

CONSTRUCTION QUALITY ASSURANCE PLAN
for
UNIT 1 FINAL COVER MAINTENANCE
McCourtney Road Landfill
Nevada County, California

Prepared for:
County of Nevada
Public Works Department
Solid Waste Division
950 Maidu Avenue
Nevada City, California 95959

Prepared by:
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Project No. 4142-01
February 2017

Project No. 4142-01
February 1, 2017

County of Nevada
Public Works Department, Solid Waste Division
950 Maidu Avenue
Nevada City, California 95959

Attention: David Garcia, Solid Waste Program Manager

Reference: ***Unit 1 Final Cover Maintenance***
McCourtney Road Landfill
Nevada County, California

Subject: ***Construction Quality Assurance Plan***

Dear Mr. Garcia:

Holdrege & Kull (H&K) prepared this Construction Quality Assurance (CQA) Plan to outline procedures for repair of settlement-related sags at ten locations on the final cover of the Old Landfill Mass (OLM), located within Closed Landfill Unit 1 at the McCourtney Road Landfill (MRL). The ten repair areas measure approximately 18,200 square feet in total.

Nine of the proposed repair areas are located on the landfill deck, having slopes no steeper than 5:1, horizontal to vertical. Liner components for the landfill deck include, from top to bottom:

- Vegetative cover (native grass mix);
- 6 inches topsoil;
- 12 inches of compacted vegetative soil;
- Geosynthetic clay liner (GCL); and
- 24 inches of compacted foundation layer soil covering the waste.

One of the proposed repair areas is located on the landfill slope, having slopes no steeper than 3:1, horizontal to vertical. Liner components for the landfill slope in this area include:

- Vegetative cover (native grass mix);
- 6 inches topsoil;
- 6 inches of compacted vegetative soil;

- 12 inches low-permeability clay layer; and
- 24 inches of compacted foundation layer soil covering the waste.

TECHNICAL SPECIFICATIONS

Technical Specifications (H&K; February 2017) are presented under separate cover.

REPAIR PROCEDURES

Repair areas 1 and 2 are large enough that installation additional GCL is required to promote drainage. Rather than removing the existing GCL at the repair areas pursuant to Section 3 of the *Final Post Closure Maintenance Plan* (H&K; April 30, 2014), the existing GCL is to remain in place, and additional GCL is to be added after grade is modified.

Repair areas 3 through 10 involve only minor augmentation of the vegetative layer to promote drainage.

An estimated 270 cubic yards of clean soil (as measured in place) are required to adjust grade at the repair locations. Approximately 220 cubic yards of select soil are to be imported, and the remainder of the soil is to be borrowed from an existing stockpile located on the deck of Landfill Unit 1.

Repair procedures are summarized below:

Repair Areas 1 and 2

1. Remove topsoil layer and vegetative layer to new GCL subgrade. Stockpile topsoil (upper six inches) and vegetative soil separately for reuse.
2. Grade, prepare and compact the subgrade surface with a smooth drum roller to support the new GCL.
3. Prepare existing GCL on the perimeter of the repair area for overlap.
4. Install new GCL over the prepared soil surface and install new well boots.
5. Replace the vegetative layer and topsoil layer and install erosion controls.

Minor Repair Areas 3 through 10

1. Place and compact additional vegetative layer using select imported soil and install erosion controls.

CONSTRUCTION QUALITY ASSURANCE

Independent CQA is required when post-closure maintenance includes modification or repair of the low hydraulic conductivity (LHC) layer, including GCL or low-permeability clay liner. This CQA Plan is consistent with the CQA procedures set forth in the Final Closure Plan (BAS and GLA, 1996A), and the *Earthwork and Geosynthetics Quality Assurance Plan for Construction of the Final Cover System* (BAS and GLA, 1996B) which is appended to the Final Closure Plan.

H&K appreciates the opportunity to provide engineering services for McCourtney Road Landfill. If you have any comments or questions regarding the content of this plan or the proposed work in general, please contact the undersigned.

Sincerely,

HOLDREGE & KULL



Bryan Botsford
Staff Geologist



Jason W. Muir, CE 60167, GE 2697
Principal Engineer

copies: Central Valley Regional Water Quality Control Board, Todd DelFrate
County of Nevada Department of Environmental Health, Grant Eisen
CalRecycle, Diane Nordstrum-Lankim
PDF via email to all recipients

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1 INTRODUCTION

The McCourtney Road Landfill (MRL) is located approximately four miles southwest of Grass Valley, as depicted on the location map, Figure 1. The geographic coordinates of the facility are latitude 39.172° north, longitude 121.109° west. The primary entrance is accessed by Wolf Mountain Road from McCourtney Road. Figure 2 is a facility map depicting the location of the two final cover repair areas.

1.1 DESCRIPTION OF CLOSED LANDFILL UNIT 1

Closed Landfill Unit 1 is a Class III landfill unit consistent with the classifications of its component landfill cells (the OLM and 89/90 Cell). Unit 1 accepted nonhazardous solid wastes, including but not limited to Municipal Solid Waste, as defined under Title 27/Subtitle D regulations.

1.2 DESCRIPTION OF LANDFILL COVER SYSTEM

The final cover system on the landfill deck (5:1, horizontal: vertical, or flatter), as defined in the Final Closure Plan (BAS and GLA, 1996) includes an engineered alternative final cover design with the following elements, listed from top to bottom:

1. Vegetative cover – native grass mix
2. Erosion resistant layer – 1½ feet vegetative cover soil (including 6" topsoil)
3. Low hydraulic conductivity (LHC) Layer – geosynthetic clay liner (GCL; hydraulic permeability (K) < 1E-09 cm/sec)
4. Foundation layer – 2 feet compacted foundation soil

The final cover system on landfill slopes includes the following components:

1. Vegetative cover – native grass mix
2. Erosion resistant layer – 1 foot vegetative cover soil (including 6" topsoil)
3. LHC layer – 1 foot compacted clay soil
4. Foundation layer – 2 feet compacted foundation soil

For the vegetative cover layer, the topsoil is amended with fertilizer and mulch to promote vegetative cover growth.

1.3 PURPOSE AND LIMITATIONS

The purpose of this QA Plan is to set forth procedures that are intended to verify that the materials used in maintenance of the final cover will be constructed, tested, and monitored according to the design specifications indicated in the approved closure plan. This QA Plan includes testing and inspection procedures that are to be performed during earthwork and geosynthetic installation to provide the County of Nevada and regulatory agencies with sufficient data to evaluate whether the end product meets the specified quality of materials and workmanship.

