CONSTRUCTION QUALITY ASSURANCE REPORT

EVERETT RIVERFRONT BUILDING B

December 19, 2023

RIVERFRONT COMMERCIAL INVESTMENTS, LLC

CONSTRUCTION QUALITY ASSURANCE REPORT

FOR

EVERETT RIVERFRONT BUILDING B

Prepared By:

HWA GEOSCIENCES, INC.
21312 30th Drive SE, Suite 110
Bothell, WA 98021
(425) 774-0106

HERRERA ENVIRONMENTAL CONSULTANTS
2200 Sixth Avenue, Suite 1100
Seattle, WA 98121
(206) 441-9080

FOLLETT ENGINEERING
1037 NE 65TH ST. #316
Seattle WA 98115
(425) 765-6304

RIVERFRONT COMMERICAL INVESTMENTS, LLC
11624 SE 5th Street, Suite 210
Bellevue, WA 98005
Tel. (425) 559-2340

EVERETT RIVERFRONT BUILDING B
CONSTRUCTION QUALITY ASSURANCE REPORT

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APPENDICES

1.0 CQA Report for Everett Riverfront Development, Riverfront Building B

RIVERFRONT COMMERCIAL INVESTMENT LLC
11624 SE 5TH Street, Suite 210, Bellevue, Washington 98005
Tel. 425.559.2300

December 4, 2023

Mr. Randy Loveless, PE
Senior Engineer; Everett Public Works Department
CITY OF EVERETT
3200 Cedar Street
Everett, WA 98201

Re: CQA Implementation Report for Everett Riverfront Development, Building B

Dear Randy.

This report documents the Construction Quality Assurance (CQA) activities conducted for the above referenced project per the requirements of the Everett Landfill/Tire Fire Site Consent Decree (CD). The CD requires that protective measures be implemented for any new development on the landfill site to ensure protection of human health and the environment from exposure to contaminants or landfill gas (LFG) present in the site subsurface.

The purpose of the Riverfront Building B CQA Report is to ensure that the construction of the mixed-use project was performed in general conformance with the requirements and intent of the accepted CQA Plan, Drawings and Specifications. During construction of the project, Riverfront Phase 1, LLC, retained and managed a multi-discipline team who completed and performed the required observations, tests, and documentation of the observed quality of materials and work in accordance with an approved CQA Plan. (Section's 2.0 – 10).

This CQA Report documents the completion of construction activities for Building B per the approved design and subsequent approved updates through Requests for Information (RFI's). This report provides verification of compliance with all CD requirements in accordance with the approved CQA Plan. This report is comprised of individual CQA documentation from the Riverfront Phase 1 consultant engineers, who were each responsible for specific components of the design and CQA as listed below. In addition, submittals, RFIs, and as-built plans documenting the completed project are appended to this report. The consultant engineers' reports address the following topics.

- Section 2.0 – HWA Geosciences Inc.: Geotechnical and structural pile components, and placement and testing of low permeability soil barrier and bentonite sand barrier elements.
- Section 3.0 – Herrera Environmental Consultants, Inc.: Composite and geomembrane elements, LFG system, and methane monitoring and ventilation system elements.
- Section 4.0 – Follett Engineering: Electrical and instrumentation and control systems.

Sincerely,

DocuSigned by:
Renay Luzama
323309D9312747C...

Renay Luzama

Sincerely,

DocuSigned by:
Eric Evans
7B78D69F851B465...

Eric C. Evans

2.0 HWA Compliance with CQA Report – Geotechnical Engineer

HWA GeoSciences Inc.
DBE/MWBE

September 21, 2023
HWA Project No. 2015-061-21

Riverfront Commercial Investment, LLC.
11624 SE 5th Street Suite 210
Everett, WA 98201

Subject: **CQA SUMMARY REPORT FOR RIVERFRONT DEVELOPMENT PHASE I BUILDING B**

This letter documents the Construction Quality Assurance (CQA) activities conducted for the above referenced project per the requirements of the Everett Landfill Consent Decree and observed by HWA GeoSciences Inc. (HWA), from June 2021 through September, 2023.

Description

Riverfront Commercial Investment, LLC is in the process of constructing a new multi-phased, mixed-use development on the old Everett Landfill. This report is in reference to the now completed, Phase I Building B area which is located on the west side of Riverfront Boulevard and north of the proposed Phase I Building A. The Phase I Building B site area included grade supported utilities below the proposed building, piles for support of the new building and a concrete apron around the building.

Construction of the Phase I Building B site required implementing environmental controls in compliance with the Everett Landfill Consent Decree. Environmental controls included expansion of the site's landfill gas (LFG) system, utility installation, management, and proper disposal of encountered refuse materials, and installation of a low permeability cover system.

Cleanup actions were required for any new development, improvements, and environmental controls on this site in accordance with the site's Consent Decree. Designs for cleanup actions required by the Consent Decree were required to be approved by the Washington State Department of Ecology (Ecology). This approval is obtained through review of and approval of an Engineering Design Report (EDR) and Plans and Specifications of the required facilities.

During construction, Riverfront Commercial Investment, LLC was responsible for providing Construction Quality Assurance (CQA) activities. The CQA activities consisted of an independent review, observation, and testing to confirm that the Contractor's work was completed in general conformance with the Plans, Specifications, and the CQA Plan. A CQA Plan was included in the EDR that identifies specific CQA activities to be performed and the required documentation of those activities, which are compiled in this CQA Report.

Construction Activities

The work requiring environmental monitoring and documentation for this CQA report included installation of utilities, LFG system installation, and installation of low permeability landfill gas barrier. Within the Riverfront Development Phase I Building B area, the sewer, water, storm, and electrical lines are being installed in addition to new sections of the site landfill gas system. Areas within the landfill refuse area utilize at least one type of low permeability barrier. Below the buildings this consists of low permeability pile supported concrete, or membranes systems designed and inspected by Herrera Environmental Consultants, Inc (Herrera). Transitions to areas immediately outside of the buildings may also consist of layers of at least three continuous feet of bentonite sand backfill (BSB) and/or low permeability soil barrier (LPSB) or a layer of HDPE geosynthetic membrane.

Construction components that are covered by this CQA report are described below:

Low Permeability Soil Barrier (LPSB) – LPSB inhibits migration of LFG upward and enhances the capability of the active LFG collection system. In addition to providing LFG control, the LPSB provides a hydraulic barrier, reducing infiltration and the generation of leachate. LPSB was used around the perimeter of the building near the surface of the site to provide a suitable gas barrier for the transition from the building and perimeter apron to the grade supported site around its perimeter. LPSB is any soil exhibiting a measurable in-place permeability rate of less than 10^{-5} cm/sec. See the documentation in Appendix B, LPSB Laboratory Analysis, and Appendix C, HWA Field Reports.

Bentonite Sand Backfill (BSB) – Similar to LPSB, BSB inhibits migration of LFG upward and enhances the capability of the active LFG collection system. BSB is an engineered material consisting of a combination of sand, bentonite powder and water. BSB has the added benefit of being easier to shape and compact while exhibiting an in-place permeability rate of less than 10^{-5} cm/sec. BSB was mostly used around pipes and penetrations into manholes and vaults and is used to limit gas migration through the landfill cap. BSB was used to supplement low permeability cover requirements where pipes were noted to have less than three feet of LPSB material above them. BSB was also used in combination with LPSB in other areas to maintain the minimum of 3 feet of low permeable soil materials. See the documentation in Appendix B, BSB Laboratory Analysis, and Appendix C, HWA Field Reports.

Other Imported Soil Materials – HWA performed conformance testing of materials brought to the site from outside sources. Imported materials consisted of gravel drainage materials and dredge sand utilized as backfill outside of areas where LPSB and BSB were required, and for use as a component in the production of BSB. Imported soils came from WSDOT approved sources that provided initial testing data. Laboratory testing was also conducted on samples collected in the field. These materials were tested in conformance with the CQA plan, project plans and specifications. Observation and testing on these materials did not pertain to the LFG barrier and as such lab data and field reports that only pertain to them are not included in this CQA summary report.

Refuse Disposal – HWA observed excavation within the refuse materials on the site. HWA documented when these materials were encountered, noted that that they received daily cover and when and how they were disposed of in predetermined refuse disposal areas. As the buildings do not contain refuse disposal areas, reports for this disposal are provided in the Phase I and II site work CQA summary report; however, information on refuse encountered and excavated within the building is documented in this CQA summary letter in the attached daily field reports in Appendix C.

Geotextile Installation – HWA observed placement of geotextile fabrics where required by the project CQA plan, site plans and specifications. See the documentation in Appendix C, HWA Field Reports.

Landfill Gas (LFG) System – The LFG system installation has been noted by HWA but is not part of our monitoring scope. HWA observed soil backfill placement, but confirmation of conformance with the CQA plan, site plans and specifications was the responsibility of Herrera.

HDPE Geomembrane Installation – HDPE geomembrane was placed in locations where Pile supported concrete, LPSB or BSB were not utilized as the LFG barrier. Confirmation of conformance with the CQA plan, site plans and specifications was the responsibility of Herrera.

Low Permeability Concrete – Low permeability concrete was used as a barrier on the pile supported apron around the perimeter of the building. The low permeability concrete was used to allow for the transition from building LFG barriers to the LFG barriers within the grade supported areas outside of the building perimeter apron.

Pile Installation – Driven grout piles were installed as part of the building foundation system. Steel casings with a steel boot on the end were driven at each proposed pile location and through the refuse, peat and fine-grained alluvial soils that comprise the aquitard below the refuse. Then a hollow mandrel was inserted into each casing, which was used to break off the boot and allow for the installation of driven grout portions of the piles that are embedded into the dense soils below the landfill. Piles were installed in accordance with HWA's geotechnical recommendations in accordance with requirements of the consent decree. Pile observations were documented in our field report which are included in Appendix C.

CQA Observation

CQA observation was provided by HWA on behalf of Riverfront Commercial Investment, LLC to monitor the installation of the various environmental controls utilized at the site. HWA was present during activities which required our CQA oversight. HWA provided evaluation of geotechnical material and conducted field testing for comparison with laboratory analyses.

CQA Testing

CQA laboratory and field testing of materials were conducted for LPSB, BSB, and low permeability concrete. Testing was conducted by HWA and the results of laboratory and field tests are summarized below.

Low Permeability Soil Barrier (LPSB)

Prior to performing work on the Riverfront Development, HWA obtained samples of existing cap soils on the site and conducted laboratory analyses to recommend material gradation specifications, and determine the appropriate moisture content and density relationship of the material placed during construction that would result in an in-place permeability of less than 10^{-5} cm/sec. Based on several rounds of testing of onsite soils with variable fines contents, HWA determined that, provided the existing soil materials contained at least 15% fines (defined as percent passing the No. 200 sieve by weight) and were compacted to at least 95% of Modified Proctor (ASTM D1557), they exhibit an in-place permeability rate of less than 10^{-5} cm/sec. LPSB was utilized around the perimeter of the building and within utility trenches near the transition from the perimeter of the proposed building apron to the grade supported areas outside of the building.

Additionally, laboratory testing was conducted on LPSB samples taken throughout the course of the project in accordance with the CQA Plan. See the documentation on LPSB acceptance testing in Appendix B and test results of field compaction testing in HWA field reports in Appendix C. Note that LPSB testing conducted around the perimeter of the building was conducted as part of the Phase I site work and reports were issued under that phase of work; however, the relevant reports related to the LPSB flipping around the perimeter of the building are included in Appendix C and a map showing the areas where low permeable soils placement occurred on site is available in Appendix D.

Bentonite Sand Backfill (BSB)

Prior to BSB placement, field tests and laboratory analyses were conducted on samples of the BSB material mixture with 5, 7 and 10 percent bentonite per dry unit weight of sand. The BSB was mixed onsite by the Contractor under observation from HWA. The moisture content and density of the samples were then measured in the lab. Permeability testing (per ASTM D5084) was used to determine the acceptable zone of moisture content and density needed to achieve the required permeability. Placement of BSB was then monitored by measuring in-place moisture content and density with a nuclear gauge to ensure the in-place moisture/density properties were within the acceptable range, and thus consistent with the laboratory findings to meet the required permeability. CQA test results for laboratory analyses are contained in Appendix B and field measured densities are recorded in HWA's field reports in Appendix C.

