																		
		6 8 11 18				1	3.0												
		12 18 14 18				2	4.5+												
5																			
6.0	690.8																		
		7 8 16 18				3													
		7 10 11 18				4													
10																			
11.0	685.8	50/2	0			5													
15		Core 120"	Rec 120"			RQD 58% R-1	*350												
20																			
21.0	675.8																		
25																			
30																			

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-174

Location: Sta. 308+61.6, 410.4 ft. RT of SR 823 CL

Date Drilled: 9/14/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro- meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
0.3	651.0 650.7						Topsoil - 4"												
		1 5 5 18				1	Medium dense brown SANDY SILT (A-4a), trace clay; contains sandstone fragments; dry to damp.												
		3 4 6 18				2													
5		5 8 8 16				3													
8.0	643.0	4 6 10 18				4		Severely weathered grayish brown SANDSTONE, argillaceous.											
10		10 11 11 18				5													
		21 7 7 14				6													
15		8 15 29 18				7													
17.5	633.5						Soft to medium hard brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, thinly bedded to thickly bedded, broken to highly fractured, with typical high angle fractures.												
20		Core 120"	Rec 120"	RQD 75%	R-1														
23.9	627.1						Hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured.												
25																			
27.5	623.5						Bottom of Boring - 27.5'												
30																			

FILE: 0121-3070-03 [11/7/2007 10:21 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-175

Location: Sta. 308+55.3, 525.3 ft. RT of SR 823 CL

Date Drilled: 9/14/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40											
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay												
0.2	628.2 628.0																								
		8	15 12	16		1			Topsoil - 2"																
		8	10 18	18		2			Medium dense brown SANDY SILT (A-4a), trace clay; contains sandstone fragments; dry to damp.																
5																									
6.0	622.2	15	16 23	18		3				Severely weathered brown SANDSTONE, argillaceous.															
8.0	620.2																								
10		Core 60"	Rec 60"		RQD 67%	R-1	*360			Soft to medium hard brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, thinly bedded to thickly bedded. @ 8.0'-8.3',9.9'-10.5', decomposed, broken zones. @ 11.0'-11.2',13.0'-13.4', high angle fractures. @ 12.4'-13.0',15.1'-16.0', broken zones.															
15																									
17.3	610.9	Core 84"	Rec 84"		RQD 83%	R-2	*293																		
20.0	608.2																								
										Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, thinly bedded to thickly bedded, moderately fractured.															
										Bottom of Boring - 20.0'															

FILE: 0121-3070-03 [11/7/2007 10:21 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-177

Location: Sta. 310+79.1, 269.6 ft. RT of SR 823 CL

Date Drilled: 8/31/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 5.0' Water level at completion: None (prior to coring) 5.6' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40							
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay								
0	581.1																				
0.3	580.8						Topsoil - 4"														
		9				1	Medium dense brown SANDY SILT (A-4a), little gravel; damp.														
		9	18			2															
		9	18			3															
		8				3															
		12	18			4	Loose to medium dense brown and gray SILT (A-4b), trace fine to coarse sand, trace gravel; damp to moist. @ 11.0'-12.5', some fine to coarse sand.														
		3	18			5															
		4	18			6															
		9				5															
		16	18																		
		19	18																		
		50/0	0			6															
8.5	572.6						Medium hard gray and brown SANDSTONE; very fine to fine grained, slightly to highly weathered, argillaceous, micaceous, thinly laminated to thickly bedded, moderately to highly fractured. @ 13.3'-13.4', 18.2'-18.5', 19.5'- 19.6', broken with typical low angle clay filled fractures.														
10																					
14.0	567.1																				
15		Core 72"	Rec 72"		RQD 54%	R-1	*244														
20.0	561.1						Bottom of Boring - 20.0'														
25																					
30																					

Client: TranSystems, Inc. Project: SCI-823-0.00 Job No. 0121-3070.03

LOG OF: Boring R-178 Location: Sta. 310+11.3, 568.7 ft. RT of SR 823 CL Date Drilled: 8/31/04 to 9/1/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 2.5' Water level at completion: None (prior to coring) 4.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40				
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay					
0.2	566.2						Topsoil - 2"											
	566.0	2				1		Loose to medium dense brown SANDY SILT (A-4a), little gravel, trace clay; damp to moist.										
3.0	563.2	9	18			1	Severely weathered brown SANDSTONE.											
		24				2												
5.0	561.2	50/6	10			2	Medium hard to hard gray and brown SANDSTONE; very fine to fine grained, moderately to highly weathered, argillaceous, micaceous, medium to thickly bedded, broken, with typical low angle rust stained fractures. Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly laminated to thickly bedded, slightly fractured. @ 13.4', low angle clay filled fracture.											
7.1	559.1																	
10		Core 120"	Rec 120"	RQD 85%	R-1													
15		Core 60"	Rec 60"	RQD 87%	R-2	*656												
20.0	546.2						Bottom of Boring - 20.0'											
25																		
30																		

Client: TranSystems, Inc. Project: SCI-823-0.00 Job No. 0121-3070.03

LOG OF: Boring R-179 Location: Sta. 313+45.2, 377.7 ft. RT of SR 823 CL Date Drilled: 9/24/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 35.3' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)										
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40										
0	742.1																							
0.4	741.7						Topsoil - 5"																	
2.5	739.6						Medium dense to dense brown SANDY SILT (A-4a); contains sandstone fragments; damp.																	
5		Core 30"	Rec 30"	RQD 77%	R-1	*288	Medium hard gray and brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thickly bedded, moderately fractured, with typical high angle rust stained fractures. @ 3.9',7.8', low angle rust stained fractures.																	
10		Core 60"	Rec 60"	RQD 77%	R-2	*285	@ 9.5'-10.0', broken zone light brown low angle fractures.																	
13.1	729.0						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thickly bedded, slightly fractured to unfractured. @ 13.5'-13.7', light brown, broken zone with low angle fractures.																	
15		Core 120"	Rec 120"	RQD 100%	R-3	*409	@ 18.4',24.7', low angle clay filled fractures.																	
20																								
25		Core 120"	Rec 120"	RQD 100%	R-4	*485	@ 24.7', low angle clay filled fractures.																	
30																								

FILE: 0121-3070-03 [11/7/2007 10:21 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-179

Location: Sta. 313+45.2, 377.7 ft. RT of SR 823 CL

Date Drilled: 9/24/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 35.3' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)							
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40							
30	712.1						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thickly bedded, slightly fractured to unfractured. @ 37.4-37.9', rust stained zone with fossils.														
35		Core 120"	Rec 120"	RQD 100%	R-5	*489															
45		Core 120"	Rec 120"	RQD 100%	R-6	*518															
55		Core 120"	Rec 120"	RQD 100%	R-7	*331															
60.0	682.1						Bottom of Boring - 60.0'														

FILE: 0121-3070-03 [11/7/2007 10:21 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-180

Location: Sta. 315+33.5, 92.5 ft. RT of SR 823 CL

Date Drilled: 9/23/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 13.9' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40										
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay											
0.2	764.7																							
	764.5	2					Topsoil - 2"																	
		2	4	12			Very stiff brown SILT AND CLAY (A-6a), trace fine to coarse sand, trace gravel; damp.																	
3.0	761.7	4	7	10	13		Hard brown and gray CLAY (A-7-6), trace to little fine to coarse sand, trace gravel; damp.	3	5	--	5	46	41											
5		6	10	14	18																			
8.5	756.2	14	24	50/5	12		Severely weathered dark brown SANDSTONE.																	
10																								
10.5	754.2						Medium hard to hard brownish gray SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, broken to highly fractured, contains few argillaceous laminations. @ 10.5'-11.0', 11.6'-11.7', high angle rust stained fracture. @ 11.5', 11.8', 12.2', low angle rust stained fracture. @ 12.5'-12.7', high angle clay filled fracture.																	
		Core 54"	Rec 54"		RQD 51%	R-1																		
15																								
20		Core 120"	Rec 120"		RQD 67%	R-2	*328																	
25							@ 22.5', brown and gray. @ 22.5', slightly to moderately fractured.																	
							@ 25.5', gray with occasional brown layer.																	
30		Core 120"	Rec 120"		RQD 100%	R-3																		

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-180

Location: Sta. 315+33.5, 92.5 ft. RT of SR 823 CL

Date Drilled: 9/23/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 13.9' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)												
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40												
30	734.7					*438	Hard gray SANDSTONE; very fine to fine grained, moderately weathered to slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly fractured to unfractured, contains few argillaceous laminations.																			
35																										
40		Core 120"	Rec 120"	RQD 100%	R-4	*490																				
45																										
50		Core 120"	Rec 120"	RQD 100%	R-5	*495																				
55																										
60		Core 120"	Rec 120"	RQD 100%	R-6																					

FILE: 0121-3070-03 [11/7/2007 10:21 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-180

Location: Sta. 315+33.5, 92.5 ft. RT of SR 823 CL

Date Drilled: 9/23/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 13.9' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40					
60	704.7					*218	Hard gray SANDSTONE; very fine to fine grained, moderately weathered to slightly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, slightly to unfractured, contains few argillaceous laminations.												
65																			
70		Core 120"	Rec 120"	RQD 100%	R-7	*268													
75.0	689.7						Bottom of Boring - 75.0'												
80																			
85																			
90																			

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-2169

Location: Sta. 307+10.1, 146.4 ft. LT of SR 823 CL

Date Drilled: 12/13/05 to 12/14/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 33.8' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
0	808.4																		
0.3	808.1						Topsosil - 4"												
		1					Loose gray SILT (A-4b), little fine to coarse sand, trace clay, trace gravel; damp to moist.												
		3	5	13		1													
3.0	805.4						Severely weathered brown SANDSTONE, argillaceous.												
		50/1		3		2													
5.0	803.4						Medium hard light brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, laminated to thickly bedded, highly fractured, decomposed zones at fractures.												
7.5	800.9						Hard light brown to gray SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, massive, moderately to highly fractured. @ 8.6',9.0',9.6',10.3',10.4' 12.4', low angle fractures. @ 9.1'-9.5', qu = 5,323 psi.												
10		Core 108"	Rec 108"		RQD 96%	R-1		*1146											
15							@ 14.2'-19.3', contains few to moderate argillaceous laminations. @ 14.5',15.7',16.2',16.9',17.8', 18.2',21.0',22.1', low angle fractures.												
20		Core 120"	Rec 120"		RQD 100%	R-2	*940												
24.0	784.4						Hard to very hard brown to gray SANDSTONE; fine to medium grained, moderately weathered, carbonaceous, argillaceous. @ 24.7',27.9', low angle fractures. @ 25.0'-26.8',27.1'-27.3', high angle rust stained fractures. @ 25.0'-27.1', calcareous.												
25																			
27.9	780.5						Hard gray SANDSTONE; very fine to fine grained.												
30		Core 120"	Rec 120"		RQD 79%	R-3		*879											

FILE: 0121-3070-03 [11/7/2007 10:21 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-2169

Location: Sta. 307+10.1, 146.4 ft. LT of SR 823 CL

Date Drilled: 12/13/05 to 12/14/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / *Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 33.8' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)								
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ●								
DESCRIPTION												PL ----- LL Blows per foot - ○ 10 20 30 40										
30	778.4						@ 28.2',30.0', low angle fractures. Hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, massive, slightly fractured, contains few argillaceous laminations. @ 34.7', low angle fracture. @ 36.5'-37.0', qu = 8,478 psi. @ 44.6', 44.7', low angle fractures.															
		Core 120"	Rec 120"	RQD 100%	R-4	*241																
50.6	757.8						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, unfractured to slightly fractured.															
		Core 120"	Rec 120"	RQD 100%	R-5	*673																
60		Core 120"	Rec 120"	RQD 100%	R-6	*1859																

Client: TranSystems, Inc. Project: SCI-823-0.00 Job No. 0121-3070.03

LOG OF: Boring R-2169 Location: Sta. 307+10.1, 146.4 ft. LT of SR 823 CL Date Drilled: 12/13/05 to 12/14/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 33.8' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40							
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay								
60	748.4						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, unfractured to slightly fractured. @ 67.7', low angle fracture along argillaceous zone.														
65																					
70		Core 120"	Rec 120"	RQD 100%	R-7	*1482															
75		Core 72"	Rec 72"	RQD 100%	R-8	*1543															
80.0	728.4						Bottom of Boring - 80.0'														
85																					
90																					

FILE: 0121-3070-03 [11/7/2007 10:21 AM]

Client: TranSystems, Inc.			Project: SCI-823-0.00			Job No. 0121-3070.03													
LOG OF: Boring R-2174			Location: Sta. 308+35.4, 167.2 ft. LT of SR 823 CL			Date Drilled: 12/14/05 to 12/16/05													
Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 31.8' (prior to coring) 34.7' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
0	794.6						Topsoil - 5"/2.0' soil removed before drilling												
-0.4	794.2							Severely weathered brown SANDSTONE, argillaceous, micaceous.											
		7 18 27	14			1													
		50/2	5			2													50+
5.0	789.6						Medium hard gray SANDSTONE; fine grained, highly weathered, argillaceous, micaceous, massive, highly fractured. @ 5.0'-5.5', 10.3'-10.6', high angle fractures. @ 6.4'-8.5', calcareous sandstone. @ 10.9'-11.2', high angle fracture.												
10		Core 120"	Rec 120"	RQD 80%	R-1	*647													
13.4	781.2						Medium hard to hard brown and gray SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, massive, slightly to moderately fractured. @ 16.3', 16.8', 17.4', 17.5', 19.1', low angle fractures. @ 18.8'-19.1', high angle fracture. @ 19.4', gray.												
15		Core 120"	Rec 120"	RQD 99%	R-2	*504													
25.0	769.6						Medium hard gray SANDSTONE; fine grained, slightly to moderately weathered, argillaceous, slightly fractured, contains few to moderate argillaceous laminations. @ 27.3'-27.5', high angle fracture.												
30		Core 120"	Rec 120"	RQD 95%	R-3														

FILE: 0121-3070-03 [11/7/2007 10:21 AM]

Client: TranSystems, Inc. Project: SCI-823-0.00 Job No. 0121-3070.03

LOG OF: Boring R-2174 Location: Sta. 308+35.4, 167.2 ft. LT of SR 823 CL Date Drilled: 12/14/05 to 12/16/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 31.8' (prior to coring) 34.7' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ———— LL Blows per foot - ○ 10 20 30 40					
30	764.6																		
35																			
37.6	757.0																		
40		Core 120"	Rec 120"	RQD 99%	R-4	*1047	Medium hard gray SANDSTONE; fine grained, slightly to moderately weathered, argillaceous, slightly fractured, contains few to moderate argillaceous laminations. @ 36.3'-37.4', very fine grained sandstone. @ 37.4'-37.6', rust stained conglomerate and sandstone. @ 37.6', low angle fracture.												
45																			
50		Core 120"	Rec 120"	RQD 100%	R-5	*1227	Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, unfractured to slightly fractured, turbidity. @ 37.4'-37.6', calcareous. @ 41.4'-42.0', iron stained, calcareous.												
55																			
60		Core 120"	Rec 120"	RQD 100%	R-6														

Client: TranSystems, Inc. Project: SCI-823-0.00 Job No. 0121-3070.03

LOG OF: Boring R-2174 Location: Sta. 308+35.4, 167.2 ft. LT of SR 823 CL Date Drilled: 12/14/05 to 12/16/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 31.8' (prior to coring) 34.7' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ———— LL Blows per foot - ○ 10 20 30 40						
60	734.6						Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, unfractured to slightly fractured, turbidity. @ 65.0'-70.0', unweathered. @ 65.3',66.3',66.9',67.6', 67.7',68.2',69.3', low angle fractures.													
65		Core 60"	Rec 60"	RQD 100%	R-7	*1868														
70.0	724.6						Bottom of Boring - 70.0'													
75																				
80																				
85																				
90																				

FILE: 0121-3070-03 [11/7/2007 10:21 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-2180

Location: Sta. 315+05.5, 121.1 ft. LT of SR 823 CL

Date Drilled: 12/21/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / *Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 3.8' (includes drilling water, with augers removed)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ———— LL Blows per foot - ○						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	10	20	30	40			
0.2	718.2																			
0.2	718.0	4	7	14	1	3.25	Topsoil - 2"/6" soil removed before drilling													
4.5	713.7	24 42 50/5	14	2a 2b			Very stiff brown SANDY SILT (A-4a), trace to little clay; contains sandstone fragments; dry to damp.													
4.5							Severely weathered brown SANDSTONE.													
6.3	711.9						Medium hard to hard brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, massive, highly fractured to broken.													
10		Core 93"	Rec 93"	RQD 81%	R-1		@ 10.6'-10.8', filled fracture.													
10.8	707.4						Hard brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, massive, slightly to highly fractured. @ 12.3'-12.6', gray. @ 12.8',13.0',13.1',13.4',14.7' 15.1', 18.7', low angle fractures.													
15		Core 72"	Rec 72"	RQD 100%	R-2															
20.0	698.2						@ 19.3', gray.													
							Bottom of Boring - 20.0'													

FILE: 0121-3070-03 [11/7/2007 10:21 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-186

Location: Sta. 324+37.9, 54.6 ft. RT of SR 823 CL

Date Drilled: 8/31/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 10.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40					
0	717.6																		
0.3	717.3						Topsoil - 3"/2.5' soil removed before drilling												
		5					Dense light brown SILT AND CLAY (A-6a); contains sandstone fragments; dry.												
2.5	715.1	11 36	11			1	Severely weathered brown SANDSTONE.												
		50/5	4			2													50+
5.0	712.6						Soft to medium hard gray and brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, highly to moderately fractured, with typically low angle fractures.												
		Core 60"	Rec 60"	RQD 52%	R-1	*390													
10							@ 10.0'-10.5', 12.0'-12.4', 12.9'-13.3', abundant argillaceous laminations.												
15		Core 120"	Rec 118"	RQD 61%	R-2	*337													
16.5	701.1						Soft to medium hard gray SANDSTONE interbedded with SILTSTONE, very fine grain to fine grain, highly weathered, micaceous, thinly bedded to very thinly bedded, broken.												
20							@ 19.0'-19.3', broken zone. @ 26.0'-26.3', 26.9'-27.1', argillaceous interbeds.												
							@ 22.2'-23.7', qu = 7,168 psi, SDI = 97.0%.												
25		Core 120"	Rec 120"	RQD 29%	R-3	*400													
30																			

Client: TranSystems, Inc. Project: SCI-823-0.00 Job No. 0121-3070.03

LOG OF: Boring R-186 Location: Sta. 324+37.9, 54.6 ft. RT of SR 823 CL Date Drilled: 8/31/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 10.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
30.0	687.6																		
30.0	687.6																		
35		Core 120"	Rec 117"	RQD 36%	R-4	*478	Soft to medium hard gray and brown SANDSTONE; very fine to fine grained, moderately to highly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, highly fractured, with typical low angle fractures. @ 31.4'-31.6',32.5'-39.1', abundant argillaceous laminations. @ 33.6',33.9', low angle clay filled fractures. @ 39.0'-39.4', fine to medium grained, poorly cemented.												
40.0	677.6						Bottom of Boring - 40.0'												
45																			
50																			
55																			
60																			

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-188

Location: Sta. 324+74.3, 265.2 ft. RT of SR 823 CL

Date Drilled: 9/1/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 7.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay							
0.2	679.7																			
	679.5	5					Topsoil - 2"/12" soil removed before drilling													
		15 34	13			1	Very stiff reddish brown SILT (A-4b), little clay, little fine to coarse sand, trace gravel; damp.	1	9	--	9	62	19							
3.0	676.7	12				2	Very stiff brown SILT AND CLAY (A-6a), trace gravel, trace fine to coarse sand; damp.													
		13 15	15																	
		5				3		3	4	--	4	62	27							
		7 10	17																	
		5				4	@ 8.5', contains sandstone fragments.													
		18 21	17																	
10		8				5														
		16 29	16																	
13.0	666.7	50/5	4			6	Severely weathered brown SANDSTONE.													
15.0	664.7						Soft to medium hard gray and brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thinly bedded to massive, highly fractured.													
		Core 72"	Rec 72"				@ 15.1'-15.7', 16.2'-17.1', 18.9'- 19.1', broken with typical low angle rust stained fractures.													
						RQD 22%														
						R-1														
21.0	658.7						Bottom of Boring - 21.0'													
25																				
30																				

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-189

Location: Sta. 326+76.5, 9.4 ft. RT of SR 823 CL

Date Drilled: 8/31/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 50.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40	
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay		
0.2	762.6 762.4	4	7	8	9	1	2.5	Topsoil - 2" Very stiff brown SILT AND CLAY (A-6a), trace fine to coarse sand; damp.							
4.0	758.6	8	21	50/6	16	2		Severely weathered brown SANDSTONE.							
5.0	757.6							Soft to medium hard brown and gray SANDSTONE; very fine to fine grained, moderately to highly weathered, argillaceous, micaceous, thinly bedded to massive, highly fractured, with typical low angle rust stained fractures, contains moderate to abundant argillaceous laminations. @ 5.0'-6.0', SDI = 89.2%. @ 7.0'-7.4', qu = 4,621 psi. @ 12.1'-12.5', broken. @ 12.5', few argillaceous laminations. @ 17.6'-17.8', argillaceous, highly weathered. @ 17.8', gray with brown weathered zones. @ 17.8',18.2',18.5',20.9', 21.3',21.7', low angle fractures. @ 25.6'-26.2', moderate argillaceous laminations. @ 27.9'-28.1', SHALE.							
10		Core 120"	Rec 118"	RQD 32%	R-1	*137									
20		Core 120"	Rec 118"	RQD 41%	R-2	*268									
28.1	734.5	Core 120"	Rec 117"	RQD 70%	R-3			Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous.							
30															

FILE: 0121-3070-03 [11/7/2007 10:26 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-189

Location: Sta. 326+76.5, 9.4 ft. RT of SR 823 CL

Date Drilled: 8/31/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 50.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ———— LL Blows per foot - ○ 10 20 30 40						
30	732.6					*320	<p>Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to massive, moderately fractured, with typical low angle clay filled fractures; contains few argillaceous laminations.</p> <p>@ 35.7',37.9',40.5', low angle fractures.</p> <p>@ 35.8'-37.5', qu = 8,880 psi, SDI = 97.9%.</p> <p>@ 42.8'-43.0', 44.0'-44.3', 44.7'-44.8', low angle fractures, moderate argillaceous laminations.</p> <p>@ 45.3',45.8',47.9',51.2', low angle fractures, argillaceous lamination zones.</p> <p>@ 50.0'-50.2', argillaceous zone with fractures.</p> <p>@ 52.7',59.8'-66.3', few to moderate argillaceous laminations.</p> <p>@ 53.5', 53.7', low angle fractures with argillaceous zones.</p> <p>@ 59.6', 59.8',60.4', 62.3',69.8', low angle fractures.</p> <p>@ 60.8'-61.1', 62.5'-63.3', broken.</p>													
35																				
40		Core 120"	Rec 118"	RQD 75%	R-4	*373														
45																				
50		Core 120"	Rec 120"	RQD 75%	R-5	*496														
55																				
60		Core 120"	Rec 120"	RQD 61%	R-6															

Client: TranSystems, Inc. Project: SCI-823-0.00 Job No. 0121-3070.03

LOG OF: Boring R-189 Location: Sta. 326+76.5, 9.4 ft. RT of SR 823 CL Date Drilled: 8/31/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 50.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)				
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40				
60	702.6					*448	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to massive, moderately fractured, with typical low angle clay filled fractures. @ 65.5',65.9',69.2',69.3', 70.8',71.3',71.6',71.7', 71.8',73.9', low angle fractures. @ 70.7'-75.0', moderate argillaceous laminations. @ 72.3'-73.0', broken.											
65																		
70		Core 120"	Rec 120"	RQD 57%	R-7	*483												
75.0	687.6						Bottom of Boring - 75.0'											
80																		
85																		
90																		

FILE: 0121-3070-03 [11/7/2007 10:26 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-191

Location: Sta. 326+88.4, 236.5 ft. RT of SR 823 CL

Date Drilled: 9/2/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40								
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay									
0.2	727.1						Topsoil - 2"/12" soil removed before drilling Severely weathered brown SANDSTONE.															
	726.9	20 32 50	12		1															82		
		25 50/4	10		2														50+			
5.0	722.1			Core 60"	Rec 58"	RQD 37%	R-1	*19	Medium hard brown SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, micaceous, thinly bedded to thickly bedded, broken to highly fractured; contains few argillaceous laminations.													
10									Soft to medium hard brown SANDSTONE interbedded with SHALE; very fine to fine grained, decomposed to highly weathered, micaceous, broken. @ 15.2'- 17.2', SILTSTONE layer.													
10.7	716.4			Core 120"	Rec 120"	RQD 38%	R-2	*340														
15									Medium hard to hard brown and gray SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, broken to highly fractured; contains few argillaceous laminations. @ 22.0'-25.0', high angle fracture. @ 26.5'-27.5', interbedded with SHALE. @ 27.6'-29.0', argillaceous broken zone.													
17.3	709.8			Core 120"	Rec 120"	RQD 53%	R-3	*304														
20																						
25																						
30																						

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-191

Location: Sta. 326+88.4, 236.5 ft. RT of SR 823 CL

Date Drilled: 9/2/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay							
30	697.1																			
30.5	696.6						Soft to medium hard brown and gray SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thinly laminated to thinly bedded, moderately to highly fractured; contains moderate to abundant argillaceous laminations.													
35		Core 120"	Rec 120"	RQD 14%	R-4	*317														
40.0	687.1						Bottom of Boring - 40.0'													
45																				
50																				
55																				
60																				

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-2186

Location: Sta. 324+28.8, 133.1 ft. LT of SR 823 CL

Date Drilled: 12/27/05

to 12/28/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: Not reported	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
0	767.7																		
		5				3.75	Topsoil - 0"												
		4	11	10			Very stiff to hard brown SILTY CLAY (A-6b), little fine to coarse sand, trace gravel; contains sandstone fragments; damp to moist. @ 3.0', brown and gray.	10	7	--	5	38	40						
		5	10	12	18			8	6	--	6	43	37						
5																			
		5	12	22	12														
8.0	759.7						Severely weathered dark brown SANDSTONE, argillaceous.												
		50/5		6															
10.0	757.7						Hard brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, massive, moderately to highly fractured. @ 10.1'-11.2', calcareous.												
15		Core 120"	Rec 117"	RQD 88%	R1	*1059													
17.1	750.6						Hard gray and brown SANDSTONE; very fine to fine grained, moderately to highly weathered, argillaceous, micaceous, massive, moderately fractured. @ 18.5', 19.3', 21.5', 25.8', low angle fractures.												
20																			
25		Core 120"	Rec 119"	RQD 98%	R2	*1137	@ 25.8', gray and slightly weathered.												
30																			

Client: TranSystems, Inc. Project: SCI-823-0.00 Job No. 0121-3070.03

LOG OF: Boring R-2186 Location: Sta. 324+28.8, 133.1 ft. LT of SR 823 CL Date Drilled: 12/27/05 to 12/28/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: Not reported	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
30.0	737.7						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, unfractured to slightly fractured.												
	737.7-																		
35		Core 120"	Rec 120"	RQD 100%	R3														
40																			
45		Core 120"	Rec 120"	RQD 100%	R4														
50																			
55		Core 120"	Rec 119"	RQD 98%	R5		@ 55.2', low angle fracture.												
60																			

FILE: 0121-3070-03 [11/7/2007 10:26 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-2187

Location: Sta. 326+69.3, 125.1 ft. LT of SR 823 CL

Date Drilled: 12/28/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: Not reported	GRADATION						STANDARD PENETRATION (N)							
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○							
0	774.6																				
		2				3.5	Topsoil - 0"														
		4	14	21	1		Very stiff brown SILT AND CLAY (A-6a), trace gravel, trace fine to coarse sand; damp.	6	4	--	4	52	34								
		12	38	50/5	10	4.5+	@ 3.5', contains sandstone fragments.														
5		8	22	30	14	4.5+															
		8	30	38	16	4.5+		0	2	--	6	58	34								
10		8	17	31	14	4.5+															
		18	50/2	5	6	4.5+	@ 13.5', dark brown.														
15.0	759.6						Very hard brown SANDSTONE; fine grained, highly weathered, argillaceous, micaceous, calcareous, medium bedded to massive, highly fractured to broken.														
							@ 15.8'-15.9', 17.3'-17.4', broken.														
							@ 16.1'-18.3', calcareous.														
20		Core 120"	Rec 118"		RQD 78%	R-1	*711														
							@ 22.5'-26.0', moderately to highly weathered, contains gray colored zones.														
25																					
26.0	748.6						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, slightly fractured.														
30		Core 120"	Rec 119"		RQD 98%	R-2															

FILE: 0121-3070-03 [11/7/2007 10:26 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-2187

Location: Sta. 326+69.3, 125.1 ft. LT of SR 823 CL

Date Drilled: 12/28/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: Not reported	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
60	714.6					*1633	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, laminated to massive, unfractured to slightly fractured, burrows.												
65		Core 60"	Rec 59"	RQD 98%	R-6	*1227													
70.0	704.6						Bottom of Boring - 70.0'												
75																			
80																			
85																			
90																			

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-193

Location: Sta. 329+27.5, 337.2 ft. RT of SR 823 CL

Date Drilled: 9/2/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
0	642.0																		
0.3	641.7						Topsoil - 3"												
		2 5 24	12			1	Medium dense brown SANDY SILT (A-4a); damp.												
3.0	639.0					2	Severely weathered gray SANDSTONE, argillaceous.												
		50/4	4																
5.0	637.0						Medium hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thinly bedded to massive, broken to highly fractured, contains moderate argillaceous laminations.												
		Core 60"	Rec 60"			RQD 62%	@ 5.0'-7.6', highly fractured, with typically low angle clay filled fractures.												
						R-1													
15		Core 120"	Rec 120"			RQD 88%	@ 17.0',17.1',19.7', low angle clay filled fractures.												
						R-2													
20.0	622.0						Bottom of Boring - 20.0'												
25																			
30																			

FILE: 0121-3070-03 [11/7/2007 10:38 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-195

Location: Sta. 332+24.3, 245.1 ft. RT of SR 823 CL

Date Drilled: 9/1/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 27.8' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40						
60	683.9																			
60.5	683.4	12"	12"	100%			Hard gray SANDSTONE.													
							Bottom of Boring - 60.5'													
65																				
70																				
75																				
80																				
85																				
90																				

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-196

Location: Sta. 333+98.8, 17.6 ft. LT of SR 823 CL

Date Drilled: 9/14/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 4.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)							
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40							
30	703.6					*417	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, pyritic, thinly bedded to massive, slightly fractured.														
35																					
40		Core 120"	Rec 120"	RQD 100%	R-4	*506															
45							@ 44.5'-44.6', shale interbed.														
50.1	683.5	Core 120"	Rec 120"	RQD 100%	R-5	*507	Medium hard to hard gray SHALE interbedded with SANDSTONE; slightly to moderately weathered, micaceous, thinly bedded.														
55.0	678.6						Bottom of Boring - 55.0'														
60																					

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-199

Location: Sta. 338+25.8, 111.0 ft. LT of SR 823 CL

Date Drilled: 9/15/04 to 9/22/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 21.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay						
0	820.4																		
-0.5	819.9						Topsoil - 6"												
		3 6 7 18				1	4.5+												
		5 9 11 18				2	4.5+	0	11	--	7	37	45						
5		9 11 16 18				3	4.5+												
		5 9 16 18				4	4.5+												
10	809.9	7 14 21 18				5	4.5+	4	12	--	14	36	34						
		7 24 41 18				6	4.25												
15		13 32 40 12				7	4.5+												
		16 33 39 15				8	4.5+												
18.0	802.4	16 27 32 18				9	4.5+												
20		11 23 50/5 16				10	4.5+	6	4	--	10	33	47						
25	794.9	27 50/5 10				11													
25.5		28 50/5 8				12													
30							Severely weathered gray SHALE, arenaceous.												

FILE: 0121-3070-03 [11/7/2007 10:38 AM]

Client: TranSystems, Inc. Project: SCI-823-0.00 Job No. 0121-3070.03

LOG OF: Boring R-199 Location: Sta. 338+25.8, 111.0 ft. LT of SR 823 CL Date Drilled: 9/15/04 to 9/22/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 21.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ———— LL Blows per foot - ○ 10 20 30 40						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay							
30	790.4						Severely weathered gray SHALE, arenaceous. @ 32.0'-37.0', micaceous.													
		30 50/5	10		13															
35																				
		50/5	5		14															
40																				
41.0	779.4						Soft to medium hard gray SHALE interbedded with SANDSTONE; highly weathered, micaceous, thinly bedded, broken, with typically low angle clay filled fractures. @ 42.5'-43.5', SDI = 18.6%.													
43.5	776.9																			
45		Core 108"	Rec 108"	RQD 0%	R-1	*76	Soft to medium hard gray to brown SANDSTONE; medium to coarse grained, decomposed to highly weathered, massive, broken to highly fractured, with typically low angle clay filled fractures, poorly cemented; contains moderate argillaceous laminations. @ 46.0'-47.4', qu = 1,701 psi, SDI = 63.5%.													
50																				
55		Core 120"	Rec 120"	RQD 36%	R-2	*215														
58.6	761.8						Medium hard gray SILTSTONE.													
59.5	760.9																			

FILE: 0121-3070-03 [11/7/2007 10:38 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-199

Location: Sta. 338+25.8, 111.0 ft. LT of SR 823 CL

Date Drilled: 9/15/04 to 9/22/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 21.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)										
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ─────────── LL Blows per foot - ○										
60	760.4						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to massive, slightly fractured. @ 62.7', 68.1', 68.2', low angle clay filled fractures. @ 68.1', 68.2', low angle clay filled fractures. @ 72.5'-74.2', qu = 9,933 psi, SDI = 98.1%.																	
65		Core 120"	Rec 120"	RQD 83%	R-3	*461																		
70																								
75		Core 120"	Rec 120"	RQD 100%	R-4	*378																		
80																								
85		Core 120"	Rec 120"	RQD 100%	R-5	*367	@ 85.3', low angle fracture.																	
90																								

Client: TranSystems, Inc. Project: SCI-823-0.00 Job No. 0121-3070.03

LOG OF: Boring R-199 Location: Sta. 338+25.8, 111.0 ft. LT of SR 823 CL Date Drilled: 9/15/04 to 9/22/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 21.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N)			
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ———— LL Blows per foot - ○ 10 20 30 40			
700.4																	
120							Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to massive.										
125		Core 120"	Rec 120"	RQD 100%	R-9	*565	@ 128.9'-129.0', argillaceous laminations.										
130							@ 130.0'-131.5', qu = 12,224 psi, SDI = 96.5%.										
135		Core 120"	Rec 120"	RQD 100%	R10	*440	@ 132.5'-134.0', qu = 11,781 psi, SDI = 96.5%.										
137.5	682.9						Medium hard gray SHALE interbedded with SANDSTONE; slightly weathered, micaceous, thinly bedded.										
140.0	680.4						Bottom of Boring - 140.0'										
145																	
150																	

FILE: 0121-3070-03 [11/7/2007 10:38 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-201

Location: Sta. 338+44.5, 150.8 ft. RT of SR 823 CL

Date Drilled: 9/15/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ─────────── LL Blows per foot - ○ 10 20 30 40										
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay											
0.3	762.5																							
	762.2						Topsoil - 3"																	
		6				4.5+	Hard brown SILT AND CLAY (A-6a), little fine to coarse sand, little gravel; damp.																	
		23	18		1																			
		7				4.5+		15	4	--	14	47	20	●										
		13	18		2																			
		11				4.5+																		
	756.5	50/2	8		3		Medium hard gray and brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thinly bedded to thickly bedded, broken, with typically low angle rust stained fractures. @ 8.2'-8.5', 12.2'-13.8', broken with typical high angle rust stained fractures.																	
10		Core 108"	Rec 108"		RQD 34%	R-1	*254																	
15							@ 19.8'-20.0', interbedded shale.																	
							@ 20.3', low angle rust stained fracture.																	
20.2	742.3						Hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, pyritic, thinly bedded to massive, moderately to slightly fractured.																	
		Core 120"	Rec 120"		RQD 96%	R-2	*294																	
25							@ 28.2', low angle fracture.																	
30		Core 120"	Rec 120"		RQD 100%	R-3																		

FILE: 0121-3070-03 [11/7/2007 10:38 AM]

<i>Client:</i> TranSystems, Inc.	<i>Project:</i> SCI-823-0.00	<i>Job No.</i> 0121-3070.03
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LOG OF: Boring R-201	<i>Location:</i> Sta. 338+44.5, 150.8 ft. RT of SR 823 CL	<i>Date Drilled:</i> 9/15/04
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Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None	GRADATION						STANDARD PENETRATION (N)									
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40									
30	732.5																						
						*409	Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, thinly bedded to massive, slightly fractured.																
35							@ 34.0', weathered low angle fracture.																
40		Core 120"	Rec 118"	RQD 100%	R-4	*340																	
45																							
50		Core 120"	Rec 120"	RQD 100%	R-5	*360	@ 52.1'-52.2', argillaceous.																
55							@ 54.8'-55.0', argillaceous, poorly laminated.																
							@ 55.0'-55.9', high angle rust stained fracture.																
60		Core 120"	Rec 120"	RQD 95%	R-6																		

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-201

Location: Sta. 338+44.5, 150.8 ft. RT of SR 823 CL

Date Drilled: 9/15/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ----- LL Blows per foot - ○			
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	10	20	30	40
60	702.5					*503	Hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, thinly bedded to massive. @ 64.2'-64.7', 65.8'-70.0', moderately argillaceous.										
65		Core 60"	Rec 60"	RQD 100%	R-7	*344											
70.0	692.5						Bottom of Boring - 70.0'										
75																	
80																	
85																	
90																	

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-2194

Location: Sta. 331+97.8, 163.1 ft. LT of SR 823 CL

Date Drilled: 12/30/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 3.3' (includes drilling water) 23.5' (after 12 hours)	GRADATION						STANDARD PENETRATION (N)				
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ———— LL Blows per foot - ○ 10 20 30 40				
0	780.4						Topsoil - 0"											
1.8		18				3.25	Very stiff brown SILT (A-4b), some clay, little fine to coarse sand, trace gravel; moist.	4	2	--	10	61	23	●				
2.1		21																
2.7		27	20	1														
3.0	777.4																	
3.0		22				2	Severely weathered brown and gray SILTSTONE, arenaceous.											
4.0		40					Severely weathered brown and gray SHALE, arenaceous.											
5.0		50/4	18	2														
5.0																		
6.0		18				3	Severely weathered brown and gray SHALE, arenaceous.											
7.0		50/6	13	3														
8.0	772.4					4	Soft brown and gray SHALE interbedded with SANDSTONE; very fine to fine grained, highly weathered to decomposed, arenaceous, massive, highly fractured.											
9.0		36																
10.0	770.4						Soft brown and gray SHALE interbedded with SANDSTONE; very fine to fine grained, highly weathered to decomposed, arenaceous, massive, highly fractured.											
10.0		50/3	12	4														
15.0		Core 120"	Rec 114"	RQD 82%	R-1	*133	@ 21.0',21.3', low angle fractures.											
20.0																		
21.7	758.7						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, massive, slightly fractured. @ 21.7'-21.8', conglomerate bed.											
21.7																		
25.0		Core 120"	Rec 120"	RQD 88%	R-2	*1108	@ 21.8', 23.6',23.8',23.9',25.5', low angle fractures. @ 25.3'-25.5', iron stained, vuggy zone.											
25.0																		
30.0																		

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-2194

Location: Sta. 331+97.8, 163.1 ft. LT of SR 823 CL

Date Drilled: 12/30/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 3.3' (includes drilling water) 23.5' (after 12 hours)	GRADATION						STANDARD PENETRATION (N)							
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40							
30.0	750.4 750.4						Very hard gray SANDSTONE; very fine to fine grained, argillaceous, laminated, unfractured to slightly fractured, turbidity.														
35		Core 120"	Rec 120"	RQD 100%	R-3	*1213															
45		Core 120"	Rec 120"	RQD 100%	R-4	*2016															
55		Core 120"	Rec 120"	RQD 100%	R-5	*1102															
60																					

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-2194

Location: Sta. 331+97.8, 163.1 ft. LT of SR 823 CL

Date Drilled: 12/30/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 3.3' (includes drilling water) 23.5' (after 12 hours)	GRADATION						STANDARD PENETRATION (N)						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ———— LL Blows per foot - ○ 10 20 30 40						
60	720.4						Very hard gray SANDSTONE; very fine to fine grained, argillaceous, laminated, unfractured to slightly fractured, turbidity.													
65		Core 120"	Rec 120"	RQD 100%	R-6	*777														
70																				
75		Core 120"	Rec 120"	RQD 100%	R-7	*1543														
80																				
85		Core 120"	Rec 120"	RQD 100%	R-8	*1265														
90.0	690.4																			

Bottom of Boring - 90.0'

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-2196

Location: Sta. 333+85.2, 168.7 ft. LT of SR 823 CL

Date Drilled: 1/4/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 10.8' (includes drilling water) 11.4' (after 17 hours)	GRADATION						STANDARD PENETRATION (N)				
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ●	Blows per foot - ○			
0	766.9																	
-0.4	766.5						Topsoil - 5"/6" soil removed before drilling											
		14 44 50/5	18	1		4.5+	Hard brown SANDY SILT (A-4a), trace clay; contains sandstone fragments; dry.											50+
		50/6	6	2		4.5+												50+
5.0	761.9						Medium hard brown SANDSTONE; fine grained, highly weathered to decomposed, argillaceous, thickly bedded, broken. @ 5.0'-7.3', broken zone. @ 7.3'-10.5', 11.1'-13.8', core loss.											
10		Core 120"	Rec 42"	RQD 11%	R-1	*577												
15.0	751.9						Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, unfractured to slightly fractured.											
20		Core 120"	Rec 120"	RQD 100%	R-2	*1184												
25																		
30		Core 120"	Rec 120"	RQD 100%	R-3													

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-2196

Location: Sta. 333+85.2, 168.7 ft. LT of SR 823 CL

Date Drilled: 1/4/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 10.8' (includes drilling water) 11.4' (after 17 hours)	GRADATION						STANDARD PENETRATION (N)						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40						
30	736.9					*1790	Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, unfractured to slightly fractured.													
35																				
40		Core 120"	Rec 120"	RQD 100%	R-4	*1465														
45																				
50		Core 120"	Rec 120"	RQD 100%	R-5	*1810														
55																				
60		Core 120"	Rec 120"	RQD 100%	R-6															

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-2196

Location: Sta. 333+85.2, 168.7 ft. LT of SR 823 CL

Date Drilled: 1/4/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetro-meter (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 10.8' (includes drilling water) 11.4' (after 17 hours)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40						
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay							
60	706.9					*1430	Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, unfractured to slightly fractured.													
65.0	701.9							Bottom of Boring - 65.0'												
70																				
75																				
80																				
85																				
90																				

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-2202

Location: Sta. 342+27.0, 64.3 ft. RT of SR 823 CL

Date Drilled: 1/9/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 34.7' (includes drilling water) 16.0' (after 27.4 hours)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○ 10 20 30 40	
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay		
0.3	721.9 721.6						<p>Topsoil - 4"/12" soil removed before drilling</p> <p>Severely weathered brown SANDSTONE, argillaceous.</p>								
		9 11 13	13			1									
		28 33 50/4	13			2									
5.5	716.4						<p>Medium hard to hard brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, massive, moderately to highly fractured.</p> <p>@ 5.5'-6.2', high angle fracture.</p> <p>@ 12.4'-12.6', high angle fracture.</p> <p>@ 13.0'-13.3', core loss.</p> <p>@ 14.9'-14.9', high angle fracture.</p>								
10		Core 114"	Rec 114"	RQD 70%	R-1	*978									
15.1	706.8														
20		Core 120"	Rec 120"	RQD 93%	R-2	*1259	<p>Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, slightly to moderately fractured.</p> <p>@ 15.9'-16.1', 15.3'- 18.6', 18.8'-19.0', iron staining.</p> <p>@ 16.0', 17.8', 18.4', 19.0', low angle fractures with iron staining.</p> <p>@ 25.6', 27.1', 29.1', shale seams with low angle fractures.</p> <p>@ 27.2'-27.7', high angle fracture.</p> <p>@ 29.1', low angle fracture.</p> <p>@ 29.3' to 29.5', high angle, rust-stained fracture.</p>								
25															
30		Core 120"	Rec 120"	RQD 85%	R-3										

FILE: 0121-3070-03 [11/7/2007 10:38 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-2202

Location: Sta. 342+27.0, 64.3 ft. RT of SR 823 CL

Date Drilled: 1/9/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 34.7' (includes drilling water) 16.0' (after 27.4 hours)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ———— LL Blows per foot - ○					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	10	20	30	40		
30	691.9																		
32.5	689.4					*1334	Hard gray SANDSTONE; fine grained, slightly weathered, argillaceous, micaceous, massive, slightly fractured. @ 30.4', 30.5', 32.1', low angle fractures.												
35							Medium hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, laminated to thinly bedded, slightly fractured.												
35.8	686.1						Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, slightly fractured. @ 35.8'-36.4', 37.7'-38.1', fine to coarse gravel seams.												
40		Core 120"	Rec 120"	RQD 84%	R-4	*847													
45																			
50		Core 120"	Rec 120"	RQD 100%	R-5	*1447													
55																			
60		Core 120"	Rec 120"	RQD 100%	R-6														

FILE: 0121-3070-03 [11/7/2007 10:38 AM]

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-2202

Location: Sta. 342+27.0, 64.3 ft. RT of SR 823 CL

Date Drilled: 1/9/05

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: None (prior to coring) 34.7' (includes drilling water) 16.0' (after 27.4 hours)	GRADATION						STANDARD PENETRATION (N)					
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○ 10 20 30 40					
60	661.9					*1505	Medium hard to hard gray SANDSTONE; very fine to fine grained, argillaceous, micaceous, massive, unfractured to slightly fractured.												
65		Core 60"	Rec 60"	RQD 100%	R-7	*1073													
70.0	651.9						Bottom of Boring - 70.0'												
75																			
80																			
85																			
90																			

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-206

Location: Sta. 349+77.5, 31.4 ft. LT of SR 823 CL

Date Drilled: 9/1/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: 21.0' Water level at completion: None (prior to coring) 6.0' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ———— LL Blows per foot - ○ 10 20 30 40				
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay					
0	674.4																	
		10 10 10	18		1	2.5	No topsoil Very stiff brown SILT AND CLAY (A-6a), little fine sand; damp to moist.											
		8 10 12	18		2	2.75		0	0	--	11	61	28					
		3 5 7	18		3	2.0												
8.0	666.4	8 11 17	18		4	4.5	Hard light brown and gray CLAY (A-7-6), "and" silt, trace fine sand; damp.	0	1	--	6	53	40					
		6 6 8	18		5	1.5												
13.0	661.4	4 7 11	18		6	1.25	Stiff light gray SILT (A-4b), little to some fine sand, little clay; contains sand seams; moist.											
15.5	658.9	6 11 50/5	17		7		Dense brown SANDY SILT (A-4a), little clay, trace gravel; contains sandstone fragments; damp to moist.											
		7 23 25	18		8													
		10 16 25	18		9			5	10	--	40	29	16					
23.5	650.9	28 50/5	11		10		Severely weathered gray SANDSTONE, argillaceous.											
25																		
26.1	648.3	50/1	0		11		Medium hard to hard gray SANDSTONE; very fine to fine grained, moderately to highly weathered, argillaceous, micaceous, thinly bedded to massive, moderately fractured. @ 26.8'-26.9', high angle clay filled fracture.											
30																		

Client: TranSystems, Inc.

Project: SCI-823-0.00

Job No. 0121-3070.03

LOG OF: Boring R-207

Location: Sta. 349+57.4, 156.5 ft. RT of SR 823 CL

Date Drilled: 9/1/04

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.		Hand Penetrometer (tsf) / * Point-Load Strength (psi)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 3.7' (includes drilling water)	GRADATION						STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ————— LL Blows per foot - ○								
				Drive	Press / Core			% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay									
0	654.2																					
10		27	18			4.5+																
		36		1																		
5		10	18			4.5+																
		12																				
		13		2					3	7	--	43	25	23								
		9	18			1.5	@ 6.0', stiff, damp.															
		9																				
		10		3																		
8.5	645.7	5				0.25	Very soft to soft gray SILT AND CLAY (A-6a), little clay, little gravel; moist.															
		7	18																			
		21		4																		
11.5	642.7	40					Severely weathered gray SANDSTONE.															
		50/3	9																			
		50/1	1																			
				6																		
15																						
15.5	638.7						Medium hard gray SANDSTONE; very fine to fine grained, moderately to highly weathered, argillaceous, micaceous, thinly bedded to massive. @ 15.5'-16.1', 18.6'-20.1', broken with typical low angle clay filled fractures. @ 16.1'-16.9', core loss, possible void. @ 16.9'-17.1', 20.1'-20.2', high angle clay filled fractures. @ 18.6'-20.5', laminated beds.															
20		Core 120"	Rec 116"		RQD 78%	R-1																
25																						
25.5	628.7						Bottom of Boring - 25.5'															
30																						

FILE: 0121-3070-03 [11/7/2007 10:39 AM]

Results of Slake Durability Index and Uniaxial Compressive Tests

Summary of Rock Cut Testing and GB-3 Recommendations

Cut	Slake Durability Index Sample Depth			Unconfined Sample Dpth		Rock Type	Unit Top Elevation	Unit Bottom Elevation	Unit RQD	Slake Durability Index	ODOT Rock Index Property Classification	Unconfined Compressive Strength (psi)	Rock Cut Slope Recommendations (Table A GB3) H:V
	Boring	Run	Depth	Run	Depth (ft.)								
US 52	R-2014	2	31.5'-32.7'	2	PL Data	Sandstone	644.7	626.7	50%	37.6	Poor	7,774	1.0:1
US 52	R-2014	3	42.4'-43.4'	3	43.4'-43.7'	Sandstone interbedded w/ Shale	626.7	618.9	66%	64.9	Fair	10,425	0.5:1 or 1.0:1
US 52	R-2014	5	54.5'-55.5'	5	55.5'-55.9'	Sandstone	618.9	562.2	99%	96.1	Very Good	7,447	0.25:1 or 0.5:1
US 52	R-2014	6	64.9'-65.7'	6	64.3'-64.8'	Sandstone	618.9	562.2	99%	98.7	Very Good	13,985	0.25:1 or 0.5:1
1	R-2016	2	27.0'-28.1'	2	26.6'-27.0'	Sandstone	706	627.9	98%	98.3	Very Good	8,879	0.25:1 or 0.5:1
1	R-2016	3	38.2'-39.6'	3	39.6'-40.0'	Sandstone	706	627.9	98%	98.4	Very Good	9,626	0.25:1 or 0.5:1
1	R-2016	5	55.4'-55.6'	5	58.6'-57.0'	Sandstone	706	627.9	98%	96.6	Very Good	12,578	0.25:1 or 0.5:1
1	R-15	3	45.5'-46.5'	3	46.6'-47.0'	Sandstone	658.8	628.4	88%	98.1	Very Good	1,911	0.25:1 or 0.5:1
1	R-15	5	68.0'-68.7'	5	66.3'-66.7'	Siltstone interbedded/ SS	628.4	619.3	81%	89.8	Very Good	4,352	0.25:1 or 0.5:1
1	R-17	6	62.0'-63.0'	6	65.0'-65.4'	Sandstone	620.8	564.2	100%	98.4	Very Good	9,419	0.25:1 or 0.5:1
1	R-18	12	117.8'-118.8'	12	119.0'-119.4'	Sandstone	629.9	622.4	100%	92.4	Very Good	3,044	0.25:1 or 0.5:1
1	R-18	16	150.0'-151.0'	16	151.1'-151.5'	Sandstone	622.4	566.2	99%	97.5	Very Good	10,810	0.25:1 or 0.5:1
1	R-23	2	26.9'-27.9'	2	26.1'-26.5'	Sandstone	658.3	638.6	60%	98.2	Very Good	1,621	2.0:1
1	R-23	3	30.5'-31.5'	2	26.1'-26.5'	Sandstone	658.3	638.6	60%	4.1	Fair	1,621	2.0:1
SR 140	B-1406	2	12.0'-13.3'	2	13.3'-13.9'	Sandstone	708.5	692	80%	96.8	Very Good	7,841	0.25:1 or 0.5:1
SR 140	B-1406	4	30.5'-31.5'	4	32.1'-32.6'	Sandstone	692	602	99%	93.2	Very Good	10,114	0.25:1 or 0.5:1
SR 140	B-1406	7	64.5'-65.3'	7	65.6'-66.2'	Sandstone	692	602	99%	97.8	Very Good	9,236	0.25:1 or 0.5:1
SR 140	B-1408	2	32.2'-33.5'	2	31.8'-32.2'	Sandstone	632	587.3	80%	96.9	Very Good	11,233	0.25:1 or 0.5:1
SR 140	B-1408	4	47.2'-48.1'	4	46.8'-47.2'	Sandstone	632	587.3	80%	97.8	Very Good	13,025	0.25:1 or 0.5:1
SR 140	B-1409	2	26.0'-28.1'	2	28.5'-29.1'	Sandstone	627.6	617	93%	97.8	Very Good	8,887	0.25:1 or 0.5:1
SR 140	B-1409	4	47.2'-48.2'	4	46.7'-47.2'	Sandstone	617	586	90%	91.5	Very Good	10,867	0.25:1 or 0.5:1
2	R-2037	2	19.4'-20.6'	2	20.6'-21.3'	Sandstone	747.5	728.7	78%	88.4	Good	2,969	1.0:1
2	R-2037	2	41.0'-42.1'	4	42.1'-42.5'	Shale	726	719.7	78%	93.2	Very Good	5,662	0.25:1 or 0.5:1
2	R-2037	2	56.5'-57.5'	6	57.5'-57.9'	Sandstone	719.7	648.6	100%	99	Very Good	13,945	0.25:1 or 0.5:1
2	R-2037	2	78.1'-79.1'	8	77.5'-78.1'	Sandstone	719.7	648.6	100%	97.8	Very Good	10,019	0.25:1 or 0.5:1
2	R-43	2	28.6'-29.7'	2	29.7'-30.3'	Sandstone	781.3	765.5	65%	39.4	Fair	10,909	0.25:1 or 0.5:1
2	R-43	4	48.5'-49.5'	4	48.0'-48.5'	Sandstone	765.5	746.6	80%	96	Very Good	11,468	0.25:1 or 0.5:1
2	R-43	6	69.5'-70.5'	6	70.5'-70.8'	Shale interbedded w/SS	746.6	728.4	62%	74.2	Fair	12,415	0.5:1 or 1.0:1
2	R-43	8	84.3'-85.4'	8	83.8'-84.3'	Sandstone	728.4	688.2	90%	98.2	Very Good	11,340	0.25:1 or 0.5:1
2	R-47	3	26.0'-27.0'	1	24.5'-25.9'	Sandstone	826.6	795.9	34%	80.1	Good	2,629	1.0:1
2	R-47	5	45.5'-46.5'	5	46.5'-46.9'	Shale	795.9	785.2	58%	11.7	Fair	2,332	1.0:1 or 1.5:1
2	R-47	7	60.8'-61.8'	7	62.0'-62.4'	Sandstone	785.2	756.1	91%	84.5	Very Good	5,340	0.25:1 or 0.5:1
2	R-47	14	134.0'-135.0'	14	135.2'-135.6'	Sandstone	756.1	658.6	98%	95.7	Very Good	12,216	0.25:1 or 0.5:1
3	R-70	8	78.2'-78.6'	8	78.2'-78.6'	Sandstone	737	677	85%	89.0	Good	9,029	0.25:1 or 0.5:1
3	R-70	11	109.5'-110.8'	11	110.5'-111.0'	Sandstone	677	647	98%	89.0	Very Good	7,588	0.25:1 or 0.5:1
3	R-70	13	130.5'-131.1'	13	130.5'-131.1'	Sandstone	647	617.5	100%	89.0	Very Good	9,892	0.25:1 or 0.5:1
3	R-73	3	30.5'-31.5'	3	28.3'-28.7'	Shale	813.4	794.5	84%	4.1	Very Poor	1,402	2.0:1
3	R-73	6	58.2'-59.0'		PL Data	Shale	778.7	773.2	100%	25.0	Poor	5,901	1.0:1
3	R-73	9	84.5'-85.5'	9	91.5'-91.9'	Siltstone interbedded w/SS	773.2	745.4	100%	83.5	Very Good	9,309	0.25:1 or 0.5:1
3	R-73	13	125.0'-125.4'		PL Data	Sandstone	745.4	680.2	100%	83.5	Very Good	8,085	0.25:1 or 0.5:1
3	R-74	5	49.0'-50.0'	5	46.7'-47.1'	Shale	815.8	809.6	78%	5.6	Good	1,911	1.0:1
3	R-78	2	28.2'-29.2'	2	27.0'-27.5'	Shale interbedded w/SS	855.2	836.8	95%	58.4	Very Good	533	2.0:1
3	R-78	4	45.2'-45.6'	4	45.2'-45.6'	Sandstone	836.8	827.6	95%	50	Very Good	7,568	0.25:1 or 0.5:1
3	R-78	6	63.2'-64.2'		PL Data	Siltstone	814	807.1	58%	93.5	Very Good	8,085	0.25:1 or 0.5:1
3	R-78	7	77.0'-77.5'	7	77.0'-77.5'	Siltstone interbedded w/Claystone	803.1	786.6	90%	53	Very Good	6,413	0.25:1 or 0.5:1
3	R-78	8	80.0'-90.0'		PL Data	Siltstone interbedded w/Claystone	803.1	786.6	90%	53.0	Very Good	6,000	0.25:1 or 0.5:1
3	R-78	12	75.0'-75.5'	12	75.0'-75.5'	Sandstone	746.6	662.1	100%	75.0	Very Good	7,932	0.25:1 or 0.5:1
3	R-78	16	169.0'-169.8'	16	169.0'-169.8'	Sandstone	746.6	662.1	100%	75.0	Very Good	10,461	0.25:1 or 0.5:1
3	R-80	6	59.5'-60.5'	6	53.8'-54.2'	Sandstone	754.4	684.4	99%	1.7	Very Good	7,492	1.0:1 or 1.5:1
3	R-80	10	98.2'-98.6'	10	98.2'-98.6'	Sandstone	754.4	684.4	99%	50.0	Very Good	10,939	0.25:1 or 0.5:1
3	R-81	2	20.0'-30.0'		PL Data	Shale interbedded w/SS	845.6	833.8	50%	76.5	Fair	7,098	1.0:1 or 2.0:1

Summary of Rock Cut Testing and GB-3 Recommendations

Cut	Slake Durability Index Sample Depth			Unconfined Sample Dpth		Rock Type	Unit Top Elevation	Unit Bottom Elevation	Unit RQD	Slake Durability Index	ODOT Rock Index Property Classification	Unconfined Compressive Strength (psi)	Rock Cut Slope Recommendations (Table A GB3) H:V
	Boring	Run	Depth	Run	Depth (ft.)								
3	R-81	5	50.3'-60.0'	5	59.0'-59.4'	Sandstone	812	788	93%	87.6	Very Good	14,914	0.25:1 or 0.5:1
3	R-81			9	93.0'-93.4'	Sandstone	788.3	752.6	100%	50	Very Good	10,067	0.25:1 or 0.5:1
3	R-84	4	30.0'-35.8'	4	31.1'-31.6'	Sandstone interbedded w/ shale	837.8	832.5	20%	3.3	Very Poor	2,801	2.0:1
3	R-84	4	35.8'-40.0'	4	39.1'-39.7'	Shale	832.5	828	20%	56.7	Poor	2,273	2.0:1
3	R-84	6	50.0'-58.3'	6	54.1'-54.5'	Siltstone interbedded w/shale	821.5	810	85%	41.5	Good	3,758	0.5:1 or 1.0:1
4	R-111	1	17.7'-18.7'	2	21.1'-20.5'	Sandstone	803.6	790.3	95%	57.8	Very Good	12,399	0.25:1 or 0.5:1
4	R-111	3	39.0'-39.7'	3	40.0'-40.4'	Sandstone	790.3	756.9	100%	98.2	Very Good	10,493	0.25:1 or 0.5:1
4	R-111	4		4	40.7'-41.1'	Sandstone	790.3	756.9	100%	50.0	Very Good	3,201	0.25:1 or 0.5:1
4	R-111	5	53.6'-54.6'	5	53.0'-53.4'	Sandstone	790.3	756.9	100%	97.5	Very Good	12,131	0.25:1 or 0.5:1
5	R-121	2	26.9'-27.6'			Siltstone	805.6	784.6	50%	5.6	Very Poor	1,407	2.0:1
5	R-121A	4	38.9'-39.6'	4	41.4'-41.9'	Shale	817.3	808.9	90%	10.2	Very Good	987	2.0:1
5	R-121A	5	47.4'-47.9'	5	52.5'-53.0'	Siltstone	808.9	789.8	90%	19.4	Very Good	1,749	1.0:1
5	R-122	2	18.8'-19.4'	2	18.3'-18.8'	Shale	856	841.1	55%	4.9	Fair	1,918	1.0:1 or 1.5:1
5	R-122			3	30.8'-31.2'	Sandstone interbedded w/Shale	841.1	835	60%	50	Fair	6,049	1.0:1
5	R-122	4	34.5'-35.5'	4	33.9'-34.5'	Shale	835	810.3	90%	1.7	Very Good	2,101	1.0:1
5	R-122	7	66.8'-67.9'	8	77.2'-77.9'	Siltstone w/ SS interbeds	810.3	787.8	92%	49	Very Good	4,920	0.25:1 or 0.5:1
5	R-122	10	95.1'-96.1'	9	84.8'-85.5'	Sandstone	787.8	756.2	97%	97.6	Very Good	4,983	0.25:1 or 0.5:1
5	R-122	10	95.1'-96.1'	10	96.2'-96.6'	Sandstone	787.8	756.2	97%	97.6	Very Good	11,696	0.25:1 or 0.5:1
6	R-145A	3	37.5'-38.5'	3	38.4'-38.8'	Shale	874.7	857	55%	45.2	Fair	703	2.0:1
6	R-145A	4	47.3'-48.3'	4	48.3'-48.7'	Sandstone	855	845.5	4%	76.3	Fair	4,072	0.5:1 or 1.0:1
6	R-145A	5	54.7'-55.7'		PL Data	Shale	845.5	834.4	58%	11.4	Fair	1,000	1.0:1 or 1.5:1.0
6	R-145A	6	65.7'-66.7'			Shale	834.4	826.1	55%	3.1	Fair	1,239	1.0:1 or 1.5:1.0
6	R-145A	7	81.3'-82.2'	7	80.8'-81.3'	Sandstone	826.1	783.4	88%	96.3	Very Good	11,150	0.25:1 or 0.5:1
6	R-146	3	22.0'-32.0'	3	31.6'-32.3'	Sandstone	884.8	842.7	93%	67.0	Very Good	2,324	1.0:1
6	R-146	5	50.6'-51.6'		See PL	Sandstone	884.8	842.7	93%	84.4	Very Good	3,381	0.25:1 or 0.5:1
6	R-147	4	33.0'-43.0'			Shale	835.2	826.5	94%	12.7	Very Good	840	2.0:1
7	R-150			3	34.0'-34.4'	Shale	843.6	826.8	67%	50	Fair	2,270	1.0:1 or 1.5:1
7	R-150			6	61.1'-62.5'	Sandstone	826.8	782.1	85%	75	Good	9,870	0.25:1 or 0.5:1
7	R-152A	7	63.6'-64.4'	7	64.5'-64.9'	Sandstone	819.3	782.3	99%	18.7	Very Good	5,416	0.25:1 or 0.5:1
7	R-153	3	23.0'-24.0'	3	24.0'-24.6'	Shale	879	850.1	70%	14.6	Fair	699	2.0:1
7	R-153	6	53.0'-54.0'	6	56.0'-56.5'	Sandstone	846.3	835	85%	80.9	Good	6,492	0.25:1 or 0.5:1
7	R-153	7	64.8'-65.8'	7	66.2'-66.7'	Shale	829	817.1	100%	41.1	Very Good	1,891	1.0:1
7	R-153	8	81.3'-82.3'	8	82.3'-82.8'	Shale	817.1	806.9	73%	41.9	Good	5,348	0.25:1 or 0.5:1
7	R-153	11	103.0'-104.0'	11	104.0'-104.4'	Sandstone	799.8	767	95%	88.1	Very Good	8,845	0.25:1 or 0.5:1
7	R-153*	3	26.2'-28.0'		PL Data	Shale	879	850.1	70%	64.2	Fair	699	2.0:1
7	R-153**	6	57.0'-58.0'			Sandstone	846.3	835	85%	1.4	Good	6,492	0.25:1 or 0.5:1
7	R-153	7	71.9'-73.0'			Shale	829	817.1	100%	38.8	Very Good	1,891	1.0:1
7	R-154	3	40.0'-40.4'			Sandstone	815.6	781.2	89%	50	Very Good	10,807	0.25:1 or 0.5:1
7	R-154	6	65.5'-65.9'			Sandstone	815.6	761.2	89%	75	Very Good	11,269	0.25:1 or 0.5:1
7	R-156	6	62.5'-63.5'			Siltstone	809.9	800.2	95%	61.3	Very Good	1,995	1.0:1
7	R-156	10	100.0'-100.9'	10	101.1'-101.5'	Sandstone	800.2	754.4	98%	91.1	Very Good	2,974	1.0:1
8	R-2169	1		1	9.1'-9.5'	Sandstone	800.9	784.4	97%	75.0	Very Good	5,323	0.25:1 or 0.5:1
8	R-2169	4		4	36.5'-37.0'	Sandstone	780.5	757.8	100%	75.0	Very Good	8,478	0.25:1 or 0.5:1
9	R-186	3	22.2'-23.2'	3	23.2'-23.7'	Sandstone interbedded w/siltstone	701.1	677.6	50%	97.0	Very Good	7,168	1.0:1
9	R-189	1	5.0'-6.0'	1	7.0'-7.4'	Sandstone	757.6	734.5	41%	89.2	Good	4,621	0.5:1 or 1.0:1
9	R-189	4	36.3'-37.5'	4	35.8'-36.3'	Sandstone	734.5	687.6	60%	97.9	Very Good	8,880	0.25:1 or 0.5:1
10	R-199	1	42.5'-43.5'	1	46.0'-46.4'	Shale interbedded w/SS	779.4	776.9	0%	18.6	Very Poor	1,701	2.0:1
10	R-199	1	46.4'-47.4'	1	46.0'-46.4'	Shale interbedded w/SS	779.4	776.9	0%	63.5	Fair	1,701	2.0:1
10	R-199	4	73.1'-74.2'	4	72.5'-73.1'	Sandstone	776.9	682.9	80%	98.1	Very Good	9,933	0.25:1 or 0.5:1
10	R-199	10	130.0'-130.9'	10	130.9'-131.5'	Sandstone	776.9	682.9	80%	96.5	Very Good	12,224	0.25:1 or 0.5:1
10	R-199	10	132.5'-133.5'	10	133.5'-134.0'	Sandstone	776.9	682.9	80%	96.5	Very Good	11,781	0.25:1 or 0.5:1

Slake Durability Test Data (ASTM D-4644)

DLZ Project Name: SCI-823-0.00
 DLZ Project Number: 0121-3070.03
 Client: TranSystems
 Date: 12/29/06

Boring	Run	Depth	Moisture Content (%)	Slake Durability Index	Loss	Type	Water Temp (°C)	Water Temp (°F)
R-2480	11	112.1'-113.1'	1	94.2	5.8	I	22.3	72.1
R-2490	1	9.5'-11.0'	1.5	97.0	3.0	I	22.4	72.3
R-2490	2	20.7'-21.7'	1.2	96.4	3.6	I	22.1	71.8
R-2490	4	41.0'-42.0'	6.2	77.3	22.7	II	22.4	72.3
R-2490	6	58.4'-59.4'	0.9	96.7	3.3	I	22.0	71.6
R-2490	7	71.0'-72.1'	0.9	97.1	2.9	I	21.8	71.2



6121 Huntley Road * Columbus, Ohio, 43229
 Phone (614) 888-0040 * Fax (614) 888-6415

Slake Durability Test Data (ASTM D-4644)

DLZ Project Name: SCI-823-0.00
 DLZ Project Number: 0121-3070.03
 Client: TranSystems
 Date: 10/27/06

Boring	Run	Depth	Moisture Content (%)	Slake Durability Index	Loss	Type	Water Temp (°C)	Water Temp (°F)
R-731	1	8.9'-10.0'	1.1	90.9	9.1	I	22.3	72.1
R-731	4	39.4'-40.9'	0.6	98.4	1.6	I	22.1	71.8
R-731	11	108.2'-109.5'	0.7	97.2	2.8	I	21.9	71.4
R-731	13	130.8'-131.8'	0.7	98.2	1.8	I	22.0	71.6
R-744	15	159.0'-160.4'	1.0	96.1	3.9	I	22.3	72.1
R-769	6	52.7'-53.8'	2.1	95.6	4.4	I	22.4	72.3
R-769	8	75.8'-77.0'	1.0	86.2	13.8	II	22.5	72.5
R-769	11	101.4'-102.7'	0.9	97.9	2.1	I	21.8	71.2
R-769	12	114.7'-115.7'	1.1	97.2	2.8	I	22.1	71.8
R-769	13	128.1'-129.1'	1.5	93.8	6.2	I	22.2	72.0



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Slake Durability Test Data (ASTM D-4644)

DLZ Project Name: SCI-823-0.00
 DLZ Project Number: 0121-3070.03
 Client: TranSystems
 Date: 10/13/06

Boring	Run	Depth	Moisture Content (%)	Slake Durability Index	Loss	Type	Water Temp (°C)	Water Temp (°F)
R-801	1	27.3'-28.3'	4	99.0	1.0	I	21.9	71.4
R-801	2	39.0'-40.0'	1.3	94.5	5.5	I	22.0	71.6
R-801	3	44.8'-46.0'	1.9	37.8	62.2	III	22.2	72.0
R-802	1	30.0'-31.4'	3.4	3.8	96.2	III	22.2	72.0
R-802	2	38.0'-39.0'	0.9	92.8	7.2	II	21.8	71.2
R-802	4	55.0'-56.4'	2.1	54.9	45.1	III	22.4	72.3
R-803	2	41.5'-42.8'	0.9	88.0	12.0	II	22.1	71.8
R-803	3	51.5'-53.0'	2.7	12.7	87.3	III	21.9	71.4
R-806	2	43.3'-44.5'	1.9	93.1	6.9	I	22.4	72.3
R-806	3	57.5'-59.2'	4.0	19.2	80.8	III	22.3	72.1



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Slake Durability Test Data

(ASTM D-4644)

DLZ Project Name: SCI-823-0.00
DLZ Project Number: 0121-3070.03
Client: TranSystems
Date: 10/13/06

Boring	Run	Depth	Moisture Content (%)	Slake Durability Index	Loss	Type	Water Temp (°C)	Water Temp (°F)
R-806	5	75.5'-77.0'	2.7	23.3	76.7	III	22.2	72.0



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Slake Durability Test Data (ASTM D-4644)

DLZ Project Name: SCI-823-0.00
 DLZ Project Number: 0121-3070.03
 Client: TranSystems
 Date: 8/10/06

Boring	Run	Depth	Moisture Content (%)	Slake Durability Index	Loss	Type	Water Temp (°C)	Water Temp (°F)
R-510	2	15.5'-16.4'	0.4	97.6	2.4	I	22.4	72.3
R-608	2	22.5'-23.5'	1.0	70.1	29.9	II	22.5	72.5
R-608	5	50.0'-51.0'	0.1	97.3	2.7	I	22.5	72.5
R-608	6	62.0'-63.0'	0.3	94.4	5.6	I	22.3	72.1
R-624	2	20.4'-21.4'	1.1	75.4	24.6	II	22.3	72.1
R-624	3	27.5'-28.4'	1.2	64.6	35.4	II	22.6	72.7
R-624	3	35.2'-36.3'	1.3	79.8	20.2	I	22.5	72.5
R-626	1	27.6'-28.5'	3.0	98.6	1.4	I	22.3	72.1
R-626	4	50.4'-51.5'	0.5	97.9	2.1	I	22.4	72.3
R-658	3	25.4'-*26.5'	3.6	98.4	1.6	I	22.6	72.7



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Slake Durability Test Data (ASTM D-4644)

DLZ Project Name: SCI-823-0.00
 DLZ Project Number: 0121-3070.03
 Client: TranSystems
 Date: 8/10/06

Boring	Run	Depth	Moisture Content (%)	Slake Durability Index	Loss	Type	Water Temp (°C)	Water Temp (°F)
R-658	4	42.9'-44.0'	0.9	82.2	17.8	II	22.6	72.7
R-658	5	49.8'-50.8'	0.7	66.8	33.2	II	22.6	72.7
R-658	7	67.4'-68.4'	4.2	99.0	1.0	I	22.3	72.1
R-658	19	184.4'-185.4'	0.9	81.0	19.0	I	22.7	72.9
R-701	2	27.9'-28.9'	2.4	98.0	2.0	I	22.7	72.9
R-724	1	10.4'-11.4'	1.2	92.9	7.1	I	22.5	72.5
R-724	2	18.3'-19.3'	0.9	8.7	91.3	III	22.5	72.5
R-724	3	28.0'-28.9'	1.9	11.4	88.6	III	22.6	72.7
R-724	6	60.5'-61.5'	4.0	98.8	1.2	I	22.5	72.5
R-724	14	140.5'-141.4'	3.1	98.7	1.3	I	22.2	72.0



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Slake Durability Test Data (ASTM D-4644)

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 DLZ Project Number: 0121-3070.03
 Client: TranSystems
 Date: 8/10/06

Boring	Run	Depth	Moisture Content (%)	Slake Durability Index	Loss	Type	Water Temp (°C)	Water Temp (°F)
R-2560	3	22.8'-23.8'	1.3	50.9	49.1	II	22.4	72.3
R-2560	4	30.0'-31.0'	0.9	59.3	40.7	II	21.8	71.2
R-2560	5	40.5'-51.4'	1.7	99.5	0.5	I	22.8	73.0
R-2560	6	51.6'-52.5'	0.5	98.1	1.9	I	22.6	72.7
R-2574	1	10.7'-11.5'	3.6	98.3	1.7	I	22.7	72.9
R-2574	7	64.6'-65.5'	0.5	86.7	22.6	I	22.5	72.5
R-2574	10	101.1'-102.0'	0.3	97.9	2.1	I	22.5	72.5
R-2584	1	10.5'-11.5'	3.8	98.3	1.7	I	22.5	72.5
R-2584	3	28.5'-29.5'	1.4	93.8	6.2	I	22.6	72.7
R-2584	9	86.0'-86.9'	0.6	94.1	5.9	I	22.4	72.3



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Slake Durability Test Data (ASTM D-4644)

DLZ Project Name: SCI-823-0.00
 DLZ Project Number: 0121-3070.03
 Client: TranSystems
 Date: 7/18/06

Boring	Run	Depth	Moisture Content (%)	Slake Durability Index	Loss	Type	Water Temp (°C)	Water Temp (°F)
R-533	2	25.7'-27.0'	1.5	61.9	38.1	II	22.5	72.5
R-533	2	30.8'-32.0'	0.8	44.9	55.1	II	22.4	72.3
R-533	3	37.2'-38.1'	1.1	94.1	5.9	I	22.2	72.0
R-533	5	57.9'-58.9'	0.4	98.4	1.6	I	22.7	72.9
R-542	3	25.7'-26.9'	1.7	35.7	64.3	III	22.6	72.7
R-633	2	13.4'-14.5'	1.0	84.0	16.0	I	22.5	72.5
R-633	3	20.2'-21.4'	1.5	63.4	36.6	II	22.6	72.7
R-633	3	26.3'-27.5'	0.9	91.4	8.6	I	22.2	72.0
R-633	5	43.2'-44.1'	1.3	13.2	86.8	III	22.8	73.0
R-633	7	63.5'-64.5'	0.6	98.4	1.6	I	22.9	73.2



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 DLZ Project Number: 0121-3070.03
 Client: TranSystems
 Date: 7/18/06

Boring	Run	Depth	Moisture Content (%)	Slake Durability Index	Loss	Type	Water Temp (°C)	Water Temp (°F)
R-633	8	56.8'-57.7'	0.9	97.2	2.8	I	22.3	72.1
R-633	10	95.2'-96.2'	0.4	98.0	2.0	I	22.5	72.5
R-679	1	10.4'-11.6'	0.7	98.1	1.9	I	22.5	72.5
R-679	2	18.4'-19.1'	0.6	98.1	22.6	I	22.4	72.3
R-679	10	97.5'-98.5'	0.4	98.5	1.5	I	22.5	72.5
R-679	11	105.4'-106.3'	0.9	89.6	10.4	II	22.5	72.5
R-679	13	133.1'-134.0'	1.2	86.6	13.4	II	22.5	72.5
R-679	14	142.5'-143.6'	1.7	76.8	23.2	III	22.3	72.1
R-679	15	154.0'-155.0'	1.5	80.6	19.4	II	22.7	72.9



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Slake Durability Test Data (ASTM D-4644)

DLZ Project Name: SCI-823-0.00
 DLZ Project Number: 0121-3070.03
 Client: TranSystems
 Date: 11/04/06

Boring	Run	Depth	Moisture Content (%)	Slake Durability Index	Loss	Type	Water Temp (°C)	Water Temp (°F)
R-731	2	20.5'-21.8'	4.7	18.9	81.1	III	21.8	71.2
R-731	3	30.5'-31.9'	1.6	3.7	96.3	III	21.6	70.9
R-731	7	68.1'-69.1'	0.3	97.9	2.1	I	22.0	71.6
R-744	2	25.0'-26.3'	1.2	70.0	30.0	II	22.1	71.8
R-744	3	40.4'-41.5'	4.1	98.2	1.8	I	22.2	72.0
R-744	4	48.5'-49.5'	4.1	98.1	1.9	I	21.7	71.1
R-744	6	68.6'-69.7'	0.4	97.8	2.2	I	21.8	71.2
R-744	10	112.6'-113.6'	1.6	83.7	16.3	III	22.2	72.0
R-744	12	127.8'-129.0'	0.7	97.5	2.5	I	21.8	71.2
R-744	17	175.6'-177.0'	1.1	64.3	35.7	III	21.5	70.7



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 DLZ Project Number: 0121-3070.03
 Client: TranSystems
 Date: 11/04/06

Boring	Run	Depth	Moisture Content (%)	Slake Durability Index	Loss	Type	Water Temp (°C)	Water Temp (°F)
R-744	18	187.8'-189.1'	1.1	78.9	21.1	III	22.0	71.6
R-769	2	10.6'-11.6'	3.3	98.2	1.8	I	22.1	71.8
R-769	4	36.3'-37.5'	3.3	97.4	2.6	I	22.2	72.0
R-769	14	135.6'-136.6'	0.8	96.8	3.2	I	21.8	71.2
B-1343	1	9.7'-11.0'	3.2	95.9	4.1	I	22.2	72.0
B-1343	2	18.9'-20.0'	3.6	98.3	1.7	I	21.9	71.4
B-1343	4	38.5'-39.7'	4.1	98.7	1.3	I	22.0	71.6
B-1343	6	58.5'-59.5'	1.9	98.0	2.0	I	21.9	71.4
B-1343	7	68.9'-70.1'	1.9	98.3	1.7	I	22.2	72.0
B-1343	8	76.7'-77.8'	2.4	98.7	1.3	I	21.8	71.2



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DLZ Project Number: 0121-3070.03
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Date: 10/13/06

Boring	Run	Depth	Moisture Content (%)	Slake Durability Index	Loss	Type	Water Temp (°C)	Water Temp (°F)
R-769	15	147.0'-148.7'	1.6	73.0	27.0	II	21.3	70.3
R-769	17	168.5'-170.0'	1.2	73.5	26.5	III	21.9	71.4
R-769	21	205.0'-206.5'	1	79.6	20.4	III	22.2	72.0



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Slake Durability Test Data (ASTM D-4644)

DLZ Project Name: SCI-823-0.00
 DLZ Project Number: 0121-3070.03
 Client: TranSystems
 Date: 12/29/06

Boring	Run	Depth	Moisture Content (%)	Slake Durability Index	Loss	Type	Water Temp (°C)	Water Temp (°F)
R-2475	3	30.4'-31.5'	2.9	95.1	4.9	I	22.0	71.6
R-2475	5	44.7'-45.7'	0.6	97.6	2.4	I	21.8	71.2
R-2475	7	65.6'-66.5'	0.9	74.7	25.3	II	21.7	71.1
R-2475	9	89.2'-90.0'	1.0	95.0	5.0	I	21.7	71.1
R-2480	1	13.9'-15.0'	1.0	33.8	66.2	II	22.2	72.0
R-2480	2	16.3'-17.7'	1.5	95.9	4.1	I	22.1	71.8
R-2480	2	21.9'-23.0'	0.9	43.1	56.9	II	22.3	72.1
R-2480	5	54.3'-55.3'	0.7	98.1	1.9	I	22.5	72.5
R-2480	7	75.3'-76.2'	0.5	97.9	2.1	I	22.1	71.8
R-2480	9	96.0'-97.0'	0.8	94.4	5.6	I	21.6	70.9



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DLZ Project Name: SCI-823-0.00
 DLZ Project Number: 0121-3070.03
 Client: TranSystems
 Date: 12/29/06

Boring	Run	Depth	Moisture Content (%)	Slake Durability Index	Loss	Type	Water Temp (°C)	Water Temp (°F)
R-2480	11	112.1'-113.1'	1	94.2	5.8	I	22.3	72.1
R-2490	1	9.5'-11.0'	1.5	97.0	3.0	I	22.4	72.3
R-2490	2	20.7'-21.7'	1.2	96.4	3.6	I	22.1	71.8
R-2490	4	41.0'-42.0'	6.2	77.3	22.7	II	22.4	72.3
R-2490	6	58.4'-59.4'	0.9	96.7	3.3	I	22.0	71.6
R-2490	7	71.0'-72.1'	0.9	97.1	2.9	I	21.8	71.2



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Unconfined Compression of Rock Core Specimens (ASTM D-2938)

DLZ Project No.: 0121-3070.03

Client: TranSystems

Project Name: SCI-823-0.00

Date: 7/11/05

Boring	Run	Depth (ft.)	D ₁	D ₂	D ₃	D _(ave)	L ₁	L ₂	L ₃	L _(ave)	L/D	Volume (ft ³)	Mass (Gram)	Unit Wt.(pcf)	Load (lbs)	Strength (psi)
B-122	2	18.3'-18.8'	1.998	1.980	2.019	1.999	5.312	5.305	5.303	5.307	2.655	0.0096336	572.78	131.08	6,020	1,918
B-122	4	33.9'-34.5'	2.005	2.004	1.917	1.975	4.890	4.890	4.900	4.893	2.477	0.0086742	513.48	130.51	6,440	2,101
B-122	8	77.2'-77.9'	1.959	1.960	1.954	1.958	5.464	5.484	5.462	5.470	2.794	0.0095237	734.60	170.05	14,810	4,920
B-122	9	84.8'-85.5'	1.956	1.968	1.967	1.964	4.424	4.428	4.426	4.426	2.254	0.0077534	541.61	154.00	15,090	4,983
B-121A	4	41.4'-41.9'	2.010	2.020	2.036	2.022	4.601	4.603	4.602	4.602	2.276	0.0085477	589.36	152.01	3,170	987
B-121A	5	52.5'-53.0'	1.955	1.975	1.962	1.964	4.722	4.721	4.717	4.720	2.403	0.0082712	567.72	151.32	5,300	1,749



Engineers * Architects * Scientists

Unconfined Compression of Rock Core Specimens (ASTM D-2938)

DLZ Project No.: 0121-3070.03

Client: TranSystems

Project Name: SCI-823-0.00

Date: 1/19/05

Boring	Run	Depth (ft.)	D ₁	D ₂	D ₃	D _(ave)	L ₁	L ₂	L ₃	L _(ave)	L/D	Volume (ft ³)	Mass (gram)	Unit Wt. (pcf)	Load (lbs)	Strength (psi)
R-80	6	53.8'-54.2'	1.981	1.982	1.984	1.983	4.633	4.627	4.640	4.633	2.337	0.0082744	599.62	159.76	23,130	7,492
			1.984	1.983	1.982											
R-80	10	98.2'-98.6'	1.992	1.993	1.993	1.993	4.683	4.672	4.694	4.683	2.350	0.0084491	647.20	168.88	34,120	10,939
			1.993	1.993	1.993											
R-81	9	93.0'-93.4'	1.989	1.991	1.990	1.990	4.747	4.757	4.756	4.753	2.388	0.0085545	602.00	155.15	31,320	10,067
			1.991	1.991	1.990											



Engineers * Architects * Scientists

Unconfined Compression of Rock Core Specimens (ASTM D-2938)

DLZ Project No.: 0121-3070.03

Client: TranSystems

Project Name: SCI-823-0.00

Date: 1/19/05

Boring	Run	Depth (ft.)	D ₁	D ₂	D ₃	D _(ave)	L ₁	L ₂	L ₃	L _(ave)	L/D	Volume (ft ³)	Mass (Gram)	Unit Wt.(pcf)	Load (lbs)	Strength (psi)
R-70	11	110.5'-111.0'	1.971	1.983	2.001	1.988	4.691	4.693	4.712	4.699	2.364	0.008432	611.20	159.80	23,540	7,588
			1.997	1.988	1.985											
R-70	13	130.5'-131.1'	1.980	1.982	1.981	1.981	4.823	4.819	4.832	4.825	2.435	0.0086045	596.09	152.73	30,500	9,892
			1.982	1.982	1.981											
R-73	3	28.3'-28.7'	1.942	1.924	1.967	1.946	4.663	4.649	4.675	4.662	2.395	0.0080238	546.86	150.26	4,170	1,402
			1.948	1.958	1.939											
R-73	9	91.5'-91.9'	1.988	1.968	1.987	1.980	4.060	4.061	4.067	4.063	2.052	0.0072321	535.61	163.28	28,650	9,309
			1.980	1.985	1.969											
R-73	13	125.0'-125.4'	1.983	1.976	1.976	1.978	4.653	4.643	4.641	4.646	2.349	0.0082532	546.17	145.90	24,830	8,085
			1.979	1.973	1.978											
R-74	5	46.7'-47.1'	1.971	1.973	1.975	1.973	4.288	4.290	4.286	4.288	2.174	0.0075793	522.76	152.06	5,840	1,911
			1.974	1.964	1.978											
R-80	6	53.8'-54.2'	1.981	1.982	1.984	1.983	4.633	4.627	4.640	4.633	2.337	0.0082744	599.62	159.76	23,130	7,492
			1.984	1.983	1.982											



Engineers * Architects * Scientists

Unconfined Compression of Rock Core Specimens (ASTM D-2938)

DLZ Project No.: 0121-3070.03

Client: TranSystems

Project Name: SCI-823-0.00

Date: 7/11/05

Boring	Run	Depth (ft.)	D ₁	D ₂	D ₃	D _(ave)	L ₁	L ₂	L ₃	L _(ave)	L/D	Volume (ft ³)	Mass (Gram)	Unit Wt.(pcf)	Load (lbs)	Strength (psi)
R-15	3	46.6'-47.0'	1.971	1.973	1.975	1.973	4.288	4.290	4.286	4.288	2.174	0.0075793	522.76	152.06	5,840	1,911
			1.974	1.964	1.978											
R-15	5	66.3'-66.7'	1.972	1.974	1.980	1.974	4.687	4.710	4.711	4.703	2.382	0.0083263	590.68	156.40	13,320	4,352
			1.979	1.971	1.969											
R-17	6	65.0'-65.4'	1.971	1.969	1.970	1.970	3.992	4.002	3.975	3.990	2.025	0.0070342	491.71	154.11	28,710	9,419
			1.97	1.971	1.969											
R-18	12	119.0'-119.4'	1.995	2.002	2.021	2.004	4.508	4.476	4.492	4.492	2.242	0.0081955	565.23	152.05	9,600	3,044
			2.019	1.987	2.000											
R-18	16	151.1'-151.5'	1.996	1.993	1.999	1.995	4.522	4.555	4.522	4.533	2.273	0.0081935	555.35	149.43	33,780	10,810
			1.993	1.994	1.993											
R-23	2	26.1'-26.5'	1.981	1.985	1.997	1.988	4.649	4.633	4.635	4.639	2.334	0.0083249	553.19	146.50	5,030	1,621
			1.999	1.979	1.984											
R-70	8	78.2'-78.6'	1.976	1.949	1.975	1.974	4.751	4.751	4.754	4.752	2.408	0.008408	534.98	140.28	27,620	9,029
			1.983	1.980	1.978											



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Unconfined Compression of Rock Core Specimens (ASTM D-2938)

DLZ Project No.: 0121-3070.03

Client: TranSystems

Project Name: SCI-823-0.00

Date: 10/12/05

Boring	Run	Depth (ft.)	D ₁	D ₂	D ₃	D _(ave)	L ₁	L ₂	L ₃	L _(ave)	L/D	Volume (ft ³)	Mass (gram)	Unit Wt.(pcf)	Load (lbs)	Strength (psi)
R-81	5	59.0'-59.4'	1.992	1.992	1.992	1.992	4.681	4.677	4.671	4.676	2.348	0.00843	591.61	154.72	46,480	14,914
			1.992	1.992	1.992											
R-84	6	54.1'-54.5'	1.969	1.967	1.973	1.972	4.840	4.830	4.854	4.841	2.455	0.0085545	611.40	157.57	11,480	3,758
			1.973	1.974	1.977											
R-111	3	40.0'-40.4'	1.995	1.986	1.987	1.988	4.639	4.613	4.635	4.629	2.328	0.008314	560.48	148.62	32,580	10,493
			1.988	1.987	1.987											
R-150	3	34.0'-34.4'	1.952	1.948	1.968	1.963	4.863	4.864	4.798	4.842	2.466	0.0084772	600.50	156.17	6,870	2,270
			1.996	1.959	1.956											
R-152A	7	64.5'-64.9'	1.967	1.966	1.950	1.961	4.772	4.752	4.762	4.762	2.428	0.0083207	599.70	158.89	16,360	5,416
			1.967	1.957	1.960											
R-154	3	40.0'-40.4'	1.980	1.980	1.979	1.980	4.631	4.646	4.622	4.633	2.340	0.0082488	560.19	149.72	32,650	10,607
			1.980	1.980	1.979											
R-154	6	65.5'-65.9'	1.977	1.977	1.984	1.979	4.253	4.258	4.244	4.252	2.148	0.007566	530.93	154.71	34,670	11,269
			1.978	1.977	1.982											



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Unconfined Compression of Rock Core Specimens (ASTM D-2938)

DLZ Project No.: 0121-3070.03

Client: TranSystems

Project Name: SCI-823-0.00

Date: 10/12/06

Boring	Run	Depth (ft.)	D ₁	D ₂	D ₃	D _(ave)	L ₁	L ₂	L ₃	L _(ave)	L/D	Volume (ft ³)	Mass (Gram)	Unit Wt.(pcf)	Load (lbs)	Strength (psi)
R-18	3	29.0'-29.5'	1.990	1.983	1.985	1.985	4.647	4.646	4.648	4.647	2.341	0.0083169	524.96	139.2	10,780	3,484
			1.991	1.986	1.974											
R-18	5	47.5'-48.0'	1.991	1.992	1.991	1.991	4.795	4.799	4.806	4.800	2.411	0.0086428	563.56	143.8	34,220	10,993
			1.992	1.990	1.989											
R-18	12	110.5'-110.9'	1.991	1.991	1.992	1.992	4.790	4.791	4.791	4.791	2.406	0.0086318	557.50	142.4	32,980	10,588
			1.992	1.991	1.992											
R-47	3	24.5'-25.9'	1.990	1.991	1.995	1.992	4.616	4.627	4.617	4.620	2.320	0.0083256	482.76	127.8	8,190	2,629
			1.992	1.994	1.988											
R-47	5	46.5'-46.9'	1.933	1.962	1.945	1.945	4.586	4.573	4.589	4.583	2.356	0.0078786	540.36	151.2	6,930	2,332
			1.926	1.956	1.950											
R-47	7	62.0'-62.4'	1.981	1.976	1.981	1.977	4.848	4.834	4.842	4.841	2.449	0.008595	631.24	161.9	16,390	5,340
			1.982	1.970	1.971											
R-47	14	135.2'-135.6'	1.990	1.989	1.990	1.990	4.791	4.791	4.794	4.792	2.408	0.0086197	563.54	144.1	37,990	12,216
			1.990	1.990	1.990											



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Unconfined Compression of Rock Core Specimens (ASTM D-2938)

DLZ Project No.: 0121-3070.03

Client: TranSystems

Project Name: SCI-823-0.00

Date: 10/12/06

Boring	Run	Depth (ft.)	D ₁	D ₂	D ₃	D _(ave)	L ₁	L ₂	L ₃	L _(ave)	L/D	Volume (ft ³)	Mass (Gram)	Unit Wt.(pcf)	Load (lbs)	Strength (psi)
TR-68A	2	20.0'-20.3'	1.992	1.991	1.99	1.992	3.801	3.803	3.801	3.802	1.909	0.0068498	453.08	145.8	29,760	9,500
			1.993	1.992	1.991											
TR-68A	3	24.3'-24.7'	1.992	1.991	1.993	1.992	4.543	4.541	4.548	4.544	2.281	0.0081901	548.64	147.7	38,220	12,266
			1.991	1.993	1.991											
TR-69A	2	18.6'-18.9'	1.987	1.986	1.986	1.985	4.122	4.119	4.122	4.121	2.076	0.0073792	463.82	138.6	36,870	11,910
			1.983	1.986	1.984											
TR-73A	1	19.2'-19.6'	1.969	1.980	1.979	1.977	4.538	4.541	4.539	4.539	2.296	0.0080589	521.31	142.6	34,560	11,260
			1.983	1.967	1.983											
R-78	2	27.0'-27.5'	1.982	1.974	1.985	1.980	4.713	4.697	4.694	4.701	2.374	0.0083747	543.93	143.2	1,640	533
			1.981	1.976	1.983											
R-78	4	45.2'-45.6'	1.985	1.990	1.990	1.988	4.592	4.592	4.588	4.591	2.309	0.0082451	513.07	137.2	23,500	7,568
			1.985	1.991	1.989											
R-78	7	77.0'-77.5'	1.985	1.987	1.988	1.986	4.357	4.350	4.353	4.353	2.192	0.0078018	560.93	158.5	19,870	6,413
			1.987	1.984	1.986											



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Unconfined Compression of Rock Core Specimens (ASTM D-2938)

DLZ Project No.: 0121-3070.03

Client: TranSystems

Project Name: SCI-823-0.00

Date: 10/12/06

Boring	Run	Depth (ft.)	D ₁	D ₂	D ₃	D _(ave)	L ₁	L ₂	L ₃	L _(ave)	L/D	Volume (ft ³)	Mass (Gram)	Unit Wt.(pcf)	Load (lbs)	Strength (psi)
R-78	12	75.0'-75.5'	1.985	1.990	1.988	1.987	4.730	4.734	4.736	4.733	2.382	0.0084914	613.00	159.2	24,600	7,932
			1.988	1.986	1.986											
R-78	16	169.0'-169.6'	1.988	1.988	1.986	1.988	4.668	4.675	4.666	4.670	2.349	0.0083814	579.30	152.4	32,460	10,461
			1.989	1.988	1.987											
R-111	1	20.1'-20.5'	1.989	1.988	1.987	1.988	4.810	4.812	4.810	4.811	2.420	0.0086359	571.23	145.8	38,480	12,399
			1.988	1.988	1.987											
R-111	5	53.0'-53.4'	1.989	1.985	1.985	1.987	4.857	4.857	4.864	4.859	2.446	0.0087145	620.67	157.0	37,610	12,131
			1.989	1.987	1.986											
R-145A	3	38.4'-38.8'	1.957	1.952	1.981	1.968	4.409	4.403	4.416	4.409	2.240	0.0077609	485.71	138.0	2,140	703
			1.984	1.952	1.984											
R-145A	4	48.3'-48.7'	1.953	1.959	1.958	1.959	4.601	4.603	4.610	4.605	2.351	0.0080267	446.66	122.7	12,270	4,072
			1.959	1.961	1.963											
R-145A	7	80.8'-81.3'	1.956	1.957	1.953	1.957	4.651	4.652	4.650	4.651	2.377	0.0080923	514.26	140.1	33,540	11,150
			1.958	1.959	1.959											



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Unconfined Compression of Rock Core Specimens (ASTM D-2938)

DLZ Project No.: 0121-3070.03

Client: TranSystems

Project Name: SCI-823-0.00

Date: 10/12/06

Boring	Run	Depth (ft.)	D ₁	D ₂	D ₃	D _(ave)	L ₁	L ₂	L ₃	L _(ave)	L/D	Volume (ft ³)	Mass (Gram)	Unit Wt.(pcf)	Load (lbs)	Strength (psi)
R-153	3	24.0'-24.6'	1.985	2.004	2.003	1.998	4.231	4.252	4.296	4.260	2.132	0.0077239	471.53	134.6	2,190	699
			1.995	1.999	2.001											
R-153	6	56.0'-56.5'	1.985	1.980	1.980	1.983	4.780	4.786	4.779	4.782	2.411	0.0085422	513.84	132.6	20,050	6,492
			1.989	1.982	1.982											
R-153	7	66.2'-66.7'	1.980	1.972	1.967	1.973	4.552	4.551	4.565	4.556	2.309	0.0080571	551.53	150.9	5,780	1,891
			1.981	1.975	1.963											
R-153	8	82.3'-82.8'	1.950	1.972	1.975	1.967	4.555	4.554	4.548	4.552	2.314	0.0080018	575.69	158.6	16,250	5,348
			1.958	1.976	1.971											
R-153	11	104.0'-104.4'	1.976	1.973	1.972	1.974	4.321	4.323	4.321	4.322	2.189	0.0076531	553.42	159.4	27,080	8,845
			1.976	1.975	1.974											
R-186	3	23.2'-23.7'	1.983	1.981	1.983	1.983	4.711	4.712	4.710	4.711	2.376	0.0084131	547.65	143.5	22,130	7,168
			1.982	1.984	1.983											
R-189	1	7.0'-7.4'	1.960	1.959	1.970	1.959	4.516	4.520	4.525	4.520	2.307	0.0078824	508.05	142.1	13,930	4,621
			1.944	1.957	1.965											



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Unconfined Compression of Rock Core Specimens (ASTM D-2938)

DLZ Project No.: 0121-3070.03

Client: TranSystems

Project Name: SCI-823-0.00

Date: 10/12/06

Boring	Run	Depth (ft.)	D ₁	D ₂	D ₃	D _(ave)	L ₁	L ₂	L ₃	L _(ave)	L/D	Volume (ft ³)	Mass (Gram)	Unit Wt.(pcf)	Load (lbs)	Strength (psi)
R-189	4	35.8'-36.3'	1.984	1.985	1.978	1.981	4.610	4.606	4.609	4.608	2.326	0.0082187	544.90	146.2	27,380	8,880
			1.984	1.981	1.976											
R-199	1	46.0'-46.4'	1.959	1.960	1.961	1.954	4.568	4.540	4.535	4.548	2.327	0.0078882	488.13	136.4	5,100	1,701
			1.946	1.958	1.940											
R-199	4	72.5'-73.1'	1.982	1.980	1.981	1.981	4.635	4.636	4.633	4.635	2.339	0.0082642	514.94	137.4	30,620	9,933
			1.984	1.979	1.981											
R-199	10	130.9'-131.5'	1.978	1.984	1.983	1.983	4.625	4.626	4.626	4.626	2.333	0.0082607	535.09	142.8	37,740	12,224
			1.981	1.987	1.983											
R-199	10	133.5'-134.0'	1.984	1.987	1.985	1.985	4.605	4.601	4.596	4.601	2.317	0.0082382	528.71	141.5	36,470	11,781
			1.986	1.986	1.984											
R-801	1	26.8'-27.3'	1.978	1.979	1.983	1.980	4.422	4.428	4.425	4.425	2.235	0.0078798	487.94	136.5	34,690	11,268
			1.977	1.980	1.982											
R-801	2	38.2'-38.6'	1.969	1.973	1.974	1.974	4.772	4.778	4.773	4.774	2.419	0.0084504	573.84	149.7	27,930	9,128
			1.976	1.976	1.975											



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Unconfined Compression of Rock Core Specimens (ASTM D-2938)

DLZ Project No.: 0121-3070.03

Client: TranSystems

Project Name: SCI-823-0.00

Date: 12/29/06

Boring	Run	Depth (ft.)	D ₁	D ₂	D ₃	D _(ave)	L ₁	L ₂	L ₃	L _(ave)	L/D	Volume (ft ³)	Mass (gram)	Unit Wt.(pcf)	Load (lbs)	Strength (psi)
R-43	2	29.7-30.3'	1.963	1.965	1.963	1.963	4.591	4.590	4.593	4.591	2.339	0.0080389	548.53	150.4	33,020	10,909
			1.962	1.964	1.962											
R-43	4	48.0'-48.5'	1.966	1.960	1.961	1.963	4.770	4.769	4.768	4.769	2.430	0.0083443	568.79	150.3	34,690	11,468
			1.964	1.962	1.962											
R-43	6	70.5'-70.8'	1.958	1.959	1.959	1.959	3.715	3.714	3.721	3.717	1.897	0.006481	451.26	153.5	37,670	12,415
			1.961	1.958	1.960											
R-43	8	83.8'-84.3'	1.964	1.966	1.961	1.964	4.386	4.385	4.385	4.385	2.233	0.0076834	493.67	141.7	34,350	11,340
			1.964	1.965	1.963											
R-2037	2	20.6'-21.3'	1.986	1.986	1.983	1.985	4.375	4.380	4.381	4.379	2.206	0.0078406	513.08	144.3	9,190	2,969
			1.983	1.989	1.985											
R-2037	4	42.1'-42.5'	1.988	1.986	1.988	1.988	4.155	4.158	4.160	4.158	2.092	0.0074624	506.01	149.5	17,570	5,662
			1.987	1.989	1.988											
R-2037	6	57.5'-57.9'	1.944	1.996	1.993	1.984	4.516	4.521	4.521	4.519	2.278	0.008083	525.32	143.3	43,120	13,945
			1.986	1.994	1.992											



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Unconfined Compression of Rock Core Specimens (ASTM D-2938)

DLZ Project No.: 0121-3070.03

Client: TranSystems

Project Name: SCI-823-0.00

Date: 12/29/06

Boring	Run	Depth (ft.)	D ₁	D ₂	D ₃	D _(ave)	L ₁	L ₂	L ₃	L _(ave)	L/D	Volume (ft ³)	Mass (Gram)	Unit Wt.(pcf)	Load (lbs)	Strength (psi)
R-2014	3	43.4'-43.7'	1.972	1.972	1.971	1.973	3.299	3.293	3.295	3.296	1.670	0.0058302	409.40	154.8	32,640	10,425
			1.978	1.973	1.974											
R-2014	5	55.5'-55.9'	1.973	1.976	1.973	1.974	4.055	4.054	4.054	4.054	2.054	0.0071736	505.96	155.5	22,780	7,447
			1.973	1.974	1.972											
R-2014	6	64.3'-64.8'	1.981	1.981	1.981	1.981	4.522	4.520	4.529	4.524	2.284	0.0080622	520.35	142.3	43,090	13,985
			1.980	1.980	1.981											
R-2016	2	26.6'-27.0'	1.978	1.979	1.982	1.980	4.618	4.615	4.617	4.617	2.332	0.0082225	533.97	143.2	27,340	8,879
			1.978	1.980	1.983											
R-2016	3	39.6'-40.0'	1.977	1.977	1.977	1.978	4.500	4.500	4.502	4.501	2.276	0.007997	536.01	147.8	29,570	9,626
			1.979	1.978	1.978											
R-2016	5	56.6'-57.0'	1.976	1.975	1.975	1.976	4.490	4.493	4.487	4.490	2.272	0.0079632	516.59	143.0	38,560	12,576
			1.977	1.975	1.977											
R-2037	8	77.5'-78.1'	1.993	1.995	1.993	1.994	4.516	4.521	4.521	4.519	2.267	0.0081592	557.27	150.6	31,270	10,019
			1.992	1.995	1.993											



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Unconfined Compression of Rock Core Specimens (ASTM D-2938)

DLZ Project No.: 0121-3070.03

Client: TranSystems

Project Name: SCI-823-0.00

Date: 12/29/06

Boring	Run	Depth (ft.)	D ₁	D ₂	D ₃	D _(ave)	L ₁	L ₂	L ₃	L _(ave)	L/D	Volume (ft ³)	Mass (Gram)	Unit Wt.(pcf)	Load (lbs)	Strength (psi)
B-1406	2	13.3'-13.9'	1.980	1.979	1.979	1.980	4.460	4.459	4.462	4.460	2.253	0.00794	515.37	143.1	24,130	7,841
			1.979	1.981	1.979											
B-1406	4	32.1'-32.6'	1.989	1.987	1.990	1.988	4.358	4.356	4.364	4.359	2.193	0.0078283	529.27	149.1	31,400	10,114
			1.989	1.987	1.987											
B-1406	7	65.6'-66.2'	1.991	1.991	1.989	1.990	4.561	4.568	4.564	4.564	2.294	0.0082102	560.88	150.6	28,720	9,236
			1.990	1.990	1.988											
B-1408	2	31.8'-32.2'	1.975	1.975	1.974	1.973	4.386	4.385	4.385	4.385	2.222	0.0077566	493.67	140.3	34,350	11,233
			1.972	1.972	1.971											
B-1408	4	46.8'-47.2'	1.981	1.982	1.981	1.981	4.610	4.610	4.613	4.611	2.328	0.0082193	541.18	145.2	40,140	13,025
			1.980	1.981	1.980											
B-1409	2	28.5'-29.1'	1.963	1.967	1.968	1.967	4.650	4.647	4.645	4.647	2.363	0.0081674	516.59	139.4	27,000	8,887
			1.967	1.969	1.967											
B-1409	4	46.7'-47.2'	1.974	1.972	1.975	1.973	4.604	4.607	4.608	4.606	2.334	0.0081475	575.54	155.7	33,230	10,867
			1.970	1.974	1.974											



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Unconfined Compression of Rock Core Specimens (ASTM D-2938)

DLZ Project No.: 0121-3070.03

Client: TranSystems

Project Name: SCI-823-0.00

Date: 7/11/05

Boring	Run	Depth (ft.)	D ₁	D ₂	D ₃	D _(ave)	L ₁	L ₂	L ₃	L _(ave)	L/D	Volume (ft ³)	Mass (Gram)	Unit Wt.(pcf)	Load (lbs)	Strength (psi)
R-122	2	18.3'-18.8'	1.998	1.980	2.019	1.999	5.312	5.305	5.303	5.307	2.655	0.0096336	572.78	131.08	6,020	1,918
R-122	4	33.9'-34.5'	2.005	2.004	1.917	1.975	4.890	4.890	4.900	4.893	2.477	0.0086742	513.48	130.51	6,440	2,101
R-122	8	77.2'-77.9'	1.959	1.960	1.954	1.958	5.464	5.484	5.462	5.470	2.794	0.0095237	734.60	170.05	14,810	4,920
R-122	9	84.8'-85.5'	1.956	1.968	1.967	1.964	4.424	4.428	4.426	4.426	2.254	0.0077534	541.61	154.00	15,090	4,983
R-121A	4	41.4'-41.9'	2.010	2.020	2.036	2.022	4.601	4.603	4.602	4.602	2.276	0.0085477	589.36	152.01	3,170	987
R-121A	5	52.5'-53.0'	1.955	1.975	1.962	1.964	4.722	4.721	4.717	4.720	2.403	0.0082712	567.72	151.32	5,300	1,749



Engineers * Architects * Scientists

Unconfined Compression of Rock Core Specimens (ASTM D-2938)

DLZ Project No.: 0121-3070.03

Client: TranSystems

Project Name: SCI-823-0.00

Date: 7/11/05

Boring	Run	Depth (ft.)	D ₁	D ₂	D ₃	D _(ave)	L ₁	L ₂	L ₃	L _(ave)	L/D	Volume (ft ³)	Mass (Gram)	Unit Wt.(pcf)	Load (lbs)	Strength (psi)
R-15	3	46.6'-47.0'	1.971	1.973	1.975	1.973	4.288	4.290	4.286	4.288	2.174	0.0075793	522.76	152.06	5,840	1,911
			1.974	1.964	1.978											
R-15	5	66.3'-66.7'	1.972	1.974	1.980	1.974	4.687	4.710	4.711	4.703	2.382	0.0083263	590.68	156.40	13,320	4,352
			1.979	1.971	1.969											
R-17	6	65.0'-65.4'	1.971	1.969	1.970	1.970	3.992	4.002	3.975	3.990	2.025	0.0070342	491.71	154.11	28,710	9,419
			1.97	1.971	1.969											
R-18	12	119.0'-119.4'	1.995	2.002	2.021	2.004	4.508	4.476	4.492	4.492	2.242	0.0081955	565.23	152.05	9,600	3,044
			2.019	1.987	2.000											
R-18	16	151.1'-151.5'	1.996	1.993	1.999	1.995	4.522	4.555	4.522	4.533	2.273	0.0081935	555.35	149.43	33,780	10,810
			1.993	1.994	1.993											
R-23	2	26.1'-26.5'	1.981	1.985	1.997	1.988	4.649	4.633	4.635	4.639	2.334	0.0083249	553.19	146.50	5,030	1,621
			1.999	1.979	1.984											
R-70	8	78.2'-78.6'	1.976	1.949	1.975	1.974	4.751	4.751	4.754	4.752	2.408	0.008408	534.98	140.28	27,620	9,029
			1.983	1.980	1.978											



Engineers * Architects * Scientists

Unconfined Compression of Rock Core Specimens (ASTM D-2938)

DLZ Project No.: 0121-3070.03

Client: TranSystems

Project Name: SCI-823-0.00

Date: 1/19/05

Boring	Run	Depth (ft.)	D ₁	D ₂	D ₃	D _(ave)	L ₁	L ₂	L ₃	L _(ave)	L/D	Volume (ft ³)	Mass (Gram)	Unit Wt.(pcf)	Load (lbs)	Strength (psi)
R-70	11	110.5'-111.0'	1.971	1.983	2.001	1.988	4.691	4.693	4.712	4.699	2.364	0.008432	611.20	159.80	23,540	7,588
			1.997	1.988	1.985											
R-70	13	130.5'-131.1'	1.980	1.982	1.981	1.981	4.823	4.819	4.832	4.825	2.435	0.0086045	596.09	152.73	30,500	9,892
			1.982	1.982	1.981											
R-73	3	28.3'-28.7'	1.942	1.924	1.967	1.946	4.663	4.649	4.675	4.662	2.395	0.0080238	546.86	150.26	4,170	1,402
			1.948	1.958	1.939											
R-73	9	91.5'-91.9'	1.988	1.968	1.987	1.980	4.060	4.061	4.067	4.063	2.052	0.0072321	535.61	163.28	28,650	9,309
			1.980	1.985	1.969											
R-73	13	125.0'-125.4'	1.983	1.976	1.976	1.978	4.653	4.643	4.641	4.646	2.349	0.0082532	546.17	145.90	24,830	8,085
			1.979	1.973	1.978											
R-74	5	46.7'-47.1'	1.971	1.973	1.975	1.973	4.288	4.290	4.286	4.288	2.174	0.0075793	522.76	152.06	5,840	1,911
			1.974	1.964	1.978											
R-80	6	53.8'-54.2'	1.981	1.982	1.984	1.983	4.633	4.627	4.640	4.633	2.337	0.0082744	599.62	159.76	23,130	7,492
			1.984	1.983	1.982											



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Unconfined Compression of Rock Core Specimens

(ASTM D-2938)

DLZ Project No.: 0121-3070.03

Client: TranSystems

Project Name: SCI-823-0.00

Date: 1/19/05

Boring	Run	Depth (ft.)	D ₁	D ₂	D ₃	D _(ave)	L ₁	L ₂	L ₃	L _(ave)	L/D	Volume (ft ³)	Mass (Gram)	Unit Wt.(pcf)	Load (lbs)	Strength (psi)
R-80	6	53.8'-54.2'	1.981	1.982	1.984	1.983	4.633	4.627	4.640	4.633	2.337	0.0082744	599.62	159.76	23,130	7,492
			1.984	1.983	1.982											
R-80	10	98.2'-98.6'	1.992	1.993	1.993	1.993	4.683	4.672	4.694	4.683	2.350	0.0084491	647.20	168.88	34,120	10,939
			1.993	1.993	1.993											
R-81	9	93.0'-93.4'	1.989	1.991	1.990	1.990	4.747	4.757	4.756	4.753	2.388	0.0085545	602.00	155.15	31,320	10,067
			1.991	1.991	1.990											



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Unconfined Compression of Rock Core Specimens (ASTM D-2938)

DLZ Project No.: 0121-3070.03

Client: TranSystems

Project Name: SCI-823-0.00

Date: 10/12/05

Boring	Run	Depth (ft.)	D ₁	D ₂	D ₃	D _(ave)	L ₁	L ₂	L ₃	L _(ave)	L/D	Volume (ft ³)	Mass (Gram)	Unit Wt.(pcf)	Load (lbs)	Strength (psi)
R-81	5	59.0'-59.4'	1.992	1.992	1.992	1.992	4.681	4.677	4.671	4.676	2.348	0.00843	591.61	154.72	46,480	14,914
			1.992	1.992	1.992											
R-84	6	54.1'-54.5'	1.969	1.967	1.973	1.972	4.840	4.830	4.854	4.841	2.455	0.0085545	611.40	157.57	11,480	3,758
			1.973	1.974	1.977											
R-111	3	40.0'-40.4'	1.995	1.986	1.987	1.988	4.639	4.613	4.635	4.629	2.328	0.008314	560.48	148.62	32,580	10,493
			1.988	1.987	1.987											
R-150	3	34.0'-34.4'	1.952	1.948	1.968	1.963	4.863	4.864	4.798	4.842	2.466	0.0084772	600.50	156.17	6,870	2,270
			1.996	1.959	1.956											
R-152A	7	64.5'-64.9'	1.967	1.966	1.950	1.961	4.772	4.752	4.762	4.762	2.428	0.0083207	599.70	158.89	16,360	5,416
			1.967	1.957	1.960											
R-154	3	40.0'-40.4'	1.980	1.980	1.979	1.980	4.631	4.646	4.622	4.633	2.340	0.0082488	560.19	149.72	32,650	10,607
			1.980	1.980	1.979											
R-154	6	65.5'-65.9'	1.977	1.977	1.984	1.979	4.253	4.258	4.244	4.252	2.148	0.007566	530.93	154.71	34,670	11,269
			1.978	1.977	1.982											



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Unconfined Compression of Rock Core Specimens

(ASTM D-2938)

DLZ Project No.: 0121-3070.03

Client: TranSystems

Project Name: SCI-823-0.00

Date: 10/12/05

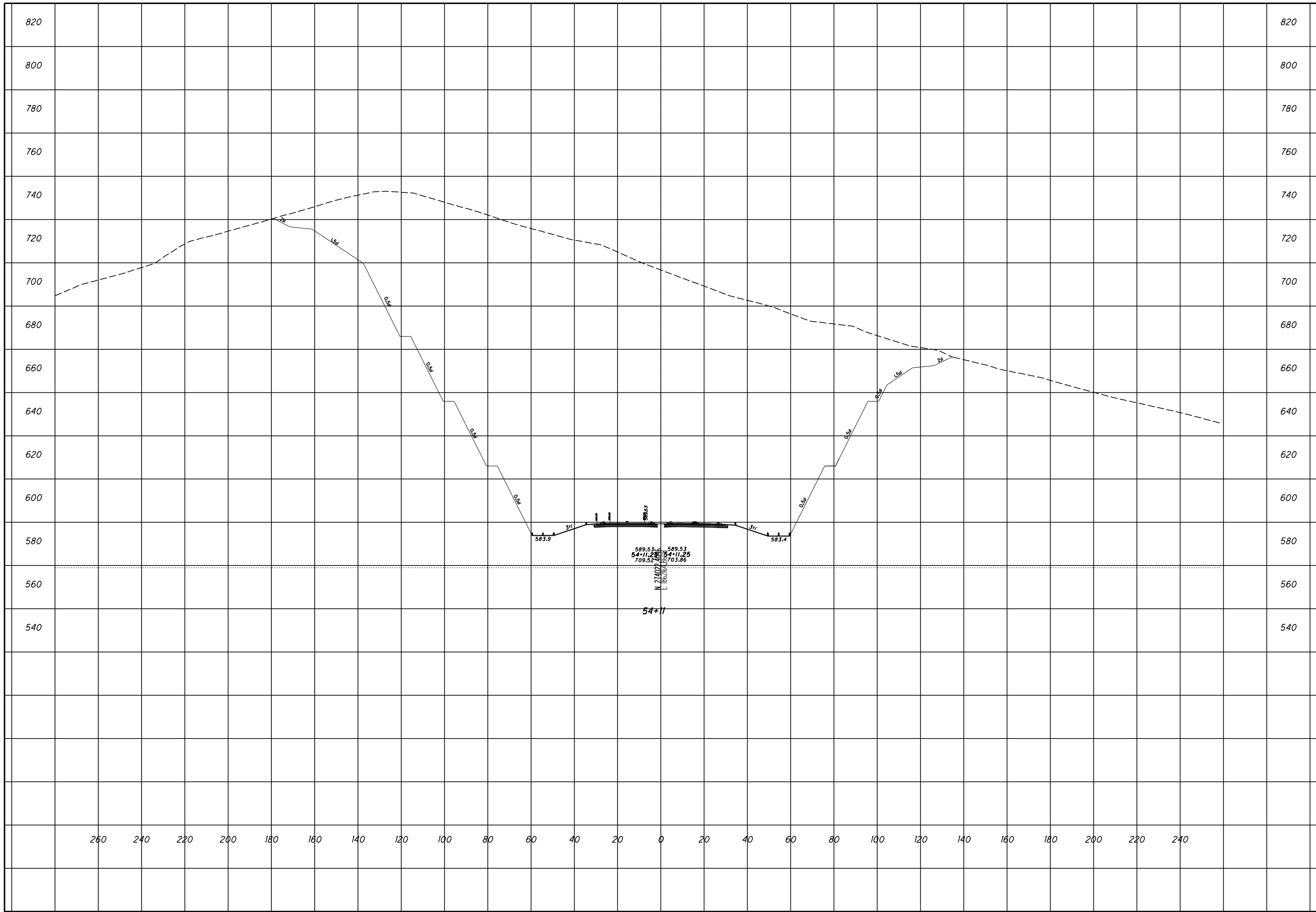
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R-156	10	101.1'-101.5'	1.981	1.982	1.983	1.983	4.782	4.785	4.798	4.788	2.415	0.0085498	589.88	152.11	9,180	2,974
			1.982	1.984	1.983											



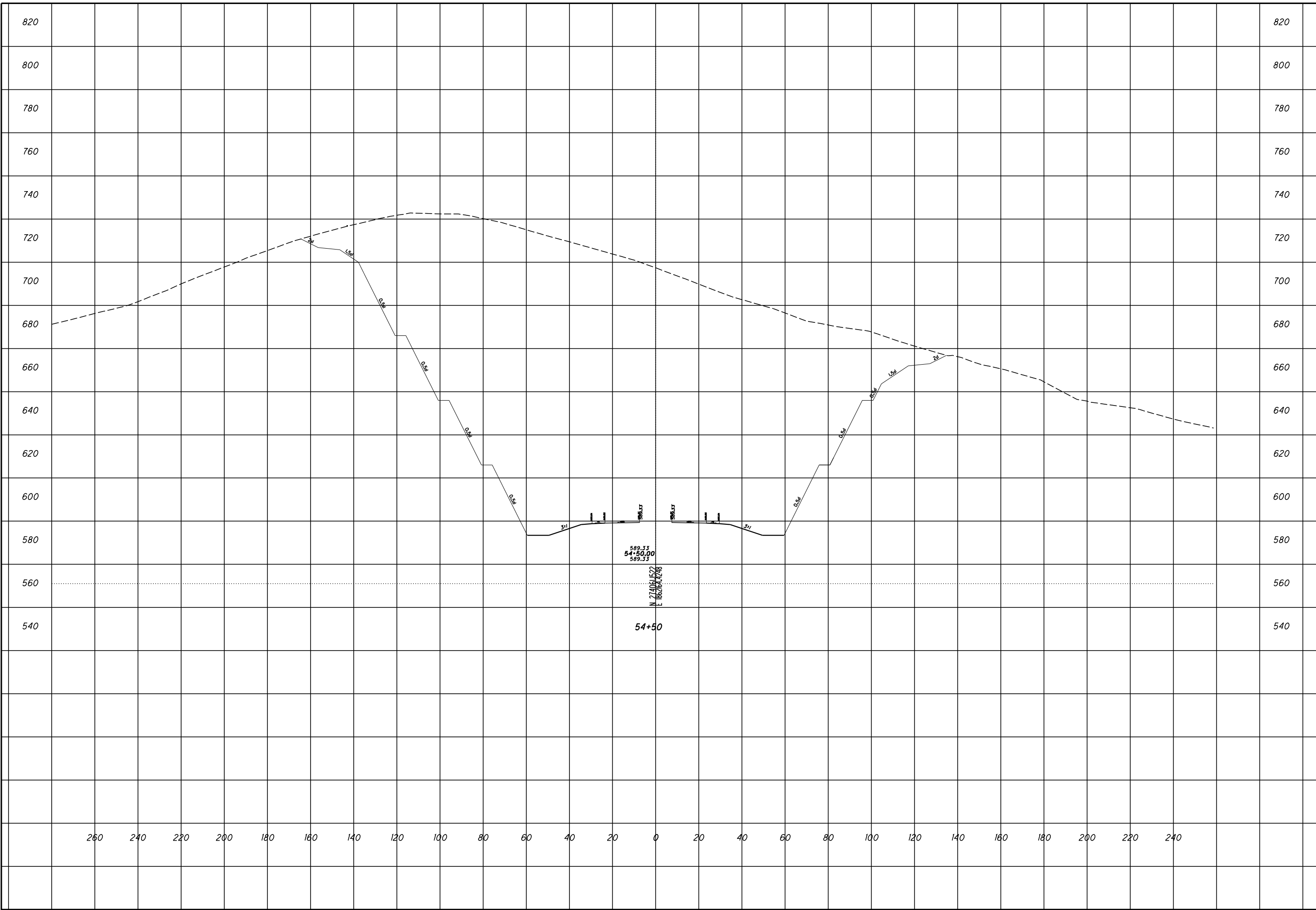
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6121 Huntley Road * Columbus, Ohio * 43229-1003 * Phone: (614) 888-0576 * Fax (614) 888-6415

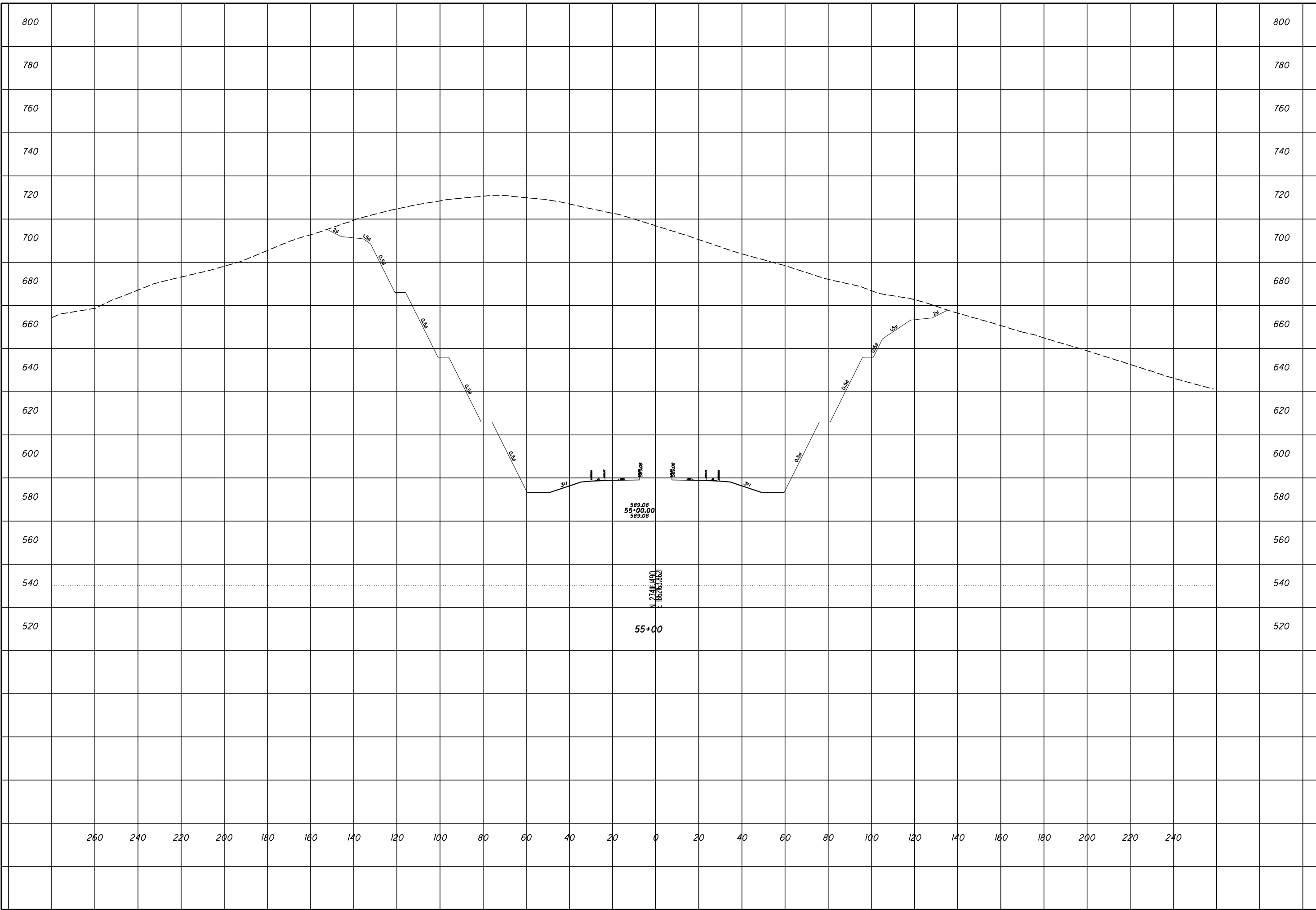
Cut Slope Cross Sections



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STA 54+11
SCI-823-0.00
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 15



CHECKED
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STA 54+50
SCI-823-0.00
 2
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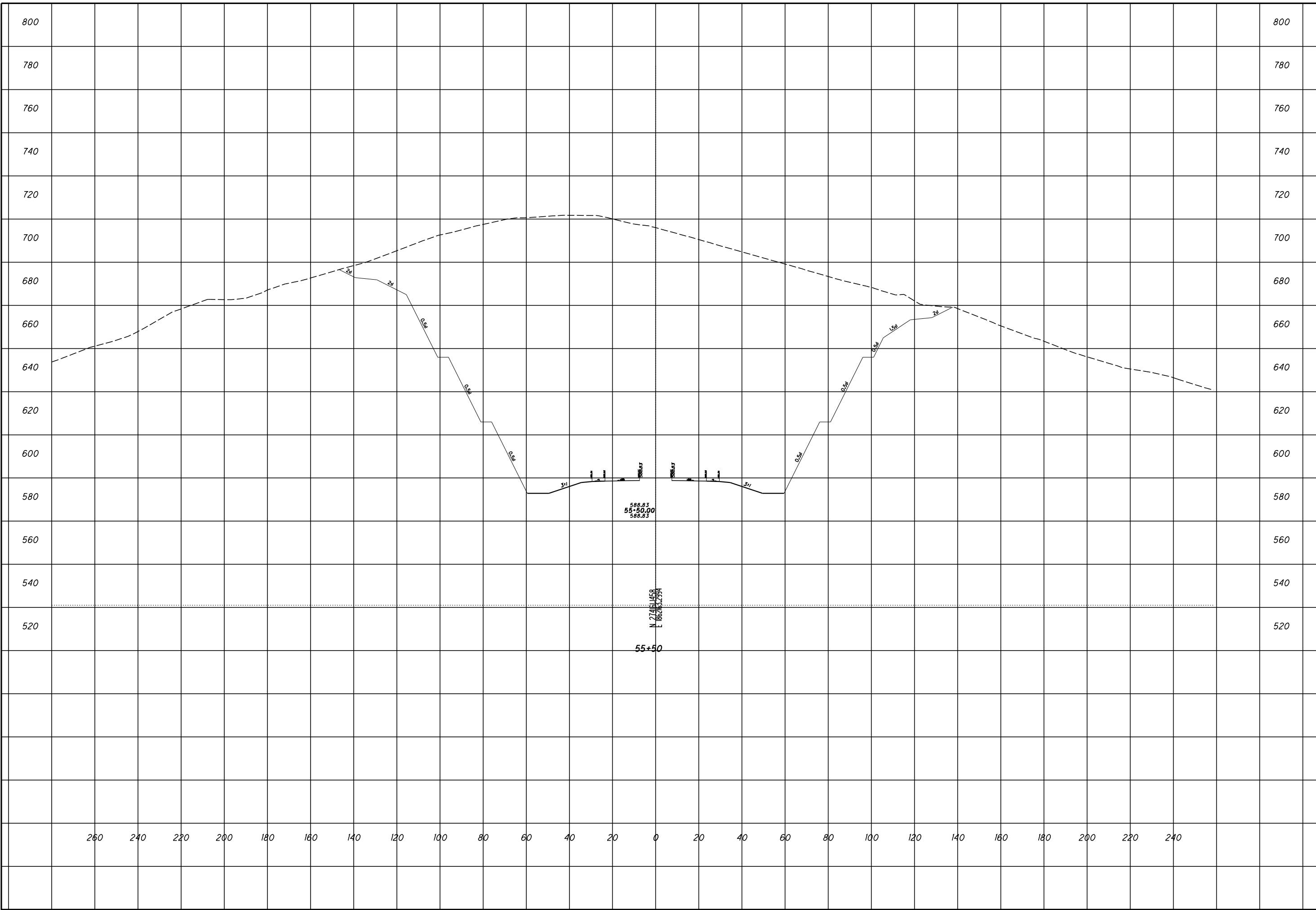


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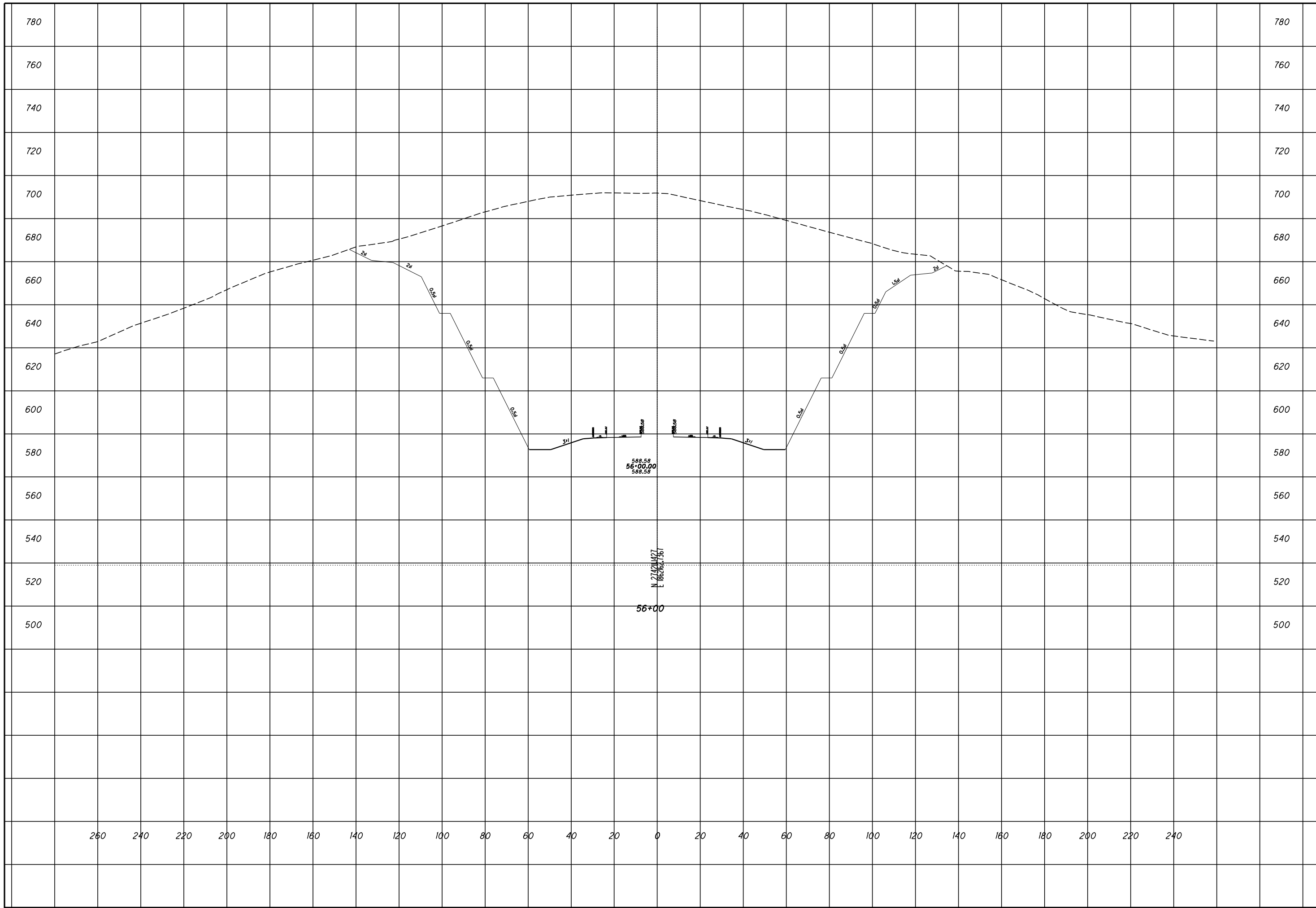
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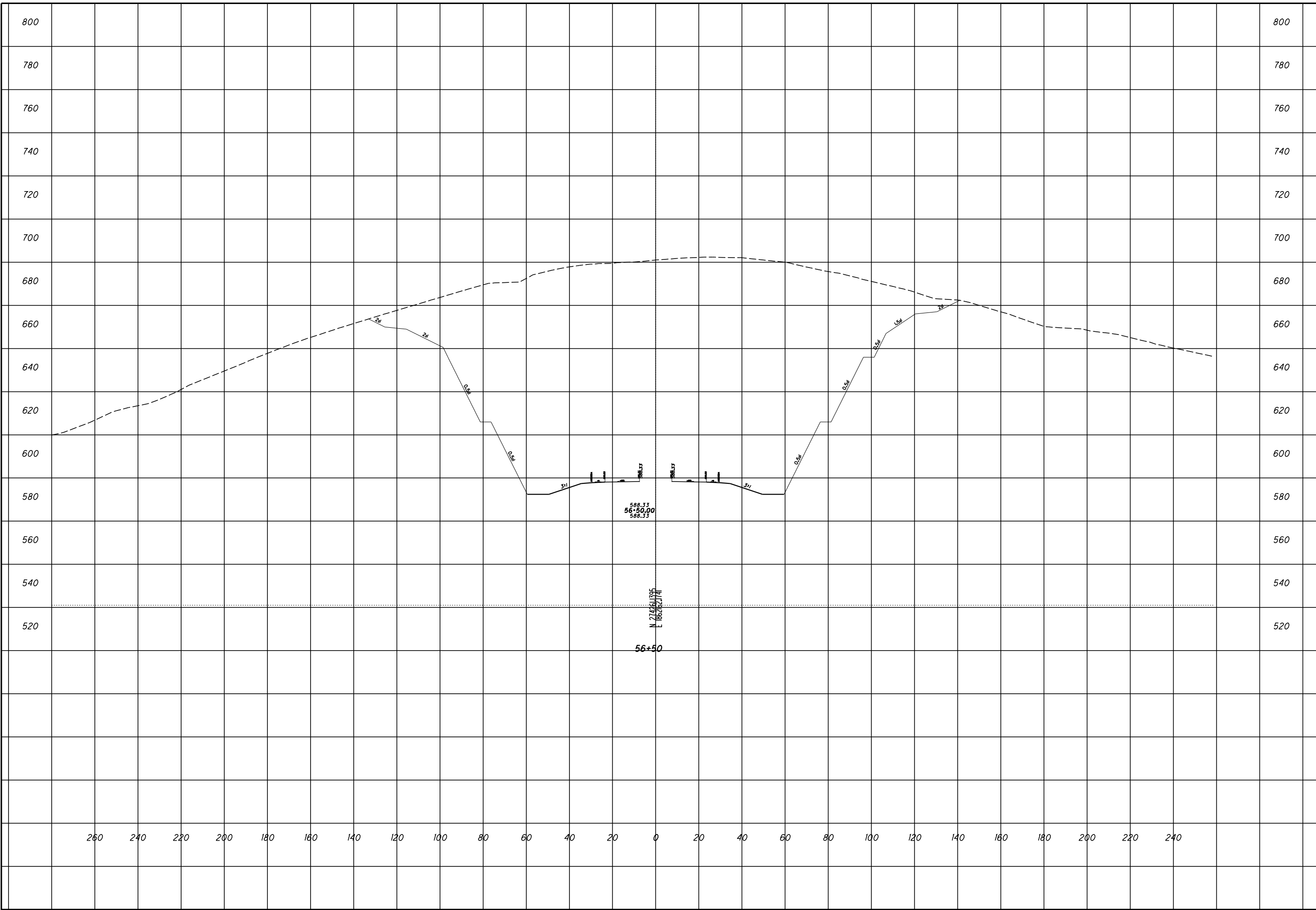
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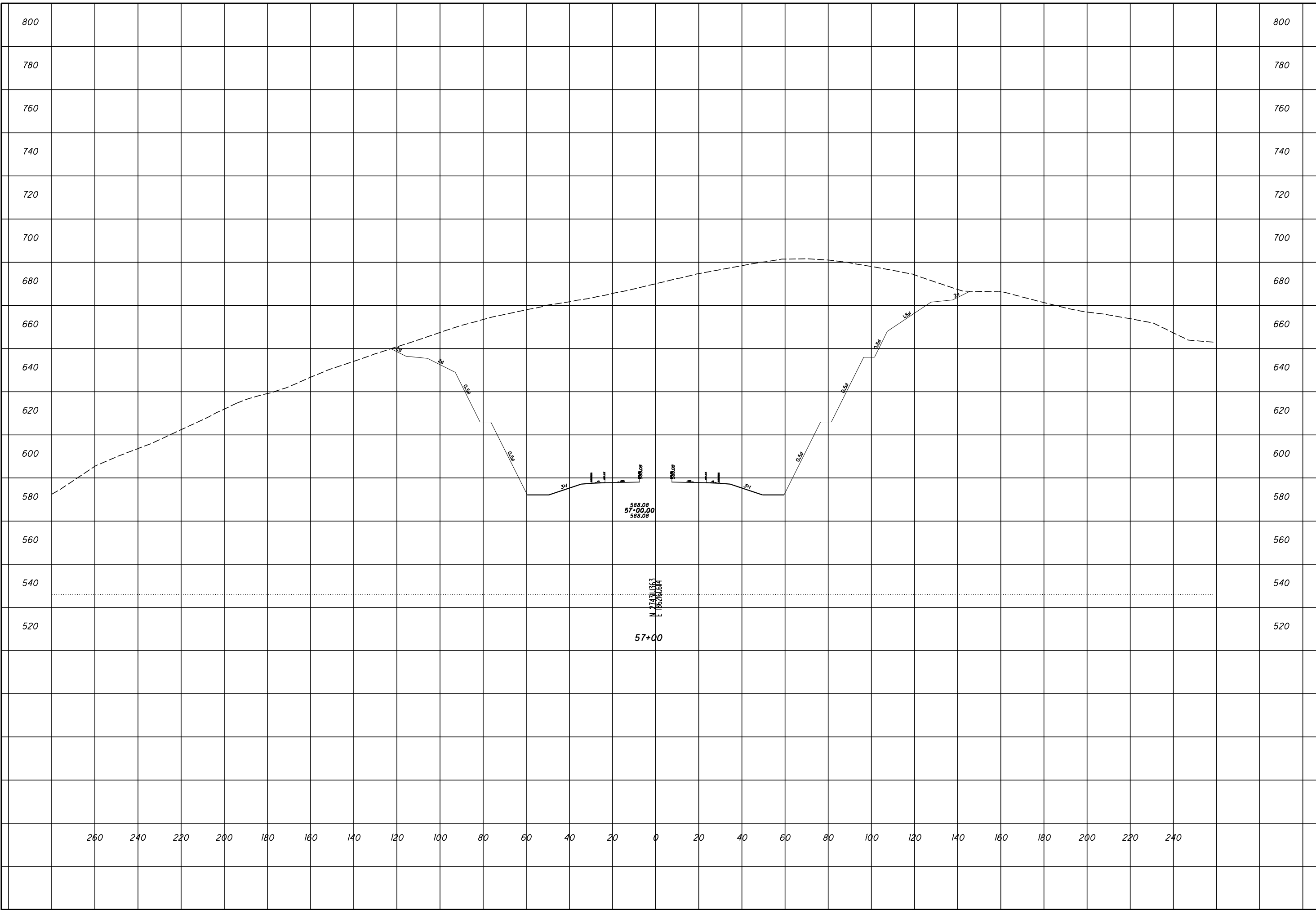


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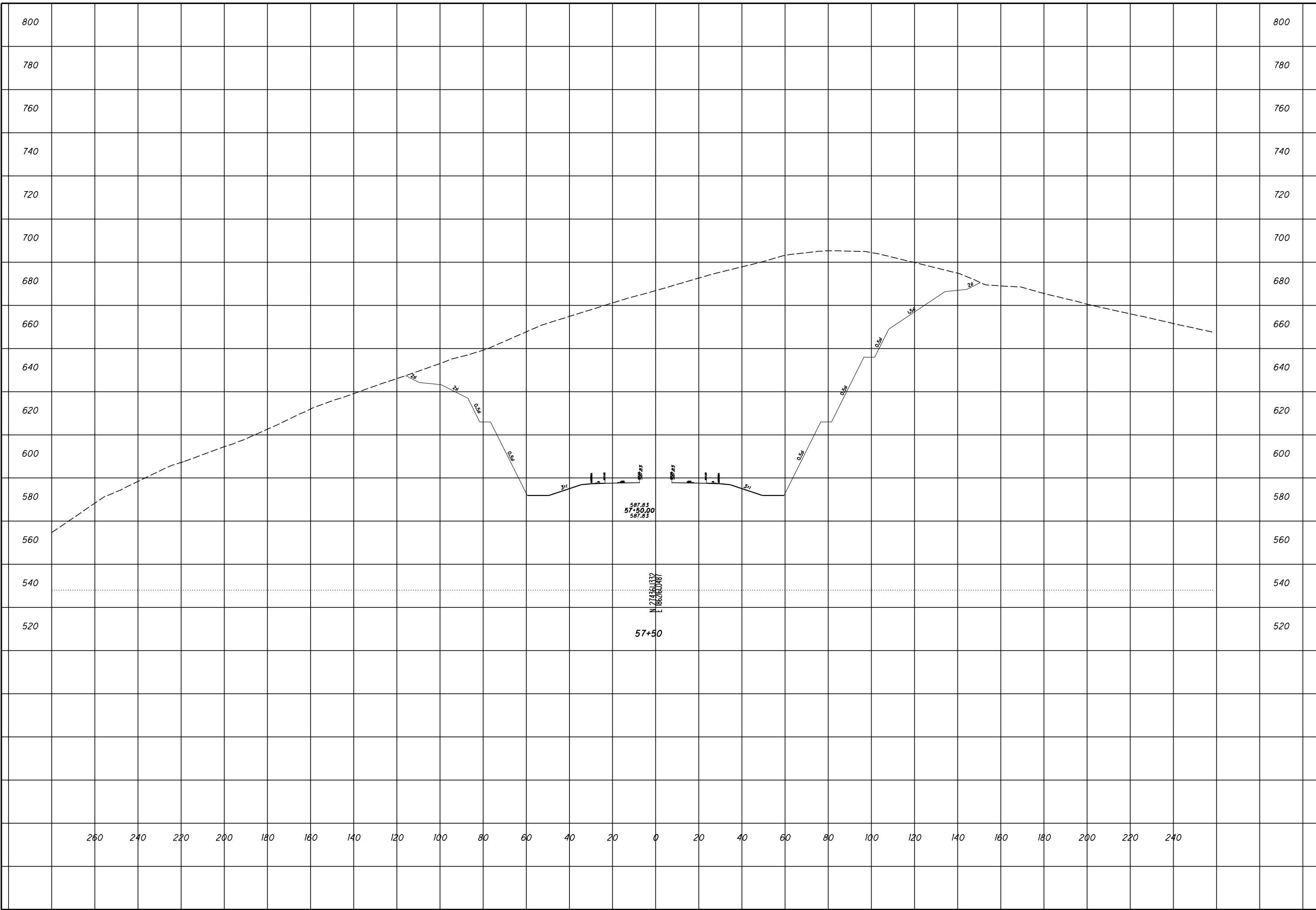
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CHECKED
ROCK CUT SLOPE DESIGN - ROCK CUT 1
STA 56+50
SCI-823-0.00
 6
 15



ROCK CUT SLOPE DESIGN - ROCK CUT 1
STA 57+00
 SCI-823-0.00
 7/15
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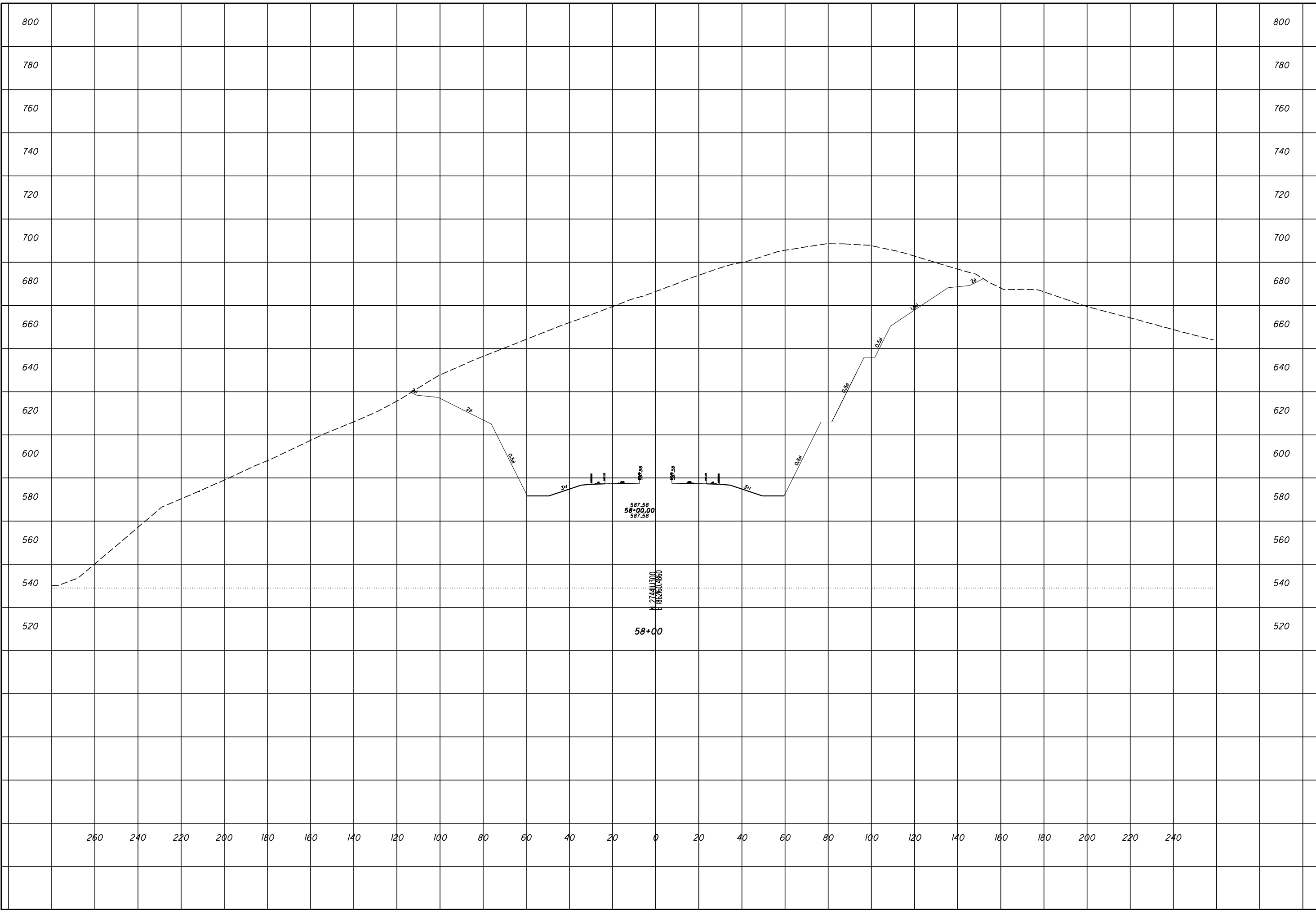


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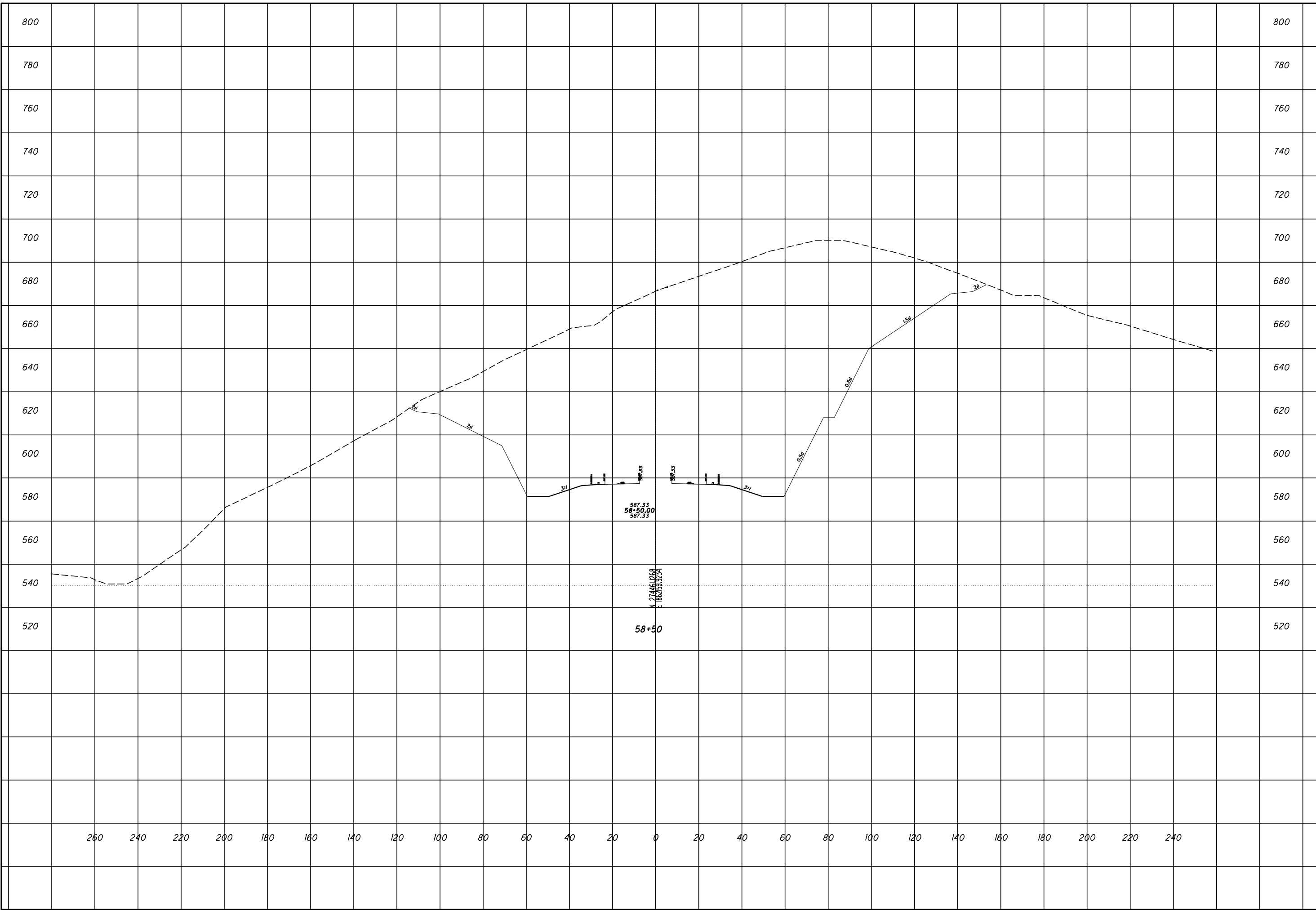
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CHECKED



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 9
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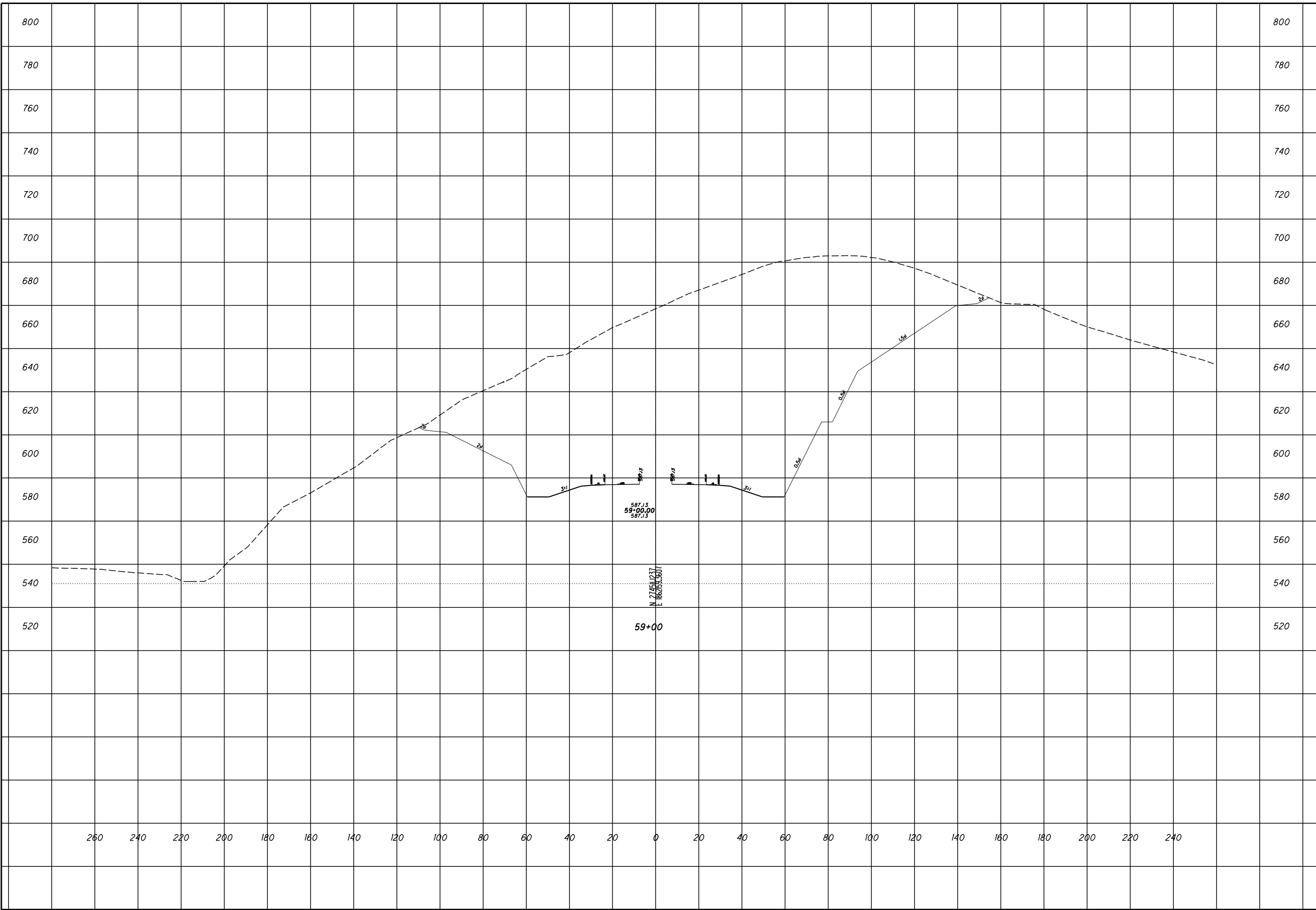


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SCI-823-0.00

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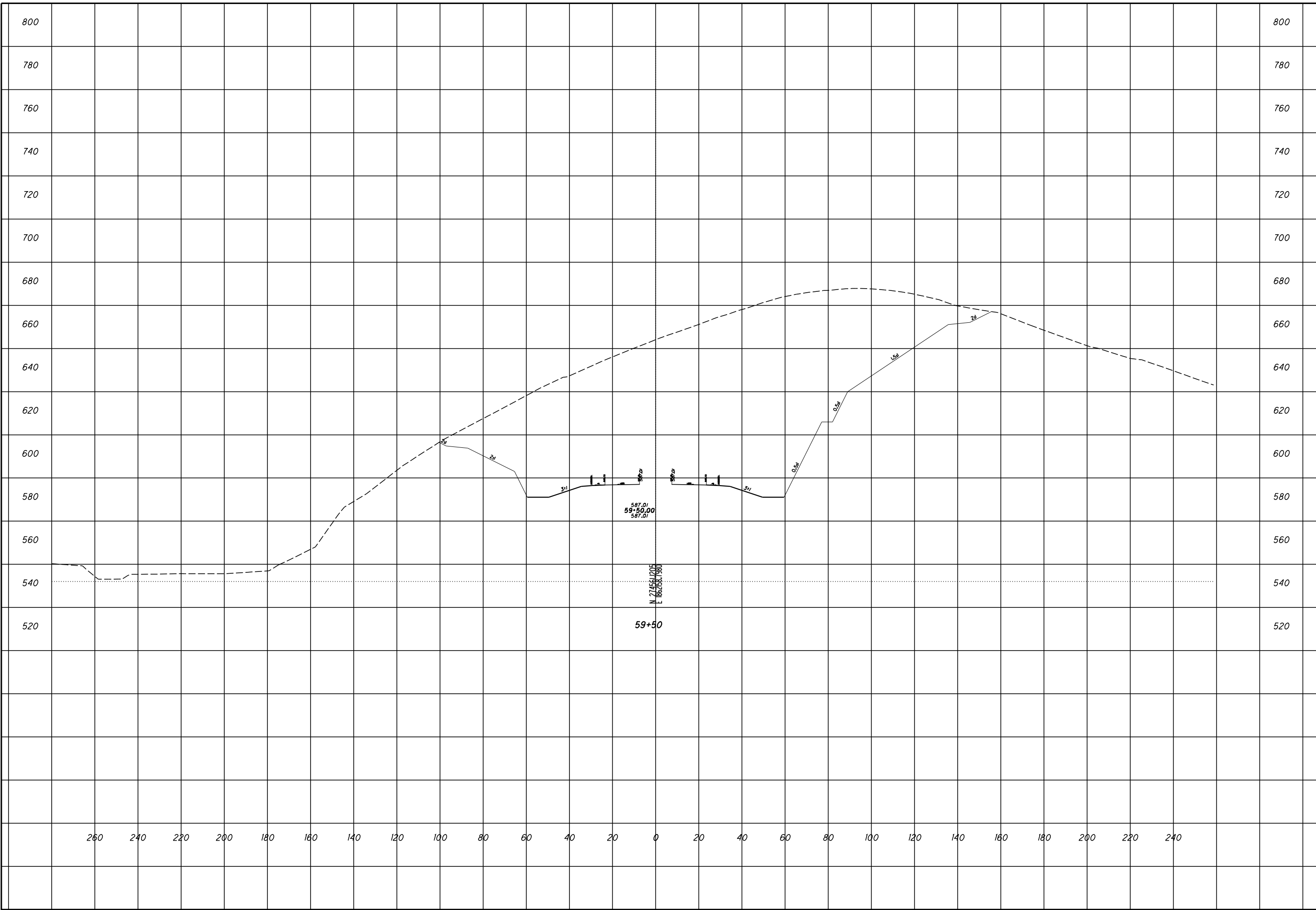
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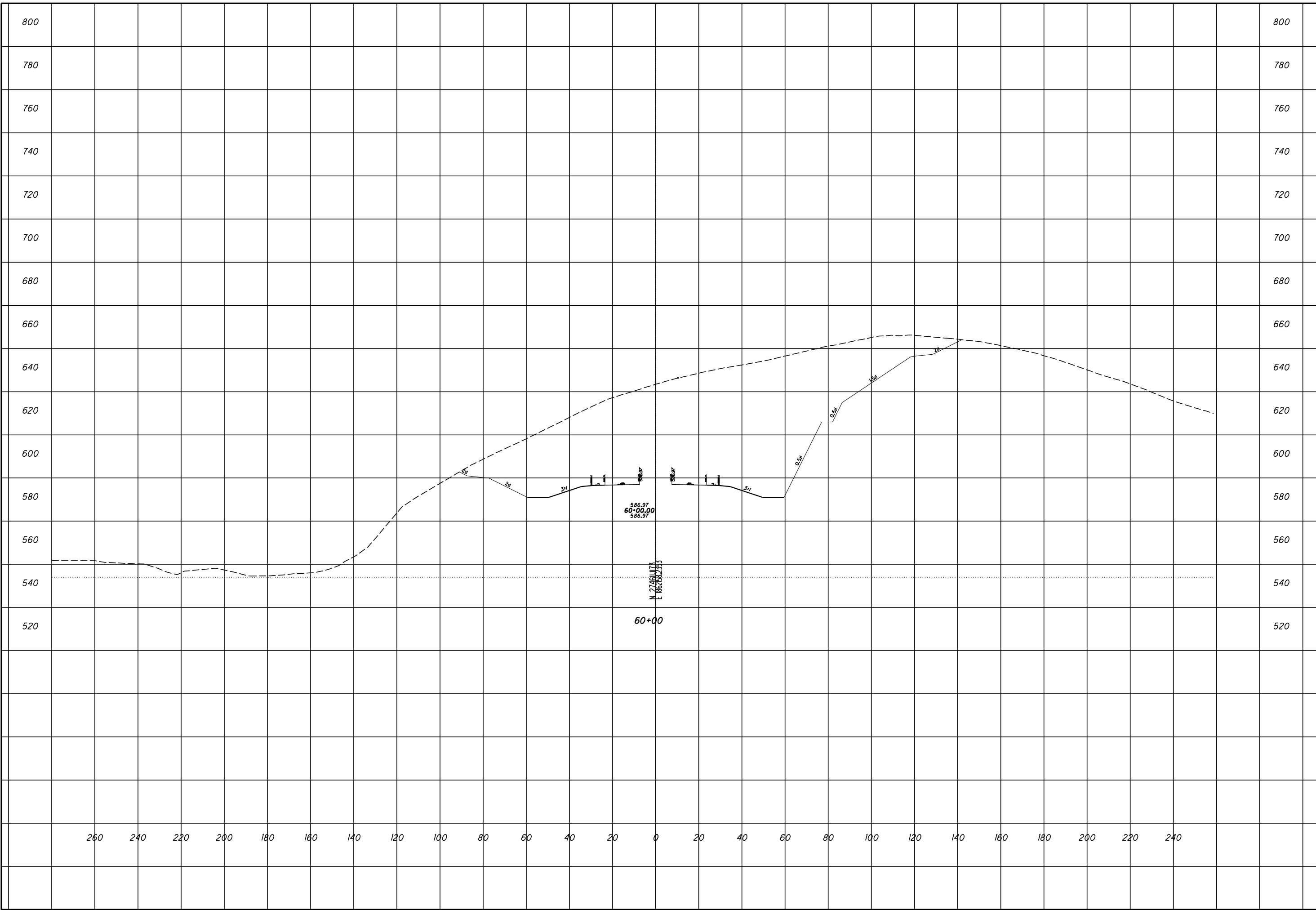
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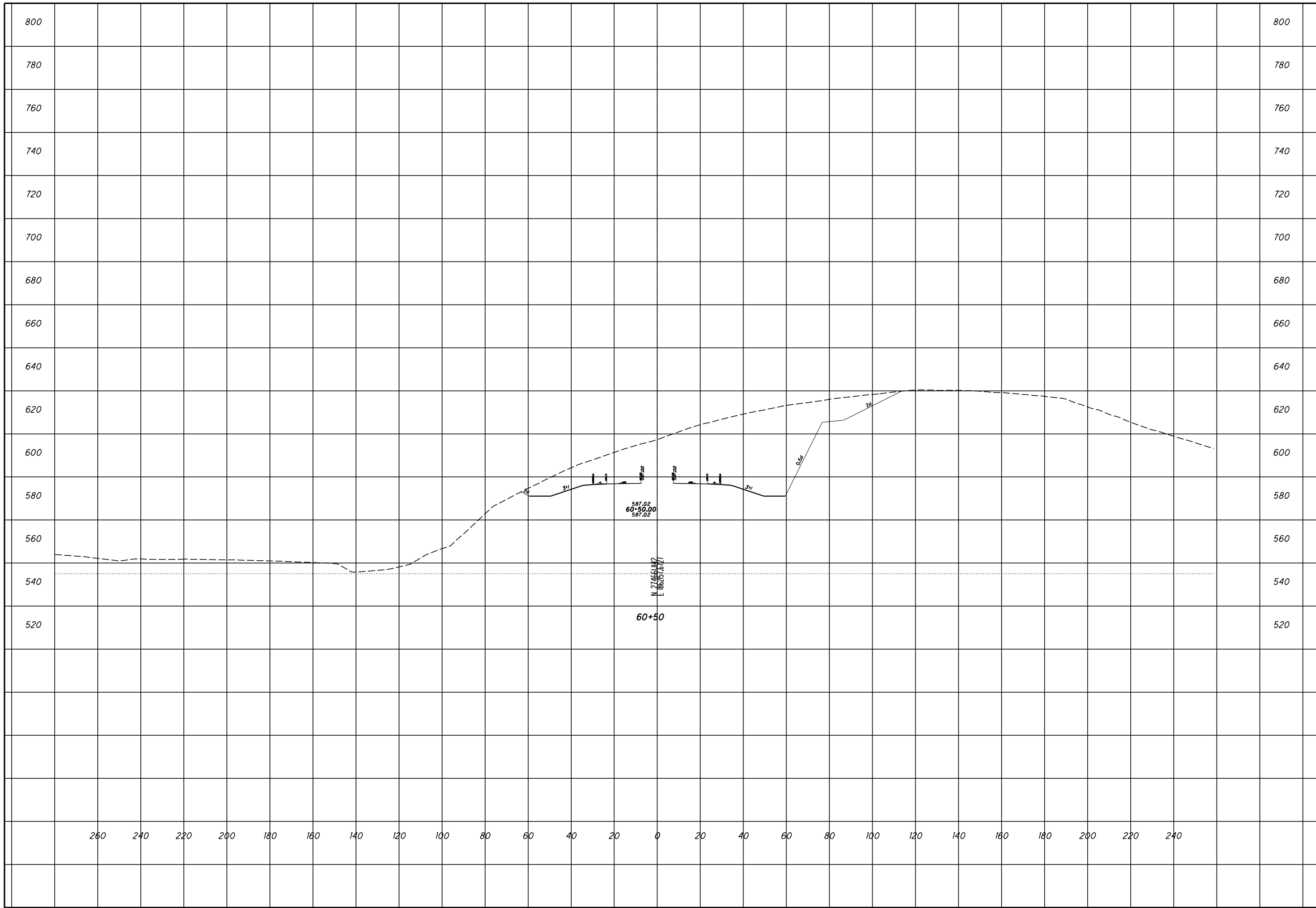
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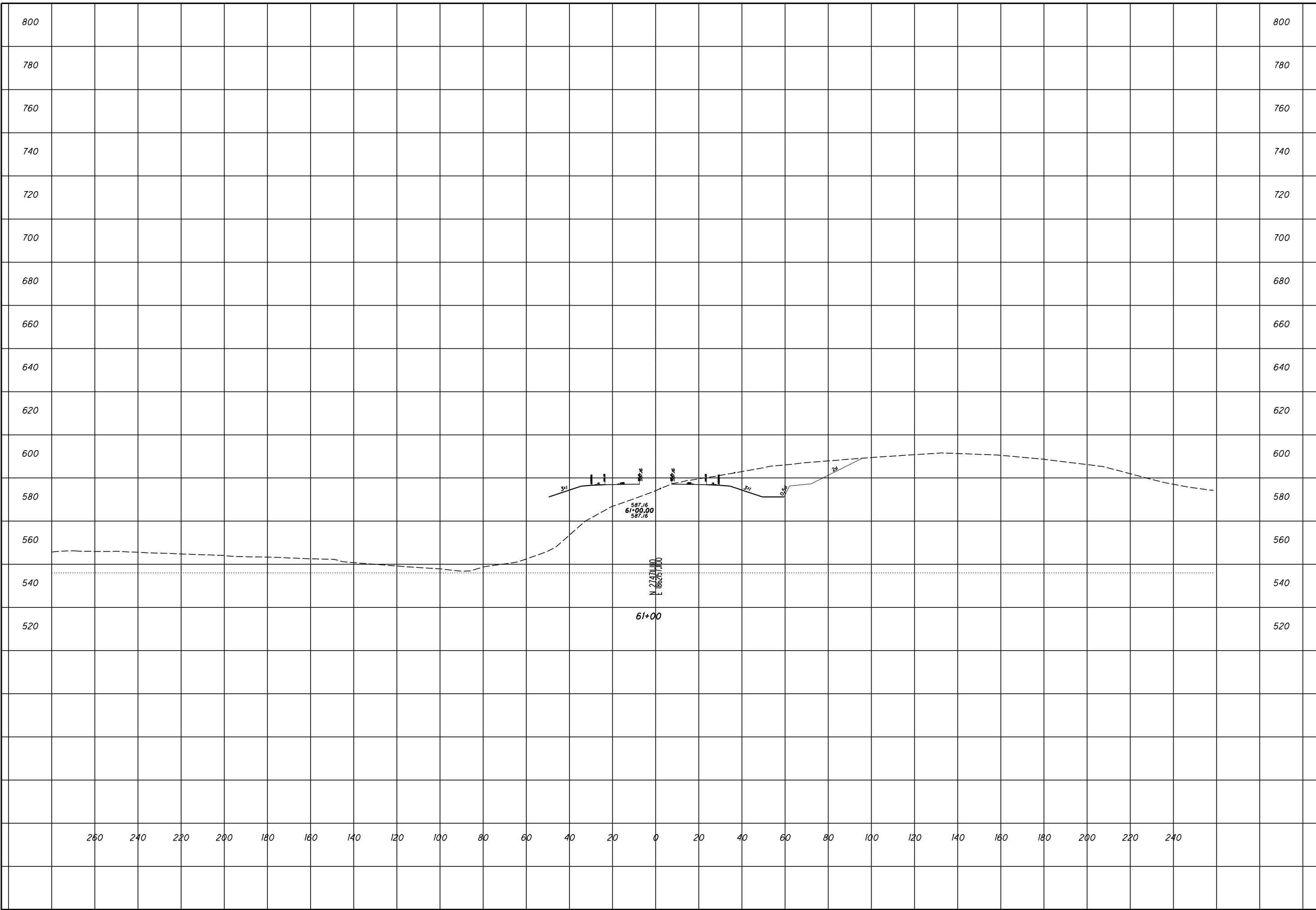
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STA 60+00
SCI-823-0.00
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STA 60+50
SCI-823-0.00
 14
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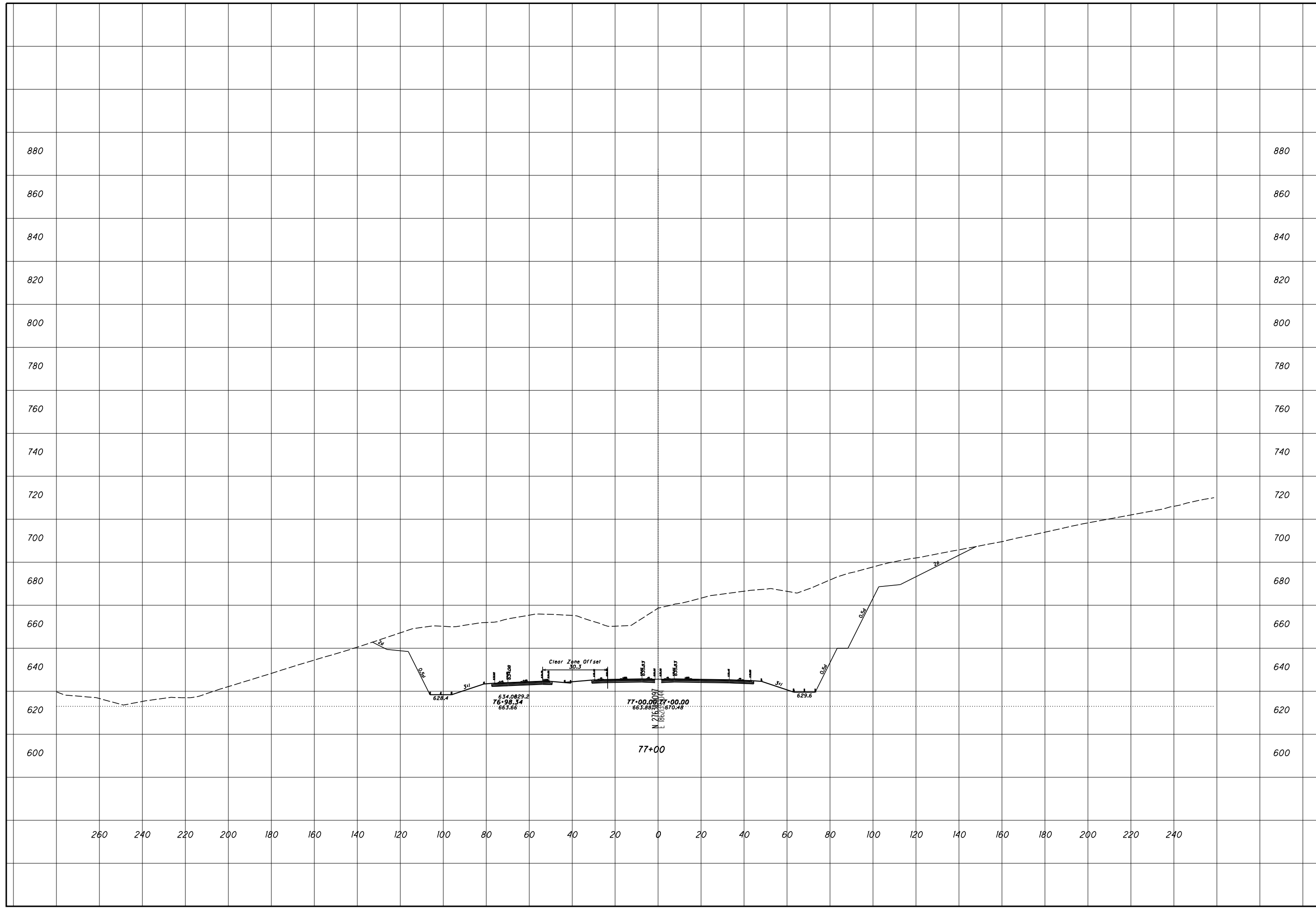
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SCI-823-0.00

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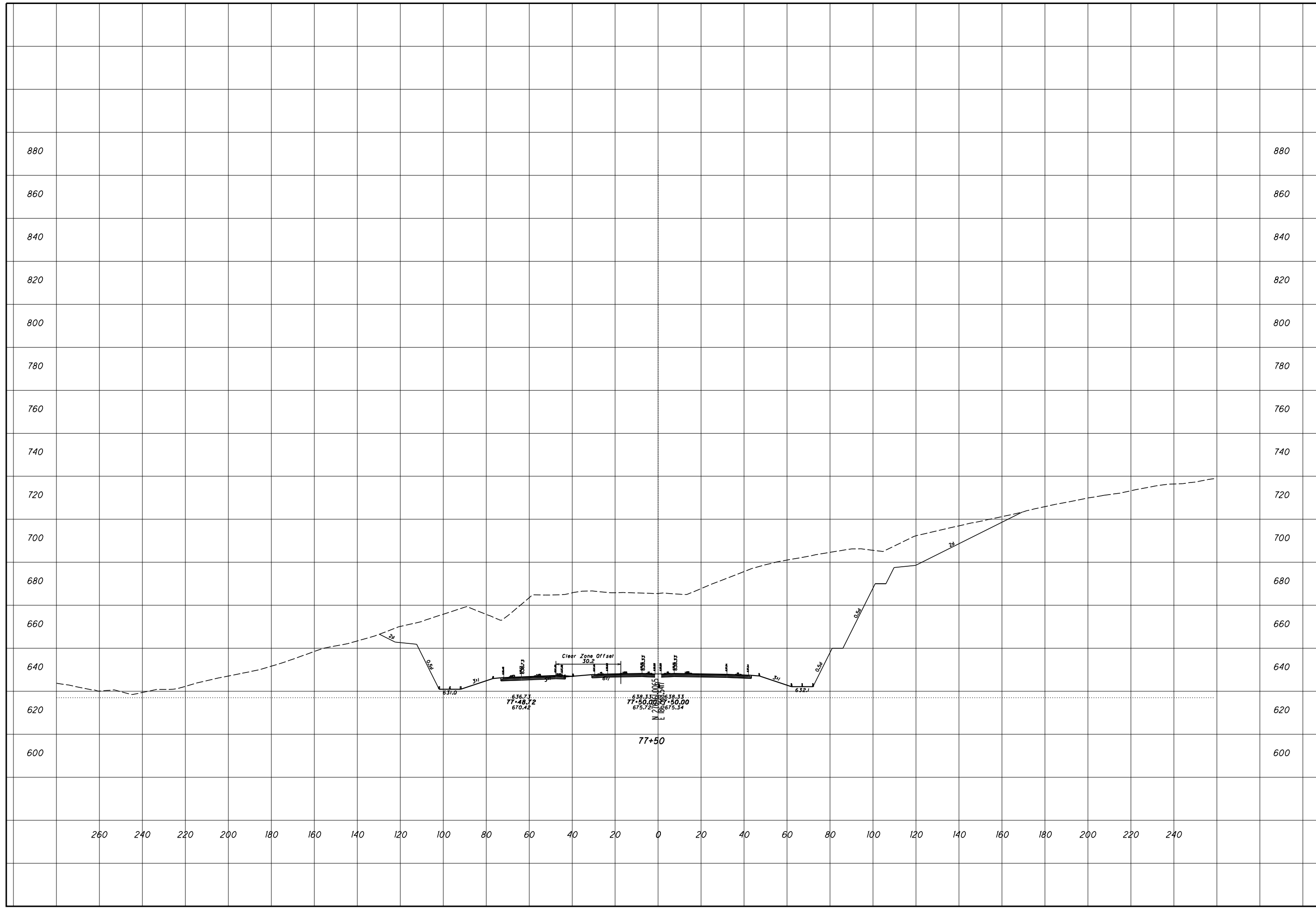
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STA 77+00

SCI-823-0.00



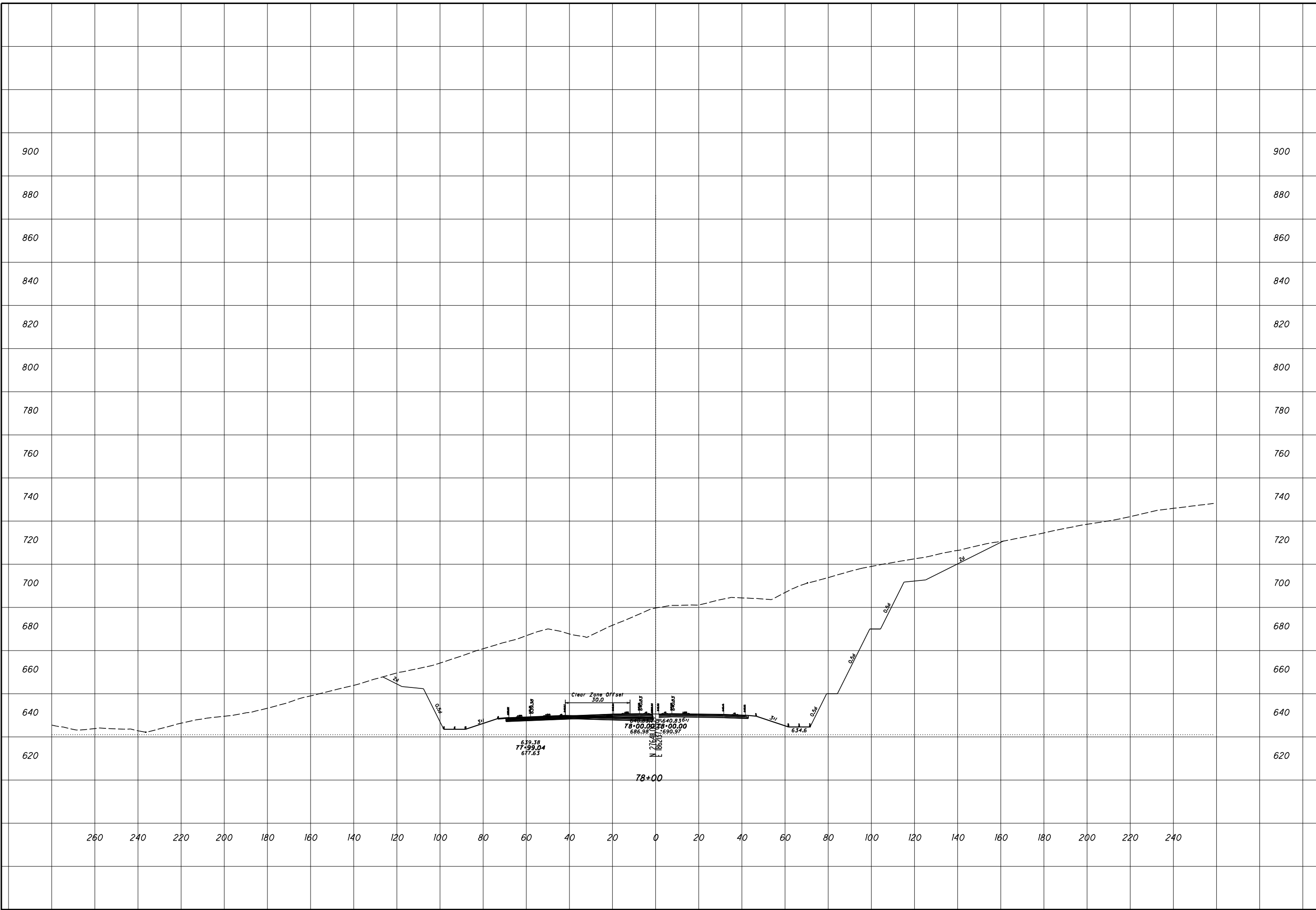
**ROCK CUT SLOPE DESIGN - ROCK CUT 2
STA 77+50**

SCI-823-0.00



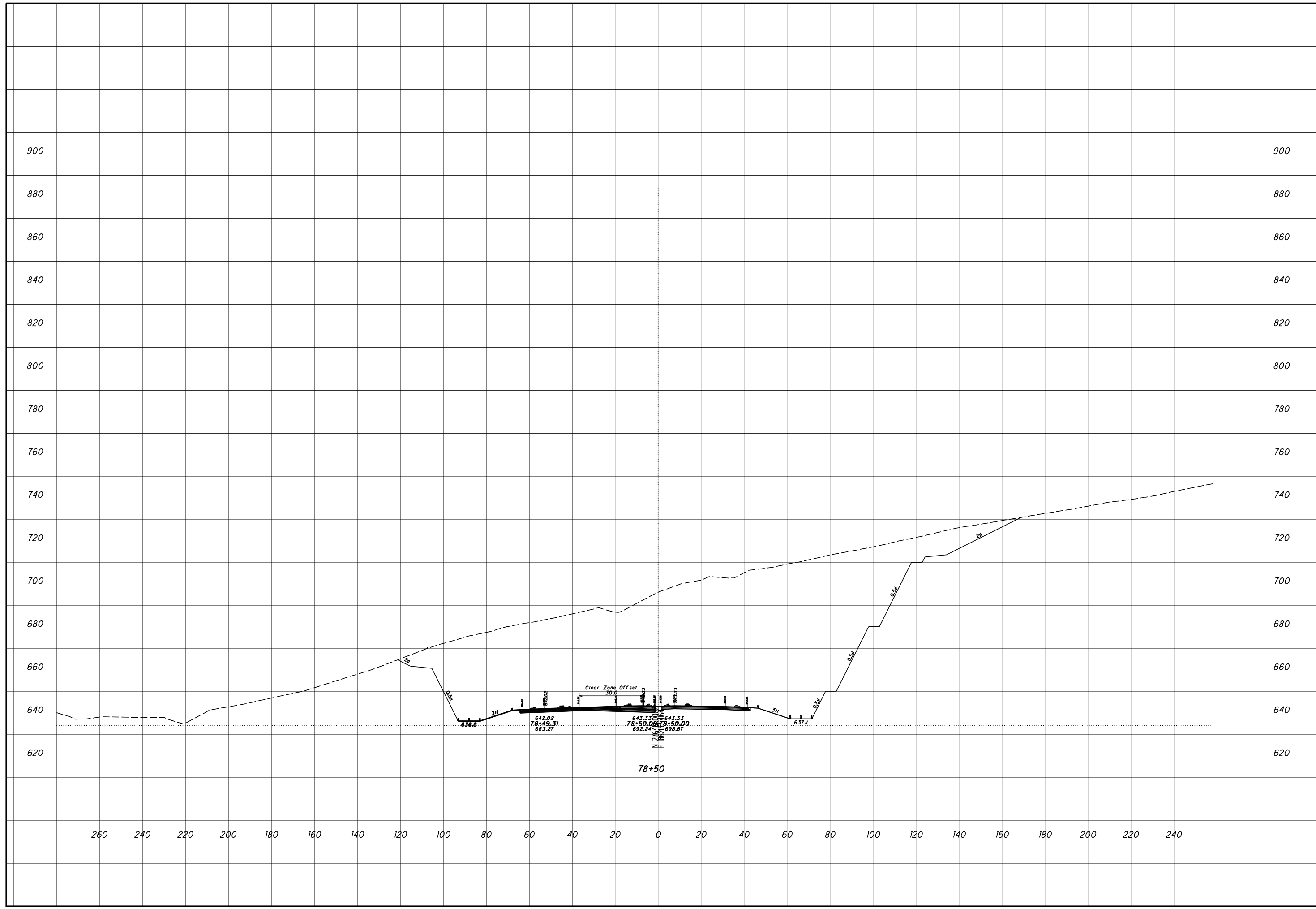
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STA 78+00

SCI-823-0.00



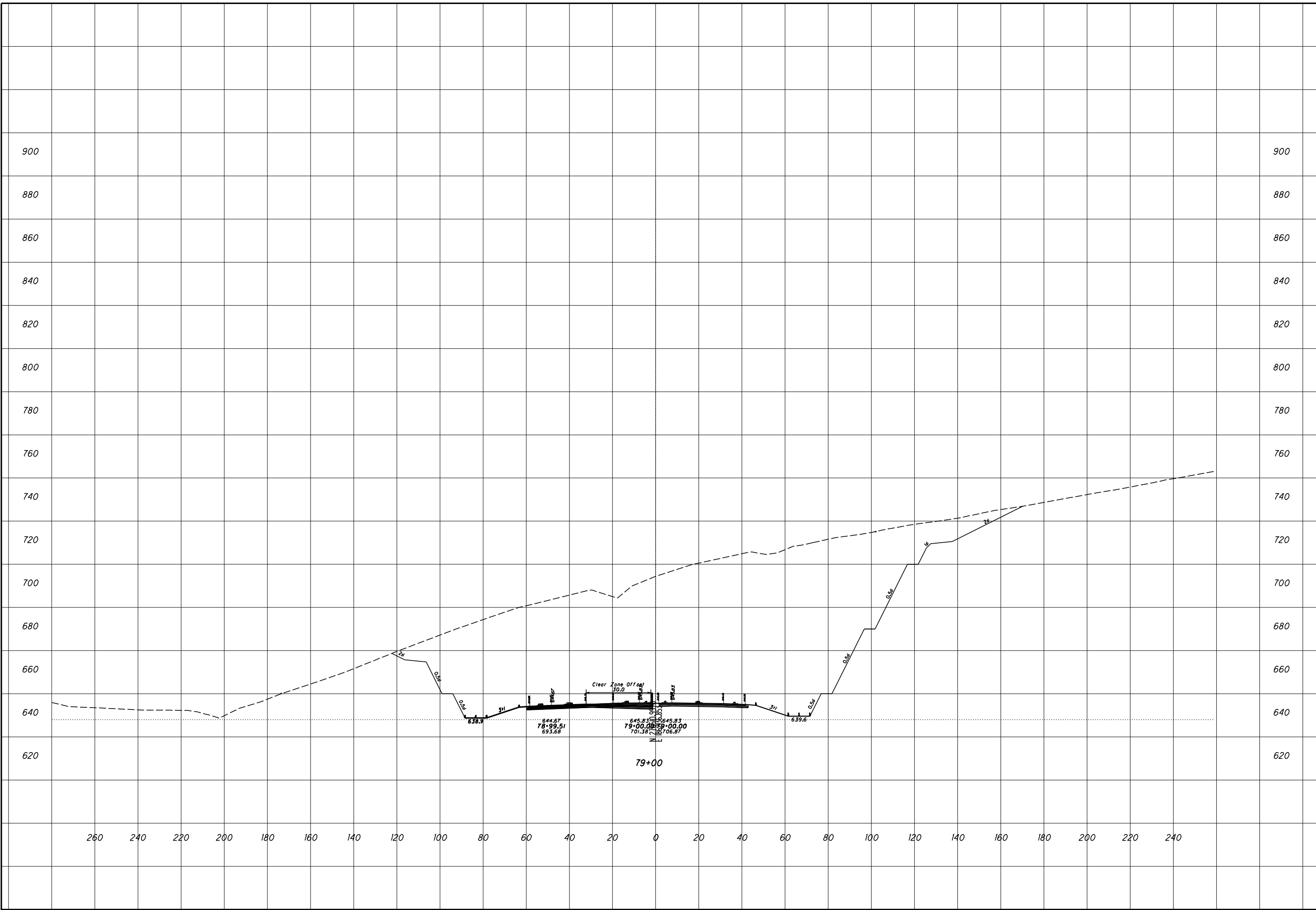
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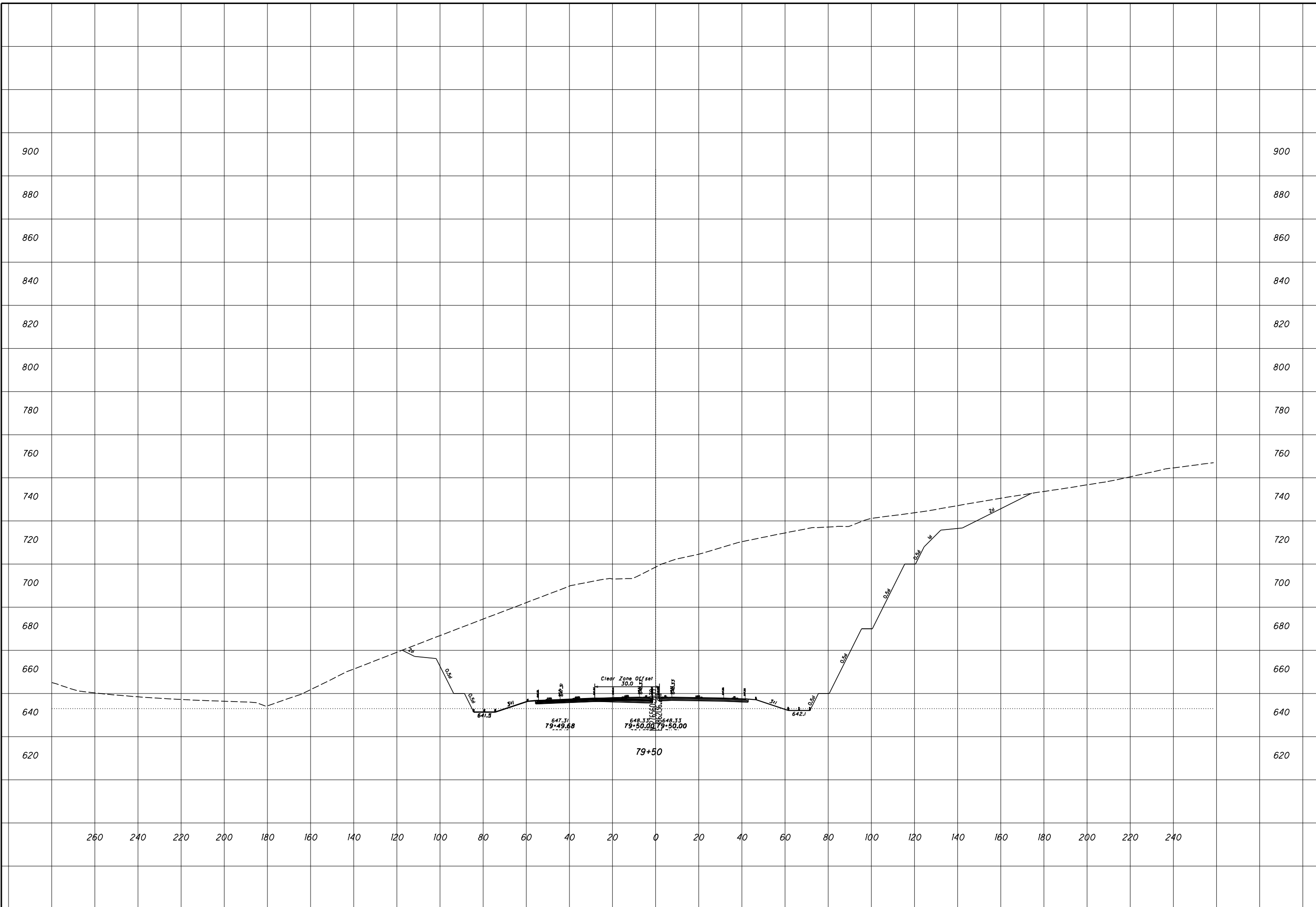
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SCI-823-0.00



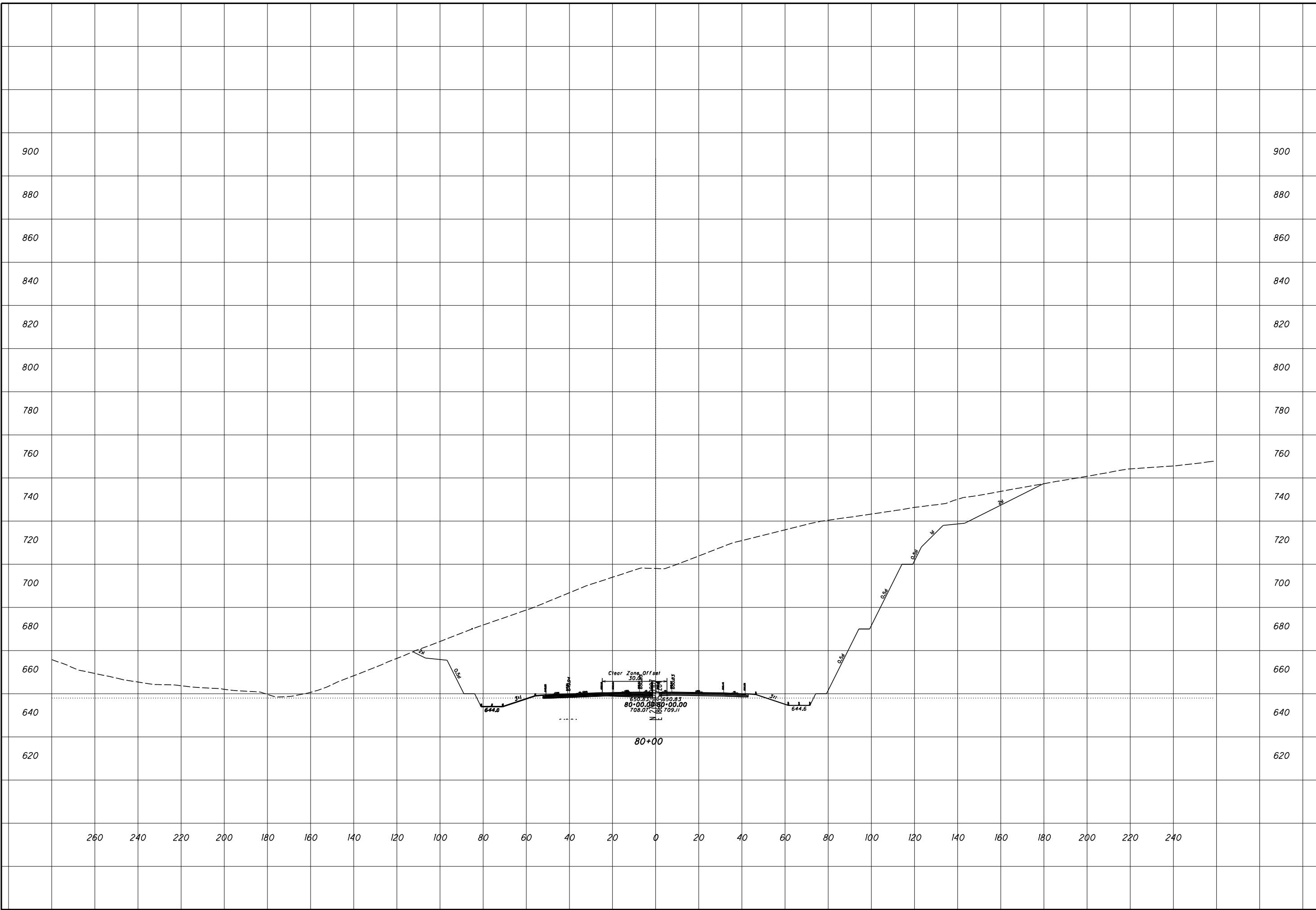
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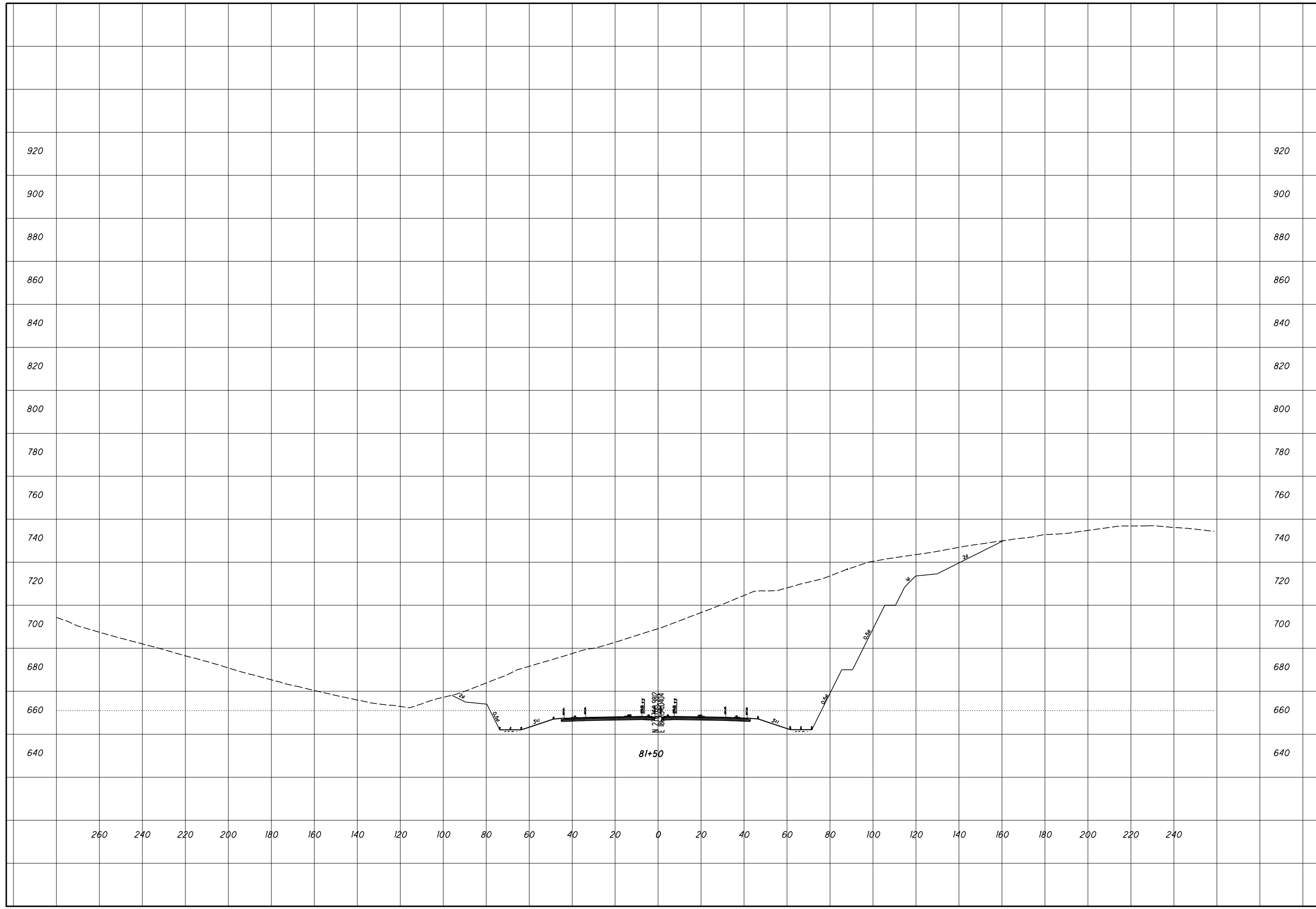
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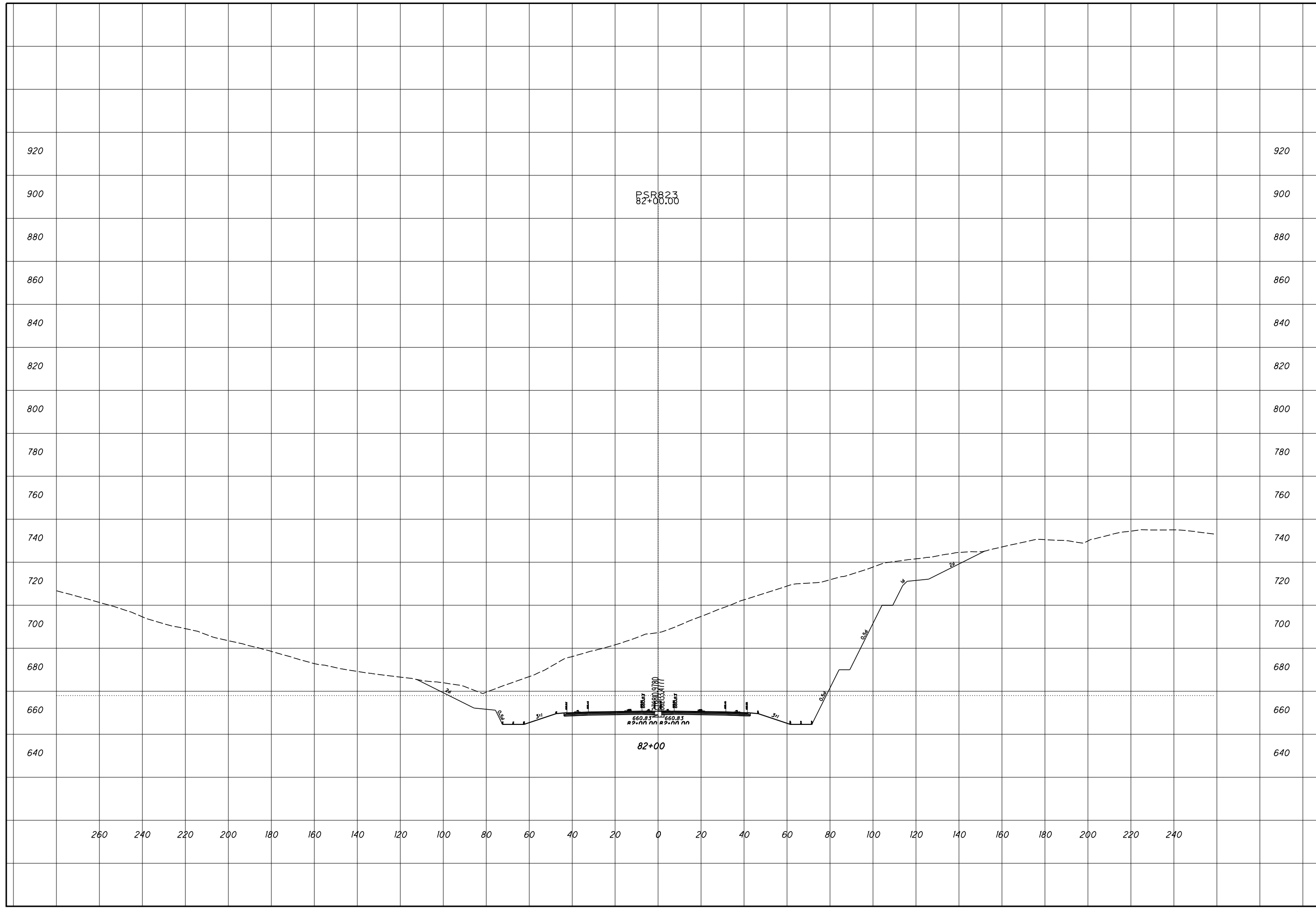
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SCI-823-0.00



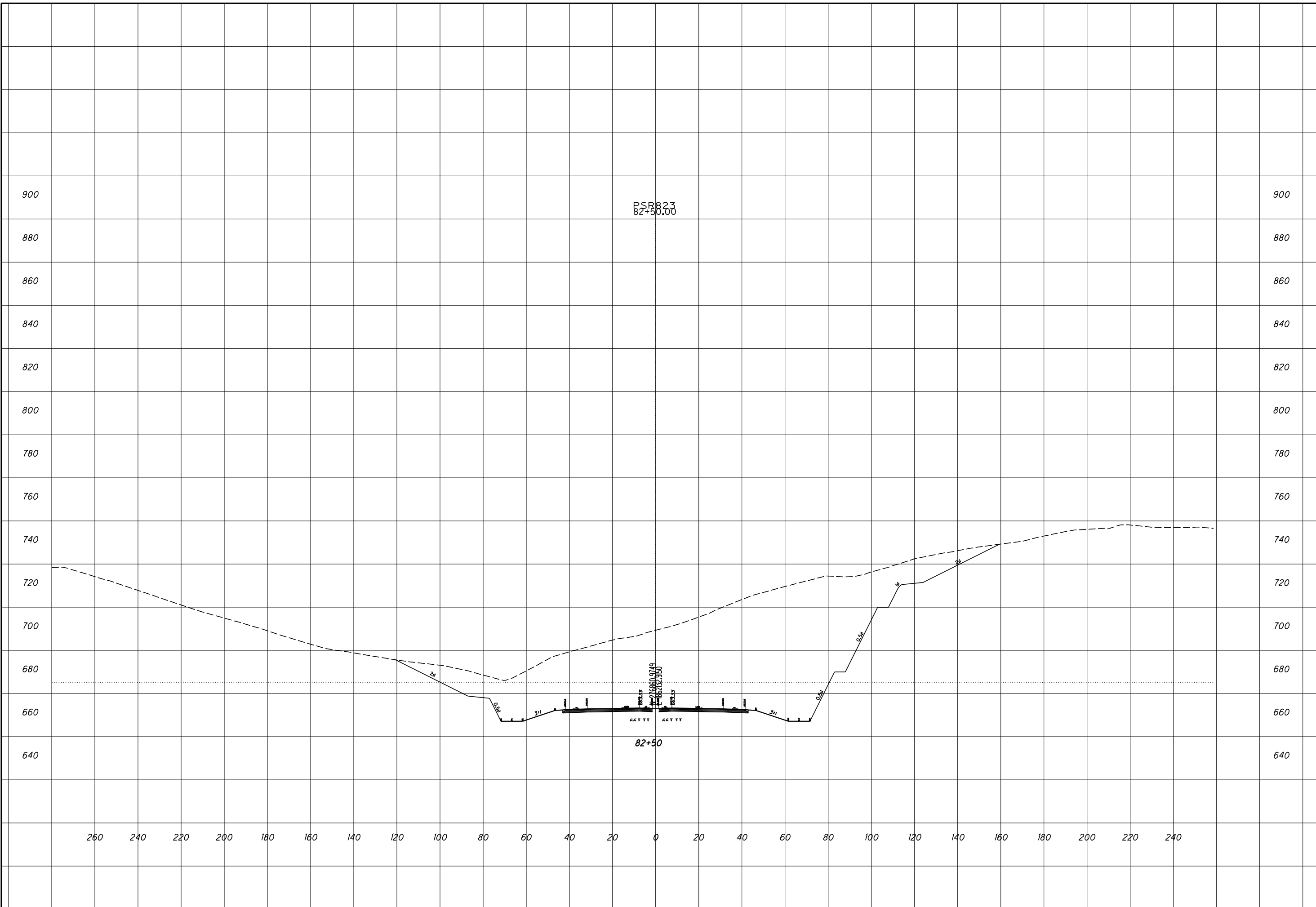
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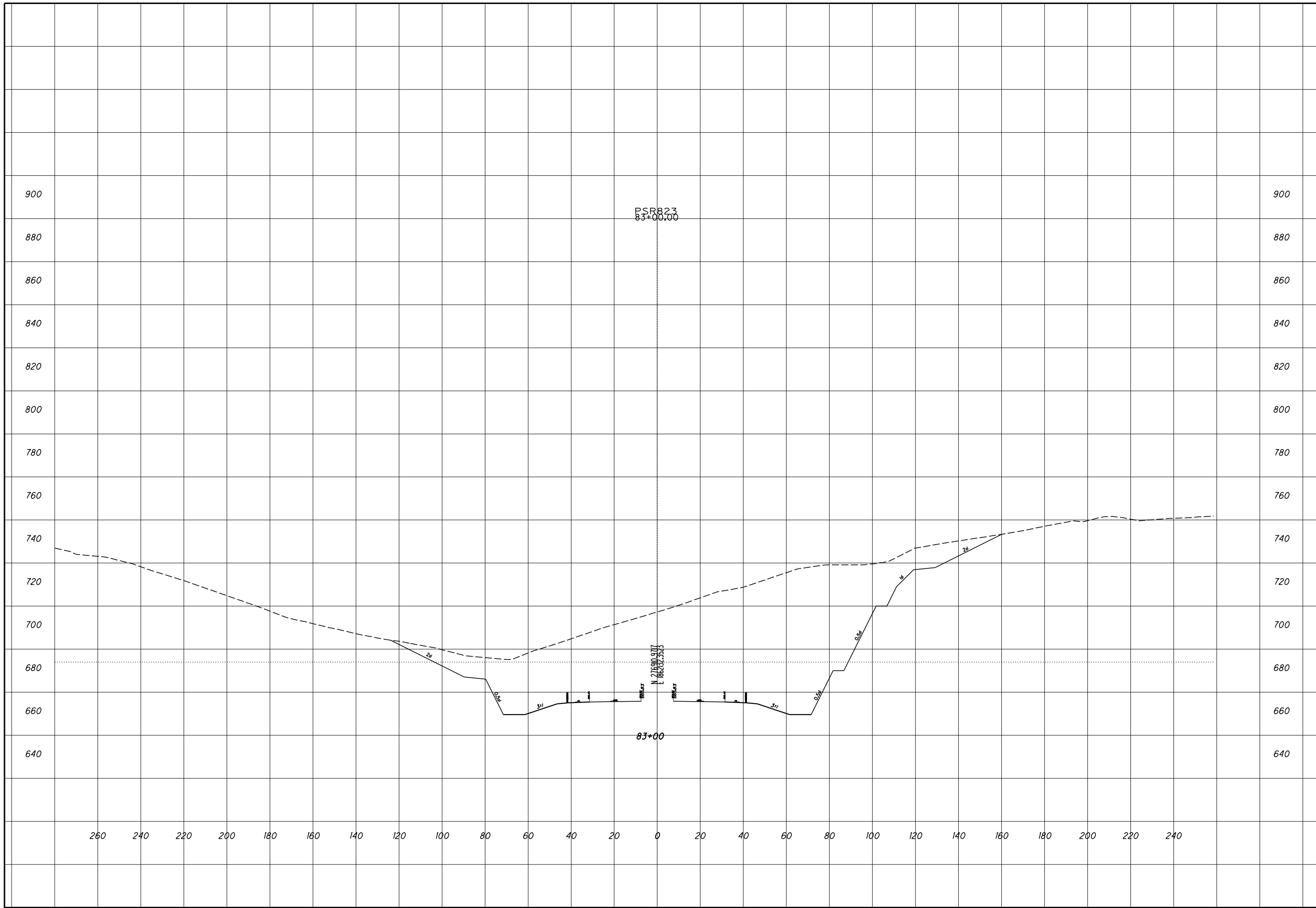
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SCI-823-0.00





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STA 83+00

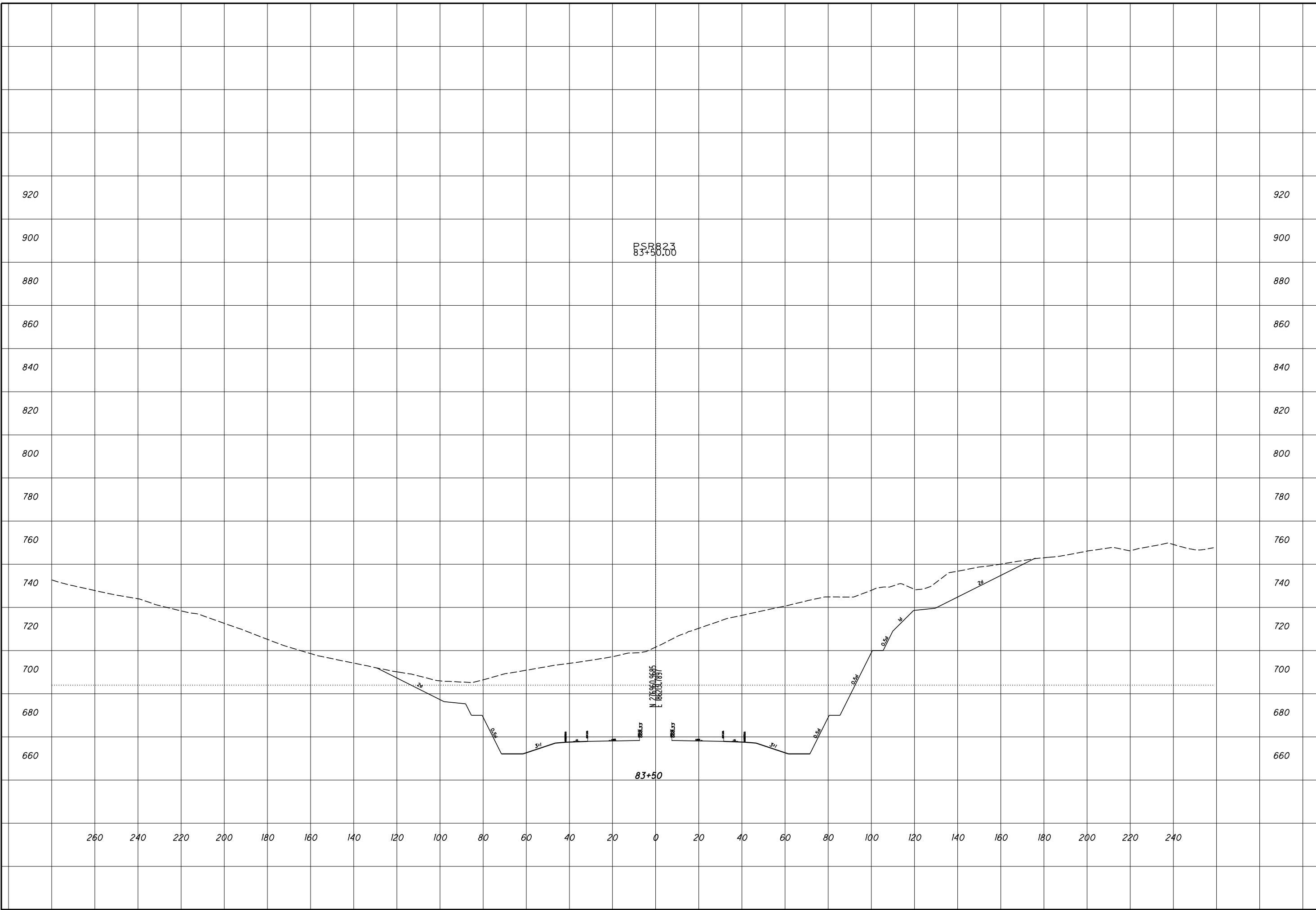
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11
57

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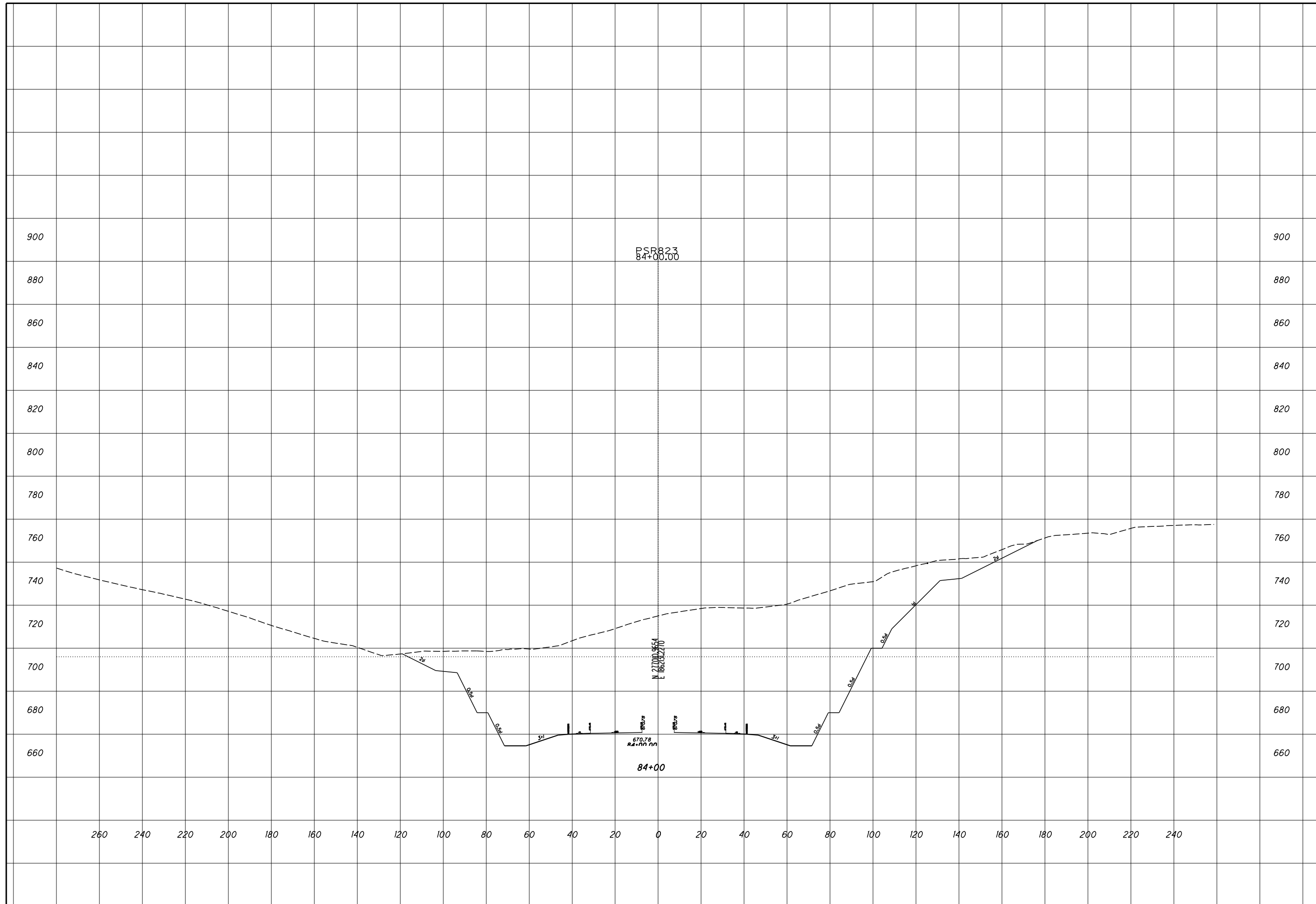
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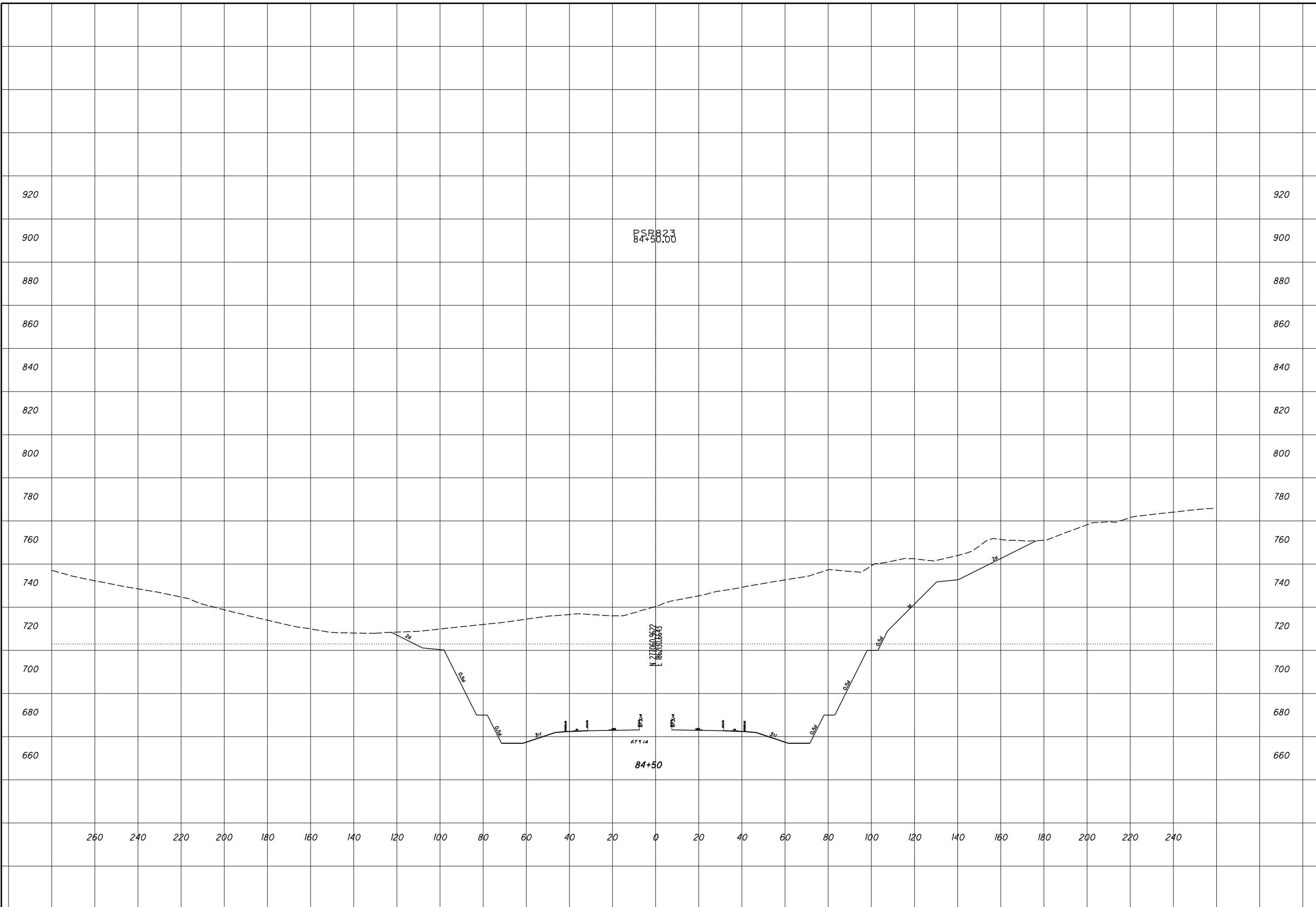
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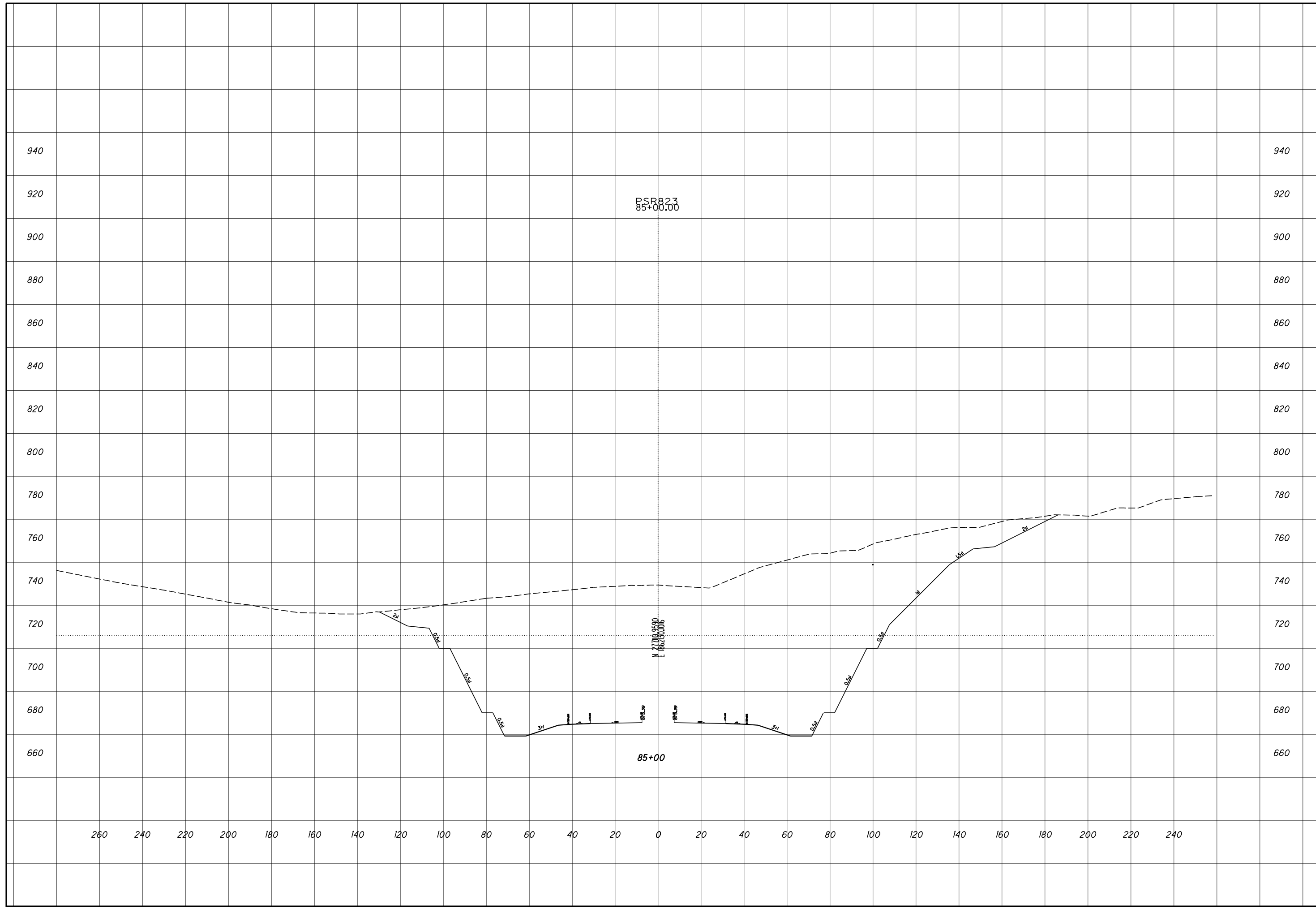
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SCI-823-0.00



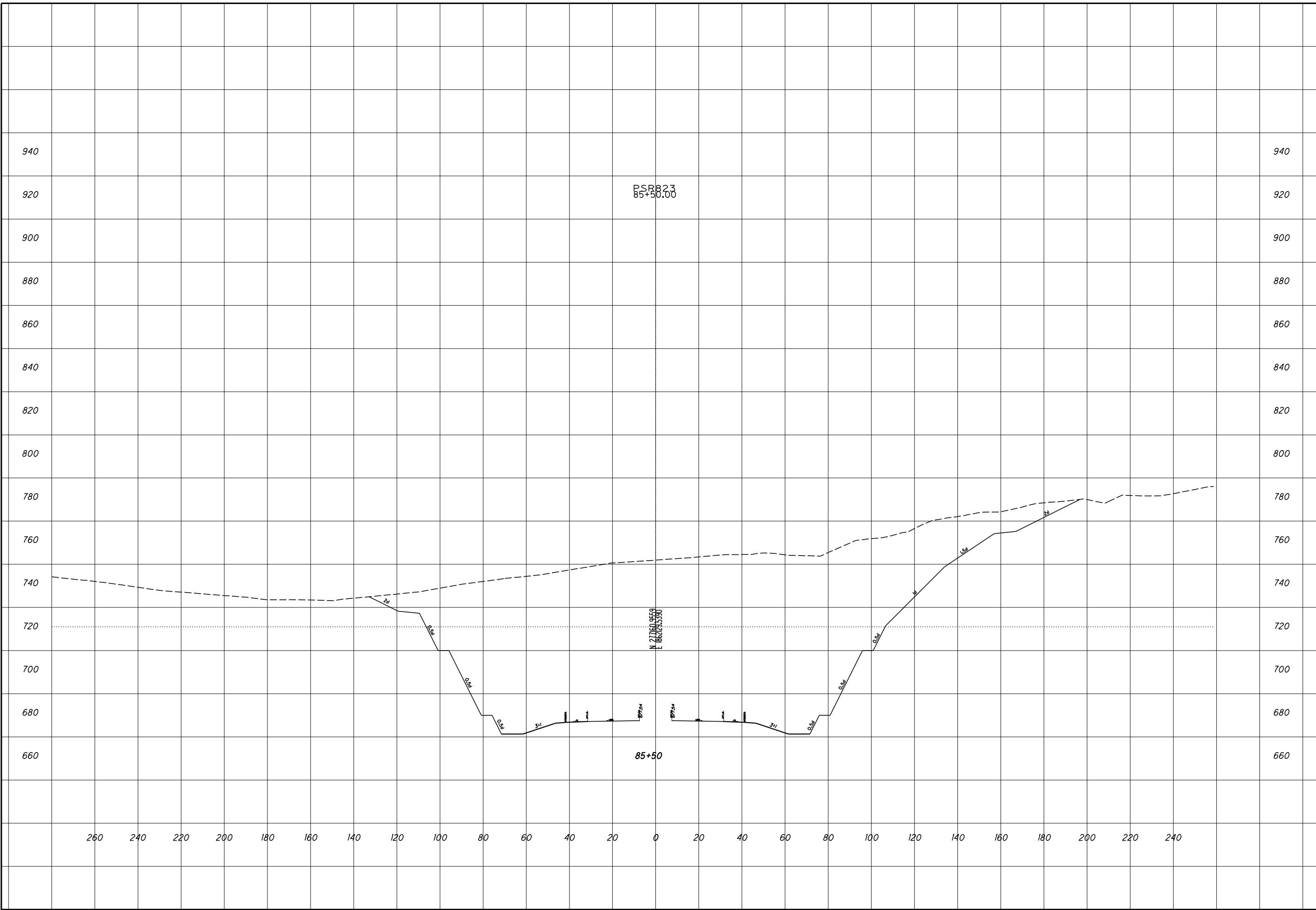
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STA 85+00

SCI-823-0.00



ROCK CUT SLOPE DESIGN - ROCK CUT 2
STA 85+50

SCI-823-0.00



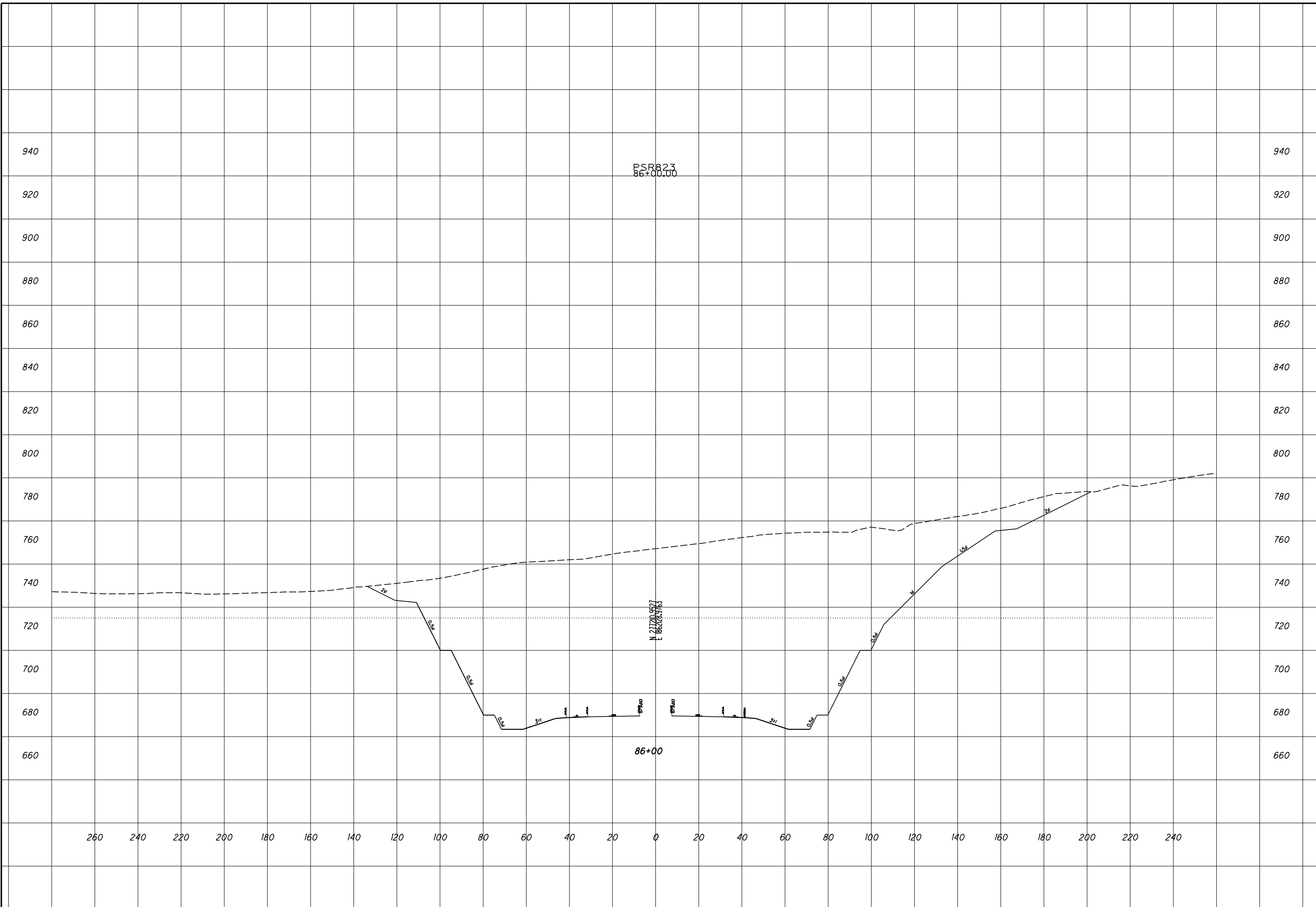
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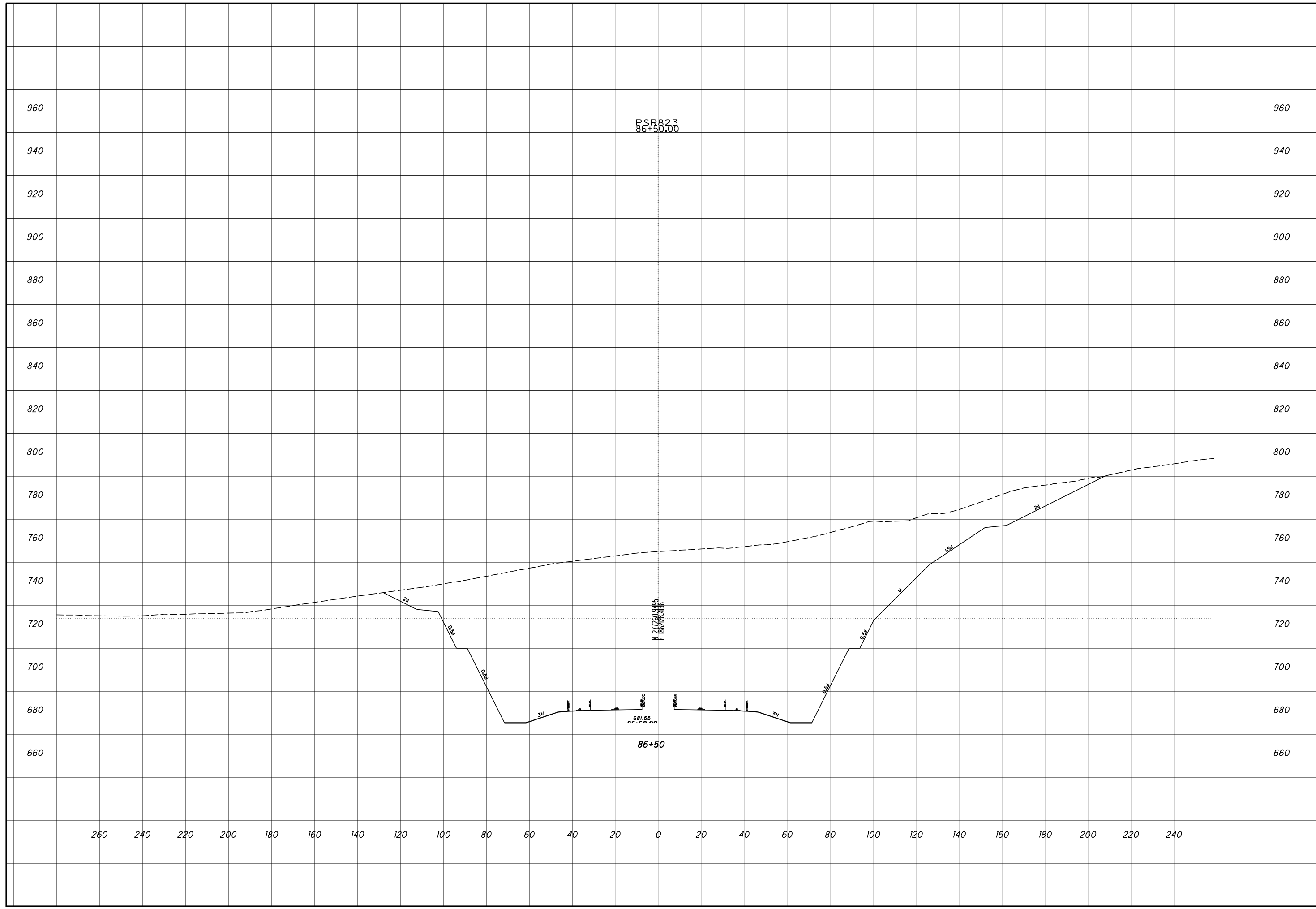
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SCI-823-0.00



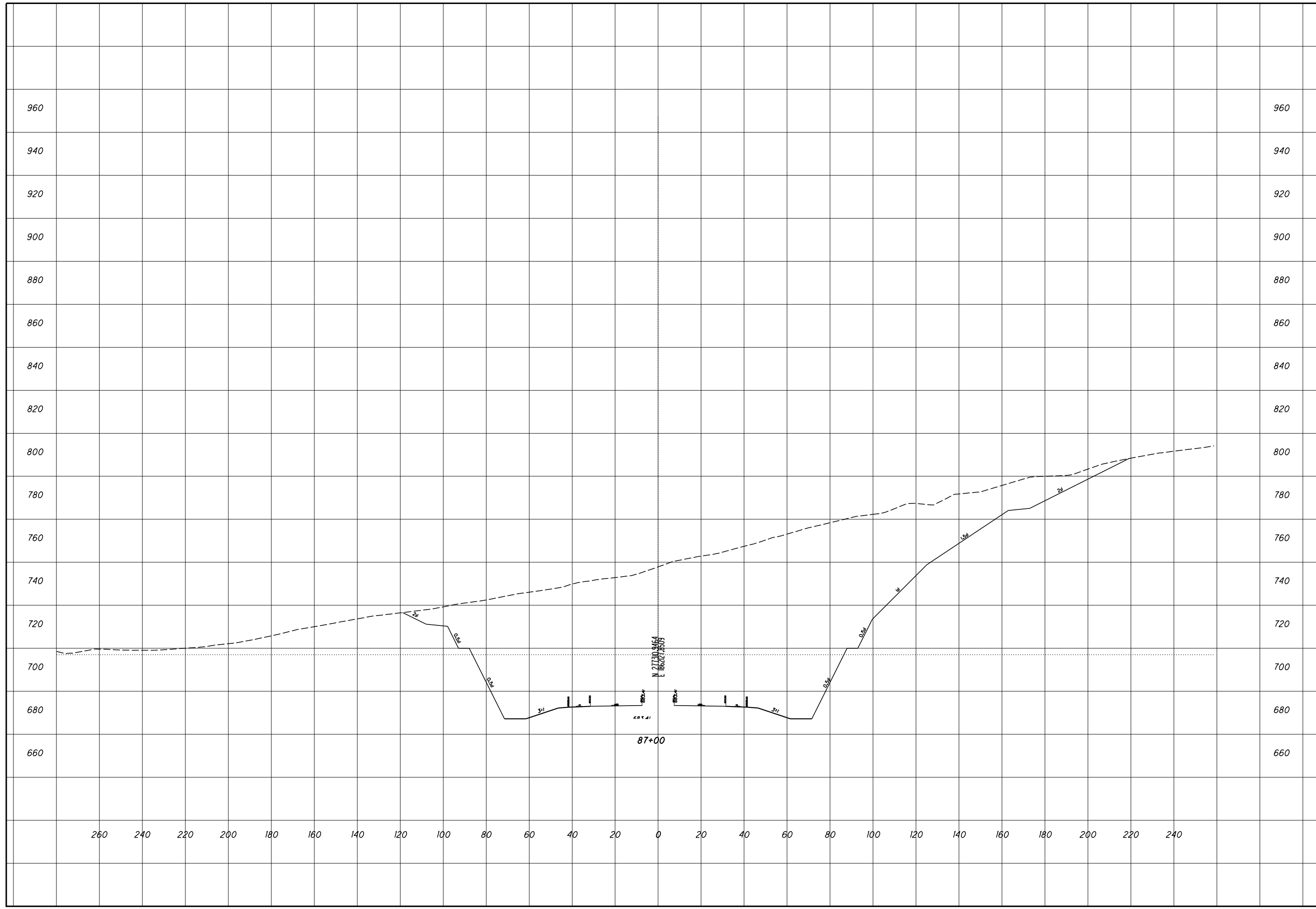
ROCK CUT SLOPE DESIGN - ROCK CUT 2
STA 86+50