In contrast to quality assurance (QA), quality control (QC) is defined as testing that the Contractor performs to control his quality of work. While QC is the sole responsibility of the Contractor, the Project Manager may, at his/her discretion, provide results of QA monitoring. If such information is provided, the release of the QA data to the Contractor is for convenience only and will in no way relieve the Contractor from QC responsibilities or project requirements.

1.4 DEFINITIONS

"Construction Manager" – Person(s) or firm(s) authorized by Nevada County to manage and oversee the administration of the Construction Contract and coordination of the Contractor, QA Manager and Monitors, and the independent testing laboratory.

"Contractor" – The firm responsible for all aspects of final cover repairs and preparation of supporting surfaces. The Contractor is further responsible for his Subcontractors.

"County" – Nevada County Department of Public Works, Solid Waste Division.

"Geosynthetics" – A generic classification given to synthetic (man-made plastic and fabric) materials used in geotechnical and construction applications. Included are flexible membrane liners (FMLs), geotextiles, geosynthetic clay liner (GCL), geonets, geogrids, geocomposites and geocells.

"Geosynthetic Clay Liner (GCL)" – A factory manufactured hydraulic barrier typically consisting of a dry bentonite clay placed between and supported by an upper and lower geotextile, and needle punched or stitch bonded for strength.

"Geosynthetic Installer" – The contractor responsible for handling, storing, placing, seaming, and other aspects of the installation of the geosynthetics included in the final cover repairs.

"Geotechnical Consultant" – Geologist/geotechnical professional registered in the State of California and responsible for geotechnical design.

"Geotextile" – A permeable synthetic textile used with soil, rock, sand, gravel or any other similar materials. It can provide protection to other systems or serve to separate different materials.

"Independent Testing Laboratory" – The firm responsible for conducting tests on geotechnical or geosynthetic samples.

"Owner" – The owner of the site, in this case, the Nevada County Department of Public Works, Solid Waste Division.

"Project Documents" – All Contractor submittals, Construction Drawings, Record Drawings, "As-Built" Plans, Construction Specifications, QA Plan, Health and Safety Plan, and Project Schedule.

"Project Manager" – The County's designated representative responsible for the project.

"Project Plans and Specifications" – All project related Drawings and Specifications including design modifications and Record Drawings.

"QA Manager" – A person or firm authorized by Nevada County to be responsible for the Construction Quality Assurance (CQA). The QA manager will be a Civil Engineer, Geotechnical Engineer or Engineering Geologist registered in the State of California and will have related experience in landfill final cover construction, landfill design and construction, and soils testing. The QA Manager is responsible for observing, testing, documenting and certifying activities related to quality assurance for all aspects of construction.

"QA Monitor" – The individual(s) working under the direction of the QA Manager. Such personnel include "Technicians", "Surveyors", "Field Engineers" and "Field Geologists" representing the QA Manager. QA Monitors responsible for the earthwork shall be experienced in landfill construction monitoring, low-permeability soil construction, and compaction testing during grading operations. QA Monitors for geosynthetic materials shall be experienced in GCL and geotextile construction and testing.

"Work" – All tools, equipment, supervision, labor, and materials or supplies necessary to complete the project as specified herein and as shown on the Project Drawings.

2 QA ORGANIZATION

2.1 SCHEDULE OF WORK

Within the number of days specified in the Contract Documents after award of the Contract, the Contractor shall provide a schedule of work to the CQA Monitor. The schedule of work shall list the anticipated dates in which each bid Item will be completed. An updated schedule shall be provided within one week of request by the CQA Monitor.

2.2 PRECONSTRUCTION MEETING

The preconstruction meeting will be held prior to or during mobilization of the Contractor onto the site. The meeting will be scheduled at a time mutually acceptable to the Engineer, Owner, CQA Manager, and the Contractor. The meeting will be documented by the CQA Manager/Monitor. The Local Enforcement Agency (LEA), Cal Recycle, and CRWQCB representatives should be invited, although their participation is not mandatory. The purpose of the preconstruction meeting will be to:

- Address questions regarding interpretation of the scope of work.
- Notify the Contractor of any special conditions related to the use permits.
- Define lines of communication and authority.
- Review testing procedures.
- Establish a procedure for notifying Contractor of deficiencies, nonconformances, and correction of nonconformances.
- Inspect the work area and establish locations for materials and equipment storage.
- Address any concerns of the state or local agencies.

2.3 GEOSYNTHETICS PRE-INSTALLATION MEETING

A pre-installation meeting will be held at the site and should be attended by the Construction Manager, Contractor, Geosynthetic Installer, QA Manager and QA Monitor(s). The meeting will not be conducted until all manufacturer certifications required by the Specifications and this document are approved. Items to be addressed at this meeting include:

- Submittals and review

- Schedule
- Responsibilities, authority and lines of communication
- Work area security and safety
- Procedures for correcting and documenting construction deficiencies
- Definition of storage areas, work areas, stockpile areas, laydown areas, access roads, haul roads, and related items

2.4 DAILY MEETINGS

The CQA Monitor may meet with the Contractor daily to evaluate the progress of work. Continuous observation will not be required for this project except during GCL installation. Where appropriate, the following topics will be discussed during the periodic meetings:

- Project schedule and updates
- Daily work items
- Personnel and equipment assignments
- Nonconformances and correction procedures

The CQA Monitor will summarize the discussion in a daily report. These meetings will be informal unless a special meeting is called for an important purpose. If a special meeting is called, the minutes of the meeting will be completed by the CQA Monitor and attached to the daily report. Daily logs are submitted to the CQA Manager for review.

2.5 PERSONNEL QUALIFICATIONS

Contractor

The Contractor is required to have a current Class A contractor's license in the State of California. The Contractor will not be selected solely on bid amount, but will also be selected based on previous experience, equipment, and ability to complete the work within the time allotted.

Engineer

The Engineer will be a civil engineer or certified engineering geologist, licensed in the State of California, with experience in landfill design. The Engineer will be responsible for the following:

- Project design
- Review of submittals, if needed
- Response to requests for information from the CQA Monitor or CQA Manager regarding the intent of the construction specifications, unforeseen site conditions or potential changes

CQA Manager

The CQA Manager will be a civil engineer or engineering geologist licensed in the State of California and experienced in landfill design and CQA. The CQA Manager may also be the Project Engineer. The CQA Manager will be responsible for:

- Review of drawings and specifications
- Review of submittals, and if needed, referral of submittals to Project Engineer
- Coordination of the preconstruction meeting
- Review of daily logs, schedules and meeting minutes
- CQA oversight
- Review of pay requests
- Review of requests for information from the contractor and referral to the Project Engineer
- Coordination between Owner and Contractor

CQA Monitor

The CQA Monitor will be, at minimum, a geologist, engineer-in-training, or trained construction supervisor with experience in landfill inspection. The responsibilities of the CQA Monitor will include:

- Perform or oversee soil testing and recordation.
- Coordinate sampling and testing.
- Observe and document installations.
- Document nonconformances and corrections (for approval by the Engineer).
- Prepare daily reports and meeting minutes, assess schedule compliance and organize inspection records.
- Keep a log of site visitors.

