STATE OF ALABAMA
No. 3365
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REGISTERED ARCHITECT

LATHAN ARCHITECTS

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ADDENDUM NO. 3
ELEMENTARY ADDITION TO SUMTER CENTRAL HIGH SCHOOL
Architect Job No. 24-38
July 30, 2024
DCM # 20240619

BIDS DUE:
Thursday, August 1, 2024, until
2:00 p.m., local time,
at the Alabama Department of Education:
Birmingham Office,
1800 International Park Drive,
Suite 400
Birmingham, AL 35243

The Plans and Specifications are here by amended. The following supersedes all contrary and/or conflicting information and is made part of the contract documents.

SPECIFICATIONS

1. The attached **REVISED SECTION 08710 – DOOR HARDWARE** is to replace any previous version issued in its entirety.

2. ADD the attached **Section 09300 – Tile** in its entirety.

DRAWINGS

1. Sheet **C2.0** – Site Layout Plan: Revised limits of concrete and no. 57 stone at storm shelters.

2. Sheet **C6.0** – Civil Details: Revised 18” curb and gutter detail; revised concrete sidewalk detail.

3. ADD the following drawings by Safe-T-Shelter:
   - Drawing No. E-UPS-GRID-1: Optional Grid / Battery Ups System Electrical Plan & View
   - Drawing No. E-UPS-GRID-2: Optional Grid / Battery UPS System Diagrams & Schedules
   - Drawing No. E-UPS-SOLAR-1: Optional Solar / Battery UPS System Electrical Plan & View
   - Drawing No. E-UPS-SOLAR-2: Optional Solar / Battery UPS System Diagrams & Schedules
   - Drawing No. STS1056 pg. 1: Shelter Code Summary, Design Parameters Structural Load Limitations & Plan Index.
   - Drawing No. STS1056 pg. 2: Single 10x56 Shelter Unit Floor Plan & Elevations
   - Drawing No. STS1056 pg. 3: Single 10x56 Shelter Unit Foundation Plan & Elevations

- Drawing No. STS1056 pg. 4: Typical Elevations & Sections Shop Drawing
- Drawing No. STS1056 pg. 5: Intake & Exhaust Hood, Side Wall & Center Bench Seating – Shop Drawing
- Drawing No. STS1056 pg. 6: Typical Intermediate Section, Door Elevations and Weld Details – Shop Drawing
- Drawing No. STS1056 pg. 7: Single 10x56 Shelter Unit Electrical Power & Grounding Plan & Details
- Drawing No. STS1056 pg. 8: Single 10x56 Shelter Unit Electrical Lighting & Receptacle Plan
- Drawing No. STS1056 pg. 9: Single 10x56 Shelter Unit Electrical Riser and Wiring Diagrams
- Drawing No. STS1056 pg. 10: Electrical Notes and Schedules
- Drawing No. STS1056 pg. 11: Option 1 – Generator Shop Drawing
- Drawing No. STS1056 pg. 12: Option 2 – Wing Wall Assembly Shop Drawing
- Drawing No. STS1056 pg. 13: Optional Restroom Configurations
- Drawing No. E-UPS-GRID-1: Optional Grid / Battery UPS System Electrical Plan & View
- Drawing No. E-UPS-GRID-2: Optional Grid / Battery UPS System Diagrams & Schedules
- Drawing No. E-UPS-SOLAR-1: Optional Solar / Battery UPS System Electrical Plan & View
- Drawing No. E-UPS-SOLAR-2: Optional Solar / Battery UPS System Diagrams & Schedules
- Drawing No. STS3-1048 pg. 1: Shelter Code Summary, Design Parameters Structural Load Limitations & Plan Index
- Drawing No. STS3-1048 pg. 2: Triple 10x48 Shelter Unit Floor Plan & Elevations
- Drawing No. STS3-1048 pg. 3: Triple 10x48 Shelter Unit Foundation Plan
- Drawing No. STS3-1048 pg. 4: Triple 10x48 Shelter Unit Foundation Sections
- Drawing No. STS3-1048 pg. 5: Typical Elevation & Sections Shop Drawing
- Drawing No. STS3-1048 pg. 6: Intake & Exhaust Hood, Side Wall & Center Bench Seating – Shop Drawing
- Drawing No. STS3-1048 pg. 7: Typical Intermediate Section, Door Elevations and Weld Details – Shop Drawing
- Drawing No. STS3-1048 pg. 8: Cross-Over Assembly Shop Drawing
- Drawing No. STS3-1048 pg. 9: Triple 10x48 Shelter Unit Electrical Power & Grounding Plan & Details
- Drawing No. STS3-1048 pg. 10: Triple 10x48 Shelter Unit Electrical Lighting & Receptacle Plan
- Drawing No. STS3-1048 pg. 11: Triple 10x48 Shelter Unit Electrical Riser and Wiring Diagrams
- Drawing No. STS3-1048 pg. 12: Electrical Notes and Schedules
- Drawing No. STS3-1048 pg. 13: Option 1 – Generator Shop Drawing
- Drawing No. STS3-1048 pg. 14: Option 2 – Wing Wall Assembly Shop Drawing
- Drawing No. STS3-1048 pg. 15: Optional Restroom Configuration
- Drawing No. E-UPS-GRID-1: Optional Grid / Battery UPS System Electrical Plan & View
- Drawing No. E-UPS-GRID-2: Optional Grid / Battery UPS System Diagrams & Schedules
- Drawing No. E-UPS-SOLAR-1: Optional Solar / Battery UPS System Electrical Plan & View
- Drawing No. E-UPS-SOLAR-2: Optional Solar / Battery UPS System Diagrams & Schedules

CLARIFICATIONS

1. This project is ESSER funded, Davis Bacon wage rates will pertain. Please refer to the Specification Index: ESSER FUND REQUIREMENTS for where to locate required payroll documents and additional instructions for completing the required forms.

2. Please note the North arrow shown on the Civil drawings is the correct orientation. The contractor is to use this North arrow orientation for all other drawings in the bid documents.

3. Reference Sheet FP0.1 Fire Pump is to be 60 HP not 1000 hp.

4. Reference Sheet FP0.2 Fire Pump is to be a vertical in-line pump.

5. The Fire Pump Controller is to be equipped with an automatic transfer switch.

1.0 - GENERAL

1.1 Related Documents

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

1.2 Summary

A. This Section includes items known commercially as finish or door hardware that are required for swing, sliding, and folding doors, except special types of unique hardware specified in the same sections as the doors and door frames on which they are installed.

B. This Section includes the following:
1. Architectural Hinges
2. Continuous Hinges
3. Key Control System, Cylinders and Cores.
4. Locksets, Latchsets and Deadbolts
5. Panic Devices and Fire Rated Exit Devices
6. Closers and Door Control Devices
7. Overhead Door Stops and Holders
8. Floor and Wall Stops
9. Door Bolts and Coordinators
10. Door Pulls, Push/Pull Plates and Push/Pull Sets
11. Protective Plates
12. Door Seals, Gasketing and Weatherstripping
13. Thresholds
14. Miscellaneous Door Control Devices
15. Electromechanical Hardware
16. Miscellaneous Access Control Components and Security Equipment

C. Related Sections: The following Sections contain requirements that relate to the following sections.
1. Section 08110: Hollow Metal Doors and Frames
2. Section 08215: Wood Doors
3. Section 08420: Aluminum-Framed Entrances and Storefronts
4. Division 16: Electrical
5. Division 28: Electronic Safety and Security

D. Products furnished but not installed under this Section to include:
1. Cylinders for locks on entrance doors.
2. Final replacement cores and keys to be installed by Owner.

1.3 References

A. Standards of the following as referenced:
1. American National Standards Institute (ANSI)
2. Door and Hardware Institute (DHI)
3. Factory Mutual (FM)
4. National Fire Protection Association (NFPA)
5. Underwriters' Laboratories, Inc. (UL)
6. UL 10C - Fire Tests Door Assemblies
7. Warnock Hersey

B. Regulatory standards of the following as referenced:
1. Department of Justice, Office of the Attorney General, *Americans with Disabilities*

Act, Public Law 101-336 (ADA).

2. CABO/ANSI A117.1: *Providing Accessibility and Usability for Physically Handicapped People*, 2010 edition.

1.4 Submittals

A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification sections.

B. 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. For items other than those scheduled in the “Headings” of Section 3, provide catalog information for the specified items and for those submitted.

C. Final hardware schedule coordinated with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Final Hardware Schedule Content: Based on hardware indicated, organize schedule into vertical format “hardware sets" indicating complete designations of every item required for each door or opening. Use specification heading numbers with any variations suffixed a, b, etc. Include the following information:
   a. Type, style, function, size, and finish of each hardware item.
   b. Name and manufacturer of each item.
   c. Fastenings and other pertinent information.
   d. Location of each hardware set cross-referenced to indications on Drawings both on floor plans and in door and frame schedule.
   e. Explanation of all abbreviations, symbols, and codes contained in schedule.
   f. Mounting locations for hardware.
   g. Door and frame sizes and materials.
   h. Keying information.
   i. Cross-reference numbers used within schedule deviating from those specified.
   j. Column 1: State specified item and manufacturer.
   k. Column 2: State prior approved substituted item and its manufacturer.
2. Furnish complete wiring diagrams, riser diagrams, elevation drawings and operational descriptions of electrical components and systems, listed by opening in the hardware submittals. Elevation drawings shall identify locations of the system components with respect to their placement in the door opening. Operational descriptions shall fully detail how each electrical component will function within the opening, including all conditions of ingress and egress. Provide a copy with each hardware schedule submitted for approval. Supply a copy with delivery of hardware to the jobsite and another copy to the Owner at the time of project completion.
3. Submittal Sequence: Submit final schedule at earliest possible date particularly where acceptance of hardware schedule must precede fabrication of other work that is critical in the Project construction schedule. Include with schedule the product data, samples, shop drawings of other work affected by door hardware, and other information essential to the coordinated review of schedule.
4. Keying Schedule: Submit separate detailed schedule indicating clearly how the Owner's final instructions on keying of locks has been fulfilled.

D. Provide samples if requested of each type of exposed hardware unit in finish indicated and tagged with full description for coordination with schedule. Submit samples prior to submission of final hardware schedule.

1. Samples will be returned to the supplier. Units that are acceptable and remain undamaged through submittal, review, and field comparison process may, after

final check of operation, be incorporated in the Work, within limitations of keying coordination requirements.

E. Templates for doors, frames, and other work specified to be factory prepared for the installation of door hardware. Check shop drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

F. Contract closeout submittals:
1. Operation and maintenance data: Complete information for installed door hardware.
2. Warranty: Completed and executed warranty forms.

1.5 Quality Assurance

A. Single Source Responsibility: Obtain each type of hardware (latch and locksets, hinges, closers, etc.) from a single manufacturer.
1. Supplier Qualifications: A recognized architectural door hardware supplier, with warehousing facilities in the Project's vicinity, that has a record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this Project and that employs an experienced Architectural Hardware Consultant (AHC) who is available for consultation to Owner, Architect, and Contractor, at reasonable times during the course of the Work.

B. Coordination Meetings:
1. Contractor to set up and attend the following:
a. Lock distributor to meet with the Owner to finalize lock functions and keying requirements and to obtain final instructions in writing.
b. Lock distributor and lock, closer and exit device manufacturer to meet with the installer prior to beginning of installation of door hardware. Instruct installer on proper installation of specified products.
2. General Contractor to set up and attend the following:
3. Meet with the Owner, General Contractor, Supplier, electrical and security contractors to coordinate all electrical hardware items. Supplier to provide riser diagrams, elevation drawings, wiring diagrams and operational descriptions as required by the General and sub-contractors.

C. Fire-Rated Openings: Provide door hardware for fire-rated openings that complies with NFPA Standard No. 80 requirements of authorities having jurisdiction.
1. Provide only items of door hardware that are listed and tested by UL or Warnock Hersey for given type/size opening and degree of label. Provide proper latching hardware, door closers, approved-bearing hinges and seals whether listed in the Hardware Schedule or not. All hardware to comply with State and local codes and UL 10C.
2. Where emergency exit devices are required on fire-rated doors, (with supplementary marking on doors' UL labels indicating "Fire Door to be equipped with Fire Exit Hardware") provide UL label on exit devices indicating "Fire Exit Hardware".

D. All hardware is to comply with Federal and State Handicap laws.

E. Substitutions: Request for substitutions of items of hardware other than those listed as "acceptable and approved" shall be made to the architect in writing no later than fourteen (14) days prior to bid opening. Approval of substitutions will only be given in writing or by Addenda. Requests for substitutions shall be accompanied by samples and/or detailed information for each manufacturer of each product showing design, functions, material

thickness and any other pertinent information needed to compare your product with that specified. Lack of this information will result in a refusal.

F. Pre-Installation Coordination:
1. Installation of hardware shall be installed or directly supervised and inspected by a skilled installer certified by the manufacturer of locksets, door closers, and exit devices used on the project, or with not less than 3 years' experience in successful completion of projects similar in size and scope.
2. Schedule a hardware pre-installation meeting on site to review and discuss the installation of continuous hinges, locksets, door closers, exit devices, overhead stops, and electromechanical door hardware.
3. Meeting attendees shall be notified 7 days in advance and shall include: Architect, Contractor, Door Hardware Installers (including low voltage hardware), Manufacturers representatives for above hardware items, and any other effected subcontractors or suppliers.
4. All attendees shall be prepared to distribute installation manuals, hardware schedules, templates, and physical hardware samples.

1.6 Product Handling

A. Tag each item or package separately with identification related to final hardware schedule, and include basic installation instructions with each item or package.

B. Packaging of door hardware is responsibility of supplier. As material is received by hardware supplier from various manufacturers, sort and repackage in containers clearly marked with appropriate hardware set number to match set numbers of approved hardware schedule. Two or more identical sets may be packed in same container.

C. Inventory door hardware jointly with representatives of hardware supplier and hardware installer until each is satisfied that count is correct.

D. Deliver individually packaged door hardware items promptly to place of installation (shop or Project site).

E. Provide secure lock-up for door hardware delivered to the Project, but not yet installed. Control handling and installation of hardware items that are not immediately replaceable so that completion of the Work will not be delayed by hardware losses both before and after installation.

1.7 Warranty

A. Special warranties:
1. Cylindrical Locks and Cylinders: Ten period Year Period
2. Door Closers: Twenty Five Year Period
3. Exit Devices: Ten Year Period
4. Electrified Exit Devices: Three Year Period

1.8 Maintenance

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions that are packed in hardware items for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

B. Parts kits: Furnish manufacturers' standard parts kits for locksets, exit devices, and door closers.

2.0 - PRODUCTS

2.1 Manufactured Units

A. Hinges:
   1. Acceptable manufacturers:
      a. Ives*
      b. Bommer
      c. McKinney
   2. Characteristics:
      a. Templates: Provide only template-produced units.
      b. Screws: Provide Phillips flat-head screws complying with the following requirements:
         1) For metal doors and frames install machine screws into drilled and tapped holes.
         2) For wood doors and frames install threaded-to-the-head wood screws.
         3) For fire-rated wood doors install #12 x 1-1/4 inch, threaded-to-the-head steel wood screws.
         4) Finish screw heads to match surface of hinges or pivots.
      c. Hinge pins: Except as otherwise indicated, provide hinge pins as follows:
         1) Out-Swing Exterior Doors: Non-removable pins.
         2) Out-Swing Corridor Doors with Locks: Non-removable pins.
         3) Interior Doors: Non-rising pins.
         4) Tips: Flat button and matching plug. Finished to match leafs.
      d. Size: Size hinges in accordance with specified manufacturer's published recommendations.
      e. Quantity: Furnish one pair of hinges for all doors up to 5'-0" high. Furnish one hinge for each additional 2-1/2 feet or fraction thereof, unless otherwise specified in Hardware Headings.

B. Geared Continuous Hinges:
   1. Acceptable manufacturers:
      a. Ives*
      b. Select Products
      c. Markar
   2. Characteristics:
      a. Continuous gear hinges to be manufactured of extruded 6063-T6 aluminum alloy with anodized finish, or factory painted finish as scheduled.
      b. All hinges are to be manufactured to template. Uncut hinges to be non-handed and to be a pinless assembly of three interlocking extrusions applied to the full height of the door and frame without mortising.
      c. Vertical door loads to be carried on chemically lubricated polyacetal thrust bearings. The door and frame leaves to be continually geared together for the entire hinge length and secured with a full cover channel. Hinge to operate to a full 180°.
      d. Hinges to be milled, anodized and assembled in matching pairs. Fasteners supplied to be steel self-drilling, self-tapping 12-24 x ¾" screws.
      e. Provide UL listed continuous hinges at fire doors. Continuous hinges at fire doors (suffix -FR) to meet the required ratings without the use of auxiliary fused pins or studs.

C. Cylinders and Keying:
   1. Acceptable manufacturers:
      a. Match existing keying system
   2. Characteristics:
      a. Existing System: Grandmaster key the locks to the Owner's existing system, with a new master key for the Project.

b. Review the keying system with the Owner and provide the type required (master, grandmaster or great-grandmaster), either new or integrated into Owner’s existing system.
c. Metals: Construct lock cylinder parts from brass or bronze, stainless steel, or nickel silver.
d. Comply with Owner's instructions for master keying and, except as otherwise indicated, provide individual change key for each lock that is not designated to be keyed alike with a group of related locks.
e. Permanently inscribe each key with number of lock that identifies cylinder manufacturer's key symbol, and notation, “DO NOT DUPLICATE”.
f. Key Material: Provide keys of nickel silver only.
g. Furnish the following Key Quantities:
    1) Three (3) change keys for each lock.
    2) Five (5) master keys for each master system.
    3) Five (5) grandmaster keys for each grandmaster system.
    4) Ten (10) construction master keys.
    5) Two (2) construction Control Keys.
    6) One (1) extra blank for each lock.
h. Furnish construction master keys to General Contractor.
    1) Deliver keys to Owner.

D. Extra Heavy Duty Cylindrical Locks and Latches:
1. Acceptable manufacturers:
    a. Schlage ND Series*
    b. Sargent 10 Line Series
    c. Corbin CL3300 Series
2. Required Features:
    a. Chassis: Cylindrical design, corrosion-resistant plated cold-rolled steel.
    b. Locking Spindle: Stainless steel, interlocking design.
    c. Latch Retractors: Forged steel. Balance of inner parts: Corrosion-resistant plated steel, or stainless steel.
    d. Lever Trim: Accessible design, independent operation, spring-cage supported, minimum 2" clearance from lever mid-point to door face.
    e. All lock functions: 7 year warranty, Vandalguard function outside lever is disengaged when in the locked mode.
    f. Rosettes: Minimum 3-7/16" diameter for coverage of ANSI/DHI A115.18, 1994 door preparation, through-bolt lugs on both spring cages to fully engage this pattern.
    g. Springs: Full compression type.
    h. Electric operation: Manufacturer-installed continuous duty solenoid.
    i. Strikes: 16 gage curved steel, bronze or brass with 1" deep box construction, lips of sufficient length to clear trim and protect clothing.
    j. Scheduled Lock Series and Design: **Field verify and match existing keying system.**
    k. Certifications:
        1) ANSI A156.2, 1994, Series 4000, Grade 1. Tested to exceed 3,000,000 cycles.
        2) UL listed for A label single doors up to 4 ft x 8 ft.

E. Exit Devices:
1. Acceptable manufacturers:
    a. Von Duprin 98 Series*
    b. Sargent 8000 Series
    c. Precision Apex 2100
2. Characteristics:

a. Exit devices to be UL Listed for life safety. Exit devices for fire rated openings to have “UL" labels for “Fire Exit Hardware."
b. Exit devices mounted on labeled wood doors to be mounted on the door per the door manufacturer’s requirements.
c. All trim to be thru-bolted to the lock stile case.
d. Lever trim to be solid case material with a break-away feature to limit damage to the unit from vandalism. Lever design to match locksets.
e. All exit devices to be made of brass, bronze, stainless steel, or aluminum material, powder coated, anodized, or plated to the standard architectural finishes to match the balance of the door hardware.
f. Provide glass bead conversion kits to shim exit devices on doors with raised glass beads.
g. All exit devices to be one manufacturer. No deviation will be considered.
h. All series exit devices to incorporate a fluid damper, which decelerates the touchpad on its return stroke and eliminates noise associated with exit device operation. All exit devices to be non-handed. Touchpad to extend a minimum of 1/2 of the door width and to extend to the height of the cross rail housing for a “no pinch” operation. Plastic touchpads are not acceptable. All latchbolts to be the deadlocking type. Latchbolts to have a self-lubricating coating to reduce wear. Plated or plastic coated latchbolts are not acceptable. Plastic linkage and “dogging” components are not acceptable.
i. Surface vertical rod devices to be UL labeled for fire door applications without the use of bottom rod assemblies. Where bottom rods are required for security applications, the devices to be UL labeled for fire doors applications with rod and latch guards by the device manufacturer.
j. Exit devices to include impact resistant, flush mounted end cap design to avoid damage due to carts and other heavy objects passing through an opening. End cap to be of heavy-duty metal alloy construction and provide horizontal adjustment to provide alignment with device cover plate. When exit device end cap is installed, no raised edges will protrude.

F. Closers and Door Control Devices:
1. Acceptable manufacturers:
a. LCN Closers 4050 Series*
b. Falcon SC70 Series
c. Norton 7500 Series
2. Characteristics:
a. 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.
b. Provide door closers with fully hydraulic, full rack and pinion action with cast aluminum cylinder.
c. Body: 1-1/2 inch (38 mm) diameter with 11/16 inch (17 mm) diameter heat-treated pinion journal and full complement bearings.
d. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and all weather requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
e. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards.
f. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and back check.
g. Pressure Relief Valve (PRV) Technology: Not permitted.
h. Provide stick on templates, 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.

G. Overhead Door Holders:
1. Acceptable manufacturers:
   a. Glynn Johnson*
   b. Rixson Firemark
2. Characteristics:
   a. Provide heavy duty concealed door holders of stainless steel.
   b. Provide heavy duty surface mounted door holders of stainless steel.
   c. Concealed holders to be installed with the jamb bracket mortised flush with the bottom of the jamb. The arm and channel to be mortised into the door.
   d. Surface holders to be installed with the jamb bracket mounted on the stop.

H. Floor Stops and Wall Bumpers:
1. Acceptable manufacturers:
   a. Ives*
   b. Trimco
   c. Rockwood Manufacturing
2. Characteristics: Refer to Hardware Headings.

I. Door Bolts/Coordinators:
1. Acceptable manufacturers:
   a. Ives*
   b. Trimco
   c. Rockwood Manufacturing
2. Characteristics:
   a. Flush bolts to be forged brass 6-3/4" x 1", with 1/2" diameter bolts. Plunger to be supplied with milled surface one side that fits into a matching guide.
   b. Automatic flush bolts to be UL listed as top and bottom bolts on a pair of classified fire doors. Bolt construction to be of rugged steel and brass components.
   c. Self-latching flush bolts to be UL listed as top and bottom bolts on a pair of classified fire doors. Bolt construction to be of rugged steel and brass components.
   d. Automatic flush bolts and self-latching flush bolts to be UL listed for fire door application without bottom bolts (LBB).
   e. Furnish dust proof bottom strikes.
   f. Coordinator to be soffit mounted non-handed fully automatic UL listed coordinating device for sequential closing of paired doors with or without astragals.
   g. Provide filler piece to close the header. Provide brackets as required for mounting of soffit applied hardware.

J. Push Plates:
1. Acceptable manufacturers:
   a. Ives*
   b. Trimco
   c. Rockwood Manufacturing
2. Characteristics:
   a. Exposed Fasteners: Provide manufacturers standard exposed fasteners.
   b. Material to be forged stainless steel, per the Hardware Headings.

c. Provide plates sized as shown in Hardware Headings.

K. Door Pulls & Pull Plates:
1. Acceptable manufacturers:
a. Ives*
b. Trimco
c. Rockwood Manufacturing
2. Characteristics:
a. Provide concealed thru-bolted trim on back to back mounted pulls, but not for single units.
b. Material to be forged stainless steel.
c. Provide units sized as shown in Hardware Headings.

L. Push Pull Sets:
1. Acceptable manufacturers:
a. Ives*
b. Trimco
c. Rockwood Manufacturing
2. Characteristics:
a. Provide mounting systems as shown in hardware sets.
b. Material to be tubular stainless steel.
c. Provide Push/Pull sets sized as shown in Hardware Headings.

M. Protective Plates:
1. Acceptable manufacturers:
a. Ives*
b. Trimco
c. Rockwood Manufacturing
2. Characteristics:
a. Provide manufacturers standard exposed fasteners for door trim units consisting of either machine screws or self-tapping screws.
b. Materials:
c. Metal Plates: Stainless Steel, .050 inch (U.S. 18 gage).
d. Fabricate protection plates not more than 2 inches less than door width on push side and not more than 1 inch less than door width on pull side.
e. Sizes:
1) Refer to hardware headings for specific sizes.
2) Kick plates to be 8 inches in height.
3) Mop plates to be 6 inches in height.
4) Kick plates and Mop plates to be 1” less that bottom rail height where applicable.
5) Armor plates to be 34 inches in height. Armor plates on fire doors to comply with NFPA 80.

N. Thresholds:
1. Acceptable manufacturers:
a. Zero Weatherstripping Co., Inc.*
b. Pemko
c. Reese Industries
2. Types: Indicated in Hardware Headings.

O. Door Seals/Gasketing:
1. Acceptable manufacturers:
a. Zero Weatherstripping Co., Inc.*
b. Pemko
c. Reese Industries

2. Types: Indicated in Hardware Headings.

P. Silencers:
1. Acceptable manufacturers:
   a. Ives*
   b. Hager
   c. Rockwood Manufacturing
2. Provide three for each single door; two for each pair of doors.

Q. Key Cabinet and System: (AS REQUIRED)
1. Acceptable manufacturers:
   a. Telkee, Inc.
2. Provide a 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 percent of the number of locks required for the project.
3. Provide complete cross index system set up by key control distributor, and place keys on markers and hooks in the cabinet as determined by the final key schedule.
4. Provide hinged-panel type cabinet for wall mounting.
5. Provide multiple-drawer type cabinet.

R. Knox Box:
1. Acceptable manufacturers: (AS REQUIRED)
   a. Knox Box 3200 Series.
2. Provide one surface mount Knox Box 3200 Series.
3. Provide unit compatible with the local Fire Department Knox key system.
4. General contractor shall install in location provided by architect.

2.2 Materials and Fabrication

A. Manufacturer's Name Plate: Do not use manufacturers' products that have manufacturer's name or trade name displayed in a visible location (omit removable nameplates) except in conjunction with required fire-rated labels and as otherwise acceptable to Architect.
1. Manufacturer's identification will be permitted on rim of lock cylinders only.

B. Base Metals: Produce hardware units of basic metal and forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness, but in no case of lesser (commercially recognized) quality than specified for applicable hardware units by applicable ANSI/BHMA A156 series standards for each type of hardware item and with ANSI/BHMA A156.18 for finish designations indicated. Do not furnish "optional" materials or forming methods for those indicated, except as otherwise specified.

C. Fasteners: Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation.
1. Do not provide hardware that has been prepared for self-tapping sheet metal screws, except as specifically indicated.
2. Furnish screws for installation with each hardware item. Provide Phillips flat-head screws except as otherwise indicated. 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 as closely as possible including “prepared for paint" surfaces to receive painted finish.
3. Provide concealed fasteners for hardware units that are exposed when door is closed except to the extent no standard units of type specified are available with concealed fasteners.

4. Use thru-bolts for installation of all exit devices, closers, and surface-mounted overhead stops. Coordinate with wood doors and metal doors and frames. Where thru-bolts are used, provide sleeves for each thru-bolt as a means of reinforcing the work, or provide sex nuts and bolts.

2.3 Hardware Finishes

A. Match items to the manufacturer's standard color and texture finish for the latch and lock sets (or push-pull units if no latch or lock sets).

B. Provide finishes that match those established by ANSI or, if none established, match the Architect's sample.

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

D. Provide protective lacquer coating on all exposed hardware finishes of brass, bronze, and aluminum, except as otherwise indicated. The suffix "-NL" is used with standard finish designations to indicate "no lacquer."

E. The designations used to indicate hardware finishes are those listed in ANSI/BHMA A156.18, "Materials and Finishes," including coordination with the traditional U.S. finishes shown by certain manufacturers for their products.

F. All hardware to be 626 (US26D), 652 (US26D) Satin Chrome Finish, with the following exceptions:
1. Continuous Hinges: 628 (US28) Clear Anodized Aluminum
2. Door Closers: 689 Powder Coat Aluminum
3. Push Plates: 630 (US32D) Satin Stainless Steel
4. Pull Plates: 630 (US32D) Satin Stainless Steel
5. Protective Plates: 630 (US32D) Satin Stainless Steel
6. Overhead Holders: 630 Satin Stainless Steel

3.0 - EXECUTION

3.1 Installation:

A. Mount hardware units at heights indicated in following applicable publications, except as specifically indicated or required to comply with governing regulations and except as otherwise directed by Architect.
1. "Recommended Locations for Builders Hardware for Standard Steel Doors and Frames" by the Door and Hardware Institute.
2. "Recommended Locations for Builders Hardware for Custom Steel Doors and Frames" by the Door and Hardware Institute.
3. NWWDA Industry Standard I.S.1.7, "Hardware Locations for Wood Flush Doors."

B. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Where cutting and fitting is required to install hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation or application of surface protection with finishing work specified in the Division 9 Sections. Do not install surface-mounted items until finishes have been completed on the substrates involved.

C. Set units level, plumb, and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.

D. Drill and countersink units that are not factory prepared for anchorage fasteners. Space

fasteners and anchors in accordance with industry standards.

E. Set thresholds for exterior doors in full bed of butyl-rubber or polyisobutylene mastic sealant complying with requirements specified in Division 7 Section “Joint Sealers”.

F. Weatherstripping and Seals: Comply with manufacturer's instructions and recommendations to the extent installation requirements are not otherwise indicated.

3.2 Adjusting, Cleaning, and Demonstrating

A. Adjust and check each operating item of hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate freely and smoothly or as intended for the application made.
   1. Where door hardware is installed more than one month prior to acceptance or occupancy of a space or area, return to the installation during the week prior to acceptance or occupancy and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to function properly with final operation of heating and ventilating equipment.

B. Clean adjacent surfaces soiled by hardware installation.

C. Door Hardware Supplier's Field Service:
   1. Inspect door hardware items for correct installation and adjustment after complete installation of door hardware.
   2. Instruct Owner's personnel in the proper adjustment and maintenance of door hardware and hardware finishes.
   3. File written report of this inspection to Architect.

3.3 Hardware Schedule

HARDWARE SET: A01
EACH TO HAVE:

2	CONT. HINGE	112XY EPT	IVE
2	POWER TRANSFER	EPT10 CON	VON
1	REMOVABLE MULLION	KR4954 STAB	VON
1	ELEC PANIC HARDWARE	LXRX-LC-QEL-98-EO-CON	VON
1	ELEC PANIC HARDWARE	LXRX-LC-QEL-98-NL-OP-110MD-CON	VON
1	RIM CYLINDER	AS REQUIRED	
1	MORTISE CYLINDER	AS REQUIRED	
2	PERMANENT IC CORE	AS REQUIRED	
2	OFFSET PULL	8190EZHD 12" O	IVE
2	OH STOP	100S	GLY
2	SURFACE CLOSER	4021 MC TBSRT	LCN
2	MOUNTING PLATE	4020-18/18G SRT (AS REQ'D)	LCN
1	MULLION SEAL	139N PSA	ZER
1	THRESHOLD	655	ZER
2	WIRE HARNESS	CON-192/192P (AS REQ'D)	SCH
2	WIRE HARNESS	CON-6W	SCH
1	CREDENTIAL READER	BY SECURITY/ACCESS CTRL SYSTEMS	
1	DESK MOUNT BUTTON	660-PB	SCE
2	DOOR CONTACT	679-05HM	SCE
1	POWER SUPPLY	PS904 900-4RL	VON

COORDINATE HARDWARE WITH ALUMINUM DOOR/FRAME MANUFACTURER/SUPPLIER.
BALANCE OF HARDWARE BY ALUMINUM DOOR/FRAME MANUFACTURER/SUPPLIER.

COORDINATE HARDWARE WITH ELECTRICAL, SECURITY AND ACCESS CONTROL SYSTEMS.
BALANCE OF EAC COMPONENTS BY ELECTRICAL, SECURITY AND ACCESS CONTROL SYSTEMS.

OPERATION: CARD READER TO UNLOCK HARDWARE AND ALLOW PASSAGE MOMENTARILY. REMOTE PUSH BUTTON FROM RECEPTION TO UNLOCK HARDWARE AND ALLOW PASSAGE MOMENTARILY. DOOR AND LATCH CONTACT MONITORED REMOTELY VIA SECURITY AND ACCESS CONTROL SYSTEMS. FREE EGRESS AT ALL TIMES.

HARDWARE SET: A02
EACH TO HAVE:

2	CONT. HINGE	112XY EPT	IVE
2	POWER TRANSFER	EPT10 CON	VON
1	REMOVABLE MULLION	KR4954 STAB	VON
1	ELEC PANIC HARDWARE	LXRX-LC-QEL-98-EO-CON	VON
1	ELEC PANIC HARDWARE	LXRX-LC-QEL-98-NL-OP-110MD-CON	VON
1	RIM CYLINDER	AS REQUIRED	
1	MORTISE CYLINDER	AS REQUIRED	
2	PERMANENT IC CORE	AS REQUIRED	
2	OFFSET PULL	8190EZHD 12" O	IVE
2	OH STOP	100S	GLY
2	SURFACE CLOSER	4021 MC TBSRT	LCN
2	MOUNTING PLATE	4020-18/18G SRT (AS REQ'D)	LCN
1	MULLION SEAL	139N PSA	ZER
2	WIRE HARNESS	CON-192/192P (AS REQ'D)	SCH
2	WIRE HARNESS	CON-6W	SCH
1	CREDENTIAL READER	BY SECURITY/ACCESS CTRL SYSTEMS	
1	DESK MOUNT BUTTON	660-PB	SCE
2	DOOR CONTACT	679-05HM	SCE
1	POWER SUPPLY	PS904 900-4RL	VON

COORDINATE HARDWARE WITH ALUMINUM DOOR/FRAME MANUFACTURER/SUPPLIER.
BALANCE OF HARDWARE BY ALUMINUM DOOR/FRAME MANUFACTURER/SUPPLIER.

COORDINATE HARDWARE WITH ELECTRICAL, SECURITY AND ACCESS CONTROL SYSTEMS.
BALANCE OF EAC COMPONENTS BY ELECTRICAL, SECURITY AND ACCESS CONTROL SYSTEMS.

OPERATION: CARD READER TO UNLOCK HARDWARE AND ALLOW PASSAGE MOMENTARILY. REMOTE PUSH BUTTON FROM RECEPTION TO UNLOCK HARDWARE AND ALLOW PASSAGE MOMENTARILY. DOOR AND LATCH CONTACT MONITORED REMOTELY VIA SECURITY AND ACCESS CONTROL SYSTEMS. FREE EGRESS AT ALL TIMES.

HARDWARE SET: A03
EACH TO HAVE:

2	CONT. HINGE	112XY EPT	IVE
2	POWER TRANSFER	EPT10 CON	VON
1	REMOVABLE MULLION	KR4954 STAB	VON
1	ELEC PANIC HARDWARE	CDSI-LXRX-LC-98-EO-CON	VON
1	ELEC PANIC HARDWARE	LXRX-LC-QEL-98-NL-OP-110MD-CON	VON
1	RIM CYLINDER	AS REQUIRED	
2	MORTISE CYLINDER	AS REQUIRED	
3	PERMANENT IC CORE	AS REQUIRED	
2	OFFSET PULL	8190EZHD 12" O	IVE
2	OH STOP	100S	GLY
2	SURFACE CLOSER	4021 MC TBSRT	LCN
2	MOUNTING PLATE	4020-18/18G SRT (AS REQ'D)	LCN
1	MULLION SEAL	139N PSA	ZER
1	THRESHOLD	655	ZER
2	WIRE HARNESS	CON-192/192P (AS REQ'D)	SCH
2	WIRE HARNESS	CON-6W	SCH
1	CREDENTIAL READER	BY SECURITY/ACCESS CTRL SYSTEMS	
2	DOOR CONTACT	679-05HM	SCE
1	POWER SUPPLY	PS902 900-4RL	VON

COORDINATE HARDWARE WITH ALUMINUM DOOR/FRAME MANUFACTURER/SUPPLIER.
BALANCE OF HARDWARE BY ALUMINUM DOOR/FRAME MANUFACTURER/SUPPLIER.

COORDINATE HARDWARE WITH ELECTRICAL, SECURITY AND ACCESS CONTROL SYSTEMS.
BALANCE OF EAC COMPONENTS BY ELECTRICAL, SECURITY AND ACCESS CONTROL SYSTEMS.

OPERATION: CARD READER TO UNLOCK HARDWARE AND ALLOW PASSAGE MOMENTARILY. DOOR AND LATCH CONTACT MONITORED REMOTELY VIA SECURITY AND ACCESS CONTROL SYSTEMS. FREE EGRESS AT ALL TIMES.

HARDWARE SET: A04
EACH TO HAVE:

6	HINGE	5BB1HW 4.5 X 4.5 NRP 630	IVE
1	CONST LATCHING BOLT	FB51P (HMD)	IVE
1	STOREROOM LOCK	ND80	SCH
1	PERMANENT IC CORE	AS REQUIRED	
2	OH STOP & HOLDER	100H	GLY
1	RAIN DRIP	142AA (AS REQ'D)	ZER
1	GASKETING	8144SBK PSA	ZER
1	ASTRAGAL	43STST	ZER
2	DOOR SWEEP	8198AA	ZER
1	THRESHOLD	65A	ZER

HARDWARE SET: A05
EACH TO HAVE:

3	HINGE	5BB1HW 4.5 X 4.5 NRP 630	IVE
1	POWER TRANSFER	EPT10 CON	VON
1	CORRIDOR LOCK	L9456L583-363 IS-LOC LX DM	SCH
1	PERMANENT IC CORE	AS REQUIRED	
1	SURFACE CLOSER	4050A SCUSH MC TBWMS	LCN
1	RAIN DRIP	142AA (AS REQ'D)	ZER
1	GASKETING	8144SBK PSA	ZER
1	DOOR SWEEP	8198AA	ZER
1	THRESHOLD	65A	ZER
1	WIRE HARNESS	CON-192/192P (AS REQ'D)	SCH
1	WIRE HARNESS	CON-6W	SCH
1	DOOR CONTACT	679-05HM	SCE

COORDINATE HARDWARE WITH ELECTRICAL, SECURITY AND ACCESS CONTROL SYSTEMS.
BALANCE OF EAC COMPONENTS BY ELECTRICAL, SECURITY AND ACCESS CONTROL SYSTEMS.
OPERATION: DOOR CONTACT MONITORED REMOTELY VIA SECURITY AND ACCESS CONTROL SYSTEMS. FREE EGRESS AT ALL TIMES.

HARDWARE SET: A06
EACH TO HAVE:

6	HINGE	5BB1HW 4.5 X 4.5 NRP 630	IVE
1	CONST LATCHING BOLT	FB51P (HMD)	IVE
1	STOREROOM LOCK	ND80	SCH
1	PERMANENT IC CORE	AS REQUIRED	
1	OH STOP & HOLDER	100H	GLY
1	SURFACE CLOSER	1450 SCUSH STD	LCN
1	RAIN DRIP	142AA (AS REQ'D)	ZER
1	GASKETING	8144SBK PSA	ZER
1	ASTRAGAL	43STST	ZER
2	DOOR SWEEP	8198AA	ZER
1	THRESHOLD	65A	ZER

HARDWARE SET: A07
EACH TO HAVE:

3	HINGE	5BB1HW 4.5 X 4.5 NRP 630	IVE
1	STOREROOM LOCK	ND80	SCH
1	PERMANENT IC CORE	AS REQUIRED	
1	OH STOP & HOLDER	100H	GLY
1	RAIN DRIP	142AA (AS REQ'D)	ZER
1	GASKETING	8144SBK PSA	ZER
1	DOOR SWEEP	8198AA	ZER
1	THRESHOLD	65A	ZER

HARDWARE SET: A08
EACH TO HAVE:

6	HINGE	5BB1HW 4.5 X 4.5 NRP 630	IVE
1	REMOVABLE MULLION	KR4954 STAB	VON
1	PANIC HARDWARE	CDSI-98-DT-SNB	VON
1	PANIC HARDWARE	CDSI-98-NL-SNB	VON
1	RIM CYLINDER	AS REQUIRED	
3	MORTISE CYLINDER	AS REQUIRED	
4	PERMANENT IC CORE	AS REQUIRED	
2	SURFACE CLOSER	4050A SCUSH MC TBWMS	LCN
2	KICK PLATE	8400 8" X 2" LDW CS B4E	IVE
1	MULLION SEAL	139N PSA	ZER
1	RAIN DRIP	142AA (AS REQ'D)	ZER
1	GASKETING	8144SBK PSA	ZER
2	DOOR SWEEP	8198AA	ZER
1	THRESHOLD	655	ZER
2	DOOR CONTACT	679-05HM	SCE

HARDWARE SET: B01
EACH TO HAVE:

3	HINGE	5BB1HW 4.5 X 4.5	IVE
1	CLASSROOM DEAD LOCK	L463	SCH
1	PERMANENT IC CORE	AS REQUIRED	
1	PUSH PLATE	8200 8" X 16"	IVE
1	PULL PLATE	8303 10" 6" X 16"	IVE
1	SURFACE CLOSER	4050A RW/PA MC TBWMS	LCN
1	MOP PLATE	8400 6" X 1" LDW B-CS	IVE
1	KICK PLATE	8400 8" X 2" LDW CS B4E	IVE
1	WALL STOP	WS401/402CCV	IVE

HARDWARE SET: B02
EACH TO HAVE:

3	HINGE	5BB1HW 4.5 X 4.5	IVE
1	PUSH PLATE	8200 8" X 16"	IVE
1	PULL PLATE	8303 10" 6" X 16"	IVE
1	SURFACE CLOSER	4050A RW/PA MC TBWMS	LCN
1	MOP PLATE	8400 6" X 1" LDW B-CS	IVE
1	KICK PLATE	8400 8" X 2" LDW CS B4E	IVE
1	WALL STOP	WS401/402CCV	IVE

HARDWARE SET: B03
EACH TO HAVE:

3	HINGE	5BB1 4.5 X 4.5	IVE
1	PRIVACY LOCK	ND40S SPA OS-OCC	SCH
1	SURFACE CLOSER	1450 RW/PA MC	LCN
1	MOP PLATE	8400 6" X 1" LDW B-CS	IVE
1	KICK PLATE	8400 8" X 2" LDW CS B4E	IVE
1	WALL STOP	WS401/402CCV	IVE

HARDWARE SET: B04
EACH TO HAVE:

3	HINGE	5BB1 4.5 X 4.5	IVE
1	PRIVACY LOCK	ND40S SPA OS-OCC	SCH
1	SURFACE CLOSER	1450 SCUSH MC	LCN
1	KICK PLATE	8400 8" X 2" LDW CS B4E	IVE

HARDWARE SET: C01
EACH TO HAVE:

3	HINGE	5BB1 4.5 X 4.5	IVE
1	ENTRANCE LOCK	ND50 IS-LOC	SCH
1	PERMANENT IC CORE	AS REQUIRED	
1	WALL STOP	WS401/402CCV	IVE

HARDWARE SET: C02
EACH TO HAVE:

3	HINGE	5BB1 4.5 X 4.5	IVE
1	OFFICE LOCK	ND50	SCH
1	PERMANENT IC CORE	AS REQUIRED	
1	WALL STOP	WS401/402CCV	IVE

HARDWARE SET: C03
EACH TO HAVE:

3	HINGE	5BB1 4.5 X 4.5	IVE
1	CLASSROOM LOCK	ND70	SCH
1	PERMANENT IC CORE	AS REQUIRED	
1	WALL STOP	WS401/402CCV	IVE

HARDWARE SET: C04
EACH TO HAVE:

3	HINGE	5BB1HW 4.5 X 4.5	IVE
1	ENTRANCE LOCK	ND50 IS-LOC	SCH
1	PERMANENT IC CORE	AS REQUIRED	
1	OH STOP	90S	GLY
1	SURFACE CLOSER	4050A RW/PA MC TBWMS	LCN
1	KICK PLATE	8400 8" X 2" LDW CS B4E	IVE

HARDWARE SET: C05
EACH TO HAVE:

3	HINGE	5BB1HW 4.5 X 4.5	IVE
1	ENTRANCE LOCK	ND50 IS-LOC	SCH
1	PERMANENT IC CORE	AS REQUIRED	
1	SURFACE CLOSER	4050A SCUSH MC TBWMS	LCN
1	KICK PLATE	8400 8" X 2" LDW CS B4E	IVE

HARDWARE SET: C06
EACH TO HAVE:

3	HINGE	5BB1 4.5 X 4.5	IVE
1	ENTRANCE LOCK	ND50 IS-LOC	SCH
1	PERMANENT IC CORE	AS REQUIRED	
1	OH STOP	90S	GLY
1	SURFACE CLOSER	1450 RW/PA MC	LCN
1	KICK PLATE	8400 8" X 2" LDW CS B4E	IVE

HARDWARE SET: C07
EACH TO HAVE:

3	HINGE	5BB1 4.5 X 4.5	IVE
1	PASSAGE SET	ND10S	SCH
1	OH STOP	90S	GLY

HARDWARE SET: C08
EACH TO HAVE:

3	HINGE	5BB1HW 4.5 X 4.5 NRP 630	IVE
1	ENTRANCE LOCK	ND50 IS-LOC	SCH
1	PERMANENT IC CORE	AS REQUIRED	
1	SURFACE CLOSER	4050A EDA MC TBWMS	LCN
1	KICK PLATE	8400 8" X 2" LDW CS B4E	IVE
1	WALL STOP	WS401/402CCV	IVE

HARDWARE SET: D01
EACH TO HAVE:

3	HINGE	5BB1 4.5 X 4.5	IVE
1	STOREROOM LOCK	ND80	SCH
1	PERMANENT IC CORE	AS REQUIRED	
1	KICK PLATE	8400 8" X 2" LDW CS B4E	IVE
1	WALL STOP	WS401/402CCV	IVE

HARDWARE SET: D02
EACH TO HAVE:

3	HINGE	5BB1 4.5 X 4.5	IVE
1	STOREROOM LOCK	ND80	SCH
1	PERMANENT IC CORE	AS REQUIRED	
1	SURFACE CLOSER	1450 SCUSH STD	LCN
1	KICK PLATE	8400 8" X 2" LDW CS B4E	IVE

HARDWARE SET: D03
EACH TO HAVE:

3	HINGE	5BB1 4.5 X 4.5	IVE
1	STOREROOM LOCK	ND80	SCH
1	PERMANENT IC CORE	AS REQUIRED	
1	OH STOP	90S	GLY
1	KICK PLATE	8400 8" X 2" LDW CS B4E	IVE

HARDWARE SET: D04
EACH TO HAVE:

6	HINGE	5BB1 4.5 X 4.5	IVE
1	CONST LATCHING BOLT	FB51P (HMD)	IVE
1	DUST PROOF STRIKE	DP1	IVE
1	STOREROOM LOCK	ND80	SCH
1	PERMANENT IC CORE	AS REQUIRED	
2	OH STOP	90S	GLY
2	KICK PLATE	8400 8" X 2" LDW CS B4E	IVE

END OF SECTION

1.0 - GENERAL

1.1 Summary

A. Related Documents: General and Supplementary Conditions of the Contract, Division 1 General Requirements, and Drawings are applicable to this Section.

B. Section Includes:
1. Porcelain Tile
2. Ceramic Tile
3. Quarry Tile
4. Glass Tile
5. Specialty Tile
6. Installation Products; adhesives, mortars, grouts and sealants
7. Waterproof membranes
8. Crack Isolation membranes
9. Thresholds, trim, cementitious backer units and other accessories specified herein.
10. Tile and grout care and maintenance recommendations.

1.2 References

A. American National Standards Institute (ANSI):
1. A108.1 - Installation of Ceramic Tile in a Mortar Bed
2. A108.5 - Installation of Ceramic tile with Dry-Set Portland Cement or Latex-Portland Cement
3. A108.10 - Installation of Grout in Tile work
4. A108.13 - Installation of Membranes for Thin-Set Ceramic Tile
5. A118.3 - Chemical Resistant, Water-Cleanable, Tile-Setting and-Grouting Epoxy and Water-Cleanable Tile-Setting Epoxy Adhesive
6. A118.4 - Latex-Portland Cement Mortar
7. A 118.5 - Chemical-Resistant Furan Mortar and Grout.
8. A118.6 - Ceramic Tile Grouts
9. A118.7 - Polymer Mortified Cement Grouts
10. A118.10 – Load-Bearing, Bonded Waterproofing Membranes for Thin-Set Ceramic Tile and Dimension Stone Installations
11. A136.1 - Organic Adhesives for Installation of Ceramic Tile
12. A137.1 - Ceramic Tile

B. American Society for Testing and Materials (ASTM):
1. C 136 - Sieve Analysis of Fine and Coarse Aggregates
2. C 144 - Aggregate for Masonry Mortar
3. C 150 - Portland Cement
4. C 207 - Hydrated Lime for Masonry Purposes
5. C 373 - Water Absorption, Bulk Density, Apparent Porosity, and Apparent Specific Gravity of Fired Whiteware Products
6. C 503 - Marble Dimensional Stone (Exterior)
7. C 623 – Young’s Modulus, Shear Modulus, and Poisson’s Ratio for Glass and Glass-Ceramics by Resonance
8. C 627 – Robinson Floor Test for Tile Service Level
9. C 847-95 Metal Lath
10. C 933-96a Welded Wire Lath
11. C 1028 - Static Coefficient of Friction of Ceramic Tile and Other like Surfaces by the Horizontal Dynamometer Pull-Meter Method
12. D 87 - Melting Point of Petroleum Wax (Cooling Curve)

13. D 226 - Asphalt Saturated Organic Felt Used in Roofing and Waterproofing
14. D 4397 - Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications
15. E-90 and E-413 for STC (Sound Transmission Class), E-492 and E-989 for IIC (Impact Insulation Class) – Sound Deadening Underlayments

C. TCA Handbook for Ceramic Tile Installation by Tile Council of America, latest edition

1.3 Submittals

A. Submit shop drawings, product data, and samples under provisions of Section 01350.

B. Shop Drawings:
1. Indicate tile layout, patterns, color arrangement, perimeter conditions, junctions with dissimilar materials, thresholds, and setting details.
2. Locate and detail expansion and control joints.

