

**BROOKE COUNTY COMMISSION
BROOKE COUNTY, WEST VIRGINIA**

BROOKE COUNTY EMS FACILITY

ADDENDUM #1

MARCH 10, 2023

THRASHER PROJECT #T60-11009

TO WHOM IT MAY CONCERN:

A Pre-Bid Conference was held on Tuesday, March 7, 2023, for the Brooke County EMS Facility project. A copy of the Pre-Bid sign in sheet is included in this Addendum. The following are clarifications and responses to questions posed by contractors for the above reference project.

A. GENERAL

None on this Addendum.

B. SPECIFICATIONS

1. REVISED: Section 074113.16 Standing Seam Metal Roof Panels
 - a. DELETE 2.2.B.1. Basis of Design Product IMETCO – Series 300
 - b. ADD 2.2.B.1. Basis of Design Product IMETCO – PermLok 1.5
 - c. ADD: 2.2.B.2.f Dimensional Metals, Inc.
 - d. ADD: 2.2.B.2.g Pac-Clad, A Carlisle Company
2. ADDED: Section 087100 Door Hardware.
3. REVISED: Section 101419 Dimensional Letter Signage
4. ADDED: Section 096119 Interior Stained Concrete

C. DRAWINGS

1. REVISED: A6.01 – Door Hardware Schedule
2. REVISED: A7.01 – Floor Finish Plan

D. QUESTIONS AND RESPONSES

Q1. You reference an Imetco Series 300 Panel which is a mechanically seamed Tee Panel. The panel description calls for a Snap Lock Panel. Is the roof panel to be mechanically seamed or a snap lock panel? If snap lock panel is correct, will DMI IL 2016, be considered as an acceptable product?

A1. Metal Roofing Panels are to be Snap Lock Panels. DMI IL2016 is an approved product. See Specifications Revisions above for additional approved manufacturers.

Q2. I wanted to see if I could get a metal building supplier on the approved list. We would like to have American Buildings Company added as an approved manufacturer for the metal panels.

A2. Yes, American Building Company is an approved manufacturer for the R- Panel metal wall panels.

Q3. Can you please clarify the floor finish in the ambulance bays? All I can find is SC but I don't see anything in the finish schedule or the table of abbreviations.

A3. Floor Finish in the Ambulance Bay is SC-Sealed Concrete. See Specification Section 099123, 3.4.G

Q4. The schedule states 1 3/8" doors but the specification sheet 083613 states 2" r 18?

A4. The specification is correct, 2" R-18 sectional doors.

Q5. Is this project Prevailing Wages?

A5. No.

Q6. In Section 1.8, it states a light filtering and light blocking fabric. Does the client want a dual roller or are there specific windows that get a certain % openness?

A6. Conference 107 should be dual roller with light filtering and light blocking shades. All other windows are to receive light filtering shades only.

Q7. There is conflicting info provided for Motorized Shades and Custom Clutch Cord. Please advise. Also, we do not see any specific details about Motorized Shades. Please advise if this will be wired for motorized or should the windows have battery packs.

A7. Window shades are manual chain operation only. No power required.

Q8. Do you have a detail/spec for the urinal in the men's room 115?

A8. Urinal: Kohler K4904-ET vitreous china top spud washout. Sloan optima smooth 186-0.5 .5 GPF Flush exposed, battery powered, sensor valve, sweat solder kit, cast wall flange. Zurn 1259 wall supported carrier.

Q9. Where are you going to locate the curb valve?

A9. Curb valve is located at the waterline hot tap.

Q10. Do you have a soil report available?

A10. Yes, Soil Report Attached.

Q11. Would R-19 or R-25 insulation be a permissible substitute for the R-21 Batt insulation?

A11. R-21 Batt Insulation is the minimum R-value requirement for the stud wall framing. R-25 insulation is a permissible substitute.

E. CLARIFICATIONS

1. Base bid flooring for Room #'s: 101, 102, 103, 104, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119 is to be Stained Sealed Concrete in lieu of LVT. Specification 096119 - Interior Stained Concrete Attached.
2. Exterior Dimensional Letter Signage is to be Illuminated Channel Letters in lieu of Cutout dimensional characters. See attached Section 101419 - Dimensional Letter Signage.
3. Top of Footing at Plan North foundation wall to be -3' -4".
4. Apply Trowel Finish to surfaces exposed to view, or to be covered with ceramic tile, or resinous flooring. Finish and measure surface so gap at any point between concrete surface and an unlevelled, freestanding, 10 ft long straightedge resting on two high spots and placed anywhere on the surface does not exceed 1/8 inch and 1/16 inch in 2 feet.
5. Parking striping is to be applied in the Ambulance Bay as shown on attached drawing A7.01.

If you have any questions or comments, please feel free to contact me at your earliest convenience. As a reminder, bids will be received until 10:00 a.m. on Friday, March 24, 2023 at the Brooke County Courthouse, located at 632 Main Street, Wellsburg, WV. 26070. Good luck to everyone and thank you for your interest in the project.

Sincerely,

THE THRASHER GROUP, INC.



Philip M Freeman, AIA, NCARB, LEED Green Associate
Project Architect

**BROOKE COUNTY COMMISSION
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BROOKE COUNTY EMS FACILITY**

**PRE-BID CONFERENCE
Tuesday, March 7, 2023**

Thrasher Project #T60-11009

Name	Representing	Phone #	Email Address
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Stacey Wise	" "		

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 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes:

1. Mechanical and electrified door hardware for:
 - a. Swinging doors.
 - b. Sliding doors.
 - c. Gates.
2. Electronic access control system components, including:
 - a. Biometric access control reader.
 - b. Electronic access control devices.
3. Field verification, preparation and modification of existing doors and frames to receive new door hardware.
4. The intent of the hardware specification is to specify the hardware for interior and exterior doors, and to establish a type, continuity, and standard of quality. However, it is the door hardware supplier's responsibility to thoroughly review existing conditions, schedules, specifications, drawings, and other Contract Documents to verify the suitability of the hardware specified.

B. Exclusions: Unless specifically listed in hardware sets, hardware is not specified in this section for:

1. Windows
2. Cabinets (casework), including locks in cabinets
3. Signage
4. Toilet accessories
5. Overhead doors

C. Related Sections:

1. Division 07 Section "Joint Sealants" for sealant requirements applicable to threshold installation specified in this section.
2. Division 09 sections for touchup, finishing or refinishing of existing openings modified by this section.

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3. Division 26 sections for connections to electrical power system and for low-voltage wiring.
4. Division 28 sections for coordination with other components of electronic access control system.

1.3 REFERENCES

A. UL - Underwriters Laboratories

1. UL 10B - Fire Test of Door Assemblies
2. UL 10C - Positive Pressure Test of Fire Door Assemblies
3. UL 1784 - Air Leakage Tests of Door Assemblies
4. UL 305 - Panic Hardware

B. DHI - Door and Hardware Institute

1. Sequence and Format for the Hardware Schedule
2. Recommended Locations for Builders Hardware
3. Key Systems and Nomenclature

C. ANSI - American National Standards Institute

1. ANSI/BHMA A156.1 - A156.29, and ANSI/BHMA A156.31 - Standards for Hardware and Specialties

1.4 SUBMITTALS

A. General:

1. Submit in accordance with Conditions of Contract and Division 01 requirements.
2. Highlight, encircle, or otherwise specifically identify on submittals deviations from Contract Documents, issues of incompatibility or other issues which may detrimentally affect the Work.
3. Prior to forwarding submittal, comply with procedures for verifying existing door and frame compatibility for new hardware, as specified in PART 3, "EXAMINATION" article, herein.

B. Action Submittals:

1. Product Data: Product data including manufacturers' technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
2. Riser and Wiring Diagrams: After final approval of hardware schedule, submit details of electrified door hardware, indicating:
 - a. Wiring Diagrams: For power, signal, and control wiring and including:
 - 1) Details of interface of electrified door hardware and building safety and security systems.
 - 2) Schematic diagram of systems that interface with electrified door hardware.
 - 3) Point-to-point wiring.

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4) Risers.

3. Samples for Verification: If requested by Architect, submit production sample or sample installations of each type of exposed hardware unit in finish indicated, and tagged with full description for coordination with schedule.
 - a. Samples will be returned to supplier in like-new condition. Units that are acceptable to Architect may, after final check of operations, be incorporated into Work, within limitations of key coordination requirements.
4. Door Hardware Schedule: Submit schedule with hardware sets in vertical format as illustrated by Sequence of Format for the Hardware Schedule as published by the Door and Hardware Institute. Indicate complete designations of each item required for each door or opening, include:
 - a. Door Index; include door number, heading number, and Architects hardware set number.
 - b. Opening Lock Function Spreadsheet: List locking device and function for each opening.
 - c. Type, style, function, size, and finish of each hardware item.
 - d. Name and manufacturer of each item.
 - e. Fastenings and other pertinent information.
 - f. Location of each hardware set cross-referenced to indications on Drawings.
 - g. Explanation of all abbreviations, symbols, and codes contained in schedule.
 - h. Mounting locations for hardware.
 - i. Door and frame sizes and materials.
 - j. Name and phone number for local manufacturer's representative for each product.
 - k. Operational Description of openings with any electrified hardware (locks, exits, electromagnetic locks, electric strikes, automatic operators, door position switches, magnetic holders or closer/holder units, and access control components). Operational description should include how door will operate on egress, ingress, and fire and smoke alarm connection.
 - 1) Submittal Sequence: Submit door hardware schedule concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate fabrication of other work that is critical in Project construction schedule.
5. Key Schedule:
 - a. After Keying Conference, provide keying schedule listing levels of keying as well as explanation of key system's function, key symbols used and door numbers controlled.
 - b. Use ANSI/BHMA A156.28 "Recommended Practices for Keying Systems" as guideline for nomenclature, definitions, and approach for selecting optimal keying system.
 - c. Provide 3 copies of keying schedule for review prepared and detailed in accordance with referenced DHI publication. Include schematic keying diagram and index each key to unique door designations.
 - d. Index keying schedule by door number, keyset, hardware heading number, cross keying instructions, and special key stamping instructions.
 - e. Provide one complete bitting list of key cuts and one key system schematic illustrating system usage and expansion.

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- 1) Forward bitting list, key cuts and key system schematic directly to Owner, by means as directed by Owner.
 - f. Prepare key schedule by or under supervision of supplier, detailing Owner's final keying instructions for locks.
 6. Templates: After final approval of hardware schedule, provide templates for doors, frames and other work specified to be factory prepared for door hardware installation.
- C. Informational Submittals:
1. Qualification Data: For Supplier, Installer and Architectural Hardware Consultant.
 2. Product Certificates for electrified door hardware, signed by manufacturer:
 - a. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.
 3. Certificates of Compliance:
 - a. Certificates of compliance for fire-rated hardware and installation instructions if requested by Architect or Authority Having Jurisdiction.
 - b. Installer Training Meeting Certification: Letter of compliance, signed by Contractor, attesting to completion of installer training meeting specified in "QUALITY ASSURANCE" article, herein.
 - c. Electrified Hardware Coordination Conference Certification: Letter of compliance, signed by Contractor, attesting to completion of electrified hardware coordination conference, specified in "QUALITY ASSURANCE" article, herein.
 4. Product Test Reports: For compliance with accessibility requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by qualified testing agency, for door hardware on doors located in accessible routes.
 5. Warranty: Special warranty specified in this Section.
- D. Fire Door Assembly Inspection and Testing:
1. Submit a written report of the results of functional testing and inspection for fire door assemblies, in compliance with NFPA 80-2007 requirements. Written report shall be provided to the Owner to be made available to the Authority Having Jurisdiction (AHJ). Report shall include the door number for each fire door assembly, door location, door and frame material, fire rating, and summary of deficiencies.
- E. Closeout Submittals:
1. Operations and Maintenance Data : Provide in accordance with Division 01 and include:
 - a. Complete information on care, maintenance, and adjustment; data on repair and replacement parts, and information on preservation of finishes.
 - b. Catalog pages for each product.
 - c. Name, address, and phone number of local representative for each manufacturer.
 - d. Parts list for each product.
 - e. Final approved hardware schedule, edited to reflect conditions as-installed.
 - f. Final keying schedule
 - g. Copies of floor plans with keying nomenclature

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- h. As-installed wiring diagrams for each opening connected to power, both low voltage and 110 volts.
- i. Copy of warranties including appropriate reference numbers for manufacturers to identify project.

1.5 QUALITY ASSURANCE

- A. Product Substitutions: Comply with product requirements stated in Division 01 and as specified herein.
 1. Where specific manufacturer's product is named and accompanied by "No Substitute," including make or model number or other designation, provide product specified. (Note: Certain products have been selected for their unique characteristics and particular project suitability.)
 - a. Where no additional products or manufacturers are listed in product category, requirements for "No Substitute" govern product selection.
 2. Where products indicate "acceptable manufacturers" or "acceptable manufacturers and products", provide product from specified manufacturers, subject to compliance with specified requirements and "Single Source Responsibility" requirements stated herein.
- B. Supplier Qualifications and Responsibilities: Recognized architectural hardware supplier with record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this Project and that provides certified Architectural Hardware Consultant (AHC) available to Owner, Architect, and Contractor, at reasonable times during the Work for consultation.
 1. Warehousing Facilities: In Project's vicinity.
 2. Scheduling Responsibility: Preparation of door hardware and keying schedules.
 3. Engineering Responsibility: Preparation of data for electrified door hardware, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.
 4. Coordination Responsibility: Coordinate installation of electronic security hardware with Architect and electrical engineers and provide installation and technical data to Architect and other related subcontractors.
 - a. Upon completion of electronic security hardware installation, inspect and verify that all components are working properly.
- C. Installer Qualifications: Qualified tradesmen, skilled in application of commercial grade hardware with record of successful in-service performance for installing door hardware similar in quantity, type, and quality to that indicated for this Project.
- D. Architectural Hardware Consultant Qualifications: Person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and meets these requirements:
 1. For door hardware, DHI-certified, Architectural Hardware Consultant (AHC).
 2. Can provide installation and technical data to Architect and other related subcontractors.
 3. Can inspect and verify components are in working order upon completion of installation.

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4. Capable of producing wiring diagrams.
 5. Capable of coordinating installation of electrified hardware with Architect and electrical engineers.
- E. Single Source Responsibility: Obtain each type of door hardware from single manufacturer.
1. Provide electrified door hardware from same manufacturer as mechanical door hardware, unless otherwise indicated.
 2. Manufacturers that perform electrical modifications and that are listed by testing and inspecting agency acceptable to authorities having jurisdiction are acceptable.
- F. Fire-Rated Door Openings: Provide door hardware for fire-rated openings that complies with NFPA 80 and requirements of authorities having jurisdiction. Provide only items of door hardware that are listed and are identical to products tested by Underwriters Laboratories, Intertek Testing Services, or other testing and inspecting organizations acceptable to authorities having jurisdiction for use on types and sizes of doors indicated, based on testing at positive pressure and according to NFPA 252 or UL 10C and in compliance with requirements of fire-rated door and door frame labels.
- G. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.
1. Air Leakage Rate: Maximum air leakage of 0.3 cfm/sq. ft. (3 cu. m per minute/sq. m) at tested pressure differential of 0.3-inch wg (75 Pa) of water.
- H. Electrified Door Hardware: Listed and labeled as defined in NFPA 70, Article 100, by testing agency acceptable to authorities having jurisdiction.
- I. Means of Egress Doors: Latches do not require more than 15 lbf (67 N) to release latch. Locks do not require use of key, tool, or special knowledge for operation.
- J. Accessibility Requirements: For door hardware on doors in an accessible route, comply with governing accessibility regulations cited in "REFERENCES" article, herein.
1. Provide operating devices that do not require tight grasping, pinching, or twisting of wrist and that operate with force of not more than 5 lbf (22.2 N).
 2. Maximum opening-force requirements:
 - a. Interior, Non-Fire-Rated Hinged Doors: 5 lbf (22.2 N) applied perpendicular to door.
 - b. Sliding or Folding Doors: 5 lbf (22.2 N) applied parallel to door at latch.
 - c. Fire Doors: Minimum opening force allowable by authorities having jurisdiction.
 3. Bevel raised thresholds with slope of not more than 1:2. Provide thresholds not more than 1/2 inch (13 mm) high.
 4. Adjust door closer sweep periods so that, from open position of 70 degrees, door will take at least 3 seconds to move to 3 inches (75 mm) from latch, measured to leading edge of door.
- K. Keying Conference: Conduct conference at Project site to comply with requirements in Division 01.

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1. Attendees: Owner, Contractor, Architect, Installer and Supplier's Architectural Hardware Consultant.
 2. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including:
 - a. Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
 - b. Preliminary key system schematic diagram.
 - c. Requirements for key control system.
 - d. Requirements for access control.
 - e. Address for delivery of keys.
- L. Coordination Conferences:
1. Installation Coordination Conference: Prior to hardware installation, schedule and hold meeting to review questions or concerns related to proper installation and adjustment of door hardware.
 - a. Attendees: Door hardware supplier, door hardware installer, Contractor.
 - b. After meeting, provide letter of compliance to Architect, indicating when meeting was held and who was in attendance.
 2. Electrified Hardware Coordination Conference: Prior to ordering electrified hardware, schedule and hold meeting to coordinate door hardware with security, electrical, doors and frames, and other related suppliers.
 - a. Attendees: electrified door hardware supplier, doors and frames supplier, electrified door hardware installer, electrical subcontractor, Owner, Architect and Contractor.
 - b. After meeting, provide letter of compliance to Architect, indicating when coordination conference was held and who was in attendance.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up for hardware delivered to Project site.
- B. Tag each item or package separately with identification coordinated with final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.
 1. Deliver each article of hardware in manufacturer's original packaging.
- C. Project Conditions:
 1. Maintain manufacturer-recommended environmental conditions throughout storage and installation periods.
 2. Provide secure lock-up for door hardware delivered to Project, but not yet installed. Control handling and installation of hardware items so that completion of Work will not be delayed by hardware losses both before and after installation.
- D. Protection and Damage:

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1. Promptly replace products damaged during shipping.
 2. Handle hardware in manner to avoid damage, marring, or scratching. Correct, replace or repair products damaged during Work.
 3. Protect products against malfunction due to paint, solvent, cleanser, or any chemical agent.
- E. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.
- F. Deliver keys and permanent cores to Owner by registered mail or overnight package service.

