	CODE DATA SUMMARY	GENERAL NOTES	OWNER
PROJECT	NEW 4,698 SQ. FT. BASE STATION #2 FACILITY FOR THE LINCOLN COUNTY AMBULANCE	BAALMAN ARCHITECTS IS ISSUING THIS SET OF CONSTRUCTION DOCUMENTS TO	
DESCRIPTION	DISTRICT LOCATED AT 28 WALTER COURT, MISSOURI 63362	FACILITATE CONSTRUCTION BY EXPRESSING THE DESIGN CONCEPT OF THIS PROJECT. ADDITIONAL DETAILED SHOP DRAWINGS AND SUBMITTALS WILL BE REQUIRED FOR PROCURING, PLACING AND CONSTRUCTING THE FINISHED WORK.	LINCOLN COUNTY
JURISDICTION	CITY OF MOSCOW MILLS, MISSOURI LINCOLN COUNTY FIRE PROTECTION DISTRICT, 700 E CHERRY STREET, TROY, MISSOURI 63379	2. BAALMAN ARCHITECTS ASSUMES THE GENERAL CONTRACTOR HAS INCLUDED IN HIS BID THE HIGHEST QUALITY AND GREATEST QUANTITY FOR THE PURPOSE OF RESOLVING ANY	AMBULANCE DISTRICT
BUILDING CODES	CONSTRUCTION SHALL CONFORM TO THE FOLLOWING CODES: 2015 INTERNATIONAL BUILDING CODE, I.B.C.	CONFLICTS IN THE CONSTRUCTION DOCUMENTS WHICH ARE IMPLIED OR UNDEFINED. 3. ALL WORK SHALL COMPLY WITH THE CURRENT FEDERAL, STATE AND AND ALL LOCAL CODES AND ORDINANCES. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND SITE	1392 S. Third Street Troy, Missouri 63379
	2014 NATIONAL ELECTRICAL CODE, N.E.C./2017 JEFFERSON COUNTY ELECTRICAL CODE 2015 INTERNATIONAL MECHANICAL CODE, I.M.C. 2015 INTERNATIONAL PLUMBING CODE, I.P.C.	CONDITIONS AND SHALL REPORT ANY INCONSISTENCIES TO THE ARCHITECT. 4. DRAWINGS ARE NOT TO BE SCALED. DIMENSIONAL DISCREPANCIES SHALL BE CLARIFIED WITH THE ARCHITECT.	Ray Antonacci, Chief Administrator
	2015 INTERNATIONAL FIRE CODE, I.F.C. 2010 ICC/ANSI A117.1 — ACCESSIBILITY CODE, I.A.C.	5. ALL DIMENSIONS ARE TO FACE OF GYP. BOARD, CONCRETE, MASONRY OR BRICK UNLESS OTHERWISE NOTED.	Office: 636-528-8488 ext. 302
CHAPTER 3 USE GROUPS	MIXED USE GROUPS: R-3 RESIDENTIAL (SLEEPING QUARTERS) AND S-2 STORAGE (APPARATUS BAYS)	THE ARCHITECT SHALL REVIEW FOR APPROVAL ALL COLOR SAMPLES. MANUFACTURERS SHALL VERIFY CONFORMANCE WITH THE DESIGN INTENT AND SCOPE OF THE CONTRACT DOCUMENTS.	Office: 636-528-8488 Fax: 636-528-6828
CHAPTER 5 HEIGHT AND AREA	ALLOWABLE HEIGHT: 3 STORIES 60 FT. (TYPE VB & SPRINKLERED) ACTUAL HEIGHT: 1 STORY 24 FT.	7. CONTRACTOR SHALL VERIFY LOCATION AND SHALL PROVIDE PROTECTION FOR UTILITIES WITHIN THE WORK AREA, WHETHER OR NOT INDICATED IN THE DRAWINGS.	www.lcad.net
	ALLOWABLE AREA: R-3, UNLIMITED S-2, 54,000 S.F. (MOST RESTRICTIVE)	8. CONTRACTOR SHALL NOTIFY UTILITY COMPANY AND OWNER IMMEDIATELY SHOULD SERVICE BE INTERRUPTED. 9. CONTRACTOR SHALL TAKE STEPS NECESSARY TO PREVENT EROSION DAMAGE ON OR	ACCESSIBILITY
	ACTUAL BUILDING AREA: R-3 AREA 2,983 SQ. FT. S-2 AREA 1,715 SQ. FT. TOTAL AREA 4,698 SQ. FT.	OFF THE SITE AND REPAIR ANY DAMAGE RESULTING FROM THIS WORK AT NO COST TO THE OWNER.	1. H.C. ACCESS TO THESE FACILITIES SHALL BE PROVIDED AT PRIMARY ENTRANCE.
CHAPTER 6 TYPE OF	VB — UNPROTECTED	10. WHERE POSSIBLE THE CONTRACTOR SHALL AVOID DAMAGING EXISTING TREES AND LANDSCAPING. CONTRACTOR SHALL COORDINATE THE DESTRUCTION OF ANY LANDSCAPE WITH THE ARCHITECT.	2. THE SLOPE OF WALKS SHALL NOT EXCEED MAX., CROSS SLOPE 2% WALKING SURFACE SLOPING GREATER THAN 2% SHALL BE SLIP RESISTANT.
CONSTRUCTION CHAPTER 6 FIRE RESISTANCE	TYPE VB CONSTRUCTION FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS: O HR RATING: EXTERIOR WALLS	11. CONTRACTOR SHALL REMOVE ALL SURPLUS MATERIALS, FALSE WORK, TEMPORARY STRUCTURES, INCLUDING: FOUNDATIONS AND DEBRIS OF ANY NATURE RESULTING FROM THEIR OPERATIONS, AND PUT THE SITE IN A NEAT AND ORDERLY CONDITION.	3. EVERY REQUIRED EXIT DOORWAY SHALL BE SIZED FOR A DOOR NOT LESS THAN 3 FT. WIDE BY NOT LESS THAN 6'-8" HIGH CAPABLE OF OPENING 90 DEGREES AND MOUNTED SO THAT THE CLEAR WIDTH OF THE EXIT WAY IS 32" MIN.
RATING CHART	O HR RATING: INTERIOR WALLS O HR RATING: ROOF CONSTRUCTION	12. CONTRACTORS SHALL VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS AT SITE PRIOR TO SUBMITTING PROPOSAL ON THE PROJECT AND NOTIFY THE ARCHITECT AS TO ANY DISCREPANCIES OR CHANGES DISCOVERED.	4. THRESHOLD TO BE A MAX. 1/4" ABOVE ADJACENT FINISH FLOOR. 5. MAXIMUM EFFORT TO OPERATE DOORS SHALL NOT EXCEED 5 LB
CHAPTER 7 FLAME SPREAD	PER SECTIONS 803 AND 805 - ALL ITEMS 25 OR LESS TESTED BY ASTM.E84	13. SUBCONTRACTORS SHALL FAMILIARIZE THEMSELVES WITH ALL PORTIONS OF THE DRAWINGS, SPECIFICATIONS, ADDENDUM AND CHANGE ORDERS THAT PERTAIN TO THEIR WORK. THEY SHALL BE HELD RESPONSIBLE FOR ADHERING TO THOSE REQUIREMENTS AND	6. THE BOTTOM 10" OF ALL DOORS EXCEPT AUTOMATIC AND SLIDING SHALL HAVE A SMOOTH UNINTERRUPTED SURFACE.
CHAPTER 7 SMOKE DEVELOPED	PER SECTIONS 803 AND 805 - ALL ITEMS 450 OR LESS, TESTED BY ASTM.E84	SHALL NOT PREPARE ANY BID. 14. IT IS THE GENERAL CONTRACTOR'S RESPONSIBILITY TO COORDINATE, LOCATE AND	7. PROVIDE LEVER TYPE HARDWARE, PANIC BARS, PUSH — PULL ACTIVATING BARS, OR OTHER HARDWARE DESIGNED TO PROVIDE PASSAGE WITHOUT REQUIRING THE ABILITY TO
CHAPTER 8 INTERIOR FINISHES	SHALL COMPLY WITH THE 2015 IBC CHAPTER 8	CONFIRM ALL FLOOR SINK, UNDERGROUND / OVERHEAD PLUMBING AND ELECTRICAL STUB-UPS.	GRASP THE OPENING HARDWARE. (30" TO 44" A.F.F.) 8. ALL DOORWAYS LEADING TO SANITARY FACILITIES SHALL HAVE 32" CLEAR UNOBSTRUCTED
CHAPTER 9 FIRE PROTECTION SYSTEMS	AUTOMATIC FIRE SUPPRESSION SYSTEM BUILDING FULLY SPRINKLERED THROUGHOUT IN ACCORDANCE WITH AN NFPA13 SPRINKLER SYSTEM	 15. ALL INTERIOR PARTITION DIMENSIONS ARE TO FACE OF GYP. BD. WALL UNLESS NOTED OTHERWISE. 16. ALL EXPOSED UNFINISHED METAL AND WOOD SHALL BE PAINTED AS PER 	OPENINGS. 9. INSULATE HOT WATER AND DRAIN PIPES AT HAND SINKS.
CHAPTER 9 FIRE	PORTABLE FIRE EXTINGUISHERS SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 906 OF THE 2015 IBC, SIZED AND LOCATED BY FIRE MARSHAL	SPECIFICATION, PAINT TO MATCH ADJACENT COLOR. 17. ALL FINISHES AND FINISH MATERIALS, COLORS AND TEXTURES SHALL BE VERIFIED	10. FAUCET CONTROLS SHALL BE OPERABLE WITH ONE HAND AND NOT REQUIRE GRASPING, PINCHING, OR TWISTING. FAUCET TO HAVE MAX. 5 LB OPERATING FORCE.
EXTINGUISHERS & SMOKE DETECTORS	SMOKE DETECTORS SHALL BE PROVIDED.	WITH ARCHITECT PRIOR TO INSTALLATION, FABRICATION OR ORDERING.	
CHAPTER 10 OCCUPANCY	R-3, RESIDENTIAL - LIVING AREAS: 2,983 S.F./200 GROSS = 14 OCCUPANTS S-2, STORAGE - APPARATUS BAYS: 1,715 S.F./300 GROSS = 5 OCCUPANTS	CONTRACTOR'S NOTES	DESIGN BUILD SYSTEMS
LOADS & MEANS OF EGRESS	ACTUAL NUMBER OF OCCUPANTS IS 4 MAXIMUM PER SHIFT	 THE CONSTRUCTION DOCUMENTS HAVE BEEN CAREFULLY PREPARED BUT MAY NOT DEPICT EVERY CONDITION TO BE ENCOUNTERED. IT IS THEREFORE THE GENERAL CONTRACTORS & SUBCONTRACTORS RESPONSIBILITY TO FIELD VERIFY ALL CONDITIONS 	1. THE FIRE PROTECTION SYSTEM FOR THE FACILITY TO BE A (DESIGN—BUILD) AUTOMATIC FIRE SUPPRESSION SYSTEM. REFER TO SHEETS FP0.1 AND FP2.0.
	EGRESS — 2 REQUIRED, 5 PROVIDED 2 EXIT DOORS FROM THE R—3 LIVING SPACE TO THE EXTERIOR. 2 EXIT DOORS FROM THE R—3 LIVING SPACE TO THE APPARATUS BAYS. 1 EXIT DOOR FROM THE S—2 APPARATUS BAY SPACE TO THE EXTERIOR.	OF AFFECTED WORK PRIOR TO SUBMITTING A BID OR STARTING ANY WORK. IF CONDITIONS DIFFER, OR ADDITIONAL WORK IS REQUIRED BEYOND THAT STATED IN THE CONSTRUCTION DOCUMENTS IT IS THE CONTRACTORS RESPONSIBILITY TO BRING SUCH	2. FOR THE SUBMISSION OF BID THE CONTRACTOR IS REQUIRED TO IDENTIFY THE SCOPE OF WORK TO BE PERFORMED FOR THE PROJECT AND CONTACT ALL GOVERNING AGENCIES AS OUTLINED HERE—IN.
	EXIT TRAVEL DISTANCE R-3 250 FT. MAX WITH SPRINKLER SYSTEM	MATTERS TO THE ATTENTION OF THE ARCHITECT IN A REASONABLE TIME PERIOD. PRIOR TO THE BID SUBMISSION, CONTRACTOR SHALL INCLUDE SUCH INSTANCES IN THEIR BID SUM OR QUALIFY IN THE BID SUBMITTAL.	3. THE DESIGN BUILD CONTRACTOR IS TO INCLUDE ALL DRAWINGS AND SPECIFICATIONS AS REQUIRED BY GOVERNING AUTHORITIES FOR THEIR RESPECTIVE WORK. SUBMISSION OF BID INCLUDES ALL REQUIRED WORK SUCH TO PROVIDE A
	S-2 300 FT. MAX WITH SPRINKLER SYSTEM EGRESS DOORS SHALL BE READILY OPENABLE FROM THE EGRESS SIDE WITHOUT THE USE OF A KEY OR SPECIAL KNOWLEDGE OR EFFORT.	2. ALL CONSTRUCTION DOCUMENTS REPRESENT A COMPREHENSIVE SCOPE OF WORK. IT IS THE CONTRACTOR'S RESPONSIBILITY TO REFERENCE ALL DRAWINGS, SPECIFICATIONS, ADDENDUM AND CHANGE ORDERS (IF APPLICABLE) TO VERIFY THEIR RESPECTIVE SCOPE	COMPLETE AND WORKING SYSTEM READY TO USE WHEN THE BUILDING IS OCCUPIED BY THE OWNER. 4. THE DESIGN—BUILD CONTRACTOR IS TO VISIT THE SITE TO VERIFY CONDITIONS AND
	THERE SHALL BE A FLOOR OR LANDING ON EACH SIDE OF A DOOR. SUCH FLOOR OR LANDING SHALL BE AT THE SAME ELEVATION ON EACH SIDE OF THE DOOR.	OF WORK. 3. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS PRIOR TO ORDERING MATERIAL,	CONFIRM THAT ADEQUATE UTILITIES AND SERVICE SIZES ARE AVAILABLE FOR THEIR WORK.
CHAPTER 29 PLUMBING	R-3 PLUMBING FIXTURE REQUIREMENTS WATER CLOSETS - ONE PER 10 REQUIRED - 3 PROVIDED (ONE PUBLIC)	EQUIPMENT, MILLWORK, ETC.	SHOP DRAWINGS
SYSTEMS	LAVATORIES — ONE PER 10 REQUIRED — 3 PROVIDED (ONE PUBLIC) SHOWERS — ONE PER 8 — 2 PROVIDED SERVICE SINK — ONE REQUIRED — ONE PROVIDED		THE CONTRACTOR SHALL PROVIDE SHOP DRAWINGS FOR THE FOLLOWING SCOPES OF
DOORS	ALL DOORS SHALL NOT REQUIRE MORE THAN 51bs OF FORCE TO OPEN		WORK: 1. PRE-ENGINEERED WOOD TRUSS DRAWINGS.
SIGNS	ALL SIGNS TO COMPLY WITH "SECTION 1111 SIGNAGE" OF THE 2015 IBC		CONCRETE & REBAR ITEMS OUTLINED WITHIN THE DRAWINGS.
	APERIES, HANGINGS AND OTHER DECORATIVE MATERIALS SUSPENDED FROM WALLS OR CEILING IBUSTIBLE OR BE MAINTAINED FLAME—RESISTANT. THE PERMISSIBLE AMOUNT OF		3. ALL EXTERIOR FINISH MATERIALS INCLUDING SIDING AND ROOFING MATERIALS,
NONCOMBUSTIBLE I RESISTANT DECORA	DECORATIVE HANGINGS SHALL NOT BE LIMITED. THE PERMISSIBLE AMOUNT OF FLAME— TIVE HANGINGS SHALL NOT EXCEED 10 PERCENT OF THE TOTAL WALL AND CEILING AREA.		GUTTERS, DOWNSPOUTS, DOORS, WINDOWS AND SHEET METAL COPINGS & FLASHINGS. 4. ALL MECHANICAL (HVAC) SYSTEM COMPONENTS, PLUMBING COMPONENTS, ELECTRICAL
FIRE BLOCKING WI INSULATION.	LL BE PROVIDED IN ALL WALLS TALLER THAN 8'-0" THAT DO NOT CONTAIN FIBERGLASS BATT		SYSTEM COMPONENTS AND LIGHTING. 5. ALL INTERIOR MATERIALS AND FINISHES INCLUDING BUT NOT LIMITED TO PLUMBING
PROVIDE ALL REQU	JIRED LABELING FOR ELECTRICAL, MECHANICAL AND STORAGE AREAS PER 2015 ICC CODES.		FIXTURES, DOORS, DOOR FRAMES, HARDWARE, CASEWORK AND CEILING & FLOORING MATERIALS.

Design Team:

Architect:

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Mike Vorhies, P.E. - Mechanical Office: 636.349.1600 ext. 294 mvorhies@caseengineeringinc.com

Dan Conrad - Electrical Office: 636.349.1600 ext. 226 dconrad@caseengineeringinc.com New Ambulance Base Station for:

LINCOLN COUNTY AMBULANCE DISTRICT

Base Station #2 28 Walter Court Moscow Mills, Missouri 63362

Drawing Issue: Date: Bid & Permit Set April 15, 2022

DRAWING INDEX

Produced by Bax Engineering - Under Separate Cover **Cover Sheet**

Demolition Plan

C-3 **Grading Plan**

Landscape Plan

Entrance Detail Existing Area Drainage Map

Proposed Drainage Area Map

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Electrical Specifications

E5.2 Electrical Specifications

E5.3 Electrical Specifications

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BAALMAN **ARCHITECTS**

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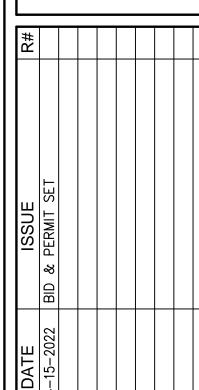
Michael J. Baalman ARCHITECT License#: A-2012004035 Certificate of Authority: 2014003655

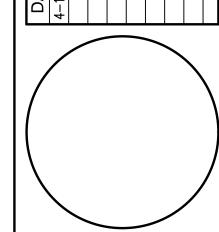
CIVIL ENGINEER

BAX ENGINEERING CO., INC. 221 Point West Blvd. St. Charles, Missouri 63301 Phone: 636-928-5552 Contact: Mark Struckhoff mstruckhoff@baxengineering.co STRUCTURAL, MECHANICAI PLUMBING & ELECTRICAL CASE ENGINEERING, INC. 796 Merus Court St. Louis, Missouri 63026 Structural Contact:

Ardie Mansouri, P.E. Phone: 636-349-1600 ext 291 amansouri@caseengineeringinc.c Mechanical, Plumbing, Electrical Contact: Jim Eyre, P.E. jeyre@caseengineeringinc.com Phone: 636-349-1600 ext 258

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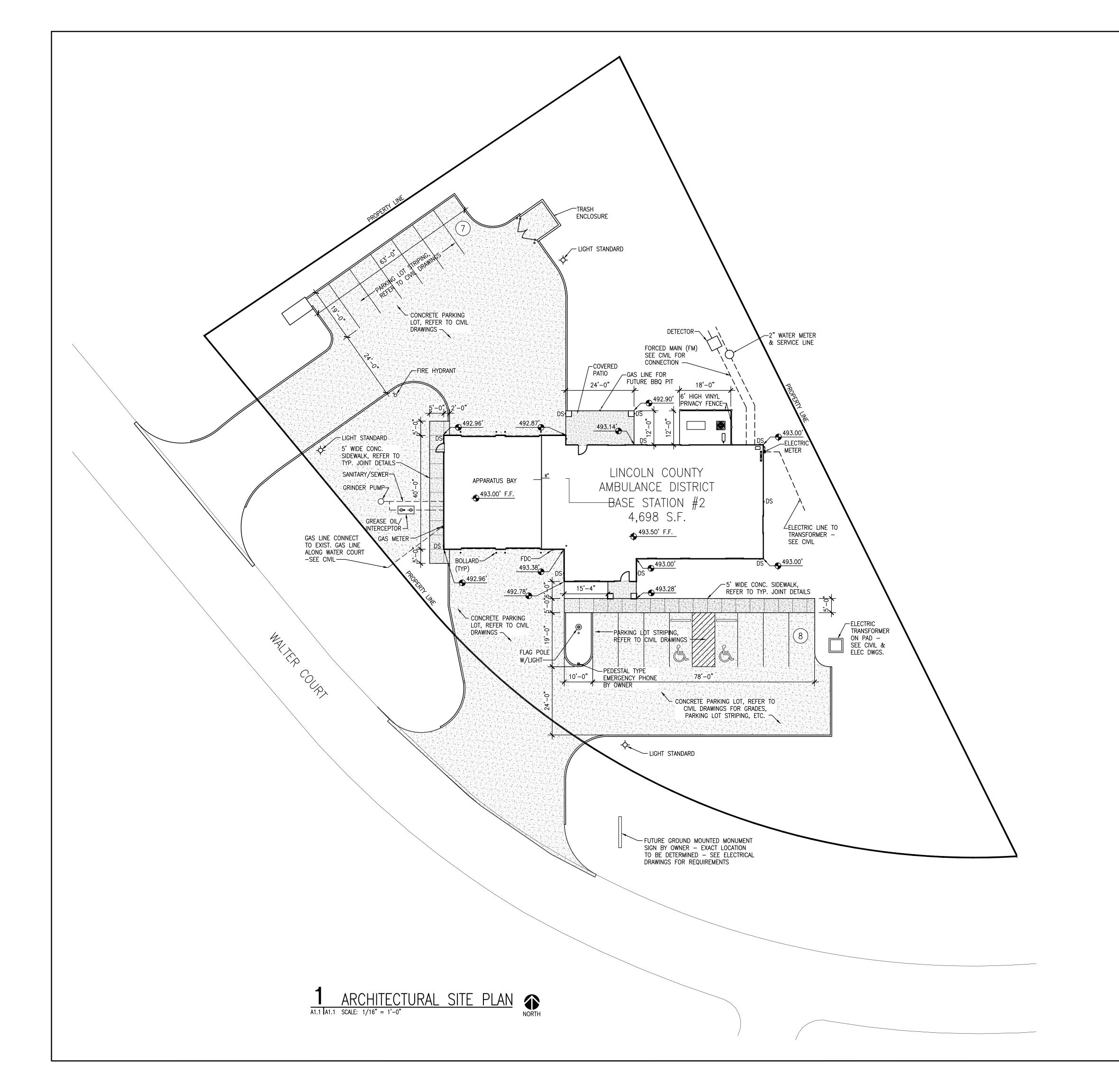
Michael J. Baalman MO# A-2012004035

PROJECT MANAGER: JKL DRAWN BY: JKL

PROJECT NUMBER 21-079 DATE

April 15, 2022 SHEET

A0 COVER SHEET & CODE INFO.



GENERAL SITE DEVELOPMENT NOTES

- 1. AREA OF TRACT: 0.87 ACRES
- 2. ZONING: C-3 GENERAL COMMERCIAL DISTRICT (CITY OF MOSCOW MILLS)
- 3. PROPOSED USE: NEW AMBULANCE DISTRICT BASE STATION
- 4. THE REQUIRED HEIGHT AND BUILDING SETBACKS ARE AS FOLLOWS: MINIMUM FRONT YARD: 50 FEET MINIMUM SIDE YARD: 15 FEET MINIMUM REAR YARD: 25 FEET MAXIMUM BUILDING HEIGHT: 75 FEET
- 5. PROPERTY OWNER: LINCOLN COUNTY AMBULANCE DISTRICT 1392 SOUTH THIRD STREET TROY, MISSOURI 63379
- 6. PROPERTY IS SERVED BY THE FOLLOWING UTILITIES: CITY OF MOSCOW MILLS SANITARY CITY OF MOSCOW MILLS WATER AMEREN MISSOURI GAS CENTURY LINK
 - LINCOLN COUNTY FIRE PROTECTION DISTRICT
- 7. PARKING CALCULATIONS: (1) SPACE PER AMBULANCE STATION EMPLOYEE, PLUS (1) GUEST SPACE 4 EMPLOYEES PER SHIFT WITH MAXIMUM OF (8) EMPLOYEES AT SHIFT CHANGE 8 + 1 = 9 SPACES REQUIRED

TOTAL PARKING SPACES REQUIRED = 9 SPACES TOTAL PARKING SPACES PROVIDED = 15 SPACES INCLUDING 2 ACCESSIBLE SPACES

- 8. ALL SIGNS SHALL REQUIRE A SEPARATE PERMIT FROM THE CITY OF MOSCOW MILLS
- 9. ALL SITE LIGHTING SHOWN FOR PRESENTATION ONLY AND EXACT LOCATIONS WILL DEPEND ON A LIGHTING LAYOUT BY A LIGHTING CONSULTANT.
- 10. ALL NEW UTILITIES SHALL BE LOCATED UNDERGROUND.
- 11. ALL CONSTRUCTION METHODS AND PRACTICES SHALL CONFORM TO OSHA STANDARDS.
- 12. ALL CONSTRUCTION AND MATERIALS USED SHALL CONFORM TO CURRENT CITY OF MOSCOW MILLS STANDARDS.
- 13. WATER AND SANITARY MAINS SHALL BE RELOCATED PRIOR TO CONSTRUCTION. CONTRACTOR SHALL COORDINATE WITH THE CITY FOR RELOCATION.
- 14. THE BENCHMARK GRADE FOR THE FLOOR PLAN ON THE ARCHITECTURAL SITE PLAN IS 100'-0".
- 15. REFER TO THE CIVIL DOCUMENTS BY BAX ENGINEERING FOR FURTHER SITE INFORMATION.

GENERAL SITE PLAN NOTES

- 1. SEE GENERAL NOTES ON THE COVER SHEET FOR MORE INFORMATION.
- 2. SEE CIVIL DRAWINGS PRODUCED BY BAX ENGINEERING UNDER SEPARATE COVER FOR MORE INFORMATION.
- 3. UNLESS OTHERWISE INDICATED ALL MATERIALS AND EQUIPMENT ON THE DRAWINGS ARE TO BE FURNISHED AND INSTALLED BY THE CONTRACTOR.
- 4. FLAGPOLE, BASIS OF DESIGN: a. GREAT AMERICAN FLAGS AND POLES www.greatamericanflagsandpoles.com
- b. AMERICAN FLAGPOLE www.americanflagpole.com
- c. CONCORD INDUSTRIES www.concordamericanflagpole.com

FLAGPOLE DESIGNED IN ACCORDANCE WITH NAAMM FP 10001 MATERIAL: ALUMINUM DESIGN: CONE TAPERED

MOUNTING: GROUND MOUNTED TYPE OUTSIDE BUTT DIA: 5 INCHES

OUTSIDE TIP DIA: 3 INCHES

NOMINAL WALL THICKNESS: 0.156 INCHES NOMINAL HEIGHT: 25 FT; MEASURED FROM GROUND ELEVATION

COLLAR: STANDARD SPUN HALYARD: INTERIOR TYPE, $\frac{5}{16}$ INCH DIA. POLYPROPYLENE, BRAIDED, WHITE

HANDHOLE: THUMB TURN IN LIEU OF KEY CYLINDER FINIAL BALL: ALUMINUM, 6 INCH DIAMETER

CLEATS: 9 INCH SIZE, ALUMINUM WITH STAINLESS STEEL FASTENINGS, 2 PER HALYARD LIGHTING GROUND ROD: 18-INCH LONG COPPER ROD, $\frac{3}{4}$ IN DIA.

FINISH: METAL SURFACES IN CONTACT WITH GROUND, ASPHALTIC PAINT

ALUMINUM: CLEAR ANODIZED INCLUDING FINIAL REFER TO ELECTRICAL DRAWINGS FOR FLAGPOLE LIGHTING

5. EMERGENCY PEDESTAL PHONE PROVIDED AND INSTALLED BY OWNER. SEE ELECTRICAL

DRAWINGS FOR ELECTRICAL REQUIREMENTS. EXACT LOCATION TO BE DETERMINED.



BAALMAN ARCHITECTS

#2 Daniel Drive O'Fallon, MO 63366 ph: 314.640.6212

Michael J. Baalman ARCHITECT License#: A-2012004035 Certificate of Authority:

2014003655 CIVIL ENGINEER

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STRUCTURAL, MECHANICAL PLUMBING & ELECTRICAL

CASE ENGINEERING, INC. 796 Merus Court St. Louis, Missouri 63026

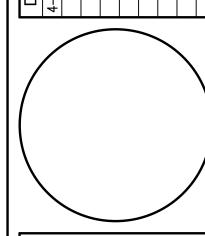
Structural Contact: Ardie Mansouri, P.E. Phone: 636-349-1600 ext 291 amansouri@caseengineeringinc.con Mechanical, Plumbing, Electrical Contact: Jim Eyre, P.E.

jeyre@caseengineeringinc.com Phone: 636-349-1600 ext 258

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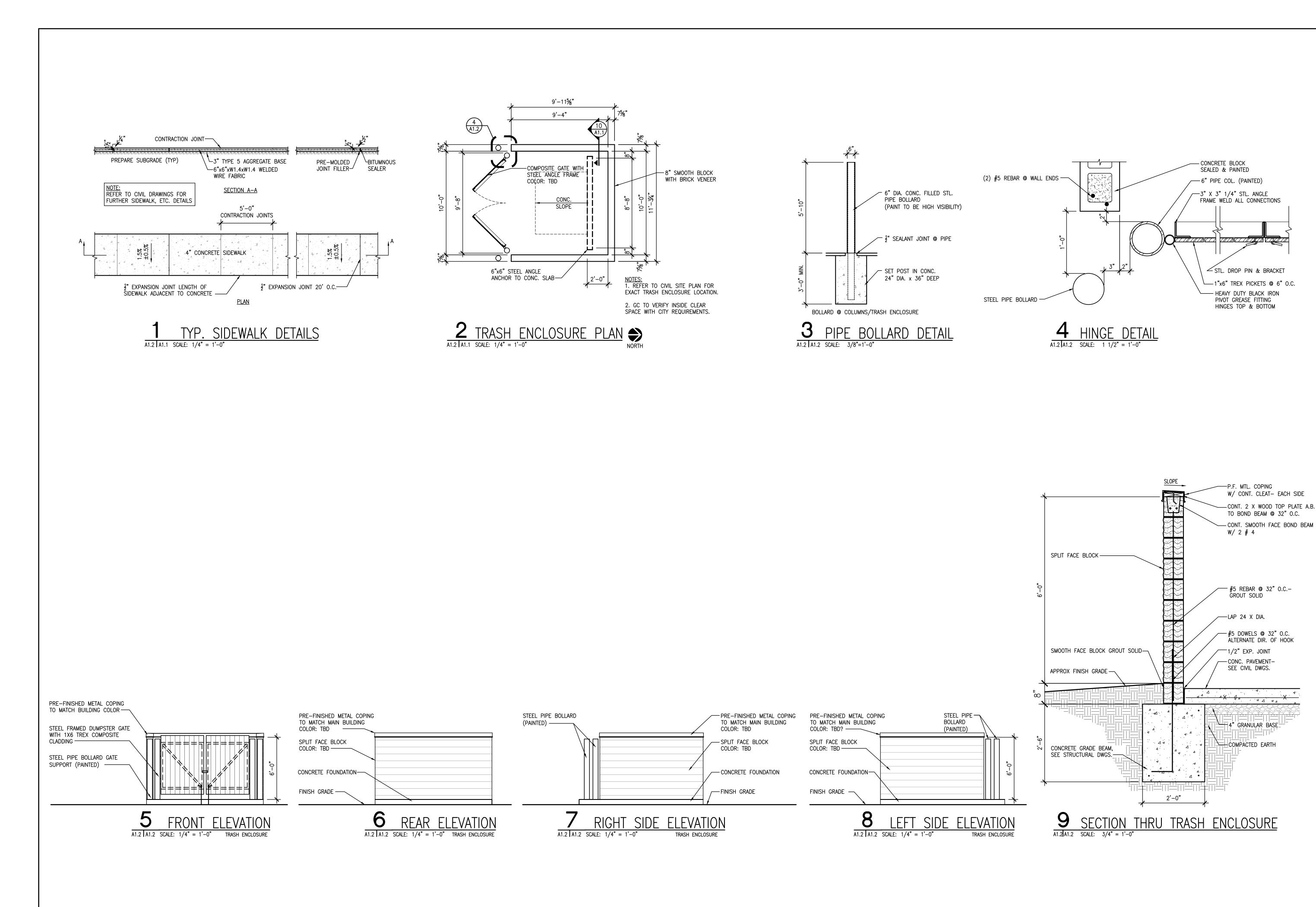
Michael J. Baalman ARCHITECT MO# A-2012004035

PROJECT MANAGER: JKL DRAWN BY: JKL

PROJECT NUMBER 21-079 DATE April 15, 2022

SHEET

A1.1 **ARCHITECTURAL** SITE PLAN



BAALMAN ARCHITECTS

#2 Daniel Drive O'Fallon, MO 63366 ph: 314.640.6212

Michael J. Baalman ARCHITECT License#: A-2012004035 2014003655

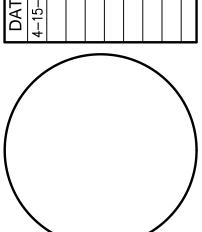
Certificate of Authority: CIVIL ENGINEER BAX ENGINEERING CO., INC. 221 Point West Blvd. St. Charles, Missouri 63301

Phone: 636-928-5552 Contact: Mark Struckhoff mstruckhoff@baxengineering.com STRUCTURAL, MECHANICAL, PLUMBING & ELECTRICAL CASE ENGINEERING, INC. 796 Merus Court St. Louis, Missouri 63026

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County ance District Lincoln Cour Ambulance I 28 Walter Court Moscow Mills, Missour Ba



Michael J. Baalman ARCHITECT MO# A-2012004035

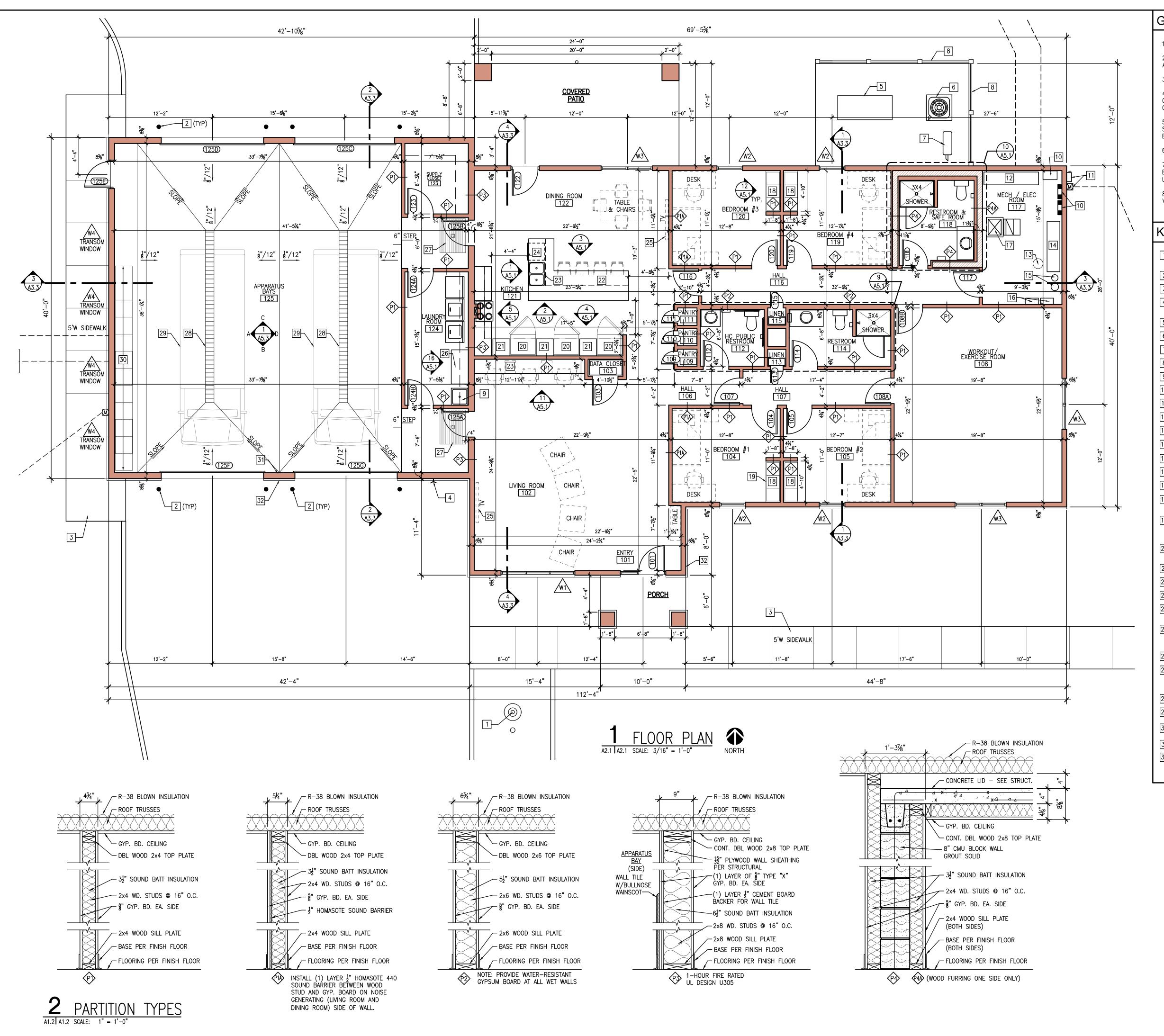
PROJECT MANAGER: JKL DRAWN BY: JKL

PROJECT NUMBER 21-079 DATE

SHEET

April 15, 2022

SITE PLAN **DETAILS**



GENERAL FLOOR PLAN NOTES

1. SEE GENERAL NOTES ON THE COVER SHEET FOR MORE INFORMATION.

2. UNLESS OTHERWISE INDICATED ALL MATERIALS AND EQUIPMENT ON THE DRAWINGS ARE TO BE FURNISHED AND INSTALLED BY THE CONTRACTOR.

3. ALL FURNITURE SHOWN DASHED IS BY OWNER.

4. ALL EXTERIOR SIDED OR STONE VENEER ARE DIMENSIONED FROM EXTERIOR FACE OF SHEATHING TO FINISHED FACE OF INTERIOR GYPSUM BOARD UNLESS NOTED OTHERWISE.

5. CONTRACTOR TO PROVIDE BLOCKING IN WALL TO SUPPORT ALL CASEWORK, SHELVING, LOCKERS, SHOWER UNITS, GRAB BARS, TOILET ACCESSORIES, TVS AND EQUIPMENT, ETC..

6. NO BACK TO BACK JUNCTION BOXES SHALL BE PERMITTED IN SOUND PARTITIONS.

7. ALL CEILING HEIGHTS ARE REFERENCED FROM NEAREST FINISHED FLOOR. ALL BEARING ELEVATIONS ARE BASED ON 100'-0" REFERENCED ELEVATION TYPICAL UNLESS NOTED OTHERWISE.

8. PROVIDE CORNER GUARDS ON ALL OUTSIDE CORNERS WHERE APPLICABLE. VERIFY LOCATIONS WITH OWNER.

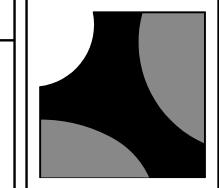
KEYED NOTES

- 1 FLAGPOLE WITH LIGHT SEE ARCHITECTURAL SITE DETAILS, CIVIL DRAWINGS AND ELECTRICAL DRAWINGS FOR MORE INFORMATION AND LOCATION.
- 2 CONCRETE BOLLARD, SEE ARCHITECTURAL SITE PLAN.
- 3 SIDEWALK SEE ARCHITECTURAL SITE PLAN
- FIRE DEPARTMENT CONNECTION, SEE CIVIL DRAWINGS AND FIRE PROTECTION DRAWINGS.
- 5 EMERGENCY GENERATOR, SEE ELECTRICAL DRAWINGS.
- 6 AIR CONDITIONER CONDENSER UNIT, SEE MECHANICAL DRAWINGS.
- 7 HEAT PUMP, SEE MECHANICAL DRAWINGS.
- 8 PRIVACY FENCE, SEE ARCHITECTURAL SITE PLAN AND CIVIL DRAWINGS.
- 9 FIBERGLASS SINGLE COMPARTMENT SERVICE SINK, SEE PLUMBING DRAWINGS.
- 10 ELECTRICAL PANELS & TRANSFER SWITCH, SEE ELECTRICAL DRAWINGS.
- 11 ELECTRIC METER AND ELECTRICAL EQUIPMENT, SEE ELECTRICAL DRAWINGS.
- SPRINKLER RISER EQUIPMENT, SEE FIRE PROTECTION DRAWINGS.

 SUMP PUMP, SEE PLUMBING DRAWINGS.
- 14 DOMESTIC WATER/BACKFLOW EQUIPMENT, SEE PLUMBING DRAWINGS.
- 15 WATER SOFTENER SYSTEM, SEE PLUMBING DRAWINGS.
- 16 WALL MOUNTED TANKLESS WATER HEATERS, SEE PLUMBING DRAWINGS.

SIDES SOLID, RECESS TRIM, RECESS HANDLE, COLOR TAUPE 51.

- 17 FURNACE, SEE MECHANICAL DRAWINGS.
- 18 18"x18"x72" METAL LOCKERS WITH 4" Z BASE. REPUBLIC SINGLE TIER, ALL
- WALL MOUNTED TV AND BRACKET ABOVE BY OWNER. PROVIDE BLOCKING IN WALL. MOUNT 7'-6" ABOVE FINISHED FLOOR TO CENTER OF BRACKET / TV. SEE ELECTRICAL DRAWINGS.
- REFRIGERATOR BY OWNER. CONNECT WATER LINE PLUMBING BY CONTRACTOR. SEE PLUMBING DRAWINGS.
- 21 PANTRY CABINET. SEE INTERIOR ELEVATIONS.
- 22 TWO-TIER SOLID SURFACE ISLAND. SEE INTERIOR ELEVATIONS.
- 23 DOUBLE-BOWL STAINLESS STEEL SINK. SEE PLUMBING DRAWINGS.
- DISHWASHER BY OWNER. CONNECT TO ELECTRIC AND PLUMBING BY CONTRACTOR. SEE ELECTRICAL AND PLUMBING DRAWINGS.
- WALL MOUNTED TV AND BRACKET ABOVE BY OWNER. PROVIDE BLOCKING IN WALL. CONSULT WITH OWNER FOR MOUNTING HEIGHT. SEE ELECTRICAL DRAWINGS.
- 26 PLASTIC LAMINATE COUNTER. SEE INTERIOR ELEVATIONS.
- 27 3'-0"x4'-0" RECESSED ENTRY MAT SYSTEM WITH FLOOR DRAIN.
 RECESSES 2", VERIFY WITH MANUFACTURER. SEE STRUCTURAL AND PLUMBING DRAWINGS.
- 28 TRENCH DRAIN SEE STRUCTURAL AND PLUMBING DRAWINGS.
- 29 AMBULANCE BY OWNER. SHOWN DASHED.
- (12) TURNOUT GEAR OPEN GRID WALL MOUNTED LOCKERS BY OWNER. PROVIDE BLOCKING AS REQUIRED.
- HOSE BIBB WITH REEL ON INTERIOR OF APPARATUS BAY. SEE PLUMBING.
- HOSE BIBB ON EXTERIOR WALL. SEE PLUMBING.



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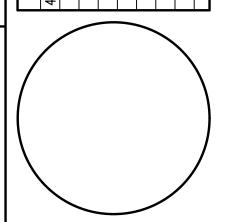
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ation #2 Facility for:

County
Ance District

Lincoln C Ambuland 28 Walter Court Moscow Mills, Mi

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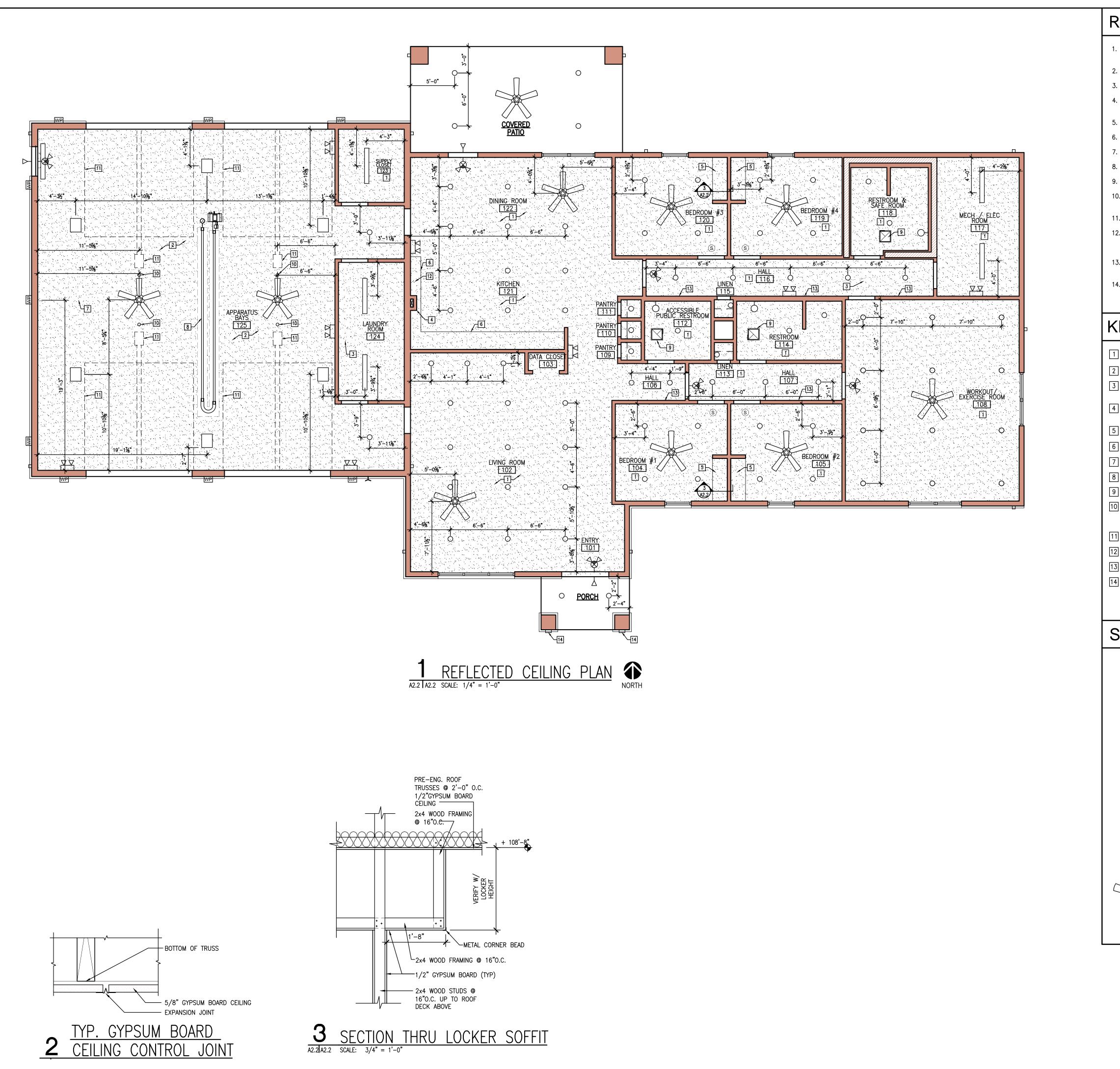


Michael J. Baalman ARCHITECT MO# A-2012004035

PROJECT MANAGER: JKL DRAWN BY: JKL

PROJECT NUMBER 21-079 DATE April 15, 2022

SHEET
A2.1
FLOOR PLAN
AND



REFLECTED CEILING PLAN GENERAL NOTES

- LIGHT FIXTURES ARE SHOWN FOR REFERENCE AND TO SHOW DESIGN INTENT. REFER TO ELECTRICAL DRAWINGS FOR ACTUAL FIXTURE TYPES AND LOCATIONS.
- CONTRACTOR TO COORDINATE ALL FIXTURE LOCATIONS WITH ALL OTHER CEILING MOUNTED ITEMS, ETC.
- 3. REFER TO ROOM FINISH SCHEDULE FOR CEILING HEIGHTS, ETC.
- 4. PROVIDE EMERGENCY ILLUMINATION MIN. AVE 1 FOOT CANDLE AND MIN. FOOT CANDLE AT PATH OF EGRESS
- 5. LIGHT FIXTURES EXIT SIGNS FIRE STROBES, ETC. TO MATCH BUILDING STANDARDS.
- 6. SEE INTERIOR ELEVATIONS AND ELECTRICAL DRAWINGS FOR LOCATIONS OF UNDER-CABINET LIGHT FIXTURES.
- 8. ALL CEILING BULKHEAD AND SOFFIT HEIGHTS ARE TAKEN FROM FINISH FLOOR.
- 10. REFERENCE MECHANICAL DRAWINGS FOR BALANCE OF MECHANICAL INFORMATION (SUPPLY DIFFUSERS,
- 11. REFERENCE ELECTRICAL DRAWINGS FOR BALANCE OF LIGHTING INFORMATION.
- 12. FIRE PROTECTION DESIGN-BUILD CONTRACTOR TO INSTALL SPRINKLER LINES AND DEVICES IN THE AREA OF WORK TO PROVIDE PROPER COVERAGE PER GOVERNING CODES. SPRINKLER HEADS TO MATCH BUILDING STANDARD. VERIFY WORK REQUIRED.
- 13. WHERE SPRINKLER SYSTEMS ARE USED PROVIDE CONCEALED WHITE SPRINKLERS AT ALL GYPSUM BOARD CEILINGS AND SOFFITS UNLESS NOTED OTHERWISE.
- 14. WHERE SPRINKLERS ARE USED, REFERENCE FIRE PROTECTION DRAWINGS FOR LOCATIONS OF SPRINKLER

- 1 5/8" GYP. BOARD CEILING @ 9'-01/2", PAINT
- $\boxed{2}$ 5/8" GYP. BOARD CEILING @ 15'-3\(\begin{align*} 37 \\ 28 \end{align*}. PAINT
- 3 20"x30" ATTIC SCUTTLE FIT BETWEEN TRUSSES, PROVIDE TRIM AROUND PERIMETER, PAINT BOTTOM TO MATCH CEILING.
- 4 HOOD EXHAUST DUCT UP THRU CABINETS AND FURRING AROUND DUCT INTO ATTIC TO ROOF. SEE MECHANICAL DRAWINGS.
- 5 5/8" GYP. BOARD SOFFIT OVER LOCKERS. VERIFY HEIGHT. PAINT TO MATCH WALL COLOR.
- 7 CONTROL JOINT IN CEILING SEE DETAIL W/A2.2.
- 8 INFRARED-HEATER. SEE MECHANICAL DRAWINGS.
- 9 EXHAUST FAN. SEE MECHANICAL DRAWINGS.
- 10 ELECTRICAL CEILING OUTLETS WITH CORD FOR AMBULANCE ELECTRIC. ONE FOR SHORE LINE POWER AND ONE FOR AC POWER. SEE ELECTRICAL DRAWINGS. VERIFY EXACT LOCATION WITH OWNER BEFORE
- [11] OVERHEAD DOOR, LIFT TRACK AND MOTOR LOCATIONS (SHOWN DASHED). SEE ELECTRICAL DRAWINGS.
- 12 UNDER CABINET LIGHT FIXTURE. SEE ELECTRICAL DRAWINGS.
- [13] RED LED TAPE LIGHT ALONG ALONG HALLWAYS MOUNTED AT 1'-0" AFF. SEE ELECTRICAL DRAWINGS.
- 14 EXTERIOR FRONT COLUMN WALL SCONCE LIGHT. SEE ELECTRICAL DRAWINGS.

SURFACE MOUNTED LED LIGHT FIXTURE

SURFACE MOUNTED LED TRACK LIGHT

SURFACE MOUNTED 8'-0" LED TUBE LIGHT FIXTURE

SURFACE MOUNTED 4'-0" LED TUBE LIGHT FIXTURE

1. PROVIDE EMERGENCY ILLUMINATION MIN. AVE 1 FOOT CANDLE AND MIN. FOOT CANDLE AT PATH OF EGRESS PER IBC CODE.

EMERGENCY BATTERY

BACKUP LIGHT (90 MIN)

WP SURFACE MOUNTED LED WALL PACK

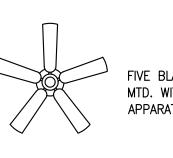
EMERGENCY EXIT LIGHT & HEADS

(90 MIN. BATTERY BACK-UP)

EMERGENCY EXIT LIGHT HEAD (90 MIN. BATTERY BACK-UP)

SMOKE DETECTOR

EXHAUST FAN



FIVE BLADE CEILING FAN, DIRECT MTD. WITH LIGHT KIT (EXCEPT IN APPARATUS BAY)

ARCHITECT MO# A-2012004035

> PROJECT MANAGER: JKL DRAWN BY: JKL

BAALMAN

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Michael J. Baalman

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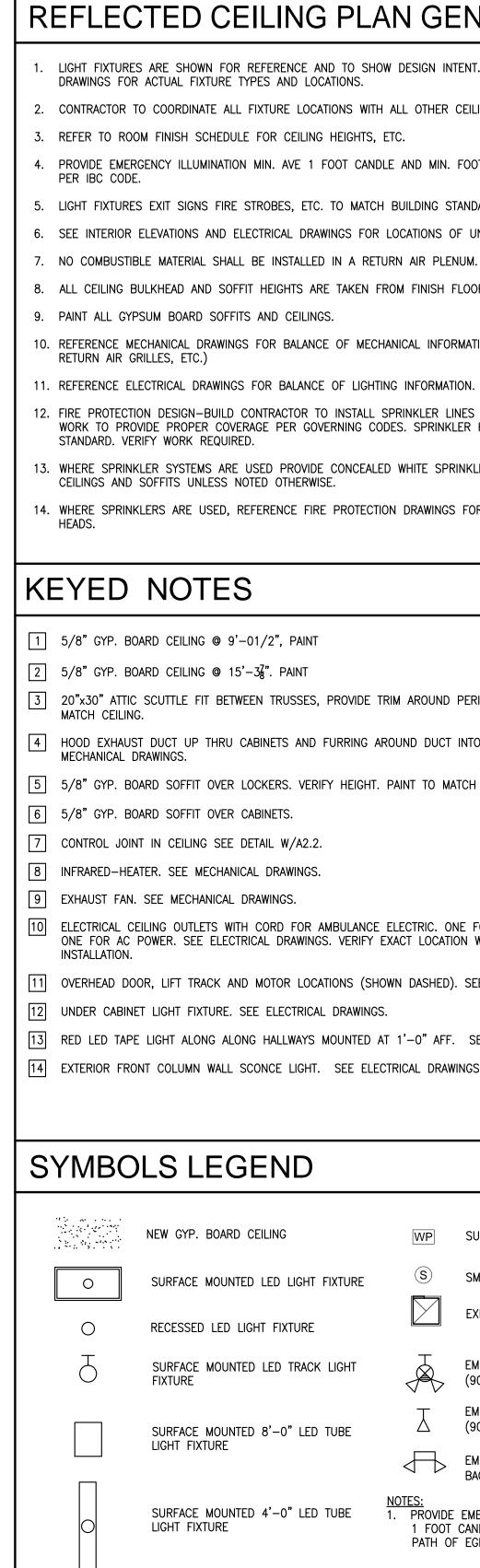
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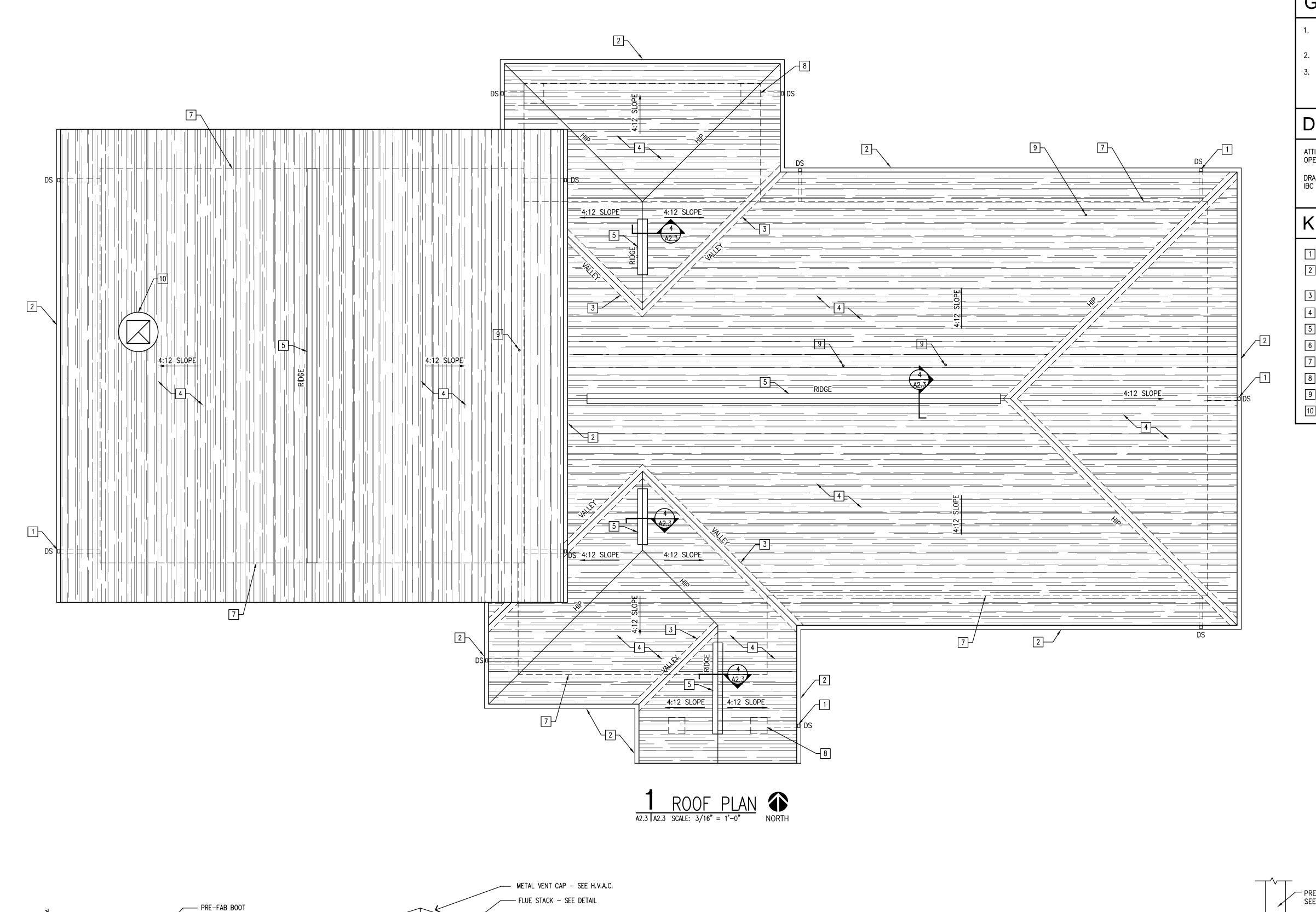
St. Charles, Missouri 63301

PROJECT NUMBER 21-079 DATE April 15, 2022

SHEET

A2.2 REFLECTED **CEILING PLAN**





GENERAL NOTES

- 1. ALL ROOF PENETRATIONS SHALL BE FLASHED AS REQUIRED BY ROOFING MANUFACTURER'S
- 2. DOWNSPOUTS TO CONNECT TO STORM SEWER PER CIVIL DRAWINGS.
- 3. COORDINATE LOCATION AND CONFIGURATION OF ALL ROOF PENETRATIONS W/ MECHANICAL, ELECTRICAL AND PLUMBING CONTRACTOR.

DRAFTSTOPPING

ATTIC DRAFTSTOPPING SHALL BE INSTALLED WHERE SHOWN OR AT A MAXIMUM OF 3,000 S.F. OPEN ATTIC SPACE.

DRAFTSTOPPING SHALL INCLUDE $\frac{1}{2}$ " MINIMUM GYPSUM BOARD OR AS ACCEPTED BY THE 2015 IBC CHAPTER 718 CONCEALED SPACES.

KEYED NOTES

- 1 PRE-FINISHED METAL DOWNSPOUTS. CONTRACTOR TO VERIFY SIZES AND LOCATIONS.
- 2 PRE-FINISHED METAL GUTTER. CONTRACTOR TO VERIFY SIZE TO ACCOMMODATE ROOF DRAINAGE PER CODE.
- 3 PROVIDE ICE AND WATER SHIELD AT ALL ROOF VALLEYS AND ROOF PERIMETER (TYP). 4 LIFETIME ARCHITECTURAL ROOF SHINGLES WITH SYNTHETIC UNDERLAYMENT.
- 5 RIDGE VENT
- 6 DRAFTSTOPPING IN ATTIC
- 7 BUILDING LINE BELOW
- 8 COLUMN BUILDING LINE BELOW
- 9 PLUMBING VENT VERIFY LOCATION WITH PLUMBING DRAWINGS
- 10 ROOF MOUNTED EXHAUST FAN



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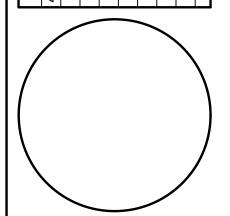
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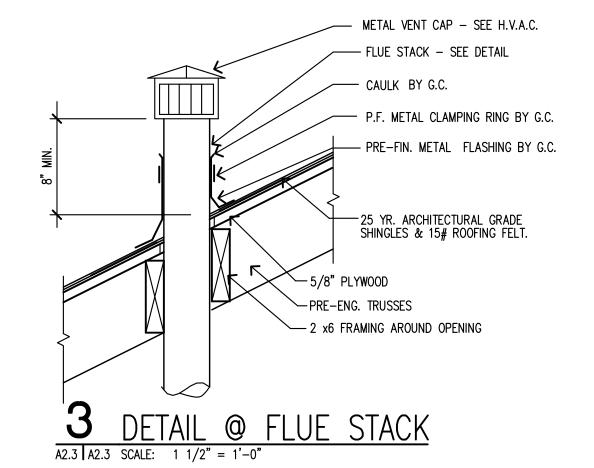
PROJECT MANAGER: JKL DRAWN BY: JKL

PROJECT NUMBER 21-079 DATE April 15, 2022

SHEET A2.3 **ROOF PLAN**

& DETAILS

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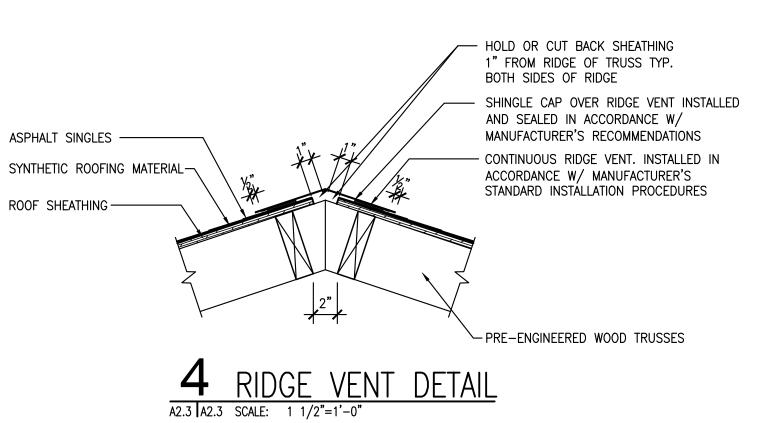
— 2 x6 FRAMING AROUND OPENING

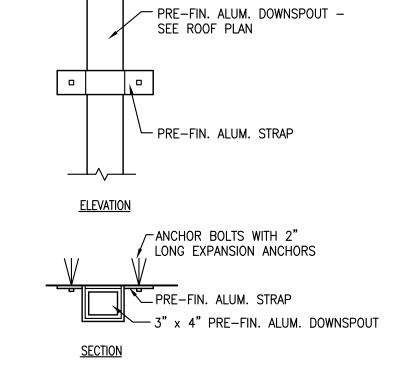
----25 YR. ARCHITECTURAL GRADE | SHINGLES AND 30# ROOFING FELT

— PRE-ENG. TRUSSES - SEE STRUCTURAL

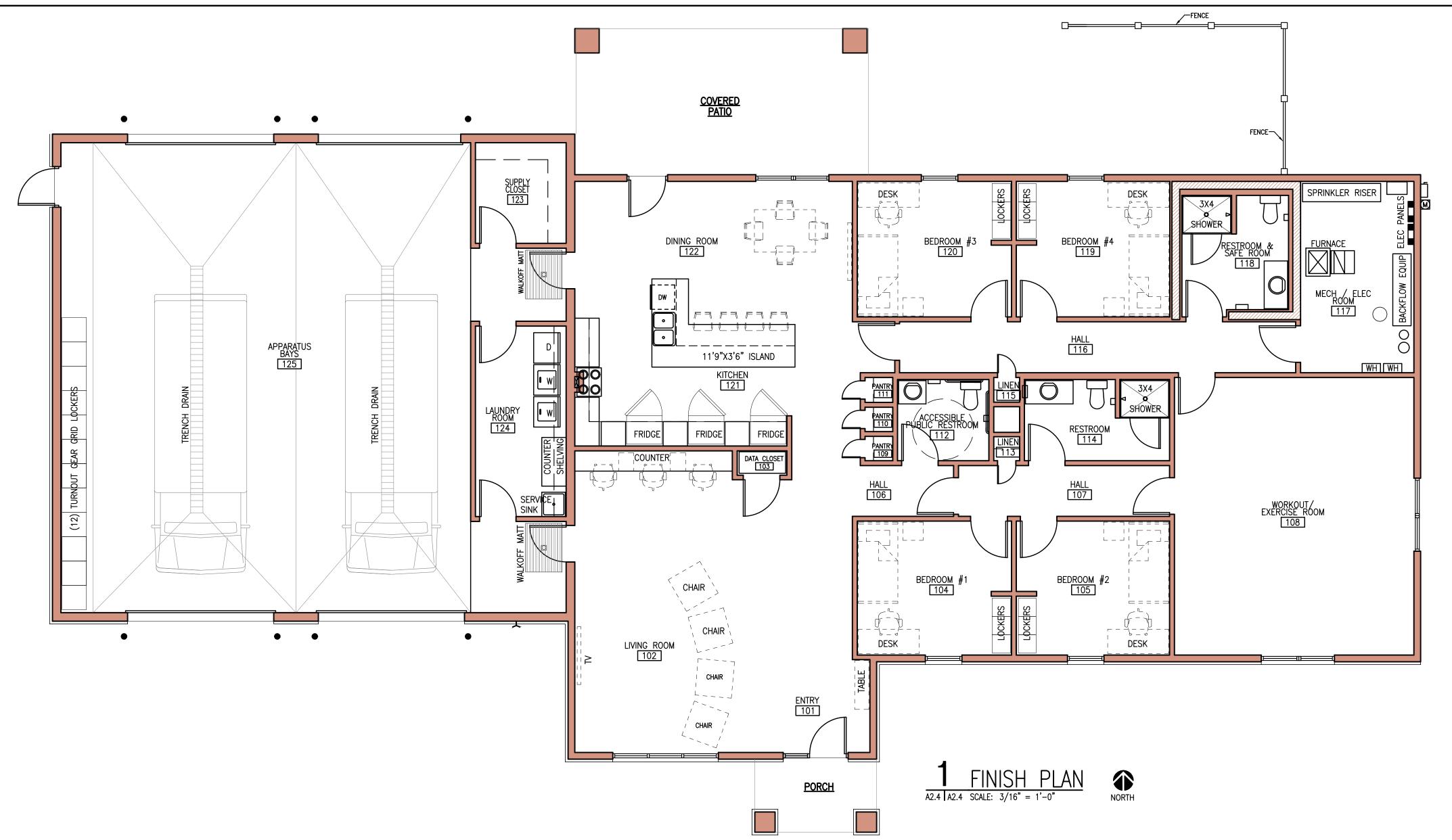
- VENT STACK - SEE PLUMBING

2 DETAIL @ VENT STACK
A2.3 A2.3 SCALE: 1 1/2" = 1'-0"





DETAIL @ DOWN SPOUT A2.3 A2.3 SCALE: $1 \frac{1}{2} = 1'-0''$



	OOM FINISH					WALLC		01	ILING	DEOO	DATINO	T	INTERIOR MATERIALS, FINISHES & COLOR SELECTIONS						
ROOM NO.	ROOM NAME	FLOOR	BASE	NORTH	EAST	WALLS SOUTH	WEST	MAT'L	HEIGHT	WALLS	RATING CLG	NOTES:	PT - POF	RCELAIN TILE SS -	- GYPSUM BOARD - SOLID SURFACE	FRP — FIBERGLASS REI CP — ENTRY MAT SYS	STEM	P — PAINT CT — CERAMIC TILE	
101	ENTRY	LVT-1	VB-1		GB	GB		GB	9'-0"	Р	Р		VB – VINY	'L BASE PL -	- PLASTIC LAMINATE	RES — RESINOUS FLOO	DRING	SC — SEALED CONCRETE	
102	LIVING ROOM	LVT-1	VB-1	GB	GB	GB	GB	GB	9'-0"	Р	Р		IDENT	MATERIAL	MANUFACTURER	TYPE/MODEL	STYLE	COLOR	DESCRIPTION
103	DATA CLOSET	LVT-1	VB-1	GB	GB	GB	GB	GB	9'-0"	Р	Р			LUXURY VINYL TILE	NEXT FLOOR	417 114	COLORADO	CHARCOAL RUSTIC OAK	
104	BEDROOM #1	LVT-1	VB-1	GB	GB	GB	GB	GB	9'-0"	Р	Р		LVT-1						
105	BEDROOM #2	LVT-1	VB-1	GB	GB	GB	GB	GB	9'-0"	Р	Р		PT-1	PORCELAIN TILE	FLORIDA TILE	12x12	MALTESE GLASED	29615 ROMAN GRAY	APPARATUS BAY ROOM
106	HALL	LVT-1	VB-1	GB	GB	GB	GB	GB	9'-0"	Р	Р		PT-2	PORCELAIN TILE	FLORIDA TILE	12x24	MALTESE GLASED	29615 ROMAN GRAY	RESTROOMS
107	HALL	LVT-1	VB-1	GB	GB	GB	GB	GB	9'-0"	Р	Р		VB-1	VINYL WALL BASE	JOHNSONITE	4"		63 BURNT UMBER	
108	WORKOUT/EXERCISE ROOM	SF-1	VB-1	GB	GB	GB	GB	GB	9'-0"	Р	Р					'			<u> </u>
109	PANTRY	LVT-1	VB-1	GB	GB	GB	GB	GB	9'-0"	Р	Р		DOORS	INTERIOR DOORS	VT INDUSTRIES	SELECT WHITE BIRCH		RIVERSTONE, RI18	
110	PANTRY	LVT-1	VB-1	GB	GB	GB	GB	GB	9'-0"	Р	Р		P-1	PAINT, FIELD	SHERWIN WILLIAMS	PROMAR 200	EGGSHELL	SW7029 AGREEABLE GRAY	
111	PANTRY	LVT-1	VB-1	GB	GB	GB	GB	GB	9'-0"	Р	Р		P-2	PAINT, ACCENT	SHERWIN WILLIAMS	PROMAR 200	EGGSHELL	PROVIDE 20% ACCENT COLOR	VERIFY ACCENT WALL LOCATIONS
112	ACCESSIBLE PUBLIC RESTROOM	PT-2	PT-2	GB	GB	GB	GB	GB	9'-0"	Р	Р		_	·				COLOR: T.B.D.	OWNER
113	LINEN	LVT-1	VB-1	GB	GB	GB	GB	GB	9'-0"	Р	Р		P-3	PAINT, GB CLG.	SHERWIN WILLIAMS	PROMAR CEILING PAINT	FLAT	CEILING WHITE	
114	RESTROOM	PT-2	PT-2	GB	GB	GB	GB	GB	9'-0"	Р	Р		P-4	PAINT, DOOR & BORROW LITE TRIM	SHERWIN WILLIAMS	PROMAR 200	SEMI-GLOSS	SW7020 BLACK FOX	
115	LINEN	LVT-1	VB-1	GB	GB	GB	GB	GB	9'-0"	Р	Р		P-5	PAINT, LATEX ENAMEL	SHERWIN WILLIAMS	ENAMEL LATEX	SATIN	SW7029 AGREEABLE GRAY	RESTROOMS
116	HALL	LVT-1	VB-1	GB	GB	GB	GB	GB	9'-0"	Р	Р			WALL PAINT	WILCOMART	00001 00	GLOSS LINE FINISH	VEDANDA TEAK	CADINITTO
117	MECH/ELEC ROOM	SC	VB-1	GB	GB	GB	GB	GB	9'-0"	Р	Р		PL-1	PLASTIC LAMINATE	WILSONART	8209k-28	GLOSS LINE FINISH	VERANDA TEAK	CABINETS
118	RESTROOM & SAFE ROOM	PT-2	PT-2	GB	GB	GB	GB	GB	9'-0"	Р	Р		PL-2	PLASTIC LAMINATE	WILSONART	4945-38		ORGANIC COTTON	COUNTERTOP IN LAUNDRY ROOM
119	BEDROOM #4	LVT-1	VB-1	GB	GB	GB	GB	GB	9'-0"	P	P		SS-1	SOLID SURFACE	WILSONART	9175ML (3)	13MM	AVALANCHE MELANGE	TRANSACTION COUNTERTOP
120	BEDROOM #3	LVT-1	VB-1	GB	GB	GB	GB	GB	9'-0"	P	P			CEALED CONCRETE					
121	KITCHEN	LVT-1	VB-1	GB	GB	GB	GB	GB	9'-0"	P	P	CT-1 BACKSPLASH TILE	SC	SEALED CONCRETE					
122	DINING ROOM	LVT-1	VB-1	GB	GB	GB	GB	GB	9'-0"	P	P		SF-1	SPORTS FLOORING	ECORE	PERFORMANCE MOTIVATE	_	ES15A STEEL APPEAL 2	
123	SUPPLY CLOSET	SC	VB-1	GB	GB	GB	GB	GB	9'-0"	P	P		CT-1	CERAMIC TILE	DAL TILE	COLOR WHEEL (3"x6" SUBW		WHITE 0100	KITCHEN BACKSPLASH
124	LAUNDRY ROOM	SC**	VB-1	GB	GB	GB	GB	GB	9'-0"	P	P		 CP-1	ENTRY MAT SYSTEM	CONSTRUCTION SPECILTIES		<u> </u>	CDADLUTE #0705	RECESSED ENTRY MAT SYSTEM
125	APPARATUS BAYS	SC**	PT-1	GB	GB	GB	GB	GB	15'-4"	Р	P	PT-1 WAINSCOT AND CP-1 ENTRY MAT **ALTERNATE FOR RESINOUS FLOORING				TEDIMAI WIT ENTITI WAT	-	GRAPHITE #9325	KECESSED EINIKT MAI STSTEM
													GT-1	GROUT	MAPEI	_	_	77 FROST	_
ABF	BREVIATIONS	S											RES-1 (ALTERNATE)	RESINOUS FLOORING WITH INTEGRAL COVE BASE	SILIKAL	62 SL	SELF LEVELING MONO SOLID COLOR	T.B.D.	PREPARE CONC. FLOOR PER MFR'S INSTRUCTIONS
		YPSUM B	OARD		FRP – F	IBFRGI ASS	REINFORC	FD PANFI	P	– PAINT			LOCKERS	METAL LOCKERS FOR BEDROOMS	REPUBLIC	18"W X 18"D X 72"D	SOLID SIDES	TAUPE 51	4" Z BASE, ALL SIDES SOLID, RECESS TRIM, RECESS HANDLE
		OLID SUR				NTRY MAT		_D 1/114LL		- CERAMI	CTILE		LOCKERS	METAL LOCKERS	REPUBLIC	25"W X 20"D X 80"H	SOLID SIDES	TAUPE 51	LOCKERS MOUNTED TO WALL



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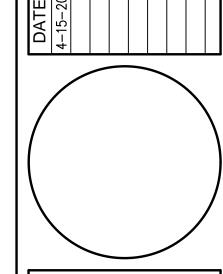
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ew Base Station #2 Facility for:
incoln County
Ambulance Distric

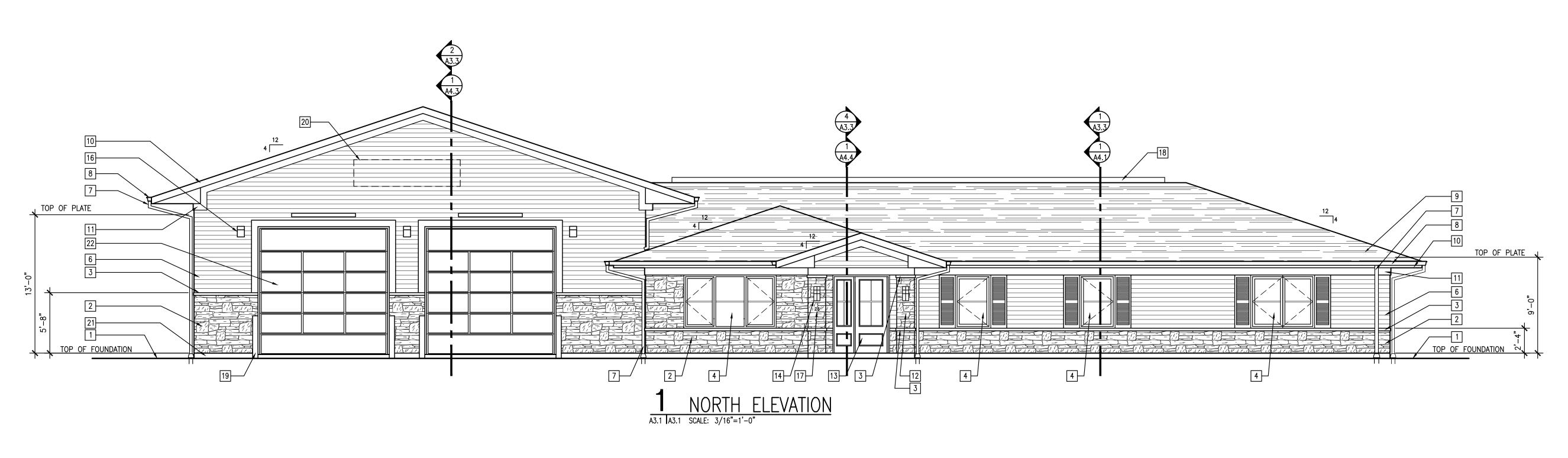


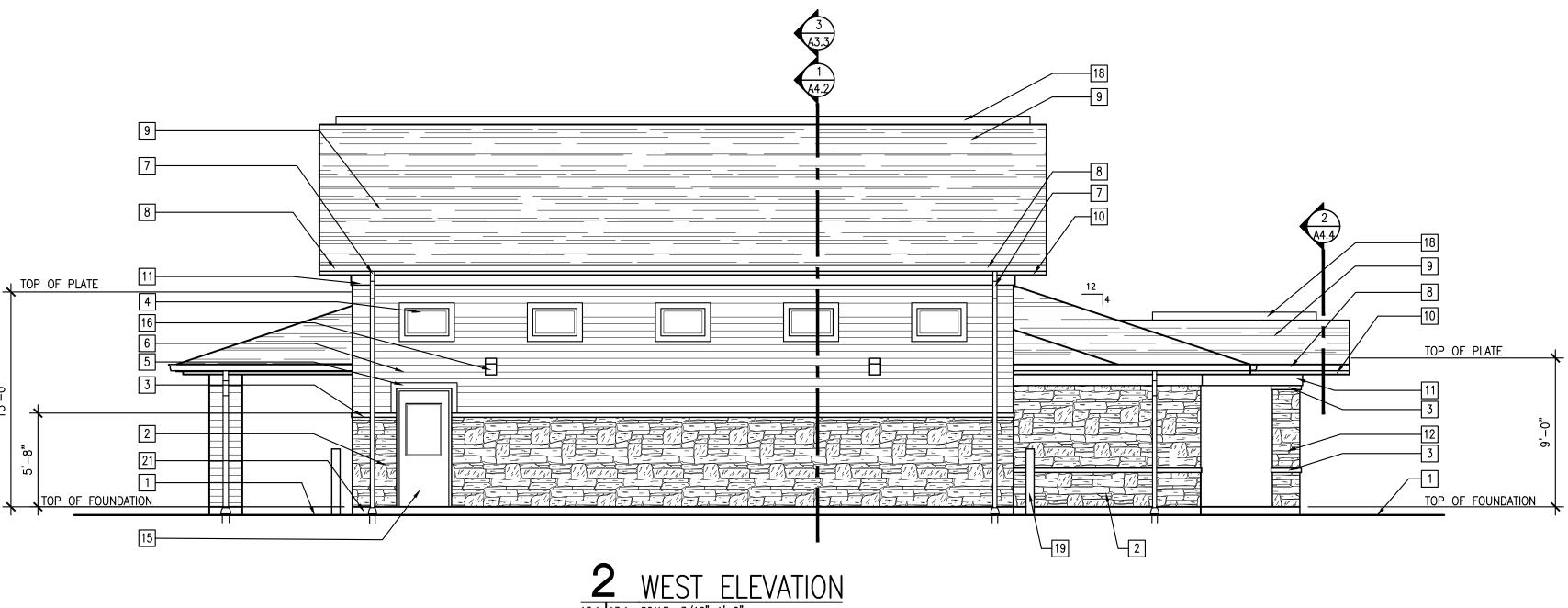
ARCHITECT MO# A-2012004035

PROJECT MANAGER: JKL DRAWN BY: JKL

PROJECT NUMBER 21-079 DATE April 15, 2022

FINISH PLAN & ROOM SCHEDULE





EXTERIOR MATERIALS AND FINISH SPECIFICATIONS

STONE VENEER SYSTEM: ELDORADO STONE, COLOR: BOARDWALK, CLIFFSTONE MORTAR: TINTED COLOR WITH SEALER ADDITIVE, WEATHERED JOINTS

STONE ACCENT BAND AND SILL BAND:

ELDORADO STONE, COLOR: ELDORADO STONE

PRE-FINISHED ALUMINUM COPINGS/TRIM:

COLOR: DARK BRONZE

PRE-FINISH FIBERGLASS DOOR: COLOR: DARK BRONZE

GLAZING: SOLAR BRONZE, LOW-E GLASS WINDOWS: SEE WINDOW TYPES ON SHEET A6.2.