Low Permeability Concrete.

Prior to the start of construction HWA performed testing on the proposed mix design for the building concrete perimeter apron. Based on the results the proposed mix design was found to have a permeability significantly less than 1.0×10^{-5} cm/sec, and is sufficient to meet the project requirements for low permeability concrete. When this concrete was used, HWA reviewed the test results from the concrete testing, conducted by others to noted that it was consistent with the

mix designs that were analyzed and found to meet the requirements of low permeability concrete. CQA test results for laboratory analyses are contained in Appendix B.

HWA Comments

The original plans for the building included the placement of BSB around the LFG riser pipes below the building. However, as stated in RFI 141 for the Building B work, the BSB below the Building, which has its own barrier systems, does not provide a benefit once settlement occurs and a void is created below the building foundation. As such, BSB around the LFG Risers was determined to not be necessary and was not placed around the risers in Building B

As noted in previous Quarterly CQA Summary Report, some of the grout quantities reported for certain piles where high (over 30% greater than theoretical volume) based on reported counts; however, grout levels within the pile did not drop significantly after pile completion and no other signs other signs of significant grout losses were noted. Piles with grout counts that predict volumes in excess of 30% were PB-25B, PB-36A, PB-36B, PB-41, and PB-150.

Grout volumes are based on stroke count from the concrete pump being used. High grout readings could have been a result of not properly resetting the stroke counter prior to pumping or clogs in the line that temporarily block flow through the grout hose. Also grout sometimes overtops the piles and thus is represented in the stroke counts used to calculate the grout volume but would not be in the actual pile. Additionally, every pile will have a slightly different shape resulting from the variation in density and thickness of materials encountered below, while our theoretical volumes are based on the assumption that piles are perfectly cylindrical. However, because the upper sections of piles though refuse are cased, HWA believes that the pile shape through this section are more cylindrical, and that grout loss (increased take) did not occur in the section of the pile through the refuse materials.

As all piles are grouted, voids created by the pile driving activity below the refuse would be filled with grout. As such HWA does not have additional concern about the creation of preferential pathways between the landfill leachate and underlying groundwater, resultant from driven pile installation.

Although HWA does not perform the concrete testing on the site, completed by Krazan and Associates Inc. (Krazan), documenting placement and field testing of the low permeability concrete are included in Appendix C. HWA was provided concrete cylinders from the concrete pour on September 24, 2021 to conduct hydraulic conductivity testing on low permeability concrete which easily met the permeability requirements. The field tests for slump, air entrainment and temperature were all within typical test parameter for this type of concrete and are similar enough to the field test result of the other concrete pours to confirm that the permeability results from our laboratory testing is indicative of the concrete throughout the concrete aprons. As such based on our laboratory testing and the field testing data, provided by Krazan, it appears that the concrete delivered on site was placed in accordance with the project plans and specifications and meets the requirements for use as low permeability concrete.

Documentation of CQA Activities

Documentation of the CQA activities is presented below.

- *Construction Quality Assurance (CQA) Declaration:* A declaration stating that the construction activities were performed in conformance with the Plans and Specifications is included in Appendix A.

- *CQA Testing and Construction Observation:* Daily construction reports related to required CQA activities covering the CQA testing, observation, and other activities are provided in the Appendixes:
    - Appendix B: Laboratory Analyses by HWA on LPSB, BSB, and low permeability concrete.
    - Appendix C: HWA Field reports summarizing site summarizing observations by HWA during pile installation, LFG system installation, LPSB, and BSB placement, including compaction testing and low permeability material depth verifications.
    - Appendix D: Everett Riverfront Low Permeability Soil Barrier Log Map.

Conclusion

The Everett Landfill Consent Decree requires that protective measures and cleanup actions be implemented for any new development on the landfill site. As part of the process, this CQA report documents these procedures for the construction of this project. The construction activities have included installation of piles and utilities such as storm, sewer, water, and electrical in addition to additions to the site's LFG system. HWA has monitored these activities and noted pile installation, along with LPSB, BSB and low permeability concrete materials used as landfill gas barrier, noting proper installation in accordance with the project CQA plan, site plans and specifications. Documentation of the CQA activities is included in the appendices of this letter report.

If you have any question pertaining to this CQA letter report please feel free to contact the undersigned at 425-774-0106.

Sincerely,
HWA GeoSciences Inc.,

Michael S. Place, P.E.
Senior Geotechnical Engineer

Attachments:

Appendix A: CQA Declaration
Appendix B: Laboratory Analyses
Appendix C: HWA Field reports
Appendix D: Everett Riverfront Low Permeability Soil Barrier Log Map

Appendix A:

CONSTRUCITON QUALITY ASSURANCE (CQA) DECLARATION

HWA | GeoSciences Inc.
DBE/MWBE

September 21, 2023
HWA Project No. 2015-061-21

Riverfront Commercial Investment, LLC
11624 SE 5th Street, Suite 210
Bellevue, Washington 98201

SUBJECT: CONSTRUCITON QUALITY ASSURANCE (CQA) DECLARATION
RIVERFRONT DEVELOPMENT PHASE I BUILDING B
EVERETT, WASHINGTON

As requested, HWA GeoSciences Inc. (HWA) has been retained to perform laboratory testing, field testing, and construction observation services to confirm compliance with the construction Quality Assurance (CQA) plan, the Consent Decree, and the project plans and specifications. Based on our observations and testing performed on the site and summarized in our CQA Report for Riverfront Development Phase I Building B, the construction activities were performed in conformance with the CQA Plan, the Consent Decree, and the project plans and specifications.

Should you have any questions after reviewing this letter, please feel free to contact us at your convenience.

HWA GeoSciences Inc.

Michael S. Place, P.E.
Senior Geotechnical Engineer

3.0 Herrera Compliance with CQA Report - Environmental Engineer

Everett Riverfront Construction Quality Assurance Final Report

Building B Environmental Controls System

Prepared for
Riverfront Commercial Investment, LLC

Prepared by
Herrera Environmental Consultants, Inc.

HERRERA
Science + Planning + Design

Everett Riverfront Construction Quality Assurance Final Report

Building B Environmental Controls System

Prepared for
Riverfront Commercial Investment, LLC
11624 Southeast Fifth Street, Suite 210
Bellevue, Washington 98005

Prepared by
Herrera Environmental Consultants, Inc.
2200 Sixth Avenue, Suite 1100
Seattle, Washington 98121
Telephone: 206-441-9080

October 11, 2023

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HERRERA

Project Description

The Everett Riverfront Development is located on the City of Everett Landfill/Tire Fire Site in Everett, Washington, located west of downtown Everett business district. The Building B project limits stretch the area of Building B which is approximately 32,200 square-feet. The southeast corner of Building B is located about a fifth of a mile north of the 41st Street roundabout and about 20 feet west of Riverfront Boulevard.

This report covers Construction Quality Assurance (CQA) observations on the environmental controls associated with Building B that were installed throughout the entire period of construction from July 2021 through June 2023 when the last component was installed and documented. The work during the construction period consisted of inspection of the landfill gas (LFG) management system including the LFG collector pipe trenches, laterals, and vents; the four header to collector connections; and the elevator pits and the above slab composite liner barrier systems. In the final quarter of inspection, the south Building B lateral connection to subheader B was made and the control valve was installed. The Final Construction Quality Assurance (CQA) Declaration Letter for the Building B environmental controls systems is included in Appendix A.

All project construction and design elements were required to comply with environmental controls set forth in the Everett Landfill/Tire Fire Consent Decree (March 2001) and were approved by the Washington State Department of Ecology. Activities for construction that were not subject to the CQA requirements per the Consent Decree are not included in this CQA report or those reports being prepared by other consultants.

Environmental Control Systems CQA Observation

CQA observation was provided by Riverfront Commercial Investment LLC (RCI) and its consultants HWA Geosciences (HWA), Perteet Inc. (Perteet), Follett Engineering (Follett) and Herrera Environmental Consultants (Herrera). Additionally, City of Everett (COE) construction inspectors and outside Consultants made routine site visits throughout the duration of construction.

Herrera provided CQA observation of the LFG collection, conveyance, and barrier system installation for Building B. CQA observation was provided through site visits, preparation of daily field inspection reports based on field observations and component testing, and site photos. Herrera verified the LFG system products used on site with approved material submittals and any associated Requests for Information (RFI). Contractor qualifications, manufacturers' quality control data, subgrade acceptance, and verification of materials with project drawings and specifications were also included in Herrera's CQA process.

Herrera's construction observation of the Building B environmental controls system began in July 2021 and finished in June 2023. Herrera's staffing for CQA was as follows:

- CQA Observer – Michael Spillane and Camryn Steiner
- Construction Submittal Review Lead – Ondrej Sklenar and Camryn Steiner

- Requests for Information Lead (RFIs) - Tyson Wright

Herrera's CQA observation deliverables were field inspection reports documenting construction activities and include photographs of products identifying installation of facilities. The inspection reports include highlighted screenshots of plan sheets that show the area of work. Table 1 provides a summary of all Building B environmental controls construction work and lists what was installed, when it was installed, and what field report the installation is documented in. Herrera's field inspection reports can be found in Appendix B.

Table 1. Summary of Work Performed and Observed for the Building B Environmental Controls System.

Date	Construction Activity	Documented in Field Report
Quarter 1 – June 1 through August 30, 2021		
7/7/2021	LFG collection pipe trenching installation	FR 001 07072021 Riverfront BldgB LFG
7/8/2021	LFG collection pipe trenching installation	FR 002 07082021 Riverfront BldgB LFG
7/15/2021	LFG collection pipe trenching installation	FR 003 07152021 Riverfront BldgB LFG
7/19/2021	Composite liner system installation in elevator pit	FR 004 07192021 Riverfront BldgB LFG
7/20/2021	Composite liner system installation in elevator pit LFG collection pipe trenching	FR 005 07202021 Riverfront BldgB LFG
7/23/2021	Composite liner system installation in elevator pit LFG collection pipe trenching	FR 006 07232021 Riverfront BldgB LFG
7/27/2021	LFG collection pipe trenching installation	FR 007 07272021 Riverfront BldgB LFG
7/28/2021	LFG collection pipe trenching installation	FR 008 07282021 Riverfront BldgB LFG
8/4/2021	Composite liner system installation mockup	FR 009 08042021 Riverfront BldgB LFG
8/5/2021	Composite liner system installation mockup	FR 010 08052021 Riverfront BldgB LFG
8/13/2021	Composite liner system installation in elevator pit	FR 011 08132021 Riverfront BldgB LFG
8/25/2021	Composite liner system installation in elevator pit	FR 012 08252021 Riverfront BldgB LFG
Quarter 2 – September 1 through November 30, 2021		
9/2/2021	LFG collection pipe trenching installation	FR 013 09022021 Riverfront BldgB LFG
9/7/2021	Composite liner system installation in elevator pit	FR 014 09072021 Riverfront BldgB LFG
9/16/2021	LFG collection pipe trenching installation	FR 015 09162021 Riverfront BldgB LFG
9/24/2021	LFG collection pipe trenching installation	FR 016 09242021 Riverfront BldgB LFG
Quarter 3 – December 1, 2021 through February 28, 2022		
Quarter 4 – March 1 through May 31, 2022		
3/23/2022	Header to collector lateral connection	FR 020 03232022 Riverfront BldgB LFG
3/24/2022	Header to collector lateral connection	FR 021 0324022 Riverfront BldgB LFG