C. Submit product data, specifications, and instructions for using mortars, adhesives and grouts.

D. Samples:
1. Submit color samples illustrating full color range of each type tile.
2. Grout: Submit manufacturer's full range of standard and designated color samples for each type for Architect's selection.

E. Submit following Informational Submittals:
1. Certifications specified in Quality Assurance article.
2. Qualification Data: Manufacturer's and installer's qualification data.
3. Manufacturer's instructions.

F. Maintenance Data: Include recommended cleaning methods, cleaning materials, stain removal methods, and polishes and waxes.

1.4 Quality Assurance

A. Single Source Responsibility:
1. Obtain each type and color tile material required from single source.
2. Obtain setting and grouting materials from one manufacturer to ensure compatibility.
3. Furnish a 10 year guarantee from installation material manufacturer. The guarantee is inclusive of installation materials, finish product, and labor.
4. Obtain prefabricated edge protection and transition and movement profiles from one manufacturer to ensure compatibility.
5. Obtain membrane from same manufacturer as setting material or from manufacturer approved by setting material manufacturer to ensure compatibility.

B. Manufacturer Qualifications:
1. Tile: Minimum 5 years experience in manufacture of tile products.
2. Setting Materials: Minimum 10 years experience in manufacture of setting and grout materials specified.

C. Installer Qualifications: Specializing in tile work having minimum of 5 years successful documented experience with work comparable to that required for this Project.

D. Certifications:
   1. Maintain one copy each of all Referenced standards and specifications on site. Include the TCA Handbook, ANSI A108 Series, ANSI A118 Series ANCI A136.1 and ANSI A137.1 and others as specified under paragraph References.
   2. Submit manufacturer's certifications that mortars, adhesives, and grouts are suitable for intended use.

E. Conform to ANSI- Recommended Standard Specifications for Ceramic Tile - A137.1.

F. Conform to TCA Ceramic Tile: The Installation Handbook.

1.5 Delivery, Storage, and Handling

A. Deliver materials in manufacturer's unopened containers, fully identified with name, brand, type, and grade.

B. Protect materials from contamination, dampness, freezing, or overheating in accordance with manufacturer's instructions.

C. Broken, cracked, chipped, stained, or damaged tile will be rejected, whether built-in or not.

D. Protect mortar and grout materials against moisture, soiling, or staining.

1.6 Environmental Requirements

A. Comply with requirements of referenced standards and recommendations of material manufacturers for environmental conditions before, during, and after installation.

B. Do not begin installation until building is completely enclosed and HVAC system is operating and maintaining temperature and humidity conditions consistent with "after occupancy" conditions for a minimum of 2 weeks.

C. Maintain continuous and uniform building temperatures of not less than 50 degrees F during installation nor more than 100 degrees F.

D. Ventilate spaces receiving tile in accordance with material manufacturers' instructions.

1.7 Warranty

A. Special Project Warranty: Submit a written warranty, executed by the Contractor, Installer, and Manufacturer, agreeing to repair or replace tile that fails in materials or workmanship within the specified warranty period.
   1. Warranty Period: 1 year after date of Substantial Completion.

1.8 Extra Materials

A. At completion of project, deliver to Owner extra stock of materials used on project as follows:
   1. Provide 10% of each size, color, and surface finish of tile.
   2. Six lineal feet of each color and type of base.

B. Store in location as directed by Owner.

C. Ensure materials are boxed and identified by manufacturer, type, and color.

1.9 Maintenance Data

A. Submit maintenance data under provisions of Section 01910.

B. Include cleaning methods, cleaning solutions recommended, stain removal methods, and polishes and waxes recommended.

2.0 - PRODUCTS

2.1 Manufacturers

A. Acceptable Manufacturer: Daltile Corporation or pre-approved equal.

B. Requests for substitutions will be considered in accordance with provisions of Section 01360 received 10 days prior to the bid.

2.2 Products

A. Ceramic Wall Tile
   1. Manufacturer: Daltile
   2. Product: Color Wheel Classic
   3. Color: Arctic White
   4. Size: 4x4
   5. Finish: Semi-Gloss
   6. Pattern: As indicated on drawings.
   7. Trim Units: Matching bead, bullnose, cove, and base shapes in sizes coordinated with field tile.

2.3 Setting Materials

A. Organic Adhesive: ANSI A136.1, thin-set bond type; use Type I in areas subject to prolonged moisture exposure.

B. Epoxy Adhesive: ANSI A118.3, thin-set bond type.

C. Mortar Bed Materials:
   1. Portland cement: ASTM C150, type 1, gray or white.
   2. Hydrated Lime: ASTM C207, Type S.
   3. Sand: ASTM C144, fine.
   4. Latex additive: As approved.
   5. Water: Clean and potable.

D. Mortar Bond Coat Materials:
   1. Dry-Set Portland Cement type: ANSI A118.1.
   2. Latex-Portland Cement type: ANSI A118.4.
   3. Epoxy: ANSI A118.3, 100 percent solids.

E. Epoxy Grout: ANSI A118.8, 100 percent solids epoxy grout; color to be selected.

F. Waterproofing Membrane at Floors: Membrane in accordance with ANSI A118.10.

G. Membrane at Walls: No. 15 (6.9 kg) asphalt saturated felt, ASTM D226, Type

H. Membrane at Walls: 4 mil (0.1 mm) thick polyethylene film, ASTM D4397.

I. Membrane at Walls: Reinforced asphalt paper.

J. Cementitious Backer Board: ANSI A118.9; High density, cementitious, glass fiber reinforced with 2 inch (50 mm) wide coated glass fiber tape for joints and corners:
   1. Thickness: 1/2 inch (13 mm).

2.4 Miscellaneous Materials

A. Temporary Protective Coating: Provide product indicated below that is formulated to protect exposed surfaces of tile against adherence of mortar and grout, is compatible with tile and mortar/grout products, and is easily removable after grouting is completed without damaging grout or tile.
   1. Petroleum paraffin wax, fully refined, tasteless, odorless, containing at least 0.5 percent oil with a melting point of 120-degree F to 140-degree F per ASTM D 87.
   2. Grout release in form of manufacturer's standard proprietary liquid coating that is specially formulated and recommended for use as a temporary protective coating for tile.

2.5 Finishing Edge Protection Profiles

A. Manufacturer - Schluter Systems or pre-approved equal. Comply with Section 01360 - Product Substitution and submit at least 10 days prior to Bid. All other approved products shall be notified in writing via addendum.

B. Products:
   1. Schluter: Deco Radius
   2. Corners provide matching outside corners as required.
   3. Material and Finish: Satin anodized aluminum.
   4. Height as required
   5. Location as noted on drawings

2.6 Mixing Mortar and Grout

Mix mortars and grouts in accordance with manufacturer’s instructions.

3.0 - EXECUTION

3.1 Examination

A. Verify that all wall surfaces are free of substances which would impair bonding of setting materials, smooth and flat within tolerances specified in ANSI A137.1, and are ready to receive.

B. Verify that sub-floor surfaces are dust-free, and free of substances which would impair bonding of setting materials to sub-floor surfaces, and are smooth and float within tolerances specified in ANSI A137.1.

C. Verify that concrete sub-floor surfaces are ready for tile installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within limits recommended by tile manufacturer and setting materials manufacturer.

D. Verify that required floor-mounted utilities are in correct location.

3.2 Preparation

A. Clean substrates.

B. Wet down or wash dry, dusty surfaces and remove excess water immediately prior to application of tiles.

C. Prepare surfaces in strict accordance with instructions of manufacturer whose setting materials or additives are being used.

D. Acid Based Cleaners: Use not permitted.

E. Scarify concrete substrates with blast track equipment if necessary to completely remove curing compounds or other substances that would interfere with proper bond of setting materials. Clean and maintain substrate in condition required by setting material manufacturer.

F. Do not seal substrate unless required by manufacturer.

G. Prime substrate when required by manufacturer.

H. Membrane
1. Flash membrane up adjacent walls and restraining surfaces.
2. Use preformed cove, corners, and expansion joint flashing.
3. Allow membrane to cure as prior to setting tile.
4. Do not allow construction traffic on membrane.

I. Apply primer-sealer to wood and plywood subfloors when recommended by setting materials manufacturer.

J. Blending: For tile exhibiting color variations within the ranges selected during sample submittals, verify that tile has been blended in factory and packaged accordingly so that tile units taken from one package show the same range in colors as those taken from other packages and match approved samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

K. Field-Applied Temporary Protective Coating: Where indicated under tile type or needed to prevent adhesion or staining of exposed tile surfaces by grout, protect exposed surfaces of tile against adherence of mortar and grout by precoating them with a continuous film of temporary protective coating indicated below, taking care not to coat unexposed tile surfaces:
1. Petroleum paraffin wax or grout release.

3.3 Installation

A. Cement Board Substrate
1. Place rough side out and fasten with galvanized or resin coated gypsum board screws at 8 inches on center in field of panel and at 6 inches on center at edges.
2. Provide 1/4 inch gap above floor or fixture lip for flexible calking.
3. Maintain manufacturer's required space between board edges.
4. Fill joints by applying tile setting material and joint reinforcement.

B. Vapor Retarder:
1. Extend vapor retarder to extremities of areas indicated to be protected from vapor transmission.
2. Secure in place with mechanical fasteners or adhesives.
3. Extend vapor retarder to cover miscellaneous voids in insulated substrates, including those filled with loose mineral-fiber insulation.
4. Seal vertical joints in vapor retarders over framing by lapping not less than two wall studs.

5. Fasten vapor retarders to framing at top, end, and bottom edges, at perimeter of wall openings, and at lap joints; space fasteners no greater than 16 inches apart.
6. Seal joints in vapor retarders caused by pipes, conduits, electrical boxes and similar items penetrating vapor retarders with vapor retarder tape.
7. Repair tears and punctures in vapor retarder immediately before concealing it with the installation of cementitious backer units.

C. Membrane:
1. Install membrane with products or methods approved in writing by membrane manufacturer when joining, sealing, fastening, or adhering sheet membranes.
2. Flash membrane to cure prior to setting tile.
3. Do not allow construction traffic on membrane.

D. Crack Isolation Membrane
1. Install crack isolation membrane over cracks of up to 1/8 inch or greater in substrates. Apply a 12 inch wide strip centered on crack. Install in accordance with manufacturer's recommendations.
2. Install membrane with products or methods approved in writing by membrane manufacturer when joining, sealing, fastening, or adhering sheet membranes.

E. Waterproofing
1. Install waterproofing in strict compliance with manufacturer's instructions.
2. Flash waterproofing up adjacent walls in accordance to manufacturer's details, to a height of 4 inches.
3. Flood test waterproof membranes after fully cured.
4. Field Quality Control water test when required.

F. Tile Installation, General
1. Install tile materials in accordance with ANSI A137.1, other referenced ANSI and TCA specifications, and TCA "Handbook for Ceramic Tile Installation", except for more stringent requirements of manufacturer or these Specifications.
2. Cut and fit tile tight to protrusions and vertical interruptions and treat with a compatible sealant as specified in Section 07900
3. Form corners and bases neatly.
4. Work tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make joint watertight, without voids, cracks, excess mortar, or grout.
5. Prepare surface, fit, set, bond, grout and clean in accordance with applicable requirements of ANSI standards and Tile Council of America.

G. Layout
1. Lay out work to pattern indicated so that full tile or joint is centered on each wall and no tile of less than half width need be used. Do not interrupt pattern through openings. Lay out tile to minimize cutting and to avoid tile less than half size.
2. For heights stated in feet and inches, use courses of full tile to produce nearest attainable heights without cutting tile.
3. No staggered joints will be permitted.
4. Align joints in tile in both directions.
5. Align joints between floor and base tile.
6. Make joints between sheets of tile exactly same width as joints within sheet.

7. File edges of cut tile smooth and even.
8. Cut and fit tile at penetrations through tile. Do not damage visible surfaces. Carefully grind edges of tile abutting built-in items. Fit tile at outlets, piping and other penetrations so that plates, collars, or covers overlap tile.
9. Extend tile work into recesses and under or behind equipment and fixtures, to form complete covering without interruptions, except as otherwise indicated. Terminate work neatly at obstructions, edges and corners without disrupting pattern or joint alignments.
10. Accurately form intersections and returns.
11. Form internal angles coved and external angles bullnosed.

H. Thin Set Method, Floors and Walls
1. Apply mortar or adhesive with notched trowel using scraping motion to work material into good contact with surface to be covered. Maintain 90 percent coverage on back of tile and fully bed all corners.
2. Apply only as much mortar or adhesive as can be covered within allowable windows as recommended by mortar or adhesive manufacturer or while surface is still tacky.
3. When installing large tiles, ceramics or mosaics, trowel small quantity of mortar or adhesive onto back of each tile or sheet of tiles.
4. Set tiles in place and rub or beat with small beating block.
5. Beat or rap tile to ensure proper bond and also to level surface of tile.
6. Align tile to show uniform joints and allow to set until firm.
7. Clean excess mortar or adhesive from surface of tile with wet cheese cloth (not a sponge) while mortar is fresh.
8. Allow face mounted tile to set until firm before removing paper and before grouting.
9. Sound tile after setting. Replace hollow sounding tiles.

I. Thick Bed Method, Horizontal Surfaces
1. Apply slurry bond coat approximately 1/16 inch thick to substrate surface using flat trowel.
2. Place thick bed mortar, 1-1/4 inch thick nominally onto slurry bond coat while coat is still wet and tacky.
3. Spread prepared mortar approximately one-half desired bed thickness and then lay reinforcing mesh.
4. Lap wire 3 inches and place additional mortar on top of wire to bring bed to required thickness.
5. Rod and compact mortar with steel trowel.
6. Before placing tiles on green or wet screed bed, apply slurry bond coat approximately 1/16 inch thick to mortar using flat trowel.
7. Apply mortar skim coat to back of each tile or sheet of tile immediately prior to placing on bed.
8. Place tiles in wet slurry coat before surface dries maintaining uniform joints.
9. After each tile or sheet of tiles is laid, beat tile with wooden block or rubber mallet to level surface and embed tiles.
10. Perform beating before mortar takes initial set.
11. Pitch surface to drain where required.
12. On hardened screed or mortar bed, install tiles by thin bed method.
13. Sound tiles after setting. Replace hollow sounding tiles.
14. Clean excess mortar or adhesive from surface of tile with wet cheese cloth (not a sponge) while mortar is fresh.

J. Grouting
1. Allow tiles to set a minimum of 48 hours before grouting.
2. If bonding materials are rapid setting, follow manufacturer’s recommendations.
3. Install in accordance with grout manufacturer's recommendations and ANSI A108.10.
4. Pack joints full and free before mortar takes initial set.
5. Clean excess grout from surface with wet cheesecloth as work progresses. Do not use hydrosponges.
6. Cure after grouting by covering with Kraft or construction paper for 72 hours. Install sealant in vertical wall joints at interior corners.

K. Marble Threshold
1. Provide thresholds at wall or framed openings to other building areas not receiving tile.
2. Set one piece threshold in adhesive without voids, full width of door opening.
3. Point threshold base flush with adjoining tile floors.
4. Cope ends to fit door frame profile.

L. Control Joints and Other Sealant Usage
1. Install control joints where tile abuts retaining surfaces such as perimeter walls, curbs, columns, wall corners and directly over cold joints and control joints in structural surfaces conforming to architectural details.
2. Install control joint in floors at spacings as indicated in TCA Installation Handbook, unless noted otherwise.
3. Rake or cut control joints through setting bed to supporting slab or structure. Keep joints free of mortar.
4. Install in accordance with TCA Installation Handbook.
5. Fill joints with self-leveling polyurethane sealant and backing material specified in Section 07910.
6. Fill joints around toilet fixtures with white silicone sanitary sealant. Refer to Section 07910.

M. Expansion Joints:
1. Keep expansion joints free of mortar and grout.
2. Use manufacturer’s expansion joint flashing when covering expansion joints with waterproof or crack isolation membranes.
3. Provide expansion joints directly over changes in material, over control and expansion joints in substrate, at juncture of floors and walls, at other restraining surfaces such as curbs, columns, bases, and wall corners, and where recommended by TCA EJ171 Expansion Joint requirements.
4. Install sealant in expansion joints.
5. Provide sealant material at items penetrating tile work, unless otherwise indicated.
6. Provide sealants and related materials in accordance with cited ANSI and TCA requirements.

3.4 Adjusting

Sound tile after setting. Replace hollow sounding units.

3.5 Cleaning

A. Clean excess mortar from surface with water as work progresses. Perform cleaning while mortar is fresh and before it hardens on surfaces.

B. Sponge and wash tile diagonally across joints. Polish with clean dry cloth.

C. Remove grout haze following recommendation of mortar additive manufacturer. Do not use acids for cleaning.

D. Remove temporary protective coating by method recommended by coating manufacturer that is acceptable to brick and grout manufacturer. Trap and remove coating to prevent it from clogging drains.

3.6 Protection

A. Prohibit traffic from floor finish for 72 hours after installation.

B. Where temporary use of new floors is unavoidable, supply large flat boards or plywood panels for walkways over Kraft paper.

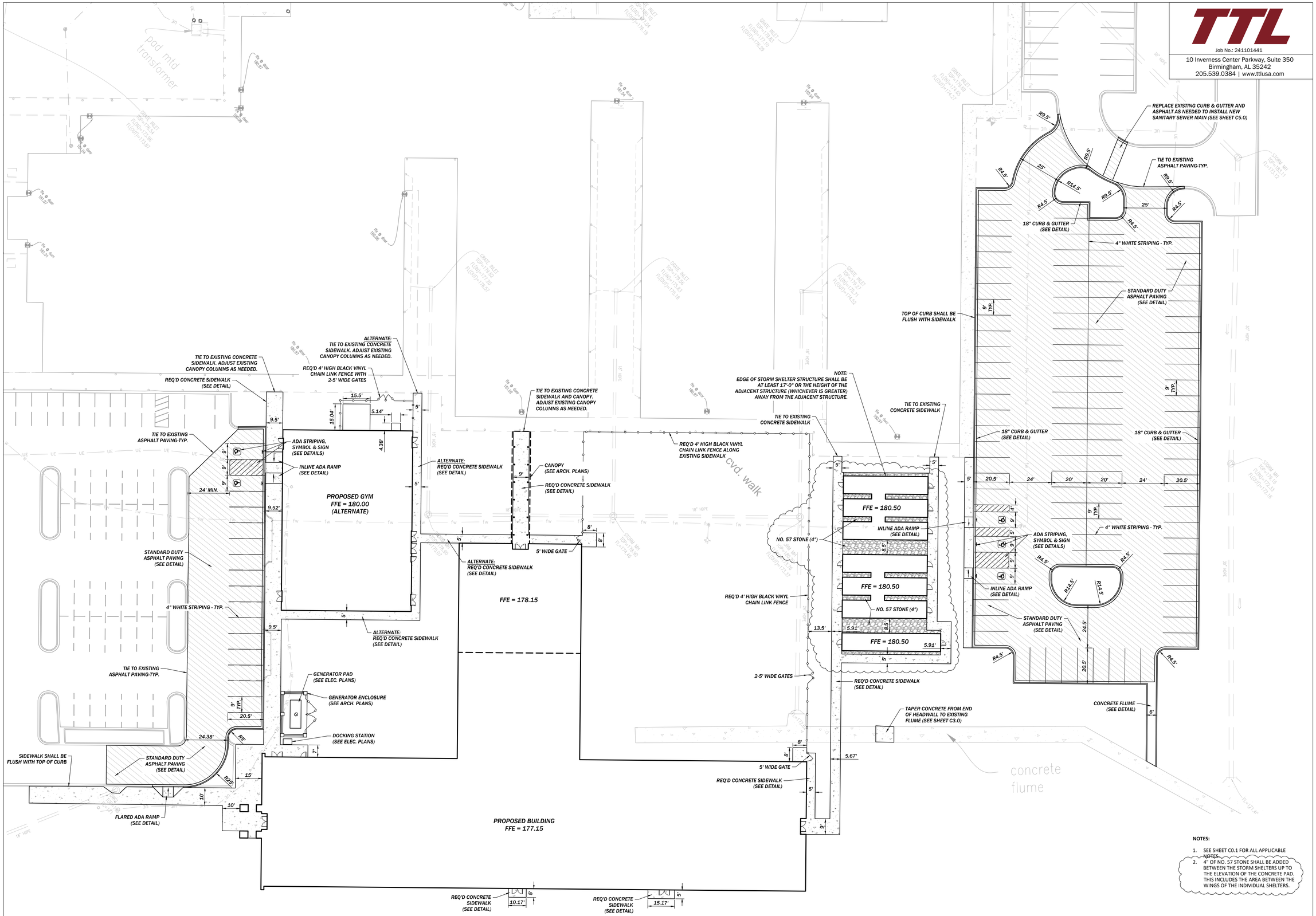
C. Protect work so that it will be without any evidence of damage or use at time of acceptance.

END OF SECTION

TTL
Job No.: 241101441
10 Inverness Center Parkway, Suite 350
Birmingham, AL 35242
205.539.0384 | www.ttlusa.com

LATHAN ARCHITECTS

ELEMENTARY ADDITION TO
SUMTER CENTRAL HIGH SCHOOL
13678 US HIGHWAY 11, YORK, AL 36925
SUMTER COUNTY BOARD OF EDUCATION



NOTES:

1. SEE SHEET C0.1 FOR ALL APPLICABLE NOTES.
2. 4" OF NO. 57 STONE SHALL BE ADDED BETWEEN THE STORM SHELTERS UP TO THE ELEVATION OF THE CONCRETE PAD. THIS INCLUDES THE AREA BETWEEN THE WINGS OF THE INDIVIDUAL SHELTERS.

SITE LAYOUT LEGEND

- STANDARD DUTY ASPHALT PAVING
- CONCRETE SIDEWALK
- NO. 57 STONE

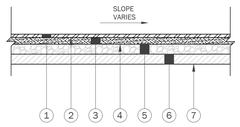
0 20 40 60
SCALE: 1"=20'

ALABAMA LICENSED No. 24443 PROFESSIONAL ENGINEER ALLEN
7/30/2024

SHEET TITLE:
SITE LAYOUT PLAN

PROJ. MGR.:	LBH
DRAWN:	CAH
DATE:	JUNE 24, 2024
REVISIONS	
1	7/16/24–ADD #1
2	7/26/24–ADD #2
3	7/30/24–ADD #3

JOB NO. 24-38
SHEET NO:
C2.0

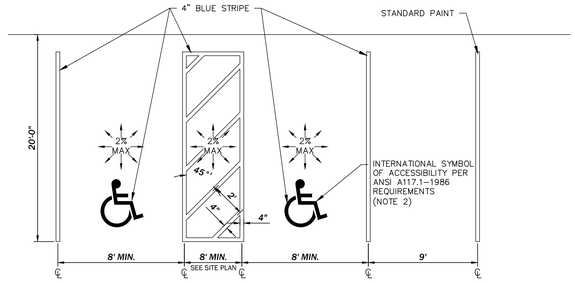


1. REQ'D: SUPERPAVE BITUMINOUS CONCRETE WEARING SURFACE LAYER, ½" MAXIMUM AGGREGATE SIZE MIX (ALDOT 424A)(1.5" COMPACTED THICKNESS)
2. REQ'D: TACK COAT (TRACKLESS TACK) (ALDOT 405A)(0.10 GAL/SY)
3. REQ'D: SUPERPAVE BITUMINOUS CONCRETE BINDER UPPER LAYER, 3/4" MAXIMUM AGGREGATE SIZE MIX (ALDOT 424B)(2" COMPACTED THICKNESS)
4. REQ'D: PRIME COAT "A" (ALDOT SECTION 401D)
5. REQ'D: CRUSHED AGGREGATE STONE BASE COURSE (ALDOT 825B)(6" COMPACTED THICKNESS) (COMPACTED TO 100% ASTM D 698)
6. REQ'D: SUBGRADE, COMPACTED TO 98% ASTM D 698)
7. REQ'D: UNCLASSIFIED/BORROW EXCAVATION (COMPACTED TO 98% ASTM D 698)

TYPICAL ASPHALT PAVEMENT (STANDARD DUTY)

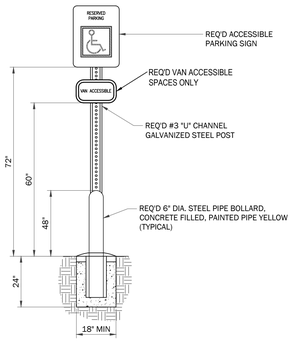
NOT TO SCALE

1. RE: SITE PLAN FOR LOCATION OF ADA PARKING SPACES AND ACCESS AISLE IN RELATIONSHIP TO THE DOOR LOCATION. (THIS DETAIL IS FOR STRIPING LAYOUT ONLY)
2. PARKING STRIPES AND THE ADA INTERNATIONAL HANDICAP SYMBOL ARE TO BE PAINTED PER THE MANUFACTURER'S RECOMMENDATIONS.



ADA PARKING LAYOUT DETAIL

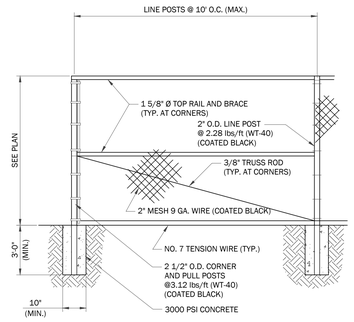
NOT TO SCALE



NOTES:
1. ADA ACCESSIBLE PARKING SIGN SHALL CONFORM TO ALL GOVERNING REGULATIONS.

ADA PARKING SIGN DETAIL

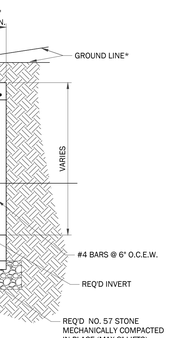
NOT TO SCALE



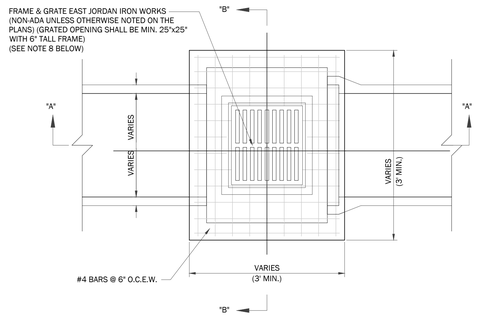
NOTES:
1. THE PERMANENT CHAIN LINK FENCING SHALL BE VINYL COATED BLACK WITH A HIGH GRADE, EXTERIOR FINISH.
2. WHERE BREAKS IN PROFILE OF FENCE TOP ARE NECESSARY IN ROUGH TERRAIN THEY SHALL BE MADE IN THE LEAST NUMBER OF INTERVALS PRACTICAL. BREAKS SHALL SPREAD OVER VERTICAL CURVES OF SUFFICIENT LENGTHS TO ENSURE A PLEASING APPEARANCE.

VINYL COATED CHAINLINK FENCE DETAIL

NOT TO SCALE



SECTION "BB"

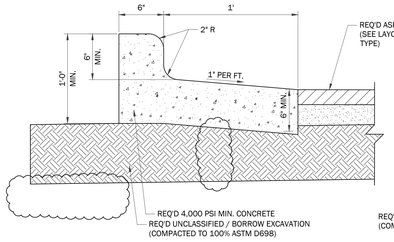


GRATE INLET PLAN

NOTES FOR ALL CONCRETE STORM DRAIN STRUCTURES:
1. USE MIN. 3000 P.S.I. CONCRETE AND DEFORMED REINFORCING STEEL TO CONSTRUCT THIS ITEM.
2. SHAPE BOTTOM TO FLOW LINE OF PIPES.
3. STEPS ARE REQUIRED FOR ALL STRUCTURES OVER 4 FEET IN DEPTH MEASURED FROM TOP OF BOX TO INVERT OUT. STEP SPACING SHALL BE AS DIRECTED BY THE ENGINEER.
4. ALL CONCRETE BOXES SHALL INCLUDE FORMED INVERTS AND RING AND COVERS OF THE TYPE SPECIFIED.
5. GROUND LINE SHALL BE SLOPED TOWARD GRATE INLET TOP. GROUND LINE SHALL BE SLOPED AWAY FROM JUNCTION BOX TOP.
6. THE CONTRACTOR SHALL REFER TO SPECIAL DRAWING NO. JB-620-B OF THE ALDOT SPECIAL AND STANDARD DRAWINGS, LATEST EDITION, FOR DIMENSIONS AND OTHER INFORMATION NECESSARY TO CONSTRUCT THIS ITEM.
7. WHEN INSTALLING A SOLID TOP FOR JUNCTION BOX OR HOLED TOP FOR GRATE INLET ON AN EXISTING STRUCTURE, THE CONTRACTOR SHALL DOWEL INTO THE TOP OF THE EXISTING STRUCTURE WALLS WITH 12" LONG #5 BARS AT 6" O.C. ALONG THE PERIMETER OF THE STRUCTURE TO ATTACH THE NEW TOP. THE CONTRACTOR SHALL APPLY AN APPROVED EPOXY FOR THE DOWEL INSTALLATIONS. THE TOP REINFORCEMENTS SHALL THEN BE TIED TO THESE DOWELS. PREPARATION OF THE EXISTING CONCRETE SHALL FOLLOW THE CONCRETE SPECIFICATIONS.
8. FRAME SHALL BE EJIW MODEL V5626-2 & GRATE SHALL BE EJIW MODEL V5726, OR APPROVED EQUAL.
9. IF THE CONTRACTOR CHOOSES TO USE A STANDARD PRECAST MANHOLE FOR THE DRAINAGE STRUCTURE, THEN HE SHALL REFERENCE THE STANDARD PRECAST MANHOLE DETAIL FOR ALL REQUIREMENTS.

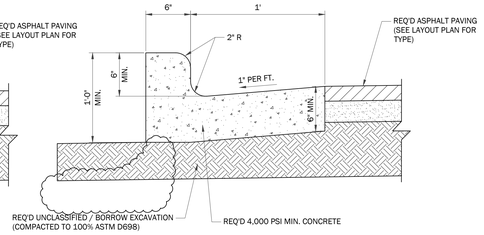
GRATE INLET

NOT TO SCALE



18" CURB & GUTTER (INVERTED)

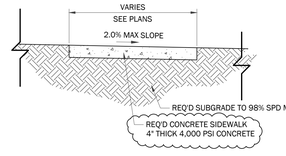
NOT TO SCALE



18" CURB & GUTTER

NOT TO SCALE

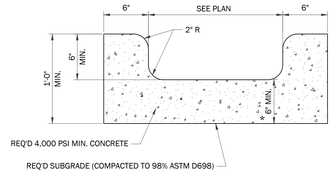
NOTES:
1. THE CONTRACTOR SHALL BE PERMITTED TO USE MACHINE PLACEMENT. THE MACHINE SHALL BE SO DESIGNED TO PLACE, SPREAD, CONSOLIDATE, SCREED, AND FINISH THE CONCRETE IN ONE (1) COMPLETE PASS IN SUCH A MANNER THAT A MINIMUM OF HAND FINISHING WILL BE NECESSARY TO PROVIDE A DENSE AND HOMOGENOUS CONCRETE SECTION. THE MACHINE SHALL SHAPE, VIBRATE, AND/OR EXTRUDE THE CONCRETE FOR THE FULL REQUIRED CONCRETE SECTION BEING PLACED.
2. EXPANSION JOINTS REQ'D. @ 50' INTERVALS (IF HAND FORMED), AT ALL RADII POINTS AT CONCRETE ENTRANCES AND CURB RETURNS, AT DROP INLETS, AT END OF WORK DAYS, AND/OR ALL COLD JOINTS. FILLER MATERIAL SHALL CONFORM TO ASTM C920 AND BE FURNISHED IN A SINGLE ONE-HALF INCH (1/2") THICK PIECE FOR FULL DEPTH AND WIDTH OF THE JOINT.
3. CONTRACTOR JOINTS MAY BE SAWCUT OR HANDFORMED. JOINTS SHALL BE 1/4 x CONCRETE THICKNESS IN DEPTH BY 1/8" WIDE AND SHALL BE 10' O.C.
4. SEE SPECIFICATIONS FOR SUBGRADE REQUIREMENTS.



NOTES:
1. EXPANSION JT. REQ'D. @ 40' MAX. INTERVALS BUT NOT LESS THAN 30' WITH EXPANSION JOINT MATERIAL.
2. CONTRACTION JOINTS SHALL BE HAND-TOOLED ONLY IN LOCATIONS AS INDICATED BY THE SCORING PATTERN SHOWN IN THE CONSTRUCTION PLANS. JOINTS SHALL BE INSTALLED AT A DEPTH OF 1/4 THICKNESS OF THE SLAB MIN. NO SAW-CUT OF JOINTS IS ALLOWED.
3. SIDEWALKS SHALL HAVE AN EXPANSION JOINT INSTALLED IN ALL LOCATIONS WHERE NEW IMPROVEMENTS MEET EXISTING INFRASTRUCTURE.
4. SIDEWALK CROSS SLOPE SHALL NOT EXCEED 2%.
5. THE CONTRACTOR SHALL PROVIDE 3 MOCKUP PANELS (AT MINIMUM 3' X 3' IN SIZE) THAT HE FLOATS LIGHT BROOM, MEDIUM BROOM, AND HEAVY BROOM. THE OWNER WILL CHOOSE THE FINISH THEY DESIRE FOR THE PROJECT AND THE CONTRACTOR WILL PROCEED AS DIRECTED.
6. OMIT
7. CONTRACTOR SHALL REFERENCE THE PLANS FOR THE CONCRETE SIDEWALK SCORING PATTERN. THE CONTRACTOR SHALL MATCH THIS PATTERN AS SHOWN.
8. EXPANSION JOINT MATERIAL SHALL BE PUSHED DOWN 1/8" FROM TOP OF SIDEWALK.
9. EXPANSION JOINT MATERIAL SHALL BE CONTINUOUS THROUGH THE OVERALL DEPTH OF THE SIDEWALK.

CONCRETE SIDEWALK

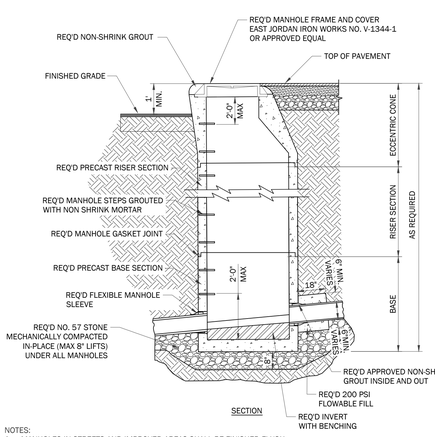
NOT TO SCALE



CONCRETE FLUME

NOT TO SCALE

NOTES:
1. EXPANSION JOINTS REQ'D. @ 50' INTERVALS, AT ALL RADII POINTS AT CONCRETE ENTRANCES AND CURB RETURNS, AT DROP INLETS, AT END OF WORK DAYS, AND/OR ALL COLD JOINTS. FILLER MATERIAL SHALL CONFORM TO ASTM C920 AND BE FURNISHED IN A SINGLE ONE-HALF INCH (1/2") THICK PIECE FOR FULL DEPTH AND WIDTH OF THE JOINT.
2. CONTRACTION JOINTS MAY BE SAWCUT OR HANDFORMED. JOINTS SHALL BE 1/4 x CONCRETE THICKNESS IN DEPTH BY 1/8" WIDE AND SHALL BE 10' O.C.



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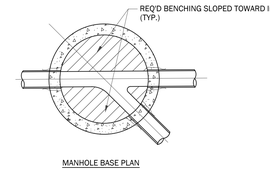
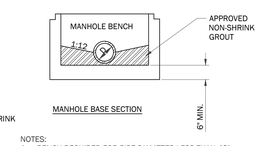


MANHOLE BASE PLAN

NOTES:
1. PLACE STEPS ON LEAST OBSTRUCTED WALL.
2. MAX. DEFLECTION ANGLE OF SEWER ALIGNMENT = 90°
3. OPENINGS FOR PIPES TO BE FACTORY CAST OR CORED.



MANHOLE BASE SECTION

NOTES:
1. BENCH REQUIRED FOR PIPE DIAMETER LESS THAN 48"

NOTES:
1. MANHOLES IN STREETS AND IMPROVED AREAS SHALL BE FINISHED FLUSH WITH FINISHED SURFACE. IN UNIMPROVED AREAS, 12" ABOVE FINISHED SURFACE OR AS DIRECTED BY THE ENGINEER.
2. AFTER SEWER PIPE HAS BEEN LAID TO CORRECT GRADE ALIGNMENT, THE OPENING BETWEEN THE SEWER PIPE AND MANHOLE WALLS WILL BE SEALED WITH NON-SHRINKING GROUT SUCH AS "WATER PLUG OR ANTI-HYDRO".
3. DAMAGE TO THE PRECAST MANHOLE STRUCTURE SPECIFICALLY TO THE TONGUE AND GROOVE ENDS AND/OR GASKET SECTION SHALL REQUIRE THE STRUCTURE TO BE REPLACED BEFORE INSTALLATION. EXTREME CARE SHOULD BE USED DURING DELIVERY, INSTALLATION, ETC.

STANDARD PRECAST MANHOLE

NOT TO SCALE

TTL
Job No.: 241101441
10 Inverness Center Parkway, Suite 350
Birmingham, AL 35242
205.539.0384 | www.ttlusa.com

LATHAN ARCHITECTS

ELEMENTARY ADDITION TO
SUMTER CENTRAL HIGH SCHOOL
13878 US HIGHWAY 11, YORK, AL 36925
SUMTER COUNTY BOARD OF EDUCATION

ALABAMA LICENSED PROFESSIONAL ENGINEER No. 24443
7/30/2024

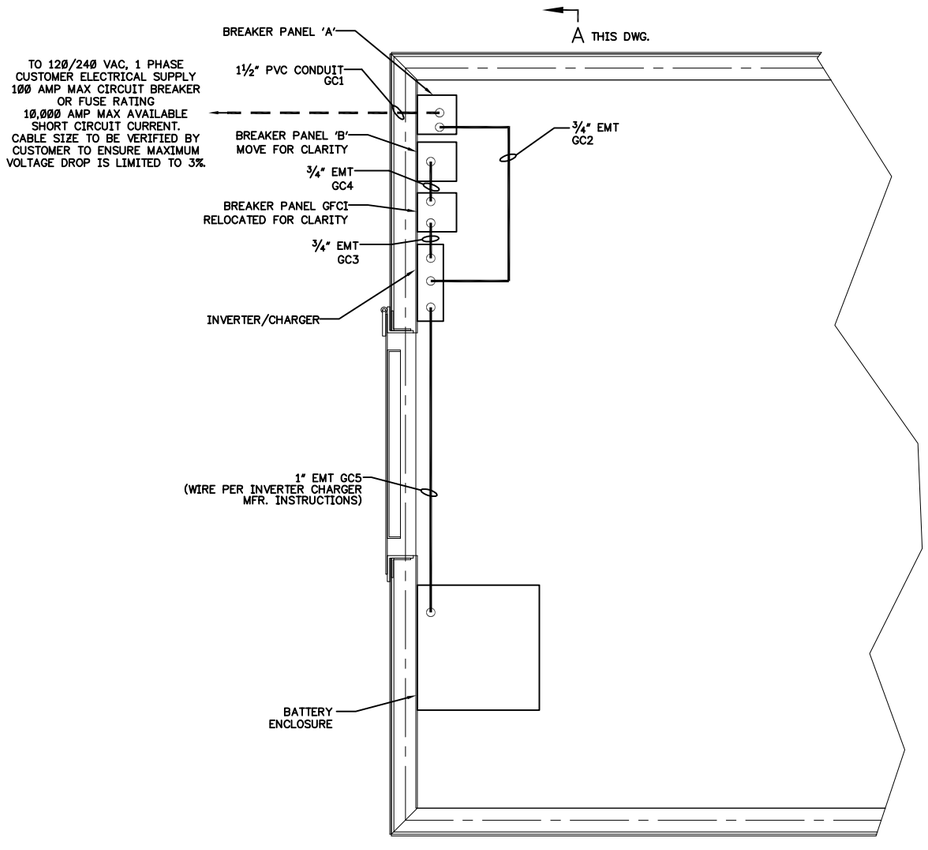
SHEET TITLE:
CIVIL DETAILS

PROJ. MGR.: LBH
DRAWN: CAH
DATE: JUNE 24, 2024
REVISIONS
1 7/30/24-ADD #3

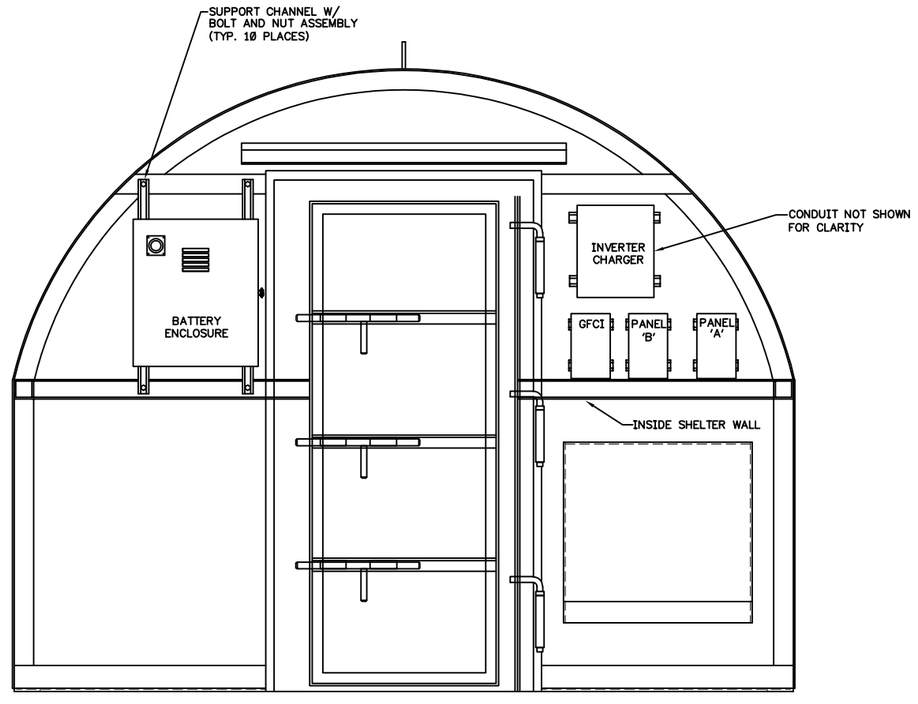
JOB NO. 24-38
SHEET NO:
C6.0

0 1" 2"

BILL OF MATERIAL	
ITEM	DESCRIPTION
1	LOAD CENTER, 100 AMP, 12-SPACE, 1- PHASE, 3-WIRE, NEMA TYPE 1 ENCLOSURE, FACTORY INSTALLED GROUND BUS, 100 AMP 2-POLE MAIN BREAKER, (1) 30 AMP 1-POLE AND (3) 20 AMP 1-POLE BRANCH CIRCUIT
	BREAKERS, SPACES TO REMAIN COVERED. GE M/N TM1210CCUG1K WITH THQL BREAKERS. PANEL DOOR TO BE PERMANENTLY LABELED "SERVICE DISCONNECT"
2	INVERTER/CHARGER, W/BUILT-IN TRANSFER SWITCH, OUTPUT RATING: 1000W(2000W SURGE), 120VAC, 8.4A, CHARGER RATING: 50A, TRANSFER SWITCH RATING: 30A, XANTREX M/N FREEDOM XC1000
3	BATTERY ENCLOSURE (ACCOMMODATES 2 BATTERIES), MATERIAL: ALUMINUM, DIMS: 22.625H X 19.25W X 19.625D, UL 508A, NEMA 3R, AMERESCO SOLAFR M/N BBA-2 OR EQUAL
4	BATTERY, 12.8V 100AH DEEP CYCLE, 1280 WATT-HOURS (WH), WEIGHT 29 LBS, 11.9" X 6.8" 8.6", EXPION360 M/N EX-G27-100C OR EQUAL
5	BATTERY SWITCH, CONTINUOUS CURRENT RATING: 275 A, VOLTAGE RATING: 48 V, SURFACE OR REAR PANEL MOUNT, VICTRON ENERGY M/N VBS127010010
6	FUSE BLOCK, 100A, CLASS T, 300V, BOX LUG CONNECTOR, 2/0–6 AWG WIRE RANGE, LITTELFUSE M/N LFT301001 W/LFT30100FBC COVER
7	FUSE, 100A, CLASS T, 125VDC, LITTELFUSE M/N JLLN100
8	NOT USED
9	LIGHT FIXTURE, INDOOR, LED LUMINAIRE, SURFACE MOUNT, 120V BALLAST, 2-32 WATT T8 LAMPS, DSS (DIVERSE SUPPLY SOLUTIONS) M/N S232
10	LIGHT FIXUTURE, OUTDOOR, 120V, 13 WATT CFL LAMP, DUSK TO DAWN AUTOMATIC LIGHT CONTROL, UTILITECH M/N GU8813-BZ-I
11	EXIT SIGN, COMBINATION SIGN/LIGHT, 120V, DUAL LAMPS, NICAD BACKUP BATTERY, COOPER LIGHTING M/N APC7R OR EQUAL
12	DUPLEX RECEPTACLE, SPECIFICATION GRADE DUPLEX AND DUPLEX/GFI RECEPTACLES LEVITON 5362/5362GF SERIES OR EQUAL
13	WALL SWITCH, SPECIFICATION GRADE 2 AND 3-WAY SWITCH, LEVITON 1221/1223 SERIES OR EQUAL
14	VENTILATION FAN, 24", 115 VOLT, 1- PHASE, 60 HZ, 1.8 AMP, 2-SPEED, 1/8 HP MOTOR, 5850 CFM @ 0.0"SP, 5560 CFM @ 0.05"SP, 9' SWITCHED CORD AND PLUG,
	INCLUDES WEATHER HOOD, J & D MANUFACTURING M/N VPES24 AND VFT140858 (HOOD)



SHELTER POWER PLAN
(GRID OPTION)



VIEW A–A
(GRID OPTION)

ALABAMA LICENSED No. 22480 PROFESSIONAL 9/15/2023 ENGINEER JOHN F. CONWAY

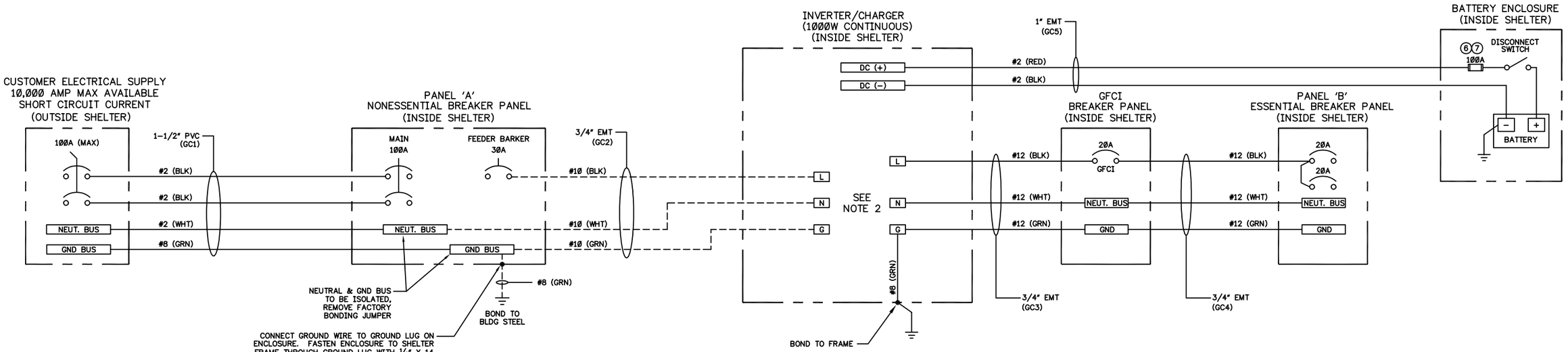
SAFE-T-SHELTER®
Safe Rooms/Shelters 1-800-462-3648

HCS Engineering Company,
DECATUR, ALABAMA (256) 353 - 1972

HCS JOB NUMBER: 23100001

REV.	DESCRIPTION	E.C.N. #	DATE	DR.	CK.
Ø	ISSUED FOR CONSTRUCTION (PSS/CMB)		9/15/23	HCS	CMB

MATERIAL	SCALE: NONE	DRAWN BY: PAUL STRANGE	
SURFACE COAT		APPROVED BY: JOHN CONWAY	
TITLE: OPTIONAL GRID / BATTERY UPS SYSTEM ELECTRICAL PLAN & VIEW			
DATE: 07/19/23	SIZE: D	DRAWING NUMBER: E-UPS-GRID-1	REV: 0

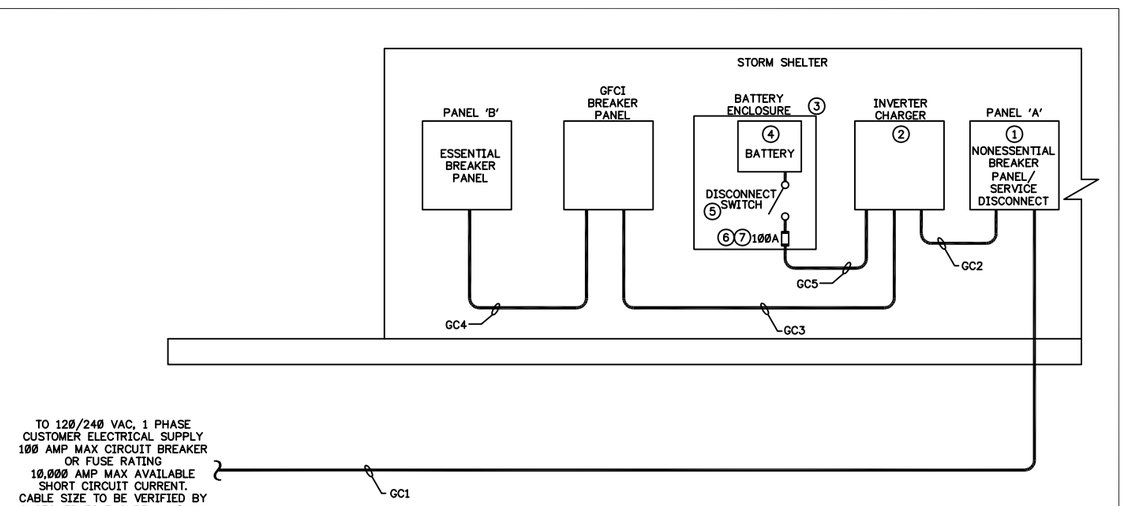


WIRING DIAGRAM GRID OPTION
(GRID OPTION)

BATTERY NOTES:

1. AVOID LONG PERIODS OF EXTREME COLD OR HOT TEMPERATURES. LONG PERIODS OF EXPOSURE TO THESE TEMPERATURES CAN RESULT IN BATTERY DAMAGE.
2. INVERTER/CHARGER XANTREX FREEDOM HAS BUILT IN TRANSFER SWITCH AND WILL SWITCH TO BATTERY POWER IF MAIN POWER IS LOST. DO NOT INSTALL INVERTER/CHARGER IN ANY COMPARTMENT CONTAINING OF FLAMMABLE VAPORS OR GASSES.