1.7 COORDINATION

- A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete. Concrete, reinforcement, and formwork requirements are specified in Division 03.
- B. Installation Templates: Distribute for doors, frames, and other work specified to be factory prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
- C. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.
- D. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.
- E. Existing Openings: Where hardware components are scheduled for application to existing construction or where modifications to existing door hardware are required, field verify existing conditions and coordinate installation of door hardware to suit opening conditions and to provide proper door operation.
- F. Direct shipments not permitted, unless approved by Contractor.

1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.
1. Warranty Period: Years from date of Substantial Completion, for durations indicated.
 - a. Closers:
 - 1) Mechanical: 10 years. Electrified: 2 years.
 - b. Automatic Operators: 1 year.
 - c. Exit Devices:
 - 1) Mechanical: 3 years.
 - 2) Electrified: 1 year.
 - d. Locksets:

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- 1) Mechanical: 3 years.
- 2) Electrified: 1 year.

e. Continuous Hinges: Lifetime warranty

2. Warranty does not cover damage or faulty operation due to improper installation, improper use or abuse.

1.9 MAINTENANCE

A. Maintenance Tools:

1. Furnish complete set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. The Owner requires use of certain products for their unique characteristics and particular project suitability to insure continuity of existing and future performance and maintenance standards. After investigating available product offerings Awarding Authority has elected to prepare proprietary specifications. These products are specified with the notation: "No Substitute."
 1. Where "No Substitute" is noted, submittals and substitution requests for other products will not be considered.
- B. Approval of manufacturers and/or products other than those listed as "Scheduled Manufacturer" or "Acceptable Manufacturers" in the individual article for the product category shall be in accordance with QUALITY ASSURANCE article, herein.
- C. Approval of products from manufacturers indicated in "Acceptable Manufacturers" is contingent upon those products providing all functions and features and meeting all requirements of scheduled manufacturer's product.
- D. Hand of Door: Drawings show direction of slide, swing, or hand of each door leaf. Furnish each item of hardware for proper installation and operation of door movement as shown.
- E. Where specified hardware is not adaptable to finished shape or size of members requiring hardware, furnish suitable types having same operation and quality as type specified, subject to Architect's approval.

2.2 MATERIALS

A. Fasteners

1. Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation.

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2. Furnish screws for installation with each hardware item. Finish exposed (exposed under any condition) screws to match hardware finish, or, if exposed in surfaces of other work, to match finish of this other work including prepared for paint surfaces to receive painted finish.
 3. Provide concealed fasteners for hardware units exposed when door is closed except when no standard units of type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt head or nut on opposite face is exposed in other work unless thru-bolts are required to fasten hardware securely. Review door specification and advise Architect if thru-bolts are required.
 4. Install hardware with fasteners provided by hardware manufacturer.
- B. Modification and Preparation of Existing Doors: Where existing door hardware is indicated to be removed and reinstalled.
1. Provide necessary fillers, Dutchmen, reinforcements, and fasteners, compatible with existing materials, as required for mounting new opening hardware and to cover existing door and frame preparations.
 2. Use materials which match materials of adjacent modified areas.
 3. When modifying existing fire-rated openings, provide materials permitted by NFPA 80 as required to maintain fire-rating.
- C. Provide screws, bolts, expansion shields, drop plates and other devices necessary for hardware installation.
1. Where fasteners are exposed to view: Finish to match adjacent door hardware material.

2.3 HINGES

- A. Provide five-knuckle, ball bearing hinges.
1. Manufacturers and Products:
 - a. Scheduled Manufacturer and Product: Ives 5BB series
 - b. Acceptable Manufacturers and Products: Hager BB series, McKinney TA/T4A series, Stanley FBB Series
- B. Requirements:
1. 1-3/4 inch (44 mm) thick doors, up to and including 36 inches (914 mm) wide:
 - a. Exterior: Standard weight, bronze or stainless steel, 4-1/2 inches (114 mm) high
 - b. Interior: Standard weight, steel, 4-1/2 inches (114 mm) high
 2. 1-3/4 inch (44 mm) thick doors over 36 inches (914 mm) wide:
 - a. Exterior: Heavy weight, bronze/stainless steel, 5 inches (127 mm) high
 - b. Interior: Heavy weight, steel, 5 inches (127 mm) high
 3. 2 inches or thicker doors:
 - a. Exterior: Heavy weight, bronze or stainless steel, 5 inches (127 mm) high
 - b. Interior: Heavy weight, steel, 5 inches (127 mm) high

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4. Provide three hinges per door leaf for doors 90 inches (2286 mm) or less in height, and one additional hinge for each 30 inches (762 mm) of additional door height.
5. Where new hinges are specified for existing doors or existing frames, provide new hinges of identical size to hinge preparation present in existing door or existing frame.
6. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
 - a. Steel Hinges: Steel pins
 - b. Non-Ferrous Hinges: Stainless steel pins
 - c. Out-Swinging Exterior Doors: Non-removable pins
 - d. Out-Swinging Interior Lockable Doors: Non-removable pins
 - e. Interior Non-lockable Doors: Non-rising pins
7. Width of hinges: 4-1/2 inches (114 mm) at 1-3/4 inch (44 mm) thick doors, and 5 inches (127 mm) at 2 inches (51 mm) or thicker doors. Adjust hinge width as required for door, frame, and wall conditions to allow proper degree of opening.
8. Doors 36 inches (914 mm) wide or less furnish hinges 4-1/2 inches (114 mm) high; doors greater than 36 inches (914 mm) wide furnish hinges 5 inches (127 mm) high, heavy weight or standard weight as specified.
9. Provide hinges with electrified options as scheduled in the hardware sets. Provide with sufficient number and wire gage to accommodate electric function of specified hardware. Locate electric hinge at second hinge from bottom or nearest to electrified locking component.
10. Provide mortar guard for each electrified hinge specified, unless specified in hollow metal frame specification.
11. Provide spring hinges where specified. Provide two spring hinges and one bearing hinge per door leaf for doors 90 inches (2286 mm) or less in height. Provide one additional bearing hinge for each 30 inches (762 mm) of additional door height.

2.4 CONTINUOUS HINGES

A. Aluminum Geared

1. Manufacturers:
 - a. Scheduled Manufacturer: Ives.
 - b. Acceptable Manufacturers: Markar, Stanley.
2. Requirements:
 - a. Provide aluminum geared continuous hinges conforming to ANSI/BHMA A156.25, Grade 2.
 - b. Provide aluminum geared continuous hinges, where specified in the hardware sets, fabricated from 6063-T6 aluminum, with 0.25-inch (6 mm) diameter Teflon coated stainless steel hinge pin.
 - c. Provide split nylon bearings at each hinge knuckle for quiet, smooth, self-lubricating operation.
 - d. Provide hinges capable of supporting door weights up to 450 pounds, and successfully tested for 1,500,000 cycles.
 - e. On fire-rated doors, provide aluminum geared continuous hinges that are classified for use on rated doors by testing agency acceptable to authority having jurisdiction.

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- f. Provide aluminum geared continuous hinges with electrified option scheduled in the hardware sets. Provide with sufficient number and wire gage to accommodate electric function of specified hardware.
- g. Install hinges with fasteners supplied by manufacturer.
- h. Provide hinges with symmetrical hole pattern.

2.5 ELECTRIC POWER TRANSFER

A. Manufacturers:

- a. Scheduled Manufacturer: Von Duprin
- b. Acceptable Manufacturers: Falcon, ABH

B. Provide power transfer with electrified options as scheduled in the hardware sets. Provide with number and gage of wires sufficient to accommodate electric function of specified hardware.

C. Locate electric power transfer per manufacturer's template and UL requirements, unless interference with operation of door or other hardware items.

2.6 FLUSH BOLTS

A. Manufacturers:

1. Scheduled Manufacturer: Ives
2. Acceptable Manufacturers: Burns, Rockwood

B. Requirements:

1. Provide automatic, constant latching, and manual flush bolts with forged bronze or stainless steel face plates, extruded brass levers, and with wrought brass guides and strikes. Provide 12 inch (305 mm) steel or brass rods at doors up to 90 inches (2286 mm) in height. For doors over 90 inches (2286 mm) in height increase top rods by 6 inches (152 mm) for each additional 6 inches (152 mm) of door height. Provide dust-proof strikes at each bottom flush bolt.

2.7 CYLINDRICAL LOCKS – GRADE 1

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: Schlage ND Series
2. Acceptable Manufacturers and Products: Sargent 11 Series, Corbin Russwin CL3100 Series.

B. Requirements:

1. Provide cylindrical locks conforming to ANSI/BHMA A156.2 Series 4000, Grade 1. Cylinders: Refer to "KEYING" article, herein.

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2. Provide cylindrical locks with classroom security function with an inside indicator that provides clear direction for users to safely and quickly secure the room.
3. Provide locksets able to withstand 3100 inch pounds of torque applied to locked outside lever without gaining access per ANSI/BHMA A156.2 Abusive Locked Lever Torque Test and cycle tested to 3 million cycles per ANSI/BHMA A156.2 Cycle Test.
4. Provide levers with vandal resistant technology for use at heavy traffic or abusive applications. Levers feature internal lock components that prevent damage caused by excessive force from persons kicking, hitting or standing on lever to gain access.
5. Provide solid steel rotational stops to control excessive rotation of lever.
6. Provide completely refunctionable lockset that allows lock function to be changed to over twenty other common functions by swapping easily accessible parts.
7. Provide locks with standard 2-3/4 inches (70 mm) backset, unless noted otherwise, with 1/2 inch latch throw. Provide proper latch throw for UL listing at pairs.
8. Provide locksets with separate anti-rotation thru-bolts, and no exposed screws.
9. Provide independently operating levers with two external return spring cassettes mounted under roses to prevent lever sag.
10. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.
11. Provide electrified options as scheduled in the hardware sets.
12. Lever Trim: Solid cast levers without plastic inserts, and wrought roses on both sides.
 - a. Lever Design: Schlage Sparta.
 - b. Tactile Warning (Knurling): Where required by authority having jurisdiction. Provide on levers on exterior (secure side) of doors serving rooms considered to be hazardous.

2.8 MORTISE LOCKS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: Schlage L9000 series
2. Acceptable Manufacturers and Products: Corbin-Russwin ML2000 series, Best 35H series (3-piece latchbolt)

B. Requirements:

1. Provide mortise locks conforming to ANSI/BHMA A156.13 Series 1000, Grade 1 Operational, Grade 1 Security, and manufactured from heavy gauge steel, containing components of steel with a zinc dichromate plating for corrosion resistance. Provide lock case that is multi-function and field reversible for handing without opening case. Cylinders: Refer to "KEYING" article, herein.
2. Indicators: Where specified, provide indicator window measuring a minimum 2 inch x 1/2 inch with 180 degree visibility. Provide messages color-coded with full text and/or symbols, as scheduled, for easy visibility.
3. Provide locks with standard 2-3/4 inches (70 mm) backset with full 3/4 inch (19 mm) throw stainless steel mechanical anti-friction 3-piece latchbolt. Provide deadbolt with full 1 inch (25 mm) throw, constructed of stainless steel.
4. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.
5. Provide electrified options as scheduled in the hardware sets. Where scheduled, provide a request to exit (RX) switch that is actuated with rotation of inside lever.
6. Provide motor based electrified locksets with electrified options as scheduled in the hardware sets and comply with the following requirements:

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- a. Universal input voltage – single chassis accepts 12 or 24V DC to allow for changes in the field without changing lock chassis.
 - b. Fail Safe/Fail Secure – changing mode between electrically locked (fail safe) and electrically unlocked (fail secure) is field selectable without opening the lock case
 - c. Low maximum current draw – maximum 0.4 amps to allow for multiple locks on a single power supply.
 - d. Low holding current – maximum 0.01 amps to produce minimal heat, eliminate “hot levers” in electrically locked applications, and to provide reliable operation in wood doors that provide minimal ventilation and air flow.
 - e. Request to Exit Switch (RX) –
 - 1) Modular Design – provide electrified locks capable of using, adding, or changing a modular RX switch without opening the lock case.
 - 2) Monitoring – where scheduled, provide a request to exit (RX) switch that detects rotation of the inside lever.
 - f. Connections – provide quick-connect Molex system standard.
 - g. UL Listed – 3 hour fire door
7. Lever Trim: Solid brass, bronze, or stainless steel, cast or forged in design specified, with wrought roses and external lever spring cages. Provide thru-bolted levers with 2-piece spindles.
- a. Lever Design: Schlage 17A.
 - b. Tactile Warning (Knurling): Where required by authority having jurisdiction. Provide on levers on exterior (secure side) of doors serving rooms considered to be hazardous.

2.9 EXIT DEVICES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: Von Duprin 99/33 series
2. Acceptable Manufacturers and Products: Detex Advantex series, Precision Apex series

B. Requirements:

1. Provide exit devices tested to ANSI/BHMA A156.3 Grade 1, and UL listed for Panic Exit or Fire Exit Hardware. Cylinders: Refer to “KEYING” article, herein.
2. Provide touchpad type exit devices, fabricated of brass, bronze, stainless steel, or aluminum, plated to standard architectural finishes to match balance of door hardware.
3. Touchpad: Extend minimum of one half of door width. Match exit device finish, stainless steel for US26, US26D, US28, US32, and US32D finishes; and for all other finishes, provide compatible finish to exit device. Provide compression springs in devices, latches, and outside trims or controls; tension springs also acceptable.
4. Provide exit devices with deadlatching feature for security and for future addition of alarm kits and/or other electrified requirements.
5. Provide exit devices with manufacturer’s approved strikes.
6. Provide exit devices cut to door width and height. Locate exit devices at height recommended by exit device manufacturer, allowable by governing building codes, and approved by Architect.

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7. Mount mechanism case flush on face of doors, or provide spacers to fill gaps behind devices. Where glass trim or molding projects off face of door, provide glass bead kits.
8. Provide cylinder dogging at non-fire-rated exit devices, unless specified less dogging.
9. Removable Mullions: 2 inches (51 mm) x 3 inches (76 mm) steel tube. Where scheduled as keyed removable mullion that is removed by use of a keyed cylinder, which is self-locking when re-installed.
10. Where lever handles are specified as outside trim for exit devices, provide heavy-duty lever trims with forged or cast escutcheon plates. Provide vandal-resistant levers that will travel to 90-degree down position when more than 35 pounds of torque are applied, and which can easily be re-set.
 - a. Lever Style: Match lever style of locksets.
 - b. Tactile Warning (Knurling): Where required by authority having jurisdiction. Provide on levers on exterior (secure side) of doors serving rooms considered to be hazardous.
11. Concealed Vertical Cable Exit Devices: provide cable-actuated concealed vertical latch system in two-point for non-rated or fire rated wood doors up to a 90 minute rating and less bottom latch (LBL) configuration for non-rated or fire rated wood doors up to 20 minute rating. Vertical rods not permitted.
 - a. Cable: Stainless steel with abrasive resistant coating. Conduit and core wire ends snap into latch and center slides without use of tools.
 - b. Wood Door Prep: Maximum 1 inch x 1.1875 inch x 3.875 inches top latch pocket and 1 inch x 1.1875 inch x 5 inches bottom latch pocket which does not require the use of a metal wrap or edge for non-rated or fire rated wood doors up to a 45 minute rating.
 - c. Latchbolts and Blocking Cams: Manufactured from sintered metal low carbon copper- infiltrated steel, with molybdenum disulfide low friction coating.
 - d. Top Latchbolt: Minimum 0.38 inch (10 mm) and greater than 90 degree engagement with strike to prevent door and frame separation under high static load.
 - e. Bottom Latchbolt: Minimum of 0.44 inch (11 mm) engagement with strike.
 - f. Product Cycle Life: 1,000,000 cycles.
 - g. Latch Operation: Top and bottom latch operate independently of each other. Top latch fully engages top strike even when bottom latch is compromised. Separate trigger mechanisms not permitted.
 - h. Latch release does not require separate trigger mechanism.
 - i. Cable and latching system characteristics:
 - 1) Installed independently of exit device installation, and capable of functioning on door prior to device and trim installation.
 - 2) Connected to exit device at single point in steel and aluminum doors, and two points for top and bottom latches in wood doors.
 - 3) Bottom latch height adjusted, from single point for steel and aluminum doors and two points for wood doors, after system is installed and connected to exit device, while door is hanging
 - 4) Bottom latch position altered up and down minimum of 2 inches (51 mm) in steel and aluminum doors without additional adjustment. Bottom latch deadlocks in every adjustment position in wood doors.
 - 5) Top and bottom latches in steel and aluminum doors and top latch in wood doors may be removed while door is hanging.

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- 6) Top latch mounting: double or single tab mount for steel doors, face mount for aluminum doors eliminating requirement of tabs, and double tab mount for wood doors.
12. Provide UL labeled fire exit hardware for fire rated openings.
13. Provide factory drilled weep holes for exit devices used in full exterior application, highly corrosive areas, and where noted in hardware sets.
14. Provide electrified options as scheduled.

2.10 ELECTRIC STRIKES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: Von Duprin 6000 series
2. Acceptable Manufacturers and Products: Folger Adam 300 series, HES 1006 series

B. Requirements:

1. Provide electric strikes designed for use with type of locks shown at each opening.
2. Provide electric strikes UL Listed as burglary-resistant.
3. Where required, provide electric strikes UL Listed for fire doors and frames.
4. Provide fail-secure type electric strikes, unless specified otherwise.
5. Coordinate voltage and provide transformers and rectifiers for each strike as required.

2.11 POWER SUPPLIES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: Schlage or Von Duprin PS900 series
2. Acceptable Manufacturers and Products No Substitutions

B. Requirements:

1. Provide power supplies, recommended and approved by manufacturer of electrified locking component, for operation of electrified locks, electrified exit devices, magnetic locks, electric strikes, and other components requiring power supply.
2. Provide appropriate quantity and size of power supplies necessary for proper operation of electrified locking components as recommended by manufacturer of electrified locking components with consideration for each electrified component using power supply, location of power supply, and approved wiring diagrams. Locate power supplies as directed by Architect.
3. Provide appropriate option boards for power supplies necessary for proper operation of the electrified locking components as recommended by the manufacturer of the electrified locking components with consideration for each electrified component used in the system.
4. Provide regulated and filtered 24 VDC power supply and UL class 2 listed.
5. Options:
 - a. Provide power supply, where specified, with internal capability of charging sealed backup batteries 24 VDC, in addition to operating DC load.

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- b. Provide sealed batteries for battery back-up at each power supply where specified.
 - c. Provide keyed power supply cabinet.
6. Provide power supply in an enclosure, complete, and requiring 120VAC to fused input.
 7. Provide power supply with emergency release terminals, where specified, that allow release of all devices upon activation of fire alarm system complete with fire alarm input for initiating “no delay” exiting mode.

2.12 CYLINDERS

A. Manufacturers:

1. Scheduled Manufacturer: Schlage
2. Acceptable Manufacturers: Best, Medeco

B. Requirements:

1. Provide cylinders/cores, from the same manufacturer of locksets, compliant with ANSI/BHMA A156.5; latest revision, Section 12, Grade 1; permanent cylinders; cylinder face finished to match lockset, manufacturer’s series as indicated. Refer to “KEYING” article, herein.
2. Provide cylinders in the below-listed configuration(s), distributed throughout the Project as indicated.
 - a. High Security: dual-locking cylinder with permanent core requiring, patented keyway.
 - b. Security: dual-locking cylinder with **interchangeable** core requiring restricted, patented keyway.
 - c. Conventional cylinder with **interchangeable** core with open keyway.
3. Patent Protection: Cylinders/cores requiring use of restricted, patented keys, patent-protected.
4. Security Cylinders: Where indicated, provide cylinders/cores with “dual-locking mechanism” with interlocking finger pin(s) to check for patented features on keys.
5. Nickel silver bottom pins.
6. Temporary Construction Cylinder Keying.
 - a. Owner or Owner’s Representative will void operation of temporary construction keys.
7. Replaceable Construction Cores..
 - a. Provide temporary construction cores replaceable by permanent cores, furnished in accordance with the following requirements.
 - 1) 12 construction change (day) keys.

2.13 KEYING

- A. Provide a factory registered keying system, complying with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference.

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B. Requirements:

1.
 - a. All Locks keyed into a new Master Key System as directed by owner
2. Provide keys with the following features.
 - a. Material: Solid nickel plated
3. Identification:
 - a. Mark permanent cylinders/cores and keys with applicable blind code per DHI publication "Keying Systems and Nomenclature" for identification. Blind code marks shall not include actual key cuts.
 - b. Identification stamping provisions must be approved by the Architect and Owner.
 - c. Failure to comply with stamping requirements shall be cause for replacement of keys involved at no additional cost to Owner.
 - d. Forward permanent cylinders/cores to Owner, separately from keys, by means as directed by Owner.
4. Quantity: Furnish in the following quantities.
 - a. Change (Day) Keys: 3 per cylinder/core.
 - b. Permanent Control Keys: 3.
 - c. Master Keys: 6.
 - d. Unused balance of key blanks shall be furnished to Owner with the cut keys.
 - e. Extra Keys:
 - 1) 6 Construction Keys

2.14 KEY CONTROL SYSTEM

A. Manufacturers:

1. Scheduled Manufacturer: Telkee
2. Acceptable Manufacturers: HPC, Lund

B. Requirements:

1. Provide key control system, including envelopes, labels, tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet, all as recommended by system manufacturer, with capacity for 150% of number of locks required for Project.
 - a. Provide complete cross index system set up by hardware supplier, and place keys on markers and hooks in cabinet as determined by final key schedule.
 - b. Provide hinged-panel type cabinet for wall mounting.

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2.15 DOOR CLOSERS

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A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: LCN 4040XP series.
2. Acceptable Manufacturers and Products: Sargent 281 series, Corbin Russwin DC8200 series

B. Requirements:

1. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory. ISO 9000 certify closers. Stamp units with date of manufacture code.
2. Provide door closers with fully hydraulic, full rack and pinion action with high strength cast iron cylinder, and full complement bearings at shaft.
3. Cylinder Body: 1-1/2 inch (38 mm) diameter with 3/4 inch (19 mm) diameter double heat-treated pinion journal.
4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards.
6. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and backcheck.
7. Provide closers with solid forged steel main arms and factory assembled heavy-duty forged forearms for parallel arm closers.
8. Pressure Relief Valve (PRV) Technology: Not permitted.
9. Finish for Closer Cylinders, Arms, Adapter Plates, and Metal Covers: Powder coating finish which has been certified to exceed 100 hours salt spray testing as described in ANSI Standard A156.4 and ASTM B117, or has special rust inhibitor (SRI).
10. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.

2.16 ELECTRO-HYDRAULIC AUTOMATIC OPERATORS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: LCN 4600 series.
2. Acceptable Manufacturers and Products: Norton 6000 series, Detex A019 series.

B. Requirements:

1. Provide low energy automatic operator units with hydraulic closer complying with ANSI/BHMA A156.19.
2. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
3. Provide units with conventional door closer opening and closing forces unless power operator motor is activated. Provide door closer assembly with adjustable spring size, back-check, and opening and closing speed adjustment valves to control door
4. Provide units with on/off switch for manual operation, motor start up delay, vestibule interface delay, electric lock delay, and door hold open delay.

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5. Provide units with conventional door closer opening and closing forces unless power operator motor is activated. Provide door closer assembly with adjustable spring size, back-check valve, sweep valve, latch valve to control door.
6. Provide drop plates, brackets, or adapters for arms as required for details.
7. Provide hard-wired actuator switches for operation as specified.
8. Provide weather-resistant actuators at exterior applications.
9. Provide key switches with LED's, recommended and approved by manufacturer of automatic operator as required for function described in operation description of hardware group below. Cylinders: Refer to "KEYING" article, herein.
10. Provide complete assemblies of controls, switches, power supplies, relays, and parts/material recommended and approved by manufacturer of automatic operator for each individual leaf. Actuators control both doors simultaneously at pairs. Sequence operation of exterior and vestibule doors with automatic operators to allow ingress or egress through both sets of openings as directed by Architect. Locate actuators, key switches, and other controls as directed by Architect.
11. Provide units with vestibule inputs that allow sequencing operation of two units, and SPDT relay for interfacing with latching or locking devices.

2.17 DOOR TRIM

A. Manufacturers:

1. Scheduled Manufacturer: Ives
2. Acceptable Manufacturers: Burns, Rockwood

B. Requirements:

1. Provide push plates 4 inches (102 mm) wide by 16 inches (406 mm) high by 0.050 inch (1 mm) thick and beveled 4 edges. Where width of door stile prevents use of 4 inches (102 mm) wide plate, adjust width to fit.
2. Provide push bars of solid bar stock, diameter and length as scheduled. Provide push bars of sufficient length to span from center to center of each stile. Where required, mount back to back with pull.
3. Provide offset pulls of solid bar stock, diameter and length as scheduled. Where required, mount back to back with push bar.
4. Provide flush pulls as scheduled. Where required, provide back-to-back mounted model.
5. Provide pulls of solid bar stock, diameter and length as scheduled. Where required, mount back to back with push bar.
6. Provide pull plates 4 inches (102 mm) wide by 16 inches (406 mm) high by 0.050 inch (1 mm) thick, beveled 4 edges, and prepped for pull. Where width of door stile prevents use of 4 inches (102 mm) wide plate, adjust width to fit.
7. Provide wire pulls of solid bar stock, diameter and length as scheduled.
8. Provide decorative pulls as scheduled. Where required, mount back to back with pull.

2.18 PROTECTION PLATES

A. Manufacturers:

1. Scheduled Manufacturer: Ives
2. Acceptable Manufacturers: Burns, Rockwood

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B. Requirements:

1. Provide kick plates, mop plates, and armor plates minimum of 0.050 inch (1 mm) thick as scheduled. Furnish with sheet metal or wood screws, finished to match plates.
2. Sizes of plates:
 - a. Kick Plates: 10 inches (254 mm) high by 2 inches (51 mm) less width of door on single doors, 1 inch (25 mm) less width of door on pairs
 - b. Mop Plates: 4 inches (102 mm) high by 2 inches (51 mm) less width of door on single doors, 1 inch (25 mm) less width of door on pairs
 - c. Armor Plates: 36 inches (914 mm) high by 2 inches (51 mm) less width of door on single doors, 1 inch (25 mm) less width of door on pairs

2.19 OVERHEAD STOPS AND OVERHEAD STOP/HOLDERS

A. Manufacturers:

1. Scheduled Manufacturers: Glynn-Johnson
2. Acceptable Manufacturers: Rixson, Sargent

B. Requirements:

1. Provide heavy duty concealed mounted overhead stop or holder as specified for exterior and interior vestibule single acting doors.
2. Provide heavy duty concealed mounted overhead stop or holder as specified for double acting doors.
3. Provide heavy or medium duty and concealed or surface mounted overhead stop or holder for interior doors as specified. Provide medium duty surface mounted overhead stop for interior doors and at any door that swings more than 140 degrees before striking wall, open against equipment, casework, sidelights, and where conditions do not allow wall stop or floor stop presents tripping hazard.
4. Where overhead holders are specified provide friction type at doors without closer and positive type at doors with closer.

2.20 DOOR STOPS AND HOLDERS

A. Manufacturers:

1. Scheduled Manufacturer: Ives
2. Acceptable Manufacturers: Burns, Rockwood

B. Provide door stops at each door leaf:

1. Provide wall stops wherever possible. Provide convex type where mortise type locks are used and concave type where cylindrical type locks are used.
2. Where a wall stop cannot be used, provide universal floor stops for low or high rise options.
3. Where wall or floor stop cannot be used, provide medium duty surface mounted overhead stop.

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2.21 THRESHOLDS, SEALS, DOOR SWEEPS, AUTOMATIC DOOR BOTTOMS, AND GASKETING

A. Manufacturers:

1. Scheduled Manufacturer: Zero International
2. Acceptable Manufacturers: Pemko, Reese

B. Requirements:

1. Provide thresholds, weatherstripping (including door sweeps, seals, astragals) and gasketing systems (including smoke, sound, and light) as specified and per architectural details. Match finish of other items.
2. Size of thresholds:
 - a. Saddle Thresholds: 1/2 inch (13 mm) high by jamb width by door width
 - b. Bumper Seal Thresholds: 1/2 inch (13 mm) high by 5 inches (127 mm) wide by door width
3. Provide door sweeps, seals, astragals, and auto door bottoms only of type where resilient or flexible seal strip is easily replaceable and readily available.

2.22 SILENCERS

A. Manufacturers:

1. Scheduled Manufacturer: Ives
2. Acceptable Manufacturers: Burns, Rockwood

B. Requirements:

1. Provide "push-in" type silencers for hollow metal or wood frames.
2. Provide one silencer per 30 inches (762 mm) of height on each single frame, and two for each pair frame.
3. Omit where gasketing is specified.

2.23 MAGNETIC HOLDERS

A. Manufacturers:

1. Scheduled Manufacturer: LCN
2. Acceptable Manufacturers: Rixson, Sargent

B. Requirements:

1. Provide wall or floor mounted electromagnetic door release as specified with minimum of 25 pounds of holding force. Coordination projection of holder and armature with other hardware and wall conditions to ensure that door sits parallel to wall when fully open. Wire magnetic holders on fire-rated doors into the fire control panel for fail-safe operation.

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2.24 FINSHES

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- A. Finish: BHMA 626/652 (US26D); except:
 - 1. Hinges at Exterior Doors: BHMA 630 (US32D)
 - 2. Continuous Hinges: BHMA 628 (US28)
 - 3. Push Plates, Pulls, and Push Bars: BHMA 630 (US32D)
 - 4. Protection Plates: BHMA 630 (US32D)
 - 5. Overhead Stops and Holders: BHMA 630 (US32D)
 - 6. Door Closers: Powder Coat to Match
 - 7. Wall Stops: BHMA 630 (US32D)
 - 8. Latch Protectors: BHMA 630 (US32D)
 - 9. Weatherstripping: Clear Anodized Aluminum
 - 10. Thresholds: Mill Finish Aluminum

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installation of hardware, examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Existing Door and Frame Compatibility: Field verify existing doors and frames receiving new hardware and existing conditions receiving new openings. Verify that new hardware is compatible with existing door and frame preparation and existing conditions.
- C. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Where on-site modification of doors and frames is required:
 - 1. Carefully remove existing door hardware and components being reused. Clean, protect, tag, and store in accordance with storage and handling requirements specified herein.
 - 2. Field modify and prepare existing door and frame for new hardware being installed.
 - 3. When modifications are exposed to view, use concealed fasteners, when possible.
 - 4. Prepare hardware locations and reinstall in accordance with installation requirements for new door hardware and with:
 - a. Steel Doors and Frames: For surface applied door hardware, drill and tap doors and frames according to ANSI/SDI A250.6.
 - b. Wood Doors: DHI WDHS.5 "Recommended Hardware Reinforcement Locations for Mineral Core Wood Flush Doors."
 - c. Doors in rated assemblies: NFPA 80 for restrictions on on-site door hardware preparation.

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3.3 INSTALLATION

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- A. Mounting Heights: Mount door hardware units at heights to comply with the following, unless otherwise indicated or required to comply with governing regulations.
 - 1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
 - 2. Custom Steel Doors and Frames: HMMA 831.
 - 3. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
- B. Install each hardware item in compliance with manufacturer's instructions and recommendations, using only fasteners provided by manufacturer.
- C. Do not install surface mounted items until finishes have been completed on substrate. Protect all installed hardware during painting.
- D. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.
- E. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
- F. Install operating parts so they move freely and smoothly without binding, sticking, or excessive clearance.
- G. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than quantity recommended by manufacturer for application indicated or one hinge for every 30 inches (750 mm) of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.
- H. Intermediate Offset Pivots: Where offset pivots are indicated, provide intermediate offset pivots in quantities indicated in door hardware schedule but not fewer than one intermediate offset pivot per door and one additional intermediate offset pivot for every 30 inches (750 mm) of door height greater than 90 inches (2286 mm).
- I. Lock Cylinders: Install construction cores to secure building and areas during construction period.
 - 1. Replace construction cores with permanent cores as indicated in keying section.
- J. Wiring: Coordinate with Division 26, ELECTRICAL sections for:
 - 1. Conduit, junction boxes and wire pulls.
 - 2. Connections to and from power supplies to electrified hardware.
 - 3. Connections to fire/smoke alarm system and smoke evacuation system.
 - 4. Connection of wire to door position switches and wire runs to central room or area, as directed by Architect.
 - 5. Testing and labeling wires with Architect's opening number.
- K. Key Control System: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.

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- L. Door Closers: Mount closers on room side of corridor doors, inside of exterior doors, and stair side of stairway doors from corridors. Closers shall not be visible in corridors, lobbies and other public spaces unless approved by Architect.
- M. Closer/holders: Mount closer/holders on room side of corridor doors, inside of exterior doors, and stair side of stairway doors.
- N. Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings or in equipment room, or alternate location as directed by Architect.
 - 1. Configuration: Provide least number of power supplies required to adequately serve doors with electrified door hardware.
- O. Thresholds: Set thresholds in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."
- P. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they may impede traffic or present tripping hazard.
- Q. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
- R. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.
- S. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.

3.4 FIELD QUALITY CONTROL

- A. Architectural Hardware Consultant: Engage qualified independent Architectural Hardware Consultant to perform inspections and to prepare inspection reports.
 - 1. Architectural Hardware Consultant will inspect door hardware and state in each report whether installed work complies with or deviates from requirements, including whether door hardware is properly installed and adjusted.

3.5 FIELD INSPECTIONS:

- A. Fire Door Assembly Inspection and Testing: Provide functional testing and inspection of fire door assemblies in accordance with NFPA 80-2007/2010. Inspections shall be performed by individuals certified by Intertek as a Fire Door Assembly Inspector, using reporting forms provided by the Door and Hardware Institute (DHI). Alternatively, inspections may be performed by individuals acceptable to the Architect, who have knowledge and understanding of the operating components of the applicable door type, and who have experience in preparing written reports of testing and inspection results.
 - 1. Schedule fire door assembly inspection within 90 days of Substantial Completion of the Project.
 - 2. Submit a signed, written final report as specified in Paragraph 1.4: Submittals.
 - 3. Contractor shall correct all deficiencies and schedule a reinspection of fire door assemblies which were noted as deficient on the inspection report.