ALUMINUM CLAD WOOD WINDOWS TYPE: FIXED AND CASEMENT (WITH FULL SCREENS)

SOFFIT PANEL: DESCRIPTION: FLUSH VENTED WITH CONCEALED FASTENERS

MANUFACTURER: T.B.D. COLOR: DARK BRONZE

VINYL SIDING: CERTAINTEED, RESTORATION CLASSIC, DOUBLE 43" DUTCHLAP WITH TRIM AS REQUIRED TO MATCH. COLOR: CASTLE STONE

ASPHALT SHINGLES: ASPHALT, LIFETIME, ARCHITECTURAL STYLE SHINGLES MANUFACTURER: GAF, OWENS CORNING OR EQUIVALENT BASIS OF DESIGN PRODUCT: GAF, TIMBERLINE HDZ, HIGH DEFINITION COLOR: BLACK

GENERAL NOTES

1. SEE EXTERIOR MATERIALS AND FINISH SPECIFICATIONS FOR MATERIAL FINISH COLORS.

2. FRONT ENTRY - FIBERGLASS DOOR W/ SIDE LIGHTS 3'-0"x6'-8" FIBERGLASS DOOR W/ LOW E GLASS 2-3/8" BACKSET NO DEAD BOLT SET STANDARD BRUSHED NICKEL HINGES SET. SINGLE SIDE LIGHT W/ LOW E GLASS, LIFETIME PRIMED WOOD FRAME W/ PRIMED INTERIOR CONTINUOUS HEAD/SILL- 6 9/16" JAMBS. BRONZE COMPRESSION WEATHERSTRIP TO COMPOSITE ADJ MILL FIN. SILL COLOR TO MATCH CLAD WINDOWS.

3. REAR ENTRY - FIBERGLASS DOOR 3'-0"x6'-8" FIBERGLASS DOOR W/ LOW E GLASS 2-3/8" BACKSET NO DEAD BOLT SET STANDARD BRUSHED NICKEL HINGES SET. LIFETIME PRIMED WOOD FRAME W/ PRIMED INTERIOR CONTINUOUS HEAD/SILL. BRONZE COMPRESSION WEATHERSTRIP TO COMPOSITE ADJ MILL FIN. SILL COLOR TO MATCH CLAD WINDOWS.

4. HOLLOW METAL DOORS AND FRAMES. COLOR TO MATCH CLAD WINDOWS. SEMI GLOSS.

5. OVERHEAD DOOR - WAYNE-DALTON THERMOSPAN 150 SECTIONAL DOORS W/ FACTORY TINTED LOW E GLASS. EXTERIOR FINISH: FACTORY PRIMED FOR FIELD PAINTING - COLOR TO MATCH CLAD WINDOWS - SEMI GLOSS. INTERIOR FINISH FACTORY PAINTED - COLOR: WHITE.

6. ALUMINUM CLAD WOOD WINDOWS: PELLA LIFESTYLE SERIES CASEMENT AND AWNING W/ LOW E GLASS AND IN EW FLAT SCREENS. FACTORY EXTERIOR FINISH COLOR: BLACK. FACTORY INTERIOR FINISH - COLOR: RED MAHOGANY, HARDWARE: OIL RUBBED BRONZE.

7. ALL INNER FLASHING OCCURRING ABOVE DOORS AND WINDOWS ARE TO CONSTRUCTED WITH END

KEYED NOTES

- 1 APPROXIMATE FINISH GRADE OR CONCRETE SIDEWALK. REFER TO CIVIL DRAWINGS.
- 2 STONE VENEER SYSTEM.
- 3 STONE ACCENT BAND. (ELDORADO STONE)
- 4 ALUMINUM CLAD WOOD WINDOWS AND TRIM. SEE WINDOW TYPES SHEET A/6.1.
- 5 PRE-FINISHED ALUMINUM TRIM AROUND WINDOW AND DOOR OPENINGS.
- 6 DOUBLE DUTCHLAP VINYL SIDING. SEE FINISH SPECIFICATIONS ON THIS SHEET.
- 7 PREFINISHED SQUARE-SHAPED METAL DOWNSPOUTS. PIPED UNDERGROUND. REFER TO CIVIL DRAWINGS.
- 8 PREFINISHED METAL GUTTER.
- 9 ASPHALT LIFETIME ARCHITECTURAL SHINGLES WITH SYNTHETIC UNDERLAYMENT.
- 10 PRE-FINISHED ALUMINUM CLAD FASCIA TRIM.
- 11 PRE-FINISHED ALUMINUM WRAPPED WOOD SHADOW BOARD.
- 12 STONE CLAD WRAPPED METAL COLUMNS.
- 13 PREFINISHED FIBERGLASS IN-SWINGING DOOR WITH SIDELITE.
- 14 DECORATIVE WALL SCONCE. REFER TO ELECTRICAL DRAWINGS, VERIFY HEIGHT.
- 15 HOLLOW METAL DOOR AND FRAME.
- [16] WALL PACK LIGHT FIXTURE. SEE ELECTRICAL DRAWINGS.
- 17 ADDRESS ON FRONT OF COLUMN (4" HIGH)
- 18 RIDGE VENT, SEE ROOF PLAN.
- 19 BOLLARD, PAINT.
- 20 SIGN BY OWNER INSTALLED BY CONTRACTOR.
- 21 CONCRETE FOUNDATION.
- 22 OVERHEAD DOOR WITH VISION PANELS (TEMP. GLASS), SEE DOOR SCHEDULE.
- 23 PREFINISHED FIBERGLASS IN-SWINGING DOOR WITH TEMP. GLASS, SEE DOOR SCHEDULE.
- 24 DOUBLE DUTCHLAP VINYL SIDING WRAPPING METAL COLUMN

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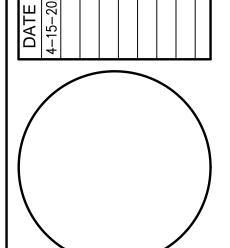
STRUCTURAL, MECHANICAL PLUMBING & ELECTRICAL CASE ENGINEERING, INC.

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amansouri@caseengineeringinc.co Mechanical, Plumbing, Electrical Contact: Jim Eyre, P.E. jeyre@caseengineeringinc.com Phone: 636-349-1600 ext 258

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Lincoln Co
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28 Walter Court
Moscow Mills, Miss



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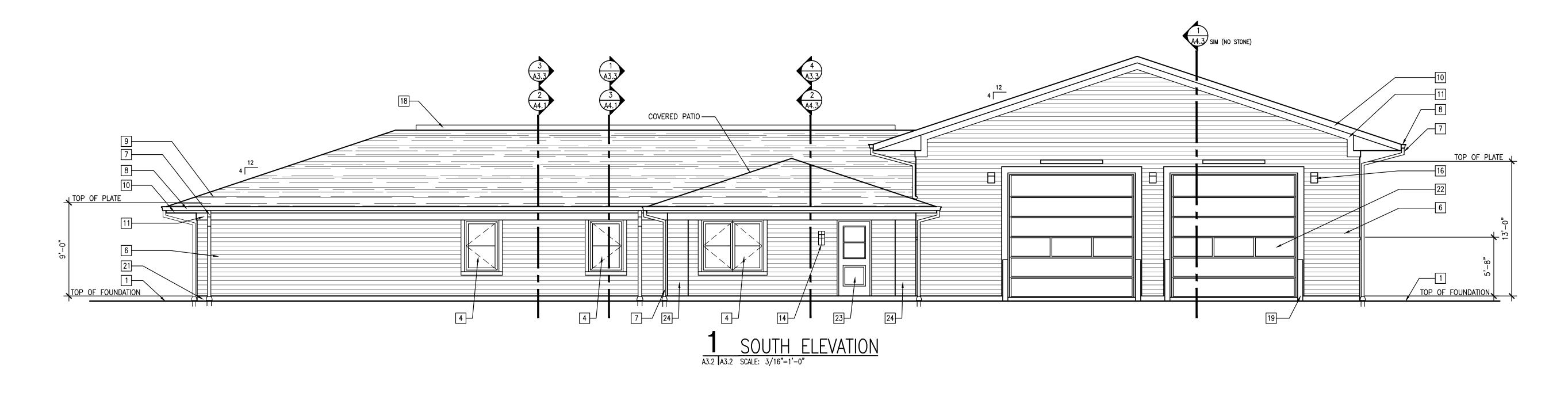
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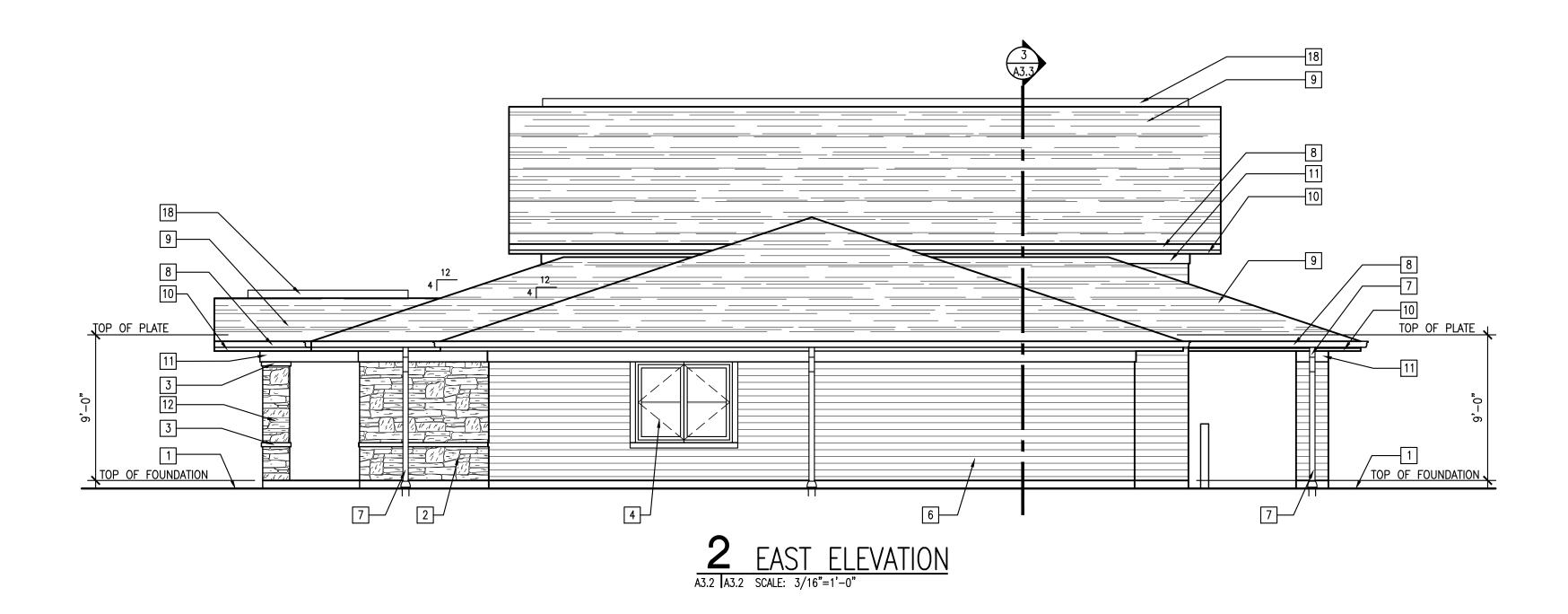
PROJECT MANAGER: JKL DRAWN BY: JKL

PROJECT NUMBER 21-079 DATE April 15, 2022

SHEET

A3.1 **EXTERIOR ELEVATIONS**





EXTERIOR MATERIALS AND FINISH SPECIFICATIONS

STONE VENEER SYSTEM: ELDORADO STONE, COLOR: BOARDWALK, CLIFFSTONE MORTAR: TINTED COLOR WITH SEALER ADDITIVE, WEATHERED JOINTS

STONE ACCENT BAND AND SILL BAND: ELDORADO STONE, COLOR: ELDORADO STONE

PRE-FINISHED ALUMINUM COPINGS/TRIM:

COLOR: DARK BRONZE

PRE-FINISH FIBERGLASS DOOR:

COLOR: DARK BRONZE

GLAZING: SOLAR BRONZE, LOW-E GLASS

WINDOWS: SEE WINDOW TYPES ON SHEET A6.2. ALUMINUM CLAD WOOD WINDOWS

TYPE: FIXED AND CASEMENT (WITH FULL SCREENS)

SOFFIT PANEL:

DESCRIPTION: FLUSH VENTED WITH CONCEALED FASTENERS MANUFACTURER: T.B.D.

COLOR: DARK BRONZE

VINYL SIDING: CERTAINTEED, RESTORATION CLASSIC, DOUBLE $4\frac{1}{2}$ " DUTCHLAP WITH TRIM AS REQUIRED TO MATCH. COLOR: CASTLE STONE

ASPHALT SHINGLES: ASPHALT, LIFETIME, ARCHITECTURAL STYLE SHINGLES MANUFACTURER: GAF, OWENS CORNING OR EQUIVALENT BASIS OF DESIGN PRODUCT: GAF, TIMBERLINE HDZ, HIGH DEFINITION COLOR: BLACK

GENERAL NOTES

- 1. SEE EXTERIOR MATERIALS AND FINISH SPECIFICATIONS FOR MATERIAL FINISH COLORS.
- 2. FRONT ENTRY FIBERGLASS DOOR W/ SIDE LIGHTS 3'-0"x6'-8" FIBERGLASS DOOR W/ LOW E GLASS 2-3/8" BACKSET NO DEAD BOLT SET STANDARD BRUSHED NICKEL HINGES SET. SINGLE SIDE LIGHT W/ LOW E GLASS, LIFETIME PRIMED WOOD FRAME W/ PRIMED INTERIOR CONTINUOUS HEAD/SILL- 6 9/16" JAMBS. BRONZE COMPRESSION WEATHERSTRIP TO COMPOSITE ADJ MILL FIN. SILL COLOR TO MATCH CLAD WINDOWS.
- 3. REAR ENTRY FIBERGLASS DOOR 3'-0"x6'-8" FIBERGLASS DOOR W/ LOW E GLASS 2-3/8" BACKSET NO DEAD BOLT SET STANDARD BRUSHED NICKEL HINGES SET. LIFETIME PRIMED WOOD FRAME W/ PRIMED INTERIOR CONTINUOUS HEAD/SILL. BRONZE COMPRESSION WEATHERSTRIP TO COMPOSITE ADJ MILL FIN. SILL COLOR TO MATCH CLAD WINDOWS.
- 4. HOLLOW METAL DOORS AND FRAMES. COLOR TO MATCH CLAD WINDOWS. SEMI GLOSS.
- 5. OVERHEAD DOOR WAYNE-DALTON THERMOSPAN 150 SECTIONAL DOORS W/ FACTORY TINTED LOW GLASS. EXTERIOR FINISH: FACTORY PRIMED FOR FIELD PAINTING — COLOR TO MATCH CLAD WINDOWS - SEMI GLOSS. INTERIOR FINISH FACTORY PAINTED - COLOR: WHITE.
- 6. ALUMINUM CLAD WOOD WINDOWS: PELLA LIFESTYLE SERIES CASEMENT AND AWNING W/ LOW E GLASS AND IN EW FLAT SCREENS. FACTORY EXTERIOR FINISH COLOR: BLACK. FACTORY INTERIOR FINISH - COLOR: RED MAHOGANY, HARDWARE: OIL RUBBED BRONZE.
- 7. ALL INNER FLASHING OCCURRING ABOVE DOORS AND WINDOWS ARE TO CONSTRUCTED WITH END

KEYED NOTES

- 1 APPROXIMATE FINISH GRADE OR CONCRETE SIDEWALK. REFER TO CIVIL DRAWINGS.
- 2 STONE VENEER SYSTEM.
- 3 STONE ACCENT BAND. (ELDORADO STONE)
- 4 ALUMINUM CLAD WOOD WINDOWS AND TRIM. SEE WINDOW TYPES SHEET A/6.1.
- 5 PRE-FINISHED ALUMINUM TRIM AROUND WINDOW AND DOOR OPENINGS.
- 6 DOUBLE DUTCHLAP VINYL SIDING. SEE FINISH SPECIFICATIONS ON THIS SHEET.
- 7 PREFINISHED SQUARE-SHAPED METAL DOWNSPOUTS. PIPED UNDERGROUND. REFER TO CIVIL DRAWINGS.
- 8 PREFINISHED METAL GUTTER.
- 9 ASPHALT LIFETIME ARCHITECTURAL SHINGLES WITH SYNTHETIC UNDERLAYMENT.
- 10 PRE-FINISHED ALUMINUM CLAD FASCIA TRIM.
- 11 PRE-FINISHED ALUMINUM WRAPPED WOOD SHADOW BOARD.
- 12 STONE CLAD WRAPPED METAL COLUMNS.
- 13 PREFINISHED FIBERGLASS IN-SWINGING DOOR WITH SIDELITE.
- 14 DECORATIVE WALL SCONCE. REFER TO ELECTRICAL DRAWINGS, VERIFY HEIGHT.
- 15 HOLLOW METAL DOOR AND FRAME.
- 16 WALL PACK LIGHT FIXTURE. SEE ELECTRICAL DRAWINGS.
- 17 ADDRESS ON FRONT OF COLUMN (4" HIGH)
- 18 RIDGE VENT, SEE ROOF PLAN.
- 19 BOLLARD, PAINT.
- 20 SIGN BY OWNER INSTALLED BY CONTRACTOR.
- 21 CONCRETE FOUNDATION.
- 22 OVERHEAD DOOR WITH VISION PANELS (TEMP. GLASS), SEE DOOR SCHEDULE.
- PREFINISHED FIBERGLASS IN-SWINGING DOOR WITH TEMP. GLASS, SEE DOOR SCHEDULE.
- 24 DOUBLE DUTCHLAP VINYL SIDING WRAPPING METAL COLUMN

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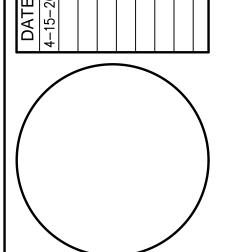
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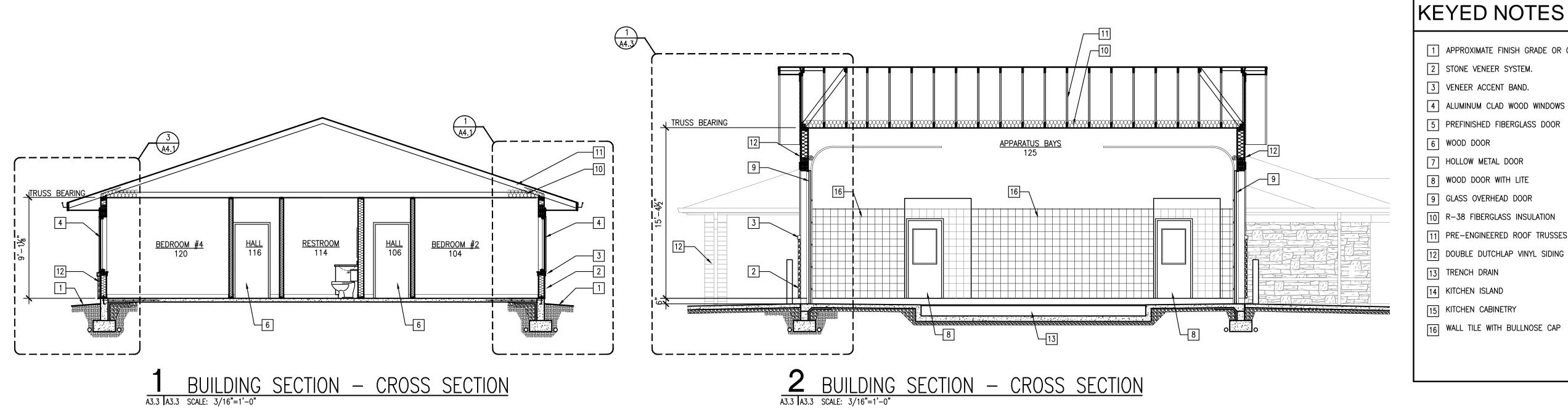
PROJECT MANAGER: JKL DRAWN BY: JKL

PROJECT NUMBER 21-079 DATE

> SHEET A3.2

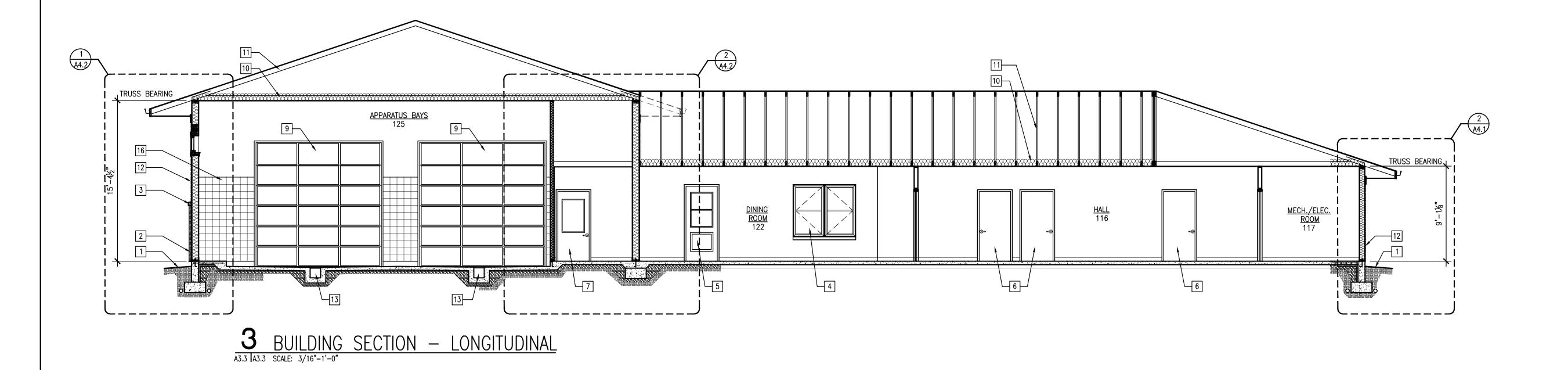
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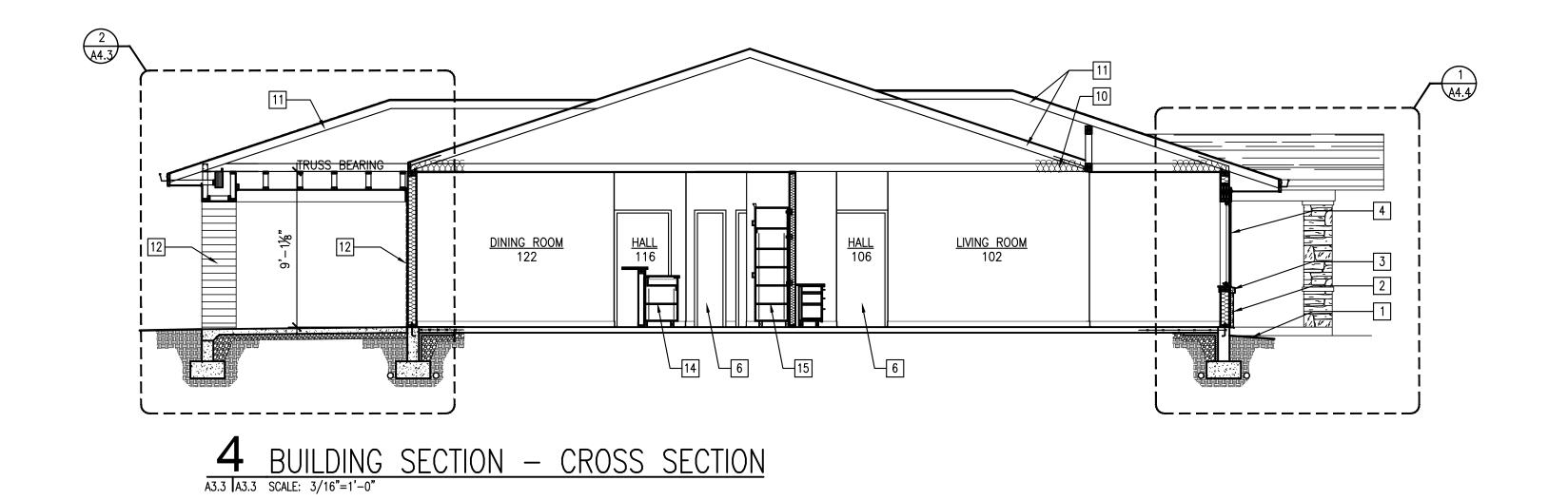
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KEYED NOTES

- 1 APPROXIMATE FINISH GRADE OR CONCRETE SIDEWALK. REFER TO CIVIL DRAWINGS.
- 2 STONE VENEER SYSTEM.
- 3 VENEER ACCENT BAND.
- 4 ALUMINUM CLAD WOOD WINDOWS WITH PAINTED WOOD STOOL AND TRIM.
- 5 PREFINISHED FIBERGLASS DOOR
- 6 WOOD DOOR
- 7 HOLLOW METAL DOOR
- 8 WOOD DOOR WITH LITE
- 9 GLASS OVERHEAD DOOR
- 10 R-38 FIBERGLASS INSULATION
- 11 PRE-ENGINEERED ROOF TRUSSES
- 13 TRENCH DRAIN
- 14 KITCHEN ISLAND
- 15 KITCHEN CABINETRY
- 16 WALL TILE WITH BULLNOSE CAP





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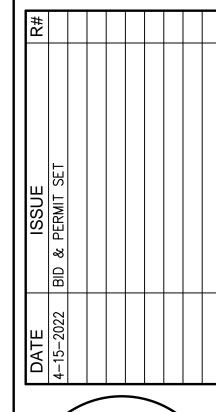
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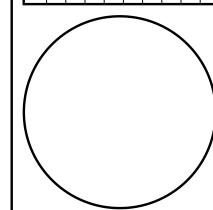
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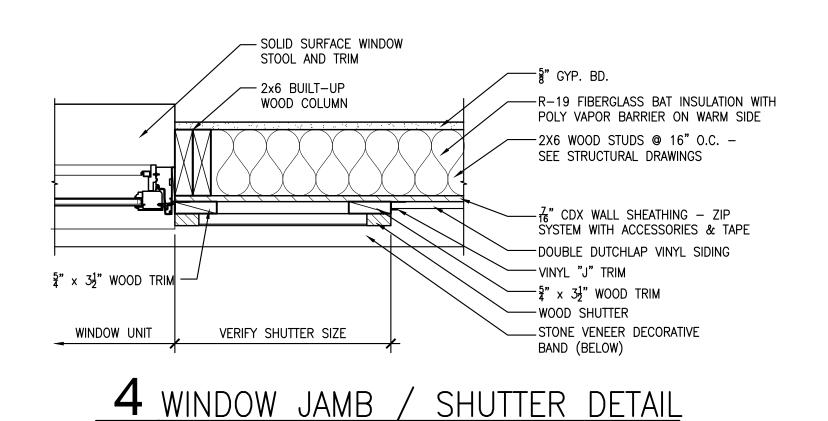
ARCHITECT MO# A-2012004035

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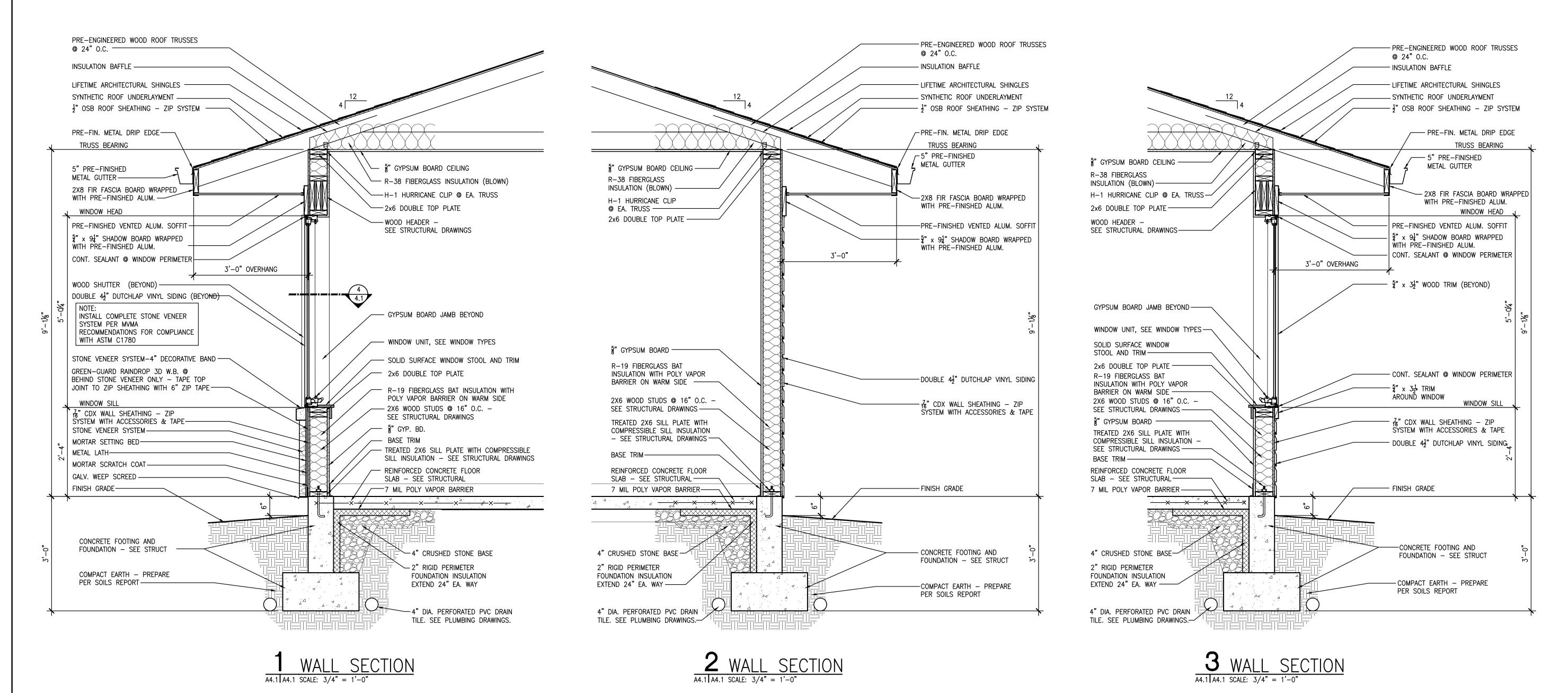
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A3.3 BUILDING SECTIONS



A4.1 A4.1 SCALE: 1-1/2" = 1'-0"



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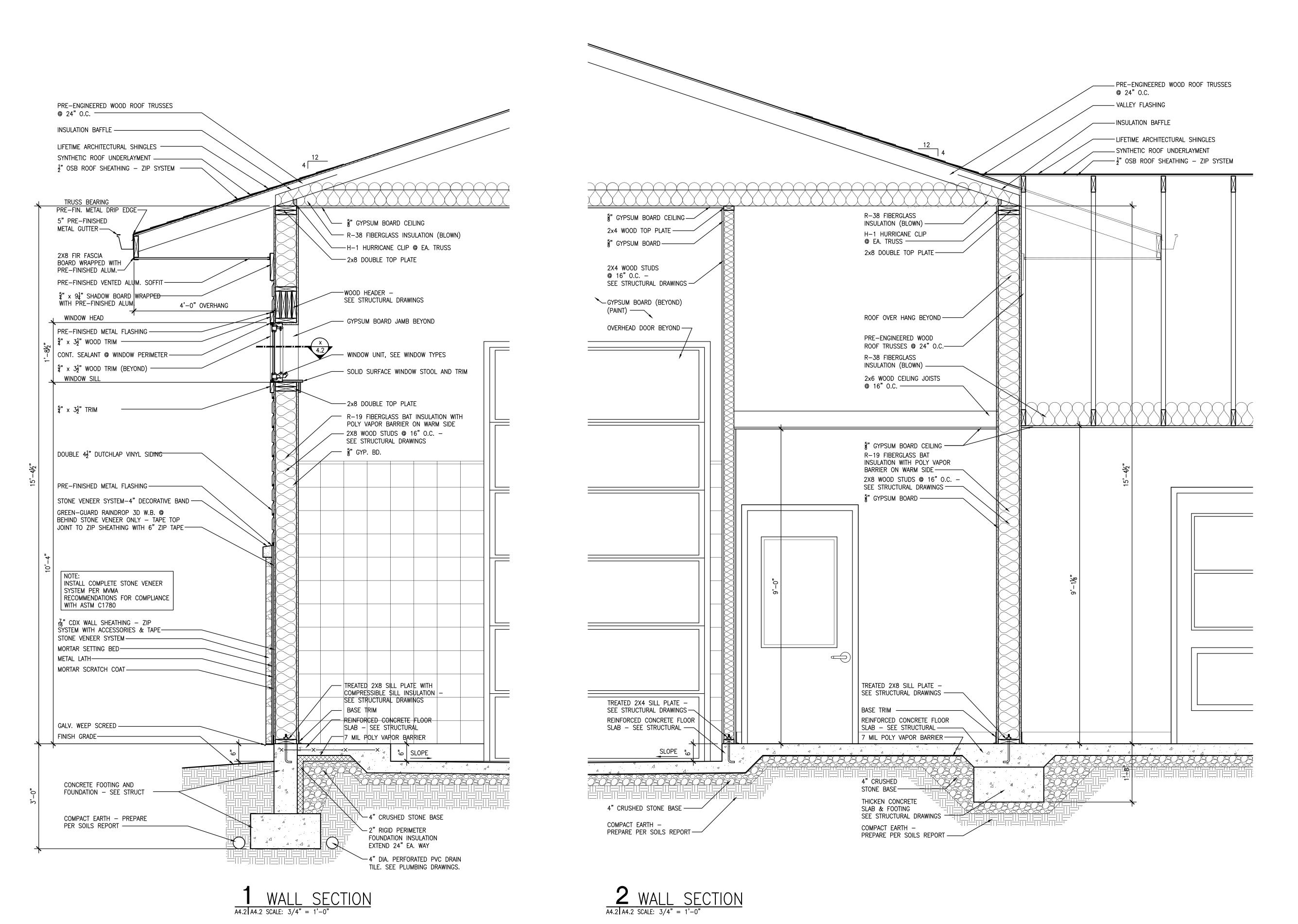
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A4. WALL **SECTIONS**





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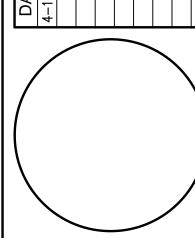
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 County
 District
 Walter Court

DATE ISSUE R#
--15-2022 BID & PERMIT SET



Michael J. Baalman ARCHITECT MO# A-2012004035

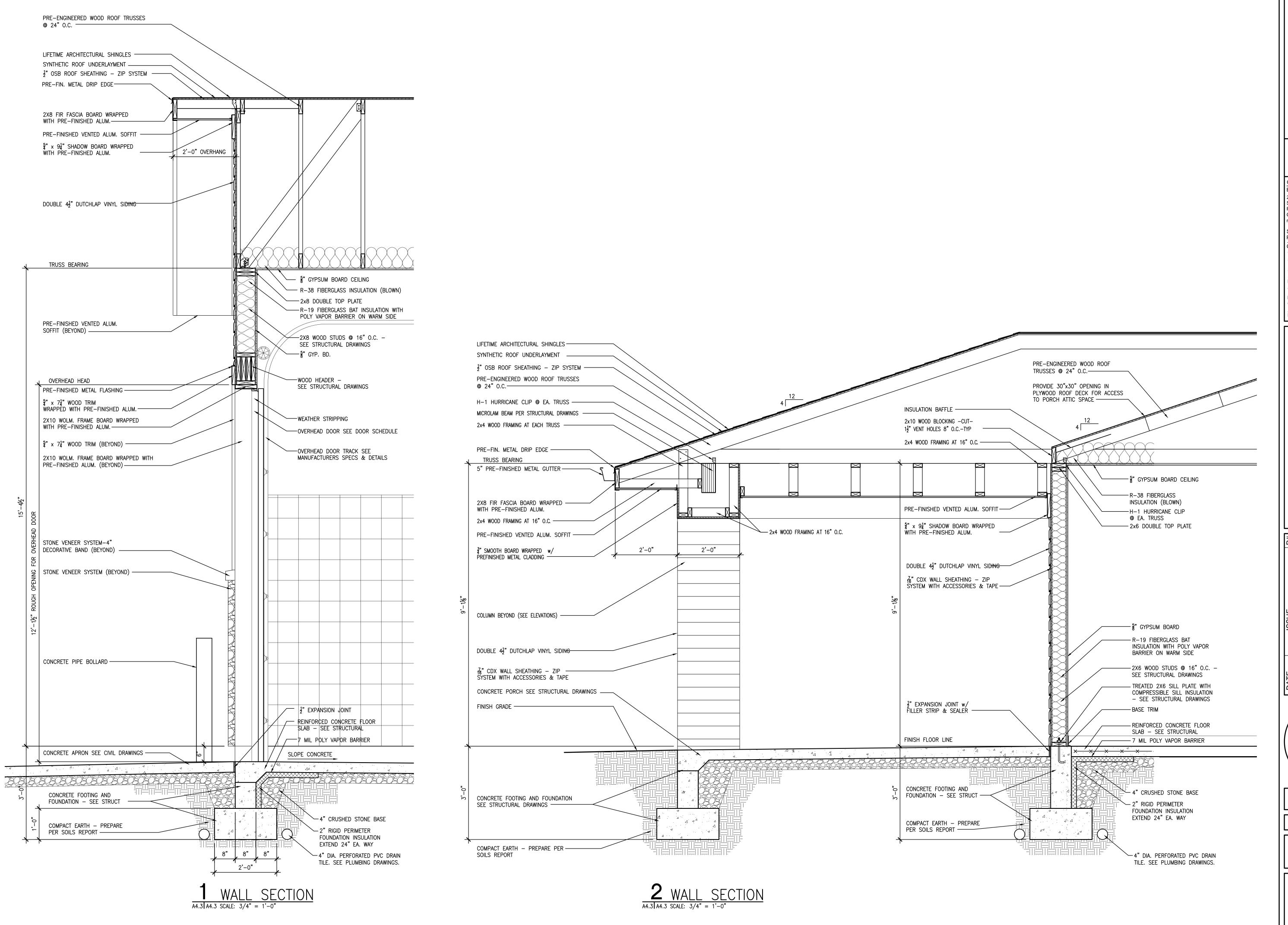
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DRAWN BY: JKL

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A4.2
WALL
SECTIONS





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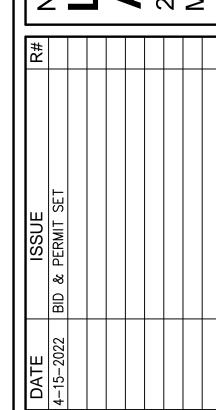
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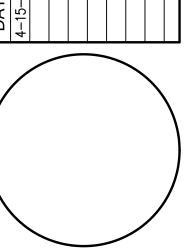
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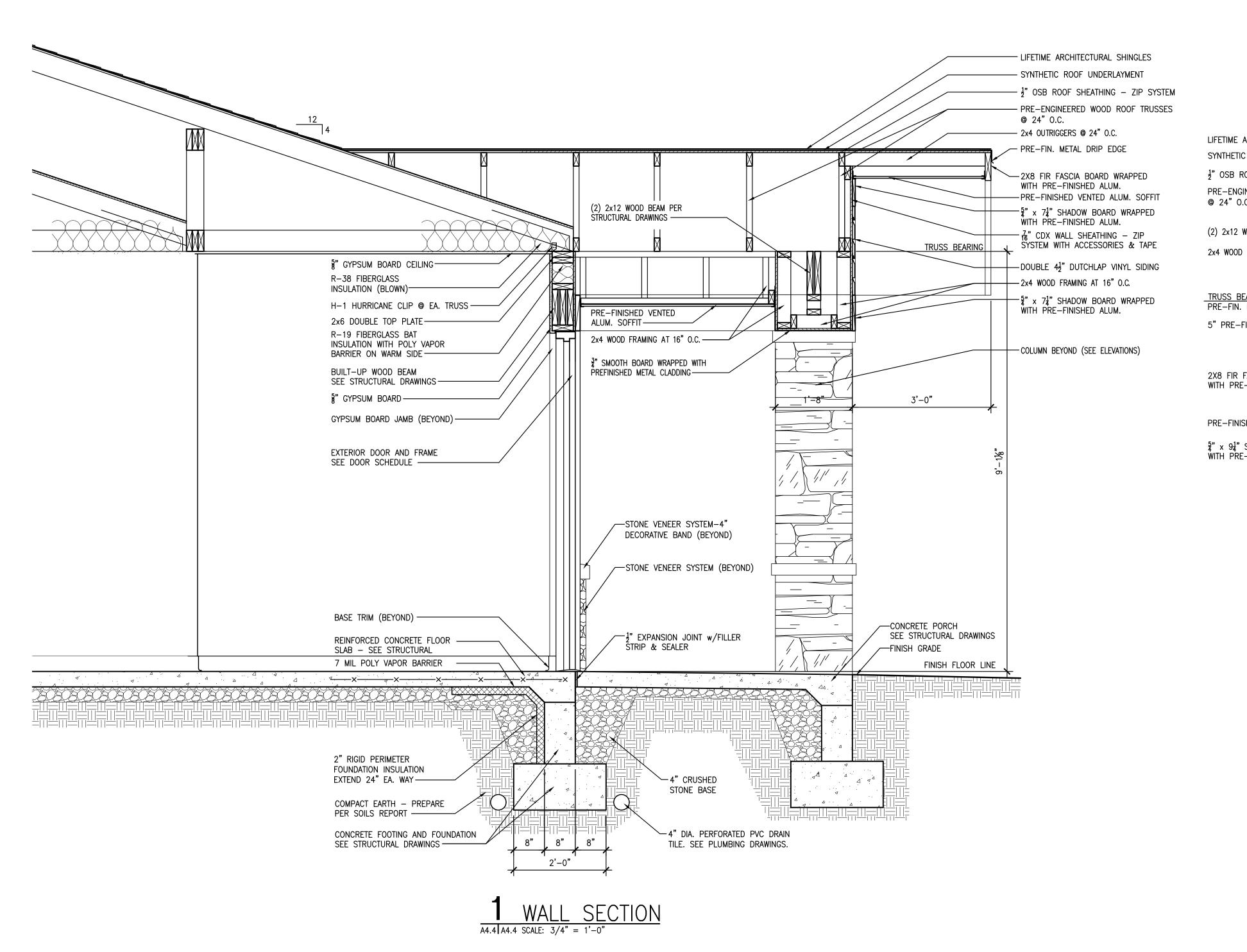
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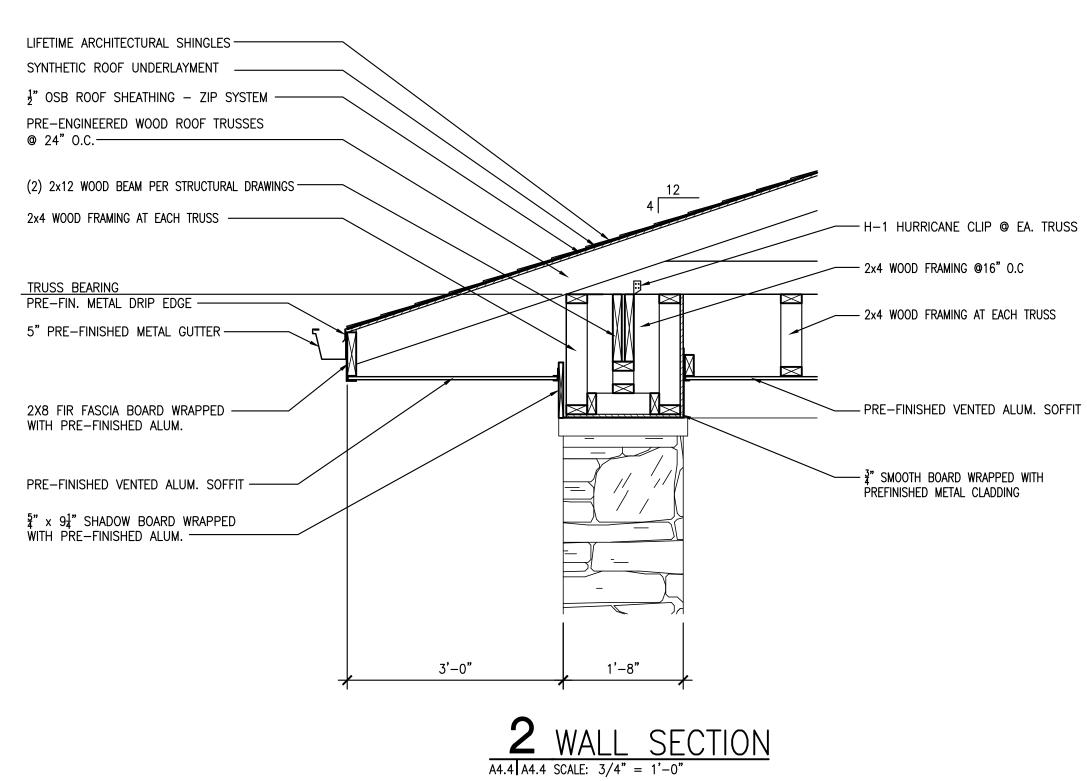
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SHEET A4.3 WALL SECTIONS







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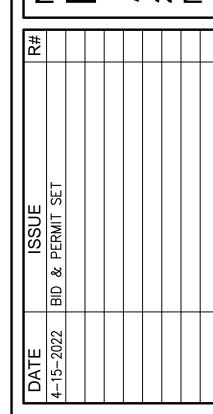
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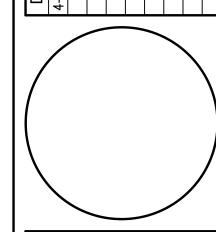
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New Base Station #2 Facility for:

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Moscow Mills, Missouri 63367





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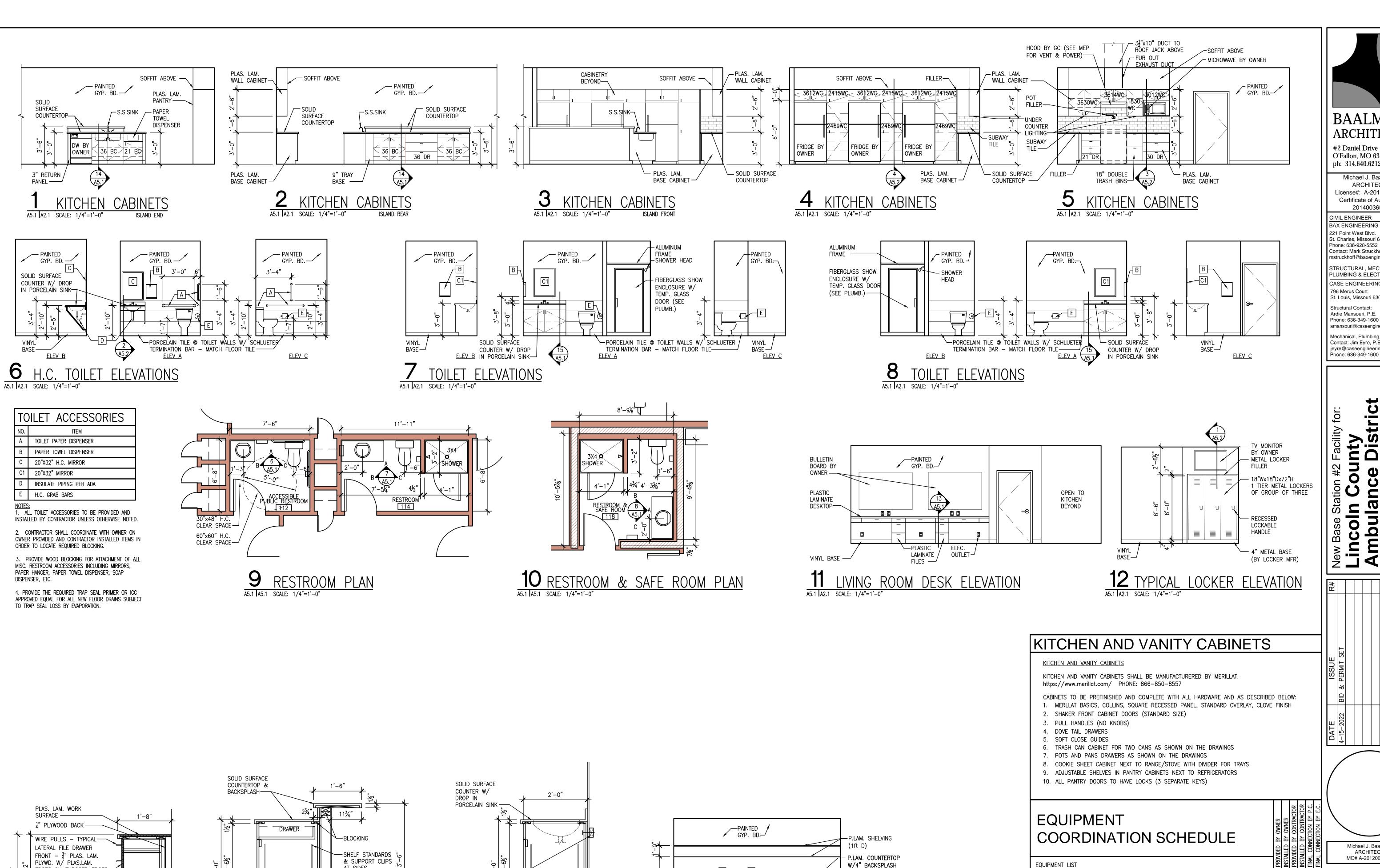
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A4.4
WALL
SECTIONS





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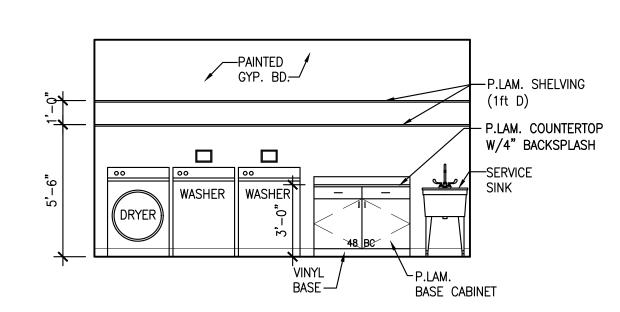
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A5. INTERIOR **ELEVATIONS**



13 CABINET SECTION A5.1 A2.1 SCALE: 3/4"=1'-0"

EDGES ON EXPOSED EDGES-

OPEN SPACE TO RUN

COMPUTER CABLES —

¾" PLYWOOD BOTTOM

4" VINYL BASE -

W/ PLAS. LAM. EDGES -

A5.1 A2.1 SCALE: 3/4"=1'-0"

4" VINYL BASE -

AT SIDES

— SHELVES

—BLOCKING

/- 4" VINYL BASE

A5.1 A2.1 SCALE: 3/4"=1'-0"

4" VINYL BASE -

BLOCKING

BLOCKING -

A5.1 A2.1 SCALE: 1/4"=1'-0"

STOVE (GAS)

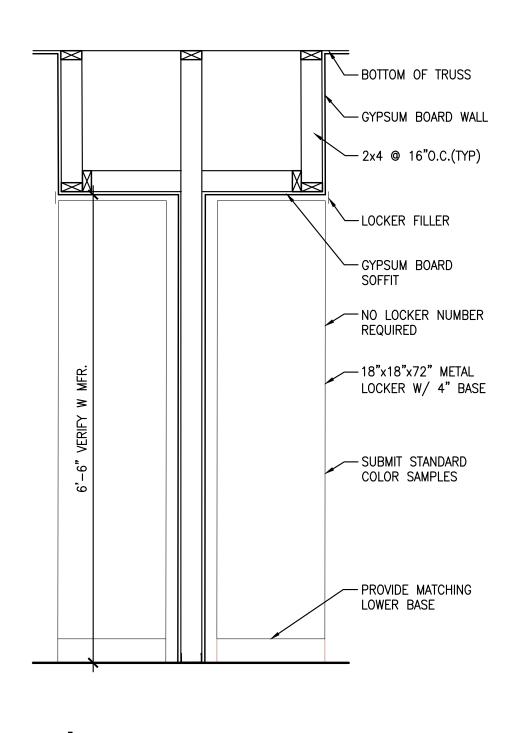
DISHWASHER

REFRIGERATOR

RANGE / HOOD

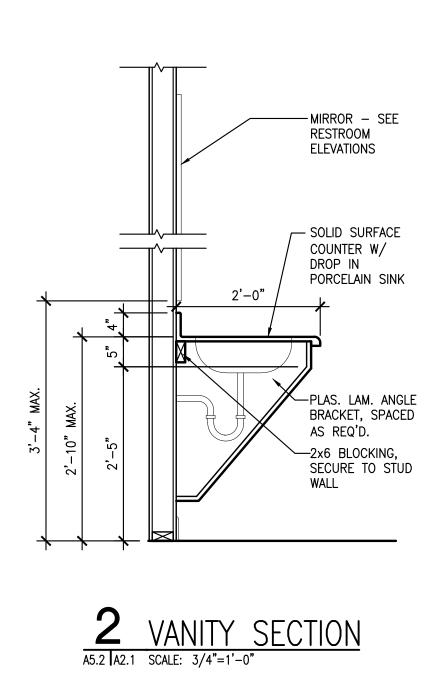
WASHER

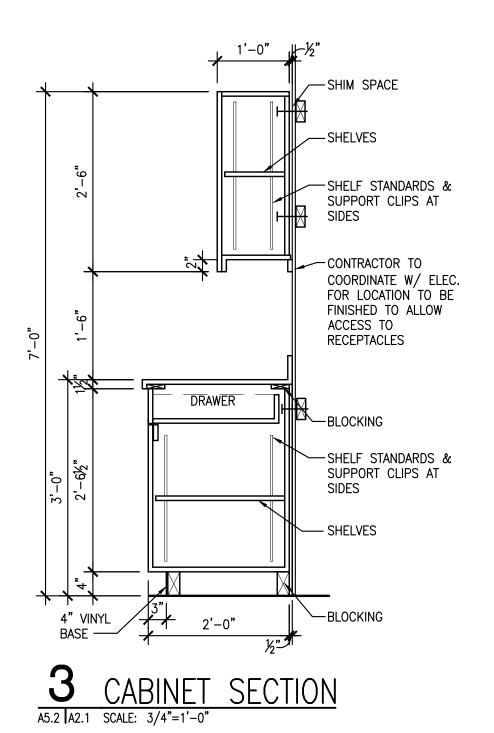
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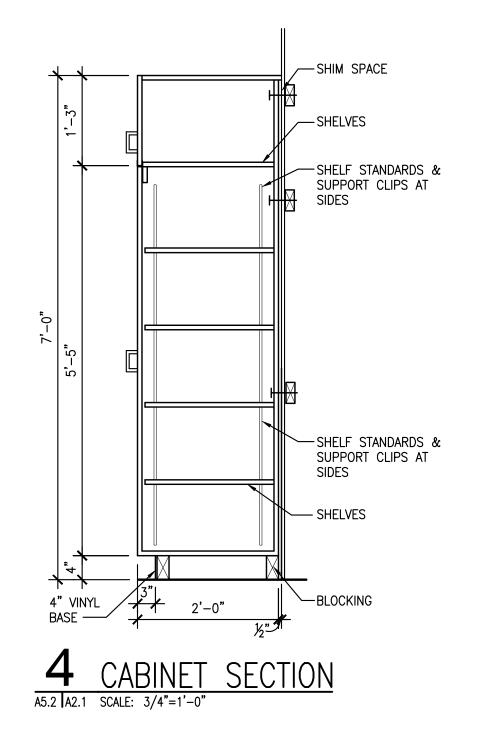


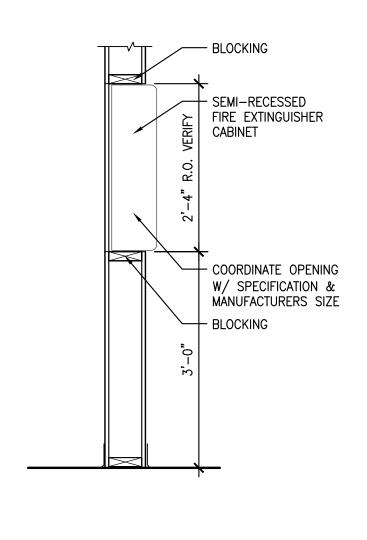
LOCKER SECTION

A5.2 A2.1 SCALE: 3/4"=1'-0"









5 FIRE EXTINGUSHER CAB
A5.2 A2.1 SCALE: 3/4"=1'-0"



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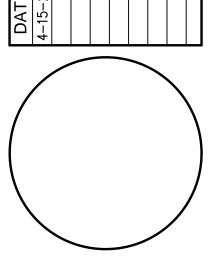
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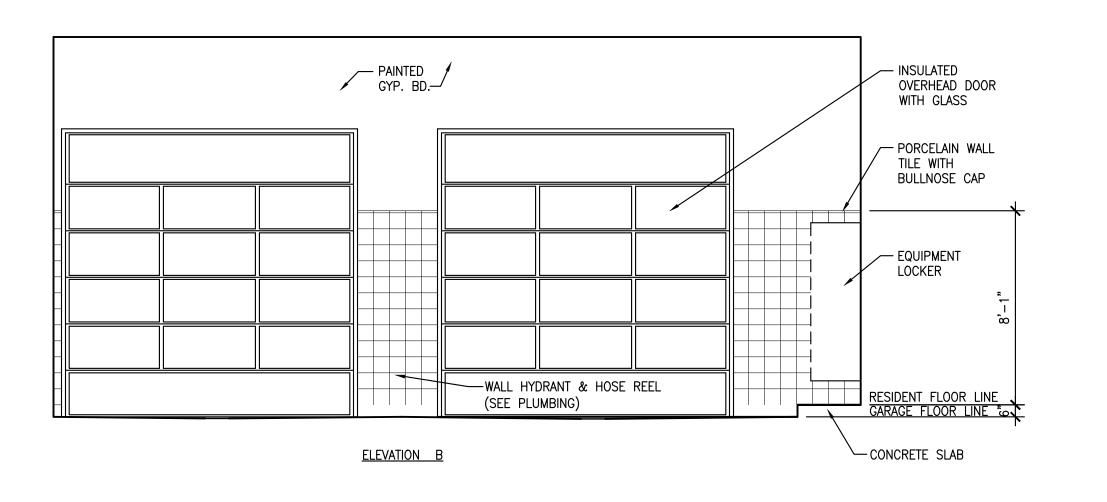
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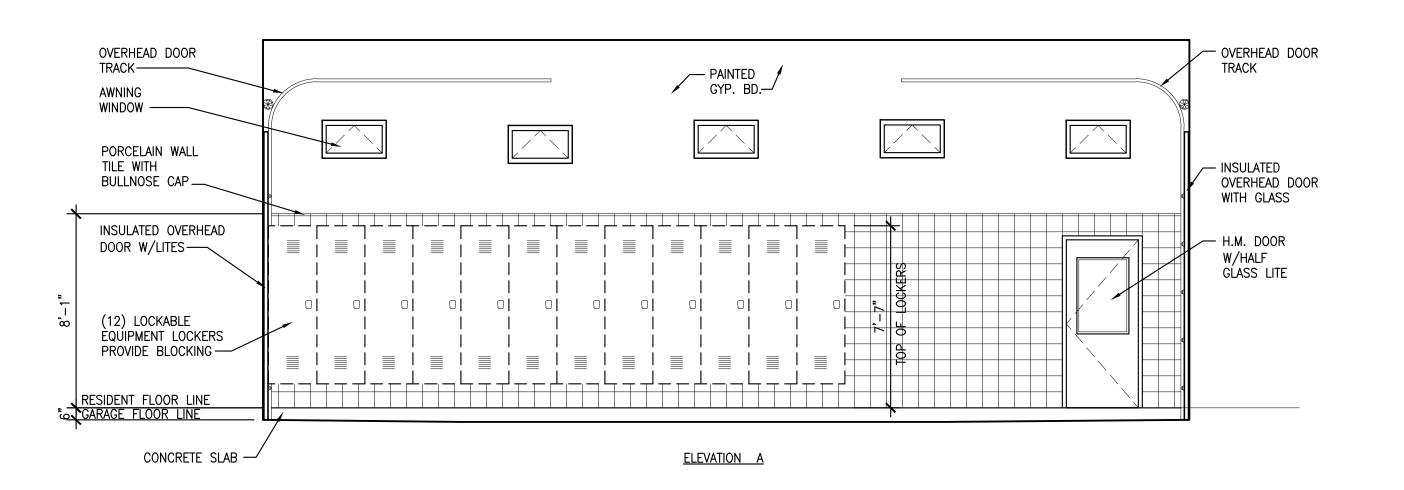
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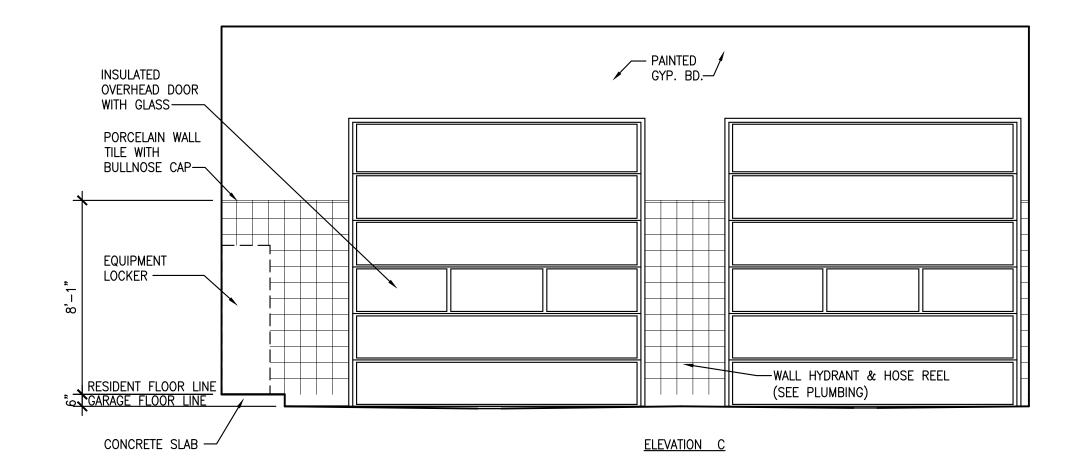
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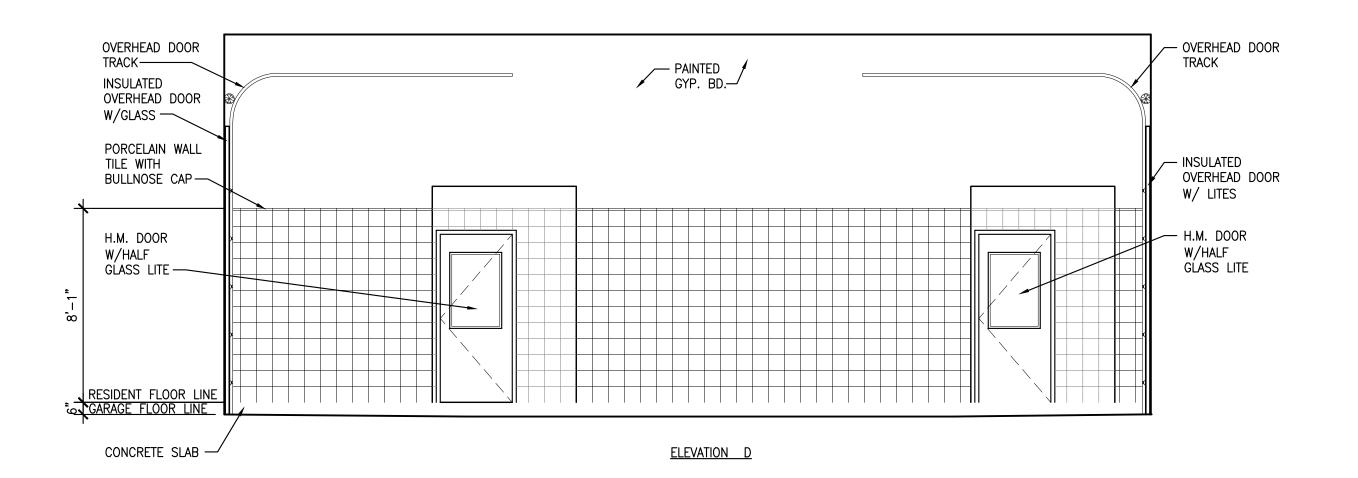
21-079 DATE April 15, 2022

> A5.2 INTERIOR **DETAILS**









1 APPARATUS BAY ELEVATIONS
A5.3 A2.1 SCALE: 1/4"=1'-0"



BAALMAN ARCHITECTS

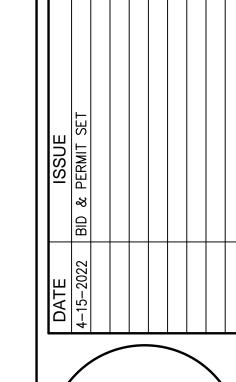
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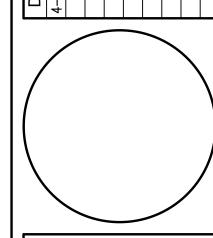
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A5.3
INTERIOR
APPARATUS BAY
ELEVATIONS

DOOR SCHEDULE DOOR DOOR FRAME FRAME FIRE TYPE MAT. MAT. TYPE RATED HARDWARE DOOR SIZE REMARKS INSWINGING FIBERGLASS DOOR WITH SIDELITE 3'-0" x 6'-8" x 1 3/4" F1 0 3'-0" x 6'-8" x 1 3/4" HCW WOOD 0 D3 3'-0" x 6'-8" x 1 3/4" SCW WOOD 0 F4 | D3 3'-0" x 6'-8" x 1 3/4" SCW WOOD 0 D3 3'-0" x 6'-8" x 1 3/4" SCW WOOD F4 0 3'-0" x 6'-8" x 1 3/4" SCW WOOD 0 3'-0" x 6'-8" x 1 3/4" SCW WOOD 0 1'-6" x 6'-8" x 1 3/4" HCW WOOD F5 0 D3 1'-6" x 6'-8" x 1 3/4" HCW WOOD F5 0 1'-6" x 6'-8" x 1 3/4" D3 HCW WOOD F5 0 3'-0" x 6'-8" x 1 3/4" D3 SCW WOOD 0 D3 1'-6" x 6'-8" x 1 3/4" HCW WOOD F5 0 D3 SCW WOOD 3'-0" x 6'-8" x 1 3/4" F4 0 D3 1'-6" x 6'-8" x 1 3/4" HCW WOOD 0 F5 3'-0" x 6'-8" x 1 3/4" D3 SCW WOOD F4 0 3'-0" x 6'-8" x 1 3/4" D3 SCW WOOD F4 45 MIN FIRE RATED DOOR AND HARDWARE D3 3'-0" x 6'-8" x 1 3/4" SCW WOOD F4 0 D3 3'-0" x 6'-8" x 1 3/4" SCW WOOD 0 F4 3'-0" x 6'-8" x 1 3/4" D3 SCW WOOD 0 F4 D2 INSWINGING FIBERGLASS DOOR 3'-0" x 6'-8" x 1 3/4" WOOD F2 0 3'-0" x 6'-8" x 1 3/4" D6 HM НМ F3 0 F3 | 45 MIN | 3'-0" x 6'-8" x 1 3/4" D5 FIRE RATED DOOR AND HARDWARE НМ D5 FIRE RATED DOOR AND HARDWARE $3'-0" \times 6'-8" \times 1 3/4"$ F3 | 45 MIN | 124B HM | НМ 125A $3'-0" \times 6'-8" \times 1 3/4"$ D4 FIRE RATED DOOR AND HARDWARE НМ НМ F3 | 45 MIN | 125B 3'-0" x 6'-8" x 1 3/4" D4 HM HM F3 | 45 MIN | FIRE RATED DOOR AND HARDWARE D8 12'-0" x 12'-0" ALUM INSULATED OVERHEAD DOOR WITH HARDWARE BY DOOR MANUFACTURER 125D 12'-0" x 12'-0" D8 INSULATED OVERHEAD DOOR WITH HARDWARE BY DOOR MANUFACTURER ALUM 0 D6 F3 125E 3'-0" x 6'-8" x 1 3/4" HM НМ 0 12'-0" x 12'-0" D7 125F ALUM 0 INSULATED OVERHEAD DOOR WITH HARDWARE BY DOOR MANUFACTURER 125G 12'-0" x 12'-0" D7 ALUM INSULATED OVERHEAD DOOR WITH HARDWARE BY DOOR MANUFACTURER

FG - FIBERGLASS ALUM — ALUMINUM SCW - SOLID CORE WOOD

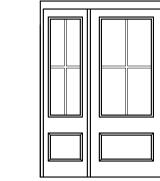
HM — HOLLOW METAL HCW - HOLLOW CORE WOOD

HARDWARE SCHEDULE

- EXTERIOR HARDWARE: 1 1/2 OR 3 PR. H.D. HINGES, EXTERIOR LOCKSET, THRESHOLD, DRIP EDGE, DOOR SWEEP, WEATHERSEAL, WALL STOP
- INTERIOR PASSAGE SET: 1 1/2 PR. H.D. HINGES, PASSAGE SET, WALL STOP
- RESTROOM SET: 1 1/2 PR. H.D. HINGES, LOCKSET, WALL STOP PRIVACY OPERATION, DOOR CLOSER, KICKPLATE
- INTERIOR PRIVACY SET: 1 1/2 PR. H.D. HINGES, LOCKSET, WALL STOP OR OVERHEAD STOP ON DOORS 109,110,111,113,115 PRIVACY OPERATION
- STOREROOM LOCKSET: 1-1/2 PR. H.D. HINGES, STOREROOM LOCK SET, KICKPLATE, WALL STOP
- OVERHEAD DOOR HARDWARE BY DOOR MANUFACTURER
- INTERIOR LOCKSET: 1 1/2 PR. H.D. HINGES, LOCKSET, DOOR CLOSER, KICKPLATE, WALL STOP
- INTERIOR LOCKSET: 1 1/2 PR. H.D. HINGES, LOCKSET, KICKPLATE, WALL STOP

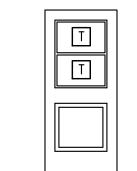
GENERAL DOOR NOTES:

- ALL WOOD DOORS TO BE A PLAIN SLICED WHITE BIRCH DOOR. OWNER TO SELECT FINISH COLOR.
- 2. VERIFY ALL DOOR HARDWARE REQUIREMENTS WITH OWNER.
- 3. ALL LATCHING INTERIOR DOORS TO HAVE LEVER TYPE ADA APPROVED ACCEPTABLE HARDWARE UNLESS OTHERWISE NOTED.
- 4. ALL HANDICAPPED ACCESSIBLE ROOM DOORS ARE REQUIRED TO HAVE A MINIMUM OF 12" CLEARANCE ON PUSH SIDE AND 18" CLEARANCE ON PULL SIDE.
- 5. VERIFY ALL HARDWARE WITH OWNER AND HARDWARE SUPPLIER PRIOR TO INSTALLATION.
- 6. ALL EGRESS DOORS SHALL BE READILY OPENABLE FROM THE EGRESS SIDE WITHOUT THE USE OF A KEY OR SPECIAL KNOWLEDGE OR EFFORT.



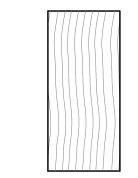
FIBERGLASS DOOR WITH

TEMP GLASS & SIDELITE



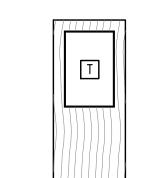
FIBERGLASS DOOR

WITH TEMP GLASS

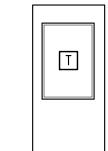


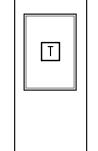
WOOD DOOR

(WHITE BIRCH)

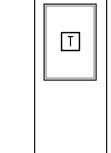


(WHITE BIRCH)









(PAINTED)

MANUFACTURED BY:

WAYNE-DALTON CORPORATION

WEBSITE: www.wayne-dalton.com

2501 S. STATE HIGHWAY

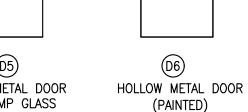
121 BUSINESS, SUITE 200

LEWISVILLE. TEXAS 75067

PHONE: 800-827-3667

LIFTMASTER MODEL 8155W

WEBSITE: www.liftmaster.com

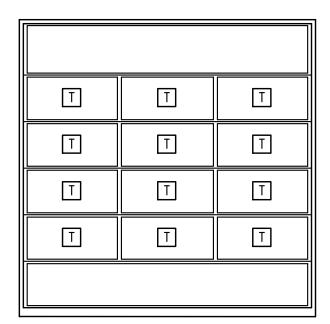


BASIS OF DESIGN FOR OVERHEAD DOORS:

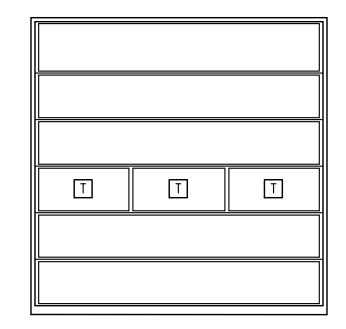
BASIS OF DESIGN FOR DOOR OPERATORS:

MANUFACTURERED BY CHAMBERLAIN LIFTMASTER

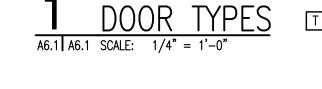
THERMOSPAN 150 INSULATED SECTIONAL DOOR

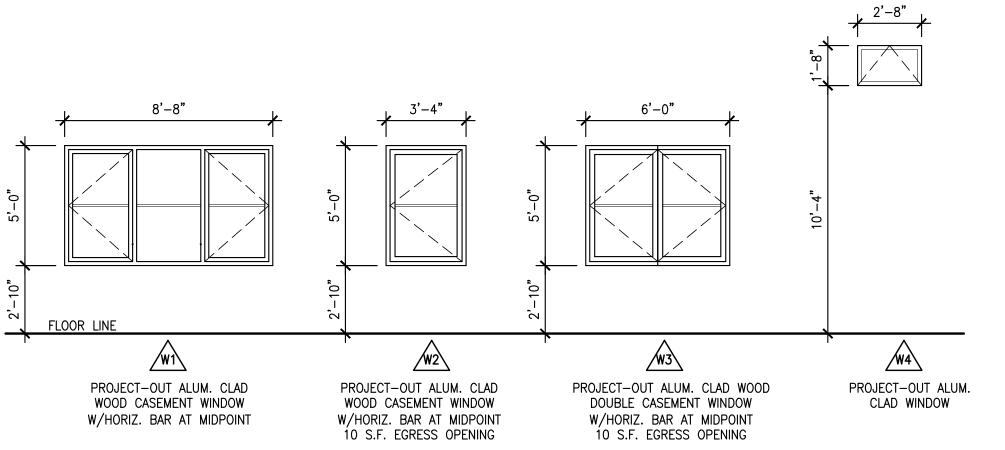


FLUSH STEEL, INSULATED OVERHEAD DOOR, STANDARD LIFT OPERATION WITH 6-INCH LOW HEADROOM TRACK AND HARDWARE, TEMPERED GLASS (FIELD PAINT EXTERIOR OF DOOR TO MATCH WINDOW)



FLUSH STEEL, INSULATED OVERHEAD DOOR, STANDARD LIFT OPERATION WITH 6-INCH LOW HEADROOM TRACK AND HARDWARE, TEMPERED GLASS (FIELD PAINT EXTERIOR OF DOOR TO MATCH WINDOW)





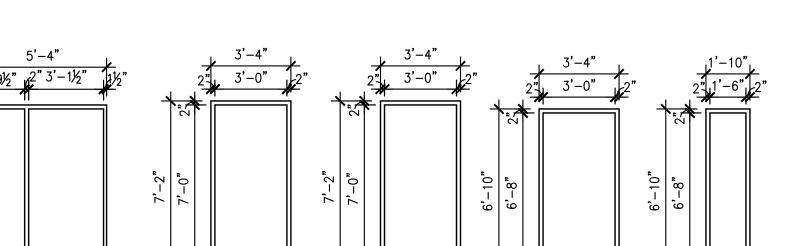
BASIS OF DESIGN FOR ALUMINUM CLAD WOOD WINDOWS:

PELLA CORPORATION; LIFESTYLE SERIES

www.pella.com/ideas/windows/lifestyle-series/

NO SUBSTITUTIONS ALLOWED.

A6.1 A6.1 SCALE: 1/4" = 1'-0"



GENERAL DOOR & WINDOW NOTES

- 1. SEE GENERAL NOTES ON THE COVER SHEET FOR MORE INFORMATION.
- 2. SEE FLOOR PLAN SHEET A2.1 FOR WINDOW LOCATIONS.
- 3. WOOD DOORS TO BE MACHINED FOR MORTISED HARDWARE AT THE FACTORY.
- WOOD DOOR CONSTRUCTION AND FINISH: FACES: A GRADE VENEER

SPECIES: WHITE BIRCH CUT: PLAIN SLICED

CORE: PARTICLEBOARD (MINERAL CORE AT FIRE RATED DOORS) BEVEL: 3 DEG. BOTH STILES

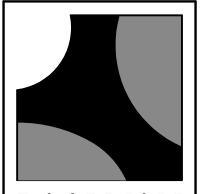
UNDERCUT: §" AT BOTTOM; 1 AT TOP AND SIDES GLASS, GLAZING AND INSTALLATION OF GLASS BY FACTORY.

ALL FIRE RATED DOORS TO HAVE A LABEL. ALL DOORS TO BE PRE-FINISHED TO ONE OF MANUFACTURER'S STANDARD COLORS.

- 5. ALL DOOR FRAMES TO BE WELDED.
- 6. PAINT EXTERIOR DOORS TO MATCH WINDOWS.
- ALUMINUM CLAD WOOD WINDOWS TO BE PELLA, LIFESTYLE SERIES WINDOWS. NO SUBSTITUTIONS.
- ALUMINUM CLAD WOOD WINDOWS HAVE STAINED WOOD PICTURE FRAME JAMB CASING ON THE INTERIOR SIDE. WOOD FRAME AND SASH, FACTORY FABRICATED AND ASSEMBLED. EXTERIOR FINISH: METAL CLAD, FACTORY FINISHED, COLOR: T.B.D. INTERIOR FINISH: COLOR T.B.D.
- SCREENS: PROVIDE FULL SCREENS FOR INSIDE OF CASEMENT WINDOWS.

9. PROVIDE WINDOWS WITH WOOD TRIM AND WOOD APRON.

- 10. ALL WINDOWS EXCEPT W4 MEET MINIMUM CLEAR OPENING OF 24" HIGH X 20" WIDE AND 5'-0" SQ. FT.
- 11. GLASS TYPES:
- a. ALL EXTERIOR GLAZING TO BE 1-INCH INSULATED SOLARBAN 60 SOLAR CONTROL LOW-E GLASS.
- b. PROVIDE TEMPERED GLAZING AS REQUIRED BY 2015 IBC.
- 12. HORIZONTAL LOUVER BLINDS: PROVIDE HORIZONTAL SLAT LOUVER BLINDS AT WINDOWS MARKED W1, W2 AND W3. BASIS OF DESIGN IS LEVOLOR; FAUX WOOD BLINDS. BLINDS TO BE HUNG FROM FULL-WIDTH HEADRAIL WITH FULL-WIDTH BOTTOM RAIL, SLATS: 2-INCH WALNUT SPECIES, SQUARE SLAT CORNERS, MANUAL OPERATION WITH LIFT CORD AND CONTROL WAND FOR RAISING AND LOWERING BY CORD WITH FULL RANGE LOCKING; BLADE ANGLE ADJUSTABLE BY CONTROL WAND.



BAALMAN **ARCHITECTS**

#2 Daniel Drive O'Fallon, MO 63366 ph: 314.640.6212

Michael J. Baalman ARCHITECT License#: A-2012004035 Certificate of Authority: 2014003655

CIVIL ENGINEER BAX ENGINEERING CO., INC. 221 Point West Blvd. St. Charles, Missouri 63301 Phone: 636-928-5552 Contact: Mark Struckhoff mstruckhoff@baxengineering.com

STRUCTURAL, MECHANICAL PLUMBING & ELECTRICAL CASE ENGINEERING, INC.

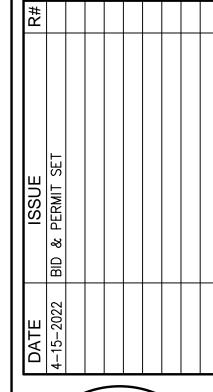
796 Merus Court St. Louis, Missouri 63026 Structural Contact: Ardie Mansouri, P.E.