Table 1 (continued). Summary of Work Performed and Observed for the Building B Environmental Controls System.		
Date	**Construction Activity**	**Documented in Field Report**
Quarter 5 – June 1 through August 31, 2022		
6/9/2022	Composite liner system	FR 022 06092022 Riverfront BldgB LFG
6/20/2022	Composite liner system	FR 023 06202022 Riverfront BldgB LFG
6/21/2022	Composite liner system	FR 024 06212022 Riverfront BldgB LFG
6/22/2022	Composite liner system	FR 025 06222022 Riverfront BldgB LFG
6/23/2022	Composite liner system	FR 026 06232022 Riverfront BldgB LFG
6/24/2022	Composite liner system	FR 027 06242022 Riverfront BldgB LFG
6/27/2022	Composite liner system	FR 028 06272022 Riverfront BldgB LFG
6/28/2022	Composite liner system	FR 029 06282022 Riverfront BldgB LFG
6/30/2022	Composite liner system	FR 030 06302022 Riverfront BldgB LFG
7/1/2022	Composite liner system	FR 031 07012022 Riverfront BldgB LFG
Quarter 6 – September 1 through November 30, 2022		
Quarter 7 – December 1, 2022 through February 28, 2023		
1/31/2023	Header to collector lateral connection	FR 032 01312023 Riverfront BldgB LFG
2/3/2023	Header to collector lateral connection	FR 033 02032023 Riverfront BldgB LFG
2/14/2023	Header to collector lateral connection	FR 034 02142023 Riverfront BldgB LFG
Quarter 8 – March 1 to completion		
6/28/2023	Header to collector lateral connection	FR 035 06282023 Riverfront BldgB LFG
6/29/2023	Header to collector lateral connection	FR 036 06292023 Riverfront BldgB LFG

LFG Collection and Conveyance System

Herrera provided CQA observation of the LFG collection and conveyance system underneath Building B that connects to the sitewide conveyance system. This included monitoring the installation of the collection pipe trenches, laterals, vents, and the four header to collector connections. Herrera inspected the LFG collection and lateral pipe joining and lateral pipe performance pressure testing as well as the quality of surrounding trench and subgrade for pipe placement. The system components that were observed and installed on top of the collection piping included the gravel blanket, 6oz non-woven geotextile, concrete topping slab, and 3-inch PVC pipes through the grade beams.

The below slab LFG collection and conveyance system components including the collection pipe trenches, laterals, vents, gravel blanket, 6oz non-woven geotextile, concrete topping slab, and 3 inch PVC pipes through the grade beams were installed during Quarters 1 and 2. Two of the four header to collector connections were installed in Quarter 4, one was installed during Quarter 7, and the last one finished up during Quarter 8. The LFG collection and conveyance system components were installed by KLB Construction.

Composite Liner System

Herrera provided CQA observation of the Building B LFG barrier system which involved monitoring the installation of each component of the composite liner system to the elevator pits and to the surface of the concrete structural slab. The composite liner system components are products manufactured by EPRO and were installed by MTN Inc.

Elevator Pit

Herrera monitored the composite liner system application to the Building B elevator pits. The composite liner system was installed in and around the elevator pits during Quarters 1 and 2.

For the interior walls of the elevator pit, the composite liner system includes reinforcement detailing of E. Poly material sandwiched between 30-mil E. Roll around wall edges and slab penetrations; Geo-Seal Base material connected to the bottom and side walls of the interior elevator pit; 80 mil Geo-Seal Core material covering the Geo-Seal Base; and Geo-Seal Bond B installed as a protection layer on top of the core material application. Smoke testing was performed on the interior elevator pit composite liner system to confirm there were no defects or leaks. Additionally, the mil (one thousandth of an inch) thickness of the Geo-Seal Core material was confirmed by collecting one coupon per elevator from the bottom of the pit lining system at the smoke test penetration. For each coupon cut from the liner system as part of Building B CQA, the Installer handed Herrera the coupon square, and the thickness was measured right away to ensure it was thick enough to account for the thinning of the core material during its drying process. If Herrera deemed the coupon too thin so that the 80-mil thickness requirement would not be met after the material was done curing, Herrera had the Installer go over the area represented by the coupon with additional core material spray. The final recorded thickness was measured of the core material only with the base layer peeled away and was measured at least a day after coupon collection to ensure adequate time for the material curing process. The Installer patched up the area where the destructive sample was collected with base and core material according to design requirements.

For the exterior walls of the elevator pit, the composite liner system includes reinforcement detailing of E. Poly material sandwiched between 30-mil E. Roll around wall edges; 80 mil Geo-Seal Core material covering the entire outer surface of the concrete grade beams; and Geo-Seal Bond B installed as a protection layer on top of the core material application. A termination bar was installed across the top of the liner to secure the Bond B material to the core material and the grade beam. Smoke testing was not applicable for the liner installed on the outer walls of the elevator pits because the main liner component,

Geo-Seal Core, was sprayed directly onto the concrete surface, avoiding the creation of any seams and access below the liner. Due to the core material being sprayed directly onto the grade beam and being unable to remove a sample from the surface, the Installer draped a section of the Geo-Seal Base material over each wall according to the frequency direction given by Herrera and applied the core material to the base material as they progressed through the installation over the entire surface. The Installer cut a square coupon from the draped section and handed Herrera the coupon square to be measured. The thickness was measured right away to ensure it was thick enough to account for the thinning of the core material during its drying process. If Herrera deemed the coupon too thin so that the 80-mil thickness requirement would not be met after the material was done curing, Herrera had the Installer go over the area represented by the coupon with additional core material spray. The final recorded thickness was measured of the core material only with the base layer peeled away and was measured at least a day after coupon collection to ensure adequate time for the material curing process. Installer patched up the area where the sample was collected with core material according to design requirements.

Vacuum testing was not required for the Building B LFG barrier because no geomembrane materials were installed or welded. Performing the mil thickness check on both the inner and outer elevator pit surfaces, and the smoke test for the inner surface was sufficient for the elevator pits composite liner CQA.

Above Slab Building System

Herrera monitored the composite liner system application to the Building B concrete structural slab. The above slab composite liner system was installed during Quarter 5.

The composite liner system includes reinforcement detailing of E. Poly material sandwiched between 30-mil E. Roll around wall edges and slab penetrations; Geo-Seal Core material covering the entire surface of the concrete structural slab; and Geo-Seal Film 11 installed as a protection layer on top of the core material application. Herrera measured the mil thickness of the Geo-Seal Core material application to the concrete structural slab approximately every 1,000 square-feet to ensure the 30-mil thickness requirement for the above slab system was met. The Installer placed a small sample square of the 11-mil film on the ground according to the frequency direction given by Herrera and applied the core material to the film as they progressed through the installation over the entire surface similar to the technique implemented for the outer elevator pit walls. If Herrera deemed the coupon too thin so that the 30-mil thickness requirement would not be met after the material was done curing, Herrera had the Installer go over the approximately 1,000 square-feet area represented by the coupon with additional core material spray. The final recorded thickness was measured of the core material only, with the film 11 layer peeled away. The relevant inspection reports (see Table 1) of Appendix B include highlighted screenshots of plan sheets that show the area of work and where coupons were collected and include tables that report the measured thicknesses of the core material coupons.

Smoke testing was not applicable for the liner installed on the concrete structural slab because Geo-Seal Core was sprayed directly onto the concrete slab, avoiding the creation of any seams and access below the liner. Smoke testing is required when there is access below the Geo-Seal product and vacuum testing is required when geomembrane materials are welded and anomalies in the welds are observed. To form a continuous protection layer on top of the core material, segments of the film 11 material were

overlapped and sprayed with core material to join the materials. No visual anomalies in liner and at film seams were observed. Performing the mil thickness check on core material application to the surface of the concrete structural slab was sufficient for the composite liner CQA due to the continuous coating of core material application and lack of visual anomalies at film seams.

Preconstruction Activities

Prior to installation of the LFG collection, conveyance, and barrier system components, Herrera performed reviews of material submittals, Installer's certification, and addressed redesigns required of RFIs.

The material submittals provided by the Contractor were reviewed by Herrera engineers for conformance with the approved project plans, project specifications, and RFIs. Following Herrera's review and approval of these materials, COE and Floyd Snider (representing the City to ensure compliance with the Consent Decree), would review and approve, or reject material submittals. If rejected, material submittals would then be revised and resubmitted until approval had been received by all reviewers.

Changes during construction to the LFG collection system were prepared by RCI as an RFI on behalf of the Contractor. RFIs were reviewed and redesigned by Herrera in collaboration with the Consultant team. RFIs are subsequently approved by COE, Floyd Snider, and RCI.

Environmental Control Systems Installation - CQA Testing

Installation and testing of the environmental controls system was photo documented and described within Herrera's field inspection reports (Appendix B).

LFG Collection and Conveyance System

Prior to installation, Herrera observed the high-density polyethylene (HDPE) pipe butt and electro-fusion joining methods. Herrera observed the pipe connections and pressure tests on the joined header pipes before installation. Reports from the fusion joining methods were collected by RCI and reviewed by Herrera and are included in Appendix C. Not all welds were created with the welding machine that is able to log fusions.

Pipe invert elevations and grades were verified by the LFG collection pipe installation Contractor (KLB Construction) and RCI. HWA observed backfilling of pipe trenches and performed compaction testing as required. Immediately prior to pipe placement in the trenches, Herrera and RCI inspected the constructed trench to confirm it was suitably prepared per the Specifications.

The summary of Contractor performed compliance testing as required by COE and the Consent Decree for the solid conveyance piping is below:

- Solid HDPE Pipe Test – HDPE pipe was pneumatically air pressure tested in accordance with ASTM F1417 and as specified in Specification Section 33 35 10.

Installed pipe was surveyed by ASPI. As-built survey information from ASPI was provided to the Consultants to prepare final as-built plans, with the inclusion of any additional changes from RFIs. As-built survey of the LFG system was provided by RCI and Herrera updated drawings as part of the project's Record Drawings. RCI's CQA Report provides the project's Record Drawings. The Building B LFG collection and conveyance pipes were installed and connected to the site LFG system in accordance with design, specification, and CQA requirements.

Composite Liner System

Prior to installation, Herrera observed the individual liner components and the mockup that was performed to replicate the anticipated field conditions and demonstrate proper application techniques and standard of workmanship. Immediately prior to liner deployment, Herrera, RCI and MTN, Inc. (composite liner installation subcontractor) inspected the subgrade surface to confirm it was suitably prepared per the Specifications.

The summary of compliance testing performed as required by COE and the Consent Decree for the composite liner system is below:

- Smoke testing – A smoke test was conducted on all under slab areas upon installation of the base sheet, the sealing of all penetrations, and application of polymer modified asphalt in accordance with specifications that were included with the drawings. Smoke testing was only applicable to and performed on the interior elevator pit liner system. Smoke testing was performed by MTN, Inc. and was observed by Herrera.
- Mil thickness testing – A mil reading caliper was used to measure the thickness of Geo-Seal core material coupon samples throughout the installation process to ensure the necessary thickness was met. Thickness verification was in accordance with drawings and specifications that were included with the drawings. Material coupon samples were collected by MTN, Inc. and measured by Herrera.

The composite liner system installation for Building B was completed in accordance with design, specification, and CQA requirements. Composite liner system installation for Building B was documented and tracked with field reports, photos, coupon thickness tables, and marked up drawings of where and when the system was installed on the Building's structural slab footprint.

HDPE Pipe Certification

The fusion weld operator certificate for the pipe fusion welder was collected by RCI and confirmed via submittal by Herrera. RCI also collected the data logger information from each HDPE pipe fusion weld

and reports were reviewed by Herrera. Some of the lateral pipe connections were welded via hand welding machine. The hand welding machine does not have the data logger attachment to record welding reports, so the weld temperature was written on the pipe at the weld. Photos were taken to document the connections that were welded via hand welding machine and are included in the relevant field inspection reports. See Appendix C for the pipe fusion reports.

HDPE pipe is PE 4710 and conforms to all applicable AWWA, ASTM, CSA, API, FM, and NSF standards. HDPE pipe and fitting material and installation submittals conformed to the requirements of Specification Section 33 35 10. Refer to approved pipe material submittals for manufacturer certifications, and detailed properties of the HDPE pipe.