SCI-823-0.00



ROCK CUT SLOPE DESIGN - ROCK CUT 2
STA 87+00

SCI-823-0.00



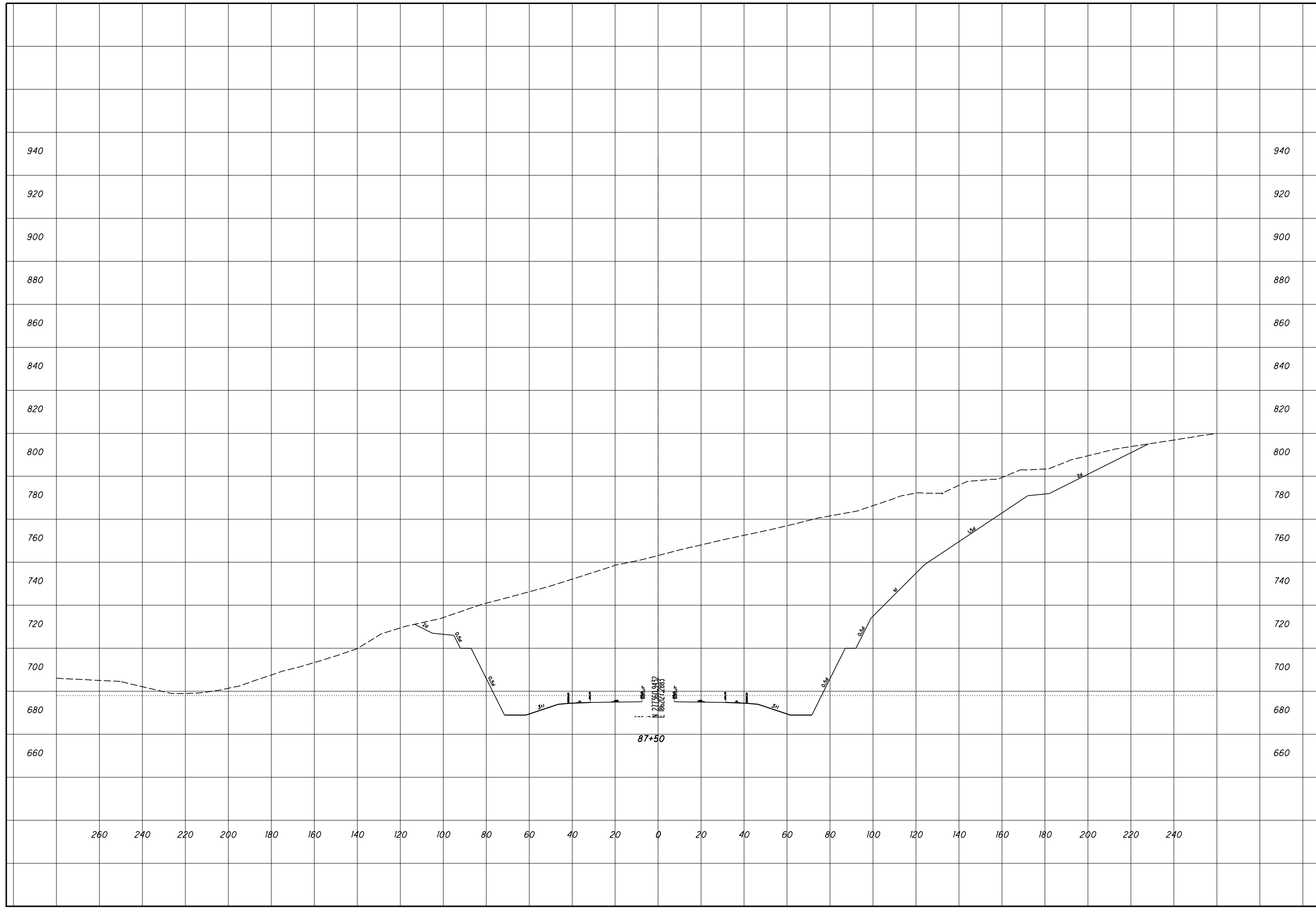
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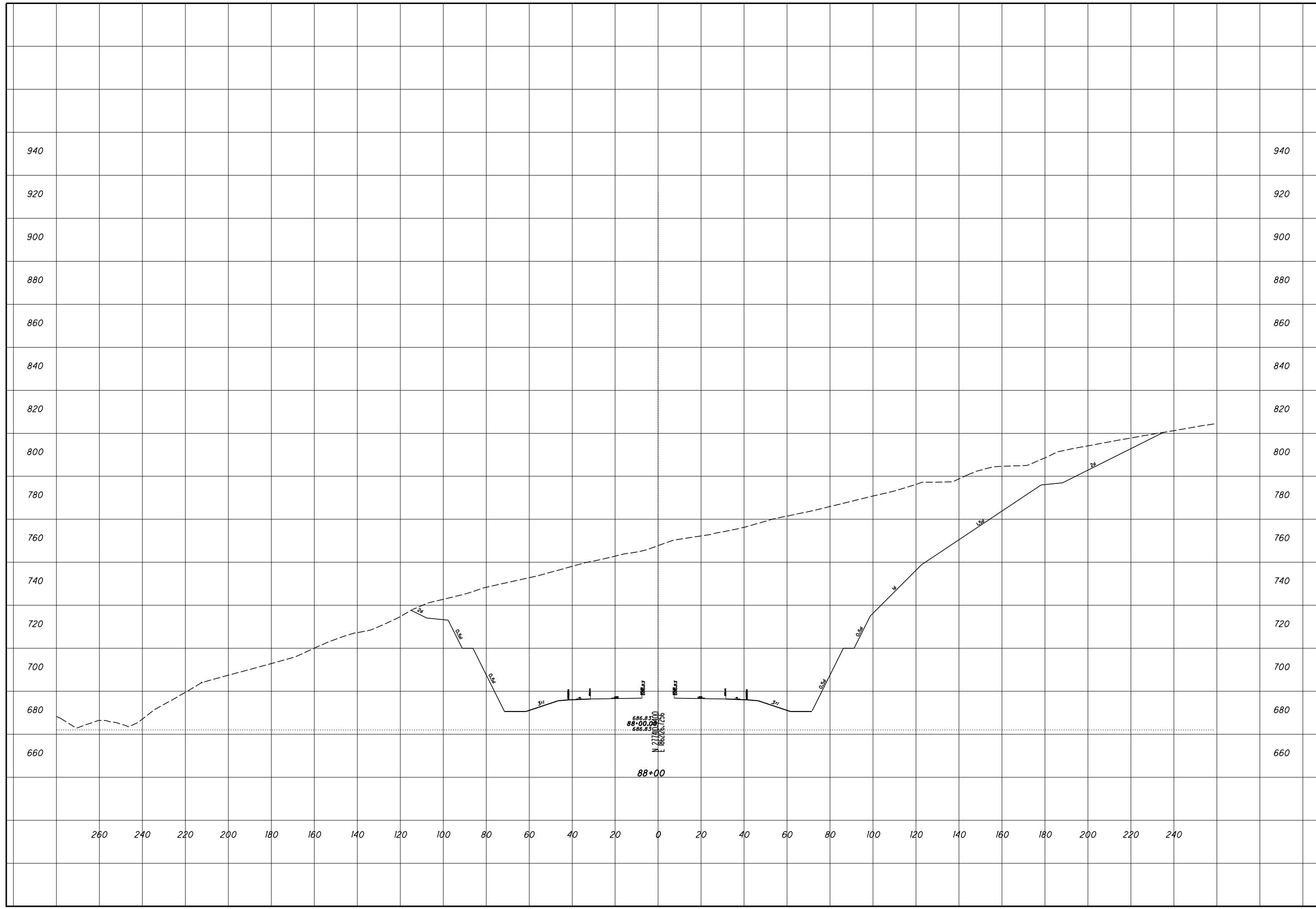
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STA 87+50**

SCI-823-0.00



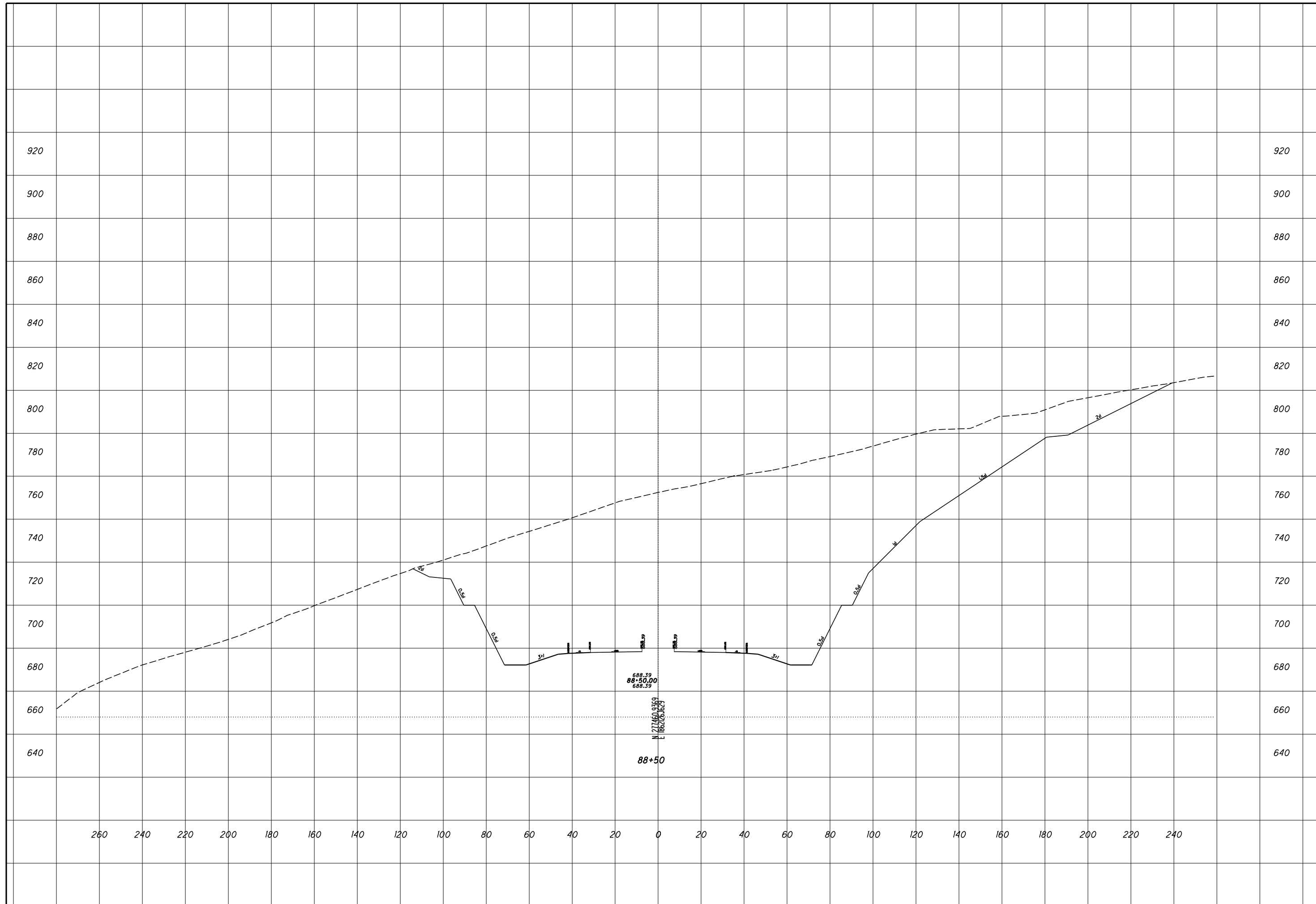
ROCK CUT SLOPE DESIGN - ROCK CUT 2
STA 88+00

SCI-823-0.00



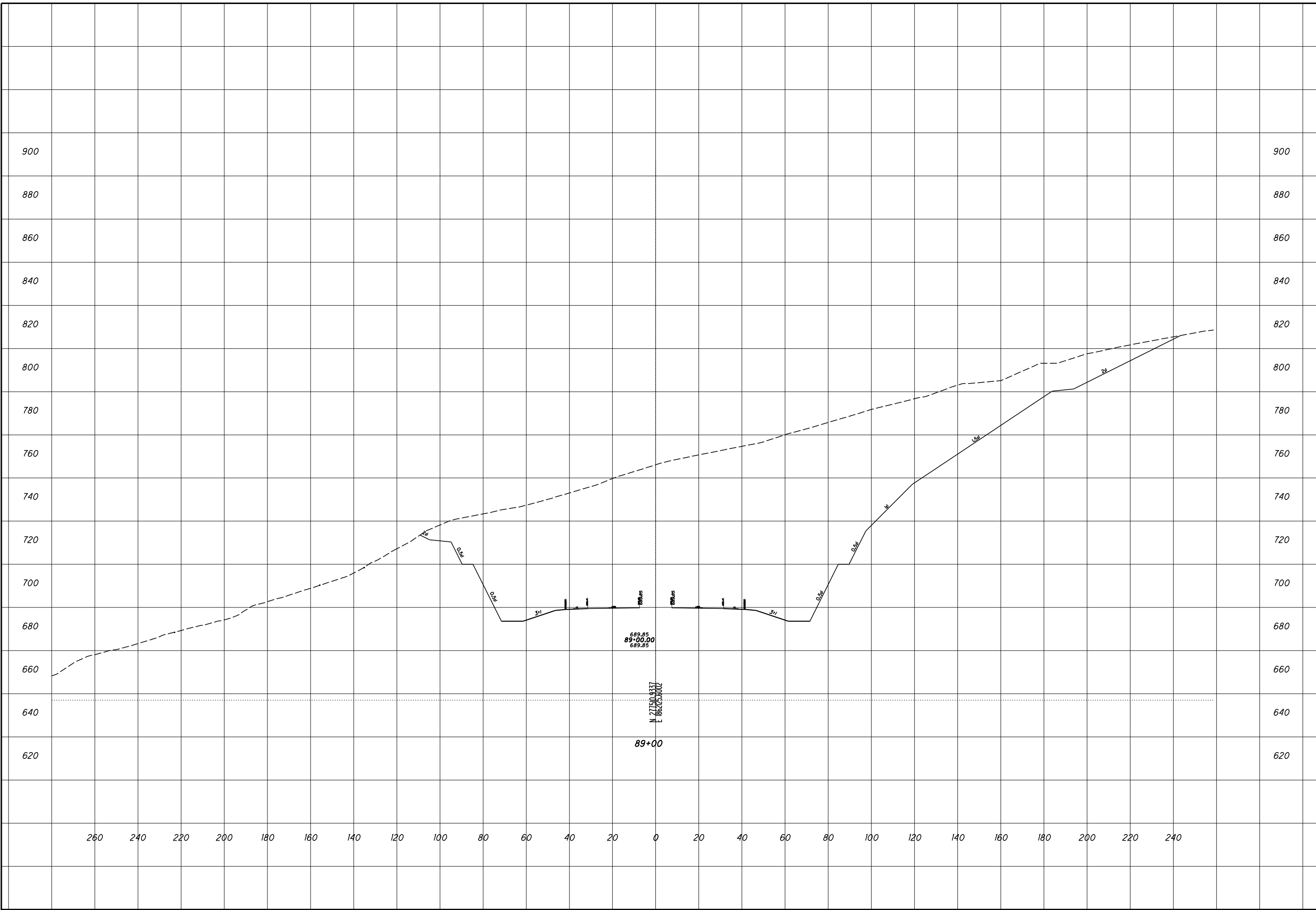
ROCK CUT SLOPE DESIGN - ROCK CUT 2
STA 88+50

SCI-823-0.00



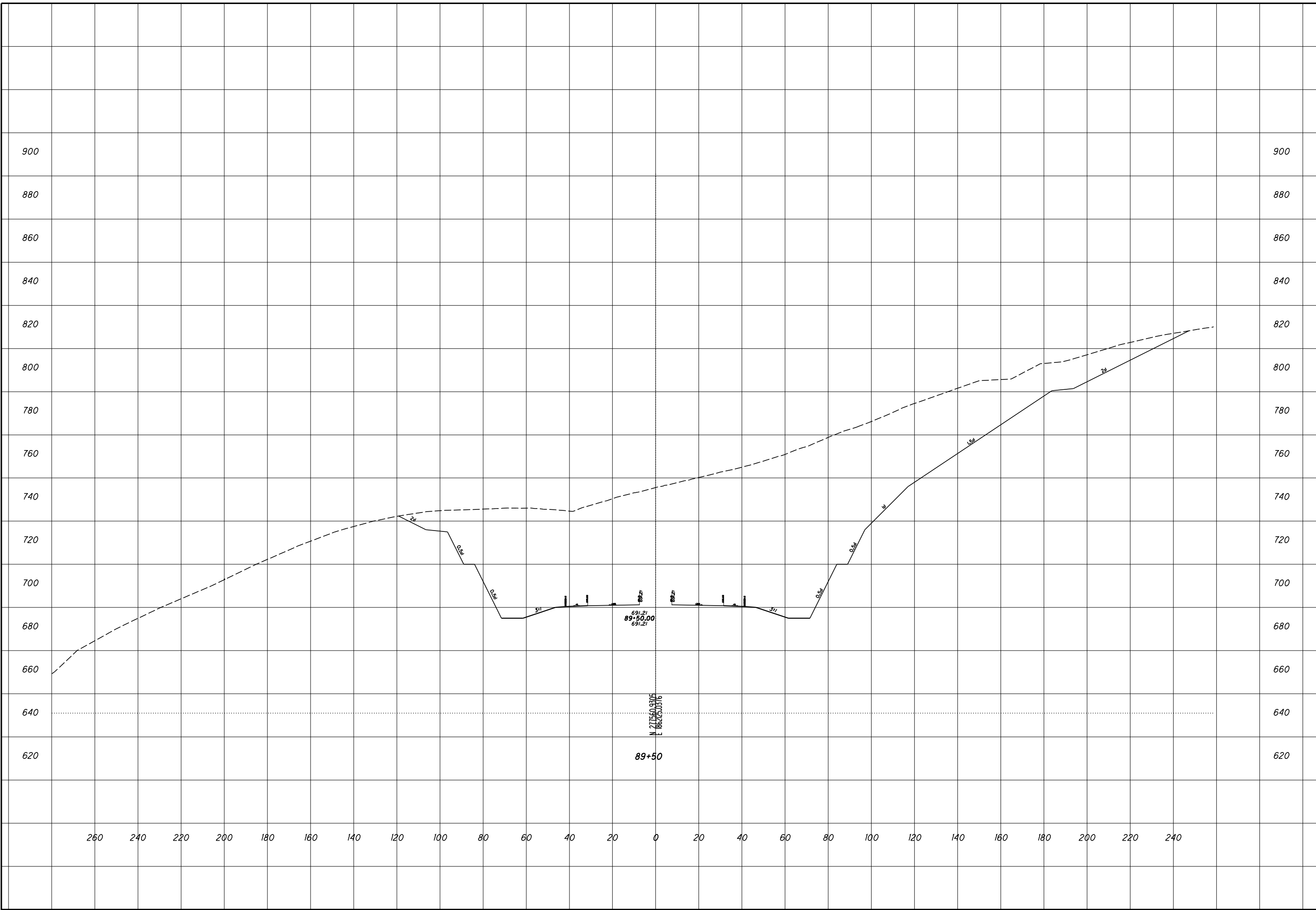
ROCK CUT SLOPE DESIGN - ROCK CUT 2
STA 89+00

SCI-823-0.00



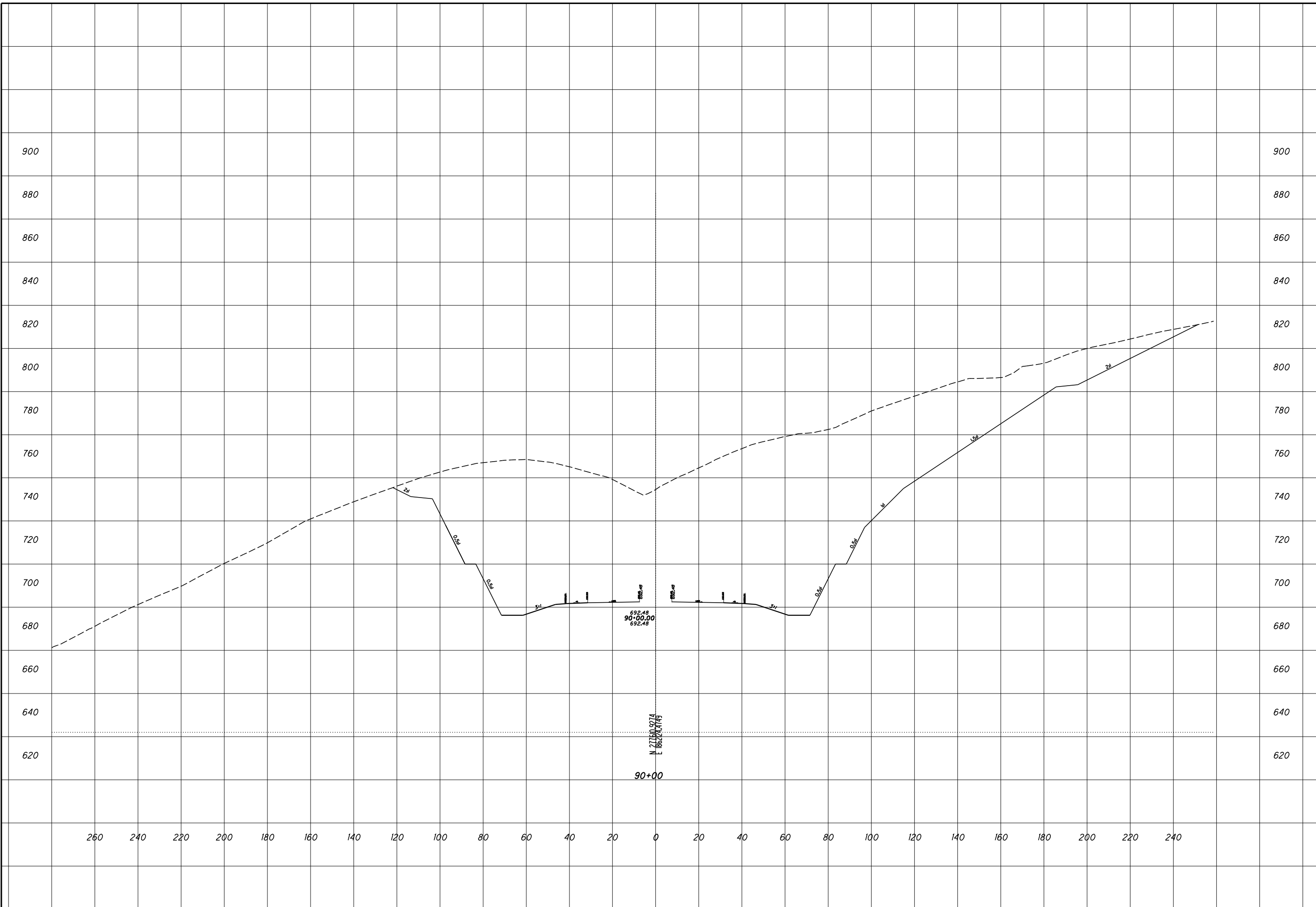
ROCK CUT SLOPE DESIGN - ROCK CUT 2
STA 89+50

SCI-823-0.00



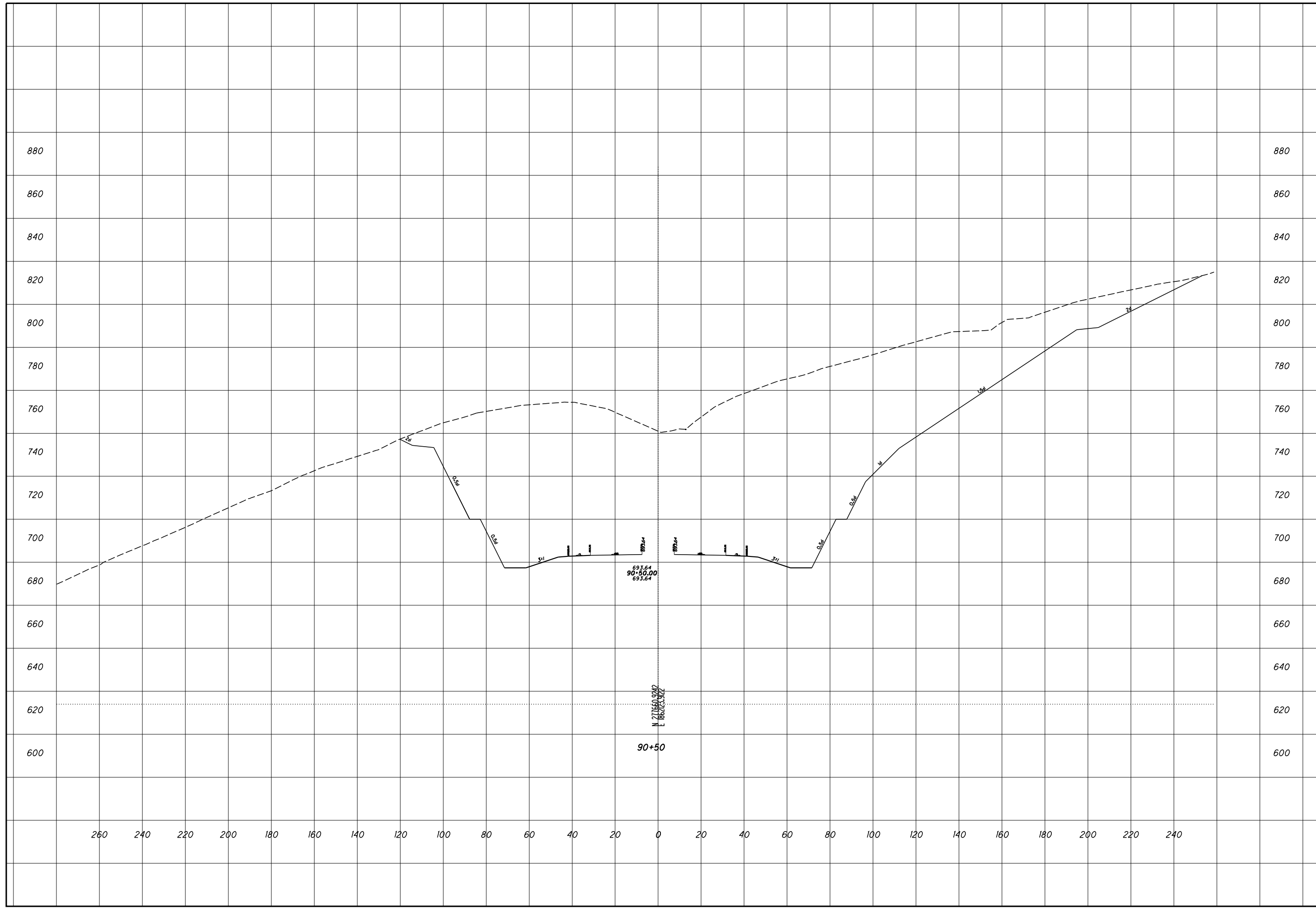
ROCK CUT SLOPE DESIGN - ROCK CUT 2
STA 90+00

SCI-823-0.00



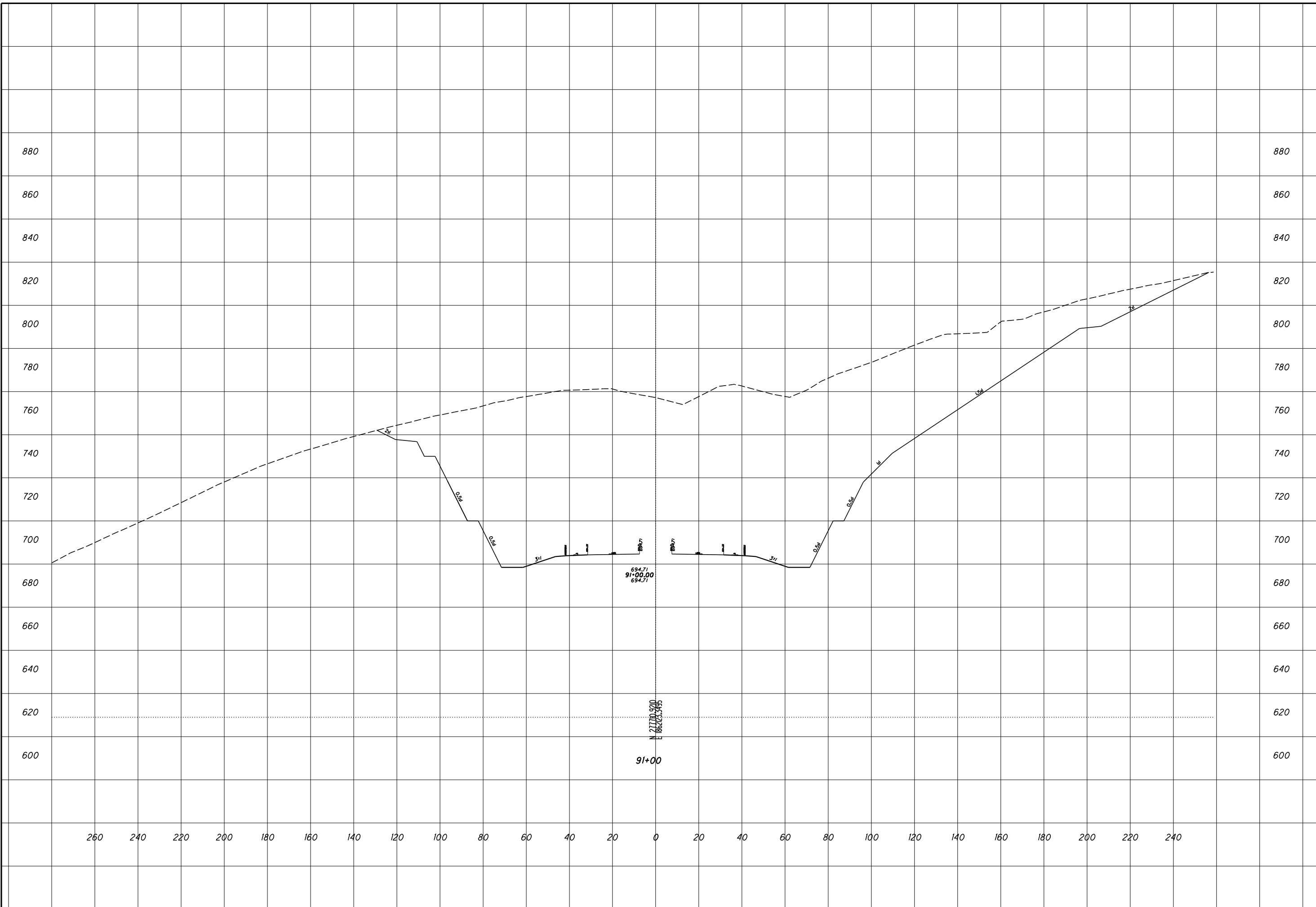
ROCK CUT SLOPE DESIGN - ROCK CUT 2
STA 90+50

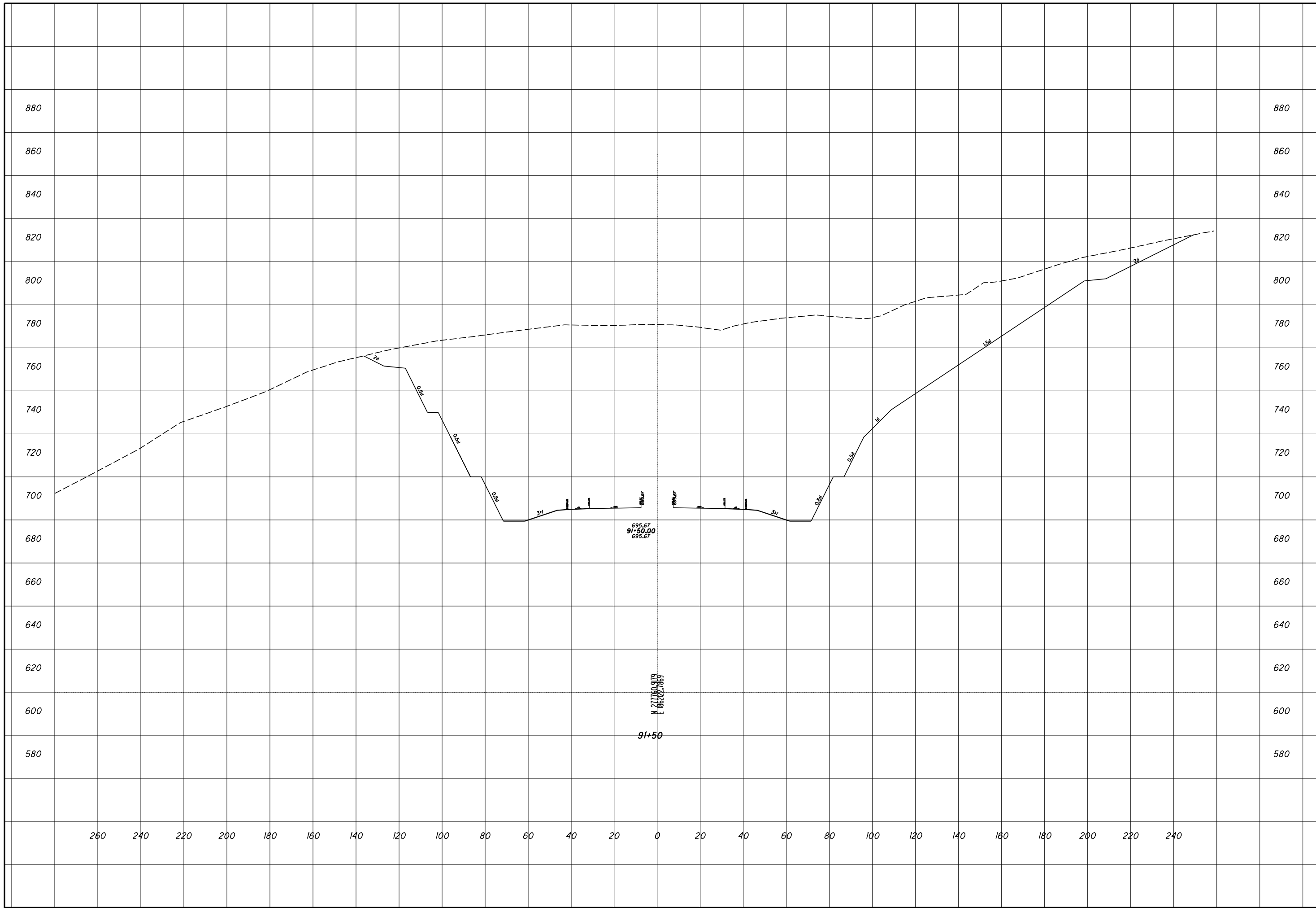
SCI-823-0.00



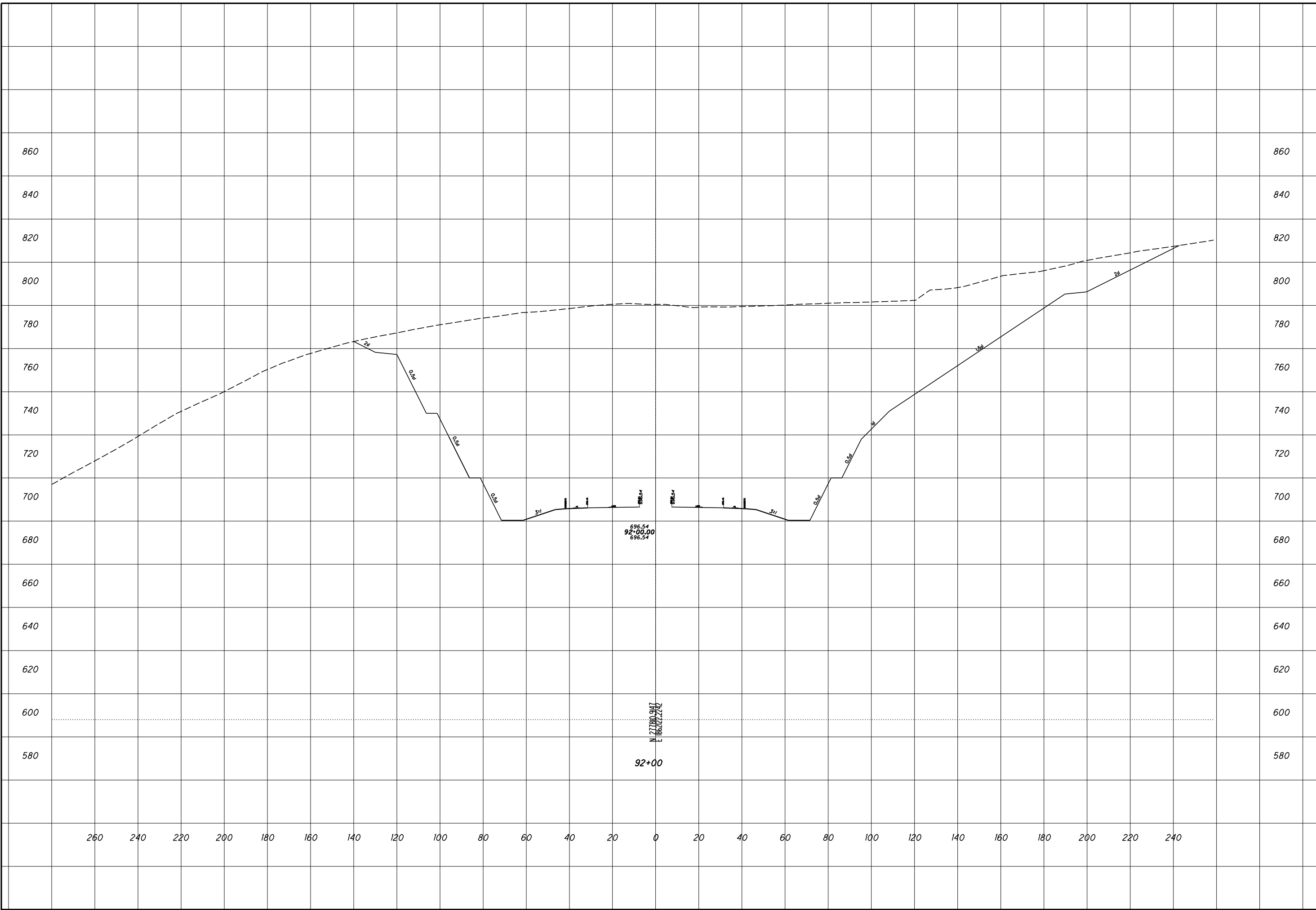
ROCK CUT SLOPE DESIGN - ROCK CUT 2
STA 91+00

SCI-823-0.00





CHECKED
ROCK CUT SLOPE DESIGN - ROCK CUT 2
STA 91+50
SCI-823-0.00
 28
 57



ROCK CUT SLOPE DESIGN - ROCK CUT 2
 STA 92+00

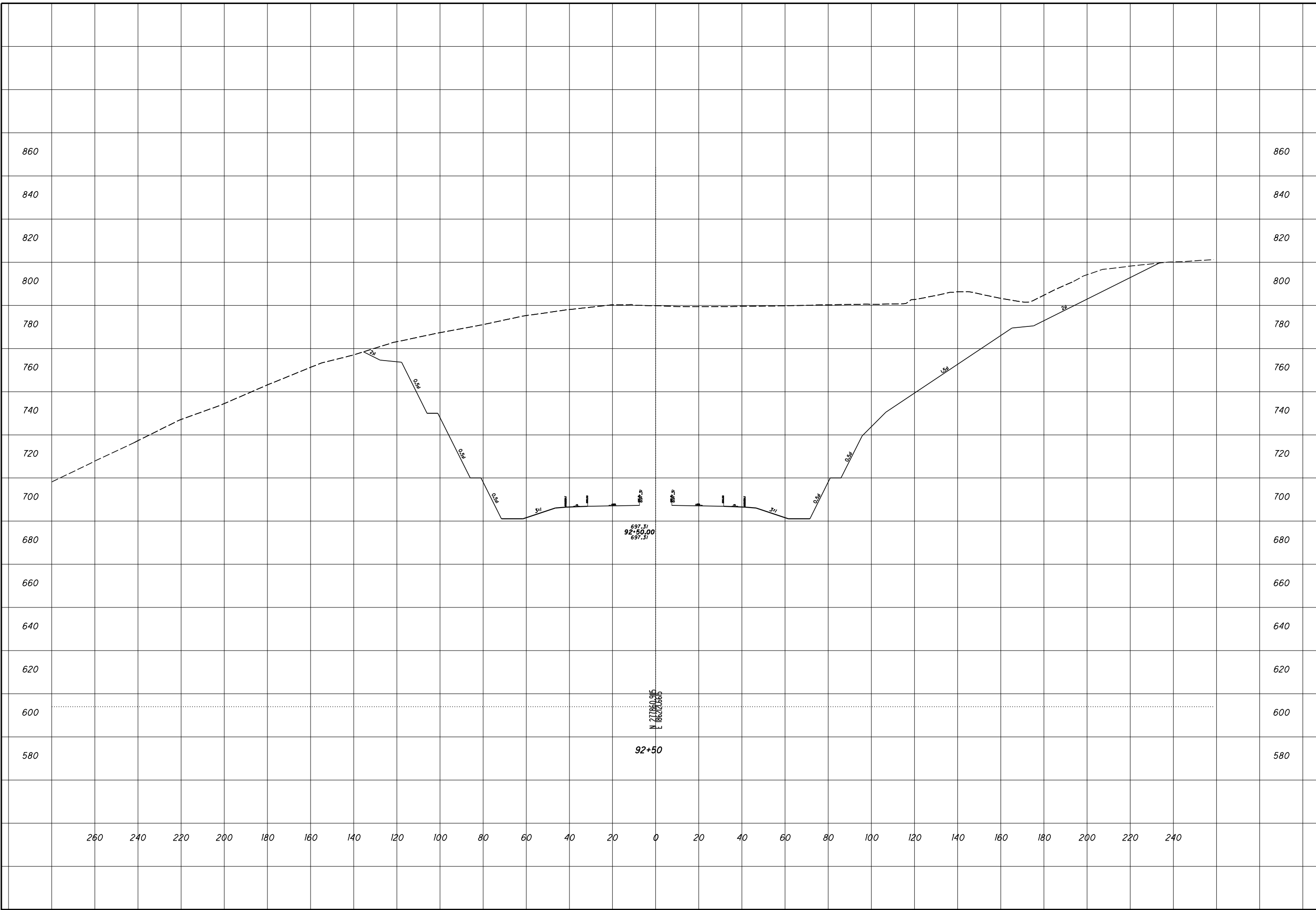
SCI-823-0.00

29
 57

CHECKED

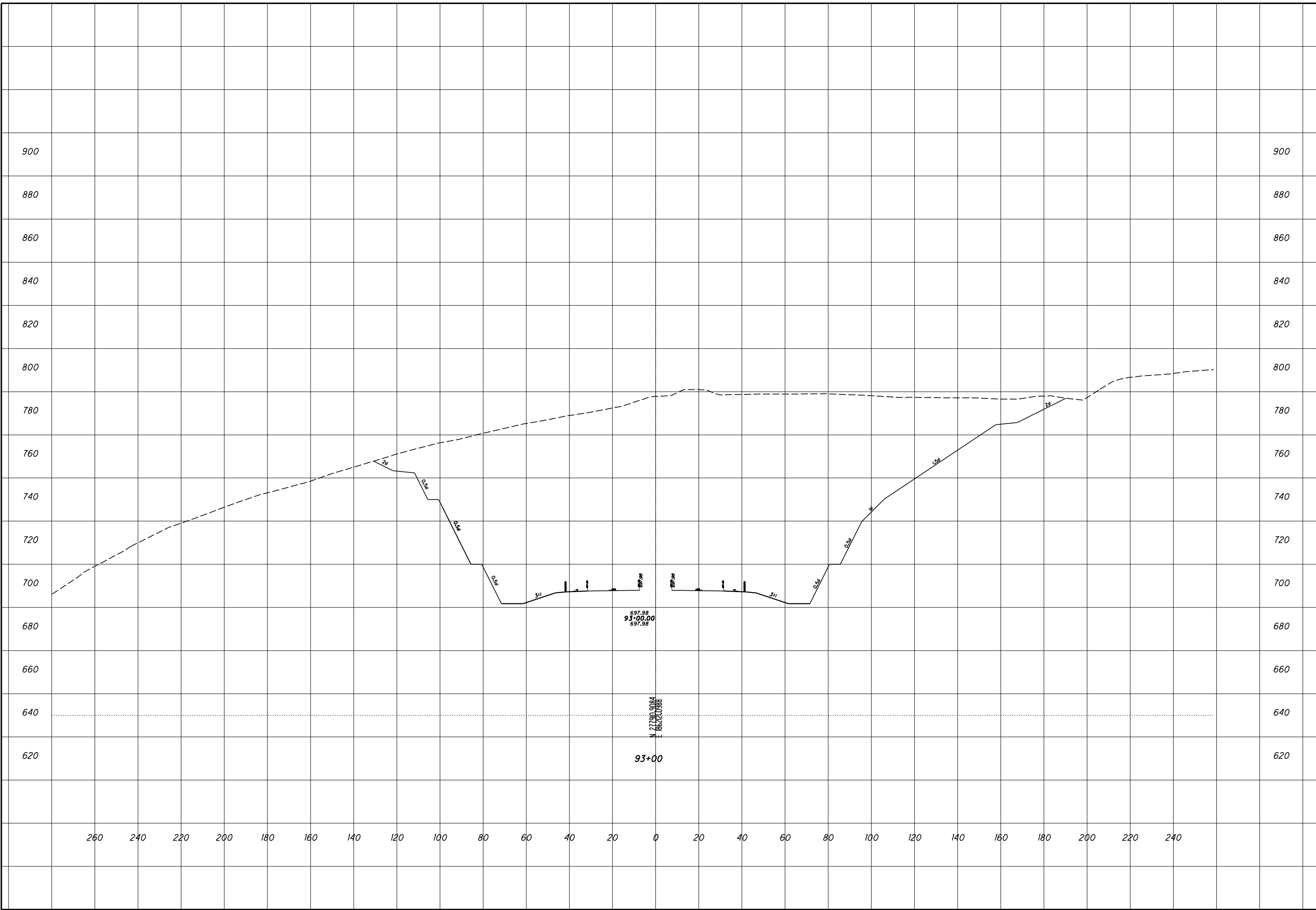
ROCK CUT SLOPE DESIGN - ROCK CUT 2
STA 92+50

SCI-823-0.00



ROCK CUT SLOPE DESIGN - ROCK CUT 2
STA 93+00

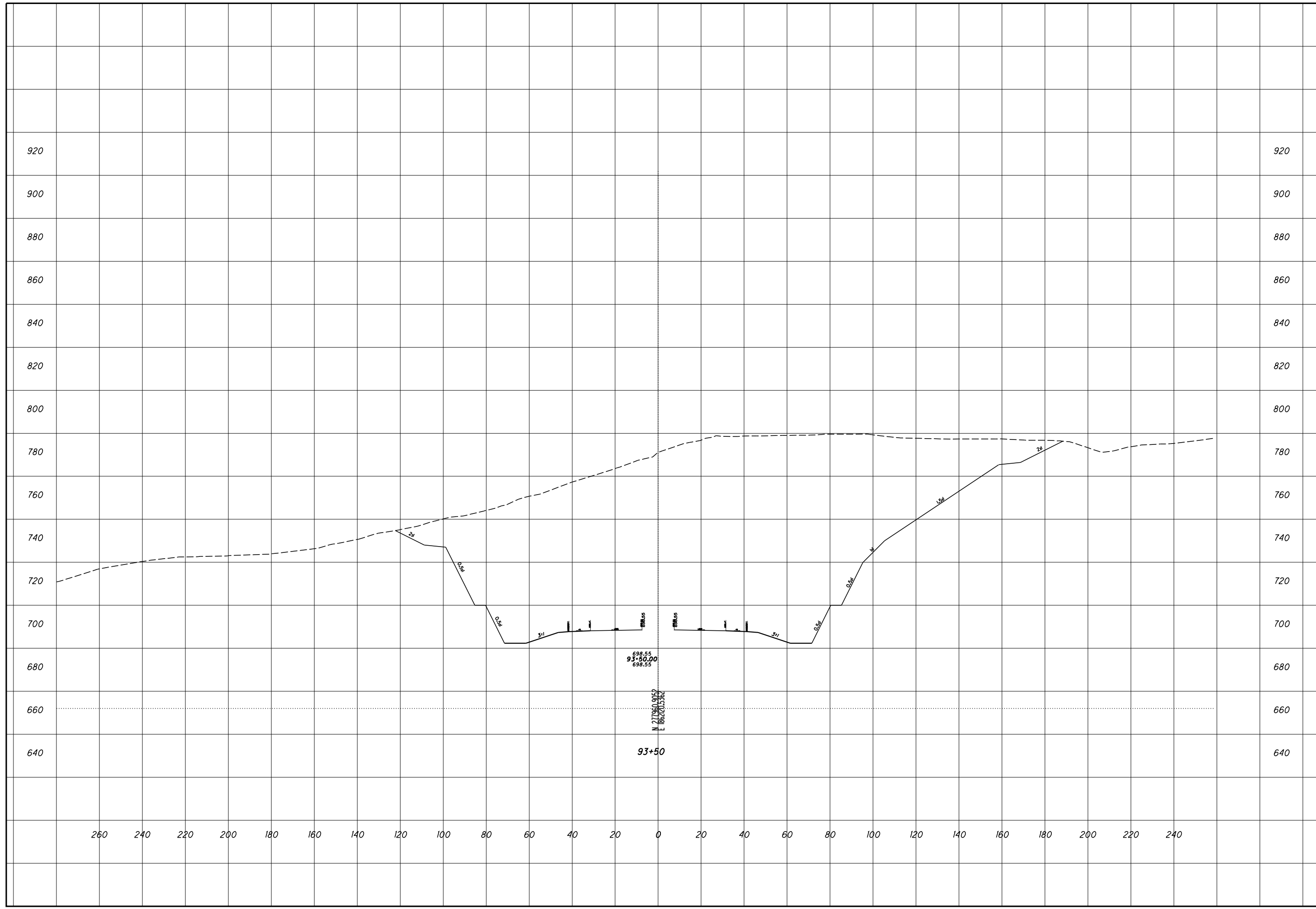
SCI-823-0.00



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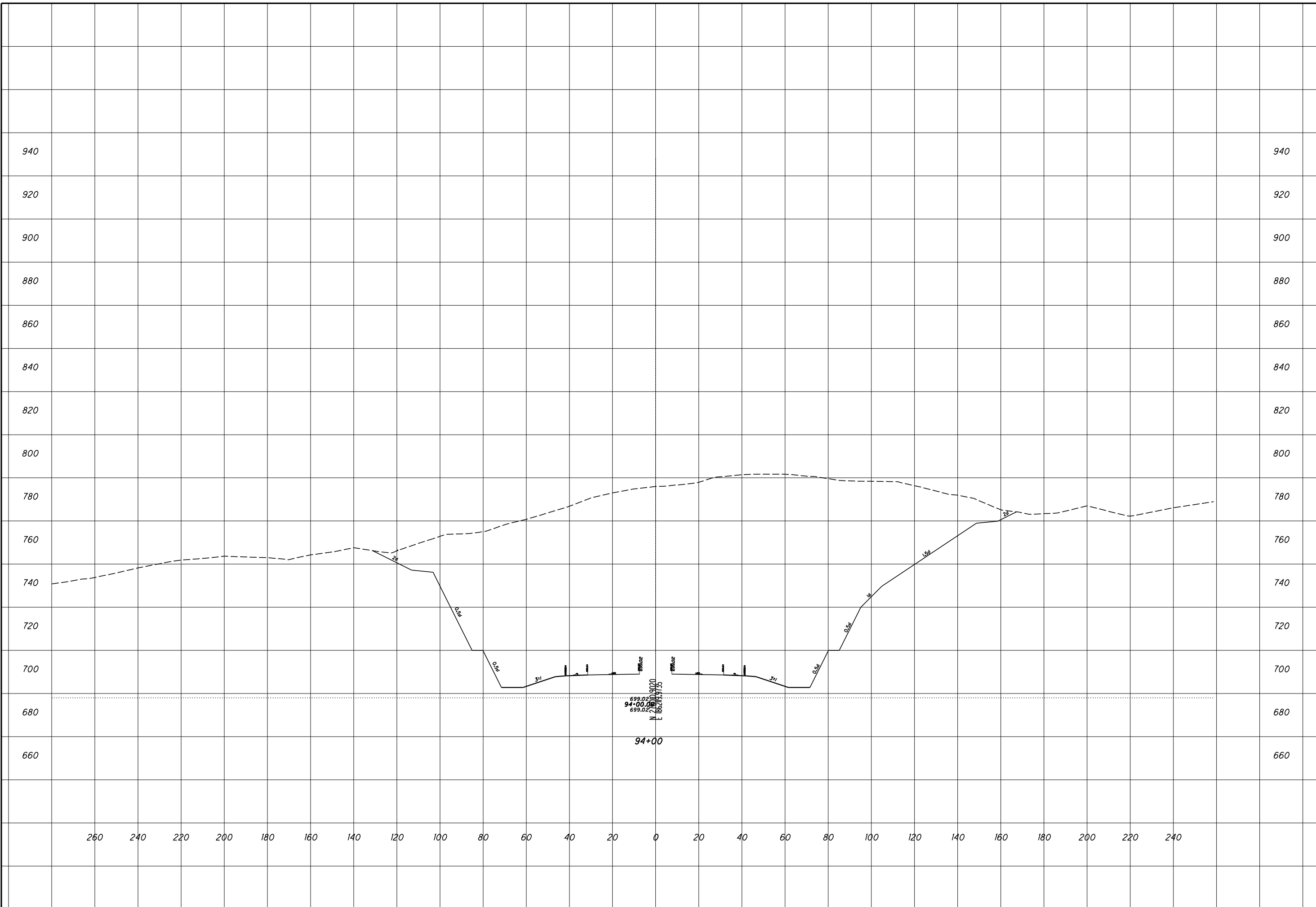
**ROCK CUT SLOPE DESIGN - ROCK CUT 2
STA 93+50**

SCI-823-0.00



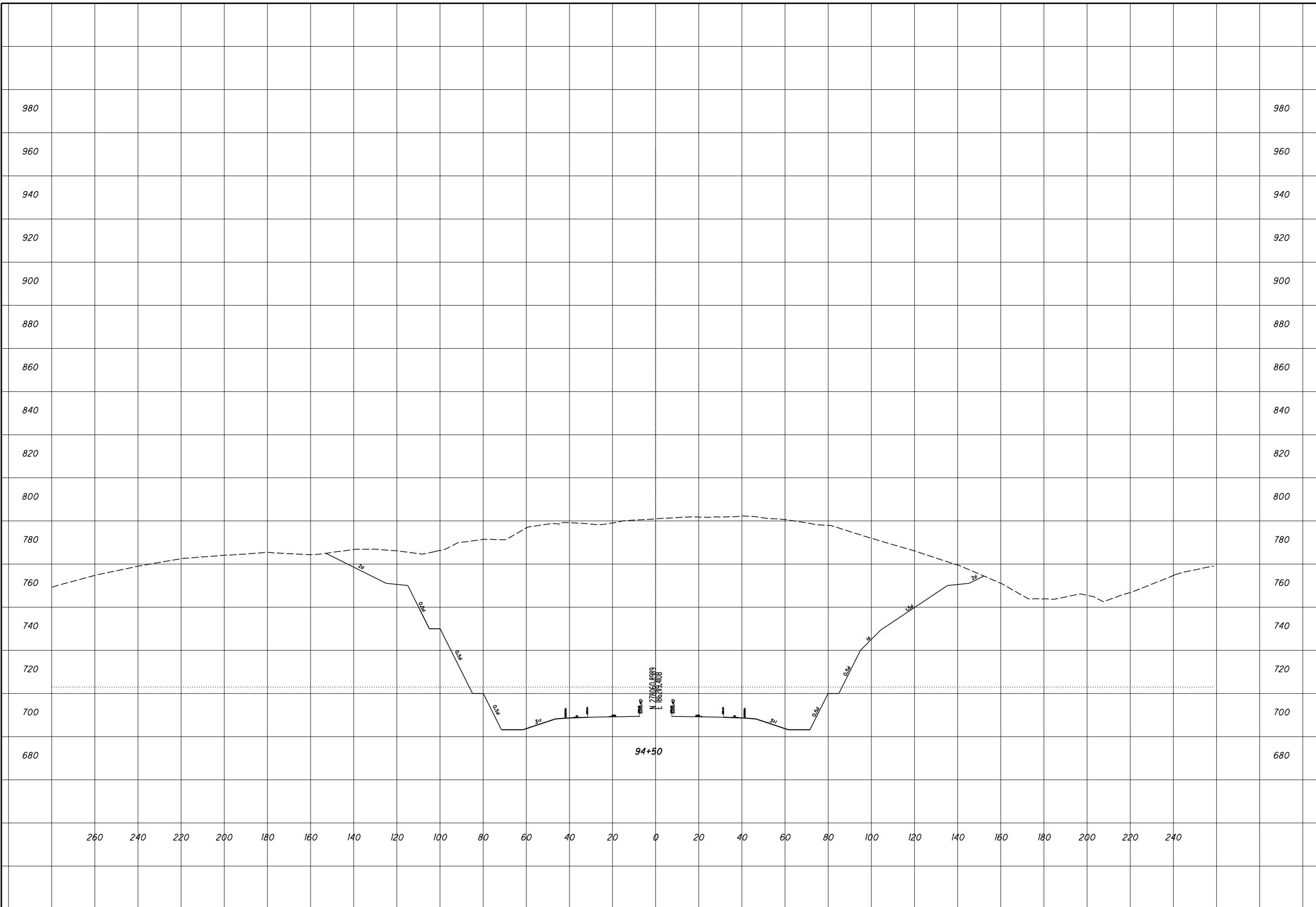
ROCK CUT SLOPE DESIGN - ROCK CUT 2
STA 94+00

SCI-823-0.00



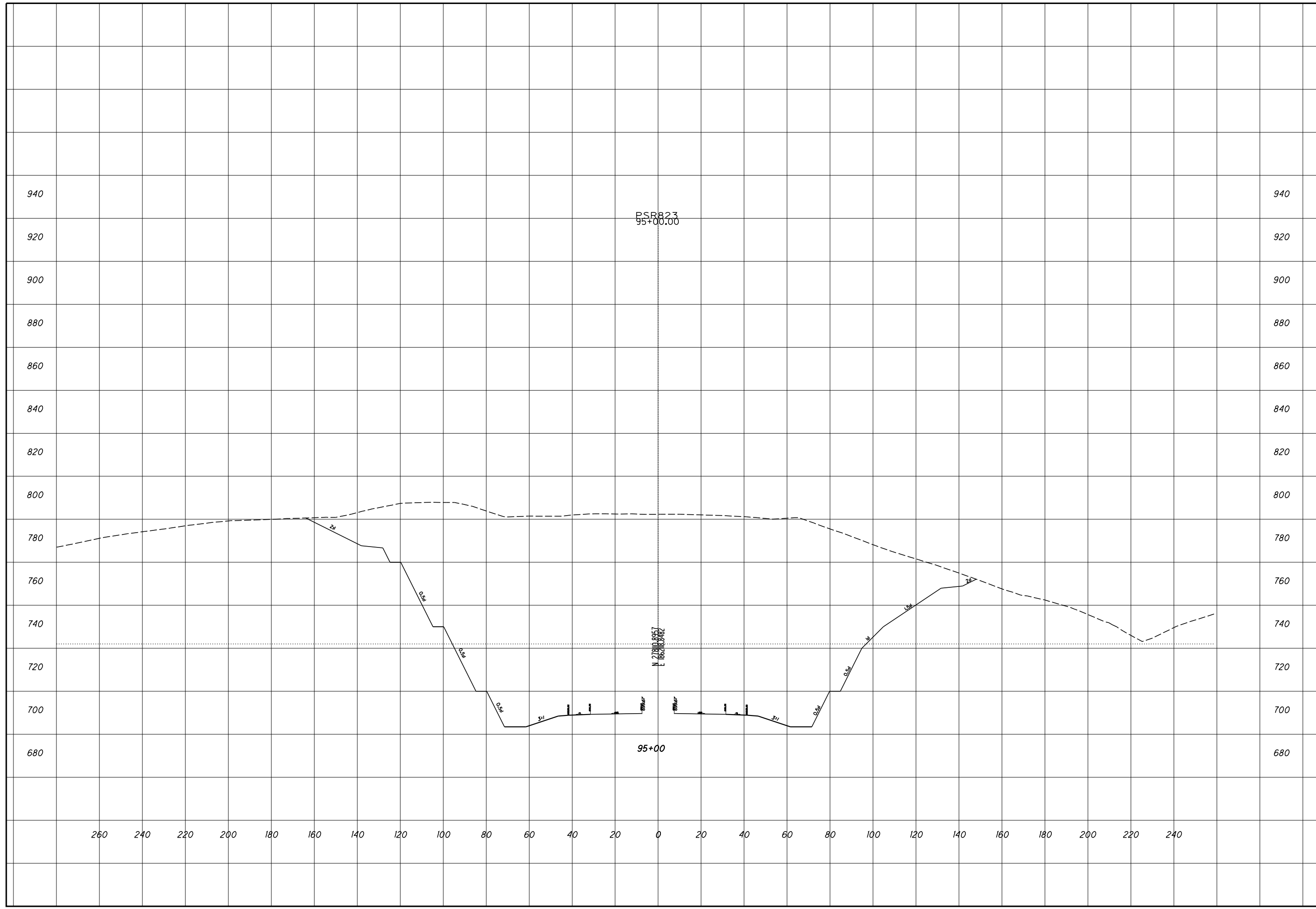
ROCK CUT SLOPE DESIGN - ROCK CUT 2
STA 94+50

SCI-823-0.00



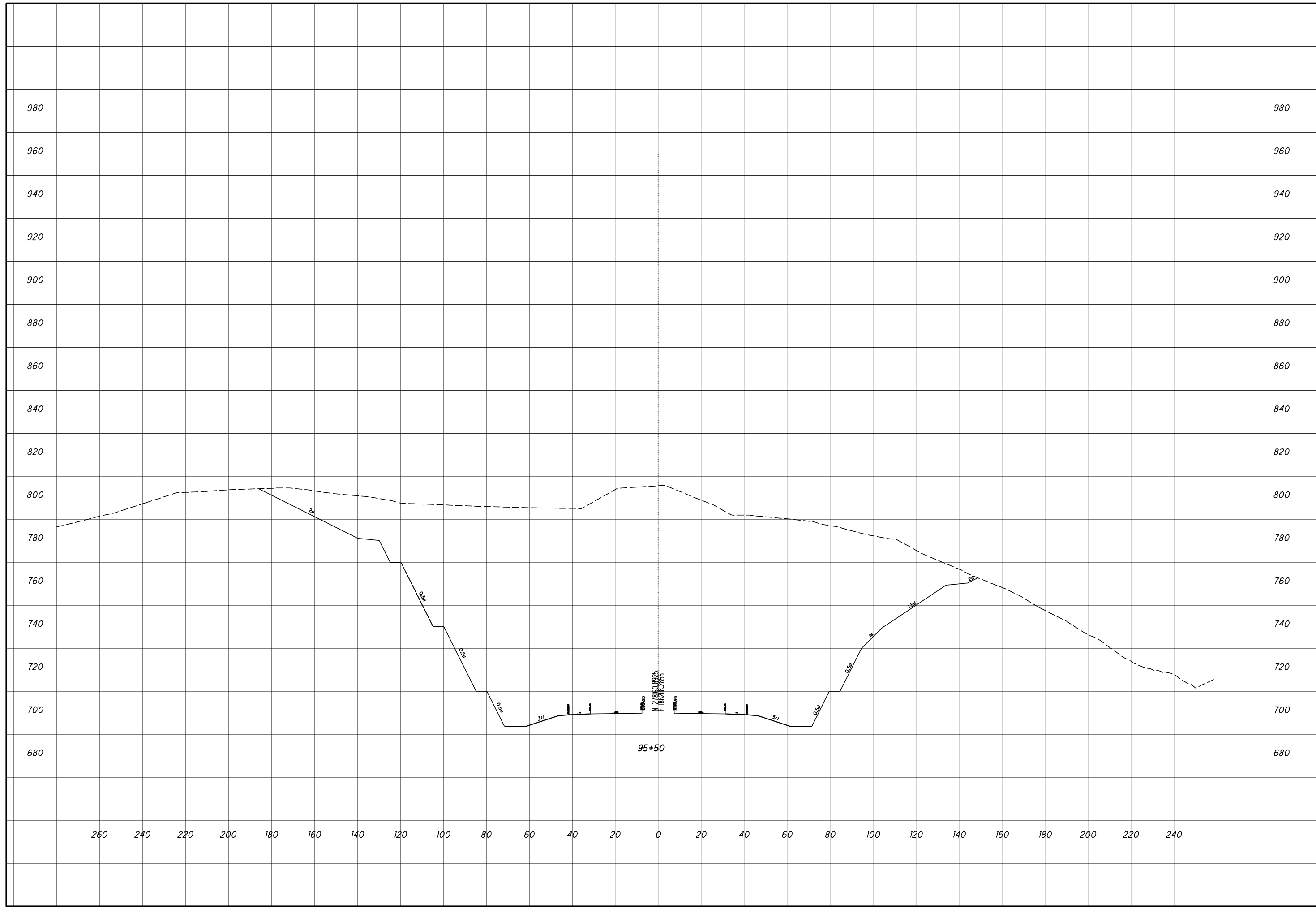
ROCK CUT SLOPE DESIGN - ROCK CUT 2
STA 95+00

SCI-823-0.00



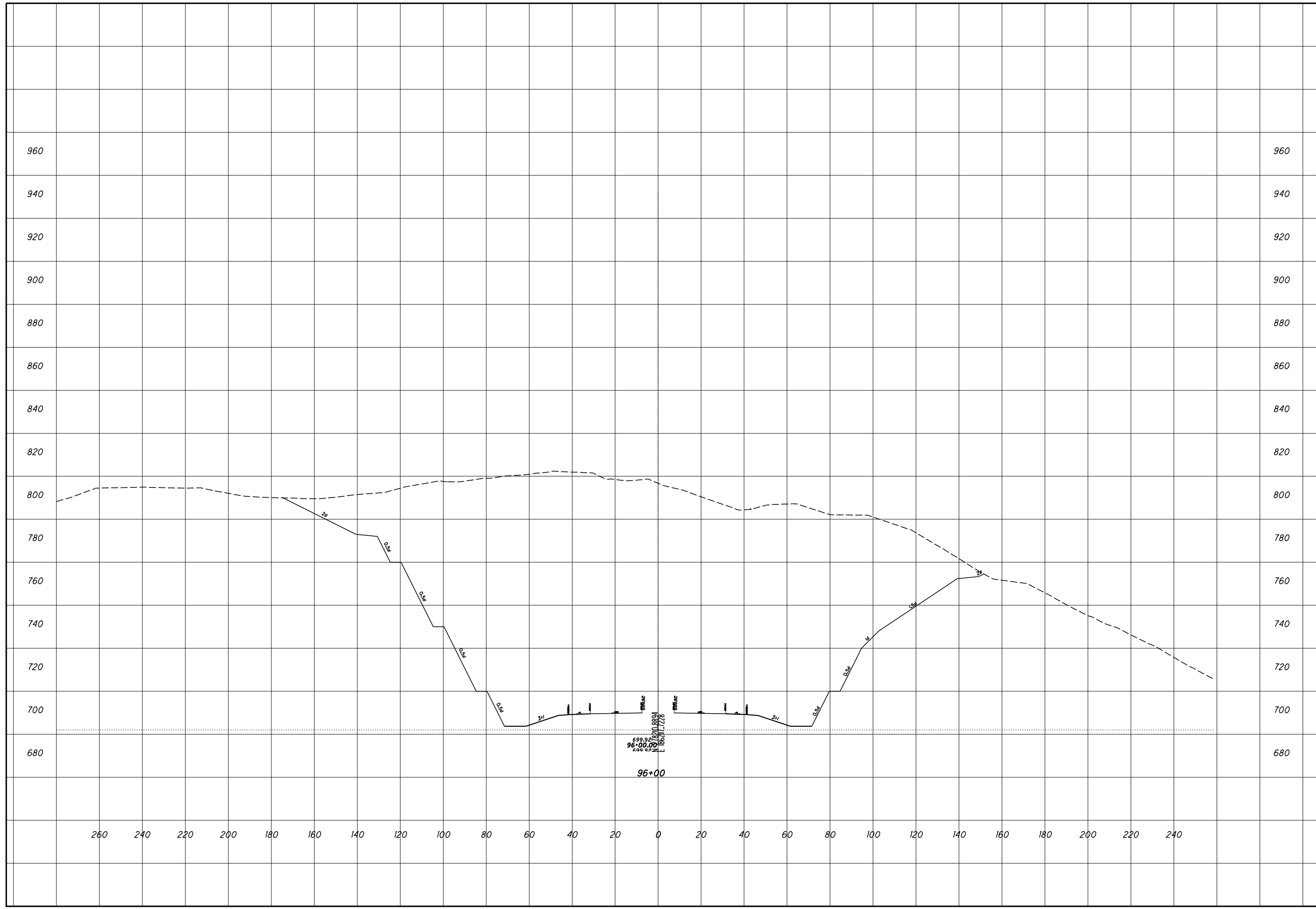
ROCK CUT SLOPE DESIGN - ROCK CUT 2
STA 95+50

SCI-823-0.00



ROCK CUT SLOPE DESIGN - ROCK CUT 2
STA 96+00

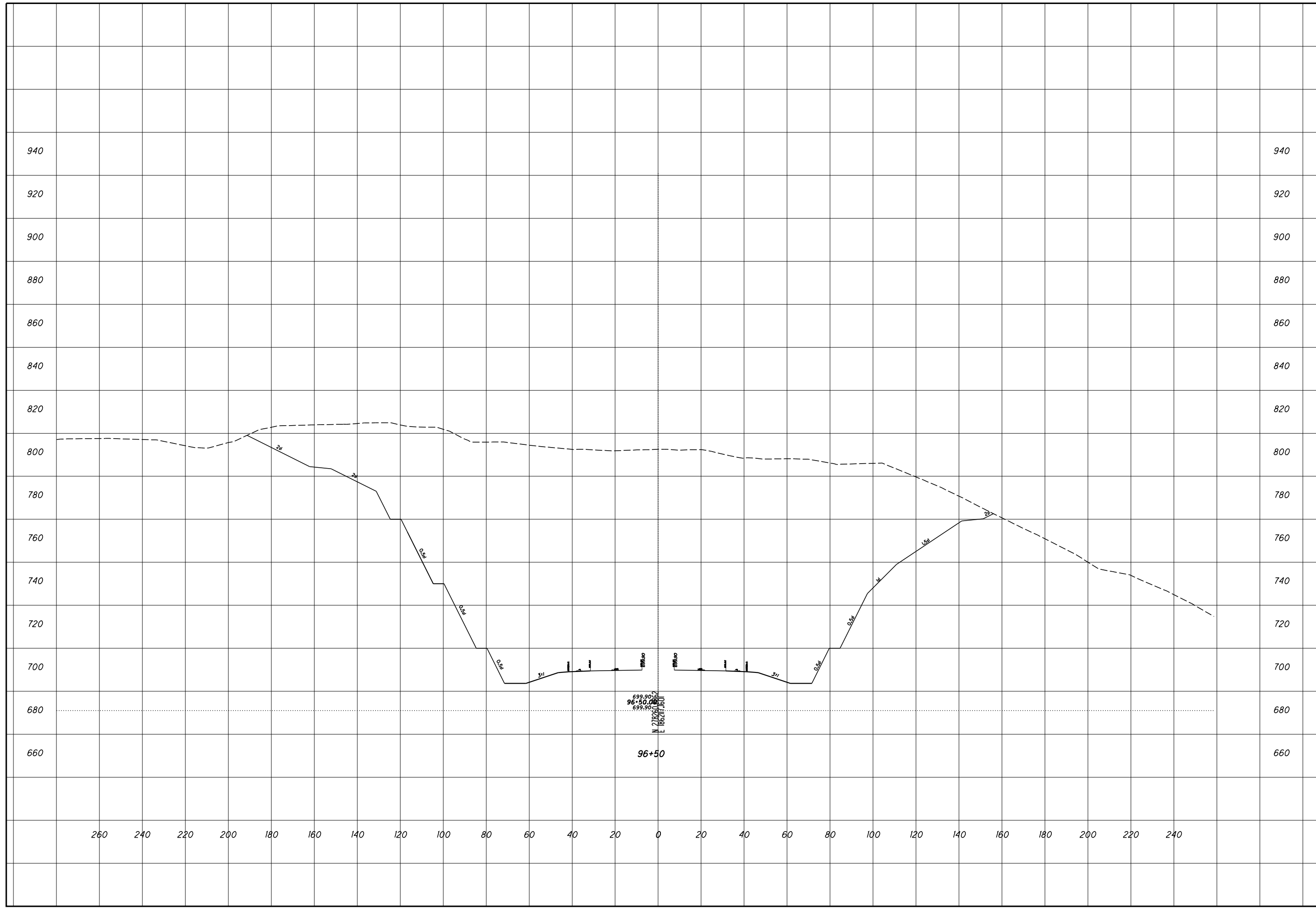
SCI-823-0.00



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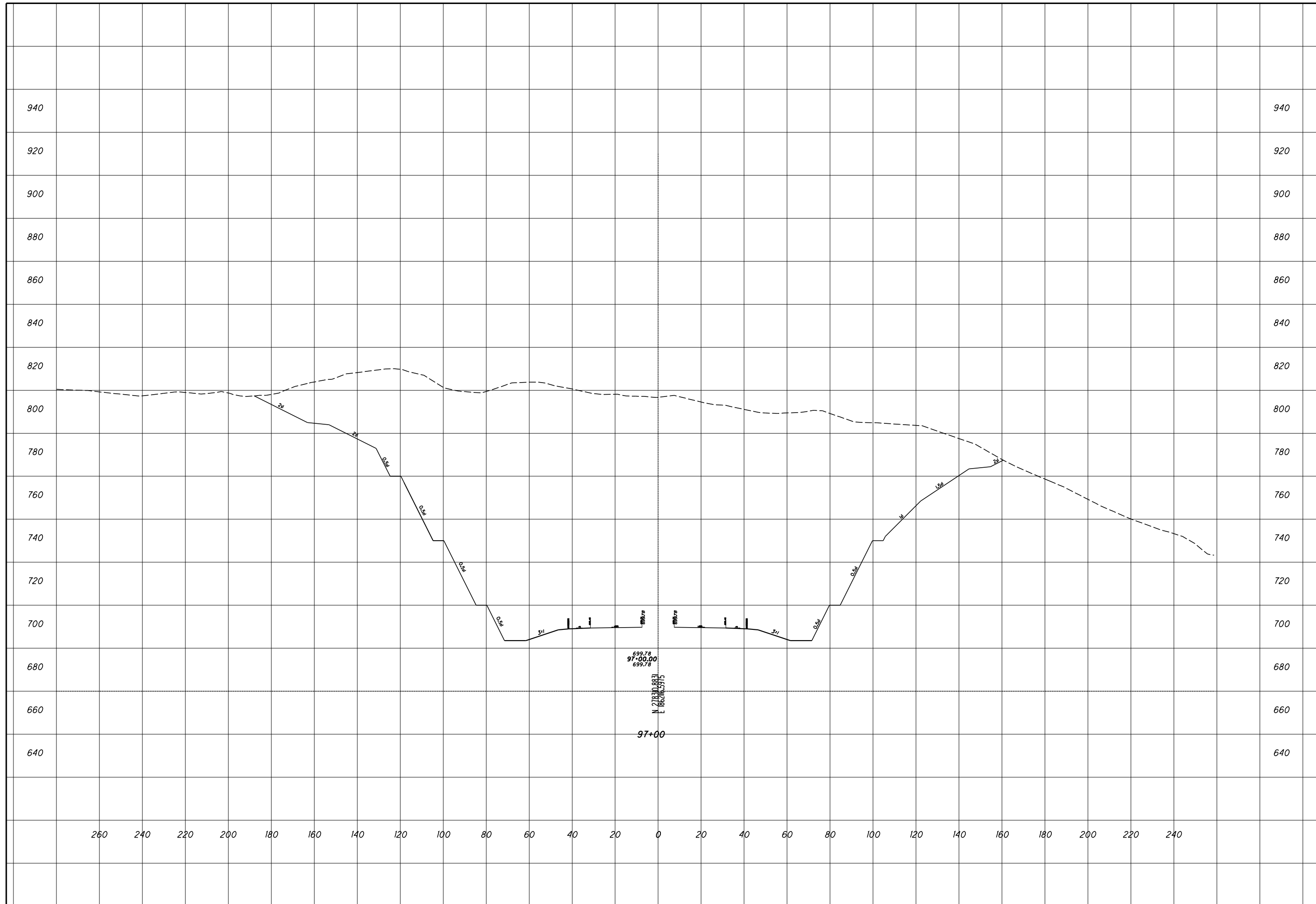
ROCK CUT SLOPE DESIGN - ROCK CUT 2
STA 96+50

SCI-823-0.00



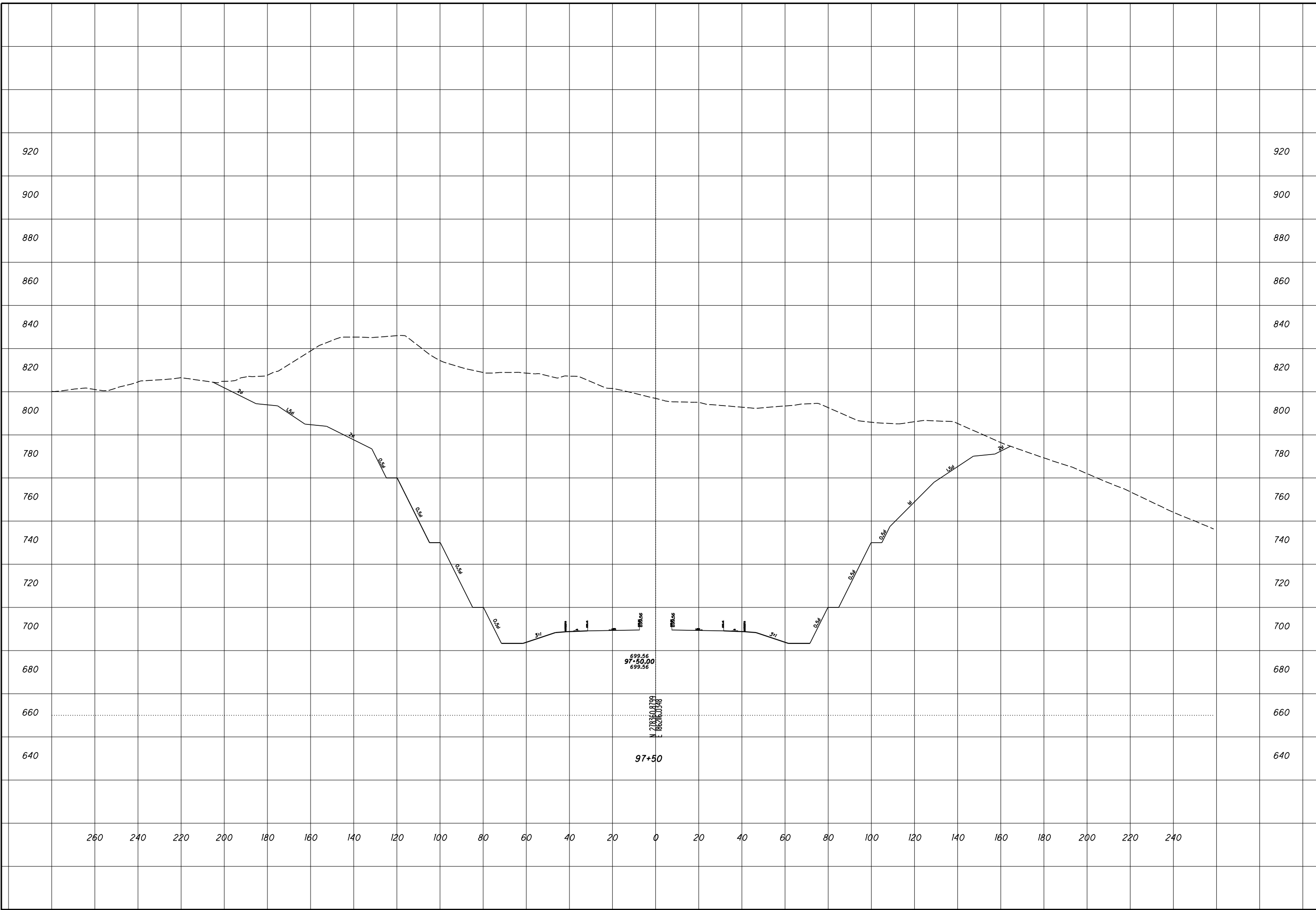
ROCK CUT SLOPE DESIGN - ROCK CUT 2
STA 97+00

SCI-823-0.00



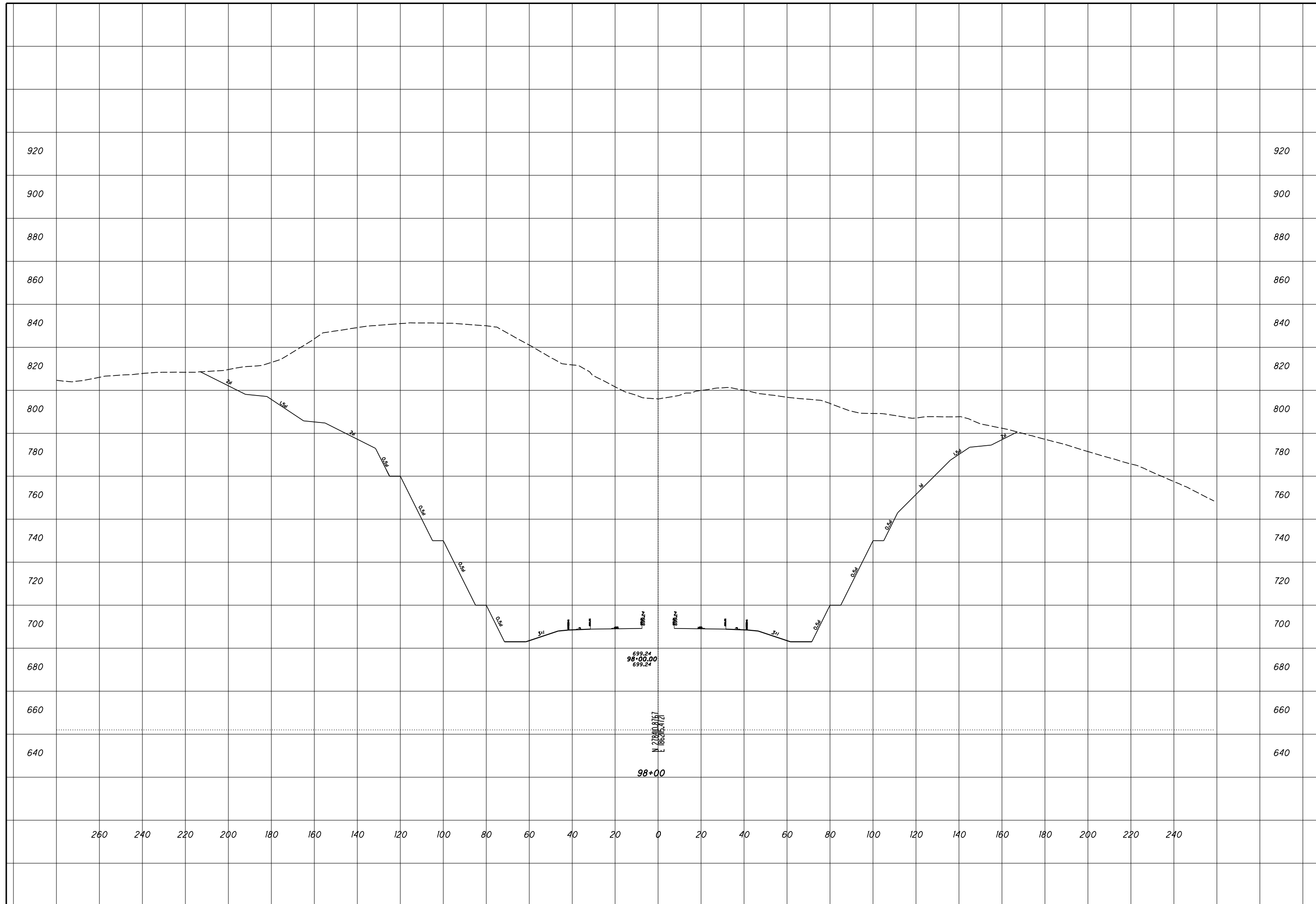
ROCK CUT SLOPE DESIGN - ROCK CUT 2
STA 97+50

SCI-823-0.00



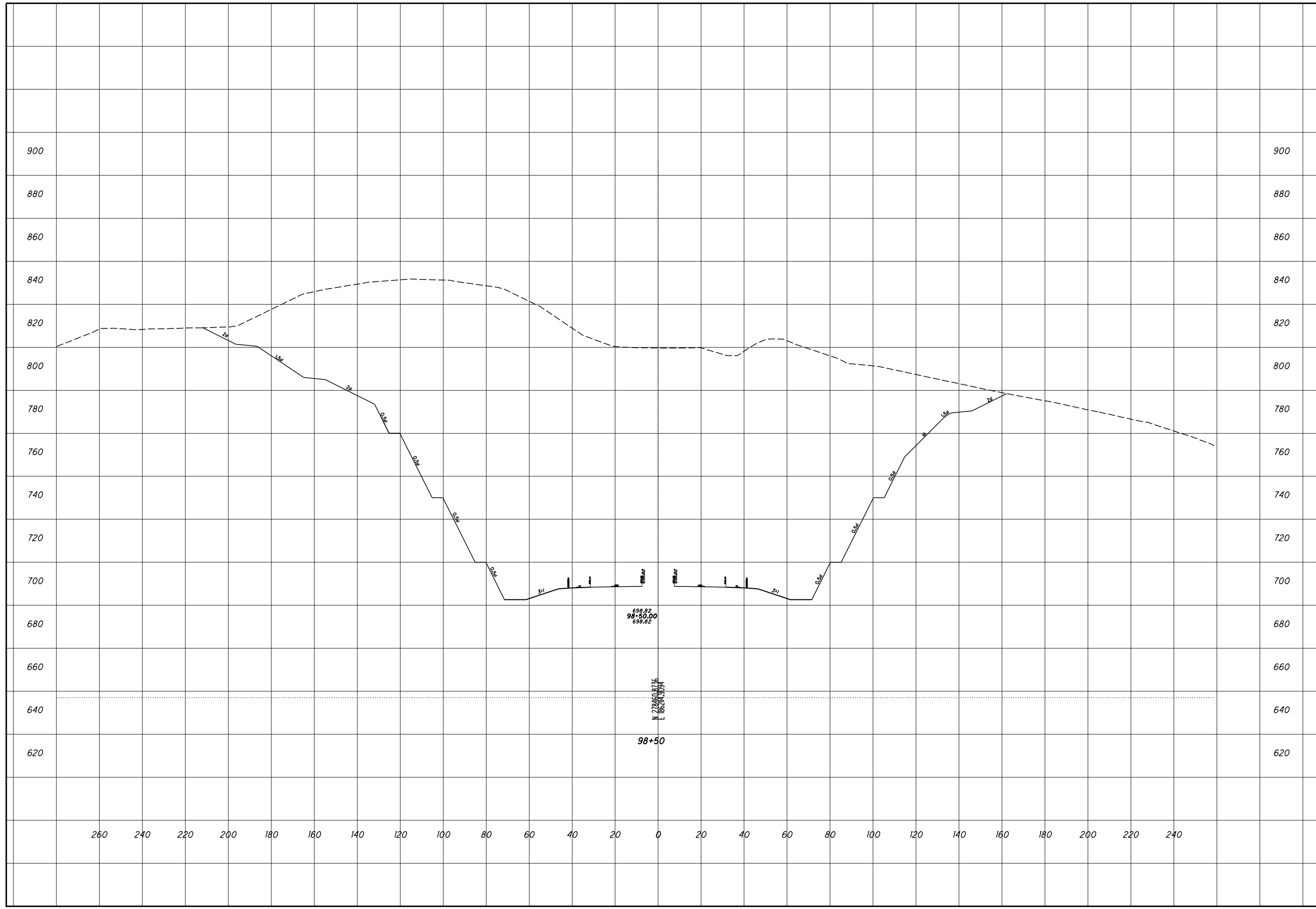
ROCK CUT SLOPE DESIGN - ROCK CUT 2
STA 98+00

SCI-823-0.00



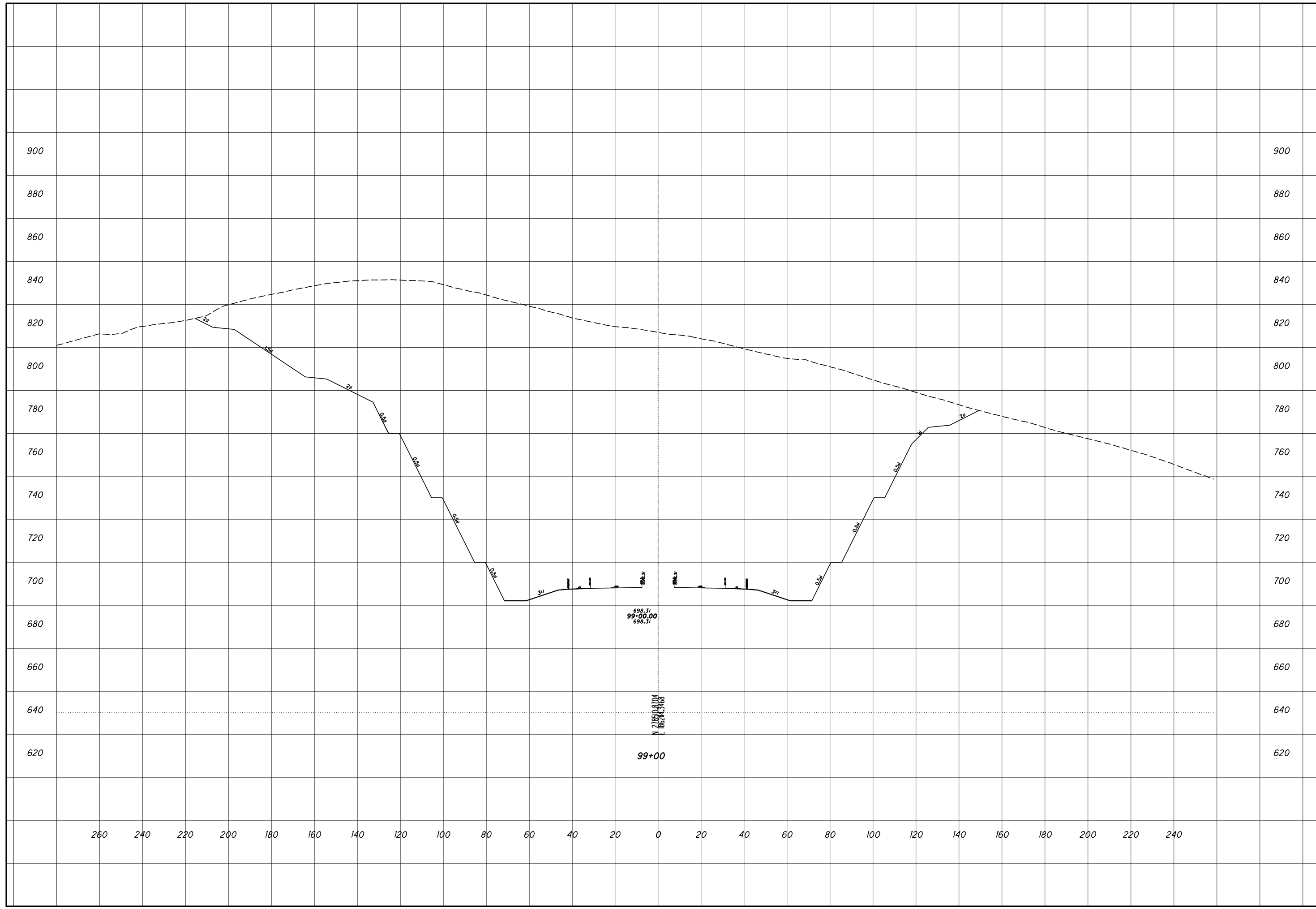
ROCK CUT SLOPE DESIGN - ROCK CUT 2
STA 98+50

SCI-823-0.00



ROCK CUT SLOPE DESIGN - ROCK CUT 2
STA 99+00

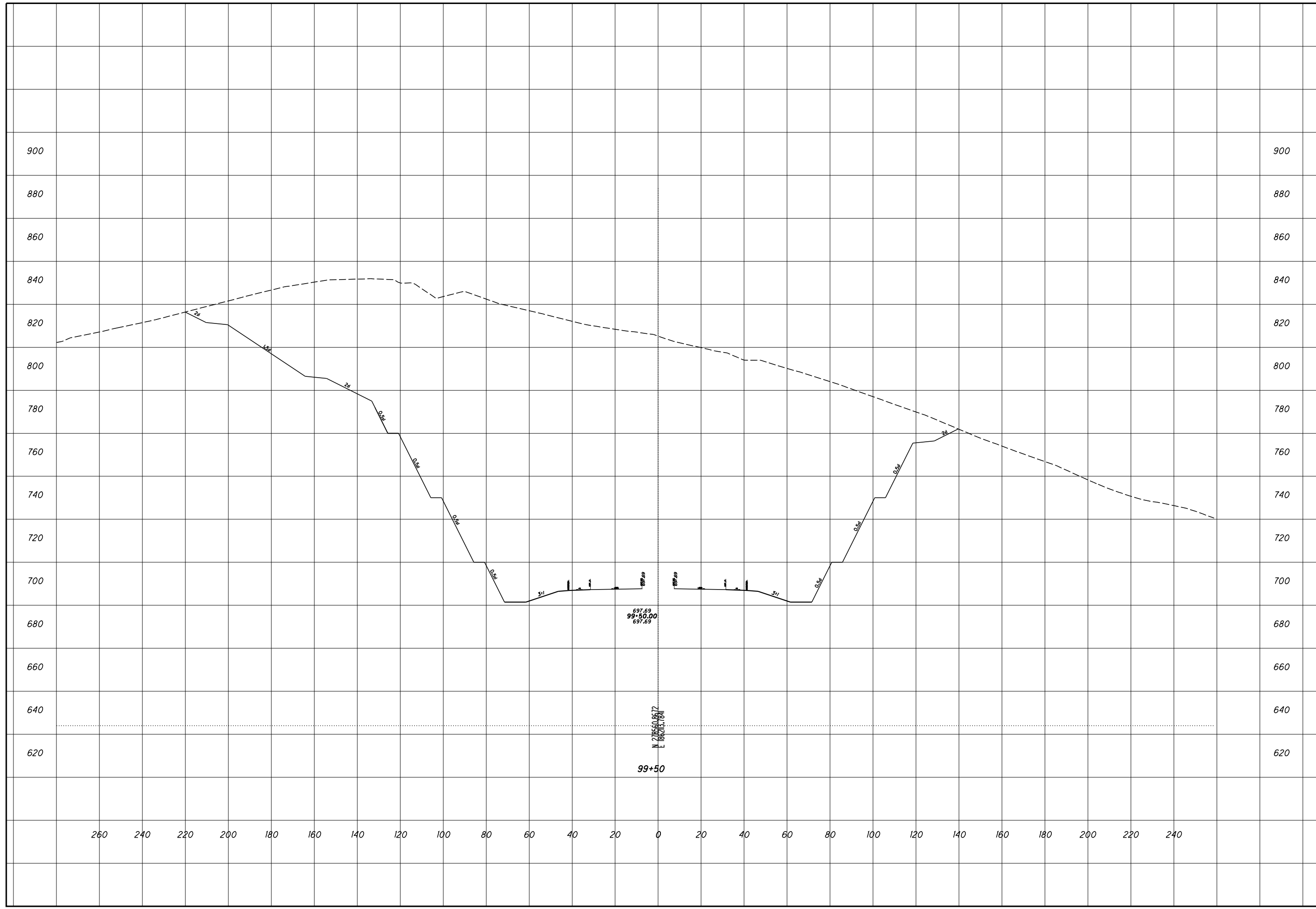
SCI-823-0.00

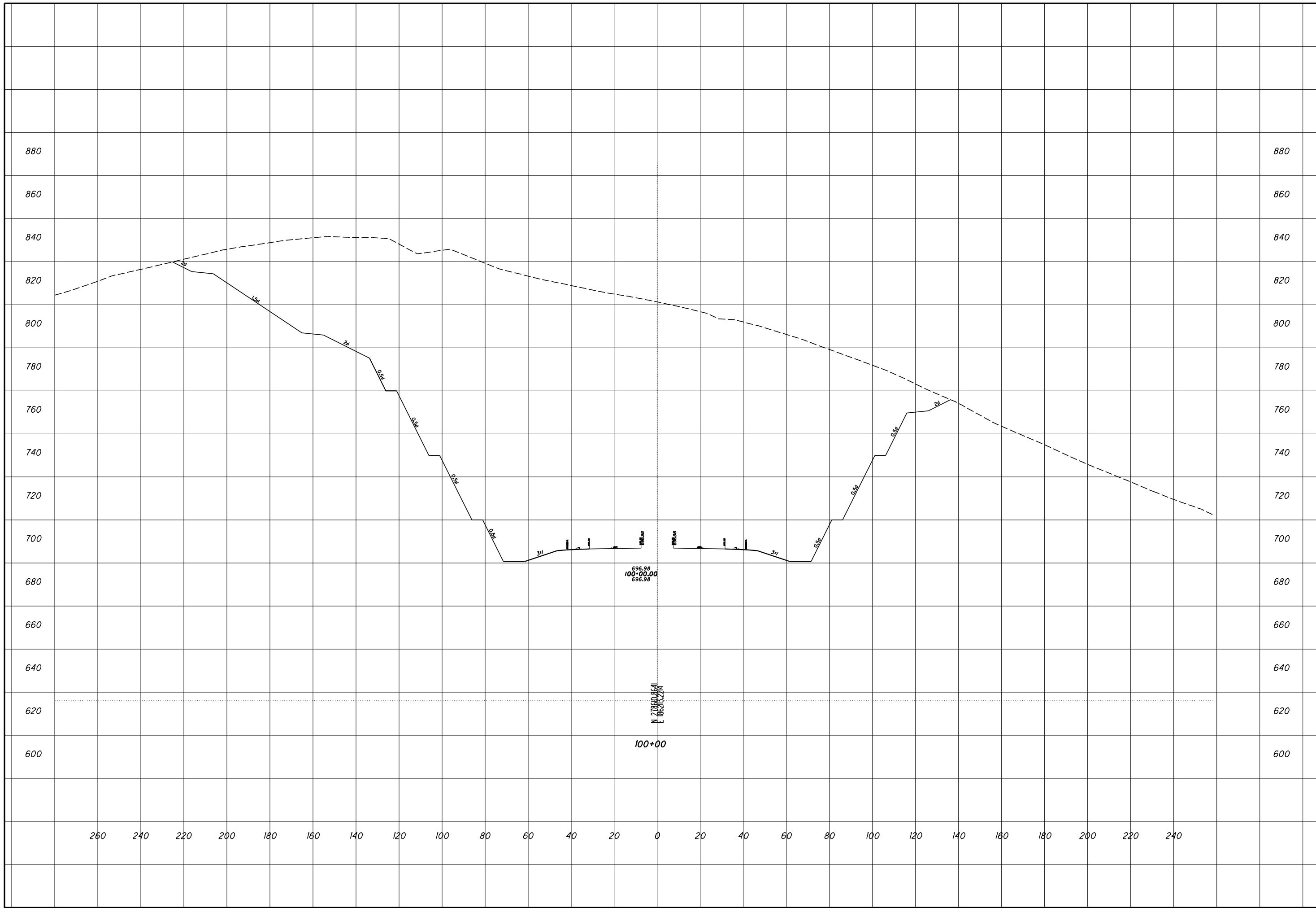


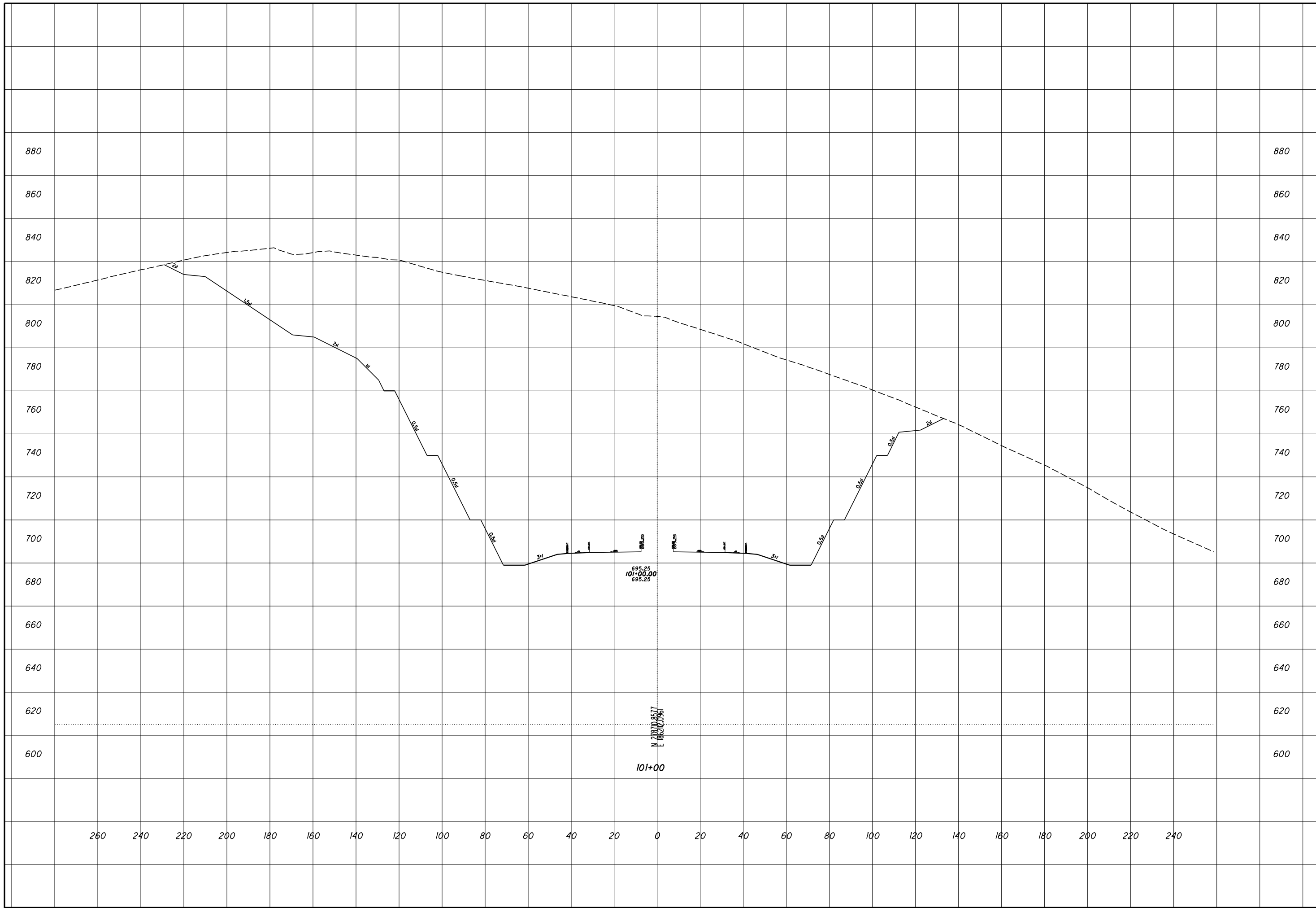
CHECKED

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STA 99+50

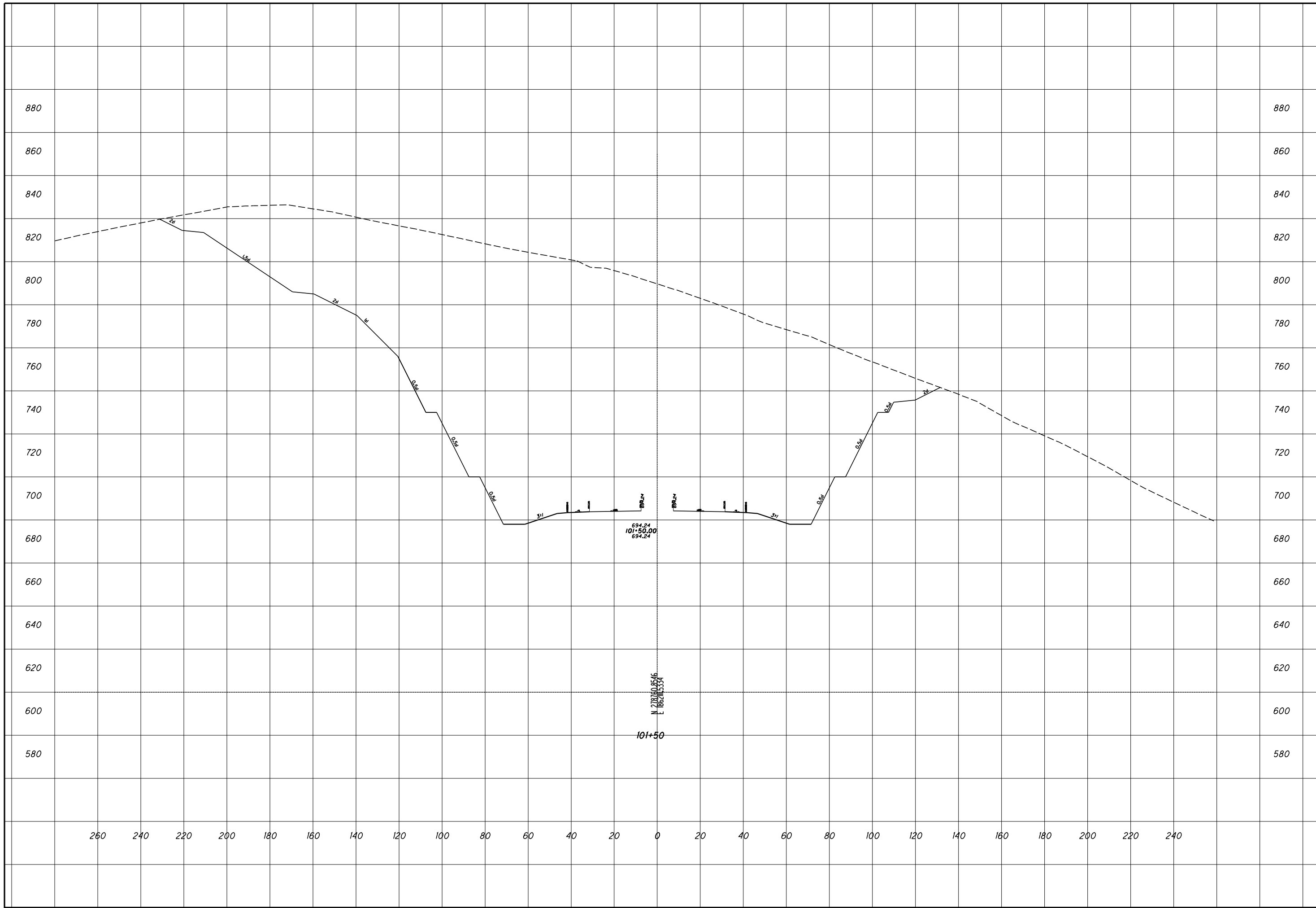
SCI-823-0.00







CHECKED
ROCK CUT SLOPE DESIGN - ROCK CUT 2
STA 101+00
SCI-823-0.00
 47
 57

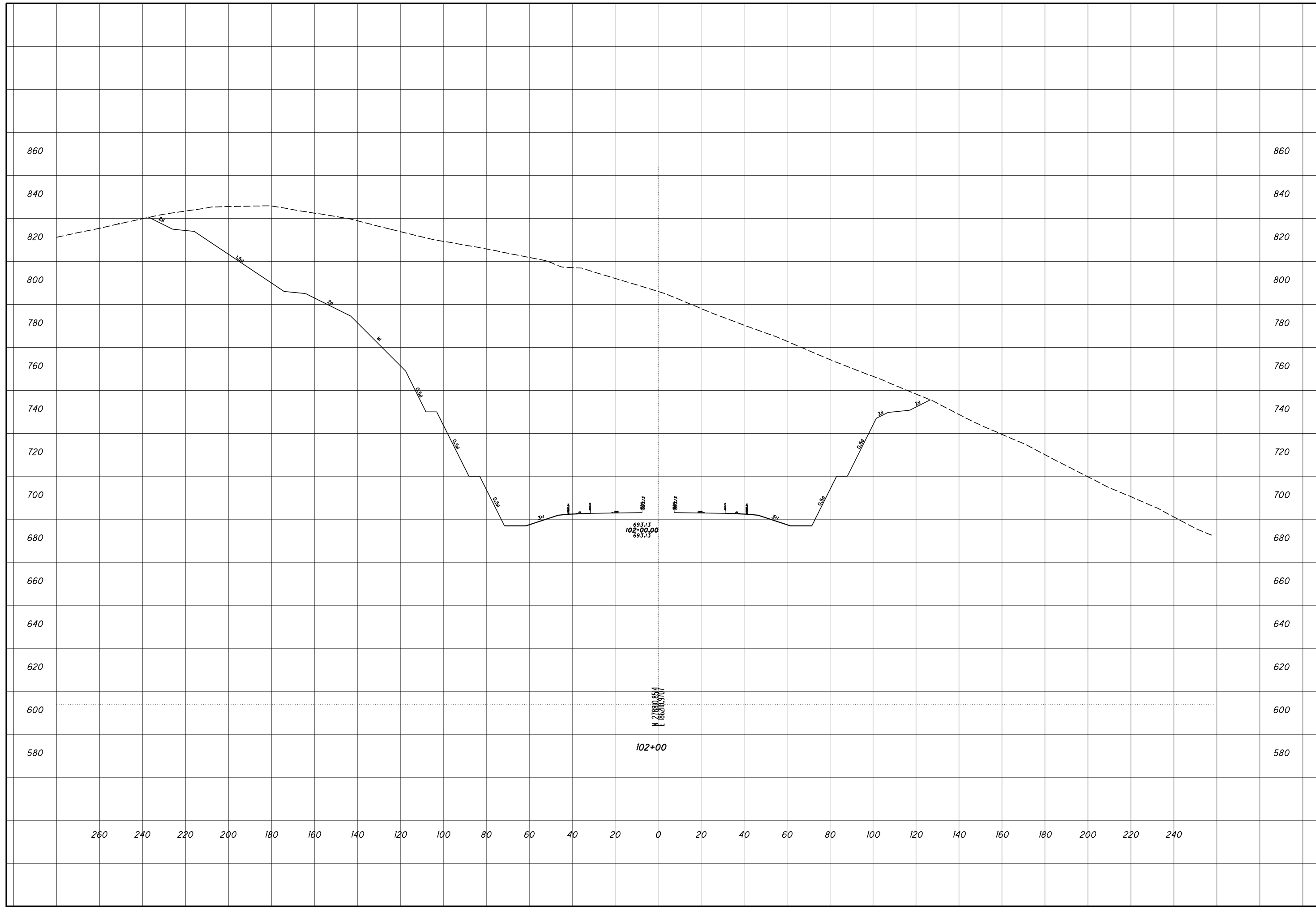


**ROCK CUT SLOPE DESIGN - ROCK CUT 2
STA 101+50**

SCI-823-0.00

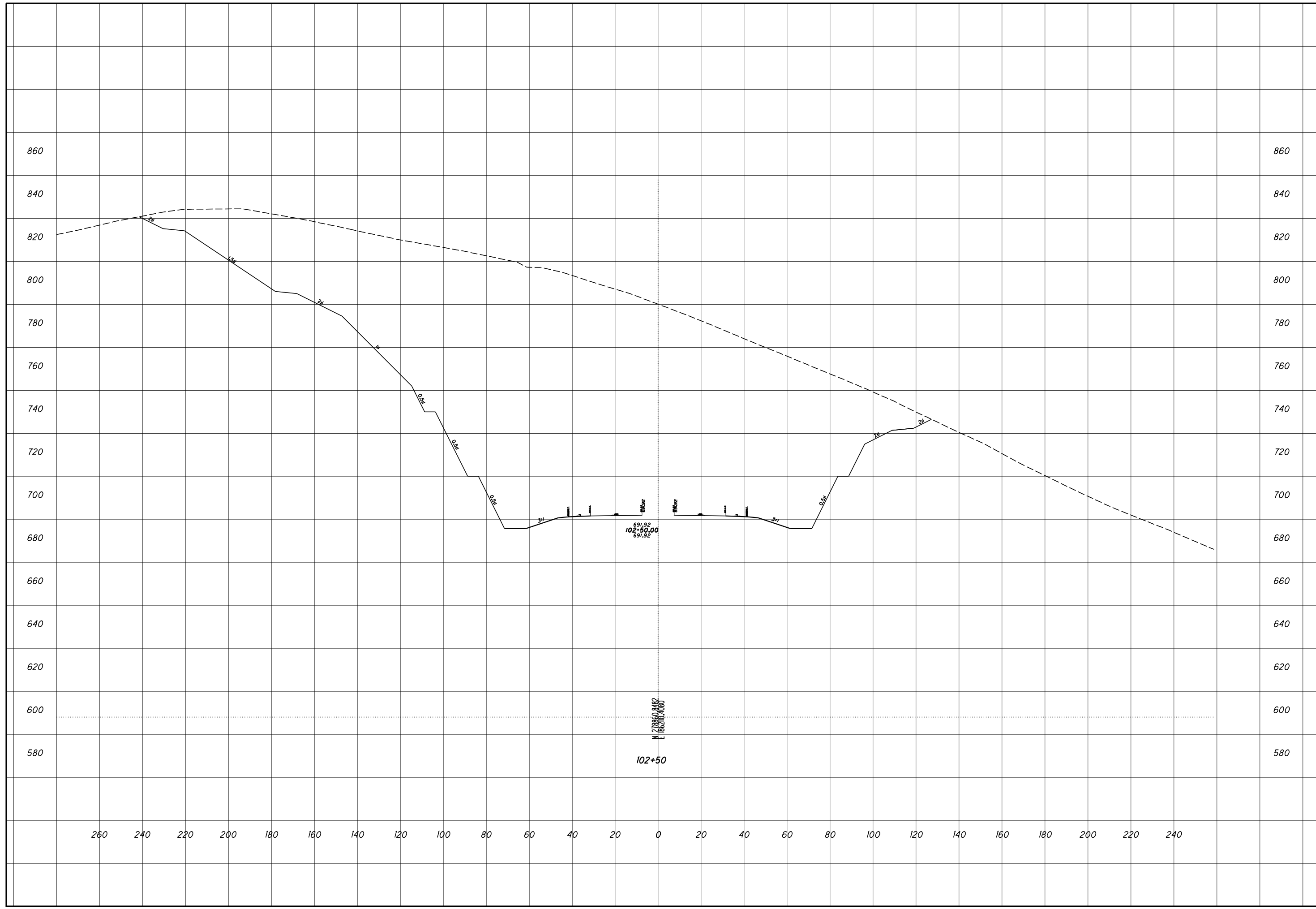
ROCK CUT SLOPE DESIGN - ROCK CUT 2
STA 102+00

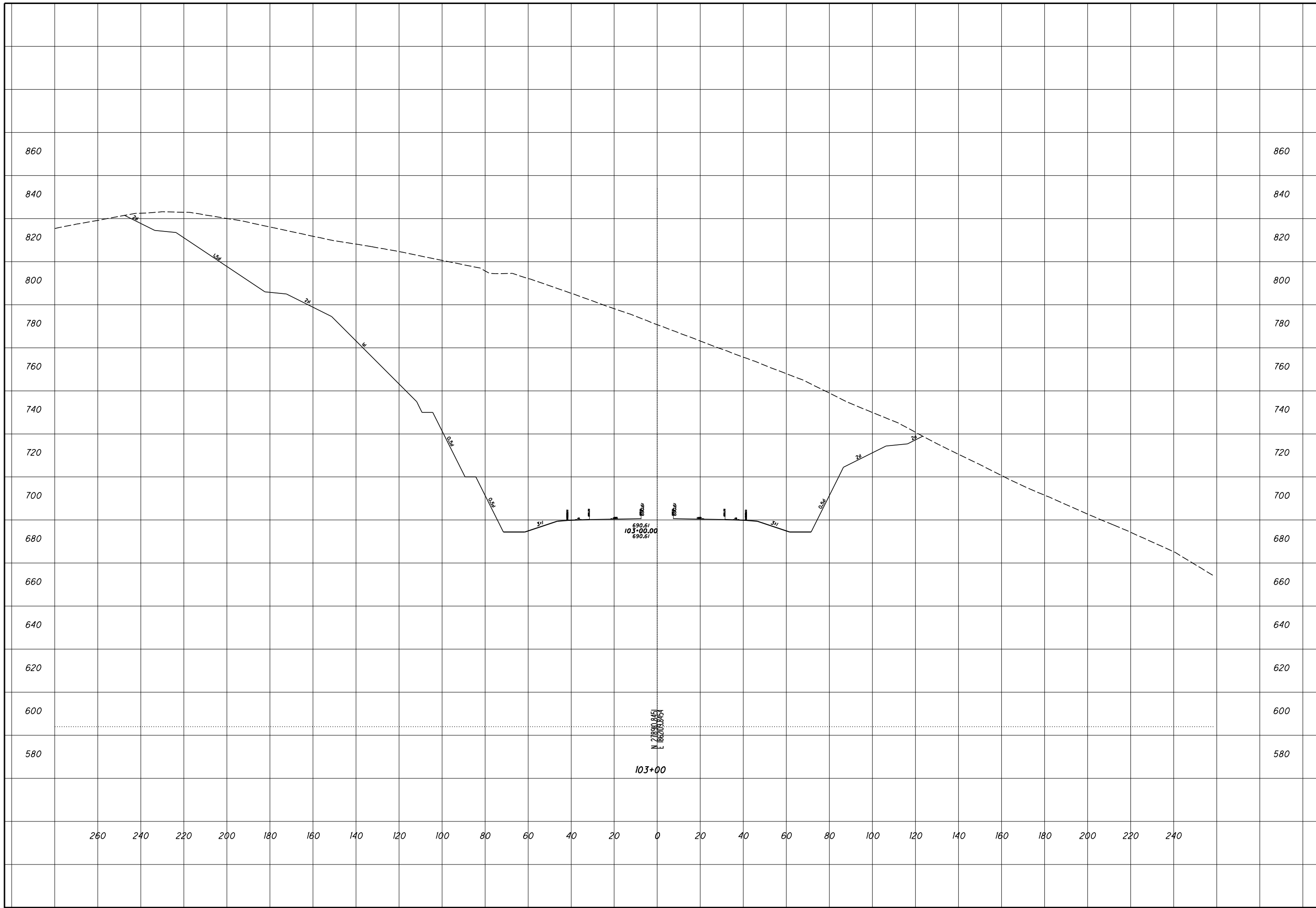
SCI-823-0.00

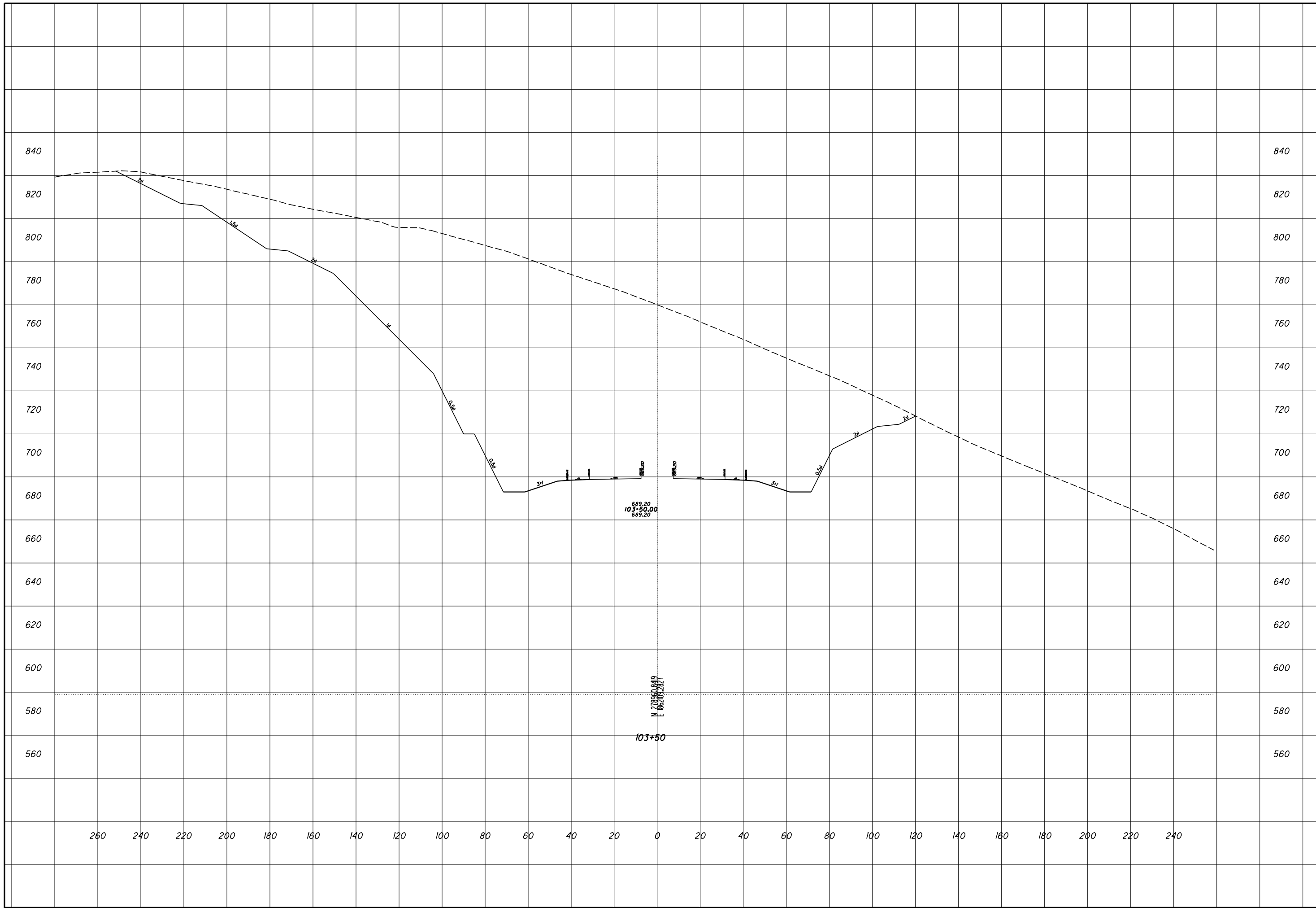


ROCK CUT SLOPE DESIGN - ROCK CUT 2
STA 102+50

SCI-823-0.00



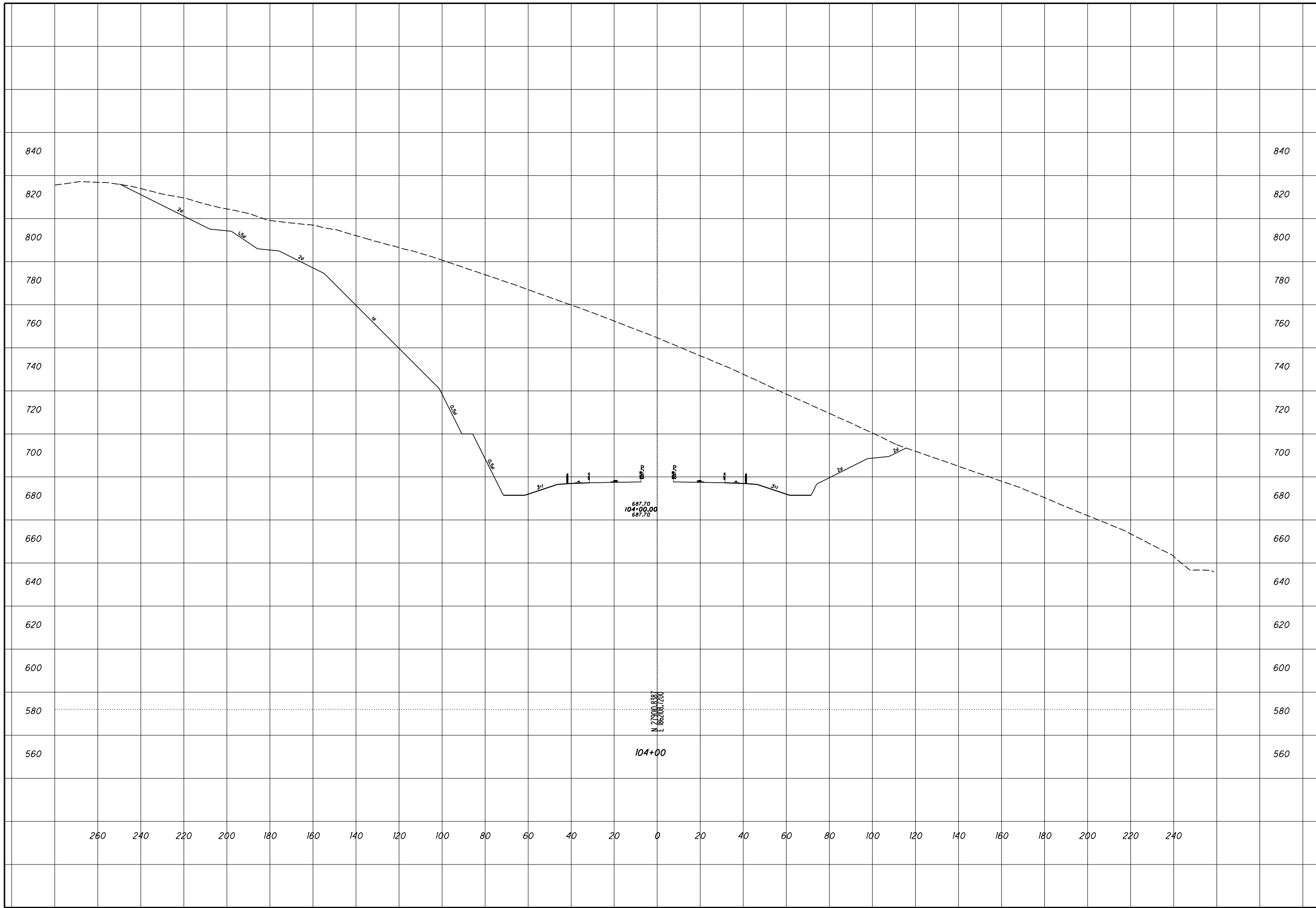




ROCK CUT SLOPE DESIGN - ROCK CUT 2
STA 103+50

SCI-823-0.00

CHECKED



ROCK CUT SLOPE DESIGN - ROCK CUT 2
STA 104+00

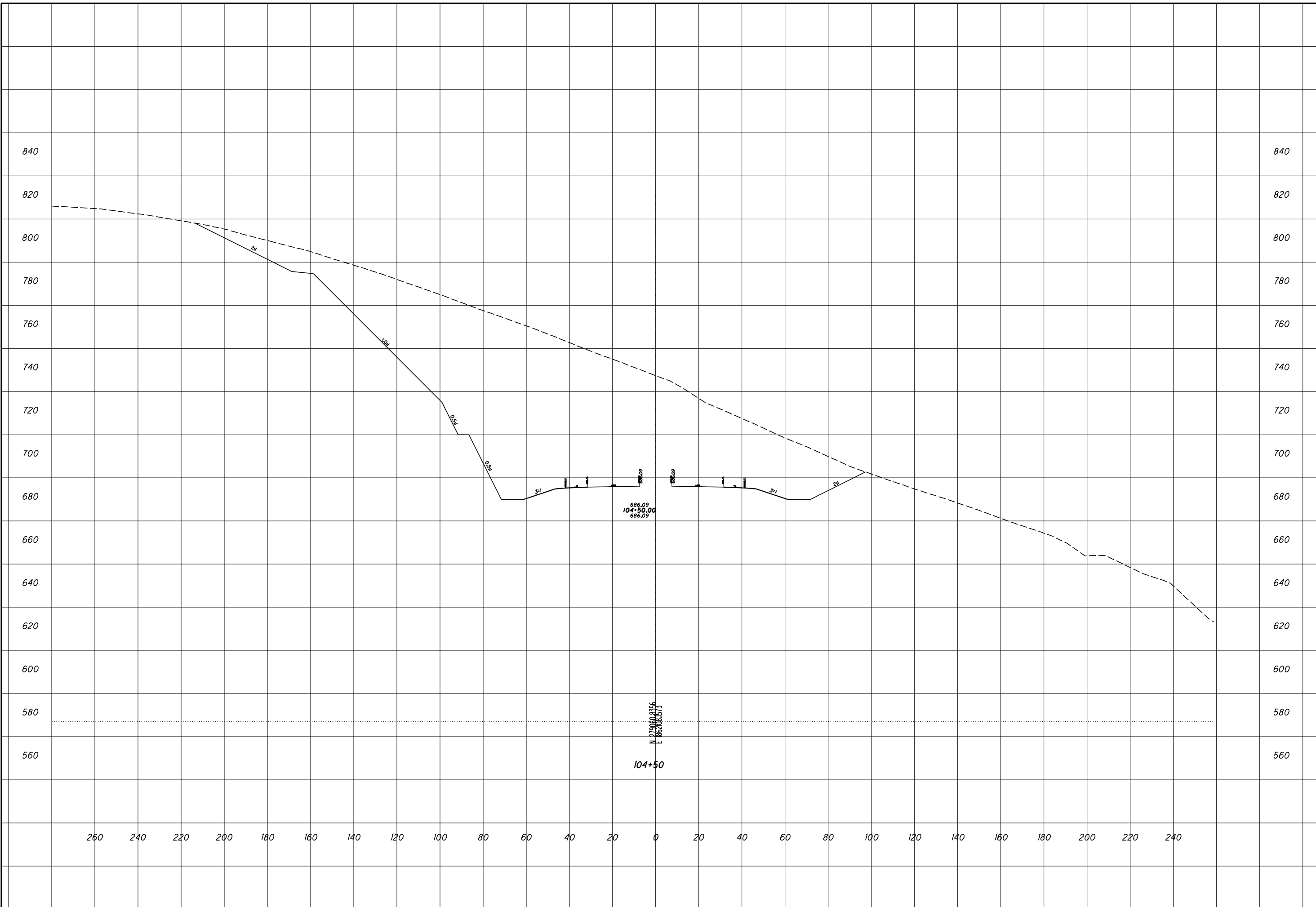
SCI-823-0.00

53
 57

CHECKED

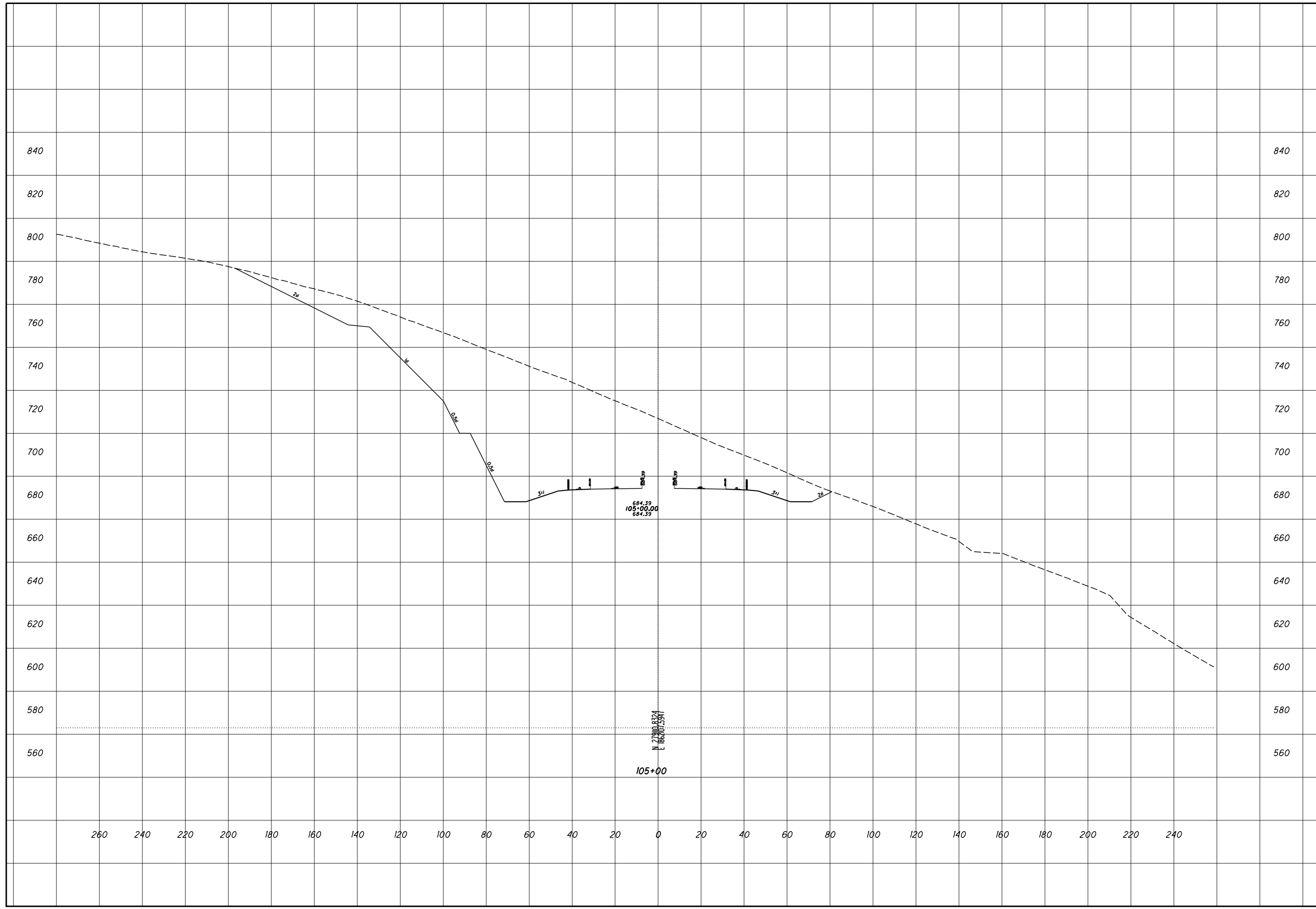
ROCK CUT SLOPE DESIGN - ROCK CUT 2
STA 104+50

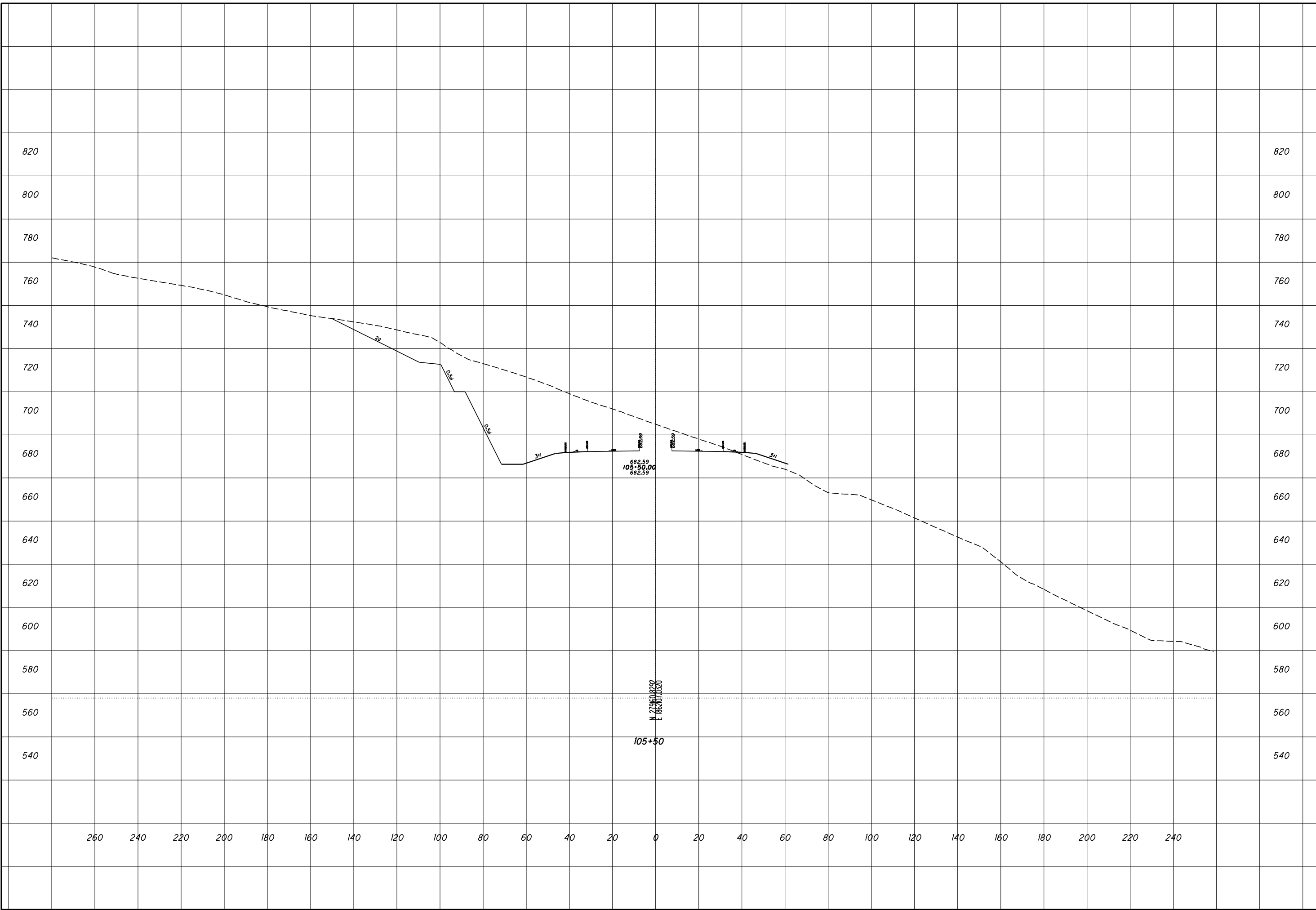
SCI-823-0.00



ROCK CUT SLOPE DESIGN - ROCK CUT 2
STA 105+00

SCI-823-0.00

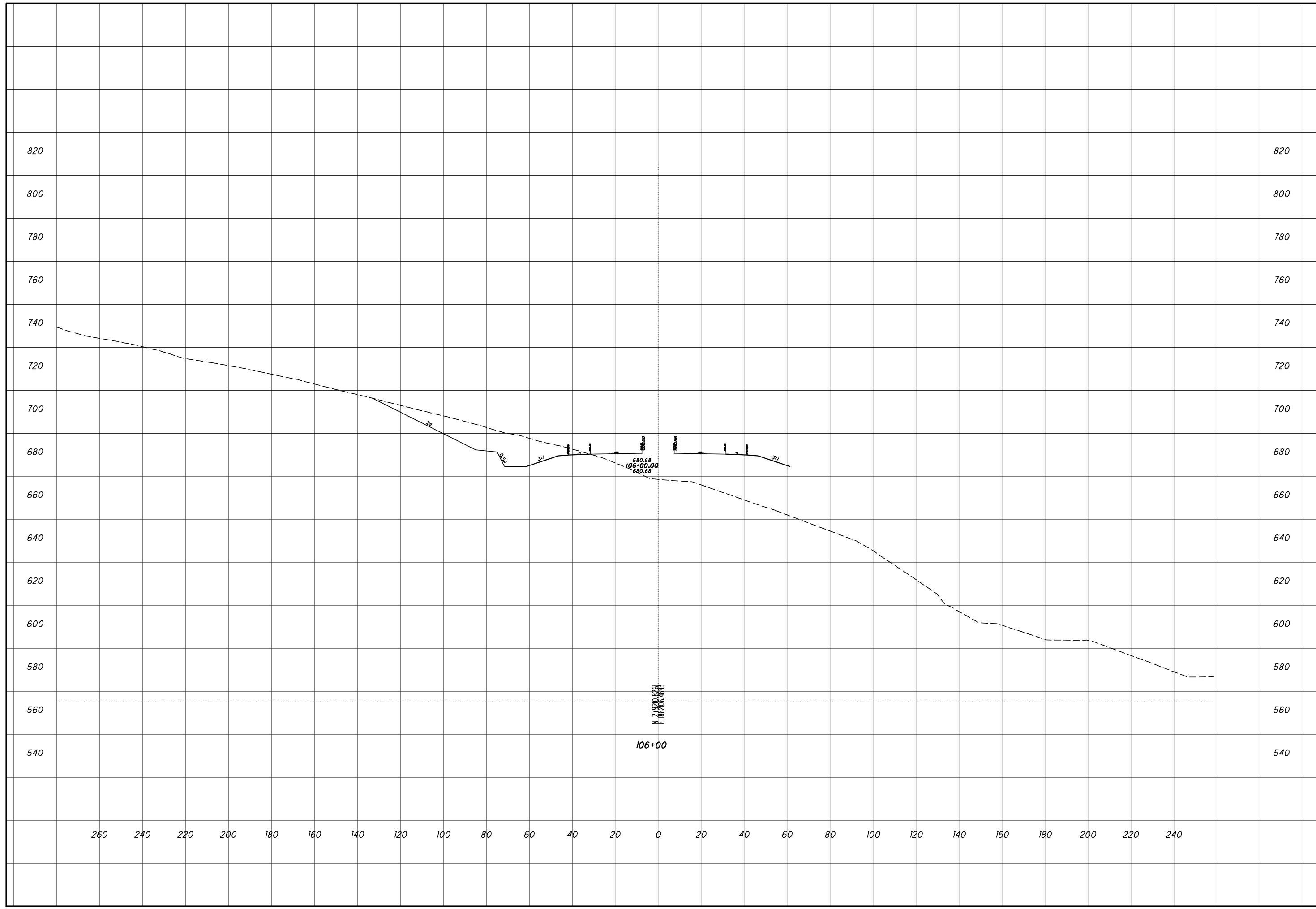




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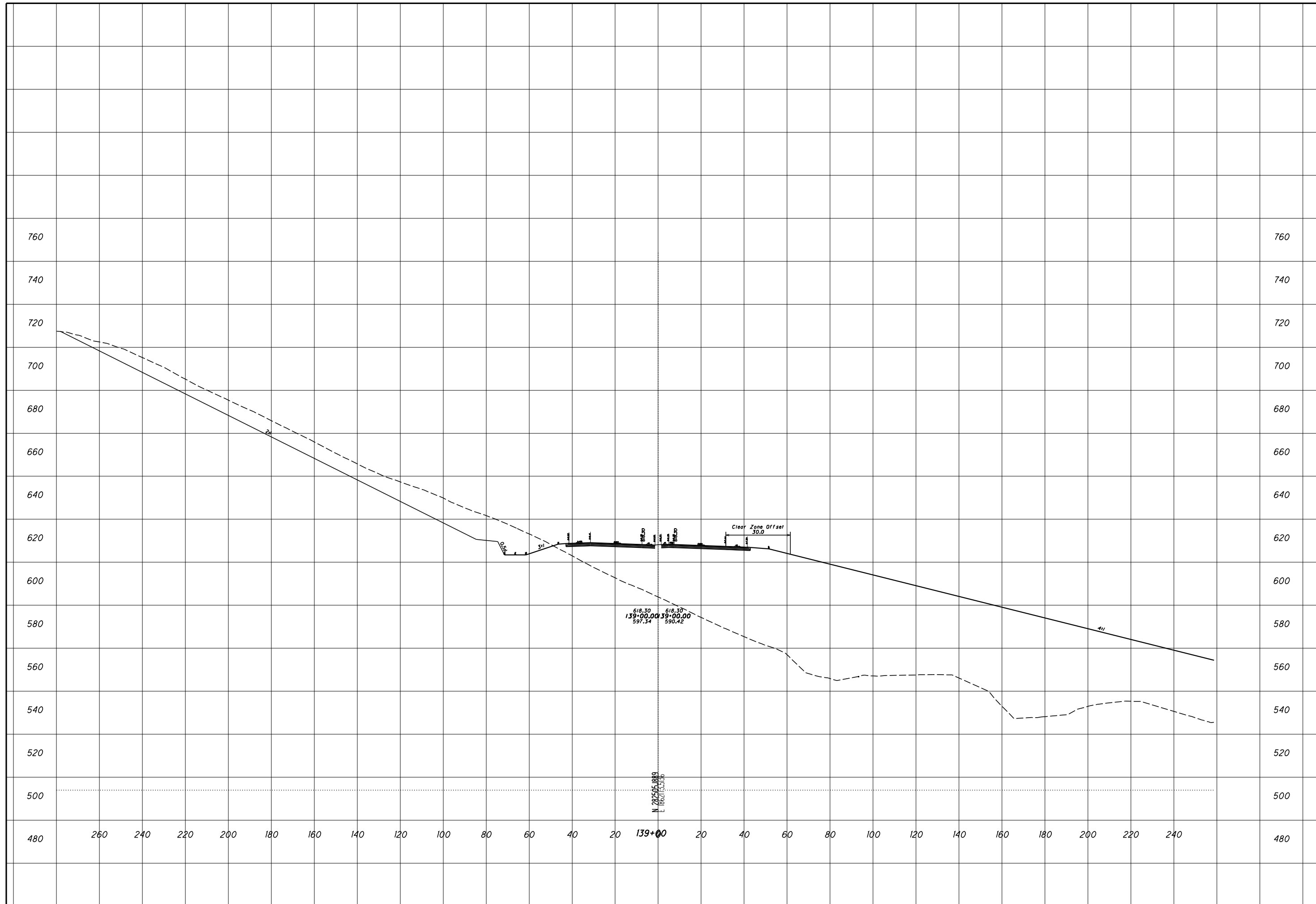
ROCK CUT SLOPE DESIGN - ROCK CUT 2
STA 106+00

SCI-823-0.00



ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 139+00

SCI-823-0.00



760
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480

260 240 220 200 180 160 140 120 100 80 60 40 20 139+00 20 40 60 80 100 120 140 160 180 200 220 240

618.30
139+00.00
597.34

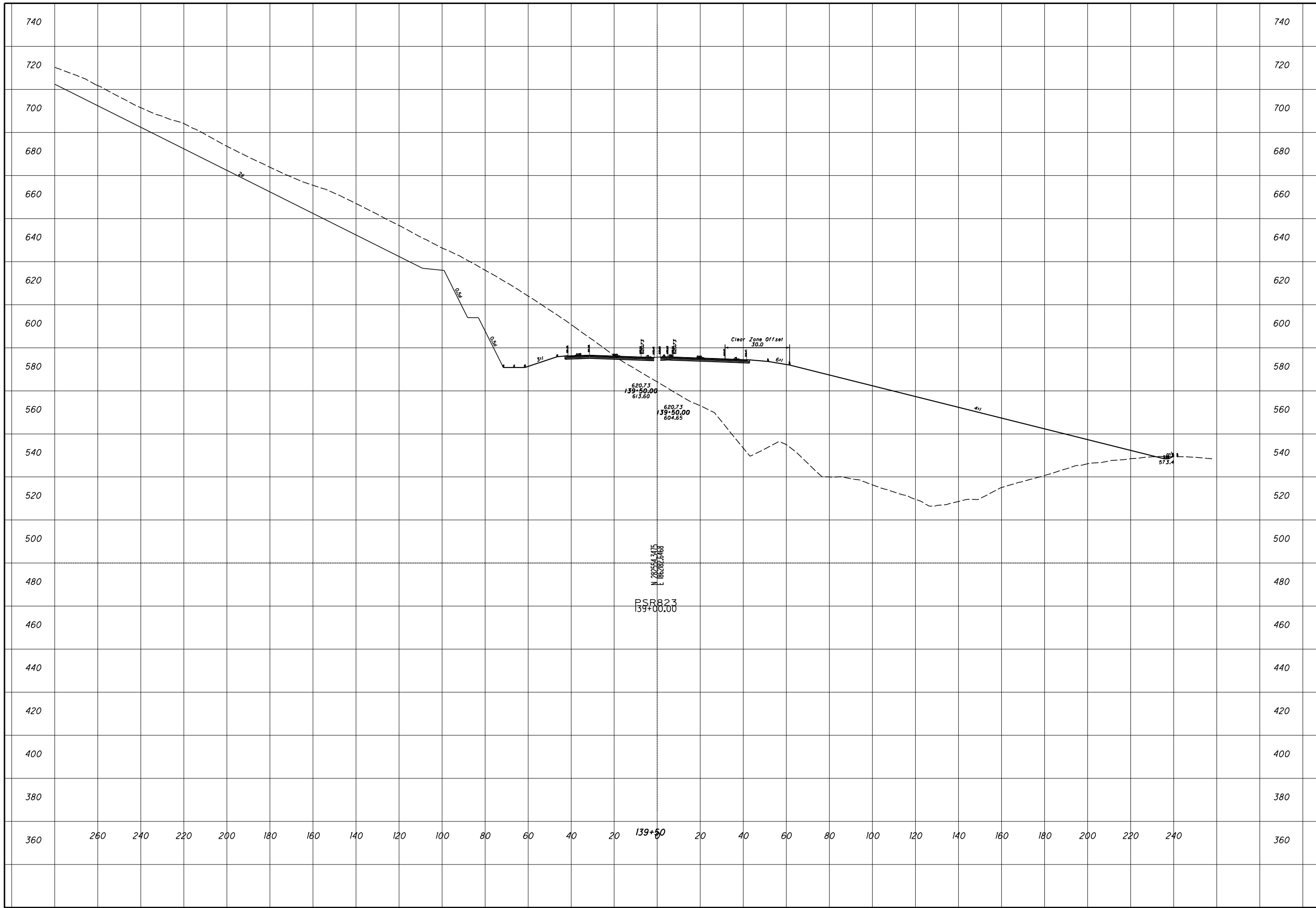
N 28°25'00.00" E
186.215356

Clear Zone Offset
30.0

0.5%

4:1

4:1

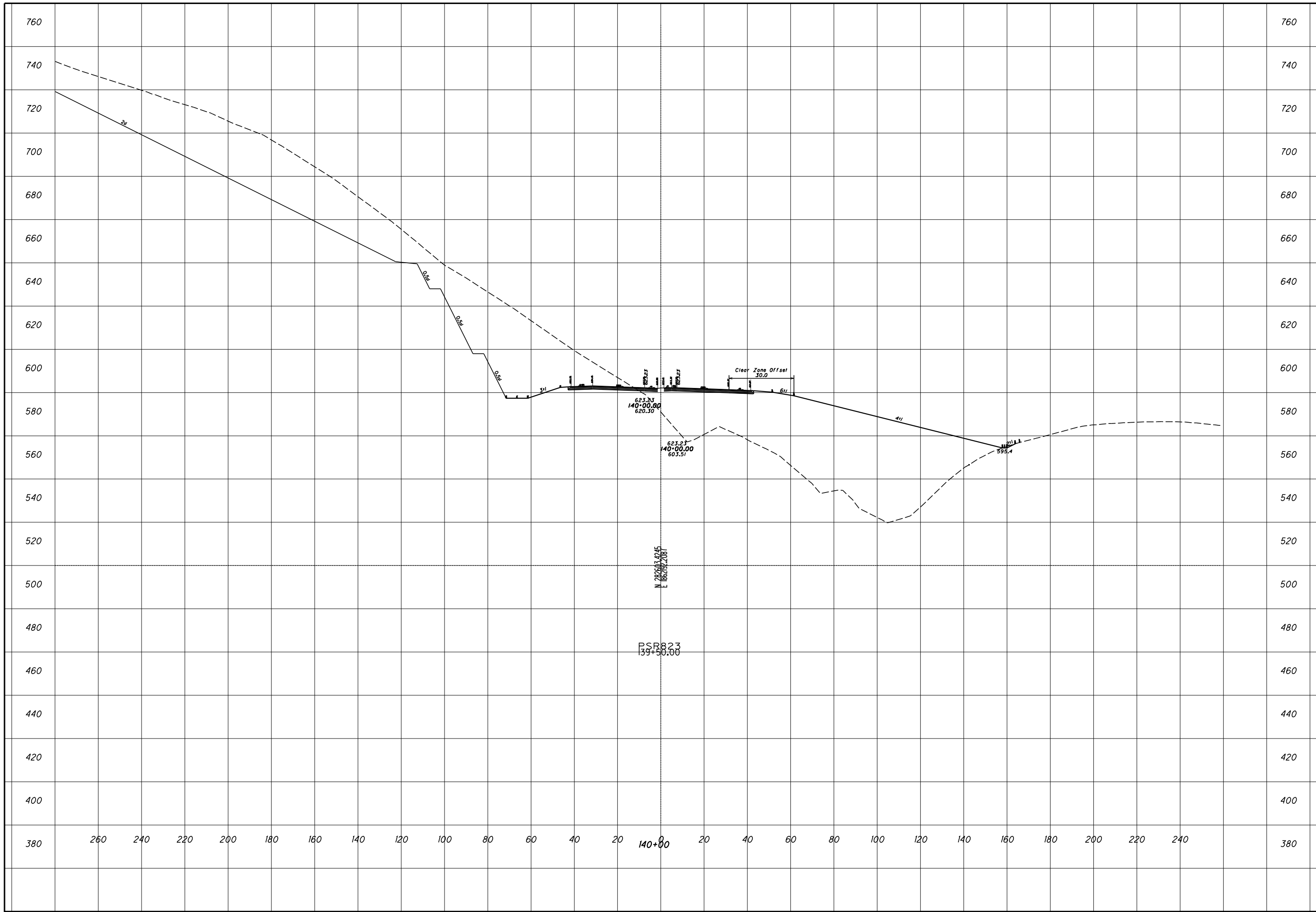


ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 139+50

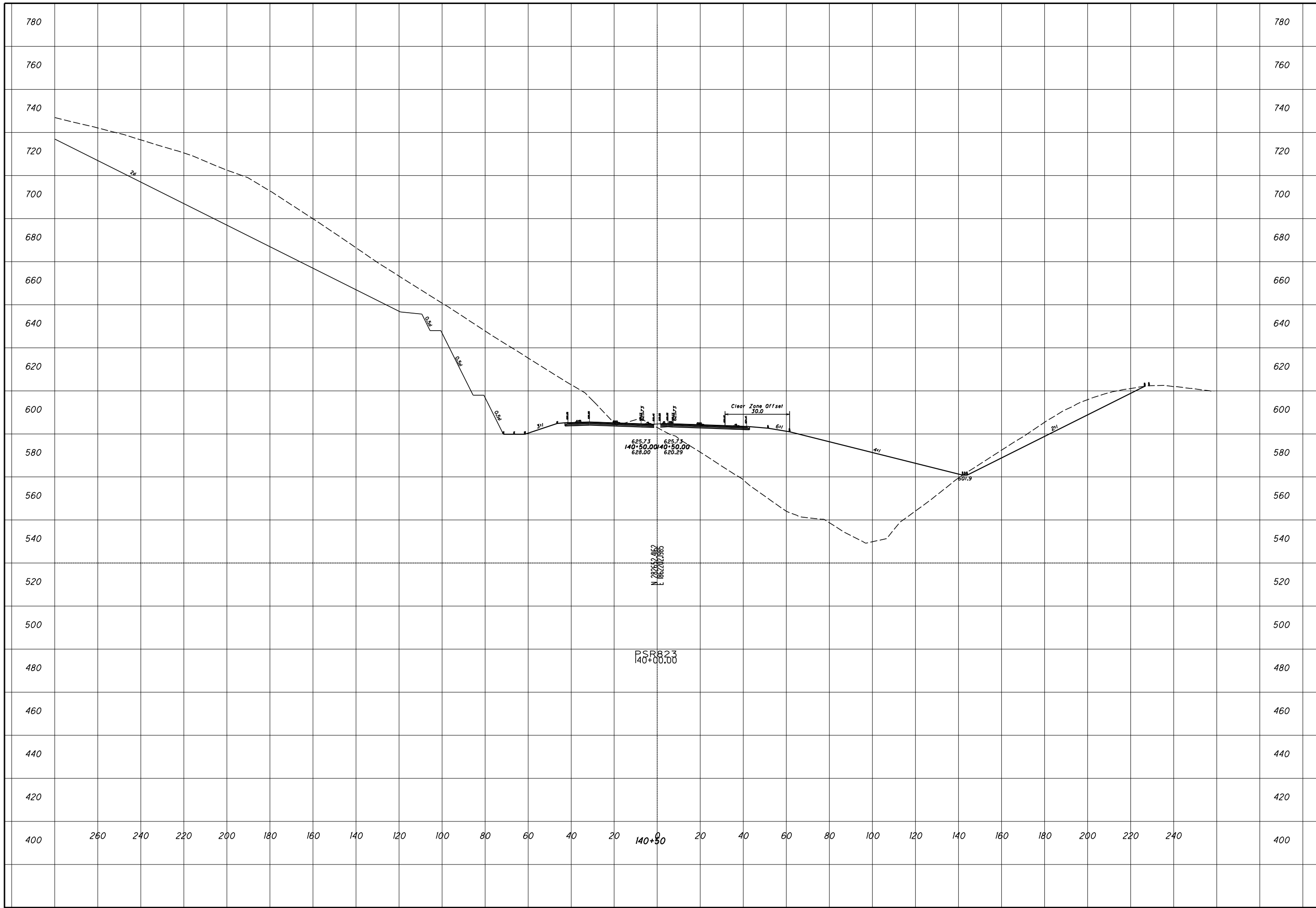
SCI-823-0.00

2
69

CHECKED



CHECKED
ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 140+00
SCI-823-0.00
 3
 69



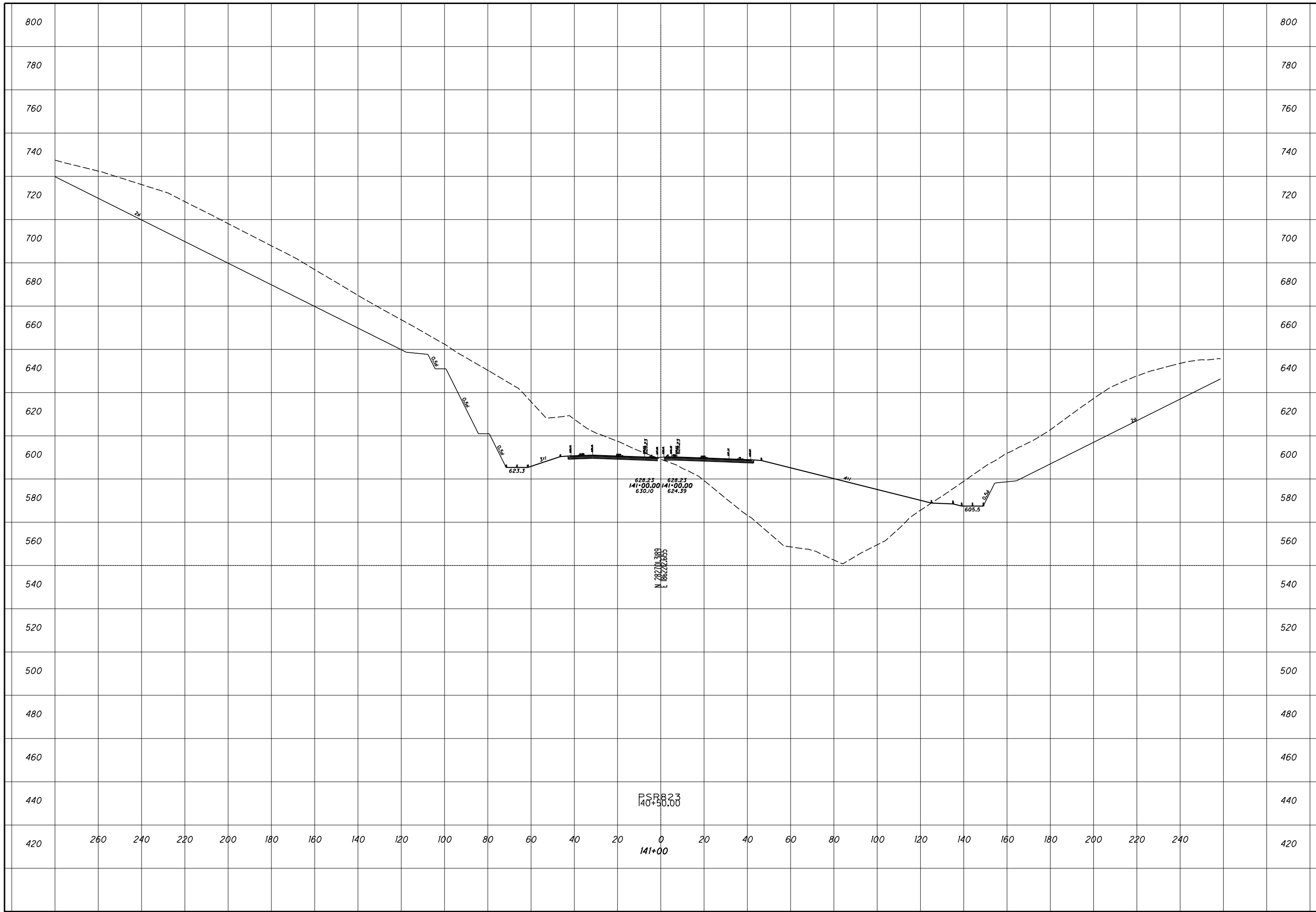
CHECKED

ROCK CUT SLOPE DESIGN - ROCK CUT 3

STA 140+50

SCI-823-0.00

4
69



ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 141+00

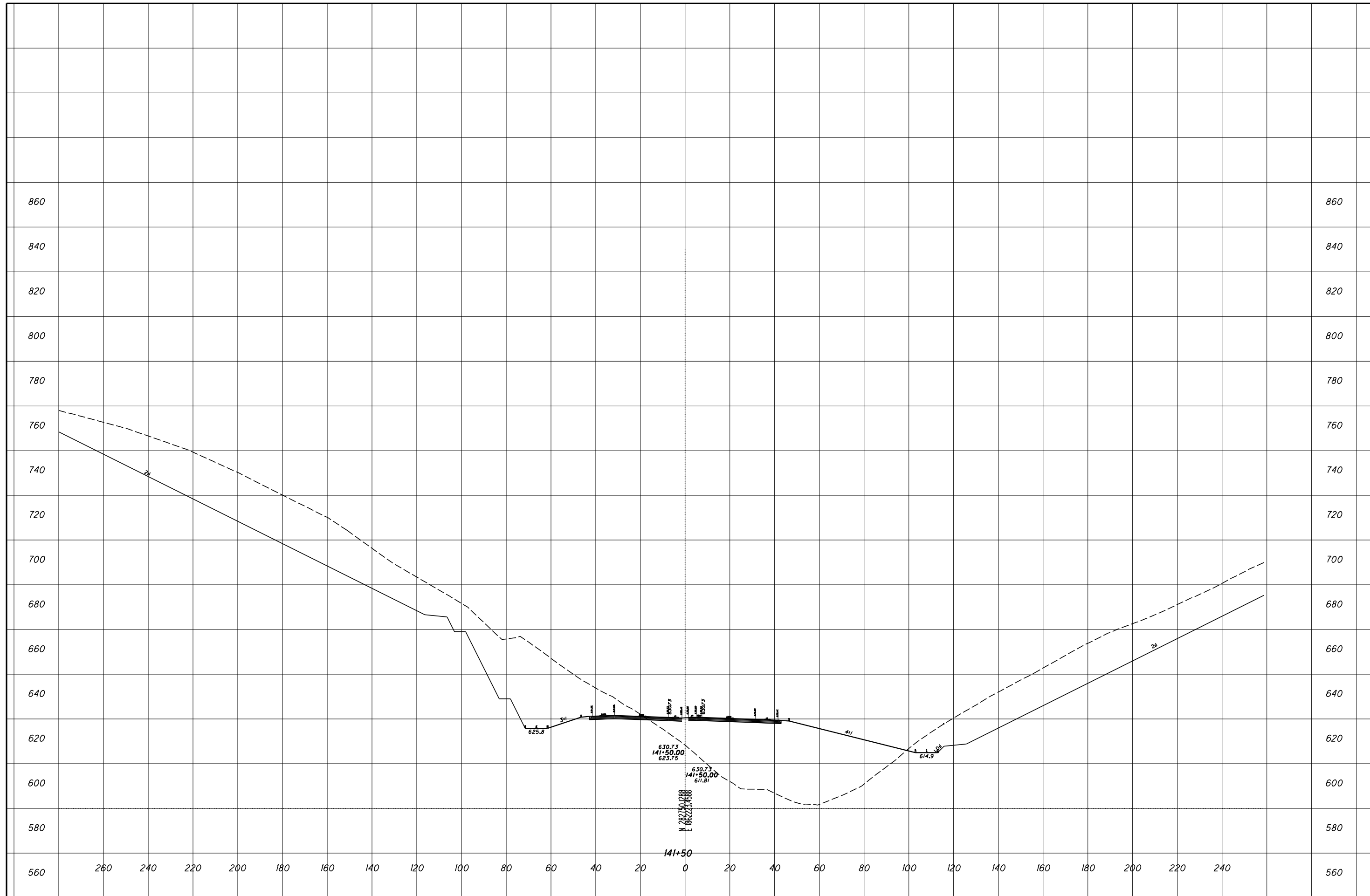
SCI-823-0.00

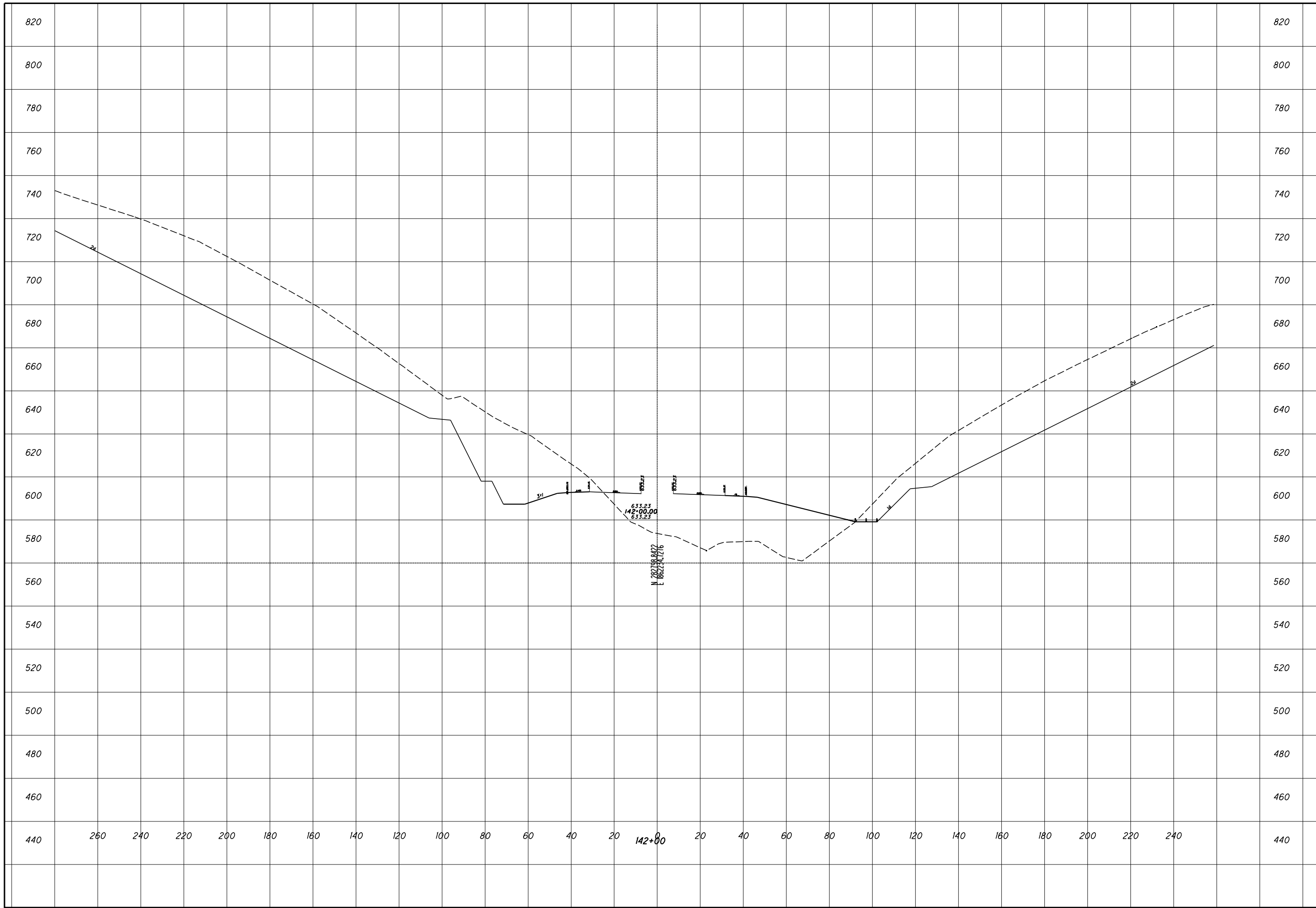
5
69

CHECKED

ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 141+50

SCI-823-0.00



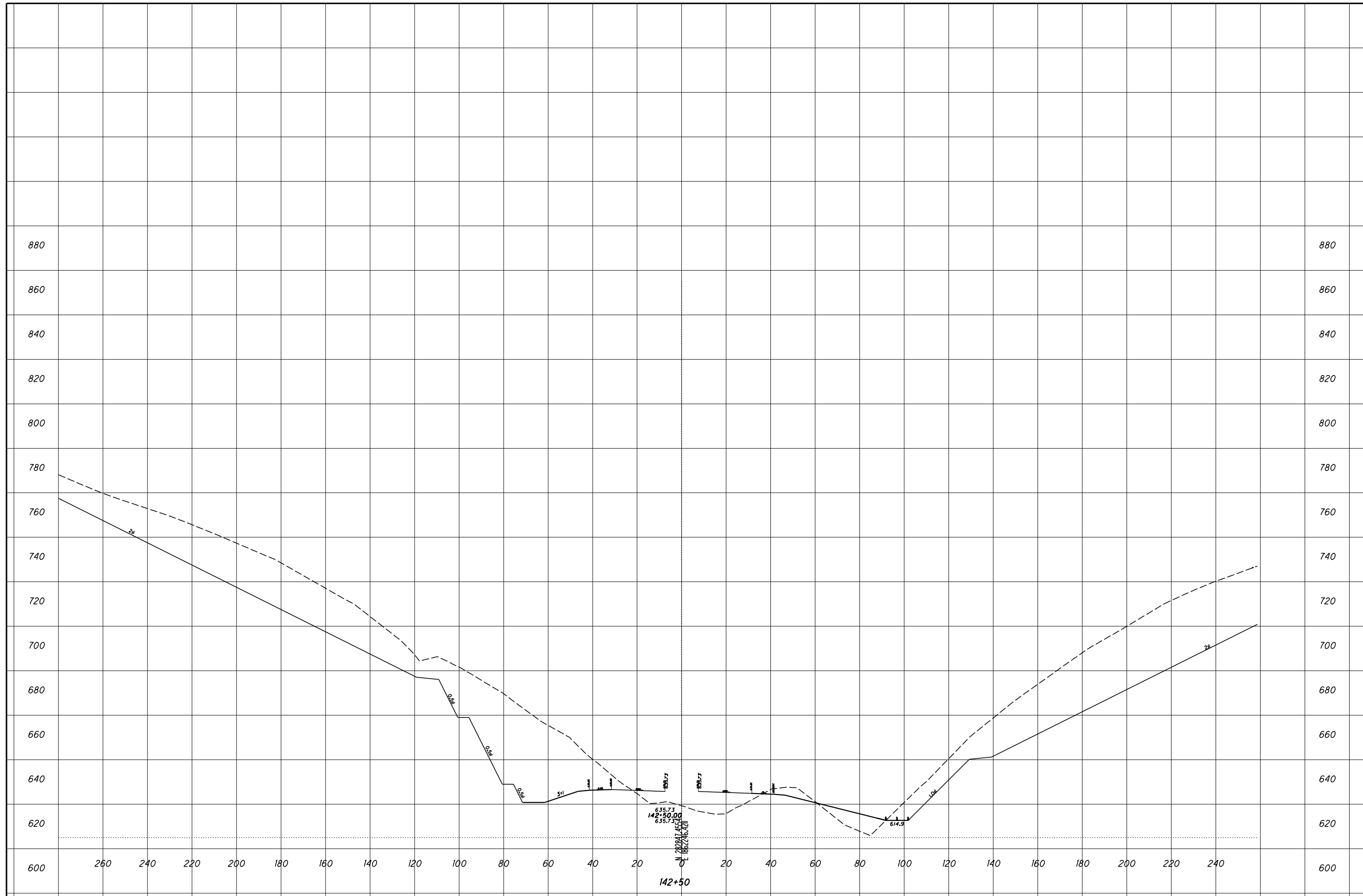


CHECKED
ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 142+00
SCI-823-0.00
 7
 69

CHECKED

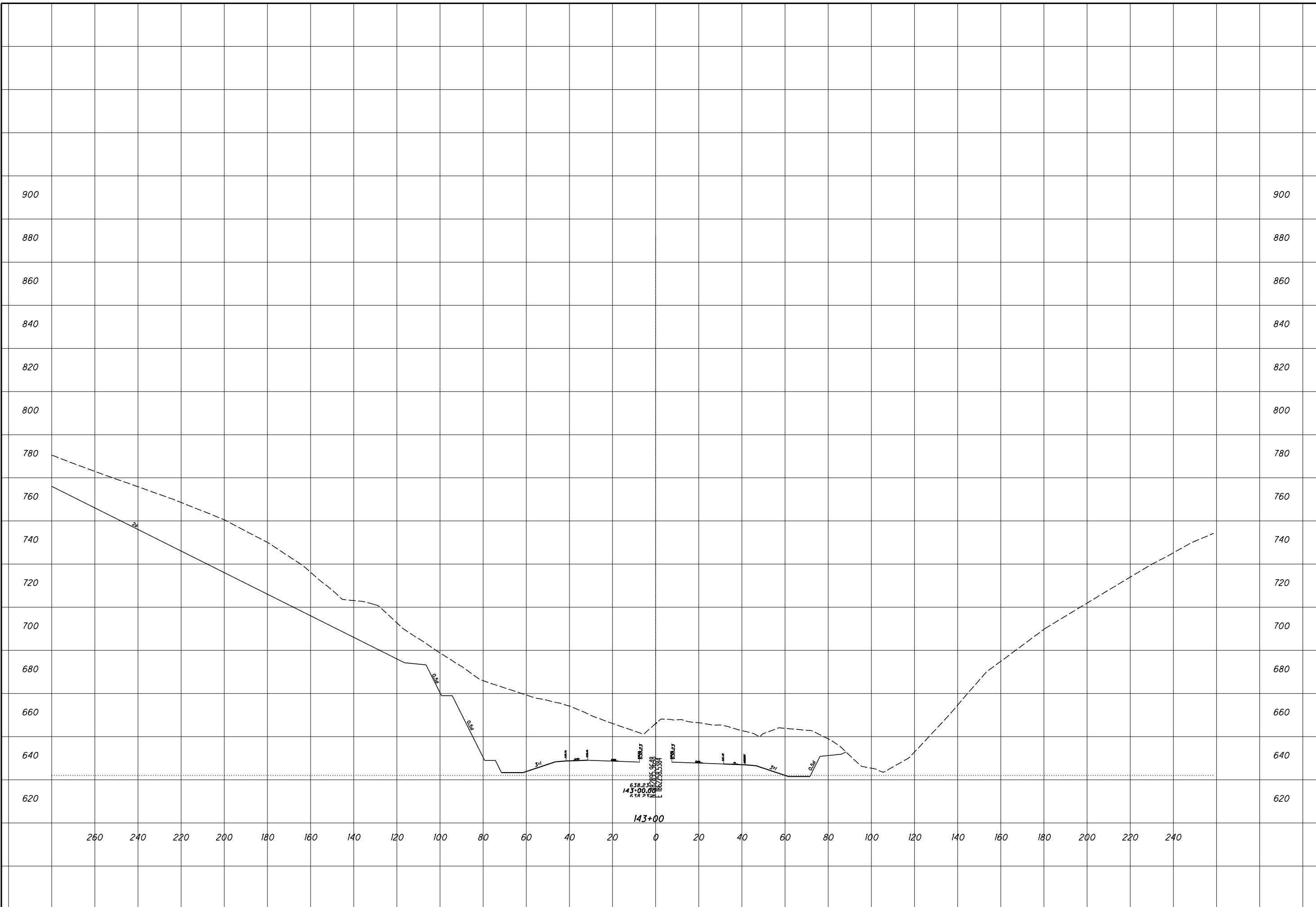
**ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 142+50**

SCI-823-0.00



ROCK CUT SLOPE DESIGN - ROCK CUT 3

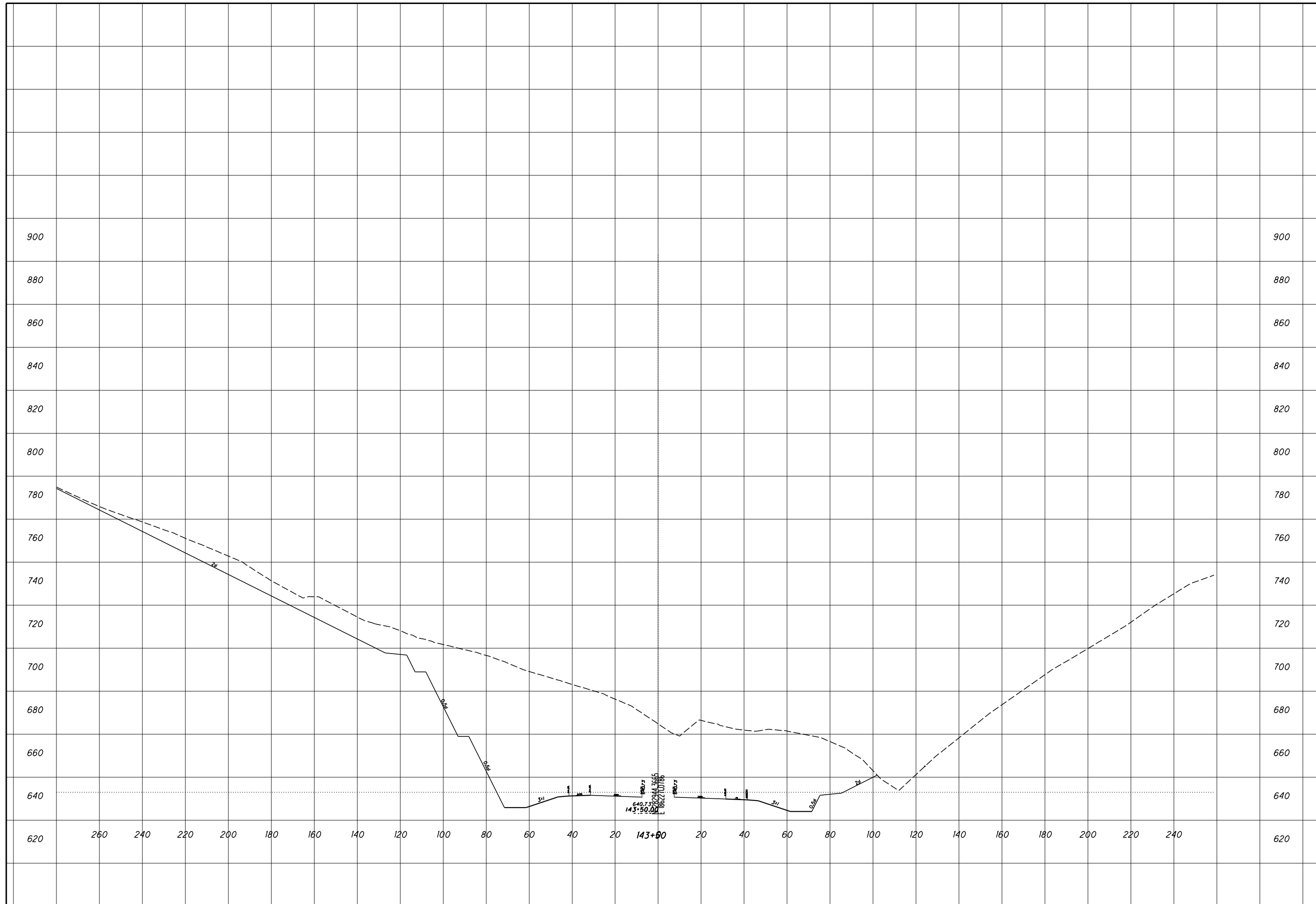
SCI-823-0.00
STA 143+00



CHECKED

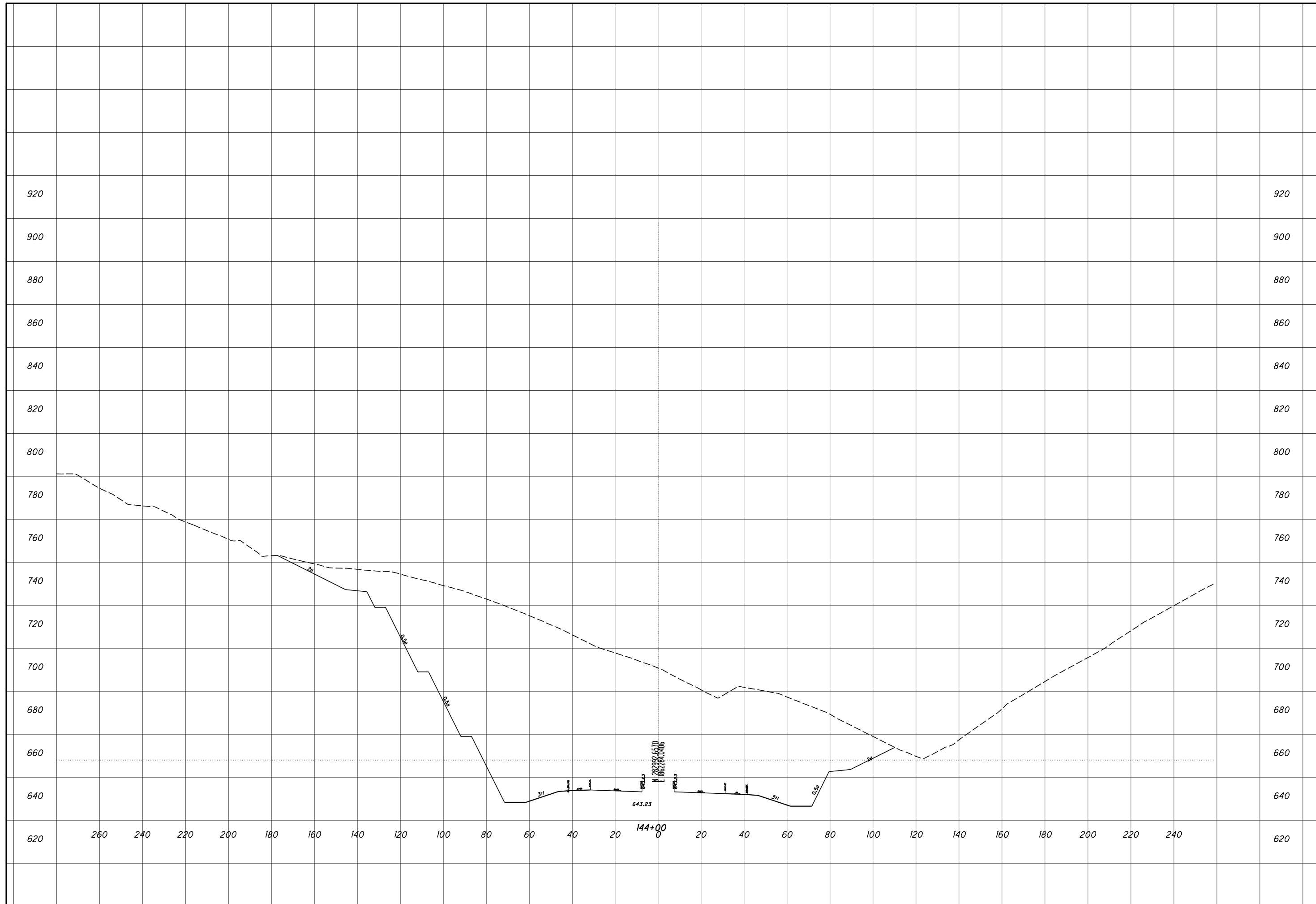
**ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 143+50**

SCI-823-0.00



**ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 144+00**

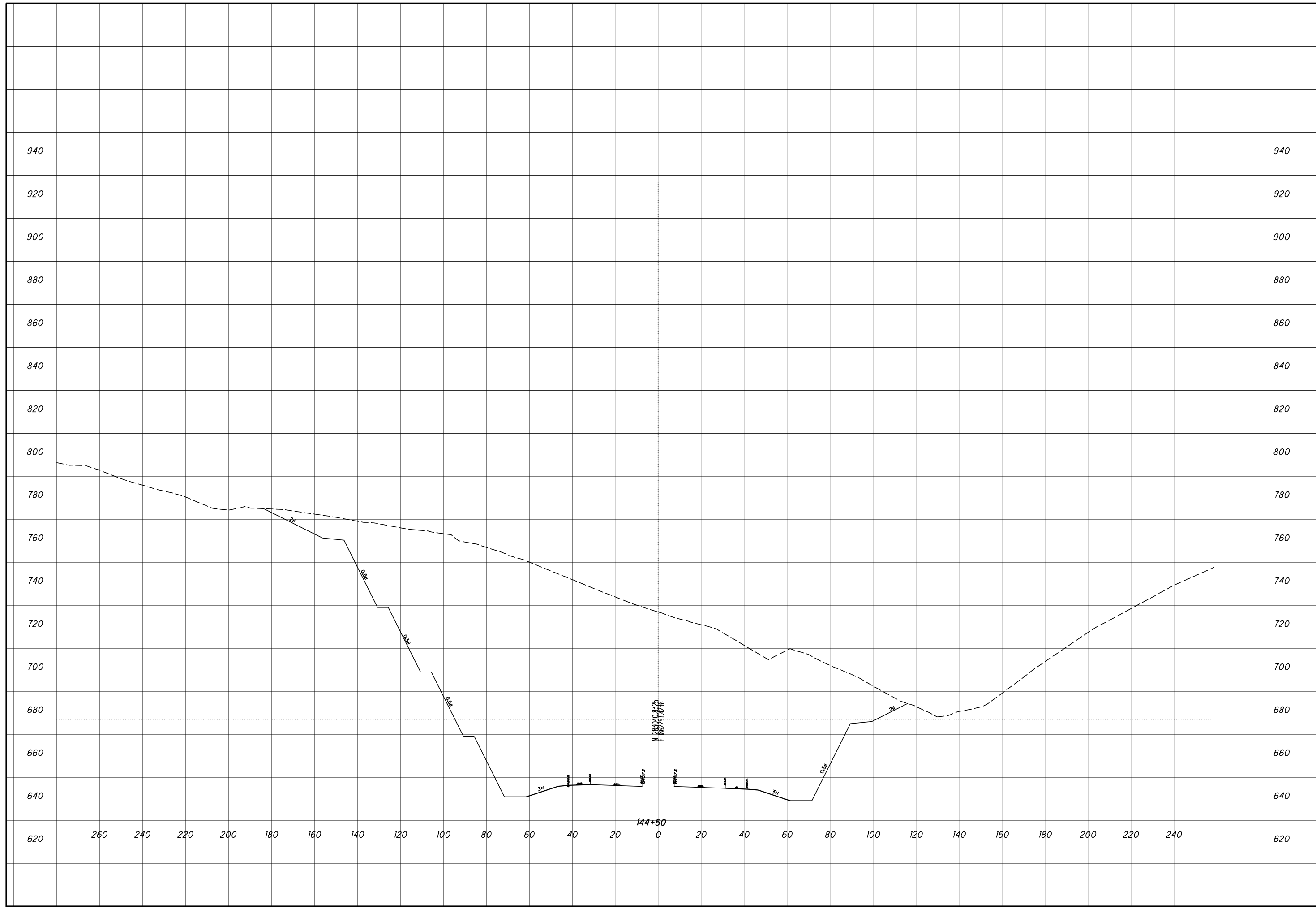
SCI-823-0.00



CHECKED

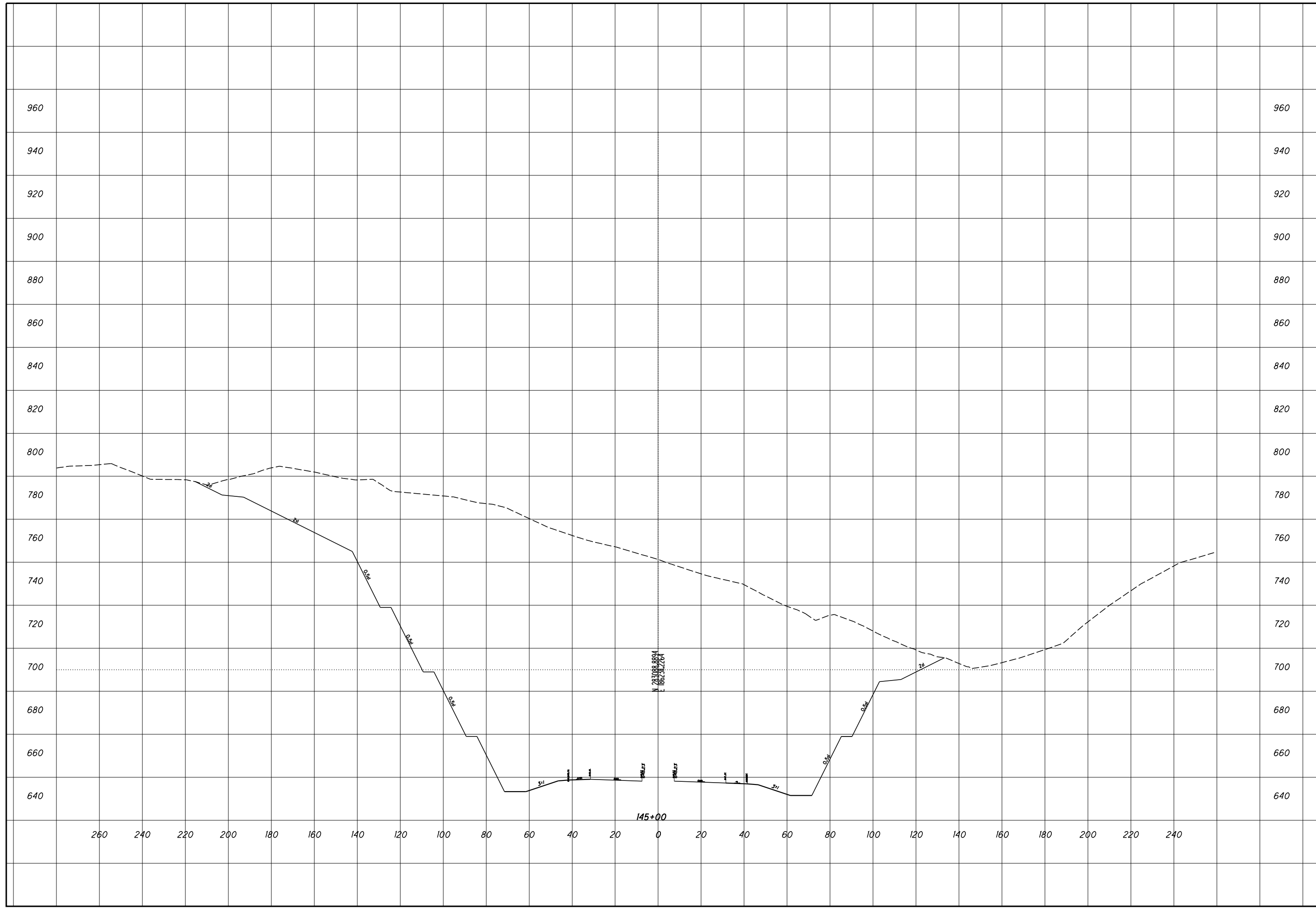
**ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 144+50**

SCI-823-0.00



ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 145+00

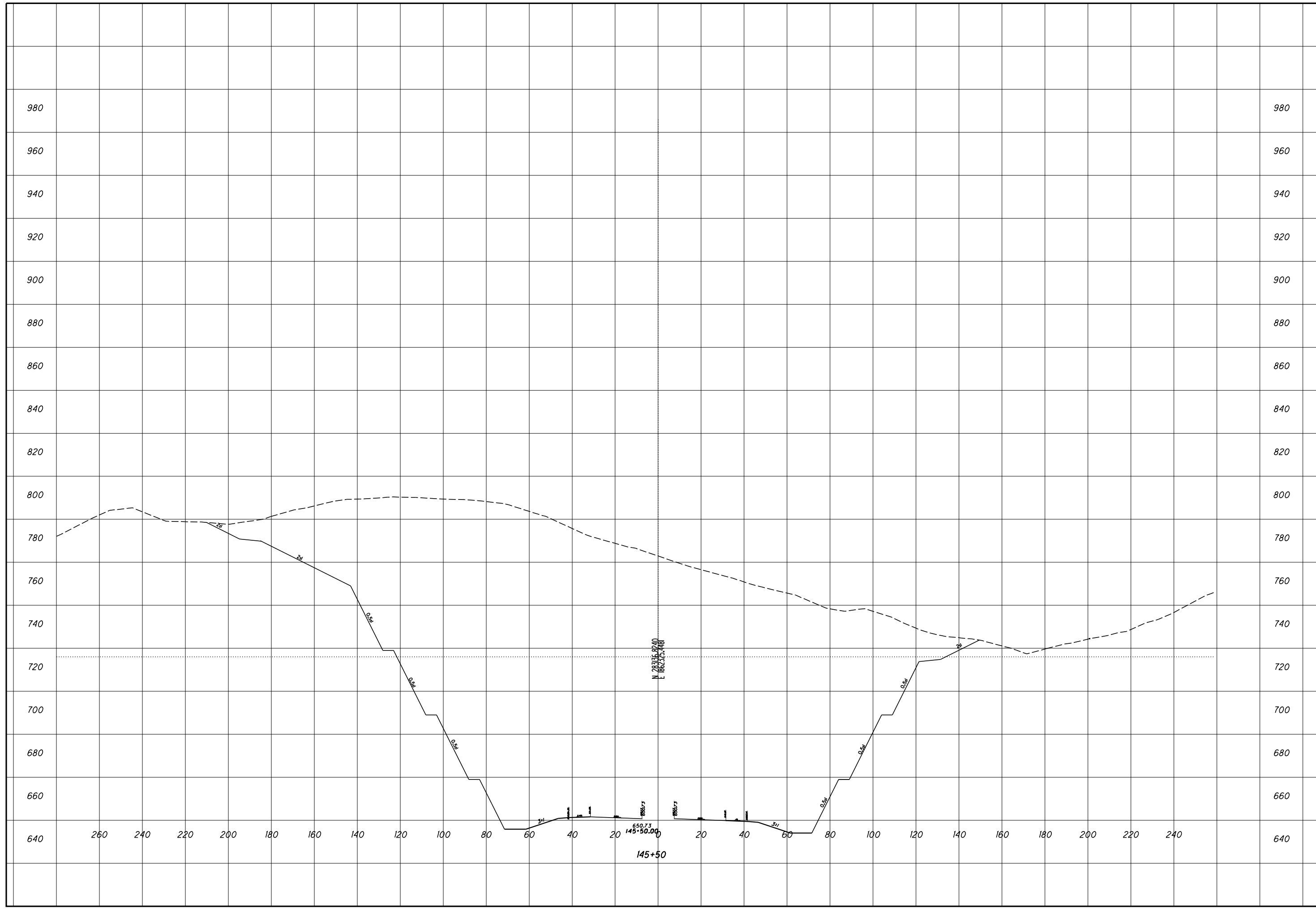
SCI-823-0.00

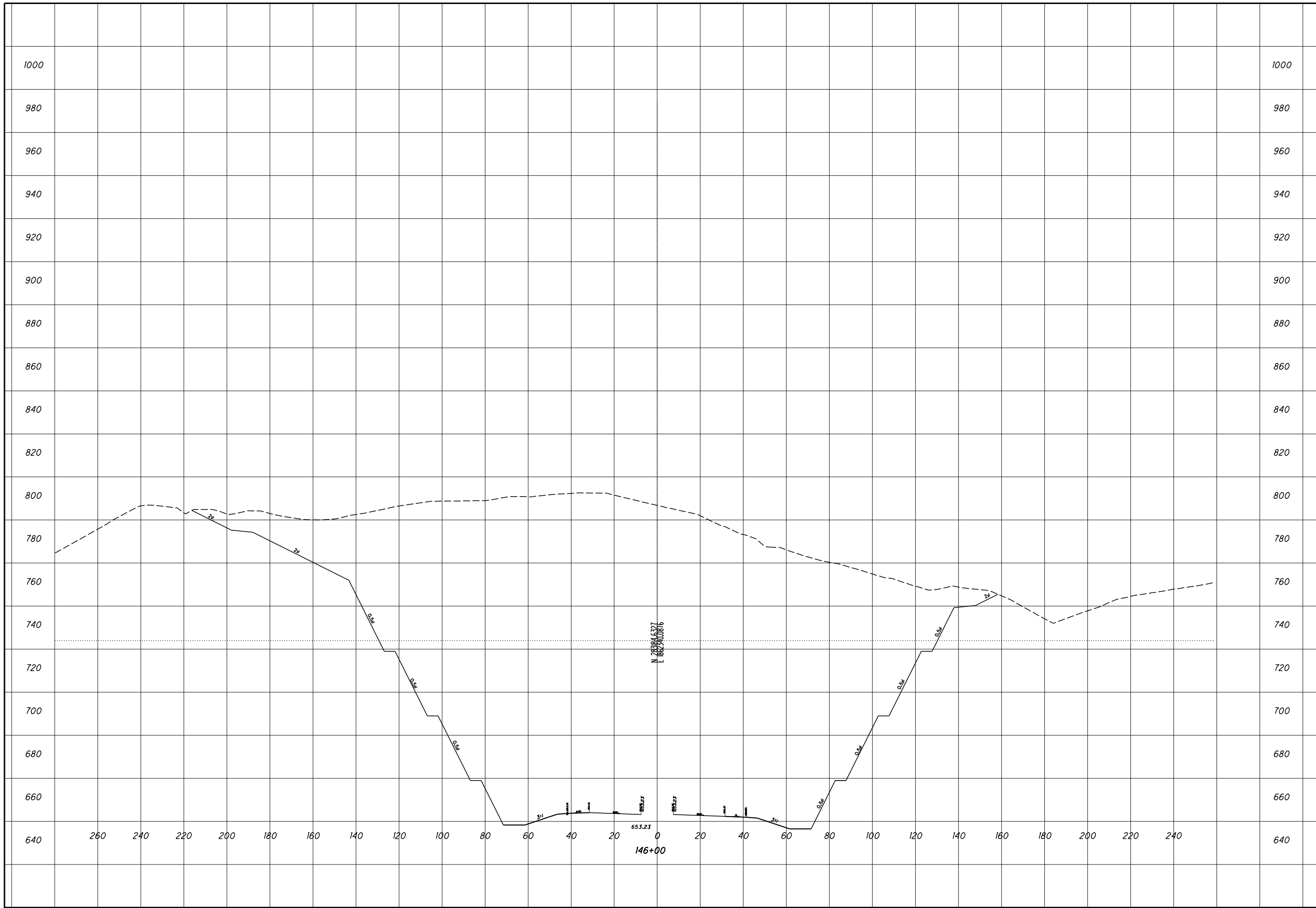


CHECKED

**ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 145+50**

SCI-823-0.00





ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 146+00

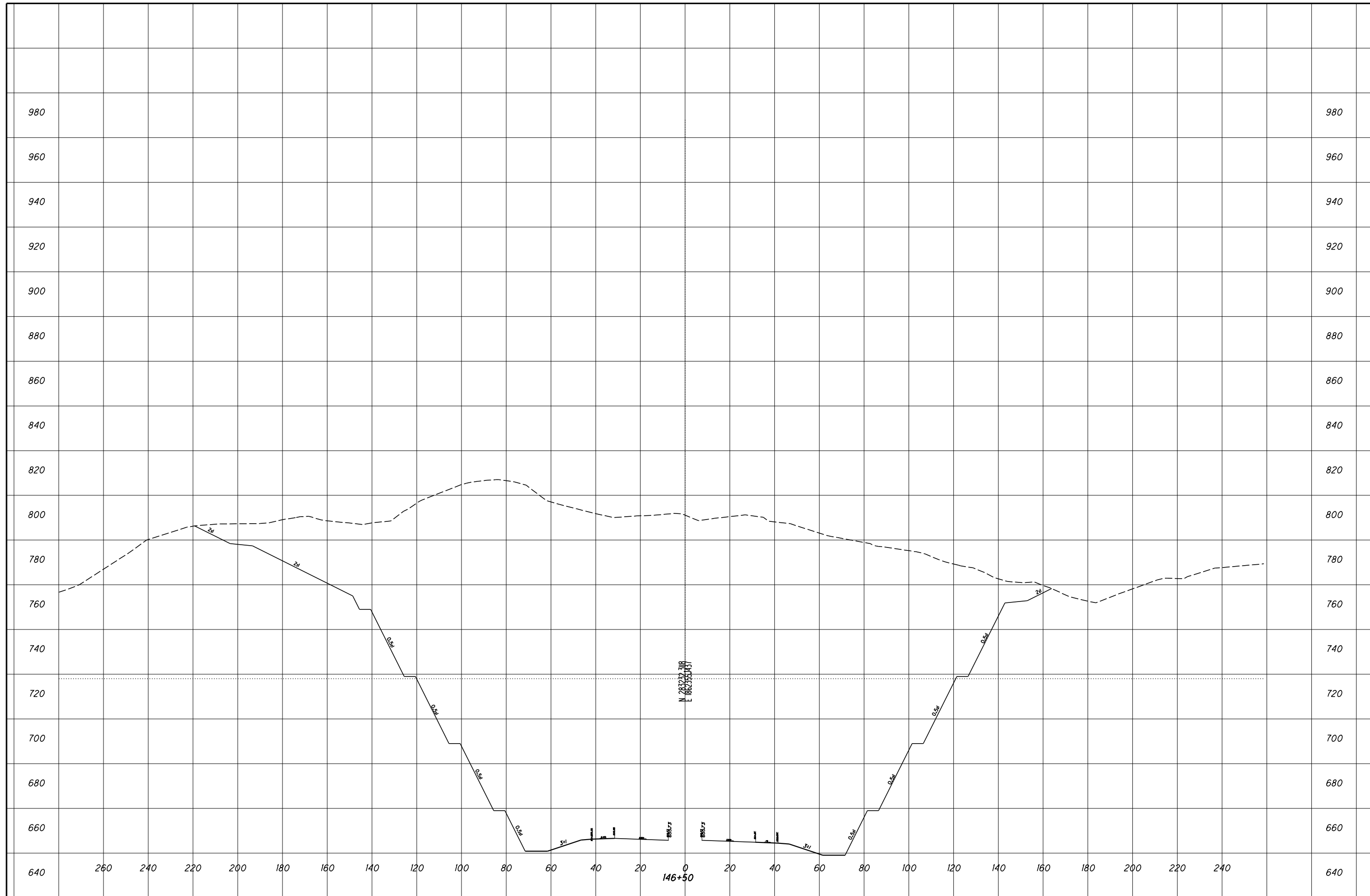
SCI-823-0.00

15
69

CHECKED

**ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 146+50**

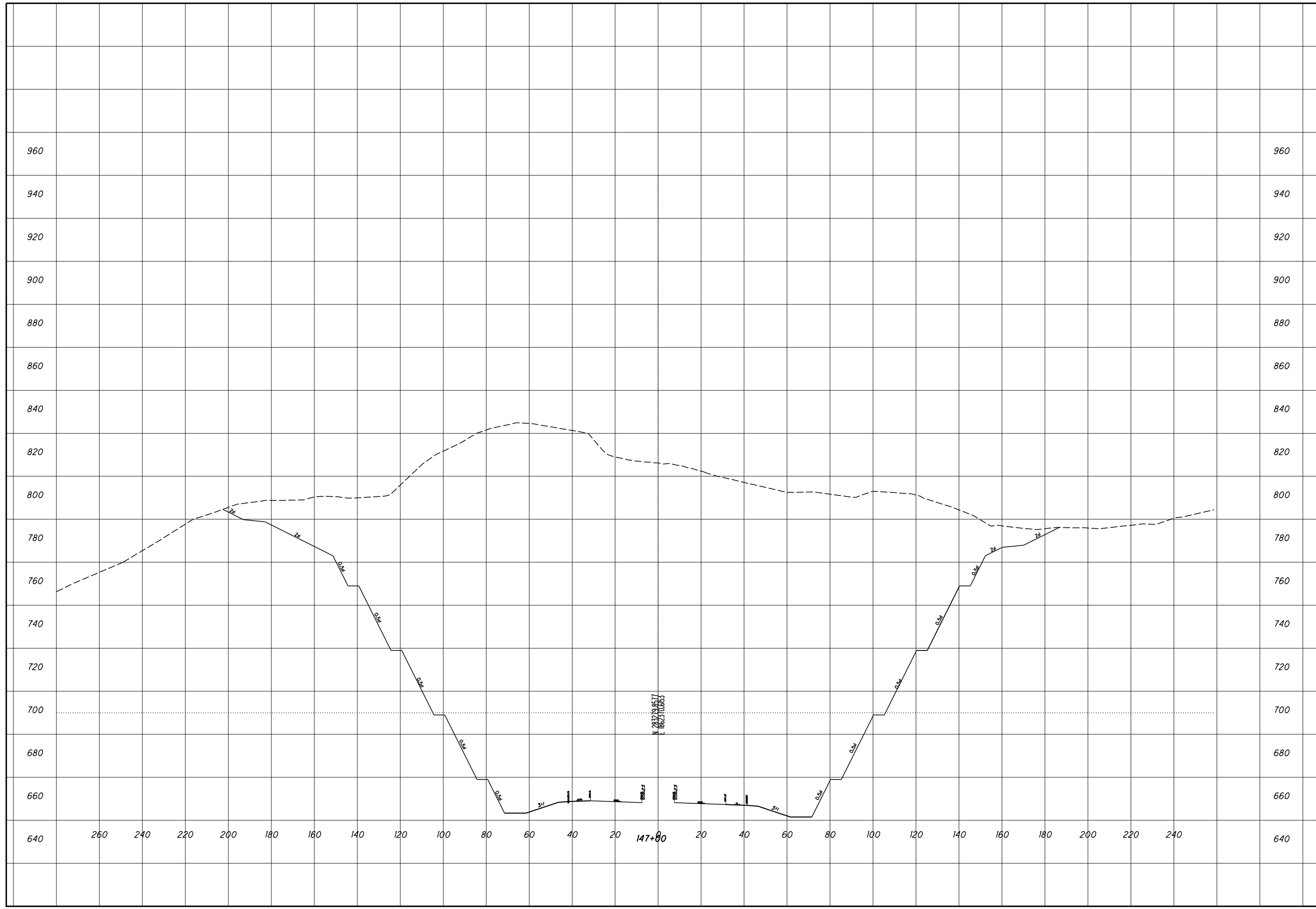
SCI-823-0.00



CHECKED

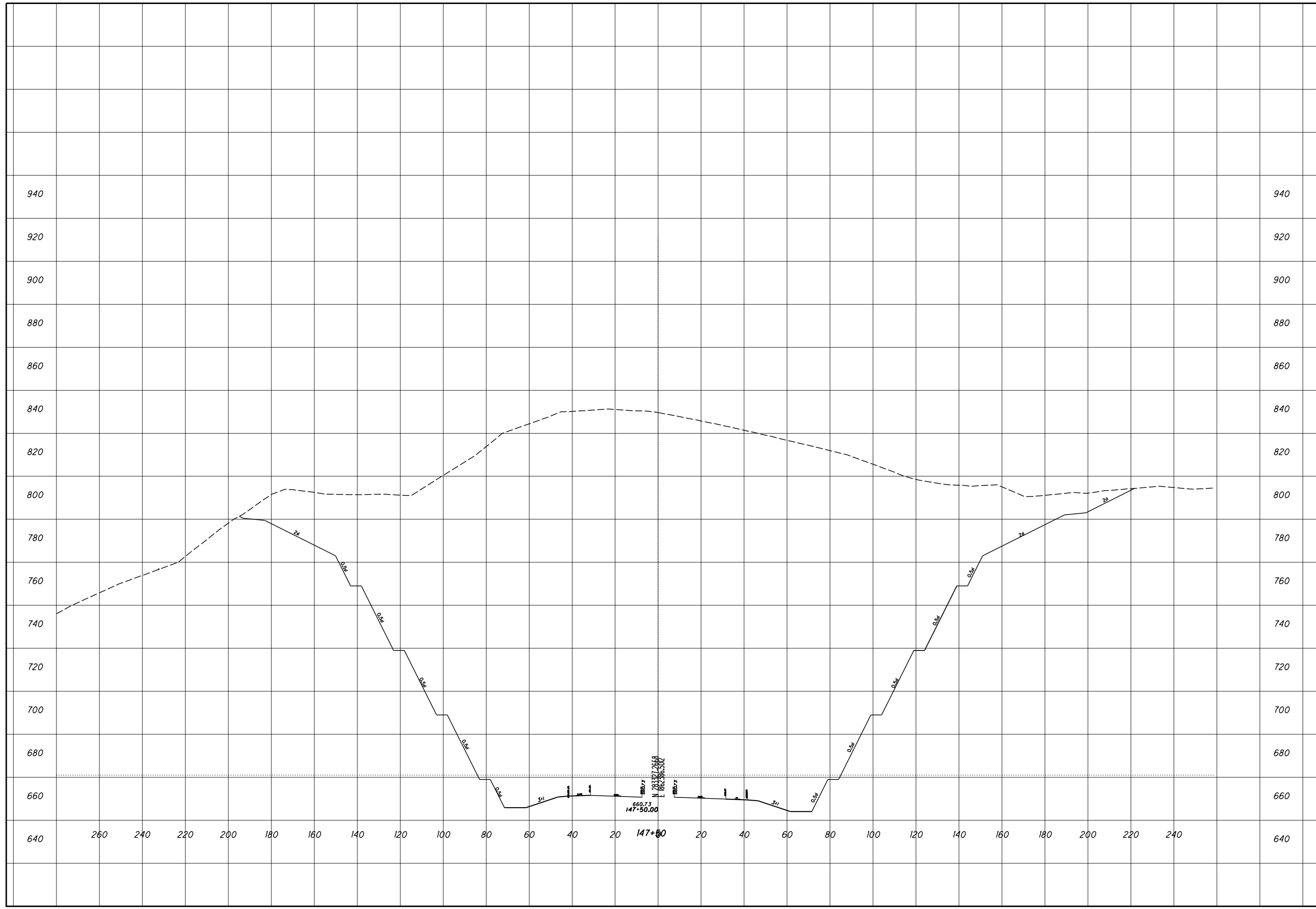
**ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 147+00**

SCI-823-0.00



ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 147+50

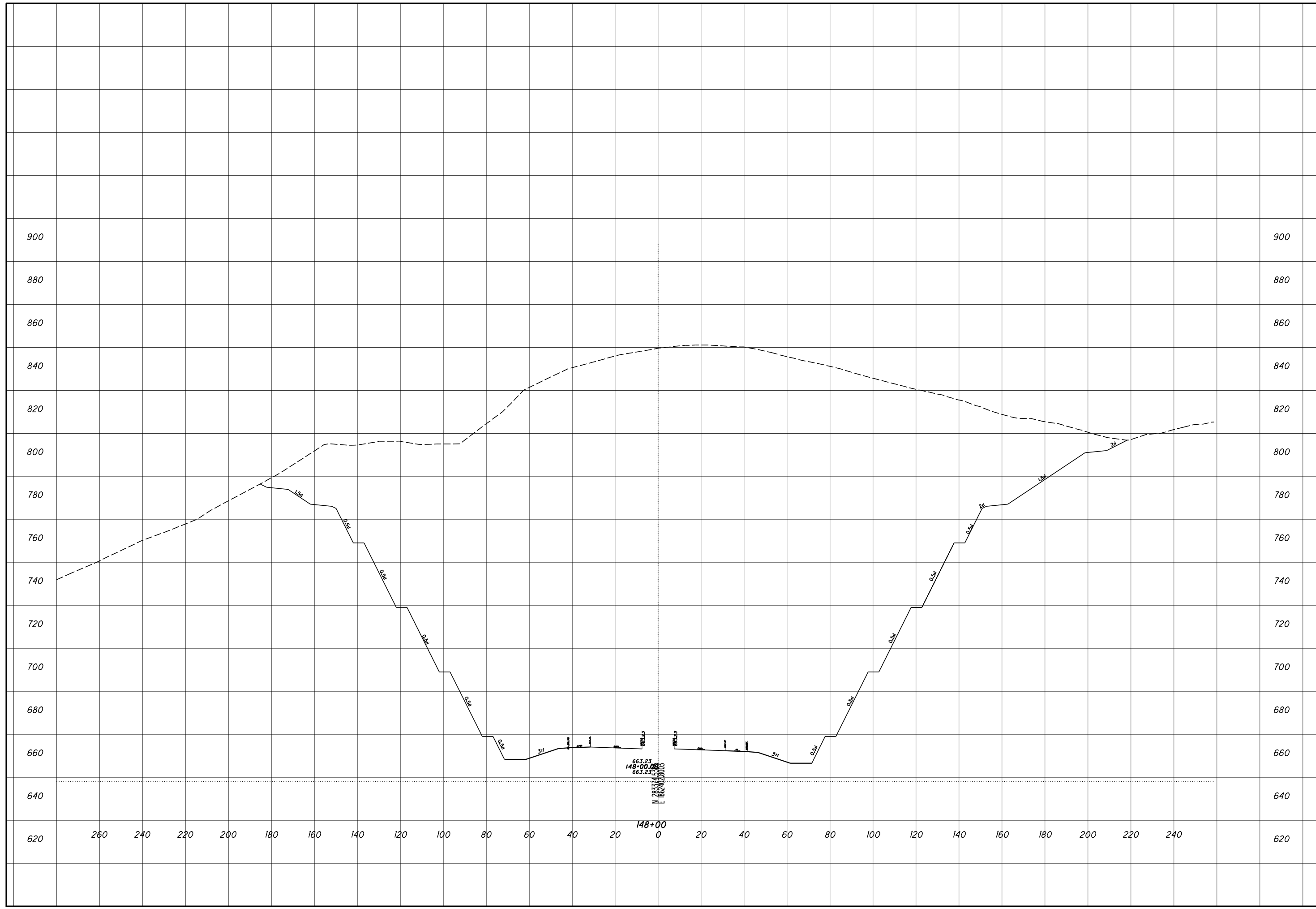
SCI-823-0.00

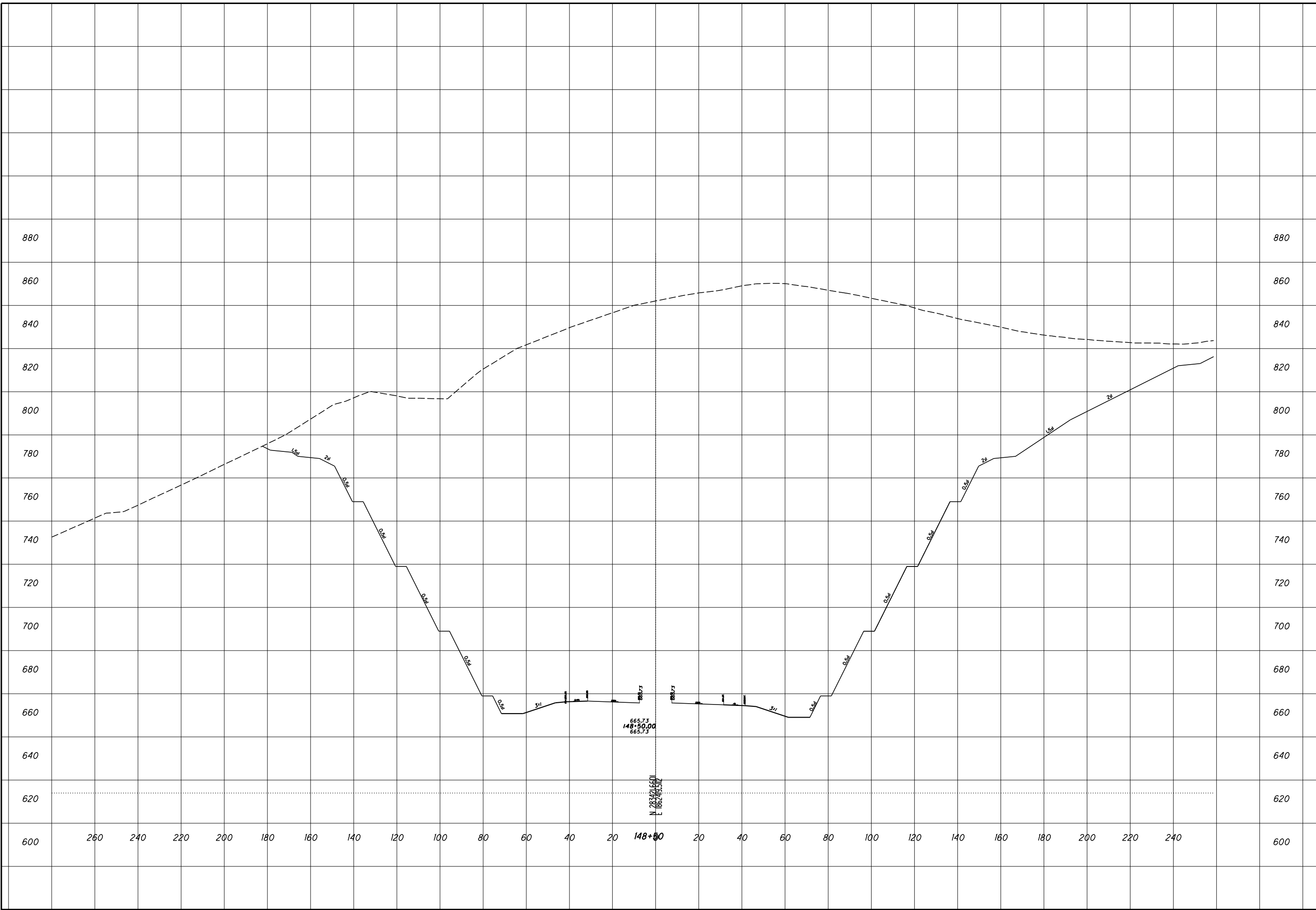


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ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 148+00

SCI-823-0.00



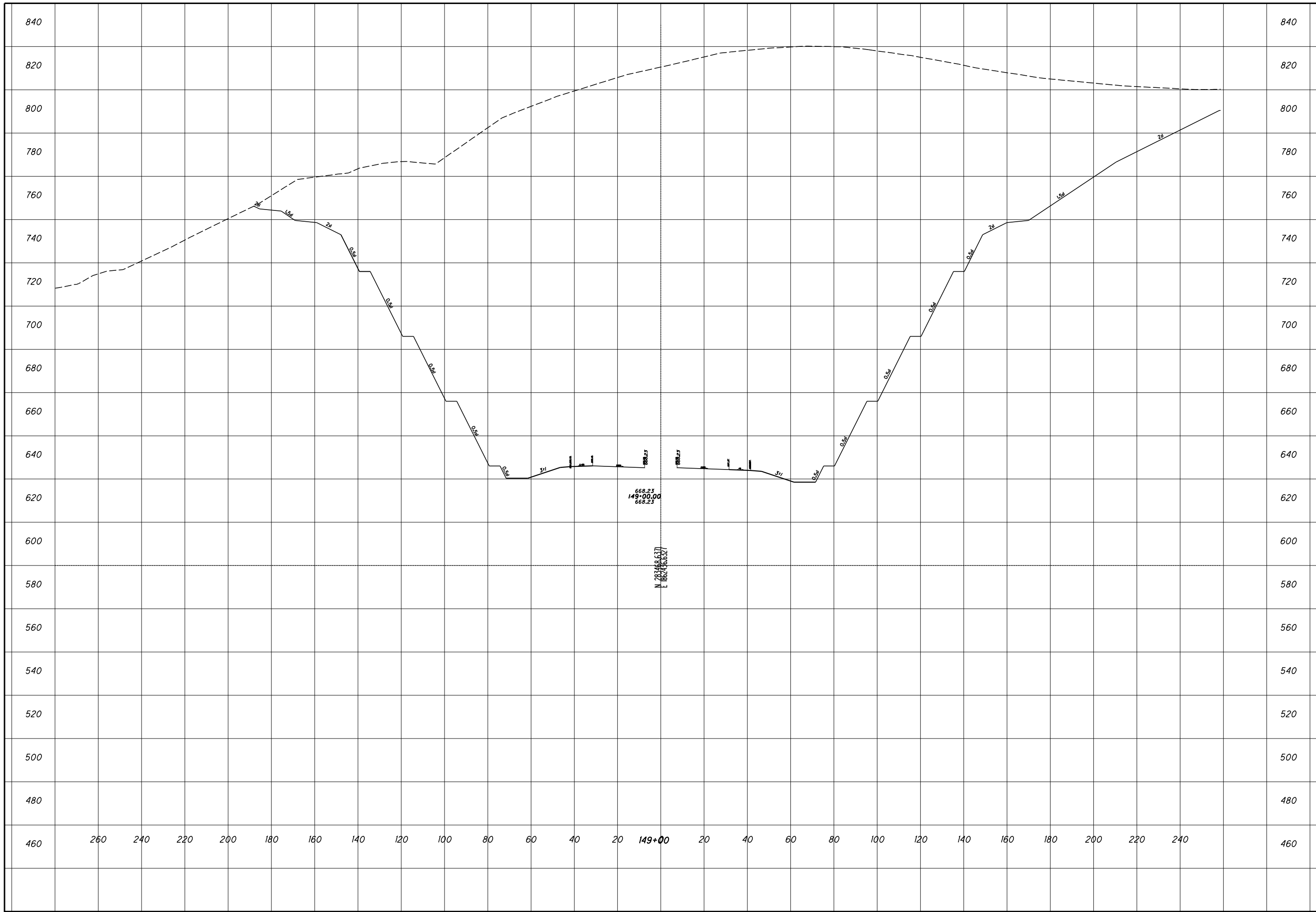


ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 148+50

SCI-823-0.00

20
69

CHECKED

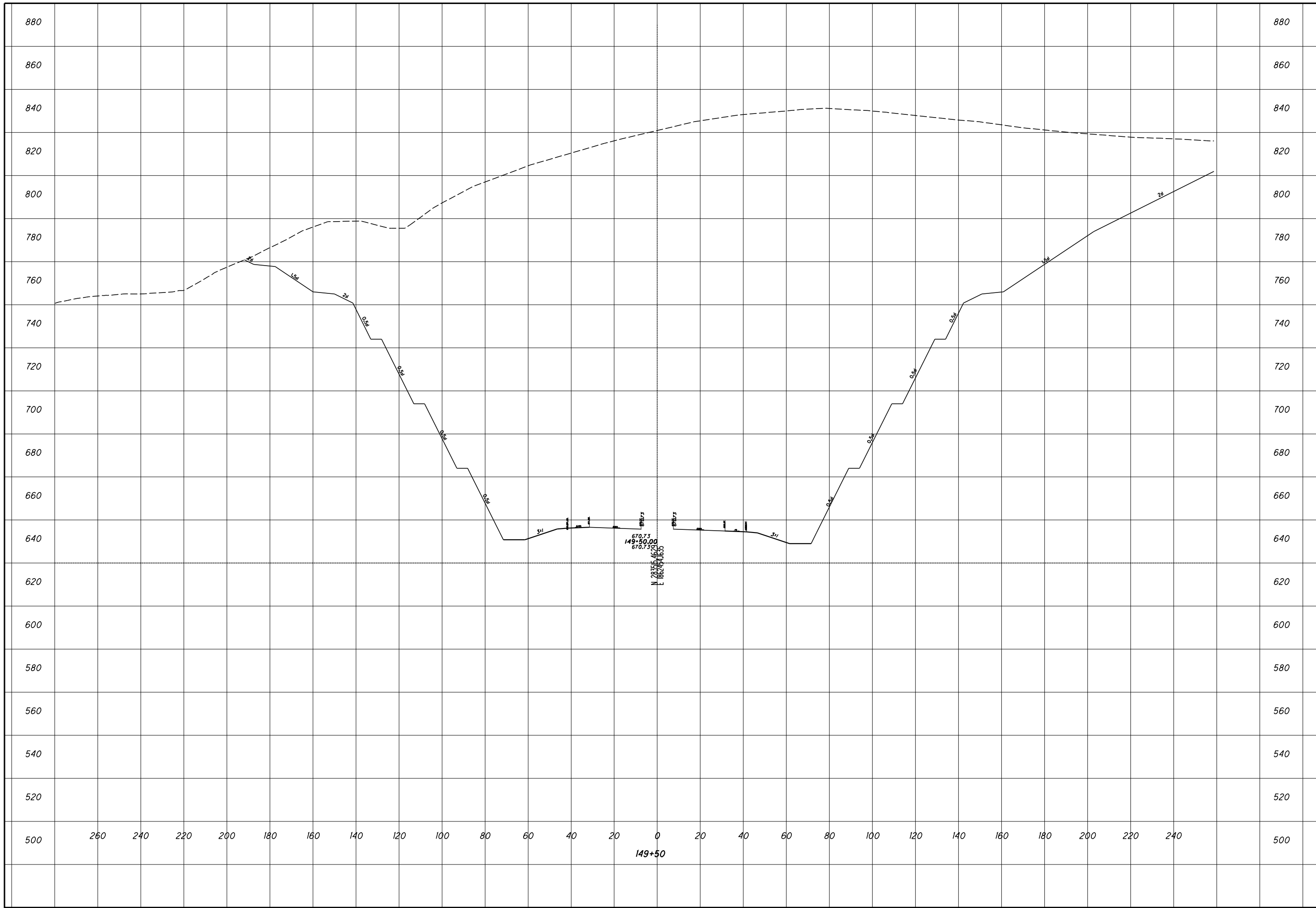


ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 149+00

SCI-823-0.00

21
69

CHECKED



ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 149+50

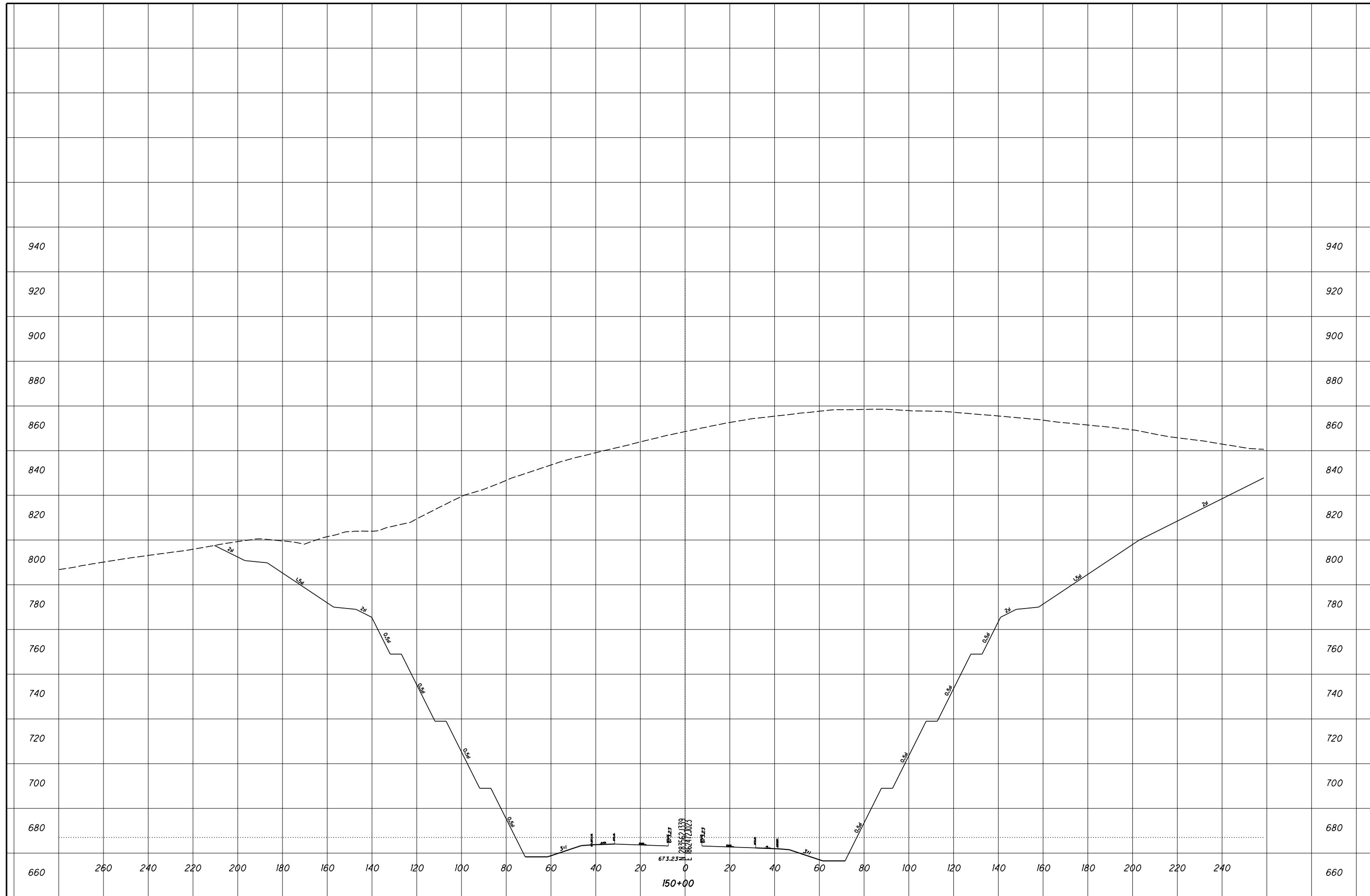
SCI-823-0.00

22
69

CHECKED

ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 150+00

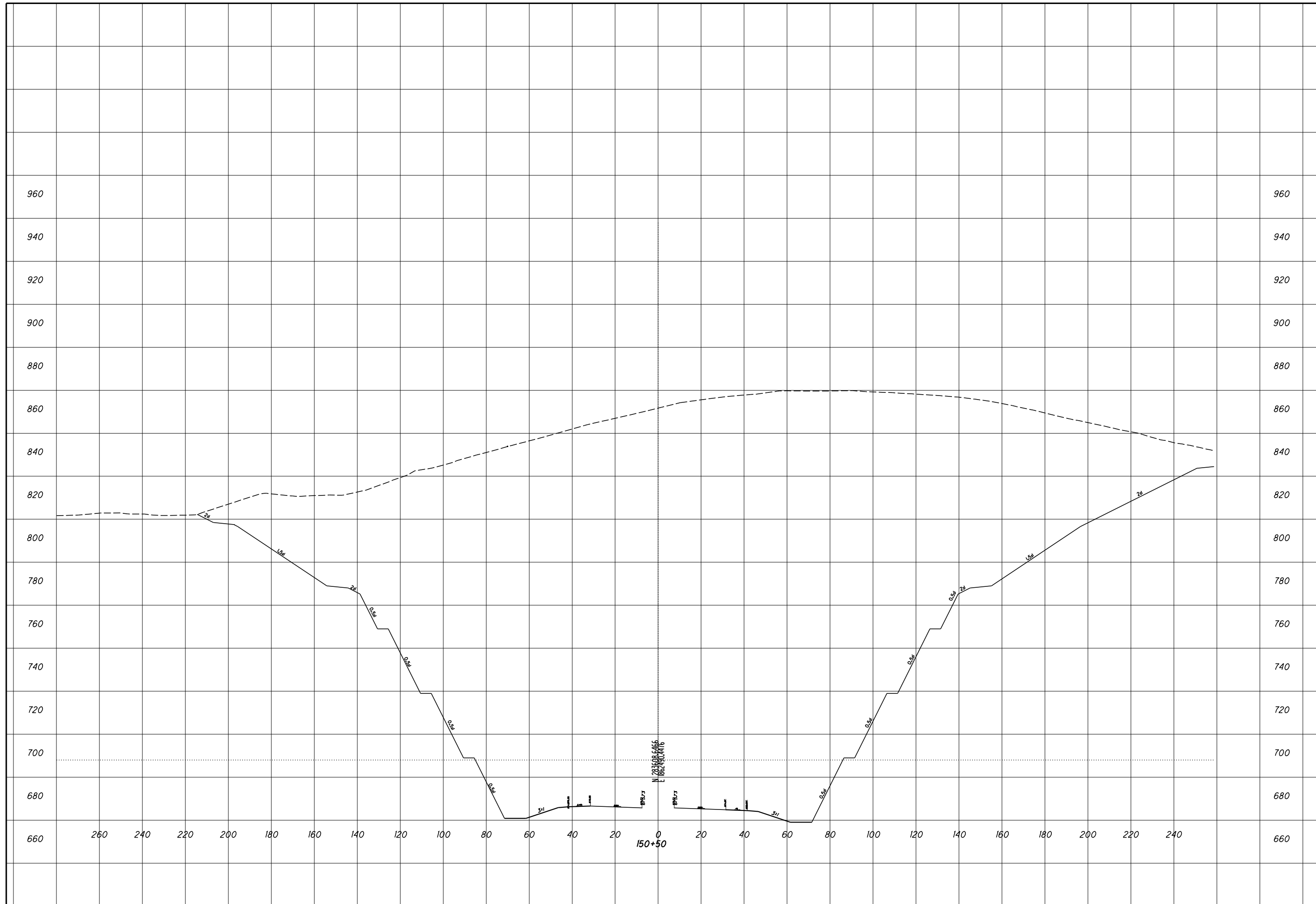
SCI-823-0.00



CHECKED

**ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 150+50**

SCI-823-0.00



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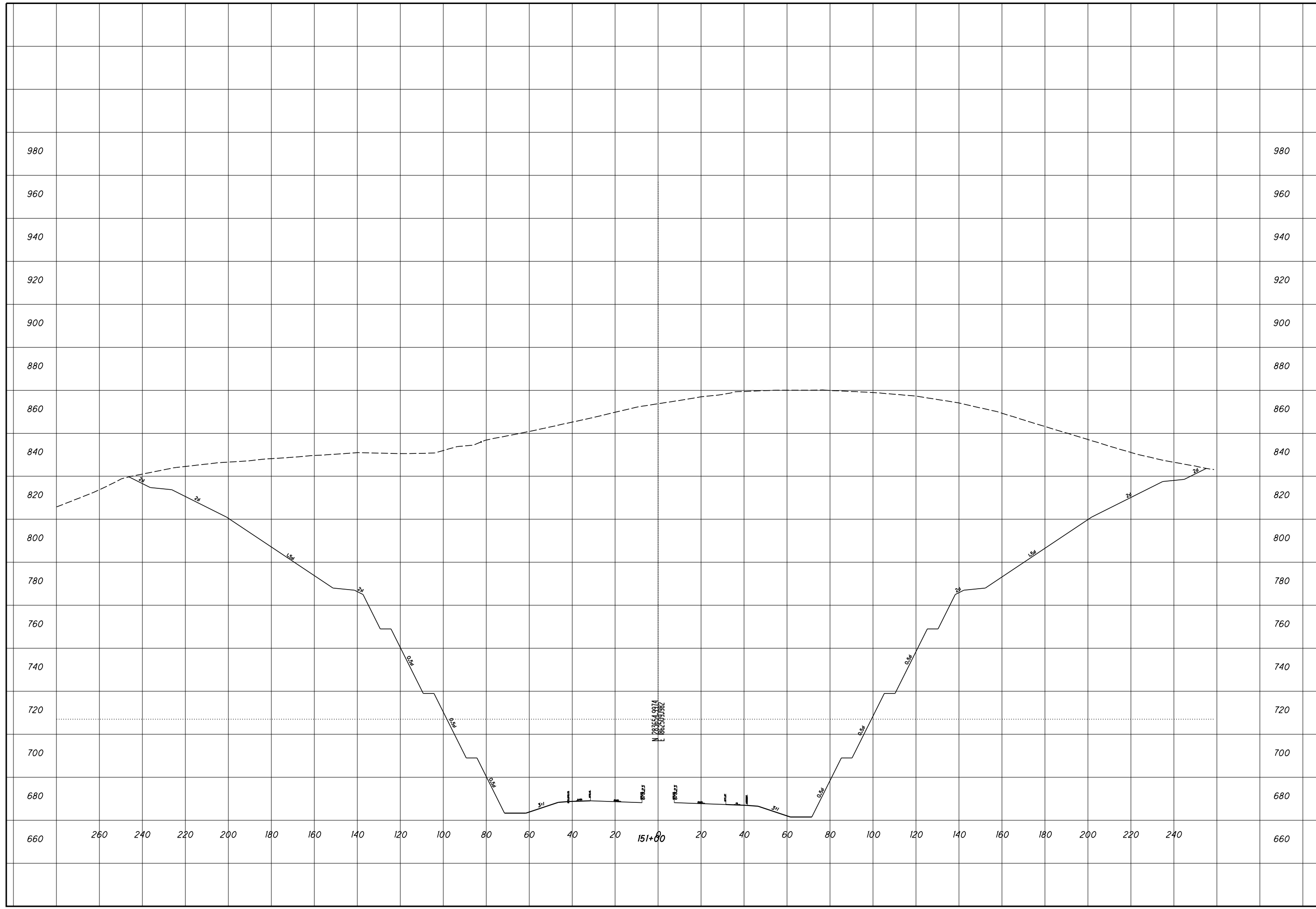
960
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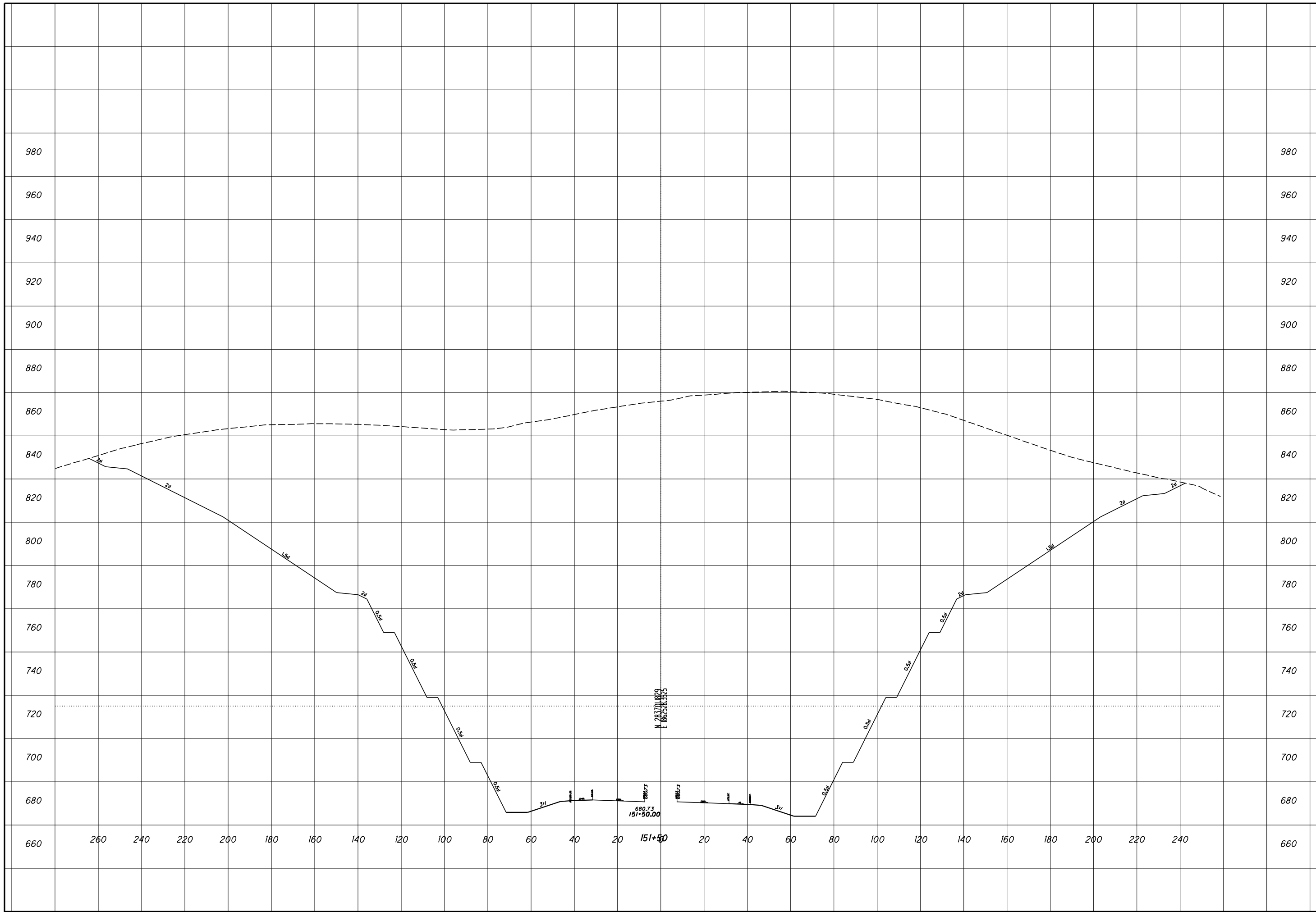
260 240 220 200 180 160 140 120 100 80 60 40 20 0 150+50 20 40 60 80 100 120 140 160 180 200 220 240

CHECKED

**ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 151+00**

SCI-823-0.00

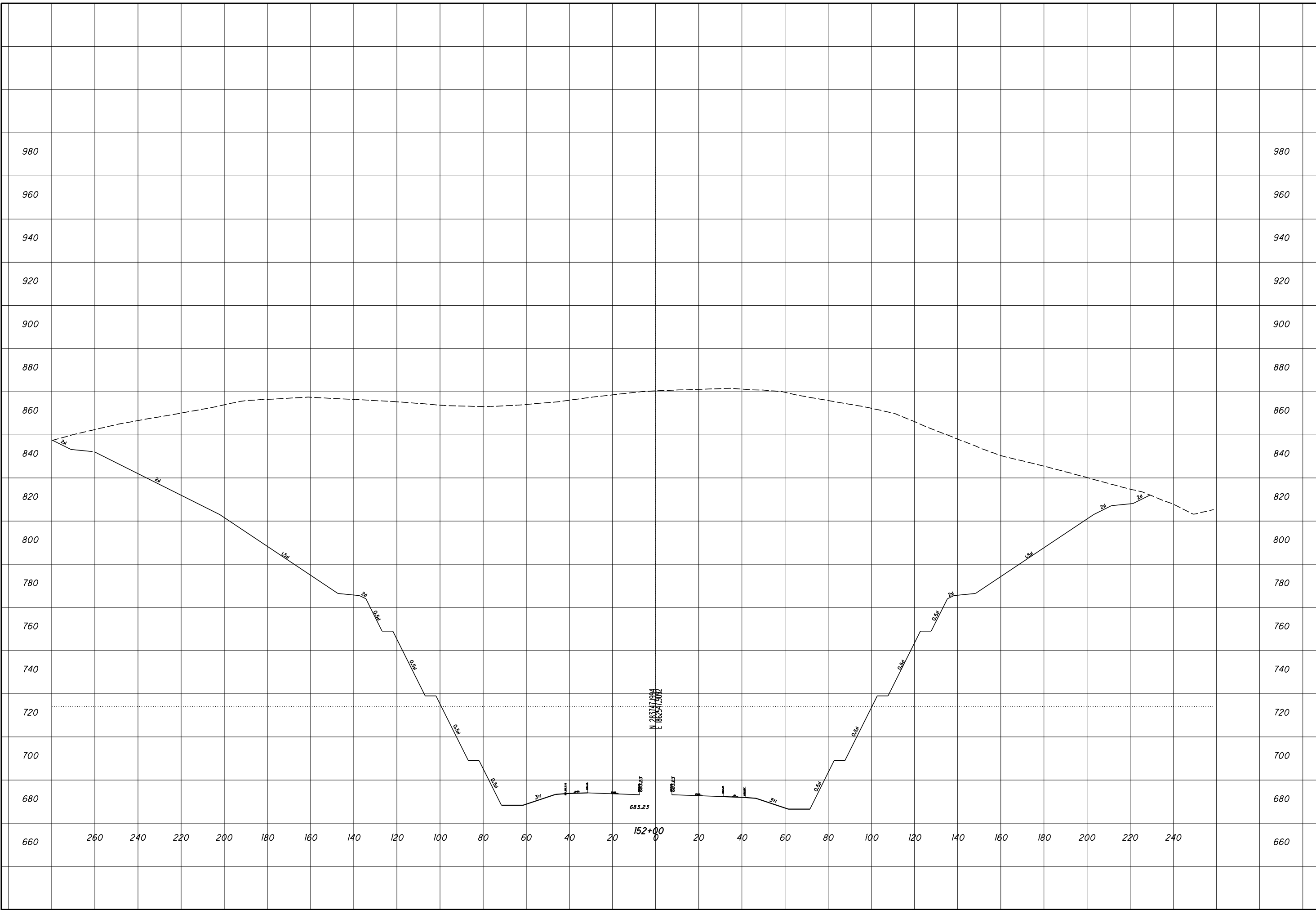




ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 151+50

SCI-823-0.00

CHECKED

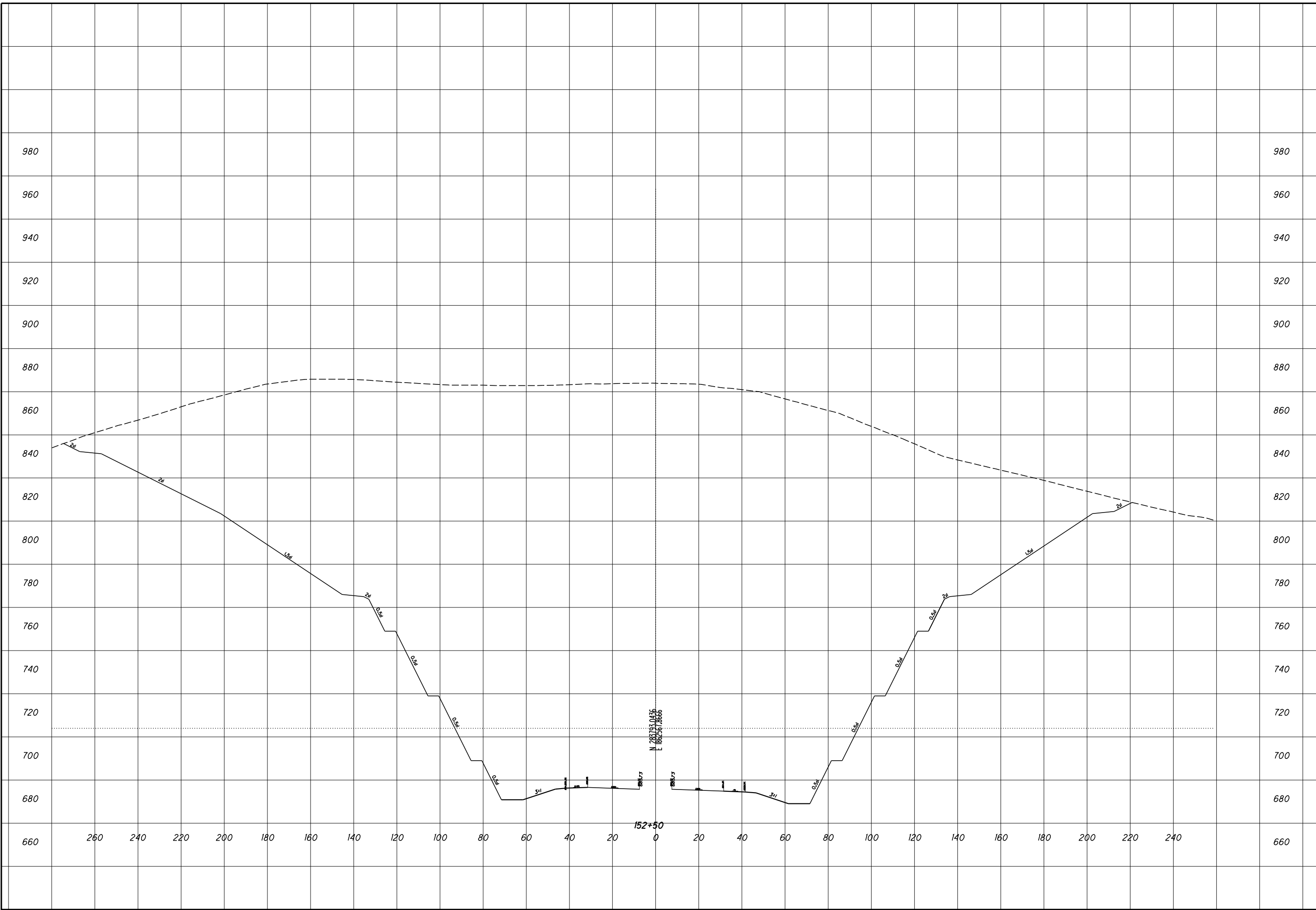


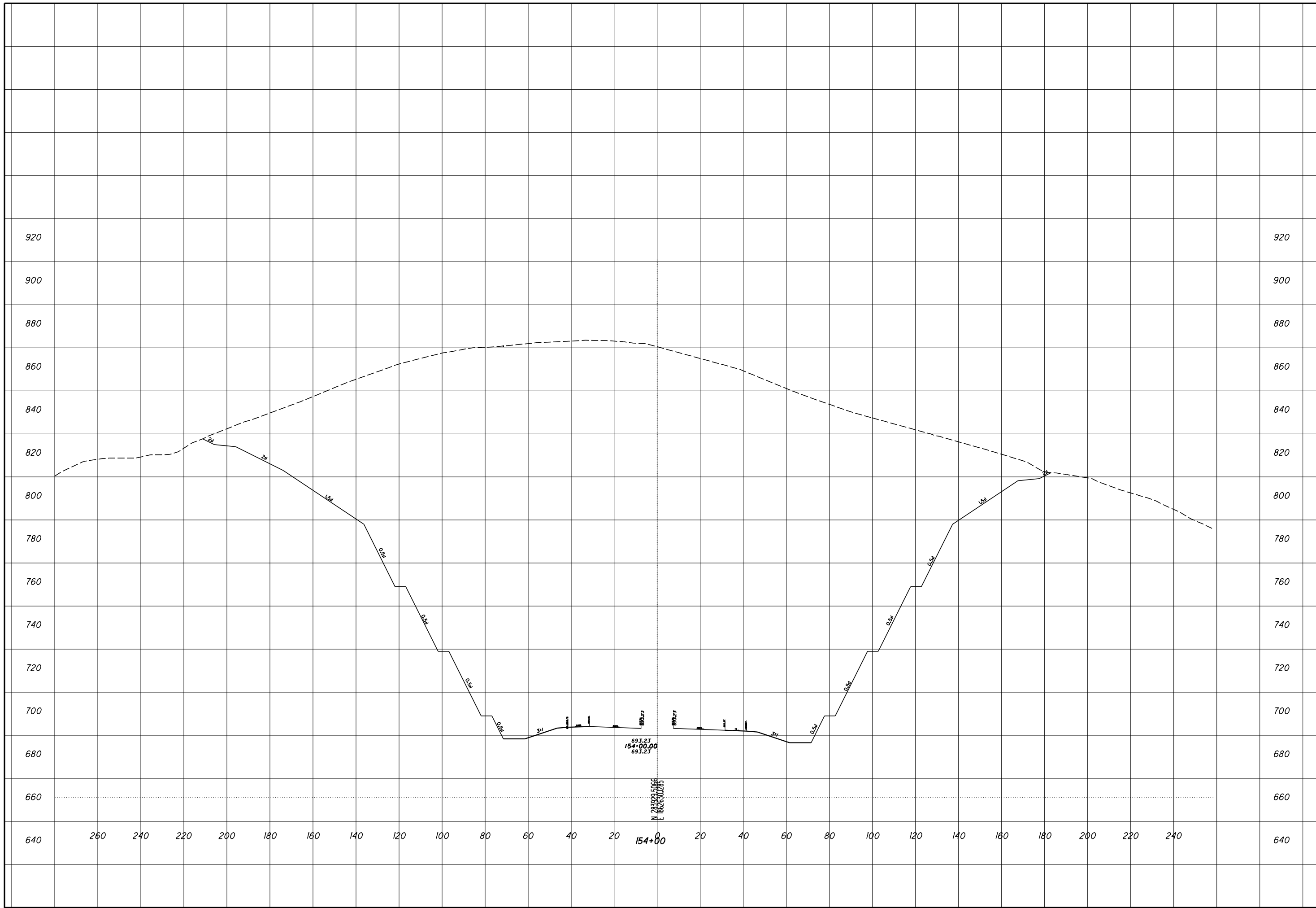
ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 152+00

