

The Town of Hillsborough

Adron F. Thompson Water/Sewer Facility: Feasibility Study



Utilities Department

K. Marie Strandwitz
Utilities Director

10.04.2019

RND
architects

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Adron F. Thompson
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Feasibility Study

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RND Architects, PA – Architecture and Interior Design

3608 Univeristy Drive Durham, NC 27707

919-490-1266

www.RNDarchitects.com

David B. Daniel, AIA

david@RNDarchitects.com

Principal

Edmondson Engineers, PA – Plumbing, Mechanical and Electrical Engineering

700 Executive Park 1920 Hwy 54, Durham, NC 27713

919-544-1936

www.edmpa.com

Dennis Hayes, PE

dennis@edmpa.com

Principal

Gardner & McDaniel, PA – Structural Engineering

3622 Lyckan Parkway Durham, NC 27707

919-489-0926

Bill Easterling, PE

bill@gmengrs.com

Principal

Coulter Jewell Thames – Civil Engineers

111 W Main St, Durham, NC 27701

919-682-0368

www.cjtpa.com

Daniel A. Jewell, RLA, ASLA

djewell@cjtpa.com

Principal

1. Introduction

RND Architects was selected to assist the Town of Hillsborough with a Feasibility Study to evaluate the renovation potential of the Adron F. Thompson Water Treatment Plant buildings and site located at 715 Dimmocks Mill Road in Hillsborough, North Carolina. The facility, which is situated on a 13.5-acre parcel on the south side of Dimmocks Mill Road, is bound on the east and north by residential property. The Eno River forms the southern boundary and the land falls off from the elevation at Dimmocks Mill to the river. The Town of Hillsborough owns the property that borders this parcel to the west which includes Kings Grant Park.

The site is occupied by several structures, the most significant of which is a masonry building originally constructed in 1936. The facility, which was once the Town of Hillsborough's water treatment plant, is a wonderful example of the simplified Art Deco Style of architecture that has remained largely unchanged, with the exception of a wood- framed addition to the rear. The Art Deco style is characterized by simple forms which are mostly vertical in nature and punched window openings. This style was used extensively from 1925 to 1940, and the buildings were embellished with hard-edged, low-relief designs, geometric shapes, and stylized floral and sunrise patterns like those exhibited above the windows of the Adron F. Thompson Building.

The facility was replaced in 1970's by the current water treatment plant located on the same parcel to the east of the Adron F. Thompson Building. After the new facility was constructed, the original the building was repurposed into office space for the Utilities Department. Today, the building houses the Town of Hillsborough's Wastewater Collection and Water Distribution Staff as well as storage supplies and materials for this department.

In the 1990's, a wood-framed addition was added to the building to provide additional office space. The site also contains various pole barn structures used for equipment storage and a one-story masonry building located to the south of the parcel which is used for the Public Works Department. Because this building is located within the 100-year floodway, we understand the Town plans to demolish this structure. Finally, there is a mobile office trailer used by Public Works that will be removed.

2. Executive Summary

The Town of Hillsborough's Adron F. Thompson Water Treatment Plant Buildings and Site will clearly accommodate the potential improvements requested by the Utilities Department without significant challenges. The continued use and modernization of the Historic Water Treatment Plant as office space further preserves an architecturally significant structure for the town. The later addition, although not historic nor architecturally significant, can be easily enlarged to accommodate future growth and address existing deficiencies. The proposed addition's architectural style should be reserved and vernacular as to not detract from the more significant water treatment plant structure.

The existing site is large enough to house all requested program spaces in a logical arrangement, even with the restrictions to new development in the flood plain which bisects the site. By reconfiguring the site with thoughtfully arranged structures, Town staff will be able to invest more time in completing work orders and maintaining on the Town's infrastructure rather than repairing equipment affected by the elements.

We understand the Town will remove the existing Public Works buildings located in the flood plain and encourage this action to protect the water shed of the Eno River and promote water quality. We support this effort because the structures are within the floodplain and do not contribute to the historic nature of the site. By eliminating these buildings and relocating the Public Works department off site, the Utilities staff could utilize the entire yard and make better use of the available space.

The provided renderings and cost estimates communicate these planned improvements. These materials will aid Town staff in prioritizing the scope of work and in securing funding for any and all portions of the development plan.

The cost of the entire recommended solution exceeds that which was verbally communicated to the Design Team. As a result, the full realization of this recommended plan may be phased over time and a prioritization exercise may be beneficial to determine which components should be immediately addressed and which may be delayed until additional funding is available.

3. Existing Conditions - Summary

Currently, the Utilities Department Site and Public Works Department share their site. We understand Public Work's plan to vacate the property and relocate to other facilities. The site consists of five distinct structures, the largest of which is the Adron F. Thompson Building. This building houses the Utilities Department's storage and staff. The historic structure is not conditioned for summer occupancy as it only has supplemental heating and cooling by small units.

There is an existing wood-framed, metal panel roof and siding pole barn used for storage. It has roll-up doors, a lean-to shed for storage, and is heated by a small electric heater. This building will continue to be used for storage in the future and will have additional structures added on to it to create more space.

An relocated equipment shed on the property shelters equipment from the elements. However, it is not adequately sized to cover all the equipment.

The Public Works Facility also consists of a masonry building located in the flood plain and a temporary modular office trailer that was installed on the fence line between the equipment yard and the adjacent current water treatment facility. Both structures are planned for removal.

See further detailed evaluations of the Utilities Department facilities, including the existing electrical, plumbing and mechanical systems in Edmondson Engineers' document attached as **Appendix A**.

Structural

Original Building – Based upon our initial observations, the original historic masonry structure is sound and would allow for the conditioning and renovation of the space to be more efficiently used as offices on the upper level and storage on the lower level. There are some indications that exterior brick has moved in areas, but this appears to be minimal and not an active issue.

Original Addition – The existing wood-framed addition is sound and a good candidate for improvement as shown in the proposed floor plans and exterior renderings, with the exception of the metal post and expanded metal deck egress stair. Because this element was constructed with marginally sized steel structural members, it does not meet current code for guard and handrails. In response, we propose a replacement with a new stair to provide a better egress solution for the expanded facility.

Building Envelope

Roof

Original Water Treatment Building – The owner advised the roof on the original water treatment plant was recently replaced and no leakage is present. We recommend this roof be maintained and left in place until repairs or replacement are needed. The owner shall inspect the building for signs of deterioration which can lead to moisture infiltration and compromises to the integrity of the masonry structural walls.

Original Addition – The current asphalt single roof on the existing addition shall be removed and replaced with a metal standing seam roof. This replacement will outlast the asphalt shingle roof and provide unity and cohesiveness to the site.

Exterior Walls

Original Water Treatment Building – Exterior walls shall be cleaned of existing lead-based paint and sealed with a permeable sealer on interior. The importance of energy efficiency shall be secondary to that of maintaining the interior brick façade finish to preserve the original character of the building. Though this may lead to higher energy consumption when the building is conditioned, this decision was weighed carefully by the design team.

Original Addition – New spray insulation should be added to existing walls by removing the interior finish and spraying the wood stud wall cavities. Existing siding will be and replaced with continuous foam insulation panels and cement board siding.

Windows

Original Water Treatment Building - New steel windows shall be installed in the original openings to mimic the lite's original pattern, while providing more efficient openings for the renovated facility. Although new steel windows are more expensive than other replacement options, it is important the replacement closely mimics the original design's intent in order to honor the historic value of the existing building. The goal is that visitors will have difficulty determining whether the new windows are the original single-pane steel framed windows or replicas.

Original Addition – The office and training space windows of the addition are small and located such that there is little opportunity for natural light into the space. These windows shall be removed, and the openings enlarged to increase natural light. These new openings should be similar in size to the original building openings, but they will be more efficient, operable, dual-paned, fiberglass-framed windows rather than steel to reduce the cost. Because the addition's aesthetic was not designed to mimic the original structure, it is not recommended the new windows match any of its features other than the size and lite arrangement.

Interior Environment

Original Water Treatment Building - The existing interior exhibits wood paneled walls with intricate wood trim that formed the original offices in the Northwest side of the structure. The wood walls should be preserved in the renovation. The remainder of the space is exposed painted masonry walls that are deteriorating. The paint shall be removed, and a new moisture permeable coating applied that will allow moisture to exit the walls without peeling the new coating. The existing window openings in the rear of the building were boarded up when the office addition was constructed. These shall be opened back up to allow the two buildings to relate to one another. The floor has two levels, with the higher level 6" above the concrete floor due to the elevation of the original trough structure. The concrete floor is in good shape and can be reused without coverings in the renovation. The raised floor is comprised of plywood and should be changed to a more durable flooring product in the renovation. The ceilings are the underside of the roof deck which creates acoustic issues that can be resolved by introducing sound absorbing ceiling elements in between structural members.

Original Addition – The office addition is comprised of a large office training room with an integral break area. A restroom and an office located on the west side with a step down floor. The interior floor of the large open office room is 1 foot higher than the original Water Treatment plant floor surface. The wood framed floor structure is covered with a low-cost vinyl flooring product that is not ideal for the current use. The paneled walls and painted paneled ceilings do not provide acoustic properties that are desirable in an office environment. The ceiling is low and surface mounted lighting does not provide light suited for the multipurpose use of this space. Overall the space is functional but could be improved greatly with new finishes and more windows into the space.

Accessibility

Original Water Treatment Building - The current Adron F. Thompson facility is not accessible. The front entrance needs a ramp to allow access. There are multiple distinct floor levels in the facility and no ramps that connect these levels. The accessibility challenges shall be corrected in the renovation.

Original Addition – The office addition exhibits multiple floor levels and the existing restroom is lower than the main level and does not have the required accessible components like grab bars or accessible fixtures.

Emergency Egress

Original Water Treatment Building - The current Adron F. Thompson facility has two exits allowing occupants to egress through the front door or downstairs to the lower level and out on either side of the building through exterior doors to grade. This arrangement is code compliant and shall remain in the renovation.

Original Addition – The office addition also has two exits, one through the Main Level of the Water Treatment Plant building and the other through an exterior door that leads to a metal egress deck and stair. This metal structure is marginal for structural stability and is not code compliant for guard or handrails and shall be replaced in the renovation.

4. Hazardous Materials

Matrix Health & Safety Consultants, LLC performed a hazardous materials assessment that included an asbestos-containing material and limited lead-based paint survey. Matrix also performed an inventory of equipment assumed to contain mercury, a PCB that would require universal waste disposal in accordance with the EPA. The hazardous materials identified at the subject facility are summarized below.

Asbestos Survey Results

MATERIAL	GENERAL LOCATION	TYPE AND PERCENTAGE OF ASBESTOS PRESENT
Window Caulking	Interior Original Structure	3% Chrysotile
Flashing Mastic	Exterior Basement Rear Left Original Structure	3% Chrysotile
Door Caulking	Original Structure	2% Chrysotile

Analysis Method: EPA 600/R-93/116 Method using Polarized Light Microscopy

Lead-Based Paint Survey Results - Exterior

COMPONENT	SUBSTRATE	COLOR	LOCATION	LEAD CONTENT (mg/cm ²)	CONDITION
Window Sash	Metal	Black and Green	Original Structure	1.0 - 1.1	Deteriorated
Exterior Railing	Metal	Gray	D Right	1.8	Deteriorated
Door Header	Metal	Green	Original Structure	2.6	Deteriorated

Lead-Based Paint Survey Results – Basement Workshop - Interior

COMPONENT	SUBSTRATE	COLOR	LOCATION	LEAD CONTENT (mg/cm ²)	CONDITION
Stair Tread	Concrete	Gray	C/D Corner	3.5	Deteriorated
Railing	Metal	Black	C/D Corner	1.4	Deteriorated

Lead-Based Paint Survey Results – Parts Room - Interior

COMPONENT	SUBSTRATE	COLOR	LOCATION	LEAD CONTENT (mg/cm ²)	CONDITION
Window Sash	Metal	Green	B Left	1.0	Deteriorated
Railing	Metal	Gray	D Center	10.2	Deteriorated
Stair Tread	Concrete	Gray	D Center	1.7	Deteriorated

MERCURY AND PCB CONTAINING EQUIPMENT RESULTS

BALLAST	BATTERIES	BULBS	MERCURY
38	0	76	0

Matrix recommends these materials and equipment be properly abated or removed and legally disposed of as part of any renovation to the Adron F. Thompson facility.

5. Owner Program

The Design Team's first task was to identify and develop the Owner's Project Requirements that would guide the study's decision making. Joel Lashley Reported the following list of items in an e-mail dated 4/10/2019. RND added explanatory text in blue after each item.