Composite Liner System Certification

The Geo-Seal material certificate for the LFG barrier system installed on top of the concrete structural slab and within and around the elevator pits was collected by RCI and confirmed via the submittal process by Herrera.

Composite liner material submittals conformed to the requirements of the specifications provided with the drawings. See Field Inspection Reports in Appendix B for composite liner system installation reports.

Changes Made During Course of Construction

Notable RFIs resulting in design changes or clarification related to CQA Consent Decree requirements during Building B environmental controls installation work are described in Table 2 below.

Table 2. RFI Design Changes.

RFI #	Subject	Description
Quarter 1 – June 1 through August 30, 2021		
023	Additional details of the composite liner system under elevator pit	Additional details added for how composite liner system was to be added under and around the exterior of the elevator pit.
058	Gas Membrane Liner – Material Specification Change – PVC to Geo-Seal	Original drawings LFG 1B1 and LFG 1B2 and specifications on LFG 1B3 had the gas membrane barrier material placed under the 3" topping slab on Level One as PVC. RFI#58 changed this material from PVC to GeoSeal, a composite liner system.
085	Additional details of the composite liner system throughout the building	Additional drawing LFG1B4 added details for how composite liner system was to be added at different scenarios throughout the building.
103	CQA Plan – Update – (Section 8) – follow-up to RFI #58	RFI#103 updated Section 8 of the CQA Plan to include the Gas Membrane Liner – Material Change approved as noted in the Response to RFI#58.

Table 2 (continued). RFI Design Changes.		
RFI #	**Subject**	**Description**
Quarter 2 – September 1 through November 30, 2021		
141	BSB Plug deletion at Building B LFG Riser vents	RFI#141 removed the BSB from around the horizontal to vertical transition of the LFG vent pipe at all locations on Building B (Drawing LFG1B2).
Quarter 3 – December 1, 2021 through February 28, 2022		
233	Methane Air Flow Monitoring in HVAC Equipment	RFI #233 clarified the HVAC equipment that needs air flow monitoring and the specific component used for the monitoring.
241	CQA Plan – UPDATE – Section 9 Composite Liner System – Manufacturer Testing Documentation	RFI #241 provides updates to drawing LFG1B3 and Sections 9.1 Liner Manufacturing and 9.2 Liner Conformance Testing of the Building CQA Plan to align with the liner manufacturer's testing documentation and submittals.
Quarter 4 – March 1 through May 31, 2022		
266	LFG – Building B Riser vent – Slip Joint Detail Revision	RFI #233 revises the LFG slip joint design at the exterior of Building B due to the vertical portion of the vent being in conflict with the curb wall and siding in the original design.
269	Revision of Fan Units to meet CD requirements of Increased Air Flow	RFI #269 provides a new matrix outlining the equipment change to meet CD increased air flow requirements. RFI #269 establishes that the criteria will be satisfied with fans that are two speed. Low speed will be normal continuous air change per hour, and when gas is detected at 1000 ppm or greater, the gas control system the signal the associated area fan to increase speed to the high speed setpoint that is a minimum of 1 air change per hour greater than the low speed.
275	Final Fan Schedule	RFI #275 provides a revised mechanical schedule and electrical drawings following RFI #269 for Revision of Fan Units to Meet CD Requirements for Increased Air Flow.
Quarter 5 – June 1 through August 31, 2022		
340	LFG – Missing Lateral Connection at NW Corner (STA: 1+84.4)	RFI #340 provides the details and methods for connecting the Building B LFC collector pipe system to the LFG lateral/header conveyance system after the designed collector lateral from Building B was missed during construction.

Table 2 (continued). RFI Design Changes.		
RFI #	**Subject**	**Description**
Quarter 6 – September 1 through November 30, 2022		
Quarter 7 – December 1, 2022 through February 28, 2023		
Quarter 8 – March 1 to completion		

Notable material submittals are described in Table 3 below.

Table 3. Submittals.		
Submittal #	**Material**	**Description**
Quarter 1 – June 1 through August 30, 2021		
317	LFG – HDPE Pipes	This submittal provided HDPE pipe data sheet and resin properties.
319	LFG – 6" x 4" EC Coupler	This submittal provided the drawing and details of the 6" x 4" EC Coupler Assembly at the LFG vent.
320	LFG – HDPE – Elbows, Tees, Fittings	This submittal provided drawings and sizes for HDPE elbows, tees, and fittings.
323	Gas Barrier – Geo Seal Composite Barrier System at Level 1	This submittal provided Geo Seal installation drawings and specifications used throughout the LFG system.
324	LFG – System Low Pressure Air Test Procedure	This submittal provided low pressure air test procedure and the equipment product catalog.
472	Geotextile – 6 oz Non-Woven Fabric	This submittal provided 6 oz Non-Woven Fabric Geotextile specifications.
498	Gas Barrier – Elevator Pits – Composite Gas & Waterproofing System	This submittal provided Geo Seal installation drawings and specifications used for the Elevator Pits.
505	Gas Barrier – Authorized Applicator Letter – Geo-Seal	This submittal provided the confirmation that MTN, Inc. had completed the necessary requirements to obtain status of Certified Applicator of EPRO Services, Inc.'s Geo-Seal System for the Riverfront Commercial Everett Building.

Table 3 (continued). Submittals.		
Submittal #	**Material**	**Description**
Quarter 2 – September 1 through November 30, 2021		
526	Gas Barrier – EPRO Composite Barrier System – Termination Bar (Alternate)	This submittal provided the termination bar installation drawings and specifications.
Quarter 3 – December 1, 2021 through February 28, 2022		
Quarter 4 – March 1 through May 31, 2022		
529	Gas Barrier – Manufacture Source QC Testing Certificates	This submittal provides the manufacturer conformance documents for the Building composite liner system. Conformance documents include a certified applicator letter in addition to manufacturer material certificates of conformance and QC tests.
Quarter 5 – June 1 through August 31, 2022		
629	Gas Barrier – Alternate Film11 Patch	This submittal provides the product information and approval letter from EPRO for the EPRO PreTak PSA Tape, an application that can be used as an alternate method to path the Film11 protection sheeting.
Quarter 6 – September 1 through November 30, 2022		
Quarter 7 – December 1, 2022 through February 28, 2023		
738	LFG – Exterior Vent Assembly (pipe, bracket, valve, cap)	This submittal provides the product information for the different components of the LFG vent pipes.
738 Revision 1	LFG – Exterior Vent Assembly (pipe, bracket, valve, cap)	This submittal provides the product information for the 8" x 4" reducer fernco fitting, revised roof cap, and transition fitting to valve of the LFG vent pipes following comments provided on Revision 0.
Quarter 8 – March 1 to completion		

MTN INC.
ENVIRONMENTAL SERVICES

WORK GUARANTEE/WARRANTY

OWNER: Riverfront Phase 1, LLC – Building B

PROJECT: Riverfront-Residential Building B

LOCATION: 3810 Riverfront Blvd, Everett, Washington 98203

Contractor: Shelter Holdings

MTN INC Certifies that all labor furnished and work performed by them are in accordance with the Subcontract, Plans, Specifications and authorized alterations and additions thereto; and that should any defect develop during the Guarantee period as hereinafter defined due to improper workmanship or arrangement, the same, together with any other work affected in correcting such defect shall, upon written notice, be made good by MTN INC without expense to the Owner and/or General Contractor.

The aforesaid Guarantee shall cover all work under the Subcontract, whether or not any portion or trade has been assigned or sublet, for a period of 1 Year.

Date of Substantial Completion: **7/25/23**

Scope of Work: Vapor Mitigation System, Elevator pit Waterproofing

SUBCONTRACTOR: MTN INC

By:

Title: Project Coordinator

Date: 05/08/23

3395 Carder Court Suite C200
Highlands Ranch, CO 80129

P. 303-768-7310

GEO-SEAL MATERIAL 10-YEAR WARRANTY

Limited Warranty: EPRO Services, Inc. (EPRO) warrants that its materials (*Geo-Seal Film 11, Geo-Seal Core, & Geo-Seal Film 5*) conform to EPRO's published specifications and are free from defects. The duration of this warranty is 10 year commencing on the date material installation is substantially completed. In order for this warranty to apply, all of the following conditions must be met: (i) the warranted project must be registered and accepted by EPRO in writing, prior to application of any EPRO material; (ii) all material must be installed by an EPRO Geo-Seal Authorized Applicator (GAA) per EPRO installation guidelines; (iii) EPRO-supplied Waterstop must be installed in all areas applicable per EPRO installation guidelines; (iv) all fees and costs relating to this Warranty must have been received by EPRO; and (v) the Claims Procedure and Time Limitations set forth below must have been strictly followed.

If the purchaser discovers within this period a failure of this material to conform to this warranty, EPRO must be promptly notified in writing within 30 days at P. O. Box 347, Derby, KS 67037. As the exclusive remedy for any breach of this Warranty, EPRO will refund the price of material only, or replace the defective material, at its election.

What is Not Covered: EPRO does not warrant any material that (a) is not applied in accordance with manufacturer's directions for application (b) is damaged, either before or after application. **NO OTHER WARRANTIES ARE MADE REGARDING THIS PRODUCT, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.**

Limitation on Remedies: In no event shall EPRO be liable for any special, incidental, or consequential damages based upon breach of warranty, breach of contract, negligence, strict tort, or any other legal theory. Such damages include, but are not limited to, loss of profits, delay, loss of use, claims of third parties, or damage to property.

Manner and Time Limit for Enforcing Disputed Warranty: Any controversy or claim arising out of or relating to this Warranty, or the breach thereof, shall be settled by an arbitration administered by the American Arbitration Association in the regional office nearest Wichita, Kansas, in accordance with its Construction Industry Arbitration Rules. Any arbitration or any other action for breach of warranty must be commenced within 1 year following notification of defect.

No Other Warranties: Unless this warranty is modified in a writing signed by both parties, the above-stated warranty is the complete and exclusive agreement between the parties.

	OWNER	APPLICATOR
NAME	Riverfront Phase 1, LLC - Bldg B	MTN, Inc.
ADDRESS	3810 Riverfront Blvd Everett, WA	3395 Carder Court, Suite C200 Highlands Ranch, CO 80129

This warranty is not valid unless signed and registered by EPRO Services, Inc. PJ Peek