SCI-823-0.00

27
69

CHECKED



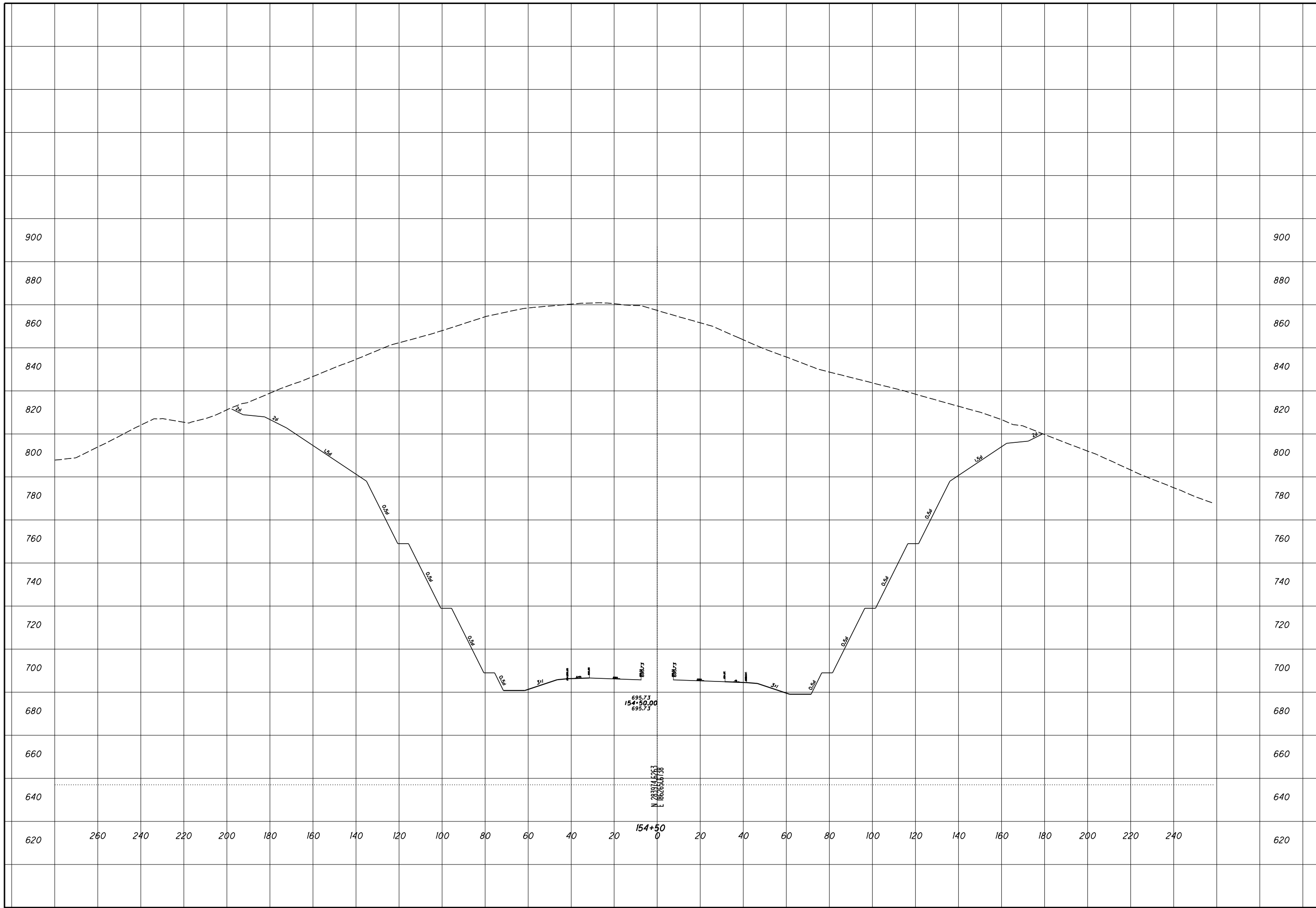


ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 154+00

SCI-823-0.00

31
 69

CHECKED



ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 154+50

SCI-823-0.00

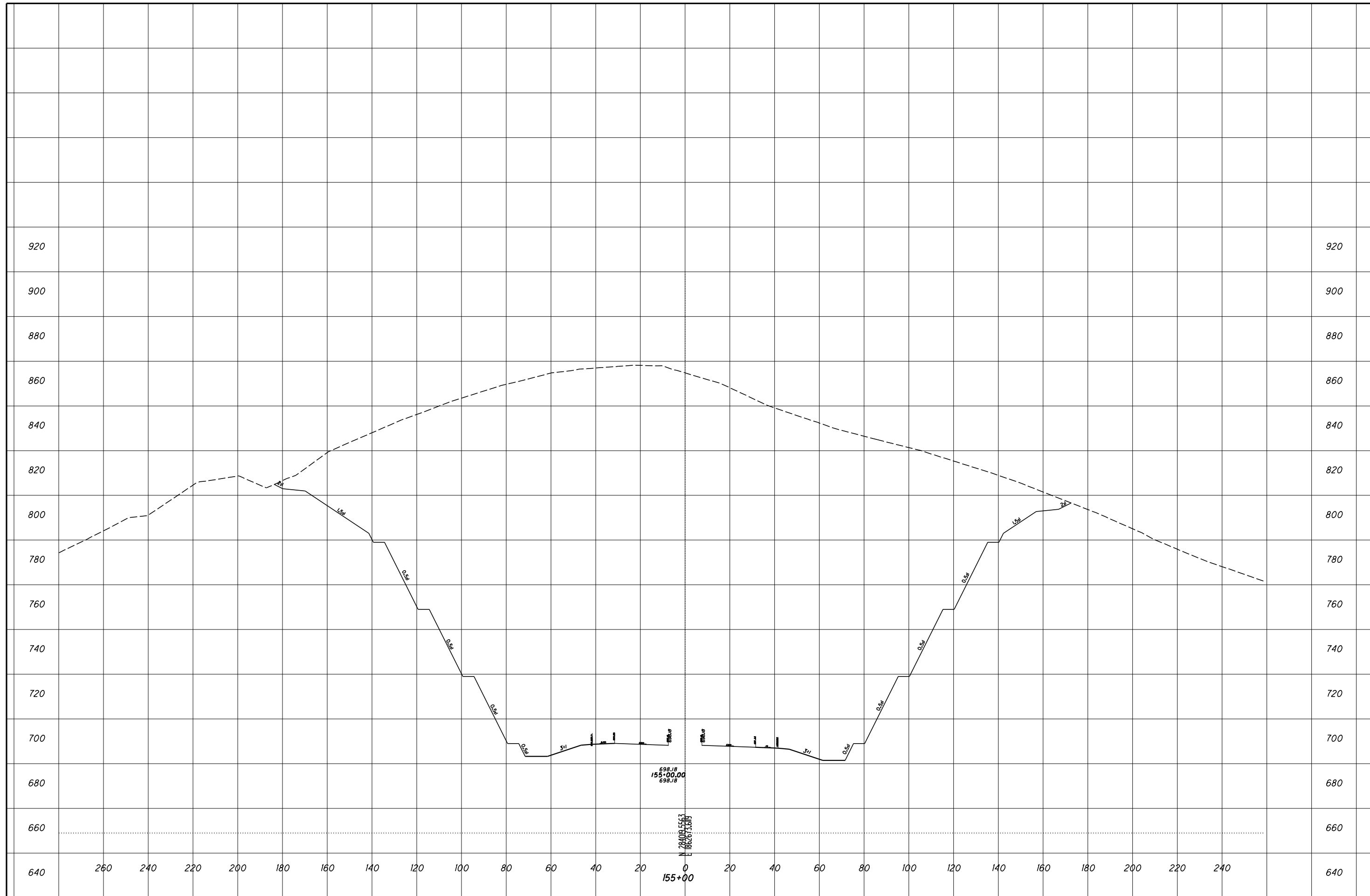
32
69

CHECKED

CHECKED

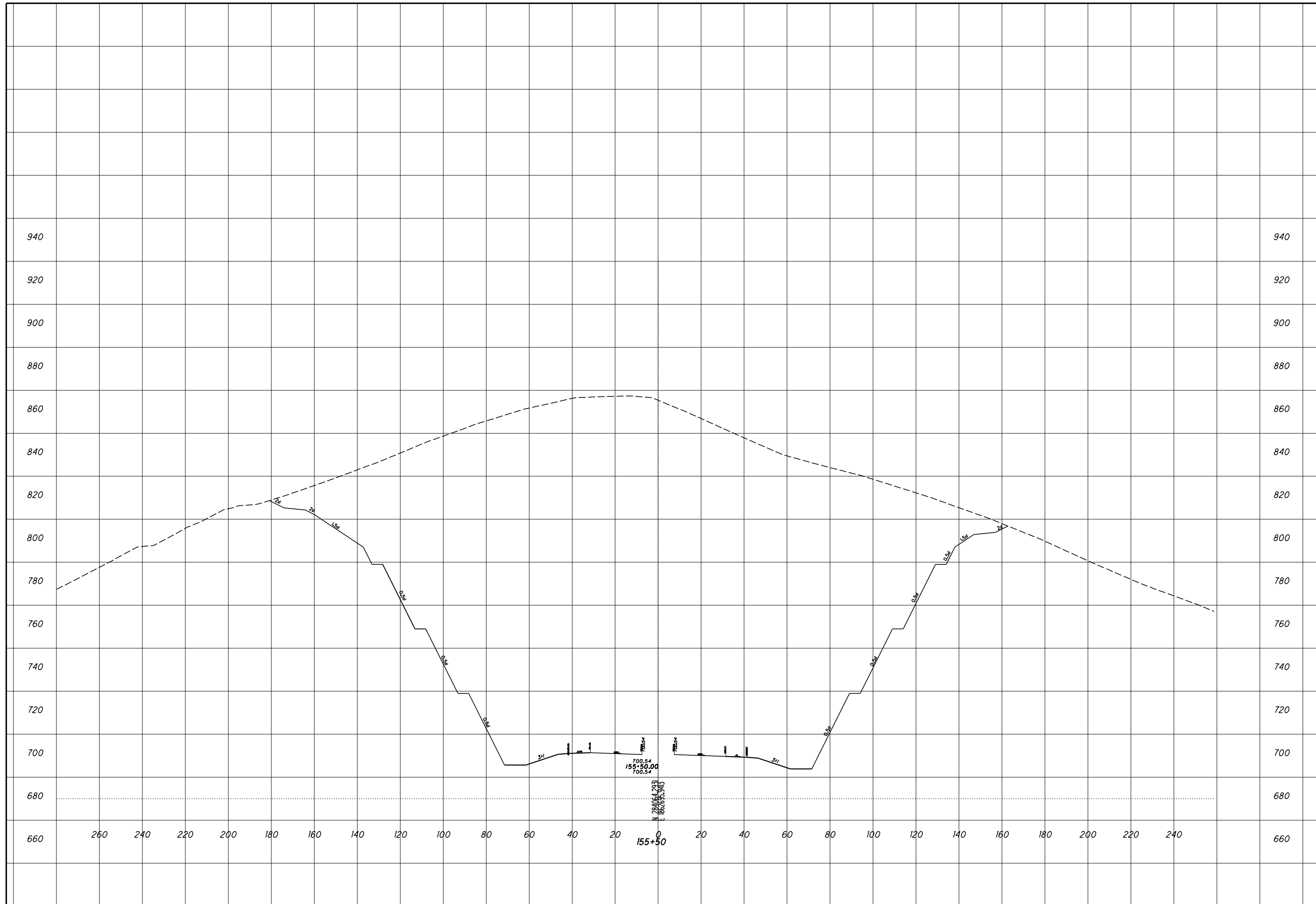
**ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 155+00**

SCI-823-0.00



ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 155+50

SCI-823-0.00



940
920
900
880
860
840
820
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780
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740
720
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660

940
920
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680
660

260 240 220 200 180 160 140 120 100 80 60 40 20 0 20 40 60 80 100 120 140 160 180 200 220 240

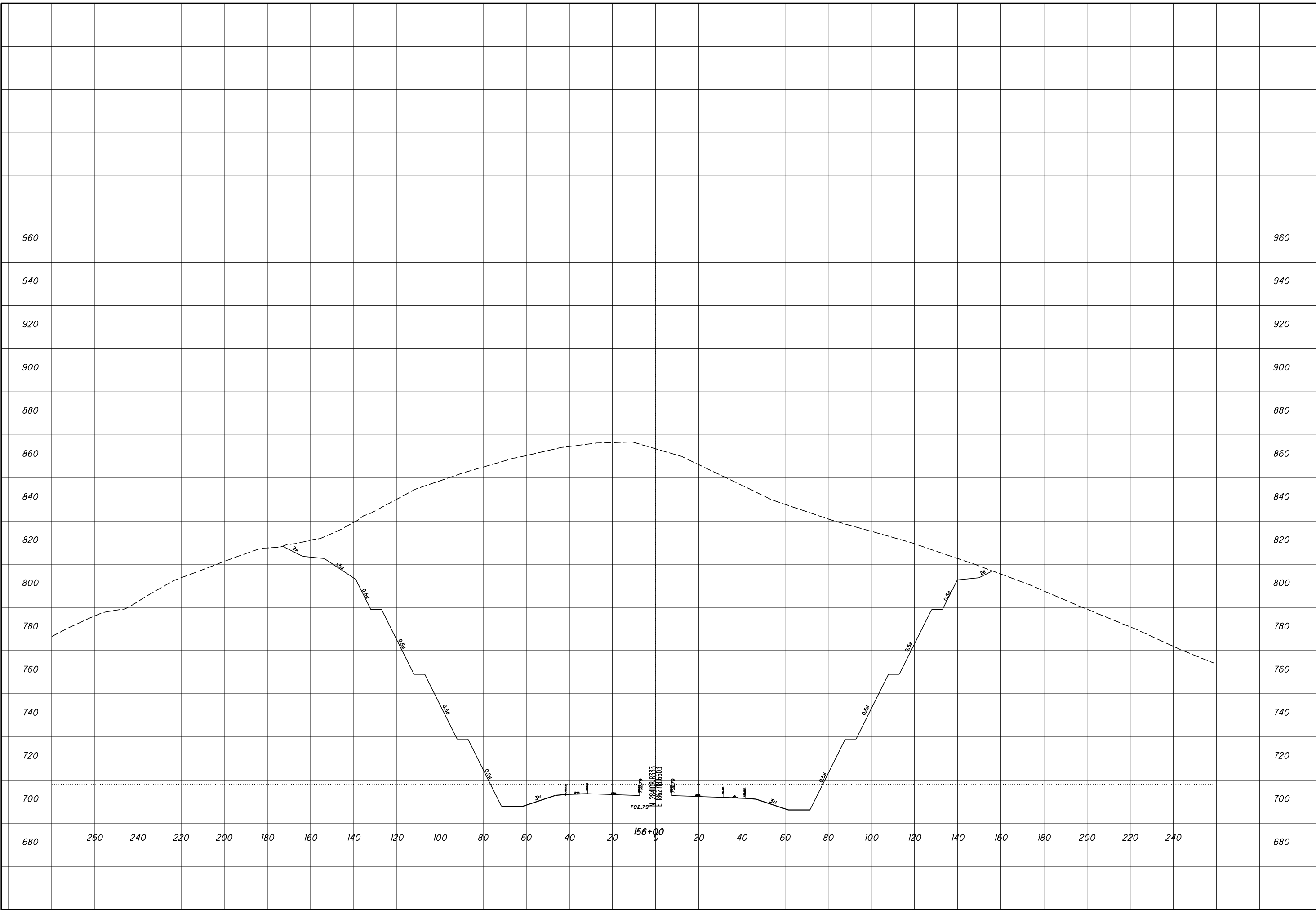
700.54
155+50.00
700.54

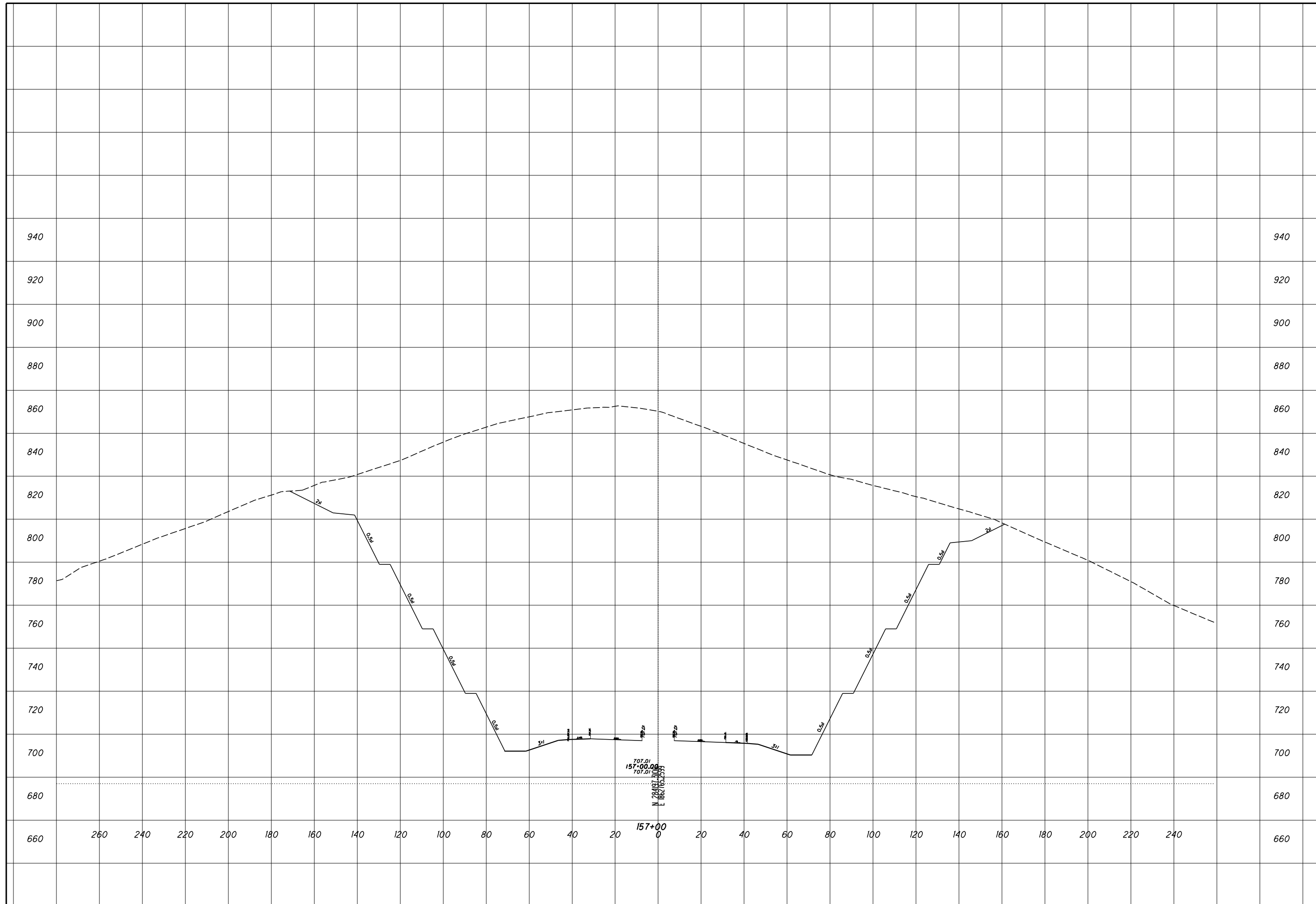
N 28°06'23" E
186.295943

155+50

ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 156+00

SCI-823-0.00





SCIENCE

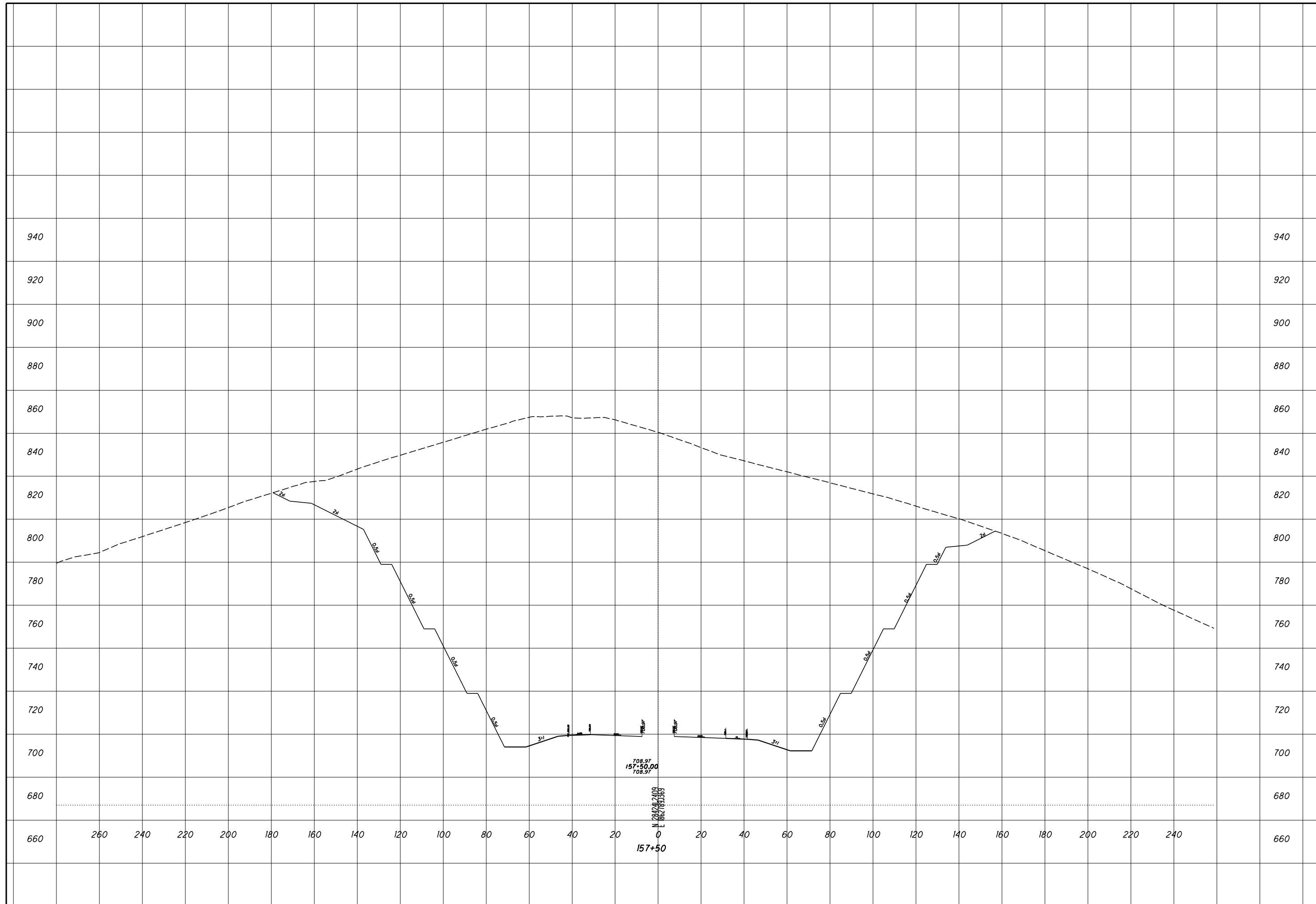
ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 157+00

37
69

CHECKED

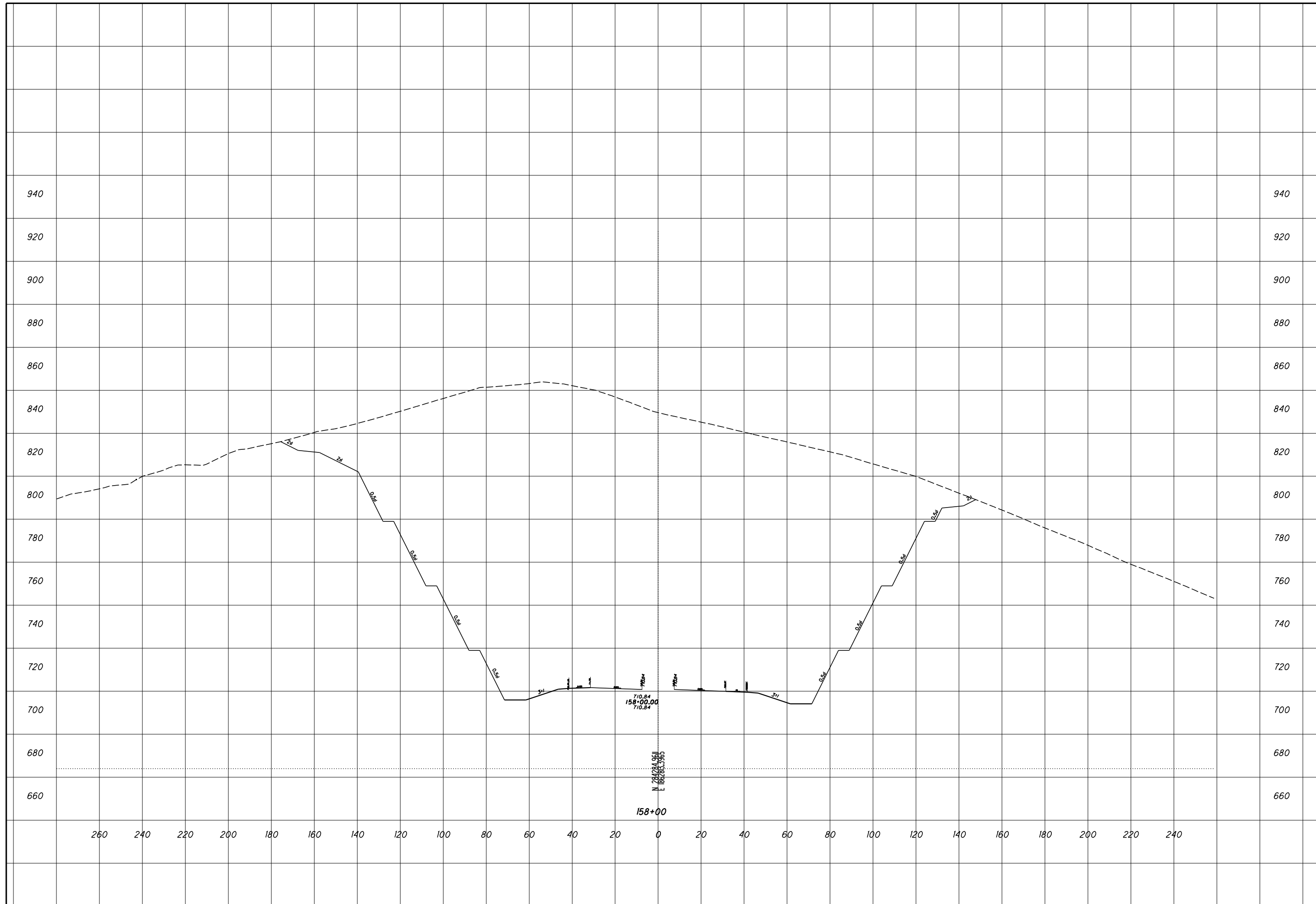
ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 157+50

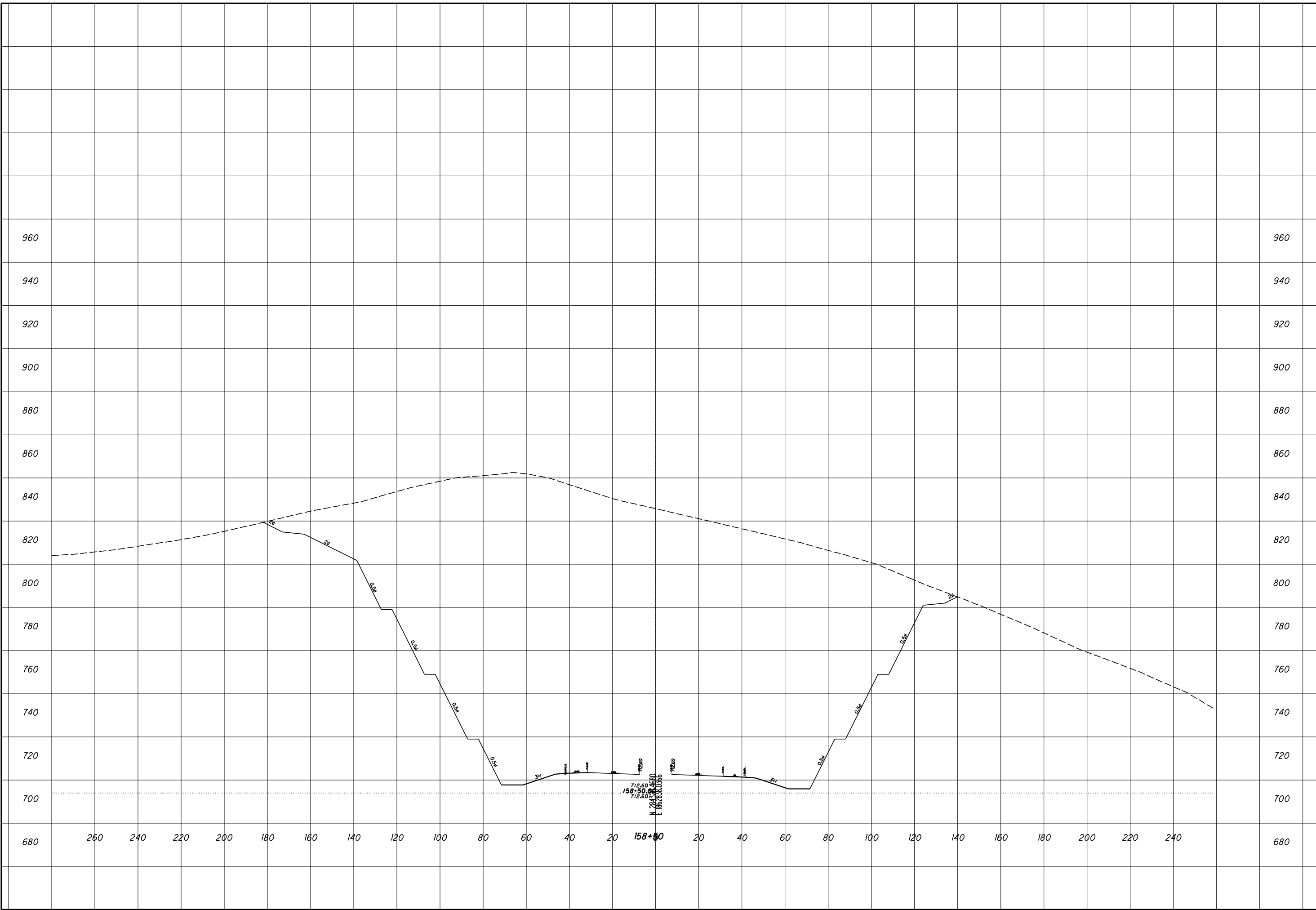
SCI-823-0.00



ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 158+00

SCI-823-0.00





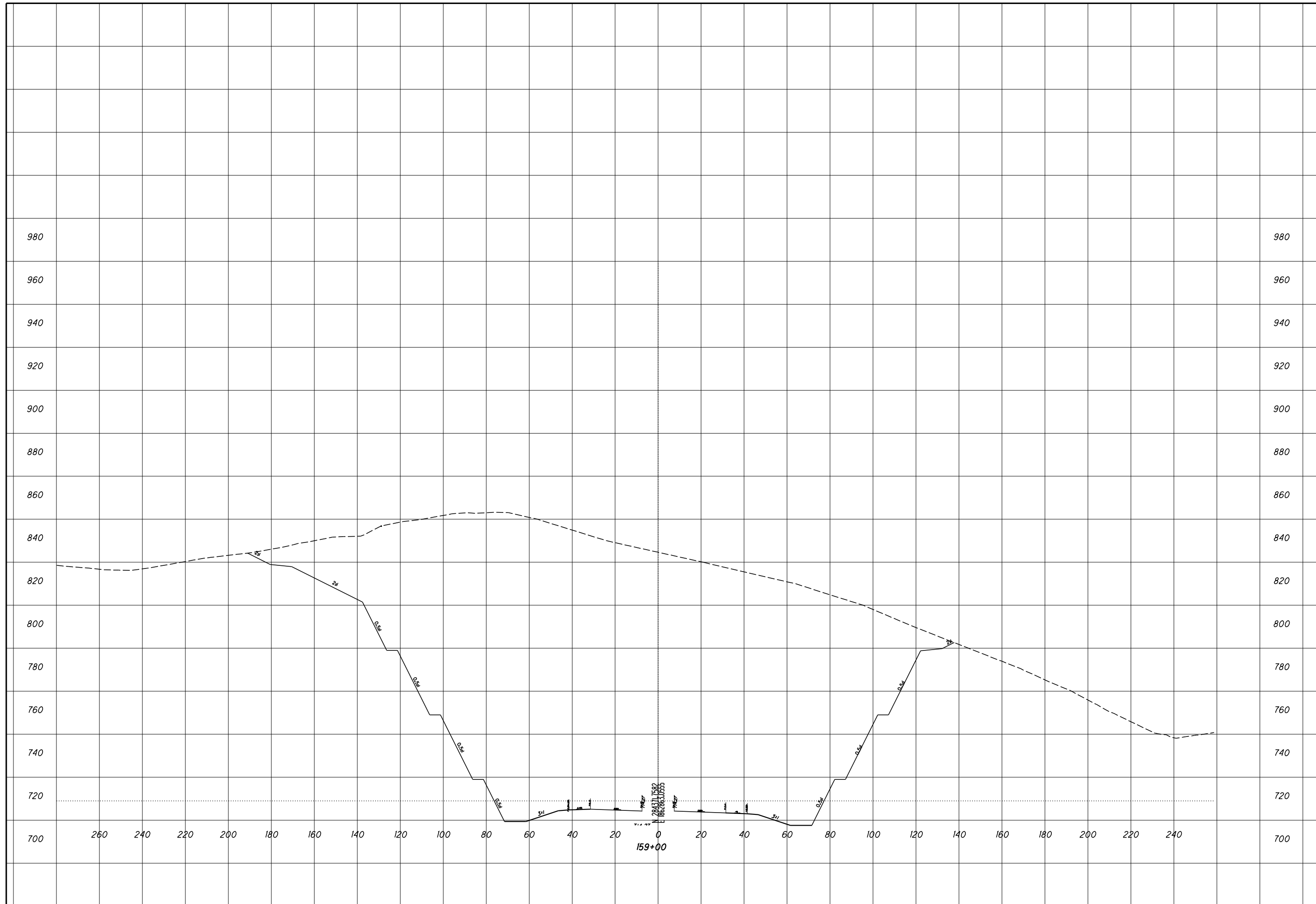
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STA 158+50

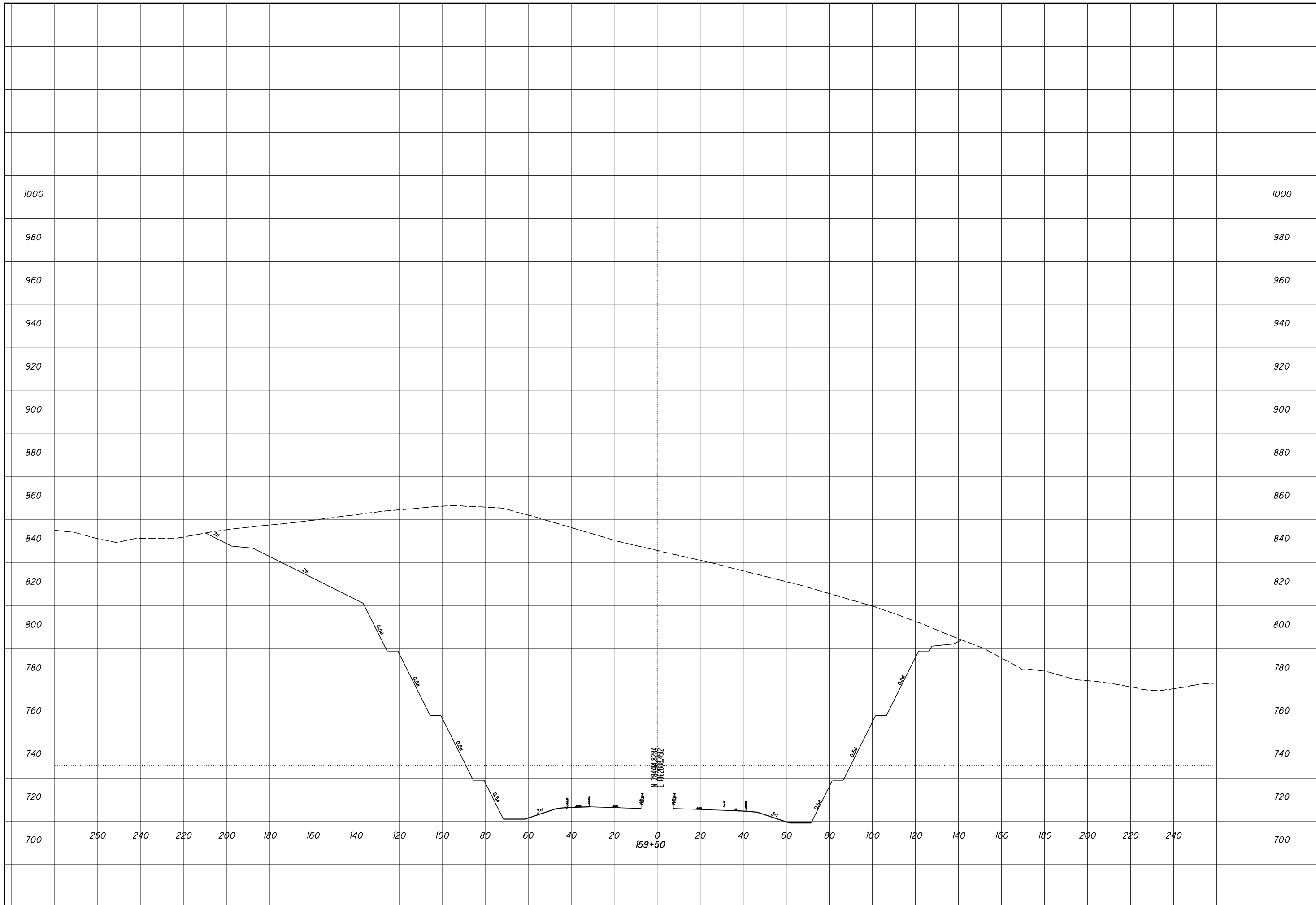
SCI-823-0.00

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ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 159+00

SCI-823-0.00



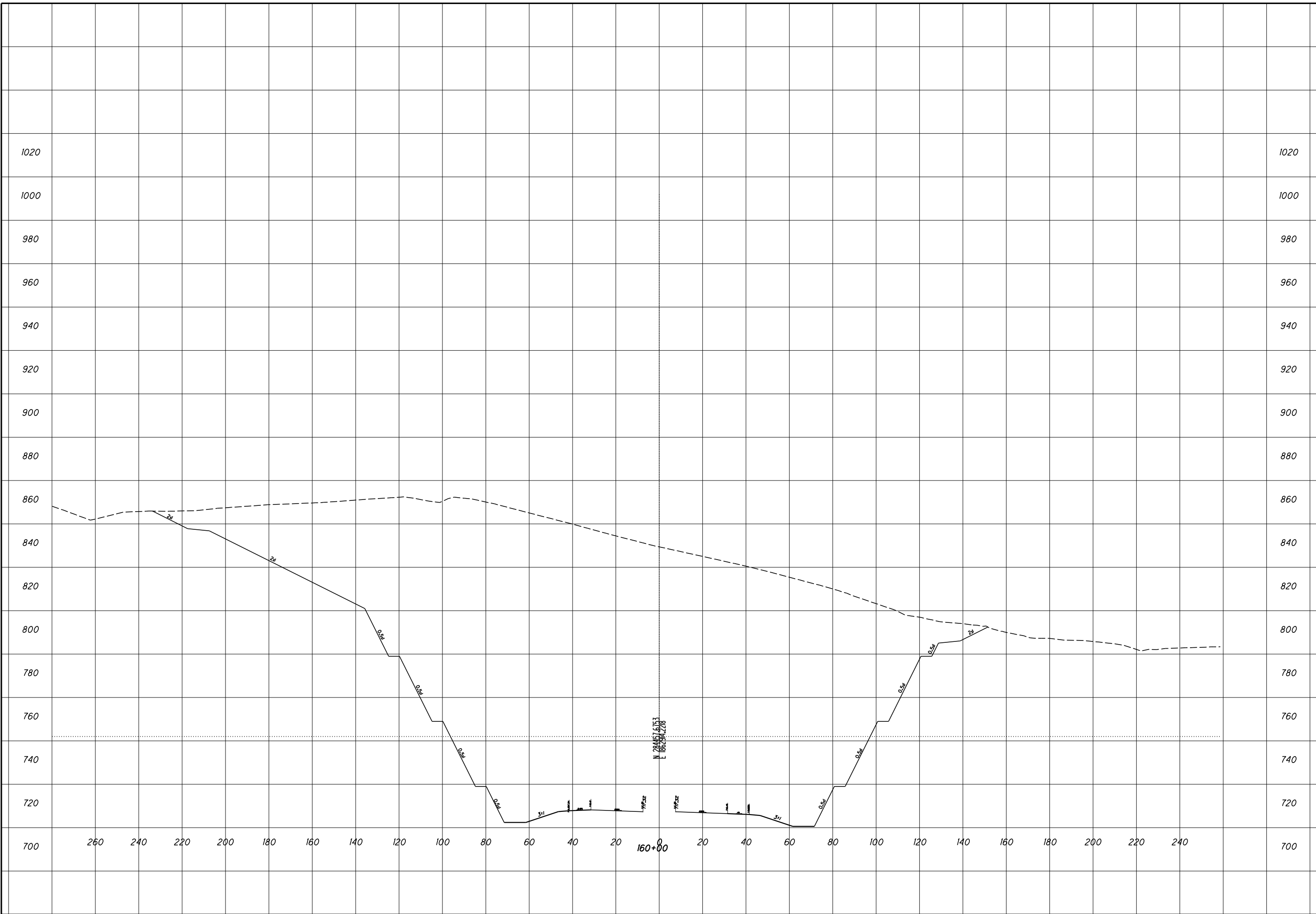


ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 159+50

SCI-823-0.00

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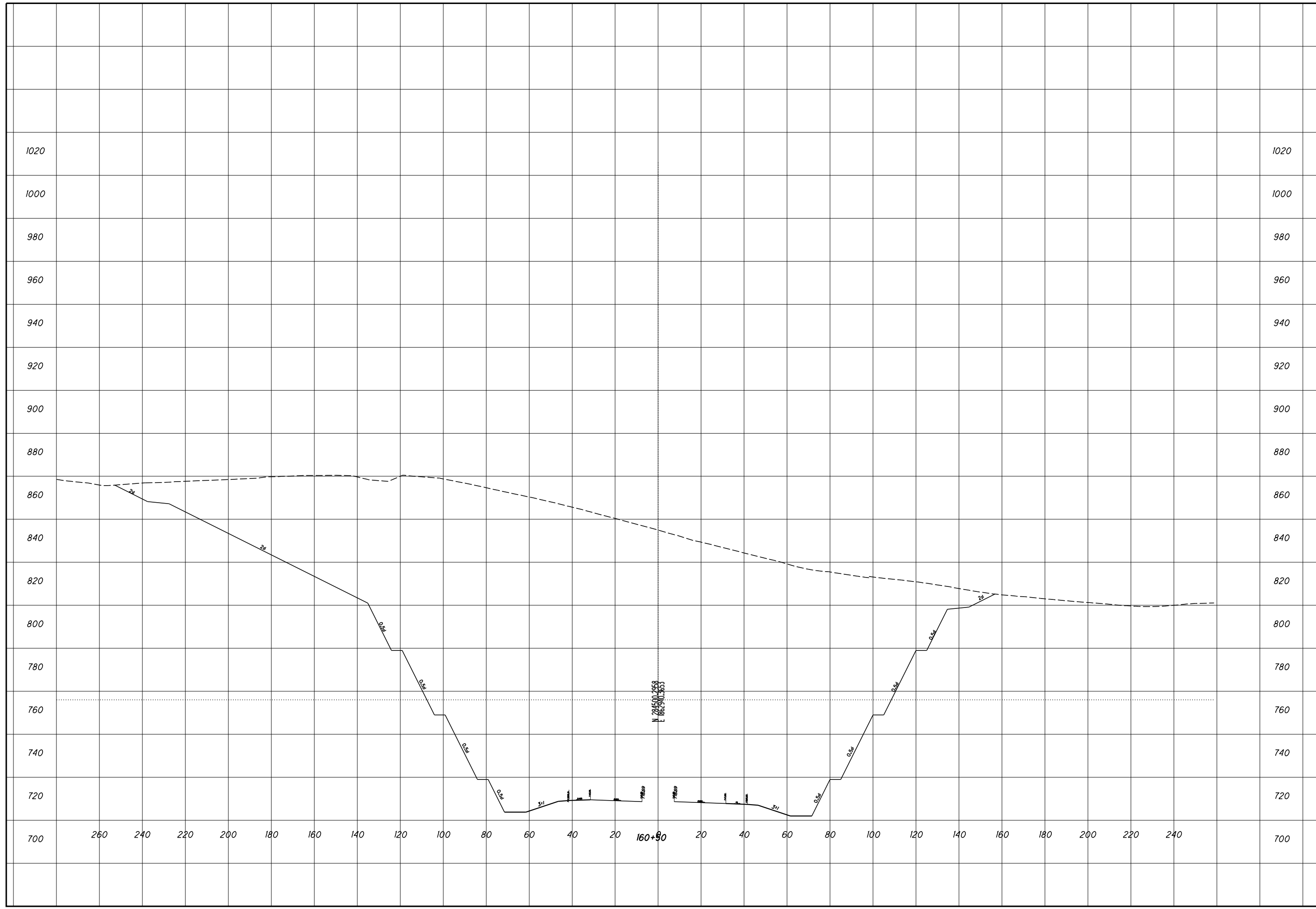
42
69

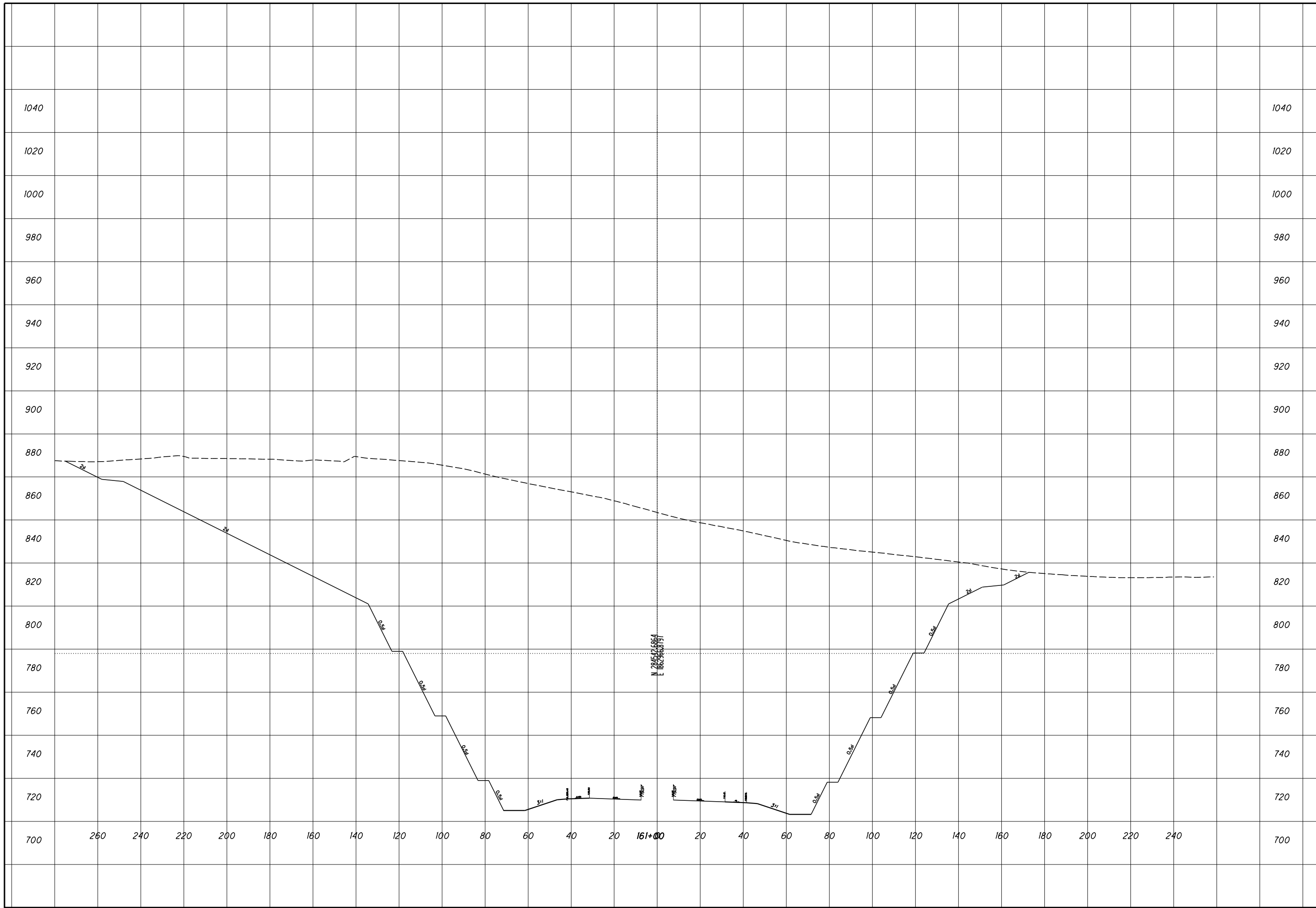


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ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 160+00
SCI-823-0.00

ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 160+50

SCI-823-0.00



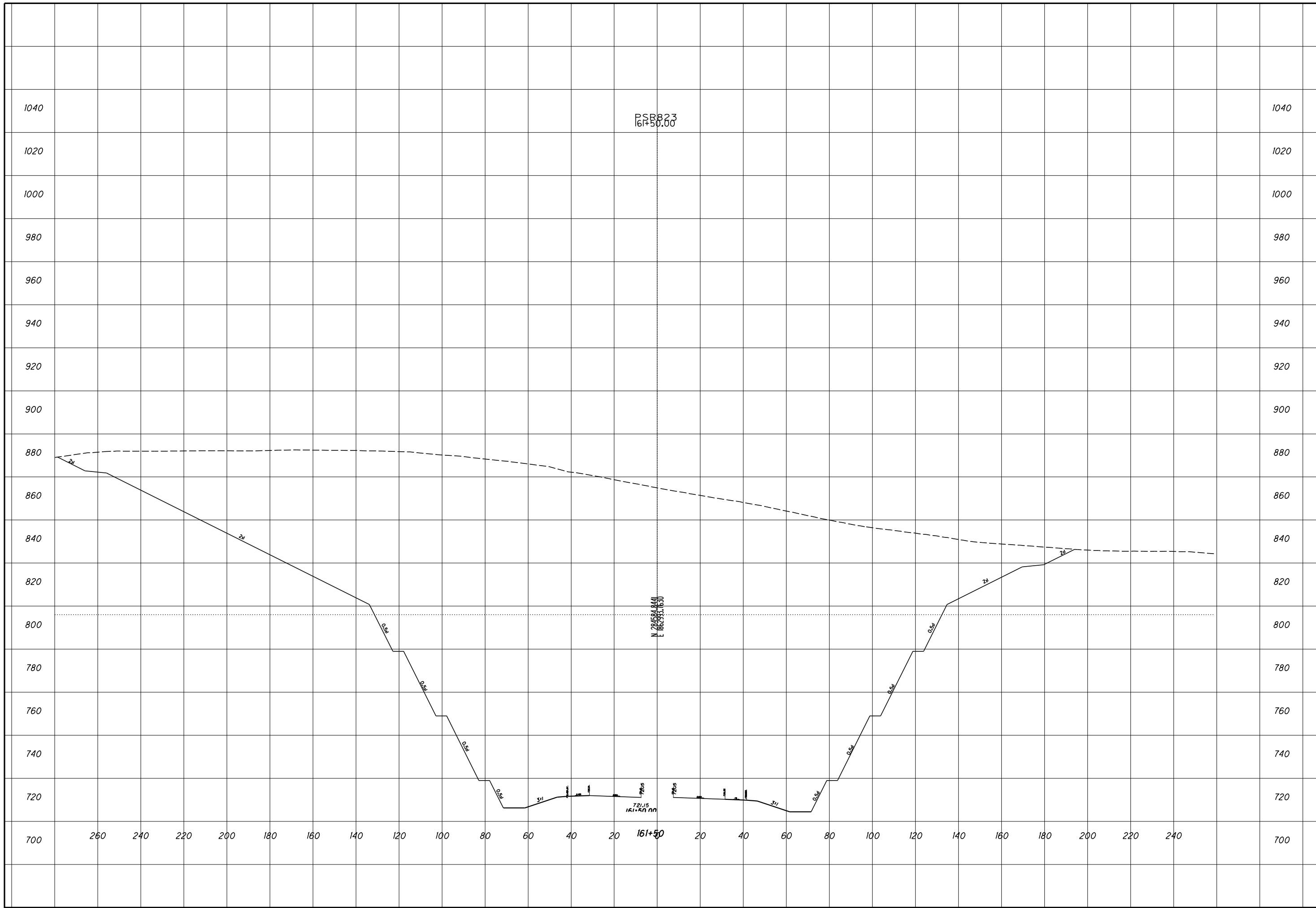


ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 161+00

SCI-823-0.00

45
69

CHECKED

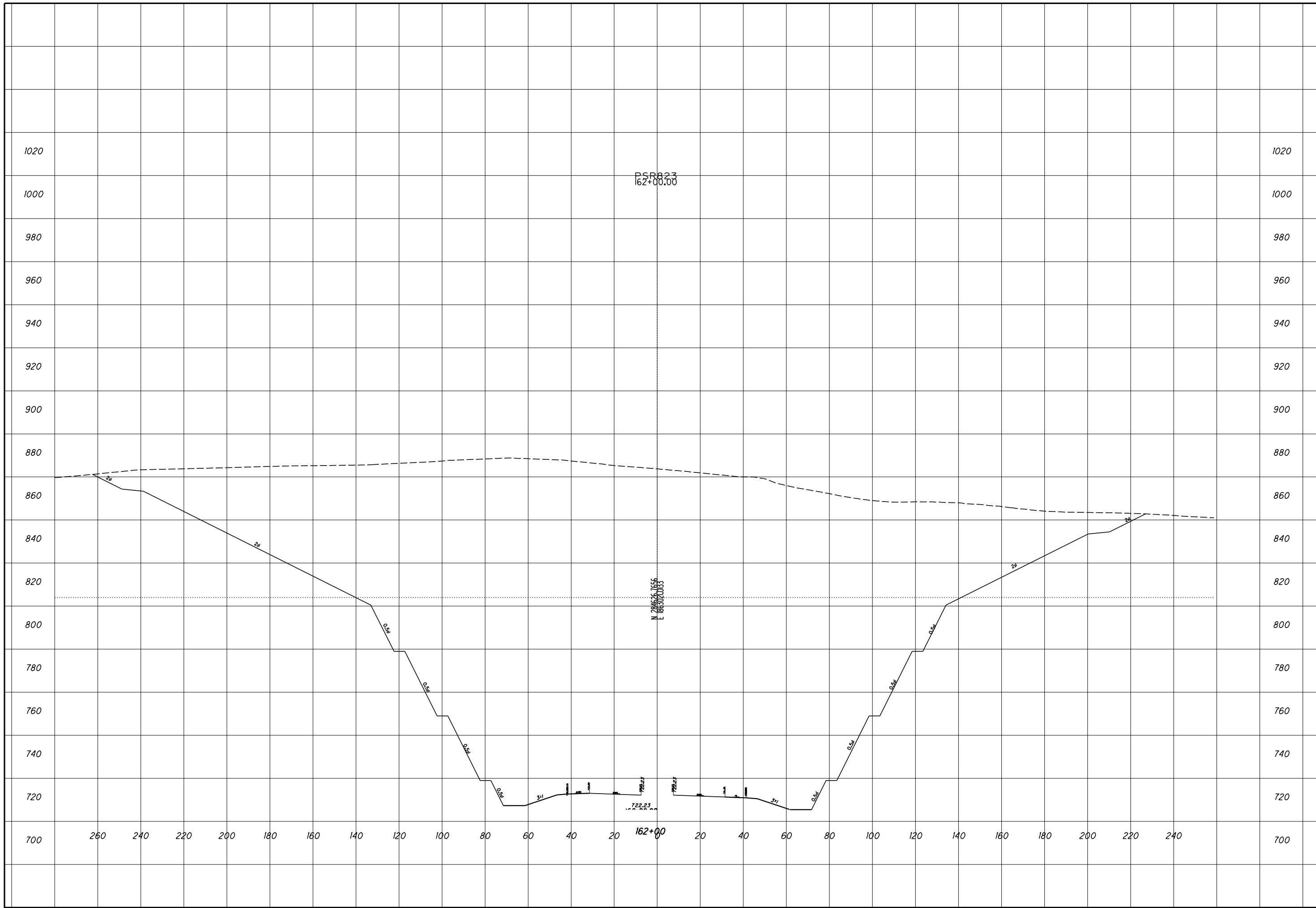


ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 161+50

SCI-823-0.00

46
69

CHECKED



ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 162+00

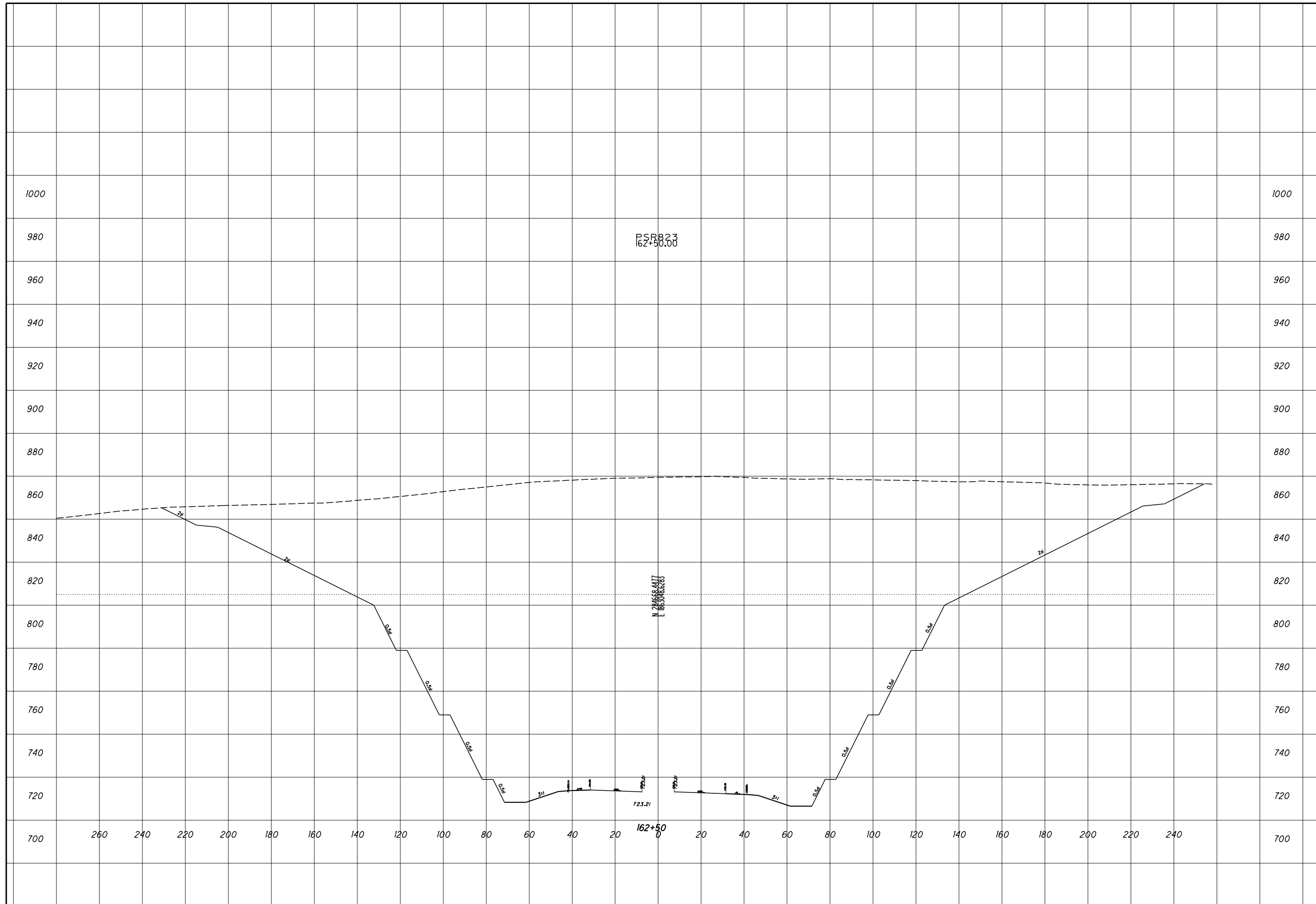
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47
69

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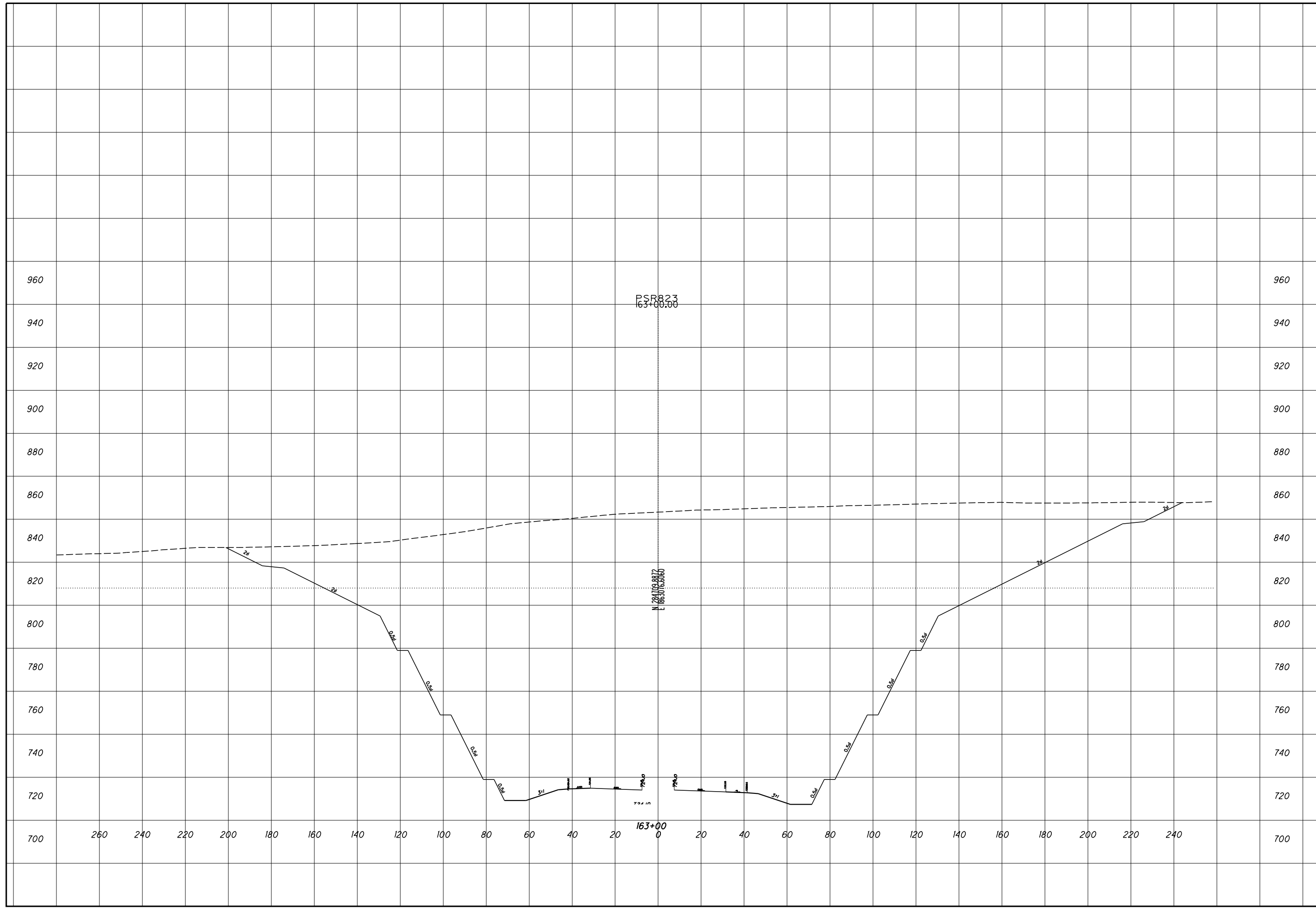
**ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 162+50**

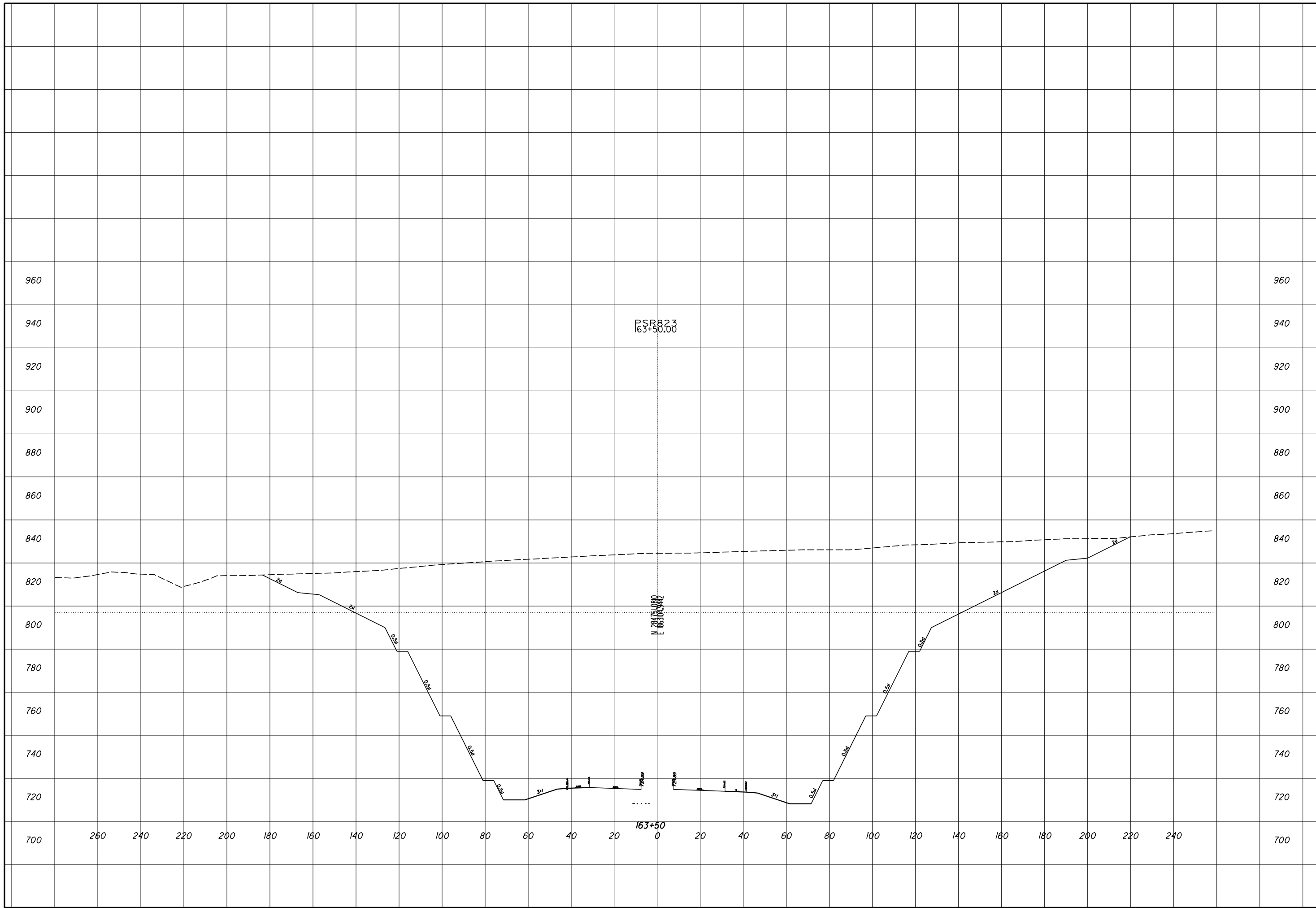
SCI-823-0.00



ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 163+00

SCI-823-0.00



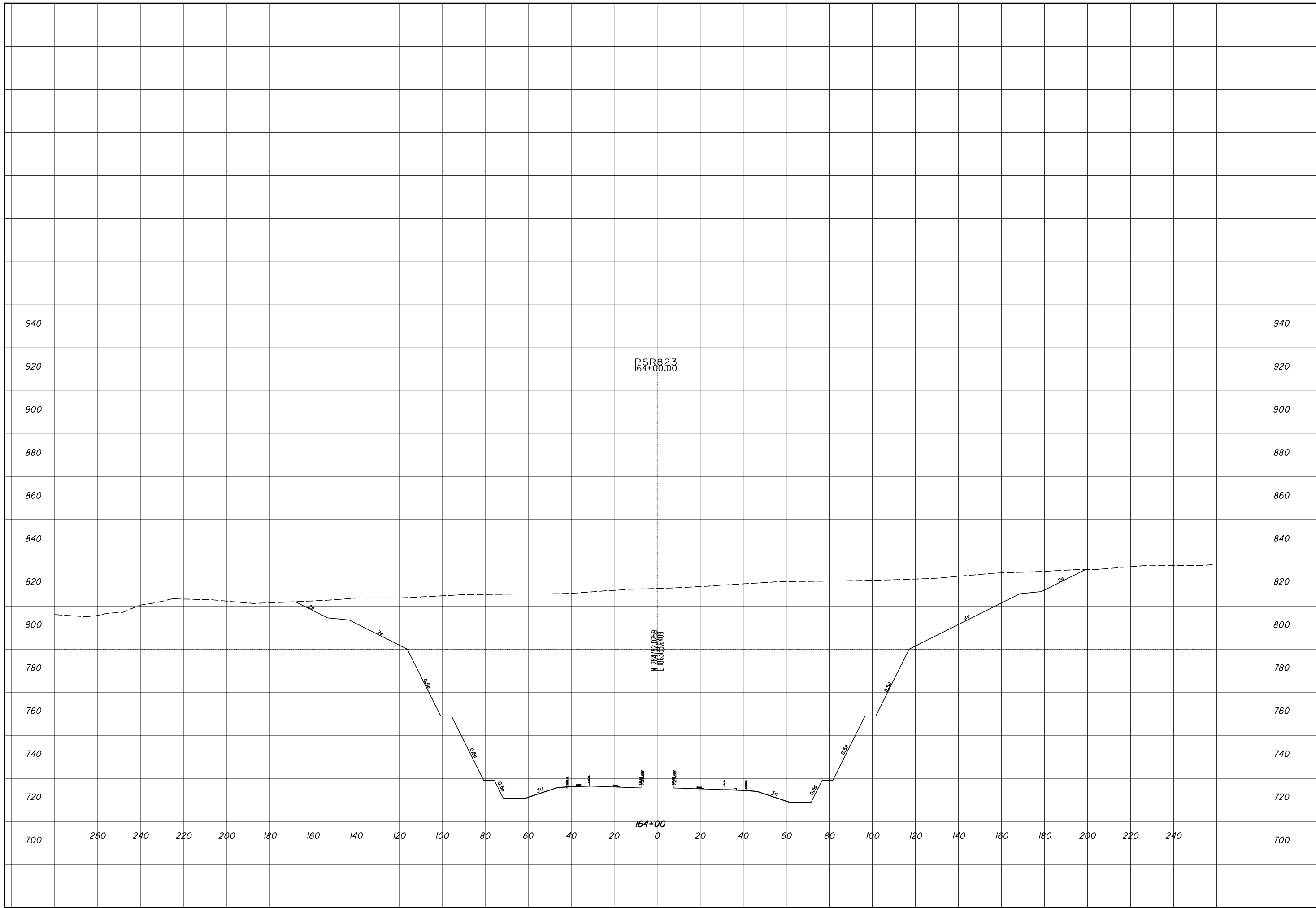


ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 163+50

SCI-823-0.00

50
 69

CHECKED



ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 164+00

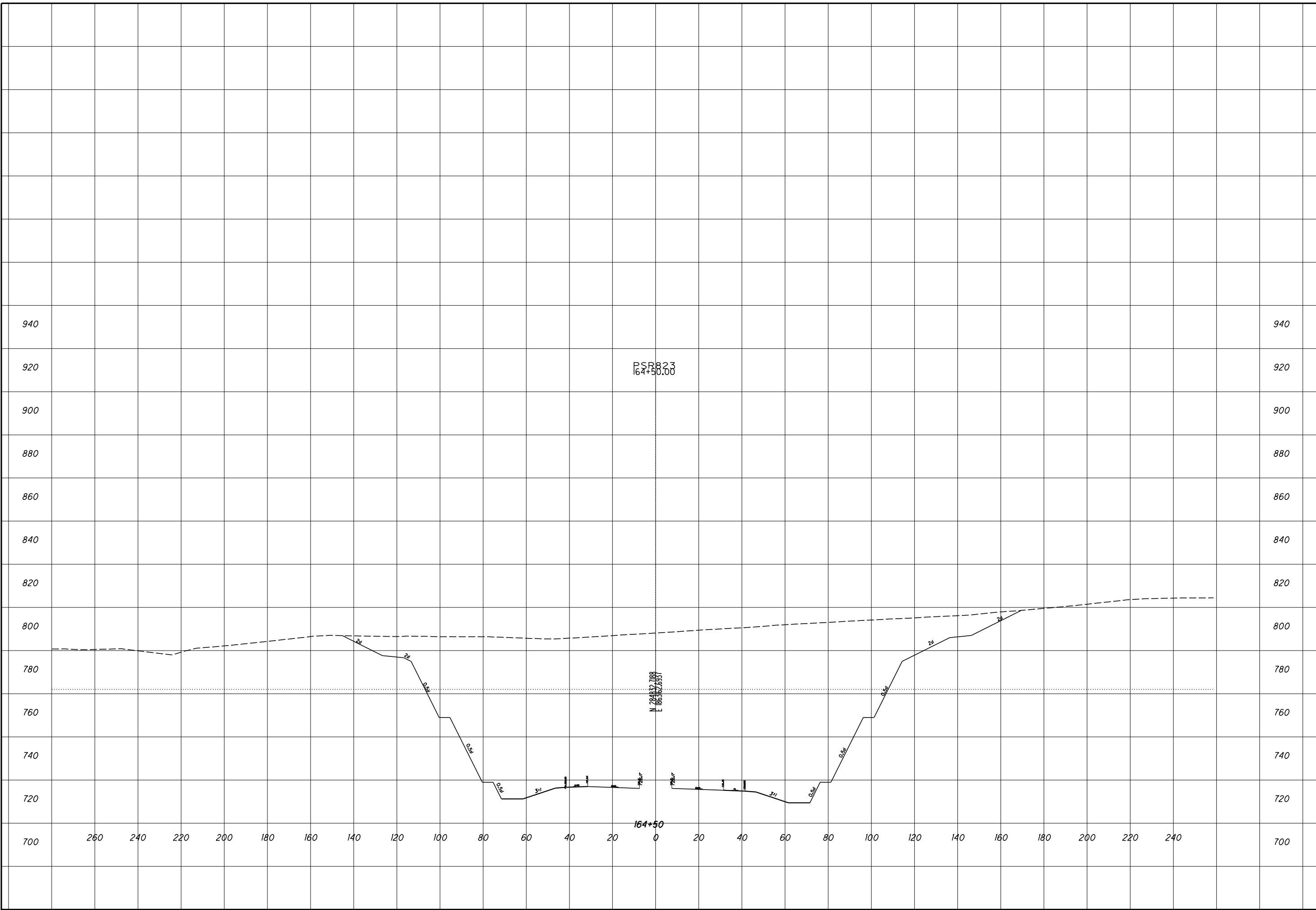
SCI-823-0.00

51
69

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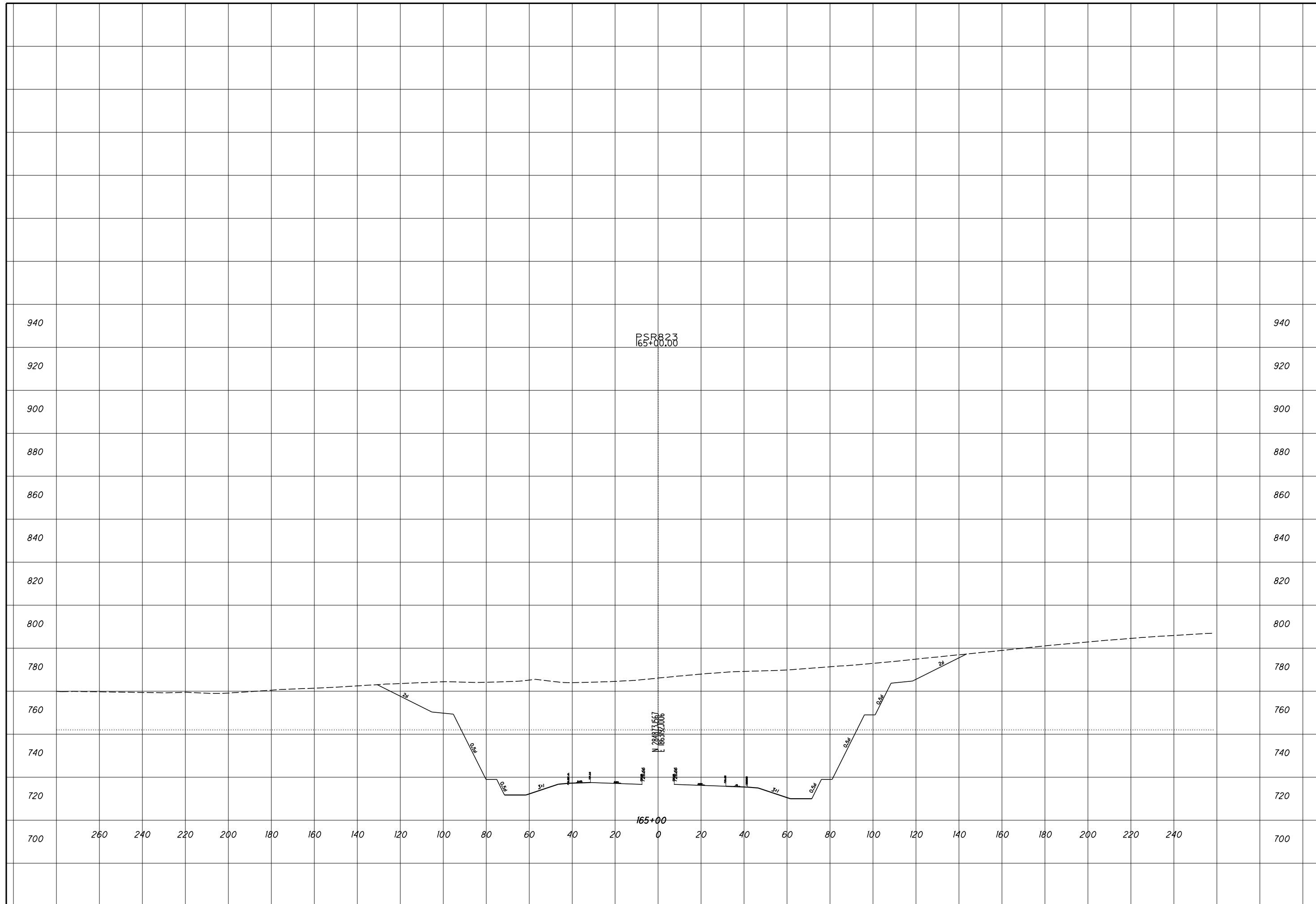
**ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 164+50**

SCI-823-0.00



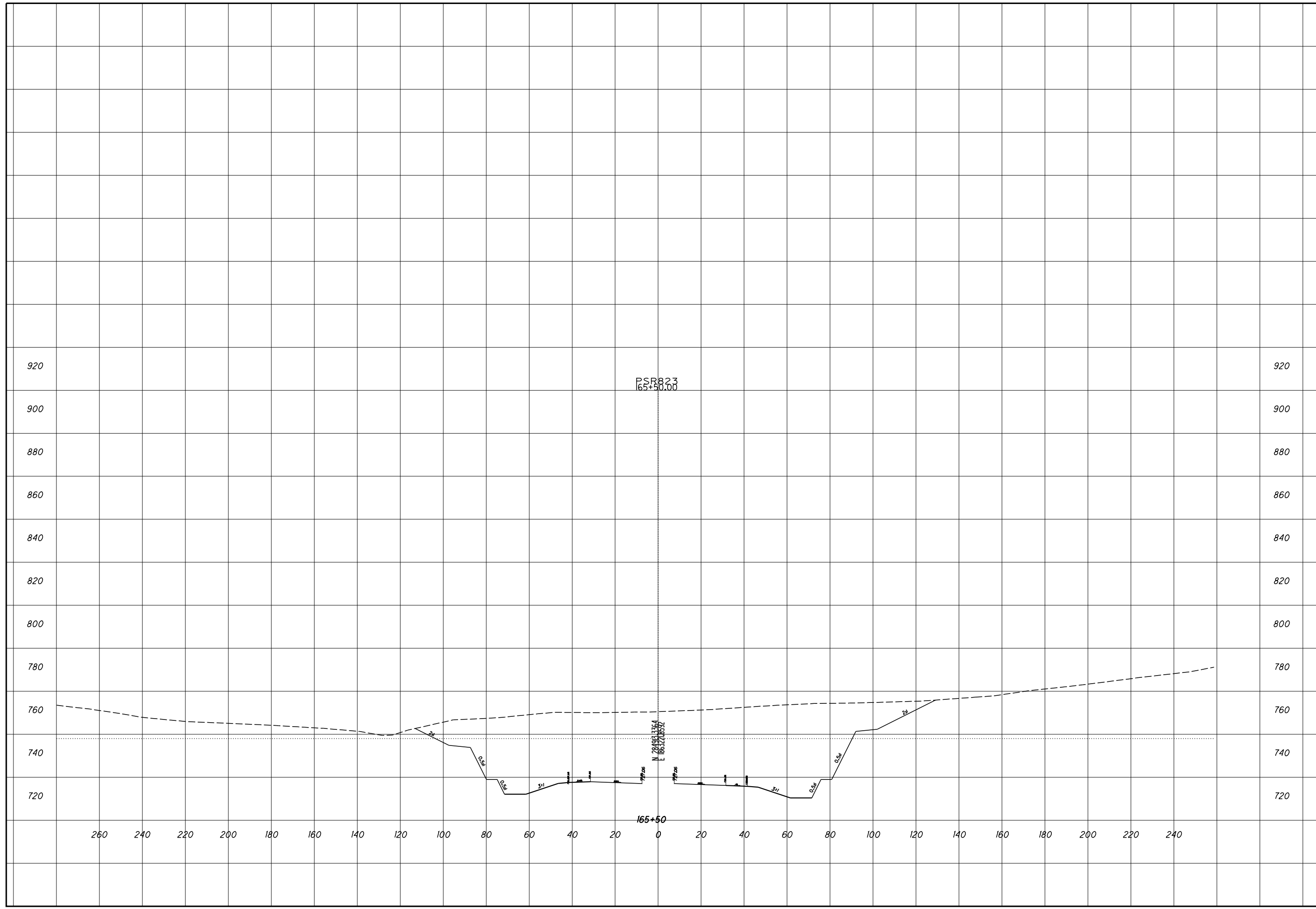
ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 165+00

SCI-823-0.00



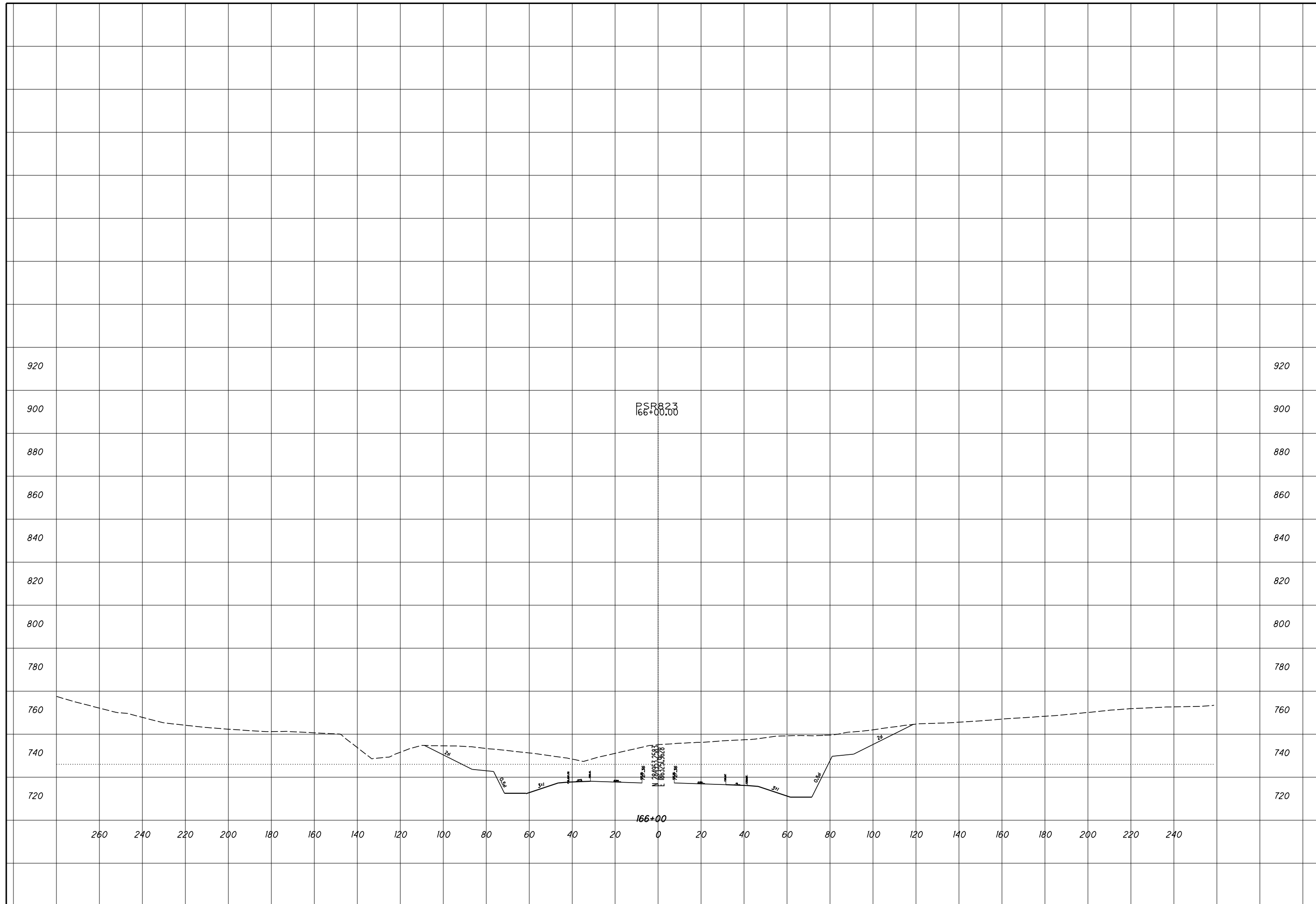
ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 165+50

SCI-823-0.00



ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 166+00

SCI-823-0.00

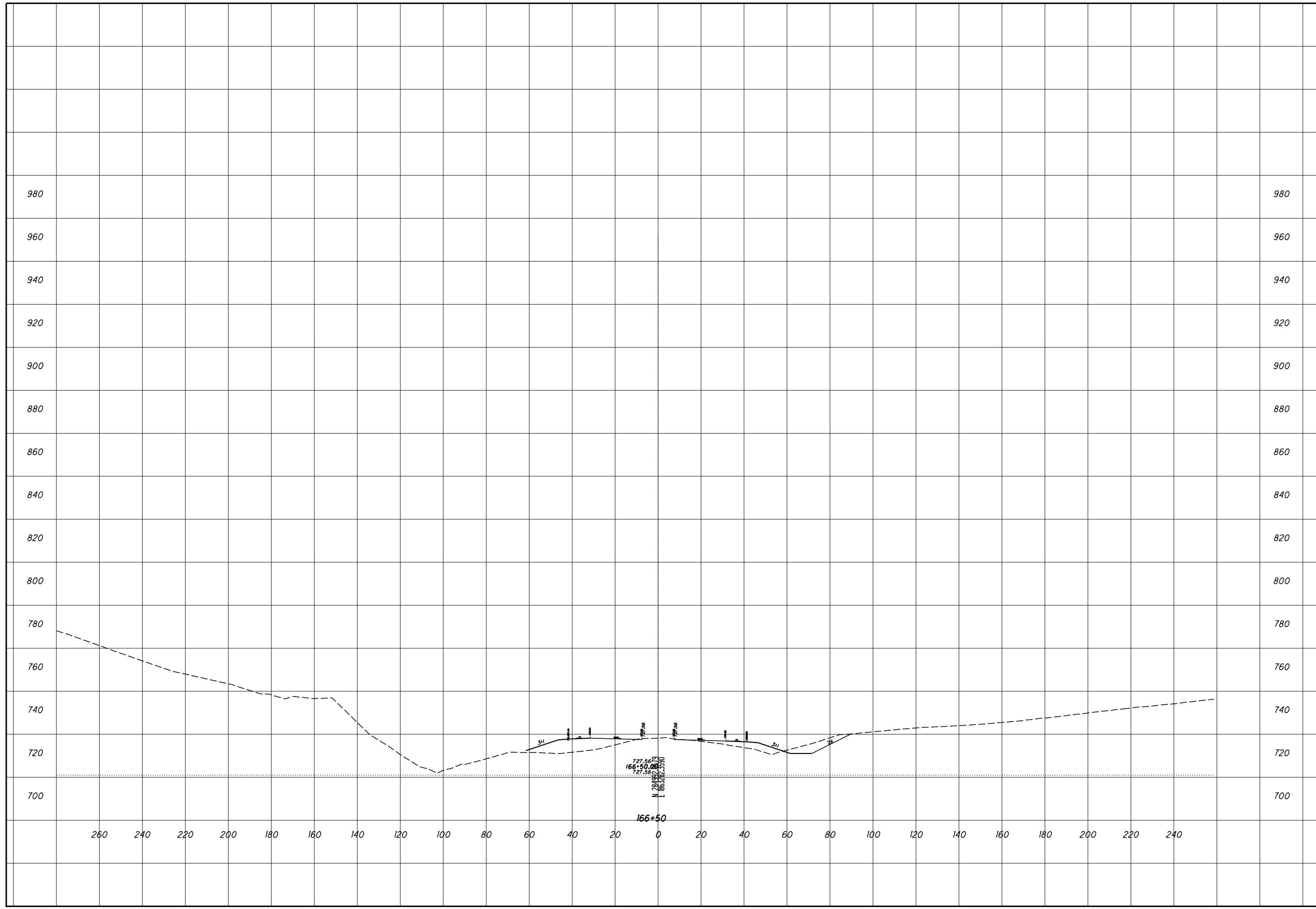


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ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 166+50

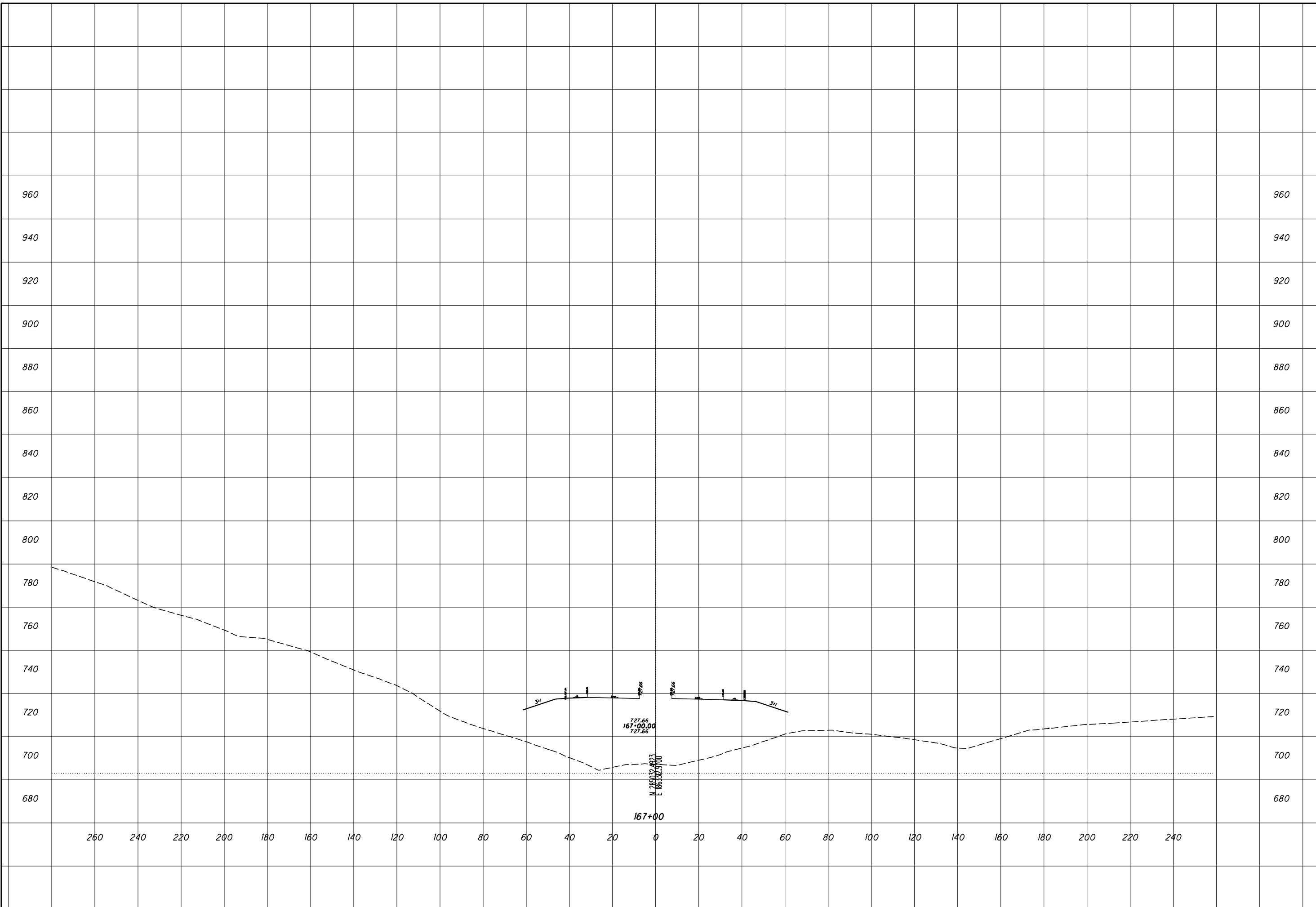
SCI-823-0.00

56
69



ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 167+00

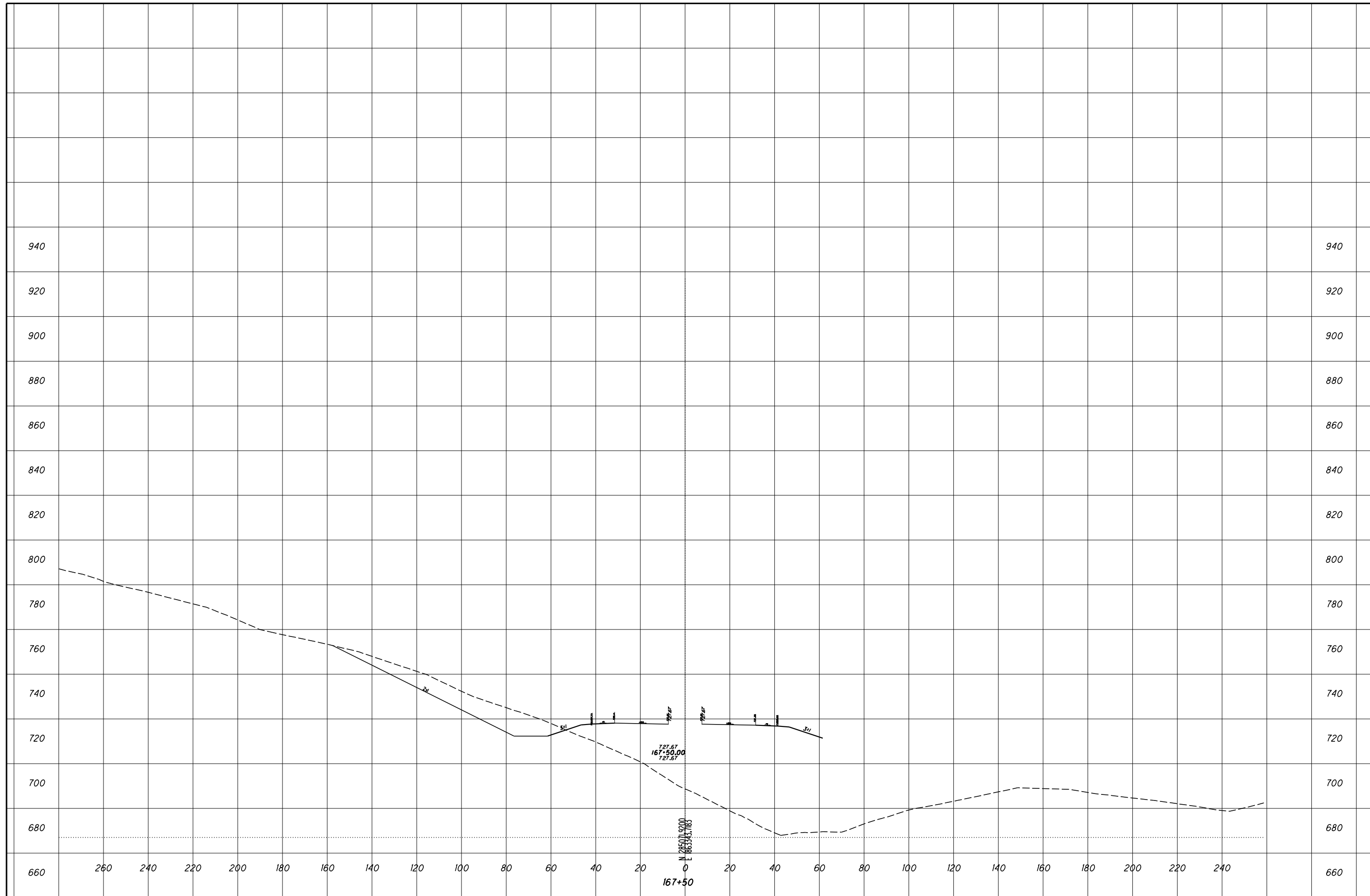
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**ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 167+50**

SCI-823-0.00

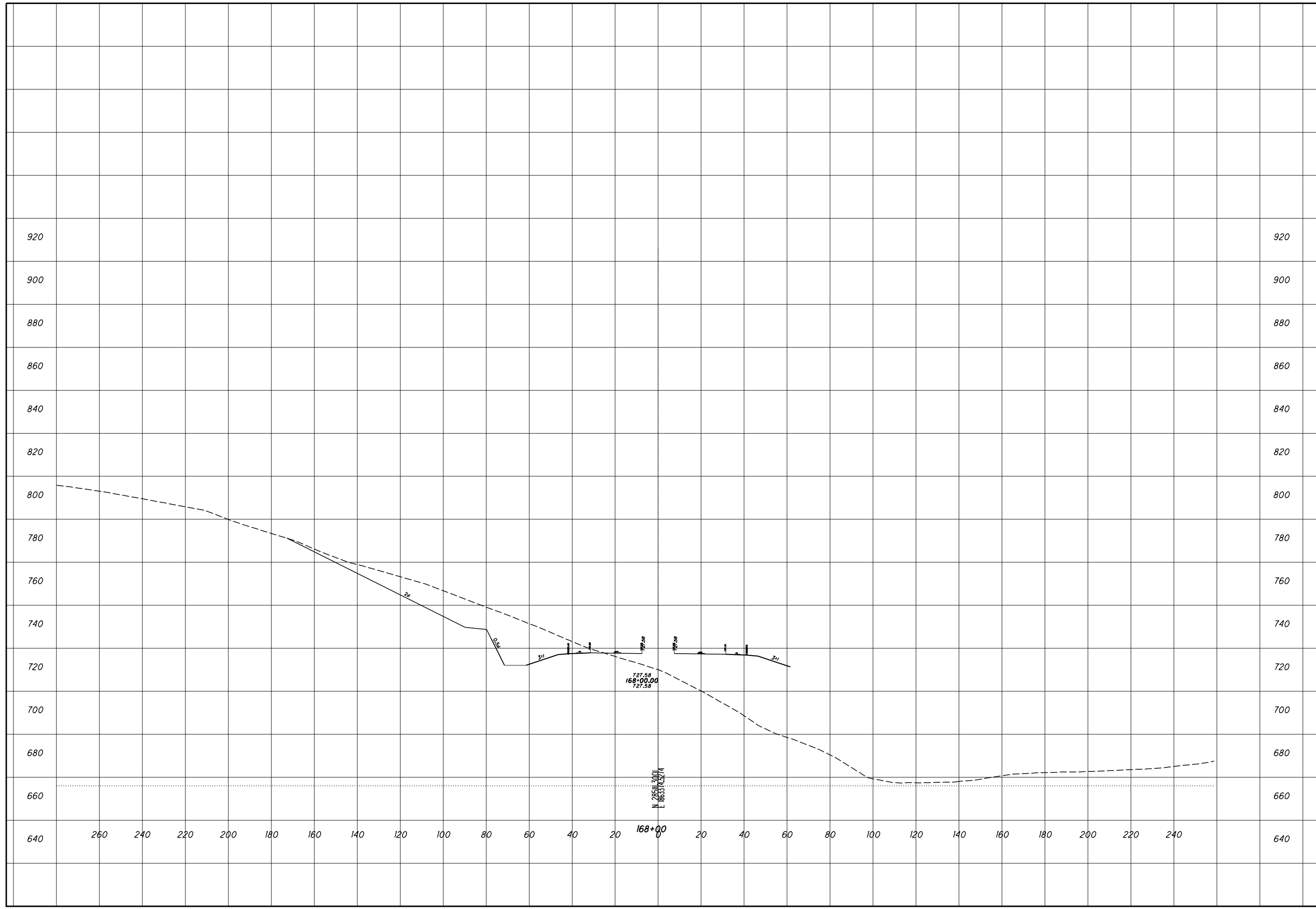


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ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 168+00

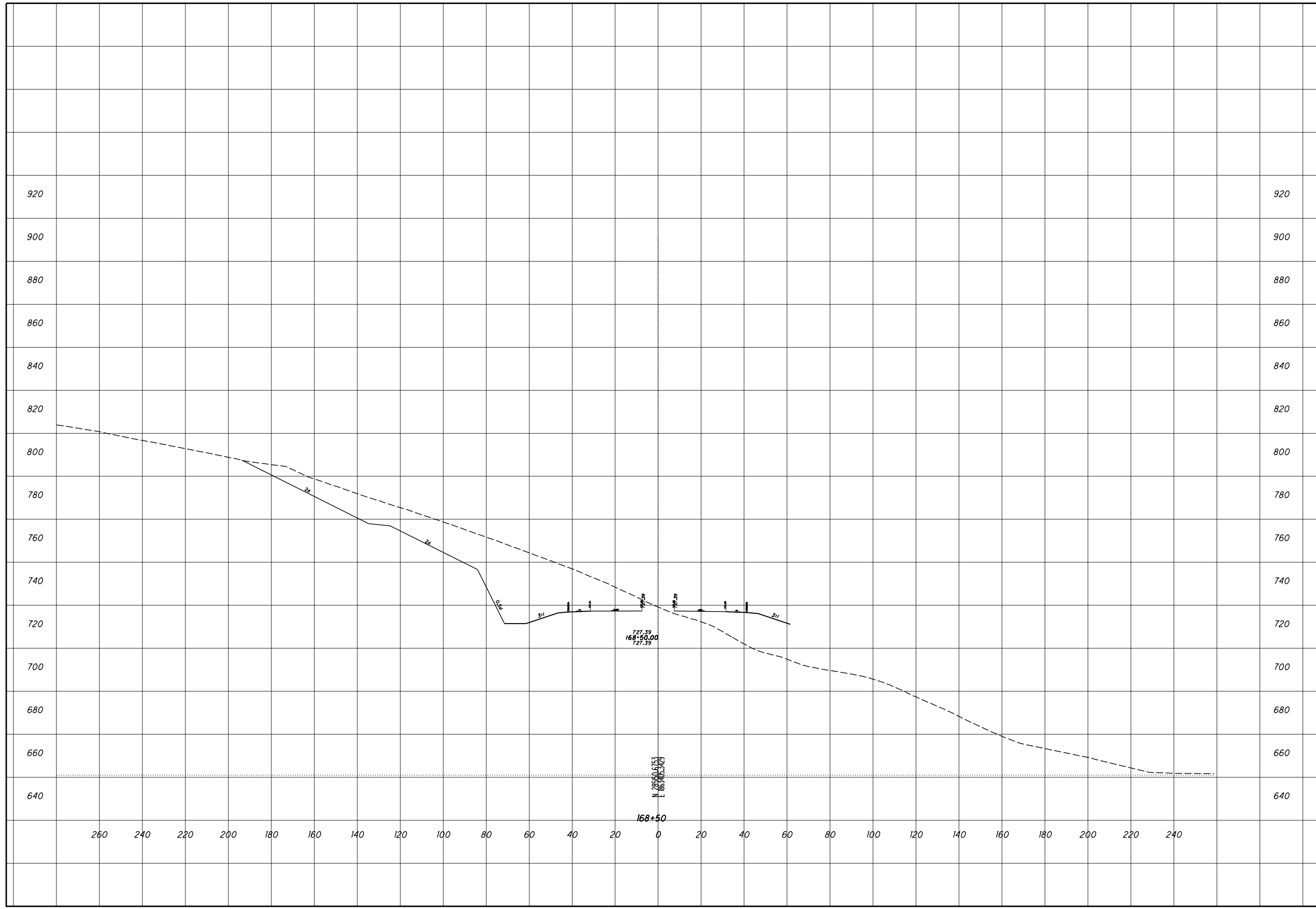
SCI-823-0.00

59
69



ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 168+50

SCI-823-0.00

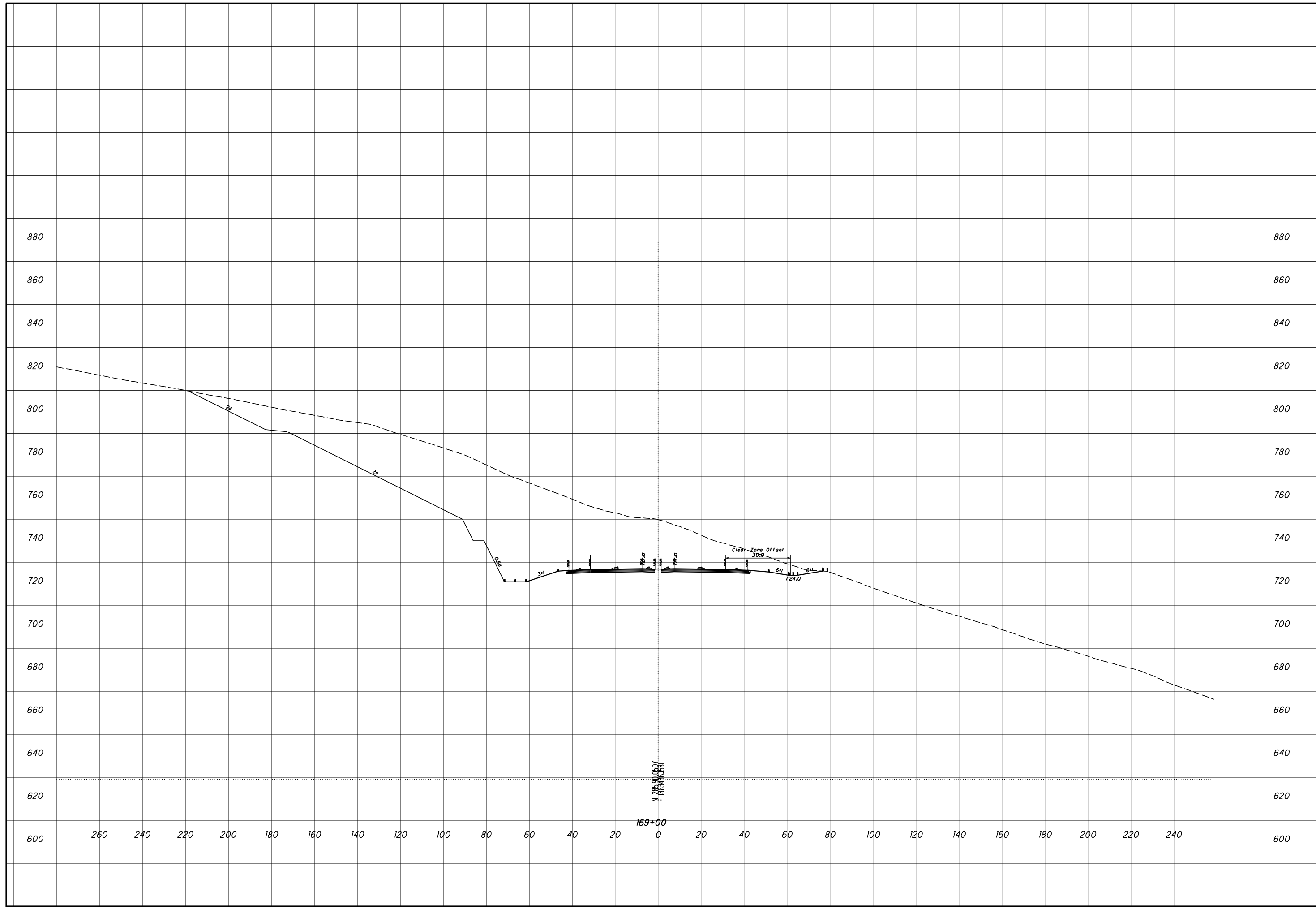


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**ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 169+00**

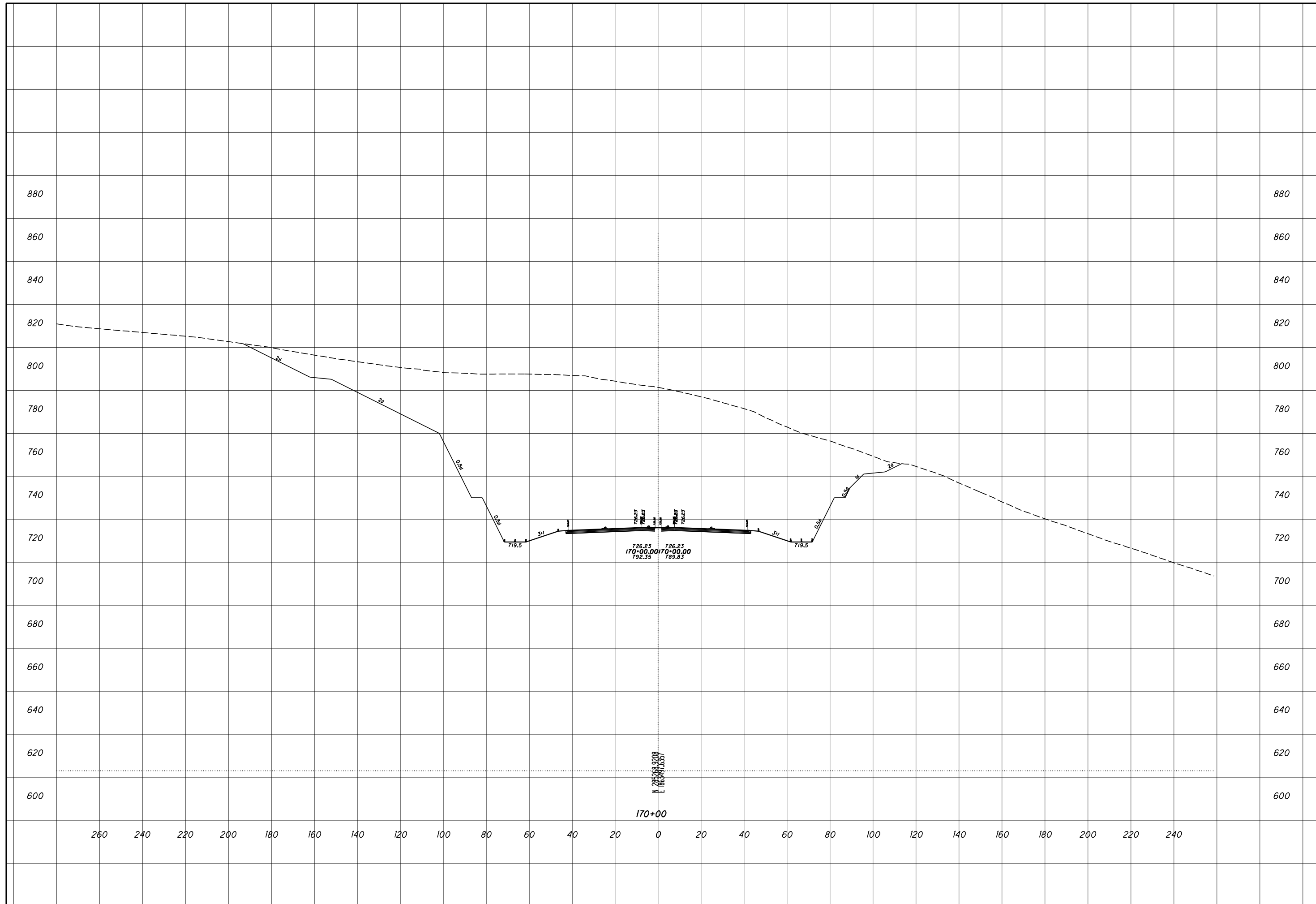
SCI-823-0.00

61
69



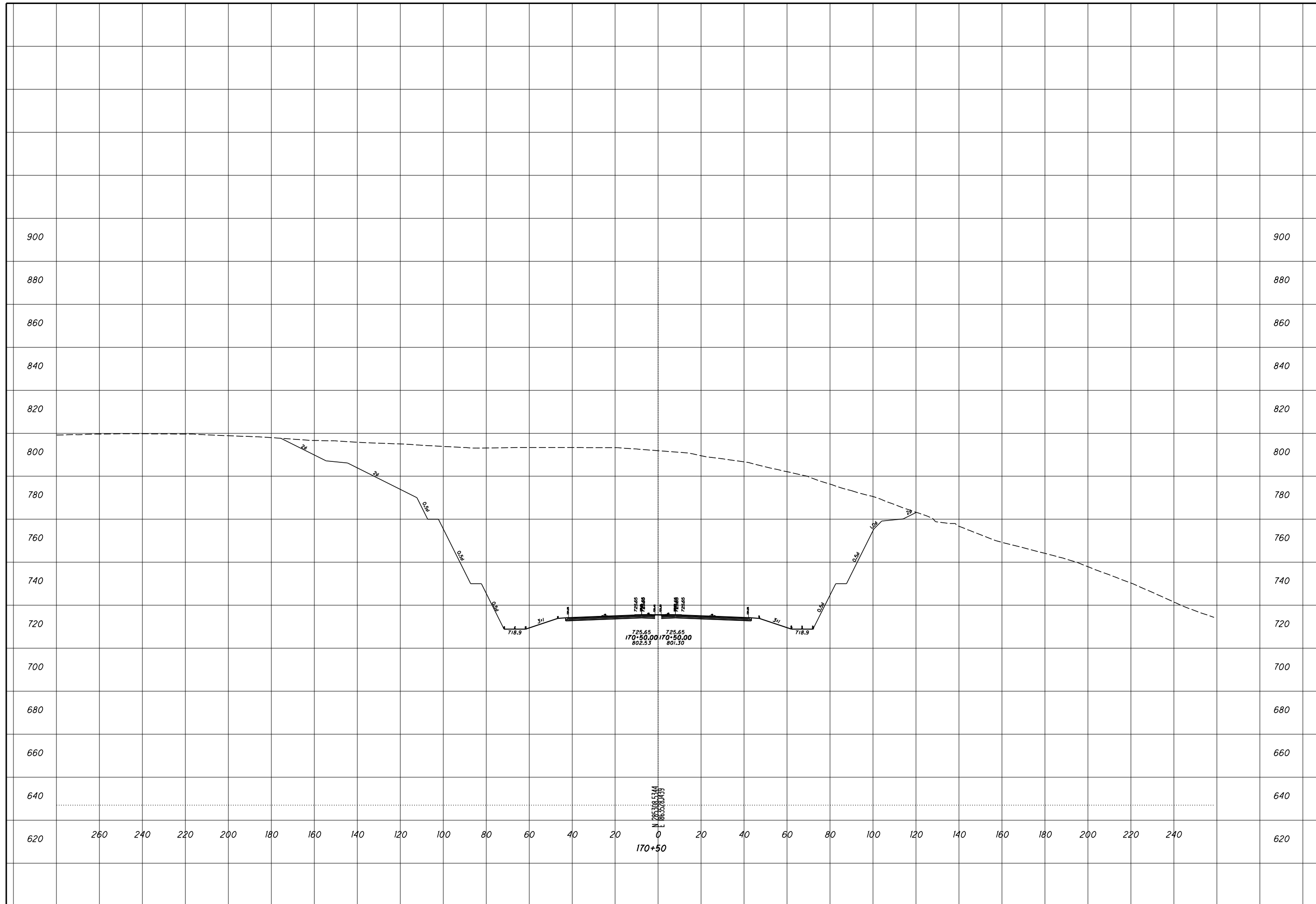
ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 170+00

SCI-823-0.00



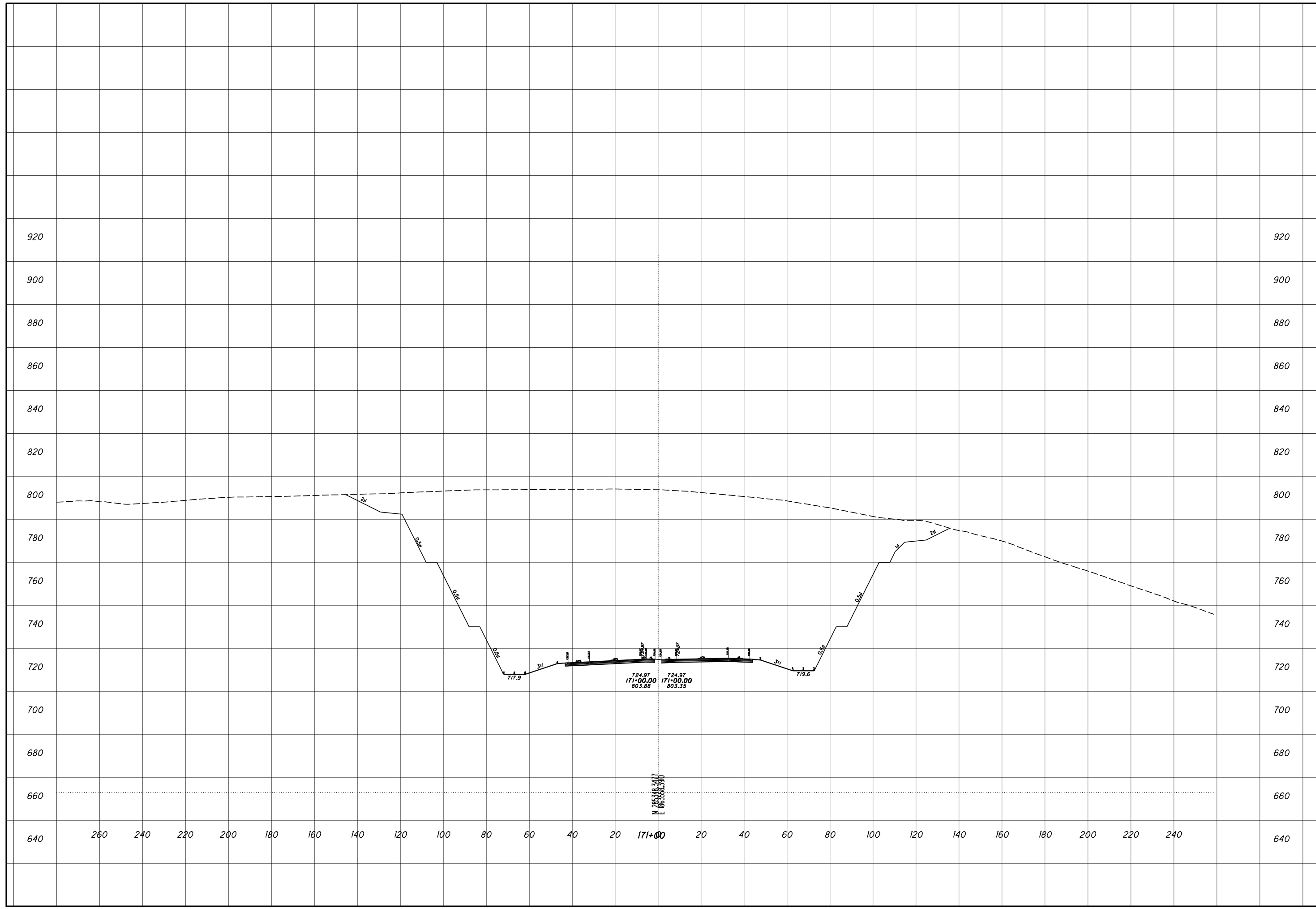
ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 170+50

SCI-823-0.00



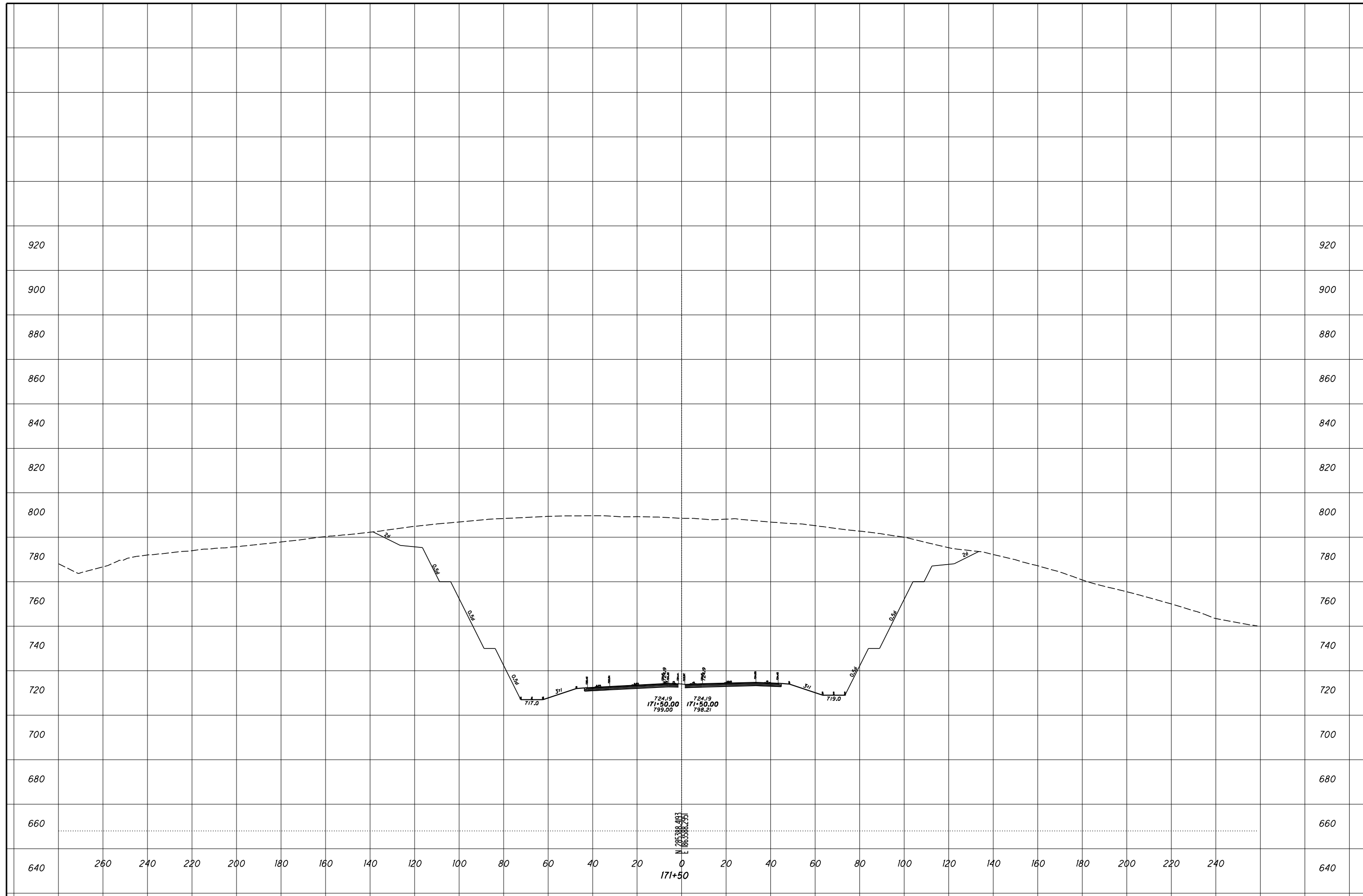
ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 171+00

SCI-823-0.00



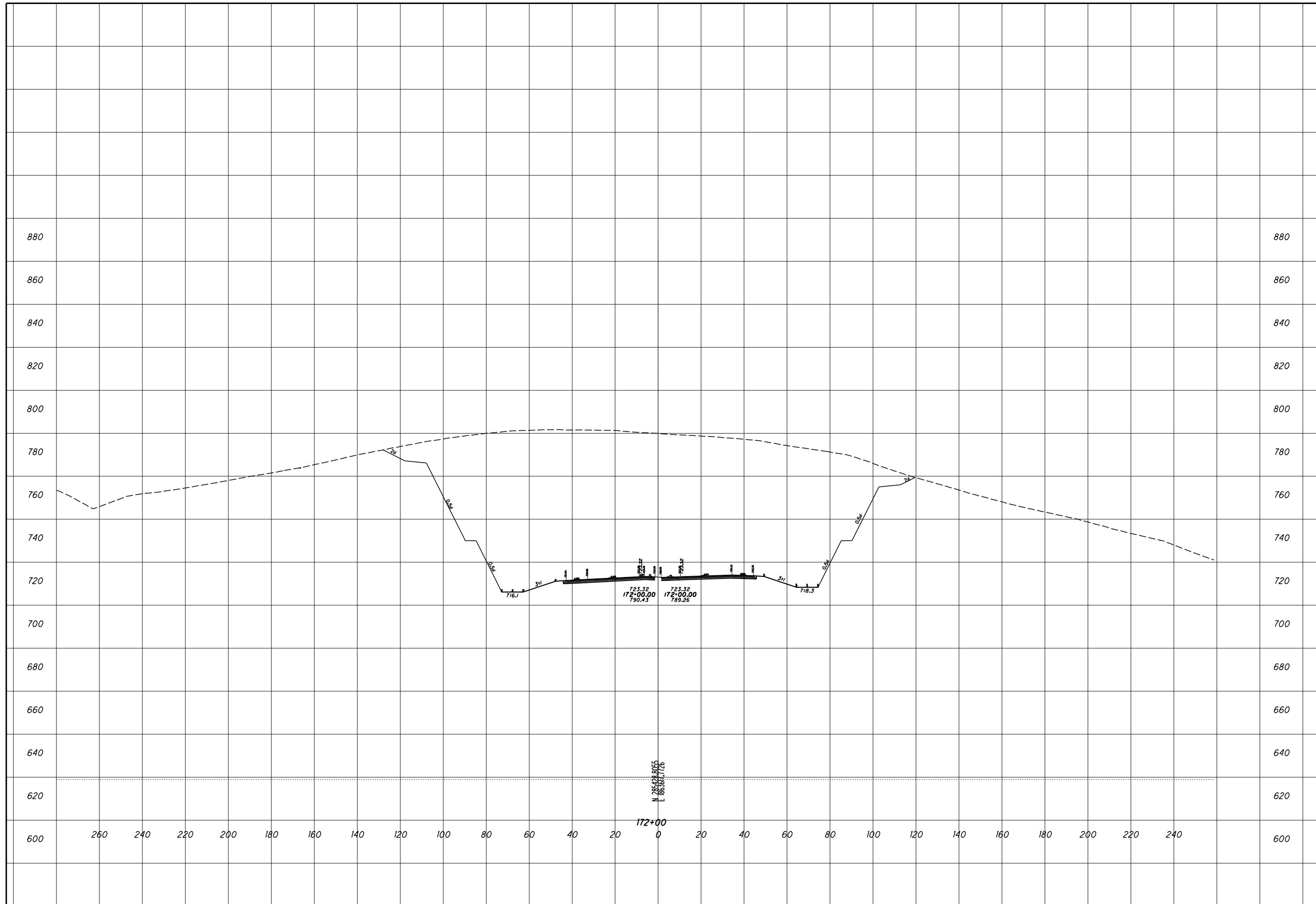
ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 171+50

SCI-823-0.00



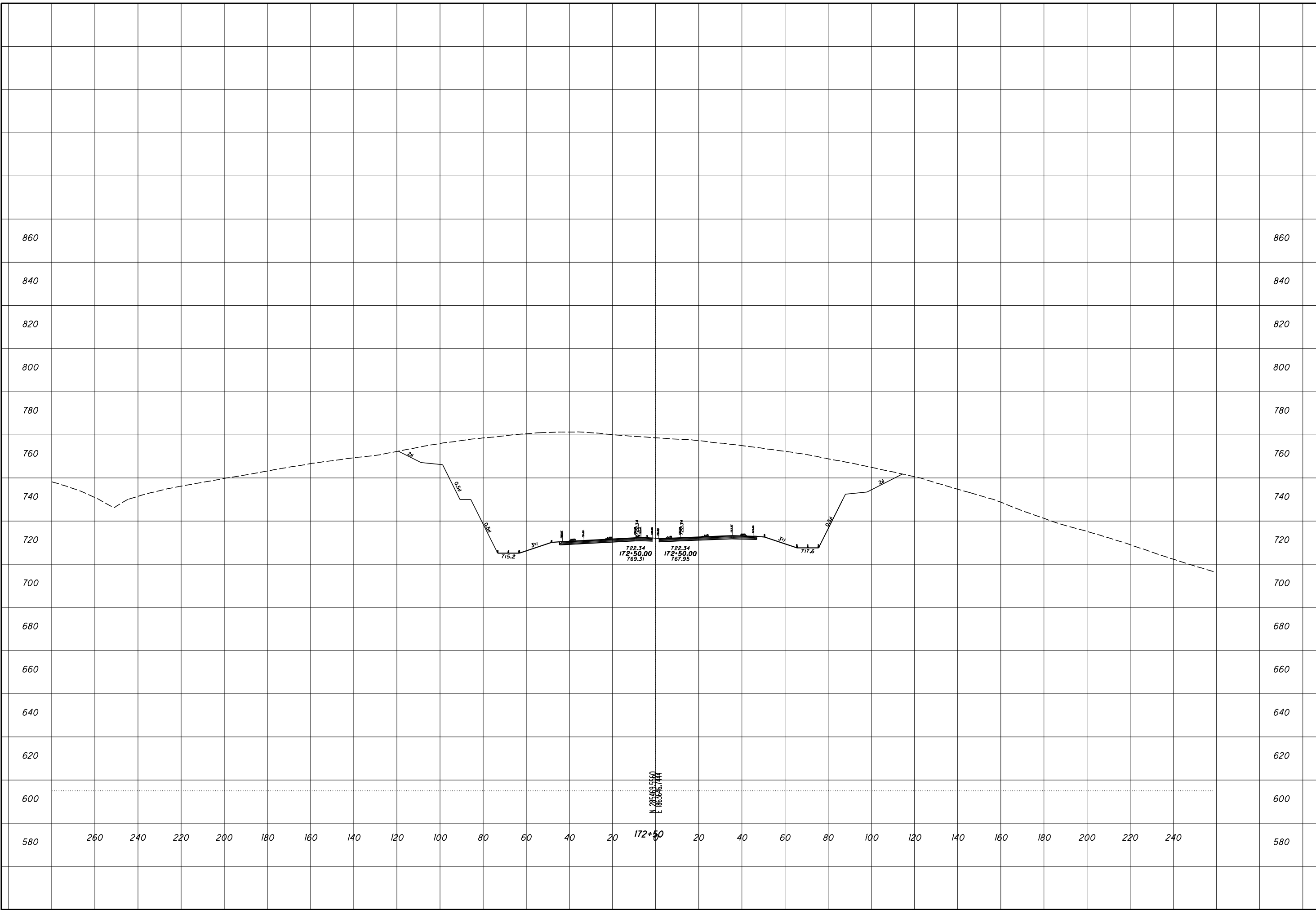
ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 172+00

SCI-823-0.00



**ROCK CUT SLOPE DESIGN - ROCK CUT 3
STA 172+50**

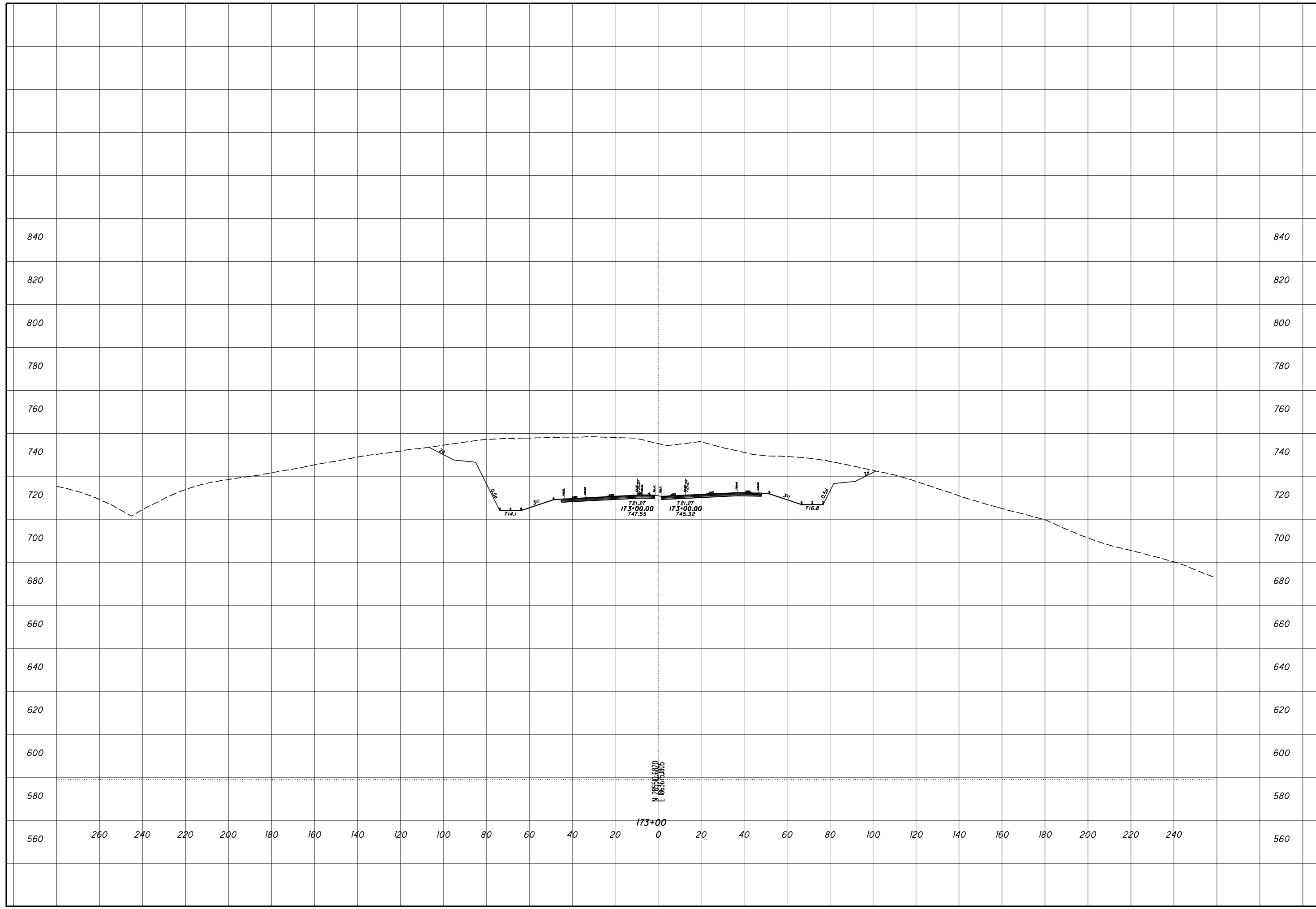
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CHECKED

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STA 173+00**

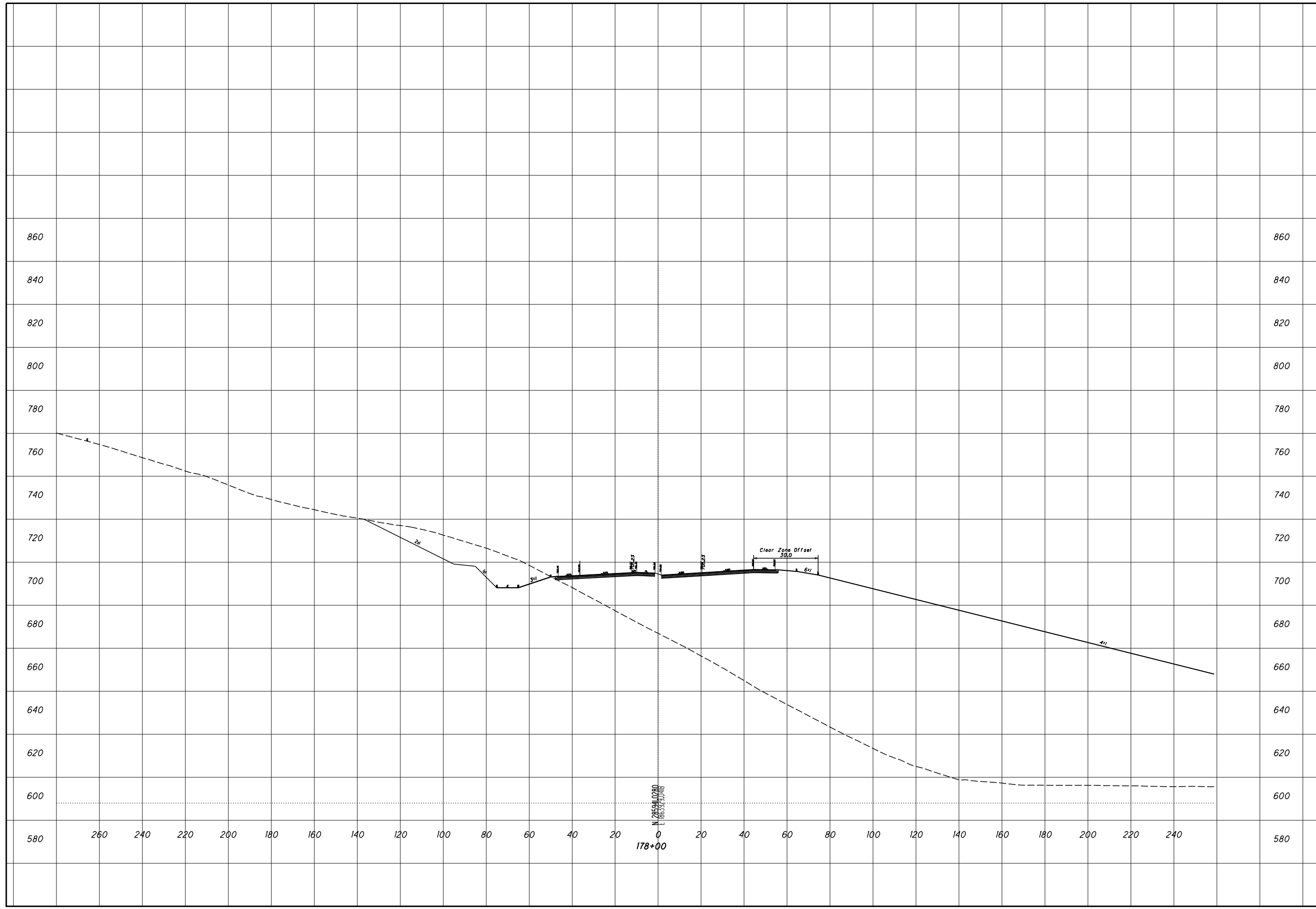
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STA 178+00**

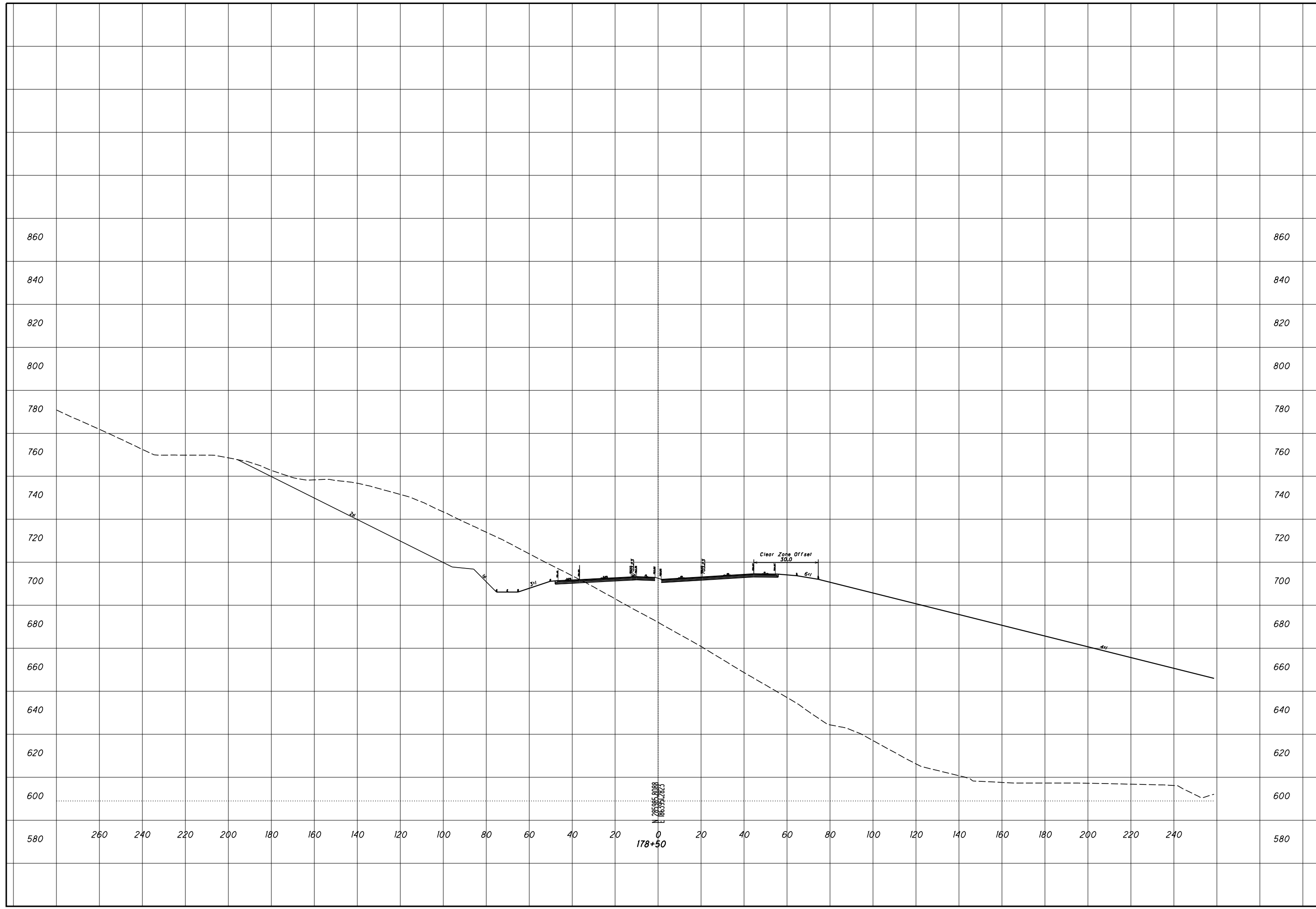
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CHECKED

**ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 178+50**

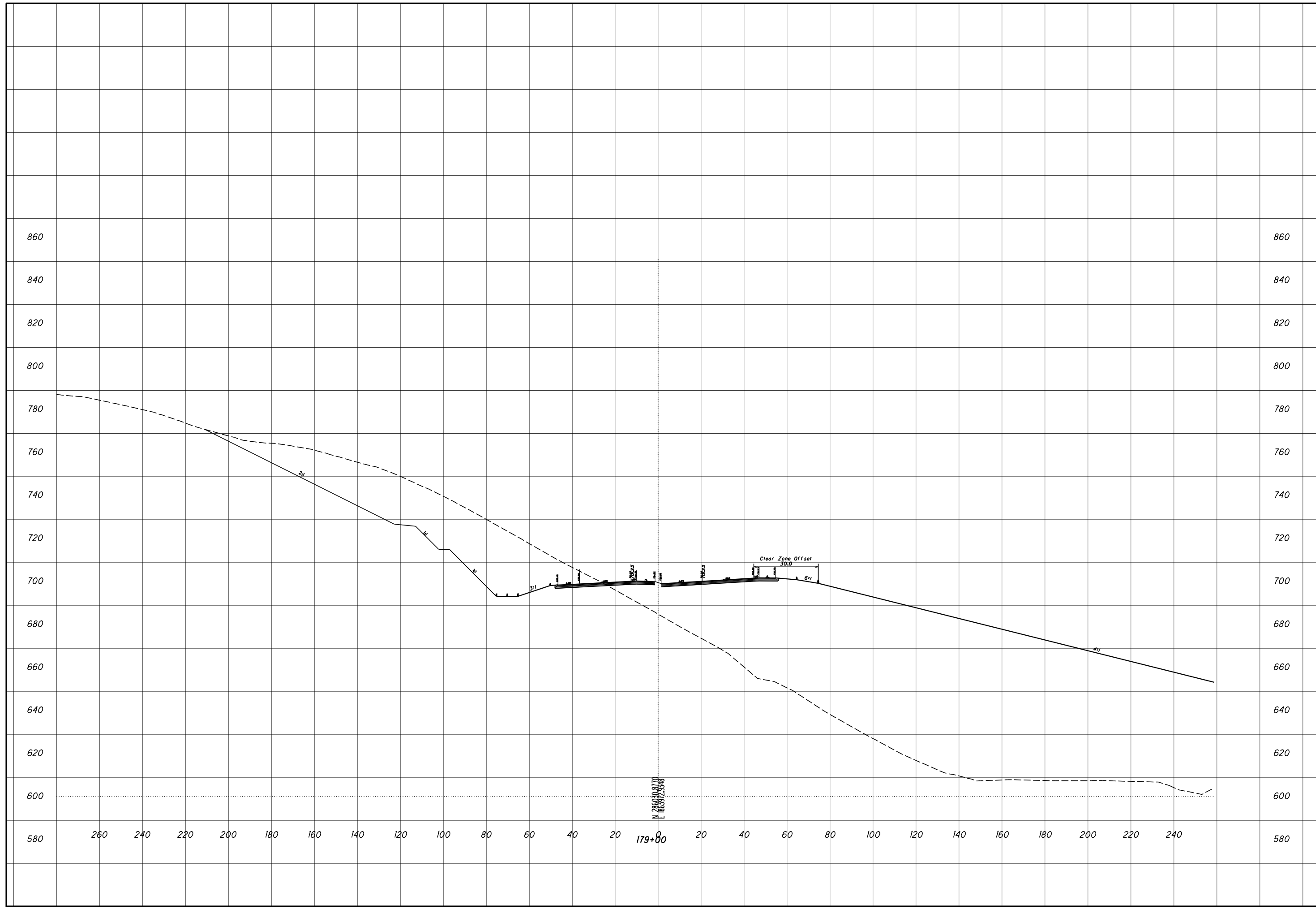
SCI-823-0.00

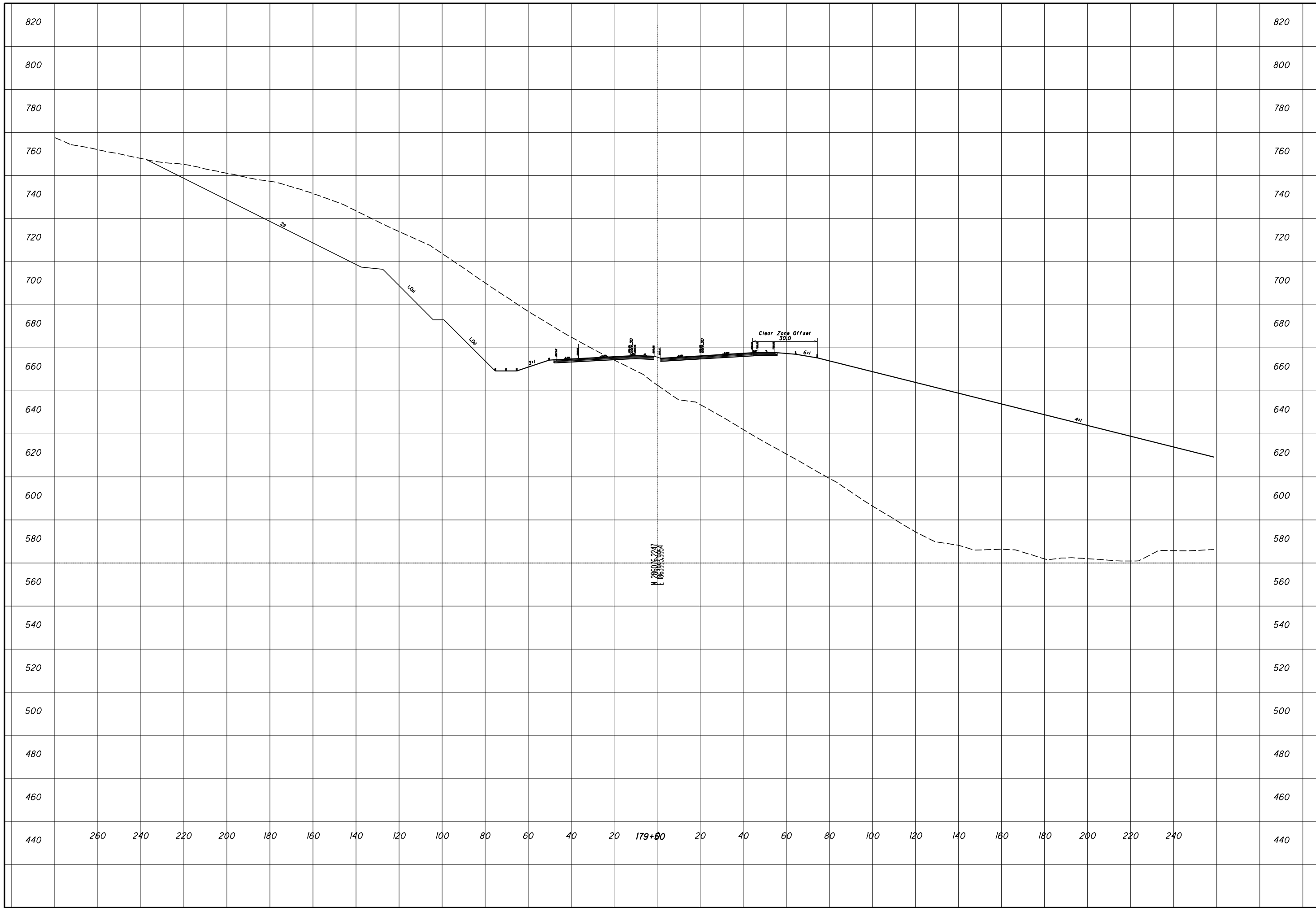


CHECKED

**ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 179+00**

SCI-823-0.00





ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 179+50

SCI-823-0.00

4
59

CHECKED

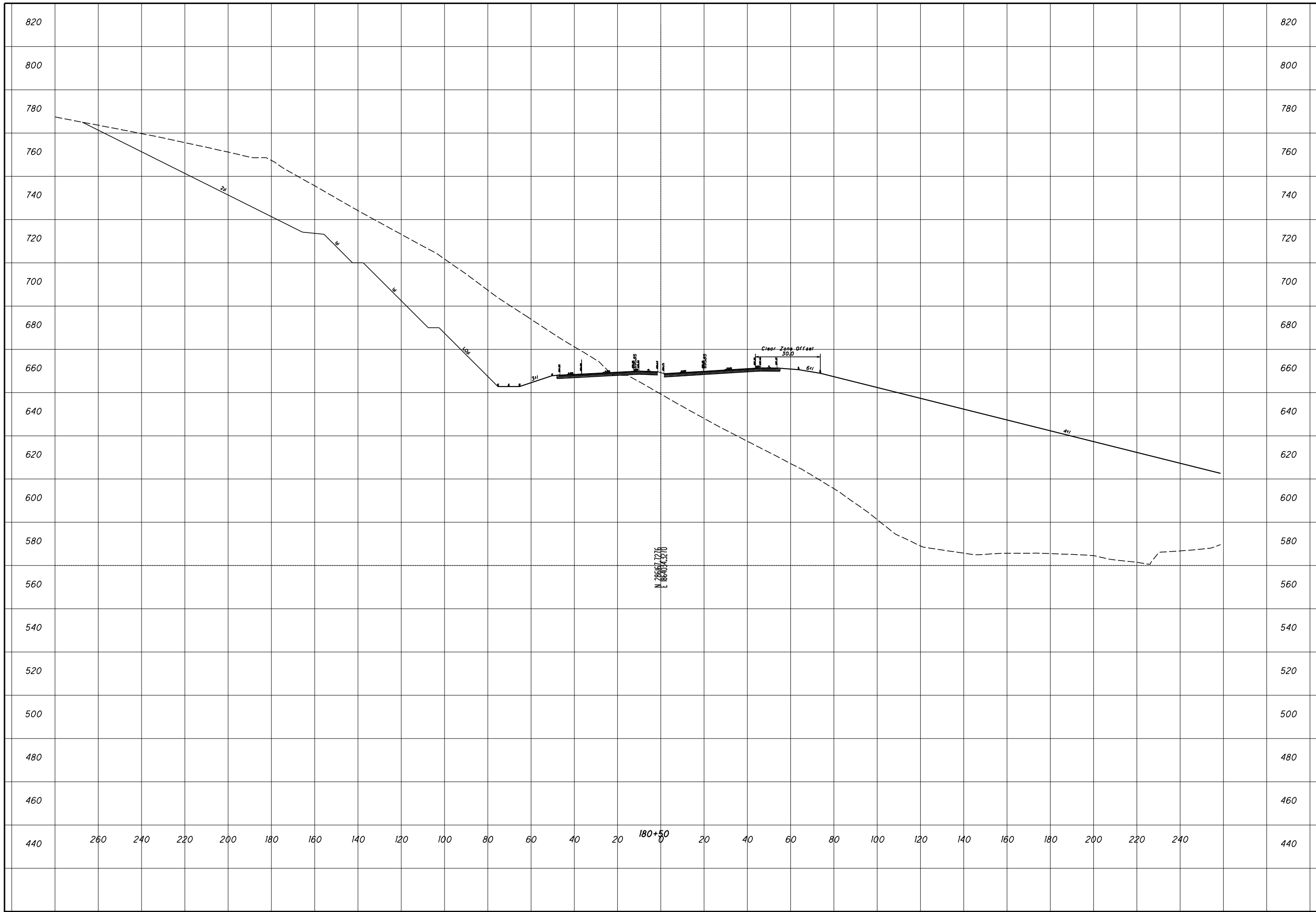


ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 180+00

SCI-823-0.00

5
59

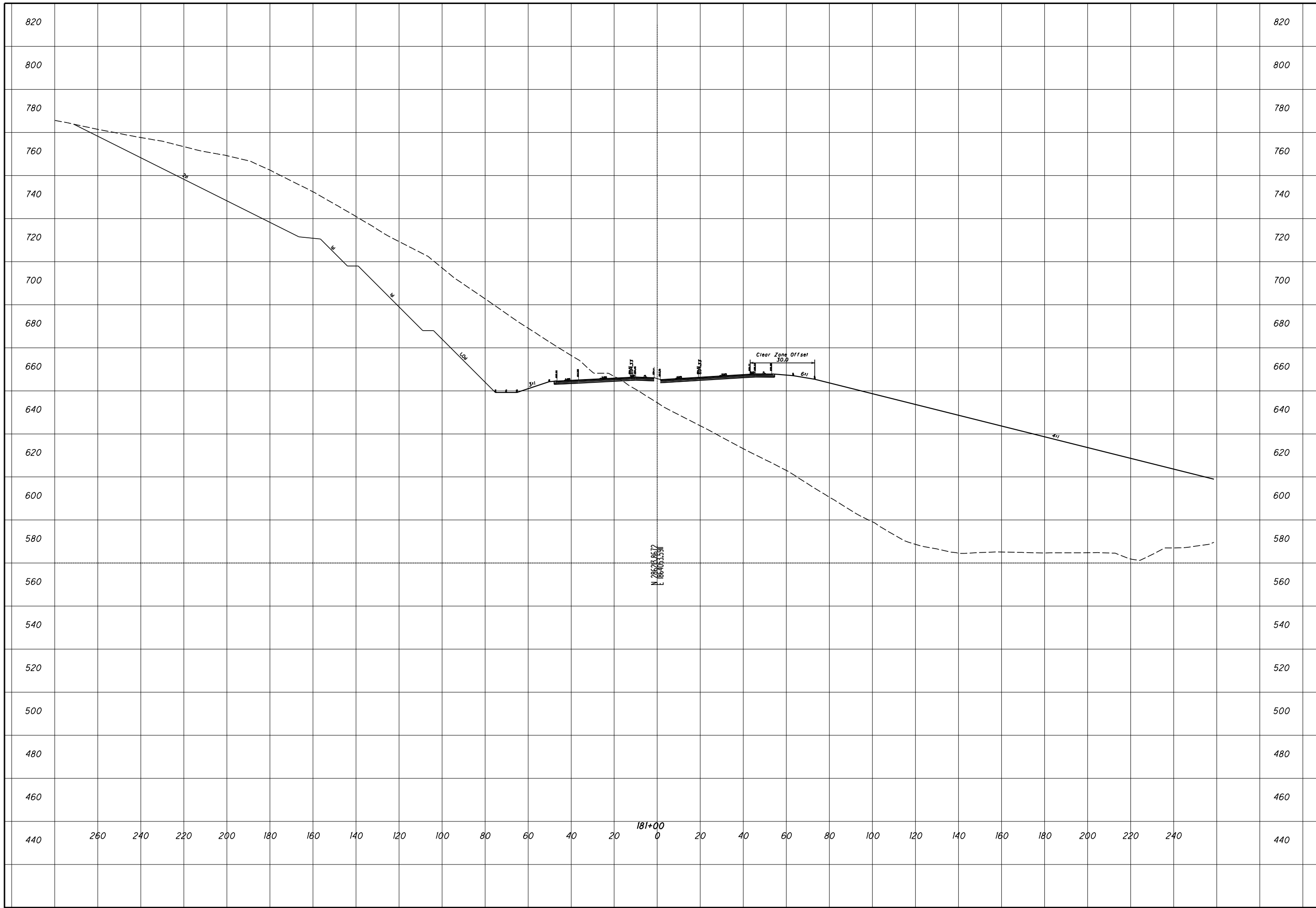
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CHECKED

**ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 180+50**

SCI-823-0.00



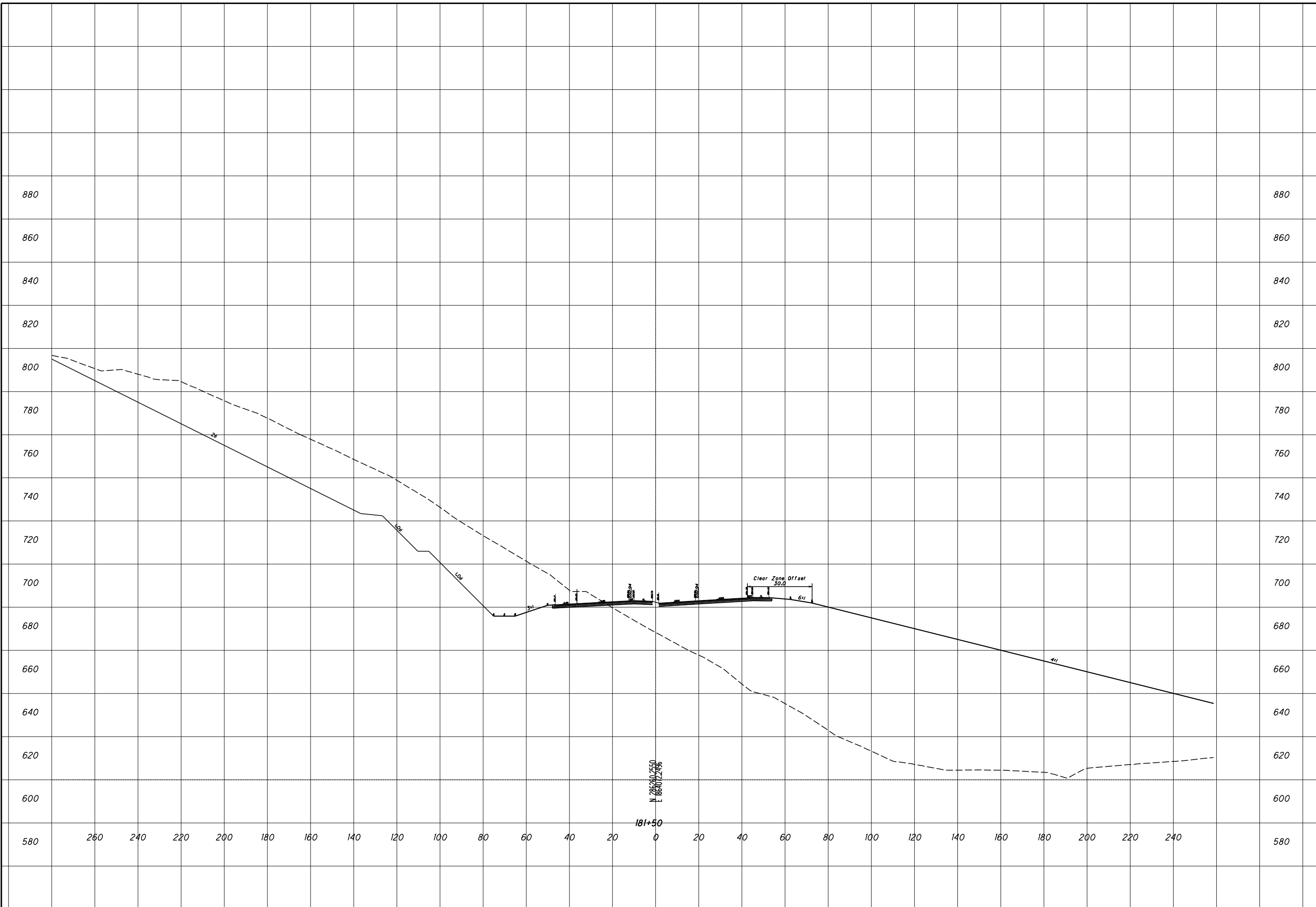
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ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 181+00

SCI-823-0.00

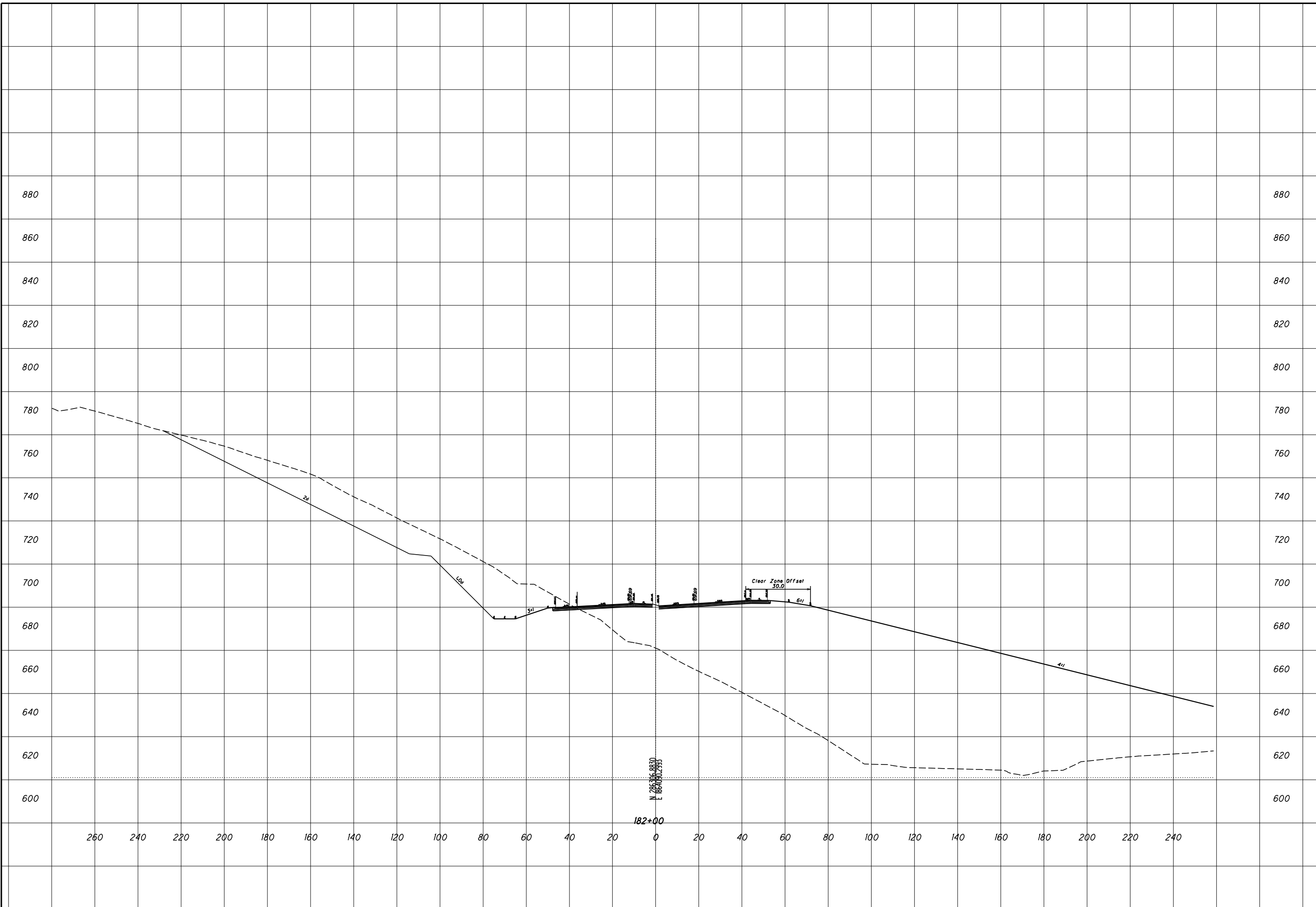
ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 181+50

SCI-823-0.00



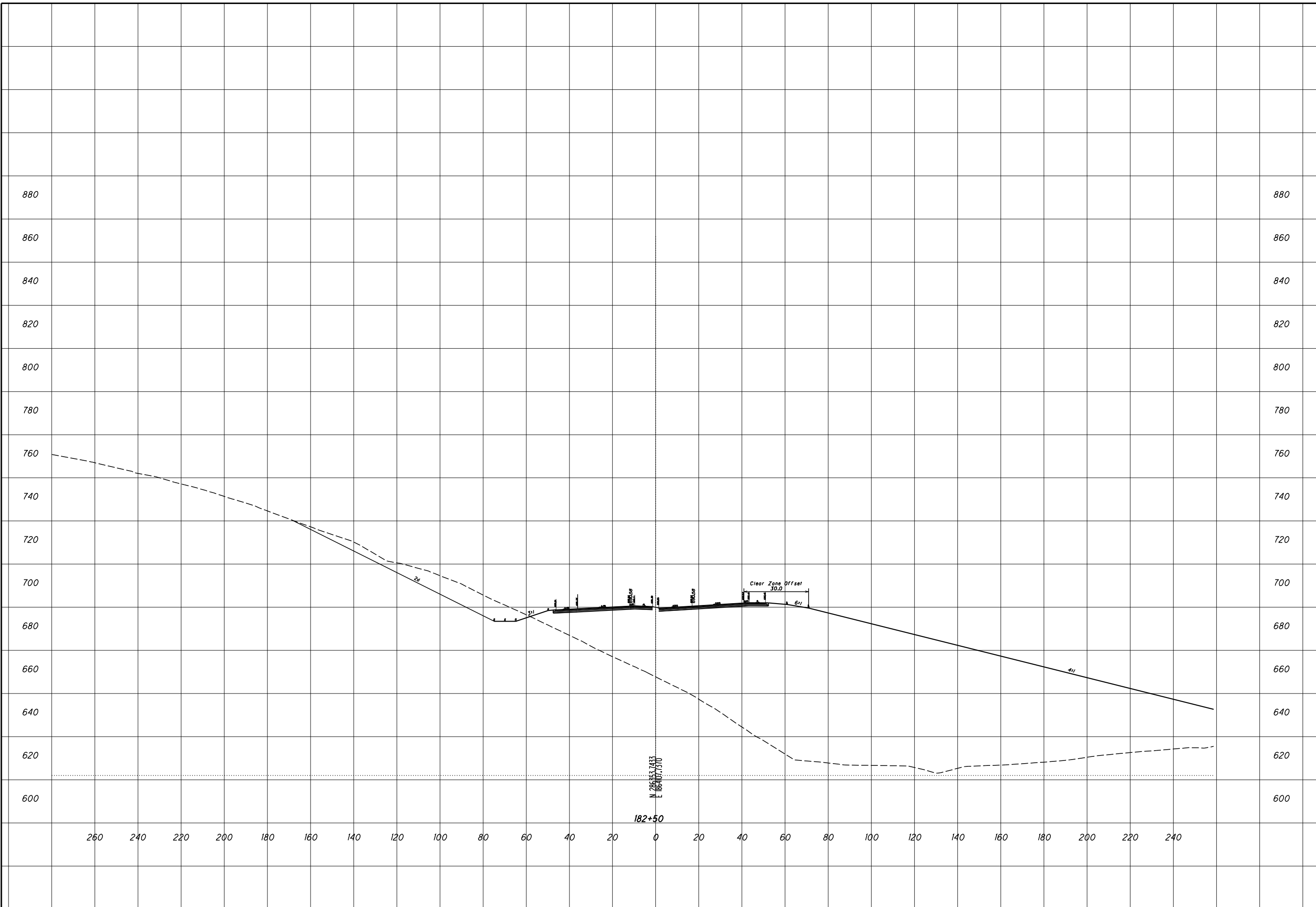
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STA 182+00

SCI-823-0.00



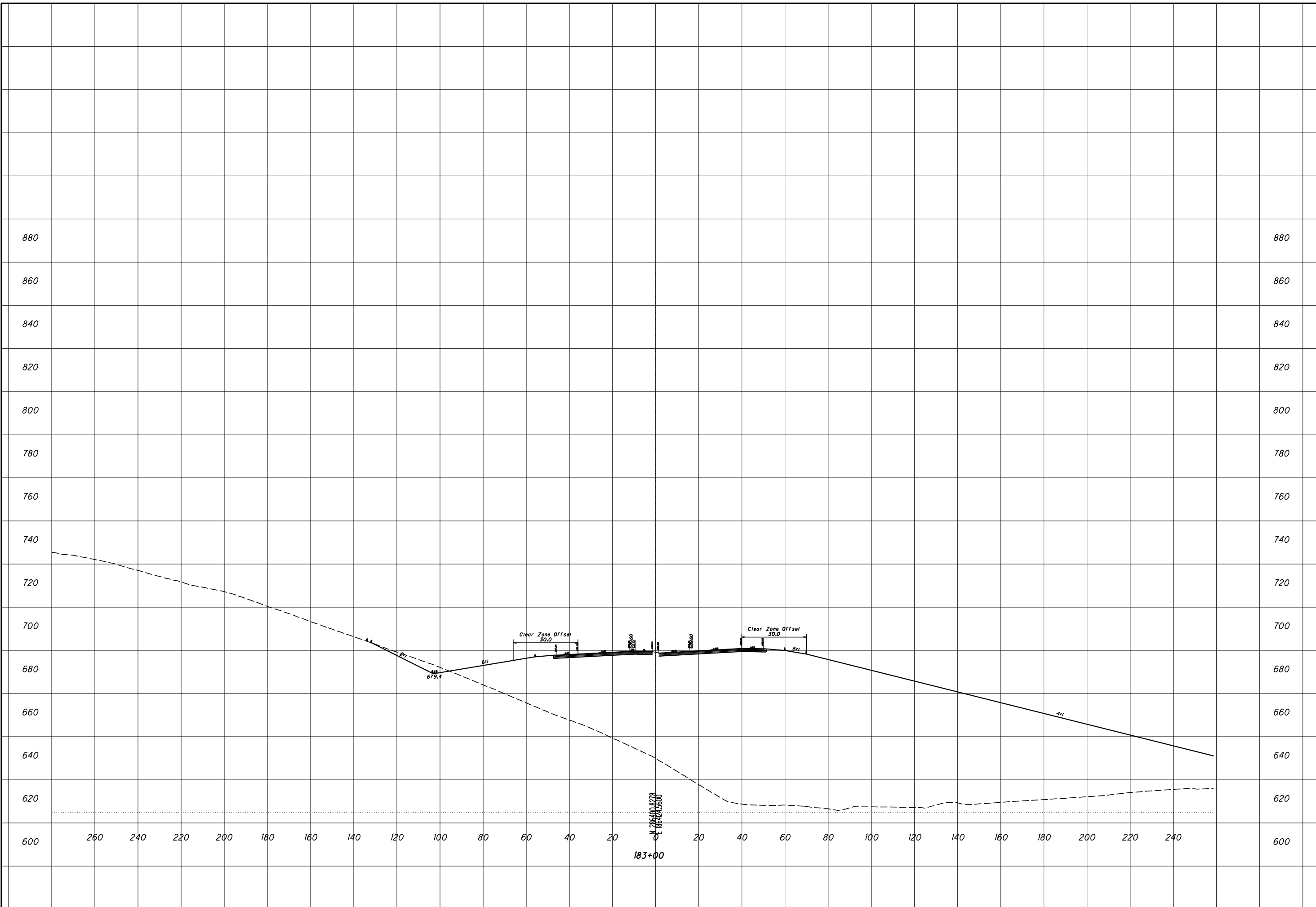
ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 182+50

SCI-823-0.00



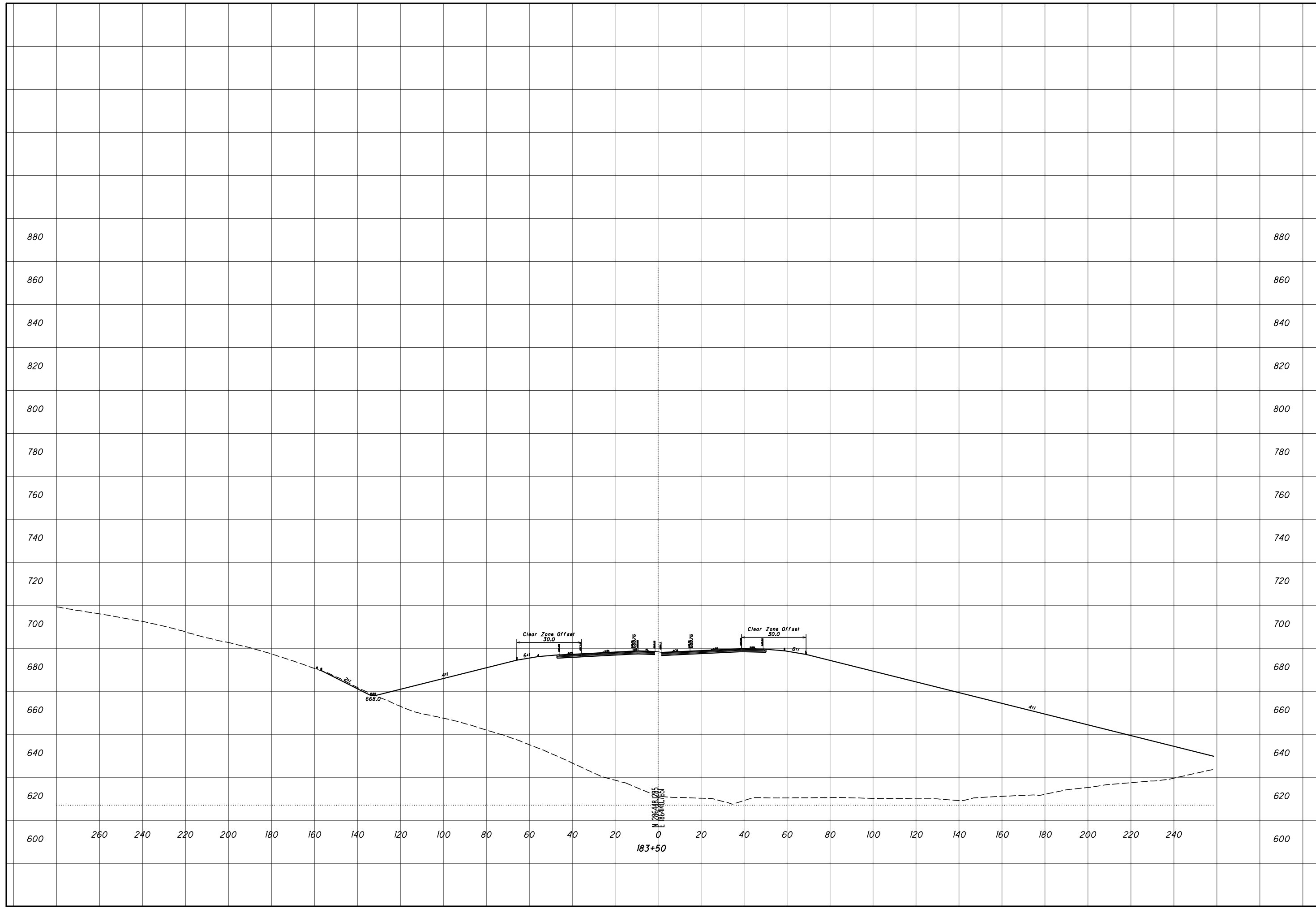
ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 183+00

SCI-823-0.00



ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 183+50

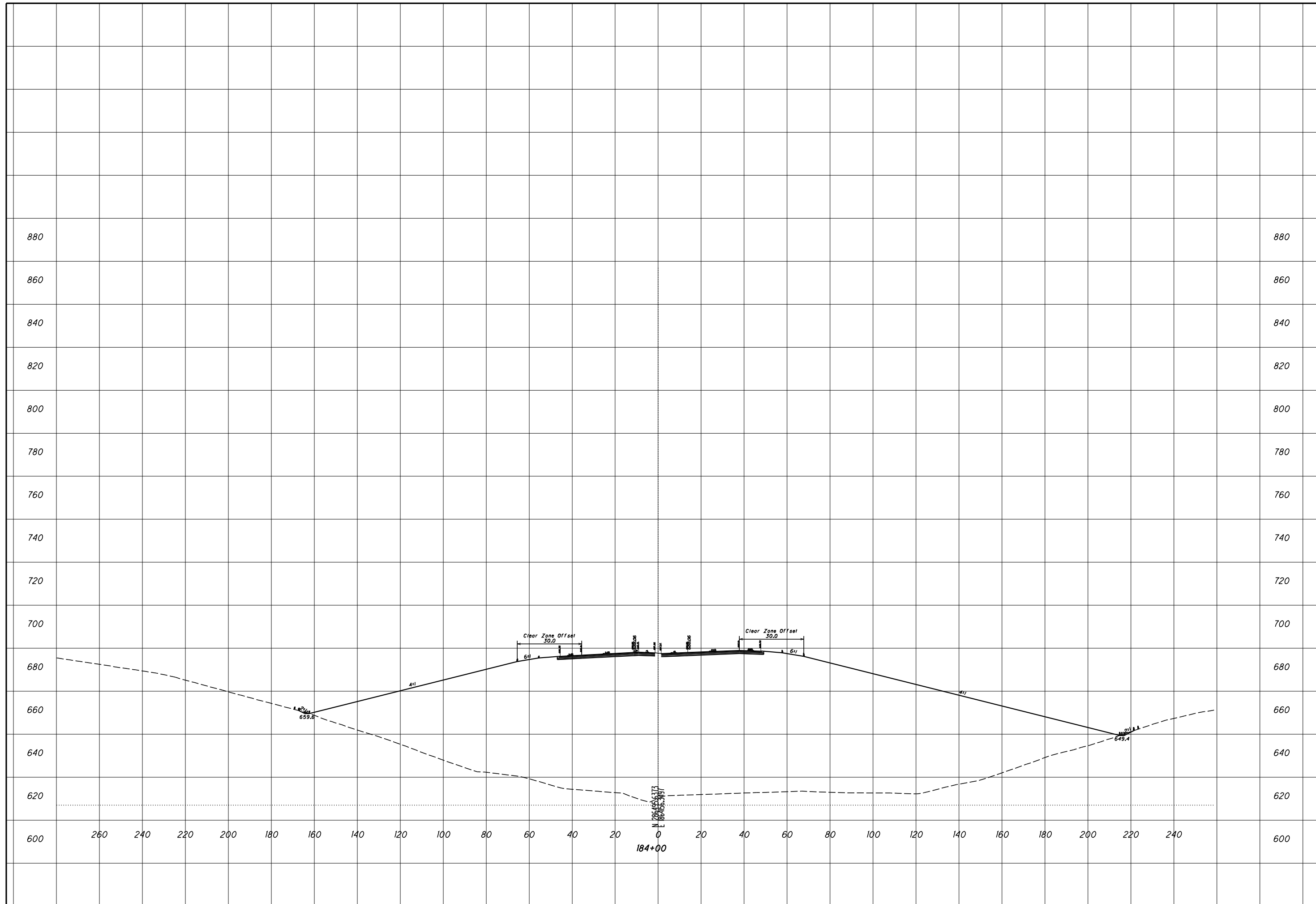
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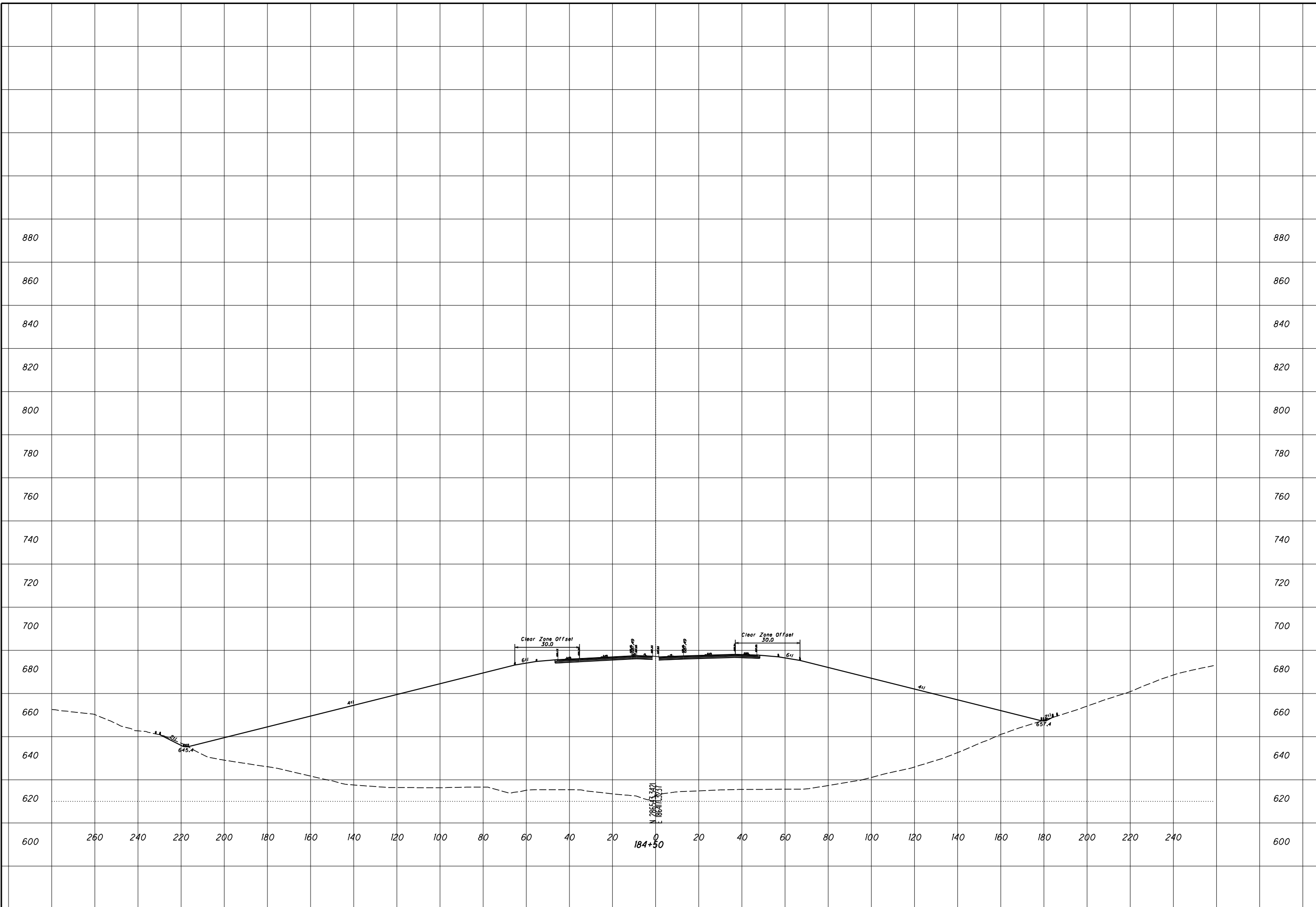
ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 184+00

SCI-823-0.00



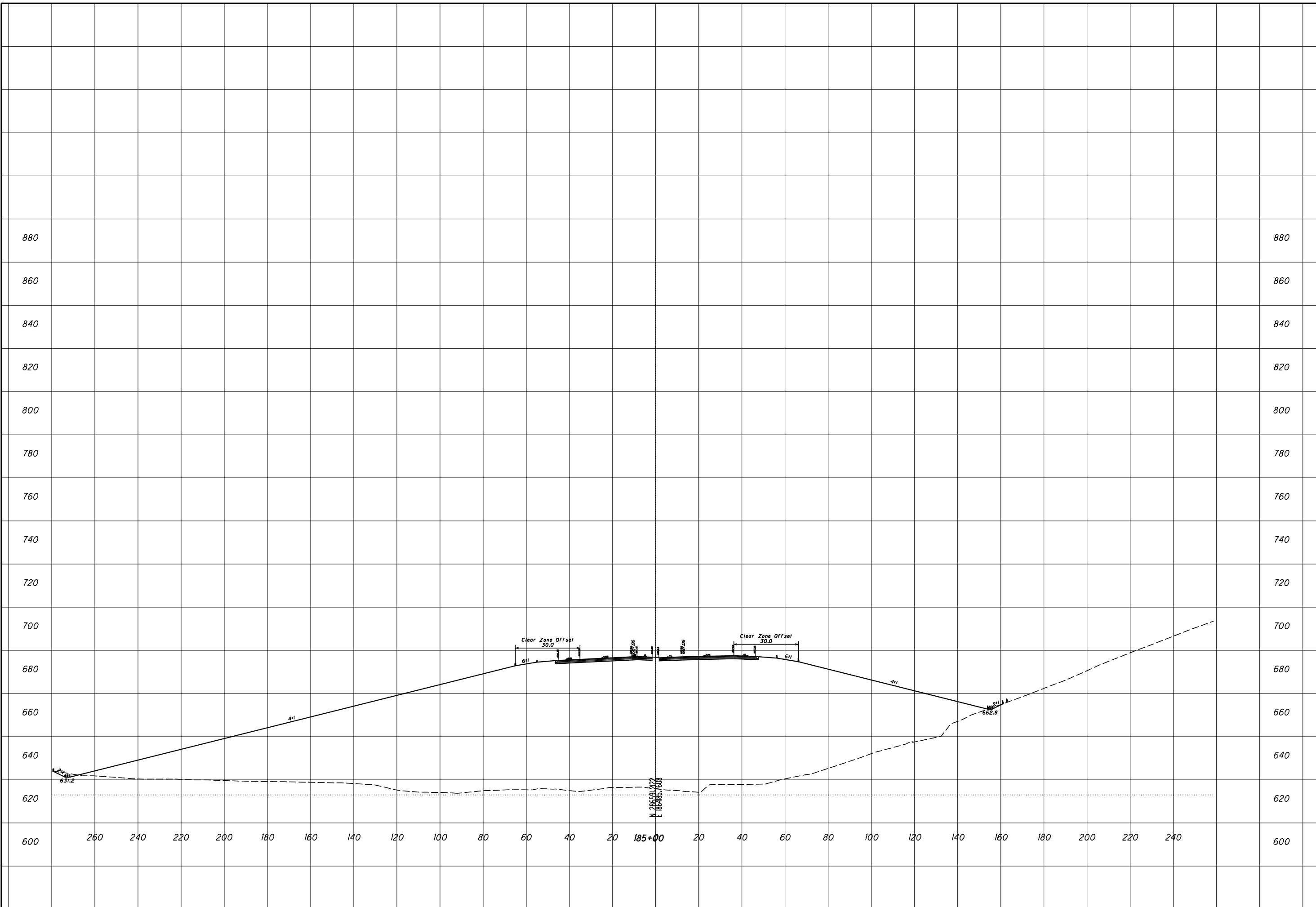
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STA 184+50

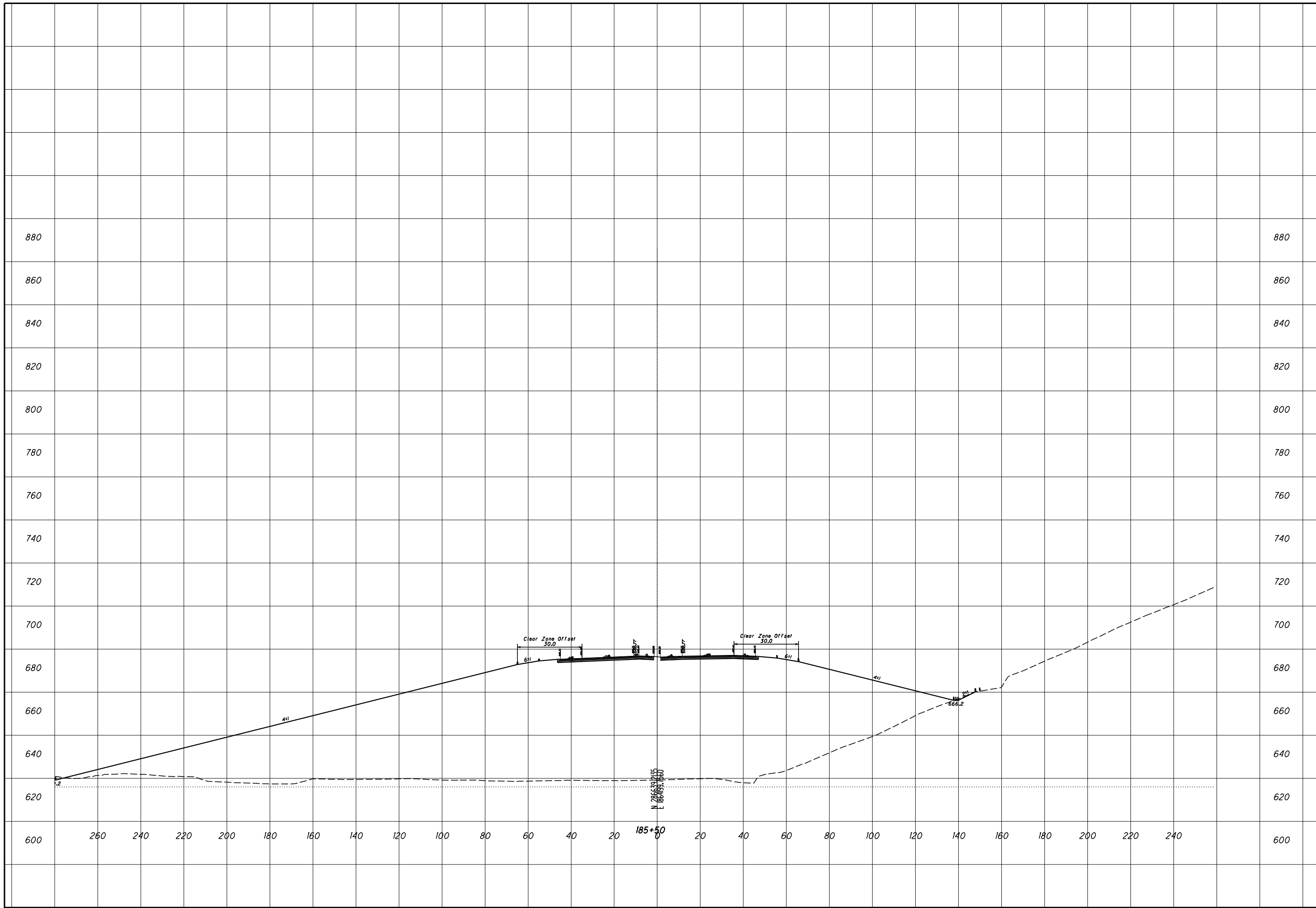
SCI-823-0.00



ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 185+00

SCI-823-0.00





ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 185+50

SCI-823-0.00

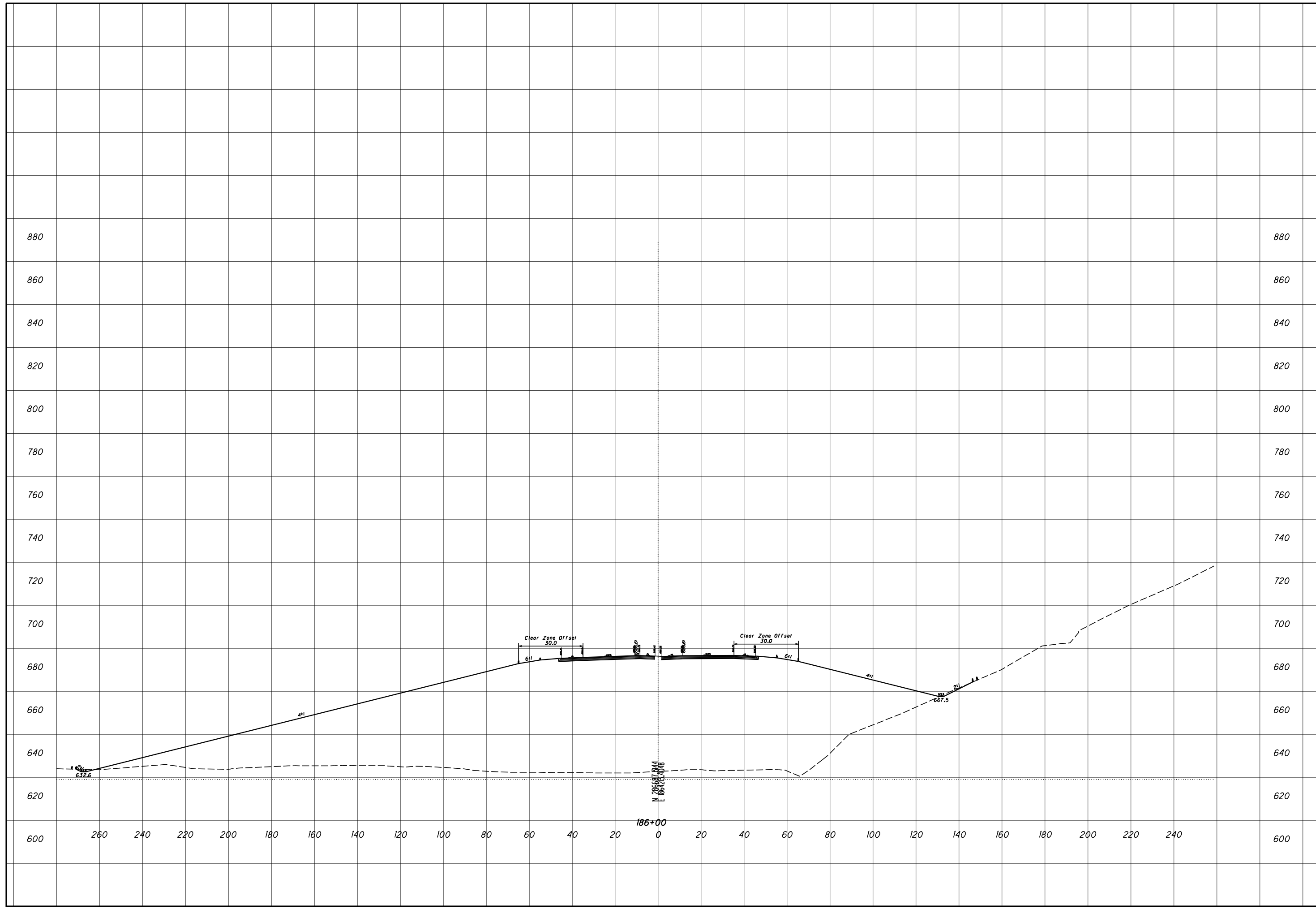
16
59

CHECKED

CHECKED

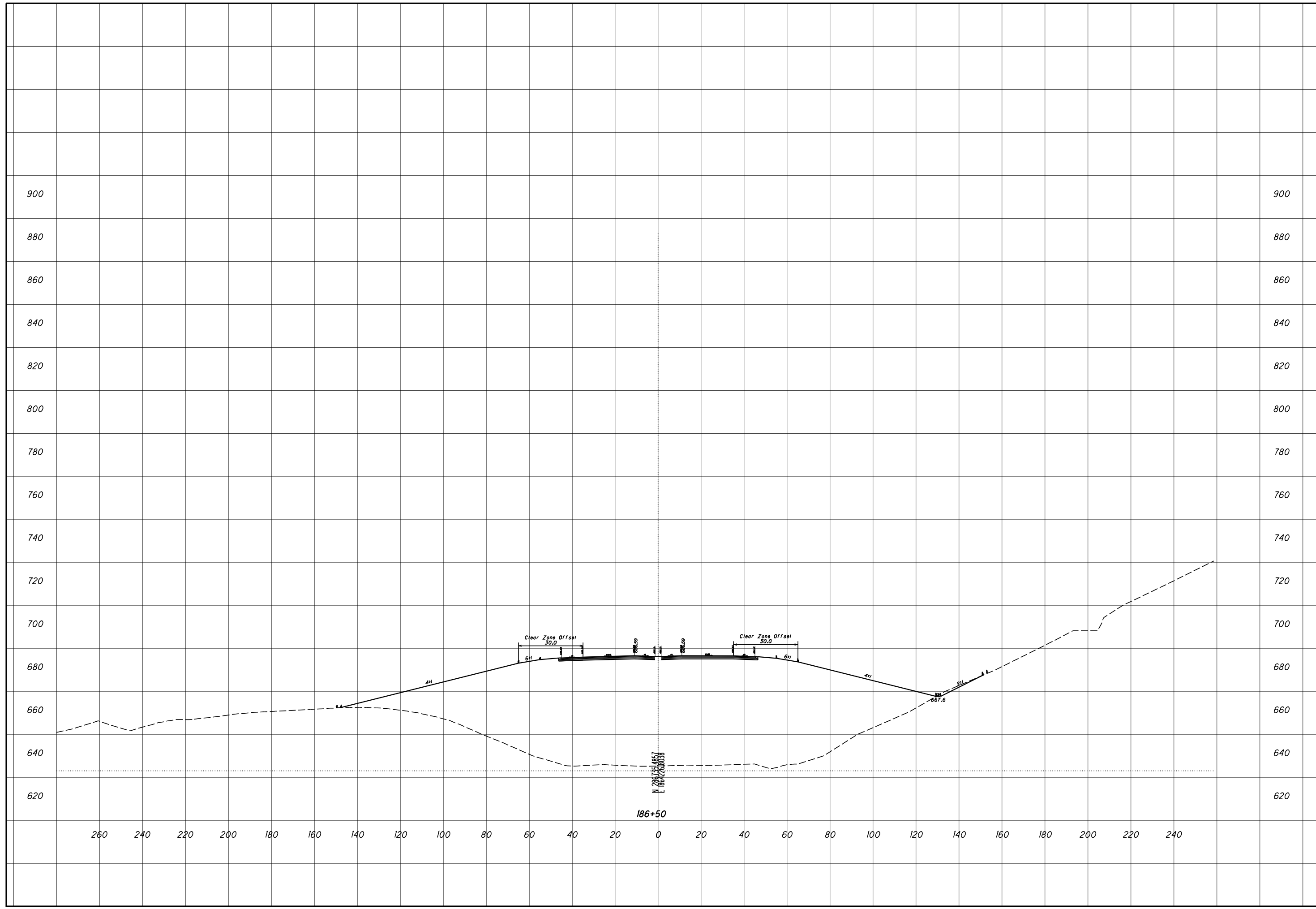
ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 186+00

SCI-823-0.00



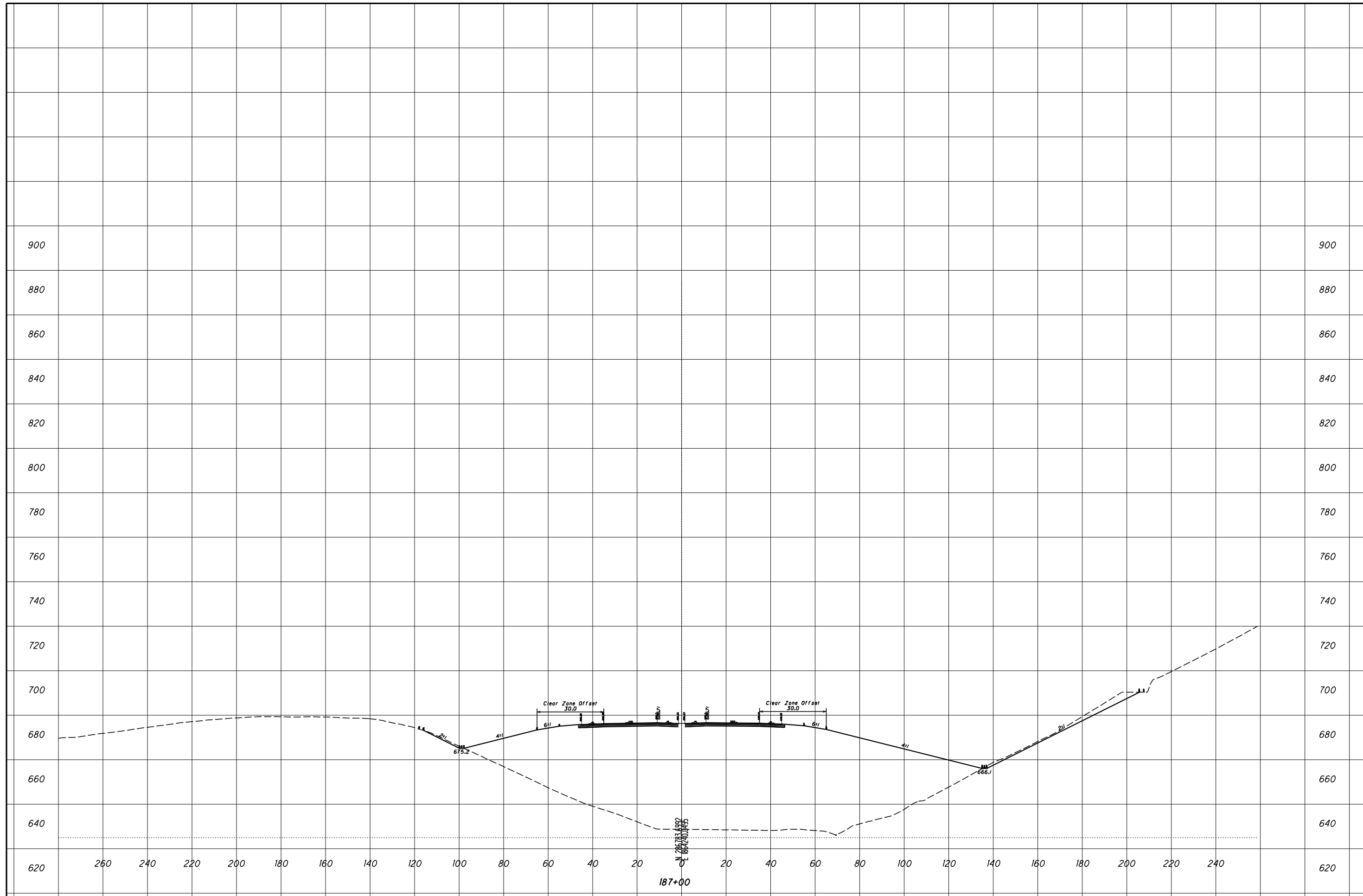
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STA 186+50

SCI-823-0.00



ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 187+00

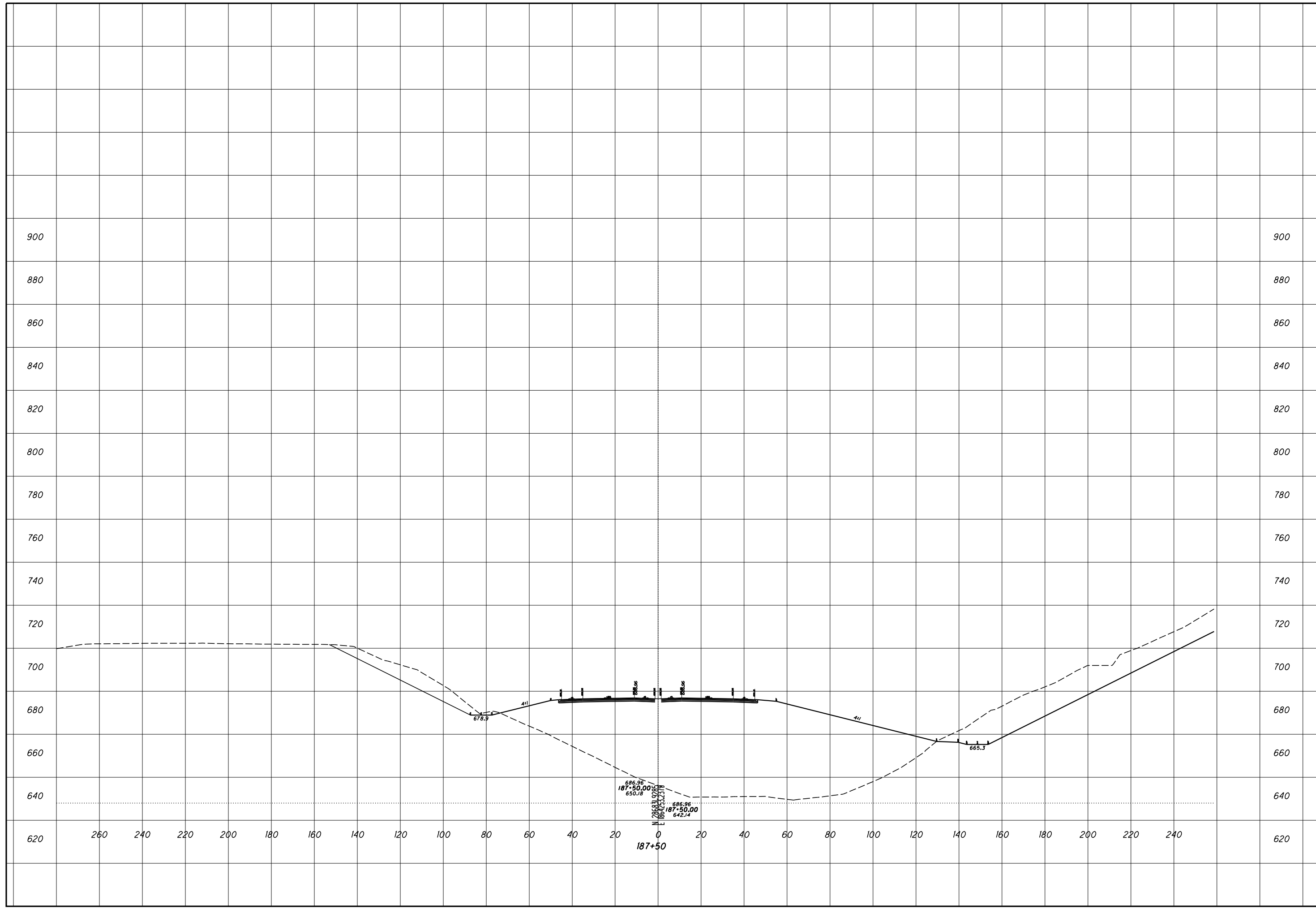
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ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 187+50

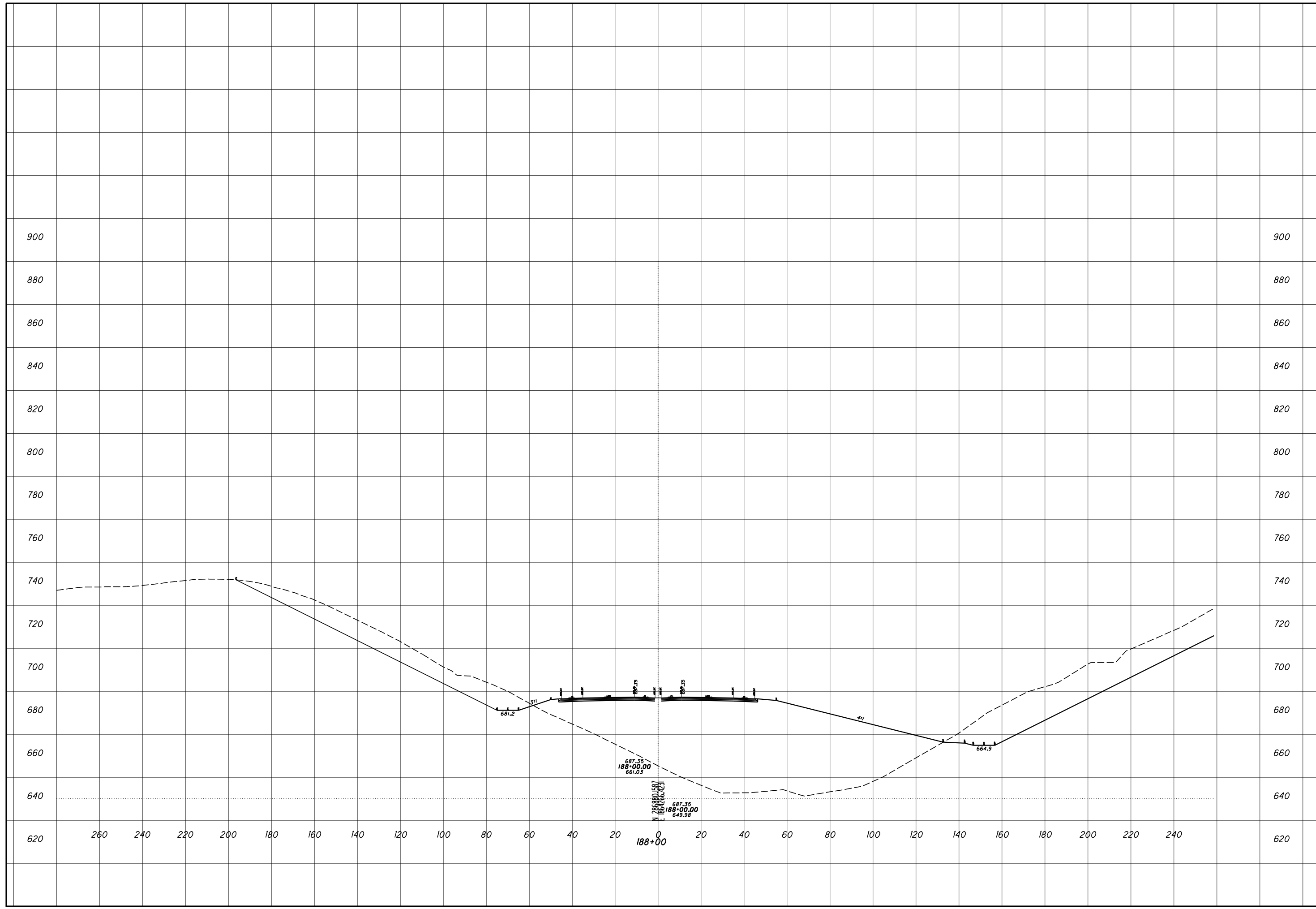
SCI-823-0.00



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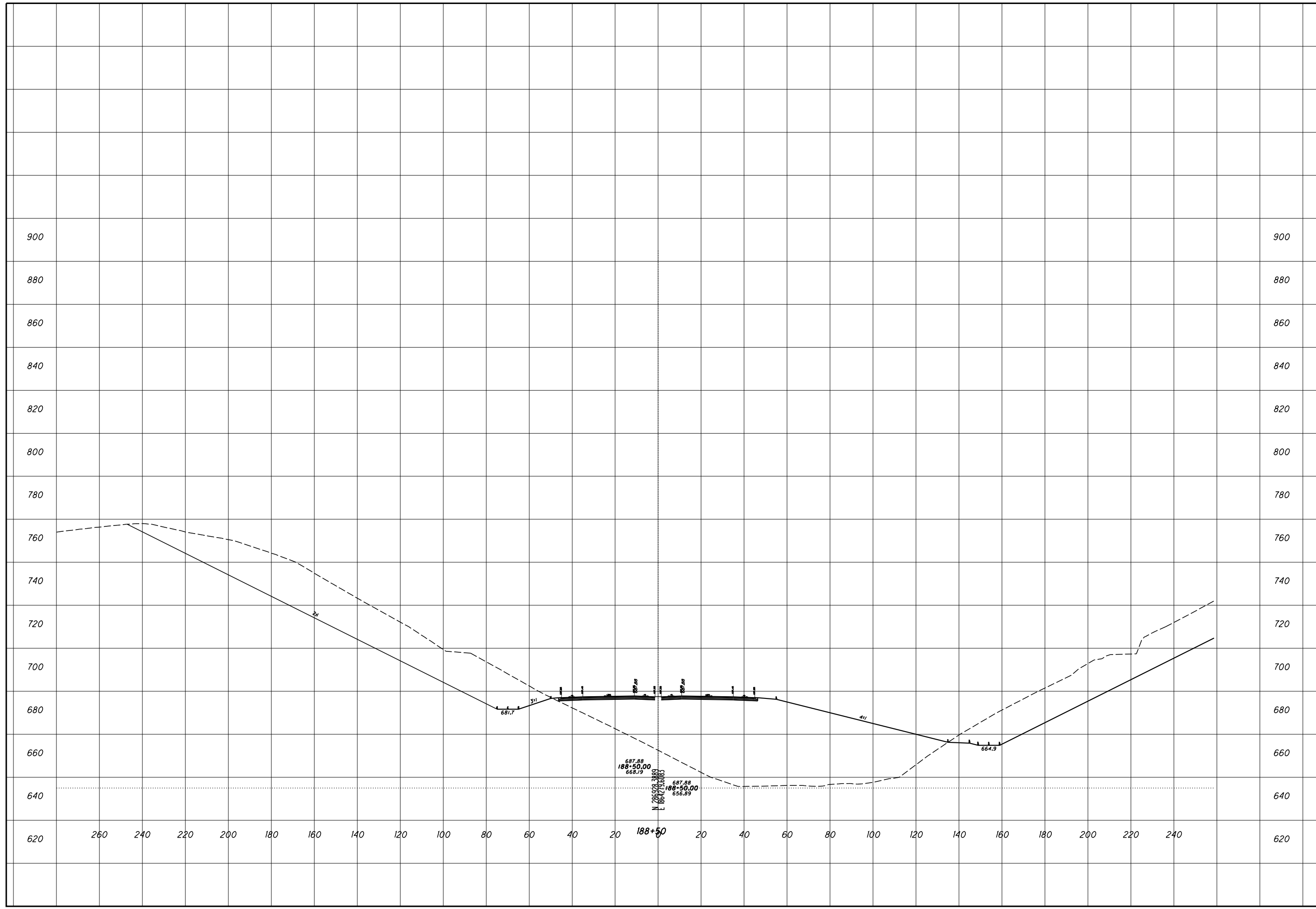
ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 188+00

SCI-823-0.00



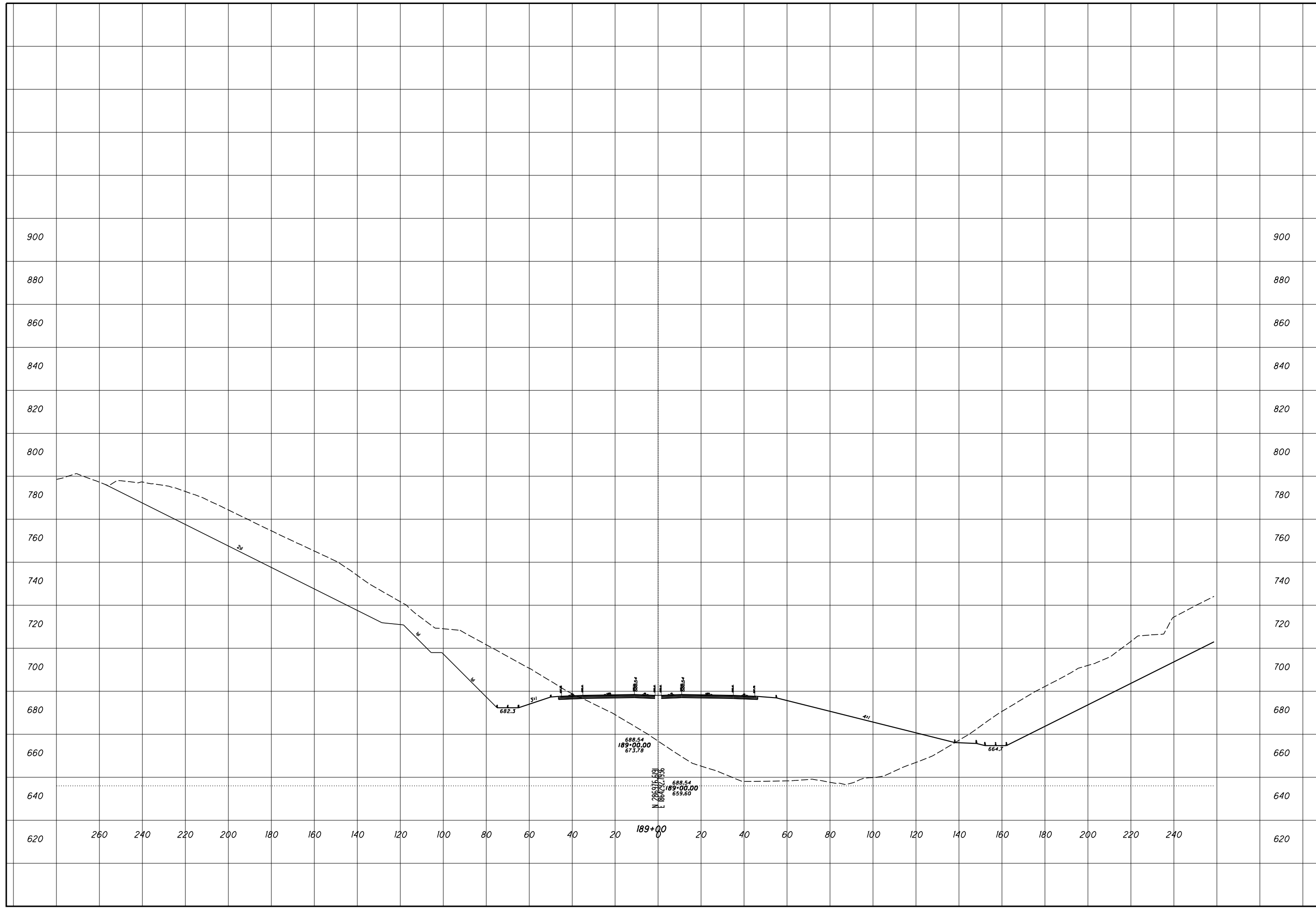
ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 188+50

SCI-823-0.00



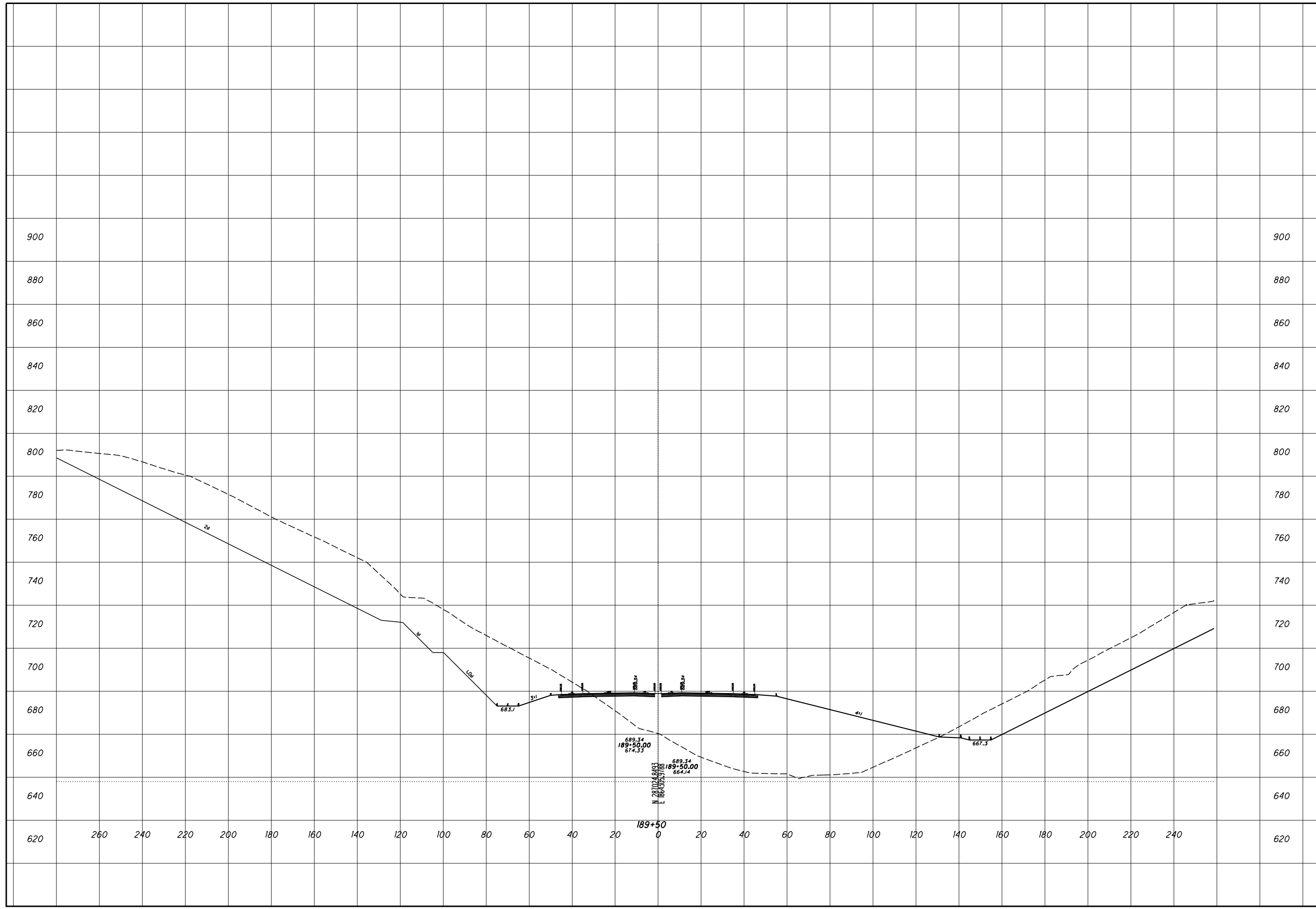
ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 189+00

SCI-823-0.00



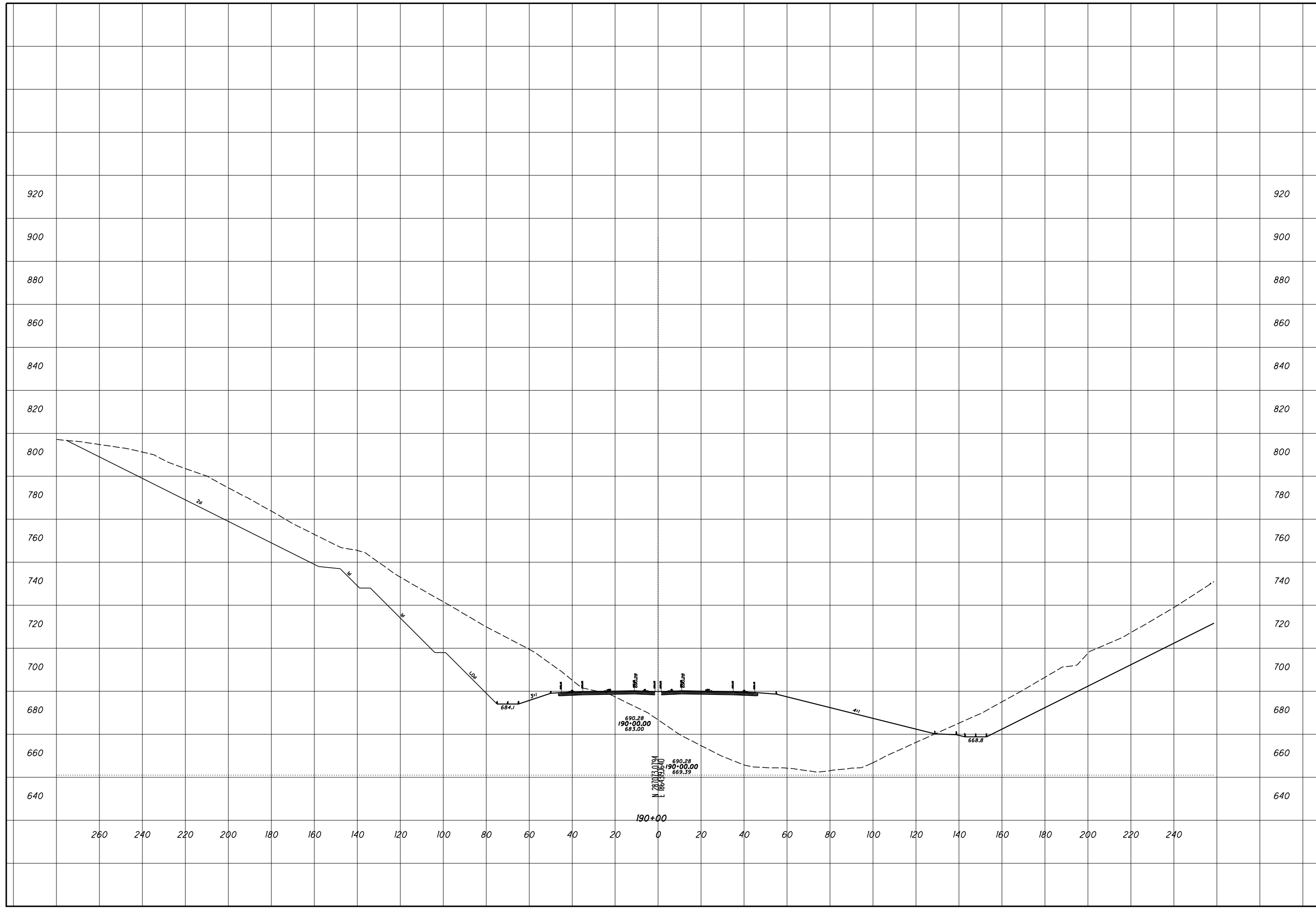
ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 189+50

SCI-823-0.00



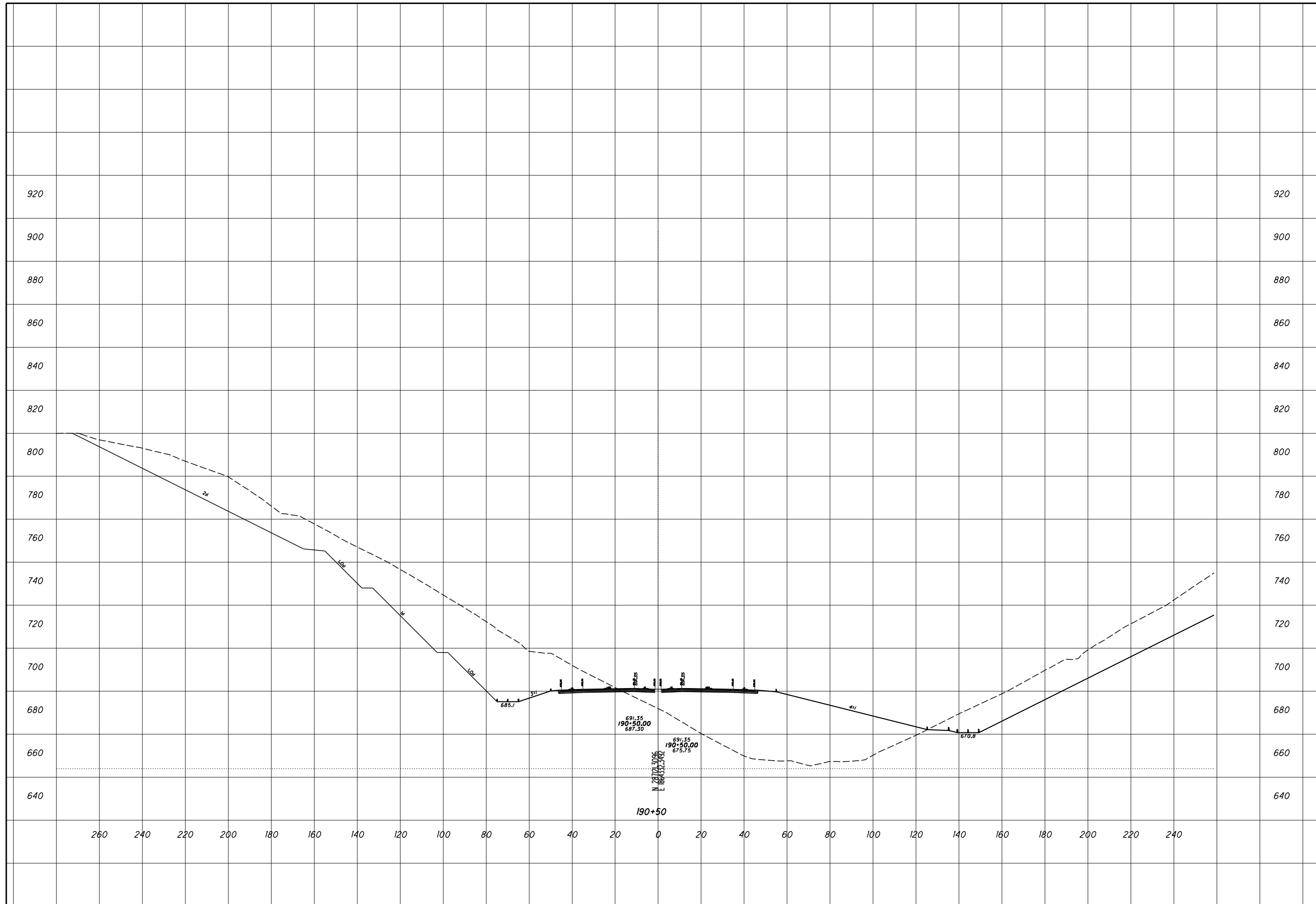
ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 190+00

SCI-823-0.00



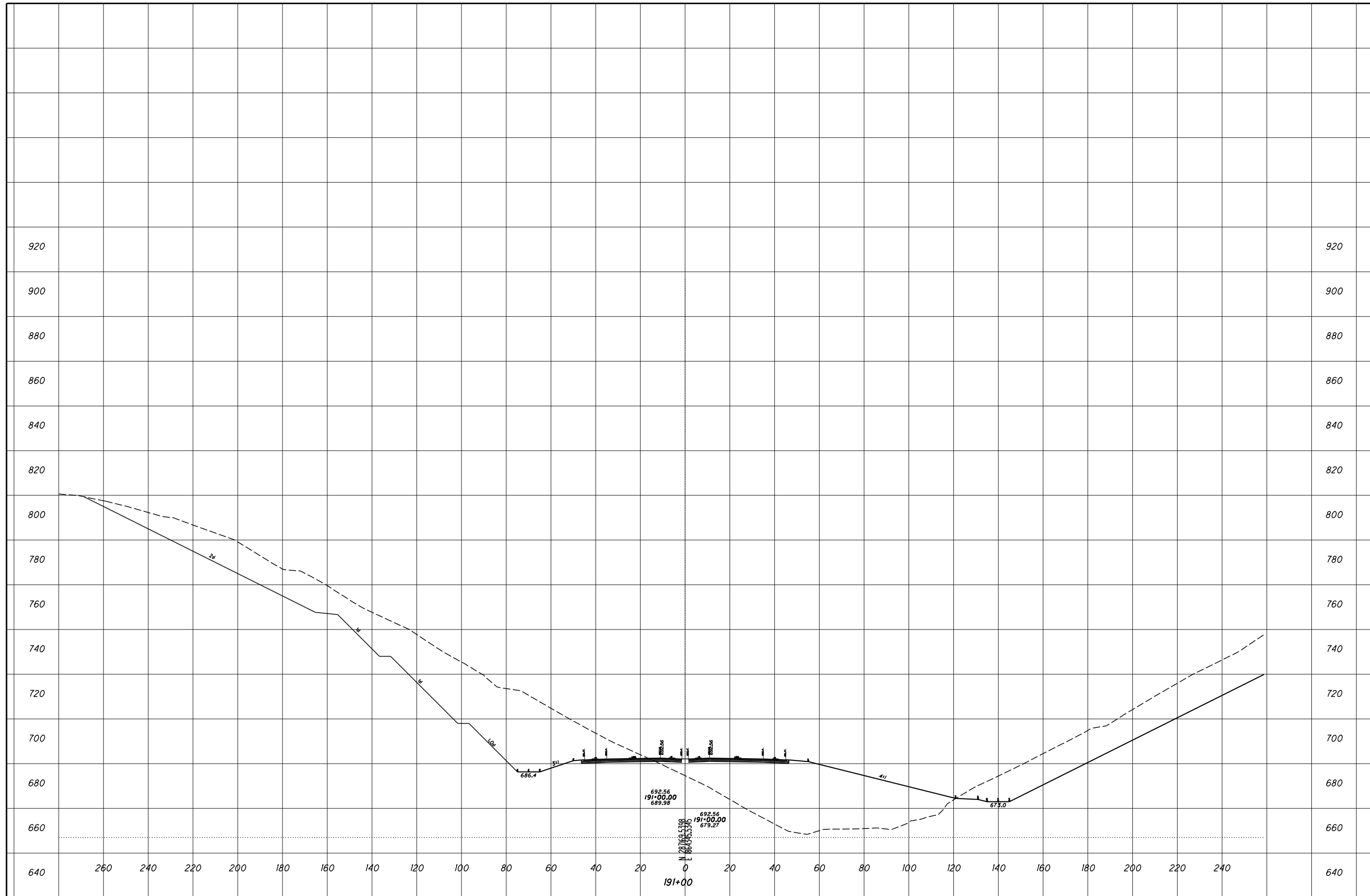
ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 190+50

SCI-823-0.00



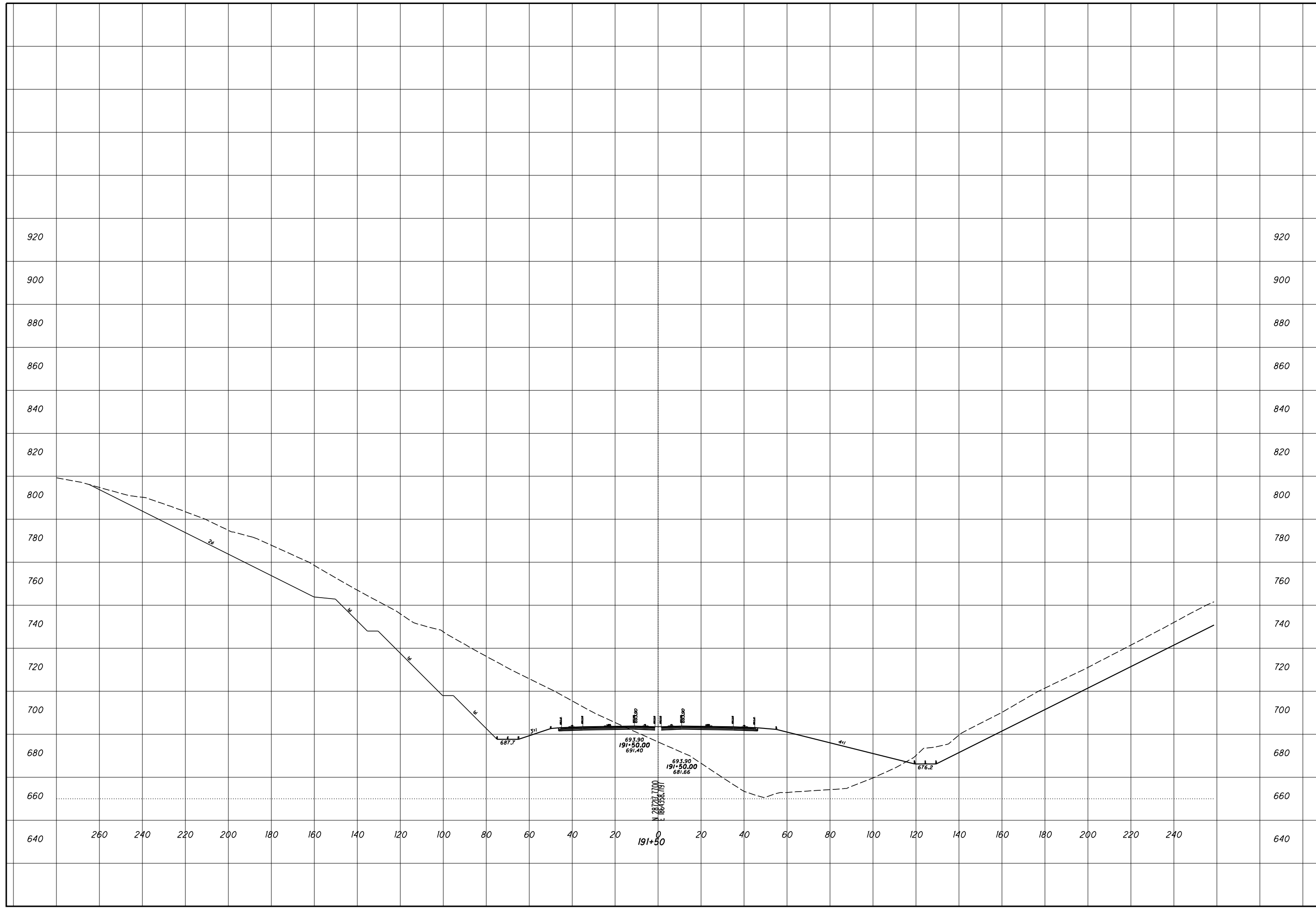
ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 191+00

SCI-823-0.00



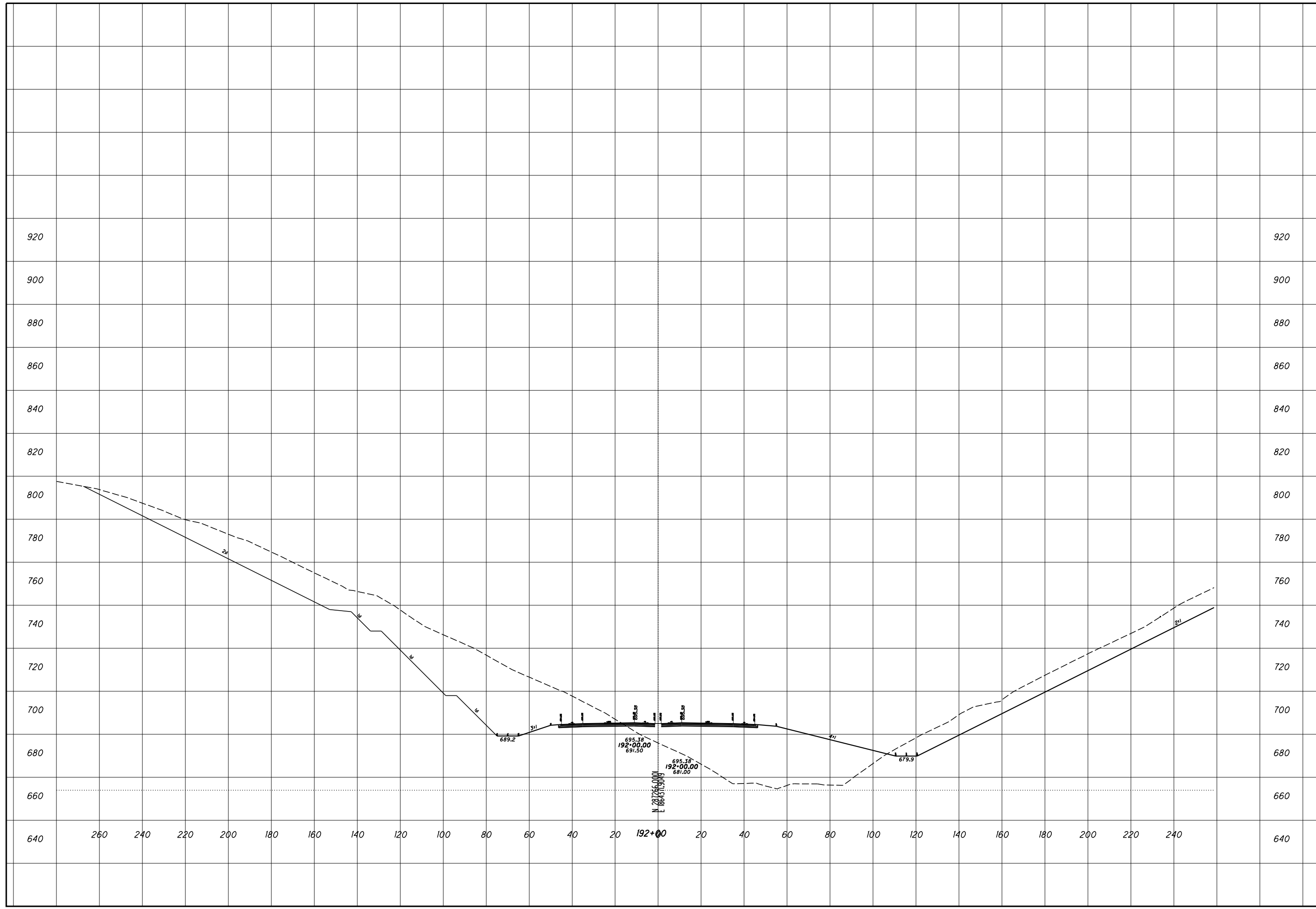
ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 191+50