Testing Laboratory

The testing laboratory performs specific tests at the request of the CQA Monitor, at the locations indicated by the CQA Monitor, and then reports the findings to the CQA Monitor. Testing may include geosynthetics or soil testing.

2.6 LINES OF COMMUNICATION AND AUTHORITY

The CQA Monitor will be the Owner's onsite representative and will be responsible for communication between the Contractor and the CQA Manager, and coordination with the surveyor (if required). The CQA Manager will be the liaison between the Owner, Project Engineer, and CQA Monitor.

3 RECORD KEEPING

3.1 FORMS

The following forms are attached to this plan:

Daily Report

The daily log will be used to summarize the work performed by the Contractor during that day. Information logged will include an estimate of temperature, weather conditions and rainfall within the last 24 hours. Temperature, rainfall and wind must be estimated in appropriate units (i.e., inches, degrees, and mph). The log must also contain the following information as applicable to the work being performed:

- Visitors
- Subcontractors present
- Equipment and personnel working
- Testing performed that day
- Summary of work performed that day, methods employed and equipment used
- Documentation of spoken communication with contractor such as deficiencies noted or corrected, clarification provided, questions asked by the contractor, information provided
- QA forms including laboratory test results, field test logs and nonconformance notices
- All references to earthwork must be keyed to survey or staking coordinates

Meeting Minutes Log

The CQA Monitor records minutes during the meetings. Copies are provided to the Engineer, Owner, and Contractor. The construction schedule, if revised, is attached.

Nonconformance Notice

The Nonconformance Notice will be used by the CQA Monitor to notify the Contractor in writing that the performance standards set forth in the Specifications have not been met. Correction of the inadequacy will also be noted on the same form. The location of the inadequacy must be defined by grid coordinates or other repeatable measurements. Field testing sheets and laboratory reports must be attached and spoken results cited.

Certification of Completion Form

The Certificate of Completion form will be used by the Engineer to notify the Contractor and Owner that the Contractor has completed a Bid Item or a portion of a Bid Item. The purpose of the Certificate of Completion will be to notify the Contractor that a scope of work is finished so that the Contractor can proceed with subsequent work and receive payment by the Owner.

3.2 ORGANIZATION

Binders or file will be kept by the CQA Monitor or CQA Manager for future submittal to the Owner, Project Engineer, and CRWQCB. The binders will include the following:

- Bid summary
- Addenda
- Notice to Proceed
- Requests for payment
- Written correspondence, including emails
- Conversation logs other than those on the daily logs
- Daily Logs and Meeting Minutes
- Survey data
- Soil and geosynthetics test results
- Submittals
- Other pertinent data

4 NONCONFORMANCE

Where testing indicates that the performance standards are not met, the CQA Monitor may at his discretion order additional testing from the Contractor to further define the lateral and vertical extent of the nonconformance. It is the Contractor's responsibility to meet the standards of the Technical Specifications regardless of the CQA Monitor's comments. After the nonconformance has been corrected, the CQA Monitor will order retests to document conformance with the performance standard. After testing indicates passing results, the CQA Monitor will complete the Nonconformance Form citing the method of correction and retest numbers. The Contractor is responsible for the cost of retests for failed original tests.

5 SPECIFIC CQA TASKS

Maintenance and repair of the final cover system shall be performed in accordance with the Project Drawings and Specifications and shall be continuously observed, and routinely sampled and tested by the QA Monitor(s) for the physical parameters described in this section.

The testing frequencies presented herein are minimum frequencies. Additional tests will be conducted by the QA Monitor at any time that, in his/her opinion, additional testing is required and/or a deficiency is suspected. Retests of previously failed areas will be performed at the discretion of the QA Manager or QA Monitor when, in his/her opinion, sufficient reworking of the area has been performed by the Contractor to warrant a retest.

Following a thorough re-working of a failed area, retesting will be performed by the QA Monitor to evaluate whether the re-worked area meets the requirements of the project.

5.1 GENERAL SITE PREPARATION

The CQA Monitor will verify the requirements for mobilization, excavation of topsoil and vegetative soil layers, placement and compaction of foundation layer soil, installation of new GCL layer, replacement of vegetative soil and topsoil, and installation of erosion controls. The CQA Monitor will report any changes from the tasks discussed with the Engineer during the preconstruction meeting.

5.2 TOPSOIL AND VEGETATIVE SOIL LAYER REMOVAL

The topsoil and vegetative soil layer in Repair Areas 1 and 2 will be excavated and removed as necessary to obtain new GCL subgrade elevation, to an extent of at

least 5 feet beyond the boundary of the area to receive new GCL. Care should be taken not to damage the existing GCL during excavation and removal of the vegetative soil layer.

After stripping the topsoil layer, vegetative soil may remain over the GCL where it does not conflict with the new GCL grade and where it does not have to be removed to facilitate GCL overlap.

A location will be chosen adjacent to each repair area for the temporary stockpiling of the removed topsoil and vegetative layer soil. Topsoil (upper six inches) and vegetative soil (six to 18 inches deep) should be stockpiled separately. Erosion control Best Management Practices should be implemented at each stockpile location.

All clearing, grubbing, stripping, and repair area preparation shall be accomplished to the satisfaction of the QA Monitor prior to placement of fill material.

5.3 SUBGRADE PREPARATION FOR GCL

Subgrade for the GCL in Repair Areas 1 and 2 will be performed in accordance with the project drawings and specifications and will be observed by the QA Monitor for the physical parameters described in this section.

Subgrade preparation will be performed to achieve design grades and to remove surface irregularities. The upper 6 inches of subgrade will be scarified, rocks in excess of 1 inch removed, smooth graded, compacted, and rolled with a smooth drum roller. The finished surfaces will be free of all rocks, sharp stones, or debris of any kind that may damage the GCL.

The finished surface of the foundation layer will not vary by more than 0.10 foot from a uniform plane when measured with a 10-foot straight edge. Additionally, a minimum of 2 percent slope will be maintained in at least one direction from any given point.

5.4 IMPORT MATERIAL

Select import soil shall be submitted for review by the QA Manager prior to import. Soil shall be clean and free of debris, uncontaminated and contain no rocks greater than 1 inch in any dimension. No rocks greater than 1 inch may be placed within 3 inches of the GCL.

