

December 20, 2019

Construction Quality Assurance Plan

Pikes Peak Heights Development Site
Colorado Springs, Colorado

Prepared For:

Pikes Peak Heights, LLC.
c/o Schuck Communities, Inc.
2 North Cascade Ave., Suite 1280
Colorado Springs, Colorado 80903

Pinyon Project No.:

I/18-1236-01.REM007.2

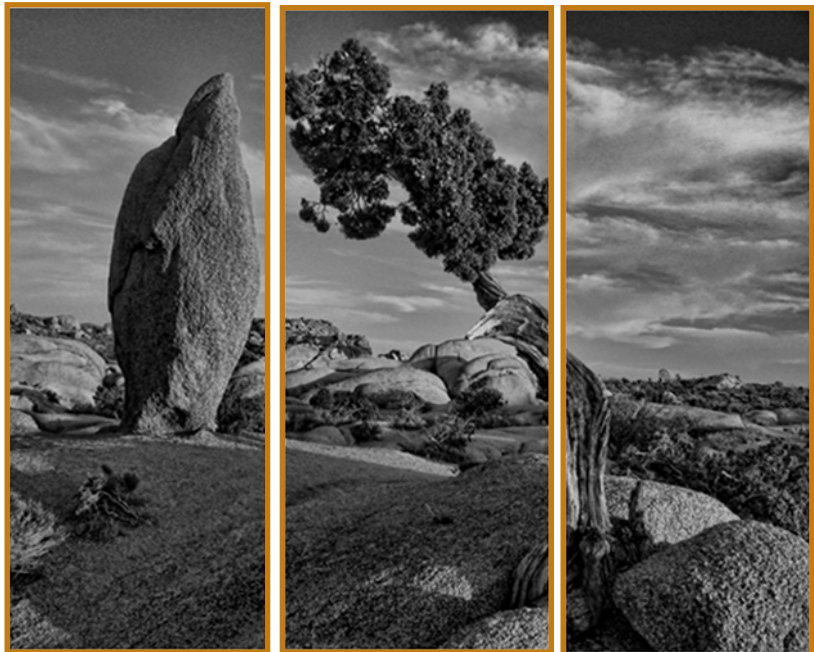


FIGURE 12

December 20, 2019

Construction Quality Assurance Plan

**Pikes Peak Heights Development Site
Colorado Springs, Colorado**

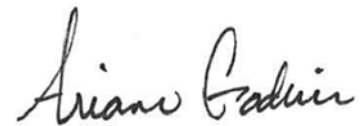
Prepared For:

Pikes Peak Heights, LLC.
c/o Schuck Communities, Inc.
2 North Cascade Ave., Suite 1280
Colorado Springs, Colorado 80903

Pinyon Project No.:

I/18-1236-01.REM007.2

Prepared by:



Arianne Godwin, PE
Environmental Engineer

Reviewed by:



Karlene R. Thomas, PE
Principal

Version History

REV 0 September 3, 2019

REV 1 October 16, 2019

REV 2 December 20, 2019

Table of Contents

1.	Introduction.....	1
2.	CQA Roles and Responsibilities.....	2
2.1	CQA Team.....	2
2.1.1	Certifying Engineer.....	2
2.1.2	CQA Staff.....	2
2.1.3	Surveyor.....	3
3.	Inspection, Sampling, and Testing.....	4
3.1	Earthwork and Backfill.....	4
3.2	Construction and Demolition Debris.....	4
3.2.1	Debris Evaluation.....	4
3.2.2	Debris Placement Oversight.....	4
3.3	Debris Cap.....	5
3.3.1	Debris Cap Evaluation.....	5
3.3.2	Debris Cap Oversight and Testing.....	5
3.4	Field Survey.....	5
4.	Corrective Action and Documentation.....	7
4.1	Corrective Action.....	7
4.1.1	Debris Corrective Action.....	7
4.1.2	Debris Cap Corrective Action.....	7
4.2	Documentation.....	7

I. Introduction

Pinyon Environmental, Inc. (Pinyon), was retained by Pikes Peak Heights, LLC (Pikes) of Schuck Communities, Inc. (Schuck) to prepare this Construction Quality Assurance (CQA) Plan for the placement and cover of construction and demolition debris associated with Pikes' construction of single and multifamily residential structures on a 67-acre parcel in Colorado Springs, Colorado. This parcel is located east of Wooten Road, south of East Platte Avenue and north and west of Sand Creek. Pikes plans to donate approximately 36 of these acres to the City of Colorado Springs (City). The donated acreage borders both banks of Sand Creek and will consist of open space and greenway for drainage and public trail usage.