SCI-823-0.00



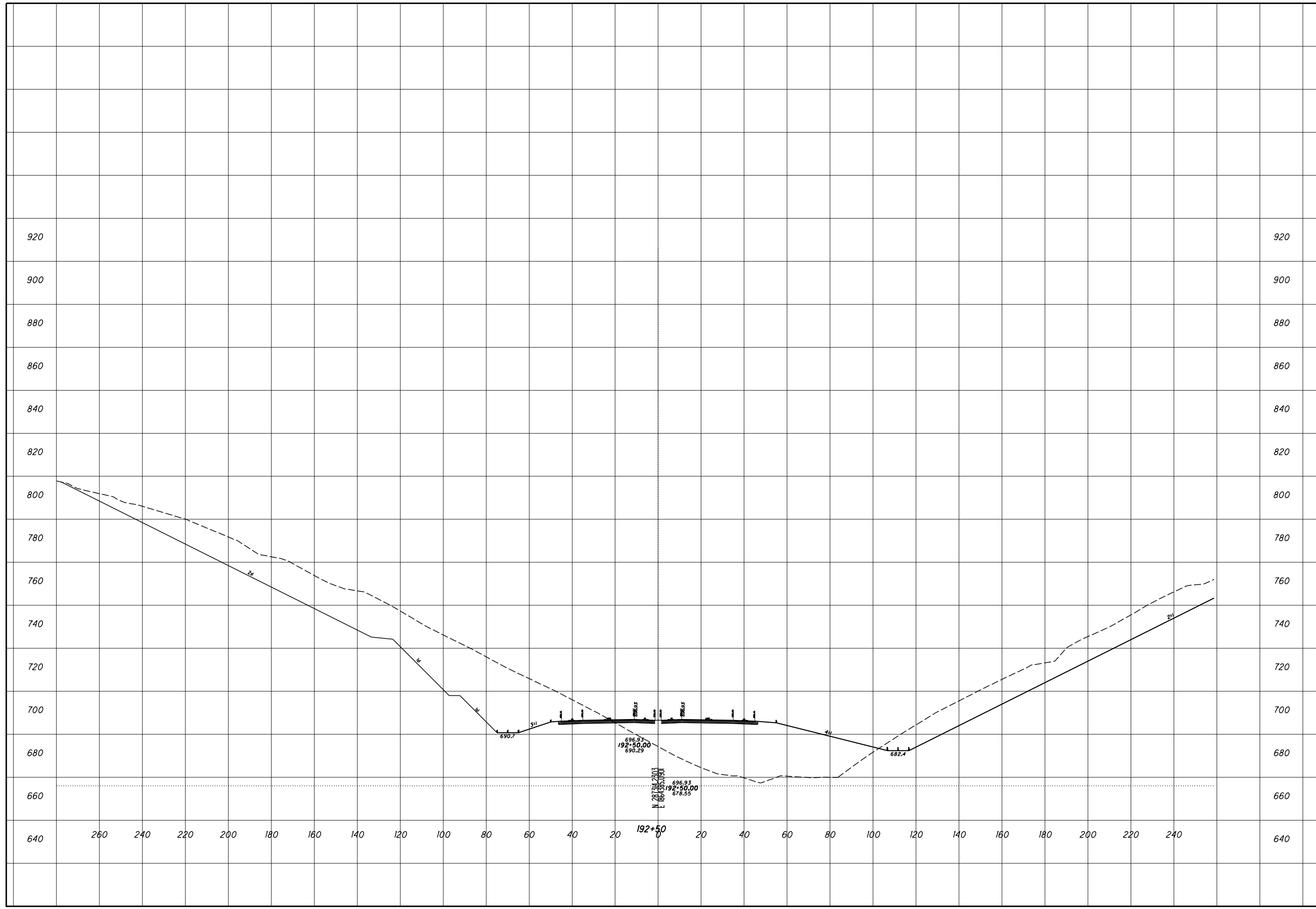
ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 192+00

SCI-823-0.00



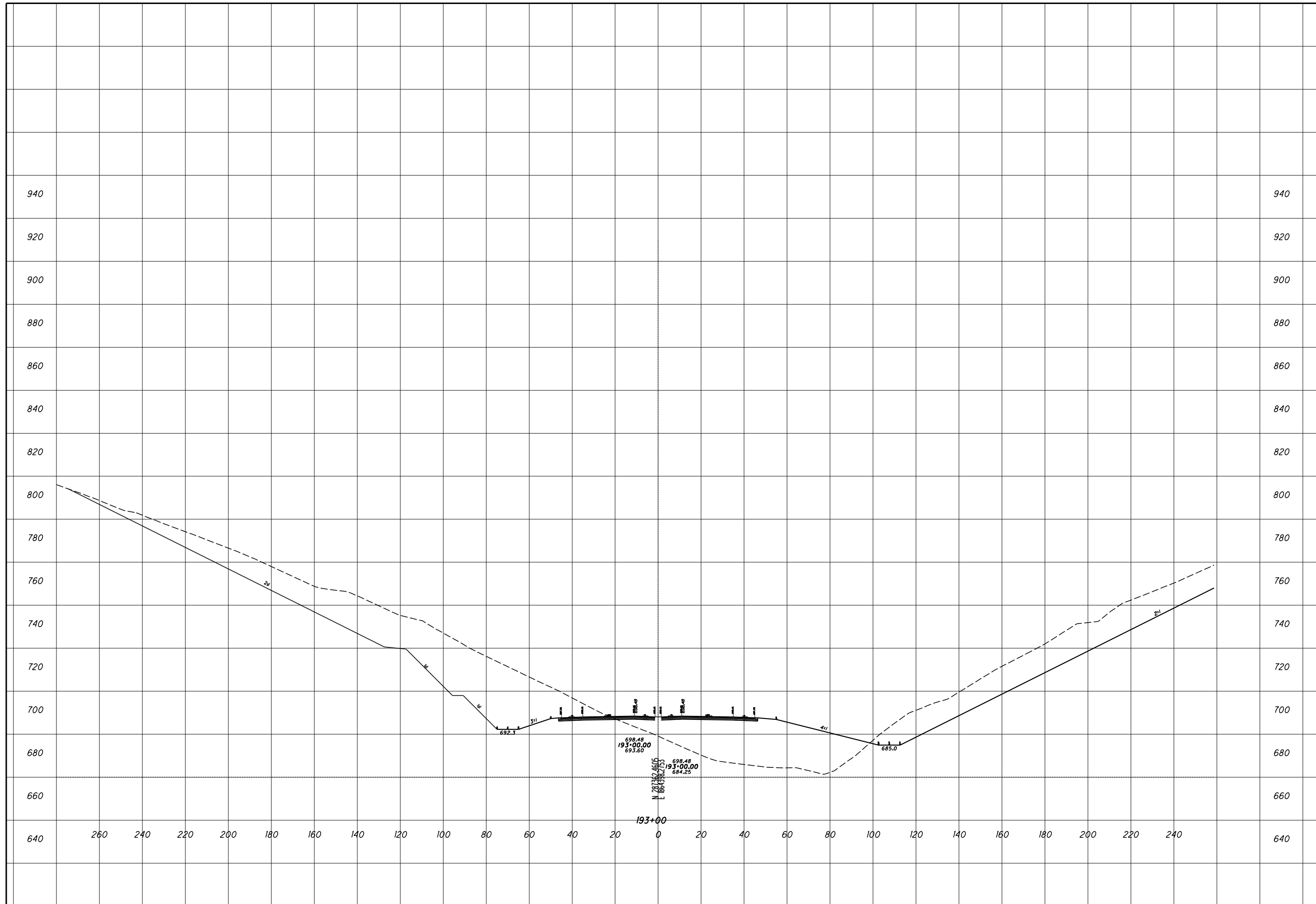
ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 192+50

SCI-823-0.00



ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 193+00

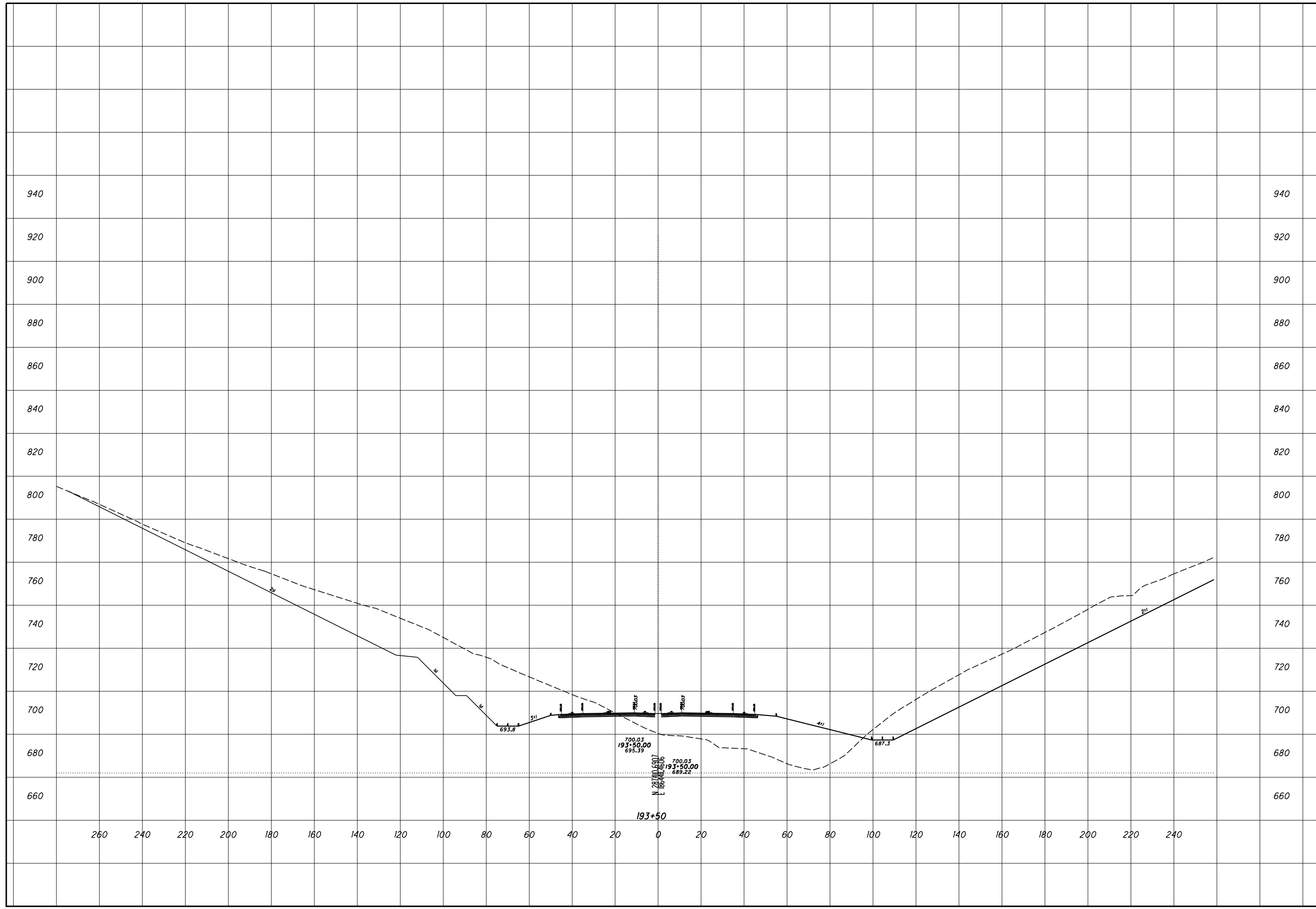
SCI-823-0.00



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**ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 193+50**

SCI-823-0.00

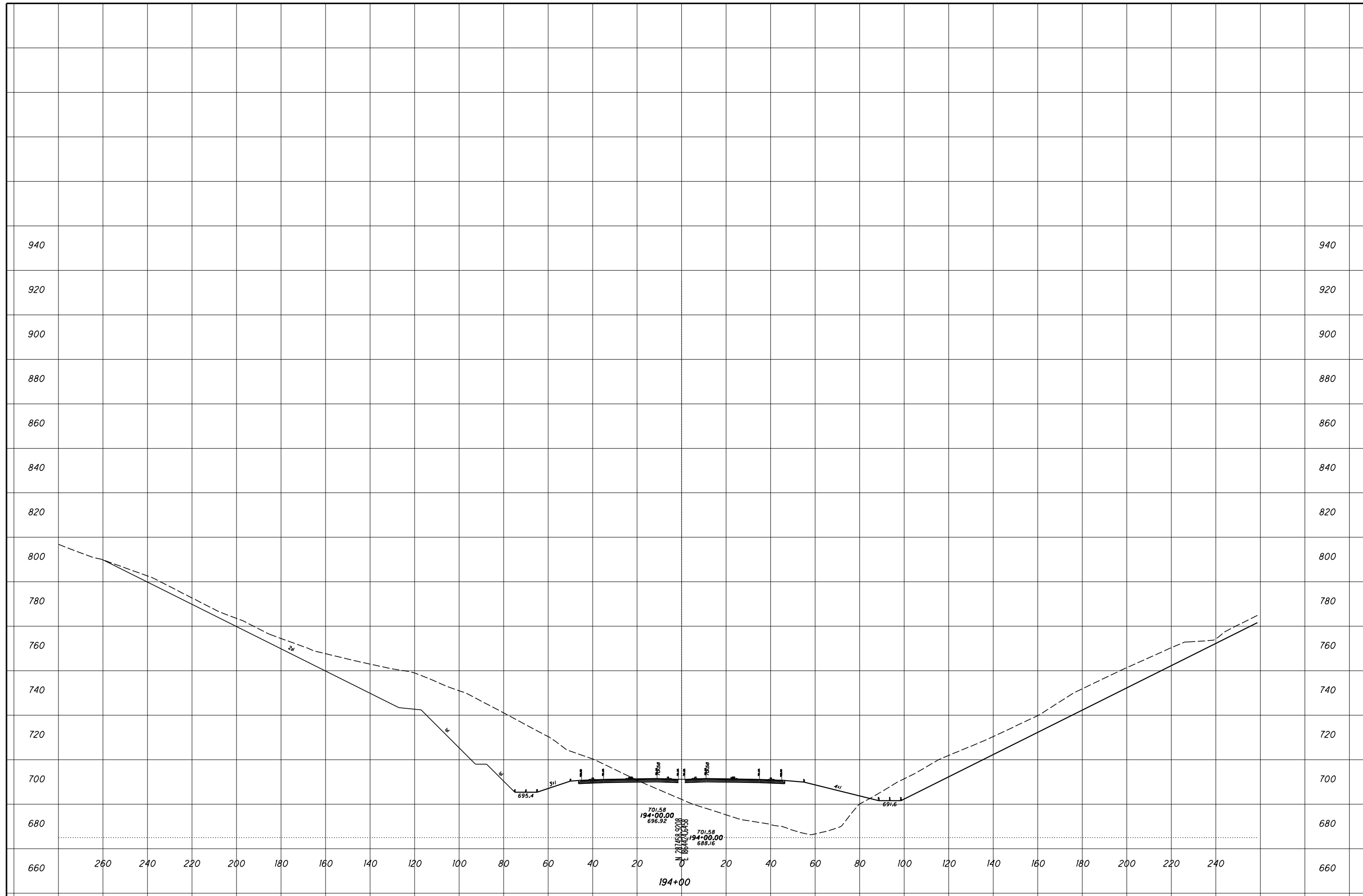


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**ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 194+00**

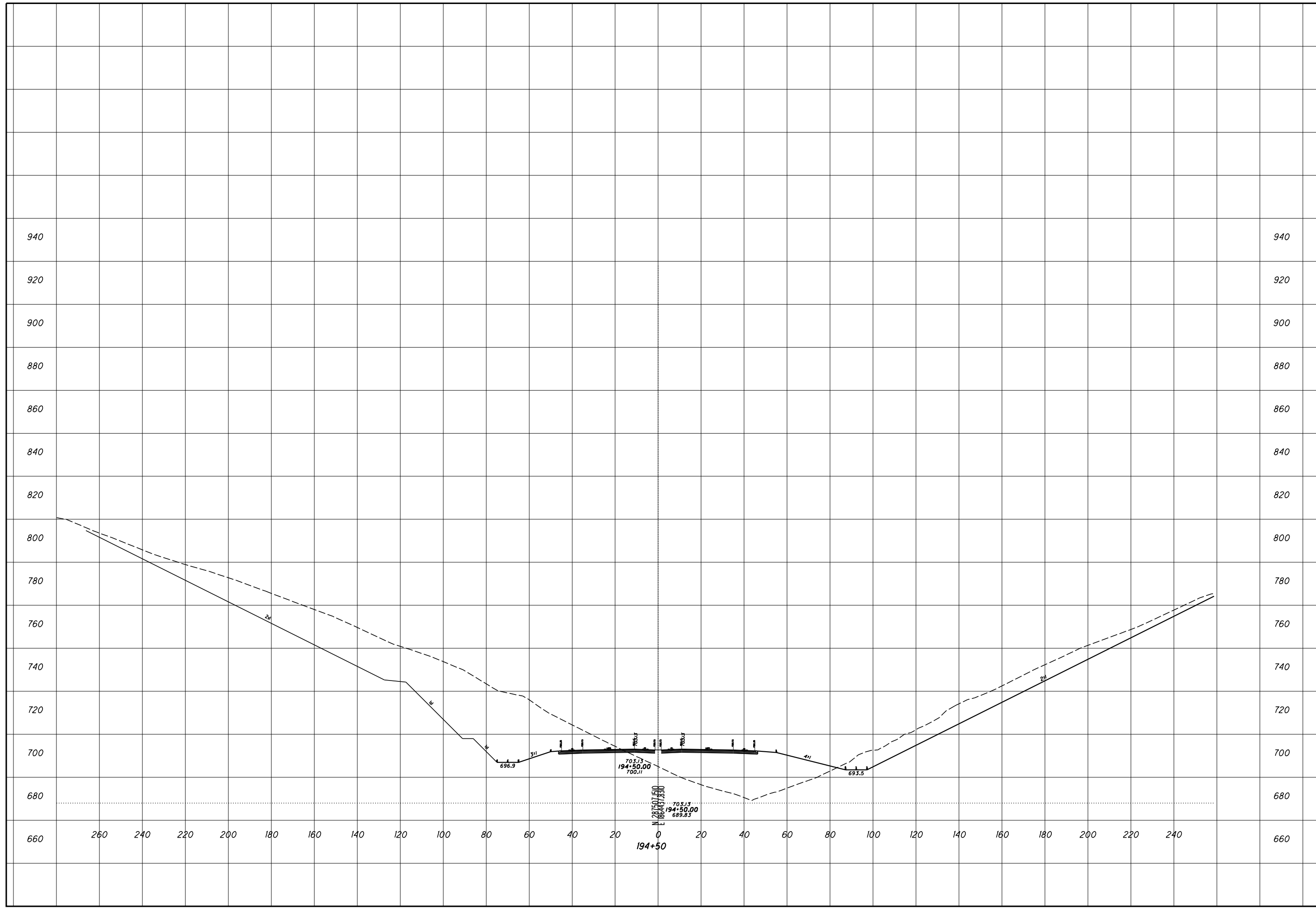
SCI-823-0.00

33
59



ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 194+50

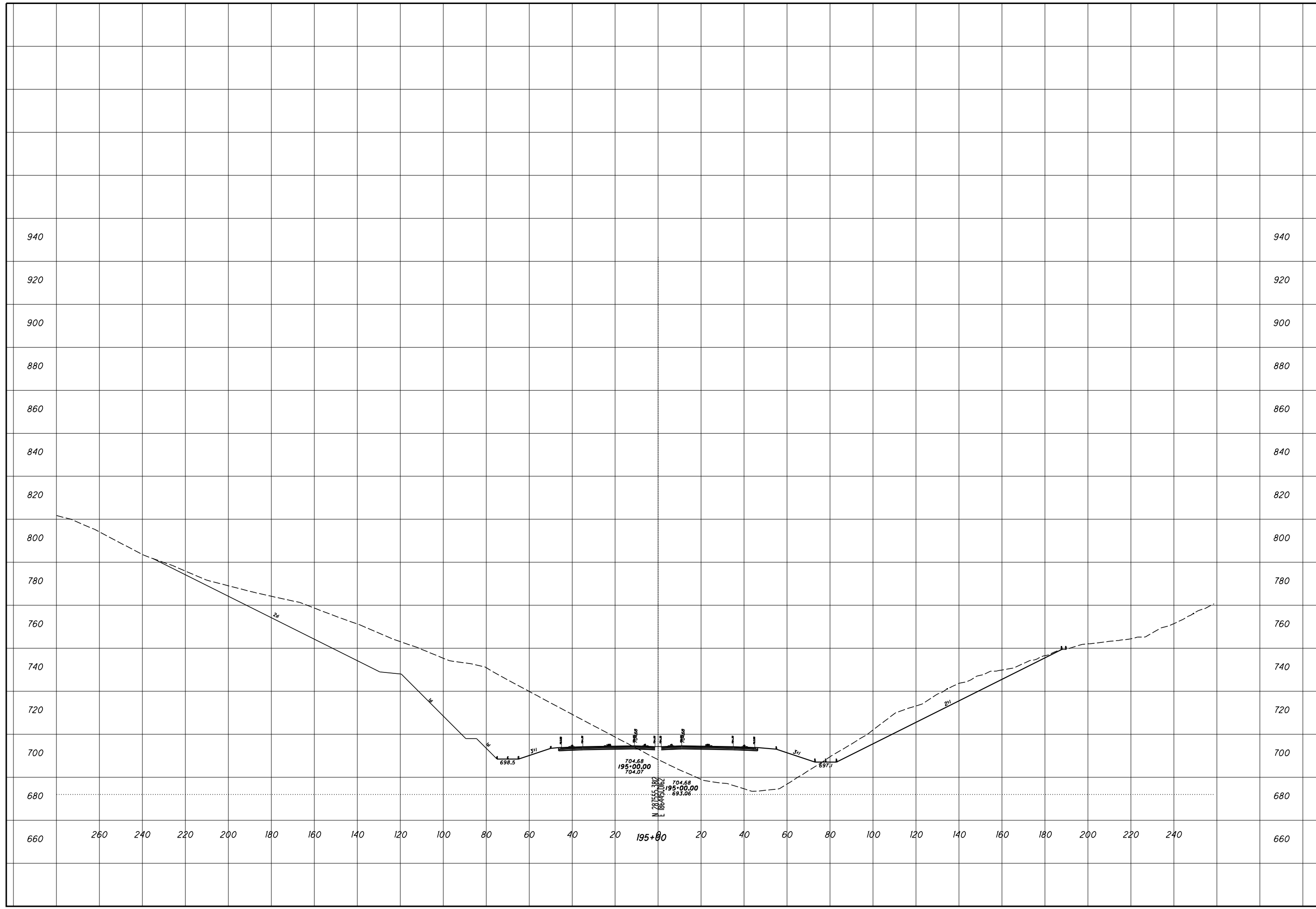
SCI-823-0.00



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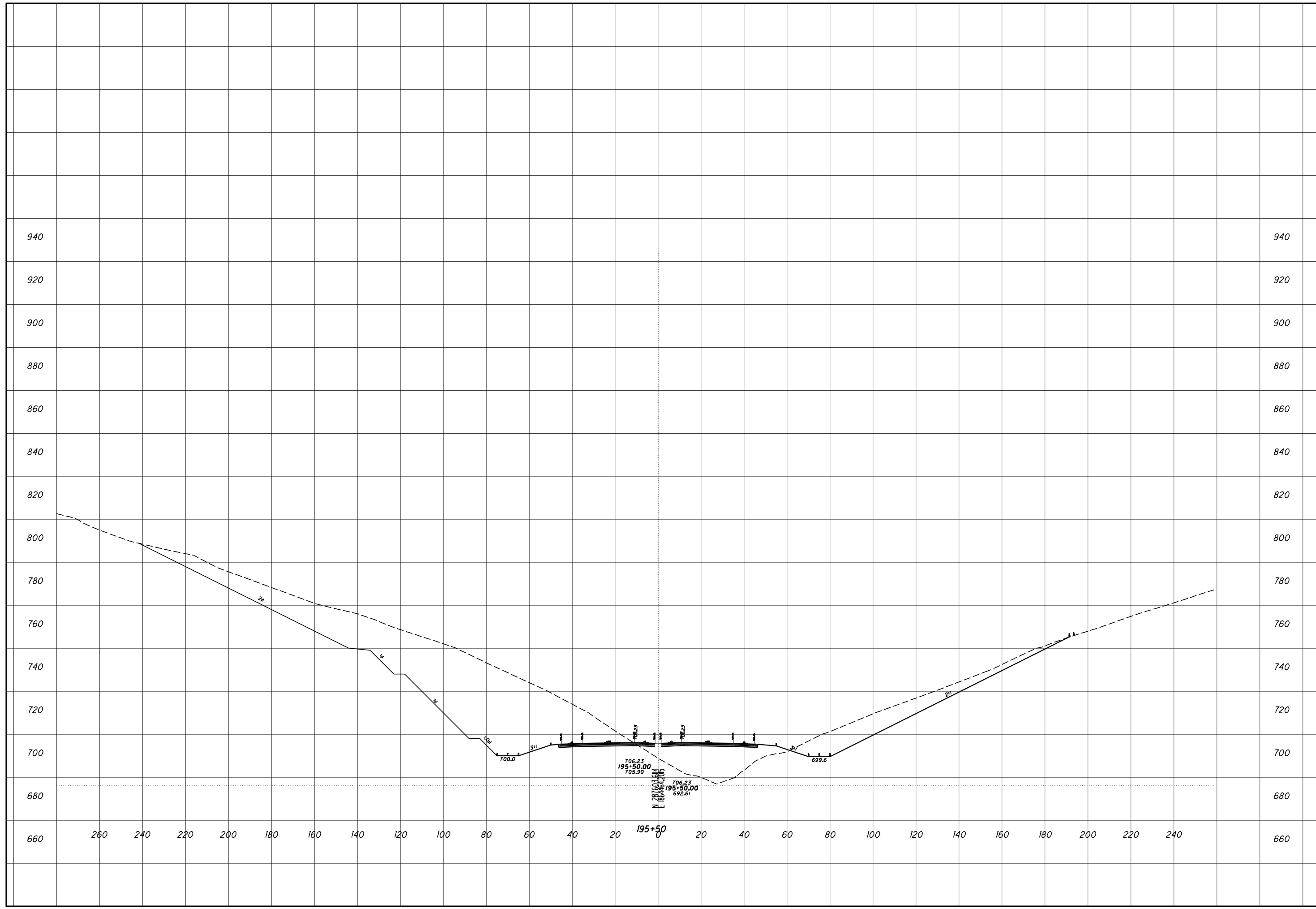
ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 195+00

SCI-823-0.00



ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 195+50

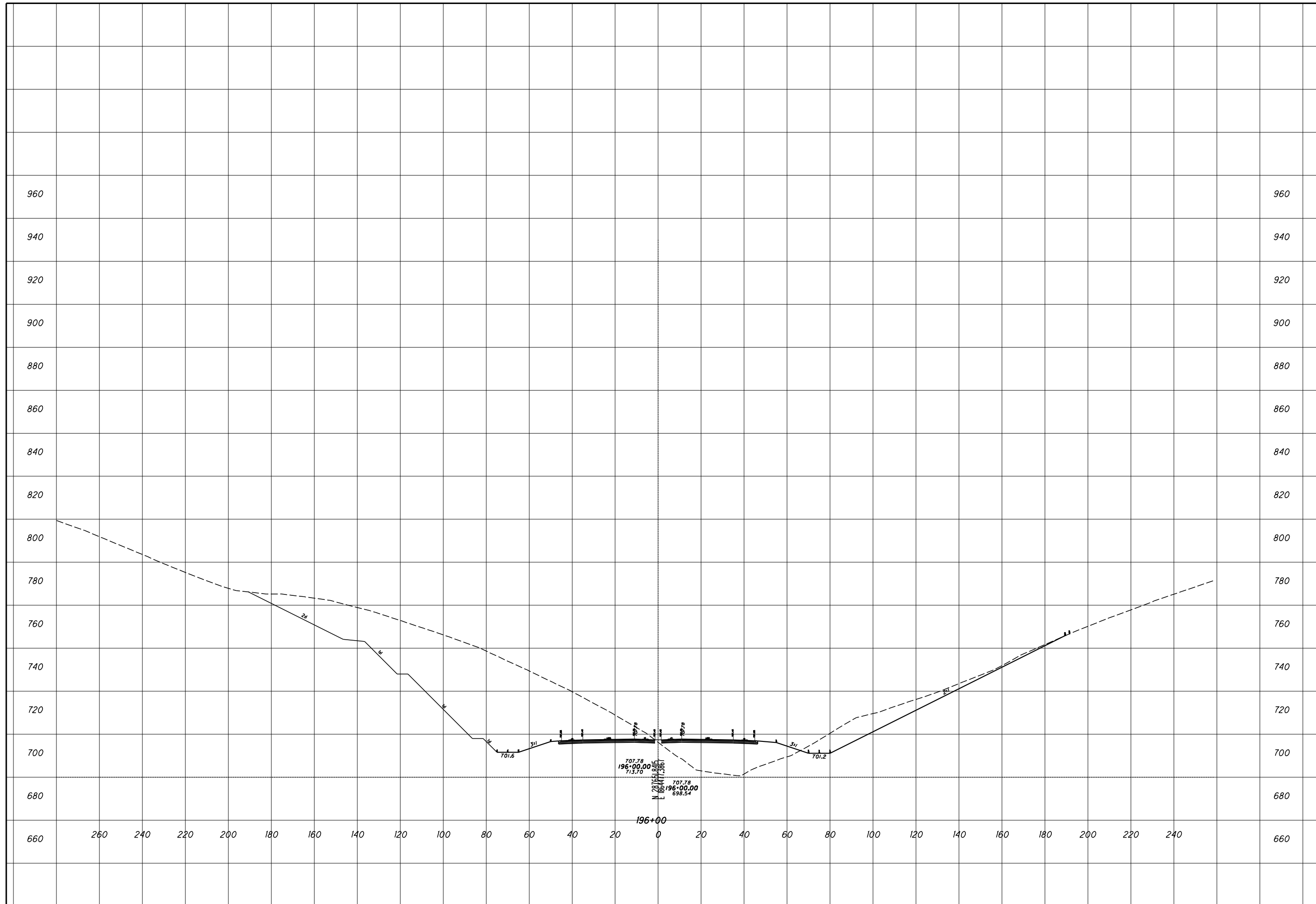
SCI-823-0.00



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ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 196+00

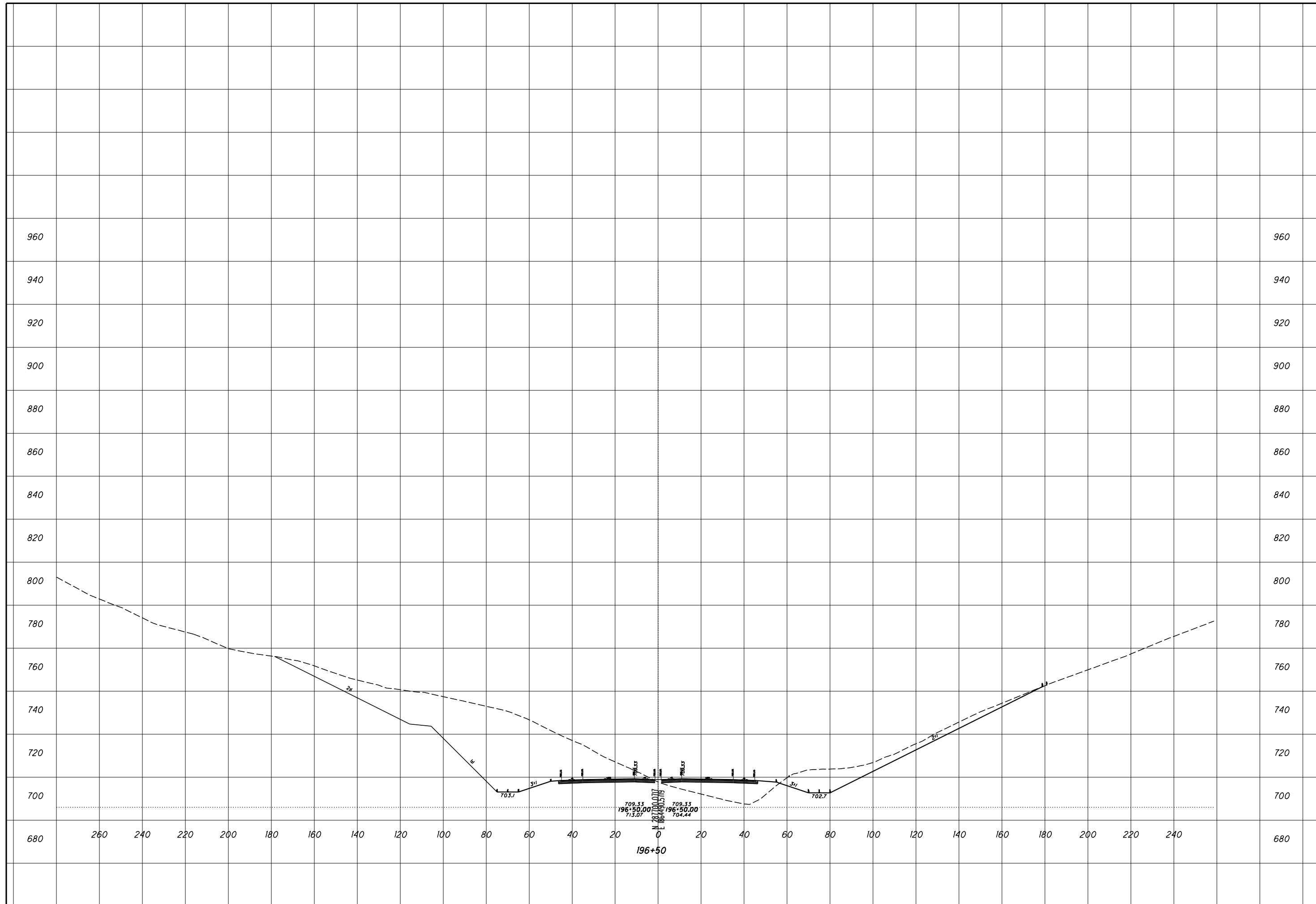
SCI-823-0.00



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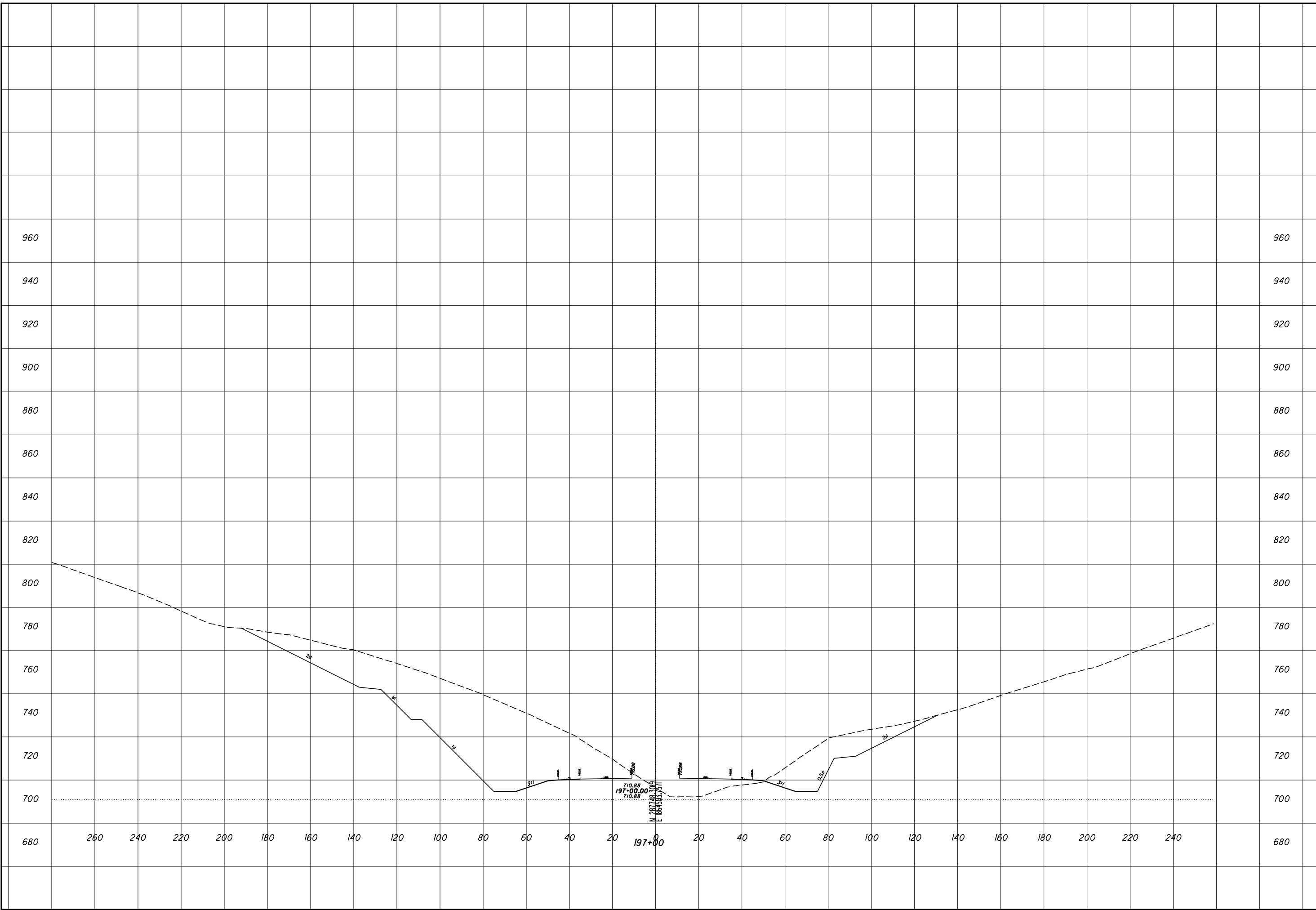
ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 196+50

SCI-823-0.00



**ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 197+00**

SCI-823-0.00

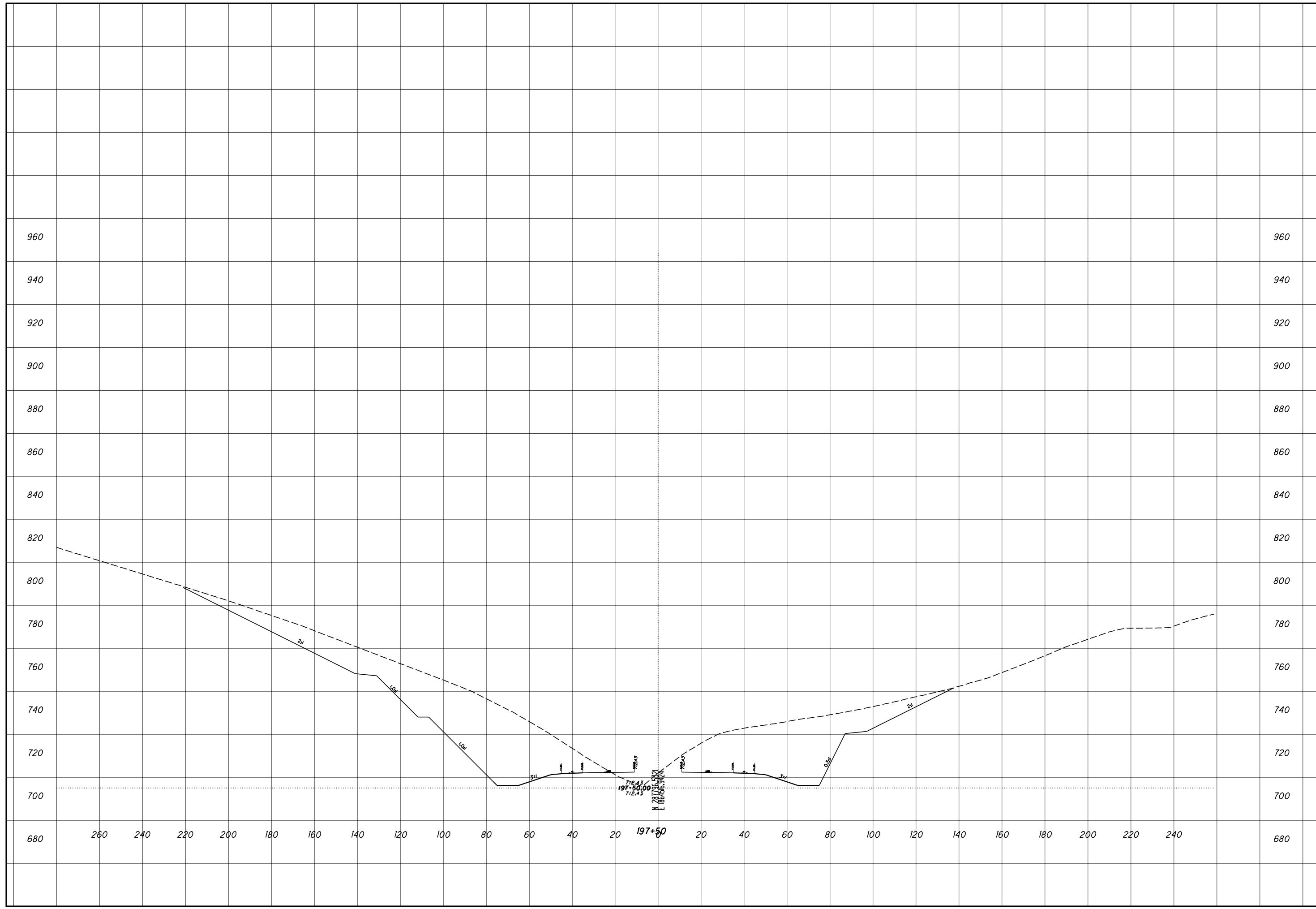


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**ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 197+50**

SCI-823-0.00

40
59

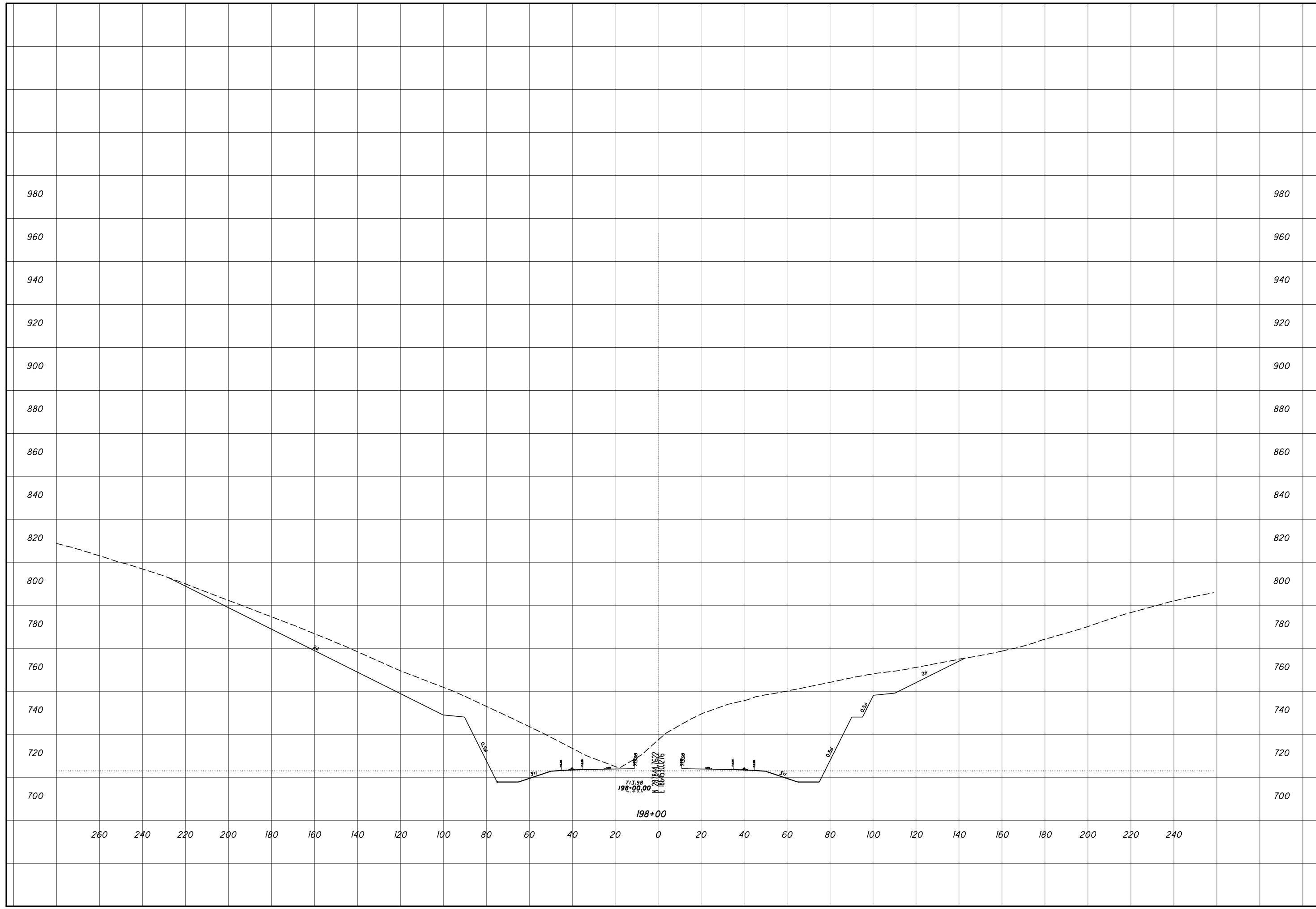


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**ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 198+00**

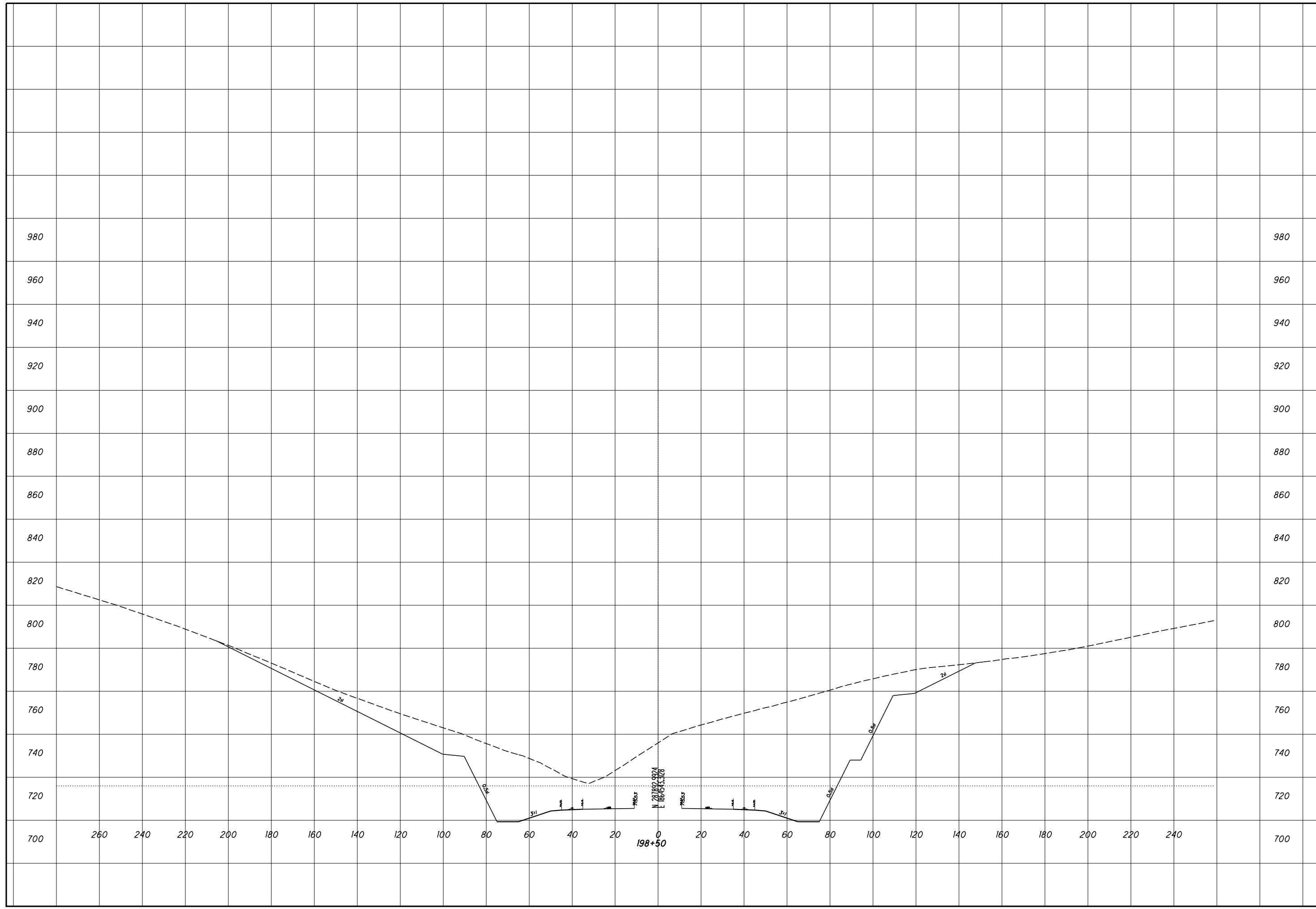
SCI-823-0.00

41
59



ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 198+50

SCI-823-0.00

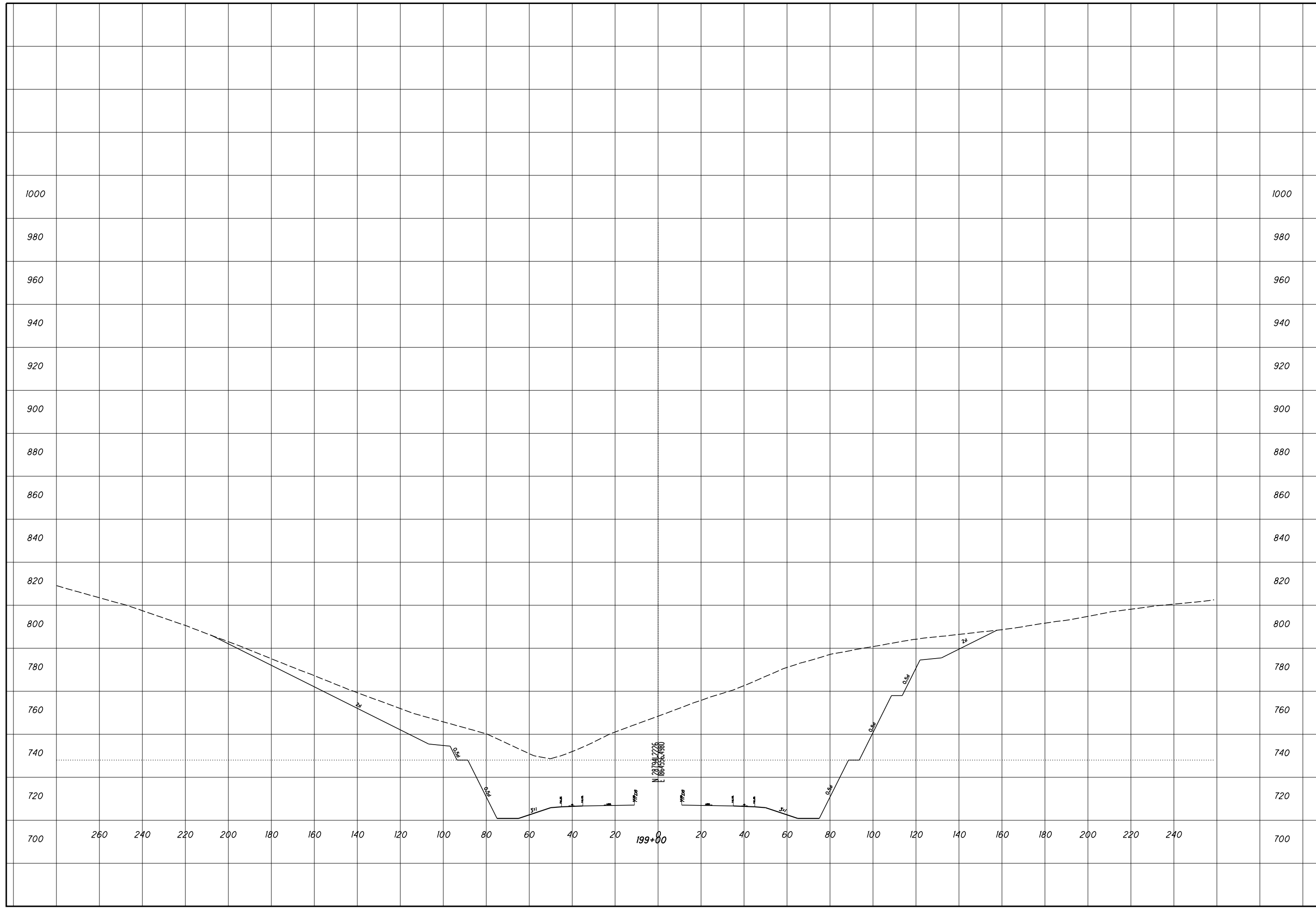


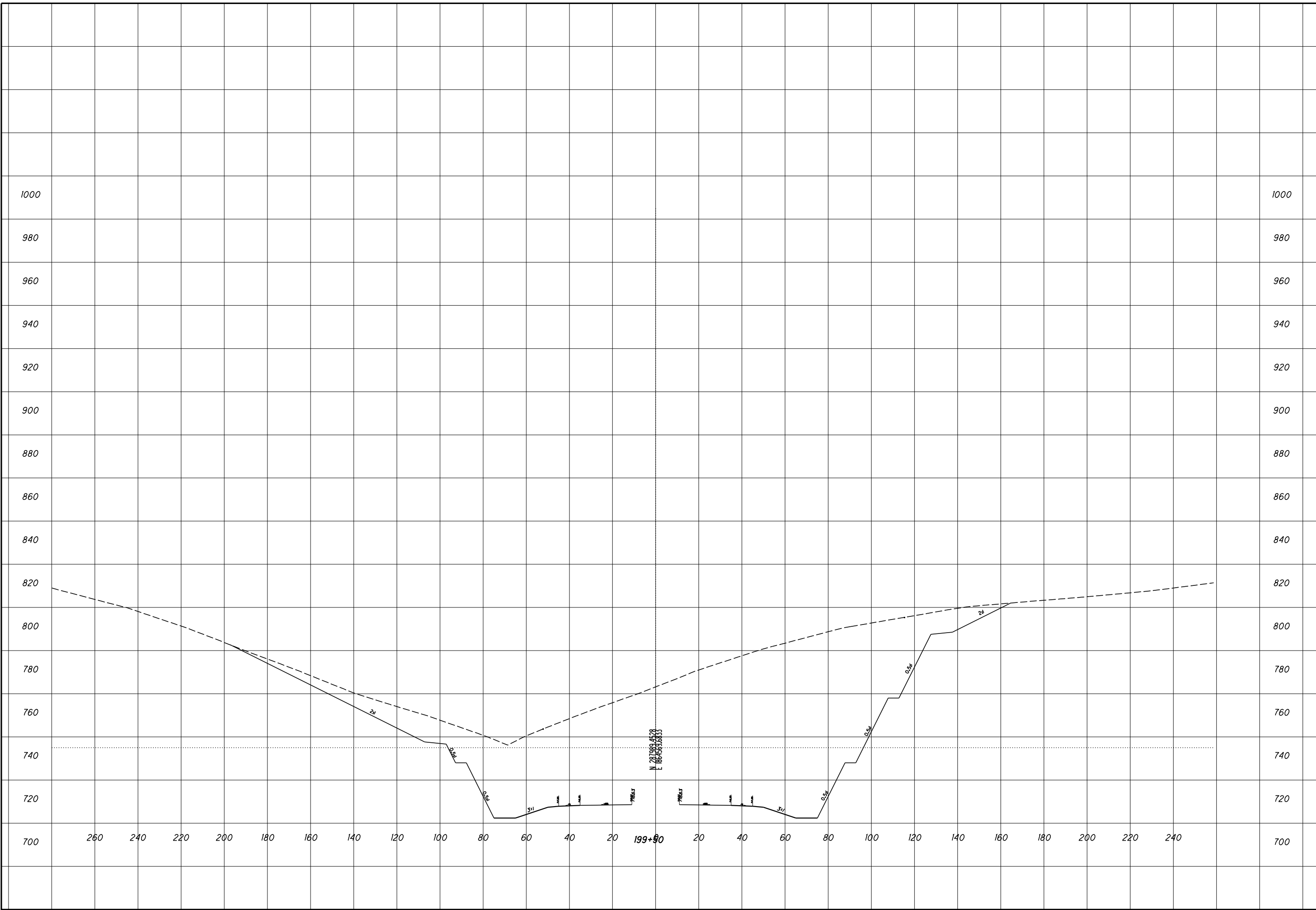
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**ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 199+00**

SCI-823-0.00

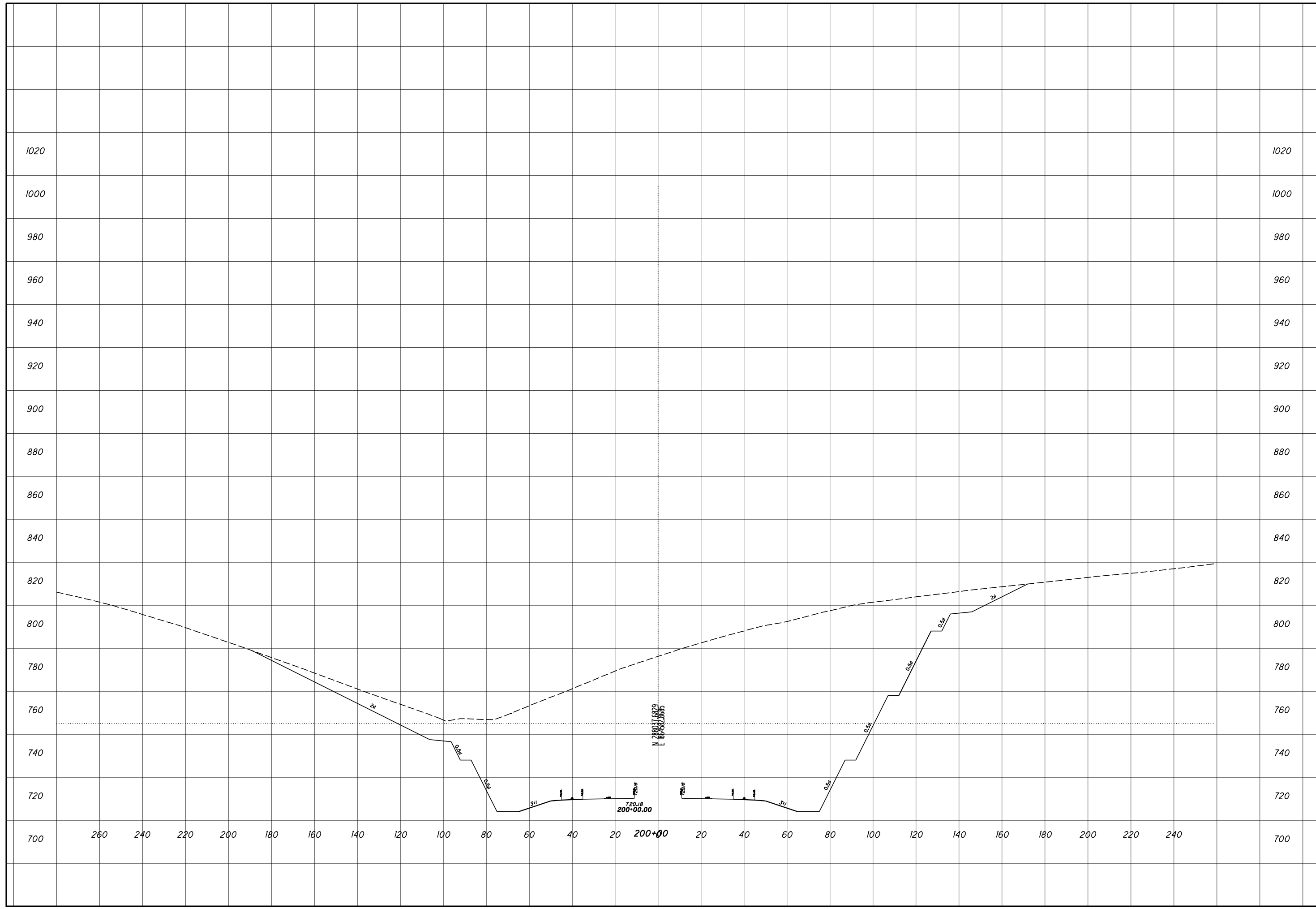
43
59

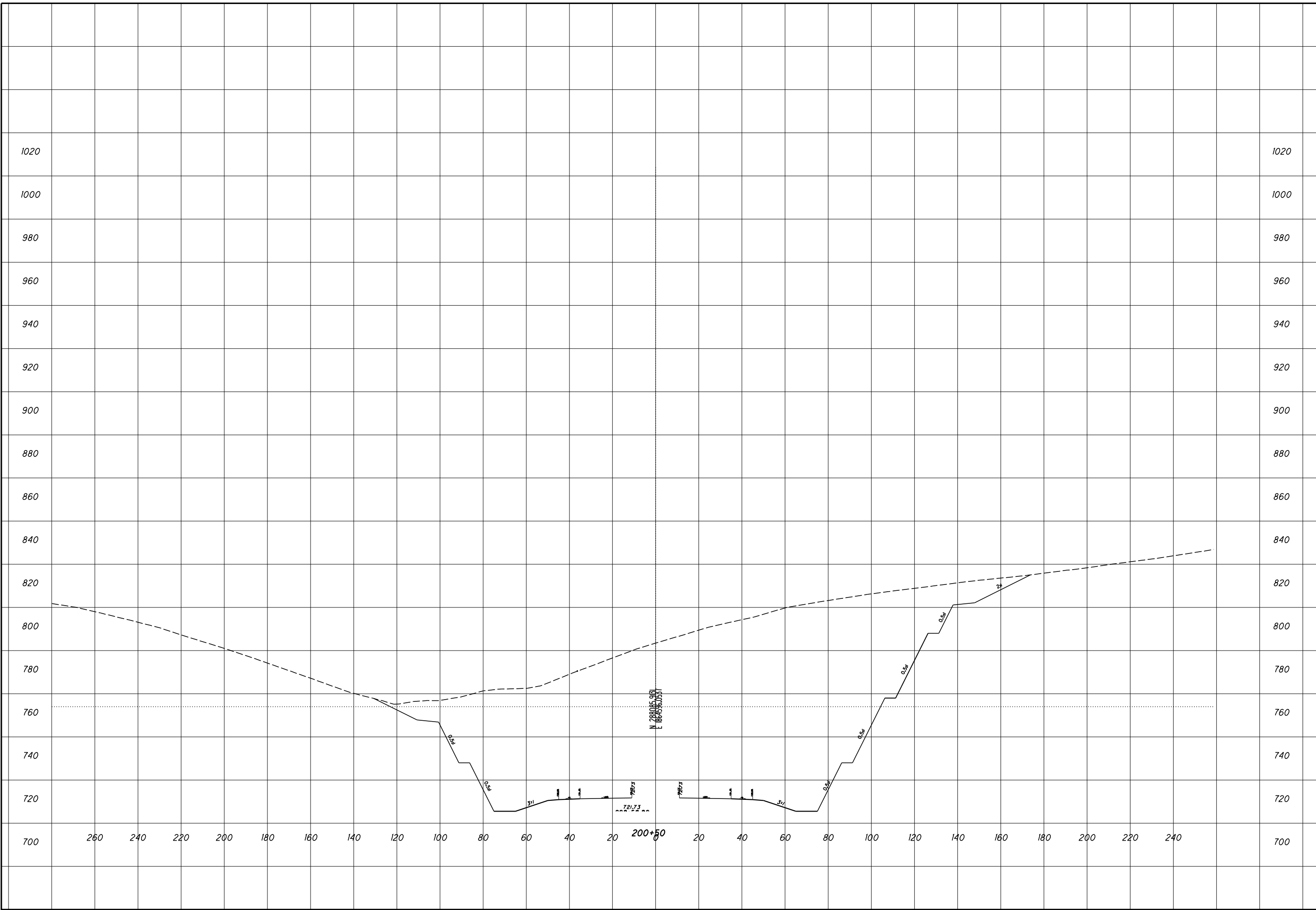




ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 200+00

SCI-823-0.00



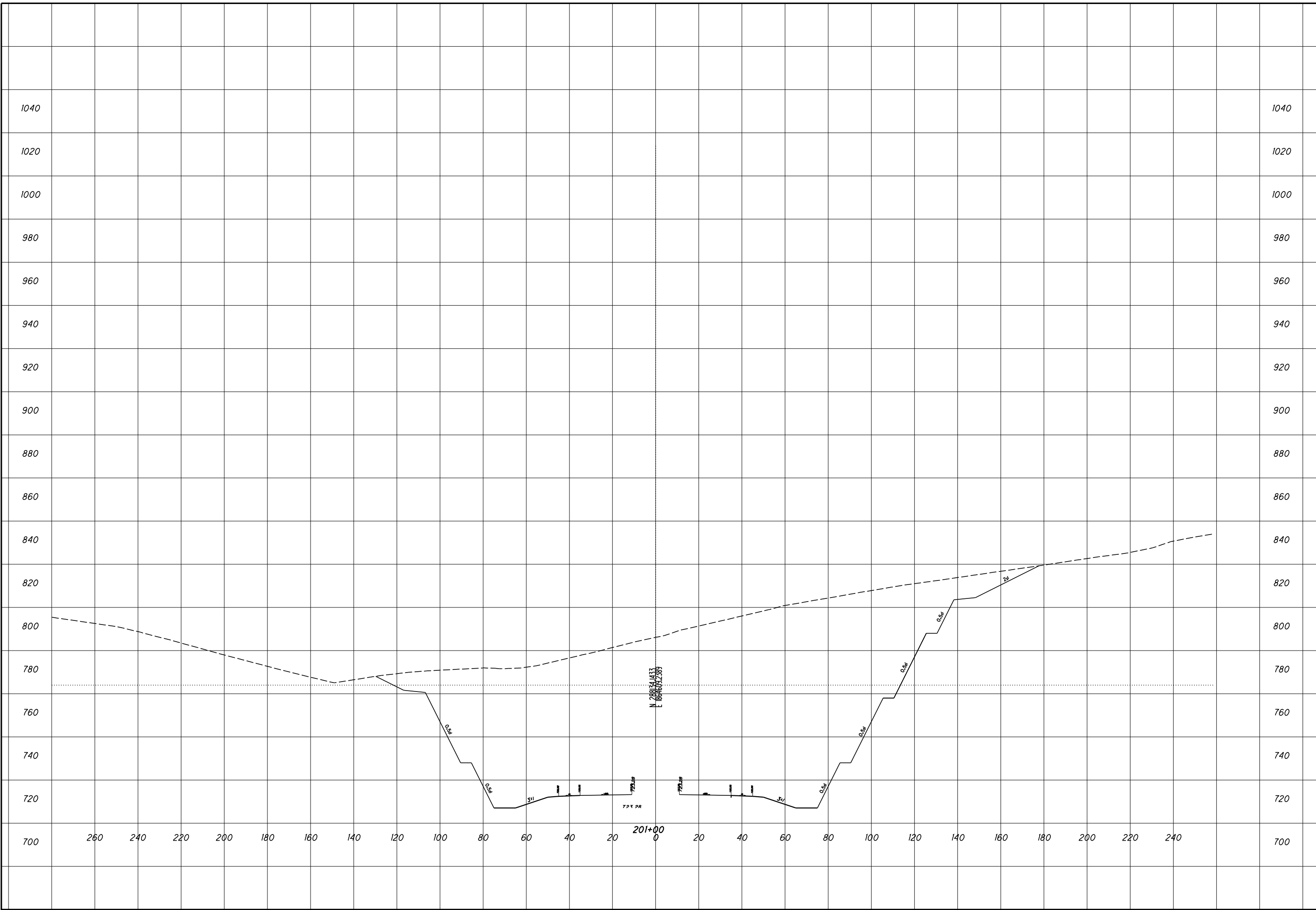


ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 200+50

SCI-823-0.00

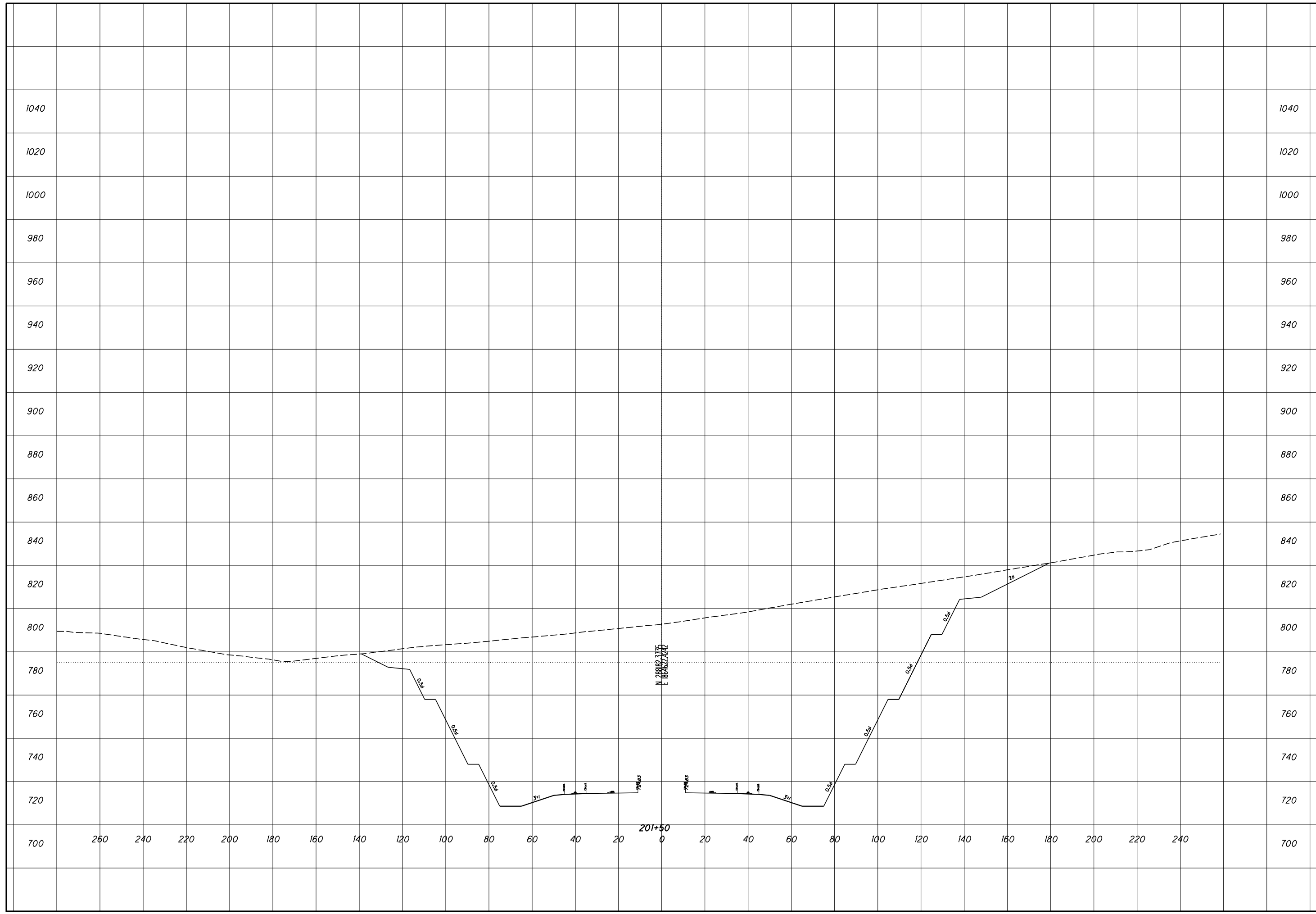
46
59

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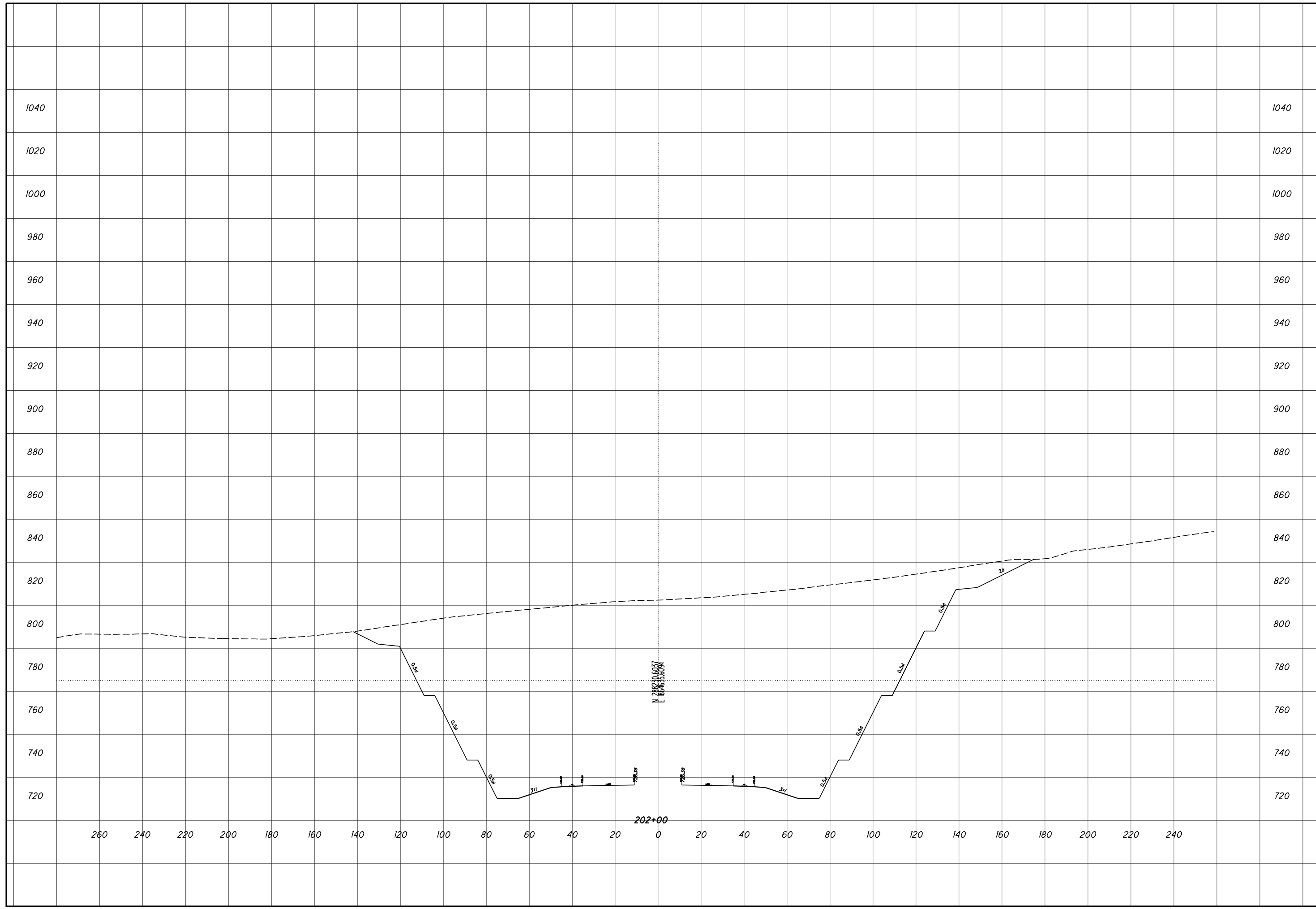
**ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 201+00**

SCI-823-0.00



**ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 202+00**

SCI-823-0.00

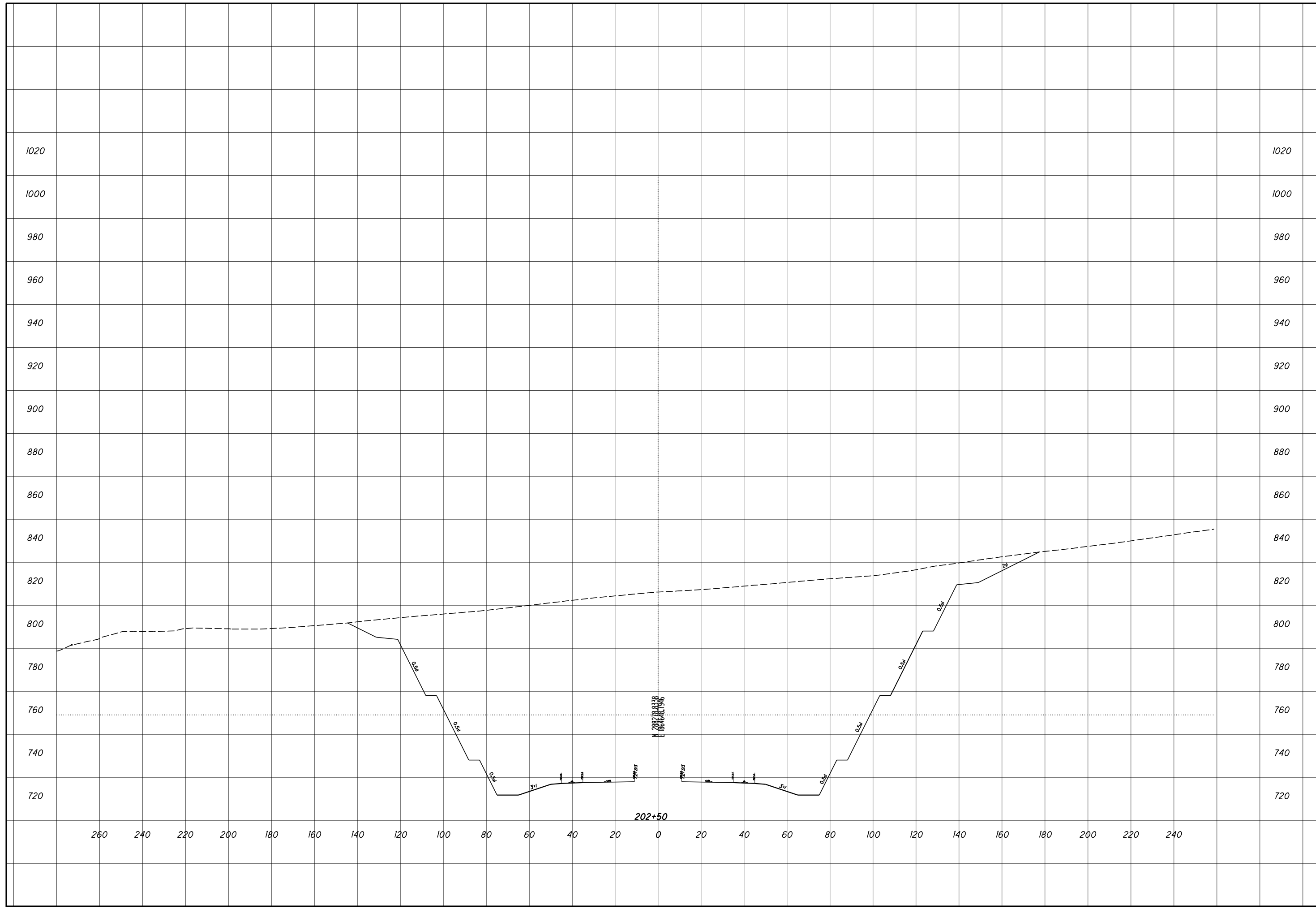


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**ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 202+50**

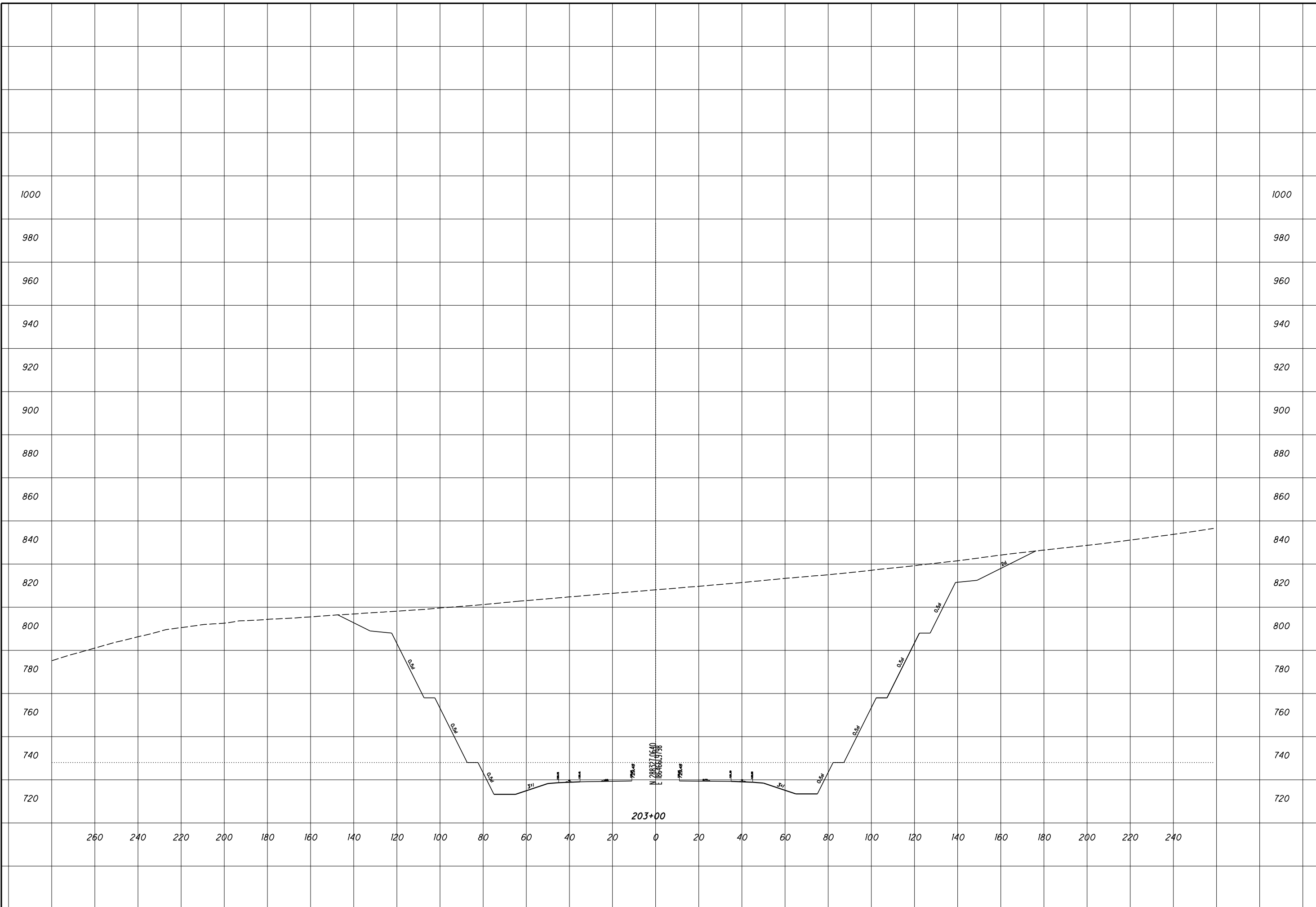
SCI-823-0.00

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**ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 203+00**

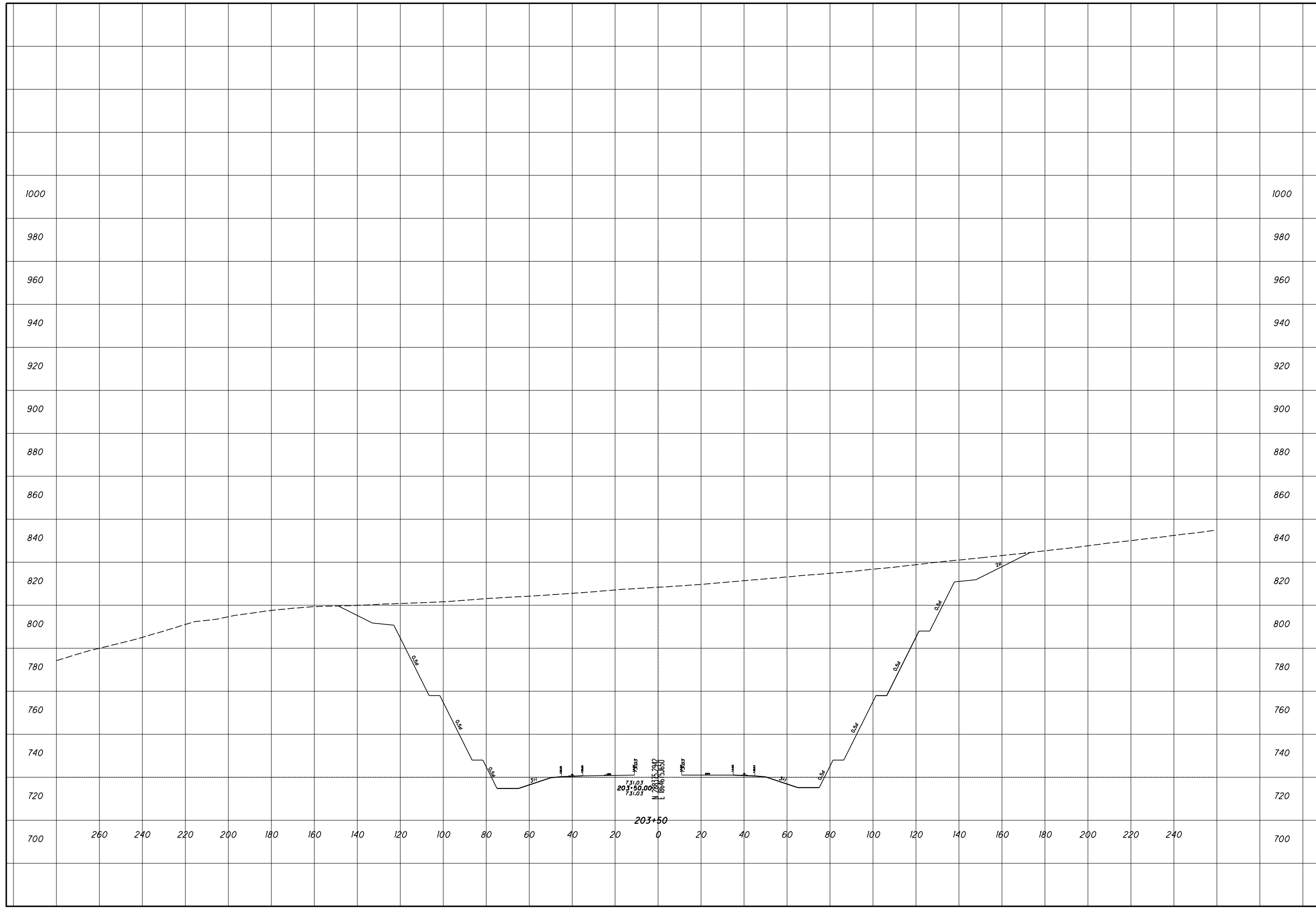
SCI-823-0.00



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**ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 203+50**

SCI-823-0.00

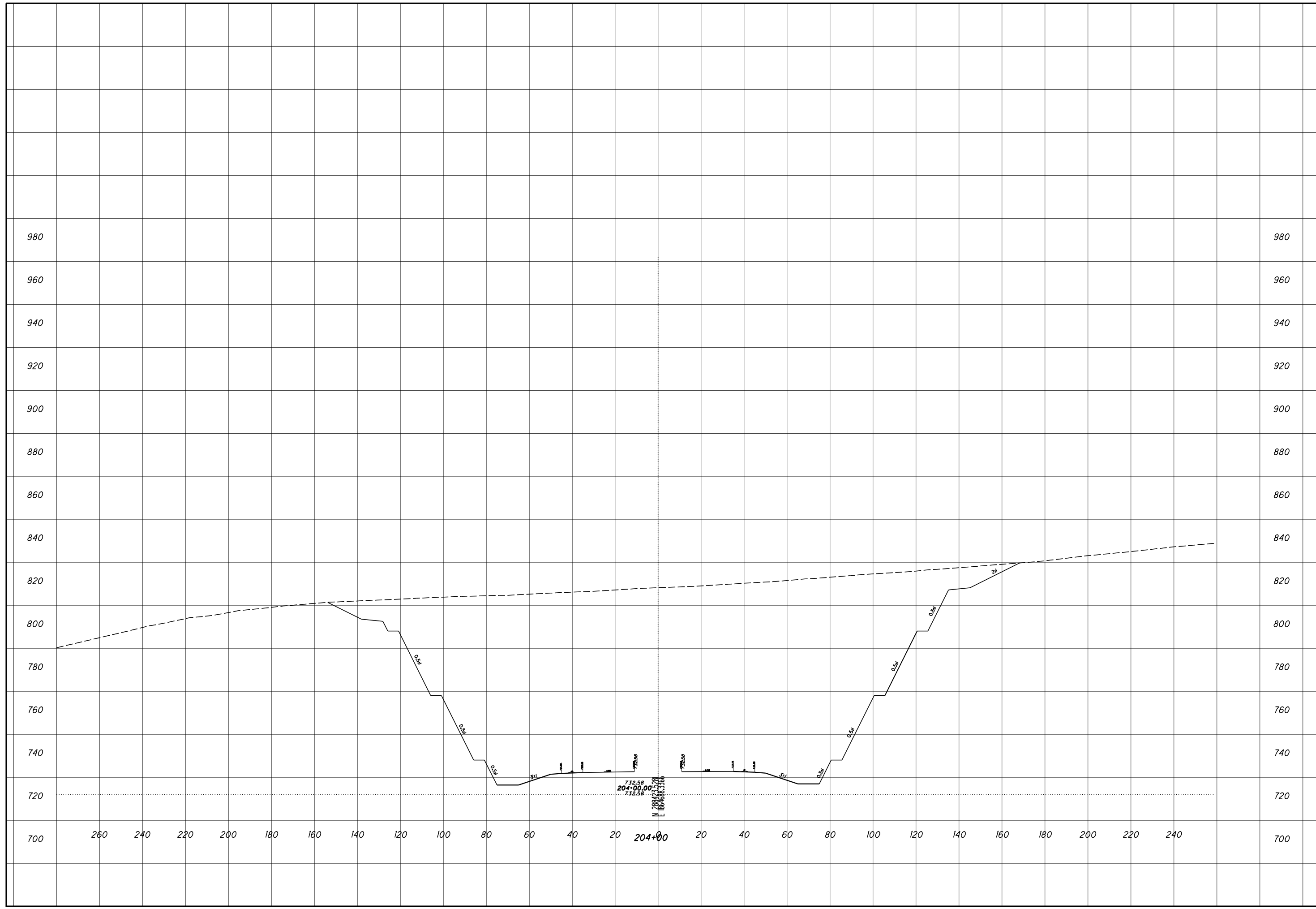


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**ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 204+00**

SCI-823-0.00

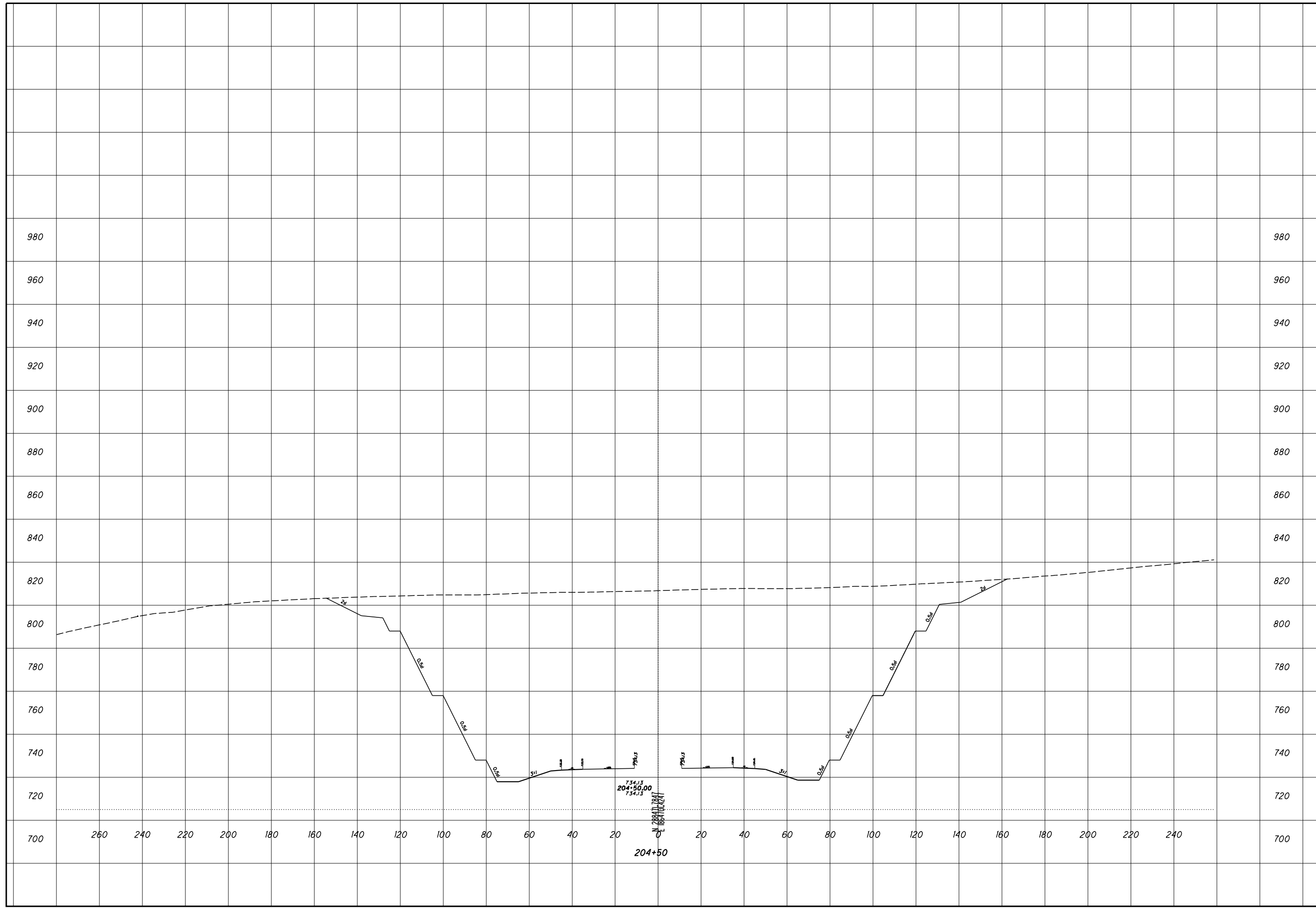
53
59



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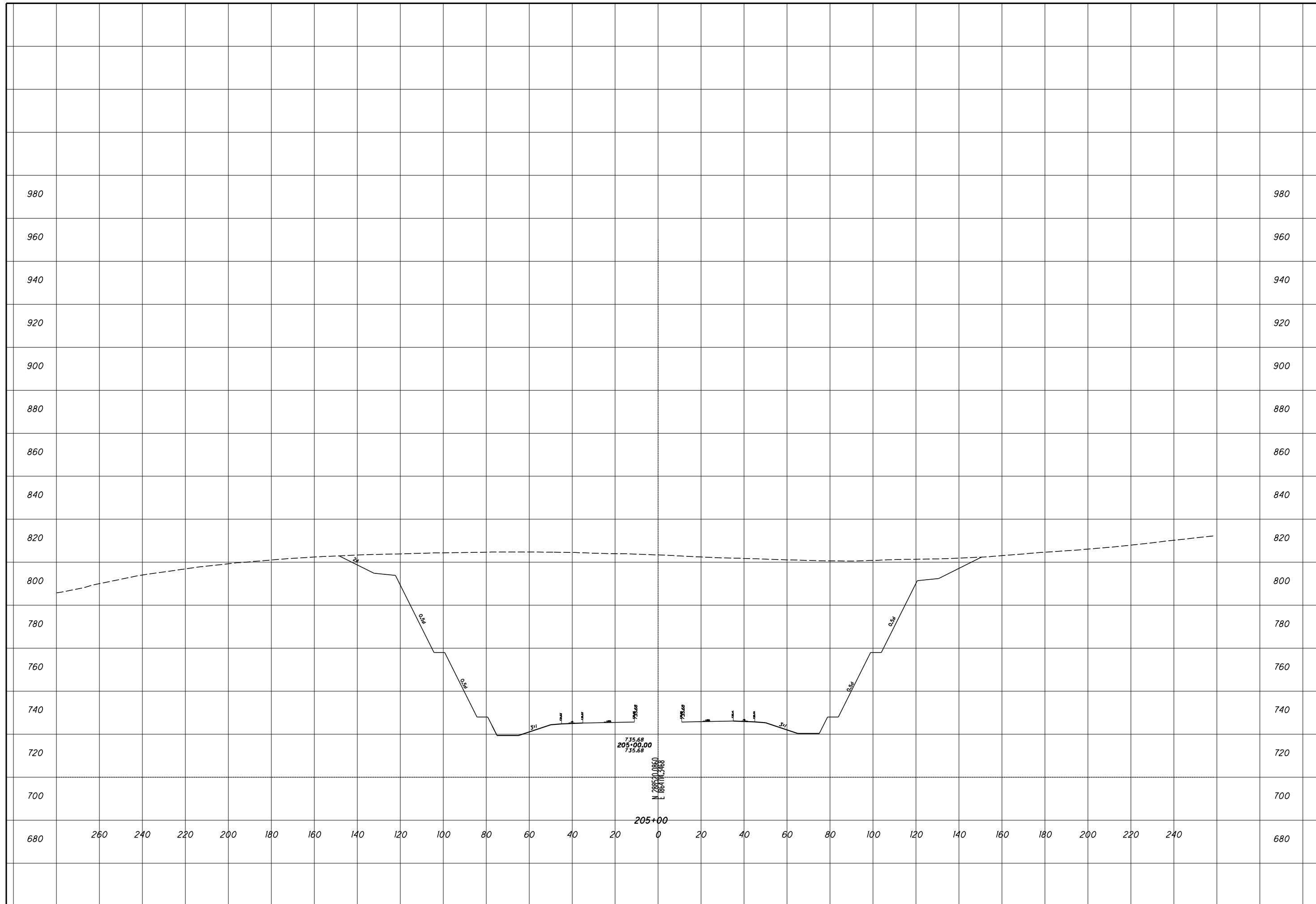
**ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 204+50**

SCI-823-0.00



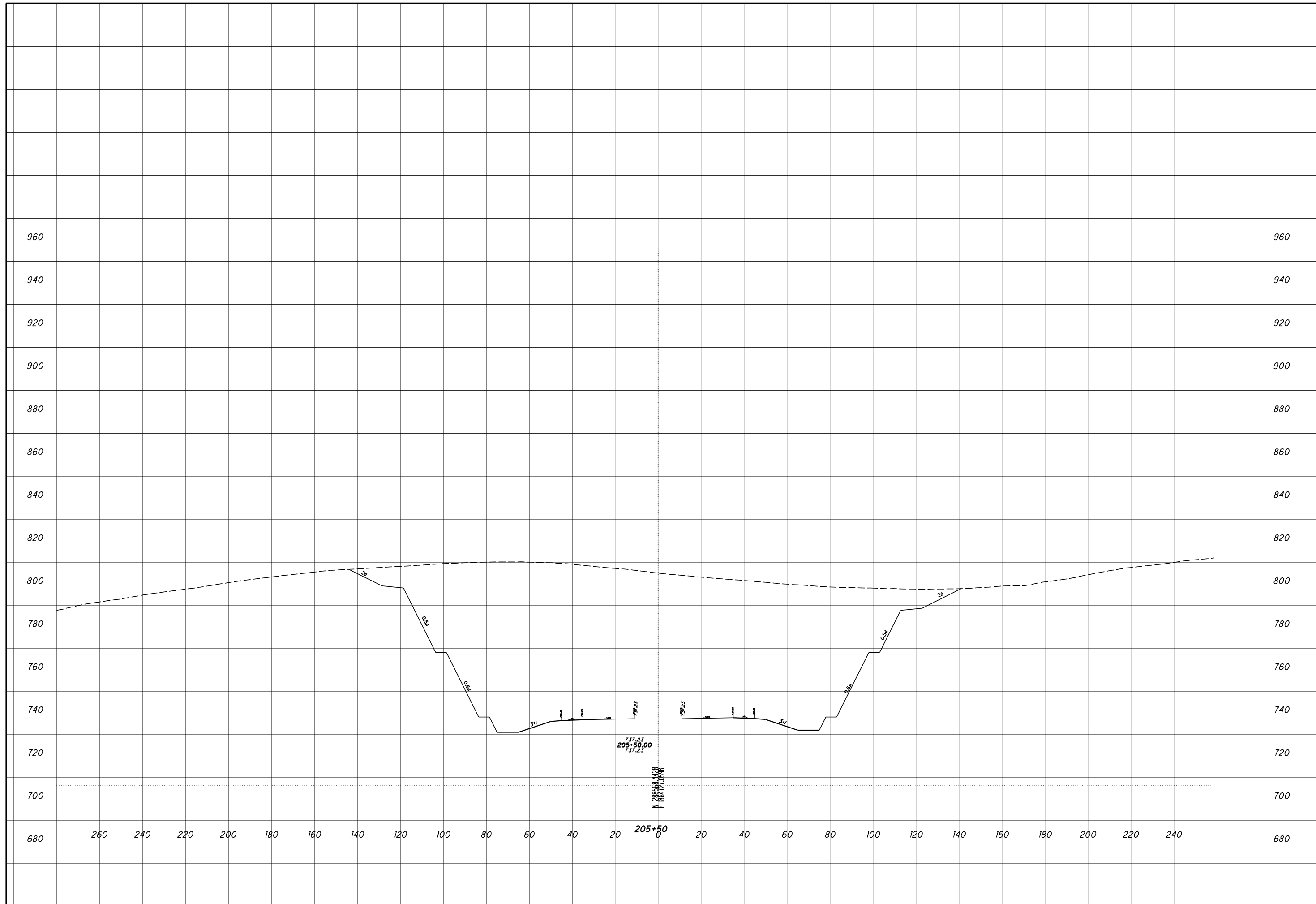
ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 205+00

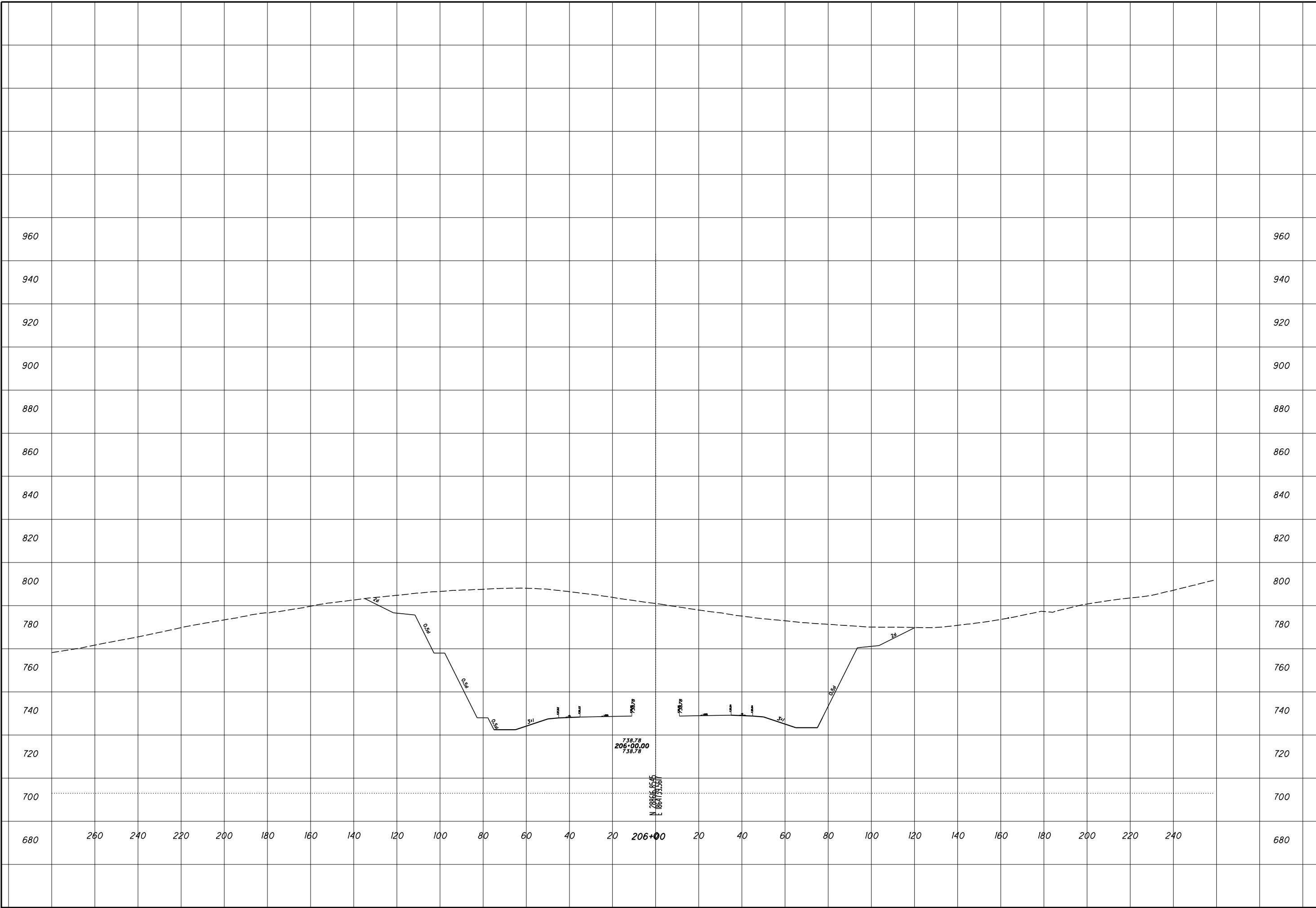
SCI-823-0.00



**ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 205+50**

SCI-823-0.00





ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 206+00

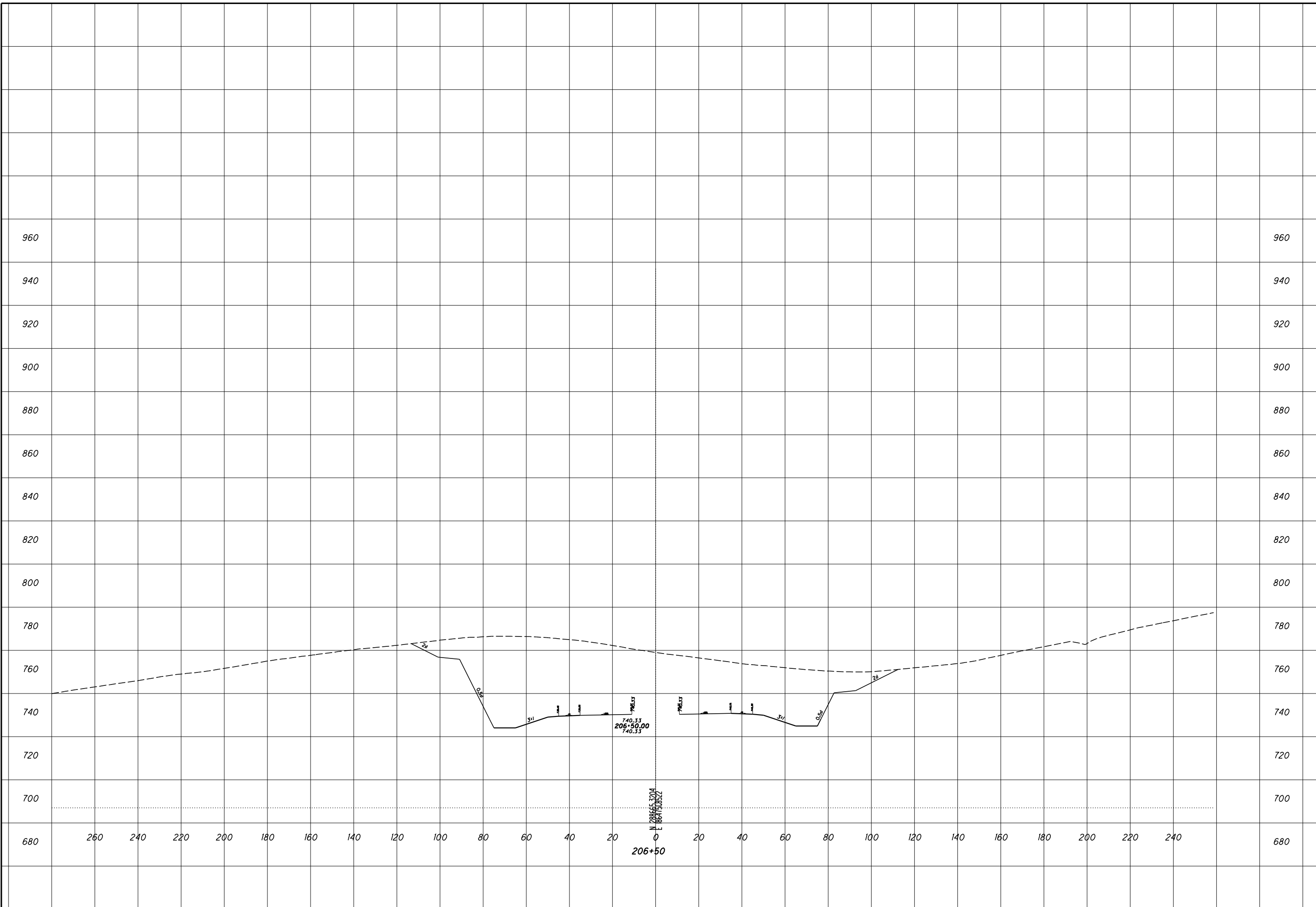
SCI-823-0.00

57
59

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ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 206+50

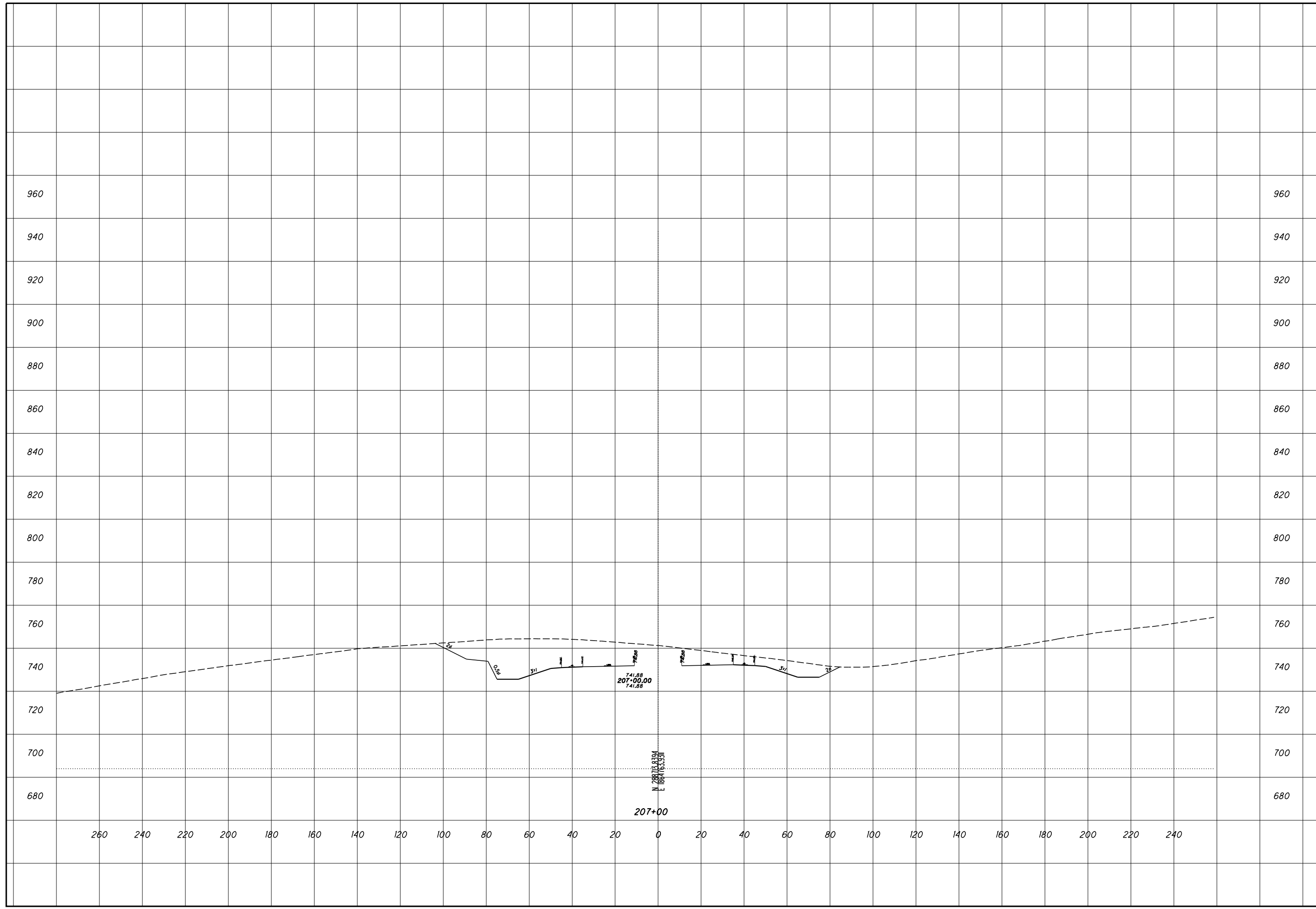
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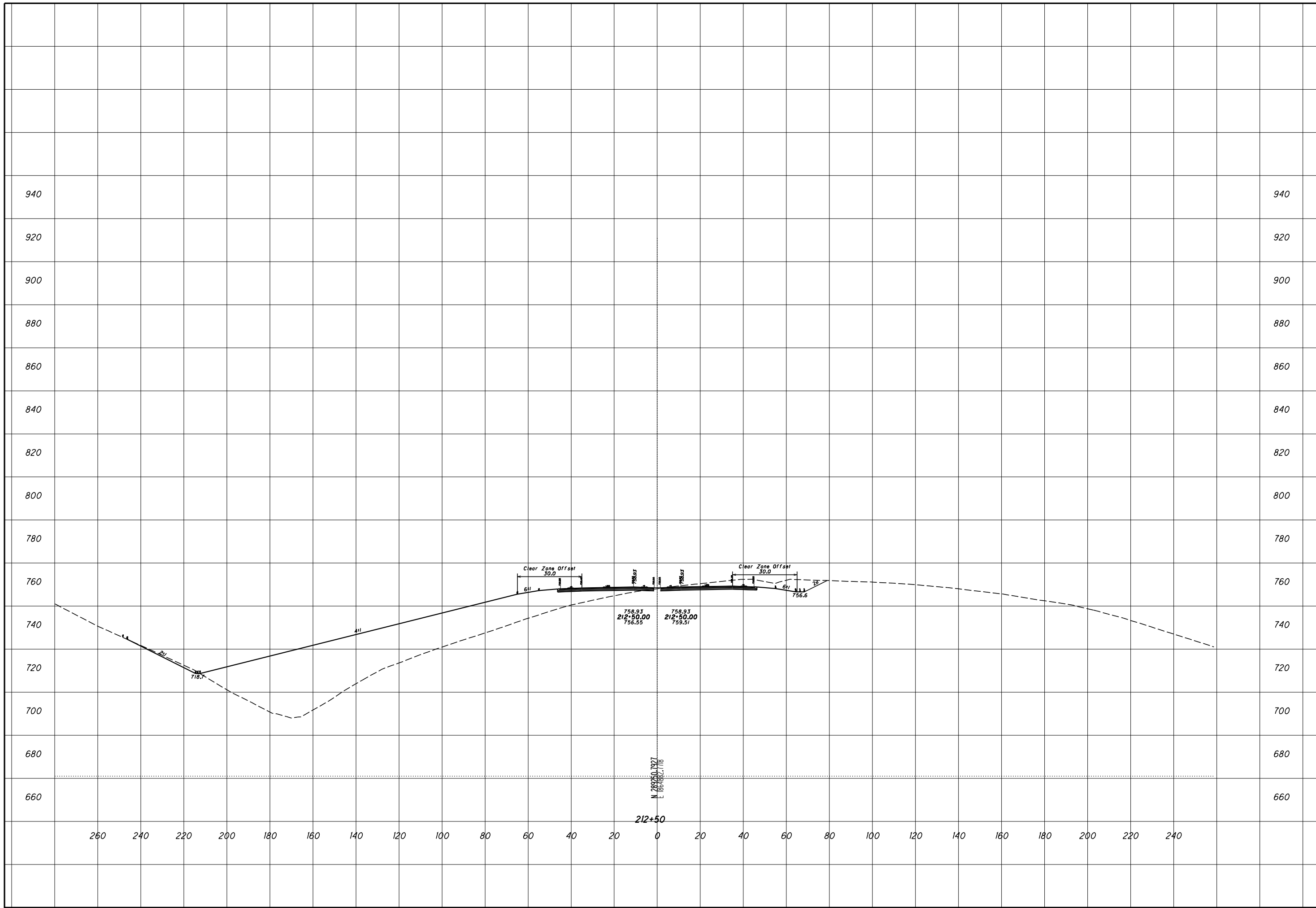
**ROCK CUT SLOPE DESIGN - ROCK CUT 4
STA 207+00**

SCI-823-0.00



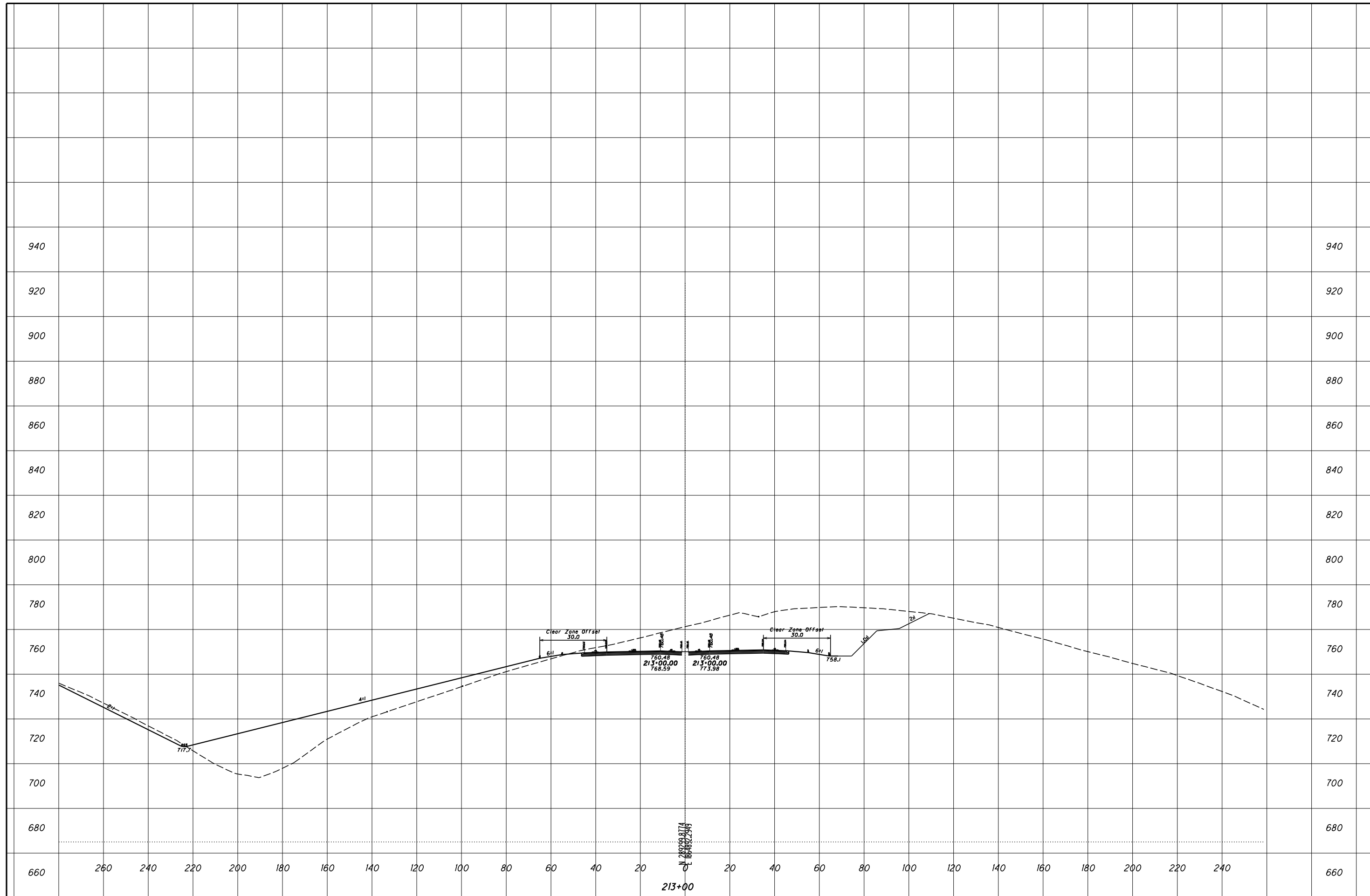
**ROCK CUT SLOPE DESIGN - ROCK CUT 5
STA 212+50**

SCI-823-0.00



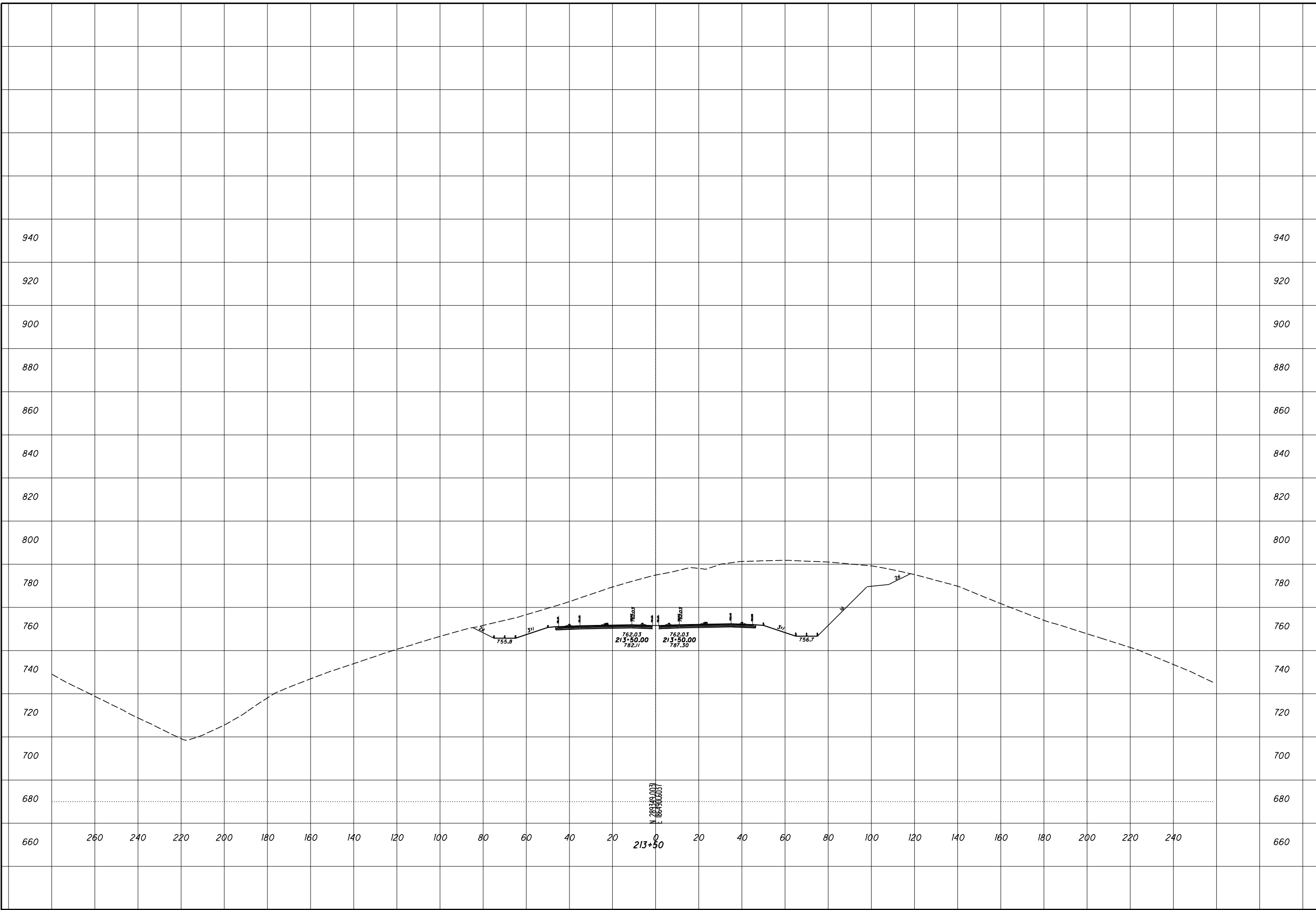
ROCK CUT SLOPE DESIGN - ROCK CUT 5
STA 213+00

SCI-823-0.00



ROCK CUT SLOPE DESIGN - ROCK CUT 5
STA 213+50

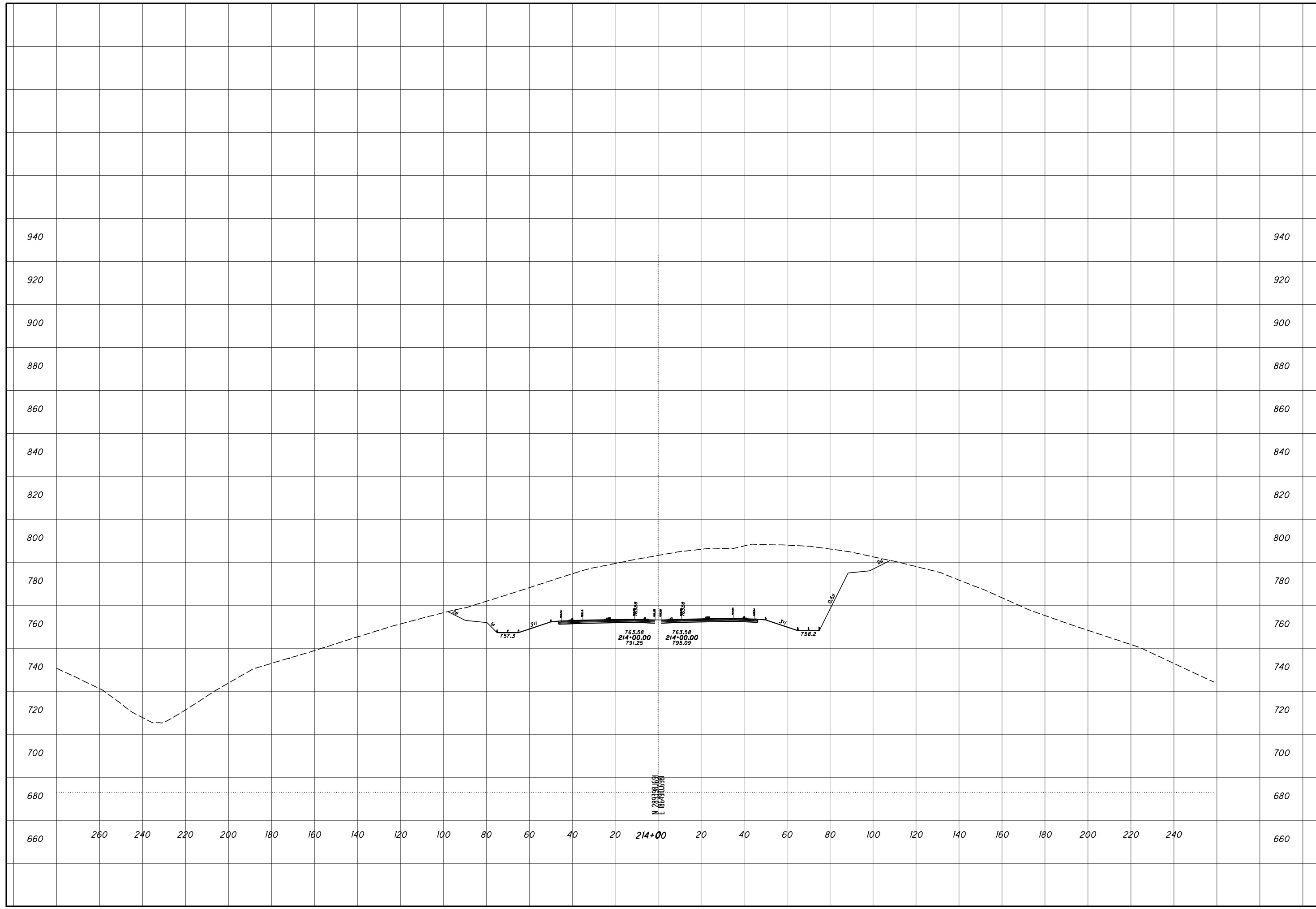
SCI-823-0.00



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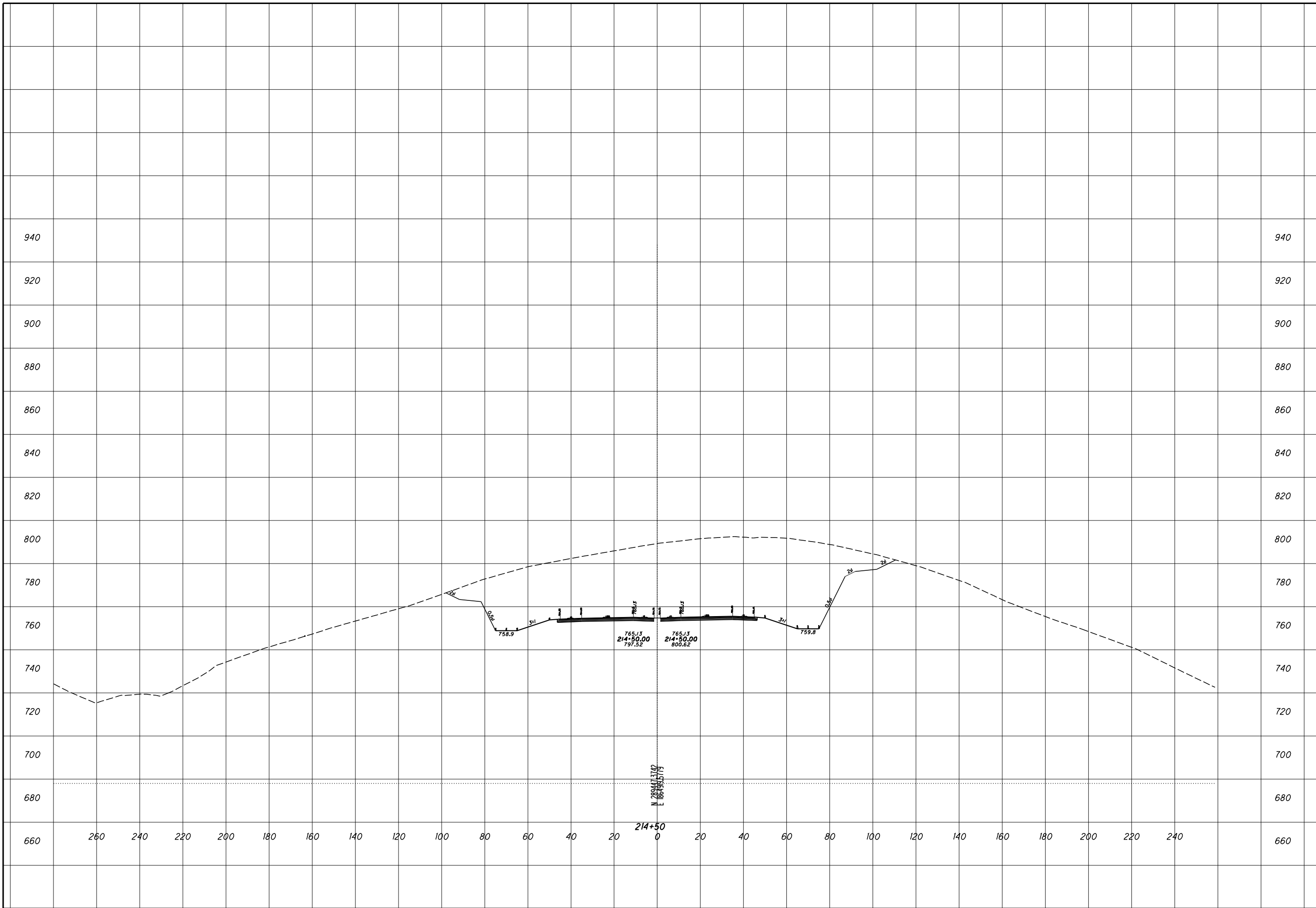
**ROCK CUT SLOPE DESIGN - ROCK CUT 5
STA 214+00**

SCI-823-0.00



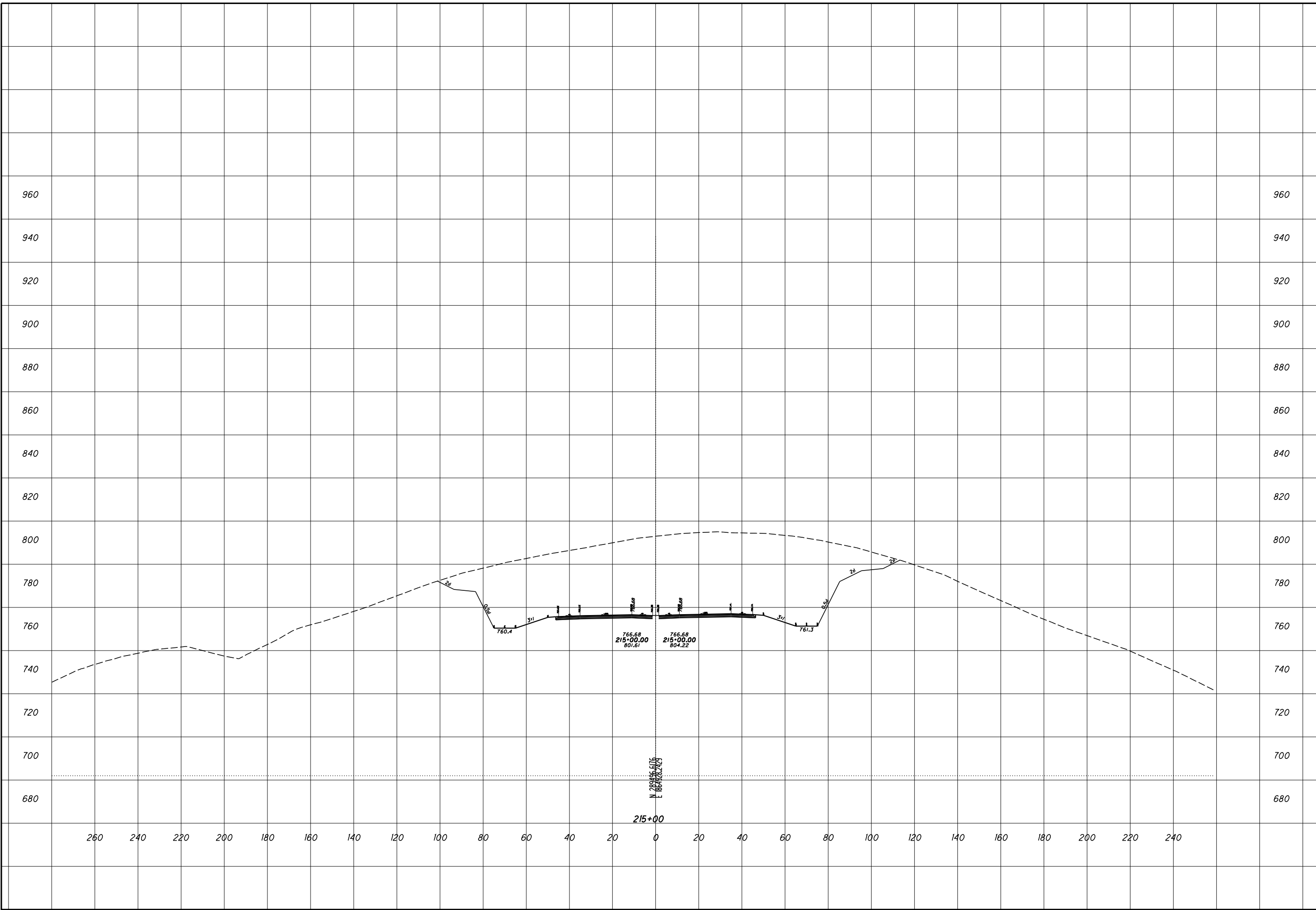
**ROCK CUT SLOPE DESIGN - ROCK CUT 5
STA 214+50**

SCI-823-0.00



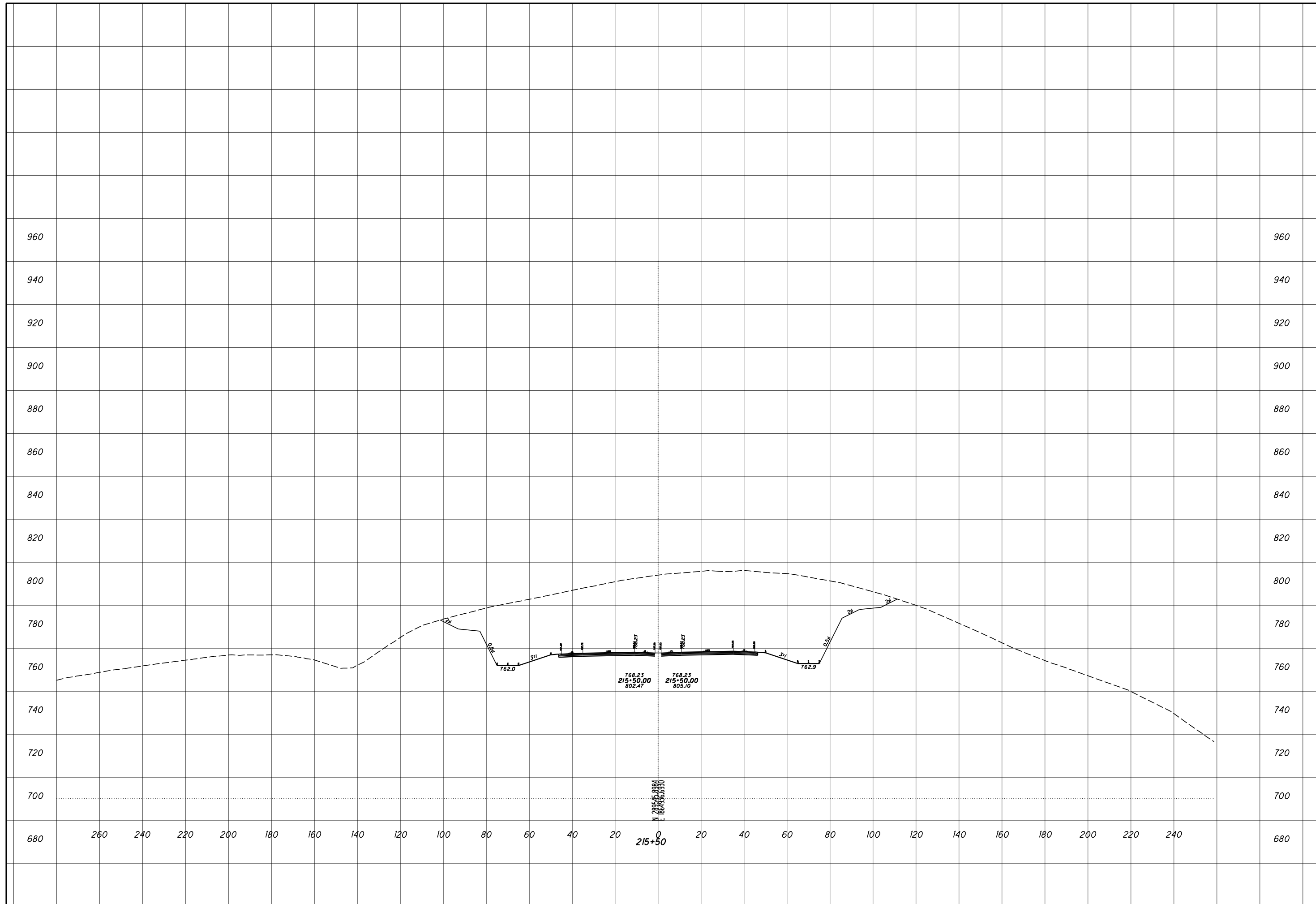
ROCK CUT SLOPE DESIGN - ROCK CUT 5
STA 215+00

SCI-823-0.00



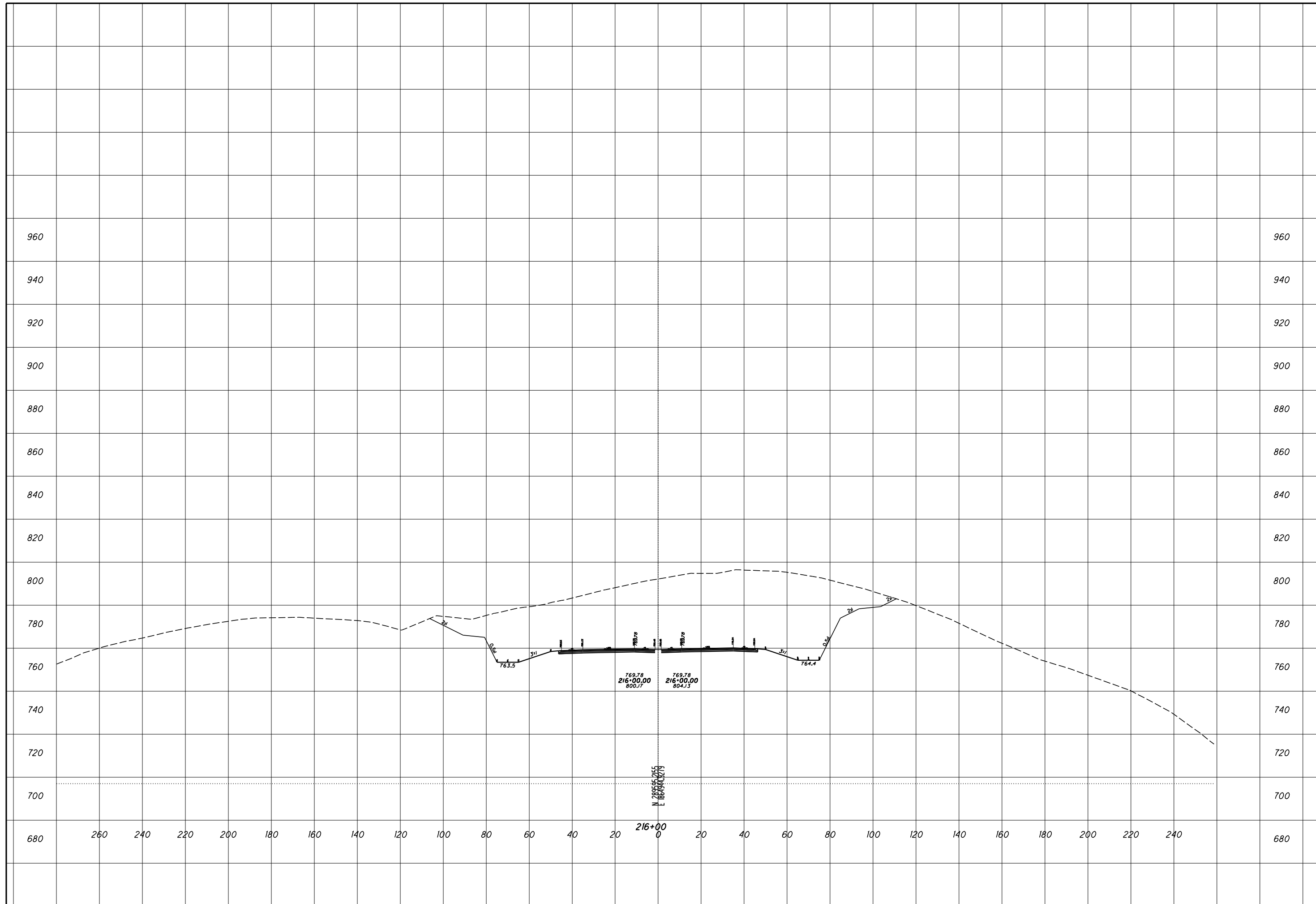
ROCK CUT SLOPE DESIGN - ROCK CUT 5
STA 215+50

SCI-823-0.00



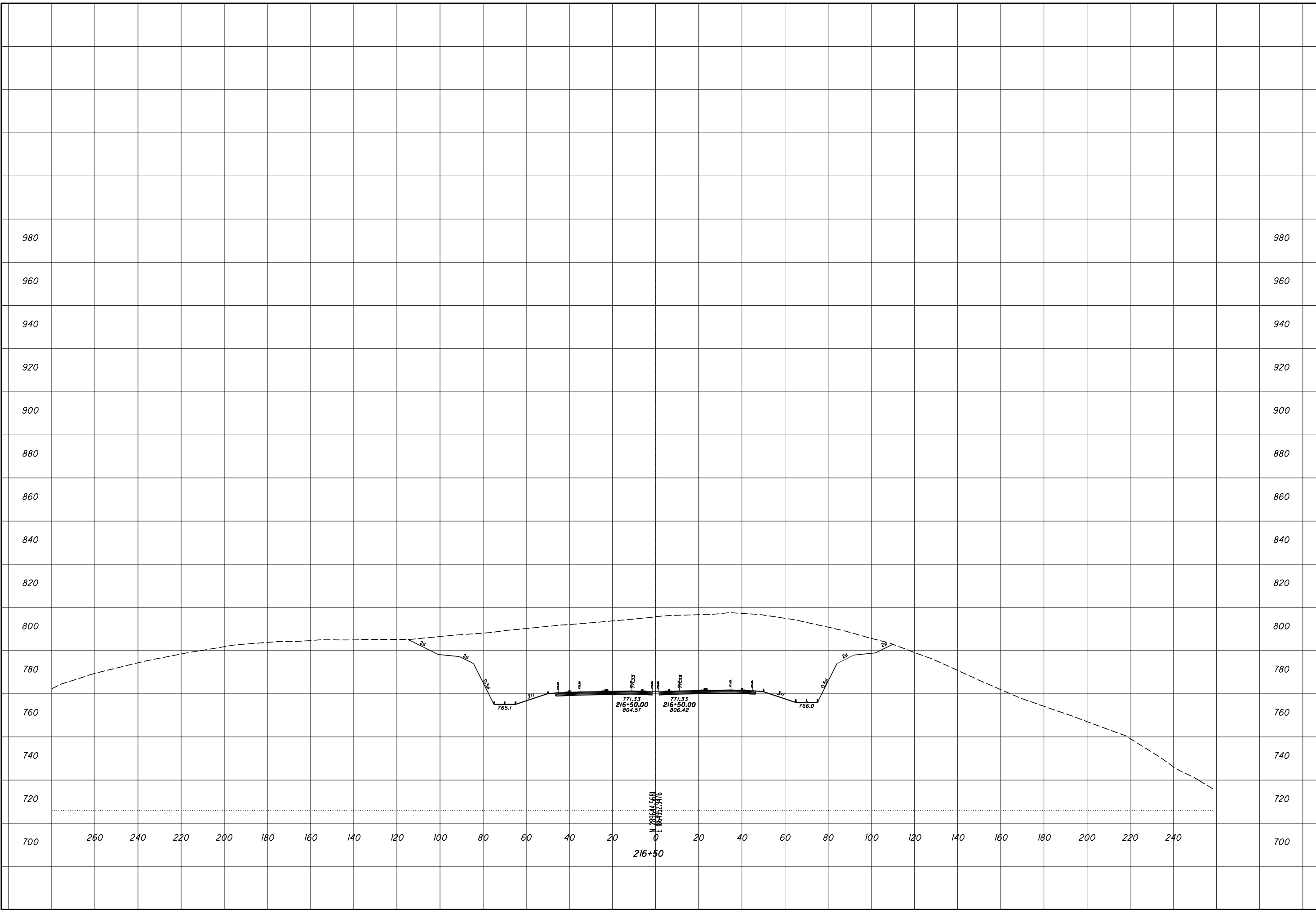
ROCK CUT SLOPE DESIGN - ROCK CUT 5
STA 216+00

SCI-823-0.00



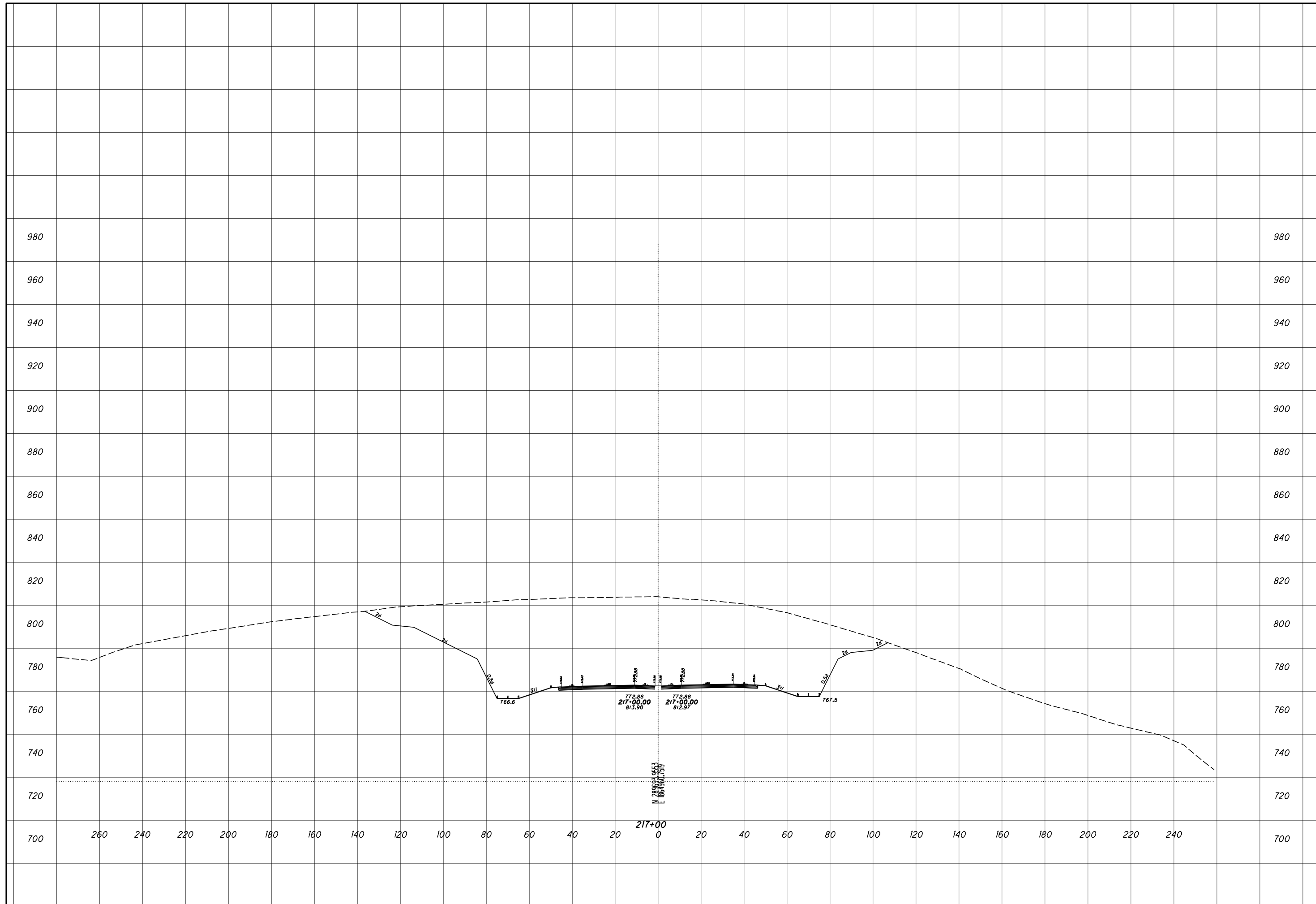
ROCK CUT SLOPE DESIGN - ROCK CUT 5
STA 216+50

SCI-823-0.00



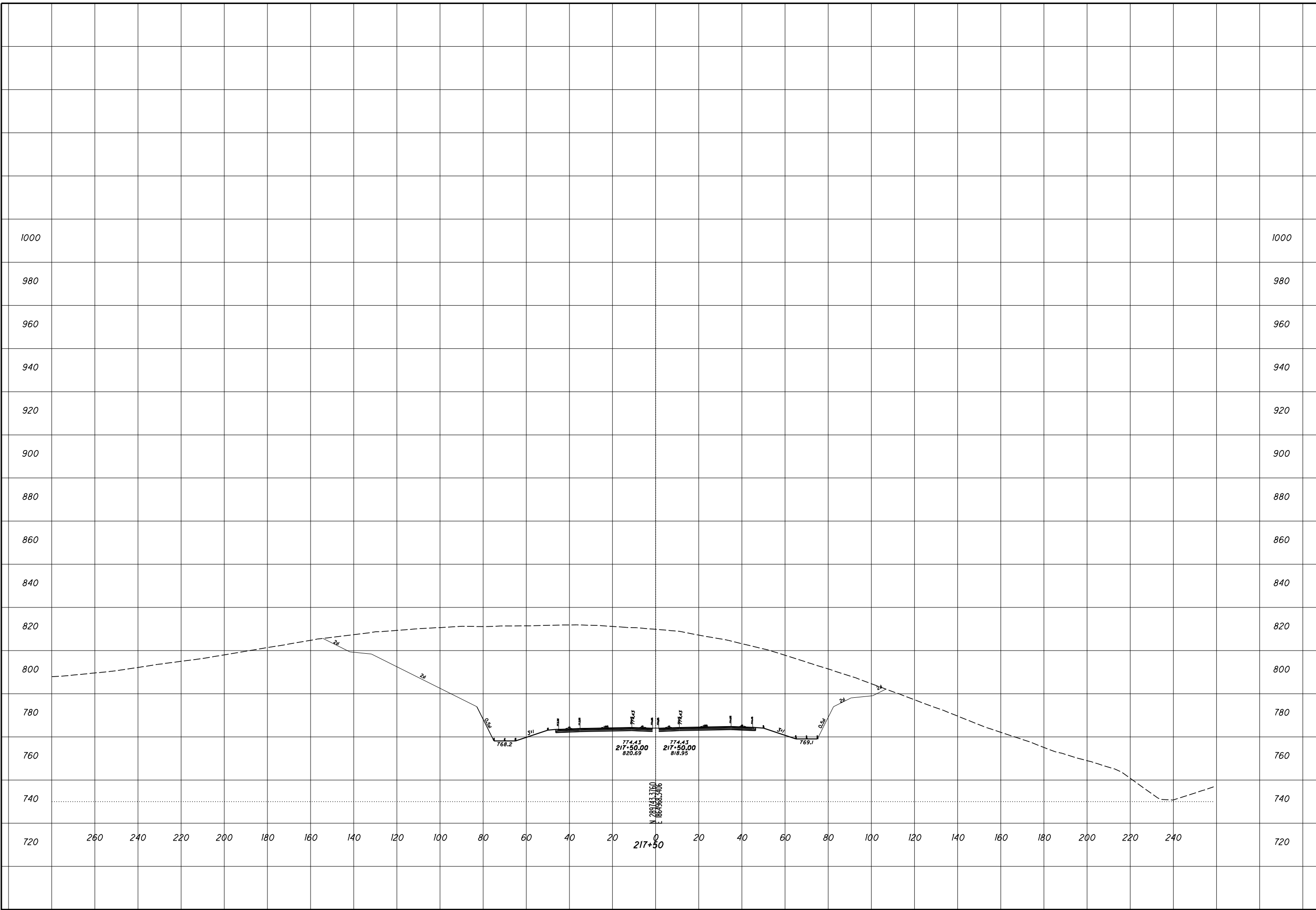
ROCK CUT SLOPE DESIGN - ROCK CUT 5
STA 217+00

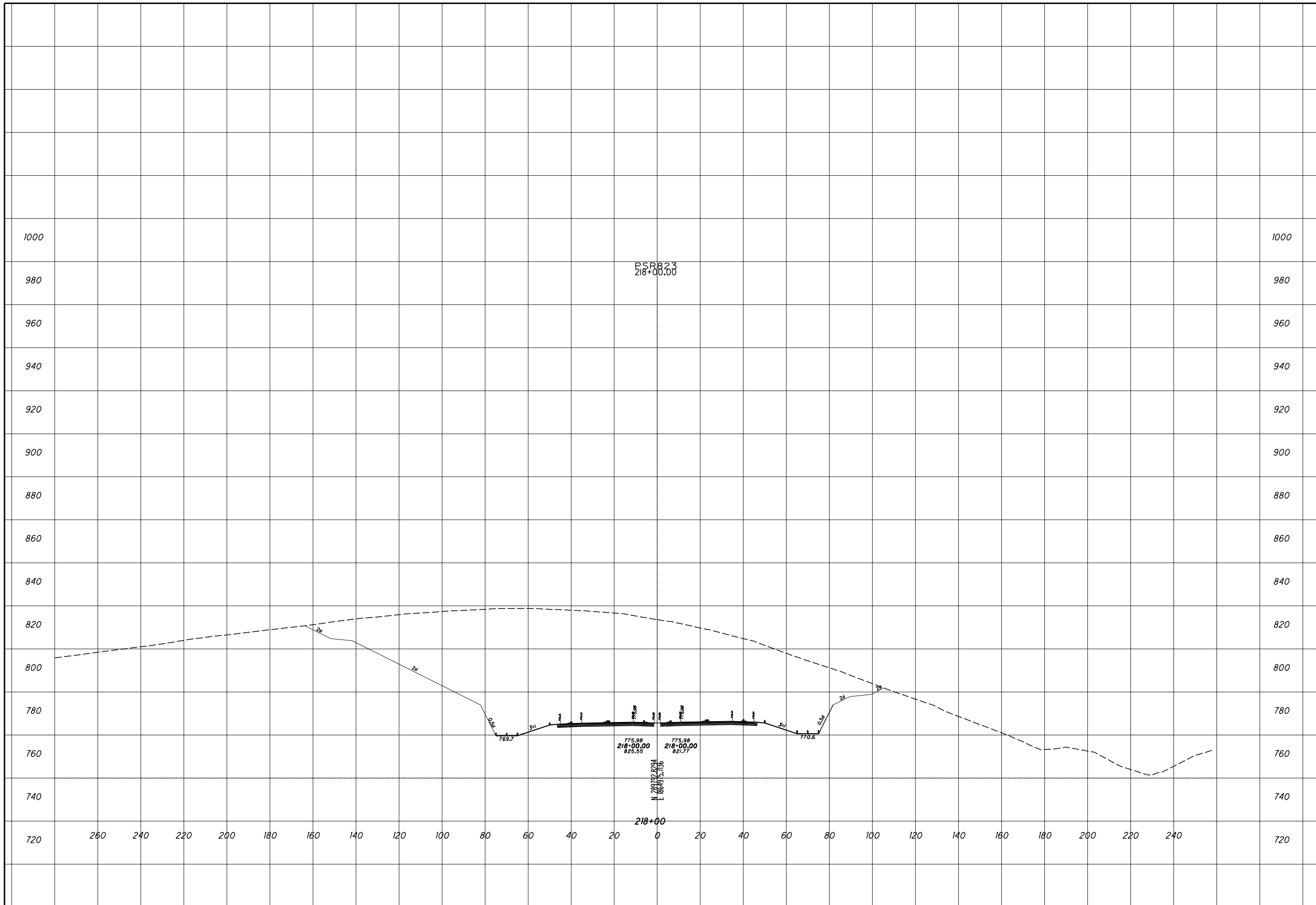
SCI-823-0.00



ROCK CUT SLOPE DESIGN - ROCK CUT 5
STA 217+50

SCI-823-0.00





ROCK CUT SLOPE DESIGN - ROCK CUT 5
STA 218+00

SCI-823-0.00

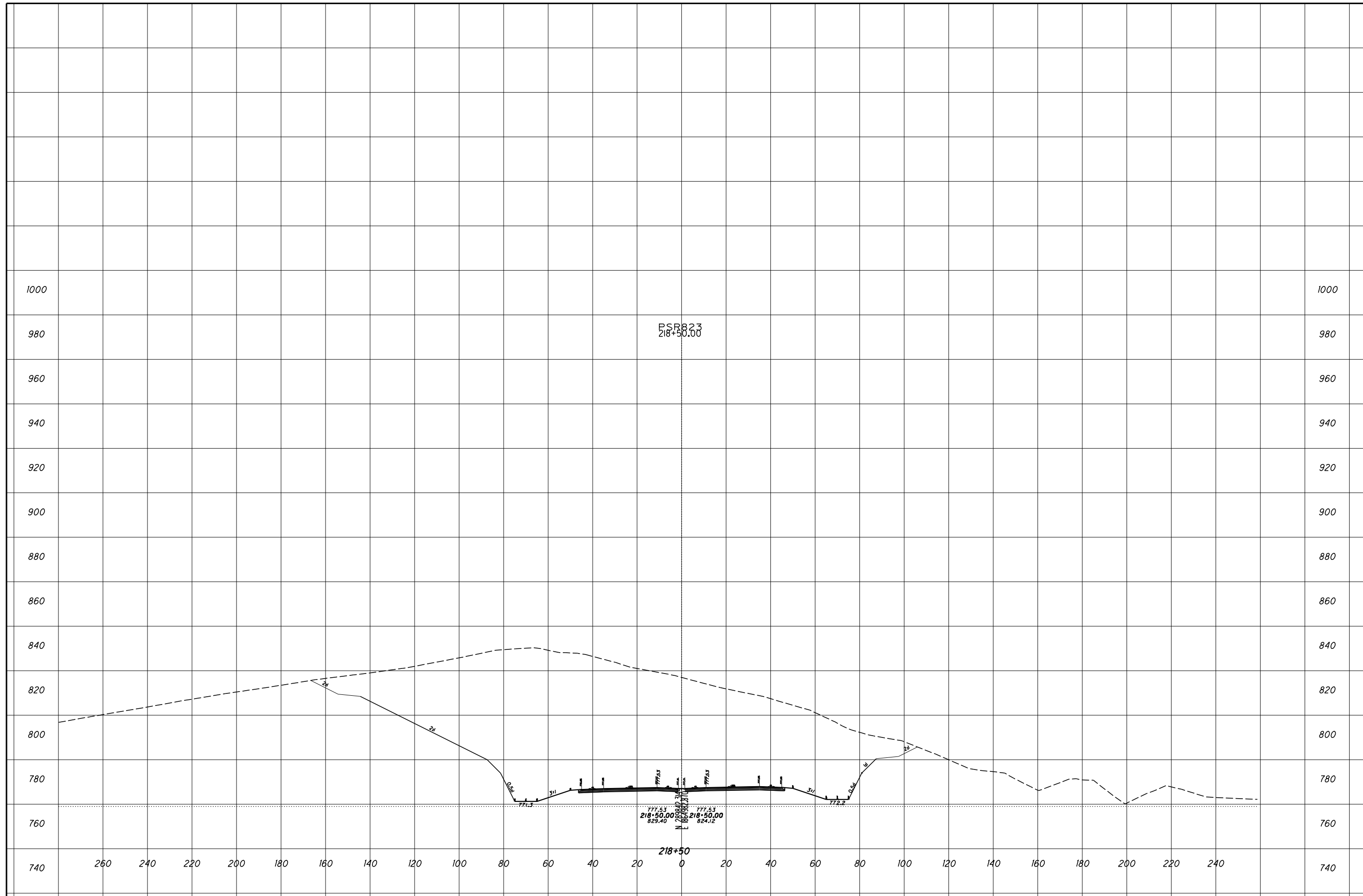
12
31

CHECKED

CHECKED

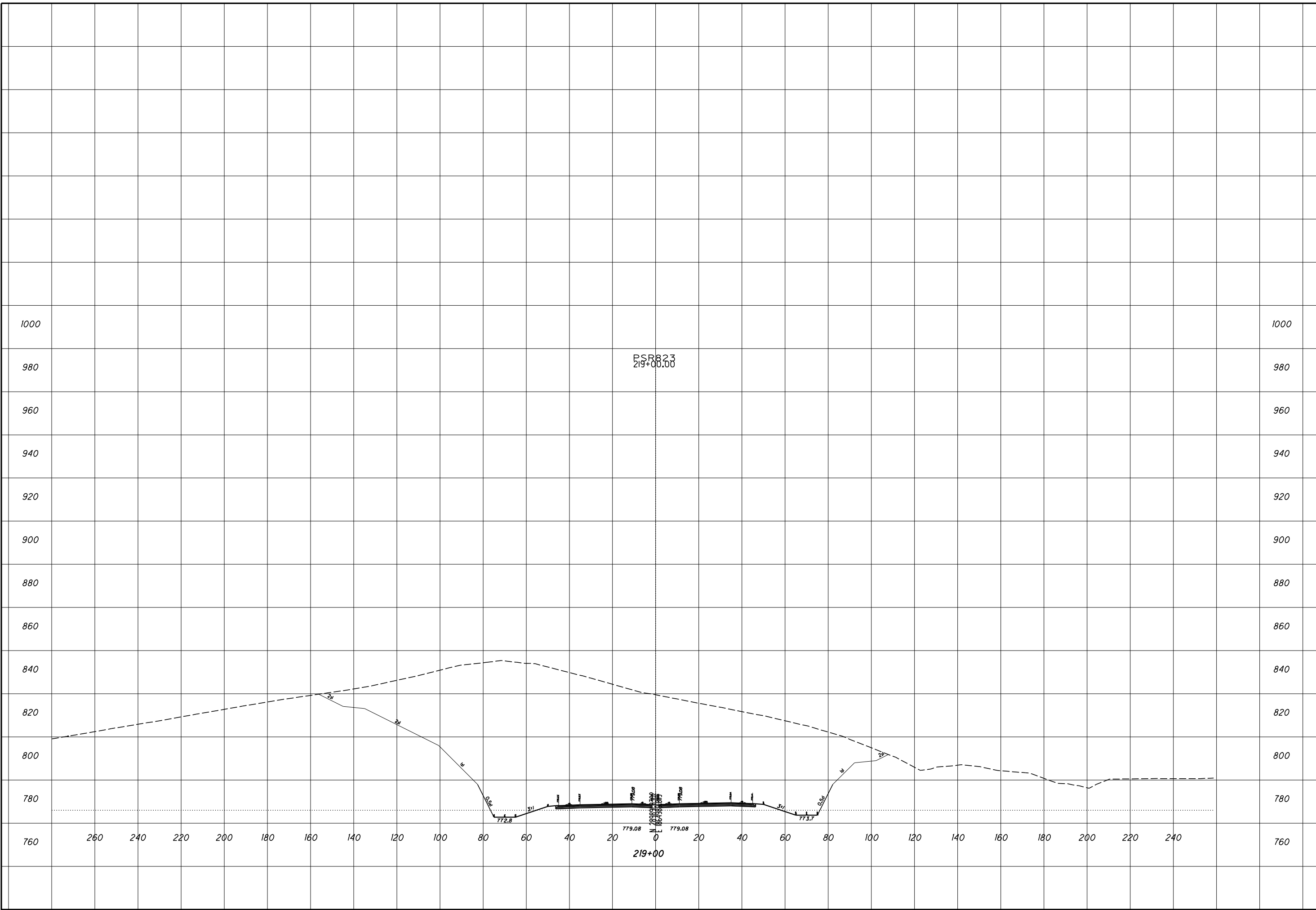
ROCK CUT SLOPE DESIGN - ROCK CUT 5
STA 218+50

SCI-823-0.00



ROCK CUT SLOPE DESIGN - ROCK CUT 5
STA 219+00

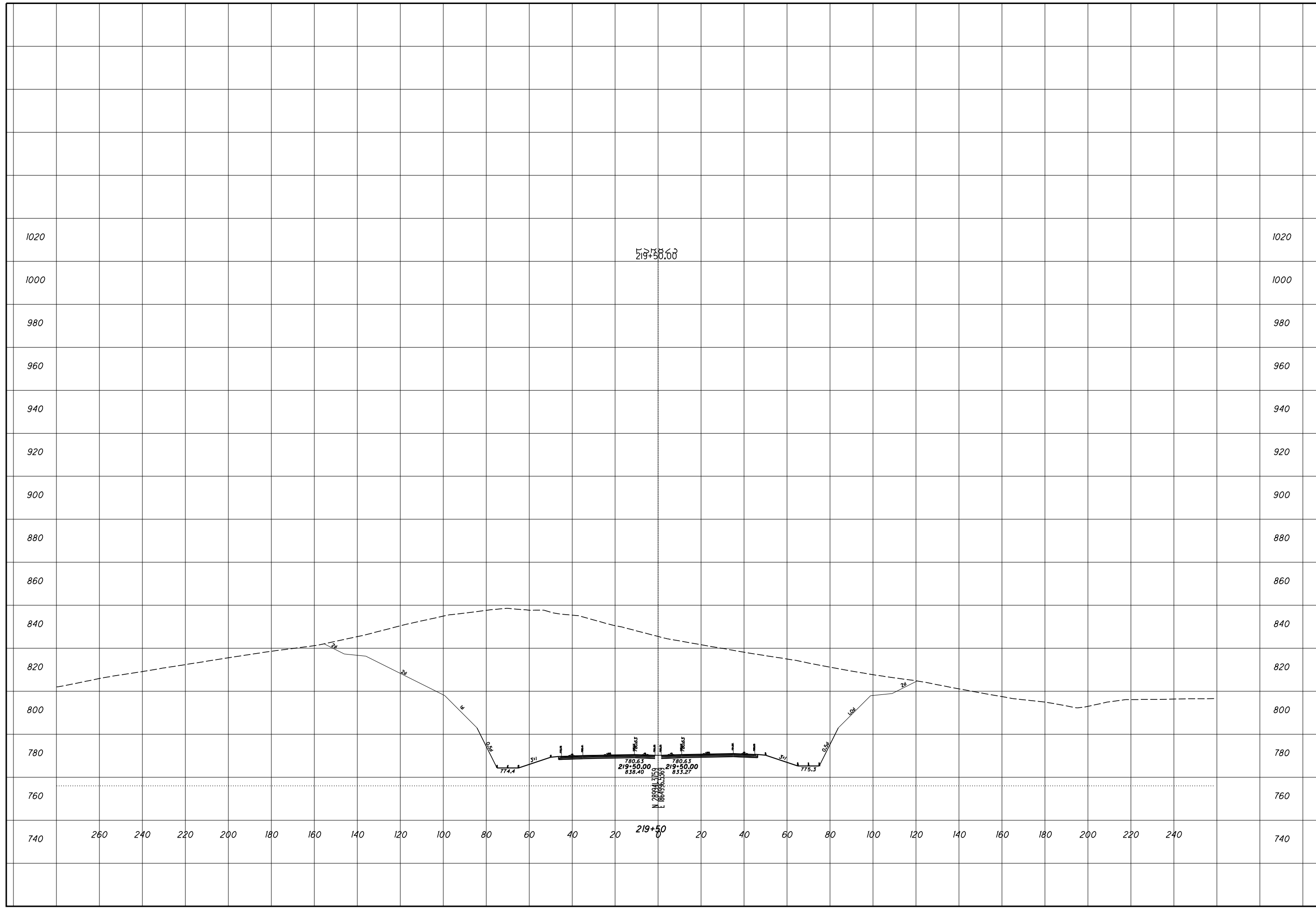
SCI-823-0.00



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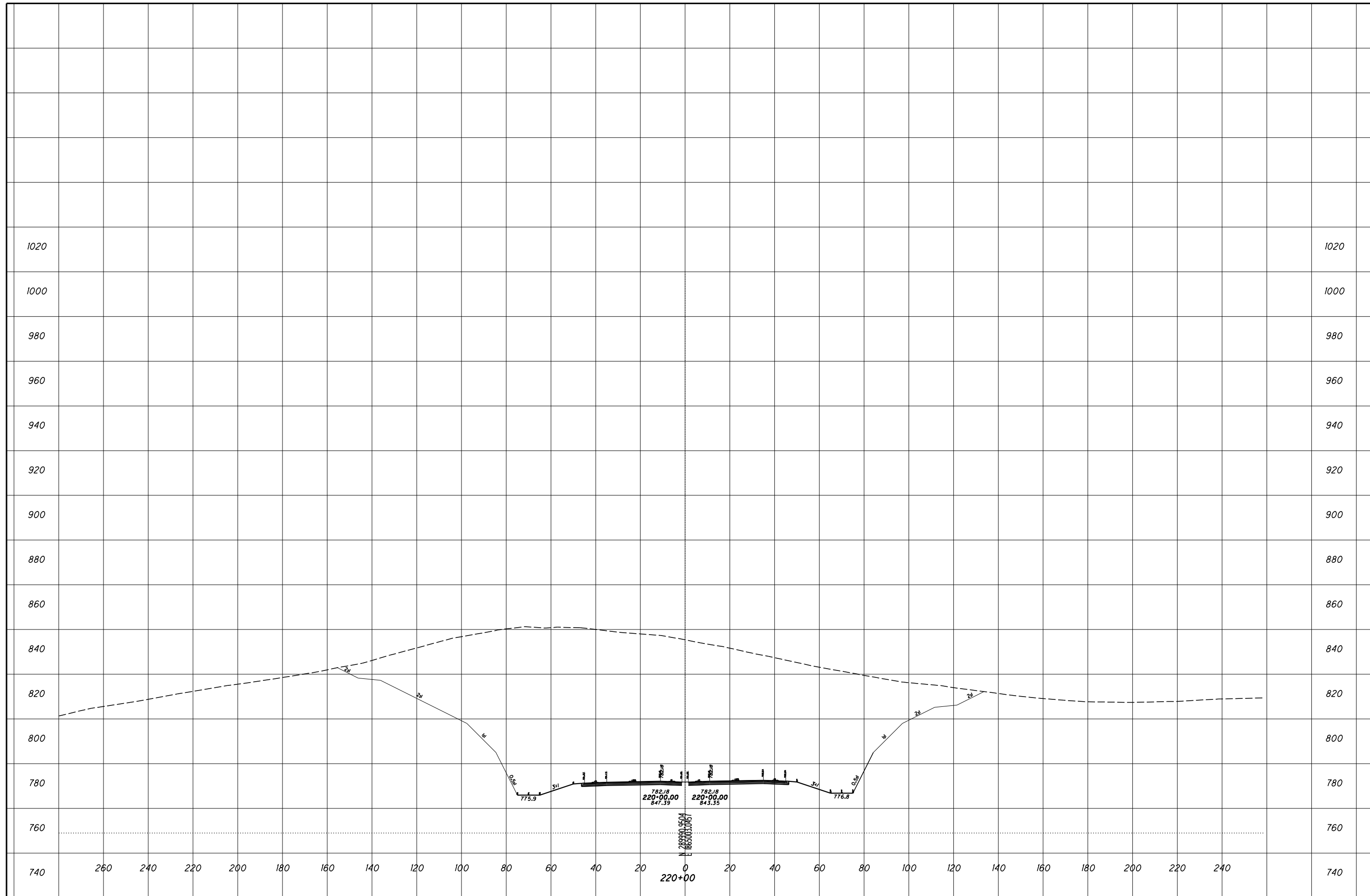
ROCK CUT SLOPE DESIGN - ROCK CUT 5
STA 219+50

SCI-823-0.00



ROCK CUT SLOPE DESIGN - ROCK CUT 5
STA 220+00

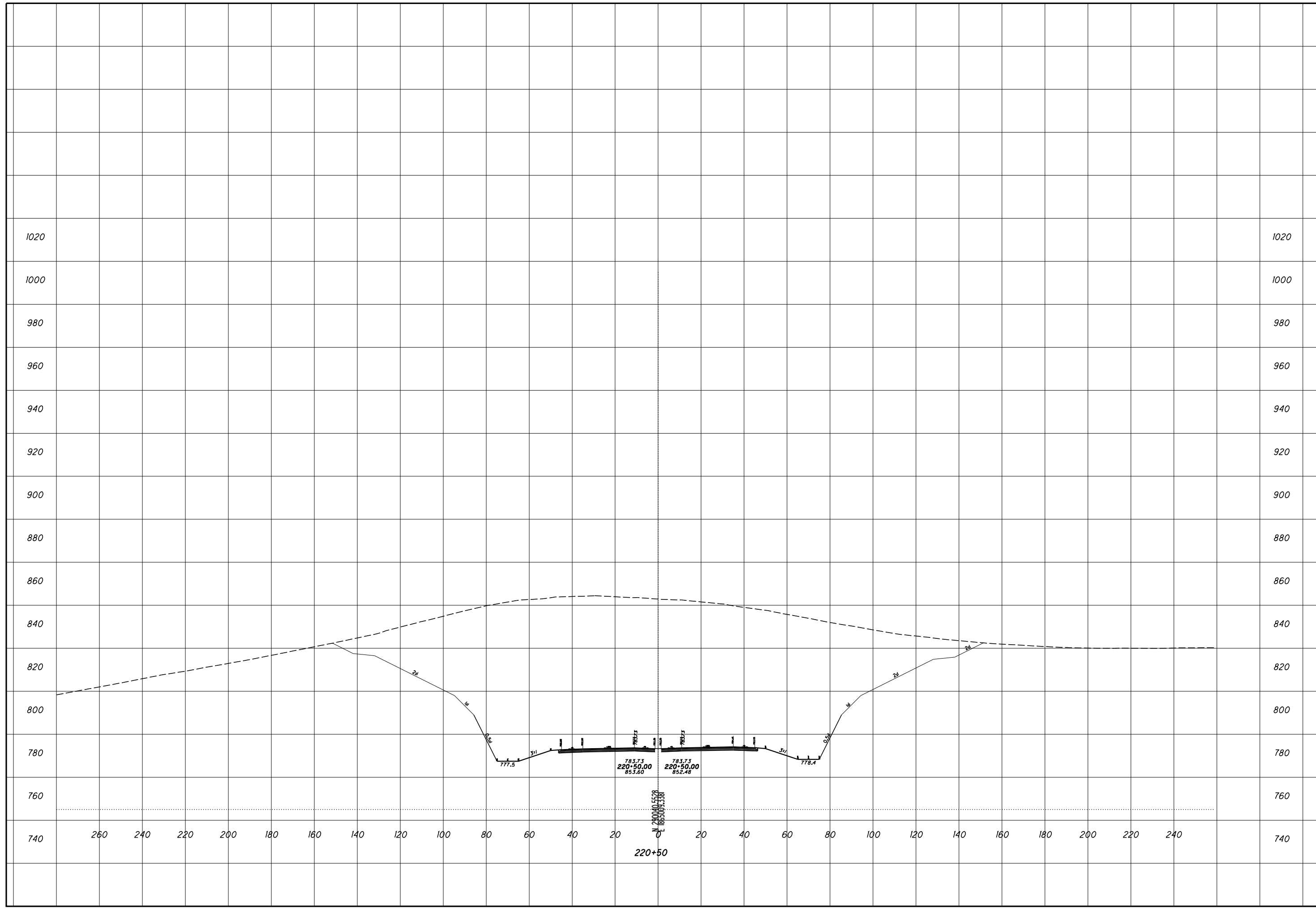
SCI-823-0.00



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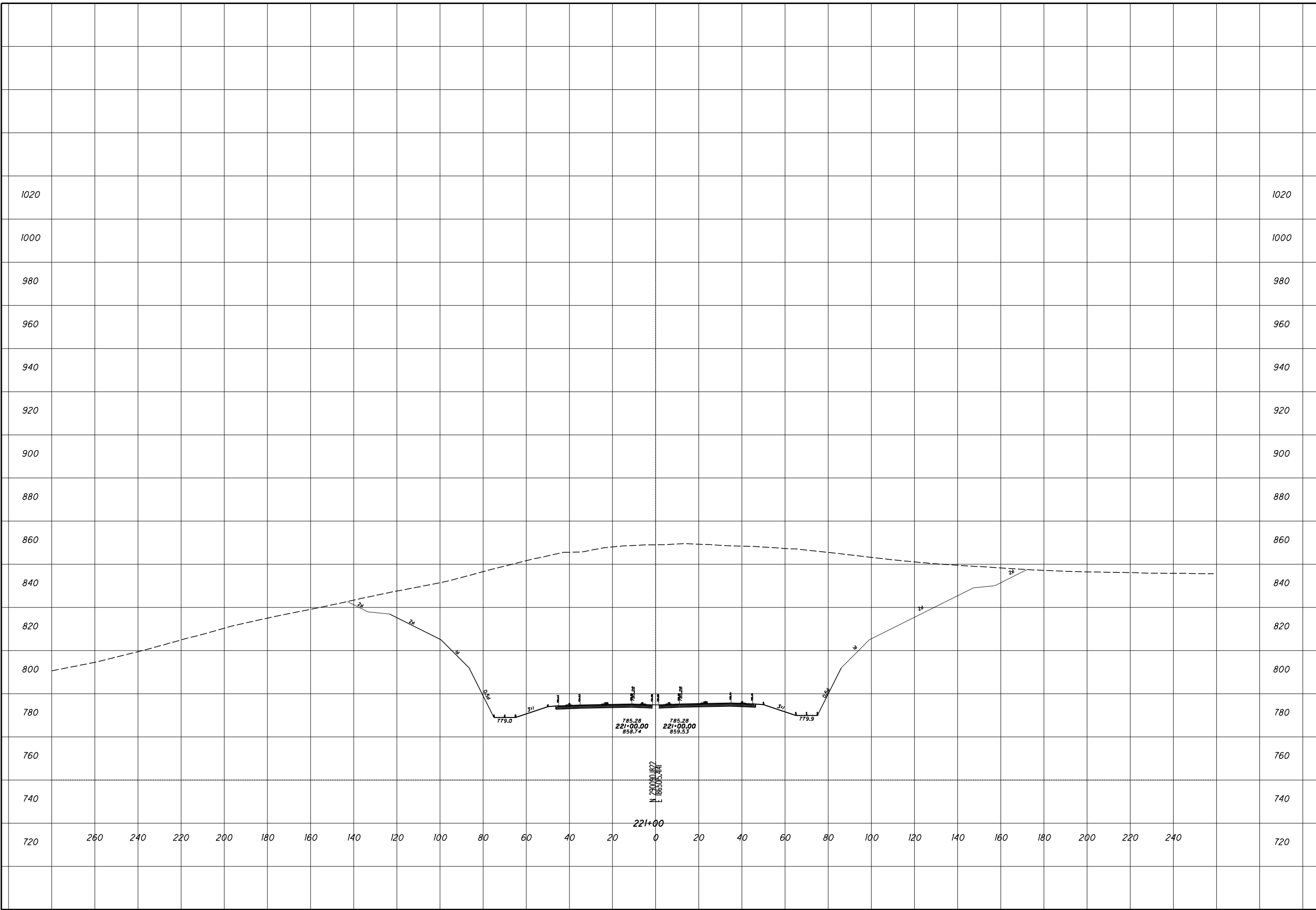
ROCK CUT SLOPE DESIGN - ROCK CUT 5
STA 220+50

SCI-823-0.00



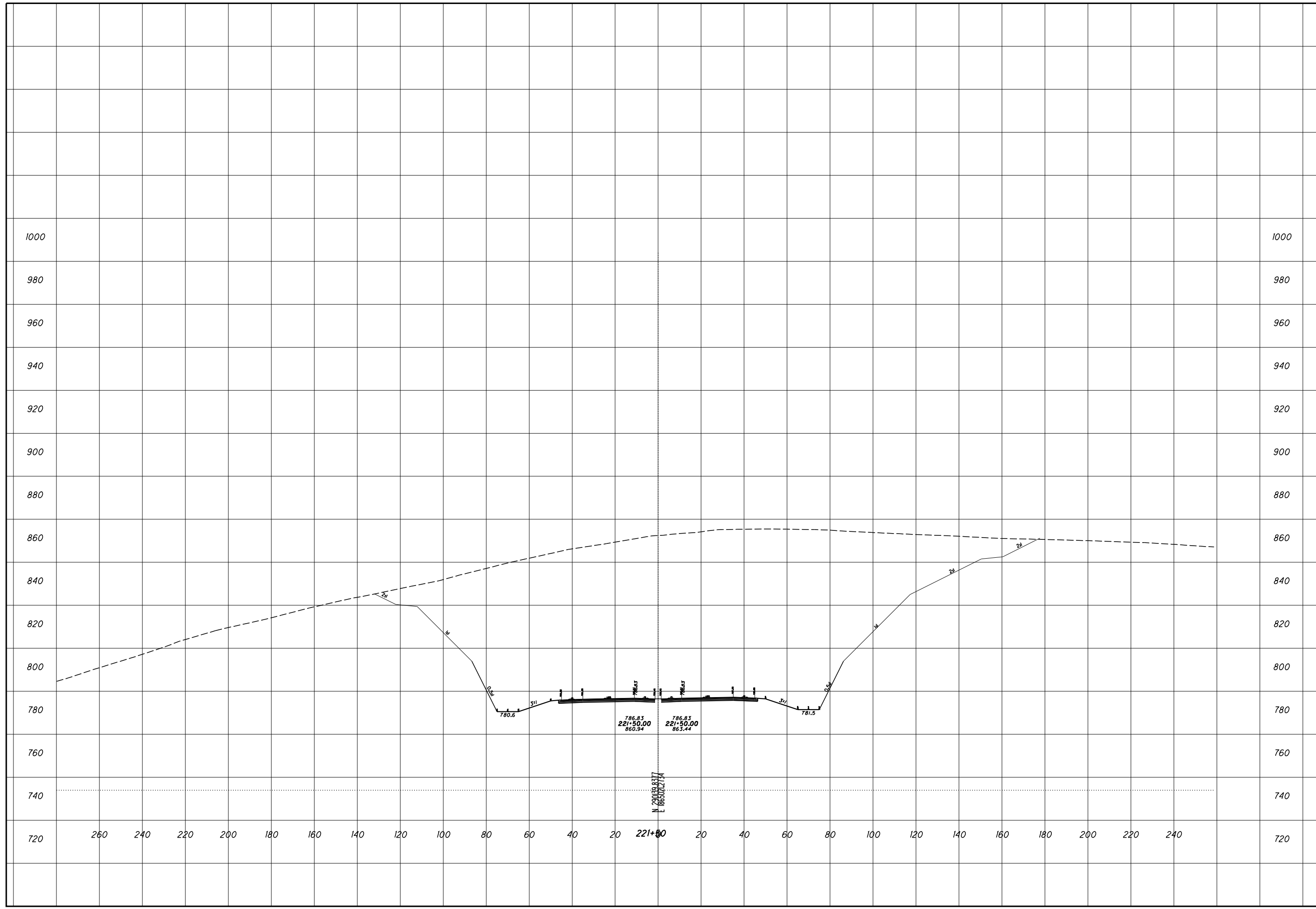
ROCK CUT SLOPE DESIGN - ROCK CUT 5
STA 221+00

SCI-823-0.00



ROCK CUT SLOPE DESIGN - ROCK CUT 5
STA 221+50

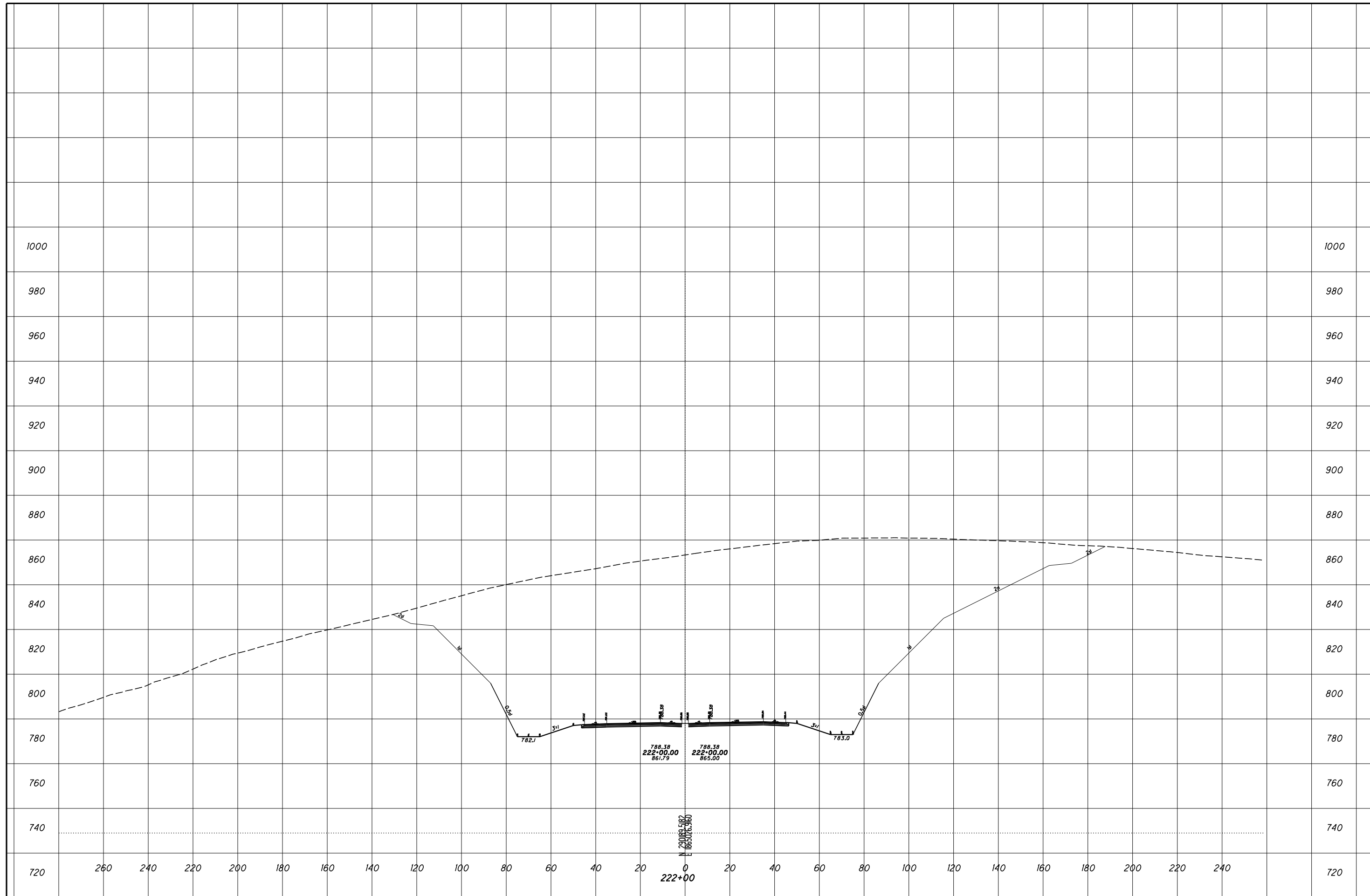
SCI-823-0.00



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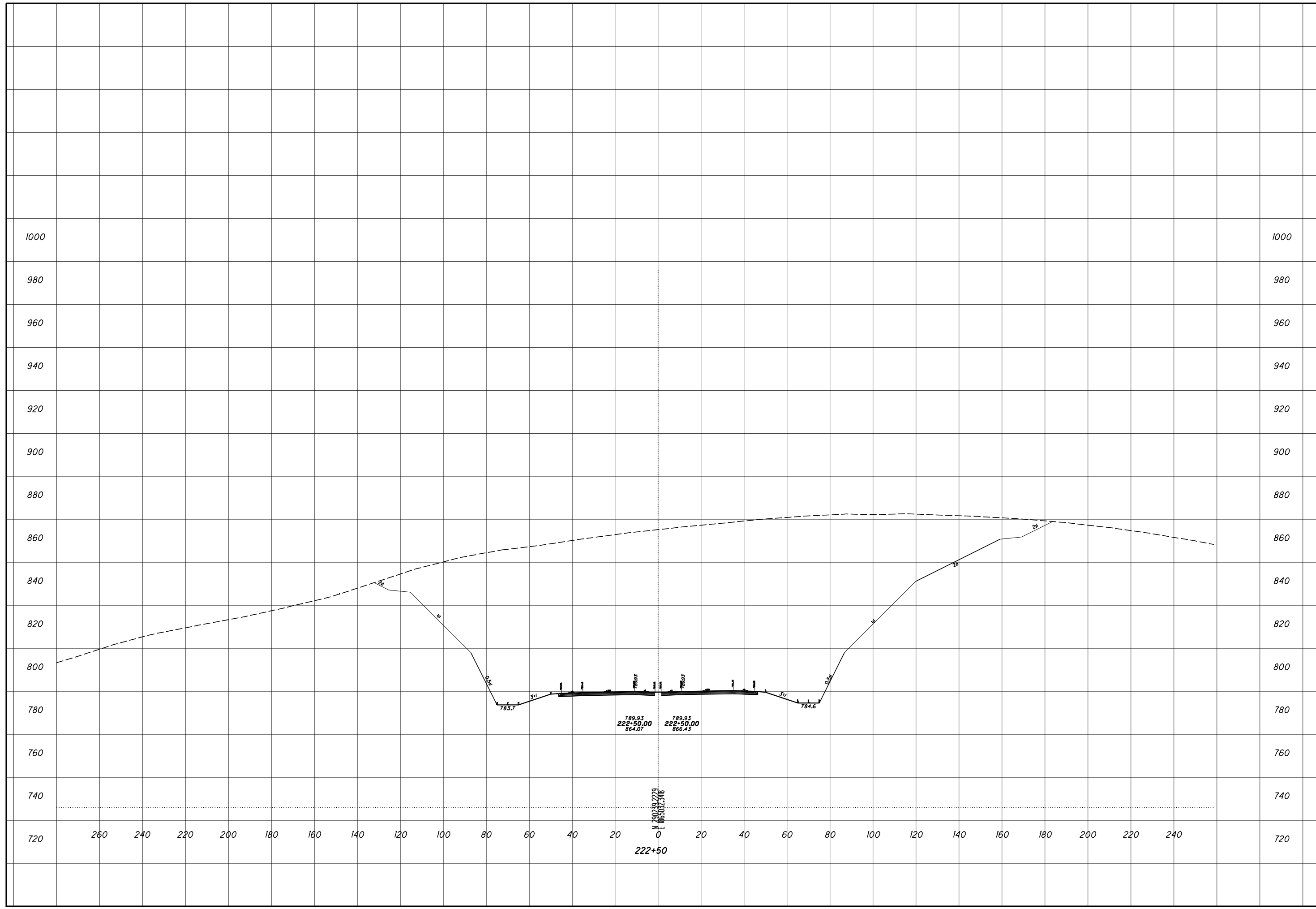
ROCK CUT SLOPE DESIGN - ROCK CUT 5
STA 222+00

SCI-823-0.00



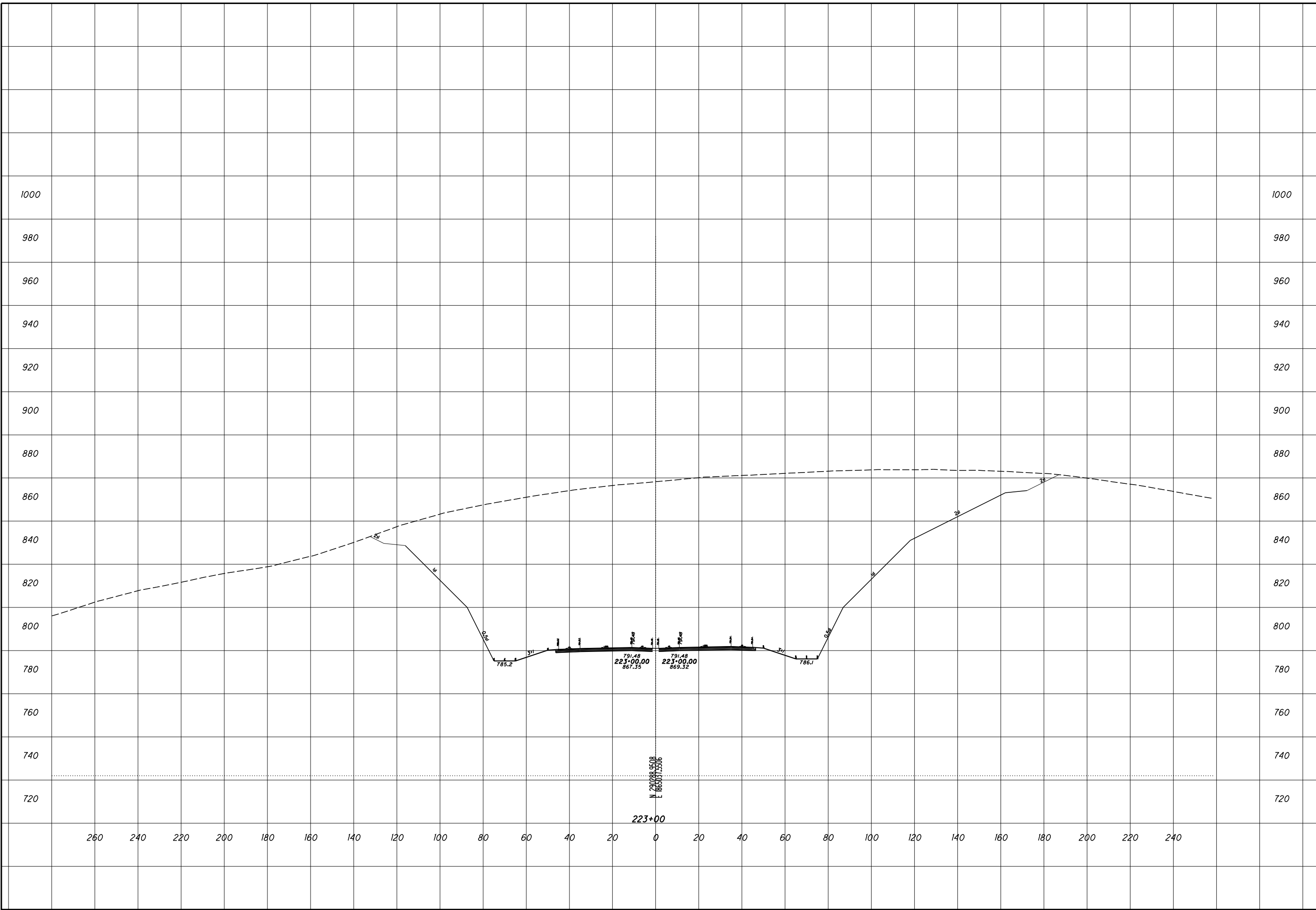
ROCK CUT SLOPE DESIGN - ROCK CUT 5
STA 222+50

SCI-823-0.00



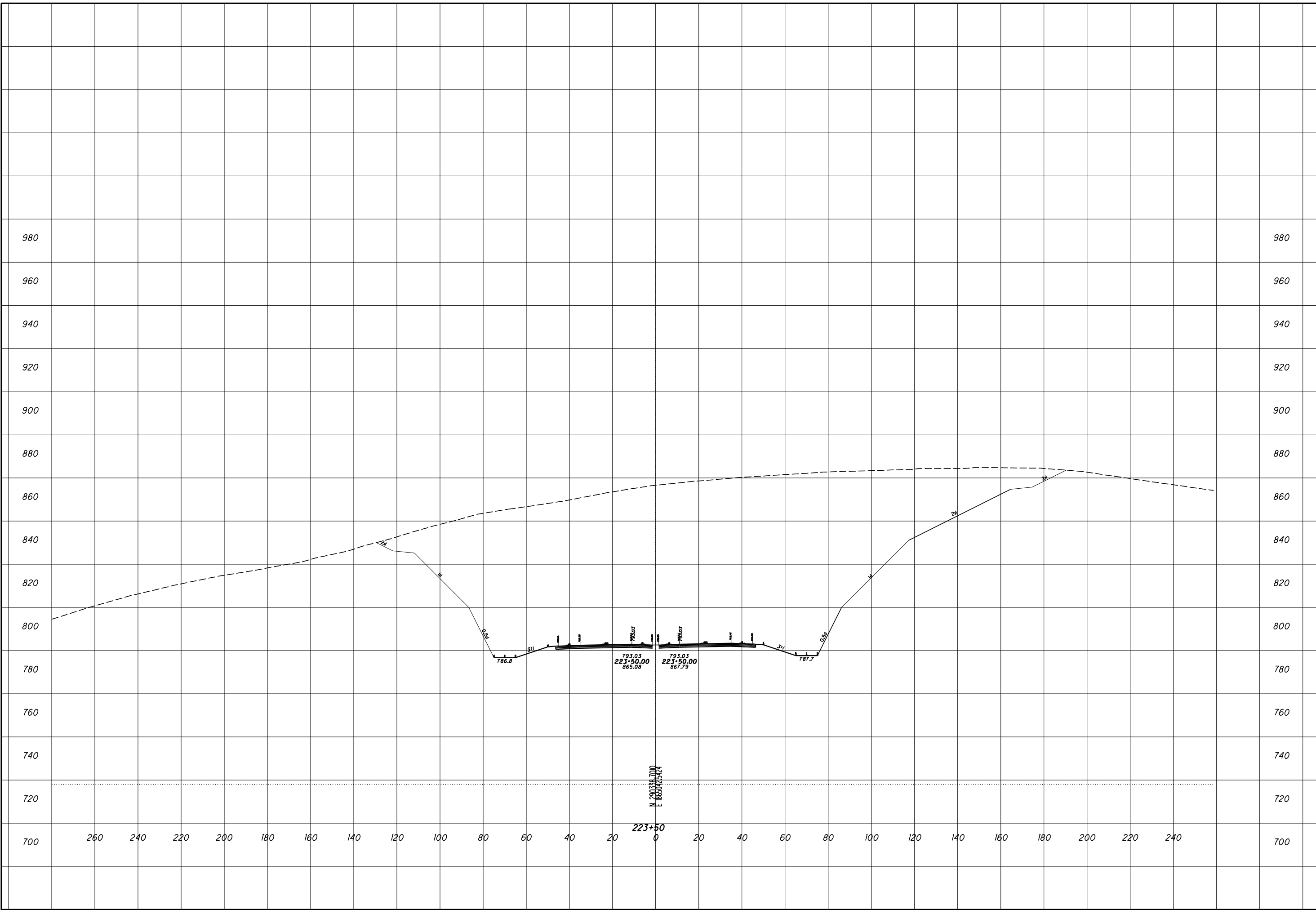
ROCK CUT SLOPE DESIGN - ROCK CUT 5
STA 223+00

SCI-823-0.00



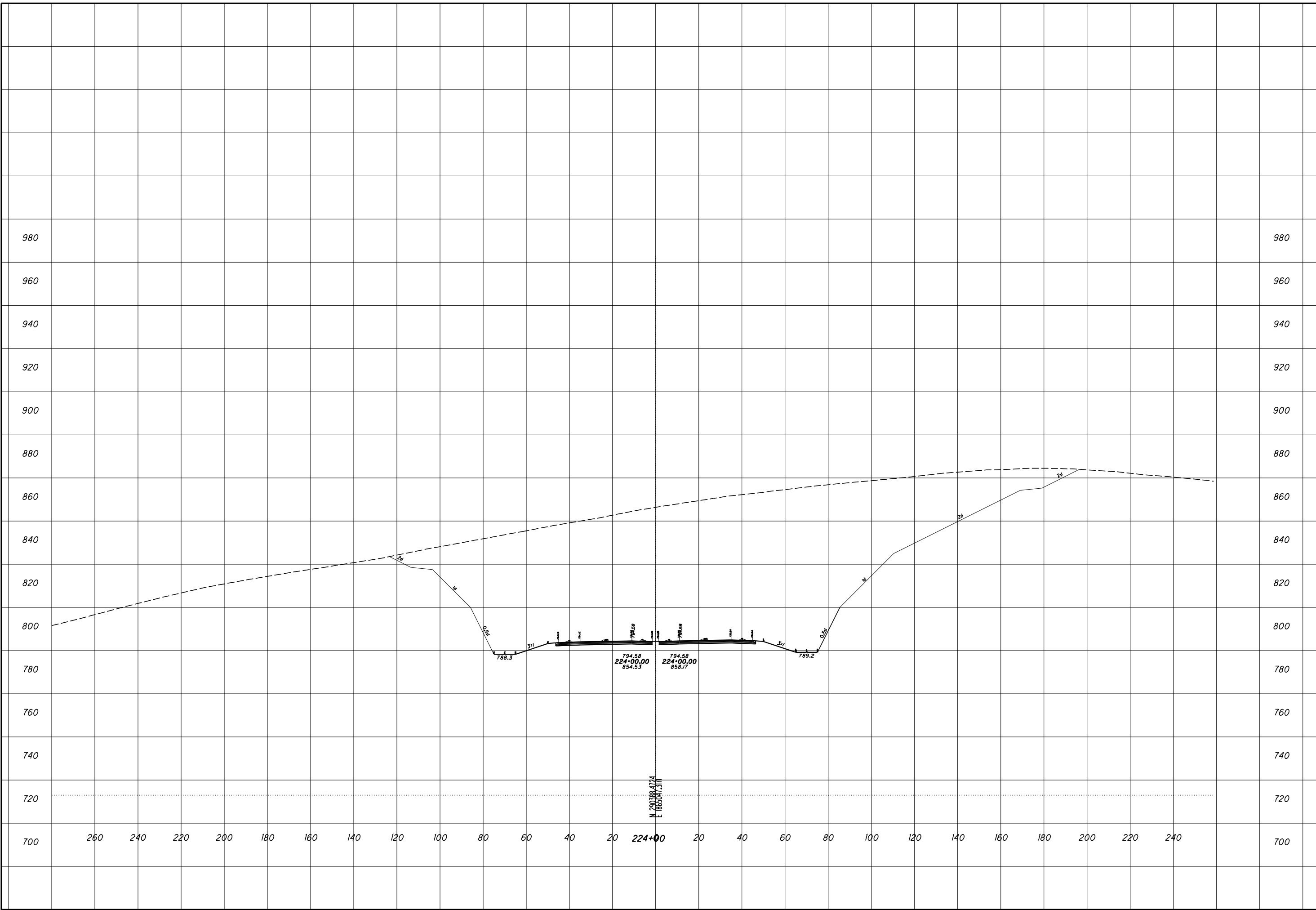
ROCK CUT SLOPE DESIGN - ROCK CUT 5
STA 223+50

SCI-823-0.00



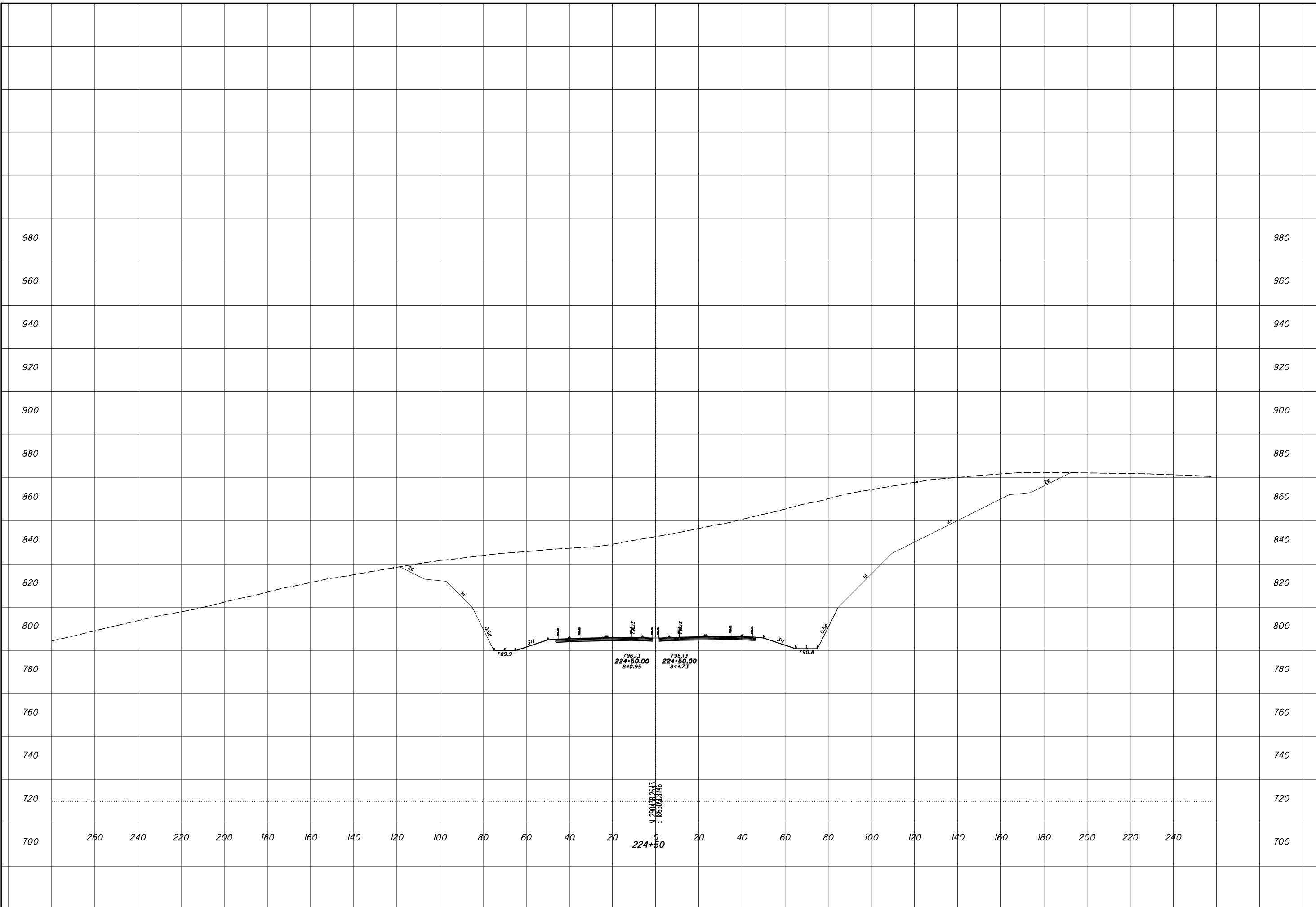
ROCK CUT SLOPE DESIGN - ROCK CUT 5
STA 224+00

SCI-823-0.00



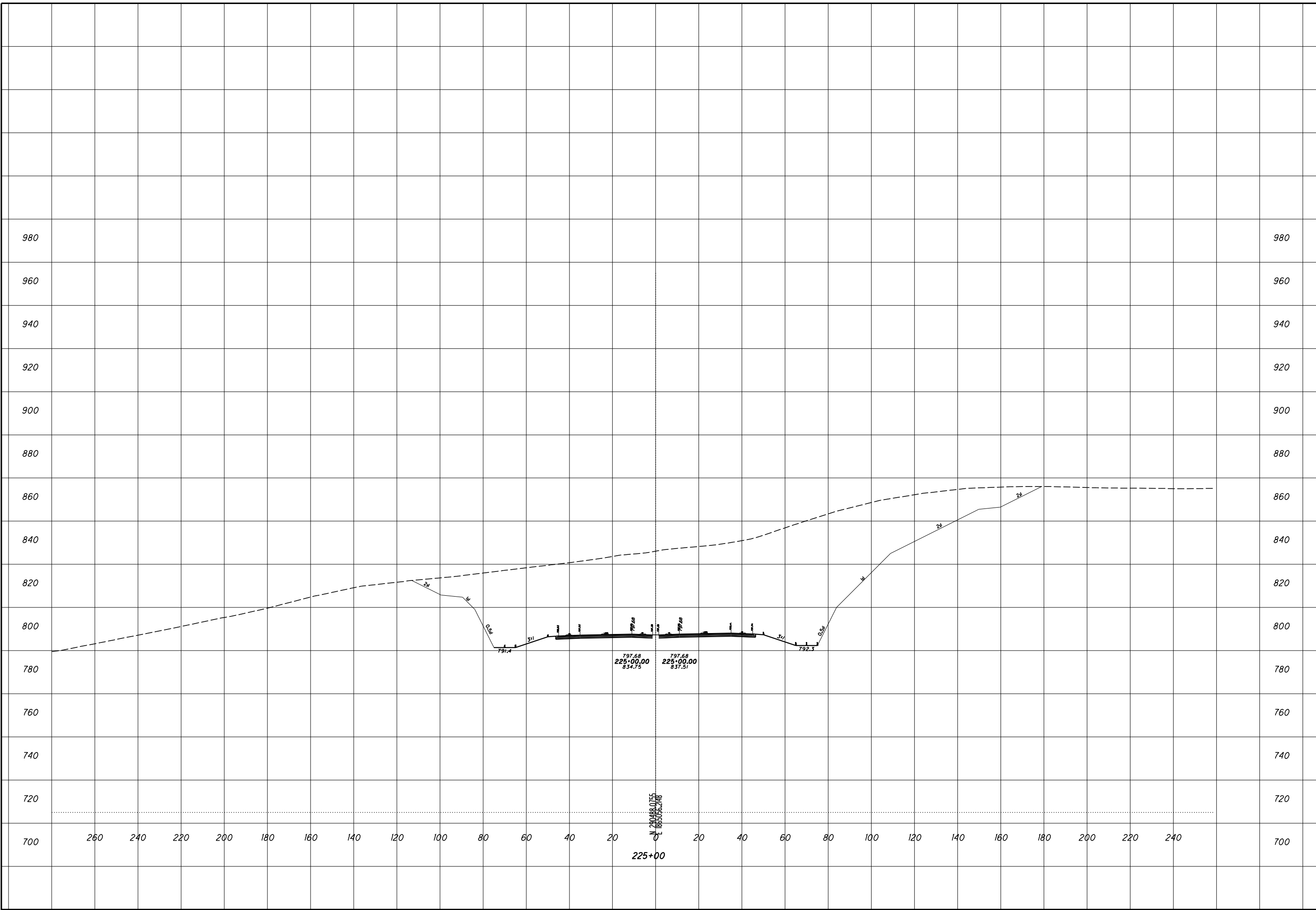
ROCK CUT SLOPE DESIGN - ROCK CUT 5
STA 224+50

SCI-823-0.00



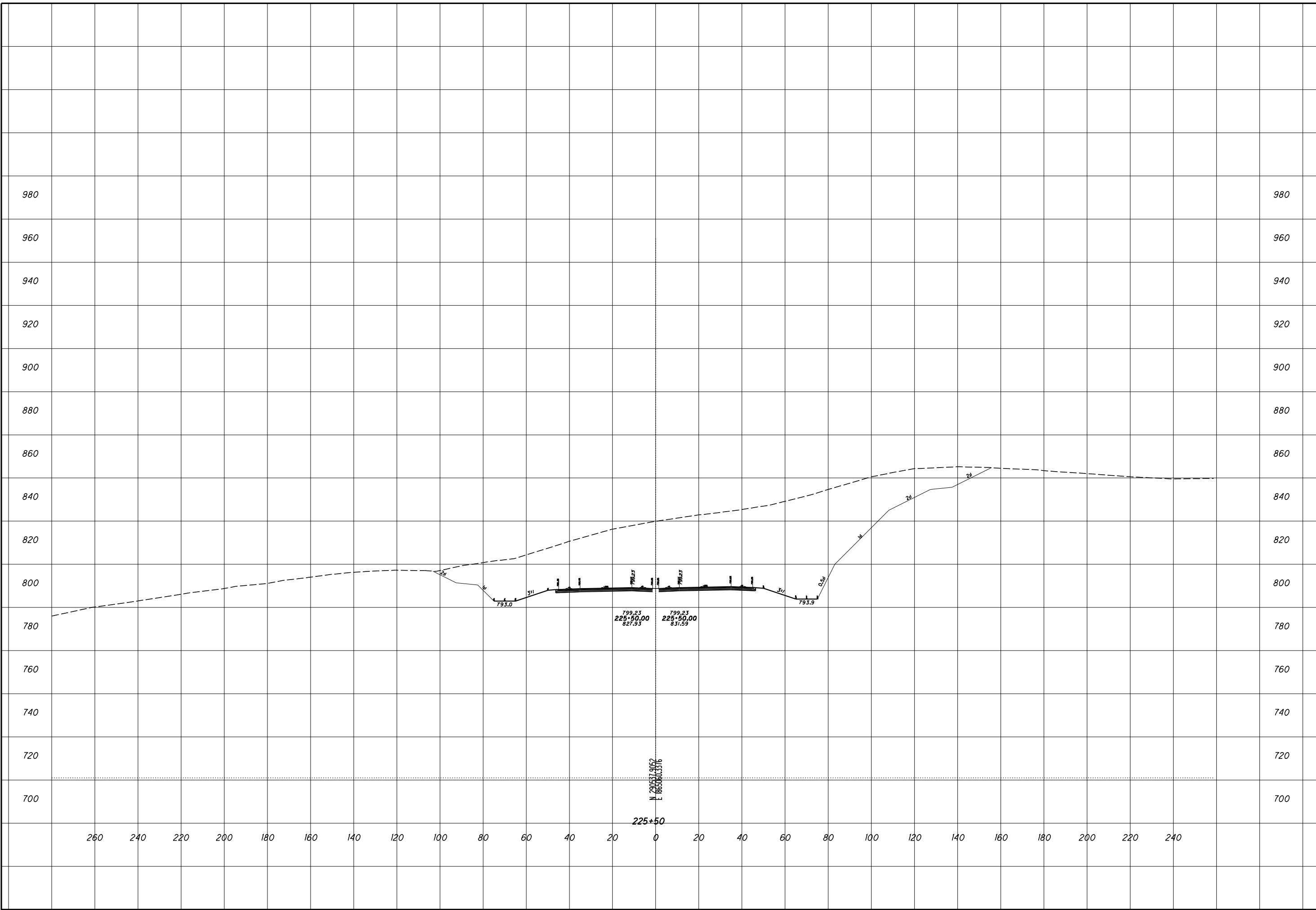
ROCK CUT SLOPE DESIGN - ROCK CUT 5
STA 225+00

SCI-823-0.00



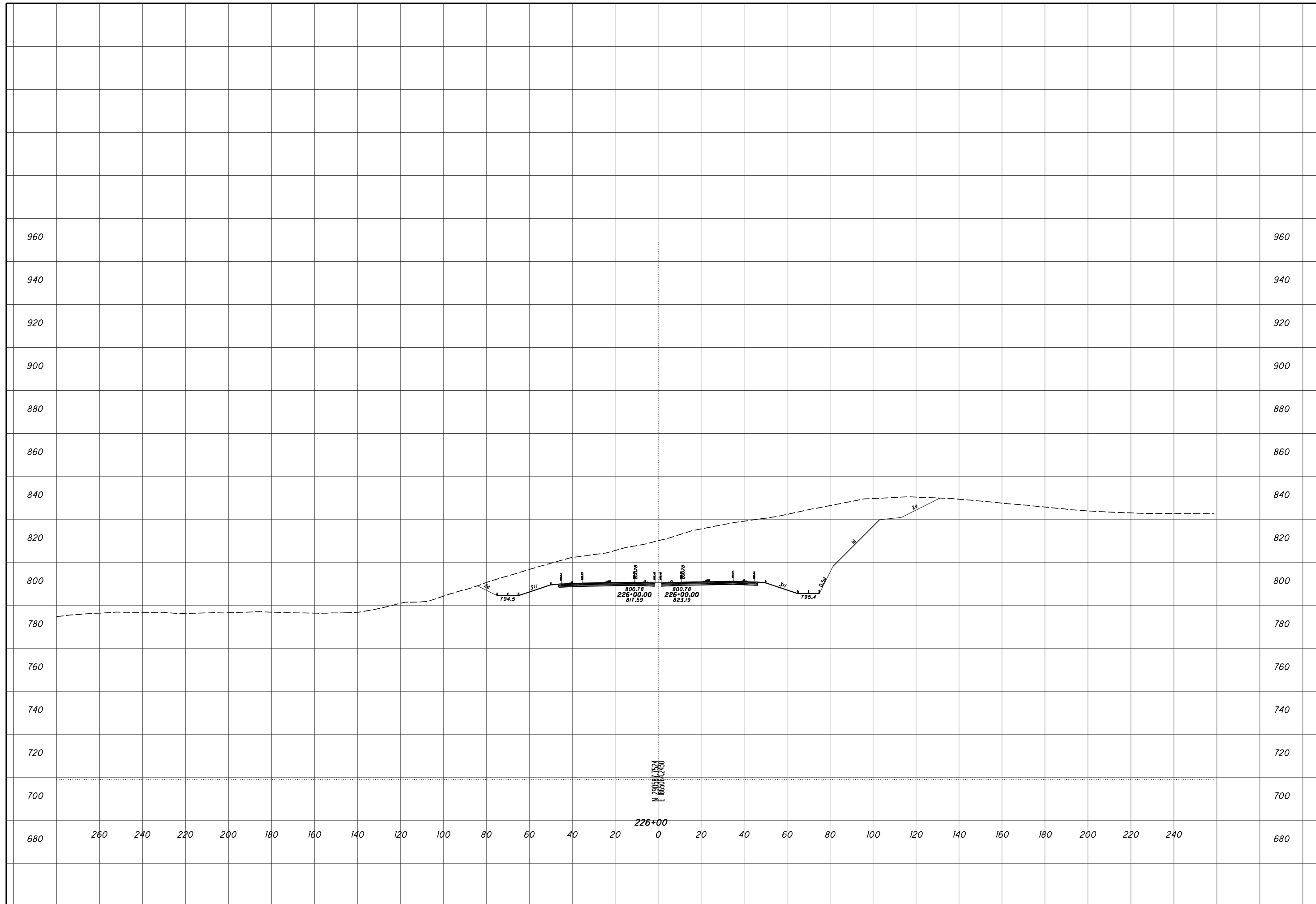
ROCK CUT SLOPE DESIGN - ROCK CUT 5
STA 225+50

SCI-823-0.00



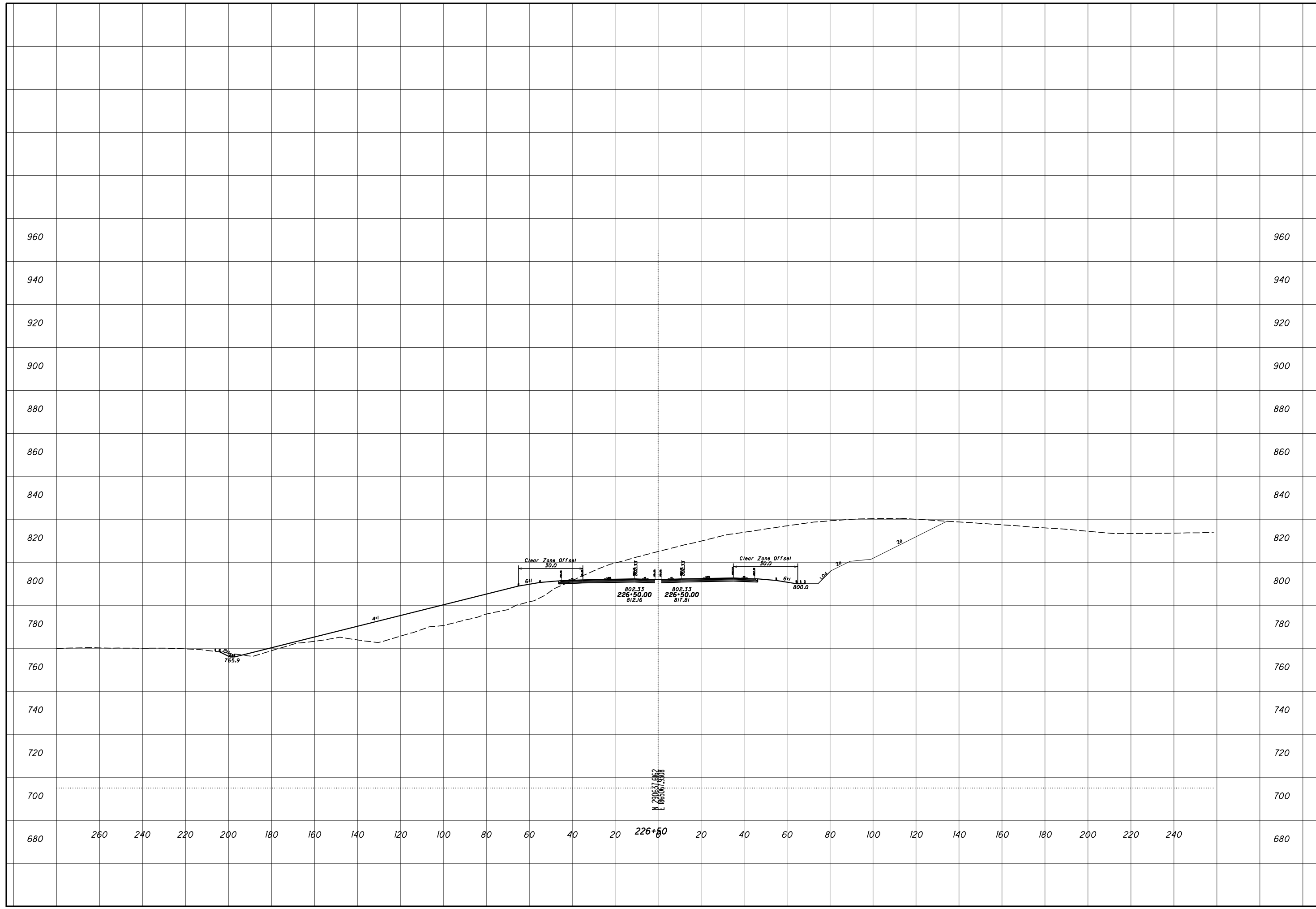
ROCK CUT SLOPE DESIGN - ROCK CUT 5
STA 226+00

SCI-823-0.00



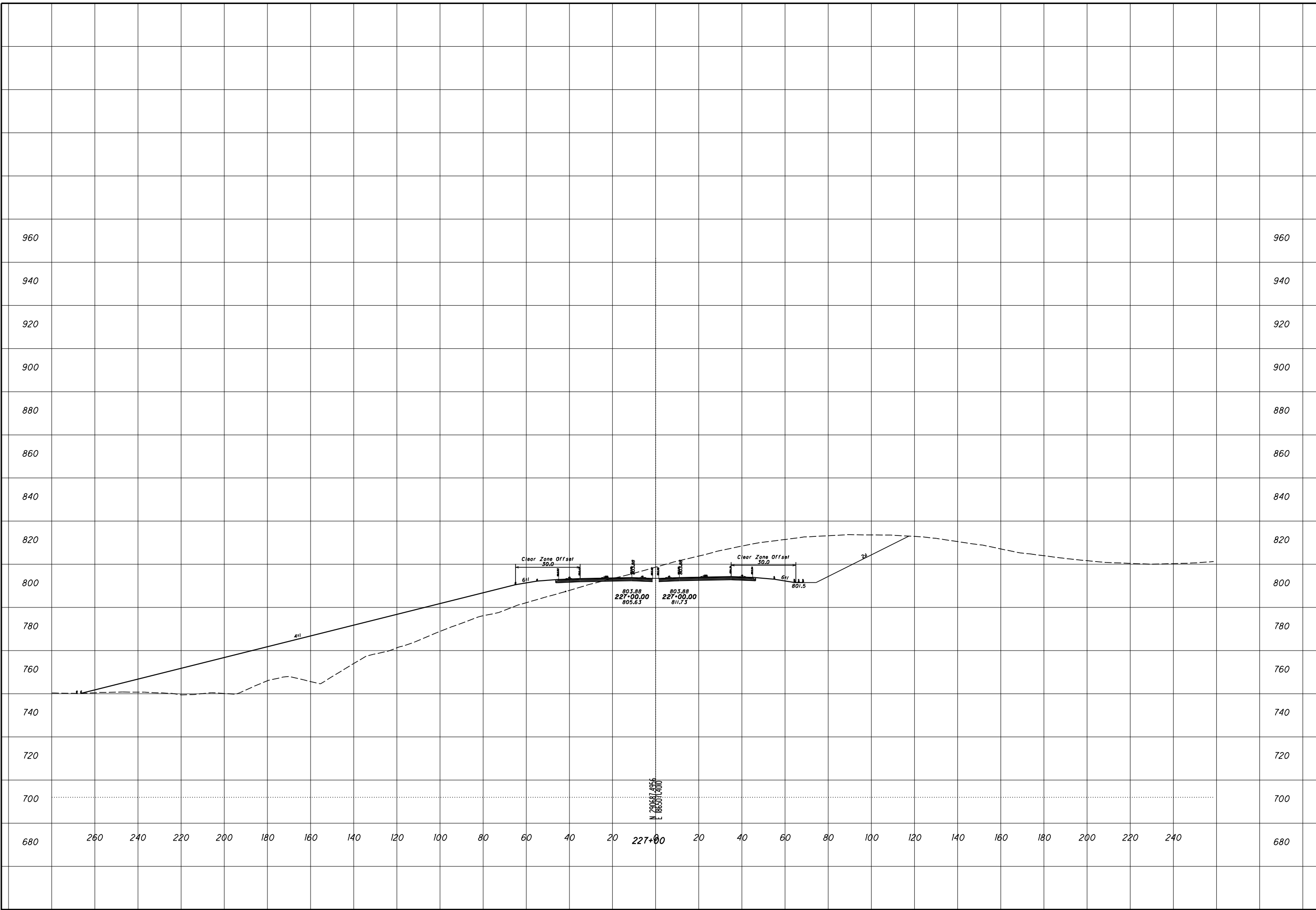
ROCK CUT SLOPE DESIGN - ROCK CUT 5
STA 226+50

SCI-823-0.00



ROCK CUT SLOPE DESIGN - ROCK CUT 5
STA 227+00

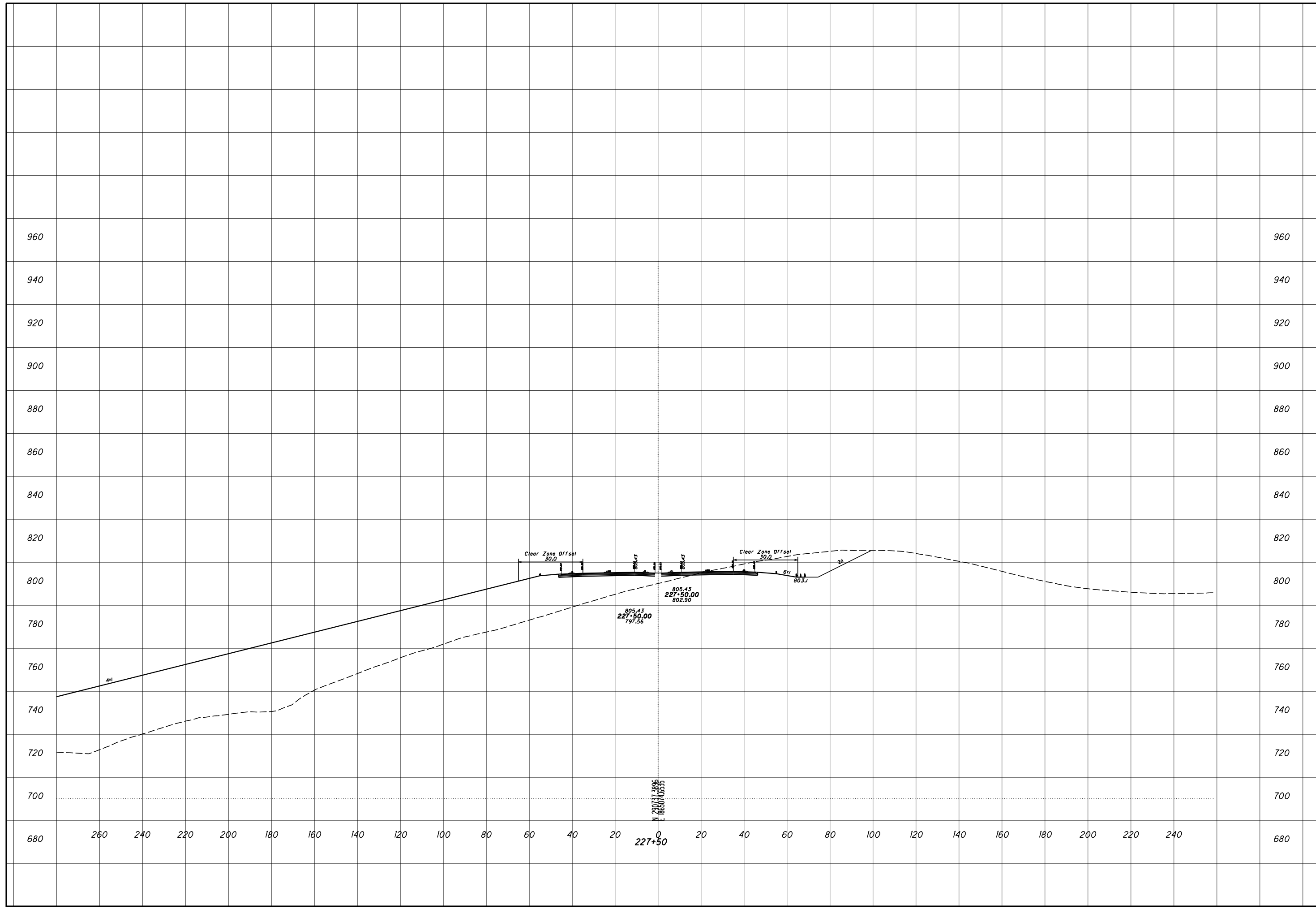
SCI-823-0.00



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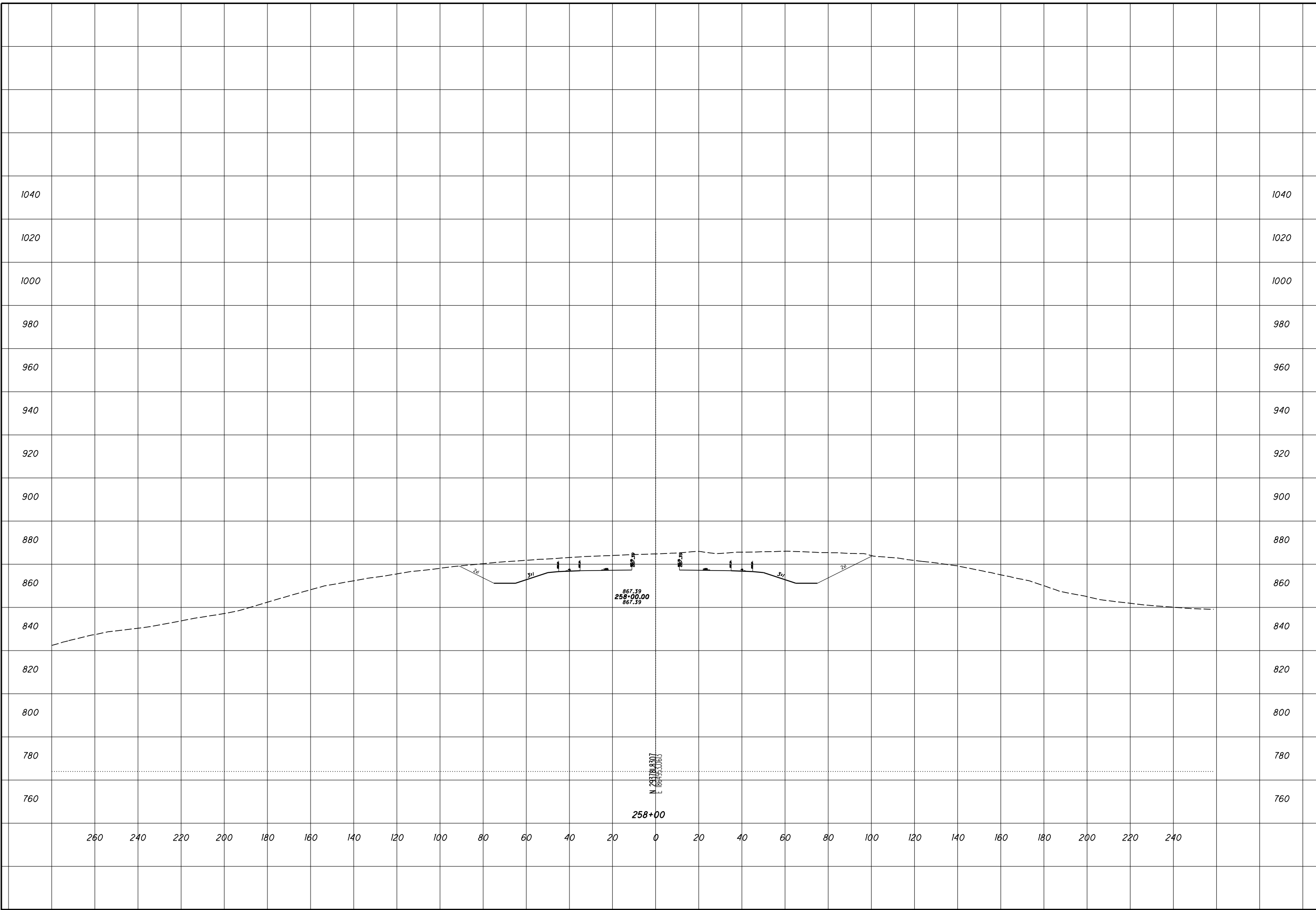
ROCK CUT SLOPE DESIGN - ROCK CUT 5
STA 227+50

SCI-823-0.00



ROCK CUT SLOPE DESIGN - ROCK CUT 6
STA 258+00

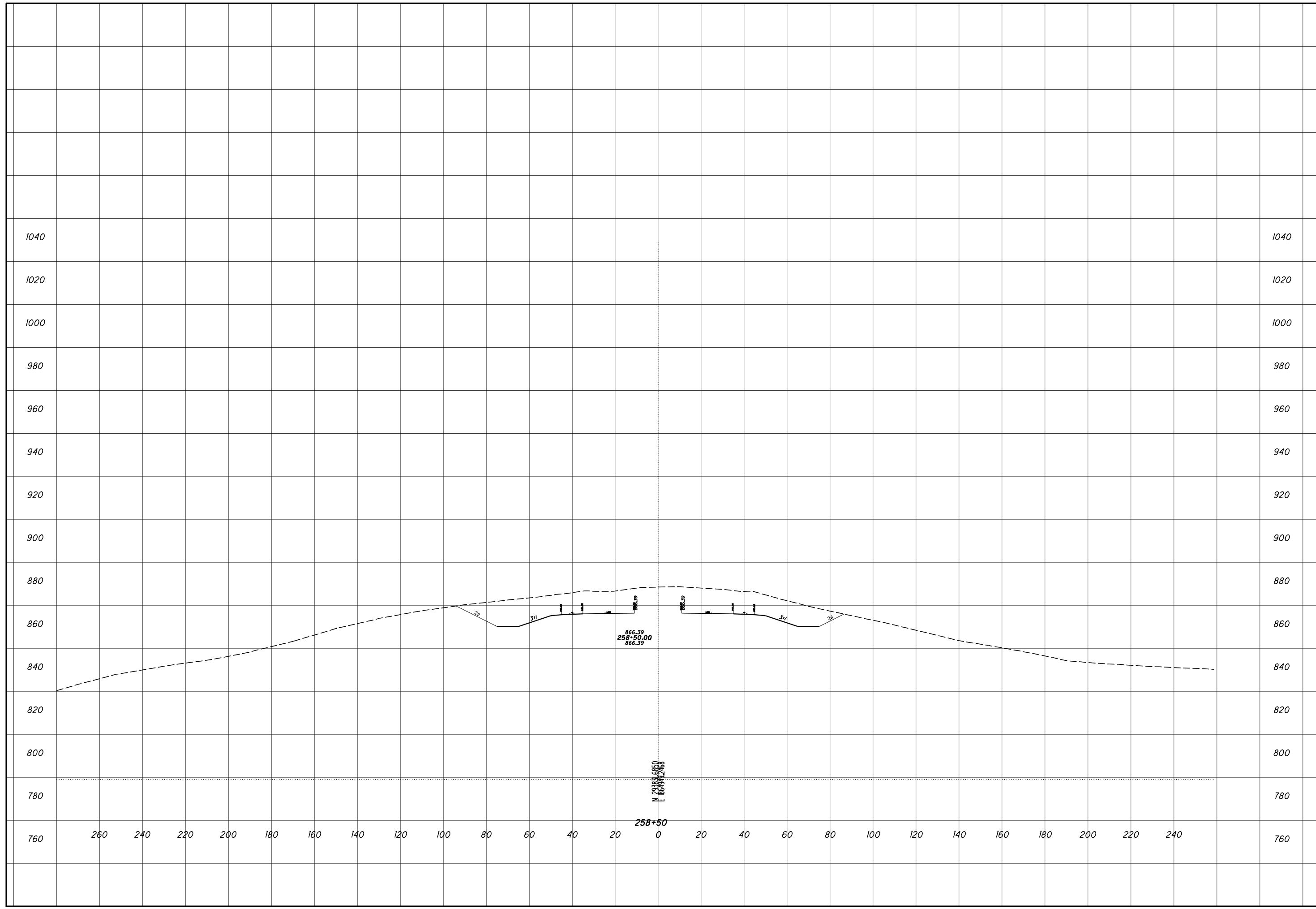
SCI-823-0.00



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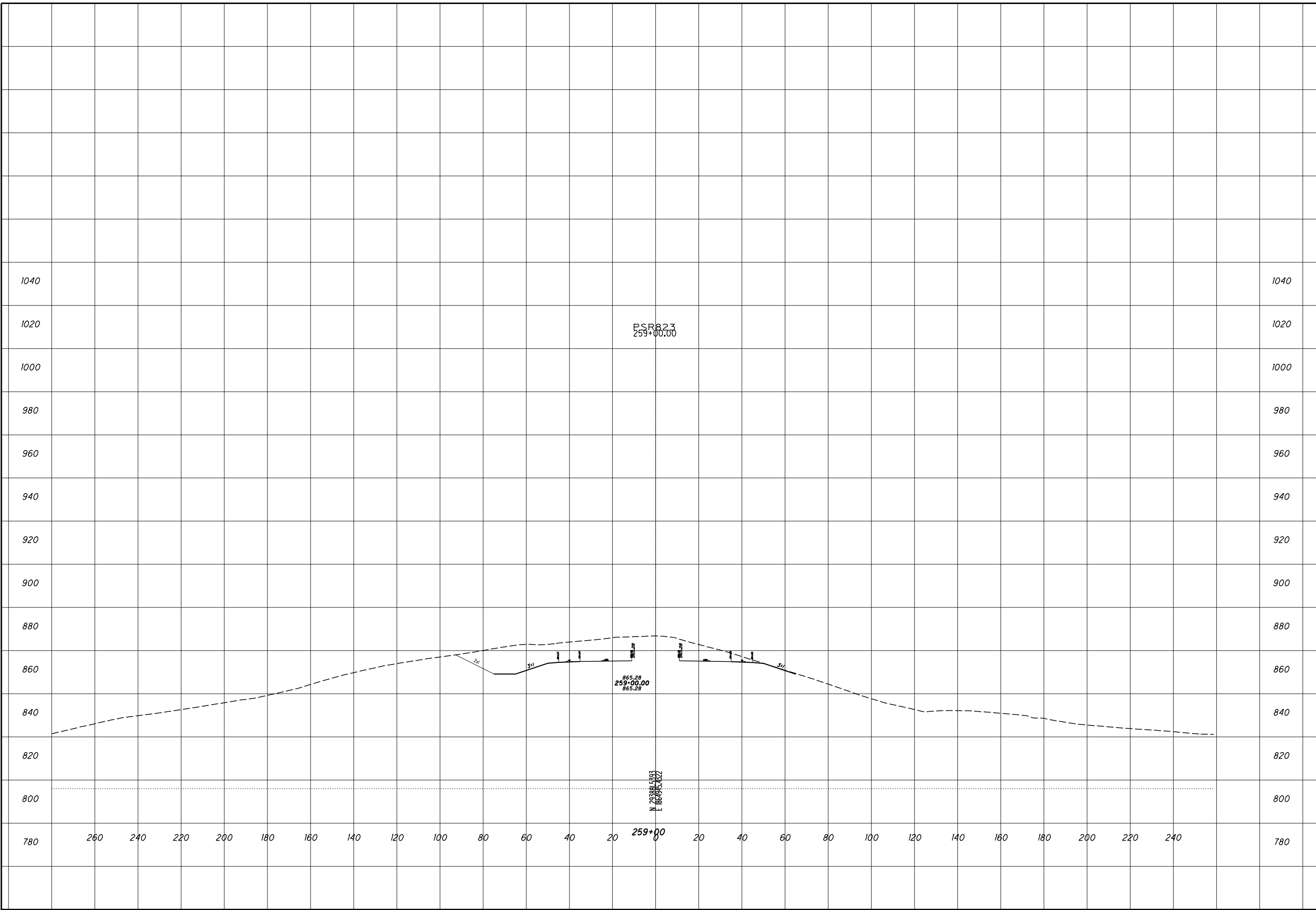
ROCK CUT SLOPE DESIGN - ROCK CUT 6
STA 258+50