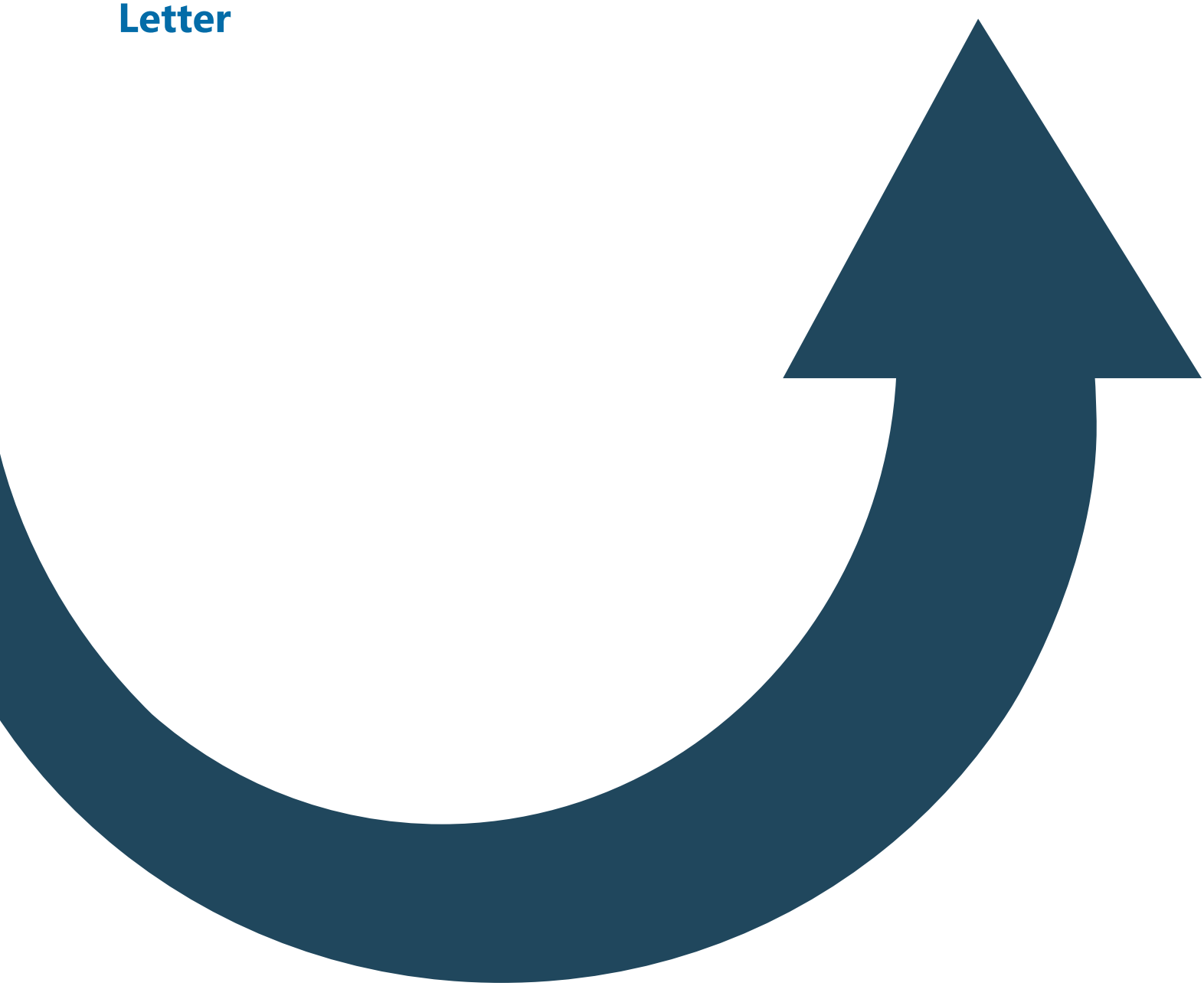
WARRANTY NO: C-WA-01024

WARRANTY START DATE: 6/29/2022

Form Rev 8-1-19

APPENDIX A

Construction Quality Assurance (CQA) Declaration Letter



HERRERA
Science + Planning + Design

October 11, 2023

Riverfront Commercial Investment, LLC
11624 Southeast 5th Street Suite 210
Bellevue, Washington 98005

Subject: Construction Quality Assurance (CQA) Declaration for Riverfront Building B in Everett, Washington

Dear Mr. Evans:

Introduction

This letter discusses the approval of the Riverfront Building B landfill gas management system following the final testing and commissioning of the gas detection, ventilation, and alarming system. All other components for the Building B landfill gas management system were inspected, tested, and approved as discussed in the Construction Quality Assurance (CQA) Report and individual field reports. Requirements for gas detection, ventilation, and alarming for the Building was established by the Consent Decree, specifically the Compliance Monitoring and Contingency Plan (CMCP) attached to the Cleanup Action Plan. The CMCP discusses the following requirements for buildings constructed on the landfill:

- Continuous sensor system in all ground floor spaces;
- Automatic activation of increased interior ventilation via the installed HVAC system and notification of appropriate operations and maintenance personnel if the methane concentration reaches 1,000 ppm;
- Actuation of evacuation and fire department notification alarms if methane concentration reaches 10,000 ppm;
- Activation of trouble light or audible tone and automatic switch to battery power in case of a power failure.

83 gas detectors connected to 17 fans were installed throughout the ground floor (Level 1) spaces of Building B and were inspected and tested over the course of three days. Enclosed are the September 14th, 2023, September 19th, 2023, and September 26th, 2023, field reports for the inspection and testing of the PrimaX® IR Infrared Gas Monitors (gas detectors) and connected ventilation fans and alarm systems installed throughout the Level 1 spaces of Building B. The field reports provide the details and photos of gas detector, ventilation fan, and alarming system validation. The field reports also include a snapshot of Appendix H of the Everett Landfill Riverfront

Development Operations, Maintenance, and Monitoring Manual that shows a map with the locations of the gas detectors, ventilation fans, and alarms. The parties on site during all or part of testing included Dave Fiala and Renay Luzama with Shelter Holdings, LLC; Randy Loveless with the City of Everett; Jeff Gabster with Floyd|Snider; Christina, Neeti, Jeremy and Alex with QCC; RJ with Fire Protection, Inc. (FPI), and Camryn Steiner with Herrera.

Commissioning Test Procedure

In order to verify the gas detection, ventilation fan activation, and alarm systems were in proper working order, several tests and checks were performed:

- Continuous Monitoring and Alarm System
    - Low Level Detection and Alarm Testing
    - High Level Detection and Alarm Testing
- Ventilation Monitoring and Alarm System
    - Non-Stairwell Ventilation Activation Testing
    - Stairwell Fire Fans Activation Testing
    - Fan Shutdown Alarm Testing
- Emergency and Standby Power System
    - Standby Power System Activation Testing
    - Emergency Notification Testing

Results of testing are included in Table 1 at the end of this letter. All system components passed.

Continuous Monitoring and Alarm System

Building B is equipped with 83 PrimaX® IR Infrared Gas Monitors (gas detectors) that were tested for accurate gas detection reading and alarm notification at the Building B Control Panel (MGCP-B). Christina, Neeti, Jeremy, and Alex with QCC calibrated the detectors and programmed the connection to the MGCP-B prior to system validation testing on September 14th and 19th. The testing procedure for the continuous monitoring and alarm system was the same for each detector.

Low Level Detection and Alarm Testing:

Alex with QCC applied 1,250 parts per million (ppm) (2.5% lower explosive limit (LEL)) methane gas to the detector while QCC, Christina and Neeti on September 14th and Jeremy on September 19th, and Camryn with Herrera verified the reading on the MGCP-B screen within an acceptable range of accuracy. Christina, Neeti, Jeremy, and Camryn verified the Low Warning (at 500 ppm, 1% LEL) and Low Alarm (at 900 ppm, 1.8% LEL)[1] notifications were activated on the MGCP-B screen as the detector reading climbed to 1,250 ppm and passed the 900 ppm threshold, and that a phone call was received from the autodialer describing the methane gas low level alarm[2]. The warning level is an extra alarm added for operational information and to provide another opportunity for notification to implement corrective action before gas levels potentially rise to the alarm and HVAC activation level. The designed low level alarm level was 1,000 ppm but was changed to 900 ppm after the detectors were not always reading 1,000 ppm when exposed to the 1,250 ppm methane gas. The 900 ppm notification alarm and HVAC activation level will remain the setpoint once the system is up and running to account for the detector readings typically coming in low at the MGCP-B.

High Level Detection and Alarm Testing:

Alex with QCC applied 12,500 ppm (25% lower explosive limit (LEL)) methane gas to the detector while QCC, Christina and Neeti on September 14th and Jeremy on September 19th, and Camryn with Herrera verified the reading on the MGCP-B screen within an acceptable range of accuracy. Christina, Neeti, Jeremy and Camryn verified the High Alarm (at 9,000 ppm, 18% LEL) notification was activated on the MGCP-B screen as the detector reading climbed to 12,500 ppm and passed the 9,000 ppm threshold, and that a phone call was received from the autodialer describing the methane gas high level alarm[2]. The High Warning Level had not been set at time of inspection. The warning level is an extra alarm added for operational information and to provide another opportunity to implement corrective action before gas levels potentially rise to the evacuation level. The gas level on the MGCP-B panel returned to zero ppm after test gas was removed.

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[1] System was programmed to read "High Methane Alarm" during September 14th, 2023 testing. This was changed to read "Low Methane Alarm" at time of September 19, 2023 testing.

[2] Christina had autodialer programmed to call her number for half of the September 14th testing. Halfway through September 14th testing and for the entire September 19th testing, autodialer was programmed to call Camryn. Jeremy and Camryn discovered the comcast line to be disconnected on September 19th testing but could confirm the autodialer was working and trying to call out the alarm. The line was restored around 12:30 pm on September 19th and Camryn received all alarm notifications from the autodialer for the rest of the day.

For all detectors but two, validation testing was performed in Test mode which was set at the MGCP-B. On Test mode, the sound alarm does not go off, only the visual alarm was activated on the MGCP-B screen. For two detectors, MGD-114 and MGD-114A, the MGCP-B was switched to Auto and the fire alarm activated in the building at the High Alarm Level of 9,000 ppm. For the test, the Fire Alarm Control Panel (FACP) notification to the fire department was intentionally disconnected to not alert the fire department. The designed low level alarm level was 10,000 ppm but was changed to 9,000 ppm after the detectors were not always reading 10,000 ppm when exposed to the 12,500 methane gas. The 9,000 ppm notification alarm and HVAC activation level will remain the setpoint once the system is up and running to account for the detector readings typically coming in low at the MGCP-B.

The Building B continuous gas detectors and alarm system from the MCGP-B are confirmed to be installed, calibrated, commissioned, and operating per design.

Ventilation Monitoring and Alarm System

Building B is equipped with 17 ventilation fans that were tested for accurate air change activation at the low level setpoint of 900 ppm and proper notification when the fan shuts down. Fans capable of performing air changes at the minimum and increased airflows were installed by the mechanical contractor prior to system validation testing on September 14th, 19th, and 26th. The stairwell fan speed was pre-programmed to run per the FACP ventilation requirements. See drawing EFB6 (also included in field report attachments) for the designed and increased airflows and air changes per hour for each fan. The HVAC Air Balance Test Report is attached.

Non-Stairwell Ventilation Activation Testing:

As designed, non-stairwell fans ran continuously at the minimum low speed air change per hour (see snapshot of drawing EFB6 attached to the field reports for exact minimum air change) when no test gas was applied. Stairwell fans (both in ceiling and duct mount detectors) remained off with the dampers closed. Alex with QCC applied 1,250 ppm methane gas to the detector and confirmed alongside Dave that the fan activated. Activation was verified by hearing the fan increase in volume, checking that the VFD/voltage reading next to the fan increased, and/or checking on the QCC programming computer that the signal was sent. In some rooms it was difficult to hear the fan near other noisy operating machinery, so the VFD/voltage reading, or computer signal was used as verification.

QCC (Christina and Neeti on September 14th, Jeremy on September 19th) and Camryn verified that fans were labeled as Running on the MGCP-B screen.

Stairwell Fire Fans Activation Testing:

Christina and Camryn verified the activation of stairwell 1, 2, and 3 fire fans on September 26th, 2023. Christina sent the signal for low level methane detection (1,000 ppm) from her computer in the electrical room as if 1,000 ppm methane gas had been detected by the stair detectors. The methane concentration reading at the MGCP-B and activation of the operator interface terminal

(OIT) and autodialer alarms were verified for the stair detectors (MGD – STR1C, STR1D, STR2C, STR2D, STR3C, and STR3D) during validation testing on September 19th. The stair fire fan signal had been turned off so fan activation was not verified previously. On September 26th, Camryn verified proper fan activation and deactivation while standing next to the fan and hearing the fan volume increase and decrease, respectively, while Christina controlled the simulation. Christina and Camryn communicated during process to make sure the signals Christina was sending/seeing on her end on her computer in the electrical room matched with what Camryn was hearing at the fan. For the stairwell systems, the MGCP-B receives fan running and damper open feedback as one combined discrete signal per stairwell from the FACP.

Fan Shutdown Alarm Testing:

A couple fans were manually shutoff during the testing to confirm that the fan status switched to Fail on the MGCP-B screen and that a visual "No Fan Air Flow" alarm triggered. Camryn received a phone call from the autodialer describing a fan failure alarm. The Building B activated fan ventilation and alarm system from the MCGP-B are confirmed to be installed, commissioned, and operating per design.

Emergency and Standby Power System

Building B is equipped with a standby power system that turns on in case of power outages.

