ADDENDUM NO. 1 **February 25, 2025**

RE: **Pendleton County Fire Station**
2663 HWY US 27 N.
Falmouth, Kentucky 41040
Project No. 24056

FROM: **Brandstetter Carroll Inc.**
2360 Chauvin Drive
Lexington, Kentucky 40517
Phone 859-268-1933
Fax 859-268-3341

TO: **Plan Holders**

This addendum forms a part of the Construction Documents and modifies the original bidding documents dated January 24, 2025. Each bidder shall acknowledge receipt of this addendum in the space provided on the Bid Form. Failure to do so may subject the Bidder to disqualification.

This Addendum consists of three (3) pages, plus Attachments.

GENERAL:

1. Bids due.
    a. Thursday March 06, 2025.
    b. Bid Time: 2:00 p.m. local time.
    c. Location: Pendleton County Courthouse, 233 Main St # 1, Falmouth, KY 41040.
2. All questions must be received, in writing, attention to Jay Quillen Brandstetter Carroll Inc, 2360 Chauvin Drive, Lexington, Kentucky 405117, (859) 268-1933 or jquillen@bciaep.com, by 5PM EST, Thursday, 02/27/2025.
3. No REVIT or AUTOCAD Files will be given out during the Bidding Process. Drawing Files will be given only to the awarded contractor and sub-contractors after they are contracted with the owner and an Electronic Files Disclaimer has been signed by all contractors.
4. Interpretations, corrections, changes, answers to questions, etc., regarding the bid will be made via Addenda only. Any other manner will not be binding, and bidders shall not rely upon them.

QUESTIONS AND ANSWERS:

1. The bid form has a contingency allowance line on it but there is not an amount listed in section 12100 of the specifications. How much is the contingency allowance for this project?
    a. $100,000.
2. Are there any other allowances?
    a. No.
3. On page 004323-1 of the bid form section 1.3 Description A.1. refers to Cost-Plus-Fee Contract. Is this a fixed fee project or Cost-Plus?
    a. Project is a lump sum contract.

4. Who is the permitting entity? The State of Kentucky, Pendleton Co, Falmouth?
    a. State of KY and City Licenses.
5. Has the project been submitted for permitting?
    a. Yes, the project is currently under review.
6. On Page 008001-6 of the Supplementary Conditions Article 9, 9.3 item .4 request an affidavit of compliance of payment for prevailing wages. Is this a prevailing wage project?
    a. No.
7. Section 003132 refers to a geotechnical report but there is not one included. Can you provide a copy of the geotechnical report?
    a. Please refer to the attached geotechnical report.
8. Can Kirby Building systems be used if a new PEMB is provided? They are not listed under section 133419.2.1 https://www.kirbybuildingsystems.com/
    a. Yes Kirby Building systems is an approved provider for section 133419
9. Where is the existing metal building that is being proposed for this project located?
    a. It is currently being stored at the Pendleton County Road Department.
10. In rooms 106 and 108 it shows a washer box for each unit. Just wondering if one of the machines is a PPE washer or extractor. If so, a washer box will not work, and a floor sink or hub drain may be required.
    a. The machine in room 108 is the extractor.
    b. The machine in Room 106 is a BAM or breathing air module.
    c. Both washer boxes have been removed.
    d. Floor sink has been added in room 108.
    e. Refer to revised drawing attached, P900.
11. The hose bibs for the bay area (HB) on the plumbing schedule has a Zurn Z-195XL. This type of hose bib does not include a vacuum breaker, will they be required to have them.
    a. We will use Zurn Z-195XL-VB for hose bib. This model has a vacuum breaker.
12. Drawing pages A101.2 & A201.2 reference Alternate #2. The drawings show the block being removed from the exterior elevations & replaced with siding, removal of the parapet wall, exterior sign not shown & what looks to be removal of the block from the interior walls along column lines 4 & 8. The write-up in the bid form only states the cost for providing a new PEMB in lieu of using the existing one.
    a. Alternate #2 should be cost associated only with a new PEMB building as shown on sheets A101.2 and A201.2.
13. Are the interior block walls along column lines 4 & 8 part of alternate #2? If so what are they being replaced with?
    a. No, the interior block walls are to be included in the base bid scope. Alternate #2 should be cost associated only with a new PEMB building.
14. Is deleting of the exterior parapet wall part of alternate #2?
    a. Yes, the alternate #2 does not include a parapet.

15. Is deleting the exterior block part of alternate #2?
    a. Yes, the alternate #2 does not include exterior CMU.
16. Is the building sign being removed as part of alternate #2?
    a. No, the signage is still to be included in the base bid scope. Alternate #2 should be cost associated only with a new PEMB building.
17. The documents call of construction within an existing PEMB. We looked on Google and visited the site and there is not a building there. Are we missing something?
    a. The existing PEMB building is from a different site and has been taken down and stored at the Pendleton County Road Department. The documents call to install this existing PEMB structure in the base bid scope.
18. The plan room I'm using says the estimated cost of this project is about $80,750; however, that will pretty much just cover the cost of materials and labor of the concrete and CMU. How realistic is that number or am I misunderstanding projected project value?
    a. The budget for the project is not being released by the owner.
19. A few questions about the split face CMU I saw on the prints. Just wanted to get an idea of color selections and exterior look. Any feedback is greatly appreciated.
    a. Color selection for split face CMU will be made during shop drawing review, standard manufactures colors will be acceptable.
20. Note on E501 refers to a drawing E-103 that was not issued. (see general notes riser diagram)
    a. A fire alarm system is not required for the facility. The General Riser Diagram note can be removed.

SUBSTITUTION REQUEST:

1. Anrin KE-200 Channel trench drains as Manufactured by NorthStar Industries are not an acceptable substitution for the proposed cast in place trench drain as shown in detail A1/A-501. Channel style drains in general will not be accepted, the intent is for a square head shovel to be used in maintenance of the trench drain, a flat bottom trench drain is required.

CHANGES TO SPECIFICATIONS:

1. 087100 Door Hardware, revised specification refer to attached.

CHANGES TO DRAWINGS:

1. A-110 RCP Plan
   A. Revised ACT grid layout in Reception room 100, refer to attached drawing ADD – 1.1.
2. P900, removed both washer boxes, and added a floor sink in room 108.

END OF ADDENDUM NO. 1

GEOTECHNICAL SUBSURFACE EXPLORATION REPORT

PROPOSED PENDLETON COUNTY FIRE STATION

ATLAS PROJECT NO. LOUGE4111

US 27, FALMOUTH, PENDLETON COUNTY, KENTUCKY

PREPARED FOR:

Pendleton County
233 Main Street
Falmouth, Kentucky 41040

C/O:
Brandstetter Carroll Inc.
2360 Chauvin Drive
Lexington, Kentucky 40517

PREPARED BY:

Atlas Technical Consultants LLC
2724 River Green Circle
Louisville, Kentucky 40206

October 3, 2024

2724 River Green Circle
Louisville, Kentucky 40206
(502) 722-1401 | oneatlas.com

October 3, 2024

MR. DAVID FIELDS
JUDGE/EXECUTIVE
PENDLETON COUNTY
233 MAIN STREET
FALMOUTH, KENTUCKY 41040

C/O:
MR. JAY QUILLEN
BRANDSTETTER CARROLL INC.
2360 CHAUVIN DRIVE
LEXINGTON, KENTUCKY 40517

Subject: **Geotechnical Subsurface Exploration Report**
Proposed Pendleton County Fire Station
US 27, Falmouth, Pendleton County, Kentucky
Atlas Project No. LOUGE24111

Dear Mr. Fields:

Submitted herewith is the report of our geotechnical subsurface exploration for the referenced project. This report contains the results of our field and laboratory testing program, and engineering interpretation of this data with respect to the available project characteristics and recommendations to aid design and construction of the foundations and other earth-connected phases for this project. The report Appendix contains site and test boring location plans, and results of field and laboratory testing. Our services have been provided in accordance with Atlas proposal number LOUGE24111 dated August 27, 2024.

We appreciate the opportunity to be of service to you on this project. If we can be of any further assistance, or if you have any questions regarding this report, please do not hesitate to contact the undersigned.

Respectfully submitted,

Atlas Technical Consultants LLC

Zane Nichols, E.I.T.
Project Geotechnical Engineer

Ryan Ortiz, P.E.
Senior Geotechnical Engineer
Licensed Kentucky 33219

CONTENTS

APPENDICES

1. PURPOSE AND SCOPE

The purpose of this study was to determine the general subsurface conditions at the project site by drilling ten (10) engineering test borings and to evaluate this data with respect to site development and foundation concept and design for the proposed fire station in Falmouth, Kentucky. Also, included is an evaluation of the site with respect to potential construction problems and recommendations related to earthwork and quality control during construction.

2. PROJECT AND SITE CHARACTERISTICS

Brandstetter Carroll, Inc. is planning for the design and construction of a new fire station located on US Highway 27 in Falmouth, Kentucky. The project site currently consists of an agricultural field. The general location of the project site is shown on the Vicinity Map (Figure 1 in the Appendix).

Based on review of the Floor Plan provided, the proposed fire station will consist of two 3,132 square feet apparatus bays, restrooms, several operations rooms, and an office. Associated parking stalls and entrances are also planned. Based on review of the Preliminary Layout Plan provided, site elevations range from about 860 feet at the east portion of the development to about 864 feet near the west portion of the development. We expect maximum cuts and fills of up to 2 feet will be required to achieve potential design grades. Maximum column, wall, and slab loads are not expected to exceed 75 kips, 3 klf, and 300 psf, respectively.

At the time of this report, grading and structural information is not available and should be provided to us for review once available. The approximate location of the proposed building is shown on the Boring Plan (Figure 2 in the Appendix).

3. GENERAL SUBSURFACE CONDITIONS

3.1 Site Geology

A review of Kentucky Geological Survey (KGS) publicly available mapping service indicates the site is underlain by the Fairview and Kope formations apart of the Falmouth Quadrangle. The Fairview formation primarily consists of interbedded limestone and shale. The limestone in this formation is more than 50 percent of the unit, dominantly medium gray to medium light gray, coarse to fine grained, and bioclastic. The Kope formation primarily consists of shale and limestone. The shale in this formation is about 80 percent of the formation, medium gray to light bluish gray and light olive gray, thickly to thinly laminated, and in sets commonly more than 2 feet thick and as much as 8 feet thick. Based on review of KGS Karst Potential Mapping, the Fairview and Kope formations are not prone to karst potential.

3.2 Subsurface Conditions

The general subsurface conditions were investigated by drilling 10 engineering test borings. The borings were drilled to macrocore refusal depths ranging from 0.2 to 3.4 feet below existing grade

(BEG). Borings were drilled at the approximate locations shown on the Boring Plan (Figure 2 in the Appendix).

The subsurface conditions disclosed by the field investigation are summarized in the following paragraphs. Detailed descriptions of the subsurface conditions encountered in each test boring are presented on the Test Boring Logs in the Appendix. The letters in parentheses following the soil descriptions are the soil classifications in accordance with the Unified Soil Classification System. It should be noted that the stratification lines shown on the soil boring logs represent approximate transitions between material types. In-situ stratum changes could occur gradually or at slightly different depths.

At the ground surface, all test borings revealed 1 to 2 inches of topsoil at the surface.

Native Lean Clay (CL) was encountered beneath surface materials at all borings excluding Borings B-2, P-2, P-3, and P-5. The lean clay was visually described as light brown with variable amounts of shale and limestone fragments. Lean clay materials extended to 0.5 to 1.0 feet BEG.

Native Fat Clay (CH) was encountered beneath surface materials at Borings B-2 and P-5. The fat clay was visually described as light brown with shale and limestone fragments. Fat clay materials extended to 1.0 to 1.3 feet BEG.

Weathered shale was encountered beneath lean clay and surface material at all boring locations. The weathered shale was visually described as brown in color and extended to depths of refusal ranging from 0.2 to 3.4 feet BEG.

The consistencies of the cohesive soils as described above and on the boring logs were estimated based on the results of the standard penetration test (ASTM D-1586).

All test borings drilled for this project were drilled to macrocore refusal. Macrocore refusal is defined herein as the depth at which a boring can no longer be advanced using macrocoring soil drilling methods and the refusal mechanism. The transition between soil and sound bedrock is typically gradual with depth, often undiscernible; therefore, the determination and estimation of required excavation method and volume can be difficult. Generally, our experiences suggests that material able to be penetrated by the drilling equipment is excavatable by mechanical means such and buckets and scrapers and materials below refusal may require blasting and hoe-ramming. In an area of limestone bedrock overlain by weathered shale bedrock and residual soil, refusal can result on weathered bedrock that includes fractured bedrock with clay filled joints or seams, on slabs of un-weathered limestone suspended in the residual soil matrix (“floaters”), on rock “pinnacles” rising above the surrounding bedrock surface, in crevices or on the upper surface of continuous bedrock. It is important to understand that macrocore refusal is not necessarily coincident with the bedrock surface since the drill tooling can penetrate the upper weathered or fractured bedrock in some cases. Macrocore refusal can also occur on obstructions such as debris, old foundations, slabs, etc. above the bedrock surface. It should be noted that bedrock may be encountered much shallower or deeper than the depths noted during this exploration.

3.3 Groundwater Conditions

Groundwater level observations were made both during and at the completion of drilling operations. Free water was not encountered above refusal at any of the boring locations for the short duration the boring was open. Groundwater levels may fluctuate in response to short-term and seasonal variations in precipitation, surface runoff, and local pockets of groundwater may be present at shallower depths in the profile during wetter periods. Subsurface water may be encountered as perched water within any existing fill, at the fill-native soil interface, or at the soil-bedrock interface. The observed groundwater levels may be locally influenced by such features.