SCI-823-0.00



ROCK CUT SLOPE DESIGN - ROCK CUT 6
STA 259+00

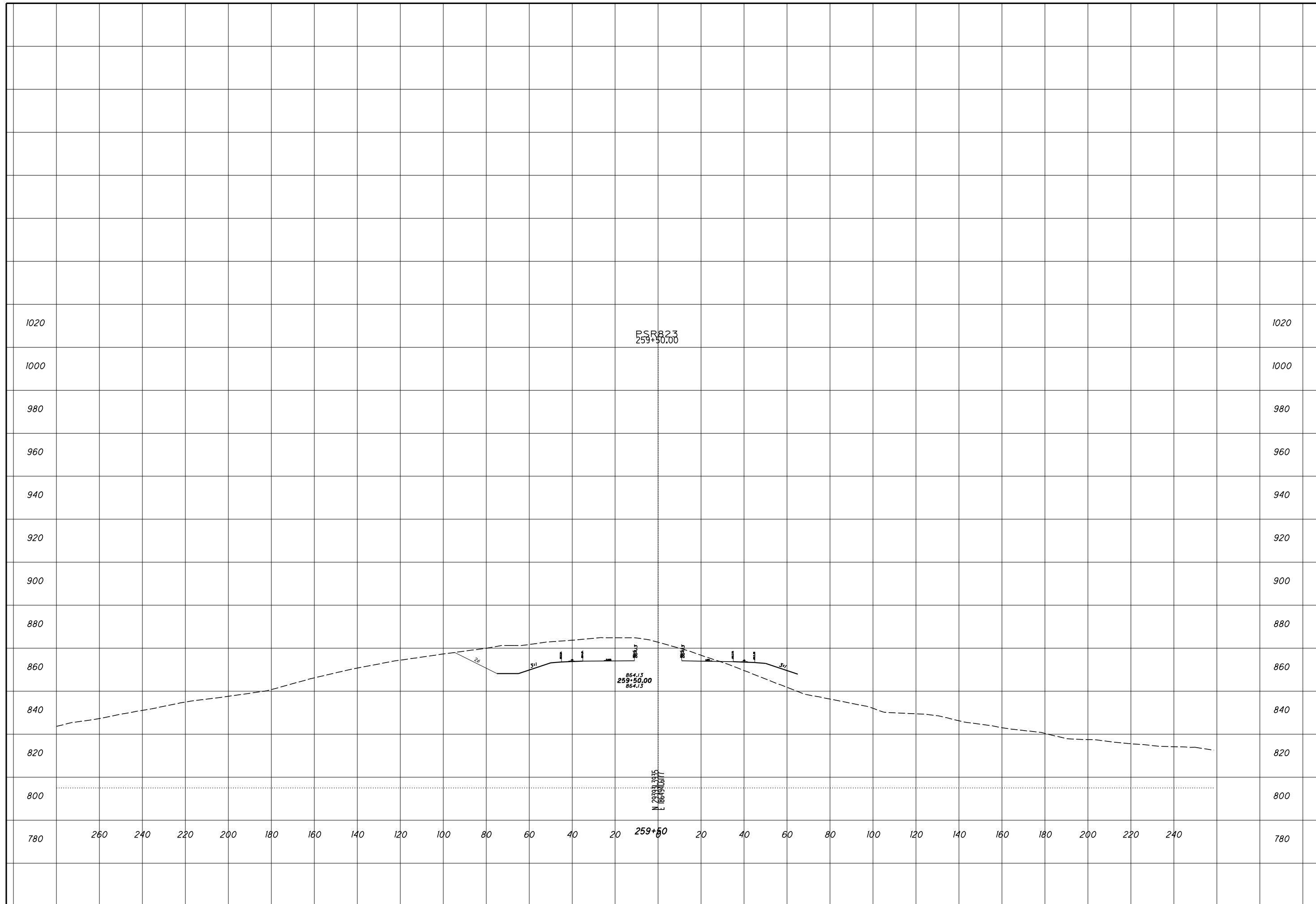
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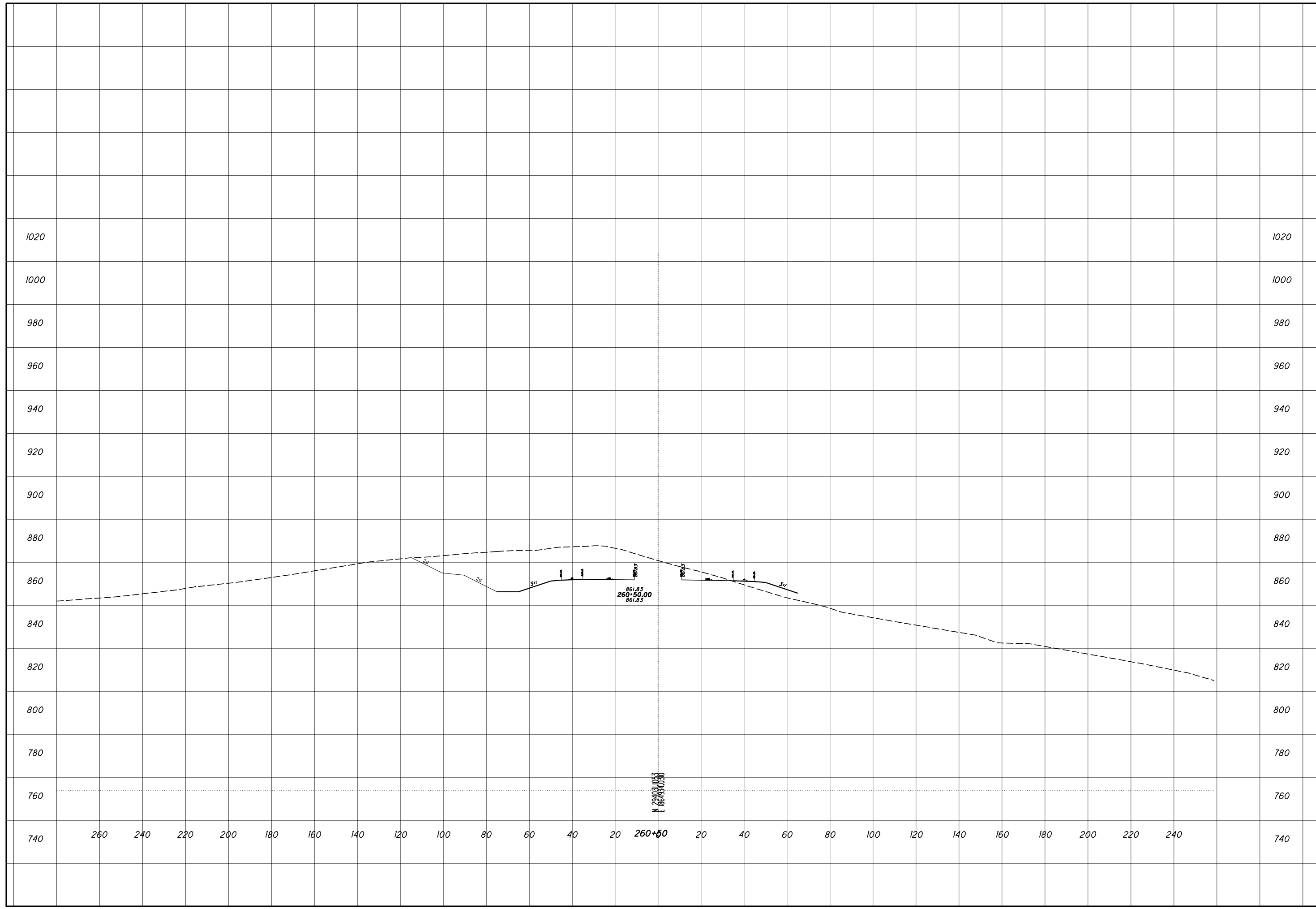
ROCK CUT SLOPE DESIGN - ROCK CUT 6
STA 259+50

SCI-823-0.00



ROCK CUT SLOPE DESIGN - ROCK CUT 6
STA 260+50

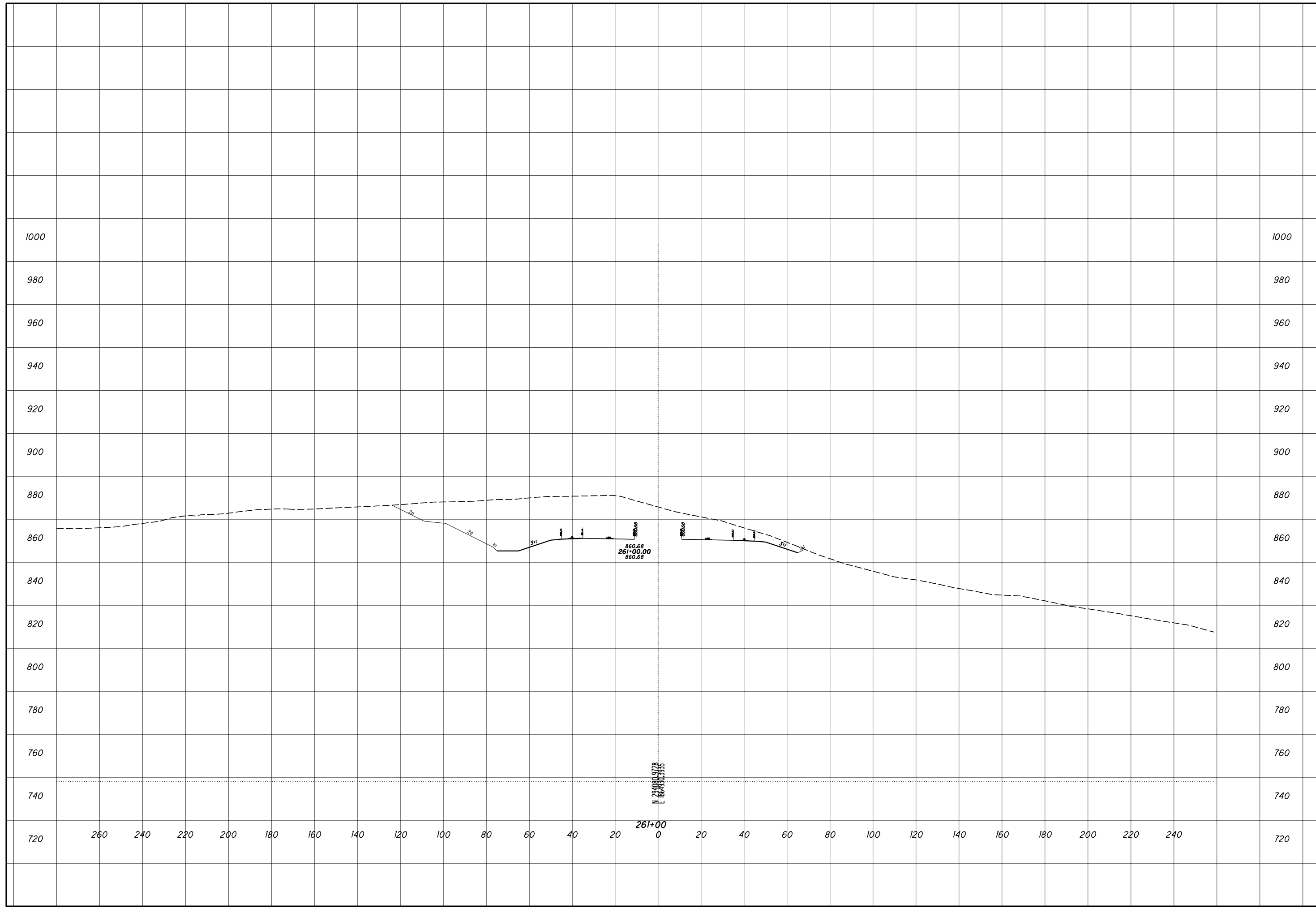
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CHECKED

**ROCK CUT SLOPE DESIGN - ROCK CUT 6
STA 261+00**

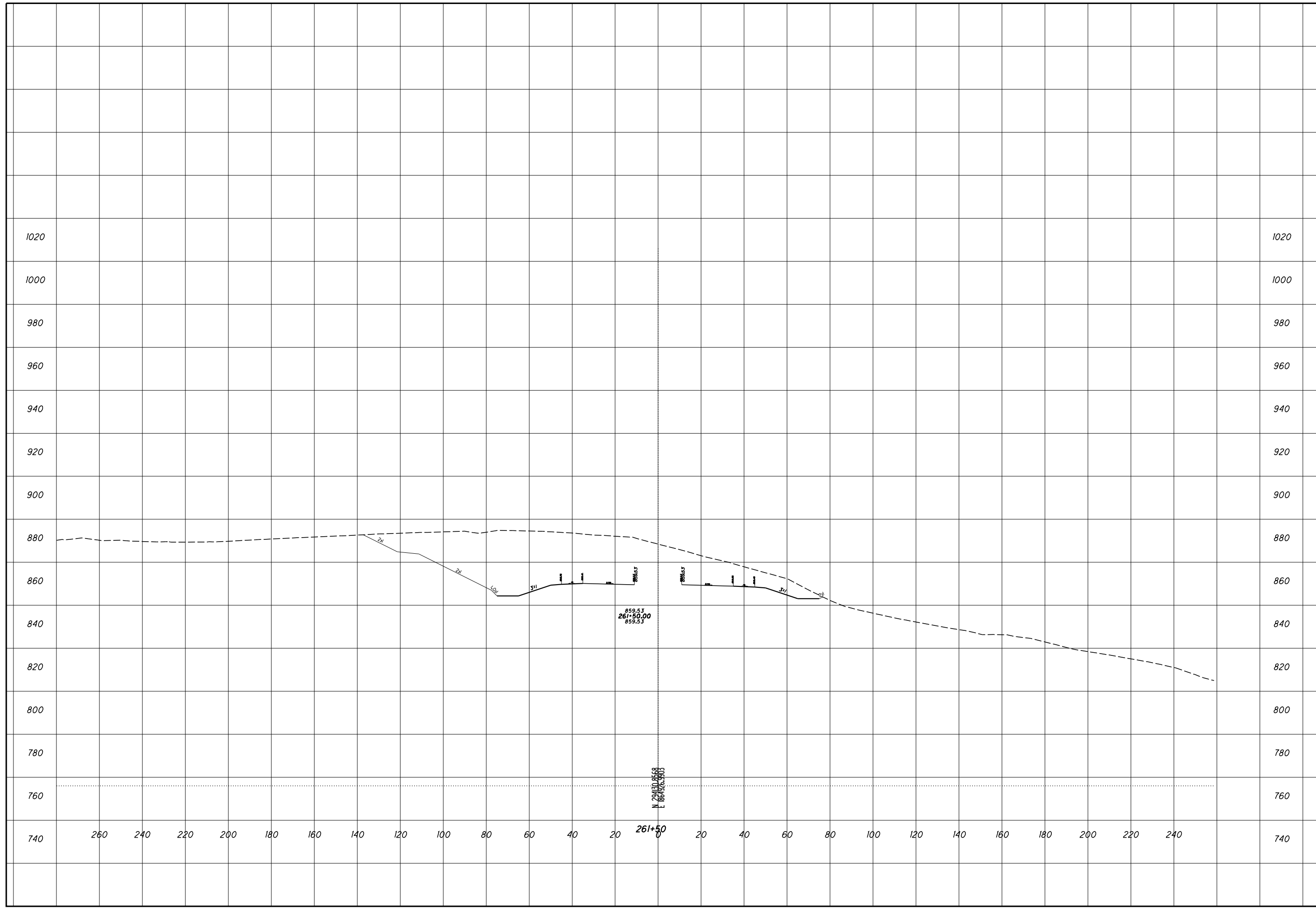
SCI-823-0.00



CHECKED

**ROCK CUT SLOPE DESIGN - ROCK CUT 6
STA 261+50**

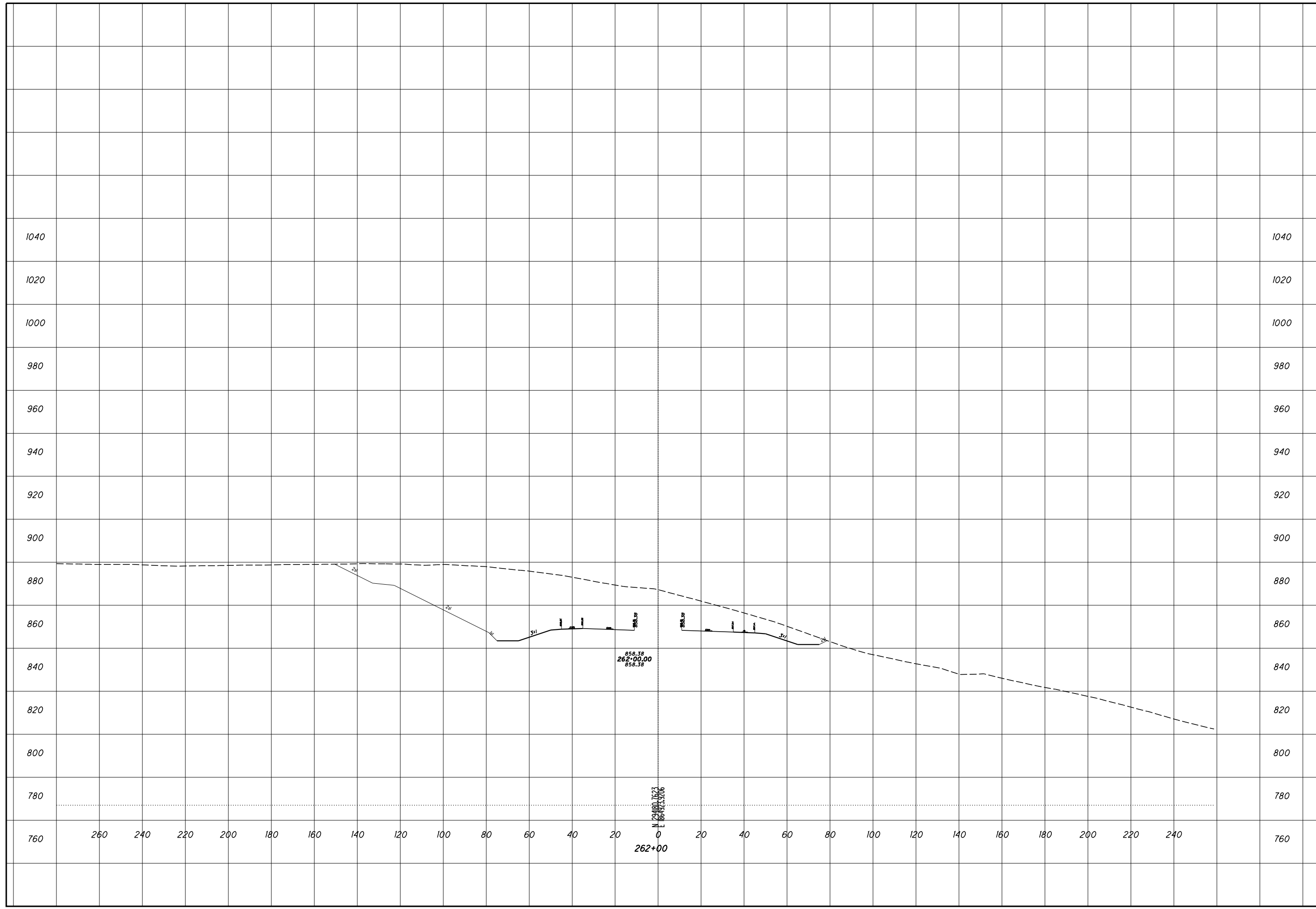
SCI-823-0.00



CHECKED

ROCK CUT SLOPE DESIGN - ROCK CUT 6
STA 262+00

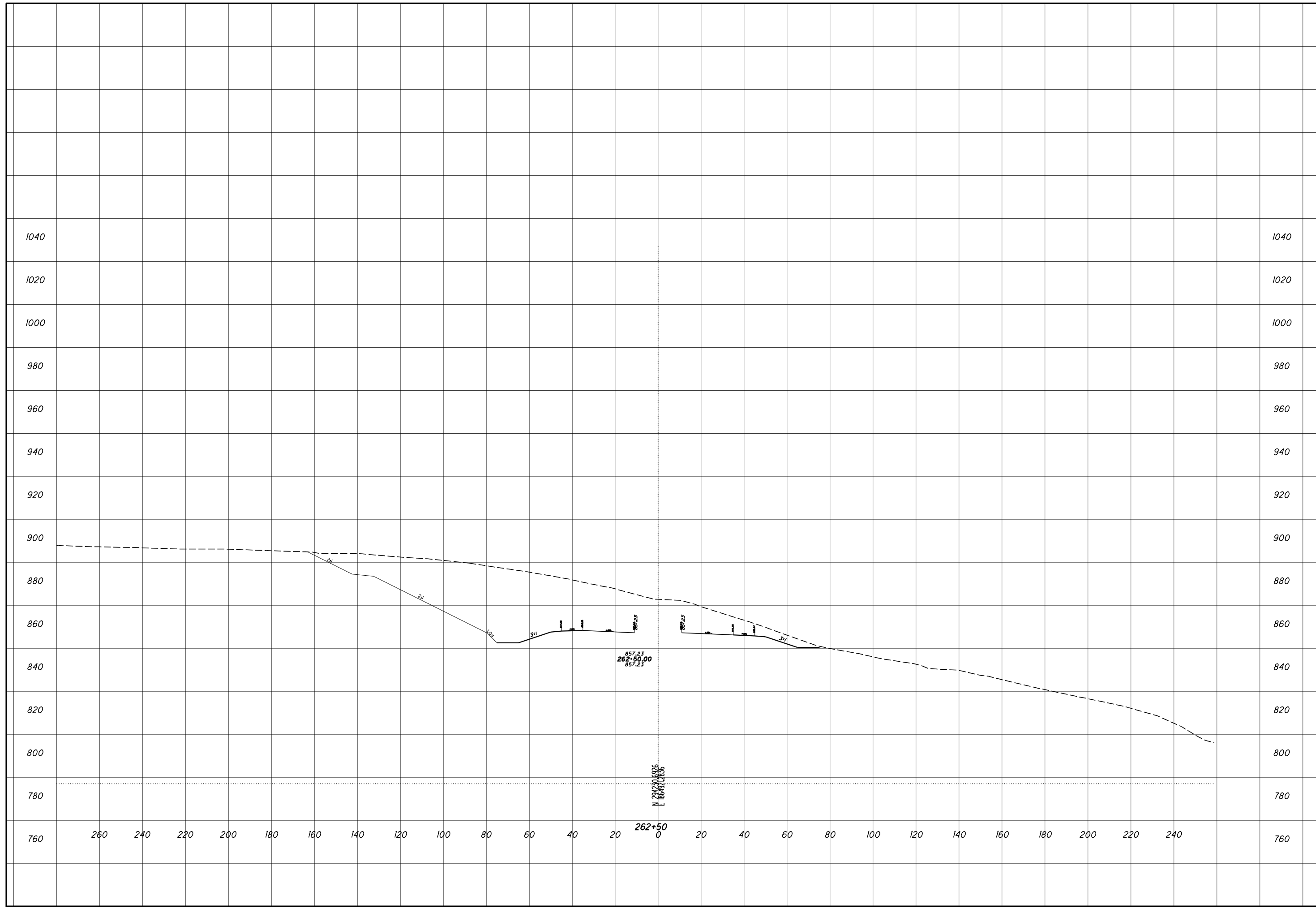
SCI-823-0.00



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ROCK CUT SLOPE DESIGN - ROCK CUT 6
STA 262+50

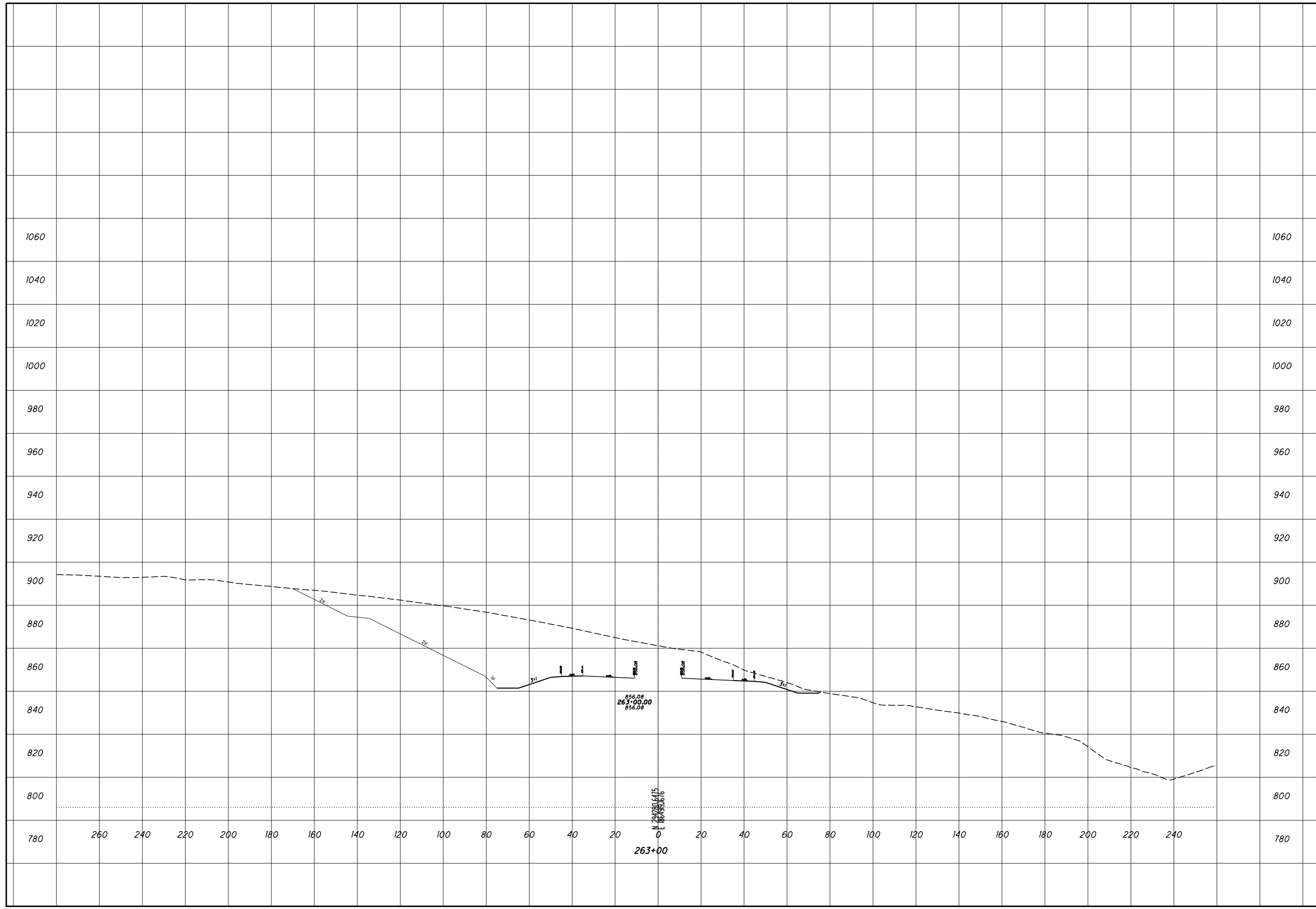
SCI-823-0.00



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ROCK CUT SLOPE DESIGN - ROCK CUT 6
STA 263+00

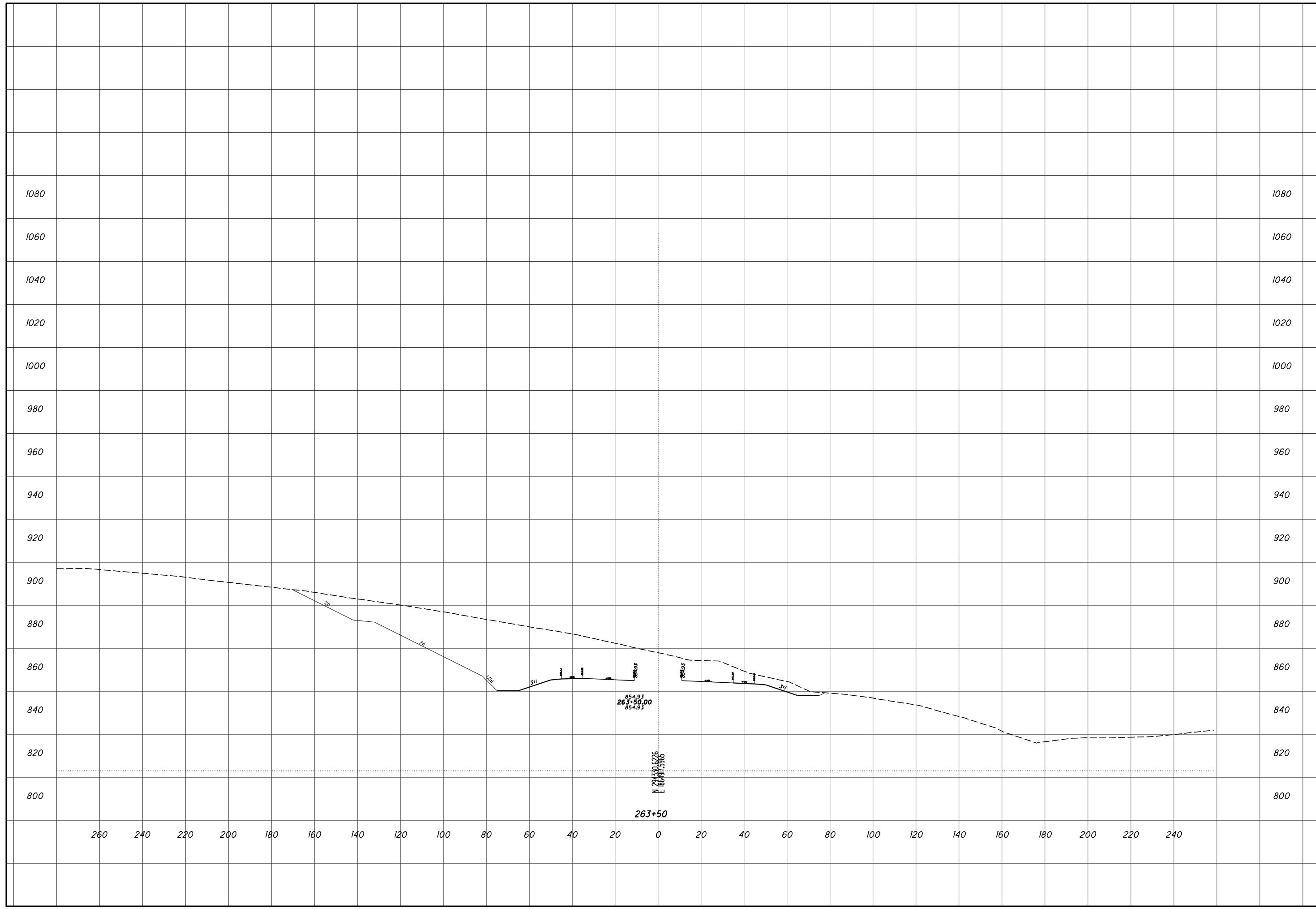
SCI-823-0.00



CHECKED

**ROCK CUT SLOPE DESIGN - ROCK CUT 6
STA 263+50**

SCI-823-0.00



CHECKED

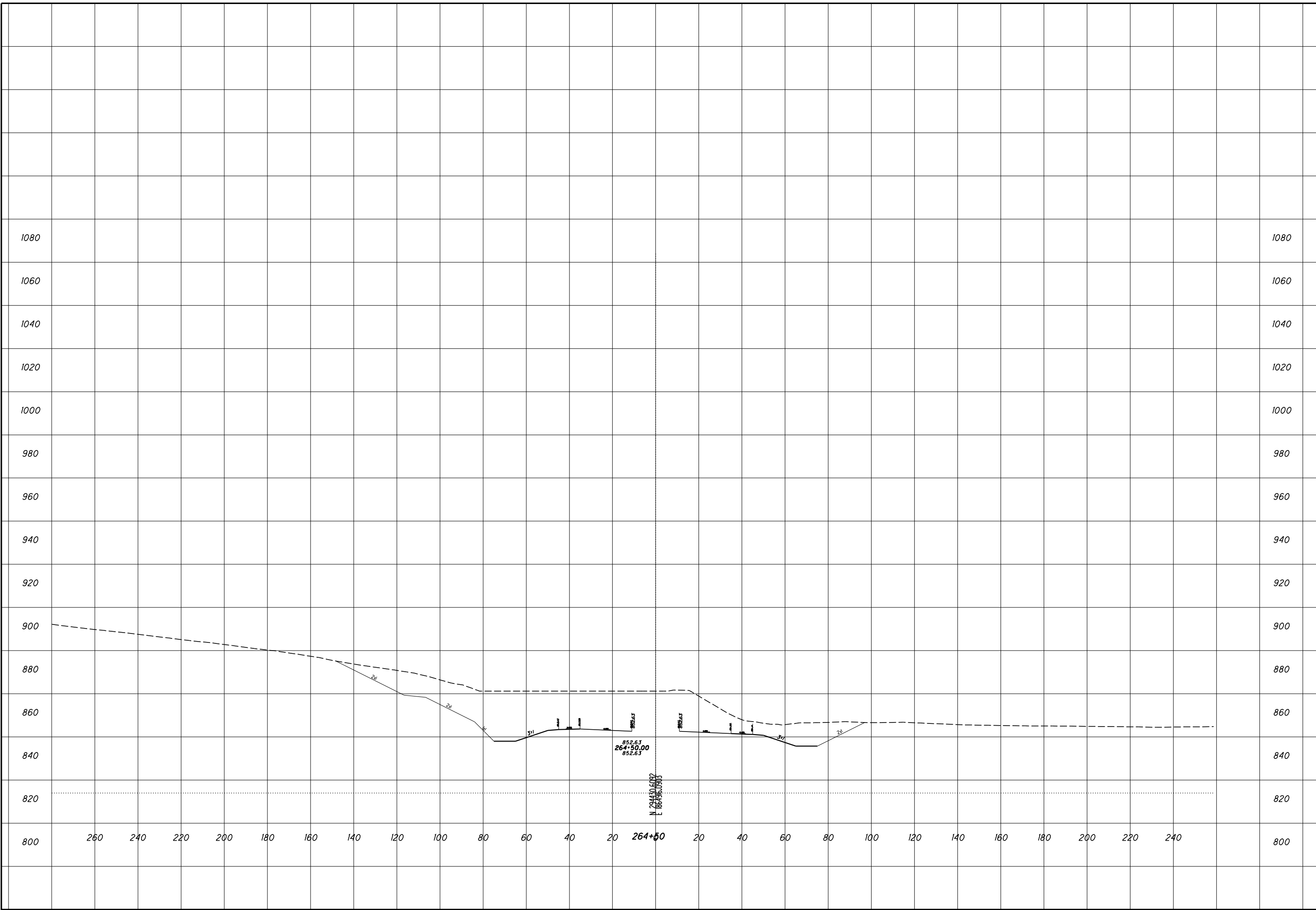
**ROCK CUT SLOPE DESIGN - ROCK CUT 6
STA 264+00**

SCI-823-0.00



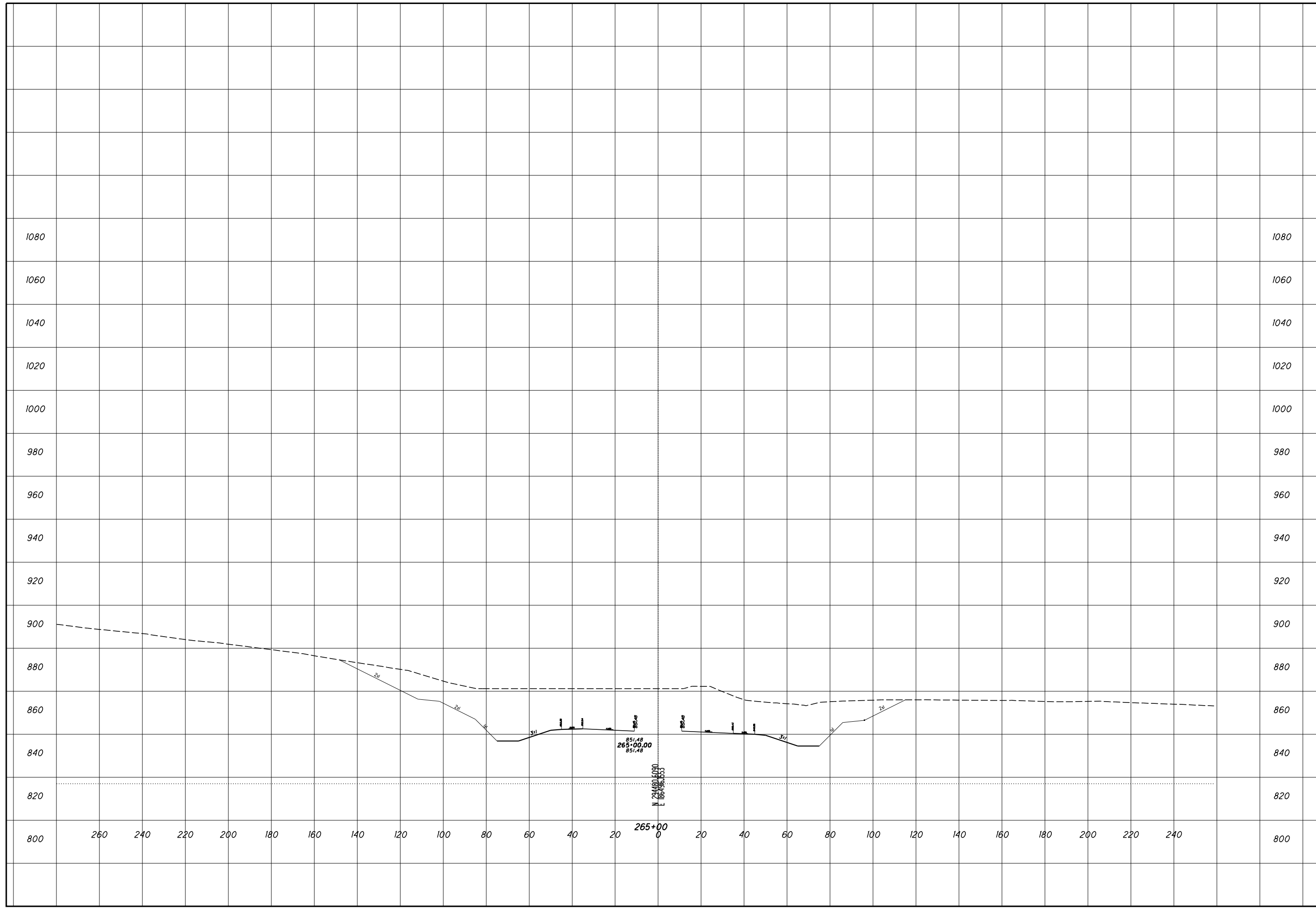
**ROCK CUT SLOPE DESIGN - ROCK CUT 6
STA 264+50**

SCI-823-0.00



ROCK CUT SLOPE DESIGN - ROCK CUT 6
STA 265+00

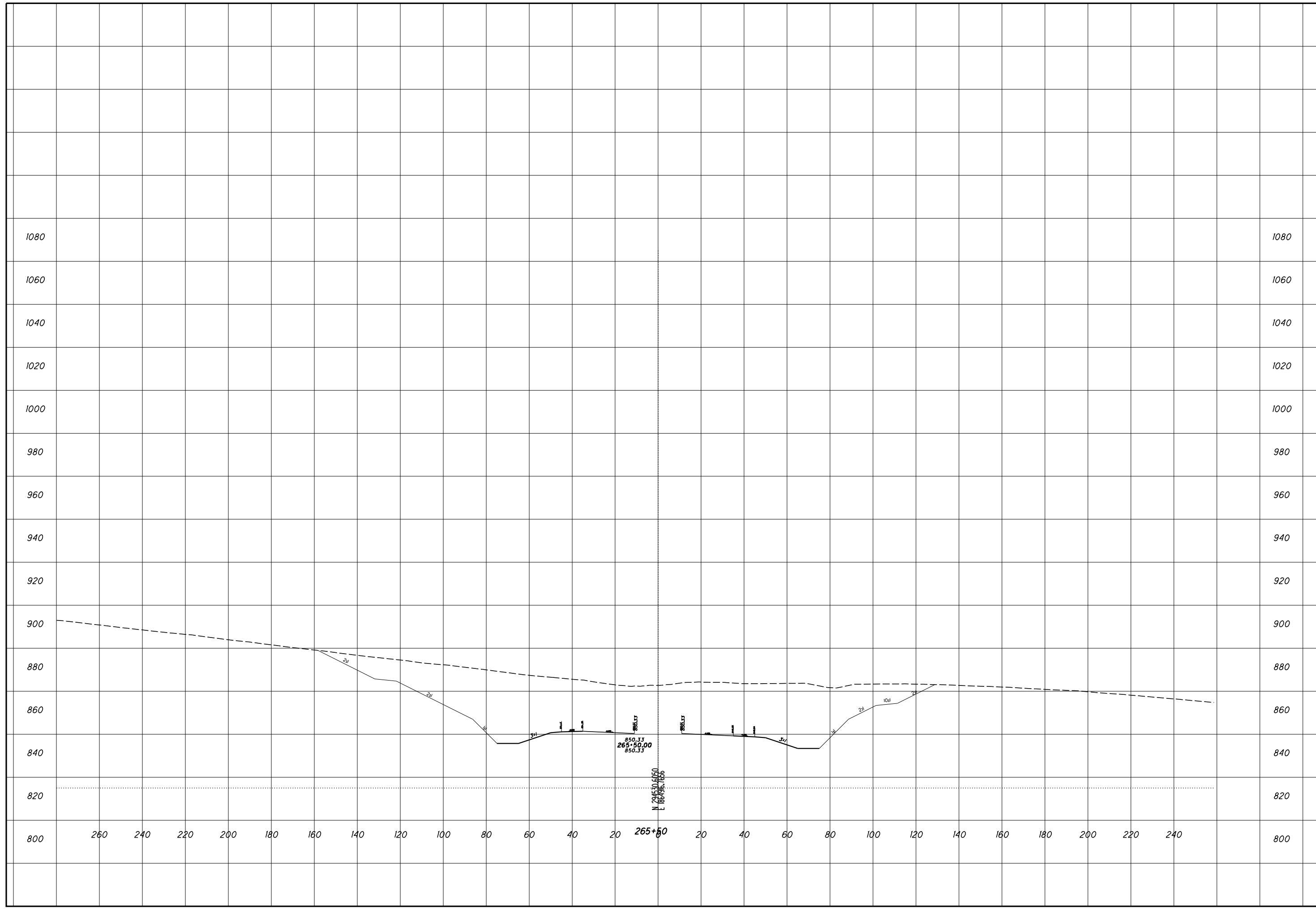
SCI-823-0.00



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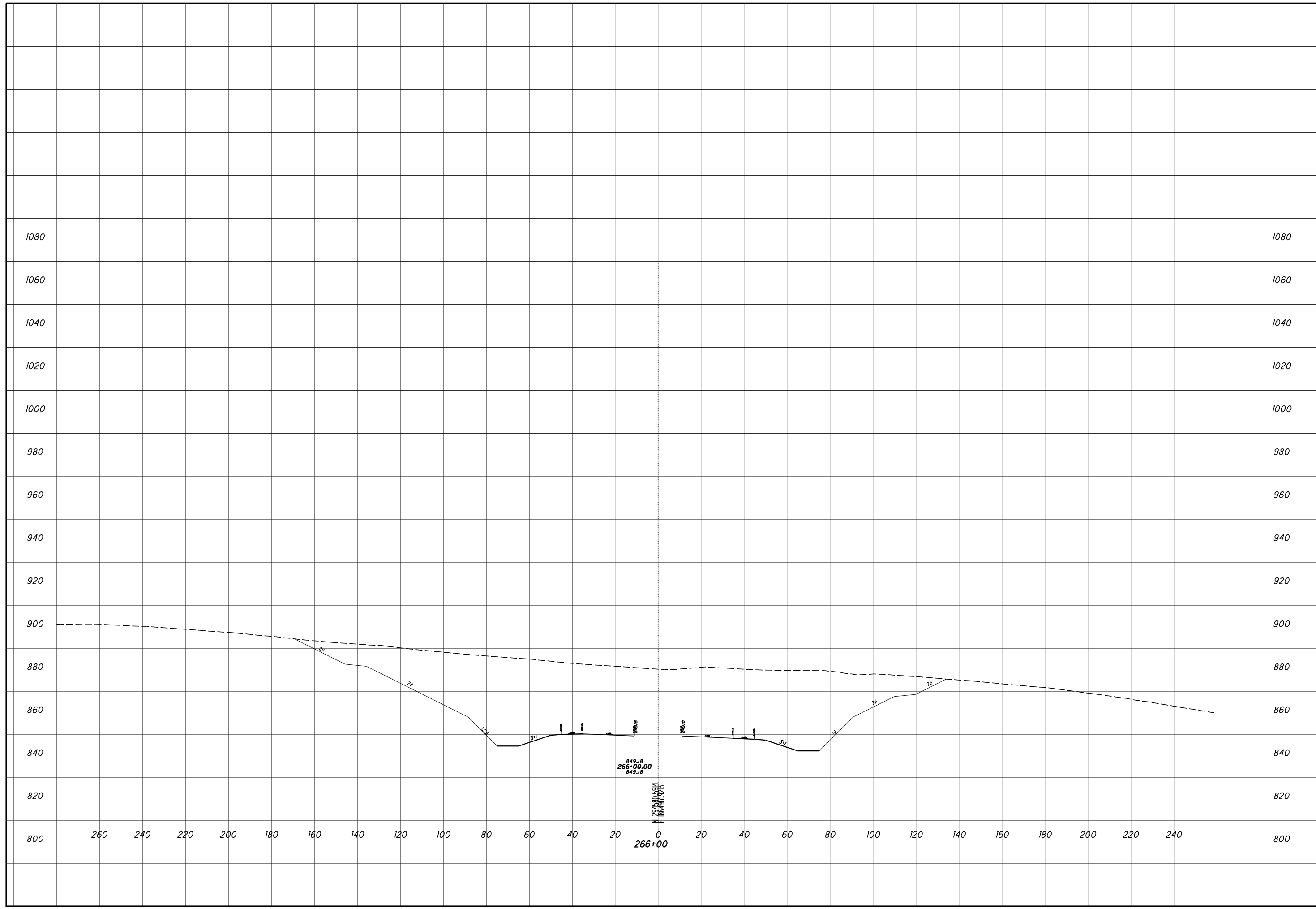
ROCK CUT SLOPE DESIGN - ROCK CUT 6
STA 265+50

SCI-823-0.00



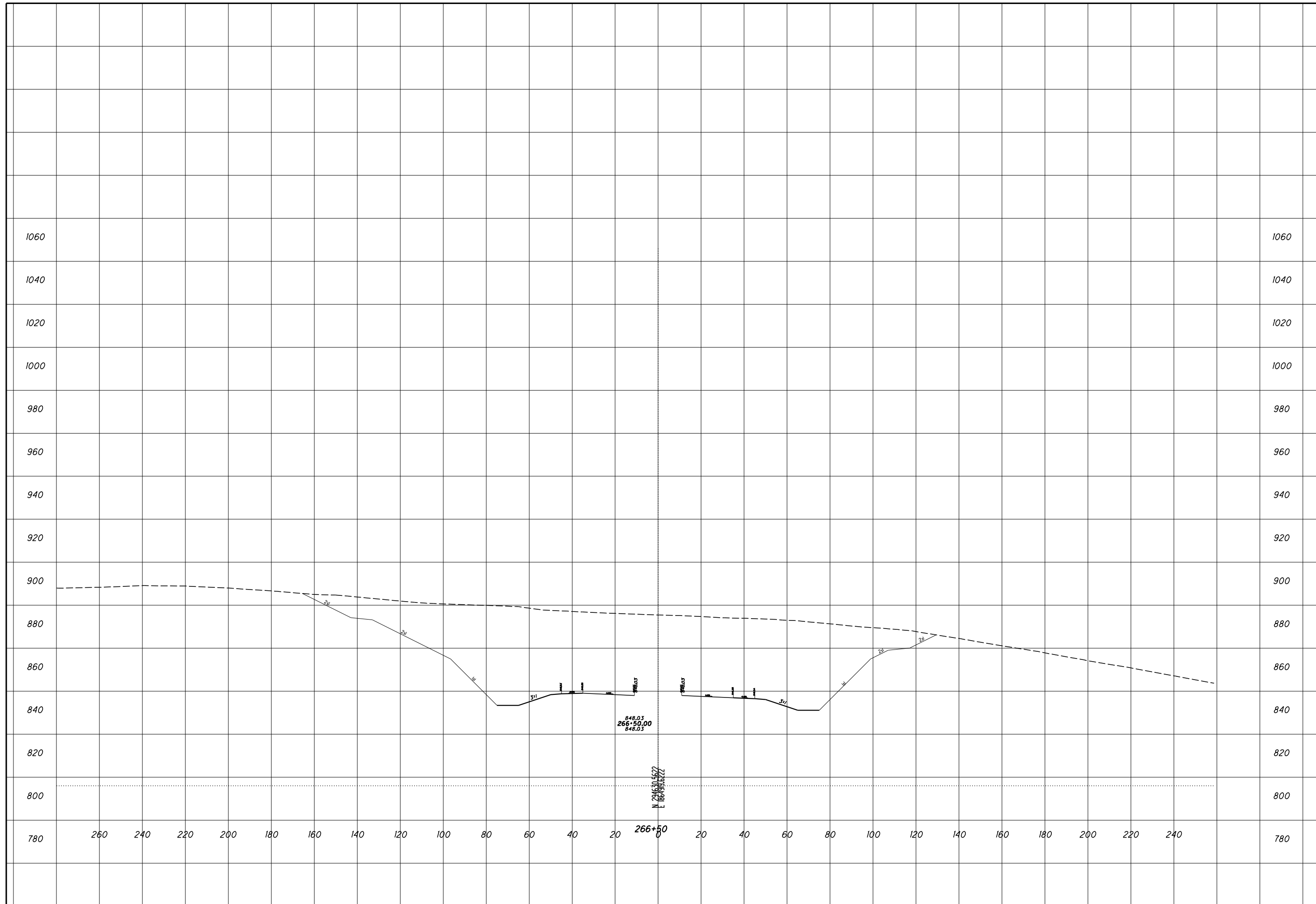
ROCK CUT SLOPE DESIGN - ROCK CUT 6
STA 266+00

SCI-823-0.00



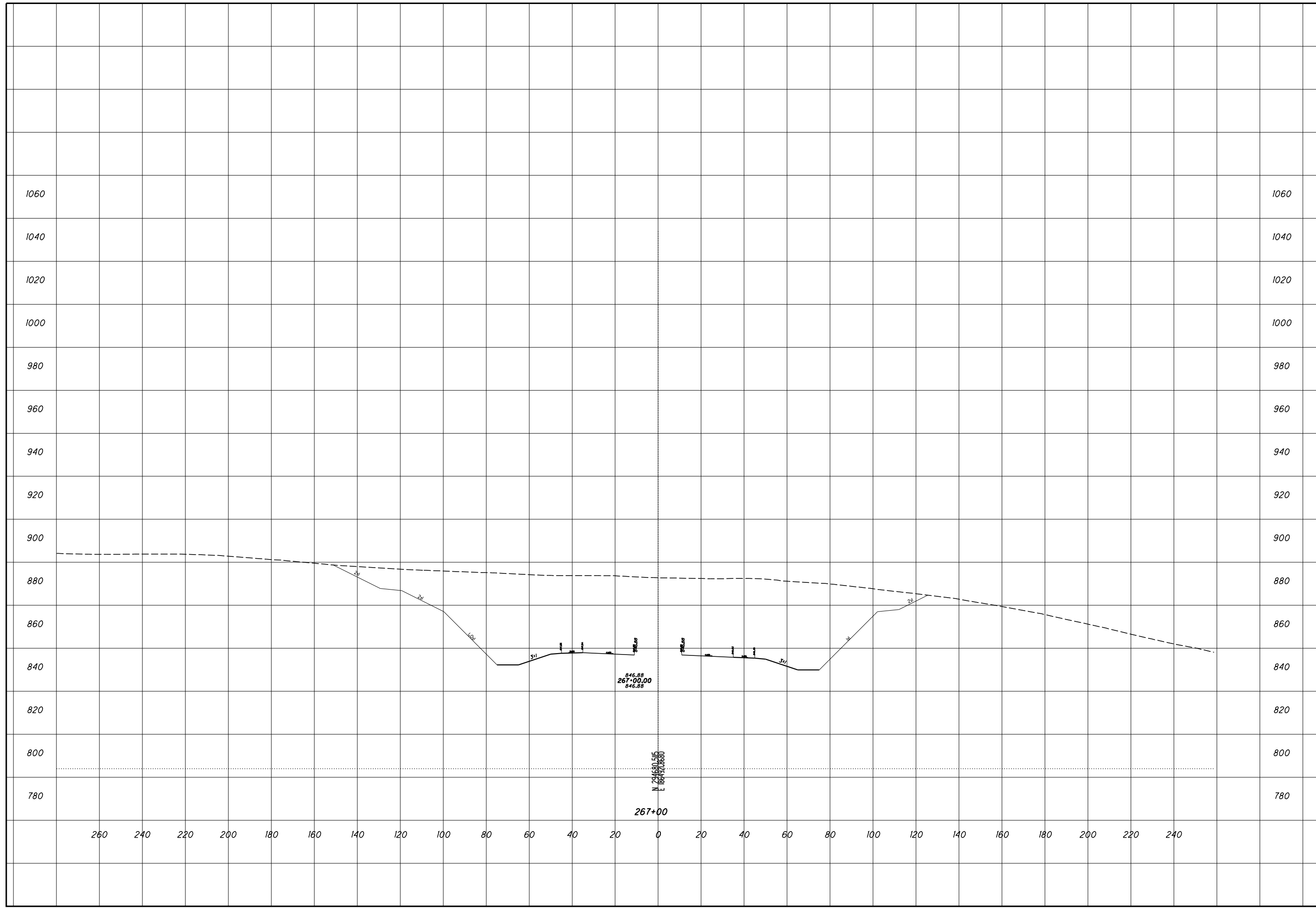
**ROCK CUT SLOPE DESIGN - ROCK CUT 6
STA 266+50**

SCI-823-0.00



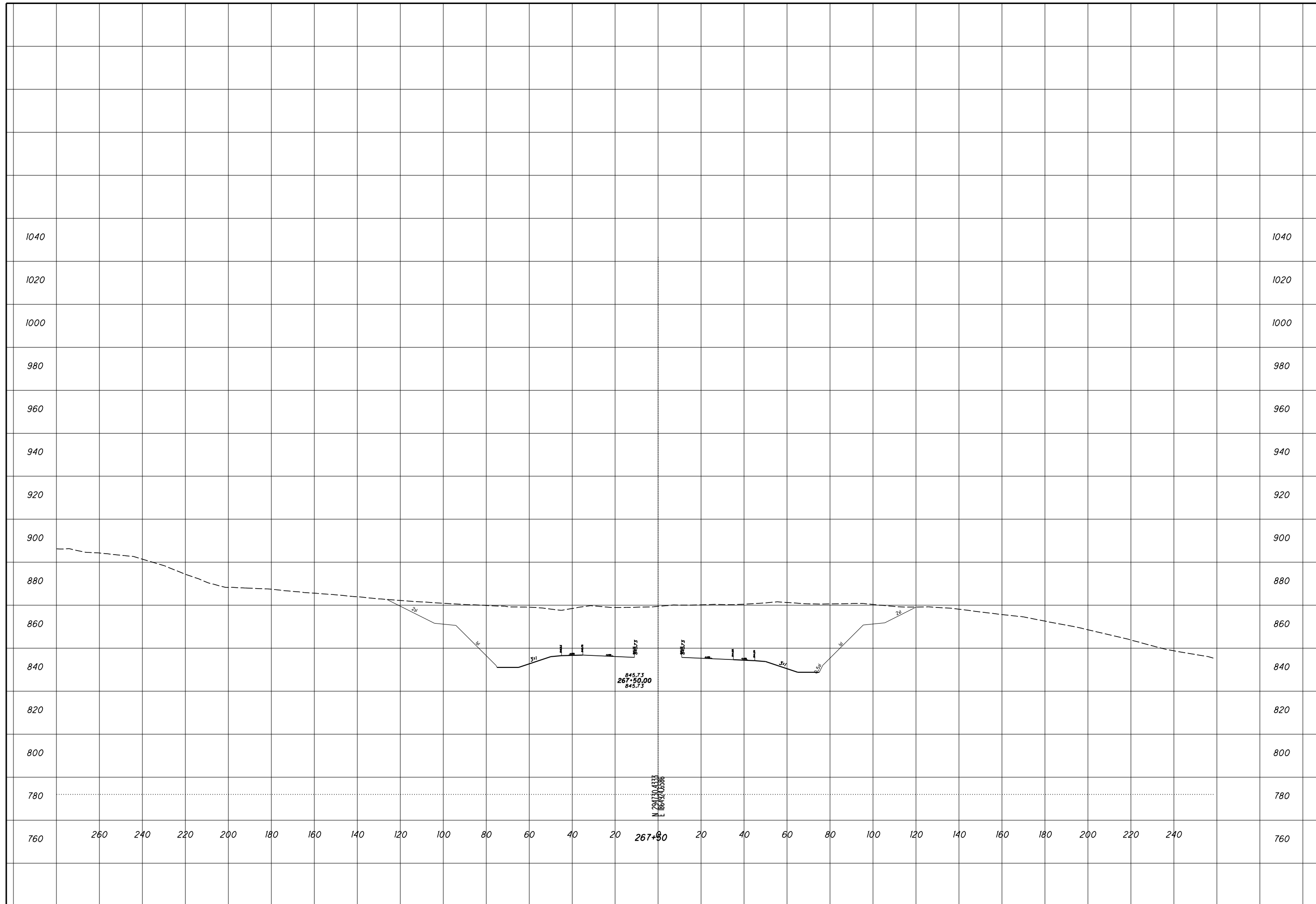
ROCK CUT SLOPE DESIGN - ROCK CUT 6
STA 267+00

SCI-823-0.00



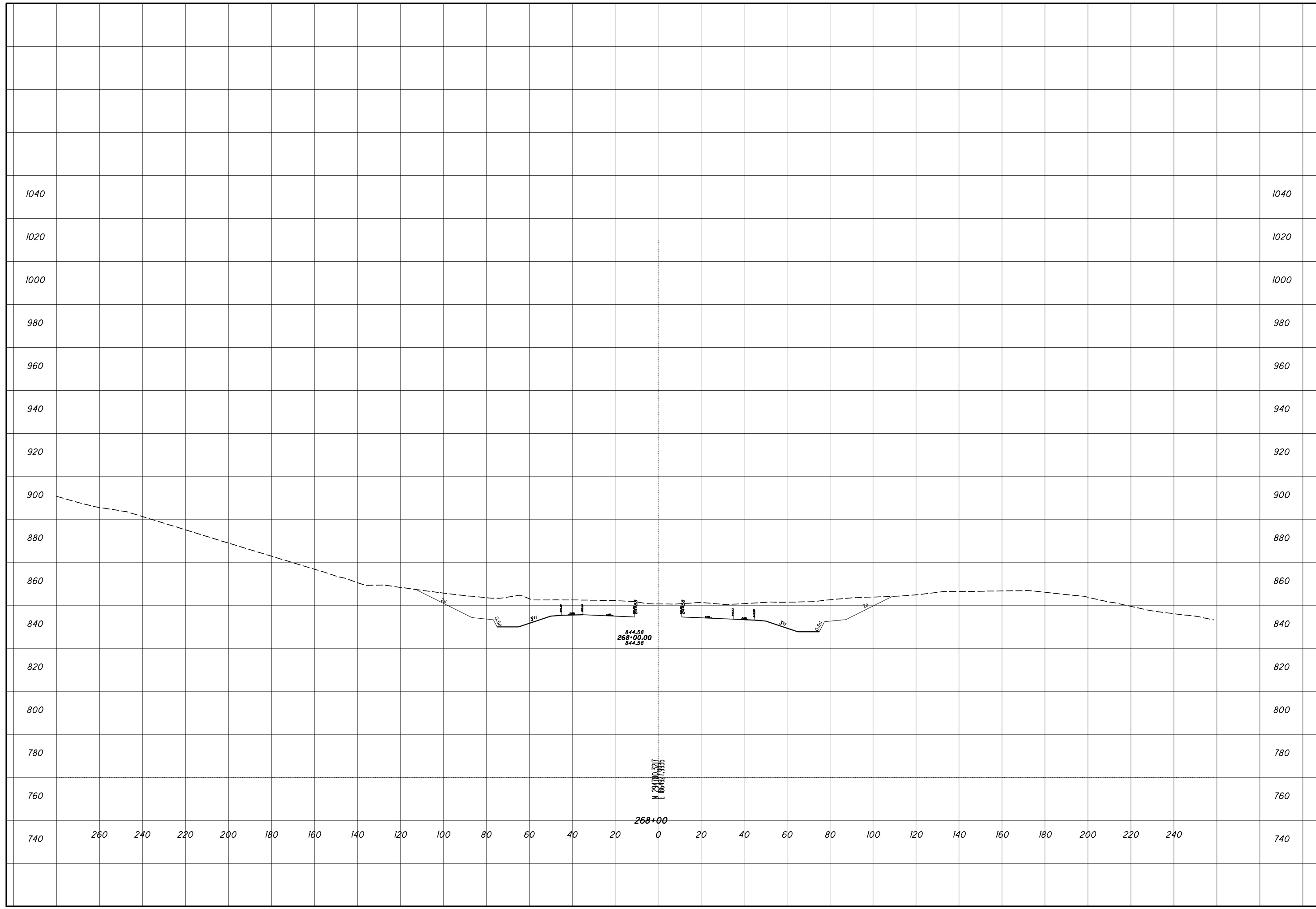
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STA 267+50**

SCI-823-0.00



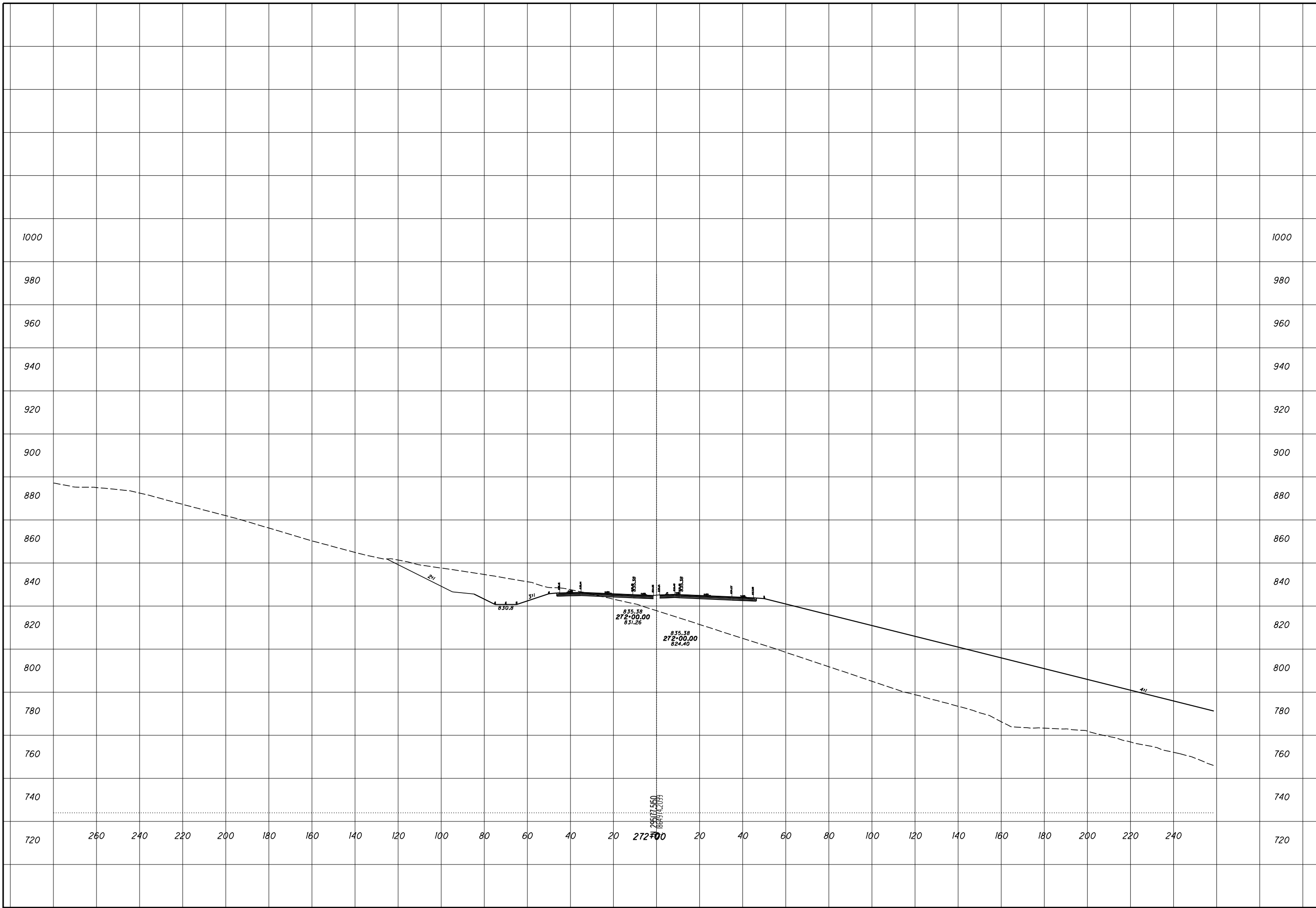
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STA 268+00**

SCI-823-0.00



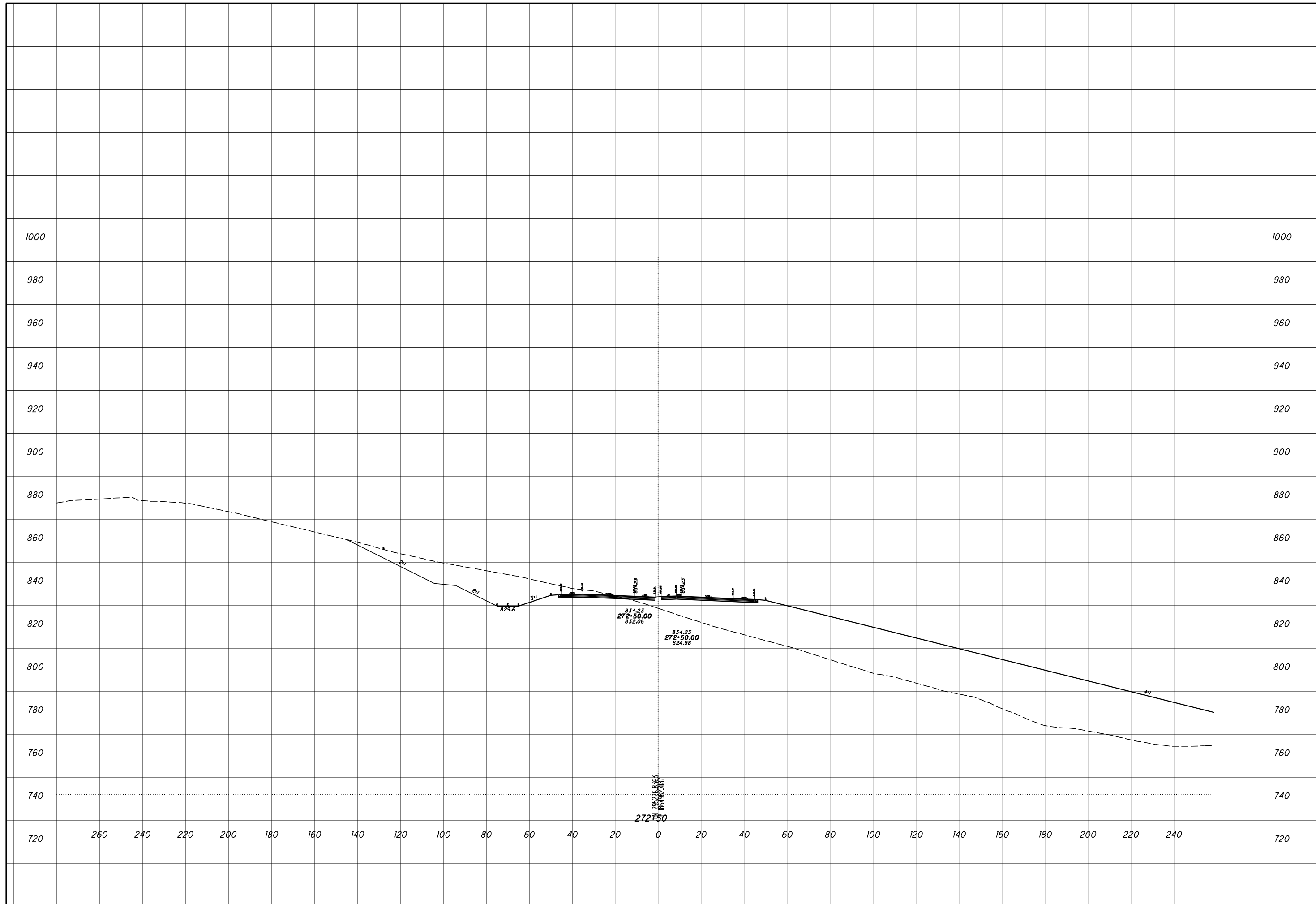
ROCK CUT SLOPE DESIGN - ROCK CUT 7
STA 272+00

SCI-823-0.00



ROCK CUT SLOPE DESIGN - ROCK CUT 7
STA 272+50

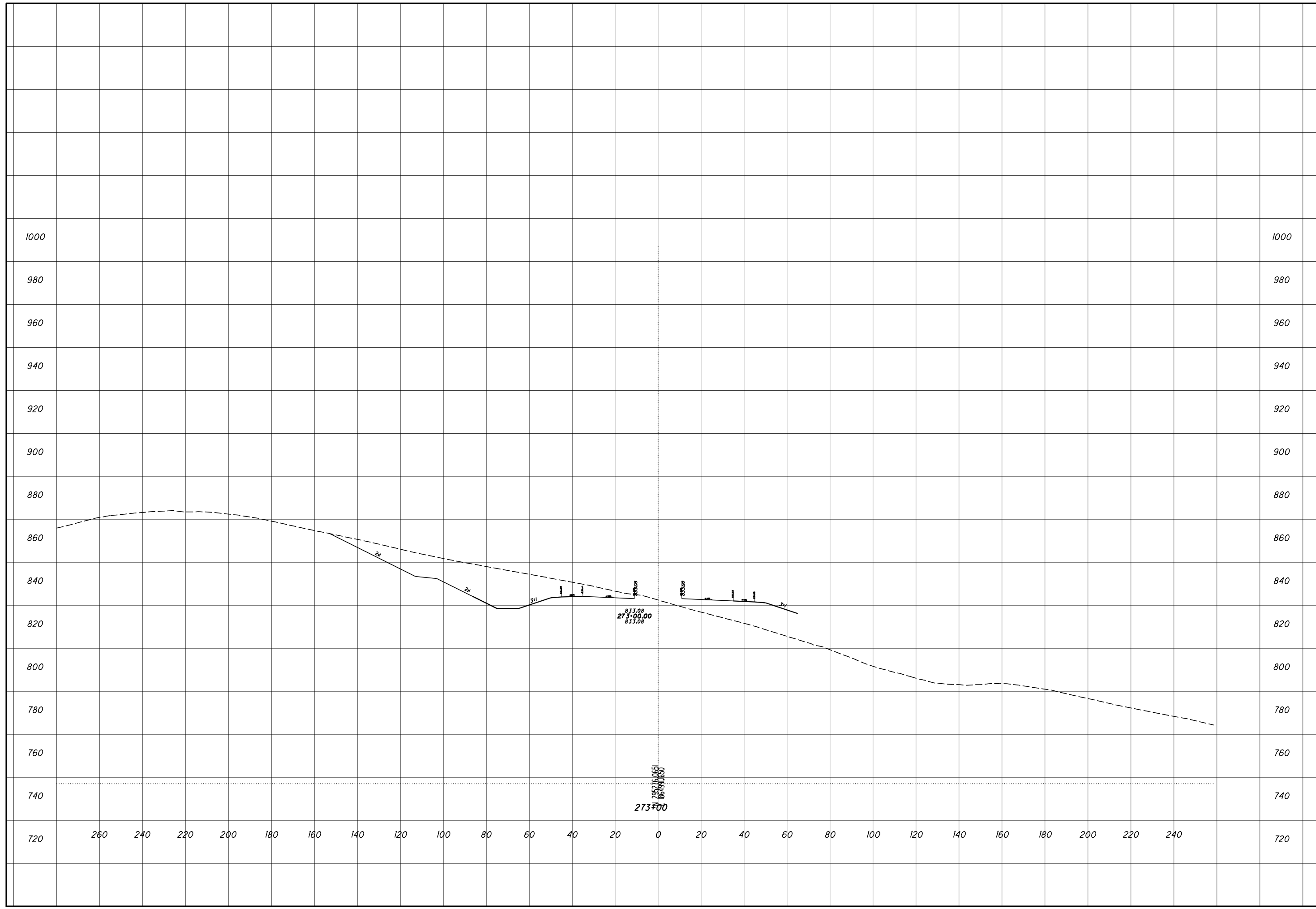
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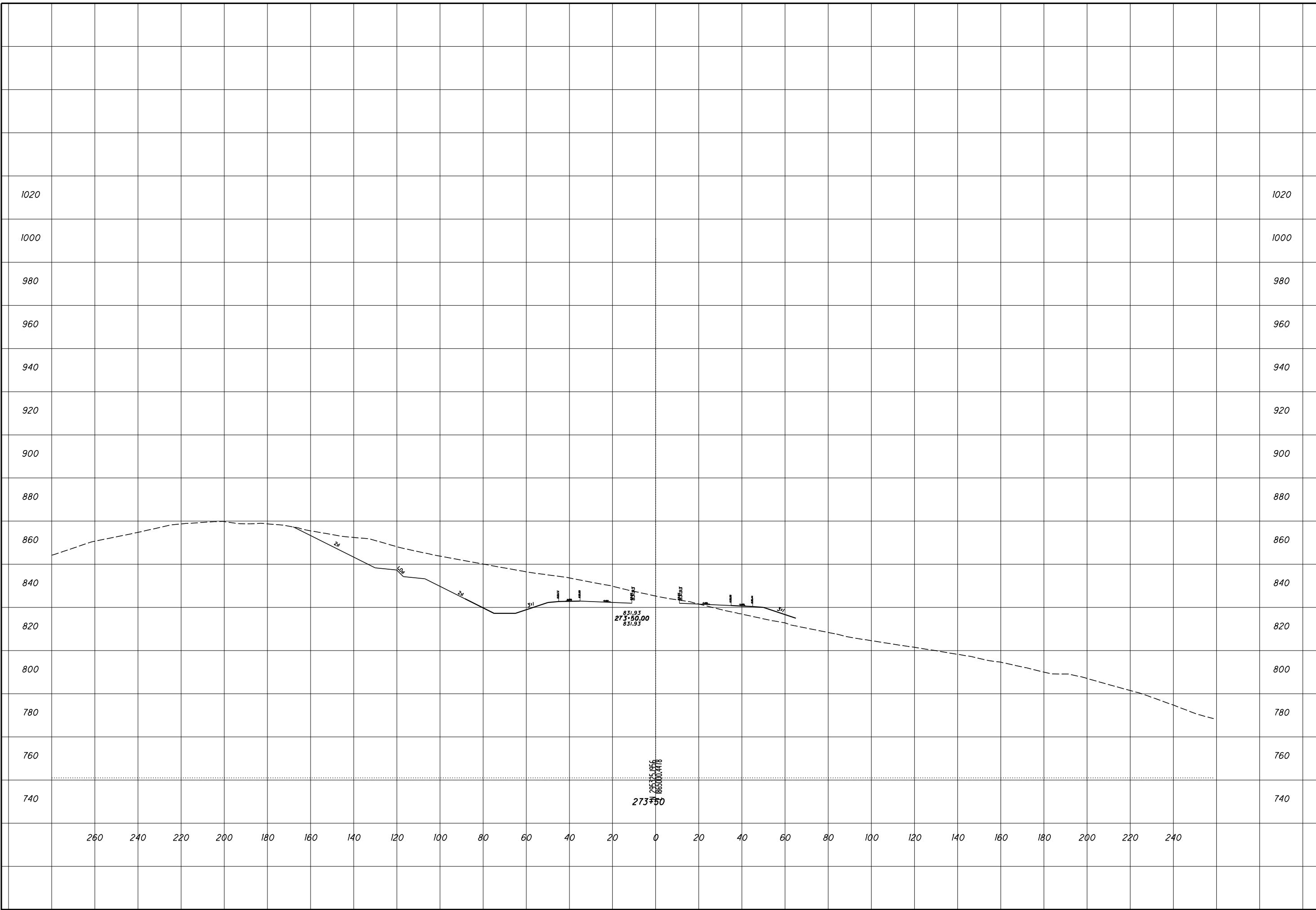
**ROCK CUT SLOPE DESIGN - ROCK CUT 7
STA 273+00**

SCI-823-0.00



ROCK CUT SLOPE DESIGN - ROCK CUT 7
STA 273+50

SCI-823-0.00



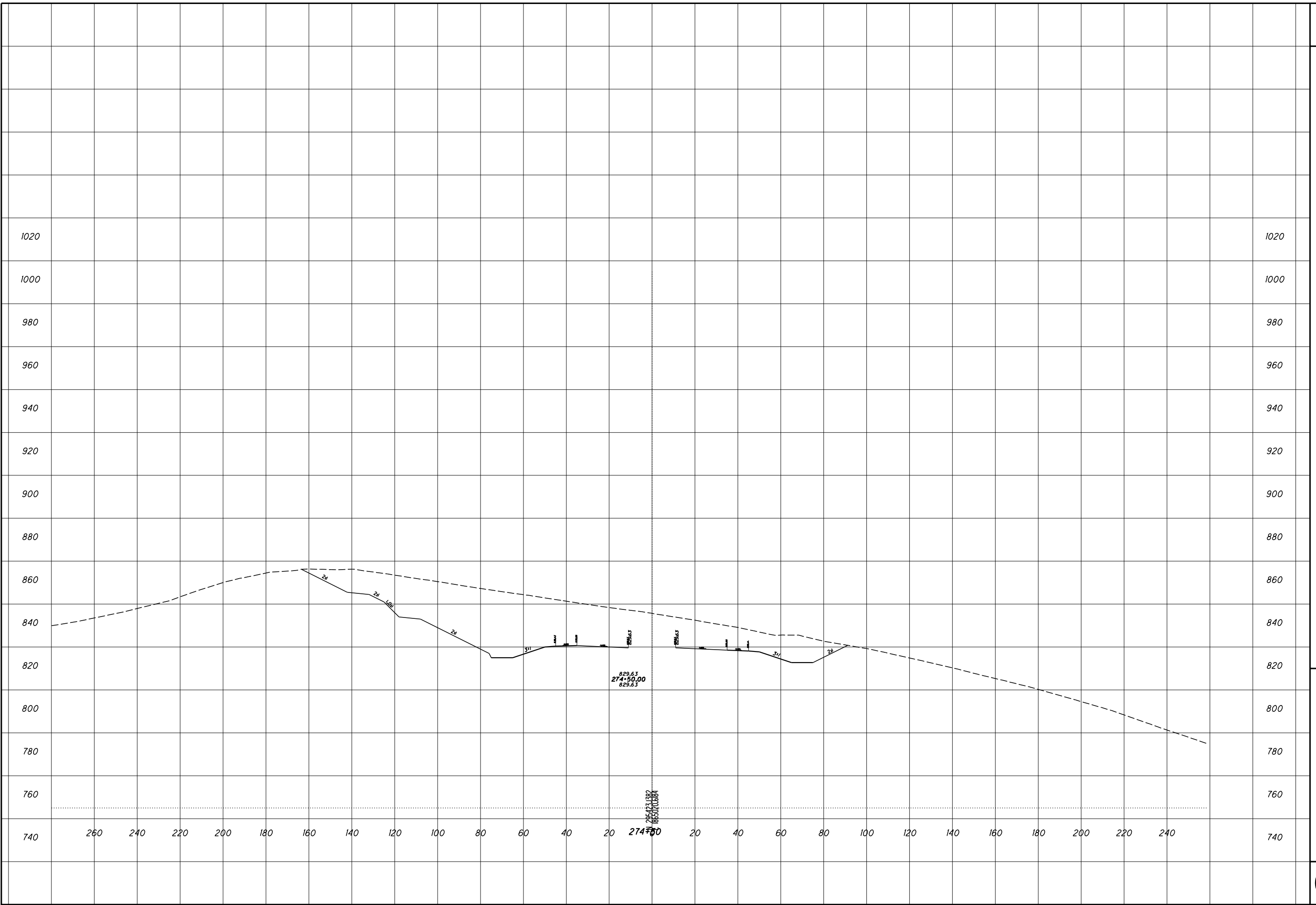
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STA 274+00

SCI-823-0.00



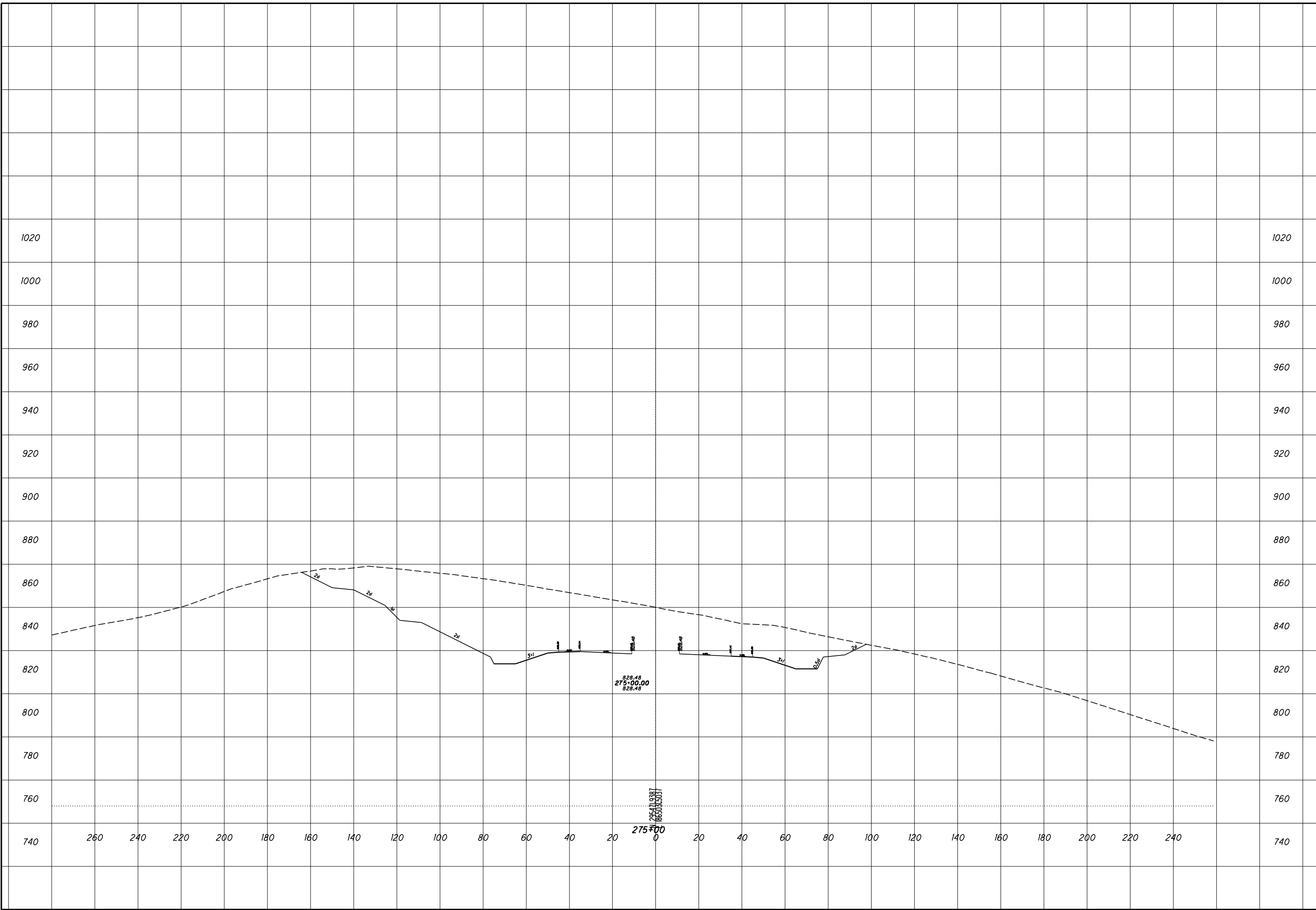
ROCK CUT SLOPE DESIGN - ROCK CUT 7
STA 274+50

SCI-823-0.00



ROCK CUT SLOPE DESIGN - ROCK CUT 7
STA 275+00

SCI-823-0.00



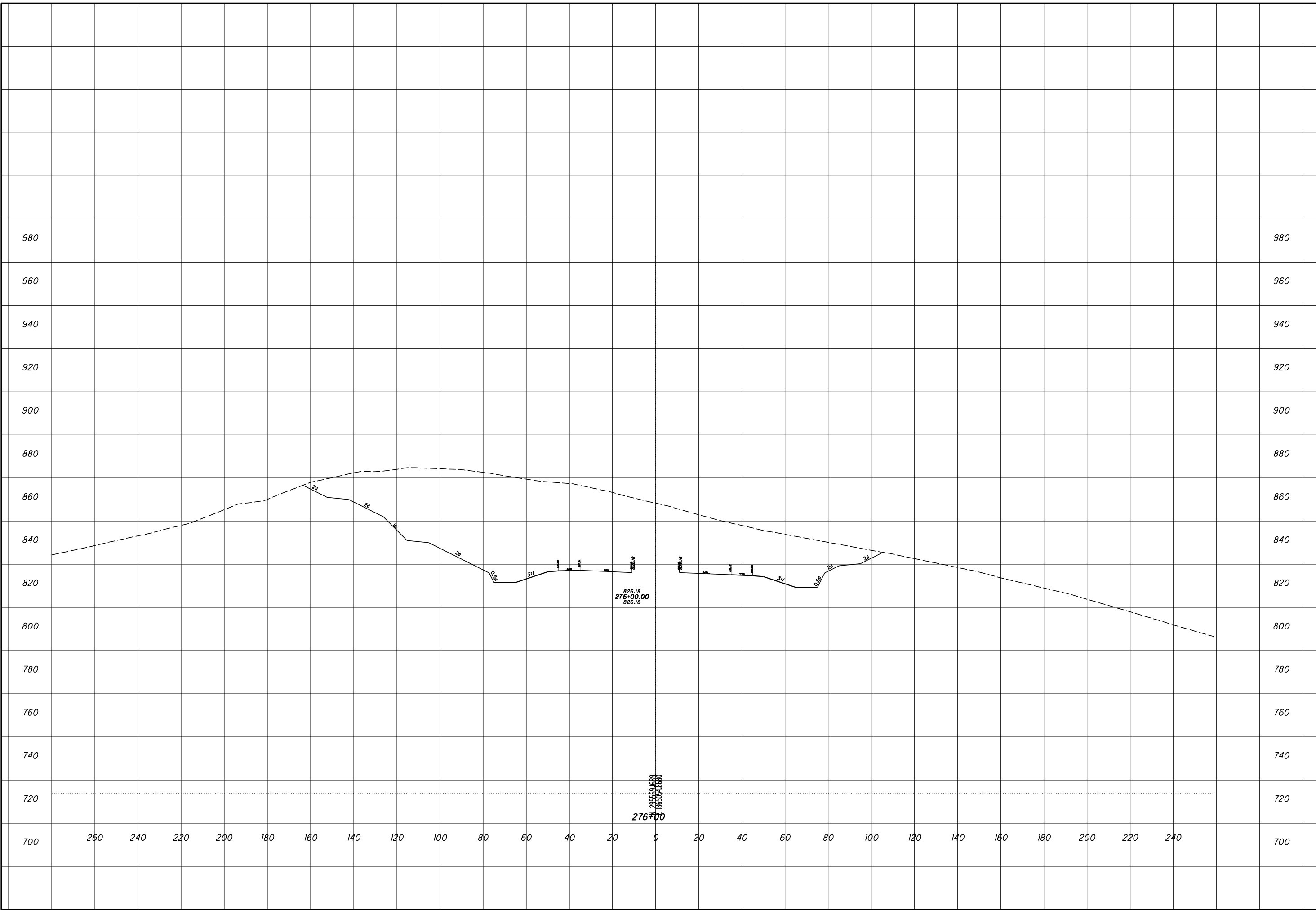
ROCK CUT SLOPE DESIGN - ROCK CUT 7
STA 275+50

SCI-823-0.00



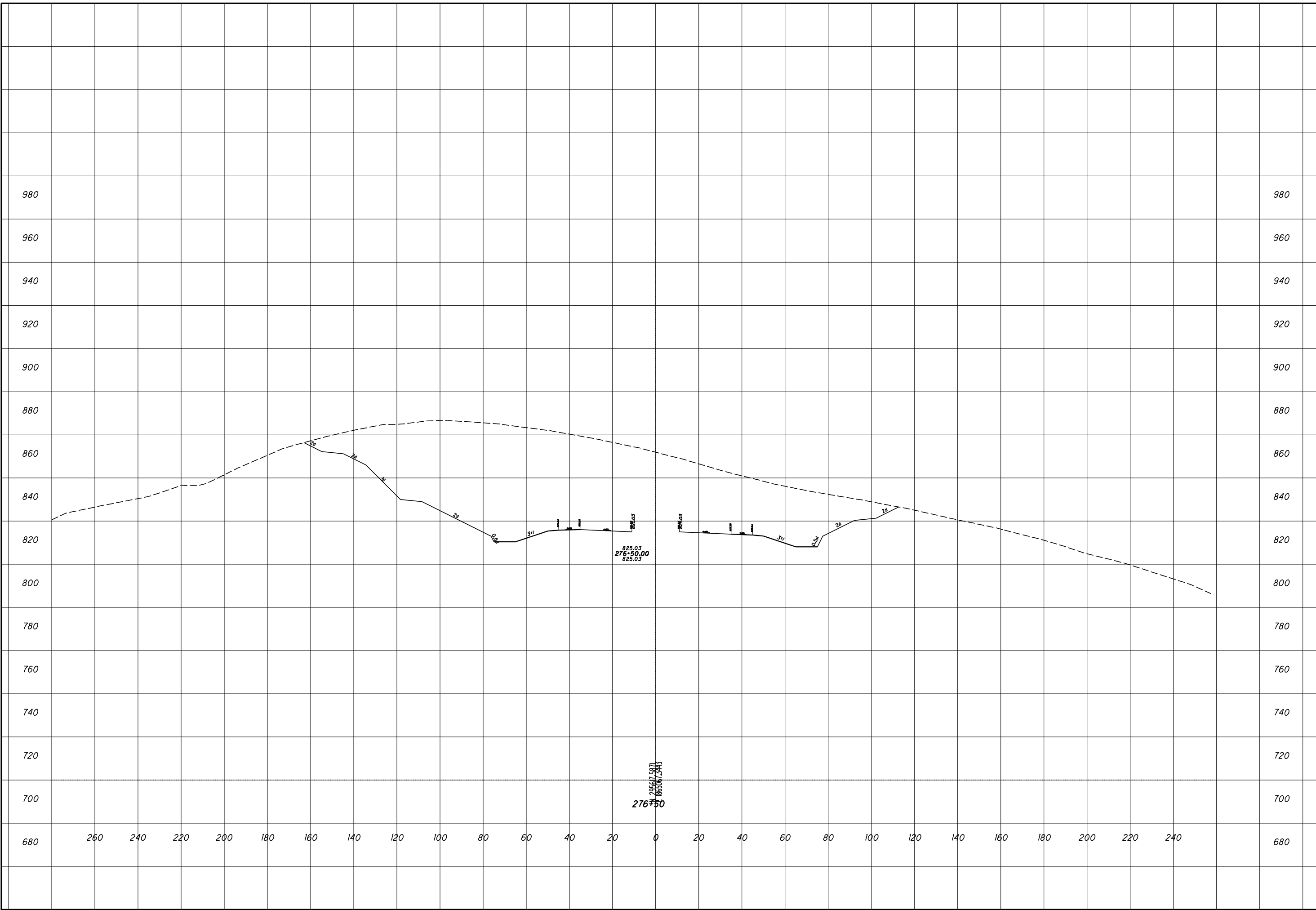
ROCK CUT SLOPE DESIGN - ROCK CUT 7
STA 276+00

SCI-823-0.00



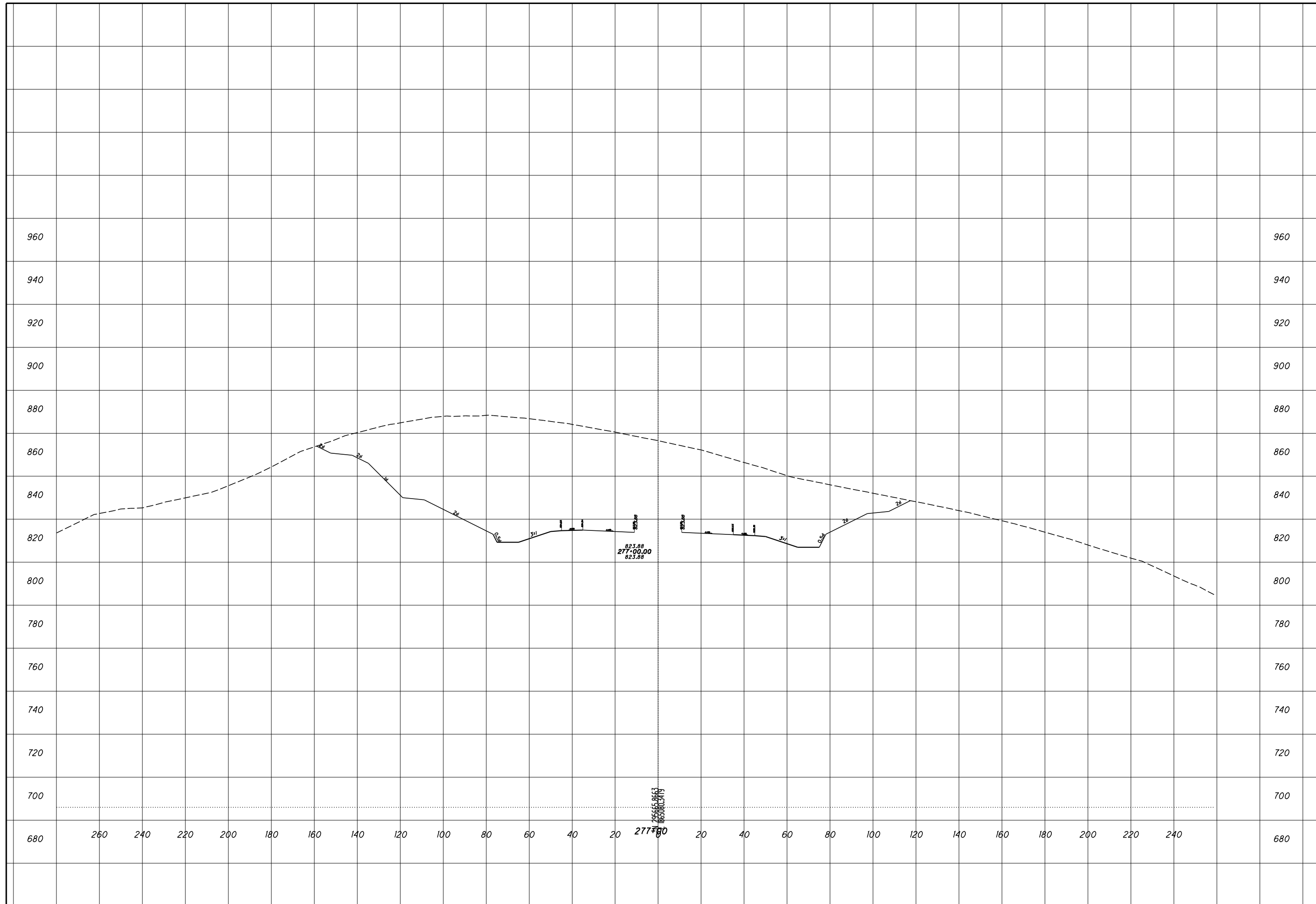
ROCK CUT SLOPE DESIGN - ROCK CUT 7
STA 276+50

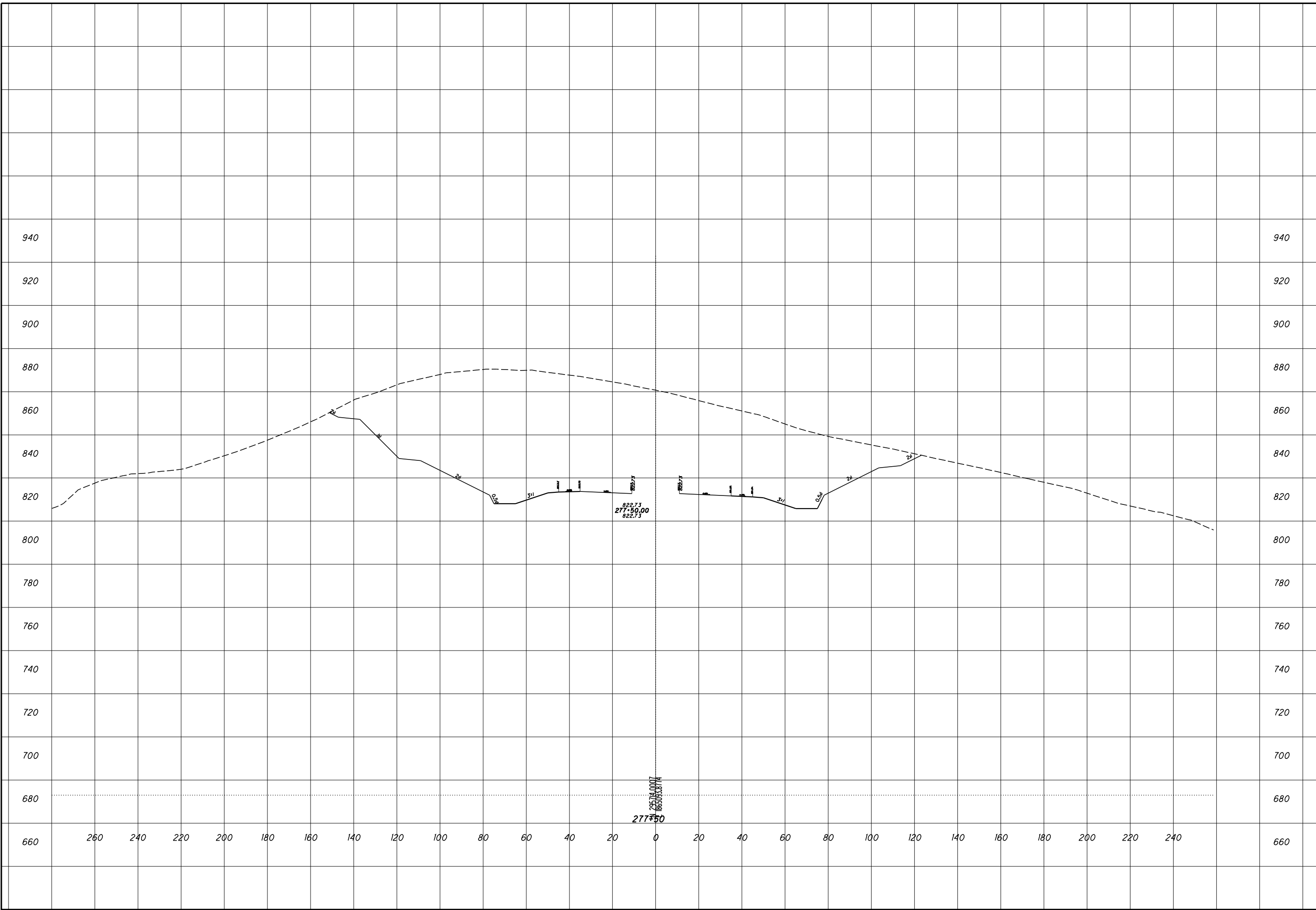
SCI-823-0.00



ROCK CUT SLOPE DESIGN - ROCK CUT 7
STA 277+00

SCI-823-0.00

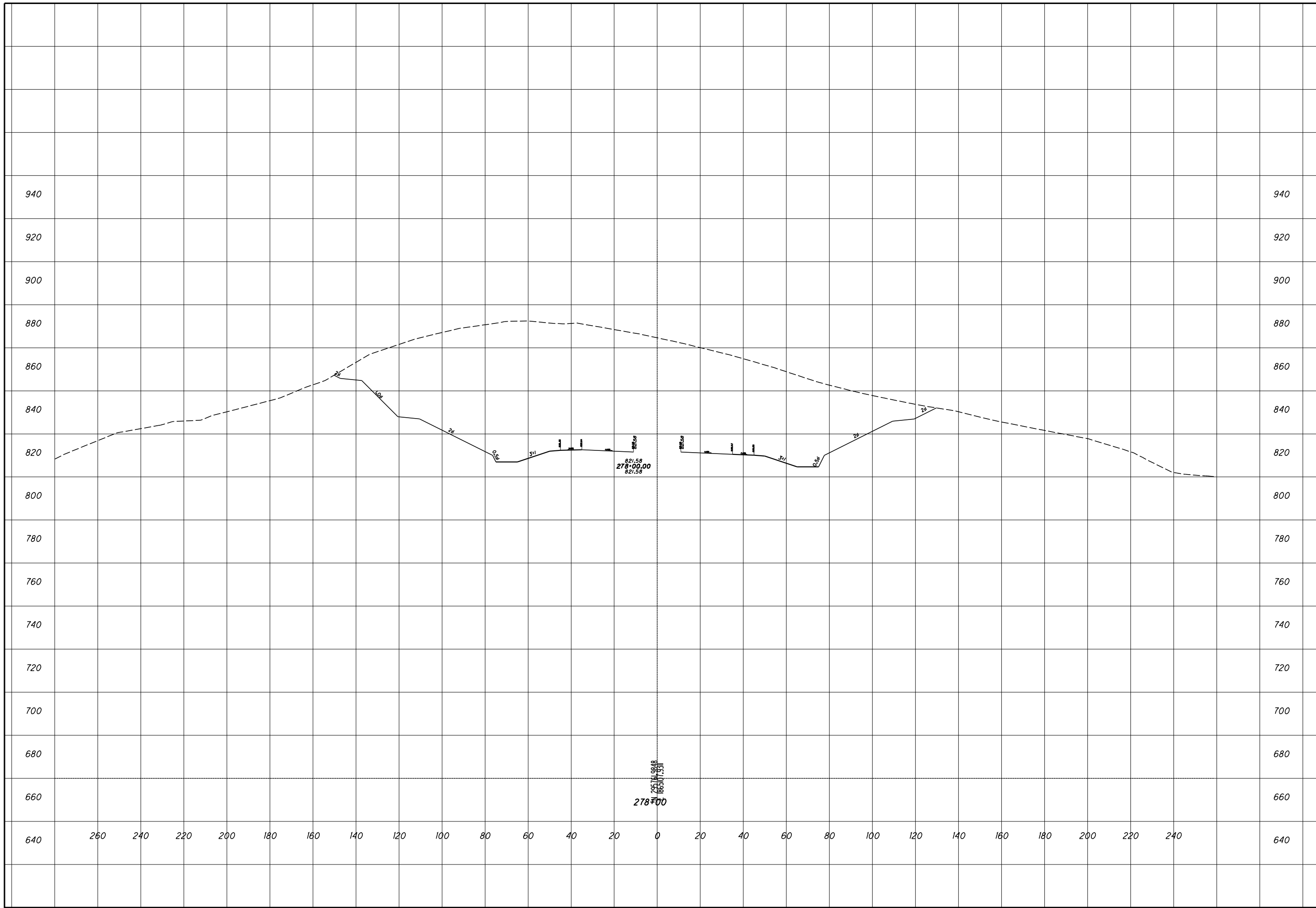




ROCK CUT SLOPE DESIGN - ROCK CUT 7
STA 277+50

SCI-823-0.00

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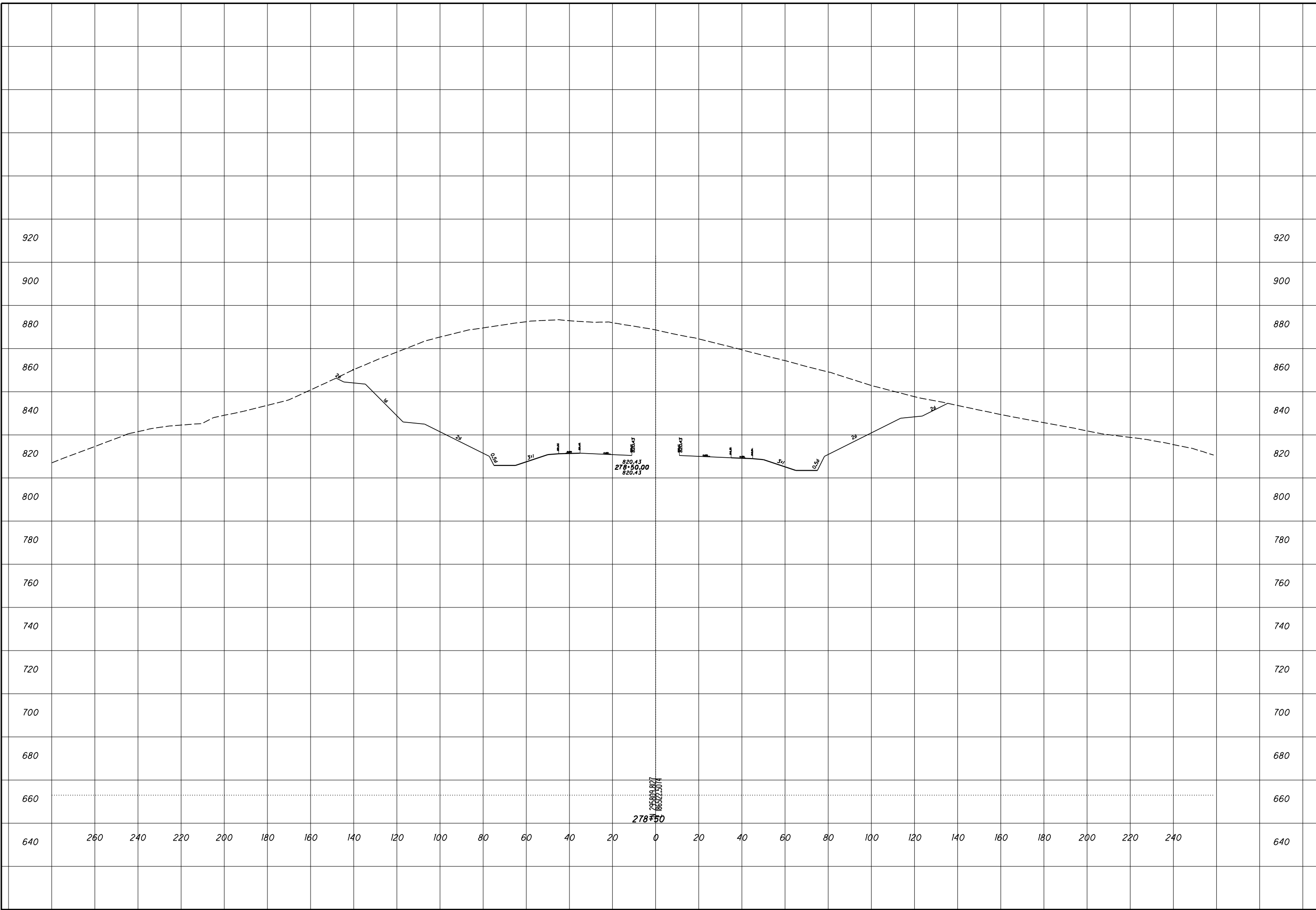
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STA 278+00

SCI-823-0.00

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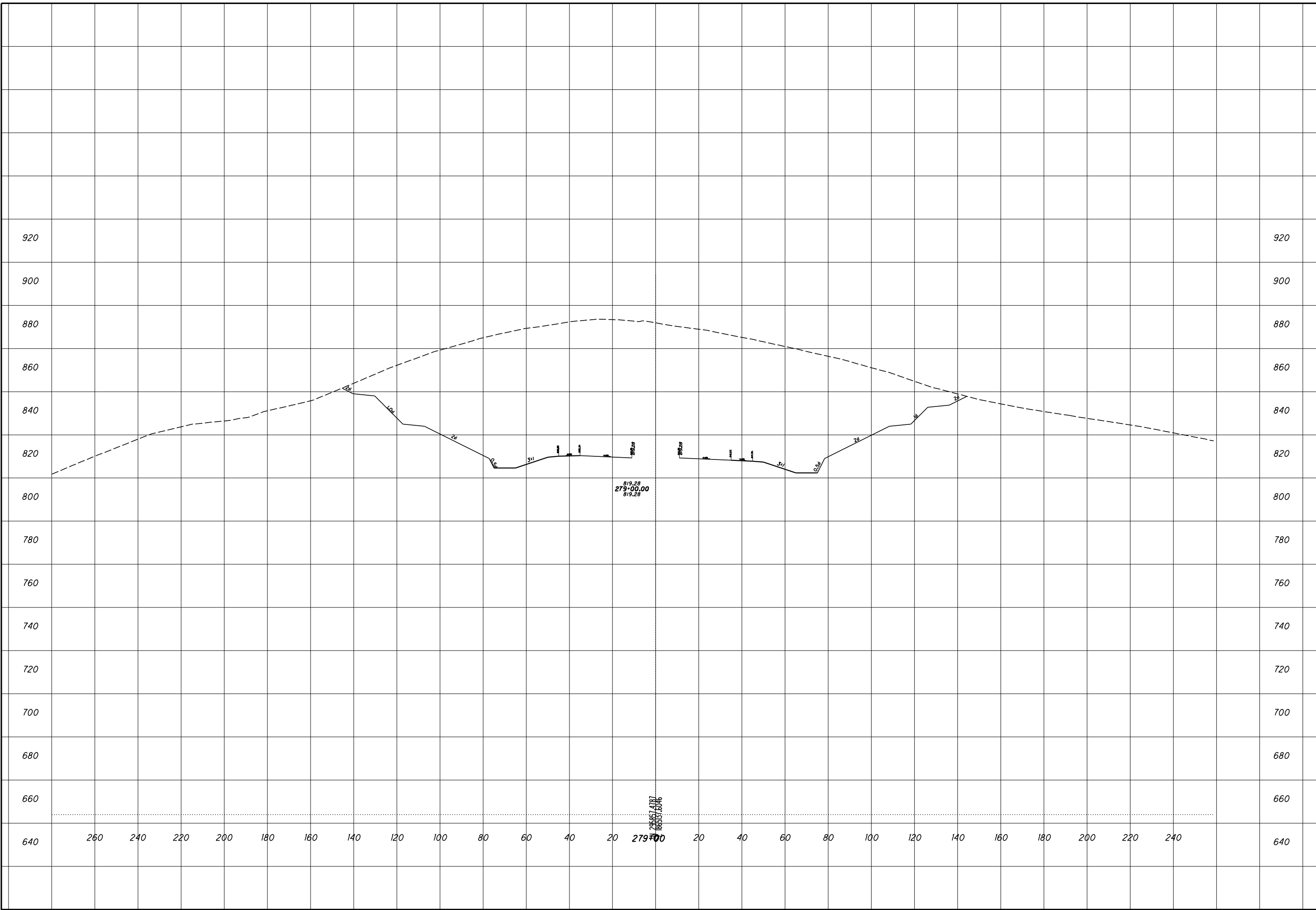
ROCK CUT SLOPE DESIGN - ROCK CUT 7
STA 278+50

SCI-823-0.00



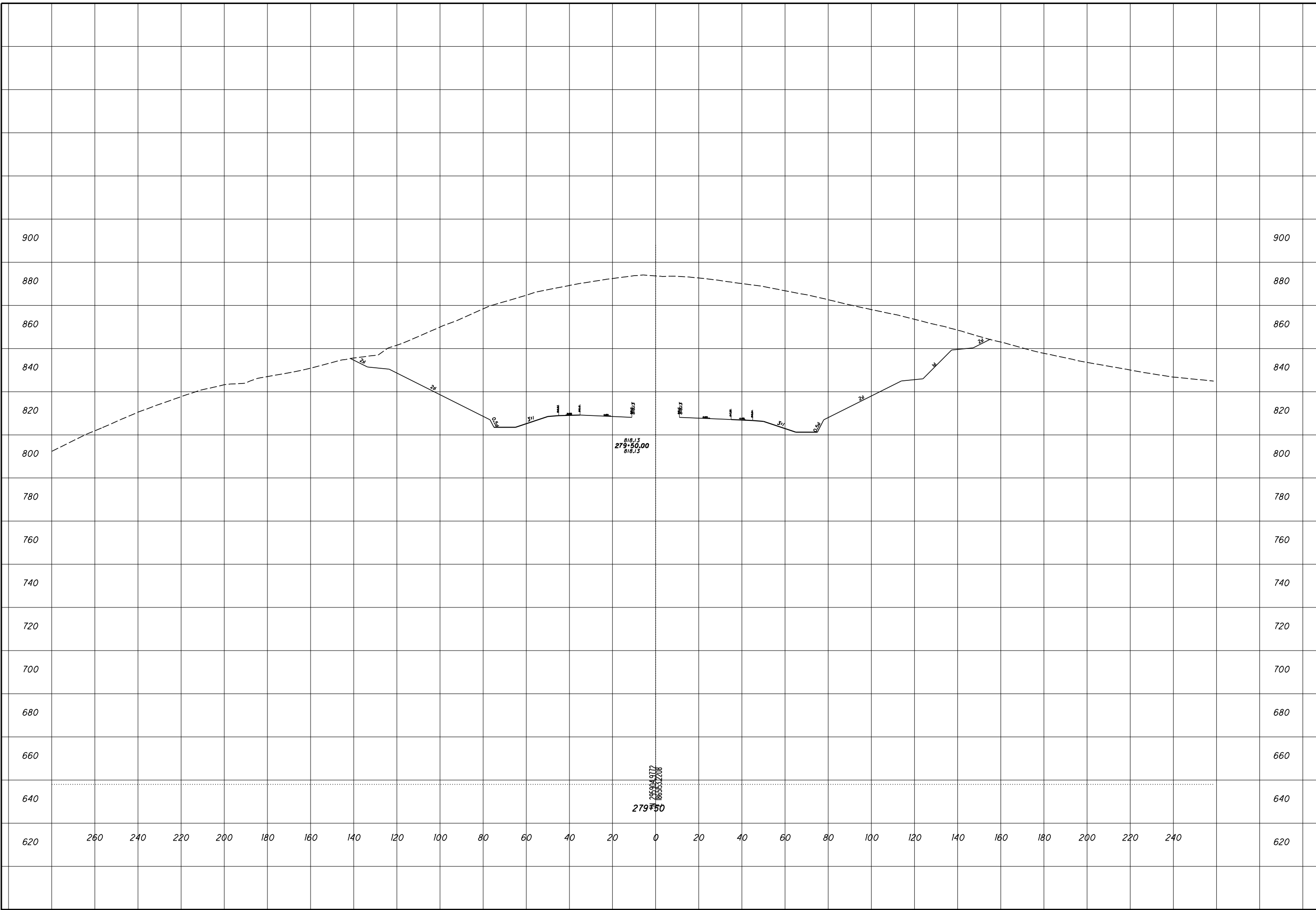
ROCK CUT SLOPE DESIGN - ROCK CUT 7
STA 279+00

SCI-823-0.00



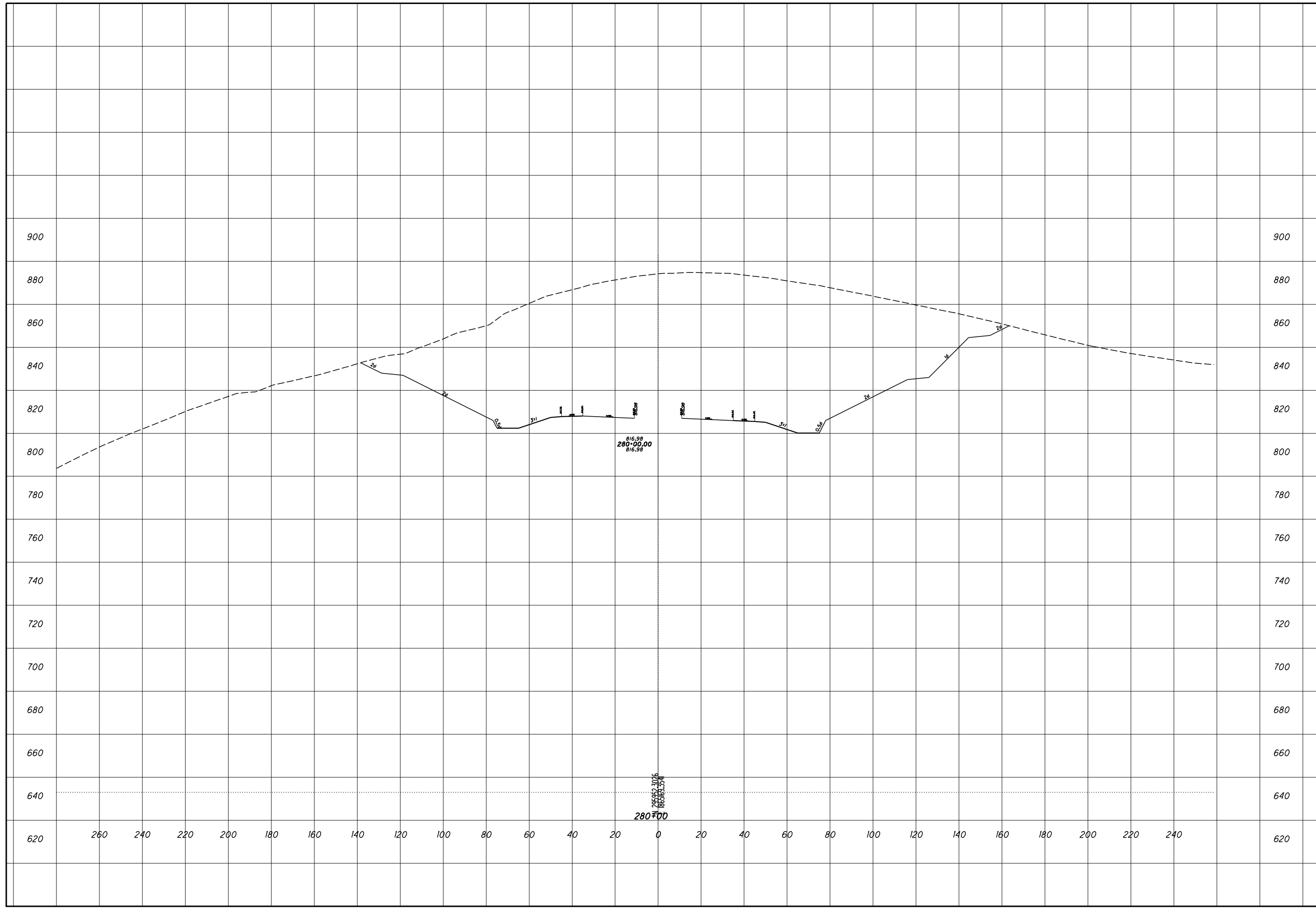
ROCK CUT SLOPE DESIGN - ROCK CUT 7
STA 279+50

SCI-823-0.00



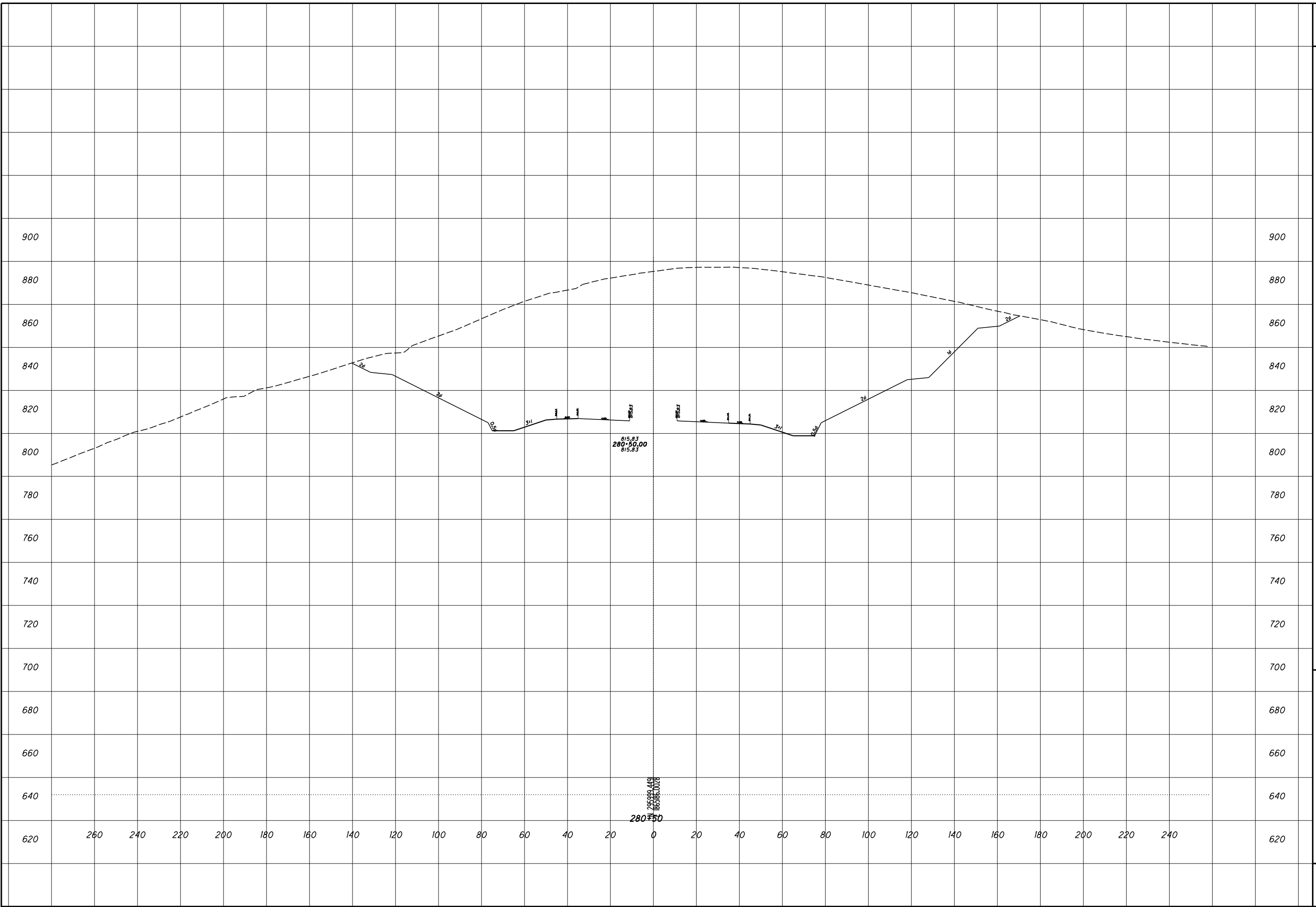
ROCK CUT SLOPE DESIGN - ROCK CUT 7
STA 280+00

SCI-823-0.00



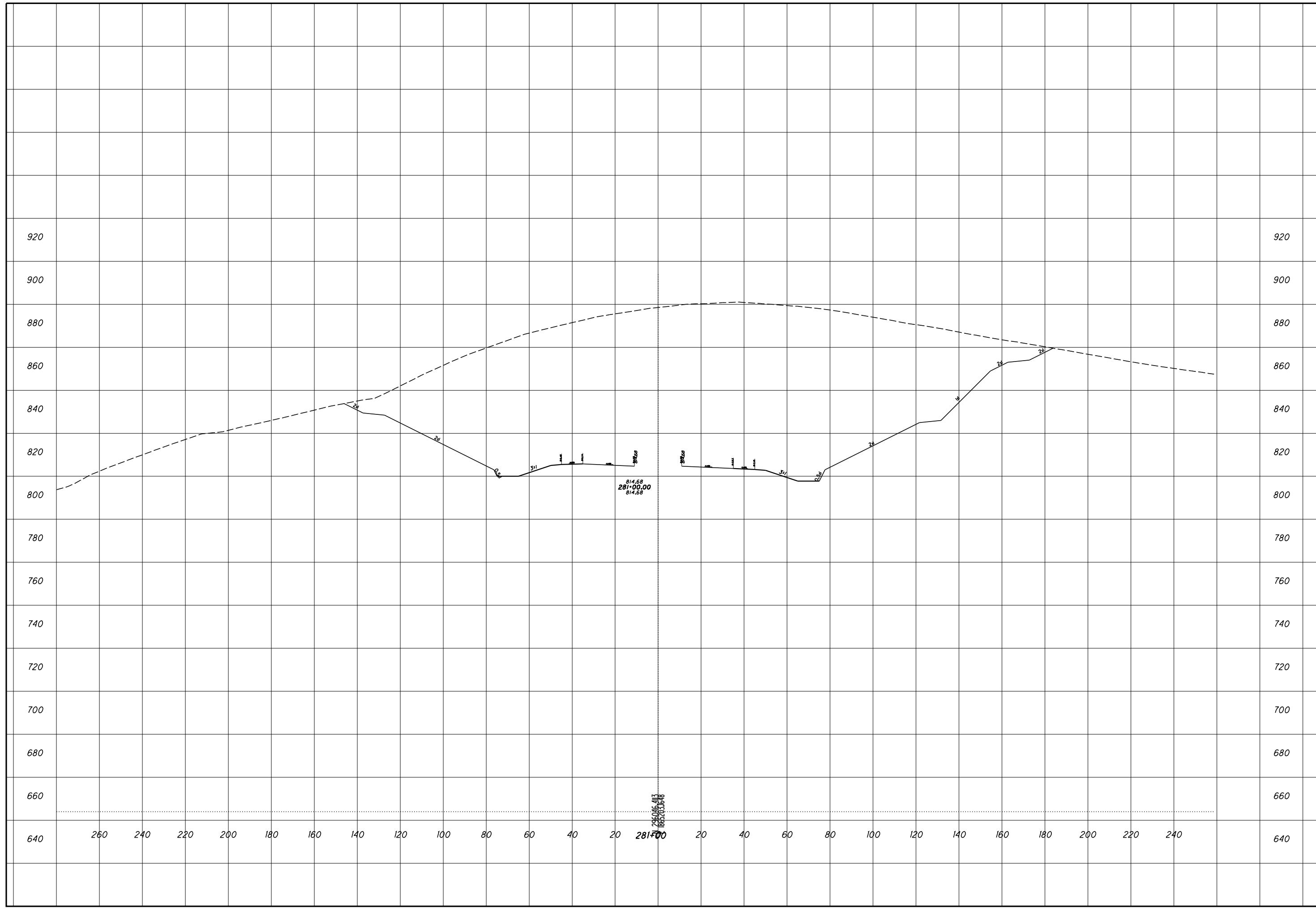
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STA 280+50

SCI-823-0.00



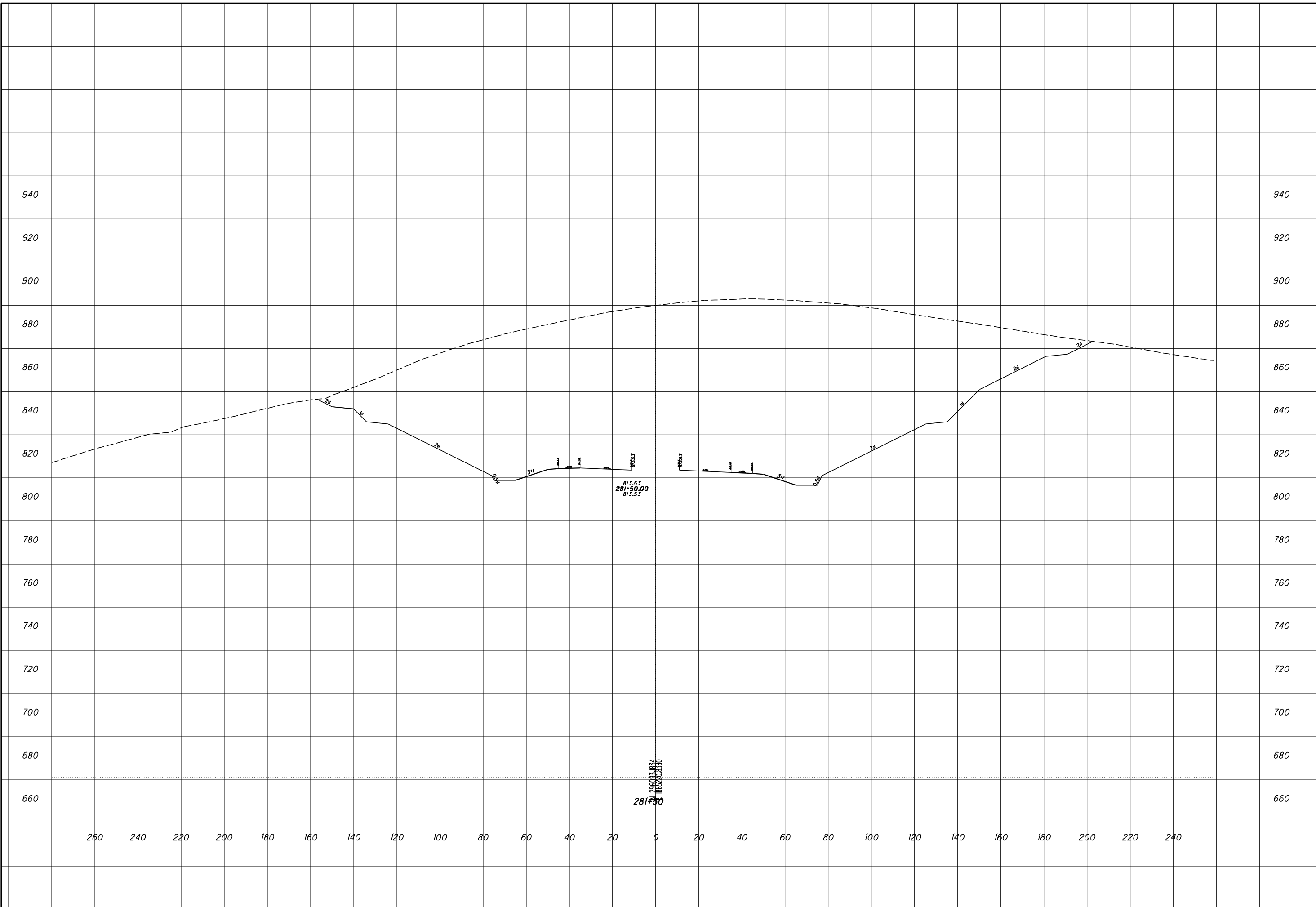
ROCK CUT SLOPE DESIGN - ROCK CUT 7
STA 281+00

SCI-823-0.00



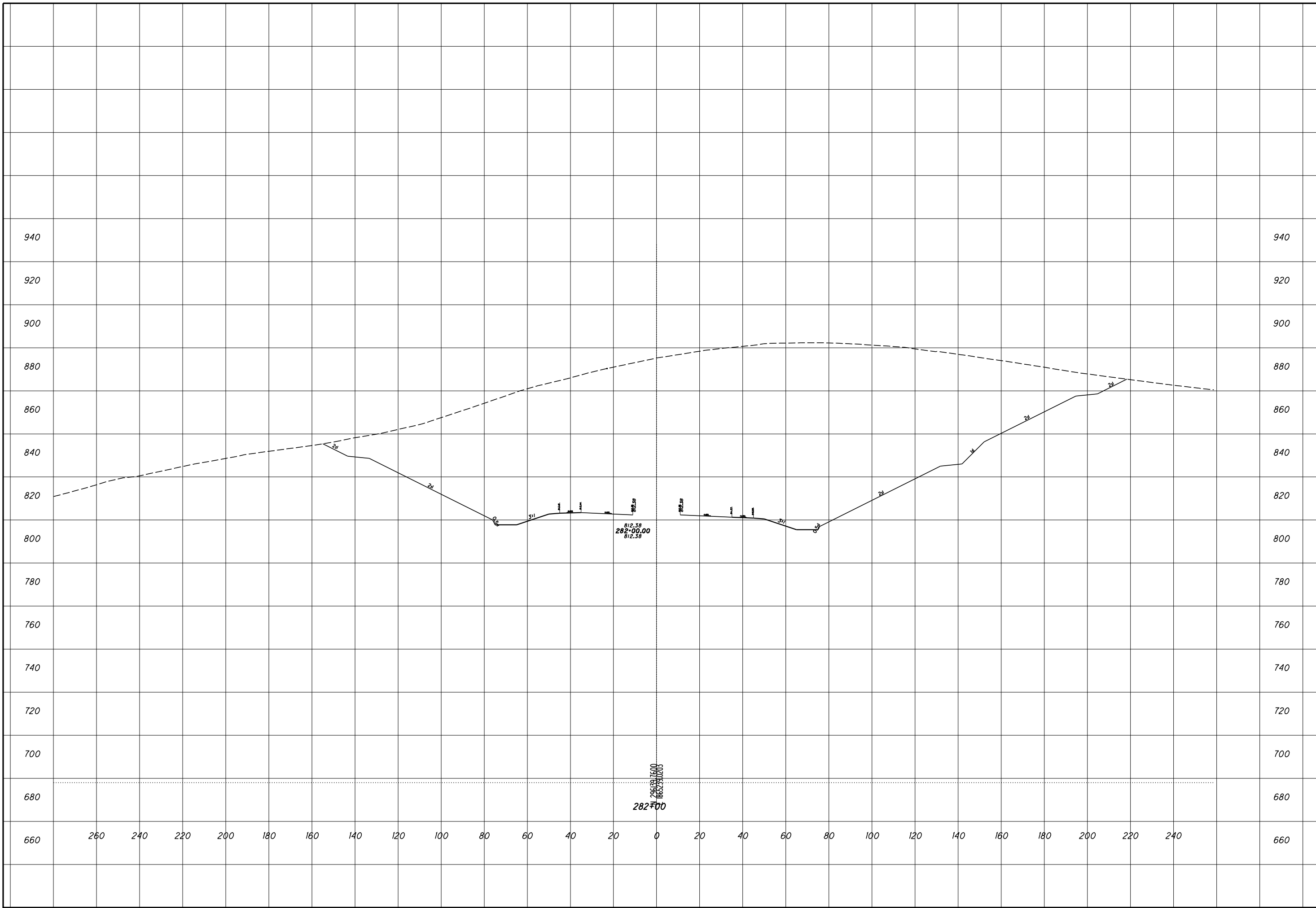
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STA 281+50

SCI-823-0.00



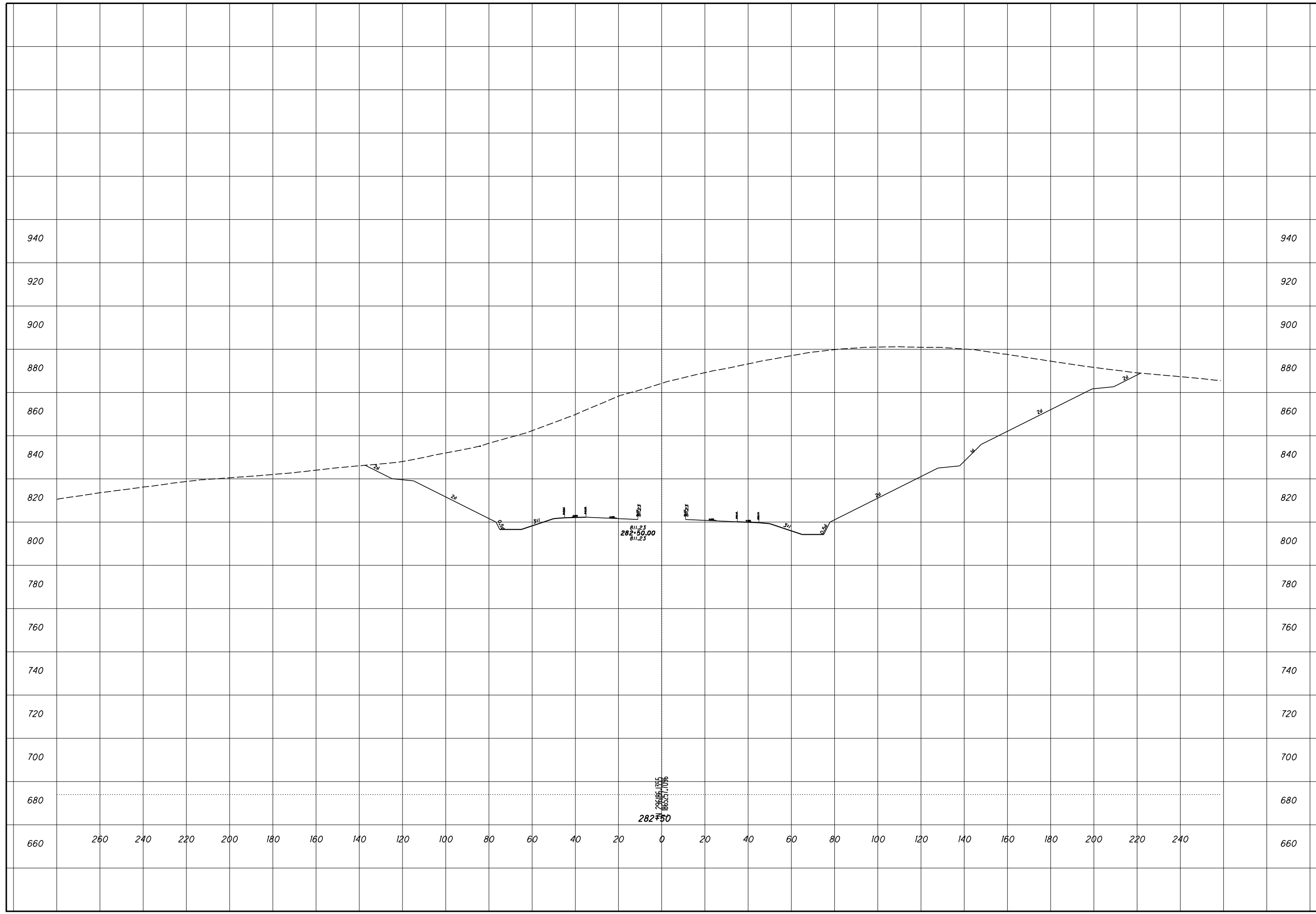
ROCK CUT SLOPE DESIGN - ROCK CUT 7
STA 282+00

SCI-823-0.00



ROCK CUT SLOPE DESIGN - ROCK CUT 7
STA 282+50

SCI-823-0.00

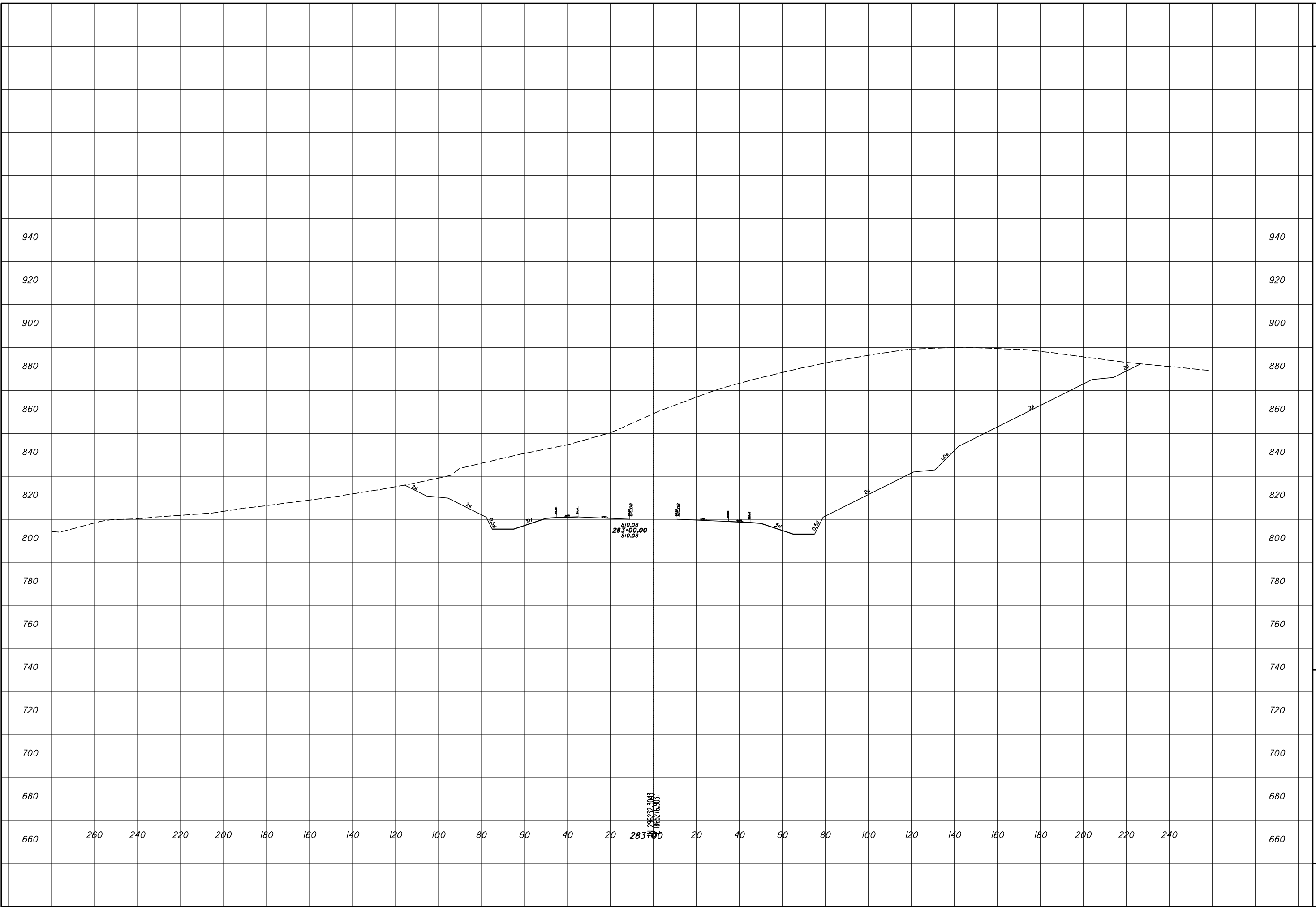


811.23
282+50.00
811.23

282+50

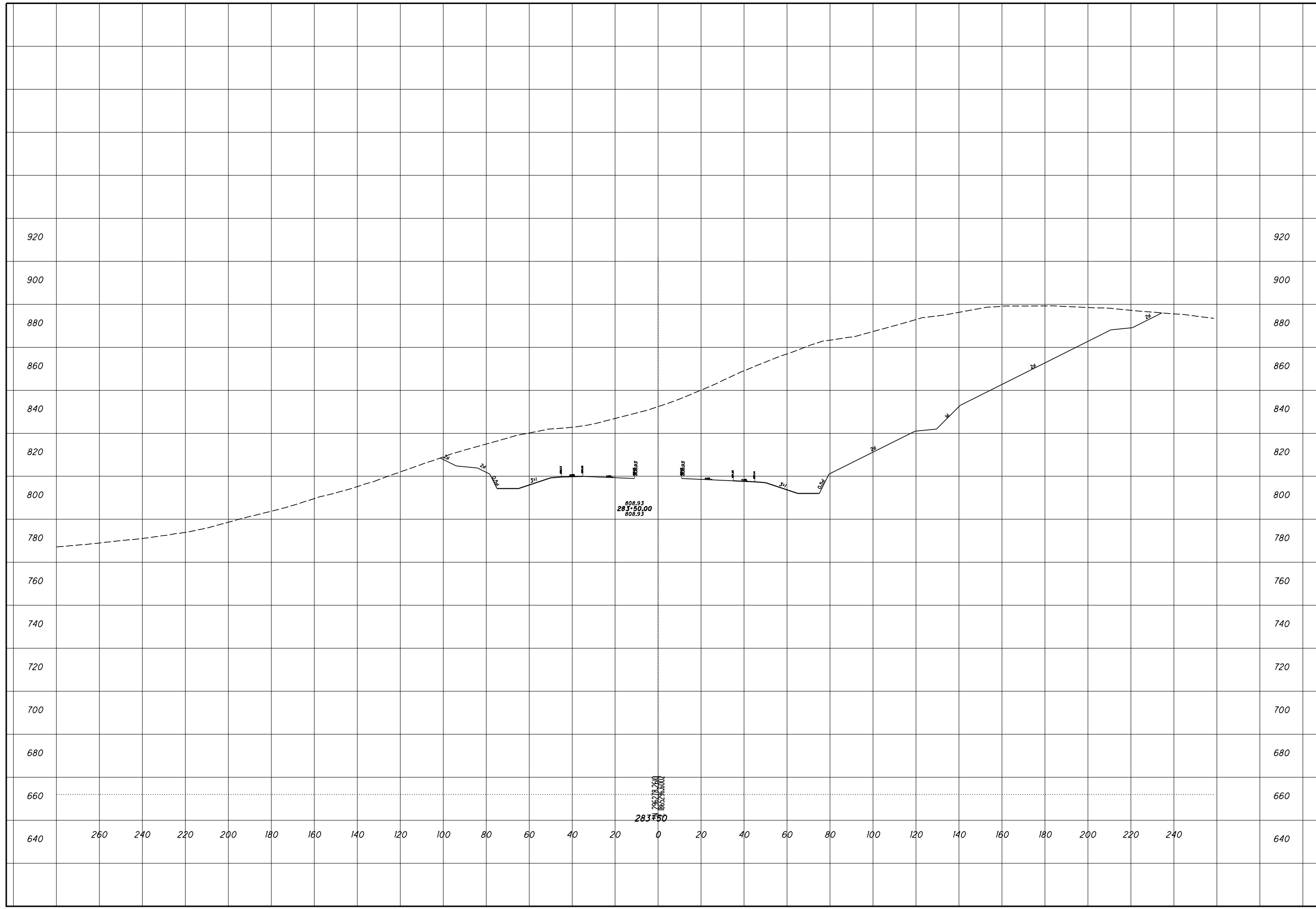
**ROCK CUT SLOPE DESIGN - ROCK CUT 7
STA 283+00**

SCI-823-0.00



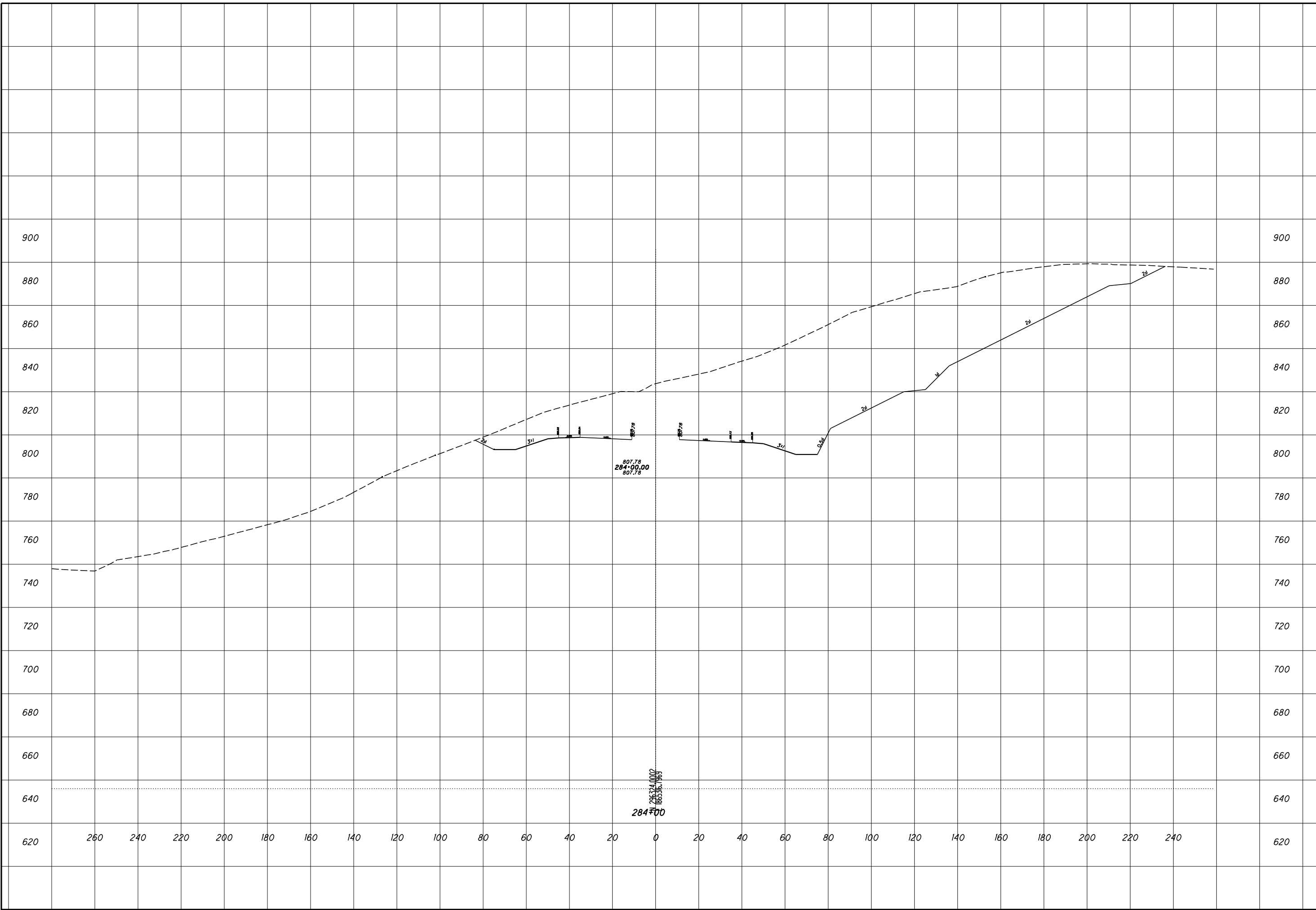
ROCK CUT SLOPE DESIGN - ROCK CUT 7
STA 283+50

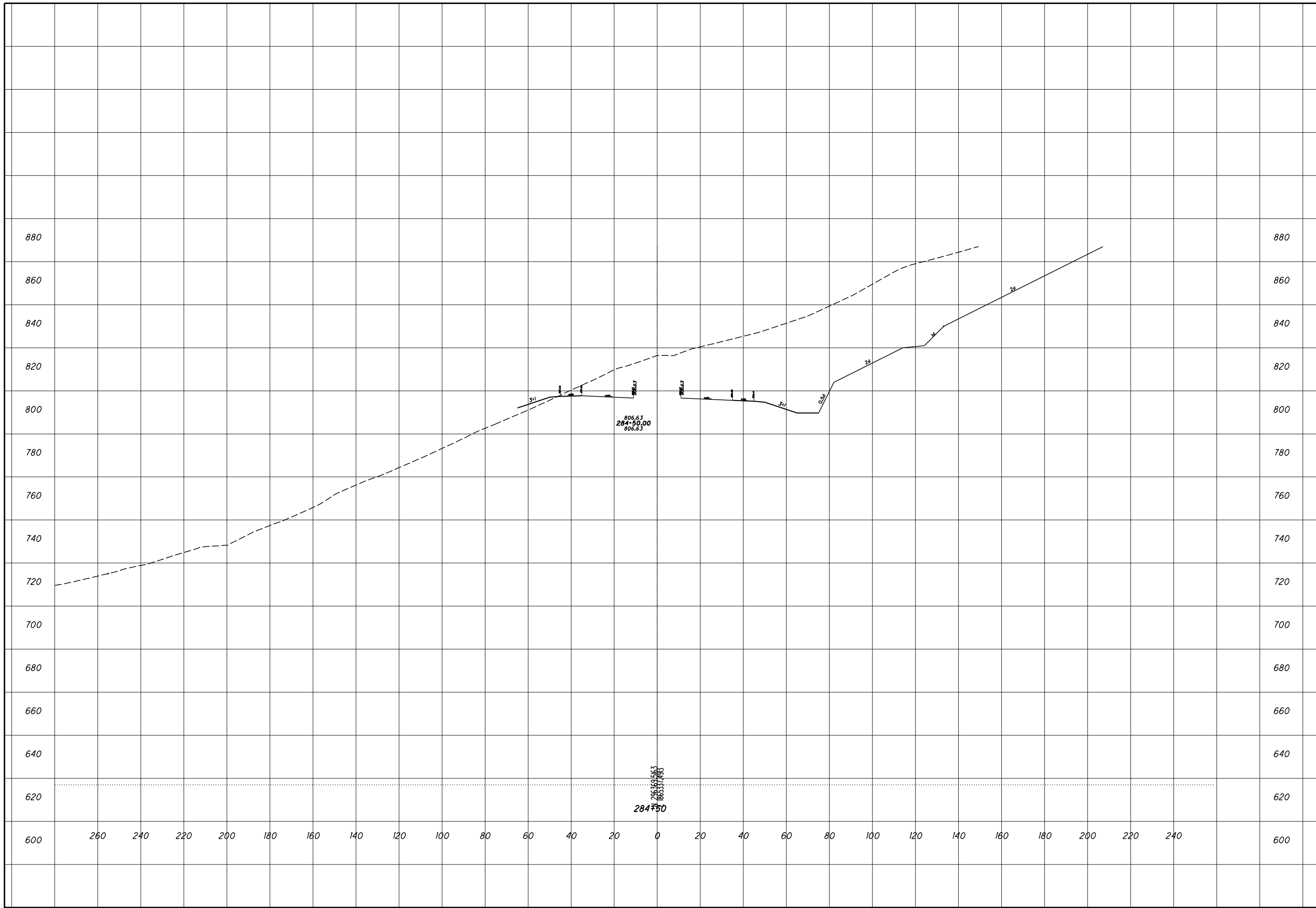
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ROCK CUT SLOPE DESIGN - ROCK CUT 7
STA 284+00

SCI-823-0.00

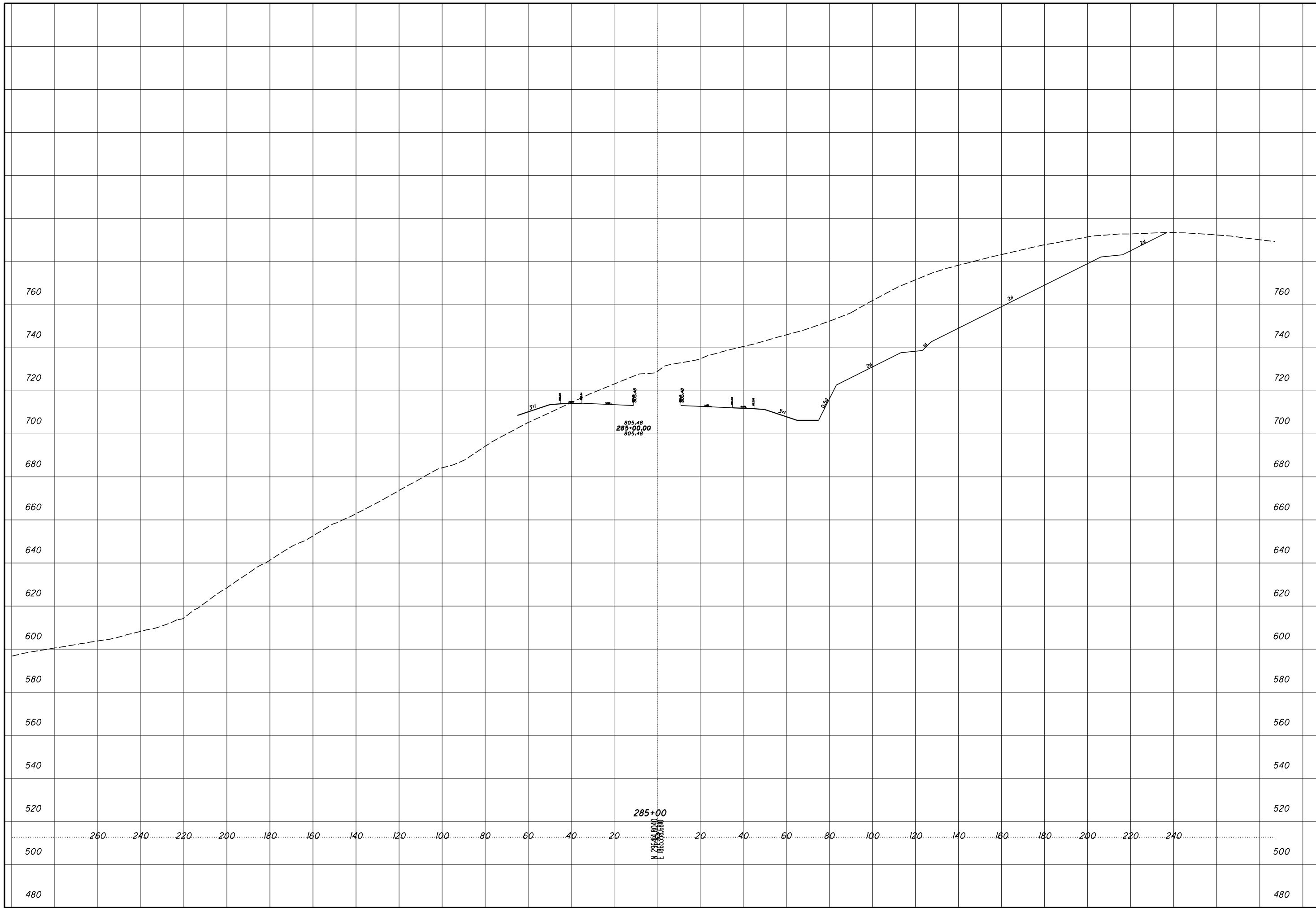




ROCK CUT SLOPE DESIGN - ROCK CUT 7
STA 284+50

SCI-823-0.00

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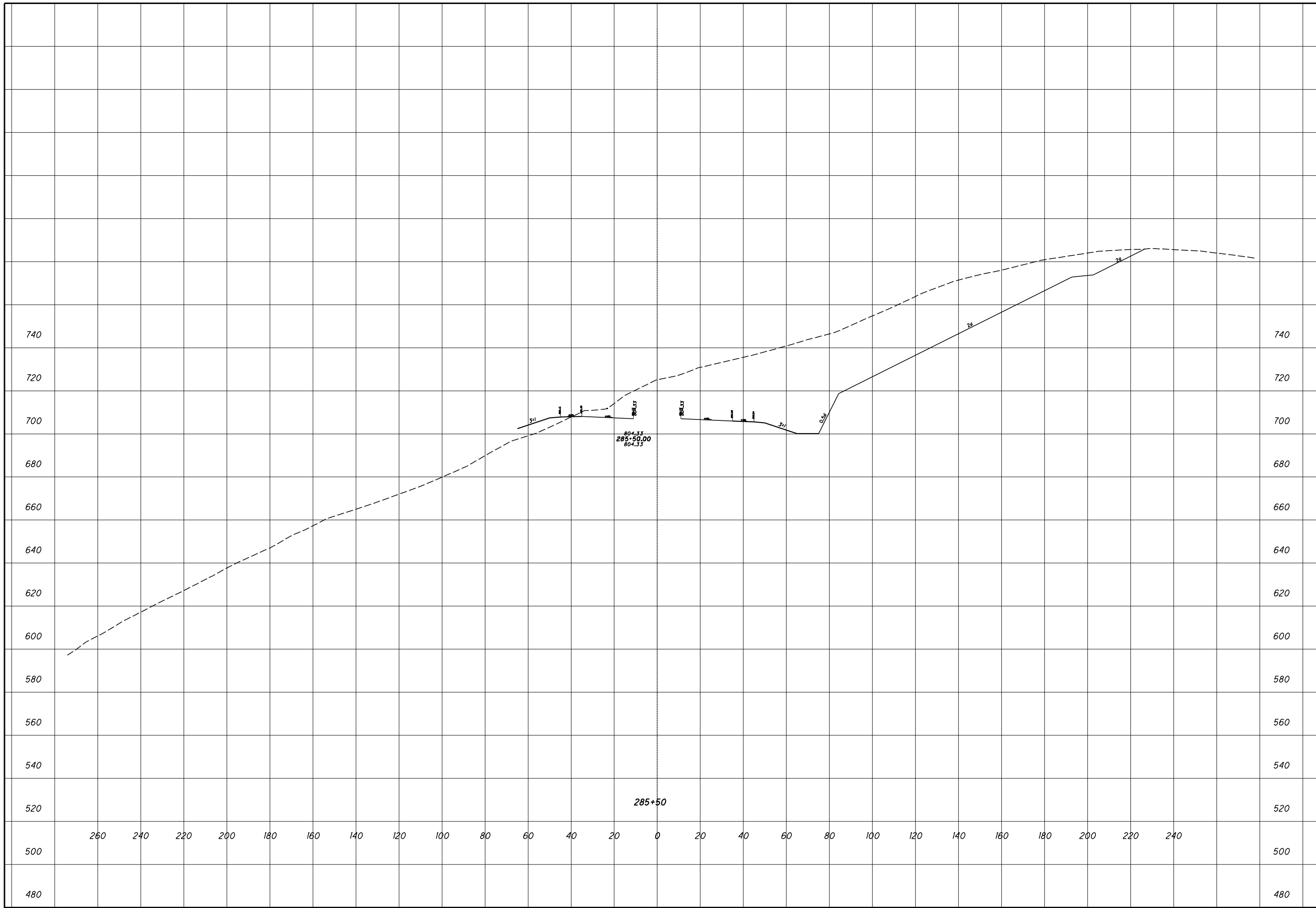


ROCK CUT SLOPE DESIGN - ROCK CUT 7
STA 285+00

SCI-823-0.00

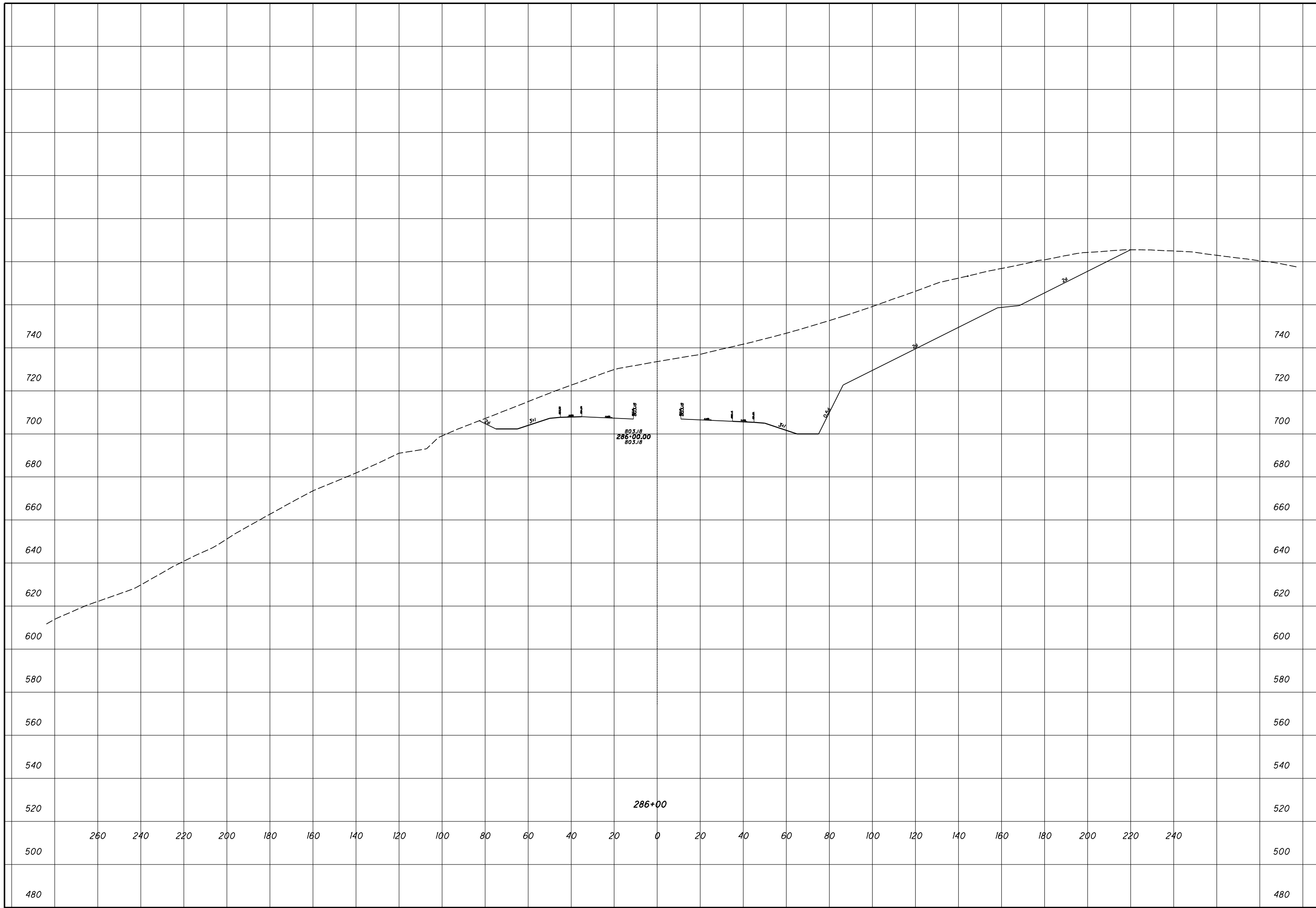
27
 36

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ROCK CUT SLOPE DESIGN - ROCK CUT 7
 STA 285+50

SCI-823-0.00

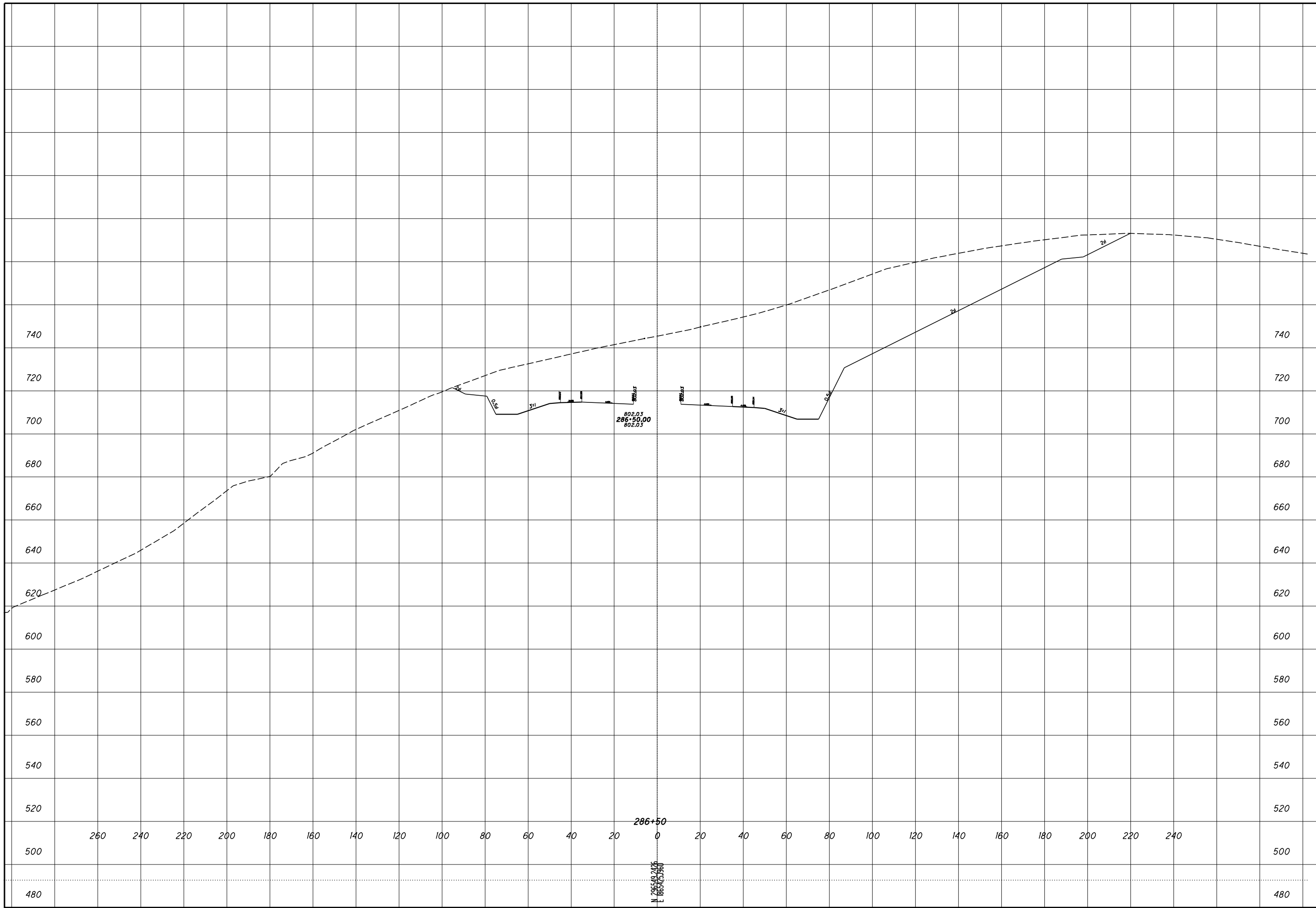


ROCK CUT SLOPE DESIGN - ROCK CUT 7
STA 286+00

SCI-823-0.00

29
36

CHECKED



ROCK CUT SLOPE DESIGN - ROCK CUT 7
STA 286+50

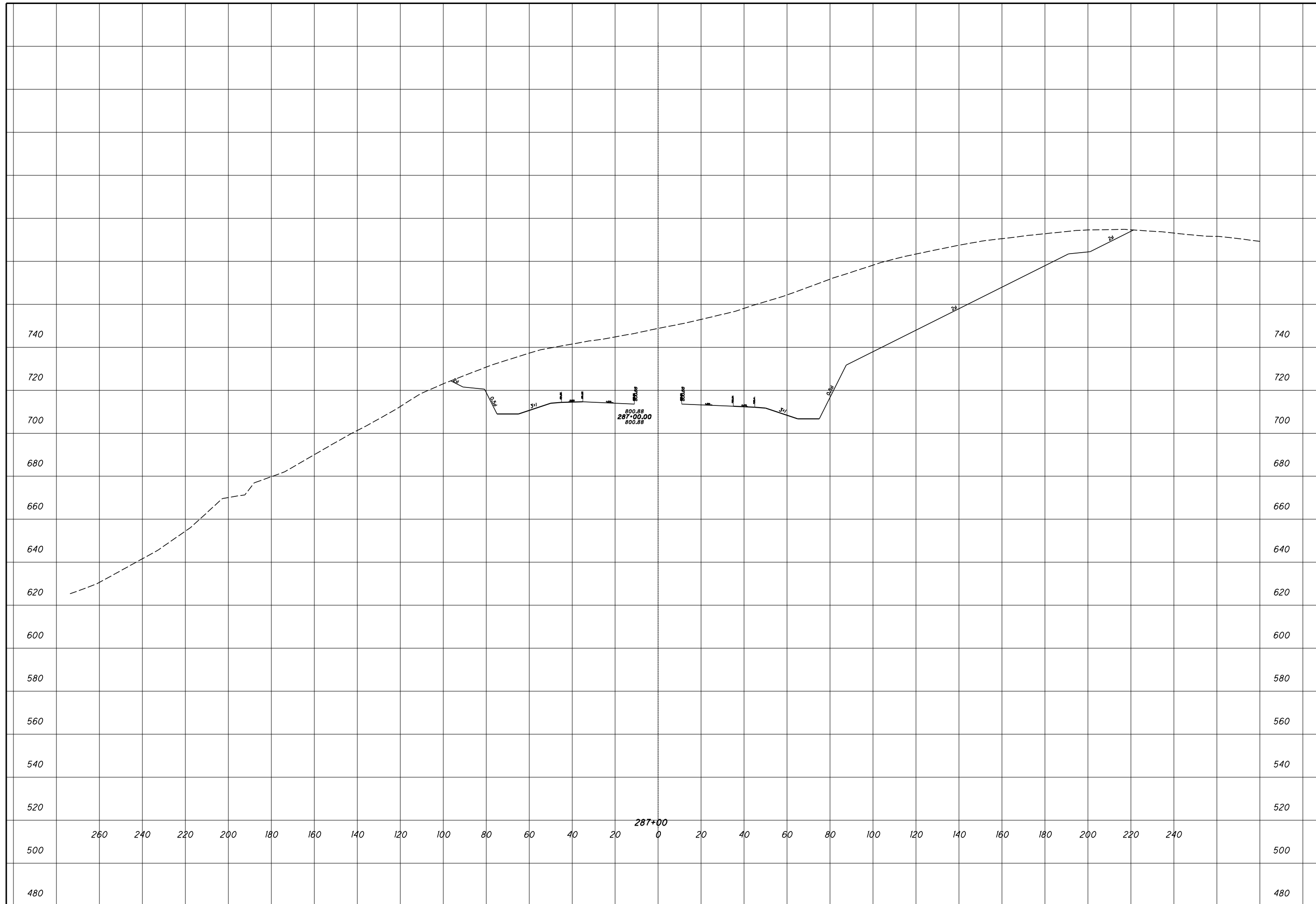
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30
36

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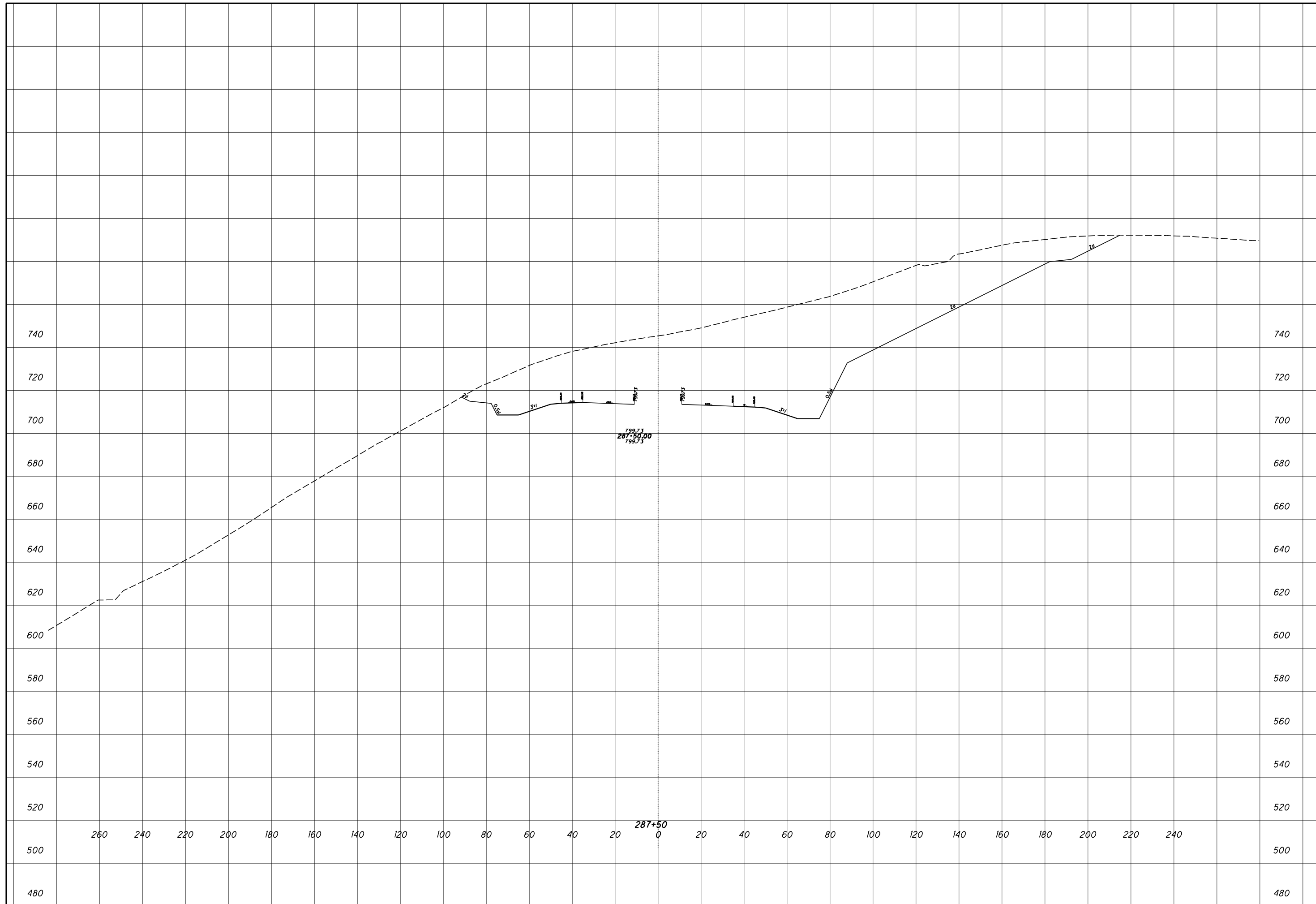
ROCK CUT SLOPE DESIGN - ROCK CUT 7
STA 287+00

SCI-823-0.00



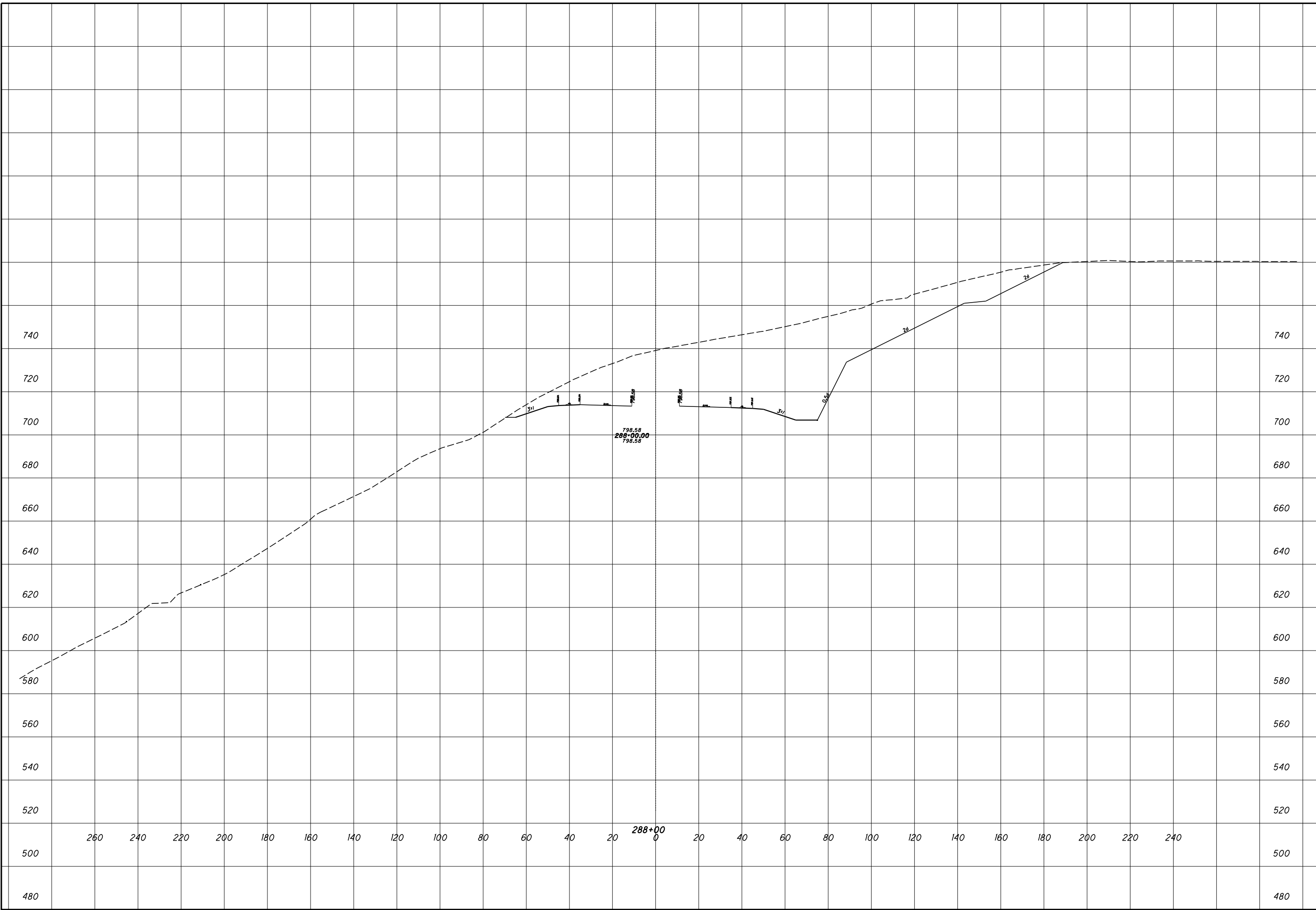
ROCK CUT SLOPE DESIGN - ROCK CUT 7
STA 287+50

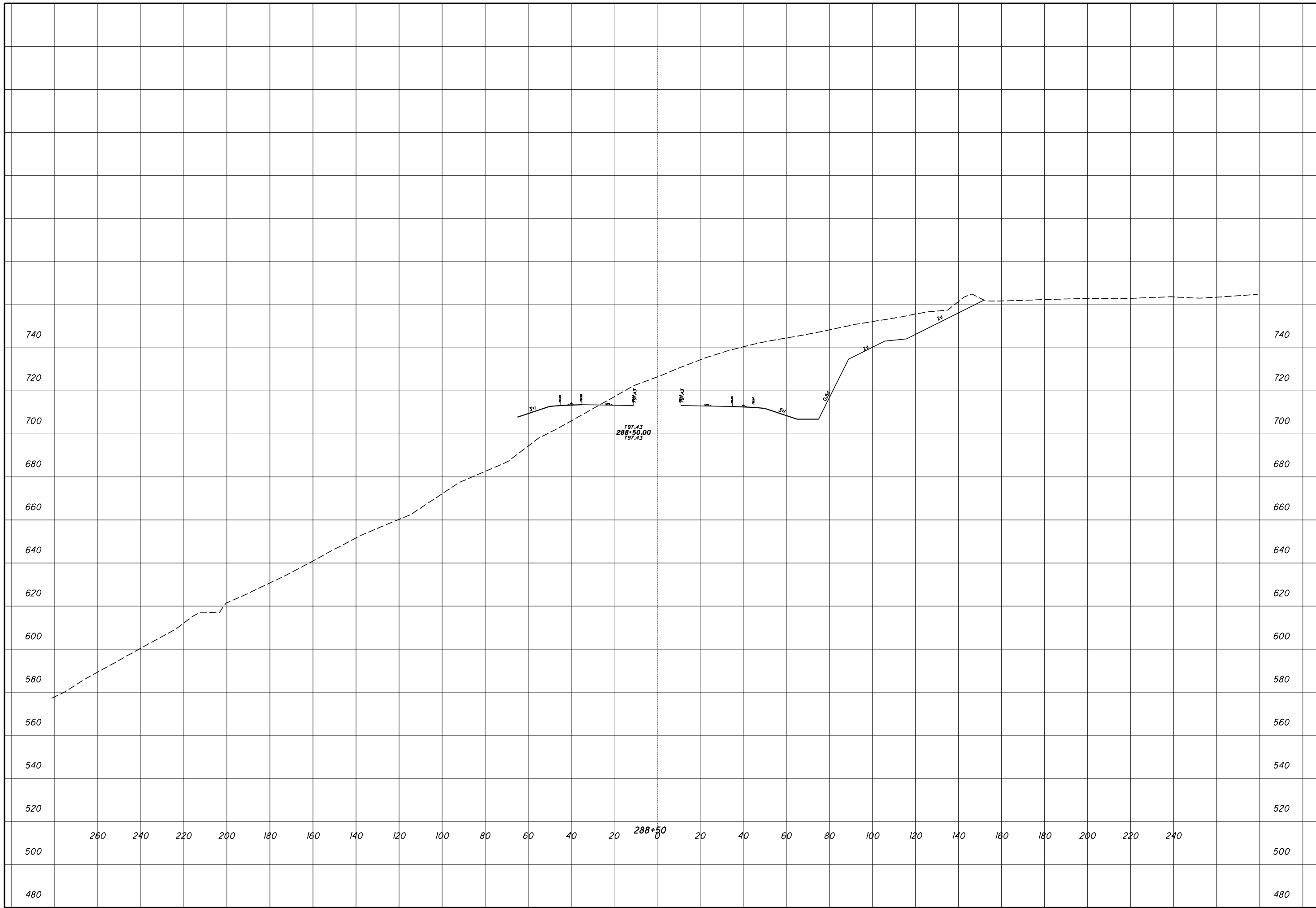
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ROCK CUT SLOPE DESIGN - ROCK CUT 7
STA 288+00

SCI-823-0.00





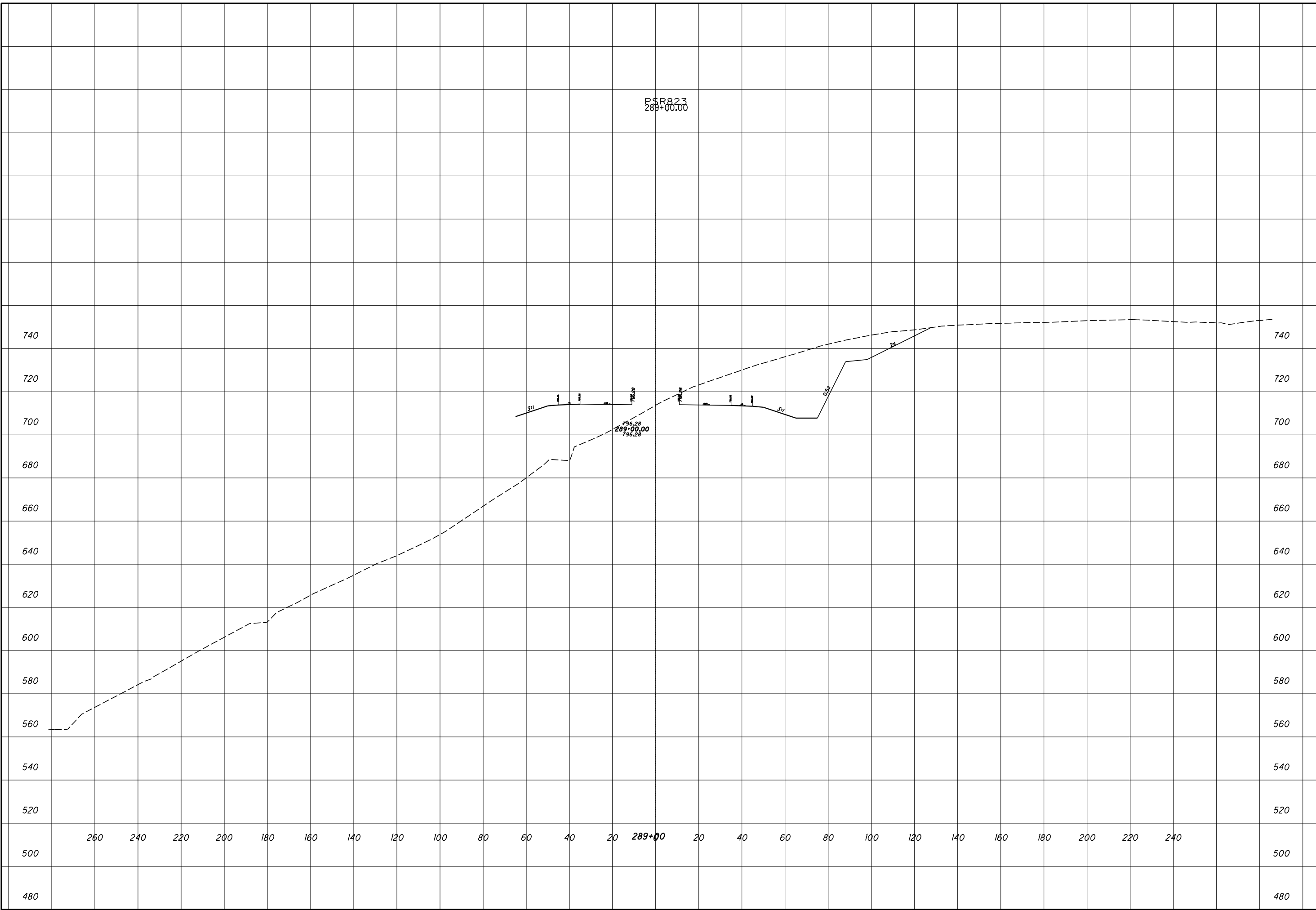
ROCK CUT SLOPE DESIGN - ROCK CUT 7
STA 288+50

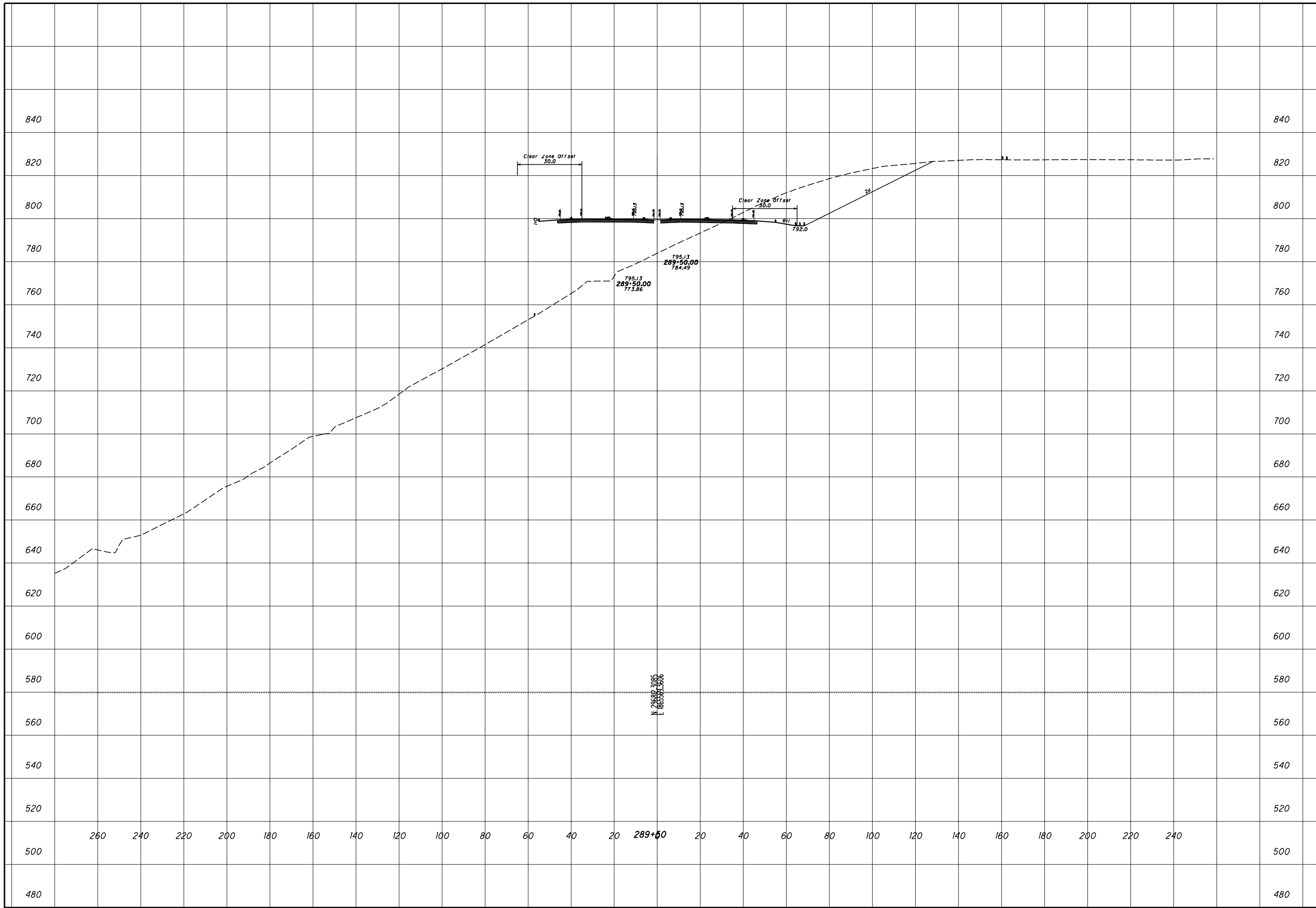
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34
36

ROCK CUT SLOPE DESIGN - ROCK CUT 7
STA 289+00

SCI-823-0.00

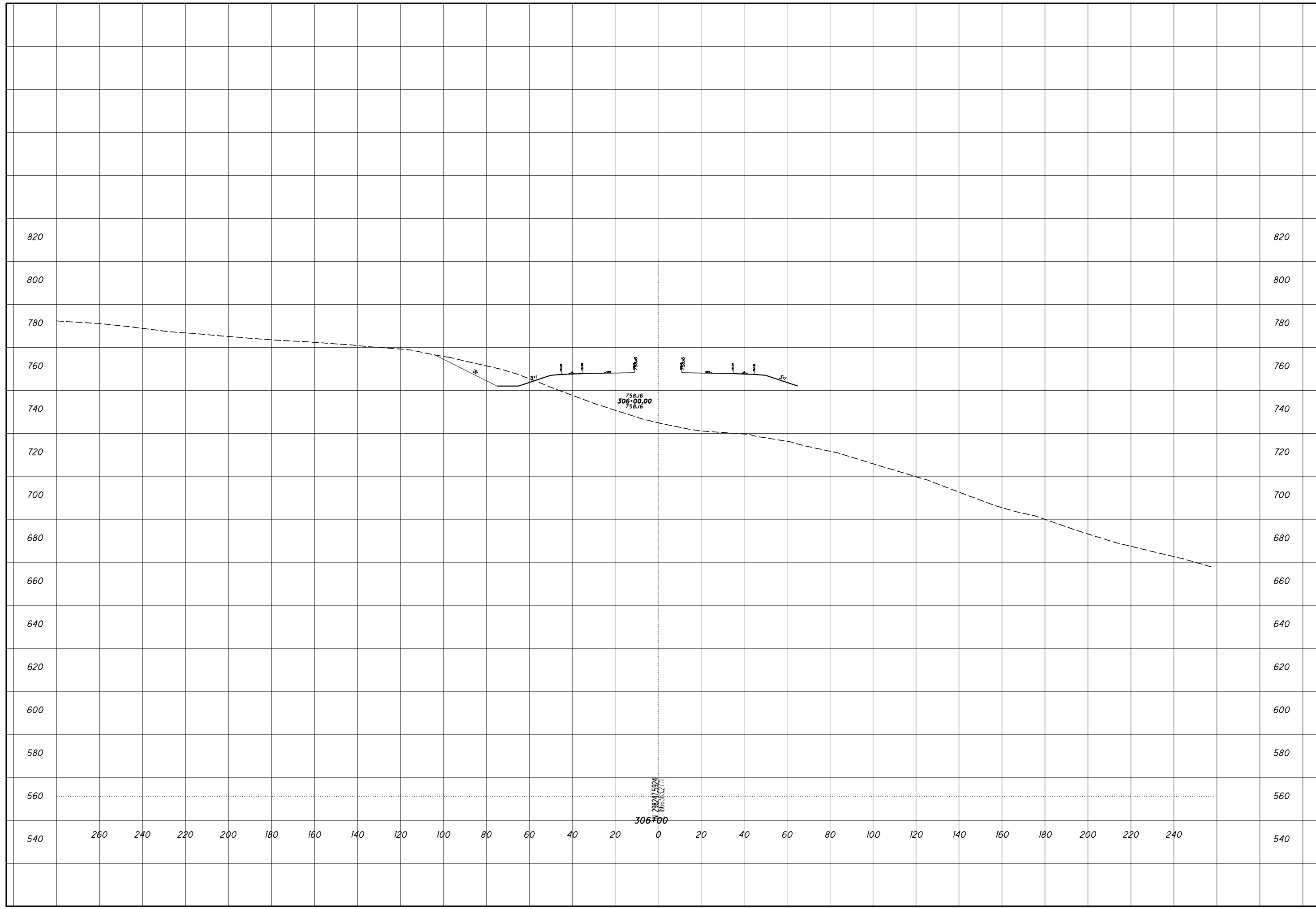




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ROCK CUT SLOPE DESIGN - ROCK CUT 7
STA 289+50
SCI-823-0.00
 36 / 36

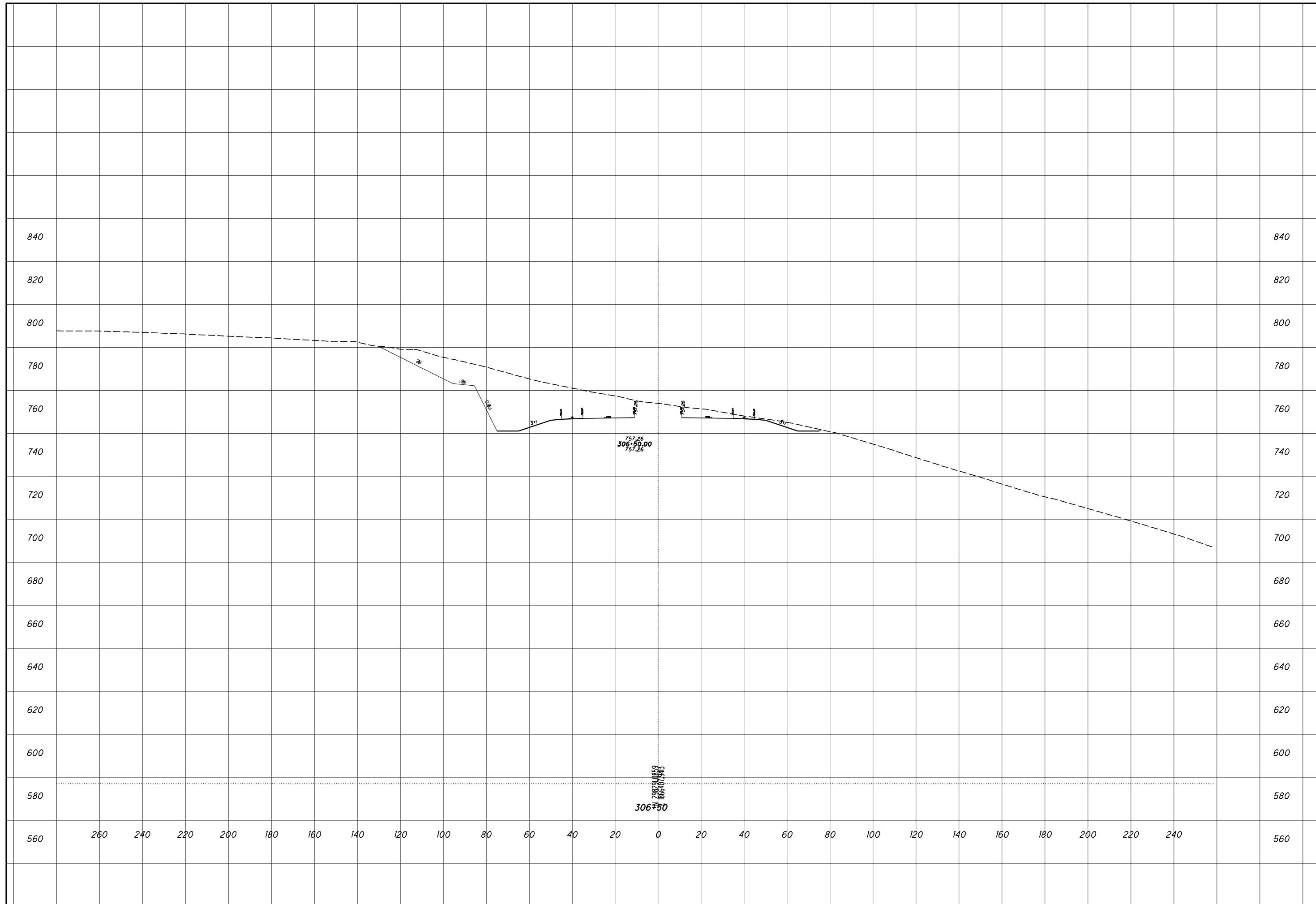
ROCK CUT SLOPE DESIGN - ROCK CUT 8
STA 306+00

SCI-823-0.00



ROCK CUT SLOPE DESIGN - ROCK CUT 8
STA 306+50

SCI-823-0.00





ROCK CUT SLOPE DESIGN - ROCK CUT 8
STA 307+00

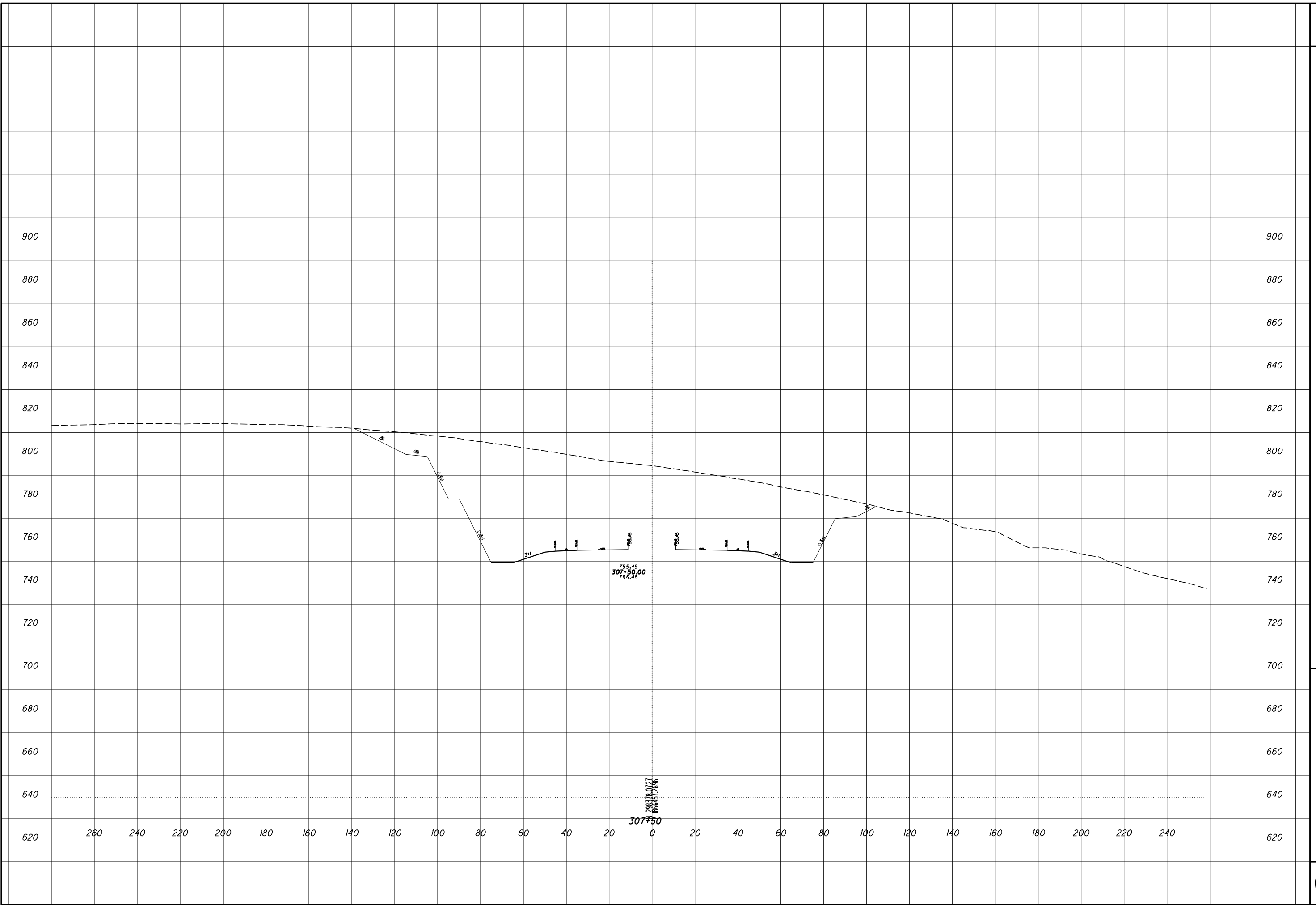
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3
 23

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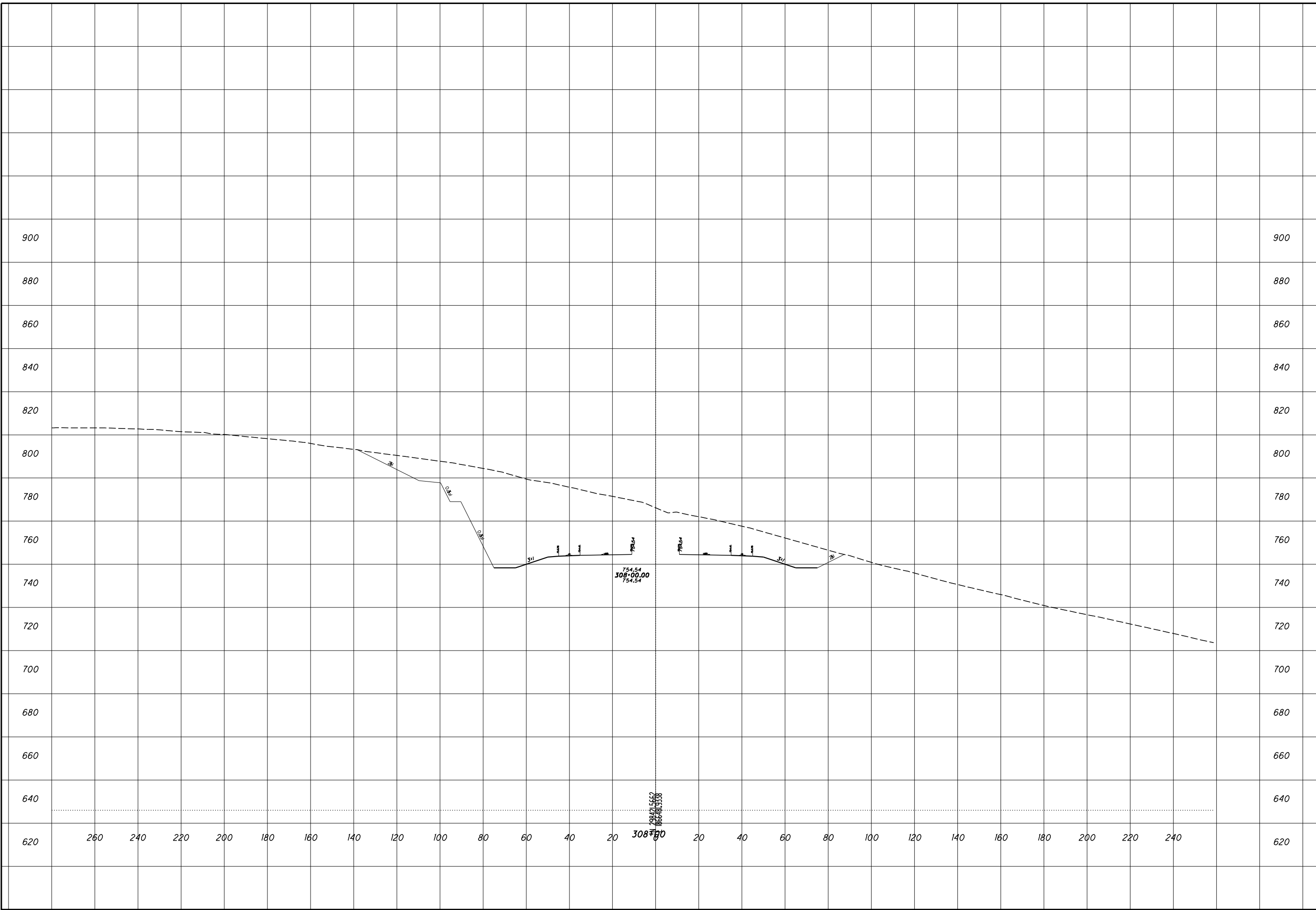
**ROCK CUT SLOPE DESIGN - ROCK CUT 8
STA 307+50**

SCI-823-0.00



ROCK CUT SLOPE DESIGN - ROCK CUT 8
STA 308+00

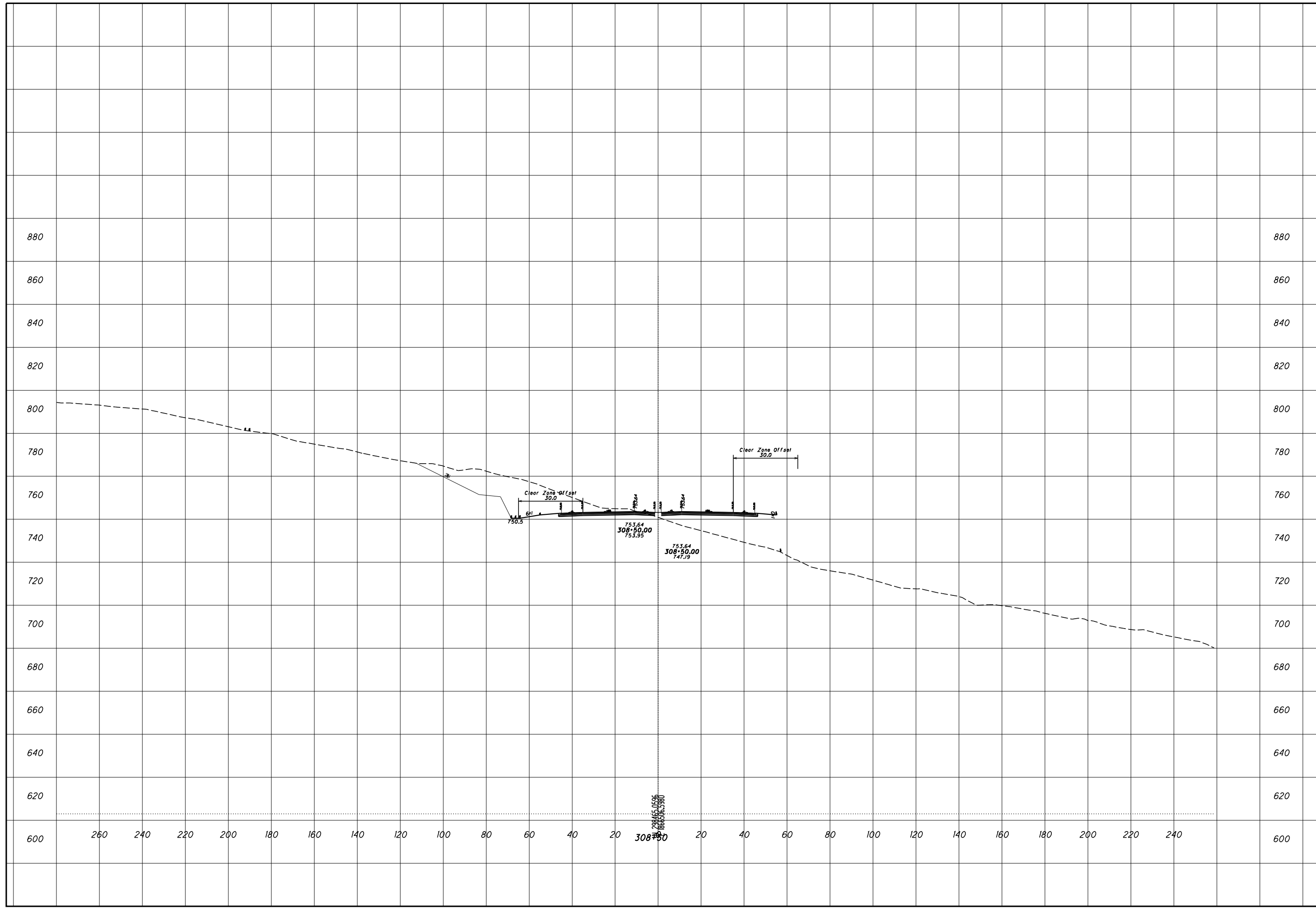
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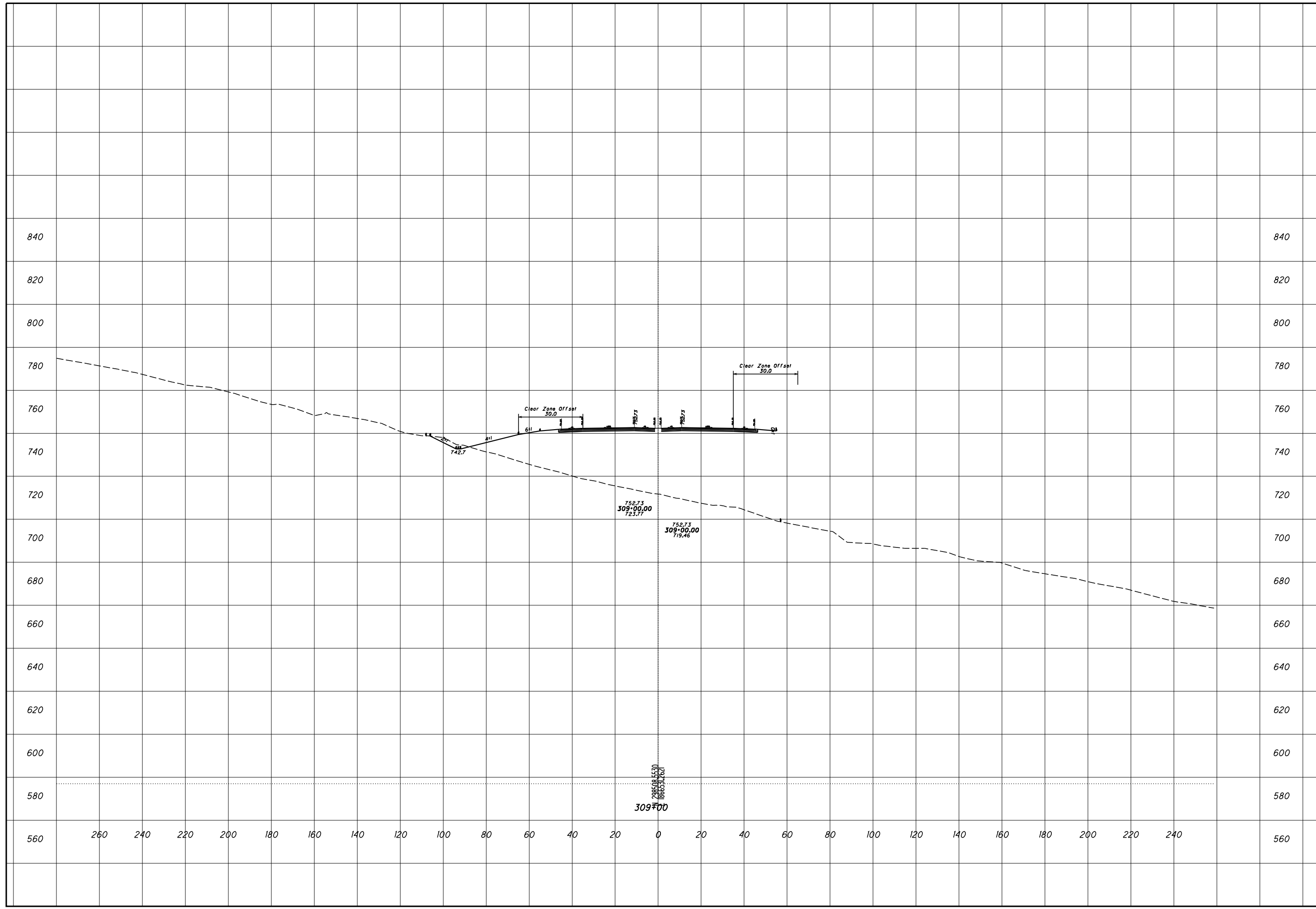
ROCK CUT SLOPE DESIGN - ROCK CUT 8
STA 308+50

SCI-823-0.00



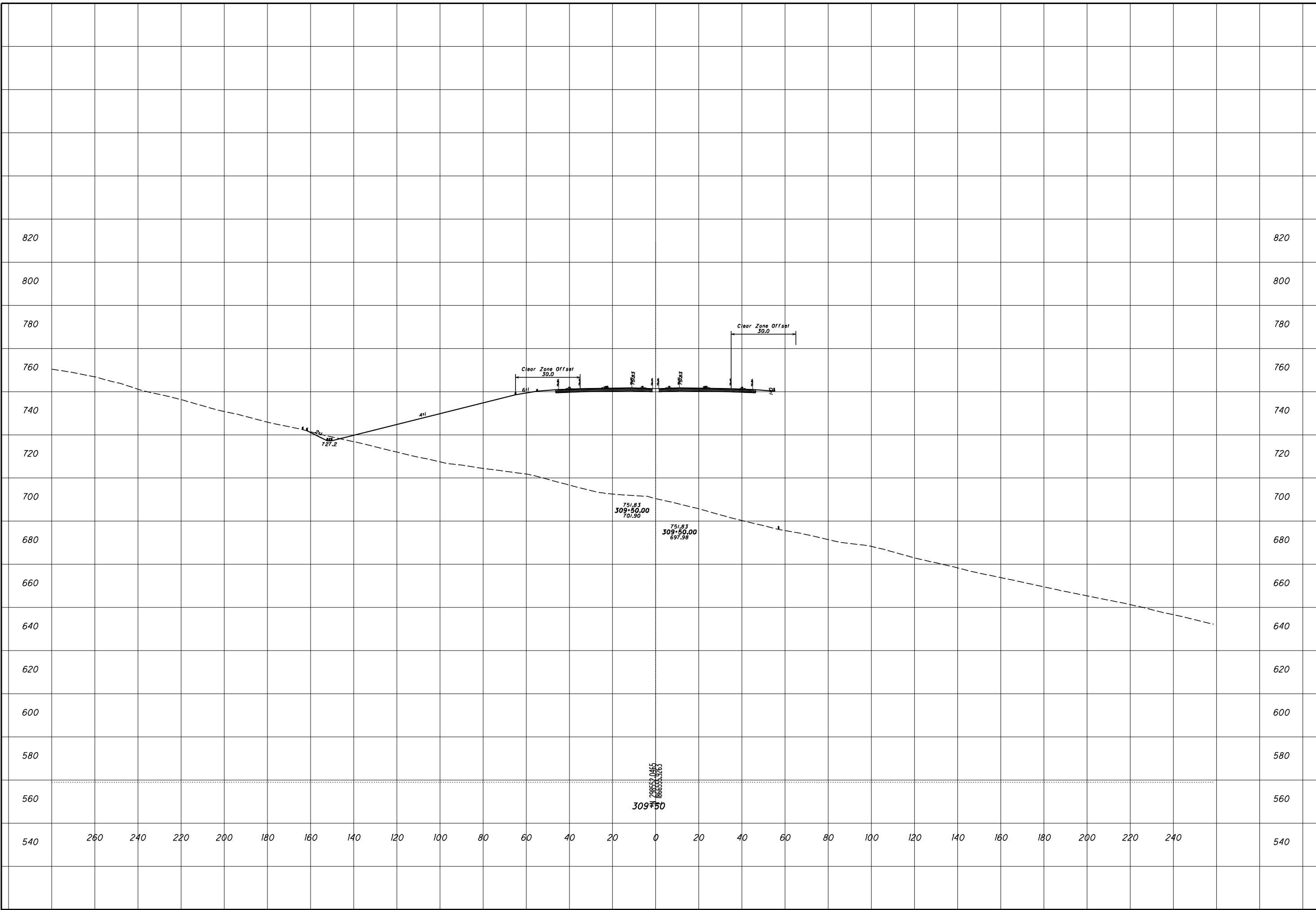
ROCK CUT SLOPE DESIGN - ROCK CUT 8
STA 309+00

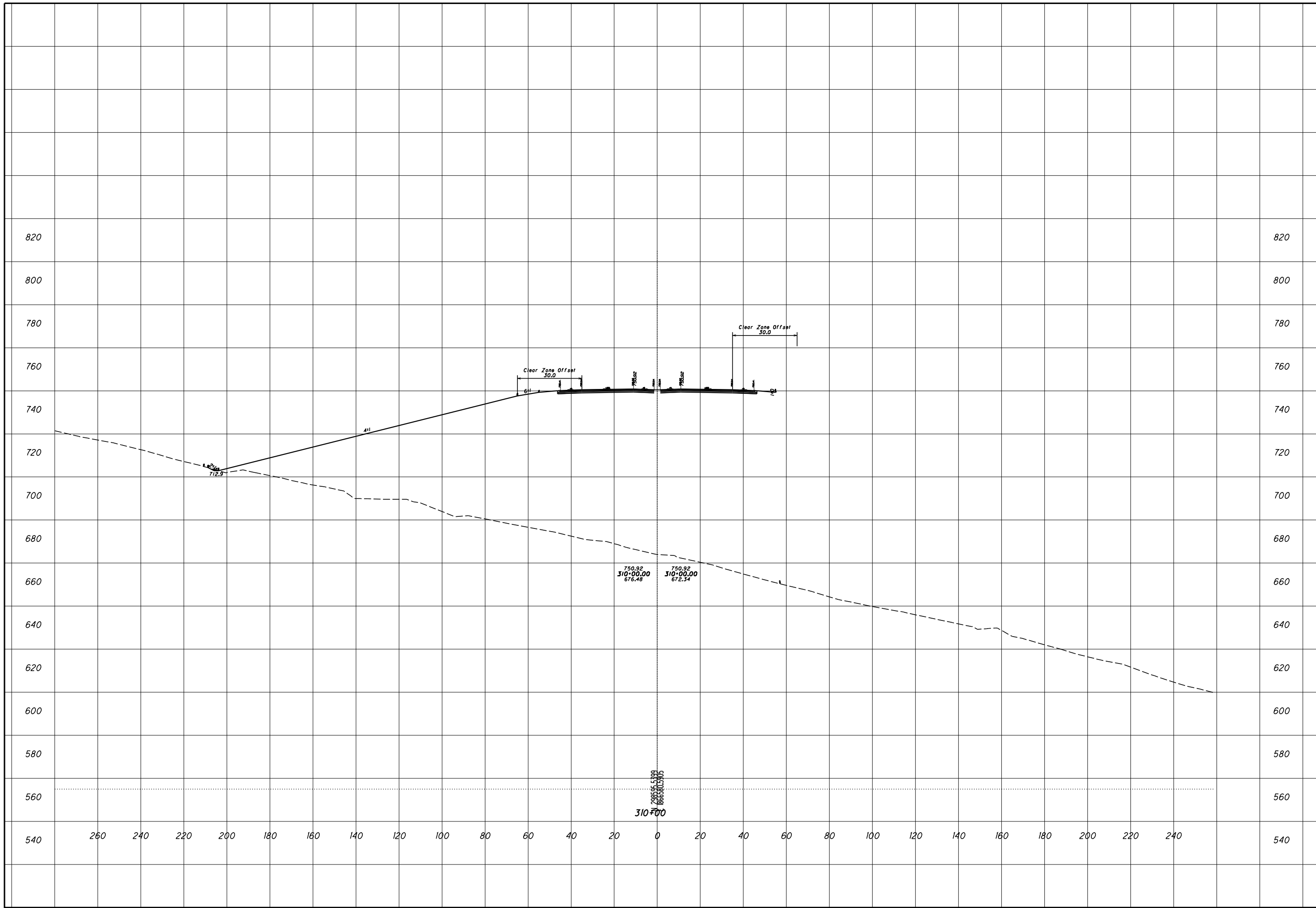
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ROCK CUT SLOPE DESIGN - ROCK CUT 8
STA 309+50

SCI-823-0.00



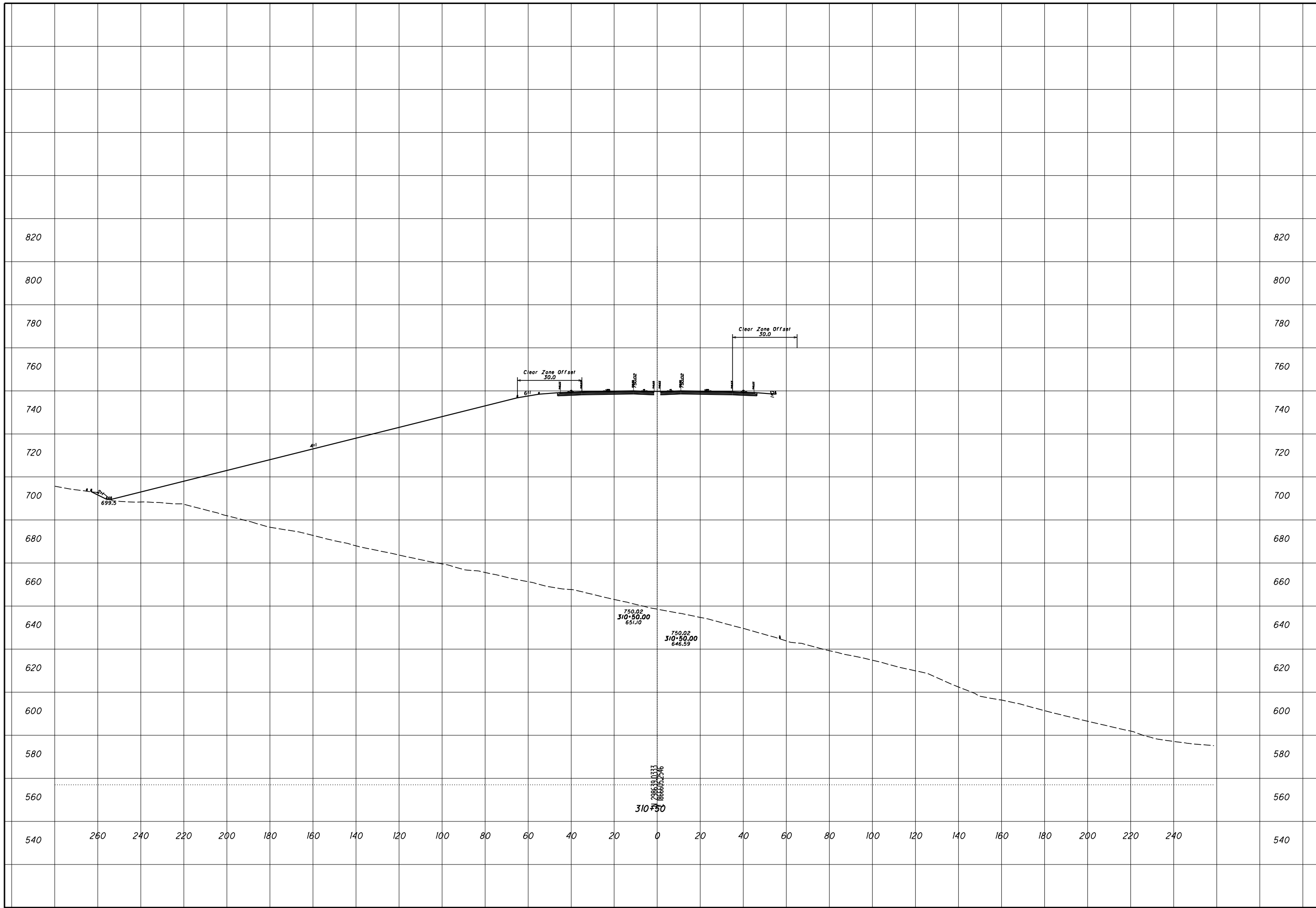


ROCK CUT SLOPE DESIGN - ROCK CUT 8
STA 310+00

SCI-823-0.00

9
23

CHECKED



ROCK CUT SLOPE DESIGN - ROCK CUT 8
STA 310+50

SCI-823-0.00

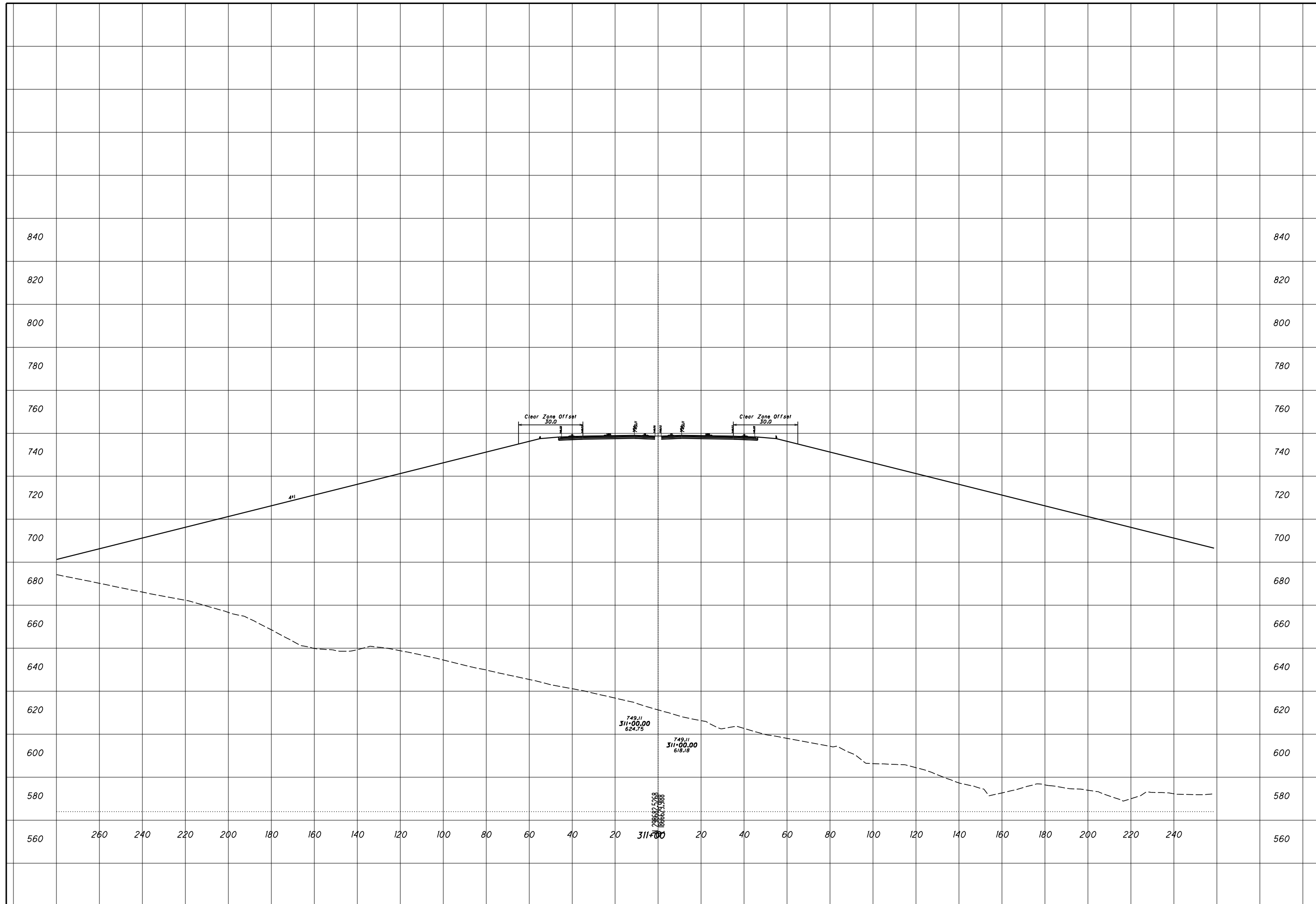
10
23

CHECKED

CHECKED

**ROCK CUT SLOPE DESIGN - ROCK CUT 8
STA 311+00**

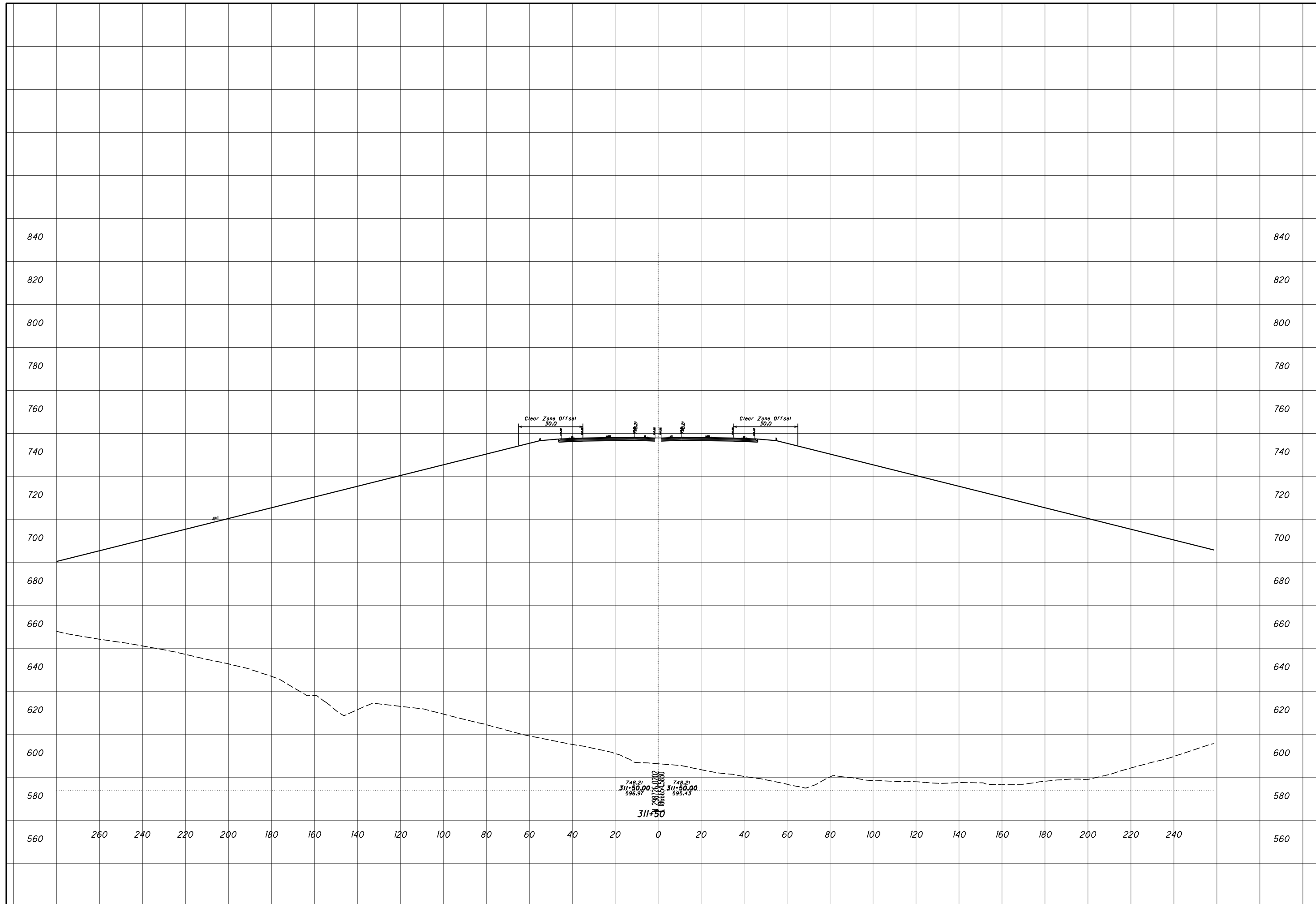
SCI-823-0.00



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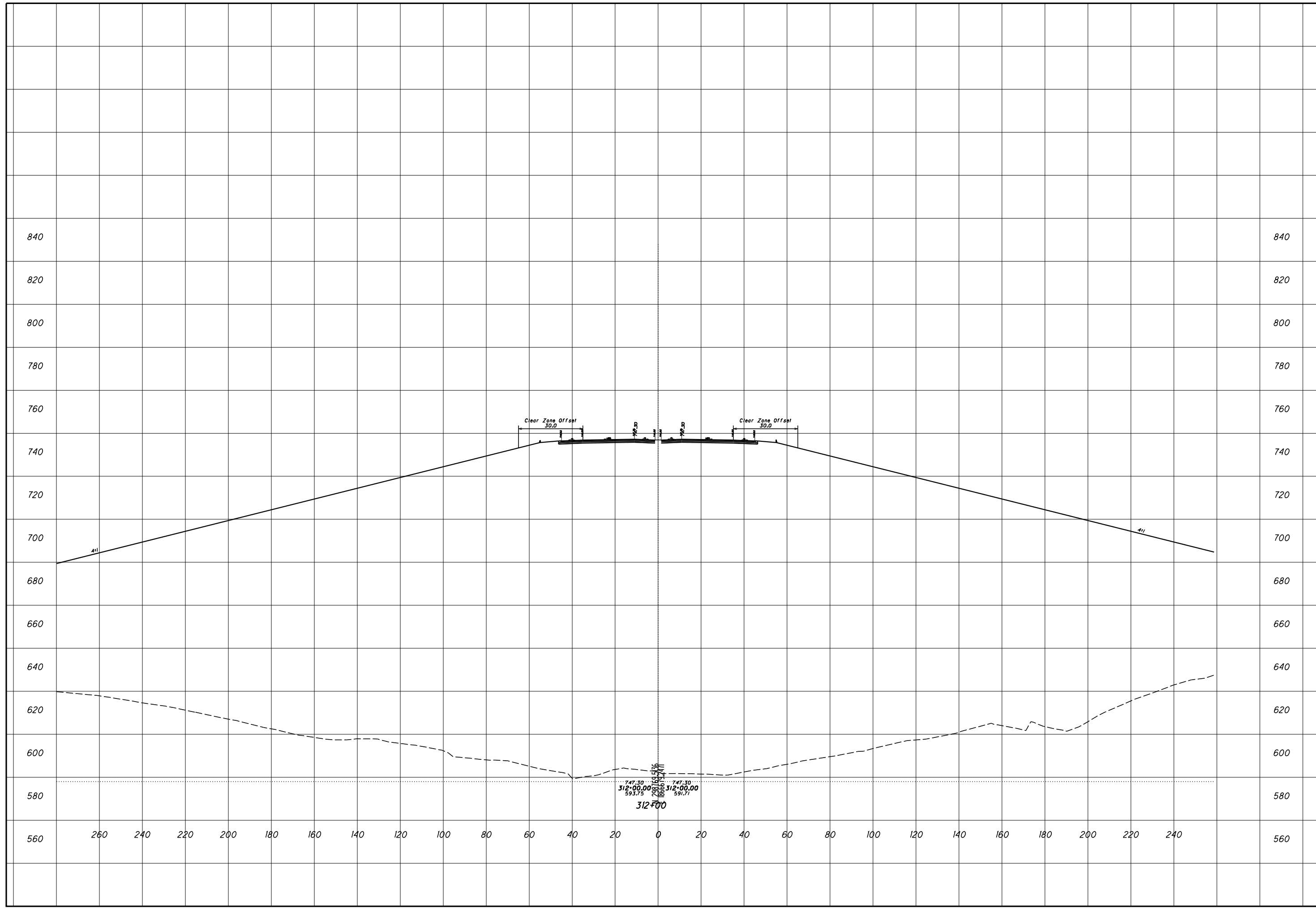
ROCK CUT SLOPE DESIGN - ROCK CUT 8
STA 311+50

SCI-823-0.00



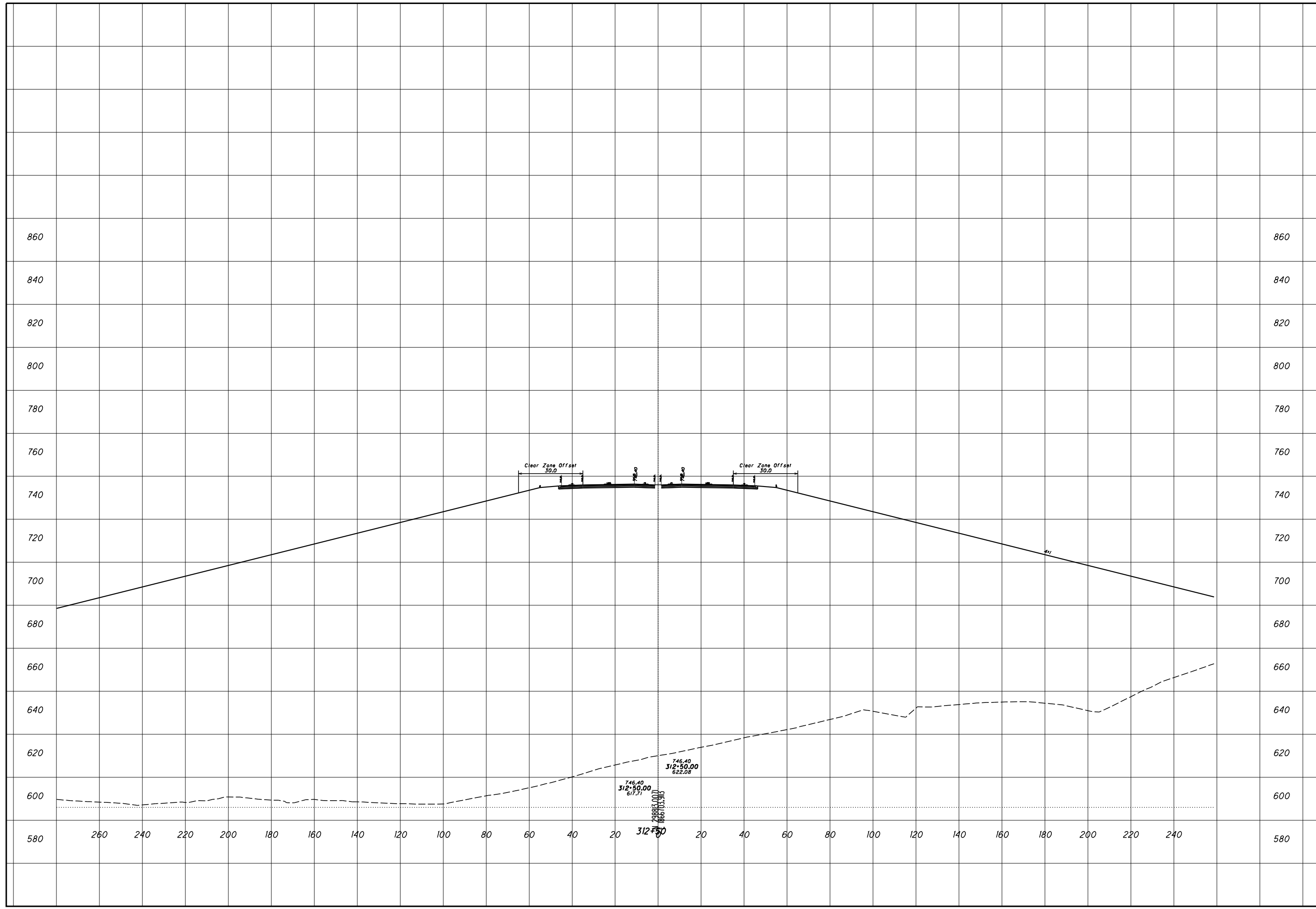
ROCK CUT SLOPE DESIGN - ROCK CUT 8
STA 312+00

SCI-823-0.00



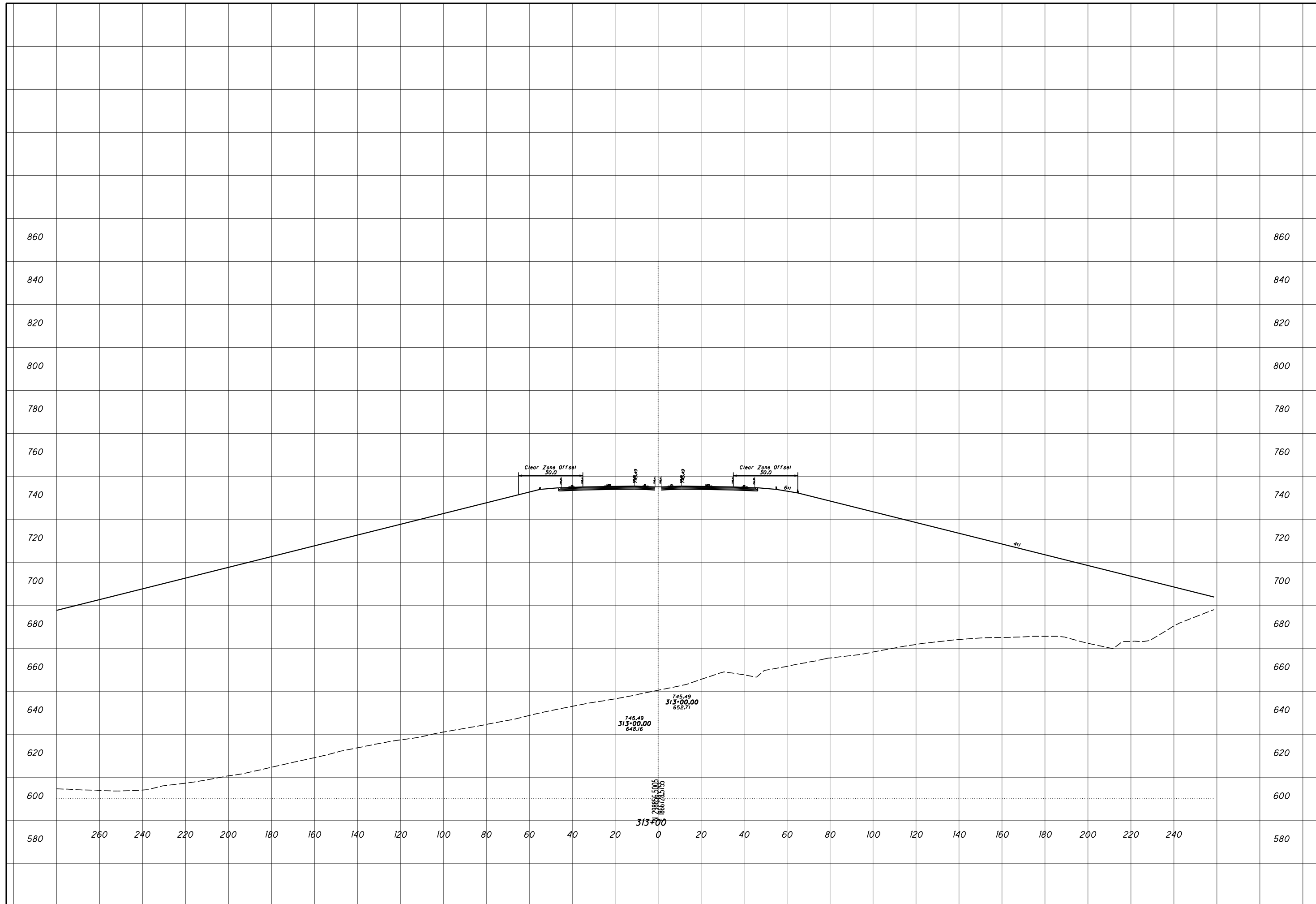
ROCK CUT SLOPE DESIGN - ROCK CUT 8
STA 312+50

