

ELECTRICAL SPECIFICATIONS

GENERAL:

PROVIDE ALL NECESSARY LABOR AND MATERIALS FOR THE INSTALLATION OF A COMPLETE AND FUNCTIONAL ELECTRICAL SYSTEM IN A NEWLY CONSTRUCTED MAINTENANCE BUILDING WHICH SHALL INCLUDE:

PROVIDE AN ELECTRICAL SERVICE WHICH SHALL INCLUDE A UNDERGROUND ELECTRICAL SERVICE AS INDICATED ON THE DRAWINGS.

PROVIDE PANELBOARDS, CIRCUIT BREAKERS, FEEDERS AND RELATED COMPONENTS TO FORM A COMPLETE POWER DISTRIBUTION SYSTEM AS INDICATED ON THE DRAWINGS.

PROVIDE POWER AND CONNECTIONS, INCLUDING LOCAL DISCONNECTS WHERE REQUIRED, FOR SUPPLYING ALL MISC. EQUIPMENT, HVAC AND PLUMBING EQUIPMENT.

PROVIDE LIGHTING FIXTURES, LIGHTING CONTROLS, WITH RELATED ACCESSORIES, SUPPORTS, HANGERS, AND RELATED BRANCH CIRCUIT WIRING.

LIGHTING CONTROLS INCLUDING LIGHTING CONTROL PANELS, LOCAL MANUAL/AUTOMATIC SWITCHES, OCCUPANCY SENSORS SYSTEMS, AND ALL ASSOCIATED EQUIPMENT AND WIRING.

PROVIDE ALL CONTROL WIRING AND CONTROLS FOR THE GARAGE VENTILATION SYSTEM.

EMERGENCY LIGHTING AND EXIT LIGHTS AS INDICATED ON THE DRAWINGS.

ALL GENERAL AND SPECIAL PURPOSE RECEPTACLES, BOXES, COVER PLATES AND RELATED BRANCH CIRCUIT WIRING.

PROVIDE ALL CUTTING, PATCHING AND REFINISHING AS REQUIRED FOR ELECTRICAL WORK.

STANDARDS AND QUALITY:

ALL EQUIPMENT SHALL BE UL LISTED.

THE PLAN REVIEW REQUIRED FOR THIS PROJECT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR INCLUDING ALL RELATED COSTS, DELIVERIES AND PICK-UP, AND THE REPRODUCTION OF ALL CONTRACT DOCUMENTS, AND NOTIFYING THE PROFESSIONAL OF ALL REVIEW COMMENTS.

ALL WORK SHALL BE INSPECTED BY A RECOGNIZED INSPECTION AGENCY.

THE CONTRACTOR SHALL INSTALL ALL HARDWARE AND EQUIPMENT IN A NEAT AND PROFESSIONAL MANNER, AND SHALL REMOVE ALL DEBRIS AND TRASH RESULTING FROM THE ELECTRICAL INSTALLATION AT THE CONCLUSION OF THE JOB OR WHEN DIRECTED BY THE PROFESSIONAL OR OWNER.

ALL WORK SHALL BE BASED ON THE 2017 N.E.C., NFPA 70 AND ICC 2018

ELECTRICAL WORK SHALL BE DONE BY NECA 1-2010 STANDARD FOR GOOD WORKMANSHIP IN ELECTRICAL CONSTRUCTION.

PROVIDE (1) ELECTRONIC PDF COPY OF SHOP DRAWINGS, CATALOG CUTS, DATA SHEETS AND DETAILED INFORMATION (PRODUCT SUBMITTALS) ON ALL PRODUCTS AS CALLED FOR IN THIS SPECIFICATION. NO WORK SHALL BE DONE OR ORDERS PLACED FOR ANY ITEM REQUIRING SHOP DRAWINGS, CATALOG CUTS, DATA SHEETS AND DETAILED INFORMATION UNTIL AFTER ITEMS HAVE BEEN APPROVED BY THE PROFESSIONAL.