1. Locker room with showers – (Inside Adron F. Thompson Facility)
2. Restroom with urinals and multiple stalls - (Inside Adron F. Thompson Facility)
3. Break room with Polar Pop Machine - (Inside Adron F. Thompson Facility)
4. Room with cubicles for the field employees (Inside Adron F. Thompson Facility)
5. Two more offices (Inside Adron F. Thompson Facility)
6. Supply room (Inside Adron F. Thompson Facility)
7. Stock room and storage for supplies (Inside Adron F. Thompson Facility)
8. Bigger parking lot. (at front and rear of Adron F. Thompson Facility)
9. Welding shop with a mechanics bay - (on equipment yard @ Adron F. Thompson Facility)
10. Heated garage for vac truck - (on equipment yard @ Adron F. Thompson Facility)
11. Lean-to for all equipment (on equipment yard @ Adron F. Thompson Facility)
12. Cover over the rock pile (on equipment yard @ Adron F. Thompson Facility)
13. Wash pit (on equipment yard @ Adron F. Thompson Facility)
14. Heat & AC – (Original Historic Adron F. Thompson Facility)

The program above and conversations with Town staff centered around the Town of Hillsborough's continued growth. To keep pace with its expansion, the Town needs to maintain its utilities and modernize its existing facilities to be more efficient and adaptable to future staff and equipment increases.

RND Architects and its consultants created a conceptual site plan and floor plans to identify locations for these improvements. In addition, costs estimates were developed for each item to assist in funding requests for future budget cycles.

6. Preliminary Assessment of Owner's Development Objectives

The Design Team evaluated the Owner's Development Objectives which were reported in the form of verbal discussions with Utilities Director, Marie Strandwitz, The RFQ for Professional Architectural Services dated February 20, 2019, as well as e-mail and on-site correspondences with Joel Lashley (Utility Systems Supervisor). After analyzing the owner's development intentions, the requested program was deemed attainable and the site and existing buildings were found to be suitable for modifications, growth and development without significant challenges. RND Architects is a strong proponent of adaptive re-use practices because it offers more sustainable solutions than new construction projects. Furthermore, RND recognizes the value of historic properties and applauds the Town for its desire to preserve the building as a functioning part of the Town's services.

7. Site Evaluation / Context Description

The 13.5 Acre site, (PIN number 9864237369), is valued at \$472,500.00. It is in the HI - Hillsborough Extra Territorial Zoning Jurisdiction and is part of the Lower Eno Unprotected. The topography falls gently from North to South down to the Eno River. Much of the site is located inside the 100-year and 500-year floodplain. Paved areas off Dimmocks Mill Road provide parking and circulation on this site. The existing buildings' arrangement has evolved over time without a comprehensive plan for the site. The current building locations will not impede the continued use of the proposed site. The existing access to the site from Dimmocks Mill Road presents several challenges which are addressed in the proposed site plan. We understand that the Town of Hillsborough will remove the existing masonry buildings in the floodplain.

The site has been thoroughly evaluated through observations and surveys. Physical characteristics, utilities, access, circulation, and parking were investigated. Codes, regulations, and ordinances were reviewed in relation to the proposed project, and recommendations for proposed improvements have been provided to assist the Owner in proceeding with the desired improvements.

8. Identification of Environmental Requirements

Environmental requirements associated with the proposed project include the protection of the adjacent stream, its buffers and floodway, and the associated floodplain. Protection of these areas has been described as needed in the recommendations, including avoidance of construction as practical, avoidance of piped discharges, and avoidance of wastewater facilities in these areas.

9. Historic Resource Inventory

The original water treatment plant building is the most structure significant on the site. It is our belief this building should be retained and renovated for use by the Utilities Department offices and storage. The facility has the potential to be modernized and improved without compromising the character of the original structure.

Another historic structure on the property is a pump house on the southeast edge of the utilities yard near the Eno River. Though not currently in use, this building was critical to the original operation of the water treatment plant. As such, this structure should be preserved and maintained by the Town as long as it is economically feasible. Though this secondary structure is not addressed in this study, it is recommended the Town actively works to stabilize and preserve the historic integrity of this structure.

10. Sustainable Solutions

The redevelopment of the Adron F. Thompson site includes renovations to several existing structures, as well as the construction of new additions. These improvements will present the Town with a number of opportunities to incorporate sustainable practices into the planned modifications. The two most promising sustainable design elements for this property are;

- A. **Solar Panels:** Solar collection for site electricity that is either ground or building mounted. The incorporation of Photo Voltaic Panels is attractive for this site because panels are a highly visible affirmation of the Town's commitment to sustainability. Given the open space surrounding the Adron F. Thompson Building and the the ground tanks between the new wastewater treatment plant, ground-mounted panels would also be less costly to utilize. The additional roof area for equipment sheds on the site may also afford the possibility of roof-mounted panels which would not interfere with the Adron F. Thompson Facility's aesthetics.

This method of sustainable building practice offers the most benefits for this site because the system is scalable. It can power small items or contribute to the power supply of the entire site. Though cost estimates for a solar collection system are not included in this report, it would be beneficial to further investigate its potentials in the ensuing design process.

- B. **Rainwater Collection:** Rooftop rainwater collections are another common practice for municipalities seeking sustainable, eco-friendly building solutions. Rainwater collection reduces runoff volume and improves water quality. To effectively capture this water for redistribution, a collection must capture up to 25% of the water from impervious or hard surfaces. This water is then filtered and reused in the building's sustainable water system or released into a public wastewater treatment facility.

In the case of the Adron F. Thompson facility, a rainwater collection system could make good use of the many roofs on the site. Metal roofs often provide the most effective surface for this purpose because of their anti-microbial paint systems. In order to establish rainwater collection, a roof must be able to withstand the weight of heavy rain or snow and there must be an easy path for the water to flow. The roof's material must endure all weather conditions and provide a smooth surface that is easy to clear of debris and dust. Asphalt, slate or tile roofs can be used as rainwater collection catchments. However, metal is the preferred roofing material due to the potential for metal to limit contaminants that may grow on the material itself. Metal roofs are often coated in anti-microbial paint systems which repel debris.

Because a roof's slope determines the speed of rainwater runoff, sloped roofs were designed over the offices and equipment sheds to aide rainwater collection. A steeply sloped roof will shed water quickly and can efficiently removing debris and prevent stagnant water buildup.

The potential efficiency of the proposed Water Catchment system can be determined by using the following formula:

Harvested Water (gallons) = Catchment Area (sq. ft.) x rainfall depth (inches) x 0.623 (conversion factor)

A detailed study would need to be performed to identify this project site's capacity based on annual rainfall amounts, the demand based on restroom usage, and estimations for the number of vehicles washed. However, by incorporating a system to reclaim water from run-off and use it for purposes where potable water is not required is attractive, especially given the Utilities Department Wastewater Collection and Water Distribution Staff is housed within this building.

A system of run-off water collection from each rooftop on the site would involve a large ground-mounted storage tank on the lower portion of the property, or a below-ground tank for purposes water collection and holding. Water would then be pumped to the point of use location, such as in a building for toilets or at the Vehicle Wash Pit. Ideally, collection tanks would be located such that drain lines from each roof would drain to the tank using gravity.

This type of system is best suited for a facility with a very large roof area. Given this site has several smaller roofs, the infrastructure needed to support a rainwater collection system becomes costly and may have a limited return on investment.

- C. **Limiting Impervious Surfaces and Located Development out of the Floodplain:** As much as practical, the Town of Hillsborough should strive to protect floodplains and limit development on this parcel to outside the 100-year flood line to improve water quality and mitigate flood damage. This decision to move all new development outside this floodplain and encourage the relocation of the existing material storage areas outside the floodplain will also protect wildlife habitats and sensitive natural areas that are adjacent to the Eno River.

We have mitigated the extent of impervious surfaces used for parking by utilizing gravel parking instead of pavement. This will allow the Town to manage watershed supply areas and protect the water quality of the Eno River. Water from the Eno River flows into Falls Lake which is a regional water supply. From there, it flows into the Neuse River and then the Albemarle-Pamlico Sound before emptying into the ocean. Hillsborough should endeavor to maintain or improve the water quality of the Eno River by promoting clean water and less pollutant run-off. This is the least costly sustainable practice and its benefits will be realized throughout the life of the site.

- D. **Increasing the amount of Natural Light in Facility:** RND Architects strives to maximize natural light in every project. Natural light reduces reliance on electricity and promotes employee well-being. We have incorporated large windows and skylights into the design where possible to flood interior spaces with natural lighting throughout the day.

11. Conceptual Renderings / Drawings

RND Architects and its consultants have developed a conceptual Site plan of the Adron F. Thompson parcel with the desired improvements to facilitate future growth of the Utilities Division. This site plan, though thoughtfully designed, may not be the exact configuration of the final plan developed for the project. However, the plan incorporates each of the Owner's project requirements and the study graduates to a design project, the site plan shall be re-evaluated to align with the stated budget and owner requirements to ensure project success.

Additionally, we have provided a conceptual floor plan of the Adron F. Thompson facility with the desired addition to facilitate future growth of the Utilities Division. This floor plan is not intended to be the final plan for construction, but it incorporates the Owner's project requirements, program and scope. When this study graduates to a design project, the program and interior spaces shall be re-evaluated to align with the stated budget and owner requirements to ensure project success.

RND Architects has also developed several exterior renderings; a rendered site plan, rendered Level 1, and Lower Level floor plans of the Adron F. Thompson Facility and Site to illustrate the conceptual plans addressing the town's desired program. These renderings may not reflect the final design solutions to be expected once the town initiates a design project, but rather these provide conceptual views of the program requirements and allow the town to plan for the implementation of improvements on this site.



LEGEND

- 1 BUILDING RENOVATION / ADDITION
- 2 WELDING SHOP & VEHICLE MAINTENANCE
- 3 VACUUM TRUCK STORAGE
- 4 EQUIPMENT SHED POLE BARN
- 5 EQUIPMENT SHED POLE BARN
- 6 EQUIPMENT YARD
- 7 COVER OVER CRUSH & RUN PILE
- 8 ENLARGE REAR PARKING LOT
- 9 ENLARGE FRONT PARKING LOT
- 10 EQUIPMENT YARD ENTRANCE
- 11 VEHICLE WASH PIT
- 12 SEWER PUMP STATION

**RENDERING:
SITE PLAN**

Hillsborough Water Treatment Facility Feasibility Study



FLOORPLAN:
LEVEL 1
 Hillsborough Water Treatment Facility Feasibility Study



FLOORPLAN:
LOWER LEVEL
 Hillsborough Water Treatment Facility Feasibility Study



RENDERING:
Elevation

Hillsborough Water Treatment Facility Feasibility Study



RENDERING:
View of Addition Southwest
Hillsborough Water Treatment Facility Feasibility Study

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RENDERING:
View of Addition Northeast
Hillsborough Water Treatment Facility Feasibility Study

RND
ARCHITECTS

RENDERING:
View of Addition Northwest
Hillsborough Water Treatment Facility Feasibility Study

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12. Description of Proposed Improvements and Estimate of the Cost of the Work

We have summarized all proposed improvements and provided estimates of the cost for each scope component identified below. The estimates shall be viewed as costs to complete the scope item if this were a single project. If multiple scope items are combined into one project, the Town of Hillsborough would realize savings from economy of scale. The higher the cost of the proposed project, the more of a savings is realized due to the economy of scale.

We understand that all desired scope items from the owner's program would exceed the amount discussed initially when identifying the owner's program for this project. It is our recommendation that the Town of Hillsborough Utilities Department along with Town Administration, select the most immediate needs and develop a budget to address these needs in a Phased approach to this site.

The numbered Scope items below correspond to the Site Plan and the Site Plan with Costs Legends allowing easy identification and cross referencing of the scope items.

1. **Adron F. Thompson Building Renovation / Addition** includes the following prices as one scope item not broken down per item below.

- a. Renovation of Historic 1936 Structure of the Adron F. Thompson Water Treatment Facility – upgrade existing building to conditioned space, new service, lights, etc. plumbing upgrades in lower level. One of the most expensive items for this portion of the scope would be to install new thermal performance steel windows that replicate the existing single pane steel windows. This is estimated at \$130,000 for the existing openings. While this expense is costly, the benefit of maintaining the overall Art Deco appearance of the facility to preserve the Architectural heritage of the Town is paramount.

\$ 360,000

- b. Building Renovation of the existing wood framed Addition to the Structure of the Adron F. Thompson Water Treatment Facility – upgrade existing building to new floor plan, new service lighting. Plumbing, HVAC, Electrical.

\$ 145,000

- c. Approximately 2,000 sf addition (1,000 sf on ground floor for storage and 1,000 sf on level 1 for office space. New HVAC, plumbing for addition. Proposed Addition – We propose the new office and storage addition to be a wood-framed structure to match the existing office addition. The lower level walls would be masonry and brick veneer. The proposed addition will have a standing seam metal roof that matches the new roof on the original addition and other roofs on the site. The windows in the addition will match the proposed replacements for the original addition.

\$ 420,000

- d. **New generator and ATS.** – Propose a new diesel 80kW generator with a belly tank with an Automatic Transfer Switch located inside the building.