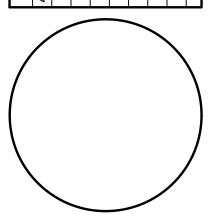
Phone: 636-349-1600 ext 291 amansouri@caseengineeringinc.com Mechanical, Plumbing, Electrical Contact: Jim Eyre, P.E. jeyre@caseengineeringinc.com Phone: 636-349-1600 ext 258

for: Inty Dis

no C

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ARCHITECT MO# A-2012004035

PROJECT MANAGER: JKL DRAWN BY: JKL

PROJECT NUMBER 21-079 DATE

> April 15, 2022 SHEET

A6.1 DOOR AND **WINDOW TYPES** & SCHEDULE

STRUCTU	JRAL ABBREVIATIONS	STRUCT	URAL ABBREVIATIONS
#	POUND(S), NUMBER	J/BRG	JOIST BEARING
&	AND	JG	
(E)	EXISTING	JG/BRG	
@ ^P	ANCHOR BOLT (S)	JST	JOIST
AB ADDL	()	JT kip	JOINT 1,000 POUNDS
ALT	ALTERNATE	ksi	kips PER SQUARE INCH
ARCH		LB	POUND
B/FTG	, , ,	LLH	LONG LEG HORIZONTAL
BLDG	BUILDING	LLV	LONG LEG VERTICAL
BLKG	BLOCKING	MAX	MAXIMUM
BM	BEAM	MECH	
BMD		MEZZ	
BN	BOUNDARY NAIL	MFR	
BOT BP	BOTTOM BASE PLATE	MIN MISC	MINIMUM MISCELLANEOUS
BRG	BEARING	MTL	METAL
BS	BOUNDARY SCREW	NS	NEAR SIDE
BTWN		NTS	NOT TO SCALE
CANT	CANTILEVER(ED)	ОС	ON CENTER
CFS	COLD-FORMED STEEL	OH	OPPOSITE HAND
CIP	CAST-IN-PLACE	OPNG	
CJ	CONTROL OR CONST JOINT	_	OUTSIDE FACE
CL	CENTER LINE	PAF	POWER-ACTUATED FASTENER
CLR	CLEAR	PARA	PARAPET
CMU COL	CONCRETE MASONRY UNIT	PEMB	PRE-ENGINEERED METAL
CONC	CONCRETE		BUILDING (MANUFACTURER)
CONN	CONNECTION	PIL	PILASTER
CONST	CONSTRUCTION	PL	PLATE
CONT	CONTINUOUS	PLBG	PLUMBING
CTR	CENTER	PLYWD	PLYWOOD
DBL	DOUBLE	psf psi	POUNDS PER SQUARE FOOT POUNDS PER SQUARE INCH
DC	DEMAND CRITICAL (WELD)	PTDF	PRESSURE TREATED
deg	DEGREE	1 101	DOUGLAS FIR
DET DF	DETAIL(S) DOUGLAS FIR	PTDFL	PRESSURE TREATED
DFL	DOUGLAS FIR LARCH		DOUGLAS FIR LARCH
dia	DIAMETER	PTSPF	PRESSURE TREATED SPRUCE PINE FIR
DIM	DIMENSION	PTSYP	PRESSURE TREATED
DWG	DRAWING		SOUTHERN YELLOW PINE
DWL	DOWEL	QT	QUANTITY
EA	EACH	REINF	REINFORCED, REINFORCING
EE EF	EACH END	REQD	REQUIRED
EL	EACH FACE ELEVATION	RTU SCHED	ROOF TOP UNIT SCHEDULE
ELEV	ELEVATION	SD	SNOW DRIFT
EMB	EMBEDMENT	SHTG	SHEATHING
EN	EDGE NAIL	SIM	SIMILAR
EOJ	END OF JOIST	SL	SNOW LOAD
EQ	EQUAL	SPF	SPRUCE PINE FIR
ETC	ET CETERA	STD	STANDARD
EW	EACH WAY	STL	STEEL
EXP EXT	EXPANSION EXTERIOR	STRUC	
FDN	FOUNDATION	SYP T&B	SOUTHERN YELLOW PINE TOP AND BOTTOM
FF	FINISH FLOOR	T&G	TONGUE AND GROOVE
FIN FLR		T/BRG	TRUSS BEARING
FLR	FLOOR	T/CONC	TOP OF CONCRETE
FRMG	FRAMING	T/FTG	TOP OF FOOTING
FRT	FIRE-RETARDENT TREATED	T/PAN	TOP OF PANEL
FS	FAR SIDE	T/PARA	TOP OF PARAPET
FTG	FOOTING	T/PIL	TOP OF PILASTER
<u>\ /</u>	FIELD VERIFY	T/S T/STL	TOP OF SLAB TOP OF STEEL
FV	GALIGE	1/31L	
ga	GAUGE GALVANIZE(D)	TYP	TYPICAI
		TYP UNO	TYPICAL UNLESS NOTED OTHERWISE
ga GALV	GALVANIZE(D)		
ga GALV GLB	GALVANIZE(D) GLULAM BEAM	UNO	UNLESS NOTED OTHERWISE
ga GALV GLB HDR HGR HK	GALVANIZE(D) GLULAM BEAM HEADER HANGER HOOK	UNO USGS	UNLESS NOTED OTHERWISE US GEOLOGICAL SURVEY
ga GALV GLB HDR HGR HK HORIZ	GALVANIZE(D) GLULAM BEAM HEADER HANGER HOOK HORIZONTAL	UNO USGS VAR VERT w/	UNLESS NOTED OTHERWISE US GEOLOGICAL SURVEY VARIES VERTICAL WITH
ga GALV GLB HDR HGR HK	GALVANIZE(D) GLULAM BEAM HEADER HANGER HOOK HORIZONTAL HOLLOW STRUCTURAL	UNO USGS VAR VERT w/ WHS	UNLESS NOTED OTHERWISE US GEOLOGICAL SURVEY VARIES VERTICAL WITH WELDED HEADED STUD(S)
ga GALV GLB HDR HGR HK HORIZ	GALVANIZE(D) GLULAM BEAM HEADER HANGER HOOK HORIZONTAL	UNO USGS VAR VERT w/	UNLESS NOTED OTHERWISE US GEOLOGICAL SURVEY VARIES VERTICAL WITH

SHOP DRAWING AND SUBMITTAL NOTES

- 1. SHOP DRAWINGS AND/OR SUBMITTALS SHALL BE FURNISHED FOR ALL STRUCTURAL COMPONENTS. UNLESS OTHERWISE NOTED, THESE SHALL BE SUBMITTED FOR REVIEW PRIOR TO FABRICATION IN ACCORDANCE WITH THESE CONTRACT DRAWINGS AND PROJECT SPECIFICATIONS (IF APPLICABLE). CONTRACTOR SHALL ALLOW A MINIMUM OF 2 WEEKS FROM RECEIPT OF SHOP DRAWINGS FOR CASE ENGINEERING INC. TO PROVIDE RESPONSE
- 2. PRIOR TO SUBMITTAL TO THE ENGINEER, THE CONTRACTOR AND ARCHITECT SHALL HAVE REVIEWED THE SHOP DRAWINGS AND MADE ANY CORRECTIONS REQUIRED. THE CONTRACTOR AND ARCHITECT SHALL STAMP THE DRAWINGS, INDICATING THE SUBMITTAL HAS BEEN REVIEWED.

 3.
- 3. STRUCTURAL DRAWINGS ARE THE SOLE PROPERTY OF CASE ENGINEERING.
 REPRODUCTION OF STRUCTURAL DRAWINGS FOR USE IN SHOP DRAWING SUBMITTALS IS
 NOT ACCEPTABLE WITHOUT OUR WRITTEN AGREEMENT.

BUILDING CODES AND STANDARDS USED FOR DESIGN 1. INTERNATIONAL BUILDING CODE 2015 EDITION ASCE 7-10

OCCUPANCY CATEGORY: IV DESIGN LOADS

1.	DESIGN LOADS	
	ROOF LIVE LOAD:	20 psf
	ROOF DEAD LOAD:	20 psf
2.	SNOW LOAD DESIGN CRITERIA	•
	SNOW LOAD IMPORTANCE FACTOR, I:	1.2
	GROUND SNOW LOAD, Pg:	20 psf
	FLAT ROOF SNOW LOAD. Pf:	16.8 ps
	THERMAL FACTOR, Ct:	1.0
	EXPOSURE FACTOR, Ce:	1.0
	MINIMUM FROST DEPTH:	2'-6"
3.	WIND LOAD DESIGN CRITERIA	
	WIND IMPORTANCE FACTOR, I:	1.0
	BASIC WIND SPEED.	115 MP

BASIC WIND SPEED: 115 MPH (3 SEC GUST)
WIND EXPOSURE CATEGORY: C
WIND ENCLOSURE CLASSIFICATION ENCLOSED
GCpi: +/- 0.18
POSITIVE WIND ROOF PRESSURES (ASD VALUES):
- ZONE 1 10 psf
- ZONE 2 & 3 10 psf
NET WIND UPLIFT ROOF PRESSURES (ASD VALUES):
- ZONE 1 16 psf

- ZONE 2 & 3 10 psf
NET WIND UPLIFT ROOF PRESSURES (ASD VALUES):

- ZONE 1 16 psf
- ZONE 2 23 psf
- ZONE 3 36 psf
- OVERHANG 33 psf
- 'a' DIMENSION 6 ft
- 'h' DIMENSION 17 ft
4. SEISMIC LOAD DESIGN CRITERIA

4. SEISMIC LOAD DESIGN CRITERIA
SEISMIC IMPORTANCE FACTOR, I:
SITE CLASS:
C
SPECTRAL RESPONSE ACCELERATIONS:
Ss=0.263g, S1=0.124g
Sds=0.210g, Sd1=0.139g
SEISMIC DESIGN CATEGORY:
D

BASIC SEISMIC-FORCE RESISTING SYSTEM:

LIGHT FRAME WOOD WALLS W/
STRUCTURAL WOOD SHEAR
PANELS
RESPONSE MODIFICATION FACTOR, R:

6.5

SYSTEM OVER-STRENGTH FACTOR, OMEGAo: 2.5

DEFLECTION AMPLIFICATION FACTOR, Cd: 4

SEISMIC RESPONSE COEFFICIENT, Cs: 0.049

ANALYSIS PROCEDURE USED: EQUIVALENT LATERAL FORCE

GENERAL STRUCTURAL NOTES

- THIS DRAWING SET IS TO BE VIEWED AS A WHOLE AND COORDINATED WITH ARCHITECTURAL, MECHANICAL, CIVIL, AND OTHER DISCIPLINES. ALL WORK PERTAINING TO A SPECIFIC CONTRACTOR MAY OR MAY NOT BE SHOWN ON SPECIFIC DRAWING SECTIONS. IT IS EACH SUBCONTRACTOR'S RESPONSIBILITY TO PREPARE HIS BID FROM A COMPLETE SET OF PLANS.
- 2. THE CONTRACTOR SHALL FOLLOW WRITTEN DIMENSIONS ONLY. DO NOT SCALE DRAWINGS. DIMENSIONS NOT SHOWN ON PLAN TO BE COORDINATED WITH ARCHITECTURAL PLANS.
- 3. ALL DETAILS AND SECTIONS SHOWN ON THE DRAWINGS ARE INTENDED TO BE TYPICAL AND SHALL APPLY AT ANY SIMILAR SITUATION ELSEWHERE ON THE JOB, EXCEPT WHERE A DIFFERENT DETAIL OR SECTION IS SHOWN.
- 4. THE STRUCTURE SHALL BE ADEQUATELY BRACED AND SHORED DURING ERECTION AGAINST WIND AND ERECTION LOADS. STRUCTURAL MEMBERS ARE DESIGNED FOR "IN-PLACE" LOADS ONLY.
- 5. THE GENERAL CONTRACTOR SHALL VERIFY ALL OPENING SIZES, PAD SIZES, AND LOCATIONS WITH THE RESPECTIVE CONTRACTORS.
- 6. THE CONTRACTOR SHALL NOTIFY THE ARCHITECT AND ENGINEER IMMEDIATELY OF ANY DISCREPANCIES BETWEEN CONSTRUCTION DOCUMENTS AND ACTUAL FIELD CONDITIONS
- 7. THE VARIOUS SUBCONTRACTORS ARE RESPONSIBLE FOR PLACING SLEEVES, OUTLET BOXES, ANCHORS, VENT OPENINGS, ETC. THAT MAY BE REQUIRED IN FOUNDATION WALLS. CONSTRUCTION MANAGER SHALL COORDINATE ALL PLACEMENT OF ITEMS IN FOUNDATION WALLS.
- 8. SEE ARCHITECTURAL PLANS FOR ADDITIONAL DETAILS AND INFORMATION.
- 9. ALL ELEVATIONS GIVEN ARE REFERENCED TO FINISHED FLOOR ELEVATIONS AT 100'-0", UNLESS SHOWN AS USGS ELEVATIONS.
- WHERE GENERAL NOTES OR TYPICAL DETAILS CONTRADICT INFORMATION PROVIDED IN BUILDING SECTIONS, THE BUILDING SECTIONS TAKE PRECEDENCE.
 WHERE INFORMATION PROVIDED IN THESE STRUCTURAL DRAWINGS CONTRADICTS
- 11. WHERE INFORMATION PROVIDED IN THESE STRUCTURAL DRAWINGS CONTRADICTS INFORMATION PROVIDED IN PROJECT SPECIFICATIONS, THE SPECIFICATIONS SHALL TAKE PRECEDENCE.
- 12. FOR ARCHITECTURAL, MEP, & STRUCTURAL COORDINATION: MODELED ELEMENTS SHOWN ON STRUCTURAL DRAWINGS SUCH AS TRUSSES, OPEN-WEB JOISTS, AND JOIST GIRDERS, ARE NOT THE FINAL CONFIGURATION. ALL COORDINATION SHALL BE PERFORMED BETWEEN THE VARIOUS TRADES AND THE SUPPLIERS OF THESE ELEMENTS FOR THE STRUCTURE, NOT WITH THE STRUCTURAL MODEL.
- 13. THIS DRAWING SET IS TO BE VIEWED AS A WHOLE, ALL TYPICAL DETAILS AND GENERAL NOTES SHOWN IN THESE DRAWINGS ARE APPLICABLE TO THE PROJECT EVEN IF THEY ARE NOT SHOWN ON PLANS OR SECTIONS.

POST-INSTALLED ANCHOR NOTES

POST-INSTALLED ANCHORS SHALL ONLY BE USED WHERE SPECIFIED ON THE CONSTRUCTION DOCUMENTS. THE CONTRACTOR SHALL OBTAIN APPROVAL FROM THE ENGINEER OF RECORD PRIOR TO INSTALLING POST-INSTALLED ANCHORS IN PLACE OF MISSING OR MISPLACED CAST-IN-PLACE ANCHORS. CARE SHALL BE TAKEN IN PLACING POST-INSTALLED ANCHORS TO AVOID CONFLICTS WITH EXISTING REBAR. HOLES SHALL BE DRILLED AND CLEANED IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS. SUBSTITUTION REQUESTS FOR PRODUCTS OTHER THAN THOSE SPECIFIED ON THESE DRAWINGS SHALL BE SUBMITTED BY THE CONTRACTOR TO THE ENGINEER OF RECORD ALONG WITH CALCULATIONS THAT ARE PREPARED & SEALED BY A REGISTERED PROFESSIONAL ENGINEER. THE CALCULATIONS SHALL DEMONSTRATE THAT THE SUBSTITUTED PRODUCT IS CAPABLE OF ACHIEVING, AT A MINIMUM, THE PERTINENT EQUIVALENT PERFORMANCE VALUES OF THE SPECIFIED PRODUCT USING THE BUILDING CODE.

- CONTRACTOR SHALL PROVIDE 1" MINIMUM CLEARANCE BETWEEN EDGES OF ANY HOLES FOR POST-INSTALLED ANCHORS AND EXISTING REINFORCING STEEL.
- 2. CONTRACTOR SHALL PROVIDE INSPECTION AND TESTING AS REQUIRED PER THE "SPECIAL INSPECTIONS" SECTION OF THESE GENERAL STRUCTURAL NOTES.
- 3. CONTRACTOR SHALL USE A HOLLOW DRILL BIT AND VACUUM SYSTEM WHEN DRILLING INTO CEMENTITIOUS MATERIALS.

DEFERRED SUBMITTALS

THE FOLLOWING DESIGN ELEMENTS MUST BE SIGNED & SEALED BY A PROFESSIONAL ENGINEER (PE/SE) REGISTERED IN THE STATE WHERE THIS PROJECT IS LOCATED, AND SUBMITTED TO THE ARCHITECT AND ENGINEER OF RECORD. DESIGNED DRAWINGS AND CALCULATIONS SHALL BE SUBMITTED FOR REVIEW AND RECORD.

- 1. PRE-FABRICATED WOOD TRUSS CALCULATIONS AND FABRICATION DRAWINGS INCLUDING:
- A. ALL TRUSS-TO-TRUSS CONNECTIONS
 - B. PLAN AND DETAILS FOR THE LOCATIONS OF ALL ERECTION/TEMPORARY AND PERMANENT LATERAL AND DIAGONAL BRACING AND/OR BLOCKING.
 - C. FRAMING PLAN LAYOUT (DIMENSIONED AND TO SCALE)
 - D. EACH TRUSS SHALL BE LEGIBLY BRANDED, MARKED, OR OTHERWISE HAVE PERMANENTLY AFFIXED THERETO THE FOLLOWING INFORMATION LOCATED WITHIN 2 FEET OF THE CENTER OF THE SPAN ON THE FACE OF THE BOTTOM CHORD.

 a. IDENTITY OF THE COMPANY MANUFACTURING THE TRUSS
 - b. DESIGN LOADSc. TRUSS SPACING
- SOIL IMPROVEMENT DESIGN, CALCULATIONS, AND IMPLEMENTATION TO ACHIEVE THE UNIFORM BEARING CAPACITIES LISTED IN THE "EXCAVATION AND EARTHWORK NOTES"

POSSIBLE FORMS OF SOIL IMPROVEMENT INCLUDE, BUT ARE NOT NECESSARILY

- LIMITED TO THE FOLLOWING:
- a. VIBRATORY STONE COLUMNSb. CONCRETE COLUMNS
- c. ENGINEERED FILL
- ALTERNATELY, FOUNDATIONS AND STRUCTURAL SLAB MAY BE SUPPORTED BY ANY OF THE FOLLOWING:
- a. HELICAL ANCHORS
- a. HELICAL ANCHOR
- b. MICROPILESc. APPROVED ALTERNATE

EXCAVATION AND EARTHWORK NOTES

- 1. THE BEARING VALUE AND LATERAL EARTH PRESSURES OF THE SOILS IS PER REPORT BY: JACOBI GEOTECHNICAL ENGINEERING, INC., DATED OCTOBER 2021. THE FOUNDATION DESIGN IS BASED ON THE FOLLOWING NET ALLOWABLE BEARING AND LATERAL EARTH PRESSURES (ALLOWABLE BEARING PRESSURES MAY BE INCREASED BY 33 PERCENT FOR WIND AND SEISMIC LOADS):
 - SPREAD FOOTINGS
 CONT. WALL FOOTINGS
- CONT. WALL FOOTINGS 2,000 psf
 ACTIVE PRESSURE 35 psf/ft
 AT-REST PRESSURE 60 psf/ft
- PASSIVE PRESSURE 250psf/f
 FRICTION COEFFICIENT 0.3
- ALL FOOTING EXCAVATIONS SHALL BE INSPECTED, PRIOR TO CONCRETE PLACEMENT, BY A SOILS ENGINEER TO VERIFY SUITABLE BEARING MATERIAL OF CAPACITY AS SPECIFIED.
- 3. NOTIFY THE OWNER'S REPRESENTATIVE WHEN ADDITIONAL EXCAVATION IS REQUIRED TO REACH SUITABLE BEARING MATERIAL.
- 4. THE SOILS ENGINEER SHALL CERTIFY IN WRITING THAT ALL FOUNDATIONS WERE PLACED ON SOIL WITH THE BEARING VALUE AS SPECIFIED.
- 5. WITHIN THE EXCAVATION AREA OF FOUNDATIONS, ALL VEGETATION, TOPSOIL, PREVIOUSLY PLACED FILL AND UNSUITABLE SOILS SHALL BE REMOVED. ALL FOOTINGS TO BEAR ON VIRGIN SOIL OR PROPERLY PLACED AND COMPACTED ENGINEERED FILL.
- 6. FOUNDATION DESIGN DOES NOT ACCOUNT FOR WINTER CONSTRUCTION. ANY UNENCLOSED / UNHEATED SPACES SHALL BE ADEQUATELY PROTECTED AGAINST FROST DURING WINTER CONSTRUCTION BY THE CONTRACTOR.
- IF ANY SOFT SPOTS, OR AREAS QUESTIONABLE FOR ANY REASONS ARE ENCOUNTERED BY THE CONTRACTOR, ARCHITECT/ENGINEER SHALL BE NOTIFIED IMMEDIATELY SO THAT ANY REQUIRED ACTION MAY BE TAKEN PRIOR TO CONTINUATION OF CONSTRUCTION IN THAT AREA.

REINFORCING STEEL NOTES

- NON-WELDED STEEL BAR REINFORCING SHALL CONFORM TO ASTM A615, GRADE 60. WELDED STEEL BAR REINFORCING SHALL CONFORM TO ASTM A706.
- WELDING OF REINFORCING STEEL SHALL BE PERFORMED BY AWS QUALIFIED WELDERS IN CONFORMANCE WITH AWS D1.1 USING E90 ELECTRODES FOR ASTM A615 REBAR, AND E80 ELECTRODES FOR ASTM A706 REBAR UNLESS OTHERWISE NOTED ON THE DRAWINGS.
 WELDED WIRE REINFORCEMENT (WWR) SHALL BE SMOOTH WIRE PER ASTM A185 WITH
- MINIMUM YIELD STRENGTH, fy = 65 ksi, OR DEFORMED WIRE PER ASTM A497 WITH MINIMUM YIELD STRENGTH, fy = 70 ksi, UNLESS NOTED OTHERWISE.

 4. MINIMUM CONCRETE COVER FOR REINFORCING STEEL IN CAST-IN-PLACE (NON-PRESTRESSED) CONCRETE SHALL BE AS FOLLOWS UNLESS OTHERWISE NOTED ON THE
 - DRAWINGS:
 A. CONCRETE CAST AGAINST EARTH = 3"
 - B. CONCRETE EXPOSED TO WEATHER:#6 BAR AND LARGER = 2"
 - #5 BAR AND SMALLER = 1 1/2"
- C. CONCRETE NOT EXPOSED TO EARTH OR WEATHER (SLABS, WALLS & JOISTS):

 #11 BARS AND SMALLER = 3/4"

 ALL DETAILING EARDICATION AND EDECTION OF PEINEOPOING STEEL SHALL COME.
- 5. ALL DETAILING, FABRICATION, AND ERECTION OF REINFORCING STEEL SHALL CONFORM TO THE LATEST EDITION OF ACI 315 (SP-66), DETAILS AND DETAILING OF CONCRETE REINFORCEMENT.
- 6, LAP SPLICE LENGTHS FOR BARS INSTALLED IN CONCRETE AND CMU SHALL BE IN ACCORDANCE WITH THE TABLE.

TENSION LAP SPLICE LENGTH IN CONCRETE NOTES

- 1. FOR HORIZONTAL BARS, VALUES IN THE TABLE SHALL BE MULTIPLIED BY 1.3 WHERE MORE THAN 12 INCHES OF FRESH CONCRETE IS CAST BELOW THE BAR.
- WHERE CLEAR SPACING OF BARS BEING SPLICED IS AT LEAST 2 BAR DIAMETERS AND CLEAR COVER AT LEAST 1 BAR DIAMETER, USE CASE 1. FOR ALL OTHER BAR ARRANGEMENTS, USE CASE 2.
- 3. VALUES IN THE TABLE ARE BASED ON 60ksi REBAR. FOR OTHER REBAR YIELD STRENGTHS, MULTIPLY VALUES IN THE TABLE BY THE SPECIFIED YIELD STRENGTH DIVIDED BY 60.
- 4. WHERE BARS OF DIFFERENT SIZES ARE SPLICED, PROVIDE THE LAP LENGTH OF THE LARGER BAR.
- WELDED WIRE REINFORCEMENT (DEFORMED OR PLAIN WIRE) SHALL BE LAPPED ONE FULL MESH SQUARE PLUS 2 INCHES MINIMUM, BUT NOT LESS THAN 12 INCHES.
- 6. REBAR IN ALL CONCRETE MEMBERS SHALL BE SPLICED IN ACCORDANCE WITH "TENSION LAP SPLICE LENGTH" TABLE, UNLESS SPECIFICALLY NOTED OTHERWISE ON THE DRAWINGS.

TENSION LAP SPLICE LENGTH IN CONCRETE - 60 KSI REBAR TABLE (INCHES) f'c = | 3,000psi | 3,000psi | 3,500psi | 3,500psi | 4,000psi | 4,000psi | 5,000psi | 5,000psi BAR SIZE | CASE 1 CASE 2 CASE 1 CASE 2 CASE 1 CASE 2 CASE 2 CASE 1 20 28 33 30 19 27 25 37 23 34 29 43 40 33 50 31 47 42 54 28 65 40 60 37 56 43 34

DEVELOPMENT LENGTH OF STANDARD HOOKS IN CONCRETE NOTES

- 1. VALUES IN TABLE ARE BASED ON 60ksi REBAR. FOR OTHER REBAR YIELD STRENGTHS,
- MULTIPLY VALUES IN THE TABLE BY THE SPECIFIED YIELD STRENGTH DIVIDED BY 60.

 2. SEE ACI 318 SECTION 12.5 FOR ALLOWABLE REDUCTIONS IN DEVELOPMENT LENGTH. IT
- SHALL NOT BE LESS THAN 8 BAR DIAMETERS OR 6 INCHES.
- 3. HOOKED BARS ARE NOT CONSIDERED EFFECTIVE IN DEVELOPING BARS IN COMPRESSION.

DEVELOPMENT LENGTH OF STANDARD HOOKS IN CONCRETE - 60 ksi REBAR TABLE (INCHES)						
BAR SIZE	f'c = 3,000 psi	f'c = 3,500 psi	f'c = 4,000 psi	f'c = 5,000 psi		
#3	9	8	8	7		
#4	11	11	10	9		
#5	14	13	12	11		
#6	17	16	15	13		

WOOD FRAMING NOTES

- WOOD FRAMING SHALL CONFORM TO THE "LUMBER TABLE" UNLESS NOTED OTHERWISE
 FOR WOOD FASTENING REQUIREMENTS, REFER TO TABLE 2304.9.1 FOR IBC 2012 AND OLDER, OR TABLE 2304.10.1 FOR IBC 2015 AND NEWER.
- 3. ALL NAILS SHALL BE GALVANIZED COMMON WIRE NAILS UNLESS OTHERWISE NOTED. SEE "WOOD FASTENER TYPES SCHEDULE" FOR MINIMUM FASTENER DIMENSIONS. NAILS IN CONTACT WITH FIRE RETARDANT TREATED OR PRESSURE TREATED WOOD SHALL BE HOT-DIP GALVANIZED (ASTM A153) OR STAINLESS STEEL (TYPE 304 OR 316). WHEN REQUIRED TO PREVENT SPLITTING, PRE-DRILL FOR NAILS WITH 1/8" DIAMETER DRILL BIT.
- 4. BOLTS AND LAG SCREWS SHALL CONFORM TO ASTM A307 AND ANSI/ASME STANDARD B18.2.1-1981, AND SHALL BE GALVANIZED. BOLTS AND LAG SCREWS IN CONTACT WITH FIRE RETARDANT TREATED OR PRESSURE TREATED WOOD SHALL BE HOT-DIP GALVANIZED (ASTM A153) OR STAINLESS STEEL (TYPE 304 OR 316). STANDARD WASHER SHALL BE PROVIDED UNDER HEAD AND NUT OF ALL BOLTS IN WOOD FRAMING. BOLT THREADS SHALL NOT BEAR ON WOOD. DRILLED HOLES FOR BOLTS SHALL BE 1/16" LARGER IN DIAMETER THAN BOLT.
- ALL BOLTS SHALL BE RETIGHTENED IMMEDIATELY PRIOR TO CLOSING IN FRAMING.
 METAL FRAMING CONNECTORS SHALL BE "SIMPSON" BRAND OR ENGINEERED APPROVED EQUIVALENT AND SHALL BE GALVANIZED. METAL FRAMING CONNECTORS IN CONTACT WITH FIRE RETARDANT TREATED OR PRESSURE TREATED WOOD SHALL BE HOT-DIP GALVANIZED (ASTM A123) OR STAINLESS STEEL (TYPE 316L). METAL FRAMING CONNECTORS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S LATEST PUBLISHED INSTALLATION INSTRUCTIONS USING THE LARGER SIZE AND QUANTITY OF FASTENERS INDICATED, UNLESS OTHERWISE NOTED.
- WASHERS USED IN SHEAR WALLS AND ANCHOR HOLD DOWNS SHALL BE SQUARE WASHERS OF SIZE AND THICKNESS INDICATED IN "SHEAR WALL SHEATHING AND FASTENER SCHEDULE". ROUND WASHERS ARE NOT ACCEPTABLE FOR SHEAR WALL APPLICATIONS
- APPLICATIONS.

 8. ALL BOLTS, WASHERS, NAILS, METAL FRAMING CONNECTORS AND OTHER FASTENERS IN CONTACT WITH PRESERVATIVE OR FIRE RETARDANT TREATED LUMBER SHALL BE HOT-
- DIPPED GALVANIZED (ASTM A153) OR STAINLESS STEEL (TYPE 304 OR 316).

 9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT WOOD USED FOR STRUCTURAL PURPOSES IS KEPT AS DRY AS POSSIBLE BEFORE AND DURING CONSTRUCTION. A MAXIMUM MOISTURE CONTENT SHALL BE MAINTAINED UNTIL THE BUILDING ENVELOPE IS CLOSED IN AND WATER-PROOFED AS FOLLOWS:

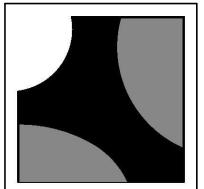
 A. KILN-DRIED LUMBER: 19%
- B. LVL & PSL: 12%
- C. PLYWOOD: 8%
- 10. ALL WOOD IN CONTACT WITH CONCRETE OR MASONRY SHALL BE PRESSURE-TREATED. ALL WOOD EXPOSED TO WEATHER SHALL BE PRESSURE-TREATED. PRESSURE TREATMENT OF WOOD THAT IS CUT SHALL BE REINSTATED ON CUT EDGES.

<u>LUMBER TABLE</u>					
MEMBER	SPECIES	GRADE			
2x PLATES, STRIPPING, MISC CONCEALED FRAMING, BLKG, & FIRE STOPPING	SOUTHERN PINE	NO 2			
SILLS ON CONCRETE OR MASONRY	PRESSURE TREATED SOUTHERN PINE	NO 2			
2x LUMBER	SOUTHERN PINE	NO 2			
ALL 4x DIMENSIONED LUMBER	SOUTHERN PINE	NO 2			
PARALLEL STRAND LUMBER (PSL)	PER MANUFACTURER	2.0E			
ENGINEERED WOOD RIM BOARD	PER MANUFACTURER	APA RATED RIM BOARD PLUS			
LAMINATED VENEER LUMBER (LVL) HEADERS, BEAMS, STRINGERS AND POSTS	PER MANUFACTURER	ICC ESR-2403. GRADE 1.9E; OR ICC ESR-1387, GRADE 1.9E; OR ICC ESR-2993, GRADE 1.9E; OR ICC ESR-1994, GRADE 2.0E			
SHEAR WALL SHEATHING	PER MANUFACTURER	APA RATED SHEATHING, EXPOSURE 1 (PS 1 OR PS 2)			
ROOF SHEATHING	PER MANUFACTURER	APA RATED SHEATHING, EXPOSURE 1 (PS 1 OR PS 2)			

WOOD FASTENER TYPES SCHEDULE

NOTE: 1.-"SD" AND "SDS" SCREWS ARE MANUFACTURED BY SIMPSON STRONG-TIE. 2.-ALL SCREWS SHALL BE INSTALLED SO THAT HEADS ARE FLUSH WITH OUTSIDE MATERIAL. DO NOT OVERDRIVE SCREWS. SCREWS WITH WING-TIPS ARE NOT PERMITTED IN SHEAR WALLS OR DIAPHRAGMS.

TYPE	DIAMETER	LENGTH
16d COMMON	0.162"	3 1/2"
10d COMMON	0.148"	3"
8d COMMON	0.131"	2 1/2"
#9 SD SCREW	0.131"	1 1/2" OR 2 1/2"
#10 SD SCREW	0.161"	1 1/2" OR 2 1/2"
SDS SCREW	0.25"	VARIES 1 1/2"-8"



BAALMAN ARCHITECTS

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Michael J. Baalman ARCHITECT License#: A-2012004035 Certificate of Authority: 2014003655

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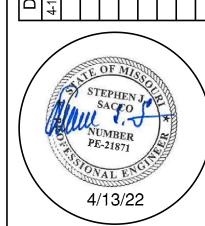
Station #2 Facility for:

In County

lance Distric

New Base Station #
Lincoln Co
Ambulance
28 Walter Court
Moscow Mills, Miss

ATE ISSUE R# R# 5-2022 BID & PERMIT SET



STEVE SACCO PE-21871

DRAWN BY:

PROJECT MANAGER: CS

PROJECT NUMBER BAA-MO-01-21 DATE April 15, 2022

S1.1

GENERAL NOTES

CONCRETE NOTES

- I. ALL CONCRETE WORK INCLUDING FORMING, REINFORCING, MIXING, PLACING, FINISHING AND CURING SHALL BE DONE IN ACCORDANCE WITH THE ACI MANUAL OF CONCRETE PRACTICE INCLUDING "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE", ACI 318, AND "SPECIFICATIONS FOR STRUCTURAL CONCRETE", ACI 301 LATEST EDITIONS.
- 2. IT SHALL BE THE RESPONSIBILITY OF THE MIX DESIGN SUPPLIER TO PROPORTION MIXES APPROPRIATELY TO REACH THE REQUIRED PROPERTIES NOTED, AND SHALL BE APPROPRIATE FOR THEIR INTENDED USE. ADMIXTURES MEETING ASTM C494 ARE OPTIONAL. HOWEVER, AIR-ENTRAINING ADMIXTURES MEETING ASTM C260 SHALL BE USED FOR CONCRETE EXPOSED TO THE EXTERIOR OR FREEZE-THAW CYCLES.
- CONTRACTOR SHALL SUBMIT CONCRETE MIX DESIGNS FOR EACH INTENDED USE ON THE PROJECT FOR REVIEW AND APPROVAL BY THE ENGINEER OF RECORD. CONTENTS OF THE MIX DESIGN SHALL COMPLY WITH, AND INCLUDE ALL INFORMATION REQUIRED BY, ACI 318, CHAPTER 5 (FOR 2011 AND EARLIER CODE EDITIONS), & CHAPTER 26 (FOR 2014 CODE EDITION). THIS INCLUDES, BUT IS NOT LIMITED TO NUMBER OF TESTS AND AGE OF TESTS INCLUDED IN THE MIX DESIGN REPORT.
- 4. ALL CONCRETE DENSITY SHALL BE NORMAL WEIGHT (145 pcf +/- 5) UNLESS OTHERWISE INDICATED.
- FLY ASH ALLOWANCES:
- 20% MAXIMUM BY WEIGHT OF CEMENTITIOUS IN FOOTINGS
- 15% MAXIMUM BY WEIGHT OF CEMENTITIOUS MATERIAL IN SLABS
 0% (NONE) ALLOWED IN SLABS TO RECEIVE SHAKE ON HARDENERS
- MACRO SYNTHETIC FIBER: POLYPROPYLENE/POLYETHYLENE SYNTHETIC MACRO FIBER COMPLYING WITH ASTM C1116 TYPE 3, MINIMUM 2 INCH LENGTH. ASPECT RATIO 50 TO 90. A. BASIS OF DESIGN: EUCLID CHEMICAL COMPANY (THE): TUFSTRAND SF;
 - WWW.EUCLIDCHEMICAL.COM OR APPROVED EQUAL.
- B. FIBER MANUFACTURER SHALL HAVE ISO 9001 CERTIFICATION.
- C. MACRO SYNTHETIC FIBER SHALL BE TESTED IN CONCRETE TO MEET THE REQUIREMENTS OF ICC-ES383.
- 7. COORDINATE CONCRETE WORK WITH THAT OF OTHER TRADES TO ALLOW FOR SETTING OF SLEEVES, ACCESSORIES, ETC.
- 8. ALL REINFORCING STEEL, ANCHOR RODS, DOWELS, AND INSERTS SHALL BE WELL-SECURED IN POSITION PRIOR TO PLACING CONCRETE. DO NOT "WET SET" OR "FLOAT" INTO CONCRETE.
- TEST CYLINDERS WILL BE REQUIRED, AND RECORDS OF RESULTS SHALL BE SUBMITTED TO ENGINEER OF RECORD. PROVIDE A MINIMUM OF (4) 6"x12" CYLINDERS FOR TESTING (1 AT 7 DAYS, 2 AT 28 DAYS, ONE SPARE). ALTERNATIVELY, PROVIDE A MINIMUM (5) 4"x8" CYLINDERS FOR TESTING (1 AT 7 DAYS, 3 AT 28 DAYS, ONE SPARE). SLUMP TESTS ARE RECOMMENDED.
- 10. CONSTRUCTION JOINTS IN CONCRETE INDICATED WITH A ROUGH, CLEAN SURFACE SHALL HAVE A 1/4" AVERAGE AMPLITUDE.
- 11. ALL COLD JOINTS SHALL BE ROUGHENED AND CLEANED PRIOR TO PLACING CONCRETE.

 12. SLUMP: CONCRETE MIXES SHALL BE PROPORTIONED TO ACHIEVE A MAXIMUM SLUMP OF 8" FOR CONCRETE CONTAINING HIGH RANGE WATER REDUCING ADMIXTURE. 6" FOR CONCRETE CONTAINING A MID-RANGE WATER REDUCING ADMIXTURE. MIXES SHALL
- HAVE A WATER SLUMP OF 2"-3" (3" TO 4" FOR CONCRETE RECEIVING A "DRY-SHAKE" HARDENER). MAXIMUM 4" WATER SLUMP FOR ALL OTHER CONCRETE.

 3. AIR CONTENT: ALL CONCRETE EXPOSED TO FREEZING AND THAWING AND/OR REQUIRED
- TO BE WATER TIGHT SHALL HAVE AN AIR CONTENT OF 4.5% TO 7.5%. ALL INTERIOR SLABS AND ALL SLABS TO RECEIVE DRY-SHAKE SHALL HAVE A MAXIMUM AIR CONTENT OF 3%.

 14. DEPOSIT AND CONSOLIDATE CONCRETE FOR FLOORS AND SLABS IN A CONTINUOUS
- OPERATION, WITHIN LIMITS OF CONSTRUCTION JOINTS, UNTIL PLACEMENT OF A PANEL OR SECTION IS COMPLETE.

 A CONSOLIDATE CONCRETE DURING PLACEMENT OPERATIONS, SO CONCRETE IS
- A. CONSOLIDATE CONCRETE DURING PLACEMENT OPERATIONS, SO CONCRETE IS THOROUGHLY WORKED AROUND REINFORCEMENT AND OTHER EMBEDDED ITEMS
- B. MAINTAIN REINFORCEMENT IN POSITION ON CHAIRS DURING CONCRETE PLACEMENT
- C. SCREED SLAB SURFACES WITH A STRAIGHT EDGE AND STRIKE OFF TO CORRECT ELEVATIONS.
- D. UTILIZE A VIBRATORY SCREED FOR CONCRETE THAT WILL RECEIVE DIAMOND POLISH FINISH. KEEP VIBRATING SCREED MOVING CONTINUOUSLY ACROSS SURFACE. DO NOT STOP SCREED IN ANY ONE PLACE WHILE VIBRATING.
- E. SLOPE SURFACES UNIFORMLY TO DRAINS WHERE REQUIRED.
 F. BEGIN INITIAL FLOATING USING BULL FLOATS OR DARBIES TO FORM A UNIFORM AND OPEN-TEXTURED SURFACE PLANE BEFORE EXCESS BLEED WATER APPEARS ON THE SURFACE. DO NOT FURTHER DISTURB SLAB SURFACES BEFORE STARTING
- FINISHING OPERATIONS.

 G. THE USE OF HIGHWAY STRAIGHT EDGES OR "BUMP CUTTERS" ON CONCRETE SLABS TO BE POLISHED IS PROHIBITED.
- 15. CONCRETE TO BE POLISHED SHALL RECEIVE A HARD STEEL TROWEL FINISH WITH A MINIMUM OF (3) SEPARATE PASSES WITH POWER TROWEL TO ACHIEVE CLASS 5 FINISH AS DESCRIBED IN ACI 302R. HAND TROWELLING SHALL BE LIMITED TO ONLY THOSE AREAS NECESSARY. REFER TO ARCHITECTURAL DRAWINGS FOR ADDITIONAL INFORMATION.
 - A. INSPECT TROWELLING MACHINE AND REMOVE ACCUMULATED MORTAR PRIOR TO EACH PASS.
- B. FINISH SURFACE SHALL BE FREE OF TROWEL MARKS, BURN MARKS AND MOTTLING.

 16 ALL CONCRETE SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH IN
- 16. ALL CONCRETE SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH IN ACCORDANCE WITH THE FOLLOWING:
 - A. "N" IN COLUMN INDICATES THE ADDITION OF ENTRAINED AIR IS NOT REQUIRED, BUT IS PERMITTED. AIR ENTRAINMENT IS NOT RECOMMENDED FOR SURFACES TO BE GIVEN A SMOOTH, DENSE, HARD-TROWELED FINISH. COORDINATE FINISH REQUIREMENTS WITH ARCHITECTURAL DRAWINGS AND/ OR SPECIFICATIONS.

	<u>CONCRETE TABLE</u>								
INTENDED USE	MIN 28 DAY STRENGTH (psi)	MAX WATER-CEME NT RATIO	% TOTAL AIR LIMITS	MACRO SYNTHETIC FIBER (1)	% MAX SHRINKAGE @ 28 DAYS				
INTERIOR SLAB ON GRADE	4,000	0.50	3	YES	0.04				
FOOTING & FOUNDATION WALLS	4,000	0.48	4.5 TO 7.5 (WHERE EXPOSED TO EXT)	-	0.05				
CONCRETE EXPOSED TO DE-ICERS	4,500	0.45	4.5 TO 7.5	-	0.05				
ALL CONCRETE NOT OTHERWISE SPECIFIED	4,000	0.48	4.5 TO 7.5	-	0.05				

TABLE NOTES

- 1. SYNTHETIC MACRO FIBER REINFORCEMENT MAY BE USED TO REPLACE REINFORCING STEEL IN CONCRETE SLABS ON GRADE AND TOPPING SLABS WHERE INDICATED ON DRAWINGS. SUBMIT FIBER MANUFACTURER'S DOCUMENTATION INDICATING THAT PROPOSED FIBER DOSAGE WILL PROVIDE A MINIMUM Fe3 VALUE AS FOLLOWS IN ACCORDANCE WITH ASTM C 1609. UNDER NO CIRCUMSTANCES SHALL DOSAGE RATE BE LESS THAN 3.0lbs PER CUBIC YARD OF CONCRETE IN SLABS ON GRADE AND TOPPING SLABS (4lbs PER CUBIC YARD FOR SLABS ON METAL DECK). SYNTHETIC MACRO FIBER REINFORCEMENT IS PROHIBITED IN CONCRETE TO RECEIVE POLISHED CONCRETE FINISHES.
- A. SLABS ON GRADE AND TOPPING SLABS
 - 1. 4" DEEP SLAB: Fe3 = 94psi
 - 6" DEEP SLAB: Fe3 = 128psi 8" DEEP SLAB: Fe3 = 180 psi
 - J. O DEEL GEAD. I C

REINFORCED MASONRY NOTES

- MASONRY CONSTRUCTION SHALL CONFORM TO THE APPLICABLE PORTIONS OF TMS 602 "SPECIFICATIONS FOR MASONRY STRUCTURES". CONCRETE MASONRY UNITS SHALL BE CLASSIFIED AS NORMAL WEIGHT DENSITY AND CONFORM TO ASTM C90. THE MASONRY ASSEMBLY SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH, (f'm) = 2,500 psi.
- 2. GROUT IN ACCORDANCE WITH ASTM C476 MAY BE FINE OR COARSE, SELF-CONSOLIDATING OR CONVENTIONAL (AT CONTRACTOR'S OPTION), AND SHALL BE PROPORTIONED TO ACHIEVE THE MINIMUM SPECIFIED COMPRESSIVE STRENGTH OF MASONRY. GROUT SHALL HAVE A DRY DENSITY OF 135 +/- 3pcf. NORMAL WEIGHT AGGREGATES IN GROUT SHALL COMPLY WITH ASTM C404. MORTAR SHALL COMPLY WITH PROPORTION SPECIFICATION REQUIREMENTS OF ASTM C270.
- 3. ALL MASONRY WALLS SHALL HAVE CONTINUOUS HORIZONTAL BOND BEAMS WITH SIZE AND SPACING PER MASONRY WALL ELEVATIONS. VERTICAL REINFORCEMENT IS PER FOUNDATION PLAN.
- 4. SUPPLY VERTICAL REINFORCING IN MINIMUM LENGTHS EQUAL TO 4'-0" PLUS LAP SPLICE
- LENGTH PER TABLE.
 5. WALL CONSTRUCTION LIFTS FOR REINFORCING BARS AND INSULATION FILL SHALL BE
- PER ACI 530.
 6. PORTLAND CEMENT AND LIME TYPE "S" MORTAR IS REQUIRED FOR ALL MASONRY
- UNLESS NOTED OTHERWISE.

 7. SEE ARCHITECTURAL PLANS FOR LOCATION AND DETAIL OF CONTROL JOINTS AND EXPANSION JOINTS. SEE TYPICAL CONTROL JOINT DETAIL FOR GUIDANCE.
- 8. VERTICAL REINFORCING IS TO BE CONTINUOUS ABOVE LINTELS TO TOP OF WALL. WELD REBAR OR WHS PER SECTIONS TO TOP OF STEEL LINTEL, GROUT CELLS SOLID AROUND REINFORCING AS NOTED ON PLANS.
- 9. REFER TO ARCHITECTURAL DRAWINGS FOR LOCATIONS AND DETAILS OF DOOR AND WINDOW OPENINGS FOR SPECIAL COURSING AND OTHER MASONRY DETAILS. THE INFORMATION SHOWN ON THE STRUCTURAL DRAWINGS IS INTENDED TO DEFINE THE STRUCTURAL REQUIREMENTS ONLY.
- 10. ALL BOLTS, ANCHORS, ETC., INSERTED IN THE WALLS SHALL BE GROUTED SOLID INTO POSITION WITH MINIMUM EDGE DISTANCE FROM ANCHOR TO EDGE OF GROUTED PORTION OF CMU IN ALL DIRECTIONS AS NOTED ON DRAWINGS.
- 11. REINFORCING SHALL CONFORM TO ASTM A615, GRADE 60, UNLESS NOTED ON DRAWINGS. REINFORCING TO BE WELDED SHALL CONFORM TO ASTM A706.
- 12. WHEN A FOUNDATION DOWEL DOES NOT LINE UP WITH A VERTICAL BLOCK CORE, IT SHALL NOT BE SLOPED MORE THAN (ONE HORIZONTAL IN 6 VERTICAL), OR 10 DEGREES. DOWEL MAY BE GROUTED INTO CELL IN VERTICAL ALIGNMENT, EVEN THOUGH IT IS IN AN ADJACENT CELL TO THE VERTICAL WALL REINFORCING, AS LONG AS THE CENTER-TO-CENTER SPACE BETWEEN THE WALL REINFORCING AND THE DOWEL DOES NOT EXCEED 8 INCHES. DOWELS SHALL NOT BE BENT INTO ALIGNMENT AFTER CONCRETE HAS BEEN
- 13. SPLICED REINFORCING SHALL BE LAPPED ACCORDING TO "MASONRY LAP SPLICE LENGTH" TABLE. SPLICED BARS SHALL BE WIRED TOGETHER. CONTRACTOR MAY OPT TO STAGGER SPLICES.
- 14. VERTICAL BARS SHALL BE HELD IN POSITION AT TOP AND BOTTOM AND AT INTERVALS NOT EXCEEDING 192 DIAMETERS OF THE REINFORCING OR 10'-0"
- NOT EXCEEDING 192 DIAMETERS OF THE REINFORCING OR 10'-0"

 15. REINFORCING STEEL SHALL BE SECURELY TIED IN PLACE AND INSPECTED BEFORE GROUTING STARTS.
- 16. VERTICAL GROUTING MAY BE EITHER "LOW LIFT" OR "HIGH LIFT" AT THE CONTRACTOR'S OPTION.
 17. VERTICAL CELLS THAT WILL BE GROUTED SHALL HAVE VERTICAL ALIGNMENT TO
- MAINTAIN A CONTINUOUS UNOBSTRUCTED CELL AREA NOT LESS THAN 2"x3".

 18. GROUTING OF MASONRY BEAMS OVER OPENINGS SHALL BE DONE IN ONE CONTINUOUS
- OPERATION.

 19. VERTICAL REINFORCING BARS SHALL MAINTAIN MINIMUM CLEARANCES AS FOLLOWS UNLESS NOTED OTHERWISE ON DRAWINGS:
- INSIDE FACE OF MASONRY = 3/4"
 ADJACENT BARS NOT SPLICED = 1" OR 1 BAR DIAMETER, WHICHEVER IS GREATER.
- 20. INSULATION INSERTS ARE NOT PERMITTED IN GROUTED CELLS.
 21. PRISM TESTS IN ACCORDANCE WITH ASTM C1314 AND ASTM C140 SHALL BE PERFORMED WITH TEST REPORTS SENT TO ARCHITECT AND EOR FOR RECORD. REFER TO SPECIAL

INSPECTIONS TABLE ITEM "EVALUATION OF STRENGTH" FOR ADDITIONAL INFORMATION.

MASONRY LAP SPLICE LENGTH NOTES

- CONTRACTOR SHALL PROVIDE DEVELOPMENT AND REBAR SPLICE LENGTHS SHOWN IN THE TABLES AS A MINIMUM UNLESS INDICATED OTHERWISE IN STRUCTURAL DETAILS OR NOTES.
- 2. "SINGLE" INDICATES ONE BAR PER CELL. "DOUBLE" INDICATES TWO BARS PER CELL. SEE PLAN.

f'm = 2,500 psi - MASONRY LAP SPLICE LENGTH TABLE (INCHES)							
	CMU SIZE	8"	10"	10"	12"	12"	
BAR SIZE	STD HOOK DEVELOPMENT LENGTH (IN)		SINGLE	DOUBLE	SINGLE	DOUBLE	
#3	5	12	12	12	12	12	
#4	6	12	12	18	12	18	
#5	8	18	14	28	12	28	
#6	9	34	26	54	21	54	
#7	10	47	36	76	36	76	
#8	12	71	48	96	47	96	

PRE-FABRICATED WOOD TRUSS NOTES

- DESIGN AND FABRICATION SHALL BE IN ACCORDANCE WITH THE TRUSS PLATE INSTITUTE PUBLICATION "DESIGN SPECIFICATION FOR METAL PLATE CONNECTED WOOD TRUSSES", LATEST EDITION.
- 2. PROVIDE ALL PERMANENT TRUSS BRACING INDICATED ON DRAWINGS OR SPECIFIED BY TRUSS MANUFACTURER. IN ADDITION, PROVIDE TEMPORARY BRACING AS INDICATED IN THE TRUSS PLATE INSTITUTE BOOKLET "BRACING WOOD TRUSSES: COMMENTARY AND RECOMMENDATIONS BWT-76".
- 3. NO FIELD MODIFICATIONS OF TRUSSES ARE PERMITTED UNLESS FABRICATOR PROVIDES CALCULATIONS AND DRAWINGS SHALL BE SIGNED AND SEALED BY A REGISTERED ENGINEER (REGISTERED IN THE STATE WHERE THE PROJECT IS LOCATED).
- 4. REFER TO "DEFERRED SUBMITTALS" FOR ADDITIONAL REQUIREMENTS.

PRE-FABRICATED WOOD ROOF TRUSSES - DESIGN CRITERIA TABLE					
TOP CHORD	20 psf LIVE LOAD 10 psf DEAD LOAD SNOW LOAD AND WIND LOAD PER ROOF PLAN AND NOTES				
BOTTOM CHORD	10 psf LIVE LOAD (NOT CONCURRENT WITH TOP CHORD LIVE LOAD) 8 psf DEAD LOAD				
WIND UPLIFT	PER "DESIGN LOADS" ON THESE GENERAL NOTES				
LOAD DURATION FACTOR	AS REQUIRED				
TRUSS SPACING	PER PLAN				
DEFLECTION LIMITS	L/240 MAXIMUM TOTAL LOAD L/360 MAXIMUM LIVE LOAD				
CAMBER	75 PERCENT OF DEAD LOAD				

SPECIAL INSPECTIONS

- 1. REFER TO THE SPECIAL INSPECTION TABLES FOR THE LIST OF ELEMENTS OF CONSTRUCTION THAT SHALL REQUIRE SPECIAL INSPECTION. THIS SHALL BE CONSIDERED A GUIDE, AND THE CONTRACTOR AND INSPECTOR SHALL REFER TO THE IBC FOR COMPLETE REQUIREMENTS, QUALIFICATIONS, EXCEPTIONS, AND SUBMITTALS. REFER TO IBC CHAPTER 17. THE OWNER SHALL BE RESPONSIBLE FOR EMPLOYING THE SPECIAL INSPECTION AGENCY. ANY "OBSERVATIONS" BY THE EOR WILL NOT BE TO PERFORM SPECIAL INSPECTIONS AND SHALL NOT BE INTERPRETED AS SUCH.
- COPIES OF ALL INSPECTION REPORTS THAT REPORT COMPLIANCE SHALL BE SUBMITTED TO THE ARCHITECT OF RECORD, STRUCTURAL ENGINEER OF RECORD, AND BUILDING INSPECTOR WITHIN 7 CALENDAR DAYS OF COMPLETION OF THAT PORTION OF WORK. A MINIMUM OF ONE (1) PROGRESS REPORT PER MONTH FOR EACH TYPE OF CONSTRUCTION REQUIRING SPECIAL INSPECTION SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER OF RECORD.
- 3. SPECIAL INSPECTOR SHALL INFORM ENGINEER OF RECORD IMMEDIATELY OF NON-COMPLIANCE WITH CONSTRUCTION DOCUMENTS OR APPROVED SUBMITTALS. CONTACT ENGINEER OF RECORD THE SAME DAY NON-COMPLIANCE IS DISCOVERED AND FOLLOW UP WITH AN OFFICIAL REPORT WITHIN 2 BUSINESS DAYS.
- 4. THE SPECIAL INSPECTIONS IDENTIFIED ON THE PLANS ARE IN ADDITION TO, AND NOT A SUBSTITUTE FOR THOSE INSPECTIONS REQUIRED TO BE PERFORMED BY A BUILDING INSPECTOR.
- 5. SPECIAL INSPECTIONS ARE NOTED AS EITHER "CONTINUOUS" OR "PERIODIC". A "CONTINUOUS" INSPECTION REQUIRES THE PRESENCE OF A QUALIFIED INSPECTOR IN THE VICINITY OF THE WORK BEING PERFORMED FOR 100% OF THAT WORK. A "PERIODIC" INSPECTION REQUIRES PART-TIME OBSERVATION OF THE WORK BEING PERFORMED. THE INSPECTOR SHALL ALSO OBSERVE THE FINAL CONDITION OF THE WORK BEFORE IT IS CLOSED FROM VIEW.
- WHEN WORK IN MORE THAN ONE CATEGORY OF WORK REQUIRING SPECIAL INSPECTION IS TO BE PERFORMED SIMULTANEOUSLY, OR THE GEOGRAPHIC LOCATION OF THE WORK IS SUCH THAT IT CANNOT BE CONTINUOUSLY OBSERVED, IT SHALL BE THE RESPONSIBILITY OF THE AGENT TO EMPLOY A SUFFICIENT NUMBER OF SPECIAL INSPECTORS TO ASSURE THAT ALL WORK IS CONTINUOUSLY INSPECTED IN ACCORDANCE WITH THOSE PROVISIONS.

	SPECIAL INSPECTIONS - CONCRETE TABLE						
ITEM	INSPECTION FREQUENCY	SCOPE					
REINFORCEMENT	PERIODIC	INSPECT REINFORCEMENT (INCLUDING PRESTRESSING TENDONS) AND PLACEMENT; VERIFY CONFORMANCE WITH CONSTRUCTION DOCUMENTS, AND THAT BARS ARE FREE FROM MATERIALS THAT COULD PREVENT BOND, ARE ADEQUATELY LAPPED, SPLICED, TIED, AND SUPPORTED					
ANCHOR INSTALLATION	PERIODIC	INSPECT CAST-IN-PLACE ANCHORS AND BOLTS					
ANCHOR INSTALLATION	PERIODIC	INSPECT POST-INSTALLED MECHANICAL AND ADHESIVE ANCHORS NOT OTHERWISE SPECIFIED					
MIX DESIGN	PERIODIC	VERIFY USE OF APPROVED MIX DESIGN					
SAMPLING AND TESTING	CONTINUOUS	PRIOR TO CONCRETE PLACEMENT, FABRICATE SPECIMENS FOR STRENGTH TESTING; PERFORM SLUMP AND AIR CONTENT TESTS, AND DETERMINE TEMPERATURE OF THE CONCRETE					
CONCRETE PLACEMENT	PERIODIC	VERIFY MAINTENANCE OF CURING TEMPERATURE AND TECHNIQUES					
CONCRETE PLACEMENT	PERIODIC	INSPECT FORMWORK FOR SHAPE, LOCATION, AND DIMENSIONS OF CONCRETE MEMBER BEING FORMED					
CONCRETE PLACEMENT	CONTINUOUS	CONCRETE PLACEMENT					

<u>s</u>	SPECIAL INSPECTIONS - SOILS AND FOUNDATIONS TABLE						
ITEM	INSPECTION FREQUENCY	SCOPE					
SOILS	PERIODIC	VERIFY MATERIALS BELOW SHALLOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY; VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL; PERFORM CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS; PRIOR TO PLACEMENT OF COMPACTED FILL, INSPECT SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY					
SOILS	CONTINUOUS	VERIFY USE OF PROPER MATERIALS, DENSITIES, LIFT THICKNESSES, AND COMPACTION OF FILL; VERIFY MATERIALS AND PROCEDURES COMPLY WITH THE GEOTECHNICAL REPORT					

SPECIAL INSPECTIONS - OFF-SITE FABRICATION (INCLUDING PRE-MANUFACTURED WOOD STRUCTURAL ELEMENTS AND ASSEMBLIES, AND STEEL FABRICATING)

_ <u> </u>	LEMEN 15 AND A55	EMBLIES, AND STEEL FABRICATING)
ITEM	INSPECTION FREQUENCY	SCOPE
FABRICATION AND IMPLEMENTATION PROCEDURES		VERIFY THAT FABRICATOR MAINTAINS DETAILED FABRICATION AND QUALITY CONTROL PROCEDURI THAT PROVIDE A BASIS FOR INSPECTION CONTRO OF THE WORKMANSHIP AND THE FABRICATOR'S ABILITY TO CONFORM TO APPROVED CONSTRUCTION DOCUMENTS AND REFERENCED STANDARDS; REVIEW PROCEDURES FOR COMPLETENESS AND ADEQUACY RELATIVE TO TH CODE REQUIREMENTS FOR THE FABRICATOR'S SCOPE OF WORK
NOTE	-	SPECIAL INSPECTION FOR OFF-SITE FABRICATION NOT REQUIRED FOR FABRICATORS APPROVED BY THE BUILDING OFFICIAL IN ACCORDANCE WITH TH CODE

SPECIAL INSPECTIONS - WOOD TABLE

ITEM	INSPECTION FREQUENCY	SCOPE
PREMANUFACTURED WOOD STRUCTURAL ELEMENTS AND ASSEMBLIES	-	SEE "OFF-SITE FABRICATION" SPECIAL INSPECTION TABLE
DIAPHRAGM AND SHEAR WALL	PERIODIC	WOOD SHEAR WALLS, SHEAR PANELS, AND DIAPHRAGMS, INCLUDING NAILING, BOLTING, ANCHORING, AND OTHER FASTENING TO COMPONENTS OF THE MAIN LATERAL SYSTEM WHEN THE FASTENER SPACING IS LESS THAN OR EQUAL TO 4 INCHES ON CENTER

SPECIAL INSPECTIONS - MASONRY - LEVEL 1 INSPECTION

(LEVEL B QUALITY ASSURANCE)

		CATEGORY I, II, III STRUCTURES
ITEM	INSPECTION FREQUENCY	SCOPE
REINFORCEMENT	PERIODIC	LAPPING AND SPLICING OF REBAR; LOCATION, PLACEMENT, GRADE, SIZE, AND TYPE OF REINFORCEMENT AND CONNECTORS
INSTALLATION OF MASONRY, GROUT, AND MORTAR	PERIODIC	CONSTRUCTION OF MORTAR JOINTS; SIZE AND LOCATION OF STRUCTURAL ELEMENTS; PROTECTION OF MASONRY IN COLD WEATHER (BELOW 40°F) OR HOT WEATHER (ABOVE 90°F); CLEAN GROUT SPACE
INSTALLATION OF MASONRY, GROUT, AND MORTAR	CONTINUOUS	GROUT PLACEMENT IN CELLS WITH STEEL REINFORCEMENT
MIXING OF MORTAR AND GROUT	PERIODIC	PROPORTIONS OF SITE-PREPARED MORTAR AND GROUT
ANCHORS	PERIODIC	GROUT PLACEMENT IN CELLS WITH STEEL REINFORCEMENT OR PRESTRESSING BONDED TENDONS
ANCHORS	PERIODIC	INSPECT POST-INSTALLED MECHANICAL AND ADHESIVE ANCHORS PER THE REQUIREMENTS IN THEIR RESPECTIVE ICC-ES REPORTS
EVALUATION OF STRENGTH	CONTINUOUS	PREPARATION OF GROUT SPECIMENS, MORTAR SPECIMENS, AND/ OR PRISMS; VERIFY I'm PRIOR TO CONSTRUCTION. A "SET" IS HEREBY DEFINED AS A MINIMUM OF 4 PRISM SPECIMENS. A MINIMUM OF 1 SET SHALL BE PREPARED AND TESTED FOR EACH DAY MASONRY IS INSTALLED. TEST 1 PRISM AT 7 DAYS, 2 AT 28 DAYS, AND THE 4th PRISM AT THE EOR'S DIRECTION, IF REQUIRED. REPORT ALL TEST RESULTS TO THE ARCHITECT AND EOR WITHIN 3 WORKING DAYS OF TESTING.
MISCELLANEOUS	PERIODIC	COMPLIANCE WITH REQUIRED INSPECTION PROVISIONS OF THE CONSTRUCTION DOCUMENTS AND THE APPROVED SUBMITTALS SHALL BE VERIFIED

BAALMAN
ARCHITECTS
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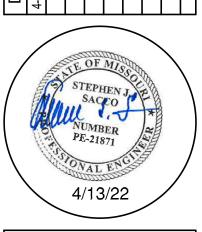
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Lincoln Go Lincoln Co Ambulance 28 Walter Court

TE ISSUE RID & PERMIT SET



STEVE SACCO PE-21871

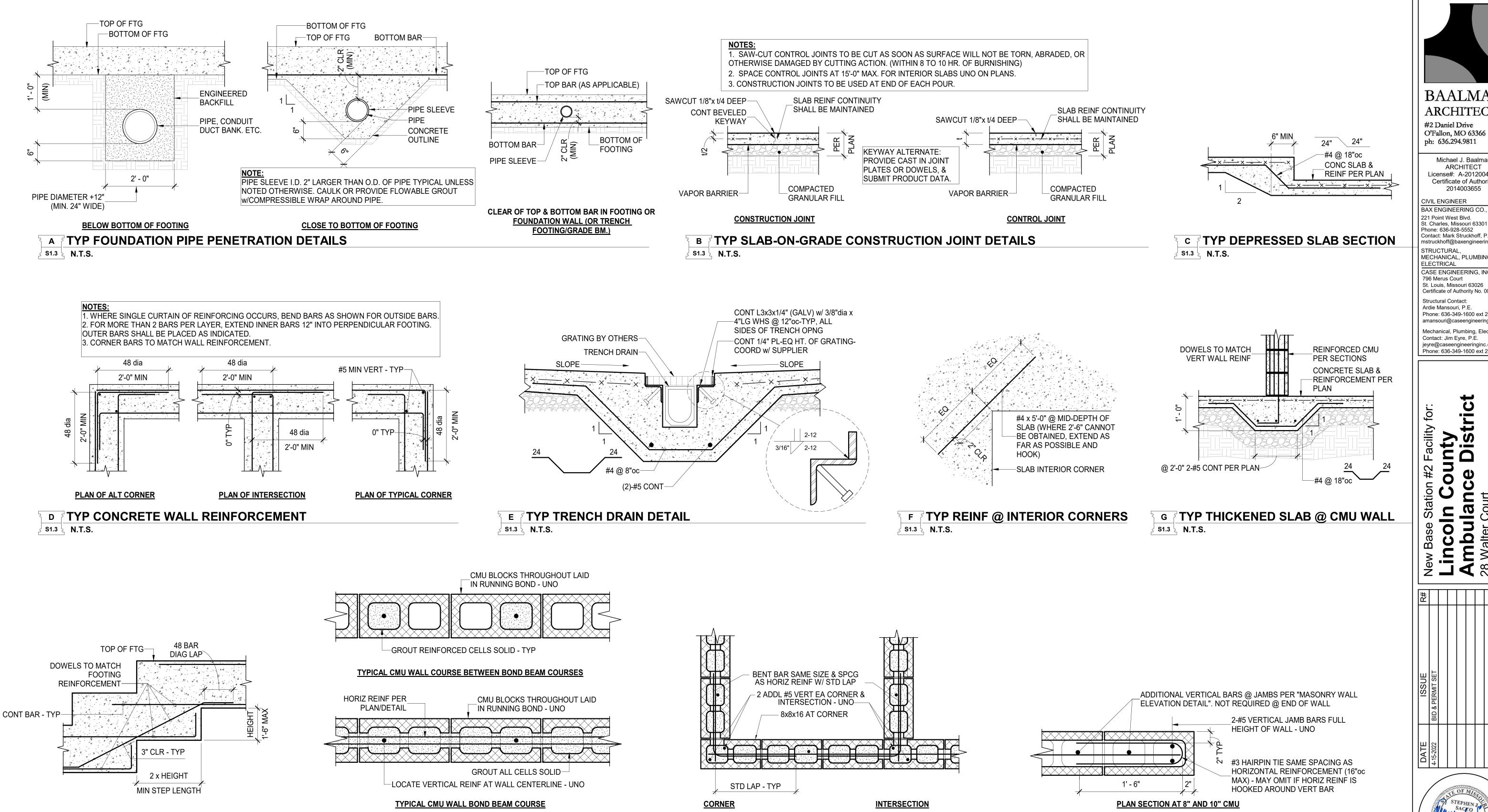
PROJECT MANAGER: CS
DRAWN BY: TJH

PROJECT NUMBER BAA-MO-01-21 DATE April 15, 2022

SHEET

SCHEDULES

S1.2
GENERAL NOTES &



| S1.3 | N.T.S.

K TYP CMU WALL CORNERS & INTERSECTIONS

ਿਸ ੇ TYP FOOTING STEP

| S1.3 | N.T.S.

TYP CMU WALL COURSES

ያ S1.3 է **N.T.S.**

BAALMAN ARCHITECTS

> Michael J. Baalman ARCHITECT

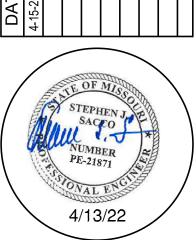
License#: A-2012004035 Certificate of Authority: 2014003655 CIVIL ENGINEER

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ELECTRICAL CASE ENGINEERING, INC. 796 Merus Court St. Louis, Missouri 63026 Certificate of Authority No. 001498 Structural Contact

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C ce Distric Ce



STEVE SACCO

PE-21871 PROJECT MANAGER: CS

DRAWN BY: PROJECT NUMBER BAA-MO-01-21 DATE

April 15, 2022

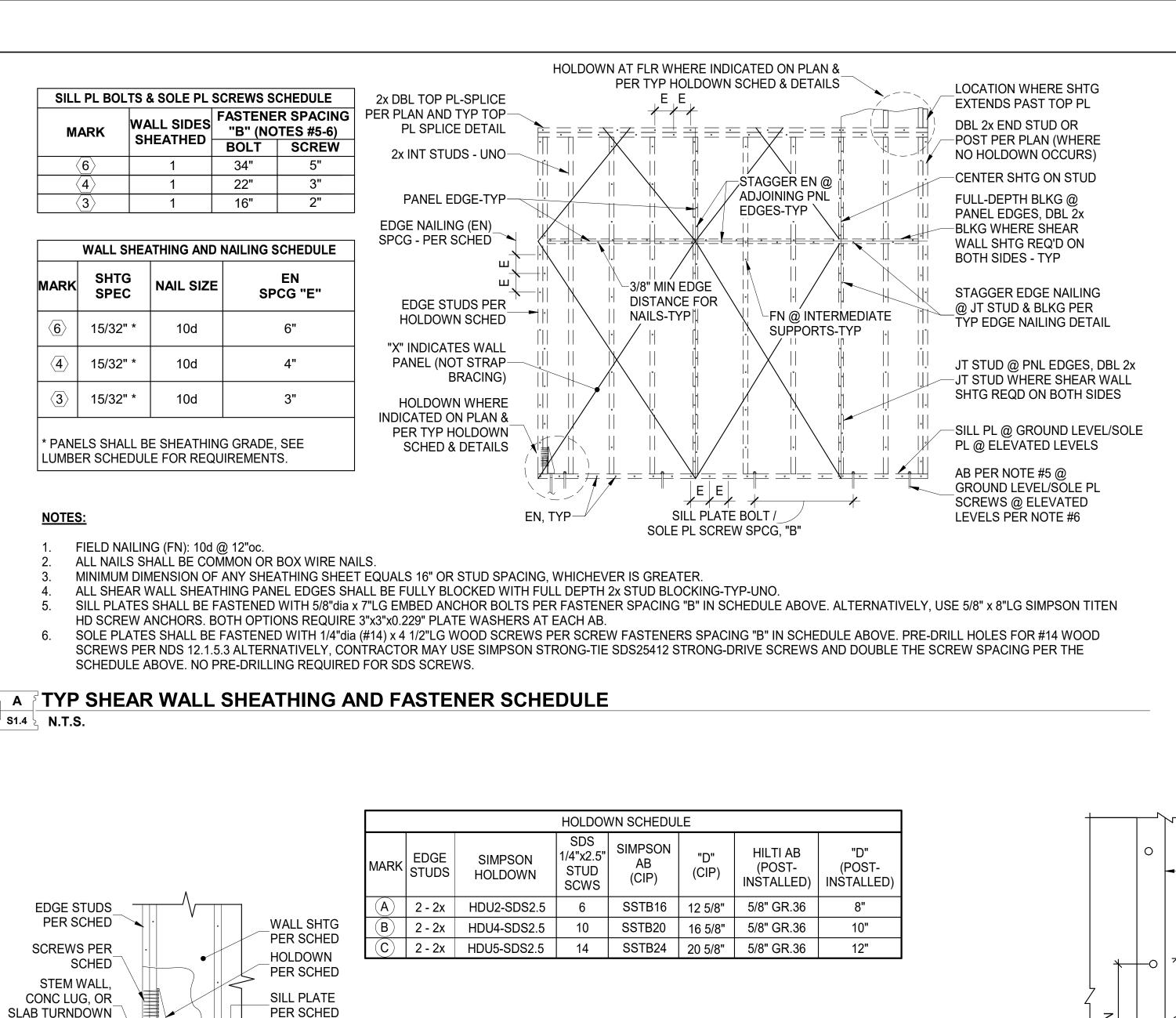
TYPICAL DETAILS

SHEET **S1.3**

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TYP CMU JAMB DETAILS

| S1.3 | N.T.S.



HOLDOWN ANCHOR BOLTS SHALL BE HOT-DIPPED GALVANIZED (ASTM A153).

THICKENED FOOTING WHERE REQUIRED TO ACHIEVE MINIMUM ANCHOR BOLT

∫ S1.4 է N.T.S.

CONTRACTOR MAY CHOOSE CAST-IN-PLACE OR POST-INSTALLED OPTION.

ADHERE WITH HILTI HIT-HY 200 SAFE SET SYSTEM ADHESIVE FOR POST-

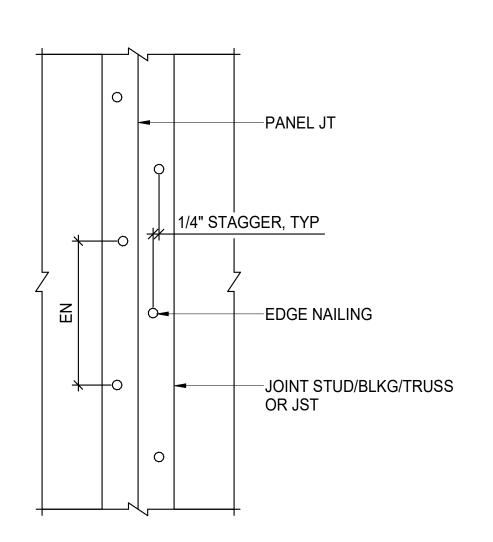
INSTALLED OPTION. IF "N/A" IS SHOWN, POST-INSTALLED OPTION IS NOT

WHERE HOLDOWN OCCURS ADJACENT TO A POST ON THE PLAN, USE THE

LARGER OF THE INDICATED POST OR THE SCHEDULE EDGE STUDS.

ALLOWED.

EMBEDMENT.



MARK

R1

SPEC

19/32" *

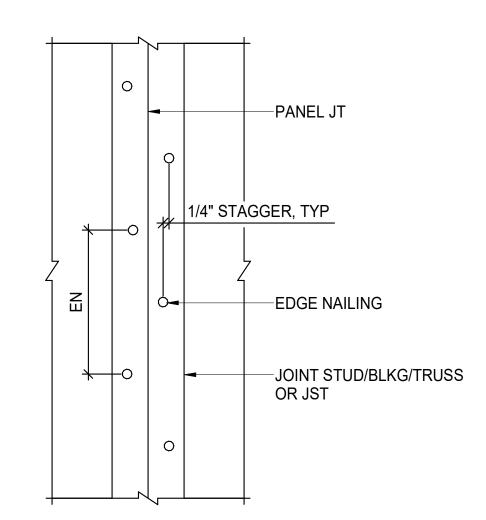
SCHEDULE FOR REQUIREMENTS.

SIMPSON STRONG-TIE.

в TYP ROOF SHEATHING DETAIL

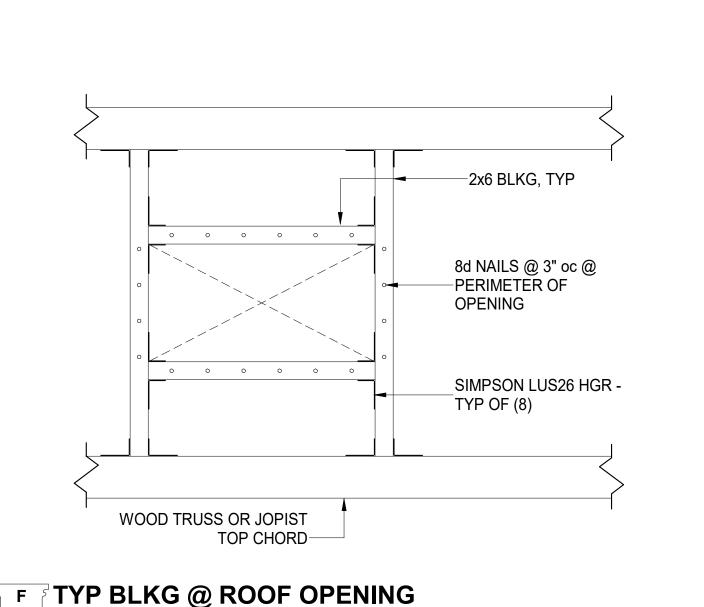
IZE

* PANELS SHALL BE SHEATHING GRADE. SEE LUMBER



ժ s1.4 է N.T.S.

TYP STAGGERED EDGE NAILING DETAIL 」S1.4 と N.T.S. 4'-0" MIN DBL CENTER DBL TOP PL JT OVER STUD, TYP



HOLDOWN AB

PER SCHED

HOLDOWN AT FOUNDATION

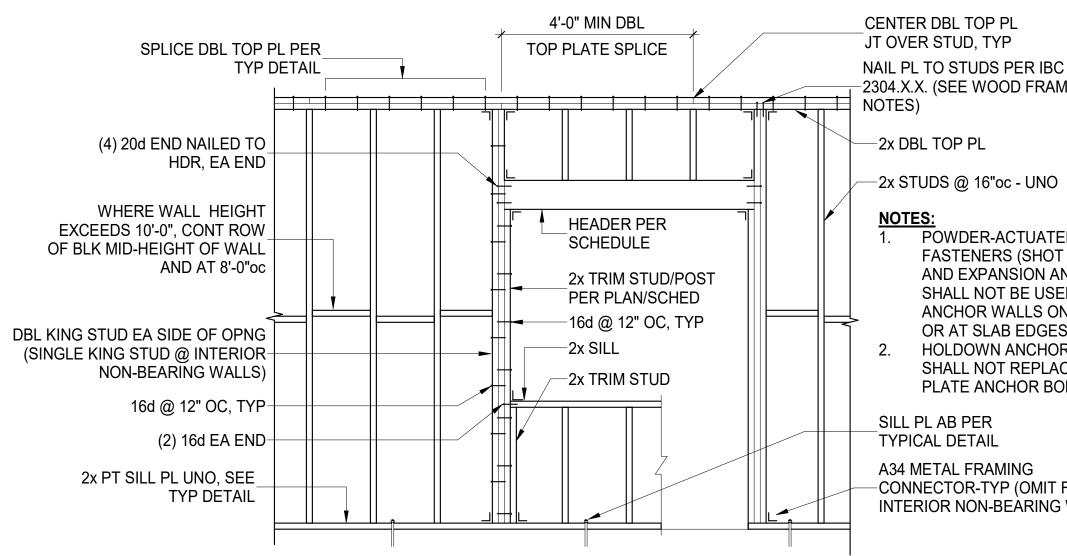
C TYP HOLDOWN SCHEDULE & DETAILS

WHERE OCCURS

T/FTG PER PLAN-

^յ Տ1.4 է **N.T.S.**

S1.4 \ N.T.S.



G TYP STRUCTURAL WALL PANEL FRAMING ELEVATION

NAIL PL TO STUDS PER IBC TABLE -2304.X.X. (SEE WOOD FRAMING GENERAL 1. POWDER-ACTUATED **FASTENERS (SHOT PINS)** AND EXPANSION ANCHORS SHALL NOT BE USED TO ANCHOR WALLS ON CURBS OR AT SLAB EDGES. HOLDOWN ANCHOR BOLTS SHALL NOT REPLACE SILL PLATE ANCHOR BOLTS. CONNECTOR-TYP (OMIT FOR INTERIOR NON-BEARING WALLS)

H TYP TOP PLATE SPLICE DETAIL S1.4 \ N.T.S.

BOUNDARY OF DIAPHRAGM (SHTG MAY EXTEND BEYOND BAALMAN DIAPHRAGM BOUNDARY) **ARCHITECTS BOUNDARY** #2 Daniel Drive NAILING (BN) O'Fallon, MO 63366 ph: 636.294.9811 BLKG @ TRANSVERSE JOINTS IF REQD (SEE SCHED) Michael J. Baalman ARCHITECT License#: A-2012004035 FIELD NAILING (FN) Certificate of Authority: AT INTERMEDIATE 2014003655 **SUPPORTS CIVIL ENGINEER** BAX ENGINEERING CO., INC. CENTER EDGES OF 221 Point West Blvd. St. Charles, Missouri 63301 SHT'G ON FRMG Phone: 636-928-5552 Contact: Mark Struckhoff, P.E. STAGGER EDGE NAILING mstruckhoff@baxengineering.co (EN) @ ADJOINING PNL STRUCTURAL. MECHANICAL, PLUMBING & **EDGES ELECTRICAL** 3/8" MIN EDGE CASE ENGINEERING, INC. 796 Merus Court DIST FOR NAILS-TYP St. Louis, Missouri 63026 Certificate of Authority No. 001498

WOOD TRUSS OR JST

SIZE & SPCG

PER FRMG PLAN

PROVIDE 1/8" GAP

BTWN ALL PANEL

ENDS & EDGES - TYP

#2 0 C oln Linco Ambra 28 Walte Moscow

Ba

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4/13/22

STEVE SACCO PE-21871

PROJECT MANAGER: CS DRAWN BY:

PROJECT NUMBER BAA-MO-01-21 DATE April 15, 2022

SHEET **S1.4**

TYPICAL DETAILS

−2X PT SILL NOTCHED OR **AB & WASHER** DRILLED HOLE (TYP) **\Phi**

_|-----

__-_-

EDGE

MEMBER

THICK

TRANSV

NO

SPCG BLKG

12"

SECTION A-A

DIAPHRAGM SHEATHING & NAILING SCHEDULE

SPCG

ARE FLUSH WITH THE SURFACE OF THE SHEATHING

19/32 CLIPS BY SIMPSON STRONG-TIE OR APPROVED EQUAL

ΕN

SPCG

DIAPHRAGM SHEATHING NAILS SHALL BE DRIVEN SO THAT THEIR HEADS

PROVIDE T & G SHEATHING AT ALL FLOORS. ALTERNATIVELY, USE PSCL

10d COMMON NAILS CAN BE SUBSTITUTED WITH #9 x 2" SCREW WSV2 BY

TYPICAL ANCHOR BOLT END DISTANCE L = 4 1/2" MIN, 12" MAX.

_-========

"X" INDICATES

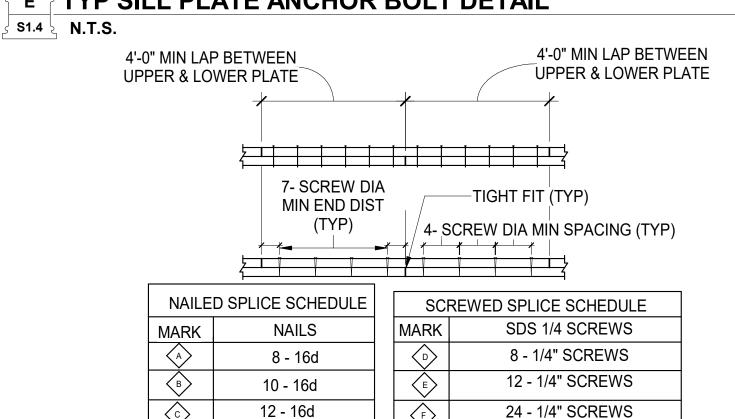
ROOF PANEL

(NOT STRAP

BRACING)

- ANCHOR BOLTS SHALL BE INSTALLED AT 12" MAXIMUM FROM EACH END OF EACH SILL PLATE PIECE, AND SHALL BE SPACED AT 48" ON CENTER MAXIMUM. SEE TYPICAL SHEAR WALL DETAIL FOR ANCHOR BOLT SPACING AT SHEAR WALLS.
- WHERE SILL PLATE IS NOTCHED, DRILLED OR CUT MORE THAN ONE THIRD OF ITS WIDTH, INSTALL ANCHOR BOLT EACH SIDE AS SHOWN. NOTCHES, CUTS AND HOLES SHALL BE TREATED WITH A
- PRESERVATIVE SOLUTION CONFORMING TO AWPA STANDARD M4. 4. ANCHOR BOLTS SHALL BE 5/8" DIAMETER FULLY THREADED WITH 3"x3" x 0.229" PLATE WASHERS.
- UNLESS OTHERWISE NOTED. MINIMUM ANCHOR BOLT EMBEDMENT SHALL BE 7", MEASURED FROM TOP OF THE CONCRETE SLAB. FOR ANCHOR BOLTS EMBEDED IN CONCRETE CURBS **NOT** POURED MONOLITHICALLY WITH THE FOUNDATION (NON-INTEGRAL CURBS), THE LENGTH OF ANCHOR BOLT IN CONCRETE CURBS SHALL NOT APPLY TO THIS MINIMUM EMBEDMENT
- ANCHOR BOLTS WITH DAMAGED THREADS SHALL NOT BE USED.
- WHERE SILL PLATE ANCHORS MUST BE POST-INSTALLED, PROVIDE 3/4"dia x 8 1/2" SIMPSON TITEN HD STAINLESS STEEL SCREW ANCHORS (INTEGRAL CURBS ONLY, OR NO CURB), OR 5/8"dia x (8 1/2" + CURB HEIGHT) STAINLESS STEEL THREADED ROD ANCHORS INSTALL w/ HILTI HIT-HY 200 ADHESIVE OR EQUIVALENT. POST-INSTALLED ANCHORS SHALL NOT REPLACE HOLDOWN ANCHOR BOLTS UNLESS ALLOWED IN THE HOLDOWN SCHEDULE.