3.4 Seismic Site Classification

A seismic site classification was performed, and design spectral responses were calculated using USGS Seismic Design Maps. Seismic design parameters were calculated based upon the observed subsurface soil profiles, and a maximum approximate depth to rock of four feet. We have assumed limestone and shale bedrock extends to 100 feet BEG. Recommended seismic design parameters follow:

Table 1: Seismic Site Design Parameters

Seismic Design Parameter	Parameter Value
Seismic Site Classification	B
Design Spectral Response at Short Periods (SD_S)	0.111g
Design Spectral Response at 1-Second Periods (SD_1)	0.055g

4. DESIGN RECOMMENDATIONS

Based on our analysis of the soil conditions and our understanding of the preliminary design details for this project as previously outlined, the following conclusions have been reached, and the following foundation recommendations developed. If the project characteristics are changed from those provided herein, or if different subsurface conditions are encountered, Atlas should be notified so that our recommendations can be reviewed, and any necessary modifications provided.

4.1 General Construction Considerations

This investigation identified actual subsurface conditions only at the boring locations selected. Even under the best of circumstances, the conditions encountered during construction can be expected to vary somewhat from the test boring results and may differ to the extent that modifications to the recommendations become necessary. Therefore, we recommend that Atlas be retained as the geotechnical consultant through the earth-related phases of this project to correlate actual soil and bedrock conditions with test boring data, identify variations, conduct additional tests that may be needed and recommend solutions to earth-related problems that may develop.

We expect the site is suitable for shallow foundation support, following the recommendations in this report. The following geotechnical concerns should be considered for design and construction of the proposed structures.

High Plasticity Fat Clays

High plasticity clays encountered at Borings B-2 and P-5 drilled for this project have the potential to undergo volume changes with fluctuations in moisture content and may be expansive or "heave" and settle or "shrink" under certain circumstances. Documented cases of heaving soils in the project area appear to result from a combination of several factors including the availability of excess moisture and the removal of overburden soil resulting in the loss of confining pressure. Although highly plastic soils were encountered at this site, the risk of heaving soil on this project can be managed by ensuring proper drainage of surface water away from the buildings, limiting irrigation watering near the buildings and preventing leaks in the water lines or drains since control of excess water sources is important to minimizing the risk of adverse effects of heaving soils. Further, fat clays encountered beneath slabs and pavement sections should be chemically stabilized or undercut and replaced with a minimum of 1.5 feet of low volume change material, such as lean clay or crushed stone. This undercut should extend below the bottom of the slab and/or pavement section.

Structures Bearing Partially on Rock and Soil

Structures bearing on both bedrock and soil may exhibit poor performance at the soil-rock interface, due to differential bearing conditions. Based on shallow bedrock encountered at the borings and potential cuts required to achieve a level building pad, it is likely that a combination of rock and soil may be encountered within foundation excavations, below floor slabs, and below pavements. Where isolated column foundations bear partially on rock and soil, the soil should be removed within the foundation footprint to rock and replaced with lean concrete. For wall footings, slabs, and pavements bearing partially on rock and soil, rock should be over-excavated by 1-foot and replaced by lean clay for a minimum distance of 40 feet from the rock-soil interface. Alternatively, the geotechnical engineer's representative can ensure that the depth to rock in the soil exposed areas grades shallow enough over the minimum 40 feet distance to ensure an adequate transition. For this project in particular, while not required, we expect it may be cost effective to bear the building foundations and slabs entirely on bedrock or on crushed stone directly on bedrock, based on long-term performance and improved design parameters.

4.2 Spread Footings

It is our opinion that, assuming proper site preparations are made as will be further discussed, the proposed building may be supported using conventional shallow spread footings bearing entirely on either stiff or better native clay soil, engineered fill, native bedrock, or lean concrete extending to stiff clays or bedrock. Footings bearing on the stiff or better naturally occurring clay soil or competent bedrock at this site or bearing within engineered fill placed directly on stiff natural soils or bedrock, can be designed for **a maximum net allowable soil bearing pressure of 3,000 pounds per square foot (psf)**. The allowable bearing capacity provided is based on a factor of safety of 3. Footings bearing completely on bedrock or crushed stone bearing directly on competent bedrock, can be designed for **a maximum net allowable soil bearing pressure of 5,000 pounds per square foot (psf)**.

All exterior footings should be established at a minimum depth of 24 inches or greater below finished exterior grades for frost protection, per Kentucky State Building Code. Interior footings in heated areas may be placed at any convenient depth if they bear within the designated foundation materials.

The footings should extend below any soils deemed unsuitable for support, such as unsuitably soft soil, down to stiff natural materials or competent bedrock. In lieu of extending the footings deeper than planned, the unsuitable materials could be undercut, and the resulting over-excavation backfilled with engineered fill, flowable fill, or lean concrete up to the design bottom of footing.

Rock coring was not performed as apart of this study. It is suggested to explore the bedrock prior to construction of the structure, particularly at foundation areas or areas where rock removal is anticipated.

In applying “net” allowable soil bearing pressures during footing design, the weight of the footings and backfill over the footings, including the floor slab, need not be included in total loads for dimensioning of footings. Wall footings should be at least twenty-four (24) inches in width, and isolated column footings should be at least thirty (30) inches square, regardless of the actual contact pressures developed, to minimize the possibility of “punching” shear failure. The previously stated recommended soil bearing capacity should be treated as an upper limit, and lower values may be utilized for foundation system design if desired.

All foundation bearing surfaces should be protected against freezing, flooding by surface water, and undue disturbance, since the foundation soils will tend to soften and lose strength when subjected to these conditions. Footing concrete should be placed the same day that footing excavations are completed. All footing excavations and bearing surfaces should be examined by a representative of Atlas to verify that conditions are compatible with the design recommendations before placing concrete.

Detailed settlement laboratory testing and subsequent analysis was beyond the scope of this exploration. However, based on the estimated structure loads, the anticipated behavior of soil types encountered during field activities, and our experience with similar projects, we expect that total settlements will not exceed 1-inch, and that differential settlements within the development will not exceed ¾-inch between columns or along continuous footing distances of 40 feet or less. We recommend the structure be designed to accommodate this magnitude of total and differential settlement. Settlement estimates are based, in part, upon the assumption that site preparation is performed in accordance with our recommendations and with good quality control of the earthworks. Removal of any unsuitable fill encountered, and proper placement and compaction of new fill is particularly important in keeping settlements within tolerable limits.

Uplift forces on the spread footings can be resisted by the weight of the footings and the soil material that is placed over the footings. It is recommended that the soil weight considered to resist uplift loads be limited to that immediately above and within the perimeter of the footings (unless a much higher factor of safety is used). A total soil unit weight of 120 lbs/cu.ft can be used for the backfill material placed above the footings, provided it is compacted as recommended in

Section 5.3. It is also recommended that a factor of safety of at least 1.3 be used for calculating uplift resistance from the footings (provided only the weight of the footing and the soil immediately above it is used to resist uplift forces).

Lateral forces on a spread footing can be resisted by the passive lateral earth pressure against the side of the footing and by friction between the soil and the base of the footing. A uniform ultimate passive pressure of 350 lbs/sq.ft can be used for that portion of the footing that is below a depth of 2 ft below the final exterior grade (no portion of the footing above this depth should use for lateral resistance). An ultimate coefficient of friction between the base of the footing and the underlying soil of 0.3 can be used in conjunction with the minimum downward load on the base of the footing.

Care must be exercised when excavating near the existing streets, utilities, etc. to protect the integrity of the existing foundations, and other features. Bracing or underpinning will be required where it is necessary to excavate below the bottom elevation of the existing streets, utilities, etc.

4.3 Floor Slabs

Floor slabs can be supported on stiff, low-plasticity natural soils or on new compacted structural fill. It is recommended that the slab-on-grade floors be supported on a minimum 6-inch-thick layer of relatively clean granular material such crushed stone. This is to help equalize moisture conditions beneath the floor slab and provide uniform support. Additionally, it will help protect the soil subgrade during construction activities and minimize the potential for required undercuts. Provided that a minimum of 6 inches of crushed stone is placed beneath the floor slabs, a modulus of subgrade reaction (k30) of 100 lbs/cu.in. can be used for design of the floor slabs bearing on stiff soils. A modulus of subgrade reaction (k30) of 300 lbs/cu.in. can be used for design of the floor slabs bearing on stiff soils crushed stone bearing directly on bedrock.

4.4 Pavement

Based on the soil conditions encountered in the test borings drilled at this site and in conjunction with our experience on similar projects in the near vicinity of this project site; it is possible that the pavement subgrade in some areas of the project will be or will become soft or yielding at the time of construction. These should be identified during proofrolling, and may require scarification and re-compaction, or other stabilization methods discussed in Section 5.1.

Controlling subsurface water in pavement areas is important to enhancing the long-term performance of the pavements. The pavement subgrade surface should be uniformly sloped to facilitate drainage through the granular base and to avoid ponding of water beneath the pavement. Subsurface perforated drainage pipes should at a minimum be included beneath the lowest lines of the pavement and between catch basins. Since the storm water catch basins in pavement areas are at the lowest points in pavement areas where water is often trapped beneath the pavements, they should be designed to allow water to drain from the aggregate base into the catch basins. At a minimum, subsurface perforated drainage pipes should be included that extend out beneath the pavement at least 20 feet from the catch basins in at least four directions in

addition to the other subsurface perforated drainage pipes included for the project. For perimeter catch basins, perforated drains should be extended in at least two directions.

The following report sections outline recommendations for asphalt and concrete pavements for automobile parking areas and truck zones. It is important to note that the recommendations for the automobile parking areas assume that these areas will not be subject to any heavy truck traffic. Therefore, in areas where truck traffic cannot be controlled (i.e., driveways), it is suggested that the thicker pavement section be utilized.

4.4.1 Asphalt Pavement

Based on the proposed site use, we expect that a combination of light and heavy-duty pavements is planned and will primarily be subject to heavy duty vehicle traffic such as fire trucks along with frequent light duty traffic and weekly garbage and delivery trucks. A CBR value of 3 has been considered for this analysis. Based on a design period of 20 years, the design equivalent single axle load (ESAL) and the conditions encountered at the site, the following asphalt pavement sections are recommended:

Automobile Parking Areas (no truck traffic)	1.5 inch of asphalt surface course 2.5 inch of asphalt base course 6 inch of granular base
Driveway Areas and Truck Zones[1]	1.5 inch of asphalt surface course 3.5 inch of asphalt base course 8 inch of granular base

[1]Note: For pavements bearing on crushed stone bearing directly on competent bedrock, the heavy duty section can be reduced to match the light duty section.

On request, we are available to perform calculations based on differing traffic loading, pavement thicknesses, or subgrade modification considerations. A geogrid supplier should be consulted to provide pavement design, if desired. A thinner pavement section would be acceptable to satisfy minimum criteria based on light duty traffic only. However, the **minimum** pavement section provided herein is strongly recommended to provide long-term stability, decreased maintenance, and more feasible remediation at the end of the pavement's useful life.

The base should be a well-graded crushed stone with a maximum of 14 percent (by weight) finer than the No. 200 sieve such in accordance with Kentucky Transportation Cabinet Standard (KYTC) Specifications for Dense Grade Aggregate (DGA).

4.4.2 Concrete Pavement

Concrete pavement thicknesses were determined from methods developed by the Portland Cement Association (PCA), the American Association of State Highway and Transportation Officials (AASHTO) and the American Concrete Institute (ACI). These methods assume that the subgrade is stiff, well-compacted and non-pumping and that all joints are properly designed, located, and sealed to minimize moisture seepage into the subgrade. It is also important to ensure that proper concrete curing practices will be employed, and that traffic will not be allowed until the

concrete has had sufficient time to cure. For design calculation purposes, the compressive strength of the concrete was assumed to be 4,000 lbs/sq.in. The modulus of subgrade reaction of the soil (k) was estimated to be 100 lbs/cu.in.

Based on the above information, the following concrete pavement sections are recommended:

Automobile Parking Areas (no truck traffic)	5 in. of concrete over minimum 6 in. of KTC DGA crushed stone over a well-compacted, non-pumping subgrade.
Driveway Areas and Truck Zones	6 in. of concrete over minimum 6 in. of KTC DGA crushed stone over a well-compacted, non-pumping subgrade.
High Shear Areas (entrance aprons) and Dumpers Pads	7 in. of concrete over minimum 6 in. of KTC DGA crushed stone over a well-compacted, non-pumping subgrade.

The performance of the asphalt and concrete paving sections is highly dependent on controlling the pumping and rutting of the subgrade soils during construction. It is important that surface and subgrade drainage be controlled to prevent water from ponding in pavement areas.

4.5 Site Grading and Drainage

Proper surface and subgrade drainage should be provided at the site to minimize any increase in moisture content of the foundation soils. Pavement subgrades should be sloped to drain and stone base underlying pavement sections should be daylighted (exposed and draining) where possible at the edge of pavements. The exterior grade should be sloped away from the structures to prevent ponding of water. Any roof drains or down spouts should be channeled or piped well away from the structure.

5. GENERAL CONSTRUCTION PROCEDURES AND RECOMMENDATIONS

Since this investigation identified actual subsurface conditions only at the test boring locations, it was necessary for our geotechnical engineers to extrapolate these conditions to characterize the entire project site. Even under the best of circumstances, the conditions encountered during construction should be expected to vary somewhat from the test boring results and may, in the extreme case, differ to the extent that modifications to the foundation recommendations become necessary. Therefore, we recommend that Atlas be retained as geotechnical consultant throughout the earth-related phases of this project to correlate actual soil conditions with test boring data, identify variations, conduct additional tests that may be needed and recommend solutions to earth-related problems that may develop.

5.1 Site Preparation

All areas that will support slabs and pavements should be properly prepared. After rough grade has been established and prior to placement of fill, the exposed subgrade should be carefully observed by the geotechnical engineer, or a qualified soils technician working under the direction

of the geotechnical engineer, by probing and testing as needed. Any organic material still in place, frozen, wet, soft, or loose soil, uncontrolled fill, existing demolition debris and pavements, foundation remnants, utilities, and other undesirable materials should be removed. The exposed subgrade should be evaluated by proofrolling with suitable equipment to check for pockets of soft material hidden beneath a thin crust of better soil. Any unsuitable materials thus exposed should be removed and replaced with well-compacted, engineered fill as outlined in Section 5.3.