Rocks or rock fragments greater than 3 inches in any dimension must be screened or otherwise removed from the fill during processing and prior to fill placement.

An estimated 220 cubic yards of select soil are to be imported, and approximately 50 cubic yards will be borrowed from an existing stockpile on the landfill deck.

Fill material will be uniformly moisture conditioned, thoroughly mixed to obtain a uniform condition, and compacted per the specifications.

Repair Areas 1 and 2

Based on a survey performed by KPFF Consulting Engineers in June 2015, approximately 70 cubic yards of fill material will be used for Repair Area 1, and approximately 110 cubic yards of fill material will be used for Repair Area 2, for an estimated total of 180 cubic yards supplemental soil, as measured in place.

Repair Areas 3 through 10

Select imported fill will be required to augment the topsoil layer at minor Repair Areas 3 through 10. An estimated 90 cubic yards of soil will be required for these minor repair areas.

Quality Assurance

The testing frequencies presented herein are minimum. Additional tests will be conducted by the QA Monitor at the QA Monitor's discretion. Testing is to be performed according to the following schedule:

Test Description	Test Designation	Minimum Test Frequency
Laboratory Compaction Curve (Moisture-Density Relationship)	ASTM D1557	One per repair area
In-Place Moisture/Density	ASTM D6938	Four per repair area
Visual Classification	ASTM D2488	Daily

The processed moisture content of on-site material should be within 2 percentage points of optimum. If testing indicates results do not meet the specifications, the lift or portion thereof should be retested, and if necessary, reworked until the required moisture/density has been attained. No GCL will be placed until the subgrade has been tested and meets the requirements of this section to the satisfaction of the QA Manager.

5.5 CONSTRUCTION OF NEW GCL LAYER

Construction of the new GCL layer will be performed in accordance with the project drawings and specifications and will be continuously observed by the QA Monitor for the physical parameters described in the technical specifications.

The Geosynthetic Installer is to submit manufacturer's certifications pursuant to the technical specifications, and each roll is to be labeled or tagged with a roll identification number and other information set forth in the technical specifications.

Quality Control Program

The Geosynthetic Installer is to submit a complete description of their quality control program, as applicable, for handling, installing, testing, repairing and providing a completed lining in accordance with the requirements of the technical specifications.

The Geosynthetic Installer is to submit a panel layout drawing and obtain approval of the Engineer prior to commencement of any GCL work.

Installation

The Geosynthetic Installer will visually inspect all GCL for imperfections, faulty or suspect areas and possible damage prior to and following installation. Damaged materials are to be replaced pursuant to the technical specifications.

The Geosynthetic Installer is to overlay all seams by a minimum of 6 inches, and will mark rolls with a continuous line along the edge of the roll at a distance of 6 inches for the purpose of verifying the minimum overlap.

Powdered bentonite will be applied (of the same quality used in the manufacturer of the GCL) between seams at the rate of 1/4 pound per linear foot of seam.

For final seaming inspection, seams and the surface of the GCL shall be checked for defects, holes, blisters, undispersed raw materials, or signs of contamination by foreign matter. The contractor shall distinctively mark, preferably with paint, repair areas, and indicate required type of repair.

Damaged GCL will be repaired with patches of the same product. Patches shall overlap the edge of a hole or tear a minimum of 12 inches in all directions. Nails and staples will not be allowed.

5.6 REPLACEMENT OF VEGETATIVE SOIL LAYER

Care should be taken to avoid damaging the GCL by making sharp turns or pivots with equipment. To prevent damage to the GCL, the initial lift(s) of soil cover shall not be compacted in excess of 90 percent of the maximum dry density as determined by ASTM D1557.

Any leading edge of panels left uncovered shall be protected at the end of the working day with a waterproof sheet which is adequately secured with sand bags or other ballast. The GCL shall not be deployed during precipitation, in the presence of excessive moisture, in areas of ponded water, or in the presence of excessive winds. All deployed GCL material shall be covered as soon as possible with a vegetative cover material and before the end of each working day.

Vegetative layer material within 12 inches of the GCL shall be placed with low-ground pressure equipment. The direction of travel for all placement equipment shall be parallel to the seams of the GCL. Vegetative layer material shall be compacted to 90 percent of the maximum dry density per ASTM D1557. Irreducible rock or rock fragments in excess of 1 inch in maximum dimension shall not be placed within 3 inches of the GCL.

The upper 6 inches of cover shall consist of topsoil that was previously salvaged and stockpiled during the initial excavation of the repair areas. If a sufficient amount of top soil cannot be salvaged, it will be imported from an approved source. Imported top soil shall have the same relative composition and structure, a friable sandy loam character, and be free of roots and rocks larger than 1 inch in greatest dimension, and must meet the requirements set forth in the technical specifications.

Topsoil is to be moisture conditioned and compacted to 85 percent of the maximum dry density as determined by ASTM D1557.

Once replacement of the vegetative soil and topsoil layers is complete, erosion controls (seed, mulch, fertilizer, fiber rolls) are to be installed pursuant to the technical specifications.

6 NOTICE OF FINAL COMPLETION

After the CQA Monitor finds all items completed, the CQA Manager will recommend the Owner file the Notice of Completion. The CQA Monitor will then compile the project documents, as described above, into an as-built report. The CQA Manager will prepare a cover letter stating that after reviewing the inspection

documents, to the best of his or her knowledge, the liner has been installed in accordance with the project contract.

7 REFERENCES

Bryan A Stirrat & Associates (BAS) and GeoLogic Associates (GLA), 1996A. Final Closure Plan for the McCourtney Road Landfill. December.

GeoLogic Associates (GLA), 1996. Earthwork and Geosynthetics Quality Assurance Plan for Construction of the Final Cover System. December.

Holdrege & Kull (H&K), 2014. Final Post Closure Maintenance Plan, McCourtney Road Landfill. April 30.