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4. Inspector shall reinspect fire door assemblies after repairs are made.
5. Additional reinspections which are required due to incomplete repairs will be performed by the inspector at the expense of the Contractor.

3.6 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.
 1. Spring Hinges: Adjust to achieve positive latching when door is allowed to close freely from an open position of 30 degrees.
 2. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.
 3. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.
- B. Occupancy Adjustment: Approximately three months after date of Substantial Completion, Installer's Architectural Hardware Consultant shall examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors, door hardware, and electrified door hardware.

3.7 CLEANING AND PROTECTION

- A. Clean adjacent surfaces soiled by door hardware installation.
- B. Clean operating items as necessary to restore proper function and finish.
- C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

3.8 DEMONSTRATION

- A. Provide training for Owner's maintenance personnel to adjust, operate, and maintain door hardware and door hardware finishes. Refer to Division 01 Section "Demonstration and Training."

3.9 DOOR HARDWARE SCHEDULE

- A. Locksets, exit devices, and other hardware items are referenced in the following hardware sets for series, type and function. Refer to the above-specifications for special features, options, cylinders/keying, and other requirements.

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Brooke County EMS Facility
Hardware Sets:

T60-11009

87566 X-77058 Version 1

HARDWARE GROUP NO. 01

FOR USE ON DOOR #(S):

101

PROVIDE EACH OPENING WITH THE FOLLOWING:

<u>QTY</u>		<u>DESCRIPTION</u>	<u>CATALOG NUMBER</u>	<u>FINISH</u>	<u>MFR</u>
1	EA	CONT. HINGE	112XY	628	IVE
1	EA	PANIC HARDWARE	CD-33A-NL-OP-388	626	VON
1	EA	RIM HOUSING	20-079	626	SCH
1	EA	MORTISE CYLINDER	26-064 X CYL CAM & RING AS REQUIRED	626	SCH
2	EA	FSIC CORE	23-030	626	SCH
1	EA	90 DEG OFFSET PULL	8190EZHD 12" STD	630-316	IVE
1	EA	OH STOP	100S	630	GLY
1	EA	SURFACE CLOSER	4040XP EDA SRI	689	LCN
1	EA	SEALS	ALL SEALS AND WEATHER STRIPS BY DOOR MANUFACTURER		B/O
1	EA	DOOR SWEEP	8197AA	AA	ZER
1	EA	THRESHOLD	65A	A	ZER

Brooke County Commission
Brooke County EMS Facility
HARDWARE GROUP NO. 02

T60-11009

FOR USE ON DOOR #(S):

101B

PROVIDE EACH OPENING WITH THE FOLLOWING:

<u>QTY</u>		<u>DESCRIPTION</u>	<u>CATALOG NUMBER</u>	<u>FINISH</u>	<u>MFR</u>
1	EA	CONT. HINGE	112XY	628	IVE
1	EA	PANIC HARDWARE	CD-33A-NL-OP-388	626	VON
1	EA	RIM HOUSING	20-079	626	SCH
1	EA	MORTISE CYLINDER	26-064 X CYL CAM & RING AS REQUIRED	626	SCH
2	EA	FSIC CORE	23-030	626	SCH
1	EA	ELECTRIC STRIKE	6300 FSE 12/24 VAC/VDC	630	VON
1	EA	90 DEG OFFSET PULL	8190EZHD 12" STD	630-316	IVE
1	EA	OH STOP	100S	630	GLY
1	EA	SURFACE CLOSER	4040XP EDA	689	LCN
1	EA	SEALS	ALL SEALS AND WEATHER STRIPS BY DOOR MANUFACTURER		B/O
1	EA	CONTROLLER	CTE-MTB15-485-B	B	SCE
1	EA	DOOR CONTACT	7764	628	SCE
1	EA	MOTION SENSOR	SCANII 12/24 VDC	BLK	SCE
1	EA	POWER SUPPLY	PS902 900-2RS 120/240 VAC		VON

HARDWARE GROUP NO. 03

FOR USE ON DOOR #(S):

111B

PROVIDE EACH OPENING WITH THE FOLLOWING:

<u>QTY</u>		<u>DESCRIPTION</u>	<u>CATALOG NUMBER</u>	<u>FINISH</u>	<u>MFR</u>
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	CLASSROOM LOCK	ND70JD SPA	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	OH STOP	100S	630	GLY
1	EA	SURFACE CLOSER	4040XP RW/PA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	626	IVE
1	EA	GASKETING	488S H & J (USE SR64 SILENCERS @ NON RATED OPENINGS)	BK	ZER

Brooke County Commission
Brooke County EMS Facility
HARDWARE GROUP NO. 04

T60-11009

FOR USE ON DOOR #(S):

123

PROVIDE EACH OPENING WITH THE FOLLOWING:

<u>QTY</u>		<u>DESCRIPTION</u>	<u>CATALOG NUMBER</u>	<u>FINISH</u>	<u>MFR</u>
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	CLASSROOM LOCK	ND70JD SPA	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	4040XP RW/PA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	626	IVE
1	EA	WALL STOP	WS406/407CCV	626	IVE
1	EA	GASKETING	488S H & J (USE SR64 SILENCERS @ NON RATED OPENINGS)	BK	ZER

HARDWARE GROUP NO. 05

FOR USE ON DOOR #(S):

108

PROVIDE EACH OPENING WITH THE FOLLOWING:

<u>QTY</u>		<u>DESCRIPTION</u>	<u>CATALOG NUMBER</u>	<u>FINISH</u>	<u>MFR</u>
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	ND80JD SPA	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	OH STOP	100S	630	GLY
1	EA	SURFACE CLOSER	4040XP RW/PA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	626	IVE
1	EA	GASKETING	488S H & J (USE SR64 SILENCERS @ NON RATED OPENINGS)	BK	ZER

Brooke County Commission
Brooke County EMS Facility
HARDWARE GROUP NO. 06

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FOR USE ON DOOR #(S):

109

PROVIDE EACH OPENING WITH THE FOLLOWING:

<u>QTY</u>		<u>DESCRIPTION</u>	<u>CATALOG NUMBER</u>	<u>FINISH</u>	<u>MFR</u>
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	ND80JD SPA	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	OH STOP	100S	630	GLY
1	EA	SURFACE CLOSER	4040XP RW/PA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	626	IVE
1	EA	GASKETING	488S H & J (USE SR64 SILENCERS @ NON RATED OPENINGS)	BK	ZER

HARDWARE GROUP NO. 07

FOR USE ON DOOR #(S):

111A

PROVIDE EACH OPENING WITH THE FOLLOWING:

<u>QTY</u>		<u>DESCRIPTION</u>	<u>CATALOG NUMBER</u>	<u>FINISH</u>	<u>MFR</u>
1	EA	CONT. HINGE	224XY	628	IVE
1	EA	PANIC HARDWARE	CD-99-NL-OP-110MD	626	VON
1	EA	RIM HOUSING	20-079	626	SCH
1	EA	MORTISE CYLINDER	26-064 X CYL CAM & RING AS REQUIRED	626	SCH
2	EA	FSIC CORE	23-030	626	SCH
1	EA	90 DEG OFFSET PULL	8190EZHD 12" STD	630-316	IVE
1	EA	SURFACE CLOSER	4040XP SCUSH SRI	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	626	IVE
1	EA	RAIN DRIP	142AA	AA	ZER
1	SET	GASKETING	429BK-S	BK	ZER
1	EA	DOOR SWEEP	8198AA	AA	ZER
1	EA	THRESHOLD	65A	A	ZER

Brooke County Commission
Brooke County EMS Facility
HARDWARE GROUP NO. 08

T60-11009

FOR USE ON DOOR #(S):

121A

PROVIDE EACH OPENING WITH THE FOLLOWING:

<u>QTY</u>		<u>DESCRIPTION</u>	<u>CATALOG NUMBER</u>	<u>FINISH</u>	<u>MFR</u>
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	CLASSROOM LOCK	ND70JD SPA	626	SCH
1	EA	SURFACE CLOSER	4040XP RW/PA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	626	IVE
1	EA	WALL STOP	WS406/407CCV	626	IVE
1	EA	GASKETING	488S H & J (USE SR64 SILENCERS @ NON RATED OPENINGS)	BK	ZER
1	EA	DOOR SWEEP	8193AA	AA	ZER
1	EA	THRESHOLD	655A-223	A	ZER

HARDWARE GROUP NO. 09

FOR USE ON DOOR #(S):

121B

PROVIDE EACH OPENING WITH THE FOLLOWING:

<u>QTY</u>		<u>DESCRIPTION</u>	<u>CATALOG NUMBER</u>	<u>FINISH</u>	<u>MFR</u>
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	630	IVE
1	EA	CLASSROOM LOCK	ND70JD SPA	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	OH STOP	100S	630	GLY
1	EA	SURFACE CLOSER	4040XP RW/PA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	626	IVE
1	EA	GASKETING	488S H & J (USE SR64 SILENCERS @ NON RATED OPENINGS)	BK	ZER
1	EA	DOOR SWEEP	8193AA	AA	ZER
1	EA	THRESHOLD	655A-223	A	ZER

Brooke County Commission
 Brooke County EMS Facility
HARDWARE GROUP NO. 10

T60-11009

FOR USE ON DOOR #(S):

120 121C 121I

PROVIDE EACH OPENING WITH THE FOLLOWING:

<u>QTY</u>		<u>DESCRIPTION</u>	<u>CATALOG NUMBER</u>	<u>FINISH</u>	<u>MFR</u>
1	EA	CONT. HINGE	224XY	628	IVE
1	EA	PANIC HARDWARE	CD-99-NL-OP-110MD	626	VON
1	EA	RIM HOUSING	20-079	626	SCH
1	EA	MORTISE CYLINDER	26-064 X CYL CAM & RING AS REQUIRED	626	SCH
2	EA	FSIC CORE	23-030	626	SCH
1	EA	ELECTRIC STRIKE	6300 FSE 12/24 VAC/VDC	630	VON
1	EA	90 DEG OFFSET PULL	8190EZHD 12" STD	630-316	IVE
1	EA	SURFACE CLOSER	4040XP SCUSH SRI	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	626	IVE
1	EA	RAIN DRIP	142AA	AA	ZER
1	SET	GASKETING	429BK-S	BK	ZER
1	EA	DOOR SWEEP	8198AA	AA	ZER
1	EA	THRESHOLD	65A	A	ZER
1	EA	CONTROLLER	CTE-MTB15-485-B	B	SCE
1	EA	DOOR CONTACT	679-05HM	BLK	SCE
1	EA	MOTION SENSOR	SCANII 12/24 VDC	BLK	SCE
1	EA	POWER SUPPLY	PS902 900-2RS 120/240 VAC		VON

HARDWARE GROUP NO. 11

FOR USE ON DOOR #(S):

112 115

PROVIDE EACH OPENING WITH THE FOLLOWING:

<u>QTY</u>		<u>DESCRIPTION</u>	<u>CATALOG NUMBER</u>	<u>FINISH</u>	<u>MFR</u>
3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	PUSH PLATE	8200 4" X 16"	630	IVE
1	EA	PULL PLATE	8303 10" 4" X 16"	626	IVE
1	EA	SURFACE CLOSER	4040XP RW/PA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	626	IVE
1	EA	MOP PLATE	8400 4" X 1" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	626	IVE
1	EA	GASKETING	488S H & J (USE SR64 SILENCERS @ NON RATED OPENINGS)	BK	ZER

Brooke County Commission
Brooke County EMS Facility
HARDWARE GROUP NO. 12

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FOR USE ON DOOR #(S):

105

PROVIDE EACH OPENING WITH THE FOLLOWING:

<u>QTY</u>		<u>DESCRIPTION</u>	<u>CATALOG NUMBER</u>	<u>FINISH</u>	<u>MFR</u>
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PRIVACY LOCK	L9040 17N 09-544 L283-722	626	SCH
1	EA	SURFACE CLOSER	4040XP RW/PA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	626	IVE
1	EA	MOP PLATE	8400 4" X 1" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	626	IVE
1	EA	GASKETING	488S H & J (USE SR64 SILENCERS @ NON RATED OPENINGS)	BK	ZER
1	EA	COAT AND HAT HOOK	582	626	IVE

HARDWARE GROUP NO. 13

FOR USE ON DOOR #(S):

113

114

PROVIDE EACH OPENING WITH THE FOLLOWING:

<u>QTY</u>		<u>DESCRIPTION</u>	<u>CATALOG NUMBER</u>	<u>FINISH</u>	<u>MFR</u>
3	EA	HINGE	5BB1HW 4.5 X 4.5	626	IVE
1	EA	PASSAGE SET	ND10S SPA	626	SCH
1	EA	SURFACE CLOSER	4040XP RW/PA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	626	IVE
1	EA	MOP PLATE	8400 4" X 1" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	626	IVE
1	EA	GASKETING	488S H & J (USE SR64 SILENCERS @ NON RATED OPENINGS)	BK	ZER

Brooke County Commission
Brooke County EMS Facility
HARDWARE GROUP NO. 14

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FOR USE ON DOOR #(S):

107

PROVIDE EACH OPENING WITH THE FOLLOWING:

<u>QTY</u>		<u>DESCRIPTION</u>	<u>CATALOG NUMBER</u>	<u>FINISH</u>	<u>MFR</u>
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PASSAGE SET	ND10S SPA	626	SCH
1	EA	SURFACE CLOSER	4040XP RW/PA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	626	IVE
1	EA	WALL STOP	WS406/407CCV	626	IVE
1	EA	GASKETING	488S H & J (USE SR64 SILENCERS @ NON RATED OPENINGS)	BK	ZER

HARDWARE GROUP NO. 15

FOR USE ON DOOR #(S):

102 106

PROVIDE EACH OPENING WITH THE FOLLOWING:

<u>QTY</u>		<u>DESCRIPTION</u>	<u>CATALOG NUMBER</u>	<u>FINISH</u>	<u>MFR</u>
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	ENTRANCE/OFFICE LOCK	ND50JD SPA	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	WALL STOP	WS406/407CCV	626	IVE
1	EA	GASKETING	488S H & J (USE SR64 SILENCERS @ NON RATED OPENINGS)	BK	ZER

HARDWARE GROUP NO. 16

FOR USE ON DOOR #(S):

121D 121E 121F 121G 121H

PROVIDE EACH OPENING WITH THE FOLLOWING:

<u>QTY</u>		<u>DESCRIPTION</u>	<u>CATALOG NUMBER</u>	<u>FINISH</u>	<u>MFR</u>
	EA	NOTE	ALL HARDWARE BY DOOR SUPPLIER		

Brooke County Commission
Brooke County EMS Facility
HARDWARE GROUP NO. 17

T60-11009

FOR USE ON DOOR #(S):

103 104 110 122

PROVIDE EACH OPENING WITH THE FOLLOWING:

<u>QTY</u>		<u>DESCRIPTION</u>	<u>CATALOG NUMBER</u>	<u>FINISH</u>	<u>MFR</u>
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	ND80JD SPA	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	4040XP RW/PA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	626	IVE
1	EA	WALL STOP	WS406/407CCV	626	IVE
1	EA	GASKETING	488S H & J (USE SR64 SILENCERS @ NON RATED OPENINGS)	BK	ZER

HARDWARE GROUP NO. 18

FOR USE ON DOOR #(S):

116 117 118 119

PROVIDE EACH OPENING WITH THE FOLLOWING:

<u>QTY</u>		<u>DESCRIPTION</u>	<u>CATALOG NUMBER</u>	<u>FINIS H</u>	<u>MFR</u>
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PRIVACY LOCK	ND40S SPA	626	SCH
1	EA	WALL STOP	WS406/407CCV	626	IVE
1	EA	GASKETING	488S H & J (USE SR64 SILENCERS @ NON RATED OPENINGS)	BK	ZER
1	EA	COAT AND HAT HOOK	582	626	IVE

HARDWARE GROUP NO. 19

FOR USE ON DOOR #(S):

MISC

PROVIDE EACH OPENING WITH THE FOLLOWING:

<u>QTY</u>		<u>DESCRIPTION</u>	<u>CATALOG NUMBER</u>	<u>FINISH</u>	<u>MFR</u>
1	EA	MULTITECH READER	MT20W USB	BLK	SCE
25	EA	CREDENTIAL	9651 CT8X4248 CONSTRUCTION FOBS	BLK	SCE
100	EA	CREDENTIAL	9691T	BLK	SCE
1	EA	SOFTWARE	ENGAGE		SCE
1	EA	ON-SITE SOFTWARE TRAINING	60-070		SCE

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End of Section.

SECTION 101419 - DIMENSIONAL LETTER SIGNAGE

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Illuminated, fabricated channel dimensional characters.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For signs.
 - 1. Include fabrication and installation details and attachments to other work.
 - 2. Show sign mounting heights, locations of supplementary supports to be provided by other installers, and accessories.
 - 3. Show message list, typestyles, graphic elements, and layout for each sign.
 - 4. Show locations of electrical service connections.
 - 5. Include diagrams for power, signal, and control wiring.
- C. Samples: For each exposed product and for each color and texture specified.
- D. Delegated-Design Submittal: For signs indicated in "Performance Requirements" Article.
 - 1. Include structural analysis calculations for signs indicated to comply with design loads; signed and sealed by the qualified professional engineer responsible for their preparation.

1.3 INFORMATIONAL SUBMITTALS

- A. Sample warranty.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance data.