It is important that positive surface drainage be established at the beginning of the earthwork operations and be maintained throughout the project. Surface water must not be allowed to pond. Furthermore, compaction and sealing of the subgrade surface is important when precipitation is expected. The site storm drainage elements (i.e., catch basins, pipes, manholes, etc.) should be installed as early as possible, which will aid in control of surface and ground water.

Care should be exercised during the grading operations at the site. Due to the nature of the near surface soils, the traffic of construction equipment may create pumping and general deterioration of the shallower soils, especially if excess surface water is present. The grading, therefore, should be done during a dry season, if possible. Based on our experience on other nearby sites, it is likely that the subgrade soils in some areas will be wet and soft when exposed. The extent to which yielding subgrade may be a problem is difficult to predict beforehand since it is dependent upon several factors including seasonal conditions, precipitation, cut depths, sequencing and scheduling of the earthwork, surface and subsurface drainage measures, the weight and traffic patterns of construction equipment, etc. In general, yielding subgrade problems are more prominent in cut areas (where the excavation exposes saturated or nearly saturated silty and clayey soils) or where little or no fill is placed. Therefore, it is suggested that provisions be made in the contract documents for subgrade improvements to be used where determined to be necessary in the field at the time of construction.

Unsuitable conditions can be particularly problematic if the construction will be done during seasons when more precipitation and cooler temperatures typically occur, such as in the late fall, winter, and spring (typically November through April). The extent to which yielding subgrades may be a problem is difficult to predict beforehand since it is dependent upon several factors, some of which are controllable and others that are not; including seasonal conditions, precipitation, cut depths, occurrence of saturated materials, sequencing and scheduling of the earthwork, surface and subsurface drainage measures, the weight and traffic patterns of construction equipment, etc. In general, yielding subgrade problems are more prominent in cut areas (where saturated or nearly saturated silty and clayey soils are exposed by the excavation or where such soils underlie more optimum materials) or where little or no fill is to be placed.

It may be possible to improve or stabilize the subgrade soils in the areas that are found to be excessively wet, soft, or yielding at the time of construction, by discing, aerating and recompacting (moisture conditioning). However, this will require a combination of time to allow for working the soils, favorable weather conditions for drying and firmer soils at shallow depth below the yielding soils to be successful. If site grading operations are planned through the winter months, subgrade stabilization is expected to be required as part of fill construction to aid in moisture conditioning during fill construction through the seasonably wetter winter months.

If it is not possible to improve the subgrade soils in this manner because of weather conditions, scheduling or other constraints or site conditions (which is most often the case); it is recommended that the subgrade soils be improved or modified using either chemical stabilization (i.e., cement), mechanical stabilization (i.e., a geogrid with additional crushed limestone placed over the subgrade), or removal of the unsuitable soils and replacement with crushed limestone or engineered soil fill. The best method for stabilizing the subgrade should be determined in the field at the time of construction based upon the actual field conditions in conjunction with the specific soil type encountered at the locations requiring stabilization, the size of the areas requiring stabilization and the construction schedule. For soil conditions such as those at this site, chemical stabilization is often the most cost-effective subgrade stabilization method particularly when large areas require stabilization. The chemical stabilization is typically performed in a single 14-16 inches thick lift and should be performed by a specialty contractor who has the necessary equipment and experience in the application of chemical stabilization methods. The site soils should be evaluated by the contractor to identify the most suitable approach.

5.2 Rock Excavation

Weathered to competent bedrock was encountered transitioning to refusal with depth and is likely to require hoe ramming and blasting to achieve desired grades if excavations and final grades are deeper than the refusal depths. The soils and weathered rock above refusal depths from the borings can generally be expected to be rippable and able to be excavated with a heavy duty excavator. Mass rock excavation via blasting may be required in building, utility corridors and detention areas due to shallow rock, pending proposed grades.

Rock coring was not performed as apart of this study. It is suggested to explore the bedrock prior to construction of the structure, particularly at foundation areas or areas where rock removal is anticipated.

All temporary excavations for foundations, utilities or other underground structures should be laid back or braced as required by current Occupational Safety and Health Administration (OSHA) requirements.

5.3 Fill Compaction

All engineered fill beneath footings, floor slabs, and pavements should be compacted to a dry density of at least 98 percent of the standard Proctor maximum dry density (ASTM D-698). For soil, the compaction should be accomplished by placing the fill in about 8 inches (or less) loose lifts and mechanically compacting each lift to at least the specified minimum dry density.

It is recommended that only well-graded granular material, such as pit-run sand, gravel, or KYTC DGA crushed stone or lean concrete be used to fill undercut excavations beneath footings and other excavations of limited lateral dimensions where proper compaction of cohesive materials is difficult, and compaction can only be accomplished with hand-held vibratory equipment.

Soil fill materials should be compacted using a non-vibratory sheeps-foot roller and aggregate fill materials should be compacted using a vibratory smooth-drum roller or as judged acceptable by

the geotechnical engineer. Field density tests should be performed on each lift as necessary to ensure that adequate moisture conditioning and compaction is being achieved.

Prior to beginning fill construction, we recommend samples of proposed borrow materials be collected for standard Proctor testing. The following criteria are recommended where soil material is utilized for structural fill:

- Soils referred to as 'low volume change" in this report have a Liquid Limit less than 50 percent.
- Limit maximum particle sizes to 4-inches (in the largest dimension) and less than 3 percent organic material by weight.
- The maximum dry density (ASTM D-1557) should be at least 100 pcf
- The soil fill should meet the requirements of the Unified Soil Classification System (USCS) (ASTM D-2487) as either CL, CL-ML, SM, SC, SP-SM, SC-SM, SP-SC, SW-SM, SW-SC, GW-GM or GW-GC
- The use of poorly-graded gravel materials such as KYTC No. 57 Stone should not be permitted as engineered fill.
- Fill consisting of non-cohesive granular soils should be a well-graded with sufficient material finer than the No. 200 sieve, similar to Kentucky Transportation Cabinet Standard (KYTC) Specifications for Dense Grade Aggregate (DGA).
- Maintain the moisture content of the fill soils to within ±2 percentage points of the soils' optimum moisture content.
- Perform one in-place density test in every 5,000 square feet for each fill layer, with a minimum of two tests per lift.
- Retain the geotechnical engineer to observe, document and test fill placement and compaction operations.
- Provide and maintain efficient drainage of building and pavement subgrades both during and after construction to prevent ponding of water and to promote rapid and efficient surface drainage.
- Maintain positive surface drainage to prevent water from ponding on surfaces during all earthwork operations.
- Roll fill surfaces with a rubber-tired or steel-drummed roller prior to precipitation events to improve surface runoff if precipitation is expected.
- Contact the geotechnical engineer should the subgrade soils become excessively wet, dry, or frozen.

5.4 Footing Excavation Observations

The soil at the base of each spread footing excavation should be observed and evaluated by a geotechnical engineer or a qualified soils technician working under the direction of the geotechnical engineer to ensure that any remnants from previous construction, old fill material, soft natural soil and any otherwise undesirable material is identified and removed at footing locations and that the footing will bear on satisfactory material. At the time of such inspection, it will be necessary to make hand auger borings or use a hand penetration device in the base of the foundation excavation to determine whether the soils below the base are satisfactory for foundation support. The necessary depth of penetration will be established during inspection.

Where undercutting is required to remove unsuitable materials beneath footings, the proposed footing bearing elevation may be re-established by backfilling after all undesirable materials have been removed. The undercut excavation beneath each footing should extend to suitable bearing soils. The dimensions of the excavation base should be determined by imaginary planes extending downward and outward on a 2 (vertical) to 1 (horizontal) slope from the base perimeter of the footing. The entire excavation should then be refilled with engineered fill. The engineered fill should be limited to low plasticity site soils or well-graded crushed stone (e.g., KYTC DGA) compacted to the minimum dry density recommended in Section 5.3; or lean concrete or cementitious flowable fill may be used. Special care should be exercised to remove any sloughed, loose or soft materials near the base of the excavation slopes. In addition, special care should be taken to "tie-in" the compacted fill with the excavation slopes with benches as necessary. This is to ensure that no pockets of loose or soft materials will be left in place along the excavation slopes below the foundation bearing level.

Soils exposed in the bases of all satisfactory foundation excavations should be protected against any detrimental change in condition such as from disturbance, rain and freezing. Surface run-off water should be drained away from the excavation and not allowed to pond. If possible, all footing concrete should be placed the same day the excavation is made. If this is not practical, the footing excavations should be adequately protected. It is recommended that a concrete “mud mat” be placed at the base of the footing excavations to protect the subgrade soils from deterioration due to seepage of ground water, surface water, etc., and to aid in the proper placement of reinforcing steel.

5.5 Construction Dewatering

Encountered ground water levels during the exploration does not appear to require any specific consideration during construction. However, depending on the seasonal conditions, some seepage into excavations may be experienced, particularly during rock excavation. It is anticipated that such seepage can be handled by conventional dewatering methods such as by pumping from sumps. However, in cases where a saturated layer is encountered in the base or sidewall of the excavation, it will not be possible to pump water directly from the base of the excavation without causing deterioration of the subgrade soil. In this case, it will be necessary to pump from a sump located adjacent to the excavation or to depress the ground water using wells or well points. The best dewatering system for each case must be determined at the time of construction based upon actual field conditions. Dewatering is not expected to be required.

6. FIELD INVESTIGATION

Field exploration included the performance of ten (10) soil test borings located approximately as shown on the enclosed Boring Plan (Figure 2 in the Appendix). Test borings were performed with a track-mounted drilling rig. Samples of the in-situ soils were obtained employing split-barrel sampling procedures in general accordance with ASTM Standard Method D-1586. Observations regarding groundwater levels, and other pertinent conditions were made at each boring location.

The encountered materials have been visually classified by the Atlas's engineering staff using the Unified Soil Classification System and are described in detail on the boring logs in the Appendix. The results of the field penetration test, strength tests, Atterberg Limit tests, water level observations and laboratory moisture content determinations are presented on the boring logs in numerical form. Samples of the soils encountered in the field were placed in sealed containers and are stored in the laboratory for further analysis, if desired. Unless notified to the contrary, all samples will be disposed of in thirty (30) days from the date of this report. In addition, a "Field Classification System for Soil Exploration" document defining the terms and symbols used on the logs and explaining the Standard Penetration Test procedure is provided immediately following the laboratory summary and results.

7. LABORATORY INVESTIGATION

In conjunction with the field exploration, a laboratory testing program was conducted to determine pertinent engineering characteristics of the subsurface materials as necessary for development of engineering recommendations. The laboratory-testing program included visual classification of all samples. Natural moisture content and Atterberg Limit tests were conducted on selected soil samples. All phases of the laboratory-testing program were conducted in general accordance with applicable ASTM specifications and procedures.

8. LIMITATIONS OF STUDY

An inherent limitation of any geotechnical engineering study is that conclusions must be drawn on the basis of data collected at a limited number of discrete locations. The recommendations provided in this report were developed from the information obtained from the test borings that depict subsurface conditions only at these specific locations and at the time designated on the logs. Soil and bedrock conditions at other locations may differ from conditions occurring at these boring locations. The nature and extent of variations between the borings may not become evident until the course of construction. If variations then appear evident, it will be necessary to re-evaluate the recommendations of this report after performing on-site observations during the excavation period and noting the characteristics of any variation.

Our professional services have been performed, our findings obtained, and our recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices. This warranty is in lieu of all other warranties either express or implied. This company is not responsible for the independent conclusions, opinions or recommendations made by others based on the field exploration and laboratory test data presented in this report.

The scope of our services does not include any environmental assessment or investigation for the presence or absence of hazardous or toxic materials in the soil, ground water or surface water within or beyond the site studied.

Atlas assumes no responsibility for any construction procedures, temporary excavations (including utility trenches), temporary dewatering or site safety during or after construction. The contractor will be solely responsible for all construction procedures, construction means and methods, construction sequencing and for safety measures during construction. All applicable federal, state and local laws and regulations regarding construction safety must be followed, including current Occupational Safety and Health Administration (OSHA) Regulations including OSHA 29 CFR Part 1926 “Safety and Health Regulations for Construction”, Subpart P “Excavations”, and/or successor regulations. The Contractor is solely responsible for designing and constructing stable, temporary excavations and should brace, shore, slope, or bench the sides of the excavations as necessary to maintain stability of the excavation sides and bottom.

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, you can benefit from a lowered exposure to problems associated with subsurface conditions at project sites and development of them that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed herein, contact your GBA-member geotechnical engineer. Active engagement in GBA exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Understand the Geotechnical-Engineering Services Provided for this Report

Geotechnical-engineering services typically include the planning, collection, interpretation, and analysis of exploratory data from widely spaced borings and/or test pits. Field data are combined with results from laboratory tests of soil and rock samples obtained from field exploration (if applicable), observations made during site reconnaissance, and historical information to form one or more models of the expected subsurface conditions beneath the site. Local geology and alterations of the site surface and subsurface by previous and proposed construction are also important considerations. Geotechnical engineers apply their engineering training, experience, and judgment to adapt the requirements of the prospective project to the subsurface model(s). Estimates are made of the subsurface conditions that will likely be exposed during construction as well as the expected performance of foundations and other structures being planned and/or affected by construction activities.

The culmination of these geotechnical-engineering services is typically a geotechnical-engineering report providing the data obtained, a discussion of the subsurface model(s), the engineering and geologic engineering assessments and analyses made, and the recommendations developed to satisfy the given requirements of the project. These reports may be titled investigations, explorations, studies, assessments, or evaluations. Regardless of the title used, the geotechnical-engineering report is an engineering interpretation of the subsurface conditions within the context of the project and does not represent a close examination, systematic inquiry, or thorough investigation of all site and subsurface conditions.

Geotechnical-Engineering Services are Performed for Specific Purposes, Persons, and Projects, and At Specific Times

Geotechnical engineers structure their services to meet the specific needs, goals, and risk management preferences of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client.