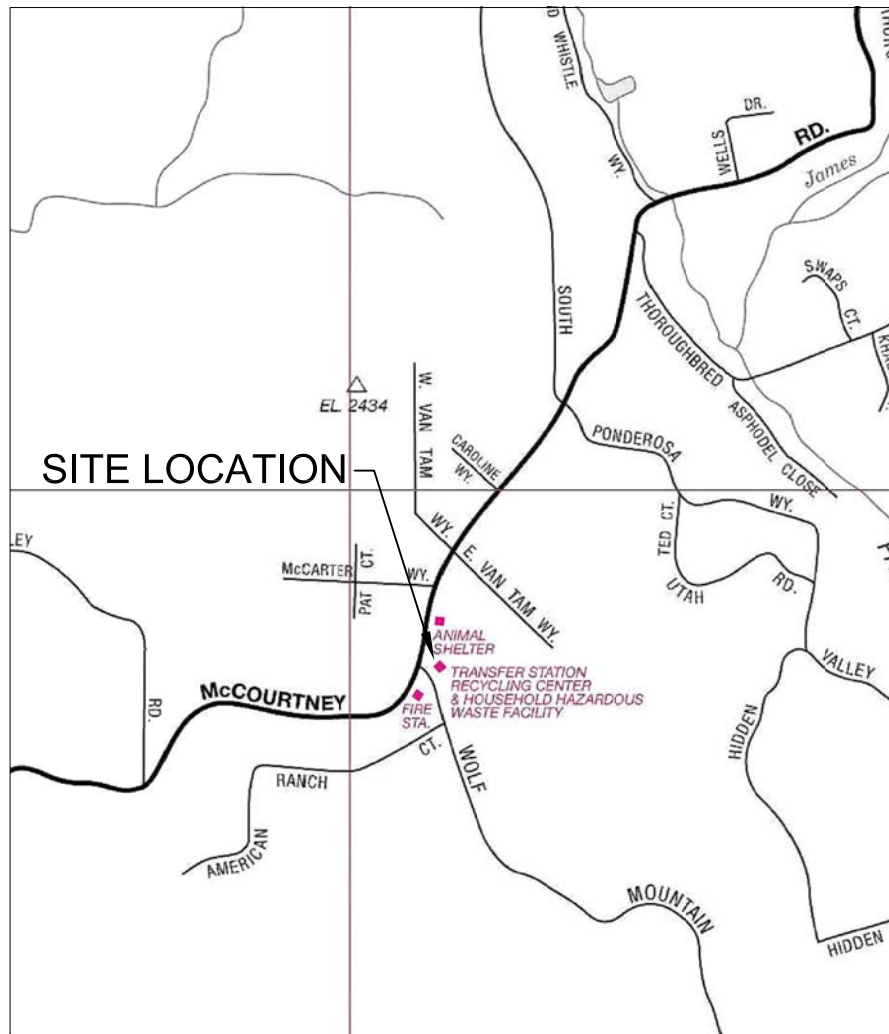
FIGURES

Figure 1 Vicinity Map and Facility Map

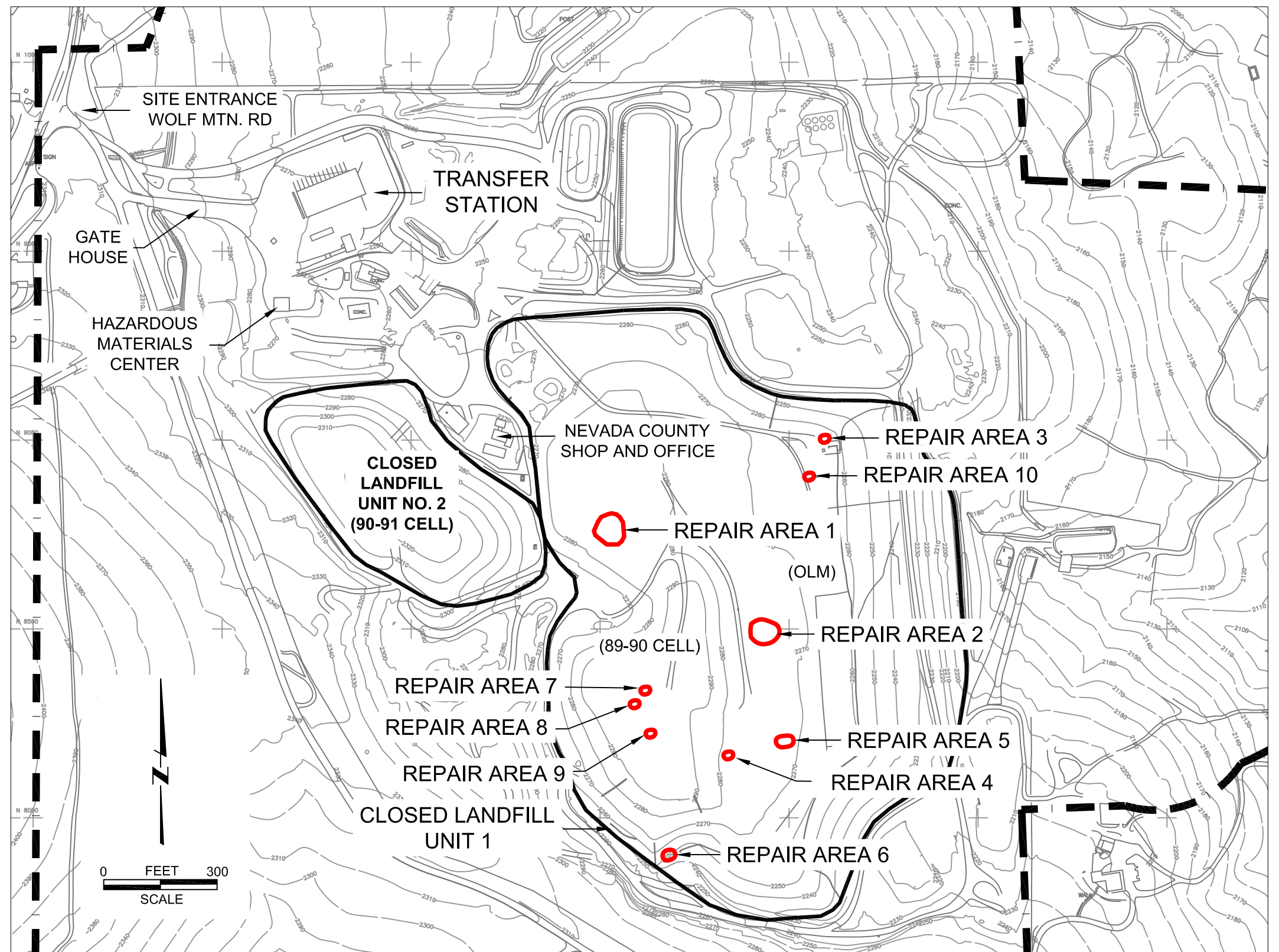
Figure 2 Typical Sections, Repair Areas 1 and 2