\$ 50,000

- e. **New Electrical service for Renovated & New Building** – The study identified the need to provide a new electrical service to provide a modern and reliable source of power to the improved facility. Rework of the electrical service is anticipated to relocate the existing meter to side of the building with a new service entrance into the basement level. It is desired the power company secondary be routed underground from the pole to the new meter location.

\$ 20,000

- f. **Hazardous Materials Abatement** - The study identified the presence of asbestos containing materials, lead based paint and ballasts that contain PCB. We have included the entire report to this document as **Appendix B**. The lead on the windows would be handled as part of asbestos disposal except for any windows that may be repurposed. The estimate does include costs for removal of lead-based paint using blasting or chemical stripping on a few repurposed windows and the concrete stair treads.

\$ 25,000

2. **Welding & Vehicle Maintenance Shop** - One Story Pole Barn Addition to existing Pole barn onsite. Use: Welding Shop and Vehicle Maintenance. Provide Heat for Shop. No A/C. Power for equipment and possibly a vehicle lift. The addition of a new welding structure to the pole barn is recommended as the western most end of the pole barn will provide for a pull through bay for vehicle maintenance and welding and will extend an existing structure rather than creating a new stand-alone structure.

\$ 96,000

3. **Vacuum Truck Storage** - Enclose the existing metal building storage shed structure that is used for storage of equipment with new wall and roof panels to provide a permanent interior storage of the Town’s Vacuum Truck, which is one of the costliest assets in the department. Provide convenience outlets in the space. Provide power operated roll-up door. Provide lighting on exterior of building. Vacuum truck needs to be plugged in to maintain readiness of truck. The existing structure shall have new purlins and exterior wall panels, replace the existing roof panels with new, provide a personnel door and a large roll-up door added to the North end to provide a secure enclosure for the valuable asset.

\$ 92,500

4. **Equipment Shed Pole Barn** - New 30' x 100' Pole barn #1. Not fully enclosed. Provide lighting and convenience outlets in building. Provide water source at this location. Provide lighted sign on exterior wall near entrance. Provide exterior lights around perimeter of building. Cost includes the replacement of a fenced gate at the building to provide security to the Equipment yard. Due to the proximity of this new structure to the existing Pole Barn it is recommended that this shed be used for smaller equipment or equipment that is not on trailers as the required room for vehicle turning to back a trailer into the bays is not available.

\$ 225,000

5. **Equipment Shed Pole Barn** - 30' x 100' Pole barn #2. Not fully enclosed. Provide lighting and convenience outlets in building. Provide water source at both ends. Provide exterior lights around perimeter of building. Cost includes the replacement of a fenced gate at the building to provide security to the Equipment yard.

\$ 218,000

6. **Equipment Yard** – Largely this component already exists on the site however with the addition of several of the items on this list, this component may require additional gravel to augment the current surfaces and additional lighting to provide security and ease of use by town staff early in the am or late in the afternoons when light levels are low due to seasonal sunrise and sunset times. We assume that all site security lighting will be provided by / leased from Duke Energy so initial costs are not provided in the estimate below. The town would lease the lighting through their rates paid monthly for the service to the site. The cost below reflects the additional gravel to be spread out on the site to provide a reliable and uniform surface for the use of the site.

\$ 18,000

7. **Covered Storage over Crush & Run Bulk Materials Pile** –The owner desires to place a roof structure to cover the crush and run storage pile. This pile is currently located inside the 100-year floodplain and inside the floodway. This structure should be created by using a high bay metal pre-engineered building structural system, metal roof panels and partial wall panels to provide cover, while allowing flood waters to migrate through the structure. Provide lighting under shed and security lighting around structure.

\$ 182,500

8. **Enlarge Rear Gravel Parking Lot** - The Existing Equipment Yard near the Public Works Building is proposed to be used for employee parking as the existing parking along Dimmocks Mill Road to the West of the front parking lot will be used for the new equipment sheds and landscaping required by the town ordinance. This lot will remain gravel and will not be striped or otherwise marked for vehicle spaces. There is room for approximately 16 spaces in this area. Provide security lighting (Duke Energy)

\$ 10,000

9. **Enlarging the Front Parking Lot** – Existing parking lot is used for staff to park in the mornings where staff gather to begin the day and, in the afternoon, when they report after completing their work orders. The existing lot is not large enough to accommodate expansion in the Utilities Department which will follow the expansion of the Town and population. New asphalt paved surfaces shall be created by creating a modular masonry retaining wall to allow engineered fill to be placed creating an enlarged, level parking lot off Dimmocks Mill. New sidewalks shall be created allowing staff to access the building. A van accessible parking space and an accessible ramp is added to the facility providing full accessibility to the renovated facility. Fencing shall be replaced with a decorative fence in this area to maintain security of the site. There are no sidewalks required along the Dimmocks Mill Road frontage for the improvements proposed. This area of Dimmocks Mill Road is not shown as a sidewalk priority area in the adopted Community Connectivity Plan. Relocated power poles and Site Lighting by Duke Energy.

\$ 120,000

10. **Equipment Yard Entrance** - New concrete paved vehicular entrance to Equipment Yard is proposed as we understand that the existing driveway to the Equipment Yard is very difficult for deliveries from tractor trailers and other large trucks to enter and can be tight for town vehicles pulling trailers to enter and exit. To remedy this, there should be a new reinforced concrete entrance created to the east of the current entrance. This new entrance should be used for all large vehicles entering and exiting the site. The new entrance will be between the two new equipment sheds and provide a second gated location for access to the site. The existing driveway should be retained for personal vehicles and access to the lower level of the Adron F. Thompson Building.

\$ 25,000

11. **Vehicle / Equipment Wash Pit** – Create a new wash pit for Vehicles used in the daily execution of the work and maintenance of the town’s water lines to be cleaned. The Vehicle / Equipment Wash has been located outside the 100-Year Floodplain. A grease trap with sediment trap (oil & Water Separator) is included with this item. We do not plan for it to discharge to the river, as to do this we would need an individual NPDES permit because the state and EPA consider wash water as wastewater. We propose to have this structure plumbed to the sanitary sewer and would tie into the Sewer Pump Station to discharge the wastewater. The cost indicated does not incorporate any sustainable measures such as using collected and stored rainwater for vehicle and equipment washing. The rooftop area on this site would make it difficult to generate the required capacity to justify the installation of a collection system for this use. Provide security lighting (Duke Energy) at this element for use at early morning and late afternoon hours.

\$ 20,000

12. **Sewer Pump Station** – A new wastewater pumps station is proposed to convey wastewater to the public sewer on the eastern side of the site. Per NC requirements, the preliminary site selection is not in the 100-Year Floodplain and is not within 100’ of the public water facilities on the site. The force main to the Public Sewer on the eastern side of the site is approximately 700’ away and is located a minimum of 50’ from the Public Water facilities s required by state regulations. The Pump Station will be provided power from the New Main Service to the Facility and new Security Lighting using Duke Energy poles shall be provided within close proximity of the pumps station.

\$ 87,500

TOTAL CONSTRUCTION COST OF ALL SCOPE ITEMS ABOVE

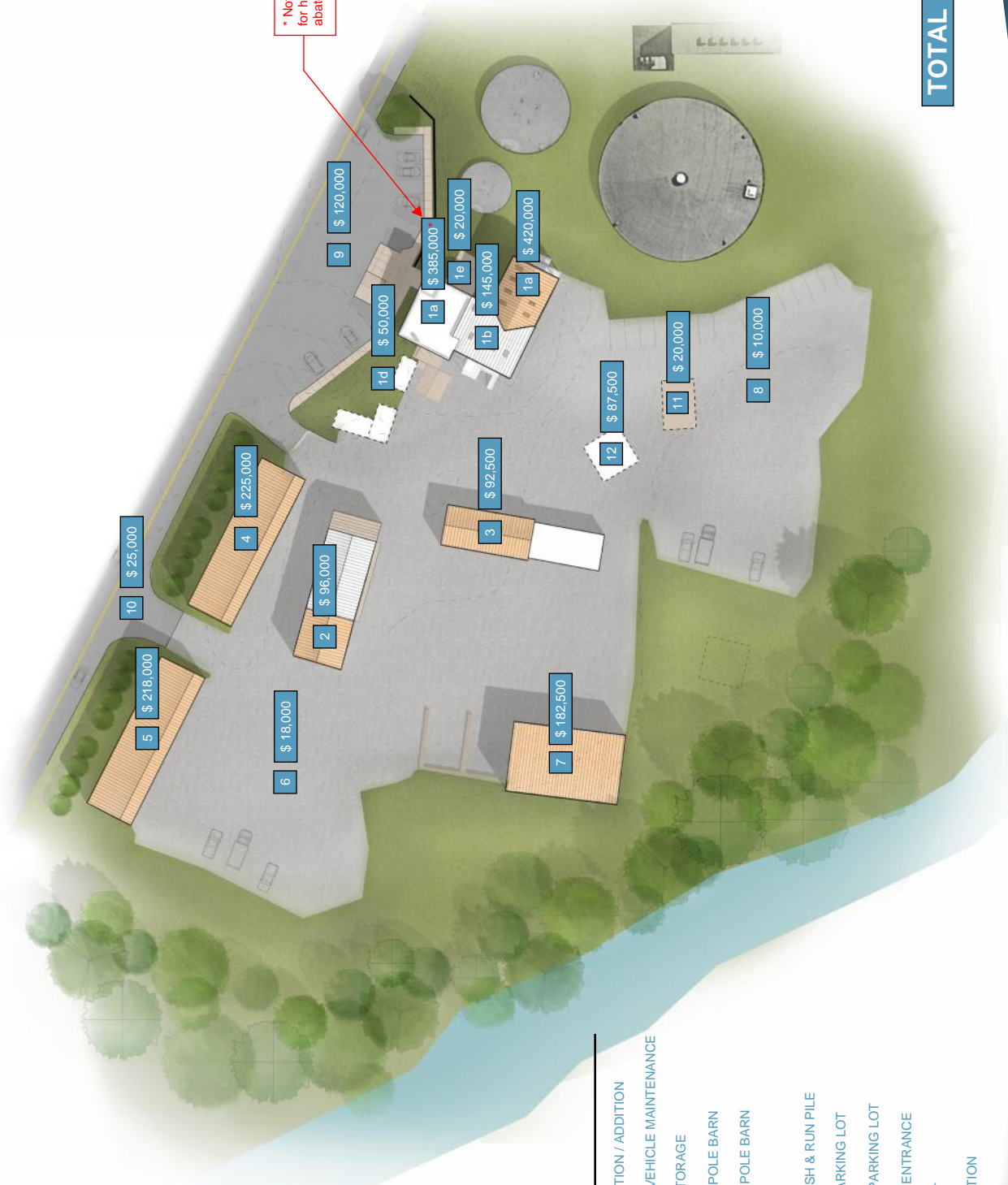
\$ 2,114,500

As stated above, if multiple items are selected for a single project, The Town of Hillsborough should expect a reduction in the total costs proportionate to the size of the project. If the owner selected two items to complete together, the savings may only amount to 1 or 2% reduction from the totaled amount, however if the owner selects all scope items, a savings of 8% to 10% may be expected.

A Contingency amount for any construction project should be figured in at 5% minimum to cover unexpected costs. When working with soils near an existing river, there is the potential for existing soils to require augmentation to achieve bearing capacity for structures and parking areas. If the project were completed as the entire scope, a \$105,000 contingency should be expected.

Design Fees for the construction portion of the project should be factored in and typically range from 8% to 12% of the expected construction cost for public ally bid municipal projects of this scope. In this case a design fee ranging from \$170,000 to \$250,000 shall be expected.

Lastly, if the projects are not funded until future calendar years, it is wise to also include escalation in the amount of 5% per year. If economic conditions change drastically from what is seen today this may be adjusted up or down as required.



* Note: Item 1a includes \$25,000 for hazardous material abatement.

LEGEND

- 1 BUILDING RENOVATION / ADDITION
- 2 WELDING SHOP & VEHICLE MAINTENANCE
- 3 VACUUM TRUCK STORAGE
- 4 EQUIPMENT SHED POLE BARN
- 5 EQUIPMENT SHED POLE BARN
- 6 EQUIPMENT YARD
- 7 COVER OVER CRUSH & RUN PILE
- 8 ENLARGE REAR PARKING LOT
- 9 ENLARGE FRONT PARKING LOT
- 10 EQUIPMENT YARD ENTRANCE
- 11 VEHICLE WASH PIT
- 12 SEWER PUMP STATION

TOTAL \$ 2,114,500

RENDERING:
SITE PLAN - WITH COST
 Hillsborough Water Treatment Facility Feasibility Study

13. Permitting Required for Conceptual Plans

Building Permits - All improvements proposed require the Town to bid the project to follow state law for contracting. The chosen design team for the project would assist the town with preparation of Construction Documents which can then be bid and permitted through the Town of Hillsborough and Orange County Planning and Inspections Department. Once a permit is issued for construction

Stormwater - Hillsborough's require stormwater control measures for anything that includes 10,000 square feet or more of new impervious surfaces. With the recommended development and the planned relocation of the Public Works facilities, the site development is not expected to increase over 10,000 square feet of new impervious surface. We understand that converting existing gravel equipment yard areas to asphalt or new buildings is not "new" impervious. Based on this expectation, a stormwater management plan for new impervious would not be required.