Standby Power System Activation Testing

Utility power was manually disconnected from Building B to test and verify the Emergency and Standby Power System turned on and provided backup power to the gas detectors, ventilation fans, and MGCP-B. MGCP-B was confirmed to be on with correct methane gas level reads. The electrical vault detectors, MGD – MVB1, MVA1, MVR1, and MVC1, all received test gas of 25,000 ppm for alarm spot checking during the testing on August 24, 2023 (see attached field report) while the backup power was on.

Emergency Notification Testing

QCC and Herrera confirmed alarm for emergency generator, fire pump, and both emergency and standby ATS triggered correctly at the MGCP-B screen. Camryn received phone call from the autodialer describing the alarms.

Conclusion

Herrera has completed the commissioning documentation for the construction and startup of the Riverfront Building B indoor methane monitoring and ventilation system. The commissioning of the indoor methane monitoring and ventilation system means the entire installed landfill gas management system for Riverfront Building B has been reviewed and approved. Based on Herrera's field inspections and the CQA information provided by Riverfront Commercial Investment LLC, the landfill gas system elements were constructed in conformance with the Plans and Construction Specifications, and the materials used in construction were in conformance with the Construction Specifications. Herrera declares, in its professional engineering judgment and opinion, that the Riverfront Building B landfill gas management, detection, ventilation, and alarming systems are complete and functional.

Sincerely,

Herrera Environmental Consultants, Inc.

10/11/2023

Tyson Wright, P.E.
Senior Engineer

Enclosure:

Cc: FR 08242023 Riverfront Site Wide LFG HEC.pdf

FR 09142023 Riverfront Building B LFG HEC.pdf

FR 09192023 Riverfront Building B LFG HEC.pdf

FR 09262023 Riverfront Building B LFG HEC.pdf

HVAC Air Balance Test Report

Table 1. Results of Gas Detection, Ventilation, and Alarming Validation Testing for Building B

				1,000 PPM (2% LEL) Test			10,000 PPM (20% LEL) Test	
Tag No.	Location	Corresponding Fan(s)	Test Date	OIT Alarm	Autodialer Alarm	Fan to High Speed	OIT Alarm	Autodialer Alarm
MGD-99	HVAC 99	ERV-1	9/19/2023	Pass	Pass	Pass	Pass	Pass
MGD-100-1	Leasing Office 100	ERV-1	9/19/2023	Pass	Pass	Pass	Pass	Pass
MGD-100-2	Leasing Office 100	ERV-1	9/19/2023	Pass	Pass	Pass	Pass	Pass
MGD-101	Office 101	ERV-1	9/19/2023	Pass	Pass	Pass	Pass	Pass
MGD-102	Office 102	ERV-1	9/19/2023	Pass	Pass	Pass	Pass	Pass
MGD-103	Office 103	ERV-1	9/19/2023	Pass	Pass	Pass	Pass	Pass
MGD-104	Office 104	ERV-1	9/19/2023	Pass	Pass	Pass	Pass	Pass
MGD-105	Office 105	ERV-1	9/19/2023	Pass	Pass	Pass	Pass	Pass
MGD-106	Office 106	ERV-1	9/19/2023	Pass	Pass	Pass	Pass	Pass
MGD-107	Office 107	ERV-1	9/19/2023	Pass	Pass	Pass	Pass	Pass
MGD-100HL	South Hallway Near Room 100	ERV-1	9/19/2023	Pass	Pass	Pass	Pass	Pass
MGD-103HL	South Hallway Near Room 103	ERV-1	9/19/2023	Pass	Pass	Pass	Pass	Pass
MGD-110HL	South Hallway Near Room 110	ERV-1	9/19/2023	Pass	Pass	Pass	Pass	Pass
MGD-108	Break Room 108	ERV-1	9/19/2023	Pass	Pass	Pass	Pass	Pass
MGD-110	BOH 110	ERV-1	9/19/2023	Pass	Pass	Pass	Pass	Pass
MGD-111A	Restroom 111A	N/A	9/14/2023	Pass	Pass		Pass	Pass
MGD-111B	Restroom 111B	N/A	9/14/2023	Pass	Pass		Pass	Pass
MGD-112-1	Comm Flex 112	ERV-6	9/19/2023	Pass	Pass	Pass	Pass	Pass
MGD-112-2	Comm Flex 112	ERV-6	9/19/2023	Pass	Pass	Pass	Pass	Pass
MGD-141	Comm Flex 112 Restroom	ERV-6	9/19/2023	Pass	Pass	Pass	Pass	Pass
MGD-113-1	Comm Flex 113	ERV-2	9/19/2023	Pass	Pass	Pass	Pass	Pass
MGD-113-2	Comm Flex 113	ERV-2	9/19/2023	Pass	Pass	Pass	Pass	Pass
MGD-113-3	Comm Flex 113	ERV-2	9/19/2023	Pass	Pass	Pass	Pass	Pass
MGD-139	South Elevator Machine Room 139	N/A	9/14/2023	Pass	Pass		Pass	Pass
MGD-114	Maintenance Room 114	EF-8	9/14/2023	Pass	Pass	Pass	Pass	Pass
MGD-114A	Maintenance Office 114A	EF-8	9/14/2023	Pass	Pass	Pass	Pass	Pass

				1,000 PPM (2% LEL) Test			10,000 PPM (20% LEL) Test	
Tag No.	Location	Corresponding Fan(s)	Test Date	OIT Alarm	Autodialer Alarm	Fan to High Speed	OIT Alarm	Autodialer Alarm
MGD-114B	Generator 114B	EF-8	9/14/2023	Pass	Pass	Pass	Pass	Pass
MGD-115	Fire 115	N/A	9/14/2023	Pass	Pass		Pass	Pass
MGD-116	Water Service 116	EF-9	9/19/2023	Pass	Pass	Pass	Pass	Pass
MGD-116HL	Hallway Near Water Service 116	N/A	9/14/2023	Pass	Pass		Pass	Pass
MGD-117	USS Room 117	SF-5	9/14/2023	Pass	Pass	Pass	Pass	Pass
MGD-118-1	Comm Flex 118	ERV-3	9/19/2023	Pass	Pass	Pass	Pass	Pass
MGD-118-2	Comm Flex 118	ERV-3	9/19/2023	Pass	Pass	Pass	Pass	Pass
MGD-118-3	Comm Flex 118	ERV-3	9/19/2023	Pass	Pass	Pass	Pass	Pass
MGD-118C	Comm Flex 118C	ERV-3	9/19/2023	Pass	Pass	Pass	Pass	Pass
MGD-119	Electrical 119	SF-6	9/14/2023	Pass	Pass	Pass	Pass	Pass
MGD-119A	Electrical 119A	SF-6	9/14/2023	Pass	Pass	Pass	Pass	Pass
MGD-120	MPOE Room 120	N/A	9/14/2023	Pass	Pass		Pass	Pass
MGD-121	Bike Room 121	EF-4	9/14/2023	Pass	Pass	Pass	Pass	Pass
MGD-122	Restroom 122	EF-4	9/14/2023	Pass	Pass	Pass	Pass	Pass
MGD-123	Restroom 123	EF-4	9/14/2023	Pass	Pass	Pass	Pass	Pass
MGD-124-1	Parcel Room 124	N/A	9/14/2023	Pass	Pass		Pass	Pass
MGD-124-2	Parcel Room 124	N/A	9/14/2023	Pass	Pass		Pass	Pass
MGD-125	Vestibule 125	N/A	9/14/2023	Pass	Pass		Pass	Pass
MGD-126-1	Concierge 126	N/A	9/14/2023	Pass	Pass		Pass	Pass
MGD-126-2	Concierge 126	N/A	9/14/2023	Pass	Pass		Pass	Pass
MGD-127-1	Lobby 127	N/A	9/14/2023	Pass	Pass		Pass	Pass
MGD-127-2	Lobby 127	N/A	9/14/2023	Pass	Pass		Pass	Pass
MGD-128	Vestibule 128	N/A	9/14/2023	Pass	Pass		Pass	Pass
MGD-129-1	Restaurant 129	ERV-4	9/19/2023	Pass	Pass	Pass	Pass	Pass
MGD-129-2	Restaurant 129	ERV-4	9/19/2023	Pass	Pass	Pass	Pass	Pass

				1,000 PPM (2% LEL) Test			10,000 PPM (20% LEL) Test	
Tag No.	Location	Corresponding Fan(s)	Test Date	OIT Alarm	Autodialer Alarm	Fan to High Speed	OIT Alarm	Autodialer Alarm
MGD-129-3	Restaurant 129	ERV-4	9/19/2023	Pass	Pass	Pass	Pass	Pass
MGD-130	Move-In 130	N/A	9/14/2023	Pass	Pass		Pass	Pass
MGD-131	Janitor 131	EF-3	9/14/2023	Pass	Pass	Pass	Pass	Pass
MGD-132	Restroom 132	EF-3	9/14/2023	Pass	Pass	Pass	Pass	Pass
MGD-133	Restroom 133	EF-3	9/14/2023	Pass	Pass	Pass	Pass	Pass
MGD-134	Security 134	N/A	9/14/2023	Pass	Pass		Pass	Pass
MGD-135-1	Trash Room 135	EF-11	9/19/2023	Pass	Pass	Pass	Pass	Pass
MGD-135-2	Trash Room 135	EF-11	9/19/2023	Pass	Pass	Pass	Pass	Pass
MGD-136-1	Comm Flex 136	EF-10 & ERV-5	9/19/2023	Pass	Pass	Pass	Pass	Pass
MGD-136-2	Comm Flex 136	EF-10 & ERV-5	9/19/2023	Pass	Pass	Pass	Pass	Pass
MGD-136C	Comm Flex 136	EF-10 & ERV-5	9/19/2023	Pass	Pass	Pass	Pass	Pass
MGD-136D	Comm Flex 136	EF-10 & ERV-5	9/19/2023	Pass	Pass	Pass	Pass	Pass
MGD-137	North Elevator Machine Room 137	N/A	9/14/2023	Pass	Pass		Pass	Pass
MGD-111HL-A	South Hallway Near Room 111	N/A	9/14/2023	Pass	Pass		Pass	Pass
MGD-111HL-B	South Hallway Near Room 111	N/A	9/14/2023	Pass	Pass		Pass	Pass
MGD-112HL	South Hallway Near Room 112	N/A	9/14/2023	Pass	Pass		Pass	Pass
MGD-120HL	South Hallway Near Room 120	N/A	9/14/2023	Pass	Pass		Pass	Pass
MGD-132HL	North Hallway Near Room 132	N/A	9/14/2023	Pass	Pass		Pass	Pass
MGD-134HL	North Hallway Near Room 134	N/A	9/14/2023	Pass	Pass		Pass	Pass
MGD-135HL	North Hallway Near Room 135	N/A	9/14/2023	Pass	Pass		Pass	Pass
MGD-137HL	North Hallway Near Room 13	N/A	9/14/2023	Pass	Pass		Pass	Pass
MGD-160	Dog Wash 160	EF-3	9/14/2023	Pass	Pass	Pass	Pass	Pass
MGD-STR1C	Stair 1 Ceiling Mount	Stair 1 Fire Fan	9/19/2023	Pass	Pass	Pass*	Pass	Pass
MGD-STR1D	Stair 1 Duct Mount	Stair 1 Fire Fan	9/19/2023	Pass	Pass	Pass*	Pass	Pass
MGD-ELEV1	Elevator 1 Shaft	N/A	9/14/2023	Pass	Pass		Pass	Pass

				1,000 PPM (2% LEL) Test			10,000 PPM (20% LEL) Test	
Tag No.	Location	Corresponding Fan(s)	Test Date	OIT Alarm	Autodialer Alarm	Fan to High Speed	OIT Alarm	Autodialer Alarm
MGD-STR2C	Stair 2 Ceiling Mount	Stair 2 Fire Fan	9/19/2023	Pass	Pass	Pass*	Pass	Pass
MGD-STR2D	Stair 2 Duct Mount	Stair 2 Fire Fan	9/19/2023	Pass	Pass	Pass*	Pass	Pass
MGD-ELEV2	Elevator 2 Shaft	N/A	9/14/2023	Pass	Pass		Pass	Pass
MGD-STR3C	Stair 3 Ceiling Mount	Stair 3 Fire Fan	9/19/2023	Pass	Pass	Pass*	Pass	Pass
MGD-STR3D	Stair 3 Duct Mount	Stair 3 Fire Fan	9/19/2023	Pass	Pass	Pass*	Pass	Pass
MGD-MVB1	Vault MVB1	N/A	8/24/2023	Pass	Pass		Pass	Pass
MGD-MVA1	Vault MVA1	N/A	8/24/2023	Pass	Pass		Pass	Pass
MGD-MVR1	Vault MVR1	N/A	8/24/2023	Pass	Pass		Pass	Pass
MGD-MVC1	Vault MVC1	N/A	8/24/2023	Pass	Pass		Pass	Pass

Notes:
* Activation of stair fire fans was verified on 9/26/2023. All other tests for stair detectors took place on 9/19/23.
Pass Test passed
Test not applicable.
OIT Operator Interface Terminal

4.0 Follett Compliance with CQA Report – Electrical Engineer

Everett Riverfront Construction Final Construction Quality Assurance Report

Building B Electrical Distribution System

Prepared for
Riverfront Commercial Investment, LLC

Prepared by
Follett Engineering
Herrera Environmental Consultants, Inc.