UNDERGROUND WORK:

UNDERGROUND RACEWAYS FOR THE MAIN ELECTRIC AND TELECOMMUNICATIONS SERVICES SHALL BE SCHEDULE 80 PVC CONCRETE ENCASED WITH 3" OF CONCRETE ALL AROUND AND IN BETWEEN THE RACEWAYS, THE TOP OF THE RACEWAY ENCASEMENT SHALL BE NOT LESS THAN 36" BELOW FINISHED GRADE. ALL ELLS SHALL BE IMC.

UNDERGROUND RACEWAYS FOR SITE SIGNAGE OR FLAG POLE LIGHTS SHALL BE MINIMUM OF 1" SCHEDULE 40 PVC, USE SCHEDULE 80 PVC UNDER PAVED AREAS OR DRIVEWAYS AND LESS THAN 18" BELOW GRADE.

RACEWAYS SHALL BE ENCASED IN 6" OF FINE SAND OR STONE DUST AND BE NOT LESS THAN 24" BELOW FINISHED GRADE FROM OF THE TOP OF THE ENCASEMENT,

ALL WORK RELATIVE TO THE MAIN ELECTRICAL SERVICE SHALL BE IN ACCORDANCE WITH THE UTILITY COMPANY RULES FOR ELECTRICAL SERVICE AND METERING.

RACEWAYS:

ALL WIRING SHALL BE INSTALLED IN CONDUIT OF REQUIRED SIZE, WITH THE MINIMUM SIZE BEING 3/4" DIA. FOR POWER WIRING AND 1/2" DIA. FOR CONTROL WIRING. CONDUIT SHALL NOT BE INSTALLED IN FLOOR SLABS.

MC CABLE WILL BE PERMITTED IN LIEU OF RACEWAYS WITH CONDUCTORS IN CERTAIN CASES AS DEFINED IN THESE SPECIFICATIONS.

EMT RACEWAYS SHALL BE USED GENERALLY, EXCEPT THE EXTERIOR OF THE BUILDING, IN WET LOCATIONS, UNDERGROUND, WITHIN CONCRETE, WHERE SUBJECT TO DAMAGE OR WHERE PROHIBITED BY THE N.E.C. USE IMC OR RIGID STEEL CONDUIT OR SCH. 80 PVC WHERE EMT IS NOT PERMITTED.

FITTINGS USED FOR EMT MUST BE COMPRESSION TYPE. USE INSULATED THROAT TYPE FOR SIZES 1-1/2" OR LARGER.

FLEXIBLE CARFLEX "NON-METALLIC" LIQUDTIGHT CONDUIT SHALL BE USED FOR CONNECTIONS TO MOTORS OR EQUIPMENT WITH A MAXIMUM LENGTH OF 24", FLEXIBLE CONDUIT SHALL BE 1/2" MINIMUM SIZE.

ALL EMPTY CONDUIT/RACEWAYS SHALL BE EQUIPPED WITH A FISH LINE.

PRODUCT SUBMITTALS ON RACEWAY ARE NOT REQUIRED, EXCEPT FOR FLEXIBLE CONDUIT.

16120 WIRE AND CABLES:

ALL WIRING SHALL BE COPPER, THHN/THWN, 90 DEGREES C, SINGLE CONDUCTOR, MINIMUM SIZE #12 FOR POWER AND #14 FOR CONTRLS, EXCEPT FOR SMALLER SIZES SPECIFICALLY NOTED ON THE DRAWINGS.

MC CABLE WITH STEEL ARMOR AND COPPER CONDUCTORS, THHN/THWN, 90 DEGREES C WILL BE PERMITTED EXCEPT AS FOLLOWS:

MC CABLE SHALL NOT BE USED: WHERE CONDUCTOR SIZE IS GREATER THAN #10; WHERE AMOUNT OF CONDUCTORS (PHASE CONDUCTORS AND NEUTRAL) EXCEED THREE CONDUCTORS; EXPOSED ON WALLS OR CEILINGS; IN WET LOCATIONS OR EXTERIOR OF THE BUILDING; UNDERGROUND OR IN CONCRETE; OR WHERE PROHIBITED BY THE N.E.C.

SHORT EXPOSED EXTENSIONS OF MC CABLE NOT OVER 36" IN LENGTH WILL BE PERMITTED FOR CONNECTIONS TO MOTORS OR EQUIPMENT.