1.5 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design sign structure and anchorage of dimensional character sign type(s) according to structural performance requirements.
- B. Structural Performance: Signs and supporting elements shall withstand the effects of gravity and other loads within limits and under conditions indicated.
- C. Thermal Movements: For exterior fabricated channel dimensional characters, allow for thermal movements from ambient and surface temperature changes.
 - 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.
- D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.2 DIMENSIONAL CHARACTERS

- A. Fabricated Channel Characters: Metal face and side returns, formed free from warp and distortion; with uniform faces, sharp corners, and precisely formed lines and profiles; internally braced for stability, to meet structural performance loading without oil-canning or other surface deformation, and for securing fasteners; and as follows.
 - 1. **Manufacturers:** Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. [A.R.K. Ramos.](#)
 - b. [ASI Sign Systems, Inc.](#)
 - c. Graphics 22 Signs, Inc.
 - d. JD Signs, Inc.
 - 2. Illuminated Characters: Halo Lit character construction with LED lighting, including transformers, insulators, and other accessories for operability, with provision for servicing and concealing connections to building electrical system. Use tight or sealed joint construction to prevent unintentional light leakage. Space lamps apart from each other and away from character surfaces as needed to illuminate evenly.
 - a. Power: As indicated on electrical Drawings.
 - 1) Provide continuous raceway.
 - 3. Character Material: Sheet or plate aluminum.
 - 4. Character Height: As indicated on Drawings.
 - 5. Character Depth: As indicated on Drawings.
 - 6. Finishes:

- a. Baked-Enamel or Powder-Coat Finish: Manufacturer's standard, in color as selected by Architect from manufacturer's full range.
7. Mounting: Projected studs.
 - a. Hold characters at manufacturer's recommended distance from wall surface.

2.3 ACCESSORIES

- A. Fasteners and Anchors: Manufacturer's standard as required for secure anchorage of signs, noncorrosive and compatible with each material joined, and complying with the following:
 1. Use concealed fasteners and anchors unless indicated to be exposed.
 2. For exterior exposure, furnish nonferrous-metal stainless-steel or hot-dip galvanized devices unless otherwise indicated.
 3. Exposed Metal-Fastener Components, General:
 - a. Fabricated from same basic metal and finish of fastened metal unless otherwise indicated.
 4. Sign Mounting Fasteners:
 - a. Concealed Studs: Concealed (blind), threaded studs welded or brazed to back of sign material or screwed into back of sign assembly.
- B. Adhesive: As recommended by sign manufacturer.
- C. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.

2.4 FABRICATION

- A. General: Provide manufacturer's standard sign assemblies according to requirements indicated.
 1. Mill joints to a tight, hairline fit. Form assemblies and joints exposed to weather to resist water penetration and retention.
 2. Provide welds and brazes behind finished surfaces without distorting or discoloring exposed side. Clean exposed welded and brazed connections of flux, and dress exposed and contact surfaces.
 3. Conceal connections if possible; otherwise, locate connections where they are inconspicuous.
 4. Internally brace dimensional characters for stability, to meet structural performance loading without oil-canning or other surface deformation, and for securing fasteners.
 5. Provide rabbets, lugs, and tabs necessary to assemble components and to attach to existing work. Drill and tap for required fasteners. Use concealed fasteners where possible; use exposed fasteners that match sign finish.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install signs using mounting methods indicated and according to manufacturer's written instructions.
 - 1. Install signs level, plumb, true to line, and at locations and heights indicated, with sign surfaces free of distortion and other defects in appearance.
 - 2. Before installation, verify that sign surfaces are clean and free of materials or debris that would impair installation.
 - 3. Corrosion Protection: Coat concealed surfaces of exterior aluminum in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.
- B. Mounting Methods:
 - 1. Concealed Studs: Using a template, drill holes in substrate aligning with studs on back of sign. Remove loose debris from hole and substrate surface.
 - a. Thin or Hollow Surfaces: Place sign in position and flush to surface, install washers and nuts on studs projecting through opposite side of surface, and tighten.
- C. Remove temporary protective coverings and strippable films as signs are installed.

END OF SECTION 101419

Brooke County EMS Facility

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SECTION 096119 – CONCRETE FLOOR STAINING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Interior Stained Concrete Flooring

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each type of product requiring color selection.

1.3 QUALITY ASSURANCE

- A. Field Sample Panels: After approval of samples, produce field sample panels to demonstrate the approved range of selections made under Sample submittals. Produce a minimum of three sets of full-scale panels, approximately 48 by 48 inches minimum, to demonstrate the expected range of finish, color, and appearance variations.
 1. Locate panels as indicated or, if not indicated, as directed by Architect.
 2. Maintain field sample panels during construction in an undisturbed condition as a standard for judging the completed Work.
 3. Demolish and remove field sample panels when directed.

PART 2 - PRODUCTS

2.1 STAIN MATERIALS

- A. Penetrating Stain: Water-based, acrylic latex, penetrating stain with colorfast pigments.
 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Americrete, Inc.
 - b. Brickform; a division of Solomon Colors.
 - c. H&C Decorative Concrete Products; a brand of Sherwin-Williams Co.
 - d. Scofield, a Business Unit of Sika Corporation.

PART 3 - EXECUTION

3.1 STAINING

- A. Newly placed concrete shall be at least 28 days old before staining.
- B. Prepare surfaces according to manufacturer's written instructions and as follows:
 - 1. Clean concrete thoroughly, in accordance with manufacturer's instructions.
 - a. Do not use acidic solutions to clean surfaces.
 - 2. Protection:
 - a. Protect walls and surrounding surfaces not to receive concrete floor stain.
 - b. Do not allow stain to come in contact with wood or metal surfaces.
 - 3. Prepare concrete in accordance with manufacturer's instructions.
 - 4. Ensure surface is clean, dry, structurally sound, and free from dirt, dust, oil, grease, solvents, paints, wax, asphalt, concrete curing compounds, sealing compounds, surface hardeners, bond breakers, adhesive residue, and other surface contaminants.
- C. Interior Applications: Concrete substrates must have a moisture vapor emission rate of less than 5lbs./1000sf per 24 hours based on a 72 hour test period according to ASTM F1869.
- D. Penetrating Stain: Apply penetrating stain to concrete surfaces according to manufacturer's written instructions and as follows:
 - 1. Apply two coats of stain. Do not scrub between coats.
 - 2. Allow to dry four hours and repeat application of stain in sufficient quantity to obtain color consistent with approved mockup.
 - 3. Allow to dry completely.

3.2 SEALING

- A. Conduct a moisture vapor emission test prior to applying any coating. Refer to the specific sealer's Technical Data Bulletin for acceptable MVER.
- B. Apply coating according to the coating manufacturer's printed instructions at a rate of 300 to 400 square feet per gallon per coat. Maintain a wet edge at all times.
- C. Allow sealer to dry completely will staying within the recoat window, before applying additional coats.
- D. Apply second application of the coating at 90 degrees to the direction of the first coat, using same application methods and rates.

3.3 PROTECTION OF STAINED CONCRETE FLOORING

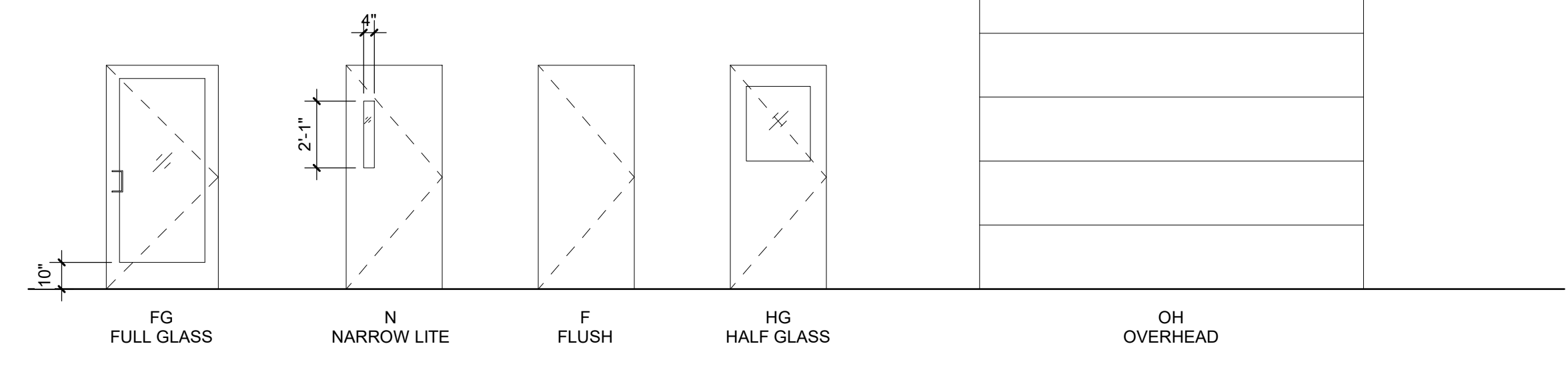
- A. Provide temporary floor protection throughout the project to safeguard the surfaces of concrete slabs before and after application of decorative finishes or installation of other materials.
- B. Temporary floor protection will be removed only while finish work to the concrete is being performed and will be replaced after the final finish has cured sufficiently.
- C. Protect surfaces from foot traffic for a minimum of 24 hours.
- D. Do not wash surfaces for a minimum of 48 hours.

3.4 Maintain stained and sealed concrete floors by sweeping. Clean spills when they occur and rinse dirt off with water. Wet-clean heavily soiled areas by mopping or by scrubbing with a rotary floor machine equipped with a scrubbing brush and a suitable, high quality commercial detergent.

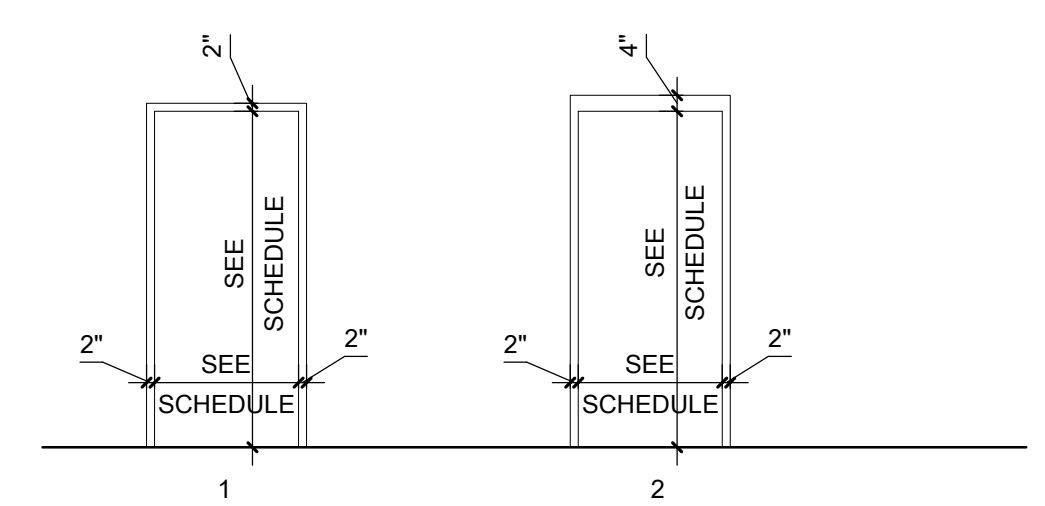
END OF SECTION 033543

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DOOR, FRAME, & HARDWARE SCHEDULE													
#	DOOR						FRAME			FIRE RATING	HARDWARE SET	ASSEMBLY ACCESS CONTROL	REMARKS
	TYPE	WIDTH	HEIGHT	THICKNESS	MATERIAL	FINISH	FRAME TYPE	FRAME MATERIAL	FRAME FINISH				
101	FG	3'-0"	7'-0"	1 3/4"	ALUM	FF	SF1	ALUM	FF		01		
101B	FG	3'-0"	7'-0"	1 3/4"	ALUM	FF	1	H.M.	P		02	Yes	
102	N	3'-0"	7'-0"	1 3/4"	HM	P	1	H.M.	P		15		
103	F	3'-0"	7'-0"	1 3/4"	HM	P	1	H.M.	P		17		
104	F	3'-0"	7'-0"	1 3/4"	HM	P	1	H.M.	P		17		
105	F	3'-0"	7'-0"	1 3/4"	HM	P	1	H.M.	P		12		
106	N	3'-0"	7'-0"	1 3/4"	HM	P	1	H.M.	P		15		
107	N	3'-0"	7'-0"	1 3/4"	HM	P	1	H.M.	P		14		
108	F	3'-0"	7'-0"	1 3/4"	HM	P	1	H.M.	P		05		
109	F	3'-0"	7'-0"	1 3/4"	HM	P	1	H.M.	P		06		
110	F	3'-0"	7'-0"	1 3/4"	HM	P	1	H.M.	P		17		
111A	HG	3'-0"	7'-0"	1 3/4"	HM	P	1	H.M.	P		07		
111B	HG	3'-0"	6'-8"	1 3/4"	HM	P	1	H.M.	P		03		
112	F	3'-0"	7'-0"	1 3/4"	HM	P	1	H.M.	P		11		
113	F	3'-0"	7'-0"	1 3/4"	HM	P	1	H.M.	P		13		
114	F	3'-0"	7'-0"	1 3/4"	HM	P	1	H.M.	P		13		
115	F	3'-0"	7'-0"	1 3/4"	HM	P	1	H.M.	P		11		
116	F	3'-0"	7'-0"	1 3/4"	HM	P	1	H.M.	P	90 MIN	18		
117	F	3'-0"	7'-0"	1 3/4"	HM	P	1	H.M.	P	90 MIN	18		
118	F	3'-0"	7'-0"	1 3/4"	HM	P	1	H.M.	P	90 MIN	18		
119	F	3'-0"	7'-0"	1 3/4"	HM	P	1	H.M.	P	90 MIN	18		
120	HG	3'-0"	7'-0"	1 3/4"	HM	P	1	H.M.	P		10	Yes	
121A	F	3'-0"	7'-0"	1 3/4"	HM	P	2	H.M.	P	90 MIN	08		
121B	F	3'-0"	7'-0"	1 3/4"	HM	P	2	H.M.	P	90 MIN	09		
121C	HG	3'-0"	7'-0"	1 3/4"	HM	P	1	H.M.	P		10	Yes	
121D	OH	12'-0"	12'-0"	1 3/8"	STL	FF					16		
121E	OH	12'-0"	12'-0"	1 3/8"	STL	FF					16		
121F	OH	12'-0"	12'-0"	1 3/8"	STL	FF					16		
121G	OH	12'-0"	12'-0"	1 3/8"	STL	FF					16		
121H	OH	12'-0"	12'-0"	1 3/8"	STL	FF					16		
121I	HG	3'-0"	7'-0"	1 3/4"	HM	P	1	H.M.	P		10	Yes	
122	F	3'-0"	7'-0"	1 3/4"	HM	P	2	H.M.	P		17		
123	F	3'-0"	7'-0"	1 3/4"	HM	P	2	H.M.	P		04		



DOOR TYPE LEGEND
1/4" = 1'-0"



FRAME TYPE LEGEND
1/4" = 1'-0"

NO.	BY	DATE	DESCRIPTION
1			

BROOKE COUNTY EMS
BROOKE COUNTY COMMISSION
3031 PLEASANT AVE, WELLSBURG WV 26070
FEBRUARY 24, 2023
CONSTRUCTION DOCUMENTS

DRAWN: DS DATE: 02/24/2023
CHECKED: PMF DATE: 02/24/2023

PROJECT No. T60-11009-00

SCHEDULES & DIAGRAMS

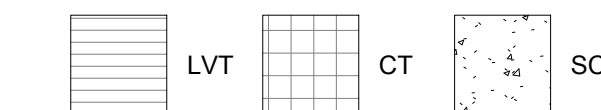
SHEET No.