FOLLETT ENGINEERING, PLLC
ELECTRICAL ENGINEERING & CONSULTING

Everett Riverfront Construction Final Construction Quality Assurance Report

Building B Electrical Distribution System

Prepared for
Riverfront Commercial Investment, LLC
11624 Southeast Fifth Street, Suite 210
Bellevue, Washington 98005

Prepared by
Follett Engineering
1037 NE 65th St #316
Seattle WA 98115

and

Herrera Environmental Consultants, Inc.
2200 Sixth Avenue, Suite 1100
Seattle, Washington 98121
Telephone: 206-441-9080

October 10, 2023

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Appendices

Tables

Project Description

The Everett Riverfront project is located on the City of Everett Landfill/Tire Fire Site in Everett, Washington, located west of downtown Everett business district. The Building B project limits stretch the area of Building B which is approximately 32,200 square-feet. The southeast corner of Building B is located about a fifth of a mile north of the 41st Street roundabout and about 20 feet west of Riverfront Boulevard.

This report covers Construction Quality Assurance (CQA) observations and inspections on the electrical distribution system associated with Building B (Permit B1912-032) that were installed throughout the entire period of construction from September 2021 to August 2023. The work during this period consisted of inspecting the settling cabinet and main control panel components including the polyvinyl chloride coated galvanized rigid conduit (PGRC), high-density polyethylene (HDPE) sleeves, EC coupler assembly, and seal offs. Additionally, the Building B methane detectors, ventilation system components, and alarms were inspected. The CQA Declaration Letter for the Building B electrical distribution system is included in Appendix A.

All project construction and design elements were required to comply with environmental controls set forth in the Everett Landfill/Tire Fire Consent Decree (March 2001) and were approved by the Washington State Department of Ecology. Activities for construction that were not subject to the CQA requirements per the Consent Decree are not included in this CQA report or those reports being prepared by other Consultants.

Design Background

The Riverfront Development in Everett, Washington is a commercial and residential development situated on a closed landfill. The location creates two major design considerations for Building B electrical systems: presence of flammable gas and potential for differential settlement.

Although the landfill has been closed since 1975, methane is still produced from the decomposing waste which creates the existence of below grade hazardous gas in locations where electrical infrastructure is needed for Building B. Defined by interpretation of application of NFPA 497 and NFPA 820, this underground area of the development site is a hazardous, Class 1, Division 2 (C1/D2) environment. In addition to below grade hazardous gas, the landfill creates potential for migration of hazardous gas above grade within Building B. As such, methane detectors are required throughout the interior of Building B to ensure methane levels remain well below the lower explosive limit. The methane detectors connect to ventilation systems and alarms in case of a methane level exceedance.

In addition to the methane issue, decomposing waste beneath the development area creates the potential for up to 30 inches of differential settlement of the development and its infrastructure which can alter or damage the installed electrical distribution system components. To address this, Building B is pile supported and as such, the building will not settle. The ground underneath the building could settle

up to 30 inches. Because of this, the raceways and wire entering through the floor of the building are designed to accommodate the 30 inches of potential differential settlement between the ground and the building floor. This is accomplished with a slip coupling for the conduit entrances and a settling cabinet to house the 30 inches of extra cable that will gradually drop down through the floor.

Building B was built to be a non-hazardous area with a physical separation of the floor and a liner installed in the building subfloor. The main HDPE conduits that route through the Phase 1 Site area couple to PGRC raceways to enter Building B. PGRC is rated for installation in C1/D2 areas and 0-15 kilovolt (kV) cables. PGRC is strong but not flexible so an HDPE conduit sleeve is utilized as a sleeve for the PGRC conduit to fall through. HDPE isn't rated for C1/D2. HDPE has the ability to flex so is considered to be the best option to deal with differential settlement potential. In accordance with code, the raceway has seal off fittings installed at each end to account for the different material and environmental rating types.

Electrical Systems CQA Observation

CQA observation was provided by Riverfront Commercial Investment LLC (RCI) and its Consultants HWA Geosciences (HWA), Perteet Inc. (Perteet), Follett Engineering (Follett), and Herrera Environmental Consultants (Herrera). Additionally, City of Everett (COE) construction inspectors and outside Consultants made routine site visits throughout the duration of construction.

Follett provided CQA observation of electrical and communication distribution system installation for Building B. CQA observation was provided through site visits and preparation of field inspection reports based on field observations and site photos. Follett verified the electrical system products used on-site with approved material submittals and any associated Requests for Information (RFI). Contractor qualifications, manufacturers' quality control data, and verification of materials with project drawings and specifications were also included in Follett CQA process.

Follett's construction observation of the Building B electrical and communication distribution system began in September 2021 and finished in August 2023. Follett Engineering staffing for CQA was as follows:

- CQA Observer – Vince Follett and Camryn Steiner (Herrera)
- Construction Submittal Review & RFI Lead – Vince Follett

Follett's CQA observation deliverables were field inspection reports documenting construction activities and include photographs of products identifying installation of facilities. The inspection reports include highlighted screenshots of plan sheets that show the area of work. Table 1 provides a summary of all Building B electrical distribution system construction work and lists what was installed, when it was installed, and what field report the installation is documented in. Follet's field inspection reports can be found in Appendix B.

Table 1. Summary of Work Performed and Inspected for the Building B Electrical Distribution System		
Date	**Construction Activity**	**Documented in Field Report**
10/13/2021	PGRC Underground cover inspection	BldgB 10-13-21
10/21/2021	PGRC above ground / EC Couplers	BldgB 10-21-21
4/3/2023	USS and settling cabinets	BldgB 4-3-23
7/25/2023	Settling cabinets and gas detection system	BldgB 7-25-23

Preconstruction Activities

Prior to installation of electrical and communication distribution system components, Follett performed reviews of material submittals and addressed redesigns required of RFIs.

The material submittals provided by the Contractor were reviewed by Follett for conformance with the approved project plans, project specifications, and RFIs. Following Follett's review and approval of these materials, COE and Floyd Snider (representing the City to ensure compliance with the Consent Decree), would review and approve, or reject material submittals. If rejected, material submittals would then be revised and resubmitted until approval had been received by all reviewers.

Changes during construction to the LFG collection system were prepared by RCI as an RFI on behalf of the Contractor. RFIs were reviewed and redesigned by Follett in collaboration with the Consultant team. RFIs are subsequently approved by COE, Floyd Snider, and RCI.

Electrical System Distribution Installation and Observation

Installation of the electrical and communication distribution system was photo documented and described within Follet's field inspection reports (Appendix B).

Building B Medium Voltage (MV) Power

Follett provided CQA observation of the primary power and raceway system (2-4 inch conduits) to the termination at the primary settling cabinet (MV-SCB) within the electrical room of Building B. MV power observation for Building B includes PGRC conduit, HDPE sleeves, EC coupler, seal offs, and cabinets.

Building B Low Voltage (LV) Power

Follett provided CQA observation and inspection for secondary power distribution (5-4 inch conduits) to the termination at the secondary settling cabinet (LV-SCB) within the electrical room of Building B. LV power observation for Building B includes PGRC conduit, HDPE sleeves, EC couplers, seal offs, and cabinet.

Building B Electric Vehicle (EV) Power

Follett provided CQA observation and inspection for secondary power distribution (4-4 inch conduits) to the termination at the secondary settling cabinet (EV-SCB) within the electrical room of Building B. EV power observation for Building B includes PGRC conduit, HDPE sleeves, EC couplers, seal offs, and cabinet.

Building B Franchise Communication (FC) Distribution

Follett provided observation and inspection for FC distribution (4-3 inch conduits) to the termination at the communications settling cabinet (FC-SCB) within the MPOE room of Building B. FC distribution observation for Building B includes PGRC conduit, HDPE sleeves, EC couplers, seal offs, and cabinets.

Building B Integrated Circuit (IC) Distribution

Follett provided observation and inspection for IC distribution (2-3 inch conduits) to the termination at the MCP settling cabinet (IC-SCB) within the electrical room of Building B. IC distribution observation for Building B includes PGRC conduit, HDPE sleeves, EC couplers, seal offs, and cabinets.

Building B DAS Distribution

Follett provided observation and inspection for DAS distribution (2-3 inch conduits) to the termination at the DAS settling cabinet (DAS-SCB) within the MPOE room of Building B.DAS observation for Building B includes PGRC conduit, HDPE sleeves, EC couplers, seal offs, and cabinets.

Building B LFG Monitoring System

Follett provided observation and inspection of the Main (Gas) Control Panel (MCP-B) within the electrical room of Building B that controls all methane detectors throughout the building and within MV vaults in the raceway system.

Methane Detectors, Alarms and Activated Ventilation Systems

Follett provided observation and inspection of the methane detectors, ventilation system equipment, and alarms. Building B is equipped with gas monitors that detect combustible hydrocarbon gas and send response to ventilation systems and building alarms upon detection of certain levels of methane. Regular building ground floor spaces are continuously monitored with PrimaX® IR Infrared Gas Monitors (PrimaX®).

Ground Floor Space

Above the foundation slab, Building B is continuously monitored with PrimaX® IR Infrared Gas Monitors that send signals for action at low and high level methane concentrations, in accordance with the Consent Decree. Each PrimaX® Gas Monitor has a single input, or sample point, and is mounted near the ceiling. The low-level response is triggered at 1,000 ppmV, or 2 percent of the lower explosive limit (LEL), and the high-level response is triggered at 10,000 ppmV, or 20 percent of the LEL. Sensors are placed throughout enclosed structures and connect to central panels that activate the heating, ventilation, and air conditioning (HVAC) system at the low detection level and activate local alarms at the high detection level. For Building B, the 1,000 ppmV low level detection notifies personnel and increases ventilation through the intake and exhaust fans. The 10,000 ppmV high level detection activates the evacuation alarm.

Building B's first floor HVAC system is setup as a combination of continuous air flow fans at one air change per hour (ACH) and activated air flow fans at 4 ACH. All non-stairwell and elevator shaft (see following sections) operate on continuous fans at a minimum 1.0 ACH and bump up an additional minimum of 1.0 ACH with a detection of 1,000 ppmV.

All ground floor ventilation fans, methane detectors, and alarms are on 24-hour backup power.

Stairwell

The stairwells are not considered occupied spaces and therefore do not have an HVAC system capable of providing continuous air flow at one air change per hour. The stairwells have a pressurization fan for smoke and fire that would be activated by the building evacuation alarm. The pressurization fan is located on the roof and pulls unconditioned air from the outside and pushes it through a duct into the top of the stairwell such that smoke is not allowed to enter the stairwell, for safe evacuation. A barometric damper, also known as a Back Draft Damper (BDD), is also located at the top of the stairwell, and allows for adequate pressurization of the stairwell and evacuation of exhaust air. The barometric damper regulates just enough positive pressure within the stairwell to keep smoke from entering by accounting for the ambient barometric pressure outside, also known as static pressure (SP), and pressure resulting from the pressurization fan on the inside. The barometric damper also keeps the pressure in the stairwell low enough for the closed doors in the stairwell to remain operable.