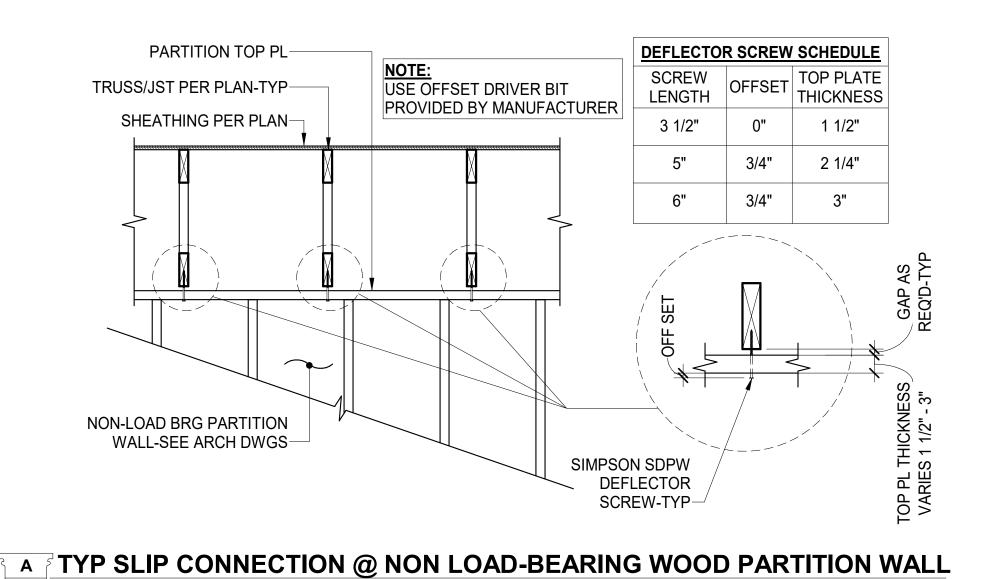
TE TYP SILL PLATE ANCHOR BOLT DETAIL



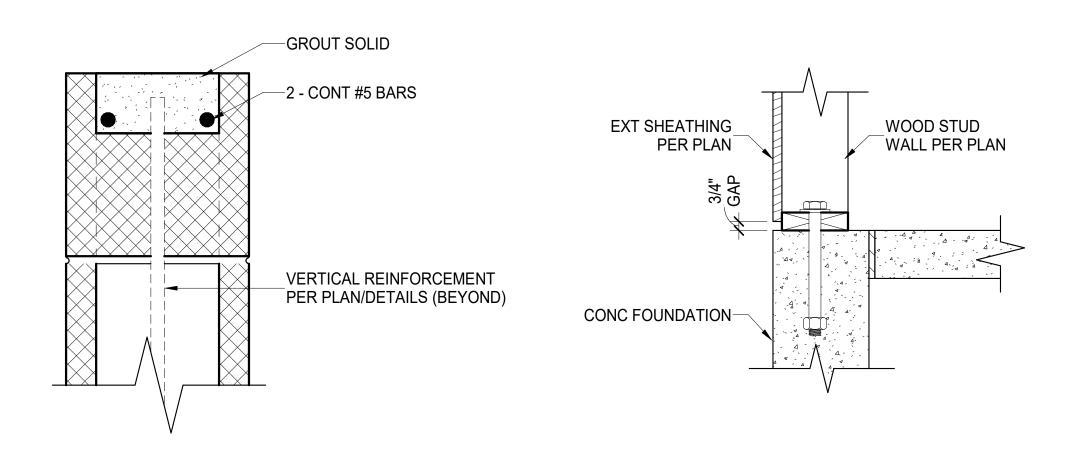
NOTES:

- SPLICE 2x DOUBLE TOP PLATES PER MARK "A" AND 3x DOUBLE TOP PLATES PER
- MARK "D" OF THE ABOVE SCHEDULE, UNLESS OTHERWISE INDICATED.
- SCREWS SHALL BE 3" LONG FOR 2x PLATES AND 5" LONG FOR 3x PLATES.
- JOINTS IN UPPER AND LOWER PLATE SHALL BE CENTERED OVER STUD OR MULLION. ALL NAILS SHALL BE COMMON WIRE NAILS.

SCHEDULE INDICATES NUMBER OF NAILS OR SCREWS ON EACH SIDE OF EACH JOINT.

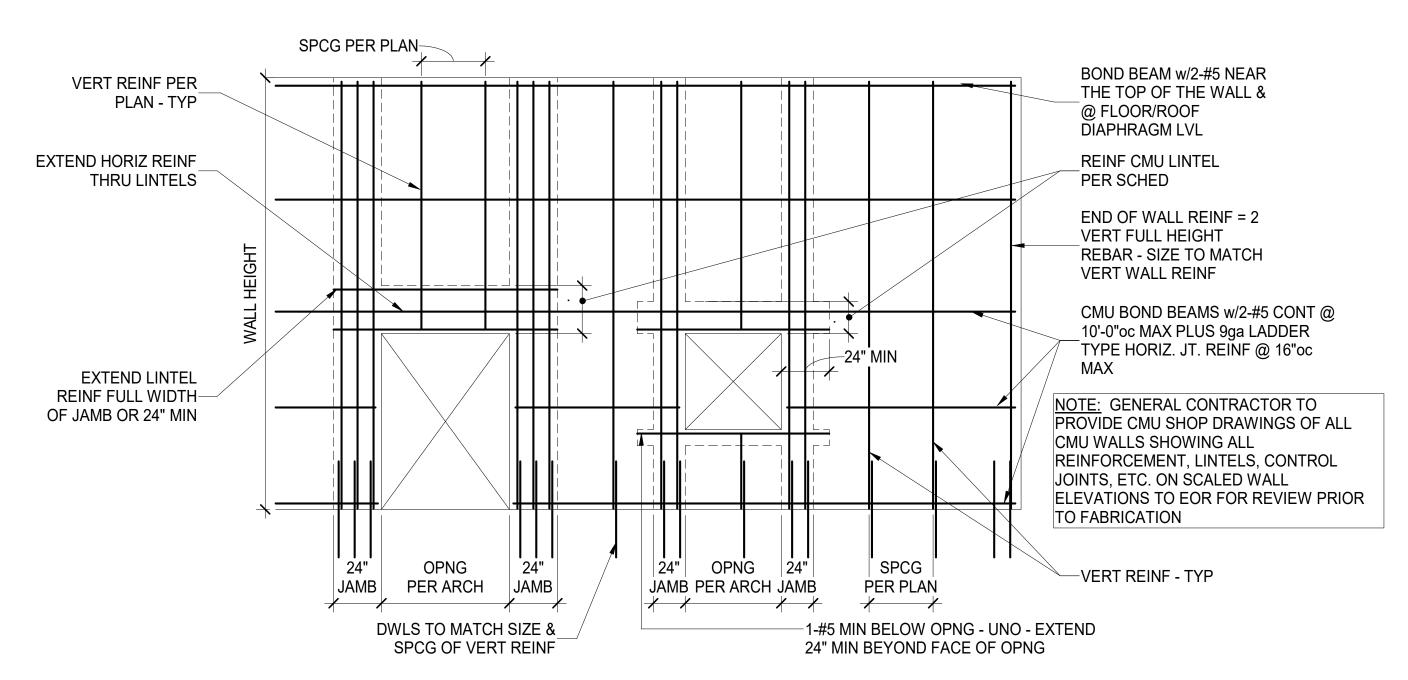


S1.5 N.T.S.

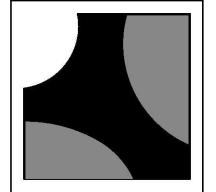


B 8" CMU BOND BEAM N.T.S.

c TYPICAL SHEATHING GAP DETAIL
S1.5 N.T.S.



D TYP REINFORCED MASONRY WALL ELEVATION
S1.5 N.T.S.



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Station #2 Facility for:

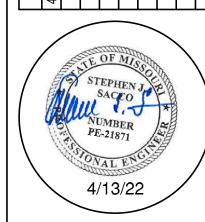
In Count

Court

Court

New Base Station #2 |
Lincoln Cou
Ambulance |
28 Walter Court
Moscow Mills, Missou

DATE ISSUE R#
4-15-2022 BID & PERMIT SET



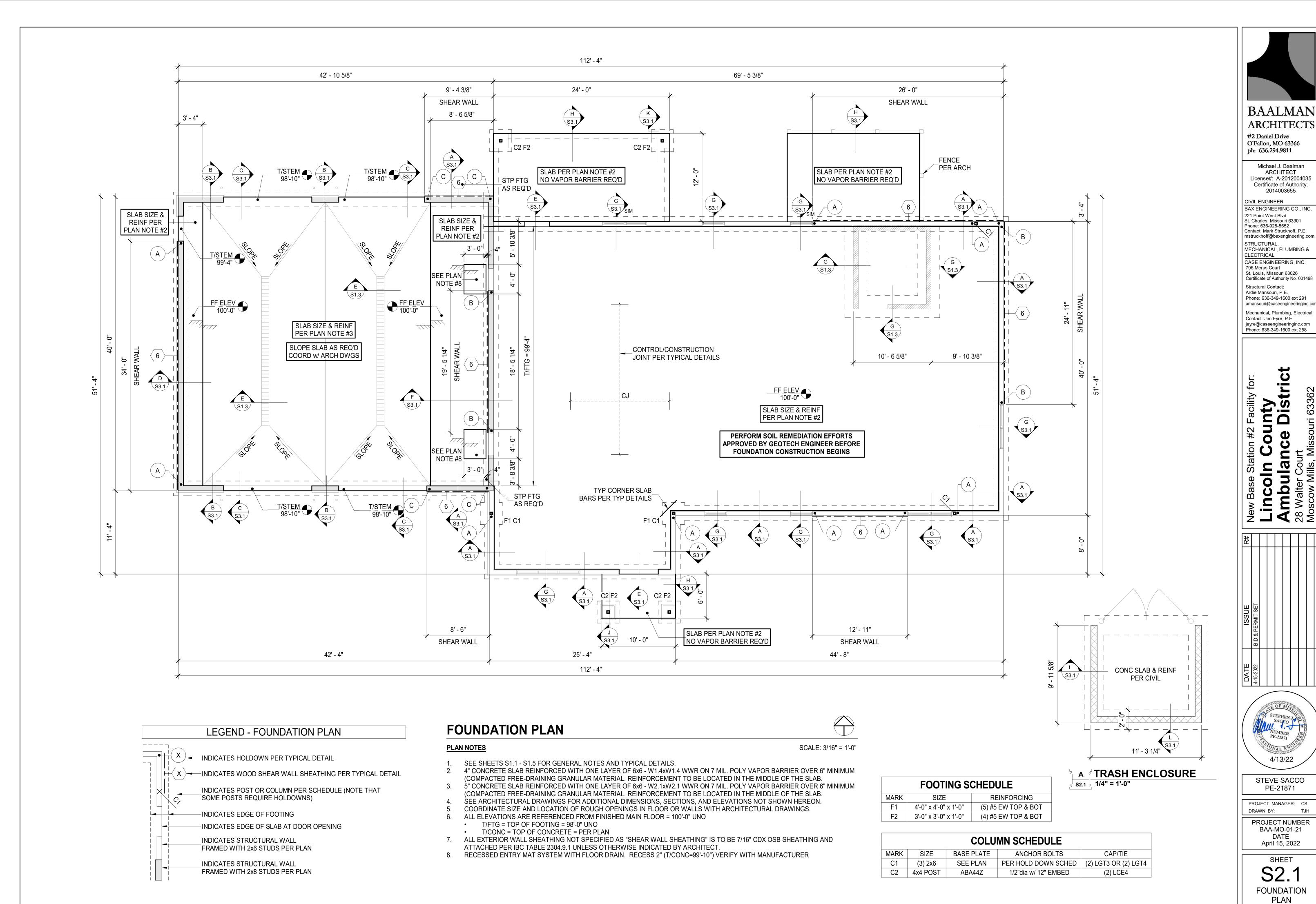
STEVE SACCO PE-21871

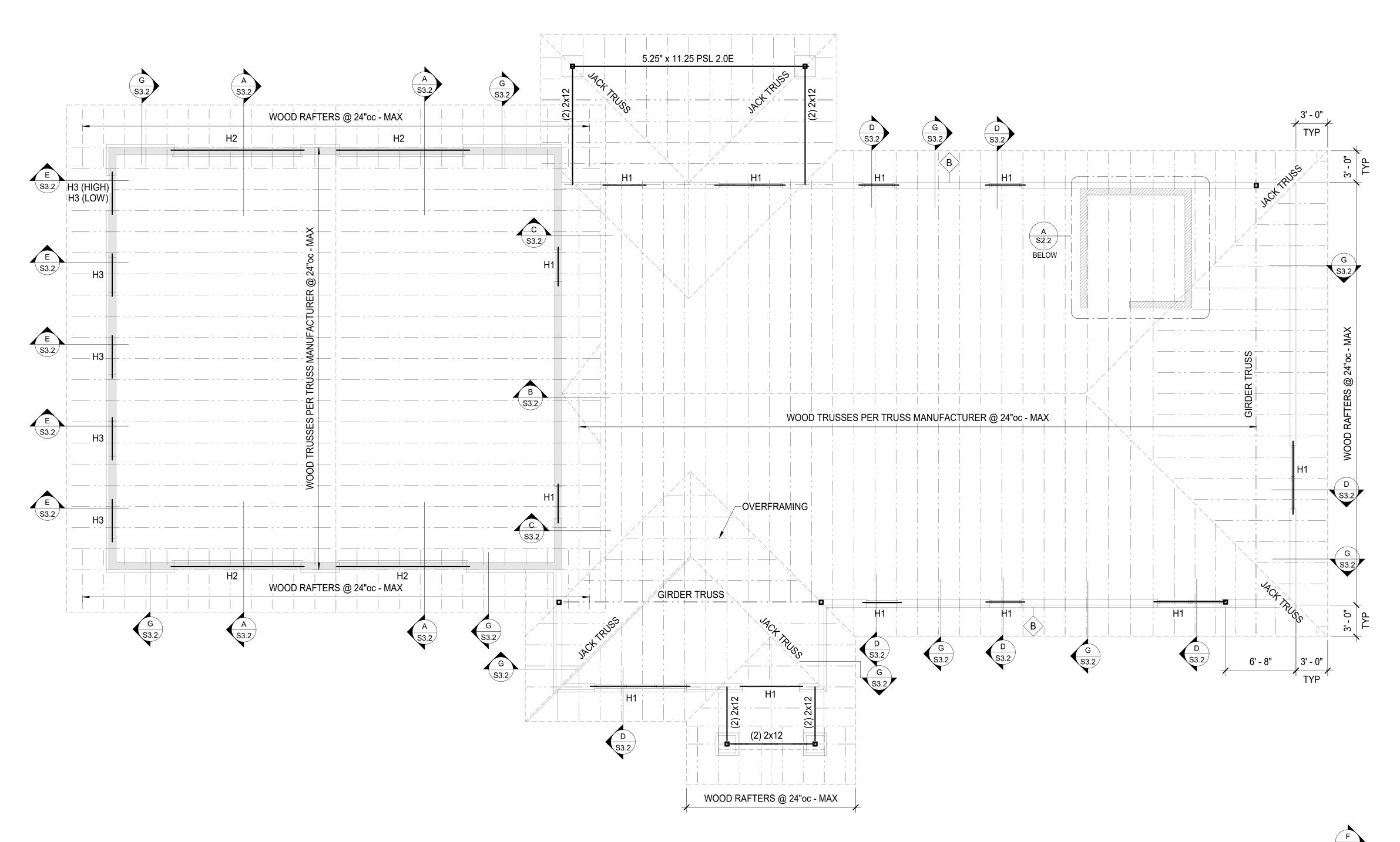
PROJECT MANAGER: CS
DRAWN BY: TJH

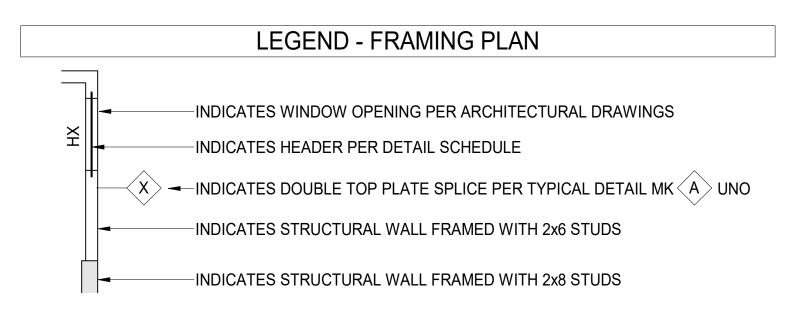
PROJECT NUMBER BAA-MO-01-21 DATE April 15, 2022

S1.5
TYPICAL DETAILS

SHEET



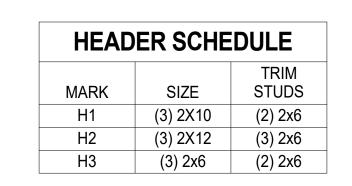




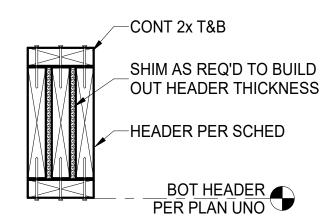
ROOF FRAMING PLAN

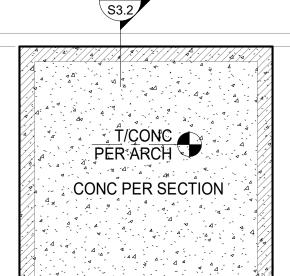
PLAN NOTES

- SEE SHEETS S1.1 S1.5 FOR GENERAL NOTES AND TYPICAL DETAILS.
- ROOF CONSTRUCTION: 5/8" PLYWOOD ROOF SHEATHING, ATTACHED TO SUPPORTS PER LUMBER NOTES, SCHEDULE, AND DETAILS.
- PROVIDE TRUSS BRIDGING AND SPACING PER TRUSS SUPPLIER.
- MAXIMUM TRUSS SPACING = 2'-0" UNO
- SEE ARCHITECTURAL DRAWINGS FOR ADDITIONAL DIMENSIONS, SECTIONS, AND ELEVATIONS NOT SHOWN HEREON.
- ALL ELEVATIONS ARE REFERENCED FROM FINISHED MAIN FLOOR = 100'-0" HIGH ROOF TRUSS BEARING = 115'-4 1/2"
- LOW ROOF TRUSS BEARING = 109'-1 1/8"



SCALE: 3/16" = 1'-0"





(2) L4 x 3 1/2" x 1/4" A SAFE ROOM ROOF FRAMING S2.2 1/4" = 1'-0"

BAALMAN **ARCHITECTS**

Michael J. Baalman ARCHITECT
License#: A-2012004035
Certificate of Authority:

#2 Daniel Drive

O'Fallon, MO 63366 ph: 636.294.9811

2014003655 CIVIL ENGINEER

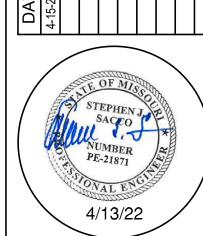
221 Point West Blvd. St. Charles, Missouri 63301 Phone: 636-928-5552
Contact: Mark Struckhoff, P.E. mstruckhoff@baxengineering.com STRUCTURAL,

BAX ENGINEERING CO., INC.

MECHANICAL, PLUMBING &
ELECTRICAL
CASE ENGINEERING, INC.
796 Merus Court
St. Louis, Missouri 63026
Certificate of Authority No. 001498 Structural Contact: Ardie Mansouri, P.E. Phone: 636-349-1600 ext 291

amansouri@caseengineeringinc.com Mechanical, Plumbing, Electrical Contact: Jim Eyre, P.E. jeyre@caseengineeringinc.com Phone: 636-349-1600 ext 258

New Base Station #2 Facility for:
Lincoln County
Ambulance District



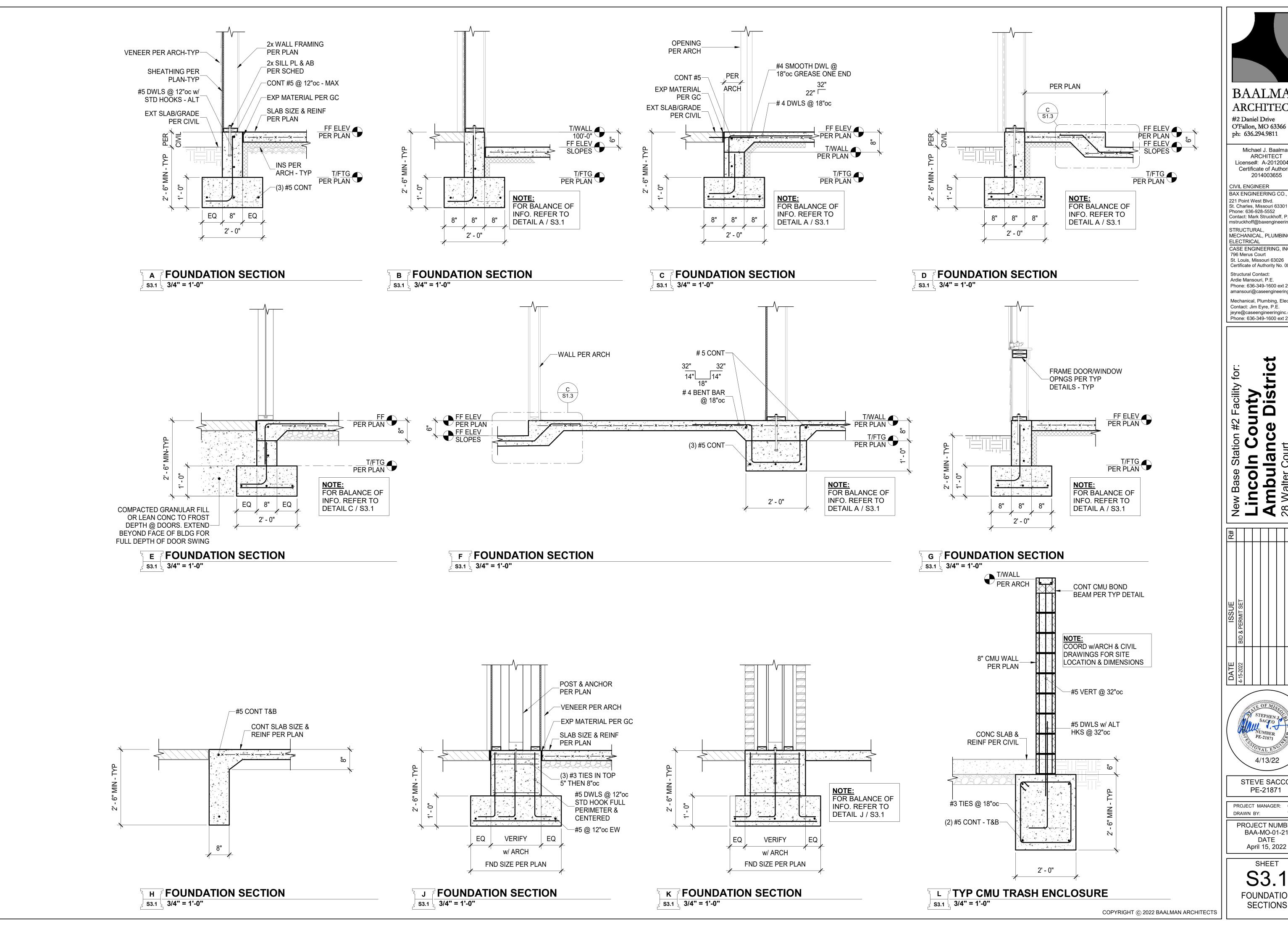
STEVE SACCO PE-21871

PROJECT MANAGER: CS DRAWN BY:

PROJECT NUMBER BAA-MO-01-21 DATE

April 15, 2022 SHEET S2.2

ROOF FRAMING PLAN



BAALMAN ARCHITECTS #2 Daniel Drive

Michael J. Baalman ARCHITECT License#: A-2012004035 Certificate of Authority:

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mstruckhoff@baxengineering.com STRUCTURAL, MECHANICAL, PLUMBING & ELECTRICAL

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Sounty ce District Lincoln Cou Ambulance 28 Walter Court Moscow Mills, Missou



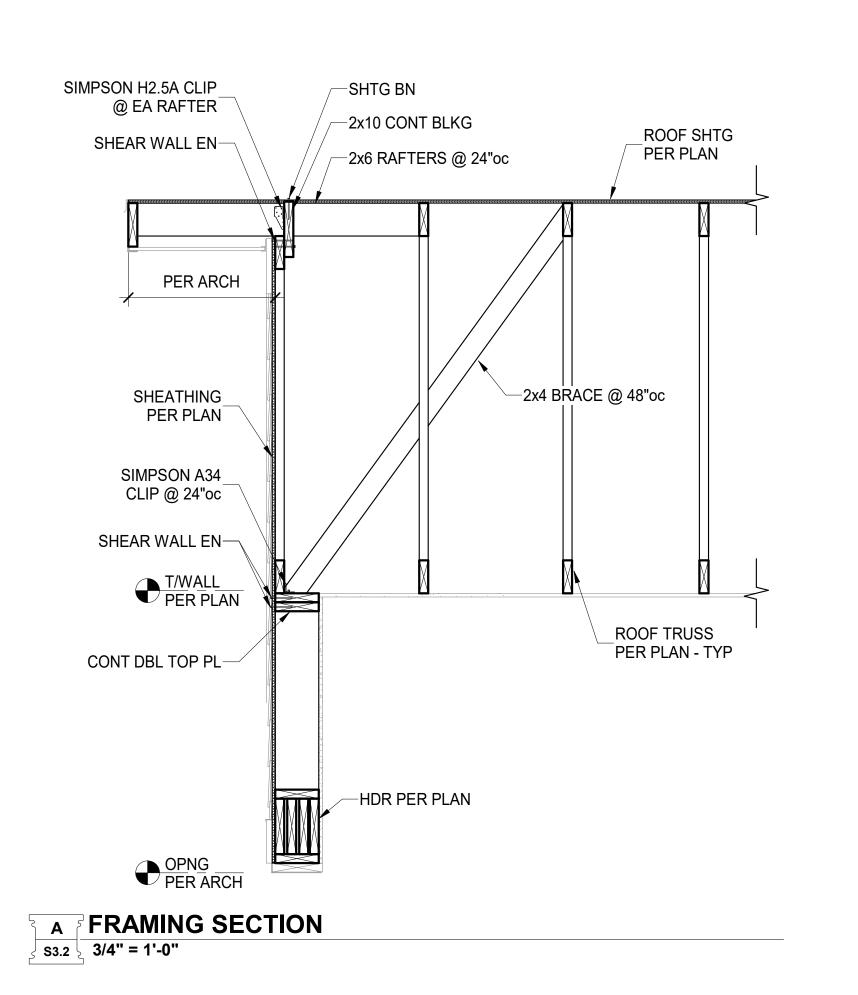
STEVE SACCO PE-21871

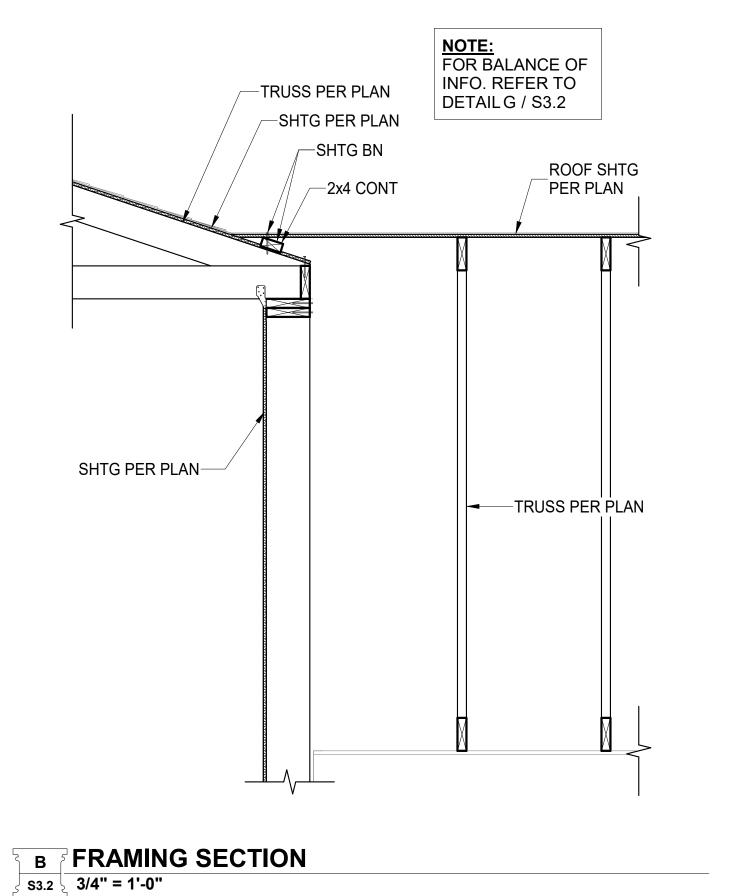
PROJECT MANAGER: CS DRAWN BY:

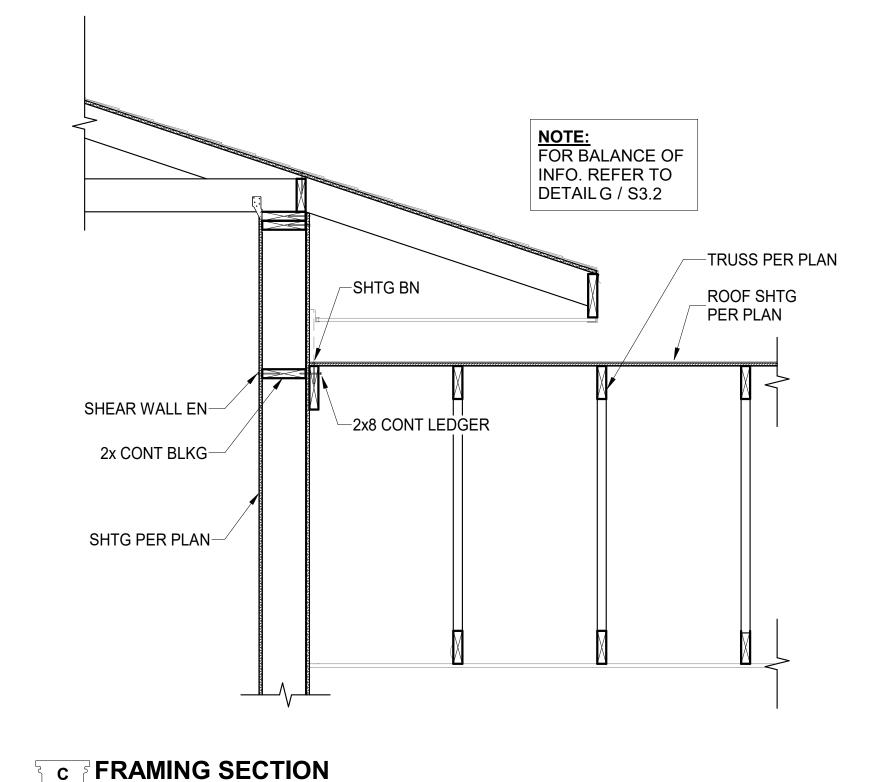
PROJECT NUMBER BAA-MO-01-21 DATE April 15, 2022

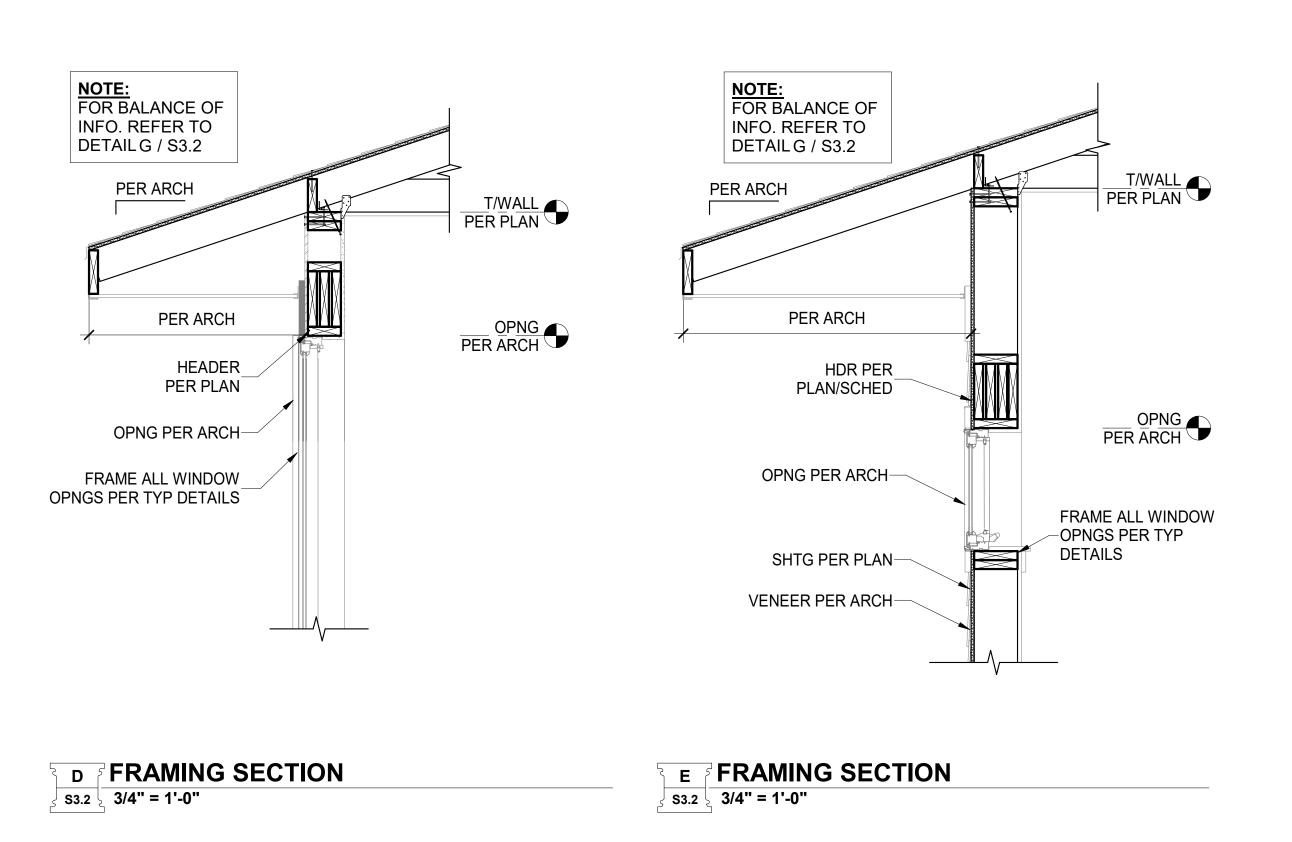
SHEET S3.1

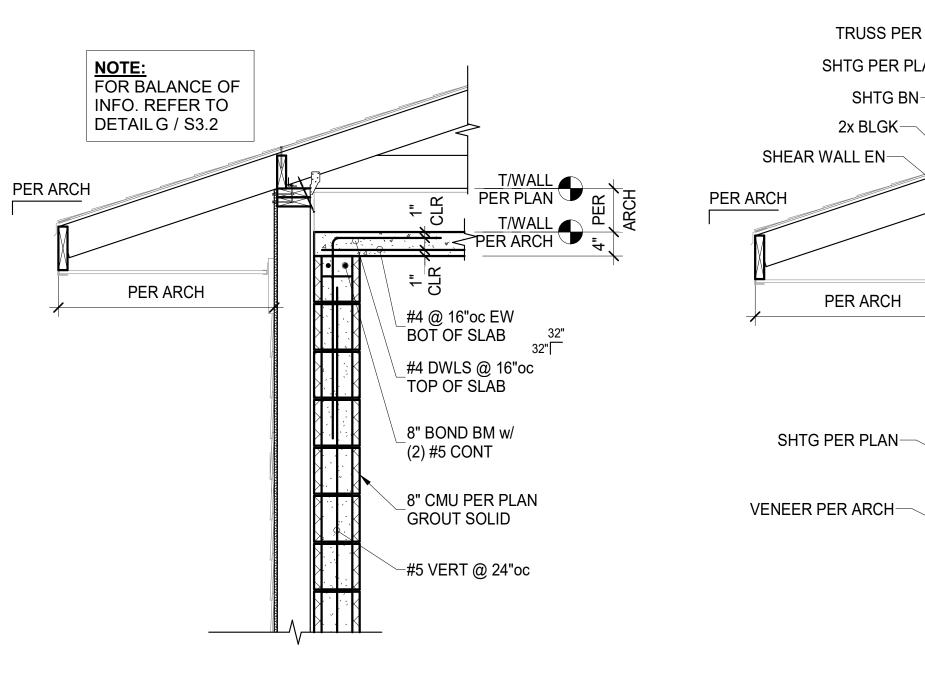
FOUNDATION SECTIONS







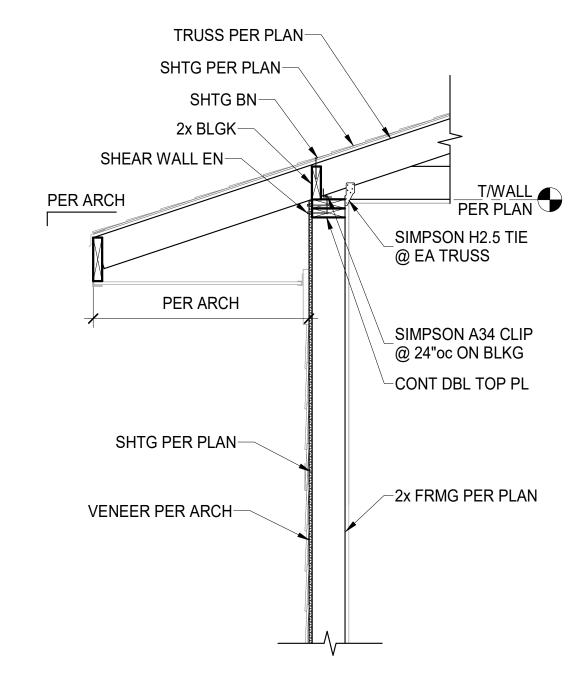




F FRAMING SECTION

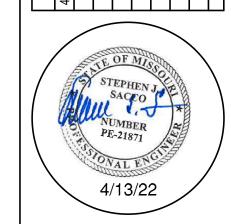
s3.2 3/4" = 1'-0"

S3.2 3/4" = 1'-0"



G FRAMING SECTION

S3.2 3/4" = 1'-0"



BAALMAN

ARCHITECTS

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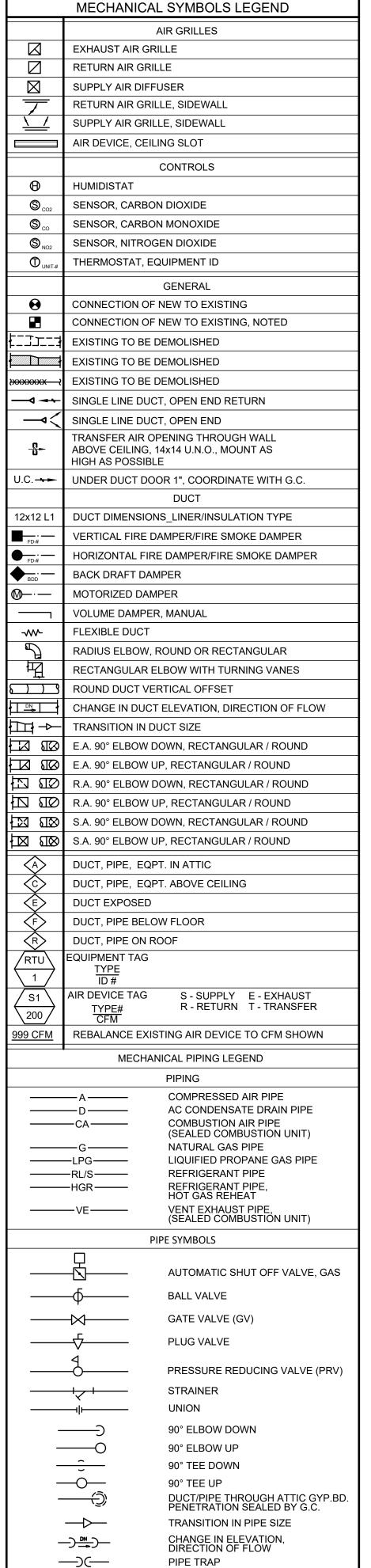
STEVE SACCO PE-21871

PROJECT MANAGER: CS
DRAWN BY: TJH

PROJECT NUMBER BAA-MO-01-21 DATE April 15, 2022

SHEET
S3.2
FRAMING
SECTIONS





PIPE APPLICATION 1 ATT AC COND. CONTROLLS TO A CON	STIAUS ALLIANS	RICHUNGS	Unisk	
PIPE MATERIAL			(K)	(LE)
COPPER TUBE: (ASTM B 88, TYPE K OR L) OR ASTM B 280, TYPE ACR. WROUGHT-COPPER FITTINGS: ASME B16.22. SOLDER: ASTM B 32 USE 95-5 TIN ANTIMONY OR ALLOY HB SOLDER TO JOIN COPPER SOCKET FITTINGS ON COPPER PIPE. BRAZING METALS: AWS A5.8.	•			
STEEL PIPE SCHEDULE 40: ASTM A 53, TYPE E OR S, GRADE B. FITTINGS: MALLEABLE-IRON, THREADED, ASME B16.3, CLASS 150, STANDARD PATTERN.		•		
STEEL PIPE SCHEDULE 40: ASTM A 53, TYPE E OR S, GRADE B. FITTINGS: WROUGHT-STEEL WELD, ASTM A 234 FOR BUTT WELDING AND SOCKET WELDING.		•		
ANNEALED-TEMPER COPPER TUBE: ASTM B 88, TYPE L. FITTINGS: ASME B16.22, WROUGHT COPPER, AND STREAMLINED PATTERN. BRAZING METALS: ALLOY WITH MELTING POINT > 1000 DEG F, AWS A5.8. BRAZING ALLOYS CONTAINING MORE THAN 0.05 PERCENT PHOSPHORUS ARE PROHIBITED.		•		
PVC PLASTIC, SOLID WALL: ASTM D 1785, SCHEDULE 40. FITTINGS: PVC SOCKET-TYPE, ASTM D 2466.			♦	
CPVC PLASTIC: ASTM F 441, SCHEDULE 40. FITTINGS: CPVC SOCKET-TYPE, ASTM F 438.			♦	• •
PIPE INSULATION (2009 IECC)				
PIPE DIAMETER: ALL; 1/2" THICK INSULATION			A	
PIPE DIAMETER: ≤ 1.5"; 1-1/2" THICK INSULATION	A			
PIPE DIAMETER: ≥ 1.5"; 2" THICK INSULATION	A			
INSULATION TYPE				
	000	EXTER	SIOR	

	WATER	R PIPE SUPPO	RT SCHEDUL	.E							
NOMINAL PIPE DIAMETER NPS (IN)		MAXIM	UM SUPPORT SPA (FEET)	ACING	CING						
	STEEL PIPE	COPPER TUBE	SCH 40 PVC		SCH 40 CPVC						
			60°F	73°F	100°F	120°F	140				
1/2	7	8	-	5	4.5	4.5	4				
3/4	7	9	5	5	5	4.5	4				
1	7	9	5.5	5.5	5.5	5	4.				
1 1/4	9	12	5.5	5.5	5.5	5.5	5				
1 1/2	9	12	6	6	5.5	5.5	5				
2	10	13	6	6	6	5.5	5				

1. INSTALL ALL PIPING, PIPE INSULATION, AND JACKETING IN STRICT ACCORDANCE WITH

3. DO NOT INSTALL ANY PIPING ABOVE ELECTRICAL PANELS AND/OR TRANSFORMERS.

5. PAINT PIPE PER ARCHITECT'S DIRECTION OR PER OWNER'S OR BUILDING STANDARD.

MANUFACTURER'S WRITTEN INSTRUCTIONS, AND PER APPLICABLE CODE AND AHJ'S

2. ALL MATERIALS INSTALLED IN PLENUM SPACES SHALL CONFORM WITH NFPA 90A AND NFPA

1	 	OR STRAIGHT HO ALVES, SPECIALTI	RIZONTAL PIPE. F ES, ETC.	ROVIDE	SUPPO	RTS ON	EACH

		GAS FU	IRNA	4CE	SCI	HED	ULE					
MFR: 0	CARRIER	FAN										
PLAN MARK	MODEL	INPUT/OUTPUT (MBH)	EFF. %	CFM	O.A. CFM	(HP)	E.S.P. (IN.W.G.)	V/PH/60	WEIGHT (LBS)	REMARKS		
GF-1	59SP6A080V2120	80.0/78.0	96.0	2000	400	1.0	0.5	115/1/60	161	1,2,3,4,5,6,7,		

ALUMINIZED STEEL INSHOT BURNERS, ALUMINIZED STEEL TUBULAR HEAT EXCHANGER, HOT ECM MULTI SPEED CONSTANT TORQUE FAN MOTOR, SPEED MEDIUM-HIGH.

- PROVIDE FULL DIAMETER AIR AND EXHAUST AIR VENT CONNECTIONS.
- PROVIDE VIBRATION ISOLATION PADS.
- MOTORIZED OUTDOOR AIR DAMPER. EXPANSION COIL MODEL: CAPMP6121ALA, "A" CONFIGURATION.

REQUIREMENTS.

90B AND BE LABELED ACCORDINGLY.

4. LABEL PIPE PER BUILDING STANDARD OR AS SCHEDULED.

- ELECTRICAL DISCONNECT AND RETURN AIR SMOKE DETECTOR BY E.C. PROVIDE WITH ELECTRONIC PROGRAMMABLE THERMOSTAT WITH REMOTE AVERAGING
- SENSORS AS SHOWN ON PLAN.

CU-1 | 24ACC46A003 | 56.5/43.9 | 14 | 95 | PER I.O.M. | 230/1/60 | 12.8/20 |

		CONDI	ENS	ING	UNIT SO	CHEDU	JLE		
MFR: C	ARRIER		CC	OLING		ELEC	CTRICAL		
MARK	MODEL	NET TTL/SENS MBH	SEER	AMB. °F	LINE SET I.D. IN.	V/PH/HZ	MCA/MOCP	WEIGHT (LBS)	REMARKS

PIPING IN STRICT ACCORDANCE WITH MANUFACTURER'S I.O.M. INSULATE PIPE PER MANUFACTURER'S I.O.M. INSULATE WITH 1" THICK ELASTOMERIC INSULATION.

PRIOR TO INSTALLATION, CONFIRM REFRIGERANT PIPE ROUTE. SIZE AND INSTALL REFRIGERANT

- ALL INSULATED PIPE ON BUILDING EXTERIOR SHALL BE WRAPPED WITH 30 MIL PVC JACKET. REFRIGERANT: R410A
- FEATURES: HIGH PRESSURE SWITCH (MANUAL RESET), TWO STAGE SCROLL COMPRESSOR, HI-CAPACITY DRIER FACTORY INSTALLED IN LIQUID LINE, LOW PRESSURE SWITCH, CRANKCASE

	HEATER, COIL HAIL GUARDS.	
5.	THERMAL EXPANSION VALVE, FIELD INSTALLED.	
6.	ELECTRICAL DISCONNECT BY E.C.	

MFR: CAR	RIER			DLSS					EATING		REFRIGERANT	ELEC.	TRICAL		
				TOTAL	AMB.	1	REFG.		AMB.		PIPING LIQUID-SUCTION			WEIGHT	
MARK	AREA SERVED	MODEL	(CFM)	(BTUH)	(°F)	EER	TYPE	(BTUH)	(°F)	COP	(I.D. IN.)	V/PH/HZ	MCA/MOCP	(LBS)	REMARKS
HP-1	IT	MPB012S4S-1L	-	12,000	95.0	13.0	R410A	4.470	5.0	4.06	1/4"-1/2"	115/1/60	15.0/20	80	1,2,3,4
FCU-1	"	MWMB012S4-2L	365	12,000	95.0	13.0	K410A	4,470	5.0	4.00	1/4 - 1/2	•	-	20	1,2,5,4

	AIR HOOD SCHEDULE												
М	FR: COOK			LISTED	FREE		FACE	ΔΡ		WEIGHT			
MARK	SERVES	MODEL NO.	CFM	SIZE LxW (IN.)	AREA SQ. FT.	FINISH MEDIUM	VELOCITY F.P.M.	(IN.W.C.)	INTAKE/ EXHAUST	LBS.	REMARKS		
IAH-1	GF-1	PR-12	300	Ø12	0.852	PAINTED	612	0.03	INT	-	1		
IAH-2	APP. BAYS 125	TRE	975	14x14x2	2.5	PAINTED	390	0.09	INT	-	1		
ERJ-1	EF-1	RJR100	110	Ø6	0.196	PAINTED	561	0.09	EXH	-	2		

- INTAKE AIR HOOD, MILL FINISH ALUMINUM, ALUMINUM BIRD SCREEN, 24V LOW LEAK TYPE MOTORIZED DAMPER, 14" FACTORY CURB, CURB SLOPED TO ROOF PITCH, PAINT CURB AND HOOD TO MATCH ROOF COLOR.
- EXHAUST ROOF JACK COLOR TO MATCH ROOF

PROVIDE FCU WITH FACTORY CONDENSATE PUMP.

	AIR DEVICE SCHEDULE														
PLAN MARK	MANUFACTURER	MODEL	MTL.	MAX. CFM	NECK SIZE	FRAME TYPE	COLOR	PATTERN	FACE SIZE	ΔP (IN.W.G.)	REMARKS				
S1	TITUS	CT-PP-3	AL	230	6"x12"	5 HD	BRNZ	30°	8"x14"	0.10	1				
S2	TITUS	301FS	AL	115	6"x6"	1	CLR ANON.	1	10"x10"	0.10	2				
R1	HART & COOLEY	672	ST	220	12"x8"	SURFACE	WHT		14"x10"	0.05	3				
R2	HART & COOLEY	672	ST	575	14"x18"	SURFACE	WHT		16"x20"	0.05	3				
R3	TITUS	350FL	AL	1240	18"x18"	1	CLR ANON.		22"x22"	0.05	-				
E1	TITUS	350FL	ST	950	12"x22"	1	CLR ANON.	-	16"x26"	0.07	-				

- FLOOR MOUNT, HEAVY DUTY BORDER TYPE 5 WITH HEAVY DUTY CORE, BRONZE ANONDIZED FACTORY FINISH, WITH MODEL AG-35 OBD.
- PROVIDE FACTORY OPPOSED BLADE DAMPER IN GRILLE
- CEILING MOUNT GRILLE WITH FACTORY OPPOSED BLADE

	DUCT INSULATION SCHEDULE													
					R				DUCT	DUCT				
TAG	MATERIAL	MFR.	TYPE	PCF	FT ² HR F	THICKNESS	LAYERS	JACKET	DIMENSION	APPLICATION	REMARKS			
L1	FIBERGLASS	KNAUF	LINER	1.5	4.2	1"	1	-	S.M.	Α	1,2,3			
W1	FIBERGLASS	KNAUF	WRAP	1.5	*4.8	1-1/2"	1	FSK	S.M.	B,C	1,2,3			
	FIBERGLASS	KNAUF	WRAP	1.5	*9.6	1-1/2"	2	FSK			4.0.0.4			

* ACTUAL INSTALLED R-VALUE AT 25% COMPRESSION. S.M.: DUCT DIMENSIONS ARE SHEET METAL DIMENSIONS. WHERE LINER IS INDICATED, DIMENSION INCLUDES LINER THICKNESS.

- INSTALL IN STRICT ACCORDANCE WITH MANUFACTURER'S I.O.M.
- COMPLIES WITH: NFPA 90A, 90B; ASTM E84; UL 723. COMPLIES WITH NFPA 255.
- MINIMUM COMBINED R-VALUE" 14.8
- APPLICATIONS--GF SUPPLY AIR PLENUM TO GYPSUM BOARD, RETURN AIR BOOTS, GAS FURNACE RETURN AIR DUCTS

FIBERGLASS KNAUF LINER 1.5 4.2 1" 1

- OUTSIDE AIR DUCT, FULL LENGTH EXHAUST AIR DUCT IN ATTIC
- RECTANGULAR SUPPLY AIR DUCT IN ATTIC

	EXHAUST FAN SCHEDULE													
MANUF	ACTURER: LOREN (ESP			МОТО)R		WEIGHT						
MARK	AREA SERVED	MODEL	CFM	IN.W.G.	SONES	DRIVE	RPM	HP	V/PH/HZ	LBS.	CONTROL	REMARKS		
EF-1	TLT 112	GC-148	75	0.5	2.0	DIRECT	1075	36.7W	115/1/60	12	А	2,3		
EF-2	TLT 114	GC-148	75	0.5	2.0	DIRECT	1075	36.7W	115/1/60	12	S	2,3		
EF-2	TLT 118	GC-148	75	0.5	2.0	DIRECT	1075	36.7W	115/1/60	12	S	2,3		
EF-3	JAN 124	GC-148	75	0.5	2.0	DIRECT	1075	36.7W	115/1/60	12	S	2,3		
EF-4A	APP. BAYS 125	120C13D	910	0.5	7.4	DIRECT	1300	0.25	115/1/60	30	G	1,4		
EF-4B	APP. BAYS 125	GC-148	75	0.5	2.0	DIRECT	1075	36.7W	115/1/60	12	С	2,3		

A: CONTROL WITH RESTROOM LIGHTING. SEE

FAN CONTROLLED VIA (CO) CARBON MONOXIDE ANI

NITROGEN OXIDE (NOx) SENSOR/DETECTOR.

S: CONTROLLED BY WALL SWITCH, SEE ELECTRICAL.

FAN OPERATES CONTINUOUSLY

- PROVIDE ALUMINUM ROOF CURB SLOPED TO MATCH ROOF PITCH, PAINT CURB TO MATCH ROOF. PROVIDE LOW LEAK 24V MOTORIZED DAMPER INTERLOCKED TO EF. DISCONNECT BY E.C. TERMINATE THROUGH ROOF WITH ROOF JACK, MAINTAIN MINIMUM
- 10'-0" HORIZONTAL SEPARATION BETWEEN EF DISCHARGE AND OA
- CEILING FAN WITH FACTORY INSTALLED DISCONNECT, BACKDRAFT DAMPER, ALUMINUM CEILING GRILLE, FLEXIBLE DUCT CONNECTION, AND VIBRATION ISOLATION MOUNTING. PROVIDE BRASCH GENERATION 2 MULTI-ZONE CONTROLLER
- (GDCP-TOUCH) TO CONTROL FAN. ON RISE IN CO OR NOx, CONTROLLER ENERGIZES FAN. WHEN GAS LEVELS DROP BELOW SETPOINT FAN DEENERGIZES.

TUBULAR RADIANT HEATER SCHEDULE										
FR: REVERB	BERRAY									
MARK	MODEL NO.	GAS IN/OUT (MBH)	TUBE LENGTH	V/PH/HZ	ACCESSORIES					
TRH-1	HL3-40-100	100.0/80.0	22'-9"	115/1/60	SEE BELOW					

PROVIDE COMPLETE WITH:

1. 304 CSST FLEXIBLE GAS CONNECTION.

2-STAGE GAS VALVE HOT SURFACE IGNITER.

197 1,2,3,4,5,6

- 4. 2-STAGE 24V THERMOSTATIC CONTROL (INTERNAL TRANSFORMER). 5. TYPE B VENT KIT WITH WEATHER CAP.
- 6. FACTORY COMBUSTION AIR ROOF INTAKE VENT. 7. STAINLESS STEEL TILTABLE REFLECTORS.
- NOTE: INSTALL IN STRICT ACCORDANCE WITH MANUFACTURER'S I.O.M.

BAALMAN

ARCHITECTS

Michael J. Baalman

ARCHITECT

License#: A-2012004035

Certificate of Authority:

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Contact: Jim Eyre, P.E.

Phone: 636-928-5552

O'Fallon, MO 63366

ENGINEER MO# E-23303

PROJECT MANAGER: JE

DRAWN BY: CK

PROJECT NUMBER 21-079 DATE April 15, 2022

SCHEDULES

MECHANICAL SPECIFICATIONS

- A. THE GENERAL CONDITIONS OF THE GENERAL SPECIFICATIONS, AND ALL APPLICABLE INSTRUCTIONS TO BIDDERS SHALL BE PART OF THESE
- "PROVIDE" AS USED HEREIN MEANS TO FURNISH AND INSTALL
- C. "FURNISH" AS USED HEREIN MEANS TO PURCHASE AND DELIVER TO THE PROJECT SITE IN UNDAMAGED CONDITION. WHERE APPLICABLE, SUBMIT FOR REVIEW AND APPROVAL AND COORDINATE WITH THE CONTRACT
- D. "INSTALL" AS USED HEREIN MEANS TO STORE AND PROTECT FROM DAMAGE, INSTALL PER MANUFACTURER'S WRITTEN INSTRUCTIONS, AND MAKE ALL CONNECTIONS COMPLETE.
- E. THE TERM "CONTRACTOR" AS USED HEREIN MEANS ANY CONTRACTOR OR SUBCONTRACTOR CONTRACTED TO PERFORM WORK INCLUDED IN AND DEFINED BY THIS SECTION.
- MECHANICAL WORK SHALL BE PROVIDED IN STRICT COMPLIANCE WITH THE 2015 IMC, AND ALL APPLICABLE LOCAL ORDINANCES, STATE LAWS AND FEDERAL LAWS.

- THOROUGHLY REVIEW THE BID INSTRUCTIONS INCLUDING ALL CIVIL, ARCHITECTURAL, STRUCTURAL, AND MEPFP CONSTRUCTION DOCUMENTS. OBTAIN AND THOROUGHLY EXAMINE THE MANUFACTURERS' WRITTEN INSTALLATION INSTRUCTIONS, DETAILS, AND REQUIREMENTS FOR THE SCHEDULED AND SPECIFIED EQUIPMENT AND MATERIALS. FOR AMBIGUOUS, CONTRADICTORY, OR CONFLICTING ITEMS WITHIN THE CONSTRUCTION DOCUMENTS, THE CONTRACTOR SHALL REQUEST CLARIFICATION IN A WRITTEN "REQUEST FOR INFORMATION" (RFI), AT LEAST FIVE (5) WORKING DAYS PRIOR TO BID DATE. RFI-RELATED WORK NOT CLARIFIED PRIOR TO BID SHALL BE PROVIDED PER THE ARCHITECT (ENGINEER) IN STRICT ACCORDANCE WITH THE MOST
- STRINGENT MATERIALS, EQUIPMENT, AND SCOPE OF WORK. IF THE CONTRACTOR BELIEVES THE DRAWINGS AND SPECIFICATIONS CONFLICT WITH CODE REQUIREMENTS, IMMEDIATELY NOTIFY THE ARCHITECT (ENGINEER) IN WRITING.
- NO ALLOWANCES WILL BE MADE DUE TO CONTRACTOR'S UNFAMILIARITY WITH THE CONSTRUCTION DOCUMENTS OR FOR THE FAILURE OF THE CONTRACTOR TO OBTAIN CLARIFICATIONS PRIOR TO BID. VISIT THE JOB SITE AND THOROUGHLY INVESTIGATE CONDITIONS. THE
- LACK OF SPECIFIC INFORMATION ON THE DRAWINGS SHALL NOT RELIEVE THE CONTRACTOR OF ANY RESPONSIBILITY. REFER TO APPLICABLE CODES CITED IN CONSTRUCTION DOCUMENTS,
- EXAMINE GOVERNING STATE AND LOCAL CODES, AND LOCAL REGULATIONS AND ORDINANCES, AND PROVIDE ALL EQUIPMENT AND INSTALLATION IN STRICT ACCORDANCE WITH SAME. REFER TO CONSTRUCTION DOCUMENTS FOR SCHEDULED AND
- SPECIFIED MATERIALS AND EQUIPMENT. INSTALLATION SHALL BE IN STRICT ACCORDANCE WITH MANUFACTURERS' WRITTEN INSTRUCTIONS AND DETAILS.

A. SUBMISSION OF A BID ACKNOWLEDGES THAT THE CONTRACTOR HAS REVIEWED THE BID INSTRUCTIONS, HAS VISITED THE SITE, EXAMINED ALL CONSTRUCTION DOCUMENTS, AND AGREES TO ALL ITEMS AND CONDITIONS WITHIN THE CONSTRUCTION DOCUMENTS. THE CONTRACTOR'S BID SHALL INCLUDE ALL MECHANICAL WORK IN THE CONSTRUCTION DOCUMENTS, INCLUDING MECHANICAL WORK RELATED TO EQUIPMENT FURNISHED/PROVIDED BY OTHERS.

A. SECURE AND PAY FOR ALL PERMITS, LICENSES, AND INSPECTIONS REQUIRED BY THE AHJ FOR THIS WORK.

MANUFACTURERS' EQUIPMENT, APPLIANCES, AND MATERIALS SCHEDULED, NOTED, AND SPECIFIED IN THE CONSTRUCTION DOCUMENTS ARE THE DESIGN STANDARD. NO SUBSTITUTIONS WILL BE ALLOWED WITHOUT PRIOR WRITTEN APPROVAL BY THE ARCHITECT OR ENGINEER. IN BIDDING, CONTRACTOR SHALL NOT ASSUME ACCEPTANCE OF SUBSTITUTIONS. CONTRACTOR MUST STATE IN SUBSTITUTION REQUEST: "PROPOSED SUBSTITUTIONS ARE OF EQUAL OR HIGHER QUALITY, EFFICIENCY AND DEPENDABILITY COMPARED TO THE SPECIFIED EQUIPMENT AND MATERIAL. CONTRACTOR ASSUMES FULL RESPONSIBILITY FOR ADDITIONAL ENGINEERING COSTS AND COSTS TO OTHER CONTRACTORS DUE TO SUBSTITUTIONS." IF DEEMED NECESSARY BY THE ARCHITECT OR ENGINEER, SUBSTITUTIONS WHICH ARE NOT APPROVED OR NOT EQUAL TO DESIGN STANDARD SHALL BE REMOVED AND THE SCHEDULED, NOTED, AND SPECIFIED EQUIPMENT AND MATERIALS SHALL BE INSTALLED AT CONTRACTOR'S EXPENSE. SUBMITTING CONTRACTOR ASSUMES FULL RESPONSIBILITY FOR ADDITIONAL ENGINEERING COSTS AND COSTS TO OTHER CONTRACTORS DUE TO SUBSTITUTIONS.

- ALL PERFORMANCE OF CONSTRUCTION SHALL BE AS REQUIRED BY THE PACE OF THE GENERAL CONSTRUCTION, AS SCHEDULED BY THE GC. PROVIDE COMPLETE INFORMATION AND FULL COOPERATION WITH OTHER CONTRACTORS AND TRADES, AS REQUIRED FOR THE TIMELY COMPLETION AND COORDINATION OF THE COMPLETE PROJECT.
- PROVIDE ALL TESTS AND INSPECTIONS REQUIRED BY AHJ.
- PROVIDE A SIGNED CERTIFICATE OF INSPECTION AT THE PROJECT

- A. PROVIDE PERMIT(S), INSPECTIONS, FINAL CERTIFICATE(S) OF INSPECTION BY AHJ, PERMIT AND INSPECTION FEES, AND ALL MATERIALS, EQUIPMENT, RIGGING, AND LABOR NECESSARY FOR A COMPLETE AND FULLY OPERATING HVAC SYSTEM.
- B. THROUGHOUT CONSTRUCTION, THIS CONTRACTOR'S WORK SHALL INCLUDE ONGOING COORDINATION OF THIS WORK WITH THE CONSTRUCTION DOCUMENTS, THE WORK OF ALL OTHER TRADES, AND WITH UTILITY SERVICE(S) AND UTILITY CONNECTION(S). FOR AMBIGUOUS, CONTRADICTORY, OR CONFLICTING ITEMS WITHIN THE CONSTRUCTION DOCUMENTS, INCLUDING BUT NOT LIMITED TO THE ACTUAL UTILITY SERVICE AND CONNECTION REQUIREMENTS, THE CONTRACTOR SHALL REQUEST CLARIFICATION IN A WRITTEN "REQUEST FOR INFORMATION" (RFI). RFI SHALL BE ISSUED WITHOUT DELAY AND PRIOR TO PROCEEDING WITH ANY RFI-SUBJECT WORK. RFI NOT CLARIFIED PRIOR TO BID SHALL BE PROVIDED PER THE ARCHITECT (ENGINEER) IN STRICT ACCORDANCE WITH THE MOST STRINGENT MATERIALS, EQUIPMENT, AND SCOPE OF WORK, AT NO ADDITIONAL COST TO THE OWNER.
- PROVIDE HOISTING FOR ALL MATERIALS AND EQUIPMENT FURNISHED AND/OR INSTALLED, IN ACCORDANCE WITH ALL CITY, STATE AND FEDERAL RULES AND REGULATIONS.
- INSTALL ALL WORK AND EQUIPMENT RIGID, DEAD LEVEL, PLUMB, AND TRUE-TO-LINE. UNLESS NOTED OTHERWISE, SUPPORT AND MOUNTING OF EQUIPMENT, DUCT, PIPING, ETC., ARE THIS CONTRACTOR'S MEANS AND METHODS. THE CONTRACTOR SHALL UNDERSTAND THE SPECIFIED AND SCHEDULED EQUIPMENT AND MATERIALS AND MEANS AND METHODS OF INSTALLATION. THIS CONTRACTOR SHALL PROVIDE ALL ACCESSORIES REQUIRED FOR PROPER SUPPORT WHETHER SHOWN ON THE DRAWINGS OR NOT. IF SUPPORTS ARE REQUIRED, CONTRACTOR SHALL SUBMIT DRAWINGS TO THE ARCHITECT FOR APPROVAL
- PROVIDE ACCESSORY MOUNTING HARDWARE INCLUDING BUT NOT LIMITED TO STRUCTURAL STEEL, STRUT SYSTEMS, ALL THREAD RODS, AND BRACES, AS REQUIRED TO MOUNT EQUIPMENT. PROVIDE STEEL SHAPES AND FRAMES TO SUPPORT EQUIPMENT WHERE NEEDED. ALL SYSTEMS SHALL BE SUPPORTED INDEPENDENT OF AND ISOLATED FROM **EQUIPMENT VIBRATION.**
- F. PRODUCTS SHALL BE INSTALLED IN ACCORDANCE WITH

- MANUFACTURERS' PRINTED INSTALLATION AND MAINTENANCE LITERATURE. COMPONENTS REQUIRING PERIODIC MAINTENANCE OR ADJUSTMENTS SHALL BE INSTALLED AS TO PERMIT ACCESS WITHOUT DAMAGE TO STRUCTURE, FINISHES, OR OTHER EQUIPMENT.
- G. PROVIDE ALL LABOR, EQUIPMENT AND MATERIAL REQUIRED FOR THE REINSTALLATION AND RE-SUPPORT OF EXISTING SERVICES (DUCTWORK, ELECTRICAL CONDUIT, PIPING, EXISTING EQUIPMENT, ETC.) DISTURBED BY THE INSTALLATION OF NEW WORK UNDER THIS CONTRACT.
- H. CONTRACTOR SHALL PROVIDE DAILY CLEAN-UP, REMOVAL AND LEGAL DISPOSAL OF ALL RUBBISH GENERATED BY THIS WORK.
- AS-BUILT DRAWINGS: DURING CONSTRUCTION, AS WORK PROCEEDS, MAINTAIN AS-BUILT MARK-UPS OF ACTUAL INSTALLATION. AT CONSTRUCTION COMPLETION AND PRIOR TO TURNOVER TO OWNER, PROVIDE FINAL MARK-UPS IN PDF AND DWG FORMAT TO ARCHITECT AND
- PROVIDE FINAL CONNECTIONS TO EQUIPMENT FURNISHED/PROVIDED BY OTHERS, AS NOTED (KITCHEN EQUIPMENT, LAUNDRY EQUIPMENT, ETC.).
- DO NOT ROUTE ANY PIPING OR DUCTWORK ABOVE ELECTRICAL PANELS. UNLESS NOTED OTHERWISE, ALL DUCT AND PIPE SHALL BE RUN
- PARALLEL TO OR AT RIGHT ANGLES TO WALLS, BEAMS, OR COLUMNS. PIPE SHALL BE RUN AS DIRECT AS POSSIBLE - AVOID UNNECESSARY OFFSETS AND MAXIMIZE HEADROOM. M. PRIOR TO ORDERING EQUIPMENT, THIS CONTRACTOR SHALL PROVIDE
- ELECTRICAL CONTRACTOR. N. CONTRACTOR SHALL MAINTAIN ACTIVITIES WITHIN AREA APPROVED BY OWNER OR GC. CONTRACTOR'S ACTIVITIES SHALL NOT INTERFERE WITH

THE OWNER'S OPERATIONS, EXCEPT AS APPROVED.

FINAL COORDINATION OF ELECTRICAL POWER REQUIREMENTS WITH THE

O. EXCEPT THOSE COORDINATED AND APPROVED BY THE G.C., CONTINUITY OF ALL BUILDING SERVICES AND UTILITIES SERVING BUILDING FACILITIES SHALL BE MAINTAINED UNINTERRUPTED AT NO ADDITIONAL COST. PROVIDE ALL NECESSARY CROSS CONNECTIONS AND TEMPORARY CONNECTIONS REQUIRED TO PERFORM THE CONSTRUCTION, AS DETERMINED BY THE G.C., AND NEEDED TO MAINTAIN CONTINUITY OF THE BUILDING SERVICE(S). THIS CONTRACTOR SHALL SCHEDULE WORK SUCH THAT ANY AND ALL CONNECTIONS, AND/OR REARRANGEMENT OF EXISTING EQUIPMENT, PIPING, ETC., SHALL ASSURE FULL RESUMPTION OF SERVICE(S) AT THE G.C.'S DESIGNATED TIME.

ALL WORK SHALL COMPLY WITH THE CONSTRUCTION DOCUMENTS OR, AS DIRECTED BY THE ARCHITECT (ENGINEER), AND SHALL BE PERFORMED IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, ORDINANCES, AND REGULATIONS OF THE AHJ, WHETHER SO SHOWN OR NOT. CONTRACTOR SHALL BE FAMILIAR WITH PROVISIONS OF ALL APPLICABLE CODES AND SHALL ENSURE THE WORK COMPLIES WITH ALL LOCAL, STATE AND FEDERAL CODES, TRADE STANDARDS AND MANUFACTURER'S RECOMMENDATIONS. IF CONTRACTOR BELIEVES THE DRAWINGS AND/OR SPECIFICATIONS CONFLICT WITH CODE REQUIREMENTS, IMMEDIATELY NOTIFY THE G.C. IN WRITING. DO NOT INSTALL WORK NOT COMPLYING WITH CODE REQUIREMENTS. IN CASE OF CONFLICT BETWEEN THE CONSTRUCTION DOCUMENTS AND THE CODES AND ORDINANCES, THE HIGHEST STANDARD SHALL APPLY. AS A MINIMUM STANDARD, CONTRACTOR SHALL SATISFY CODE REQUIREMENTS. ALL MODIFICATIONS REQUIRED BY AHJ SHALL BE MADE BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER. BEFORE COMMENCING WORK NOT SHOWN IN DOCUMENTS BUT REQUIRED TO ACHIEVE FULL COMPLIANCE WITH CODES, CONTRACTOR SHALL NOTIFY ARCHITECT (ENGINEER).

CORE-DRILL OR SAW-CUT EXISTING FLOORS, WALLS, ROOF, ETC., AS REQUIRED FOR EQUIPMENT, PIPE, OR DUCTWORK. PRIOR TO CUTTING, PERFORM NON-DESTRUCTIVE TESTING TO VERIFY LOCATION OF PIPING. CONDUIT, AND STRUCTURAL COMPONENTS, NOTIFY ARCHITECT (ENGINEER) OF ANY DISCREPANCIES. PATCH SURROUNDING AREAS FLUSH WITH ADJACENT SURFACE AND READY TO RECEIVE FINISH. PATCH AND REPAIR ROOF TO MATCH EXISTING ROOFING.

10. FIRE STOPPING

A. PROVIDE FIRE STOPPING FOR PENETRATIONS OF DUCT, PIPING, AND OTHER MECHANICAL EQUIPMENT THROUGH FIRE-RATED VERTICAL BARRIERS (WALLS AND PARTITIONS), HORIZONTAL BARRIERS (FLOOR/CEILING ASSEMBLIES), AND VERTICAL SERVICE SHAFT WALLS AND PARTITIONS. (WHERE THIS WORK IS BEING PERFORMED UNDER A GC, PRIOR TO INSTALLATION, THIS CONTRACTOR SHALL COORDINATE FIRESTOPPING WITH GC). FIRESTOP SYSTEM INSTALLATION MUST MEET REQUIREMENTS OF ASTM E 814 OR UL 1479 TESTED ASSEMBLIES THAT PROVIDE A FIRE RATING EQUAL TO OR GREATER THAN THAT OF CONSTRUCTION BEING PENETRATED. INSTALL IN STRICT ACCORDANCE WITH UL FIRE RESISTANCE DIRECTORY, AHJ, AND MANUFACTURER'S SPECIFIED REQUIREMENTS. ONLY TESTED FIRESTOP SYSTEMS BY "3M", "HILTI", OR EQUAL SHALL BE USED. REFER TO ARCHITECTURAL DRAWINGS FOR ASSEMBLY RATING.

11. MATERIALS AND WORKMANSHIP

- ALL MANUFACTURED ARTICLES, MATERIALS, AND EQUIPMENT SHALL BE NEW U.N.O., FREE OF DEFECTS, AND INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS AND DETAILS, AND INDEPENDENTLY TESTED AND LABELED BY A NATIONALLY RECOGNIZED TESTING LABORATORY - UNDERWRITERS LABORATORIES (UL) OR INTERTEK (ETL). ALL LIKE MATERIALS USED SHALL BE OF THE SAME MANUFACTURE AND QUALITY U.N.O.
- B. ALL MATERIALS WITHIN PLENUMS SHALL BE NONCOMBUSTIBLE OR SHALL HAVE A FLAME SPREAD INDEX OF NOT MORE THAN 25 AND A SMOKE DEVELOPED INDEX OF NOT MORE THAN 50 WHEN TESTED IN ACCORDANCE WITH ASTM E84 OR UL 723. ALL MATERIALS INSTALLED IN PLENUM SPACES SHALL BE LISTED AND LABELED FOR SUCH APPLICATION.
- C. ALL WORK SHALL BE SUPERVISED BY THE INSTALLING CONTRACTOR'S COMPETENT AND SKILLED FOREMAN. ALL WORK SHALL BE PERFORMED BY COMPETENT AND SKILLED WORKERS, WITH ALL TRADE AND MANUFACTURER REQUIRED TRAINING, AND EXECUTED IN A NEAT AND WORKMANLIKE MANNER. ALL WORK SHALL BE IN STRICT ACCORDANCE WITH THE BEST QUALITY STANDARDS OF THE TRADE AND IN CONFORMANCE WITH ALL FEDERAL, STATE, AND LOCAL CODES AND STANDARDS, INCLUDING APPLICABLE OSHA REGULATIONS. PROPERLY PROTECT WORK DURING CONSTRUCTION. AT CONSTRUCTION COMPLETION, THOROUGHLY CLEAN WORK AND REMOVE ALL DEBRIS FROM THE PREMISES.

12. PROTECTION OF WORK AND PROPERTY

- PROTECT ALL WORK FROM DAMAGE AND PROTECT THE OWNER'S PROPERTY FROM DIRT, DAMAGE, OR LOSS ARISING FROM CONTRACTOR
- COMPLY WITH OSHA REQUIREMENTS AND TAKE ALL NECESSARY PRECAUTIONS FOR EMPLOYEE SAFETY.
- PROTECT ALL OPEN PIPING, DUCT, AND EQUIPMENT, EXISTING AND NEW FROM CONSTRUCTION DIRT AND DUST. COVER, CAP, OR PLUG OPEN ENDS OF PIPING AND DUCT. KEEP EQUIPMENT CLOSED OR COVER AND SEAL EQUIPMENT OPENINGS. ANY MECHANICAL SYSTEMS, NEW AND/OR EXISTING OPERATED DURING CONSTRUCTION SHALL BE PROTECTED BY COVERING EACH RETURN AIR DUCT OPENING WITH MERV 8 FILTERS AND INSTALLING MERV 8 FILTER(S) IN EQUIPMENT FILTER RACK. PRIOR TO TESTING AND BALANCING, REMOVE FILTERS FROM FILTER RACKS AND INSTALL NEW MERV 8 FILTERS.
- AT COMPLETION OF WORK, PRIOR TO EQUIPMENT START-UP, REMOVE COVERS, CAPS, OR PLUGS ON DUCT AND PIPING.

A. THIS CONTRACTOR IS SOLELY RESPONSIBLE FOR ALL DAMAGES TO THE

PROPERTY (GROUNDS, WALKS, ROADS, BUILDING COMPONENTS, FINISHES, PIPING SYSTEMS, ELECTRICAL SYSTEMS, HVAC SYSTEMS, AND THEIR EQUIPMENT AND CONTENT) CAUSED BY LEAKS IN THE SYSTEMS BEING INSTALLED OR HAVING BEEN INSTALLED AS PART OF THIS WORK. ALL REPAIRS WILL BE MADE AT THIS CONTRACTOR'S EXPENSE.

DRAWINGS AND SPECIFICATIONS

- A. DRAWINGS ARE DIAGRAMMATIC AND INTENDED TO SHOW GENERAL LOCATIONS OF DUCTS, PIPES, AND EQUIPMENT AND THE METHODS OF CONNECTING AND CONTROL. THE DRAWINGS SHALL BE FOLLOWED AS CLOSELY AS ACTUAL BUILDING CONDITIONS AND THE WORK OF OTHER TRADES PERMIT. THE DRAWINGS ARE NOT INTENDED TO SHOW EVERY CONNECTION IN DETAIL OR ALL OFFSETS, TRANSITIONS, OR FITTINGS REQUIRED FOR A COMPLETE SYSTEM NOR IS IT IMPLIED THAT ALL CONFLICTS BETWEEN BUILDING ELEMENTS AND/OR OTHER TRADES ARE INDICATED. DO NOT SCALE DRAWINGS. EXAMINE FIELD CONDITIONS AND SEE ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR EXACT LOCATION OF DOORS, WINDOWS, LIGHTS, ETC.
- B. THE DRAWINGS AND SPECIFICATIONS ARE MUTUALLY COMPLEMENTARY, AND ANY WORK REQUIRED BY ONE BUT NOT BY THE OTHER SHALL BE REQUIRED BY BOTH.
- C. PRIOR TO INSTALLING EQUIPMENT, DUCT, OR PIPE COORDINATE PROPOSED LOCATIONS WITH EACH TRADE/DISCIPLINE AND GC. EXAMINE EACH DISCIPLINE'S DRAWINGS FOR CONSTRUCTION DETAILS, CEILING HEIGHTS, REQUIRED CLEARANCES, AND SPACE CONSTRAINTS. PROVIDE SYSTEMS INSTALLATION BASED ON THIS EXAMINATION AND COORDINATION. IMMEDIATELY REPORT INSTALLATION CONFLICTS IN WRITING TO THE GC. RESOLVE ALL CONFLICTS WITH GC AND OTHER TRADES PRIOR TO PROCEEDING. INSTALLING CONTRACTOR IS FULLY RESPONSIBLE FOR CORRECT INTERPRETATION AND APPLICATION OF ALL SIZES AND DIMENSIONS.
- D. SIGNIFICANT DEVIATIONS OR CHANGES FROM THE DRAWINGS, WHICH ARE REQUIRED TO ACCOMPLISH THE INTENT OF THE CONTRACT DOCUMENTS MUST BE REVIEWED AND APPROVED BY THE ARCHITECT (ENGINEER) BEFORE PROCEEDING. IF THE CONTRACTOR BELIEVES CHANGES TO THE CONTRACT DRAWINGS ARE NECESSARY, SHOP DRAWINGS WITH WRITTEN DESCRIPTIONS OF THE PROPOSED CHANGES SHALL BE SUBMITTED TO THE ARCHITECT (ENGINEER) FOR APPROVAL.
- ALL PIPE, DUCTS, VENTS, ETC., EXTENDING THROUGH WALLS AND ROOF SHALL BE FLASHED WATERPROOF. PROVIDE ALL FLASHING FOR PIPE AND DUCTWORK PENETRATING BUILDING ENVELOPE. PROVIDE DUCT AND/OR PIPE SLEEVES AT WALL PENETRATIONS. SEAL ANNULAR SPACE WEATHER TIGHT.

A. PROVIDE COMPLETE EQUIPMENT CONTROLS, INCLUSIVE OF ALL COMPONENTS, VOLTAGES, PROGRAMMING, (PNEUMATIC TUBING), WIRING ETC. FOR COMPLETE AND OPERATIONAL SYSTEMS. MOUNT THERMOSTATS AND SWITCHES 4'-0" ABOVE FINISHED FLOOR. MOUNT OTHER SENSORS (HUMIDITY, CO2, CO, NOX, ETC.) PER MANUFACTURER'S IOM. PRIOR TO MOUNTING, COORDINATE THERMOSTAT LOCATION(S) WITH FINAL FIXTURES AND EQUIPMENT. DO NOT MOUNT THERMOSTATS IN DIRECT SUNLIGHT, IN DISCHARGE OF SUPPLY GRILLE(S), NEAR HEAT PRODUCING APPLIANCES OR EQUIPMENT, ON WALLS WITH INTERNAL HEAT SOURCES (DUCT OR PIPING), OR ON EXTERIOR WALLS. IF EXTERIOR WALL MOUNTING IS NECESSARY, PROVIDE INSULATED MOUNTING BASE. WHERE THERMOSTAT LOCATION IS SUBJECT TO DAMAGE, PROVIDE LOCKABLE HIGH-IMPACT GUARD.

- A. IN FINISHED AREAS, ALL PIPING SHALL BE CONCEALED UNLESS NOTED
- B. SEE PIPE SCHEDULE FOR PIPE MATERIALS AND PIPE INSULATION.
- C. DO NOT INSTALL PVC PIPING IN PLENUM AREAS H. PAINT PIPE TO MATCH OWNER'S OR BUILDING STANDARD.
- PROVIDE PIPE LABELS AND FLOW DIRECTION PER BUILDING OR FACILITY'S STANDARD OR AS SCHEDULED. ORIENT ALL MARKERS SO AS TO BE VISIBLE FROM FLOOR LEVEL. AT A MINIMUM PIPE LABELS AND FLOW DIRECTION MARKERS SHALL BE LOCATED:
- AT LEAST ONCE IN EACH ROOM
- AT EQUIPMENT CONNECTIONS
- AT ACCESS DOORS
- AT BRANCH MAINS ON ALL ACCESSIBLE PIPE A MAXIMUM OF 25' BETWEEN MARKERS.
- J. BRANCH TAKE-OFFS SHALL BE MADE WITH SWING CONNECTIONS AS REQUIRED TO AVOID STRESS AT THESE POINTS.
- K. DO NOT INSTALL ANY PIPING ABOVE ELECTRICAL PANELS AND/OR
- INSTALL AND SIZE REFRIGERANT PIPE IN STRICT ACCORDANCE WITH EQUIPMENT/APPLIANCE MANUFACTURER'S IOM. DO NOT INSTALL REFRIGERANT PIPE BELOW GROUND. REFRIGERANT PIPE INSTALLED ON BUILDING EXTERIOR SHALL BE ROUTED TO MINIMIZE EXTERIOR EXPOSURE. INSULATE REFRIGERANT PIPE PER MANUFACTURER'S IOM. PROVIDE INSULATION EXPOSED TO AMBIENT CONDITIONS WITH A
- CONTINUOUS 30 MIL PVC JACKET. M. ROUTE PIPE THROUGH ROOF WITH ALUMINUM PIPE HOOD, PATE CURB MODEL "PHA-2" WITH 14" TALL MODEL "PC-2" CURB. SEAL PIPE THROUGH CURB WEATHER-TIGHT.
- N. PRIOR TO INSTALLING EQUIPMENT/APPLIANCES, CAREFULLY CONSIDER FALL REQUIREMENTS OF CONDENSATE DRAIN PIPE. PROVIDE MINIMUM 1/8" / FOOT SLOPE. EXTEND CONDENSATE DRAIN PIPE TO AN APPROVED RECEPTOR AND TERMINATE VIA AN INDIRECT CONNECTION.
- O. ALL HOLES REQUIRED THROUGH EXISTING FLOORS AND MASONRY WALLS SHALL BE CORE DRILLED.

17. <u>DUCT MOUNTED SMOKE DETECTORS</u>

A. RETURN AIR DUCT MOUNTED SMOKE DETECTORS SHALL BE PROVIDED BY E.C. (WITH THE SCHEDULE EQUIPMENT, SEE SCHEDULE) AND UPON DETECTING SMOKE, SHALL SHUT DOWN PROTECTED AIR SYSTEM.

- A. SUBMIT SHOP DRAWINGS ON SCHEDULED AND NOTED EQUIPMENT AND MATERIALS. PRIOR TO SUBMITTAL, EACH SHOP DRAWING SHALL BE REVIEWED BY THE CONTRACTOR TO ASSURE THAT THE PROPOSED EQUIPMENT IS CLEARLY MARKED, HIGHLIGHTED, AND NOTED. ALL DIMENSIONS, QUANTITIES, CONNECTIONS, CAPACITATES AND ACCESSORIES SHALL BE CLEARLY SHOWN IN CONFORMANCE WITH THE CONTRACT DOCUMENTS, AND SHALL BE MARKED OR STAMPED TO CONFIRM THAT SUCH REVIEW WAS MADE AND COMPLIANCE WAS CONFIRMED. SHOP DRAWING SUBMITTED WITHOUT BEING MARKED HIGHLIGHTED, AND NOTED WILL BE REJECTED WITHOUT REVIEW.
- PROVIDE ADEQUATE TIME FOR SUBMITTAL REVIEW AND CORRECTIONS IF ANY, TO PREVENT CONSTRUCTION DELAY. DO NOT PERFORM ANY PORTION OF WORK WHICH REQUIRES APPROVED SUBMITTALS UNTIL THE RESPECTIVE SUBMITTALS HAVE BEEN APPROVED BY THE ENGINEER.
- C. REVIEW OF SHOP DRAWINGS BY THE OWNER, OWNER'S AGENT, ARCHITECT, OR ENGINEER IS FOR GENERAL COMPLIANCE WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR IS SOLELY RESPONSIBILITY FOR COMPLYING WITH ALL TERMS OF THE CONTRACT DOCUMENTS AND FOR PERFORMANCE OF ALL EQUIPMENT AND MATERIALS PURCHASED, FOR QUANTITIES, PROPER FIT, AND OTHER DIMENSIONAL REQUIREMENTS.

A. REFER TO DUCT INSULATION SCHEDULE FOR CLARIFICATION OF DUCT

DIMENSIONS. PROVIDE ALL DUCTWORK IN STRICT ACCORDANCE WITH THE SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION (SMACNA) "HVAC DUCT CONSTRUCTION STANDARDS -METAL AND FLEXIBLE", LATEST EDITION. U.N.O. ALL RIGID DUCTWORK SHALL BE GALVANIZED SHEET METAL. ALL EXPOSED DUCTWORK SHALL HAVE A MILL-PHOSPHATIZED FINISH FOR PAINT ADHESION. EXPOSED ROUND DUCT SHALL BE SPIRAL SEAM TYPE. NO FIBERGLASS DUCTBOARD WILL BE ALLOWED.

- B. PROVIDE TURNING VANES AT ALL CHANGES IN DIRECTION.
- PROVIDE DAMPERS AT EACH BRANCH DUCT SERVING AIR DEVICES AND AS SHOWN AND DETAILED. PROVIDE EACH ROUND BRANCH DUCT TAKE-OFF FROM MAIN DUCT WITH SPIN-IN FITTING AND BALANCING DAMPER. DAMPER SHALL BE YOUNG REGULATOR MODEL 5020R LOCKING QUADRANT VOLUME DAMPER WITH 2" HANDLE STANDOFF FOR INSULATION THICKNESS. WHERE BRANCH TAKE-OFF IS INACCESSIBLE FOR BALANCING, PROVIDE BALANCING DAMPER IN GRILLE NECK OR BOWDEN "270-275" REMOTE CABLE CONTROL.
- ALL FLEXIBLE DUCT SHALL BE THERMAFLEX TYPE MKE, MAXIMUM 7'-0" LONG. FLEXDUCT SHALL BE INSTALLED IN ACCESSIBLE CONCEALED SPACES ONLY, FULLY STRETCHED OUT AND WITHOUT SAGS OR KINKS. CONNECTIONS TO FITTINGS AND AIR DEVICES SHALL BE MADE WITH TWO (2) BAND CLAMPS. BAND CLAMP THE INNER LINER TIGHT TO FITTING OR AIR DEVICE, THEN THE INSULATION AND VAPOR-PROOF JACKET SHALL BE CLAMPED TIGHT. FLEX DUCT INSTALLATION ABOVE INACCESSIBLE CEILINGS IS UNACCEPTABLE.
- AIR DUCT TIGHTNESS TESTS SHALL BE PER 2012 IECC SECTION R403.2. PROVIDE WITH ROUGH-IN TEST OR POST CONSTRUCTION TEST. ROUGH-IN TEST: TTL LEAKAGE < 4 CFM PER 100 SQUARE FEET OF CONDITIONED FLOOR AREA AT DIFFERENTIAL PRESSURE OF 0.1 INCHES OF W.G. ACROSS THE ENTIRE SYSTEM, INCLUDING THE FAN COIL UNIT CABINET. ALL AIR DEVICES SHALL BE SEALED DURING THE TEST. IF THE FCU IS NOT INSTALLED AT THE TIME OF THE TEST, TOTAL LEAKAGE SHALL BE <3 CFM PER 100 SQUARE FEET OF OF CONDITIONED FLOOR AREA. POST CONSTRUCTION TEST: TOTAL LEAKAGE < 4 CFM PER 100 SQUARE FEET OF CONDITIONED FLOOR AREA AT DIFFERENTIAL PRESSURE OF 0.1 INCHES OF W.G. ACROSS THE ENTIRE SYSTEM, INCLUDING THE FAN COIL UNIT CABINET. ALL AIR DEVICES SHALL BE SEALED DURING THE TEST.]

- A. IN CONDITIONED AREAS, SEAL ALL LONGITUDINAL AND TRANSVERSE JOINTS WITH A NON-HARDENING, NON-MIGRATING MASTIC OR LIQUID ELASTIC SEALANT, WITH VOC CONTENT NO GREATER THAN 250G/L AND RECOMMENDED BY THE MANUFACTURER FOR SEALING SHEET METAL DUCT. SEAL ALL JOINTS, SPIN-IN FITTINGS, AND FASTENING SCREWS WITH MASTIC. HVAC SYSTEM LEAKAGE SHALL NOT EXCEED 5% OF DESIGN FLOW. DUCT TAPE IS NOT ALLOWED.
- IN UNCONDITIONED AREAS (INCLUDING BUT NOT LIMITED TO EXTERIOR OF BUILDING, ATTIC, CRAWL SPACES, ETC.): SEAL ALL LONGITUDINAL AND TRANSVERSE JOINTS WITH CARLISLE'S "HARDCAST FOIL-SEALANT DUCT SEALING SYSTEM" - NO EXCEPTIONS. INSTALL IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS. PROVIDE INITIAL SEALANT OF HARDCAST'S IRON-GRIP 601, SPRAY-SEAL, OR VERSA-GRIP 181 LIQUID MASTIC SEALANT. AFTER SEALANT HAS CURED COMPLETELY OVERLAY THE MASTIC WITH 4" WIDE STRIP OF AFT-701 ROLLED SEALANT. SEAL ALL JOINTS, SPIN-IN FITTINGS, AND FASTENERS. HVAC SYSTEM LEAKAGE SHALL NOT EXCEED 5% OF DESIGN FLOW.

A. CLOTHES DRYER DUCT SHALL BE ALUMINUM DUCT SEALED WATER TIGHT. FABRICATE DRYER DUCT WITH NO FASTENERS PROTRUDING INTO INSIDE OF DUCT. TERMINATE DRYER DUCT WITH BACKDRAFT DAMPER AND WITHOUT A SCREEN.

22. <u>DUCT INSULATION</u>

A. SEE DUCT INSULATION SCHEDULE.

- INSTALL ALL EQUIPMENT AND MATERIALS IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTALLATION AND OPERATIONS MANUAL AND IN
- STRICT ACCORDANCE WITH ALL LOCAL CODES AND REGULATIONS. B. U.N.O. PROVIDE ALL MOTORIZED EQUIPMENT WITH VIBRATION ISOLATION MOUNTING AND FLEXIBLE DUCT AND FLEXIBLE PIPE CONNECTIONS.
- LABEL ALL EQUIPMENT WITH ID TAGS, LETTERING SHALL BE 1" HIGH BLACK ON WHITE BACKGROUND. ID TAGS IN PLENUM SPACES SHALL BE PLENUM RATED. EQUIPMENT NOT PLENUM MOUNTED SHALL BE LABELED WITH ENGRAVED PHENOLIC RESIN NAMEPLATES ADHERED TO UNIT CABINET WITH RTV SILICONE. LETTERING SHALL BE 1" HIGH BLACK ON WHITE BACKGROUND.
- ALL EQUIPMENT, DUCT, PIPE, ETC. MOUNTED FROM BOLTED CONNECTIONS SHALL HAVE DOUBLE NUTS AT ATTACHMENT TO STRUCTURE AND HANGER, NO EXCEPTIONS.

24. <u>FIRE AND FIRE-SMOKE DAMPERS</u>

A. PROVIDE FIRE DAMPERS AND/OR FIRE SMOKE DAMPERS AT DUCT PENETRATIONS OF RATED ASSEMBLIES AND AS REQUIRED BY AHJ. REFER TO ARCHITECTURAL DRAWINGS FOR ASSEMBLY RATINGS. INSTALL DAMPERS IN STRICT ACCORDANCE WITH MANUFACTURER'S DETAILS AND MAINTAIN MANUFACTURER'S DETAILS ONSITE FOR AHJ REVIEW. PROVIDE ACCESS PANELS OF ADEQUATE SIZE TO FACILITATE SERVICE ACCESS OF DAMPER. IN LIEU OF ACCESS PANELS, A REMOVABLE DUCT SECTION IS ACCEPTABLE.

25. OUTDOOR AIR INTAKES

PROVIDE A MINIMUM 10'-0" HORIZONTAL CLEARANCE BETWEEN MECHANICAL EQUIPMENT OUTDOOR AIR INTAKES AND EXHAUST FAN DISCHARGES, COMBUSTION EXHAUST, PLUMBING VENTS, AND ANY OTHER HAZARDOUS OR NOXIOUS CONTAMINANT.

26. <u>AIR FILTERS</u>

A. PROVIDE THREE (3) SETS OF NEW MERV 8 DISPOSABLE AIR FILTERS, PER THE FOLLOWING: FOR HVAC SYSTEMS OPERATED DURING CONSTRUCTION, PROVIDE FILTERS IN EQUIPMENT AND ON RETURN AIR DUCT OPENINGS TO PROTECT DUCT FROM DIRT; IN HVAC EQUIPMENT PRIOR TO AIR TESTING, ADJUSTING, AND BALANCING; AND AT PROJECT COMPLETION - ONE (1) SPARE SET FOR HVAC EQUIPMENT.

27. <u>SEISMIC RESTRAINT</u>

PROVIDE SEISMIC RESTRAINT OF SYSTEMS AND EQUIPMENT IN STRICT ACCORDANCE WITH THE BUILDING CODE. SUBMIT ALL REQUIRED DETAILS TO AHJ FOR REVIEW AND APPROVAL. IF REQUIRED BY AHJ, PROVIDE ENGINEERED SEISMIC-RESTRAINT DRAWINGS, SIGNED AND SEALED BY A PROFESSIONAL ENGINEER, LICENSED IN THE STATE. SUBMIT COPIES INCLUDING CALCULATIONS AND DETAILS, AS REQUIRED BY AHJ TO ARCHITECT (ENGINEER) AND TO AHJ FOR REVIEW AND APPROVAL.

A. UPON COMPLETION OF WORK, INSPECT INSTALLATION OF ALL EQUIPMENT AND SYSTEMS. OPEN ALL ACCESS COVERS ON EQUIPMENT. REMOVE ALL SURPLUS MATERIALS AND DEBRIS AND PROPERLY DISPOSE OF SAME.

29. TESTING, ADJUSTING, & BALANCING

- PRIOR TO EQUIPMENT START-UP, REMOVE COVERS, CAPS, OR PLUGS ON DUCT AND PIPING.
- B. UPON COMPLETION OF WORK, MC SHALL PROVIDE HVAC TESTING:

- i. AFTER INSTALLING EQUIPMENT AND AFTER ELECTRICAL CIRCUITRY HAS BEEN ENERGIZED, TEST UNITS FOR COMPLIANCE WITH REQUIREMENTS.
- ii. INSPECT FOR AND REMOVE SHIPPING BOLTS, BLOCKS, AND TIE-DOWN STRAPS.
- iii. OPERATIONAL TEST: AFTER ELECTRICAL CIRCUITRY HAS BEEN ENERGIZED, START UNITS TO CONFIRM PROPER MOTOR ROTATION, BELT TENSION, DAMPER FUNCTION, COOLING FUNCTION, HEATING FUNCTION, AND UNIT OPERATION.
- iv. TEST AND ADJUST CONTROLS AND SAFETIES. REPLACE DAMAGED AND MALFUNCTIONING CONTROLS AND EQUIPMENT.
- v. REMOVE AND REPLACE MALFUNCTIONING UNITS AND RETEST AS SPECIFIED ABOVE.
- vi. SUBMIT TESTING REPORT TO ARCHITECT (ENGINEER).
- C. UPON COMPLETION OF WORK, PROVIDE AN HVAC TESTING, ADJUSTING, AND BALANCING REPORT PERFORMED BY AN INDEPENDENT CONTRACTOR CERTIFIED BY AABC, NEBB, OR TABB. BALANCE SYSTEMS WITHIN 10% OF DESIGN FLOW. TAB SHALL BE PERFORMED IN STRICT ACCORDANCE WITH SMACNA'S "TAB PROCEDURAL GUIDE", LATEST EDITION. MC SHALL BE PRESENT DURING TAB SHOULD ANY CORRECTIONS BE REQUIRED.

30. CLOSEOUT - AT CONSTRUCTION COMPLETION AND PRIOR TO TURNOVER TO OWNER (TENANT)

- A. PROVIDE FINAL MARK-UPS IN PDF (DWG) FORMAT TO ARCHITECT AND
- B. PROVIDE A SIGNED CERTIFICATE OF INSPECTION AT THE PROJECT COMPLETION.
- C. PROVIDE THE OWNER WITH A BOUND OWNER'S MANUAL. THE MANUAL SHALL CONSIST OF A THREE-RING LOOSE-LEAF BINDER CONTAINING ALL PRINTED MATERIAL FOR INSTALLED EQUIPMENT INCLUDING BUT NOT LIMITED TO: WARRANTY INFORMATION, SERVICE AND CLEANING INSTRUCTIONS, NOTICES TO OWNER, OPERATING MANUALS, AND MAINTENANCE INSTRUCTIONS.
- D. TRAIN THE OWNER IN THE THERMOSTATS AND CONTROLS FUNCTIONS AND OPERATING THE EQUIPMENT USING THE THERMOSTATS. CONTRACTOR SHALL PROGRAM THE THERMOSTATS PER THE OWNER'S TIME SCHEDULES AND SETPOINTS.

- A. ON ALL WORK INCLUDED IN THIS CONTRACT, PROVIDE ONE (1) YEAR UNCONDITIONAL WRITTEN WARRANTY FOR LABOR, EQUIPMENT, AND MATERIALS TO REPLACE ALL FAULTY MATERIALS AND/OR LABOR, AT NO COST TO OWNER, BEGINNING ON DATE OF ACCEPTANCE BY OWNER.
- B. WITHIN THE WARRANTY PERIOD, DURING THE OPPOSITE SEASON (HEATING/COOLING) FROM THAT IN WHICH THE INITIAL ADJUSTMENTS WERE MADE, THIS CONTRACTOR SHALL MAKE AN INSPECTION OF THE INSTALLED BUILDING SYSTEMS. AT THIS INSPECTION, WITH SYSTEMS OPERATING, THIS CONTRACTOR SHALL MAKE ANY NECESSARY MODIFICATIONS TO THE INITIAL ADJUSTMENTS REQUIRED TO PRODUCE OPTIMUM OPERATION OF THE SYSTEM COMPONENTS, TO PRODUCE THE PROPER CONDITIONS IN EACH SPACE.

-- END OF SPECIFICATIONS -

GAS FURNACE/CU - SPLIT SYSTEM EQUIPMENT SEQUENCE OF OPERATIONS

(NOTE: ST=SPACE TEMPERATURE) UNOCCUPIED MODE (IF ANY):

- A. SETPOINT: HEATING 65°F/COOLING 83°F (ADJUSTABLE) B. OUTSIDE AIR DAMPER: CLOSED
- C. SUPPLY FAN: NORMALLY OFF, OPERATES ONLY ON THERMOSTAT CALL
- D. HEATING STAGE(S): ENERGIZES WHEN ST < SETPOINT-3°F E. COOLING STAGE(S): ENERGIZES WHEN ST > SETPOINT+3°F
- F. R.A. SMOKE DETECTOR/NORMAL MODE: NO ACTION G. R.A. SMOKE DETECTOR/ALARM MODE: SUPPLY FAN SHUT DOWN,

FURNACE OFF, CU OFF.

FOR HEATING OR COOLING.

- PREOCCUPIED MODE (IF ANY): A. SETPOINT: HEATING 70°F/COOLING 73°F (ADJUSTABLE) B. OUTSIDE AIR DAMPER: CLOSED
- C. SUPPLY FAN: RUNS CONTINUOUSLY D. HEATING STAGE(S): ENERGIZES WHEN ST < SETPOINT-3°F
- E. COOLING STAGE(S): ENERGIZES WHEN ST > SETPOINT+3°F F. R.A. SMOKE DETECTOR/NORMAL MODE: NO ACTION

G. R.A. SMOKE DETECTOR/ALARM MODE: SUPPLY FAN SHUT DOWN, FURNACE OFF, CU OFF.

- A. SETPOINT: HEATING 70°F/COOLING 75°F (ADJUSTABLE)
- B. OUTSIDE AIR DAMPER: OPEN TO SCHEDULED CFM C. SUPPLY FAN: RUNS CONTINUOUSLY. D. HEATING STAGE(S): ENERGIZES WHEN ST < SETPOINT-3°F
- E. COOLING STAGE(S): ENERGIZES WHEN ST > SETPOINT+3°F F. R.A. SMOKE DETECTOR/NORMAL MODE: NO ACTION

G. R.A. SMOKE DETECTOR/ALARM MODE: SUPPLY FAN SHUT DOWN,

*PRIOR TO PROGRAMMING, COORDINATE WITH OWNER TIME OF DAY SCHEDULES AND SPACE SETPOINT TEMPERATURES.

THIS OCCUPANCY MAY ONLY HAVE "OCCUPIED MODE", COORDINATE WITH

MECHANICAL CONTRACTOR SHALL TRAIN OWNER IN THERMOSTAT CONTROLS.

FCU-1/HP-1 (NOTE: ST=SPACE TEMPERATURE)

FURNACE OFF, CU OFF.

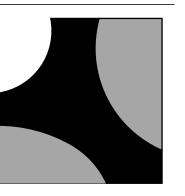
- A. SETPOINT: HEATING 70°F/COOLING 75°F (ADJUSTABLE) B. SUPPLY FAN: RUNS ONLY ON A CALL FOR COOLING OR HEATING.
- C. HEATING STAGE(S): ENERGIZES WHEN ST < SETPOINT-3°F D. COOLING STAGE(S): ENERGIZES WHEN ST > SETPOINT+3°F

*PRIOR TO PROGRAMMING, COORDINATE WITH OWNER TIME OF DAY SCHEDULES AND SPACE SETPOINT TEMPERATURES.

MECHANICAL CONTRACTOR SHALL TRAIN OWNER IN THERMOSTAT CONTROLS.

THIS OCCUPANCY MAY ONLY HAVE "OCCUPIED MODE", COORDINATE WITH

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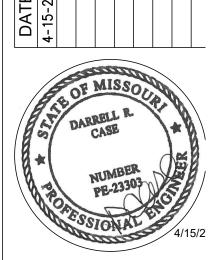
CIVIL ENGINEER BAX ENGINEERING CO., INC. 221 Point West Blvd St. Charles, Missouri 63301 Phone: 636-928-5552 Contact: Mark Struckhoff, P.E. mstruckhoff@baxengineering.com

PLUMBING & ELECTRICAL CASE ENGINEERING, INC. 796 Merus Court St. Louis, Missouri 63026

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 \Box



MO# E-23303 PROJECT MANAGER: JE

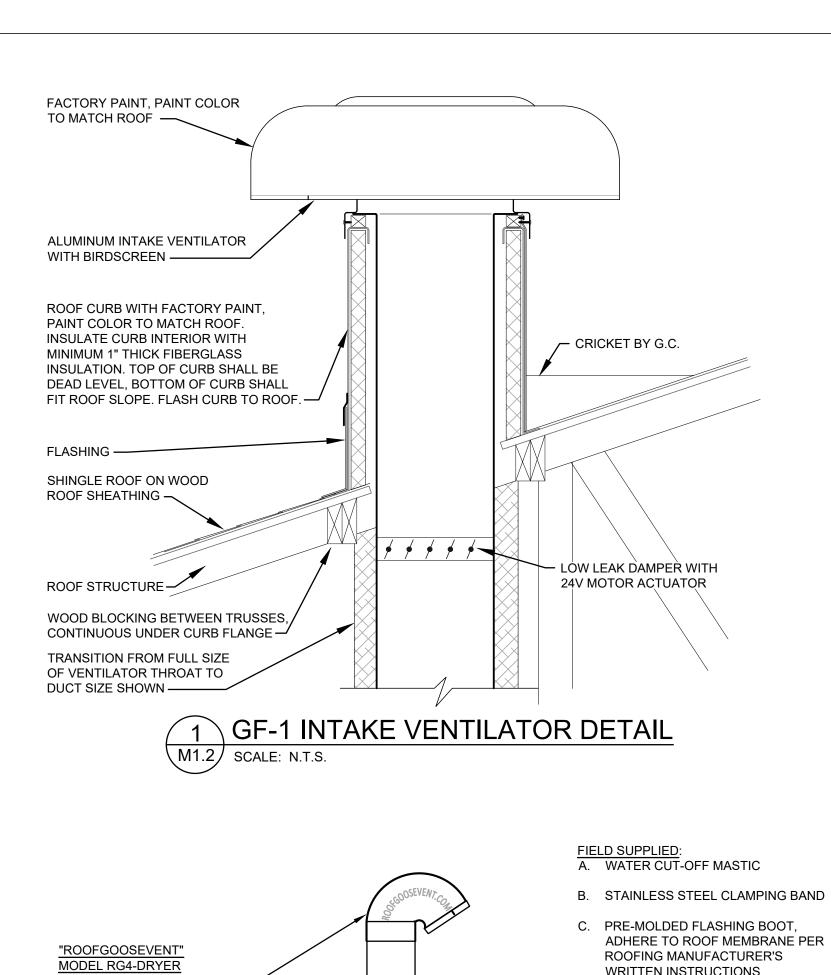
Darrell R Case

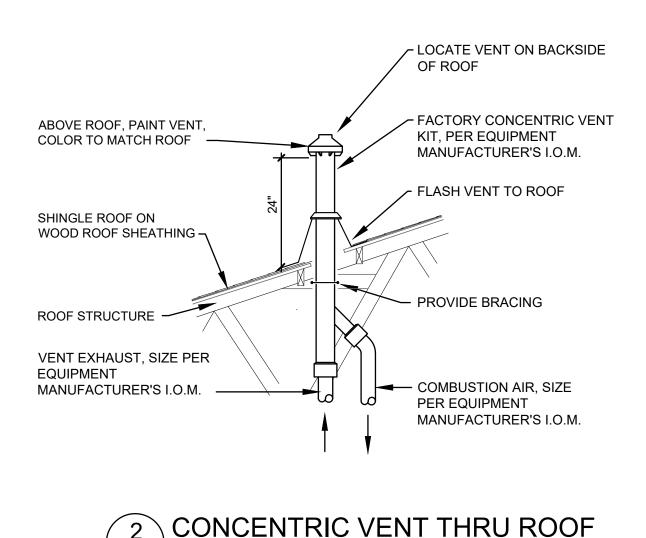
ENGINEER

DRAWN BY: CK

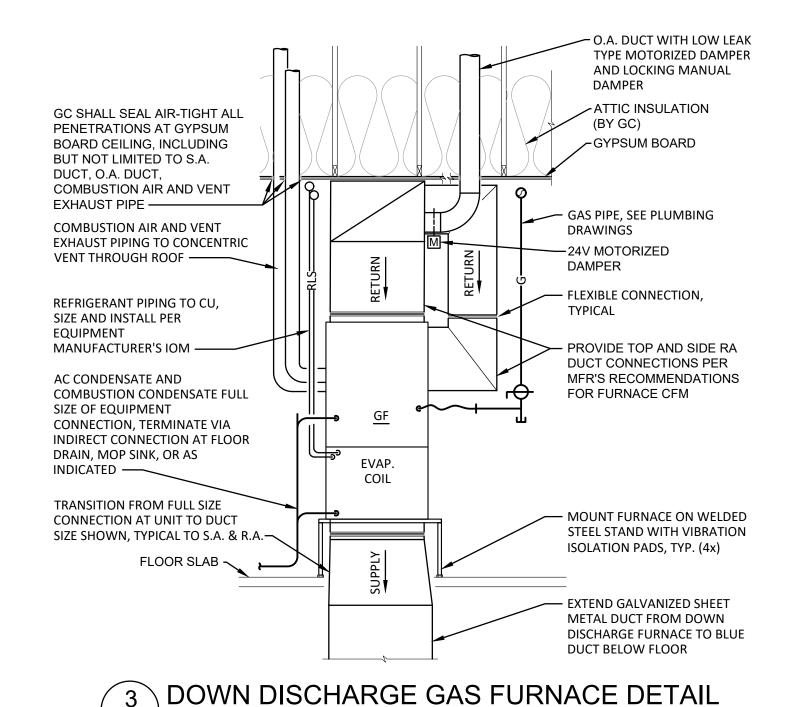
PROJECT NUMBER 21-079 DATE April 15, 2022

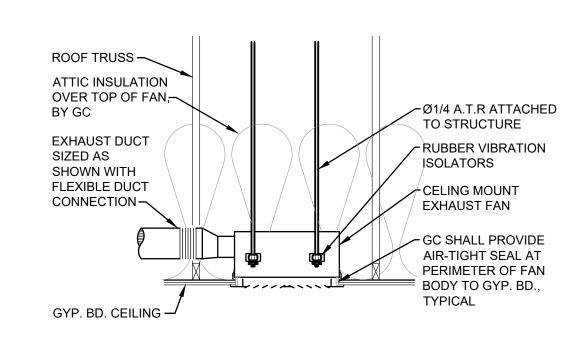
MECHANICAL SPECIFICATIONS



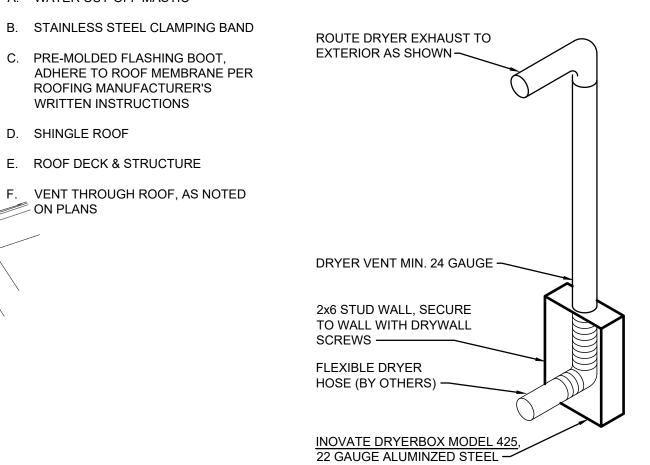


SCALE: NO SCALE





CEILING EXHAUST FAN DETAIL SCALE: NO SCALE



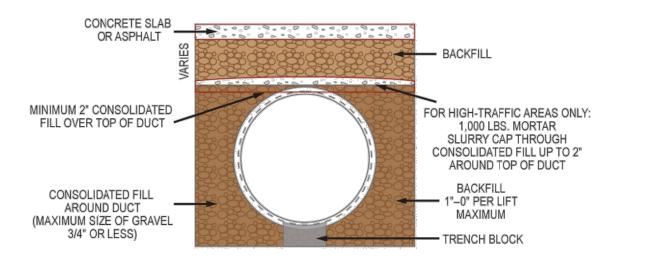
WRITTEN INSTRUCTIONS

E. ROOF DECK & STRUCTURE

CLOTHES DRYER VENT DETAILS

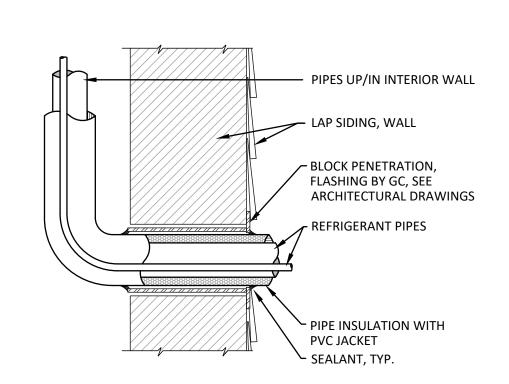
D. SHINGLE ROOF

ON PLANS



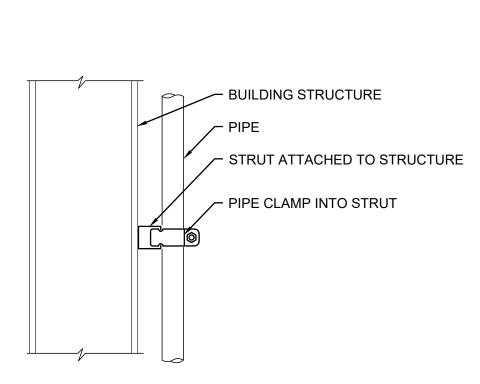
√M1.2/ SCALE: NO SCALE

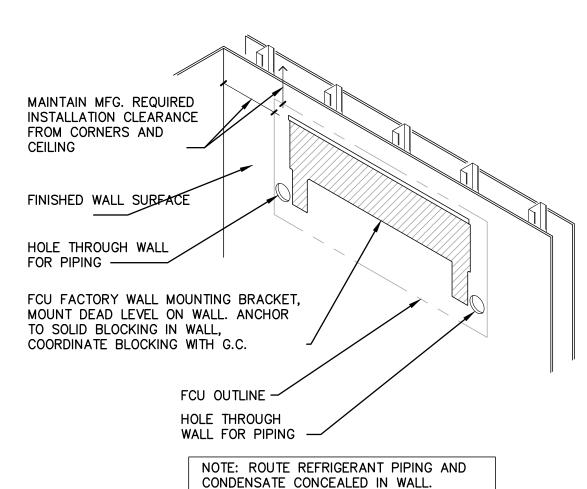


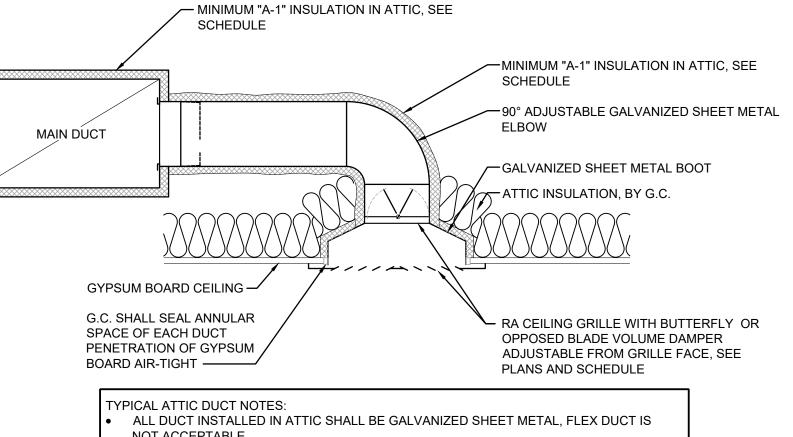


UNINSULATED PIPE PENETRATION SIMILAR

\ INSULATED PIPE - SLEEVE DETAIL M1.2 SCALE: NO SCALE







NOT ACCEPTABLE. SEAL ALL DUCT JOINTS AND SEAMS WITH AN APPROVED DUCT SEALANT AFTER ATTIC DUCT ROUGH IN (ALL R.A. DUCT THROUGH EACH CEILING PENETRATION) AND PRIOR TO INSULATING, TEMPORARILY CAP OPENINGS AND LEAK TEST DUCT. LEAKAGE MAY NOT EXCEED 5%. G.C. MUST WITNESS TESTING. AFTER SUCCESSFUL LEAKAGE TEST, INSULATE ATTIC DUCT WITH TYPE "A-1" AS SCHEDULED, MINIMUM R-12.8 G.C. SHALL SEAL ANNULAR SPACE OF EACH DUCT PENETRATION OF GYPSUM BOARD

10 BRANCH DUCT - AIR GRILLE DETAIL M1.2 | SCALE: NO SCALE

AIR-TIGHT.

INSTALL, INSULATE, AND SIZE - ALUMINUM STRAPS AND STAINLESS REFRIGERANT PIPING PER STEEL SCREWS **EQUIPMENT MANUFACTURER'S** I.O.M. PROVIDE 30 MIL PVC - MIRO INDUSTRIES (OR EQUAL) JACKET ON PIPE INSULATION PREFABRICATED PIPE STANDS, **EXPOSED TO AMBIENT INSTALL AS APPROVED BY ROOF** CONDITIONS. — MEMBRANE MFGR. CONCRETE PAD -

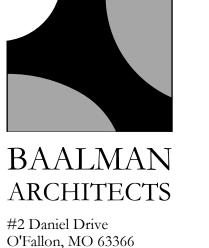
> **SUPPORT SPACING:** RIGID 1" AND UNDER - 6' RIGID 1-1/4" AND OVER - 10'

WOOD BLOCKS WILL NOT BE APPROVED.

STEEL STRAP SIZES: 1/8" X 1-1/8" FOR 3/4" TO 1-1/4" PIPE, 3/16" X 1-1/4" FOR 1-1/2" TO 2" PIPE,

11 GRADE PIPE SUPPORT DETAIL

M1.2 | SCALE: NO SCALE



ph: 314.640.6212 Michael J. Baalman ARCHITECT License#: A-2012004035 Certificate of Authority:

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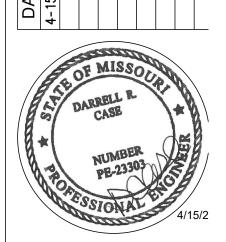
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St. Louis, Missouri 63026 Structural Contact: Ardie Mansouri, P.E. Phone: 636-349-1600 ext 291 amansouri@caseengineeringinc.com Mechanical, Plumbing, Electrical Contact: Jim Eyre, P.E. jeyre@caseengineeringinc.com

Phone: 636-349-1600 ext 258

796 Merus Court

0 Ba



Darrell R Case **ENGINEER** MO# E-23303

PROJECT MANAGER: JE DRAWN BY: CK

PROJECT NUMBER 21-079 DATE

April 15, 2022

SHEET

MECHANICAL DETAILS

\ PIPE DROP DETAIL M1.2 | SCALE: NO SCALE

VENT WITH INTEGRAL

BACKDRAFT DAMPER

SECURE BASE BUSHING

W/ "ROOFGOOSEVENT" S.S. HOSE CLAMP &

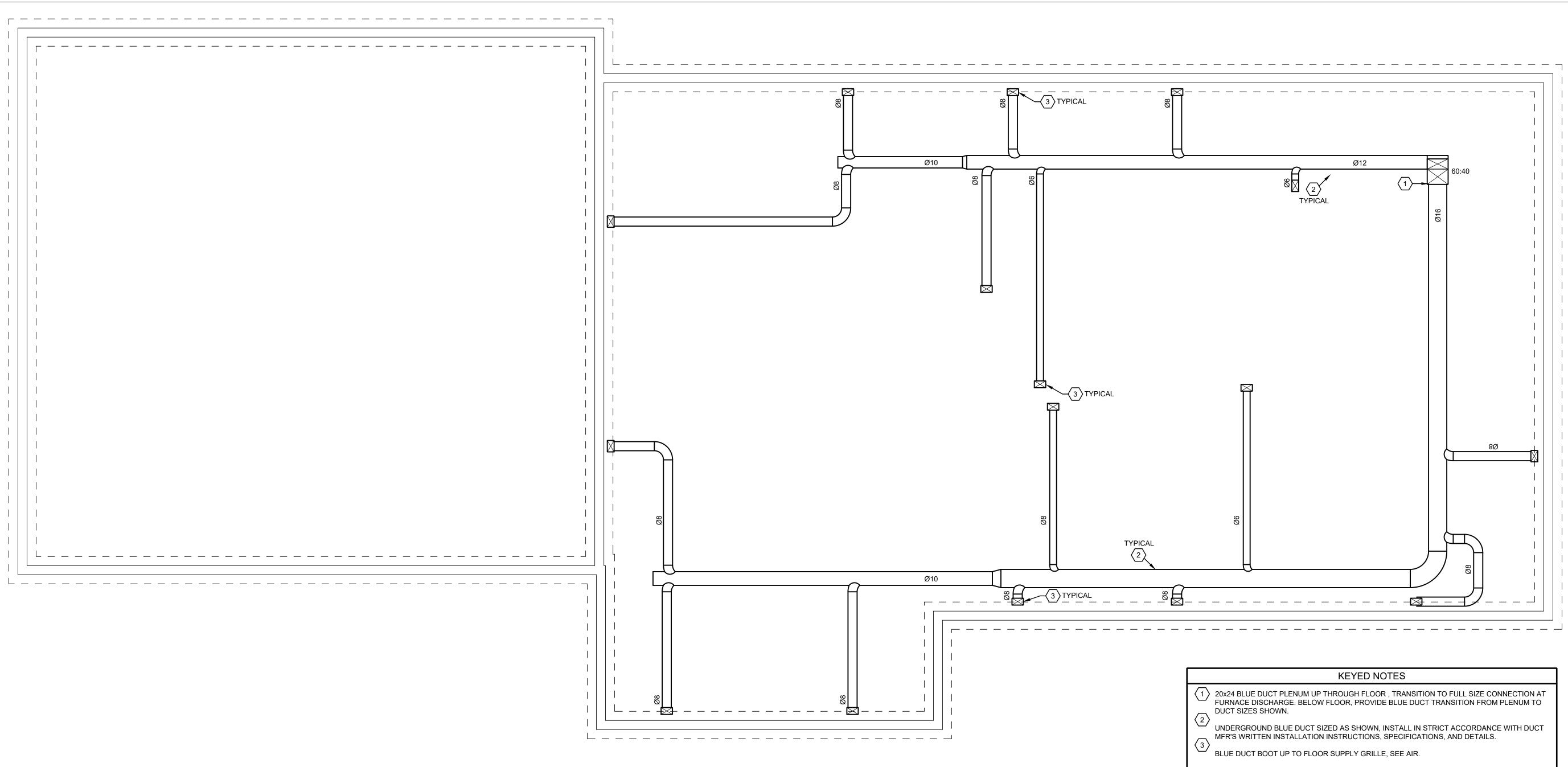
SCREWS BEFORE ROOF

3/4" STRAP ANCHORED TO BLOCKING ~

FIELD SUPPLIED, GALVANIZED 26 GAUGE METAL DUCT TO EXTEND 27" ABOVE ROOF MEMBRANE

FLASHING —

9 DUCTLESS SPLIT FCU MOUNTING DETAIL \backslash M1.2/ SCALE: NO SCALE



1 MECHANICAL FOUNDATION PLAN

1. ALL SUPPLY DUCT AND FITTINGS BELOW GROUND SHALL BE BLUE DUCT, NO EXCEPTIONS. INSTALL DUCT AND FITTINGS IN STRICT ACCORDANCE WITH BLUE

M2.0 SCALE: 1/4" = 1'-0"

DUCT'S WRITTEN INSTRUCTIONS AND DETAILS.

UNDERGROUND DUCT NOTES:

ENGINEER MO# E-23303

PROJECT MANAGER: JE DRAWN BY: CK

PROJECT NUMBER 21-079 DATE April 15, 2022

MECHANICAL PLAN

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DATE	-15-2022				

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#2 Daniel Drive

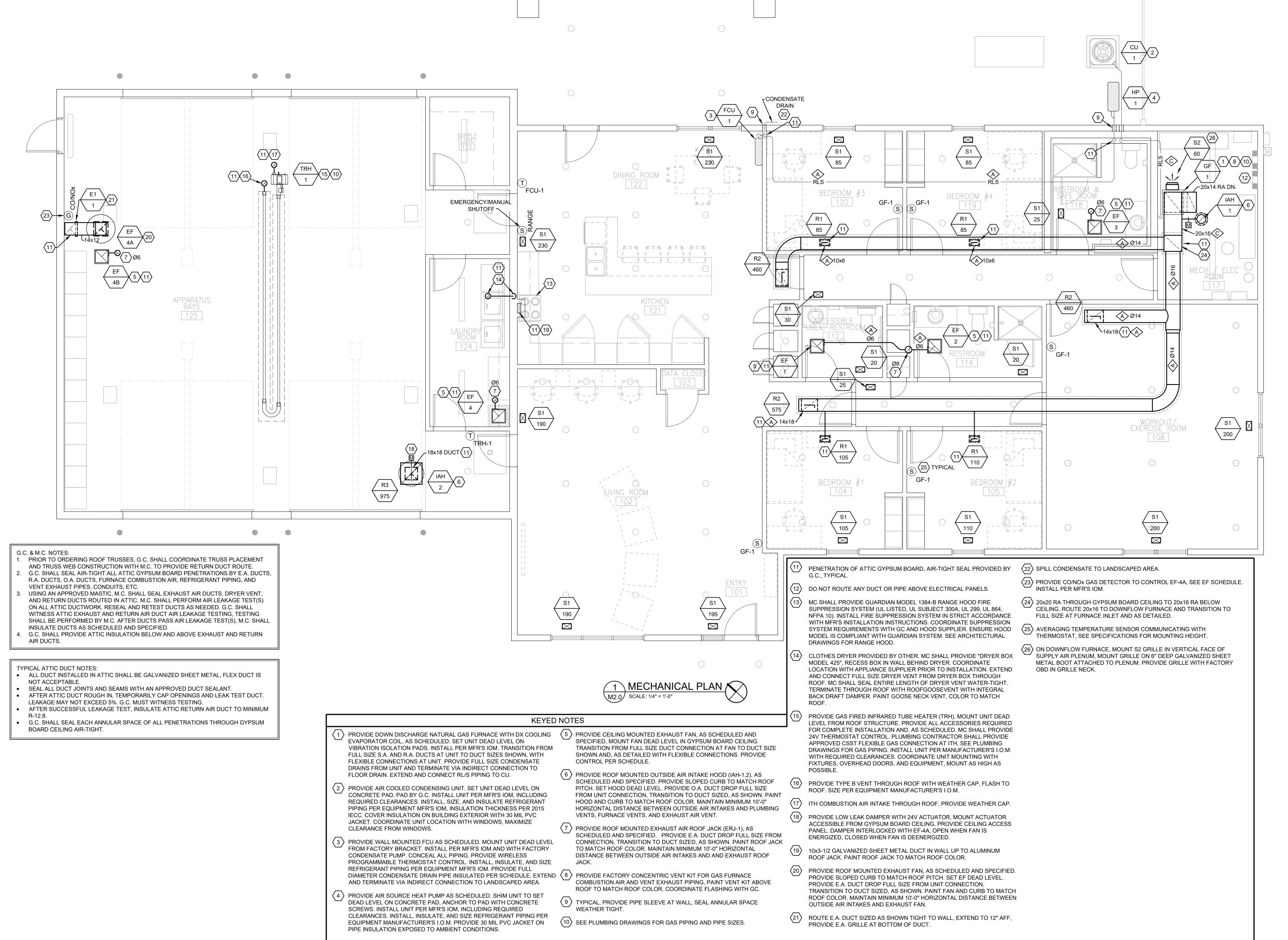
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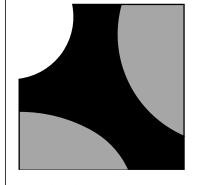
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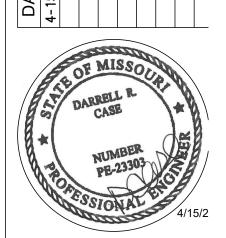
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Sase Station #2 Facility for:

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bulance District

ATE ISSUE R#
5-2022 BID & PERMIT SET



Darrell R Case ENGINEER MO# E-23303

PROJECT MANAGER: JE

DRAWN BY: CK
PROJECT NUMBER

21-079 DATE April 15, 2022

MECHANICAL PLAN

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PLUMBING ABBREVIATION

A.F.F ABOVE FINISHED FLOOR BATHTUB CLEANOUT COTG CLEANOUT TO GRADE COLD WATER DCVA DOUBLE CHECK VALVE ASSEMBLY DWH DOMESTIC WATER HEATER ESP ELEVATOR SUMP PUMP ETR **EXISTING TO REMAIN** ELECTRIC WATER COOLER **EWC** FCO FLOOR CLEANOUT FD F.F. FLOOR DRAIN FINISH FLOOR HOSE BIB HW **HOT WATER** HWR HOT WATER RETURN HWRP HOT WATER RECIRCULATING PUMP HYDRANT ICE MAKER BOX INV. EL INVERT ELEVATION LAV LAVATORY MOB BASIN NATURAL GAS REDUCED PRESSURE BACKFLOW PREVENTOR SHOWER SINK SANITARY STACK STORM TYPICAL VENT VENT STACK VTR VENT THRU ROOF WASTE WASTE STACK WB WASHER BOX WCO WALL CLEANOUT WATER CLOSET

WALL HYDRANT

WSP

WATER HEATER PAN

WASHER SAFE PAN

PIPING LEGEND FLOW SWTICH SHUTOFF VALVE BALANCING VALVE STRAINER THERMOMETER GAUGE PRESSURE/TEMPERATURE TEST PLUG — — — CW COLD WATER —— – – — HW HOT WATER — – – – HWR HOT WATER RETURN — — — FW FILTERED COLD WATER — — — SW SOFT COLD WATER _____ W/S WASTE/SANITARY ___ __ V VENT ---- CA COMPRESSED AIR _ ST STORM CO CLEANOUT FCO FLOOR CLEANOUT | WCO WALL CLEANOUT ELBOW, TURNED UP ELBOW, TURNED DOWN BRANCH CONNECTION, TOP BRANCH CONNECTION, BOTTOM PIPE CAP OR BLIND FLANGE CONNECT TO EXISTING

NOT ALL OF THE ITEMS ABOVE ARE IN THIS PROJECT

GENERAL NOTES:

- 1. PLUMBING CONTRACTOR SHALL EXECUTE ALL WORK SO THAT IT PRECEDES WITH A MINIMUM OF INTERFERENCE WITH OTHER TRADES.
- 2. VERIFY EXACT ROUGH-IN AND FINAL EQUIPMENT REQUIREMENTS IN FIELD.
- 3. THE PLUMBING CONTRACTOR SHALL BE RESPONSIBLE FOR ALL FINAL CONNECTIONS TO PLUMBING FIXTURES AND KITCHEN EQUIPMENT. THIS INCLUDES, BUT NOT LIMITED TO FURNISHINGS AND INSTALLING ALL TRAPS, DRAINS AND SUPPLIES WITH STOPS.
- 4. THE PLUMBING CONTRACTOR SHALL VERIFY THAT ALL PIPING, AS SHOWN ON THESE DRAWINGS WILL NOT CONFLICT WITH ANY DRAINS, SCUTTLES, JOINTS, VENTS, EQUIPMENT, ETC.
- COORDINATE ROUTING AND LOCATIONS OF WASTE AND VENT PIPING WITH ALL OTHER TRADES.
- 6. THE PLUMBING CONTRACTOR SHALL COORDINATE WITH THE GENERAL CONTRACTOR AND OTHER TRADES, ALL REQUIRED OPENINGS AND EXCAVATIONS. ALL REQUIRED OPENINGS IN FOUNDATIONS, FLOORS, WALLS, AND ROOFS SHALL BE DESIGNED INTO THE STRUCTURE INITIALLY BY THE USE OF SLEEVES, CURBS, ETC. CUTTING AND PATCHING SHALL BE HELD TO MINIMUM.
- 7. ALL ITEMS PROJECTING THROUGH ROOFS SHALL BE FLASHED, A MINIMUM OF 12" ABOVE THE ROOF. ALL VENTS SHALL BE A MINIMUM OF 10' FROM ANY OUTSIDE AIR INTAKE.
- 8. ALL FLOOR DRAINS SHALL HAVE 6" DEEP SEAL TRAPS.
- THE PLUMBING CONTRACTOR SHALL BE RESPONSIBLE FOR CONNECTING WATER SUPPLY TO THE COFFEE MAKERS, TEA BREWERS, AND ICE MACHINES AND ALL OTHER LIKE KITCHEN EQUIPMENT.
- 10. WRAP ALL CONDENSATE PIPE IN FREEZER WITH HEAT TRACING TAPE AND INSULATE ALL CONDENSATE DRAIN PIPING. ROUTE COOLER CONDENSATE DRAIN PIPING TO HUB DRAIN/FLOOR DRAIN AS INDICATED.
- 11. INSULATE ALL WATER AND WASTE PIPING UNDER LAVATORIES.
- 12. POT SINKS TO BE ANCHORED TO WALL AND SEALED WITH SILICONE CAULKING.
- 13. INSTALL GAS VALVE (FBC) IN GAS LINE TO COOKING EQUIPMENT. INSTALL UNIONS AT THE SOLENOID VALVE.
- 14. PLUMBING CONTRACTOR TO PROVIDE AND INSTALL SHUTOFF COCKS, QUICK DISCONNECTS AND FLEXIBLE LINES AT GAS EQUIPMENT.
- 15. PROVIDE VACUUM BREAKERS AT FIXTURES WITH HOSE THREAD CONNECTIONS.
- 16. PROVIDE DIELECTRIC UNIONS AT ALL DISSIMILAR METAL PIPE CONNECTIONS.
- 17. LAVATORY AND HAND SINK FAUCETS SHALL HAVE A THERMAL MIXING VALVE AND LIMIT HOT WATER FLOW TO 110F TO COMPLY WITH THE LOCAL HEALTH OR PLUMBING DEPARTMENT RECOMMENDATIONS.
- 18. FURNISH ALL LABOR, MATERIAL AND EQUIPMENT REQUIRED FOR THE COMPLETION AND OPERATION OF ALL SYSTEMS IN THIS SECTION OF WORK IN ACCORDANCE WITH ALL APPLICABLE CODES.
- 19. FURNISH AND INSTALL COMPLETE SYSTEM OF SOIL, WASTE AND VENT PIPING FROM ALL PLUMBING FIXTURES, AND/OR OTHER EQUIPMENT.
- 20. CLEANOUT PLUGS SHALL BE INSTALLED IN ACCORDANCE WITH PLUMBING CODE REQUIREMENTS AT EACH
- CHANGE IN DIRECTION. CLEANOUTS SHALL BE PLACED IN READILY ACCESSIBLE LOCATIONS.

 21. ALL SOIL, WASTE AND VENT LINES SHALL BE CONCEALED IN THE BUILDING CONSTRUCTION, EXCEPT FOR FOR
- INDIRECT DRAINS WHEN REQUIRED.

 22. FURNISH AND INSTALL A COMPLETE SYSTEM OF HOT AND COLD WATER AND WASTE PIPING FROM SUPPLIES TO
- ALL FIXTURES AND/OR EQUIPMENT REQUIRING THESE SERVICES. VERIFY LOCATION OF BEGINNING POINTS.
- 23. COPPER PIPING SHALL BE PROTECTED AGAINST CONTACT WITH MASONRY OR DISSIMILAR METALS, HANGERS, SUPPORTS, ANCHORS AND CLIPS SHALL BE COPPER OR COPPER PLATED. WHERE COPPER PIPING IS CARRIED ON IRON TRAPEZE HANGERS WITH OTHER PIPING, SATISFACTORY AND PERMANENT ELECTROLYTIC ISOLATION MATERIAL SHALL PROTECT THE COPPER AGAINST CONTACT WITH OTHER METALS.
- 24. WHERE COPPER PIPING IS SLEEVED THROUGH MASONRY, SLEEVES SHALL BE COPPER OR RED BRASS. WHERE COPPER MUST BE CONCEALED IN A MASONRY PARTITION OR AGAINST MASONRY, CONTACT SHALL BE PREVENTED BY COATING THE COPPER HEAVILY WITH ASPHALTIC ENAMEL AND PROVIDING 15# ASPHALT SATURATED FELT BETWEEN THE PIPE AND MASONRY.
- 25. ALL CUTTING AND PATCHING OF SLAB, ROOF OR OTHER BUILDING COMPONENTS TO BE BY THE GENERAL CONTRACTOR
- 26. ALL ADA FIXTURES SHALL ALSO MEET THE REQUIREMENTS OF ANSI A117.1.
- 27. IN TOILET ROOMS, COORDINATE FIXTURES, TRIM AND ACCESSORIES TO AVOID CONFLICTS WITH ALL MOUNTED GRAP BAR
- 28. PROVIDE ISOLATION VALVES ON ALL INDIVIDUAL FIXTURES AND RESTROOM GROUPS.
- 29. ALL VENT- THROUGH-ROOF LOCATIONS TO BE 4", ALL VENT THROUGH WALLS SHALL BE A MIN 10' FROM FLOOR, OR INTAKES AND TERMINATE WITH A WALL CAP.
- 30. ALL WATER PIPING SHALL BE INSULATED, AND ANY BURIED WATER LINES SHALL HAVE A SLEVE FOR BURIAL APPLICATIONS
- 31. PROVIDE SHUTOFF VALVES AT ALL DOMESTIC WATER LINES, BRANCHES, AND PRIOR TO ALL EQUIPMENT. SHUT OFF VALVES ARE NOT SHOWN FOR CLARITY.

	PLUMBING FIXTURE SCHEDULE													
Mark	Description	Provided By	Manufacturer	Model	Accessory Manufacturer	Accessory Model	Cold Water Pipe	Hot Water Pipe	Waste Pipe	Vent Pipe	Remarks			
BP-1	BOOSTER PUMP	GC	FRANKLIN ELECTRIC	2IL-23033-G1S-C			2"	0"	0"	0"	BOOSTER PUMP TO BOOST A MIN OF 40 PSI TO BRING THE PRESSURE TO 60 PSI PRIOR TO WATER SOFTNER. 208V, 2"GROVE,4.8 GAL TANK, 2 PUMPS, PRESSURE TANK, PRESSURE SWITCH AND GAUGE, CHECK VALVE AND INLINE BY PASS. PROVIDE TRANSFORMER 305619014 PROVIDE WATER SHEILD AS NEEDED.			
DW-1	DISHWASHER	OWNER	GE	SEE ARCHITECHUAL PLANS			0"	1/2"	2"	0"	DISCHARGE TO CONNECT TO GARBAGE DISPOSAL, HOSE TO BE RAN AS HIGH AS POSSIBLE TO PROVIDE AIR GAP PRIOR TO CONNECTING TO DISPOSIAL.			
GD-1	GARBAGE DISPOSAL		IN SINKERATOR	BADGER 5			0"	1/2"	2"	0"	WITH CORD, 115V SINGLE PHASE.			
GG	GAS GRILL (OUTSIDE)	OWNER		GENESIS 2 E-435			0"	0"	0"	0"	NATURAL GAS GRILL, PROVIDE OUTLET BOX BURNABY VGP-EXT-75 VERIFY GAS GRILL BTU.			
GR	GAS RANGE	OWNER	SEE ARCHITECHUAL PLANS	SEE ARCHITECHUAL PLANS			0"	0"	0"	0"				
	TANKLESS WATER HEATER		AO SMITH	540H			0"	0"	0"	0"	100 F RISE, 199 MBH, 120 V SINGLE PHASE. INTAKE/EXHAUST VENT TO BE ROUTED TO THE OUTSIDE 10FT FROM INTAKE			
HB-1	HOSE BIBB	GC	WOODFORD	B67			3/4"	0"	0"	0"	FREEZE PROOF FAUCET, PROVIDE ONE FOR BOTH HOT AND COLD WATER.			
HB-2	HOSE BIBB	GC	WOODFORD	67			3/4"	0"	0"	0"	FREEZE PROOF FAUCET WITH FREEZE PROOF BOX			
HR-1	HOSE REEL	GC	REELCRAFT	CT6100HN			3/4"	0"	0"	0"	PROVIDE WALL MOUNTED MANUAL CRANK HOSE REEL TO BE ABLE TO BE CONNECTED TO HB-1.			
LAV-1	LAVATORY - DROP IN - ADA	GC	KOHLER		DELTA	25911LF	1/2"	1/2"	2"	1 1/2"	DRAIN, TRAP, ANGLE STOPS AND TMV SET TO 105F.			
MS-1	MOP SINK	GC	FIAT	MSB-2424	T&S BRASS	897-CP	3/4"	3/4"	3"	2"	WALL MOUNTED FAUCET WITH BUCKET HOLDER. PROVIDE MOP HANGER WALL BRAKETS. PROVIDE CHECK VALVES ON BOTH HOT WATER AND COLD WATER PRIOR TO FAUCET			
OB-2	COFFEE/ICE MAKER OUTLET BOX		SIOUX CHIEF	696-RG1010MF			1/2"	0"	0"	0"	WITH MINI ARRESTOR			
OB-3	WASHING MACHINE OUTLET BOX		SIOUX CHIEF	696-R2313MF			1/2"	1/2"	2"	2"	WITH MINI ARRESTOR			
PF-1	POT FILLER		KHOLER	K-22066			1/2"	0"	0"	0"	PROVIDE CHECK VALVE			
S-1	2 BOWL SINK	GC	KOHLER		KOHLER	K-596	1/2"	1/2"	2"	2"	PROVIDE ANGLE STOPS, DRAINS, AND TMV SET TO 105F			
SH-1	SHOWER STALL	GC	SEE ARCHITECHUAL PLANS	SEE ARCHITECHUAL PLANS	DELTA	T17230	1/2"	1/2"	2"	1 1/2"	PROVIDE SHOWER DRAIN ,TRAP AND A TMV SET TO 110 MAX. FOR FIBERGLASS SHOWER STALL.			
WC-1	WATER CLOSET - FLOOR - FLUSH TANK- ADA	GC	ТОТО	CST244EF			1/2"	0"	4"	2"	TANK TYPE TANK TOILET, SS113 SOFT CLOSE SEAT, TRIP LEVER TO BE LOCATED ON APPROACH SIDE. 1.28 GPF.			
WS-1	WATER SOFTNER SYSTEM	GC	CULLIGAN	CTM-90			2"	0"	1 1/2"	0"	57 GPM @ 15 PSI DROP. MIN INLET PRESSURE 35 PSI, 120V SINGLE PHASE. WITH BRINE TANK. PROVIDE WATER BY PASS AND CHECK VALVES. INSTALL PER MANUFACTUERS INSTRUCTIONS.			

FUEL LOADS SUMMARY BUILDING NATURAL GAS SERVICE = 1" LINE 30 PSI REGULATED TO 2 PSI BEFORE METER DEVELOPED LENGTH = 250'-0" CONTRACTOR TO REGULATE TO 7.5 W.C BEFORE ENTERING BUILDING WITH SEISMIC SHUT OFF TOTAL LOAD = 1060 MBH PIPE SIZE @ 7.5 W.C. = 2.5" 2015 IFGC MARK DESCRIPTION GF-1 AIR HANDELING UNIT GWH-1&2 TANKLESS WATER HEATER 1 400 TRH-1 TUBULAR RADIENT HEATER 1 100 GG GAS GRILL (OUTSIDE) 1 240 GR TOTAL

	PIPE MATERIAL
SYSTEM	MATERIAL
CONDENSATE	COPPER, PVC
CONDENSER WATER	COPPER TUBING, STAINLESS STEEL, SCHEDULE 80 STEEL
DOMESTIC WATER	PVC, CPVC, COPPER, PEX-A
FIRE PROTECTION	GALVANIZED OR BLACK STEEL
HYDRONIC	COPPER TUBING, STAINLESS STEEL, SCHEDULE 40 STEEL
NATURAL GAS	SCHEDULE 40 BLACK STEEL
REFRIGERANT	ACR COPPER OR SCHEDULE 40 BLACK STEEL
SANITARY VENT	CAST IRON, ABS, PVC
SANITARY WASTE	CAST IRON, ABS, PVC
STORM DRAINAGE	CAST IRON, ABS, PVC

			WASTE	DFU DEMAND		
ID	FIXTURE DESCRIPTION	QTY	SIZE	UNIT	TOTAL	
FD-1	FLOOR DRAIN	1	2"	2	2	
FD-1	FLOOR DRAIN	5	3"	6	30	
FD-2	FLOOR DRAIN	2	2"	2	4	
GD-1	GARBAGE DISPOSAL	1	2"	2	2	
LAV-1	LAVATORY - DROP IN - ADA	3	2"	1	3	
MS-1	MOP SINK	1	3"	2	2	
OB-3	WASHING MACHINE OUTLET BOX	2	2"	3	6	
S-1	2 BOWL SINK	1	2"	4	4	
SH-1	SHOWER STALL	2	2"	2	4	
WC-1	WATER CLOSET - FLOOR - FLUSH TANK- ADA	3	4"	4	12	
rand total: 2	1				69	

WATER SUPPI	LY FIXTURE UNIT SUMMARY								
BUILDING WATER CONDITIONS BUILDING DOMESTIC WATER SUPPLY SIZE = 2" BUILDING STATIC WATER PRESSURE = 45 PSI									
BUILDING PRESSURE LOSS									
METER, STRAINER, RPZ, LOSS	= 25 PSI								
WATER SOFTNER	= 15 PSI								
LOWEST PRESSURE REQUIRED	= 20 PSI								
TOTAL PRESSURE LOSS	= 60 PSI								
45 PSI - 60 PSI = -15 PSI									
TOTAL BOOST REQUIRED IS 40 PSI.									
TOTAL BUILDING LOAD 32 GPM WITH TANKS @ 4 FPS = MIN 2"									

			CWFU					
			DEM	IAND	HWFU	DEMAND	WSFU [DEMAND
ID	FIXTURE DESCRIPTION	QTY	UNIT	TOTAL	UNIT	TOTAL	UNIT	TOTAL
BP-1	BOOSTER PUMP	1	0.25	0.25	0	0	0.25	0.25
DW-1	DISHWASHER	1	0	0	1.5	1.5	1.5	1.5
HB-1	HOSE BIBB	4	2.5	10	0	0	2.5	10
HB-2	HOSE BIBB	4	2.5	10	0	0	2.5	10
HR-1	HOSE REEL	2	2.5	5	0	0	2.5	5
LAV-1	LAVATORY - DROP IN - ADA	3	1.5	4.5	1.5	4.5	2	6
MS-1	MOP SINK	1	2.25	2.25	2.25	2.25	3	3
OB-2	COFFEE/ICE MAKER OUTLET BOX	3	0.5	1.5	0	0	0.5	1.5
OB-3	WASHING MACHINE OUTLET BOX	2	3	6	3	6	4	8
PF-1	POT FILLER	1	0	0	0	0	1.5	1.5
S-1	2 BOWL SINK	1	1.5	1.5	1.5	1.5	2	2
SH-1	SHOWER STALL	2	1.5	3	1.5	3	2	4
WC-1	WATER CLOSET - FLOOR - FLUSH TANK- ADA	3	5	15	0	0	5	15
WS-1	WATER SOFTNER SYSTEM	1	0.25	0.25	0	0	0.25	0.25
ΓΟΤΑL				59.25		18.75	•	68

	PLUMBING DRAIN SCHEDULE											
Identity Type Mark	Description	Manufacturer	Model	Remarks								
FD-1	FLOOR DRAIN	WATTS	FD-1100-M	PROVIDE TRAP SEALS OR TRAP PRIMERS								
FD-2	FLOOR DRAIN	WATTS	FD-1100-M	PROVIDE TRAP PRIMER. DRAIN FOR CNS MATT.								
TD-1	TRENCH DRAIN	MIFAB	T-1400-13-PGE-4-	PROVIDE LOAD CLASS E GRATE MIFAB T100-PGE-4-HP								



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ARCHITECTS
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CASE
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796 Merus Court T 636.349.1

CIVIL ENGINEER

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MECHANICAL, PLUMBING & ELECTRICAL
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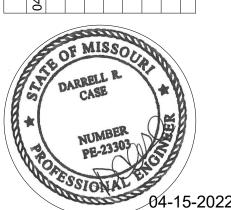
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ation #2 Facility for:

County
Ince Distric

_incoln C Ambuland 8 Walter Court

DATE ISSUE R#
1/15/2022 BID & PERMIT SET 0



DARREL R. CASE PE-23303

PROJECT MANAGER: JKL
DRAWN BY: CLK

PROJECT NUMBER 21-079 DATE APRIL 15, 2022

PLUMBING NOTES & SCHEDULES

THE "ARCHITECTURAL GENERAL CONDITIONS" GOVERN WORK UNDER THIS SECTION.

BEFORE SUBMITTING A PROPOSAL, THIS CONTRACTOR SHALL VISIT THE SITE OF THE WORK AND SHALL CAREFULLY EXAMINE THE DRAWINGS AND SPECIFICATIONS. IT IS EXPRESSLY UNDERSTOOD THAT THIS PROPOSAL IS BASED ON THE ABOVE REQUIREMENTS AND THAT IT COVERS EVERYTHING NECESSARY TO DO AND COMPLETE THE WORK.

NO DEVIATION FROM THE DRAWINGS AND /OR SPECIFICATIONS WILL BE ALLOWED WITHOUT PRIOR WRITTEN APPROVAL OF ARCHITECT OR ENGINEER. THIS CONTRACTOR SHALL COOPERATE WITH THE OTHER CONTRACTORS TO ALLOW FOR THE INSTALLATION OF THEIR WORK AS WELL AS HIS OWN.

THIS CONTRACTOR SHALL BE RESPONSIBLE FOR HIS WORK FITTING IN PLACE WITHOUT CONFLICT WITH THE OTHER TRADES, WHERE PROPER PLANNING COULD

NOTHING IN THE DRAWINGS AND/OR SPECIFICATIONS SHALL BE INTERPRETED TO CONFLICT WITH ANY CITY OR PROVINCIAL LAW, REGULATION, CODE, ORDINANCE, RULING, OR FIRE UNDERWRITER'S REQUIREMENT APPLICABLE TO THIS CLASS OF

SHOULD THE DRAWINGS AND/OR SPECIFICATIONS CONFLICT WITH SUCH LAWS OR ORDINANCES, THE CONFLICTING PORTION OF THE WORK SHALL BE INSTALLED STRICTLY IN ACCORDANCE WITH SUCH LAWS AND ORDINANCES WITHOUT EXTRA

THIS CONTRACTOR SHALL SECURE AND PAY FOR ALL NECESSARY PERMITS AND INSPECTIONS REQUIRED FOR THIS INSTALLATION OF HIS WORK.

PLUMBING SYSTEMS SHALL BE PROTECTED FROM EARTHQUAKE DAMAFE PER CODE REQUIREMENTS FOR SEISMIC DESIGN CATEGORY D.

THE INFORMATION GIVEN HEREIN AND ON THE DRAWINGS IS AS EXACT AS COULD BE SECURED, BUT ITS EXTREME ACCURACY IS NOT GUARANTEED. THIS CONTRACTOR SHALL EXAMINE THE LOCATIONS AND VERIFY ALL MEASUREMENTS, DISTANCES, ELEVATIONS AND EXISTING PIPE SIZES BEFORE STARTING THE WORK AS ALL PIPING SYSTEMS SHOWN ON THE DRAWINGS ARE DIAGRAMMATIC ONLY.

THIS CONTRACTOR SHALL PROVIDE ALL NECESSARY OFFSETS, RAISED AND DROPS IN PIPING AND DUCTWORK AS REQUIRED BY BUILDING CONDITIONS AT NO ADDITIONAL

MECHANICAL DRAWINGS SHALL NOT BE USED FOR GENERAL CONSTRUCTION DIMENSIONS OR FOR TYPE OF MATERIAL USED. FOR EXACT BUILDING LAYOUT, DIMENSIONS AND BUILDING MATERIAL USED, THIS CONTRACTOR SHALL REFER TO THE ARCHITECTURAL DRAWINGS.

SHOP OR INSTALLATION DRAWINGS, FOUNDATION PLANS, EQUIPMENT OR APPARATUS DRAWINGS SHALL BE FURNISHED BY THIS CONTRACTOR. THESE DRAWINGS SHALL BE CLEARLY MARKED INDICATING WHICH ITEMS ARE TO BE SUPPLIED AND SHALL STATE CAPACITIES, SIZES AND GENERAL DESCRIPTION OF ALL EQUIPMENT. ANY CHANGES FROM THE SPECIFIED ITEMS SHALL BE NOTED ON THE SUBMITTALS.

SHOP DRAWINGS OF SPECIAL APPARATUS OR EQUIPMENT WHICH IS TO BE FABRICATED INDIVIDUALLY FOR THIS PROJECT AND IS NOT DESCRIBED BY STANDARD MANUFACTURER'S DRAWINGS OR BULLETINS SHALL BE SUBMITTED FOR PROCESSING BEFORE FABRICATION.

THESE DRAWINGS SHALL BE SUBMITTED IN A TIMELY MANNER.

IT SHALL BE THIS CONTRACTORS RESPONSIBILITY TO MAINTAIN LIAISON WITH ALL PARTIES CONCERNED WITH THE MATERIAL SUBMITTED. THIS CONTRACTOR SHALL NOT PURCHASE ANY EQUIPMENT UNTIL SHOP DRAWINGS HAVE BEEN PROCESSED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY FEES ACCRUED FROM THE RETURN OF FIXTURES PURCHASED PRIOR TO THE REVIEW OF SHOP DRAWINGS AND

THIS CONTRACTOR SHALL SUBMIT NO DRAWINGS WITHOUT NOTATION INDICATING DATE OF CONTRACTOR'S REVIEW AND SIGNATURE OF CHECK FOR CONTRACTOR TOGETHER WITH CONTRACTOR'S NAME AND PROJECT IDENTIFICATION.

ARCHITECT'S PROCESSING WILL NOT CONSTITUTE A COMPLETE CHECK BUT WILL INDICATE ONLY THAT GENERAL METHOD OF CONSTRUCTION AND DETAILING IS SATISFACTORY.

ARCHITECT'S PROCESSING WILL NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR ERRORS SINCE THIS CONTRACTOR IS SOLELY RESPONSIBLE FOR DIMENSIONS AND DESIGNS OF ADEQUATE CONNECTIONS, DETAILS AND SATISFACTORY CONSTRUCTION OF ALL WORK, AS WELL AS FURNISHING MATERIALS AND WORKMANSHIP REQUIRED BY DRAWINGS AND SPECIFICATIONS WHICH MAY NOT BE INDICATED ON THE SUBMITTALS WHEN APPROVED.

CORRECTIONS OR COMMENTS MADE ON THE SHOP DRAWINGS DURING ENGINEER REVIEW DO NOT RELIEVE THE CONTRACTOR FROM COMPLIANCE WITH THE REQUIREMENTS OF THE PLANS AND SPECIFICATIONS. REVIEW OF A SPECIFIC ITEM SHALL NOT INCLUDE REVIEW OF AN ASSEMBLY OF WHICH THE ITEM IS A COMPONENT. THE CONTRACTOR IS RESPONSIBLE FOR: EQUIPMENT VOLTAGES AND DIMENSIONS TO BE CONFIRMED AND CORRELATED WITH ALL DISCIPLINES PRIOR TO PURCHASE; INFORMATION THAT PERTAINS SOLELY TO THE FABRICATION PROCESSES OR TO THE MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES OF CONSTRUCTION; COORDINATION OF THE WORK WITH THAT OF ALL OTHER TRADES AND PERFORMING ALL WORK IN A SAFE AND SATISFACTORY MANNER.

6. <u>SUBSTITUTIONS OF EQUIPMENT OR MATERIAL</u>

THE BRAND NAMES OF EQUIPMENT OR MATERIALS SPECIFIED HEREIN SHALL ESTABLISH QUALITY, CAPACITY, TYPE AND DIMENSIONS TO BE INCLUDED IN THE BASE

APPROVAL OF SUBSTITUTED ITEMS WILL BE BASED ON ABILITY AND CAPACITY TO PERFORM FUNCTION SERVED, QUALITY AND AVAILABILITY OF PARTS AND SERVICE, QUALITY OF EQUIPMENT, DELIVERY SCHEDULE, ETC. THE ARCHITECT SHALL REVIEW ALL SUCH REQUESTS BUT RESERVES THE SOLE RIGHT OF JUDGEMENT TO APPROVE OR REJECT THE PROPOSED SUBSTITUTIONS.

ACCEPTANCE OR REJECTION OF PROPOSED SUBSTITUTIONS SHALL NOT CAUSE ADDITIONAL COST. ANY CHANGES OF PIPING, DUCTWORK, ELECTRICAL CONTROLS OR INSTALLATION REQUIRED BECAUSE OF THE SUBSTITUTION OR EQUIPMENT SHALL BE PAID FOR BY THIS CONTRACTOR PROPOSING THE SUBSTITUTION.

7. <u>ERECTION OF APPARATUS</u>

ALL WORK SHALL BE DONE UNDER THE PERSONAL SUPERVISION OF THIS CONTRACTOR WHO SHALL PROVIDE A COMPETENT FOREMAN TO LAY OUT ALL WORK. ALL WORK SHALL BE LAID OUT WITH DUE REGARD FOR THE SPACE REQUIREMENTS OF THE OTHER CONTRACTORS. THIS CONTRACTOR SHALL REPORT ANY CONFLICTS OR DIFFICULTIES IN REGARD TO THE INSTALLATION IMMEDIATELY.

WHERE CROWDED LOCATIONS EXIST OR WHERE THERE IS A POSSIBILITY OF CONFLICT BETWEEN TRADES, THIS CONTRACTOR SHALL MAKE COMPOSITE DRAWINGS SHOWING THE EXACT LOCATIONS OF PIPES, DUCT, CONDUIT AND EQUIPMENT. DRAWINGS SHALL BE BASED ON FIELD MEASUREMENTS AND AFTER CONSULTATION AND AGREEMENT BETWEEN THE TRADES, SHALL BE APPROVED BY ARCHITECT AND ENGINEER BEFORE INSTALLATION OF THE WORK.

EQUIPMENT OF A TYPE TO REQUIRE REPLACEMENT, SERVICING, ADJUSTING OR MAINTENANCE SHALL BE LOCATED TO ALLOW EASY ACCESS AND SPACE FOR REMOVAL OF INTERNAL ASSEMBLIES, IT REQUIRED.

8. <u>EXCAVATION AND BACKFILL</u>

THIS CONTRACTOR SHALL DO ALL EXCAVATION REQUIRED TO INSTALL PIPES AND EQUIPMENT SHOWN ON THE PLANS OR REQUIRED FOR PROPER OPERATION. EXCESS EXCAVATION BELOW THE REQUIRED LEVEL SHALL BE BACKFILLED WITH EARTH AND THOROUGHLY TAMPED. UTILITIES SERVICES LINES SHALL BE INSPECTED

AND APPROVED BY THE PROPER INSPECTION AUTHORITY BEFORE BACKFILLING.

INSTALL PLASTIC PIPE AND FITTINGS IN STRICT ACCORDANCE WITH THE INSTALLATION RECOMMENDATIONS OF THE PIPE AND FITTINGS MANUFACTURER, APPENDIX X1 OF ASTM D2265 (STORAGE AND INSTALLATION PROCEDURES FOR PLASTIC DRAIN, WASTE, AND VENT PIPING) AND FOR BURIED PIPE ASTM D2321 (STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY-FLOW APPLICATIONS). SUCH INSTRUCTIONS SHALL INCLUDE BUT ARE NOT LIMITED TO CUTTING, SOLVENT CEMENTING AND PRIMING, JOINTS, CONNECTIONS, TRANSITIONS, ALIGNMENT AND GRADE, TRENCHING, BEDDING, BACKFILL AND COMPACTION, SUPPORTS AND SPACING AND ALLOWANCE FOR THERMAL EXPANSION

CAST IRON PIPING TRENCHING SHALL BE IN ACCORDANCE TO THE CAST IRON SOIL PIPE AND FITTINGS HANDBOOK ISSUED BY THE CAST IRON SOIL PIPE INSTITUTE.

THE BOTTOM OF TRENCHES SHALL BE TAMPED HARD AN GRADED TO SECURE THE REQUIRED FALL. ROCK, WHERE ENCOUNTERED SHALL BE EXCAVATED TO A DEPTH OF SIX INCHES (6") BELOW THE BOTTOM OF THE PIPE, AND BEFORE THE PIPE IS LAID, THE SPACE BETWEEN BOTTOM PIPE AND ROCK SURFACE SHALL BE FILLED WITH GRAVEL. IF TRENCHES ARE DEEPER THAN BOTTOM OF FLOORING OR CLOSER THAN THREE FEET (3'0") TO FOOTING THEY MUST BE FILLED WITH COHESIVE SOIL AND COMPACTED TO 95% OF MAXIMUM DENSITY, STANDARD PROCTOR, ASTM D- 698. ALL OTHER EXCAVATIONS UNDER FLOOR SLABS COMPACTED TO 95% STANDARD PROCTOR.

WHEN EXCESS DIRT HAS BEEN REMOVED, THE TRENCH SHALL BE BROUGHT TO THE REQUIRED LEVEL WITH SAND AND GRAVEL FIRMLY COMPACTED.

TRENCHES AND EXCAVATION SHALL BE BACKFILLED IN 6" LAYERS OF EARTH, FREE FROM CLODS, AND STONES THOROUGHLY TAMPED TO A DEPTH OF 12" ABOVE THE PIPE AFTER THAT DEPTH HAS BEEN REACHED, BACKFILLING SHALL BE DONE IN 12" LAYERS, THOROUGHLY TAMPED.

THIS CONTRACTOR SHALL BE RESPONSIBLE FOR ANY REPAIRS TO ANY DAMAGES OR SAGS TO THE PIPING SYSTEMS THAT OCCUR FROM THE IMPROPER EXCAVATION AND BACKFILL METHODS.

9. <u>EQUIPMENT SUPPORTS</u>

ANY STRUCTURAL STEEL MEMBERS REQUIRED TO ADAPT THE EQUIPMENT AND PIPING AS FURNISHED BY THIS CONTRACTOR, TO THE BUILDING STEEL OR STRUCTURE, SHALL BE INCLUDED IN THE BID OF THE CONTRACTOR FURNISHING THE EQUIPMENT OR PIPING HANGING OF ALL EQUIPMENT AND REQUIRED SUPPORTING STEEL AND BRACING SHALL BE FURNISHED BY THE CONTRACTOR WHO SUPPLIES THE EQUIPMENT.

CUTTING AND PATCHING

THIS CONTRACTOR SHALL INCLUDE ALL CUTTING, PATCHING AND PAINTING OF PATCHED AREAS REQUIRED FOR AND RESULTING FROM THE INSTALLATION OF ALL OF THIS CONTRACTOR'S WORK, EXCEPT WHERE NOTED OTHERWISE.

ALL OPENINGS AROUND PIPE PENETRATIONS THROUGH SMOKE OR FIRE-RATED FLOORS, CEILINGS OR WALLS SHALL BE SEALED AIRTIGHT WITH MATERIAL HAVING A RATING EQUAL TO THE MATERIAL OF THE WALL, CEILING AND/OR FLOOR PENETRATED.

ALL PATCHING SHALL BE NEATLY FINISHED TO THE SATISFACTION OF THE ARCHITECT.

ACCESS PANELS

THIS CONTRACTOR SHALL LOCATE AND FURNISH FOR INSTALLATION BY THE GENERAL CONTRACTOR, ALL ACCESS PANELS AS REQUIRED FOR ACCESS TO VALVES, AND THE PROPER SERVICING OF EQUIPMENT AND LINES INSTALLED UNDER THE CONTRACT.

ALL PANELS SHALL BE MILCOR, STYLE "M" FOR MASONRY, "A" FOR ACOUSTICAL TILE AND "K" FOR PLASTER: EXCEPT FOR FIRE-RATED UL 1-1/2 HOUR AND "B" LABEL ACCESS PANELS SHALL BE FURNISHED IN FIRE-RATED WALLS AND CEILINGS AS INDICATED ON THE DRAWINGS. ACCESS DOORS SHALL BE 12" X 12" MINIMUM SIZE FOR VALVES.

12. <u>DIELECTRIC UNIONS</u>

FOR THE PREVENTION OF ELECTROLYTIC CORROSION AT CONNECTIONS BETWEEN PIPE OF DISSIMILAR METALS OR BETWEEN PIPE AND EQUIPMENT CONNECTIONS OF DISSIMILAR METALS, PROVIDE DIELECTRIC UNIONS OR FLANGES.

MOTORS, STARTERS AND DISCONNECTS

UNLESS SPECIFIED TO BE FURNISHED WITH EQUIPMENT, ALL MOTOR STARTERS AND DISCONNECT SWITCHES SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL

14. <u>JOINTS AND FITTINGS</u>

THREADS ON SCREWED PIPE SHALL BE STANDARD, CLEAN BUTT AND TAPERED. PIPE SHALL BE REAMED OF BURRS AND KEPT CLEAN OF SCALE, DIRT AND SHAVINGS. TREADS SHALL BE MADE WITH FLAKED GRAPHITE AND LUBRICATING OIL OR APPROVED PIPE COMPOUND ON THE MALE THREAD ONLY.

COPPER-TO-STEEL AND COPPER-TO-BRASS JOINTS SHALL BE MADE WITH SILVER SOLDER. ALL OTHER COPPER-TO-COPPER JOINTS ABOVE GROUND SHALL BE MADE WITH LEAD FREE SOLDER. COPPER PIPE SHALL BE CUT SQUARE, BURRS REMOVED AND CARE SHALL BE GIVEN TO KEEP THE LINES FREE OF DIRT AND MOISTURE. ALL TUBING AND FITTINGS SHALL BE THOROUGHLY CLEANED.

WELDED PIPE SHALL HAVE BUTT WELDED SINGLE "V" TYPE JOINTS FOR WHICH PIPE HAS BEEN BEVELED TO 45 DEGREES. WELD SHALL BE ONE-FOURTH GREATER THICKNESS THAN THE PIPE. CONNECTIONS TO EQUIPMENT, ACCESSORIES, ETC. SHALL BE MADE BY MEANS OF FLANGES AND/OR ADAPTERS.

UNIONS SHALL BE PROVIDED AT EACH SCREWED VALVE AND UNIONS OR FLANGES AT EACH EQUIPMENT CONNECTION.

15. <u>EXPANSION JOINTS</u>

FURNISH AND INSTALL FLEXONICS EXPANSION JOINTS IN PIPING SYSTEM WHERE SHOWN OR NECESSARY FOR EXPANSION AND CONTRACTION.

EXPANSION JOINTS IN PIPE 4" AND GREATER SHALL BE THE PACKLESS TYPE WITH STAINLESS STEEL BELLOWS AND HAVE WELDED OR FLANGED END. JOINTS SHALL HAVE TRAVERSE AS INDICATED ON THE PLANS. EXPANSION JOINTS SHALL BE OF THE CONTROLLED FLEXING TYPE.

TYPE CONSTRUCTED OF TWO-PLY STAINLESS STEEL BELLOWS AND CARBON STEEL SHROUDS AND END FITTINGS, INTERNAL GUIDES AND ANTI-TORQUE DEVICES. EXPANSION JOINTS IN STEEL PIPE UNDER 4" IN SIZE SHALL BE OF THE COMPENSATOR

EXPANSION JOINTS IN COPPER PIPE UNDER 4" IN SIZE SHALL BE OF THE COMPENSATOR

TYPE CONSTRUCTED OF TWO-PLY STAINLESS STEEL ELBOWS AND CARBON STEEL SHROUDS AND END FITTINGS, INTERNAL GUIDES AND ANTI-TORQUE DEVICES.

PROVIDE GUIDES ON EACH SIDE OF EXPANSION JOINT, AT 4 PIPE DIAMETERS, 14 PIPE DIAMETERS, AND A THIRD GUIDE AS RECOMMENDED BY THE MANUFACTURER.

16. <u>PIPE FLEXIBLE CONNECTIONS</u>

FLEXIBLE PIPE CONNECTIONS SHALL BE RESISTOFLEX #R6904 OR APPROVED EQUAL FLEXIBLE CONNECTIONS MADE FROM TEFLON.

PROVIDE FOR MOVEMENT IN PIPING BY USE OF SWING JOINTS AT CONNECTION OF ALL BRANCHES TO MAINS AND RISERS. ALL BRANCHES FROM MAINS AND RISERS SHALL HAVE 1/4" CLEARANCE BETWEEN PIPE INSULATION AND SLEEVE TO PERMIT PIPE MOVEMENT.

THIS CONTRACTOR SHALL FURNISH AND INSTALL ALL VALVES OF ONE MANUFACTURER, FIGURE NUMBER AND TYPE THROUGHOUT THE ENTIRE INSTALLATION OF THE WORK, UNLESS OTHERWISE SPECIFIED. THE FOLLOWING NUMBERS ARE FROM THE CRANE CATALOG. EQUAL VALVES OF REPUTABLE MANUFACTURERS, SUCH AS HAMMOND, NIBCO-SCOTT AND/OR JENKINS WILL BE CONSIDERED EQUIVALENT.

ALL VALVES SHALL BE BUILT FOR A MINIMUM OF 125 PSIG WORKING PRESSURE.

ISOLATION VALVES SHALL BE PROVIDED ON ALL INDIVIDUAL FIXTURES AND FIXTURE

CHECK VALVES 2-1/2" AND SMALLER SHALL BE #36 (SCREWED ENDS) OR #1342 (SOLDER-JOINT ENDS) SWING-TYPE WITH BRONZE BODY AND BRONZE TRIM.

BUTTERFLY VALVES 2" AND LARGER SHALL BE #12F, IRON BODY, CAST-IRON WAFER W/LOCK

BALL VALVE UP TO 3" IN SIZE SHALL BE APOLLO SERIES #70 BRONZE VALVE WITH CHROME-PLATED BALL AND TEFLON SEAT.

GAS LINE COCKS UP TO 4" SHALL BE #320. 1/2 PSI FOR INDOOR APPLIANCE CONNECTIONS SHALL CONFORM TO ANSI Z21.15 AND CSA 9.1, 5 PSI FOR INDOOR SHUTOFF SHALL CONFORM TO CGA 91-002 AND ASME B16.44

HOSE END VALVES SHALL BE #438 GATE VALVES WITH HOSE END NIPPLES.

PROVIDE ISOLATION VALVES AT EACH FIXTURE AND FIXTURE GROUP SUPPLIES. PROVIDE SHUT OFF VALVES AT EACH BRANCH AND LABEL IN THE CEILING BELOW.

18. <u>PIPE SLEEVES AND COLLARS</u>

THIS CONTRACTOR SHALL LAY OUT ALL HIS WORK AND SET SLEEVES IN NEW CONSTRUCTION AS CONCRETE FORMS AND WALL ARE ERECTED SO AS TO BE ABLE TO INSTALL HIS WORK WITHOUT CUTTING OR BREAKING OF FLOORS OR WALLS. ALL SLEEVES FOR INSULATED PIPING SHALL BE LARGE ENOUGH TO ALLOW INSULATION TO PASS THROUGH SLEEVE.

ALL SLEEVES PASSING THROUGH FLOORS WHICH ARE WATERPROOFED SHALL BE COPPER TUBING SLEEVES EXTENDING 1" ABOVE FINISHED FLOOR. ALL OTHER SLEEVES SHALL BE 24 GAUGE GALVANIZED PIPES AND SLEEVES TO BE THOROUGHLY PACKED WITH WATERPROOF SEALANT AND THE REMAINING SPACE FILLED WITH MASTIC AND MUST BE WATERTIGHT.

ALL SLEEVES PASSING THROUGH INNER WALLS SHALL BE STANDARD PIPE THIMBLES EQUAL TO THE THICKNESS OF THE WALL.

SPACES BETWEEN PIPES AND SLEEVES THROUGH OUTSIDE WALLS, ABOVE GRADE, SHALL BE CAULKED WITH CAULKING COMPOUND; THOSE BELOW GRADE SHALL BE MADE WATERTIGHT.

SPACE AROUND ALL PIPING THROUGH FIRE OR SMOKE RATED PARTITIONS OR FLOORS SHALL BE SEALED AIRTIGHT WITH MATERIALS OR EQUIPMENT AS SPECIFIED UNDER FIRESTOPPING.

ALL PIPE PENETRATIONS OF SLABS ON GRADE SHALL BE WRAPPED WITH #15 BUILDING FELTS OR FOAM WRAP.

<u>HANGERS</u>

PIPE HANGER AND SUPPORT PRODUCTS INSTALLATION

VERTICAL PIPING: MSS TYPE 8 OR 42 CLAMPS INDIVIDUAL, STRAIGHT, HORIZONTAL PIPING RUNS: 100 FEET AND LESS: MSS TYPE 1, ADJUSTABLE, STEEL CLEVIS HANGERS. LONGER THAN 100 FEET: MSS TYPE 43, ADJUSTABLE ROLLER HANGERS. LONGER THAN 100 FEET IF INDICATED: MSS TYPE 49, SPRING CUSHION ROLLS.

MULTIPLE, STRAIGHT, HORIZONTAL PIPING RUNS 100 FEET OR LONGER:MSS TYPE 44, PIPE ROLLS. SUPPORT PIPE ROLLS ON TRAPEZE. BASE OF VERTICAL PIPING: MSS TYPE 52, SPRING HANGERS.

SUPPORT VERTICAL PIPING AND TUBING AT BASE AND AT EACH FLOOR. ROD DIAMETER MAY BE REDUCED ONE SIZE FOR DOUBLE-ROD HANGERS, TO A MINIMUM OF 3/8 INCH

INSTALL HANGERS FOR ALL PIPING PER MSS SP-69, MANUFACTURERS MANUALS AND AS PER HANGER SUPPORT DETAIL ON DRAWINGS INSTALL SUPPORTS FOR VERTICAL COPPER TUBING EVERY 10 FEET INSTALL SUPPORTS FOR VERTICAL STEEL PIPING EVERY 15 FEET. SUPPORT PIPING AND TUBING NOT LISTED IN THIS ARTICLE ACCORDING TO MSS

DAMAGE BY LEAKS

SP-69 AND MANUFACTURER'S WRITTEN INSTRUCTIONS.

THIS CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGES TO THE GROUNDS, WALKS, ROADS, ALL BUILDING COMPONENTS AND FINISHES, PIPING SYSTEMS, ELECTRICAL SYSTEMS AND THEIR EQUIPMENT AND CONTENT, CAUSED BY LEAKS IN THE PIPING SYSTEMS BEING INSTALLED OR HAVING BEEN INSTALLED HEREIN. ALL REPAIRS WILL BE MADE AT THIS CONTRACTOR'S EXPENSE.

FURNISH AND INSTALL BRADY #B-350 THIN FILM OR APPROVED EQUAL PIPE MARKERS. MARKERS SHALL BE 1-1/8" HIGH FOR PIPES 3" AND UNDER AND 2-1/4" HIGH FOR PIPES OVER

PIPE MARKERS SHALL BE LOCATED:

AT EQUIPMENT CONNECTIONS AT ACCESS DOORS

AT BRANCH MAINS ON ALL ACCESSIBLE PIPE A MAXIMUM OF 75' BETWEEN MARKERS.

AT ALL PENETRATIONS ON EITHER SIDE OF PENETRATION

PIPES PASSING THROUGH FLOORS AND FINISHED CEILINGS, FITTED WITH CHROME- PLATED PLATES OR ESCUTCHEONS LARGE ENOUGH TO COMPLETELY CLOSE OPENING AROUND PIPE OR PIPE COVERING AND FLOOR SUPPORT IN THE CASE OF VERTICAL PIPING, SECURELY HELD IN PLACE; CAULK WATERTIGHT AROUND PIPE IN UNFINISHED ROOMS.

23. <u>FIRE STOPPING</u>

THE PENETRATIONS OF FIRE AND/OR SMOKE RATED WALLS OR FLOORS SHALL BE PROTECTED BY A UL APPROVED MATERIAL TO RETAIN THE INTEGRITY OF THE TIME-RATED CONSTRUCTION BY MAINTAINING AS EFFECTIVE BARRIER AGAINST THE SPREAD OF FLAME, SMOKE AND GASES. IT SHALL BE USED IN ALL DUCT CABLE, CONDUIT AND PIPING PENETRATIONS THROUGH FLOOR SLABS AND TIME-RATED WALLS, AND/OR FLOORS. THE RATING OF THE FIRESTOPPING SHALL EQUAL THE RATING OF THE TIME-RATED ASSEMBLY.

FIRESTOPPING MATERIAL SHALL BE 3M FIRE BARRIER SEALING SYSTEM OF APPROVED EQUAL. FIRESTOPPING MATERIAL SHALL CONSTITUTE ONE OR MORE OF THE FOLLOWING PRODUCTS:

CAULK: CP-25 PUTTY: #303 WRAP/STRIP: FS195

COMPOSITE SHEET: CS195 PENETRATING SEALING SYSTEMS: 7900 SERIES

INSTALLATION OF FIRESTOPPING SHALL BE INSTALLED IN ACCORDANCE WITH AND IN STRICT CONFORMITY WITH MANUFACTURER'S PRINTED INSTRUCTIONS AS TO SURFACE PREPARATION, INSTALLATION AND QUALITY CONTROL. AREAS OF WORK SHALL REMAIN ACCESSIBLE UNTIL INSPECTION AND APPROVAL BY THE APPLICABLE CODE AUTHORITIES.

ON INSULATED PIPES, THE FIRE-RATING CLASSIFICATION SHALL NOT REQUIRE REMOVAL OF THE INSULATION.

SUBMIT MANUFACTURER'S PRODUCT DATA, LETTER OF CERTIFICATION OR CERTIFIED LABORATORY TEST REPORT THAT THE MATERIAL OR COMBINATION OF MATERIALS MEET THE REQUIREMENTS SPECIFIED IN ASTM E814 AND ARE SO CLASSIFIED IN UL'S BUILDING MATERIALS DIRECTORY. MATERIALS SHALL MEET AND BE ACCEPTABLE FOR USE BY ALL MODEL BUILDING CODES. MATERIALS SHALL MEET THE REQUIREMENTS OF NFPME61- LIFE SAFETY CODE AND NFPA 70 NATIONAL ELECTRICAL CODE.

SUBMIT SHOP DRAWINGS, PRODUCT DATA, CERTIFICATES AND MANUFACTURER'S INSTALLATION INSTRUCTIONS. SUBMIT MANUFACTURER'S PRODUCT DATA FOR ALL MATERIALS AND PREFABRICATED DEVICES, PROVIDING DESCRIPTIONS SUFFICIENT FOR IDENTIFICATION AT THE JOB SITE. INCLUDE MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION.

SUBMIT SHOP DRAWINGS SHOWING PROPOSED MATERIAL, REINFORCEMENT, ANCHORAGE, FASTENINGS, AND METHOD OF INSTALLATION. CONSTRUCTION DETAILS SHALL ACCURATELY REFLECT ACTUAL JOB CONDITIONS.

24. <u>CLEANUP AND ADJUSTMENT</u>

ALL PARTS WORK LEFT CLEAN: EQUIPMENT, FIXTURES, VALVES, PIPES AND FITTINGS CLEANED OF GREASE AND METAL CUTTINGS. ANY DISCOLORATION OR OTHER DAMAGE TO PORTIONS OF BUILDING. ITS FINISH OR FURNISHING DUE TO THIS CONTRACTORS FAILURE TO PROPERLY CLEAN INTERIOR OF PIPING, REPAIRED AT THIS CONTRACTOR'S EXPENSE. ALL AUTOMATIC CONTROL DEVISES ADJUSTED FOR PROPER OPERATION. ALL SURPLUS MATERIALS AND ANY RUBBISH REMOVED AS IT ACCUMULATES. ALL EQUIPMENT LEFT IN SAFE, PROPER OPERATING CONDITION.

DAMAGE TO ANY PORTIONS MUST BE REPAIRED OF THE PART REPLACED BY THIS CONTRACTOR AND ALL PARTS LEFT WITHOUT DENTS, SCRATCHES, THROUGH THE FINISH PAINT, LOOSE PLASTER, STAINS OR OTHER BLEMISHES.

25. <u>PIPE TESTING AND START-UP</u>

ALL PIPING TO BE TESTED IN ACCORDANCE WITH THE FOLLOWING:

WATER - 100 PSI WATER PRESSURE ALL TESTING MUST HOLD FOR AT LEAST 24 HOURS WITHOUT LOSS OF PRESSURE OR VACUUM. ALL CONCEALED PIPING SHALL BE TESTED IN THE PRESENCE OF THE OWNER'S REPRESENTATIVE PRIOR TO COVERING. BEFORE STARTING ANY SYSTEM, ALL EQUIPMENT SHALL BE LUBRICATED PER MANUFACTURERS REQUIREMENTS BY THIS CONTRACTOR. TEST ENTIRE BUILDING SYSTEMS UNDER FULL LOAD CONDITIONS FOR A PERIOD OF NOT LESS THAT ONE (1) WEEK DURING WHICH TIME THE OPERATING PERSONNEL SHALL BE FULLY INSTRUCTED IN THE OPERATION AND MAINTENANCE OF THE PLANT. AFTER THE PLANT IS IN FULL OPERATION, THIS CONTRACTOR IS TO FURNISH WHATEVER ADDITIONAL SERVICE IS REQUIRED TO RECALIBRATE AND RESET CONTROLS, VALVES, BALANCING COCKS, ETC. TO ENSURE PROPER OPERATION OF THIS SYSTEM.

26. <u>TESTING AND BALANCING</u>

THIS CONTRACTOR SHALL AT THE TIME OF INSTALLATION ENSURE THAT ALL DEVICES TO COMPLETE TESTING AND BALANCING AS DIRECTED HEREIN ARE FURNISHED AND INSTALLED DURING FABRICATION AND INSTALLATION OF WORK. THIS WORK SHALL BE PERFORMED PRIOR TO TURNOVER TO BUILDING OCCUPANT AND WITH AMPLE TIME TO MAKE ANY NECESSARY REPAIRS OR CHANGES TO ACHIEVE A PROPERLY OPERATING SYSTEM.

27. <u>SEISMIC RESTRAINTS ON MECHANICAL EQUIPMENT</u>

ALL PLUMBING EQUIPMENT SHALL BE PROVIDED WITH SEISMIC RESTRAINING SERVICES AS REQUIRED BY LOCAL BUILDING CODES. CONTRACTOR SHALL HAVE LOCAL BUILDING OFFICE REVIEW EACH PIECE OF EQUIPMENT WHEN INSTALLED AND THE CONTRACTOR SHALL INSTALL ALL REQUIRED TIE DOWN, ANCHORS, STRAPS OR OTHER DEVICES REQUIRED.

THIS CONTRACTOR SHALL GUARANTEE ALL EQUIPMENT, MATERIALS, AND LABOR FURNISHED UNDER THIS CONTRACT TO BE FREE FROM DEFECTS FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF SUBSTANTIAL COMPLETION AND SHALL REPAIR OR REPLACE ANY EQUIPMENT OR MATERIAL WHICH IS DEFECTIVE OR IMPROPERLY INSTALLED. IN ADDITION, THIS CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR ANY DAMAGE TO THE BUILDINGS AND ITS CONTENTS OR OTHER EQUIPMENT, CAUSED BY DEFECTS OR IMPROPER INSTALLATION OF EQUIPMENT OR MATERIALS INSTALLED UNDER THIS SECTION OF THE SPECIFICATIONS.

29. <u>TEMPORARY WATER</u>

TEMPORARY WATER SERVICE (IF REQUIRED) TO THE BUILDING SHALL BE PROVIDED BY THIS CONTRACTOR TO THE BUILDING FOR CONSTRUCTION PURPOSES. THIS CONTRACTOR TO MAINTAIN WATER SERVICE AS REQUIRED DURING CONSTRUCTION.

30. <u>DOMESTIC WATER SERVICE</u>

THIS CONTRACTOR SHALL COORDINATE EXACT AVAILABLE DELIVERY PRESSURE AND PROVIDE ALTERNATE FEE FOR A PRESSURE BOOSTING SYSTEM IF PRESSURE IS LESS THAN 65PSI STATIC. PROVIDE PRESSURE REDUCING VALVE WITH STRAINER IN SERVICE LINE IF REQUIRED BY LOCAL CODES OR PRESSURE IS ABOVE 80 PSI.

JOINTS SHALL BE CLEANED AND DEBURRED AS RECOMMENDED BY THE MANUFACTURER AND FEDERAL, STATE, AND LOCAL CODES AND PRESS FITTINGS ARE AN ACCEPTABLE IF ALLOWED BY LOCAL AHJ. WHERE PRESS FITTING S ARE NOT ALLOWED SOLDERED AS LISTED BELOW. FLUX SHALL BE NON-CORROSIVE. VICTAULIC GROUVED COUPLINGS ARE ACCEPTABLE ALTERNATE IF ALLOWED BY LOCAL AHJ.

ABOVE GRADE - WHERE FITTINGS ARE SOLDERED BOTH FITTINGS AND TUBING SHALL BE CLEANED AS DESCRIBED ABOVE. UNDER NO CIRCUMSTANCES SHALL DISSIMILAR METALS COME INTO DIRECT CONTACT WITH COPPER TUBING; E.G., GALVANIZED STRAPPING, HANGERS, OR CLAMPS TO SECURE THE TUBING.

BELOW GRADE, OR FLOOR SLAB ON EARTH OR STONE FILL - HIGH TEMPERATURE, SOLDER, 1200 DEG. F OR GREATER MELTING POINT.

NOTE: WATER PIPE TO BE PROPERLY SECURED AND ALIGNED SO AS NOT TO EXERT VERTICAL OR HORIZONTAL STRESSES ON THE SEATING OF THE MATING (MALE AND FEMALE) SURFACES OF THE UNIONS.

MATERIALS - UNDERGROUND: TYPE "K" COPPER TUBE, SOFT TEMPER MATERIALS - ABOVEGROUND: UPONOR PEX-A PIPE AND FITTINGS ALTERNATE MATERIALS - VIEGA, PROPRESS COPPER 1/2-INCH THROUGH 4-INCH WITH EPDM SEALING ELEMENT AND/OR VIEGA, PROPRESS 304 OR 316 STAINLESS 1/2-INCH THROUGH 4-INCH WITH EPDM OR FKM SEALING ELEMENT IS ACCEPTABLE IF ALLOWED BY LOCAL CODE. NOTE: COPPER PIPING IS NOT TO BE USED ON FILTERED OR RO WATER LINES.

31. <u>STERILIZATION OF DOMESTIC WATER SYSTEM</u>

THE ENTIRE DOMESTIC WATER DISTRIBUTION SYSTEM SHALL BE FLUSHED CLEAR OF ANY DEBRIS AND THOROUGHLY STERILIZED WITH A SOLUTION CONTAINING NOT LESS THAN 100 PARTS PER MILLION OF AVAILABLE CHLORINE. THE SOLUTION SHALL REMAIN IN THE SYSTEM FOR TWO (2) HOURS DURING WHICH TIME ALL VALVES AND FAUCETS SHALL BE OPENED AND CLOSED SEVERAL TIMES. AFTER STERILIZATION, THE SOLUTION SHALL BE FLUSHED FROM THE SYSTEM WITH CLEAN WATER UNTIL THE RESIDUE CHLORINE CONTENT IS NOT GREATER THAN THE CHLORINE LEVEL OF THE AVAILABLE WATER SUPPLY.

STERILIZATION SHALL BE PERFORMED PRIOR TO TURNOVER TO OCCUPANT AS TO NOT ALLOW FOR THE WATER SYSTEM TO REMAIN STAGNANT FOR LONGER THAN 24 HOURS.

THIS CONTRACTOR SHALL HAVE THE WATER TESTED AND APPROVED BY THE HEALTH

32. <u>SANITARY SEWERS</u> THIS CONTRACTOR SHALL CONNECT SANITARY SEWER AS INDICATED ON THE DRAWINGS.

VERIFY DIRECTION OF FLOW PRIOR TO ANY ROUGH-IN WORK. EACH PIPE SHALL BE LAID TO THE LINE AND GRADE INDICATED ON THE PLANS AND SUCH A MANNER AS TO FORM A CLOSE CONCENTRIC JOINT WITH THE ADJOINING PIPE AND TO

PRESENT OFFSETS IN FLOW LINE. ALL PIPE SHALL BE LAID WITH THE BELLS UPHILL. THE SUB-GRADES SHALL BE KEPT FREE FROM WATER WHILE PIPES ARE BEING LAID. ALL PIPE SHALL BE LAID WITH ENDS ABUTTING AND TRUE TO LINE AND GRADE. THEY SHALL BE FITTED AND MATCHED SO THAT THEY WILL FORM A SEWER WITH A SMOOTH AND UNIFORM

EACH JOINT SHALL BE CLEANED AS IT IS LAID AND ALL BELLS SHALL BE CLEANED BEFORE PIPES ARE JOINED.

EPOXY COATED CAST IRON PIPE AND FITTINGS SHALL CONFORM TO THE REQUIREMENTS OF CICPI STANDARD 301, ASTM A888 AND ASTM A74, AND BE LINED WITH SUITABLE EPOXY COATING.. PIPE AND FITTINGS SHALL BE MARKED WITH COLLECTIVE TRADEMARK OF THE CAST IRON SOIL PIPE INSTITUTE AND BE LISTED BT NSF INTERNATIONAL.

PVC SEWER PIPE MAY BE USED IN LIEU OF THAT SPECIFIED ABOVE IF ALLOWED BY LOCAL CODES.

ABS AND FOAM CORE PVC ARE NOT ACCEPTABLE MATERIALS.

SDR 35 IS NOT ACCEPTABLE FOR UNDER BUILDING USE. 33. WASTE, SOIL, DRAIN AND VENT PIPING

THE DRAINS, SOIL WASTE AND VENT PIPE AND FITTINGS INCLUDING EXTENSIONS TO SEWERS SHALL BE OF THE SIZES INDICATED ON THE DRAWINGS. PIPE AND FITTINGS TO BE, CYLINDRICAL AND FREE FROM CRACKS OR OTHER DEFECTS.

ALL TRENCHES TO BE DUG WITH GRADUAL FALL, THE PIPING TO BE STRAIGHT AND FREE FROM ANY SAGS.

THE ARRANGEMENT OF THE SYSTEM SHALL BE AS SHOWN ON THE DRAWINGS AND AS DIRECT AS POSSIBLE, AVOIDING ALL UNNECESSARY OFFSETS. THE STACKS SHALL BE FIRMLY SECURED IN POSITION WITH WROUGHT IRON CLAMPS AT EACH FLOOR.

ALL CHANGES IN DIRECTION OF SOIL OR WASTE PIPE SHALL BE MADE BY MEANS OF "Y" BRANCHES AND 1/8 BENDS. NINETY DEGREE SHORT TURN FITTINGS WILL NOT BE PERMITTED EXCEPT TO INDIVIDUAL FIXTURE CONNECTIONS OR WHERE THE FLOW IS FROM THE HORIZONTAL TO THE VERTICAL.

SANITARY CLEANOUTS ARE TO BE PROVIDED AT EVERY TURN GREATER THAN 45° EVERY 75' AT ANY STACK ROUTING BELOW GRADE. NOT ALL CLEANOUTS LOCATIONS MAY BE SHOWN ON THE DRAWING.

ALL TRAP SCREWS MUST BE OF FULL SIZE OF PIPE UP TO 4" AND 4" FOR ALL OVER THIS SIZE. CONNECTIONS BETWEEN OUTLETS OF FIXTURES AND SOIL OR WASTE PIPE SHALL BE MADE WITH "Y" BRANCHES TO "TY" BRANCHES WHEREVER POSSIBLE. ALL HORIZONTAL SOIL WASTE AND VENT PIPE SHALL BE GRADED TOWARD OUTLETS AND PIPE NOT BURIED SHALL BE INSTALLED ABOVE THE CEILING OR CLOSE AS POSSIBLE TO THE CONSTRUCTION ABOVE WHERE THERE IS NO CEILING.

THE STACKS SHALL BE EXTENDED THROUGH ROOF OF BUILDING TO POINTS NOT LESS THAT 12" ABOVE ROOF. EXTENSIONS THROUGH ROOF SHALL BE MADE WATER- TIGHT BY MEANS OF A LEAD FLASHING OF FOUR POINTS SHEET LEAD SPREAD OVER A DISTANCE OF NOT LESS THAN TWELVE INCHES (12") AROUND PIPE. THIMBLE TO BE SOLDERED TO BASE AND EXTENDED OVER AND TURNED DOWN INTO END OF PIPE IN AN APPROVED MANNER.

ALL CLEANOUTS IN FLOORS TO BE JOSAM #8360 OR EQUAL. ADJUSTABLE CLEANOUT WITH BODY TO MATCH THE PIPING MATERIAL, CAST BRASS SCORIATED COVER WITH LETTERS C.O. CAST IN TOP AND CONCEALED BRASS PLUG.

CLEANOUTS SHALL BE INSTALLED IN BASE OF EACH STACK. CONCEALED CLEANOUTS SHALL HAVE JOSAM #8600 OR EQUAL. CAST BRASS CHROMIUM PLATED FLAT ACCESS

EPOXY COATED CAST IRON PIPE AND FITTINGS SHALL CONFORM TO THE REQUIREMENTS OF CICPI STANDARD 301, ASTM A888 AND ASTM A74, AND BE LINED WITH SUITABLE EPOXY COATING.. PIPE AND FITTINGS SHALL BE MARKED WITH COLLECTIVE TRADEMARK OF THE CAST IRON SOIL PIPE INSTITUTE AND BE LISTED BT NSF INTERNATIONAL.

ALL JOINTS OF CAST IRON PIPE SHALL BE MADE WITH MANUFACTURERS RECOMMENDED JOINING MATERIAL. AT THE CONTRACTOR'S OPTION HE MAY USE NO-HUB PIPE, FITTINGS, COUPLING AND GASKETS IN LIEU OF CAULKED JOINTS IF APPROVED BY THE LOCAL CODES AND ORDINANCES.

IF APPROVED BY THE LOCAL CODES, SCHEDULE 40 PVC PIPE WITH DWV FITTINGS MAY BE USED FOR THE WASTE AND VENT SYSTEM. PVC PIPE AND FITTINGS SHALL BE INSTALLED IN STRICT ACCORDANCE WITH ALL CODES. ENCASEMENT OF PVC PIPES WITHIN RATED SHAFTS SHALL BE THE COST OF THIS CONTRACTOR.

ABS AND FOAM CORE PVC ARE NOT ACCEPTABLE MATERIALS.

SDR 35 IS NOT ACCEPTABLE FOR UNDER BUILDING USE

35. <u>WASTE, VENT AND WATER CONNECTIONS</u>

EACH VENT FLASHING SHALL BE MADE WATER-TIGHT WITH THE ROOF BY PROPER WATER PROOF FLASHING.

THE MINIMUM SIZE OF WASTE, VENT, AND WATER CONNECTION TO THE INDIVIDUAL FIXTURES SHALL BE AS SHOWN ON DRAWINGS.

APPEARING IN FIXTURE LIST. NO WATER PIPE LESS THAN 1/2" SHALL BE INSTALLED IN CONCEALED PLACES SUCH AS IN PARTITIONS OR WALLS ETC.

36. PLUMBING FIXTURES AND TRIM PLUMBING FIXTURES SHALL BE FURNISHED AND INSTALLED IN A NEAT AND WORKMANLIKE MANNER WITH PROPER CONNECTIONS TO SUPPLY AND DRAINAGE PIPING. ALL FIXTURES SHALL BE FREE OF FLAWS AND DEFECTS OF ANY SORT IN MATERIAL AND WORKMANSHIP AND SHALL OPERATE PERFECTLY WHEN INSTALLED IN ACCORDANCE WITH MANUFACTURER'S DIRECTION.

WHERE FIXTURES ARE GROUPED PIPES SHALL BE INCREASED IN PROPORTION: IN ALL

CASES THE SIZE ARRANGEMENTS AND CONNECTIONS OF WATER AND VENT PIPING

SHALL NOT BE LESS THAN SIZE OF OPENINGS SPECIFIED FOR FIXTURES AND

MATERIALS: FIXTURES SHALL BE THE STANDARD PRODUCT OF ONE OF THE MANUFACTURER'S LISTED IN THE PLUMBING FIXTURE SCHEDULE, OR ANY EQUAL UNIT APPROVED BY THE ENGINEER.

INSTALLATION: THIS CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTION OF THE

PLUMBING FIXTURES AND ACCESSORIES DURING CONSTRUCTION. HE SHALL REPLACE BROKEN. FIXTURES SHALL BE COVERED WITH BUILDING PAPER AND WOODEN CRATES DURING CONSTRUCTION. CONTRACTOR SHALL COORDINATE EXACT AND PROVIDE ROUGH-IN LOCATIONS WITH

FIELD CONDITIONS AND PLANS PRIOR TO ANY WORK, CONTRACTOR SHALL CONNECT ALL FIXTURES TO THE PLUMBING SYSTEM. ALL FIXTURES TO BE INSTALLED TO DIMENSIONS WITH CHROME-PLATED SUPPLIES WITH STOPS. ALL FIXTURES INSTALLED TO DIMENSIONS SHOWN ON THE DRAWINGS. ALL WATER

CLOSETS SHALL HAVE CAULKING BETWEEN THE FLOOR AND UNDERSIDE OF THE

PLUMBING EQUIPMENT: (REFER TO SCHEDULE ON THE DRAWINGS)

ALL INSULATION SHALL HAVE COMPOSITE (INSULATION, JACKET OR FACINGS AND ADHESIVE USED TO ADHERE THE FACING OR JACKET TO THE INSULATION) FIRE AND SMOKE HAZARD RATINGS AS TESTED BY PROCEDURE ASTM E-84, NFPA 225 UL 723 NOT

FLAME SPREAD 25 SMOKE DEVELOPED 50

38. <u>NATURAL GAS PIPING SYSTEM</u>

ALL ACCESSORIES SUCH AS ADHESIVES, MASTICS, CEMENTS, TAPES AND CLOTH FOR

FITTINGS SHALL HAVE THE SAME COMPONENTS RATINGS AS LISTED ABOVE. INSULATION SHALL BE APPLIED ON CLEAN, DRY SURFACES AND AFTER INSPECTION AND RELEASE FOR INSULATION APPLICATION. ALL INSULATION SHALL BE CONTINUOUS THROUGH WALL AND CEILING OPENINGS AND SLEEVES. INSULATION ON ALL COLD SURFACES WHERE VAPOR BARRIER JACKETS ARE USED, WILL BE APPLIED WITH A CONTINUOUS, UNBROKEN VAPOR SEAL, INCLUDING ALL FITTINGS AND VALVES. ALL INSULATION TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S. FITTINGS

INSULATION SCHEDULE DOMESTIC COLD WATER - 1/2" THICK ARMAFLEX (FLAME SPREAD 25/ SMOKE

SHALL BE FINISHED WITH 1/4" COAT OF INSULATING CEMENT AND CANVAS.

DOMESTIC HOT WATER RETURN- 1" THICK ARMAFLEX (FLAME SPREAD 25/ SMOKE DEVELOPED 50) EXPOSED STORM WASTE AND SANITARY WASTE - 1/2" THICK ARMAFLEX (FLAME

DOMESTIC HOT WATER - 1" THICK ARMAFLEX (FLAME SPREAD 25/ SMOKE DEVELOPED

SPREAD 25/ SMOKE DEVELOPED 50) ALL MATERIALS USED SHALL COMPLY WITH SECTIONS 1712 AND 1713 OF THE UBC.

ALL PIPING FROM GAS METER TO GAS-FIRED EQUIPMENT SHALL BE FURNISHED AND INSTALLED BY THIS CONTRACTOR.

ALL GAS PIPING TO BE IN ACCORDANCE WITH LOCAL CODES, NFPA-54, IFGC AND UPC

ALL GAS PIPING SHALL BE INSTALLED IN ACCORDANCE WITH NFPA-54, LOCAL CODES,

AND REGULATIONS. ALL GAS PIPING SHALL BE SCHEDULE 40 BLACK OR GALVANIZED STEEL WITH BLACK OR GALVANIZED WITH MALLEABLE SCREWED FITTINGS. USE TEFLON TAPE ON ALL THREADED JOINTS. FITTINGS LARGER THAN TWO INCHES (2") SHALL BE WELDED. PROVIDE UNIONS AND GAS SHUT-OFF VALVES AT EACH PIECE OF GAS FIRED EQUIPMENT OR APPLIANCE. ANY GAS PIPING CONCEALED IN CHASES AND/OR

FLEXIBLE CSST PIPING MATERIAL IS AN ACEPTABLE ALTERNATE ONLY IF ALLOWED BY LOCAL AHJ AND RESIZED PER MANUFACTURERS SIZING GUIDELINES.

ALL FLEXIBLE GAS PIPING SYSTEM COMPONENTS MUST BE: A.1 CSA INTERNATIONAL CERTIFIED CORRUGATED

INACCESSIBLE CEILING IS TO BE WELDED WITH WELDED FITTINGS.

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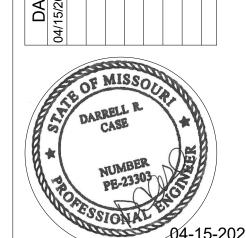
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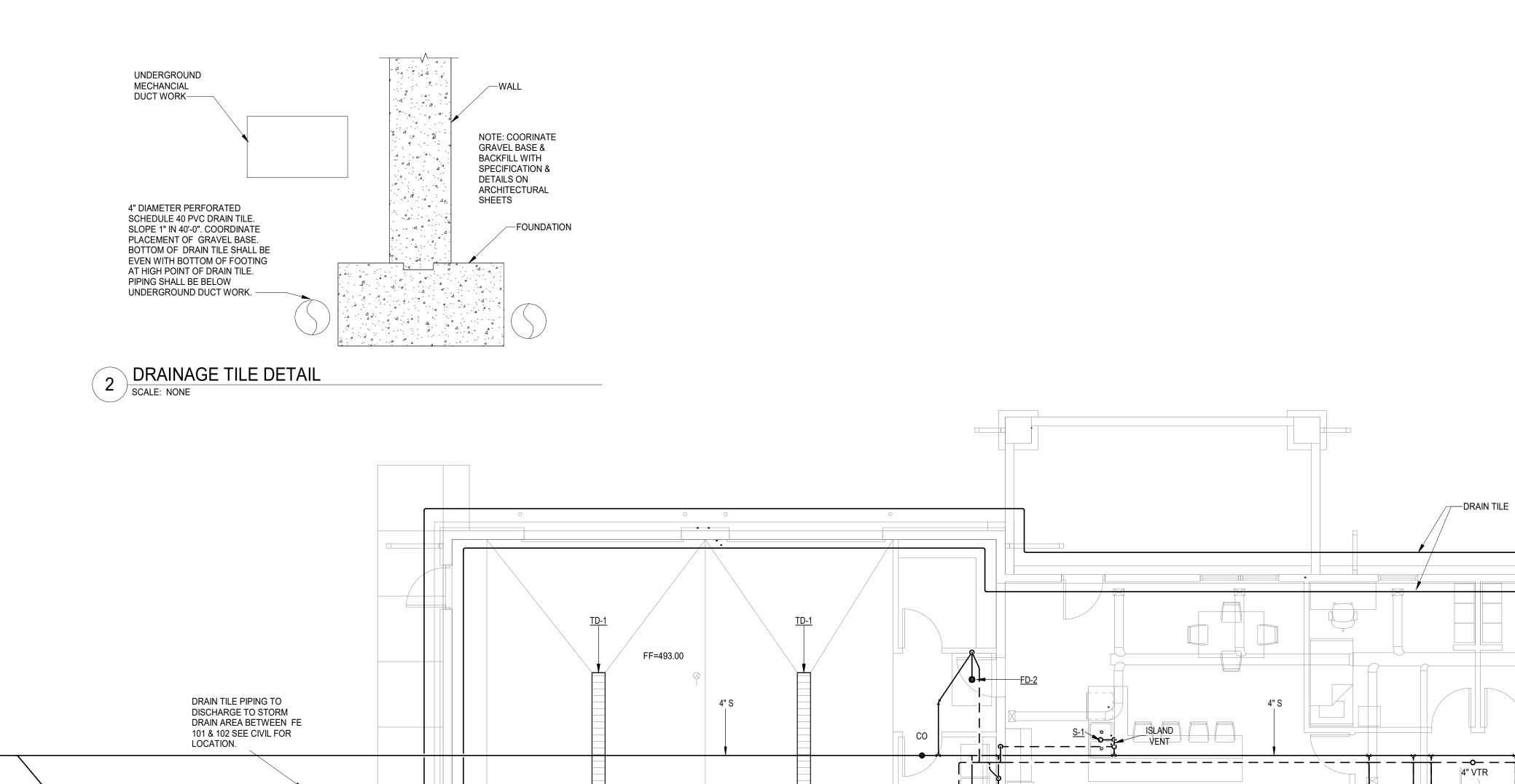
DARREL R. CASE PE-23303

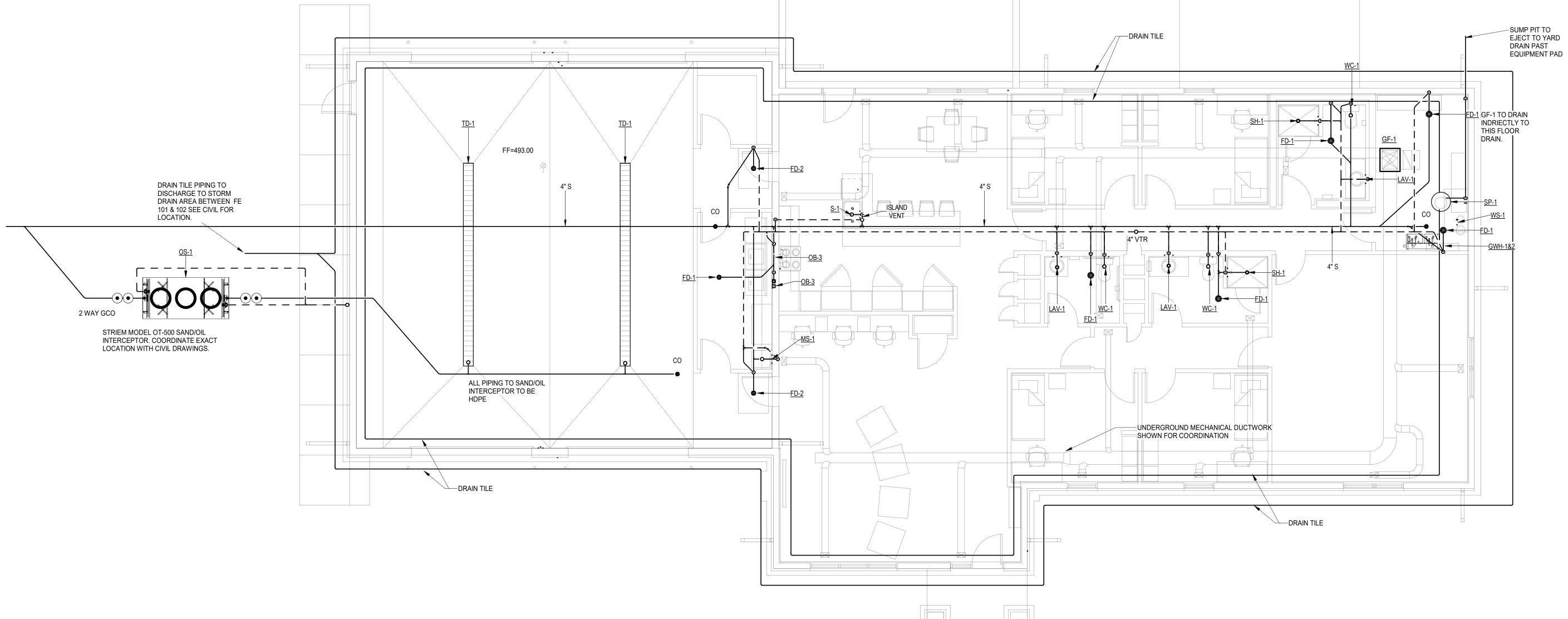
PROJECT MANAGER: JKL DRAWN BY: CLK PROJECT NUMBER

> DATE APRIL 15, 2022

21-079

SPECIFICATIONS AND SYMBOLS









BAALMAN ARCHITECTS #2 Daniel Drive O'Fallon, MO 63366 ph: 636.294.9811

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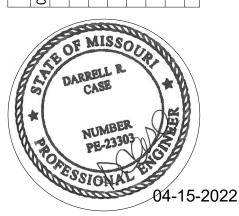
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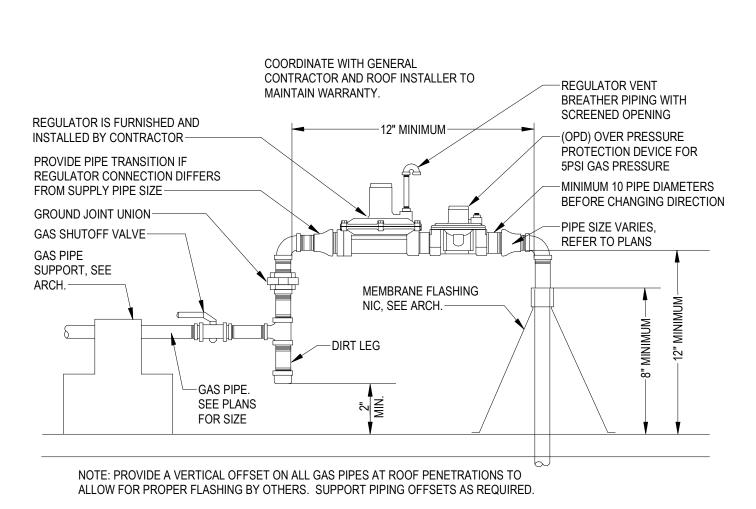


DARREL R. CASE PE-23303

PROJECT MANAGER: JKL DRAWN BY:

> PROJECT NUMBER 21-079 DATE APRIL 15, 2022

SHEET P100 WASTE & VENT PLAN



GAS PIPE ROOF PENETRATION DETAIL

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

CONDUIT TO ADDITIONAL BURNERS AND MAXITROL GAS PRESSURE CONTROLLING MEANS - 120V WIRING. REGULATOR IF NEEDED— SHUT-OFF VALVE (INCLUDED -MAIN BRANCH GAS W/ BURNER)-NOTE: LIGHTS ARE NOT TO HANG DOWN NEAR THE BURNERS AND NEED TO BE A MIN 12" ABOVE THE HEATERS. GAS NIPPLE--STAINLESS STEEL FLEX GAS CONNECTOR (INCLUDED W/ BURNER) NOTE: HANG HEATERS PER MANUFACTURERS RECOMMENDATIONS, AND SECURE HEATERS TO PREVENT SWAYING.

GAS HEATER DETAIL

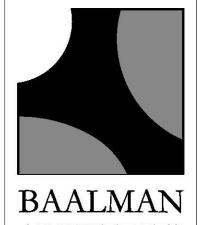
SCALE: NO SCALE

-1/2" TEMPERED WATER TO LAVATORIES (SET TO 105"F) -SHUT-OFF VALVE (TYP) -THERMOMETER -MIXING VALVE —CHECK VALVE (TYP) → DOMESTIC CW → DOMESTIC HW

TEMPERING VALVE DETAIL SCALE: 1/8" = 1'-0"

KEYNOTES

- PROVIDE POINT OF USE MIXING VALVE MV-1 TO PROVIDE 105 DEG. MAX TEMP. WATER PROVIDE BYPASS FOR BOOSTER PUMP FOR WHEN CITY'S WATER LINES ARE REDONE. INSTALL PER MANUFACTUERS INSTRUCTIONS.
- CONTRACTOR TO INSTALL NATURAL GAS SOLENOID VALVE TO SHUT OFF THE GAS LINE TO KITCHEN EQUIPMENT WHEN FIRE ALARM AND ALARM CALL IS ACTIVATED. PROVIDE A PUSH BUTTON CONTROLLER (ISIMET) BY EQUIPMENT THAT WILL ACT AS AN EMERGENCY SHUT OFF AND VALVE RESET. THIS IS TO ENSURE GAS COOKING APPLIANCES TO BE SHUT OFF WHEN FIRE ALARM IS ACTIVATED AND WILL ALLOW MANUAL RESET IF COOK WILL NOT NEED TO GO TO FIRE ALARM CALL. COORDINATE INSTALLATION AND CONTROLS WITH ELECTRICAL AND FIRE ALARM CONTRACTOR.
- 4 CONTRACTOR TO INSTALL NATURAL GAS SOLENOID VALVE TO SHUT OFF THE GAS LINE TO GRILL EQUIPMENT WHEN FIRE ALARM AND ALARM CALL IS ACTIVATED. PROVIDE A PUSH BUTTON BY EQUIPMENT THAT WILL ACT AS AN EMERGENCY SHUT OFF AND VALVE RESET. THIS IS TO ENSURE GAS COOKING APPLIANCES TO BE SHUT OFF WHEN FIRE ALARM IS ACTIVATED AND WILL ALLOW MANUAL RESET IF COOK WILL NOT NEED TO GO TO FIRE ALARM CALL. COORDINATE INSTALLATION AND CONTROLS WITH ELECTRICAL AND FIRE ALARM CONTRACTOR. PROVIDE FLEX CONNECT IN WALL BOX FOR FUTURE OUTSIDE GRILL.
- PROVIDE WATER PRESSURE REGULATOR SET TO 75 PSI ON THE INCOMMING WATER SERVICE EVEN IF WATER PRESSURE DOES NOT MEET THIS CRITERA. CITY WILL BE UPDATEING WATER LINES IN THIS AREA IN THE FUTURE.



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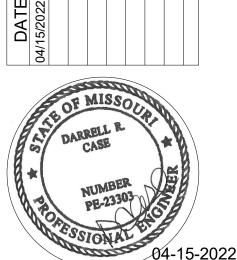
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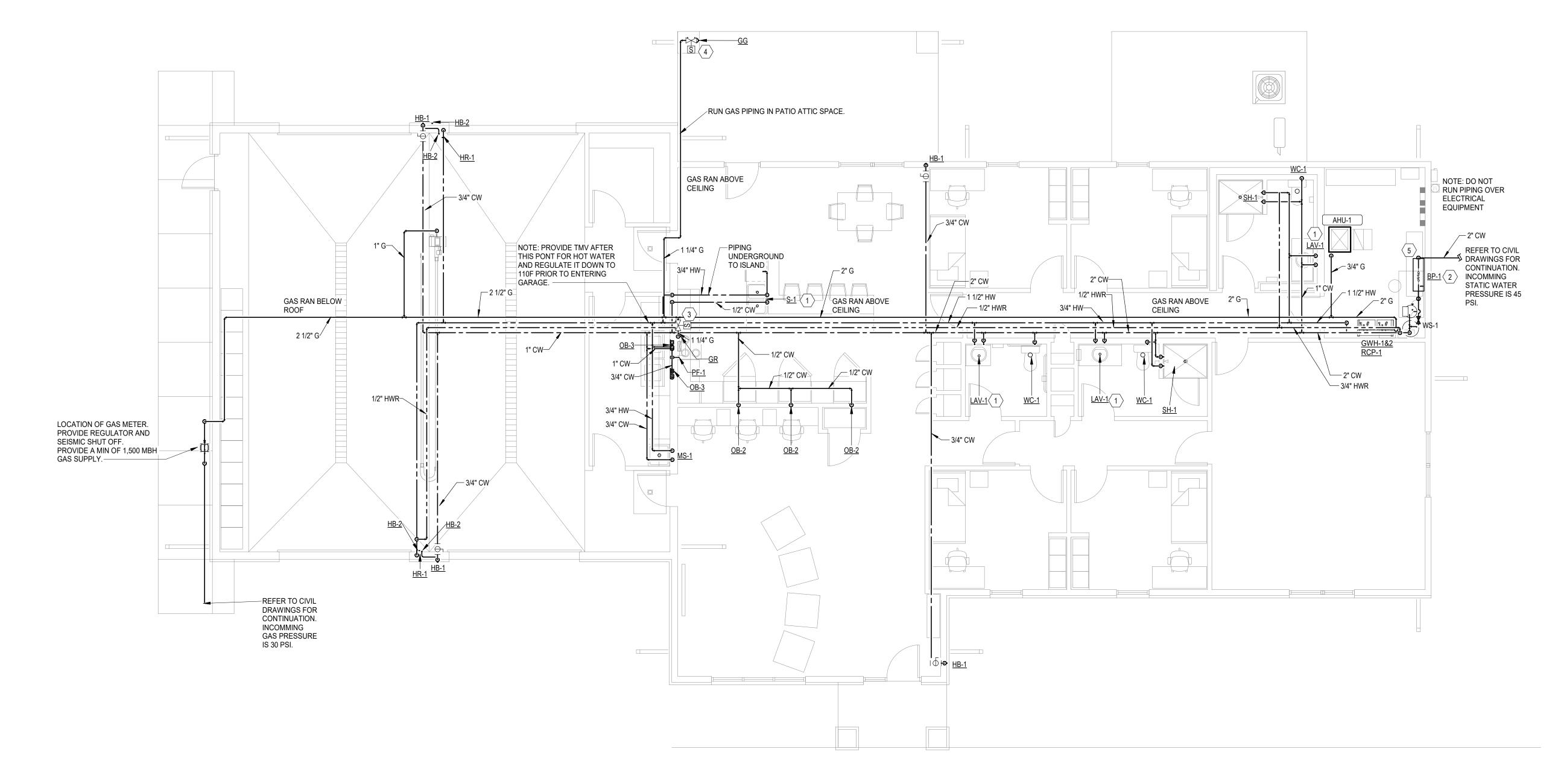
DARREL R. CASE PE-23303

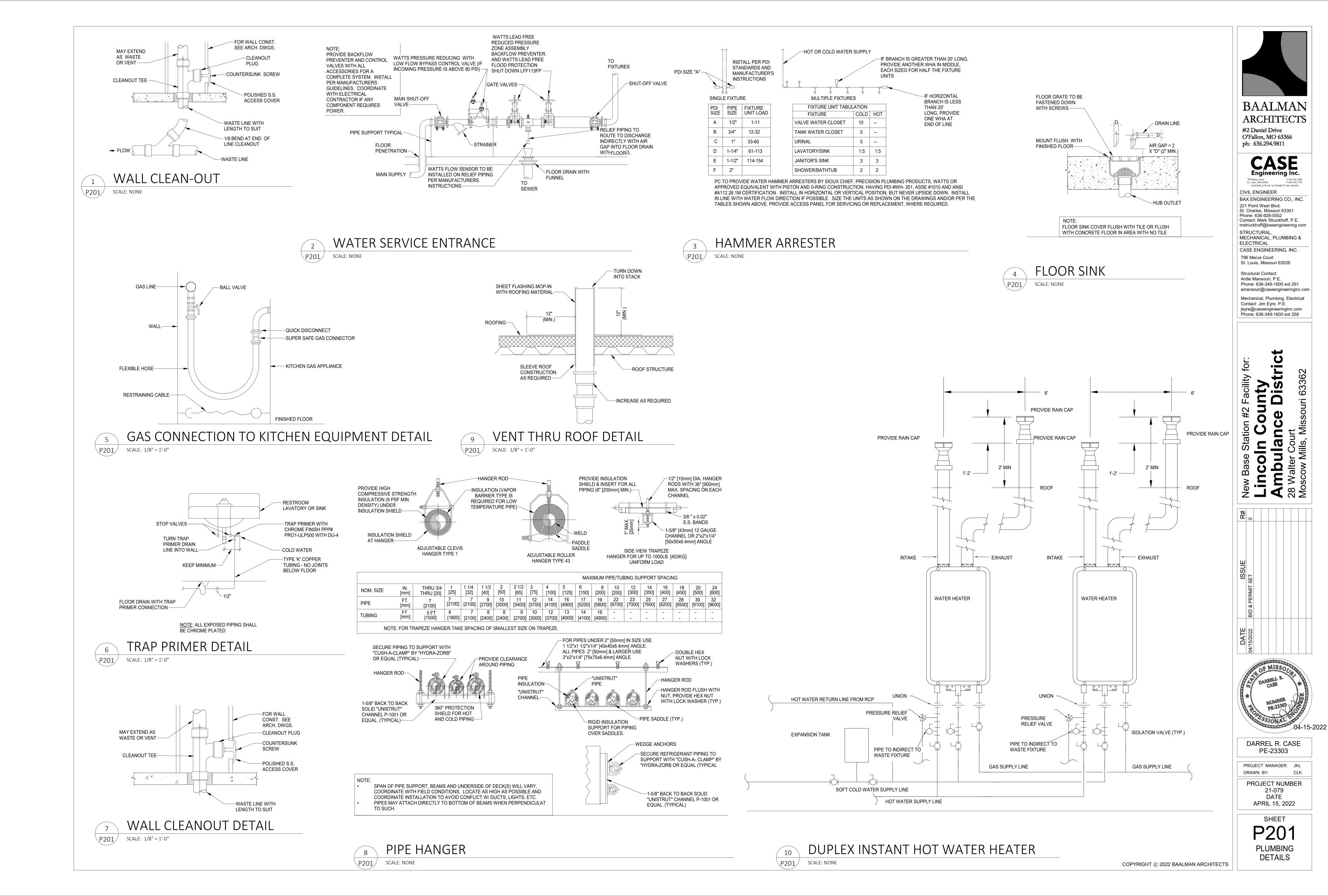
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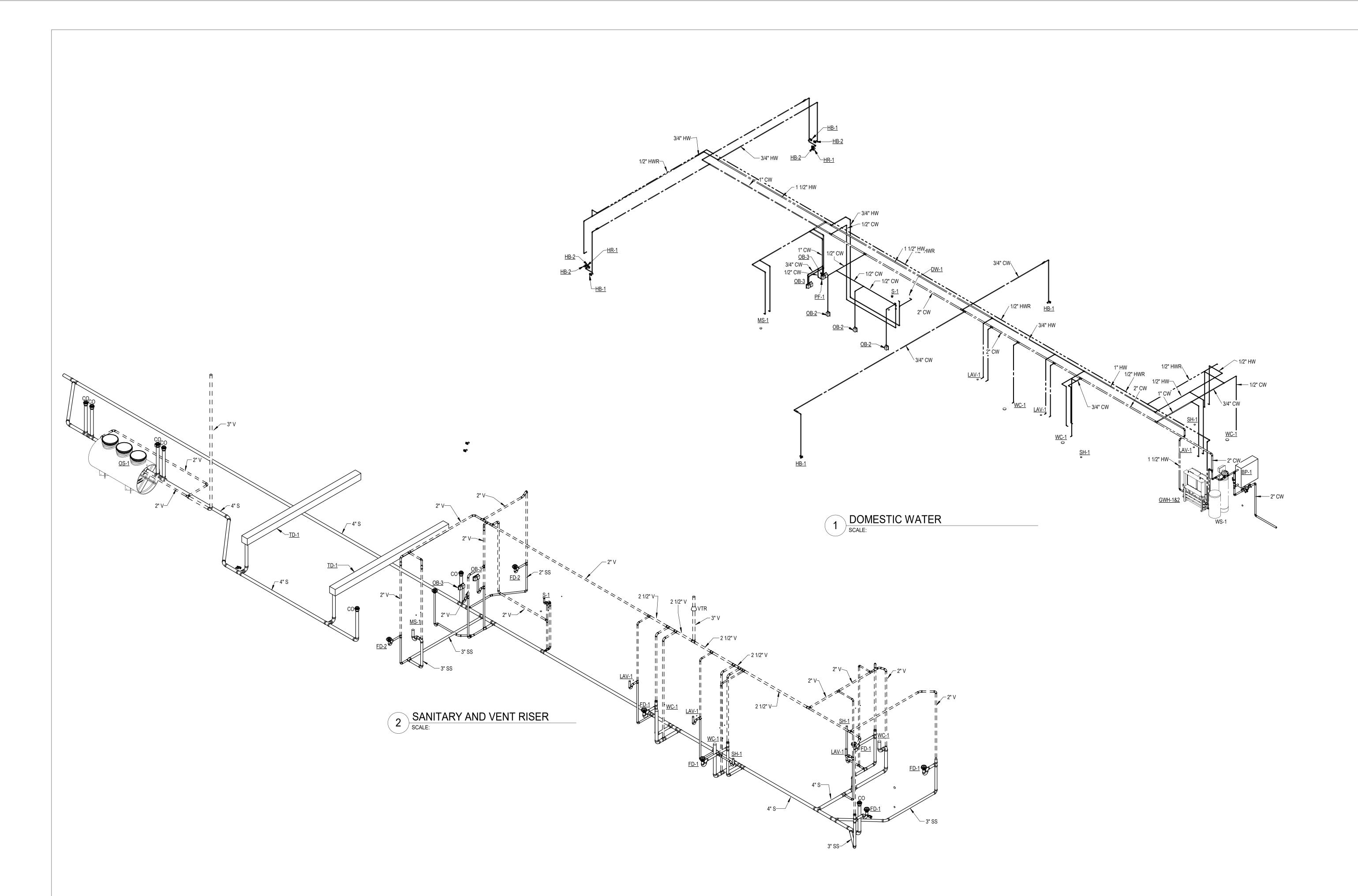
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SHEET

WATER AND GAS PLAN









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STRUCTURAL, MECHANICAL, PLUMBING & ELECTRICAL CASE ENGINEERING, INC.

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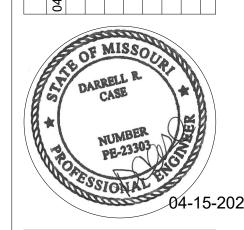
Structural Contact:
Ardie Mansouri, P.E.
Phone: 636-349-1600 ext 291 amansouri@caseengineeringinc.com

Mechanical, Plumbing, Electrical Contact: Jim Eyre, P.E. jeyre@caseengineeringinc.com Phone: 636-349-1600 ext 258

ce District

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ISSUE	BID & PERMIT SET				
DATE	04/15/2022				



DARREL R. CASE PE-23303

PROJECT MANAGER: JKL DRAWN BY:

> PROJECT NUMBER 21-079 DATE APRIL 15, 2022

P300 PLUMBING ISOMECTRICS

SHEET

NEW PANEL BOARD MP SURFACE MOUNTED										
120/240 VOLTS 1 PHASE 3 WIRE 400 AMP. BUS 22,000 A.I.C. RATED 400 AMP. MAIN LUGS ONLY FED FROM ATS										
CKT. NO.	TRIP AMPS	NO. POLE	LOAD SERVED	LOAD-	V. A. Bø	LOAD SERVED	NO. POLE	TRIP	CKT.	
1	20	1	BAY EXIT SIDE RECEPTACLES	800 300	>	FIRE ALARM SYSTEM PANEL	1	20	2	LO
3	20	1	LIVING ROOM AREA RECEPTACLES		800 800	IT CLOSET RECEPTACLES	1	20	4	LO
5	20	1	WORK COUNTER RECEPTACLES	900 800		IT CLOSET RECEPTACLES	1	20	6	LO
7	20	1	LIVING ROOM TV AREA RECEPT.S		900 200	TRUCK BAY CEILING FANS	1	20	8	
9	20	1	KITCHEN COUNTER RECEPTACLES	400 800		GAS DRYER	1	20	10	
11	20	1	KITCHEN REFRIGERATOR		1000 1500	WASHING MACHINE	1	20	12	
13	20	1	KITCHEN REFRIGERATOR	1000 1500		WASHING MACHINE	1	20	14	
15	20	1	KITCHEN REFRIGERATOR		1000	HOT WATER RE-CIRCULATION PUMP	1	20	16	
17	20	1	DISHWASHER	1200 800	>	TRUCK BAY FANS EF4A & EF4B	1	20	18	
19	20	1	DISPOSAL		1000	TRUCK BAY DOOR OPENERS	1	20	20	
21	20	1	UNDER SINK WATER CHILLER	600 1180	>	TRUCK BAY DOOR OPENERS	1	20	22	
23	20	1	SUPPLY CLOSET RECEPTACLES		400 1180	TRUCK BAY DOOR OPENERS	1	20	24	
25	20	1	EXTERIOR BUILDING LIGHTS	600 1180		TRUCK BAY DOOR OPENERS	1	20	26	
27	20	2	SITE POLE LIGHTS		400 1800	FAN COIL HP-1/FCU-1	1	20	28	
29	20	2	SHE POLE LIGHTS	400 1200	>	TRUCK BAY TUBULAR HEATER TRH-1	1	20	30	
31	20	2	DRY PIPE COMPRESSOR		1200 2160	GAS FURNANCE GF-1 (1 HP)	1	30	32	
33	20	2	DRI FIFE COMPRESSOR	1200 1540		COMPENSING LIMIT OIL 1	2	20	34	
35	40	2	WATER SYSTEM BOOSTER PUMP		3750 1540	CONDENSING UNIT CU-1	2	20	36	
37	40	2	WAIER STSTEM BOUSTER PUMP	3750 1200	>	FLAG POLE LIGHT	1	20	38	
39		2 TV	7.00		 3750) CANITARY ORINDER BUMP		40	40	
41	30		TVSS MODULE	 3750	\ \ \	SANITARY GRINDER PUMP (5 HP)	2	40	42	
	FE	ED TI	HRU LUGS FOR PANEL A		12020					
	38610 36580									

LOAD DESCRIPTION	DEMAND FACTOR	VOLT -	AMPS
	D.F.	CONNECTED	DEMAND
LIGHTING & FRONT SIGN	1.25	5570	6965
RECEPTACLES	1st 10KVA @ 100% REMAINDER @ 50%	9080	9080
MOTORS	ALL @ 100% PLUS 25% OF LARGEST	22920	22920
MISC. EQUIPMENT	1.00	29380	29380
KITCHEN EQUIPMENT	NEC TABLE (220.56) 0.65		
KHVAC EQUIPMENT	1.00	8240	8240
	TOTAL-	75190	76585

PANELBOARD LOAD = 76585 V.A. FULL LOAD AMPS = 319.1 A.

12	0/2	<u>40</u> VC	DLTS <u>1</u> PHASE <u>3</u> WI	RE <u>400</u>	_AMP. BUS	22,000	A.I.C	. RA	ιΤΕΙ
_	400	_ AM	P. MAIN LUGS ONLY	1		FED FROM _	PAN	EL I	MΡ
CKT. NO.	TRIP AMPS	NO. POLE	LOAD SERVED	LOAD- V. Aø Bø		LOAD SERVED	NO. POLE	TRIP	CH
1	20	1	RESTROOM 118 RECEPTACLE	180 1200		#4 RECEPTACLES & FAN	1	20	2
3	20	1	RESTROOM 114 RECEPTACLE	180		#3 RECEPTACLES & FAN	1	20	4
5	20	1	GENERAL RECEPTACLES	540 1200		#2 RECEPTACLES & FAN	1	20	6
7	20	1	GENERAL DINING AREA RECEPT.	540 120		#1 RECEPTACLES & FAN	1	20	8
9	20	1	EXTERIOR PATIO RECEPTACLES	540		ID PATIO CEILING FANS	1	20	1
11	20	1	GAS SOLENOID CONTROL	200 540		RECEPTACLES	1	20	1
13	20	1	STOVE ELECTRICAL CONNECTION	200 600		ROOM RECEPTACLES	1	20	1
15	20	1	KITCHEN COUNTER RECEPTACLES	400		ROOM RECEPTACLES	1	20	1
17	20	1	KITCHEN COUNTER RECEPTACLES	600 400	EXERCISE	ROOM RECEPTACLES	1	20	1
19	20	1	KITCHEN ISLAND RECEPTACLES	400		ROOM RECEPTACLES	1	20	2
21	20	1	SPARE	600	EXERCISE	ROOM RECEPTACLES	1	20	2
23	20	1	SPARE		— CDADE		1	20	2
25	20	1	SPARE		SPARE		1	20	2
27	20	1	SPARE		— CDADE		1	20	2
29	20	1	BAY ENTRANCE RECEPTACLES	900 1000		E POWER	1	20	3
31	20	1	LAUNDRY/BAY RECEPTACLES	540 100		E SHORELINE	1	20	3
33	20	1	SPARE	1000	AMBULANO	E POWER	1	20	3
35	20	1	PUBLIC AREA LIGHTING	830		E SHORELINE	1	20	3
37	20	1	BAY LIGHTING	710	GENERATO	R BATTERY CHARGER	1	20	3
39	20	1	BEDROOM AREA LIGHTING	790	$\overline{\mathbf{n}}$	D DI 001/ HE-TED			4
41	20	1	BEDROOM AREA LIGHTING	640	GENERATO	R BLOCK HEATER	2	30	4
				13510 120	20		1		_

	13310 12020				
LOAD DESCRIPTION	DEMAND FACTOR	VOLT - AMPS			
	D.F.	CONNECTED	DEMAND		
LIGHTING & FRONT SIGN	1.25	2970	3715		
RECEPTACLES	1st 10KVA @ 100% REMAINDER @ 50%	5280	5280		
MOTORS	ALL @ 100% PLUS 25% OF LARGEST				
MISC. EQUIPMENT	1.00	17280	17280		
KITCHEN EQUIPMENT	NEC TABLE (220.56) 0.65				
*HVAC EQUIPMENT	1.00				
•	TOTAL	25530	26275		

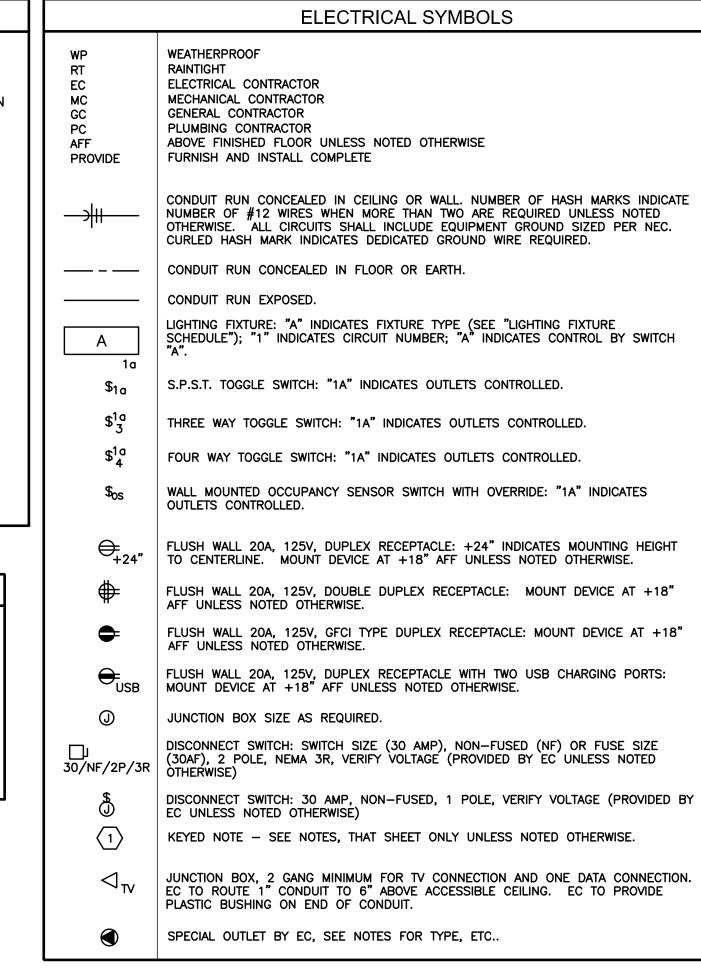
PANELBOARD LOAD = 26275 V.A. FULL LOAD AMPS = 109.5 A.

FIRE ALARM SYSTEM SYMBOLS						
F	FIRE ALARM SYSTEM MANUAL STATION					
ΕH	FIRE ALARM SYSTEM HEAT DETECTOR					
F _{CM}	FIRE ALARM SYSTEM COMBINATION SMOKE DETECTOR/CARBON MONOXIDE DETECTOR					
F _{SD}	FIRE ALARM SYSTEM SMOKE DETECTOR					
F _{SD}	FIRE ALARM SYSTEM DUCT SMOKE DETECTOR					
F⊲	FIRE ALARM SYSTEM AUDIO/VISUAL ALARM					
F\ , wp	FIRE ALARM SYSTEM WEATHERPROOF AUDIO/VISUAL ALARM					
(F)-	FIRE ALARM SYSTEM VISUAL ALARM					
F _{FRM}	FIRE ALARM SYSTEM RELAY MODULE					
F _{FMM}	FIRE ALARM SYSTEM MONITOR MODULE					
F _{FS}	FIRE ALARM SYSTEM SPRINKLER FLOW SWITCH MONITOR					
F _{TS}	FIRE ALARM SYSTEM SPRINKLER TAMPER SWITCH MONITOR					
F _{PM}	FIRE ALARM SYSTEM PRESSURE MONITOR					
FACP	FIRE ALARM SYSTEM CONTROL PANEL					
F⊲	SPRINKLER SYSTEM EXTERIOR AUDIO/VISUAL DEVICE					

OWNER PROVIDED VENDOR EQUIPMENT

GC TO COORDINATE WITH OWNER'S VENDORS FOR ANY CONTRACTOR ITEMS NEEDED (i.e.: EMPTY CONDUITS, JUNCTION BOXES, CABLING, ETC.) AND FOR COORDINATION WITH INSTALLATION TIMEFRAME FOR THE ITEMS LISTED

- 1) DISPATCH/ALERT SYSTEMS SPEAKER SYSTEMS FOR NOTIFICATION VOICE AND DATA SYSTEMS
- BUILDING ACCESS CONTROLS BUILDING SECURITY SYSTEMS
- VERIFY ADDITIONAL ITEMS WITH OWNER PRIOR TO BIDDING.



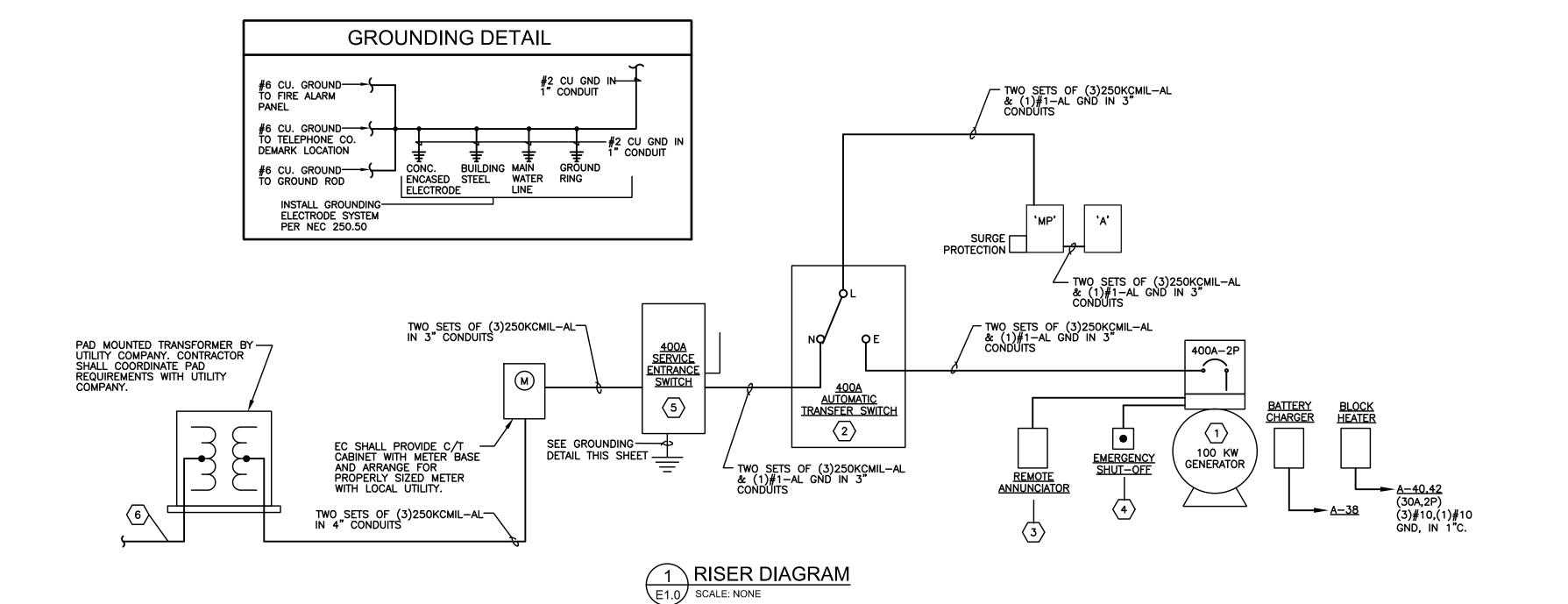
GENERAL NOTES

- EC TO PROVIDE HANDLE TIE ON ALL MULTIWIRE BRANCH CIRCUITS PER NEC 210.4(B).
- 2. ALL SPARE CIRCUIT BREAKERS AND DISCONNECT SWITCHES SHALL BE LEFT IN THE OFF POSITION.
- 3. EC SHALL VERIFY THE VOLTAGE AND AMPERAGE REQUIREMENTS OF ALL EQUIPMENT DELIVERED TO THE SITE PRIOR TO CONNECTION. EC SHALL NOTIFY OWNER OF ANY DIFFERENCE.

KEYED NOTES

- REFER TO SITE PLAN ON SHEET, E4.0 FOR LOCATION OF EMERGENCY GENERATOR.
- 2 EC TO PROVIDE AUTOMATIC TRANSFER SWITCH 120/240V, 400 AMP, TWO-POLE, THREE-WIRE, WITH A SOLID NEUTRAL, NEMA 1 ENCLOSURE.
- \langle 3 \rangle REFER TO SHEET E3.0 FOR LOCATION OF REMOTE ANNUNCIATOR. 4 FIELD VERIFY WITH OWNER LOCATION OF GENERATOR EMERGENCY SHUT-OFF.
- 5 EC TO PROVIDE SERVICE ENTRANCE RATED, 240 VOLT, 1 PHASE, 3 WIRE, NEMA 3R, DISCONNECT SWITCH WITH 400 AMP FUSES.
- 6 EC TO PROVIDE (1) 4" SCHED 40 PVC CONDUIT WITH PULL WIRE FROM TRANSFORMER TO UTILITY POLE FOR UTILITY COMPANY CABLES.

 COORDINATE FULL REQUIREMENTS WITH UTILITY COMPANY PRIOR TO



BAALMAN **ARCHITECTS**

O'Fallon, MO 63366 ph: 314.640.6212 Michael J. Baalman

#2 Daniel Drive

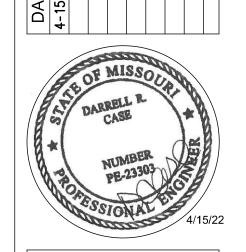
ARCHITECT License#: A-2012004035 Certificate of Authority: 2014003655 CIVIL ENGINEER

BAX ENGINEERING CO., INC. 221 Point West Blvd. St. Charles, Missouri 63301 Phone: 636-928-5552 Contact: Mark Struckhoff, P.E. mstruckhoff@baxengineering.com STRUCTURAL, MECHANICAL, PLUMBING & ELECTRICAL

CASE ENGINEERING, INC. 796 Merus Court St. Louis, Missouri 63026

Structural Contact: Ardie Mansouri, P.E. Phone: 636-349-1600 ext 291 amansouri@caseengineeringinc.com Mechanical, Plumbing, Electrical Contact: Jim Eyre, P.E. jeyre@caseengineeringinc.com Phone: 636-349-1600 ext 258

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ENGINEER MO# E-23303

PROJECT MANAGER: JE

PROJECT NUMBER 21-079 DATE

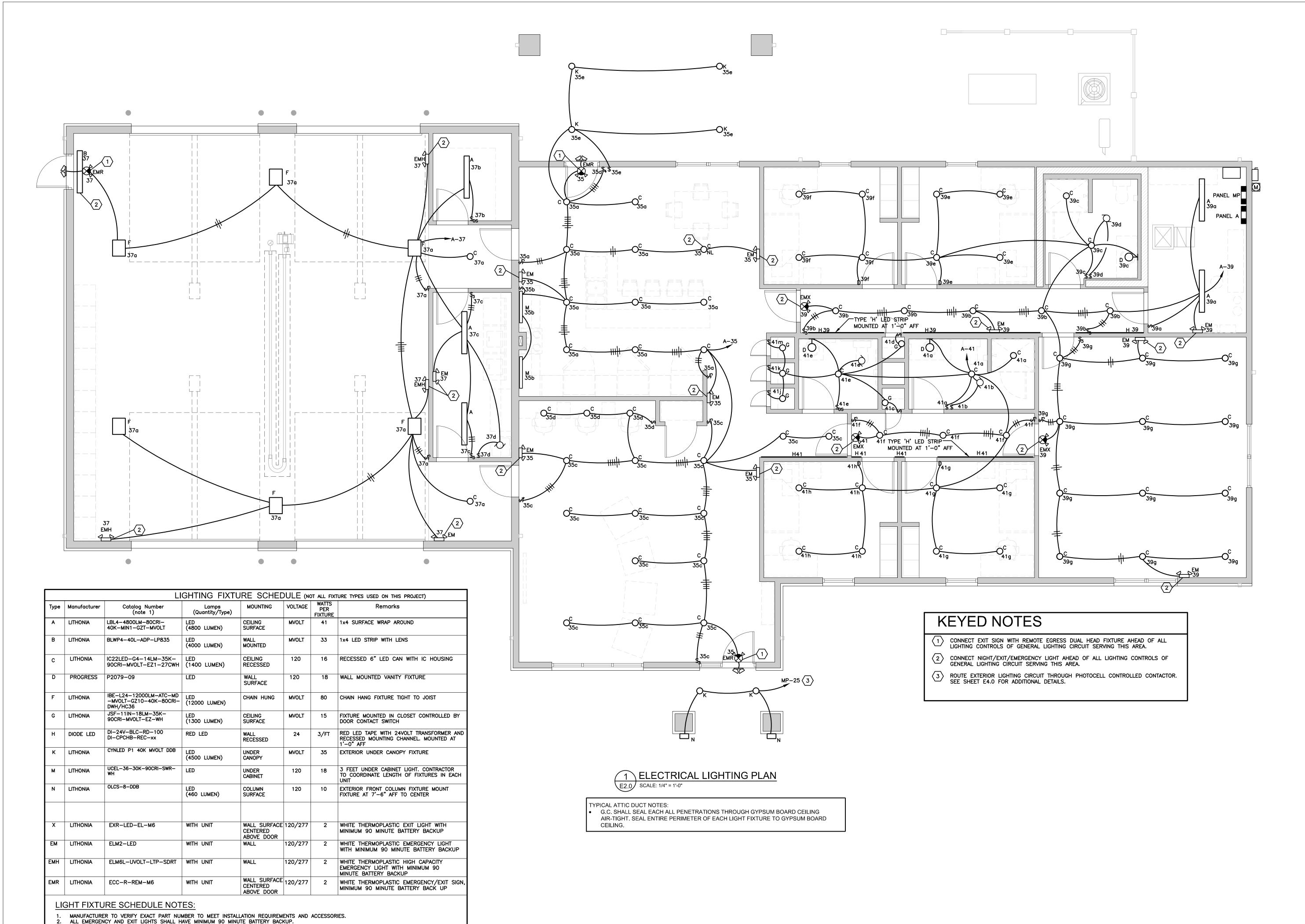
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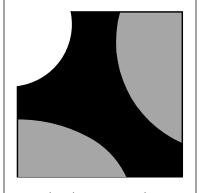
April 15, 2022 SHEET

POWER ONE-LINE & PANEL SCHEDULES

⁽LO PROVIDE LOCK-ON DEVICE) (TS CIRCUIT VIA TIMESWITCH) (GFI GFCI TYPE CIRCUIT BREAKER) * HVAC LOAD BASED ON UNIT MCA WHICH INCLUDES 25% OF LARGEST MOTOR

⁽LO PROVIDE LOCK-ON DEVICE) (TS CIRCUIT VIA TIMESWITCH) (GFI GFCI TYPE CIRCUIT BREAKER) * HVAC LOAD BASED ON UNIT MCA WHICH INCLUDES 25% OF LARGEST MOTOR





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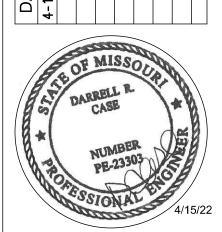
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Station #2 Facility for:

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DATE ISSUE
4-15-2022 BID & PERMIT SET



Darrell R Case ENGINEER MO# E-23303

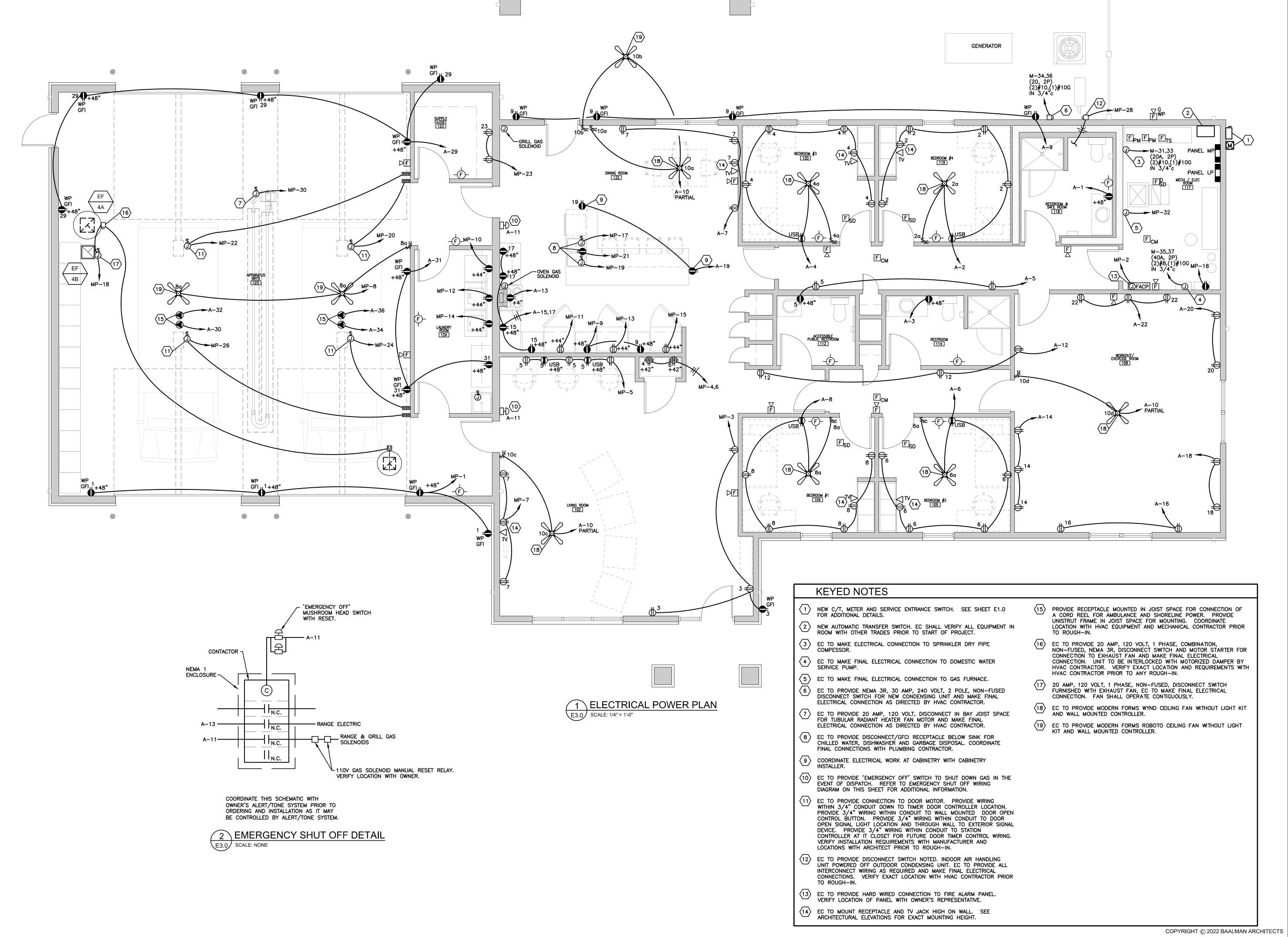
PROJECT MANAGER: JE DRAWN BY: CK

PROJECT NUMBER 21-079

DATE
April 15, 2022
SHEET

ELECTRICAL LIGHTING

PLAN



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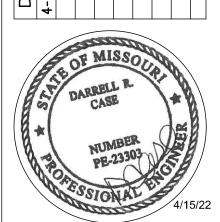
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DATE ISSUE
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Darrell R Case ENGINEER MO# E-23303

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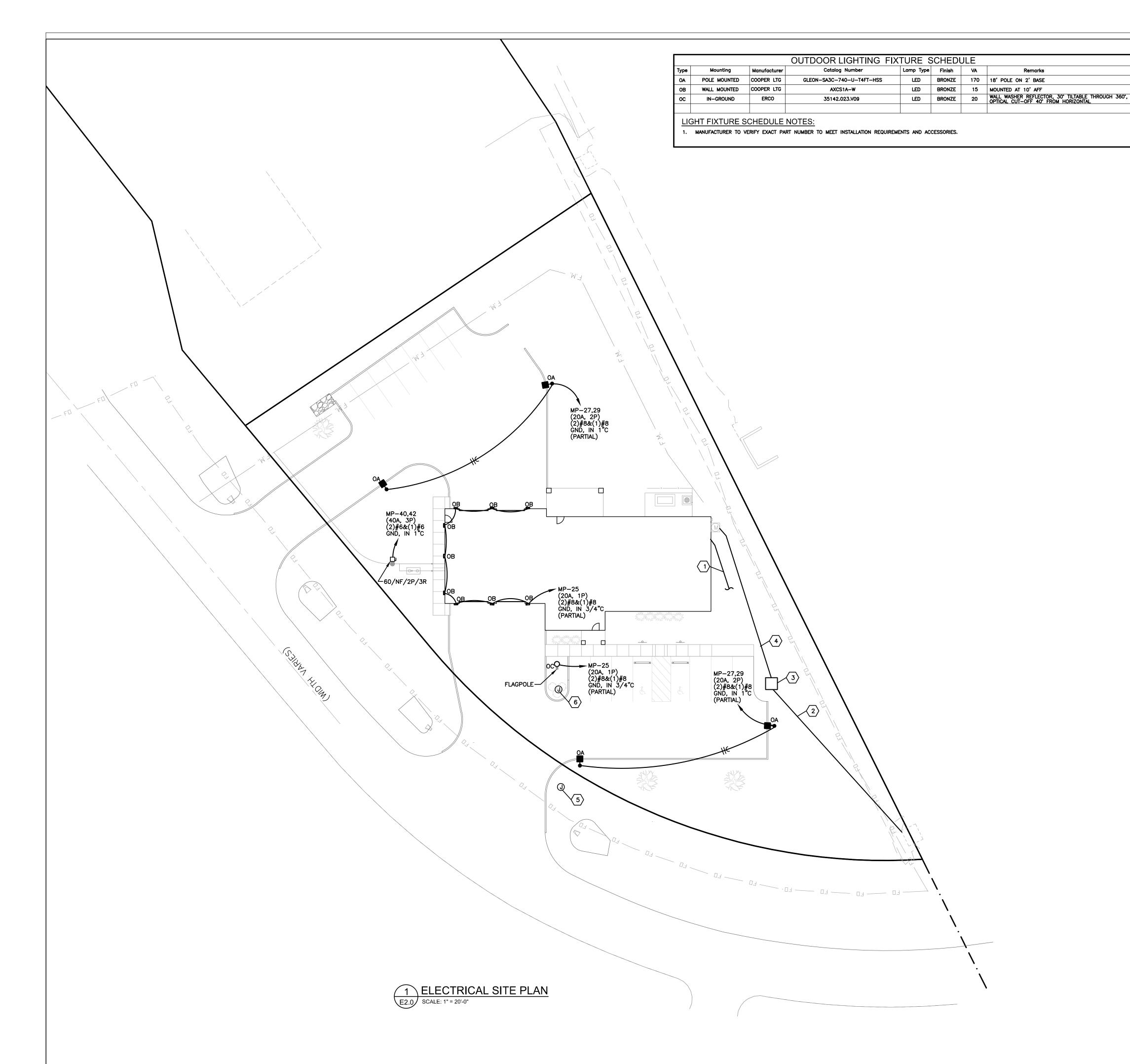
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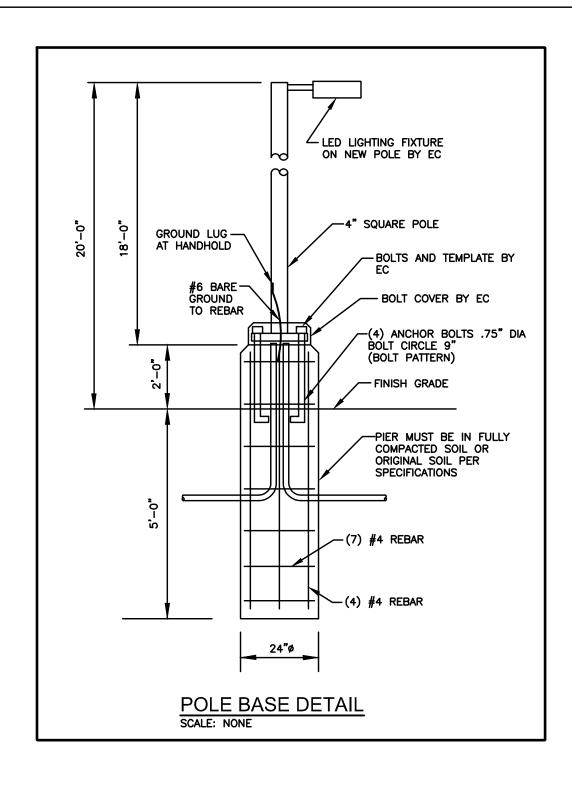
PROJECT NUMBER 21-079 DATE April 15, 2022

SHEET

PLAN

ELECTRICAL POWER





KEYED NOTES:

- EC TO PROVIDE ONE 4" PVC CONDUIT W/PULLWIRE FOR TELEPHONE SERVICE; ROUTE 36" BELOW GRADE; STUB-UP AS DIRECTED BY OWNER'S LOW VOLTAGE VENDER. COORDINATE WITH LOCAL UTILITY AND CIVIL DRAWINGS.
- EC TO PROVIDE 4" SCHEDULE 40 PVC CONDUIT WITH PULLING TAPE (3/4" WIDE, 2500 LB. STRENGTH) FROM POINT OF SERVICE DELIVERY TO UTILITY TRANSFORMER. CONDUIT SHALL BE A MINIMUM 36" BELOW FINAL GRADE. EC SHALL COORDINATE LOCATION, LENGTH AND TERMINATION WITH CIVIL DRAWINGS AND UTILITY PRIOR TO BIDDING.
- UTILITY TRANSFORMER. EC TO VERIFY EXACT LOCATION OF PAD MOUNTED TRANSFORMER WITH LOCAL UTILITY AND CIVIL DRAWINGS.
- SEE SHEET E1.0 FOR SIZE OF SERVICE ENTRANCE CONDUITS FOR BUILDING. COORDINATE CONDUCTOR INSTALLATION WITH LOCAL UTILITY. EC TO PROVIDE A PER FOOT COST OF SERVICE CONDUITS AND FEEDERS FOR DISTANCE BEYOND THAT CURRENTLY SHOWN ON DRAWING. FINAL DISTANCE SHALL BE COORDINATED WITH UTILITY COMPANY AND CIVIL
- PROVIDE TWO 1" CONDUITS WITH PULL STRING FROM QUAZITE BOX BACK TO DATA CLOSET FOR FUTURE MONUMENT SIGN. VERIFY EXACT LOCATION WITH OWNER'S REPRESENTATIVE.
- PROVIDE TWO 1" CONDUITS WITH PULL STRING FROM QUAZITE BOX BACK TO DATA CLOSET FOR FUTURE CALL BOX. VERIFY EXACT LOCATION WITH OWNER'S REPRESENTATIVE.



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Darrell R Case ENGINEER MO# E-23303

PROJECT MANAGER: JE DRAWN BY: CK

PROJECT NUMBER 21-079 DATE

E4.0

April 15, 2022

ELECTRICAL SITE PLAN

- A. GENERAL AND SUPPLEMENTARY CONDITIONS WITHIN THE SPECIFICATIONS ARE HEREBY INCORPORATED AND BECOME PART OF THESE SECIFICATIONS AND AS SUCH SHALL BE APPLICABLE TO THE WORK OF THE ELECTRICAL CONTRACT
- B. PRIOR TO SUBMISSION OF A BID PROPOSAL, THE CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH ALL CONDITIONS AND LIMITATIONS THAT IMPACT THE WORK OF THIS CONTRACT. NO ADDITIONAL COSTS TO THE OWNER SHALL BE PERMITTED FOR CHANGES TO THE WORK AS A RESULT OF THE CONTRACTORS FAILURE TO VISIT THE SITE PRIOR TO BIDDING AND IDENTIFY ITEMS THAT WERE ABLE TO BE VERIFIED DURING A SITE VISIT PRIOR TO THE SUBMISSION OF A BID PROPOSAL
- CONTRACTOR SHALL PROVIDE AN ADEQUATE AMOUNT OF WORKERS AND MATERIALS AS REQUIRED TO KEEP PACE WITH THE CONSTRUCTION SCHEDULE AND TO NOT IMPEDE OR HINDER THE WORK OF OTHER TRADES. CONTRACTOR SHALL RETAIN WORKERS AND PLACE ORDERS FOR EQUIPMENT IN A TIMELY MANNER SUCH THAT THE CONSTRUCTION SCHEDULE AND THE WORK OF OTHER TRADES IS NOT IMPAIRED, DUE TO LATE DELIVERIES, ETC. CONTRACTOR SHALL VERIFY DELIVERY DATES WITH EQUIPMENT SUPPLIERS AFTER THE MATERIAL HAS BEEN
- D. THE CONTRACTOR SHALL PROVIDE AN OFFICE SPACE AND ON SITE STORAGE FOR MATERIAL AND EQUIPMENT SUPPLIED. LOCATION FOR OFFICE AND MATERIAL/EQUIPMENT STORAGE AREA SHALL BE AS DIRECTED BY THE GENERAL CONTRACTOR.
- E. PROVIDE ALL ELECTRICAL WORK, AS SHOWN ON THE DRAWINGS AND AS SPECIFIED HEREIN AS REQUIRED FOR FULL OPERATION, FOR ALL EQUIPMENT FURNISHED BY THE OWNER UNDER A SEPARATE CONTRACT.
- F. PRIOR TO PURCHASE AND INSTALLATION OF MATERIALS, CONTRACTOR SHALL SUBMIT ALL FIRE STOPPING MATERIALS PROPOSED FOR USE ON THIS PROJECT TO THE LOCAL AUTHORITIES HAVING JURISDICTION (AHJ) FOR REVIEW AND APPROVAL. PROVIDE COPIES OF ALL FIRESTOPPING MATERIALS APPROVED BY THE AHJ TO
- G. CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIAL, EQUIPMENT, RIGGING, AND MISCELLANEOUS ITEMS AS REQUIRED FOR A COMPLETE, OPERATIONAL AND FUNCTIONAL ELECTRICAL INSTALLATION AS SHOWN ON THE DRAWINGS AND AS SPECIFIED IN THESE SPECIFICATIONS.

- A. THE SCOPE OF WORK LIST BELOW IS INTENDED TO PROVIDE ONLY A BRIEF OVERVIEW OF THE ELECTRICAL SCOPE OF WORK. IT IS NOT INTENDED TO BE AN ALL INCLUSIVE DEFINITION OF THE ELECTRICAL WORK TO BE PERFORMED. THE COMPLETE SCOPE OF ELECTRICAL WORK TO BE PERFORMED SHALL BE BASED UPON THE
- DRAWINGS AND THE SPECIFICATIONS B. THE ELECTRICAL WORK SHALL INCLUDE, BUT SHALL NOT NECESSARILY BE LIMITED TO THE FOLLOWING ITEMS:
- 1. PROVIDE ELECTRICAL SERVICE TO THE FACILITY IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
- 2. PROVIDE TEMPORARY CONSTRUCTION POWER AND LIGHTING SYSTEM PROVIDE A NEW EMERGENCY GENERATOR AND AUTOMATIC TRANSFER SWITCH.
- PROVIDE A LIGHTNING PROTECTION SYSTEM
- 5. PROVIDE NEW FEEDERS AND BRANCH CIRCUITS TO ELECTRICAL WORK. 6. PROVIDE NEW INTERIOR AND EXTERIOR LIGHTING FIXTURES AND LIGHTING CONTROL DEVICES.
- PROVIDE NEW EMERGENCY EGRESS LIGHTING FIXTURES AND EXIT SIGNS.
- 8. PROVIDE NEW CIRCUIT BREAKER PANELS. 9. PROVIDE NEW RECEPTACLES AT LOCATIONS INDICATED.
- 10. PROVIDE POWER TO NEW MECHANICAL AND PLUMBING EQUIPMENT.
- 11. PROVIDE POWER TO ALL ELECTRICALLY OPERATED EQUIPMENT. 12. PROVIDE ROUGH-IN FOR VARIOUS LOW VOLTAGE SYSTEM CABLES AND DEVICES.
- PROVIDE A POWER SYSTEM STUDY.
- 14. PROVIDE A FIRE ALARM AND DETECTION SYSTEM. 15. PROVIDE ROUGH-IN FOR FAVIOUS LOW VOLTAGE SYSTEMS AS DIRECTED BY THE OWNER AND THE LOW
- VOLTAGE SYSTEM VENDORS.
- 16. PROVIDE ALL REQUIRED TESTING OF INSTALLED WORK AND SYSTEMS.

BIDS AND SUBSTITUTIONS

17. PROVIDE A WARRANTY.

- A. PRIOR TO SUBMISSION OF A BID PROPOSAL, CONTRACTOR SHALL THOROUGHLY REVIEW THE BID INSTRUCTIONS AND ALL CIVIL, ARCHITECTURAL, STRUCTURAL, AND MEPFP CONSTRUCTION DOCUMENTS. OBTAIN DOCUMENTS FOR EACH DISCIPLINE AND THOROUGHLY REVIEW FOR INFORMATION THAT MAY BE ASSOCIATED WITH OR HAVE AN IMPACT ON THE ELECTRICAL WORK.
- B. FOR AMBIGUOUS, CONTRADICTORY, OR CONFLICTING ITEMS WITHIN THE CONSTRUCTION DOCUMENTS. THE CONTRACTOR SHALL REQUEST CLARIFICATION BY MEANS OF A WRITTEN "REQUEST FOR INFORMATION" (RFI), SUBMITTED AT LEAST FIVE (5) WORKING DAYS PRIOR TO THE BID DATE. RFI'S THAT WERE NOT ABLE TO BE CLARIFIED PRIOR TO SUBMISSION OF BID SHALL BE PROVIDED PER THE ARCHITECT AND/OR ENGINEER IN STRICT ACCORDANCE WITH THE MOST STRINGENT MATERIALS, EQUIPMENT AND SCOPE OF WORK.
- C. SHOULD THE CONTRACTOR WISH TO SUBMIT AN ALTERNATE PRODUCT TO THE MANUFACTURERS NAMED IN THESE SPECIFICATIONS OR ON THE DRAWINGS FOR ANY EQUIPMENT, THE CONTRACTOR SHALL SUBMIT A VOLUNTARY ALTERNATIVE A MINIMUM OF SEVEN (7) CALENDAR DAYS PRIOR TO BID, STATING THE
- MANUFACTURER'S NAME, MODEL NUMBER, WRITTEN, DETAILED PRODUCT DATA.). WHERE MATERIALS OR EQUIPMENT ARE SPECIFIED BY NAME THE PROPOSED SUBSTITUTE MATERIAL OR EQUIPMENT SHALL BE IDENTICAL TO THE SPECIFIED MATERIAL OR EQUIPMENT IN ALL CHARACTERISTICS OF QUALITY FUNCTION AND SERVICEARILITY REGARDLESS OF APPLICATION IN THE PROJECT AND IN ADDITION WHEN THE ARCHITECT DEEMS THAT AESTHETIC SIGNIFICANCE IS IMPORTANT, THE EQUAL MATERIAL OR EQUIPMENT MUST BE IDENTICAL IN ALL CHARACTERISTICS OF VISUAL APPEARANCE, DESIGN, COLOR AND TEXTURE.
- E. ANY PROPOSED EQUAL PRODUCT SHALL BE SUBMITTED TO ARCHITECT / ENGINEER FOR REVIEW AND PRIOR
- APPROVAL, WHICH ARCHITECT / ENGINEER MAY APPROVE OR DISAPPROVE AT ITS SOLE DISCRETION. F. IN ALL CASES, SHOULD THE ALTERNATE MANUFACTURER BE USED, THIS CONTRACTOR SHALL BEAR ALL ADDITIONAL COSTS INCLUDING, BUT NOT LIMITED TO, RESPONSIBILITY OF COORDINATION WITH ALL OTHER TRADES, ANY CHANGES INCURRED IN PLUMBING, ELECTRICAL, MECHANICAL, GENERAL CONTRACTORS, ETC., WHICH RESULT FROM EQUIPMENT SUBSTITUTION.
- G. WORK PERFORMED OR CONSTRUCTED WITH PRODUCTS THAT ARE UNAPPROVED EQUALS IS PERFORMED AT CONTRACTOR'S RISK AND ANY REQUIRED CORRECTION OF WORK INCORPORATING UNAPPROVED EQUALS SHALL BE AT CONTRACTOR'S SOLE COST AND EXPENSE.
- H. IN THE EVENT THE SUBSTITUTED MATERIAL OR EQUIPMENT DOES NOT PERFORM TO MEET THE DESIGN INTENT, SPECIFIED STANDARDS, FIT WITHIN THE SPACE ALLOCATED OR MEET QUALITY STANDARDS, THE CONTRACTOR SHALL PROVIDE THE SPECIFIED MATERIAL OR EQUIPMENT AND BEAR ALL COSTS TO REPLACE THE SUBSTITUTE ITEM(S).

QUALITY ASSURANCE

A. ALL MATERIALS AND EQUIPMENT SHALL BE NEW AND ALL WORK SHALL BE INSTALLED WITH THE MAXIMUM

SPEED CONSISTENT WITH CURRENT ACCEPTED TRADE PRACTICES.

- B. FURNISH MATERIALS AND EQUIPMENT PROMPTLY AFTER AUTHORIZATION TO PROCEED, AND PROCEED WITH WORK IN PROGRESS WITH THE OTHER CONTRACTORS ON THE PROJECT PERFORM ALL WORK OF THIS CONTRACT IN A MANNER THAT WILL NOT CAUSE INTERFERENCES OR DELAYS
- TO, OR INTERFERE WITH, THE PROGRESS OF OTHER CONTRACTORS. D. PROVIDE PERMITS, INSPECTIONS, FINAL CERTIFICATES OF INSPECTION BY THE AUTHORITY HAVING
- JURISDICTION, PERMIT AND INSPECTION FEES AND ALL MATERIALS, EQUIPMENT AND LABOR AS REQUIRED FOR A COMPLETE, FUNCTIONAL, CODE COMPLIANT AND FULLY OPERATIONAL ELECTRICAL SYSTEM. E. INSTALL ALL WORK AND EQUIPMENT PLUMB, SQUARE, RIGID AND TRUE-TO-LINE. UNLESS NOTED OTHERWISE,
- SUPPORT AND MOUNTING OF EQUIPMENT, FIXTURES, ETC., SHALL THE THE MEANS AND METHODS OF THIS CONTRACTOR. THIS CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS AND ACCESSORIES FOR A CODE COMPLIANT INSTALLATION OF THE ELECTRICAL WORK, WHETHER OR NOT SHOWN ON THE DRAWINGS OR SPECIFIED IN THESE
- G. ALL WORK SHALL BE SUPERVISED BY THE INSTALLING CONTRACTORS QUALIFIED FOREMAN. ALL WORK SHALL BE PERFORMED BY PROPERLY TRAINED AND SKILLED WORKERS. ALL WORK SHALL BE PERFORMED AND INSTALLED IN A NEAT AND WORKMANLIKE MANNER. ALL WORK SHALL BE IN STRICT ACCORDANCE WITH THE ESTABLISHED QUALITY STANDARDS OF THE TRADE AND IN CONFORMANCE WITH ALL FEDERAL, STATE AND
- H. PROPERLY PROTECT WORK DURING CONSTRUCTION. AT CONSTRUCTION COMPLETION, THOROUGHLY CLEAN ALL WORK OF THIS CONTRACT AND REMOVE ALL DEBRIS FROM THE PREMISES. ALL DEBRIS SHALL BE LEGALLY

LOCAL CODES, ORDINANCES, REGULATIONS AND STANDARDS, INCLUDING ALL APPLICABLE OSHA

- I. PROVIDE ALL MOUNTING HARDWARE AND ACCESSORIES, INCLUDING BUT NOT NECESSARILY LIMITED TO STEEL SLOTTED CHANNEL FRAMING MEMBERS, ALL THREAD RODS, BRACES, ETC, AS REQUIRED FOR THE INSTALLATION OF THE WORK.
- ELECTRICAL DEVICES, INCLUDING, BUT NOT NECESSARILY LIMITED TO MOTOR STARTERS, DISCONNECT SWITCHES, ETC., SHALL BE SUPPORTED INDEPENDENT OF AND ISOLATED FROM VIBRATING EQUIPMENT. SECURE ELECTRICAL EQUIPMENT TO STRICTURE OF FIELD FABRICATED SUPPORT SYSTEM AND PROVIDE FLEXIBLE ELECTRICAL CONNECTION FROM ELECTRICAL DEVICE TO THE EQUIPMENT BEING SERVED.
- K. REQUIREMENTS OF REGULATORY AGENCIES:
- 1. PERMITS: ARRANGE AND PAY FOR ALL PERMITS, INSPECTIONS AND UTILITY CONNECTIONS REQUIRED.
- 2. PROVIDE ALL TESTS AND INSPECTIONS REQUIRED BY THE AUTHORITY HAVING JURISDICTION. PROVIDE A SIGNED CERTIFICATE OF INSPECTION AT THE COMPLETION OF THE PROJECT. INCLUDE IN
- OPERATION AND MAINTENANCE MANUALS.
- L. REFERENCED INDUSTRY STANDARDS:
- 1. THE APPLICABLE PORTIONS OF THE FOLLOWING STANDARDS FORM A PART OF THIS PROJECT MANUAL TO THE SAME FORCE AND EFFECT AS IF THE CONTENTS OF THE REFERENCED STANDARD ARE REPEATED
- a. INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS (IEEE)
- INSULATED POWER CABLE ENGINEERS ASSOCIATION (IPCEA) NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)
- AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
- AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) f. NATIONAL ELECTRICAL TESTING ASSOCIATION (NETA)

- 2. ALL EQUIPMENT, APPARATUS AND SYSTEMS SHALL BE RATED AND TESTED BY A NATIONALLY RECOGNIZED TESTING LABORATORY (UL, ETL., ETC.) FABRICATED AND INSTALLED WITH THE APPLICABLE INDUSTRY STANDARDS.
- M. CODES AND STANDARDS
- 1. COMPLY WITH SPECIFIED CODES AND STANDARDS. IF CONFLICT EXISTS BETWEEN CODES OR STANDARDS AND DRAWINGS, PROJECT MANUAL OR ADDENDA REQUIREMENTS, REQUEST CLARIFICATION FROM ARCHITECT/ENGINEER.
- 2. CONFORM TO THE INSTALLATION RULES AND REGULATIONS OF THE CODES AND STANDARDS LISTED INCLUDING ALL SUBSEQUENTLY PUBLISHED AMENDMENTS THERETO ISSUED PRIOR TO THE DATE OF THE BIDDING DOCUMENTS.
- OVER THIS PROJECT 4. COMPLY WITH THE APPLICABLE EDITION OF THE FOLLOWING CODES AND STANDARDS THAT HAVE BEEN

3. CONFORM TO THE REQUIREMENTS OF ALL LOCAL, STATE AND FEDERAL AGENCIES WHICH HAVE AUTHORITY

- ADOPTED BY AND ARE ENFORCED BY THE AUTHORITY HAVING JURISDICTION:
- a. 2015 INTERNATIONAL BUILDING CODE WITH LOCAL AMENDMENTS. b. 2015 INTERNATIONAL ENERGY CONSERVATION CODE WITH LOCAL AMENDMENTS c. 2015 INTERNATIONAL MECHANICAL CODE WITH LOCAL AMENDMENTS
- d. 2014 NATIONAL ELECTRICAL CODE (NEC), NFPA 70. e. LIFE SAFETY CODE, NFPA 101
- f. NATIONAL FIRE ALARM CODE, NFPA 72 g. AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES
- h. ASME A17.1, 2019 SAFETY CODE FOR ELEVATORS AND ESCALATORS
- i. ALL LOCAL CODES AND ORDINANCES ENFORCED BY THE CITY OF MOSCOW MILLS, MISSOURI. j. ALL LOCAL CODES AND ORDINANCES ENFORCED BY LINCOLN COUNTY, MISSOURI.
- k. ALL LOCAL CODES AND ORDINANCES ADOPTED AND ENFORCED BY THE AUTHORITY HAVING JURISDICTION. N. NATIONALLY RECOGNIZED TESTING LABORATORIES - REFERENCED STANDARDS:
- 1. ALL EQUIPMENT, APPARATUS, MATERIALS AND SYSTEMS SHALL BE RATED AND TESTED BY A NATIONALLY RECOGNIZED TESTING LABORATORY (UL, ETL, ETC.) FABRICATED AND INSTALLED WITH THE APPLICABLE
- INDUSTRY STANDARDS. ALL EQUIPMENT, APPARATUS, MATERIALS AND SYSTEMS SHALL BE LISTED AND LABELED BY A NATIONALLY
- O. CONTRACTOR SHALL CONTACT AUTHORITIES HAVING JURISDICTION (AHJ) TO ARRANGE FOR ALL REGULARLY REQUIRED INSPECTIONS OF THE WORK OF THIS CONTRACT. ELECTRICAL WORK THAT WILL BE CONCEALED SHALL BE INSPECTED AND APPROVED BY THE AHJ PRIOR TO CONCEALING THE ELECTRICAL WORK. CONTRACTOR SHALL FURNISH A CERTIFICATE OF FINAL INSPECTION AND APPROVAL FROM ALL AUTHORITIES HAVING JURISDICTION AND FROM ALL ENFORCEMENT AGENCIES.

ELECTRICAL CONTRACT DOCUMENTS

RECOGNIZED TESTING LABORATORY.

- A. THE ELECTRICAL DRAWINGS (DRAWINGS) AND THE SPECIFICATIONS SHALL TOGETHER FORM A SET OF CONTRACT DOCUMENTS FOR THE ELECTRICAL WORK. NEITHER THE DRAWINGS OR THE SPECIFICATIONS SHALL BE COMPLETE WITHOUT THE OTHER. ANY ITEM SHOWN ON THE DRAWINGS OR SPECIFIED IN THE SPECIFICATIONS SHALL BE CONSIDERED AS IF SHOWN AND SPECIFIED IN BOTH.
- B. ANY QUESTIONS REGARDING THE CONTENT OR INTENT OF THE DRAWINGS AND/OR SPECIFICATIONS SHALL IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE ENGINEER FOR CLARIFICATION. SHOULD DIRECTION/CLARIFICATION FROM THE ENGINEER NOT BE OBTAINED DUE TO TIME CONSTRAINTS OR COMMUNICATION LIMITATIONS, THE GREATER QUANTITY, HIGHER QUALITY OF CONDITION MOST FAVORABLE TO THE OWNER SHALL BE ASSUMED AND INCLUDED IN THE WORK OF THIS CONTRACT.
- C. ELECTRICAL DRAWINGS AND SPECIFICATIONS: COMPLY WITH THE FOLLOWING REQUIREMENTS:
- 1. CONTRACTOR SHALL FAMILIARIZE THEMSELVES WITH ALL DRAWINGS AND SPECIFICATIONS WITHIN THE CONTRACT DOCUMENTS, INCLUDING, BUT NOT NECESSARILY LIMITED TO, GEOTECHNICAL, LANDSCAPE, CIVIL, ARCHITECTURAL, STRUCTURAL, MECHANICAL, PLUMBING AND FIRE PROTECTION DRAWINGS AND SPECIFICATIONS.
- 2. CONTRACTOR BECOME FAMILIAR WITH THE LOCATIONS OF ALL SHAFTS, CHASES, PLENUM SPACES, SUSPENDED CEILINGS, EQUIPMENT LOCATIONS AND THE WORK OF OTHER TRADES AND COORDINATE SAME WITH THE ELECTRICAL WORK TO BE PERFORMED.
- THE ELECTRICAL DRAWINGS ARE DIAGRAMMATIC IN NATURE AND ARE INTENDED TO INDICATE APPROXIMATE LOCATION ONLY OF ELECTRICAL WORK. THE ACTUAL LOCATION OF ANY ELECTRICAL WORK SHALL NOT INTERFERE WITH THE LOCATION, CLEARANCES, ETC. REQUIRED BY THE WORK OF OTHER TRADES.
- 4. THE LOCATION OF DEVICES AND LIGHT FIXTURES AS SHOWN ON THE DRAWINGS IS DIAGRAMMATIC. THE OWNER SHALL HAVE THE RIGHT TO RELOCATE ANY DEVICES OR LIGHT FIXTURES BEFORE THEY ARE INSTALLED WITHOUT ADDITIONAL COST.
- 5. PRIOR TO ROUGH-IN, CONTRACTOR SHALL COORDINATE ALL DEVICE LOCATIONS WITH THE ARCHITECTURAL WALL ELEVATIONS. 6. DIMENSIONS INDICATED ON THE DRAWINGS SHALL TAKE PRECEDENCE OVER DIMENSIONS OBTAINED BY
- MEASURING THE DRAWINGS WITH A SCALE, RULER, TAPE MEASURE, ETC. ALL DIMENSIONS, WHETHER INDICATED WITH FIGURES OR SCALED, SHALL BE VERIFIED IN THE FIELD. 7. PRIOR TO ORDERING LARGE EQUIPMENT, INCLUDING BUT NOT NECESSARILY LIMITED TO SWITCHBOARDS.
- METERING EQUIPMENT, ETC. CONTRACTOR SHALL VERIFY THAT THE EQUIPMENT TO BE INSTALLED WILL FIT WITHIN THE SPACE AVAILABLE
- 9. VERIFY THE ACTUAL LOCATIONS OF DOOR SWINGS, WINDOW LOCATIONS, CASEWORK, WALL MOUNTED MARKERBOARDS, ETC. PRIOR TO THE ROUGH IN OF ELECTRICAL WORK. ALL ELECTRICAL WORK THAT HAS BEEN INSTALLED THAT IS IN CONFLICT WITH THE WORK OF OTHER TRADES DUE TO THE LACK OF CONTRACTOR

8. CONTRACTOR SHALL NOTIFY THE ARCHITECT OR ENGINEER OF ANY DISCREPANCIES BETWEEN THE

ELECTRICAL DRAWINGS AND THE CIVIL, STRUCTURAL, ARCHITECTURAL, PLUMBING, FIRE PROTECTION OR

- COORDINATION SHALL BE RELOCATED AT NO ADDITIONAL COST TO THE OWNER. D. DEFINITIONS: THE FOLLOWING TERMS ARE USED ON THE ELECTRICAL DRAWINGS AND IN THE SPECIFICATIONS AND SHALL BE DEFINED AS FOLLOWS:
- 1. CONTRACTOR THE ELECTRICAL CONTRACTOR OR ANY OF THEIR SUB-CONTRACTORS.
- 2. WORK ALL MATERIAL, LABOR, TRANSPORTATION OF THE ELECRICAL CONTRACTOR OR ANY OF THEIR SUB-CONTRACTORS. FURNISH - PURCHASE, SUBMIT FOR REVIEW AND APPROVAL, COORDINATE WITH THE CONTRACT DOCUMENTS
- 4. INSTALL TO STORE AS DIRECTED, PROTECT FROM DAMAGE, INSTALL IN PLACE, MAKE READY FOR CONNECTION TO THE REQUIRED SERVICE.

AND DELIVER TO THE PROJECT SITE IN NEW, UNDAMAGED CONDITION.

- 5. CONNECT CONNECT TO THE REQUIRED SERVICE AS REQUIRED FOR PROPER OPERATION, TEST FOR PROPER OPERATION AND FUNCTIONALITY IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS AND REQUIREMENTS SPECIFIED WITHIN THESE SPECIFICATIONS AND TURN OVER TO THE OWNER IN FULL OPERATING CONDITION. 6. PROVIDE - FURNISH, INSTALL AND CONNECT AS DEFINED ABOVE FOR A COMPLETE, FUNCTIONAL AND CODE COMPLIANT INSTALLATION, READY FOR INTENDED USE.
- 7. FINISHED SPACE SPACES HAVING WALLS PAINTED OR FINISHED WITH WALL COVERING, LAY-IN OR DRYWALL CEILINGS, AND FINISHED FLOORING MATERIALS. EXAMPLES OF FINISHED SPACES INCLUDE, BUT ARE NOT NECESSARILY LIMITED TO, ALL SPACES IN OFFICES, LOBBIES, CORRIDORS, TOILET ROOMS, ETC.
- 8. UNFINISHED SPACES SPACES WITH UNFINISHED WALLS AND FLOORS AND TYPICALLY ARE NOT EQUIPPED WITH A CEILING. EXAMPLES INCLUDE, BUT ARE NOT NECESSARILY LIMITED TO, MECHANICAL ROOMS, ELECTRICAL ROOMS, SERVICE AREAS, ETC.
- 9. REMOVE DETACH ITEMS FROM EXISTING CONSTRUCTION AND LEGALLY DISPOSE OF THEM OFF SITE UNLESS INDICATED TO BE REMOVED AND SALVAGED OR REMOVED AND RE-INSTALLED.
- 10. REMOVE AND SALVAGE CAREFULLY DETACH FROM EXISTING CONSTRUCTION IN A MANNER TO PREVENT DAMAGE AND DELIVER TO OWNER READY FOR RE-USE. 11. REMOVE AND REINSTALL - DETACH ITEMS FROM EXISTING CONSTRUCTION, PREPARE FOR RE-USE,
- RE-INSTALL AND RECONNECT WHERE INDICATED SUCH THAT THE RE-INSTALLED ITEM IS FULLY OPERATIONAL. 12. EXISTING TO REMAIN - EXISTING ITEMS OF CONSTRUCTION THAT ARE NOT TO BE PERMANENTLY REMOVED AND THAT ARE NOT OTHERWISE INDICATED TO BE REMOVED, REMOVED AND SALVAGED OR REMOVED AND RE-INSTALLED.

ELECTRONIC DRAWING FILES:

- A. ELECTRONIC DRAWING FILES AS PREPARED BY CASE ENGINEERING ARE INSTRUMENTS OF SERVICE AS AND HAVE BEEN PREPARED SOLELY FOR USE AS PART OF THE WORK OF THIS CONTRACT.
- B. DURING THE COURSE OF THE IMPLEMENTATION OF THE PROJECT, COPIES OF THE DIGITAL ELECTRONIC FILES OF THESE DRAWINGS CAN BE OBTAINED FROM CASE ENGINEERING FOR THE PREPARATION OF SUBMITTALS AND SHOP DRAWINGS.
- C. ANY ELECTRONIC MEDIA TRANSMITTED TO THE CONTRACTOR SHALL REMAIN THE PROPERTY OF CASE ENGINEERING AND ARE SUBJECT TO ITS COPYRIGHT. THE FILES ARE TO BE USED SOLELY TO FACILITATE THE DEVELOPMENT OF SUBMITTALS, SHOP DRAWINGS, CONSTRUCTION AND CONSTRUCTION DOCUMENTATION FOR THE PROJECT TITLE PROJECT AND ARE NOT TO BE COPIED OR REUSED FOR OTHER PROJECTS D. THESE ELECTRONIC FILES ARE NON-CERTIFIED RECORDINGS OF PRINTED DOCUMENTS PREPARED BY OR FOR CASE ENGINEERING AND ARE NOT A PART OF THE CONTRACT DOCUMENTS. THESE FILES ARE PROVIDED ONLY FOR
- ISSUED DURING THE BIDDING PERIOD, AS MODIFIED BY ANY SUBSEQUENT CONTRACT AMENDMENT OR E. ANY REVISIONS, ADDITIONS AND/OR DELETIONS TO THESE ELECTRONIC FILES, EITHER INTENTIONAL OR UNINTENTIONAL, SHALL BE MADE AT THE FULL RISK OF THE PERSON(S) MAKING SUCH REVISIONS, ADDITIONS AND/OR DELETIONS. SUCH PERSONS SHALL HOLD HARMLESS AND INDEMNIFY CASE ENGINEERING OF ANY AND ALL RESPONSIBILITIES AND LIABILITIES.

THE CONVENIENCE OF THE RECEIVING PARTY AND OTHERS PROVIDING SERVICES TO THE RECEIVING PARTY. IN

ACCORDANCE WITH THE CONSTRUCTION CONTRACT, THE OFFICIAL CONTRACT DOCUMENTS ARE THE DOCUMENTS

- F. CONTRACTOR ACCEPTS ELECTRONIC FILES FOR DRAWINGS AND SPECIFICATIONS "AS-IS". IN CASE OF ANY DIFFERENCES BETWEEN THESE FILES AND THE OFFICIAL CONTRACT DOCUMENTS, THE OFFICIAL CONTRACT DOCUMENTS GOVERN. IN PREPARING YOUR WORK. AND AS REQUIRED BY THE CONTRACT DOCUMENTS. YOU REMAIN RESPONSIBLE FOR COORDINATION OF THE INFORMATION WITH THE FIELD CONDITIONS, THE WORK OF TOTHER TRADES AND THE CONTRACT DOCUMENTS, INCLUDING ALL REVISIONS, AMENDMENTS, AND MODIFICATIONS.
- G. ALL ELECTRONIC FILE STANDARDS ARE AS IDENTIFIED IN THE ELECTRONIC FILE EXTENSION WITHIN THE FILE. RECIPIENT AGREES THAT CASE ENGINERING CANNOT BE HELD RESPONSIBLE FOR PROBLEMS ARISING FROM FILES

WHICH HAVE BEEN CONVERTED FROM ITS ORIGINAL FORMAT FOR USE IN NON-NATIVE APPLICATIONS (E.G. REVIT

H. ANY USE OF THE INFORMATION OBTAINED OR DERIVED FROM THESE ELECTRONIC FILES WILL BE AT THE RECEIVING PARTY'S SOLE RISK AND WITHOUT LIABILITY, RISK OR LEGAL EXPOSURE TO CASE ENGINEERING. YOU AGREE TO INDEMNIFY AND HOLD HARMLESS CASE ENGINEERING AGAINST ANY CLAIMS, DAMAGES, OR LIABILITIES OF ANY KIND RELATING TO YOUR USE OF THE ABOVE TRANSMITTED INFORMATION.

- A. REVIEW OF THE SHOP DRAWINGS IS RENDERED AS A SERVICE ONLY AND SHALL NOT BE CONSIDERED AS A GUARANTEE OF MEASUREMENTS OR OF BUILDING CONDITIONS; NOR SHALL IT BE CONSTRUED AS RELIEVING THE CONTRACTOR'S OF BASIC RESPONSIBILITIES UNDER HIS CONTRACT. ARCHITECT/ENGINEER WILL REVIEW SHOP DRAWINGS ONLY FOR CONFORMANCE WITH DESIGN CONCEPT OF THE PROJECT. REVIEW BY THE ARCHITECT/ENGINEER SHALL NOT BE CONSTRUED:
- 1. AS PERMITTING ANY DEPARTURE FROM THE CONTRACT REQUIREMENTS.
- 2. AS RELIEVING THE CONTRACTOR OF THE RESPONSIBILITY FOR ANY ERROR IN DETAILS, DIMENSIONS OR OTHERWISE THAT MAY EXIST.
- AS APPROVED DEPARTURES FROM ADDITIONAL DETAILS OR INSTRUCTIONS PREVIOUSLY FURNISHED BY THE ARCHITECT/ENGINEER.

B. SHOP DRAWINGS:

- 1. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AND DESCRIPTIVE LITERATURE OF EQUIPMENT TO BE FURNISHED UNDER THIS CONTRACT. DRAWINGS SHALL STATE CAPACITIES, SIZES, ETC., OF ALL EQUIPMENT AND SHALL BE CERTIFIED. SEE GENERAL CONDITIONS AND SUPPLEMENTARY CONDITIONS FOR
- 2. EACH SHOP DRAWING, PRODUCT DATA SHEET AND/OR SPECIFICATION SHEET SHALL BE MARKED WITH THE NAME AND LOCATION OF THE PROJECT. THE SHOP DRAWINGS SHALL INCLUDE STAMPS PROVIDING EVIDENCE OF HAVING BEEN REVIEWED BY THE CONTRACTOR GENERAL CONTRACTOR AND ELECTRICAL CONTRACTOR, STAMPED AND SIGNED CERTIFYING THAT THEY HAVE FOUND THEM TO BE 100% COMPLETE AND ACCURATE, PRIOR TO SUBMISSION TO THE ENGINEER.
- 3. SHOP DRAWINGS RECEIVED BY THE ENGINEER THAT HAVE NOT BEEN REVIEWED AND STAMPED BY THE GENERAL CONTRACTOR AND THE ELECTRICAL CONTRACTOR WILL BE RETURNED WITHOUT BEING REVIEWED. 4. PRODUCT DATA SHEETS PROVIDED AS SUBMITTALS THAT CONTAIN MULTIPLE DIFFERENT ITEMS ON A PAGE SHALL BE MARKED TO CLEARLY IDENTIFY THE SPECIFIC ITEM BEING SUBMITTED FOR REVIEW. SUBMITTALS THAT DO NOT COMPLY WITH THIS REQUIREMENT WILL BE RETURNED WITHOUT REVIEW.
- 5. SHOP DRAWING REVIEW IS FOR PURPOSE OF DETERMINING ONLY THAT EQUIPMENT SUBMITTED CONFORMS WITH GENERAL DESIGN INTENT AND SHALL NOT REMOVE RESPONSIBILITY FROM CONTRACTOR. 6. BY APPROVING AND SUBMITTING SHOP DRAWINGS, PRODUCT DATA, SAMPLES AND SIMILAR SUBMITTALS, THE CONTRACTOR REPRESENTS THAT THE CONTRACTOR HAS DETERMINED AND VERIFIED MATERIALS, FIELD MEASUREMENTS AND FIELD CONSTRUCTION CRITERIA RELATED THERETO, OR WILL DO SO, AND HAS CHECKED AND COORDINATED THE INFORMATION CONTAINED WITHIN SUCH SUBMITTALS WITH THE REQUIREMENTS OF THE WORK
- AND OF THE CONTRACT DOCUMENTS. WHERE CONTRACTOR HAS FAILED TO PROVIDE PROPER SPACE FOR EQUIPMENT AND REQUIRED CLEARANCES (AS REQUIRED BY LOCAL AUTHORITY HAVING JURISDICTION, AS RELATED TO CODE REQUIREMENTS AS NOTED OR SHOWN ON PLANS OR AS NOTED ON SUBMITTALS) CONTRACTOR SHALL RELOCATE THE EQUIPMENT AS DIRECTED BY ENGINEER. CONTRACTOR SHALL BE HELD RESPONSIBLE FOR ANY AND ALL CHANGES RESULTING FROM SUCH RELOCATIONS AND SHALL BEAR ANY AND ALL INCREASE COSTS TO CONTRACTOR AS WELL AS COSTS TO OTHER TRADES IN MAKING SAID REVISIONS.
- C. THE CONTRACTOR SHALL PERFORM NO PORTION OF THE WORK REQUIRING SUBMITTAL AND REVIEW OF SHOP DRAWINGS, PRODUCT DATA, SAMPLES OR SIMILAR SUBMITTALS UNTIL THE RESPECTIVE SUBMITTALS HAS BEEN APPROVED BY THE ENGINEER.

ELECTRICAL COORDINATION DRAWINGS

A. THIS CONTRACTOR SHALL PROVIDE ALL REQUIRED SUPPORT IN THE DEVELOPMENT OF A COMBINED SET OF ELECTRONIC COORDINATION DRAWING(S). COORDINATION DRAWINGS SHALL BE 1/4" = 1-0" ALONG WITH A DETAILED 3-D MODEL SHOWING LOCATIONS, DIMENSIONS AND HEIGHT OF INSTALLATION OF ALL MAJOR PIECES OF EQUIPMENT, DUCTWORK AND PIPING PROVIDED UNDER THEIR RESPECTIVE CONTRACTS THAT IS TO BE INSTALLED IN THE VICINITY OF AND ADJACENT TO THE ELECTRICAL WORK. COORDINATION DRAWINGS SHALL INCLUDE THE FOLLOWING ITEMS AS A MINIMUM:

- 1) BOTTOM ELEVATION OF DUCT HEIGHT AND SIZE
- 2) PIPING ELEVATIONS AND SIZE 3) CONDUIT ELEVATIONS AND SIZE
- 4) HANGER SUPPORT LOCATIONS (DUCTWORK / PIPING / CONDUIT / CABLE TRAY) 5) LIGHTING FIXTURES
- 6) VOICE AND DATA SYSTEM COMPONENTS
- 7) VIDEO SERVEILLANCE SYSTEM COMPONENTS 8) ACCESS CONTROL SYSTEM COMPONENTS
- 9) FIRE PROTECTION MAINS/BRANCH LINES/HEAD PLACEMENT WITH ELEVATIONS AND SIZE
- 10) BUILDING STRUCTURE BACKGROUND 11) PROPOSED LOCATIONS FOR ACCESS PANELS (DUCTWORK/PIPING/CONDUIT/CABLE TRAY)
- B. MEET WITH REPRESENTATIVES OF THE OTHER DISCIPLINES/TRADES TO COORDINATE THE ELECTRICAL WORK WITH THE WORK OF EACH DISCIPLINE AND TO OBTAIN INFORMATION REGARDING THEIR WORK THAT IS TO BE INDICATED ON THE COORDINATION DRAWINGS.

POWER SYSTEM STUDIES - GENERAL

- A. PROVIDE COMPUTER-BASED, POWER SYSTEM STUDIES THAT INCLUDES: 1. AN OVERCURRENT PROTECTIVE DEVICE SELECTIVE COORDINATION STUDY TO DETERMINE OVERCURRENT PROTECTIVE DEVICE SETTINGS FOR SELECTIVE TRIPPING;
- A SHORT CIRCUIT STUDY TO DETERMINE THE MINIMUM INTERRUPTING CAPACITY OF CIRCUIT PROTECTIVE
- 3. AN ARC-FLASH STUDY TO DETERMINE THE ARC-FLASH HAZARD DISTANCE AND THE INCIDENT ENERGY TO WHICH PERSONNEL COULD BE EXPOSED DURING WORK ON OR NEAR ELECTRICAL EQUIPMENT. B. STUDIES SHALL BE PERFORMED UTILIZING COMPUTER PROGRAMS THAT ARE DISTRIBUTED NATIONALLY AND

ARE IN WIDE USE. SOFTWARE ALGORITHMS SHALL COMPLY WITH REQUIREMENTS OF STANDARDS AND GUIDES

- SPECIFIED IN THIS SECTION. MANUAL CALCULATIONS ARE UNACCEPTABLE. C. STUDY SHALL BE PREPARED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF MISSOURI.
- D. SOFTWARE DEVELOPERS: SUBJECT TO COMPLIANCE WITH SPECIFIED REQUIREMENTS, PERFORM STUDIES UTILIZING SOFTWARE PRODUCTS BY ONE OF THE FOLLOWING:
- SEE EDITING INSTRUCTION NO.2 IN THE EVALUATIONS FOR DISCUSSION OF OPTIONAL
- EASY POWER
- POWER ANALYTICS CORPORATION
- 3. SKM SYSTEMS ANALYSIS E. STUDY SHALL INCLUDE AN EXECUTIVE SUMMARY, COMMENTS AND RECOMMENDATIONS FOR SYSTEM
- IMPROVEMENTS, WHERE NEEDED. F. STUDY SHALL BE SIGNED AND SEALED BY THE PROFESSIONAL ENGINEER RESPONSIBLE FOR THE PREPARATION OF THE STUDY.
- G. ALL STUDIES SHALL BE BASED ON THE DEVICE CHARACTERISTICS OF ACTUAL NEW COMPONENTS BEING
- H. STUDY SHALL INCLUDE A ONE-LINE DIAGRAM, SHOWING THE FOLLOWING MINIMUM INFORMATION, AS
- 1. PROTECTIVE DEVICE DESIGNATIONS AND AMPERE RATINGS.
- 2. CABLE SIZE AND LENGTHS. TRANSFORMER KILOVOLT AMPERE (KVA) AND VOLTAGE RATINGS.
- 4. MOTOR AND GENERATOR DESIGNATIONS AND KVA RATINGS. 5. SWITCHGEAR, SWITCHBOARD, MOTOR-CONTROL CENTER, AND PANELBOARD DESIGNATIONS.
- I. PROVIDE ALL FIELD LABOR AS REQUIRED TO OBTAIN ALL DATA NECESSARY TO CONDUCT THE STUDIES SPECIFIED HEREIN. J. SUBMIT STUDIES FOR REVIEW BEFORE SUBMITTING THE SYSTEM OVERCURRENT PROTECTIVE DEVICE AND
- POWER DISTRIBUTION EQUIPMENT SUBMITTALS. SUBMIT STUDY REPORT FOR REVIEW PRIOR TO RECEIVING FINAL APPROVAL OF THE OVERCURRENT ROTECTIVE DEVICE AND DISTRIBUTION EQUIPMENT SUBMITTALS. K. WHERE FORMAL COMPLETION OF STUDIES WILL CAUSE A DELAY IN THE ORDERING AND MANUFACTURING OF OVERCURRENT PROTECTIVE DEVICES AND POWER DISTRIBUTION EQUIPMENT, OBTAIN APPROVAL FROM ENGINEER FOR PRELIMINARY SUBMITTAL OF SUFFICIENT STUDY DATA TO ENSURE THAT THE SELECTION OF

DEVICES AND ASSOCIATED CHARACTERISTICS IS SATISFACTORY AND IN COMPLIANCE WITH THE RESULTS OF

OVERCURRENT PROTECTIVE DEVICE SELECTIVE COORDINATION STUDY

THE STUDIES BEING PERFORMED.

- A. PROVIDE A COMPUTER-BASED, OVERCURRENT PROTECTIVE DEVICE SELECTIVE COORDINATION STUDY TO DETERMINE OVERCURRENT PROTECTIVE DEVICES AND TO DETERMINE OVERCURRENT PROTECTIVE DEVICE
- B. REPORT RECOMMENDED SETTINGS OF PROTECTIVE DEVICES, READY TO BE APPLIED IN THE FIELD. USE MANUFACTURER'S DATA SHEETS FOR RECORDING THE RECOMMENDED SETTING OF OVERCURRENT PROTECTIVE DEVICES WHEN AVAILABLE.
- C. COMPLY WITH IEEE 242 FOR CALCULATING SHORT-CIRCUIT CURRENTS AND DETERMINING COORDINATION TIME INTERVALS.
- D. COMPLY WITH IEEE 399 FOR GENERAL STUDY PROCEDURES.
- E. THE STUDY SHALL BE BASED ON THE DEVICE CHARACTERISTICS SUPPLIED BY DEVICE MANUFACTURER.

- F. FOR NEW EQUIPMENT, USE CHARACTERISTICS SUBMITTED UNDER THE PROVISIONS OF ACTION SUBMITTALS AND INFORMATION SUBMITTALS FOR THIS PROJECT.
- G. GATHER AND TABULATE ALL REQUIRED INPUT DATA TO SUPPORT COORDINATION STUDY. COMPLY WITH RECOMMENDATIONS IN IEEE 551 FOR THE AMOUNT OF DETAIL REQUIRED TO BE ACQUIRED IN THE FIELD.
- H. FIELD DATA GATHERING SHALL BE UNDER THE DIRECT SUPERVISION AND CONTROL OF THE ENGINEER IN CHARGE OF PERFORMING THE STUDY, AND SHALL BE BY THE ENGINEER OR ITS REPRESENTATIVE WHO HOLDS NETA ETT LEVEL III CERTIFICATION OR NICET ELECTRICAL POWER TESTING LEVEL III CERTIFICATION.

SHORT CIRCUIT STUDY

- A. PROVIDE A COMPUTER-BASED, SHORT CIRCUIT STUDY TO DETERMINE THE MINIMUM INTERRUPTING CAPACITY OF CIRCUIT PROTECTIVE DEVICES.
- B. FOR NEW EQUIPMENT, USE CHARACTERISTICS SUBMITTED UNDER THE PROVISIONS OF ACTION SUBMITTALS AND INFORMATION SUBMITTALS FOR THIS PROJECT.

SEE EDITING INSTRUCTION NO.4 IN THE EVALUATIONS FOR DATA ON NETA AND NICET

C. GATHER AND TABULATE ALL REQUIRED DATA TO SUPPORT THE SHORT-CIRCUIT STUDY. COMPLY WITH RECOMMENDATIONS IN IEEE 551 AS TO THE AMOUNT OF DETAIL THAT IS REQUIRED TO BE ACQUIRED IN THE

D. FIELD DATA GATHERING SHALL BE UNDER THE DIRECT SUPERVISION AND CONTROL OF THE ENGINEER IN CHARGE OF PERFORMING THE STUDY, AND SHALL BE BY THE ENGINEER OR ITS REPRESENTATIVE WHO HOLDS

NETA ETT LEVEL III CERTIFICATION OR NICET ELECTRICAL POWER TESTING LEVEL III CERTIFICATION. E. PERFORM STUDY FOLLOWING THE GENERAL STUDY PROCEDURES CONTAINED IN IEEE 399.

SHOULD BE OBTAINED AND VERIFIED BY CONTRACTOR.

F. CALCULATE SHORT-CIRCUIT CURRENTS ACCORDING TO IEEE 551.

G. BASE STUDY ON THE DEVICE CHARACTERISTICS SUPPLIED BY DEVICE MANUFACTURER FOR NEW DEVICES. COORDINATE FIRST TWO PARAGRAPHS BELOW WITH DRAWINGS. SEE EDITING INSTRUCTION

NO. 3 IN THE EVALUATIONS FOR DISCUSSION ON THE ONE-LINE DIAGRAM. SEE EDITING INSTRUCTION NO. 3 IN THE EVALUATIONS FOR DISCUSSION OF WHAT DATA SHOULD

BE INDICATED ON THE ONE-LINE DIAGRAM, WHERE THE STUDY SHOULD STOP, AND WHAT DATA

- H. BEGIN SHORT-CIRCUIT CURRENT ANALYSIS AT THE SERVICE, EXTENDING DOWN TO THE SYSTEM
- **OVERCURRENT PROTECTIVE DEVICES AS FOLLOWS:** 1. TO NORMAL SYSTEM LOW-VOLTAGE LOAD BUSES WHERE FAULT CURRENT IS 10 KA OR LESS.
- A. PROVIDE A COMPUTER-BASED, ARC-FLASH HAZARD STUDY TO DETERMINE THE ARC-FLASH HAZARD DISTANCE AND THE INCIDENT ENERGY TO WHICH PERSONNEL COULD BE EXPOSED DURING WORK ON OR NEAR NEW ELECTRICAL EQUIPMENT.
- B. ELECTRICAL SURVEY DATA: GATHER AND TABULATE ALL REQUIRED INPUT DATA TO SUPPORT STUDY. COMPLY WITH RECOMMENDATIONS IN IEEE 1584 AND NFPA 70E AS TO THE AMOUNT OF DETAIL THAT IS REQUIRED TO BE C. FIELD DATA GATHERING SHALL BE UNDER THE DIRECT SUPERVISION AND CONTROL OF THE ENGINEER IN
- CHARGE OF PERFORMING THE STUDY, AND SHALL BE BY THE ENGINEER OR ITS REPRESENTATIVE WHO HOLDS NETA ETT LEVEL III CERTIFICATION OR NICET ELECTRICAL POWER TESTING LEVEL III CERTIFICATION. D. FOR NEW EQUIPMENT, USE CHARACTERISTICS SUBMITTED UNDER THE PROVISIONS OF ACTION SUBMITTALS AND INFORMATION SUBMITTALS FOR THIS PROJECT.
- E. INCIDENT ENERGY AND FLASH PROTECTION BOUNDARY CALCULATIONS:
- ARCING FAULT MAGNITUDE.
- 2. PROTECTIVE DEVICE CLEARING TIME. DURATION OF ARC.

INCIDENT ENERGY.

ARC-FLASH BOUNDARY. WORKING DISTANCE.

ARC FLASH HAZARD STUDY

- HAZARD RISK CATEGORY. 8. RECOMMENDATIONS FOR ARC-FLASH ENERGY REDUCTION.
- F. HAZARD LABELS SHALL HAVE AN ORANGE HEADER WITH THE WORDING, "WARNING, ARC-FLASH HAZARD," AND SHALL INCLUDE THE FOLLOWING INFORMATION TAKEN DIRECTLY FROM THE ARC-FLASH HAZARD ANALYSIS:
- LOCATION DESIGNATION.
- NOMINAL VOLTAGE. FLASH PROTECTION BOUNDARY.
- HAZARD RISK CATEGORY.
- INCIDENT ENERGY WORKING DISTANCE.
- ENGINEERING REPORT NUMBER, REVISION NUMBER, AND ISSUE DAT G. ARC FLASH HAZARD WARNING LABELS SHALL BE A 3.5-BY-5-INCH THERMAL TRANSFER LABEL OF HIGH-ADHESION POLYESTER FOR EACH WORK LOCATION INCLUDED IN THE ANALYSIS.
- H. LABELS SHALL BE MACHINE PRINTED, WITH NO FIELD-APPLIED MARKINGS Retain "Electrical Survey Data" Paragraph below if the arc-flash study is being performed independent of electrical design or on existing equipment. Coordinate requirements with Section 260572 "Overcurrent Protective Device Short-Circuit Study." Coordinate requirements with Section 260573 "Overcurrent Protective Device Coordination Study" if required. See Editing Instruction No. 4 in the Evaluations for data on NETA and NICET certification.

- RECORD DOCUMENTS A. DURING THE PROGRESS OF THE WORK, CONTRACTOR SHALL MAINTAIN A CURRENT (DAILY) AS-BUILT SET OF THE DRAWINGS AND SPECIFICATIONS, INDICATING THEREON ALL WORK INSTALLED AT VARIANCE WITH SUCH CONTRACT DOCUMENTS INCLUDING, WITHOUT LIMITATION, WORK COVERED BY ADDENDA, FIELD WORK
- B. AT THE COMPLETION OF THE WORK. ENGINEER SHALL FURNISH CONTRACTOR WITH A COMPLETE SET OF THE LATEST REVISED RECORD DRAWINGS IN ELECTRONIC FORM, AND CONTRACTOR SHALL INDICATE THEREON ALL AS-BUILT CHANGES AND SUCH ADDITIONAL DETAILS NECESSARY OR APPROPRIATE TO PROVIDE A COMPLETE REFERENCE DOCUMENT FOR USE BY ENGINEER/OWNER. IF VARIATIONS AND DETAILS CANNOT BE SHOWN OF FARI Y THEREON, THE CONTRACTOR SHALL PREPARE SUPPLEMENTAL DRAWINGS ADEQUATE TO IMPART THE INFORMATION. THESE ADDITIONAL DRAWINGS SHALL ALSO BE IN ELECTRONIC FORM. THE FOREGOING DRAWINGS COLLECTIVELY SHALL CONSTITUTE THE "AS-BUILT" DRAWINGS FOR THE WORK. C. ALL INDICATIONS ON "AS-BUILT" DRAWINGS SHALL BE EXECUTED IN A LEGIBLE MANNER AT CONTRACTOR'S
- DRAWINGS WITH RESPECT TO SCALE, DRAWING SHEET SIZES AND SEQUENTIAL INDEXING. ALL CHANGES SHALL BE MARKED CLEARLY IN RED AND CLOUDED. D. ENGINEER SHALL REVIEW CONTRACTOR'S "AS-BUILT" DRAWINGS AND NOTIFY CONTRACTOR OF OBSERVED DISCREPANCIES OR DEVIATIONS. CONTRACTOR SHALL PROMPTLY CORRECT AND RESUBMIT REVISED DRAWINGS FOR ENGINEER REVIEW. COMPLETED "AS-BUILT" DRAWINGS SHALL BE DELIVERED TO OWNER THROUGH

COST, USING METHODS AND LEGEND PRESENTATIONS COMPATIBLE WITH THE OVERALL SCHEME OF THE RECORD

ORDERS, CHANGE ORDERS, AND ENGINEERS

- COORDINATION WITH UTILITY COMPANIES A. PRIOR TO COMMENCEMENT OF WORK, CONTRACTOR SHALL COORDINATE THE WORK OF THIS CONTRACT WITH AUTHORIZED REPRESENTATIVES OF EACH SERVING UTILITY THAT WILL PROVIDE SERVICE TO THIS SITE, INCLUDING BUT NOT NECESSARILY LIMITED TO, ELECTRIC, TELEPHONE AND CABLE/SATELLITE TV SERVICE
- B. CONTRACTOR SHALL MEET WITH AUTHORIZED REPRESENTATIVES OF EACH SERVING UTILITY TO DISCUSS UTILITY COMPANY SCOPE OF WORK, CONTRACTOR SCOPE OF WORK, POINT OF SERVICE PICK-UP, DETAILS REGARDING SYSTEM INTERFACE, UTILITY COMPANY STANDARDS TO BE COMPLIED WITH, EMERGENCY
- GENERATOR CHARACTERISTICS, AUTOMATIC TRANSFER SWITCH CHARACTERISTICS, ETC. C. CONTRACTOR SHALL PREPARE MEETING NOTES FOR EACH MEETING TO DOCUMENT ITEMS DISCUSSED, AGREEMENTS REACHED, ACTION IETMS ASSIGNED, ETC. SUBMIT MEETING MINUTES TO GENERAL CONTRACTOR

AND ENGINEER OF RECORD.

PROPER INSTALLATION OF THE WORK.

EQUIPMENT MANUALS PRIOR TO INSTALLATION OF THE WORK.

- COORDINATION WITH OTHER TRADES A. CONTRACTOR SHALL GIVE CAREFUL CONSIDERATION TO THE WORK OF OTHER TRADES ON THE PROJECT.
- B. ANY WORK INSTALLED WITHOUT REGARD TO THE WORK OF OTHER TRADES WHICH MUST, IN THE OPINION OF THE OWNER OR ARCHITECT/ENGINEER, BE MOVED TO PERMIT THE INSTALLATION OF OTHER WORK, SHALL BE MOVED AND REPLACED AS A PART OF THIS WORK WITHOUT EXTRA CHARGE.

C. SET ALL SLEEVES AND CUT AND PATCH ALL MISCELLANEOUS HOLES NECESSARY FOR THE CONVENIENT AND

ELECTRICAL WORK SHALL BE INSTALLED SO AS TO NOT CONFLICT WITH THE WORK OF OTHER TRADES.

- D. CONFER WITH THE OTHER CONTRACTORS REGARDING THE LOCATION AND SIZE OF PIPES, EQUIPMENT DUCTS. OPENINGS AND SPECIAL ARCHITECTURAL TREATMENTS IN ORDER THAT THERE MAY BE NO INTERFERENCES BETWEEN THE INSTALLATION OR THE PROGRESS OF THE WORK OF ANY CONTRACTOR ON THE PROJECT. E. CONTRACTOR SHALL OBTAIN AND REVIEW INSTALLATION MANUALS FOR EACH ITEM OF EQUIPMENT BEING PROVIDED BY OTHER TRADES OR THE OWNER THAT REQUIRES A POWER AND/OR CONTROL WIRING CONNECTION. OBTAIN MANUALS FROM THE OTHER TRADES OR OWNER PRIOR TO ROUGH IN OF ANY ELECTRICAL WORK. NOTIFY THE ENGINEER OF ANY DISCREPANCIES BETWEEN THE ELECTRICAL DRAWINGS AND SPECIFICATIONS AND THE
- F. ALL LINE VOLTAGE WIRING AND FINAL CONNECTIONS TO COMPLETE MECHANICAL SYSTEMS SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR.
- G. ALL ELECTRICAL CONDUIT, WIRE, AND CONNECTIONS RELATING TO MECHANICAL EQUIPMENT CONTROLS AND ALL WIRING ASSOCIATED WITH STARTER HOLDING COILS, SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR

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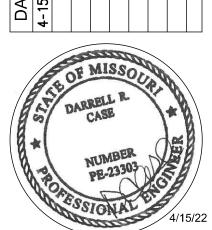
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MO# E-23303 PROJECT MANAGER: JE DRAWN BY: CK

Darrell R Case

ENGINEER

PROJECT NUMBER

21-079

DATE

April 15, 2022

ELECTRICAL SPECIFICATIONS

- H. THE CONTRACTOR INSTALLING THE MECHANICAL EQUIPMENT SHALL BE RESPONSIBLE FOR PROVIDING MAGNETIC MOTOR STARTERS WHERE SUCH STARTERS ARE PART OF THE CONTROL PACKAGE OF THE EQUIPMENT
- I. ALL OTHER STARTERS SHALL BE FURNISHED, INSTALLED AND CONNECTED BY THE ELECTRICAL CONTRACTOR. THE CONTRACTOR INSTALLING THE STARTERS THAT ARE PART OF A CONTROL PACKAGE SHALL COORDINATE STARTER REQUIREMENTS WITH THE ELECTRICAL SPECIFICATIONS.
- J. ACCESS PANELS, IN WALLS OR CEILINGS, REQUIRED (I.E., AUTOMATIC OR MANUAL DAMPER, FIRE OR SMOKE DAMPER, COIL OR CONTROL INSTRUMENT MOUNTED IN A DUCT OR PIPE) SHALL BE PROVIDED BY THE RESPECTIVE CONTRACTOR. ACCESS PANELS ARE NOT REQUIRED IN AREAS WHERE THE CEILING SYSTEM IS LAY-IN TILE; HOWEVER, SUFFICIENT SPACE SHALL BE AVAILABLE IN AND THROUGH THE CEILING SYSTEM TO ALLOW MAINTENANCE AND ADJUSTMENT OF DAMPERS, AND CLEANING OF COILS AS NECESSARY, OR A SUITABLE ACCESS PANEL SHALL BE PROVIDED FOR THAT PURPOSE. ACCESS PANELS SHALL BE MINIMUM 18 INCHES BY 18 INCHES WHEREVER POSSIBLE AND SHALL BE PROVIDED WITH FLUSH TRIM AND AN ALLEN-KEY OPERATED CAMLOCK FASTENER. PANELS SHALL BE MANUFACTURED BY KARP, MILCOR, BILCO OR NYSTROM.
- K. PROVIDE ALL EXCAVATING, PUMPING, BACKFILLING AND COMPACTING AS REQUIRED TO ACCOMMODATE THE INSTALLATION OF THE WORK OF THIS CONTRACT.
- EQUIPMENT AND DEVICES THAT HAVE FACTORY PRIME COAT OR FINAL SURFACE FINISH SHALL BE REPLACED, REPAIRED OR REFINISHED IF DEFECTIVE OR DAMAGED DURING INSTALLATION.
- M. ITEMS OF EQUIPMENT MAY BE SPECIFIED IN THE SINGULAR FORM, HOWEVER, PROVIDE AND INSTALL THE QUANTITY OF ITEMS OF EQUIPMENT AS REQUIRED FOR A COMPLETE AND FUNCTIONAL SYSTEM.
- N. ARRANGE ALL WORK SO A MINIMUM PERIOD OF INTERRUPTION OR OUTAGES WILL OCCUR IN THE TEMPORARY OR PERMANENT TRANSFER OF SERVICES AS REQUIRED FOR ALL ELECTRICAL REVISIONS. NOT LESS THAN 48 HOURS NOTIFICATION TO THE USING AGENCY/OWNER SHALL BE REQUIRED BEFORE APPROVAL WILL BE GRANTED FOR ANY DISRUPTION OF SERVICES. THE OUTAGE REQUEST SHALL INCLUDE THE EXTENT OF THE WORK TO BE DONE, LENGTH OF OUTAGE TIME REQUIRED AND THE TIME AT WHICH THE OUTAGE IS TO BEGIN. NO ALLOWANCE WILL BE MADE FOR EXTRA PAYMENT AS A RESULT OF SCHEDULING "OVERTIME" WORK NECESSARY TO PERFORM BEFORE OR AFTER NORMAL OR REGULAR WORKING HOURS TO ACCOMPLISH THE
- O. PROVIDE FINAL ELECTRICAL CONNECTIONS TO EQUIPMENT FURNISHED/PROVIDED BY OTHERS, (HVAC EQUIPMENT, PLUMBING EQUIPMENT, "HEAD END" AND CONTROL EQUIPMENT FOR ALL VARIOUS LOW VOLTAGE
- P. COORDINATE THE NEMA CONFIGURATION OF THE RECEPTACLE TO BE PROVIDED WITH THE NEMA PLUG CONFIGURATION OF THE CORD/PLUG ASSEMBLY FURNISHED WITH THE EQUIPMENT TO BE INSTALLED. PROVIDE RECEPTACLES HAVING A NEMA CONFIGURATION THAT MATCHES THE NEMA CONFIGURATION OF THE PLUG ON THE
- Q. COORDINATE ELECTRICAL PANEL LOCATIONS WITH OTHER TRADES TO AVOID THE ROUTING OF PIPING OR DUCTWORK ABOVE THE ELECTRICAL PANELS.
- R. PROVIDE FINAL COORDINATION OF AVAILABLE POWER (VOLTAGE/PHASE) WITH OTHER TRADES PRIOR TO THEIR ORDERING OF EQUIPMENT.

- A. THE ENGINEER HAS NO CONTRACTUAL RESPONSIBILITY IN CONNECTION WITH JOB SITE SAFETY MEASURES OR PRECAUTIONS AS RELATED TO MEANS, METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES. B. CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS OF THE JOB SITE,
- INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK. C. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL SUCH SAFETY MEASURES AND SHALL CONSULT WITH THE LOCAL, STATE OR FEDERAL SAFETY INSPECTOR FOR INTERPRETATION WHENEVER IN DOUBT AS TO WHETHER SAFE CONDITIONS DO OR DO NOT EXIST; OR WHETHER THEY ARE OR ARE NOT IN COMPLIANCE WITH SAFETY REGULATIONS
- D. ALL MATERIALS INSTALLED WITHIN AIR HANDLING PLENUMS SHALL BE NON-COMBUSTIBLE AND SHALL HAVE A FLAME SPREAD INDEX OF NOT MORE THAN 25 AND A SMOKE DEVELOPED INDEX OF NOT MORE THAN 50 WHEN TESTED IN ACCORDANCE WITH ASTM E84 OR UL 723. ALL MATERIALS INSTALLED WITHIN PLENUM SPACES SHALL BE LISTED AND LABELED FOR SUCH APPLICATION.
- PROTECT ALL WORK FROM DAMAGE AND PROTECT THE OWNER'S PROPERTY FROM DIRT, DAMAGE OR LOSS ARISING FROM THE CONTRACTOR'S WORK.
- F. COMPLY WITH ALL APPLICABLE OSHA REQUIREMENT AND TAKE ALL NECESSARY PRECAUTIONS FOR THE SAFETY OF WORKERS AND OWNER'S PERSONNEL
- PROTECT ALL NEW OPEN CONDUITS AND EQUIPMENT FROM CONSTRUCTION DIRT AND DUST. COVER, CAP OR PLUG OPEN ENDS OF CONDUIT. KEEP EQUIPMENT CLOSED OR COVER AND SEAL EQUIPMENT OPENINGS.

TEMPORARY CONSTRUCTION POWER AND LIGHTING

- A. THE CONTRACTOR SHALL PROVIDE ALL REQUIRED TEMPORARY CONSTRUCTION POWER AND LIGHTING TO ALLOW ALL CONTRACTORS AND SUB-CONTRACTORS TO PERFORM THE WORK OF THEIR CONTRACTS.
- B. PRIOR TO THE SUBMISSION OF A BID PROPOSAL. THE CONTRACTOR SHALL CONTACT THE GENERAL CONTRACTOR TO COORDINATE THE TYPE OF EQUIPMENT TO BE UTILIZED DURING THE WORK OF THIS CONTRACT. THE ELECTRICAL BID SHALL INCLUDE ALL MATERIAL AND LABOR COSTS ASSOCIATED WITH PROVIDING TEMPORARY CONSTRUCTION POWER AND LIGHTING SYSTEM THROUGHOUT THE PROJECT AREA
- PROVIDE TEMPORARY LIGHTING IN ALL WORK AREAS AS DIRECTED BY THE GENERAL CONTRACTOR. LAMPS FOR TEMPORARY LIGHTING SHALL BE MINIMUM 2,000 LUMENS AND SHALL BE MAINTAINED BY THE GC DURING THE
- PROVIDE TEMPORARY POWER DISTRIBUTION SUFFICIENT TO ACCOMMODATE THE TEMPORARY LIGHTING SYSTEM AND CONSTRUCTION OPERATIONS, INCLUDING THE USE OF POWER TOOLS (BUT NOT INCLUDING HEAVY-DUTY ELECTRICAL WELDING UNITS), ELECTRIC HEATING UNITS AND START-UP OF SPECIFIED BUILDING EQUIPMENT THAT IS TO BE TESTED, STARTED, OR PLACED INTO USE PRIOR TO COMPLETION OF ITS PERMANENT

MATERIAL AND EQUIPMENT HANDLING AND STORAGE

- A. COORDINATE THE DELIVERIES OF ELECTRICAL MATERIALS AND PRODUCTS WITH THE GENERAL CONTRACTOR. B. COORDINATE THE SCHEDULING AND SEQUENCING OF THE WORK SO THAT STORAGE REQUIREMENTS AT THE PROJECT ARE MINIMIZED. IN GENERAL, DO NOT DELIVER INDIVIDUAL ITEMS OF EQUIPMENT TO THE PROJECT SUBSTANTIALLY AHEAD OF THE TIME OF INSTALLATION.
- C. ALL MATERIALS SHALL BE COVERED PRIOR TO INSTALLATION AND PROTECTED FROM DAMAGE, EXTERIOR ELEMENTS, WATER AND MOISTURE INFILTRATION, ETC. UNTIL FINAL ACCEPTANCE. D. COORDINATE THE MOVEMENT OF PERSONNEL AND THE TRANSPORTATION OF MATERIAL AND EQUIPMENT THROUGH THE BUILDING WITH THE GENERAL CONTRACTOR AND THE OWNER'S REPRESENTATIVE.

CONCRETE PADS FOR ELECTRICAL EQUIPMENT

- A. ALL CONCRETE PADS FOR ALL INTERIOR AND EXTERIOR ELECTRICAL EQUIPMENT, AS NOTED ON THE DRAWINGS, SHALL BE PROVIDED AS A PART OF THE ELECTRICAL WORK.
- B. PROVIDE ALL EXCAVATION, SOIL REMOVAL FROM SITE, GRADING, COMPACTION, FORMS AND REINFORCING STEEL, CONCRETE FINISHING, FORM REMOVAL, BACKFILLING, FINISHED GRADING, ETC. AS REQUIRED FOR PAD
- C. CONCRETE SHALL BE STEEL REINFORCED, 3,000 PSI. D. CONCRETE PADS WITHIN THE BUILDING INTERIOR SHALL BE MINIMUM NOMINAL 4 INCH HIGH AND ANCHORED
- TO THE FLOOR WITH DOWELS.
- E. EDGES OF CONCRETE PADS SHALL BE CHAMFERED APPROXIMATELY ONE (1) INCH TO PREVENT CHIPPING. F. CONSTRUCT CONCRETE PADS FOR UTILITY COMPANY EQUIPMENT SHALL BE CONSTRUCTED IN ACCORDANCE WITH UTILITY COMPANY SPECIFICATIONS, REQUIREMENTS AND DETAILS. ADDITIONALLY, PROVIDE ALL CONDUIT STUB OUTS AND GROUNDING PROVISIONS AS REQUIRED BY UTILITY COMPANY.

G. CONSTRUCT CONCRETE PADS FOR ELECTRICAL EQUIPMENT SUCH AS EMERGENCY GENERATOR, ETC. TO A

SIZE SIX (6) INCHES LARGER THAN THE EQUIPMENT TO BE INSTALLED ON THE PAD, ALL SIDES. H. FINISHED GRADE AROUND EXTERIOR CONCRETE PADS SHALL BE SLOPED TO ACHIEVE POSITIVE WATER DRAINAGE AWAY FROM THE PAD.