SCI-823-0.00



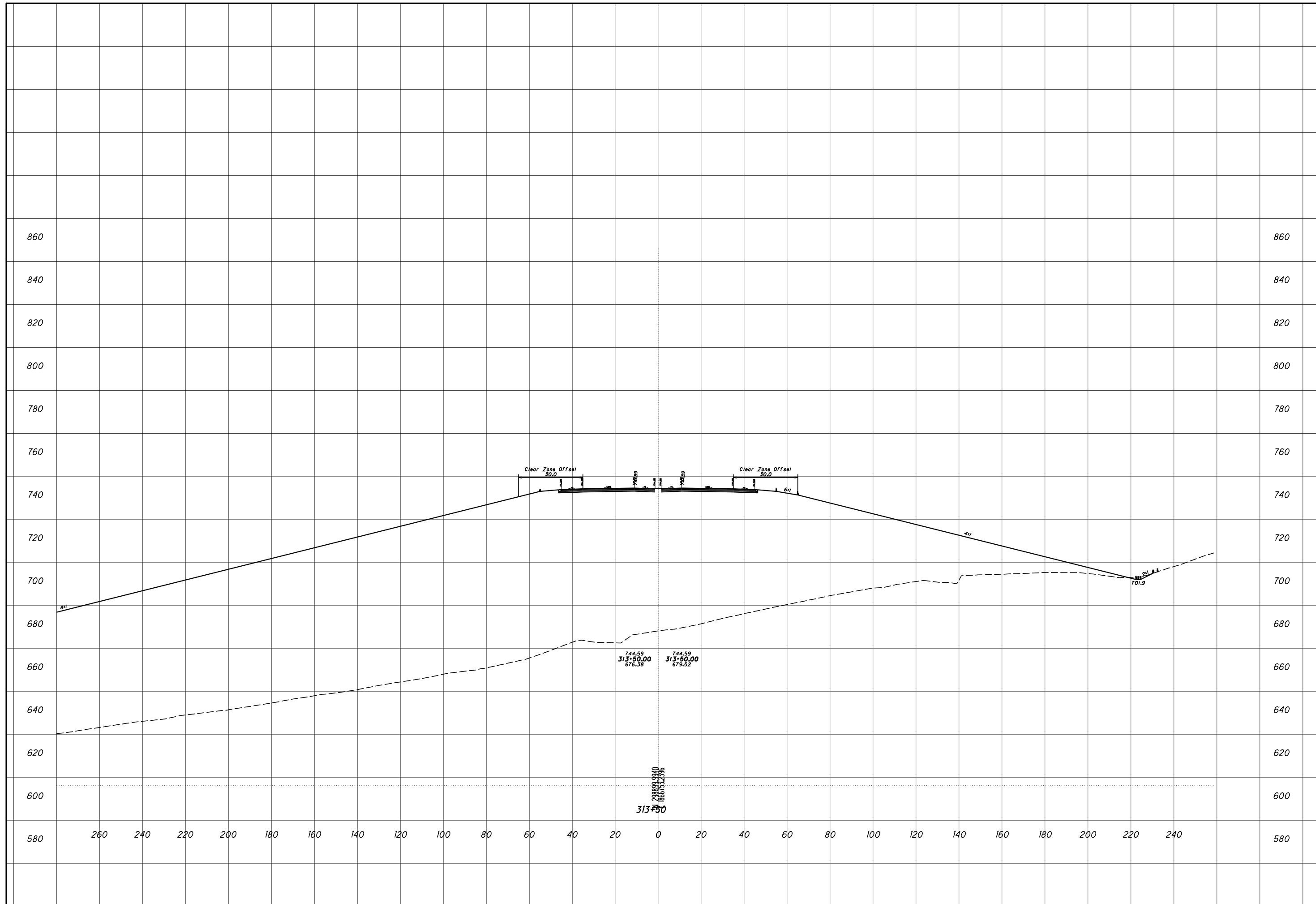
ROCK CUT SLOPE DESIGN - ROCK CUT 8
STA 313+00

SCI-823-0.00



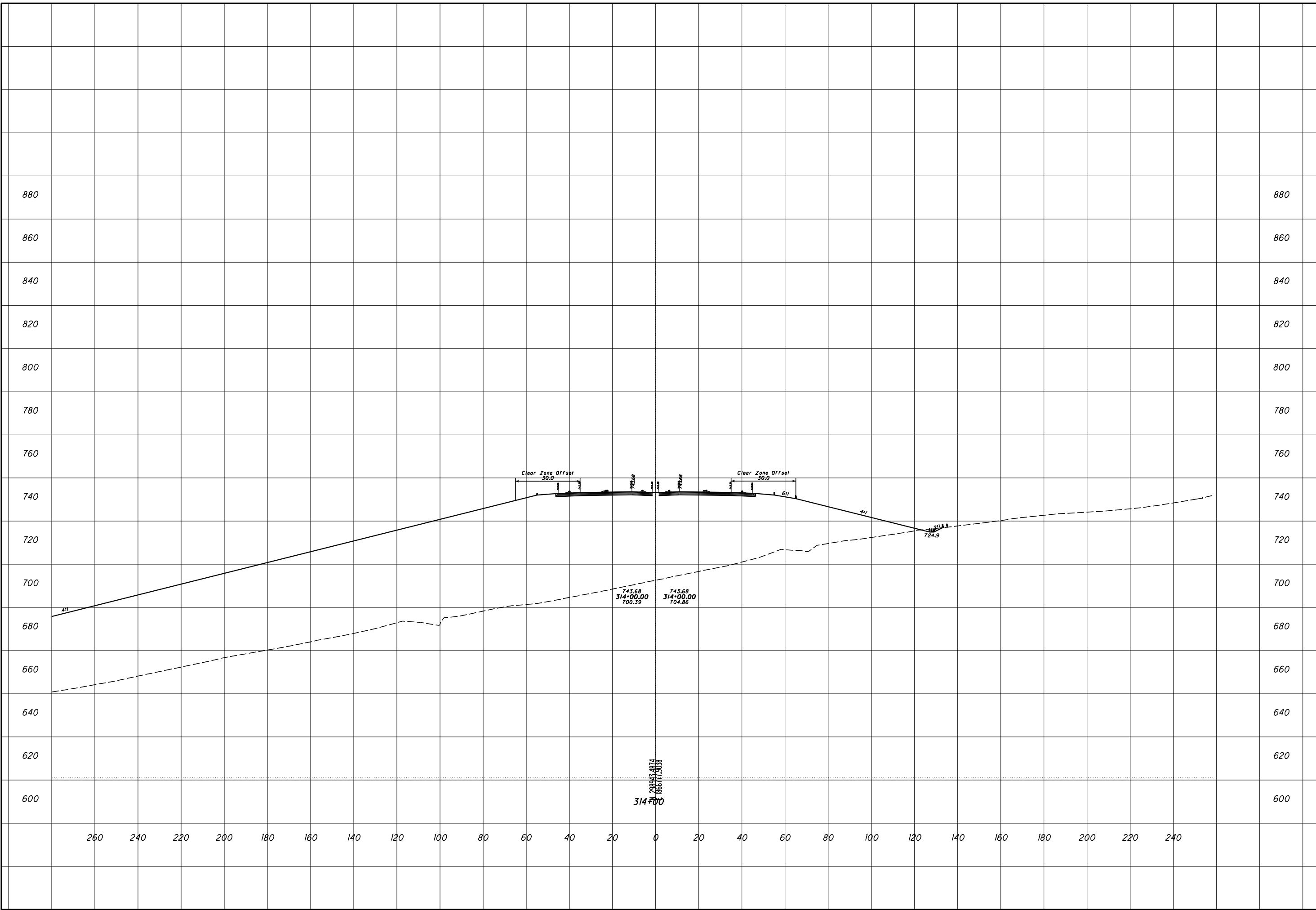
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STA 313+50

SCI-823-0.00



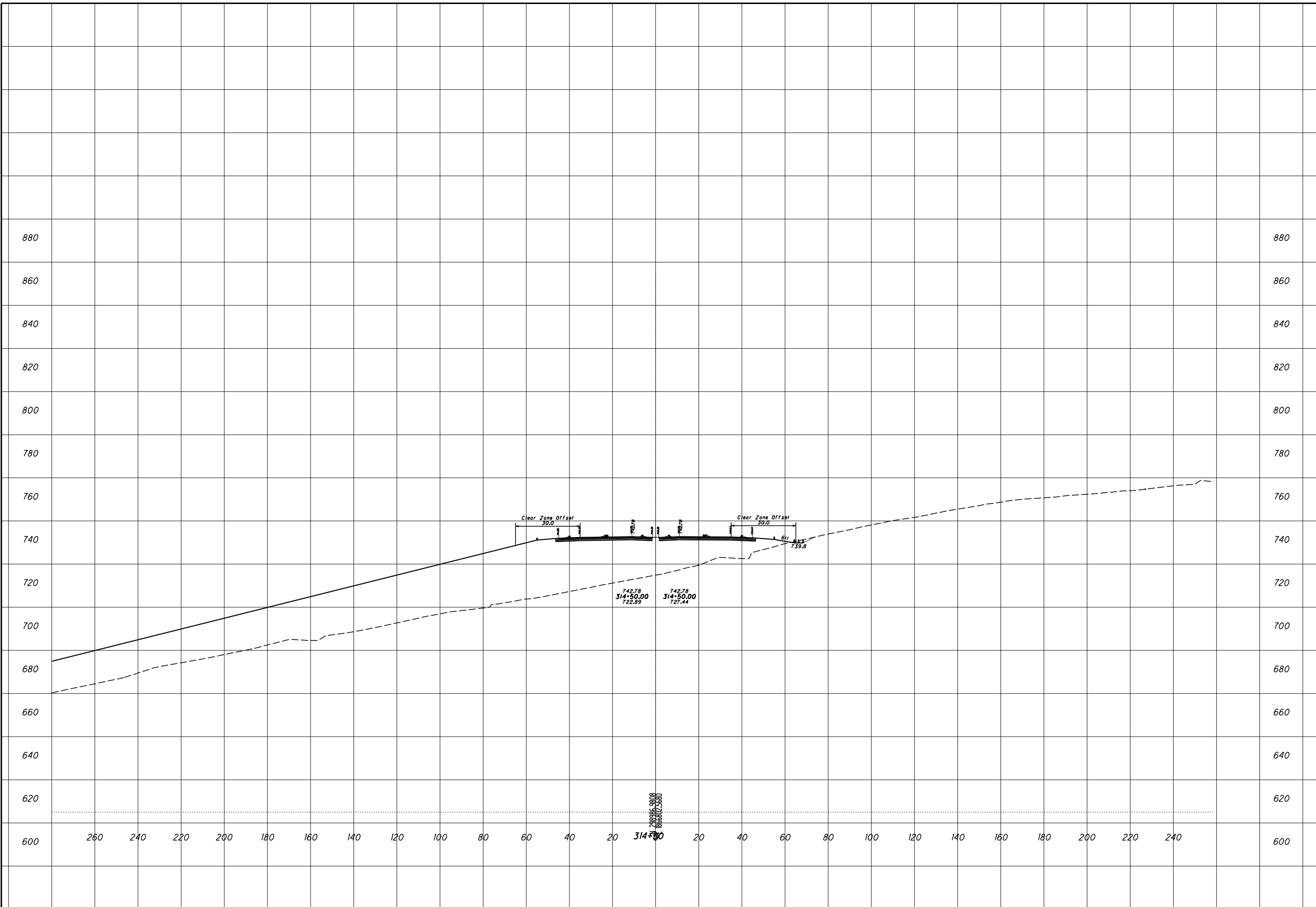
ROCK CUT SLOPE DESIGN - ROCK CUT 8
STA 314+00

SCI-823-0.00



ROCK CUT SLOPE DESIGN - ROCK CUT 8
STA 314+50

SCI-823-0.00



288.98
166.02
314+50.00

Clear Zone Offset
30.0

Clear Zone Offset
30.0

742.78
314+50.00
722.89

742.78
314+50.00
727.44

61

739.8

880

880

860

860

840

840

820

820

800

800

780

780

760

760

740

740

720

720

700

700

680

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660

660

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600

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240

220

200

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160

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314+50.00

20

40

60

80

100

120

140

160

180

200

220

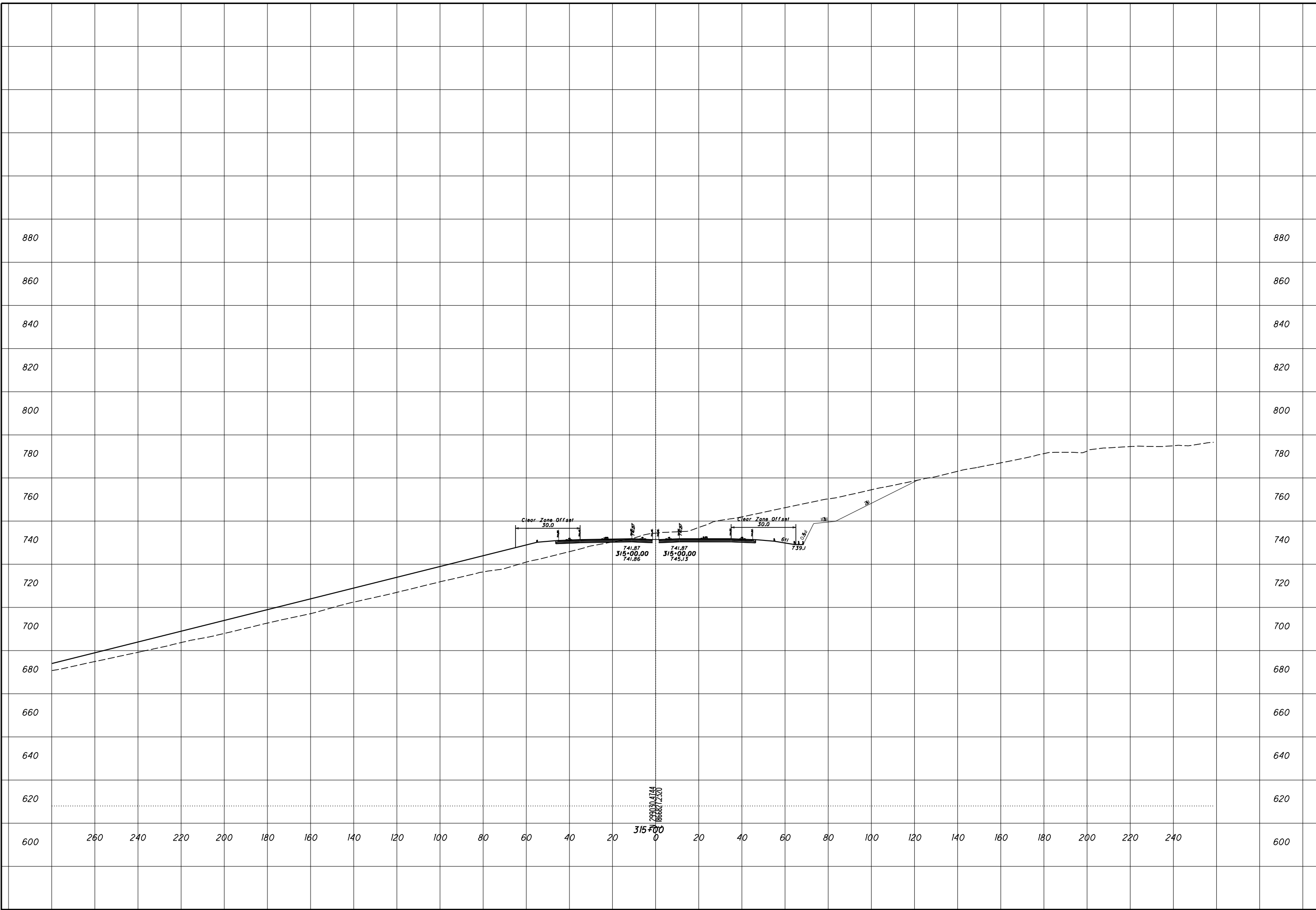
240

600

600

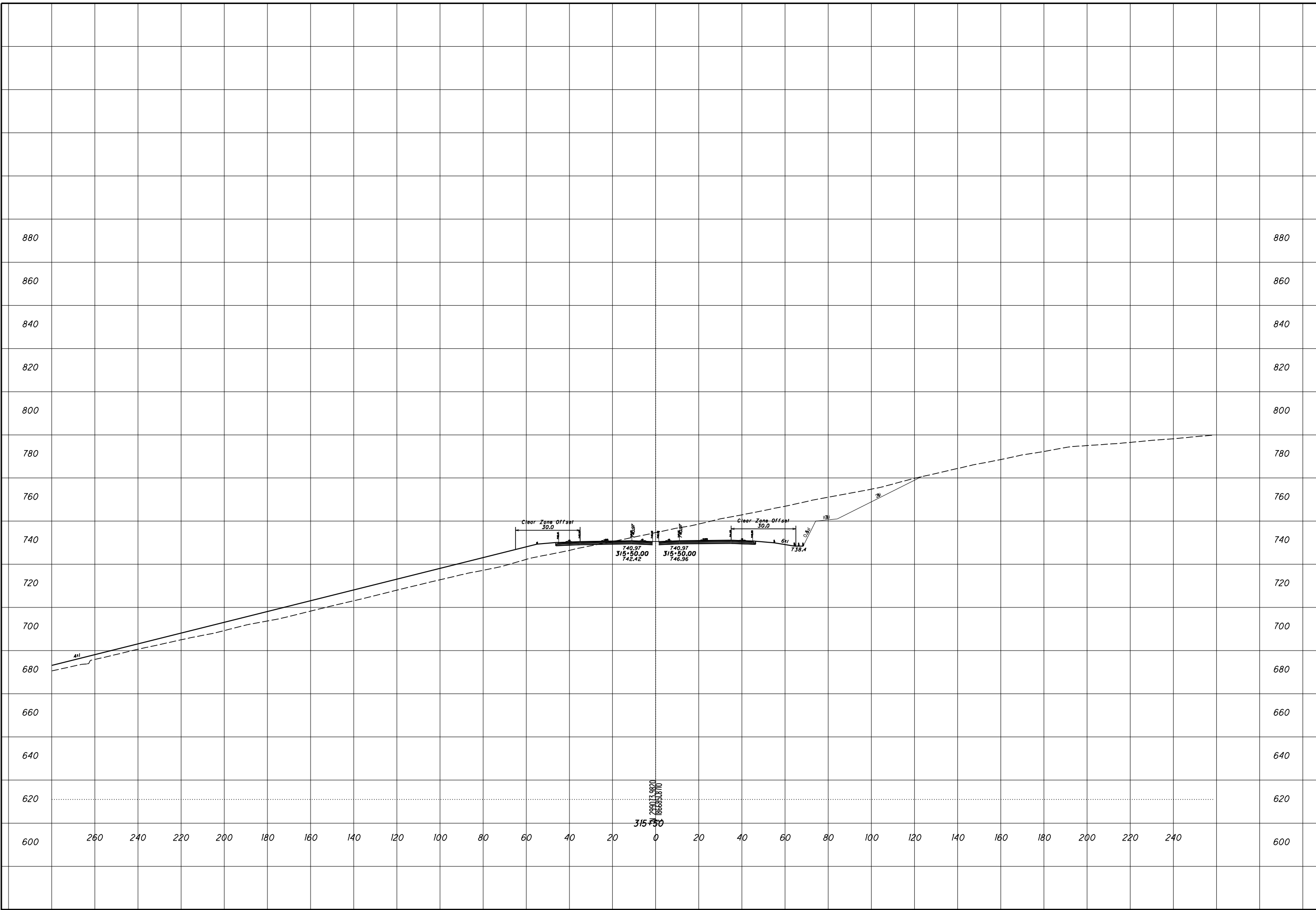
ROCK CUT SLOPE DESIGN - ROCK CUT 8
STA 315+00

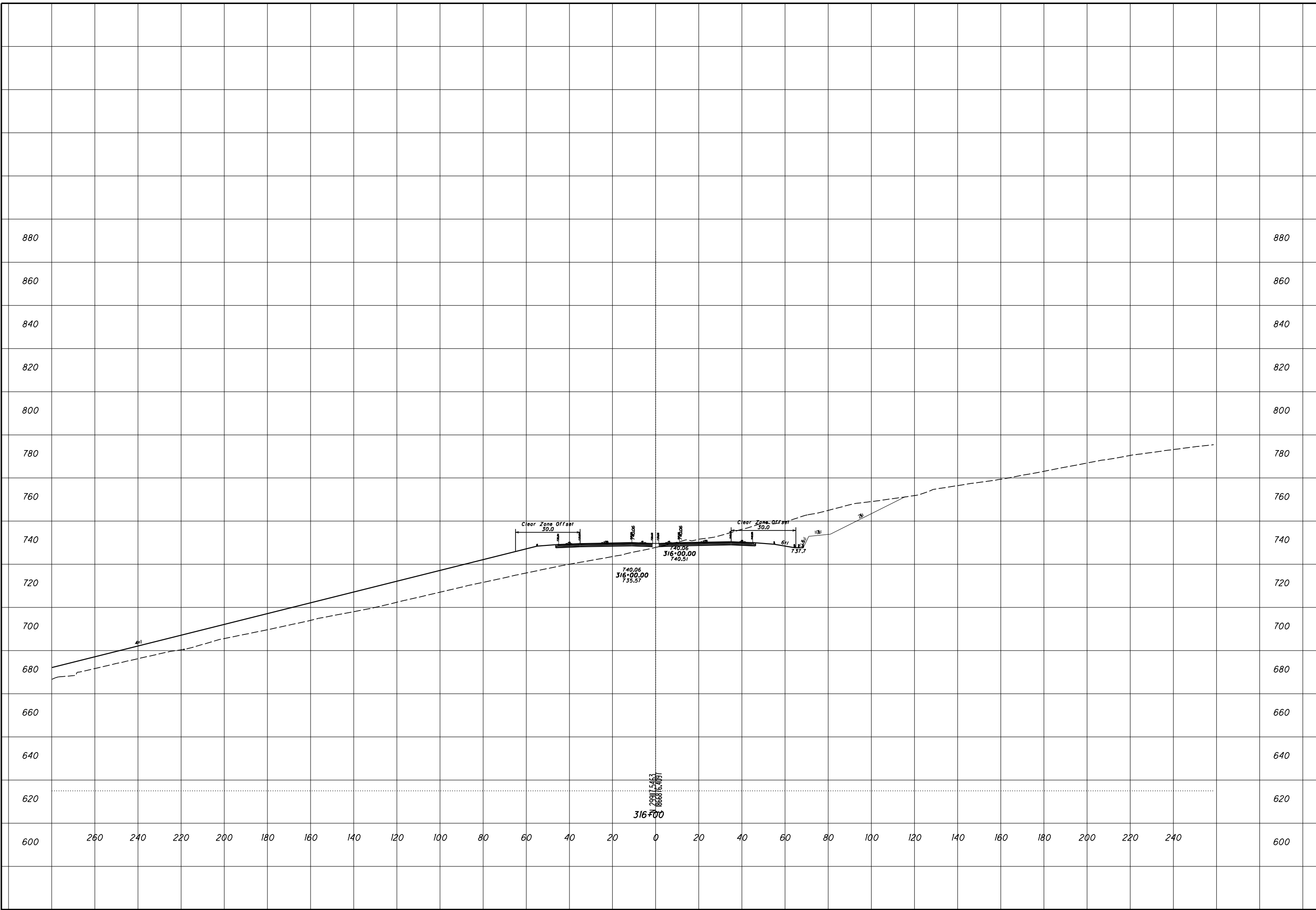
SCI-823-0.00



ROCK CUT SLOPE DESIGN - ROCK CUT 8
STA 315+50

SCI-823-0.00





ROCK CUT SLOPE DESIGN - ROCK CUT 8
STA 316+00

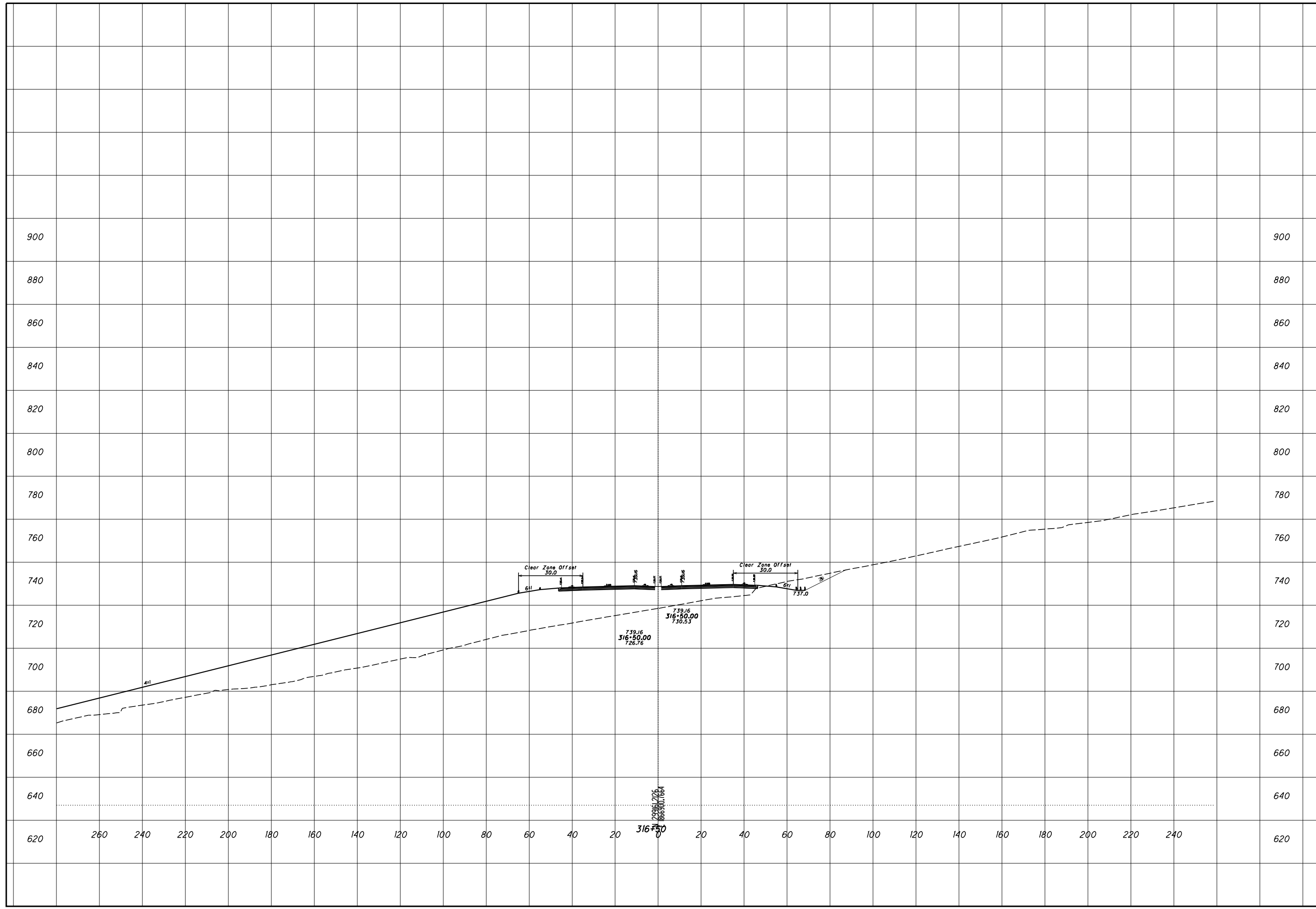
SCI-823-0.00

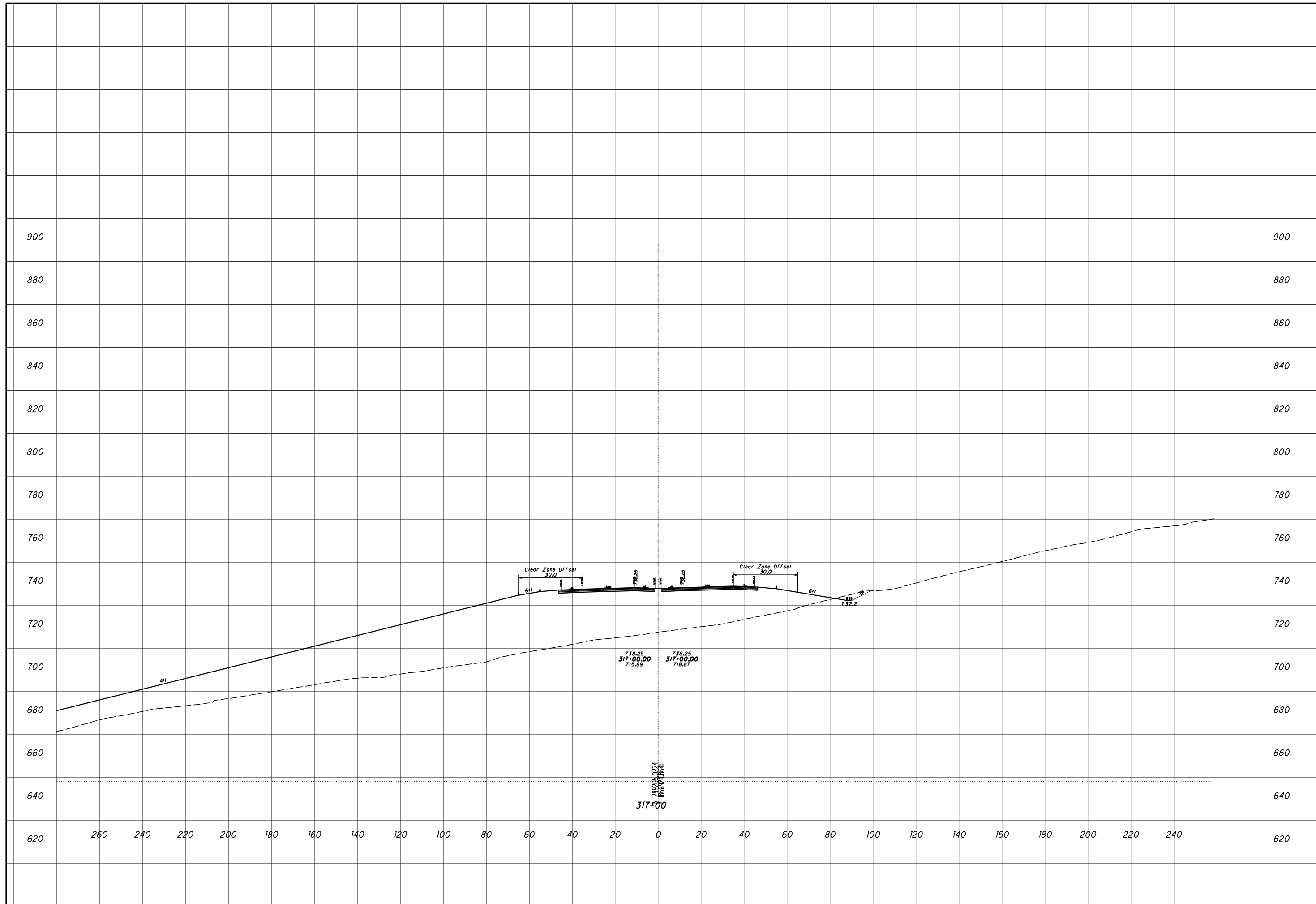
21
23

CHECKED

ROCK CUT SLOPE DESIGN - ROCK CUT 8
STA 316+50

SCI-823-0.00





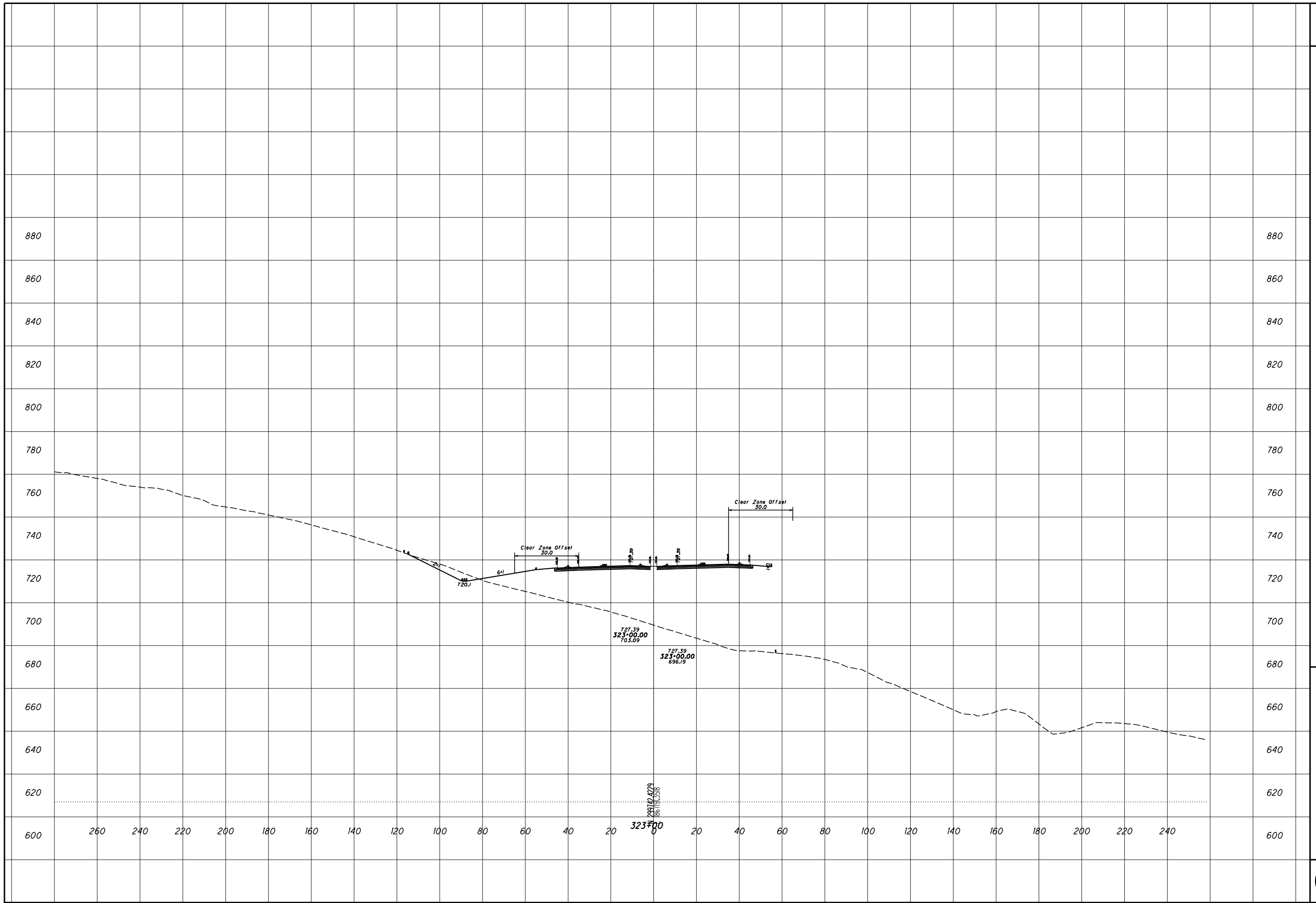
CHECKED

**ROCK CUT SLOPE DESIGN - ROCK CUT 8
STA 317+00**

SCI-823-0.00

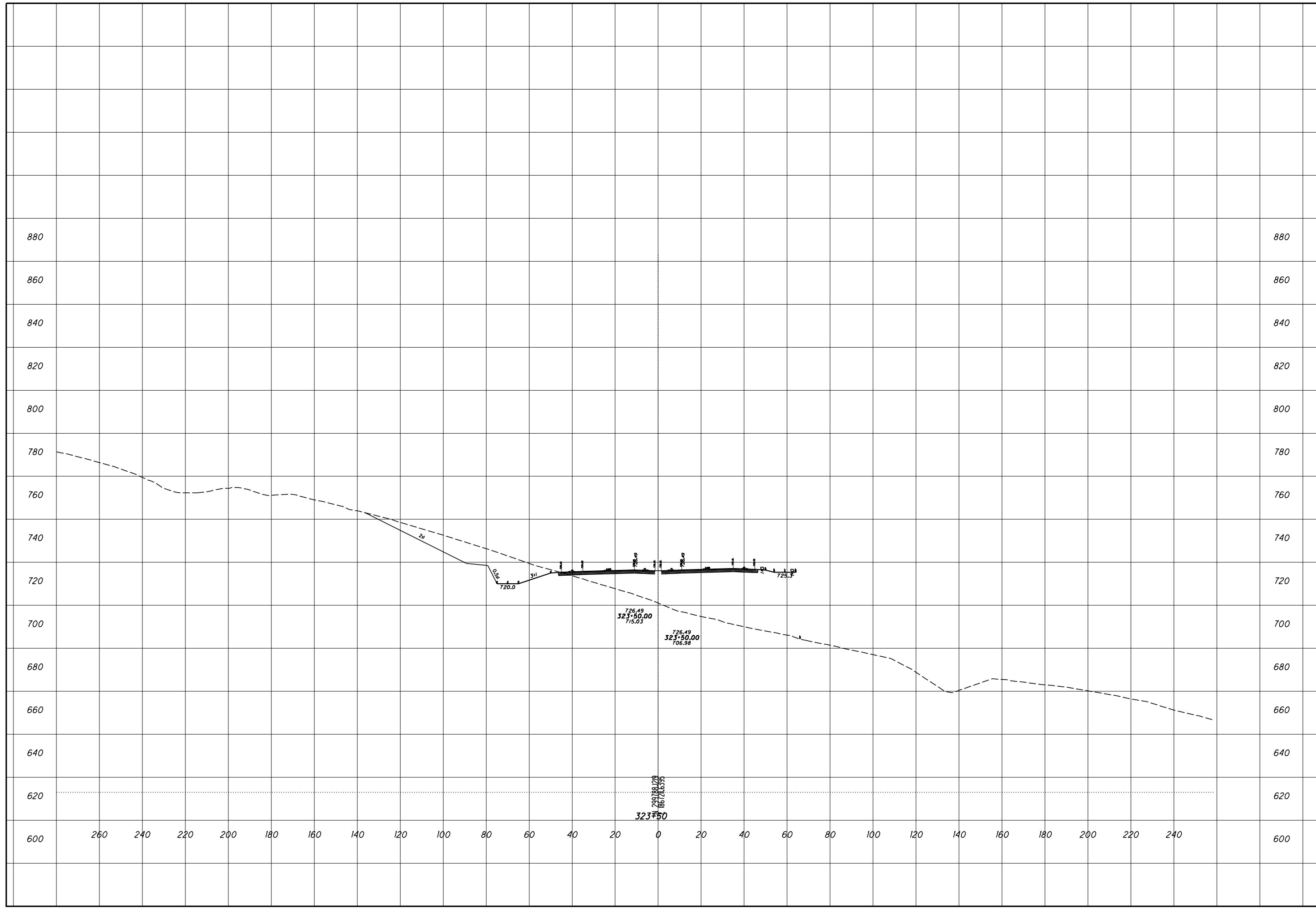
ROCK CUT SLOPE DESIGN - ROCK CUT 9
STA 323+00

SCI-823-0.00



ROCK CUT SLOPE DESIGN - ROCK CUT 9
STA 323+50

SCI-823-0.00



CHECKED

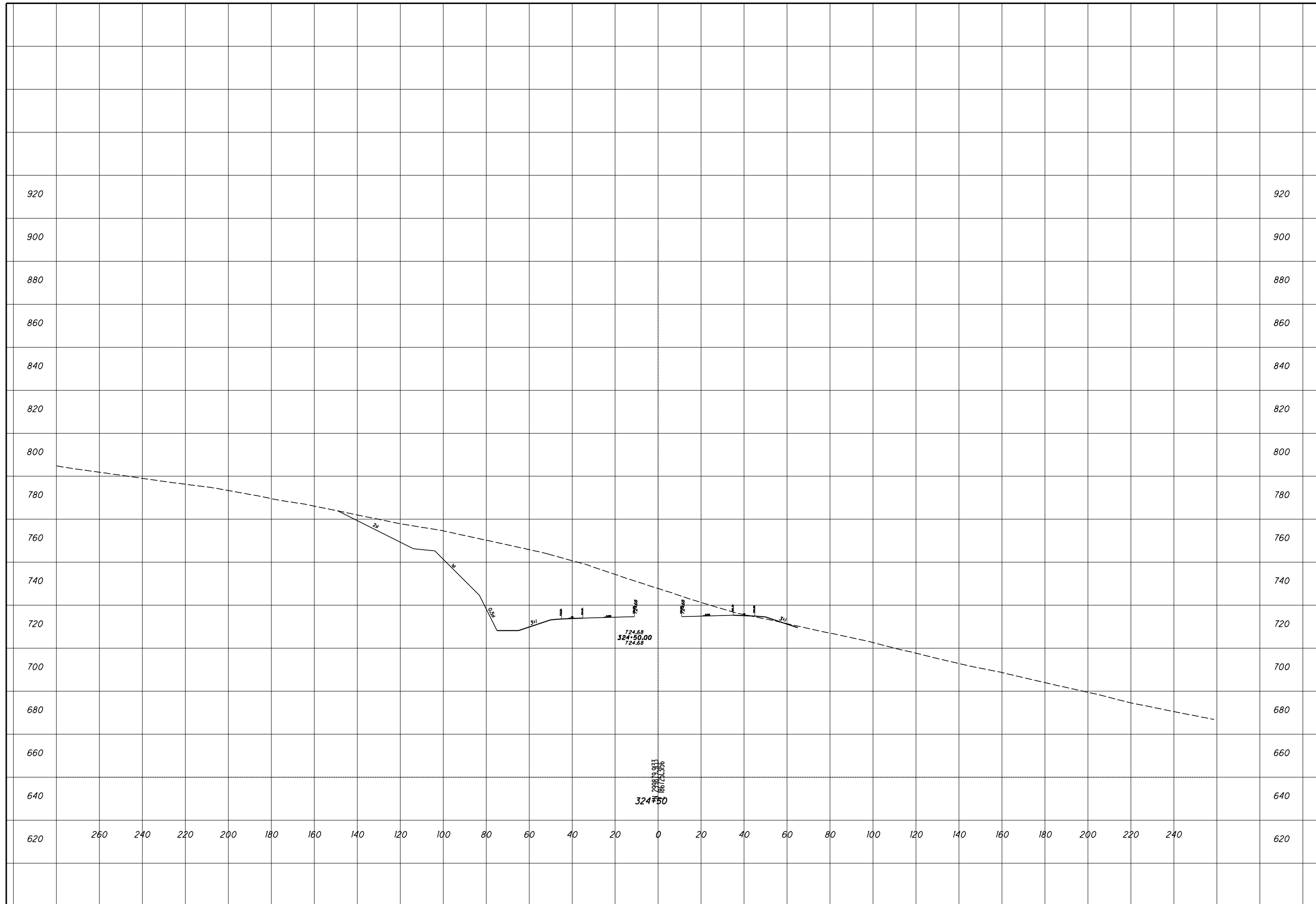
ROCK CUT SLOPE DESIGN - ROCK CUT 9
STA 324+00

SCI-823-0.00



**ROCK CUT SLOPE DESIGN - ROCK CUT 9
STA 324+50**

SCI-823-0.00



ROCK CUT SLOPE DESIGN - ROCK CUT 9
STA 325+00

SCI-823-0.00



ROCK CUT SLOPE DESIGN - ROCK CUT 9
STA 325+50

SCI-823-0.00



**ROCK CUT SLOPE DESIGN - ROCK CUT 9
STA 326+00**

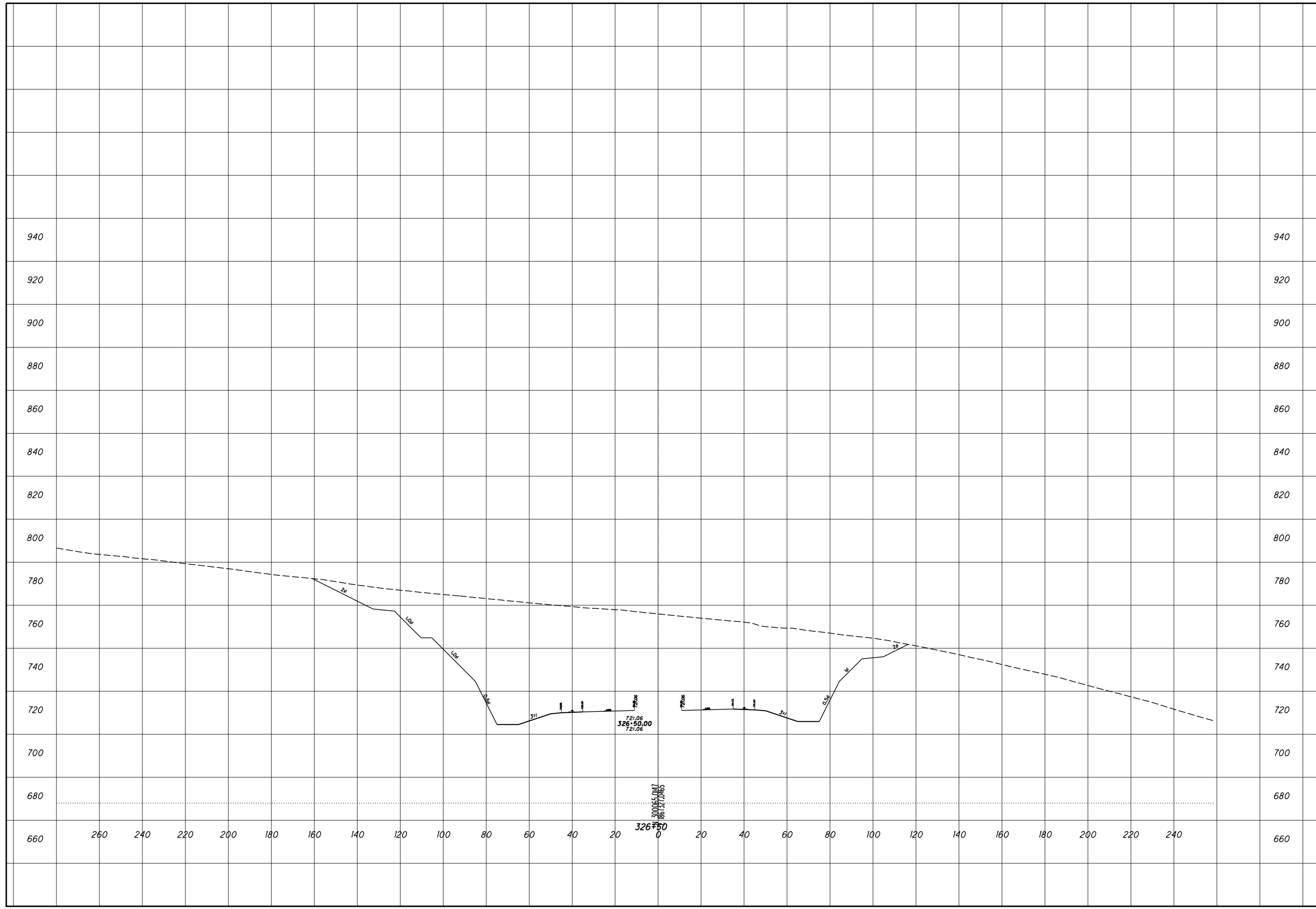
SCI-823-0.00



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ROCK CUT SLOPE DESIGN - ROCK CUT 9
STA 326+50

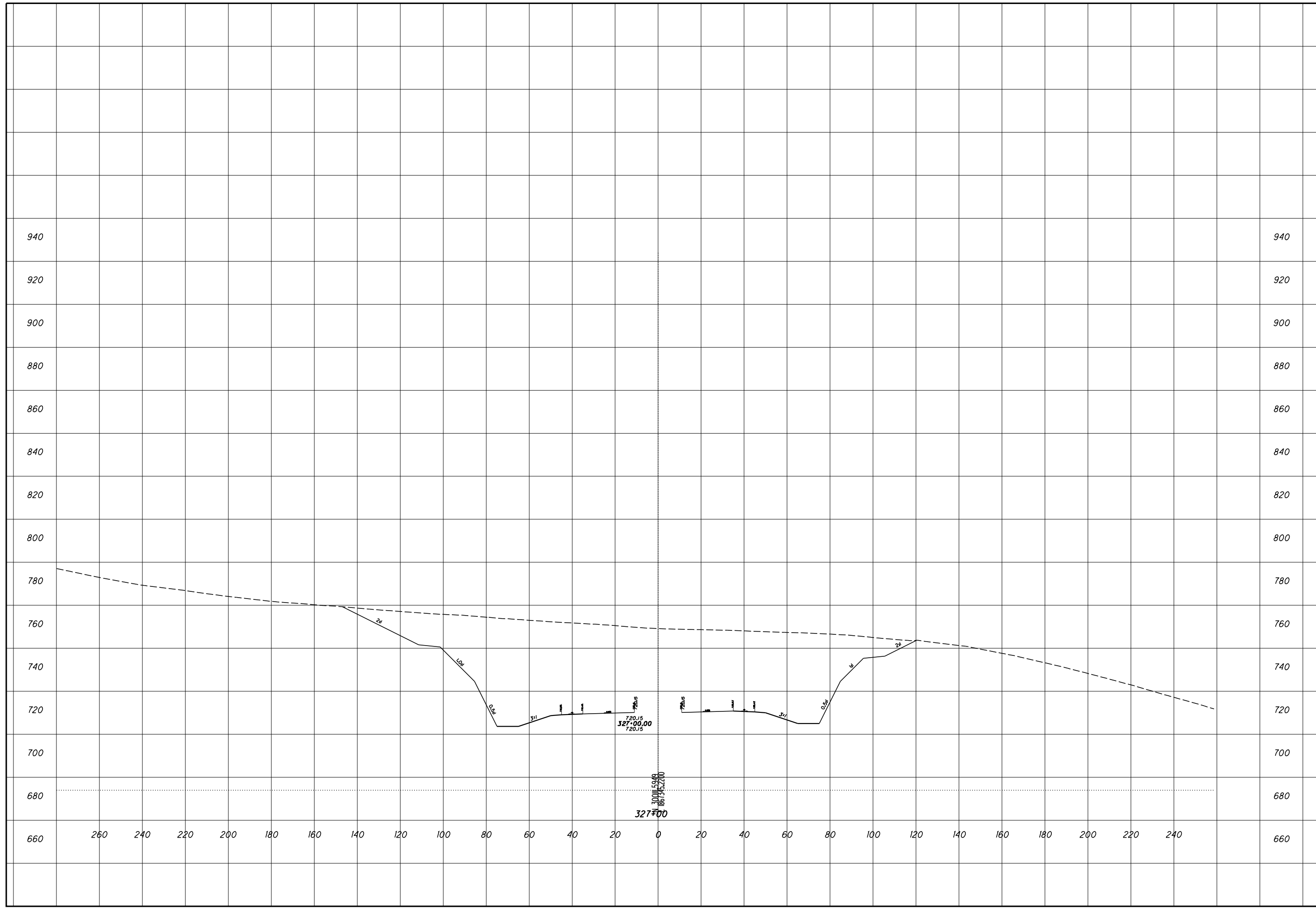
SCI-823-0.00



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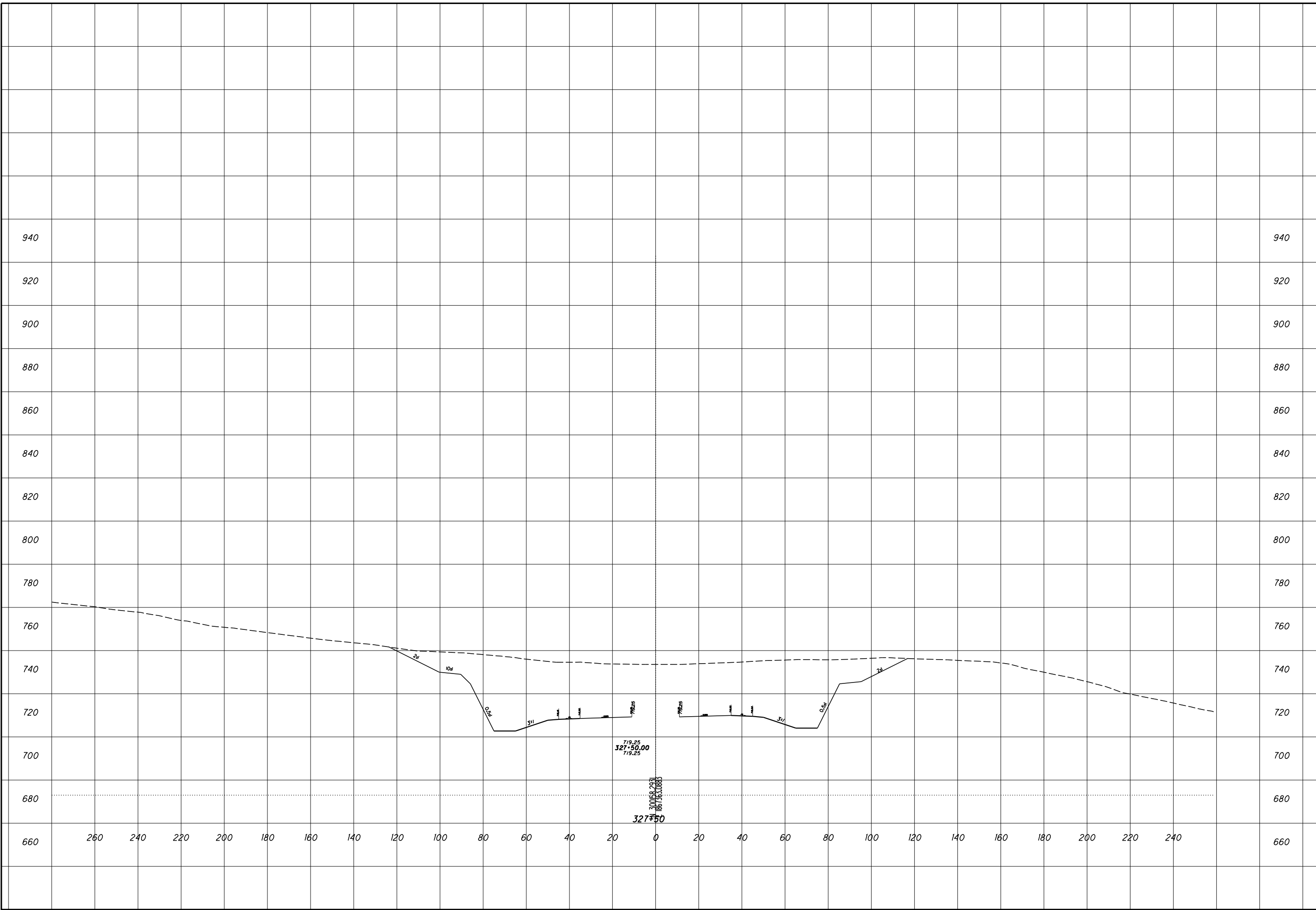
**ROCK CUT SLOPE DESIGN - ROCK CUT 9
STA 327+00**

SCI-823-0.00



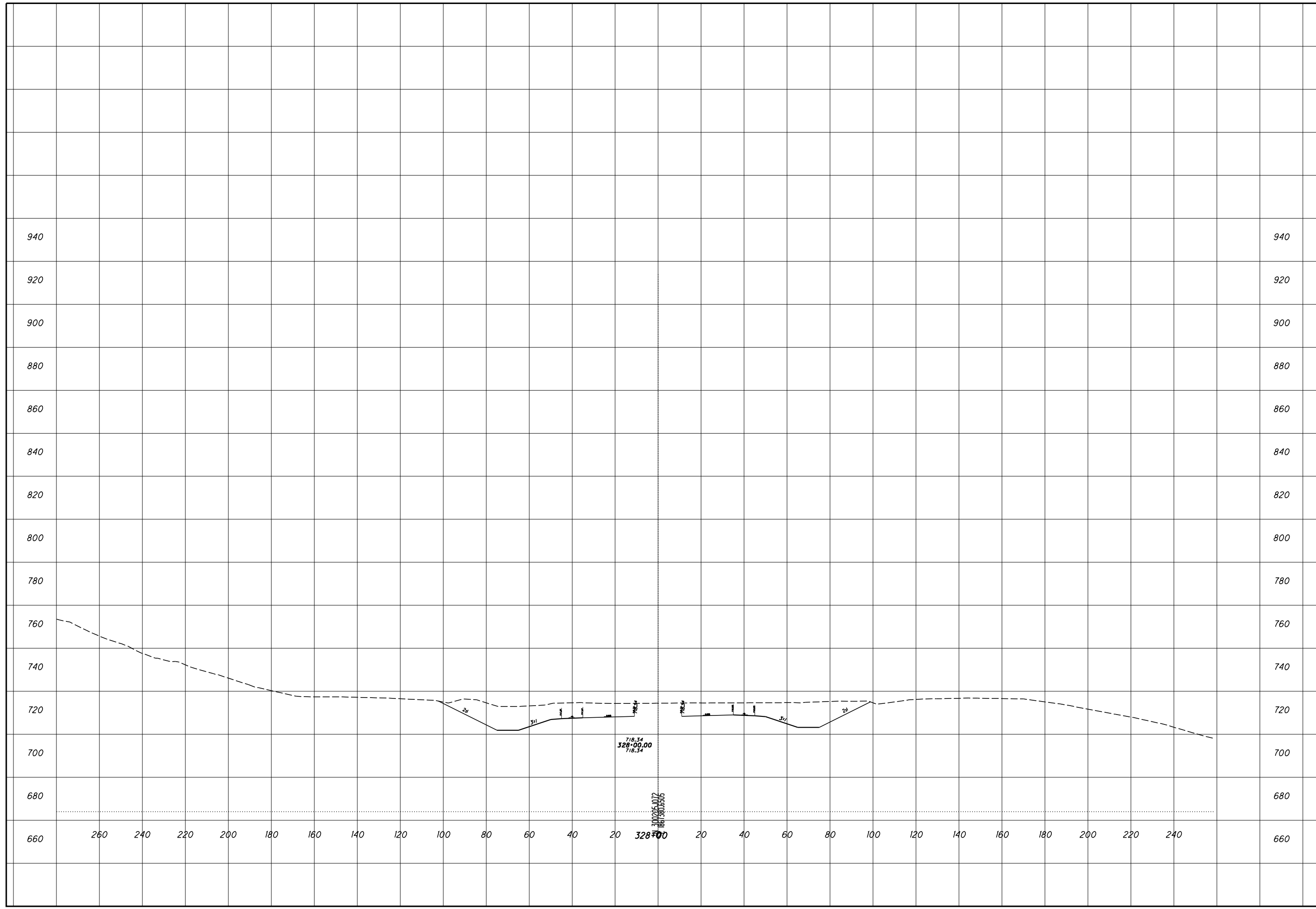
ROCK CUT SLOPE DESIGN - ROCK CUT 9
STA 327+50

SCI-823-0.00



ROCK CUT SLOPE DESIGN - ROCK CUT 9
STA 328+00

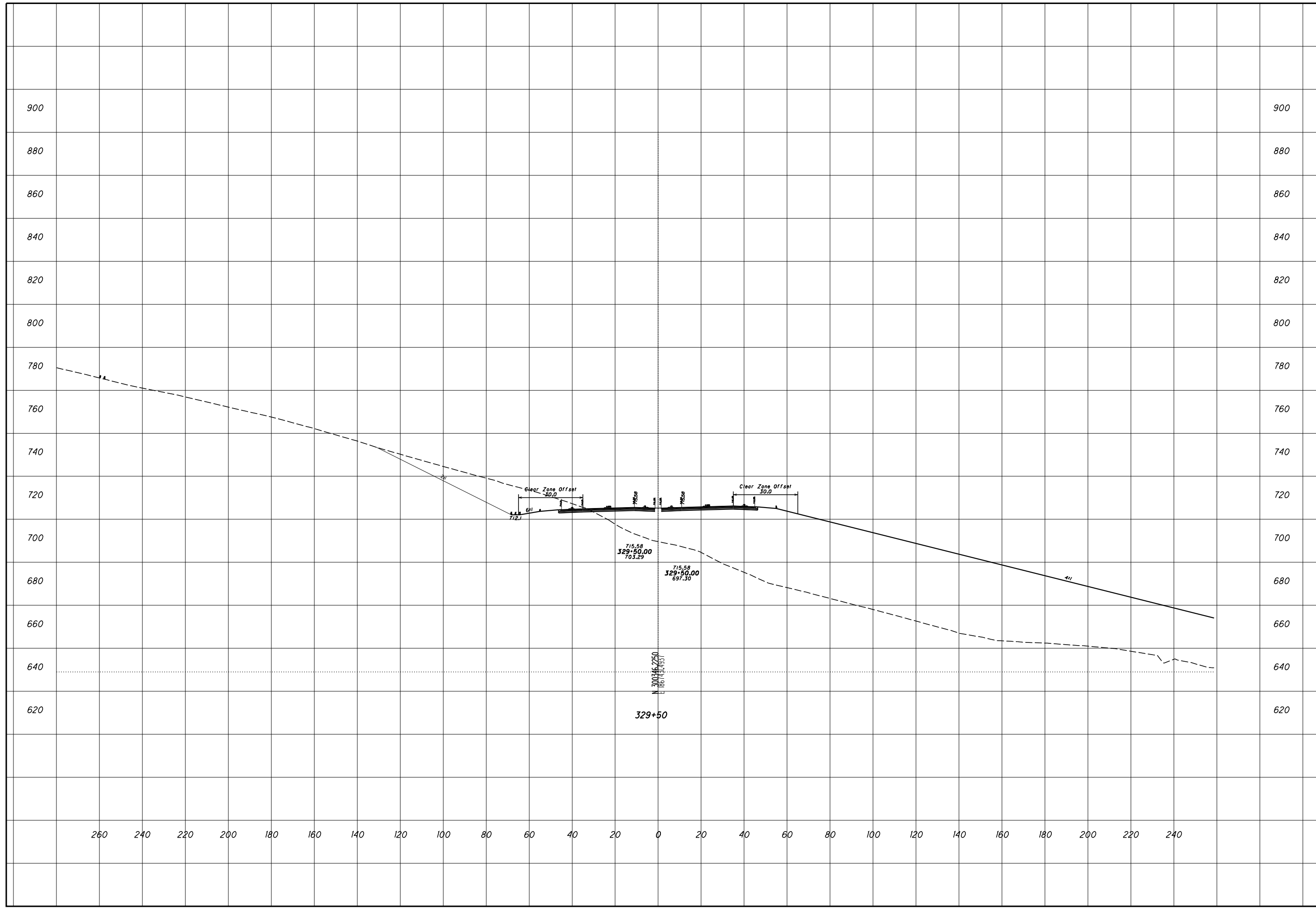
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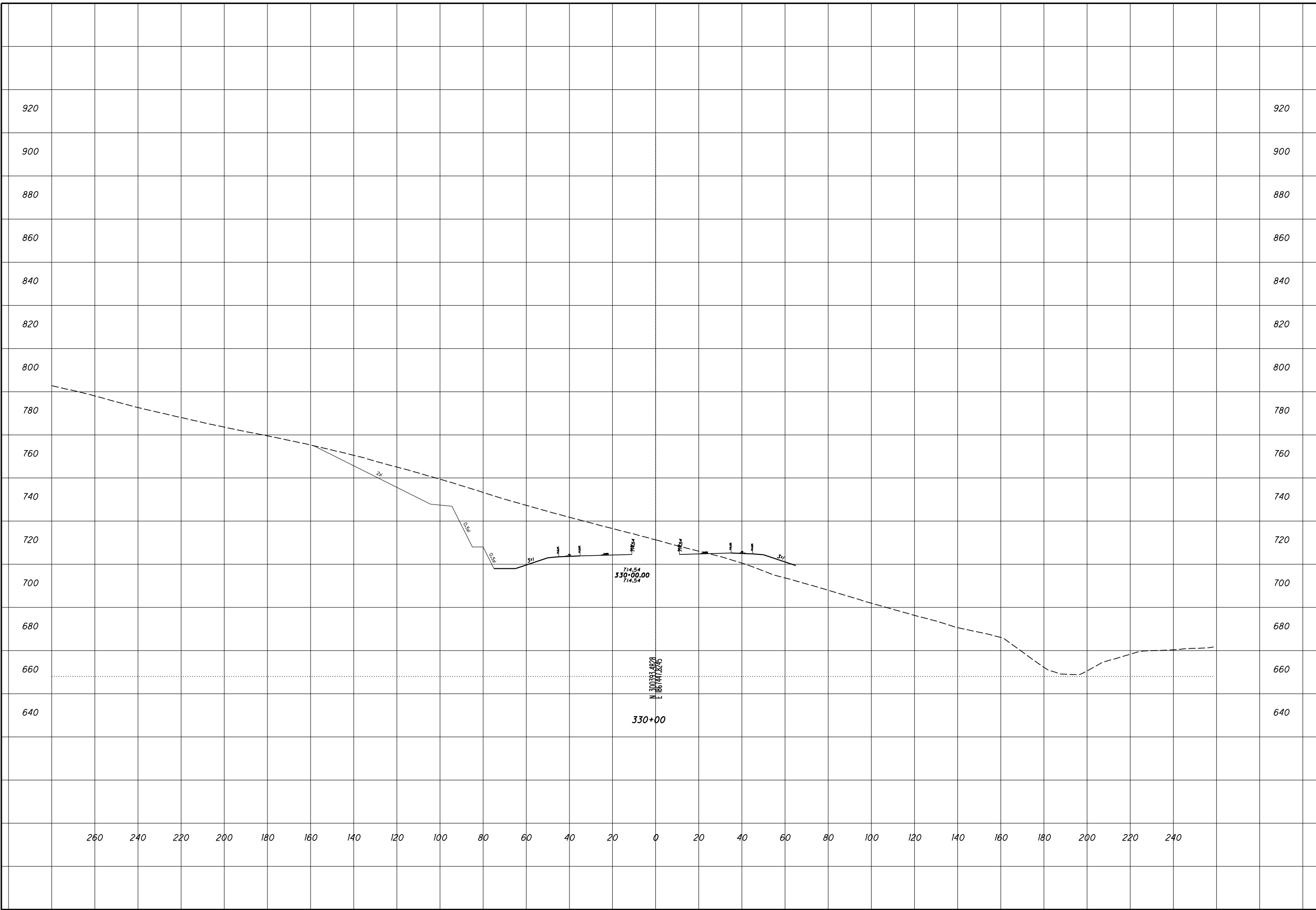
ROCK CUT CLOPE DESIGN - ROCK CUT 10
STA 329+50

SCI-823-0.00



ROCK CUT CLOPE DESIGN - ROCK CUT 10
STA 330+00

SCI-823-0.00



ROCK CUT CLOPE DESIGN - ROCK CUT 10
STA 330+50

SCI-823-0.00



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ROCK CUT CLOPE DESIGN - ROCK CUT 10
STA 331+00

SCI-823-0.00



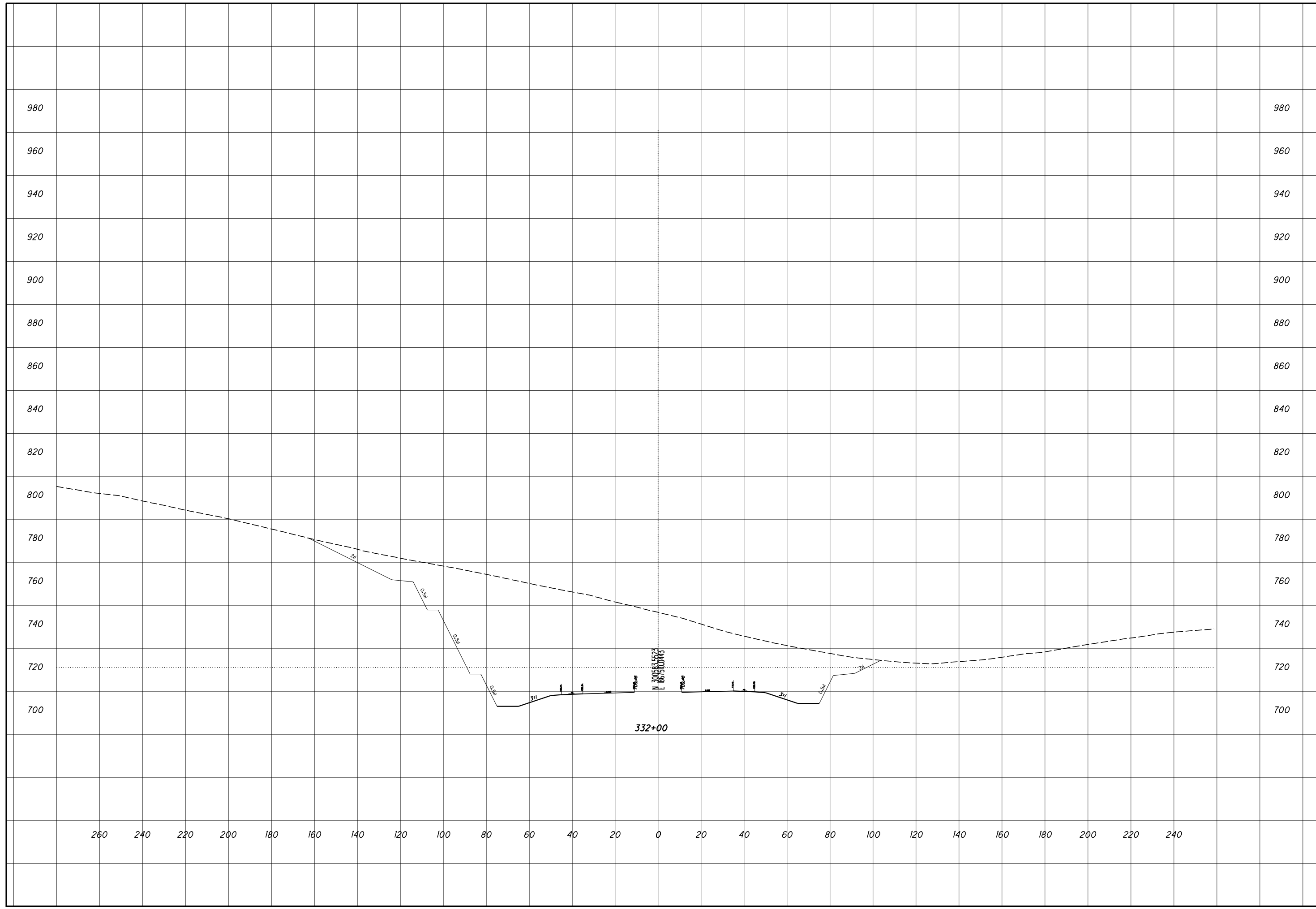
ROCK CUT CLOPE DESIGN - ROCK CUT 10
STA 331+50

SCI-823-0.00



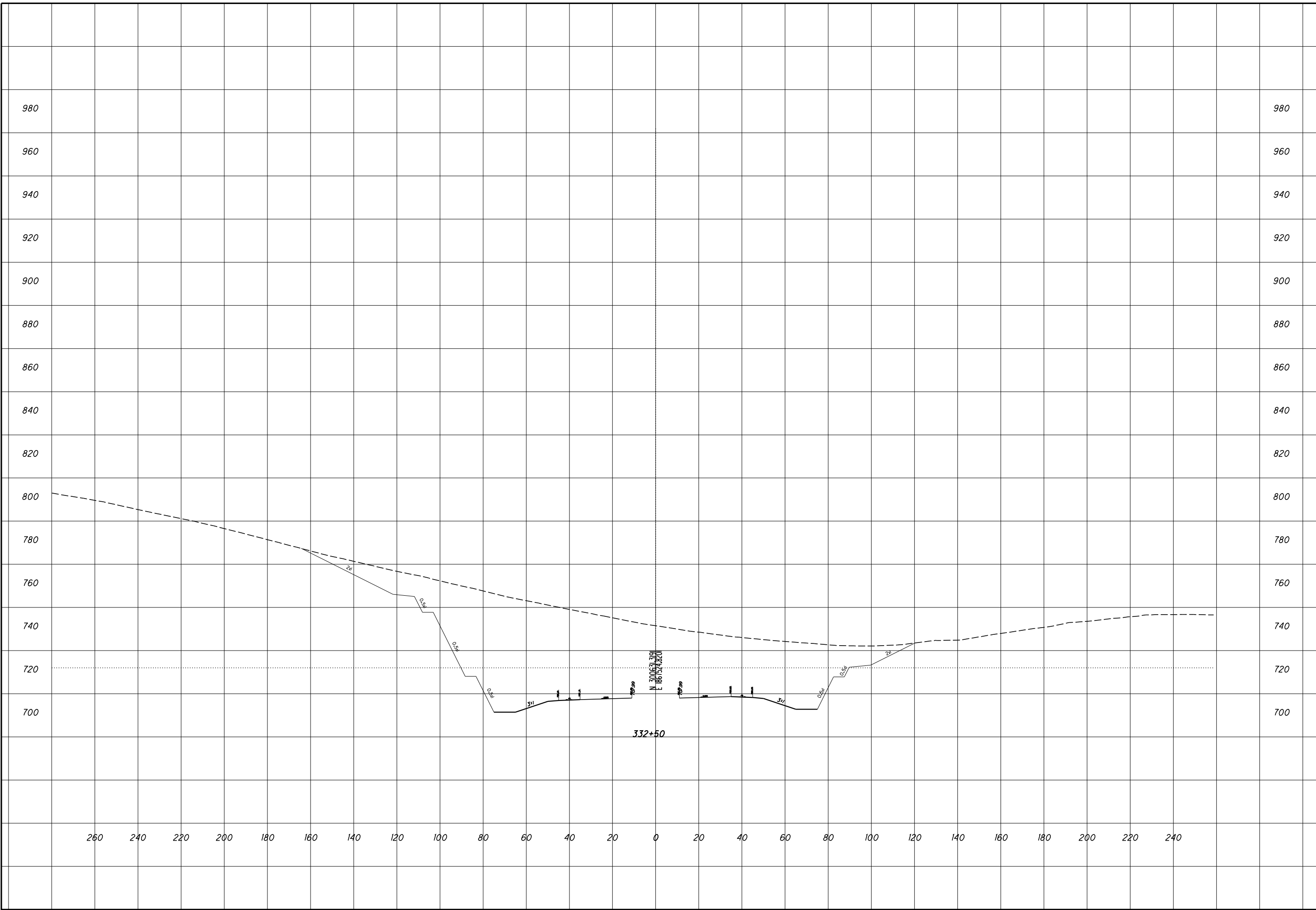
ROCK CUT CLOPE DESIGN - ROCK CUT 10
STA 332+00

SCI-823-0.00



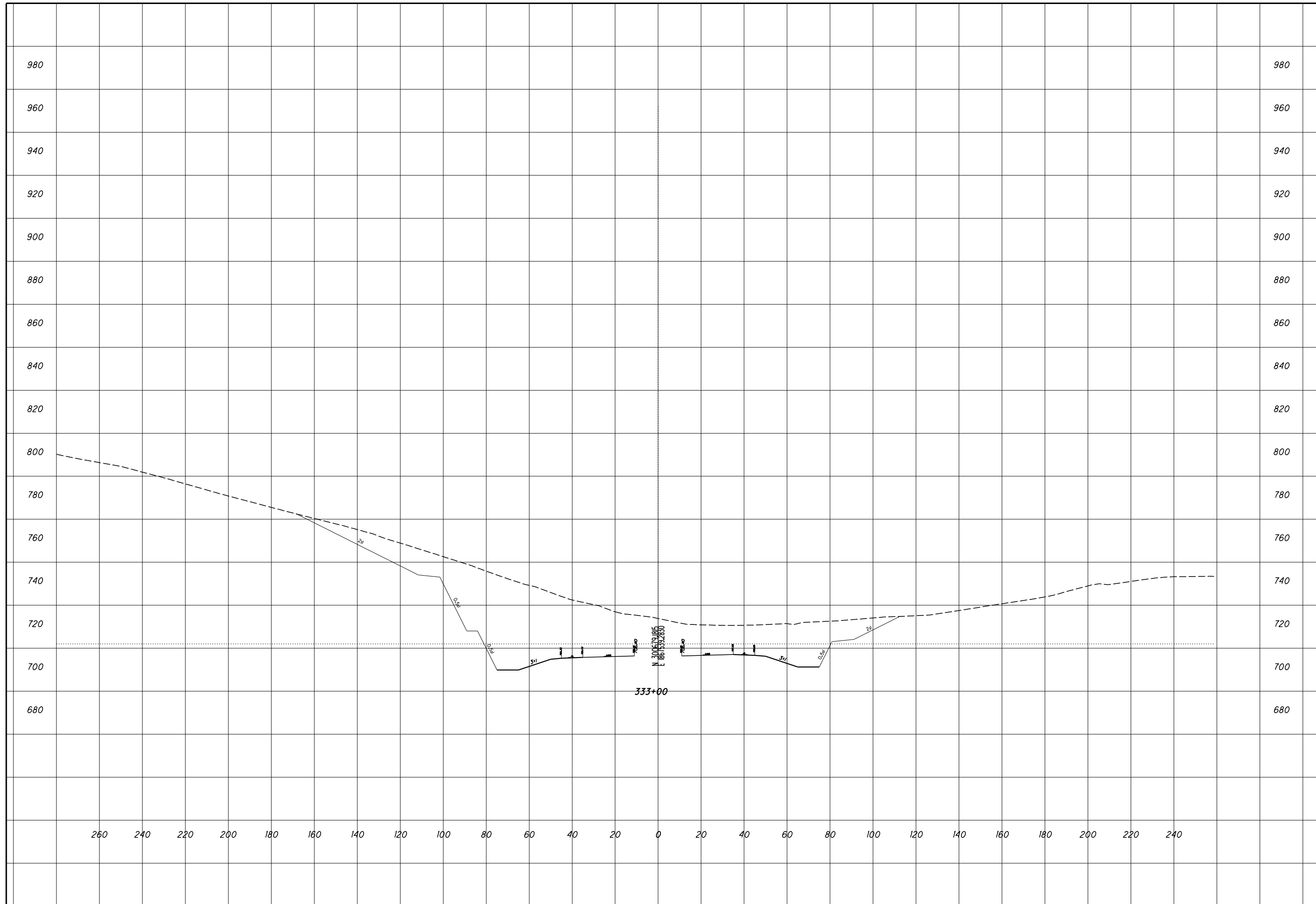
ROCK CUT CLOPE DESIGN - ROCK CUT 10
STA 332+50

SCI-823-0.00



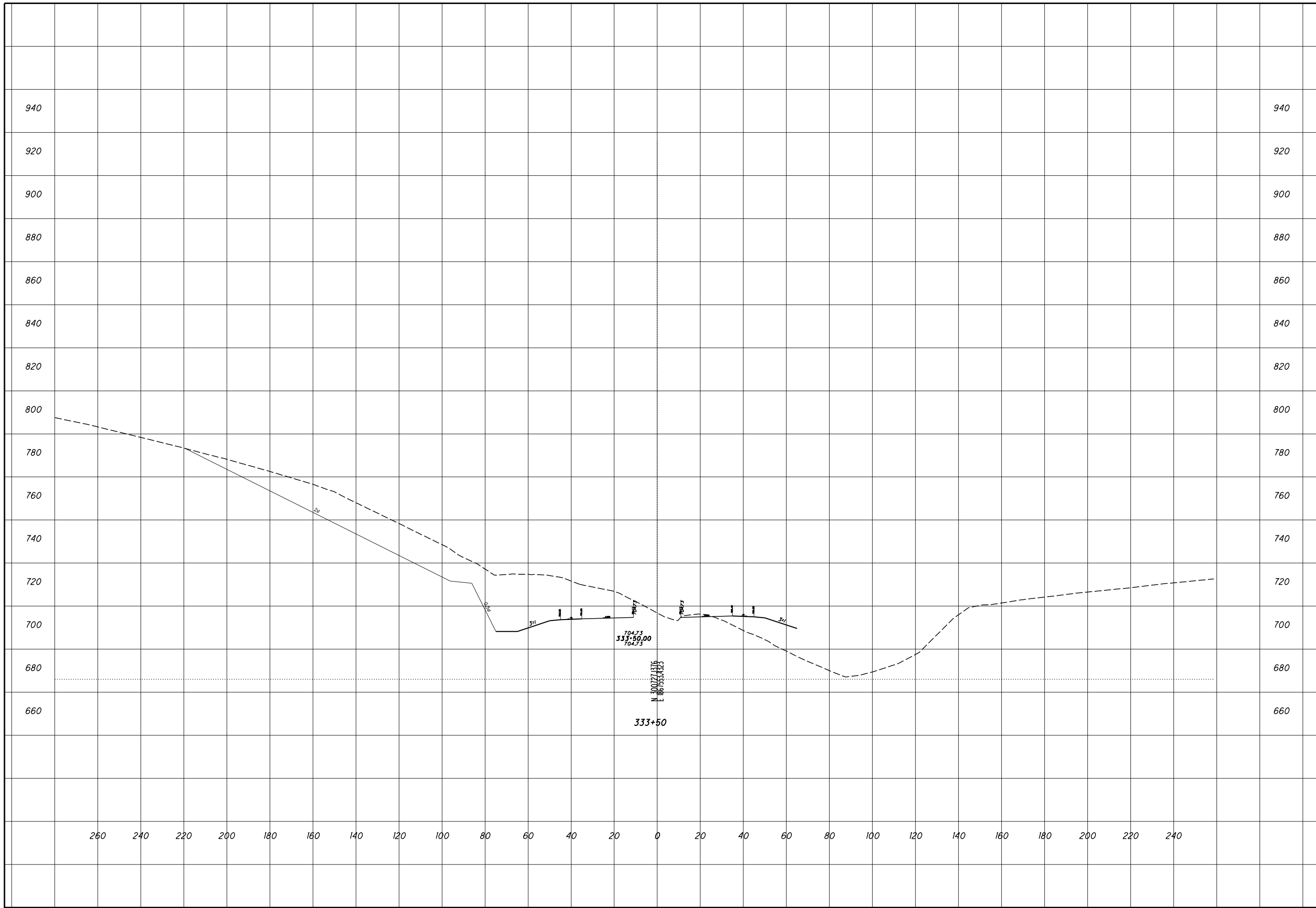
ROCK CUT CLOPE DESIGN - ROCK CUT 10
STA 333+00

SCI-823-0.00



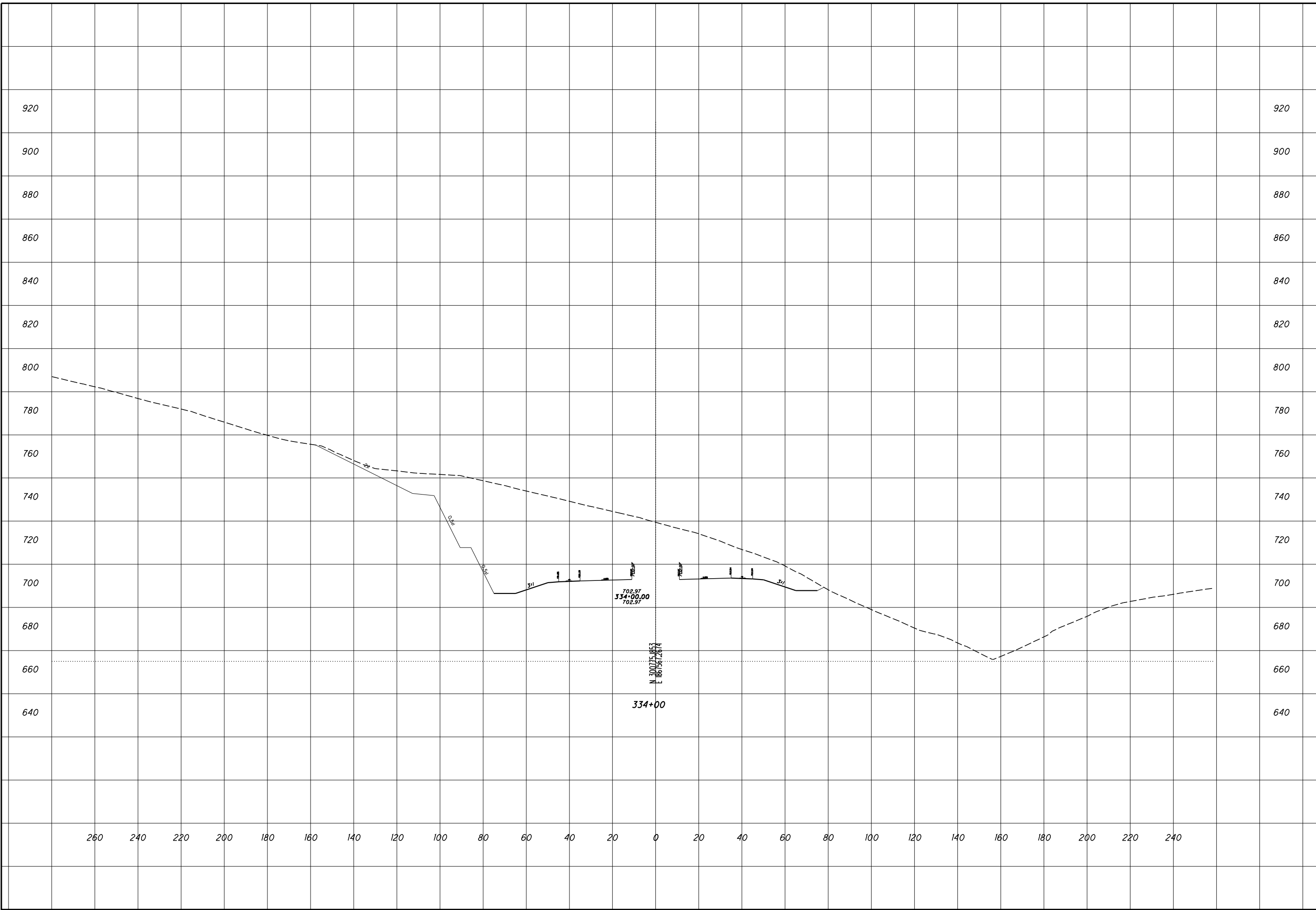
ROCK CUT CLOPE DESIGN - ROCK CUT 10
STA 333+50

SCI-823-0.00



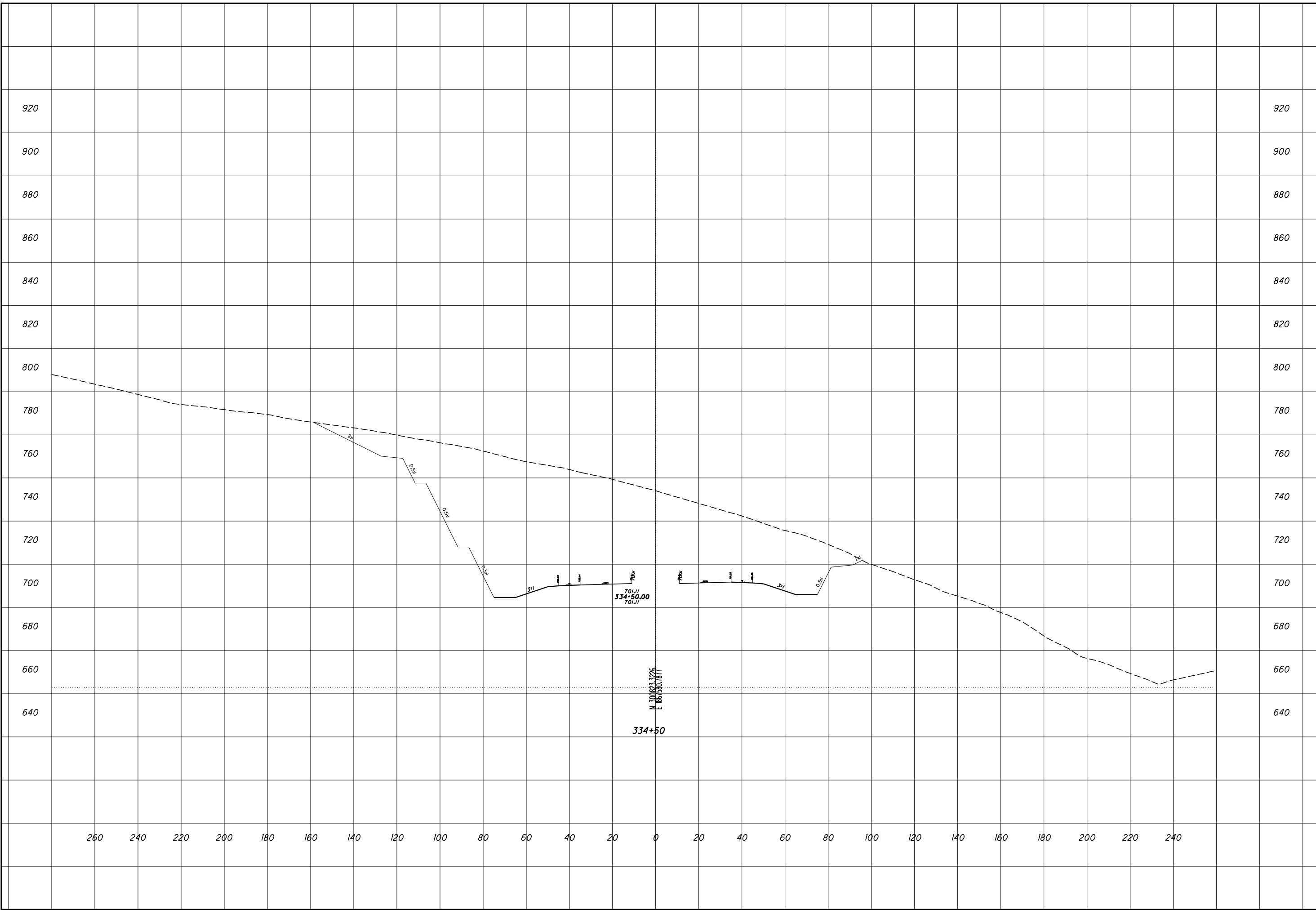
ROCK CUT CLOPE DESIGN - ROCK CUT 10
STA 334+00

SCI-823-0.00



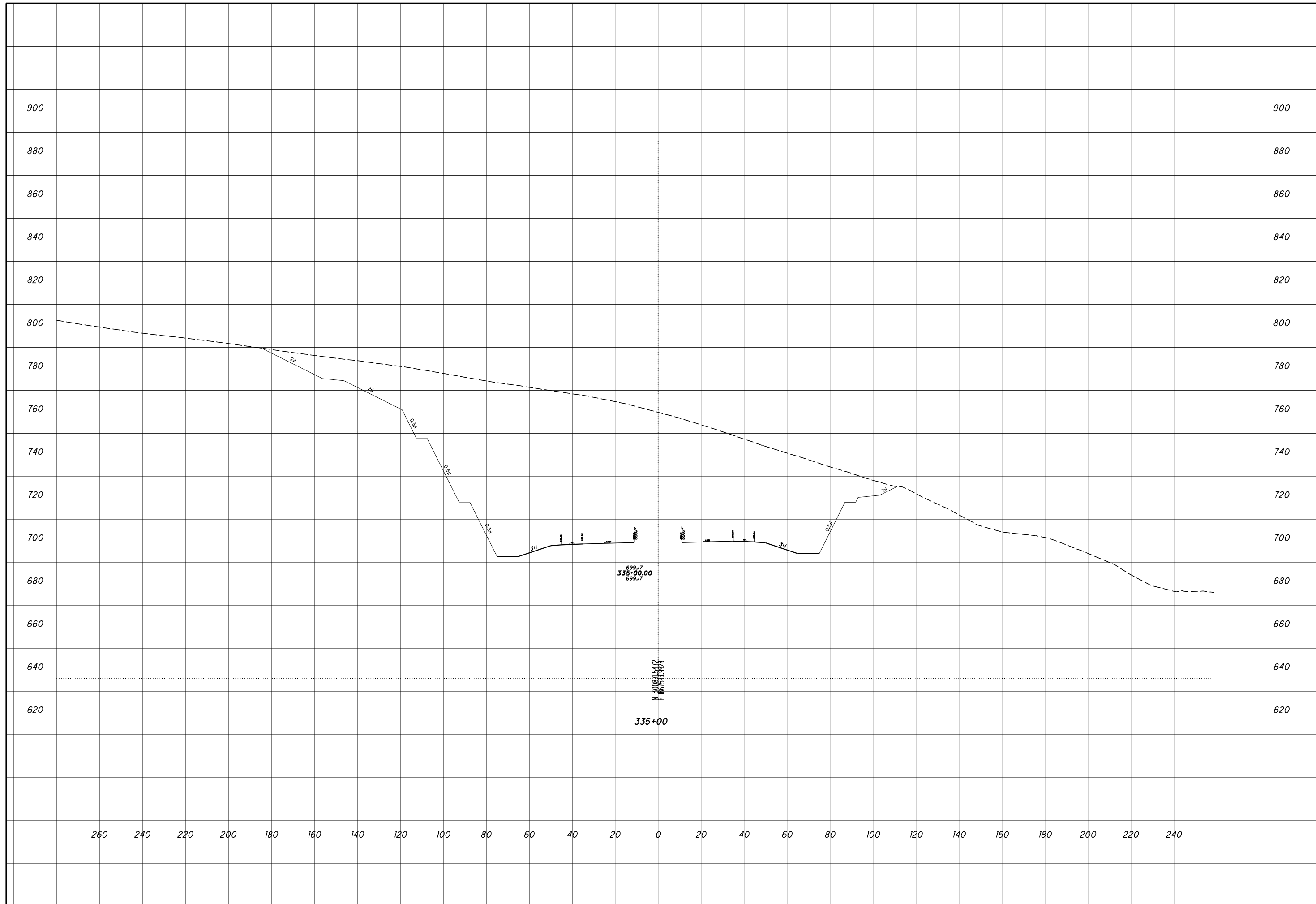
ROCK CUT CLOPE DESIGN - ROCK CUT 10
STA 334+50

SCI-823-0.00



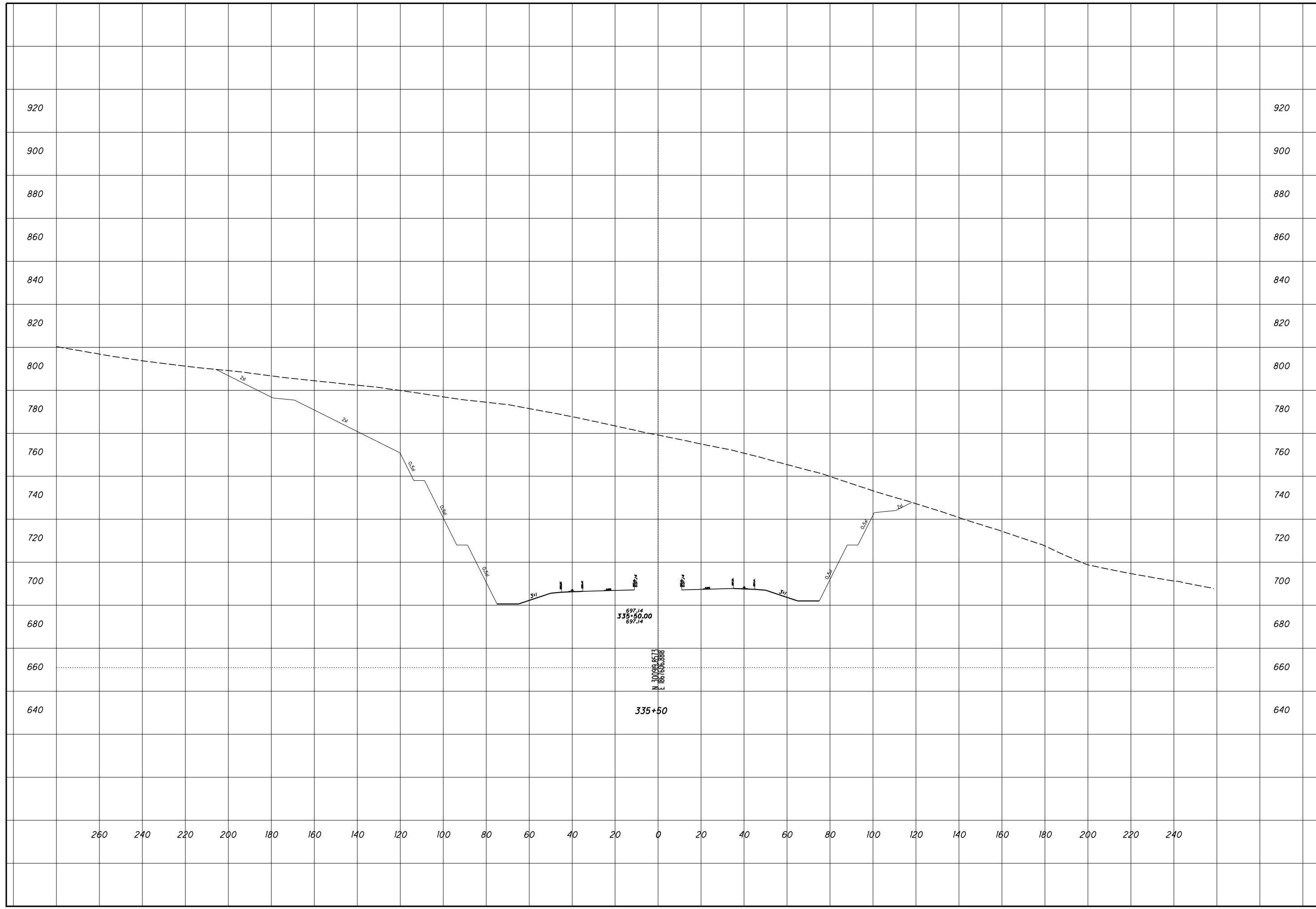
ROCK CUT CLOPE DESIGN - ROCK CUT 10
STA 335+00

SCI-823-0.00



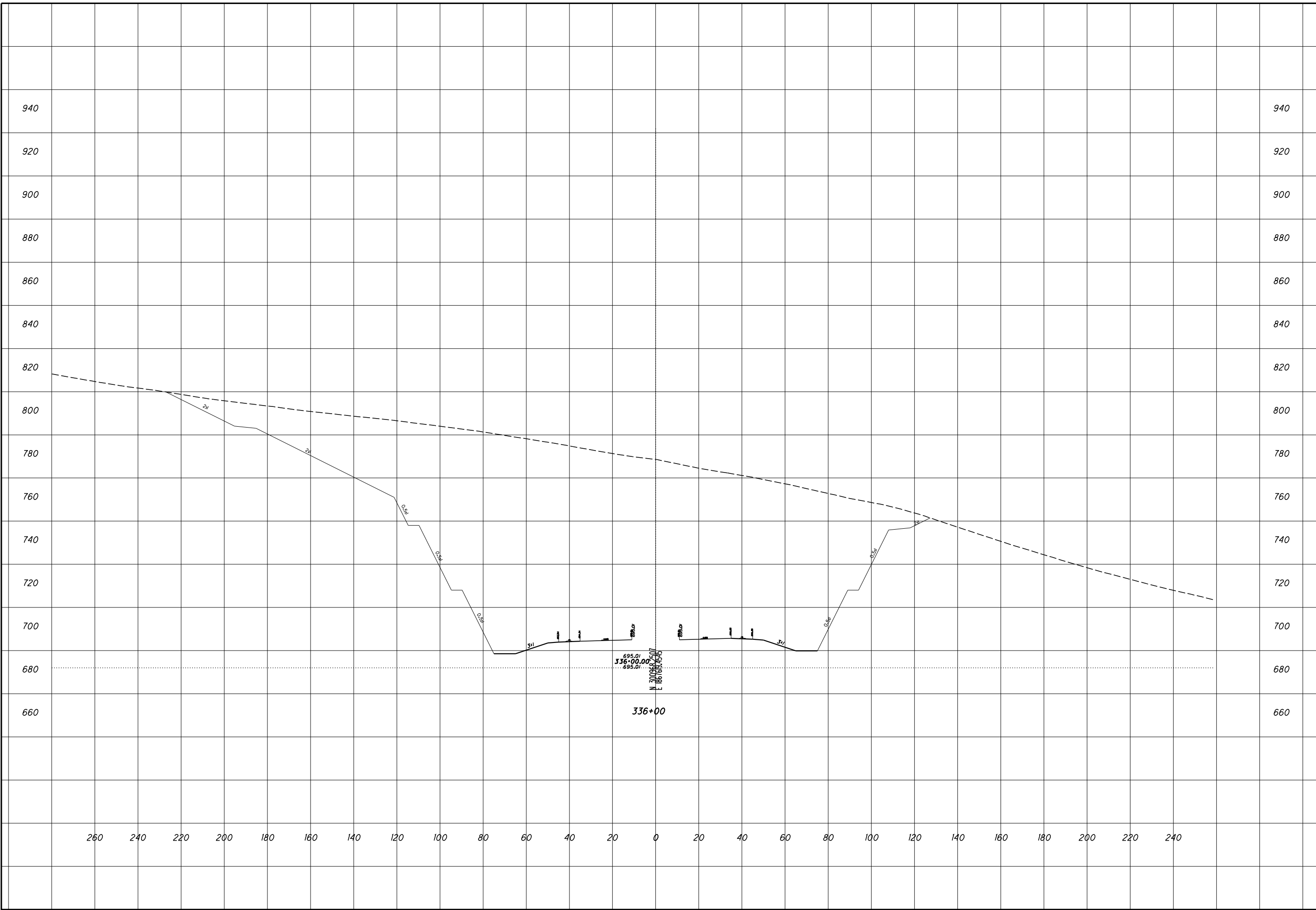
ROCK CUT CLOPE DESIGN - ROCK CUT 10
STA 335+50

SCI-823-0.00



ROCK CUT CLOPE DESIGN - ROCK CUT 10
STA 336+00

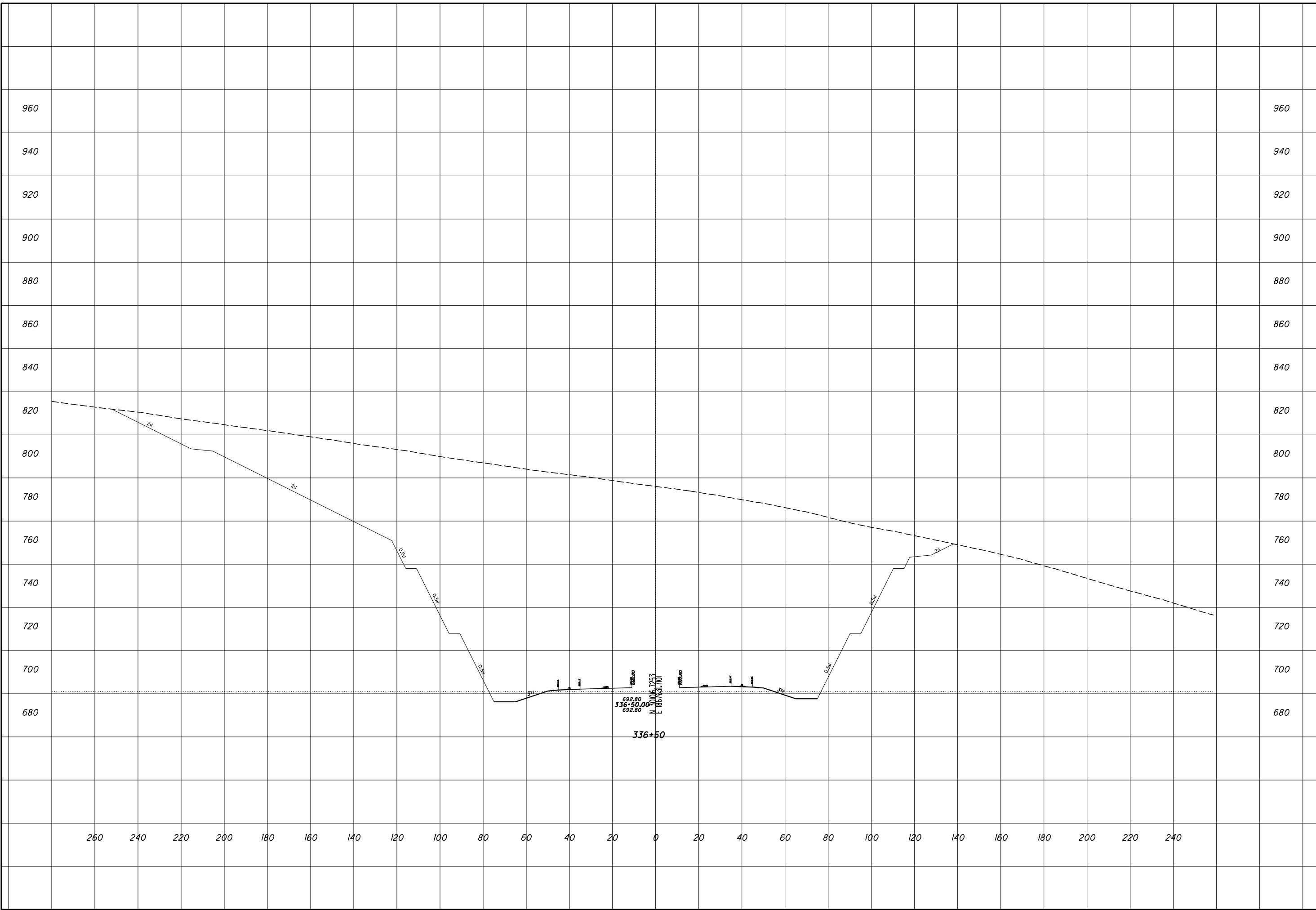
SCI-823-0.00



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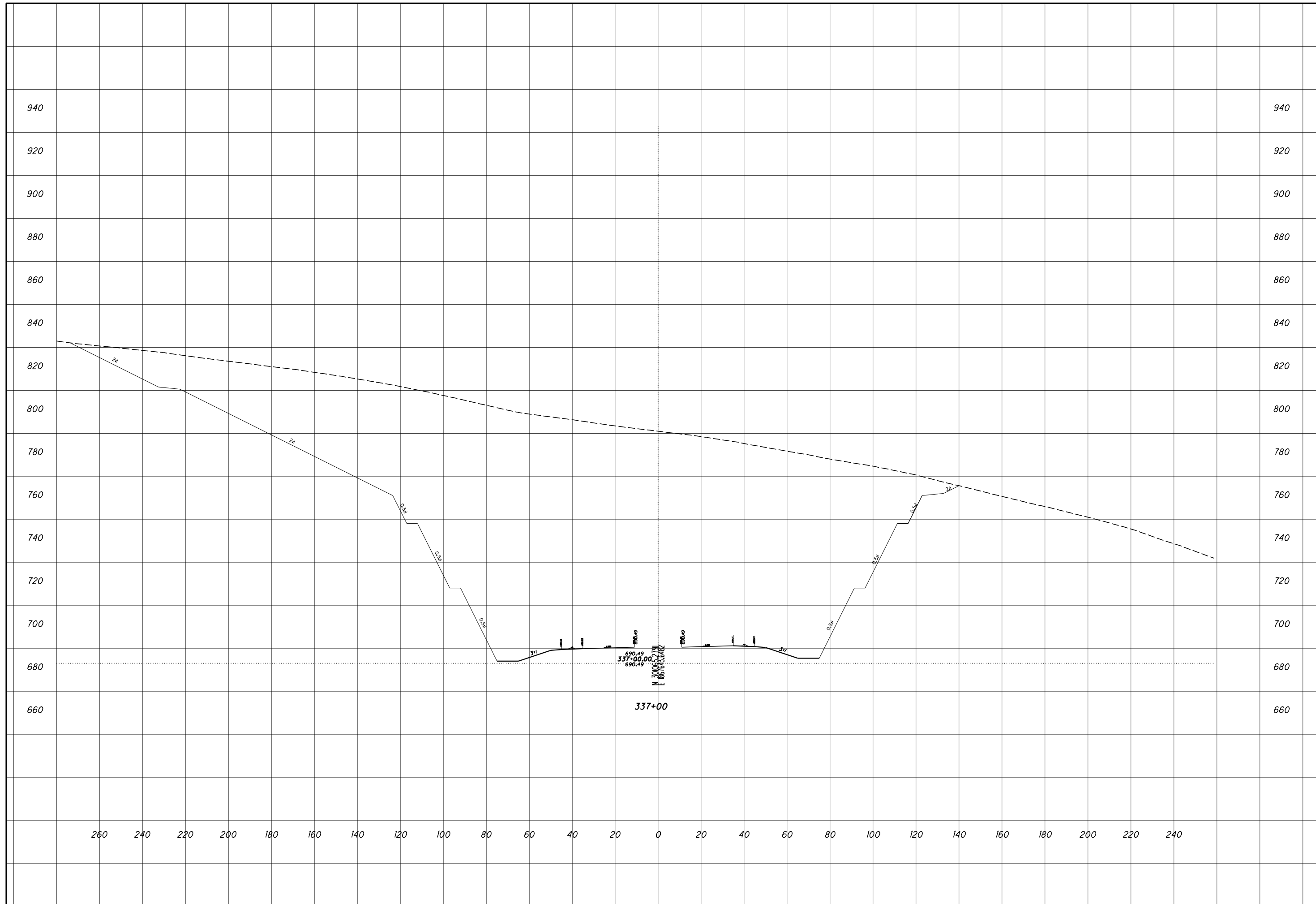
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STA 336+50

SCI-823-0.00



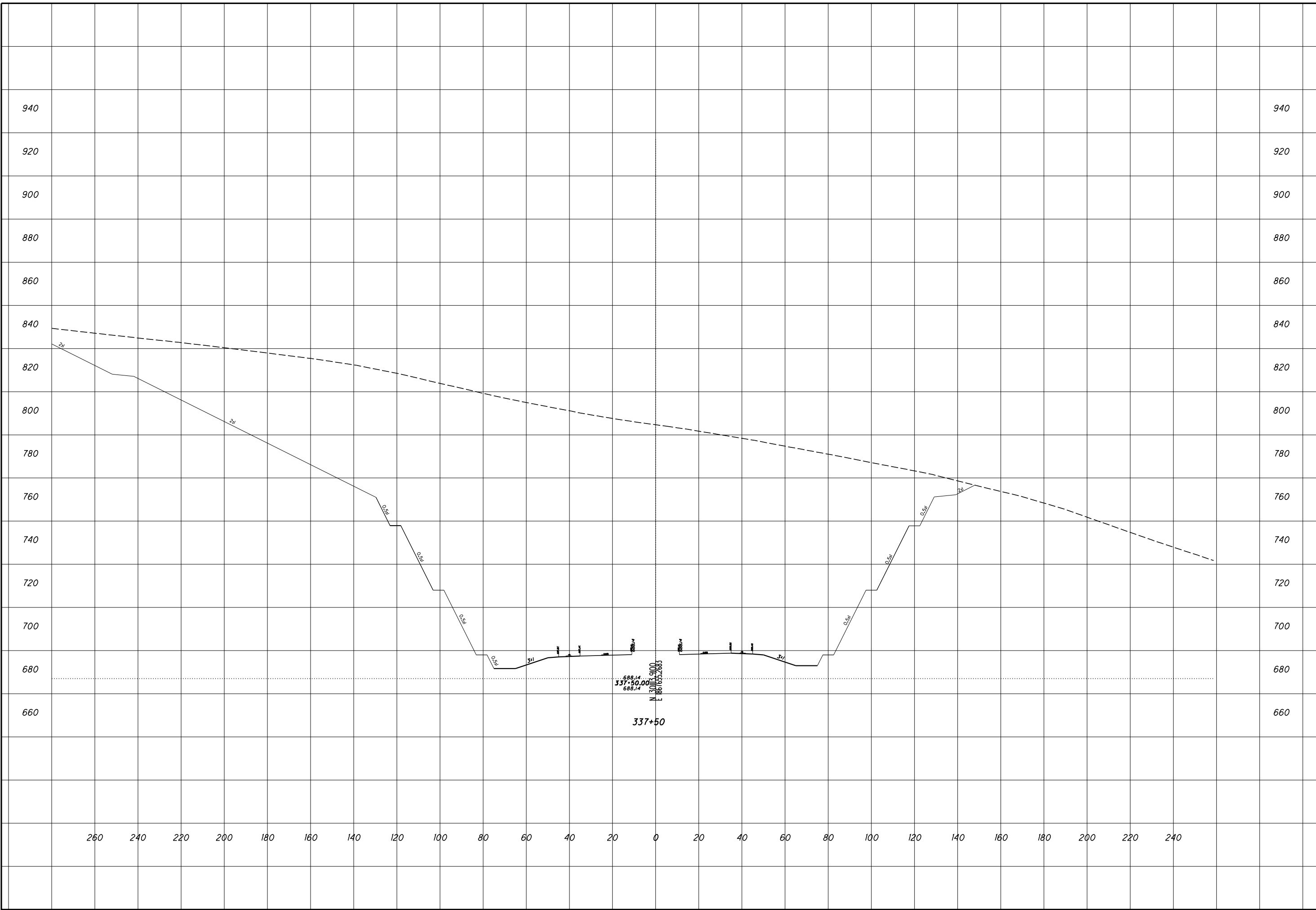
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STA 337+00

SCI-823-0.00



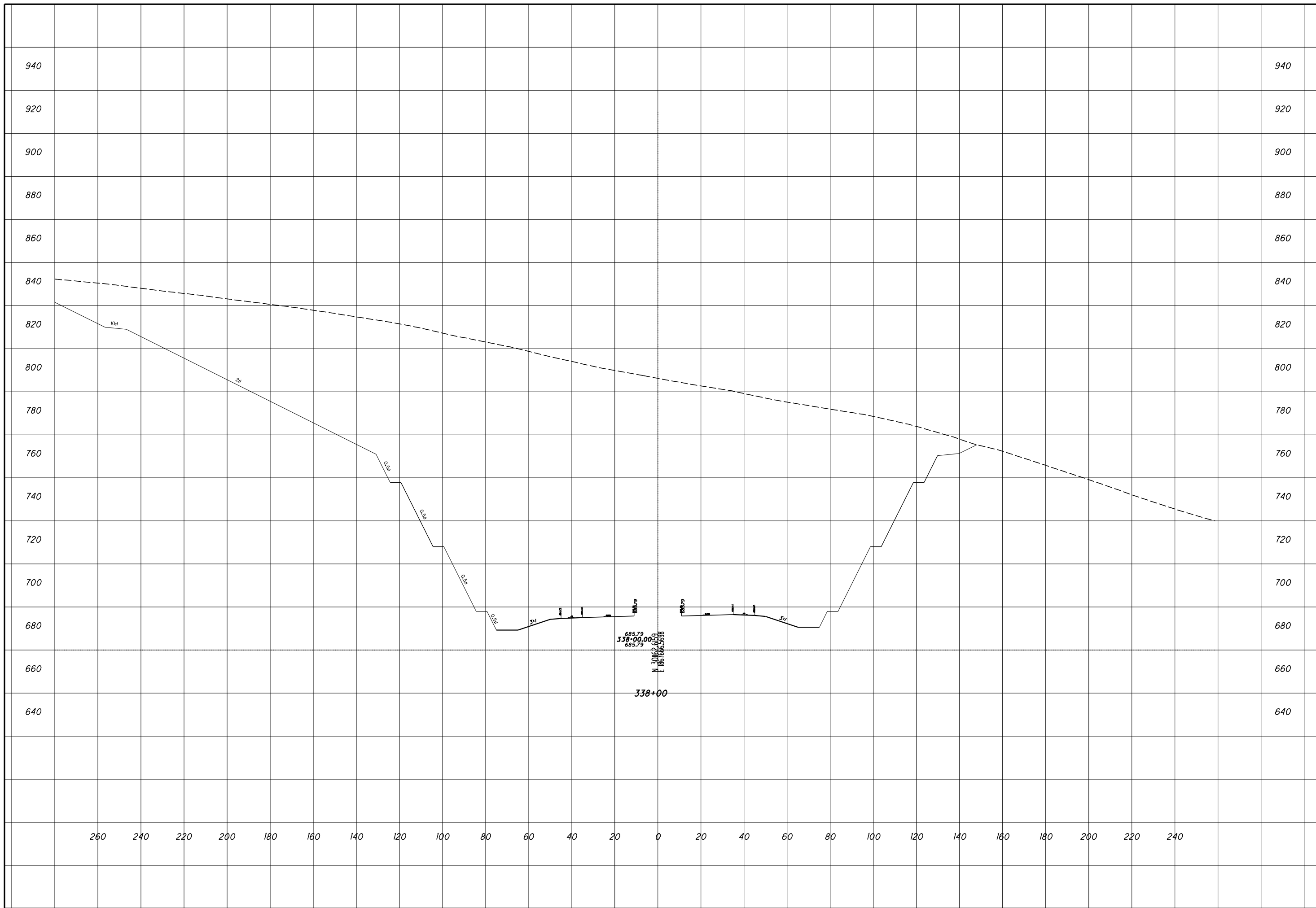
ROCK CUT CLOPE DESIGN - ROCK CUT 10
STA 337+50

SCI-823-0.00



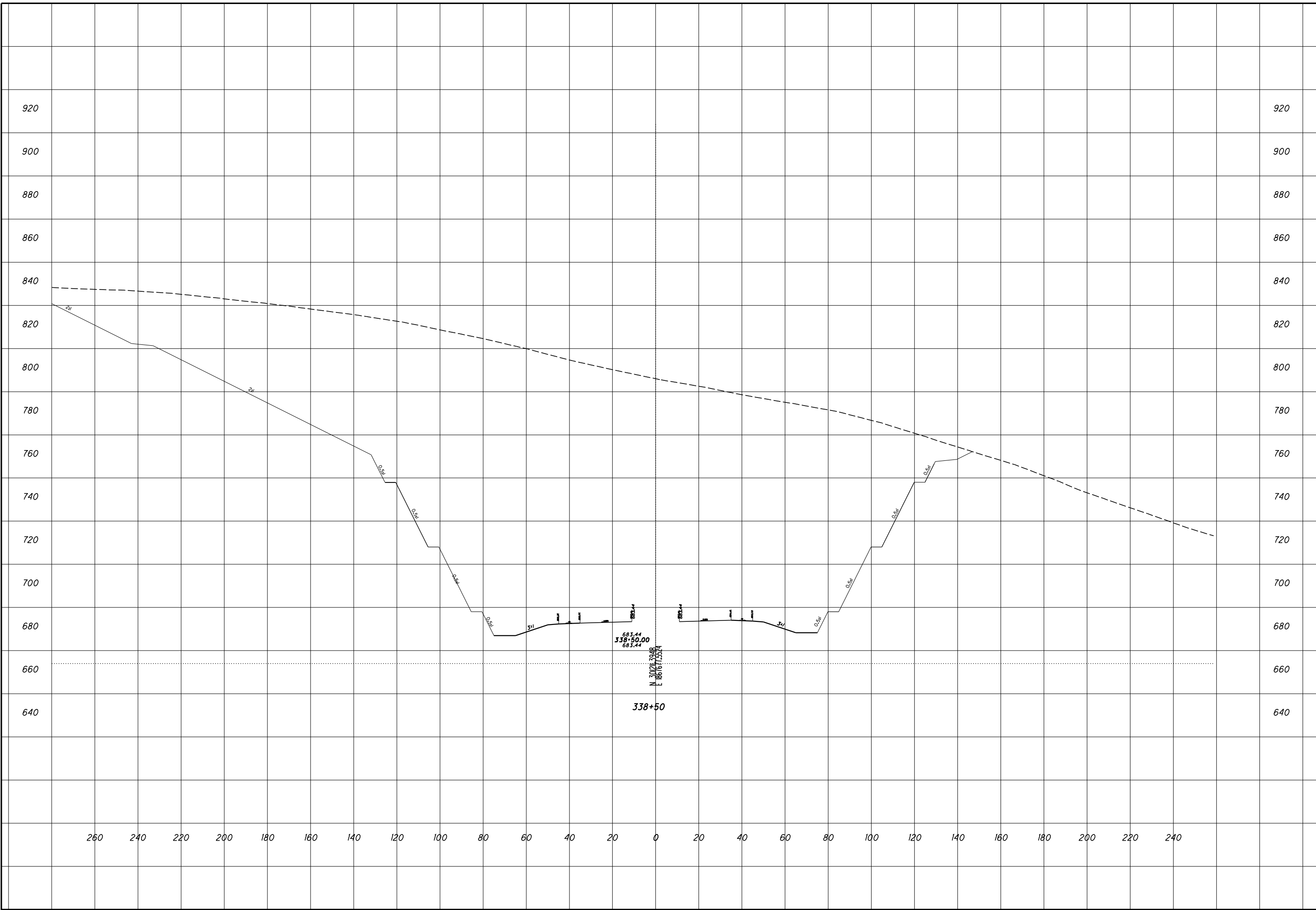
**ROCK CUT CLOPE DESIGN - ROCK CUT 10
STA 338+00**

SCI-823-0.00



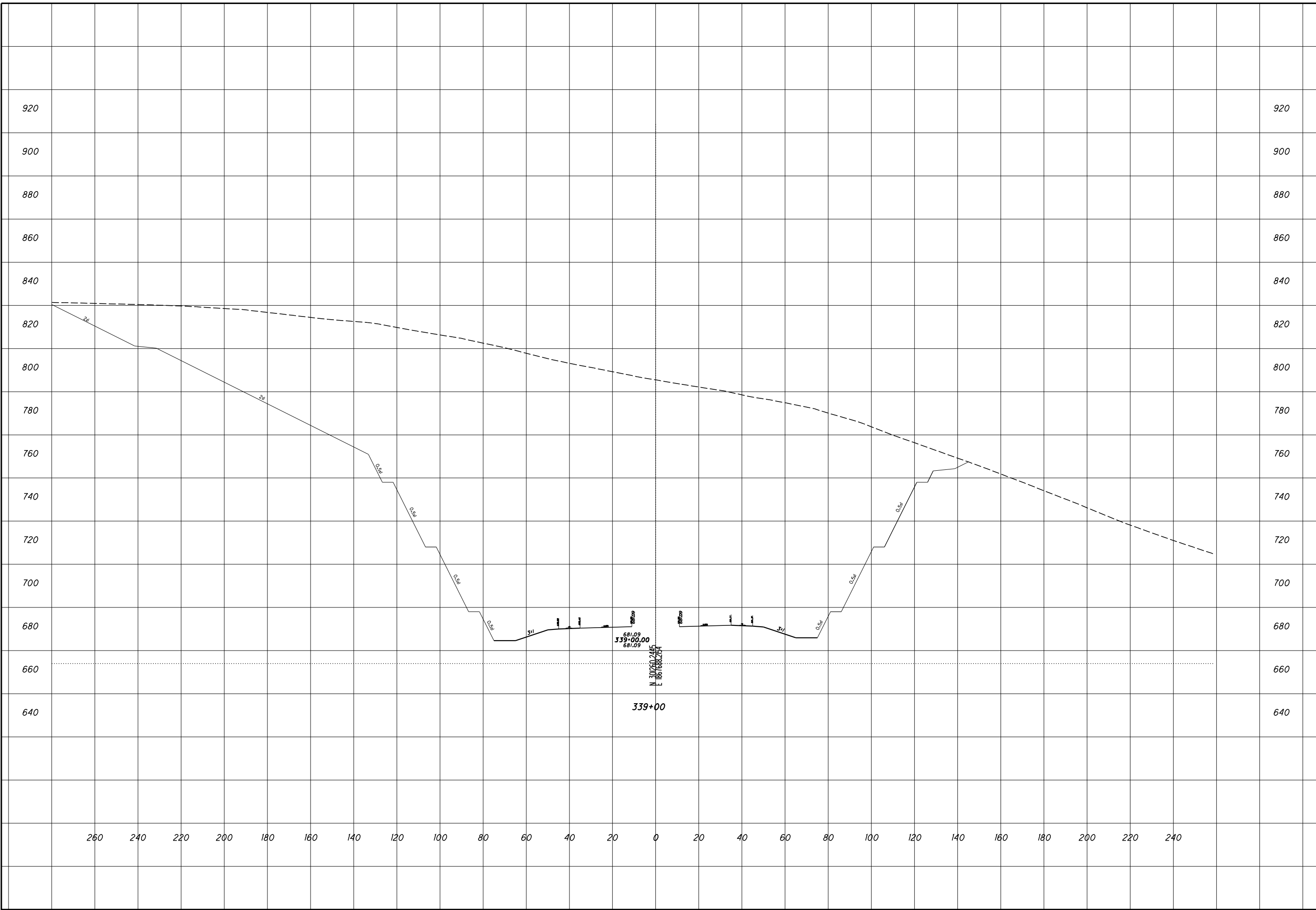
ROCK CUT CLOPE DESIGN - ROCK CUT 10
STA 338+50

SCI-823-0.00



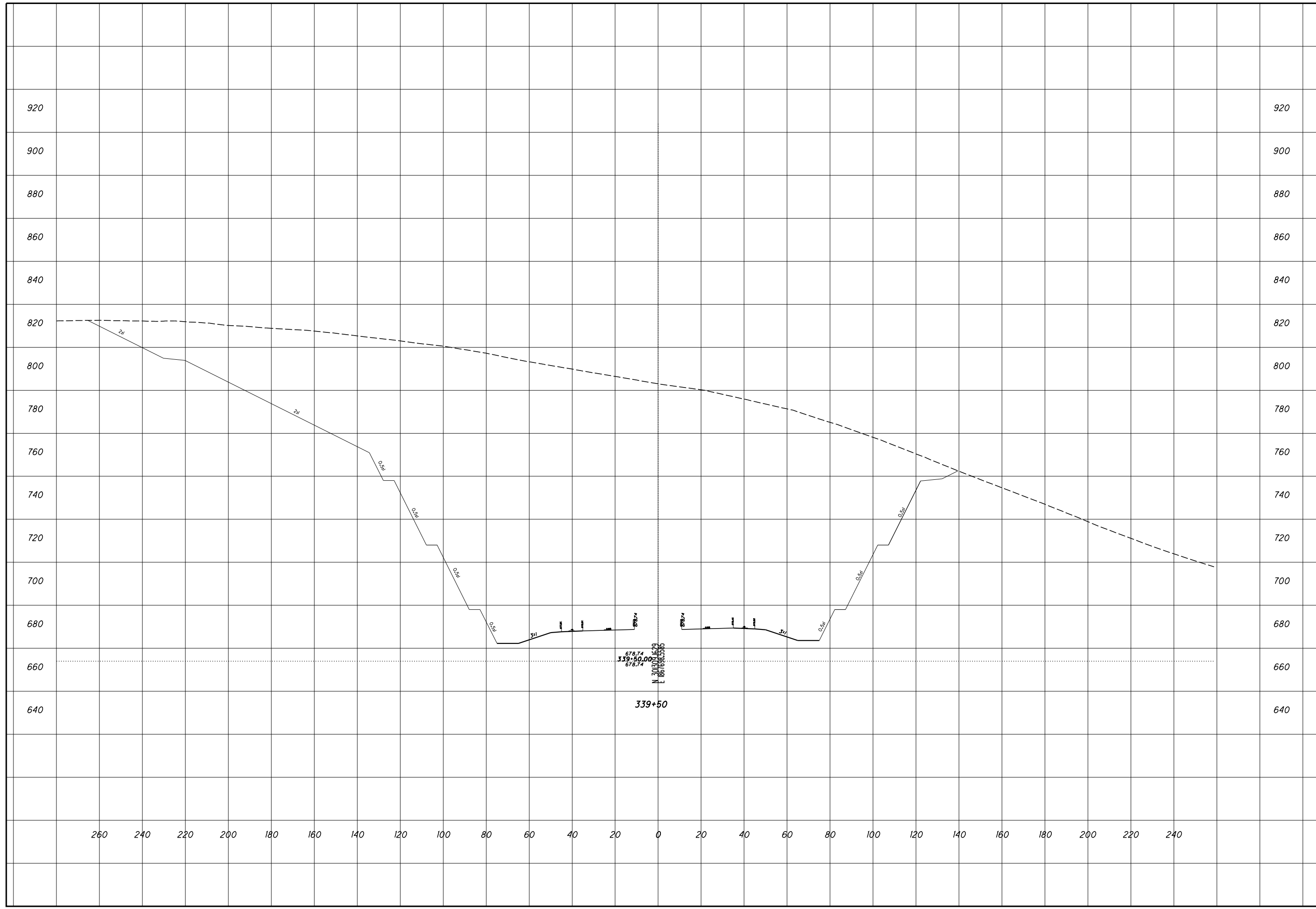
ROCK CUT CLOPE DESIGN - ROCK CUT 10
STA 339+00

SCI-823-0.00



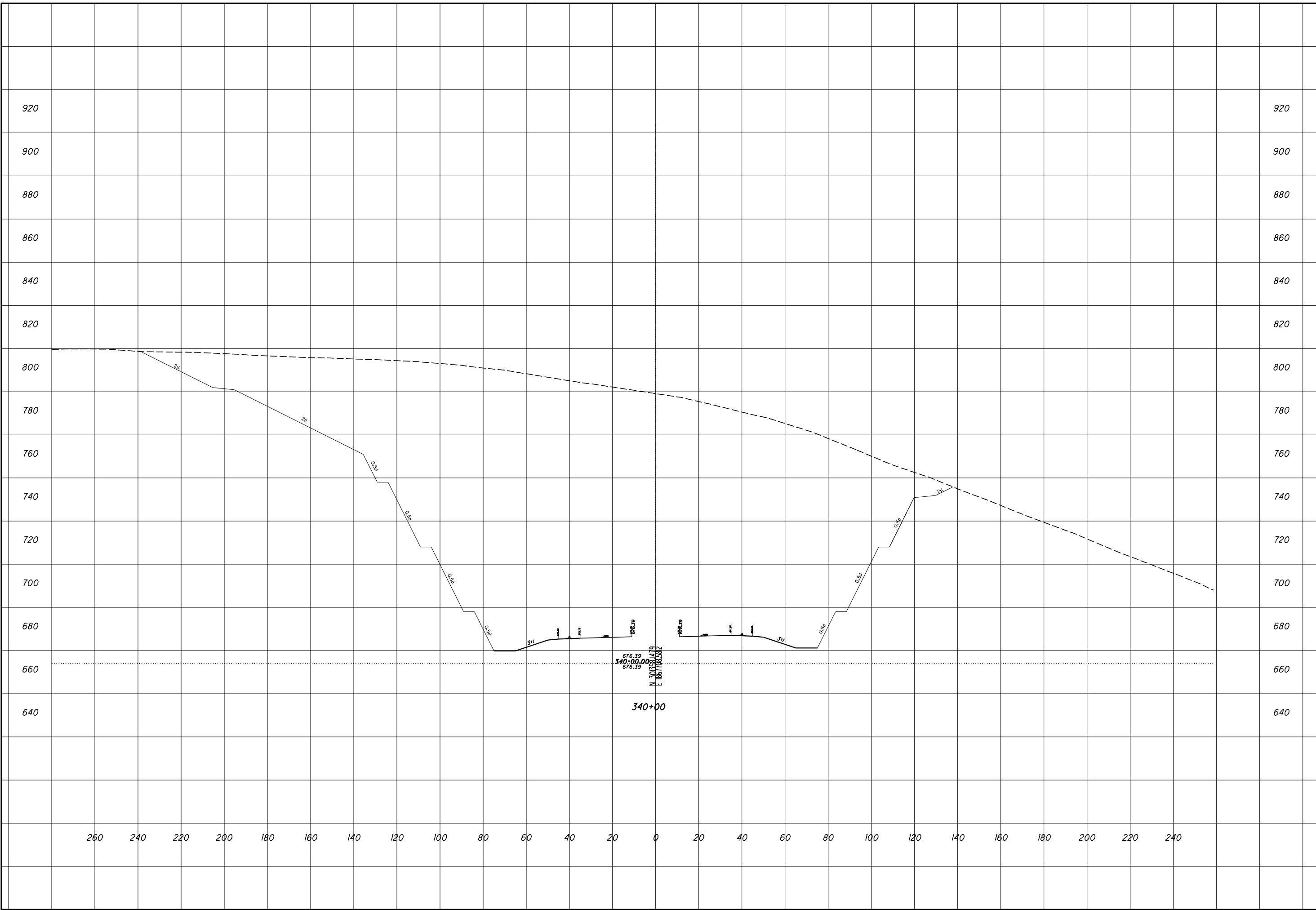
ROCK CUT CLOPE DESIGN - ROCK CUT 10
STA 339+50

SCI-823-0.00



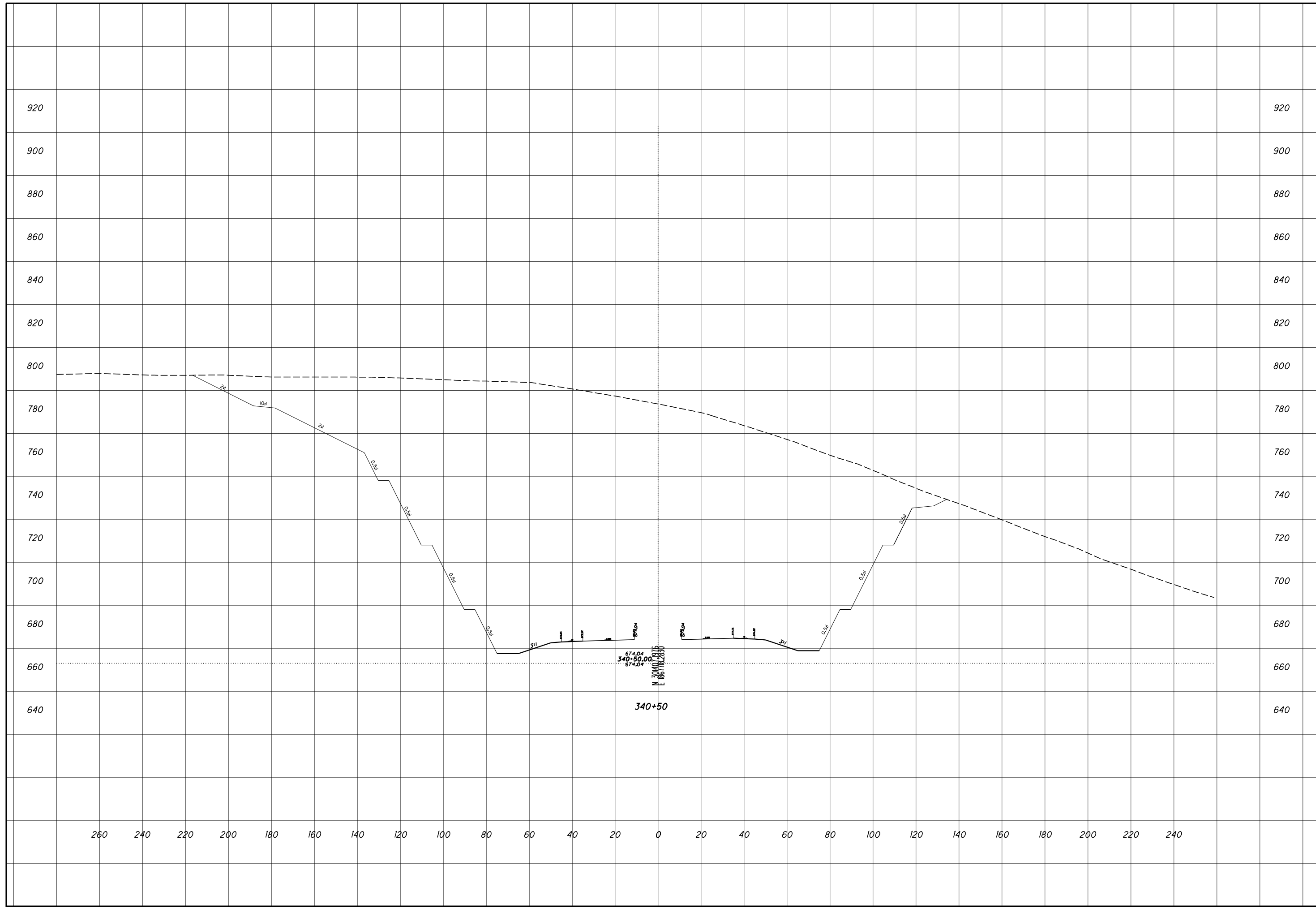
ROCK CUT CLOPE DESIGN - ROCK CUT 10
STA 340+00

SCI-823-0.00



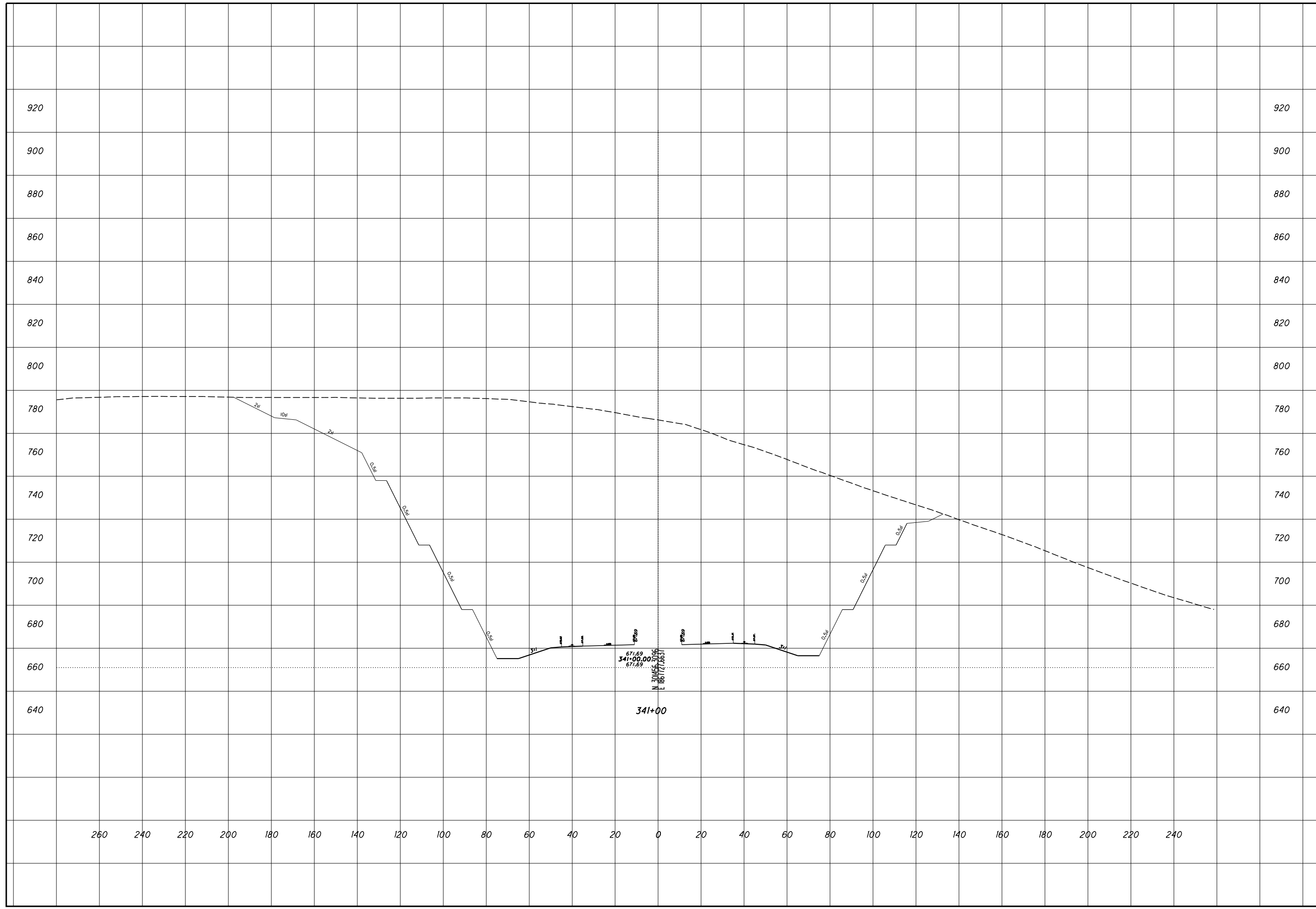
ROCK CUT CLOPE DESIGN - ROCK CUT 10
STA 340+50

SCI-823-0.00



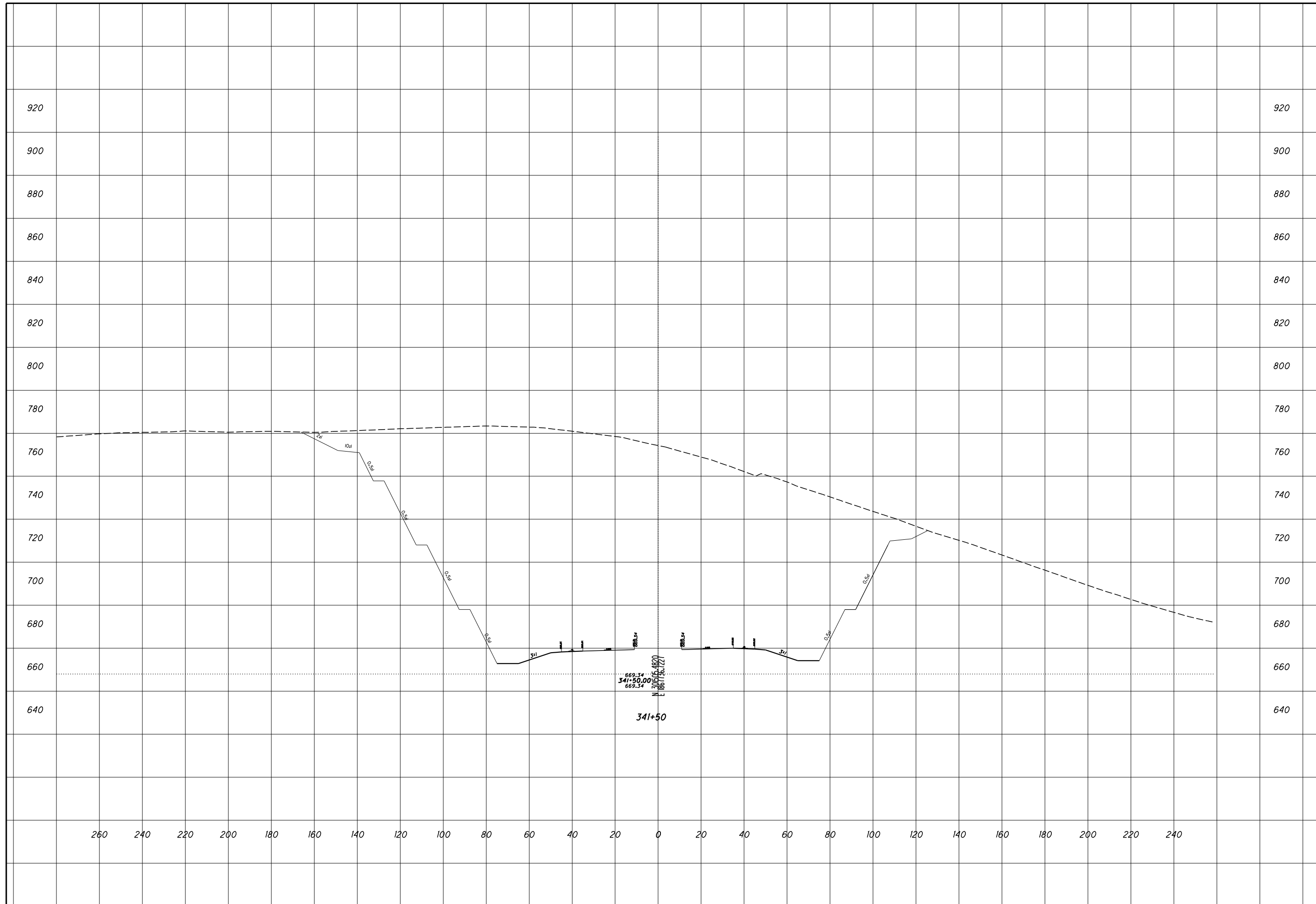
ROCK CUT CLOPE DESIGN - ROCK CUT 10
STA 341+00

SCI-823-0.00



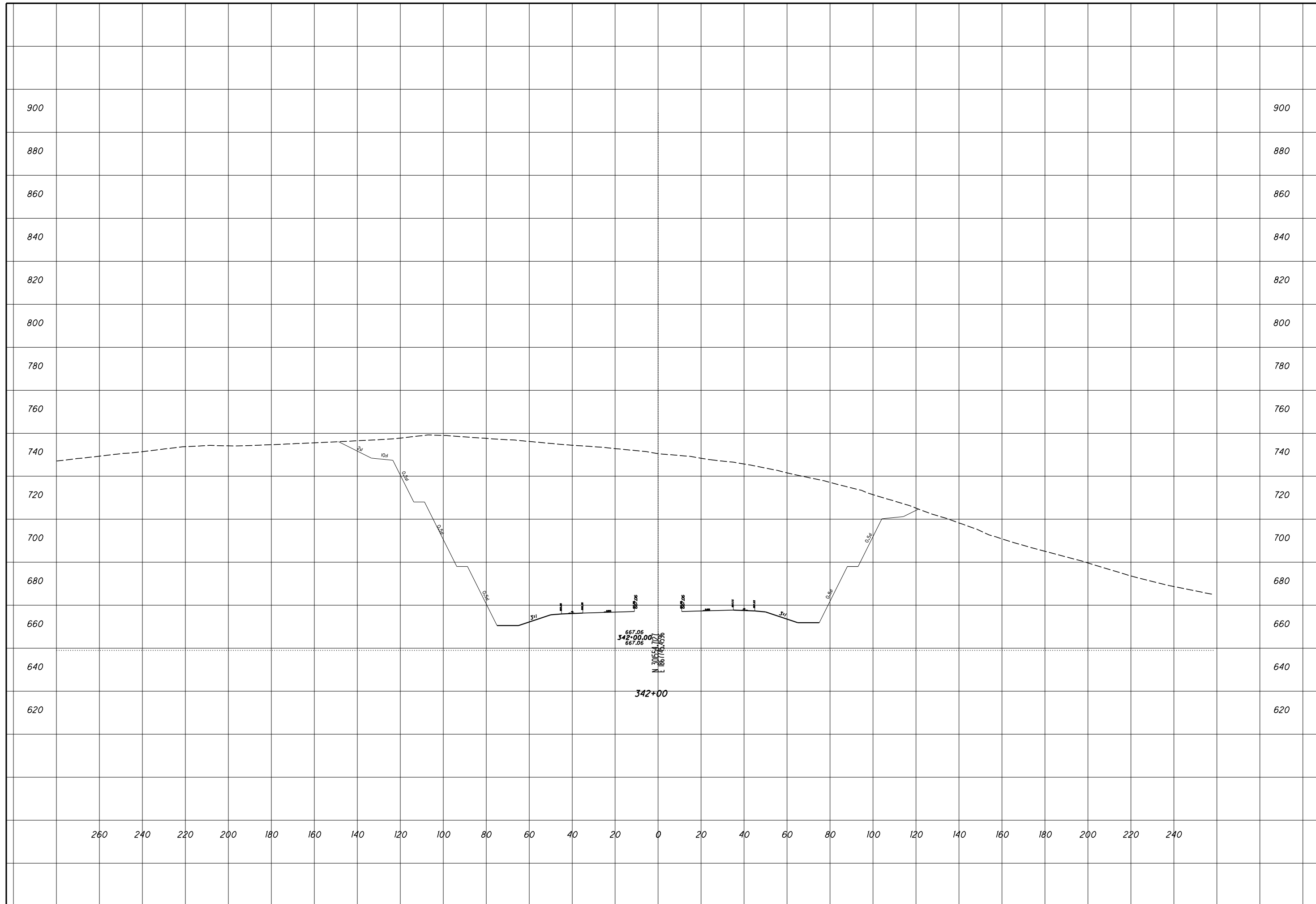
ROCK CUT CLOPE DESIGN - ROCK CUT 10
STA 341+50

SCI-823-0.00



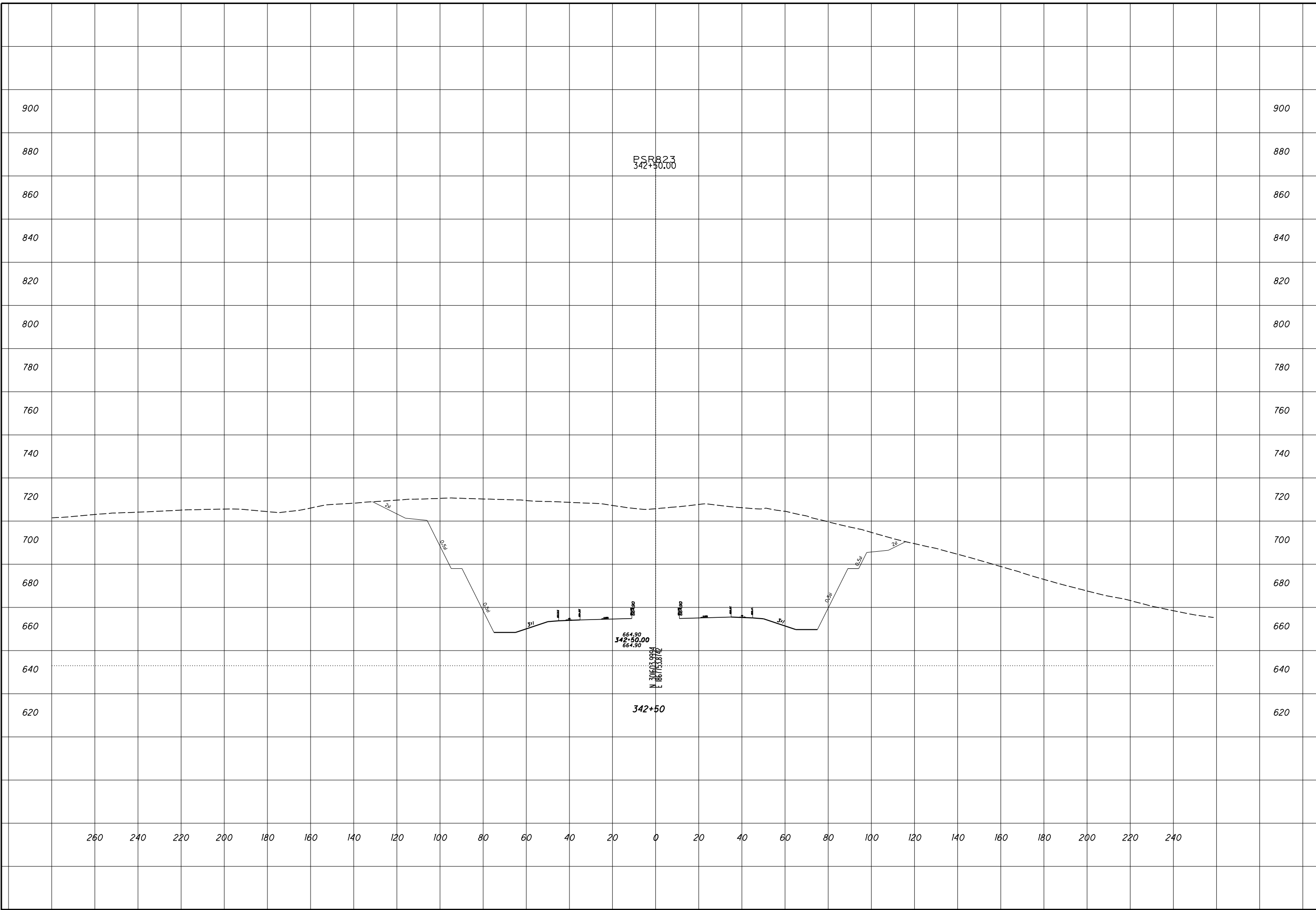
ROCK CUT CLOPE DESIGN - ROCK CUT 10
STA 342+00

SCI-823-0.00



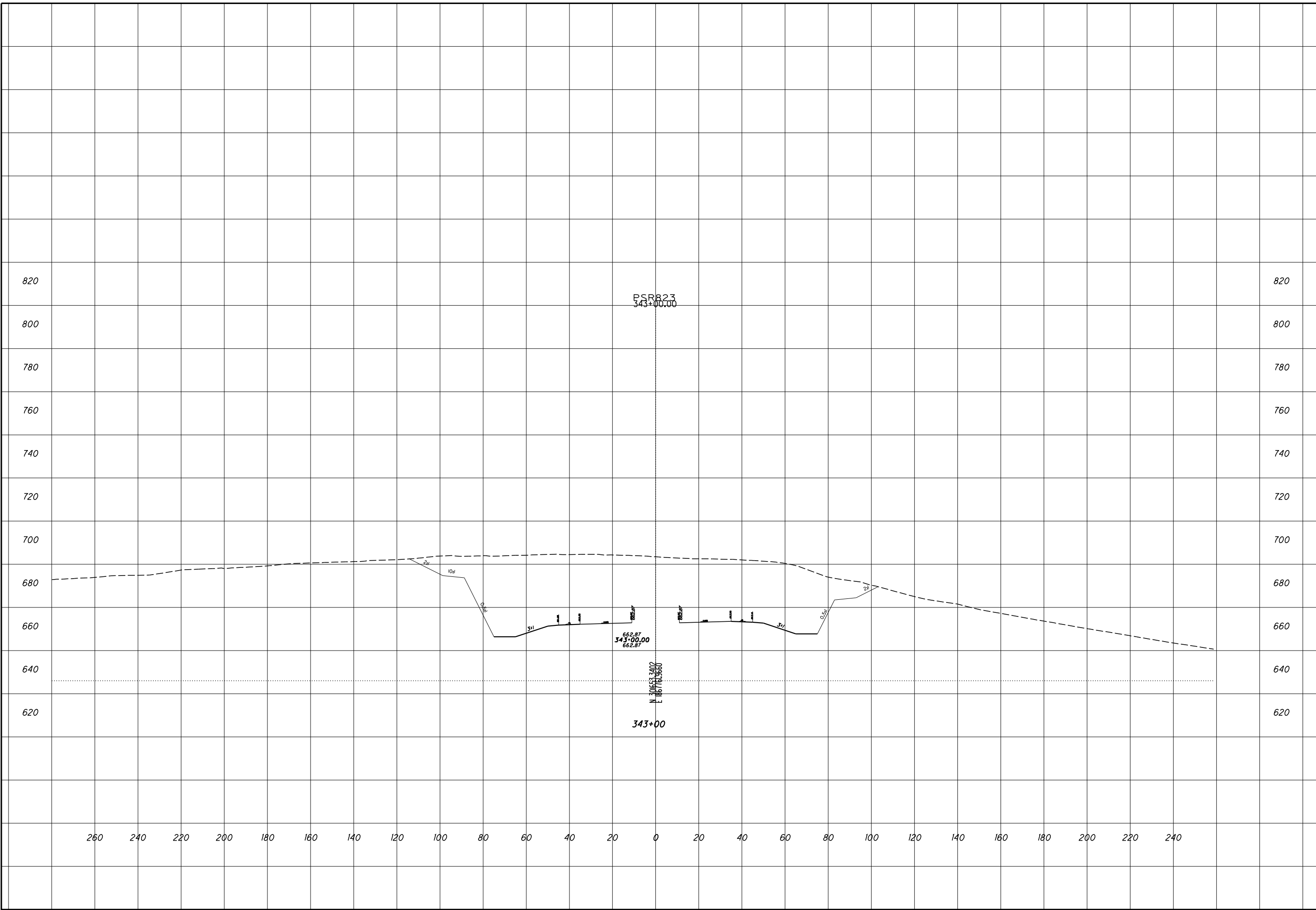
ROCK CUT CLOPE DESIGN - ROCK CUT 10
STA 342+50

SCI-823-0.00



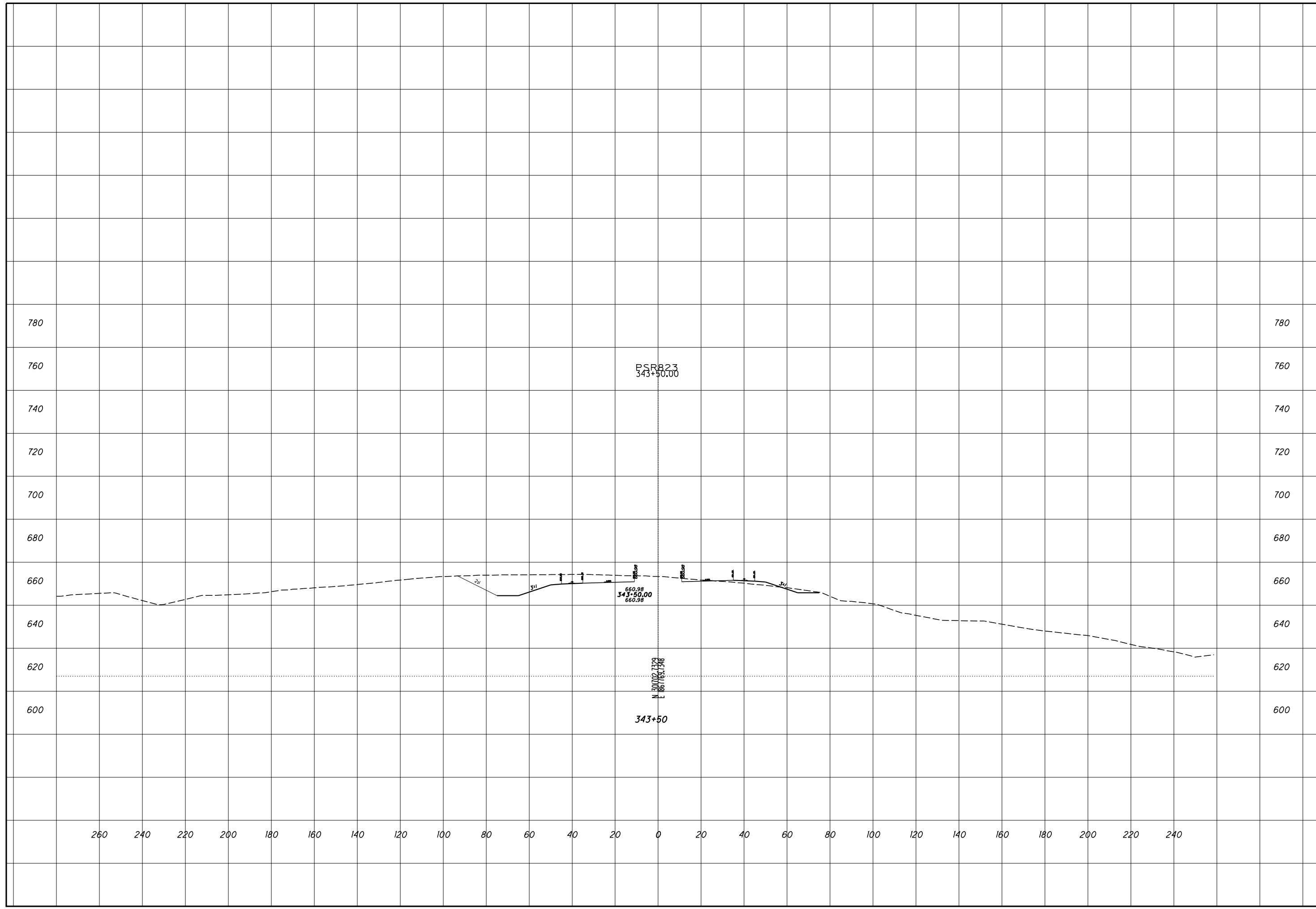
ROCK CUT CLOPE DESIGN - ROCK CUT 10
STA 343+00

SCI-823-0.00



ROCK CUT CLOPE DESIGN - ROCK CUT 10
STA 343+50

SCI-823-0.00



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PSR 823
343+50.00

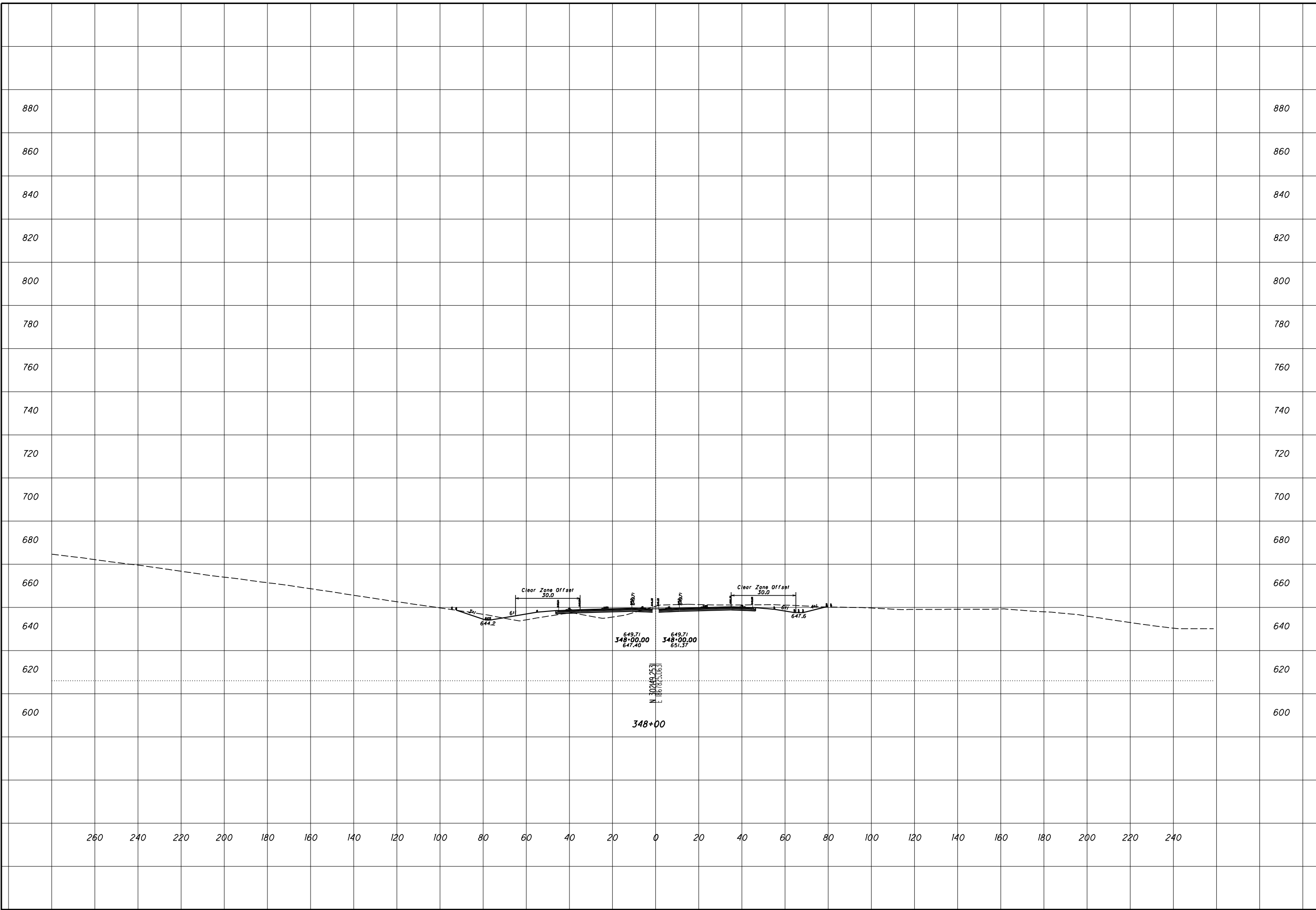
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343+50.00
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N 300702.739
E 186765.736

343+50

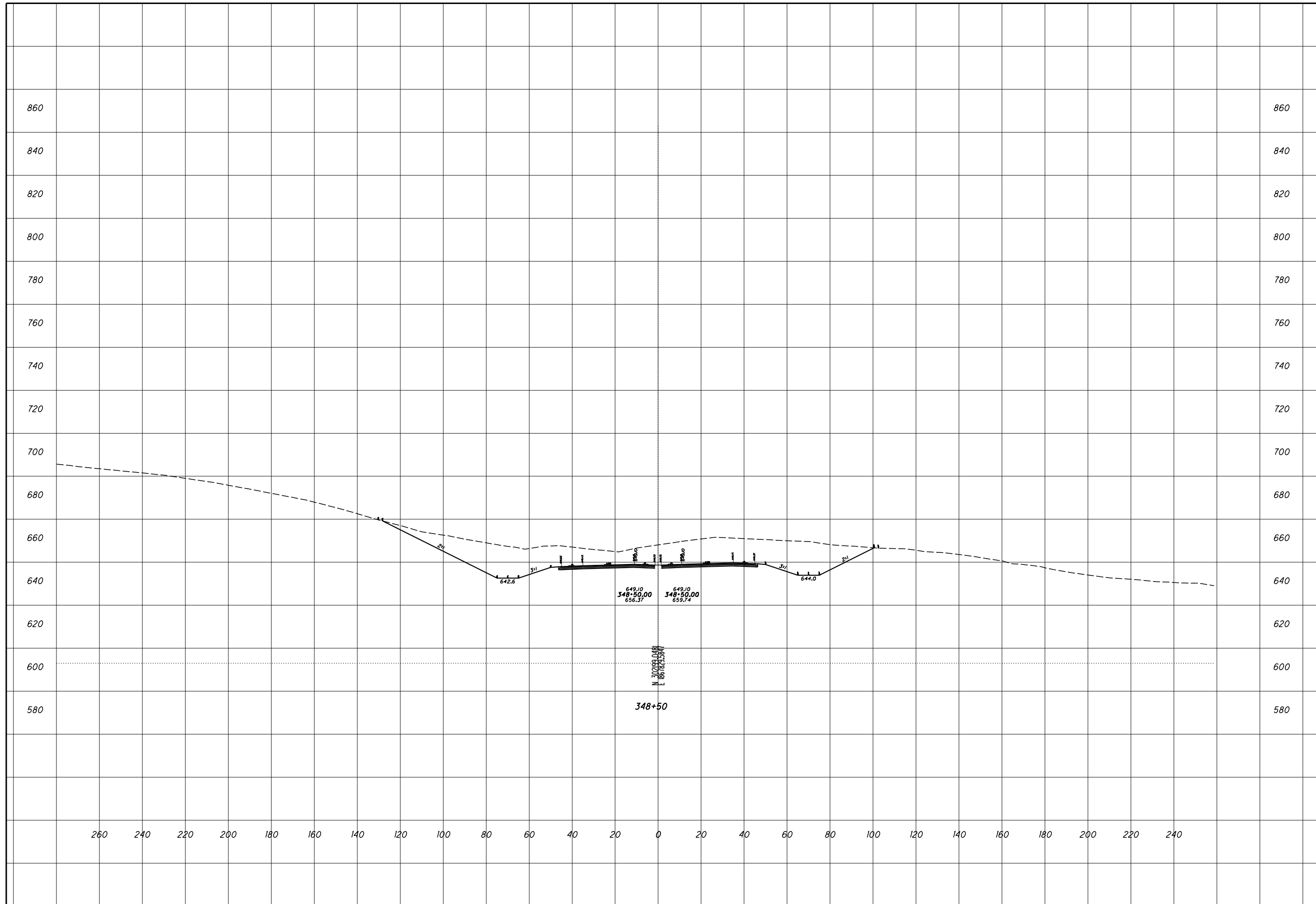
ROCK CUT SLOPE DESIGN - ROCK CUT 11
STA 348+00

SCI-823-0.00



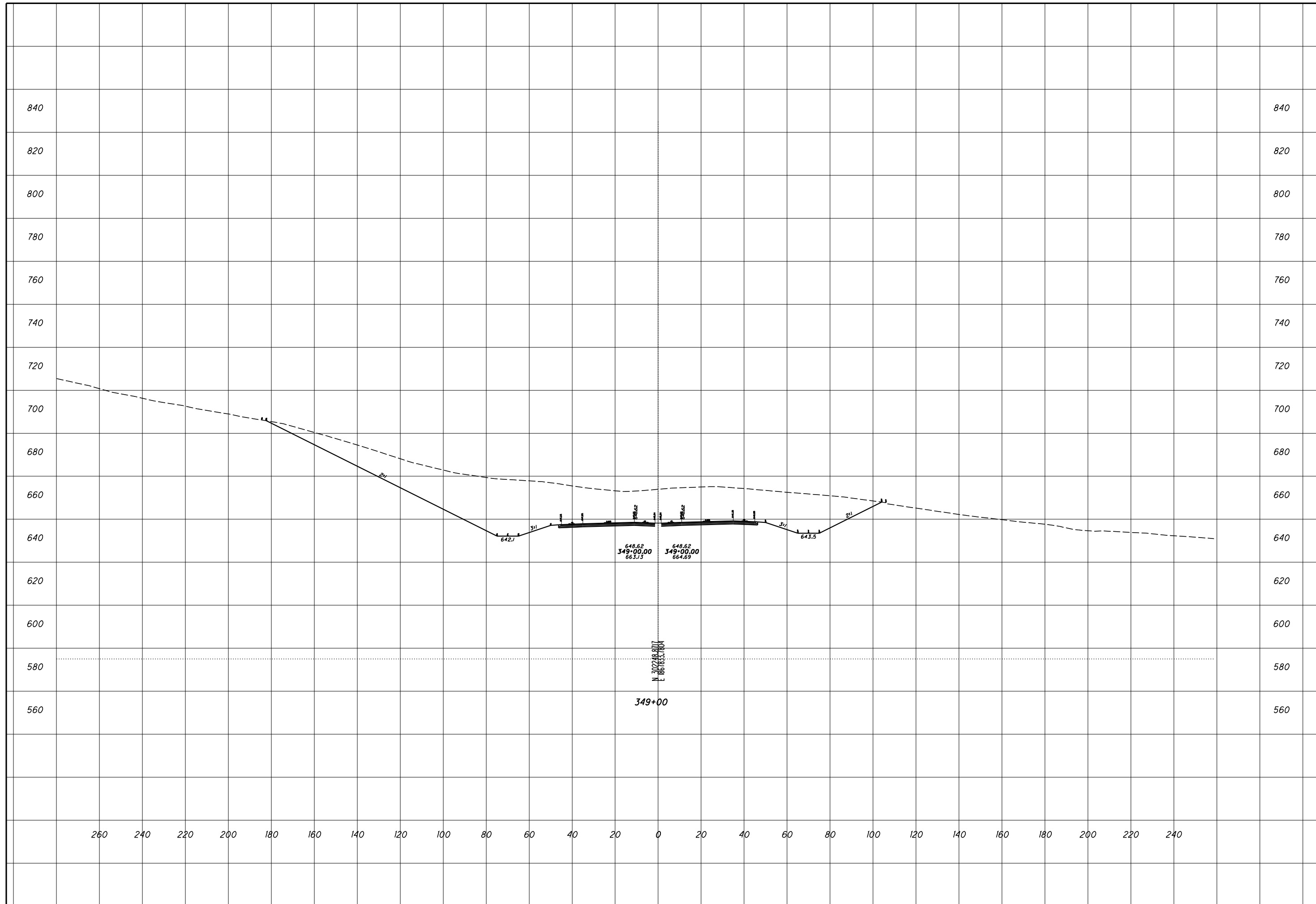
ROCK CUT SLOPE DESIGN - ROCK CUT 11
STA 348+50

SCI-823-0.00



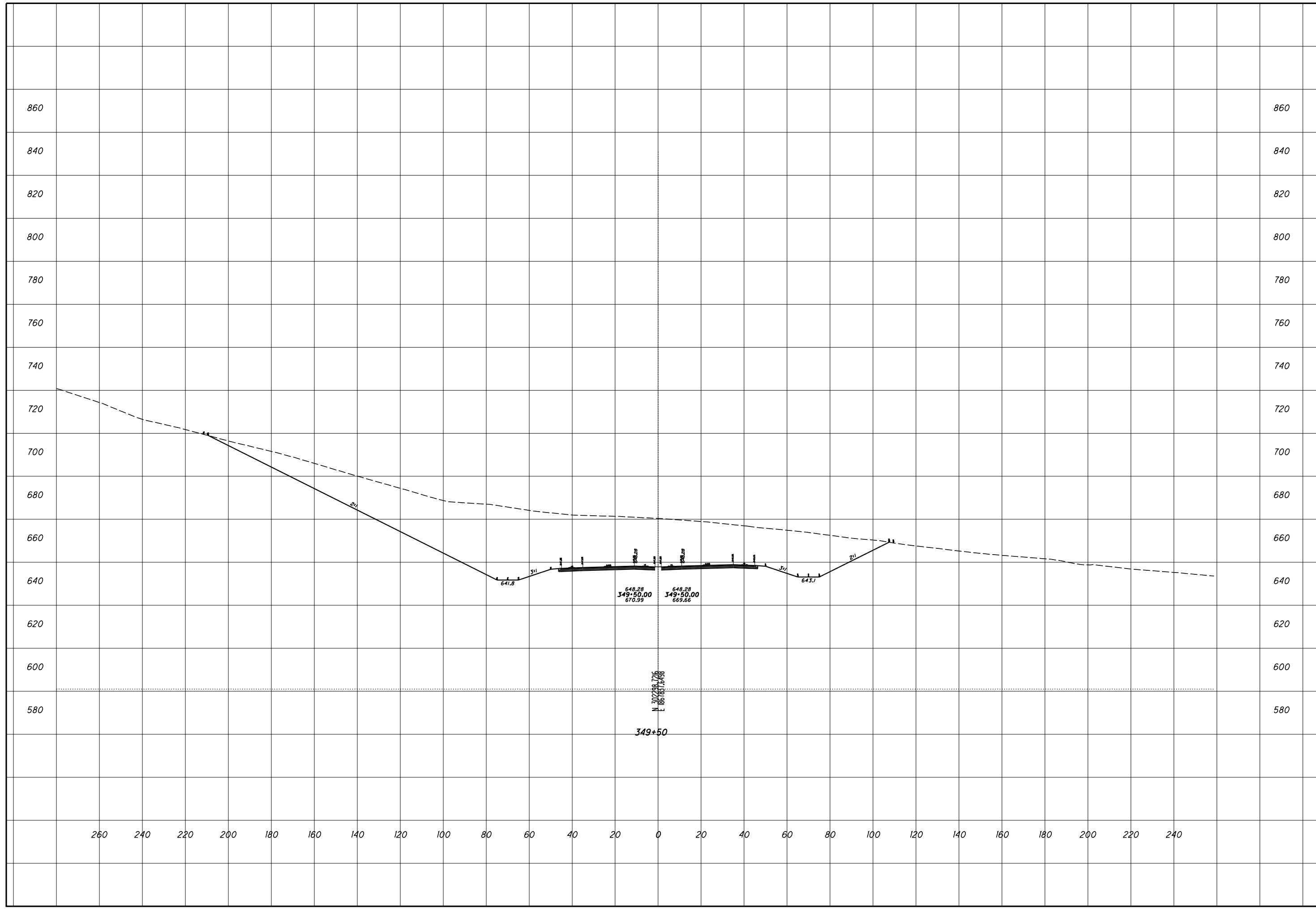
ROCK CUT SLOPE DESIGN - ROCK CUT 11
STA 349+00

SCI-823-0.00



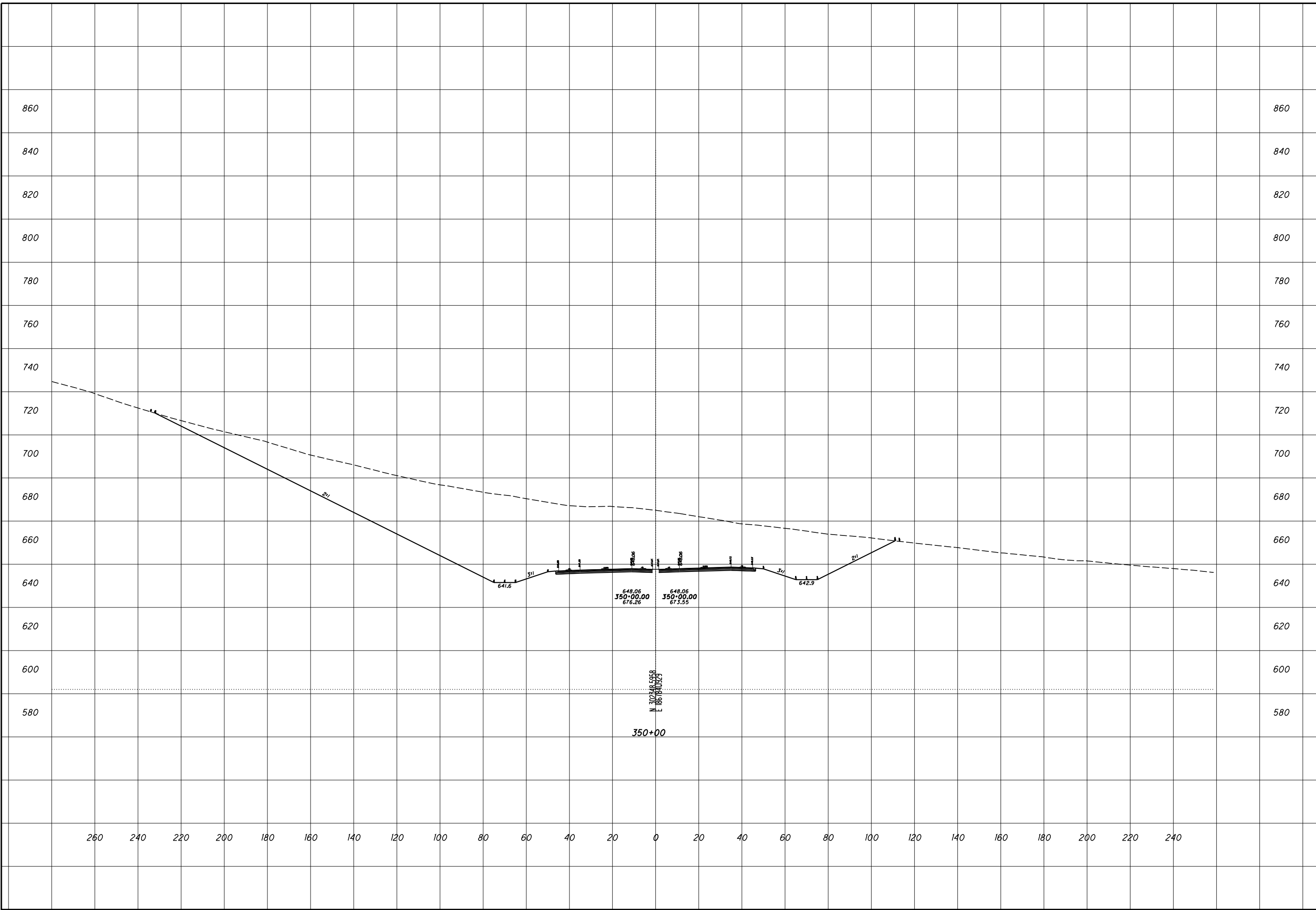
ROCK CUT SLOPE DESIGN - ROCK CUT 11
STA 349+50

SCI-823-0.00



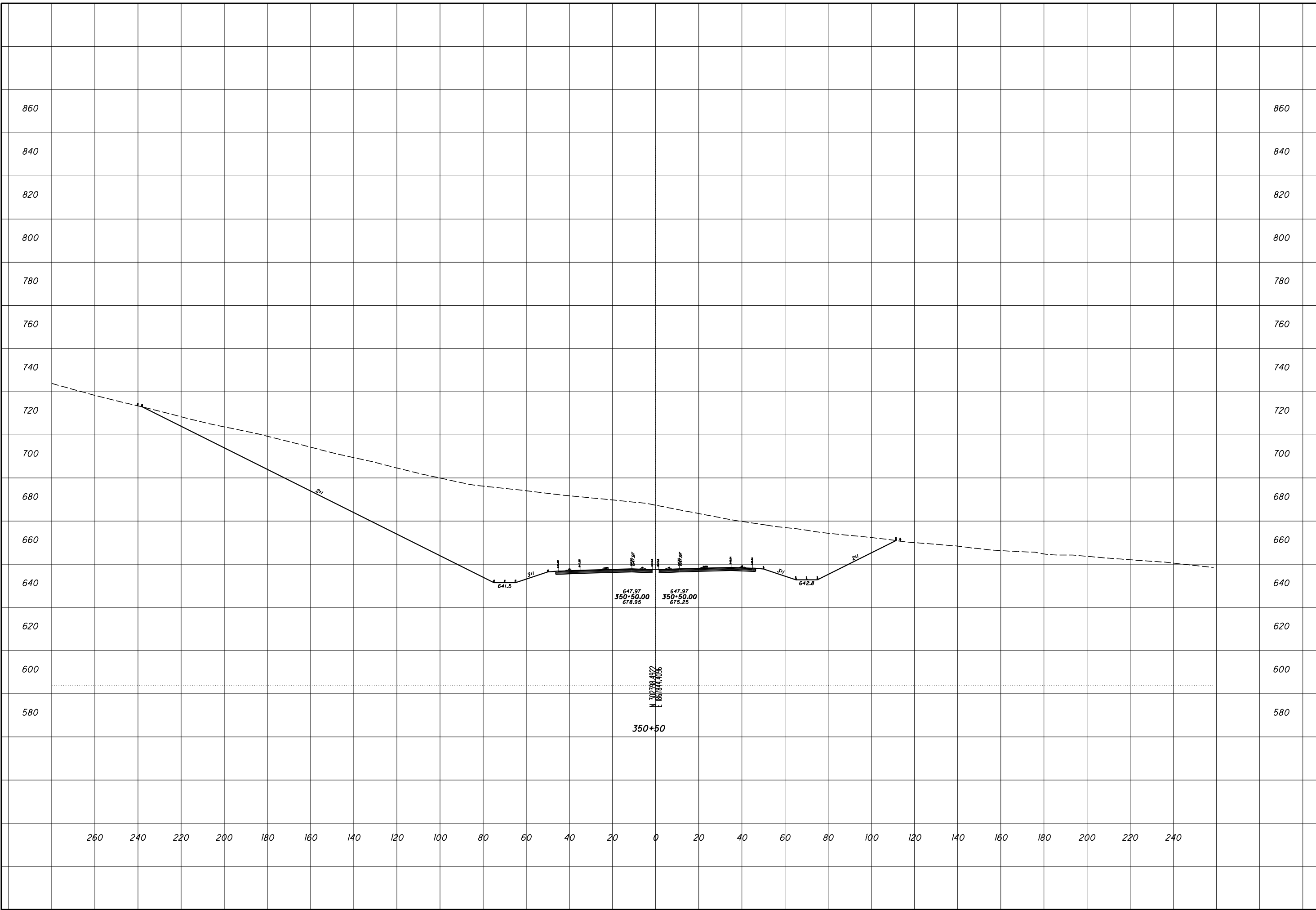
ROCK CUT SLOPE DESIGN - ROCK CUT 11
STA 350+00

SCI-823-0.00



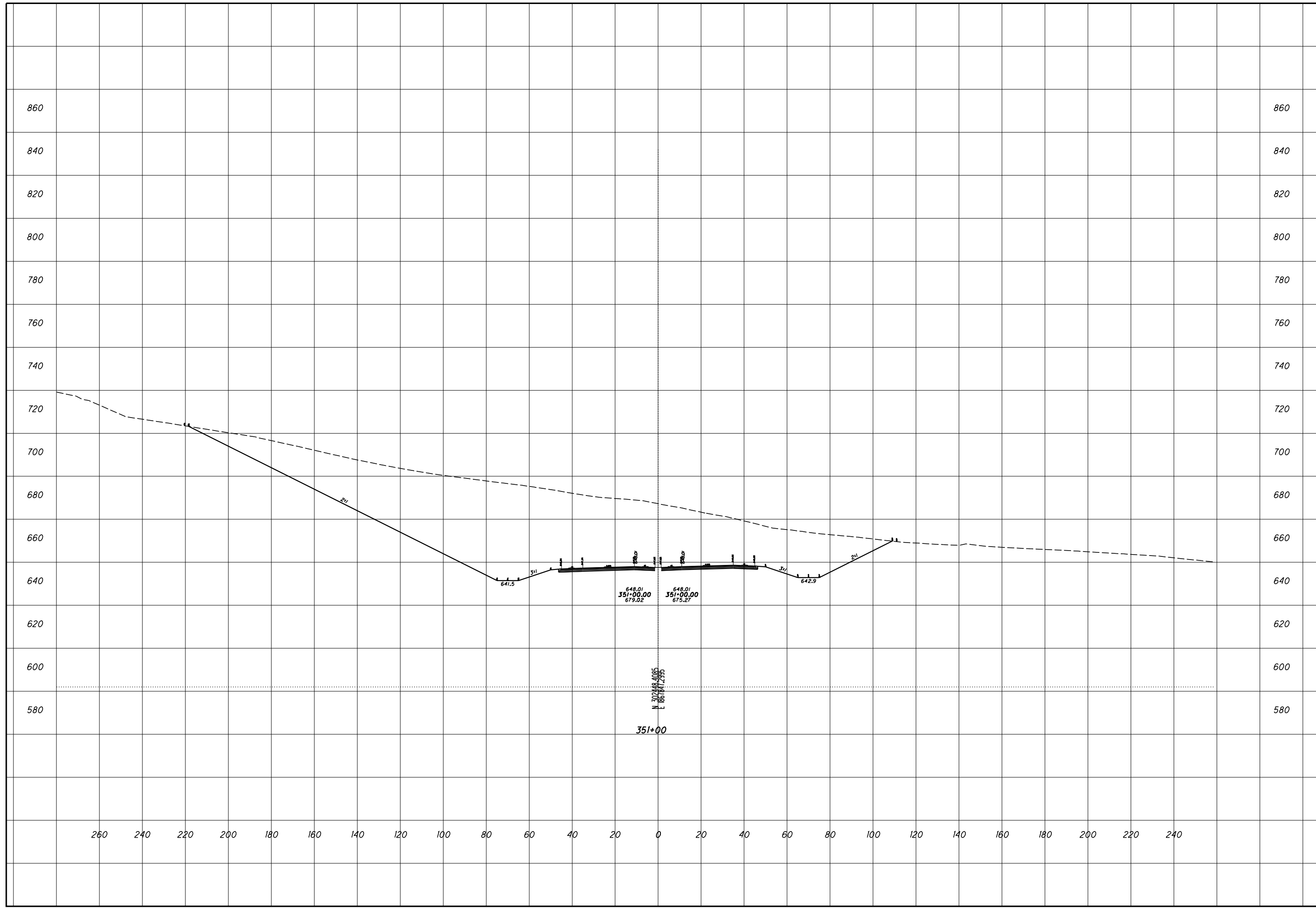
**ROCK CUT SLOPE DESIGN - ROCK CUT 11
STA 350+50**

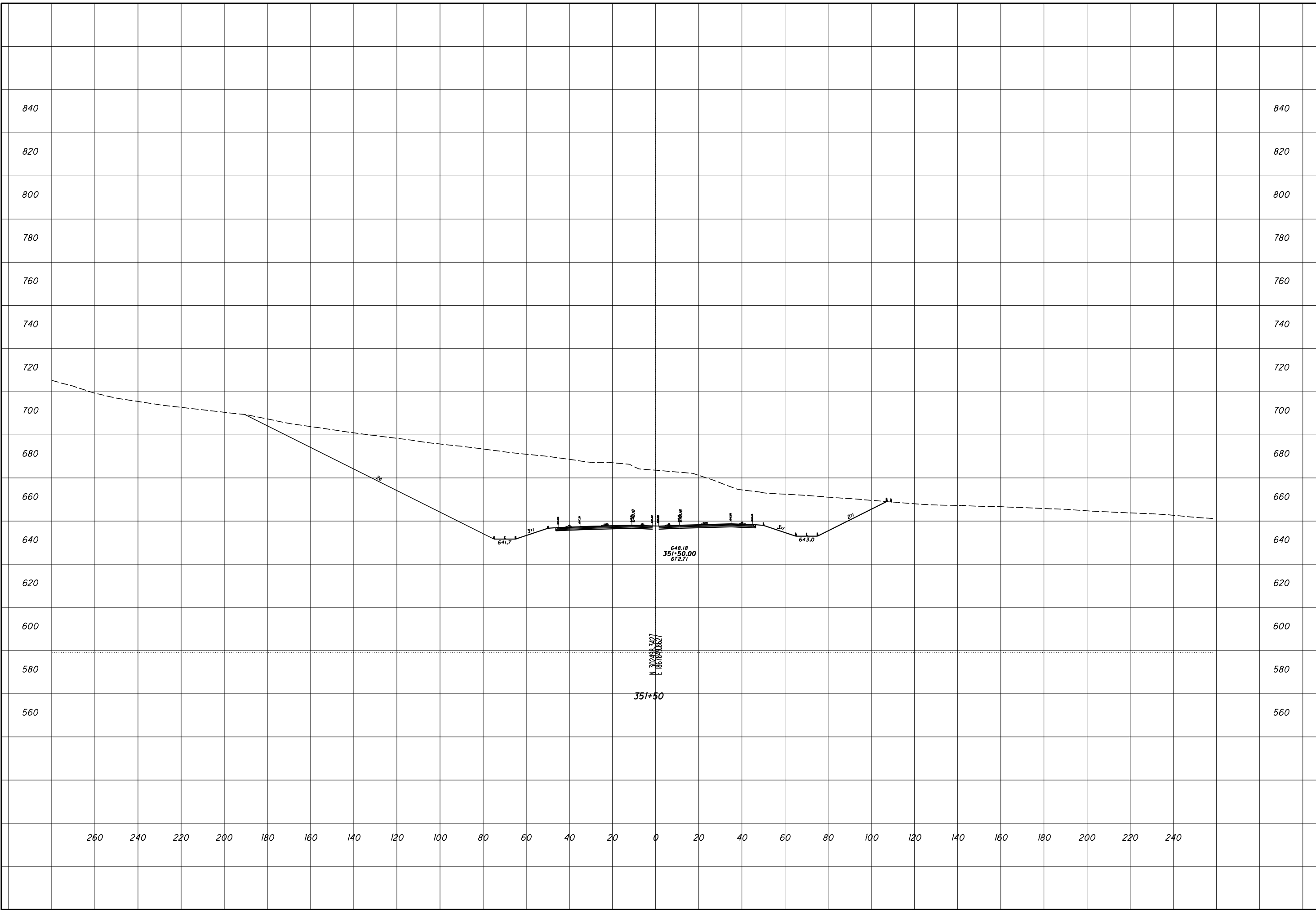
SCI-823-0.00



ROCK CUT SLOPE DESIGN - ROCK CUT 11
STA 351+00

SCI-823-0.00

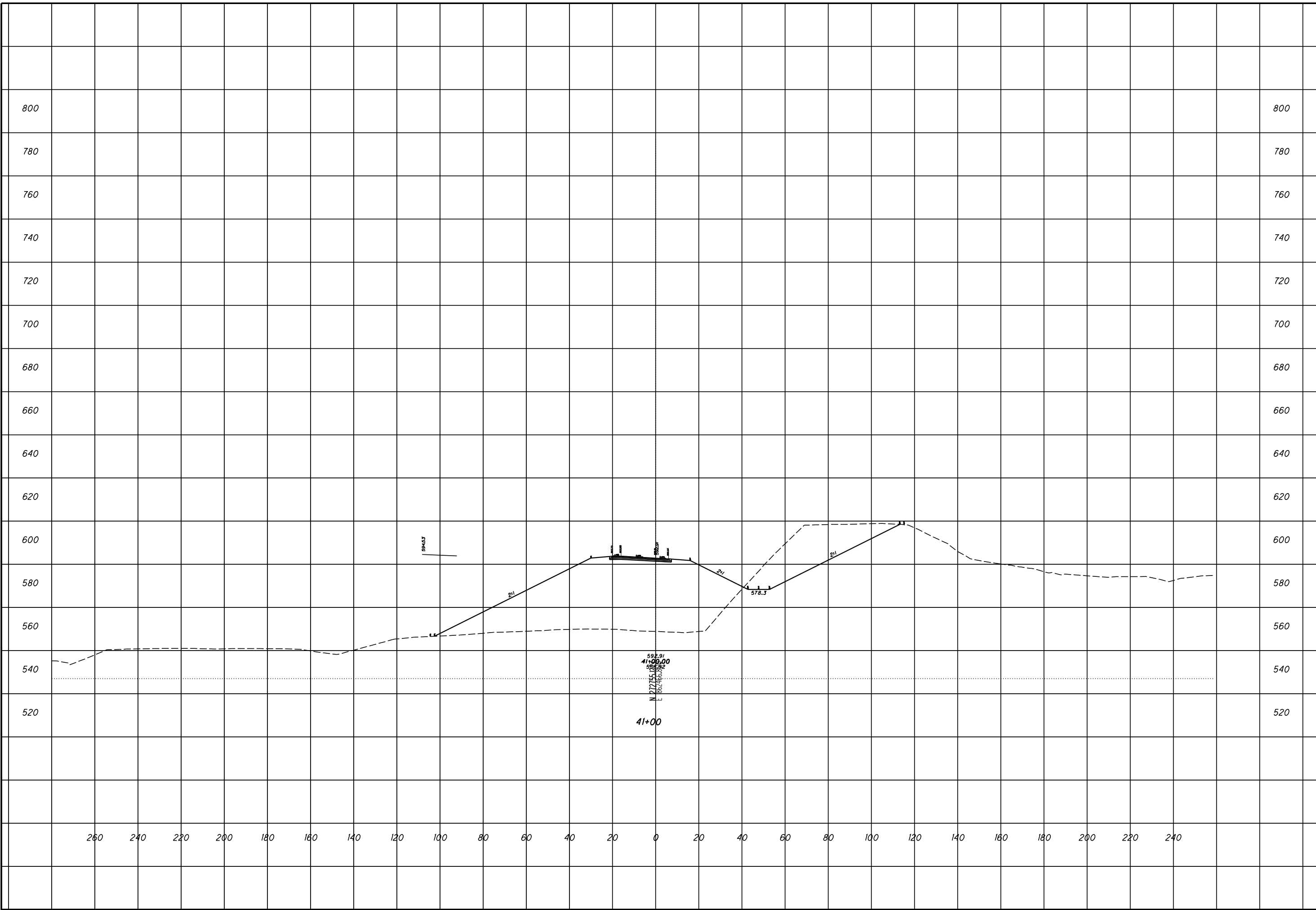




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ROCK CUT SLOPE DESIGN - ROCK CUT 11
STA 351+50
SCI-823-0.00

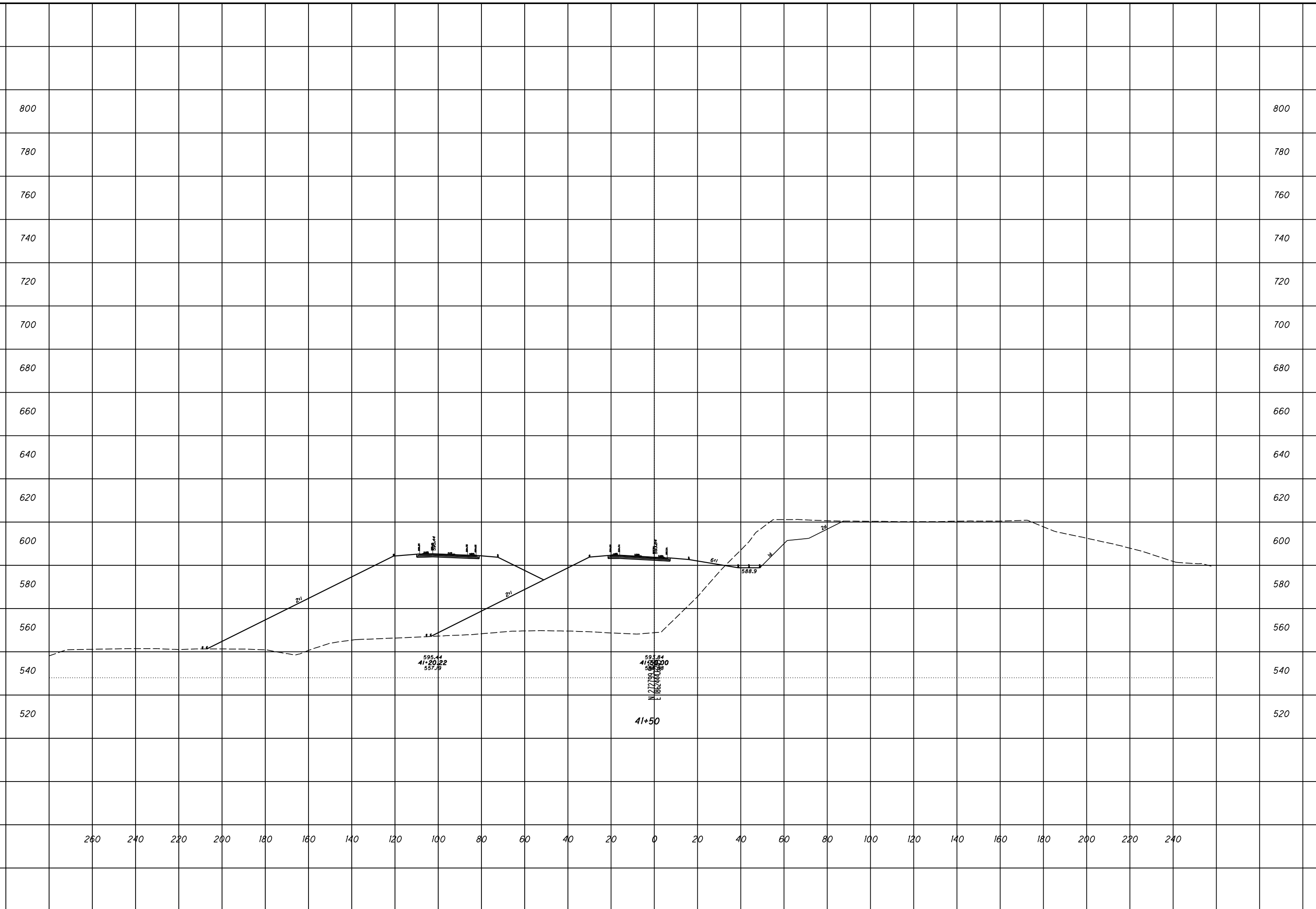
ROCK CUT SLOPE DESIGN - US 52 RAMP A
STA 41+00

SCI-823-0.00



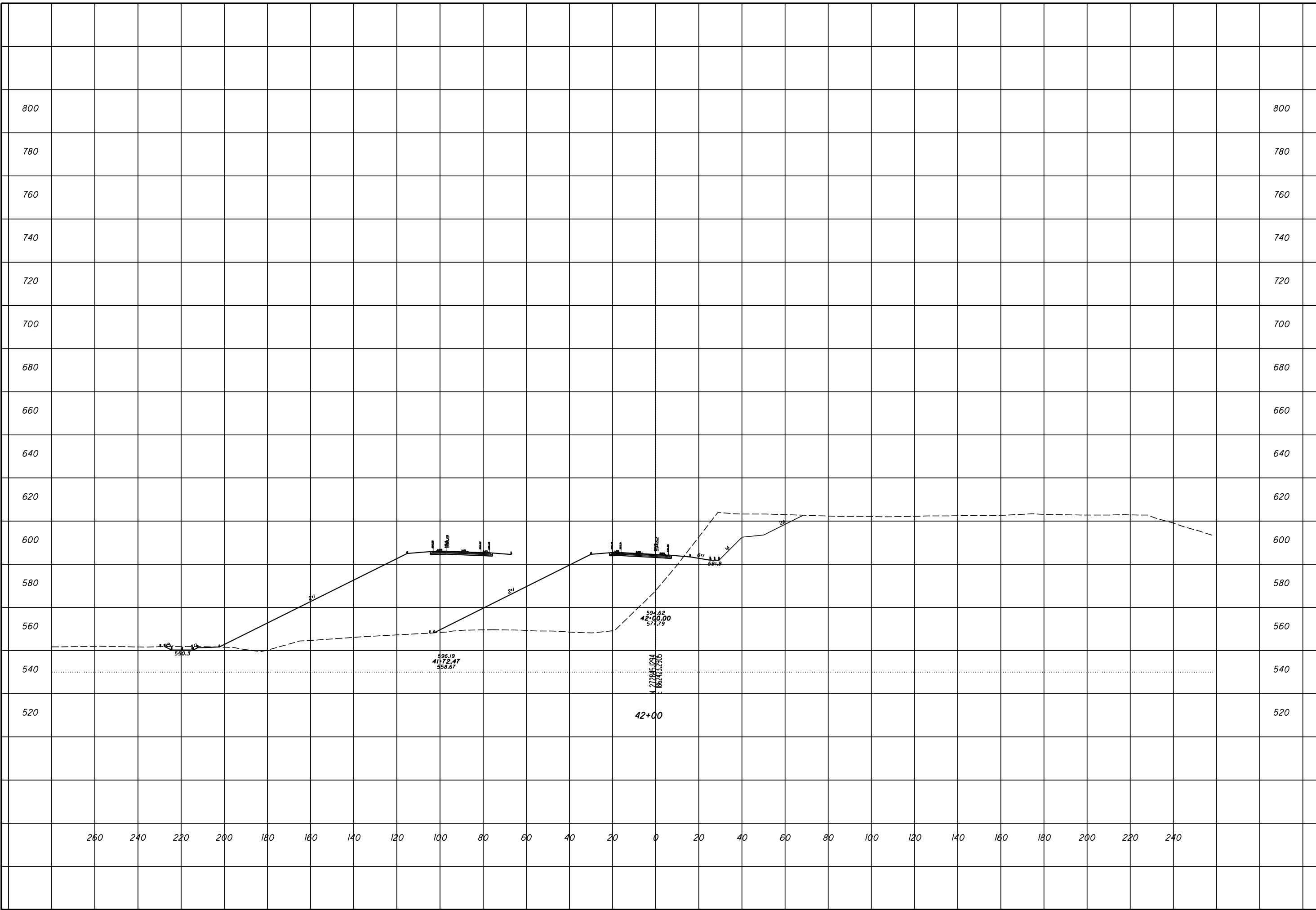
ROCK CUT SLOPE DESIGN - US 52 RAMP A
STA 41+50

SCI-823-0.00



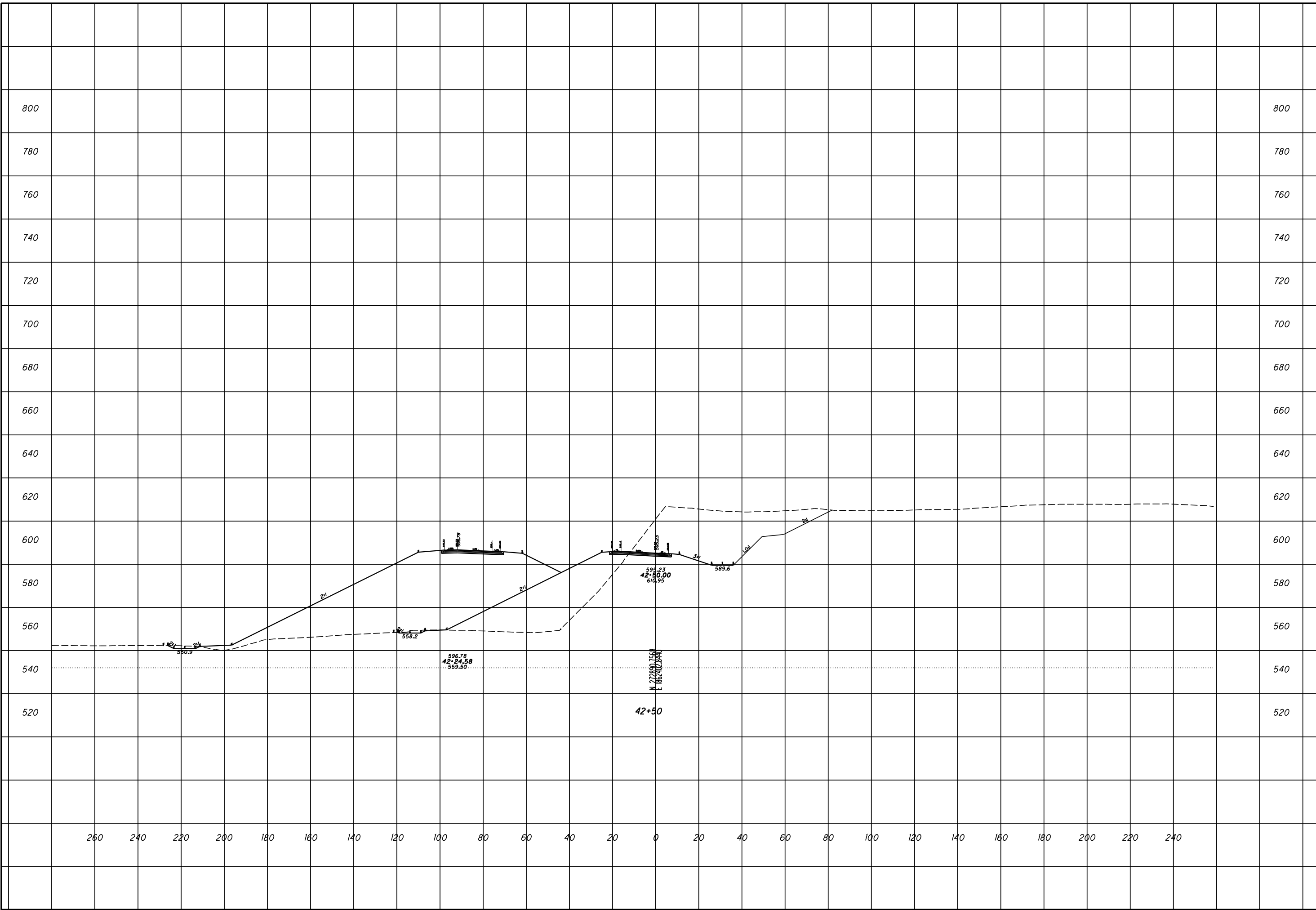
ROCK CUT SLOPE DESIGN - US 52 RAMP A
STA 42+00

SCI-823-0.00



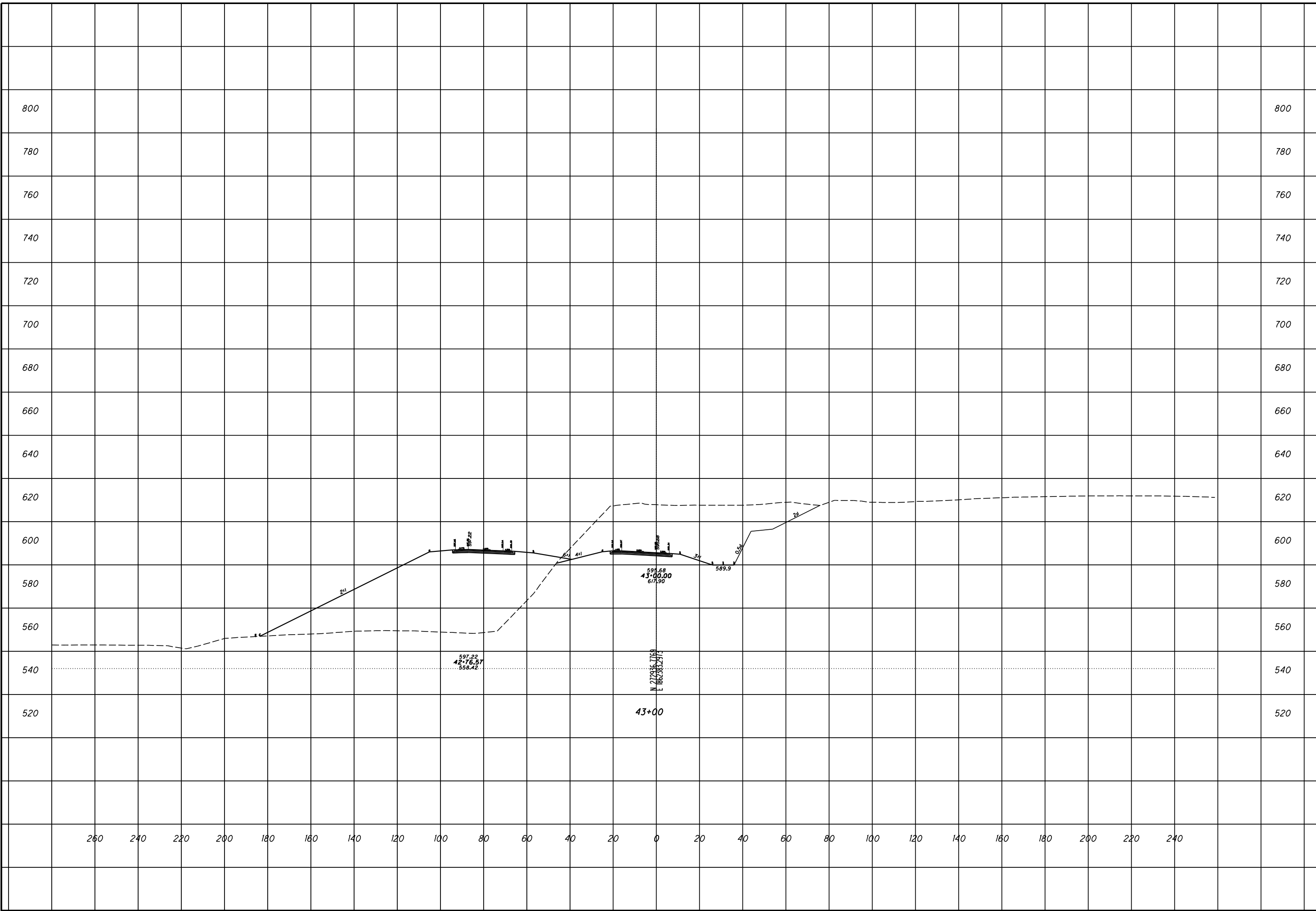
ROCK CUT SLOPE DESIGN - US 52 RAMP A
STA 42+50

SCI-823-0.00



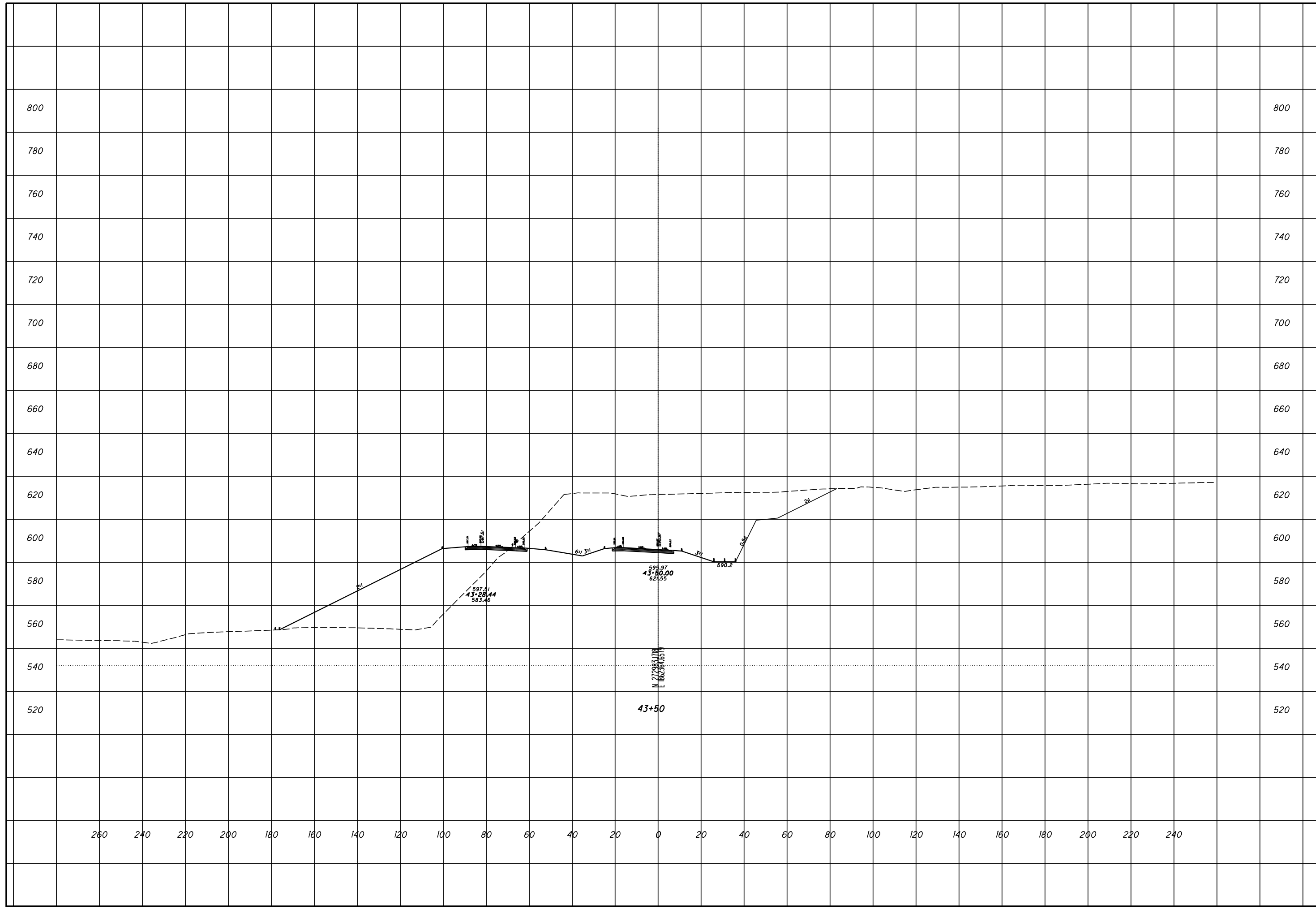
ROCK CUT SLOPE DESIGN - US 52 RAMP A
STA 43+00

SCI-823-0.00



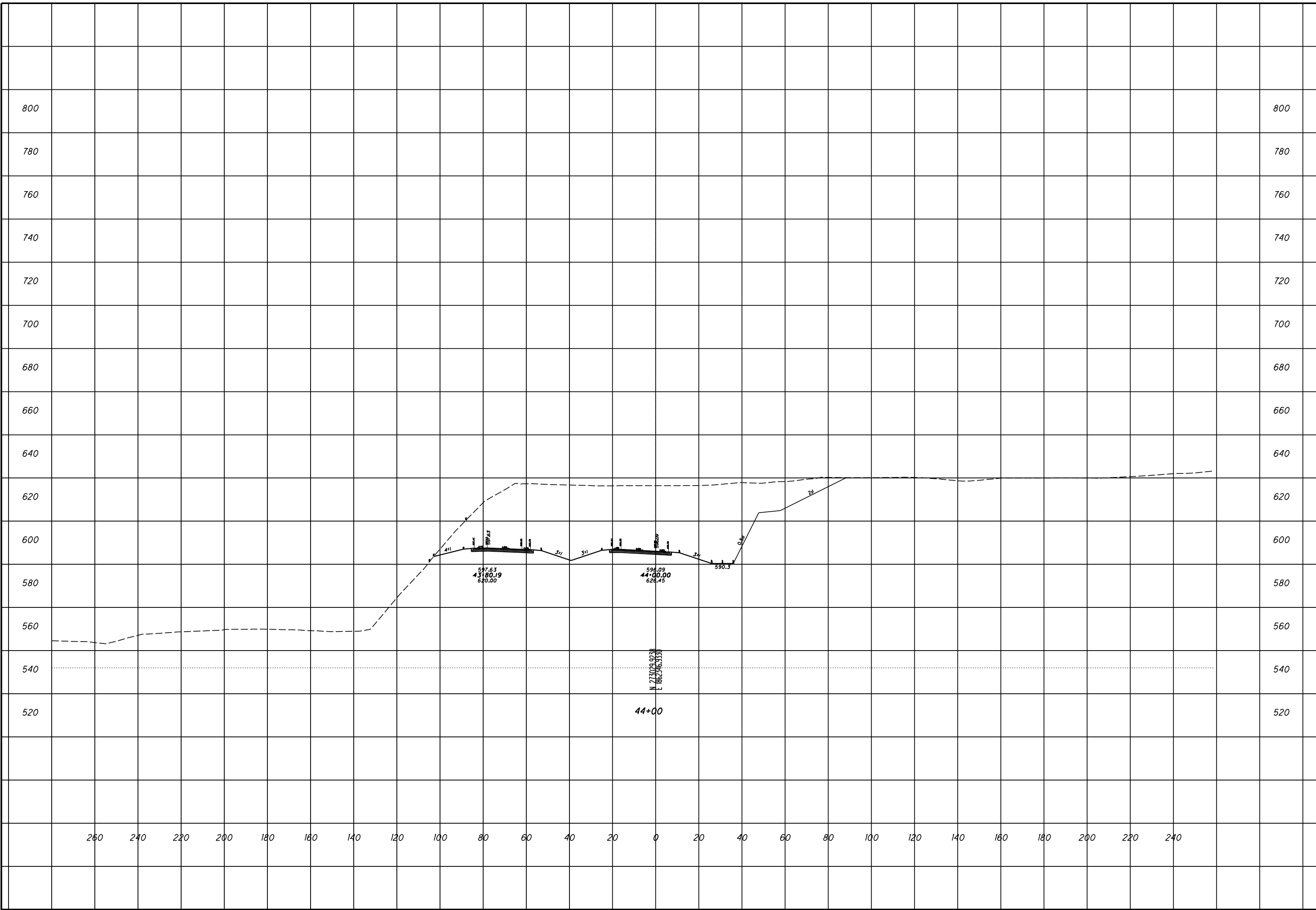
ROCK CUT SLOPE DESIGN - US 52 RAMP A
STA 43+50

SCI-823-0.00



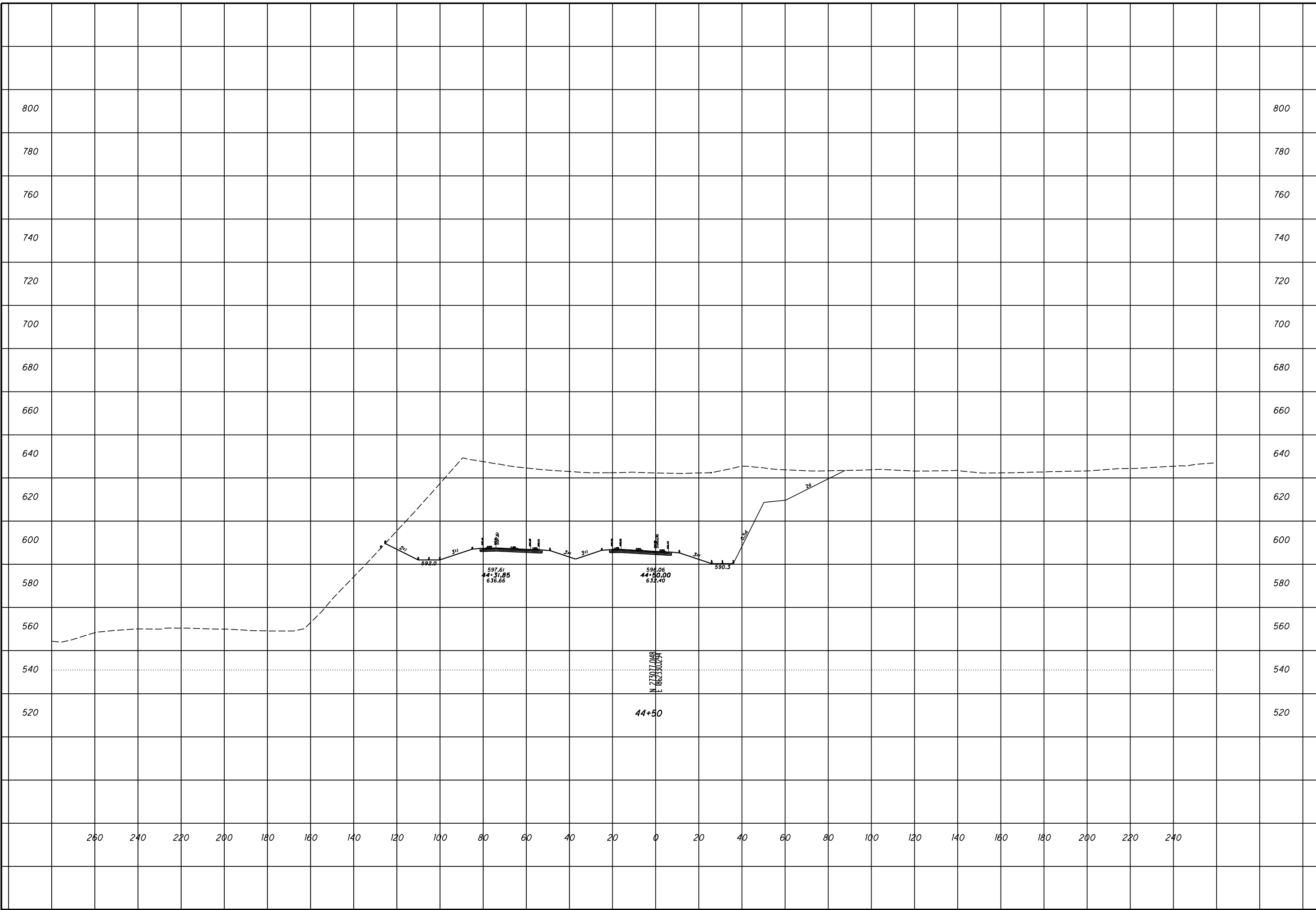
ROCK CUT SLOPE DESIGN - US 52 RAMP A
STA 44+00

SCI-823-0.00



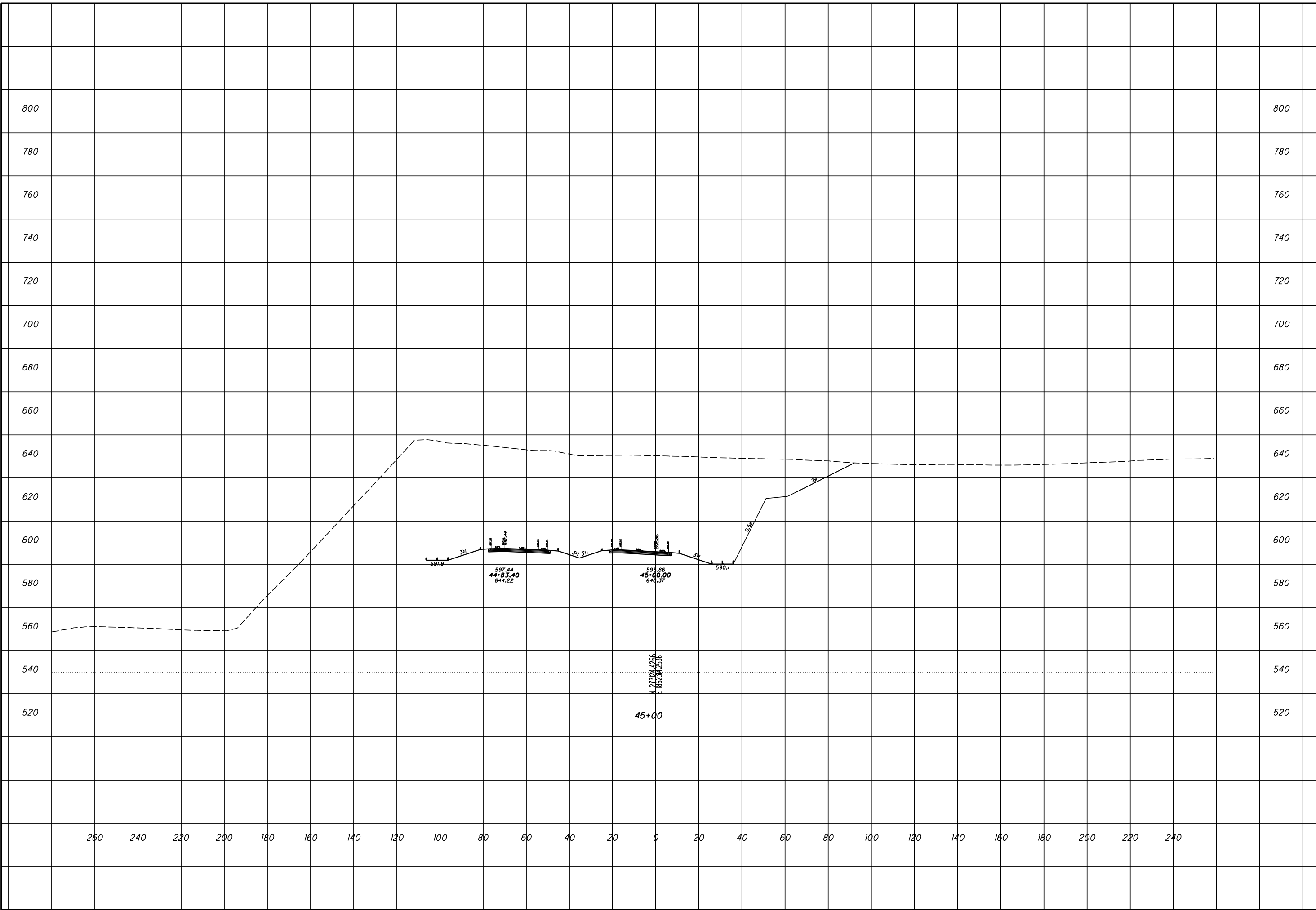
ROCK CUT SLOPE DESIGN - US 52 RAMP A
STA 44+50

SCI-823-0.00



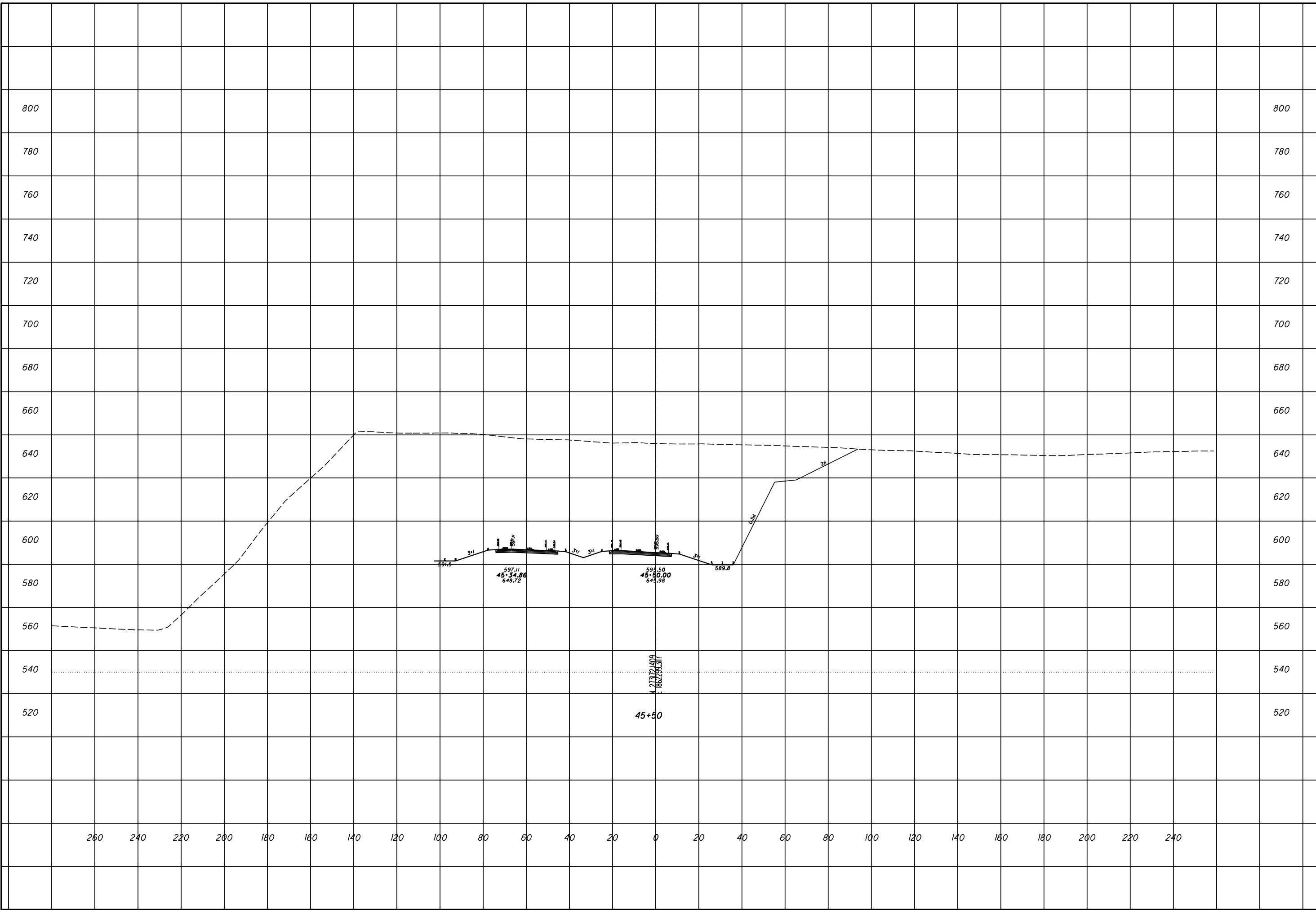
ROCK CUT SLOPE DESIGN - US 52 RAMP A
STA 45+00

SCI-823-0.00



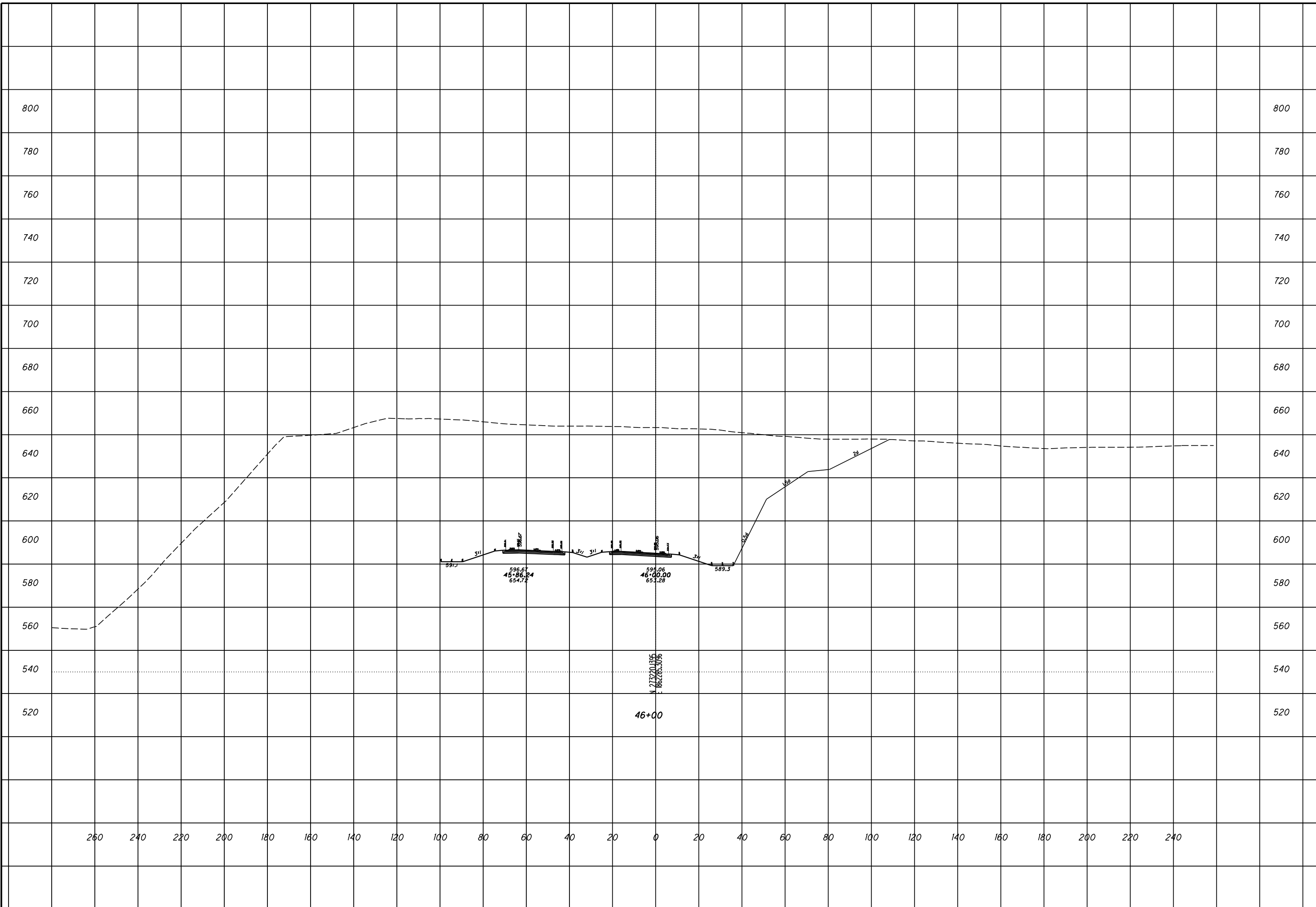
ROCK CUT SLOPE DESIGN - US 52 RAMP A
STA 45+50

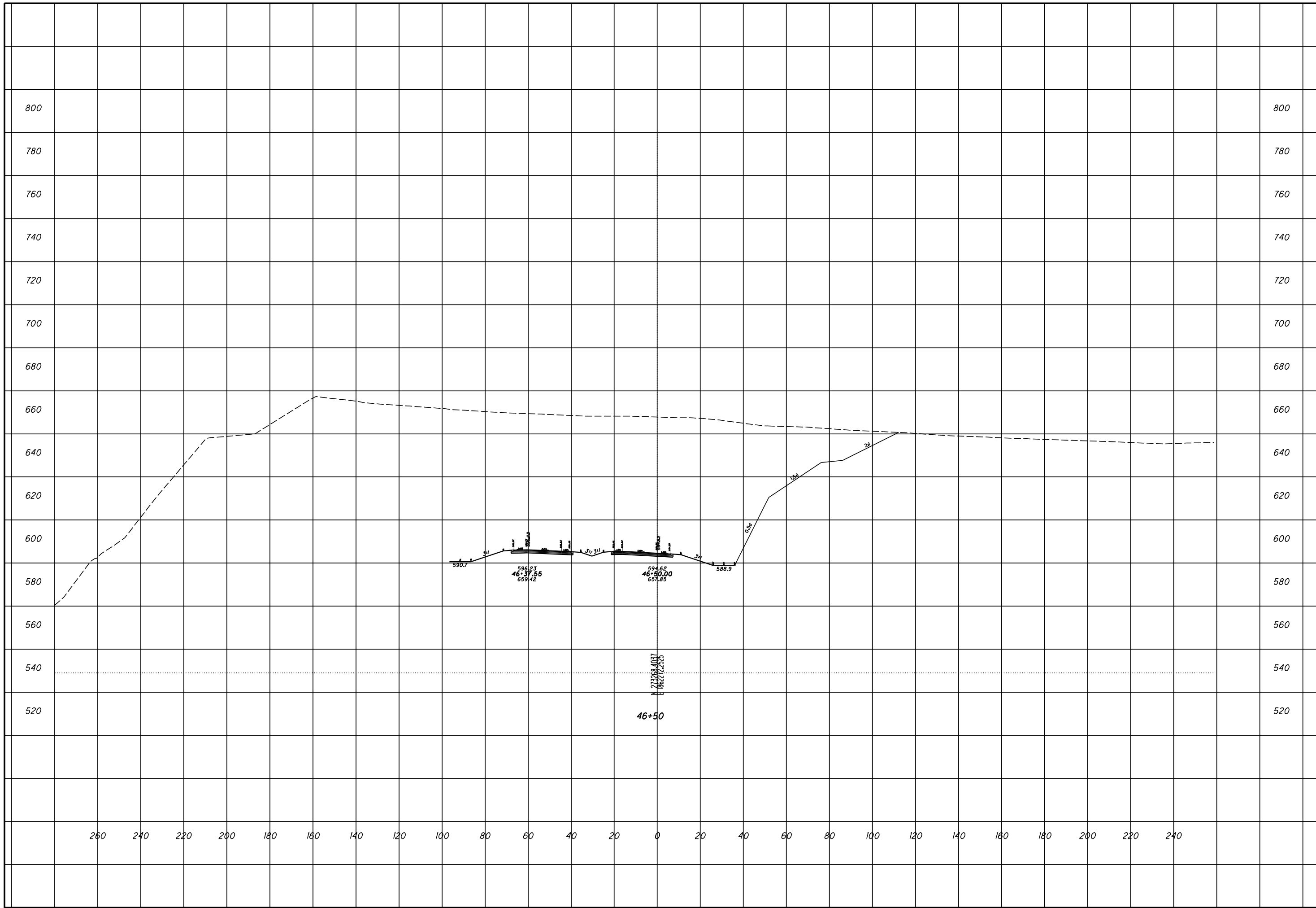
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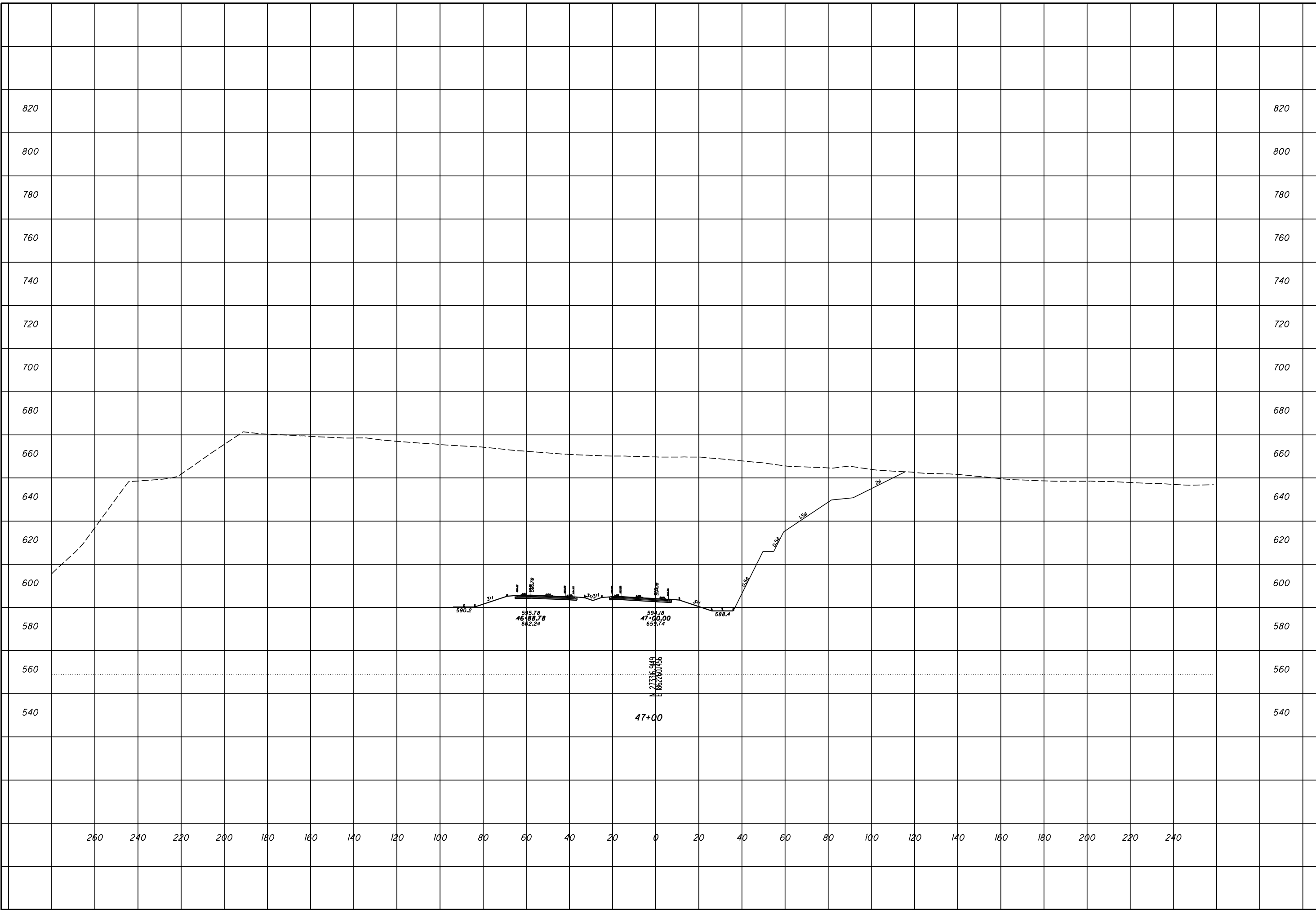
ROCK CUT SLOPE DESIGN - US 52 RAMP A
STA 46+00

SCI-823-0.00





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ROCK CUT SLOPE DESIGN - US 52 RAMP A
STA 46+50
SCI-823-0.00
 12
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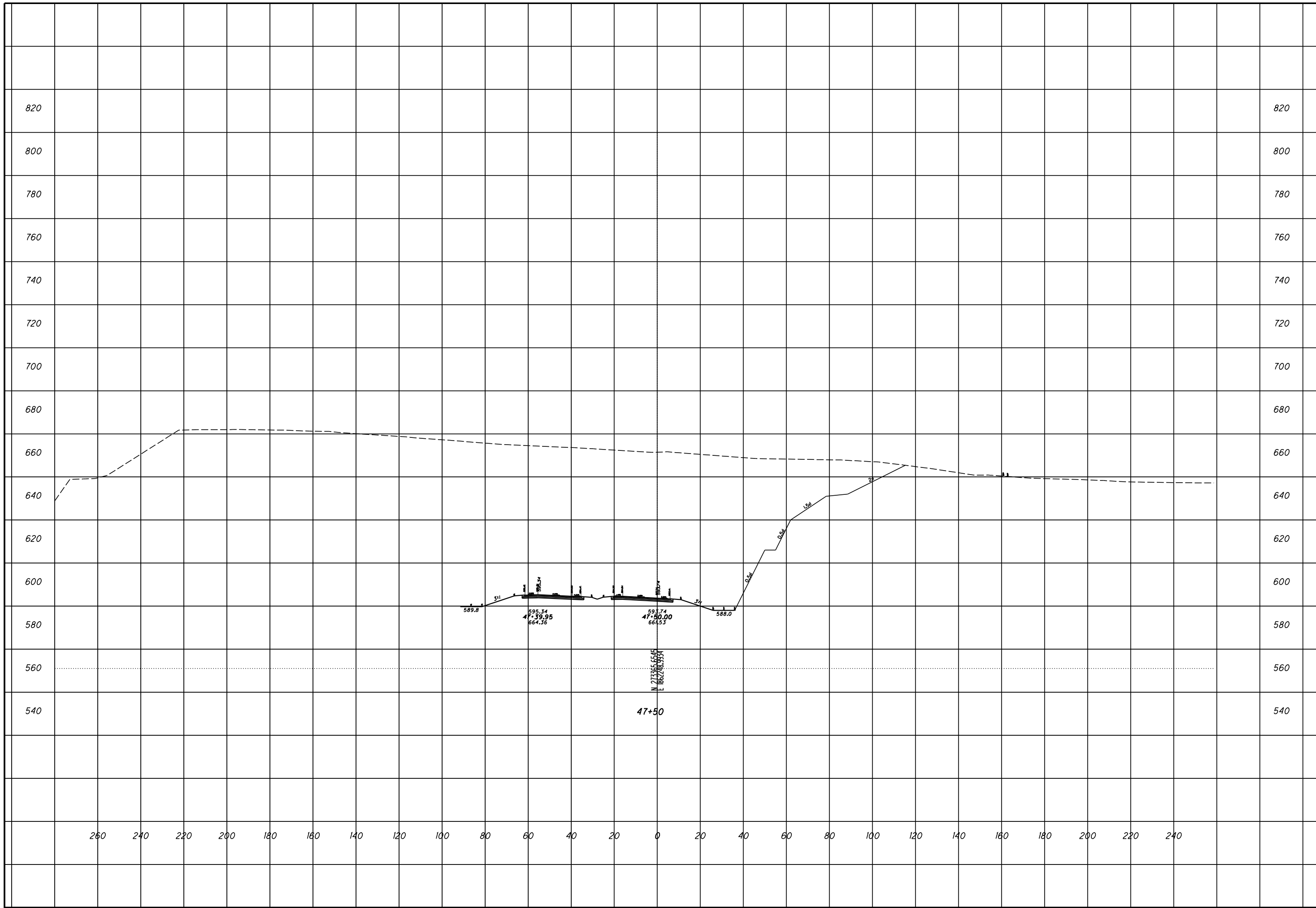


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**ROCK CUT SLOPE DESIGN - US 52 RAMP A
STA 47+00**