The stairwells are equipped with a PrimaX® Gas Monitor located at the top of the stairwell on the ceiling or within 1 foot of it. The sensor is placed at the top of the stairwell instead of the ground floor as is typical for all other ground floor spaces. This sensor is placed on the ceiling no closer than 4-feet from the duct inlet of the stairwell pressurization fan.

A second PrimaX® Gas Monitor is installed on the side of the pressurization fan ducting, outdoors, and can be maintained from the roof.

To be certain that methane is unable to accumulate at the top of the stairwell, the sensors and stairwell pressurization fans are connected to the Methane Control Panel. A signal is sent to the stairwell pressurization fan to activate at the low-level methane detection of 1,000 ppmV. The stairwell pressurization fan activation mitigates further intrusion of any methane from entering the stairwell or the fan ducting, and the barometric damper allows for exhausting of any methane that could accumulate at the ceiling. The low-level signal also gets sent to maintenance personnel for investigation and mitigation of the source. If high level methane (10,000 ppmV) is detected by any of the sensors, the Methane Control Panel will also send a signal to the fire alarm panel for evacuation.

Elevator Shafts

The elevator shafts are also not considered occupied spaces and therefore do not have an HVAC system capable of providing continuous air flow at one air change per hour. The elevators are called to the ground floor upon activation of the evacuation alarm and remain inoperable with the doors open until turned back on by the fire department.

Like the stairwells, the elevator shafts require methane detection at the top of the elevator shaft. Equipment not associated with the elevators is typically not allowed to be installed in the elevator shafts so to minimize the amount of equipment and need for maintenance within the elevator shaft, the PrimaX® sensor is placed on the ceiling of the elevator shaft while the transmitter is located outside of the elevator shaft. In all other applications within the Building B, the sensor and transmitter are directly connected. Two 1-inch conduits penetrate the elevator shaft overrun space. One conduit contains the sensor cable (between sensor and transmitter) and the other conduit contains a calibration tube for remote maintenance (between sensor and outside of elevator shaft).

The overrun spaces are not vented to the exterior and no fans provide airflow; however, the movement of the elevator cars up and down in the shaft provide airflow and will displace any accumulation of methane. If accumulation were to occur, the sensor will send notification to maintenance personnel for investigation and mitigation at the low-level detection (1,000 ppmV). If high level methane (10,000 ppmV) is detected by any of the sensors, the Methane Control Panel will also send a signal to the fire alarm panel for evacuation.

Changes Made During Course of Construction

Notable RFIs resulting in design changes or clarification related to CQA Consent Decree requirements during Building B electrical and communication distribution system installation work are described in Table 2.

Table 2. RFI Design Changes

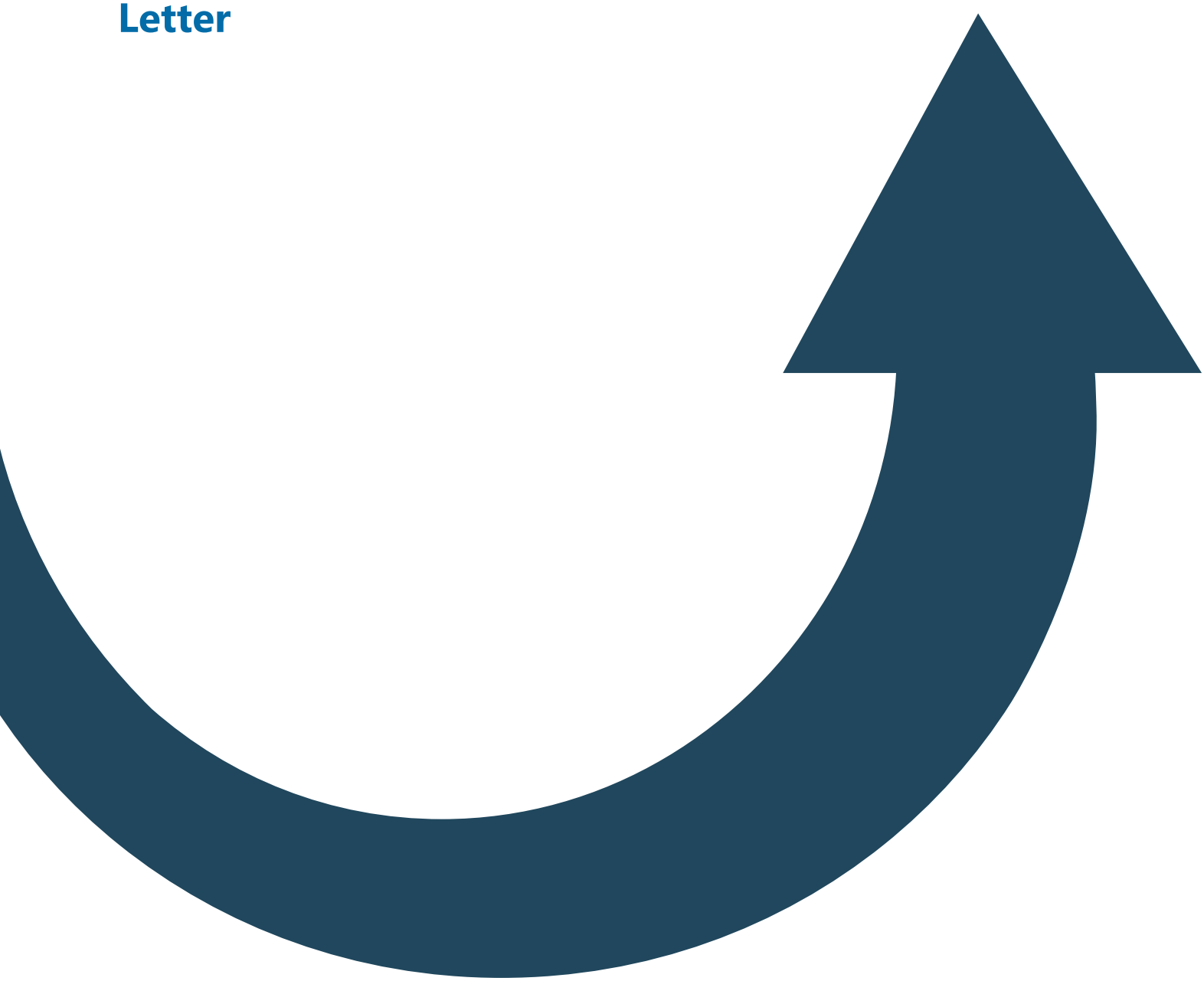
RFI #	Material	Description
408	Building Stairwell and Elevator Methane Monitoring	RFI #408 provides the Building Stairwell and Elevator Methane Monitoring Technical Memo.
405	LFG - Gas Detector Layout Revision & Mounting Height	RFI #405 provides proposed methane detector location modifications after methane detectors were not spaced correctly per the detector spacing table on EFB1 and in some cases were in conflict with ceiling mounted electrical/HVAC gear and architectural ceiling features.
269	Revision of Fan Units to meet CD requirements of Increased Air Flow	RFI #269 provides a new matrix outlining the equipment change to meet CD increased air flow requirements. RFI #269 establishes that the criteria will be satisfied with fans that are two speed. Low speed will be normal continuous air change per hour, and when gas is detected at 1000 ppm or greater, the gas control system the signal the associated area fan to increase speed to the high speed setpoint that is a minimum of 1 air change per hour greater than the low speed.
88	Follett Engineering - Redesign - EF Drawings	RFI #88 provides redesigned Drawings to include EFB8, EFB9, EFB10, EFB11, EFB12, and EFB13 along with Herrera details.

Notable material submittals are described in Table 3.

Table 3. Submittals.		
Submittal #	**Material**	**Description**
771	Methane Gas Alarm Control Cables	Methane Gas Alarm Control Cables for the Project.
633	Methane Detection - MCP-B, PLC Control Panel	Attached for review is the Submittal for the Building B MGCP PLC control panel.
582	Electrical - PMX Meter 1000 Series	Electrical - PMX Meter 1000 Series
332	Methane Detection - Hardware - (gas detectors, panels, MCP-B etc.)	Attached is the methane detection system hardware and instrumentation submittal. Reference sheets 1-8 for bill of material lists.
331	Methane Detection - Shop Drawings	Attached are the Building B Shop drawings for the Methane detection system. Including drawings for: MGCP-B METHANE GAS MONITOR PLC CONTROL PANELMGCP-B METHANE GAS MONITOR PLC CONTROL PANELMGCP-B METHANE GAS MONITOR PLC CONTROL PANELMGCP-B DISCRETE INPUTS SLOTS 1MGCP-B DISCRETE INPUTS SLOTS 2MGCP-B DISCRETE OUTPUTS SLOTS 3MGCP-B DISCRETE OUTPUTS SLOTS 4MGCP-B ANALOG INPUTS SLOTS 5MGCP-B ANALOG INPUTS SLOTS 6MGCP-B ANALOG INPUTS SLOTS 7MGCP-B ANALOG INPUTS SLOTS 8MGCP-B ANALOG INPUTS SLOTS 9MGCP-B ANALOG INPUTS SLOTS 10MGCP-B ANALOG INPUTS SLOTS 11MGCP-B DISCRETE INPUTS SLOT 12MGCP-B ALARM WIRINGIC-SCB I&C SETTLING CABINETDAS-SCB DAS SETTLING CABINETFC-SCB COMMUNICATIONS SETTLING CABINETEV-SCB EV SETTLING CABINETLV-SCB LV SETTLING CABINETMV-SCB PRIMARY SETTLING CABINETG-SCB GROUNDING SETTLING CABINET
324	LFG - System Low Pressure Air Test Procedure	Attached for review is the pneumatic air pressure testing method for the LFG piping. (Spec Ref. 7-224(6), used on Blvd Project)
320	LFG - HDPE - Elbows, Tees, Fittings	Attached for review are the HDPE fittings for the below slab LFG piping.
319	LFG - 6"x 4" EC Coupler	LFG - 6"x 4" EC Coupler
317	LFG - HDPE Pipes	Attached for review is the below slab LFG piping.
297	Electrical - 12.47 kV - Unit Substation by EATON	Electrical - 12.47 kV - Unit Substation by EATON
276	DAS - Engineered Design	System Infrastructure, Cabling, Antenna, connectors, couplers, devices, Head end unit.
218	Plumbing - Grease Interceptor - 1500 gal. - (GI)	Grease Interceptor
211	Plumbing - Fittings - (vent / waste)	Fittings for below slab Waste & Vent piping
210	Plumbing - Waste Piping - (under-ground)	Waste & Vent Piping for underslab plumbing

APPENDIX A

Construction Quality Assurance (CQA) Declaration Letter



FOLLETT ENGINEERING, PLLC

Mobile 425-765-6304 ELECTRICAL ENGINEERING & CONSULTING 1037 NE 65th St. #316
Vince@FollettEngineering.com Seattle, WA 98115

October 5, 2023

Riverfront Commercial Investment, LLC
11624 Southeast 5th Street Suite 210
Bellevue, Washington 98005

Subject: Construction Quality Assurance (CQA) Declaration for Riverfront Development Building B in Everett, Washington

Follett Engineering, PLLC (Follett), with support from Herrera Environmental Consultants, performed construction observation services to confirm compliance with the Construction Quality Assurance (CQA) Plan, the Consent Decree, and the project plans and specifications. Based on the design of the system and the observations on site as summarized in the Building B Electrical Distribution System CQA Report, Follett declares, in its professional engineering judgment and opinion, that the Building B electrical distribution system was constructed in conformance with the project plans and Consent Decree, and that the materials used in construction were in conformance with the construction specifications.

Sincerely,

Follett Engineering, PLLC.

10/10/2023

Vincent Follett
Vince Follett, P.E.
Electrical Engineer