PRODUCT SUBMITTALS ARE REQUIRED ON ALL MC CABLES.

BOXES, FITTINGS AND SUPPORTS:

USE STANDARD PRESS STEEL OUTLET BOXES, EXCEPT USE CAST TYPE OUTLET BOXES IN WET LOCATIONS OR ON THE EXTERIOR OF THE BUILDING.

JUNCTION, PULL OR TERMINAL BOXES SHALL BE STEEL WITH FACTORY PAINT, NEMA 1 IN DRY, DUST FREE CLEAN ENVIRONMENTS, NEMA 3R WHERE EXPOSED TO RAIN OR MOISTURE, OR NEMA TYPE AS NOTED ON THE DRAWINGS.

ALL TERMINAL BOXES AND BOXES USED AS CONTROL PANELS SHALL HAVE HINGED FRONT COVERS WITH DOOR LATCH. BOXES SHALL INCLUDE EQUIPMENT MOUNTING PANELS. BOXES USED FOR CONTROL PANELS MUST HAVE A LOCKABLE DOOR LATCH WITH PAD LOCK.

FITTINGS USED FOR EMT MUST BE COMPRESSION TYPE. USE INSULATED THROAT TYPE FOR SIZES 1-1/2" OR LARGER.

ALL TERMINAL BLOCKS MUST BE RATED AT LEAST 20 AMPERES CONTINUOUS AT 120 VAC, HAVE SCREW TYPE COMPRESSION CONNECTIONS AND BE ARRANGED FOR DIN MOUNTING IN TERMINAL BOXES OF ADEQUATE SIZE. TERMINAL BLOCKS MUST BE USED FOR CONNECTIONS TO CONTROL WIRING,

ALL TERMINAL BOXES, PULL BOXES, JUNCTION BOXES, CABINETS, ETC. SHALL BE LABELED IN A MANNER AS APPROVED BY THE PROFESSIONAL.

PRODUCT SUBMITTALS ARE REQUIRED ON ALL PRODUCTS, EXCEPT FOR PRESS STEEL WALL AND CEILING OUTLET BOXES.

WIRING DEVICES:

ALL GENERAL PURPOSE RECEPTACLES SHALL BE 20 AMPERES, 120 VOLTS, AC, HEAVY-DUTY SPECIFICATION GRADE, AS MANUFACTURED BY HUBBELL, COOPER, OR P&S. COLOR TO BE WHITE. ALL LIGHTING CONTROL SWITCHES SHALL BE TOGGLE TYPE 20 AMPERES, 120/277 VOLTS, AC, HEAVY-DUTY SPECIFICATION GRADE, AS MANUFACTURED BY HUBBELL, COOPER, OR P&S. ARCHITECT TO SELECT COLOR.

GFCI TYPE RECEPTACLES SHALL BE 20 AMPERES, 120 VOLTS, COMMERCIAL SPECIFICATION GRADE, CLASS A GFCI, AND MUST MEET OR EXCEED ALL LATEST UL943 (3RD EDITION) AND UL 498 REQUIREMENTS, AS MANUFACTURED BY HUBBELL, COOPER, OR P&S. COLOR TO BE WHITE.

ALL WEATHERPROOF RECEPTACLES TO BE RATED WEATHERPROOF AND WEATHER RESISTANT AND SHALL BE EQUIPPED WITH HINGED COVERS DESIGNED TO CLOSE OVER CONNECTED POWER CORDS. PER N.E.C.

COVER PLATES TO BE HIGH ABUSE NYLON FOR USE WITH FLUSH MOUNTED OUTLET BOXES. COLOR TO BE WHITE.

TVSS UNITS SHALL BE AS INDICATED ON THE DRAWINGS.

OCCUPANCY SENSORS SHALL BE AS SHOWN ON THE DRAWINGS ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL REQUIRED ADJUSTMENT TO SENSORS TO PROVIDE PERFORMANCE ACCEPTABLE TO THE OWNER.

CATALOG INFORMATION, DATA SHEETS, ETC. ARE REQUIRED FOR ALL ITEMS INCLUDING COVER PLATES.