SCI-823-0.00

13
27

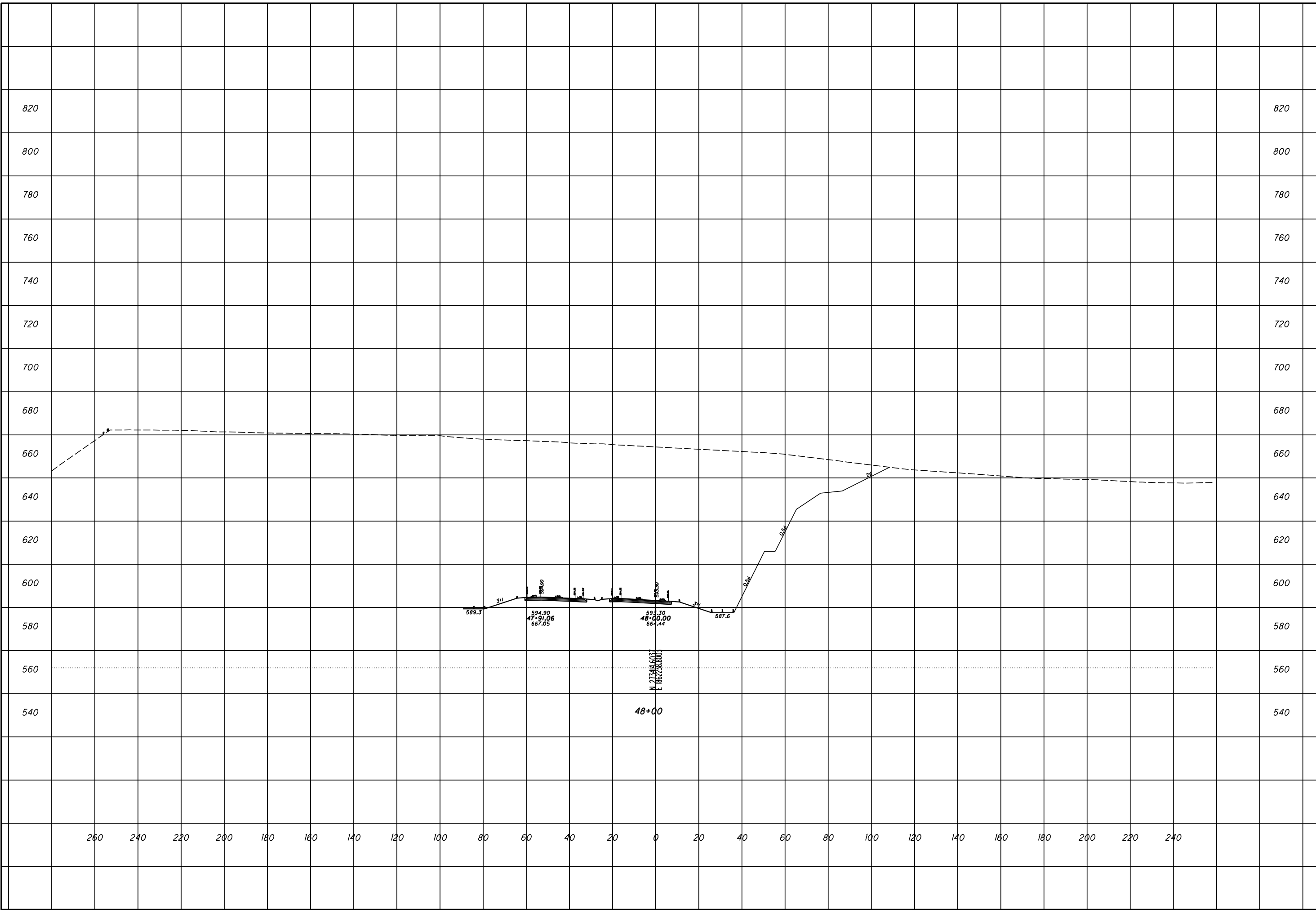


ROCK CUT SLOPE DESIGN - US 52 RAMP A
STA 47+50

SCI-823-0.00

14
27

CHECKED



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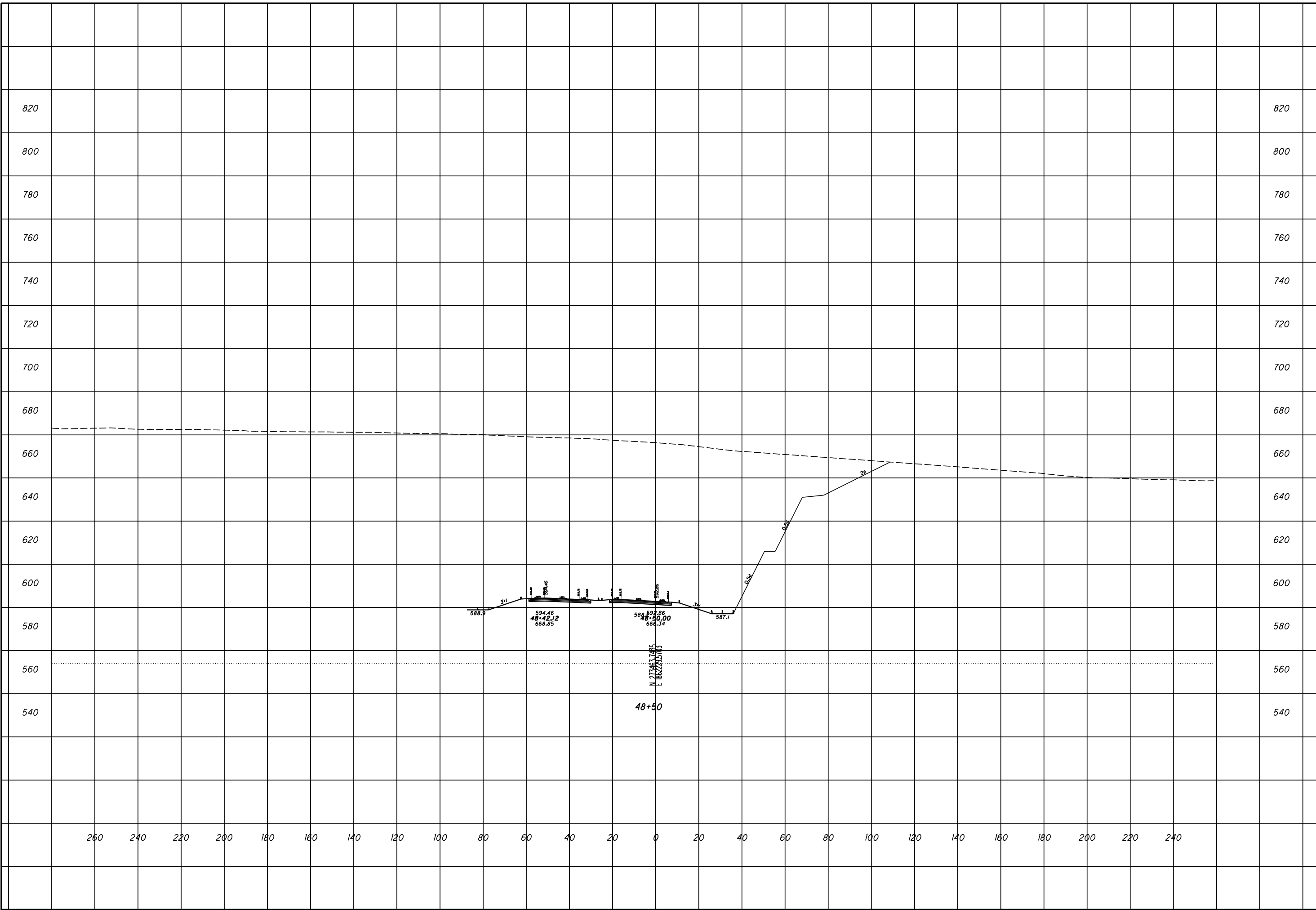
**ROCK CUT SLOPE DESIGN - US 52 RAMP A
STA 48+00**

SCI-823-0.00

15
27

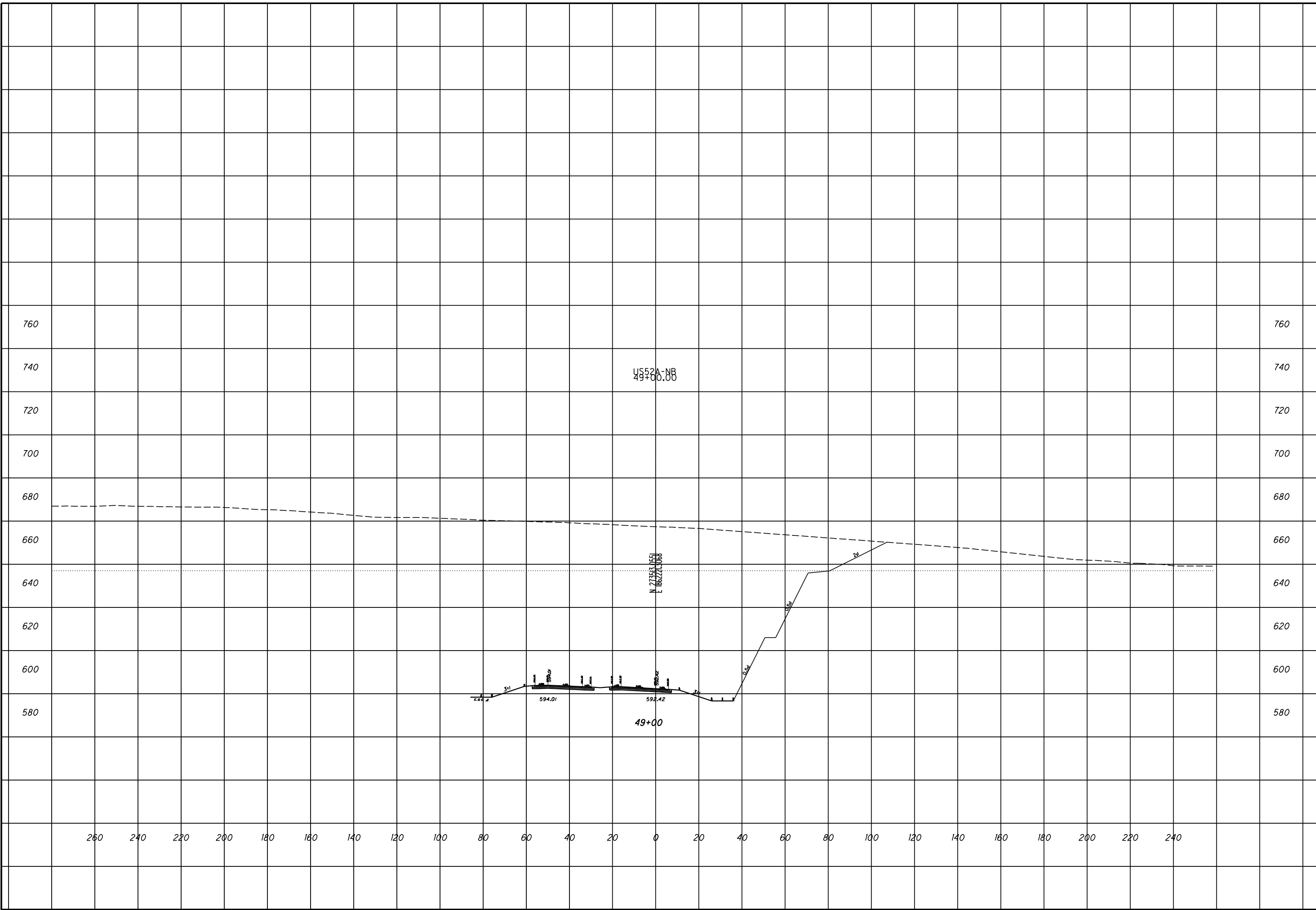
ROCK CUT SLOPE DESIGN - US 52 RAMP A
STA 48+50

SCI-823-0.00



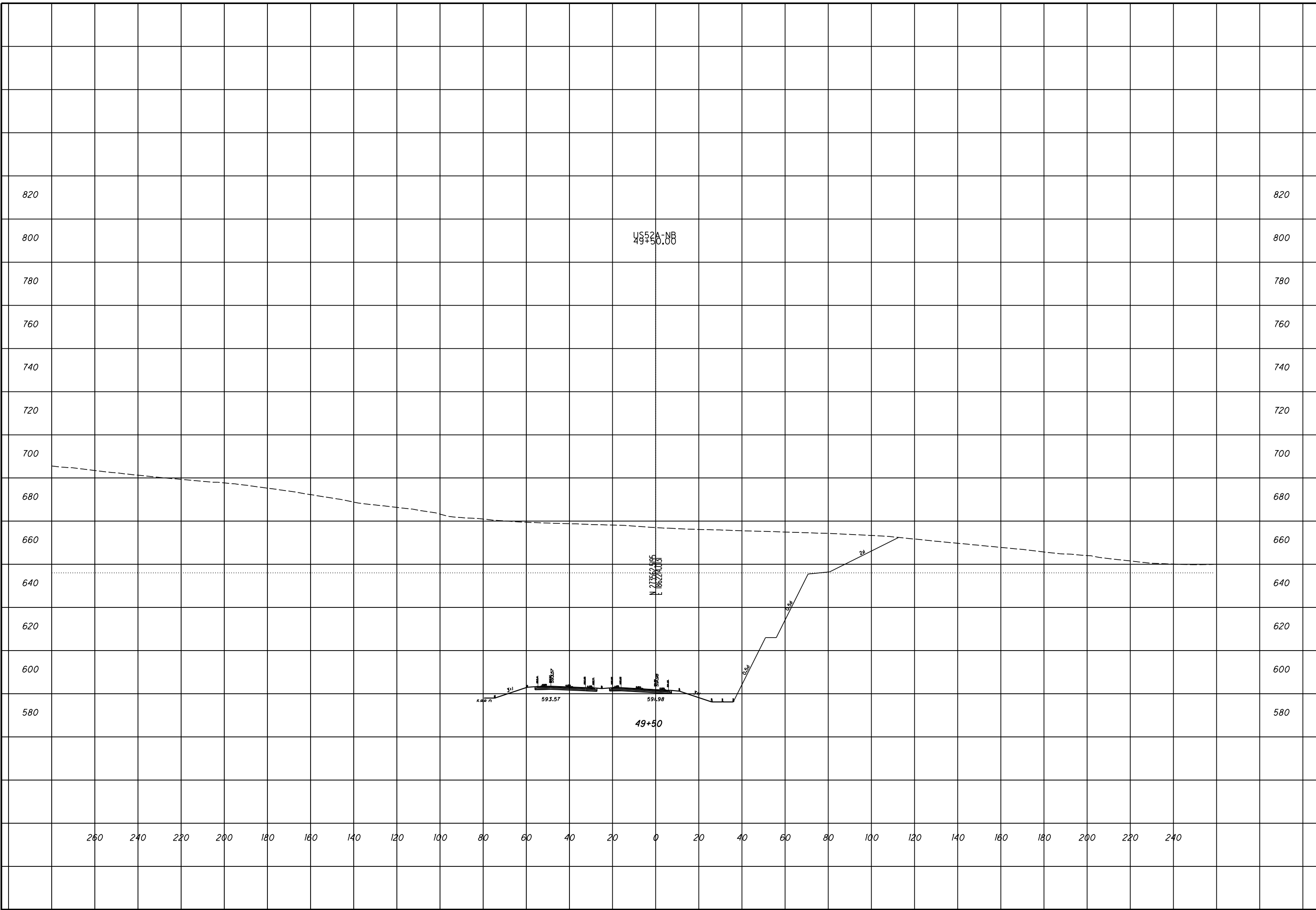
ROCK CUT SLOPE DESIGN - US 52 RAMP A
STA 49+00

SCI-823-0.00



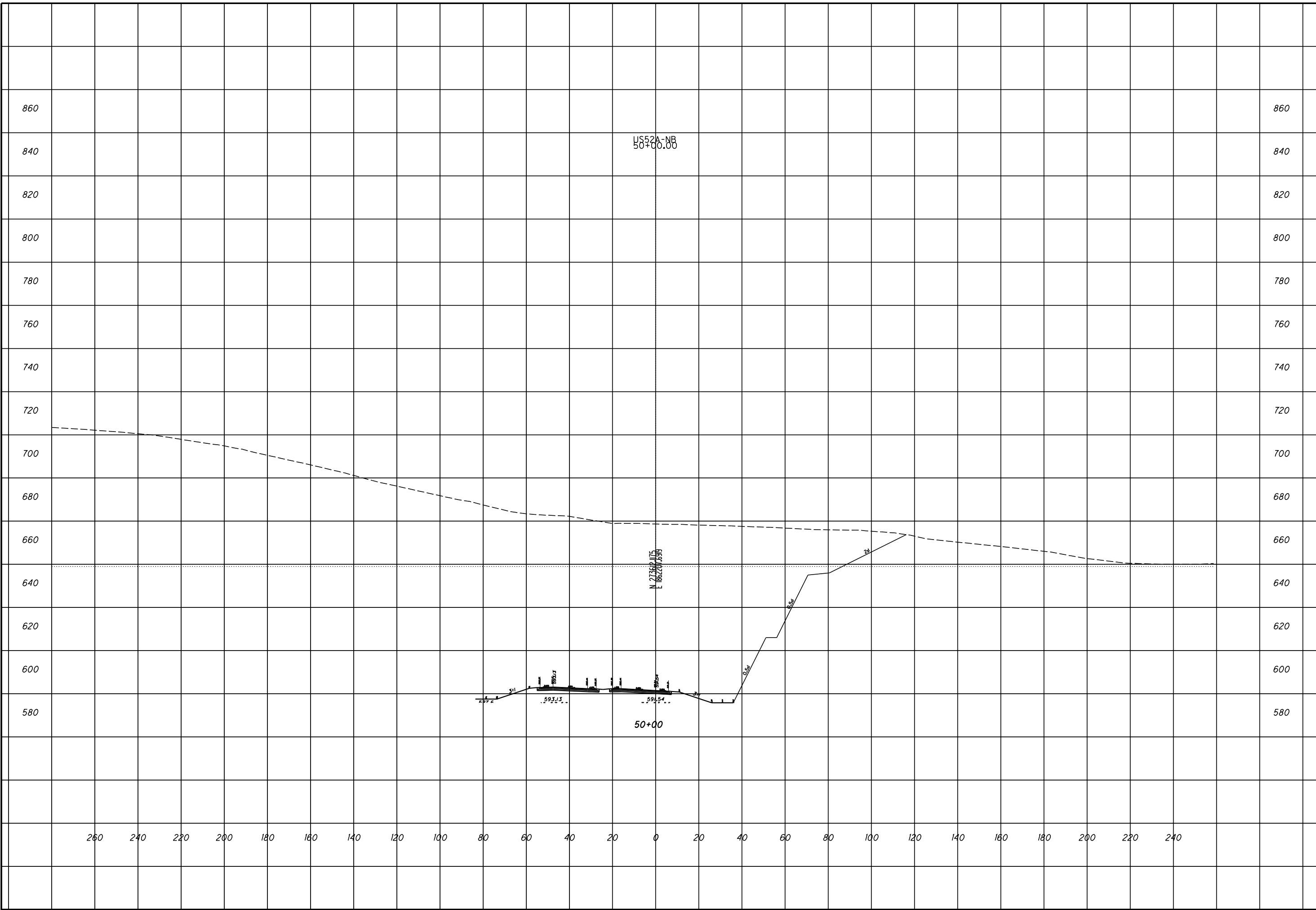
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STA 49+50

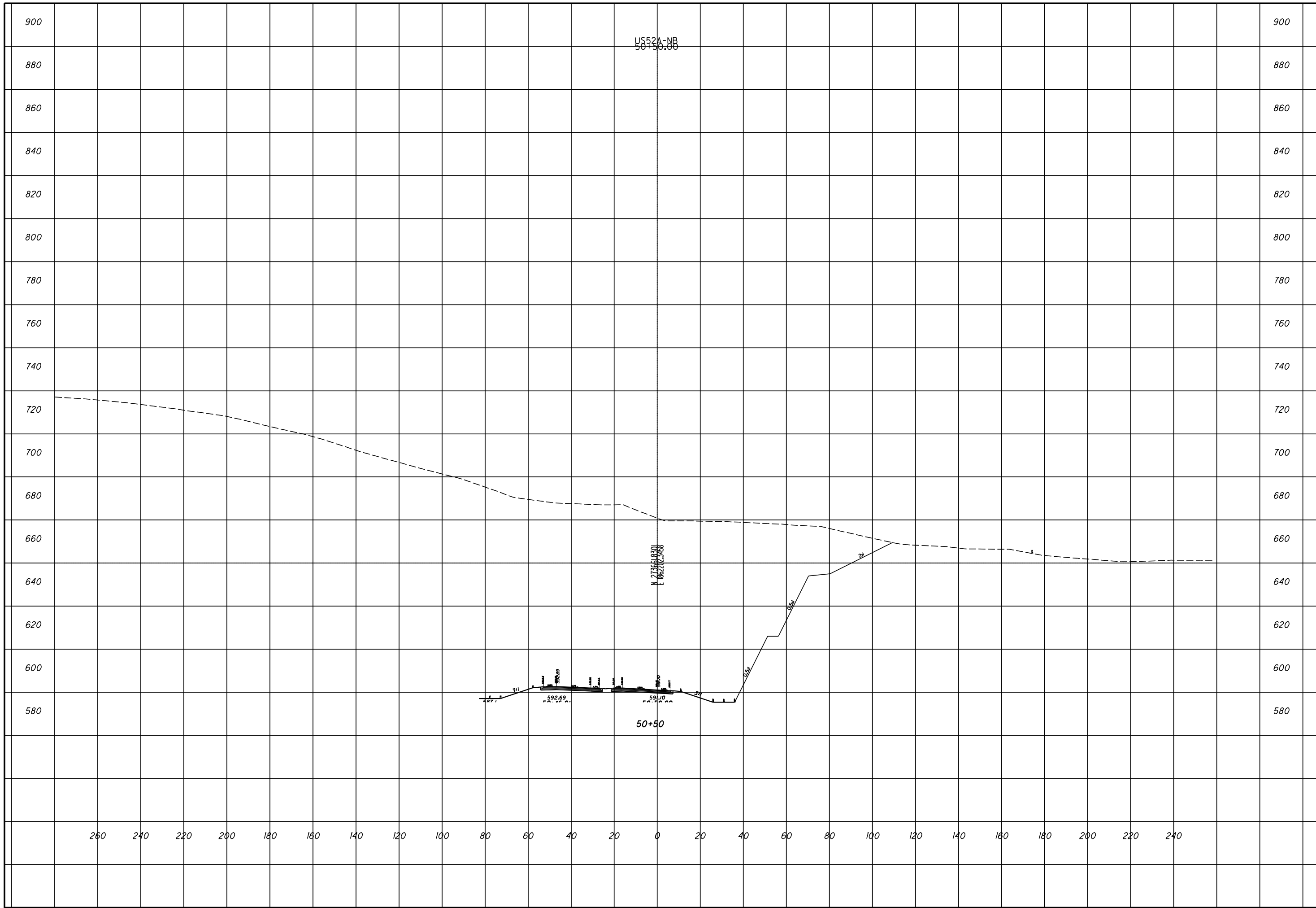
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ROCK CUT SLOPE DESIGN - US 52 RAMP A
STA 50+00

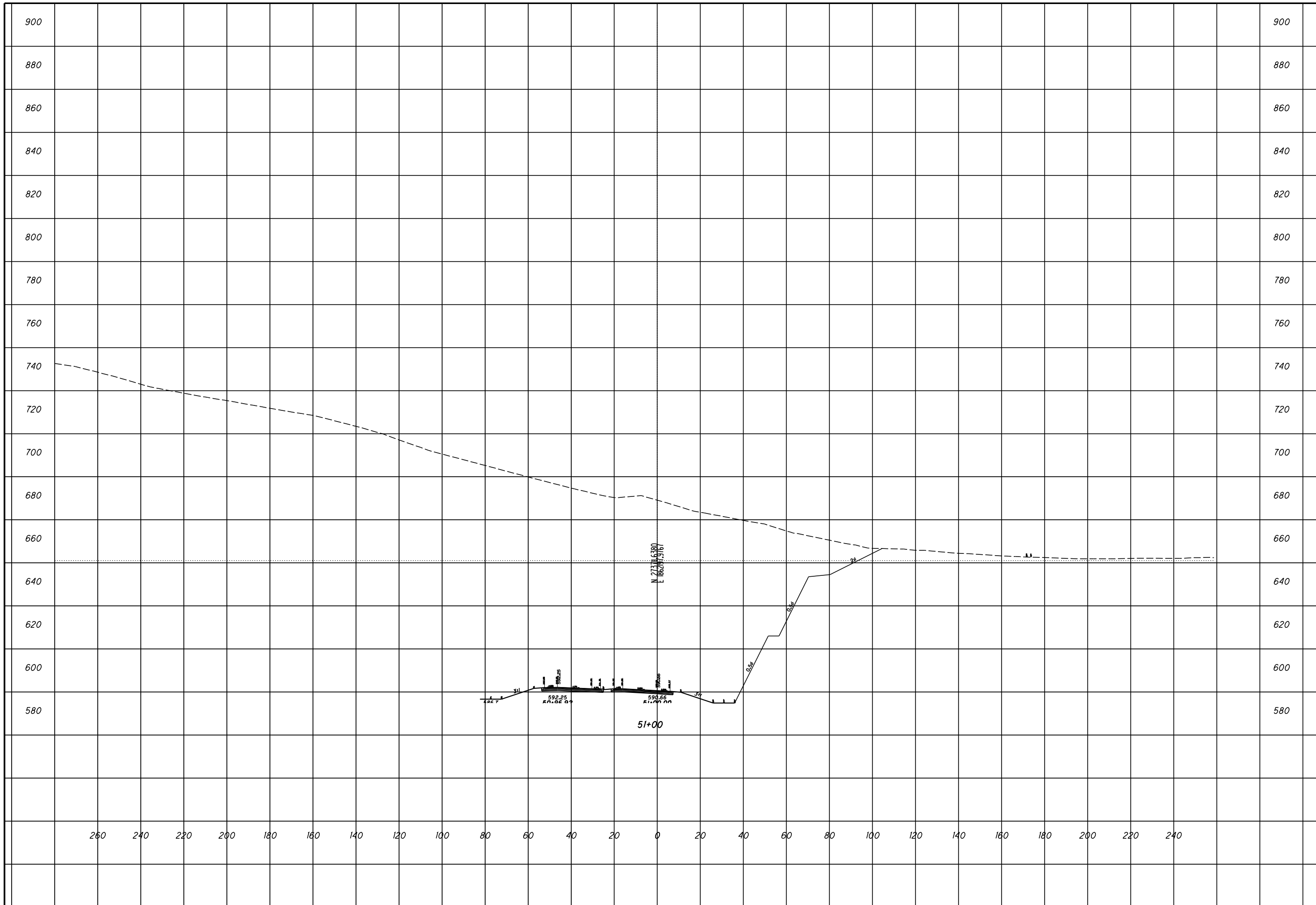
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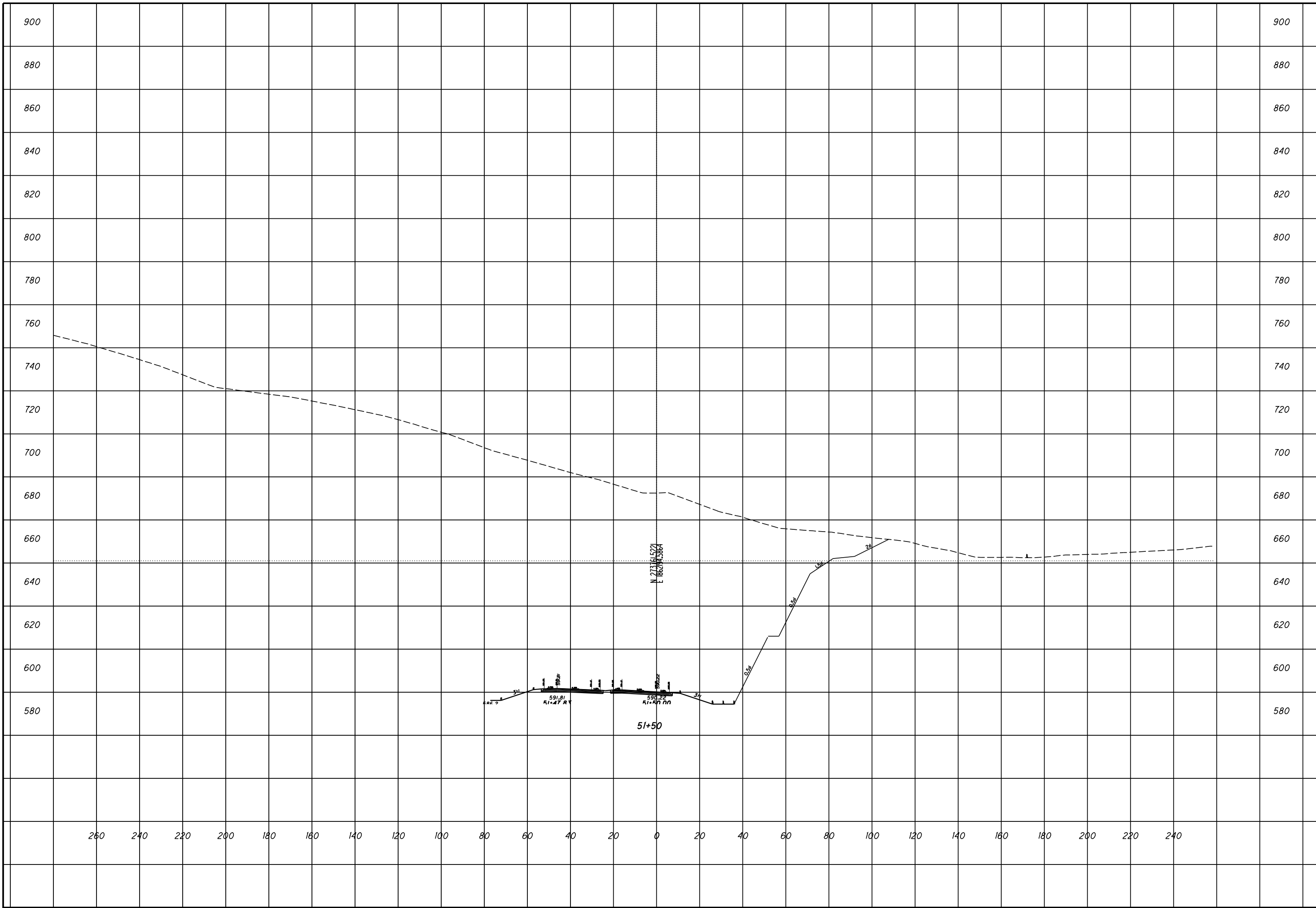


ROCK CUT SLOPE DESIGN - US 52 RAMP A
STA 51+00

SCI-823-0.00

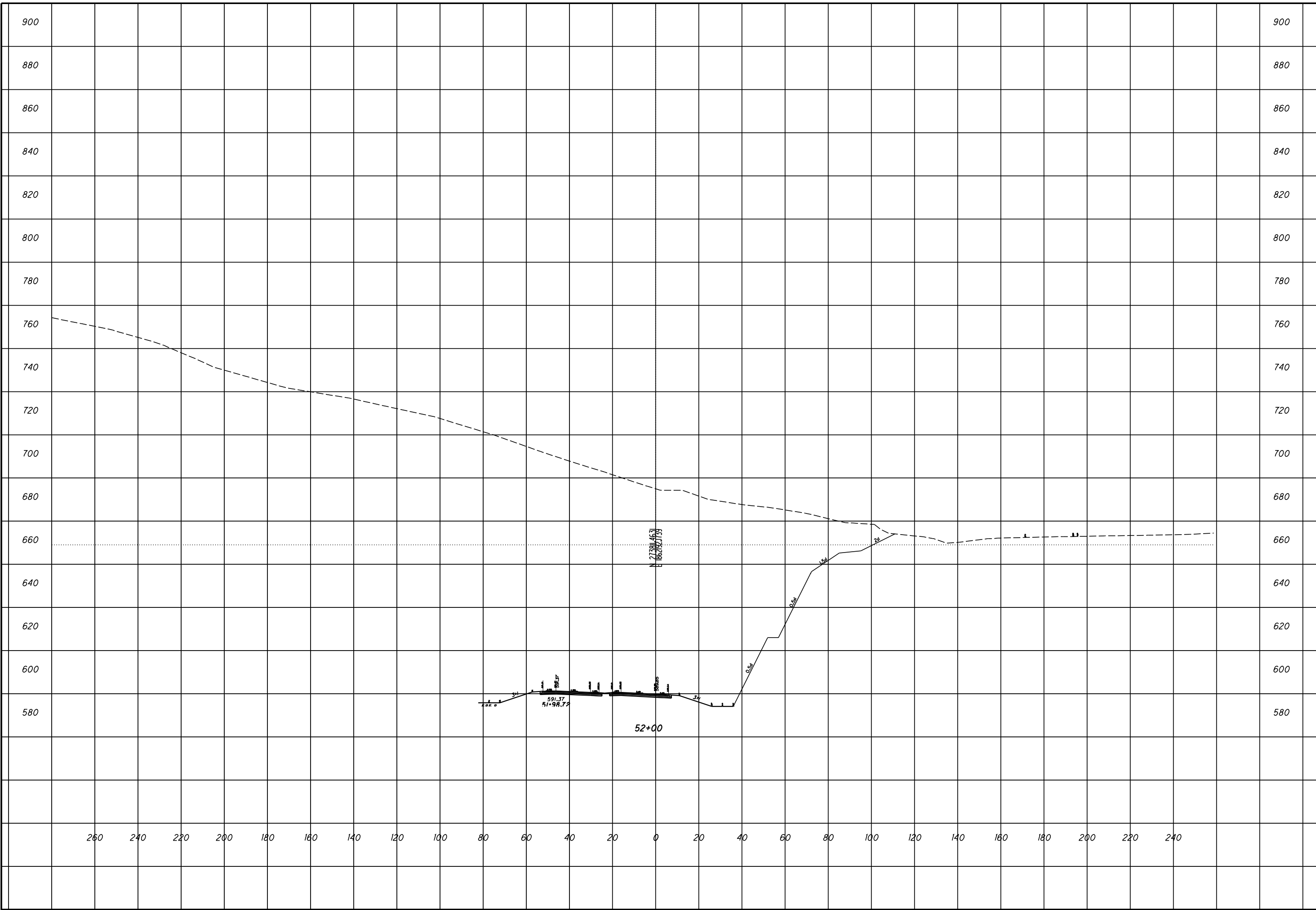
21
27

CHECKED



ROCK CUT SLOPE DESIGN - US 52 RAMP A
STA 51+50

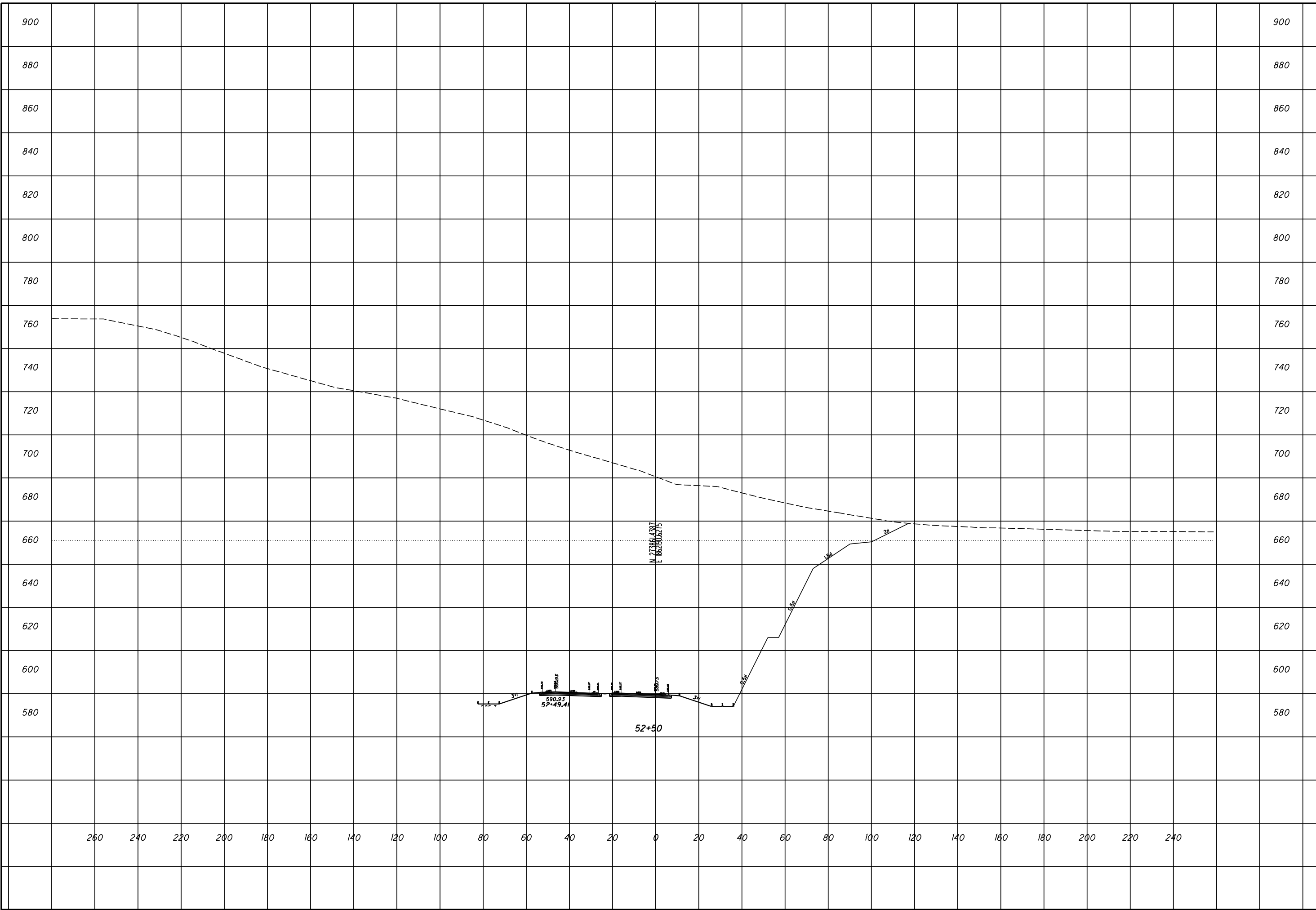
SCI-823-0.00



ROCK CUT SLOPE DESIGN - US 52 RAMP A
STA 52+00

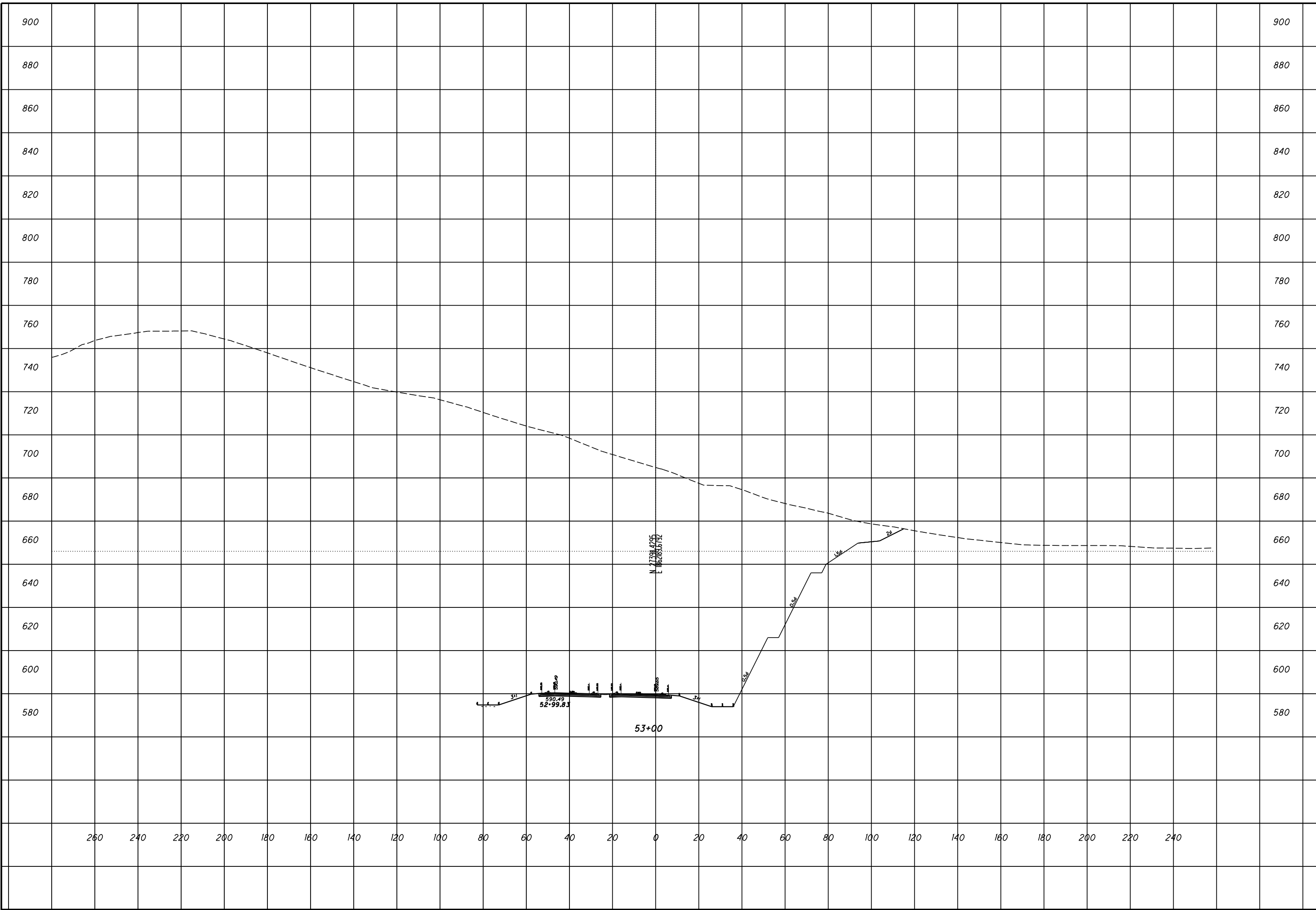
SCI-823-0.00

CHECKED

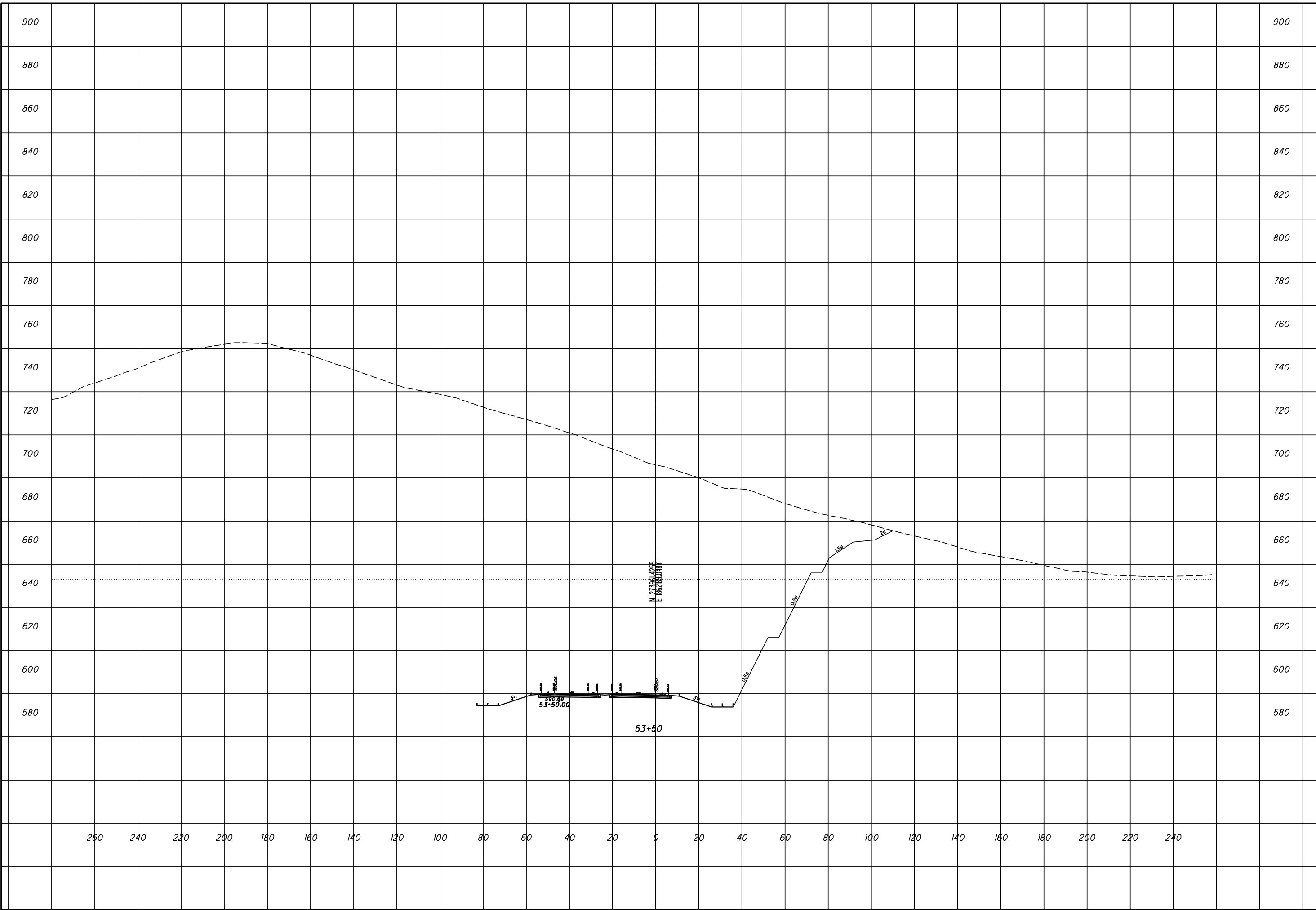


ROCK CUT SLOPE DESIGN - US 52 RAMP A
 STA 52+50

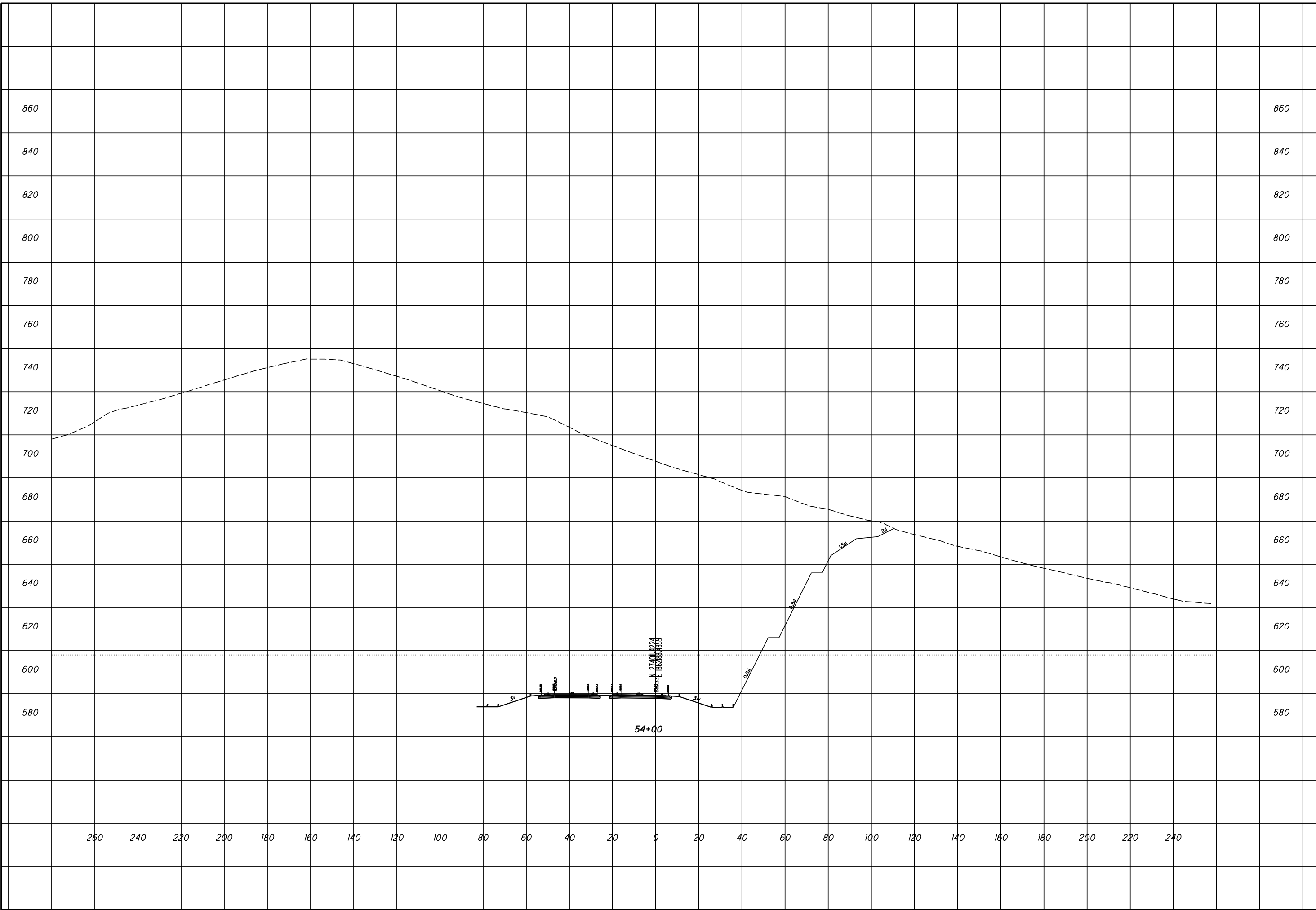
SCI-823-0.00



CHECKED
 ROCK CUT SLOPE DESIGN - US 52 RAMP A
 STA 53+00
 SCI-823-0.00
 25
 27



CHECKED
ROCK CUT SLOPE DESIGN - US 52 RAMP A
STA 53+50
SCI-823-0.00
 26
 27

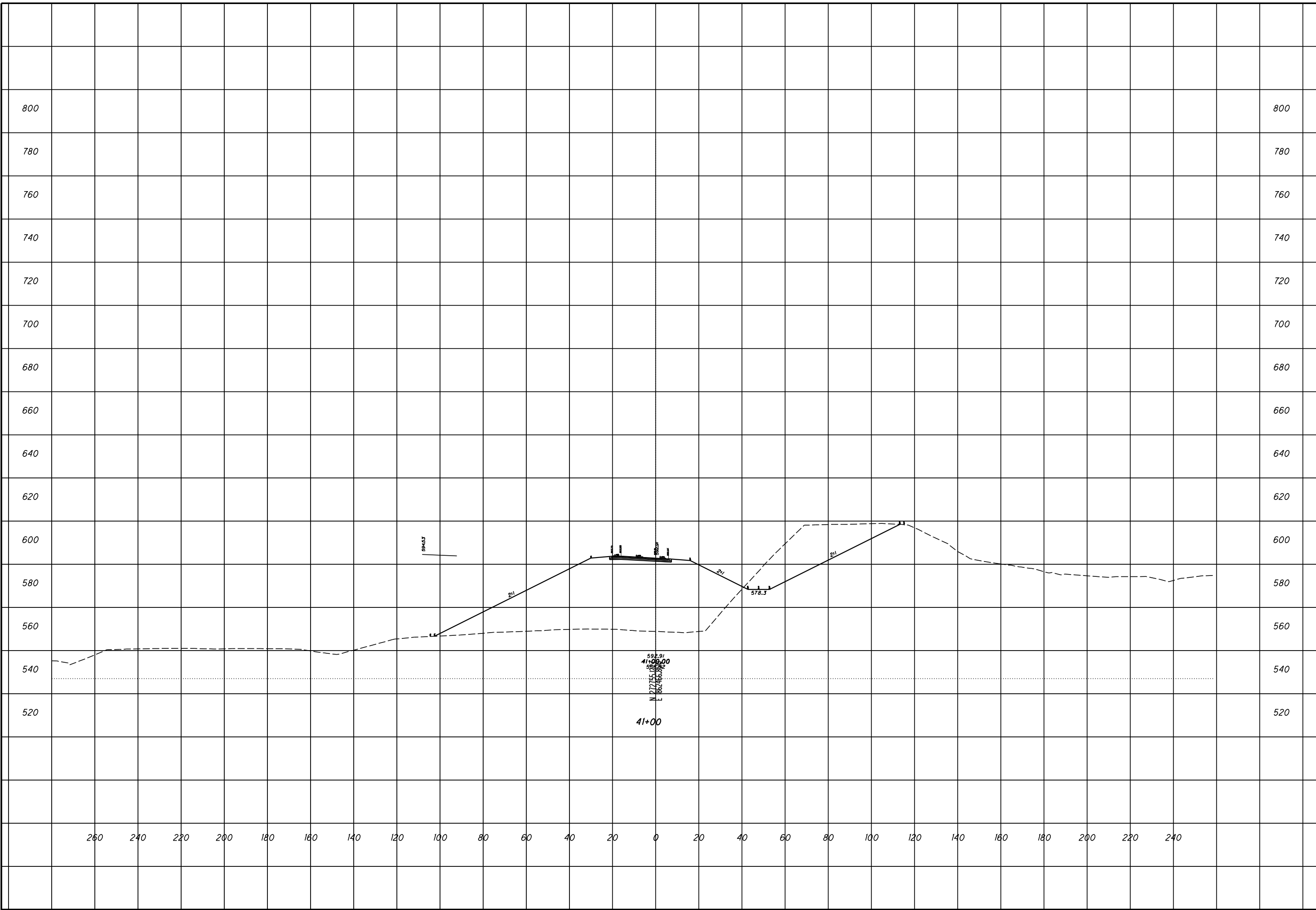


ROCK CUT SLOPE DESIGN - US 52 RAMP A
STA 54+00

SCI-823-0.00

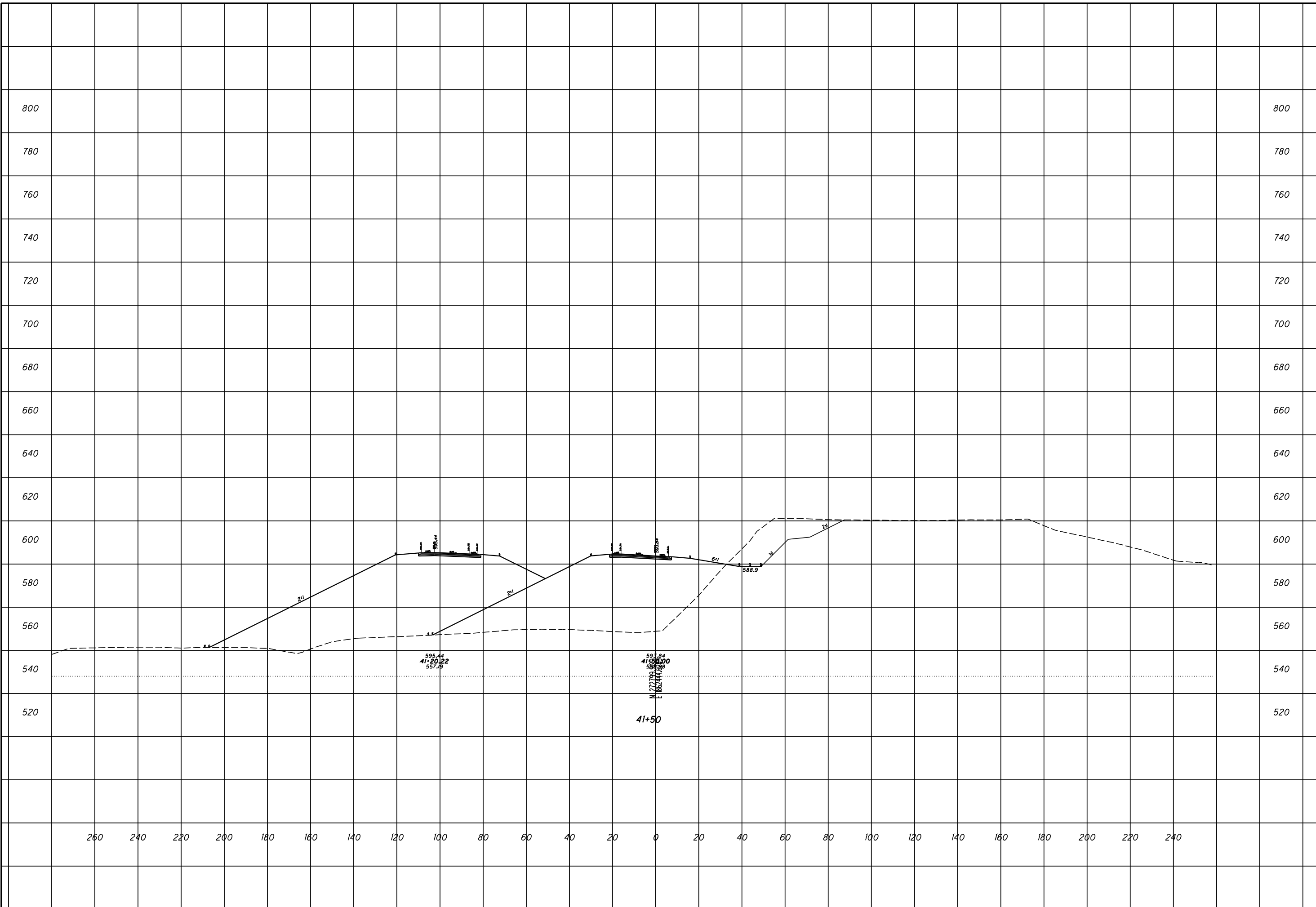
ROCK CUT SLOPE DESIGN - US 52 RAMP A
STA 41+00

SCI-823-0.00



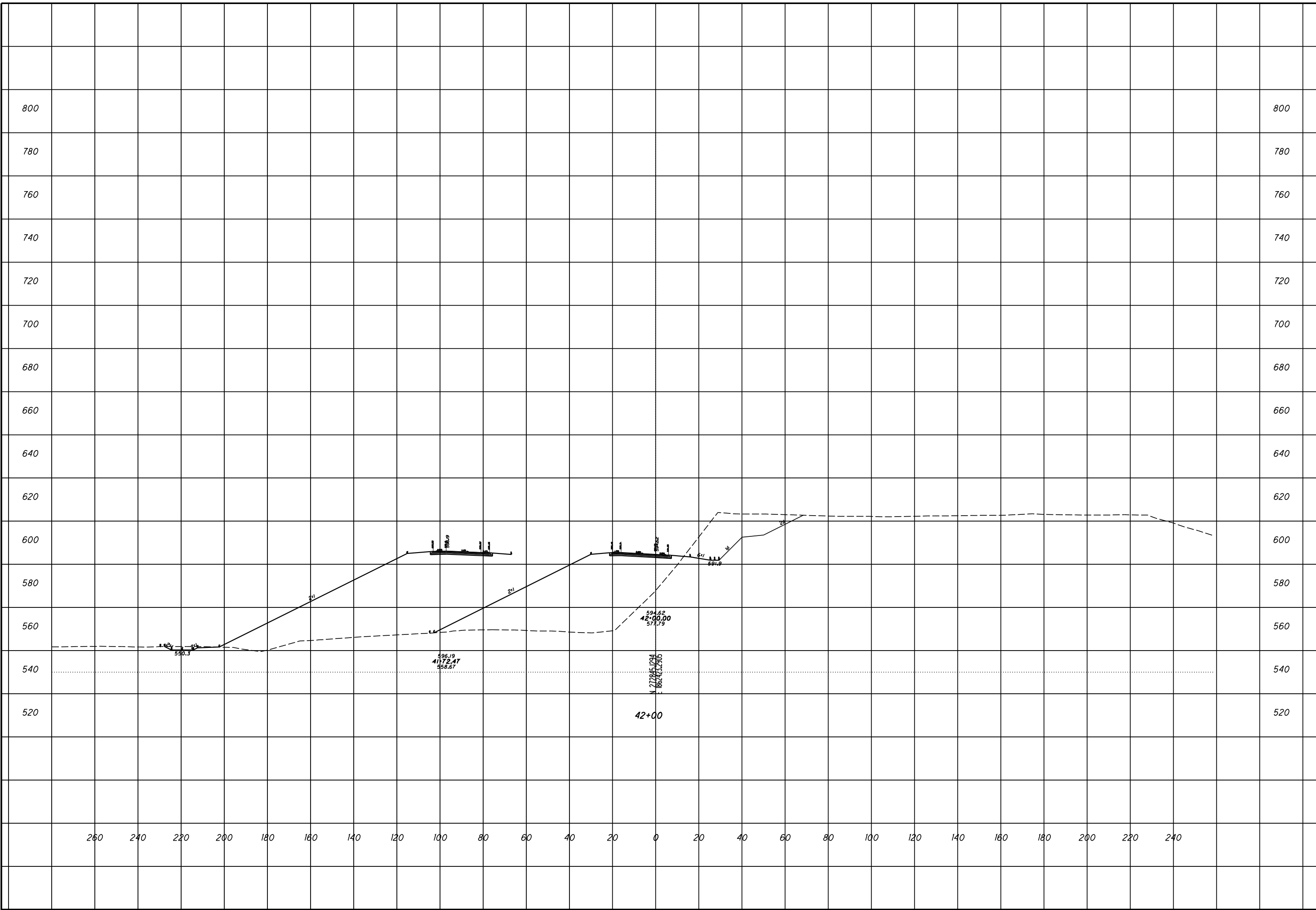
ROCK CUT SLOPE DESIGN - US 52 RAMP A
STA 41+50

SCI-823-0.00



ROCK CUT SLOPE DESIGN - US 52 RAMP A
STA 42+00

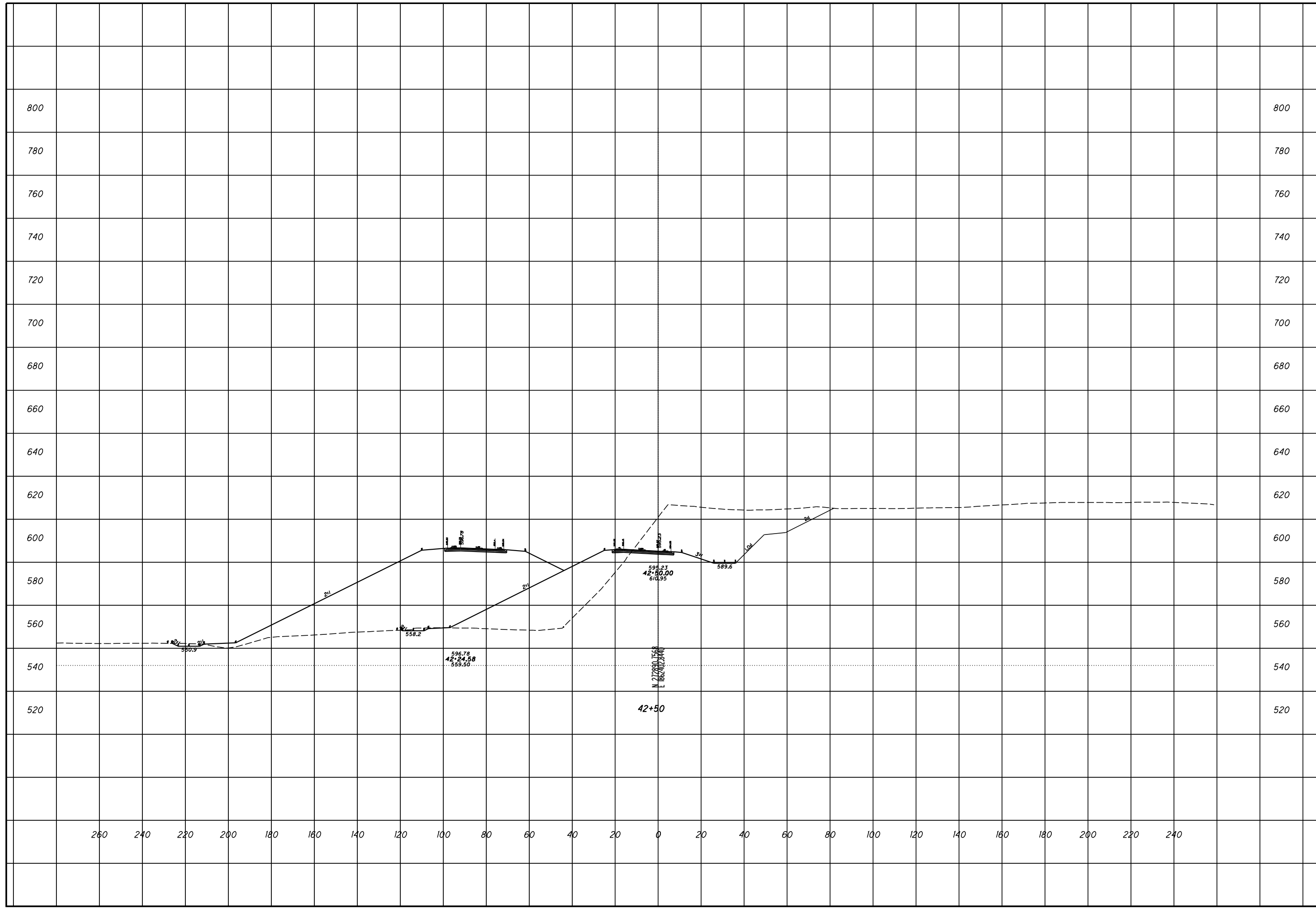
SCI-823-0.00

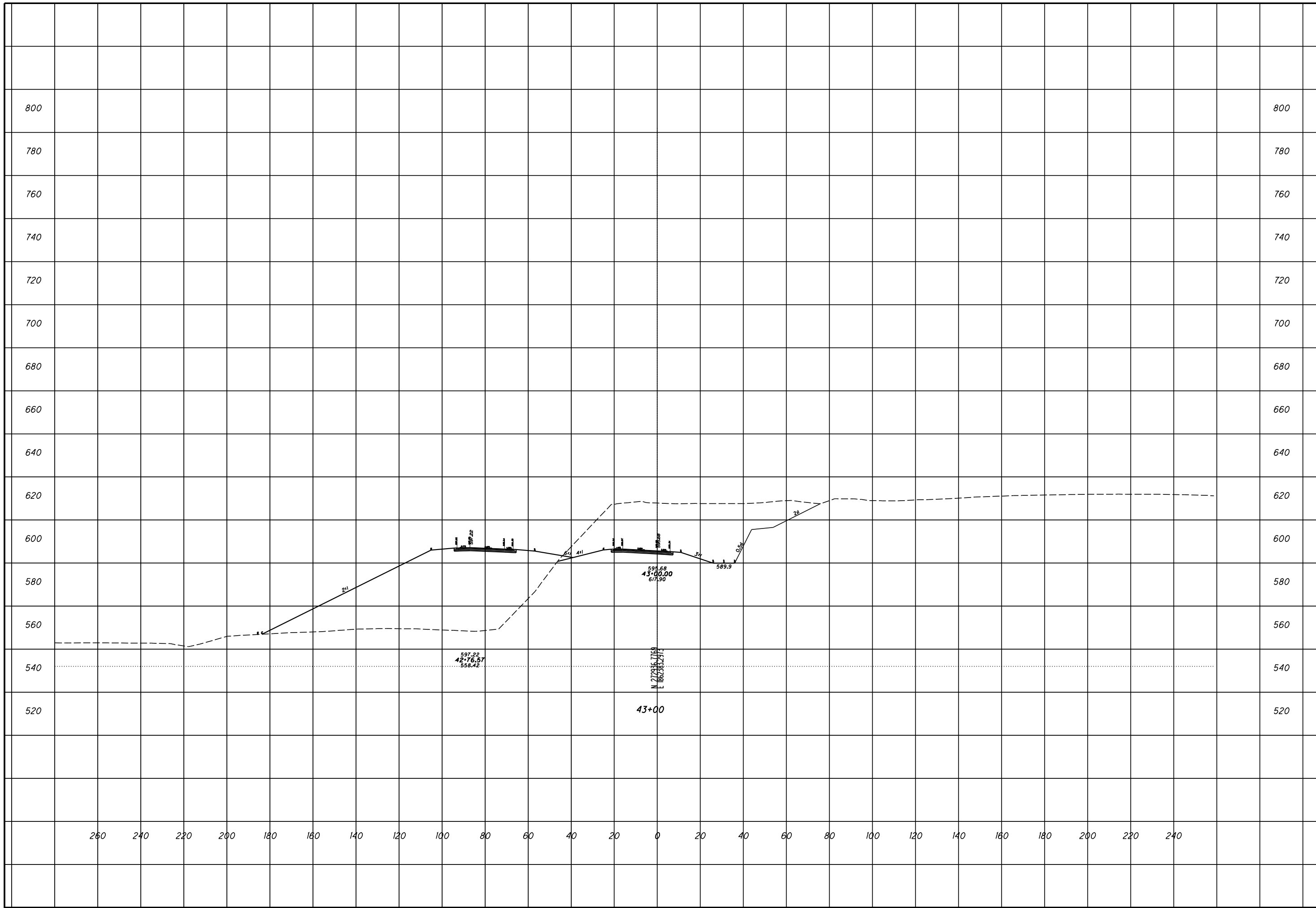


CHECKED

ROCK CUT SLOPE DESIGN - US 52 RAMP A
STA 42+50

SCI-823-0.00





ROCK CUT SLOPE DESIGN - US 52 RAMP A
STA 43+00

SCI-823-0.00

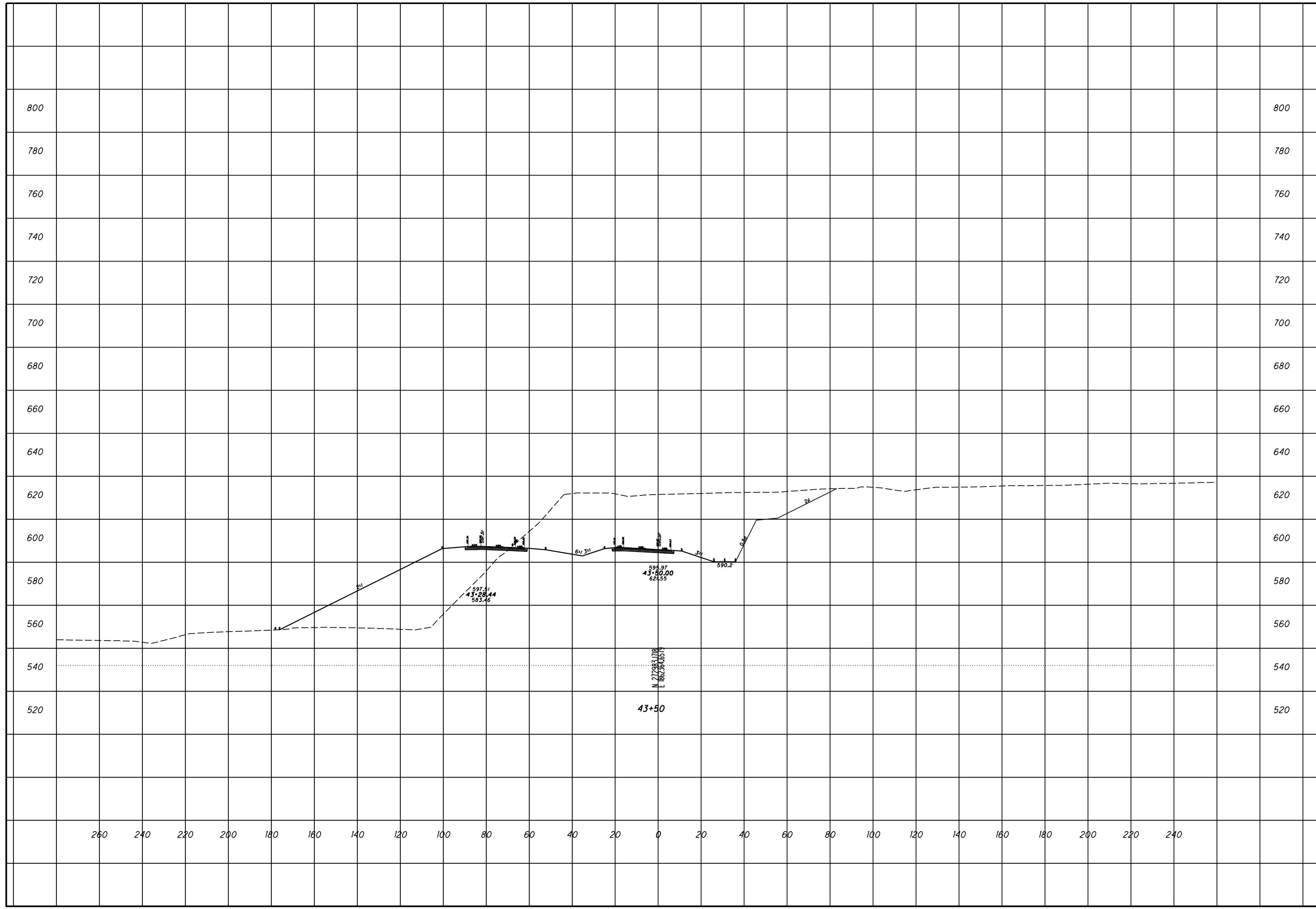
5
27

CHECKED

CHECKED

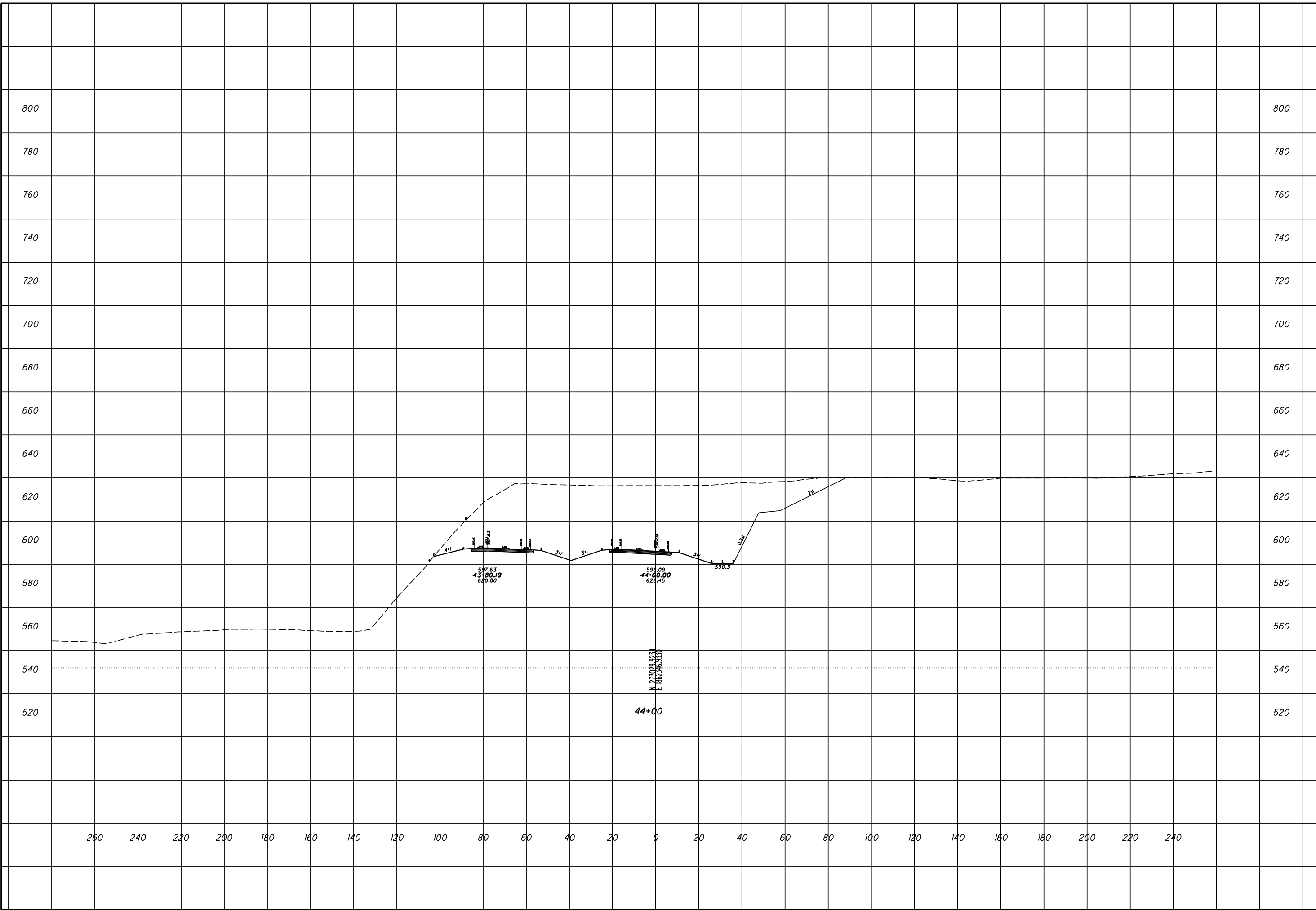
ROCK CUT SLOPE DESIGN - US 52 RAMP A
STA 43+50

SCI-823-0.00



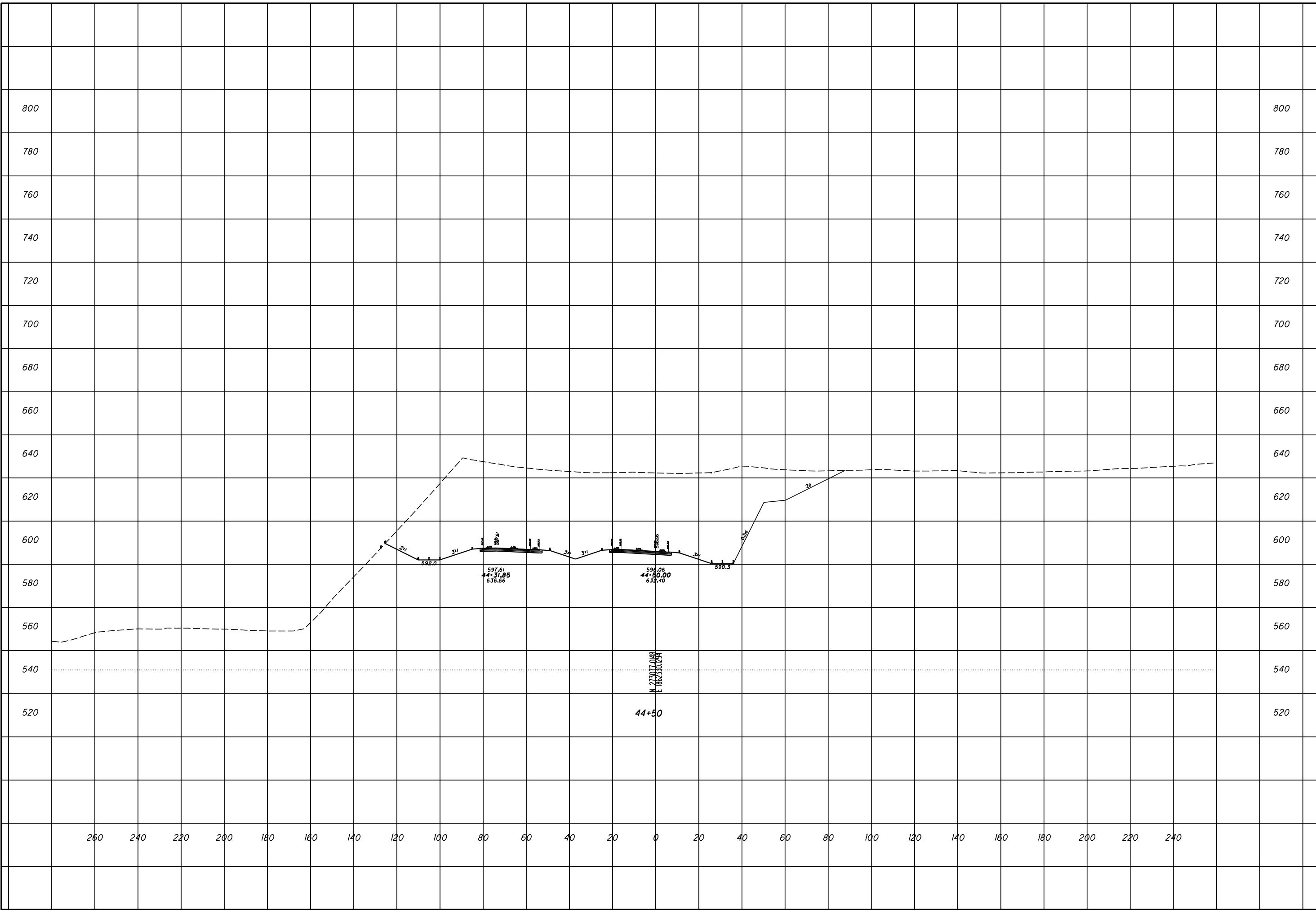
ROCK CUT SLOPE DESIGN - US 52 RAMP A
STA 44+00

SCI-823-0.00



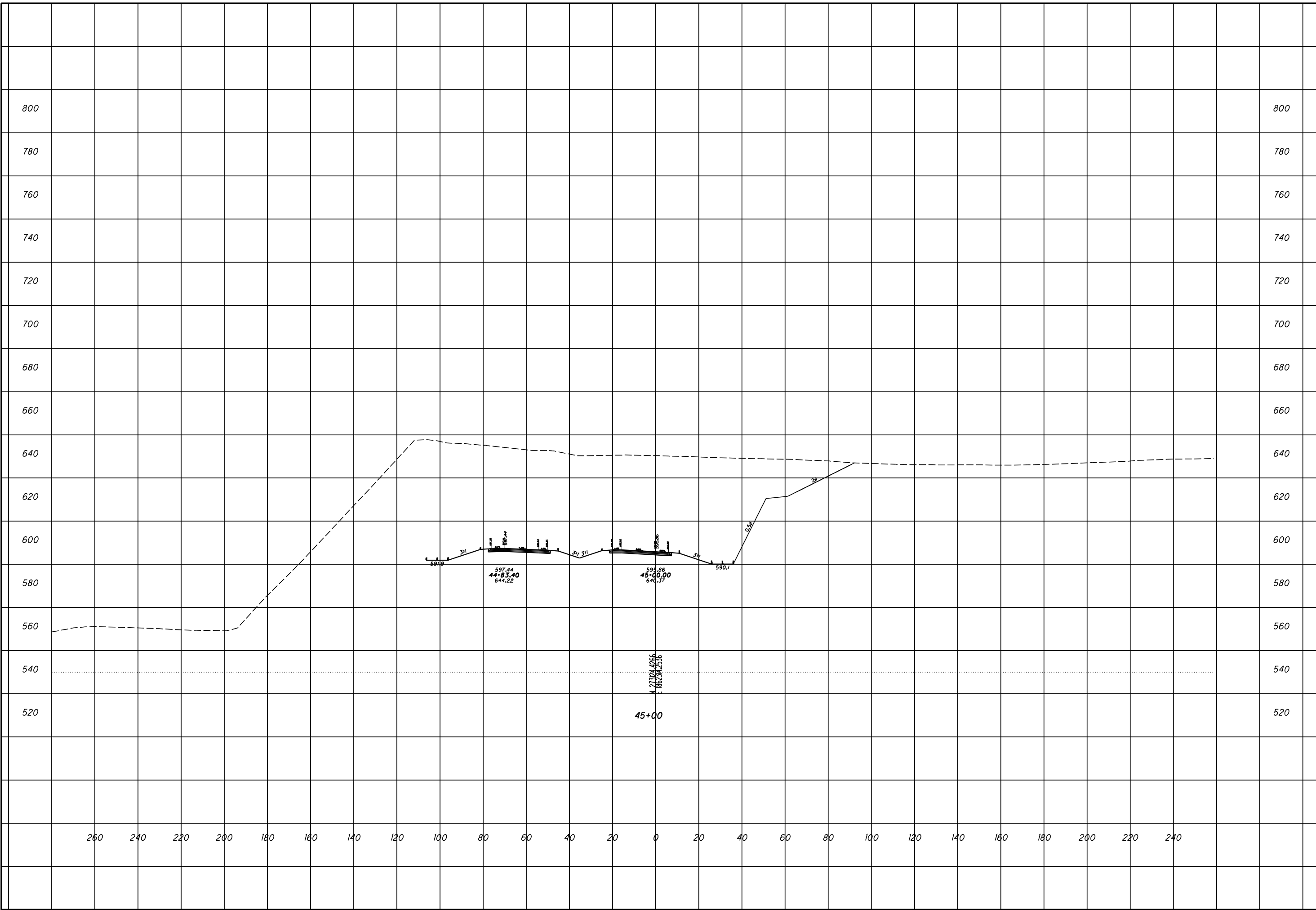
ROCK CUT SLOPE DESIGN - US 52 RAMP A
STA 44+50

SCI-823-0.00



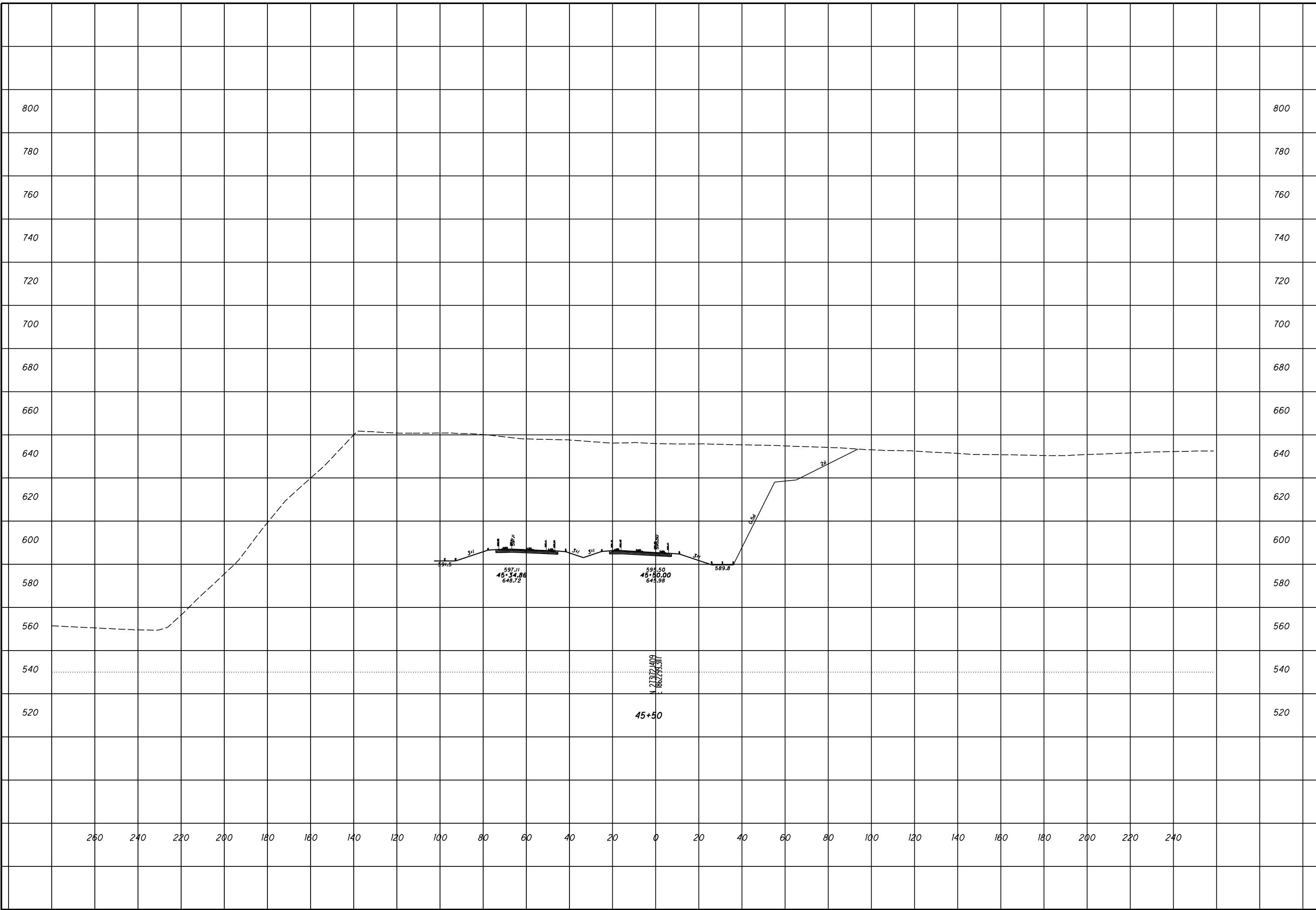
ROCK CUT SLOPE DESIGN - US 52 RAMP A
STA 45+00

SCI-823-0.00



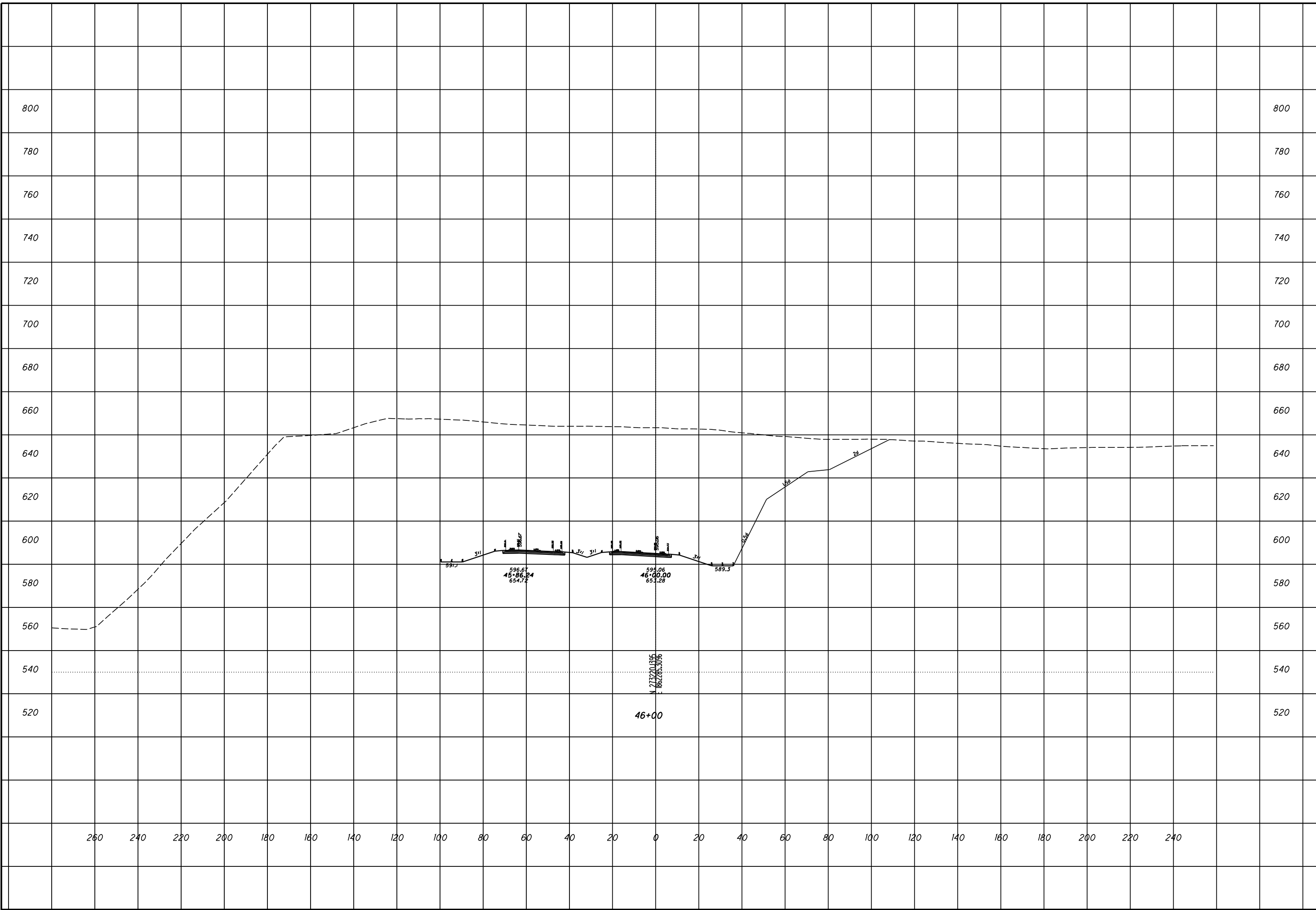
ROCK CUT SLOPE DESIGN - US 52 RAMP A
STA 45+50

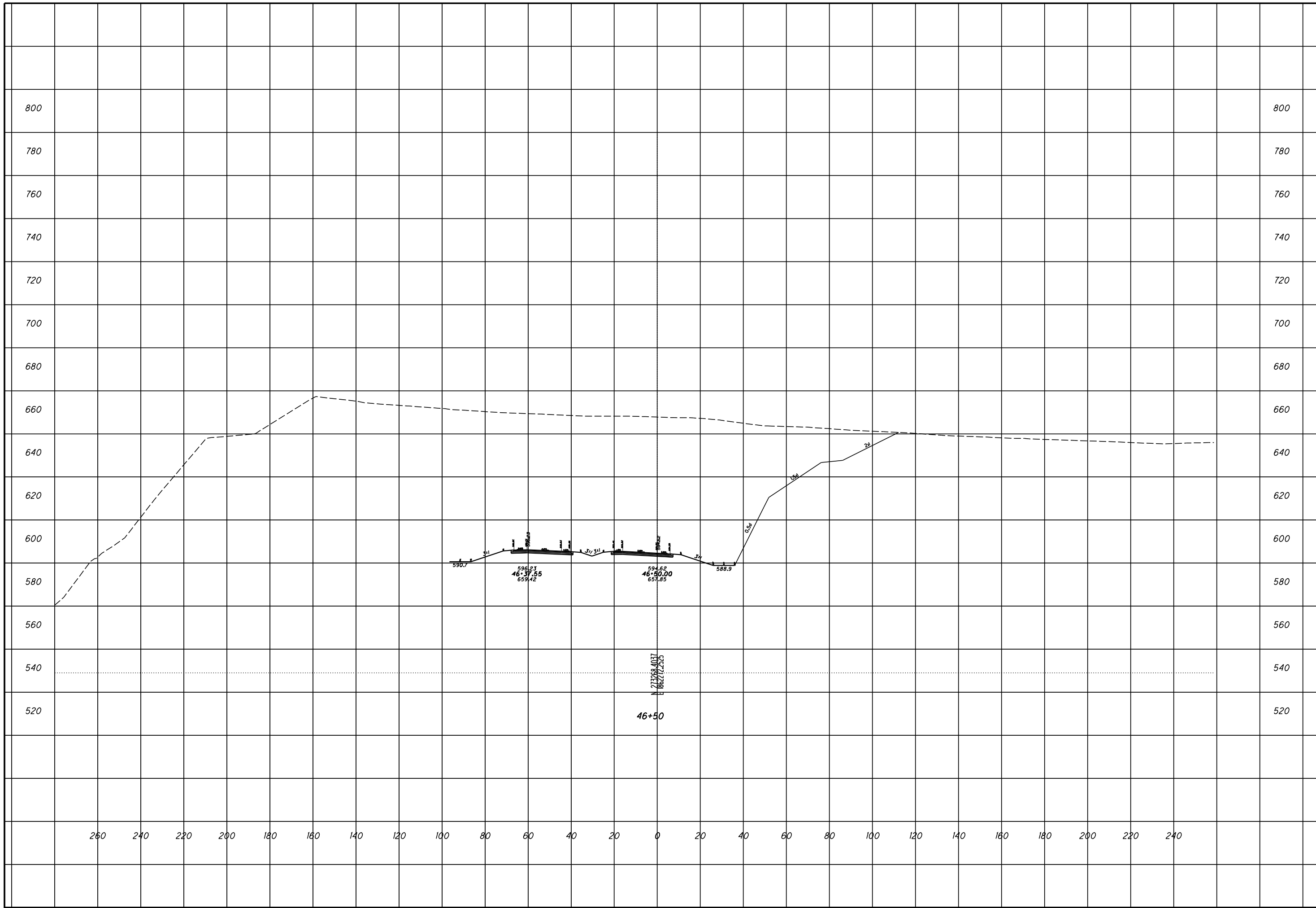
SCI-823-0.00



ROCK CUT SLOPE DESIGN - US 52 RAMP A
STA 46+00

SCI-823-0.00





ROCK CUT SLOPE DESIGN - US 52 RAMP A
STA 46+50

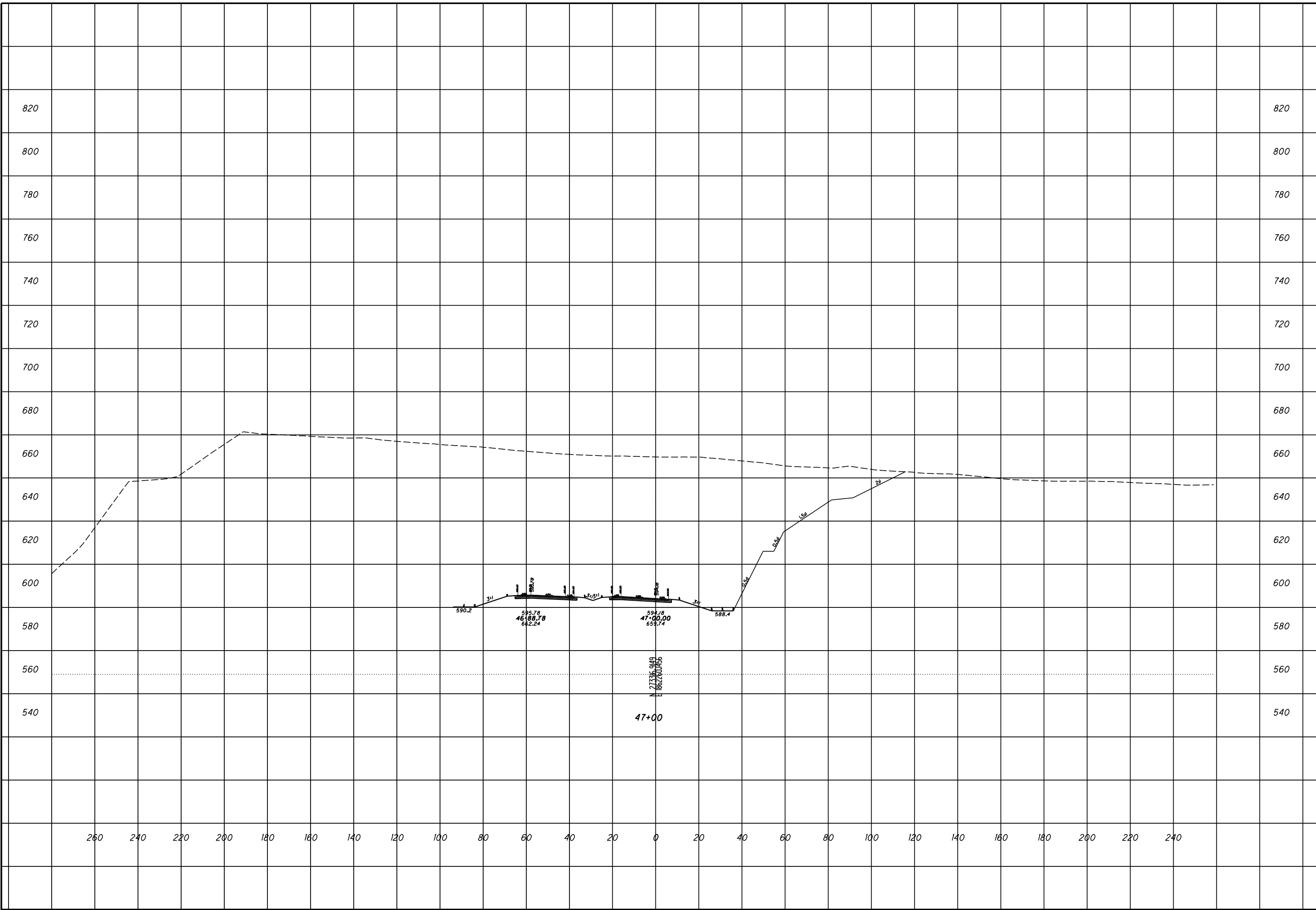
SCI-823-0.00

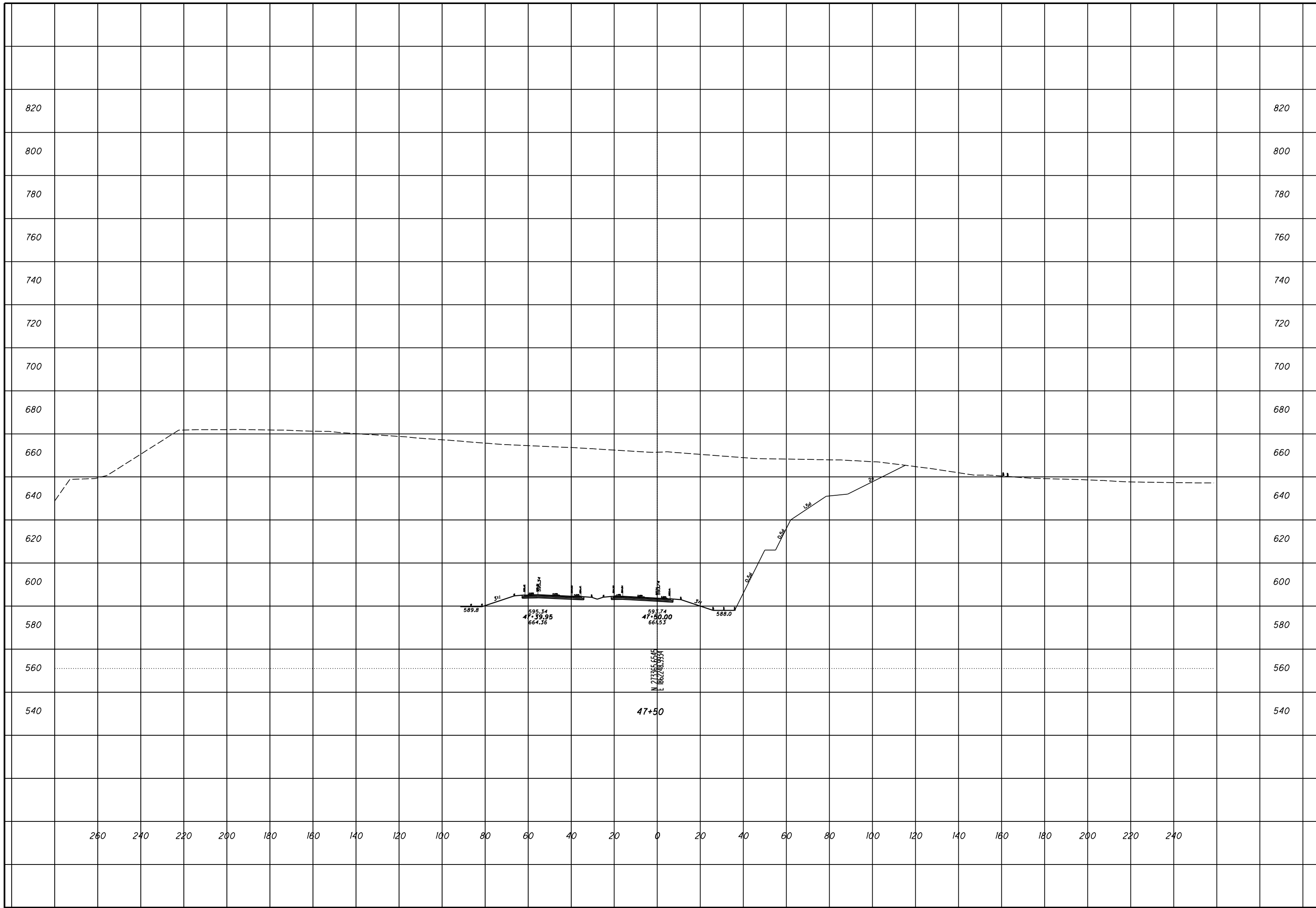
12
27

CHECKED

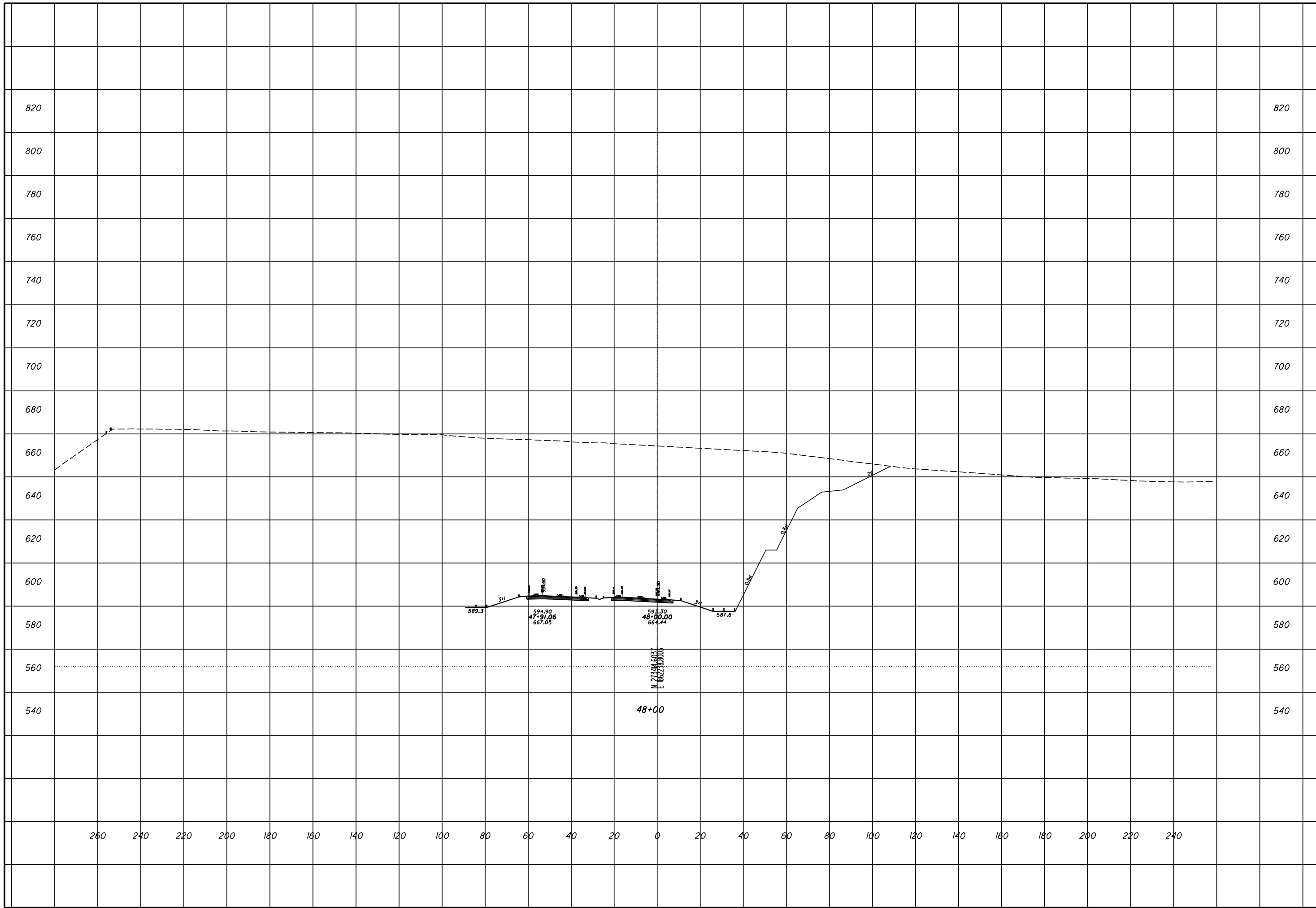
ROCK CUT SLOPE DESIGN - US 52 RAMP A
STA 47+00

SCI-823-0.00





CHECKED
ROCK CUT SLOPE DESIGN - US 52 RAMP A
STA 47+50
SCI-823-0.00
 14
 27

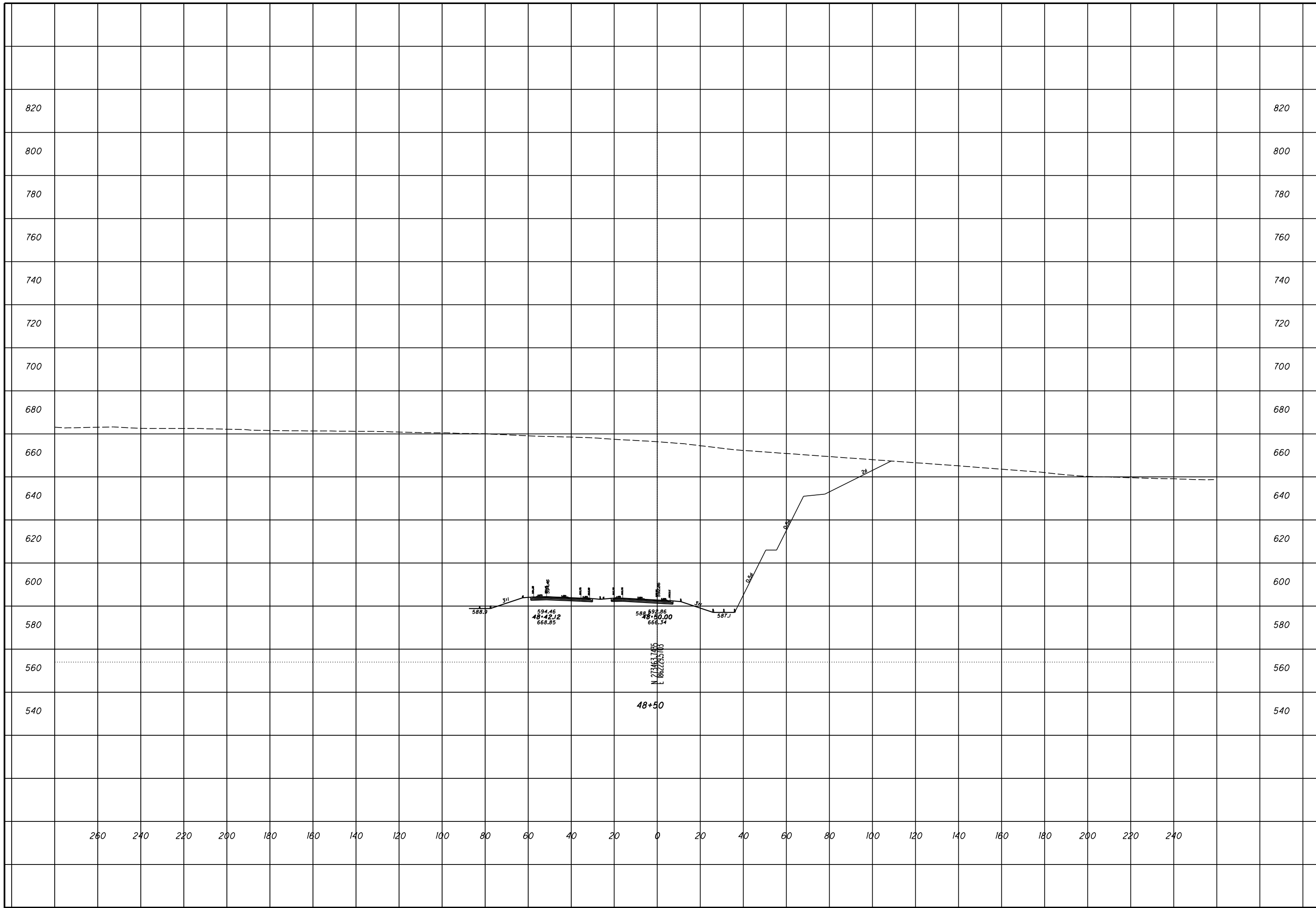


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**ROCK CUT SLOPE DESIGN - US 52 RAMP A
STA 48+00**

SCI-823-0.00

15
27



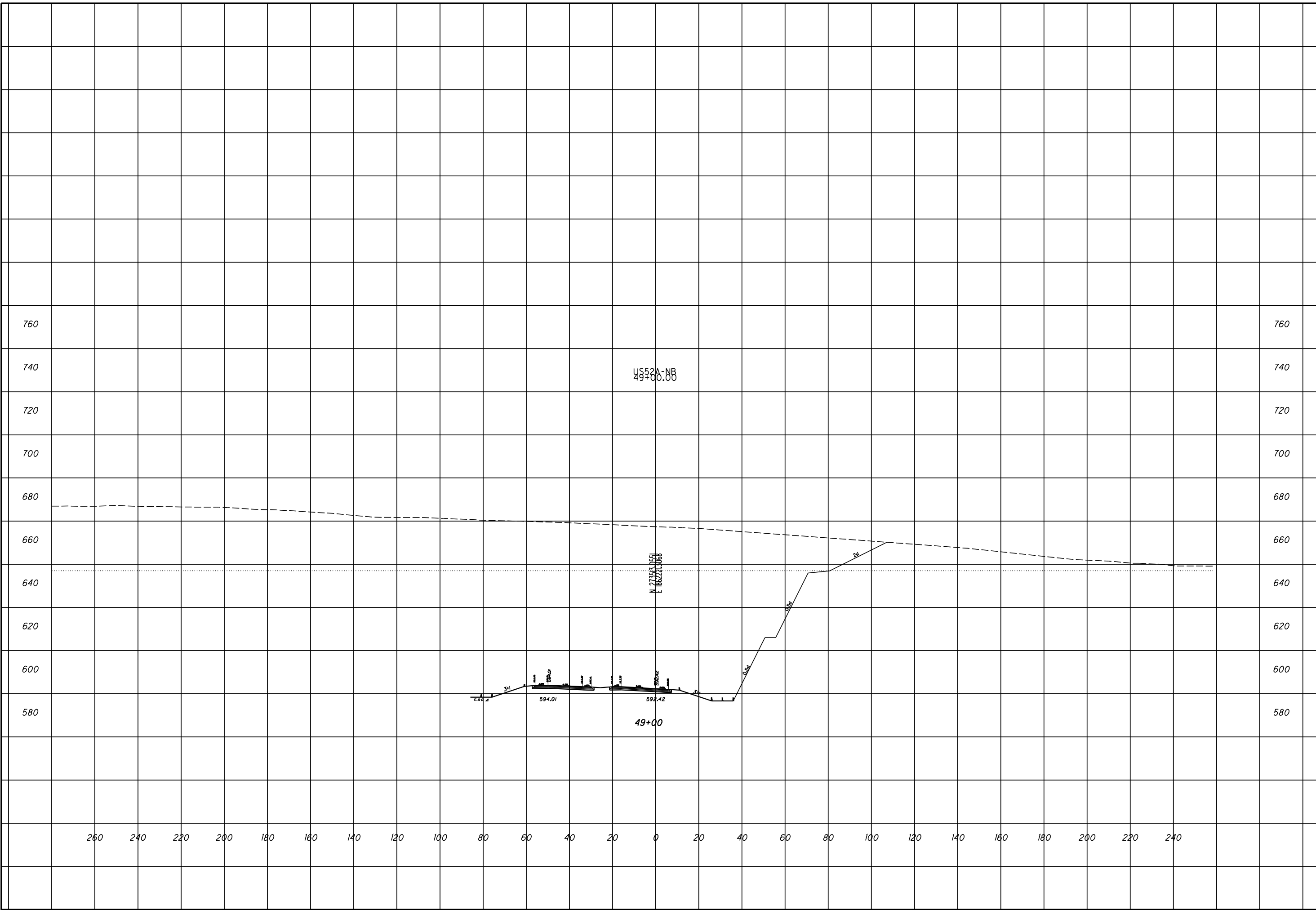
ROCK CUT SLOPE DESIGN - US 52 RAMP A
STA 48+50

SCI-823-0.00

CHECKED

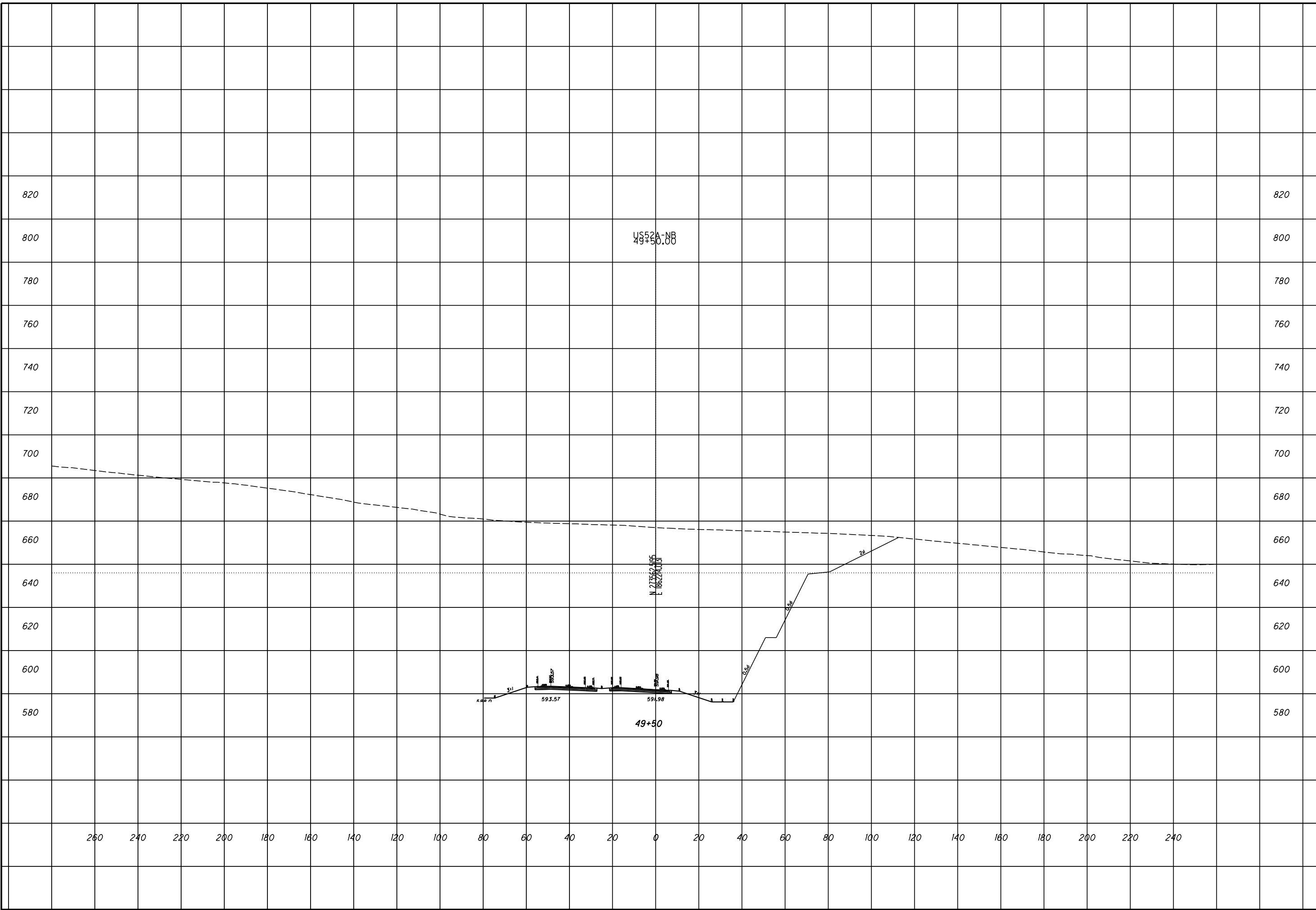
ROCK CUT SLOPE DESIGN - US 52 RAMP A
STA 49+00

SCI-823-0.00



ROCK CUT SLOPE DESIGN - US 52 RAMP A
STA 49+50

SCI-823-0.00



820

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200

220

240

US 52A-NB
49+50.00

N 27° 56' 49" E
186.24' 0.31

49+50

593.57

594.98

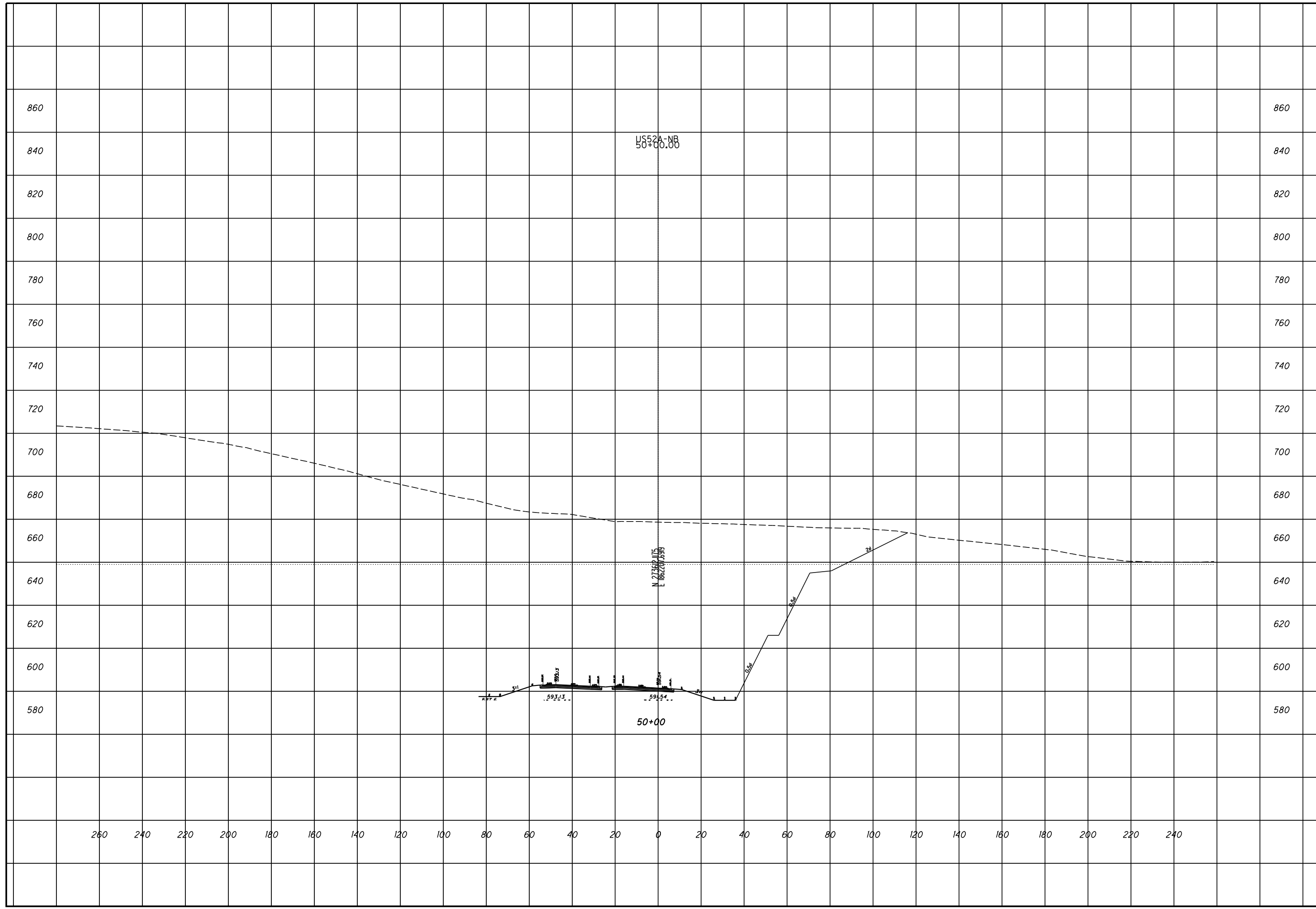
5%

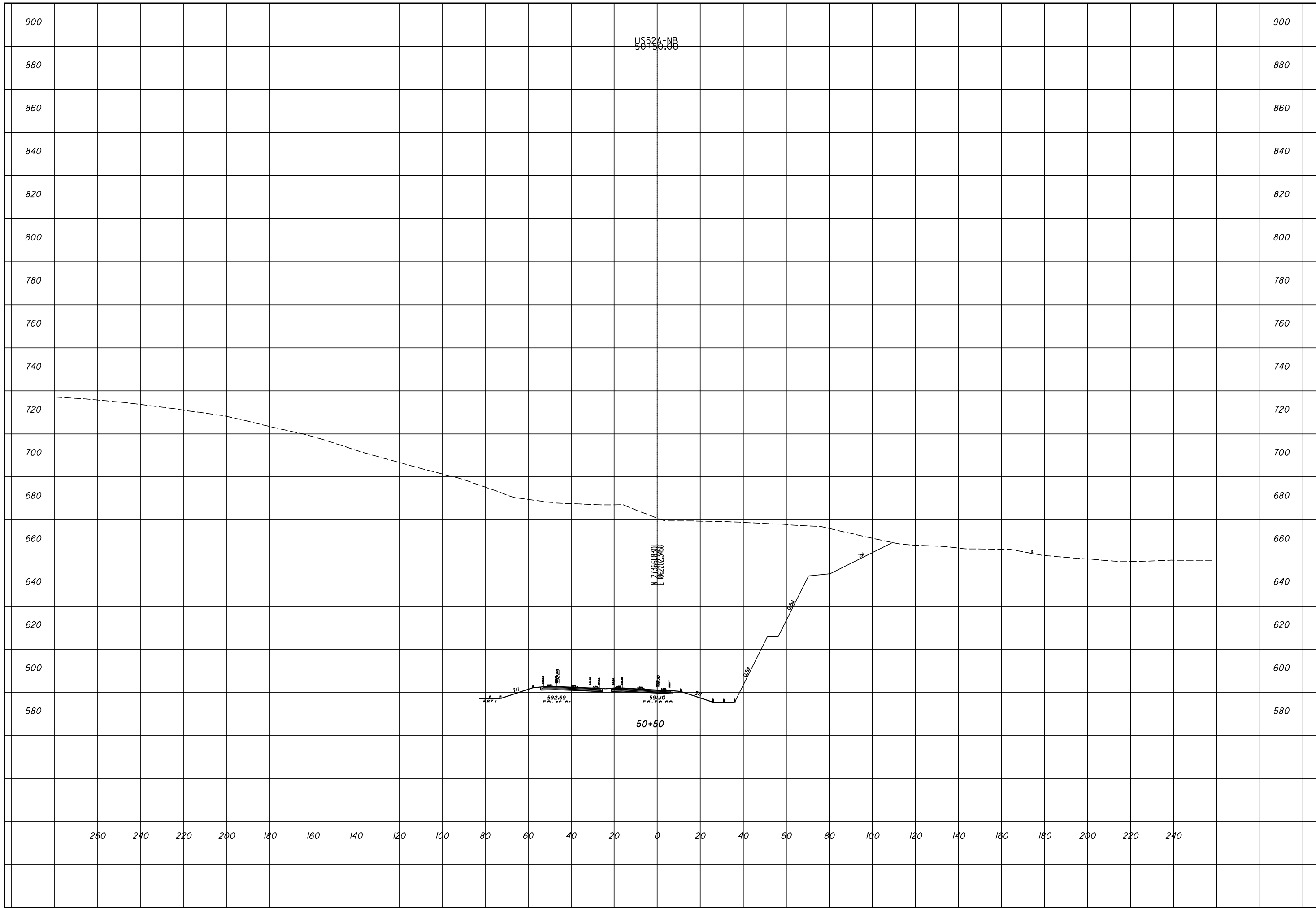
0.5%

2%

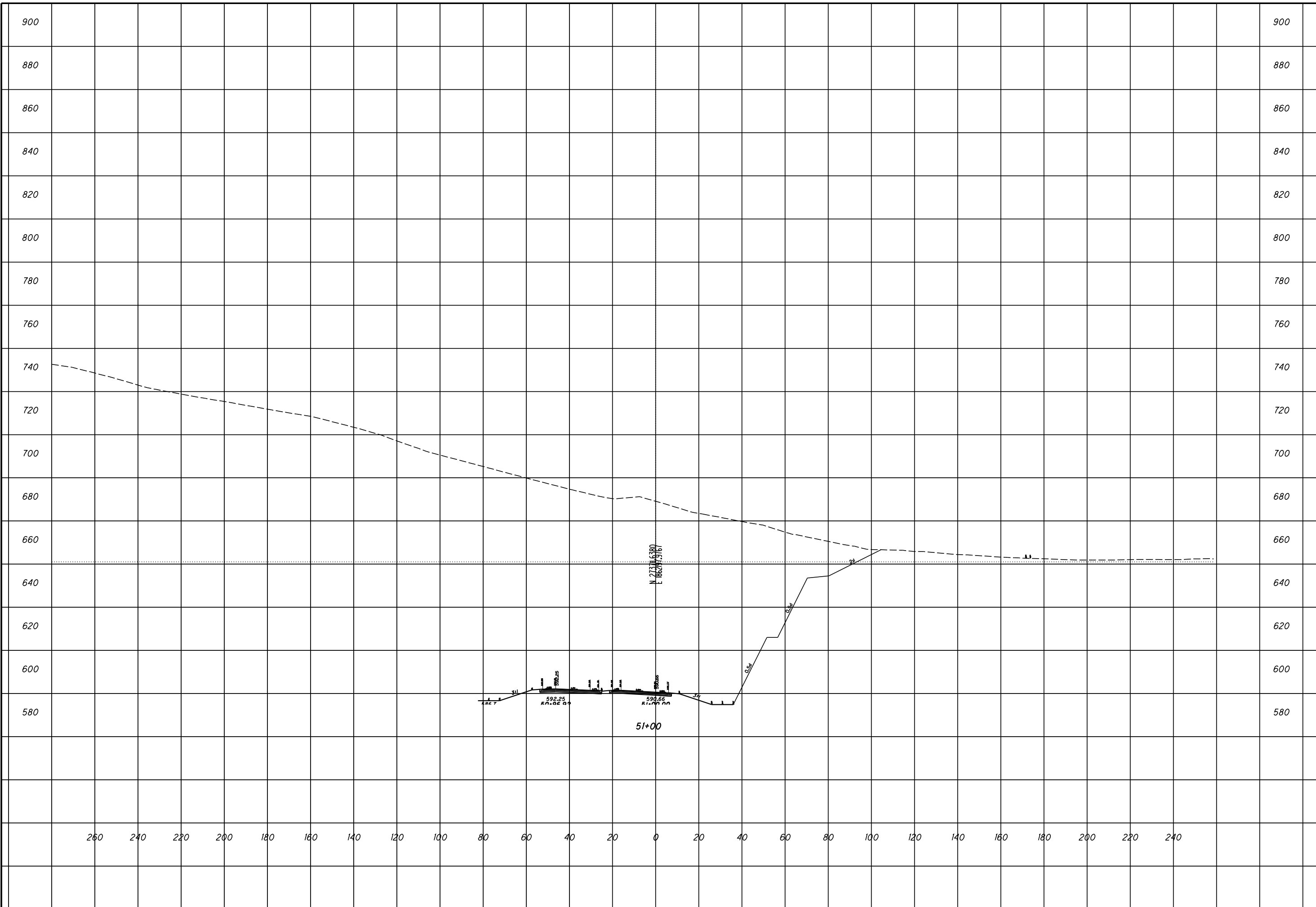
ROCK CUT SLOPE DESIGN - US 52 RAMP A
STA 50+00

SCI-823-0.00

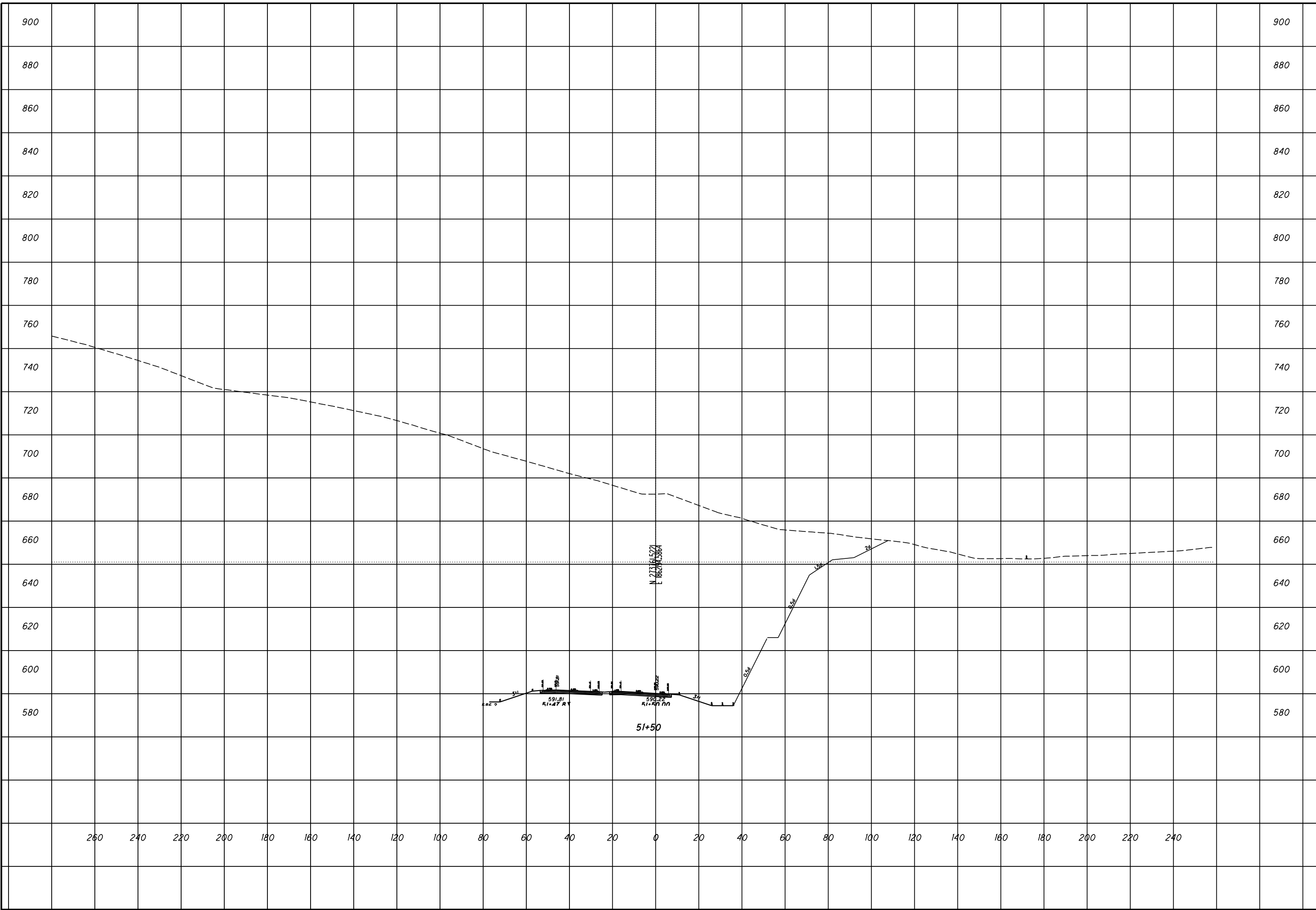




CHECKED
 ROCK CUT SLOPE DESIGN - US 52 RAMP A
 STA 50+50
 SCI-823-0.00
 20
 27



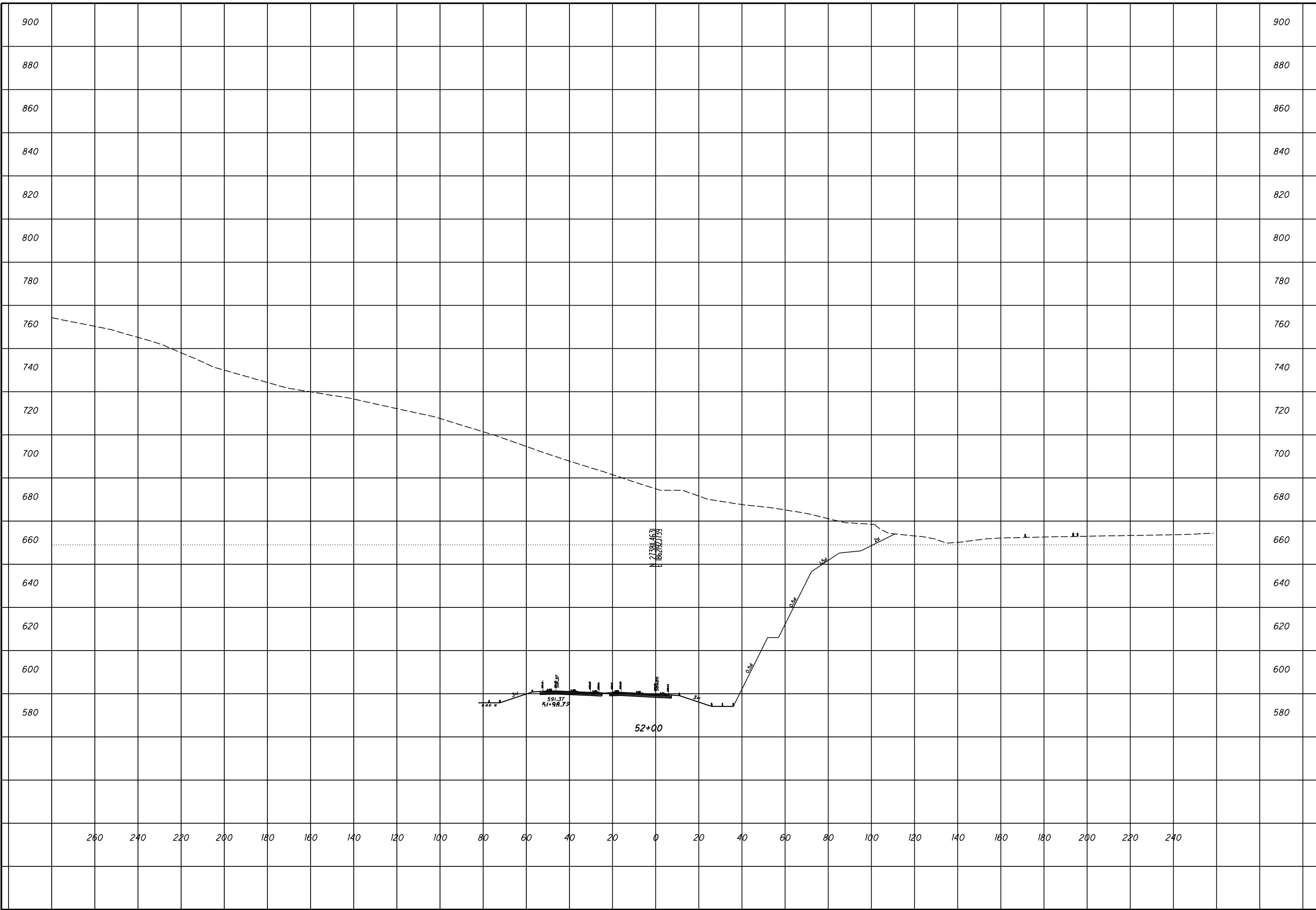
CHECKED
 ROCK CUT SLOPE DESIGN - US 52 RAMP A
 STA 51+00
 SCI-823-0.00
 21
 27



ROCK CUT SLOPE DESIGN - US 52 RAMP A
STA 51+50

SCI-823-0.00

22
27

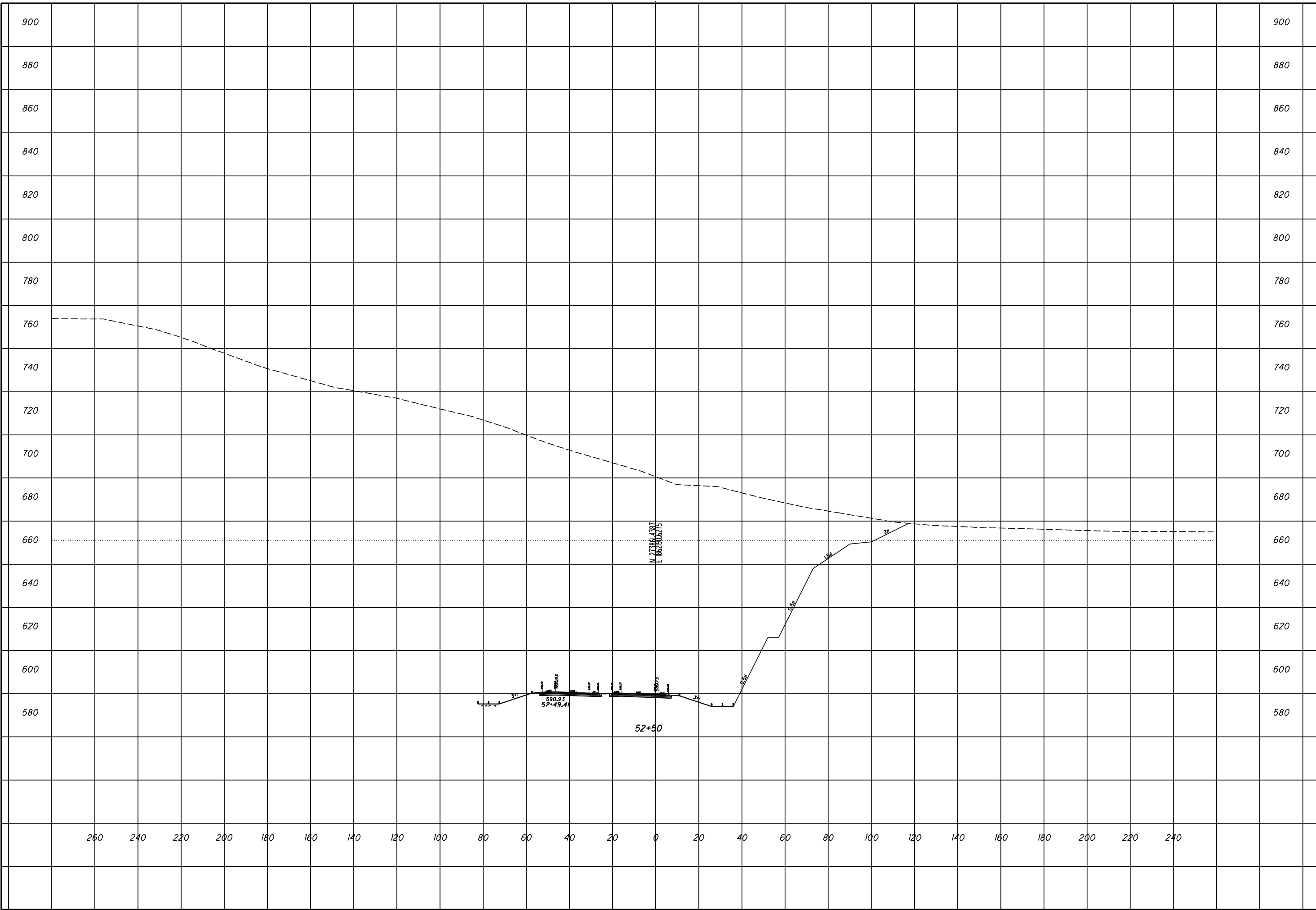


ROCK CUT SLOPE DESIGN - US 52 RAMP A
STA 52+00

SCI-823-0.00

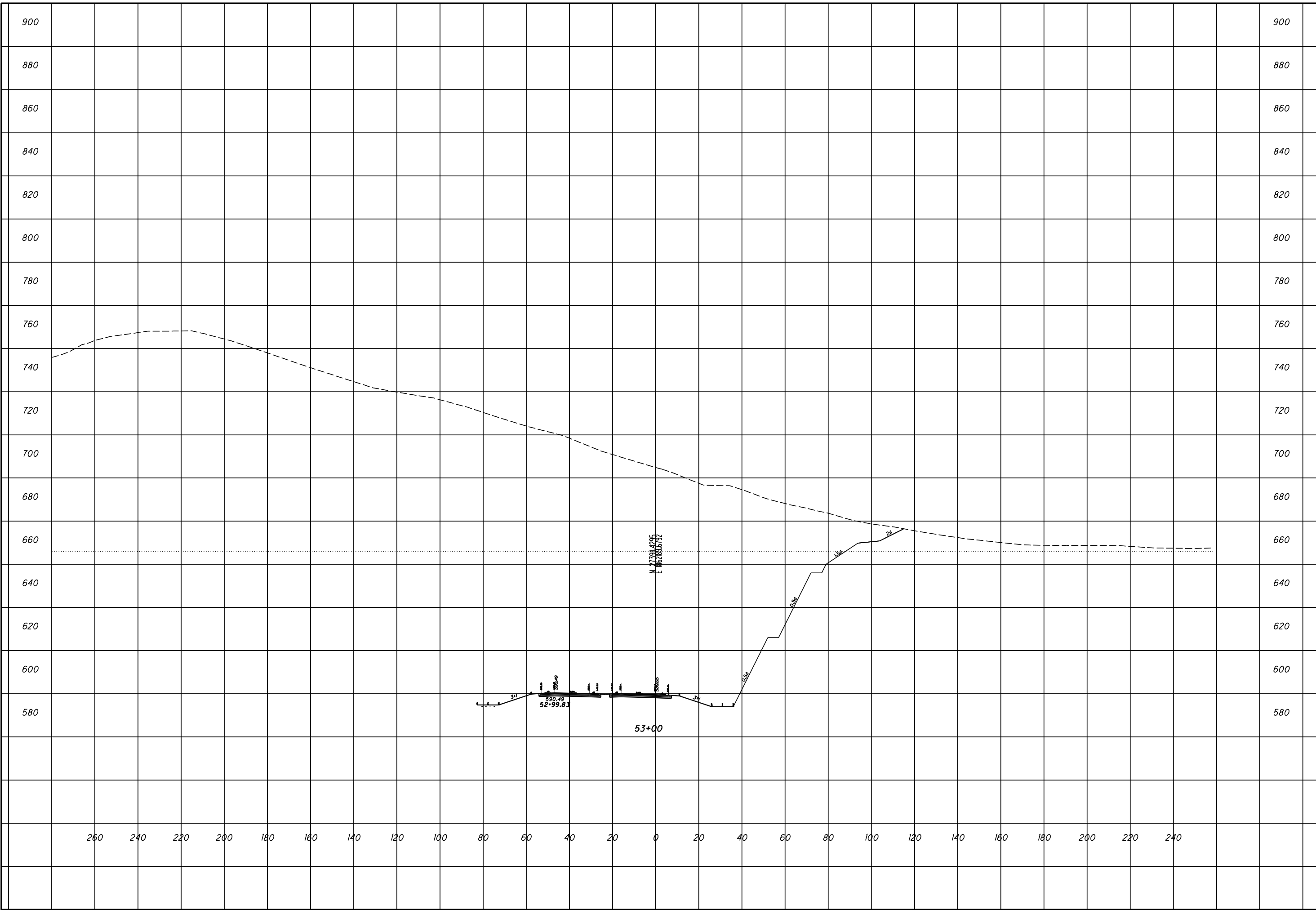
23
27

CHECKED



ROCK CUT SLOPE DESIGN - US 52 RAMP A
 STA 52+50

SCI-823-0.00

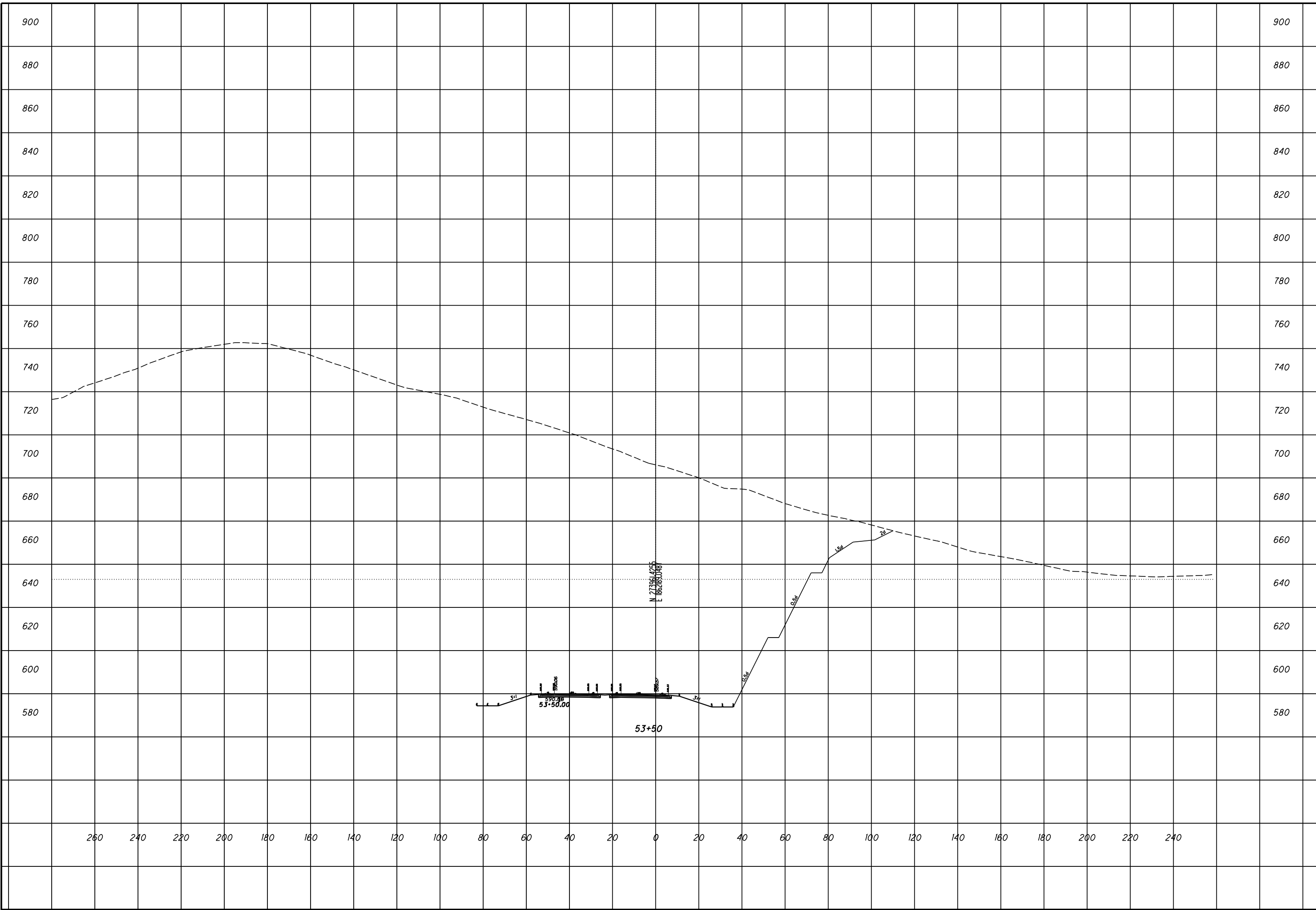


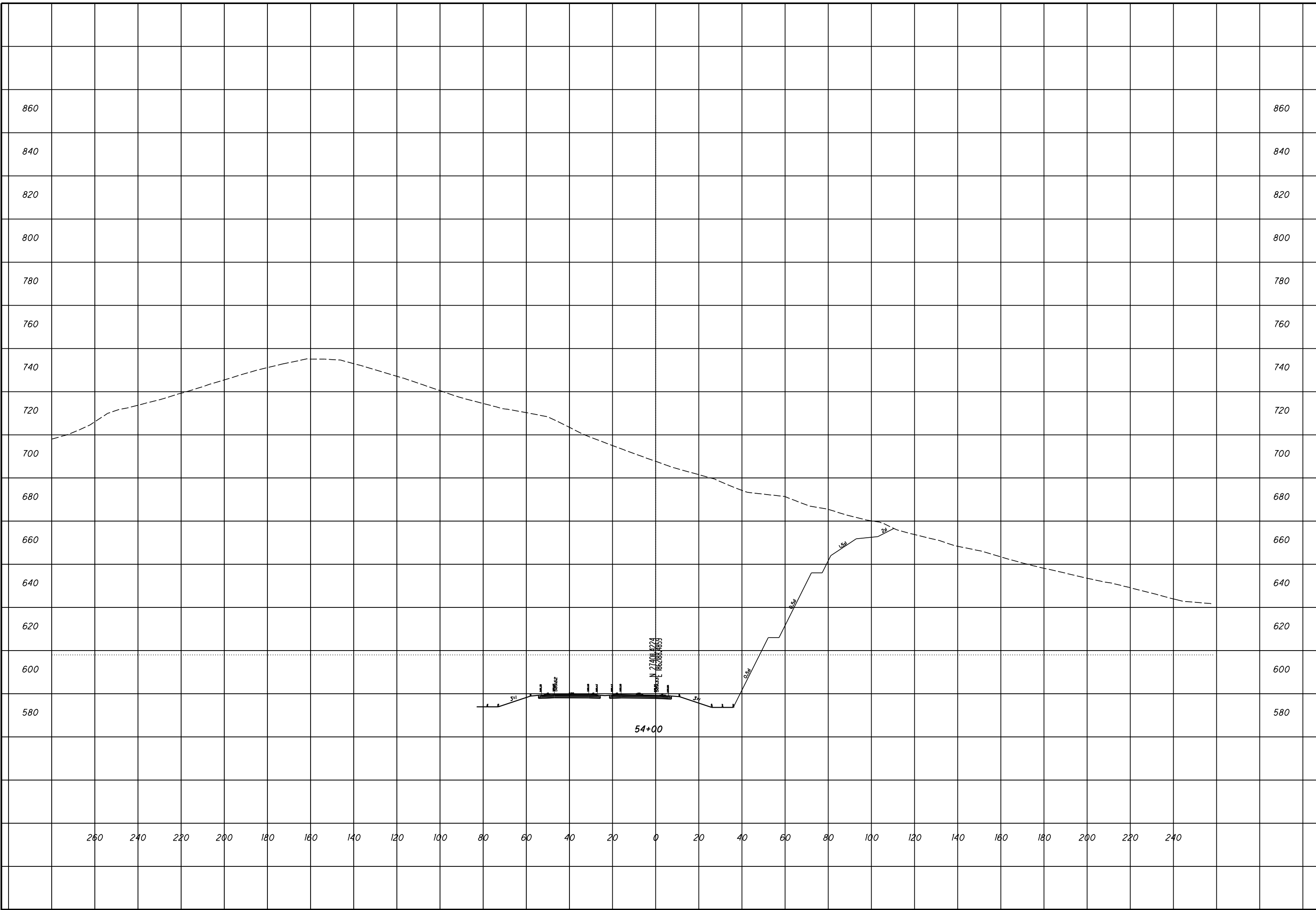
ROCK CUT SLOPE DESIGN - US 52 RAMP A
STA 53+00

SCI-823-0.00

25
27

CHECKED

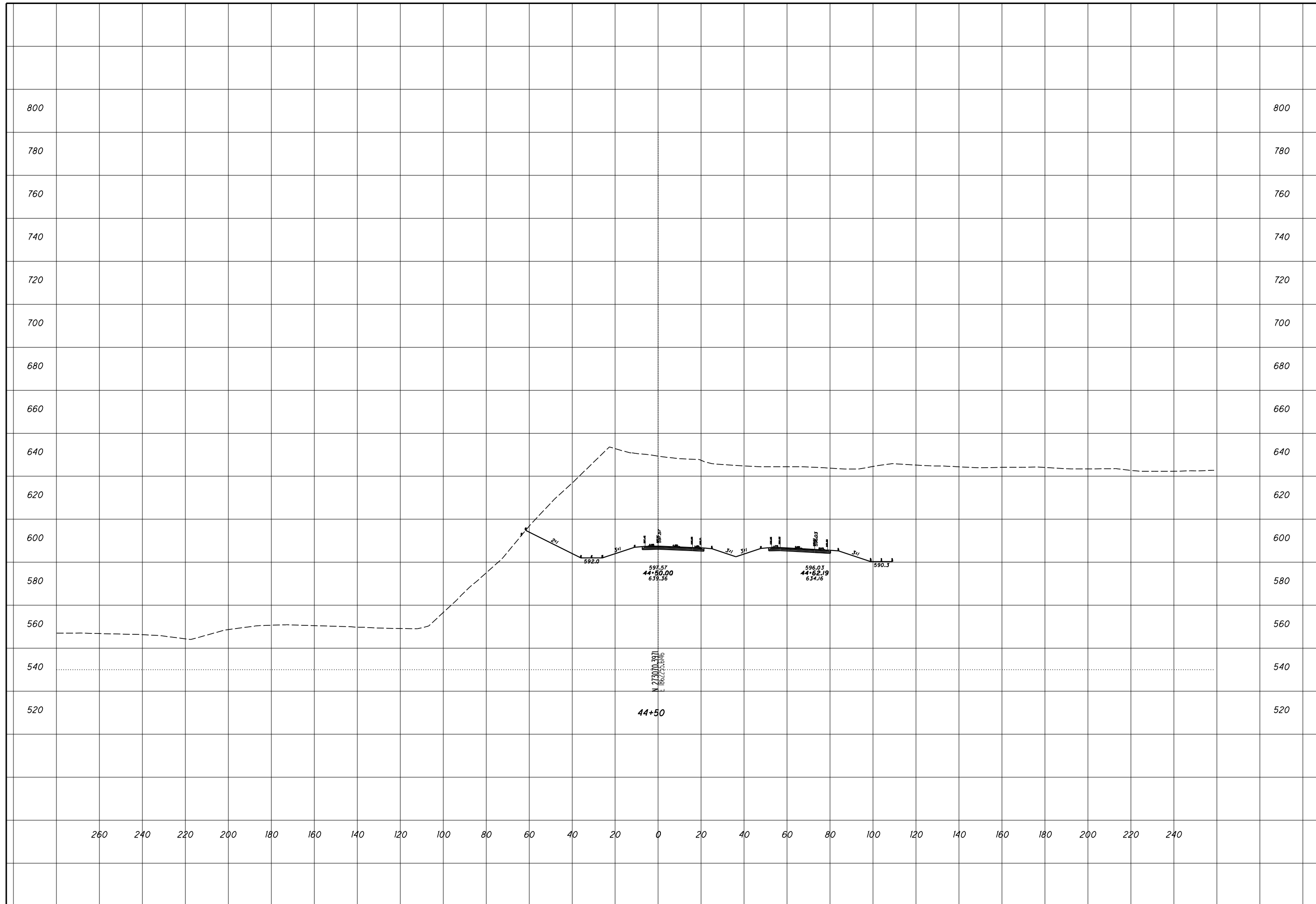




CHECKED
ROCK CUT SLOPE DESIGN - US 52 RAMP A
STA 54+00
SCI-823-0.00
 27
 27

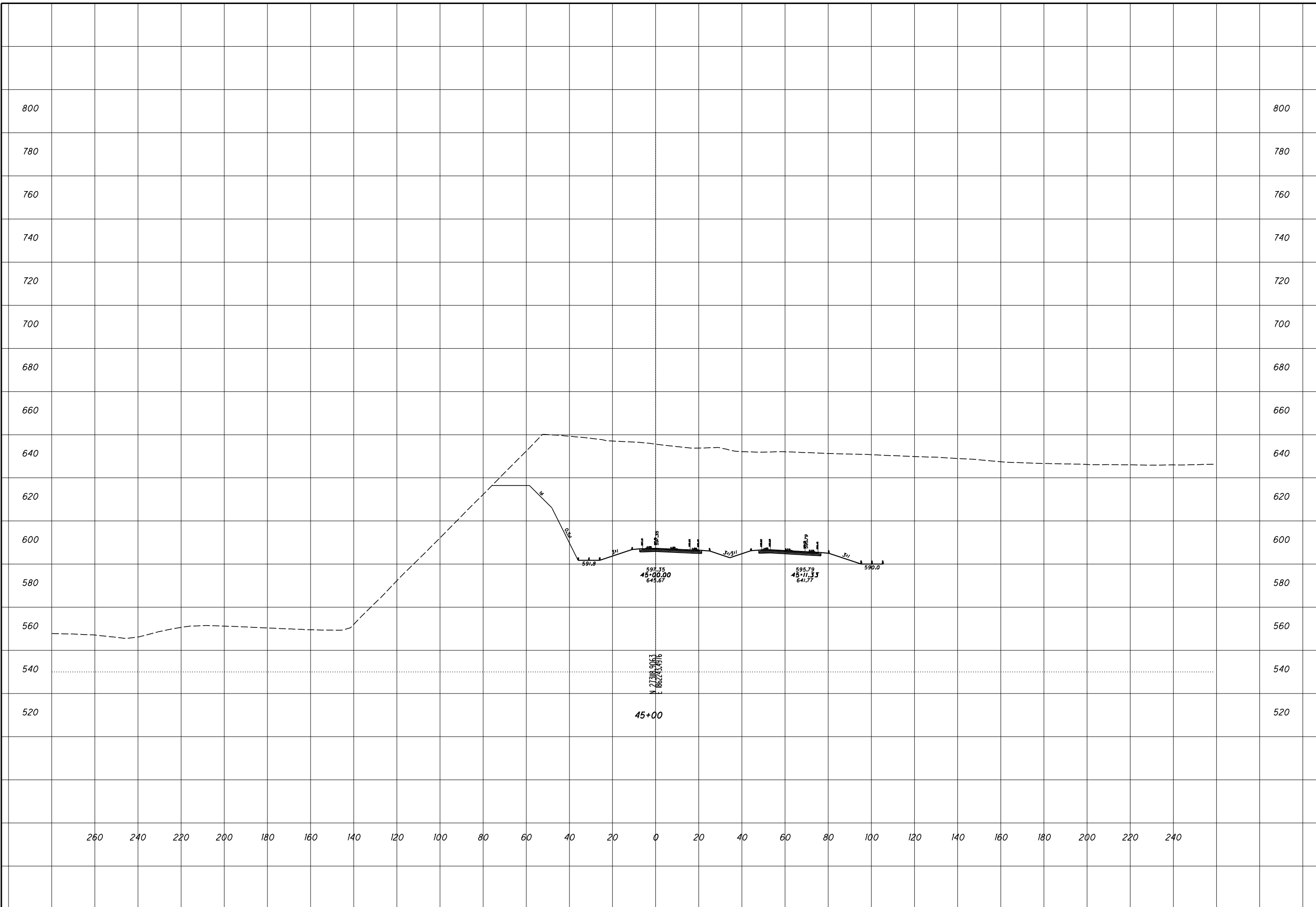
**ROCK CUT SLOPE DESIGN - US 52 RAMP B
STA 44+50**

SCI-823-0.00



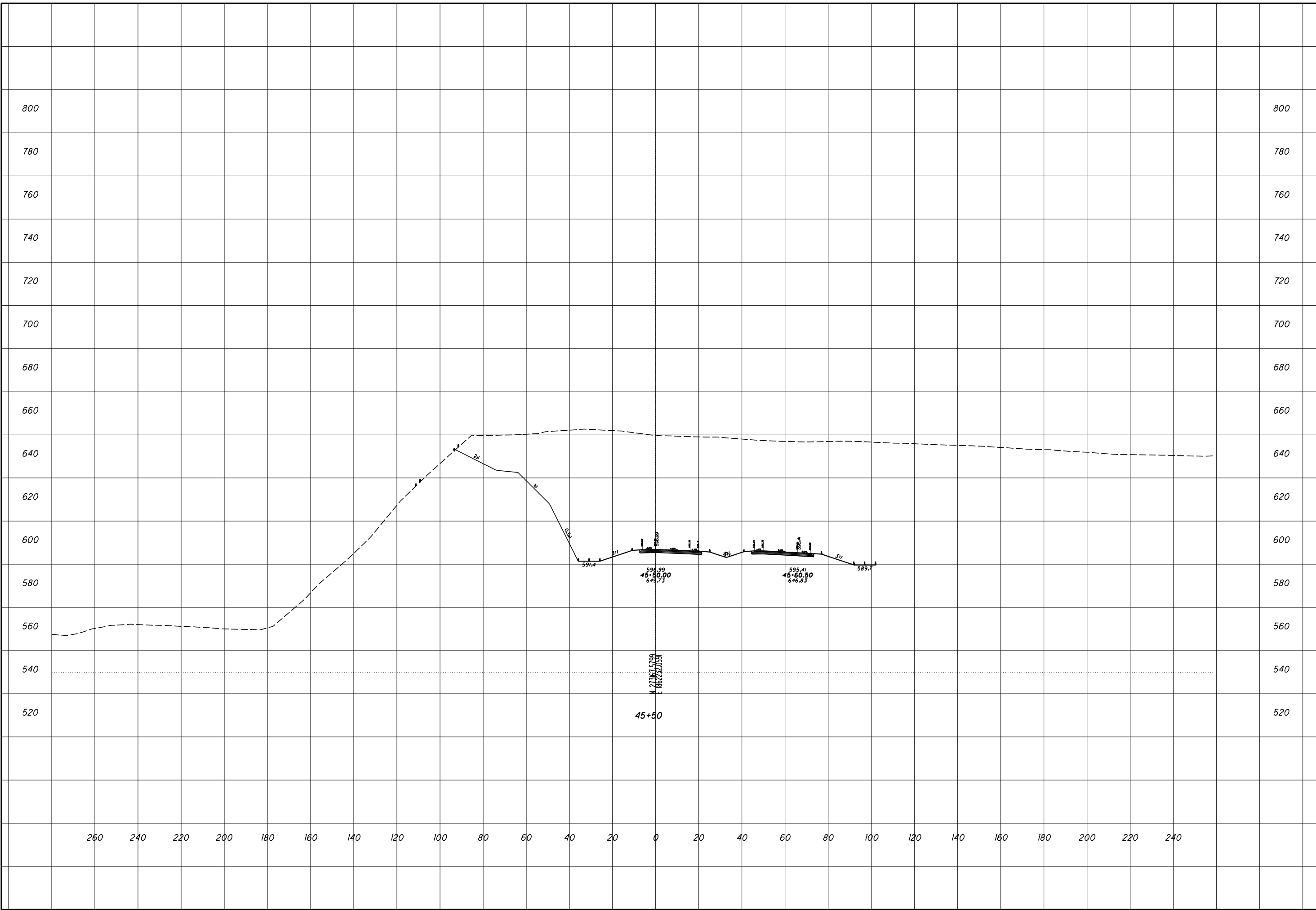
**ROCK CUT SLOPE DESIGN - US 52 RAMP B
STA 45+00**

SCI-823-0.00



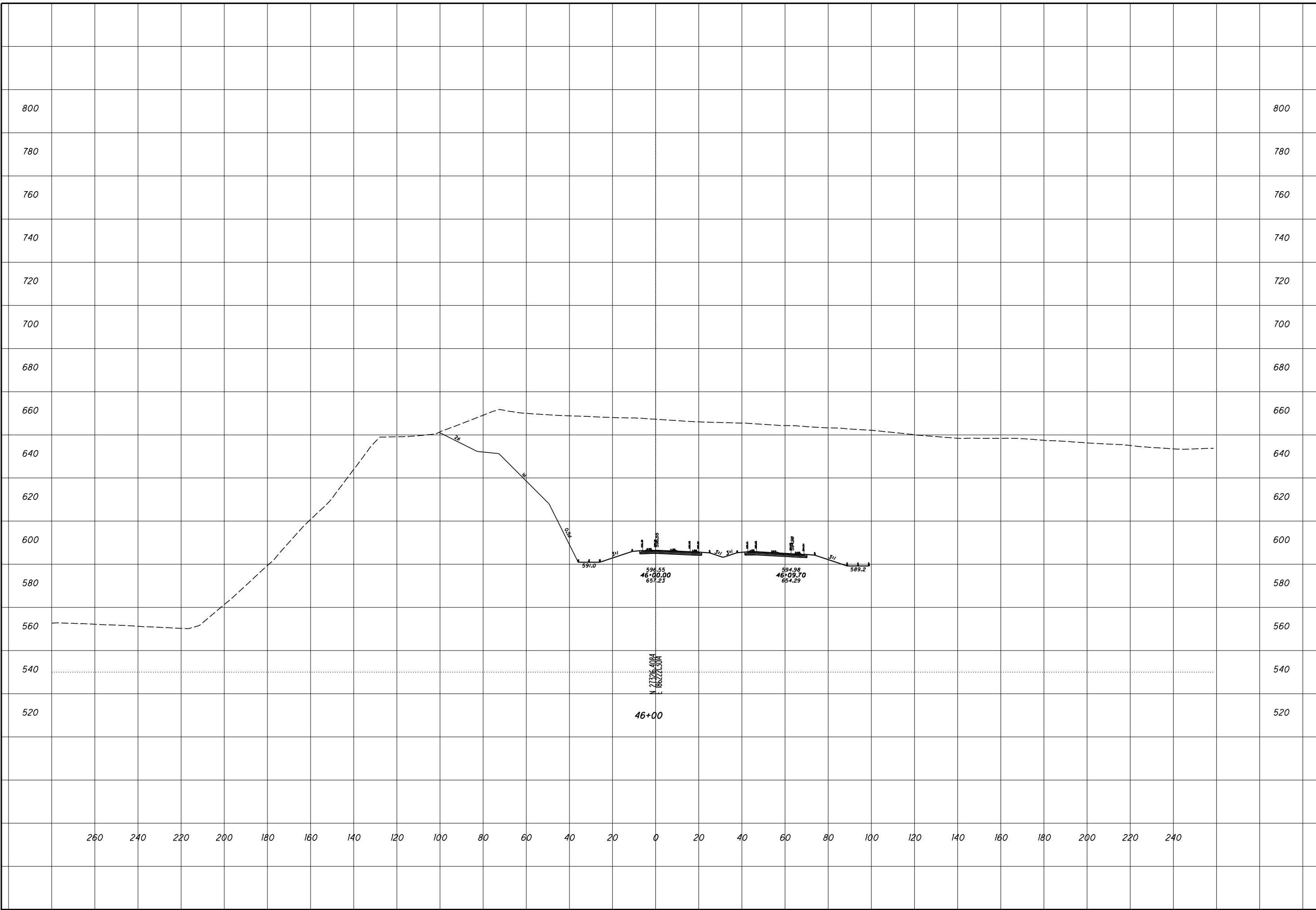
**ROCK CUT SLOPE DESIGN - US 52 RAMP B
STA 45+50**

SCI-823-0.00



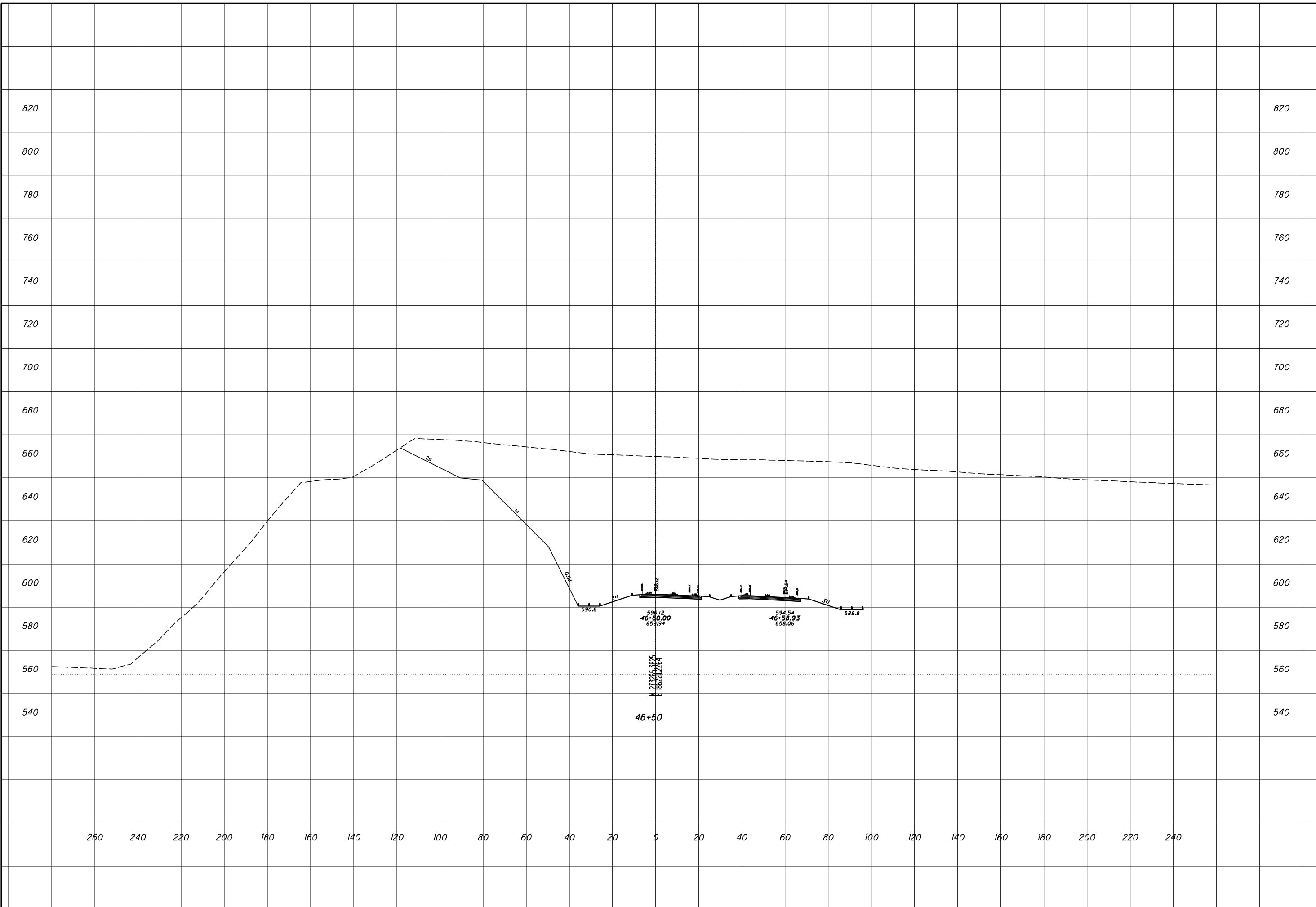
**ROCK CUT SLOPE DESIGN - US 52 RAMP B
STA 46+00**

SCI-823-0.00



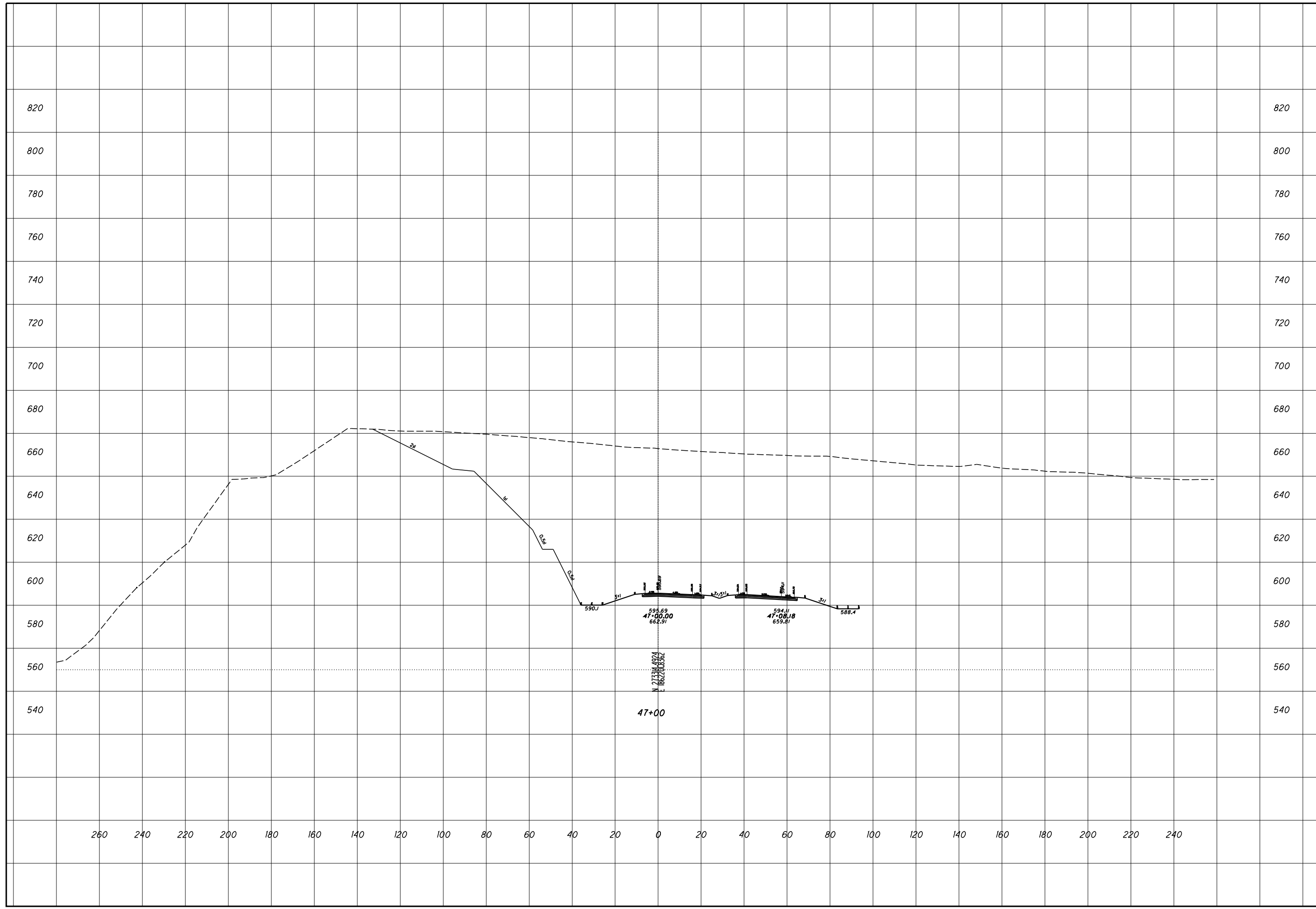
**ROCK CUT SLOPE DESIGN - US 52 RAMP B
STA 46+50**

SCI-823-0.00



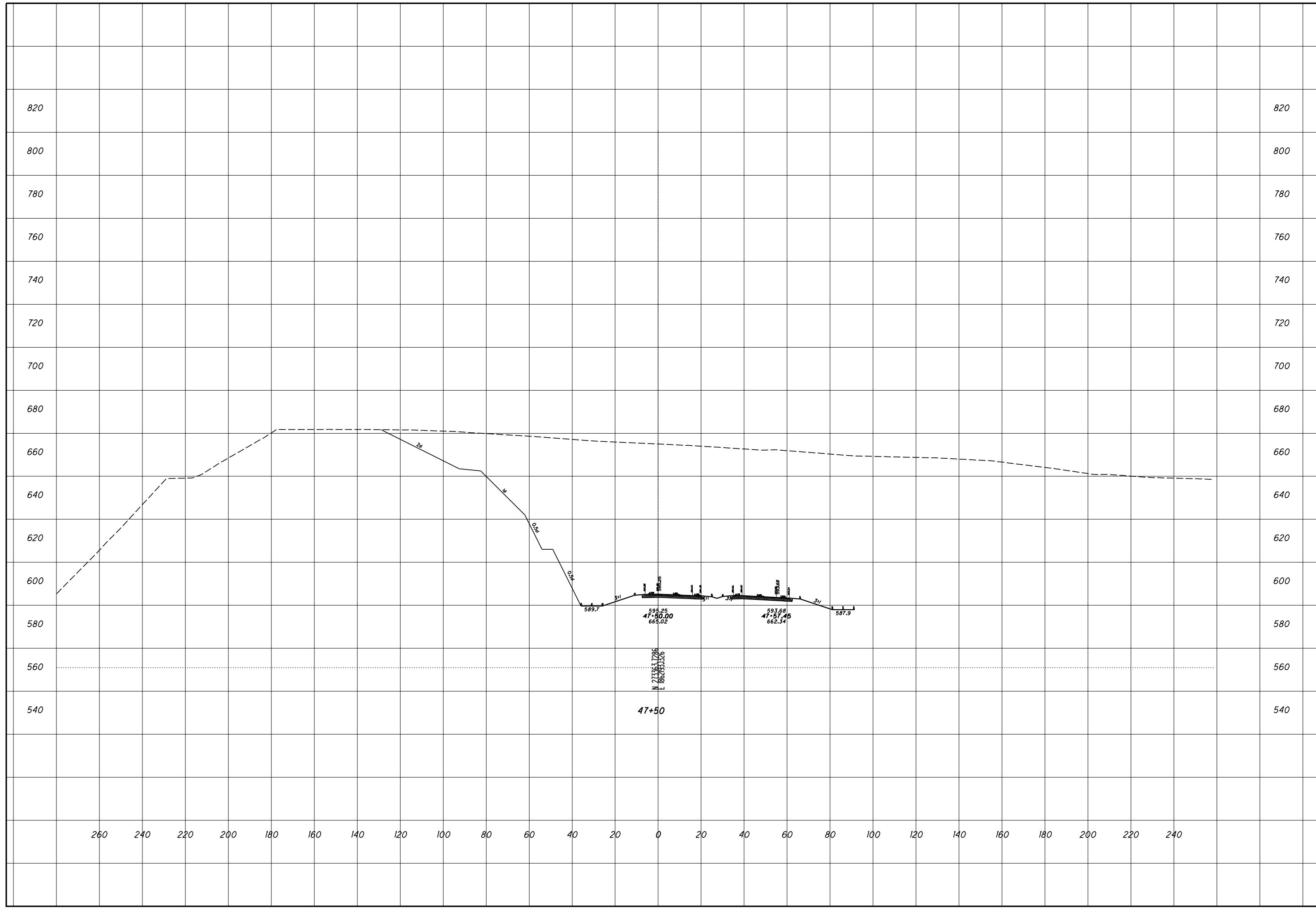
ROCK CUT SLOPE DESIGN - US 52 RAMP B
STA 47+00

SCI-823-0.00



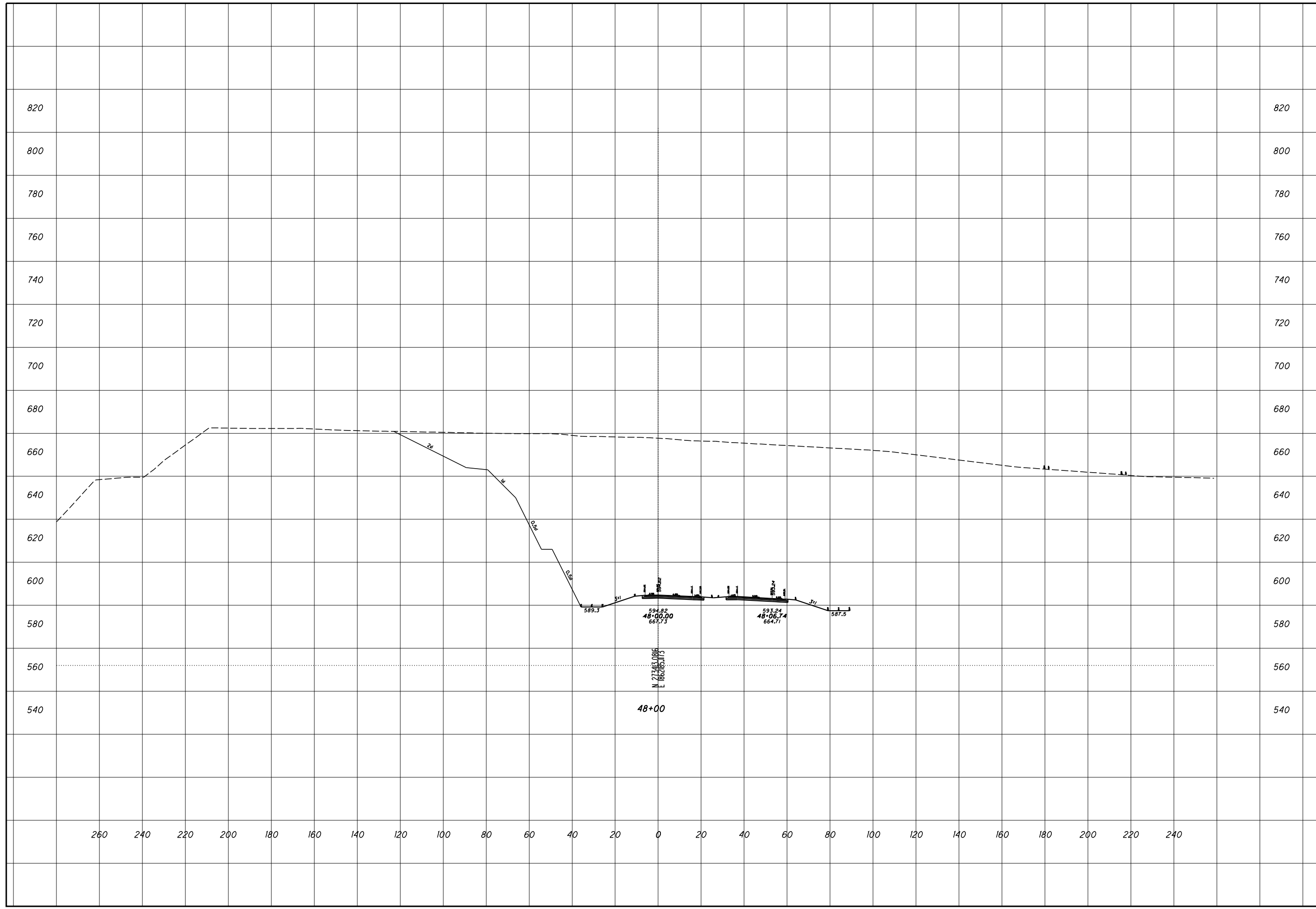
**ROCK CUT SLOPE DESIGN - US 52 RAMP B
STA 47+50**

SCI-823-0.00



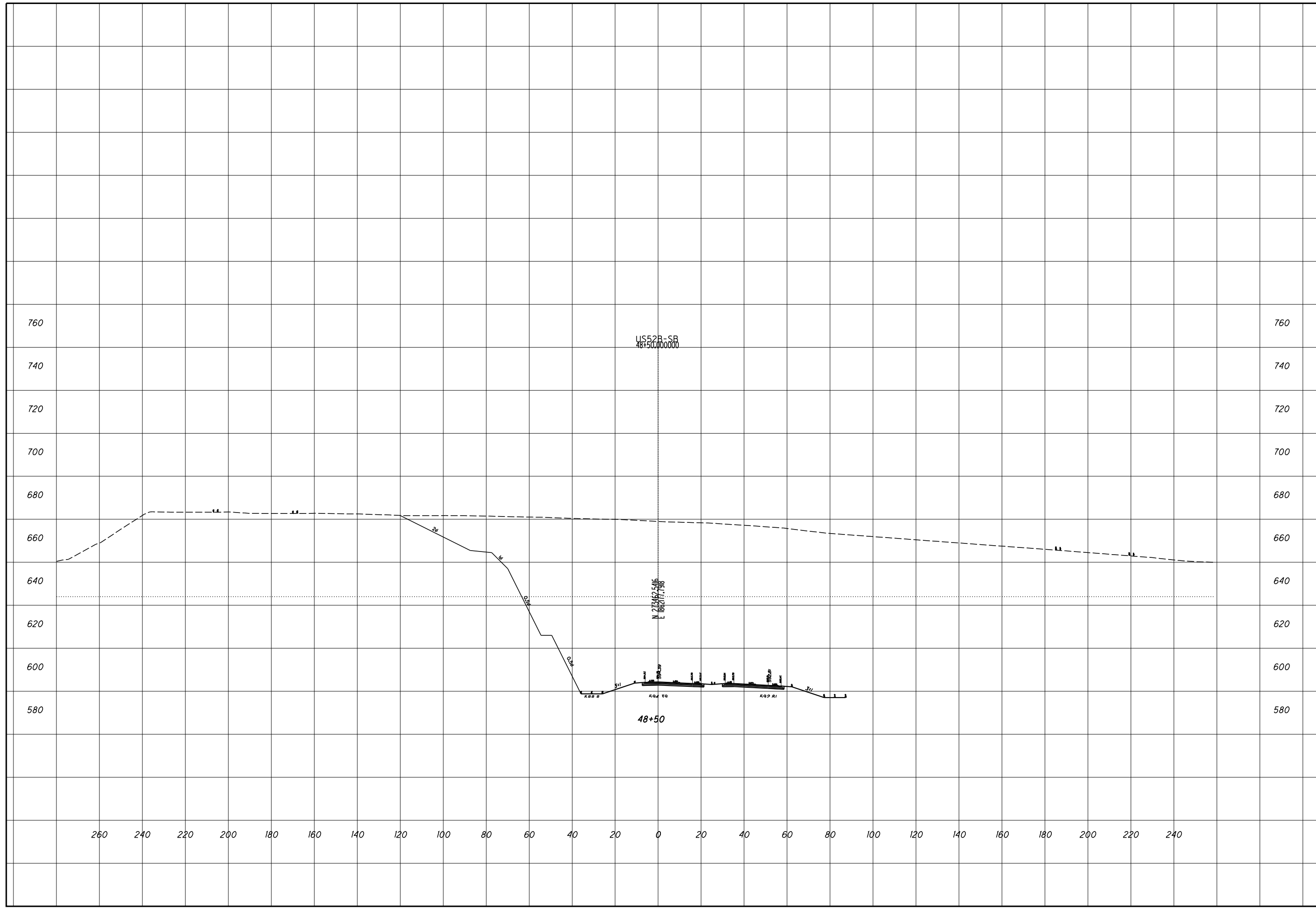
ROCK CUT SLOPE DESIGN - US 52 RAMP B
STA 48+00

SCI-823-0.00



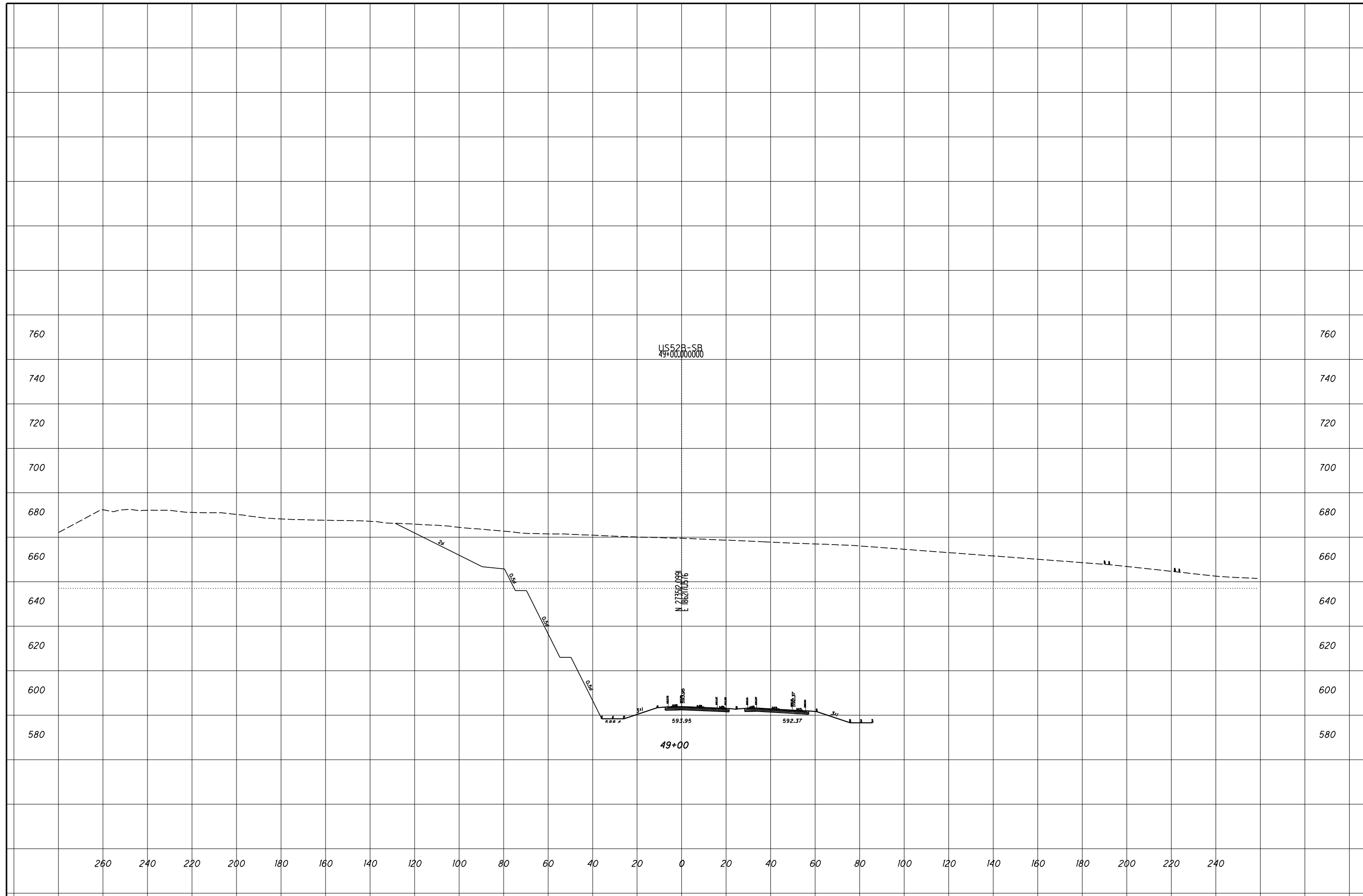
ROCK CUT SLOPE DESIGN - US 52 RAMP B
STA 48+50

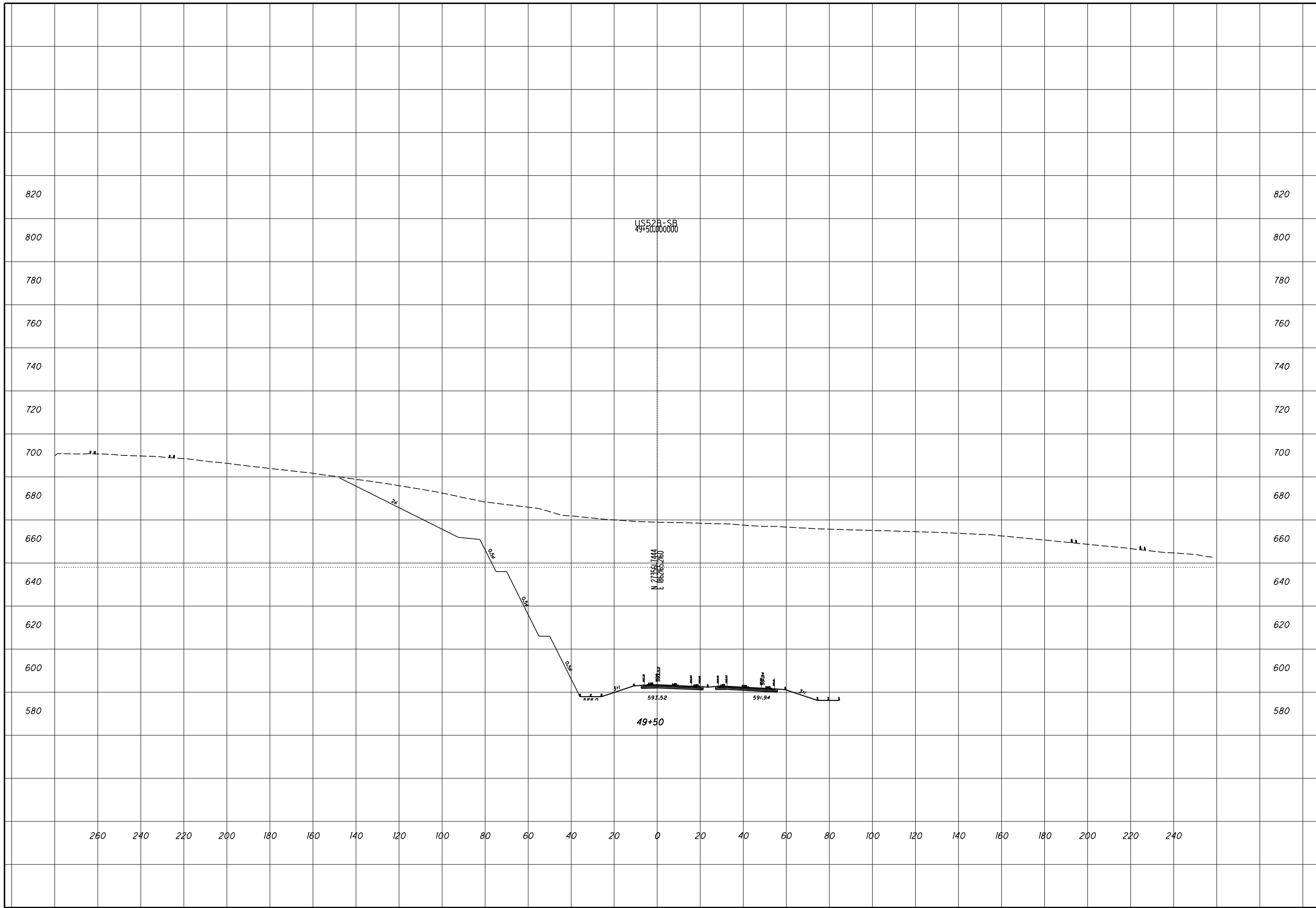
SCI-823-0.00



ROCK CUT SLOPE DESIGN - US 52 RAMP B
STA 49+00

SCI-823-0.00

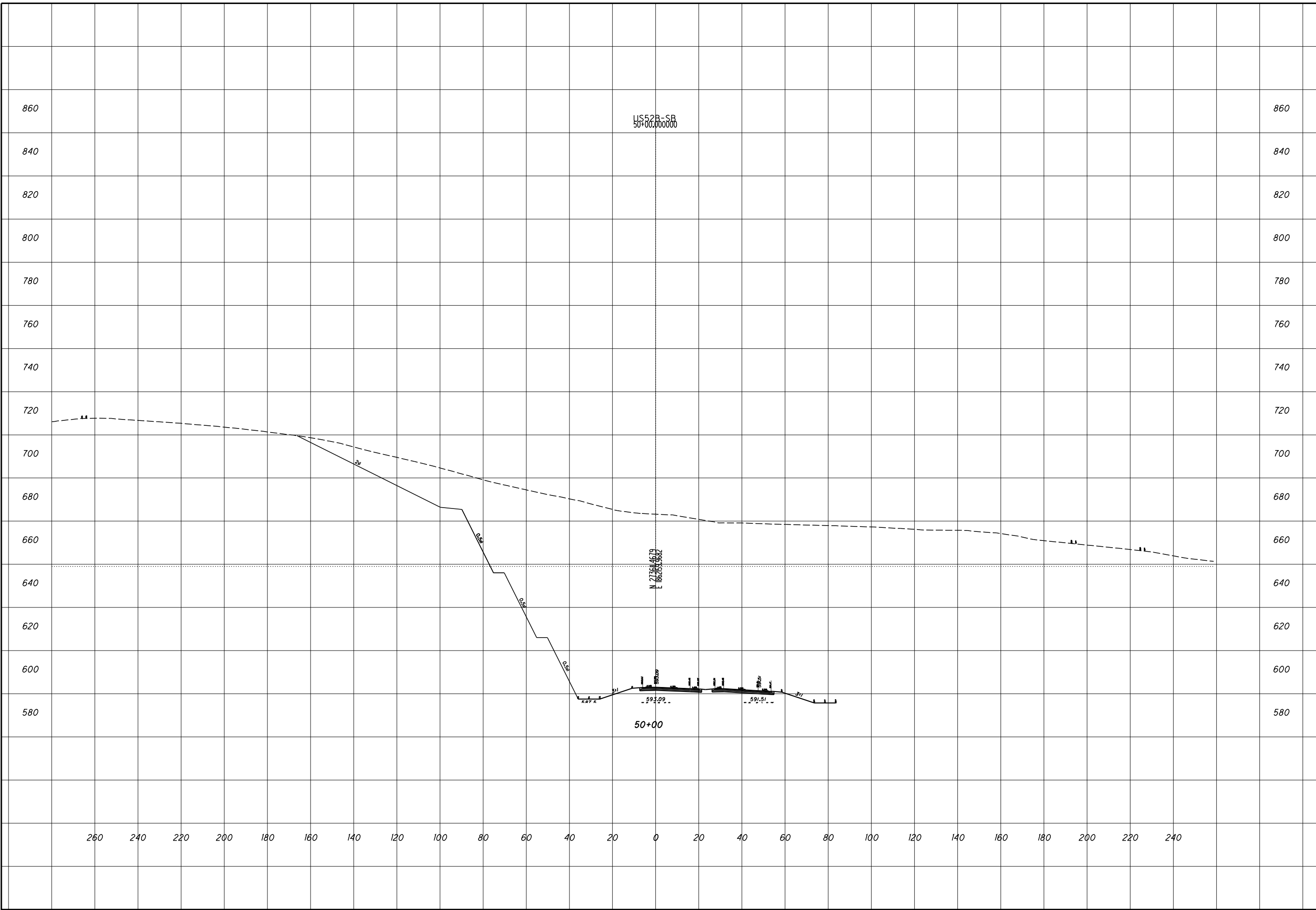


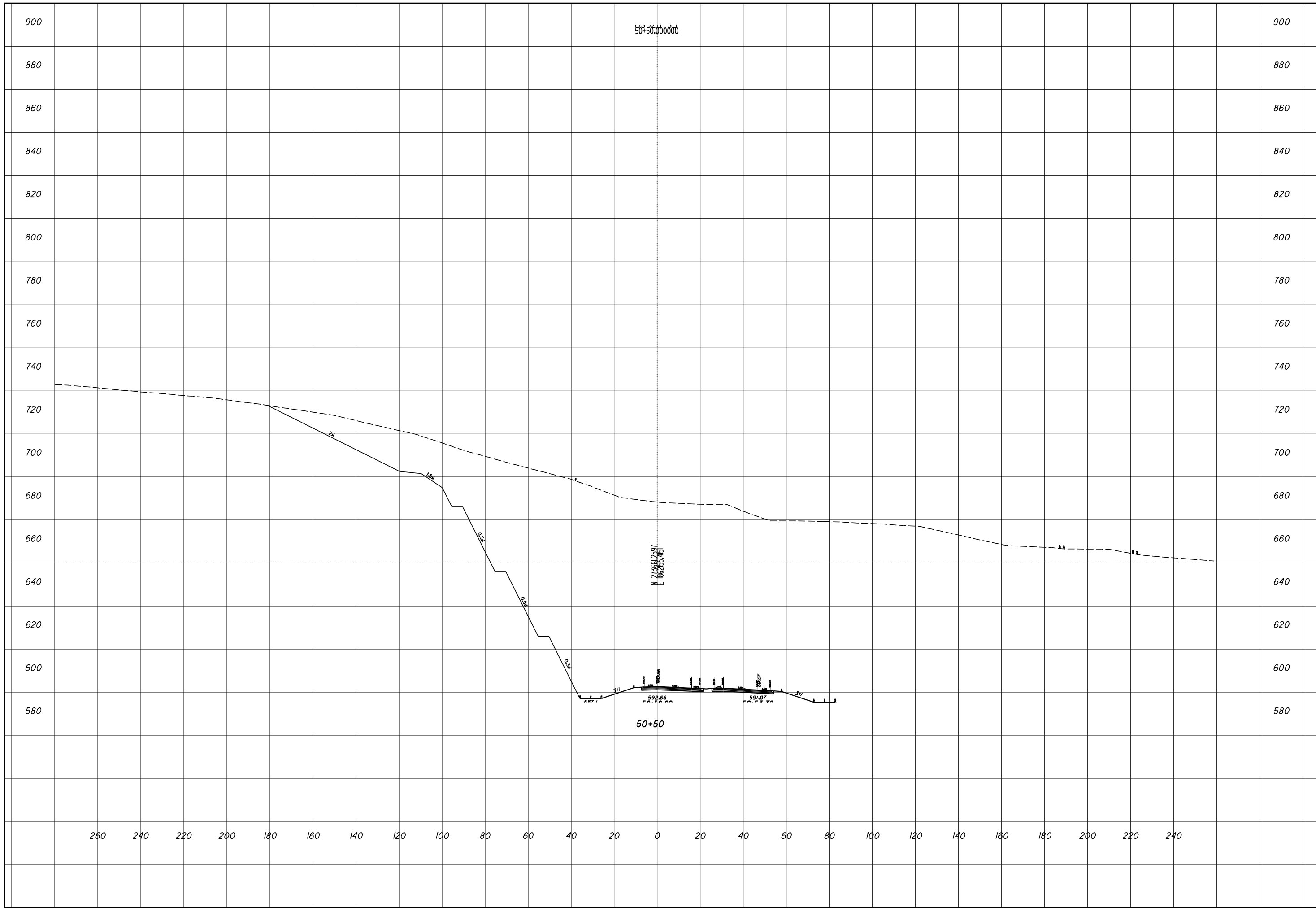


CHECKED
ROCK CUT SLOPE DESIGN - US 52 RAMP B
STA 49+50
SCI-823-0.00
 11 / 20

ROCK CUT SLOPE DESIGN - US 52 RAMP B
STA 50+00

SCI-823-0.00



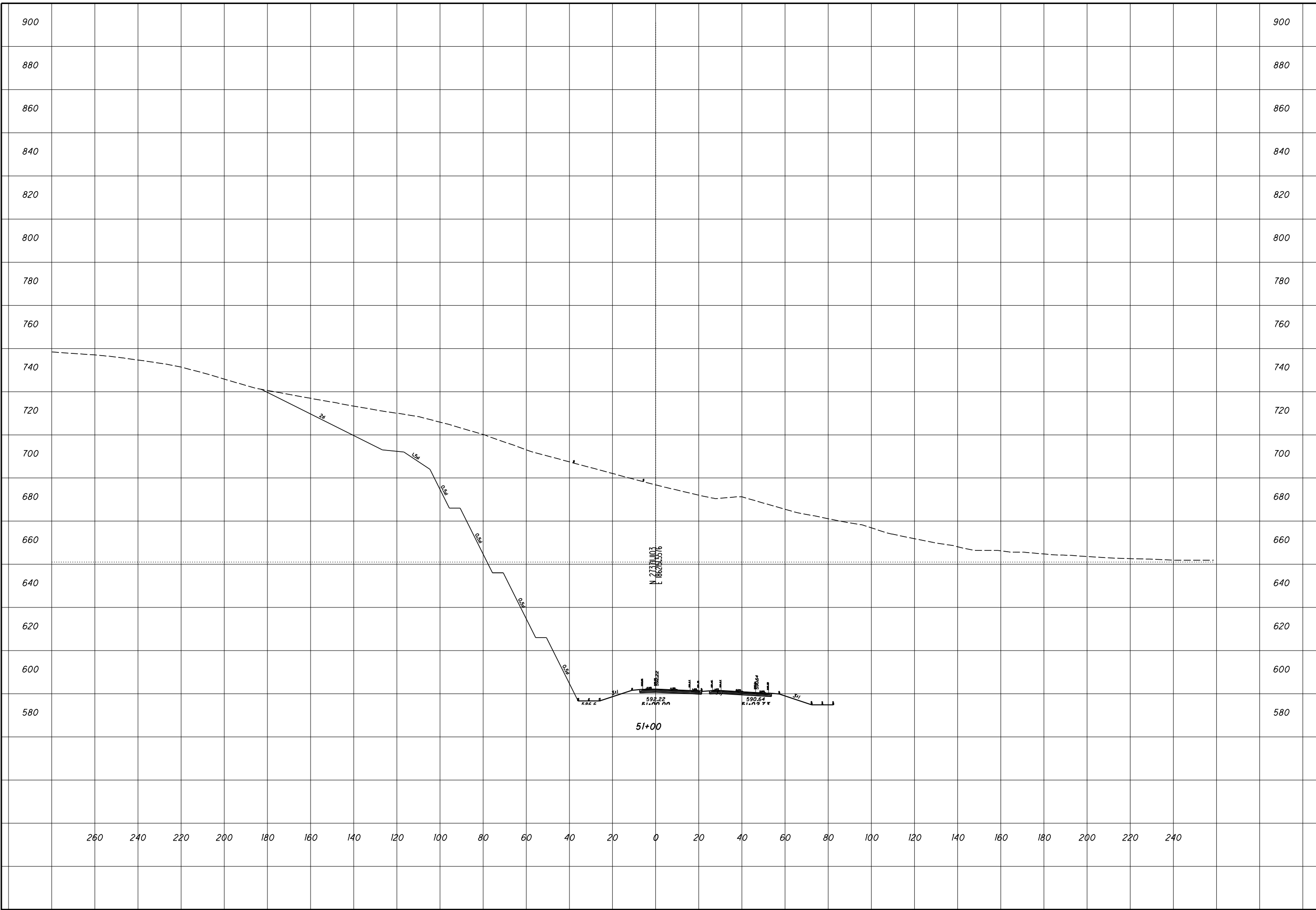


CHECKED

ROCK CUT SLOPE DESIGN - US 52 RAMP B
STA 50+50

SCI-823-0.00

13
20



ROCK CUT SLOPE DESIGN - US 52 RAMP B
STA 51+00

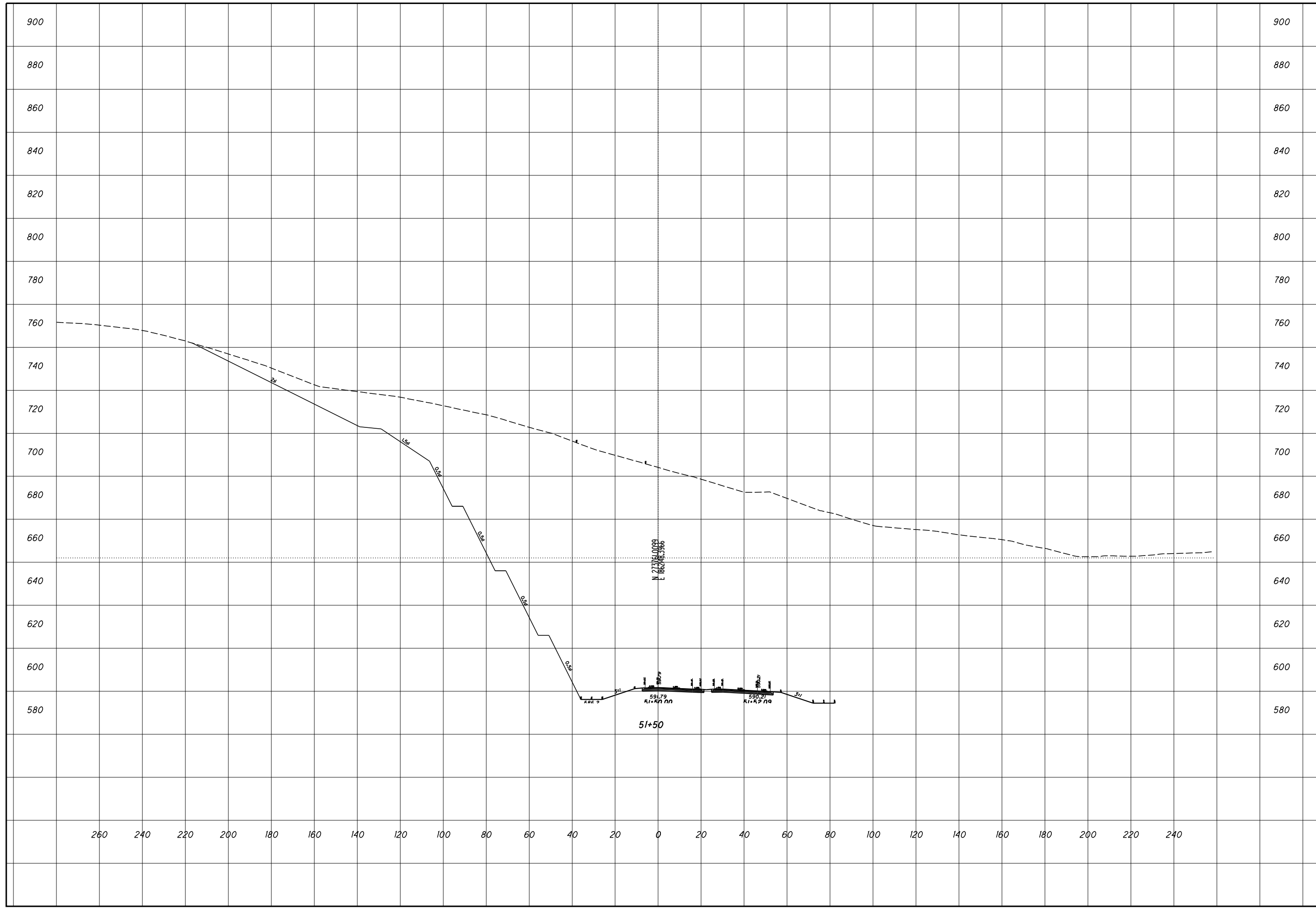
SCI-823-0.00

CHECKED

CHECKED

**ROCK CUT SLOPE DESIGN - US 52 RAMP B
STA 51+50**

SCI-823-0.00



900

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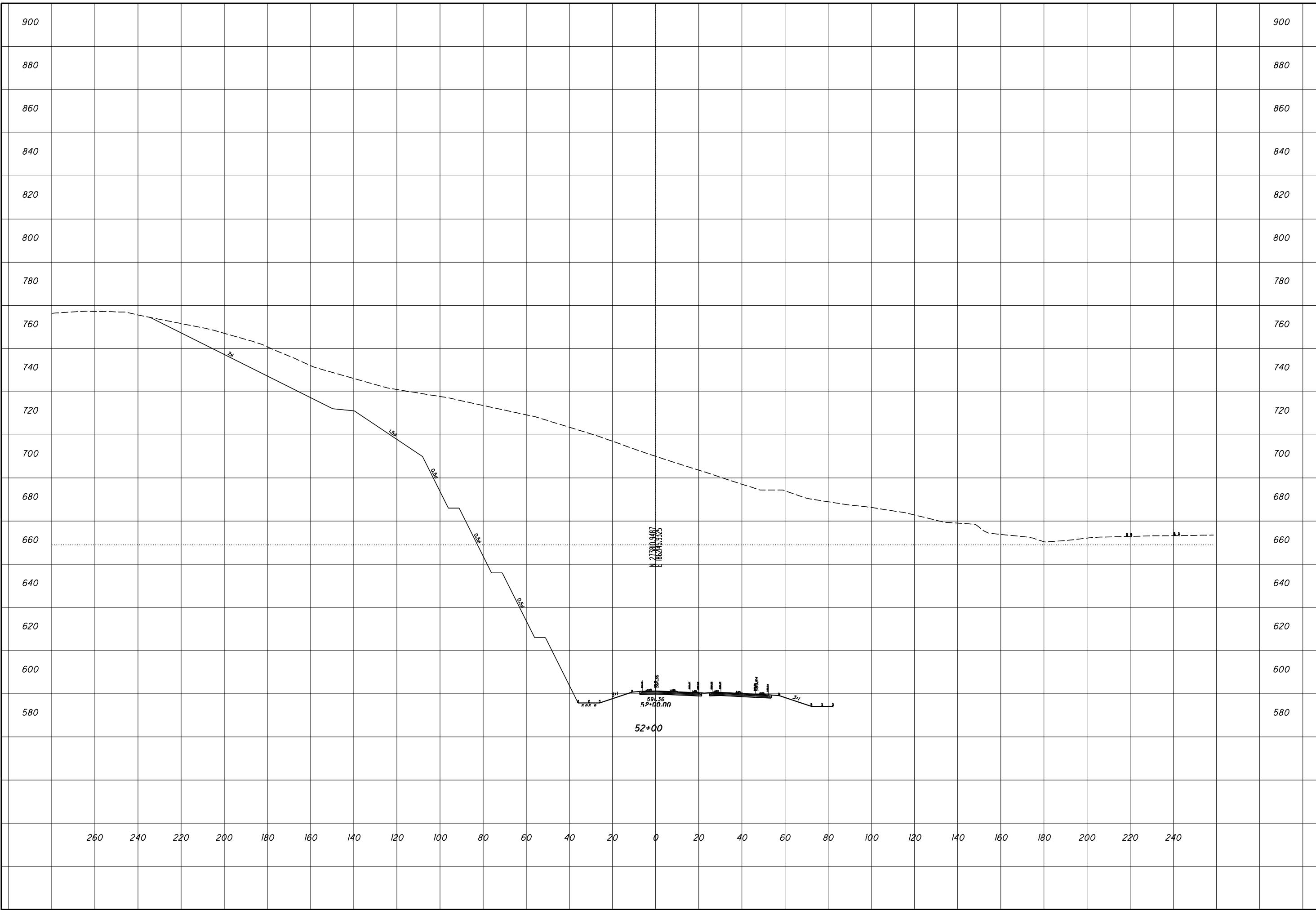
240

N 23°16'00.99"
E 186278.956

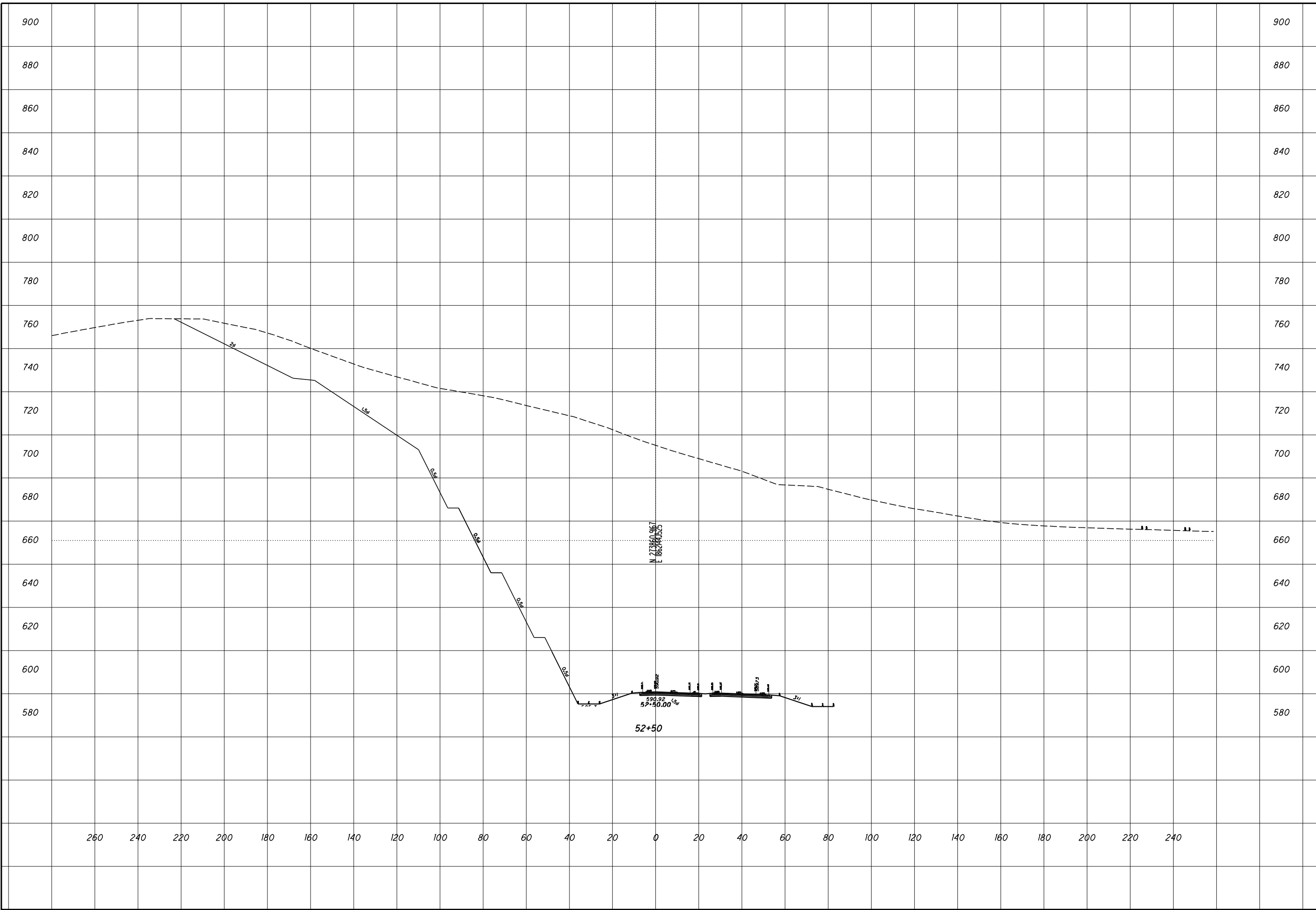
51+50

591.79
51+47.00

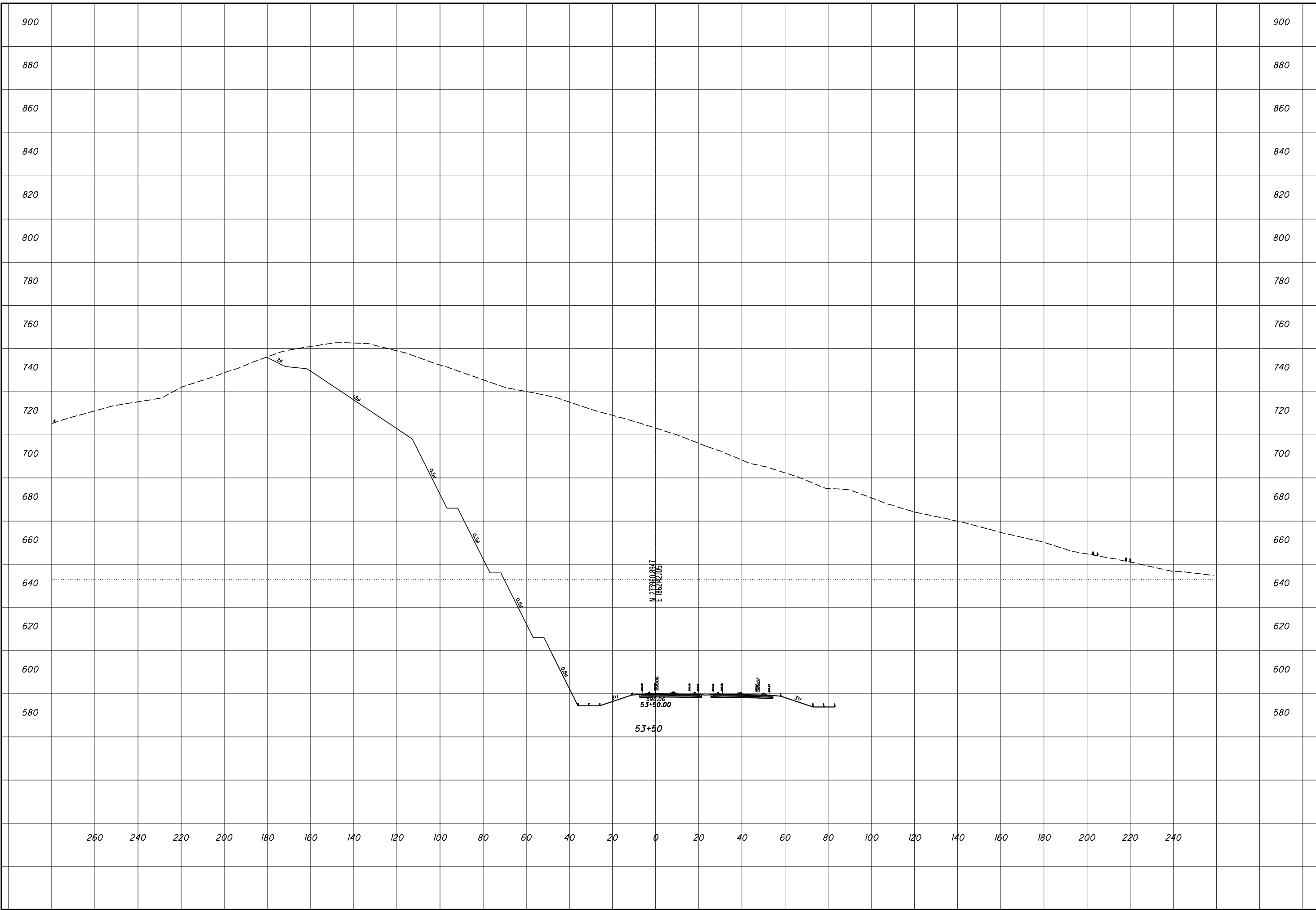
590.21
51+42.00



CHECKED
ROCK CUT SLOPE DESIGN - US 52 RAMP B
STA 52+00
SCI-823-0.00
 16
 20



CHECKED
ROCK CUT SLOPE DESIGN - US 52 RAMP B
STA 52+50
SCI-823-0.00
 17
 20

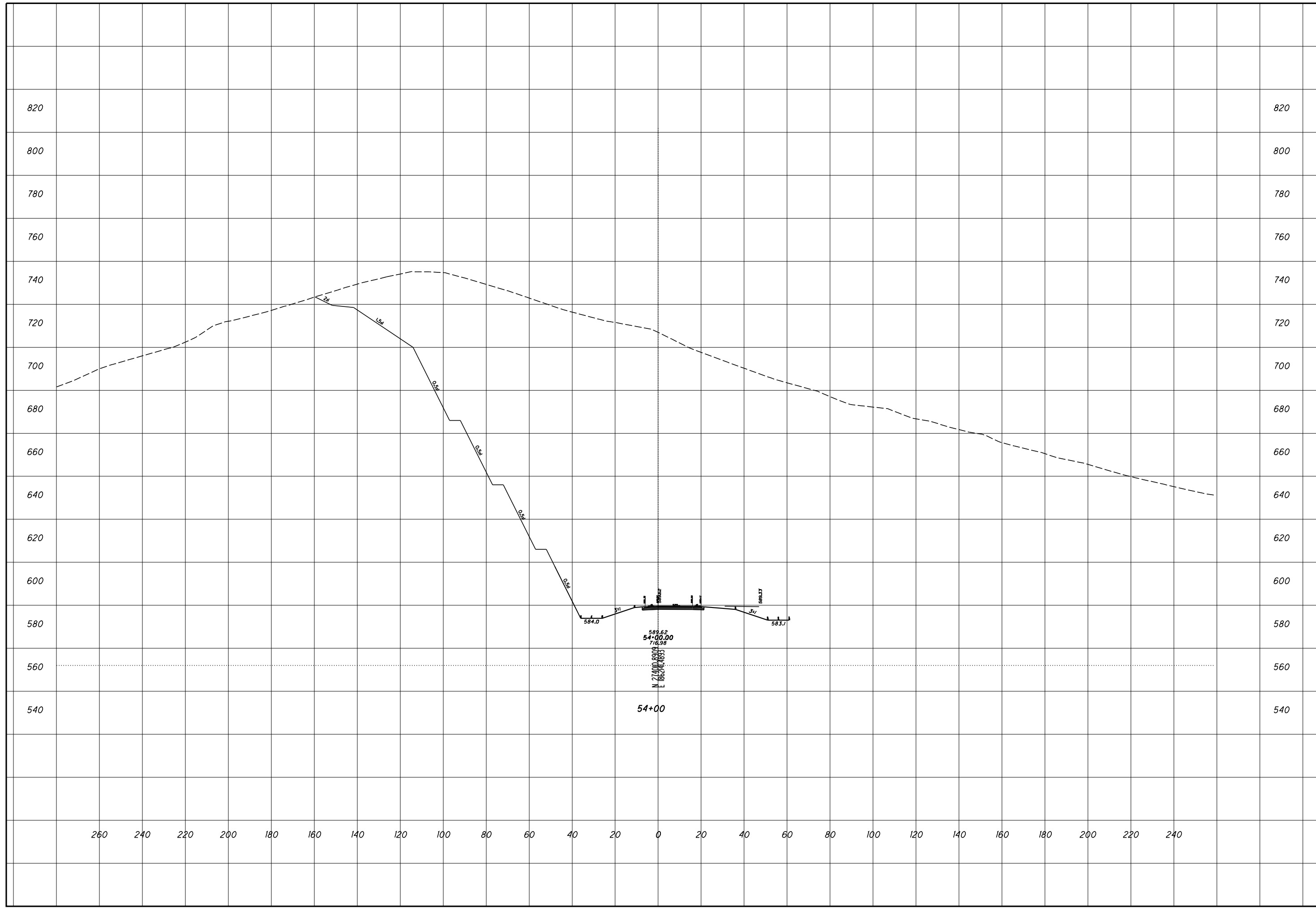


CHECKED

19
20

ROCK CUT SLOPE DESIGN - US 52 RAMP B
STA 54+00

SCI-823-0.00



CHECKED

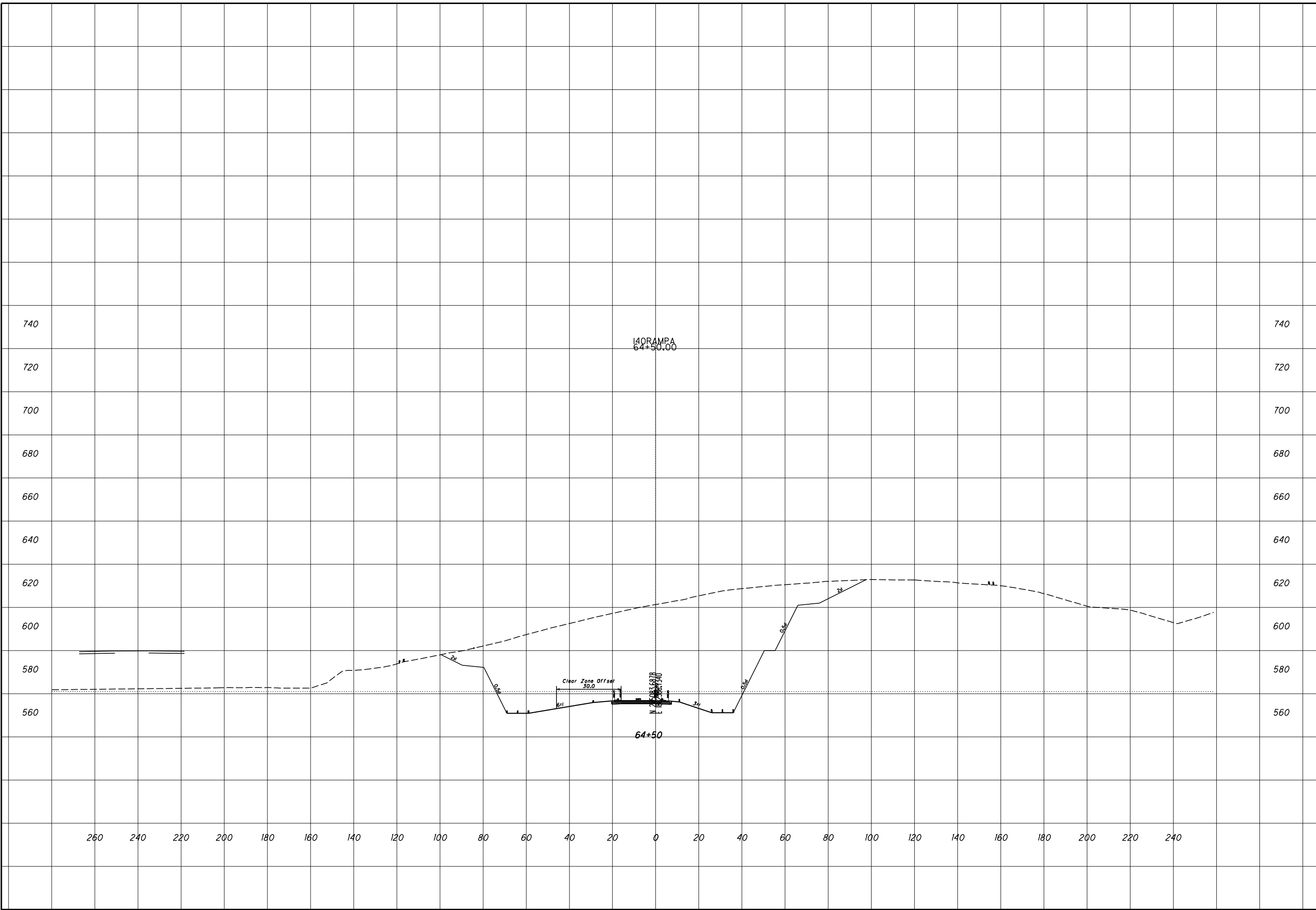
ROCK CUT SLOPE DESIGN - SR 140 RAMP A
STA 64+00

SCI-823-0.00



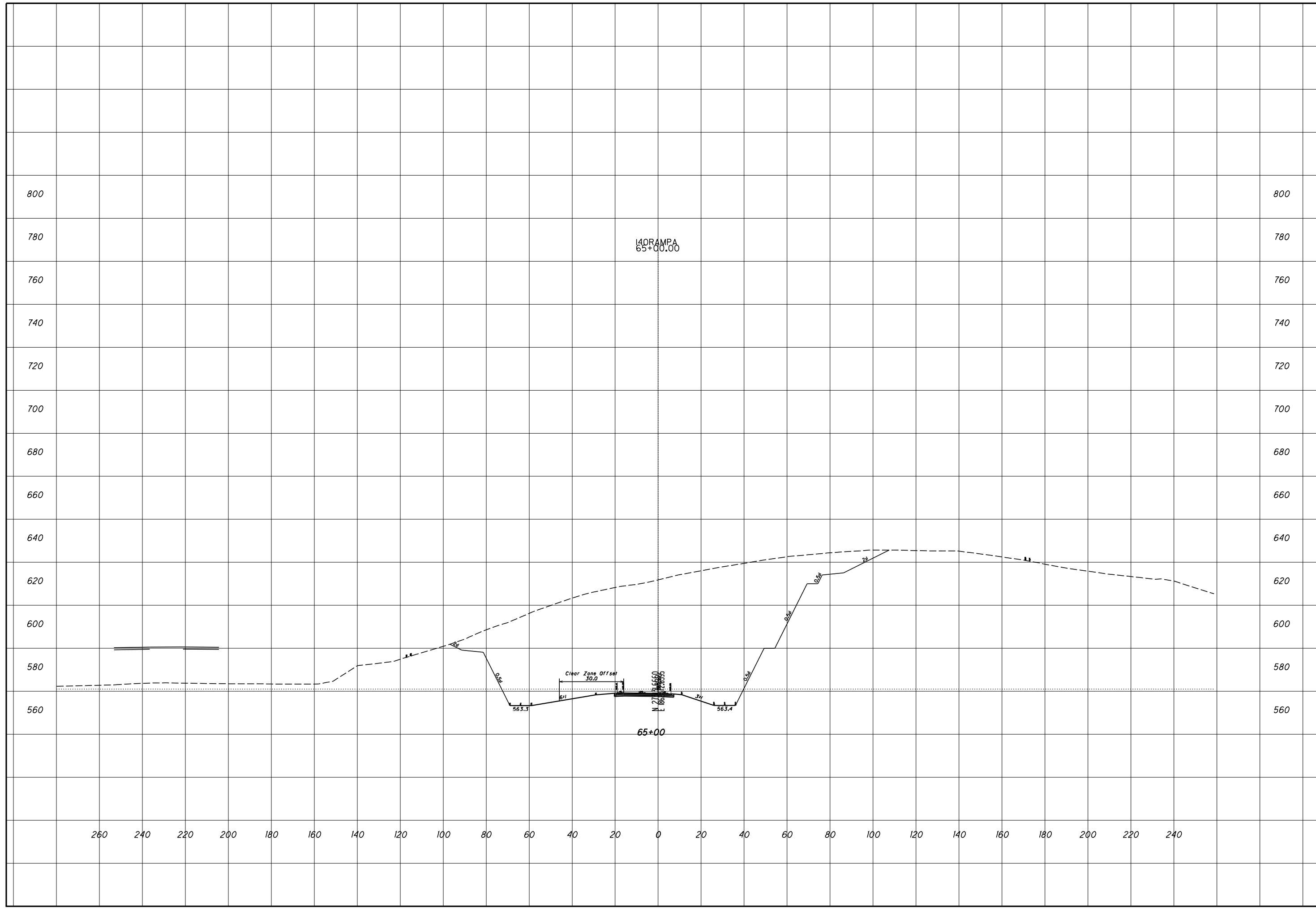
ROCK CUT SLOPE DESIGN - SR 140 RAMP A
STA 64+50

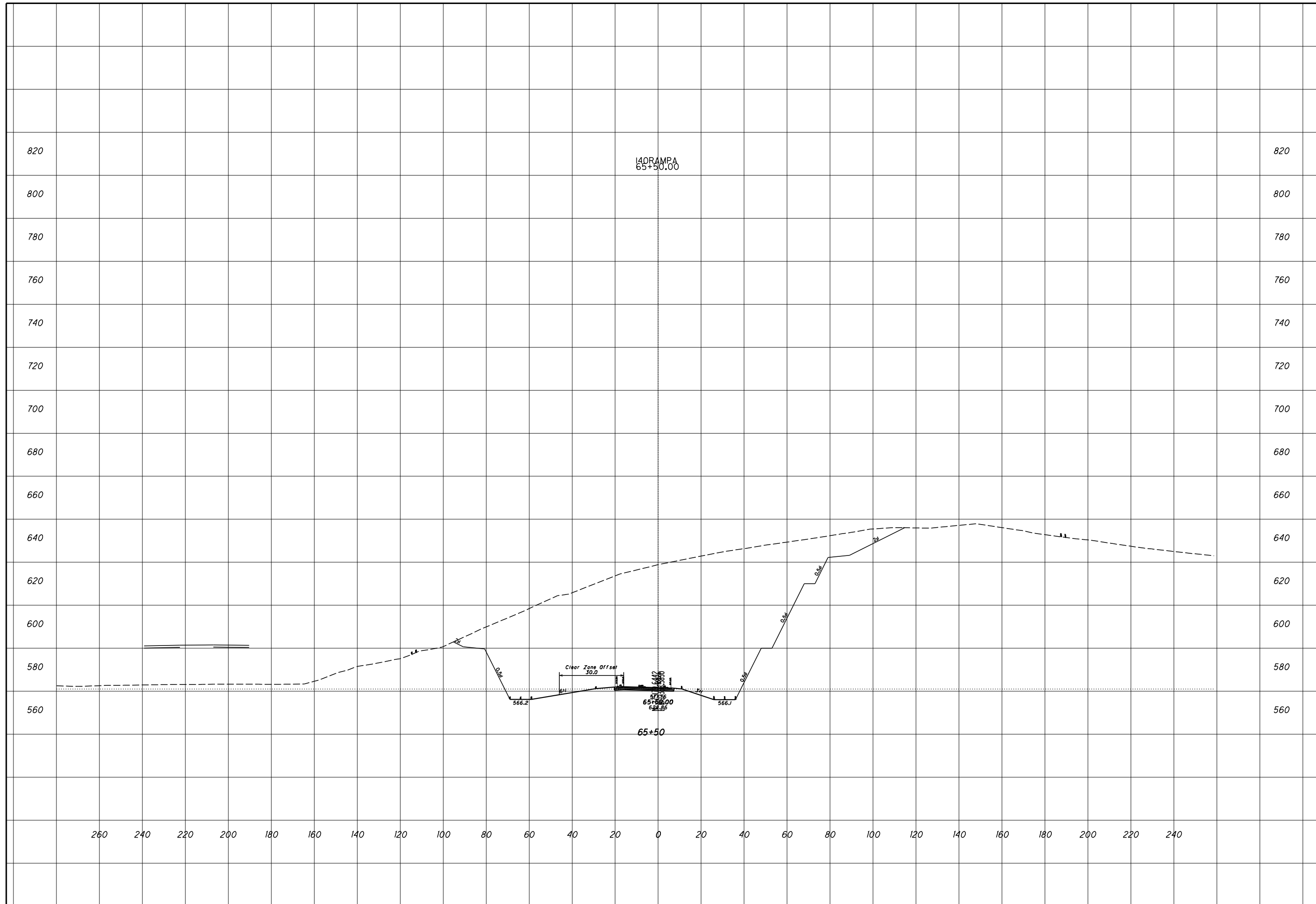
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ROCK CUT SLOPE DESIGN - SR 140 RAMP A
STA 65+00

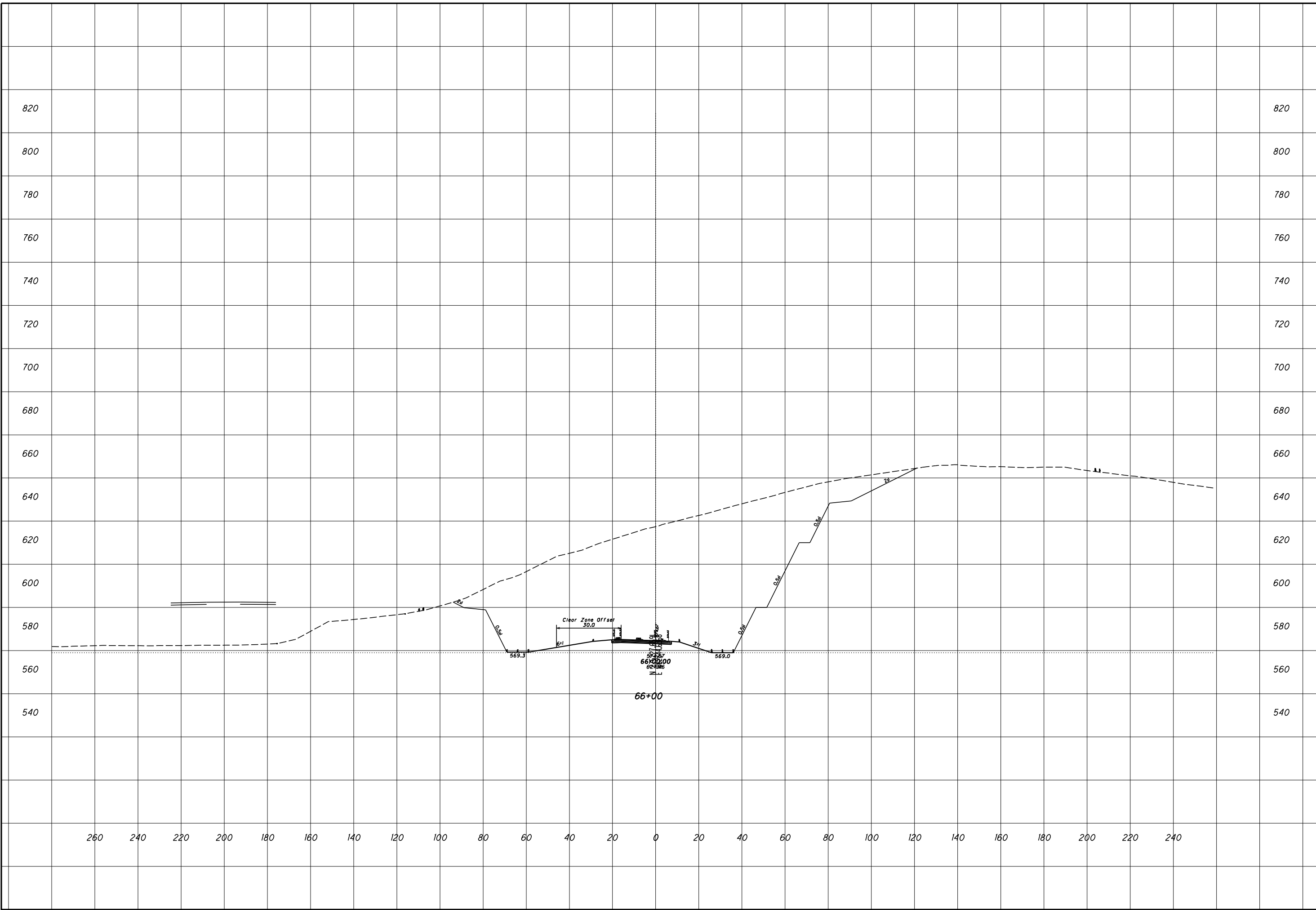
SCI-823-0.00





ROCK CUT SLOPE DESIGN - SR 140 RAMP A
STA 66+00

SCI-823-0.00



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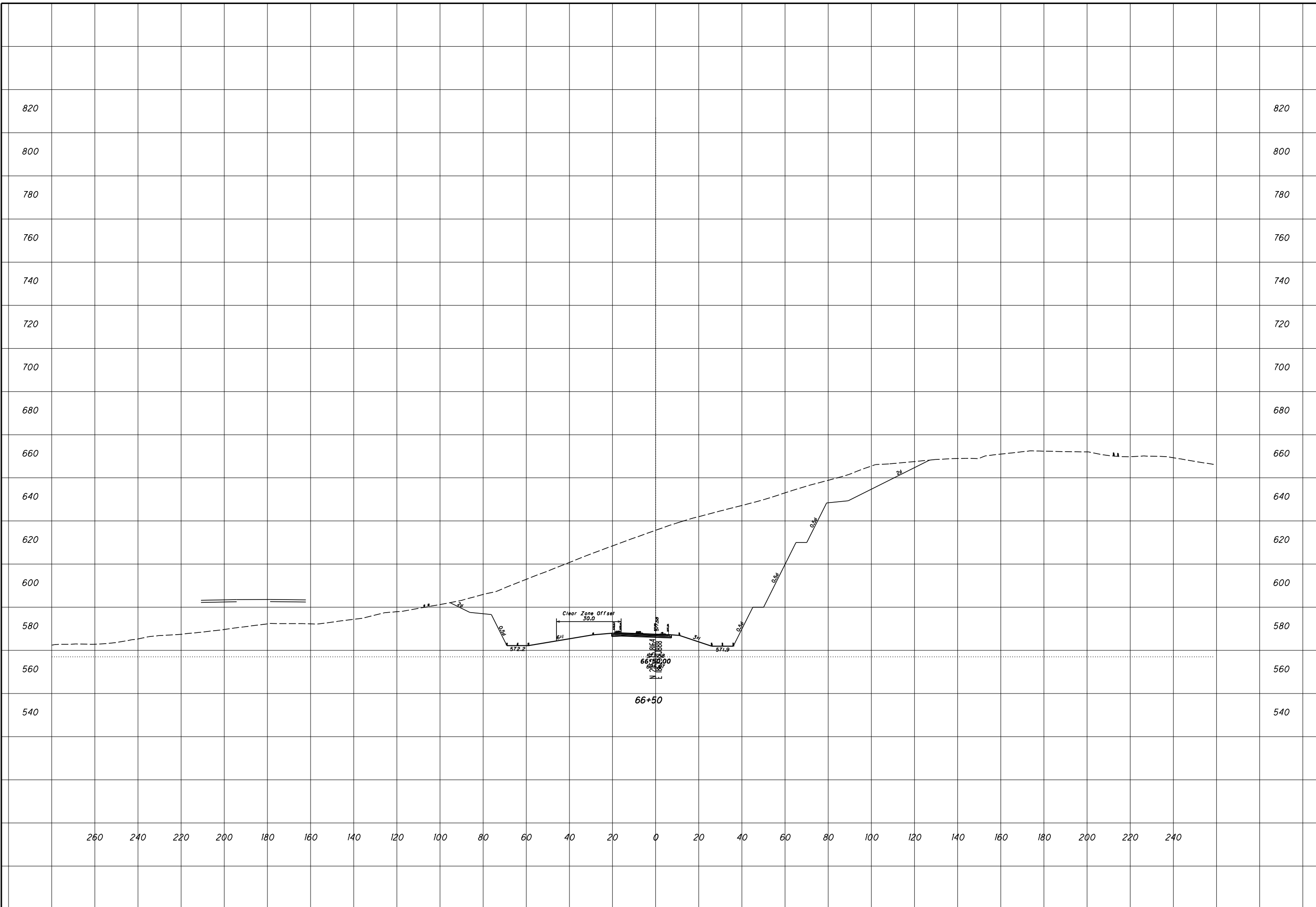
560

