VAPOR INTRUSION MITIGATION SYSTEM CONSTRUCTION QUALITY ASSURANCE FACT SHEET

Overview and Purpose

Construction quality assurance (CQA) of a vapor intrusion mitigation system (VIMS) should be performed to ensure that VIMS components are installed per the VIMS design and that unanticipated construction scenarios that impact VIMS installation are documented and brought to the attention of the VIMS design team. Installation of each VIMS component should be documented by CQA personnel prior to being covered by subsequent VIMS layers or building materials. For example, installation of a VIMS membrane should be inspected prior to pouring of the concrete slab above.

CQA also involves documenting that the materials used to construct the VIMS meet or exceed those specified in the VIMS design. The VIMS design engineer (or equivalent) and regulator (as applicable) should approve, in writing, deviations from the VIMS design.

A project-specific CQA plan should be developed and shared with the VIMS installation contractor(s) for their information prior to commencing construction. An example CQA plan outline is provided as Appendix J. For small projects, a project-specific CQA plan may not be needed; however, the absence of a project-specific CQA does not obviate the need for CQA to be performed. The VIMS designer should ensure that CQA is performed, regardless of whether a project-specific CQA plan has been developed.

State Agency Requirements

Some state agencies have specific requirements for CQA. The VIMS design team should be aware of these requirements and should account for them during the VIMS design and installation planning phase of a project.

Vapor Intrusion Mitigation System Product Manufacturer Requirements

VIMS product manufacturers (e.g., membrane and epoxy coating) may have specific training and certifications for installers and for staff performing CQA. Some manufacturers also require that installation contractors have specialized certifications for product installation. The VIMS designer may have experience requirements for installation contractors. Furthermore, the VIMS product manufacturers or VIMS designer may have specific testing requirements, such as smoke testing, to confirm the membrane layers are adequately sealed prior to fully covering the membrane. The project team (designer and installation contractor) should plan for these trainings, certifications, and installation testing requirements to avoid impacting the construction schedule. Documentation of these trainings, certifications, and field installation quality checks may be required for manufacturers to provide a product warranty.

Construction Quality Assurance Tasks

Tasks to be performed during VIMS installation CQA will depend on the approach and mitigation technology. This section describes some general tasks to be considered during CQA of typical new

construction and retrofit VIMS. In general, products used for construction of a VIMS should meet the specifications in the design; prior to installation, products should be stored in a manner that does not subject them to damage or deterioration.

In general, CQA should be performed on components of a VIMS either during material placement or prior to being covered by other building materials (e.g., the venting layer should be inspected prior to installation of the overlying VIMS membrane).

New Construction and Retrofit Systems

VIMS installation for a new construction building is typically managed by a general contractor, who is responsible for the construction of the entire building. As such, the general contractor will likely be the main point of contact for scheduling and planning the VIMS CQA for a new building. The VIMS designer or CQA designee should plan to communicate regularly with the general contractor to ensure that CQA of VIMS component installation is performed.

VIMS installation for an existing building (e.g., a retrofit system) is typically performed by a single contractor. The building owner or VIMS designer will often directly contract the mitigation contractor.

For both new construction and retrofit systems, the VIMS designer, CQA staff, and mitigation contractor(s) should have a preconstruction meeting prior to commencement of VIMS installation to discuss the mitigation system installation plan, review the CQA plan (if one is prepared for the site), and assign roles and responsibilities for ensuring the system is installed per the design.

VIMS CQA will typically involve inspection of the following components:

- Sub-slab venting layer (e.g., gravel or aerated floor forms)
- Extraction points
- Geotextile(s) and/or protection layer(s)
- Horizontal collection piping (solid and/or perforated) or low-profile geogrid strips
- Sub-slab monitoring probes
- VIMS passive membrane
- Riser pipes and conveyance pipes
- VIMS monitors and alarms
- VIMS fans

The above list of components is not considered exhaustive. The VIMS designer should ensure that system-specific CQA needs are considered during project planning. CQA staff should document observations in field notes and photographs.

For long-duration projects, weekly status meetings should be used to track progress and check in on the construction process and to resolve potential construction concerns. If discrepancies between the VIMS design and installation conditions are noted, a meeting should be held to resolve the discrepancies.

CQA Documentation

CQA documentation can be as minimal as assembling field notes and photographs or as robust as a formal CQA report. The VIMS designer should understand the local regulatory requirements for CQA documentation. At a minimum, documentation of CQA activities should be stored in the project file by the VIMS designer.

An example of a VIMS CQA plan outline can be found in **Appendix J**.