A6.01(R)

GENERAL NOTES:

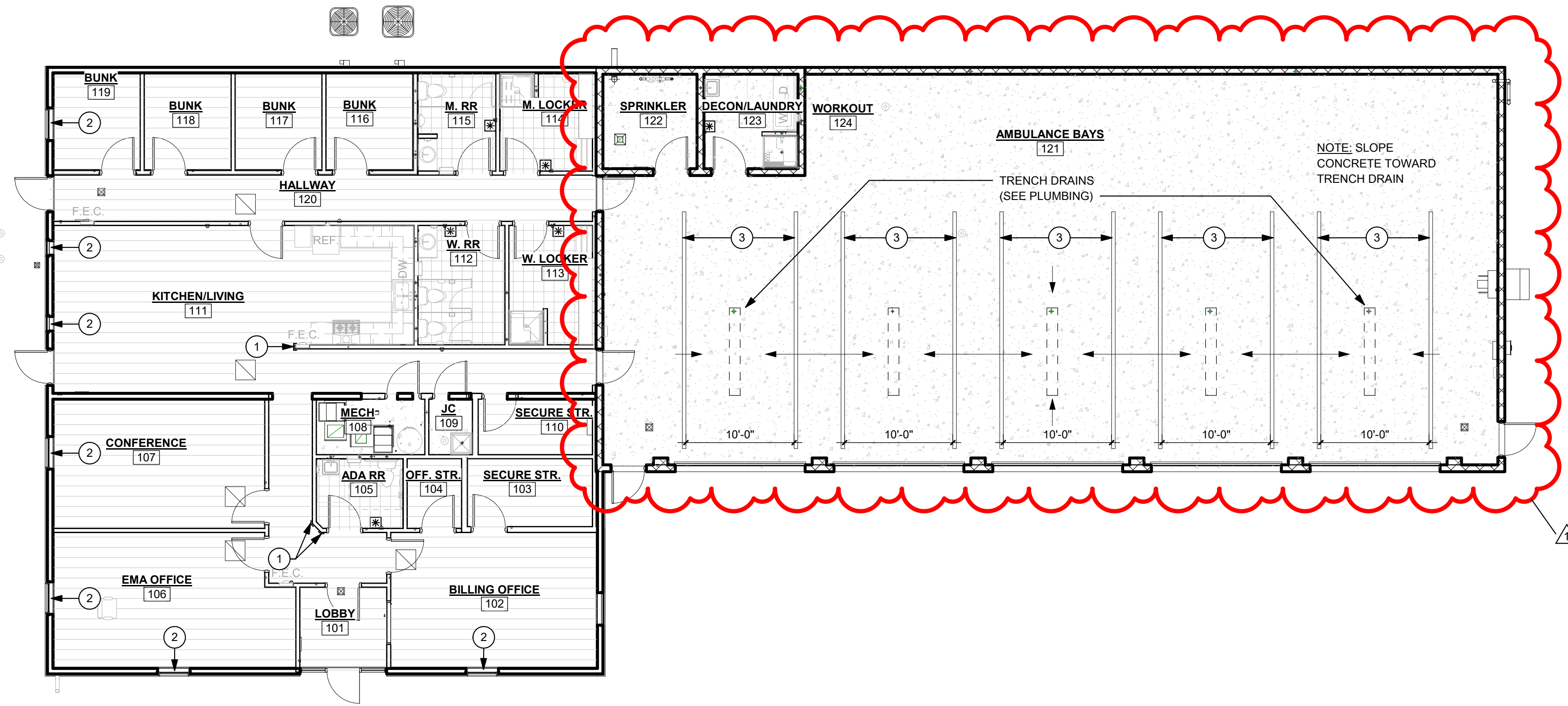
1. THE SCOPE OF THE WORK IS GENERALLY LIMITED TO THE AREAS SHOWN ON THESE PLANS. WORK NECESSARY TO RUN ELECTRICAL SERVICE TO EXISTING PANELS OR EXTEND OR REROUTE OTHER UTILITY LINES IS ALSO INCLUDED.
2. VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS PRIOR TO COMMENCEMENT OF ANY ON SITE ACTIVITIES.
3. INTERIOR DIMENSIONS SHOWN ON THESE PLANS ARE FROM FACE OF FINISHED WALL TO FACE OF FINISHED WALL UNLESS NOTED OTHERWISE.
4. TYPICAL NEW WALLS SHALL BE 6" ABOVE FINISHED CEILING HEIGHT. VERIFY CEILING HEIGHTS ON ROOM FINISH SCHEDULE, SHEET A1.02. NEW WALLS SHALL BE 2x6 WOOD STUDS WITH 5/8" GWB. ON EACH SIDE.
5. INSTALL WOOD BLOCKING IN NEW WALLS TO RECEIVE WALL-MOUNTED ITEMS. WOOD BLOCKING SHALL BE FIRE RETARDANT TREATED.
6. PREPARE ALL NEW SURFACES TO RECEIVE SCHEDULED FINISH. REFERENCE ROOM FINISH SCHEDULE, SHEET A6.01.
7. FINISH FLOOR MAT'L TRANSITIONS SHALL OCCUR AT CENTERLINE OF DOOR.

FLOOR FINISH LEGEND

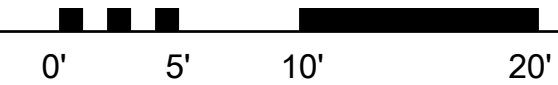


FINISH PLAN REFERENCE NOTES

NOTE #	DESCRIPTION
1	PROVIDE CORNER GUARD
2	PROVIDE WINDOW SHADE
3	PAINT STRIPING ON AMBULANCE BAY FLOOR. SEE SPECIFICATION 321723.



1 FINISH FLOOR PLAN
A7.01(R) 1/8" = 1'-0"



ROOM FINISH SCHEDULE

ROOM #	ROOM NAME	FLOOR FINISH	BASE	WALL FINISH				CEILING HEIGHT	CEILING FINISH	REMARKS
				NORTH	EAST	SOUTH	WEST			
101	LOBBY	LVT	RB	P	P	P	P	9'-0"	ACT	
102	BILLING OFFICE	LVT	RB	P	P	P	P	9'-0"	ACT	
103	SECURE STR.	LVT	RB	P	P	P	P	10'-0"	ACT	
104	OFF. STR.	LVT	RB	P	P	P	P	9'-0"	ACT	
105	ADA RR	CT	RB	T	P/T	P	P/T	9'-0"	ACT	2
106	EMA OFFICE	LVT	RB	P	P	P	P	9'-0"	ACT	
107	CONFERENCE	LVT	RB	P	P	P	P	9'-0"	ACT	
108	MECH	SC	RB	P	P	P	P	9'-0"	ACT	
109	JC	SC	RB	P	P	P	P	9'-0"	ACT	
110	SECURE STR.	SC	RB	P	P	P	P	10'-0"	ACT	
111	KITCHEN/LIVING	LVT	RB	P	P	P	P	9'-0"	ACT	
112	W. RR	CT	RB	P	P/T	P/T	P/T	9'-0"	ACT	2
113	W. LOCKER	CT	RB	P	P	P/T	P/T	9'-0"	ACT	1,3
114	M. LOCKER	CT	RB	P	P	P/T	P/T	9'-0"	ACT	1,3
115	M. RR	CT	RB	P/T	P	P/T	P/T	9'-0"	ACT	
116	BUNK	LVT	RB	P	P	P	P	9'-0"	ACT	
117	BUNK	LVT	RB	P	P	P	P	9'-0"	ACT	
118	BUNK	LVT	RB	P	P	P	P	9'-0"	ACT	
119	BUNK	LVT	RB	P	P	P	P	9'-0"	ACT	
120	HALLWAY	LVT	RB	P	P	P	P	9'-0"	ACT	
121	AMBULANCE BAYS	SC	-	P	P	P	P	-	P	
122	SPRINKLER	SC	-	P	P	P	P	8'-0"	ACT	
123	DECON/LAUNDRY	SC	RB	P	P	P	P	8'-0"	ACT	1
124	WORKOUT	SC	-	P	P	P	P	-	P	

REMARKS:

1. ACT - 2 AT SHOWERS
2. TILE TO 6'-0" A.F.F.
3. TILE ADJACENT TO SHOWER

NO.	BY	DATE	DESCRIPTION
1			

BROOKE COUNTY EMS
BROOKE COUNTY COMMISSION
3031 PLEASANT AVE, WELLSBURG WV 26070
FEBRUARY 24, 2023
CONSTRUCTION DOCUMENTS

DRAWN: DS DATE: 02/24/2023
CHECKED: PMF DATE: 02/24/2023

PROJECT No. T60-11009.00

FLOOR FINISH PLAN

SHEET No.

A7.01(R)



**GEOTECHNICAL INVESTIGATION
WELLSBURG EMS FACILITY
BROOKE COUNTY, WEST VIRGINIA**

NGE PROJECT No. W22085

SUBMITTED TO:

**THE THRASHER GROUP, INC.
BRIDGEPORT , WEST VIRGINIA**

SUBMITTED BY:

**NGE, LLC
ST. ALBANS, WEST VIRGINIA**

AUGUST 2022



August 4, 2022

Mr. Craig M. Baker
The Thrasher Group, Inc.
600 White Oak Boulevard
Bridgeport, WV 26330

Subject: Geotechnical Investigation
Wellsburg EMS Facility
Brooke County, West Virginia
NGE Project No. W22085

Dear Mr. Baker:

In accordance with your request, we have performed a geotechnical investigation for the proposed new building Wellsburg, West Virginia. Our services were performed in accordance with the scope of work outlined in our Proposal PW22552 dated March 15, 2022.

This report presents the results of the field and laboratory investigation performed to determine the subsurface conditions, as well as our conclusions and recommendations pertaining to site development and design of the building foundations.

We appreciate the opportunity to assist you with this project. Please contact us if you have any questions concerning this report, or if we can provide any further assistance with this project.

Respectfully submitted,
NGE, LLC

A handwritten signature in black ink, appearing to read 'Noah Stevens'.

Noah Stevens, P.E.
Project Engineer

A handwritten signature in black ink, appearing to read 'John E. Nottingham'.

John E. Nottingham, P.E.
President



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FIGURES

Figure 1 – Boring Location Plan
Figures 2 to 9 – Test Boring Logs

APPENDIX

Appendix A – Laboratory Test Results

1.0 SCOPE OF SERVICES

The purpose of our investigation was to evaluate subsurface conditions and provide site development and foundation design recommendations for the proposed building site. The results of our field exploration and geotechnical engineering evaluation are presented in the following report. Our scope of services included the following items:

- Engineering field work including site reconnaissance and drilling supervision.
- Drilling of 6 test borings with standard penetration testing and sampling.
- Laboratory testing of selected soil specimens.
- Preparation of this geotechnical engineering report including the following items:
 - A description of subsurface investigation methods utilized;
 - Typed test boring logs providing detailed descriptions of the subsurface conditions encountered at each boring location including groundwater levels;
 - A generalized description of the subsurface conditions;
 - Results of laboratory testing performed on select soil samples;
 - Recommendations for site preparation;
 - Recommendations for fill placement including suitable material types and compaction criteria;
 - Foundation recommendations including the recommended foundation type, depth, allowable loading, and estimated foundation settlement;
 - Recommendations for concrete slab-on-grade design and construction including subgrade preparation.

2.0 SITE & PROJECT DESCRIPTION

The proposed site for the Brooke County EMS facility is located just west of Pleasant Avenue in Wellsburg, WV. The proposed building location currently consists of a relatively level, grass covered lot. Two residential structures which were located in the building and parking lot area were recently demolished. We understand the proposed facility will include a 5,150 square foot, two-story office space, as well as a 2,900 square foot single story structure containing apparatus bays. We understand both buildings will be pre-engineered steel-frame structures. A moderate to steeply sloping fill embankment is present just west of the proposed structure locations. The crest of existing fill embankment was approximately 12 feet from Boring B-6 (southwest office building corner), 14 feet from Boring B-4 (northwest office building corner), and 17 feet from Boring B-2 (northwest Apparatus Bay structure corner). The fill embankment is up to about 20 feet in height. Our scope of services did not include slope stability analysis of the existing fill embankment. We were not provided with the proposed grading or finish floor elevations during the preparation of this report; however, based on the existing topography we expect the required grading work will be relatively minor. The boring locations, proposed building locations, and existing site features are illustrated on Figure 1.

3.0 TEST BORINGS

3.1 Boring Locations & Depths

A total of 6 test borings were drilled for the project. The boring locations were selected by our engineer and staked in the field by others. The approximate boring locations are shown on Figure No. 1. The test borings were drilled to depths ranging from 21.5 to 41.5 feet using a track-mounted rotary drilling rig equipped with 3-1/4 inch I.D. hollow stem augers.

3.2 Subsurface Exploration Methods

Within each test boring, standard penetration testing and sampling (SPT) was performed at 2.5 ft. to 5 ft. intervals. The standard penetration testing and sampling was performed in accordance with ASTM D-1586. Standard penetration testing is performed by driving a 2.0 inch O.D. split-barrel sampler into the soil with a 140-lb. hammer dropping a distance of 30 inches. The sampler is driven a distance of 18 inches in three 6-inch increments, and the number of hammer blows required to drive the sampler the last two 6-inch increments of penetration is termed the standard penetration resistance or "N-value". These values provide an indication of the consistency or relative density of the soil. A 1-3/8 inch diameter soil sample was retrieved from the split-barrel sampler in conjunction with each penetration test. A representative portion of each split-barrel sample was placed in an air-tight glass jar.

Upon completion of drilling, all samples were delivered to our laboratory where they were examined by a geologist and geotechnical engineer. Soil descriptions, standard penetration numbers, and other pertinent subsurface information are provided on the boring logs included in the back of this report (Figures 2 through 9).

4.0 SUBSURFACE CONDITIONS

Details of the subsurface conditions encountered by the soil test borings are shown on the boring logs (Figures 2 to 9). The boring logs represent our interpretation of the subsurface conditions based on examination of the split-spoon samples. The stratification lines indicated on the boring logs represent approximate boundaries between soil types; however, the actual transition may be gradual. The conditions represented by the test borings should be considered applicable only at the boring locations. It should be assumed that the reported conditions might be different at other locations. The subsurface conditions encountered in the test borings are described in the following paragraphs.

4.1 Soil Conditions

Beneath the surficial layer of topsoil, the upper soil layer encountered within the borings consisted of fill material comprised primarily of silty to sandy clay with varying amounts of rock fragments. There were some zones within the fill material that were more granular with less clay/silt. Based on review of historical satellite images of the site, the fill has been in place for over 30 years. The standard penetration N-values obtained within the fill material (excluding a boulder encountered in Boring B-6) ranged from 3 to 28 blows per foot of penetration (bpf), indicative of a soft to very stiff condition. Most of the penetration values obtained within the fill were in the medium stiff to stiff range for cohesive soils. The fill material extended to depths ranging from approximately 10 to 25 feet below the existing ground surface.

Natural soils were encountered beneath the fill in Borings B-1, B-2, B-3, and B-6. The natural soils consisted primarily of silty to clayey sand, although a layer of sandy silt was encountered in Boring B-1. The natural soil extended to the boring termination depths within each of the borings in which it was encountered. N-values obtained within the natural sand layer ranged from 2 to 25 bpf, indicative of a very loose to medium dense relative soil density. The natural sandy silt encountered in Boring B-1 was soft as indicated by N-values of 3 to 4 bpf. All of the borings were terminated within the soil overburden.

4.2 Results of Laboratory Testing

Laboratory testing of recovered soil specimens included natural moisture content and Atterberg liquid and plastic limits. The results of the laboratory testing are shown on the boring logs (Figures 2 to 9). Results of the Atterberg liquid and plastic limit tests are summarized in Table 4.2 below. Most of the clayey soils at the site were found to be low to moderately plastic (CL type soils in accordance with USCS) based on visual observation and lab testing. Results of the laboratory testing are also provided in Appendix A.

Table 4.2 – Summary of Engineering Classification Testing

Boring & Depth	Atterberg Limits		Soil Description
	LL	PI	
B-1 / S-3 5.0 – 6.5 ft.	30	11	Brown SILTY to SANDY CLAY (CL) with rock fragments
B-3 / S-2 2.5 – 4.0 ft.	37	17	Red and brown SILTY to SANDY CLAY (CL) with rock fragments
B-6 / S-3 5.0 – 6.5 ft.	33	13	Brown and gray SILTY to SANDY CLAY (CL) with rock fragments

4.3 Groundwater

All of the borings were noted to be dry during drilling and shortly following borehole completion. The absence or presence of groundwater in the boreholes at the time of drilling does not necessarily mean that groundwater will or will not be present at other times or locations. Seasonal variations in rainfall will cause fluctuations in groundwater levels and influence the presence of water in upper soils.

5.0 SITE DEVELOPMENT RECOMMENDATIONS

5.1 Site Preparation

All existing vegetation and topsoil located within the development area should be removed prior to beginning site grading and/or other construction activities. Any underground utility lines located in the developed area should be removed and/or relocated. All voids created by removal of underground items should be properly backfilled in accordance with Section 5.2 of this report.

Proof-rolling of soil subgrades within the construction areas should be performed prior to placing any fill or base stone for slab-on-grade construction. Proof rolling should be performed using a minimum 10-ton static weight smooth-drum roller (without vibration). The proof-rolling will cause rutting and deformations of softer soils. Any areas which exhibit excessive deflection should be undercut and replaced with engineered fill. An experienced geotechnical engineer or technician should observe and document the performance of the proof-rolling.

The development of the site should address surface drainage. Appropriate drainage should be provided both during and after site grading is complete such that surface water does not become ponded or entrapped around or under the new building structure or pavement. All storm water runoff should be conveyed away from the building area using proper grading and storm water collection systems. Roof drains should be properly constructed and maintained to ensure all roof runoff is conveyed away from the building.

The onsite clayey soils are prone to rutting and pumping when subjected to construction traffic, particularly, heavy rubber tired vehicles. The likelihood that these conditions will develop can be reduced by providing adequate site drainage and limiting construction traffic areas. Soil which has become over-worked and excessively soft must be undercut and replaced with compacted backfill prior to construction.

5.2 Fill and Backfill Recommendations

Based on the gentle topographic relief at the proposed building sites, we anticipate that only minor thicknesses of new fill will be required for site development. Any soft areas encountered during site development should be undercut and backfilled at the direction of a qualified engineering firm. Fill and backfill should be placed in maximum 8-inch loose lifts and compacted to 95% of the maximum dry density as determined by the standard Proctor laboratory test (ASTM D-698). Each layer of fill or backfill should be tested by a qualified geotechnical firm to determine that adequate compaction has been achieved prior to placement of additional fill lifts. Fill or backfill should consist of non-organic soil/rock material with a maximum particle size of 4 inches in any direction and a plasticity index not greater than 16 percent. The moisture content of fill or backfill material should be within three percent of the optimum moisture content as determined by a standard Proctor test.

Limited Space Backfilling:

Limited spaces are defined as areas where backfill operations are restricted to the use of small mechanical compaction equipment. Most deficiencies in compacted backfill around subsurface structures have occurred in limited spaces where required densities are difficult to achieve because of restricted working room and relatively low compaction effort or use of

equipment that is too lightweight. All structural backfill, including that placed in limited spaces must be systematically compacted to the project requirements, even if crushed aggregate is placed. Oversized rock fragments should not be placed around pipes or other below-ground structures. Backfilling in limited access areas such as utility trenches and around below grade structures such as manholes, junction boxes, and curb inlets should have a lift thickness limited to 4 to 6 inches loose measure. A sufficient amount of testing or observation should be conducted to verify that proper compaction is achieved. In extremely tight spaces, use of alternate backfill materials such as flowable fill should be considered.

5.3 Excavation Considerations

Grading plans were not available at the time this report was prepared. Based on the existing topography, we expect only minimal cuts will be required to develop the building area. Any excavation deeper than 4 feet in which workers are required to enter must be properly shored or sloped in accordance with OSHA requirements. Any water which collects within excavations should be promptly removed by pumping from a strategically located sump(s).

6.0 FOUNDATION AND CONCRETE SLAB RECOMMENDATIONS

As previously discussed, an existing fill embankment is situated just west of the proposed structure locations. The fill embankment is up to about 20 feet in height. The borings were as close as 12 feet to the crest of the fill embankment. We recommend the building foundations be offset a minimum of 10 feet from the crest of the existing fill embankment to avoid structural damage from potential long-term slope creep.

We understand both planned buildings will be pre-engineered steel-frame structures. Based on the results of this geotechnical investigation, it is our opinion that the site is suitable for use of shallow spread foundations designed for a maximum allowable bearing pressure of 1,400 psf. All foundations should extend a minimum of 36 inches below finish grade for frost protection. Minimum foundation dimensions of 2.0 and 3.0 feet should be used for continuous wall and individual column footings, respectively. These minimum dimensions should be maintained to reduce the potential for a local shear or punching type bearing failure.

Excavation operations can result in loosening of the bearing material in the base of footing excavations. All loose/soft soil should be removed or properly recompacted. Any large rock fragments protruding from the foundation excavation base should be removed and backfilled with properly compacted fill. It is emphasized that all foundation excavations must be examined by our engineer to verify the bearing soils are suitable for recommended design bearing pressure. We recommend the following ground improvement measures be taken in the areas where soft or otherwise unsuitable bearing conditions are encountered in the base of a foundation excavation:

1. Any excessively soft or otherwise unsuitable soils should be undercut to a suitable bearing level at the direction of our engineer.
2. Upon approval by the geotechnical engineer, the foundation excavation should be backfilled with unreinforced concrete to within 36 inches of finish grade. We recommend concrete backfill have a minimum 28-day compressive strength of 2,000 psi. As an

alternative, the excavation can be backfilled with compacted WVDOH Class 1 crusher-run limestone placed in accordance with Section 5.2 of this report.

3. After concrete backfill has cured a minimum of one day, conventional reinforced concrete spread foundations can be constructed atop the backfill.

The soil bearing materials are susceptible to softening if exposed to standing water which could result from precipitation during construction. Therefore, footing concrete should be placed as soon as possible following completion of the footing excavations. Surface runoff should be drained away from the excavations and not be allowed to pond. If possible, all footing concrete should be poured during the same day the footing excavation is made. Any water present in the foundation excavations should be entirely removed prior to concrete placement.

6.1 Spread Foundation Settlement Considerations

Based on a bearing capacity of 1,400 psf, we estimate a total foundation settlement of two inches and a differential settlement of one inch. In order to reduce the effects of differential settlement on masonry walls or veneer (if used), we recommend the following measures be considered in the construction:

1. Use vertical control joints constructed at an aspect ratio of 1.5 or less (aspect ratio is wall section length to height ratio) for full height masonry walls. For example, the maximum recommended vertical control joint spacing for a 12 feet high wall = $12 \times 1.5 = 18$ feet. In addition, vertical control joints should be provided at locations of stress concentrations such as: at changes in wall height, at changes in wall thickness, near one or both sides of door and window openings, and adjacent to corners of walls or intersections within a distance equal to half the control joint spacing.
2. Continuous wall foundations should be constructed with two steel reinforcement layers (one layer in the top half and one layer near the foundation base). Each layer should be constructed with a minimum of 3 strands of No. 5 steel reinforcement bars in each layer. More and/or larger reinforcement bars should be used if determined by the project's structural engineer.

6.2 Concrete Slabs-On-Grade

We expect slabs-on-grade for the proposed structure will bear on existing soil or newly placed engineered fill constructed in accordance with Section 5.2 of this report. We recommend the subgrade be proof-rolled using a minimum 10-ton smooth-drum roller without vibration. Any areas which exhibit excessive deflection or pumping should be undercut and backfilled with crushed stone under the direction of our engineer. We recommend concrete slabs be designed using a modulus of subgrade reaction of 150 pounds per cubic inch (pci). As a minimum, the upper four inches of concrete slab subgrade should consist of free draining crushed stone, such as No. 57 stone to serve as a capillary water barrier and a leveling surface.

The use of a vapor barrier between the gravel layer and bottom of the floor slab should be at the discretion of the designer who can evaluate the potential impact of water vapor transmission on floor coverings, equipment and/or interior furnishings. In order to control slab

cracking, floor slabs should be jointed as per ACI guidelines and any crack control inclusion such as wire mesh should be permanently supported in its proper position and not pulled up with hook bars during concrete placement.

Often there is some delay between initial grading and the time when the contractor is ready to construct the slab-on-grade. Although the subgrade soils may have been thoroughly compacted and passed initial proof-roll testing, exposure to weather, excess moisture and/or construction traffic can destroy the soil's integrity. We recommend that the construction specifications include provisions for the restoration of the subgrade soils to an acceptable condition prior to construction of floor slabs.

7.0 CONSTRUCTION TESTING

We recommend that a qualified geotechnical firm be retained by the owner to provide a comprehensive construction-testing program to assist the owner in determining that certain aspects of construction are being carried out in general conformance with the applicable plans and specifications. This construction testing primarily includes inspection of the building undercut, testing of fill materials during placement and compaction and observation of foundation construction.

8.0 REPORT LIMITATIONS

- This report has been prepared for the exclusive use of **Thrasher Engineering** for specific application to the subject project. All recommendations contained in this report have been made in accordance with generally accepted soil and foundation engineering practices in the area and at the time where the services were performed. No other warranties are implied or expressed.
- The scope of services represented by this report does not include slope stability analysis.
- The scope of services represented by this report does not include an environmental assessment, or exploration for the presence or absence of wetlands, hazardous, or toxic material at the site. Moreover, the scope of services does not include evaluation of the potential for subsidence from past underground mining.
- The analysis and recommendations submitted in this report are based, in part, upon the data obtained from a limited number of soil test borings. The nature and extent of variations in soil conditions between the borings may not become evident until construction. If variations then appear evident, it may be necessary to re-evaluate the recommendations of this report and provide additional recommendations.
- Contractors reviewing this report should acknowledge that the discussions and recommendations contained herein are for design information purposes only and may not be sufficient to prepare accurate bids. Any conclusions drawn by the contractor regarding subsurface conditions, quantities of unsuitable soils, rock, groundwater, or methods and means of construction are at their sole risk.
- It is important that the geotechnical engineer be provided the opportunity to review the final geotechnical construction related plans and specifications to verify that the

recommendations in this report are properly interpreted and incorporated in the design. If the geotechnical engineer is not accorded the privilege of making this recommended review, he can assume no responsibility for misinterpretation of these recommendations.

Figures




NOTES

1. BORING LOCATION PLAN IS FOR ILLUSTRATIVE PURPOSES ONLY; BORING LOCATIONS ARE APPROXIMATE.
2. SITE PLAN IS BASED ON DRAWING PROVIDED BY THE THRASHER GROUP, INC.
3. IMAGE AFTER GOOGLE EARTH.

LEGEND

 B-# APPROXIMATE LOCATION OF BORING

DATE	NO.	REVISION


Geotechnical & Environmental Engineering Services
 650 MacCorkle Avenue West
 Saint Albans, West Virginia 25177
 (304) 201-5180 FAX 201-5182
 www.ngeconsulting.com

PROJECT: WELLSBURG EMS FACILITY
 CLIENT: THE THRASHER GROUP, INC.
 SHEET: BORING LOCATION PLAN

Project No.	W22085
Drawn:	NLS
Checked:	---
Approved:	---
Scale:	NTS
Date:	8-4-22
CAD File #	NA

FIGURE 1



Project Name: **Wellsburg EMS Facility
Brooke County, West Virginia**

BORING NO.

Project Number: **W22085**

B- 1

Elevation, feet	Depth, feet	Sample Type	Symbol / USCS	Location: See Figure 1 Offset:		Recovery %	RQD	Blow Count (N-Value)	Moisture %	Liquid Limit	Plasticity Index	Silt and Clay %	Sand %
				Surface El.: ---									
				<input type="checkbox"/> Split Spoon <input checked="" type="checkbox"/> Shelby Tube <input checked="" type="checkbox"/> Rock Core <input type="checkbox"/> Bag Sample									
MATERIAL DESCRIPTION													
				TOPSOIL	0.3			4-5-4 (9)	14				
				Brown and gray SILTY to SANDY CLAY with rock fragments, moist, soft to very stiff				4-4-6 (10)					
	5							2-7-2 (9)	25	30	11		
				- w/numerous rock frags (7.5 - 12.5 ft.)				10-18-8 (26)					
	10			- FILL -				3-3-3 (6)					
					12.5			4-1-2 (3)					
	15			Brown SANDY SILT , moist, soft				2-1-3 (4)					
								2-1-2 (3)					
	20				20.0			2-3-3 (6)					
				Brown SAND , damp	21.5								
				Bottom of Test Boring @ 21.5 ft.									
	25												
	30												

NGE BASIC LOG - NO PENETROMETER LOG REPORTS.GPJ NGE_1.GDT 8/4/22

Completion Depth:	21.5 ft.
Date Boring Started:	6/10/22
Date Boring Completed:	6/10/22
Engineer/Geologist:	CEM
Driller:	NGE

Remarks: **Boring was noted to be dry during drilling operations and at boring completion.**

Depth to Water @ 24 hrs.: ---



Project Name: **Wellsburg EMS Facility
Brooke County, West Virginia**

BORING NO.

Project Number: **W22085**

B- 2

Elevation, feet	Depth, feet	Sample Type	Symbol / USCS	Location: See Figure 1 Offset:		Recovery %	RQD	Blow Count (N-Value)	Moisture %	Liquid Limit	Plasticity Index	Silt and Clay %	Sand %
				Surface El.: ---									
				<input type="checkbox"/> Split Spoon <input checked="" type="checkbox"/> Shelby Tube <input checked="" type="checkbox"/> Rock Core <input type="checkbox"/> Bag Sample									
				MATERIAL DESCRIPTION									
				TOPSOIL	0.3			2-2-4 (6)	14				
				Brown SILTY to SANDY CLAY with rock fragments, moist, medium stiff to stiff									
	5							5-3-5 (8)	10	37	17		
								2-9-5 (14)	13				
	10			- FILL -									
								5-3-3 (6)					
								3-4-5 (9)	12				
								2-3-7 (10)					
	15												
								5-3-4 (7)					
								5-5-7 (12)					
	20												
								9-7-5 (12)					
	25			Brown SILTY to CLAYEY SAND , damp, very loose to medium dense	21.3								
								2-2-2 (4)	19				
	30												

NGE BASIC LOG - NO PENETROMETER LOG REPORTS.GPJ NGE_1.GDT 8/4/22

Completion Depth:	41.5 ft.
Date Boring Started:	6/9/22
Date Boring Completed:	6/9/22
Engineer/Geologist:	CEM
Driller:	NGE

Remarks: **Boring was noted to be dry during drilling operations and at boring completion.**

Depth to Water @ 24 hrs.: ---



Project Name: **Wellsburg EMS Facility
Brooke County, West Virginia**

BORING NO.

Project Number: **W22085**

B- 2

Elevation, feet	Depth, feet	Sample Type	Symbol / USCS	Location: See Figure 1 Offset:	Recovery %	RQD	Blow Count (N-Value)	Moisture %	Liquid Limit	Plasticity Index	Silt and Clay %	Sand %
				Surface El.: ---								
				<input type="checkbox"/> Split Spoon <input checked="" type="checkbox"/> Shelby Tube <input checked="" type="checkbox"/> Rock Core <input type="checkbox"/> Bag Sample								
				MATERIAL DESCRIPTION								
	35			Brown SILTY to CLAYEY SAND , damp, very loose to medium dense - w/rock fragments from 30.0 ft.			10-10-8 (18)					
	40			- w/coal fragments @ 40.0 ft.			4-7-7 (14)					
	41.5						6-9-16 (25)					
	45			Bottom of Test Boring @ 41.5 ft.								
	50											
	55											
	60											

NGE BASIC LOG - NO PENETROMETER LOG REPORTS.GPJ NGE_1.GDT_8/4/22

Completion Depth:	41.5 ft.
Date Boring Started:	6/9/22
Date Boring Completed:	6/9/22
Engineer/Geologist:	CEM
Driller:	NGE

Remarks: **Boring was noted to be dry during drilling operations and at boring completion.**

Depth to Water @ 24 hrs.: ---



Project Name: **Wellsburg EMS Facility
Brooke County, West Virginia**

BORING NO.

Project Number: **W22085**

B- 3

Elevation, feet	Depth, feet	Sample Type	Symbol / USCS	Location: See Figure 1 Offset:		Recovery %	RQD	Blow Count (N-Value)	Moisture %	Liquid Limit	Plasticity Index	Silt and Clay %	Sand %
				Surface El.: ---									
				<input type="checkbox"/> Split Spoon <input checked="" type="checkbox"/> Shelby Tube <input checked="" type="checkbox"/> Rock Core <input type="checkbox"/> Bag Sample									
				MATERIAL DESCRIPTION									
	5			Brown and gray SILTY to SANDY CLAY with rock fragments, moist, soft to very stiff - red and brown (2.5 - 4.0 ft.) - FILL -			9-12-16 (28)	20					
	10							4-3-3 (6)	22				
								2-2-2 (4)					
								1-1-2 (3)	20				
	15			Brown SILTY SAND , damp, very loose to medium dense				1-1-1 (2)					
								3-4-6 (10)	11				
								2-3-6 (9)					
	20							6-6-8 (14)					
								5-4-6 (10)					
	21.5												
				Bottom of Test Boring @ 21.5 ft.									
	25												
	30												

NGE BASIC LOG - NO PENETROMETER LOG REPORTS.GPJ NGE_1.GDT_8/4/22

Completion Depth:	21.5 ft.
Date Boring Started:	6/9/22
Date Boring Completed:	6/9/22
Engineer/Geologist:	CEM
Driller:	NGE

Remarks: **Boring was noted to be dry during drilling operations and at boring completion.**

Depth to Water @ 24 hrs.: ---



Project Name: **Wellsburg EMS Facility
Brooke County, West Virginia**

BORING NO.

Project Number: **W22085**

B- 4

Elevation, feet	Depth, feet	Sample Type	Symbol / USCS	Location: See Figure 1 Offset:		Recovery %	RQD	Blow Count (N-Value)	Moisture %	Liquid Limit	Plasticity Index	Silt and Clay %	Sand %
				Surface El.: ---									
				<input type="checkbox"/> Split Spoon <input checked="" type="checkbox"/> Shelby Tube <input checked="" type="checkbox"/> Rock Core <input type="checkbox"/> Bag Sample									
				MATERIAL DESCRIPTION									
				TOPSOIL 0.3 Brown and gray SILTY to SANDY CLAY with rock and coal fragments, moist, medium stiff to stiff - w/coal frags (2.5 - 4.0 ft.) - mostly rock fragments (5.0 - 6.5 ft.) - very rocky (10.0 - 11.5 ft.) - FILL - - w/trace organics (15.0 - 16.5 ft.) - very rocky (17.5 - 19.0 ft.)				3-3-3 (6)	13				
	5							4-4-3 (7)	20				
	10							3-6-8 (14)					
	15							4-3-7 (10)					
	20							4-2-3 (5)					
								6-5-4 (9)					
								5-5-5 (10)					
								4-4-3 (7)					
								3-10-5 (15)					
				21.5									
				Bottom of Test Boring @ 21,5 ft.									
	25												
	30												

NGE BASIC LOG - NO PENETROMETER LOG REPORTS.GPJ NGE_1.GDT_8/4/22

Completion Depth:	21.5 ft.
Date Boring Started:	6/10/22
Date Boring Completed:	6/10/22
Engineer/Geologist:	CEM
Driller:	NGE

Remarks: **Boring was noted to be dry during drilling operations and at boring completion.**

Depth to Water @ 24 hrs.: ---



Project Name: **Wellsburg EMS Facility
Brooke County, West Virginia**

BORING NO.

Project Number: **W22085**

B- 5

Elevation, feet	Depth, feet	Sample Type	Symbol / USCS	Location: See Figure 1 Offset:		Recovery %	RQD	Blow Count (N-Value)	Moisture %	Liquid Limit	Plasticity Index	Silt and Clay %	Sand %
				Surface El.: ---									
				<input type="checkbox"/> Split Spoon <input checked="" type="checkbox"/> Shelby Tube <input checked="" type="checkbox"/> Rock Core <input type="checkbox"/> Bag Sample									
MATERIAL DESCRIPTION													
				TOPSOIL	0.7			2-2-3 (5)	13				
	5			Brown SILTY to SANDY CLAY with rock fragments, moist, soft to very stiff				5-8-9 (17)					
	10			- red and brown (10.0 - 11.5 ft.)				4-3-2 (5)					
	15			- brown and gray, very plastic (12.5 - 14.0 ft.)				2-3-2 (5)	14				
	20			- FILL -				9-10-5 (15)					
	21.5			- possible original sand @ 20.0 ft.				3-2-2 (4)					
	21.5			Bottom of Test Boring @ 21.5 ft.				3-4-5 (9)					
	25							4-3-2 (5)					
	30							16-11-6 (17)					

NGE BASIC LOG - NO PENETROMETER LOG REPORTS.GPJ NGE_1.GDT 8/4/22

Completion Depth:	21.5 ft.
Date Boring Started:	6/9/22
Date Boring Completed:	6/9/22
Engineer/Geologist:	CEM
Driller:	NGE

Remarks: **Boring was noted to be dry during drilling operations and at boring completion.**

Depth to Water @ 24 hrs.: ---



Project Name: **Wellsburg EMS Facility
Brooke County, West Virginia**

BORING NO.

Project Number: **W22085**

B- 6

Elevation, feet	Depth, feet	Sample Type	Symbol / USCS	Location: See Figure 1 Offset:		Recovery %	RQD	Blow Count (N-Value)	Moisture %	Liquid Limit	Plasticity Index	Silt and Clay %	Sand %
				Surface El.: ---									
				<input type="checkbox"/> Split Spoon <input checked="" type="checkbox"/> Shelby Tube <input type="checkbox"/> Rock Core <input type="checkbox"/> Bag Sample	MATERIAL DESCRIPTION								
				TOPSOIL	0.1'			1-3-4 (7)	21				
				Brown and gray SILTY to SANDY CLAY with rock fragments, moist, medium stiff to stiff				2-4-3 (7)					
	5							1-3-3 (6)	18	33	13		
								3-3-3 (6)	13				
	10			- poor recovery (10.0 - 11.5 ft.)				8-9-4 (13)					
				- w/numerous rock fragments from 10.0 ft.				3-9-5 (14)					
	15							3-5-6 (11)					
				- FILL -				3-6-6 (12)					
	20							50/1"					
				- possible boulder @ 20.0 ft.									
	25				25.0			5-5-6 (11)					
				Brown CLAYEY SAND with rock fragments, damp, medium dense									
	30												

NGE BASIC LOG - NO PENETROMETER LOG REPORTS.GPJ NGE_1.GDT_8/4/22

Completion Depth:	41.5 ft.
Date Boring Started:	6/9/22
Date Boring Completed:	6/9/22
Engineer/Geologist:	CEM
Driller:	NGE

Remarks: **Boring was noted to be dry during drilling operations and at boring completion.**

Depth to Water @ 24 hrs.: ---



Project Name: **Wellsburg EMS Facility
Brooke County, West Virginia**
Project Number: **W22085**

**BORING NO.
B- 6**

Elevation, feet	Depth, feet	Sample Type	Symbol / USCS	Location: See Figure 1 Offset:		Recovery %	RQD	Blow Count (N-Value)	Moisture %	Liquid Limit	Plasticity Index	Silt and Clay %	Sand %
				Surface El.: ---									
				<input type="checkbox"/> Split Spoon <input checked="" type="checkbox"/> Shelby Tube <input type="checkbox"/> Rock Core <input type="checkbox"/> Bag Sample	MATERIAL DESCRIPTION								
				Brown CLAYEY SAND with rock fragments, damp, medium dense				3-5-6 (11)	26				
	35			- more clayey, w/few rock fragments from 35.0 ft.				6-5-6 (11)					
	40							5-5-6 (11)					
				Bottom of Test Boring @ 41.5 ft.									
	45												
	50												
	55												
	60												

NGE BASIC LOG - NO PENETROMETER LOG REPORTS.GPJ NGE_1.GDT_8/4/22

Completion Depth:	41.5 ft.
Date Boring Started:	6/9/22
Date Boring Completed:	6/9/22
Engineer/Geologist:	CEM
Driller:	NGE

Remarks: **Boring was noted to be dry during drilling operations and at boring completion.**
Depth to Water @ 24 hrs.: ---

Appendix A

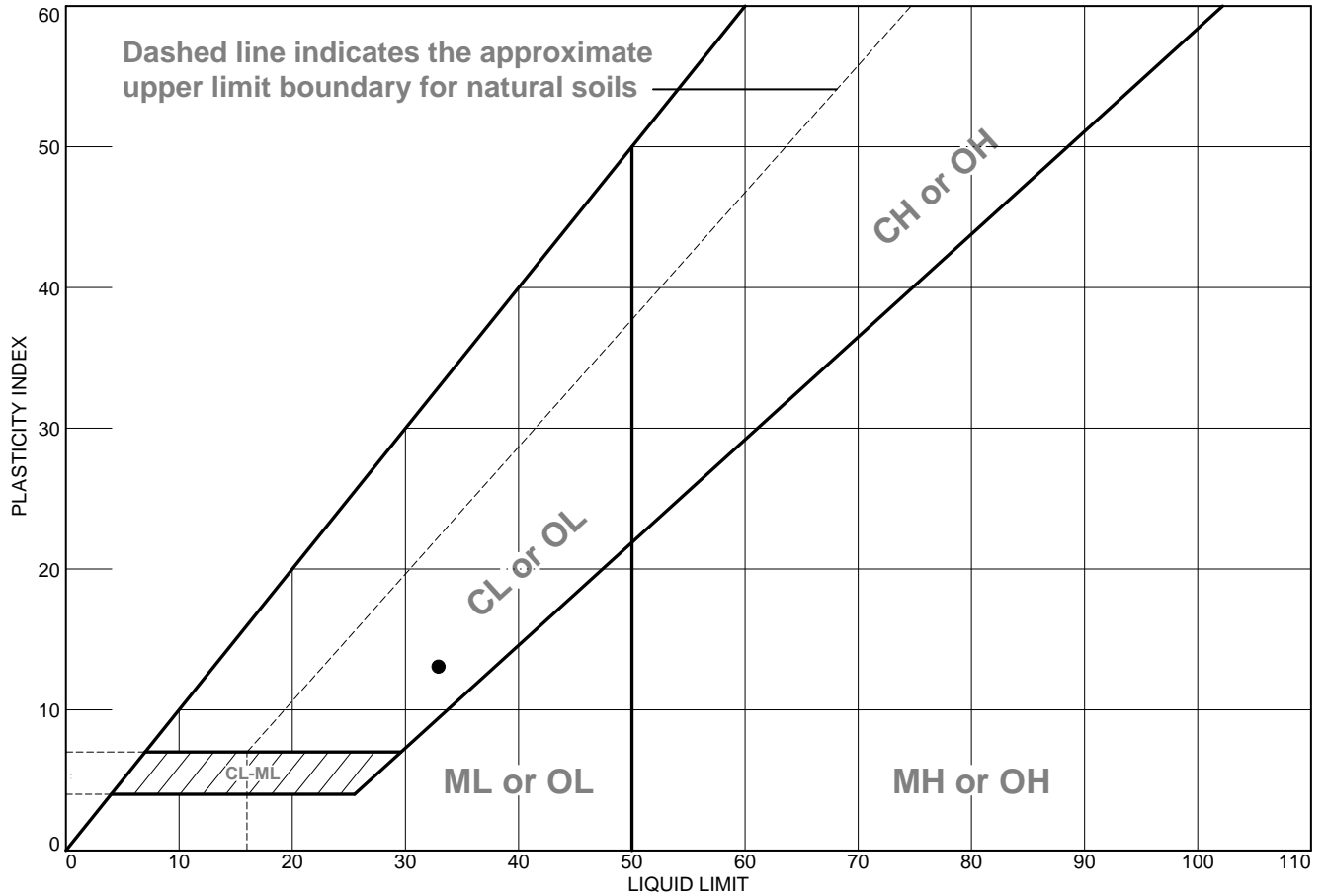


Phone: (304)201-5180
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www.ngeconsulting.com

W22085
Wellsburg EMS
MOISTURE CONTENT ANALYSIS SUMMARY

Boring No.	Sample Depth (ft.)	% Moisture	Boring No.	Sample Depth (ft.)	% Moisture
B-1	0-1.5	13.9%			
B-1	5-6.5	24.7%			
B-2	0-1.5	13.9%			
B-2	2.5-4	9.8%			
B-2	5-6.5	13.0%			
B-2	10-11.5	11.9%			
B-2	25-26.5	19.0%			
B-3	0-1.5	19.8%			
B-3	2.5-4	22.0%			
B-3	7.5-9	20.4%			
B-3	12.5-14	11.1%			
B-4	0-1.5	13.2%			
B-4	2.5-4	19.6%			
B-5	0-1.5	12.8%			
B-5	10-11.5	13.6%			
B-6	0-1.5	21.0%			
B-6	5-6.5	17.7%			
B-6	7.5-9	13.3%			
B-6	30-31.5	25.6%			

LIQUID AND PLASTIC LIMITS TEST REPORT



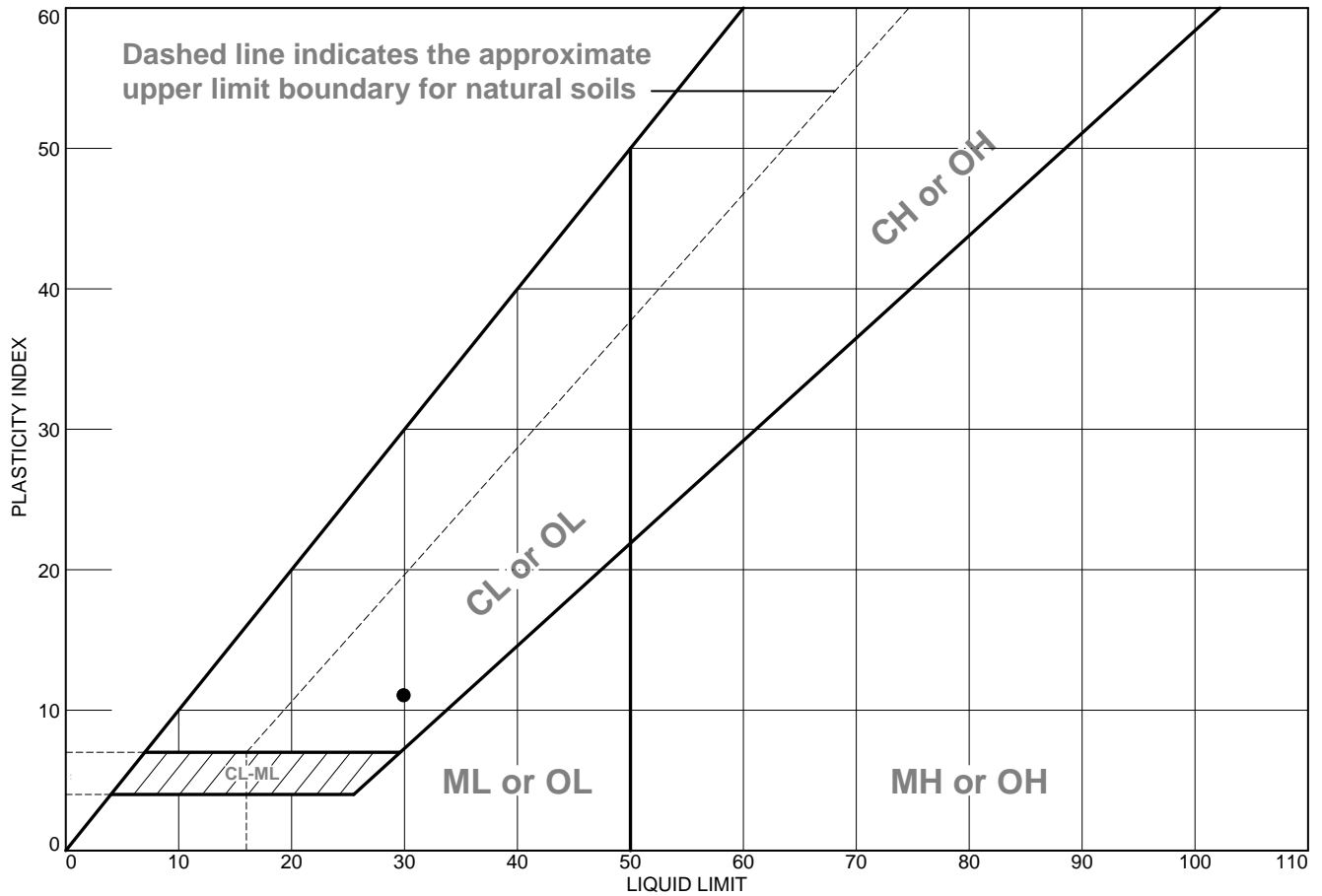
	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Brown and gray SILTY to SANDY CLAY w/rock frags	33	20	13			

<p>Project No. W22085 Client: Thrasher</p> <p>Project: Wellsburg EMS Facility</p> <p>● Source of Sample: B-6 Depth: 5.0 - 6.5 ft. Sample Number: 3</p>	<p>Remarks:</p>
<p>NGE, LLC</p> <p>St. Albans, West Virginia</p>	

Figure

Tested By: DP _____ **Checked By:** CEM _____

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Brown and gray SILTY to SANDY CLAY w/rock frags	30	19	11			

Project No. W22085 **Client:** Thrasher

Project: Wellsburg EMS Facility

● **Source of Sample:** B-1 **Depth:** 5.0 - 6.5 ft. **Sample Number:** 3

NGE, LLC

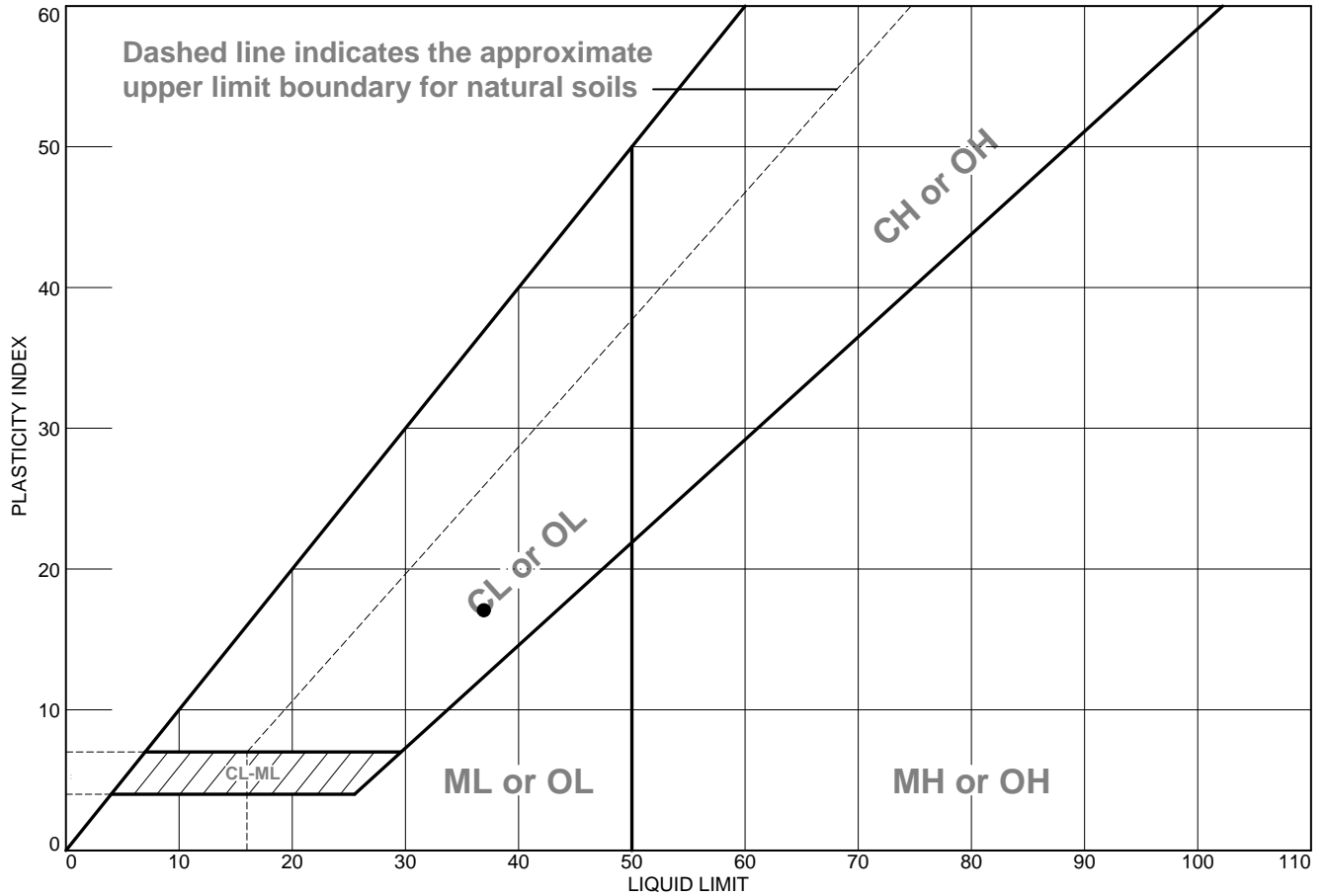
St. Albans, West Virginia

Remarks:

Figure

Tested By: DP **Checked By:** CEM

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Red and brown SILTY to SANDY CLAY w/rock frags	37	20	17			

Project No. W22085 **Client:** Thrasher
Project: Wellsburg EMS Facility
Source of Sample: B-3 **Depth:** 2.5 - 4.0 ft. **Sample Number:** 2

NGE, LLC
St. Albans, West Virginia

Remarks:

Figure

Tested By: DP **Checked By:** CEM