560

540

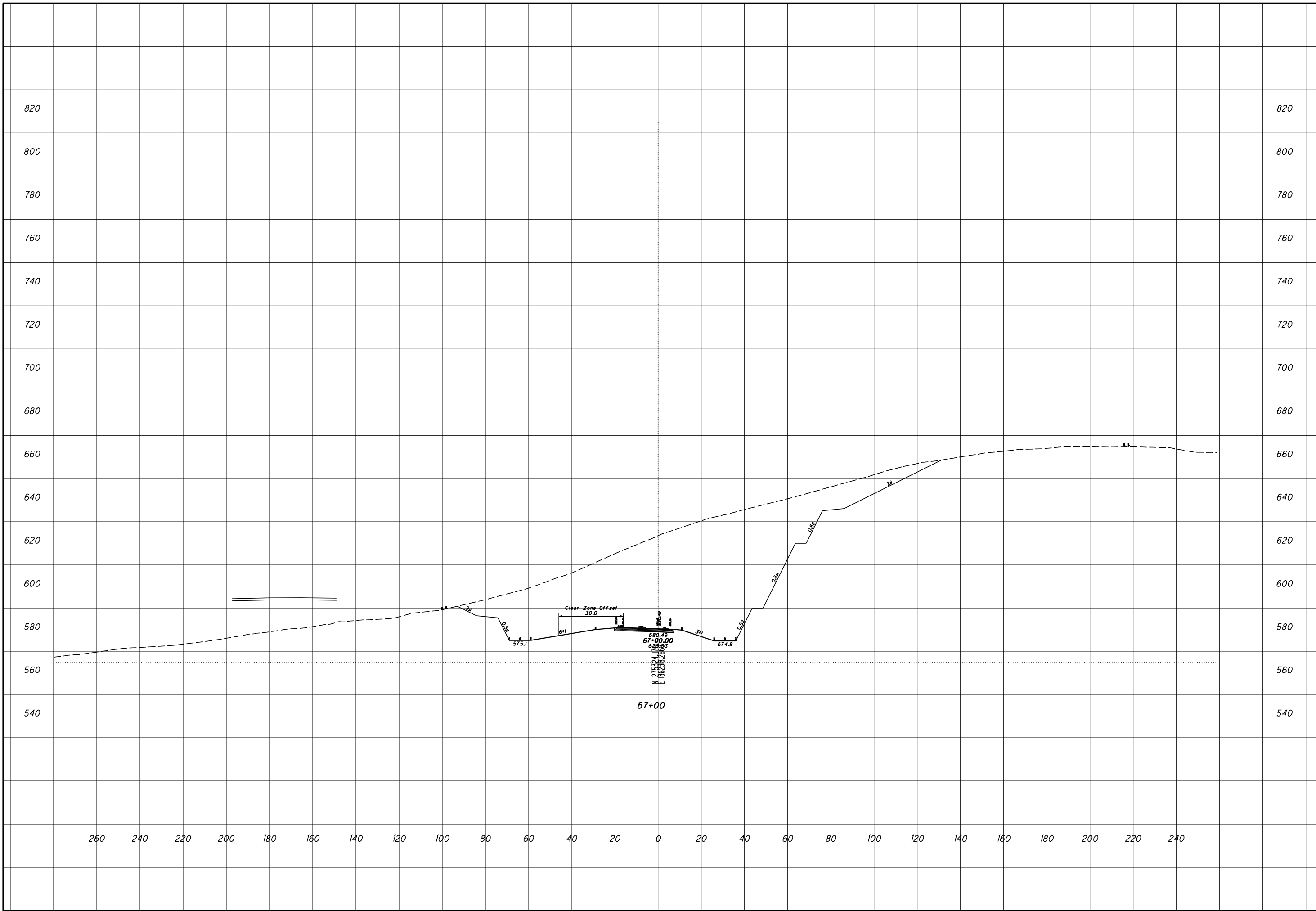
540

260 240 220 200 180 160 140 120 100 80 60 40 20 0 20 40 60 80 100 120 140 160 180 200 220 240



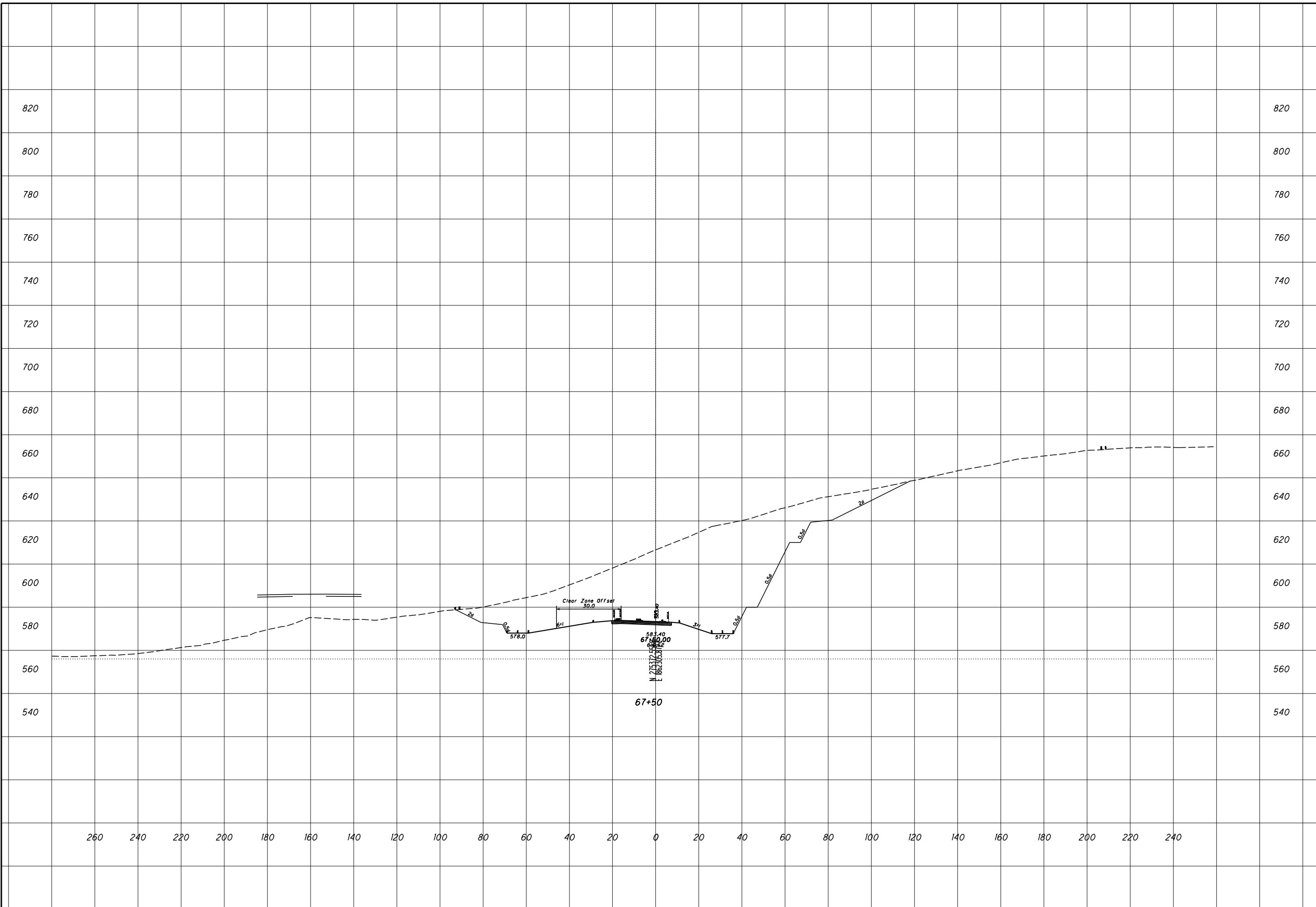
ROCK CUT SLOPE DESIGN - SR 140 RAMP A
STA 67+00

SCI-823-0.00



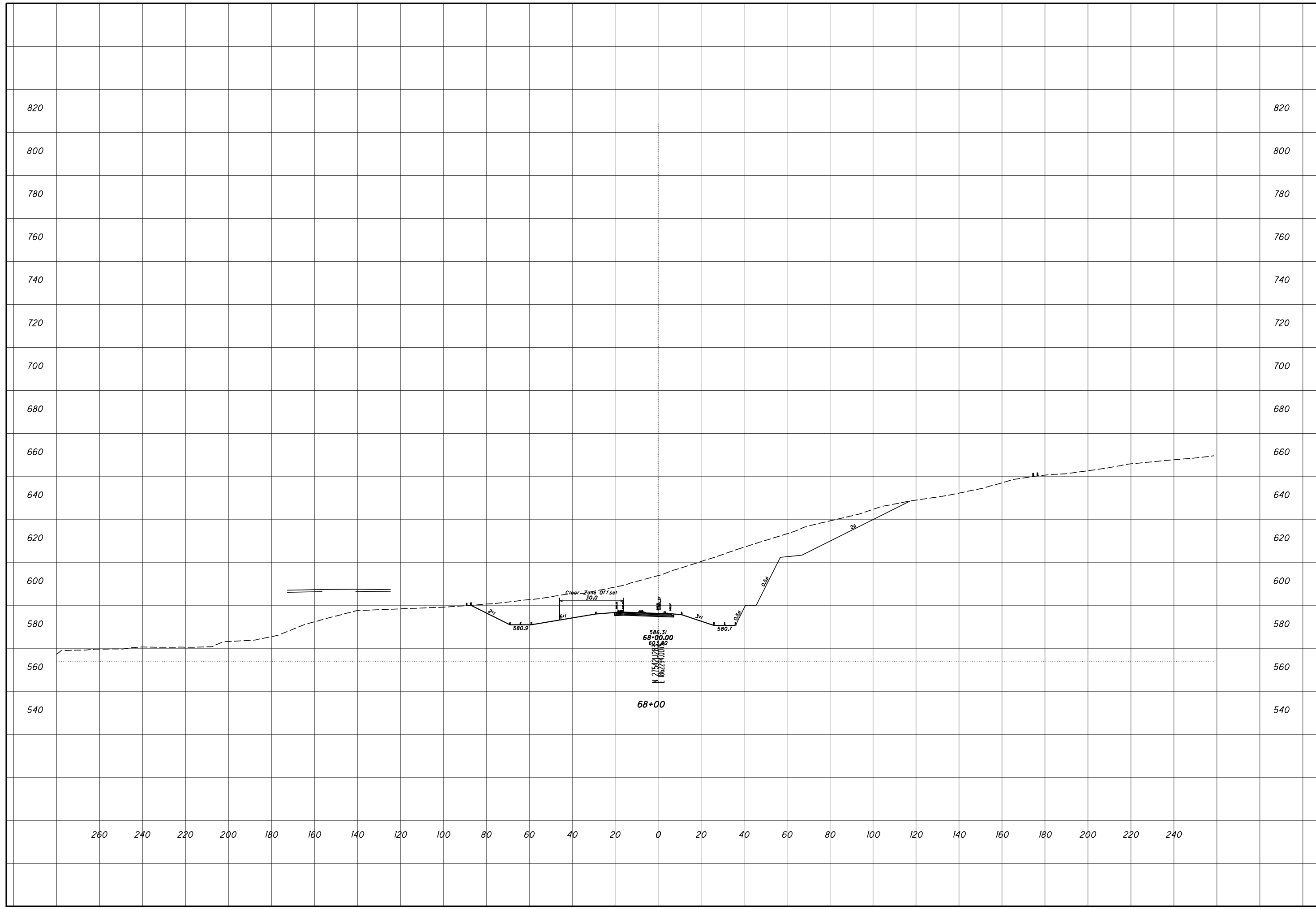
ROCK CUT SLOPE DESIGN - SR 140 RAMP A
STA 67+50

SCI-823-0.00



ROCK CUT SLOPE DESIGN - SR 140 RAMP A
STA 68+00

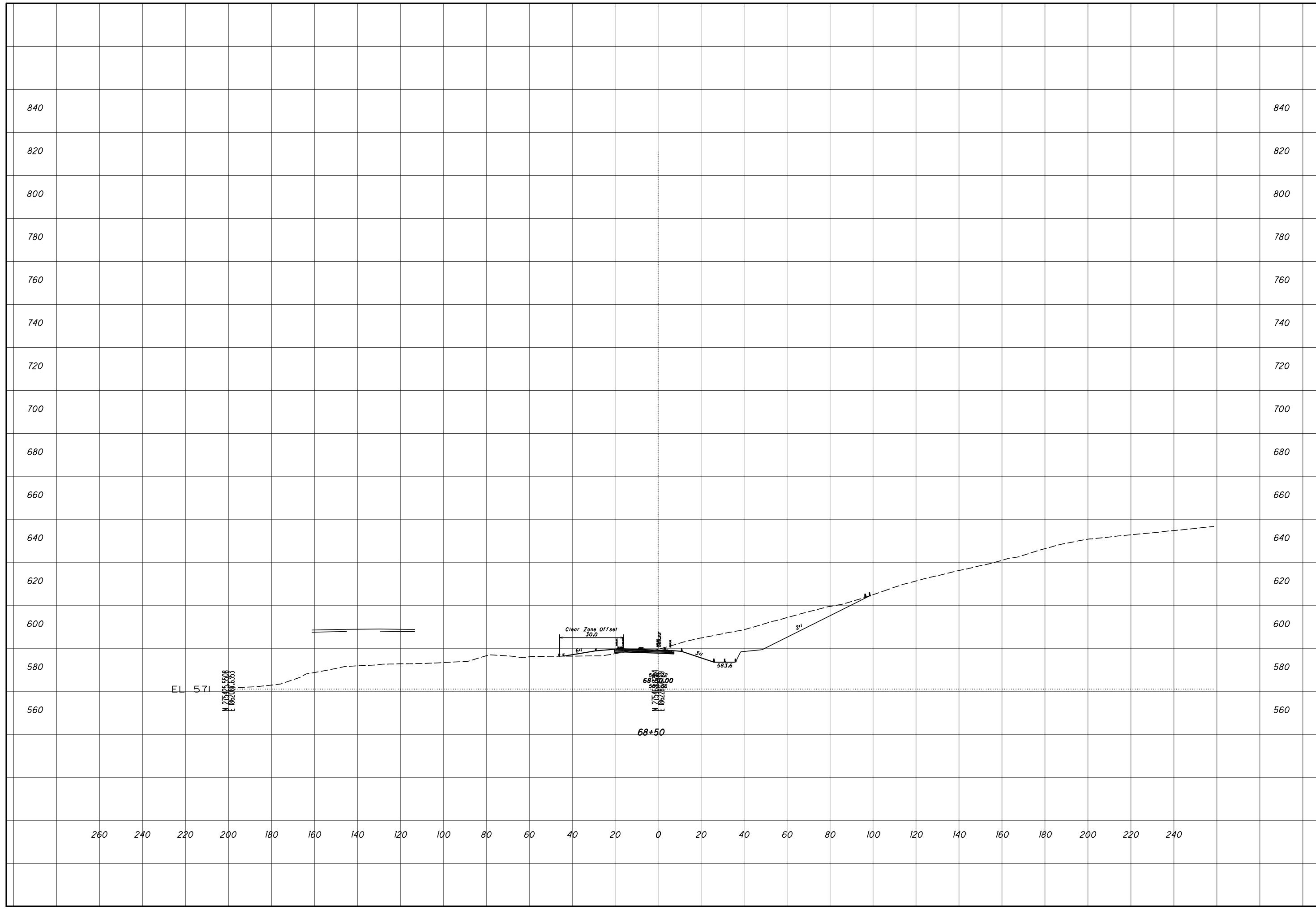
SCI-823-0.00



CHECKED

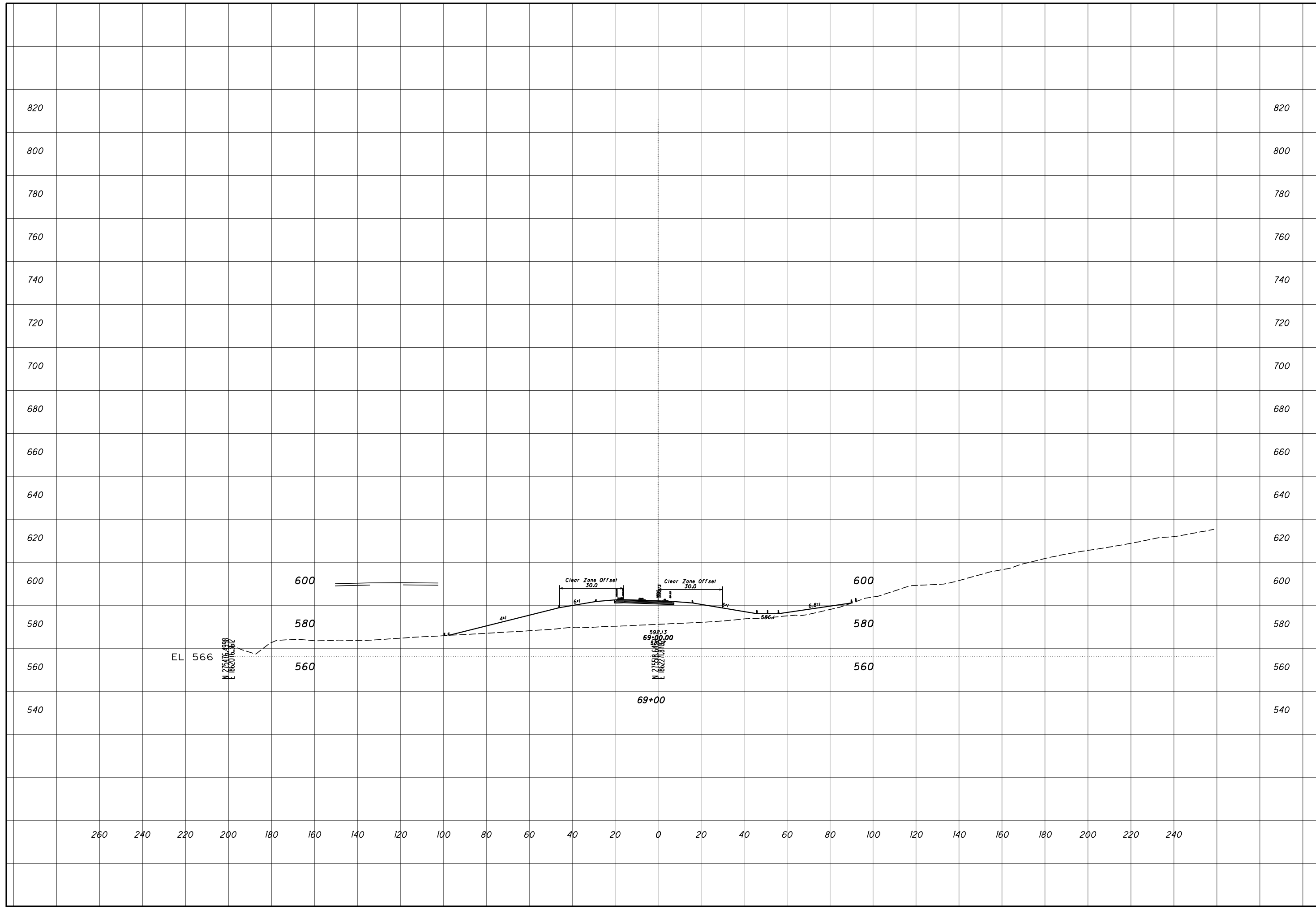
ROCK CUT SLOPE DESIGN - SR 140 RAMP A
STA 68+50

SCI-823-0.00



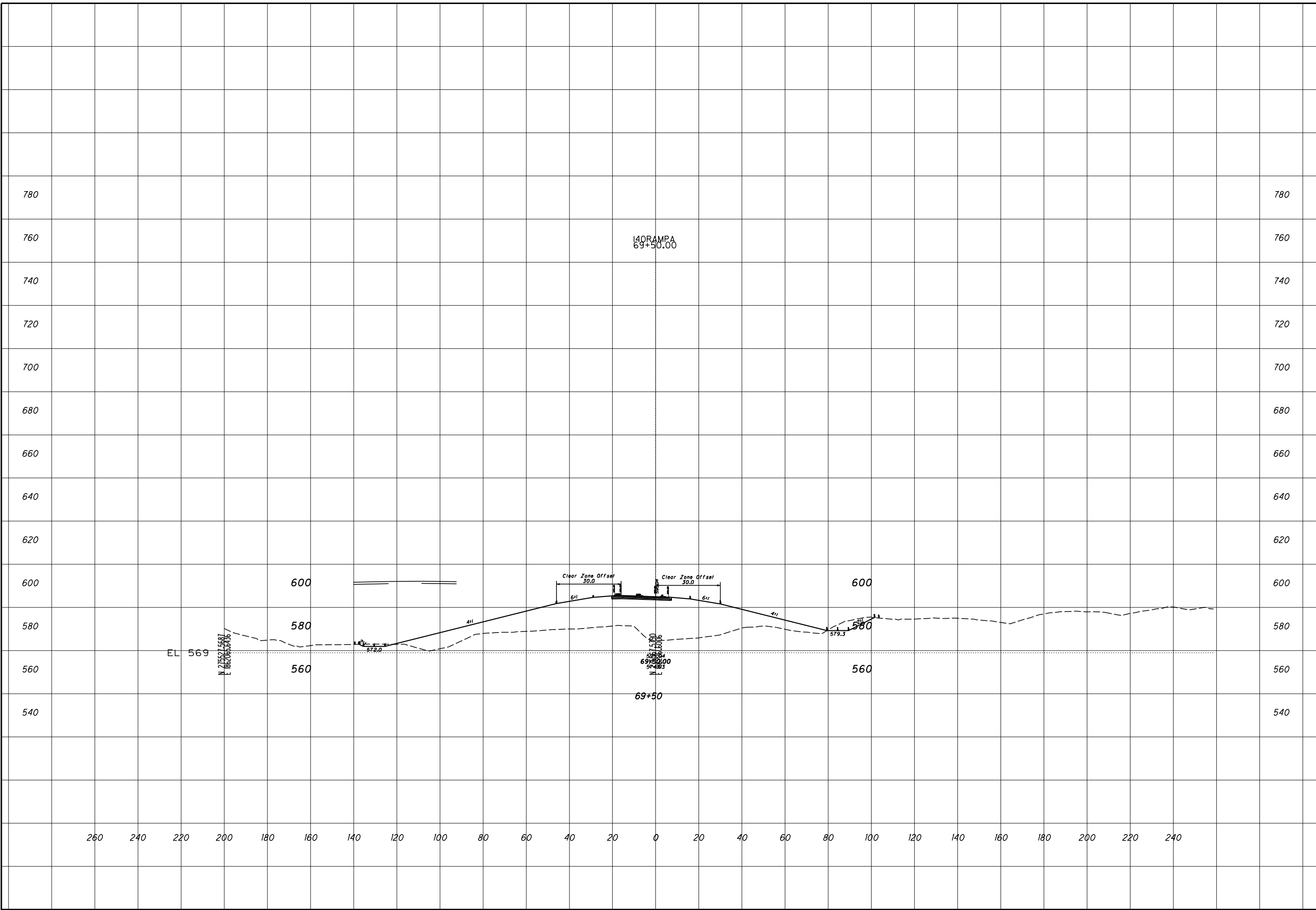
ROCK CUT SLOPE DESIGN - SR 140 RAMP A
STA 69+00

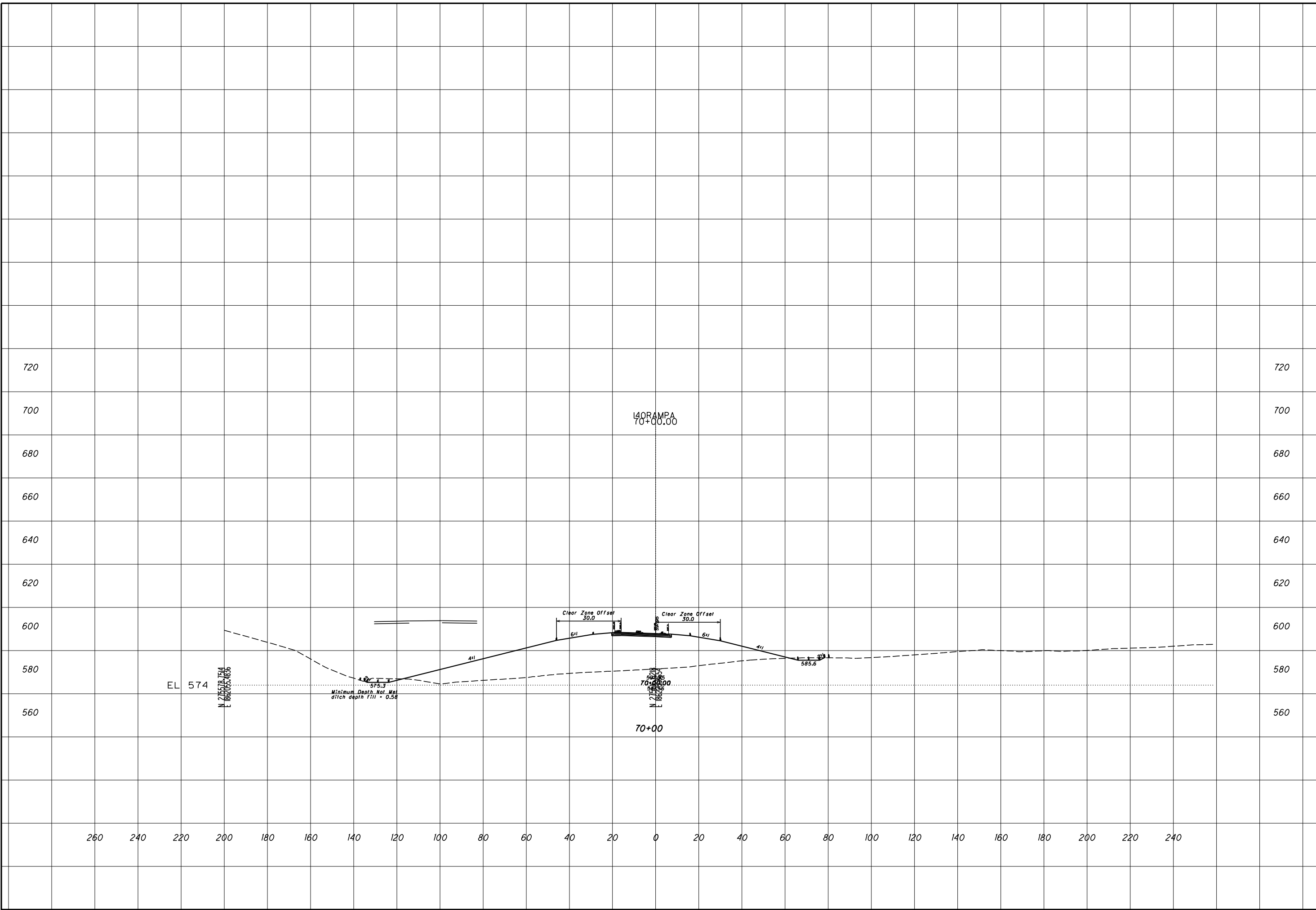
SCI-823-0.00



ROCK CUT SLOPE DESIGN - SR 140 RAMP A
STA 69+50

SCI-823-0.00

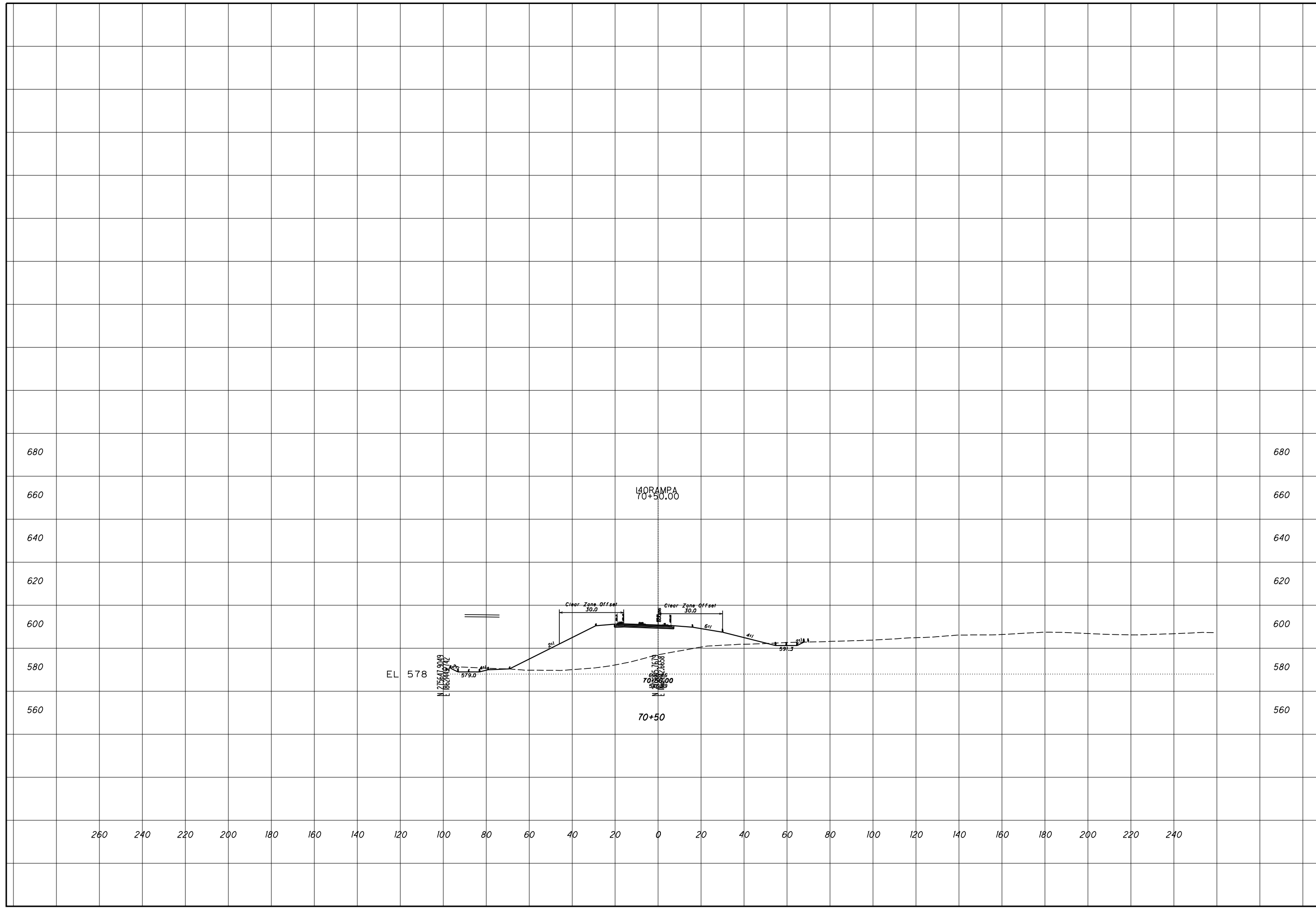




CHECKED

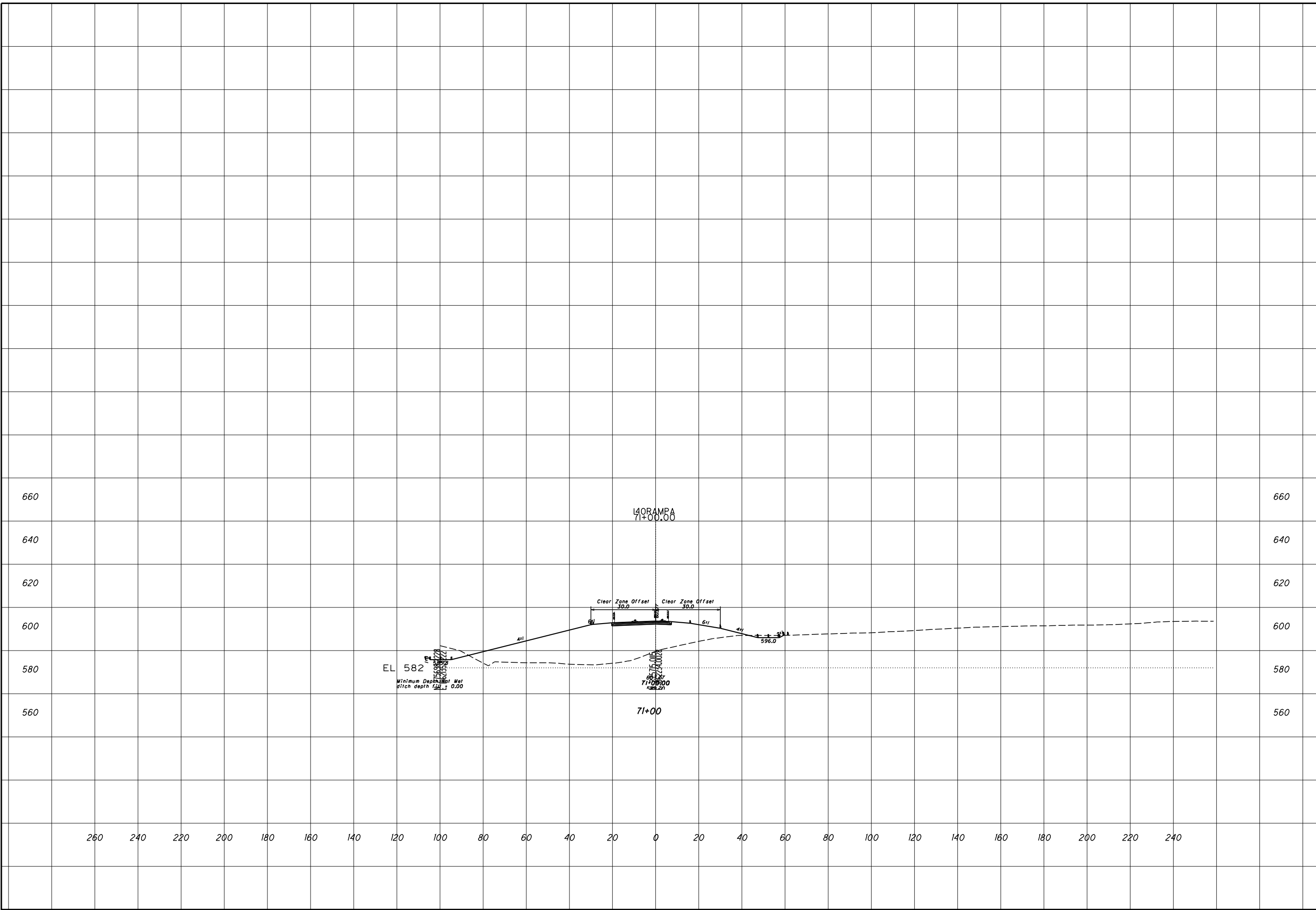
ROCK CUT SLOPE DESIGN - SR 140 RAMP A
STA 70+50

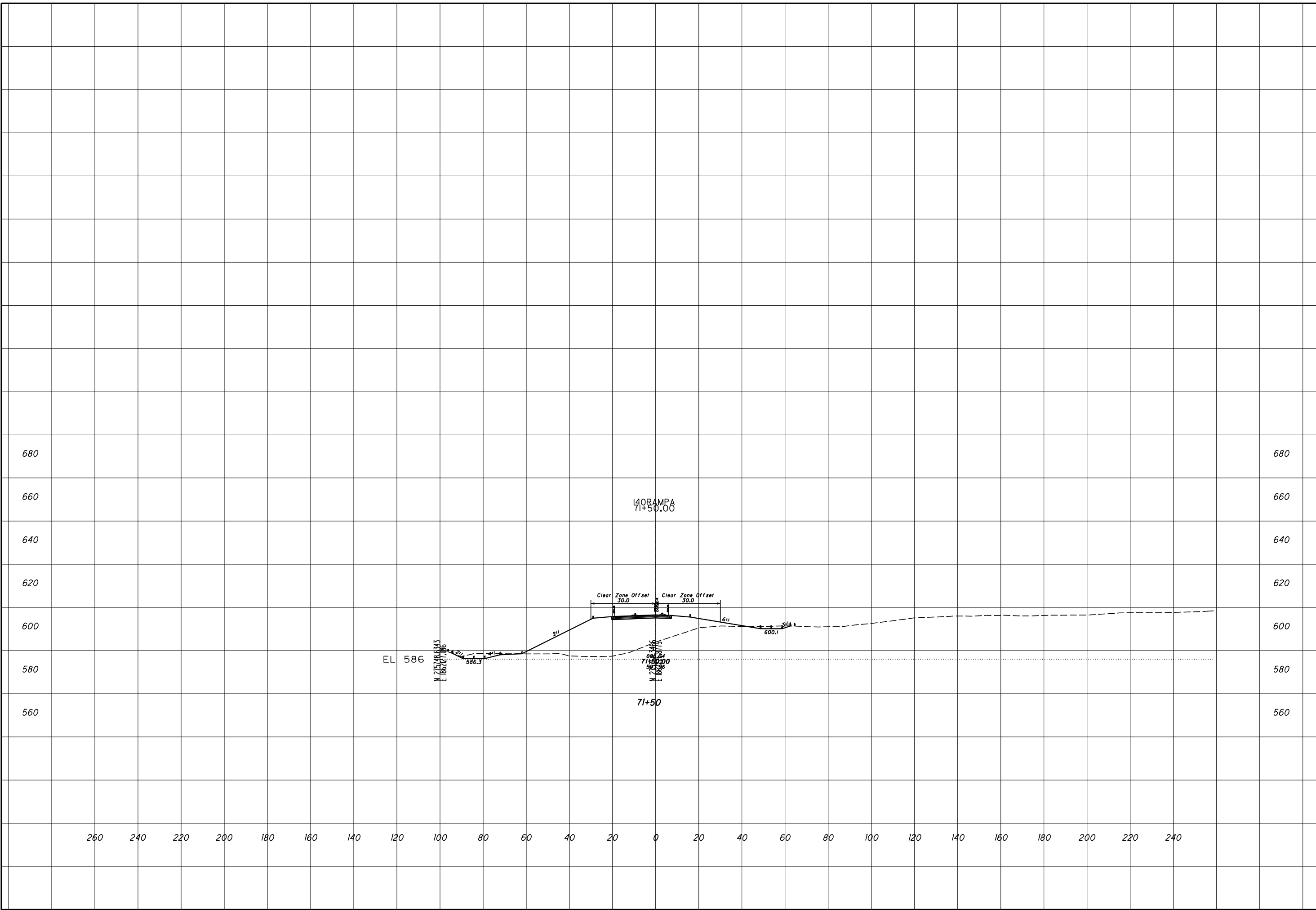
SCI-823-0.00



ROCK CUT SLOPE DESIGN - SR 140 RAMP A
STA 71+00

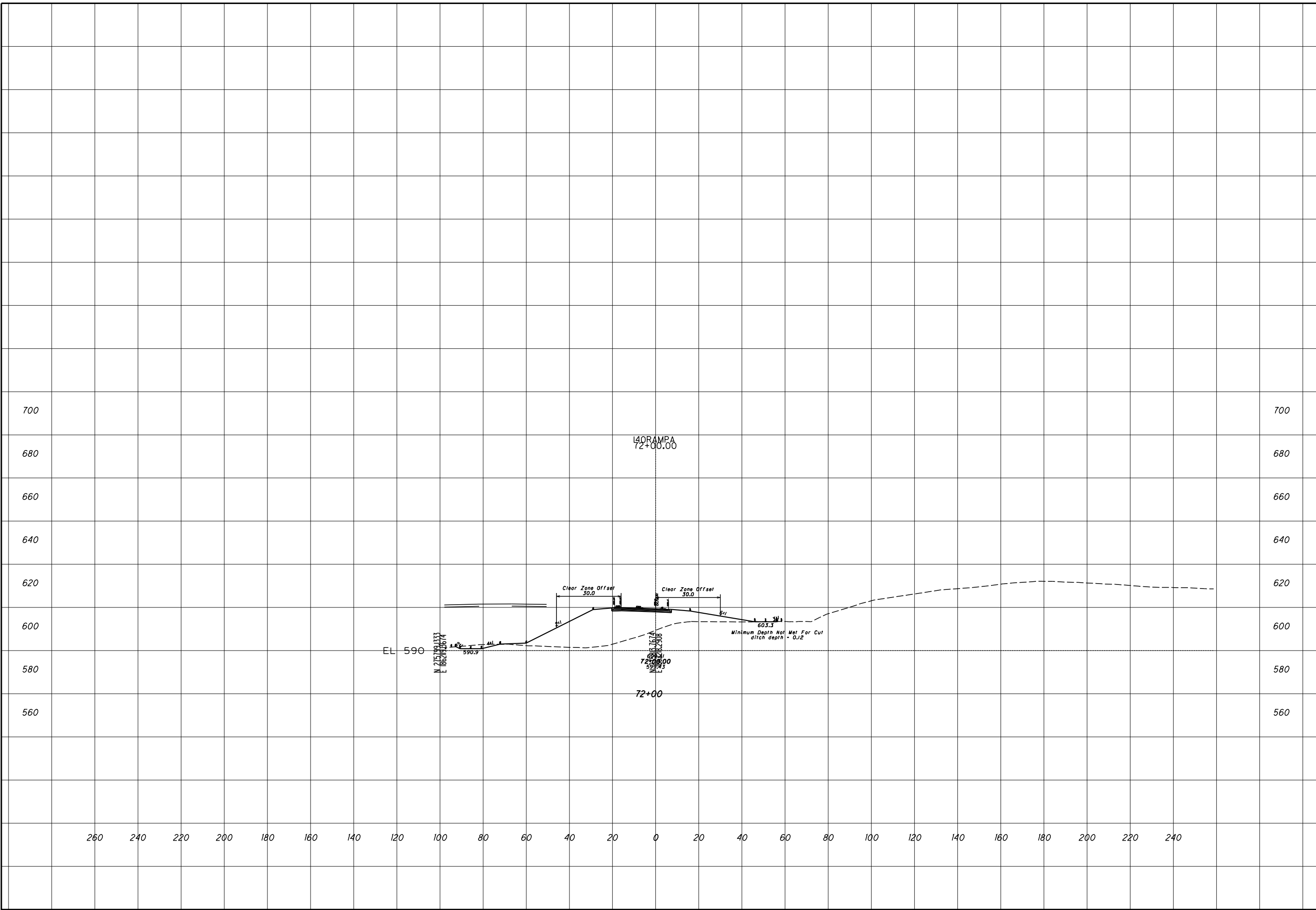
SCI-823-0.00





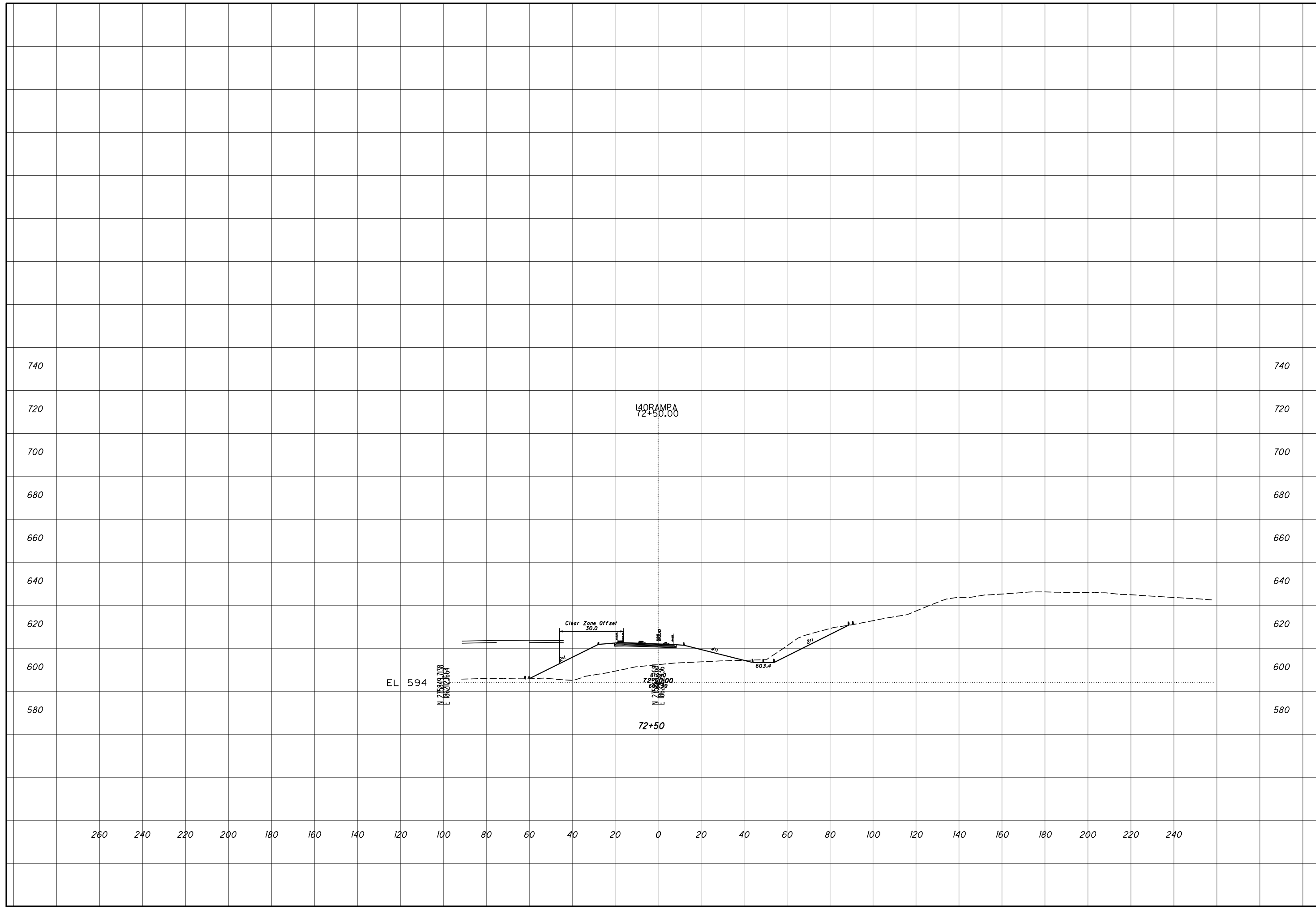
ROCK CUT SLOPE DESIGN - SR 140 RAMP A
STA 72+00

SCI-823-0.00



ROCK CUT SLOPE DESIGN - SR 140 RAMP A
STA 72+50

SCI-823-0.00



740

740

720

720

700

700

680

680

660

660

640

640

620

620

600

600

580

580

260

240

220

200

180

160

140

120

100

80

60

40

20

0

20

40

60

80

100

120

140

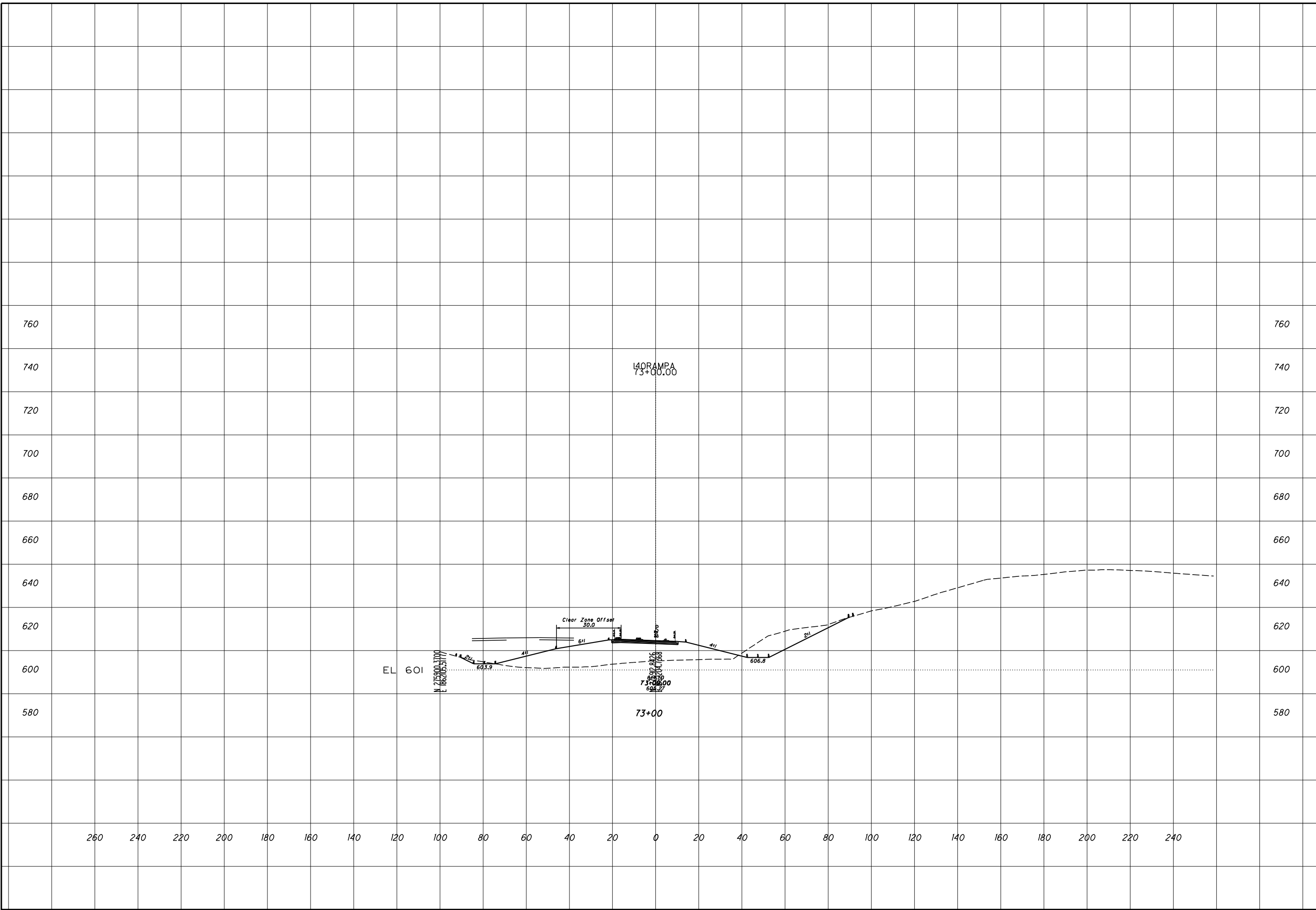
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180

200

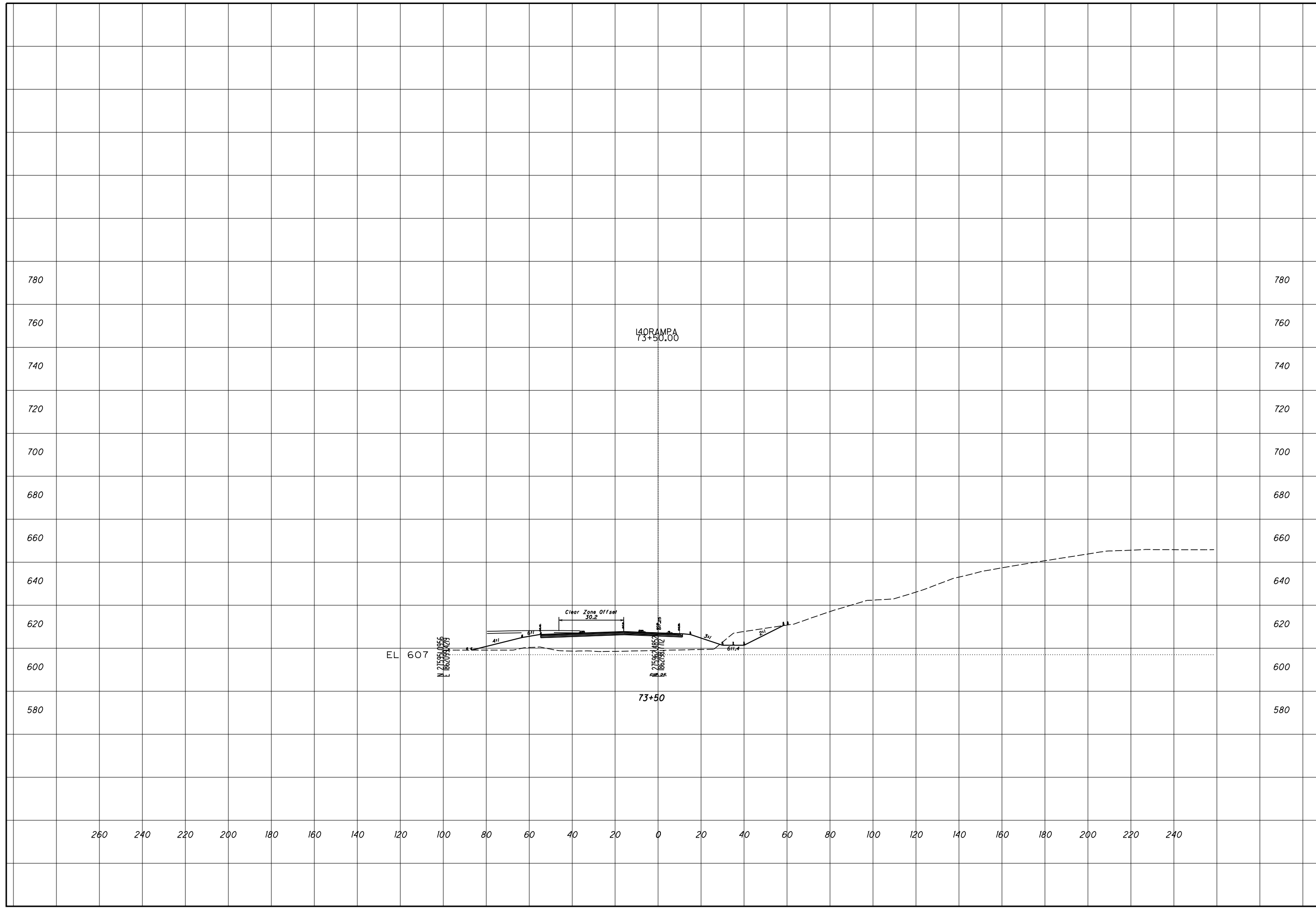
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240



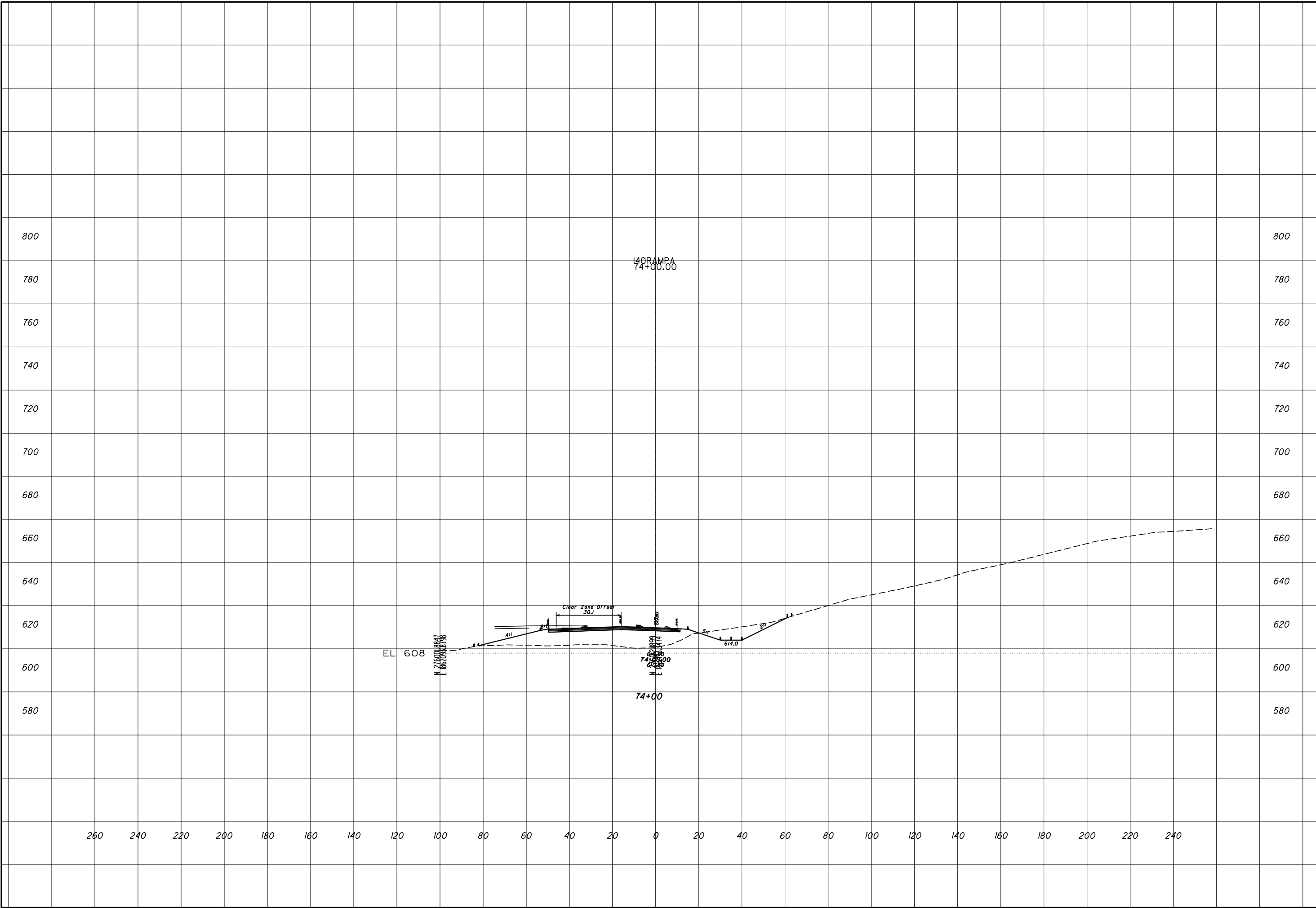
ROCK CUT SLOPE DESIGN - SR 140 RAMP A
STA 73+50

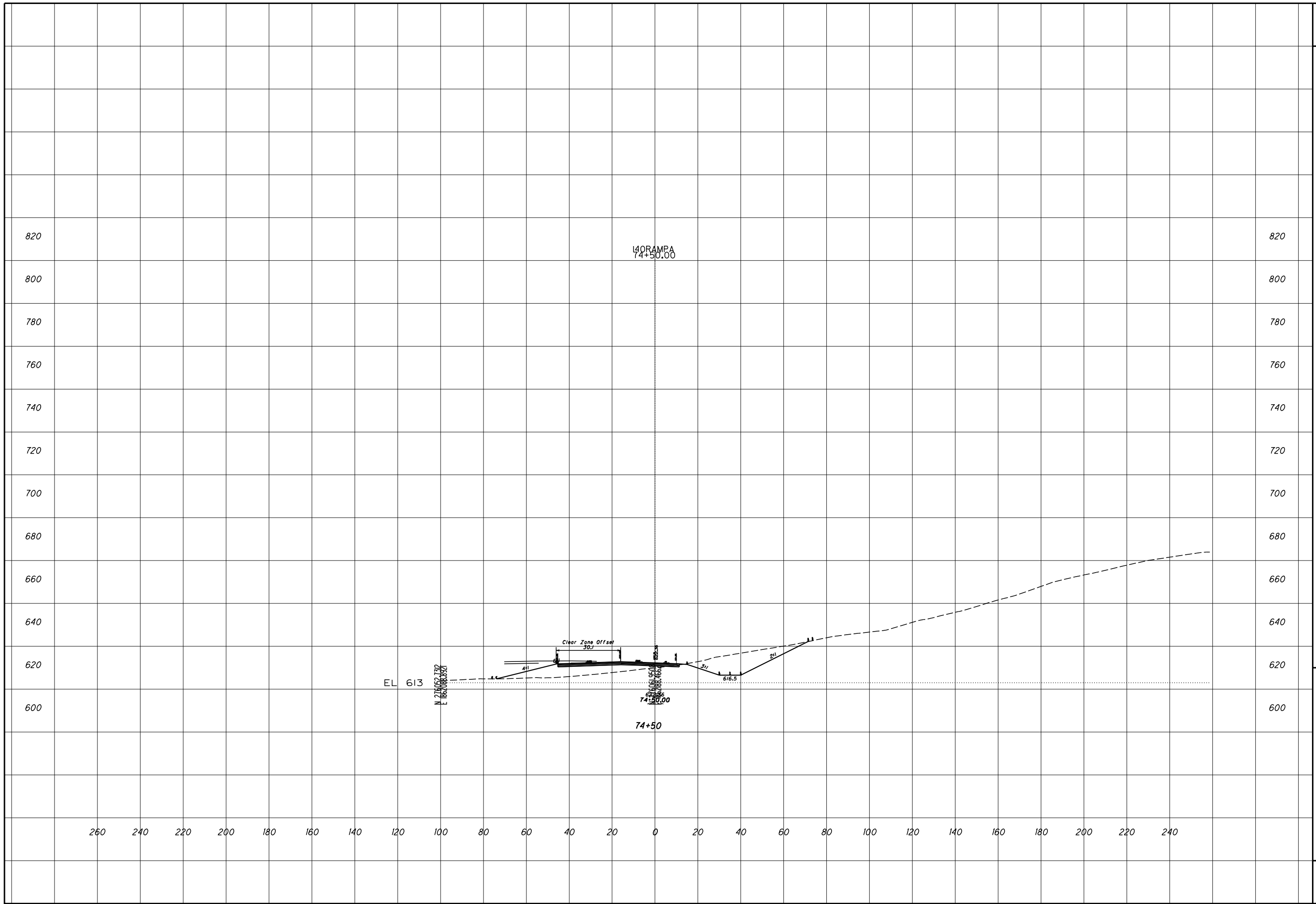
SCI-823-0.00



**ROCK CUT SLOPE DESIGN - SR 140 RAMP A
STA 74+00**

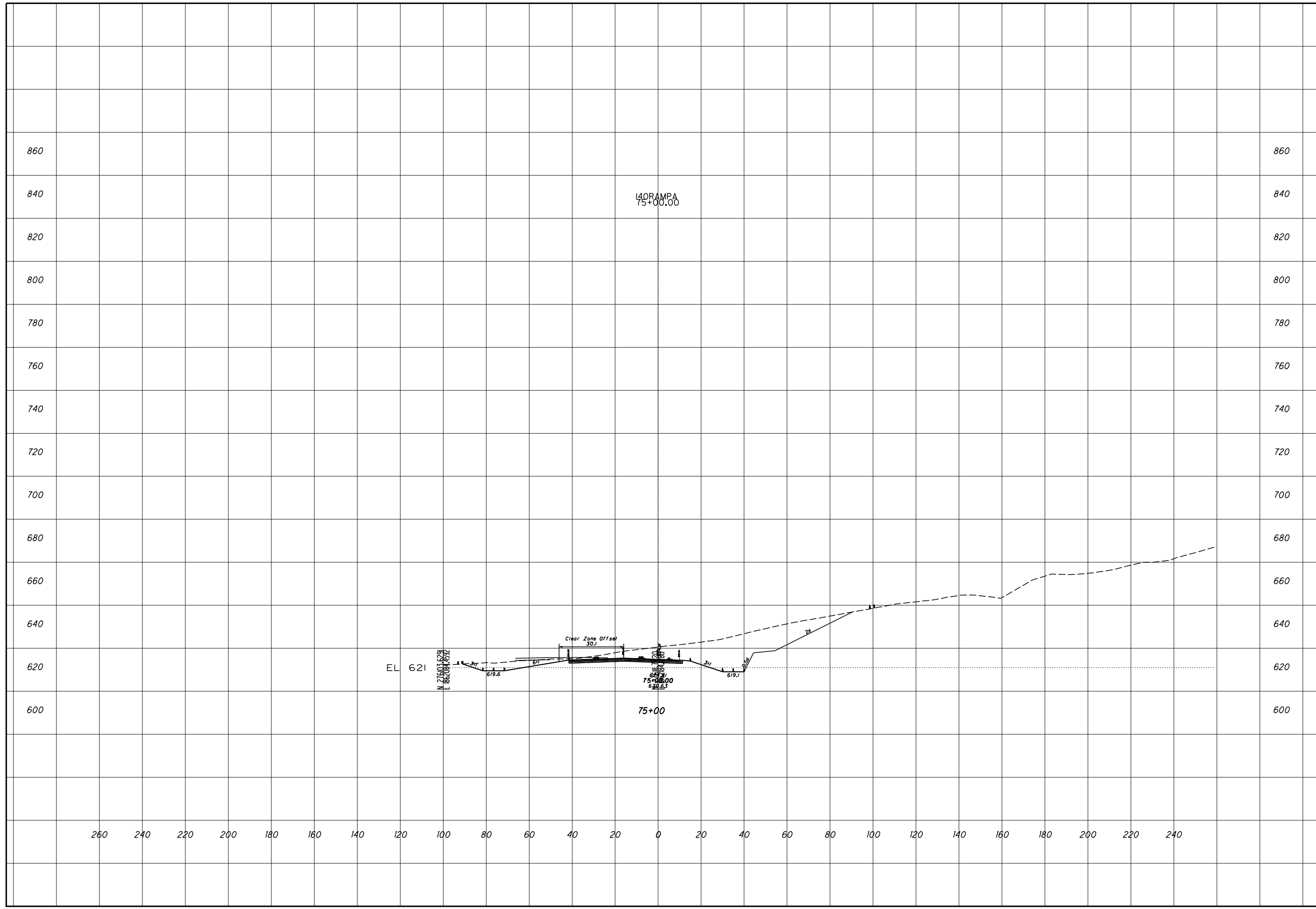
SCI-823-0.00





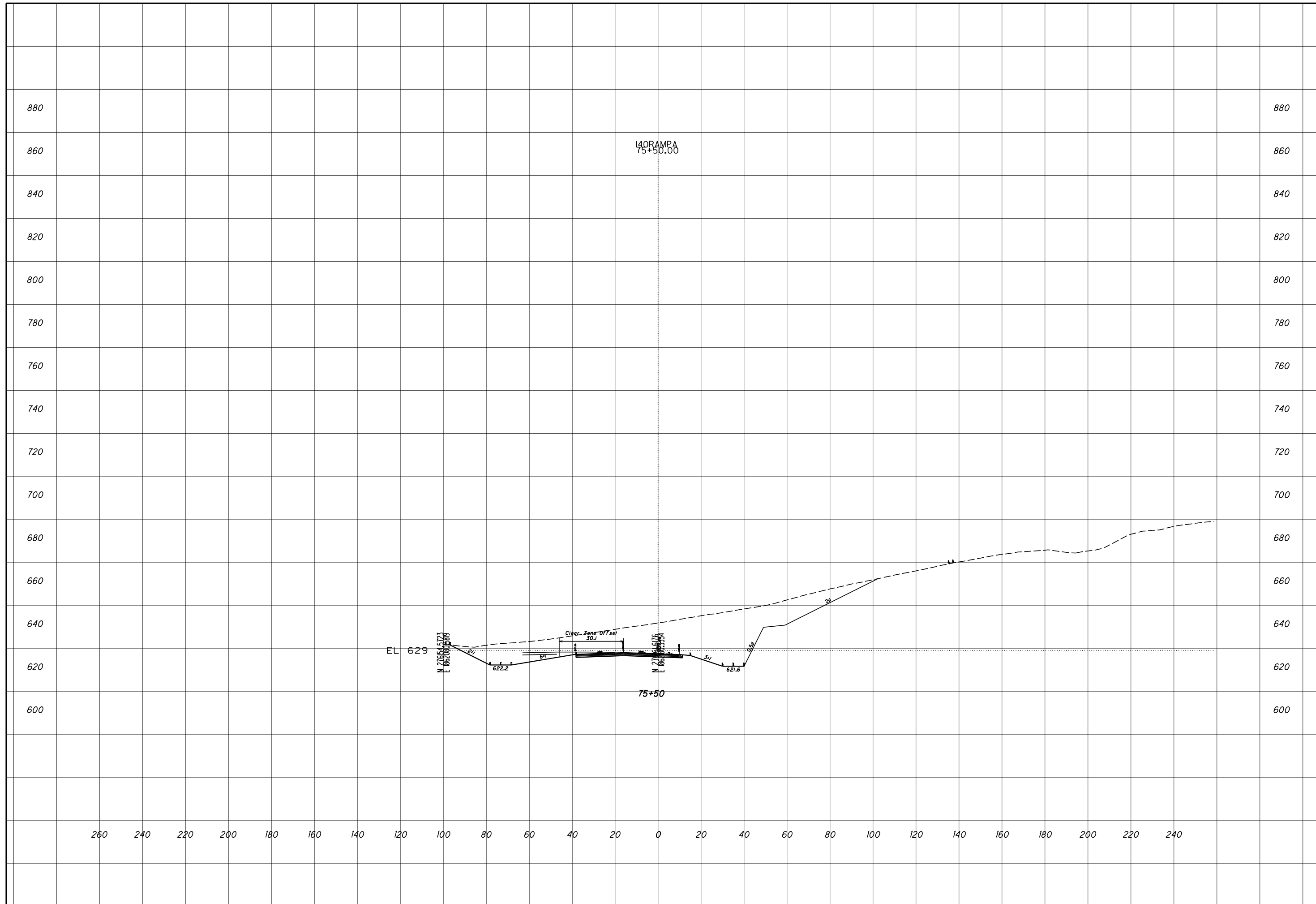
ROCK CUT SLOPE DESIGN - SR 140 RAMP A
STA 75+00

SCI-823-0.00



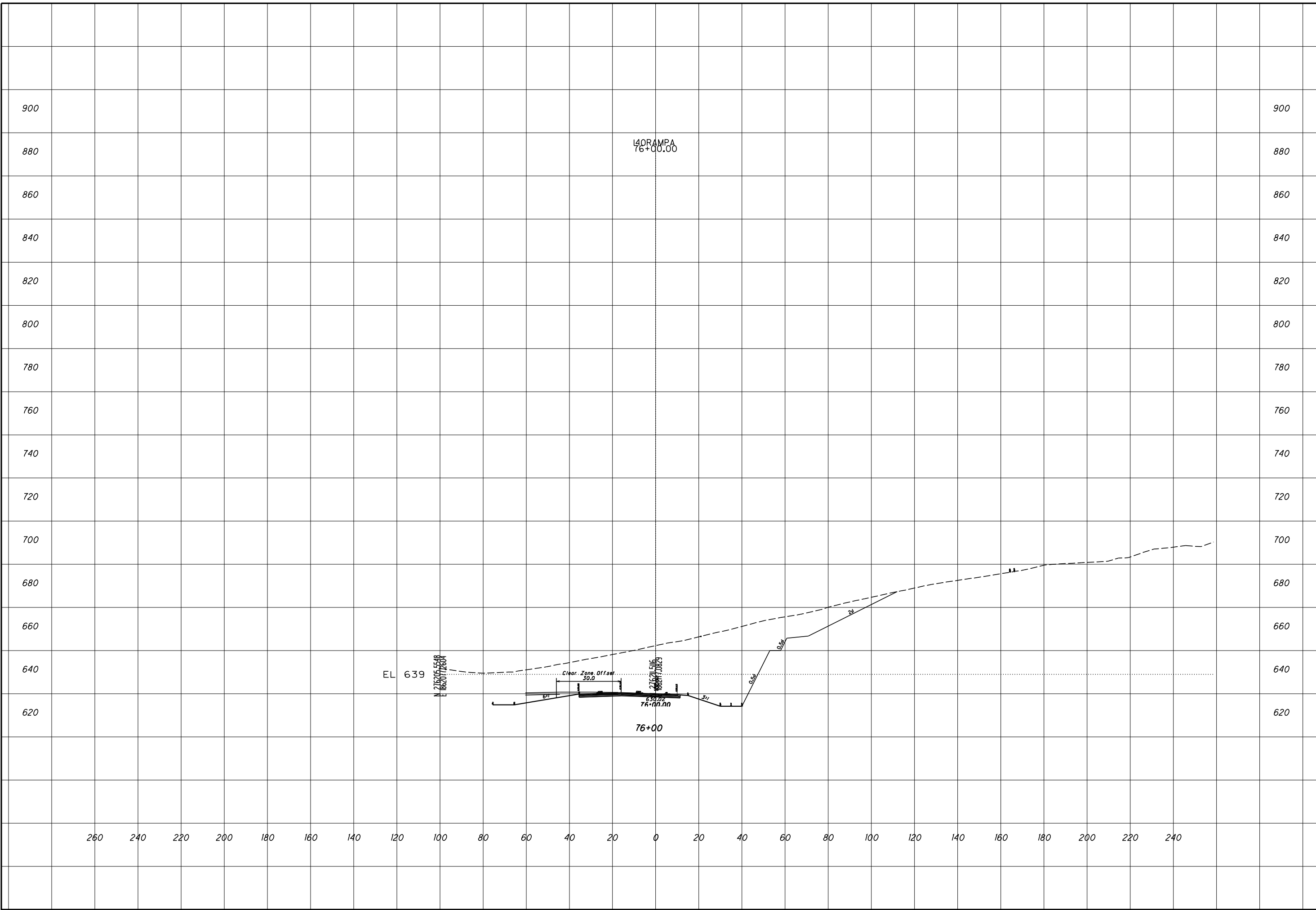
ROCK CUT SLOPE DESIGN - SR 140 RAMP A
STA 75+50

SCI-823-0.00



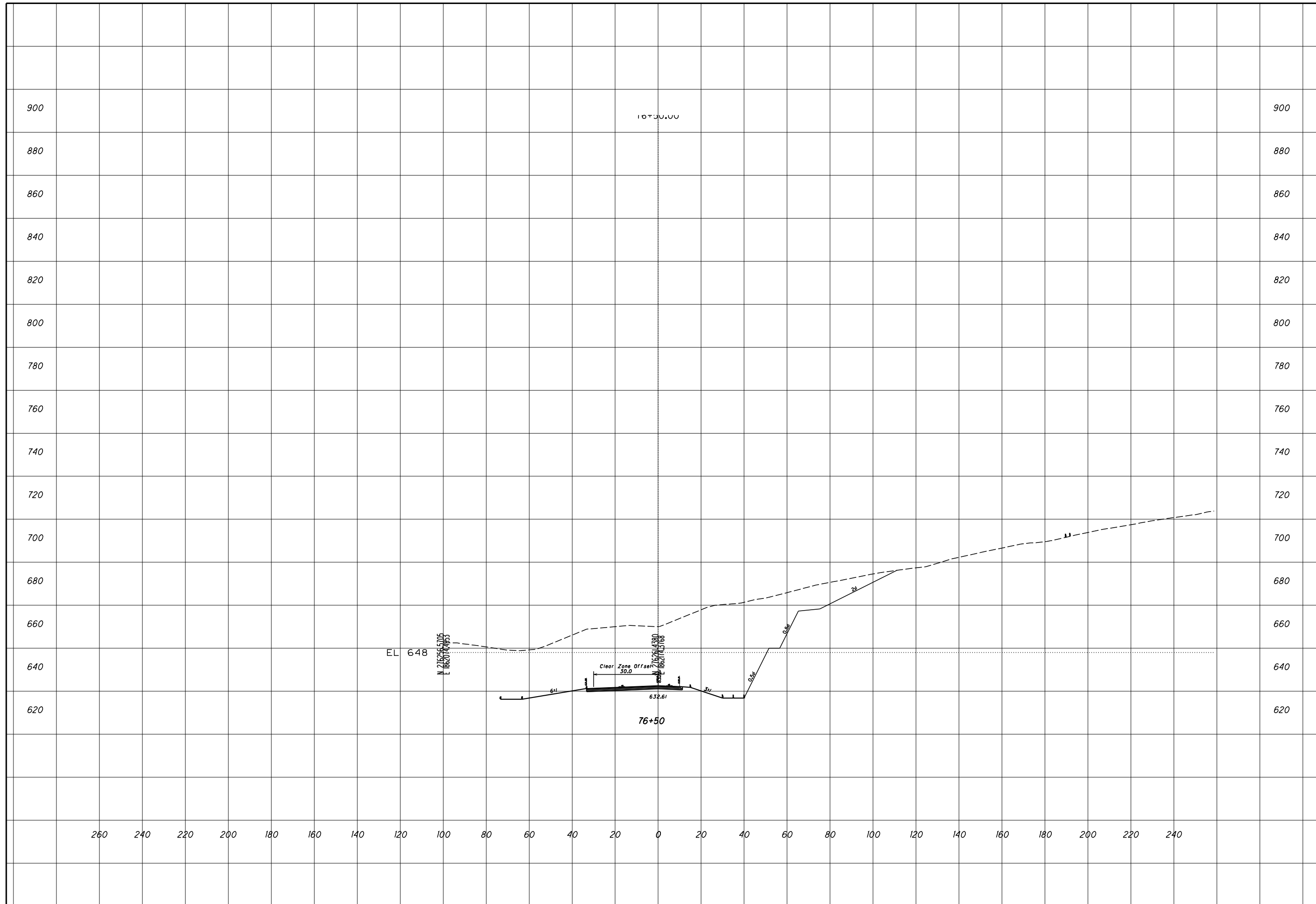
ROCK CUT SLOPE DESIGN - SR 140 RAMP A
STA 76+00

SCI-823-0.00



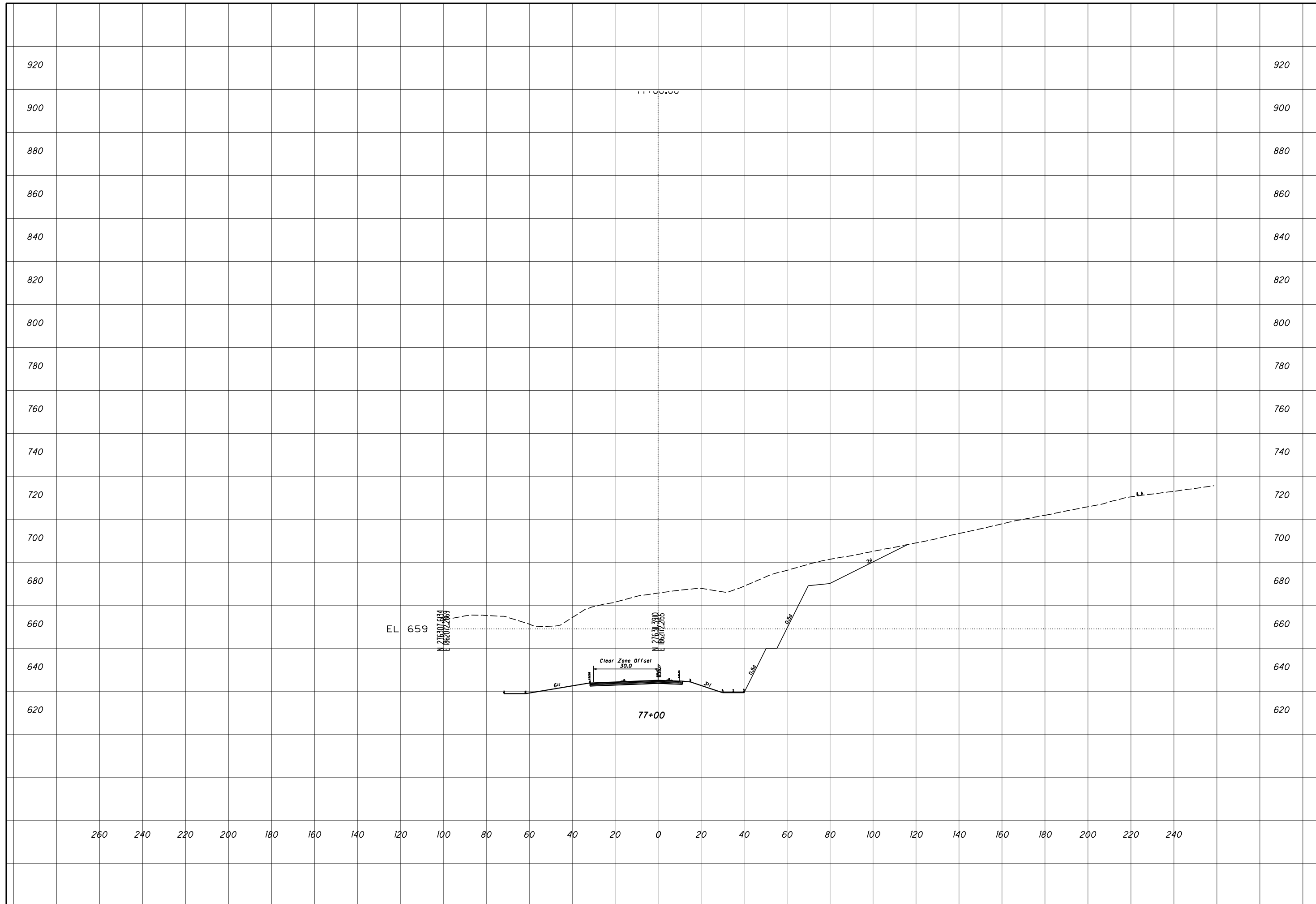
ROCK CUT SLOPE DESIGN - SR 140 RAMP A
STA 76+50

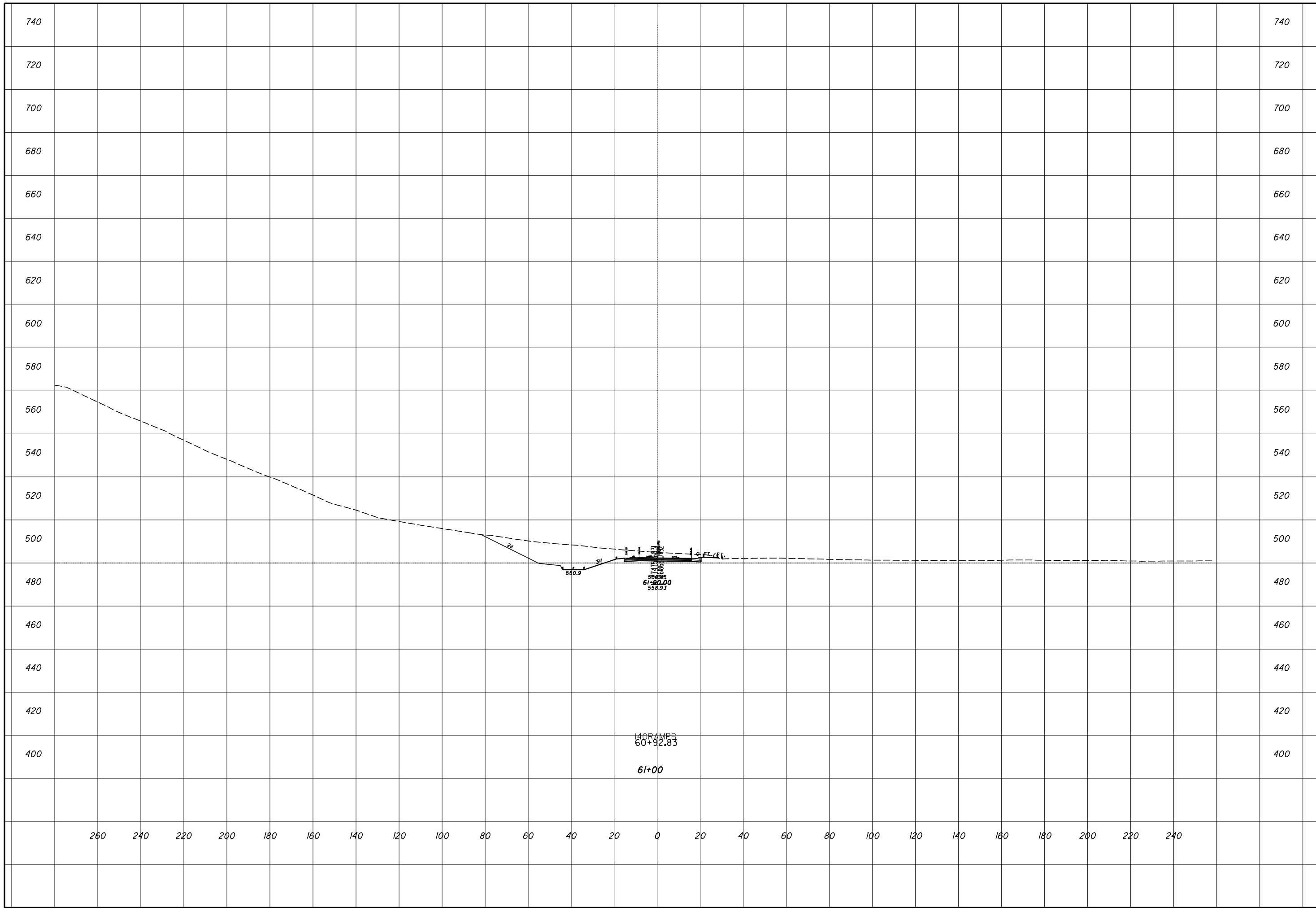
SCI-823-0.00



ROCK CUT SLOPE DESIGN - SR 140 RAMP A
STA 77+00

SCI-823-0.00



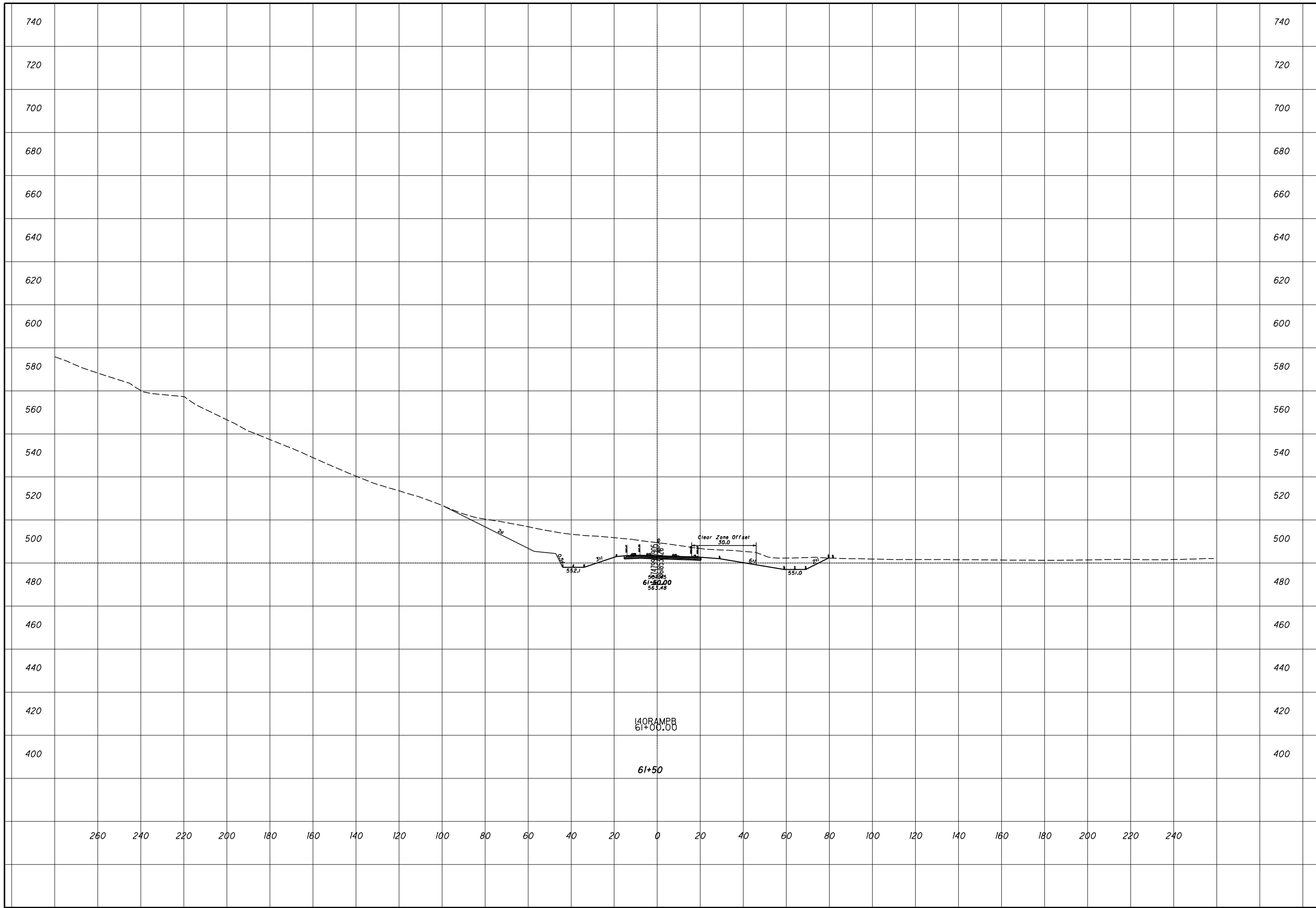


ROCK CUT SLOPE DESIGN - SR 140 RAMP B
STA 61+00

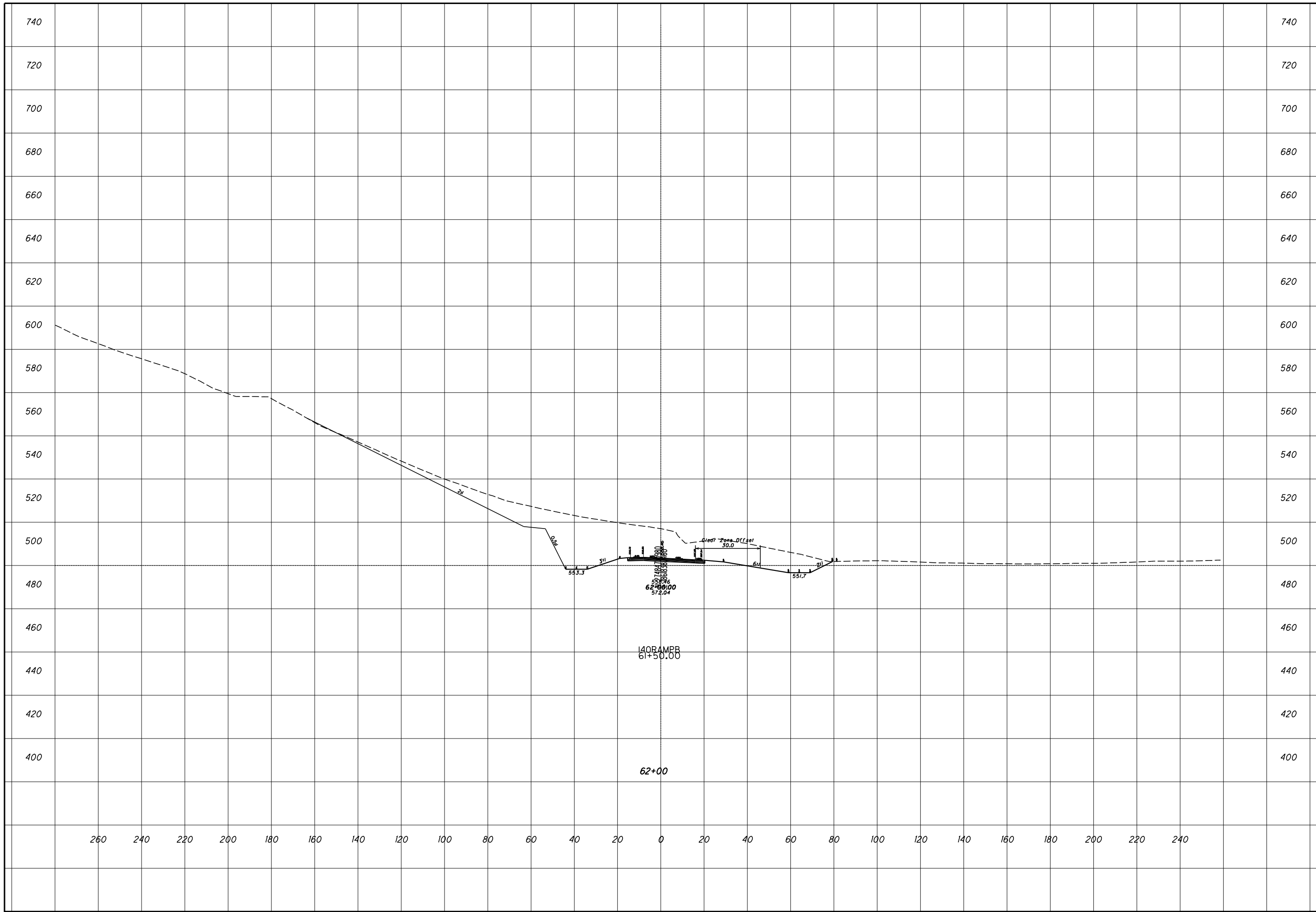
SCI-823-0.00

1
34

CHECKED



CHECKED
ROCK CUT SLOPE DESIGN - SR 140 RAMP B
STA 61+50
SCI-823-0.00
 2
 34

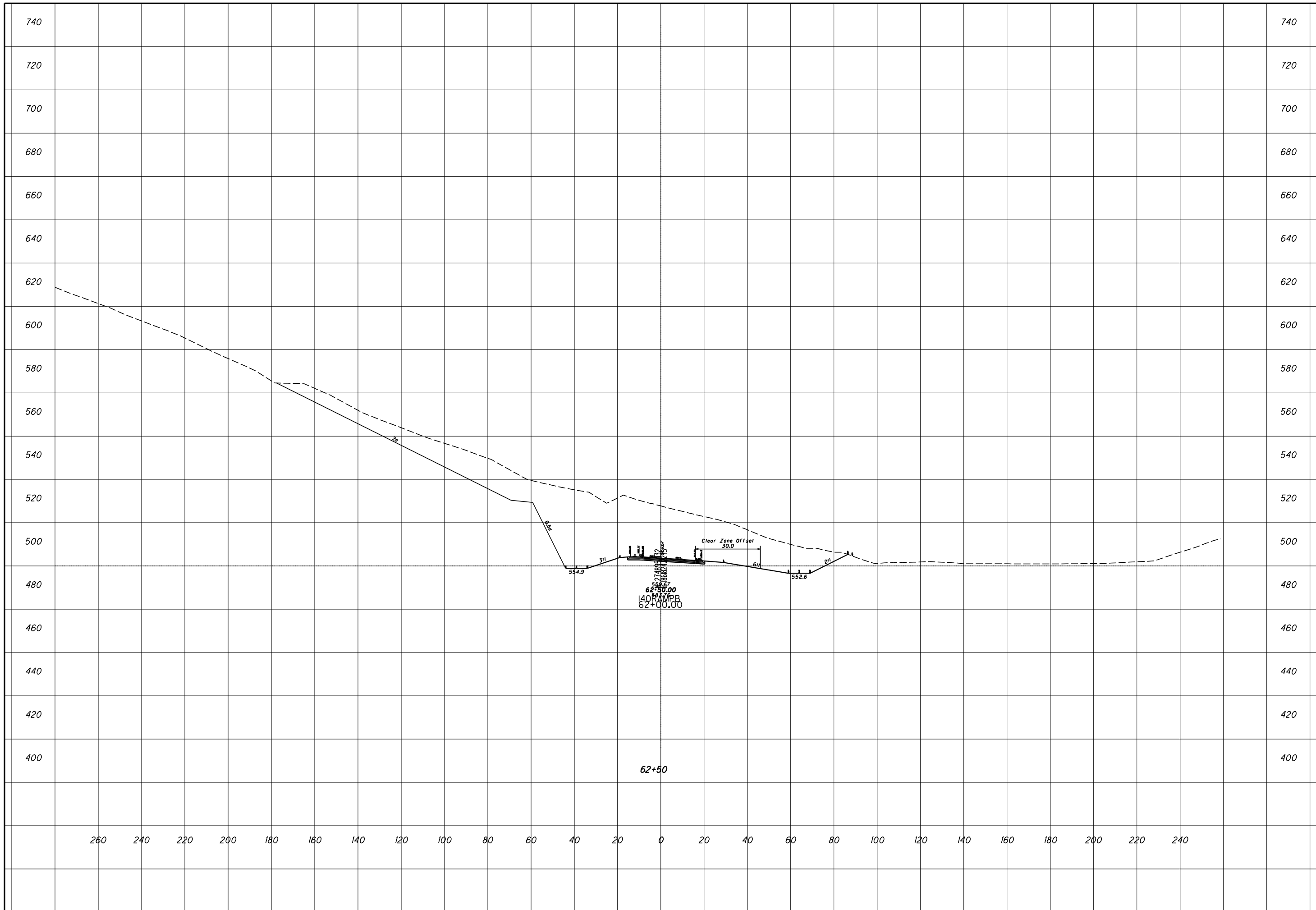


ROCK CUT SLOPE DESIGN - SR 140 RAMP B
STA 62+00

SCI-823-0.00

3
 34

CHECKED

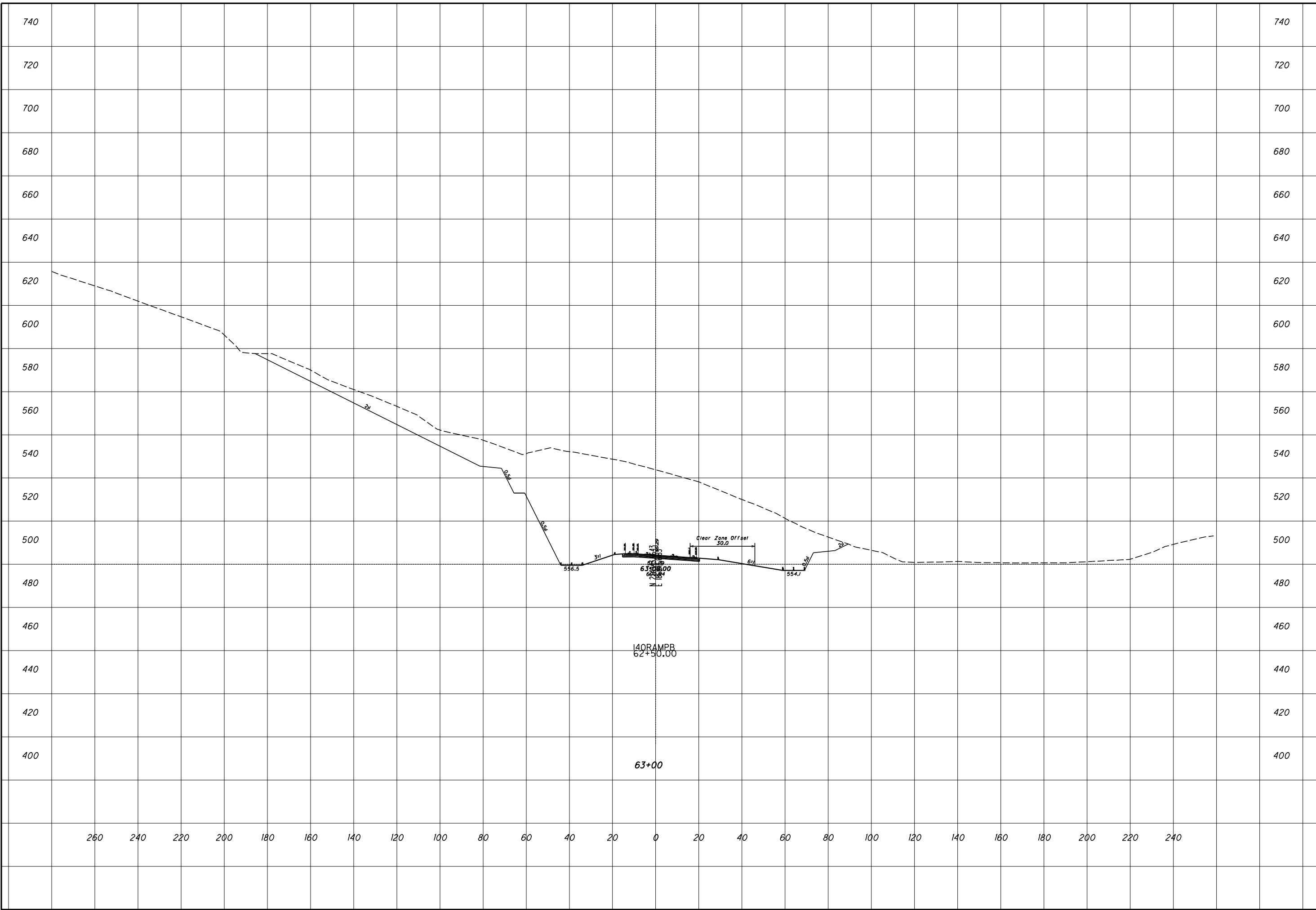


CHECKED

**ROCK CUT SLOPE DESIGN - SR 140 RAMP B
STA 62+50**

SCI-823-0.00

4
34



ROCK CUT SLOPE DESIGN - SR 140 RAMP B
STA 63+00

SCI-823-0.00

5
34

CHECKED

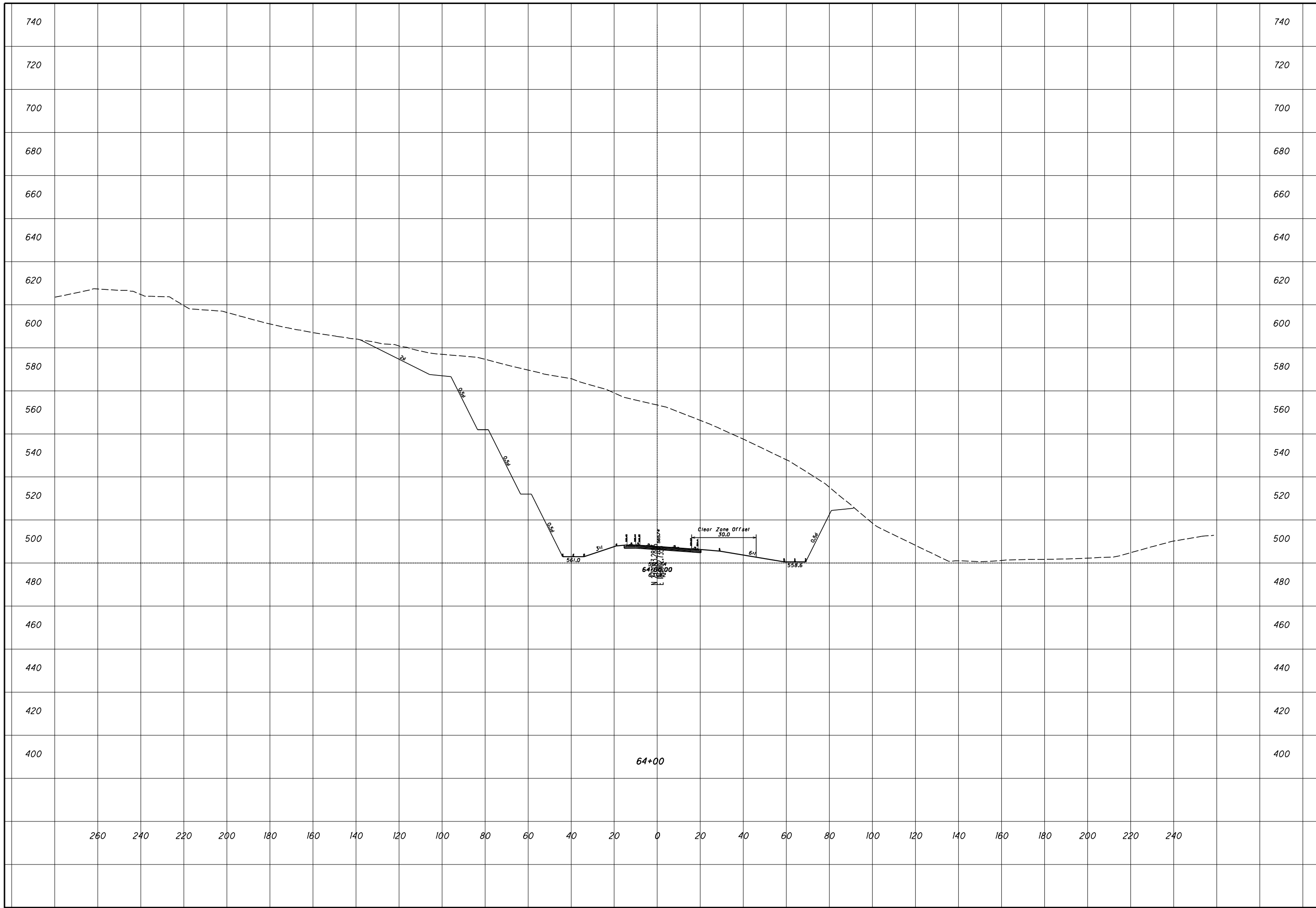


ROCK CUT SLOPE DESIGN - SR 140 RAMP B
STA 63+50

SCI-823-0.00

6
34

CHECKED

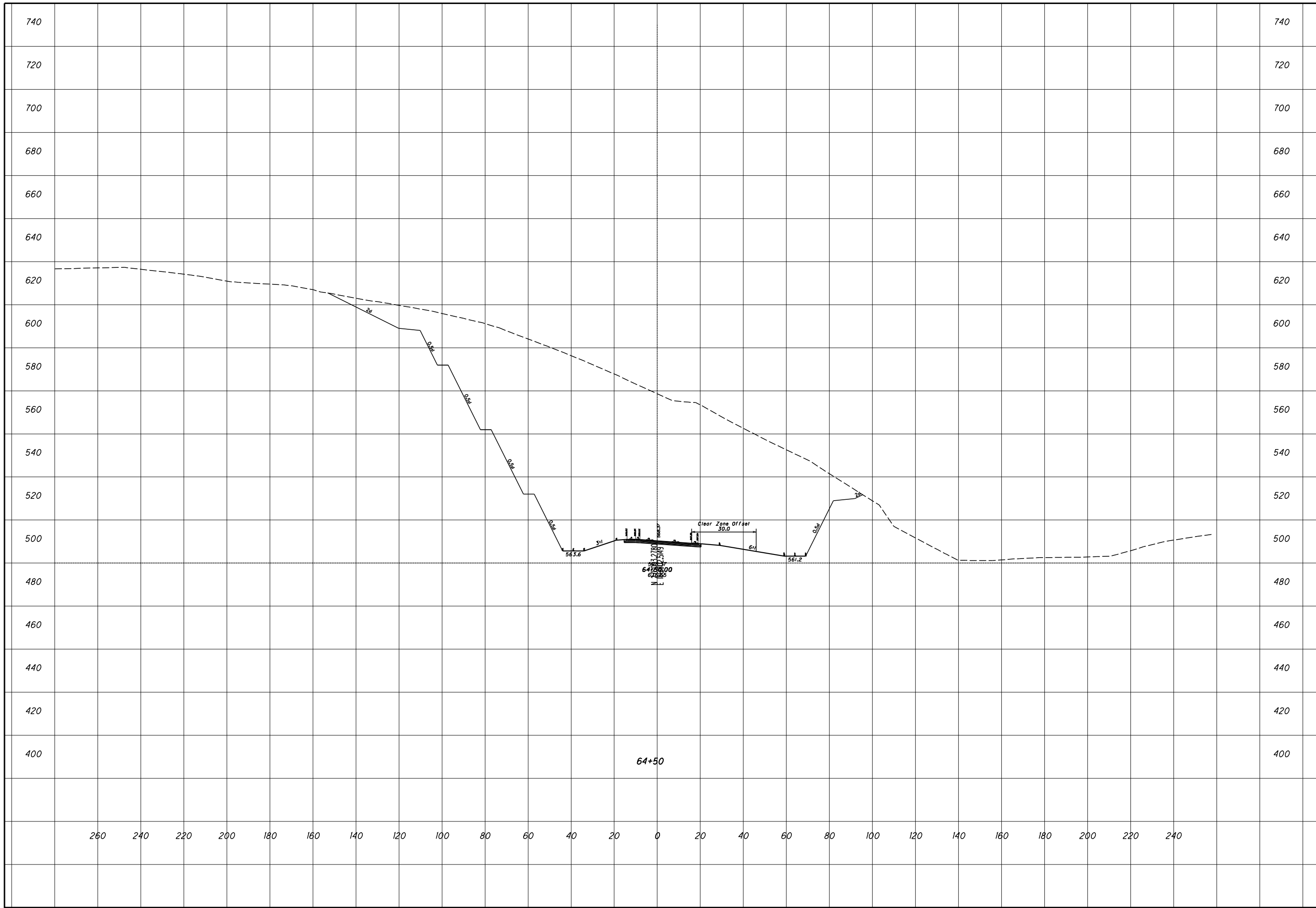


ROCK CUT SLOPE DESIGN - SR 140 RAMP B
STA 64+00

SCI-823-0.00

7
34

CHECKED

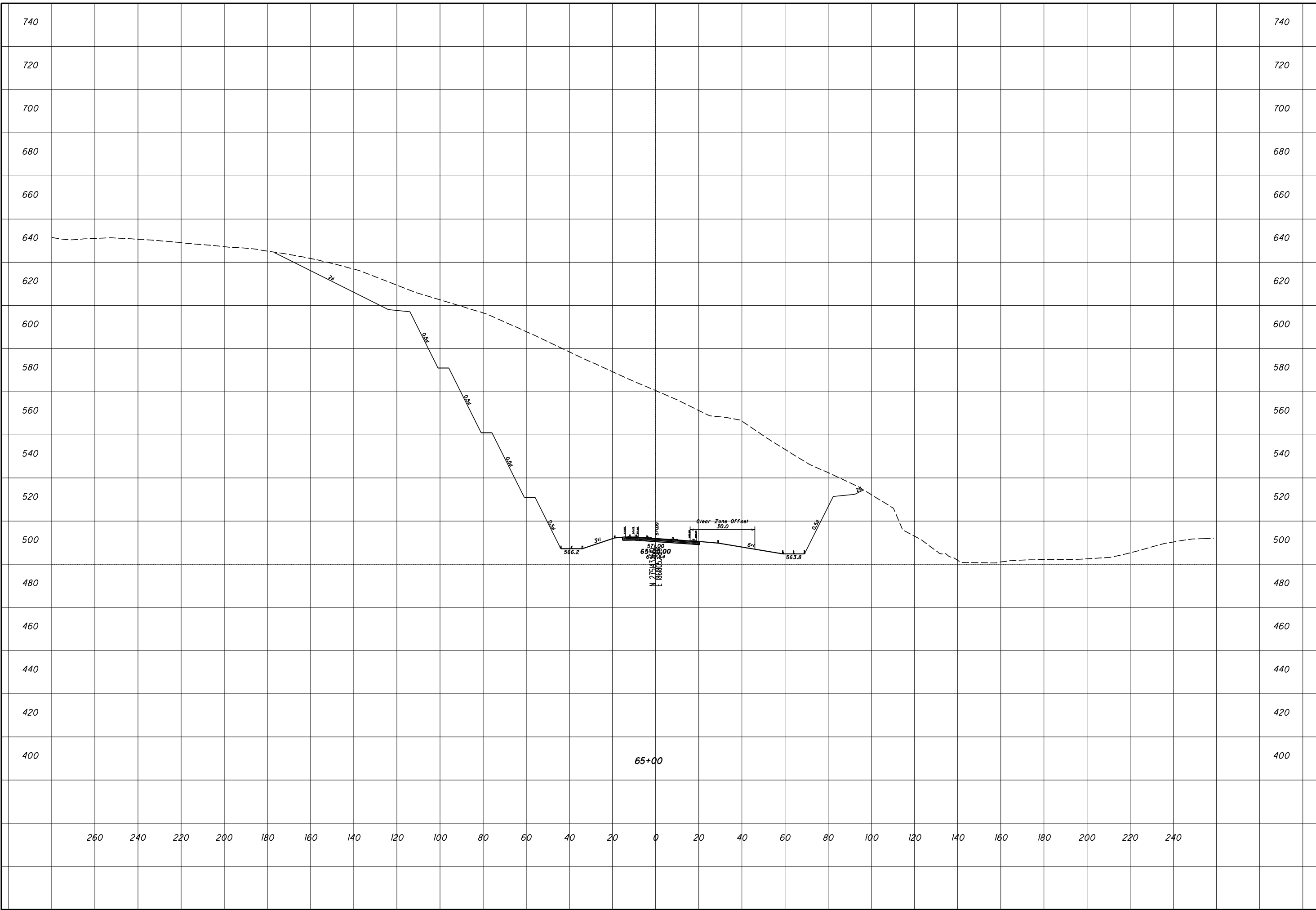


ROCK CUT SLOPE DESIGN - SR 140 RAMP B
STA 64+50

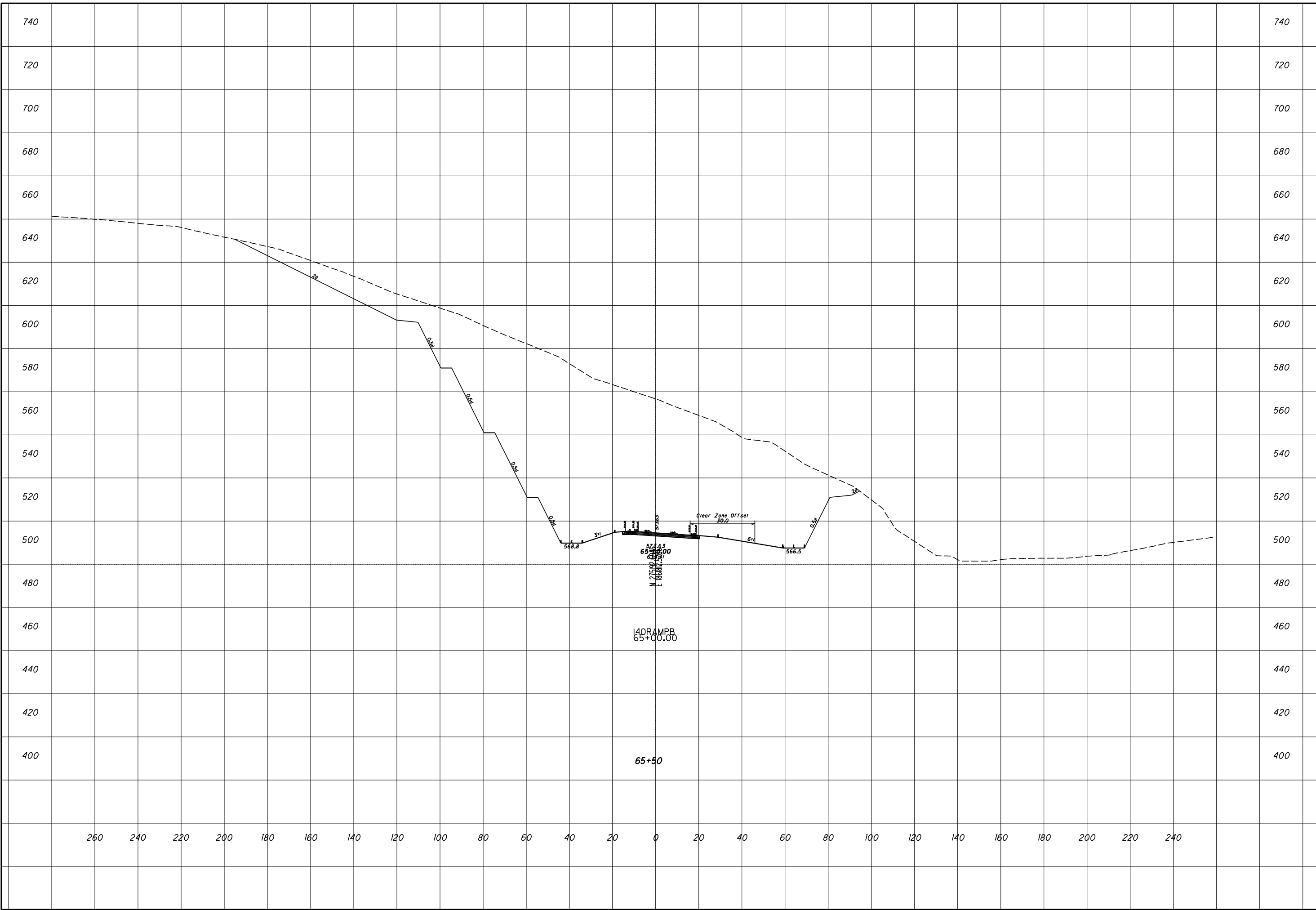
SCI-823-0.00

8
34

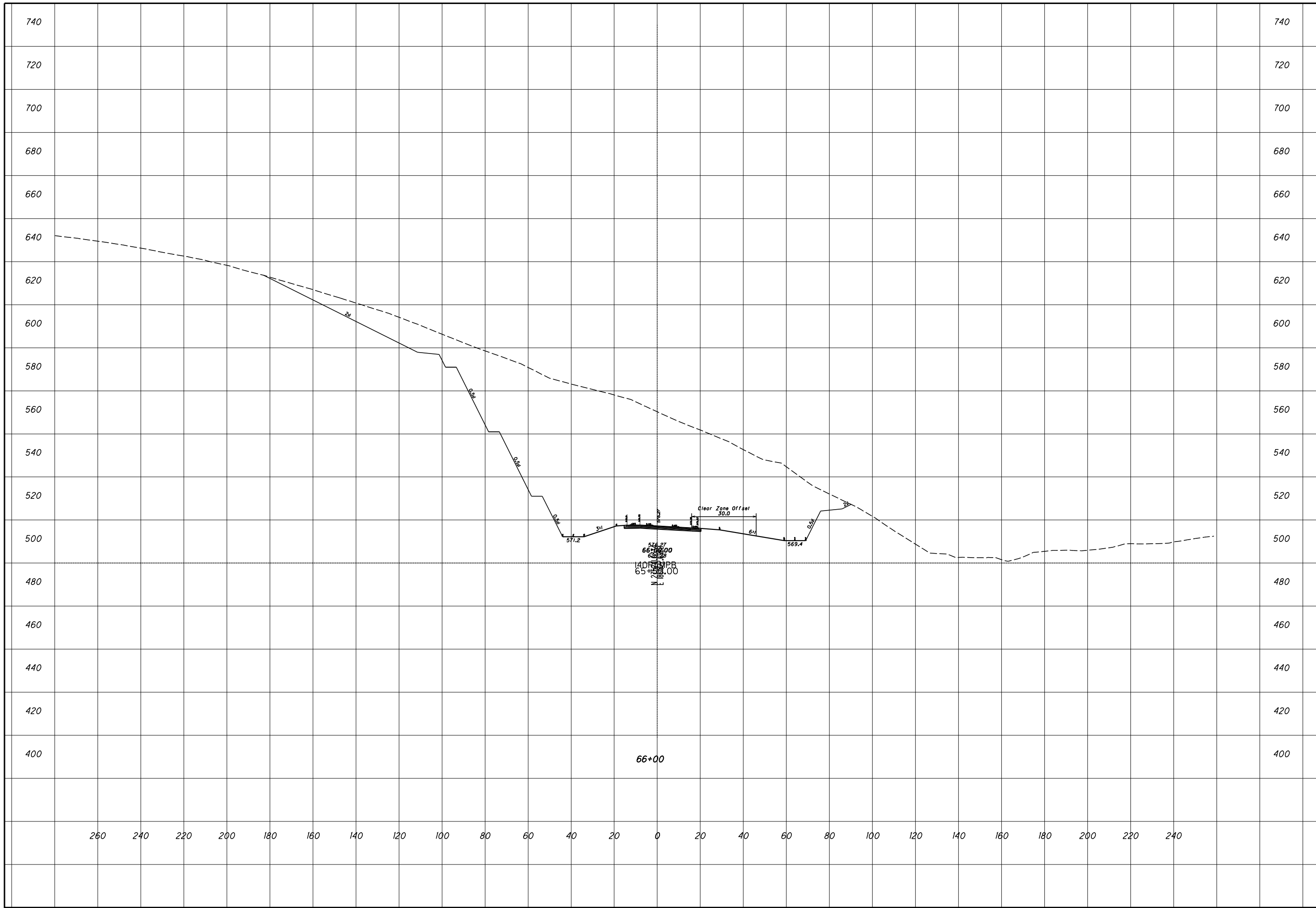
CHECKED



CHECKED



CHECKED
ROCK CUT SLOPE DESIGN - SR 140 RAMP B
STA 65+50
SCI-823-0.00
 10
 34



ROCK CUT SLOPE DESIGN - SR 140 RAMP B
STA 66+00

SCI-823-0.00

Checked

740

740

720

720

700

700

680

680

660

660

640

640

620

620

600

600

580

580

560

560

540

540

520

520

500

500

480

480

460

460

440

440

420

420

400

400

260 240 220 200 180 160 140 120 100 80 60 40 20 0 20 40 60 80 100 120 140 160 180 200 220 240

66+00

571.2
 526.27
 66+00.00
 65+50.00
 569.4

Clear Zone Offset
 30.0

140 MPH

3:1

3:1

2:1

2:1

0.5H

0.5H

0.5H

0.5H

0.5H

0.5H

0.5H

0.5H

0.5H

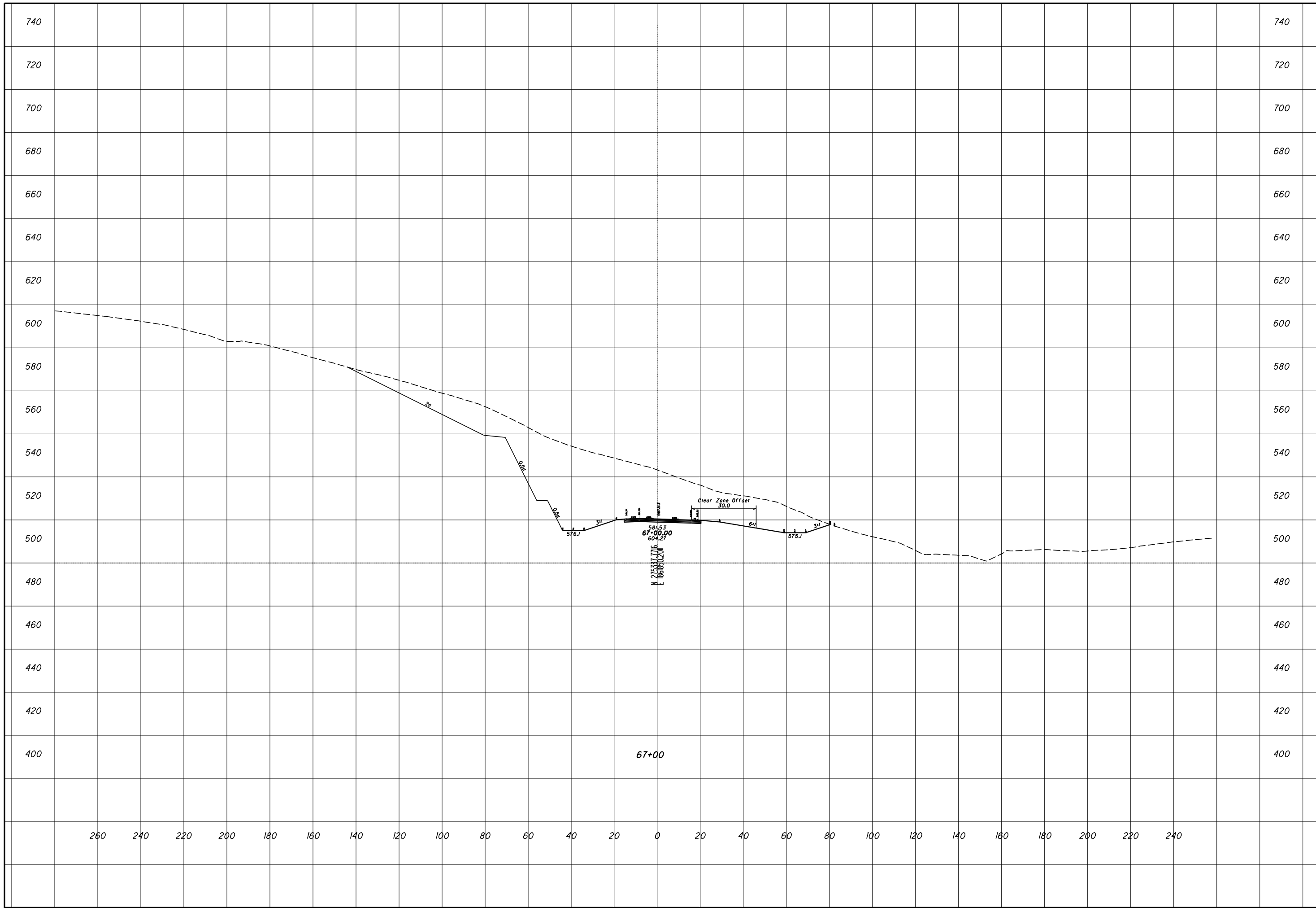


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ROCK CUT SLOPE DESIGN - SR 140 RAMP B
 STA 66+50

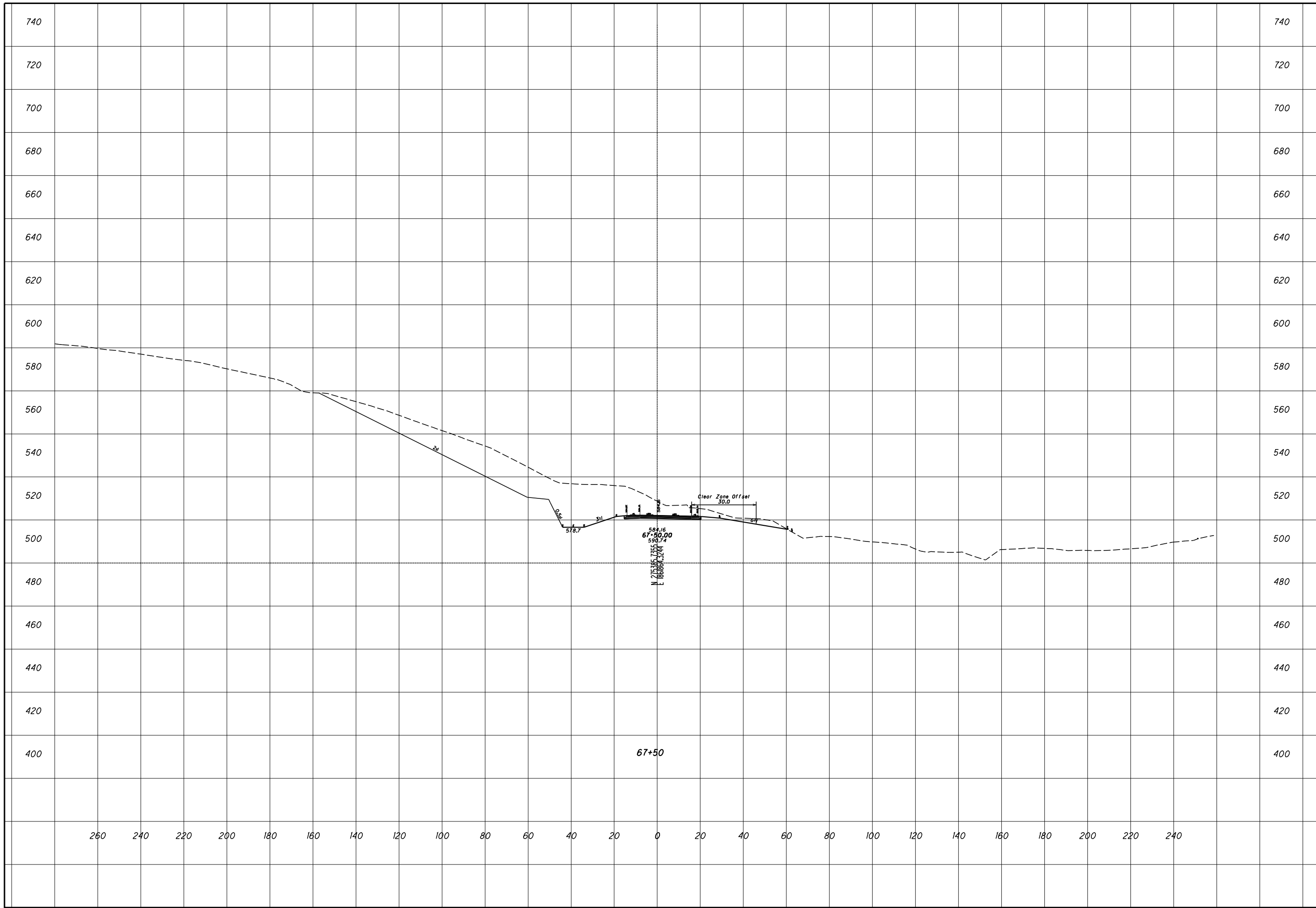
SCI-823-0.00

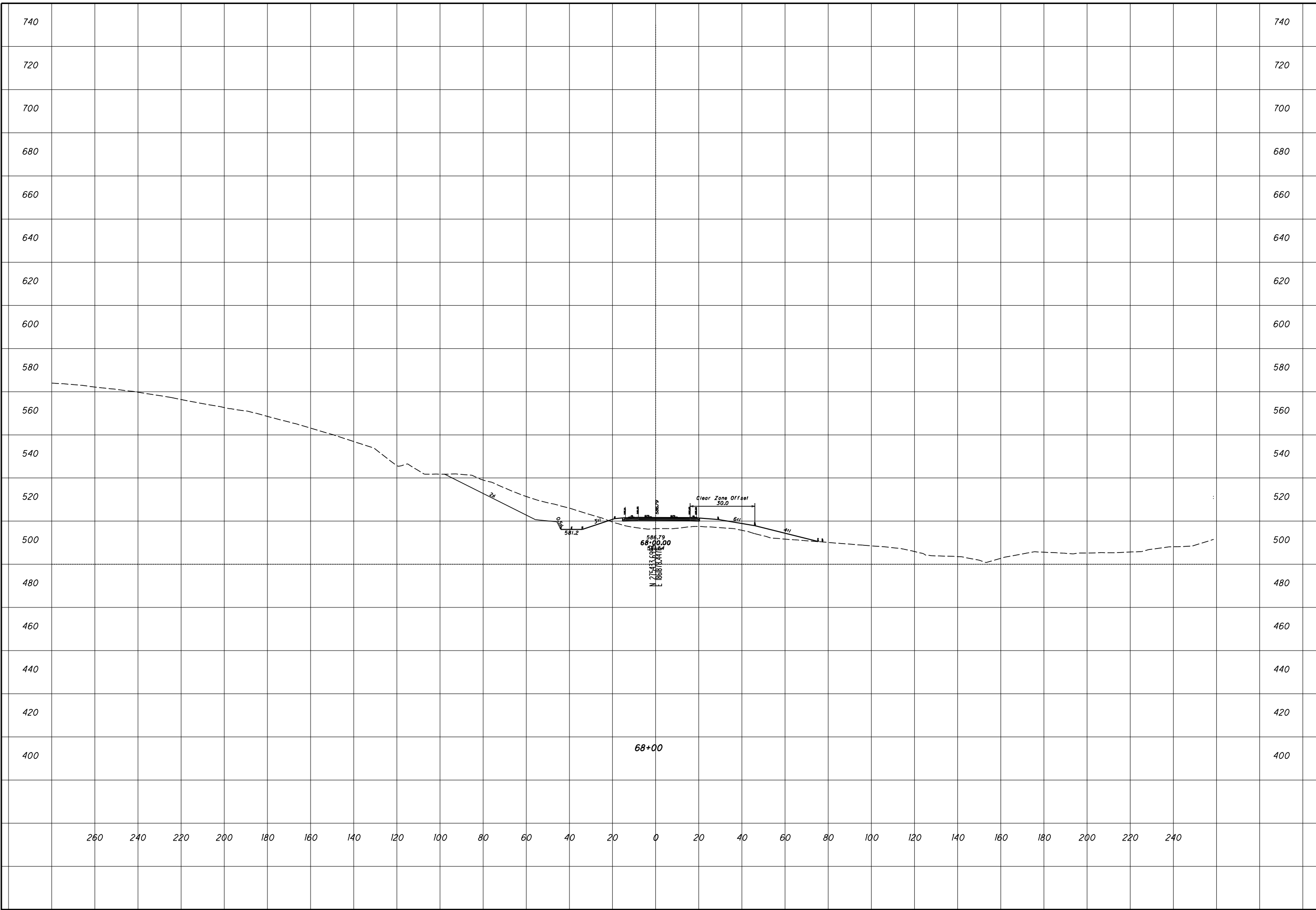
12
34



CHECKED

13
34



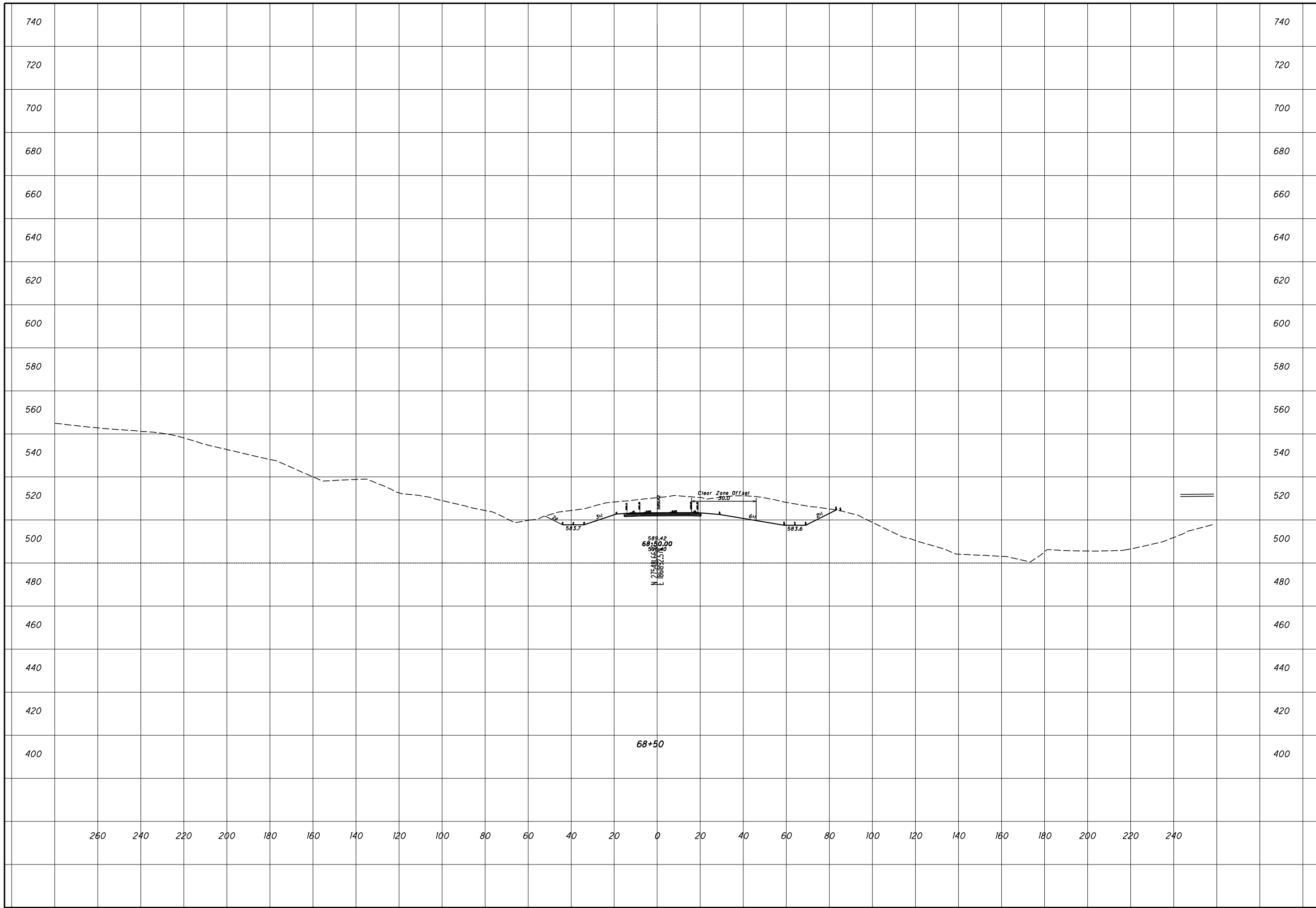


ROCK CUT SLOPE DESIGN - SR 140 RAMP B
STA 68+00

SCI-823-0.00

15
34

CHECKED



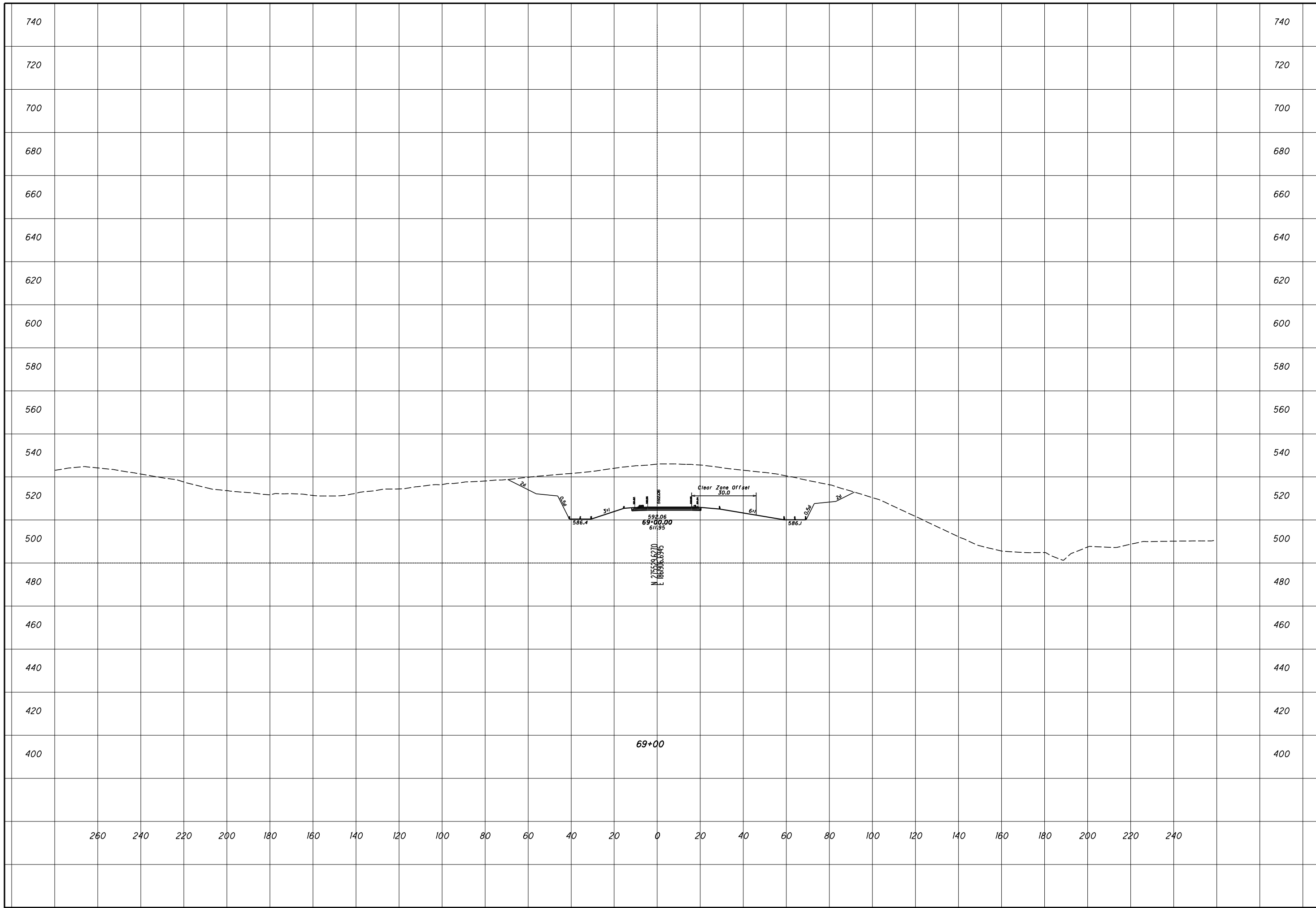
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ROCK CUT SLOPE DESIGN - SR 140 RAMP B

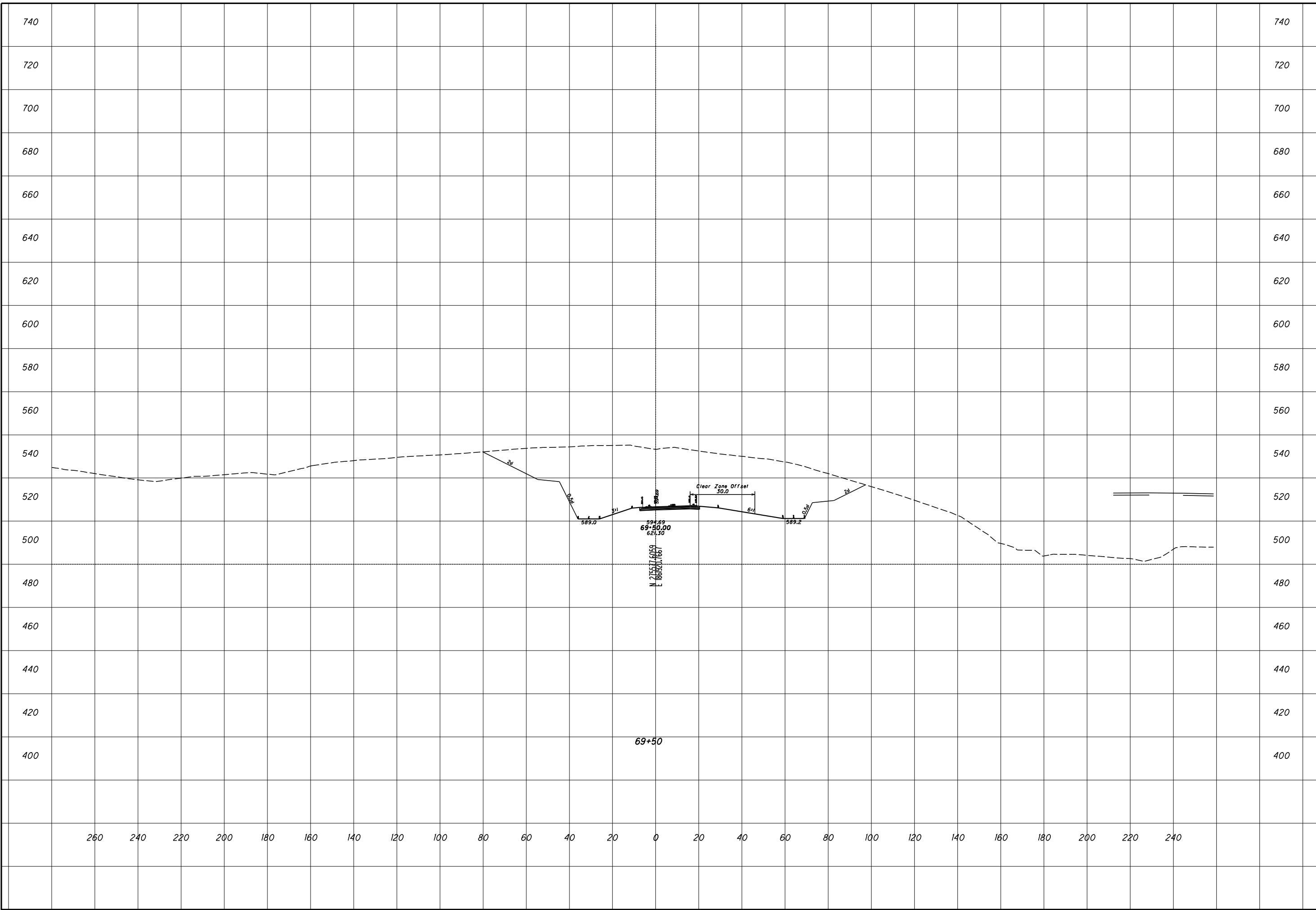
STA 68+50

SCI-823-0.00

16
34



CHECKED
ROCK CUT SLOPE DESIGN - SR 140 RAMP B
STA 69+00
SCI-823-0.00
 17
 34

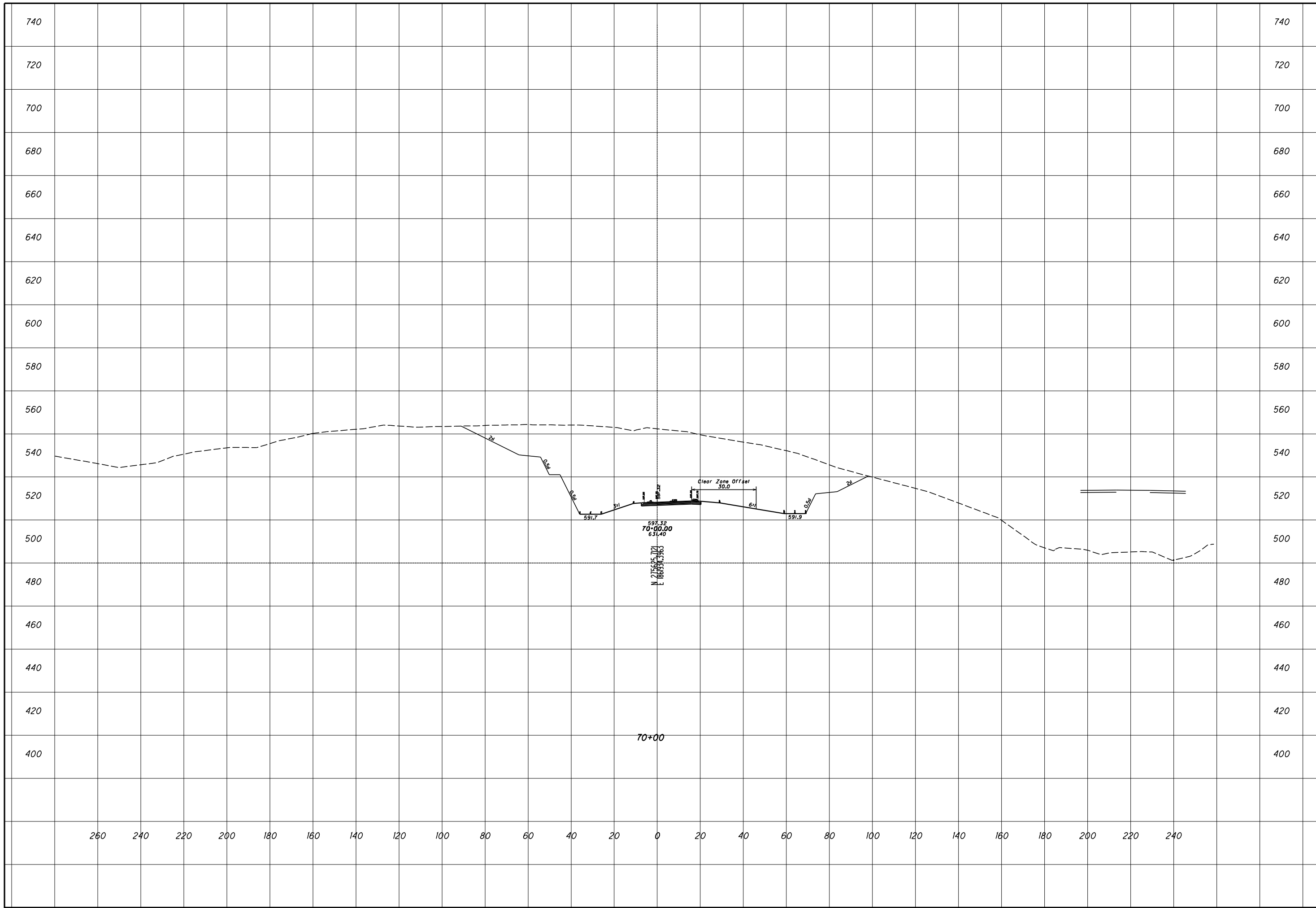


ROCK CUT SLOPE DESIGN - SR 140 RAMP B
STA 69+50

SCI-823-0.00

18
34

CHECKED



ROCK CUT SLOPE DESIGN - SR 140 RAMP B
STA 70+00

SCI-823-0.00

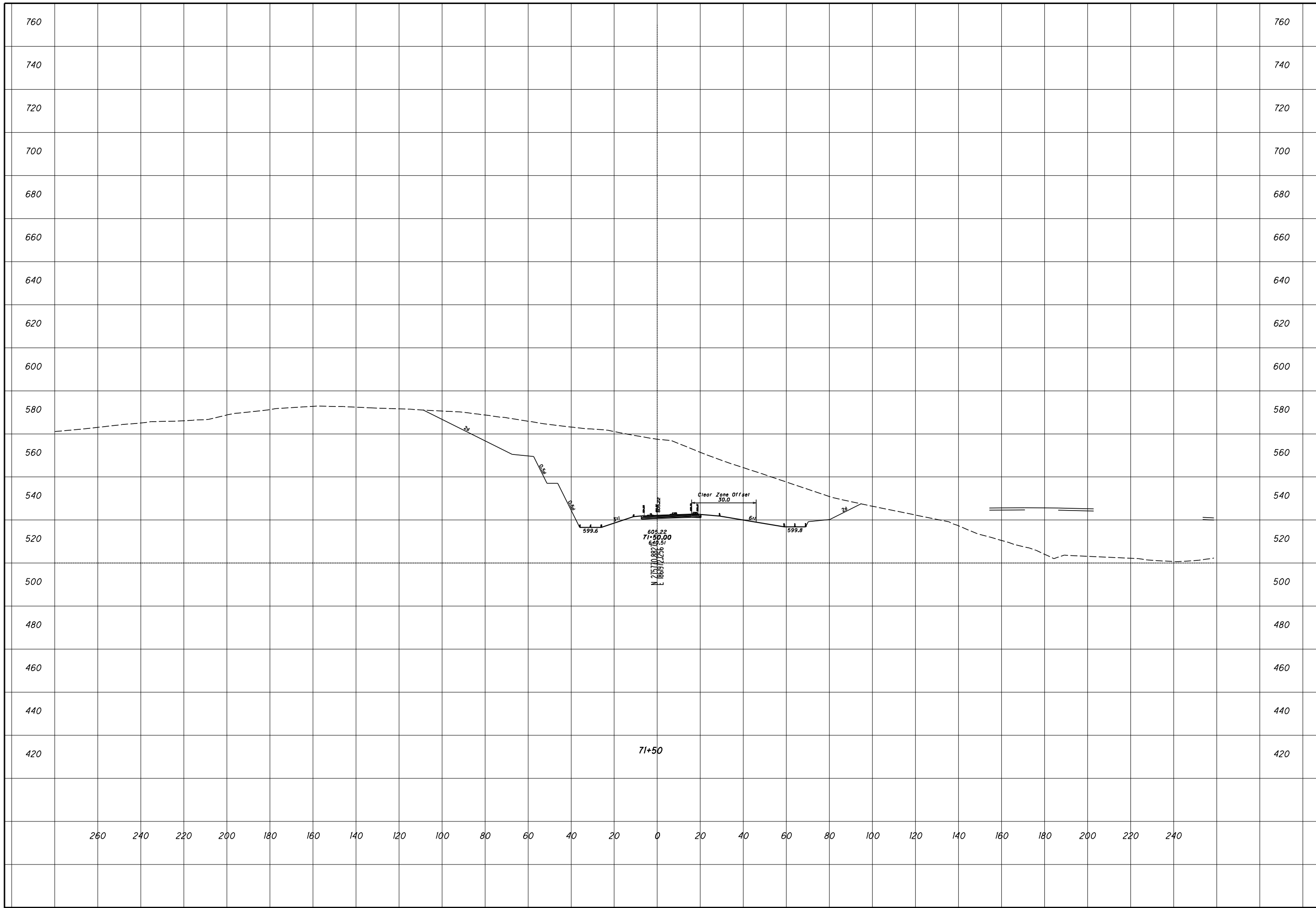
19
34

CHECKED

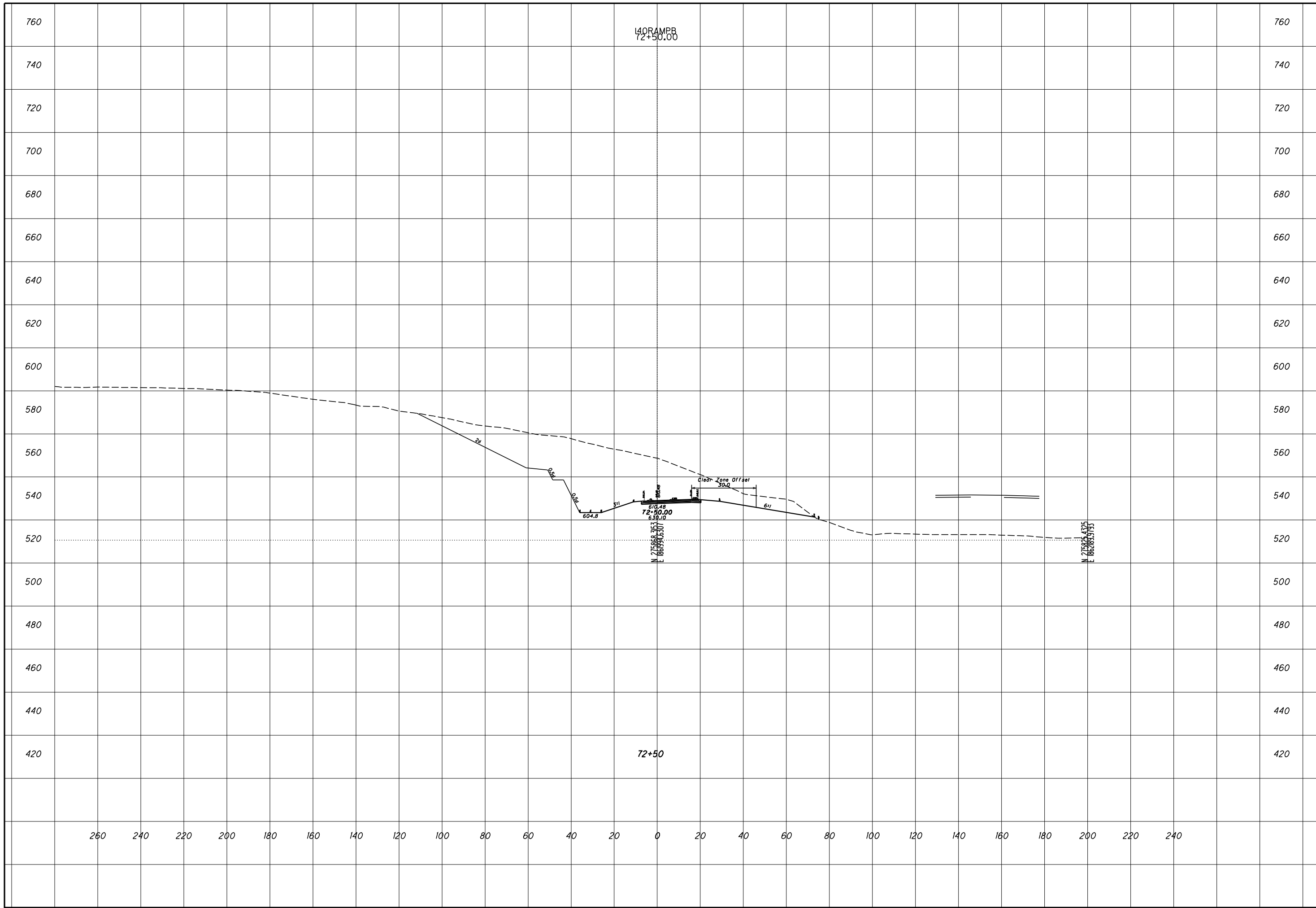


CHECKED
ROCK CUT SLOPE DESIGN - SR 140 RAMP B
STA 70+50
SCI-823-0.00
 20
 34





CHECKED
ROCK CUT SLOPE DESIGN - SR 140 RAMP B
STA 71+50
SCI-823-0.00
 22
 34



CHECKED

**ROCK CUT SLOPE DESIGN - SR 140 RAMP B
STA 72+50**

SCI-823-0.00

24
34

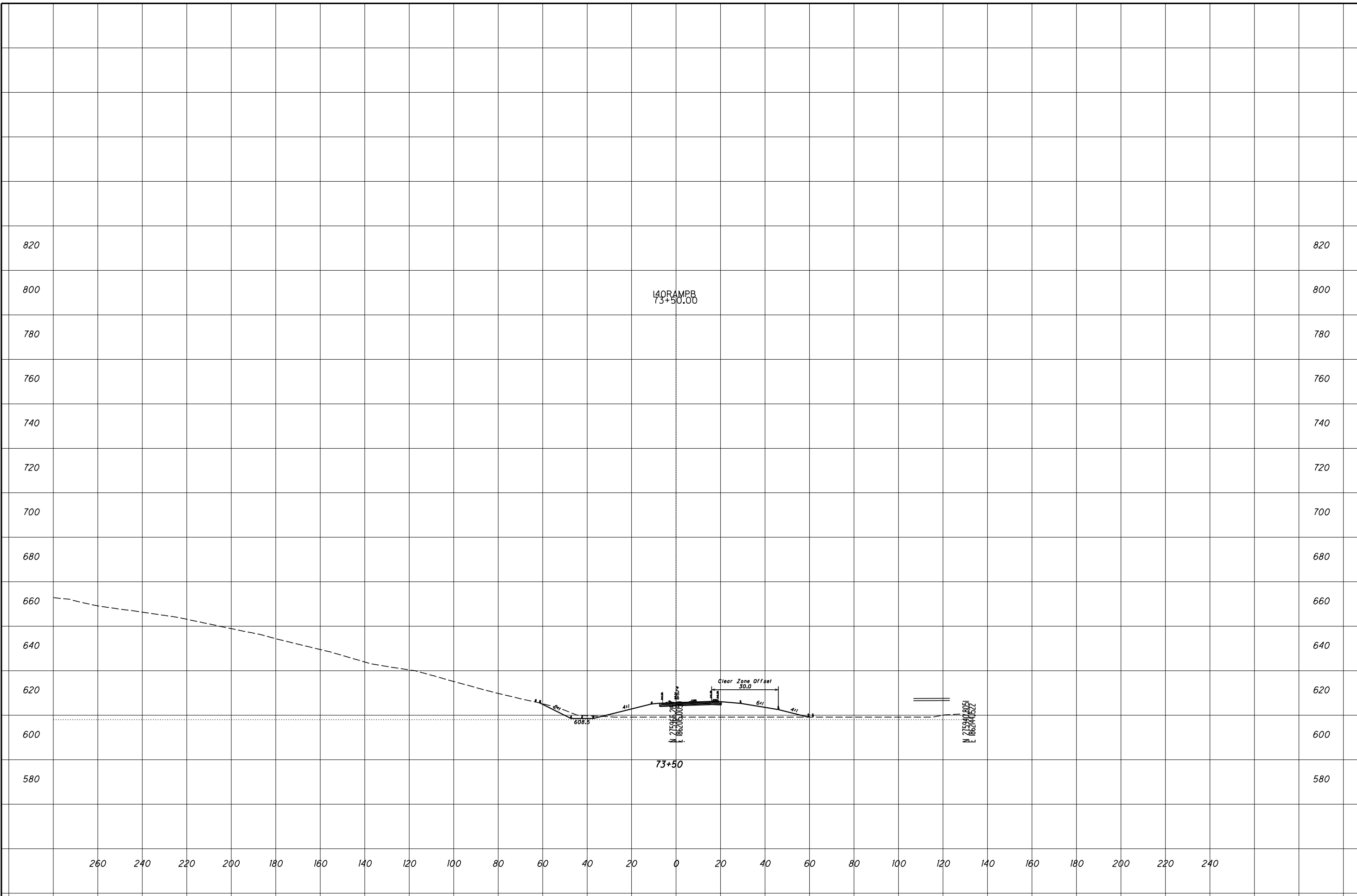
ROCK CUT SLOPE DESIGN - SR 140 RAMP B
STA 73+00

SCI-823-0.00



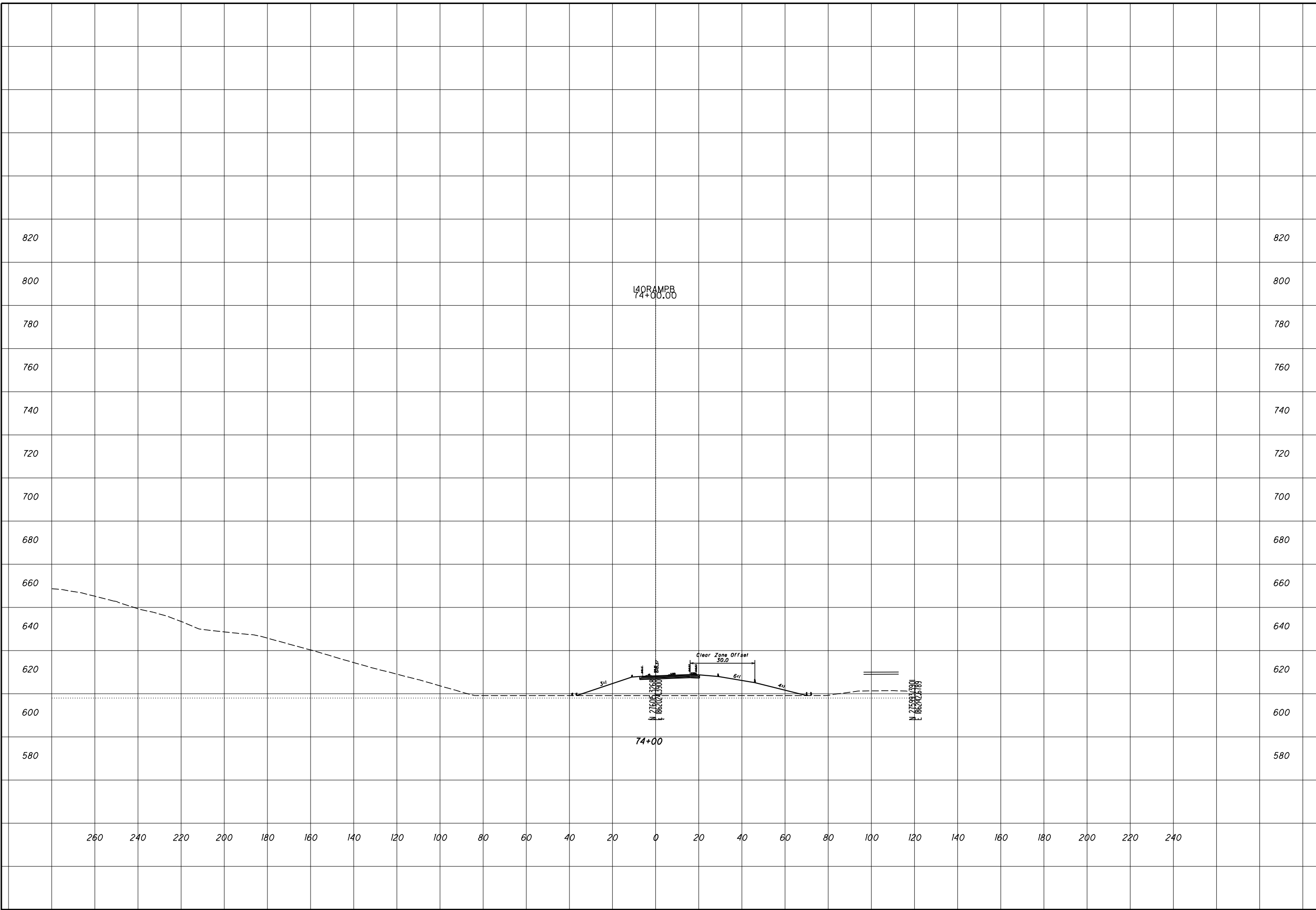
ROCK CUT SLOPE DESIGN - SR 140 RAMP B
STA 73+50

SCI-823-0.00



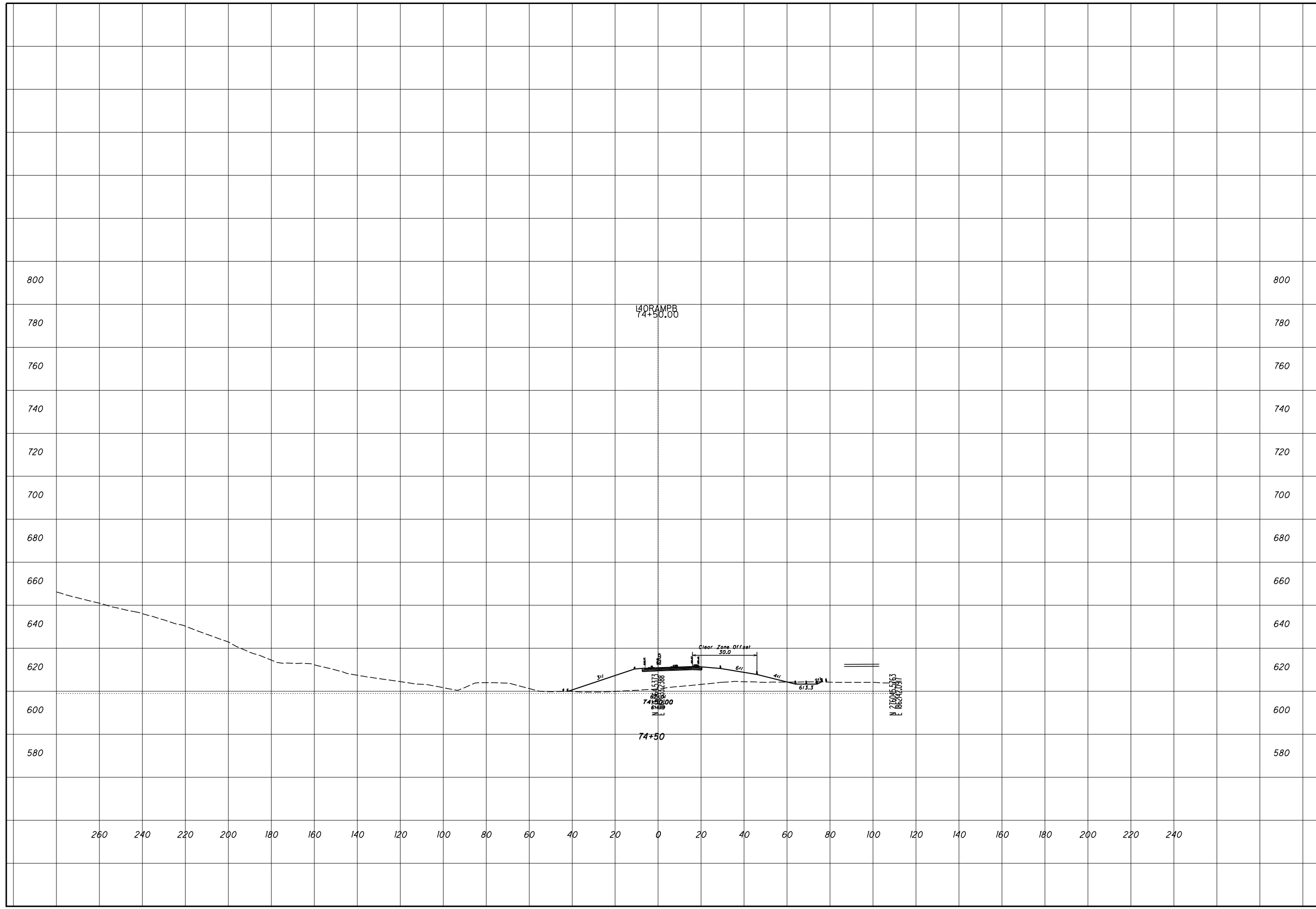
ROCK CUT SLOPE DESIGN - SR 140 RAMP B
STA 74+00

SCI-823-0.00



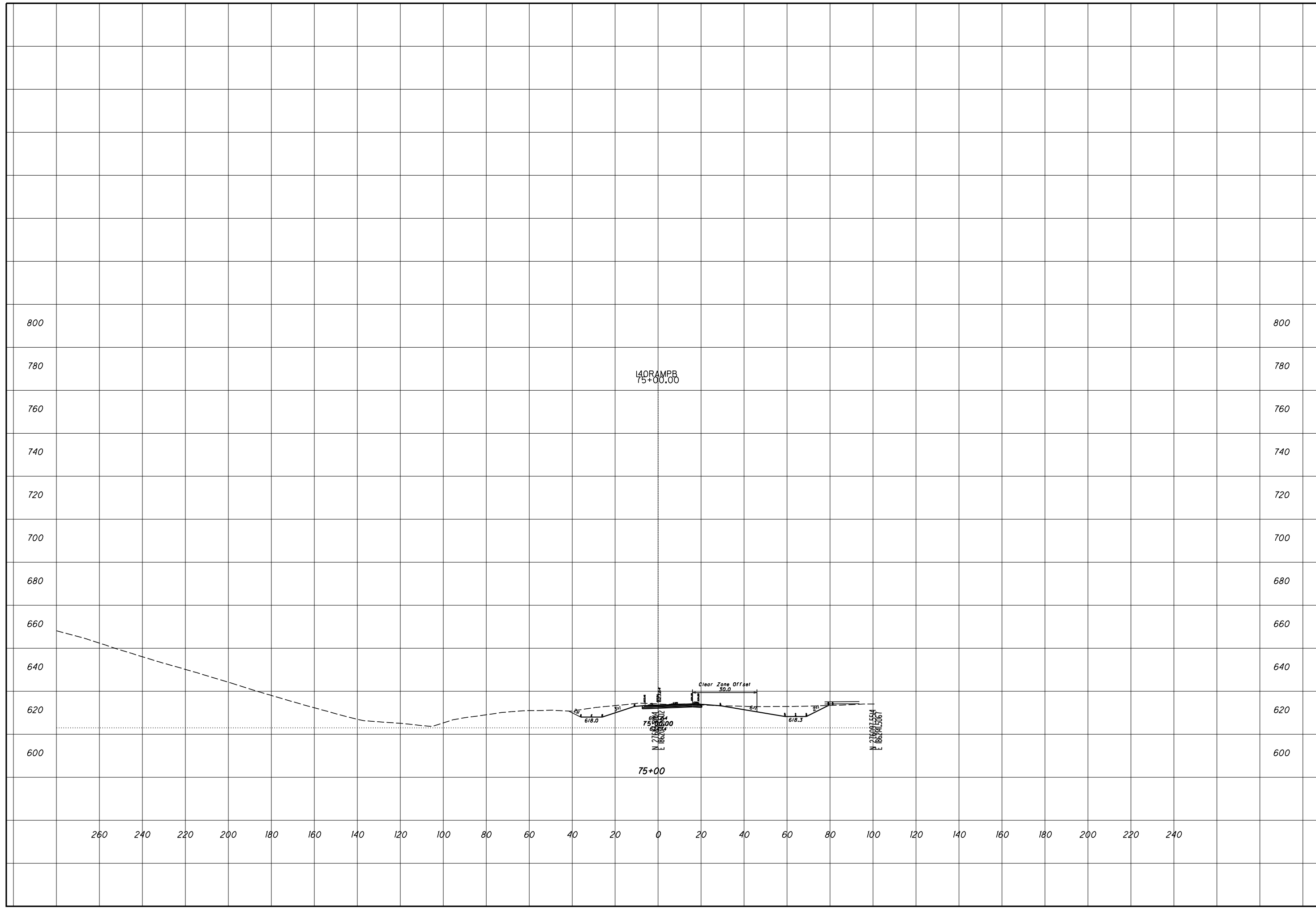
ROCK CUT SLOPE DESIGN - SR 140 RAMP B
STA 74+50

SCI-823-0.00



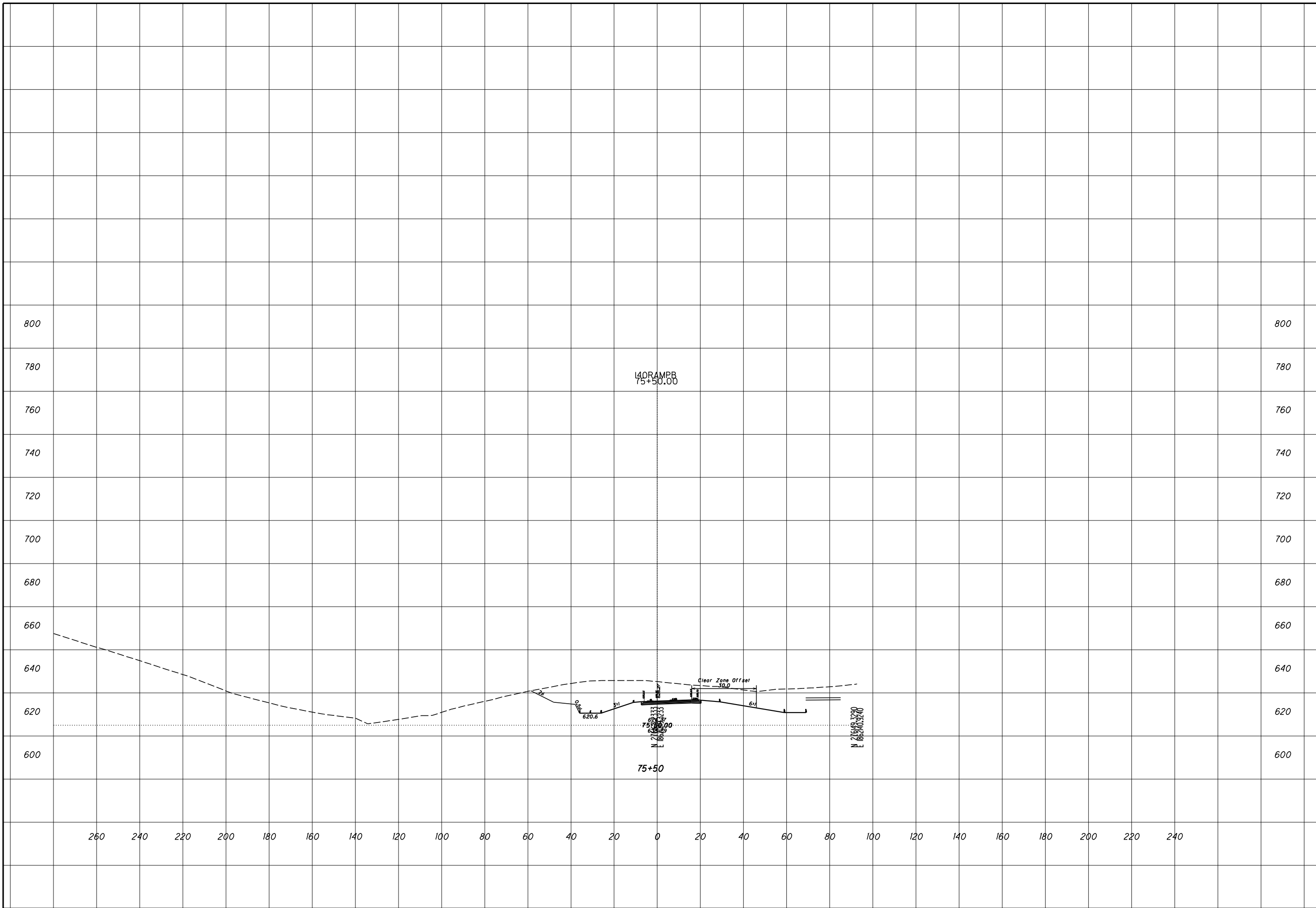
ROCK CUT SLOPE DESIGN - SR 140 RAMP B
STA 75+00

SCI-823-0.00



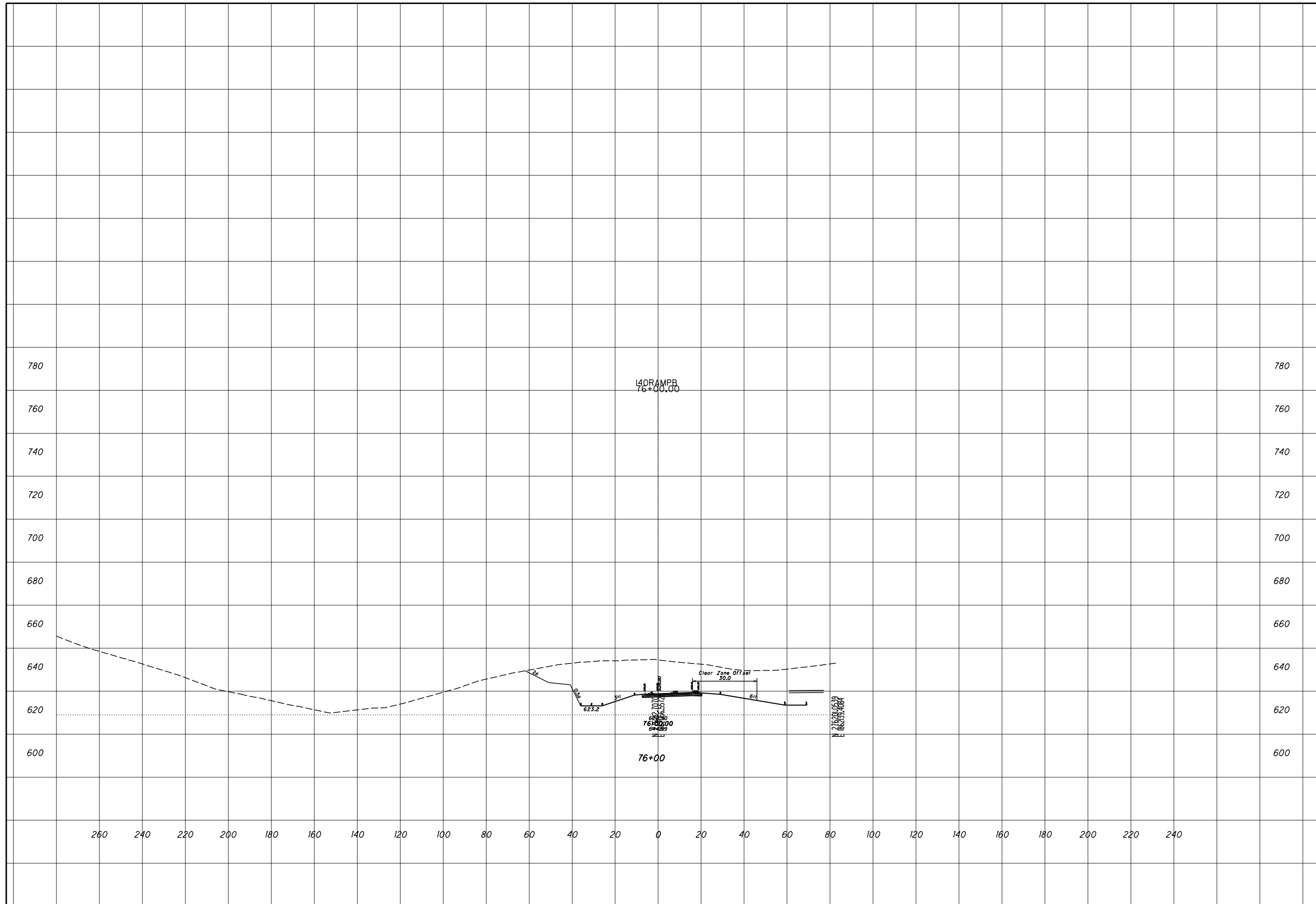
**ROCK CUT SLOPE DESIGN - SR 140 RAMP B
STA 75+50**

SCI-823-0.00



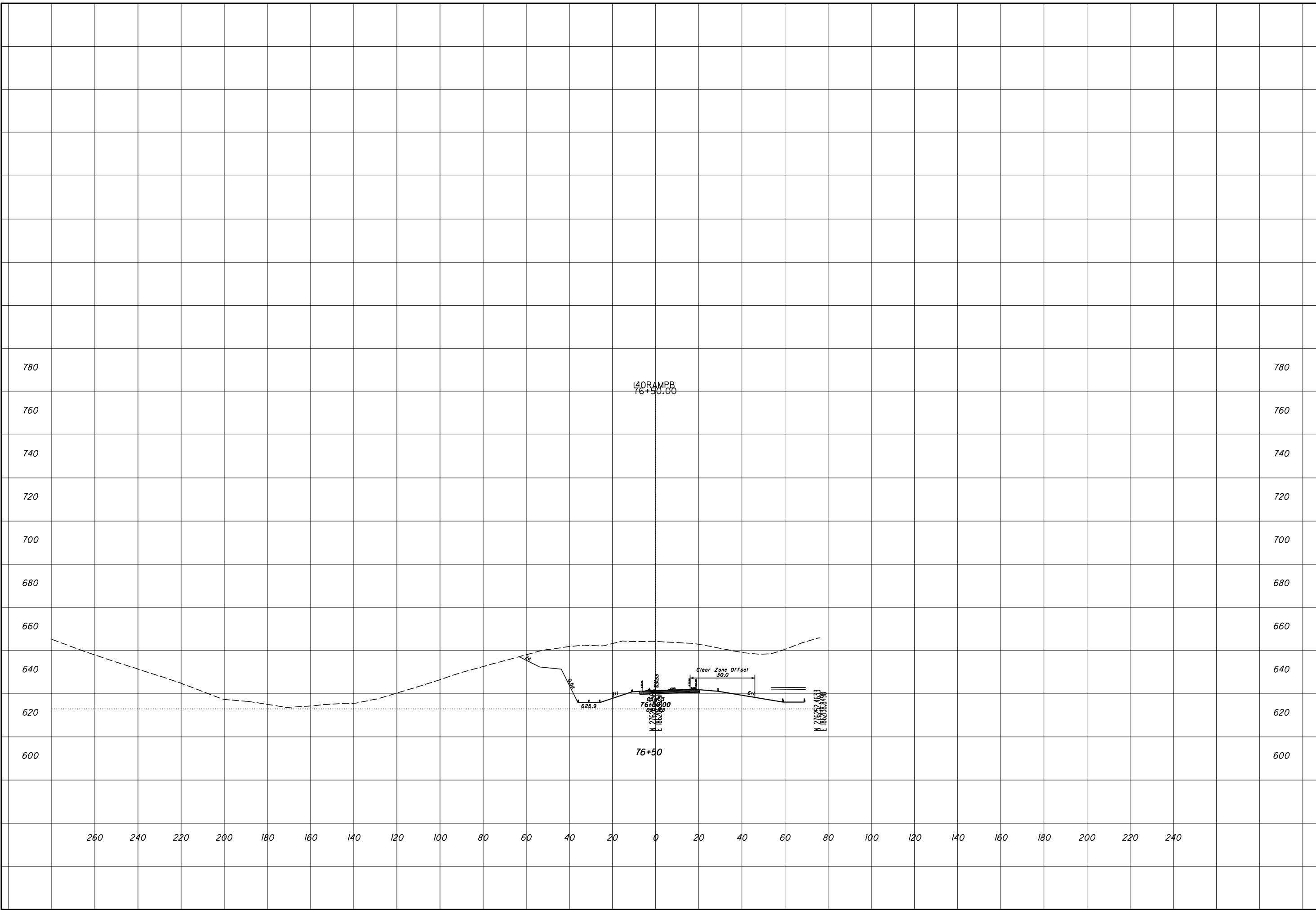
ROCK CUT SLOPE DESIGN - SR 140 RAMP B
STA 76+00

SCI-823-0.00



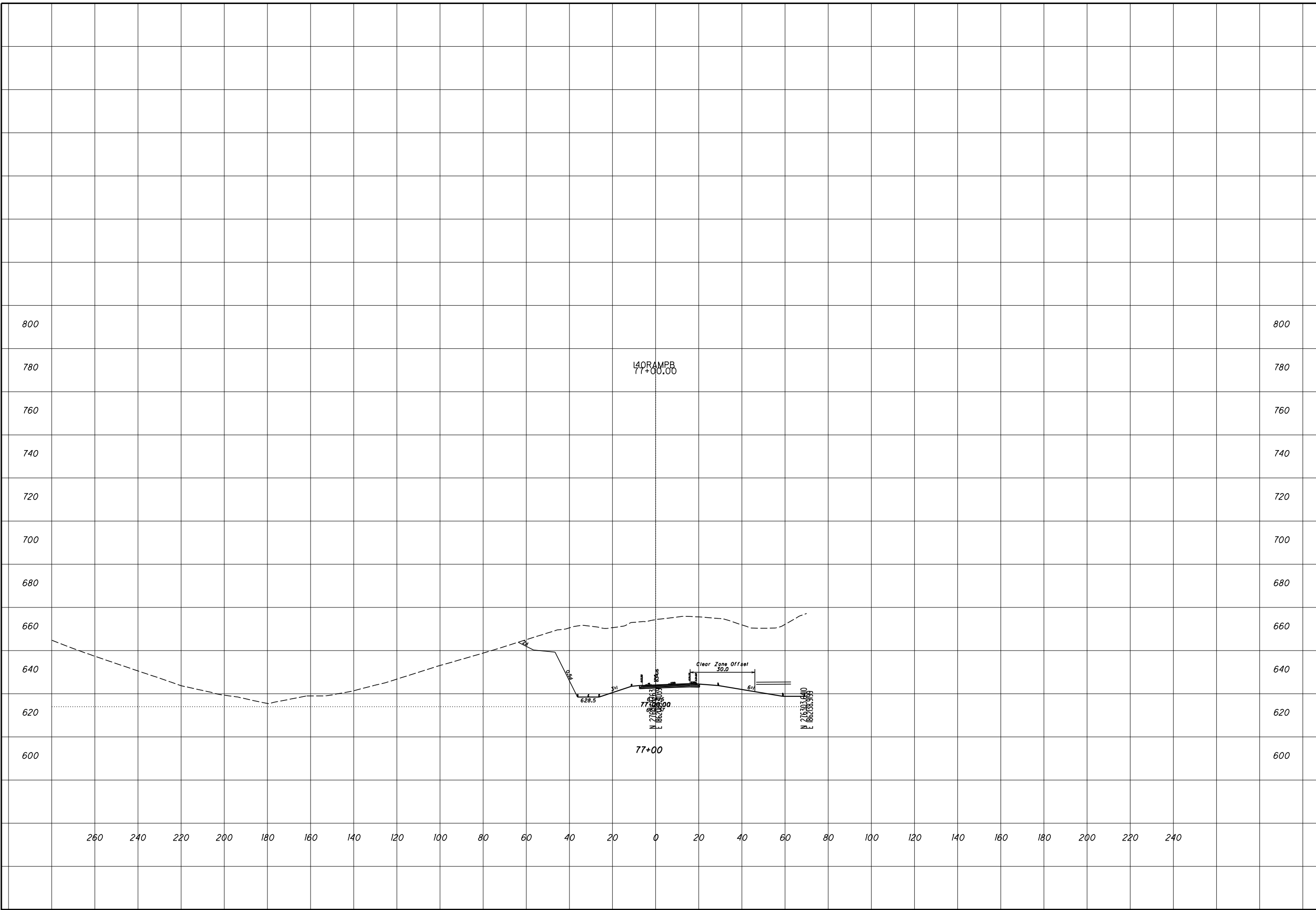
ROCK CUT SLOPE DESIGN - SR 140 RAMP B
STA 76+50

SCI-823-0.00



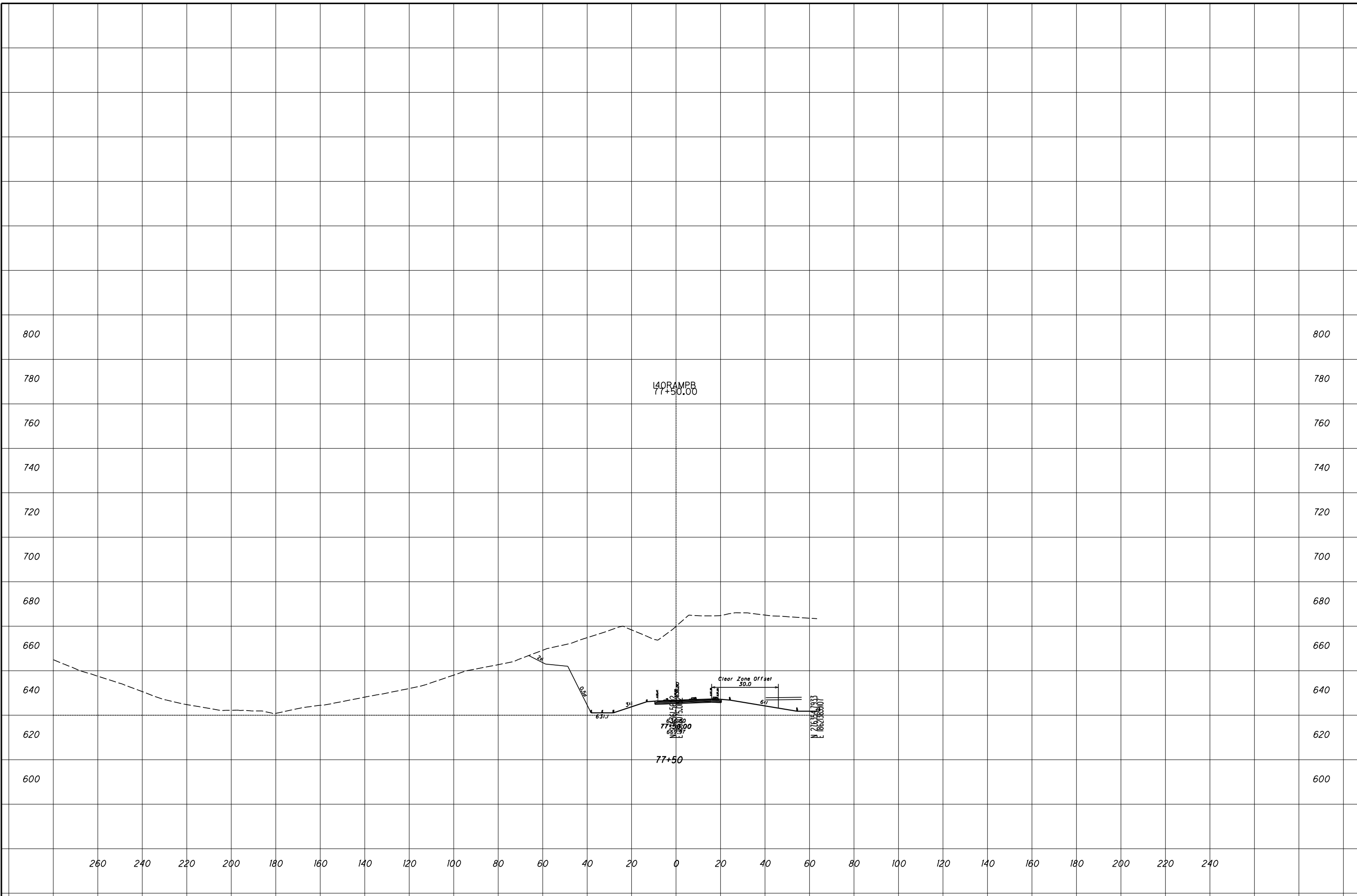
ROCK CUT SLOPE DESIGN - SR 140 RAMP B
STA 77+00

SCI-823-0.00



ROCK CUT SLOPE DESIGN - SR 140 RAMP B
STA 77+50

SCI-823-0.00



Colorado Rock Fall Simulation Analysis

Cut 1 STA 54+11.25\Left LT-Max - fail

Input File Specifications

Units of Measure: U.S.
Total Number of Cells: 7
Analysis Point 1 X-Coordinate: 126.8
Analysis Point 2 X-Coordinate: 131.8
Analysis Point 3 X-Coordinate:
Initial Y-Top Starting Zone Coordinate: 150
Initial Y-Base Starting Zone Coordinate: 90

Remarks:

Cell Data

Cell No.	S.R.	Tang. C.	Norm. C.	Begin X	Begin Y	End X	End Y
1	.5	.68	.15	0	141.7	45.7	92.1
2	.3	.8	.18	45.7	92.1	65.7	62.1
3	.3	.8	.18	65.7	62.1	85.7	32.1
4	.3	.8	.18	85.7	32.1	101.8	0
5	.3	.8	.2	101.8	0	111.8	0
6	.3	.8	.2	111.8	0	126.8	5
7	.1	.9	.9	126.8	5	131.8	5.4

Cut 1 STA 54+11.25\Left LT-Max - fail

Total Number of Rocks Simulated: 500
Starting Velocity in X-Direction: 1 ft/sec
Starting Velocity in Y-Direction: 1 ft/sec
Starting Cell Number: 1
Ending Cell Number: 7
Rock Density: 155 lb/ft³
Rock Shape: Discoidal
Diameter: 1.5 ft
Thickness: 1.5 ft

Cut 1 STA 54+11.25\Left LT-Max - fail

Analysis Point 1: X = 126.8, Y = 5

Total Rocks Passing Analysis Point: 37

Cumulative Probability Ht. (ft)	Velocity (ft/sec)	Energy (ft-lb)	Bounce
50%	8.91	980	0.03
75%	11.26	1467	6.01
90%	13.37	1906	11.39
95%	14.64	2169	14.62
98%	16.06	2465	18.25

Velocity (ft/sec)	Bounce Height (ft)	Kinetic Energy (ft-lb)
Maximum: 16.84	Maximum: .66	Maximum: 3109
Average: 8.91	Average: .1	Average: 980
Minimum: 2.65	G. Mean: .03	Std. Dev.: 722
Std. Dev.: 3.48	Std. Dev.: 8.86	

Remarks:

Cut 1 STA 54+11.25\Left LT-Max - fail

Analysis Point 2: X = 131.8, Y = 5

Total Rocks Passing Analysis Point: 30

Cumulative Probability Ht. (ft)	Velocity (ft/sec)	Energy (ft-lb)	Bounce
50%	8.64	838	0.13
75%	10.96	1282	4.59
90%	13.05	1681	8.61
95%	14.3	1921	11.02
98%	15.71	2190	13.73

Velocity (ft/sec)	Bounce Height (ft)	Kinetic Energy (ft-lb)
Maximum: 16	Maximum: .74	Maximum: 2514
Average: 8.64	Average: .28	Average: 838
Minimum: 2.98	G. Mean: .13	Std. Dev.: 657
Std. Dev.: 3.44	Std. Dev.: 6.61	

Remarks:

Cut 1 STA 54+11.25\Left LT-Max - fail

Velocity Units: ft/sec Bounce Height Units: ft

Cell #	Max. Vel.	Avg. Vel.	S.D. Vel.	Max. Bounce Ht.	Avg. Bounce Ht.
1	42	25	8.57	6	1
2	60	41	6.78	14	2
3	72	50	6.6	12	4
4	79	61	7.23	21	9
5	70	21	15.19	7	0
6	17	9	3.48	1	0
7	16	9	3.44	1	0

Cut 1 STA 54+11.25\Left LT-Max - fail

X Interval	Rocks Stopped
0 To 10 ft	0
10 To 20 ft	0
20 To 30 ft	0
30 To 40 ft	0
40 To 50 ft	0
50 To 60 ft	0
60 To 70 ft	0
70 To 80 ft	0
80 To 90 ft	0
90 To 100 ft	0
100 To 110 ft	1
110 To 120 ft	294
120 To 130 ft	171
130 To 131.8 ft	4

Cut 1 STA 54+11.25\Left LT-Avg

Input File Specifications

Units of Measure: U.S.
Total Number of Cells: 7
Analysis Point 1 X-Coordinate: 126.8
Analysis Point 2 X-Coordinate: 131.8
Analysis Point 3 X-Coordinate:
Initial Y-Top Starting Zone Coordinate: 141.7
Initial Y-Base Starting Zone Coordinate: 131.7

Remarks:

Cell Data

Cell No.	S.R.	Tang. C.	Norm. C.	Begin X	Begin Y	End X	End Y
1	.28	.68	.15	0	141.7	45.7	92.1
2	.21	.8	.18	45.7	92.1	65.7	62.1
3	.21	.8	.18	65.7	62.1	85.7	32.1
4	.21	.8	.18	85.7	32.1	101.8	0
5	.21	.8	.2	101.8	0	111.8	0
6	.21	.8	.2	111.8	0	126.8	5
7	.21	.8	.2	126.8	5	131.8	5.4

CRSP Simulation Specifications: Used with M:\proj\0121\3070.03\Cut Slope Designs\CRSP Analyses\Phase III CRSP Analyses\Cut 1 STA 54+11.25\Left LT-Avg.doc

Total Number of Rocks Simulated: 500
Starting Velocity in X-Direction: 1 ft/sec
Starting Velocity in Y-Direction: -1 ft/sec
Starting Cell Number: 1
Ending Cell Number: 7
Rock Density: 155 lb/ft³
Rock Shape: Discoidal
Diameter: 1.0 ft
Thickness: 1.0 ft

Cut 1 STA 54+11.25\Left LT-Avg

Analysis Point 1: X = 126.8, Y = 5

Total Rocks Passing Analysis Point: 28

Cumulative Probability Ht. (ft)	Velocity (ft/sec)	Energy (ft-lb)	Bounce
50%	8.33	275	0.05
75%	10.98	429	4.86
90%	13.36	569	9.19
95%	14.79	652	11.79
98%	16.39	746	14.7

Velocity (ft/sec)	Bounce Height (ft)	Kinetic Energy (ft-lb)
Maximum: 17.24	Maximum: .68	Maximum: 888
Average: 8.33	Average: .15	Average: 275
Minimum: 2.64	G. Mean: .05	Std. Dev.: 229
Std. Dev.: 3.92	Std. Dev.: 7.12	

Remarks:

Cut 1 STA 54+11.25\Left LT-Avg

Analysis Point 2: X = 131.8, Y = 5

Total Rocks Passing Analysis Point: 13

Cumulative Probability Ht. (ft)	Velocity (ft/sec)	Energy (ft-lb)	Bounce
50%	8.69	251	0.03
75%	10.96	368	5.68
90%	13.01	472	10.77
95%	14.23	535	13.83
98%	15.61	606	17.25

Velocity (ft/sec)	Bounce Height (ft)	Kinetic Energy (ft-lb)
Maximum: 13.94	Maximum: .28	Maximum: 572
Average: 8.69	Average: .07	Average: 251
Minimum: 3.08	G. Mean: .03	Std. Dev.: 172
Std. Dev.: 3.36	Std. Dev.: 8.38	

Remarks:

Cut 1 STA 54+11.25\Left LT-Avg.doc

Velocity Units: ft/sec Bounce Height Units: ft

Cell #	Max. Vel.	Avg. Vel.	S.D. Vel.	Max. Bounce Ht.	Avg. Bounce Ht.
1	43	33	4.2	6	2
2	59	47	5.62	14	4
3	70	52	6.72	12	4
4	80	63	7.28	22	10
5	73	27	20.97	9	1
6	17	8	3.92	1	0
7	14	9	3.36	0	0

Cut 1 STA 54+11.25\Left LT-Avg.doc

X Interval	Rocks Stopped
0 To 10 ft	0
10 To 20 ft	0
20 To 30 ft	0
30 To 40 ft	0
40 To 50 ft	0
50 To 60 ft	0
60 To 70 ft	0
70 To 80 ft	0
80 To 90 ft	0
90 To 100 ft	0
100 To 110 ft	6
110 To 120 ft	279
120 To 130 ft	199
130 To 131.8 ft	3

Cut 1 STA 54+11.25\Left NC-Max.doc

Input File Specifications

Units of Measure: U.S.
Total Number of Cells: 11
Analysis Point 1 X-Coordinate: 126.8
Analysis Point 2 X-Coordinate: 131.8
Analysis Point 3 X-Coordinate: 0
Initial Y-Top Starting Zone Coordinate: 141.7
Initial Y-Base Starting Zone Coordinate: 131.7

Remarks:

Cell Data

Cell No.	S.R.	Tang. C.	Norm. C.	Begin X	Begin Y	End X	End Y
1	.25	.75	.18	0	141.7	23.9	125.8
2	.15	.85	.2	23.9	125.8	40.7	92.1
3	.15	.85	.2	40.7	92.1	45.7	92.1
4	.15	.85	.2	45.7	92.1	60.7	62.1
5	.15	.85	.2	60.7	62.1	65.7	62.1
6	.15	.85	.2	65.7	62.1	80.7	32.1
7	.15	.85	.2	80.7	32.1	85.7	32.1
8	.15	.85	.2	85.7	32.1	101.8	0
9	.15	.85	.2	101.8	0	111.8	0
10	.15	.85	.2	111.8	0	126.8	5
11	.1	0.9	.9	126.8	5	131.8	5.4

CRSP Simulation Specifications: Used with M:\proj\0121\3070.03\Cut Slope Designs\CRSP Analyses\Phase III CRSP Analyses\Cut 1 STA 54+11.25\Left NC-Max.doc

Total Number of Rocks Simulated: 500
Starting Velocity in X-Direction: 1 ft/sec
Starting Velocity in Y-Direction: -1 ft/sec
Starting Cell Number: 1
Ending Cell Number: 11
Rock Density: 155 lb/ft³
Rock Shape: Discoidal
Diameter: 1.5 ft
Thickness: 1.5 ft

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Analysis Point 1: X = 126.8, Y = 5

Total Rocks Passing Analysis Point: 20

Cumulative Probability Ht. (ft)	Velocity (ft/sec)		Energy (ft-lb)	Bounce
50%	5.97	420	0.01	
75%	7.44	629	5.36	
90%	8.77	816	10.17	
95%	9.57	928	13.06	
98%	10.46	1055	16.3	

Velocity (ft/sec)	Bounce Height (ft)		Kinetic Energy (ft-lb)
Maximum: 10.95	Maximum: .25	Maximum: 1294	
Average: 5.97	Average: .01	Average: 420	
Minimum: 2.92	G. Mean: .01	Std. Dev.: 308	
Std. Dev.: 2.19	Std. Dev.: 7.92		

Remarks:

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Analysis Point 2: X = 131.8, Y = 5

Total Rocks Passing Analysis Point: 8

Cumulative Probability Ht. (ft)	Velocity (ft/sec)		Energy (ft-lb)	Bounce
50%	6.32	416	0.09	
75%	7.74	609	5	
90%	9.01	783	9.43	
95%	9.78	888	12.08	
98%	10.64	1005	15.06	

Velocity (ft/sec)	Bounce Height (ft)		Kinetic Energy (ft-lb)
Maximum: 10.03	Maximum: .38	Maximum: 1011	
Average: 6.32	Average: .18	Average: 416	
Minimum: 3.86	G. Mean: .09	Std. Dev.: 286	
Std. Dev.: 2.1	Std. Dev.: 7.28		

Remarks:

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Velocity Units: ft/sec Bounce Height Units: ft

Cell #	Max. Vel.	Avg. Vel.	S.D. Vel.	Max. Bounce Ht.	Avg. Bounce Ht.
1	22	16	2.39	1	0
2	51	42	4.48	14	2
3	50	15	6.6	2	0
4	57	36	3.62	25	10
5	47	27	14.37	20	4
6	65	45	10.37	26	7
7	66	22	15	18	1
8	66	40	8.77	26	9
9	49	22	13.53	15	2
10	11	6	2.19	0	0
11	10	6	2.1	0	0

CRSP Rocks Stopped Data - M:\proj\0121\3070.03\Cut Slope Designs\CRSP
Analyses\Phase III CRSP Analyses\Cut 1 STA 54+11.25\Left NC-Max.doc

X Interval	Rocks Stopped
0 To 10 ft	1
10 To 20 ft	1
20 To 30 ft	0
30 To 40 ft	0
40 To 50 ft	1
50 To 60 ft	0
60 To 70 ft	6
70 To 80 ft	0
80 To 90 ft	8
90 To 100 ft	0
100 To 110 ft	20
110 To 120 ft	296
120 To 130 ft	152
130 To 131.8 ft	7

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Input File Specifications

Units of Measure: U.S.
Total Number of Cells: 7
Analysis Point 1 X-Coordinate: 126.8
Analysis Point 2 X-Coordinate: 131.8
Analysis Point 3 X-Coordinate:
Initial Y-Top Starting Zone Coordinate: 141.7
Initial Y-Base Starting Zone Coordinate: 131.7

Remarks:

Cell Data

Cell No.	S.R.	Tang. C.	Norm. C.	Begin X	Begin Y	End X	End Y
1	.5	.68	.15	0	141.7	45.7	92.1
2	.3	.8	.18	45.7	92.1	65.7	62.1
3	.3	.8	.18	65.7	62.1	85.7	32.1
4	.3	.8	.18	85.7	32.1	101.8	0
5	.3	.8	.2	101.8	0	111.8	0
6	.3	.8	.2	111.8	0	126.8	5
7	.1	.9	.9	126.8	5	131.8	5.4

CRSP Simulation Specifications: Used with M:\proj\0121\3070.03\Cut Slope
Designs\CRSP Analyses\Phase III CRSP Analyses\Cut 1 STA 54+11.25\Left LT-Max.doc

Total Number of Rocks Simulated: 500
Starting Velocity in X-Direction: 1 ft/sec
Starting Velocity in Y-Direction: -1 ft/sec
Starting Cell Number: 1
Ending Cell Number: 7
Rock Density: 155 lb/ft³
Rock Shape: Discoidal
Diameter: 1.5 ft
Thickness: 1.5 ft

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Analysis Point 1: X = 126.8, Y = 5

Total Rocks Passing Analysis Point: 37

Cumulative Probability Ht. (ft)	Velocity (ft/sec)	Energy (ft-lb)	Bounce
50%	8.14	872	0.02
75%	10.65	1409	7.89
90%	12.91	1892	14.97
95%	14.26	2182	19.22
98%	15.78	2508	23.99

Velocity (ft/sec)	Bounce Height (ft)	Kinetic Energy (ft-lb)
Maximum: 19.54	Maximum: .99	Maximum: 4152
Average: 8.14	Average: .13	Average: 872
Minimum: 2.03	G. Mean: .02	Std. Dev.: 795
Std. Dev.: 3.72	Std. Dev.: 11.65	

Remarks:

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Analysis Point 2: X = 131.8, Y = 5

Total Rocks Passing Analysis Point: 28

Cumulative Probability Ht. (ft)	Velocity (ft/sec)	Energy (ft-lb)	Bounce
50%	8.07	782	0.12
75%	10.58	1319	5.9
90%	12.84	1802	11.1
95%	14.19	2092	14.22
98%	15.71	2418	17.73

Velocity (ft/sec)	Bounce Height (ft)	Kinetic Energy (ft-lb)
Maximum: 18.83	Maximum: 1.12	Maximum: 3977
Average: 8.07	Average: .32	Average: 782
Minimum: 2.79	G. Mean: .12	Std. Dev.: 795
Std. Dev.: 3.71	Std. Dev.: 8.56	

Remarks:

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Velocity Units: ft/sec Bounce Height Units: ft

Cell #	Max. Vel.	Avg. Vel.	S.D. Vel.	Max. Bounce Ht.	Avg. Bounce Ht.
1	43	32	5.02	6	2
2	59	46	5.29	15	4
3	70	52	6.91	12	4
4	81	63	7.08	22	10
5	76	24	17.87	9	0
6	20	8	3.72	1	0
7	19	8	3.71	1	0

CRSP Rocks Stopped Data - M:\proj\0121\3070.03\Cut Slope Designs\CRSP
Analyses\Phase III CRSP Analyses\Cut 1 STA 54+11.25\Left LT-Max.doc

X Interval	Rocks Stopped
0 To 10 ft	0
10 To 20 ft	0
20 To 30 ft	0
30 To 40 ft	0
40 To 50 ft	0
50 To 60 ft	0
60 To 70 ft	0
70 To 80 ft	0
80 To 90 ft	0
90 To 100 ft	0
100 To 110 ft	2
110 To 120 ft	270
120 To 130 ft	199
130 To 131.8 ft	1

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Input File Specifications

Units of Measure: U.S.
Total Number of Cells: 11
Analysis Point 1 X-Coordinate: 126.8
Analysis Point 2 X-Coordinate: 131.8
Analysis Point 3 X-Coordinate: 0
Initial Y-Top Starting Zone Coordinate: 141.7
Initial Y-Base Starting Zone Coordinate: 131.7

Remarks:

Cell Data

Cell No.	S.R.	Tang. C.	Norm. C.	Begin X	Begin Y	End X	End Y
1	0.14	.75	.18	0	141.7	23.9	125.8
2	0.12	.85	.2	23.9	125.8	40.7	92.1
3	.12	.85	.2	40.7	92.1	45.7	92.1
4	.12	.85	.2	45.7	92.1	60.7	62.1
5	.12	.85	.2	60.7	62.1	65.7	62.1
6	.12	.85	.2	65.7	62.1	80.7	32.1
7	.12	.85	.2	80.7	32.1	85.7	32.1
8	.12	.85	.2	85.7	32.1	101.8	0
9	.12	.85	.2	101.8	0	111.8	0
10	.12	.85	.2	111.8	0	126.8	5
11	.12	.85	.2	126.8	5	131.8	5.4

CRSP Simulation Specifications: Used with M:\proj\0121\3070.03\Cut Slope Designs\CRSP Analyses\Phase III CRSP Analyses\Cut 1 STA 54+11.25\Left NC-Avg.doc

Total Number of Rocks Simulated: 500
Starting Velocity in X-Direction: 1 ft/sec
Starting Velocity in Y-Direction: -1 ft/sec
Starting Cell Number: 1
Ending Cell Number: 11
Rock Density: 155 lb/ft³
Rock Shape: Discoidal
Diameter: 1.0 ft
Thickness: 1.0 ft

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Analysis Point 1: X = 126.8, Y = 5

Total Rocks Passing Analysis Point: 4

Cumulative Probability Ht. (ft)	Velocity (ft/sec)	Energy (ft-lb)	Bounce
50%	6.14	133	0.01
75%	6.14	133	0.69
90%	6.14	133	1.3
95%	6.14	133	1.66
98%	6.14	133	2.07

Velocity (ft/sec)	Bounce Height (ft)	Kinetic Energy (ft-lb)
Maximum: 10.57	Maximum: .06	Maximum: 319
Average: 6.14	Average: .02	Average: 133
Minimum: 2.9	G. Mean: .01	Std. Dev.: 0
Std. Dev.: 0	Std. Dev.: 1	

Remarks:

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Analysis Point 2: X = 131.8, Y = 5

Total Rocks Passing Analysis Point: 1

Cumulative Probability Ht. (ft)	Velocity (ft/sec)	Energy (ft-lb)	Bounce
50%	7.58	166	0
75%	7.58	166	0.68
90%	7.58	166	1.28
95%	7.58	166	1.65
98%	7.58	166	2.06

Velocity (ft/sec)	Bounce Height (ft)	Kinetic Energy (ft-lb)
Maximum: 7.58	Maximum: 0	Maximum: 165
Average: 7.58	Average: -.01	Average: 165
Minimum: 7.58	G. Mean: 0	Std. Dev.: 0
Std. Dev.: 0	Std. Dev.: 1	

Remarks:

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Velocity Units: ft/sec Bounce Height Units: ft

Cell #	Max. Vel.	Avg. Vel.	S.D. Vel.	Max. Bounce Ht.	Avg. Bounce Ht.
1	22	16	2.92	1	0
2	50	41	4.76	12	2
3	25	14	4.98	1	0
4	45	36	3.32	24	10
5	47	26	15.34	19	4
6	65	45	10.56	24	6
7	66	21	15.88	14	1
8	80	40	8.67	26	9
9	50	21	14.07	16	1
10	11	6	0	0	0
11	8	8	0	0	-1

CRSP Rocks Stopped Data - M:\proj\0121\3070.03\Cut Slope Designs\CRSP
Analyses\Phase III CRSP Analyses\Cut 1 STA 54+11.25\Left NC-Avg.doc

X Interval	Rocks Stopped
0 To 10 ft	185
10 To 20 ft	165
20 To 30 ft	3
30 To 40 ft	0
40 To 50 ft	2
50 To 60 ft	0
60 To 70 ft	2
70 To 80 ft	0
80 To 90 ft	2
90 To 100 ft	0
100 To 110 ft	7
110 To 120 ft	96
120 To 130 ft	36
130 To 131.8 ft	1

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Input File Specifications

Units of Measure: U.S.
Total Number of Cells: 7
Analysis Point 1 X-Coordinate: 111.9
Analysis Point 2 X-Coordinate: 116.9
Analysis Point 3 X-Coordinate:
Initial Y-Top Starting Zone Coordinate: 126.6
Initial Y-Base Starting Zone Coordinate: 116.6

Remarks:

Cell Data

Cell No.	S.R.	Tang. C.	Norm. C.	Begin X	Begin Y	End X	End Y
1	.5	.68	.15	0	132.3	8.6	126.6
2	.3	.8	.18	8.6	126.6	70.6	32.6
3	.3	.8	.18	70.6	32.6	86.9	0
4	.3	.8	.2	86.9	0	96.9	0
5	.3	.8	.2	96.9	0	111.9	5
6	.3	.8	.2	111.9	5	116.9	5.4
7	.3	.8	.2	116.9	5.4	122.9	5.7

CRSP Simulation Specifications: Used with M:\proj\0121\3070.03\Cut Slope Designs\CRSP Analyses\Phase III CRSP Analyses\Cut 1 Sta 54+50\Left weathered Max.dat

Total Number of Rocks Simulated: 500
Starting Velocity in X-Direction: 1 ft/sec
Starting Velocity in Y-Direction: -1 ft/sec
Starting Cell Number: 1
Ending Cell Number: 7
Rock Density: 155 lb/ft³
Rock Shape: Discoidal
Diameter: 1.5 ft
Thickness: 1.5 ft

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Analysis Point 1: X = 111.9, Y = 5

Total Rocks Passing Analysis Point: 33

Cumulative Probability Ht. (ft)	Velocity (ft/sec)	Energy (ft-lb)	Bounce
50%	8.56	954	0.06
75%	11.35	1527	2.47
90%	13.85	2042	4.63
95%	15.35	2351	5.93
98%	17.04	2698	7.39

Velocity (ft/sec)	Bounce Height (ft)	Kinetic Energy (ft-lb)
Maximum: 18.53	Maximum: .65	Maximum: 3314
Average: 8.56	Average: .12	Average: 954
Minimum: 1.97	G. Mean: .06	Std. Dev.: 848
Std. Dev.: 4.12	Std. Dev.: 3.56	

Remarks:

Cut 1 Sta 54+50\Left weathered Max.dat

Analysis Point 2: X = 116.9, Y = 5

Total Rocks Passing Analysis Point: 15

Cumulative Probability Ht. (ft)	Velocity (ft/sec)	Energy (ft-lb)	Bounce
50%	9.24	1035	0.04
75%	11.82	1592	7.28
90%	14.15	2093	13.78
95%	15.54	2395	17.69
98%	17.11	2732	22.08

Velocity (ft/sec)	Bounce Height (ft)	Kinetic Energy (ft-lb)
Maximum: 16.09	Maximum: 2.11	Maximum: 2669
Average: 9.24	Average: .26	Average: 1035
Minimum: 4.32	G. Mean: .04	Std. Dev.: 825
Std. Dev.: 3.83	Std. Dev.: 10.72	

Remarks:

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Velocity Units: ft/sec Bounce Height Units: ft

Cell #	Max. Vel.	Avg. Vel.	S.D. Vel.	Max. Bounce Ht.	Avg. Bounce Ht.	
1	No rocks	past end of cell				
2	68	52	6.17	12	4	
3	81	64	7.48	22	10	
4	72	25	18.88	8	0	
5	19	9	4.12	1	0	
6	16	9	3.83	2	0	
7	13	9	2.86	0	0	

CRSP Rocks Stopped Data - M:\proj\0121\3070.03\Cut Slope Designs\CRSP
Analyses\Phase III CRSP Analyses\Cut 1 Sta 54+50\Left weathered Max.dat

X Interval	Rocks Stopped
0 To 10 ft	1
10 To 20 ft	0
20 To 30 ft	0
30 To 40 ft	0
40 To 50 ft	0
50 To 60 ft	0
60 To 70 ft	0
70 To 80 ft	0
80 To 90 ft	4
90 To 100 ft	100
100 To 110 ft	338
110 To 120 ft	48
120 To 122.9 ft	2

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Input File Specifications

Units of Measure: U.S.
Total Number of Cells: 7
Analysis Point 1 X-Coordinate: 111.9
Analysis Point 2 X-Coordinate: 116.9
Analysis Point 3 X-Coordinate:
Initial Y-Top Starting Zone Coordinate: 126.6
Initial Y-Base Starting Zone Coordinate: 116.6

Remarks:

Cell Data

Cell No.	S.R.	Tang. C.	Norm. C.	Begin X	Begin Y	End X	End Y
1	.5	.68	.15	0	132.3	8.6	126.6
2	.3	.8	.18	8.6	126.6	70.6	32.6
3	.3	.8	.18	70.6	32.6	86.9	0
4	.3	.8	.2	86.9	0	96.9	0
5	.3	.8	.2	96.9	0	111.9	5
6	.3	.8	.2	111.9	5	116.9	5.4
7	.3	.8	.2	116.9	5.4	122.9	5.7

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Total Number of Rocks Simulated: 500
Starting Velocity in X-Direction: 1 ft/sec
Starting Velocity in Y-Direction: -1 ft/sec
Starting Cell Number: 1
Ending Cell Number: 7
Rock Density: 155 lb/ft³
Rock Shape: Discoidal
Diameter: 1.5 ft
Thickness: 1.5 ft

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Analysis Point 1: X = 111.9, Y = 5

Total Rocks Passing Analysis Point: 29

Cumulative Probability Ht. (ft)	Velocity (ft/sec)	Energy (ft-lb)	Bounce
50%	7.59	801	0.02
75%	9.98	1310	9.64
90%	12.13	1768	18.3
95%	13.42	2043	23.49
98%	14.87	2351	29.33

Velocity (ft/sec)	Bounce Height (ft)	Kinetic Energy (ft-lb)
Maximum: 16.4	Maximum: .94	Maximum: 3291
Average: 7.59	Average: .15	Average: 801
Minimum: 2.39	G. Mean: .02	Std. Dev.: 753
Std. Dev.: 3.54	Std. Dev.: 14.25	

Remarks:

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Analysis Point 2: X = 116.9, Y = 5

Total Rocks Passing Analysis Point: 11

Cumulative Probability Ht. (ft)	Velocity (ft/sec)	Energy (ft-lb)	Bounce
50%	8.37	800	0.03
75%	10.69	1197	5.23
90%	12.78	1553	9.9
95%	14.03	1768	12.71
98%	15.44	2008	15.85

Velocity (ft/sec)	Bounce Height (ft)	Kinetic Energy (ft-lb)
Maximum: 13.26	Maximum: .47	Maximum: 1792
Average: 8.37	Average: .11	Average: 800
Minimum: 3.68	G. Mean: .03	Std. Dev.: 587
Std. Dev.: 3.44	Std. Dev.: 7.69	

Remarks:

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Velocity Units: ft/sec Bounce Height Units: ft

Cell #	Max. Vel.	Avg. Vel.	S.D. Vel.	Max. Bounce Ht.	Avg. Bounce Ht.
1	No rocks	past end of cell			
2	67	53	6.11	12	4
3	79	64	7.35	22	9
4	73	25	18.74	8	0
5	16	8	3.54	1	0
6	13	8	3.44	0	0
7	11	7	3.51	0	0

CRSP Rocks Stopped Data - M:\proj\0121\3070.03\Cut Slope Designs\CRSP
Analyses\Phase III CRSP Analyses\Cut 1 Sta 54+50\Left weathered Max- pass.doc

X Interval	Rocks Stopped
0 To 10 ft	1
10 To 20 ft	0
20 To 30 ft	0
30 To 40 ft	0
40 To 50 ft	0
50 To 60 ft	0
60 To 70 ft	0
70 To 80 ft	0
80 To 90 ft	1
90 To 100 ft	89
100 To 110 ft	345
110 To 120 ft	57
120 To 122.9 ft	2

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Input File Specifications

Units of Measure: U.S.
Total Number of Cells: 6
Analysis Point 1 X-Coordinate: 101.1
Analysis Point 2 X-Coordinate: 106.1
Analysis Point 3 X-Coordinate:
Initial Y-Top Starting Zone Coordinate: 96.5
Initial Y-Base Starting Zone Coordinate: 86.5

Remarks:

Cell Data

Cell No.	S.R.	Tang. C.	Norm. C.	Begin X	Begin Y	End X	End Y
1	0.28	.68	.15	0	96.5	38.9	64.3
2	0.21	.8	.18	38.9	64.3	58.9	34.3
3	0.21	.8	.18	58.9	34.3	76.1	0
4	0.21	.8	.2	76.1	0	86.1	0
5	0.21	.8	.2	86.1	0	101.1	5
6	0.21	.8	.2	101.1	5	106.1	5.4

CRSP Simulation Specifications: Used with M:\proj\0121\3070.03\Cut Slope Designs\CRSP Analyses\Phase III CRSP Analyses\Cut 1 Sta 58+00.00\Right LT-Avg.doc

Total Number of Rocks Simulated: 500
Starting Velocity in X-Direction: 1 ft/sec
Starting Velocity in Y-Direction: -1 ft/sec
Starting Cell Number: 1
Ending Cell Number: 6
Rock Density: 155 lb/ft³
Rock Shape: Discoidal
Diameter: 1 ft
Thickness: 1 ft

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Analysis Point 1: X = 101.1, Y = 5

Total Rocks Passing Analysis Point: 20

Cumulative Probability Ht. (ft)	Velocity (ft/sec)		Energy (ft-lb)	Bounce
50%	7.3	210	0.07	
75%	9.22	316	4.44	
90%	10.94	412	8.38	
95%	11.98	469	10.74	
98%	13.14	533	13.38	

Velocity (ft/sec)	Bounce Height (ft)		Kinetic Energy (ft-lb)
Maximum: 13.48	Maximum: .79	Maximum: 657	
Average: 7.3	Average: .18	Average: 210	
Minimum: 2.39	G. Mean: .07	Std. Dev.: 157	
Std. Dev.: 2.84	Std. Dev.: 6.47		

Remarks:

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Analysis Point 2: X = 106.1, Y = 5

Total Rocks Passing Analysis Point: 7

Cumulative Probability Ht. (ft)	Velocity (ft/sec)		Energy (ft-lb)	Bounce
50%	7.44	171	0.01	
75%	8.67	227	9.04	
90%	9.78	278	17.15	
95%	10.44	308	22.02	
98%	11.19	342	27.49	

Velocity (ft/sec)	Bounce Height (ft)		Kinetic Energy (ft-lb)
Maximum: 10.84	Maximum: .28	Maximum: 334	
Average: 7.44	Average: .08	Average: 171	
Minimum: 4.88	G. Mean: .01	Std. Dev.: 83	
Std. Dev.: 1.82	Std. Dev.: 13.36		

Remarks:

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Velocity Units: ft/sec Bounce Height Units: ft

Cell #	Max. Vel.	Avg. Vel.	S.D. Vel.	Max. Bounce Ht.	Avg. Bounce Ht.
1	33	24	3.06	3	0
2	52	41	5.3	13	3
3	69	53	6.54	18	7
4	63	16	9.12	4	0
5	13	7	2.84	1	0
6	11	7	1.82	0	0

CRSP Rocks Stopped Data - M:\proj\0121\3070.03\Cut Slope Designs\CRSP
Analyses\Phase III CRSP Analyses\Cut 1 Sta 58+00.00\Right LT-Avg.doc

X Interval	Rocks Stopped
0 To 10 ft	0
10 To 20 ft	0
20 To 30 ft	0
30 To 40 ft	0
40 To 50 ft	0
50 To 60 ft	0
60 To 70 ft	0
70 To 80 ft	10
80 To 90 ft	148
90 To 100 ft	312
100 To 106.1 ft	23

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Input File Specifications

Units of Measure: U.S.
Total Number of Cells: 6
Analysis Point 1 X-Coordinate: 101.1
Analysis Point 2 X-Coordinate: 106.1
Analysis Point 3 X-Coordinate:
Initial Y-Top Starting Zone Coordinate: 96.5
Initial Y-Base Starting Zone Coordinate: 86.5

Remarks:

Cell Data

Cell No.	S.R.	Tang. C.	Norm. C.	Begin X	Begin Y	End X	End Y
1	.5	.68	.15	0	96.5	38.9	64.3
2	.3	.8	.18	38.9	64.3	58.9	34.3
3	.3	.8	.18	58.9	34.3	76.1	0
4	.3	.8	.2	76.1	0	86.1	0
5	.3	.8	.2	86.1	0	101.1	5
6	.1	.9	.9	101.1	5	106.1	5.4

CRSP Simulation Specifications: Used with M:\proj\0121\3070.03\Cut Slope Designs\CRSP Analyses\Phase III CRSP Analyses\Cut 1 Sta 58+00.00\Right LT-Max.doc

Total Number of Rocks Simulated: 500
Starting Velocity in X-Direction: 1 ft/sec
Starting Velocity in Y-Direction: -1 ft/sec
Starting Cell Number: 1
Ending Cell Number: 6
Rock Density: 155 lb/ft³
Rock Shape: Discoidal
Diameter: 1.5 ft
Thickness: 1.5 ft

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Analysis Point 1: X = 101.1, Y = 5

Total Rocks Passing Analysis Point: 14

Cumulative Probability Ht. (ft)	Velocity (ft/sec)	Energy (ft-lb)	Bounce
50%	9.27	1128	0.05
75%	12.35	1734	7.66
90%	15.12	2279	14.51
95%	16.78	2607	18.62
98%	18.65	2974	23.23

Velocity (ft/sec)	Bounce Height (ft)	Kinetic Energy (ft-lb)
Maximum: 17.25	Maximum: .72	Maximum: 2926
Average: 9.27	Average: .18	Average: 1128
Minimum: 3.33	G. Mean: .05	Std. Dev.: 897
Std. Dev.: 4.56	Std. Dev.: 11.28	

Remarks:

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Analysis Point 2: X = 106.1, Y = 5

Total Rocks Passing Analysis Point: 10

Cumulative Probability Ht. (ft)	Velocity (ft/sec)	Energy (ft-lb)	Bounce
50%	10.33	1174	0.19
75%	12.72	1682	3.19
90%	14.87	2139	5.89
95%	16.16	2413	7.51
98%	17.61	2721	9.33

Velocity (ft/sec)	Bounce Height (ft)	Kinetic Energy (ft-lb)
Maximum: 15.22	Maximum: .98	Maximum: 2504
Average: 10.33	Average: .41	Average: 1174
Minimum: 5.11	G. Mean: .19	Std. Dev.: 752
Std. Dev.: 3.54	Std. Dev.: 4.44	

Remarks:

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Velocity Units: ft/sec Bounce Height Units: ft

Cell #	Max. Vel.	Avg. Vel.	S.D. Vel.	Max. Bounce Ht.	Avg. Bounce Ht.
1	32	23	3.47	4	1
2	52	40	5.34	12	2
3	68	53	5.88	18	7
4	59	15	6.78	3	0
5	17	9	4.56	1	0
6	15	10	3.54	1	0

CRSP Rocks Stopped Data - M:\proj\0121\3070.03\Cut Slope Designs\CRSP
Analyses\Phase III CRSP Analyses\Cut 1 Sta 58+00.00\Right LT-Max.doc

X Interval	Rocks Stopped
0 To 10 ft	2
10 To 20 ft	0
20 To 30 ft	0
30 To 40 ft	0
40 To 50 ft	0
50 To 60 ft	0
60 To 70 ft	0
70 To 80 ft	2
80 To 90 ft	146
90 To 100 ft	325
100 To 106.1 ft	15

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Input File Specifications

Units of Measure: U.S.
Total Number of Cells: 9
Analysis Point 1 X-Coordinate: 101.1
Analysis Point 2 X-Coordinate: 106.1
Analysis Point 3 X-Coordinate:
Initial Y-Top Starting Zone Coordinate: 96.5
Initial Y-Base Starting Zone Coordinate: 86.5

Remarks:

Cell Data

Cell No.	S.R.	Tang. C.	Norm. C.	Begin X	Begin Y	End X	End Y
1	0.14	.75	.18	0	96.5	26.7	78.7
2	0.12	.85	.2	26.7	78.7	33.9	64.3
3	0.12	.85	.2	33.9	64.3	38.9	64.3
4	.12	.85	.2	38.9	64.3	53.9	34.3
5	.12	.85	.2	53.9	34.3	58.9	34.3
6	.12	.85	.2	58.9	34.3	76.1	0
7	.12	.85	.2	76.1	0	86.1	0
8	.12	.85	.2	86.1	0	101.1	5
9	.12	.85	.2	101.1	5	106.1	5.4

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Total Number of Rocks Simulated: 500
Starting Velocity in X-Direction: 1 ft/sec
Starting Velocity in Y-Direction: -1 ft/sec
Starting Cell Number: 1
Ending Cell Number: 9
Rock Density: 155 lb/ft³
Rock Shape: Discoidal
Diameter: 1.0 ft
Thickness: 1.0 ft

CRSP Analysis Point 1 Data - M:\proj\0121\3070.03\Cut Slope Designs\CRSP
Analyses\Phase III CRSP Analyses\Cut 1 Sta 58+00.00\Right NC-Avg.doc

Analysis Point 1: X = 101.1, Y = 5

NO ROCKS PAST ANALYSIS POINT 1

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Analysis Point 2: X = 106.1, Y = 5

NO ROCKS PAST ANALYSIS POINT 2

CRSP Data Collected at End of Each Cell - M:\proj\0121\3070.03\Cut Slope Designs\CRSP Analyses\Phase III CRSP Analyses\Cut 1 Sta 58+00.00\Right NC-Avg.doc

Velocity Units: ft/sec Bounce Height Units: ft

Cell #	Max. Vel.	Avg. Vel.	S.D. Vel.	Max. Bounce Ht.	Avg. Bounce Ht.
1	23	18	2.63	1	0
2	35	30	2.41	10	5
3	36	13	8.31	3	0
4	51	38	4.77	19	3
5	46	15	6.86	9	0
6	57	39	4.49	26	9
7	51	16	11.97	10	0
8	No rocks	past end of cell			
9	No rocks	past end of cell			

CRSP Rocks Stopped Data - M:\proj\0121\3070.03\Cut Slope Designs\CRSP Analyses\Phase III CRSP Analyses\Cut 1 Sta 58+00.00\Right NC-Avg.doc

X Interval	Rocks Stopped
0 To 10 ft	161
10 To 20 ft	169
20 To 30 ft	3
30 To 40 ft	5
40 To 50 ft	0
50 To 60 ft	13
60 To 70 ft	0
70 To 80 ft	1
80 To 90 ft	83
90 To 100 ft	65
100 To 106.1 ft	0

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Input File Specifications

Units of Measure: U.S.
Total Number of Cells: 9
Analysis Point 1 X-Coordinate: 101.1
Analysis Point 2 X-Coordinate: 106.1
Analysis Point 3 X-Coordinate:
Initial Y-Top Starting Zone Coordinate: 96.5
Initial Y-Base Starting Zone Coordinate: 86.5

Remarks:

Cell Data

Cell No.	S.R.	Tang. C.	Norm. C.	Begin X	Begin Y	End X	End Y
1	.25	.75	.18	0	96.5	26.7	78.7
2	.15	.85	.2	26.7	78.7	33.9	64.3
3	.15	.85	.2	33.9	64.3	38.9	64.3
4	.15	.85	.2	38.9	64.3	53.9	34.3
5	.15	.85	.2	53.9	34.3	58.9	34.3
6	.15	.85	.2	58.9	34.3	76.1	0
7	.15	.85	.2	76.1	0	86.1	0
8	.15	.85	.2	86.1	0	101.1	5
9	.1	.9	.9	101.1	5	106.1	5.4

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Total Number of Rocks Simulated: 500
Starting Velocity in X-Direction: 1 ft/sec
Starting Velocity in Y-Direction: -1 ft/sec
Starting Cell Number: 1
Ending Cell Number: 9
Rock Density: 155 lb/ft³
Rock Shape: Discoidal
Diameter: 1.5 ft
Thickness: 1.5 ft

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Analysis Point 1: X = 101.1, Y = 5

Total Rocks Passing Analysis Point: 2

Cumulative Probability Ht. (ft)	Velocity (ft/sec)		Energy (ft-lb)	Bounce
50%	7.77	724	0.09	
75%	7.77	724	0.76	
90%	7.77	724	1.37	
95%	7.77	724	1.73	
98%	7.77	724	2.14	

Velocity (ft/sec)	Bounce Height (ft)		Kinetic Energy (ft-lb)
Maximum: 10.59	Maximum: .25	Maximum: 1205	
Average: 7.77	Average: .14	Average: 724	
Minimum: 4.96	G. Mean: .09	Std. Dev.: 0	
Std. Dev.: 0	Std. Dev.: 1		

Remarks:

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Analysis Point 2: X = 106.1, Y = 5

Total Rocks Passing Analysis Point: 1

Cumulative Probability Ht. (ft)	Velocity (ft/sec)		Energy (ft-lb)	Bounce
50%	10.59	1070	0.06	
75%	10.59	1070	0.74	
90%	10.59	1070	1.35	
95%	10.59	1070	1.71	
98%	10.59	1070	2.12	

Velocity (ft/sec)	Bounce Height (ft)		Kinetic Energy (ft-lb)
Maximum: 10.59	Maximum: .06	Maximum: 1070	
Average: 10.59	Average: .06	Average: 1070	
Minimum: 10.59	G. Mean: .06	Std. Dev.: 0	
Std. Dev.: 0	Std. Dev.: 1		

Remarks:

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Velocity Units: ft/sec Bounce Height Units: ft

Cell #	Max. Vel.	Avg. Vel.	S.D. Vel.	Max. Bounce Ht.	Avg. Bounce Ht.
1	24	18	2.3	1	0
2	36	30	2.58	11	5
3	38	14	8.64	5	0
4	56	38	4.76	17	2
5	46	15	6.23	7	0
6	57	39	3.71	26	10
7	51	15	11.92	11	0
8	11	8	0	0	0
9	11	11	0	0	0

CRSP Rocks Stopped Data - M:\proj\0121\3070.03\Cut Slope Designs\CRSP
Analyses\Phase III CRSP Analyses\Cut 1 Sta 58+00.00\Right NC-Max.doc

X Interval	Rocks Stopped
0 To 10 ft	0
10 To 20 ft	1
20 To 30 ft	0
30 To 40 ft	0
40 To 50 ft	0
50 To 60 ft	17
60 To 70 ft	0
70 To 80 ft	0
80 To 90 ft	279
90 To 100 ft	201
100 To 106.1 ft	1

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Input File Specifications

Units of Measure: U.S.
Total Number of Cells: 8
Analysis Point 1 X-Coordinate: 177
Analysis Point 2 X-Coordinate: 182
Analysis Point 3 X-Coordinate:
Initial Y-Top Starting Zone Coordinate: 139.1
Initial Y-Base Starting Zone Coordinate: 129.1

Remarks:

Cell Data

Cell No.	S.R.	Tang. C.	Norm. C.	Begin X	Begin Y	End X	End Y
1	.28	.68	.15	0	139.1	51.2	110.6
2	.3	.6	.15	51.2	110.6	72.2	100.1
3	.28	.68	.15	72.2	100.1	119.2	55.6
4	.21	.8	.18	119.2	55.6	139.2	25.6
5	.21	.8	.18	139.2	25.6	152	0
6	.21	.8	.2	152	0	162	0
7	.21	.8	.2	162	0	177	5
8	.21	.8	.2	177	5	182	5.4

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Total Number of Rocks Simulated: 500
Starting Velocity in X-Direction: 1 ft/sec
Starting Velocity in Y-Direction: -1 ft/sec
Starting Cell Number: 1
Ending Cell Number: 8
Rock Density: 155 lb/ft³
Rock Shape: Discoidal
Diameter: 1.0 ft
Thickness: 1.0 ft

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Analysis Point 1: X = 177, Y = 5

Total Rocks Passing Analysis Point: 12

Cumulative Probability Ht. (ft)	Velocity (ft/sec)		Energy (ft-lb)	Bounce
50%	6.03	136	0.01	
75%	7.26	195	6.83	
90%	8.36	248	12.96	
95%	9.03	280	16.64	
98%	9.77	316	20.78	

Velocity (ft/sec)	Bounce Height (ft)	Kinetic Energy (ft-lb)	
Maximum: 10	Maximum: .24	Maximum: 350	
Average: 6.03	Average: .02	Average: 136	
Minimum: 3.67	G. Mean: .01	Std. Dev.: 87	
Std. Dev.: 1.82	Std. Dev.: 10.1		

Remarks:

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Analysis Point 2: X = 182, Y = 5

Total Rocks Passing Analysis Point: 1

Cumulative Probability Ht. (ft)	Velocity (ft/sec)		Energy (ft-lb)	Bounce
50%	5.36	79	0	
75%	5.36	79	0.68	
90%	5.36	79	1.28	
95%	5.36	79	1.65	
98%	5.36	79	2.06	

Velocity (ft/sec)	Bounce Height (ft)	Kinetic Energy (ft-lb)	
Maximum: 5.36	Maximum: 0	Maximum: 79	
Average: 5.36	Average: -.08	Average: 79	
Minimum: 5.36	G. Mean: 0	Std. Dev.: 0	
Std. Dev.: 0	Std. Dev.: 1		

Remarks:

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Velocity Units: ft/sec Bounce Height Units: ft

Cell #	Max. Vel.	Avg. Vel.	S.D. Vel.	Max. Bounce Ht.	Avg. Bounce Ht.
1	24	17	2.27	1	0
2	24	18	2.88	2	0
3	46	34	4.62	5	2
4	62	49	5.59	17	6
5	73	59	7.51	25	8
6	68	18	14	7	0
7	10	6	1.82	0	0
8	5	5	0	0	-1

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X Interval	Rocks Stopped
0 To 10 ft	137
10 To 20 ft	118
20 To 30 ft	0
30 To 40 ft	0
40 To 50 ft	0
50 To 60 ft	0
60 To 70 ft	0
70 To 80 ft	0
80 To 90 ft	0
90 To 100 ft	0
100 To 110 ft	0
110 To 120 ft	0
120 To 130 ft	0
130 To 140 ft	0
140 To 150 ft	0
150 To 160 ft	8
160 To 170 ft	173
170 To 180 ft	61
180 To 182 ft	2

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Input File Specifications

Units of Measure: U.S.
Total Number of Cells: 8
Analysis Point 1 X-Coordinate: 177
Analysis Point 2 X-Coordinate: 182
Analysis Point 3 X-Coordinate:
Initial Y-Top Starting Zone Coordinate: 139.1
Initial Y-Base Starting Zone Coordinate: 129.1

Remarks:

Cell Data

Cell No.	S.R.	Tang. C.	Norm. C.	Begin X	Begin Y	End X	End Y
1	.5	.68	.15	0	139.1	51.2	110.6
2	.6	.6	.15	51.2	110.6	72.2	100.1
3	.5	.68	.15	72.2	100.1	119.2	55.6
4	.3	.8	.18	119.2	55.6	139.2	25.6
5	.3	.8	.18	139.2	25.6	152	0
6	.3	.8	.2	152	0	162	0
7	.3	.8	.2	162	0	177	5
8	0.1	0.9	0.9	177	5	182	5.4

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Total Number of Rocks Simulated: 500
Starting Velocity in X-Direction: 1 ft/sec
Starting Velocity in Y-Direction: -1 ft/sec
Starting Cell Number: 1
Ending Cell Number: 8
Rock Density: 155 lb/ft³
Rock Shape: Discoidal
Diameter: 1.5 ft
Thickness: 1.5 ft

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Analysis Point 1: X = 177, Y = 5

Total Rocks Passing Analysis Point: 11

Cumulative Probability Ht. (ft)	Velocity (ft/sec)		Energy (ft-lb)	Bounce
50%	7.38	670	0.03	
75%	9.24	949	7.17	
90%	10.9	1200	13.59	
95%	11.9	1351	17.44	
98%	13.02	1520	21.77	

Velocity (ft/sec)	Bounce Height (ft)		Kinetic Energy (ft-lb)
Maximum: 11.49	Maximum: .46	Maximum: 1355	
Average: 7.38	Average: .11	Average: 670	
Minimum: 3.01	G. Mean: .03	Std. Dev.: 413	
Std. Dev.: 2.74	Std. Dev.: 10.57		

Remarks:

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Analysis Point 2: X = 182, Y = 5

Total Rocks Passing Analysis Point: 8

Cumulative Probability Ht. (ft)	Velocity (ft/sec)		Energy (ft-lb)	Bounce
50%	6.87	515	0.25	
75%	8.65	720	1.61	
90%	10.24	904	2.83	
95%	11.2	1015	3.56	
98%	12.28	1139	4.38	

Velocity (ft/sec)	Bounce Height (ft)		Kinetic Energy (ft-lb)
Maximum: 10.39	Maximum: .74	Maximum: 1052	
Average: 6.87	Average: .31	Average: 515	
Minimum: 1.61	G. Mean: .25	Std. Dev.: 303	
Std. Dev.: 2.63	Std. Dev.: 2.01		

Remarks:

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Velocity Units: ft/sec Bounce Height Units: ft

Cell #	Max. Vel.	Avg. Vel.	S.D. Vel.	Max. Bounce Ht.	Avg. Bounce Ht.
1	21	15	2.47	1	0
2	23	14	3.61	2	0
3	43	32	4.76	6	2
4	60	48	5.67	18	5
5	72	57	7.31	25	7
6	69	18	12.11	5	0
7	11	7	2.74	0	0
8	10	7	2.63	1	0

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X Interval	Rocks Stopped
0 To 10 ft	138
10 To 20 ft	113
20 To 30 ft	0
30 To 40 ft	0
40 To 50 ft	0
50 To 60 ft	0
60 To 70 ft	0
70 To 80 ft	0
80 To 90 ft	0
90 To 100 ft	0
100 To 110 ft	0
110 To 120 ft	0
120 To 130 ft	0
130 To 140 ft	0
140 To 150 ft	0
150 To 160 ft	10
160 To 170 ft	158
170 To 180 ft	72
180 To 182 ft	1

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Input File Specifications

Units of Measure: U.S.
Total Number of Cells: 12
Analysis Point 1 X-Coordinate: 177
Analysis Point 2 X-Coordinate: 182
Analysis Point 3 X-Coordinate:
Initial Y-Top Starting Zone Coordinate: 139.1
Initial Y-Base Starting Zone Coordinate: 129.1

Remarks:

Cell Data

Cell No.	S.R.	Tang. C.	Norm. C.	Begin X	Begin Y	End X	End Y
1	.14	.75	.18	0	139.1	41.2	111.6
2	.14	.75	.18	41.2	111.6	51.2	110.6
3	.15	.75	.18	51.2	110.6	72.2	100.1
4	.14	.75	.18	72.2	100.1	111.7	60.6
5	.12	.85	.2	111.7	60.6	114.2	55.6
6	.12	.85	.2	114.2	55.6	119.2	55.6
7	.12	.85	.2	119.2	55.6	134.2	25.6
8	.12	.85	.2	134.2	25.6	139.2	25.6
9	.12	.85	.2	139.2	25.6	152	0
10	.12	.85	.2	152	0	162	0
11	.12	.85	.2	162	0	177	5
12	.12	.85	.2	177	5	182	5.4

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Total Number of Rocks Simulated: 500
Starting Velocity in X-Direction: 1 ft/sec
Starting Velocity in Y-Direction: -1 ft/sec
Starting Cell Number: 1
Ending Cell Number: 12
Rock Density: 155 lb/ft³
Rock Shape: Discoidal
Diameter: 1.0 ft
Thickness: 1.0 ft

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Analysis Point 1: X = 177, Y = 5

Total Rocks Passing Analysis Point: 3

Cumulative Probability Ht. (ft)	Velocity (ft/sec)	Energy (ft-lb)	Bounce
50%	8.07	245	0.01
75%	8.07	245	0.68
90%	8.07	245	1.29
95%	8.07	245	1.65
98%	8.07	245	2.06

Velocity (ft/sec)	Bounce Height (ft)	Kinetic Energy (ft-lb)
Maximum: 10.48	Maximum: .08	Maximum: 371
Average: 8.07	Average: 0	Average: 245
Minimum: 4.1 G. Mean: .01	Std. Dev.: 0	
Std. Dev.: 0	Std. Dev.: 1	

Remarks:

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Analysis Point 2: X = 182, Y = 5

Total Rocks Passing Analysis Point: 2

Cumulative Probability Ht. (ft)	Velocity (ft/sec)	Energy (ft-lb)	Bounce
50%	7.61	168	0.01
75%	7.61	168	0.68
90%	7.61	168	1.29
95%	7.61	168	1.65
98%	7.61	168	2.06

Velocity (ft/sec)	Bounce Height (ft)	Kinetic Energy (ft-lb)
Maximum: 8.32	Maximum: .06	Maximum: 201
Average: 7.61	Average: .02	Average: 168
Minimum: 6.9 G. Mean: .01	Std. Dev.: 0	
Std. Dev.: 0	Std. Dev.: 1	

Remarks:

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Velocity Units: ft/sec Bounce Height Units: ft

Cell #	Max. Vel.	Avg. Vel.	S.D. Vel.	Max. Bounce Ht.	Avg. Bounce Ht.
1	29	23	2.02	1	0
2	22	17	2.14	1	0
3	28	23	2.09	1	0
4	47	40	2.93	3	1
5	50	42	3.17	6	3
6	45	25	7.64	1	0
7	59	34	9.07	28	22
8	63	39	8.88	25	16
9	75	53	8.28	38	20
10	64	34	23.54	24	5
11	10	8	0	0	0
12	8	8	0	0	0

Cut 2 Sta 103+00\Left NC - Avg.dat

X Interval	Rocks Stopped
0 To 10 ft	159
10 To 20 ft	140
20 To 30 ft	5
30 To 40 ft	0
40 To 50 ft	0
50 To 60 ft	0
60 To 70 ft	0
70 To 80 ft	0
80 To 90 ft	0
90 To 100 ft	0
100 To 110 ft	0
110 To 120 ft	0
120 To 130 ft	0
130 To 140 ft	0
140 To 150 ft	0
150 To 160 ft	2
160 To 170 ft	155
170 To 180 ft	37
180 To 182 ft	0

APPENDIX C

ODOT General Earthwork Design Checklist - Centerline Cuts Checklist

III.A. Centerline Cuts Checklist

C-R-S: SCI-823-0.00 (Stage 1)	PID: 77366	Reviewer: B. Mott/E. Tse	Date: 11-16-07
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If you do not have a centerline cut on the project, you do not have to fill out this checklist.

Soil Cuts	
<u>Y</u> N X 1	Does drilling provide continuous stratigraphic sections for the range of elevations that represent proposed cut slope areas?
<u>Y</u> N X 2	Do the cut slopes have a minimum stability F.S. of 1.30 and are not steeper than 2:1? Check stability calculation method used: <input checked="" type="checkbox"/> STABL or equivalent software <input type="checkbox"/> hand calculations
<u>Y</u> N X 3	If there is a "red bed" or other historically unstable soil or rock layer through the cut slopes, was this layer considered as a possible failure zone?
Y N <u>X</u> 4	Have erosion protection measures been addressed for backslopes, side slopes, and ditches (including riprap recommendations or special slope treatments)?
Y N <u>X</u> 5	Have issues related to any special usage of excavated soils been addressed?
	6 If the cut is not completely above the water table,
Y N <u>X</u>	a Did the design consider the construction or long term ramifications of cutting below the water table?
Y N <u>X</u>	b Did the design consider additional drainage in the cut slope (springs / seeps) and roadway base?
Rock Slopes	
<i>For rockfall and additional design considerations, see the "Rockfall Corrections Checklist."</i>	
<u>Y</u> N X 7	Has the subsurface exploration adequately characterized the rock in accordance with the <u>Geotechnical Bulletin 3: Rock Cut Slope and Catchment Design (GB 3)?</u>
<u>Y</u> N X 8	Have the slope angles, benching scheme, rockfall catchment design, and drainage controls been determined as prescribed in GB 3?
<u>Y</u> N X 9	In accordance with GB 3, are the rock cut slopes, benches, and catchment areas indicated on all appropriate cross-sections?

III.A. Centerline Cuts Checklist

Y	N	<input checked="" type="checkbox"/>	10	In accordance with GB 3, has the rockfall catchment software analysis output and the cost analysis comparing catchment configurations been provided?
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Notes:

Stage 1: