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REPORT

For Environmental Protection Division

Monitoring and Maintenance Plan
Old 4th Ward Multifamily Development
652 Angier Avenue NE
Atlanta, Fulton County, Georgia

625 Holcomb Bridge Road, Norcross, GA 30071 • 770-209-0029 • unitedconsulting.com

February 28, 2024 (Revised June 2, 2025)

Ms. Shannon Ridley
Brownfields Unit Coordinator
Land Protection Branch
Environmental Protection Division
Floyd Towers East, Suite 1054
2 Martin Luther King, Jr. Drive SE
Atlanta, Georgia 30334

RE: Monitoring and Maintenance Plan
Old 4th Ward Multifamily Development
652 Angier Avenue NE
Atlanta, Fulton County, Georgia
Project No.: TMCRW-20-GA-04066-06

Dear Ms. Ridley:

On behalf of **Maple Multi-Family Land SE, LP** and **DRI/Maple OFW, LLC, a Delaware limited liability company (DRI/Maple OFW, LLC)**, United Consulting is submitting this Monitoring and Maintenance Plan (MMP) for the above referenced property (Subject Property). As documented in the recent Prospective Purchaser Compliance Status Report (PPCSR), the Subject Property is in compliance with Type 5 Risk Reduction Standards (RRS) for soil, which includes institutional and engineering controls. As such, the institutional controls include a Uniform Environmental Covenant (UEC) and long-term monitoring through implementation of this MMP. A draft UEC was distributed following the initial PPCSR for EPD review. Following approval of the PPCSR and recordation of the UEC, this MMP will be implemented and initiate annual reporting.

Please contact Russell Griebel with United Consulting at 770-582-2788, if you have any questions or if we can be of further assistance.

Sincerely,

UNITED CONSULTING

Brandon W. Sharp
Project Engineer

Russell C. Griebel, P.G., C.P.G.
Executive Vice President/Chief Consultant

BWS/RCG/rg

SharePoint: 20-GA-04066-06.MMP

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Attachment

1.0 INTRODUCTION

1.1 Purpose

This Monitoring and Maintenance Plan (MMP) has been developed by United Consulting on behalf of **Maple Multi-Family Land SE, LP** and **DRI/Maple OFW, LLC** (hereinafter referred to as the Owners) for the Old 4th Ward Multifamily Development at 652 Angier Avenue NE in Atlanta, Fulton County, Georgia. The requirements outlined herein are to be applied site-wide at the Subject Property, currently referred to as Fulton County Parcel ID 14 001800050774. The Owners have redeveloped the Subject Property with a multifamily residential development, the layout and boundaries of the Subject Property are illustrated on Figure 1 in Attachment A.

The purpose of this MMP is to describe the procedures relative to the current and potential future maintenance of engineering controls for the Subject Property and to also ensure that the associated institutional controls as identified in the Uniform Environmental Covenant (UEC), dated April 15, 2025, are being implemented. This plan has been submitted to the Georgia Environmental Protection Division (EPD) Brownfield Program as part of the Prospective Purchaser Compliance Status Report (PPCSR) for the Subject Property. The Owners of the Subject Property are responsible for implementation of this MMP and compliance with the conditions and requirements established herein. If site conditions change, this MMP may be revised to address such conditions, subject to EPD approval.

1.2 Background

The Owners entered the Subject Property into the Georgia Brownfield Program through submittal of a Prospective Purchaser Corrective Action Plan (PPCAP) and a PPCAP Amendment, respectively dated March 9, 2021 and April 1, 2021. The PPCAP and Amendment were subsequently approved by the EPD on March 18, 2021 and May 3, 2021. Based on the impracticability of certification of the Subject Property to residential Type 1 and/or Type 2 Risk Reduction Standards (RRS), the PPCAP proposed certification of compliance for soils with a residential Type 5 RRS. As noted in the PPCAP, as amended, soil sampling indicated a widespread distribution of undocumented fill conditions and soil impacts (with concentrations above residential RRS) across the Subject Property, up to depths of approximately 30 to 40 feet. The significant volume of these heterogeneous fill materials made the excavation of such technically impracticable. Such an excavation would have additionally created safety/shoring concerns with existing roadways and a historical sewer trunk line, due to the required depths. As such, the PPCAP, as amended, proposed engineering and institutional controls (i.e., the Type 5 RRS remedy) across the Subject Property to ensure the protectiveness and support the redevelopment. The Type 5 RRS engineering controls are illustrated on Figure 3 in Attachment A.

Exposure to impacted soils with concentrations greater than residential RRS has been addressed through institutional and engineering controls across the Subject Property. The institutional controls will include the UEC that will be recorded in the Subject Property's chain of title, and the long-term monitoring required within this MMP. The UEC documents the implemented engineering controls on the Subject Property, Vapor Intrusion Mitigation System (VIMS), groundwater use restriction, and long-term monitoring requirements. The engineering controls include an engineered soil barrier and hardscape

covers (i.e., concrete foundations/slabs, sidewalks, concrete pavement/pavers) throughout the Subject Property as well as the VIMS. Engineering control details were included in the PPCSR and are discussed further below.

2.0 ENGINEERING AND INSTITUTIONAL CONTROLS

Engineering and institutional controls are implemented across the Subject Property to limit the potential exposure between receptors and the underlying impacted soil and/or groundwater media. The following is a discussion of the details and application of the Type 5 RRS engineering controls, as generally illustrated on Figure 3.

2.1 Engineering Controls

2.1.1 Protective Surface Covers

The Type 5 RRS approach included the implementation of the following engineering controls as site-wide protective surface covers on the Subject Property. The selection and location of these protective covers were identified and detailed within the PPCAP, as amended, prior to implementation.

Hardscapes

Across the Subject Property, protective site development hardscapes (i.e., concrete foundations/slabs, sidewalks, concrete pavement, pavers) control exposure to soils not covered by the engineered soil barrier. Figure 3 illustrates the limits of the building foundations, parking deck, and the various hardscapes (e.g., concrete cap) located on the Subject Property.

Engineered Soil Barrier

In the areas of the Subject Property where hardscapes are absent, a softscape layer (i.e., engineered soil barrier/soil cap) was implemented. The engineered soil barrier includes a minimum of 1 foot of environmentally tested clean soil (i.e., meeting residential Type 1 RRS) with an underlying demarcation barrier. The location and limits of the soil cap on the Subject Property are illustrated on Figure 3.

2.1.2 Signage

Permanent Markers

As required under Section 391-3-19-.08 (7) of the HSRA Rules, three permanent markers have been installed on the Subject Property, their locations are generally illustrated on Figure 4.

2.1.3 Vapor Intrusion Mitigation System (VIMS)

The potential for vapor intrusion at the Subject Property was assessed during various sampling events and documented in the PPCSR. Through these assessments, the Owner elected to install a passive VIMS to address the present vapor conditions at the Subject Property and within the footprint of occupied portions of the redevelopment (excluding the parking garage). The VIMS plans are included as Attachment F and illustrate the extents of the VIMS and its design specifications.

The VIMS, a Land Science Technologies (NST) Nitra-Seal barrier system, generally included the following elements:

- Installation of course gravel aggregate and venting systems (LST Terra-Vent) beneath the redevelopment, as connected to vertical discharge pipes (locations illustrated within the VIMS plans included as Attachment F);
- Installation of a robust base (LST Nitra-Base) with a minimum 40-mil spray-applied membrane (LST Nitra-Seal Core);
- Sealing off barrier penetrations using asphaltic emulsion-based material (LST Nitra-Seal Core Detail), as described in the design; and
  Installation of a protective layer (LST Bond Protection Layer) across the extents of the VIMS to prevent disturbance prior to concrete placement.

2.2 Institutional Controls

2.2.1 Corrective Action Interference

As discussed above, engineering controls have been implemented across the Subject Property to restrict exposure to documented soil impacts. The engineering controls include the use of site development hardscapes (i.e., concrete foundations/slabs, sidewalks, concrete pavement, pavers) and an engineered soil barrier with 1 foot of soil meeting residential Type 1 RRS. As such, activities which may result in the release of and/or exposure to underlying impacted soils are prohibited (e.g., drilling, excavation, or grading), with exception to any required maintenance or repair of the existing engineering controls. The three permanent markers installed are to be maintained on the Subject Property to delineate the restricted use area and prohibitions of disturbance. The approximate locations of the permanent markers are illustrated on Figure 4.

2.2.2 Groundwater Use

The use or extraction of groundwater at the Subject Property is prohibited, except for environmental sampling and analysis requirements.

2.2.3 Monitoring and Maintenance Plan

As detailed within the PPCSR and UEC, this MMP has been prepared to detail the requirements and procedures which shall be implemented to maintain the existing corrective actions at the Subject Property, further discussed below in Section 4.0.

3.0 LAND USE AND DISTURBANCES

Activities on the Subject Property which may result in exposure to soils impacted with constituents at concentrations greater than residential RRS are prohibited, with the exception of required maintenance, repair, and/or replacement of the engineering controls. Intrusive activities which may disturb the protective surface covers (i.e., engineering controls) on the Subject Property must be conducted in accordance with this MMP. Examples of prohibited intrusive activities include, but are not limited to: drilling, digging, placement of any objects or use of any equipment which deforms or stresses the surface beyond its load bearing capability, piercing the surface with a rod, spike or similar item, bulldozing or earthwork. Notably, routine landscaping is not considered an intrusive disturbance activity.

If required, any planned intrusive activities must be evaluated/approved by the Owners before implementation to determine applicable health/safety requirements and the waste management requirements/disposal options. Planned barrier breaches should be documented through a request including the following information: the purpose of the proposed disturbance, description of disturbance activities, dates/duration of disturbance, contact information for the qualified contractor conducting the work, and documentation for excavation monitoring and barrier replacement (if applicable). Following approval by the Owners and execution of the planned work, notification of the disturbance activities will be included as part of the annual reporting package to the EPD, discussed in Section 5.0.

At the time of these disturbance activities, soils must be managed in accordance with this MMP and the maintenance/repair requirements detailed below in Section 4.0 (for softscapes and hardscapes). Generally, any disturbance will require the planned management of soils to mitigate the potential for exposure to and/or release of impacted materials. Materials generated from these disturbances may require additional characterization to support their appropriate off-site disposal, if required.

In the event of an emergency breach and/or disturbance, the Owners are to be notified of the conditions so that appropriate corrective actions can be coordinated, approved, documented, and subsequently reported to the EPD. Emergency contact information is included in Section 5.3. Corrective actions implemented to address such emergency conditions should be conducted in accordance with the same maintenance/repair requirements of this MMP and Section 4.0. Disturbance activities, planned and/or unforeseen, are to be completed by contractors in accordance with Occupational Health and Safety Administration (OSHA) requirements. The Contractor is responsible for meeting all OSHA requirements and documentation, including worker safety.

4.0 MAINTENANCE AND INSPECTION

Items and systems subject to inspection and/or maintenance include:

- Engineering Controls
  - Protective Surface Covers
  - Signage/Permanent Markers
  - Vapor Intrusion Mitigation System (VIMS)

- Institutional Controls
  - Groundwater Use Restriction
  - Land Use Restriction
  - Monitoring and Maintenance Plan

The process to maintain the engineering controls are discussed below. Inspections will be performed at least annually, documented using the Inspection Form provided in Attachment C, and will be reported to the EPD annually.

Inspections should be conducted of the entire Subject Property, by a representative of the Owners and will be familiar with the MMP. Field observations and notes should be included in the Inspection Form included in Attachment C. The inspector will inform the property manager of deficiencies noted during the inspections.

4.1 Protective Surface Covers

The protective surface covers at the Subject Property include hardscapes and the engineered soil barrier. The hardscapes include concrete foundations/slabs, sidewalks, concrete pavement, pavers. The engineered soil barrier (soil cap) includes a minimum of 1 foot of environmentally tested clean soil (i.e., meeting residential RRS) with an underlying demarcation barrier. The existing demarcation barrier installed beneath the engineered soil barrier is characterized as a black, non-woven geotextile material (i.e. Mirafi N-series polypropylene geotextile or similar). The in-progress installation of the demarcation barrier is documented within the site photographs included as Attachment E.

4.1.1 Hardscapes

The various hardscapes on the Subject Property will be maintained to prevent damage, cracks, movement, and/or removal that could lead to impacted soil exposure. Existing hardscapes and their locations are illustrated on Figure 3.

4.1.2 Engineered Soil Barrier

The soil cap will be maintained to prevent damage, removal, and/or erosion due to weather conditions or unintended use. The integrity of the soil cap, including its required minimum 1 foot depth, will be inspected and documented on the Inspection Form included in Attachment C, with observed significant changes noted therein.

Significant damage (which exposes the demarcation barrier and/or underlying soil) and/or less significant damage (which does not expose impacted soils) to the protective surface covers will be repaired within 60 days of discovery. The repairs will be made in accordance with sound engineering practices, and will be conducted by qualified personnel, as applicable. If maintenance of the cover is required, documentation of the activities, including a description of the protective surface cover conditions, the severity of the observed damage, a description of the repairs, the dates that repairs were initiated and completed, and the name of the inspector, will be included on the Maintenance Form. The EPD will be notified of the repairs to the protective surface cover through the required annual reporting.

Vegetative cover is generally present on the Subject Property where the existing soil cap is in place. As such, landscapers will be informed of this MMP and be required to maintain vegetative cover in a manner consistent and protective of the soil cap and underlying demarcation barrier.

4.2 Signage

Permanent Markers

As required under Section 391-3-19-.08 (7) of the HSRA Rules, permanent markers have been installed on the Subject Property. Disturbance or removal of such markers is prohibited. The integrity of the markers will be inspected and maintained to avoid being altered, crushed, broken, defaced, destroyed, or unreadable. The results of the inspection will be recorded on the Inspection Form provided in Attachment C. Observed significant changes to the permanent markers during the inspection will be noted therein.

Any damage or alterations to the permanent markers will be repaired within 60 days of discovery. The repairs will be made in accordance with sound engineering practices and will be conducted by qualified personnel, as applicable. The EPD will be notified of the repairs to the permanent markers through the required annual reporting.

4.3 Vapor Intrusion Mitigation System (VIMS)

The VIMS constitutes a long-term approach to mitigate the potential vapor intrusion pathway. For the operations of the passive VIMS installation, routine operations and maintenance activities are not generally required for the system other than confirming that the discharge outlets are not obstructed and/or damaged. As such, the following visual inspections of the VIMS components and documentation of its operational conditions will be conducted to confirm that the system remains operating as designed:

- Visual inspection of exposed VIMS components, including the extraction risers and/or roofline piping terminations (locations illustrated within the VIMS plans included as Attachment F) for damage or abnormal conditions; and
- Visual inspection of occupied portions of the redevelopment (excluding the parking deck) to ensure that no significant changes to the building construction have occurred which would impact the operation of the VIMS, including foundation modifications, remodeled areas, additions to the redevelopment, and/or slab damage/unauthorized breaches.

Visual inspections of the exposed VIMS components and their continued unobstructed operation will be documented in the Inspection Form included in Attachment C, with changes/damage noted therein. If maintenance/repair of the VIMS is required, further discussed in Section 4.6.3, documentation of these activities (as performed by qualified contractors), will be included in a non-routine inspection report.

4.4 Groundwater and Land Use Restrictions

During the inspection, the inspector shall look for indications of access to, or tapping of, groundwater on the Subject Property.

Barring termination of the UEC, the Subject Property shall only be used in accordance with the approved Type 5 RRS remedies and protective of exposure to impacted media. The inspection must verify the use of the Subject Property to be consistent with the intended land use. The results of the inspection must be summarized in the Inspection Form provided in Attachment C.

4.5 Monitoring and Maintenance Plan

Should revisions to this MMP be required, such revisions will be submitted to the EPD for review and approval within 90 days.

4.6 Maintenance and Repairs

Any maintenance or repairs required to the engineering controls must be conducted in a timely manner and must be documented in the Maintenance and Repair Form (see Attachment D) and included in the required annual reporting to the EPD. As noted above, repairs to the engineering controls must be documented and performed within 60 days of discovery.

Based on the previous soil testing results on the Subject Property, personal protective equipment (PPE) should include Level D generally including safety glasses, hard hat, ear plugs, safety gloves, steel toed boots, and safety vests, at a minimum. All disturbance activities, planned and/or unforeseen, are to be completed by contractors in accordance with OSHA requirements**.** The Contractor is responsible for meeting all OSHA requirements and documentation, including worker safety. All companies involved in the execution of the maintenance and/or repair requirements of this MMP are to prepare their own Health and Safety Plans (HASPs) for their workers as it relates to their tasks and decontamination procedures for their personnel and equipment.

Contractors conducting maintenance and/or repairs of the engineering controls will be provided a copy of this MMP. Contractors will incorporate the requirements of this MMP into their HASPs.

4.6.1 Softscapes

Any planned and/or unforeseen disturbances to the engineered soil barrier, illustrated on Figure 3, require repairs and/or maintenance to be documented to assure its continued protection of human health and the environment. In order to limit the exposure pathway for occupants and workers, these repairs should be completed within 60 days of disturbance and/or discovery. Areas of disturbance and/or work areas should be secured with fencing to control and/or limit unintended access.

As detailed above in Section 2.1.1, the engineered soil barrier consists of an application of a softscape layer that is a minimum of 1 foot of environmentally tested clean soil (i.e., meeting residential Type 1 RRS) underlain with a demarcation barrier where hardscapes are absent.

Disturbed soils generated from within the existing engineered soil barrier profile (i.e. not including soils cut from below 1 foot, below the demarcation barrier, or covered by hardscapes) may be reused to maintain/repair the soil cap without additional testing. Any soil cut from below 1 foot in depth (i.e., below the demarcation barrier) or below hardscapes should be either 1) characterized for appropriate landfill disposal or 2) placed below the replacement engineered soil layer/demarcation barrier and/or directly below hardscapes, if it is geotechnically suitable. Wherever the demarcation barrier is breached, the layer must be replaced with a black, non-woven geotextile material (i.e., Mirafi N-series polypropylene geotextile) or equivalent.

If soil export is required, such soil is to be stockpiled and tested, with the export managed according to the obtained analytical testing results. The stockpile must be secured and protected from erosion (i.e. stockpiled on plastic sheeting, bermed, and covered) from the time of stockpiling to the time of off-site disposal. Depending on the testing results, soil export may be disposed of at a Subtitle D landfill.

If soil import is required, such soil is to be environmentally tested prior to importing, to assure that the soils meet residential Type 1 RRS and remain suitable for use within the engineered soil barrier. Analytical testing for import soils is to include VOCs, SVOCs, and RCRA metals, at a minimum.

4.6.2 Hardscapes

Any planned and/or unforeseen disturbances to the protective site development hardscapes (i.e., concrete foundations/slabs, sidewalks, concrete pavement and pavers) which control exposure to soils not covered by the engineered soil barrier, require documented repairs and/or maintenance to assure the continued efficacy of the Type 5 RRS approach. Soils beneath hardscapes are not to be used to repair or maintain the engineered soil barrier. Soils generated from below all hardscapes should be stockpiled separately for characterization/disposal or prioritized for reuse below the engineered soil barrier, if geotechnically suitable or possible. If soil export is required, excavated soils should be stockpiled and protected from erosion (i.e. on plastic sheeting, bermed, and covered) from the time of excavation to the time of off-site disposal.

4.6.3 Vapor Intrusion Mitigation System (VIMS)

During routine maintenance of exposed VIMS components, identified components must be replaced if signs of deterioration or damage are observed, including warping, cracking, weathering, and/or discoloration. The VIMS discharge piping must be replaced with a Schedule 40 PVC or higher rated pressure pipe (e.g. Schedule 80 PVC). Identified obstructions or blockages in the discharge system should be removed and corrected to maintain operational efficacy as designed.

Should future building improvements include cutting/drilling through the on-grade slab foundation which may potentially disturb the VIMS, repairs should be implemented to properly seal the barrier breach or repair damaged sections of the sub-slab components of the venting system or post-slab vapor barrier. An appropriately qualified and manufacturer-certified contractor must conduct the repair to the VIMS. All contractors should conduct work in accordance with their own Health & Safety Plan.

A professional engineer or geologist specializing in the design of such systems shall be retained to provide a work plan, design drawings and specifications, and/or other necessary engineering design documents for extensive repairs or significant alterations to the VIMS. An as-built drawing must be provided to reflect changes to the VIMS, to be summarized in a non-routine inspection report and be kept alongside the archived documentation reports.

5.0 SCHEDULE AND REPORTING

This MMP and associated reports and maintenance logs will be kept in the Subject Property's management office for a duration of three years. Any comments or questions regarding this document should be directed to the property manager.

5.1 Schedule

The following schedule is anticipated based on the design objectives and basis of design to date:

Inspections		
Type	Frequency and Date	Documentation
Subject Property (Site-wide)		
Engineering Controls	Annually	Inspection Form (See Attachment C)
Signage	Annually	
Groundwater Use	Annually	
VIMS	Annually	
Non-Routine		
Type	Frequency and Date	Documentation
Repairs or Alterations	As needed, during renovations/redevelopment	Documented and reported to EPD annually

5.2 Reporting & Recordkeeping

Inspections of the Subject Property shall occur at least annually. The results of these inspections will be included on the Inspection Forms included as Attachment C. A copy of the Inspection Form will be submitted to the EPD annually by December 31. The cover/transmittal letter for the forms shall include the name, mailing address, telephone number, and email of the person that EPD should contact regarding the requirements associated with the Subject Property.

If any planned disturbances, emergency corrective actions, repairs, and/or alterations to the engineering controls are required, these activities are also to be documented and included within the annual reporting package to the EPD. All inspection records (i.e., routine and non-routine inspections) will be maintained on-site for the Owners by Subject Property management personnel.

5.3 Emergency Reporting

Unforeseen failures, disturbances, and/or breaches of the corrective measures at the Subject Property should be immediately reported to the Property Manager and Owners by site personnel. Contact information is provided below, if an emergency situation is encountered:

Owner s Representative:

NAME: _____

EMAIL: _____

PHONE: _____

Property Manager/Representative:

NAME: _____

EMAIL: _____

PHONE: _____

Any repairs/modifications to the components of the protective barriers should be completed within 60 days and will require reporting to the EPD within the annual reporting package.

6.0 TERMINATION

In the event that termination of the UEC and Type 5 RRS remedies on the Subject Property can be supported, a report will be prepared by a Georgia registered Professional Engineer or a Georgia registered Professional Geologist. Formal approval of system termination by the EPD is required via submittal of a status report, prior to deactivation and/or removal.

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ATTACHMENT A

Figures

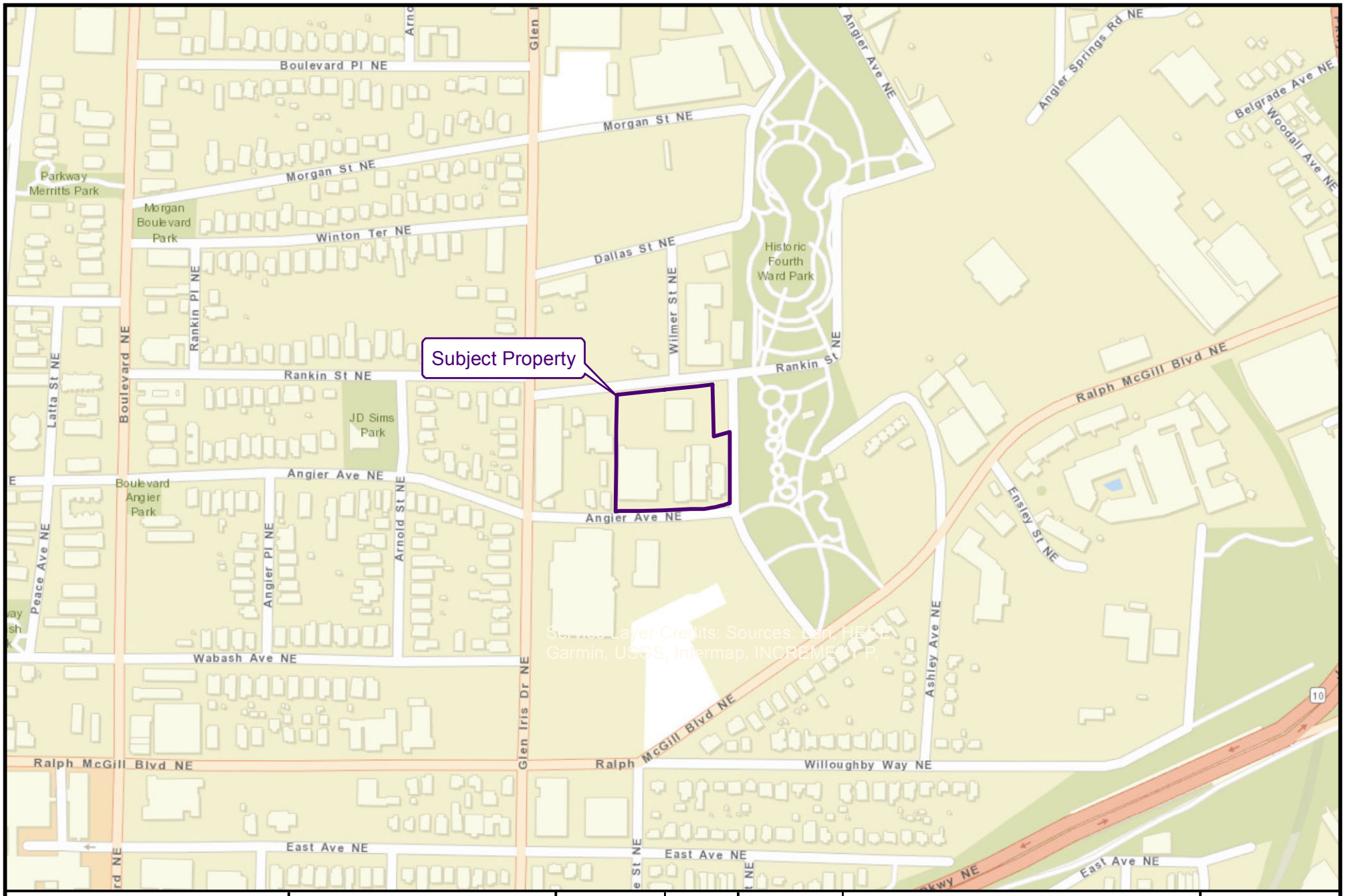

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Figure Scale

N

0 250 500

1 inch = 400 feet

Prepared:	BWS
Checked:	RCG
Date:	01/15/24

Title:	Subject Property Location Map
Project:	Old 4th Ward Multifamily Development
Project No.	20-GA-04066-06
Client:	DRI/Maple OFW, LLC

FIG. 1

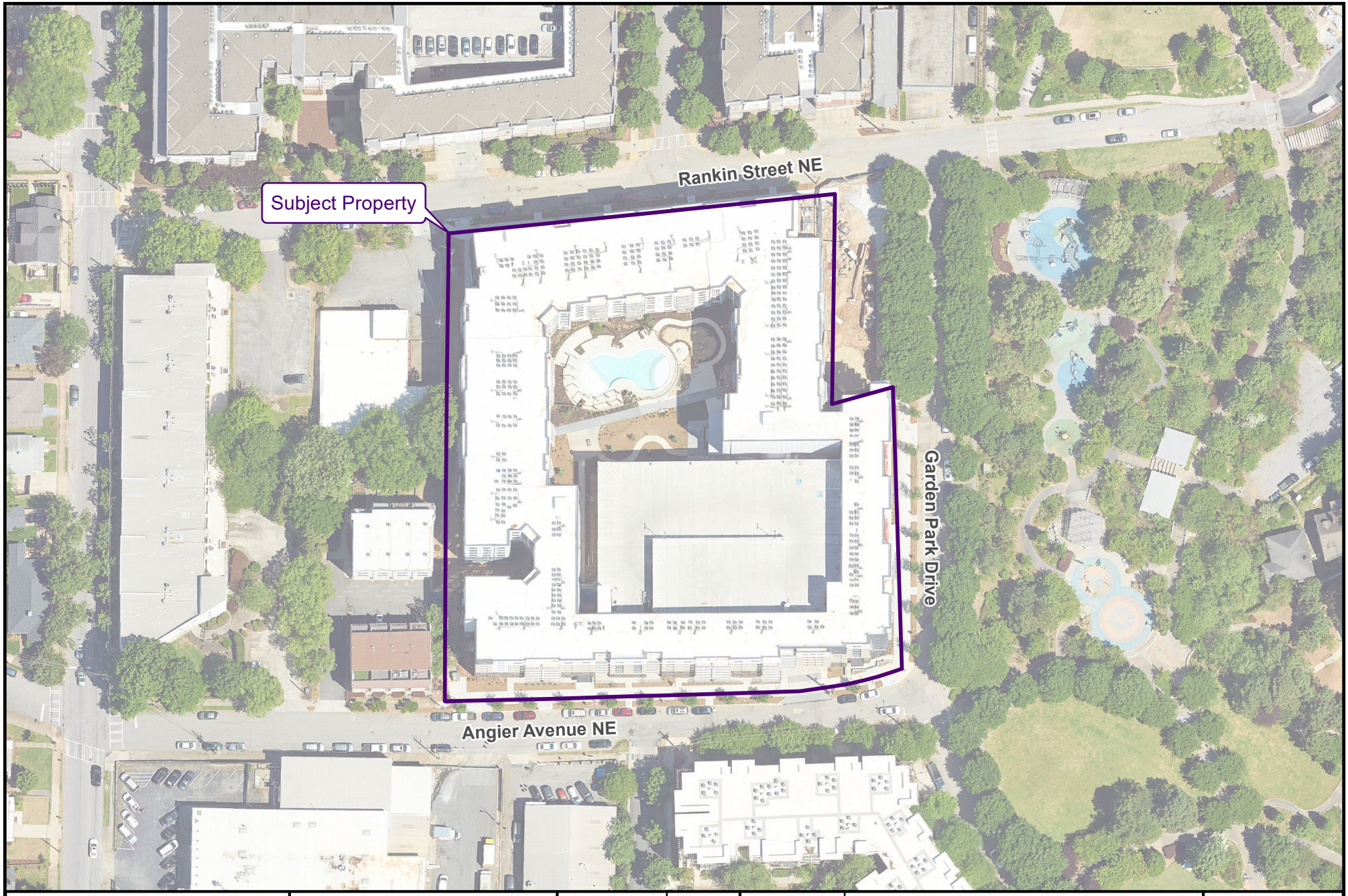

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Figure Scale

N

0 75 150

1 inch = 100 feet

Prepared:	BWS
Checked:	RCG
Date:	05/16/24

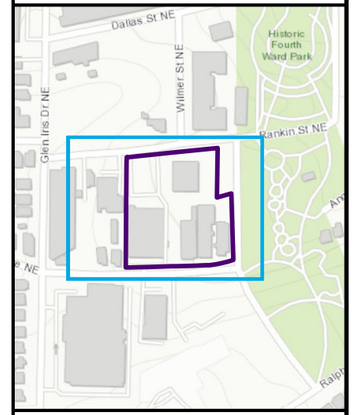
Title:	Existing Conditions Map (Google Earth, Apr. 2023)
Project:	Old 4th Ward Multifamily Development
Project No.	20-GA-04066-06
Client:	DRI/Maple OFW, LLC

FIG. 2

Areas outside of the engineered cap (i.e. concrete foundations/slabs, sidewalks, concrete pavement, pavers) required implementation of the engineered soil barrier. The engineered soil barrier (soil cap) consisted of 1 FT of enviromentally-tested clean soil (meeting residential Type 1 RRS) with an underlying demarcation barrier.

References: Level 1 Floor Plan A1-01 (Rule Joy Trammell Rubio, September 2020)

Map Index



Legend

- Subject Property Boundary
- Building Foundation Cap
- Parking Deck Cap
- Soil Cap
- Concrete Cap

Note: Site layout illustrates the applied approaches for compliance with the Type 5 RRS under the Georgia Brownfield Program. The Type 5 RRS approach includes an engineered cap to control exposure to impacted soils. The cap included the parking deck concrete slabs, concrete sidewalks, decorative stone, brick pavers, concrete building foundations. and/or a minimum of **one foot** of environmentally tested clean soils (meeting residential RRS). The original version of this drawing is in full color, black and white reproductions may not accurately depict certain information.

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Project:
Old 4th Ward Multifamily Development

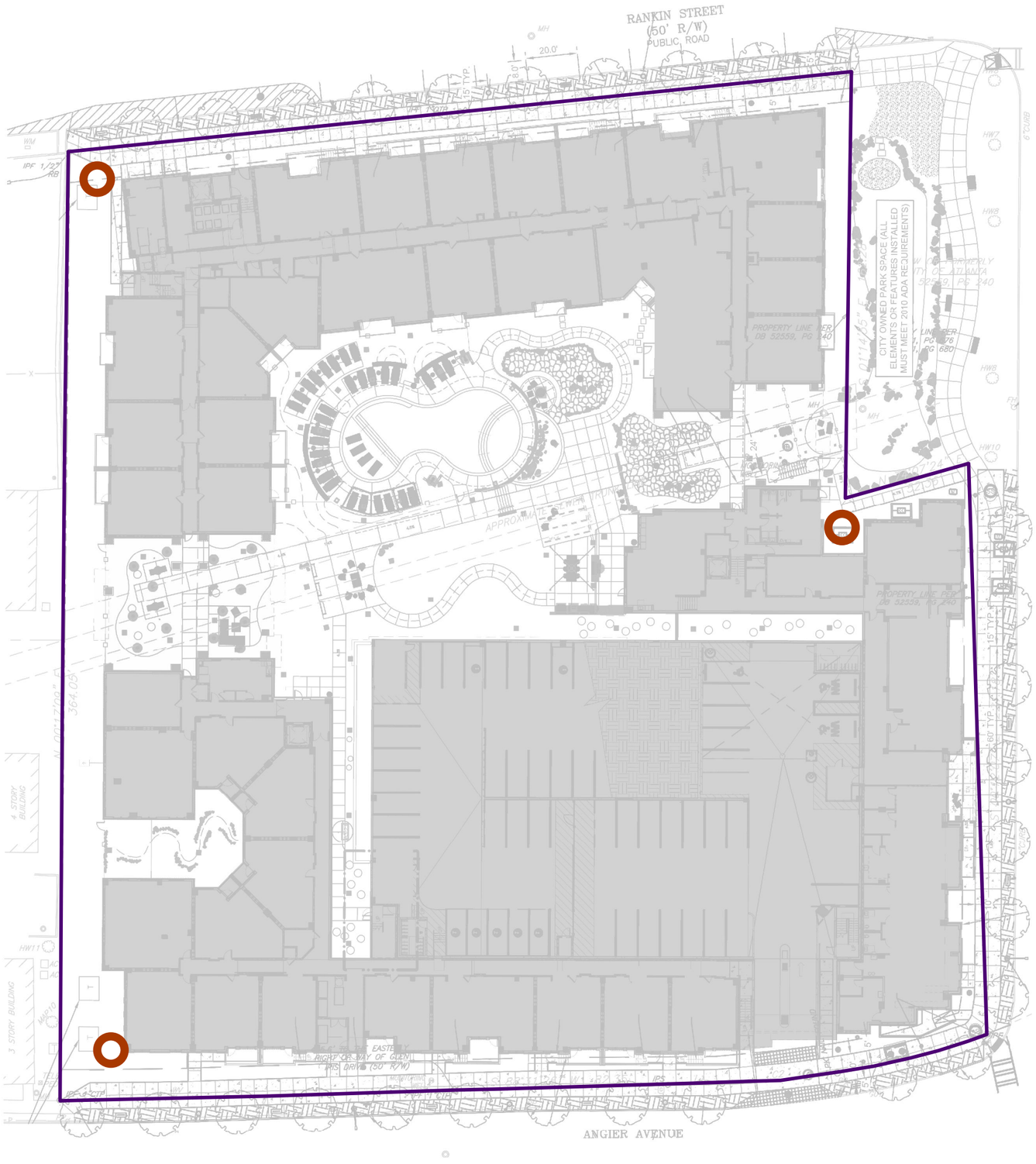
Client:
DRI/Maple OFW, LLC

Sheet Title: Type 5 RRS Engineering Controls

Scale: N 0 12.5 25 50
1 inch = 45 feet

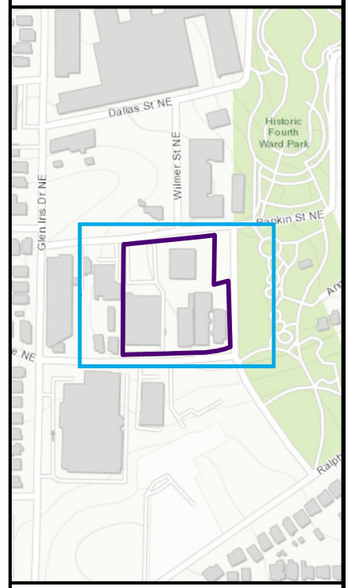
Prepared:	B. Sharp
Checked:	R. Griebel
Date:	May 16, 2024
Project No.	20-GA-04066-06

FIGURE 3



References: Site Plans (Kimley-Horn, December 2020)

Map Index



Legend

- Subject Property Boundary
- Permanent Marker Location

Note:
Original version of this drawing is in color. Black-and-white reproductions may not accurately depict certain information.

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770-209-0029 Fax 582-2900 www.unitedconsulting.com

Project:
Old 4th Ward Multifamily Development

Client:
DRI/Maple OFW, LLC

Sheet Title: Permanent Marker Location Plan

Scale: N 0 10 20 40
1 inch = 45 feet

Prepared:	B. Sharp
Checked:	R. Griebel
Date:	Jun 2, 2025
Project No.	20-GA-04066-06

FIGURE 4

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ATTACHMENT B

Permanent Marker Specifications

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Signage Specifications (Permanent Markers)

FRONT
SCALE: HALF SIZE

SPECIFICATIONS FOR BRONZE PLAQUE

Bronze Plaque 10"W x 10"H
5/16" Thick
Circular
Raised Copy & Border
Pebble With Polished Surface
Double Line Border
2025 Black Painted
Per Artfile Supplied
Semi-Gloss Finish (15% Matte)
Blind Mount - Standard Studs
No Rosettes Required

Raised - Brushed Bronze with matte clear finish

Recessed - Pebble Finish Painted Black

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ATTACHMENT C

Inspection Form

625 Holcomb Bridge Road, Norcross, GA 30071 • 770-209-0029 • unitedconsulting.com

Appendix C — Inspection Form
652 Angier Avenue NE
Atlanta, Fulton County, Georgia

No.	Criteria Response	YES	NO
	Subject Property Use		
1	Does the Subject Property meet the use criteria for the approved Type 5 RRS remedies (i.e. engineering controls), protective of exposure to impacted media?		
1a	If no to 1, has the Uniform Environmental Covenant (UEC) been terminated?		
1b	If yes to 1a, attached a written explanation to document the closure of long-term maintenance requirements.		
	Engineering Controls		
	Hardscapes		
2	Are the various hardscapes (i.e. concrete foundations/slabs, sidewalks, concrete pavement, pavers) on the Subject Property intact and of sufficient quality to prevent exposure to impacted soils? (See Figure 2 in the Monitoring and Maintenance Plan; MMP)		
2a	If no to 2, are corrective measures being taken? Perform repairs within 60 days of discovery.		
	Engineered Soil Barrier (Soil Cap)		
3	Is the protective surface cover (soil cap and demarcation barrier) intact and of sufficient quality to prevent exposure to impacted soils? (See Figure 2 of the MMP)		
3a	If no to 3, are corrective actions being taken? Perform repairs within 60 days of discovery. Please attach a written explanation.		
	Signage (Permanent Markers)		
4	Are the three permanent markers at the Subject Property in place and legible? (See Figure 4 of MMP)		
4a	If no to 4, are corrective actions being taken? Perform repairs within 60 days of discovery. Please attach a written explanation.		
	Vapor Intrusion Mitigation System (VIMS)		
5	Are the exposed components of the VIMS (i.e. the extraction risers and roofline piping terminations) damaged, obstructed, and/or observed to be abnormal?		
5a	Is there evidence that changes to the building construction of the Subject Property (excluding the parking garage) have occurred? Including foundation modifications, remodeled areas, additions to the redevelopment, and/or slab damage/unauthorized breaches?		

Groundwater			
6	Is there evidence of the use of groundwater other than for groundwater sampling, analysis, and monitoring?		
6a	If yes to 5, take immediate actions to stop such use, and properly close and abandon such wells. Please attach a written explanation.		
Monitoring and Maintenance Plan			
7	Based on review of the MMP, are revisions to the plan needed?		
7a	If yes to 6, submitted the revised MMP to the EPD for review and approval within 90 days.		
Inspection			
8	Date of inspection:		
8a	Name of inspector:		
8b	Photographs showing current land use, engineering controls, and permanent markers (attached)		

Certification:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

_____ _____

NAME (Please type or print) TITLE

_____ _____

SIGNATURE DATE

UNITED
CONSULTING

ATTACHMENT D

Maintenance and Repairs Form

625 Holcomb Bridge Road, Norcross, GA 30071 • 770-209-0029 • unitedconsulting.com

Appendix D
Maintenance and Repairs Form
652 Angier Avenue NE
Atlanta, Fulton County, Georgia

Item No. (See Annual Evaluation Form)	Maintenance or Repairs Required	Date Identified	Date Repairs Completed	Re-inspection Date and Initials

UNITED
CONSULTING

ATTACHMENT E

Site Photographs

Photo: Site demolition activities, view north

Photo: Site demolition activities, view west

Photo: Witness barrier placement and rough-in staging, southwestern greenspace

Photo: Witness barrier placement and rough-in staging

UNITED CONSULTING

Property:	Old 4th Ward Multifamily Development
Location:	Atlanta, Georgia
Client:	Maple Multi-Family Land SE, LP; DRI/Maple O4W, LLC
Project Number:	TMCRW-20-GA-04066-06

Site Photographs

Photo: Placement and backfill of tested import soils atop witness barrier

Photo: In-progress rooftop completion (including VIMS vents)

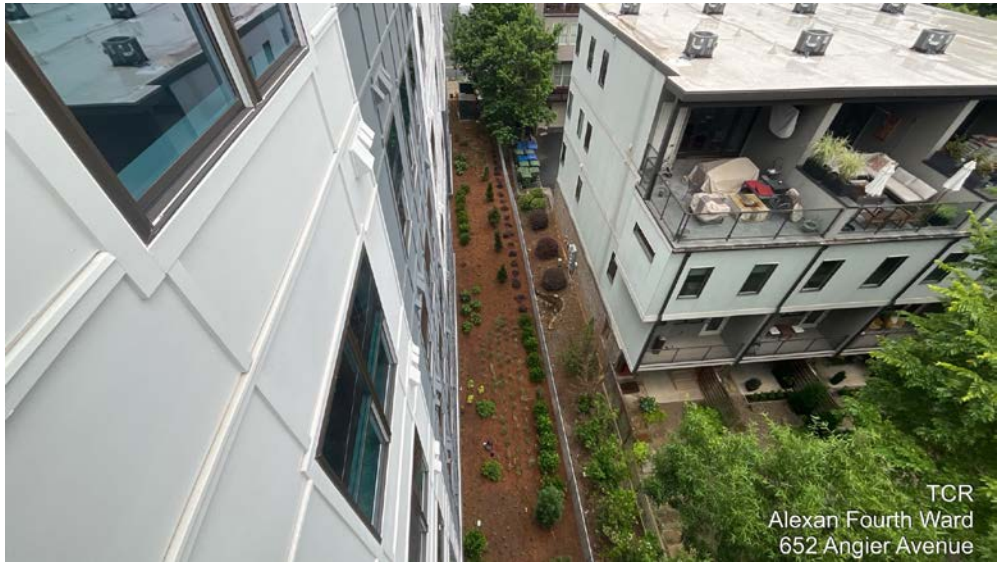


Photo: Final site conditions, western greenspace

Photo: Final site conditions, interior courtyard/pool area

UNITED CONSULTING

Property:	Old 4th Ward Multifamily Development
Location:	Atlanta, Georgia
Client:	Maple Multi-Family Land SE, LP; DRI/Maple O4W, LLC
Project Number:	TMCRW-20-GA-04066-06

Site Photographs

UNITED
CONSULTING

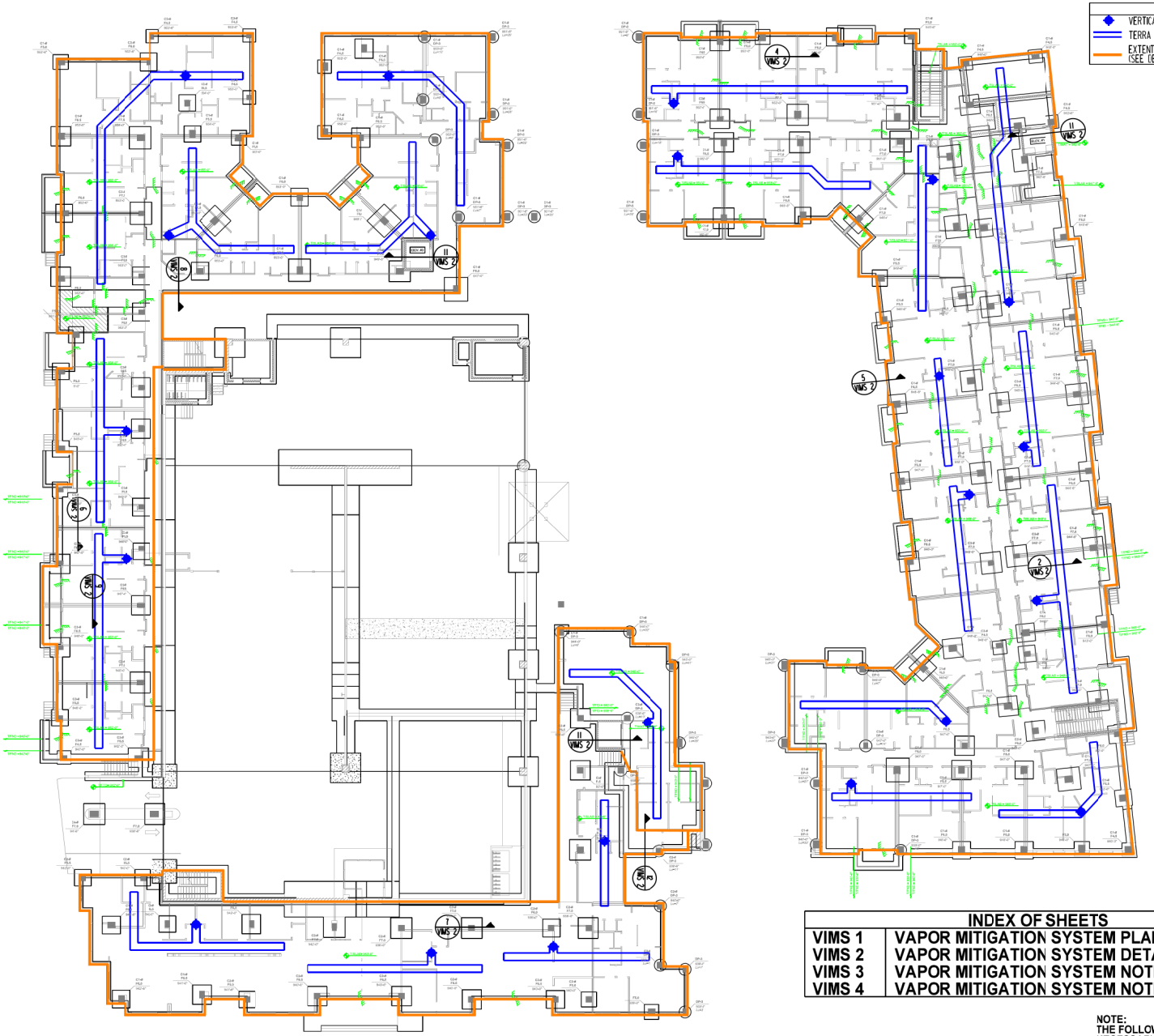
ATTACHMENT F

Vapor Intrusion Mitigation System (VIMS) Plans

625 Holcomb Bridge Road, Norcross, GA 30071 • 770-209-0029 • unitedconsulting.com

REFERENCE: BASE PLAN PROVIDED BY ELLINWOOD + MUCHADO, LLC ON 1-25-21

SCALE IN FEET
0 8 16 24 32



INDEX OF SHEETS

NOTE:
THE FOLLOWING VIMS PLANS MAY BE MODIFIED AS NECESSARY IN FIELD BY A QUALIFIED/CERTIFIED VIMS INSTALLER AS APPROVED BY DESIGN FIRM.

REVISION

DATE

625 Holcomb Bridge Road
Norcross, Georgia 30071
770-209-0029 Fax 382-2900
www.unitedconsulting.com

We're here for you

UNITED CONSULTING

PROJECT DESCRIPTION

ALEXAN 04W
652 ANGIERS AVENUE
ATLANTA, FULTON COUNTY, GEORGIA
TRAMMELL CROW RESIDENTIAL

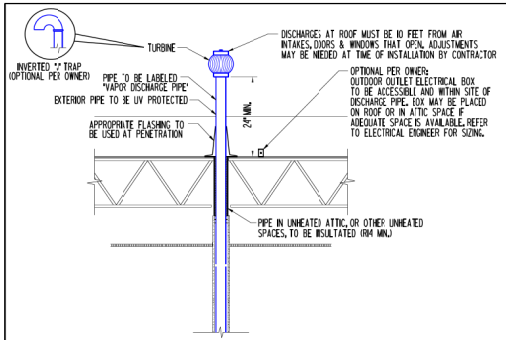
SHEET TITLE

VAPOR MITIGATION SYSTEM (VIMS) PLAN

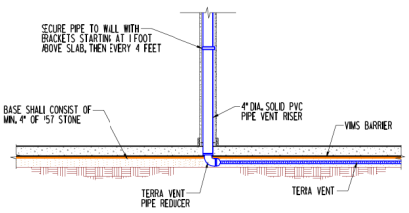
SCALE: 1" = 16'
PREPARED BY: VPV
CHECKED BY: SC
DATE: 3-5-21
PJ NO.: TMCRW-21-GA-04066-07

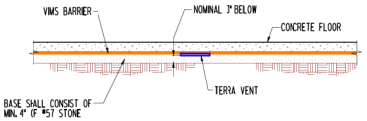
DRAWING NUMBER

VIMS 1



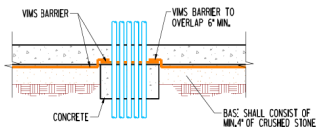
1 VIMS 2 TYPICAL DISCHARGE PIPE
SCALE: NONE



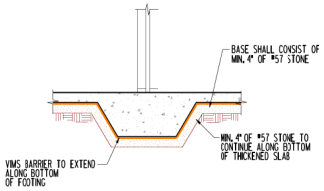


NOTE:
AGGREGATE BASE SHALL CONSIST OF MIN. 4 INCHES OF #57 STONE. PROVIDED MATERIALS ARE COMPACTED AND ROLLED FLAT OR BUFFER MATERIAL IS PLACED ON TOP.

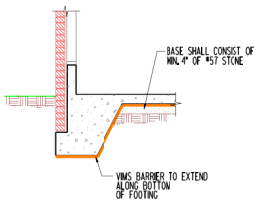
2 VIMS 2 VIMS APPROACH
SCALE: NONE



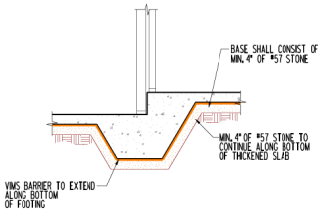
3 VIMS 2 DUCT BANK PENETRATION SECTON
SCALE: NONE



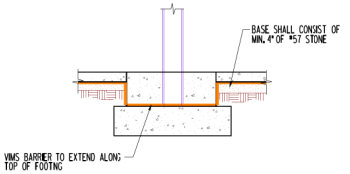
4 VIMS 2 PARTY/SHEAR/LOAD BEARING WALL SECTION
SCALE: NONE



5 VIMS 2 EXTERIOR WALL SECTION
SCALE: NONE

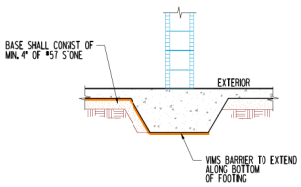


6 VIMS 2 STEP FOOTING SECTION
SCALE: NONE

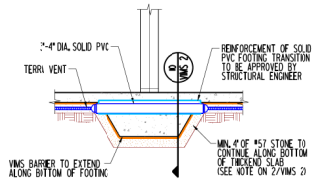


NOTE:
SEQUENCE OF INSTALLATION WILL CONTROL FINAL DETAIL, COORDINATE WITH INSTALLER

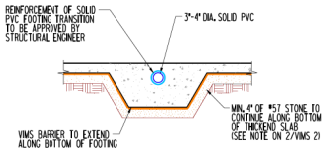
7 VIMS 2 COLUMN SECTION
SCALE: NONE



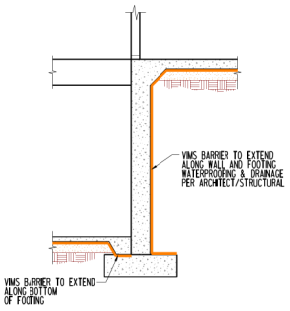
8 VIMS 2 CMU WALL SECTION
SCALE: NONE



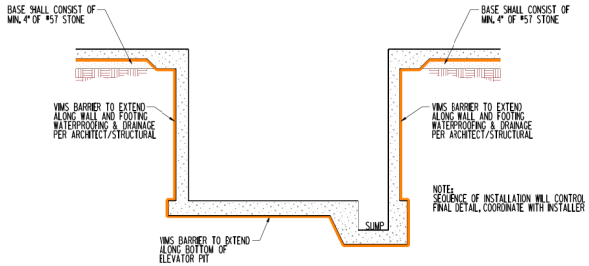
9 VIMS 2 VENT FOOTING TRANSITION SECTION
SCALE: NONE



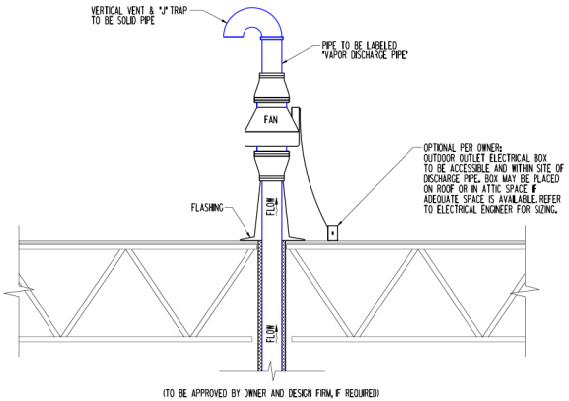
IC VIMS 2 SLEEVE AT FOOTING TRANSITION SECTION
SCALE: NONE



12 VIMS 2 BASEMENT WALL SECTION
SCALE: NONE

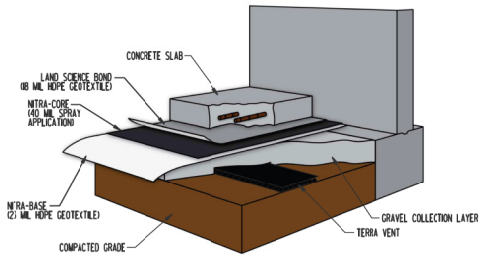


11 VIMS 2 ELEVATOR PIT SECTION
SCALE: NONE



(TO BE APPROVED BY OWNER AND DESIGN FIRM, IF REQUIRED)

A VIMS 2 OPTIONAL BLOWER DETAIL
SCALE: NONE



B VIMS 2 NITRA-SEAL PROFILE
SCALE: NONE

NOTE:
THE FOLLOWING ARE TYPICAL DETAILS FOR THE VIMS SYSTEM. ALSO REFER TO PLANS, NOTES & MANUFACTURING DETAILS. REFER TO STRUCTURAL DRAWINGS/DETAILS FOR ACTUAL FOUNDATION. IN FIELD MODIFICATION MAY BE NECESSARY BY QUALIFIED/CERTIFIED VIMS INSTALLER, AS APPROVED BY DESIGN FIRM.

REVISION

DATE

625 Holcomb Bridge Road
Norcross, Georgia 30071
770-209-0029 Fax 382-2900
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UNITED CONSULTING

PROJECT DESCRIPTION
ALEXAN 04W
652 ANGIERS AVENUE
ATLANTA, FULTON COUNTY, GEORGIA
TRAMMELL CROW RESIDENTIAL

SHEET TITLE
VAPOR MITIGATION SYSTEM (VIMS) DETAILS

SCALE:	NONE
PREPARED BY:	VPV
CHECKED BY:	SC
DATE:	3-5-21
PJ NO.:	TMCRW-21-GA-04066-07

DRAWING NUMBER
VIMS 2

VAPOR INTRUSION MITIGATION SYSTEM PLAN SET

PART 1 – GENERAL

1.01 BASIS OF PLAN SET

A. THE BASIS OF PLAN SET FOR THIS VAPOR INTRUSION MITIGATION SYSTEM (VIMS) WAS THE RESULTS OF VARIOUS SOIL, GROUNDWATER, AND SOIL-GAS SAMPLING ACTVITIES ACROSS THE PROPERTY BY UNITED CONSULTING. VOLATILE AND OTHER COMPOUNDS WERE DETECTED IN SOME OF THESE MEDIA. THE PROPERTY HAS BEEN ENTERED INTO THE GEORGIA BROWNFIELD PROGRAM, AND HAS FILED A BROWNFIELD CORRECTIVE ACITON PLAN TO ADDRESS THE IMPACTS PRESENT. AS PART OF THE BROWNFIELD PLAN, THE PROPERTY OWNER HAS ELECTED FOR THE INSTALLATION OF A PASSIVE VIMS AS A CONSERVATIVE MEASURE. THE VIMS INCLUDES UTILIZING LAND SCIENCE TECHNOLOGIES NITRA-SEAL BARRIER SYSTEMS, OR EQUILIVANT SPRAY APPLIED SYSTEMS.

B. THE VIMS GENERALLY INCLUDES THREE PRIMARY COMPONENTS; 1) A LAYER OF UNIFORM SIZED GRAVEL BELOW THE PLANNED FOOTPRINT OF THE BUILDINGS, EXCLUDING THE PARKING DECK, WITH 2) A COLLECTION AND PERFORATED VENT NETWORK. THE PERFORATED VENT NETWORK CONNECTS TO SOLID PIPES WHICH EXTEND VERTICALLY THROUGH THE WALLS FOR DISCHARGE ABOVE THE ROOF LINES. VENTING (PASSIVE TURBINES) ARE ATTACHED TO THE TOPS OF EACH DISCHARGE PIPE. THE GRAVEL LAYER IS TOPPED WITH 3) A VAPOR INTRUSION BARRIER, THAT IS TOPPED WITH THE BUILDINGS CONCRETE SLAB. THIS IS TO CREATE A BARRIER BELOW THE BUILDING SLAB AREAS.

PART 2 – VAPOR GRAVEL COLLECTION LAYER

2.01 INSTALLATION

A. VAPOR GRAVEL COLLECTION LAYER (GCL) UNDER THE BUILDING SHALL EXTEND PERIMETER FOOTING TO PERIMETER FOOTING BELOW THE ENTIRE BUILDING, AS ILLUSTRATED ON VIMS 1. GCL TO PASS BELOW THE INTERNAL THICKENED SLABS AND SLAB DEPRESSION AS SHOWN ON THE DETAILS SHEET, AND THE STRUCTURAL PLANS.

B. UTILITIES TO BE PLACED BELOW THE COLLECTION PIPING NETWORK, AND BELOW THE GCL. VENT PIPES SHALL NOT BE DISTURBED. UTILITIES SHALL ONLY PASS VERTICALLY THROUGH THE GCL AND VAPOR INTRUSION BARRIER.

C. ALL UTILITY CONDUITS MUST BE SEALED AT THE LOCATIONS ENTERING THE BUILDING FROM THE SLAB. AT THE SLAB LEVEL, THE INTERIORS OF THE CONDUITS SHALL BE SEALED WITH CLOSED CELL POLYURETHANE FOAM, OR EQUAL, FOR A MINIMUM OF 6 CONDUIT DIAMETER INCHES OR 6 INCHES WHICHEVER IS GREATER.

D. GCL TO BE NOT LESS THAN 4 INCHES THICK, AND SHALL BE COMPACTED AND ROLLED FLAT. COMPACTION SHOULD MEET THE GEOTECHNICAL AND STRUCTURAL SPECIFICATIONS.

E. THE SUBGRADE SURFACE PREPARATION SHALL BE IN ACCORDANCE WITH SECTION 4.12.

2.02 MATERIALS

A. VAPOR GRAVEL COLLECTION LAYER TO BE NO. 57 STONE. THE VIMS BARRIER MANUFACTURE, LAND SCIENCE, HAS APPROVED THIS MATERIAL. FOLLOWING IS STONE GRADATION:

SIZE	PERCENT PASSING
1.5 INCHES	100
1 INCH	95-100
¾ INCH	--
½ INCH	25-60
3/8 INCH	--
#4	0-10
#8	0-5
#16	--

PART 3 – VAPOR COLLECTION PIPING NETWORK

3.01 PERFORMANCE REQUIREMENTS

A. GENERAL: PROVIDE A GAS VENTING MATERIAL THAT COLLECTS GAS VAPORS AND DIRECTS THEM TO DISCHARGE OR TO COLLECTION POINTS AS SPECIFIED IN THE GAS VAPOR COLLECTION SYSTEM DRAWINGS AND COMPLIES WITH THE PHYSICAL REQUIREMENTS SET FORTH BY THE MANUFACTURER.

3.02 SUBMITTALS

A. SUBMIT PRODUCT DATA FOR EACH TYPE OF GAS VENTING SYSTEM SPECIFIED, INCLUDING MANUFACTURER'S SPECIFICATIONS.

B. SAMPLE – SUBMIT REPRESENTATIVE SAMPLES OF THE FOLLOWING FOR APPROVAL:

1. GAS VENTING, TERRA-VENT (ALSO KNOWN AS VAPOR VENT BY OTHERS).
2. TERRA-VENT ACCESSORIES.

3.03 QUALITY ASSURANCE

A. INSTALLER QUALIFICATIONS: ENGAGE AN EXPERIENCED INSTALLER WHO IS CERTIFIED IN WRITING AND APPROVED BY VAPOR INTRUSION BARRIER MANUFACTURER LAND SCIENCE TECHNOLOGIES FOR THE INSTALLATION OF THE NITRA-SEAL VAPOR INTRUSION BARRIER SYSTEM.

B. MANUFACTURER QUALIFICATION: OBTAIN GAS VENTING (TERRA-VENT), VAPOR INTRUSION BARRIER AND SYSTEM COMPONENTS FROM A SINGLE MANUFACTURER LAND SCIENCE TECHNOLOGIES.

C. PRE-INSTALLATION CONFERENCE: A PRE-INSTALLATION CONFERENCE SHALL BE HELD PRIOR TO INSTALLATION OF THE VENTING SYSTEM, VAPOR INTRUSION BARRIER AND WATERPROOFING SYSTEM (WATERPROOFING IS NOT INCLUDED IN THIS PLAN SET) TO ASSURE PROPER SITE AND INSTALLATION CONDITIONS, TO INCLUDE CONTRACTOR, APPLICATOR, ARCHITECT/ENGINEER AND SPECIAL INSPECTOR (IF ANY).

3.04 DELIVERY, STORAGE, AND HANDLING

A. DELIVER MATERIALS TO PROJECT SITE AS SPECIFIED BY MANUFACTURER LABELED WITH MANUFACTURER'S NAME, PRODUCT BRAND NAME AND TYPE, DATE OF MANUFACTURE, SHELF LIFE, AND DIRECTIONS FOR HANDLING.

B. STORE MATERIALS AS SPECIFIED BY THE MANUFACTURER IN A CLEAN, DRY, PROTECTED LOCATION AND WITHIN THE TEMPERATURE RANGE REQUIRED BY MANUFACTURER. PROTECT STORED MATERIALS FROM DIRECT SUNLIGHT.

C. REMOVE AND REPLACE MATERIAL THAT IS DAMAGED.

3.05 MANUFACTURERS

A. LAND SCIENCE TECHNOLOGIES, SAN CLEMENTE, CA. 949-366-8000

1. TERRA-VENT (ALSO KNOWN AS VAPOR VENT BY OTHERS)

3.06 GAS VENT MATERIALS

A. TERRA-VENT – TERRA-VENT IS A LOW PROFILE, TRENCHLESS, FLEXIBLE, SUB SLAB VAPOR COLLECTION SYSTEM. TERRA-VENT SHALL BE USED, MANUFACTURED BY LAND SCIENCE TECHNOLOGIES. IT WILL BE CONNECTED TO SOLID SCHEDULE 40 PVC PIPING FOR TRANSMISSION AND VERTICAL DISCHARGE AS INDICATED ON THE PLANS.

B. WHERE TERRA-VENT ENCOUNTERS THICKENED SLABS OR FOOTINGS, A SECTION OF SOLID (NON-SLOTTED) AND SMOOTH 3 INCH DIAMETER SCHEDULE 40 PVC PIPING SHALL BE USED TO PASS THROUGH THE FOOTINGS TO A MINIMUM 6 INCHES OUTSIDE THE FOOTING EDGES. STEEL COLLAR PIPE PASSES OR OTHER COMPRESSIVE FILLERS MAY ALSO BE REQUIRED BY STRUCTURAL ENGINEER. CONFIRM REQUIREMENTS WITH ENGINEER PRIOR TO INSTALLATION OF BARRIER SYSTEM.

C. INTERIOR VERTICAL DISCHARGE PIPING TO BE SMOOTH AND SOLID 4 INCH DIAMETER SCHEDULE 40 PVC PIPING. EXTERIOR DISCHARGE PIPING TO BE UV PROTECTED SMOOTH 4 INCH DIAMETER SCHEDULE 40 PVC PIPING, OR PAINTED WITH WATER BASED LATEX PAINT FORMULATED FOR OUTDOOR USE FOR UV PROTECTION.

D. VERTICAL DISCHARGE PIPING SHALL BE LABELED TO AVOID CONFUSION DURING CONSTRUCTION. COLOR CODING OF THE PIPING DURING THE INSTALLATION PROCESS IS ALSO RECOMMENDED. VERTICAL DISCHARGE PIPES SHALL BE **LABELED "GAS-VAPOR/RADON DISCHARGE PIPE"** AT THE FINAL DISCHARGES AT THE ROOF.

E. STARTING AT 1 FOOT ABOVE THE GROUND FLOOR SLAB, THE VERTICAL PIPING SHALL BE SECURED TO STRUCTURE AT A MAXIMUM 4 FOOT SPACING USING HANGER STRAPPING, PIPE CLIPS, COLLARS, OR EQUIVALENT TO AVOID PRESSURE AT SLABS AND COLLECTION PIPING NETWORK.

F. IN UNHEATED SPACES, THE DISCHARGE PIPING SHALL BE WRAP-INSULATED WITH MINIMUM RATING OF R14 INSULATION.

G. DISCHARGE PIPING EXHAUST SHALL BE A MINIMUM OF 24 INCHES ABOVE ROOF SURFACE (DETAIL 1, VIMS-2), AND A MINIMUM OF 10 FEET AWAY FROM ANY WINDOWS, AIR INTAKES OR OTHER OPENINGS IN THE BUILDING OR ADJACENT BUILDINGS. THE DISCHARGE LOCATIONS MAY NEED TO BE ADJUSTED DURING CONSTRUCTION TO AVOID SUCH CONFLICTS. THE INSTALLATION CONTRACTOR IS RESPONSIBLE FOR MEETING HIEGHT AND DISTANCE REQUIREMENTS.

H. ALL PVC PIPING ELBOWS SHALL BE SCHEDULE 40 SMOOTH ROUNDED CURVE MODELS, SUCH AS SWEEP 45 AND 90 DEGREE BENDS. ELBOWS AND T'S SHALL BE COMPATIBLE WITH LATERAL COLLECTION TERRA VENT. ALL PVC PIPING COLLARS, T'S, AND ELBOWS SHALL BE SECURED WITH ADEQUATE AND COMPATIBLE PIPING CEMENT, SUCH AS OATEY EP42. WHERE THE SUBSLAB TERRA-VENT CONNECTS TO PIPE REDUCERS, THESE SHALL BE SEALED USING FABRIC REINFORCEMENT TAPE.

3.07 AUXILIARY MATERIALS

A. TERRA-VENT PIPE REDUCERS.

B. REINFORCED TAPE.

C. TERRA-VENT END OUT.

D. 4 INCH DIAMETER SCHEDULE 40 PVC TRANSMISSION AND VERTICAL VENT PIPING.

E. WIND TURBINES. THE TOP OF EACH OF THE 22 DISCHARGE PIPES SHALL BE EQUIPPED WITH PASSIVE WIND TURBINES (DETAIL 1, VIMS-2). TURBINES TO BE ATTACHED TO PIPE TOPS IN ACCORDANCE WITH MANUFACTURER SPECIFICATIONS. WIND TURBINES TO BE EMPIRE, TURBINE VENTILATOR, 4 INCH, TVO4G, OR EQUAL. (WWW.EMPIREVENT.COM). ALTERNATIVES SUCH AS J-HOOK PIPE TERMINATIONS MAY BE UTILIZED AS APPROVED BY THE OWNER.

F. ELECTRICAL JUNCTION BOXES. AS AN OPTION PER THE PROPERTY OWNER: ELECTRICAL JUNCTION BOXES SHALL BE PLACED NEXT TO EACH OF THE DISCHARGE PIPES AT THE ROOF IN THE EVENT THAT BLOWERS ARE NEEDED LATER (DETAIL 1, VIMS-2 AND DETAIL A, VIMS-2). ALTERNATIVELY, ELECTRICAL JUNCTION BOXES MAY BE PLACED IN THE ROOF CEILING AREA IF THERE IS SUFFICIENT SPACE. THE FANS OR JUNCTION BOXES ARE NOT TO BE IN LIVING SPACES. REFER TO ELECTRICAL ENGINEER FOR SIZING AND PLACEMENT MINIMUM REQUIREMENTS.

3.08 EXAMINATION

A. EXAMINE SUBSTRATES, AREAS, AND CONDITIONS UNDER WHICH GAS VENT SYSTEM WILL BE INSTALLED, WITH INSTALLER PRESENT, FOR COMPLIANCE WITH REQUIREMENTS. DO NOT PROCEED WITH INSTALLATION UNTIL UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.

3.09 SUBSTRATE PREPARATION

A. VERIFY SUBSTRATE IS PREPARED ACCORDING TO PROJECT REQUIREMENTS, INCLUDING GEOTECHNICAL RECOMENDATIONS.

3.10 PREPARATION FOR STRIP COMPOSITE

A. MARK THE LAYOUT OF STRIP GEOCOMPOSITE TERRA-VENT PER LAYOUT PLAN SET ON VIMS 1. THE LAYOUT IS PER THIS PLAN SET AND THE ARCHITECTURAL DRAWINGS. THE LOCATIONS OF THE VERTICAL RISERS ARE TO BE FIELD VERIFIED BY THE PLUMBING SUBCONTRACTOR AND THE DEVELOPMENT GENERAL CONTRACTOR TO ASSURE THEIR LOCATIONS ARE IN THE NEEDED WALL LOCATIONS FOR VERTICAL PASSAGE.

3.11 STRIP GEOCOMPOSITE INSTALLATION

A. INSTALL TERRA-VENT OVER SUBSTRATE MATERIAL WHERE DESIGNATED ON DRAWINGS WITH THE FLAT BASE OF THE CORE PLACED DOWN AND SHALL BE OVERLAPPED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. THE TERRA-VENT SHALL BE PLACED INTO THE GCL SO THAT THE TOP OF THE TERRA-VENT IS FLUSH WITH THE TOP OF THE GCL.

B. AT AREAS WHERE TERRA-VENT STRIPS INTERSECT, CUT AND FOLD BACK FABRIC TO EXPOSE THE DIMPLED CORE. ARRANGE THE STRIPS SO THAT THE TOP STRIP INTERCONNECTS INTO THE BOTTOM STRIP. UNFOLD FABRIC TO COVER THE CORE AND USE REINFORCING TAPE, AS APPROVED BY THE MANUFACTURER, TO SEAL THE CONNECTION TO PREVENT GRAVEL FROM ENTERING THE CORE.

C. TERRA-VENT TO PASS THROUGH THICKENED SLABS AS ILLUSTRATED ON VIMS 1A THROUGH 1D, AND THE DETAILS SHEETS. PLACE SOLID PIPE THROUGH CONCRETE AREA, SLEEVED AND REINFORCED PER THE STRUCTURAL SPECIFICATIONS, AND ATTACH A TERRA-VENT PIPE REDUCER AT BOTH ENDS OF THE PIPE BEFORE CONNECTING THE TERRA-VENT TO THE PIPE REDUCER. SEAL THE TERRA-VENT TO THE TERRA-VENT PIPE REDUCER USING FABRIC REINFORCEMENT TAPE.

D. PLACE VENT RISERS AND DISCHARGES PER VIMS 1. CONNECT TERRA-VENT TO TERRA-VENT PIPE REDUCER AND SEAL WITH FABRIC REINFORCED TAPE. USE TERRA-VENT PIPE REDUCER WITH THE SPECIFIED DIAMETER PIPING AS SHOWN ON SYSTEM DRAWINGS. VERTICAL DISCHARGE PIPING AND FOOTING PASS PIPING SHALL BE 4 AND 3 INCH DIAMETER SOLID SCHEDULE 40 PVC, RESPECTIVELY.

E. THE TERRA-VENT PIPE TO DISCHARGE IN THE 22 LOCATIONS PER VIMS 1. THE TOPS OF EACH OF THE PVC PIPES SHALL BE EQUIPPED WITH WIND TURBINES.

F. DURING CONSTRUCTION, CARE MUST BE TAKEN NOT TO DAMAGE THE TERRA-VENT NETWORK. IN HIGH TRAFFIC AREAS PLYWOOD MAY BE TEMPORARILY PLACED ACROSS THE PIPING AREAS TO SPREAD LOAD DISTRIBUTION. DAMAGED TERRA-VENT MUST BE REPLACED PRIOR TO PLACEMENT OF THE VAPOR INTRUSION BARRIER.

3.12 PLACEMENT OF OVERLYING AND ADJACENT MATERIALS

A. ALL OVERLYING AND ADJACENT MATERIAL SHALL BE PLACED OR INSTALLED USING APPROVED PROCEDURES AND GUIDELINES TO PREVENT DAMAGE TO THE STRIP GEOCOMPOSITE.

B. EQUIPMENT SHALL NOT BE DIRECTLY DRIVEN OVER AND STAKES OR ANY OTHER MATERIALS MAY NOT BE DRIVEN THROUGH THE STRIP GEOCOMPOSITE.

PART 4 - VAPOR INTRUSION BARRIER (NITRA-SEAL BARRIER PRODUCT)

4.01 GENERAL INSTALLATION

A. VAPOR INTRUSION BARRIER UNDER THE BUILDING SHALL EXTEND PERIMETER FOOTING TO PERIMETER FOOTING BELOW THE ENTIRE BUILDING AS ILLUSTRATED ON VIMS 1. EXCEPT WHERE NOTED ON THE DRAWINGS, IT IS NOT PRESENT BELOW THE PARKING DECK, OR UNIT DECKS/PATIOS. VAPOR INTRUSION BARRIER PASSES BELOW THE INTERNAL THICKENED SLABS AND SLAB DEPRESSIONS. IT IS PRESENT ON THE ELEVATOR PIT WALLS, AND EXTENDS BELOW THE ELEVATOR PITS, AND ON SPLIT WALLS WHERE OCCUPIED SPACE IS PRESENT ON THE LOWER LEVELS.

4.02 PERFORMANCE REQUIREMENTS

A. GENERAL: PROVIDE A VAPOR INTRUSION BARRIER SYSTEM THAT LIMITS THE PASSAGE OF VOLATILE ORGANIC COMPOUND VAPORS AND COMPLIES WITH PHYSICAL REQUIREMENTS AS DEMONSTRATED BY TESTING PERFORMED BY AN INDEPENDENT TESTING AGENCY OF MANUFACTURER'S CURRENT VAPOR INTRUSION BARRIER FORMULATIONS AND SYSTEM PLAN SET.

4.03 SUBMITTALS

A. SUBMIT PRODUCT DATA FOR EACH TYPE OF VAPOR INTRUSION BARRIER, INCLUDING MANUFACTURER'S PRINTED INSTRUCTIONS FOR EVALUATING AND PREPARING THE SUBSTRATE, TECHNICAL DATA, AND TESTED PHYSICAL AND PERFORMANCE PROPERTIES.

B. PROJECT DATA - SUBMIT SHOP DRAWINGS SHOWING EXTENT OF VAPOR INTRUSION BARRIER, INCLUDING DETAILS FOR OVERLAPS, FLASHING, PENETRATIONS, AND OTHER TERMINATION CONDITIONS.

C. SAMPLES – SUBMIT REPRESENTATIVE SAMPLES OF THE FOLLOWING FOR APPROVAL:

1. VAPOR INTRUSION BARRIER COMPONENTS.
   a. NITRA-SEAL – NITRILE-ADVANCED VAPOR BARRIER

D. CERTIFIED INSTALLER CERTIFICATES – SUBMIT CERTIFICATES SIGNED BY MANUFACTURER CERTIFYING THAT INSTALLERS COMPLY WITH REQUIREMENTS UNDER SECTION 5.

4.04 DELIVERY, STORAGE, AND HANDLING

A. DELIVER MATERIALS TO PROJECT SITE AS SPECIFIED BY MANUFACTURER LABELED WITH MANUFACTURER'S NAME, PRODUCT BRAND NAME AND TYPE, DATE OF MANUFACTURE, SHELF LIFE, AND DIRECTIONS FOR STORING AND MIXING WITH OTHER COMPONENTS.

B. STORE MATERIALS AS SPECIFIED BY THE MANUFACTURER IN A CLEAN, DRY, PROTECTED LOCATION AND WITHIN THE TEMPERATURE RANGE REQUIRED BY MANUFACTURER. PROTECT STORED MATERIALS FROM DIRECT SUNLIGHT. IF FREEZING TEMPERATURES ARE EXPECTED, NECESSARY STEPS SHOULD BE TAKEN TO PREVENT THE FREEZING OF THE NITRA-CORE AND NITRA-CORE DETAIL COMPONENTS.

C. REMOVE AND REPLACE MATERIAL THAT CANNOT BE APPLIED WITHIN ITS STATED SHELF LIFE.

4.05 PROJECT CONDITIONS

A. PROTECT ALL ADJACENT AREAS NOT TO BE INSTALLED ON. WHERE NECESSARY, APPLY MASKING TO PREVENT STAINING OF SURFACES TO REMAIN EXPOSED WHEREVER MEMBRANE ABUTS TO OTHER FINISH SURFACES.

B. PERFORM WORK ONLY WHEN EXISTING AND FORECASTED WEATHER CONDITIONS ARE WITHIN MANUFACTURER'S RECOMMENDATIONS FOR THE MATERIAL AND APPLICATION METHOD USED.

C. MINIMUM CLEARANCE OF 24 INCHES IS REQUIRED FOR APPLICATION OF PRODUCT. FOR AREAS WITH LESS THAN 24-INCH CLEARANCE, THE MEMBRANE MAY BE APPLIED BY HAND USING NITRA-CORE DETAIL.

D. AMBIENT TEMPERATURE SHALL BE WITHIN MANUFACTURER'S SPECIFICATIONS. (GREATER THAN +45 DEGREES F/+7 DEGREES C.) CONSULT MANUFACTURER FOR THE PROPER REQUIREMENTS WHEN DESIRING TO APPLY NITRA-CORE BELOW 45 DEGREES F/7 DEGREES C.

E. ALL PLUMBING, ELECTRICAL, MECHANICAL AND STRUCTURAL ITEMS TO BE UNDER OR PASSING THROUGH THE VAPOR INTRUSION BARRIER SYSTEM SHALL BE POSITIVELY SECURED IN THEIR PROPER POSITIONS AND APPROPRIATELY PROTECTED PRIOR TO MEMBRANE APPLICATION. UTILITY PENETRATION BANKS SHALL BE USED (DETAIL 3, VIMS 2).

F. VAPOR INTRUSION BARRIER SHALL BE INSTALLED BEFORE PLACEMENT OF REINFORCING STEEL. WHEN NOT POSSIBLE, ALL EXPOSED REINFORCING STEEL SHALL BE MASKED BY GENERAL CONTRACTOR PRIOR TO MEMBRANE APPLICATION.

G. STAKES USED TO SECURE THE CONCRETE FORMS **SHALL NOT PENETRATE** THE VAPOR INTRUSION BARRIER SYSTEM AFTER IT HAS BEEN INSTALLED. IF STAKES NEED TO PUNCTURE THE VAPOR INTRUSION BARRIER SYSTEM AFTER IT HAS BEEN INSTALLED, THE NECESSARY REPAIRS NEED TO BE MADE BY A CERTIFIED LAND SCIENCE APPLICATOR. VAPOR STAKES MAY BE INSTALLED PRIOR TO THE VAPOR INTRUSION BARRIER AS TO PROVIDE A MEANS FOR CONCRETE FORM PLACEMENT. TO CONFIRM THE STAKING PROCEDURE IS IN AGREEMENT WITH THE MANUFACTURES RECOMMENDATION, CONTACT LAND SCIENCE TECHNOLOGIES.

4.06 WARRANTY

A. GENERAL WARRANTY: THE MANUFACTURER SPECIAL WARRANTY SPECIFIED IN THIS ARTICLE SHALL NOT DEPRIVE THE OWNER OF OTHER RIGHTS THE OWNER MAY HAVE UNDER OTHER PROVISIONS OF THE CONTRACT DOCUMENTS, AND SHALL BE IN ADDITION TO, AND RUN CONCURRENT WITH, OTHER WARRANTIES MADE BY THE CONTRACTOR UNDER REQUIREMENTS OF THE CONTRACT DOCUMENTS.

B. SPECIAL WARRANTY: SUBMIT A WRITTEN WARRANTY SIGNED BY VAPOR INTRUSION BARRIER MANUFACTURER AGREEING TO REPAIR OR REPLACE VAPOR INTRUSION BARRIER THAT DOES NOT MEET REQUIREMENTS OR THAT DOES NOT REMAIN VOLATILE ORGANIC COMPOUND VAPOR TIGHT WITHIN THE SPECIFIED WARRANTY PERIOD. WARRANTY DOES NOT INCLUDE FAILURE OF VAPOR INTRUSION BARRIER DUE TO FAILURE OF SUBSTRATE PREPARED AND TREATED ACCORDING TO REQUIREMENTS OR FORMATION OF NEW JOINTS AND CRACKS IN THE ATTACHED TO STRUCTURES THAT EXCEED 1/16 INCH (1.58 MM) IN WIDTH.

1. WARRANTY PERIOD: 1 YEAR AFTER DATE OF SUBSTANTIAL COMPLETION.

C. THE ABOVE IS WARRANT INFORMATION FROM THE MANUFACTURER. ADDITIONAL WARRANTIES ARE AVAILABLE UPON REQUEST TO THE MANUFACTURER. OWNER SHALL SELECT ANY SUCH DESIRED WARRANTY FROM THE MANUFACTURER.

4.07 MANUFACTURER

A. LAND SCIENCE TECHNOLOGIES™, SAN CLEMENTE, CA. (949) 481-8118

1. NITRA-SEAL – NITRILE-ADVANCED VAPOR BARRIER – CONSISTING OF:
   a. NITRA-BASE SHEET LAYER
   b. NITRA-CORE AND NITRA-CORE DETAIL
   c. LAND SCIENCE BOND PROTECTION LAYER

4.08 VAPOR INTRUSION BARRIER SPRAY MATERIALS

A. FLUID APPLIED VAPOR INTRUSION BARRIER SYSTEM – NITRA-CORE; A SINGLE COURSE, HIGH BUILD, NITRILE-MODIFIED, ASPHALT EMULSION. WATERBORNE AND SPRAY APPLIED AT AMBIENT TEMPERATURES. A NOMINAL THICKNESS OF 40 DRY MILS, AS SPECIFIED. NON-TOXIC AND ODORLESS. NITRA-CORE DETAIL HAS SIMILAR PROPERTIES WITH GREATER VISCOSITY AND IS TROWEL OR BRUSH APPLIED. MANUFACTURED BY LAND SCIENCE TECHNOLOGIES AND IS APPLICABLE NITRA-SEAL BARRIER SYSTEMS.

B. FLUID APPLIED VAPOR INTRUSION BARRIER PHYSICAL PROPERTIES.

NITRA-SEAL CORE – TYPICAL CURED PROPERTIES

PROPERTIES	TEST METHOD	NITRA-CORE
Application to Nitra-Base	40 mils (23 ft2/gal)	
Typical Uncured Properties		
Specific Gravity	ASTM D 244	1.0
Brookfield Viscosity	ASTM D2196	75 – 90 centipoises
pH	Oakton	10 – 13
Residue Content	ASTM D2939	62 – 65%
Color	Brown to Black	
Demulsibility	ASTM D6936	35 – 40%
Non-Toxic	No Solvent	
Shelf Life	6 months	
Packaging (Each):	55 gal. drums and 275 gal. totes	

4.09 VAPOR INTRUSION BARRIER SHEET MATERIALS

1. NITRA-SEAL – NITRILE-ADVANCED VAPOR BARRIER

THE NITRA-BASE LAYER IS A 10-MIL HIGH DENSITY POLYETHYLENE SHEET THERMALLY BONDED TO A 3 OUNCE NON-WOVEN GEOTEXTILE; TOTALING 23-MILS.

A. SHEET COURSE USAGE
1. AS FOUNDATION BASE LAYER, USE NITRA-BASE LAYER AND/OR OTHER BASE SHEET AS REQUIRED OR APPROVED BY THE MANUFACTURER.
2. AS A TOP PROTECTIVE LAYER, USE LAND SCIENCE BOND LAYER AND/OR OTHER PROTECTION AS REQUIRED OR APPROVED BY THE MANUFACTURER.
3. NITRA-BASE AND LAND SCIENCE BOND LAYER PHYSICAL PROPERTIES:

PROPERTIES	TEST METHOD	NITRA-BASE
Film Thickness	23 mil	
Color	Clear HDPE/White Geotextile	
Weight	ASTM D751 – 06	6.85 oz/yd^2
Tensile Strength (grab)	ASTM D751 – 06	CD – 270.5 lbf.
		MD – 350.9 lbf.
Tear Strength (Trapezoidal)	ASTM D751 – 06	CD – 48.3 lbf.
		MD – 44.4 lbf
Puncture Resistance	ASTM D4833-07	103.1 lbf.
Life Expectancy	ASTM E 154-93	Indefinite
Elongation	ASTM D751 – 06	CD – 26.0%
		MD – 32.6%
Chemical Resistance	Excellent	
Packaging (Each):	102" x 150'	

LAND SCIENCE BOND LAYER IS A CHEMICALLY RESISTANT SHEETS COMPRISED OF A 5-MIL HIGH DENSITY WOVEN POLYETHYLENE SHEET THERMALLY BONDED TO A 3 OZ NON-WOVEN GEOTEXTILE; TOTALING 18-MILS.

AS TOP PROTECTIVE LAYER, USE LAND SCIENCE BOND LAYER AND/OR OTHER PROTECTION AS REQUIRED OR APPROVED BY THE MANUFACTURER.

PROPERTIES	TEST METHOD	LAND SCIENCE BOND
Film Thickness	18 mil	
Color	Gray HDPE - White Geotextile	
Weight	ASTM D751 – 06	6.76 oz/yd^2
Tensile Strength (grab)	ASTM D751 – 06	CD – 186.8 lbf.
		MD – 153.4 lbf.
Tear Strength (Trapezoidal)	ASTM D751 – 06	CD – 36.7 lbf.
		MD – 28.0 lbf
Puncture Resistance	ASTM D4833-07	61.2 lbf.
Life Expectancy	ASTM E 154-93	Indefinite
Elongation	ASTM D751 – 06	CD – 72.1%
		MD – 49.6%
Chemical Resistance	Excellent	
Packaging (Each):	102" x 150' Roll	

4.10 AXILLARY MATERIALS

A. SHEET FLASHING: 60-MIL REINFORCED MODIFIED ASPHALT SHEET GOOD WITH DOUBLE-SIDED ADHESIVE.

B. REINFORCING/DETAIL STRIP: MANUFACTURER'S RECOMMENDED POLYPROPYLENE AND POLYESTER FABRIC.

C. GAS VENTING MATERIALS: TERRA-VENT AND ASSOCIATED FITTINGS.

D. SEAM DETAILING SEALANT MASTIC: NITRA-CORE DETAIL, A HIGH OR MEDIUM VISCOSITY POLYMER MODIFIED WATER BASED ASPHALT MATERIAL.

1. BACK ROD: CLOSED-CELL POLYETHYLENE FOAM.

EXECUTION

4.11 AUXILIARY MATERIALS

A. EXAMINE SUBSTRATES, AREAS, AND CONDITIONS UNDER WHICH VAPOR INTRUSION BARRIER WILL BE APPLIED, WITH INSTALLER PRESENT, FOR COMPLIANCE WITH REQUIREMENTS. DO NOT PROCEED WITH INSTALLATION UNTIL UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.

4.12 SUBGRADE SURFACE PREPARATION

A. VERIFY SUBSTRATE IS PREPARED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS. ON A HORIZONTAL SURFACE, THE SUBSTRATE SHOULD BE FREE FROM MATERIAL THAT CAN POTENTIALLY PUNCTURE THE VAPOR INTRUSION BARRIER. ADDITIONAL PROTECTION OR CUSHION LAYERS MIGHT BE REQUIRED IF THE EARTH OR GRAVEL SUBSTRATE CONTAINS TOO MANY JAGGED POINTS AND EDGES THAT COULD PUNCTURE ONE OR MORE OF THE SYSTEM COMPONENTS. CONTACT MANUFACTURER TO CONFIRM SUBSTRATE IS WITHIN MANUFACTURES RECOMMENDATIONS.

B. NITRA-SEAL CAN ACCOMMODATE A WIDE RANGE OF SUBSTRATES. THE MANUFACTURER APPROVED THE USE OF THE SPECIFIED NO. 57 STONE GCL, WITHOUT THE NEED FOR A 4 OZ GEOTEXTILE CUSHION LAYER, PROVIDED THE STONE IS COMPACTED AND ROLLED FLAT. COMPACTION SHOULD ALSO MEET THE SITE-SPECIFIC GEOTECHNICAL AND STRUCTURAL SPECIFICATIONS.

C. MASK OFF ADJOINING SURFACE NOT RECEIVING THE VAPOR INTRUSION BARRIER SYSTEM TO PREVENT THE SPILLAGE OR OVER SPRAY AFFECTING OTHER CONSTRUCTION.

D. EARTH, SAND OR GRAVEL SUBGRADES SHOULD BE PREPARED AND COMPACTED TO LOCAL BUILDING CODE REQUIREMENTS.

4.13 CONCRETE SURFACE PREPARATION

A. CLEAN AND PREPARE CONCRETE SURFACE TO MANUFACTURER'S RECOMMENDATIONS. IN GENERAL, ONLY APPLY THE NITRA-CORE MATERIAL TO DRY, CLEAN AND UNIFORM SUBSTRATES. CONCRETE SURFACES MUST BE A LIGHT TROWEL, LIGHT BROOM OR EQUIVALENT FINISH. REMOVE FINS, RIDGES AND OTHER PROJECTIONS AND FILL HONEYCOMB, AGGREGATE POCKETS, GROUT JOINTS AND TIE HOLES, AND OTHER VOIDS WITH HYDRAULIC CEMENT OR RAPID-SET GROUT. IT IS THE APPLICATOR'S RESPONSIBILITY TO POINT OUT UNACCEPTABLE SUBSTRATE CONDITIONS TO THE GENERAL CONTRACTOR AND ENSURE THE PROPER REPAIRS ARE MADE.

B. WHEN APPLYING THE NITRA-CORE OR NITRA-CORE DETAIL MATERIAL TO CONCRETE IT IS IMPORTANT TO NOT APPLY THE PRODUCT OVER STANDING WATER. APPLYING OVER STANDING WATER WILL RESULT IN THE MEMBRANE NOT SETTING UP PROPERLY ON THE SUBSTRATE.

C. SURFACES MAY NEED TO BE WIPED DOWN OR CLEANED PRIOR TO APPLICATION. THIS INCLUDES, BUT IS NOT LIMITED TO, THE REMOVAL OF FORMING OILS, CONCRETE CURING AGENTS, DIRT ACCUMULATION, AND OTHER DEBRIS. CONTACT FORM RELEASE AGENT MANUFACTURER OR CONCRETE CURING AGENT MANUFACTURER FOR VOC CONTENT AND PROPER METHODS FOR REMOVING THE RESPECTIVE AGENT.

D. APPLYING THE NITRA-CORE TO "GREEN" CONCRETE IS ACCEPTABLE AND CAN BE ADVANTAGEOUS IN CREATING A SUPERIOR BOND TO THE CONCRETE SURFACE. TO HELP REDUCE BLISTERING, APPLY A PRIMER COAT OF ONLY THE ASPHALT COMPONENT OF THE NITRA-CORE SYSTEM. SOME BLISTERING OF THE MEMBRANE WILL OCCUR AND MAY BE MORE SEVERE ON WALLS EXPOSED TO DIRECT SUNLIGHT. BLISTERING IS NORMAL AND WILL SUBSIDE OVER TIME. USING A NEEDLE NOSE DEPTH GAUGE CONFIRM THAT THE SPECIFIED MIL THICKNESS HAS BEEN APPLIED.

4.14 PREPARATIONS AND TREATMENT OF TERMINATIONS

REVISION

DATE

UNITED CONSULTING
We're here for you
625 Holcomb Bridge Road
Norcross, Georgia 30071
770-209-0029 Fax 582-2900
www.unitedconsulting.com

PROJECT DESCRIPTION

ALEXAN 04W
652 ANGIERS AVENUE
ATLANTA, FULTON COUNTY, GEORGIA
TRAMMELL CROW RESIDENTIAL

SHEET TITLE

VAPOR MITIGATION SYSTEM (VIMS) NOTES

SCALE: NONE
PREPARED BY: VPV
CHECKED BY: SC
DATE: 3-5-21

DRAWING NUMBER

VIMS 3

A. PREPARE THE SUBSTRATE SURFACE IN ACCORDANCE WITH SECTION 4.13 OF THIS DOCUMENT. CONCRETE SURFACES THAT ARE NOT A LIGHT TROWEL, LIGHT BROOM OR EQUIVALENT FINISH, WILL NEED TO BE REPAIRED.

B. TERMINATIONS ON HORIZONTAL AND VERTICAL SURFACES SHOULD EXTEND A MINIMUM OF 6" ONTO THE TERMINATION SURFACE. JOB-SPECIFIC CONDITIONS MAY PREVENT A 6" TERMINATION. IN THESE CONDITIONS, CONTACT MANUFACTURER FOR RECOMMENDATIONS.

C. APPLY 60 MILS OF NITRA-CORE TO THE TERMINATING SURFACE AND THEN EMBED THE NITRA-BASE LAYER BY PRESSING IT FIRMLY INTO THE NITRA-CORE LAYER. NEXT, APPLY 40 MILS OF NITRA-CORE TO THE NITRA-BASE LAYER. WHEN COMPLETE, APPLY THE LAND SCIENCE BOND LAYER. AFTER THE PLACEMENT OF THE LAND SCIENCE BOND LAYER IS COMPLETE, APPLY A FINAL 30 MIL SEAL OF THE NITRA-CORE LAYER OVER THE EDGE OF THE TERMINATION. FOR FURTHER CLARIFICATION, REFER TO THE TERMINATION DETAIL PROVIDED BY MANUFACTURER.

D. THE STATED TERMINATION PROCESS IS APPROPRIATE FOR TERMINATING THE MEMBRANE ONTO EXTERIOR FOOTINGS, PILE CAPS, INTERIOR FOOTINGS AND GRADE BEAMS, AS APPLICABLE. WHEN TERMINATING THE MEMBRANE TO STEM WALLS OR VERTICAL SURFACES THE SAME PROCESS SHOULD BE USED. SEE PLAN SET AND MANUFACTURER DETAILS.

4.15 PREPARATIONS AND TREATMENT OF PENETRATIONS

A. ALL PIPE PENETRATIONS SHOULD BE SECURELY IN PLACE PRIOR TO THE INSTALLATION OF THE VAPOR BARRIER SYSTEM. ANY LOOSE PENETRATIONS SHOULD BE SECURED PRIOR TO NITRA-CORE APPLICATION, AS LOOSE PENETRATIONS COULD POTENTIALLY EXERT PRESSURE ON THE MEMBRANE AND DAMAGE THE MEMBRANE AFTER INSTALLATION.

B. TO PROPERLY SEAL AROUND PENETRATIONS, CUT A PIECE OF THE BASE LAYER (NITRA-BASE AS PER AREA ON VIMS 1) THAT WILL EXTEND 6" BEYOND THE OUTSIDE PERIMETER OF THE PENETRATION. CUT A HOLE IN THE BASE LAYER JUST BIG ENOUGH TO SLIDE OVER THE PENETRATION, ENSURING THE BASE LAYER FITS SNUG AGAINST THE PENETRATION. THIS CAN BE DONE BY CUTTING AN "X" NO LARGER THAN THE INSIDE DIAMETER OF THE PENETRATION. THERE SHOULD NOT BE A GAP LARGER THAN A 1/8 INCH BETWEEN THE BASE LAYER AND THE PENETRATION. OTHER METHODS CAN ALSO BE UTILIZED, PROVIDED, THERE IS NOT A GAP LARGER THAN 1/8 INCH BETWEEN THE BASE LAYER AND THE PENETRATION.

C. SEAL THE BASE LAYER USING NITRA-CORE OR NITRA-CORE DETAIL TO THE UNDERLYING BASE LAYER.

D. APPLY ONE COAT OF NITRA-CORE DETAIL OR NITRA-CORE SPRAY TO THE BASE LAYER AND AROUND THE PENETRATION AT A THICKNESS OF 30 MILS (EACH SYSTEM). PENETRATIONS SHOULD BE TREATED IN A 3-INCH RADIUS AROUND PENETRATION AND 3 INCHES ONTO PENETRATING OBJECT.

E. EMBED A FABRIC REINFORCING STRIP AFTER THE FIRST APPLICATION OF THE NITRA-CORE SPRAY OR NITRA-CORE DETAIL MATERIAL AND THEN APPLY A SECOND 30 MIL COAT OVER THE EMBEDDED JOINT REINFORCING STRIP ENSURING ITS COMPLETE SATURATION OF THE EMBEDDED STRIP AND TIGHT SEAL AROUND THE PENETRATION.

F. AFTER THE PLACEMENT OF THE LAND SCIENCE BOND LAYER, A CABLE TIE SHOULD THEN BE PLACED AROUND THE FINISHED PENETRATION OF EACH BARRIER SYSTEM. THE CABLE TIE SHOULD BE SNUG, BUT NOT OVERLY TIGHT SO AS TO SLICE INTO THE FINISHED SEAL.

G. IN AREAS OF HIGH DENSITY UTILITY PENETRATIONS, UTILITY PENETRATION BANKS SHOULD BE USED. THE PENTRATION BANK TO CONSIST OF A CONCRETE PAD WITH A THICKNESS OF 12 INCHES, WITH THE LATERAL LIMITS A MINIMUM OF 8 INCHES FROM THE OUTER EDGE OF THE NEAREST UTILITY. THE TOP OF THE CONCRETE BANK SHOULD BE FLUSH WITH THE TOP OF THE GC,. APPLY ONE COAT OF NITRA-CORE DETAIL OR NITRA-CORE SPRAY TO THE TOP OF THE CONCRETE AND AROUND THE PENETRATION AND 3 INCHES ONTO PENETRATING OBJECT AT A THICKNESS OF 30 MILS. THE BASE LAYER SHOULD EXTEND ONTO THE TOP OF THE CONCRETE BANK A MINIMUM OF 6 INCHES, FOLLOWED BY CORE AND BOND LAYERS (AS APPROPRIATE PER BARRIER TYPE) IN ACCORDANCE WITH DETAIL 3, VIMS 2.

OPTION: A FINAL APPLICATION OF NITRA-CORE MAY BE USED TO PROVIDE A FINISHING SEAL AFTER THE PROTECTIVE LAYER HAS BEEN INSTALLED.

NOTE: METAL OR OTHER SLICK PENETRATION SURFACES MAY REQUIRE TREATMENT IN ORDER TO ACHIEVE PROPER ADHESION. FOR PLASTIC PIPES, SAND PAPER MAY BE USED TO ACHIEVE A PROFILE AN EMERY CLOTH IS MORE APPROPRIATE FOR METAL SURFACES. AN EMERY CLOTH SHOULD ALSO BE USED TO REMOVE ANY RUST ON METAL SURFACES.

4.16 NITRA-BASE LAYER INSTALLATION

A. INSTALL THE BASE LAYER OVER SUBSTRATE MATERIAL IN ONE DIRECTION WITH SIX-INCH OVERLAPS AND THE GEOTEXTILE (FABRIC SIDE) FACING DOWN.

B. SECURE THE BASE SEAMS BY APPLYING 60 MILS OF NITRA-CORE BETWEEN THE 6 INCH OVERLAPPED SHEETS WITH THE GEOTEXTILE SIDE DOWN.

C. VISUALLY VERIFY THERE ARE NO GAPS/FISH-MOUTHS IN SEAMS.

D. FOR BEST RESULTS, INSTALL AN EQUAL AMOUNT OF BASE AND CORE IN ONE DAY. LEAVING UNSPRAYED BASE OVERNIGHT MIGHT ALLOW EXCESS MOISTURE TO COLLECT ON THE BASE. IF EXCESS MOISTURE COLLECTS, IT NEEDS TO BE REMOVED.

NOTE: IN WINDY CONDITIONS IT MIGHT BE NECESSARY TO ENCAPSULATE THE SEAM BY SPRAYING THE NITRA-CORE LAYER OVER THE COMPLETED BASE SEAMS.

4.17 NITRA-CORE APPLICATION

A. SET UP SPRAY EQUIPMENT ACCORDING TO MANUFACTURER'S INSTRUCTIONS.

B. MIX AND PREPARE MATERIALS ACCORDING TO MANUFACTURER'S INSTRUCTIONS.

C. THE TWO CATALYST NOZZLES (8001) SHOULD BE ADJUSTED TO CROSS AT ABOUT 18 INCHES FROM THE END OF THE WAND. THIS APEX OF CATALYST AND EMULSION SPRAY SHOULD THEN BE LESS THAN 24 INCH BUT GREATER THAN 12" FROM THE DESIRED SURFACE WHEN SPRAYING. WHEN PROPERLY SPRAYED THE FAN PATTERN OF THE CATALYST SHOULD RANGE BETWEEN 65 DEGREES AND 80 DEGREES.

D. ADJUST THE AMOUNT OF CATALYST USED BASED ON THE AMBIENT AIR TEMPERATURE AND SURFACE TEMPERATURE OF THE SUBSTRATE RECEIVING THE MEMBRANE. IN HOT WEATHER USE LESS CATALYST AS HOT CONDITIONS WILL QUICKLY "BREAK" THE EMULSION AND FACILITATE THE CURING OF THE MEMBRANE. IN COLD CONDITIONS AND ON VERTICAL SURFACES USE MORE CATALYST TO "BREAK" THE EMULSION QUICKER TO EXPEDITE CURING AND SET UP TIME IN COLD CONDITIONS.

E. TO SPRAY THE NITRA-CORE LAYER, PULL THE TRIGGER ON THE GUN. A 42 DEGREE FAN PATTERN SHOULD FORM WHEN PROPERLY SPRAYED. APPLY ONE SPRAY COAT OF NITRA- CORE TO OBTAIN A SEAMLESS MEMBRANE FREE FROM PINHOLES OR SHADOWS, WITH AN AVERAGE DRY FILM THICKNESS OF 40 MILS (1.80 MM) FOR NITRA-SEAL SYSTEMS.

F. APPLY THE NITRA-CORE LAYER IN A SPRAY PATTERN THAT IS PERPENDICULAR TO THE APPLICATION SURFACE. THE CONCERN WHEN SPRAYING AT AN ANGLE IS THAT AN AREA MIGHT BE MISSED. USING A PERPENDICULAR SPRAY PATTERN WILL LIMIT VOIDS AND THIN SPOTS, AND WILL ALSO CREATE A UNIFORM AND CONSISTENT MEMBRANE.

G. VERIFY FILM THICKNESS OF VAPOR INTRUSION BARRIER EVERY 500 SQUARE FT. (46.4 SQUARE M). FOR INFORMATION REGARDING QUALITY CONTROL MEASURES, REFER TO THE QUALITY CONTROL PROCEDURES IN PART 5 OF THIS SPECIFICATION.

H. THE MEMBRANE WILL GENERALLY CURE IN 24 TO 48 HOURS. AS A RULE, WHEN TEMPERATURE DECREASES OR HUMIDITY INCREASES, THE CURING OF THE MEMBRANE WILL BE PROLONGED. THE MEMBRANE DOES NOT NEED TO BE FULLY CURED PRIOR THE PLACEMENT OF THE LAND SCIENCE BOND LAYER, PROVIDED MIL THICKNESS HAS BEEN VERIFIED AND A SMOKE TEST HAS BEEN CONDUCTED.

I. **DO NOT PENETRATE** MEMBRANE AFTER IT HAS BEEN INSTALLED. IF MEMBRANE IS PENETRATED AFTER THE MEMBRANE IS INSTALLED, IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO NOTIFY THE CERTIFIED INSTALLER TO MAKE REPAIRS.

J. AT VERTICAL CONCRETE WALLS APPLY NITRA-CORE DIRECTLY TO CONCRETE SURFACE AND USE MANUFACTURER'S RECOMMENDED PROTECTION MATERIAL BASED ON SITE SPECIFIC CONDITIONS. IF APPLYING NITRA-CORE AGAINST SHORING, CONTACT MANUFACTURER FOR SITE SPECIFIC INSTALLATION INSTRUCTIONS.

NOTE: CARE SHOULD BE TAKEN TO NOT TRAP MOISTURE BETWEEN THE LAYERS OF THE MEMBRANE. TRAPPING MOISTURE MAY OCCUR FROM APPLYING A SECOND COAT PRIOR TO THE MEMBRANE CURING. REPAIRS AND DETAILING MAY BE DONE OVER THE NITRA-CORE LAYER WHEN NOT FULLY CURED.

4.18 NITRA-SEAL LAND SCIENCE BOND PROTECTION COURSE INSTALLATION

A. INSTALL LAND SCIENCE BOND PROTECTION COURSE PERPENDICULAR TO THE DIRECTION OF THE NITRA-BASE COURSE WITH OVERLAPPED SEAMS OVER NOMINALLY CURED MEMBRANE NO LATER THAN RECOMMENDED BY MANUFACTURER AND BEFORE STARTING SUBSEQUENT CONSTRUCTION OPERATIONS.

B. SWEEP OFF ANY WATER THAT HAS COLLECTED ON THE SURFACE OF THE NITRA-CORE LAYER, PRIOR TO THE PLACEMENT OF THE LAND SCIENCE BOND LAYER.

C. OVERLAP AND SEAM THE LAND SCIENCE BOND LAYER IN THE SAME MANNER AS THE NITRA-BASE LAYER.

D. TO EXPEDITE THE CONSTRUCTION PROCESS, THE LAND SCIENCE BOND LAYER CAN BE PLACED OVER THE NITRA-CORE IMMEDIATELY AFTER THE SPRAY APPLICATION IS COMPLETE, PROVIDED THE NITRA-CORE MIL THICKNESS HAS BEEN VERIFIED.

PART 5 -QUALITY CONTROL/QUALITY ASSURANCE

5.01 QA/CC

A. INSTALLER QUALIFICATIONS: ENGAGE AN EXPERIENCED INSTALLER WHO HAS BEEN TRAINED AND CERTIFIED IN WRITING BY THE MEMBRANE MANUFACTURER, LAND SCIENCE TECHNOLOGIES™ FOR THE INSTALLATION OF THE NITRA-SEAL SYSTEMS. THIS PLAN SET AND SUPPORTING MANUFACTURER DETAILS AND SPECIFICATIONS SHALL BE APPROVED BY THE ARCHITECT, STRUCTURAL ENGINEER, AND BUILDING CODE OFFICIALS, AS APPROPRIATE. THIS IS THE RESPONSIBILITY OF THE OWNER.

B. MANUFACTURER QUALIFICATION: OBTAIN VAPOR INTRUSION BARRIER MATERIALS AND SYSTEM COMPONENTS FROM A SINGLE MANUFACTURER SOURCE LAND SCIENCE TECHNOLOGIES.

C. FIELD SAMPLE: APPLY VAPOR INTRUSION BARRIER SYSTEM FIELD SAMPLE TO 100 SQUARE FT (9.3 SQUARE M) IN AREAS OF NITRA-SEAL OF FIELD AREA DEMONSTRATE APPLICATION, DETAILING, THICKNESS, TEXTURE, AND STANDARD OF WORKMANSHIP. THIS CAN BE ACCOMPLISHED AT THE ONSET OF THE FIRST APPLICATION.

1. NOTIFY ENGINEER OR SPECIAL INSPECTOR ONE WEEK IN ADVANCE OF THE DATES AND TIMES WHEN FIELD SAMPLE WILL BE PREPARED.
2. IF ENGINEER OR SPECIAL INSPECTOR DETERMINES THAT FIELD SAMPLE DOES NOT MEET REQUIREMENTS, REAPPLY FIELD SAMPLE UNTIL FIELD SAMPLE IS APPROVED.
3. RETAIN AND MAINTAIN APPROVED FIELD SAMPLE DURING CONSTRUCTION IN AN UNDISTURBED CONDITION AS A STANDARD FOR JUDGING THE COMPLETED VAPOR INTRUSION BARRIER.

D. PRE-INSTALLATION CONFERENCE: A PRE-INSTALLATION CONFERENCE SHALL BE HELD PRIOR TO APPLICATION OF THE VAPOR INTRUSION BARRIER SYSTEM TO ASSURE PROPER SITE AND INSTALLATION CONDITIONS. TO INCLUDE CONTRACTOR, APPLICATOR, ARCHITECT/ENGINEER, OTHER TRADES INFLUENCED BY VAPOR INTRUSION BARRIER INSTALLATION AND SPECIAL INSPECTOR (IF ANY).

E. THE VAPOR BARRIER SHALL BE INSTALLED IN ACCORDANCE WITH THIS PLAN SET AND THE MANUFACTURER'S INSTALLATION GUIDELINES/SPECIFICATIONS. SHOULD CONFLICTS ARISE, USE THE MOST STRINGENT SPECIFICATION PER OCCURRENCE.

F. FOR PROJECTS THAT WILL REQUIRE A MATERIAL OR LABOR MATERIAL WARRANTY, LAND SCIENCE TECHNOLOGIES WILL REQUIRE A MANUFACTURER'S REPRESENTATIVE OR CERTIFIED 3RD PARTY INSPECTOR TO INSPECT AND VERIFY THAT THE MEMBRANE HAS BEEN INSTALLED PER THE MANUFACTURER'S RECOMMENDATIONS. THE OWNER MUST COORDINATE THIS WARRANTY WITH THE MANUFACTURER, AND NOTIFY THE DESIGNING FIRM IF A MATERIAL OR LABOR MATERIAL WARRANTY IS SELECTED.

THE CERTIFIED INSTALLER IS RESPONSIBLE FOR CONTACTING THE INSPECTOR FOR INSPECTION. PRIOR TO APPLICATION OF THE MEMBRANE, A NOTICE PERIOD FOR INSPECTION SHOULD BE AGREED UPON BETWEEN THE APPLICATOR AND INSPECTOR.

G. THE MEASUREMENT TOOLS LISTED BELOW WILL HELP VERIFY THE THICKNESS OF THE NITRA-CORE LAYER. AS MEASUREMENT VERIFICATION EXPERIENCE IS GAINED, THESE TOOLS WILL HELP CONFIRM THICKNESS MEASUREMENTS THAT CAN BE OBTAINED BY PRESSING ONE'S FINGERS INTO THE NITRA-CORE MEMBRANE.

TO VERIFY THE MIL THICKNESS OF THE NITRA-CORE, THE FOLLOWING MEASUREMENT DEVICES ARE REQUIRED.

1. MIL READING CALIPER: CALIPERS ARE USED TO MEASURE THE THICKNESS OF COUPON SAMPLES. TO MEASURE COUPON SAMPLES CORRECTLY, THE THICKNESS OF THE NITRA-SEAL SHEET LAYERS (18 MILS EACH) MUST BE TAKEN INTO ACCOUNT. MARK SAMPLE AREA FOR REPAIR.
2. WET MIL THICKNESS GAUGE: A WET MIL THICKNESS GAUGE MAY BE USED TO QUICKLY MEASURE THE MIL THICKNESS OF THE NITRA-CORE LAYER. THE THICKNESS OF THE NITRA-SEAL SHEET LAYERS DO NOT FACTOR INTO THE MIL THICKNESS READING.

NOTE: WHEN FIRST USING A WET MIL THICKNESS GAUGE ON A PROJECT, COLLECT COUPON SAMPLES TO VERIFY THE WET MIL GAUGE THICKNESS READINGS.

3. NEEDLE NOSE DIGITAL DEPTH GAUGE: A NEEDLE NOSE DEPTH GAUGE SHOULD BE USED WHEN MEASURING THE NITRA-CORE THICKNESS ON VERTICAL WALLS OR IN FIELD MEASUREMENTS. MARK MEASUREMENT AREA FOR REPAIR.

TO OBTAIN A PROPER WET MIL THICKNESS READING, TAKE INTO ACCOUNT THE 20 TO 30 PERCENT SHRINKAGE THAT WILL OCCUR AS THE MEMBRANE FULLY CURES. NOT TAKING INTO ACCOUNT THE THICKNESS OF THE SHEET LAYERS, A FRESHLY SPRAYED MEMBRANE SHOULD HAVE A MINIMUM WET THICKNESS OF 50 (20 PERCENT) TO 57 (30 PERCENT) MILS.

H. IT SHOULD BE NOTED THAT TAKING TOO MANY DESTRUCTIVE SAMPLES CAN BE DETRIMENTAL TO THE MEMBRANE. AREAS WHERE COUPON SAMPLES HAVE BEEN REMOVED NEED TO BE MARKED FOR REPAIR.

I. SMOKE TESTING OR OTHER LST APPROVED INTEGRITY TESTING IS REQUIRED TO TEST THE SEAL CREATED AROUND PENETRATIONS AND TERMINATIONS. SMOKE TESTING IS CONDUCTED BY PUMPING NON-TOXIC SMOKE UNDERNEATH THE VAPOR INTRUSION BARRIER AND THEN REPAIRING THE AREAS WHERE SMOKE APPEARS. REFER TO SMOKE TESTING PROTOCOL PROVIDED BY LAND SCIENCE TECHNOLOGIES.

J. VISUAL INSPECTIONS PRIOR TO PLACEMENT OF CONCRETE, BUT AFTER THE INSTALLATION OF CONCRETE REINFORCING, IS RECOMMENDED TO IDENTIFY ANY PUNCTURES THAT MAY HAVE OCCURRED DURING THE INSTALLATION OF REBAR, POST TENSION CABLES, ETC. PUNCTURES IN THE SYSTEM SHOULD BE EASY TO INDENTIFY DUE TO THE COLOR CONTRASTING LAYERS OF THE SYSTEM.

K. THE VIMS MUST BE PROPERLY INSTALLED TO ASSURE FUNCTION AS DESIGNED. THE MINIMUM RECOMMENDED TIMES FOR OBSERVING BY REPRESENTATIVES OF THE PLAN SET FIRM OR CERTIFIED 3RD PARTY INSPECTOR ARE:

1. WHEN THE GRAVEL COLLECTION LAYER IS DOWN AND THE VAPOR COLLECTION PIPING NETWORK IS IN PLACE WITH THE DISCHARGE PIPE STUBS TEMPORARILY CAPPED FOR CONCRETE SLAB PLACEMENT
2. PERIODICALLY DURING PLACEMENT OF VAPOR INTRUSION BARRIER
3. WHEN THE VAPOR INTRUSION BARRIER IS IN PLACE, SEALED TO FOOTINGS, AND ALL PERFORATIONS HAVE BEEN SEALED
4. WHEN THE SMOKE TEST IS BENG PERFORMED
5. WHEN THE CONCRETE REINFORCING IS IN PLACE PRIOR TO THE CONCRETE SLAB BEING POURED
6. WHEN THE SYSTEM IS COMPLETE

L. ANY CHANGES TO THE VIMS SHALL BE PROVIDED TO THE DESIGNING FIRM FOR REVIEW AND APPROVAL PRIOR TO DEVIATIONS FROM THIS PLAN SET. ALL CHANGES SHALL BE DOCUMENTED.

REVISION | DATE

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PROJECT DESCRIPTION

ALEXAN 04W
652 ANGIERS AVENUE
ATLANTA, FULTON COUNTY, GEORGIA
TRAMMELL CROW RESIDENTIAL

SHEET TITLE
VAPOR MITIGATION SYSTEM (VIMS) NOTES

SCALE: NONE
PREPARED BY: VPV
CHECKED BY: SC
DATE: 3-5-21

DRAWING NUMBER
VIMS 4