Before 1996, portions of this property were used to landfill construction debris from Colorado Springs Utilities (CSU). This construction debris was reportedly composed strictly of asphalt, gravel, soil, and concrete. A detailed discussion of the debris and a list of investigations completed documenting debris location and type can be found in the project-specific Materials Management Plan (MMP). Construction and demolition debris for the purposes of this project is defined as consisting of inert materials. "Inert material" means non-water soluble and non-putrescible solids together with such minor amounts and types of other materials as will not significantly affect the inert nature of such solids. The term includes, but is not limited to, earth, sand, gravel rock, concrete which has been in a hardened state for at least sixty days, masonry, asphalt paving fragments, and other inert solids. The debris will NOT include any of the following;

- Organic components (being defined as no plant, wood, paper or other biodegradable substances)
- Material that would qualify as suspect asbestos containing material (ACM) under state regulations (e.g. floor tile, transite, insulation, etc.)
- Materials such as concrete or brick that have associated material suspected of being ACM (such as sealants, adhesives, mastics, coatings, adhered materials, or resins).
- Metal will not be included in the waste stream that will be buried on Site; per CDPHE guidance, metal is not considered inert and will be salvaged and removed.

Throughout the project documents, the debris listed above will be referenced as "construction and demolition debris". Some of this construction debris underlies the footprints of the residential structures being constructed. Consequently, this underlying construction debris is scheduled to be removed and replaced with natural fill prior to construction. The natural fill will be excavated from an area near Sand Creek. The construction debris will be placed in this natural-fill excavation and then covered in accordance with the Final Cover Plan prepared by Drexel, Barrel and Company.

The purpose of this CQA Plan is to outline the procedures that will be used to document that the excavation, placement, and cover of these materials is completed in accordance with the specifications, roles, responsibilities, and required qualifications indicated in the project-specific Materials Management Plan and approved Final Cover Plan. In addition, the CQA Plan discusses the observations, inspections, testing, and measurements that will be performed. It is critical for the ultimate success of the cover that quality be addressed during all phases of construction.

This CQA Plan is a supplemental document to the Final Cover Plan and Materials Management Plan (MMP). If this CQA Plan and the project-specific Cover Plan have differing information, the Final Cover Plan will take precedence. This CQA Plan does not endorse, review, or assure the design in the Final Cover Plan.

2. CQA Roles and Responsibilities

The team; inspection, testing, and sampling; and corrective action and documentation that will be used to demonstrate that the placement of final cover on the new fill area fulfills the requirements in the Final Cover Plan are outlined below. Note that procedures for the removal and characterization of the construction and demolition debris is covered in the MMP.

2.1 CQA Team

The CQA Plan will be implemented under the supervision of a Colorado registered professional engineer (Certifying Engineer) designated by the Contractor. This individual will oversee the execution of the CQA Plan and related field testing and certification activities. This individual will also be responsible for identifying appropriate personnel and firms and coordination so that qualified CQA staff are present during the construction and cover of the new fill area. CQA testing and measurements will provide a measure of the final product quality and its conformance with project plans and specifications.

The CQA staff will include the Certifying Engineer, field CQA crew, and field survey crew. The Certifying Engineer's responsibilities and those of the CQA staff will include the following:

- Interpreting and clarifying project drawings and specifications with the designer and the Contractor
- Observing the equipment, personnel, and procedures used by the contractor during placement of the debris
- Reviewing the Contractor's quality control records, summary, and interpretations of test data for accuracy and appropriateness
- Timely discussing any defects, shortfalls, or other non-conformance issues with the Contractor
- Reporting the communications, actions, and results to the project team or their representatives on monitoring results (See Section 1.2 of the MMP for a listing of the project team and key responsibilities)

The responsibilities of the Certifying Engineer and the CQA staff vary.