CONDUIT SCHEDULE					
"CONDUIT NO."	"CONDUIT SIZE"	CONDUCTORS	FUNCTION	FROM	TO
GC1	1-1/2" SCH 40 PVC	3- #2 W/#8 GND	BUILDING FEEDER	OWNER SUPPLY PANEL	PANEL 'A'
GC2	3/4" EMT	2- #10 W/GND	INVERTER/CHARGER AC INPUT	PANEL 'A'	INVERTER/CHARGER
GC3	3/4" EMT	2- #12 W/GND	INVERTER/CHARGER AC OUTPUT	INVERTER/CHARGER	GFCI PANEL
GC4	3/4" EMT	2- #12 W/GND	PANEL 'B' FEEDER	GFCI PANEL	PANEL 'B'
GC5	1" EMT	2- #2	INVERTER/CHARGER DC INPUT	BATTERY ENCLOSURE	INVERTER/CHARGER



RISER DIAGRAM GRID OPTION
(GRID OPTION)

DIRECTORY	LOAD-WATTS L1	LOAD-WATTS L2	No.	AMPS		AMPS	No.	LOAD-WATTS L1	LOAD-WATTS L2	DIRECTORY
MAIN BREAKER – BACK FED			1	100		30	2	.		INVERTER/CHARGER
			3	100		20	4		.	RECEPTACLE–DEHUMIDIFIER
SPACE			5	20		20	6			SPACE
SPACE			7	–		–	8			SPACE
SPACE			9	–		–	10			SPACE
SPACE			11	–		–	12			SPACE
SUB TOTAL WATTS	–	–			N			.	.	SUB TOTAL WATTS
240/120V 1–PH 3–WIRE	TOTAL WATTS, L1							.		PANEL 'A' DIRECTORY NONESSENTIAL LOADS
100 AMP MAIN BREAKER	TOTAL WATTS, L2							.		
(ISOLATED GROUND BUS)	TOTAL WATTS							.		

PANEL DIRECTORY	LOAD WATTS L1	No.	AMPS	
PANEL 'B' (GFCI)	.	1	20	
SPACE	.	2	.	
SUB TOTAL WATTS	–	.	.	N
120V 1–PH 2–WIRE	TOTAL WATTS, L1			.
(ISOLATED GROUND BUS) GFCI BREAKER	TOTAL WATTS			.
GFCI BREAKER PANEL ESSENTIAL LOADS				

PANEL DIRECTORY	LOAD WATTS L1	No.	AMPS	
LIGHTS	.	1	20	
RECEPTACLES	.	2	20	
SUB TOTAL WATTS	–	.	.	N
120V 1–PH 2–WIRE	TOTAL WATTS, L1			.
(ISOLATED GROUND BUS)	TOTAL WATTS			.
PANEL 'B' ESSENTIAL LOADS				

ALABAMA LICENSED No. 22480 PROFESSIONAL 9/15/2023 ENGINEER JOHN F. CONWAY

SAFE-T-SHELTER®
Safe Rooms/Shelters 1-800-462-3648

HCS Engineering Company,
DECATUR, ALABAMA (256) 353 - 1972

HCS JOB NUMBER: 23100001

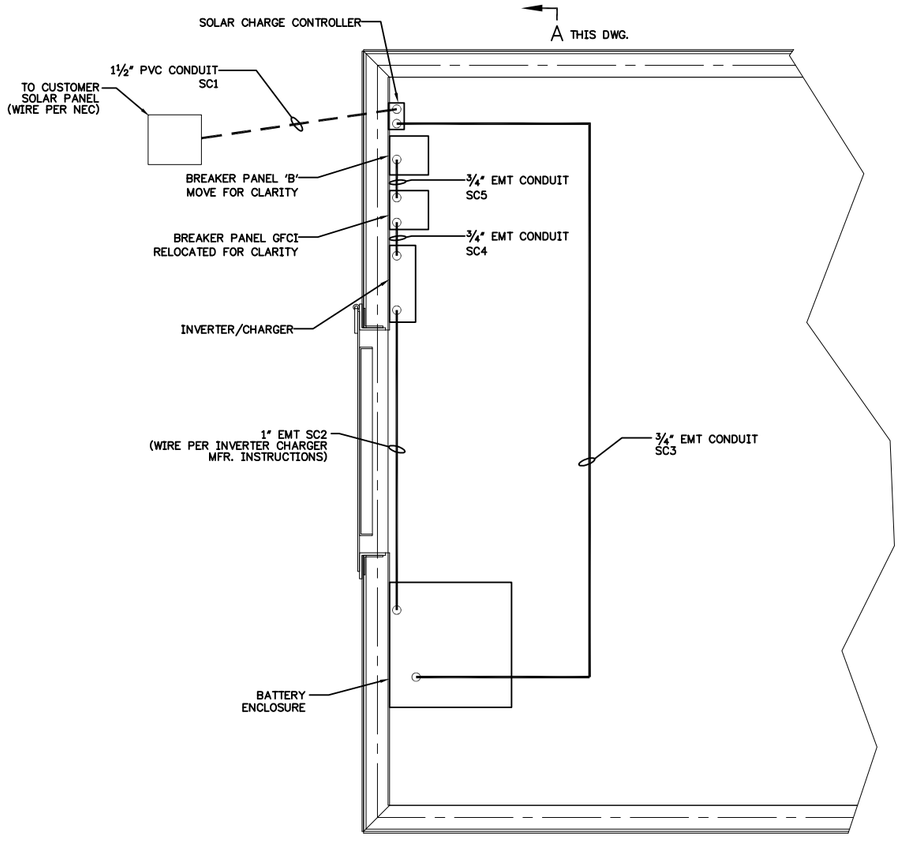
REV.	DESCRIPTION	E.C.N. #	DATE	DR.	CK.
0	ISSUED FOR CONSTRUCTION (PSS/CMB)		9/15/23	HCS	CMB

MATERIAL	SCALE	DRAWN BY
SURFACE COAT	NONE	PAUL STRANGE
		APPROVED BY: JOHN CONWAY

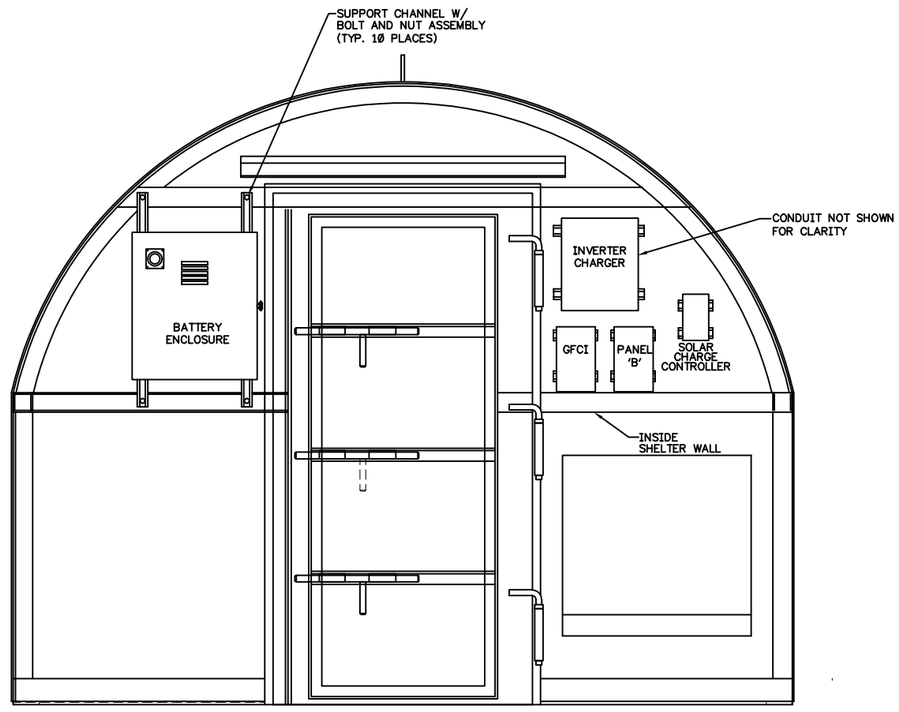
TITLE: OPTIONAL GRID / BATTERY UPS SYSTEM DIAGRAMS & SCHEDULES

DATE	SIZE	DRAWING NUMBER	REV
07/19/23	D	E-UPS-GRID-2	0

BILL OF MATERIAL	
ITEM	DESCRIPTION
1	NOT USED
2	NOT USED
3	BATTERY ENCLOSURE (ACCOMMODATES 2 BATTERIES), MATERIAL: ALUMINUM, DIMS: 22.625H X 19.25W X 19.625D, UL 508A, NEMA 3R, AMERESCO SOLAFR M/N BBA-2 OR EQUAL
4	BATTERY, 12.8V 100AH DEEP CYCLE, 1280 WATT-HOURS (WH), WEIGHT 29 LBS, 11.9" X 6.8" 8.6", EXPION360 M/N EX-G27-100C OR EQUAL
5	BATTERY SWITCH, CONTINUOUS CURRENT RATING: 275 A, VOLTAGE RATING: 48 V, SURFACE OR REAR PANEL MOUNT, VICTRON ENERGY M/N VBS127010010
6	FUSE BLOCK, 100A, CLASS T, 300V, BOX LUG CONNECTOR, 2/0–6 AWG WIRE RANGE, LITTELFUSE M/N LFT301001 W/LFT30100FBC COVER
7	FUSE, 100A, CLASS T, 125VDC, LITTELFUSE M/N JLLN100
8	FUSE, 30A, CLASS T, 125VDC, LITTELFUSE M/N JLLN030
9	LIGHT FIXTURE, INDOOR, LED LUMINAIRE, SURFACE MOUNT, 120V BALLAST, 2-32 WATT T8 LAMPS, DSS (DIVERSE SUPPLY SOLUTIONS) M/N S232
10	LIGHT FIXUTURE, OUTDOOR, 120V, 13 WATT CFL LAMP, DUSK TO DAWN AUTOMATIC LIGHT CONTROL, UTILITECH M/N GU8813-BZ-I
11	EXIT SIGN, COMBINATION SIGN/LIGHT, 120V, DUAL LAMPS, NICAD BACKUP BATTERY, COOPER LIGHTING M/N APC7R OR EQUAL
12	DUPLEX RECEPTACLE, SPECIFICATION GRADE DUPLEX AND DUPLEX/GFI RECEPTACLES LEVITON 5362/5362GF SERIES OR EQUAL
13	WALL SWITCH, SPECIFICATION GRADE 2 AND 3-WAY SWITCH, LEVITON 1221/1223 SERIES OR EQUAL
14	VENTILATION FAN, 24", 115 VOLT, 1- PHASE, 60 HZ, 1.8 AMP, 2-SPEED, 1/8 HP MOTOR, 5850 CFM @ 0.0"SP, 5560 CFM @ 0.05"SP, 9' SWITCHED CORD AND PLUG,
	INCLUDES WEATHER HOOD, J & D MANUFACTURING M/N VPES24 AND VFT140858 (HOOD)
15	SOLAR CHARGE CONTROLLER, 12/24VDC, WIRE TERMINALS UP TO 6 AWG, CIRCUIT VOLTAGE100 VDC, BATTERY OUTPUT 9A2 VDC, (L X W X D) 7.1" X 4.0" X 2.4", XANTREX M/N 710-3024-01 OR EQUAL
16	SOLAR PANEL, FLEXIBLE, 220W, 24.6V, 44 MONO-CRYSTALLINE PERC CELLS, DIMENSIONS (L X W X D) 71.6" X 28.8" X 0.08", XANTREX M/N 784-0220 OR EQUAL



SHELTER POWER PLAN
(SOLAR OPTION)



VIEW A–A
(SOLAR OPTION)

ALABAMA LICENSED No. 22480 PROFESSIONAL ENGINEER JOHN F. CONWAY 9/15/2023

HCS Engineering Company,
DECATUR, ALABAMA (256) 353 - 1972

HCS JOB NUMBER: 2310ØØØ1

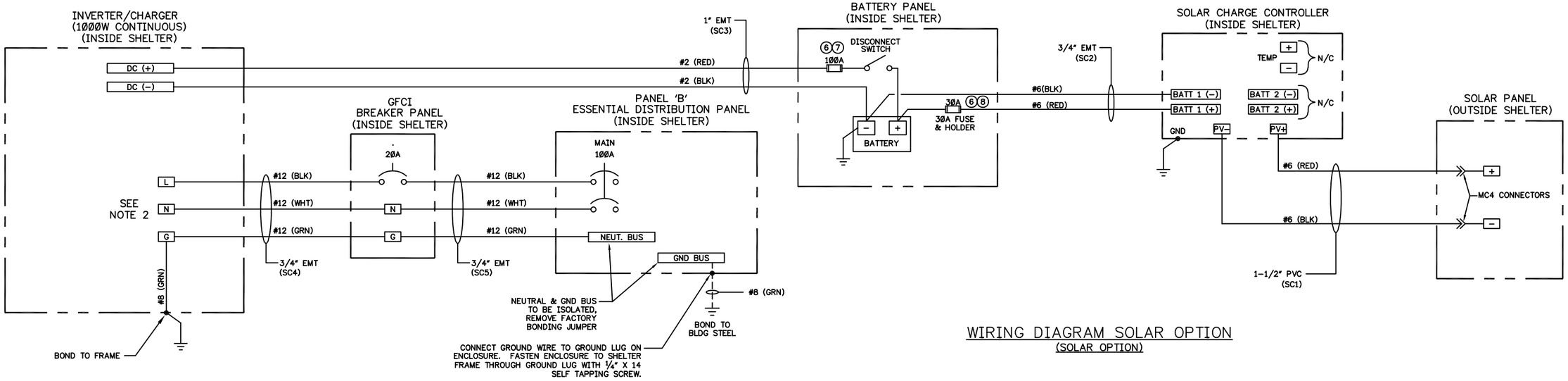
REV.	DESCRIPTION	E.C.N. #	DATE	DR.	CK.
Ø	ISSUED FOR CONSTRUCTION (PSS/CMB)		9/15/23	HCS	CMB

SAFE-T-SHELTER®
Safe Rooms/Shelters 1-800-462-3648

MATERIAL	SCALE	DRAWN BY
SURFACE CVAT	NONE	PAUL STRANGE
		APPROVED BY: JOHN CONWAY

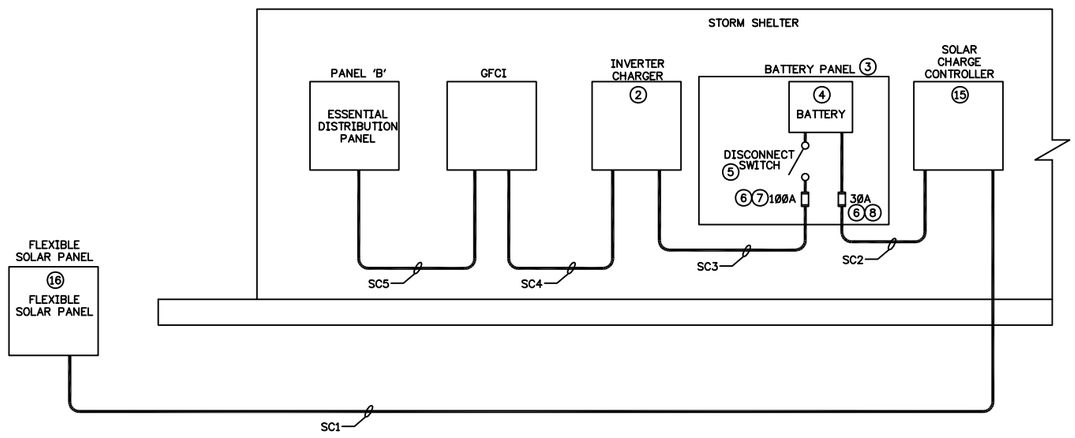
TITLE: OPTIONAL SOLAR / BATTERY UPS SYSTEM ELECTRICAL PLAN & VIEW

DATE	SIZE	DRAWING NUMBER	REV
07/19/23	D	E-UPS-SOLAR-1	0



WIRING DIAGRAM SOLAR OPTION
(SOLAR OPTION)

CONDUIT SCHEDULE					
"CONDUIT NO."	"CONDUIT SIZE"	CONDUCTORS	FUNCTION	FROM	TO
SC1	1-1/2" SCH 40 PVC	2-#6	SOLAR PANEL OUTPUT	SOLAR PANEL	SOLAR CHARGE CONTROLLER
SC2	3/4" EMT	2-#6	SOLAR CHARGE CONTROLLER OUTPUT	SOLAR CHARGE CONTROLLER	BATTERY ENCLOSURE
SC3	1" EMT	2-#2	INVERTER/CHARGER DC INPUT	BATTERY ENCLOSURE	INVERTER/CHARGER
SC4	3/4" EMT	2-#12 W/GND	INVERTER/CHARGER AC OUTPUT	INVERTER/CHARGER	GFCI PANEL
SC5	3/4" EMT	2-#12 W/GND	PANEL 'B' FEEDER	GFCI PANEL	PANEL 'B'



RISER DIAGRAM SOLAR OPTION
(SOLAR OPTION)

BATTERY NOTES:

1. AVOID LONG PERIODS OF EXTREME COLD OR HOT TEMPERATURES. LONG PERIODS OF EXPOSURE TO THESE TEMPERATURES CAN RESULT IN BATTERY DAMAGE.
2. INVERTER/CHARGER XANTREX FREEDOM HAS BUILT IN TRANSFER SWITCH AND WILL SWITCH TO BATTERY POWER IF MAIN POWER IS LOST. DO NOT INSTALL INVERTER/CHARGER IN ANY COMPARTMENT CONTAINING OF FLAMMABLE VAPORS OR GASSES.

PANEL DIRECTORY	LOAD WATTS L1	No.	AMPS	
PANEL 'B' (GFCI)	.	1	20	
SPACE	.	2	.	
SUB TOTAL WATTS	–	.	.	N
120V 1-PH 2-WIRE	TOTAL WATTS, L1			.
(ISOLATED GROUND BUS) GFCI BREAKER	TOTAL WATTS			.
GFCI BREAKER PANEL ESSENTIAL LOADS				

PANEL DIRECTORY	LOAD WATTS L1	No.	AMPS	
LIGHTS	.	1	20	
RECEPTACLES	.	2	20	
SUB TOTAL WATTS	–	.	.	N
120V 1-PH 2-WIRE	TOTAL WATTS, L1			.
(ISOLATED GROUND BUS)	TOTAL WATTS			.
PANEL 'B' ESSENTIAL LOADS				

ALABAMA LICENSED No. 22480 PROFESSIONAL ENGINEER JOHN F. CONWAY 9/15/2023

SAFE-T-SHELTER®
Safe Rooms/Shelters 1-800-462-3648

HCS Engineering Company,
DECATUR, ALABAMA (256) 353 - 1972

HCS JOB NUMBER: 23100001

REV.	DESCRIPTION	E.C.N. #	DATE	DR.	CK.
0	ISSUED FOR CONSTRUCTION (PSS/CMB)		9/15/23	HCS	CMB

MATERIAL: SURFACE COAT
SCALE: NONE
DRAWN BY: PAUL STRANGE
APPROVED BY: JOHN CONWAY
TITLE: OPTIONAL SOLAR / BATTERY UPS SYSTEM DIAGRAMS & SCHEDULES
DATE: 07/19/23
SIZE: D
DRAWING NUMBER: E-UPS-SOLAR-2
REV: 0

REV.	DESCRIPTION	E.C.N. #	DATE	BY	CK

SAFE-T-SHELTER®
SAFE ROOMS & STORM SHELTERS

10' X 56' COMMUNITY STORM SHELTER MODEL #: STS1056

CONSTRUCTION DOCUMENTS: DESIGN INFORMATION
THE CONSTRUCTION, DRAWINGS AND SPECIFICATIONS FOR THIS SAFE ROOM COMPLY WITH THEAPPLICABLE PROVISIONS OF FEMA DOCUMENT 361, "SAFE ROOMS FOR TORNADOES AND HURRICANES: GUIDANCE FOR COMMUNITY AND RESIDENTIAL SAFE ROOMS, APRIL 2021 AND ICC-500-2020. THIS SAFE ROOM IS FOR TORNADO PROTECTION AND IS DEISGNED TO WITHSTAND 250 MPH WINDS.

1. DESIGNATION: TORNADO SHELTER
2. WIND DESIGN CONFIRMS TO FEMA 361-2021/ICC 500-2020ICC/NSSA STANDARD FOR THE DESIGN AND CONSTRUCTION OF STORM SHELTERS
3. SHELTER DESIGN WIND SPEED: 250 MPH
4. SHELTER FLOOR DESIGN LIVE LOAD: 150 PSF
5. SHELTER ROOF DESIGN LIVE LOAD: 100 PSF
6. SHELTER DESIGN DEAD LOAD: 20 PSF
7. MISILE IMPACT COMPLIANCE:
   PROTECTED OCCUPANT AREAS:
   WALLS: ¼" STEEL PLATE
   ROOF STRUCTURE: ¼' STEEL PLATE
   PROTECTED OCCUPANT AREA DOORS: FEMA 361COMPLIANT
   PROTECTED OCCUPANT AREA LOUVERS: FEMA 361 COMPLIANT
   VENTILATION LOUVER: FEMA 361 COMPLIANT
8. SHELTER NOT TO BE CONSTRUCTED WITHIN AN AREA SUSCEPTIBLE TO FLOODING

STEEL MATERIALS LIST AND NOTES
1. ALL CHANNEL, ANGLES, AND PLATES TO BE A36 U.N.O
2. ALL STEEL TUBE SECTIONS TO BE A500 GRADE B
3. ALL STEEL PIPE SECTIONS TO BE SCH 40 GRADE A501 OR A53
4. TYPICAL SHELTER WALLS ARE ¼" THICK SOLID PLATE STEEL
5. ALL CHANNEL, 3x3 & 2 ½ x2 ½ ANGLES, AND PLATE TO BE ¼" THICK STEEL. TUBE 3/16" THICK STEEL.
6. ALL 4x4 ANGLES TO BE 3/8" THICK STEEL
7. SEAT MATERIAL AND GENERATOR PROTECTIVE HOUSING MATERIAL TO BE 3/16" THICK STEEL
8. ALL DIMENSIONS ARE NOMINAL AND ARE SUBJECT TO CONVENTIONAL INDUSTRY TOLERANCES.

DRAWING INDEX

CONCRETE
1. CONCRETING OPERATIONS SHALL COMPLY WITH ACI STANDARDS.
2. MINIMUM CONCRETE COMPRESSIVE STRENGTH AT 28 DAYS (PSI).
3. STRENGTH: 3500 PSI
4. TYPE: NORMAL WT.
5. W/C: 0.513
6. AIR: 3% - 5%
7. SLUMP: 3" TO 5"
8. REINFORCING BARS; ASTM A615 GRADE 60
9. REINFORCING STEEL SHOWN IN SECTIONS AND DETAILS ARE A SCHEMATIC INDICATION THAT REINFORCING EXISTS. SEE SECTION NOTES AND GENERAL NOTES FOR ACTUAL REINFORCING REQUIRED.
10. REINFORCING BAR PLACING ACCESSORIES IN ACCORDANCE WITH ACI MANUAL OF STANDARD PRACTICE.
11. DETAIL REINFORCEMENT IN ACCORDANCE WITH ACI 315.
12. ALL SPLICES SHALL BE CLASS "B" TENSION LAP SPLICE OR PROPERLY SELECTED MECHANICAL SPLICES, PROPERLY INSTALLED PER MANUFACTURING SPECIFICATIONS.
13. MINIMUM CONCRETE COVERAGE OF REINFORCEMENT: SLAB
    FOUNDATION ----------2" TOP & 3" BOTTOM & SIDES

FOUNDATION QUALITY CONTROL DURING CONSTRUCTION
1. FOOTINGS SHALL BE NEATLY EXCAVATED WHERE POSSIBLE WITH SIDES AND TOP EDGES FREE OF LOOSE OR WET MATERIALS. WHERE NEAT EXCAVATION IS NOT POSSIBLE, FOOTING EXCAVATION SHALL BE OPEN CUT WITH EDGES FORMED AND BRACED. THE BOTTOM EXCAVATION SHALL BE CLEAN AND DRY WITH ALL LOOSE MATERIAL REMOVED FOR AN ESSENTIALLY FLAT BEARING SURFACE. WHERE SOFT OR UNSUITABLE BEARING SURFACES ARE ENCOUNTERED, THE AREA SHALL BE UNDERCUT AS REQUIRED AND REPLACED WITH LEAN CONCRETE OR COMPACTED DENSE GRADED CRUSHED STONE AS DIRECTED BY THE ARCHITECT OR ENGINEER.

BUILDING CODE DATA
ICC 500-2020, FEMA 361-2021, FEMA 320-2021, NEC-2020, IBC 2021

OCCUPANCY TYPE:	ASSEMBLY A-3
CONSTRUCTION TYPE:	I B
BUILDING AREA:	560 SF
PROPOSED HEIGHT:	8'0"
PROPOSED LENGTH:	56'0"
PROPOSED WIDTH:	10'0"

EGRESS REQUIREMENTS SUMMARY
OCCUPANCY LOAD: 110 PERSONS
WITH (1) RESTROOM: 106 PERSONS
WITH (2) RESTROOMS: 103 PERSONS

OCCUPANCY LOAD & EGRESSCALCULATIONS
ICC 500 – COMMUNITY SHELTER USE
USABLE FLOOR AREA = 560 SF – 5 SF (ICC 501.1.2.2 – FIXED/MOVABLE) = 555 SF
555 SF – 10 SF (ONE WHEELCHAIR SPACE) = 545 SF
545 SF / 5 SF/PERSON = 109 STANDING/SEATING
109 STANDING/SEAT + 1 WC = 110 TOTAL

WITH ONE (1) REST ROOM:
USABLE FLOOR AREA = 560 SF – 17.5 SF = 542.5 SF
542.5 SF – 5 SF (ICC 501.1.2.2 – FIXED/MOVABLE) = 537.5 SF
537.5 SF – 10 SF (ONE WHEELCHAIR SPACE) = 527.5 SF
527.5 SF / 5 SF/PERSON = 105 STANDING/SEATING
105 STANDING/SEAT + 1 WC = 106 TOTAL

WITH TWO (2) REST ROOM:
USABLE FLOOR AREA = 560 SF – 35 SF = 525 SF
525 SF – 5 SF (ICC 501.1.2.2 –FIXED/MOVABLE) = 520 SF
520 SF – 10 SF (ONE WHEELCHAIR SPACE) = 510 SF
510 SF / 5 SF/PERSON = 102 STANDING/SEATING
102 STANDING/SEAT + 1 WC = 103 TOTAL

ALABAMA REGISTERED NO. 12307 PROFESSIONAL ENGINEER DONALD B. HEACOCK
4/1/23

ALABAMA MANUFACTURED HOUSING COMMISSION
These MODULAR PLANS are approved and deemed To comply with all ordinances or regulations enacted by any local government. (AL Act No. 81-706)
Daniel G. White
7/9/2023

SAFE-T-SHELTER®
SAFE ROOMS & STORM SHELTERS

PROJECT			
MATERIAL	SCALE: N.T.S.	DRAWN BY:	
SURFACE CUAT		APPROVED BY:	
TITLE: SHELTER CODE SUMMARY, DESIGN PARAMETERS STRUCTURAL LOAD LIMITATIONS & PLAN INDEX			
UNLESS OTHERWISE SPECIFIED TOLERANCE EXCEPT AS NOTED (XXX ± .005, XX ± .020, X ± .040, FRACTION ± 1/16")	04/01/23	SIZE	DRAWING NUMBER: STS1056 Page 1 — REV

REV	DESCRIPTION	ECN #	DATE	BY	CK

1 PREFABPRICATED STEEL STRUCTURE ANCHORED AND SEALED TO SMOOTH CONCRETE FLOOR

2 ICC-500 COMPLIANT STEEL DOOR ASSEMBLY

3 ICC-500 COMPLIANT VENTILATION LOUVERED INTAKE HOOD

4 ICC-500 COMPLIANT VENTILATION LOUVERED EXHAUST HOOD

5 TYPICAL PREFABRICATED WALL BENCH, 4'-0"

6 TYPICAL PREFABRICATED WALL BENCH, 7'-6"

7 TYPICAL PREFABRICATED CENTER BENCH, 8'-0"

8 TRANSFER SWITCH/LOAD CENTER 'A'

9 ELECTRICAL PANEL 'B'

10 DEHUMIDIFIER W/ 5/8"x6'-0" RUBBER HOSE DISCHARGE THRU SHELTER SIDE WALL

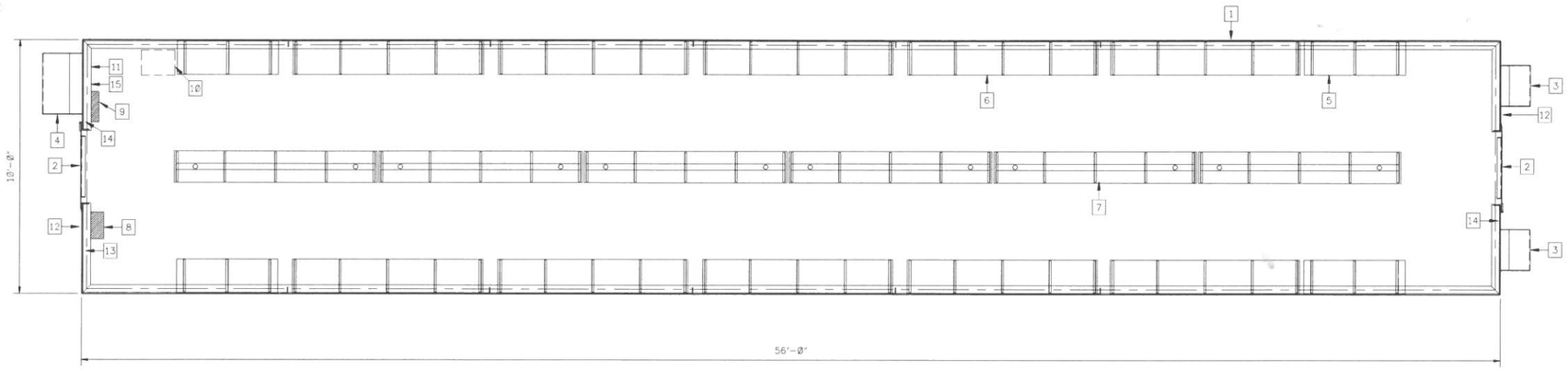
11 EXHAUST FAN

12 TORNADO SHELTER SIGNAGE

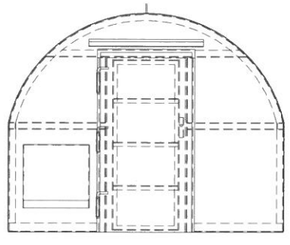
13 TORNADO SHELTER SIGNAGE, MANUFACTURER DESIGN WIND SPEED & MAXIMUM OCCUPANT LOAD

14 FIRE EXTINGUISHER

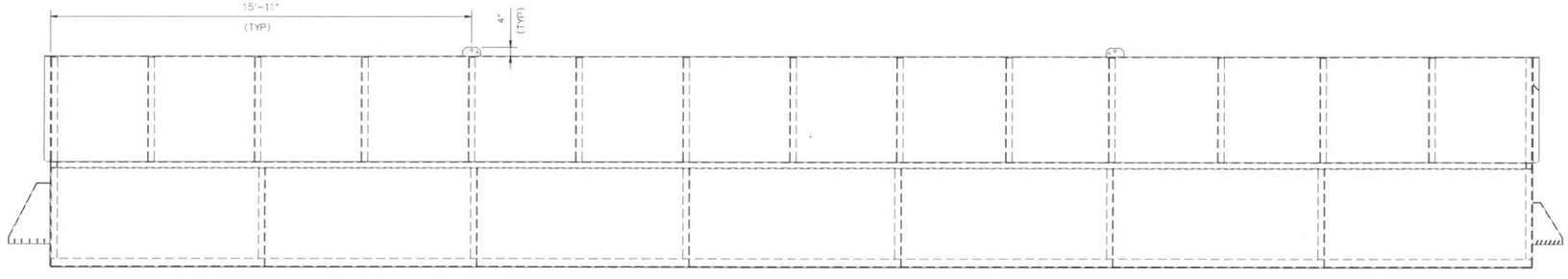
15 FIRST AID KIT



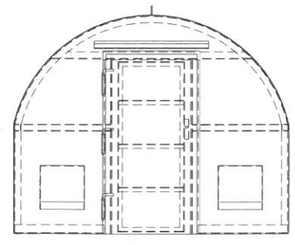
FLOOR PLAN



BACK ELEV.



SIDE ELEV.



FRONT ELEV.

ALABAMA MANUFACTURED HOUSING COMMISSION
These MODULAR PLANS are approved and deemed To comply with all ordinances or regulations enacted by any local government. (AL Act No. 83-706)
Daniel G. White
7/9/2023

ALABAMA REGISTERED NO. 12307 PROFESSIONAL ENGINEER DONALD B. HEADRICK JR.
4/1/23

THE CONSTRUCTION, DRAWINGS AND SPECIFICATIONS FOR THIS SAFE ROOM COMPLY WITH THE APPLICABLE PROVISIONS OF FEMA DOCUMENT 361, "SAFE ROOMS FOR TORNADOES AND HURRICANES: GUIDANCE FOR COMMUNITY AND RESIDENTIAL SAFE ROOMS", APRIL 2021 AND ICC-500-2020. THIS SAFE ROOM IS FOR TORNADO PROTECTION AND IS DESIGNED TO WITHSTAND 250 MPH WINDS.

UNLESS OTHERWISE SPECIFIED: TOLERANCE EXCEPT AS NOTED XXX ± .005, XX ± .030, X ± .040, FRACTION ± 1/16"

SAFE-T-SHELTER ®
SAFE ROOMS & STORM SHELTERS

PROJECT

MATERIAL: SURFACE COAT

SCALE: 3/8"=1'-0"

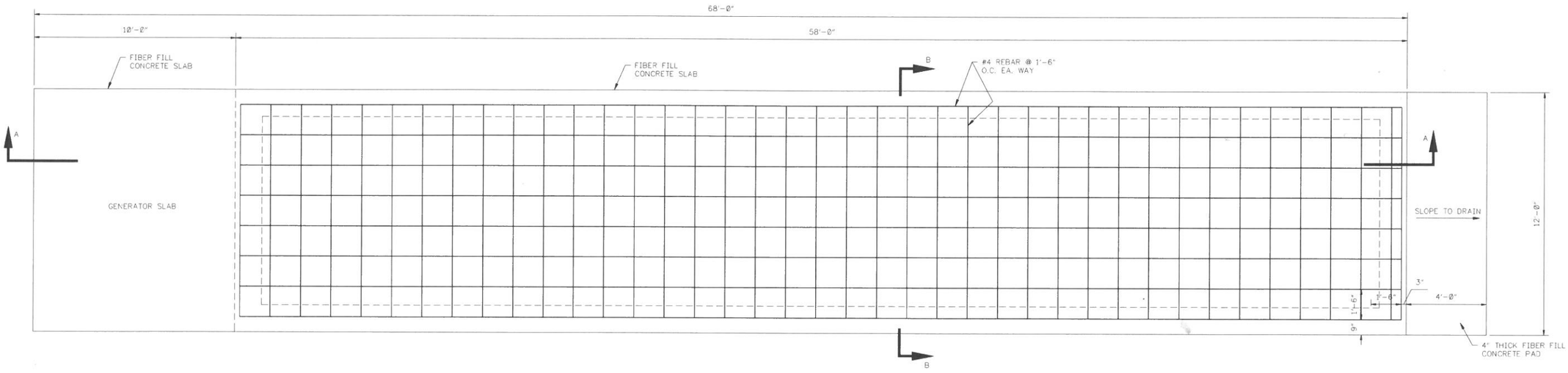
DRAWN BY: D. STOVER

APPROVED BY:

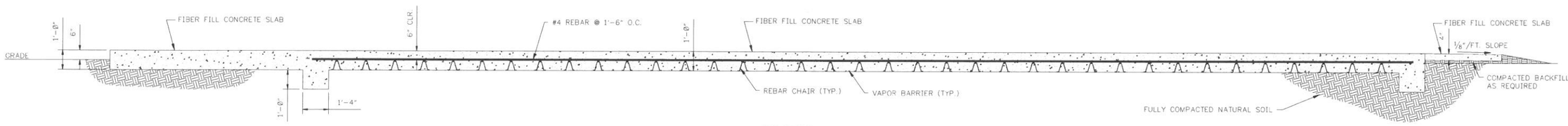
TITLE: SINGLE 10x56 SHELTER UNIT FLOOR PLAN & ELEVATIONS

DATE	SIZE	DRAWING NUMBER	REV
04/01/23	D	STS1056 Page 2	1

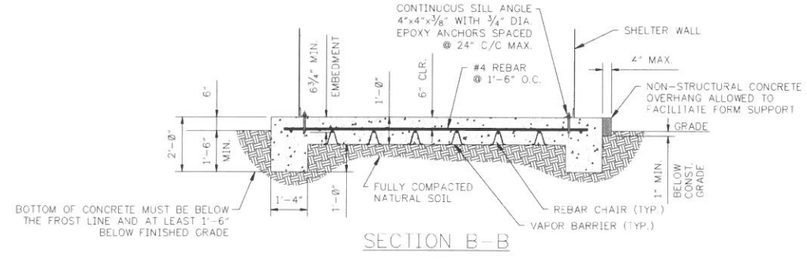
REV	DESCRIPTION	ECN #	DATE	DR	CK



FOUNDATION PLAN



SECTION A-A



SECTION B-B

NOTES:
MINIMUM CONCRETE STRENGTH (f'c) = 3500 PSI @ 28 DAYS
MINIMUM REINFORCING STRENGTH (fy) = 60 KSI
MINIMUM CONCRETE COVER OVER REINFORCING:
CONCRETE CAST AGAINST EARTH: 3"
CONCRETE EXPOSED TO WEATHER: 2"

ALABAMA MANUFACTURED HOUSING COMMISSION
These MODULAR PLANS are approved and deemed To comply with all ordinances or regulations enacted by any local government. (AL Act No. 81-706)
Daniel G. White
7/9/2023

ALABAMA REGISTERED NO. 12307 PROFESSIONAL ENGINEER DONALD B. HEACOCK JR.
4/1/23

THE CONSTRUCTION, DRAWINGS AND SPECIFICATIONS FOR THIS SAFE ROOM COMPLY WITH THE APPLICABLE PROVISIONS OF FEMA DOCUMENT 361, "SAFE ROOMS FOR TORNADOES AND HURRICANES: GUIDANCE FOR COMMUNITY AND RESIDENTIAL SAFE ROOMS", APRIL 2021AND ICC-500-2020 THIS SAFE ROOM IS FOR TORNADO PROTECTION AND IS DESIGNED TO WITHSTAND 250 MPH WINDS.

SAFE-T-SHELTER ®
SAFE ROOMS & STORM SHELTERS

PROJECT:

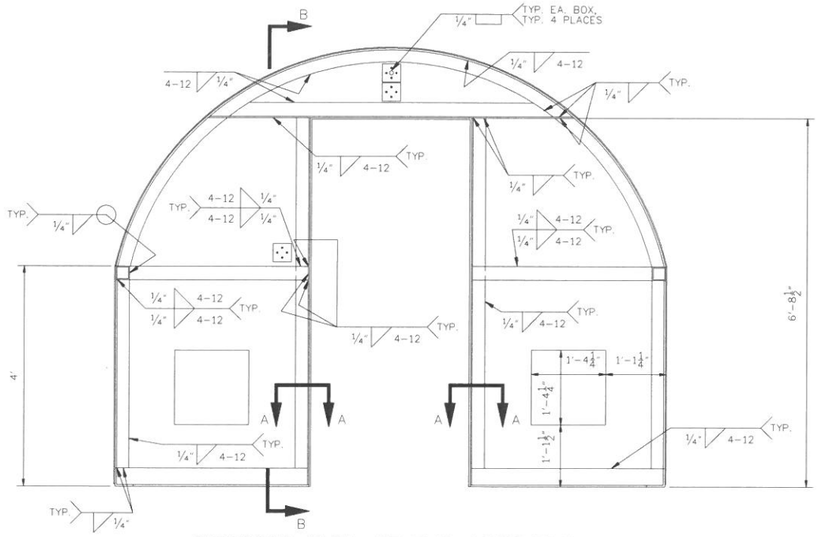
MATERIAL: SURFACE CUAT | SCALE: 3/8" = 1'-0" | DRAWN BY: D. STOVER | APPROVED BY:

TITLE: SINGLE 10x56 SHELTER UNIT FOUNDATION PLAN & ELEVATIONS

UNLESS OTHERWISE SPECIFIED: TOLERANCE EXCEPT AS NOTED XXX ± .005, XX ± .020, X ± .040, FRACTION ± 1/16"

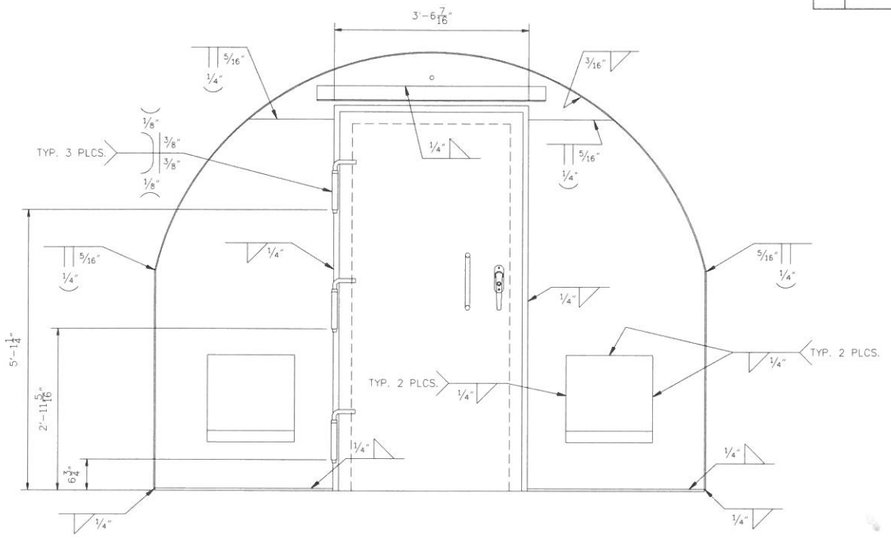
DATE:	SIZE:	DRAWING NUMBER	REV
04/01/23	D	STS1056 Page 3	1

REV.	DESCRIPTION	E.C.N. #	DATE	BY.	CK.



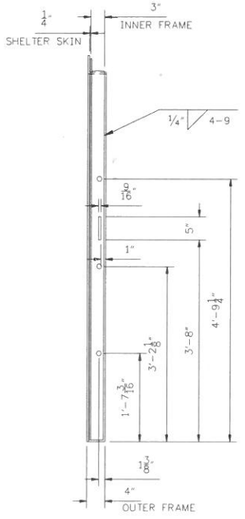
INTERIOR ELEV. OF END ASSEMBLY

SCALE: 3/4"= 1'-0"



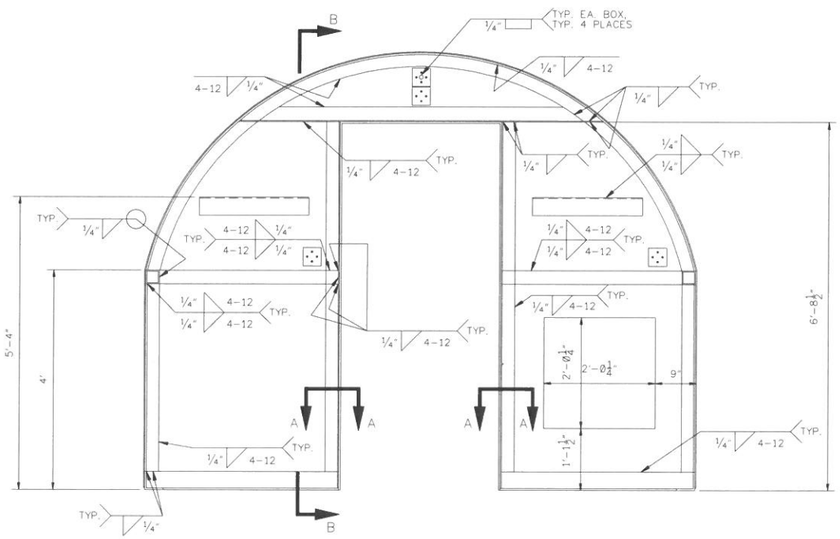
EXTERIOR ELEV. OF END ASSEMBLY

SCALE: 3/4"= 1'-0"



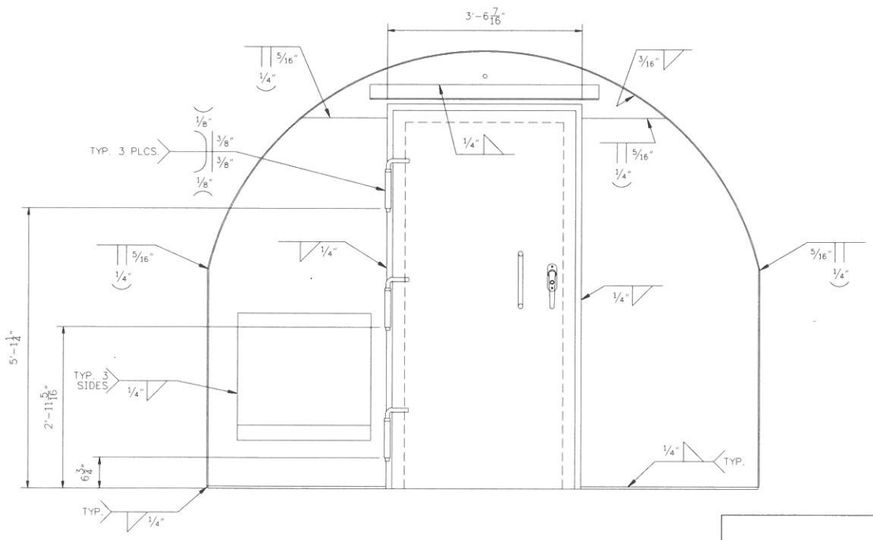
SECTION 'B-B'

SCALE: 3/4" = 1'-0"



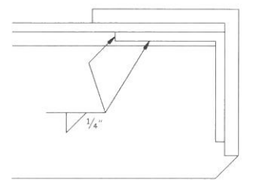
INTERIOR ELEV. OF END ASSEMBLY

SCALE: 3/4"= 1'-0"



EXTERIOR ELEV. OF END ASSEMBLY

SCALE: 3/4"= 1'-0"



SECTION 'A-A'

SCALE: 6" = 1'-0"

ALABAMA REGISTERED NO. 12307 PROFESSIONAL ENGINEER DONALD B. HEADRICK

4/1/23

ALABAMA MANUFACTURED HOUSING COMMISSION

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Daniel G. White

7/9/2023

SAFE-T-SHELTER®
SAFE ROOMS & STORM SHELTERS

PROJECT

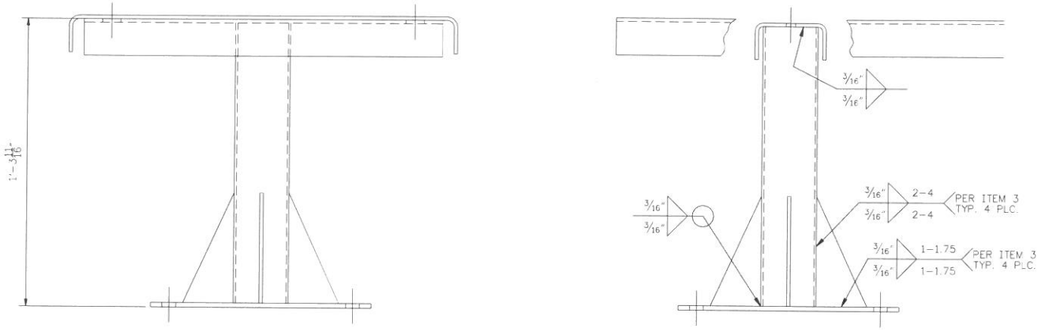
MATERIAL	SCALE:	DRAWN BY:
SURFACE CUAT	AS NOTED	APPROVED BY:

TITLE: TYPICAL ELEVATIONS & SECTIONS SHOP DRAWING

UNLESS OTHERWISE SPECIFIED: TOLERANCE EXCEPT AS NOTED — XXX ± .005, XX ± .020, X ± .040, FRACTION ± 1/16"

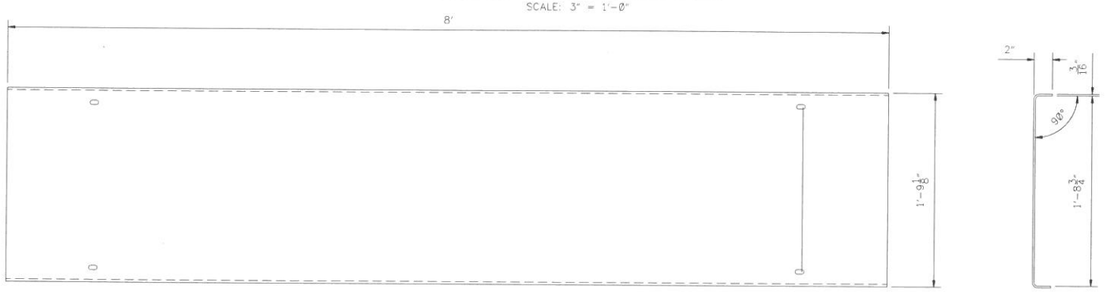
DATE:	SIZE:	DRAWING NUMBER	REV
04/01/23		STS1056 Page 4	1

REV.	DESCRIPTION	ECN #	DATE	DR.	CK.