Construction in Floodplain Permit - The addition of Wall panels to the existing storage shed to house the Vacuum Truck and the addition of the Structure to cover the Crush & Run Materials Pile would require a permit to be issued from the NC DENR for this development as it occurs in the floodplain. The structures would be designed to allow water to migrate through the building rather than destroy it when and if this area floods. The floor of the vacuum truck storage shed should be elevated if possible, above the Base Flood Elevation (BFE) and flood vents used to allow water to filter through the building.

Hillsborough's Unified Development Ordinance Requirements - Dimmocks Mill Road is classified as a Residential Collector in Hillsborough's adopted Street Design Standards and is classified as a Local Road by NCDOT. Section 6.5.4.4 of Hillsborough's UDO states a buffer is not required when a non-residential parcel is adjacent to an arterial or collector street. Since the Town says it's a collector, then no buffer is required along the street frontage. However, UDO Section 6.10.3.8 requires a 10-foot wide planted setback around the parking perimeter. Three-foot high opaque screening of parking (fencing or landscaping) is required when adjacent to streets & residentially used property.

The above requirements are not meant to be all inclusive or exhaustive of the permitting required for the project to be realized as conceived. The chosen Design Team will have to evaluate each scope item and identify permitting and Ordinance requirements for each specific item to ensure compliance.

14. Accessibility Compliance

RND Architects has proposed a fully accessible facility. Although the Existing Building Code may be utilized if only a portion of the building were renovated to avoid the requirement to upgrade the building to full accessibility, the plan we have developed is fully accessible without a burden of massive expense to achieve full compliance. Starting at the site arrival point, we have provided a van accessible parking space. On Level 1 (upper Level) the accessible route into the Adron F. Thompson Water/Sewer begins with a proposed exterior ramp and an interior ramp to the floor level at the trough raised to the floor level of the existing addition floor level which is 12" up from the original floor level. The lower level also receives a van accessible parking spot and the route into the lower level is fully accessible. Restrooms on both levels and the showers on the upper level are provided with accessible grab bars, plumbing fixtures, floor clearances at fixtures and doors to enable these spaces to be fully compliant.

15. Recommended Next Steps

RND Architects and its team of professional design consultants has identified that the Adron F. Thompson Site and Building is a good candidate with potential to be renovated to further the town's vision as a prosperous town, filled with vitality, fostering a strong sense of community, which celebrates its unique heritage and small-town character. Hillsborough's mission states that the staff and elected officials, as stewards of the public trust who exist to make the Vision for Hillsborough a reality. We manage and provide infrastructure, resources, and services that enhance the quality of life for the living beings and land within our town.

After the town has reviewed the attached report we recommend a meeting to identify any outstanding challenges related to the implementation of the proposed development. Once comfortable that the scope is complete and thorough, we recommend that the town take steps to request funding for all or portions of the proposed development to allow the Utilities staff an efficient, safe and environmentally friendly workplace. The proposed improvements contained in this report shall be fully designed by a professional team led by an Architecture Firm experienced in municipal projects. Town leadership may take the report and its recommendations of new and improved structures for the Adron F. Thompson Site and Facility as a road map to complete site improvements. We realize that the town may not be able to fund the entire amount of planned improvements at once, however identifying the most important components will lead to a budget funding request that can be achieved without expending the entire amount.

Immediately, we support and recommend the town begin the removal of small existing masonry buildings occupied by the Town's Public Works Department which are proposed for demolition as well as a portion of the existing gravel area that falls approximately below the 520-topography line. We support this because the removal of any occupied structure and as much impervious within the regulated floodplain area on this site to improve the ecological impact from the continued use of this site as an Equipment Yard. We understand that the removal of impervious surfaces and structures within the floodplain was a key component of the restoration project that the Town is planning.

Once funding is secured, the town may elect to solicit Requests for Proposals (RFP) from qualified design teams for the realization of the improvements. This process would be similar to the process undertaken to select RND Architects and its team for this study. Many towns, cities and state government departments, after selecting a team for a feasibility study or advance planning, are able to contract directly with the same design team that provided the study as the requirement for selecting a qualified firm to provide professional services has already been met. This is most often used when the study has met or exceeded the needs of the Town and the town has become comfortable with the design team during the study process and trusts that the design and construction administration will be successful based on track records or personal experience.



TOWN OF HILLSBOROUGH, NC

Adron F. Thompson Water Treatment Facility Assessment

FEASIBILITY STUDY – APPENDIX A

Plumbing – Mechanical – Electrical Systems

October 4, 2019

INTRODUCTION:

A site and facility assessment was conducted by Edmondson Engineers at the Adron F. Thompson Water Treatment facility in Hillsborough. The purpose of this assessment was to determine the condition of existing Plumbing, Mechanical and Electrical Systems in the existing buildings and to provide probable budgetary cost estimates for recommended upgrades of these buildings. These assessments were for the main building and the auxiliary maintenance building which are currently the only structures with Plumbing, Mechanical or Electrical infrastructure.

Budgetary cost estimates were also determined for proposed new structures and renovated structures requiring plumbing, mechanical and electrical infrastructure to be added.

A. EXISTING BUILDINGS:

1 Main Building:

Plumbing:

- a. No plumbing on upper level of original building.
- b. Plumbing on lower level of original building needs to be completely replaced. Access and fixtures do not meet current ADA guidelines.
- c. The addition has one toilet with lavatory, floor mounted tank type water closet, shower and a washer and dryer. Additionally, there is break room sink and ice machine. Access and fixtures do not meet current ADA guidelines.
- d. A dedicated electric water heater is provided on both levels.

Mechanical:

- a. Basement of original building has gas fired unit heaters and wall mounted ventilation fan only.
- b. Upper level has window unit and minimal ducted supply from HVAC unit in addition. This equipment serves only the offices.
- c. A constant volume, single packaged DX unit with gas heat provides heating, cooling and ventilation to the existing addition.
- d. The toilet in addition has a dedicated individual exhaust fan. The toilet in the basement does not have exhaust.

Electrical:

- a. Electrical Service:
 1. Duke Energy overhead electrical service rated 120/240V, 200A, single phase fed from pole mounted transformer.
 2. Exterior meter is located on front of building adjacent to main entry door.
 3. Service entrance panelboard is a 40 space load center manufactured by Siemens. Located inside building near main entry.
 4. There are ten (10) spaces available if this panel.
 5. The main panel feeds a 60A subpanel installed in the addition work / break room.
 6. The addition sub-panel is main lug only Siemens, 12 space load center with no available space or electrical capacity.
 7. There is an additional small GE load center located in an office in original building.

- b. Emergency Power:
 - The building has a Kohler 30kW diesel generator which is wired directly to a 100A circuit breaker in the main electrical panel.
 - No transfer switch is provided and manual transfer is accomplished by turning off main breaker, turning on emergency breaker and starting generator. This is not a code compliant installation that should be corrected by installing a transfer switch.
- c. Wiring Methods:
 - The building is wired using a combination of rigid metallic, rigid non-metallic, EMT, MC Cable and nonmetallic cable.
- d. The building Lighting:
 - Normal Interior Lighting – Surface mounted. Combination of incandescent and fluorescent strip light fixtures.
 - Normal Exterior Lighting - Building Mounted, HID and decorative incandescent lantern type at main entrance.
 - Interior Emergency Lighting - Battery powered, combination exit / emergency fixtures at exterior doors.
 - Exterior Emergency Lighting - None at egress doors.
 - Emergency lighting is not code compliant.
- e. Telecom:
 - Wall mounted IT equipment cabinet is located in addition work / break room.
- f. Other Electrical:
 - No Fire Alarm. None required.

2 Auxiliary Maintenance Building:

Plumbing:

- a. No plumbing in building but there is one yard hydrant on exterior at east end of building.
- b. Additionally there is an air compressor with piping and air outlets under the covered exterior area on the east of the building.

Mechanical:

- a. Only a small electric unit heater is provided for the space. No cooling or ventilation was observed.

Electrical:

- a. Service Entrance
 - Duke Energy electrical service rated 120/240V, 200A, single phase. Underground service from pole mounted transformer at road near main vehicle entry gate.
 - Panel and exterior meter are located on NE corner of building.
 - Service entrance panelboard is a 30 space load center manufactured by Cutler-Hammer.
 - There are nine (9) spaces available if this panel.
 - No emergency power.
- b. Wiring Methods:
 - The building is wired using a combination of EMT conduit and MC Cable.
- c. Lighting:
 - Normal Interior Lighting - Overhead, open fluorescent strips.
 - Normal Exterior Lighting - HID Building Mounted on end of the west end and wet rated, vapor tight fluorescent fixtures installed under the shed roof on the east end.
 - Interior Emergency Lighting - Battery powered, combination exit / emergency fixtures at main door.
 - Exterior Emergency Lighting - None at egress doors.
- d. Power:
 - Cord reels in ceiling
 - Receptacles spaced around perimeter of interior back and side walls.
 - Additional receptacles are installed along exterior walls.
 - Interior receptacles do not appear to be GFCI protected.
- e. Other Electrical:
 - Air Compressor disconnect on east end under shed roof
 - E-stop for fuel dispensing on post for shed on SE end.
 - No Fire Alarm (none required)
 - No Telecom
 - No Security

See pictures and additional comments below.

Main Building (Original) –Basement:



HVAC:

- Heat: Propane fired unit heaters.
- Cooling: Through wall ventilation fan.
- Toilet Exhaust: Natural

Plumbing:

- ADA Compliant: No (toilet, water cooler, utility sink).
- Water Heater: 2,000W Electric
- Gas Piping: Copper, exposed.
- Propane, forced air unit heater.
- Waste and Vent Piping: Cast Iron exposed.
- Water Piping: Copper Exposed



Main Building (Original) –Basement:



Electrical:

- Combination of obsolete incandescent and fluorescent (T12) fixtures.
- Miscellaneous Power: Wall mounted receptacles and cord reel for shop equipment and tools
- Wiring Methods: Assortment of surface mounted rigid metal conduit, EMT, flexible conduit and MC Cable.
- Emergency Lighting: One combination emergency / exit fixture. Additional emergency lighting needed.



Main Building (Original) – Upper Level:



Electrical:

- Overhead drop from Duke Energy Power Pole.
- 120/240V, 200A, 1-Phase Service
- Power Meter mounted on front of building near main entrance.
- 30kW Kohler generator with diesel base tank.
- Service Entrance Panel surface mounted near main entrance.
- 100A Generator feed directly into panelboard. Generator breaker is locked out but not interlocked with the main utility service breaker. This arrangement is not code compliant and should be corrected in the renovation.
- Wiring Methods: Assortment of surface mounted rigid metal conduit, EMT, PVC and MC Cable.
- Feeds addition (60A)



Main Building (Original) – Upper Level:

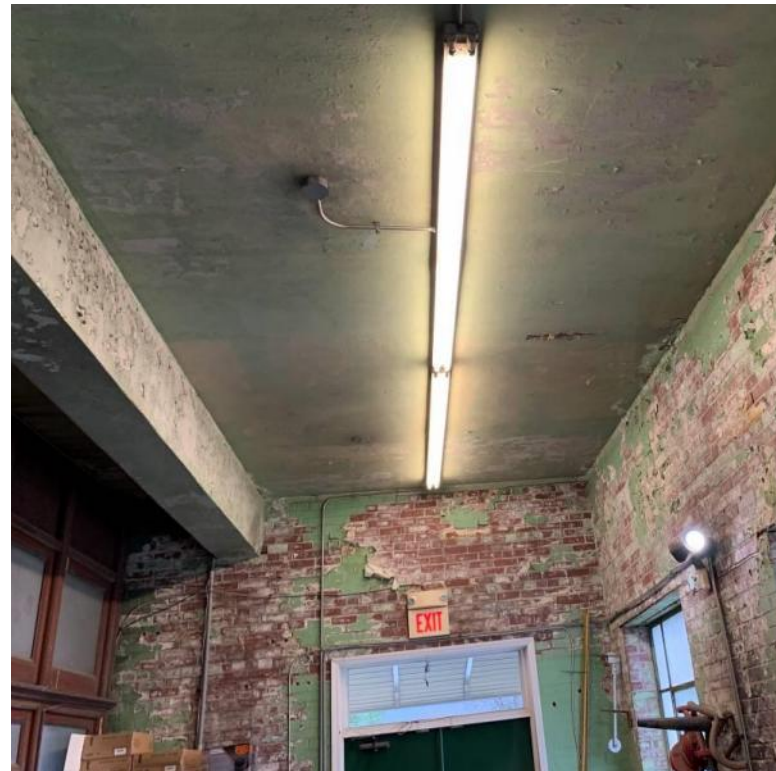


Electrical:

- Combination of obsolete incandescent and fluorescent (T12) fixtures.
- Emergency Lighting: One combination emergency / exit fixture. Additional emergency lighting needed.
- 50A Load Center recessed in wall in office does not have code minimum clear work space.
- Exterior emergency Egress Lighting: None.
- Building has no fire alarm system.

HVAC: Minimal - Window unit for front office and ducted supply from addition for side office.

Plumbing: None



Main Building (Addition) – Upper Level:



Plumbing:

- Break Area with Sink
- Toilet with shower.
- Washer and dryer in toilet.



Main Building (Addition) – Upper Level:



Plumbing:

- Piping exposed is unconditioned storage area below.
- Water Heater in Break / Multi-purpose room with screen wall enclosure.
- Ice Machine in Break / Multi-purpose room.



Main Building (Addition) – Upper Level:



HVAC:

- 5-Ton Package Unit with electric cooling and propane heating (100,000BTU/HR).
- Unit service addition and small adjacent office in original building.
- Stand alone toilet exhaust / light combo.
- Side wall dryer vent
- Residential recirculating range hood.

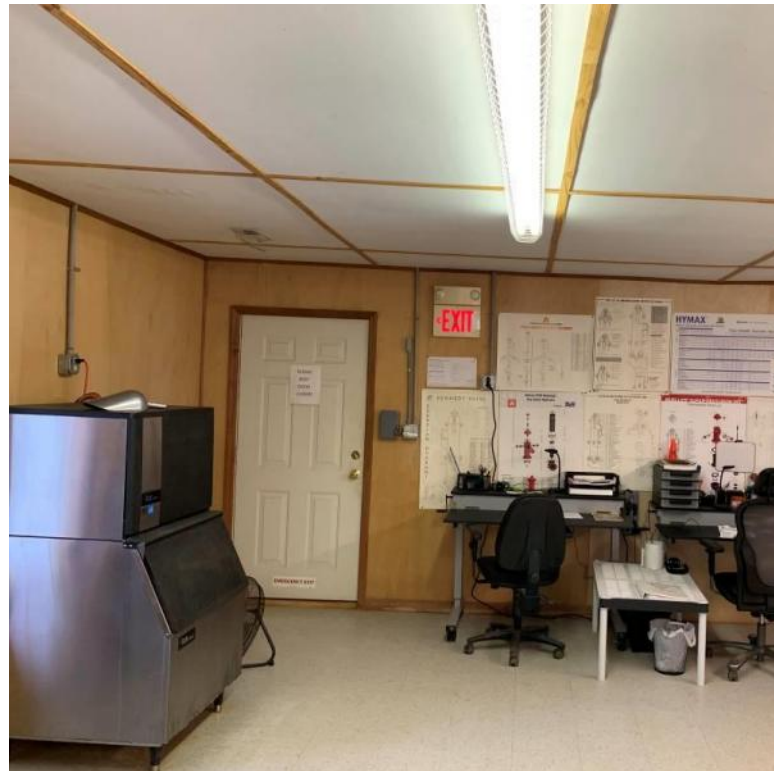


Main Building (Addition) – Upper Level:



Electrical:

- 120/240V, 60A subpanel fed from main service panel in original building
- Obsolete Fluorescent Lighting
- Only one exit path marked.
- Insufficient emergency lighting
- No exterior egress emergency lighting.



Auxiliary Building:



Plumbing:

- No water service inside building
- Yard hydrant on exterior at east end of building.
- Air compressor, piping and drops on exterior at east end of building.
- Fueling station emergency shut off.



Auxiliary Building:



HVAC:

- Minimal Heat Only. One small electric unit heater.

Electrical:

- Duke Energy 120/240V, 200A, Single-Phase electrical service.
- Service Entrance routed under ground pole line to building meter.
- Meter installed on north side of building (east end).
- 200A Load Center installed inside building directly behind meter.
- Convenience Receptacles installed on East end of building under shed roof.
- Fluorescent gasketed fixtures installed on East end of building under shed roof.



Auxiliary Building:



Electrical:

- 200A Load Center installed inside building directly behind meter in north east corner.
- Open lamp fluorescent shop lights
- Power: Receptacles installed along walls, Cord reels installed overhead.

HVAC:

- Minimal Heat Only. One small ceiling mounted unit heater.



Auxiliary Building:



Electrical:

- 200A Load Center installed inside building directly behind meter in north east corner.
- Open lamp fluorescent shop lights
- Power: Receptacles installed along walls, Cord reels installed overhead.
- Power: Receptacles installed on exterior of building on West end.
- Area light installed on West end of building. No other exterior building mounted lights. No exterior emergency egress lighting.



B. RECOMMENDATIONS:

1. Main Building:

Plumbing:

- a. Rework plumbing systems complete for new layout and additional load. Anticipated work includes:
 - New fixtures throughout,
 - New hot and cold water piping,
 - New waste and vent piping,
 - New water heating equipment,
 - Relocated ice machine. Recommend installation out of multipurpose room in exterior location to remove heat load from building.
 - Relocate laundry room.

Mechanical:

- a. Original Building: Provide a new constant volume, split system single zone heat pump unit that will provide heating, cooling and ventilation to the basement and first floor spaces of the original building. The estimated cooling load for this building is 7.5 tons during typical usage. Outside air delivered to the building through the unit will be modulated with a carbon dioxide sensor to further reduce energy usage.

For the lower level office a new ductless split-system DX unit will provide heating and cooling.

- b. The existing constant volume, single packaged DX unit will provide heating, cooling and ventilation to the existing addition. Duct work will be reworked as required for the new room layout and supply and return grills will be replaced throughout. If the ceiling is opened up in the multi-purpose space, spiral duct will be considered for exposed installations.
- c. A new constant volume, split-system heat pump unit will provide heating, cooling and ventilation to the new addition.
- d. New toilets will be provided with individual exhaust fan.
- e. Ceiling-mounted fans will individually exhaust toilet and locker rooms.
- f. New laundry room dryer will be vented to outdoors.
- g. Welding Shop: New propane gas unit heater, wall mounted propeller fan for general warm weather ventilation, and an exhaust fan with capture hood for welding operations.
- h. Ceiling-mounted fans will individually exhaust toilet and locker rooms.

Electrical:

- a. The existing power demand will need to be reviewed but any additional square footage or electrical load will likely exceed the existing electrical service capacity and require a larger service.
- b. Rework of the electrical service is anticipated to relocate the existing meter to side of the building with a new service entrance into the basement level. It is desired the power company secondary be routed underground from the pole to the new meter location.
- c. Site parking lot modifications may require the existing power pole to be relocated. All service rework will need to be coordinated with Duke Energy as the design develops.
- d. The generator feeder needs to be reworked and a transfer switch installed. It is desired that a new generator be installed along with a new automatic transfer switch. The new generator would ideally be large enough to power the entire building.
- e. If the generator is used for emergency lighting a separate branch for life safety system would need to be installed to maintain separation between optional stand-by power.
- f. Battery backed up emergency fixtures are recommended. Emergency lighting needs to be installed inside and outside to bring the building into compliance with current life safety codes.
- g. Replace all existing lighting with energy efficient, dimmable LED lighting.
- h. Install occupancy sensor lighting controls to meet current energy code.
- i. Owner should consider installation of a central fire alarm system with full ADA compliant notification. However, this occupancy and building size is not required to have a fire alarm system.

2. Maintenance Building:

Plumbing:

- a. Provide yard hydrant on west end of building for pole barn addition that will be used for vehicle maintenance and welding area.
- b. Extend compressed air drop to new addition on west end of building.

Mechanical:

- a. Provide additional heat in building

Electrical:

- a. Provide additional power on west end of building for welding station
- b. Provide lighting on west end of building for new pole barn addition.
- c. Replace existing lighting inside and outside of building with energy efficient LED lighting.
- d. Provide battery backed up emergency lighting inside and outside to bring the building into compliance with current life safety codes.
- e. Existing electrical service size will need to be confirmed once additional loads are known. It is anticipated that the existing service will be sufficient.



MATRIX

Health & Safety Consultants, L.L.C.

August 20, 2019

RND Architects PA
3608 University Drive Suite 204
Durham, NC 27707

Attention: Karylee Laird

Subject: Limited Survey for the Presence of Asbestos-Containing
Materials and Lead-Based Paints
715 Dimmocks Mill Road
Hillsborough, North Carolina
Matrix Job Number: 190854

Dear Mrs. Laird:

Matrix Health & Safety Consultants, L.L.C. (Matrix) is pleased to present this report of the limited survey to identify the presence of asbestos-containing materials and lead-based paints at the referenced project. In addition, equipment assumed to contain mercury (thermostats and fluorescent bulbs), PCBs (light ballasts), and batteries (backup emergency lights and alarm systems) were also identified. This report includes a description of the scope of services performed, results of the survey, and recommendations.

PROJECT INFORMATION

Matrix understands that the subject property is scheduled for renovations in the near future. In order to determine if asbestos or lead-based paint is present at the property, Matrix performed a limited survey to identify these materials. The survey was performed on August 14, 2019 by Matrix inspector John Pearson (NC Asbestos Inspector No. 12246, NC Lead Risk Assessor 120185). Roofing of the original structure was excluded from this survey at owners request.

ASBESTOS SURVEY PROCEDURES

The survey began with a visual inspection of accessible areas for the presence of suspect asbestos-containing materials that may be disturbed during renovation activities. Both friable and nonfriable suspect asbestos-containing materials were considered during the course of the survey.

Friable materials are those materials that can be pulverized or reduced to powder by hand pressure. A sampling strategy was determined and bulk samples of suspect ACM's were obtained. Suspect ACM's were grouped based on material homogeneity. A homogeneous area is an area which contains materials that seem by texture, color and wear to be uniform and applied during the same general time period.

In order to determine if the suspect materials documented during the survey contained asbestos, the materials were sampled and delivered to Eurofins CEI in Cary, NC for laboratory analysis. Each sample obtained was placed in a sealed container and labeled with a consecutive number, location and date. This information was logged on our Asbestos Bulk Sampling Record sheet and then sent to the laboratory. A signed chain-of-custody form is maintained with the samples until they are returned or disposed of.

ASBESTOS ANALYSIS PROCEDURES

The collected asbestos samples were analyzed using Polarized Light Microscopy (PLM) in conjunction with dispersion staining techniques using EPA Method 600/R-93/116. The bulk laboratory analysis provided the asbestos content (positive or negative), percentage of asbestos, asbestos type and identification of other non-asbestos fibers. A material is considered by the EPA to be asbestos-containing if asbestos is present in a quantity **greater than one percent (1%)**. The results of the laboratory analysis are presented in the attached laboratory analytical report.

ASBESTOS SURVEY RESULTS

The following table includes the materials identified as asbestos-containing during our survey. For a list of all materials tested, please refer to the laboratory analytical report.

Asbestos Survey Results

MATERIAL	GENERAL LOCATION	TYPE AND PERCENTAGE OF ASBESTOS PRESENT
Window Caulking	Interior Original Structure	3% Chrysotile
Flashing Mastic	Exterior Basement Rear Left Original Structure	3% Chrysotile
Door Caulking	Original Structure	2% Chrysotile

Analysis Method: EPA 600/R-93/116 Method using Polarized Light Microscopy

LEAD-BASED PAINT SURVEY PROCEDURES

The lead-based paint survey began with our inspectors/risk assessors walking the subject property and documenting testing combinations and selecting test locations. The walls/sides of the property are distinguished by Side A, B, C, or D. Wall or side A is typically the side of the main entrance, then moving clockwise would be wall/side B, C, or D. After the testing strategy was determined, Matrix used an LPA-1 Lead Paint Spectrum Analyzer (XRF) to determine the lead content (mg/cm²) of painted surfaces at the subject property. For the purpose of this survey, paints with concentrations of 1.0 mg/cm² or greater were considered lead-based paint.

Below you will find the lead-based paint results summarizing identified components with concentrations **greater than or equal to 1.0 mg/cm²** of lead. However, detectable lead quantities less than 1.0 mg/cm² may constitute a lead dust hazard even though it is not a lead-based paint as

defined by Federal Standards. For a list of all surfaces tested and XRF results, refer to the attached XRF Testing Report.

Lead-Based Paint Survey Results - Exterior

COMPONENT	SUBSTRATE	COLOR	LOCATION	LEAD CONTENT (mg/cm ²)	CONDITION
Window Sash	Metal	Black and Green	Original Structure	1.0 - 1.1	Deteriorated
Exterior Railing	Metal	Gray	D Right	1.8	Deteriorated
Door Header	Metal	Green	Original Structure	2.6	Deteriorated

Lead-Based Paint Survey Results – Basement Workshop - Interior

COMPONENT	SUBSTRATE	COLOR	LOCATION	LEAD CONTENT (mg/cm ²)	CONDITION
Stair Tread	Concrete	Gray	C/D Corner	3.5	Deteriorated
Railing	Metal	Black	C/D Corner	1.4	Deteriorated

Lead-Based Paint Survey Results – Parts Room - Interior

COMPONENT	SUBSTRATE	COLOR	LOCATION	LEAD CONTENT (mg/cm ²)	CONDITION
Window Sash	Metal	Green	B Left	1.0	Deteriorated
Railing	Metal	Gray	D Center	10.2	Deteriorated
Stair Tread	Concrete	Gray	D Center	1.7	Deteriorated

RECOMMENDATIONS

The National Emissions Standard for Hazardous Air Pollutants (NESHAP) requires the removal of asbestos-containing materials prior to renovation or demolition activities, which would disturb them. Matrix recommends that asbestos-containing materials that will be disturbed during renovation/demolition be removed by a qualified asbestos abatement contractor, using North Carolina accredited personnel, in accordance with applicable federal and state regulations governing the removal of asbestos-containing materials.

Matrix recommends the following options for treatment of identified lead-based hazards or the prevention of future lead-based paint hazards. Any or all of the options listed below will reduce or eliminate the hazard.

Surfaces tested during the course of this inspection were considered to be “intact” to “deteriorated” condition. Surfaces in “deteriorated” condition are considered to be “lead-based paint hazards” as defined in Title X and should be addressed through abatement or interim controls.

Abatement is a measure or measures designed to permanently eliminate lead-based paint hazards.

1. Replacement of LBP Coated Building Components
 - a. Windows
 - b. Railings

2. Encapsulation - Stair Treads and Door Headers
 - a. Liquid applied or adhesively bonded covering
 - b. Manufacturer must provide a 20-year warranty
 - c. Property Owner must conduct periodic visual monitoring
 - d. Certified risk assessors must approve the use of encapsulants for a specific surface.

The Occupational Safety and Health Administration (OSHA) Lead in Construction Standard (29 CFR 1926.62) states that “negative” readings (i.e. those below the HUD/EPA definition of what constitutes LBP [1.0 mg/cm²]) **does not** relieve contractors from performing exposure assessments (personal air monitoring) on their employees per the OSHA Lead Standard, and should not be interpreted as lead free. Although a reading may indicate “negative”, airborne lead concentrations still may exceed the OSHA Action Level or the OSHA Permissible exposure limit (PEL) depending on the work activity. Additionally, Matrix recommends that activities that cause the disturbance of lead-based paint be performed by North Carolina Certified workers and supervisors.

MERCURY AND PCB CONTAINING EQUIPMENT

Matrix performed a site survey of the subject facility to document and identify mercury and PCB containing equipment. This survey does not include laboratory analysis for identifying or quantifying PCB’s and mercury in equipment. The following table lists potential sources for these substances.

MERCURY AND PCB CONTAINING EQUIPMENT RESULTS

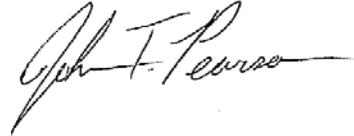
BALLAST	BATTERIES	BULBS	MERCURY
38	0	76	0

These items should be handled and disposed of as Universal Wastes in accordance with EPA regulations.

Matrix appreciates the opportunity to have provided these services. We would be glad to discuss any of the results contained in this report, at your convenience. If there are any questions concerning this report or results, please contact us.

Sincerely,

MATRIX HEALTH & SAFETY CONSULTANTS, L.L.C.

A handwritten signature in black ink, appearing to read "John T. Pearson", written in a cursive style.

John T. Pearson
Project Manager

Attachments: Laboratory Analysis Reports
 XRF Testing Data

Laboratory Analysis Reports

August 20, 2019

Matrix Health & Safety Consultants
2900 Yonkers Road
Raleigh, NC 27604

CLIENT PROJECT: 715 Dimmocks Mill Road
CEI LAB CODE: B194511

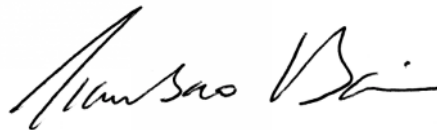
Dear Customer:

Enclosed are asbestos analysis results for PLM Bulk samples received at our laboratory on August 15, 2019. The samples were analyzed for asbestos using polarizing light microscopy (PLM) per the EPA 600 Method.

Sample results containing >1% asbestos are considered asbestos-containing materials (ACMs) per EPA regulatory requirements. The detection limit for the EPA 600 Method is <1% asbestos by weight as determined by visual estimation.

Thank you for your business and we look forward to continuing good relations.

Kind Regards,



Tianbao Bai, Ph.D., CIH
Laboratory Director



CEI

AMENDED

ASBESTOS ANALYTICAL REPORT
By: Polarized Light Microscopy

Prepared for

Matrix Health & Safety Consultants

CLIENT PROJECT: 715 Dimmocks Mill Road

LAB CODE: B194511

TEST METHOD: EPA 600 / R93 / 116 and EPA 600 / M4-82 / 020

REPORT DATE: 08/16/19

TOTAL SAMPLES ANALYZED: 26

SAMPLES >1% ASBESTOS: 5



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AMENDED

Asbestos Report Summary

By: POLARIZING LIGHT MICROSCOPY

PROJECT: 715 Dimmocks Mill Road

LAB CODE: B194511

METHOD: EPA 600 / R93 / 116 and EPA 600 / M4-82 / 020

Client ID	Layer	Lab ID	Color	Sample Description	ASBESTOS %
715-1		B68288	Gray	Brick Mortar	None Detected
715-2		B68289	Gray	Brick Mortar	None Detected
715-3		B68290	Green,Tan	Window Caulking	Chrysotile 3%
715-4		B68291	Green,Tan	Window Caulking	None Detected
715-5		B68292	White,Light Gray	Drywall/Joint Compound	None Detected
715-6		B68293	White,Light Gray	Drywall/Joint Compound	None Detected
715-7		B68294A	Brown,Off-white	Floor Tile	None Detected
		B68294B	Tan	Mastic	None Detected
715-8		B68295A	Brown,Off-white	Floor Tile	None Detected
		B68295B	Tan	Mastic	None Detected
715-9		B68296A	Tan	Vinyl Flooring	None Detected
		B68296B	Yellow	Mastic	None Detected
715-10		B68297A	Tan	Vinyl Flooring	None Detected
		B68297B	Yellow	Mastic	None Detected
715-11		B68298A	Gray	Floor Tile	None Detected
		B68298B	Yellow	Mastic	None Detected
715-12		B68299A	Gray	Floor Tile	None Detected
		B68299B	Yellow	Mastic	None Detected
715-13		B68300A	Beige,Off-white	Sheet Vinyl	None Detected
		B68300B	Yellow	Mastic	None Detected
715-14		B68301A	Beige,Off-white	Sheet Vinyl	None Detected
		B68301B	Yellow	Mastic	None Detected
715-15		B68302A	Brown,Off-white	Sheet Vinyl	None Detected
		B68302B	Yellow	Mastic	None Detected
715-16		B68303A	Brown,Off-white	Sheet Vinyl	None Detected
		B68303B	Yellow	Mastic	None Detected
715-17		B68304	Black,Brown	Roofing Shingle	None Detected
715-18		B68305	Black,Brown	Roofing Shingle	None Detected
715-19		B68306	Black	Roofing Paper	None Detected
715-20		B68307	Black	Roofing Paper	None Detected



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AMENDED

Asbestos Report Summary

By: POLARIZING LIGHT MICROSCOPY

PROJECT: 715 Dimmocks Mill Road

LAB CODE: B194511

METHOD: EPA 600 / R93 / 116 and EPA 600 / M4-82 / 020

Client ID	Layer	Lab ID	Color	Sample Description	ASBESTOS %
715-21		B68308	Gray,Tan	Block Mortar	None Detected
715-22		B68309	Gray,Tan	Block Mortar	None Detected
715-23		B68310	Black	Flashing Mastic	Chrysotile 3%
715-24		B68311	Black	Flashing Mastic	Chrysotile 3%
715-25	Layer 1	B68312	White,Tan	Caulking	Chrysotile 3%
	Layer 2	B68312	Off-white,Green	Caulking	None Detected
	Layer 3	B68312	Black,Green	Caulking	None Detected
715-26	Layer 1	B68313	White,Tan	Caulking	Chrysotile 3%
	Layer 2	B68313	Off-white,Green	Caulking	None Detected
	Layer 3	B68313	Black,Green	Caulking	None Detected



CEI

AMENDED**ASBESTOS BULK ANALYSIS**

By: POLARIZING LIGHT MICROSCOPY

Client: Matrix Health & Safety Consultants
2900 Yonkers Road
Raleigh, NC 27604

Lab Code: B194511
Date Received: 08-15-19
Date Analyzed: 08-16-19
Date Reported: 08-16-19

Project: 715 Dimmocks Mill Road

ASBESTOS BULK PLM, EPA 600 METHOD

Client ID Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS		ASBESTOS %
			Fibrous	Non-Fibrous	
715-1 B68288	Brick Mortar	Heterogeneous Gray Non-fibrous Bound	35%	Calc Carb	None Detected
			65%	Silicates	
715-2 B68289	Brick Mortar	Heterogeneous Gray Non-fibrous Bound	35%	Calc Carb	None Detected
			65%	Silicates	
715-3 B68290	Window Caulking	Heterogeneous Green,Tan Fibrous Bound	90%	Caulk	3% Chrysotile
			7%	Silicates	
715-4 B68291	Window Caulking	Heterogeneous Green,Tan Fibrous Bound	<1%	Cellulose	None Detected
			95%	Caulk	
715-5 B68292	Drywall/Joint Compound	Heterogeneous White,Light Gray Fibrous Bound	3%	Cellulose	None Detected
			77%	Gypsum	
715-6 B68293	Drywall/Joint Compound	Heterogeneous White,Light Gray Fibrous Bound	3%	Cellulose	None Detected
			77%	Gypsum	
715-7 B68294A	Floor Tile	Homogeneous Brown,Off-white Non-fibrous Bound	100%	Vinyl	None Detected
			10%	Calc Carb	
			10%	Silicates	



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AMENDED**ASBESTOS BULK ANALYSIS**

By: POLARIZING LIGHT MICROSCOPY

Client: Matrix Health & Safety Consultants
 2900 Yonkers Road
 Raleigh, NC 27604

Lab Code: B194511
Date Received: 08-15-19
Date Analyzed: 08-16-19
Date Reported: 08-16-19

Project: 715 Dimmocks Mill Road

ASBESTOS BULK PLM, EPA 600 METHOD

Client ID Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS				ASBESTOS %
			Fibrous		Non-Fibrous		
B68294B	Mastic	Homogeneous Tan Fibrous Bound	<1%	Cellulose	95%	Mastic 5% Silicates	None Detected
715-8 B68295A	Floor Tile	Homogeneous Brown,Off-white Non-fibrous Bound			100%	Vinyl	None Detected
B68295B	Mastic	Homogeneous Tan Fibrous Bound	<1%	Cellulose	95%	Mastic 5% Silicates	None Detected
715-9 B68296A	Vinyl Flooring	Heterogeneous Tan Fibrous Bound	30% 10%	Cellulose Fiberglass	60%	Vinyl	None Detected
B68296B	Mastic	Homogeneous Yellow Fibrous Bound	<1%	Cellulose	90%	Mastic 10% Silicates	None Detected
715-10 B68297A	Vinyl Flooring	Heterogeneous Tan Fibrous Bound	30% 10%	Cellulose Fiberglass	60%	Vinyl	None Detected
B68297B	Mastic	Homogeneous Yellow Fibrous Bound	<1%	Cellulose	90%	Mastic 10% Silicates	None Detected



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AMENDED

ASBESTOS BULK ANALYSIS

By: POLARIZING LIGHT MICROSCOPY

Client: Matrix Health & Safety Consultants
2900 Yonkers Road
Raleigh, NC 27604

Lab Code: B194511
Date Received: 08-15-19
Date Analyzed: 08-16-19
Date Reported: 08-16-19

Project: 715 Dimmocks Mill Road

ASBESTOS BULK PLM, EPA 600 METHOD

Client ID Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS			ASBESTOS %
			Fibrous		Non-Fibrous	
715-11 B68298A	Floor Tile	Homogeneous Gray Non-fibrous Bound		100%	Vinyl	None Detected
B68298B	Mastic	Homogeneous Yellow Fibrous Bound	<1%	Cellulose 90%	Mastic 10% Silicates	None Detected
715-12 B68299A	Floor Tile	Homogeneous Gray Non-fibrous Bound		100%	Vinyl	None Detected
B68299B	Mastic	Homogeneous Yellow Fibrous Bound	<1%	Cellulose 90%	Mastic 10% Silicates	None Detected
715-13 B68300A	Sheet Vinyl	Heterogeneous Beige, Off-white Fibrous Bound	40% 10%	Cellulose Fiberglass	50% Vinyl	None Detected
B68300B	Mastic	Homogeneous Yellow Fibrous Bound	<1%	Cellulose 95%	Mastic 5% Silicates	None Detected
715-14 B68301A	Sheet Vinyl	Heterogeneous Beige, Off-white Fibrous Bound	40% 10%	Cellulose Fiberglass	50% Vinyl	None Detected



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AMENDED**ASBESTOS BULK ANALYSIS**

By: POLARIZING LIGHT MICROSCOPY

Client: Matrix Health & Safety Consultants
2900 Yonkers Road
Raleigh, NC 27604

Lab Code: B194511
Date Received: 08-15-19
Date Analyzed: 08-16-19
Date Reported: 08-16-19

Project: 715 Dimmocks Mill Road

ASBESTOS BULK PLM, EPA 600 METHOD

Client ID Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS				ASBESTOS %
			Fibrous		Non-Fibrous		
B68301B	Mastic	Homogeneous Yellow Fibrous Bound	<1%	Cellulose	95%	Mastic 5% Silicates	None Detected
715-15 B68302A	Sheet Vinyl	Heterogeneous Brown,Off-white Fibrous Bound	40%	Cellulose	50%	Vinyl	None Detected
B68302B	Mastic	Homogeneous Yellow Fibrous Bound	<1%	Cellulose	95%	Mastic 5% Silicates	None Detected
715-16 B68303A	Sheet Vinyl	Heterogeneous Brown,Off-white Fibrous Bound	40%	Cellulose	50%	Vinyl	None Detected
B68303B	Mastic	Homogeneous Yellow Fibrous Bound	<1%	Cellulose	95%	Mastic 5% Silicates	None Detected
715-17 B68304	Roofing Shingle	Heterogeneous Black,Brown Fibrous Bound	15%	Fiberglass	45%	Tar 25% Gravel 15% Calc Carb	None Detected
715-18 B68305	Roofing Shingle	Heterogeneous Black,Brown Fibrous Bound	15%	Fiberglass	45%	Tar 25% Gravel 15% Calc Carb	None Detected

Client: Matrix Health & Safety Consultants
 2900 Yonkers Road
 Raleigh, NC 27604

Lab Code: B194511
Date Received: 08-15-19
Date Analyzed: 08-16-19
Date Reported: 08-16-19

Project: 715 Dimmocks Mill Road

ASBESTOS BULK PLM, EPA 600 METHOD

Client ID Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS				ASBESTOS %
			Fibrous		Non-Fibrous		
715-19 B68306	Roofing Paper	Homogeneous Black Fibrous Bound	60%	Cellulose Fiberglass	40%	Tar	None Detected
715-20 B68307	Roofing Paper	Homogeneous Black Fibrous Bound	60%	Cellulose Fiberglass	40%	Tar	None Detected
715-21 B68308	Block Mortar	Heterogeneous Gray,Tan Fibrous Bound	<1%	Cellulose	40%	Calc Carb Silicates	None Detected
715-22 B68309	Block Mortar	Heterogeneous Gray,Tan Fibrous Bound	<1%	Cellulose	40%	Calc Carb Silicates	None Detected
715-23 B68310	Flashing Mastic	Heterogeneous Black Fibrous Bound	<1%	Fiberglass	80%	Binder Calc Carb	3% Chrysotile
Lab Notes: Analyst opinion: Contamination from adjacent material							
715-24 B68311	Flashing Mastic	Heterogeneous Black Fibrous Bound	<1%	Fiberglass	80%	Binder Calc Carb	3% Chrysotile
Lab Notes: Analyst opinion: Contamination from adjacent material							
715-25 Layer 1 B68312	Caulking	Heterogeneous White,Tan Fibrous Bound			57%	Calc Carb	3% Chrysotile
					40%	Binder	



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AMENDED

ASBESTOS BULK ANALYSIS

By: POLARIZING LIGHT MICROSCOPY

Client: Matrix Health & Safety Consultants
2900 Yonkers Road
Raleigh, NC 27604

Lab Code: B194511
Date Received: 08-15-19
Date Analyzed: 08-16-19
Date Reported: 08-16-19

Project: 715 Dimmocks Mill Road

ASBESTOS BULK PLM, EPA 600 METHOD

Client ID Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS		ASBESTOS %
			Fibrous	Non-Fibrous	
Layer 2 B68312	Caulking	Heterogeneous	90%	Caulk	None Detected
		Off-white,Green	5%	Silicates	
		Non-fibrous	5%	Paint	
		Bound			
Layer 3 B68312	Caulking	Heterogeneous	95%	Caulk	None Detected
		Black,Green	5%	Paint	
		Non-fibrous			
		Bound			
715-26 Layer 1 B68313	Caulking	Heterogeneous	57%	Calc Carb	3% Chrysotile
		White,Tan	40%	Binder	
		Fibrous			
		Bound			
Layer 2 B68313	Caulking	Heterogeneous	90%	Caulk	None Detected
		Off-white,Green	5%	Silicates	
		Non-fibrous	5%	Paint	
		Bound			
Layer 3 B68313	Caulking	Heterogeneous	95%	Caulk	None Detected
		Black,Green	5%	Paint	
		Non-fibrous			
		Bound			

LEGEND: Non-Anth = Non-Asbestiform Anthophyllite
Non-Trem = Non-Asbestiform Tremolite
Calc Carb = Calcium Carbonate

METHOD: EPA 600 / R93 / 116 and EPA 600 / M4-82 / 020

REPORTING LIMIT: <1% by visual estimation

REPORTING LIMIT FOR POINT COUNTS: 0.25% by 400 Points or 0.1% by 1,000 Points

REGULATORY LIMIT: >1% by weight

Due to the limitations of the EPA 600 method, nonfriable organically bound materials (NOBs) such as vinyl floor tiles can be difficult to analyze via polarized light microscopy (PLM). EPA recommends that all NOBs analyzed by PLM, and found not to contain asbestos, be further analyzed by Transmission Electron Microscopy (TEM). Please note that PLM analysis of dust and soil samples for asbestos is not covered under NVLAP accreditation. *Estimated measurement of uncertainty is available on request.*

This report relates only to the samples tested or analyzed and may not be reproduced, except in full, without written approval by Eurofins CEI. Eurofins CEI makes no warranty representation regarding the accuracy of client submitted information in preparing and presenting analytical results. Interpretation of the analytical results is the sole responsibility of the client. Samples were received in acceptable condition unless otherwise noted. This report may not be used by the client to claim product endorsement by NVLAP or any other agency of the U.S. Government.

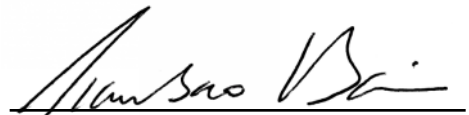
Information provided by customer includes customer sample ID, location, volume and area as well as date and time of sampling.

ANALYST:

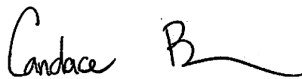


McLane Brown

APPROVED BY:



Tianbao Bai, Ph.D., CIH
Laboratory Director



Candace Burrus

**AMENDED due to Login Typographical Error -
Incorrect Project Name**



CEI

CHAIN OF CUSTODY

26

730 SE Maynard Road, Cary, NC 27511
 Tel: 866-481-1412; Fax: 919-481-1442

LAB USE ONLY:	
CEI Lab Code:	B194511
CEI Lab I.D. Range:	B68288 - B68313

COMPANY INFORMATION	PROJECT INFORMATION
CEI CLIENT #:	Job Contact: John T. Pearson
Company: Matrix Health + Safety	Email / Tel: jtp@matrixhsc.com
Address: 2900 Yonkers Road Raleigh, NC 27604	Project Name: 715 Dimmock Mill Road
Email: jtp@matrixhsc.com	Project ID#:
Tel: 919 2363848 Fax:	PO #:
	STATE SAMPLES COLLECTED IN: NC

IF TAT IS NOT MARKED STANDARD 3 DAY TAT APPLIES.

ASBESTOS	METHOD	TURN AROUND TIME					
		4 HR	8 HR	1 DAY	2 DAY	3 DAY	5 DAY
PLM BULK	EPA 600	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PLM POINT COUNT (400)	EPA 600	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PLM POINT COUNT (1000)	EPA 600	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PLM GRAV w POINT COUNT	EPA 600	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PLM BULK	CARB 435	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PCM AIR	NIOSH 7400	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEM AIR	EPA AHERA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEM AIR	NIOSH 7402	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEM AIR (PCME)	ISO 10312	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEM AIR	ASTM 6281-15	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEM BULK	CHATFIELD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEM DUST WIPE	ASTM D6480-05 (2010)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEM DUST MICROVAC	ASTM D5755-09 (2014)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEM SOIL	ASTM D7521-16	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEM VERMICULITE	CINCINNATI METHOD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEM QUALITATIVE	IN-HOUSE METHOD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OTHER:		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

REMARKS / SPECIAL INSTRUCTIONS:		<input checked="" type="checkbox"/> Accept Samples <input type="checkbox"/> Reject Samples	
Relinquished By:	Date/Time	Received By:	Date/Time
<i>[Signature]</i>	9-15-19 1:38	<i>[Signature]</i>	9/15 140

Samples will be disposed of 30 days after analysis

XRF Testing Data

715 Dimmocks Mill Road

Matrix Health & Safety Consultants LLC

2900 Yonkers Road
Raleigh, NC 27604

INSPECTION DATE: 8/14/2019 - 8/14/2019

INSTRUMENT TYPE: Heuresis Corp.
Pb200i XRF Lead Paint Analyzer
2364

ACTION LEVEL: 1.0 mg/cm²

STATEMENT:

715 Dimmocks Mill Road

Inspection Date: 8/14/2019 - 8/14/2019
 Action Level: 1.0 mg/cm²
 Total Readings: 83
 Unit Started: 08/14/2019 12:06:04
 Unit Ended: 08/14/2019 13:20:17

Inspection Site: 715 Dimmocks Mill Road
 Hillsborough, NC 27278

Read #	Result	RTA Present	COMPONENTS	SUBSTRATE	SIDE	CONDITION	Color	Floor	ROOM	Lead (mg/cm ²)	Mode
1	Positive	Off	Calibration							1.1 mg/cm ²	Action Level
2	Positive	Off	Calibration							1.0 mg/cm ²	Action Level
3	Positive	Off	Calibration							1.0 mg/cm ²	Action Level
4	Negative	Off	Calibration							0.0 mg/cm ²	Action Level
5	Negative	Off	Calibration							0.0 mg/cm ²	Action Level
6	Negative	Off	Calibration							-0.1 mg/cm ²	Action Level
7	Negative	Off	Door	Metal	A Left	Intact	Green	First	Exterior	-0.1 mg/cm ²	Action Level
8	Negative	Off	Door Casing	Wood	A Left	Intact	White	First	Exterior	0.2 mg/cm ²	Action Level
9	Negative	Off	Railing	Metal	A Center	Deteriorated	Black	First	Exterior	0.2 mg/cm ²	Action Level
10	Positive	Off	Window Sash	Metal	A Center	Deteriorated	Green	First	Exterior	1.1 mg/cm ²	Action Level
11	Negative	Off	Railing	Metal	A Left	Intact	Green	First	Exterior	0.1 mg/cm ²	Action Level
12	Positive	Off	Window Sash	Metal	B Right	Intact	Black	First	Exterior	1.0 mg/cm ²	Action Level
13	Negative	Off	Door Casing	Metal	B Right	Intact	Gray	Basement	Exterior	0.1 mg/cm ²	Action Level
14	Negative	Off	Door	Metal	B Right	Intact	Gray	Basement	Exterior	0.1 mg/cm ²	Action Level
15	Negative	Off	Garage door	Metal	C Right	Intact	Green	Basement	Exterior	0.1 mg/cm ²	Action Level
16	Negative	Off	Column	Metal	D Center	Intact	Black	Basement	Exterior	0.1 mg/cm ²	Action Level
17	Negative	Off	Door	Metal	C Left	Intact	Green	Basement	Exterior	0.2 mg/cm ²	Action Level
18	Negative	Off	Door Casing	Metal	C Left	Intact	Green	Basement	Exterior	0.1 mg/cm ²	Action Level

715 Dimmocks Mill Road

715 Dimmocks Mill Road
Hillsborough, NC 27278

Inspection Site:

8/14/2019 - 8/14/2019

Inspection Date: 8/14/2019 - 8/14/2019

Action Level: 1.0 mg/cm²

Total Readings: 83

Unit Started: 08/14/2019 12:06:04

Unit Ended: 08/14/2019 13:20:17

Read #	Result	RTA Present	COMPONENTS	SUBSTRATE	SIDE	CONDITION	Color	Floor	ROOM	Lead (mg/cm ²)	Mode
19	Negative	Off	Stringer	Metal	D Right	Intact	Black	Basement	Exterior	0.2 mg/cm ²	Action Level
20	Positive	Off	Railing	Metal	D Right	Deteriorated	Gray	Basement	Exterior	1.8 mg/cm ²	Action Level
21	Negative	Off	Door Casing	Metal	D Center	Intact	Gray	Basement	Exterior	0.1 mg/cm ²	Action Level
22	Negative	Off	Door	Metal	D Center	Intact	Gray	Basement	Exterior	0.0 mg/cm ²	Action Level
23	Positive	Off	Door Header	Metal	D Center	Deteriorated	Green	Basement	Exterior	2.6 mg/cm ²	Action Level
24	Negative	Off	Window Sash	Metal	D Left	Deteriorated	Black	Basement	Exterior	0.2 mg/cm ²	Action Level
25	Negative	Off	Wall	Concrete	A-Upper	Deteriorated	Green	Basement	Workshop	0.3 mg/cm ²	Action Level
26	Negative	Off	Wall	Concrete	B Right	Deteriorated	Green	Basement	Workshop	0.4 mg/cm ²	Action Level
27	Negative	Off	Wall	Concrete	C Right	Deteriorated	Green	Basement	Workshop	0.2 mg/cm ²	Action Level
28	Negative	Off	Door Casing	Wood	C Right	Deteriorated	Green	Basement	Workshop	-0.1 mg/cm ²	Action Level
29	Negative	Off	Door	Wood	C Right	Deteriorated	Gray	Basement	Workshop	0.0 mg/cm ²	Action Level
30	Positive	Off	Tread	Concrete	C Right	Deteriorated	Gray	Basement	Workshop	3.5 mg/cm ²	Action Level
31	Positive	Off	Railing	Metal	D Left	Deteriorated	Black	Basement	Workshop	0.4 mg/cm ²	Action Level
32	Negative	Off	Door	Metal	D Left	Intact	Green	Basement	Workshop	0.3 mg/cm ²	Action Level
33	Negative	Off	Door Casing	Metal	D Left	Intact	Green	Basement	Workshop	0.2 mg/cm ²	Action Level
34	Negative	Off	Door Casing	Wood	D Right	Deteriorated	Gray	Basement	Workshop	0.1 mg/cm ²	Action Level
35	Negative	Off	Window Sash	Metal	A Left	Deteriorated	Green	Basement	Workshop	0.6 mg/cm ²	Action Level
36	Negative	Off	Ceiling	Concrete		Deteriorated	Green	Basement	Workshop	0.4 mg/cm ²	Action Level

715 Dimmocks Mill Road

Inspection Site: 715 Dimmocks Mill Road
Hillsborough, NC 27278

Inspection Date: 8/14/2019 - 8/14/2019
 Action Level: 1.0 mg/cm²
 Total Readings: 83
 Unit Started: 08/14/2019 12:06:04
 Unit Ended: 08/14/2019 13:20:17

Read #	Result	RTA Present	COMPONENTS	SUBSTRATE	SIDE	CONDITION	Color	Floor	ROOM	Lead (mg/cm ²)	Mode
37	Negative	Off	Wall	Concrete	D	Deteriorated	White	Basement	Workshop	0.5 mg/cm ²	Action Level
38	Negative	Off	Window Sash	Metal	D	Deteriorated	White	Basement	Workshop	0.9 mg/cm ²	Action Level
39	Negative	Off	Wall	Concrete	A Center	Deteriorated	Green	Basement	Workshop	0.3 mg/cm ²	Action Level
40	Negative	Off	Wall	Concrete	B Center	Deteriorated	Green	Basement	Workshop	0.4 mg/cm ²	Action Level
41	Negative	Off	Wall	Concrete	C Center	Deteriorated	Green	Basement	Workshop	0.3 mg/cm ²	Action Level
42	Negative	Off	Wall	Concrete	D Center	Deteriorated	Green	Basement	Workshop	0.3 mg/cm ²	Action Level
43	Negative	Off	Ceiling	Concrete	D Center	Deteriorated	Green	Basement	Workshop	0.2 mg/cm ²	Action Level
44	Negative	Off	Siding	Vinyl	D Right	Intact	Gray	First	Exterior	0.0 mg/cm ²	Action Level
45	Negative	Off	Facia	Aluminum	C Left	Intact	White	First	Exterior	0.0 mg/cm ²	Action Level
46	Negative	Off	Window Sash	Vinyl	C Center	Intact	White	First	Exterior	-0.1 mg/cm ²	Action Level
47	Negative	Off	Door	Aluminum	C Right	Intact	White	First	Exterior	0.0 mg/cm ²	Action Level
48	Negative	Off	Wall	Brick	A Center	Deteriorated	Green	First	Parts Room	0.4 mg/cm ²	Action Level
49	Negative	Off	Wall	Brick	B Center	Deteriorated	Green	First	Parts Room	0.6 mg/cm ²	Action Level
50	Negative	Off	Wall	Brick	C Center	Deteriorated	Green	First	Parts Room	0.4 mg/cm ²	Action Level
51	Negative	Off	Wall	Brick	D Center	Deteriorated	Green	First	Parts Room	0.5 mg/cm ²	Action Level
52	Negative	Off	Wall	Wood	A Left	Deteriorated	Green	First	Parts Room	0.1 mg/cm ²	Action Level
53	Negative	Off	Wall	Wood	A Center	Deteriorated	Dark Stain	First	Parts Room	0.1 mg/cm ²	Action Level
54	Negative	Off	Floor	Concrete	A Center	Deteriorated	Tan	First	Parts Room	0.4 mg/cm ²	Action Level

715 Dimmocks Mill Road

715 Dimmocks Mill Road
Hillsborough, NC 27278

Inspection Site:

8/14/2019 - 8/14/2019

Inspection Date: 8/14/2019 - 8/14/2019

Action Level: 1.0 mg/cm²

Total Readings: 83

Unit Started: 08/14/2019 12:06:04

Unit Ended: 08/14/2019 13:20:17

Read #	Result	RTA Present	COMPONENTS			CONDITION	Color	Floor	ROOM	Lead (mg/cm ²)	Mode
			Window Sash	Metal	B Left						
55	Positive	Off	Window Sash	Metal	B Left	Deteriorated	Green	First	Parts Room	1.0 mg/cm ²	Action Level
56	Positive	Off	Railing	Metal	D Center	Deteriorated	Gray	First	Parts Room	10.2 mg/cm ²	Action Level
57	Positive	Off	Stair	Concrete	D Center	Deteriorated	Gray	First	Parts Room	1.7 mg/cm ²	Action Level
58	Negative	Off	Wall	Brick	A Center	Deteriorated	White	First	A Center	0.4 mg/cm ²	Action Level
59	Negative	Off	Wall	Brick	A Center	Deteriorated	White	First	A Center	0.3 mg/cm ²	Action Level
60	Negative	Off	Ceiling	Concrete	A Center	Deteriorated	Green	First	A Center	0.2 mg/cm ²	Action Level
61	Negative	Off	Wall	Brick	A Center	Intact	White	First	A/D	0.1 mg/cm ²	Action Level
62	Negative	Off	Wall	Wood	C Center	Intact	Dark Stain	First	A/D	0.1 mg/cm ²	Action Level
63	Negative	Off	Wall	Brick	D Center	Intact	White	First	A/D	0.4 mg/cm ²	Action Level
64	Negative	Off	Window Sill	Concrete	D Center	Deteriorated	Blue	First	A/D	0.4 mg/cm ²	Action Level
65	Negative	Off	Window Sash	Metal	D Center	Deteriorated	Blue	First	A/D	0.8 mg/cm ²	Action Level
66	Negative	Off	Mini-Blind	Vinyl	D Center	Deteriorated	White	First	A/D	-0.1 mg/cm ²	Action Level
67	Negative	Off	Door Casing	Wood	B Center	Intact	White	First	A/D	-0.2 mg/cm ²	Action Level
68	Negative	Off	Door	Metal	B Center	Intact	White	First	A/D	0.0 mg/cm ²	Action Level
69	Negative	Off	Ceiling	Drywall		Intact	Blue	First	A/D	0.0 mg/cm ²	Action Level
70	Negative	Off	Ceiling	Drywall		Intact	White	First	Collectic	0.0 mg/cm ²	Action Level
71	Negative	Off	Window Sash	Metal	D	Intact	Black	First	Collectic	0.1 mg/cm ²	Action Level
72	Negative	Off	Door	Wood	B Center	Intact	Clear Stain	First	Collectic	0.0 mg/cm ²	Action Level

Photos



715 Dimmocks Mill Road Water Plant A Side



715 Dimmocks Mill Road Water Plant B Side



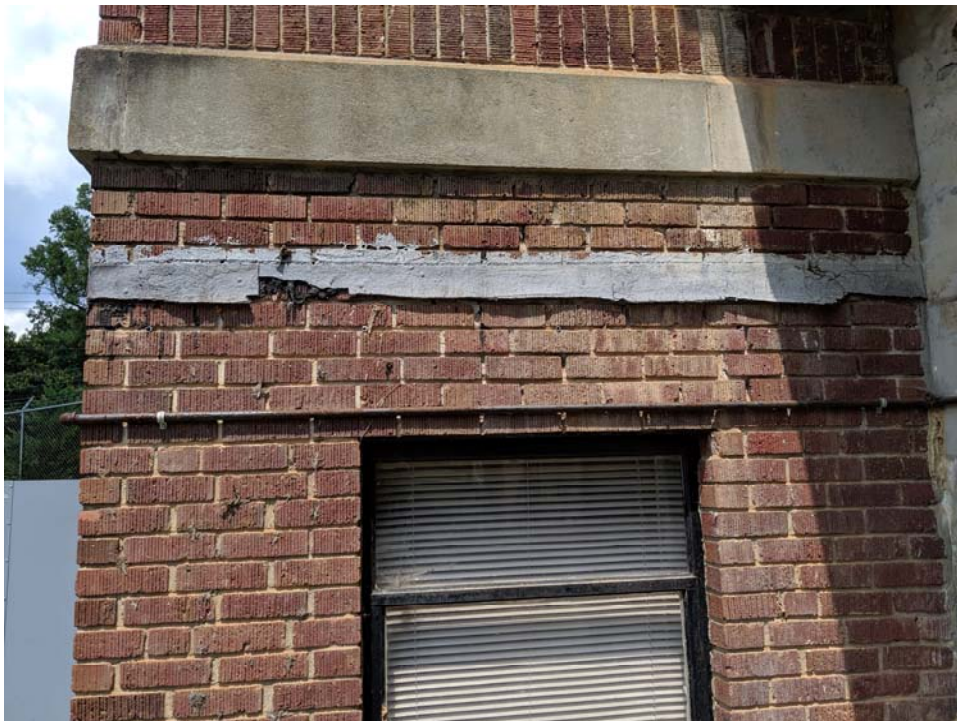
715 Dimmocks Mill Road Water Plant C Side



715 Dimmocks Mill Road Water Plant D Side



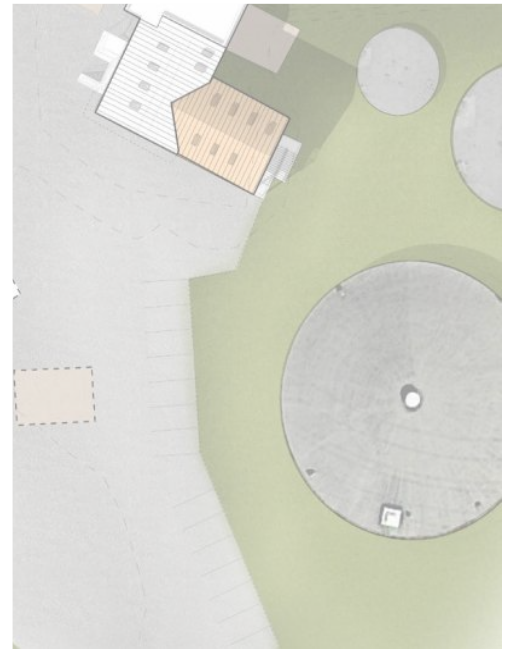
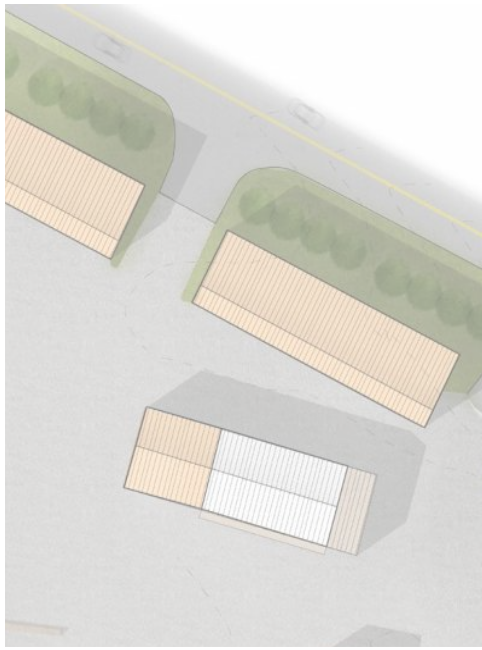
Asbestos containing window caulk between window sash and brick.



Asbestos containing flashing on C Side.



Door caulk on original brick structure.



The Town of Hillsborough

Adron F. Thompson Water/Sewer Facility: Feasibility Study

RND
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