Likewise, geotechnical-engineering services are performed for a specific project and purpose. For example, it is unlikely that a geotechnical-engineering study for a refrigerated warehouse will be the same as one prepared for a parking garage; and a few borings drilled during a preliminary study to evaluate site feasibility will not be adequate to develop geotechnical design recommendations for the project.

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project or purpose;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, the reliability of a geotechnical-engineering report can be affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying the recommendations in it. A minor amount of additional testing or analysis after the passage of time – if any is required at all – could prevent major problems.

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read the report in its entirety. Do not rely on an executive summary. Do not read selective elements only. *Read and refer to the report in full.*

You Need to Inform Your Geotechnical Engineer About Change

Your geotechnical engineer considered unique, project-specific factors when developing the scope of study behind this report and developing the confirmation-dependent recommendations the report conveys. Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the elevation, configuration, location, orientation, function or weight of the proposed structure and the desired performance criteria;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project or site changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept*

responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface using various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing is performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgement to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team through project completion to obtain informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, they are not final, because the geotechnical engineer who developed them relied heavily on judgement and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* exposed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a continuing member of the design team, to:

- confer with other design-team members;
- help develop specifications;
- review pertinent elements of other design professionals' plans and specifications; and
- be available whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction-phase observations.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for information purposes only.* To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. This happens in part because soil and rock on project sites are typically heterogeneous and not manufactured materials with well-defined engineering properties like steel and concrete. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

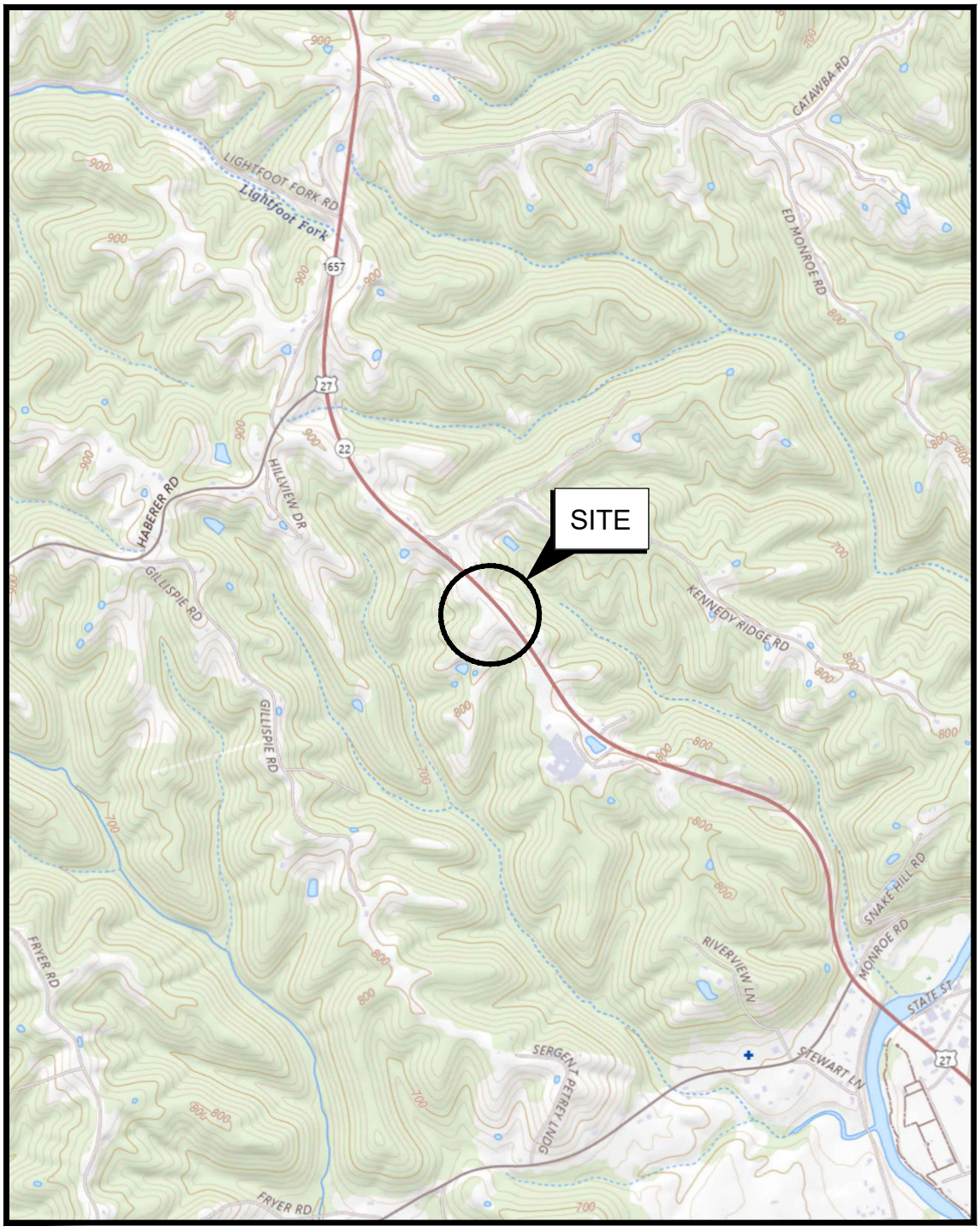
The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually provide environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures.* If you have not obtained your own environmental information about the project site, ask your geotechnical consultant for a recommendation on how to find environmental risk-management guidance.

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, the engineer's services were not designed, conducted, or intended to prevent migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration. Confront the risk of moisture infiltration*** by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are not building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

Telephone: 301/565-2733
e-mail: info@geoprofessional.org www.geoprofessional.org



N

VICINITY MAP

PROPOSED PENDLETON COUNTY FIRE STATION
SOUTH SIDE OF US-27
APPROXIMATELY 900 SOUTHEAST OF KENNEDY RIDGE ROAD

Project Number: LOUGE24111		Drn. By: JG
Date: 10/01/2024	Scale: 1" = 2,000'	Ckd. By: ZN
ATLAS		1

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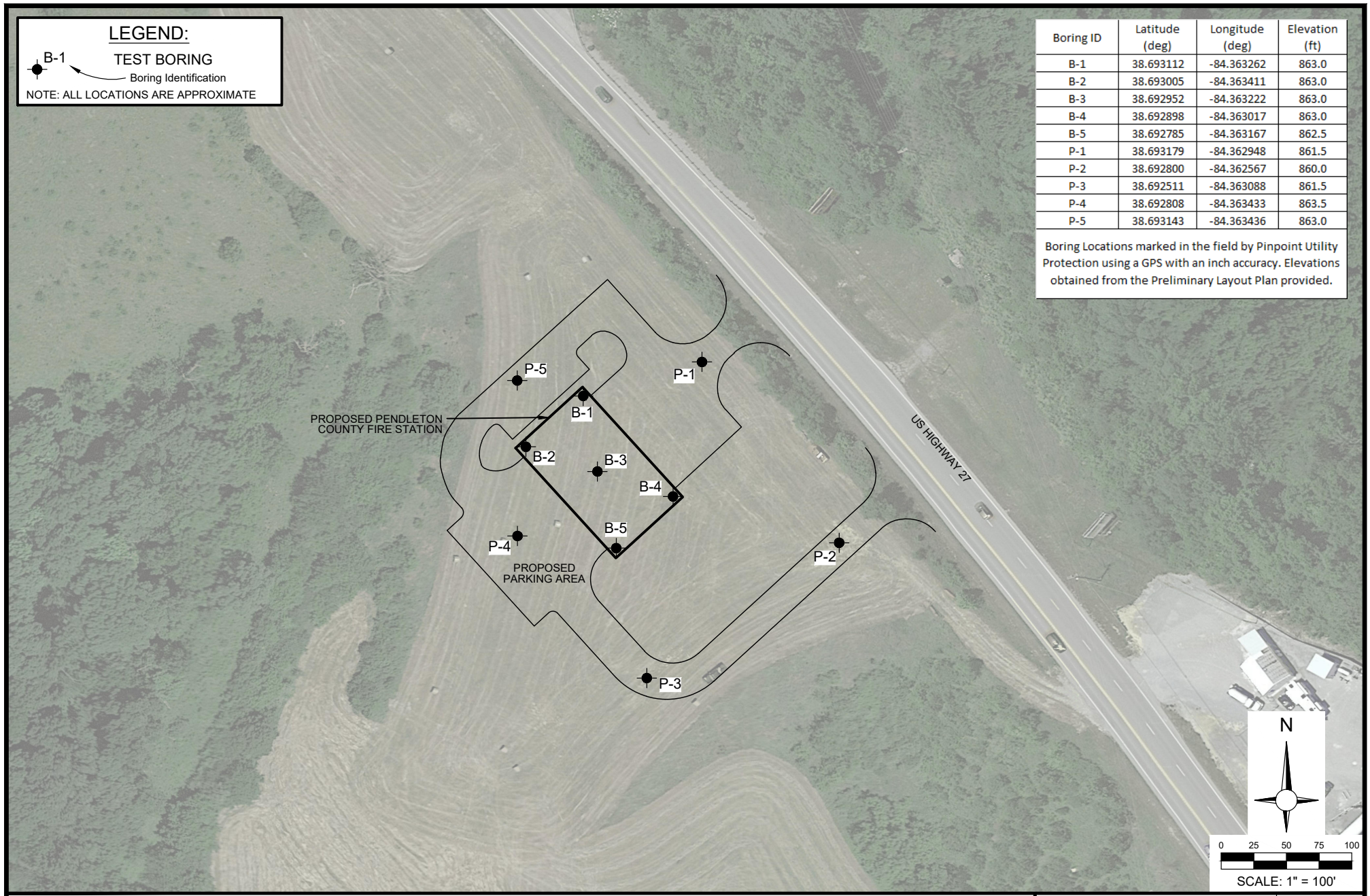

Boring ID	Latitude (deg)	Longitude (deg)	Elevation (ft)
B-1	38.693112	-84.363262	863.0
B-2	38.693005	-84.363411	863.0
B-3	38.692952	-84.363222	863.0
B-4	38.692898	-84.363017	863.0
B-5	38.692785	-84.363167	862.5
P-1	38.693179	-84.362948	861.5
P-2	38.692800	-84.362567	860.0
P-3	38.692511	-84.363088	861.5
P-4	38.692808	-84.363433	863.5
P-5	38.693143	-84.363436	863.0

Boring Locations marked in the field by Pinpoint Utility Protection using a GPS with an inch accuracy. Elevations obtained from the Preliminary Layout Plan provided.

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BORING PLAN

PROPOSED PENDLETON COUNTY FIRE STATION
SOUTH SIDE OF US-27
APPROXIMATELY 900 SOUTHEAST OF KENNEDY RIDGE ROAD

Project Number: LOUGE24111		Drn. By: MS
Date: 09/06/2024	Scale: AS SHOWN	Ckd. By: ZN
		2

LEGEND TO CLASSIFICATION AND SYMBOLS

SOIL TYPES

(Shown in Graphic Log)

SAMPLER TYPES

(Shown in Sampler Column)

ATLAS

CONSISTENCY OF COHESIVE SOILS

(Automatic Hammer)

SPT "N" VALUE	CONSISTENCY	UNCONFINED COMPRESSIVE STRENGTH (PSF)
<2	Very Soft	<500
2-3	Soft	500-1,000
4-6	Medium Stiff	1,000-2,000
7-12	Stiff	2,000-4,000
13-26	Very Stiff	4,000-8,000
>26	Hard	>8,000

RELATIVE DENSITY OF COHESIONLESS SOILS

SPT "N" VALUE	RELATIVE DENSITY
<5	Very Loose
5 to 10	Loose
11 to 30	Medium Dense
31 to 50	Dense
>50	Very Dense

ESTIMATES RELATIVE MOISTURE CONDITION

(Visual classification relative to assumed optimum moisture content (OMC) of standard proctor)

Dry	-Air dry to dusty
Slightly Moist	-Dusty to approximate -2% OMC
Moist	-Approximate ±2% OMC
Very Moist	-Approximate +2% OMC to saturated
Wet	-Contains free water and/or saturated

RELATIVE HARDNESS OF ROCK

(Automatic Hammer)

Very Soft	-Pieces 1 inch or more in thickness can be broken by finger pressure.
Soft	-May be broken with fingers
Medium	-Corners and edges may be broken with fingers
Moderately Hard	-Moderate blow of hammer required to break sample
Hard	-Hard blow of hammer required to break sample
Very Hard	-Several hard blows of hammer required to break sample

RELATIVE WEATHERING OF ROCK

Fresh	-No visible sign of weathering, slight discoloration
Slightly	-Discoloration and discontinuity surfaces
Moderately	-Less than half disintegrated, significant discoloration
Highly	-More than half disintegrated
Completely	-All rock disintegrated into soil. Rock matrix intact.
Residual Soil	-All rock converted to soil. Rock matrix destroyed.

PARTICLE SIZE IDENTIFICATION

(ASTM D2488)

Boulders	> 12 inches
Cobbles	12 to 3 inches
Gravel	
Coarse	3 to ¾ inches
Fine	¾ to 4.75 mm
Sand [1]	
Coarse	4.75 to 2 mm
Medium	2 to 0.425
Fine	0.425 to 0.075 mm
Silt or Clay [2]	<0.075 mm

1. *No. 4 Sieve to No. 200 Sieve*
2. *Finer than No. 200 Sieve*

PROPORTION OF SAND AND GRAVEL

(By Dry Weight)

Trace	<15%
With	15 to 29%
Modifier	>29%

PROPORTION OF FINES

(By Dry Weight)

Trace	<5%
With	5 to 12%
Modifier	>12%

TERMS

Standard Penetration Test "N" Value (SPT "N" Value)	Number of blows required to drive a 1.4 inch (inside diameter) split spoon sampler 1 foot by a 140 pound hammer falling 30 inches
Recovery (REC)	Total length of rock recovered in the core barrel divided by the total length of the core run
Rock Quality Designation (RQD)	Total length of sound rock segments recovered longer or equal to 4 inches divided by the total length of core run

Atlas Technical Consultants, LLC
2724 River Green Circle
Louisville, KY 40206
(502) 722-1401
Fax (502) 267-4072

TEST BORING LOG

CLIENT **Pendleton County**
PROJECT NAME **Pendleton County Fire Station**
PROJECT LOCATION **US 27**
Falmouth, Kentucky

BORING # **B-1**
JOB # **LOUGE24111**
DRAWN BY **P. Presnell**
APPROVED BY **R. Ortiz**

DRILLING and SAMPLING INFORMATION

Date Started	9/18/24	Hammer Wt.	140 lbs.
Date Completed	9/18/24	Hammer Drop	30 in.
Drill Foreman	M. Reynolds	Spoon Sampler OD	2 in.
Inspector	P. Presnell	Rock Core Dia.	2 in.
Boring Method	Macrocore, AH	Shelby Tube OD	3 in.

SURFACE ELEVATION (ft): 863.0
Latitude (deg): 38.693112, Longitude (deg): -84.363262

SOIL CLASSIFICATION	Stratum Depth	Depth Scale	Sample No.	Sample Type	Sampler Graphics Recovery Graphics	Groundwater	Standard Penetration Test Blows per 6" [*N-Value*] *blows/foot*	Qu-tsf Unconfined Compressive Strength	PP-tsf Pocket Penetrometer	Moisture Content %	Liquid Limit (LL)	Plastic Limit (PL)	Percent Passing #200 Sieve	Remarks
TOPSOIL	0.1													
LEAN CLAY (CL), Light brown, with shale and limestone fragments			1	SS			10-50/2"- [*50/2"*]		N/A	10.2				
WEATHERED SHALE, Brown, with limestone fragments	0.7													Classified from 0.7 to 1.8 feet based on macrocore cuttings
Refusal at 1.8 feet	1.8													

Sample Type
SPT - Standard Penetration Test
SS - Driven Split Spoon
SH - Pressed Shelby Tube
CA - Continuous Flight Auger
RC - Rock Core
CU - Cuttings
CT - Continuous Tube

Depth to Groundwater

Noted on Drilling Tools	- ft	
At Completion (in augers)	- ft	
At Completion (open hole)	- ft	
After - hours	- ft	
After - hours	- ft	
Cave Depth	- ft	

Boring Method
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling

Atlas Technical Consultants, LLC
2724 River Green Circle
Louisville, KY 40206
(502) 722-1401
Fax (502) 267-4072

TEST BORING LOG

CLIENT **Pendleton County**
PROJECT NAME **Pendleton County Fire Station**
PROJECT LOCATION **US 27**
Falmouth, Kentucky

BORING # **B-2**
JOB # **LOUGE24111**
DRAWN BY **P. Presnell**
APPROVED BY **R. Ortiz**

DRILLING and SAMPLING INFORMATION

Date Started	9/18/24	Hammer Wt.	140 lbs.
Date Completed	9/18/24	Hammer Drop	30 in.
Drill Foreman	M. Reynolds	Spoon Sampler OD	2 in.
Inspector	P. Presnell	Rock Core Dia.	2 in.
Boring Method	Macrocore, AH	Shelby Tube OD	3 in.

SOIL CLASSIFICATION

SURFACE ELEVATION (ft): 863.0
Latitude (deg): 38.693005, Longitude (deg): -84.363411

Stratum Depth	Depth Scale	Sample No.	Sample Type	Sampler Graphics / Recovery Graphics	Groundwater	Standard Penetration Test Blows per 6" [*N-Value*] *blows/foot*	Qu-tsf Unconfined Compressive Strength	PP-tsf Pocket Penetrometer	Moisture Content %	Liquid Limit (LL)	Plastic Limit (PL)	Percent Passing #200 Sieve	Remarks
TOPSOIL													
0.1		1	SS			7-5-50/4" [*50/4"*]		N/A	7.6	60	25		
FAT CLAY (CH), Light brown, with shale and limestone fragments													
1.0													
WEATHERED SHALE, Brown													
2.1													
Refusal at 2.1 feet													

Sample Type
SPT - Standard Penetration Test
SS - Driven Split Spoon
SH - Pressed Shelby Tube
CA - Continuous Flight Auger
RC - Rock Core
CU - Cuttings
CT - Continuous Tube

Depth to Groundwater

Noted on Drilling Tools	- ft
At Completion (in augers)	- ft
At Completion (open hole)	- ft
After - hours	- ft
After - hours	- ft
Cave Depth	- ft

Boring Method
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling

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TEST BORING LOG

CLIENT **Pendleton County**
PROJECT NAME **Pendleton County Fire Station**
PROJECT LOCATION **US 27**
Falmouth, Kentucky

BORING # **B-3**
JOB # **LOUGE24111**
DRAWN BY **P. Presnell**
APPROVED BY **R. Ortiz**

DRILLING and SAMPLING INFORMATION

Date Started	9/18/24	Hammer Wt.	140 lbs.
Date Completed	9/18/24	Hammer Drop	30 in.
Drill Foreman	M. Reynolds	Spoon Sampler OD	2 in.
Inspector	P. Presnell	Rock Core Dia.	2 in.
Boring Method	Macrocore, AH	Shelby Tube OD	3 in.

TEST DATA

SOIL CLASSIFICATION	Stratum Depth	Depth Scale	Sample No.	Sample Type	Sampler Graphics Recovery Graphics	Groundwater	Standard Penetration Test Blows per 6" [*N-Value*] *blows/foot*	Qu-tsf Unconfined Compressive Strength	PP-tsf Pocket Penetrometer	Moisture Content %	Liquid Limit (LL)	Plastic Limit (PL)	Percent Passing #200 Sieve	Remarks
SURFACE ELEVATION (ft): 863.0 Latitude (deg): 38.692952, Longitude (deg): -84.363222														
TOPSOIL	0.1													
LEAN CLAY (CL), Light brown, with shale fragments			1	SS			5- 50/5"- [*50/5"*]		N/A	11.8				
WEATHERED SHALE, Brown	0.5													
Refusal at 1.8 feet	1.8													

Sample Type
SPT - Standard Penetration Test
SS - Driven Split Spoon
SH - Pressed Shelby Tube
CA - Continuous Flight Auger
RC - Rock Core
CU - Cuttings
CT - Continuous Tube

Depth to Groundwater

Noted on Drilling Tools	-	ft
At Completion (in augers)	-	ft
At Completion (open hole)	-	ft
After - hours	-	ft
After - hours	-	ft
Cave Depth	-	ft

Boring Method
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling

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TEST BORING LOG

CLIENT **Pendleton County**
PROJECT NAME **Pendleton County Fire Station**
PROJECT LOCATION **US 27**
Falmouth, Kentucky

BORING # **B-4**
JOB # **LOUGE24111**
DRAWN BY **P. Presnell**
APPROVED BY **R. Ortiz**

DRILLING and SAMPLING INFORMATION

Date Started	9/18/24	Hammer Wt.	140 lbs.
Date Completed	9/18/24	Hammer Drop	30 in.
Drill Foreman	M. Reynolds	Spoon Sampler OD	2 in.
Inspector	P. Presnell	Rock Core Dia.	2 in.
Boring Method	Macrocore, AH	Shelby Tube OD	3 in.

SOIL CLASSIFICATION

SURFACE ELEVATION (ft): 863.0
Latitude (deg): 38.692898, Longitude (deg): -84.363017

Stratum Depth	Depth Scale	Sample No.	Sample Type	Sampler Graphics / Recovery Graphics	Groundwater	Standard Penetration Test Blows per 6" [*N-Value*] *blows/foot*	Qu-tsf Unconfined Compressive Strength	PP-tsf Pocket Penetrometer	Moisture Content %	Liquid Limit (LL)	Plastic Limit (PL)	Percent Passing #200 Sieve	Remarks
0.1		1	SS			4-50/5"-[*50/5"*]		N/A	14.2				

TOPSOIL

LEAN CLAY (CL), Light brown, trace veiny root fragments, with shale fragments

0.5

WEATHERED SHALE, Brown

1.7

Refusal at 1.7 feet

Sample Type
SPT - Standard Penetration Test
SS - Driven Split Spoon
SH - Pressed Shelby Tube
CA - Continuous Flight Auger
RC - Rock Core
CU - Cuttings
CT - Continuous Tube

Depth to Groundwater

Noted on Drilling Tools	-	ft
At Completion (in augers)	-	ft
At Completion (open hole)	-	ft
After - hours	-	ft
After - hours	-	ft
Cave Depth	-	ft

Boring Method
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling

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TEST BORING LOG

CLIENT **Pendleton County** BORING # **B-5**

PROJECT NAME **Pendleton County Fire Station** JOB # **LOUGE24111**

PROJECT LOCATION **US 27** DRAWN BY **P. Presnell**

Falmouth, Kentucky APPROVED BY **R. Ortiz**

DRILLING and SAMPLING INFORMATION

Date Started	9/18/24	Hammer Wt.	140 lbs.
Date Completed	9/18/24	Hammer Drop	30 in.
Drill Foreman	M. Reynolds	Spoon Sampler OD	2 in.
Inspector	P. Presnell	Rock Core Dia.	2 in.
Boring Method	Macrocore, AH	Shelby Tube OD	3 in.

SURFACE ELEVATION (ft): 862.5

Latitude (deg): 38.692785, Longitude (deg): -84.363167

SOIL CLASSIFICATION	Stratum Depth	Depth Scale	Sample No.	Sample Type	Sampler Graphics / Recovery Graphics	Groundwater	Standard Penetration Test Blows per 6" [*N-Value*] *blows/foot*	Qu-tsf Unconfined Compressive Strength	PP-tsf Pocket Penetrometer	Moisture Content %	Liquid Limit (LL)	Plastic Limit (PL)	Percent Passing #200 Sieve	Remarks
TOPSOIL	0.1													
LEAN CLAY (CL), Light brown and Brown, trace veiny root fragments, with shale fragments			1	SS			4-9-50/2" [*50/2"*]		N/A	10.3				
WEATHERED SHALE, Brown	1.0													
Refusal at 1.9 feet	1.9													

TEST DATA

Sample Type
- SPT - Standard Penetration Test
- SS - Driven Split Spoon
- SH - Pressed Shelby Tube
- CA - Continuous Flight Auger
- RC - Rock Core
- CU - Cuttings
- CT - Continuous Tube

Depth to Groundwater

Noted on Drilling Tools	- ft	
At Completion (in augers)	- ft	
At Completion (open hole)	- ft	
After - hours	- ft	
After - hours	- ft	
Cave Depth	- ft	

Boring Method
- HSA - Hollow Stem Augers
- CFA - Continuous Flight Augers
- DC - Driving Casing
- MD - Mud Drilling

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TEST BORING LOG

CLIENT **Pendleton County**
PROJECT NAME **Pendleton County Fire Station**
PROJECT LOCATION **US 27**
Falmouth, Kentucky

BORING # **P-1**
JOB # **LOUGE24111**
DRAWN BY **P. Presnell**
APPROVED BY **R. Ortiz**

DRILLING and SAMPLING INFORMATION

Date Started	9/18/24	Hammer Wt.	140 lbs.
Date Completed	9/18/24	Hammer Drop	30 in.
Drill Foreman	M. Reynolds	Spoon Sampler OD	2 in.
Inspector	P. Presnell	Rock Core Dia.	2 in.
Boring Method	Macrocore, AH	Shelby Tube OD	3 in.

SOIL CLASSIFICATION

SURFACE ELEVATION (ft): 861.5
Latitude (deg): 38.693179, Longitude (deg): -84.362948

Stratum Depth	Depth Scale	Sample No.	Sample Type	Sampler Graphics Recovery Graphics	Groundwater	Standard Penetration Test Blows per 6" [*N-Value*] *blows/foot*	Qu-tsf Unconfined Compressive Strength	PP-tsf Pocket Penetrometer	Moisture Content %	Liquid Limit (LL)	Plastic Limit (PL)	Percent Passing #200 Sieve	Remarks
TOPSOIL			SS			8-35-50/5" [*50/5"*]		N/A	7.8				
0.2													
LEAN CLAY (CL), Light brown, with shale and limestone fragments		1											
0.8													
WEATHERED SHALE, Brown, with limestone fragments													Classified from 0.8 to 3.4 feet based on macrocore cuttings
3.4													
Refusal at 3.4 feet													

Sample Type
SPT - Standard Penetration Test
SS - Driven Split Spoon
SH - Pressed Shelby Tube
CA - Continuous Flight Auger
RC - Rock Core
CU - Cuttings
CT - Continuous Tube

Depth to Groundwater

Noted on Drilling Tools	- ft	
At Completion (in augers)	- ft	
At Completion (open hole)	- ft	
After - hours	- ft	
After - hours	- ft	
Cave Depth	- ft	

Boring Method
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling

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TEST BORING LOG

CLIENT **Pendleton County**
PROJECT NAME **Pendleton County Fire Station**
PROJECT LOCATION **US 27**
Falmouth, Kentucky

BORING # **P-2**
JOB # **LOUGE24111**
DRAWN BY **P. Presnell**
APPROVED BY **R. Ortiz**

DRILLING and SAMPLING INFORMATION

Date Started	9/18/24	Hammer Wt.	140 lbs.
Date Completed	9/18/24	Hammer Drop	30 in.
Drill Foreman	M. Reynolds	Spoon Sampler OD	2 in.
Inspector	P. Presnell	Rock Core Dia.	2 in.
Boring Method	Macrocore, AH	Shelby Tube OD	3 in.

SOIL CLASSIFICATION

SURFACE ELEVATION (ft): 860.0
Latitude (deg): 38.6928, Longitude (deg): -84.362567

TEST DATA

SOIL CLASSIFICATION	Stratum Depth	Depth Scale	Sample No.	Sample Type	Sampler Graphics Recovery Graphics	Groundwater	Standard Penetration Test Blows per 6" [*N-Value*] *blows/foot*	Qu-tsf Unconfined Compressive Strength	PP-tsf Pocket Penetrometer	Moisture Content %	Liquid Limit (LL)	Plastic Limit (PL)	Percent Passing #200 Sieve	Remarks
TOPSOIL	0.2		1	SS			50/4"-- [*50/4"*]		N/A	8.9				
WEATHERED SHALE, Brown, with limestone fragments														
Refusal at 1.2 feet	1.2													

Sample Type
SPT - Standard Penetration Test
SS - Driven Split Spoon
SH - Pressed Shelby Tube
CA - Continuous Flight Auger
RC - Rock Core
CU - Cuttings
CT - Continuous Tube

Depth to Groundwater

Noted on Drilling Tools	- ft	
At Completion (in augers)	- ft	
At Completion (open hole)	- ft	
After - hours	- ft	
After - hours	- ft	
Cave Depth	- ft	

Boring Method
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling

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TEST BORING LOG

CLIENT **Pendleton County** BORING # **P-3**

PROJECT NAME **Pendleton County Fire Station** JOB # **LOUGE24111**

PROJECT LOCATION **US 27** DRAWN BY **P. Presnell**

Falmouth, Kentucky APPROVED BY **R. Ortiz**

DRILLING and SAMPLING INFORMATION

Date Started	9/18/24	Hammer Wt.	140 lbs.
Date Completed	9/18/24	Hammer Drop	30 in.
Drill Foreman	M. Reynolds	Spoon Sampler OD	2 in.
Inspector	P. Presnell	Rock Core Dia.	2 in.
Boring Method	Macrocore, AH	Shelby Tube OD	3 in.

TEST DATA

SOIL CLASSIFICATION	Stratum Depth	Depth Scale	Sample No.	Sample Type	Sampler Graphics Recovery Graphics	Groundwater	Standard Penetration Test Blows per 6" [*N-Value*] *blows/foot*	Qu-tsf Unconfined Compressive Strength	PP-tsf Pocket Penetrometer	Moisture Content %	Liquid Limit (LL)	Plastic Limit (PL)	Percent Passing #200 Sieve	Remarks
SURFACE ELEVATION (ft): 861.5 Latitude (deg): 38.692511, Longitude (deg): -84.363088														
TOPSOIL	0.1		1	SS			50/2"-- [*50/2"*]		N/A	8.0				
WEATHERED SHALE, Brown	0.2													
Refusal at 0.2 feet														

Sample Type
- SPT - Standard Penetration Test
- SS - Driven Split Spoon
- SH - Pressed Shelby Tube
- CA - Continuous Flight Auger
- RC - Rock Core
- CU - Cuttings
- CT - Continuous Tube

Depth to Groundwater

Noted on Drilling Tools	- ft
At Completion (in augers)	- ft
At Completion (open hole)	- ft
After - hours	- ft
After - hours	- ft
Cave Depth	- ft

Boring Method
- HSA - Hollow Stem Augers
- CFA - Continuous Flight Augers
- DC - Driving Casing
- MD - Mud Drilling

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TEST BORING LOG

CLIENT **Pendleton County**
PROJECT NAME **Pendleton County Fire Station**
PROJECT LOCATION **US 27**
Falmouth, Kentucky

BORING # **P-4**
JOB # **LOUGE24111**
DRAWN BY **P. Presnell**
APPROVED BY **R. Ortiz**

DRILLING and SAMPLING INFORMATION

Date Started	9/18/24	Hammer Wt.	140 lbs.
Date Completed	9/18/24	Hammer Drop	30 in.
Drill Foreman	M. Reynolds	Spoon Sampler OD	2 in.
Inspector	P. Presnell	Rock Core Dia.	2 in.
Boring Method	Macrocore, AH	Shelby Tube OD	3 in.

SOIL CLASSIFICATION

SURFACE ELEVATION (ft): 863.5
Latitude (deg): 38.692808, Longitude (deg): -84.363433

Stratum Depth	Depth Scale	Sample No.	Sample Type	Sampler Graphics / Recovery Graphics	Groundwater	Standard Penetration Test Blows per 6" [*N-Value*] *blows/foot*	Qu-tsf Unconfined Compressive Strength	PP-tsf Pocket Penetrometer	Moisture Content %	Liquid Limit (LL)	Plastic Limit (PL)	Percent Passing #200 Sieve	Remarks
0.1		1	SS			3-50/2"-[*50/2"*]		N/A	16.4				
0.5													
2.3													

TOPSOIL

LEAN CLAY (CL), Brown, trace veiny root fragments, with shale and limestone fragments

WEATHERED SHALE, Brown

Refusal at 2.3 feet

Sample Type
SPT - Standard Penetration Test
SS - Driven Split Spoon
SH - Pressed Shelby Tube
CA - Continuous Flight Auger
RC - Rock Core
CU - Cuttings
CT - Continuous Tube

Depth to Groundwater

Noted on Drilling Tools	-	ft
At Completion (in augers)	-	ft
At Completion (open hole)	-	ft
After - hours	-	ft
After - hours	-	ft
Cave Depth	-	ft

Boring Method
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling

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TEST BORING LOG

CLIENT **Pendleton County**
PROJECT NAME **Pendleton County Fire Station**
PROJECT LOCATION **US 27**
Falmouth, Kentucky

BORING # **P-5**
JOB # **LOUGE24111**
DRAWN BY **P. Presnell**
APPROVED BY **R. Ortiz**

DRILLING and SAMPLING INFORMATION

Date Started	9/18/24	Hammer Wt.	140 lbs.
Date Completed	9/18/24	Hammer Drop	30 in.
Drill Foreman	M. Reynolds	Spoon Sampler OD	2 in.
Inspector	P. Presnell	Rock Core Dia.	2 in.
Boring Method	Macrocore, AH	Shelby Tube OD	3 in.

SOIL CLASSIFICATION
SURFACE ELEVATION (ft): 863.0
Latitude (deg): 38.693143, Longitude (deg): -84.363436

Stratum Depth	Depth Scale	Sample No.	Sample Type	Sampler Graphics / Recovery Graphics	Groundwater	Standard Penetration Test Blows per 6" [*N-Value*] *blows/foot*	Qu-tsf Unconfined Compressive Strength	PP-tsf Pocket Penetrometer	Moisture Content %	Liquid Limit (LL)	Plastic Limit (PL)	Percent Passing #200 Sieve	Remarks
TOPSOIL													
0.1		1	SS			4-8-7 [*15*]		N/A	12.0				
FAT CLAY (CH), Light brown, trace veiny root fragments to 0.7 feet, with shale and limestone fragments													
1.3													
WEATHERED SHALE, Brown													
1.6		2	SS			50/1"-- [*50/1"*]		N/A					
Refusal at 1.6 feet													

Sample Type
SPT - Standard Penetration Test
SS - Driven Split Spoon
SH - Pressed Shelby Tube
CA - Continuous Flight Auger
RC - Rock Core
CU - Cuttings
CT - Continuous Tube

Depth to Groundwater

Noted on Drilling Tools	- ft	
At Completion (in augers)	- ft	
At Completion (open hole)	- ft	
After - hours	- ft	
After - hours	- ft	
Cave Depth	- ft	

Boring Method
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling

Borehole	Depth	Sample Type	Liquid Limit	Plastic Limit	Plasticity Index	Class-ification	Water Content (%)	Unconfined Compressive Strength (tsf)	Dry Density (pcf)	Wet Density (pcf)	Max. Dry Density (pcf)	Opt. Water Content (%)	CBR	Swell (%)	RQD	Percent Recovery	Specific Gravity	% Finer #200
B-1	0.0	SS					10.2											
B-2	0.0	SS	60	25	35	CH	7.6											
B-3	0.0	SS					11.8											
B-4	0.0	SS					14.2											
B-5	0.0	SS					10.3											
P-1	0.0	SS					7.8											
P-2	0.0	SS					8.9											
P-3	0.0	SS					8.0											
P-4	0.0	SS					16.4											
P-5	0.0	SS					12.0											

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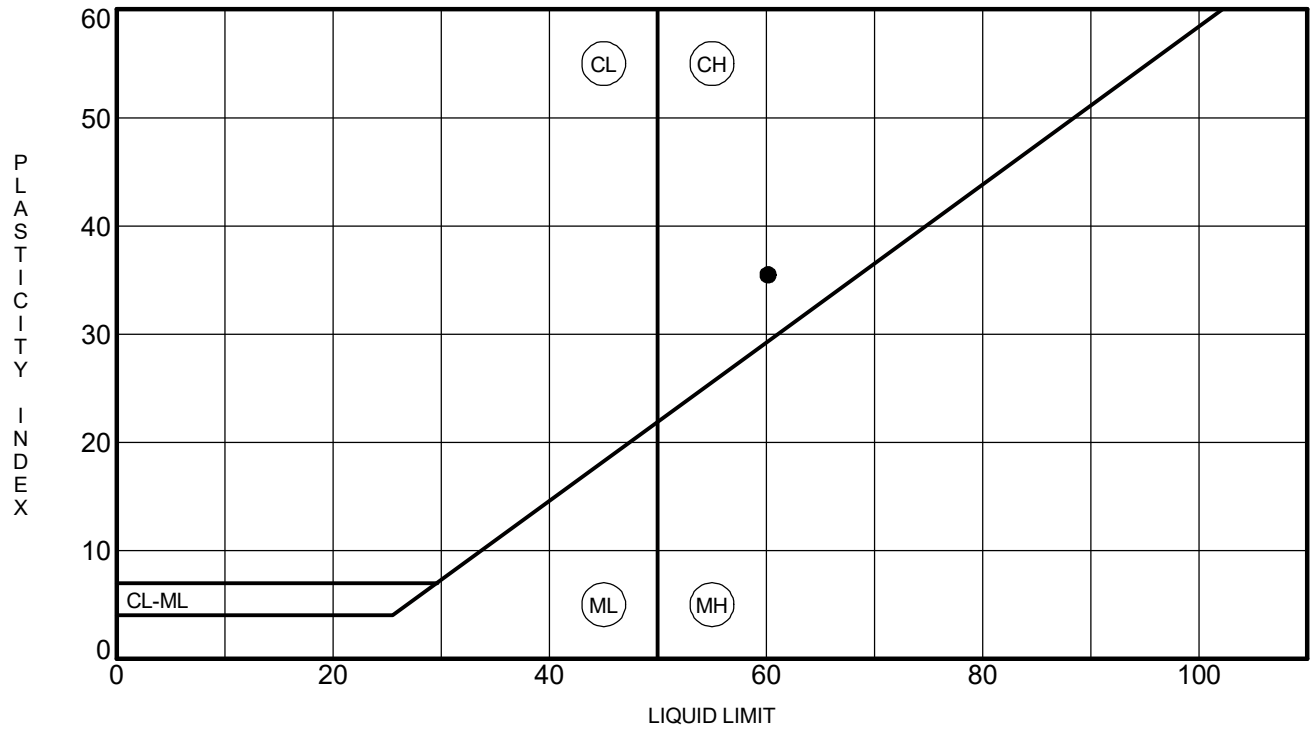
SPT - Split Spoon Sample
BG - Bulk Grab Sample
k - Coefficient of Permeability
- See Attached test Results

Summary of Laboratory Results

Client: Pendleton County
Project: Pendleton County Fire Station
Location: US 27
City, State: Falmouth, Kentucky
Number: LOUGE24111 Date: 10/2/2024



Specimen Identification		LL	PL	PI	Water Content	Description
● **B-2**	**0.0**	**60**	**25**	**35**	**7.6**	**FAT CLAY (CH), Light brown**

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ATTERBERG LIMITS RESULTS

Client: Pendleton County
Project: Pendleton County Fire Station
Location: US 27
City, State: Falmouth, Kentucky
Number: LOUGE24111 Date: 10/2/2024

SECTION 087100 - DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes commercial door hardware for the following:

1. Swinging doors.
2. Other doors to the extent indicated.

B. Door hardware includes, but is not necessarily limited to, the following:

1. Mechanical door hardware.
2. Electromechanical door hardware.
3. Cylinders specified for doors in other sections.

C. Related Sections:

1. Division 08 Section “Hollow Metal Doors and Frames”.
2. Division 08 Section “Flush Wood Doors”.
3. Division 08 Section “Aluminum-Framed Entrances and Storefronts”.

D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
2. ICC/IBC - International Building Code.
3. NFPA 70 - National Electrical Code.
4. NFPA 80 - Fire Doors and Windows.
5. NFPA 101 - Life Safety Code.
6. NFPA 105 - Installation of Smoke Door Assemblies.
7. State Building Codes, Local Amendments.

E. Standards: All hardware specified herein shall comply with the following industry standards as applicable. Any undated reference to a standard shall be interpreted as referring to the latest edition of that standard:

1. ANSI/BHMA Certified Product Standards - A156 Series.
2. UL10C - Positive Pressure Fire Tests of Door Assemblies.
3. ANSI/UL 294 - Access Control System Units.
4. UL 305 - Panic Hardware.

5. ANSI/UL 437- Key Locks.

1.3 SUBMITTALS

A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing, fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
3. Content: Include the following information:

    a. Type, style, function, size, label, hand, and finish of each door hardware item.
    b. Manufacturer of each item.
    c. Fastenings and other pertinent information.
    d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
    e. Explanation of abbreviations, symbols, and codes contained in schedule.
    f. Mounting locations for door hardware.
    g. Door and frame sizes and materials.
    h. Warranty information for each product.

4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.

C. Shop Drawings: Details of electrified access control hardware indicating the following:

1. Wiring Diagrams: Upon receipt of approved schedules, submit detailed system wiring diagrams for power, signaling, monitoring, communication, and control of the access control system electrified hardware. Differentiate between manufacturer-installed and field-installed wiring. Include the following:

    a. Elevation diagram of each unique access controlled opening showing location and interconnection of major system components with respect to their placement in the respective door openings.
    b. Complete (risers, point-to-point) access control system block wiring diagrams.

c. Wiring instructions for each electronic component scheduled herein.

2. Electrical Coordination: Coordinate with related sections the voltages and wiring details required at electrically controlled and operated hardware openings.

D. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.

E. Informational Submittals:

1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.

1.4 CLOSEOUT SUBMITTALS

A. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Procedures.

B. Project Record Documents: Provide record documentation of as-built door hardware sets in digital format (.pdf, .docx, .xlsx, .csv) and as required in Division 01, Project Record Documents.

1.5 QUALITY ASSURANCE

A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.

B. Certified Products: Where specified, products must maintain a current listing in the Builders Hardware Manufacturers Association (BHMA) Certified Products Directory (CPD).

C. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

D. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.

E. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.

1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.
2. Provide electromechanical door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated.

F. Each unit to bear third party permanent label indicating compliance with the referenced testing standards.

G. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:

1. Function of building, purpose of each area and degree of security required.
2. Plans for existing and future key system expansion.
3. Requirements for key control storage and software.
4. Installation of permanent keys, cylinder cores and software.
5. Address and requirements for delivery of keys.

H. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.

1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
3. Review sequence of operation narratives for each unique access controlled opening.
4. Review and finalize construction schedule and verify availability of materials.
5. Review the required inspecting, testing, commissioning, and demonstration procedures

I. At completion of installation, provide written documentation that components were applied according to manufacturer's instructions and recommendations and according to approved schedule.

1.6 DELIVERY, STORAGE AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.

B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.

C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.7 COORDINATION

A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.

B. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

1.8 WARRANTY

A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:

1. Structural failures including excessive deflection, cracking, or breakage.
2. Faulty operation of the hardware.
3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
4. Electrical component defects and failures within the systems operation.

C. Warranty Period: Unless otherwise indicated, warranty shall be one year from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 BUTT HINGES

A. Hinges: ANSI/BHMA A156.1 butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.

1. Quantity: Provide the following hinge quantity:

a. Two Hinges: For doors with heights up to 60 inches.

b. Three Hinges: For doors with heights 61 to 90 inches.
c. Four Hinges: For doors with heights 91 to 120 inches.
d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.

2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:

a. Widths up to 3’0”: 4-1/2” standard or heavy weight as specified.
b. Sizes from 3’1” to 4’0”: 5” standard or heavy weight as specified.

3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:

a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.

4. Hinge Options: Comply with the following:

a. Non-removable Pins: With the exception of electric through wire hinges, provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for all out-swinging lockable doors.

5. Manufacturers:

a. McKinney (MK) - TA/T4A Series, 5-knuckle.

2.2 CONTINUOUS HINGES

A. Continuous Geared Hinges: ANSI/BHMA A156.26 Grade 1-600 continuous geared hinge. with minimum 0.120-inch thick extruded 6063-T6 aluminum alloy hinge leaves and a minimum overall width of 4 inches. Hinges are non-handed, reversible and fabricated to template screw locations. Factory trim hinges to suit door height and prepare for electrical cut-outs.

1. Manufacturers:.

a. Pemko (PE).

2.3 CYLINDERS AND KEYING

A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.

B. Cylinder Types: Original manufacturer cylinders able to supply the following cylinder formats and types:

1. Threaded mortise cylinders with rings and cams to suit hardware application.

2. Rim cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
3. Bored or cylindrical lock cylinders with tailpieces as required to suit locks.
4. Tubular deadlocks and other auxiliary locks.
5. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
6. Keyway: Manufacturer’s Standard.

C. Small Format Interchangeable Cores: Provide small format interchangeable cores (SFIC) as specified, core insert, removable by use of a special key; usable with other manufacturers' cylinders.

D. Keying System: Each type of lock and cylinders to be factory keyed.

1. Supplier shall conduct a "Keying Conference" to define and document keying system instructions and requirements.
2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
3. New System: Key locks to a new key system as directed by the Owner.

E. Key Quantity: Provide the following minimum number of keys:

1. Change Keys per Cylinder: Two (2)
2. Master Keys (per Master Key Level/Group): Five (5).
3. Construction Control Keys (where required): Two (2).
4. Permanent Control Keys (where required): Two (2).

F. Construction Keying: Provide temporary keyed construction cores.

G. Key Registration List (Bitting List):

1. Provide keying transcript list to Owner's representative in the proper format for importing into key control software.
2. Provide transcript list in writing or electronic file as directed by the Owner.

2.4 KEY CONTROL

A. Key Control Cabinet: Provide a key control system including envelopes, labels, and tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet. Key control cabinet shall have expansion capacity of 150% of the number of locks required for the project.

1. Manufacturers:

a. Lund Equipment (LU).
b. MMF Industries (MM).
c. Telkee (TK).

2.5 CYLINDRICAL LOCKS AND LATCHING DEVICES

A. Cylindrical Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.2, Series 4000, Operational Grade 1 Certified Products Directory (CPD) listed cylindrical locksets. Listed manufacturers shall meet all functions and features as specified herein.

1. Manufacturers:

a. Sargent Manufacturing (SA) - 10X Line.

2.6 LOCK AND LATCH STRIKES

A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:

1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.

B. Standards: Comply with the following:

1. Strikes for Mortise Locks and Latches: BHMA A156.13.
2. Strikes for Bored Locks and Latches: BHMA A156.2.
3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
4. Dustproof Strikes: BHMA A156.16.

2.7 ELECTRIC STRIKES

A. Standard Electric Strikes: Electric strikes conforming to ANSI/BHMA A156.31, Grade 1, for use on non-rated or fire rated openings. Strikes shall be of stainless steel construction tested to a minimum of 1500 pounds of static strength and 70 foot-pounds of dynamic strength with a minimum endurance of 1 million operating cycles. Provide strikes with 12 or 24 VDC capability, fail-secure unless otherwise specified. Where specified provide latchbolt and latchbolt strike monitoring indicating both the position of the latchbolt and locked condition of the strike.

1. Manufacturers:

a. HES (HS) - 1500/1600 Series.

B. Surface Mounted Rim Electric Strikes: Surface mounted rim exit device electric strikes conforming to ANSI/BHMA A156.31, Grade 1, and UL Listed for both Burglary Resistance and for use on fire rated door assemblies. Construction includes internally mounted solenoid with two heavy-duty, stainless steel locking mechanisms operating independently to provide

tamper resistance. Strikes tested for a minimum of 500,000 operating cycles. Provide strikes with 12 or 24 VDC capability supplied standard as fail-secure unless otherwise specified. Option available for latchbolt and latchbolt strike monitoring indicating both the position of the latchbolt and locked condition of the strike. Strike requires no cutting to the jamb prior to installation.

1. Manufacturers:

    a. HES (HS) - 9400/9500/9600/9700/9800 Series.

C. Provide electric strikes with in-line power controller and surge suppressor by the same manufacturer as the strike with the combined products having a five year warranty.

2.8 CONVENTIONAL EXIT DEVICES

A. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:

1. Exit devices shall have a five-year warranty.
2. At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.
3. Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult manufacturer’s catalog and template book for specific requirements.
4. Except on fire rated doors, provide exit devices with hex key dogging device to hold the pushbar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.
5. Devices must fit flat against the door face with no gap that permits unauthorized dogging of the push bar. The addition of filler strips is required in any case where the door light extends behind the device as in a full glass configuration.
6. Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy duty escutcheon trim with threaded studs for thru-bolts.

    a. Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets.
    b. Where function of exit device requires a cylinder, provide a cylinder (Rim or Mortise) as specified in Hardware Sets.

7. Vertical Rod Exit Devices: Where surface or concealed vertical rod exit devices are used at interior openings, provide as less bottom rod (LBR) unless otherwise indicated. Provide dust proof strikes where thermal pins are required to project into the floor.
8. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2” wide stiles.
9. Dummy Push Bar: Nonfunctioning push bar matching functional push bar.
10. Rail Sizing: Provide exit device rails factory sized for proper door width application.
11. Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.

B. Conventional Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 Certified Products Directory (CPD) listed exit devices. Listed manufacturers shall meet all functions and features as specified herein.

1. Manufacturers:

a. Sargent Manufacturing (SA) - 80 Series.

2.9 SURFACE DOOR CLOSERS

A. All door closers specified herein shall meet or exceed the following criteria:

1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers.
2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.
3. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the Americans with Disabilities Act, provide units complying with ANSI ICC/A117.1.
4. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
5. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.
6. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.

B. Door Closers, Surface Mounted (Heavy Duty): ANSI/BHMA A156.4, Grade 1 Certified Products Directory (CPD) listed surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control. Provide non-handed units standard..

1. Manufacturers:

a. Sargent Manufacturing (SA) - 351 Series.

2.10 ARCHITECTURAL TRIM

A. Door Protective Trim

1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.
2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on stop side of single doors and 1” LDW on stop side of pairs of doors, and

not more than 1" less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.

3. Where plates are applied to fire rated doors with the top of the plate more than 16” above the bottom of the door, provide plates complying with NFPA 80. Consult manufacturer’s catalog and template book for specific requirements for size and applications.
4. Protection Plates: ANSI/BHMA A156.6 protection plates (kick, armor, or mop), fabricated from the following:

    a. Stainless Steel: 300 grade, 050-inch thick.

5. Options and fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets. Provide countersunk screw holes.
6. Manufacturers:

    a. Rockwood (RO).

2.11 DOOR STOPS AND HOLDERS

A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.

B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.

1. Manufacturers:

    a. Rockwood (RO).

C. Overhead Door Stops and Holders: ANSI/BHMA A156.8, Grade 1 Certified Products Directory (CPD) listed overhead stops and holders to be surface or concealed types as indicated in Hardware Sets. Track, slide, arm and jamb bracket to be constructed of extruded bronze and shock absorber spring of heavy tempered steel. Provide non-handed design with mounting brackets as required for proper operation and function.

1. Manufacturers:

    a. Norton Rixson (RF).
    b. Sargent Manufacturing (SA).

2.12 ARCHITECTURAL SEALS

A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.

B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.

1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.

C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.

1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NFPA 252, Standard Methods of Fire Tests of Door Assemblies.

D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.

E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.

F. Manufacturers:

1. Pemko (PE).

2.13 FABRICATION

A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.14 FINISHES

A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.

B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware

C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.

B. Wood Doors: Comply with ANSI/DHI A115-W series.

3.3 INSTALLATION

A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.

1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.

B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:

1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
2. DHI TDH-007-20: Installation Guide for Doors and Hardware.
3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.

C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.

D. Push Plates and Door Pulls: When through-bolt fasteners are in the same location as a push plate, countersink the fasteners flush with the door face allowing the push plate to sit flat against the door.

E. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."

F. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.4 FIELD QUALITY CONTROL

A. Field Inspection (Punch Report): Reference Division 01 Sections “Closeout Procedures”. Produce project punch report for each installed door opening indicating compliance with approved submittals and verification hardware is properly installed, operating and adjusted. Include list of items to be completed and corrected, indicating the reasons or deficiencies causing the Work to be incomplete or rejected.

1. Organization of List: Include separate Door Opening and Deficiencies and Corrective Action Lists organized by Mark, Opening Remarks and Comments, and related Opening Images and Video Recordings.

3.5 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.6 CLEANING AND PROTECTION

A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.

B. Clean adjacent surfaces soiled by door hardware installation.

C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.7 DEMONSTRATION

A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.8 DOOR HARDWARE SETS

A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with

corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

1. Quantities listed are for each pair of doors, or for each single door.
2. The supplier is responsible for handing and sizing all products.
3. Where multiple options for a piece of hardware are given in a single line item, the supplier shall provide the appropriate application for the opening.
4. At existing openings with new hardware the supplier shall field inspect existing conditions prior to the submittal stage to verify the specified hardware will work as required. Provide alternate solutions and proposals as needed.

B. Manufacturer's Abbreviations:

1. MK - McKinney
2. PE - Pemko
3. SA - SARGENT
4. HS - HES
5. RF - Rixson
6. RO - Rockwood
7. OT - Other
8. SU - Securitron

Hardware Sets

Set: 1.0

Doors: 110A, 110D, 111C, 111D

1	Continuous Hinge	CFMxxxHD1		PE
1	Rim Exit Device, Storeroom	737P 8804 ETL	US32D	SA
1	SMART Pac Bridge Rectifier	2005M3		HS
1	Electric Strike	9600	630	HS
1	Surf Overhead Stop	9-X36	689	RF
1	Parallel Rigid Offset Arm Surface Closer	351 PD10	EN	SA
1	Kick Plate	K1050 10" X 2" LDW CSK BEV	US26D	RO
1	Gasketing	2891APK		PE
1	Rain Guard	346A		PE
1	Sweep	3452ANB		PE
1	Threshold	2005AT		PE
1	Card Reader	BY SECURITY CONTRACTOR		OT

1	Position Switch	DPS-M / W		SU
1	Power Supply	AQL SERIES (BY AMPERAGE REQUIRED)		SU
1	Wiring Diagram	ELEVATION AND POINT TO POINT AS SPECIFIED		OT

Notes: Door normally closed, latched and secured.
Entry by valid card read or key override.
Free egress at all times.

Set: 2.0

Doors: 100B, 108B

1	Continuous Hinge	CFMxxxHD1		PE
1	Storeroom/Closet Lock	737P 10XG04 LL	US26D	SA
1	Electric Strike	1600-CLB	630	HS
1	SMART Pac Bridge Rectifier	2005M3		HS
1	Surf Overhead Stop	9-X36	689	RF
1	Parallel Rigid Offset Arm Surface Closer	351 PD10	EN	SA
1	Kick Plate	K1050 10" X 2" LDW CSK BEV	US26D	RO
1	Gasketing	2891APK		PE
1	Rain Guard	346A		PE
1	Sweep	3452ANB		PE
1	Threshold	2005AT		PE
1	Card Reader	BY SECURITY CONTRACTOR		OT
1	Position Switch	DPS-M / W		SU
1	Power Supply	AQL SERIES (BY AMPERAGE REQUIRED)		SU
1	Wiring Diagram	ELEVATION AND POINT TO POINT AS SPECIFIED		OT

Notes: Door is normally closed, latched and secured.
Entry by valid card reader or key override.
Free egress at all times.

Set: 3.0

Doors: 103

3	Hinge, Full Mortise, Hvy Wt	T4A3786 4-1/2" x 4-1/2"	US26D	MK
1	Rim Exit Device, Passage	12 8815 ETL	US32D	SA
1	Parallel Heavy Duty W/ Stop Arm Surface Closer	351 CPS	EN	SA
1	Kick Plate	K1050 10" X 2" LDW CSK BEV	US26D	RO
1	Gasketing	S88BL		PE

Set: 4.0

Doors: 105

3	Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK
1	Privacy Lock	10XU65 LL	US26D	SA
1	Wall Stop	409	US26D	RO
1	Gasketing	S88BL		PE
1	Coat Hook	RM820	US32D	RO

Set: 5.0

Doors: 101

3	Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK
1	Passage Latch	10XU15 LL	US26D	SA
1	Wall Stop	409	US26D	RO
3	Silencer	608/609 RKW		RO

Set: 6.0

Doors: 107, 109

3	Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK
1	Passage Latch	10XU15 LL	US26D	SA
1	Surf Overhead Stop	10-X36	689	RF
3	Silencer	608/609 RKW		RO

Set: 7.0

Doors: 100A

3	Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK
1	Passage Latch	10XU15 LL	US26D	SA
1	Parallel Heavy Duty W/ Stop Arm Surface Closer	351 CPS	EN	SA

1	Kick Plate	K1050 10" X 2" LDW CSK BEV	US26D	RO
3	Silencer	608/609 RKW		RO

Set: 8.0

Doors: 102

3	Hinge, Full Mortise, Hvy Wt	T4A3786 4-1/2" x 4-1/2"	US26D	MK
1	Passage Latch	10XU15 LL	US26D	SA
1	Parallel Heavy Duty W/ Stop Arm Surface Closer	351 CPS	EN	SA
1	Kick Plate	K1050 10" X 2" LDW CSK BEV	US26D	RO
3	Silencer	608/609 RKW		RO

Set: 9.0

Doors: 108A

3	Hinge, Full Mortise, Hvy Wt	T4A3786 4-1/2" x 4-1/2"	US26D	MK
1	Passage Latch	10XU15 LL	US26D	SA
1	Standard Surface Closer	351 O	EN	SA
1	Wall Stop	409	US26D	RO
1	Gasketing	S88BL		PE

Set: 10.0

Doors: 110B, 110C, 110F, 111A, 111B, 111E, 111F, 111G

1	Hardware	ALL HARDWARE BY DOOR MANUFACTURER		OT

Mark	Hardware
100A	7.0

100B	2.0
101	5.0

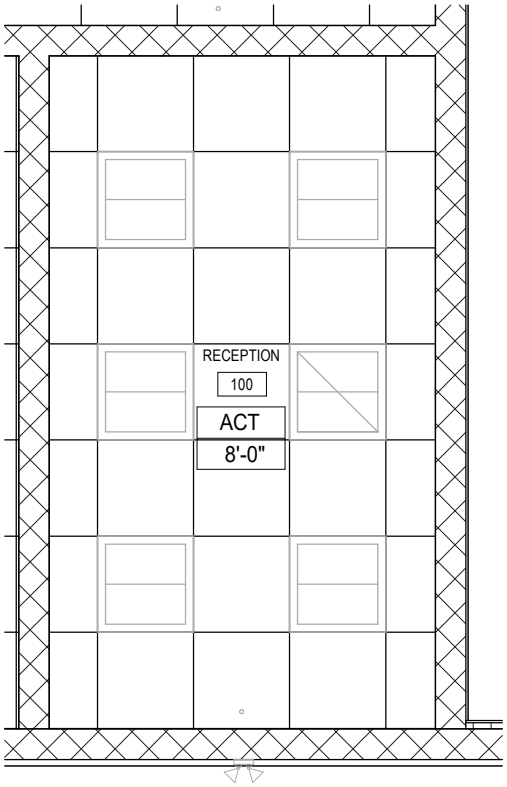
102	8.0
103	3.0

105	4.0
107	6.0
108A	9.0
108B	2.0
109	6.0
110A	1.0

110B	10.0
110C	10.0
110D	1.0
110F	10.0
111A	10.0
111B	10.0

111C	1.0
111D	1.0
111E	10.0
111F	10.0
111G	10.0

END OF SECTION 087100



1 RCP Plan

1/4" = 1'-0"

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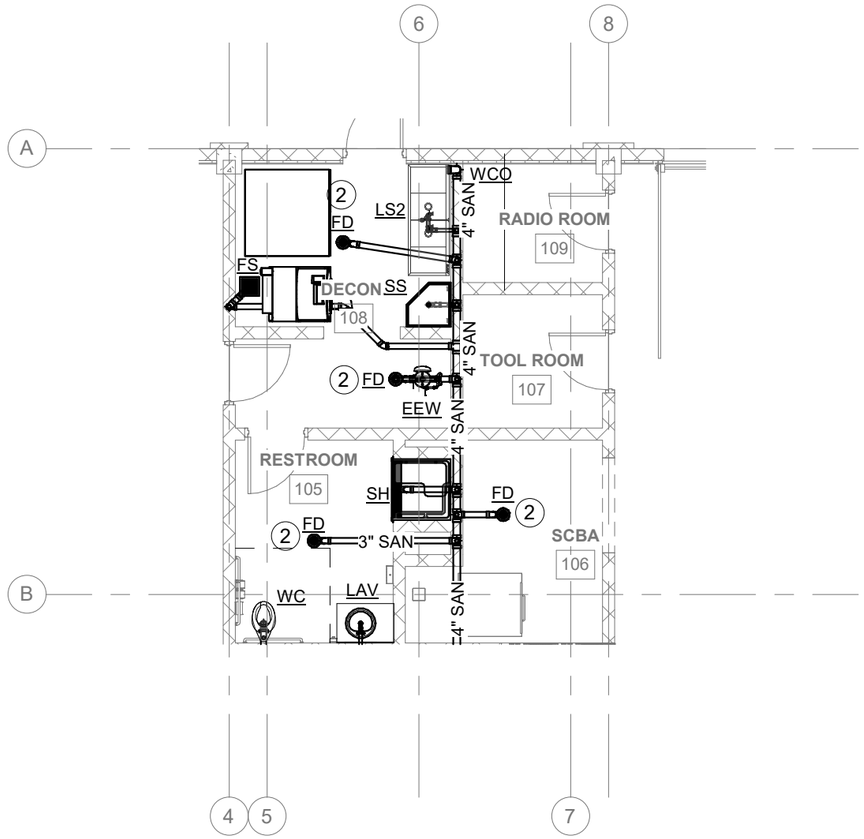
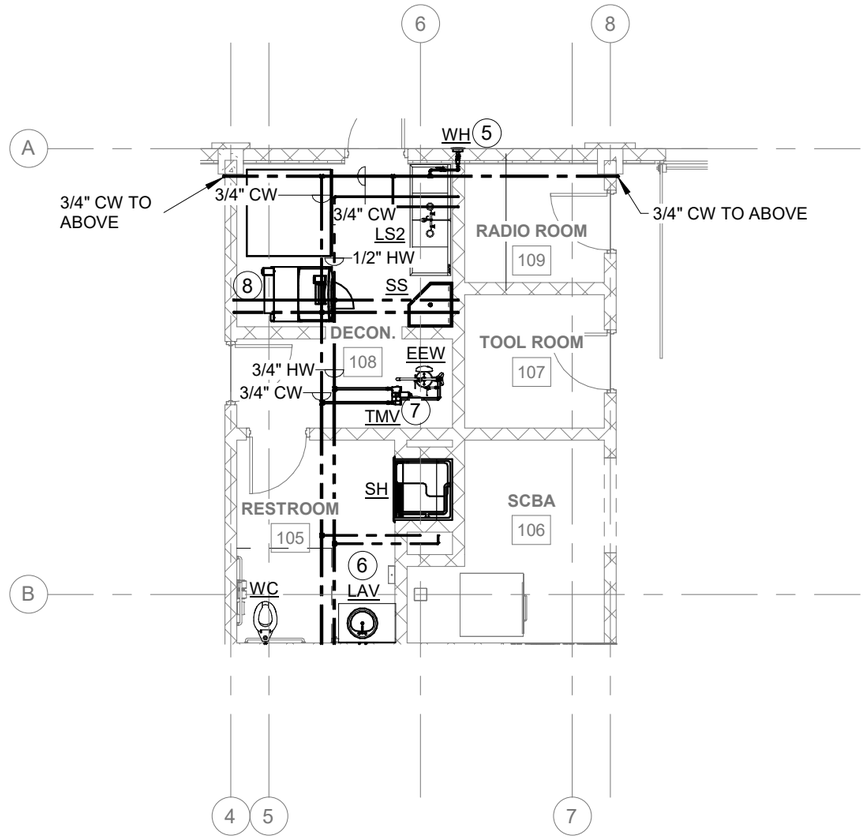
p. 859.268.1933 www.brandstettercarroll.com
Lexington Cincinnati Cleveland Dallas Charleston



1 P900 First Floor DWV Plan Change

SCALE: 1/8" = 1'-0"



2 P900 First Floor Domestic Plumbing Plan Change

SCALE: 1/8" = 1'-0"

E2M CONSULTING ENGINEERING
682 TUXEDO PLACE
CINCINNATI, OH 45206
TEL: 513.587.0050
www.e2m-eng.com

SCOPE OF WORK FOR:

Pendleton County Fire

SEAL

STATE OF KENTUCKY
LAWRENCE S. AYER
18127
REGISTERED PROFESSIONAL ENGINEER

SIGNATURE

DATE

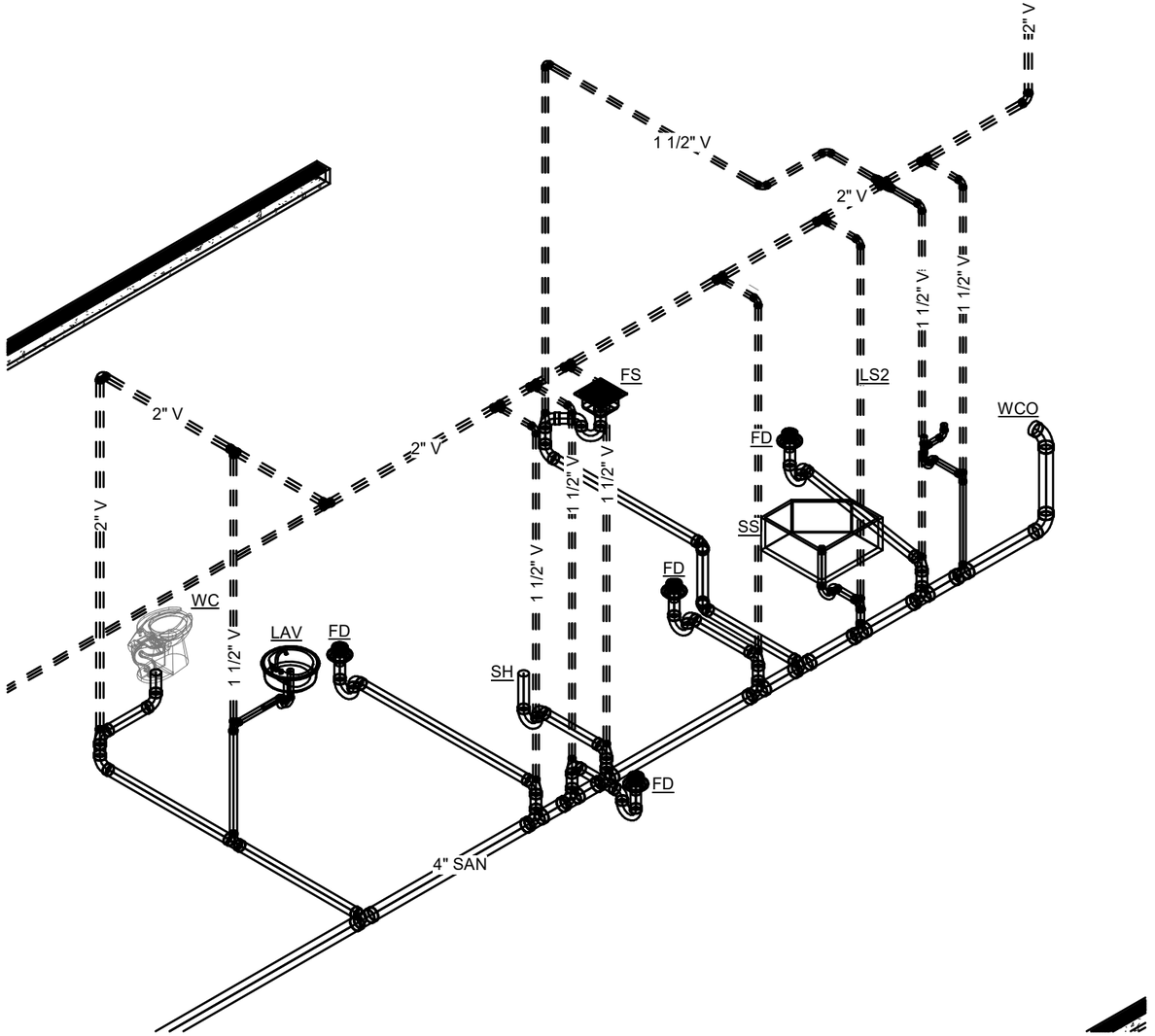
DRAWN BY:	Author
CHECKED BY:	Checker
SCALE:	AS NOTED
JOB NUMBER:	24240
START DATE:	02/14/2022

P900

2/21/2025 3:01:05 PM

Autodesk Docs://24056 Pendleton Fire Station/Pendleton Fire Station - MEP - R25.rvt

FLOOR SINK (FS): ZURN MODEL Z1750. PROVIDE WITH ZURN TRAP SEAL DEVICE Z1072-3. PLUMBING CONTRACTOR SHALL ADJUST HEIGHT,AND ROTATION (SQUARE WITH WALLS). TILE CONTRACTOR TO PROVIDE FINAL GROUT.



1 P901 DWV Isometric Change

SCALE: NONE

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SEAL

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P901

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