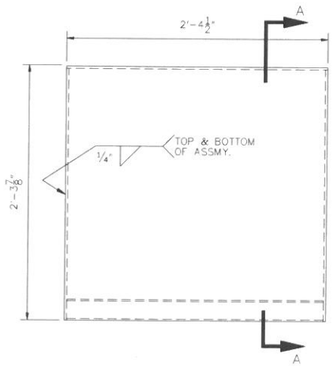
CENTER BENCH ASSEMBLY

SCALE: 3" = 1'-Ø"

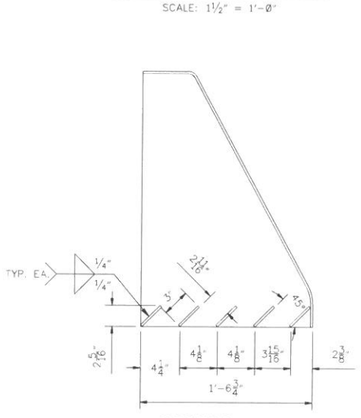


CENTER BENCH TOP

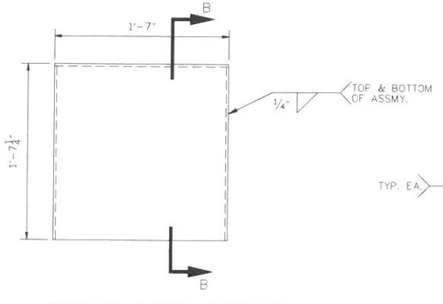
SCALE: 1½" = 1'-Ø"



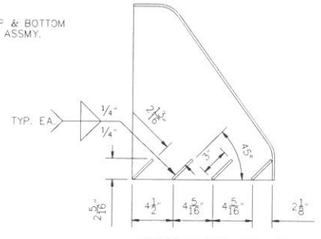
EXHAUST HOOD ASSEMBLY



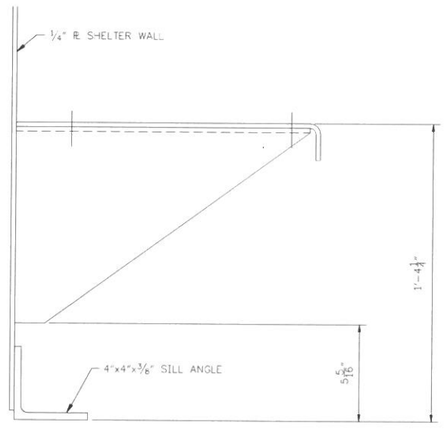
SECTION A-A

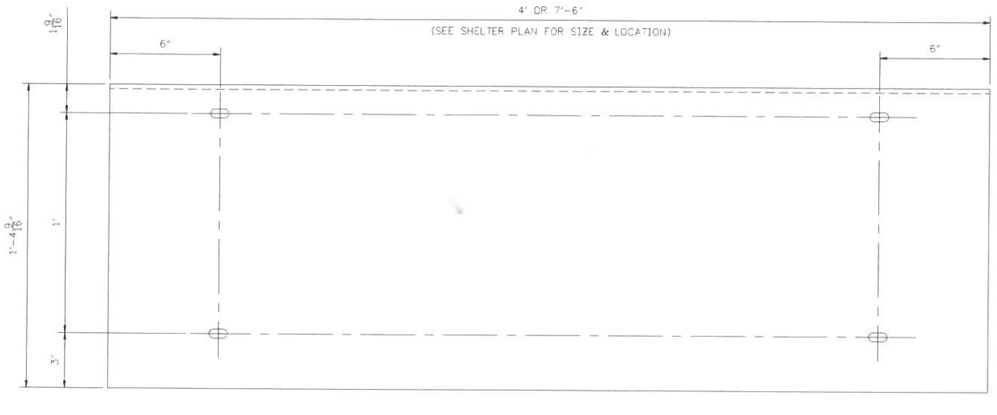


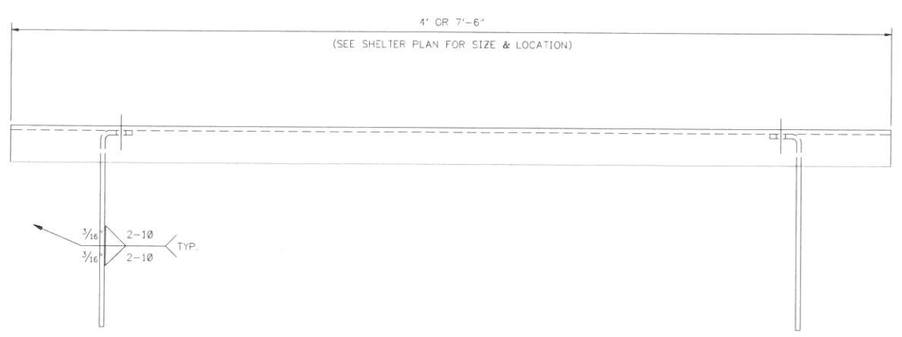
INTAKE HOOD ASSEMBLY



SECTION B-B







SIDE BENCH ASSEMBLY

SCALE: 1½" = 1'-Ø"

ALABAMA REGISTERED NO. 12307 PROFESSIONAL ENGINEER DONALD B. HEADRICK, JR.
4/1/23

ALABAMA MANUFACTURED HOUSING COMMISSION
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Daniel G. White
7/9/2023

SAFE-T-SHELTER®
SAFE ROOMS & STORM SHELTERS

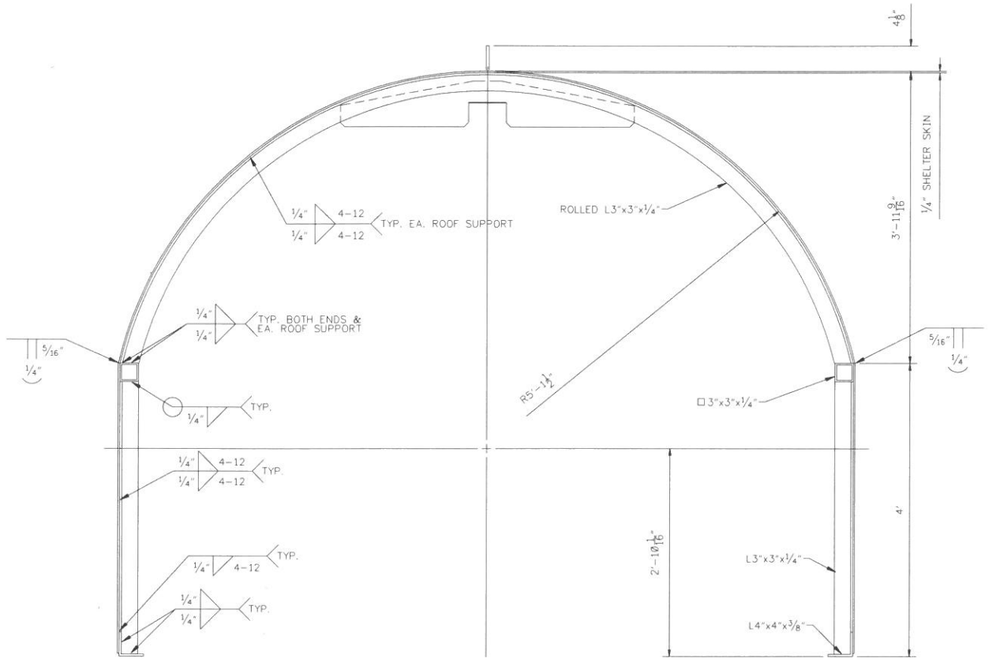
SCALE: 1 1/2"=1'-0"
DRAWN BY:
SURFACE COAT:
APPROVED BY:

TITLE: INTAKE & EXHAUST HOOD, SIDE WALL & CENTER BENCH SEATING - SHOP DRAWING

UNLESS OTHERWISE SPECIFIED: TOLERANCE EXCEPT AS NOTED
XXX ± .005
XX ± .020
X ± .040
FRACTION ± 1/16"

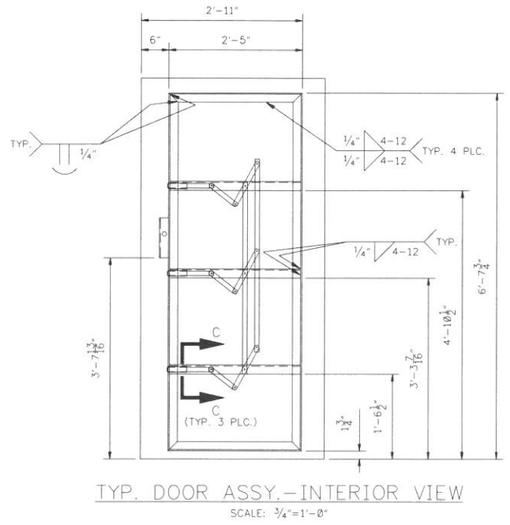
DATE: 04/01/23
SIZE: D
DRAWING NUMBER: STS1056 Page 5
REV: 1

REV.	DESCRIPTION	E.C.N. #	DATE	DR.	CK.



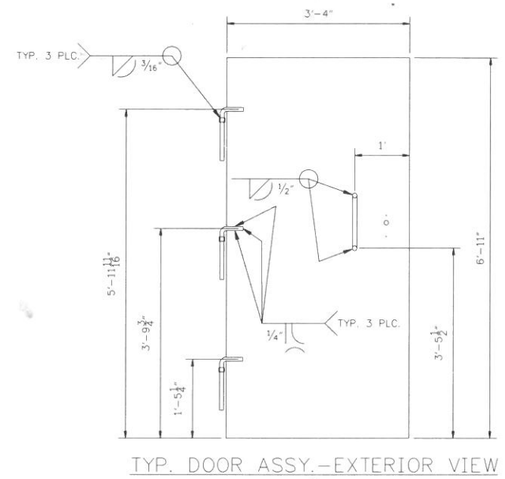
TYPICAL INTERMEDIATE SUPPORT ELEVATION

SCALE: ¾"= 1'-Ø"



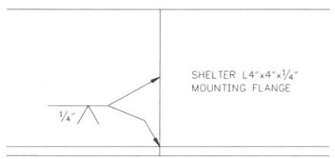
TYP. DOOR ASSY.-INTERIOR VIEW

SCALE: ¾"=1'-Ø"



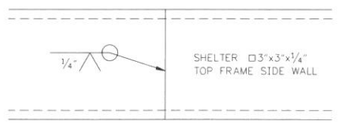
TYP. DOOR ASSY.-EXTERIOR VIEW

SCALE: ¾"=1'-Ø"



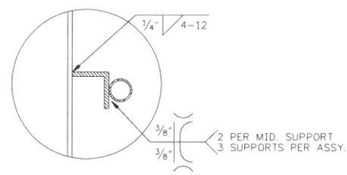
SHELTER MOUNTING FLANGE WELD DETAIL

SCALE: 6" = 1'-Ø"



SHELTER TOP FRAME WELD DETAIL

SCALE: 6" = 1'-Ø"



SECTION 'C-C'

SCALE: 3"= 1'-Ø"

ALABAMA REGISTERED NO. 12307 PROFESSIONAL ENGINEER DONALD B. HEACOCK, JR.

Donald B. Heacock Jr. 4/1/23

ALABAMA MANUFACTURED HOUSING COMMISSION

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Daniel G. White 7/12/2023

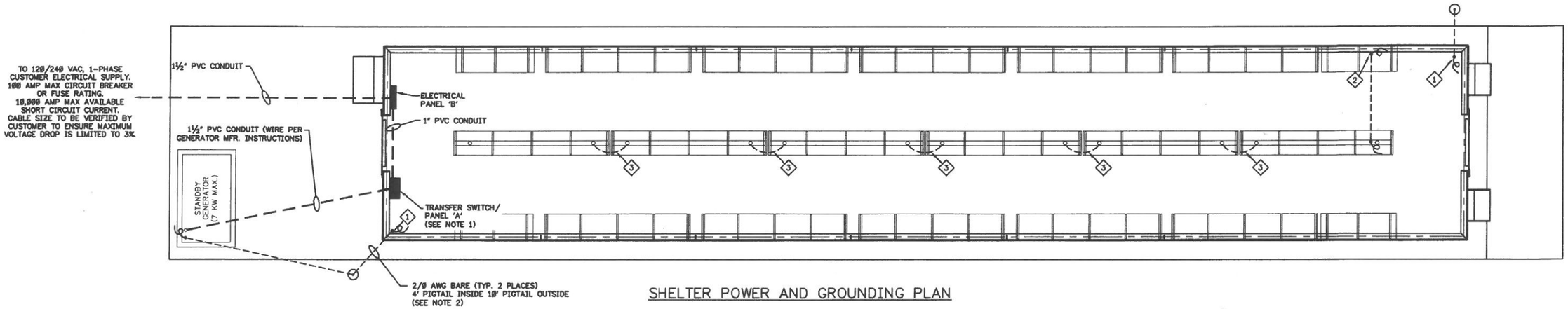
SAFE-T-SHELTER®
SAFE ROOMS & STORM SHELTERS

SURFACE CUAT	SCALE: AS NOTED	DRAWN BY:	
		APPROVED BY:	

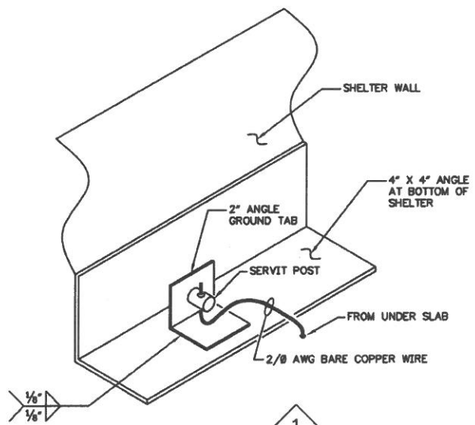
TITLE: TYPICAL INTERMEDIATE SECTION, DOOR ELEVATIONS AND WELD DETAILS - SHOP DRAWING

UNLESS OTHERWISE SPECIFIED: TOLERANCE EXCEPT AS NOTED — XXX ± .005, XX ± .020, X ± .040, FRACTION ± 1/16"

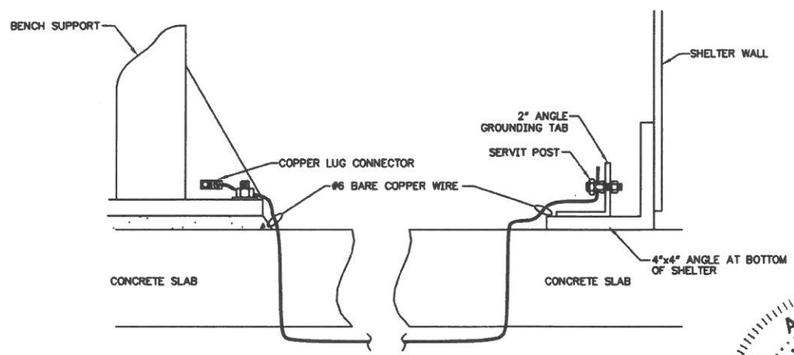
DATE:	SIZE:	DRAWING NUMBER	REV
04/01/23		STS1056 Page 6	1



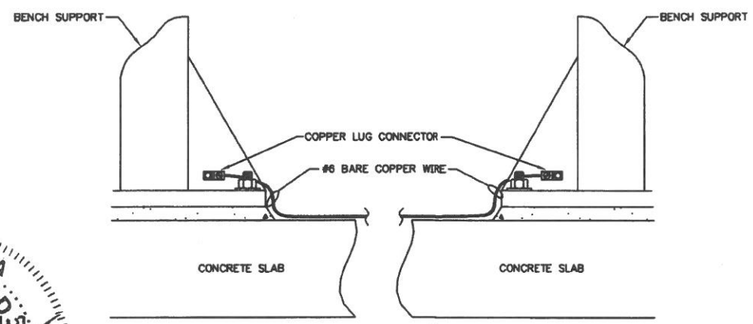
SHELTER POWER AND GROUNDING PLAN



DETAIL 1
GROUND BAR INSTALLATION
(THIS DWG.)



DETAIL 2
BENCH GROUND DETAIL
(THIS DWG.)



DETAIL 3
BENCH GROUND DETAIL
(THIS DWG.)

ALABAMA LICENSED
J. F. Conway
NO. 22480
PROFESSIONAL
3/10/17
ENGINEER
JOHN F. CONWAY

ALABAMA MANUFACTURED HOUSING COMMISSION
These MODULAR PLANS are approved and deemed To comply with all ordinances or regulations enacted by any local government. (AL Act No. 81-706)
Daniel G. White
7/9/2023

LEGEND

- ---- BELOW GRADE
- ⟨X⟩ DETAIL NUMBER (SEE THIS DWG.)
- ⊙ GROUND ROD, ⅝" x 8' COPPER CLAD

NOTES:

1. TRANSFER SWITCH/PANEL 'A' TO BE INSTALLED AFTER SHELTER IS SET IN PLACE.
2. GROUNDING SYSTEM TO BE COMPLETED AFTER SHELTER IS SET IN PLACE.

HCS JOB NUMBER: 14100001

REV.	DESCRIPTION	ECN #	DATE	BY	CK
0	ORIGINAL ISSUE (DRS/JFC)		05/04/15	HCS	
1	UPDATE NOTES AND GROUNDING ARRANGEMENTS		1/22/16	HCS	
2	GENERAL REVISIONS		3/10/17	HCS	

HCS Engineering Company, Inc.
DECATUR, ALABAMA (256) 353 - 1972

SAFE-T-SHELTER ®
SAFE ROOMS & STORM SHELTERS

PROJECT

MATERIAL / SURFACE COAT

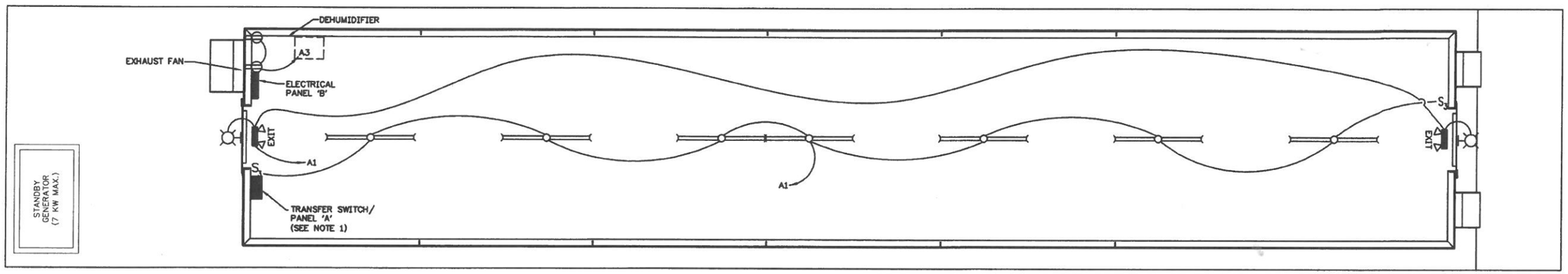
SCALE: 3/8"=1'-0"

DRAWN BY: D. STOVER

APPROVED BY

TITLE: SINGLE 10x56 SHELTER UNIT
ELECTRICAL POWER & GROUNDING PLAN & DETAILS

DATE: 06/04/15 | SIZE: D | DRAWING NUMBER: D-11056-E1 | REV: 2



SHELTER LIGHTING AND RECEPTACLE PLAN

LEGEND

- 4' FLUORESCENT STRIP LIGHT W/ WIRE GUARD
- EXIT SIGN W/ LIGHTS
- OUTDOOR, WALL MTD. LIGHT
- S_3 THREE-WAY SWITCH
- XX HOME RUN CONDUIT (CIRCUIT NUMBER)
- DUPLEX RECEPTACLE

NOTES:

1. TRANSFER SWITCH/PANEL 'A' TO BE INSTALLED AFTER SHELTER IS SET IN PLACE.

ALABAMA MANUFACTURED HOUSING COMMISSION
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Daniel G. White
7/9/2023

ALABAMA LICENSED NO. 22480 PROFESSIONAL ENGINEER JOHN F. CONWAY
7/10/17

HCS Engineering Company, Inc.
DECATUR, ALABAMA (256) 353 - 1972

HCS JOB NUMBER: 14100001

REV.	DESCRIPTION	ECN #	DATE	BY	CK
0	ORIGINAL ISSUE (JFC/DRS)		06/04/15	HCS	
1	CHANGE CIRCUIT ASSIGNMENTS		1/22/16	HCS	
2	GENERAL REVISIONS		3/18/17	HCS	

SAFE-T-SHELTER®
SAFE ROOMS & STORM SHELTERS

PROJECT

MATERIAL / SURFACE COAT

SCALE: 3/8"=1'-0"

DRAWN BY: D. STOVER

APPROVED BY

TITLE: SINGLE 10x56 SHELTER UNIT
ELECTRICAL LIGHTING & RECEPTACLE PLAN

DATE	SIZE	DRAWING NUMBER	REV
06/04/15	D	D-11056-E2	2

DIRECTORY	LOAD–WATTS L1	LOAD–WATTS L2	No.	AMPS		AMPS	NO.	LOAD–WATTS L1	LOAD–WATTS L2	DIRECTORY
LIGHTS (EXIT, INSIDE & OUTSIDE)	500		1	15		15	2			SPARE
RECEPTACLES (FAN & DEHUMIDIFIER)		1100	3	20		15	4			SPARE
SPARE			5	20		20	6			SPARE
SPARE			7	20		30	8			SPARE
SPARE			9	30		30	10			SPARE
SUB TOTAL WATTS	500	1100			N			–	–	SUB TOTAL WATTS
240/120V 1–PH 3–WIRE	TOTAL WATTS, L1					500				PANEL 'A' ATS PANEL
MAIN LUG ONLY	TOTAL WATTS, L2					1100				
CIRCUIT INTERRUPTING CAPACITY: 10,000 SYM–AMPS	TOTAL WATTS					1600				

DIRECTORY	LOAD–WATTS L1	LOAD–WATTS L2	No.	AMPS		AMPS	NO.	LOAD–WATTS L1	LOAD–WATTS L2	DIRECTORY
MAIN BREAKER – BACK FED			1	100		40	2	500		ATS NORMAL POWER
			3	100		40	4		1100	
FUTURE			5	–		–	6			FUTURE
FUTURE			7	–		–	8			FUTURE
FUTURE			9	–		–	10			FUTURE
FUTURE			11	–		–	12			FUTURE
SUB TOTAL WATTS	–	–			N			500	1100	SUB TOTAL WATTS
240/120V 1–PH 3–WIRE	TOTAL WATTS, L1					500				PANEL 'B' NORMAL SOURCE PD PANEL
100A THERMAL–MAGNETIC MAIN BREAKER	TOTAL WATTS, L2					1100				
CIRCUIT INTERRUPTING CAPACITY: 10,000 SYM–AMPS	TOTAL WATTS					1600				

8KW GENERATOR
RATED 7KW NAT. GAS
1.0 P.F. (7KVA), 240/120V

35A

BOND TO FRAME

#2/0 BARE TO GND WELL

#6 (BLK)
#6 (BLK)
#6 (WHT)
#6 (GRN)

NEUT. BUS
GND BUS

UTIL. SENSE – N1 – #18 (YEL)
UTIL. SENSE – N2 – #18 (YEL)
LOAD SENSE – T1 – #18 (WHT)

6–#18 (CONTROLS)

COMMON ALARM – 209
COMMON ALARM – 210
DC COMMON – 0 – (BLK)
+12VDC – 194 – (RED)
CONTROL TRANSFER – 23 – (WHT)

1–1/2" PVC (CN–2)

PANEL 'A'
50A AUTOMATIC TRANSFER SWITCH
(INSIDE SHELTER)

UTIL. SENSE – F1 – N1 – #18 (YEL)
UTIL. SENSE – F2 – N2 – #18 (YEL)
LOAD SENSE – F3 – T1 – #18 (WHT)
FUSES

+12VDC – TR1–8 – 194 – BLK – RED
CONTROL XFER – TR1–7 – 23 – WHT
TIMER RELAY

E1 – #6 (BLK)
N1 – TO ATS CB'S
E2 – #6 (BLK)
N2 – TO ATS CB'S

#6 (GRN)

BOND TO FRAME

#2/0 BARE TO GND WELL

CUSTOMER ELECTRICAL SUPPLY
10,000 AMP MAX AVAILABLE
SHORT CIRCUIT CURRENT

100A

1–1/2" PVC (CN–1)

#2 (BLK)
#2 (BLK)
#2 (WHT)
#6 (GRN)

NEUT. BUS
GND BUS

PANEL 'B'
(INSIDE SHELTER)

MAIN 100A
FEEDER BRKR 40A

1" PVC (CN–3)

#6 (BLK)
#6 (BLK)
#6 (WHT)
#6 (GRN)

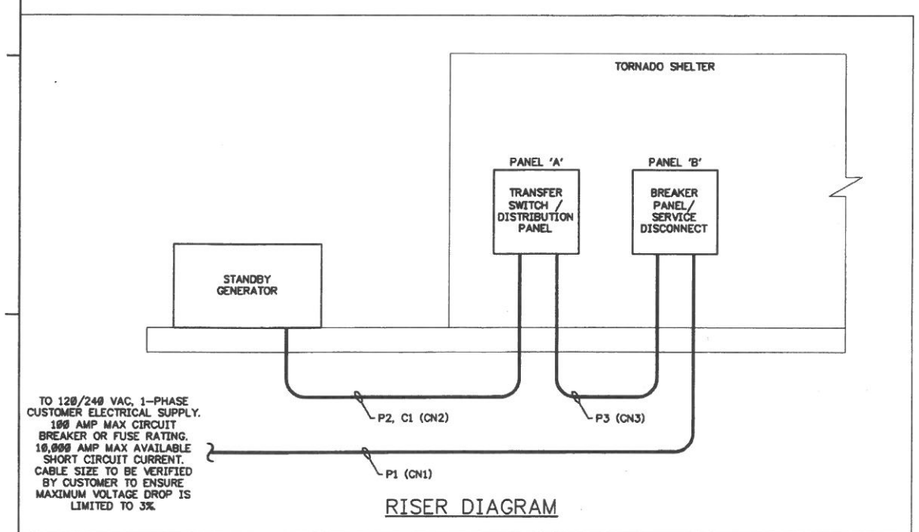
NEUT. BUS
GND BUS

#6 (GRN)

NEUTRAL & GND BUS TO BE ISOLATED, REMOVE FACTORY BONDING JUMPER

CONNECT GROUND WIRE TO GROUND LUG ON ENCLOSURE. FASTEN ENCLOSURE TO SHELTER FRAME THROUGH GROUND LUG WITH ¼" X 14 SELF TAPPING SCREW.

WIRING DIAGRAM



RISER DIAGRAM

ALABAMA MANUFACTURED HOUSING COMMISSION
These MODULAR PLANS are approved and deemed To comply with all ordinances or regulations enacted by any local government. (AL Act No. 81-706)
Daniel G. White
7/9/2023

ALABAMA LICENSED NO. 22480 PROFESSIONAL ENGINEER JOHN F. CONWAY 3/16/17

HCS Engineering Company, Inc.
DECATUR, ALABAMA (256) 353 - 1972

HCS JOB NUMBER: 14100001

REV.	DESCRIPTION	C.C.S. #	DATE	BY	CK
0	ORIGINAL ISSUE (DRS/JFC)		05/04/15	HCS	
1	REVISE NOTES, GROUNDING DETAILS AND CIRCUIT ASSIGNMENTS		1/22/16	HCS	
2	GENERAL REVISIONS		3/10/17	HCS	

SAFE-T-SHELTER®
SAFE ROOMS & STORM SHELTERS

PROJECT

MATERIAL: SURFACE COAT
SCALE: NONE
DRAWN BY: D. STOVER
APPROVED BY:

TITLE: SINGLE 10x56 SHELTER UNIT
ELECTRICAL RISER AND WIRING DIAGRAMS

DATE	SIZE	DRAWING NUMBER	REV
06/04/15	D	D-11056-E3	2

CONDUIT SCHEDULE						
CONDUIT NO.	CONDUIT SIZE	CONDUCTORS	FUNCTION	FROM	TO	CIRCUITS
CN1	1-1/2" SCH 40 PVC	3-#2 w/#6 GND	100 AMP BUILDING FEEDER (BY CUSTOMER)	PNL (BY CUSTOMER)	PANEL 'B'	P1
CN2	1-1/2" SCH 40 PVC	3-#6 w/#6 GND, 6-#18 VENDOR CONTROL CABLE	AUTOMATIC TRANSFER SWITCH (ATS) EMERGENCY SOURCE	GENERATOR	ATS/PANEL 'A'	P2, C1
CN3	1" SCH. 40 PVC	3-#6 w/GND,	AUTOMATIC TRANSFER SWITCH (ATS) NORMAL SOURCE	PANEL 'B'	ATS/PANEL 'A'	P3

CIRCUIT SCHEDULE					
CIRCUIT	WIRE SIZE DATA	DESCRIPTION	FROM	TO	REMARKS/ROUTING
P1	3-#2 w/ #6 GND	100 AMP BUILDING SUPPLY	PNL (BY CUSTOMER)	PANEL 'B'	CN-1, 1 1/2" PVC TO NEW STORM SHELTER
P2	3-#6 w/ #6 GND	AUTOMATIC TRANSFER SWITCH (ATS) EMERGENCY SOURCE	GENERATOR	ATS/PANEL 'A'	CN-2, 1 1/2" PVC, GENERATOR TO ATS
P3	3-#6 w/ #6 GND	AUTOMATIC TRANSFER SWITCH (ATS) NORMAL SOURCE	PANEL 'B'	ATS/PANEL 'A'	CN-3, 1" PVC
C1	6-#18 VENDOR CONTROL CABLE	GENERATOR/ATS CONTROL CABLE AND UTIL SENSE	GENERATOR	ATS/PANEL 'A'	CN-2, 1 1/2" PVC, GENERATOR TO ATS

EQUIPMENT SCHEDULE	
1	STANDBY GENERATOR, 8KW 120/240V, 1-PHASE, NATURAL GAS OR LP OPERATION, WEATHER PROTECTIVE HOUSING, LCD DISPLAY CONTROL PANEL, 35 AMP MAIN CIRCUIT BREAKER, INCLUDES 50 AMP PRE-WIRED AUTOMATIC TRANSFER SWITCH/BREAKER PANEL. GENERAC MODEL 006237-0 (8 KW).
2	AUTOMATIC TRANSFER SWITCH (INCLUDED WITH ITEM 1), 50 AMP, 120/240V, WEEKLY EXERCISER TIMER, NEMA 1 ENCLOSURE, BREAKERS TO BE RATED AT 10,000 AIC. SEE PANEL SCHEDULE FOR BRANCH CIRCUIT BREAKER REQUIREMENTS.
3	LOAD CENTER, 100 AMP, 120/240V, 12-POSITION, 1- PHASE, 3-WIRE, NEMA TYPE 1 PANEL BOARD, FACTORY INSTALLED GROUND BUS, APPROVED FOR SERVICE ENTRANCE WHEN WIRED PER NEC, BREAKERS TO BE RATED AT 10,000 AIC, INCLUDES 100 AMP 2-POLE MAIN BREAKER, 1-40 AMP 2-POLE BRANCH CIRCUIT BREAKER, SPARE SPACES TO REMAIN COVERED. GE MODEL # TM1210CCUG1K WITH THQL BREAKERS OR EQUAL. PANEL DOOR TO BE PERMANENTLY LABELED "SERVICE DISCONNECT". SEE PANEL SCHEDULE FOR BRANCH CIRCUIT BREAKER REQUIREMENTS.
4	LIGHT FIXTURE. FLOURESCENT LUMINAIRE, SURFACE MOUNT, 120V BALLAST, 2-32 WATT T8 LAMPS, DSS (DIVERSE SUPPLY SOLUTIONS) MODEL # S232 OR EQUAL.
5	OUTSIDE LIGHT, 120V, 13 WATT CFL LAMP, DUSK TO DAWN AUTOMATIC LIGHT CONTROL, RATED FOR OUTDOOR USE, UTILITECH MODEL GU6813-BZ-I OR EQUAL.
6	EXIT SIGN, COMBINATION SIGN/LIGHT, 120V, DUAL LAMPS, NICAD BACKUP BATTERY, COOPER LIGHTING MODEL # APC7R OR EQUAL
7	DUPLEX RECEPTACLE, SPECIFICATION GRADE DUPLEX AND DUPLEX/GFI RECEPTACLES LEVITON 5362/5362GF SERIES OR EQUAL
8	WALL SWITCH, SPECIFICATION GRADE 2 AND 3-WAY SWITCH, LEVITON 1221/1223 SERIES OR EQUAL.
9	VENTILATION FAN, 24", 115 VOLT, 1-PHASE, 60 HZ, 1.8 AMP, 2-SPEED, 1/8 HP MOTOR, CFM @ 0.0"SP (HI/LOW): 5850/3475, CFM @ 0.05"SP (HI): 5560, RPM(HI/LOW): 1200/900, INCLUDES CHROME INLET GUARD AND OUTLET SHUTTERS, 9' SWITCHED CORD AND PLUG, USE J & D MANUFACTURING PART NO. VPE24C OR EQUAL.

GENERAL NOTES:

WIRE AND CABLE:

1. WIRE AND CABLE TYPES:

   INSULATED WIRE: 600 VOLT, SINGLE CONDUCTOR, 75°C MIN. INSULATION RATING, POWER CABLE, NEC TYPE THHN/THWN. CONDUCTOR: CLASS B COPPER, INSULATION: POLYVINYL CHLORIDE "PVC", CONDUCTOR JACKET: NYLON.

   BARE WIRE: CLASS B COMPRESSED CONCENTRIC-LAY-STRANDED, SOFT DRAWN, COPPER CONDUCTORS.

2. CONNECTORS: ALL CONNECTORS SHALL BE DESIGNED AND SIZED FOR SPECIFIC CABLE BEING CONNECTED AND SHALL BE SOLDERLESS, PRESSURE-TYPE CONNECTORS CONSTRUCTED OF NON-CORRODIBLE TIN-PLATED COPPER. THE RATED CURRENT-CARRYING CAPACITY SHALL BE EQUAL TO OR GREATER THAN THE CABLE BEING CONNECTED.

   POWER CONNECTORS (10 AWG AND SMALLER): "SCOTCHLOK" PRE-INSULATED SPRING WIRE CONNECTORS. BUCHANAN OPEN-END COPPER SPLICING CAPS, APPLIED WITH COMPATIBLE TOOL, WITH NYLON SNAP-ON INSULATORS.

   POWER CONNECTORS (SIZES 8-4 AWG): NON-INSULATED RING-TONGUE TYPE. RING TONGUE SIZED TO MATCH TERMINAL STUD SIZE. BRAZED BARREL SEAM. APPLICATION TOOLING DESIGNED TO CRIMP THE WIRE BARREL (CONDUCTOR GRIP) WITH A ONE-STEP CRIMP.

   POWER CONNECTORS (SIZES 2 AWG - 750 MCM): NON-INSULATED ONE-HOLE RECTANGULAR TONGUE FOR SIZES 2 AWG THROUGH 3/0 AWG AND TWO-HOLE RECTANGULAR TONGUE FOR 4/0 AWG THROUGH 750 MCM.

   CONTROL, INSTRUMENT, AND SPECIALTY CABLE CONNECTORS: TIN-PLATED COPPER. VINYL OR NYLON PRE-INSULATED RING-TONGUE TYPE PREFERRED. FLAT SPADE LUGS WILL NOT BE PERMITTED. VINYL PRE-INSULATED SPRING-TYPE SPADE TERMINALS; HOLLINGSWORTH "MINI SPRING SPADES"; THOMAS AND BETTS "LOCKING-FORK"; PANDUIT "LOCKING-FORK" SIZED TO MATCH TERMINAL STUD SIZE ARE ACCEPTABLE.

   GROUNDING CONNECTIONS: ALL GROUNDING SURFACES SHALL BE CLEANED TO OBTAIN "BRIGHT" METAL AT ALL POINTS OF CONTACT.

3. CABLE TIES: CABLE TIES SHALL BE NYLON SELF-LOCKING TYPE, HAVE A NORMAL SERVICE TEMPERATURE RANGE OF -40C TO 85C, BE WEATHER-RESISTANT TYPE FOR OUTDOOR. USE AMP SPECIAL INDUSTRIES "AMP-TY," DENNISON MANUFACTURING COMPANY "BAR-LOK," PANDUIT CORPORATION "PAN-TY," THOMAS & BETTS "TY-RAP," OR MINNESOTA MINING AND 3M BRAND CABLE TIES.

4. TERMINAL BLOCKS:

   MOUNTING IN TERMINAL BOXES: BLOCKS TO BE DESIGNED AND SIZED FOR THE CABLES BEING TERMINATED AND RATED 600V. PROVIDE BINDING SCREW-TYPE TERMINALS FOR POWER CABLES AND STRAP SCREW OR TUBULAR CLAMP TERMINALS FOR CONTROL AND INSTRUMENT CABLES. THE RATED CURRENT CARRYING CAPACITY SHALL BE EQUAL TO OR GREATER THAN THE CABLE BEING TERMINATED.

   MOUNTING IN CABINETS, PANELS, CONTROL BOARDS, ETC.: BLOCKS TO BE DESIGNED AND SIZED FOR THE CABLES BEING TERMINATED AND RATED 600V. PROVIDE BINDING SCREW TYPE TERMINALS FOR POWER CABLES. THE RATED CURRENT CARRYING CAPACITY SHALL BE EQUAL TO OR GREATER THAN THE CABLE BEING TERMINATED. PROVIDE MARKING STRIP ON BLOCKS FOR POWER CABLES AND CONTROL CABLES.

5. WIRE AND CABLE INSTALLATION: DO NOT SUBJECT CABLE TO PULLING TENSIONS OR SIDEWALL PRESSURES IN EXCESS OF MANUFACTURER'S RECOMMENDATIONS. ATTACH PULLING GRIPS OVER THE CABLE SHEATH TO PREVENT SLIPPING OF THE INSULATION. DO NOT SUBJECT CABLE TO BENDING RADIUS LESS THAN THOSE RECOMMENDED BY THE CABLE MANUFACTURER OR (WHICHEVER IS GREATER) EIGHT TIMES THE CABLE OUTSIDE DIAMETER DURING OR AFTER INSTALLATION. INSTALL INTERMEDIATE SPLICES ONLY AS INDICATED OR AS APPROVED BY OWNER OR OWNER REPRESENTATIVE. SUPPORT CABLES AT CONNECTIONS OR TERMINATION POINTS SUCH THAT ANY STRAIN ON CABLE WILL NOT BE TRANSMITTED TO THE CONNECTION OR TERMINATION. INSTALL CABLE SUPPORTS IN VERTICAL RUNS OF CONDUIT AT BOXES AND AT TERMINATIONS IN EQUIPMENT, AND AS REQUIRED TO MEET INTERMEDIATE SUPPORT REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC). ALL PULLING COMPOUNDS SHALL BE APPROVED BY WIRE AND CABLE MANUFACTURER AS BEING COMPATIBLE WITH CABLE MATERIALS. ATTACH A CABLE IDENTIFICATION TAG TO EACH CABLE AT ALL TERMINATION OR END POINTS.

6. POWER, CONTROL, INSTRUMENT AND SPECIALTY CABLE: INSTALL METALLIC BARRIER IN ALL BOXES TO SEPARATE POWER AND CONTROL FROM LOW-LEVEL SIGNAL (50V OR LESS) INSTRUMENTATION CIRCUITS WHERE RUN IN THE SAME BOX.

   TERMINATE AND GROUND, CONTROL, INSTRUMENT, AND SPECIALTY CABLE SHIELDS AS INDICATED AND RECOMMENDED BY THE MANUFACTURER OF THE EQUIPMENT BEING CONNECTED. IN GENERAL, GROUND THE SHIELDS AT THE CONTROL BOARDS FOR CONTROL CABLES AND AT THE RECEIVING END EQUIPMENT FOR INSTRUMENTATION AND SPECIALTY CABLES.

CONDUIT

GENERAL NOTES:

1. RIGID STEEL CONDUIT: THE CONDUIT SHALL CONFORM TO ANSI C80.1 AND SHALL BE MILD DUCTILE STEEL, CIRCULAR IN CROSS SECTION WITH UNIFORM WALL THICKNESS SUFFICIENTLY ACCURATE TO CUT CLEAN THREADS. EACH LENGTH SHALL BE THREADED ON BOTH ENDS WITH THREADS PROTECTED. ALL SCALE, GREASE, DIRT, BURRS AND OTHER FOREIGN MATTER SHALL BE REMOVED FROM INSIDE AND OUTSIDE PRIOR TO APPLICATION OF COATING MATERIALS. THE CONDUIT SHALL BE GALVANIZED BY THE HOT-DIP PROCESS AS FOLLOWS: INTERIOR AND EXTERIOR SURFACES COATED WITH A SOLID-UNBROKEN LAYER OF 99% VIRGIN ZINC BY DIPPING. COATING SHALL NOT SHOW FIXED DEPOSITS OF COPPER AFTER FOUR 1-MINUTE IMMERSIONS IN A STANDARD COPPER SULFATE SOLUTION. ONE COAT OF ZINC CHROMATE FINISH ON INSIDE AND OUTSIDE SURFACES TO PREVENT OXIDATION AND WHITE RUST. THE COUPLINGS AND ELBOWS SHALL BE FABRICATED, COATED AND FINISHED BY THE SAME PROCESS AS CONDUIT.

2. RIGID POLYVINYL CHLORIDE (PVC) CONDUIT: THE CONDUIT SHALL BE FABRICATED FROM SELF-EXTINGUISHING HIGH IMPACT POLYVINYL CHLORIDE DESIGNED FOR ABOVEGROUND AND UNDERGROUND INSTALLATIONS. USE TYPE EPC SCHEDULE 40 HEAVY-WALL RIGID CONDUIT. FITTINGS AND ACCESSORIES SHALL BE FABRICATED FROM SAME MATERIAL AS CONDUIT. PROVIDE SOLVENT-CEMENT-TYPE JOINTS AS RECOMMENDED BY MANUFACTURER.

3. RIGID STEEL CONDUIT FITTINGS: HEAVY-DUTY CAST MALLEABLE IRON FITTINGS: MOGUL TYPE FOR CONDUIT SIZES 1-1/2 INCHES AND LARGER. LBD OR ROLLER ACTION TYPE LB FOR RIGHT ANGLE FITTINGS FOR CONDUIT SIZES 2 INCHES AND LARGER. FULL-THREADED HUBS AND RUBBER-GASKETED COVERS. PROVIDE ZINC, CADMIUM-PLATED OR BRONZE HARDWARE BOLTS AND SCREWS FOR ASSEMBLY. FINISH WITH CADMIUM-PLATED OR GALVANIZING.

4. INDOOR AND OUTDOOR BOXES: PROVIDE FS OR RS TYPE JUNCTION BOXES WITH CADMIUM ZINC ELECTROPLATE AND HOT-DIP GALVANIZED FINISH. COVER SHALL BE FASTENED WITH CADMIUM-PLATED BOLTS. PROVIDE THREADED CONDUIT ENTRANCE HUBS ON ALL BOXES. PROVIDE RUBBER OR NEOPRENE GASKET FOR COVER AND HUBS (NEMA TYPE 4 ENCLOSURE). CONFORM TO NEMA TYPE 4 ENCLOSURE. PROVIDE FOR THE ISOLATION OF POWER CIRCUITS FROM OTHER TYPE CIRCUITS.

5. ELECTRICAL BOXES (LESS THAN 100 CU. IN.): METALLIC OUTLET BOXES SHALL CONFORM TO ANSI/UL514A.

6. ELECTRICAL SPLICE BOXES (GREATER THAN 100 CU. IN.): METALLIC SPLICE BOXES SHALL CONFORM TO UL50, TYPE 1.

7. SUPPORT SYSTEM: FABRICATED FROM MANUFACTURED FRAMING MEMBERS EQUAL TO "UNISTRUT" P-3000 SERIES AS MANUFACTURED BY UNISTRUT CORPORATION. CONSTRUCT AS REQUIRED TO RIGIDLY SUPPORT ALL CONDUIT RUNS AND BOXES. PROVIDE CONDUIT CLAMPS, SIZED FOR THE SPECIFIC CONDUIT SIZE, TO SUPPORT ALL EXPOSED METALLIC CONDUIT. PROVIDE NONMAGNETIC CLAMPS TO SUPPORT NONMETALLIC CONDUITS. PROVIDE STEEL RODS, ANCHORS, INSERTS, BOLTS, WASHER, NUTS AND ALL OTHER SUPPORT HARDWARE.

8. INSTALLATION: PROVIDE SUITABLE PROTECTION FOR CONDUIT RISERS AGAINST DAMAGE DURING CONSTRUCTION. CAP ENDS OF ALL CONDUITS BEFORE CONCRETE IS POURED. CAP ALL CONDUITS AFTER CLEANING WHERE CONDUITS ARE TO BE LEFT EMPTY BY THIS CONTRACT. CAREFULLY REAM ENDS OF ALL CONDUIT LENGTHS AFTER CUTTING TO ELIMINATE SHARP BURRS. CLEAN OUT ALL CONDUIT BEFORE PULLING WIRE. CLEAN OUT ALL CONDUITS IMMEDIATELY AFTER CONCRETE WORK IS FINISHED. SHIFT LOCATIONS AS REQUIRED TO AVOID INTERFERENCE WITH OTHER EQUIPMENT AND PIPING BEING INSTALLED.

9. HOLES AND SLEEVES: PROVIDES THROUGH FLOORS, WALLS AND ROOFS AS NECESSARY FOR CONDUIT RUNS, INCLUDING APPROVED FLASHING AND WEATHER PROOFING AT OUTSIDE WALLS AND ON ROOFS. INSTALL SLEEVES OR FORMS FOR ALL OPENINGS IN NEW WORK. PROVIDE THE REQUIRED INSERTS AND HOLES, COMPLETELY SLEEVED, BONDED, CURBED, FLASHED AND FINISHED OFF IN AN APPROVED MANNER, WHETHER IN CONCRETE, STEEL GRATING, METAL PANELS OR ROOFS. MAKE CONNECTIONS TO BOXES, PANELS, AND OTHER EQUIPMENT AS FOLLOWS: MYERS SCREW-TIGHT HUBS OR EQUIVALENT THREADED HUBS FOR ALL OUTDOOR CONDUIT ENTRANCES. ENTER FROM BOTTOM OF ENCLOSURE OR EQUIPMENT UNLESS PHYSICALLY NOT POSSIBLE. RUNNING THREADS WILL NOT BE PERMITTED. COAT ALL FIELD CUT THREADS IN GALVANIZED CONDUIT WITH COLD GALVANIZE PAINT. COMPLY WITH APPLICABLE REQUIREMENTS OF NEC PERTAINING TO INSTALLATION OF CONDUIT SYSTEMS. PLACE DRAINAGE FITTINGS OR WEEP HOLES AT UNAVOIDABLE LOW POINTS WHERE MOISTURE CAN COLLECT. INSTALL AN ENTIRE CONDUIT SYSTEM THAT IS ELECTRICALLY CONTINUOUS WITH BONDING JUMPERS PROVIDED AS NECESSARY TO CONFORM TO NEC. ALL CONDUIT RUNS SHALL HAVE A METAL TAG ATTACHED ON EACH END 12 INCHES OR LESS FROM THE END WITH AN IDENTIFICATION NUMBER. ALL SPARE CONDUITS SHALL HAVE A 200-POUND NYLON PULL ROPE INSTALLED INSIDE AND BE CAPPED FOR FUTURE USE.

10. EXPOSED CONDUIT INSTALLATION: INSTALL HORIZONTAL RUNS AS HIGH ABOVE FLOOR AS POSSIBLE, AND IN NO CASE LOWER THAN 7 FEET ABOVE FLOOR, WALKWAY, OR PLATFORM IN PASSAGE AREA. RUN CONDUIT PARALLEL OR PERPENDICULAR TO WALLS, CEILING, BEAMS AND COLUMNS UNLESS INDICATED OTHERWISE. ROUTE TO CLEAR ALL DOORS, WINDOWS, ACCESS WELLS, AND OPENINGS. GROUP PARALLEL RUNS IN NEATLY ALIGNED BANKS WHERE POSSIBLE WITH MINIMUM OF 1-INCH CLEARANCE BETWEEN CONDUITS. MAINTAIN 6-INCH CLEARANCE BETWEEN CONDUIT AND COVERINGS ON LINES; STEAM, HOT WATER, ETC. DO NOT EXCEED A DISTANCE OF 8 FEET BETWEEN SUPPORTS ON HORIZONTAL OR VERTICAL RUNS.

11. CONCEALED CONDUIT INSTALLATION: CONCEAL CONDUIT FOR LIGHTING, CONVENIENCE OUTLETS, AND OTHER CIRCUITS IN WALLS, CEILING AND FLOORS WHERE POSSIBLE. CONCEALED CONDUIT SHALL BE RIGID STEEL IF NOT EMBEDDED IN CONCRETE AND PVC SCHEDULE 40 IF EMBEDDED IN CONCRETE. DO NOT INSTALL CONDUIT IN CONCRETE WHERE CONDUIT OUTSIDE DIAMETER EXCEEDS ONE-THIRD OF CONCRETE THICKNESS. USE EXPANSION AND DEFLECTION FITTING WITH BONDING JUMPERS AT ALL CONCRETE EXPANSION JOINTS. TIE SECURELY IN PLACE TO PREVENT MOVEMENT WHEN CONCRETE IS POURED. INSTALL IN FLOOR SLABS IN AS STRAIGHT A RUN AS POSSIBLE. CONDUIT CROSSOVERS ARE NOT PERMITTED UNLESS CONDUIT TOTAL OUTSIDE DIAMETER IS ONE-THIRD OF THE CONCRETE THICKNESS OR LESS. USE LONG RADIUS ELBOWS EXCEPT ON RISERS WHERE CURVED PORTION OF ELBOW WOULD EXTEND ABOVE THE FINISHED FLOOR OR FOUNDATION. PVC CONDUIT EMBEDDED IN CONCRETE SHALL TRANSITION TO RIGID GALVANIZED STEEL FOR ALL 90-DEGREE ELBOWS AND BEFORE TURNING EXPOSED. MAKE ALL JOINTS WATERTIGHT AFTER INSTALLATION BY COATING ALL FINISHED JOINTS WITH COAL TAR SOLUTION APPLIED AT 15 MILS MINIMUM DRY FILM.

12. BURIED CONDUIT INSTALLATION: USE SCH 40 PVC CONDUIT. INSTALL IN AS STRAIGHT A RUN AS POSSIBLE BETWEEN TERMINATION POINTS. BURY CONDUITS AS MINIMUM OF 30 INCHES BELOW FINISH GRADE UNLESS INDICATED OTHERWISE. SLOPE CONDUIT AWAY FROM CONDUIT RISERS WHERE POSSIBLE. MAINTAIN 6-INCH SEPARATION FROM UNDERGROUND PIPING. USE LONG RADIUS BENDS AT ALL RISERS UNLESS INDICATED OTHERWISE. AFTER TRENCH BOTTOM HAS BEEN FINISHED TO GRADE, LAY CONDUIT. CAP ENDS OF ALL CONDUIT RISERS BEFORE BACKFILLING. PROVIDE WATERTIGHT SEAL AROUND WIRES WHERE CONDUIT TERMINATES IN PULL BOX.

11. CONDUIT FITTINGS INSTALLATION: INSTALL SPECIAL BOXES AS INDICATED FOR SIZE REQUIRED FOR CONDUITS AND CABLES ENTERING AND LEAVING BOX. INSTALL WHERE REQUIRED FOR PULL OR JUNCTION BOXES AND FOR MOUNTING OR CONNECTING TO SWITCHES, OUTLETS, INTERMEDIATE TERMINAL BLOCKS OR CONTROL DEVICES. PROVIDE 1/4-INCH WEEP HOLES IN INTERIOR BOXES WHERE CONDUITS ENTER FROM EXTERIOR OR BURIED INSTALLATION. CONSTRUCT SUPPORTS WITH SUFFICIENT RIGIDITY TO HOLD ALL MOUNTED EQUIPMENT AND MATERIAL IN PERMANENT AND NEAT ALIGNMENT. DESIGN SUPPORTS TO PROVIDE 1/4-INCH SPACE BETWEEN EQUIPMENT HOUSINGS AND WALLS OR COLUMNS UPON WHICH THEY ARE MOUNTED. DO NOT EXCEED LOAD REQUIREMENTS IN NEC AND NEMA STANDARDS.

LABELING

1. SERVICE EQUIPMENT SHALL BE LABELED WITH A CONSPICUOUS AND PERMANENT LABEL INDICATING AVAILABLE FAULT CURRENT AND DATE CALCULATED. LABEL AND FAULT CURRENT VALUE TO BE PROVIDED BY CUSTOMER.
2. THE CUSTOMER SHALL PROVIDE AND INSTALL A LABEL ON THE PANELBOARD DOOR WITH THE LOCATION, DEVICE OR EQUIPMENT THAT SUPPLIES POWER TO THE PANELBOARD.
3. PANELBOARD AND TRANSFER SWITCH DOORS TO BE LABELED WITH ARC-FLASH WARNING LABEL, BRADY CAT. NO. 94913 OR EQUAL.

ALABAMA LICENSED PROFESSIONAL ENGINEER JOHN F. CONWAY NO. 22480 2/17/2017

ALABAMA MANUFACTURED HOUSING COMMISSION
These MODULAR PLANS are approved and deemed To comply with all ordinances or regulations enacted by any local government. (AL Act No. 83-706)
Daniel G. White
7/9/2023

HCS Engineering Company, Inc.
DECATUR, ALABAMA (256) 353 - 1972

HCS JOB NUMBER: 14100001

REV.	DESCRIPTION	C.C.N. #	DATE	BY	CK.
0	ORIGINAL ISSUE (DRS/JFC)		12/18/14	HCS	
1	GENERAL REVISIONS (DRS/JFC)		5/21/15	HCS	
2	GENERAL REVISIONS (JFC)		2/22/17	HCS	

SAFE-T-SHELTER®
SAFE ROOMS & STORM SHELTERS

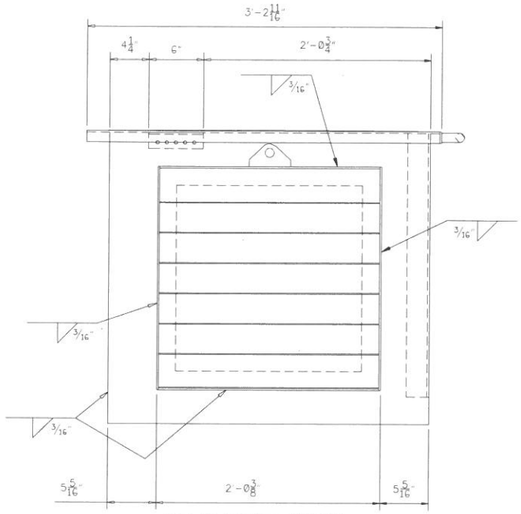
PROJECT

MATERIAL | SCALE: NONE | DRAWN BY: D. STOVER
SURFACE DAY | APPROVED BY:

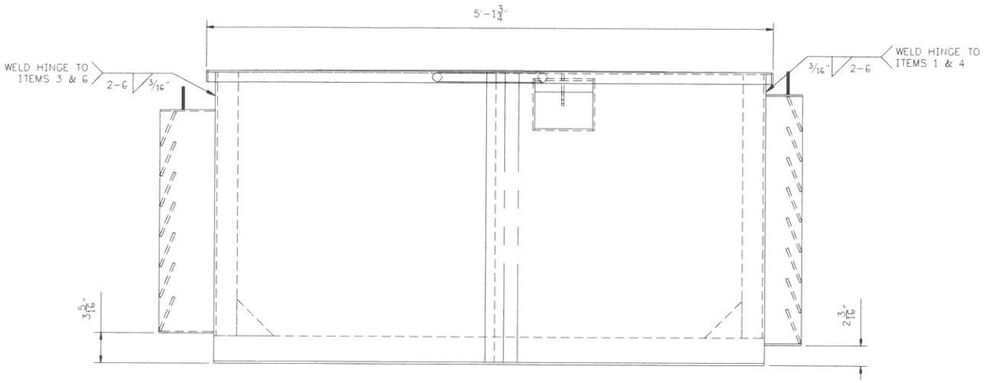
TITLE: ELECTRICAL NOTES AND SCHEDULES

DATE: 12/10/14 | SIZE: D | DRAWING NUMBER: D-NON-ESPEC | REV: 2

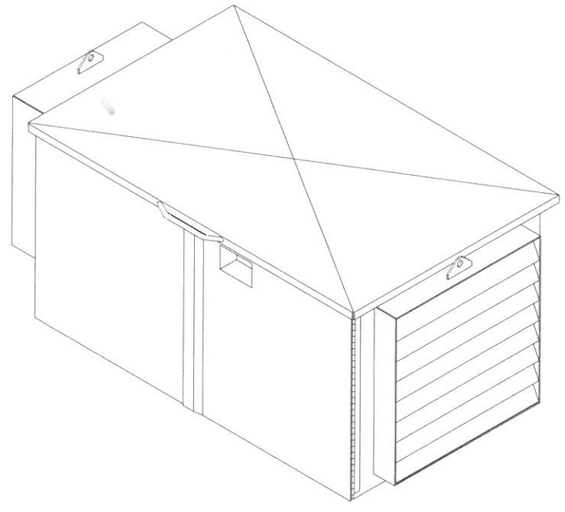
REV	DESCRIPTION	ECN #	DATE	DR	CK

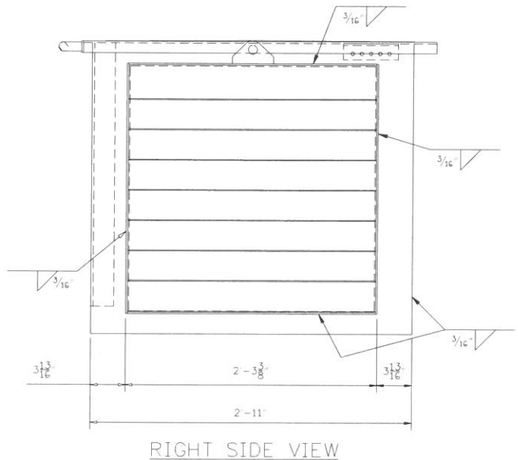


LEFT SIDE VIEW

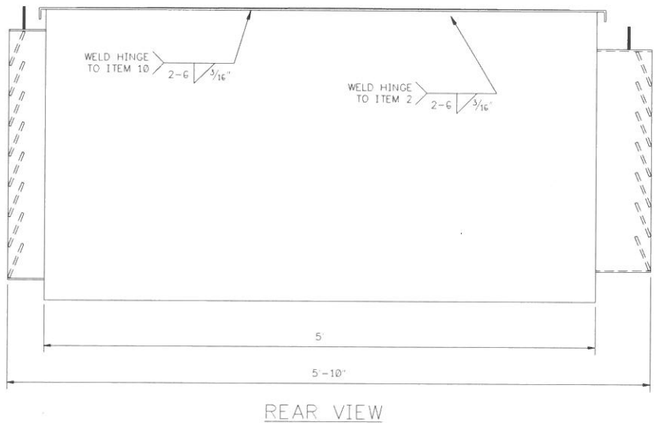


FRONT VIEW





RIGHT SIDE VIEW



REAR VIEW

GENERATOR BOX ASSEMBLY

SCALE: 1½" = 1'-0"

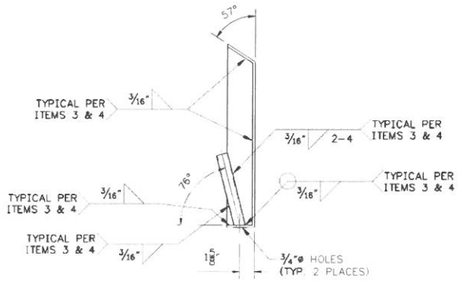
ALABAMA MANUFACTURED HOUSING COMMISSION
These MODULAR PLANS are approved and deemed To comply with all ordinances or regulations enacted by any local government. (AL Act No. 81-706)
Daniel G. White
7/9/2023

ALABAMA REGISTERED NO. 12307 PROFESSIONAL ENGINEER DONALD B. HEACOCK JR.
Donald B. Heacock
4/1/23

SAFE-T-SHELTER©
SAFE ROOMS & STORM SHELTERS

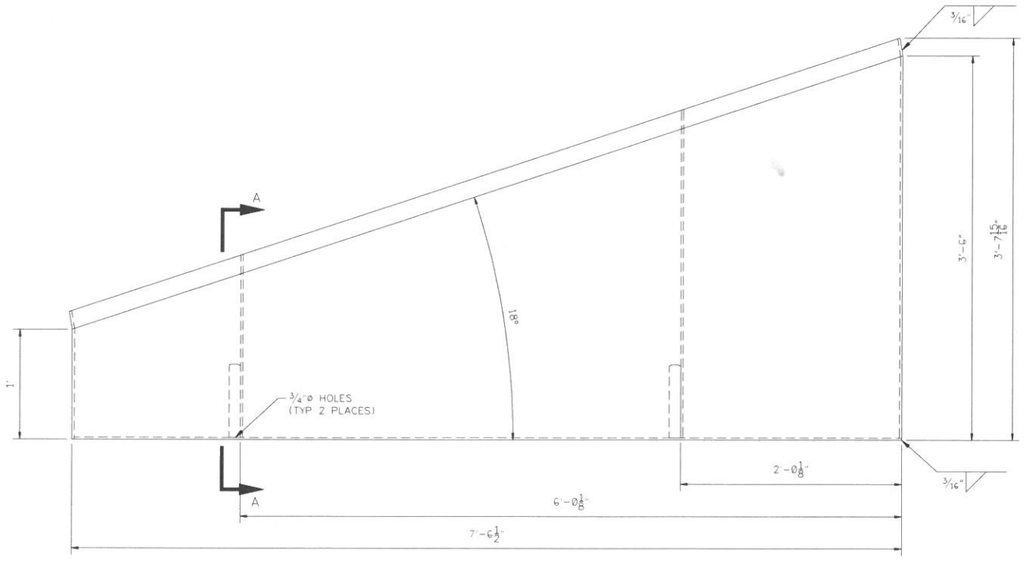
SUBJECT			
MATERIAL	SCALE: 1 1/2"=1'-0"	DRAWN BY:	
SURFACE CLIAT		APPROVED BY	
TITLE: OPTION 1 - GENERATOR SHOP DRAWING			
UNLESS OTHERWISE SPECIFIED: TOLERANCE EXCEPT AS NOTED — XXX ± .005, XX ± .020, X ± .040, FRACTION ± 1/16"	04/01/23	SIZE:	DRAWING NUMBER: STS1056 Page 11 — REV: 1

REV	DESCRIPTION	E.C.N. #	DATE	DR.	CK.



SECTION A-A

SCALE: 1½" = 1'-0"



OPTION 2 - WING ASSEMBLY

SCALE: 1½" = 1'-0"

ALABAMA REGISTERED NO. 12307 PROFESSIONAL ENGINEER DONALD B. HEICKLEN JR.

4/1/23

ALABAMA MANUFACTURED HOUSING COMMISSION

These MODULAR PLANS are approved and deemed To comply with all ordinances or regulations enacted by any local government. (AL Act No. 81-706)

Daniel G. White

7/9/2023

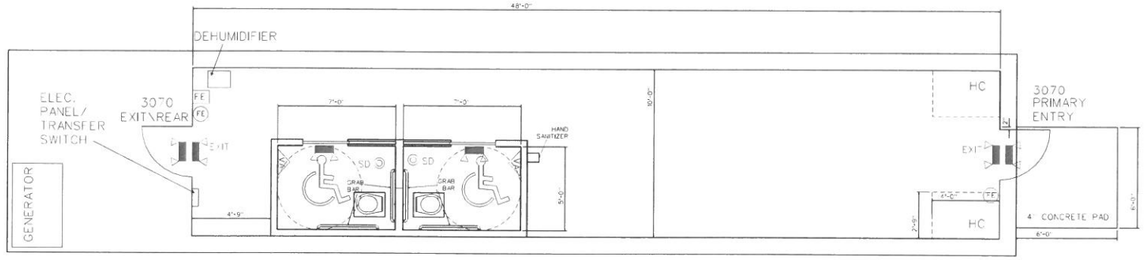
SAFE-T-SHELTER®
SAFE ROOMS & STORM SHELTERS

MATERIAL: SURFACE CUAT	SCALE: 1 1/2"=1'-0"	DRAWN BY:
		APPROVED BY:

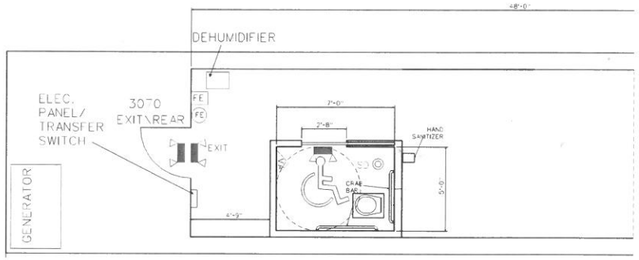
TITLE: OPTION 2 - WING WALL ASSEMBLY SHOP DRAWING

UNLESS OTHERWISE SPECIFIED TOLERANCE EXCEPT AS NOTED: XXX ± .005, XX ± .020, X ± .040, FRACTION ± 1/16"

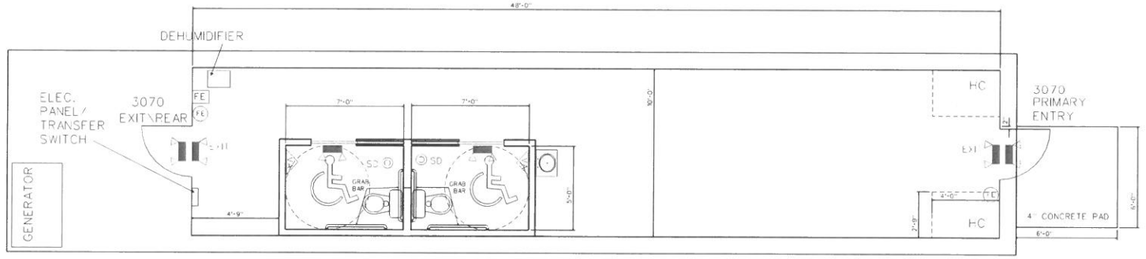
DATE	SIZE	DRAWING NUMBER	REV
04/01/23		STS1056 Page 12	1



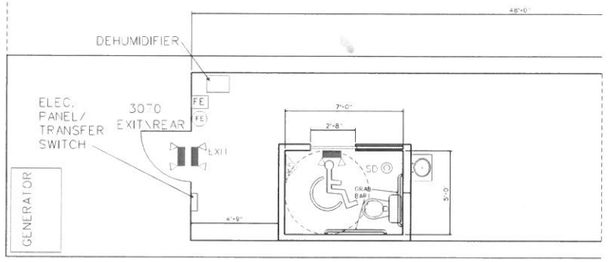
DOUBLE
CHEMICAL RESTROOM
FLOOR PLAN OPTION C
1/4"=1'-0"



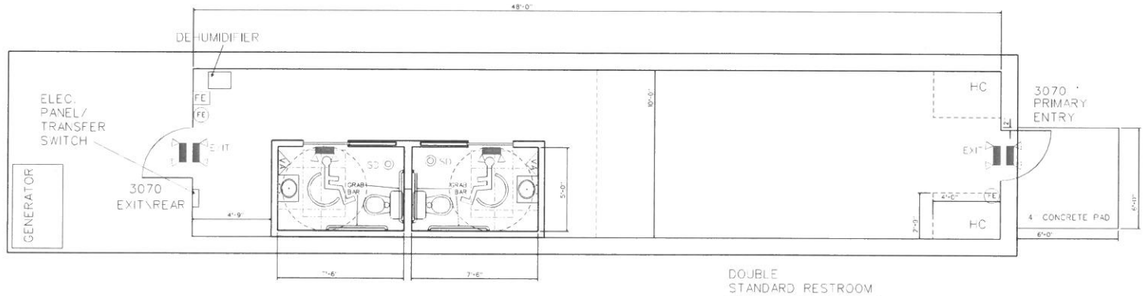
SINGLE
CHEMICAL RESTROOM
FLOOR PLAN OPTION C-1
1/4"=1'-0"



DOUBLE
STANDARD RESTROOM
FLOOR PLAN OPTION B
1/4"=1'-0"



SINGLE
STANDARD RESTROOM
FLOOR PLAN OPTION B-1
1/4"=1'-0"



DOUBLE
STANDARD RESTROOM
FLOOR PLAN OPTION A
1/4"=1'-0"

LIFE SAFTY LEGEND

- FE — FIRST AID KIT
- EXIT — EXIT SIGN WITH LIGHTS
- EMERGENCY LIGHTS
- VISUAL ALARM
- SD — SMOKE DETECTOR
- FE — FIRE EXTINGUISHER

Restroom(s) to be constructed at customer's site, after shelter has been delivered and anchored. Restroom(s) to be constructed by STS or others.

The construction for this safe room shall comply with the applicable provisions of FEMA Document 361, "Design and Construction Guidance for Community Shelters", March 2015 and ICC 500-2014. This safe room shall be designed to withstand tornado winds of 250 mph

The shelter shall comply with all applicable provisions of the 2010 ADA Standards for Accessible Design.

Occupancy Load per FEMA 361= 110 / 106 / 103

ALABAMA MANUFACTURED HOUSING COMMISSION
These MODULAR PLANS are approved and deemed To comply with all ordinances or regulations enacted by any local government. (AL Act No. 81-706)
Daniel G. White
7/9/2023

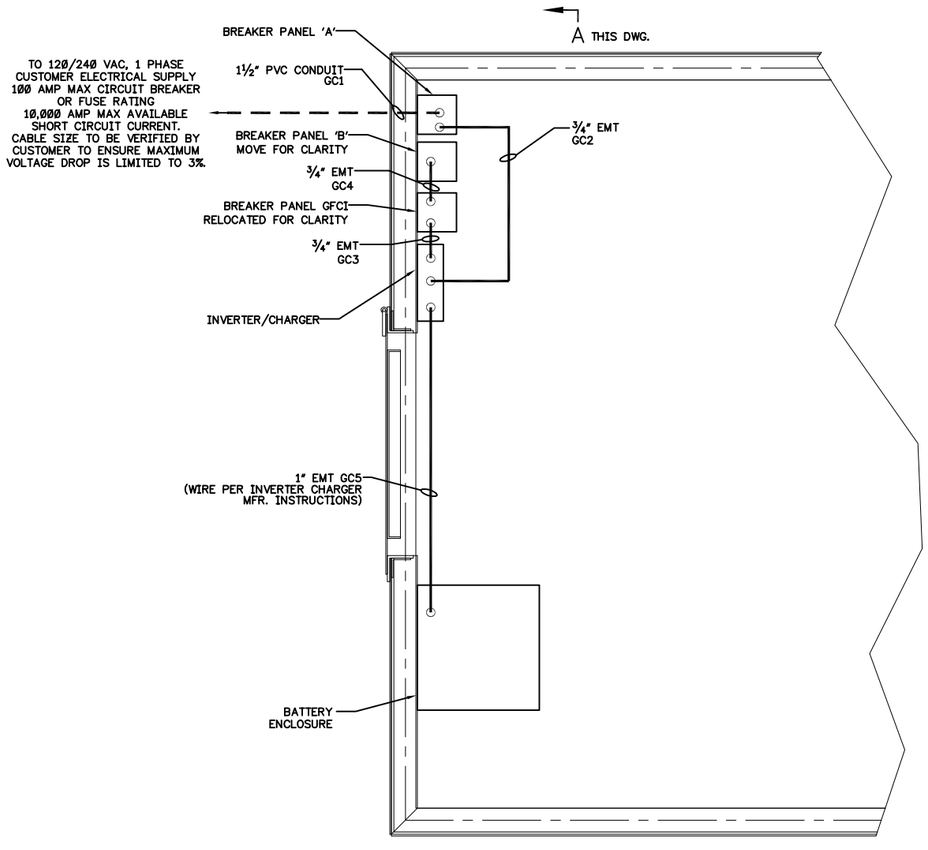
DAVID ALAN MILSTEAD-ARCHITECT AL-2556
800 South Montgomery Ave. Sheffield, AL. 35660
Phone 256-383-9007
rmilstead.architect@att.net

RESTROOM CONFIGURATIONS OPTIONAL SAFETY SHELTER

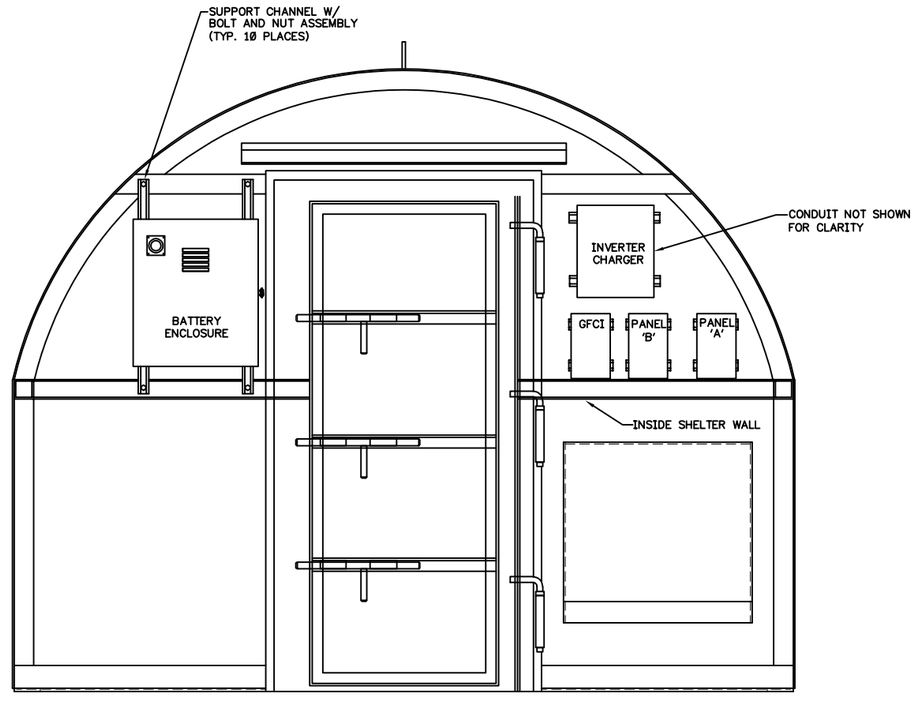
Date: 16 JULY 2015
Rev:

A-1
1

BILL OF MATERIAL	
ITEM	DESCRIPTION
1	LOAD CENTER, 100 AMP, 12-SPACE, 1- PHASE, 3-WIRE, NEMA TYPE 1 ENCLOSURE, FACTORY INSTALLED GROUND BUS, 100 AMP 2-POLE MAIN BREAKER, (1) 30 AMP 1-POLE AND (3) 20 AMP 1-POLE BRANCH CIRCUIT
	BREAKERS, SPACES TO REMAIN COVERED. GE M/N TM1210CCUG1K WITH THQL BREAKERS. PANEL DOOR TO BE PERMANENTLY LABELED "SERVICE DISCONNECT"
2	INVERTER/CHARGER, W/BUILT-IN TRANSFER SWITCH, OUTPUT RATING: 1000W(2000W SURGE), 120VAC, 8.4A, CHARGER RATING: 50A, TRANSFER SWITCH RATING: 30A, XANTREX M/N FREEDOM XC1000
3	BATTERY ENCLOSURE (ACCOMMODATES 2 BATTERIES), MATERIAL: ALUMINUM, DIMS: 22.625H X 19.25W X 19.625D, UL 508A, NEMA 3R, AMERESCO SOLAFR M/N BBA-2 OR EQUAL
4	BATTERY, 12.8V 100AH DEEP CYCLE, 1280 WATT-HOURS (WH), WEIGHT 29 LBS, 11.9" X 6.8" 8.6", EXPION360 M/N EX-G27-100C OR EQUAL
5	BATTERY SWITCH, CONTINUOUS CURRENT RATING: 275 A, VOLTAGE RATING: 48 V, SURFACE OR REAR PANEL MOUNT, VICTRON ENERGY M/N VBS127010010
6	FUSE BLOCK, 100A, CLASS T, 300V, BOX LUG CONNECTOR, 2/0–6 AWG WIRE RANGE, LITTELFUSE M/N LFT301001 W/LFT30100FBC COVER
7	FUSE, 100A, CLASS T, 125VDC, LITTELFUSE M/N JLLN100
8	NOT USED
9	LIGHT FIXTURE, INDOOR, LED LUMINAIRE, SURFACE MOUNT, 120V BALLAST, 2-32 WATT T8 LAMPS, DSS (DIVERSE SUPPLY SOLUTIONS) M/N S232
10	LIGHT FIXUTURE, OUTDOOR, 120V, 13 WATT CFL LAMP, DUSK TO DAWN AUTOMATIC LIGHT CONTROL, UTILITECH M/N GU8813-BZ-I
11	EXIT SIGN, COMBINATION SIGN/LIGHT, 120V, DUAL LAMPS, NICAD BACKUP BATTERY, COOPER LIGHTING M/N APC7R OR EQUAL
12	DUPLEX RECEPTACLE, SPECIFICATION GRADE DUPLEX AND DUPLEX/GFI RECEPTACLES LEVITON 5362/5362GF SERIES OR EQUAL
13	WALL SWITCH, SPECIFICATION GRADE 2 AND 3-WAY SWITCH, LEVITON 1221/1223 SERIES OR EQUAL
14	VENTILATION FAN, 24", 115 VOLT, 1- PHASE, 60 HZ, 1.8 AMP, 2-SPEED, 1/8 HP MOTOR, 5850 CFM @ 0.0"SP, 5560 CFM @ 0.05"SP, 9' SWITCHED CORD AND PLUG,
	INCLUDES WEATHER HOOD, J & D MANUFACTURING M/N VPES24 AND VFT140858 (HOOD)



SHELTER POWER PLAN
(GRID OPTION)



VIEW A–A
(GRID OPTION)

ALABAMA LICENSED No. 22480 PROFESSIONAL 9/15/2023 ENGINEER JOHN F. CONWAY

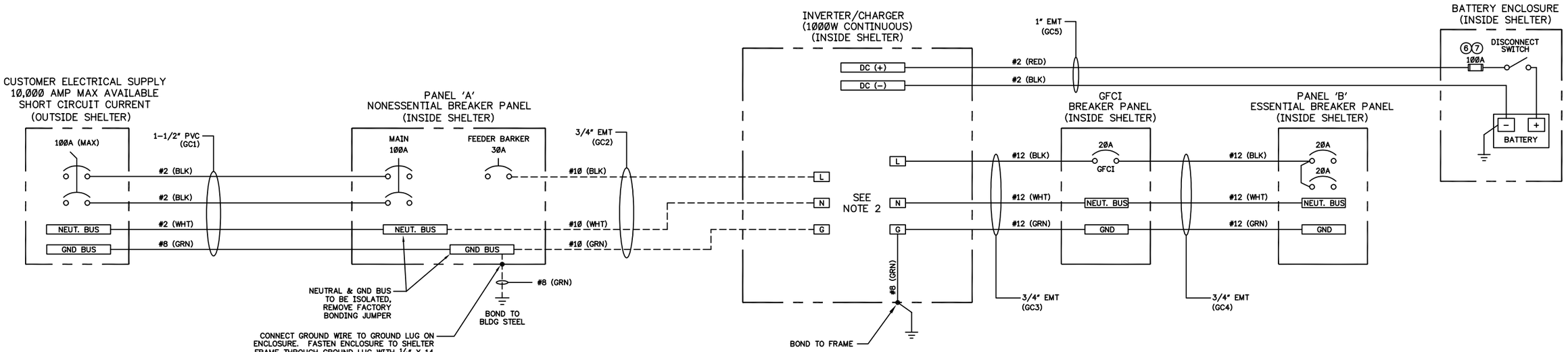
SAFE-T-SHELTER®
Safe Rooms/Shelters 1-800-462-3648

HCS Engineering Company,
DECATUR, ALABAMA (256) 353 - 1972

HCS JOB NUMBER: 23100001

REV.	DESCRIPTION	E.C.N. #	DATE	DR.	CK.
Ø	ISSUED FOR CONSTRUCTION (PSS/CMB)		9/15/23	HCS	CMB

MATERIAL	SCALE: NONE	DRAWN BY: PAUL STRANGE	
SURFACE COAT		APPROVED BY: JOHN CONWAY	
TITLE: OPTIONAL GRID / BATTERY UPS SYSTEM ELECTRICAL PLAN & VIEW			
DATE: 07/19/23	SIZE: D	DRAWING NUMBER: E-UPS-GRID-1	REV: 0

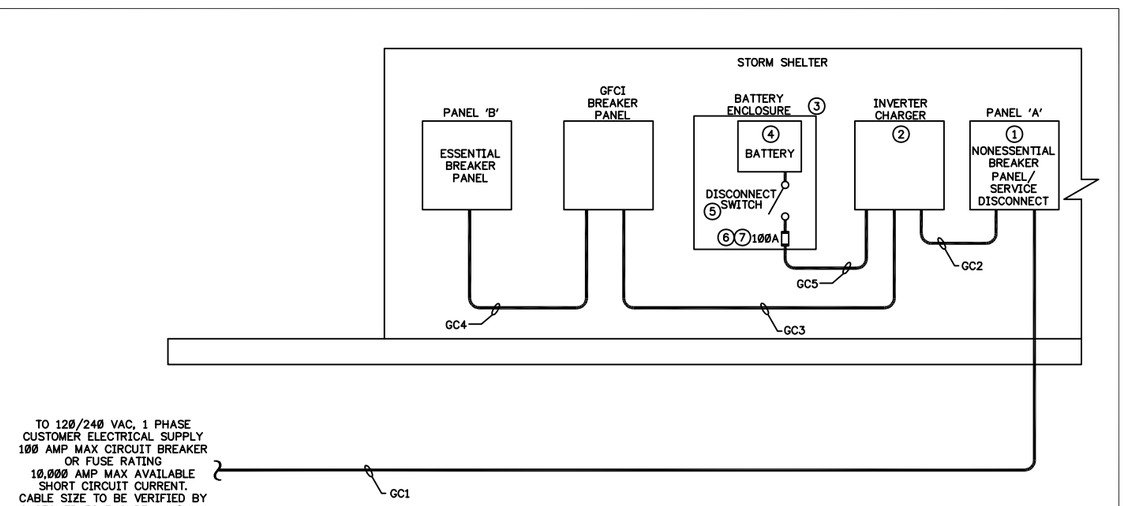


WIRING DIAGRAM GRID OPTION
(GRID OPTION)

BATTERY NOTES:

1. AVOID LONG PERIODS OF EXTREME COLD OR HOT TEMPERATURES. LONG PERIODS OF EXPOSURE TO THESE TEMPERATURES CAN RESULT IN BATTERY DAMAGE.
2. INVERTER/CHARGER XANTREX FREEDOM HAS BUILT IN TRANSFER SWITCH AND WILL SWITCH TO BATTERY POWER IF MAIN POWER IS LOST. DO NOT INSTALL INVERTER/CHARGER IN ANY COMPARTMENT CONTAINING OF FLAMMABLE VAPORS OR GASSES.

CONDUIT SCHEDULE					
"CONDUIT NO."	"CONDUIT SIZE"	CONDUCTORS	FUNCTION	FROM	TO
GC1	1-1/2" SCH 40 PVC	3- #2 W/#8 GND	BUILDING FEEDER	OWNER SUPPLY PANEL	PANEL 'A'
GC2	3/4" EMT	2- #10 W/GND	INVERTER/CHARGER AC INPUT	PANEL 'A'	INVERTER/CHARGER
GC3	3/4" EMT	2- #12 W/GND	INVERTER/CHARGER AC OUTPUT	INVERTER/CHARGER	GFCI PANEL
GC4	3/4" EMT	2- #12 W/GND	PANEL 'B' FEEDER	GFCI PANEL	PANEL 'B'
GC5	1" EMT	2- #2	INVERTER/CHARGER DC INPUT	BATTERY ENCLOSURE	INVERTER/CHARGER



RISER DIAGRAM GRID OPTION
(GRID OPTION)

DIRECTORY	LOAD-WATTS L1	LOAD-WATTS L2	No.	AMPS		AMPS	No.	LOAD-WATTS L1	LOAD-WATTS L2	DIRECTORY
MAIN BREAKER – BACK FED			1	100		30	2	.		INVERTER/CHARGER
			3	100		20	4		.	RECEPTACLE–DEHUMIDIFIER
SPACE			5	20		20	6			SPACE
SPACE			7	–		–	8			SPACE
SPACE			9	–		–	10			SPACE
SPACE			11	–		–	12			SPACE
SUB TOTAL WATTS	–	–			N			.	.	SUB TOTAL WATTS
240/120V 1–PH 3–WIRE	TOTAL WATTS, L1							.		PANEL 'A' DIRECTORY NONESSENTIAL LOADS
100 AMP MAIN BREAKER	TOTAL WATTS, L2							.		
(ISOLATED GROUND BUS)	TOTAL WATTS							.		

PANEL DIRECTORY	LOAD WATTS L1	No.	AMPS	
PANEL 'B' (GFCI)	.	1	20	
SPACE	.	2	.	
SUB TOTAL WATTS	–	.	.	N
120V 1–PH 2–WIRE	TOTAL WATTS, L1			.
(ISOLATED GROUND BUS) GFCI BREAKER	TOTAL WATTS			.
GFCI BREAKER PANEL ESSENTIAL LOADS				

PANEL DIRECTORY	LOAD WATTS L1	No.	AMPS	
LIGHTS	.	1	20	
RECEPTACLES	.	2	20	
SUB TOTAL WATTS	–	.	.	N
120V 1–PH 2–WIRE	TOTAL WATTS, L1			.
(ISOLATED GROUND BUS)	TOTAL WATTS			.
PANEL 'B' ESSENTIAL LOADS				

ALABAMA LICENSED No. 22480 PROFESSIONAL 9/15/2023 ENGINEER JOHN F. CONWAY

SAFE-T-SHELTER®
Safe Rooms/Shelters 1-800-462-3648

HCS Engineering Company,
DECATUR, ALABAMA (256) 353 - 1972

HCS JOB NUMBER: 23100001

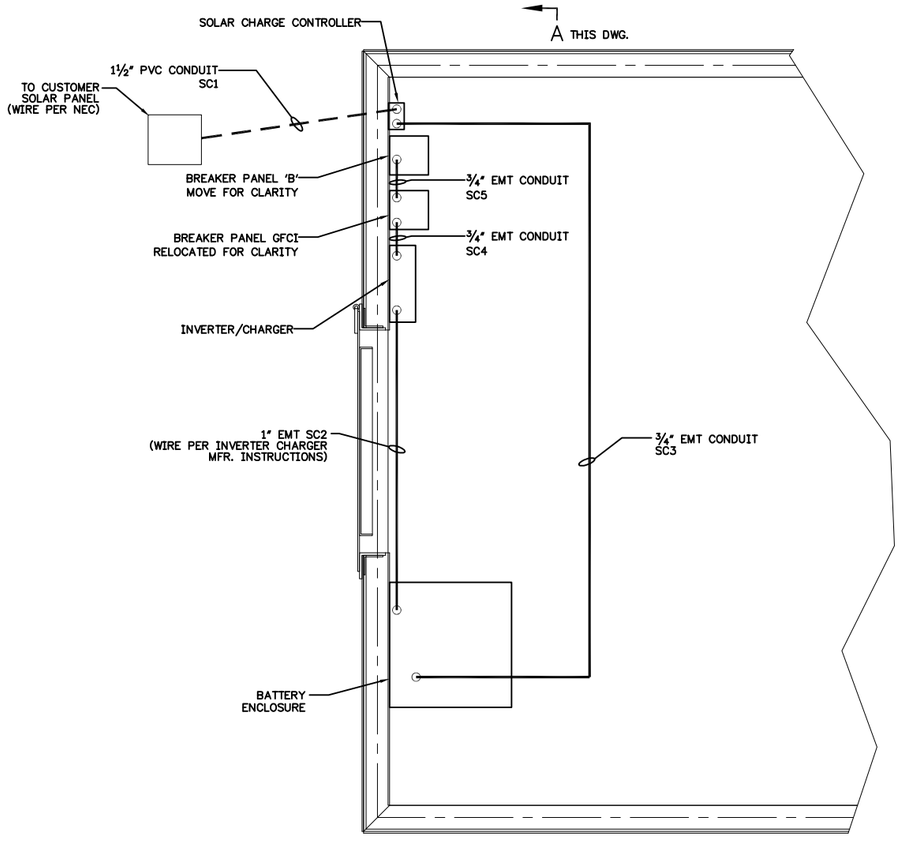
REV.	DESCRIPTION	E.C.N. #	DATE	DR.	CK.
0	ISSUED FOR CONSTRUCTION (PSS/CMB)		9/15/23	HCS	CMB

MATERIAL	SCALE	DRAWN BY
SURFACE COAT	NONE	PAUL STRANGE
		APPROVED BY: JOHN CONWAY

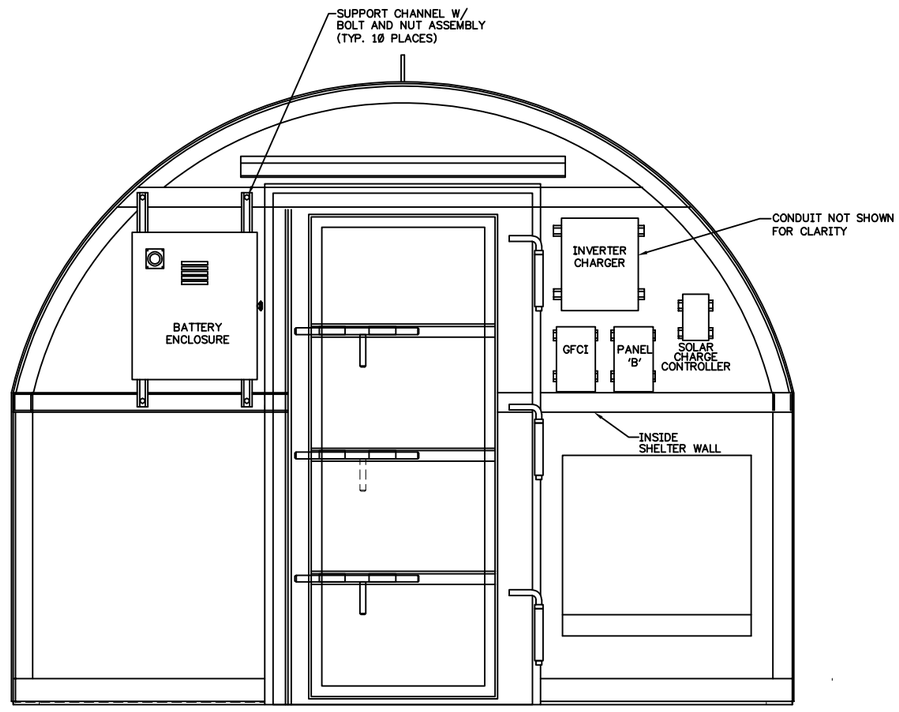
TITLE: OPTIONAL GRID / BATTERY UPS SYSTEM DIAGRAMS & SCHEDULES

DATE	SIZE	DRAWING NUMBER	REV
07/19/23	D	E-UPS-GRID-2	0

BILL OF MATERIAL	
ITEM	DESCRIPTION
1	NOT USED
2	NOT USED
3	BATTERY ENCLOSURE (ACCOMMODATES 2 BATTERIES), MATERIAL: ALUMINUM, DIMS: 22.625H X 19.25W X 19.625D, UL 508A, NEMA 3R, AMERESCO SOLAFR M/N BBA-2 OR EQUAL
4	BATTERY, 12.8V 100AH DEEP CYCLE, 1280 WATT-HOURS (WH), WEIGHT 29 LBS, 11.9" X 6.8" 8.6", EXPION360 M/N EX-G27-100C OR EQUAL
5	BATTERY SWITCH, CONTINUOUS CURRENT RATING: 275 A, VOLTAGE RATING: 48 V, SURFACE OR REAR PANEL MOUNT, VICTRON ENERGY M/N VBS127010010
6	FUSE BLOCK, 100A, CLASS T, 300V, BOX LUG CONNECTOR, 2/0–6 AWG WIRE RANGE, LITTELFUSE M/N LFT301001 W/LFT30100FBC COVER
7	FUSE, 100A, CLASS T, 125VDC, LITTELFUSE M/N JLLN100
8	FUSE, 30A, CLASS T, 125VDC, LITTELFUSE M/N JLLN030
9	LIGHT FIXTURE, INDOOR, LED LUMINAIRE, SURFACE MOUNT, 120V BALLAST, 2-32 WATT T8 LAMPS, DSS (DIVERSE SUPPLY SOLUTIONS) M/N S232
10	LIGHT FIXUTURE, OUTDOOR, 120V, 13 WATT CFL LAMP, DUSK TO DAWN AUTOMATIC LIGHT CONTROL, UTILITECH M/N GU8813-BZ-I
11	EXIT SIGN, COMBINATION SIGN/LIGHT, 120V, DUAL LAMPS, NICAD BACKUP BATTERY, COOPER LIGHTING M/N APC7R OR EQUAL
12	DUPLEX RECEPTACLE, SPECIFICATION GRADE DUPLEX AND DUPLEX/GFI RECEPTACLES LEVITON 5362/5362GF SERIES OR EQUAL
13	WALL SWITCH, SPECIFICATION GRADE 2 AND 3-WAY SWITCH, LEVITON 1221/1223 SERIES OR EQUAL
14	VENTILATION FAN, 24", 115 VOLT, 1- PHASE, 60 HZ, 1.8 AMP, 2-SPEED, 1/8 HP MOTOR, 5850 CFM @ 0.0"SP, 5560 CFM @ 0.05"SP, 9' SWITCHED CORD AND PLUG,
	INCLUDES WEATHER HOOD, J & D MANUFACTURING M/N VPES24 AND VFT140858 (HOOD)
15	SOLAR CHARGE CONTROLLER, 12/24VDC, WIRE TERMINALS UP TO 6 AWG, CIRCUIT VOLTAGE100 VDC, BATTERY OUTPUT 9A2 VDC, (L X W X D) 7.1" X 4.0" X 2.4", XANTREX M/N 710-3024-01 OR EQUAL
16	SOLAR PANEL, FLEXIBLE, 220W, 24.6V, 44 MONO-CRYSTALLINE PERC CELLS, DIMENSIONS (L X W X D) 71.6" X 28.8" X 0.08", XANTREX M/N 784-0220 OR EQUAL



SHELTER POWER PLAN
(SOLAR OPTION)



VIEW A–A
(SOLAR OPTION)

ALABAMA LICENSED No. 22480 PROFESSIONAL ENGINEER JOHN F. CONWAY 9/15/2023

HCS Engineering Company,
DECATUR, ALABAMA (256) 353 - 1972

HCS JOB NUMBER: 2310ØØØ1

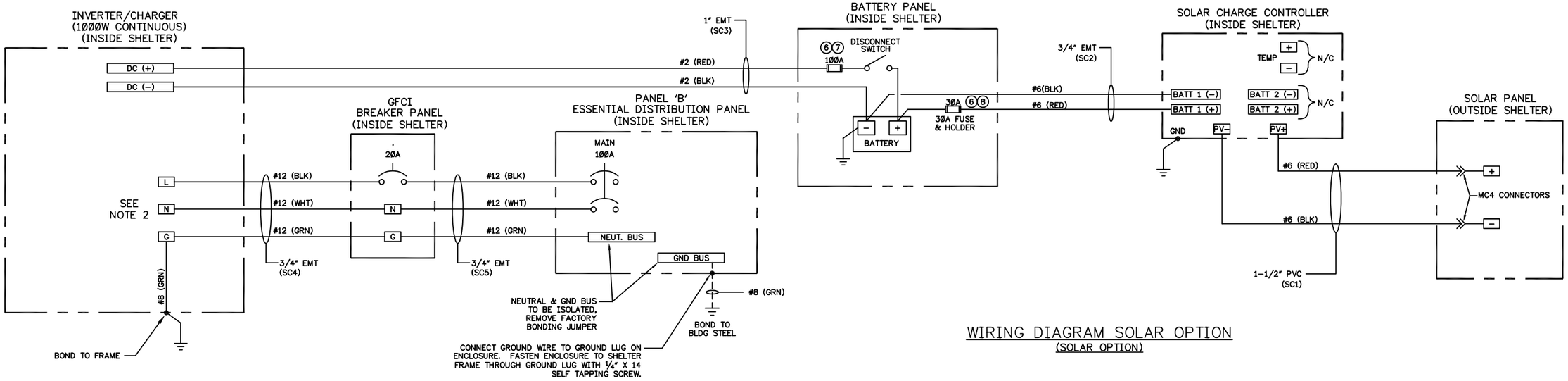
REV.	DESCRIPTION	E.C.N. #	DATE	DR.	CK.
Ø	ISSUED FOR CONSTRUCTION (PSS/CMB)		9/15/23	HCS	CMB

SAFE-T-SHELTER®
Safe Rooms/Shelters 1-800-462-3648

MATERIAL	SCALE	DRAWN BY
SURFACE CVAT	NONE	PAUL STRANGE
		APPROVED BY: JOHN CONWAY

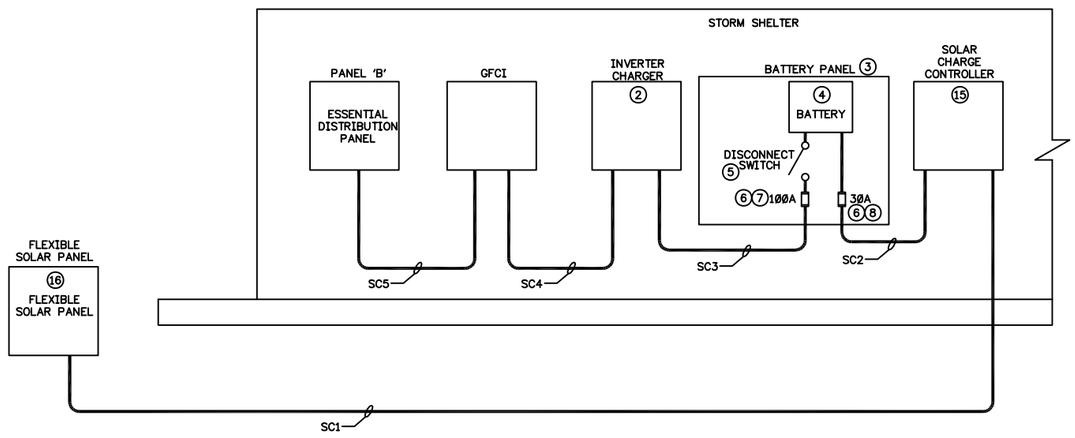
TITLE: OPTIONAL SOLAR / BATTERY UPS SYSTEM ELECTRICAL PLAN & VIEW

DATE	SIZE	DRAWING NUMBER	REV
07/19/23	D	E-UPS-SOLAR-1	0



WIRING DIAGRAM SOLAR OPTION
(SOLAR OPTION)

CONDUIT SCHEDULE					
"CONDUIT NO."	"CONDUIT SIZE"	CONDUCTORS	FUNCTION	FROM	TO
SC1	1-1/2" SCH 40 PVC	2-#6	SOLAR PANEL OUTPUT	SOLAR PANEL	SOLAR CHARGE CONTROLLER
SC2	3/4" EMT	2-#6	SOLAR CHARGE CONTROLLER OUTPUT	SOLAR CHARGE CONTROLLER	BATTERY ENCLOSURE
SC3	1" EMT	2-#2	INVERTER/CHARGER DC INPUT	BATTERY ENCLOSURE	INVERTER/CHARGER
SC4	3/4" EMT	2-#12 W/GND	INVERTER/CHARGER AC OUTPUT	INVERTER/CHARGER	GFCI PANEL
SC5	3/4" EMT	2-#12 W/GND	PANEL 'B' FEEDER	GFCI PANEL	PANEL 'B'



RISER DIAGRAM SOLAR OPTION
(SOLAR OPTION)

BATTERY NOTES:

1. AVOID LONG PERIODS OF EXTREME COLD OR HOT TEMPERATURES. LONG PERIODS OF EXPOSURE TO THESE TEMPERATURES CAN RESULT IN BATTERY DAMAGE.
2. INVERTER/CHARGER XANTREX FREEDOM HAS BUILT IN TRANSFER SWITCH AND WILL SWITCH TO BATTERY POWER IF MAIN POWER IS LOST. DO NOT INSTALL INVERTER/CHARGER IN ANY COMPARTMENT CONTAINING OF FLAMMABLE VAPORS OR GASSES.