2.1.1 *Certifying Engineer*

The Certifying Engineer will be registered in the State of Colorado and have experience and knowledge in the quality assurance of the components required to be monitored and observed. CQA staff will be under the supervision of the Certifying Engineer. The Certifying Engineer will be required to visit the Site as needed during construction and review/approve/sign documentation prepared by CQA staff.

The Certifying Engineer will have the authority to stop work or reject work if problems or deficiencies are encountered.

2.1.2 *CQA Staff*

The field CQA staff will have experience in the construction work being completed. They will perform field testing of soils and other earthen materials for evaluation and verification purposes as needed. The field CQA staff includes a Certified Asbestos Building Inspector (CABI) and Qualified Project Monitor (QPM); these staff will be engaged as necessary. Note that a the QPM will be on-site during excavation and placement activities

of all construction and demolition debris.

2.1.3 Surveyor

Survey staking, layout, and related work will be performed by a professional land surveyor licensed in the State of Colorado. The field surveyor is responsible for providing survey results, as required in the Cover Plan, to the engineer.

3. Inspection, Sampling, and Testing

The following is an overview of CQA activities that will be conducted before, during, or after construction. The testing frequencies may be adjusted based on field observations and results of testing during construction.

3.1 Earthwork and Backfill

The quality assurance activities for earthwork includes:

- Loosening, removing, loading, transporting, depositing, and compacting in its final location all materials wet and dry, as required for the purposes of completing the work specified in the Final Cover Plan
- Verification of placement and geotechnical properties in accordance with the Final Cover Plan
- Performing additional incidental earthwork

3.2 Construction and Demolition Debris

Construction and demolition debris will be relocated from the western portion of the project area to the disposal area shown in the Final Cover Plan.

3.2.1 Debris Evaluation

As outlined in the MMP, the QPM will document that construction and demolition debris is placed in the disposal area shown on the Cover Plan and that the construction and demolition debris consists of only of inert materials. “Inert material” means non-water soluble and non-putrescible solids together with such minor amounts and types of other materials as will not significantly affect the inert nature of such solids. The term includes, but is not limited to, earth, sand, gravel rock, concrete which has been in a hardened state for at least sixty days, masonry, asphalt paving fragments, and other inert solids. The debris will NOT include any of the following:

- Organic components (being defined as no plant, wood, paper or other biodegradable substances)
- Material that would qualify as suspect asbestos containing material (ACM) under state regulations (e.g., floor tile, transite, insulation, etc.)
- Materials such as concrete or brick that have associated material suspected of being ACM (such as sealants, adhesives, mastics, coatings, adhered materials, or resins).
- Metal will not be included in the waste stream that will be buried on Site; per CDPHE guidance, metal is not considered inert and will be salvaged and removed.

3.2.2 Debris Placement Oversight

During placement debris, CQA staff will be onsite to visually observe and document the composition of the debris and the placement. If the composition of this material indicates the potential for asbestos or other non-allowed debris, protocols outlined in the MMP will be followed.

3.3 Debris Cap

The Final Cover Plan specifies that native soil will be placed on top of the construction debris placed in the natural-fill excavation.

3.3.1 Debris Cap Evaluation

The cap material will be constructed from onsite weed-free, native soil. Prior to construction of the cap, the cap material will be evaluated for:

- Environmental impacts (e.g. will not contain any visual or olfactory indications of contamination)
- Absence of organics and materials larger than 2-inches in diameter (Screening may be required)
- Moisture content

3.3.2 Debris Cap Oversight and Testing

Installation of the debris cap will be completed as outlined in the Cover Plan. The field CQA staff or engineer will monitor and record the installation of the debris cap including:

- Consistency and composition of the materials during processing and placement (as outlined in Section 3.3.1)
- Compaction of the debris cap; densely compacted to at least 95 percent of maximum standard Proctor dry density (ASTM D698)
- Percent moisture; the materials should be processed to within 2 percent of optimum moisture content
- Areas where damage due to excess moisture, insufficient moisture, or freezing may have occurred; moisture content and presence of frozen soils will be monitored on the day of fill placement
- Thickness and final grading requirements presented in the Cover Plan are met by field survey (Section 3.4)
- Erosion control measures as outlined in the Cover Plan and Storm Water Management Plan (SWMP)

3.4 Field Survey

Field surveying will be conducted to confirm that the final cover is constructed in accordance with the Cover Plan. Survey reports will be provided to the engineer and included in the final certification report.

All construction staking activities will be performed by a crew under the supervision of a Colorado licensed Professional Land Surveyor. All construction staking will be performed using conventional construction layout practices. Site control will be provided by the permanent site control points already established on Site. All Site control points will be tied into the State plane coordinate system.

Field surveys will be conducted on a grid system and appropriate break lines in accordance with the Cover Plan. The survey will be performed on the subgrade (the surface on which the final cover system is placed) and the top of the uppermost layer in the final cover. The survey of the top of the cover will be conducted on a grid corresponding to the subgrade. The grid will be established on a 50-foot maximum spacing and 50

foot maximum along break lines. Tighter spacing will be utilized as necessary on grade breaks/break lines. Bottom, perimeter extents and top of debris burial limits will also be surveyed to confirm burial limits and volumes. Final cap thickness will meet 3-foot minimum thickness at surveyed locations or additional fill will be added.

4. Corrective Action and Documentation

Ongoing CQA is planned to minimize deficient work and provide for corrective action prior to completion of an activity. The recordkeeping and on-site observation activities are further designed to provide documentation of compliance or non-compliance and corrective action.

4.1 Corrective Action

If it is determined through quality assurance testing that the construction materials do not conform with specifications in the Final Cover Plan, the extent of the area requiring correction will be defined. If corrective action is identified, the Certifying Engineer will communicate the deficiency and its extent to the Contractor, and scope of corrective action required. The contractor will remedy the area and the materials will then be re-tested.

4.1.1 Debris Corrective Action

If the CQA observations indicate that improper material is present in the debris (Section 3.2.1), the impacted debris will be removed. The improper material will be disposed of as outlined in the MMP. The QPM will observe and document excavation and disposal of the improper material.

4.1.2 Debris Cap Corrective Action

If CQA testing indicates that improper materials were used, the defective material will be removed. If the backfilling is inadequate but proper material has been used the backfill may be: 1) removed and replaced; 2) adjusted and reworked in place; or 3) scarified and reworked. CQA personnel will observe all repairs and perform additional testing to confirm suitable construction, conformance with the approved CQA Plan, and the final construction plans and specifications.

Continuous quality control is imperative during placement of the cover in order to catch defects early. If CQA testing indicates the cover does not conform to the Cover Plan, the area that does not conform will be mitigated. Additional testing may be required to confirm the mitigation conforms to cover specifications in the Final Cover Plan.

4.2 Documentation

The Final Certification Report will be prepared in accordance with Colorado Department of Public Health and Environment (CDPHE) requirements and will be submitted to CDPHE for review within 60 calendar days of the completion of construction of the new fill area. The Final Certification Report will include a statement by the Certifying Engineer that construction has been completed in accordance with the approved engineering design plans, drawings, and specifications. At a minimum, the following elements will be included in the Final Certification Report:

- Records of on-site observation, including daily log reports and photograph documentation, via the CQA officer or the CQA staff (details on daily log requirements can be found in the MMP)
- Summary of major construction activities during placement of the debris and cover; significant changes to all CDPHE-approved plans will be approved by the CDPHE prior to implementation
- Drawings where the debris was placed
- On-site test results including individual test-result sheets and data summary pages

- Completed survey data
- Non-compliant items, associated communications, and mitigation actions
- Sample, field test, and field measurement locations
- Means, methods, and material specification for backfill
- Significant changes to CDPHE-approved drawings, specifications, and CQA Plan