Figure 3 Repair Area 1

Figure 4 Repair Area 2



VICINITY MAP
NOT TO SCALE

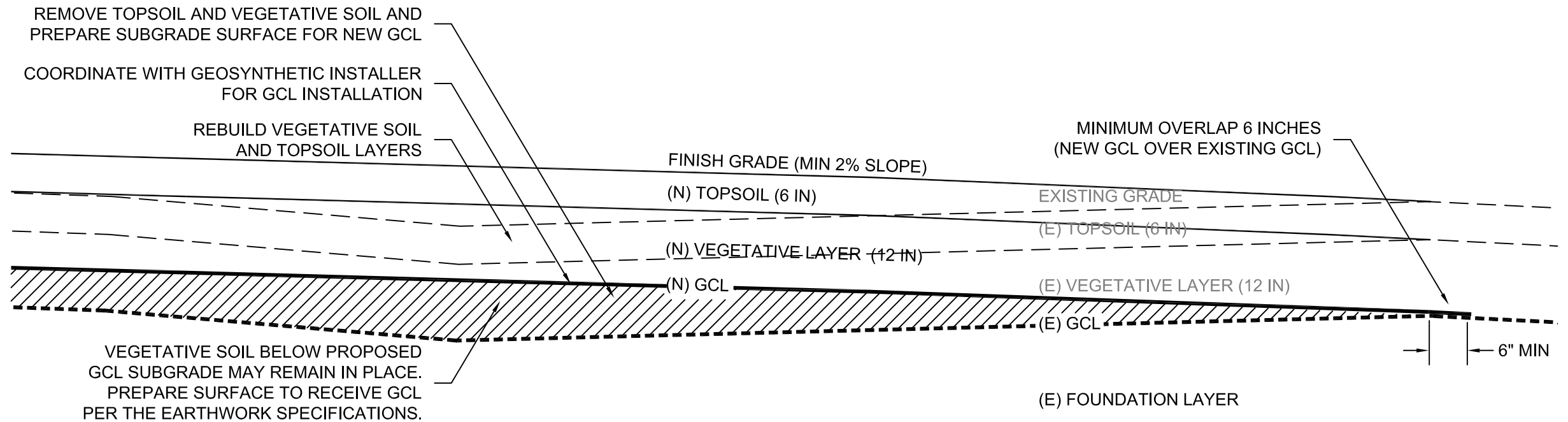


FACILITY MAP
1 INCH = 300 FEET



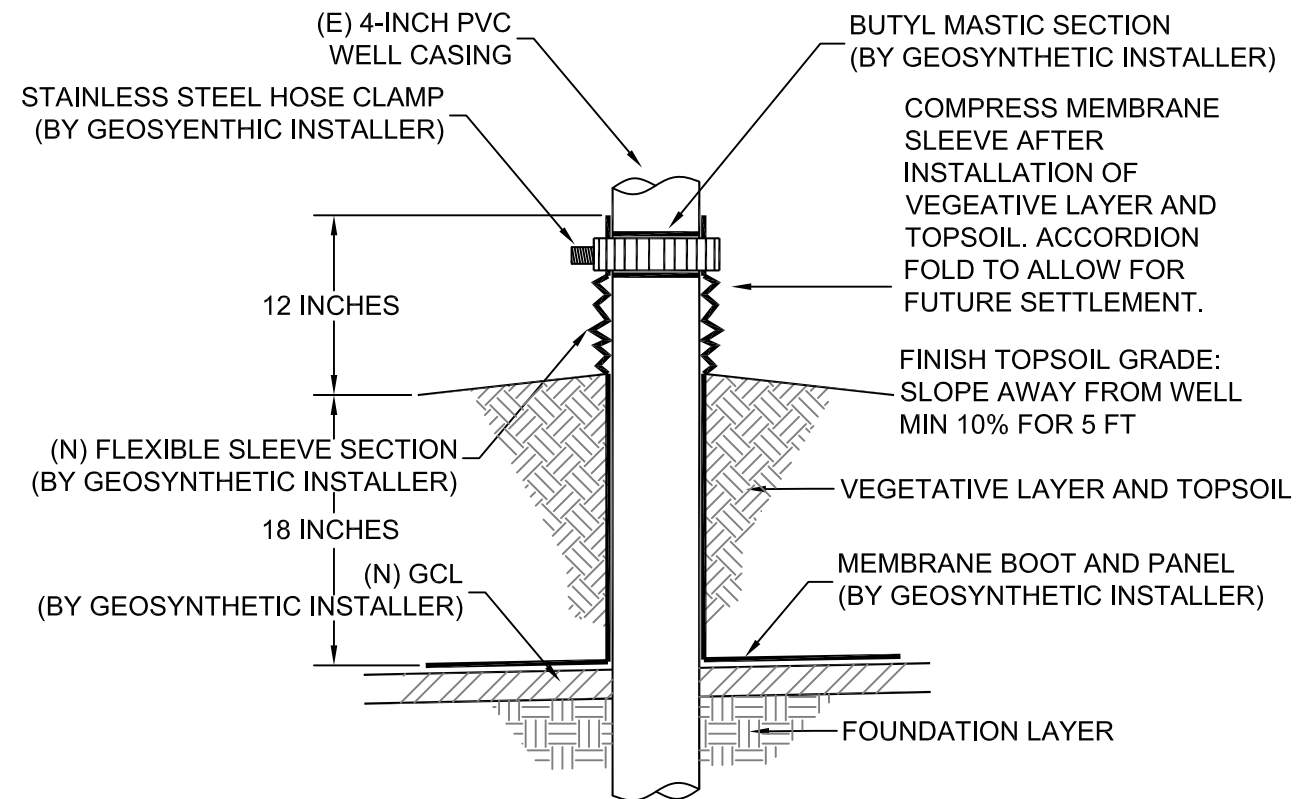
NO.	REVISIONS	DATE	ORDER NO.:	R5-2014-0022
			DRAWN BY:	BOTSFORD
			CHECKED BY:	MUIR
			H&K PROJECT:	4142-01
			DATE:	FEBRUARY 2017