PANEL DIRECTORY	LOAD WATTS L1	No.	AMPS	
PANEL 'B' (GFCI)	.	1	20	
SPACE	.	2	.	
SUB TOTAL WATTS	–	.	.	N
120V 1-PH 2-WIRE	TOTAL WATTS, L1			.
(ISOLATED GROUND BUS) GFCI BREAKER	TOTAL WATTS			.
GFCI BREAKER PANEL ESSENTIAL LOADS				

PANEL DIRECTORY	LOAD WATTS L1	No.	AMPS	
LIGHTS	.	1	20	
RECEPTACLES	.	2	20	
SUB TOTAL WATTS	–	.	.	N
120V 1-PH 2-WIRE	TOTAL WATTS, L1			.
(ISOLATED GROUND BUS)	TOTAL WATTS			.
PANEL 'B' ESSENTIAL LOADS				

ALABAMA LICENSED No. 22480 PROFESSIONAL ENGINEER JOHN F. CONWAY 9/15/2023

SAFE-T-SHELTER®
Safe Rooms/Shelters 1-800-462-3648

HCS Engineering Company,
DECATUR, ALABAMA (256) 353 - 1972

HCS JOB NUMBER: 23100001

REV.	DESCRIPTION	E.C.N. #	DATE	DR.	CK.
0	ISSUED FOR CONSTRUCTION (PSS/CMB)		9/15/23	HCS	CMB

MATERIAL: SURFACE COAT
SCALE: NONE
DRAWN BY: PAUL STRANGE
APPROVED BY: JOHN CONWAY
TITLE: OPTIONAL SOLAR / BATTERY UPS SYSTEM DIAGRAMS & SCHEDULES
DATE: 07/19/23
SIZE: D
DRAWING NUMBER: E-UPS-SOLAR-2
REV: 0

REV.	DESCRIPTION	E.C.N. #	DATE	DR	CK

SAFE-T-SHELTER®
SAFE ROOMS & STORM SHELTERS

TRIPLE 10'X48' COMMUNITY STORM SHELTER MODEL #: STS3-1048

CONSTRUCTION DOCUMENTS: DESIGN INFORMATION

THE CONSTRUCTION, DRAWINGS AND SPECIFICATIONS FOR THIS SAFE ROOM COMPLY WITH THEAPPLICABLE PROVISIONS OF FEMA DOCUMENT 361, "SAFE ROOMS FOR TORNADOES AND HURRICANES: GUIDANCE FOR COMMUNITY AND RESIDENTIAL SAFE ROOMS", APRIL 2021 AND ICC-500-2020. THIS SAFE ROOM IS FOR TORNADO PROTECTION AND IS DEISGNED TO WITHSTAND 250 MPH WINDS.

1. DESIGNATION: TORNADO SHELTER
2. WIND DESIGN CONFIRMS TO FEMA 361-2021ICC 500-2020 ICC/NSSA STANDARD FOR THE DESIGN AND CONSTRUCTION OF STORM SHELTERS
3. SHELTER DESIGN WIND SPEED: 250 MPH
4. SHELTER FLOOR DESIGN LIVE LOAD: 150 PSF
5. SHELTER ROOF DESIGN LIVE LOAD: 100 PSF
6. SHELTER DESIGN DEAD LOAD: 20 PSF
7. MISILE IMPACT COMPLIANCE:
   PROTECTED OCCUPANT AREAS:
   WALLS: ¼" STEEL PLATE
   ROOF STRUCTURE: ¼' STEEL PLATE
   PROTECTED OCCUPANT AREA DOORS: FEMA 361COMPLIANT
   PROTECTED OCCUPANT AREA LOUVERS: FEMA 361 COMPLIANT
   VENTILATION LOUVER: FEMA 361 COMPLIANT
8. SHELTER NOT TO BE CONSTRUCTED WITHIN AN AREA SUSCEPTIBLE TO FLOODING

STEEL MATERIALS LIST AND NOTES

1. ALL CHANNEL, ANGLES, AND PLATES TO BE A36 U.N.O
2. ALL STEEL TUBE SECTIONS TO BE A500 GRADE B
3. ALL STEEL PIPE SECTIONS TO BE SCH 40 GRADE A501 OR A53
4. TYPICAL SHELTER WALLS ARE ¼" THICK SOLID PLATE STEEL
5. ALL CHANNEL, 3x3 & 2 ½ x2 ½ ANGLES, AND PLATE TO BE ¼" THICK STEEL. TUBE 3/16" THICK STEEL.
6. ALL 4x4 ANGLES TO BE 3/8" THICK STEEL
7. SEAT MATERIAL AND GENERATOR PROTECTIVE HOUSING MATERIAL TO BE 3/16" THICK STEEL
8. ALL DIMENSIONS ARE NOMINAL AND ARE SUBJECT TO CONVENTIONAL INDUSTRY TOLERANCES.

DRAWING INDEX

CONCRETE

1. CONCRETING OPERATIONS SHALL COMPLY WITH ACI STANDARDS.
2. MINIMUM CONCRETE COMPRESSIVE STRENGTH AT 28 DAYS (PSI).
3. STRENGTH: 3500 PSI
4. TYPE: NORMAL WT.
5. W/C: 0.513
6. AIR: 3% - 5%
7. SLUMP: 3" TO 5"
8. REINFORCING BARS; ASTM A615 GRADE 60
9. REINFORCING STEEL SHOWN IN SECTIONS AND DETAILS ARE A SCHEMATIC INDICATION THAT REINFORCING EXISTS. SEE SECTION NOTES AND GENERAL NOTES FOR ACTUAL REINFORCING REQUIRED.
10. REINFORCING BAR PLACING ACCESSORIES IN ACCORDANCE WITH ACI MANUAL OF STANDARD PRACTICE.
11. DETAIL REINFORCEMENT IN ACCORDANCE WITH ACI 315.
12. ALL SPLICES SHALL BE CLASS "B" TENSION LAP SPLICE OR PROPERLY SELECTED MECHANICAL SPLICES, PROPERLY INSTALLED PER MANUFACTURING SPECIFICATIONS.
13. MINIMUM CONCRETE COVERAGE OF REINFORCEMENT: SLAB
    FOUNDATION ----------2" TOP & 3" BOTTOM & SIDES

FOUNDATION QUALITY CONTROL DURING CONSTRUCTION

1. FOOTINGS SHALL BE NEATLY EXCAVATED WHERE POSSIBLE WITH SIDES AND TOP EDGES FREE OF LOOSE OR WET MATERIALS. WHERE NEAT EXCAVATION IS NOT POSSIBLE, FOOTING EXCAVATION SHALL BE OPEN CUT WITH EDGES FORMED AND BRACED. THE BOTTOM EXCAVATION SHALL BE CLEAN AND DRY WITH ALL LOOSE MATERIAL REMOVED FOR AN ESSENTIALLY FLAT BEARING SURFACE. WHERE SOFT OR UNSUITABLE BEARING SURFACES ARE ENCOUNTERED, THE AREA SHALL BE UNDERCUT AS REQUIRED AND REPLACED WITH LEAN CONCRETE OR COMPACTED DENSE GRADED CRUSHED STONE AS DIRECTED BY THE ARCHITECT OR ENGINEER.

BUILDING CODE DATA

ICC 500-2020, FEMA 361-2021, FEMA 320-2021, NEC-2020, IBC 2021

OCCUPANCY TYPE:	ASSEMBLY A-3
CONSTRUCTION TYPE:	I B
BUILDING AREA:	1.488 SF
PROPOSED HEIGHT:	8'0"
PROPOSED LENGTH:	48'0"
PROPOSED WIDTH:	38'0"

EGRESS REQUIREMENTS SUMMARY

OCCUPANCY LOAD:	293 PERSONS
WITH (1) RESTROOM:	289 PERSONS
WITH (2) RESTROOMS:	286 PERSONS

OCCUPANCY LOAD & EGRESSCALCULATIONS
ICC 500 – COMMUNITY SHELTER USE
USABLE FLOOR AREA = 1,488 SF – 10 SF (ICC 501.1.2.2 – FIXED/MOVABLE) = 1,478 SF
1,478 SF – 20 SF (TWO WHEELCHAIR SPACE) = 1,458 SF
1,458 SF / 5 SF/PERSON = 292 STANDING/SEATING
292 STAND/SEATING + 1 WC = 293 TOTAL

WITH ONE (1) REST ROOM:
USABLE FLOOR AREA = 1,488 SF – 17.5 SF = 1,470.5 SF
1,470.5 SF – 10 SF (ICC 501.1.2.2 – FIXED/MOVABLE) = 1,460.5 SF
1,460.5 SF – 20 SF (TWO WHEELCHAIR SPACE) = 1,440.5 SF
1,440.5 SF / 5 SF/PERSON = 288 STANDING/SEATING
288 STAND/SEATING + 1 WC = 289 TOTAL

WITH TWO (2) REST ROOM:
USABLE FLOOR AREA = 1,488 SF – 35 SF = 1,453 SF
1,453 SF – 10 SF (ICC 501.1.2.2 –FIXED/MOVABLE) = 1,443 SF
1,443 SF – 20 SF (TWO WHEELCHAIR SPACE) = 1,423 SF
1,423 SF / 5 SF/PERSON = 285 STANDING/SEATING
285 STAND/SEATING + 1 WC = 286 TOTAL

ALABAMA REGISTERED NO. 12307 PROFESSIONAL ENGINEER DONALD B. HEDDLESTON JR.
4/1/23

UNLESS OTHERWISE SPECIFIED TOLERANCE EXCEPT AS NOTED: XXX ± .005, XX ± .020, X ± .040, FRACTION ± 1/16"

SAFE-T-SHELTER®
SAFE ROOMS & STORM SHELTERS

PROJECT

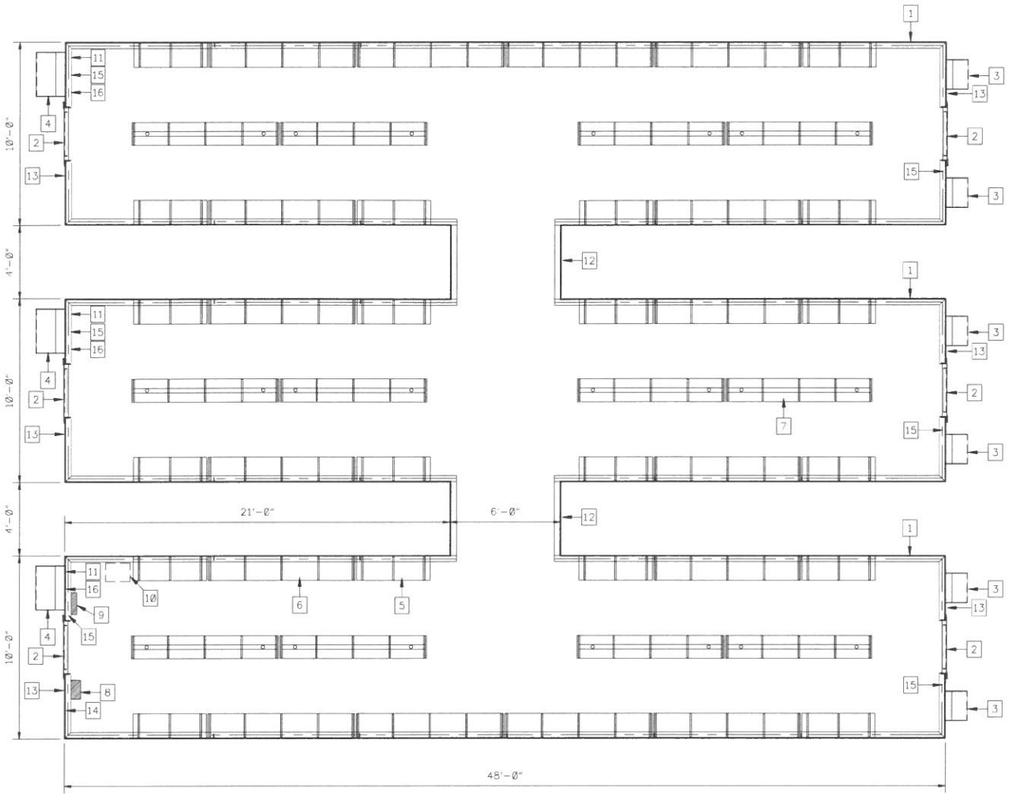
MATERIAL | SCALE: N.T.S. | DRAWN BY | SURFACE CUAT | APPROVED BY:

TITLE: SHELTER CODE SUMMARY, DESIGN PARAMETERS
STRUCTURAL LOAD LIMITATIONS & PLAN INDEX

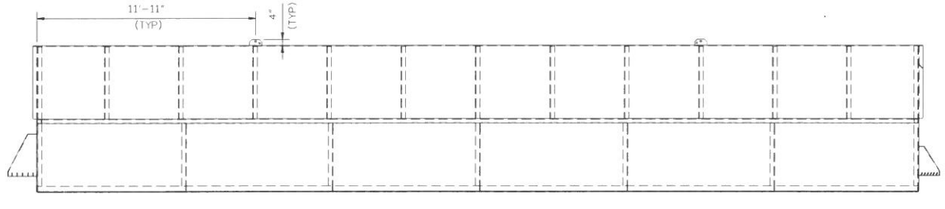
04/01/23 | SIZE | DRAWING NUMBER: STS3-1048 Page 1 | REV

Updated: 02-03-2017

REV.	DESCRIPTION	E.C.N. #	DATE	BR.	CK.

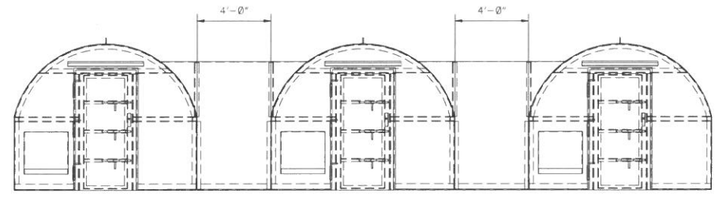


FLOOR PLAN

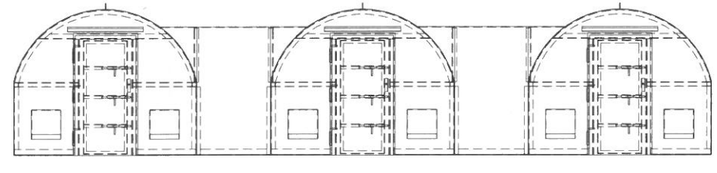


SIDE ELEV.

1. PREFABRICATED STEEL STRUCTURE ANCHORED AND SEALED TO SMOOTH CONCRETE FLOOR
2. ICC-500 COMPLIANT STEEL DOOR ASSEMBLY
3. ICC-500 COMPLIANT VENTILATION LOUVERED INTAKE HOOD
4. ICC-500 COMPLIANT VENTILATION LOUVERED EXHAUST HOOD
5. TYPICAL PREFABRICATED WALL BENCH, 4'-0"
6. TYPICAL PREFABRICATED WALL BENCH, 7'-6"
7. TYPICAL PREFABRICATED CENTER BENCH, 8'-0"
8. TRANSFER SWITCH/LOAD CENTER 'A'
9. ELECTRICAL PANEL 'B'
10. DEHUMIDIFER
11. EXHAUST FAN
12. PREFABRICATED STEEL INTERCONNECT
13. TORNADO SHELTER SIGNAGE
14. TORNADO SHELTER SIGNAGE, MANUFACTURER DESIGN WIND SPEED & MAXIMUM OCCUPANT LOAD
15. FIRE EXTINGUISHER
16. FIRST AID KIT



BACK ELEV.



FRONT ELEV.

ALABAMA REGISTERED NO. 12307 PROFESSIONAL ENGINEER DONALD B. HANCOCK, JR.
4/1/23

THE CONSTRUCTION, DRAWINGS AND SPECIFICATIONS FOR THIS SAFE ROOM COMPLY WITH THE APPLICABLE PROVISIONS OF FEMA DOCUMENT 361, "SAFE ROOMS FOR TORNADOES AND HURRICANES: GUIDANCE FOR COMMUNITY AND RESIDENTIAL SAFE ROOMS", APRIL 2021 AND ICC-500-2020. THIS SAFE ROOM IS FOR TORNADO PROTECTION AND IS DESIGNED TO WITHSTAND 250 MPH WINDS.

UNLESS OTHERWISE SPECIFIED: XXX ± .005, XX ± .020, X ± .040, FRACTION ± 1/16" — TOLERANCE EXCEPT AS NOTED

SAFE-T-SHELTER®
SAFE ROOMS & STORM SHELTERS

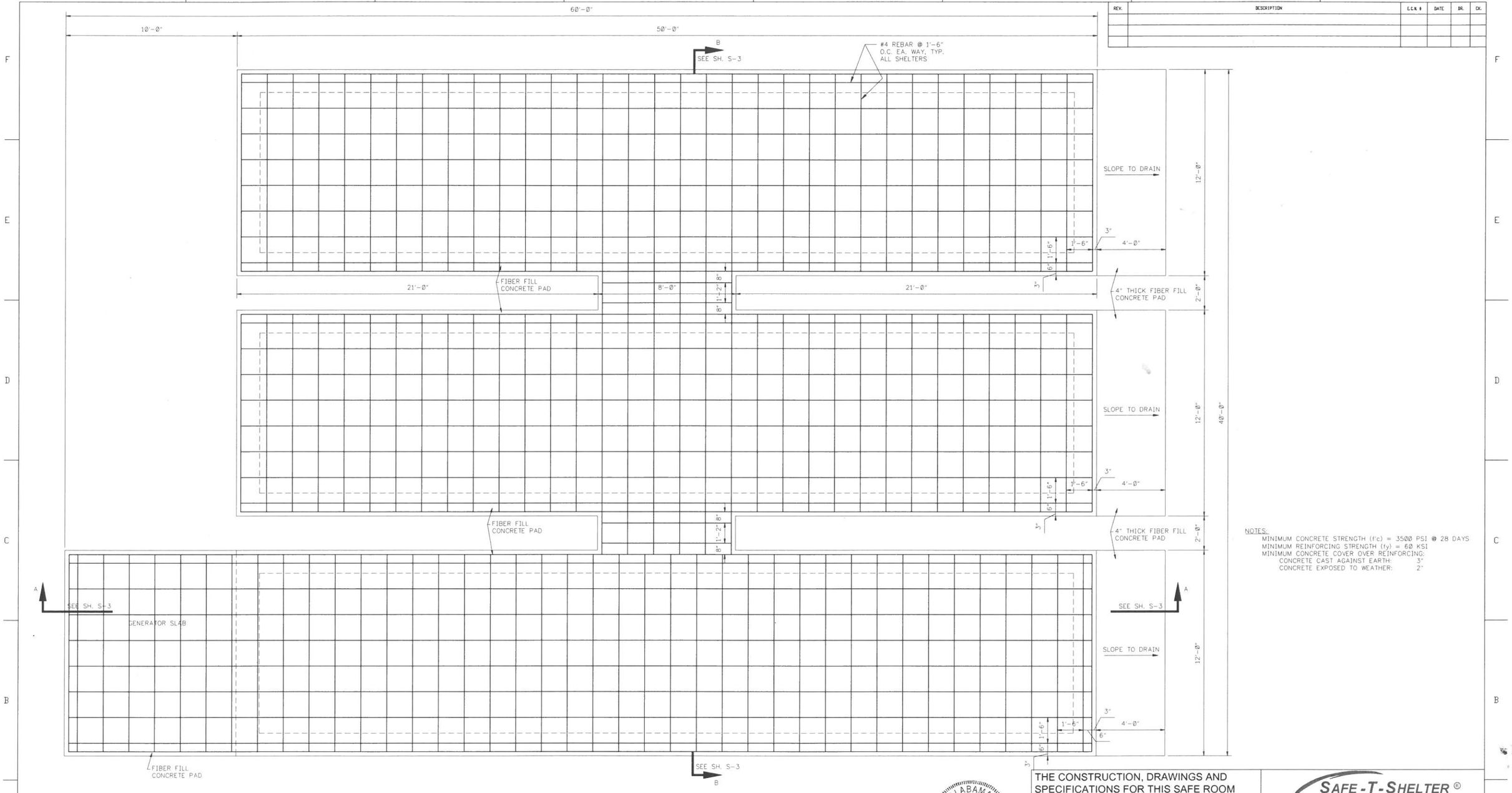
PROJECT

MATERIAL | SCALE: 1/4"=1'-0" | DRAWN BY: D. STOVER | SURFACE CSMT | APPROVED BY:

TITLE: TRIPLE 10x48 SHELTER UNIT FLOOR PLAN & ELEVATIONS

DATE:	SIZE:	DRAWING NUMBER	REV
04/01/23	D	STS3-1048 Page 2	1

REV.	DESCRIPTION	E.C.N. #	DATE	BR.	CK.



FOUNDATION PLAN

NOTES:
MINIMUM CONCRETE STRENGTH (f'c) = 3500 PSI @ 28 DAYS
MINIMUM REINFORCING STRENGTH (fy) = 60 KSI
MINIMUM CONCRETE COVER OVER REINFORCING:
CONCRETE CAST AGAINST EARTH: 3"
CONCRETE EXPOSED TO WEATHER: 2"

ALABAMA REGISTERED NO. 12307 PROFESSIONAL ENGINEER DONALD B. HANCOCK JR.
4/1/23

THE CONSTRUCTION, DRAWINGS AND SPECIFICATIONS FOR THIS SAFE ROOM COMPLY WITH THE APPLICABLE PROVISIONS OF FEMA DOCUMENT 361, "SAFE ROOMS FOR TORNADOES AND HURRICANES: GUIDANCE FOR COMMUNITY AND RESIDENTIAL SAFE ROOMS", APRIL 2021 AND ICC-500-2020. THIS SAFE ROOM IS FOR TORNADO PROTECTION AND IS DESIGNED TO WITHSTAND 250 MPH WINDS.

UNLESS OTHERWISE SPECIFIED: TOLERANCE EXCEPT AS NOTED — XXX ± .005, XX ± .020, X ± .040, FRACTION ± 1/16"

SAFE-T-SHELTER®
SAFE ROOMS & STORM SHELTERS

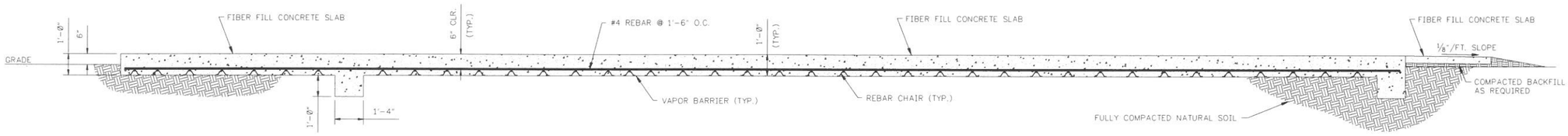
PROJECT

MATERIAL: SURFACE CUAT
SCALE: 3/8" = 1'-0"
DRAWN BY: D. STOVER
APPROVED BY:

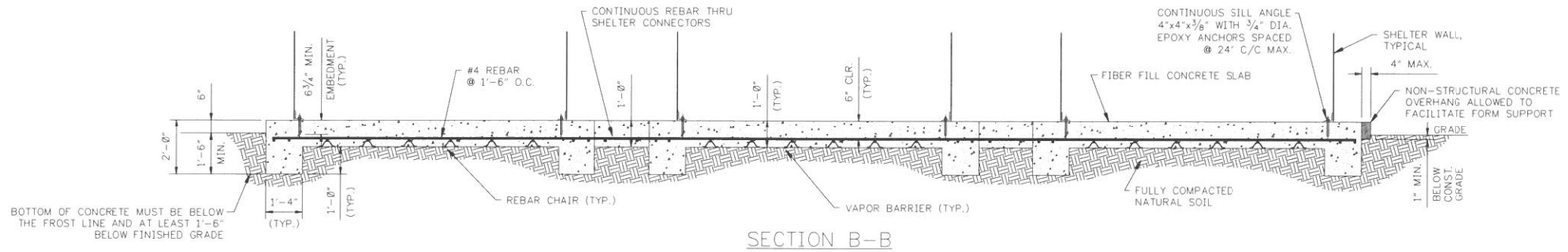
TITLE: TRIPLE 10x48 SHELTER UNIT FOUNDATION PLAN

DATE: 04/01/23
SIZE: D
DRAWING NUMBER: STS3-1048 Page 3
REV: 1

REV.	DESCRIPTION	E.C.N. #	DATE	DR.	CK.



SECTION A-A



SECTION B-B

NOTES:
MINIMUM CONCRETE STRENGTH (f'c) = 3500 PSI @ 28 DAYS
MINIMUM REINFORCING STRENGTH (fy) = 60 KSI
MINIMUM CONCRETE COVER OVER REINFORCING:
CONCRETE CAST AGAINST EARTH: 3"
CONCRETE EXPOSED TO WEATHER: 2"

ALABAMA REGISTERED NO. 12367 PROFESSIONAL ENGINEER DONALD B. HEACOCK JR.
Donald B. Heacock
4/1/23

THE CONSTRUCTION, DRAWINGS AND SPECIFICATIONS FOR THIS SAFE ROOM COMPLY WITH THE APPLICABLE PROVISIONS OF FEMA DOCUMENT 361, "SAFE ROOMS FOR TORNADOES AND HURRICANES: GUIDANCE FOR COMMUNITY AND RESIDENTIAL SAFE ROOMS", APRIL 2021 AND ICC-500-2020. THIS SAFE ROOM IS FOR TORNADO PROTECTION AND IS DESIGNED TO WITHSTAND 250 MPH WINDS.

UNLESS OTHERWISE SPECIFIED TOLERANCE EXCEPT AS NOTED: XXX ± .005, XX ± .020, X ± .040, FRACTION ± 1/16"

SAFE-T-SHELTER ®
SAFE ROOMS & STORM SHELTERS

PROJECT

MATERIAL: SURFACE CUAT

SCALE: 3/8" = 1'-0"

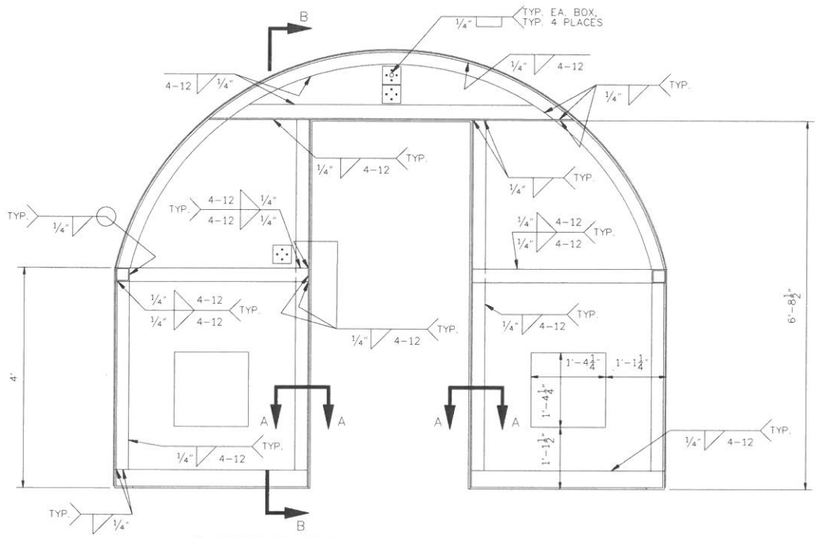
DRAWN BY: D. STOVER

APPROVED BY:

TITLE: TRIPLE 10x48 SHELTER UNIT FOUNDATION SECTIONS

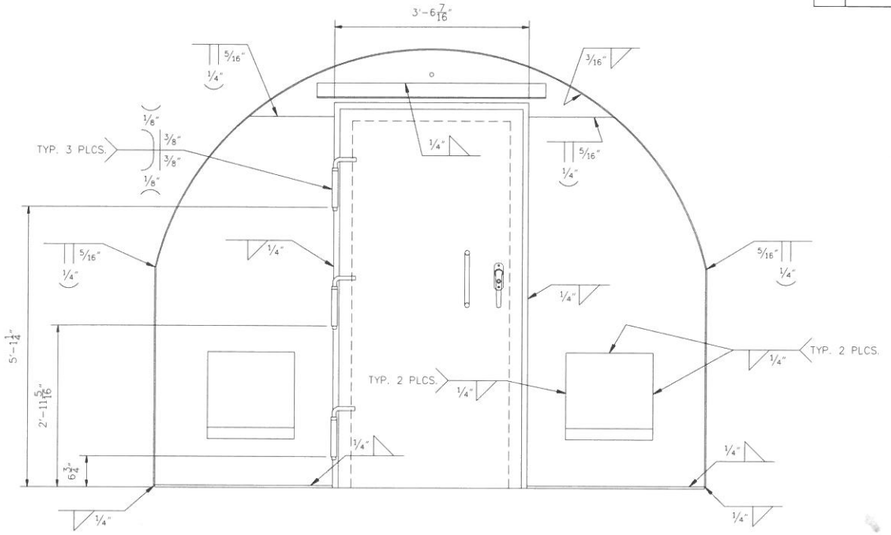
DATE:	SIZE:	DRAWING NUMBER	REV
04/01/23	D	STS3-1048 Page 4	1

REV.	DESCRIPTION	E.C.N. #	DATE	BY.	CK.



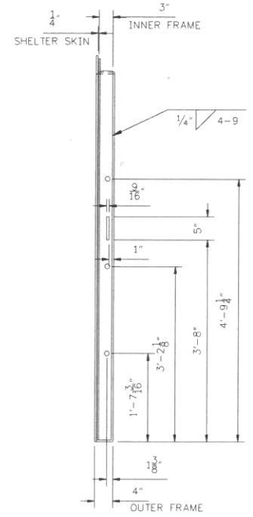
INTERIOR ELEV. OF END ASSEMBLY

SCALE: 3/4"= 1'-0"



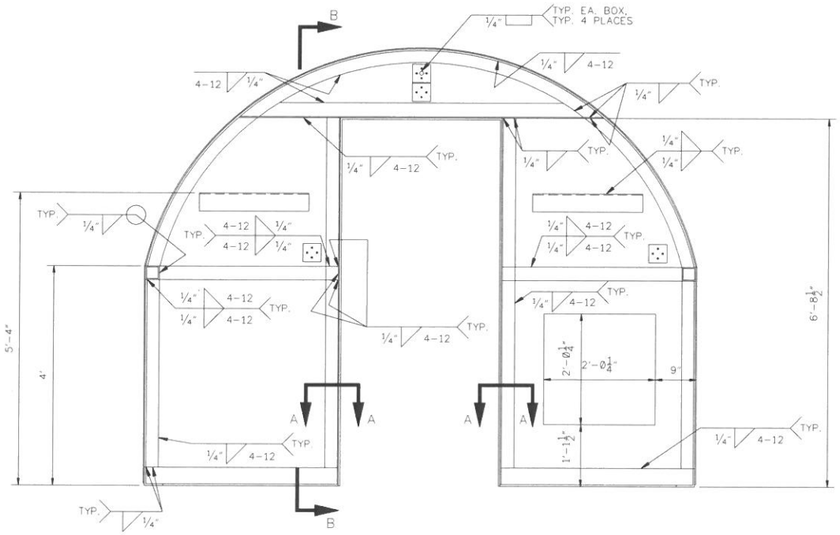
EXTERIOR ELEV. OF END ASSEMBLY

SCALE: 3/4"= 1'-0"



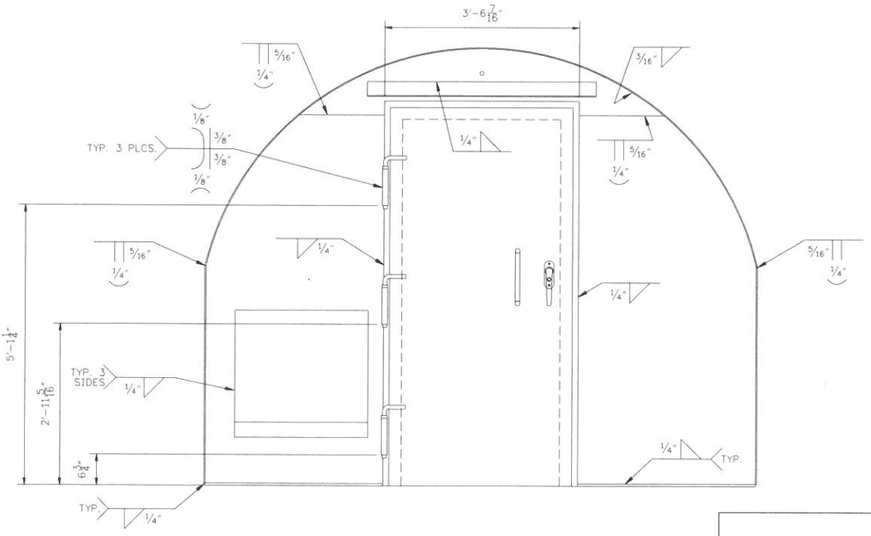
SECTION 'B-B'

SCALE: 3/4" = 1'-0"



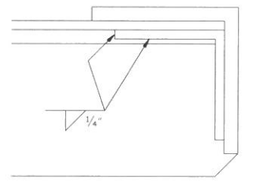
INTERIOR ELEV. OF END ASSEMBLY

SCALE: 3/4"= 1'-0"



EXTERIOR ELEV. OF END ASSEMBLY

SCALE: 3/4"= 1'-0"



SECTION 'A-A'

SCALE: 6" = 1'-0"

ALABAMA REGISTERED NO. 12307 PROFESSIONAL ENGINEER DONALD B. HEADRICK, JR.

4/1/23

UNLESS OTHERWISE SPECIFIED: TOLERANCE EXCEPT AS NOTED — XXX ± .005, XX ± .020, X ± .040, FRACTION ± 1/16"

SAFE-T-SHELTER®
SAFE ROOMS & STORM SHELTERS

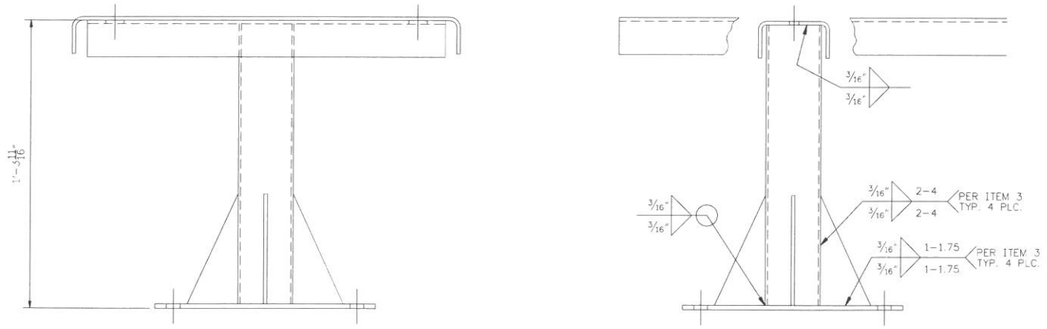
PROJECT

MATERIAL: SURFACE CUAT | SCALE: AS NOTED | DRAWN BY: | APPROVED BY:

TITLE: TYPICAL ELEVATIONS & SECTIONS SHOP DRAWING

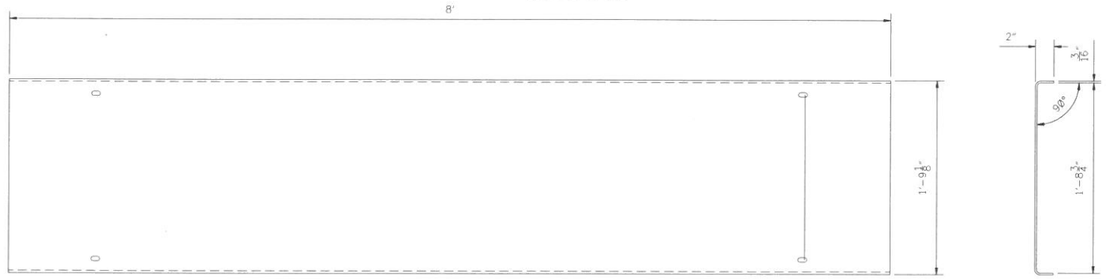
DATE: 04/01/23 | SIZE: | DRAWING NUMBER: STS3-1048 Page 5 | REV: 1

REV.	DESCRIPTION	ECN #	DATE	BY	CK



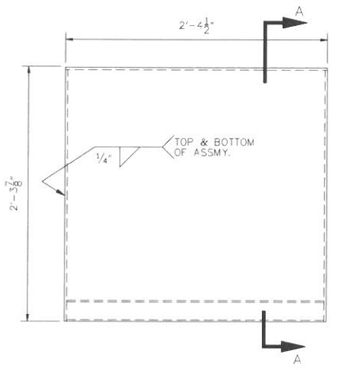
CENTER BENCH ASSEMBLY

SCALE: 3" = 1'-Ø"

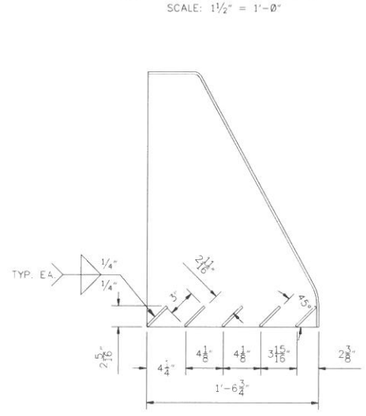


CENTER BENCH TOP

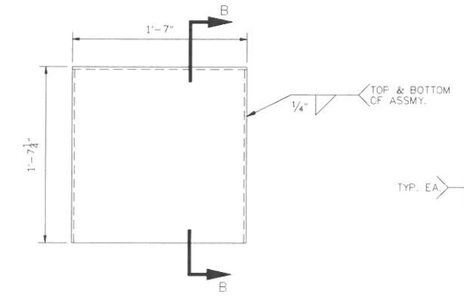
SCALE: 1½" = 1'-Ø"



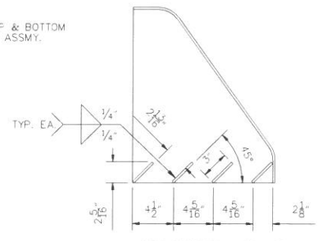
EXHAUST HOOD ASSEMBLY



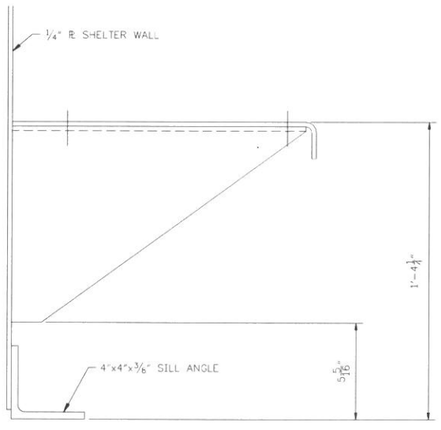
SECTION A-A

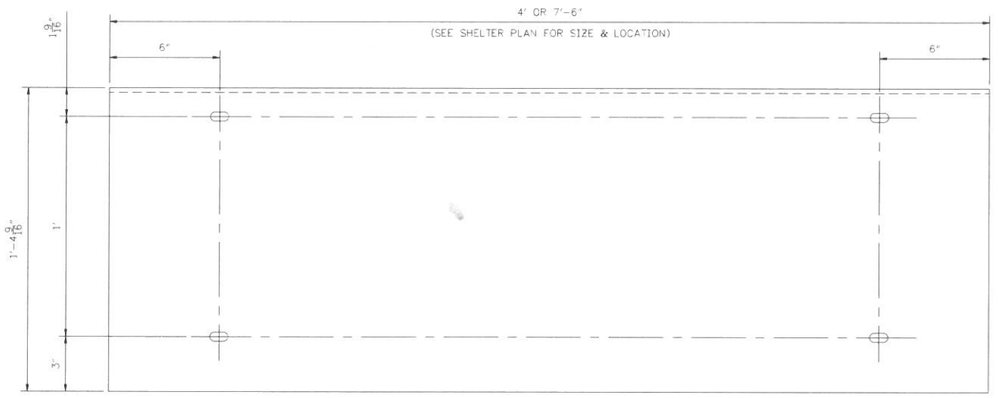


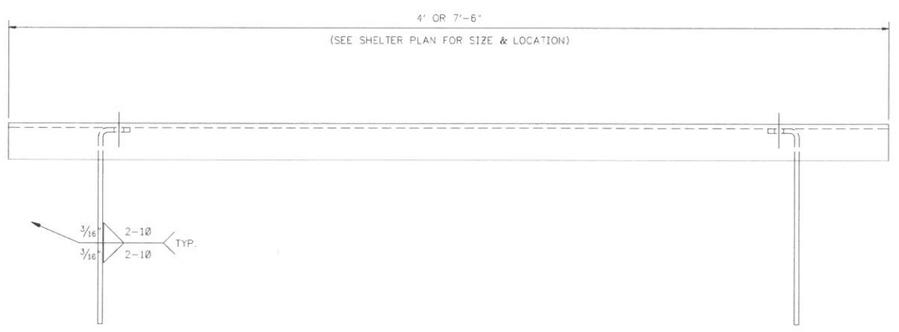
INTAKE HOOD ASSEMBLY



SECTION B-B







SIDE BENCH ASSEMBLY

SCALE: 1½" = 1'-Ø"

ALABAMA REGISTERED NO. 12307 PROFESSIONAL ENGINEER DONALD P. HEACOCK, JR.

4/1/23

SAFE-T-SHELTER©
SAFE ROOMS & STORM SHELTERS

PROJECT

MATERIAL: SURFACE CUAT

SCALE: 1 1/2"=1'-0"

DRAWN BY:

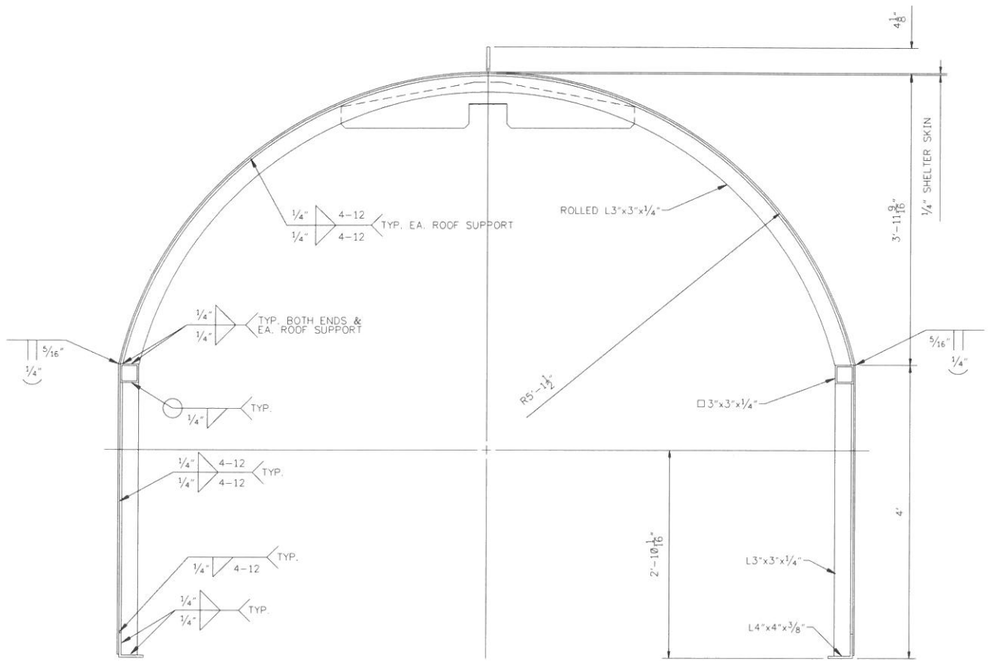
APPROVED BY:

TITLE: INTAKE & EXHAUST HOOD, SIDE WALL & CENTER BENCH SEATING - SHOP DRAWING

UNLESS OTHERWISE SPECIFIED TOLERANCE EXCEPT AS NOTED: XXX ± .005, XX ± .030, X ± .040, FRACTION ± 1/16"

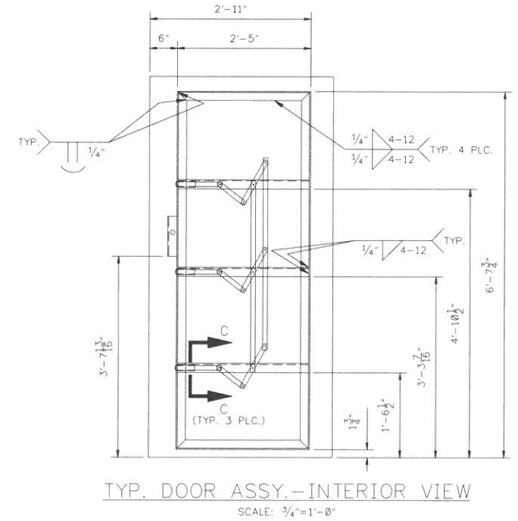
DATE: 04/01/23 | SIZE: D | DRAWING NUMBER: STS3-1048 Page 6 | REV: 1

REV.	DESCRIPTION	E.C.N. #	DATE	DR.	CK.



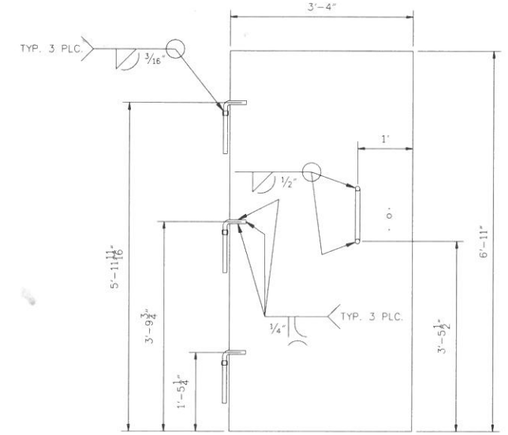
TYPICAL INTERMEDIATE SUPPORT ELEVATION

SCALE: 3/4"= 1'-0"



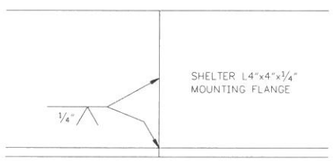
TYP. DOOR ASSY.-INTERIOR VIEW

SCALE: 3/4"=1'-0"



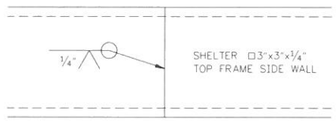
TYP. DOOR ASSY.-EXTERIOR VIEW

SCALE: 3/4"=1'-0"



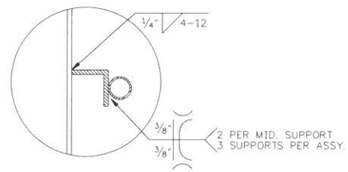
SHELTER MOUNTING FLANGE WELD DETAIL

SCALE: 6" = 1'-0"



SHELTER TOP FRAME WELD DETAIL

SCALE: 6" = 1'-0"



SECTION 'C-C'

SCALE: 3"= 1'-0"

ALABAMA REGISTERED NO. 12307 PROFESSIONAL ENGINEER DONALD B. HEACOCK, JR.

4/1/23

UNLESS OTHERWISE SPECIFIED: TOLERANCE EXCEPT AS NOTED .XXX ± .005 .XX ± .020 .X ± .040 FRACTION ± 1/16"

SAFE-T-SHELTER®
SAFE ROOMS & STORM SHELTERS

PROJECT

MATERIAL: SURFACE CUAT

SCALE: AS NOTED

DRAWN BY:

APPROVED BY:

TITLE: TYPICAL INTERMEDIATE SECTION, DOOR ELEVATIONS AND WELD DETAILS - SHOP DRAWING

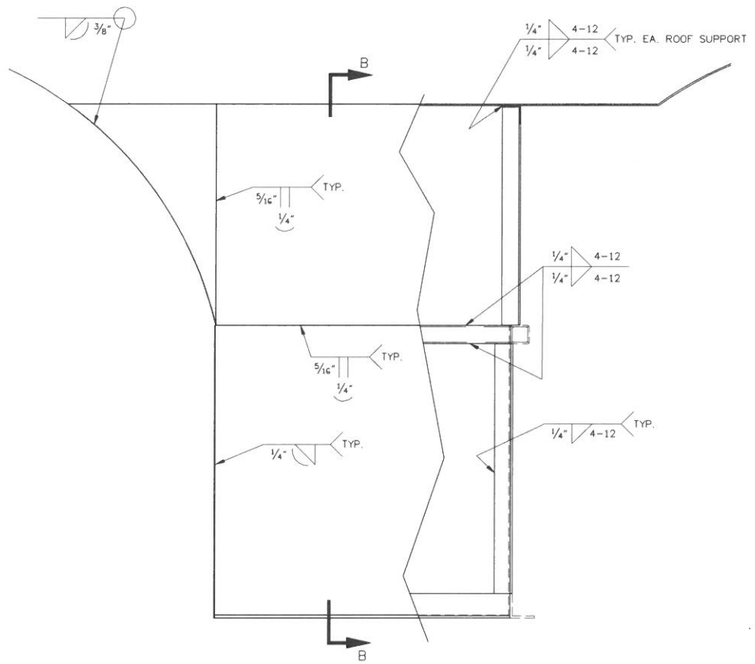
DATE: 04/01/23

SIZE:

DRAWING NUMBER: STS3-1048 Page 7

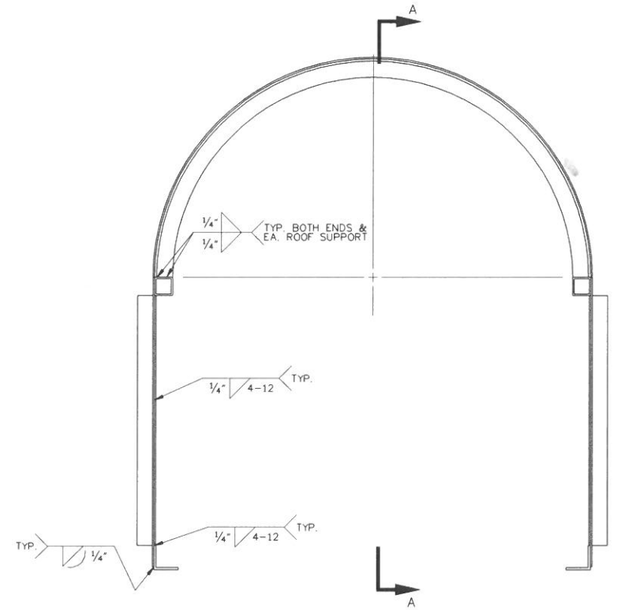
REV: 1

REV.	DESCRIPTION	E.C.N. #	DATE	BY	CK.



CROSS-OVER ELEVATION/SECTION A-A

SCALE: 1"= 1'-0"



CROSS-OVER ELEVATION/SECTION B-B

SCALE: 1"= 1'-0"

NOTE:
CROSSOVER IS MANUFACTURED BY SAFE-T-SHELTER AT MANUFACTURING FACILITY. CROSSOVER TO BE SET, INSTALLED AND WELDED BY SAFE-T-SHELTER.

ALABAMA REGISTERED NO. 12307 PROFESSIONAL ENGINEER DONALD B. HEADRICK JR.

4/1/23

UNLESS OTHERWISE SPECIFIED TOLERANCE EXCEPT AS NOTED XXX ± .005 XX ± .020 X ± .040 FRACTION ± 1/16"

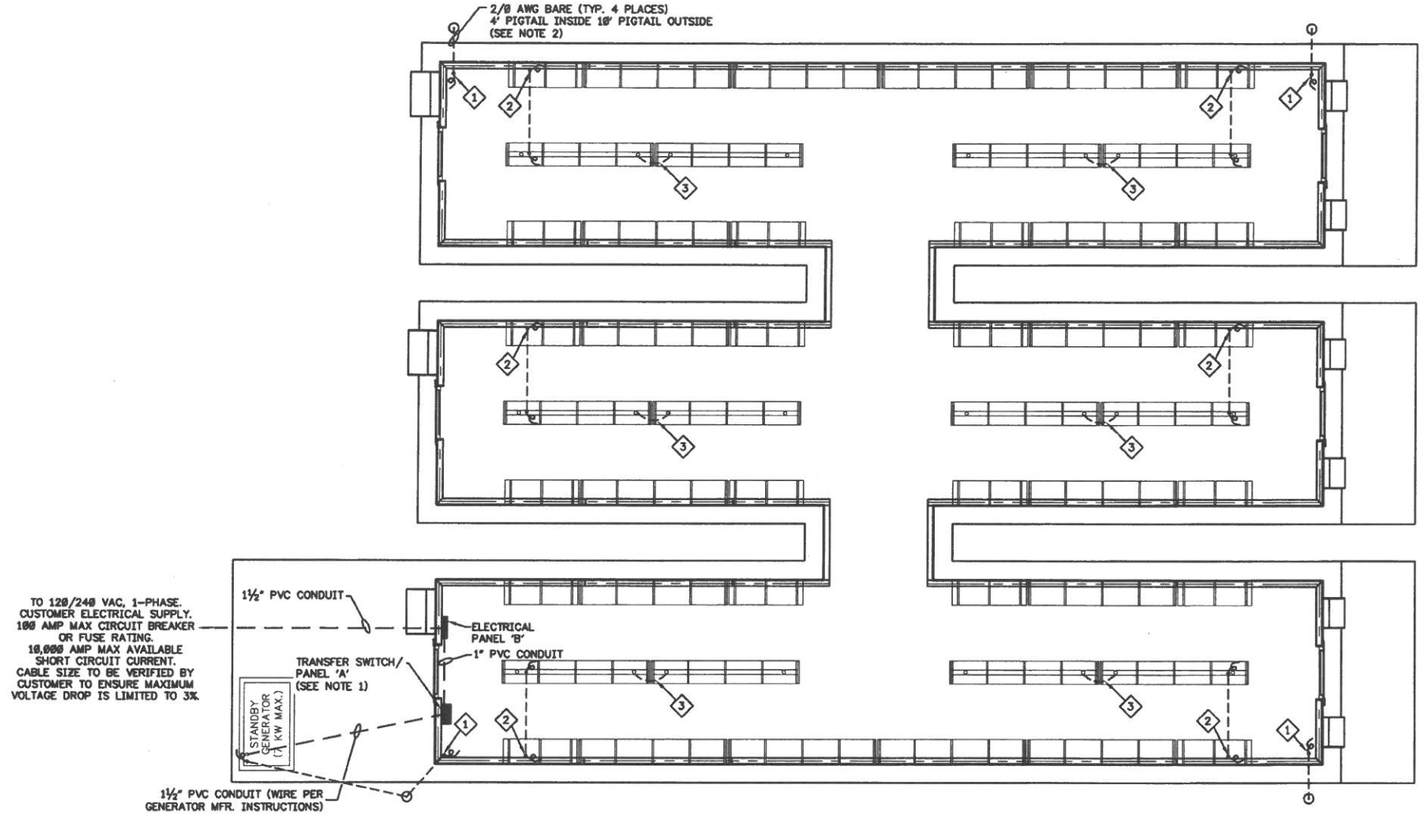
SAFE-T-SHELTER®
SAFE ROOMS & STORM SHELTERS

PROJECT

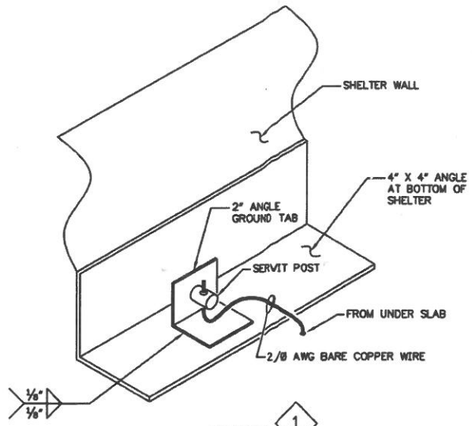
MATERIAL: SURFACE CUAT | SCALE: 1"=1'-0" | DRAWN BY: | APPROVED BY:

TITLE: CROSS-OVER ASSEMBLY SHOP DRAWING

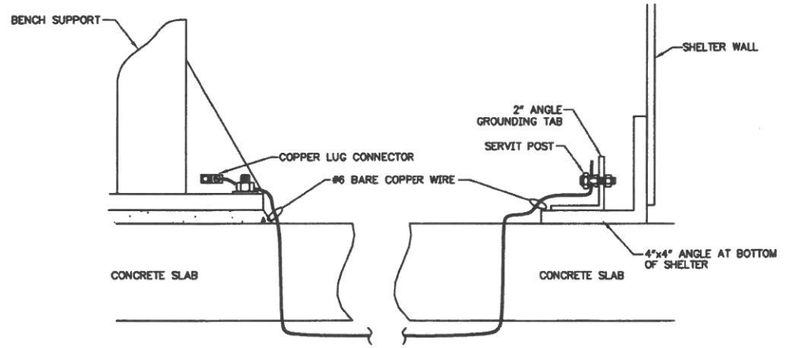
04/01/23 | SIZE: | DRAWING NUMBER: STS3-1048 Page 8 | REV: 1



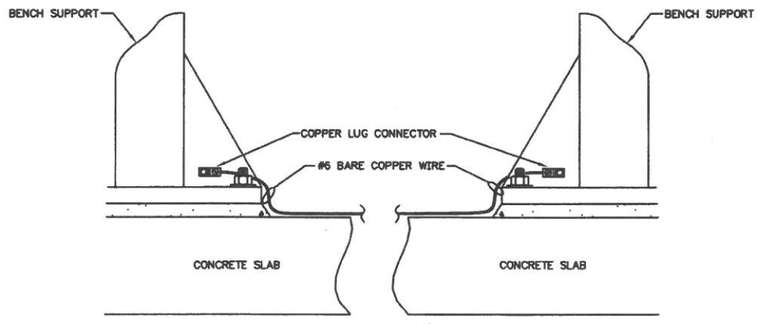
SHELTER POWER AND GROUNDING PLAN



DETAIL 1
GROUND BAR INSTALLATION
(THIS DWG.)



DETAIL 2
BENCH GROUND DETAIL
(THIS DWG.)



DETAIL 3
BENCH GROUND DETAIL
(THIS DWG.)

NOTES:

1. TRANSFER SWITCH/PANEL 'A' TO BE INSTALLED AFTER SHELTER IS SET IN PLACE.
2. GROUNDING SYSTEM TO BE COMPLETED AFTER SHELTER IS SET IN PLACE.

LEGEND

- ---- BELOW GRADE
- ◇ DETAIL NUMBER (SEE THIS DWG.)
- ⊙ GROUND ROD, ⅝" x 8' COPPER CLAD

ALABAMA LICENSED
John F. Conway
NO. 22480
PROFESSIONAL
3/10/17
ENGINEER
JOHN F. CONWAY

HCS Engineering Company, Inc.
DECATUR, ALABAMA (256) 353 - 1972

HCS JOB NUMBER: 14100001

REV.	DESCRIPTION	E.C.N. #	DATE	BY	CK.
0	ORIGINAL ISSUE (DRS/JFC)		06/10/15	HCS	
1	UPDATE NOTES AND GROUNDING ARRANGEMENT		1/21/16	HCS	
2	GENERAL REVISIONS		3/10/17	HCS	

SAFE-T-SHELTER®
SAFE ROOMS & STORM SHELTERS

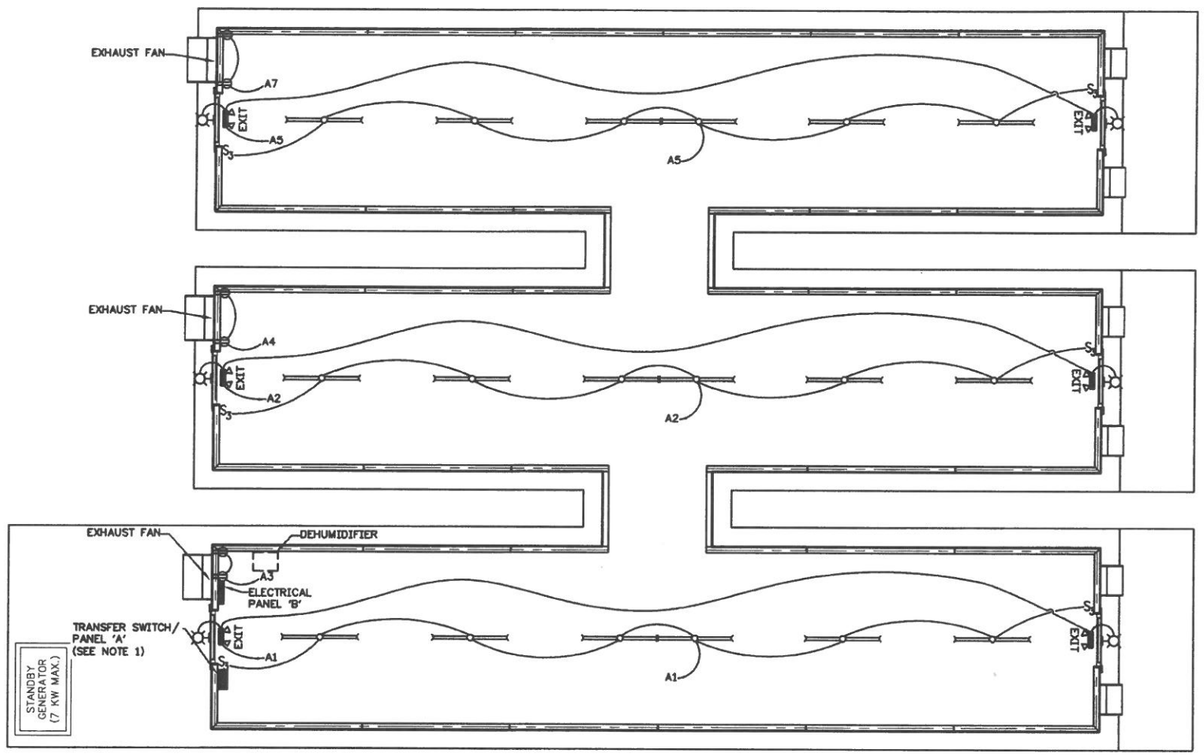
PROJECT

MATERIAL
SURFACE COAT

SCALE 1/4"=1'-0"
DRAWN BY D. STOVER
APPROVED BY

TITLE
TRIPLE 10x48 SHELTER UNIT
ELECTRICAL POWER & GROUNDING PLAN & DETAILS

DATE 06/10/15
SIZE D
DRAWING NUMBER D-31048-E1
REV 2



SHELTER LIGHTING AND RECEPTACLE PLAN

LEGEND

- 4' FLUORESCENT STRIP LIGHT W/ WIRE GUARD
- EXIT SIGN W/ LIGHTS
- OUTDOOR, WALL MTD. LIGHT
- S_3 THREE-WAY SWITCH
- XX HOME RUN CONDUIT (CIRCUIT NUMBER)
- DUPLEX RECEPTACLE

NOTES:

1. TRANSFER SWITCH/PANEL 'A' TO BE INSTALLED AFTER SHELTER IS SET IN PLACE.

ALABAMA LICENSED NO. 22480 PROFESSIONAL ENGINEER JOHN F. CONWAY 3/10/17

HCS Engineering Company, Inc.
DECATUR, ALABAMA (256) 353 - 1972

HCS JOB NUMBER: 14100001

REV.	DESCRIPTION	ECN #	DATE	BY	CK
0	ORIGINAL ISSUE (DRS/JFC)		06/10/15	HCS	
1	CHANGE CIRCUIT ASSIGNMENTS		1/22/16	HCS	
2	GENERAL REVISIONS		3/10/17	HCS	

SAFE-T-SHELTER®
SAFE ROOMS & STORM SHELTERS

PROJECT

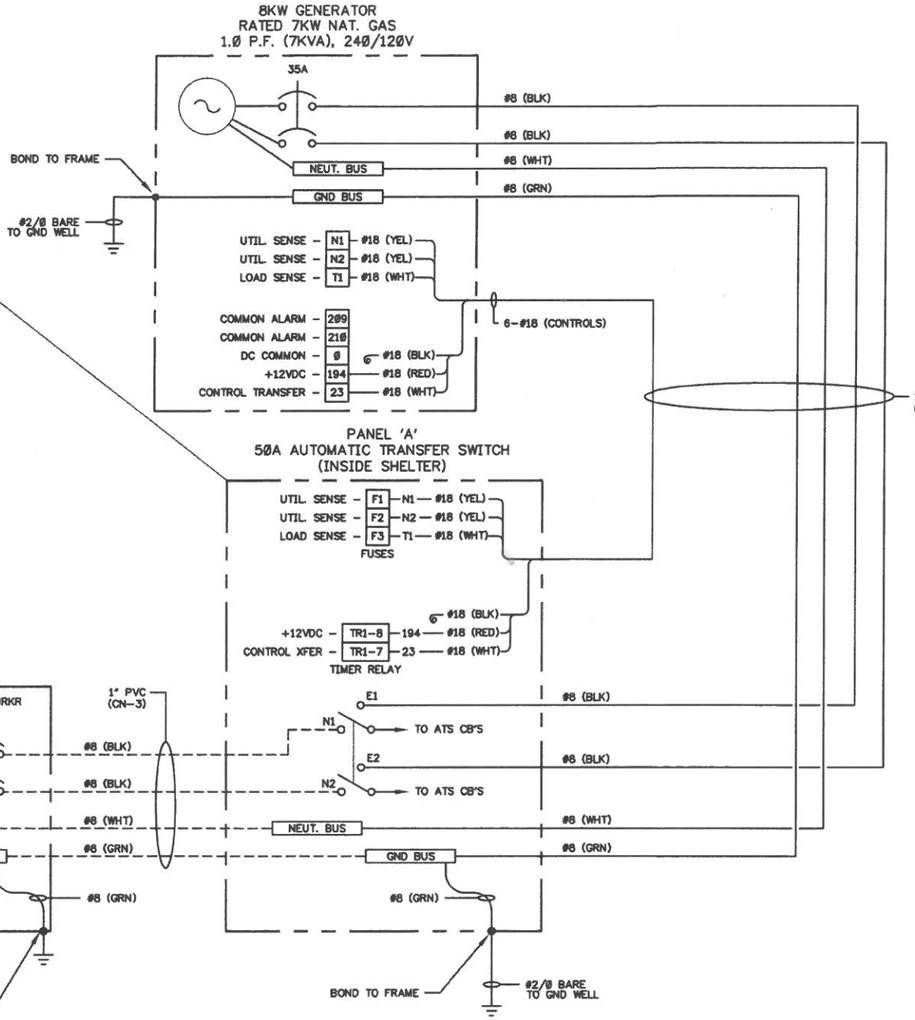
MATERIAL
SURFACE COAT
SCALE: 1/4"=1'-0"
DRAWN BY: D. STOVER
APPROVED BY

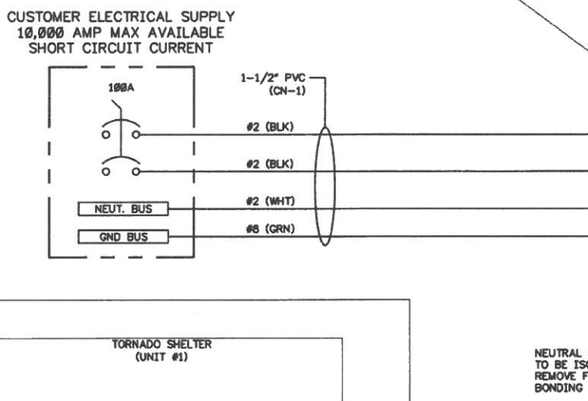
TITLE: TRIPLE 10x48 SHELTER UNIT
ELECTRICAL LIGHTING & RECEPTACLE PLAN

DATE	SIZE	DRAWING NUMBER	REV
06/10/15	D	D-31048-E2	2

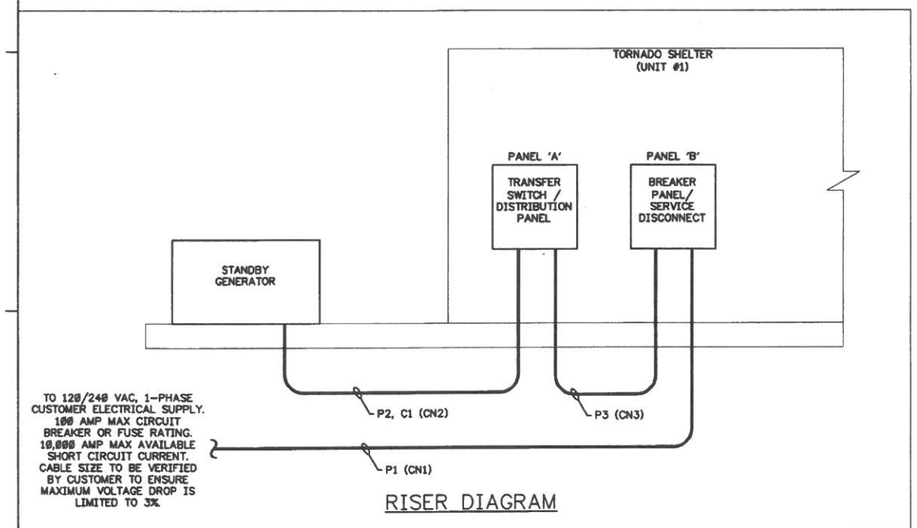
DIRECTORY	LOAD–WATTS L1	LOAD–WATTS L2	No.	AMPS		AMPS	No.	LOAD–WATTS L1	LOAD–WATTS L2	DIRECTORY
LIGHTS (EXIT, INSIDE & OUTSIDE) (UNIT #1)	400		1	15		20	2	1100		RECEPTACLE (FAN & DEHUMIDIFIER) (UNIT #2)
RECEPTACLE (FAN & HUMIDIFIER) (UNIT #1)		1100	3	20		15	4		400	LIGHTS (EXIT, INSIDE, OUTSIDE) (UNIT #2)
LIGHTS (EXIT, INSIDE & OUTSIDE) (UNIT #3)	400		5	15		15	6			SPARE
RECEPTACLE (FAN & HUMIDIFIER) (UNIT #3)		1100	7	30		20	8			SPARE
SPARE			9	30		20	10			SPARE
SUB TOTAL WATTS	800	2200			N			1100	400	SUB TOTAL WATTS
240/120V 1–PH 3–WIRE					TOTAL WATTS, L1	1900				PANEL 'A' ATS PANEL
MAIN LUG ONLY					TOTAL WATTS, L2	2600				
CIRCUIT INTERRUPTING CAPACITY: 10,000 SYM–AMPS					TOTAL WATTS	4500				

DIRECTORY	LOAD–WATTS L1	LOAD–WATTS L2	No.	AMPS		AMPS	No.	LOAD–WATTS L1	LOAD–WATTS L2	DIRECTORY
MAIN BREAKER – BACK FED			1	100		40	2	1900		ATS NORMAL POWER
			3	100		40	4		2600	
FUTURE			5	–		–	6			FUTURE
FUTURE			7	–		–	8			FUTURE
FUTURE			9	–		–	10			FUTURE
FUTURE			11	–		–	12			FUTURE
SUB TOTAL WATTS	–	–			N			1900	2600	SUB TOTAL WATTS
240/120V 1–PH 3–WIRE					TOTAL WATTS, L1	1900				PANEL 'B' NORMAL SOURCE PD PANEL
100A THERMAL–MAGNETIC MAIN BREAKER					TOTAL WATTS, L2	2600				
CIRCUIT INTERRUPTING CAPACITY: 10,000 SYM–AMPS					TOTAL WATTS	4500				





WIRING DIAGRAM



RISER DIAGRAM

ALABAMA LICENSED PROFESSIONAL ENGINEER JOHN F. CONWAY NO. 22480 3/10/17

HCS Engineering Company, Inc.
DECATUR, ALABAMA (256) 353 - 1972

HCS JOB NUMBER: 14100001

REV.	DESCRIPTION	ECN #	DATE	BY	CK.
Ø	ORIGINAL ISSUE (DRS/JFC)		06/10/15	HCS	
1	REVISE NOTES, GROUNDING DETAILS AND CIRCUIT ASSIGNMENTS		1/22/15	HCS	
2	GENERAL REVISIONS		3/10/17	HCS	

SAFE-T-SHELTER®
SAFE ROOMS & STORM SHELTERS

PROJECT

MATERIAL: SURFACE COAT | SCALE: NONE | DRAWN BY: D. STOVER | APPROVED BY:

TITLE: TRIPLE 10x48 SHELTER UNIT
ELECTRICAL RISER AND WIRING DIAGRAMS

DATE: 06/10/15 | SIZE: D | DRAWING NUMBER: D-31048-E3 | REV: 2

CONDUIT SCHEDULE						
CONDUIT NO.	CONDUIT SIZE	CONDUCTORS	FUNCTION	FROM	TO	CIRCUITS
CN1	1-1/2" SCH 40 PVC	3-#2 w/#6 GND	100 AMP BUILDING FEEDER (BY CUSTOMER)	PNL (BY CUSTOMER)	PANEL 'B'	P1
CN2	1-1/2" SCH 40 PVC	3-#6 w/#6 GND, 6-#18 VENDOR CONTROL CABLE	AUTOMATIC TRANSFER SWITCH (ATS) EMERGENCY SOURCE	GENERATOR	ATS/PANEL 'A'	P2, C1
CN3	1" SCH. 40 PVC	3-#6 w/GND,	AUTOMATIC TRANSFER SWITCH (ATS) NORMAL SOURCE	PANEL 'B'	ATS/PANEL 'A'	P3

CIRCUIT SCHEDULE					
CIRCUIT	WIRE SIZE DATA	DESCRIPTION	FROM	TO	REMARKS/ROUTING
P1	3-#2 w/ #6 GND	100 AMP BUILDING SUPPLY	PNL (BY CUSTOMER)	PANEL 'B'	CN-1, 1 1/2" PVC TO NEW STORM SHELTER
P2	3-#6 w/ #6 GND	AUTOMATIC TRANSFER SWITCH (ATS) EMERGENCY SOURCE	GENERATOR	ATS/PANEL 'A'	CN-2, 1 1/2" PVC, GENERATOR TO ATS
P3	3-#6 w/ #6 GND	AUTOMATIC TRANSFER SWITCH (ATS) NORMAL SOURCE	PANEL 'B'	ATS/PANEL 'A'	CN-3, 1" PVC
C1	6-#18 VENDOR CONTROL CABLE	GENERATOR/ATS CONTROL CABLE AND UTIL SENSE	GENERATOR	ATS/PANEL 'A'	CN-2, 1 1/2" PVC, GENERATOR TO ATS

EQUIPMENT SCHEDULE	
1	STANDBY GENERATOR, 8KW 120/240V, 1-PHASE, NATURAL GAS OR LP OPERATION, WEATHER PROTECTIVE HOUSING, LCD DISPLAY CONTROL PANEL, 35 AMP MAIN CIRCUIT BREAKER, INCLUDES 50 AMP PRE-WIRED AUTOMATIC TRANSFER SWITCH/BREAKER PANEL. GENERAC MODEL #006237-0 (8 KW).
2	AUTOMATIC TRANSFER SWITCH (INCLUDED WITH ITEM 1), 50 AMP, 120/240V, WEEKLY EXERCISER TIMER, NEMA 1 ENCLOSURE, BREAKERS TO BE RATED AT 10,000 AIC. SEE PANEL SCHEDULE FOR BRANCH CIRCUIT BREAKER REQUIREMENTS.
3	LOAD CENTER, 100 AMP, 120/240V, 12-POSITION, 1- PHASE, 3-WIRE, NEMA TYPE 1 PANEL BOARD, FACTORY INSTALLED GROUND BUS, APPROVED FOR SERVICE ENTRANCE WHEN WIRED PER NEC, BREAKERS TO BE RATED AT 10,000 AIC, INCLUDES 100 AMP 2-POLE MAIN BREAKER, 1-40 AMP 2-POLE BRANCH CIRCUIT BREAKER, SPARE SPACES TO REMAIN COVERED. GE MODEL # TM1210CCUGIK WITH THQL BREAKERS OR EQUAL. PANEL DOOR TO BE PERMANENTLY LABELED "SERVICE DISCONNECT". SEE PANEL SCHEDULE FOR BRANCH CIRCUIT BREAKER REQUIREMENTS.
4	LIGHT FIXTURE. FLOURESCENT LUMINAIRE, SURFACE MOUNT, 120V BALLAST, 2-32 WATT T8 LAMPS, DSS (DIVERSE SUPPLY SOLUTIONS) MODEL # S232 OR EQUAL.
5	OUTSIDE LIGHT, 120V, 13 WATT CFL LAMP, DUSK TO DAWN AUTOMATIC LIGHT CONTROL, RATED FOR OUTDOOR USE, UTILITECH MODEL GU8813-BZ-I OR EQUAL.
6	EXIT SIGN, COMBINATION SIGN/LIGHT, 120V, DUAL LAMPS, NICAD BACKUP BATTERY, COOPER LIGHTING MODEL # APC7R OR EQUAL
7	DUPLEX RECEPTACLE, SPECIFICATION GRADE DUPLEX AND DUPLEX/GFI RECEPTACLES LEVITON 5362/5362GF SERIES OR EQUAL
8	WALL SWITCH, SPECIFICATION GRADE 2 AND 3-WAY SWITCH, LEVITON 1221/1223 SERIES OR EQUAL.
9	VENTILATION FAN, 24", 115 VOLT, 1-PHASE, 60 HZ, 1.8 AMP, 2-SPEED, 1/8 HP MOTOR, CFM @ 0.0"SP (HI/LOW): 5850/3475, CFM @ 0.05"SP (HI): 5560, RPM(HI/LOW): 1200/900, INCLUDES CHROME INLET GUARD AND OUTLET SHUTTERS, 9' SWITCHED CORD AND PLUG, USE J & D MANUFACTURING PART NO. VPE24C OR EQUAL.

GENERAL NOTES:

WIRE AND CABLE:

1. WIRE AND CABLE TYPES:

   INSULATED WIRE: 600 VOLT, SINGLE CONDUCTOR, 75°C MIN. INSULATION RATING, POWER CABLE, NEC TYPE THHN/THWN. CONDUCTOR: CLASS B COPPER, INSULATION: POLYVINYL CHLORIDE "PVC", CONDUCTOR JACKET: NYLON.

   BARE WIRE: CLASS B COMPRESSED CONCENTRIC-LAY-STRANDED, SOFT DRAWN, COPPER CONDUCTORS.

2. CONNECTORS: ALL CONNECTORS SHALL BE DESIGNED AND SIZED FOR SPECIFIC CABLE BEING CONNECTED AND SHALL BE SOLDERLESS, PRESSURE-TYPE CONNECTORS CONSTRUCTED OF NON-CORRODIBLE TIN-PLATED COPPER. THE RATED CURRENT-CARRYING CAPACITY SHALL BE EQUAL TO OR GREATER THAN THE CABLE BEING CONNECTED.

   POWER CONNECTORS (10 AWG AND SMALLER): "SCOTCHLOK" PRE-INSULATED SPRING WIRE CONNECTORS. BUCHANAN OPEN-END COPPER SPLICING CAPS, APPLIED WITH COMPATIBLE TOOL, WITH NYLON SNAP-ON INSULATORS.

   POWER CONNECTORS (SIZES 8-4 AWG): NON-INSULATED RING-TONGUE TYPE. RING TONGUE SIZED TO MATCH TERMINAL STUD SIZE. BRAZED BARREL SEAM. APPLICATION TOOLING DESIGNED TO CRIMP THE WIRE BARREL (CONDUCTOR GRIP) WITH A ONE-STEP CRIMP.

   POWER CONNECTORS (SIZES 2 AWG - 750 MCM): NON-INSULATED ONE-HOLE RECTANGULAR TONGUE FOR SIZES 2 AWG THROUGH 3/0 AWG AND TWO-HOLE RECTANGULAR TONGUE FOR 4/0 AWG THROUGH 750 MCM.

   CONTROL, INSTRUMENT, AND SPECIALTY CABLE CONNECTORS: TIN-PLATED COPPER. VINYL OR NYLON PRE-INSULATED RING-TONGUE TYPE PREFERRED. FLAT SPADE LUGS WILL NOT BE PERMITTED. VINYL PRE-INSULATED SPRING-TYPE SPADE TERMINALS; HOLLINGSWORTH "MINI SPRING SPADES"; THOMAS AND BETTS "LOCKING-FORK"; PANDUIT "LOCKING-FORK" SIZED TO MATCH TERMINAL STUD SIZE ARE ACCEPTABLE.

   GROUNDING CONNECTIONS: ALL GROUNDING SURFACES SHALL BE CLEANED TO OBTAIN "BRIGHT" METAL AT ALL POINTS OF CONTACT.

3. CABLE TIES: CABLE TIES SHALL BE NYLON SELF-LOCKING TYPE, HAVE A NORMAL SERVICE TEMPERATURE RANGE OF -40C TO 85C, BE WEATHER-RESISTANT TYPE FOR OUTDOOR. USE AMP SPECIAL INDUSTRIES "AMP-TY," DENNISON MANUFACTURING COMPANY "BAR-LOK," PANDUIT CORPORATION "PAN-TY," THOMAS & BETTS "TY-RAP," OR MINNESOTA MINING AND 3M BRAND CABLE TIES.

4. TERMINAL BLOCKS:

   MOUNTING IN TERMINAL BOXES: BLOCKS TO BE DESIGNED AND SIZED FOR THE CABLES BEING TERMINATED AND RATED 600V. PROVIDE BINDING SCREW-TYPE TERMINALS FOR POWER CABLES AND STRAP SCREW OR TUBULAR CLAMP TERMINALS FOR CONTROL AND INSTRUMENT CABLES. THE RATED CURRENT CARRYING CAPACITY SHALL BE EQUAL TO OR GREATER THAN THE CABLE BEING TERMINATED.

   MOUNTING IN CABINETS, PANELS, CONTROL BOARDS, ETC.: BLOCKS TO BE DESIGNED AND SIZED FOR THE CABLES BEING TERMINATED AND RATED 600V. PROVIDE BINDING SCREW TYPE TERMINALS FOR POWER CABLES. THE RATED CURRENT CARRYING CAPACITY SHALL BE EQUAL TO OR GREATER THAN THE CABLE BEING TERMINATED. PROVIDE MARKING STRIP ON BLOCKS FOR POWER CABLES AND CONTROL CABLES.

5. WIRE AND CABLE INSTALLATION: DO NOT SUBJECT CABLE TO PULLING TENSIONS OR SIDEWALL PRESSURES IN EXCESS OF MANUFACTURER'S RECOMMENDATIONS. ATTACH PULLING GRIPS OVER THE CABLE SHEATH TO PREVENT SLIPPING OF THE INSULATION. DO NOT SUBJECT CABLE TO BENDING RADIUS LESS THAN THOSE RECOMMENDED BY THE CABLE MANUFACTURER OR (WHICHEVER IS GREATER) EIGHT TIMES THE CABLE OUTSIDE DIAMETER DURING OR AFTER INSTALLATION. INSTALL INTERMEDIATE SPLICES ONLY AS INDICATED OR AS APPROVED BY OWNER OR OWNER REPRESENTATIVE. SUPPORT CABLES AT CONNECTIONS OR TERMINATION POINTS SUCH THAT ANY STRAIN ON CABLE WILL NOT BE TRANSMITTED TO THE CONNECTION OR TERMINATION. INSTALL CABLE SUPPORTS IN VERTICAL RUNS OF CONDUIT AT BOXES AND AT TERMINATIONS IN EQUIPMENT, AND AS REQUIRED TO MEET INTERMEDIATE SUPPORT REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC). ALL PULLING COMPOUNDS SHALL BE APPROVED BY WIRE AND CABLE MANUFACTURER AS BEING COMPATIBLE WITH CABLE MATERIALS. ATTACH A CABLE IDENTIFICATION TAG TO EACH CABLE AT ALL TERMINATION OR END POINTS.

6. POWER, CONTROL, INSTRUMENT AND SPECIALTY CABLE: INSTALL METALLIC BARRIER IN ALL BOXES TO SEPARATE POWER AND CONTROL FROM LOW-LEVEL SIGNAL (50V OR LESS) INSTRUMENTATION CIRCUITS WHERE RUN IN THE SAME BOX.

   TERMINATE AND GROUND, CONTROL, INSTRUMENT, AND SPECIALTY CABLE SHIELDS AS INDICATED AND RECOMMENDED BY THE MANUFACTURER OF THE EQUIPMENT BEING CONNECTED. IN GENERAL, GROUND THE SHIELDS AT THE CONTROL BOARDS FOR CONTROL CABLES AND AT THE RECEIVING END EQUIPMENT FOR INSTRUMENTATION AND SPECIALTY CABLES.

CONDUIT

GENERAL NOTES:

1. RIGID STEEL CONDUIT: THE CONDUIT SHALL CONFORM TO ANSI C80.1 AND SHALL BE MILD DUCTILE STEEL, CIRCULAR IN CROSS SECTION WITH UNIFORM WALL THICKNESS SUFFICIENTLY ACCURATE TO CUT CLEAN THREADS. EACH LENGTH SHALL BE THREADED ON BOTH ENDS WITH THREADS PROTECTED. ALL SCALE, GREASE, DIRT, BURRS AND OTHER FOREIGN MATTER SHALL BE REMOVED FROM INSIDE AND OUTSIDE PRIOR TO APPLICATION OF COATING MATERIALS. THE CONDUIT SHALL BE GALVANIZED BY THE HOT-DIP PROCESS AS FOLLOWS: INTERIOR AND EXTERIOR SURFACES COATED WITH A SOLID-UNBROKEN LAYER OF 99% VIRGIN ZINC BY DIPPING. COATING SHALL NOT SHOW FIXED DEPOSITS OF COPPER AFTER FOUR 1-MINUTE IMMERSIONS IN A STANDARD COPPER SULFATE SOLUTION. ONE COAT OF ZINC CHROMATE FINISH ON INSIDE AND OUTSIDE SURFACES TO PREVENT OXIDATION AND WHITE RUST. THE COUPLINGS AND ELBOWS SHALL BE FABRICATED, COATED AND FINISHED BY THE SAME PROCESS AS CONDUIT.

2. RIGID POLYVINYL CHLORIDE (PVC) CONDUIT: THE CONDUIT SHALL BE FABRICATED FROM SELF-EXTINGUISHING HIGH IMPACT POLYVINYL CHLORIDE DESIGNED FOR ABOVEGROUND AND UNDERGROUND INSTALLATIONS. USE TYPE EPC SCHEDULE 40 HEAVY-WALL RIGID CONDUIT. FITTINGS AND ACCESSORIES SHALL BE FABRICATED FROM SAME MATERIAL AS CONDUIT. PROVIDE SOLVENT-CEMENT-TYPE JOINTS AS RECOMMENDED BY MANUFACTURER.

3. RIGID STEEL CONDUIT FITTINGS: HEAVY-DUTY CAST MALLEABLE IRON FITTINGS: MOGUL TYPE FOR CONDUIT SIZES 1-1/2 INCHES AND LARGER. LBD OR ROLLER ACTION TYPE LB FOR RIGHT ANGLE FITTINGS FOR CONDUIT SIZES 2 INCHES AND LARGER. FULL-THREADED HUBS AND RUBBER-GASKETED COVERS. PROVIDE ZINC, CADMIUM-PLATED OR BRONZE HARDWARE BOLTS AND SCREWS FOR ASSEMBLY. FINISH WITH CADMIUM-PLATED OR GALVANIZING.
4. INDOOR AND OUTDOOR BOXES: PROVIDE FS OR RS TYPE JUNCTION BOXES WITH CADMIUM ZINC ELECTROPLATE AND HOT-DIP GALVANIZED FINISH. COVER SHALL BE FASTENED WITH CADMIUM-PLATED BOLTS. PROVIDE THREADED CONDUIT ENTRANCE HUBS ON ALL BOXES. PROVIDE RUBBER OR NEOPRENE GASKET FOR COVER AND HUBS (NEMA TYPE 4 ENCLOSURE). CONFORM TO NEMA TYPE 4 ENCLOSURE. PROVIDE FOR THE ISOLATION OF POWER CIRCUITS FROM OTHER TYPE CIRCUITS.
5. ELECTRICAL BOXES (LESS THAN 100 CU. IN.): METALLIC OUTLET BOXES SHALL CONFORM TO ANSI/UL514A.
6. ELECTRICAL SPLICE BOXES (GREATER THAN 100 CU. IN.): METALLIC SPLICE BOXES SHALL CONFORM TO UL50, TYPE 1.
7. SUPPORT SYSTEM: FABRICATED FROM MANUFACTURED FRAMING MEMBERS EQUAL TO "UNISTRUT" P-3000 SERIES AS MANUFACTURED BY UNISTRUT CORPORATION. CONSTRUCT AS REQUIRED TO RIGIDLY SUPPORT ALL CONDUIT RUNS AND BOXES. PROVIDE CONDUIT CLAMPS, SIZED FOR THE SPECIFIC CONDUIT SIZE, TO SUPPORT ALL EXPOSED METALLIC CONDUIT. PROVIDE NONMAGNETIC CLAMPS TO SUPPORT NONMETALLIC CONDUITS. PROVIDE STEEL RODS, ANCHORS, INSERTS, BOLTS, WASHER, NUTS AND ALL OTHER SUPPORT HARDWARE.
8. INSTALLATION: PROVIDE SUITABLE PROTECTION FOR CONDUIT RISERS AGAINST DAMAGE DURING CONSTRUCTION. CAP ENDS OF ALL CONDUITS BEFORE CONCRETE IS POURED. CAP ALL CONDUITS AFTER CLEANING WHERE CONDUITS ARE TO BE LEFT EMPTY BY THIS CONTRACT. CAREFULLY REAM ENDS OF ALL CONDUIT LENGTHS AFTER CUTTING TO ELIMINATE SHARP BURRS. CLEAN OUT ALL CONDUIT BEFORE PULLING WIRE. CLEAN OUT ALL CONDUITS IMMEDIATELY AFTER CONCRETE WORK IS FINISHED. SHIFT LOCATIONS AS REQUIRED TO AVOID INTERFERENCE WITH OTHER EQUIPMENT AND PIPING BEING INSTALLED.
9. HOLES AND SLEEVES: PROVIDES THROUGH FLOORS, WALLS AND ROOFS AS NECESSARY FOR CONDUIT RUNS, INCLUDING APPROVED FLASHING AND WEATHER PROOFING AT OUTSIDE WALLS AND ON ROOFS. INSTALL SLEEVES OR FORMS FOR ALL OPENINGS IN NEW WORK. PROVIDE THE REQUIRED INSERTS AND HOLES, COMPLETELY SLEEVED, BONDED, CURBED, FLASHED AND FINISHED OFF IN AN APPROVED MANNER, WHETHER IN CONCRETE, STEEL GRATING, METAL PANELS OR ROOFS. MAKE CONNECTIONS TO BOXES, PANELS, AND OTHER EQUIPMENT AS FOLLOWS: MYERS SCREW-TIGHT HUBS OR EQUIVALENT THREADED HUBS FOR ALL OUTDOOR CONDUIT ENTRANCES. ENTER FROM BOTTOM OF ENCLOSURE OR EQUIPMENT UNLESS PHYSICALLY NOT POSSIBLE. RUNNING THREADS WILL NOT BE PERMITTED. COAT ALL FIELD CUT THREADS IN GALVANIZED CONDUIT WITH COLD GALVANIZE PAINT. COMPLY WITH APPLICABLE REQUIREMENTS OF NEC PERTAINING TO INSTALLATION OF CONDUIT SYSTEMS. PLACE DRAINAGE FITTINGS OR WEEP HOLES AT UNAVOIDABLE LOW POINTS WHERE MOISTURE CAN COLLECT. INSTALL AN ENTIRE CONDUIT SYSTEM THAT IS ELECTRICALLY CONTINUOUS WITH BONDING JUMPERS PROVIDED AS NECESSARY TO CONFORM TO NEC. ALL CONDUIT RUNS SHALL HAVE A METAL TAG ATTACHED ON EACH END 12 INCHES OR LESS FROM THE END WITH AN IDENTIFICATION NUMBER. ALL SPARE CONDUITS SHALL HAVE A 200-POUND NYLON PULL ROPE INSTALLED INSIDE AND BE CAPPED FOR FUTURE USE.
10. EXPOSED CONDUIT INSTALLATION: INSTALL HORIZONTAL RUNS AS HIGH ABOVE FLOOR AS POSSIBLE, AND IN NO CASE LOWER THAN 7 FEET ABOVE FLOOR, WALKWAY, OR PLATFORM IN PASSAGE AREA. RUN CONDUIT PARALLEL OR PERPENDICULAR TO WALLS, CEILING, BEAMS AND COLUMNS UNLESS INDICATED OTHERWISE. ROUTE TO CLEAR ALL DOORS, WINDOWS, ACCESS WELLS, AND OPENINGS. GROUP PARALLEL RUNS IN NEATLY ALIGNED BANKS WHERE POSSIBLE WITH MINIMUM OF 1-INCH CLEARANCE BETWEEN CONDUITS. MAINTAIN 6-INCH CLEARANCE BETWEEN CONDUIT AND COVERINGS ON LINES; STEAM, HOT WATER, ETC. DO NOT EXCEED A DISTANCE OF 8 FEET BETWEEN SUPPORTS ON HORIZONTAL OR VERTICAL RUNS.
11. CONCEALED CONDUIT INSTALLATION: CONCEAL CONDUIT FOR LIGHTING, CONVENIENCE OUTLETS, AND OTHER CIRCUITS IN WALLS, CEILING AND FLOORS WHERE POSSIBLE. CONCEALED CONDUIT SHALL BE RIGID STEEL IF NOT EMBEDDED IN CONCRETE AND PVC SCHEDULE 40 IF EMBEDDED IN CONCRETE. DO NOT INSTALL CONDUIT IN CONCRETE WHERE CONDUIT OUTSIDE DIAMETER EXCEEDS ONE-THIRD OF CONCRETE THICKNESS. USE EXPANSION AND DEFLECTION FITTING WITH BONDING JUMPERS AT ALL CONCRETE EXPANSION JOINTS. TIE SECURELY IN PLACE TO PREVENT MOVEMENT WHEN CONCRETE IS POURED. INSTALL IN FLOOR SLABS IN AS STRAIGHT A RUN AS POSSIBLE. CONDUIT CROSSOVERS ARE NOT PERMITTED UNLESS CONDUIT TOTAL OUTSIDE DIAMETER IS ONE-THIRD OF THE CONCRETE THICKNESS OR LESS. USE LONG RADIUS ELBOWS EXCEPT ON RISERS WHERE CURVED PORTION OF ELBOW WOULD EXTEND ABOVE THE FINISHED FLOOR OR FOUNDATION. PVC CONDUIT EMBEDDED IN CONCRETE SHALL TRANSITION TO RIGID GALVANIZED STEEL FOR ALL 90-DEGREE ELBOWS AND BEFORE TURNING EXPOSED. MAKE ALL JOINTS WATERTIGHT AFTER INSTALLATION BY COATING ALL FINISHED JOINTS WITH COAL TAR SOLUTION APPLIED AT 15 MILS MINIMUM DRY FILM.
12. BURIED CONDUIT INSTALLATION: USE SCH 40 PVC CONDUIT. INSTALL IN AS STRAIGHT A RUN AS POSSIBLE BETWEEN TERMINATION POINTS. BURY CONDUITS AS MINIMUM OF 30 INCHES BELOW FINISH GRADE UNLESS INDICATED OTHERWISE. SLOPE CONDUIT AWAY FROM CONDUIT RISERS WHERE POSSIBLE. MAINTAIN 6-INCH SEPARATION FROM UNDERGROUND PIPING. USE LONG RADIUS BENDS AT ALL RISERS UNLESS INDICATED OTHERWISE. AFTER TRENCH BOTTOM HAS BEEN FINISHED TO GRADE, LAY CONDUIT. CAP ENDS OF ALL CONDUIT RISERS BEFORE BACKFILLING. PROVIDE WATERTIGHT SEAL AROUND WIRES WHERE CONDUIT TERMINATES IN PULL BOX.
11. CONDUIT FITTINGS INSTALLATION: INSTALL SPECIAL BOXES AS INDICATED FOR SIZE REQUIRED FOR CONDUITS AND CABLES ENTERING AND LEAVING BOX. INSTALL WHERE REQUIRED FOR PULL OR JUNCTION BOXES AND FOR MOUNTING OR CONNECTING TO SWITCHES, OUTLETS, INTERMEDIATE TERMINAL BLOCKS OR CONTROL DEVICES. PROVIDE 1/4-INCH WEEP HOLES IN INTERIOR BOXES WHERE CONDUITS ENTER FROM EXTERIOR OR BURIED INSTALLATION. CONSTRUCT SUPPORTS WITH SUFFICIENT RIGIDITY TO HOLD ALL MOUNTED EQUIPMENT AND MATERIAL IN PERMANENT AND NEAT ALIGNMENT. DESIGN SUPPORTS TO PROVIDE 1/4-INCH SPACE BETWEEN EQUIPMENT HOUSINGS AND WALLS OR COLUMNS UPON WHICH THEY ARE MOUNTED. DO NOT EXCEED LOAD REQUIREMENTS IN NEC AND NEMA STANDARDS.