GROUNDING

ALL GROUNDING SHALL BE INSTALLED PER THE LATEST EDITION OF THE N.E.C.

THE MAIN GROUNDING SHALL BE AS INDICATED ON THE DRAWINGS.

ALL RACEWAYS INCLUDING FLEXIBLE CONDUIT USED FOR LIGHTING, POWER AND CONTROL WIRING SHALL INCLUDE A GREEN GROUNDING CONDUCTOR.

EQUIPMENT CONNECTIONS:

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE FINAL POWER CONNECTIONS TO ALL EQUIPMENT PROVIDED UNDER THIS PROJECT (UNLESS INDICATED OTHERWISE) WHICH REQUIRES ELECTRICAL POWER. THE CONTRACTOR'S RESPONSIBILITY ENDS AT THE RECEPTACLE WHERE EQUIPMENT IS FURNISHED WITH POWER CORD AND MALE RECEPTACLE CAPS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING RECEPTACLE CONFIGURATION WITH THE MALE RECEPTACLE CAPS ON THE EQUIPMENT CORDS.

THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING CONNECTION REQUIREMENTS TO EACH PIECE OF EQUIPMENT. VERIFY THE QUANTITY OF CONDUCTORS (PHASES OR HOTS, NEUTRALS, GROUNDS, ETC.) THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE ARRANGEMENT FOR MAKING THE PROPER CONNECTIONS (BY CONTRACTOR OR OTHERS) IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

ALL FINAL CONNECTIONS TO EQUIPMENT BY THE CONTRACTORE SHALL BE MADE WITH FLEXIBLE CONDUIT NOT TO EXCEED LENGTH AS INDICATED IN THESE SPECIFICATIONS.

ALL DISCONNECT SWITCHES REQUIRED BY THE N.E.C. SHALL BE PROVIDED AND INSTALLED BY THE CONTRACTOR.

GENERAL NOTES

ALL CIRCUITS FOR POWER INDICATED SHALL BE 1/2"C W/ 2#12 AND 1#12G (MIN.) UNLESS INDICATED OTHERWISE OR REQUIRED. (USE MC CABLE ONLY AS APPROVED BY SPECS.)

GENERALLY ALL RACEWAYS, CABLES, AND OUTLET BOXES SHALL BE INSTALLED CONCEALED, EXCEPT IN UNFINISHED AREAS THE BUILDING OR WHERE PERMITTED BY THE ARCHITECT.

IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY LOCATION OF ALL OUTLETS BEFORE ROUGHING IN FOR THE OUTLET. THE OWNER SHALL HAVE THE RIGHT TO RELOCATE ANY OUTLET ON THE PROJECT TEN (10) FEET FROM THE LOCATION INDICATED ON THE PLANS, PRIOR TO ROUGHING IN FOR THE OUTLET.

THE MANUFACTURER'S CATALOG NUMBERS FOR LIGHTING FIXTURES INDICATED IN THE LIGHT FIXTURE SCHEDULE DOES NOT INCLUDE ALL AUXILIARY COMPONENT PARTS NECESSARY FOR A COMPLETE AND PROPER INSTALLATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING AND INSTALLING ALL MATERIALS AND EQUIPMENT NEEDED TO COMPLETELY AND PROPERLY INSTALL EACH LIGHT FIXTURE IN ITS RESPECTIVE TYPE OF CEILING.

ALL WIRING AND CABLING SHALL BE PROPERLY MARKED FOR IDENTIFICATION.

ALL EXTERIOR LIGHT FIXTURES, WIRING DEVICES, OUTLET BOXES AND JUNCTION/PULL BOXES MUST BE UL LISTED OR SUITABLE FOR INSTALLATION IN WET LOCATIONS WITH ALL APPROPRIATE GASKETS AND COVERS PROVIDED.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION OF ALL LIGHT FIXTURE TYPES, MOUNTING, FINISHES, SWITCHING ARRANGEMENTS AND THE TYPE CEILING WHERE FIXTURE IS TO BE INSTALLED.. THIS COORDINATION SHALL BE DONE BETWEEN THE CONTRACTOR AND THE OWNER.

THE CONTRACTOR WILL BE RESPONSIBLE FOR MAINTAINING THE INTEGRITY OF ALL FIRE RATED WALLS, FLOORS, AND CEILINGS. THE MATERIAL USED FOR MAINTAINING THE FIRE RATING MUST BE EQUAL TO OR GREATER THAN THE RATING OF THE WALL, FLOOR, OR CEILING. ALL MATERIAL USED FOR MAINTAINING THE FIRE RATING MUST BE APPROVED BY THE PROFESSIONAL. WHERE RECESSED LIGHT FIXTURES PENETRATE FIRE RATED CEILINGS, THE CONTRACTOR SHALL PROVIDE ALL MATERIALS FOR MAINTAINING THE INTEGRITY OF THE CEILING FIRE RATING, IF REQUIRED. THE WORK SHALL BE DONE TO MEET NFPA, STATE AND LOCAL CODE REQUIREMENTS.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR CHECKING AND VERIFY THE ELECTRICAL DATA REQUIREMENTS ON EACH PIECE OF HVAC AND PLUMBING EQUIPMENT PRIOR TO ROUGH-IN WORK AND INSURE THAT PROPER SIZED CIRCUITS, DISC. SWITCHES AND CIRCUIT BREAKER HAS BEEN PROVIDED FOR EACH ITEM AND PROVIDE CHANGES AS REQUIRED..

THE CONTRACTOR SHALL MAKE ALL FINAL CONNECTIONS TO HVAC, PLUMBING & OWNER'S EQUIPMENT AND PROVIDE A LOCAL DISCONNECT SWITCH. THE CONTRACTOR SHALL REVIEW AND VERIFY MCA & MFA RATINGS FOR EACH PIECE EQUIPMENT. VERIFY THE ELECTRICAL CHARACTERISTICS AND THE EXACT LOCATION OF EACH PIECE OF EQUIPMENT WITH THE RESPECTIVE CONTRACTOR PRIOR TO THE EXECUTION OF ALL ROUGH WORK.

MAIN ELECTRIC SERVICE ENTRANCE:

PROVIDE MAIN UNDERGROUND ELECTRICAL SERVICE AS INDICATED ON THE MAIN POWER DIAGRAM. CIRCUIT BREAKERS OR PANELBOARDS USED IN THE MAIN ELECTRICAL SERVICE ENTRANCE SHALL BE SUITABLE AS SERVICE ENTRANCE EQUIPMENT AND SHALL BE SO LABELED. THE UTILITY CO. IS ADAMS ELECTRIC COOP.

SAFETY SWITCHES:

ALL SAFETY SWITCHES SHALL BE HEAVY-DUTY TYPE (240V) CAPABLE OF BEING LOCKED IN THE OFF AND THE ON POSITIONS, AND SHALL BE CONTAINED IN NEMA 1 TYPE ENCLOSURES FOR INDOOR USE, AND IN NEMA 3R OR NEMA 4 FOR OUTDOOR USE.

SAFETY SWITCHES SHALL INCLUDE A GROUND BAR AND NEUTRAL BAR WHERE A NEUTRAL CONDUCTOR IS USED.

PRODUCT SUBMITTALS AE REQUIRED ON ALL PRODUCTS.

PANELBOARDS:

PANELBOARDS SHALL BE SURFACE OR RECESSED MOUNTED AS INDICATED ON THE DRAWINGS. ALL BUSING SHALL BE COPPER.

VOLTAGE, PHASE, WIRE ARRANGEMENT, AMPERE RATING, AND AMPERE INTERRUPTING CURRENT RATING SHALL BE AS INDICATED ON THE DRAWINGS FOR EACH PANELBOARD.

ALL PANELBOARDS SHALL BE FULLY RATED WITH FULL SIZE BOLT-TO-THE-BUS TYPE CIRCUIT BREAKERS.

EACH PANELBOARD SHALL HAVE A SOLID NEUTRAL BAR AND BONDED GROUND BAR.

CIRCUIT BREAKER LOCKING DEVICES SHALL BE WHERE SO INDICATED ON THE DRAWINGS.

ALL PANELBOARDS SHALL BE EQUIPPED WITH A TYPE-IN DIRECTORY PROPERLY IDENTIFYING ALL CONNECTED LOADS. CIRCUIT IDENTIFICATION SHALL BE TYPED IN AND BE AS COMPLETE AND SPECIFIC AS POSSIBLE, FOR EXAMPLE; "LTG. - MAIN CONF. RM." OR "RECEPTACLES -RMS. 105-107".

PANELBOARDS SHALL BE AS MANUFACTURED BY SQUARE D, FOR 120/240V, 1 PHASE, 3 WIRE OR EQUAL USE SQUARE D, TYPE NQ FOR 120/240V, 1 PHASE, 3 WIRE. PANELBOARDS OVER 400A SHALL BE SQUARE D "I-LINE" TYPE.

REFER TO THE DRAWINGS FOR ADDITIONAL INFORMATION ON PANELBOARDS.

PRODUCT SUBMITTALS ARE REQUIRED ON ALL PRODUCTS. COMPLETE INFORMATION INCLUDING CIRCUIT BREAKER BREAKDOWN ON EACH PANEL IS REQUIRED.

INTERIOR LIGHTING FIXTURES:

ALL LIGHTING FIXTURES SHALL BE THE TYPE AS INDICATED ON THE DRAWINGS.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING AND INSTALLING ALL RELATED MOUNTING HARDWARE, OUTLET BOXES, HANGERS, SUPPORTS, ETC. TO RENDER A COMPLETE LIGHTING INSTALLATION SYSTEM READY FOR OPERATION.

THE CONTRACTOR SHALL INSURE THAT DRIVE/POWER SUPPLY DISCONNECTING MEANS FOR LED LIGHTING IN ACCORDANCE WITH THE N.E.C. 410.130(g) ARE MEET FOR ALL LIGHT FIXTURES USED ON THIS PROJECT.

CATALOG CUTS OR MANUFACTURER'S INFORMATION ON EACH TYPE OF LIGHTING FIXTURE SHALL BE SUBMITTED FOR APPROVAL.

SINGLE POLE DISCONNECT MEANS -- Sx

SHALL BE 20A OR 30A HEAVY-DUTY SPEC. GRADE TOGGLE SWITCH IN A NEMA 1 ENCLOSURE UNLESS NOTED OTHERWISE ON THE DRAWINGS.

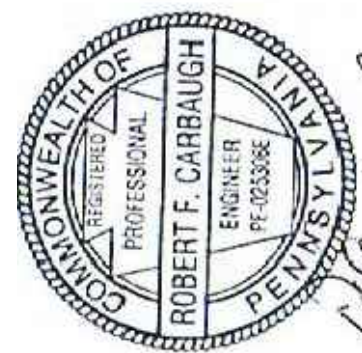
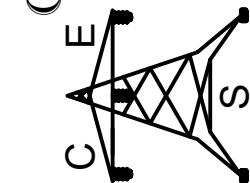
MANUAL MOTOR STARTERS (DISCONNECT SWITCH) -- Sm

SHALL BE ENCLOSED TOGGLE SWITCH AC MOTOR STARTER, 30A, 1-POLE, 600VAC, NEMA 1 ENCLOSURE UNLESS NOTED OTHERWISE ON THE DRAWINGS. BRYANT OR APPROVED EQUAL.

EXCAVATION, BACKFILL AND COMPACTION

THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL EXGAVATION, BACKFILL, COMPACTION AND MAKE REQUIRED PER 1 CALL AND CLEAR ALL SUBSURFACE UTILITIES FOR ALL UNDERGROUND WORK. ALL WORK SHALL BE DONE TO THE COMPLETE SATISFACTION OF THE OWNER.

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EQUIPMENT BUILDING
CONSTRUCTION DRAWING
FOR
PROPOSED FIRST FLOOR PLAN
SOUTH HAMPTON TWP. CUMBERLAND COUNTY, PA

Drawn By: HH
Designed By: HH
Checked By: RC
File: 2022-SH-009
Date: 08/18/2023
Scale: 3/16"=1'-0"
Drawing No.

E-7

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