TYPICAL REPAIR SECTION
NOT TO SCALE

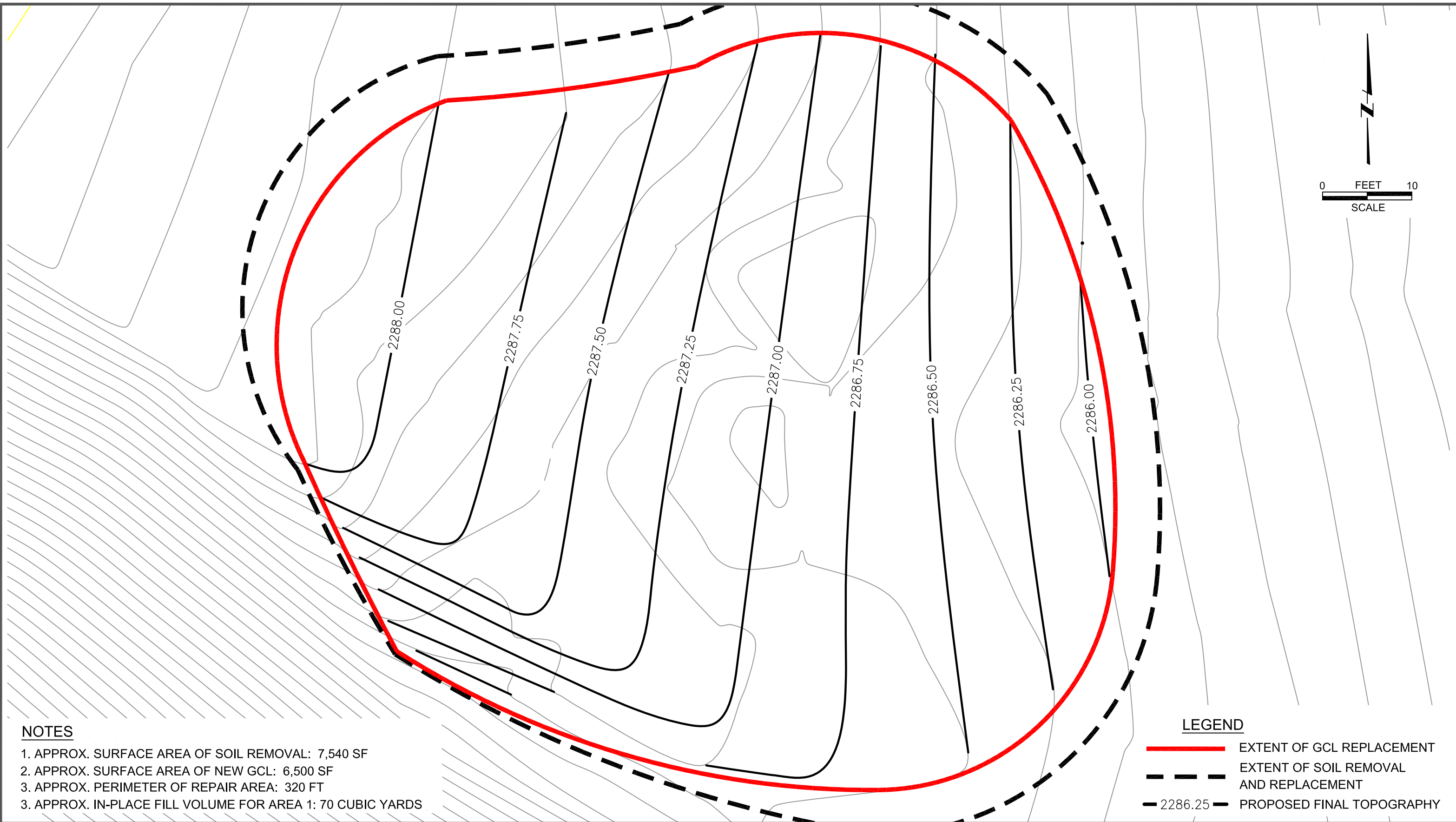


TYPICAL WELL BOOT
NOT TO SCALE

WELL BOOT AND NEW GCL TO BE INSTALLED BY GEOSYNTHETICS INSTALLER UNDER SEPARATE CONTRACT. CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH GEOSYNTHETICS INSTALLER REGARDING CONTRACTOR'S EARTHWORK SCHEDULE.



NO.	REVISIONS	DATE	ORDER NO.:	R5-2014-0022
			DRAWN BY:	BOTSFORD
			CHECKED BY:	MUIR
			H&K PROJECT:	4142-01
			DATE:	FEBRUARY 2017



NOTES

- 1. APPROX. SURFACE AREA OF SOIL REMOVAL: 7,540 SF
- 2. APPROX. SURFACE AREA OF NEW GCL: 6,500 SF
- 3. APPROX. PERIMETER OF REPAIR AREA: 320 FT
- 3. APPROX. IN-PLACE FILL VOLUME FOR AREA 1: 70 CUBIC YARDS

LEGEND

- EXTENT OF GCL REPLACEMENT
- - - - - EXTENT OF SOIL REMOVAL AND REPLACEMENT
- - - - - 2286.25 PROPOSED FINAL TOPOGRAPHY

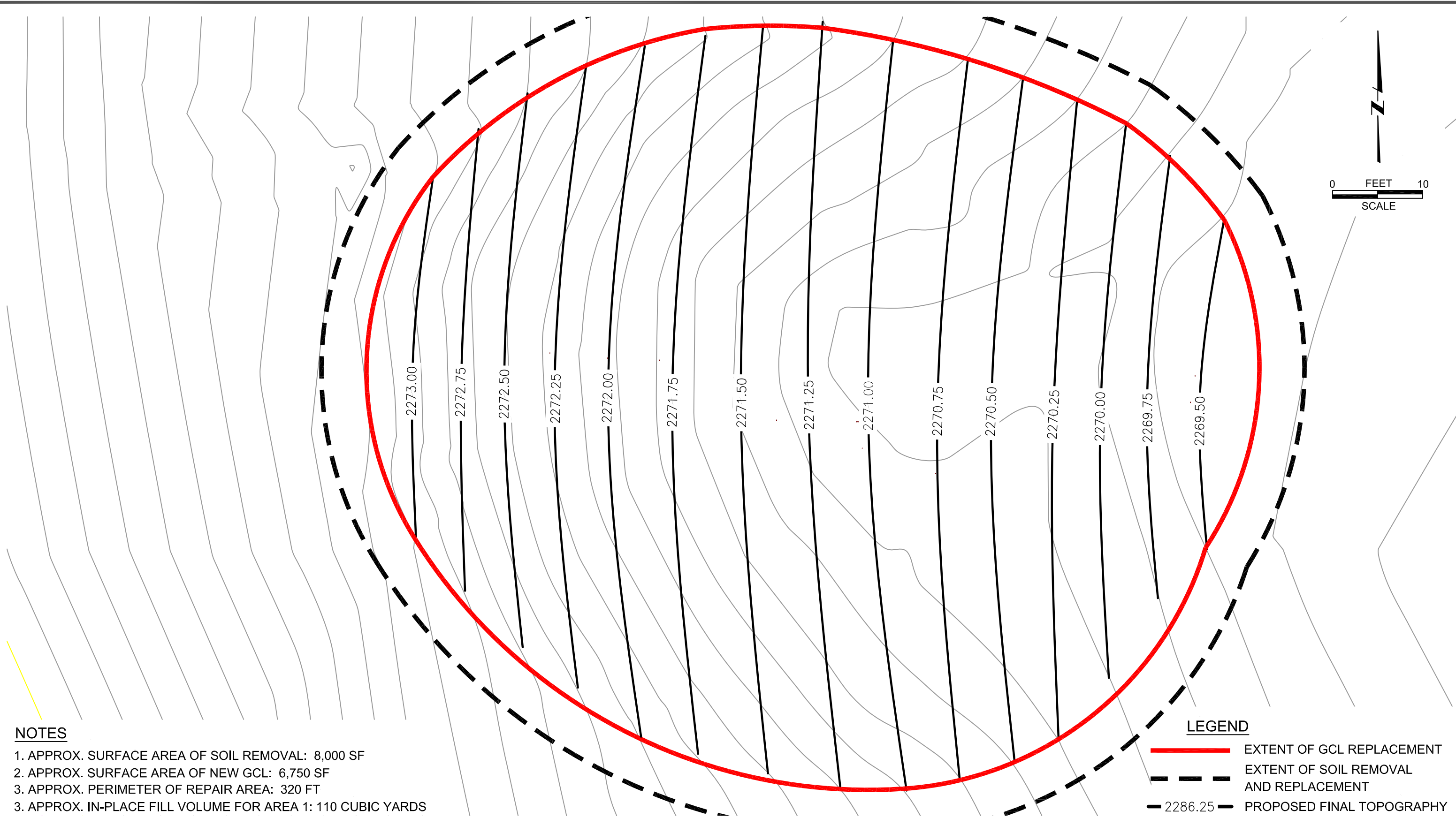
HK HOLDREGG & KULL
 CONSULTING ENGINEERS • GEOLOGISTS
 792 SEARLS AVENUE, NEVADA CITY, CALIFORNIA 95959
 (530) 478-1305 phone www.HOLDREGGandKULL.com (530) 478-1019 fax
 NEVADA CITY • TRUCKEE • CHICO • YUBA CITY



REPAIR AREA 1
 McCOURTNEY ROAD LANDFILL
 NEVADA COUNTY, CALIFORNIA

NO.	REVISIONS	DATE

ORDER NO.:	R5-2014-0022
DRAWN BY:	BOTSFORD
CHECKED BY:	MUIR
H&K PROJECT:	4142-01
DATE:	FEBRUARY 2017



NOTES

- 1. APPROX. SURFACE AREA OF SOIL REMOVAL: 8,000 SF
- 2. APPROX. SURFACE AREA OF NEW GCL: 6,750 SF
- 3. APPROX. PERIMETER OF REPAIR AREA: 320 FT
- 3. APPROX. IN-PLACE FILL VOLUME FOR AREA 1: 110 CUBIC YARDS

LEGEND

- EXTENT OF GCL REPLACEMENT
- - - - - EXTENT OF SOIL REMOVAL AND REPLACEMENT
- - - - - 2286.25 PROPOSED FINAL TOPOGRAPHY

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 NEVADA CITY • TRUCKEE • CHICO • YUBA CITY



REPAIR AREA 2
 McCOURTNEY ROAD LANDFILL
 NEVADA COUNTY, CALIFORNIA

NO.	REVISIONS	DATE	ORDER NO.:	R5-2014-0022
			DRAWN BY:	BOTSFORD
			CHECKED BY:	MUIR
			H&K PROJECT:	4142-01
			DATE:	FEBRUARY 2017

APPENDIX A – CQA FORMS

Field Report and Field Test Summary

Meeting Minutes

Nonconformance Notice

Certificate of Completion



Nevada City, California (530) 478-1305 – Truckee, California ((530) 587-5156 – Chico, California (530) 894-2487– Murphys, California (530) 362-2775

Field Report

Project-Phase #:	Task#	Project Name:	Date:	DFR #:
Project Manager:	H&K Rep:	Project Location:	Day of Week:	Weather:
Client (name, address):			Client Representative (name, phone number):	
General Contractor (name, address):			General Contractors Representative (name, phone number):	
Specialty Contractor:			Specialty Contractors Representative (name, phone number):	
Plans / Specifications (name, date, by):				
Project Briefing (date, with):				
Previously Reported (report #, date, by):				

Field Memos (outstanding test):
Field Memos (general):

NOTES (Describe work completed during the day, any problems and their solutions):

Picture Caption here	Picture Caption here

I hereby certify that the noted portions of the work at the above address which required periodic and/or continuous inspection, and which I was employed to inspect, were inspected and, in my opinion, and to the best of my knowledge, comply with the provisions of the approved plans and specifications, except as noted.	
Signature _____	Date _____

Holdrege & Kull

Table 1

Summary of Field Relative Compaction Test Results

Project No.: _____ **Project Name:** _____ **Location:** _____

Test Information		Relative Test Location Data					Lab Data					Spec.		#= Failing				
No.	Date (m/d/y)	Construction Unit Description	Relative Coordinates			Depth Below Finish Subgrade (ft)	Elev. or A.B. (ft)	Curve No.	Max. Dry Unit Wt. (pcf)	Opt. Moist. Content (%)	Lab. K Factor	Gauge Moist. Cont. (%)	corrected moistur		Wet Unit Wt.	Dry Unit Wt. (pcf)	Rel. Comp. (%)	Min. Relative Comp. (%)
			LCL or Northing (ft)	RCL or Easting (ft)	Location or Station (ft)													
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**UNIT 1 COVER MAINTENANCE, MCCOURTNEY ROAD LANDFILL
MEETING MINUTES LOG**

Date:

Attendance:

Topics Discussed:

NONCONFORMANCE NOTICE / FIELD MEMO



HOLDREGE & KULL

CONSULTING ENGINEERS • GEOLOGISTS

Notice #:

Project Name:		Project #:	DFR#:
Field Technician:		Date:	
Submitted To:		Company:	
Description of Item:			
Plans / Specifications / Detail Reference:			Date of Plans / Specs:
Observed By:	Signature:	Date:	
Corrective Action Observed By:	Signature:	Date:	

FIELD COPY - WHITE

CONTRACTOR'S COPY - YELLOW

CLIENT'S COPY - PINK

CERTIFICATE OF COMPLETION



Notice #:

Project Name:		Project #:	DFR#:
Field Technician:		Date:	
Submitted To:		Company:	
Description of Item:			
Plans / Specifications / Detail Reference:			Date of Plans / Specs:
Observed By:	Signature:	Date:	
Corrective Action Observed By:	Signature:	Date:	

FIELD COPY - WHITE

CONTRACTOR'S COPY - YELLOW

CLIENT'S COPY - PINK