LABELING

1. SERVICE EQUIPMENT SHALL BE LABELED WITH A CONSPICUOUS AND PERMANENT LABEL INDICATING AVAILABLE FAULT CURRENT AND DATE CALCULATED. LABEL AND FAULT CURRENT VALUE TO BE PROVIDED BY CUSTOMER.
2. THE CUSTOMER SHALL PROVIDE AND INSTALL A LABEL ON THE PANELBOARD DOOR WITH THE LOCATION, DEVICE OR EQUIPMENT THAT SUPPLIES POWER TO THE PANELBOARD.
3. PANELBOARD AND TRANSFER SWITCH DOORS TO BE LABELED WITH ARC-FLASH WARNING LABEL, BRADY CAT. NO. 94913 OR EQUAL.

ALABAMA LICENSED PROFESSIONAL ENGINEER NO. 22480 JOHN F. CONWAY 2/17/2017

SAFE-T-SHELTER®
SAFE ROOMS & STORM SHELTERS

HCS Engineering Company, Inc.
DECATUR, ALABAMA (256) 353 - 1972

HCS JOB NUMBER: 14100001

REV.	DESCRIPTION	E.C.N. #	DATE	BY	CK.
0	ORIGINAL ISSUE (DRS/JFC)		12/18/14	HCS	
1	GENERAL REVISIONS (DRS/JFC)		5/21/15	HCS	
2	GENERAL REVISIONS (JFC)		2/22/17	HCS	

PROJECT

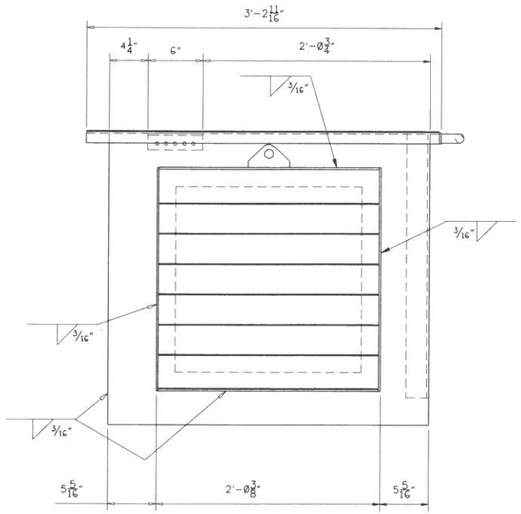
MATERIAL | SCALED: NONE | DRAWN BY: D. STOVER

SURFACE COAT | APPROVED BY:

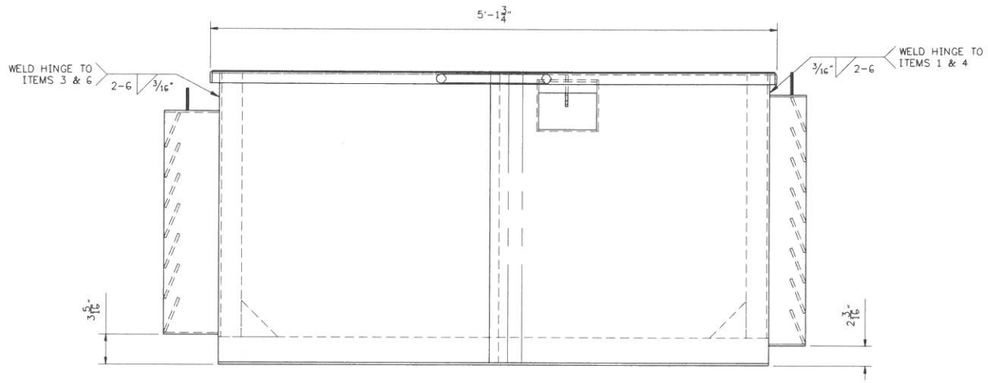
TITLE: ELECTRICAL NOTES AND SCHEDULES

DATE: 12/10/14 | SIZE: D | DRAWING NUMBER: D-NON-ESPEC | REV: 2

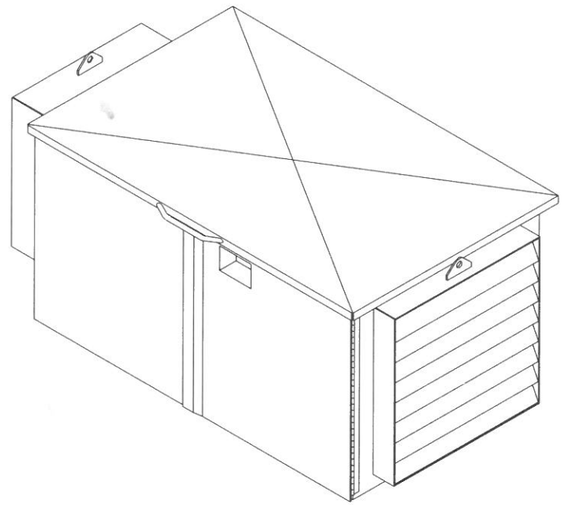
REV	DESCRIPTION	E.C.N. #	DATE	DR	CK

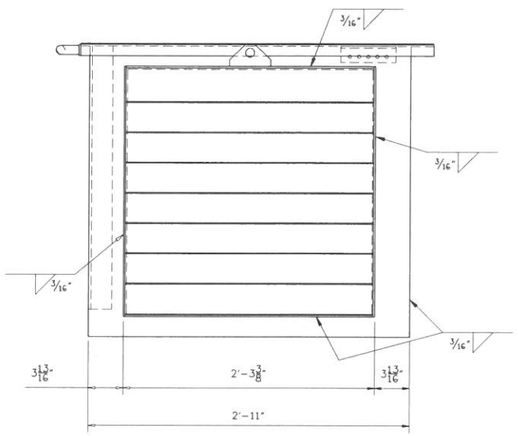


LEFT SIDE VIEW

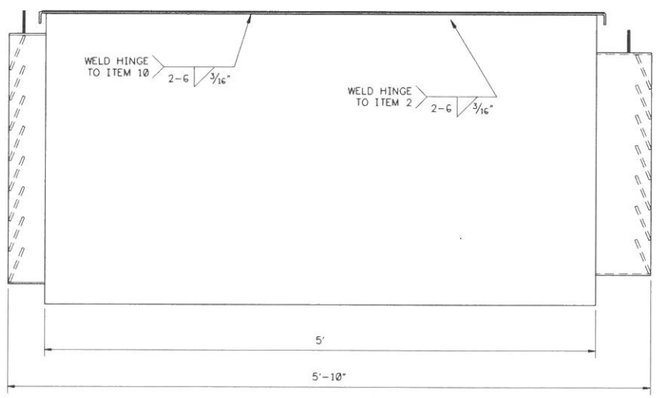


FRONT VIEW





RIGHT SIDE VIEW



REAR VIEW

GENERATOR BOX ASSEMBLY

SCALE: 1½" = 1'-0"

ALABAMA REGISTERED NO. 12307 PROFESSIONAL ENGINEER DONALD B. HEATON

4/1/23

SAFE-T-SHELTER©
SAFE ROOMS & STORM SHELTERS

PROJECT

MATERIAL: SURFACE CUAT

SCALE: 1 1/2"=1'-0"

DRAWN BY:

APPROVED BY:

TITLE: OPTION 1 - GENERATOR SHOP DRAWING

UNLESS OTHERWISE SPECIFIED TOLERANCE EXCEPT AS NOTED: XXX ± .005, XX ± .010, X ± .040, FRACTION ± 1/16"

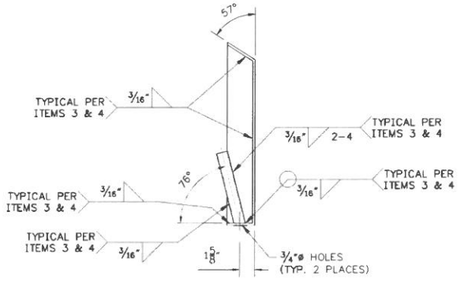
04/01/23

SIZE:

DRAWING NUMBER: STS3-1048 Page 13

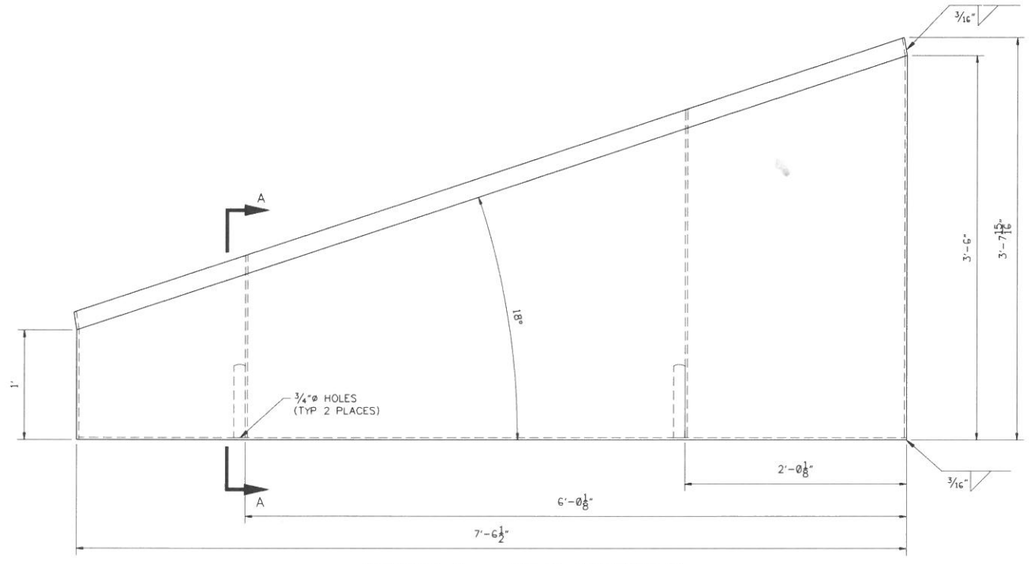
REV: 1

REV.	DESCRIPTION	E.C.N. #	DATE	DR.	CK.



SECTION A-A

SCALE: 1½" = 1'-0"



OPTION 2 - WING ASSEMBLY

SCALE: 1½" = 1'-0"

ALABAMA REGISTERED NO. 12307 PROFESSIONAL ENGINEER DONALD B. HEADRICK JR.

4/1/23

UNLESS OTHERWISE SPECIFIED TOLERANCE EXCEPT AS NOTED XXX ± .005 XX ± .020 X ± .040 FRACTION ± 1/16"

SAFE-T-SHELTER©
SAFE ROOMS & STORM SHELTERS

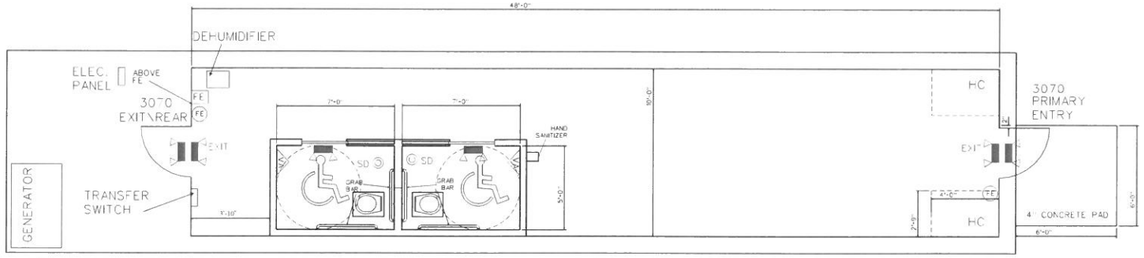
PROJECT

MATERIAL | SCALE: 1 1/2"=1'-0" | DRAWN BY

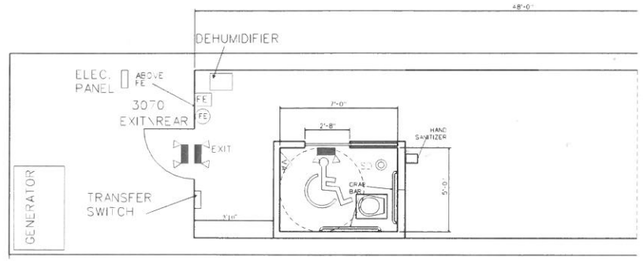
SURFACE CUAT | APPROVED BY:

TITLE: OPTION 2 - WING WALL ASSEMBLY SHOP DRAWING

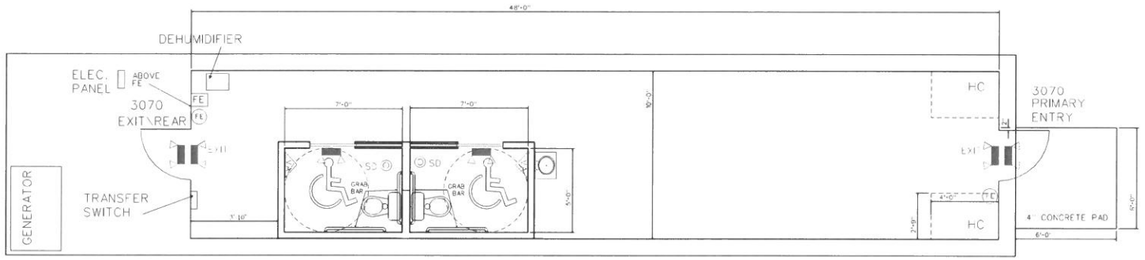
04/01/23 | SIZE | DRAWING NUMBER: STS3-1048 Page 14 | REV: 1



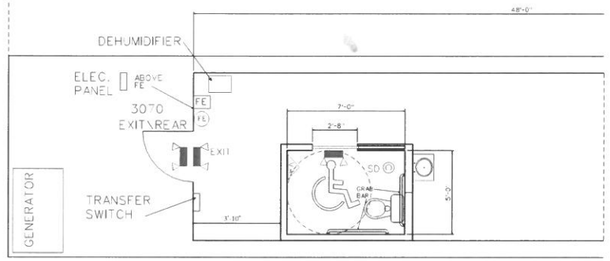
DOUBLE
CHEMICAL RESTROOM
FLOOR PLAN OPTION C
1/4"=1'-0"



SINGLE
CHEMICAL RESTROOM
FLOOR PLAN OPTION C-1
1/4"=1'-0"



DOUBLE
STANDARD RESTROOM
FLOOR PLAN OPTION B
1/4"=1'-0"



SINGLE
STANDARD RESTROOM
FLOOR PLAN OPTION B-1
1/4"=1'-0"

Restroom(s) to be constructed at customers site. After shelter has been delivered and anchord.
Restroom(s) to be constructed by STS or others.

LIFE SAFTY LEGEND

- FE — FIRST AID KIT
- EXIT — EXIT SIGN WITH LIGHTS
- EMERGENCY LIGHTS
- VISUAL ALARM
- SD — SMOKE DETECTOR
- FE — FIRE EXTINGUISHER

The construction for this safe room shall comply with the applicable provisions of FEMA Document 361, "Design and Construction Guidance for Community Shelters", March 2015 and ICC 500–2014. This safe room shall be designed to withstand tornado winds of 250 mph.

The shelter shall comply with all applicable provisions of the 2010 ADA Standards for Accessible Design.

Occupancy Load per FEMA 361 - 293 / 289 / 286

DAVID ALAN MILSTEAD-ARCHITECT AL-2556
800 South Montgomery Ave. Sheffield, AL. 35660
Phone 256-383-9007
rmilstead.architect@att.net

RESTROOM CONFIGURATIONS

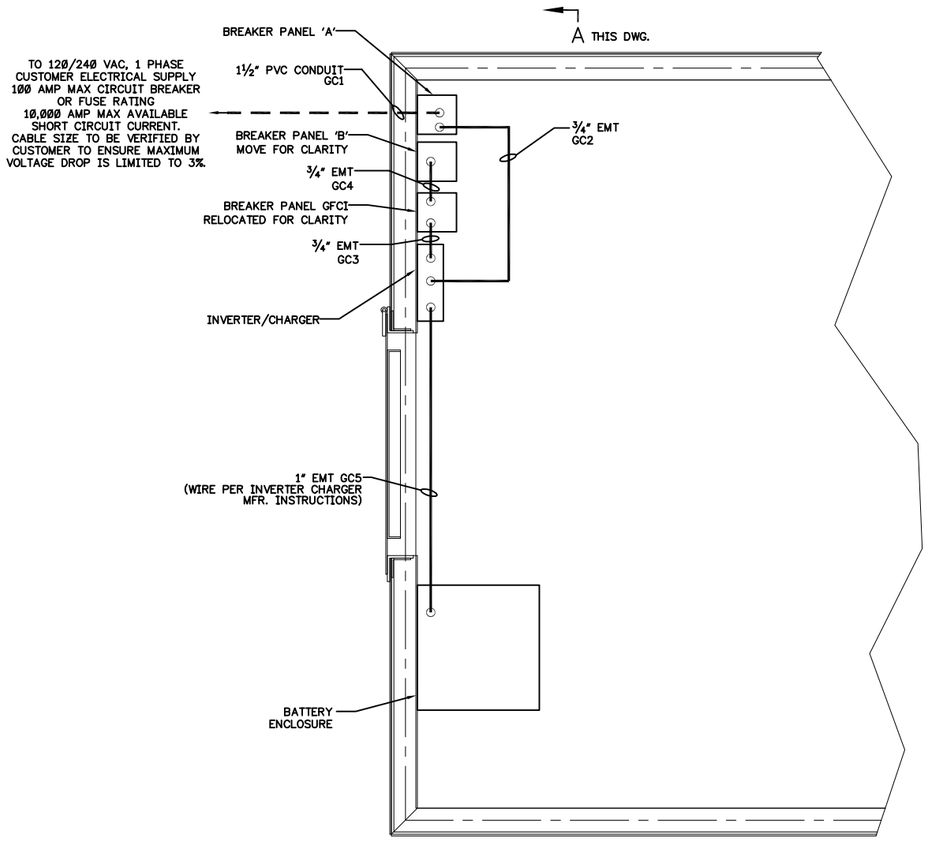
OPTIONAL

SAFETY SHELTER

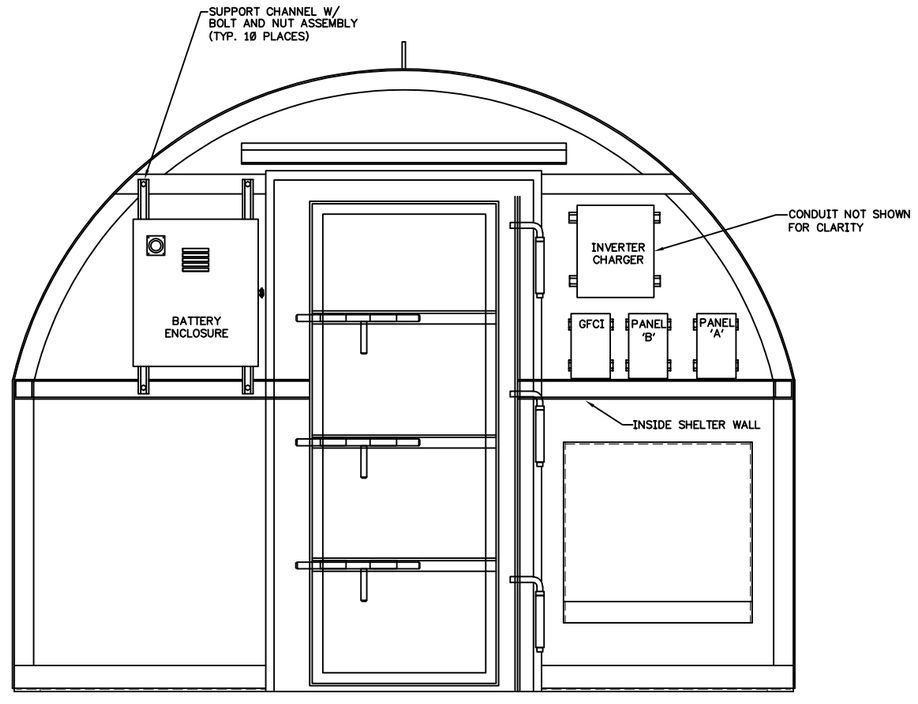
Date: 16 JULY 2015
Rev:

A-1
1

BILL OF MATERIAL	
ITEM	DESCRIPTION
1	LOAD CENTER, 100 AMP, 12-SPACE, 1- PHASE, 3-WIRE, NEMA TYPE 1 ENCLOSURE, FACTORY INSTALLED GROUND BUS, 100 AMP 2-POLE MAIN BREAKER, (1) 30 AMP 1-POLE AND (3) 20 AMP 1-POLE BRANCH CIRCUIT
	BREAKERS, SPACES TO REMAIN COVERED. GE M/N TM1210CCUG1K WITH THQL BREAKERS. PANEL DOOR TO BE PERMANENTLY LABELED "SERVICE DISCONNECT"
2	INVERTER/CHARGER, W/BUILT-IN TRANSFER SWITCH, OUTPUT RATING: 1000W(2000W SURGE), 120VAC, 8.4A, CHARGER RATING: 50A, TRANSFER SWITCH RATING: 30A, XANTREX M/N FREEDOM XC1000
3	BATTERY ENCLOSURE (ACCOMMODATES 2 BATTERIES), MATERIAL: ALUMINUM, DIMS: 22.625H X 19.25W X 19.625D, UL 508A, NEMA 3R, AMERESCO SOLAFR M/N BBA-2 OR EQUAL
4	BATTERY, 12.8V 100AH DEEP CYCLE, 1280 WATT-HOURS (WH), WEIGHT 29 LBS, 11.9" X 6.8" 8.6", EXPION360 M/N EX-G27-100C OR EQUAL
5	BATTERY SWITCH, CONTINUOUS CURRENT RATING: 275 A, VOLTAGE RATING: 48 V, SURFACE OR REAR PANEL MOUNT, VICTRON ENERGY M/N VBS127010010
6	FUSE BLOCK, 100A, CLASS T, 300V, BOX LUG CONNECTOR, 2/0–6 AWG WIRE RANGE, LITTELFUSE M/N LFT301001 W/LFT30100FBC COVER
7	FUSE, 100A, CLASS T, 125VDC, LITTELFUSE M/N JLLN100
8	NOT USED
9	LIGHT FIXTURE, INDOOR, LED LUMINAIRE, SURFACE MOUNT, 120V BALLAST, 2-32 WATT T8 LAMPS, DSS (DIVERSE SUPPLY SOLUTIONS) M/N S232
10	LIGHT FIXUTURE, OUTDOOR, 120V, 13 WATT CFL LAMP, DUSK TO DAWN AUTOMATIC LIGHT CONTROL, UTILITECH M/N GU8813-BZ-I
11	EXIT SIGN, COMBINATION SIGN/LIGHT, 120V, DUAL LAMPS, NICAD BACKUP BATTERY, COOPER LIGHTING M/N APC7R OR EQUAL
12	DUPLEX RECEPTACLE, SPECIFICATION GRADE DUPLEX AND DUPLEX/GFI RECEPTACLES LEVITON 5362/5362GF SERIES OR EQUAL
13	WALL SWITCH, SPECIFICATION GRADE 2 AND 3-WAY SWITCH, LEVITON 1221/1223 SERIES OR EQUAL
14	VENTILATION FAN, 24", 115 VOLT, 1- PHASE, 60 HZ, 1.8 AMP, 2-SPEED, 1/8 HP MOTOR, 5850 CFM @ 0.0"SP, 5560 CFM @ 0.05"SP, 9' SWITCHED CORD AND PLUG,
	INCLUDES WEATHER HOOD, J & D MANUFACTURING M/N VPES24 AND VFT140858 (HOOD)



SHELTER POWER PLAN
(GRID OPTION)



VIEW A–A
(GRID OPTION)

ALABAMA LICENSED No. 22480 PROFESSIONAL 9/15/2023 ENGINEER JOHN F. CONWAY

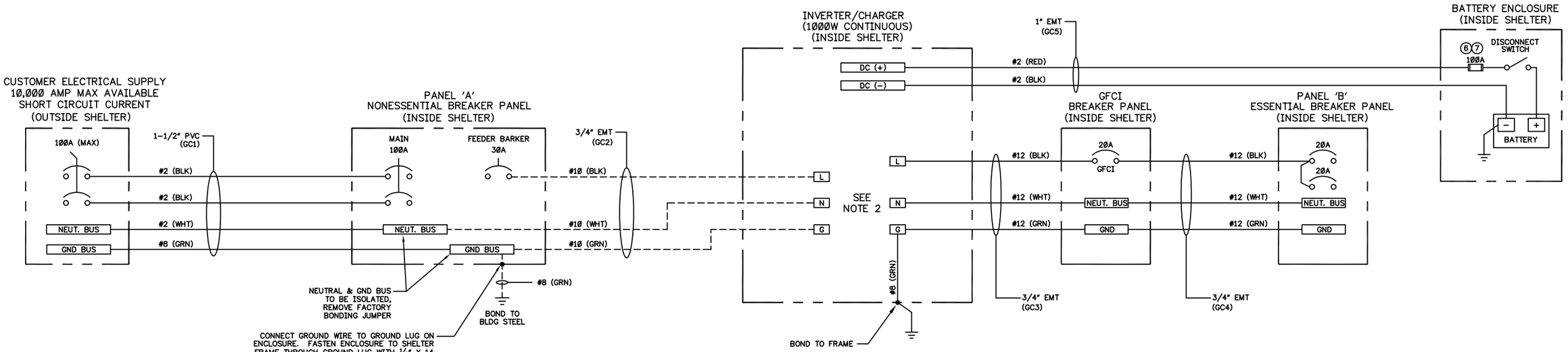
SAFE-T-SHELTER®
Safe Rooms/Shelters 1-800-462-3648

HCS Engineering Company,
DECATUR, ALABAMA (256) 353 - 1972

HCS JOB NUMBER: 23100001

REV.	DESCRIPTION	E.C.N. #	DATE	DR.	CK.
Ø	ISSUED FOR CONSTRUCTION (PSS/CMB)		9/15/23	HCS	CMB

MATERIAL	SCALE: NONE	DRAWN BY: PAUL STRANGE	
SURFACE COAT		APPROVED BY: JOHN CONWAY	
TITLE: OPTIONAL GRID / BATTERY UPS SYSTEM ELECTRICAL PLAN & VIEW			
DATE: 07/19/23	SIZE: D	DRAWING NUMBER: E-UPS-GRID-1	REV: 0

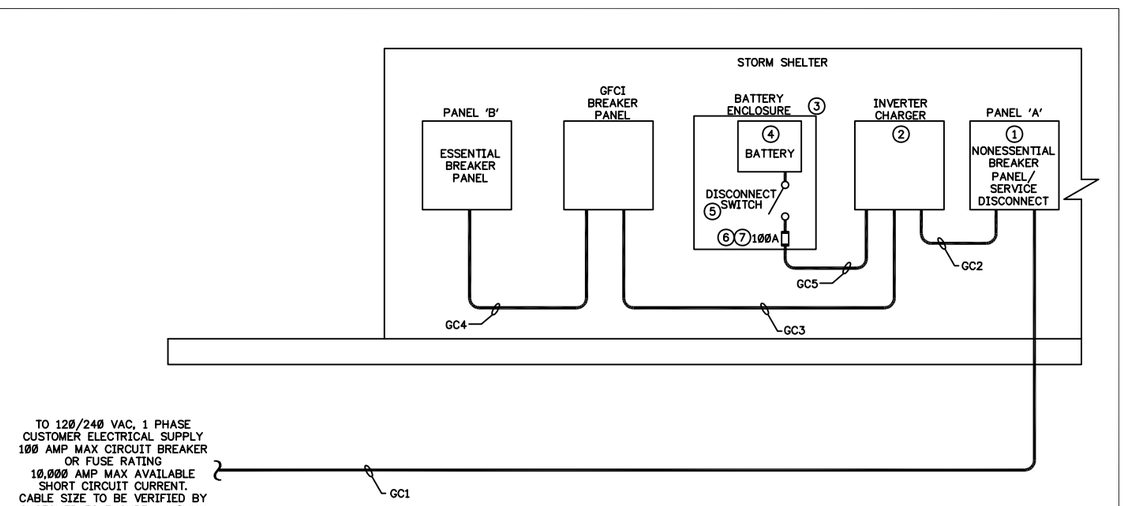


WIRING DIAGRAM GRID OPTION
(GRID OPTION)

BATTERY NOTES:

1. AVOID LONG PERIODS OF EXTREME COLD OR HOT TEMPERATURES. LONG PERIODS OF EXPOSURE TO THESE TEMPERATURES CAN RESULT IN BATTERY DAMAGE.
2. INVERTER/CHARGER XANTREX FREEDOM HAS BUILT IN TRANSFER SWITCH AND WILL SWITCH TO BATTERY POWER IF MAIN POWER IS LOST. DO NOT INSTALL INVERTER/CHARGER IN ANY COMPARTMENT CONTAINING OF FLAMMABLE VAPORS OR GASSES.

CONDUIT SCHEDULE					
"CONDUIT NO."	"CONDUIT SIZE"	CONDUCTORS	FUNCTION	FROM	TO
GC1	1-1/2" SCH 40 PVC	3- #2 W/#8 GND	BUILDING FEEDER	OWNER SUPPLY PANEL	PANEL 'A'
GC2	3/4" EMT	2- #10 W/GND	INVERTER/CHARGER AC INPUT	PANEL 'A'	INVERTER/CHARGER
GC3	3/4" EMT	2- #12 W/GND	INVERTER/CHARGER AC OUTPUT	INVERTER/CHARGER	GFCI PANEL
GC4	3/4" EMT	2- #12 W/GND	PANEL 'B' FEEDER	GFCI PANEL	PANEL 'B'
GC5	1" EMT	2- #2	INVERTER/CHARGER DC INPUT	BATTERY ENCLOSURE	INVERTER/CHARGER



RISER DIAGRAM GRID OPTION
(GRID OPTION)

DIRECTORY	LOAD-WATTS L1	LOAD-WATTS L2	No.	AMPS		AMPS	No.	LOAD-WATTS L1	LOAD-WATTS L2	DIRECTORY
MAIN BREAKER – BACK FED			1	100		30	2	.		INVERTER/CHARGER
			3	100		20	4		.	RECEPTACLE–DEHUMIDIFIER
SPACE			5	20		20	6			SPACE
SPACE			7	–		–	8			SPACE
SPACE			9	–		–	10			SPACE
SPACE			11	–		–	12			SPACE
SUB TOTAL WATTS	–	–			N			.	.	SUB TOTAL WATTS
240/120V 1–PH 3–WIRE	TOTAL WATTS, L1							.		PANEL 'A' DIRECTORY NONESSENTIAL LOADS
100 AMP MAIN BREAKER	TOTAL WATTS, L2							.		
(ISOLATED GROUND BUS)	TOTAL WATTS							.		

PANEL DIRECTORY	LOAD WATTS L1	No.	AMPS	
PANEL 'B' (GFCI)	.	1	20	
SPACE	.	2	.	
SUB TOTAL WATTS	–	.	.	N
120V 1–PH 2–WIRE	TOTAL WATTS, L1			.
(ISOLATED GROUND BUS) GFCI BREAKER	TOTAL WATTS			.
GFCI BREAKER PANEL ESSENTIAL LOADS				

PANEL DIRECTORY	LOAD WATTS L1	No.	AMPS	
LIGHTS	.	1	20	
RECEPTACLES	.	2	20	
SUB TOTAL WATTS	–	.	.	N
120V 1–PH 2–WIRE	TOTAL WATTS, L1			.
(ISOLATED GROUND BUS)	TOTAL WATTS			.
PANEL 'B' ESSENTIAL LOADS				

ALABAMA LICENSED No. 22480 PROFESSIONAL 9/15/2023 ENGINEER JOHN F. CONWAY

SAFE-T-SHELTER®
Safe Rooms/Shelters 1-800-462-3648

HCS Engineering Company,
DECATUR, ALABAMA (256) 353 - 1972

HCS JOB NUMBER: 23100001

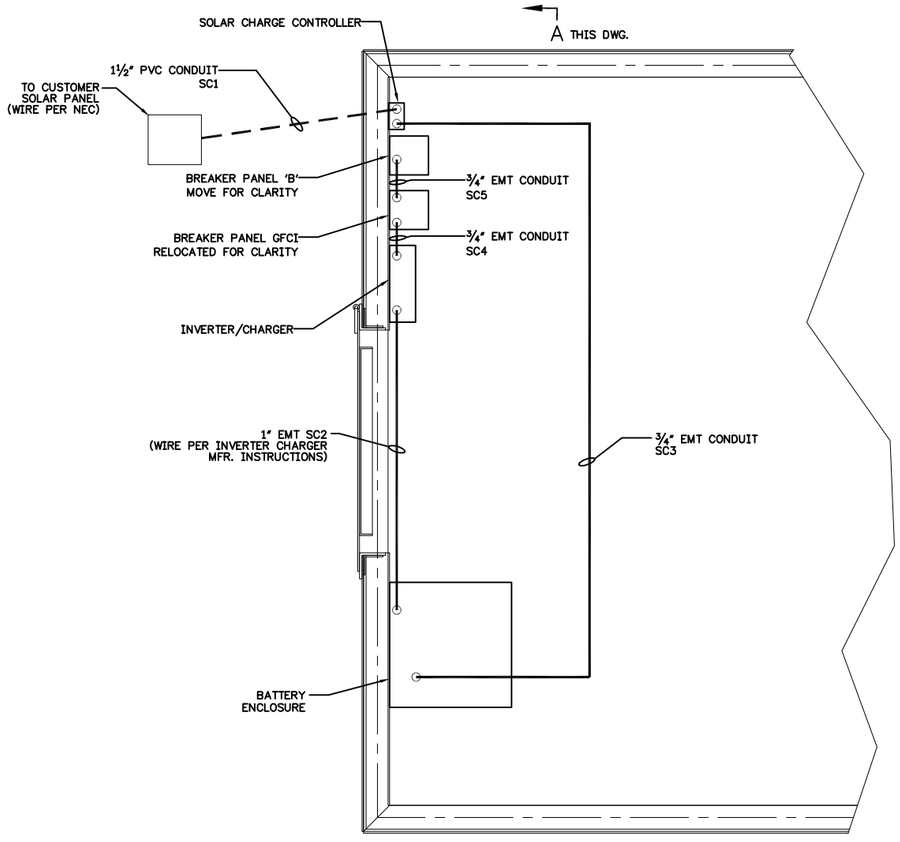
REV.	DESCRIPTION	E.C.N. #	DATE	DR.	CK.
0	ISSUED FOR CONSTRUCTION (PSS/CMB)		9/15/23	HCS	CMB

MATERIAL	SCALE	DRAWN BY
SURFACE COAT	NONE	PAUL STRANGE
		APPROVED BY: JOHN CONWAY

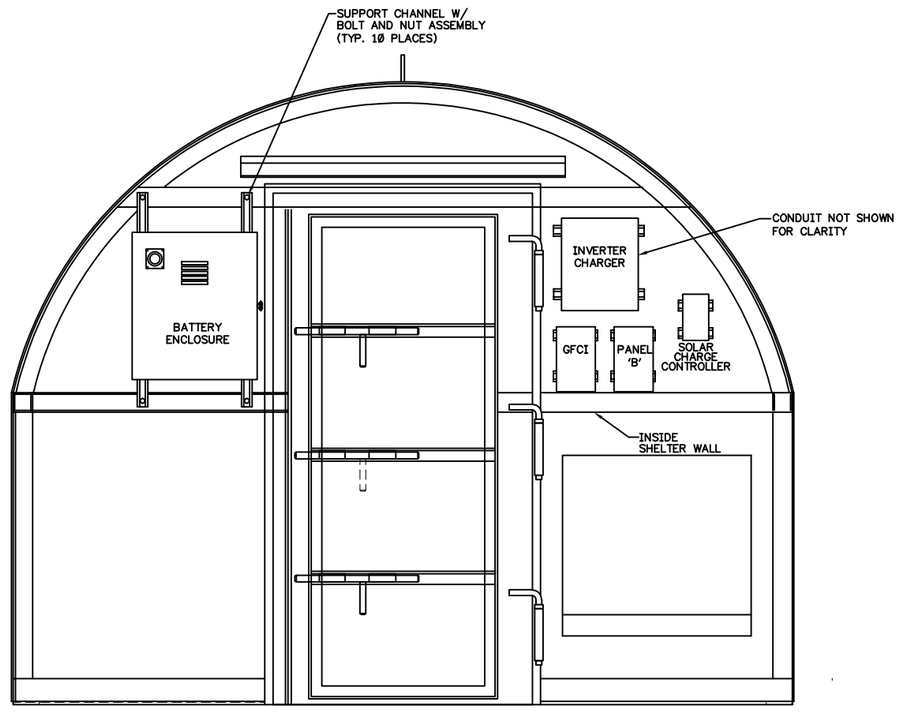
TITLE: OPTIONAL GRID / BATTERY UPS SYSTEM DIAGRAMS & SCHEDULES

DATE	SIZE	DRAWING NUMBER	REV
07/19/23	D	E-UPS-GRID-2	0

BILL OF MATERIAL	
ITEM	DESCRIPTION
1	NOT USED
2	NOT USED
3	BATTERY ENCLOSURE (ACCOMMODATES 2 BATTERIES), MATERIAL: ALUMINUM, DIMS: 22.625H X 19.25W X 19.625D, UL 508A, NEMA 3R, AMERESCO SOLAFR M/N BBA-2 OR EQUAL
4	BATTERY, 12.8V 100AH DEEP CYCLE, 1280 WATT-HOURS (WH), WEIGHT 29 LBS, 11.9" X 6.8" 8.6", EXPION360 M/N EX-G27-100C OR EQUAL
5	BATTERY SWITCH, CONTINUOUS CURRENT RATING: 275 A, VOLTAGE RATING: 48 V, SURFACE OR REAR PANEL MOUNT, VICTRON ENERGY M/N VBS127010010
6	FUSE BLOCK, 100A, CLASS T, 300V, BOX LUG CONNECTOR, 2/0–6 AWG WIRE RANGE, LITTELFUSE M/N LFT301001 W/LFT30100FBC COVER
7	FUSE, 100A, CLASS T, 125VDC, LITTELFUSE M/N JLLN100
8	FUSE, 30A, CLASS T, 125VDC, LITTELFUSE M/N JLLN030
9	LIGHT FIXTURE, INDOOR, LED LUMINAIRE, SURFACE MOUNT, 120V BALLAST, 2-32 WATT T8 LAMPS, DSS (DIVERSE SUPPLY SOLUTIONS) M/N S232
10	LIGHT FIXUTURE, OUTDOOR, 120V, 13 WATT CFL LAMP, DUSK TO DAWN AUTOMATIC LIGHT CONTROL, UTILITECH M/N GU8813-BZ-I
11	EXIT SIGN, COMBINATION SIGN/LIGHT, 120V, DUAL LAMPS, NICAD BACKUP BATTERY, COOPER LIGHTING M/N APC7R OR EQUAL
12	DUPLEX RECEPTACLE, SPECIFICATION GRADE DUPLEX AND DUPLEX/GFI RECEPTACLES LEVITON 5362/5362GF SERIES OR EQUAL
13	WALL SWITCH, SPECIFICATION GRADE 2 AND 3-WAY SWITCH, LEVITON 1221/1223 SERIES OR EQUAL
14	VENTILATION FAN, 24", 115 VOLT, 1- PHASE, 60 HZ, 1.8 AMP, 2-SPEED, 1/8 HP MOTOR, 5850 CFM @ 0.0"SP, 5560 CFM @ 0.05"SP, 9' SWITCHED CORD AND PLUG,
	INCLUDES WEATHER HOOD, J & D MANUFACTURING M/N VPES24 AND VFT140858 (HOOD)
15	SOLAR CHARGE CONTROLLER, 12/24VDC, WIRE TERMINALS UP TO 6 AWG, CIRCUIT VOLTAGE100 VDC, BATTERY OUTPUT 9A2 VDC, (L X W X D) 7.1" X 4.0" X 2.4", XANTREX M/N 710-3024-01 OR EQUAL
16	SOLAR PANEL, FLEXIBLE, 220W, 24.6V, 44 MONO-CRYSTALLINE PERC CELLS, DIMENSIONS (L X W X D) 71.6" X 28.8" X 0.08", XANTREX M/N 784-0220 OR EQUAL



SHELTER POWER PLAN
(SOLAR OPTION)



VIEW A–A
(SOLAR OPTION)

ALABAMA LICENSED No. 22480 PROFESSIONAL ENGINEER JOHN F. CONWAY 9/15/2023

HCS Engineering Company,
DECATUR, ALABAMA (256) 353 - 1972

HCS JOB NUMBER: 2310ØØØ1

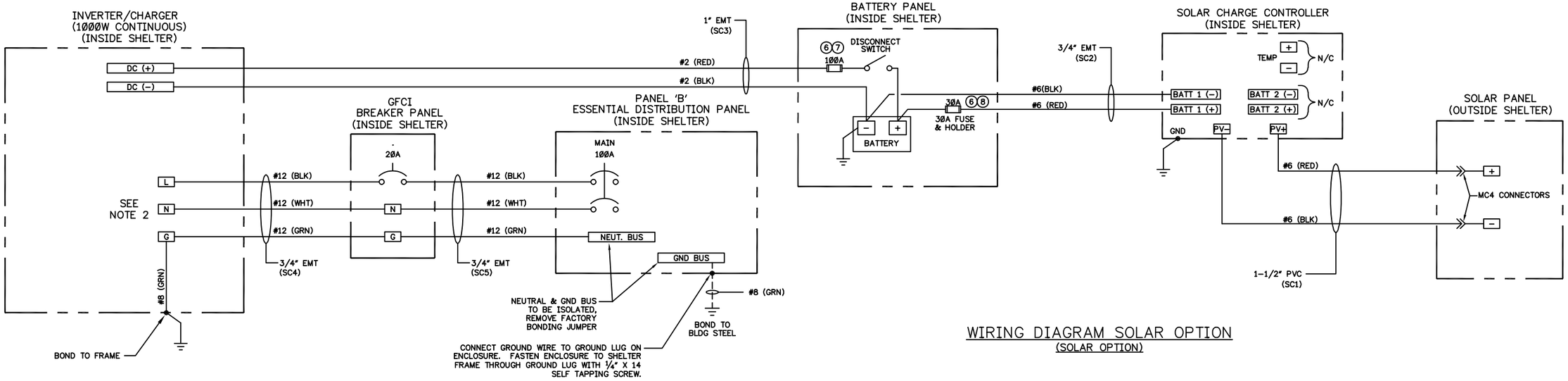
REV.	DESCRIPTION	E.C.N. #	DATE	DR.	CK.
Ø	ISSUED FOR CONSTRUCTION (PSS/CMB)		9/15/23	HCS	CMB

SAFE-T-SHELTER®
Safe Rooms/Shelters 1-800-462-3648

MATERIAL	SCALE	DRAWN BY
SURFACE CVAT	NONE	PAUL STRANGE
		APPROVED BY: JOHN CONWAY

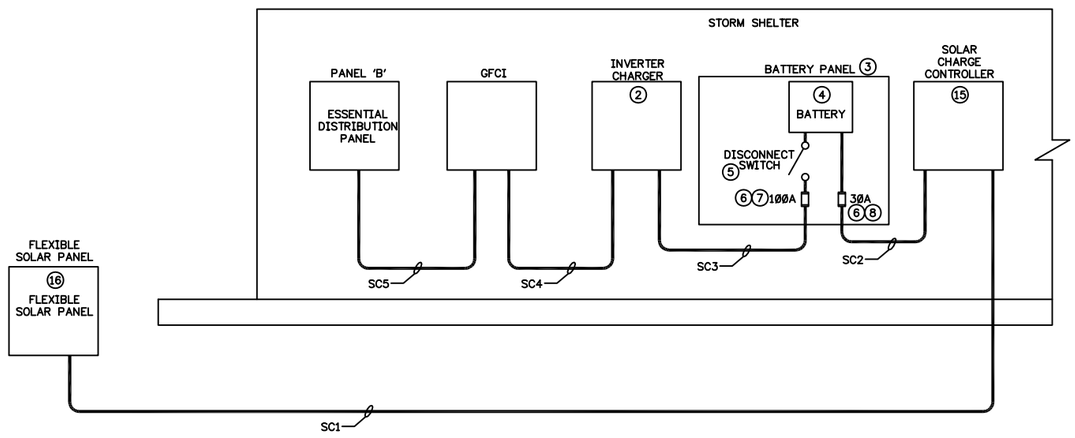
TITLE: OPTIONAL SOLAR / BATTERY UPS SYSTEM ELECTRICAL PLAN & VIEW

DATE	SIZE	DRAWING NUMBER	REV
07/19/23	D	E-UPS-SOLAR-1	0



WIRING DIAGRAM SOLAR OPTION
(SOLAR OPTION)

CONDUIT SCHEDULE					
"CONDUIT NO."	"CONDUIT SIZE"	CONDUCTORS	FUNCTION	FROM	TO
SC1	1-1/2" SCH 40 PVC	2-#6	SOLAR PANEL OUTPUT	SOLAR PANEL	SOLAR CHARGE CONTROLLER
SC2	3/4" EMT	2-#6	SOLAR CHARGE CONTROLLER OUTPUT	SOLAR CHARGE CONTROLLER	BATTERY ENCLOSURE
SC3	1" EMT	2-#2	INVERTER/CHARGER DC INPUT	BATTERY ENCLOSURE	INVERTER/CHARGER
SC4	3/4" EMT	2-#12 W/GND	INVERTER/CHARGER AC OUTPUT	INVERTER/CHARGER	GFCI PANEL
SC5	3/4" EMT	2-#12 W/GND	PANEL 'B' FEEDER	GFCI PANEL	PANEL 'B'



RISER DIAGRAM SOLAR OPTION
(SOLAR OPTION)

BATTERY NOTES:

1. AVOID LONG PERIODS OF EXTREME COLD OR HOT TEMPERATURES. LONG PERIODS OF EXPOSURE TO THESE TEMPERATURES CAN RESULT IN BATTERY DAMAGE.
2. INVERTER/CHARGER XANTREX FREEDOM HAS BUILT IN TRANSFER SWITCH AND WILL SWITCH TO BATTERY POWER IF MAIN POWER IS LOST. DO NOT INSTALL INVERTER/CHARGER IN ANY COMPARTMENT CONTAINING OF FLAMMABLE VAPORS OR GASSES.

PANEL DIRECTORY	LOAD WATTS L1	No.	AMPS	
PANEL 'B' (GFCI)	.	1	20	
SPACE	.	2	.	
SUB TOTAL WATTS	–	.	.	N
120V 1-PH 2-WIRE	TOTAL WATTS, L1			.
(ISOLATED GROUND BUS) GFCI BREAKER	TOTAL WATTS			.
GFCI BREAKER PANEL ESSENTIAL LOADS				

PANEL DIRECTORY	LOAD WATTS L1	No.	AMPS	
LIGHTS	.	1	20	
RECEPTACLES	.	2	20	
SUB TOTAL WATTS	–	.	.	N
120V 1-PH 2-WIRE	TOTAL WATTS, L1			.
(ISOLATED GROUND BUS)	TOTAL WATTS			.
PANEL 'B' ESSENTIAL LOADS				

ALABAMA LICENSED No. 22480 PROFESSIONAL ENGINEER JOHN F. CONWAY 9/15/2023

SAFE-T-SHELTER®
Safe Rooms/Shelters 1-800-462-3648

HCS Engineering Company,
DECATUR, ALABAMA (256) 353 - 1972

HCS JOB NUMBER: 23100001

REV.	DESCRIPTION	E.C.N. #	DATE	DR.	CK.
0	ISSUED FOR CONSTRUCTION (PSS/CMB)		9/15/23	HCS	CMB

MATERIAL: SURFACE COAT
SCALE: NONE
DRAWN BY: PAUL STRANGE
APPROVED BY: JOHN CONWAY
TITLE: OPTIONAL SOLAR / BATTERY UPS SYSTEM DIAGRAMS & SCHEDULES
DATE: 07/19/23
SIZE: D
DRAWING NUMBER: E-UPS-SOLAR-2
REV: 0