SEQUENCING AND SCHEDULING

- A. COORDINATE ELECTRICAL EQUIPMENT INSTALLATION WITH OTHER BUILDING COMPONENTS AND THE PROJECT
- B. ARRANGE FOR CHASES, SLOTS, AND OPENINGS IN BUILDING STRUCTURE DURING PROGRESS OF CONSTRUCTION TO ALLOW FOR ELECTRICAL INSTALLATIONS.
- C. SEQUENCE, COORDINATE, AND INTEGRATE INSTALLING ELECTRICAL MATERIALS AND EQUIPMENT FOR EFFICIENT FLOW OF THE WORK
- D. COORDINATE CONNECTING ELECTRICAL SERVICE TO COMPONENTS FURNISHED UNDER OTHER SECTIONS OR BY OTHER DISCIPLINES/TRADES. E. COORDINATE REQUIREMENTS FOR ACCESS PANELS AND DOORS WHERE ELECTRICAL ITEMS REQUIRING
- ACCESS ARE CONCEALED BY FINISHED SURFACES.

MAINTENANCE OF WORK AREAS

- A. DURING THE PROJECT, THIS CONTRACTOR SHALL MAINTAIN HIS WORK AREA IN AN ORGANIZED MANNER, SHALL NOT ALLOW DEBRIS TO ACCUMULATE, AND SHALL STORE EQUIPMENT, TOOLS AND SUPPLIES IN A MANNER WHICH SHALL NOT CAUSE INTERFERENCE WITH THE ACTIVITIES OF OTHERS ENGAGED ON THE
- B. OPEN ENDS OF CONDUIT, EQUIPMENT AND SPECIALTIES SHALL BE KEPT PROPERLY CLOSED DURING CONSTRUCTION AND INSTALLATION SO AS TO AVOID CONTAMINATION.

UTILITY COMPANY METERING EQUIPMENT

- A. PROVIDE ALL EQUIPMENT REQUIRED FOR ELECTRICITY METERING BY THE LOCAL SERVING UTILITY COMPANY.
- B. ELECTRICAL SERVICE CONNECTIONS: COORDINATE WITH UTILITY COMPANIES AND COMPONENTS THEY FURNISH AS FOLLOWS:
- 1. COMPLY WITH REQUIREMENTS OF UTILITIES PROVIDING ELECTRICAL POWER SERVICES.
- 2. COORDINATE INSTALLATION AND CONNECTION OF UTILITIES AND SERVICES, INCLUDING PROVISION FOR

ELECTRICITY-METERING COMPONENTS.

- C. METERS SHALL BE FURNISHED BY UTILITY COMPANY; INSTALLED BY ELECTRICAL CONTRACTOR.
 - RETAIN AND REVISE THE REMAINDER OF THIS ARTICLE TO REFLECT UTILITY COMPANY'S REQUIREMENTS FOR EQUIPMENT TO BE PROVIDED BY CONTRACTOR.
- D. CURRENT-TRANSFORMER CABINETS: PROVIDE CURRENT TRANSFORMER CABINETS THAT COMPLY WITH REQUIREMENTS OF ELECTRICAL-POWER UTILITY COMPANY.
- RETAIN ONE OR BOTH OF FIRST TWO PARAGRAPHS BELOW. RETAIN BOTH IF OWNER'S METER IS NOT IN A MODULAR METER CENTER.

E. METER SOCKETS: COMPLY WITH REQUIREMENTS OF ELECTRICAL-POWER UTILITY COMPANY.

F. INSTALL ALL CONDUITS AND EQUIPMENT ACCORDING TO UTILITY COMPANY'S WRITTEN REQUIREMENTS. PROVIDE EMPTY CONDUITS FOR METERING LEADS AND EXTEND GROUNDING CONNECTIONS AS REQUIRED BY UTILITY COMPANY.

FIRE STOPPING

- A. PROVIDE FIRE STOPPING FOR PENETRATIONS BY CONDUIT OR CABLES AND OTHER EQUIPMENT THROUGH FIRE-RATED VERTICAL BARRIERS (WALLS AND PARTITIONS), HORIZONTAL BARRIERS (FLOOR/CEILING ASSEMBLIES) AND VERTICAL SHAFT WALLS AND PARTITIONS.
- B. FIRESTOP SYSTEM INSTALLATION SHALL COMPLY WITH THE REQUIREMENTS OF ASTM E 814 OR UL 1479 TESTED ASSEMBLIES THAT PROVIDE A FIRE RATING EQUAL TO OR GREATER THAN THAT OF THE CONSTRUCTION BEING PENETRATED, INSTALL FIRESTOP SYSTEM COMPONENTS IN STRICT ACCORDANCE WITH THE UL FIRE RESISTANCE DIRECTORY, THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION AND THE FIRESTOP SYSTEM MANUFACTURERS SPECIFIED REQUIREMENTS.
- C. ONLY TESTED FIRESTOP SYSTEMS BY "3M", "HILTI", OR APPROVED EQUAL SHALL BE USED. REFER TO ARCHITECTURAL DRAWINGS FOR ASSEMBLY RATING.

- A. PROVIDE SEISMIC RESTRAINT FOR ELECTRICAL WORK AND SYSTEMS AND EQUIPMENT IN STRICT ACCORDANCE WITH THE APPLICABLE BUILDING CODE AND THE REQUIREMENTS OF THE AUTHORITY HAVING
- B. SUBMIT ALL SEISMIC DETAILS TO THE AUTHORITY HAVING JURISDICTION FOR REVIEW AND APPROVAL AS REQUIRED BY THE AUTHORITY HAVING JURISDICTION. PROVIDE ENGINEEERED SEISMIC-RESTRAINT DRAWINGS THAT ARE SIGNED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE IN WHICH THE PROJECT IS BEING CONSTRUCTED.
- C. SUBMIT COPIES OF ALL DETAILS, CALCULATIONS AND DOCUMENTATION AS REQUIRED BY THE AUTHORITY HAVING JURISDICTION TO THE ARCHITECT/ENGINEER AND TO THE AUTHORITY HAVING JURISDICTION FOR REVIEW AND APPROVAL.

A. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR THE HOISTING OF ALL MATERIALS AND EQUIPMENT FURNISHED OR INSTALLED UNDER THIS SECTION OF THE SPECIFICATIONS, IN ACCORDANCE WITH ALL CITY, STATE AND FEDERAL RULES AND REGULATIONS.

ACOUSTICS AND VIBRATION

A. ALL ITEMS WHICH ARE A SOURCE OF NOISE GENERATION AND/OR MECHANICAL VIBRATION SHALL BE INSTALLED WITH PROPER ATTENUATION PROVISIONS INCLUDING ABSORBERS, ISOLATORS, OR MUFFLERS AS REQUIRED TO PREVENT OBJECTIONABLE NOISES AND VIBRATIONS.

EXCAVATION AND BACKFILLING

- A. PROVIDE ALL EXCAVATION REQUIRED FOR INSTALLATION OF THE ELECTRICAL WORK AS SHOWN ON THE DRAWINGS AND AS SPECIFIED HEREIN. EXCESS EXCAVATION BELOW THE REQUIRED LEVEL SHALL BE BACKFILLED WITH CLEAN EARTH AND THOROUGHLY TAMPED.
- B. ELECTRICAL WORK INSTALLED WITHIN EXCAVATIONS SHALL BE INSPECTED AND APPROVED BY THE PROPER INSPECTION AUTHORITY BEFORE BACKFILLING.

CUTTING & PATCHING

- A. CORE-DRILL OR SAW-CUT FLOORS, WALLS, ROOF, ETC., AS REQUIRED FOR THE INSTALLATION OF THE ELECTRICAL WORK. STRUCTURAL COMPONENTS, INCLUDING BUT NOT NECESSARILY LIMITED TO, COLUMNS, BEAMS, GIRDIRS, PLATES OR JOISTS SHALL NOT BE CUT.
- B. PRIOR TO PERFORMING ANY CUTTING OPERATIONS, PERFORM NON-DESTRUCTIVE TESTING TO VERIFY THE LOCATION OF HIDDEN STRUCTURAL COMPONENTS, CONDUITS OR PIPING. NOTIFY THE ARCHITECT/ENGINEER OF ANY IMPEDIMENTS AND OR DISCREPANCIES THAT ARE DISCOVERED DURING THE NON-DESTRUCTIVE
- C. PATCH SURROUNDING AREAS FLUSH WITH ADJACENT SURFACES AND PREPARE TO RECEIVE SPECIFIED FINISHES. PATCH AND REPAIR ROOF TO MATCH EXISTING ROOFING SYSTEM. ALL ROOF WORK SHALL BE PERFORMED TO MEET THE WARRANTY REQUIREMENTS OF THE EXISTING ROOFING SYSTEM. WORK SHALL BE PERFORMED BY TECHNICIANSSERTIFIED BY THE MANUFACTURER OF THE EXISTING OR NEW ROOFING SYSTEM, AS APPLICABLE
- D. COORDINATE REQUIRED OPENINGS AND PENETRATIONS WITH THE GENERAL CONTRACTOR AND THE OTHER TRADES.

GROUNDING

- A. PROVIDE ELECTRICAL SERVICE, SYSTEM AND EQUIPMENT GROUNDING IN ACCORDANCE WITH APPLICABLE
- NEC REQUIREMENTS. REFER TO GROUNDING DETAIL ON DRAWINGS FOR ADDITIONAL INFORMATION. B. THE EQUIPMENT GROUNDING SYSTEM SHALL CONSIST OF A CONTINUOUS CONDUIT INSTALLATION AND A GREEN INSULATED EQUIPMENT GROUNDING CONDUCTOR.
- C. PROVIDE A GREEN INSULATED EQUIPMENT GROUNDING CONDUCTOR IN ALL CONDUITS CONTAINING FEEDERS AND BRANCH CIRCUITS

D. EQUIPMENT GROUNDING SHALL USE ONLY APPROVED GROUNDING CLAMPS AND CONNECTORS, AS

- MANUFACTURED BY PENN-UNION, BURNDY, OR O-Z/GEDNEY. E. PROVIDE A #6 AWG GREEN INSULATED GROUNDING CONDUCTOR FROM THE GROUND BAR AT TELEPHONE
- TERMINAL BOARD TO THE ELECTRICAL SERVICE GROUND. F. PROVIDE A COPPER GROUNDING BAR AT THE TELEPHONE TERMINAL BACKBOARD. GROUNDING BAR SHALL BE 1/4 INCH X 4 INCHES X 12 INCHES, PRE-DRILLED FOR CONDUCTOR TERMINATIONS, WITH NON-METALLIC

STAND-OFF BRACKETS WITH INSULATORS. CHATSWORTH PRODUCTS 10622-012 OR APPROVED EQUAL.

EQUIPMENT INSTALLATION

- A. INSTALL ALL EQUIPMENT AND MATERIALS IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTALLATION AND OPERATIONS MANUAL, IN ACCORDANCE WITH INDUSTRY STANDARDS AND IN STRICT ACCORDANCE WITH ALL APPLIVABLE LOCAL CODES AND REGULATIONS.
- B. PROVIDE ALL MOTORIZED EQUIPMENT WITH VIBRATION ISOLATION MOUNTING AND FLEXIBLE POWER CONNECTIONS.
- C. ALL EQUIPMENT MOUNTED FROM BOLTED CONNECTIONS SHALL HAVE DOUBLE NUTS AT ATTACHMENT TO STRUCTURE AND HANGER, NO EXCEPTIONS.

EQUIPMENT IDENTIFICATION

DIRECTORIES ARE NOT ACCEPTABLE.

- A. PROVIDE EQUIPMENT LABELS ON PANELBOARDS, DISCONNECTS, TRANSFORMERS, CONTROLS, ETC. THAT COMPLIES WITH THE REQUIREMENTS OF NEC ARTICLE 408.4. EQUIPMENT LABELS SHALL BE ENGRAVED PHENOLIC RESIN NAMEPLATES ATTACHED TO CABINET OR ENCLOSURE WITH MECHANICAL FASTENERS. SELF-ADHESIVE NAMEPLATES ARE NOT ACCEPTABLE. LETTERING SHALL BE 1/2" HIGH, BLACK TEXT ON WHITE BACKGROUND.
- B. PROVIDE CIRCUIT DIRECTORIES WITHIN PANELS THAT COMPLY WITH THE REQUIREMENTS OF NEC ARTICLE
- C. UTILIZE FINAL, OWNER ASSIGNED ROOM NAMES AND NUMBERS TO IDENTIFY SPACES WITHIN THE CIRCUIT DIRECTORIES. D. CIRCUIT DIRECTORY SHALL BE TYPEWRITTEN OR COMPUTER GENERATED. HANDWRITTEN CIRCUIT
- E. THE COVERS OF ALL OUTLET AND JUNCTION BOXES INSTALLED ABOVE CEILINGS AND INSTALLED EXPOSED IN UNFINISHED SPACES SHALL BE LABELED TO IDENTIFY THE SERVING PANEL, VOLTAGE, PHASE AND CIRCUIT NUMBERS CONTAINED WITHIN THE BOX. LABEL SHALL BE LEGIBLY HANDWRITTEN WITH BLACK, FELT TIP PERMANENT MARKER.
- F. THE COVER PLATES OF ALL WIRING DEVICES SHALL BE LABELED TO IDENTIFY THE SERVING PANEL AND THE CIRCUITS SERVING THE DEVICE. LABELS SHALL BE MACHINE PRINTED, BLACK TEXT ON A CLEAR, SELF ADHESIVE
- G. ENGRAVED NAMEPLATES INSTALLED ON ELECTRICAL EQUIPMENT ITEMS SHALL BE ENGRAVED TO IDENTIFY THE SERVING PANEL, VOLTAGE, PHASE AND THE IDENTIFICATION TAG OF THE LOAD SERVED.

- A. ALL INTERIOR AND EXTERIOR CONDUIT SHALL BE INSTALLED PARALLEL WITH OR AT RIGHT ANGLES TO WALLS, BEAMS, OR STRUCTURAL ELEMENTS. CONDUIT SHALL BE INSTALLED IN A PATH AS DIRECT AS POSSIBLE. AVOID UNNECESSARY OFFSETS AND MAXIMIZE HEADROOM. B. ALL INTERIOR AND EXTERIOR CONDUITS SHALL BE INSTALLED AND SUPPORTED IN ACCORDANCE WITH NEC
- REQUIREMENTS. C. MINIMUM CONDUIT SIZE SHALL BE 3/4" TRADE SIZE. SWITCH LEGS SHALL BE 1/2" TRADE SIZE.
- D. WITHIN INTERIOR FINISHED AREAS, ALL CONDUIT SHALL BE INSTALLED CONCEALED WITHIN WALLS AND ABOVE

- E. CONDUIT INSTALLED WITHIN THE INTERIOR OF THE BUILDING SHALL BE GALVANIZED ELECTRICAL METALLIC
- TUBING (EMT). CONDUIT FITTINGS FOR INDOOR EMT CONDUITS SHALL BE CAST METAL, SET SCREW TYPE. F. EMT SHALL BE USED FOR INTERIOR FEEDERS AND BRANCH CIRCUITS INSTALLED CONCEALED ABOVE
- CEILINGS, CONCEALED WITHIN INTERIOR PARTITIONS AND WHEN INSTALLED EXPOSED IN UNFINISHED SPACES. G. CONDUITS INSTALLED EXPOSED ON THE EXTERIOR OF THE BUILDING SHALL BE GALVANIZED RIGID STEEL. FITTINGS SHALL BE THREADED TYPE.
- H. CONDUITS INSTALLED UNDER SLAB ON GRADE CONSTRUCTION SHALL BE RIGID NON-METALLIC (RNC), SCHEDULE 40 PVC. RNC SHALL COMPLY WITH NEMA TC 2 AND UL 651 UNLESS OTHERWISE INDICATED. FITTINGS FOR RIGID NON-METALLIC CONDUIT SHALL COMPLY WITH NEMA TC 3; MATCH TO CONDUIT TYPE AND MATERIAL. PROVIDE GALAVNIZED RIGID STEEL ELBOWS WHERE SCHEDULE 40 PVC CONDUITS TURN UP FROM BELOW FLOOR SLAB AND EXTEND UP TO ABOVE THE FLOOR SLAB.
- I. CONDUITS INSTALLED DIRECT BURIED WITHIN GRADE SHALL BE RIGID NON-METALLIC (RNC), SCHEDULE 40 PVC. CONDUITS INSTALLED UNDER VEHICULAR DRIVES SHALL BE (RNC), SCHEDULE 80. RNC SHALL COMPLY WITH NEMA TC 2 AND UL 651 UNLESS OTHERWISE INDICATED. FITTINGS FOR RIGID NON-METALLIC CONDUIT SHALL COMPLY WITH NEMA TC 3: MATCH TO CONDUIT TYPE AND MATERIAL. PROVIDE GALAVNIZED RIGID STEEL ELBOWS WHERE PVC CONDUITS TURN UP FROM BELOW FLOOR SLAB AND EXTEND UP TO ABOVE THE
- J. CONDUIT BENDS FOR INTERIOR POWER AND LIGHTING CIRCUITS SHALL NOT BE LESS THAN STANDARD RADIUS
- K. CONDUIT BENDS FOR FEEDERS, TELEPHONE, DATA AND COMMUNICATION WIRING SYSTEMS SHALL NOT BE LESS THAN INDUSTRY STANDARD LONG RADIUS BENDS.
- PROVIDE CONDUIT EXPANSION FITTINGS IN ALL CONDUIT RUNS THAT EXTEND ACROSS BUILDING EXPANSION JOINTS AND WHERE MOVEMENT MAY BE ENCOUNTERED.
- M. CONDUIT SHALL BE SUPPORTED FROM STRUCTURE ONLY. N. CONDUIT SHALL BE INSTALLED AS TO BE ACCESSIBLE FOR REPLACEMENT AND MAINTENANCE.
- O. SCHEDULE 40 PVC CONDUIT SHALL ONLY BE USED BELOW GRADE. P. EXPOSED METALLIC CONDUITS THAT REQUIRE PAINTING SHALL BE PAINTED BY THE GENERAL CONTRACTOR.
- Q. ALL PENETRATIONS REQUIRED THROUGH NEW FLOORS AND MASONRY WALLS SHALL BE CORE DRILLED. R. PROVIDE FLEXIBLE METAL CONDUIT FOR CONNECTIONS TO VIBRATING EQUIPMENT. MAXIMUM CONDUIT
- LENGTH SHALL BE 36 INCHES. S. PROVIDE LIQUID-TIGHT FLEXIBLE METAL CONDUIT FOR CONNECTIONS TO VIBRATING EQUIPMENT IN WET OR
- OUTDOOR LOCATIONS. MAXIMUM CONDUIT LENGTH SHALL BE 36 INCHES. T. PROVIDE FLEXIBLE METAL CONDUIT FOR FINAL CONNECTIONS TO RECESSES LIGHT FIXTURES (FIXTURE WHIPS). MAXIMUM CONDUIT LENGTH SHALL BE 72 INCHES.
- U. ALL UNDERGROUND CONDUITS INSTALLED BEYOND THE BUILDING OUTLINE SHALL HAVE A WARNING TAPE INSTALLED WITHIN THE TRENCH. TAPE SHALL IDENTIFY THE TYPE OF SERVICE WITHIN THE TRENCH. V. ACCEPTABLE MANUFACTURERS FOR GALVANIZED RIGID CONDUIT. EMT. FLEXIBLE METAL CONDUITS AND
- LIQUID-TIGHT FLEXIBLE METAL CONDUITS SHALL BE ALLIED, REPUBLIC, WHEATLAND, ELECTRI-FLEX AND ANACONDA. W. ACCEPTABLE MANUFACTURERS FOR METAL CONDUIT FITTINGS SHALL BE THOMAS AND BETTS OR APPROVED
- X. ACCEPTABLE MANUFACTURERS FOR RIGID NON-METALLIC CONDUIT AND ASSOCIATED FITTINGS AND ACCESSORIES: CARLON, CERTAINTEED, CANTEX OR APPROVED EQUAL.

CONDUCTORS

- A. ALL CONDUCTORS SHALL BE SOFT DRAWN, ANNEALED COPPER, #12 AWG MINIMUM.
- B. CONDUCTORS #12 AND #10 AWG SHALL BE SOLID; #8 AWG AND LARGER SHALL BE STRANDED. C. THE USE OF ALUMINUM CONDUCTORS IS NOT ACCEPTABLE.
- D. SECONDARY SERVICE ENTRANCE: TYPE THHN/THWN, SINGLE CONDUCTORS IN CONDUIT.
- E. EXTERIOR FEEDERS: TYPE THHN/THWN, SINGLE CONDUCTORS IN CONDUIT. F. CONDUCTORS FROM POWER DISTRIBUTION EQUIPMENT TO LINE SIDE OF VFD: TYPE THHN/THWN, SINGLE
- CONDUCTORS IN CONDUIT G. CONDUCTORS FROM LOAD SIDE OF VFD TO ELECTRICAL CONNECTION POINT ON MOTOR - VFD MOTOR CABLE AS MANUFACTURED BY BELDEN.
- H. EXPOSED, INTERIOR FEEDERS: TYPE THHN/THWN, SINGLE CONDUCTORS IN CONDUIT. I. FEEDERS INSTALLED CONCEALED IN CEILINGS, WALLS, PARTITIONS: TYPE THHN-THWN, SINGLE CONDUCTORS
- J. FEEDERS INSTALLED CONCEALED IN CONCRETE, BELOW SLABS-ON-GRADE AND UNDERGROUND: TYPE THHN/THWN, SINGLE CONDUCTORS IN SCHEDULE 40 PVC CONDUIT.
- K. EXPOSED, INTERIOR, BRANCH CIRCUITS: TYPE THHN/THWN, SINGLE CONDUCTORS IN CONDUIT. L. BRANCH CIRCUITS CONCEALED IN NEW CEILINGS, WALLS, AND PARTITIONS: TYPE THHN/THWN, SINGLE
- CONDUCTORS IN CONDUIT. M. BRANCH CIRCUITS CONCEALED BELOW SLABS-ON-GRADE, AND UNDERGROUND: TYPE THHN/THWN, SINGLE
- N. CONTINUITY: ALL CONDUCTORS SHALL BE CONTINUOUS FROM OUTLET TO OUTLET. O. ACCEPTABLE MANUFACTURERS FOR CONDUCTORS: GENERAL CABLE COMPANY, CAROL, ANACONDA, ROME,
- SOUTHWIRE. CLASS 1 CONTROL CIRCUITS: TYPE THHN/THWN, IN CONDUIT.
- Q. CLASS 2 CONTROL CIRCUITS: POWER-LIMITED PLENUM RATED CABLE, CONCEALED IN BUILDING FINISHES.
- R. THE USE OF NON-METALLIC-SHEATHED CABLE, TYPE NM IS NOT ACCEPTABLE. S. THE USE OF MC CABLE IS APPROVED FOR USE ONLY WHERE ACCEPTABLE TO THE AUTHORITY HAVING JURISDICTION. ALL CONDUCTORS WITHIN MC CABLE SHALL BE COPPER, #12 AWG MINIMUM. ALL MC CABLE SHALL BE PROVIDED WITH AN INSULATED EQUIPMENT GROUND CONDUCTOR. EVEN WHEN ITS USE IS PERMITTED BY THE AUTHORITY HAVING JURISDICTION, METAL CLAD CABLE IS NOT ACCEPTABLE FOR BRANCH CIRCUIT HOME RUNS TO
- PANELBOARDS AND DEDICATED BRANCH CIRCUITS. T. WIRE CONNECTORS SHALL BE EQUAL TO SCOTCH LOCK FOR #8 AWG AND SMALLER, THOMAS AND BETTS
- LOCK-TITE FOR #6 AND LARGER. U. PROVIDE #10 AWG CONDUCTORS FOR BRANCH CIRCUITS HAVING A CONDUCTOR LENGTH LONGER THAN 75
- V. ACCEPTABLE MANUFACTURERS FOR CONDUCTORS AND MC CABLE: GENERAL CABLE COMPANY, CAROL, ANACONDA, ROME, SOUTHWIRE OR APPROVED EQUAL.

CONDUCTOR COLOR CODING

- A. PROVIDE COLOR CODING SYSTEM AS LISTED BELOW FOR ALL FEEDERS AND BRANCH CIRCUITS AND USED AS A BASIS FOR BALANCING LOAD ON PANELS.
- B. COLOR CODING FOR CONDUCTOR #12 AWG THROUGH #6 AWG SHALL CONSIST OF COLOR CODED THERMOPLASTIC INSULATION OF THE COLORS SPECIFIED HEREIN. C. COLOR CODING FOR CONDUCTORS #8 AWG AND LARGER SHALL BE FIELD APPLIED SELF ADHESIVE TAPE OF THE COLOR SPECIFIED HEREIN FOR THE PARTICULAR PHASE. THE LAST TWO WRAPS AROUND THE CONDUCTORS
- SHALL BE INSTALLED WITHOUT TENSION TO PREVENT UNWRAPPING. D. 120/240V: PHASE A--BLACK, PHASE B--RED, NEUTRAL--WHITE, EQUIPMENT GROUND--GREEN

UL 514A.

- **BOXES AND FITTINGS** A. ALL OUTLET BOXES AND JUNCTION BOXES SHALL BE UL LISTED AND LABELED FOR USE IN SPACE THEY OCCUPY AND THE PURPOSE THEY SERVE.
- B. SHEET METAL OUTLET AND DEVICE BOXES FOR DRY, INTERIOR APPLICATIONS: COMPLY WITH NEMA OS 1 AND
 - IN "CAST-METAL OUTLET AND DEVICE BOXES" PARAGRAPH BELOW, ALUMINUM BOXES ARE SUITABLE FOR USE WITH STEEL RACEWAYS IN MOST ENVIRONMENTS. TYPE FD IS A DEVICE BOX WITH EXTRA DEPTH. MANY OTHER CONFIGURATIONS ARE AVAILABLE.
- C. CAST-METAL OUTLET AND DEVICE BOXES FOR EXTERIOR APPLICATIONS: COMPLY WITH NEMA FB 1, FERROUS ALLOY, TYPE FS OR FD, WITH GASKETED COVER.
- D. OUTLET BOXES INSTALLED WITHIN FIRE RATED ASSEMBLIES SHALL HAVE A FIRE RATING EQUAL TO OR GREATER THAN THE RATING OF THE WALL IN WHICH IT IS INSTALLED. E. WHEN INSTALLING OUTLET BOXES IN FIRE RATED ASSEMBLIES, NO TWO OUTLET BOXES SHALL BE INSTALLED IN THE SAME CAVITY BETWEEN WALL STUDS. THIS INCLUDES THE OUTLETS ON THE OTHER SIDE OF THE WALL. ALL

BOXES SHALL HAVE MORE THAN 24 INCHES OF HORIZONTAL SPACING BETWEEN OUTLETS ON EITHER SIDE OF THE

FIRE RATED WALL. WITHIN FIRE RATED ASSEMBLIES HAVING STUDS AT 24" OC. OUTLETBOXES SHALL BE PLACED AT

- LEAST ONE STUD CAVITY AWAY (BOTH SIDES OF WALL). WITHIN FIRE RATED ASSEMBLIES HAVING STUDS AT 16", OUTLET BOXES SHALL BE PLACED APPROXIMATELY TWO STUD CAVITIES AWAY (BOTH SIDES OF WALL). F. OUTLET BOXES SHALL BE 4 INCHES SQUARE BY 2 1/8 INCHES DEEP, EXCEPT FOR 2" PARTITIONS SHALL BE AT
- LEAST 1-1/2" DEEP. G. OUTLET BOXES FOR VOICE AND DATA DEVICES SHALL BE 4 11/16 INCHES SQUARE BY 2 1/8 INCHES DEEP. H. OUTLET BOXES FOR FIRE ALARM SYSTEM DEVICES SHALL BE AS REQUIRED BY THE DEVICE TO BE INSTALLED. COORDINATE BOX REQUIREMENTS FOR FIRE ALARM SYSTEM DEVICES WITH FOR FIRE ALARM SYSTEM
- I. ALL PULLBOXES SHALL BE CONSTRUCTED OF GALVANIZED STEEL, OF METAL GAUGE AND PHYSICAL SIZE AS REQUIRED BY THE N.E.C. FOR THE NUMBER AND SIZE OF CONDUITS AND CONDUCTORS ASSOCIATED WITH THE J. FIXTURE OUTLET BOXES IN/OR ON CEILINGS SHALL NOT BE LESS THAN 1-1/2" DEEP OR LESS THAN 4" SQUARE.

ALL OUTLET BOXES INTENDED TO SUPPORT FIXTURES SHALL BE EQUIPPED WITH 3/8" FIXTURE STUDS FASTENED

THROUGH THE BOTTOM OF THE BOX WITH FOUR BOLTS. K. ACCEPTABLE MANUFACTURERS FOR BOXES: APPLETON, STEEL CITY, RACO OR APPROVED EQUAL.

PANELBOARDS

VENDOR/INSTALLER.

- A. PANELBOARDS SHALL BE LIGHTING AND APPLIANCE TYPE, DEAD FRONT, SAFETY TYPE, FURNISHED WITH BRANCH CIRCUIT BREAKER OVERCURRENT PROTECTIVE DEVICES, COPPER PHASE, NEUTRAL AND EQUIPMENT GROUNDING BUS BARS. MAIN CIRCUIT BREAKER OR MAIN LUG ONLY AS NOTED ON THE DRAWINGS. MAIN BUSES AND CONNECTORS SHALL BE HARD DRAWN COPPER OF 98% CONDUCTIVITY, WITH CURRENT CARRYING CAPACITY TO MAINTAIN ESTABLISHED RISE TESTS AS DEFINED IN UL STANDARD UL 67.
- B. LOAD CENTERS ARE NOT ACCEPTABLE FOR USE.
- A. CIRCUIT BREAKERS SHALL BE MOLDED CASE, BOLT-ON TYPE SUITABLE FOR VOLTAGE AND AMPERE RATINGS INDICATED ON DRAWINGS AND IN PANEL SCHEDULES. REFER TO THE PANEL SCHEDULES ON THE DRAWINGS FOR ADDITIONAL ACCESSORIES TO BE PROVIDED AT SELECT CIRCUIT BREAKERS.
- 3. CIRCUIT BREAKERS SHALL HAVE A MINIMUM AMPERE INTERRUPTING CAPACITY (AIC) OF 22,000 AMPERES FOR
- C. WHERE THE POWER SYSTEM STUDY IDENTIFIES AVAILABLE FAULT CURRENT VALUES AT NEW PANELS THAT ARE HIGHER THAN THE MINIMUM AIC RATINGS SPECIFIED HEREIN, PROVIDE CIRCUIT BREAKERS IN THE PANELS THAT HAVE AIC RATINGS GREATER THAN THE AVAILABLE FAULT CURRENT AT THE PANEL AS DETERMINED BY THE POWER SYSTEM STUDY
- D. CABINETS SHALL BE 20" WIDE BY 6" DEEP UNLESS OTHERWISE NOTED, FLUSH OR SURFACE MOUNTED AS IDENTIFIED IN THE PANEL SCHEDULES ON THE DRAWINGS. E. PROVIDE NEMA 1 ENCLOSURES FOR INTERIOR PANELS. PROVIDE NEMA 3R ENCLOSURES FOR EXTERIOR
- F. PANELBOARDS SHALL BE EQUIPPED WITH FLUSH TYPE LOCK AND CATCH. ALL LOCKS SHALL BE KEYED ALIKE,
- WITH TWO KEYS SUPPLIED WITH EACH LOCK. G. CIRCUIT BREAKERS SERVING LIGHTING CIRCUITS SHALL BE RATED FOR SWITCH DUTY.
- H. CIRCUIT BREAKERS SERVING HVAC EQUIPMENT SHALL BE HACR RATED.
- I. ALL LUGS SHALL BE OF THE SOLDERLESS TYPE AND RATED AT A MINIMUM OF 75°C. J. PROVIDE CIRCUIT DIRECTORY BEHIND CLEAR PLASTIC COVER ON INSIDE OF THE DOOR. DIRECTORY SHALL BE TYPEWRITTEN OR COMPUTER GENERATED. HANDWRITTEN CIRCUIT DIRECTORIES ARE NOT ACCEPTABLE. CIRCUIT
- LABELING WITHIN DIRECTORIES SHALL COMPLY WITH THE REQUIREMENTS OF NEC 408.4. K. PANEL CIRCUITS SHALL BE CONFIGURED SUCH THAT THE LOAD IS DISTRUBUTED EVENLY ACROSS ALL PHASES TO WITHIN 10% IN ACCORDANCE WITH NEC REQUIREMENTS. L. ALL NEW PANELBOARDS SHALL BE LABELED TO IDENTIFY THE AMOUNT OF FAULT CURRENT AVAILABLE AT THE
- PANEL AS DETERMINED BY THE POWER SYSTEM STUDY TO BE PERFORMED. LABEL SHALL BE MACHINE PRINTED, BLACK TEXT ON WHITE, SELF ADHESIVE TAPE. INSTALL LABEL ADJACENT TO PANELS ENGRAVED NAMEPLATE. M. ALL NEW PANELBOARDS SHALL BE LABELED TO IDENTIFY THE ARC FLASH HAZARD CHARACTERISTICS AT THE PANEL AS DETERMINED BY THE POWER SYSTEM STUDY TO BE PERFORMED.
- N. ALL "SPARE" CIRCUIT BREAKERS SHALL BE SET TO THE "OFF" POSITION. O. ACCEPTABLE MANUFACTURERS FOR PANELBOARDS: SQUARE D (SCHNEIDER), ABB (GENERAL ELECTRIC), SIEMENS OR EATON.

SWITCHES

- A. TOGGLE SWITCHES SHALL BE SINGLE POLE, 3-WAY OR 4-WAY AS NOTED ON THE DRAWINGS, 20 AMPERES, 120/277 VOLT AC TYPE, SPECIFICATION GRADE WITH SCREW TERMINALS. HUBBELL 1221-X, 1223-X OR 1224-X OR APPROVED EQUIVALENT BY ONE OF THE ADDITIONAL MANUFACTURERS SPECIFIED HEREIN.
- B. TOGGLE SWITCHES SHALL BE MOUNTED AT DOORS, INSTALLED ADJACENT TO THE TRIM ON THE STRIKING SIDE OF THE DOOR, REGARDLESS OF THE LOCATION INDICATED ON THE DRAWINGS. VERIFY ALL DOOR SWINGS PRIOR TO INSTALLATION OF OUTLET BOXES FOR SWITCHES.
- C. DEVICE COLOR SHALL BE AS SELECTED BY THE OWNER/ARCHITECT. D. ADDITIONAL ACCEPTABLE MANUFACTURERS FOR SWITCHES: LEGRAND, LEVITON OR APPROVED EQUAL.

- A. RECEPTACLES SHALL BE 20 AMP, 125 VOLT, 2-POLE, 3-WIRE, SPECIFICATION GRADE, GROUNDING TYPE, NEMA 5-20R WITH SCREW TERMINALS. HUBBELL 5362-W OR APPROVED EQUAL BY ONE OF THE ADDITIONAL MANUFACTURERS SPECIFIED HEREIN.
- CAPABLE OF PROTECTING DOWNSTREAM RECEPTACLES ON A SINGLE CIRCUIT, SOLID STATE GROUND FAULT SENSING AND SIGNALING, 5 MILLIAMP TRIP LEVEL, NEMA 5-20R WITH SCREW TERMINALS. HUBBELL GF5362-X OR APPROVED EQUAL BY ONE OF THE ADDITIONAL MANUFACTURERS SPECIFIED HEREIN. C. ISOLATED GROUND RECEPTACLES SHALL BE ORANGE, 20 AMP, 125 VOLT, 2-POLE, 3-WIRE, GROUNDING TYPE,

B. GFI RECEPTACLES SHALL BE 20 AMP, 125 VOLT, 2-POLE, 3-WIRE, GROUNDING TYPE, FEED THROUGH TYPE

- NEMA 5-20R WITH SCREW TERMINALS. HUBBELL IG-5362-W OR APPREOVED EQUAL BY ONE OF THE ADDITIONAL MANUFACTURERS SPECIFIED HEREIN. D. PROVIDE SPECIAL PURPOSE RECEPTACLES HAVING NEMA CONFIGURATIONS THAT MATE AND MATCH THE
- NEMA PLUG CONFIGURATION PROVIDED WITH THE EQUIPMENT TO BE CONNECTED. E. COVER PLATES FOR EXTERIOR RECEPTACLES SHALL BE RATED FOR "WEATHERPROOF WHILE IN USE".
- F. DEVICE COLOR SHALL BE AS SELECTED BY THE OWNER/ARCHITECT. G. ADDITIONAL ACCEPTABLE MANUFACTURERS FOR SWITCHES AND RECEPTACLES: LEGRAND, LEVITON OR

- COVER PLATES FOR TOGGLE SWITCHES AND RECEPTACLES
- A. COVER PLATES SHALL BE NYLON, OF CONFIGURATION TO MATCH THE WIRING DEVICE. B. CONFIGURATION AND COLOR OF COVER PLATE SHALL MATCH THAT OF THE WIRNG DEVICE THAT THE PLATE WILL BE INSTALLED ON.
- C. COVER PLATE COLOR SHALL BE AS SELECTED BY THE OWNER/ARCHITECT. D. ADDITIONAL ACCEPTABLE MANUFACTURERS FOR COVER PLATES: LEGRAND, LEVITON OR APPROVED EQUAL.
- MOUNTING HEIGHTS FOR ELECTRICAL DEVICES AND EQUIPMENT A. DEVICES AND EQUIPMENT SHALL BE INSTALLED AT THE MOUNTING HEIGHTS NOTED BELOW UNLESS NOTED
- OTHERWISE ON THE DRAWINGS OR REQUIRED BY APPLICABLE CODES AND STANDARDS: SEE EDITING INSTRUCTION NO.2 IN THE EVALUATIONS FOR DISCUSSION OF OPTIONAL

1. TOGGLE SWITCHES, WALL SWITCH OCCUPANCY SENSORS AND DIMMERS FOR LIGHTING CONTROL - TOP OF

- DEVICE 48" AFF 2. CONVENIENCE RECEPTACLES -TOP OF DEVICE 18" AFF
- 3. CONVENIENCE RECEPTACLES AT COUNTERTOPS BOTTOM OF DEVICE 44" AFF OR AS NOTED ON THE 4. TELEPHONE AND DATA OUTLETS - TOP OF DEVICE 18" AFF OR AS REQUIRED BY THE ADJACENT CASEWORK

5. DISCONNECT SWITCHES - TOP OF ENCLOSURE MAXIMUM 66" AFF 6. PANELBOARDS - TOP OF ENCLOSURE MAXIMUM 72" AFF

- SURFACE METAL RACEWAY A. SURFACE METAL RACEWAY SHALL BE TWO PIECE #2100 AS MANUFACTURED BY WIREMOLD.
- B. PROVIDE ALL MANUFACTURERS STANDARD COMPONENTS AND ACCESSORIES REQUIRED TO ACCOMMODATE
- THE CONFIGURATION SHOWN. C. RECEPTACLES SHALL BE 120 VAC, 23 AMPS.

TERMINATION OF THE EQUIPMENT GROUNDING CONDUCTOR.

- DISCONNECT SWITCHES A. PROVIDE DISCONNECT SWITCHES AS SHOWN ON THE DRAWINGS AND AS REQUIRED BY APPLICABLE CODES. B. DISCONNECT SWITCHES SHALL BE HEAVY DUTY TYPE, UL LISTED AND LABELED, EQUIPPED WITH A LUG FOR
- C. DISCONNECT SWITCHES SHALL HAVE NEMA 1 ENCLOSURES FOR DRY, INDOOR APPLICATIONS; NEMA 3R ENCLOSURES FOR OUTDOOR OR WET LOCATION APPLICATIONS. D. PROVIDE FUSIBLE OR NON-FUSIBLE SWITCHES AS NOTED ON THE DRAWINGS AND AS REQUIRED BY THE EQUIPMENT BEING SERVED BY THE SWITCH.
- E. ALL DISCONNECT SWITCHES SHALL BE EQUIPPED WITH AN ENGRAVED NAMEPLATE TO IDENTIFY THE SOURCE PANEL, CIRCUIT NUMBERS AND THE LOAD SERVED BY THE SWITCH. F. ACCEPTABLE MANUFACTURERS FOR DISCONNECT SWITCHES: SQUARE D (SCHNEIDER), ABB (GENERAL

ELECTRIC), SIEMENS OR EATON.

- MOTOR CONTROLLERS A. PROVIDE ENCLOSED MOTOR CONTROLLERS AS SPECIFIED HEREIN FOR CONTROL OF MOTORS RATED FOR 600 VOLTS AND LESS.
- B. ALL MOTOR CONTROLLERS SHALL BE EQUIPPED WITH AN ENGRAVED NAMEPLATE TO IDENTIFY THE SOURCE PANEL, CIRCUIT NUMBERS AND THE LOAD SERVED BY THE CONTROLLER. C. COORDINATE LAYOUT AND INSTALLATION OF ENCLOSED CONTROLLERS WITH OTHER CONSTRUCTION INCLUDING CONDUIT, PIPING, EQUIPMENT, AND ADJACENT SURFACES. MAINTAIN REQUIRED WORKSPACE

CLEARANCES AND REQUIRED CLEARANCES FOR EQUIPMENT ACCESS DOORS AND PANELS.

E. FRACTIONAL HORSEPOWER MANUAL CONTROLLERS: "QUICK-MAKE, QUICK-BREAK" TOGGLE OR PUSH-BUTTON ACTION; MARKED TO SHOW WHETHER UNIT IS OFF, ON, OR TRIPPED.

GENERAL REQUIREMENTS FOR FULL-VOLTAGE CONTROLLERS: COMPLY WITH NEMA ICS 2, GENERAL PURPOSE,

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ENGINEER

PROJECT NUMBER

21-079

DATE

April 15, 2022 SHEET

ELECTRICAL SPECIFICATIONS

SEE EDITING INSTRUCTION NO.1 IN THE EVALUATIONS FOR CAUTIONS ABOUT NAMING MANUFACTURERS. RETAIN ONE OF FIRST TWO SUBPARAGRAPHS AND LIST OF MANUFACTURERS BELOW. SEE SECTION 016000 "PRODUCT REQUIREMENTS."

1. CONFIGURATION: NON-REVERSING.

SEE EDITING INSTRUCTION NO. 5 AND "OVERLOAD PROTECTION" ARTICLE IN THE EVALUATIONS FOR ADDITIONAL GUIDANCE ON RETAINING OPTIONS IN FIRST SUBPARAGRAPH BELOW. ALTHOUGH CLASS 10 SEEMS TO BE "STANDARD" FOR THIS EQUIPMENT. SOME MANUFACTURERS MAY OFFER OTHERS. RETAIN FIRST OPTION BELOW UNLESS ANOTHER CLASS IS REQUIRED AND

2. OVERLOAD RELAYS: INVERSE-TIME-CURRENT CHARACTERISTICS; NEMA ICS 2, CLASS 10 TRIPPING CHARACTERISTICS; HEATERS MATCHED TO NAMEPLATE FULL-LOAD CURRENT OF ACTUAL PROTECTED MOTOR; EXTERNAL RESET PUSH BUTTON.

> FIRST OPTION IN FIRST SUBPARAGRAPH BELOW IS AVAILABLE ONLY WITH NEMA 250, TYPE 1 ENCLOSURES BUT NOT FROM ALL LISTED MANUFACTURERS. CONSULT MANUFACTURERS FOR AVAILABILITY OF FLUSH ENCLOSURES AND FINISHES FOR FLUSH COVER PLATES BECAUSE EACH MANUFACTURER OFFERS DIFFERENT TYPES.

3. FLUSH MOUNTED WITHIN FINISHED SPACES; SURFACE MOUNTED WITHIN UNFINISHED SPACES.

NOT ALL MANUFACTURERS OFFER A GREEN PILOT LIGHT; PILOT LIGHTS ARE NOT AVAILABLE IN HAZARDOUS AND SOME CAST-TYPE ENCLOSURES.

- 4. RED PILOT LIGHT TO INDICATE MOTOR "RUNNING"...
- 5. ACCEPTABLE MANUFACTURERS: SQUARE D (SCHNEIDER), ABB (GENERAL ELECTRIC), SIEMENS, EATON.
- F. MAGNETIC CONTROLLERS: FULL VOLTAGE, ACROSS THE LINE, ELECTRICALLY HELD.

SEE EDITING INSTRUCTION NO.1 IN THE EVALUATIONS FOR CAUTIONS ABOUT NAMING MANUFACTURERS. RETAIN ONE OF FIRST TWO SUBPARAGRAPHS AND LIST OF MANUFACTURERS BELOW, SEE SECTION 016000 "PRODUCT REQUIREMENTS."

1. CONFIGURATION: NON-REVERSING.

- 2. CONTACTOR COILS: PRESSURE-ENCAPSULATED TYPE.
- a. OPERATING VOLTAGE: DEPENDING ON CONTACTOR NEMA SIZE AND LINE-VOLTAGE RATING. MANUFACTURER'S STANDARD MATCHING CONTROL POWER OR LINE VOLTAGE.
- 3. POWER CONTACTS: TOTALLY ENCLOSED, DOUBLE-BREAK, SILVER-CADMIUM OXIDE; ASSEMBLED TO ALLOW INSPECTION AND REPLACEMENT WITHOUT DISTURBING LINE OR LOAD WIRING.
- 4. CONTROL CIRCUITS: 120 VOLTS AC: OBTAINED FROM INTEGRAL CONTROL POWER TRANSFORMER (CPT). WITH PRIMARY AND SECONDARY FUSES. OF SUFFICIENT CAPACITY TO OPERATE INTEGRAL DEVICES AND REMOTELY LOCATED PILOT, INDICATING, AND CONTROL DEVICES, WITH 20 PERCENT SPARE VA CAPACITY.

RETAIN FIRST SUBPARAGRAPH BELOW IF RETAINING CPT IN LAST SUBPARAGRAPH ABOVE AND SPARE CPT CAPACITY IS REQUIRED. SPARE CAPACITY IS NORMALLY AVAILABLE IN 100-VA INCREMENTS. CONSULT MANUFACTURERS FOR MAXIMUM SPARE CAPACITY AND CPT SIZES AVAILABLE FOR DIFFERENT NEMA AND ENCLOSURE SIZES BECAUSE ADDING SPARE CAPACITY AND AN OVERSIZED CPT MAY REQUIRE USING AN ENLARGED ENCLOSURE.

- 5. TWO (2) N.C. AUXILIARY CONTACTS.
- 6. TWO (2) N.O.AUXILIARY CONTACTS.
- 7. EXTERNAL OVERLOAD RESET PUSH BUTTON.
- 8. ACCEPTABLE MANUFACTURERS: SQUARE D (SCHNEIDER), ABB (GENERAL ELECTRIC), SIEMENS, EATON OR APPROVED EQUAL.

COMBINATION CONTROLLERS ARE MAGNETIC CONTROLLERS COMBINED WITH A DISCONNECTING MEANS, OCPD, OR BOTH. SEE EDITING INSTRUCTION NO. 2 AND "COMBINATION CONTROLLERS"

RELAYS DIFFER FROM THOSE INDICATED IN "MAGNETIC CONTROLLERS" PARAGRAPH ABOVE. G. COMBINATION MAGNETIC CONTROLLER/DISCONNECT SWITCH: FACTORY-ASSEMBLED COMBINATION OF

MAGNETIC CONTROLLER AS SPECIFIED HEREIN AND INTEGRAL FUSIBLE DISCONNECTING MEANS.

SEE EDITING INSTRUCTION NO.1 IN THE EVALUATIONS FOR CAUTIONS ABOUT NAMING MANUFACTURERS. RETAIN ONE OF FIRST TWO SUBPARAGRAPHS AND LIST OF MANUFACTURERS BELOW. SEE SECTION 016000 "PRODUCT REQUIREMENTS."

ARTICLE IN THE EVALUATIONS FOR GUIDANCE ON USING COMBINATION CONTROLLERS AND THE

DIFFERENT TYPES OF DISCONNECTING MEANS AND OCPDS. INDICATE REQUIREMENTS FOR

DISCONNECTING MEANS AND OCPDS ON DRAWINGS. REVISE PARAGRAPH BELOW IF OVERLOAD

DISCONNECTING MEANS AND OCPDS MUST BE CLOSELY COORDINATED WITH CALCULATED SHORT-CIRCUIT CURRENT VALUES AT THE CONTROLLER LOCATIONS BECAUSE THEY ARE DIRECTLY RELATED TO THE SHORT-CIRCUIT WITHSTAND RATINGS OF THEIR COMBINATION CONTROLLERS, ALTHOUGH FUSIBLE SWITCHES (WITH APPROPRIATE FUSES) CAN PROVIDE TYPE 2 CONTROLLER PROTECTION FROM VERY HIGH SHORT-CIRCUIT CURRENTS NOT ALL CIRCUIT BREAKERS OR MCPS CAN. SEE EDITING INSTRUCTION NO. 7 IN THE EVALUATIONS FOR EXPLANATION OF PROTECTION TYPES AND WHEN THEY SHOULD BE CONSIDERED.

1. FUSIBLE DISCONNECTING MEANS:

- a. NEMA KS 1, HEAVY-DUTY, HORSEPOWER-RATED, FUSIBLE SWITCH WITH CLIPS OR BOLT PADS TO ACCOMMODATE CLASS R FUSES.
- b. LOCKABLE HANDLE: ACCEPTS THREE PADLOCKS AND INTERLOCKS WITH COVER IN CLOSED POSITION.
- 2. ACCEPTABLE MANUFACTURERS: SQUARE D (SCHNEIDER), ABB (GENERAL ELECTRIC), SIEMENS, EATON OR APPROVED EQUAL

RETAIN FIRST SUBPARAGRAPH BELOW IF EXTERNAL CONTROL POWER IS USED OR FOR REMOTE INDICATION OF DISCONNECTING MEANS POSITION.

NONFUSIBLE SWITCHES HAVE NO INHERENT SHORT-CIRCUIT OR INTERRUPTING CURRENT RATINGS AND SO MUST BE USED IN SERIES WITH UPSTREAM FUSES OR SPECIFIC TYPES AND RATINGS OF CIRCUIT BREAKERS. SEE "APPLICATION OF SWITCHES AND CIRCUIT BREAKERS"

H. ENCLOSED CONTROLLERS: NEMA ICS 6, TO COMPLY WITH ENVIRONMENTAL CONDITIONS AT INSTALLED LOCATION.

> SEE "ENCLOSURES" ARTICLE IN THE EVALUATIONS FOR DISCUSSION OF ENCLOSURE TYPES. COORDINATE SUBPARAGRAPHS BELOW WITH DRAWINGS BY IDENTIFYING THE DESIGNATED AREAS ON PLANS OR BY INCLUDING THE REQUIRED ENCLOSURE TYPES. ENCLOSURE MATERIALS AND FINISHES MAY BE ADDED TO THE SECTION TEXT, AVAILABILITY OF SOME ENCLOSURE TYPES IS LIMITED BY TYPE OF CONTROLLER; CONSULT MANUFACTURERS FOR AVAILABILITY OF, AND LIMITATIONS ON, OTHER THAN NEMAICS 6. TYPE 1 ENCLOSURES, REDUCED-VOLTAGE SOLID-STATE CONTROLLERS ARE NOT USUALLY AVAILABLE IN OTHER THAN TYPES 1, 3R, AND 12.

1. DRY AND CLEAN INDOOR LOCATIONS: TYPE 1.

ARTICLE IN THE EVALUATIONS.

- 2. OUTDOOR LOCATIONS: TYPE 3R.
- I. CONTROLLER INSTALLATION: INSTALL ENCLOSED CONTROLLERS ON WALLS WITH TOPS AT UNIFORM HEIGHT UNLESS OTHERWISE INDICATED. FOR CONTROLLERS NOT INSTALLED AT WALLS, PROVIDE FIELD FABRICATED FREESTANDING RACKS CONSISTING OF SLOTTED STEEL CHANNEL FRAMING MEMBERS.
- J. INSTALL FUSES IN EACH COMBINATION FUSIBLE-SWITCH ENCLOSED MOTOR CONTROLLER ASSEMBLY.

FUSES

- A. PROVIDE CARTRIDGE FUSES RATED FOR 250 V AC AND LESS FOR USE AS SPECIFIED HEREIN.
- B. CHARACTERISTICS: NEMA FU 1, CURRENT-LIMITING, NON-RENEWABLE CARTRIDGE FUSES WITH VOLTAGE RATINGS CONSISTENT WITH CIRCUIT VOLTAGES.
- AND WITH SYSTEM SHORT-CIRCUIT CURRENT LEVELS. D. EXAMINE UTILIZATION EQUIPMENT NAMEPLATES AND INSTALLATION INSTRUCTIONS. INSTALL FUSES OF SIZES

C. COORDINATE FUSE RATINGS WITH UTILIZATION EQUIPMENT NAMEPLATE LIMITATIONS OF MAXIMUM FUSE SIZE

- AND WITH CHARACTERISTICS APPROPRIATE FOR EACH PIECE OF EQUIPMENT.
- E. CARTRIDGE FUSE APPLICATIONS:

CLASS T FUSES IN "SERVICE ENTRANCE" SUBPARAGRAPH ARE NORMALLY USED IN MAIN SWITCHES AHEAD OF METER BANKS BECAUSE OF THEIR COMPACT SIZE AND EXCELLENT CURRENT-LIMITING CHARACTERISTICS. THEIR CURRENT-LIMITING FEATURE OFTEN ALLOWS USING CIRCUIT BREAKERS WITH 10-KA INTERRUPTING RATING AT TENANT METERS. SEE "CARTRIDGE FUSES" ARTICLE IN THE EVALUATIONS FOR ADDITIONAL GUIDANCE IN MAKING SELECTIONS.

> MULTIPLE FUSE TYPES MIGHT BE SPECIFIED FOR AN APPLICATION FROM THE FOLLOWING TYPES FOR A SINGLE PROJECT, IF MORE THAN ONE CLASS IS SELECTED FOR ANY OF THE FOLLOWING. APPLICATIONS, INDICATE ON THE DRAWINGS WHICH CLASS IS REQUIRED FOR EACH FUSE OF THAT APPLICATION TYPE. CONSIDER USING A CHART TO CLEARLY INDICATE USAGE.

- 1. SERVICE ENTRANCE EQUIPMENT, UP TO AND INCLUDING 600 AMPS: CLASS RK1, BUSSMANN LPN-RK-SP FOR 250 VOLTS.
- 2. SERVICE ENTRANCE EQUIPMENT, 601 TO 6,000 AMPS: CLASS L, BUSSMANN KRP-C-SP FOR 250 VOLTS.
- 3. FEEDERS, UP TO AND INCLUDING 600 AMPS: CLASS RK1, BUSSMANN LPN-RK-SP FOR 250 VOLTS.
- 4. FEEDERS, 601 TO 6,000 AMPS: CLASS L, BUSSMANN KRP-C-SP FOR 250 VOLTS,

5. CONTROL POWER TRANSFORMER (CPT) CIRCUITS: CLASS CC, TIME DELAY, CONTROL TRANSFORMER DUTY. 6. BASIS OF DESIGN FOR FUSES SHALL BE BUSSMANN. ADDITIONAL ACCEPTABLE MANUFACTURERS FOR SPECIFIED FUSES SHALL BE LITTLEFUSE AND MERSEN, OR APPROVED EQUAL.

> If retaining subparagraph below, verify open indication is available in the fuse type or fuse covers included in the Specifications. If indication is desired for some fuse types and not others, include a list of fuses that require indication.

LIGHTING FIXTURES

A. ALL LIGHTING FIXTURES AND LIGHT SOURCES SHALL BE FURNISHED, INSTALLED AND CONNECTED BY THE ELECTRICAL CONTRACTOR, UNLESS NOTED OTHERWISE.

B. THIS CONTRACTOR SHALL INSTALL LIGHTING FIXTURES AND LIGHT SOURCES AS INDICATED ON THE DRAWINGS AND AS SPECIFIED HEREIN. PROVIDE LIGHTING FIXTURES COMPLETE WITH HANGERS, PLASTER FRAMES, AND ALL OTHER NECESSARY ACCESSORIES REQUIRED FOR A COMPLETE AND FUNCTIONAL INSTALLATION.

C. THIS CONTRACTOR SHALL EXAMINE THE LIGHTING FIXTURE SHIPMENT UPON DELIVERY TO VERIFY FIXTURE QUANTITIES AND TO INSPECT SHIPMENT FOR DAMAGE. SHOULD THE LIGHTING FIXTURE SHIPMENT BE INCOMPLETE

OR DAMAGE. CONTRACTOR SHALL NOTIFY THE OWNER. D. AFTER THE LIGHTING FIXTURE SHIPMENT HAS BEEN EXAMINED, VERIFIED AND ACCEPTED, THE CONTRACTOR SHALL TRANSPORT THE LIGHT FIXTURE SHIPMENT TO AN AREA FOR SAFE STORAGE UNTIL FIXTURES ARE READY TO BE INSTALLED. AFTER ACCEPTANCE OF THE LIGHTING FIXTURE DELIVERY. THE CONTRACTOR ASSUMES ALL RESPONSIBILITY FOR THE FIXTURES UNTIL THE PROJECT IS TURNED OVER TO THE OWNER.

E. LED'S SHALL BE COMPLIANT WITH THE RESTRICTION OF HAZARDOUS SUBSTANCES DIRECTIVE (ROHS). F. LUMINAIRES SHALL BE FULLY ACCESSIBLE FROM BELOW CEILING PLANE FOR CHANGING DRIVERS, POWER SUPPLIES, AND ARRAYS.

G. LED DRIVERS SHALL BE SOLID STATE AND ACCEPT 120 THROUGH 277 VAC AT 60 HZ INPUT. H. THE LED LIGHT SOURCE SHALL BE FULLY DIMMABLE WITH USE OF COMPATIBLE DIMMERS SWITCH DESIGNATED FOR LOW VOLTAGE LOADS.

I. THE CONTRACTOR SHALL ENSURE THAT EXTERNAL LIGHTING CONTROL EQUIPMENT IS COMPATIBLE WITH LED CONTROL REQUIREMENTS.

J. PROVIDE CONNECTOR TYPES AND WIRING AS APPROPRIATE FOR UN-INTERRUPTED COMMUNICATION BETWEEN DEVICES, CONSIDERING DISTANCE MAXIMUMS, FIELD OBSTRUCTIONS, AND ACCESSIBILITY. K. ENSURE THAT CONNECTION POINTS ARE OPTICALLY ISOLATED FOR SYSTEM NOISE REDUCTION. FOR CONTROL COMPONENTS THAT ARE PART OF THE OVERALL AREA CONTROL SYSTEM, SEE DIMMING CONTROLS

L. COMPATIBILITY: CERTIFIED BY MANUFACTURER FOR USE WITH INDIVIDUALLY SPECIFIED LUMINAIRE AND INDIVIDUALLY SPECIFIED POWER SUPPLIES AND/OR DRIVERS.

M. SUBMITTALS SHALL INCLUDE FINAL COORDINATION BY THIS CONTRACTOR WITH THE FINAL CEILING AND FINISH SCHEDULES TO INSURE THE PROPER INSTALLATION AND MOUNTING OF FIXTURES. N. RFFFR TO THE LIGHTING FIXTURE SCHEDULE ON THE DRAWINGS FOR FIXTURES TO BE PROVIDED. NO SUBSTITUTIONS PERMITTED FOR THE SPECIFIED LIGHTING FIXTURES.

LIGHTING CONTROLS

SPECIFICATIONS.

- A. TIME SWITCHES, PHOTOCELLS AND CONTACTORS FOR LIGHTING CONTROL SHALL BE AS DETAILED ON
- B. WALL SWITCH OCCUPANCY SENSORS SHALL BE DUAL TECHNOLOGY TYPE WITH MANUAL SWITCH. WATT STOPPER DW-100 OR APPROVED EQUAL.
- C. CEILING MOUNTED OCCUPANCY SENSORS SHALL BE DUAL TECHNOLOGY TYPE WITH POWER PACK. WATT STOPPER DT-300 WITH BZ-200 POWER PACK, OR APPROVED EQUAL.

TELECOMMUNICATIONS SERVICE ENTRANCE

A. PROVIDE A PLYWOOD BACKBOARD FOR TERMINATION OF TELECOMMUNICATION SERVICE AND DISTRIBUTION COMPONENTS.

B. PLYWOOD BACKBOARD SHALL BE 4' X 8' X 3/4", FIRE RATED, PAINTED WITH TWO (2) COATS OF LIGHT GRAY ENAMEL PAINT. MASK FIRE RATED LABEL TO PREVENT THE LABEL FROM BEING PAINTED OVER.

C. PROVIDE A 4" EMPTY CONDUIT WITH PULLSTRING FROM THE PLYWOOD BACKBOARD TO POINT OF SERVICE DELIVERY FROM THE SERVING UTILITY COMPANY. PROVIDE A NYLON BUSHING ON THE END OF CONDUIT WITHIN THE BUILDING FOR CABLE PROTECTION.

D. PROVIDE A COPPER GROUNDING BAR AT THE TELECOMMUNICATION BACKBOARD. GROUNDING BAR SHALL BE 1/4 INCH X 4 INCHES X 12 INCHES, PRE-DRILLED FOR CONDUCTOR TERMINATIONS, WITH NON-METALLIC STAND-OFF BRACKETS WITH INSULATORS. CHATSWORTH PRODUCTS 10622-012 OR APPROVED EQUAL.

E. PROVIDE A #6 AWG GREEN INSULATED GROUNDING CONDUCTOR FROM THE GROUND BAR AT TELECOMMUNICATION BACKBOARD TO THE ELECTRICAL SERVICE GROUND. COMPLY WITH THE REQUIREMENTS OF NEC ARTICLE 800.100.

LIGHTNING PROTECTION SYSTEM

EMERGENCY GENERATOR

AUTOMATIC TRANSFER SWITCH ROUGH IN FOR LOW VOLTAGE SYSTEMS

A. CONTRACTOR SHALL PROVIDE ALL REQUIRED ELECTRICAL ROUGH-IN FOR THE VARIOUS LOW VOLTAGE SYSTEMS TO BE INSTALLED. LOW VOLTAGE SYSTEMS INCLUDE, BUT ARE NOT NECESSARILY LIMITED TO:

1. ALERTING SYSTEM 2. PAGING SYSTEMS AND NOTIFICATION

- 3. VOICE AND DATA SYSTEM
- 4. CABLE TV/SATELLITE TV SYSTEMS 5. BUILDING ACCESS CONTROLS
- 6. VIDEO SURVEILLANCE SYSTEMS
- 7. INTRUSION DETECTION SYSTEMS B. ELECTRICAL ROUGH-IN FOR LOW VOLTAGE SYSTEMS SHALL INCLUDE, BUT SHALL NOT NECESSARILY BE LIMITED TO, OUTLET BOXES WITH DEVICE RINGS, EMPTY CONDUIT WITH PULLSTRINGS, NYLON BUSHINGS ON

C. CONTRACTOR SHALL COORDINATE SCOPE OF WORK, DEVICE LOCATIONS, EQUIPMENT LOCATIONS, ETC. WITH THE GENERAL CONTRACTOR, OWNER'S REPRESENTATIVE AND REPRESENTATIVES OF THE VARIOUS LOW VOLTAGE

THE END OF CONDUIT STUBS FOR CABLE PROTECTION, FIRE RATED SLEEVES THROUGH FIRE RATED

CLEANING

A. IMMEDIATELY PRIOR TO INSPECTION FOR SUBSTANTIAL COMPLETION, REMOVE ANY REMAINING WASTE MATERIALS AND RUBBISH FROM THE PROJECT SITE. REMOVE PROTECTIVE COATING, BARRIERS AND OTHER PROTECTIVE DEVICES, TEMPORARY WORK, AND SURPLUS MATERIALS.

B. LEAVE ELECTRICAL ROOMS AND SIMILAR UNFINISHED SPACES "BROOM CLEAN." DUST ELECTRICAL WORK IN MECHANICAL AND ELECTRICAL ROOMS AND SIMILAR UNFINISHED SPACES. REMOVE CONSTRUCTION DIRT AND DEBRIS FROM INTERIOR OF EQUIPMENT, PANELS, DISCONNECTS, ETC. THOROUGHLY IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS

C. UPON COMPLETION OF THE CONTRACT ALL REMAINING MATERIALS AND RUBBISH SHALL BE REMOVED FROM THE BUILDING AND PREMISES AND THE WORK AREAS SHALL BE LEFT CLEAN AND FREE FROM STAINS, MORTAR, PAINT SPOTS, ETC.

D. UPON COMPLETION OF THE WORK, PUT SYSTEMS INTO SERVICE MAINTAINING RESPONSIBILITY FOR THE EQUIPMENT DURING ALL TESTING OPERATIONS INCLUDING THE LUBRICATING AND TURNING ON AND OFF OF SUCH APPARATUS.

E. CLEAN ALL LIGHT FIXTURES AND TOUCH UP ANY VISIBLE SCRATCHES. REPLACE FIXTURES THAT HAVE BEEN DAMAGED.

TESTING

A. PROVIDE ALL TESTS AS REQUIRED BY THE AUTHORITY HAVING JURISDICTION. B. PROVIDE THE TESTS AS OUTLINED HEREINAFTER AND OTHER TESTS REQUIRED TO ESTABLISH THE

ADEQUACY, QUALITY, SAFETY, COMPLETED STATUS AND SUITABLE OPERATION OF EACH SYSTEM. C. PROMPTLY CORRECT ANY FAILURES, DEFICIENCIES AND/OR DEFECTS REVEALED BY THESE TESTS. AFTER CORRECTING FAILURES, DEFICIENCIES OF DEFECTS, CONDUCT NEW TESTING TO VERIFY THAT THE DEFICIENCY HAS BEEN RECTIFIED AND THE SYSTEM IS FUNCTIONING PROPERLY.

D. TEST THE GROUNDS WITH A GROUND RESISTANCE DIRECT READING SINGLE-TEST MEGGER. E. INSULATION RESISTANCE BETWEEN PHASE CONDUCTORS AND GROUND SHALL NOT BE LESS THAN 1,000,000

F. PANELBOARDS - TEST INSULATION RESISTANCE FOR EACH PANELBOARD BUS AND FEEDER. TEST THE CONTINUITY OF EACH CIRCUIT. VERIFY THE OPERATION OF ALL CIRCUIT BREAKERS. G. PANELBOARDS SHALL HAVE PHASE CURRENTS BALANCED TO WITHIN +/- 10% VARIATION BETWEEN AVERAGE PHASE CURRENT AND MEASURED INDIVIDUAL PHASE.

H. AN OPERATIONAL TEST OF THE EMERGENCY LIGHTING/EXIT SIGNAGE SYSTEM SHALL BE PERFORMED IN THE PRESENCE OF THE OWNER AND THE AUTHORITY HAVING JURISDICTION TO DEMONSTRATE PROPER OPERATION AND COMPLIANCE WITH APPLICABLE CODES AND SPECIFIED REQUIREMENTS.

OPERATION AND MAINTENANCE MANUALS

A. THIRTY (30) DAYS PRIOR TO SUBSTANTIAL COMPLETION, SUBMIT OPERATING AND MAINTENANCE MANUALS FOR EQUIPMENT TO ENGINEER FOR APPROVAL. INCLUDE ONE COPY OF EACH FINAL APPROVED SUBMITTAL FOR RECORD PURPOSES, INDICATING THE ACTUAL PRODUCT INSTALLED. INCLUDE SIGNIFICANT CHANGES IN

- THE PRODUCT DELIVERED TO PROJECT SITE AND CHANGES IN MANUFACTURER'S WRITTEN INSTRUCTIONS FOR INSTALLATION. B. PROVIDE ORGANIZED WARRANTY SECTION IN THE LEAD BINDER. ORGANIZE WARRANTY DOCUMENTS INTO AN
- ORDERLY SEQUENCE BASED ON THE TABLE OF CONTENTS OF THE PROJECT MANUAL. A COPY OF EACH WARRANTY SHALL ALSO BE PROVIDED IN THE RESPECTIVE EQUIPMENT SECTION.
- PROVIDE COMPREHENSIVE CONTACT LIST IN THE LEAD BINDER INCLUDING CONTRACTOR AND SUBCONTRACTOR'S NAMES, ADDRESSES, TELEPHONE AND CONTACT PERSON FOR OWNER'S USE. D. PROVIDE MANUFACTURER'S COMPLETE PRODUCT DATA SHEETS INCLUDING ASSEMBLY DRAWINGS, WIRING DIAGRAMS, MECHANICAL DIAGRAMS, INSTALLATION DIAGRAMS, AND INSTRUCTIONS. IDENTIFY EQUIPMENT IN

MANUAL AND CROSS-REFERENCE BY INCLUDING SERIAL NUMBER OF ACTUAL COMPONENTS. E. PROVIDE TEST REPORTS FROM MANUFACTURER START-UP INDICATING SYSTEMS TO BE OPERATING

PROPERLY, INCLUDING GROUNDING TESTS, PANELBOARD TESTS, STRUCTURED CABLING SYSTEM TESTS, ETC. F. PROVIDE ELECTRONIC COPY OF FINAL OPERATION AND MAINTENANCE MANUALS IN FULL COLOR PDF FORMAT ON PORTABLE FLASH DRIVE. ALL FILES SHALL CLEARLY INDICATE SPECIFIC INFORMATION RELATED TO ACTUAL PRODUCTS INSTALLED.

TRAINING OF OWNER'S DESIGNATED PERSONNEL

- A. PREPARE AND SUBMIT OPERATING INSTRUCTIONS, AS REQUIRED BY SPECIFICATION SECTIONS, AND TRAIN OWNER'S PERSONNEL IN USE AND MAINTENANCE OF OPERATING EQUIPMENT.
- B. AFTER INSTALLATION IS COMPLETE, SCHEDULE TO MEET AND TRAIN OWNER'S DESIGNATED PERSONNEL IN USE, OPERATION, CARE, AND CLEANING OF EQUIPMENT. TRAINING SESSIONS SHALL BE PRESENTED ONLY BY QUALIFIED PERSONNEL, THOROUGHLY FAMILIAR WITH USE AND MAINTENANCE OF EQUIPMENT. C. TRAINING SESSIONS SHALL TAKE PLACE AT THE PROJECT SITE, AT DATES AND TIMES CONVENIENT TO THE

OWNER. CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING THE OWNER TO ARRANGE DATES AND TIMES FOR TRAINING SESSIONS. PROVIDE A MINIMUM OF SIXTEEN (16) HOURS OF ON-SITE TRAINING. D. NOTIFY THE ENGINEER IN WRITING A MINIMUM OF 72 HOURS IN ADVANCE OF ANY SCHEDULED OWNER EQUIPMENT TRAINING. FOLLOWING ALL TRAINING, PROVIDE RECORD OF OWNER TRAINING INCLUDING THE TYPE OF TRAINING, WHO CONDUCTED THE TRAINING, AND LIST OF ATTENDEES. INCLUDE COPY OF TRAINING RECORD IN FACH SET OF O&M MANUALS

E. OWNER TRAINING SESSIONS SHALL BE VIDEO RECORDED TO DIGITAL MEDIA. DIGITAL MEDIA SHALL BE CLEARLY LABELED INDICATING CONTENT OF EQUIPMENT COVERED BY TRAINING, AND COPIES PROVIDED AS FOLLOWS: ONE (1) COPY TO THE OWNER, ONE (1) COPY TO THE ENGINEER, AND ONE (1) COPY SHALL BE INCLUDED IN EACH SET OF O&M MANUALS.

WARRANTY

A. THE CONTRACTOR SHALL GUARANTEE ALL MATERIALS, EQUIPMENT AND THE INSTALLATION TO BE FREE OF DEFECTS THAT MAY DEVELOP IN ANY PART OF THEIR WORK CAUSED BY FAULTY WORKMANSHIP, MATERIAL OR FOLLIPMENT FAILURES FOR A MINIMUM OF ONE (1) YEAR FROM THE DATE OF SUBSTANTIAL COMPLETION OR FOR AS LONG AS NORMAL EQUIPMENT MANUFACTURER WARRANTIES ARE IN EFFECT FROM THE DATE OF OWNER ACCEPTANCE OF THE PROJECT, WHICHEVER IS LATER.

B. DURING THE ONE (1) YEAR WARRANTY PERIOD, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO THE PREMISES CAUSED BY DEFECTS IN WORKMANSHIP OR DEFECTS IN THE WORK OR EQUIPMENT FURNISHED AND/OR INSTALLED UNDER THEOWORK OF THE ELECTRICAL CONTRACT.

LIGHTNING PROTECTION FOR STRUCTURES

- A. The lightning protection system information shown on the Contract Documents is provided to represent general design intent only. The information shown on the Contract Documents is not intended to represent a complete scope of work required to achieve all requirements specified herein.
- B. The Lightning Protection System vendor shall provide a complete system design for the lightning protection system as
- specified herein and as required to achieve the requirements specified herein. C. Provide product data submittals for each type of product specified herein.
- D. Lightning Protection System Vendor shall provide shop drawings as follows:
- 1. Include layouts of the lightning protection system, with details of the components to be used in the installation. 2. Include raceway locations needed for the installation of conductors.
- 3. Details of air terminals, ground rods, ground rings, conductor supports, splices, and terminations, including concealment requirements.
- 4. Include roof attachment details, coordinated with roof installation.
- 5. Calculations required by NFPA 780 for bonding of metal bodies.
- 6. Lightning protection cabling attachments to roofing systems and accessories. 7. Lightning protection strike termination device attachment to roofing systems, coordinated with the roofing system
- 8. Lightning protection system components penetrating roofing and moisture protection systems and system components,
- coordinated with the roofing system manufacturer.

E. Product Certificates: Provide for each type of roof adhesive for attaching the roof-mounted air terminal assemblies,

- approved by the roofing-material manufacturer. F. Completion Certificate: UL Master Label Certificate.
- G. Subject to compliance with specified products, provide products by one of the following: Harger, Robbins, Thompson or
- approved equal. H. NFPA Lightning Protection Standard: Comply with NFPA 780 requirements for Class I buildings.
- I. UL Lightning Protection Standard: Comply with UL 96A requirements for Class I buildings. J. Lightning Protection Components, Devices, and Accessories: Listed and labeled by a qualified nationally recognized testing agency as complying with UL 96, and marked for intended location and application.

NFPA 780, LPI 175, and UL 96A stipulate minimum size requirements for components, depending on selected metal and class of building. To require components larger than minimum size, to specify component material composition, or for Projects with unique lighting protection requirements, add component requirements here.

The specified standards prohibit the use of aluminum conductors and materials embedded in concrete or masonry, or installed in a location subject to excessive moisture, and within 18 in (460 mm) of the point where the lightning protection system conductor comes into contact with the earth.

K. Components of the lightning protection system shall include, but shall not necessarily be limited to, copper pointed tip

air terminals, air terminal supports, stranded copper Class 1 main conductors, stranded copper secondary conductors. solid copper, 5/8 inch diameter by 10 feet long ground rods, splices and connectors as required. Retain "Air Terminal Bracing" Paragraph below for terminals more than 24 inches (610 mm) in height that require bracing.

Revise first paragraph below to indicate which standards apply. Retain UL 96A if just compliance with UL Master Label or LPI certification is desired. Retain NFPA 780 if the most stringent or comprehensive requirements are needed. L. Install lightning protection components and systems according to UL 96A.

M. Conceal conductors within normal view from exterior locations at grade within 200 feet of building. Comply with requirements for concealed installations in UL 96A. 1. Roof penetrations required for down conductors and connections to structural-steel framework shall be made using listed through-roof fitting and connector assemblies with solid rods and appropriate roof flashings. Use materials approved by the roofing manufacturer for the purpose. Conform to the methods and materials required at roofing penetrations of the lightning protection components to ensure compatibility with the roofing specifications and

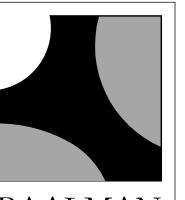
2. Install conduit where necessary to comply with conductor concealment requirements.

3. Air Terminals on Single-Ply Membrane Roofing: Comply with adhesive manufacturer's written instructions.

N. Ground Ring Electrode: The conductor shall be not less than the main-size lightning conductor. O. Aboveground concealed connections, and connections in earth or concrete, shall be done by exothermic welds or by high-compression fittings listed for the purpose. Aboveground exposed connections shall be done using exothermic weld connections, listed and labeled for the purpose.

P. Do not combine materials that can form an electrolytic couple that will accelerate corrosion in the presence of moisture unless moisture is permanently excluded from junction of such materials. Use conductors with protective coatings where conditions would cause deterioration or corrosion of conductors

Q. Special Inspections: Engage a qualified special inspector to perform inspections as required to obtain a UL Master Label for the system.



#2 Daniel Drive O'Fallon, MO 63366 ph: 314.640.6212

Michael J. Baalman ARCHITECT License#: A-2012004035 Certificate of Authority:

2014003655 CIVIL ENGINEER BAX ENGINEERING CO., INC. 221 Point West Blvd. St. Charles, Missouri 63301

Phone: 636-928-5552 Contact: Mark Struckhoff, P.E. mstruckhoff@baxengineering.com STRUCTURAL, MECHANICAL

PLUMBING & ELECTRICAL CASE ENGINEERING, INC. 796 Merus Court

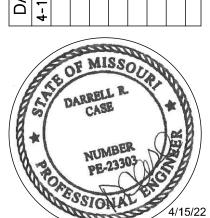
St. Louis, Missouri 63026 Structural Contact: Ardie Mansouri, P.E. Phone: 636-349-1600 ext 291 amansouri@caseengineeringinc.com Mechanical, Plumbing, Electrical

jeyre@caseengineeringinc.com

Phone: 636-349-1600 ext 258

Contact: Jim Eyre, P.E.

C tri C



ENGINEER MO# E-23303

PROJECT MANAGER: JE DRAWN BY: CK

Darrell R Case

PROJECT NUMBER 21-079 DATE April 15, 2022

ELECTRICAL

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SPECIFICATIONS

FIRE-ALARM SYSTEMS

- A. Design Intent Drawings / Delegated Design:
- 1. The extent of fire alarm work shown on the Contract Documents is intended to represent general design intent only. The information shown is not intended to represent all work required for a complete, functional and Code compliant

2. The fire alarm system vendor shall be responsible for providing a final system design that incorporates all devices, system components, wiring and functionality as required for a complete, functional and Code compliant fire alarm system.

- B. Submit product data for each type of product, including furnished options and accessories. C. Submit project specific shop drawings for fire-alarm system.
- 1. Comply with recommendations and requirements in the "Documentation" section of the "Fundamentals" chapter in
- 2. Include plans, elevations, sections, details, and attachments to other work.
- 3. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and locations. Indicate conductor sizes, indicate termination locations and requirements, and distinguish between factory and field wiring.
- 4. Detail assembly and support requirements.
- 5. Include voltage drop calculations for notification-appliance circuits.
- 6. Include battery-size calculations.
- 7. Include input/output matrix.
- 8. Include statement from manufacturer that all equipment and components have been tested as a system and meet all
- requirements in this Specification and in NFPA 72. 9. Include performance parameters and installation details for each detector.
- 10. Include floor plans to indicate final outlet locations showing address of each addressable device. Show size and route of cable and conduits and point-to-point wiring diagrams.
- D. Shop Drawings shall be prepared by persons with the following qualifications:
- a. Trained and certified by manufacturer in fire-alarm system design.
- b. NICET-certified, fire-alarm technician; Level IV minimum. c. Licensed or certified by authorities having jurisdiction.
- E. Operation and Maintenance Data: For fire-alarm systems and components to include in emergency, operation, and maintenance manuals.
- 1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:
- a. Comply with the "Records" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72. b. Provide "Fire Alarm and Emergency Communications System Record of Completion Documents" according to the "Completion Documents" Article in the "Documentation" section of the "Fundamentals" chapter in NFPA 72. c. Complete wiring diagrams showing connections between all devices and equipment. Each conductor shall be numbered
- at every junction point with indication of origination and termination points. d. Riser diagram.
- e. Device addresses.
- f. Record copy of site-specific software. g. Provide "Inspection and Testing Form" according to the "Inspection, Testing and Maintenance" chapter in NFPA 72.
- h. Manufacturer's required maintenance related to system warranty requirements.
- Abbreviated operating instructions for mounting at fire-alarm control unit and each annunciator unit.
- F. Installer Qualifications: Personnel shall be trained and certified by manufacturer for installation of units required for this
- G. Installer Qualifications: Installation shall be by personnel certified by NICET as fire-alarm Level IV technician.
- H. NFPA Certification: Obtain certification according to NFPA 72 by an NRTL (nationally recognized testing laboratory).
- I. Provide system manufacturer's certification that all components provided have been tested as, and will operate as, a
- J. Fire alarm system shall be non-coded, UL-certified addressable system, with multiplexed signal transmission and horn/strobe evacuation.
- K. All components provided shall be listed for use with the selected system.
- L. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application. M. Seismic Performance: Fire-alarm control unit and raceways shall withstand the effects of earthquake motions
- determined according to ASCE/SEL7.
- 1. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified."
- N. Acceptable Manufacturers: Products as manufactured by Notifier (Honeywell) and System Sensor are identified within this specification as the Basis of Design for products to be provided. Subject to compliance with specified requirements,
- equivalent products manufactured by Silent Knight, Simplex, Siemens, EST shall be provided. O. Fire Alarm Control Panel - Intelligent, addressable with capacity for 318 devices minimum (159 detectors, 159 modules),
- 6.0 Amp power supply with (4) Class A/B notification appliance circuits, 80 character display, integral battery and charger. Notifier (Honeywell) NFS 320 (Basis of Design product).
- P. Manual Fire Alarm Boxes Intelligent, addressable, dual action, key reset. Notifier (Honeywell) NBG-12LX. Q. Multi Criteria Detectors - Intelligent, addressable, ceiling mounted, capable of detecting four elements of a fire (carbon
- monoxide, flame, photoelectric smoke detection, thermal detection), 6 levels of sensitivity. Notifier (Honeywell) FSC-851A R. Photoelectric Smoke Detectors - Intelligent, addressable, ceiling mounted, two-wire SLC connection, optical sensing
- chamber, with adjustable sensitivity from the fire alarm control panel. Notifier (Honeywell) FSP-851A. Sounder Bases: Notifier (Honeywell) B200S or B200S-LF series products as applicable.
- Photoelectric Duct Smoke Detectors Intelligent, addressable, non-relay type, two-wire SLC connection, optical sensing chamber, with adjustable sensitivity from the fire alarm control panel, housing for installation at ductwork. Notifier
- U. Heat Detectors Intelligent, addressable, ceiling mounted, rate-of-rise type, two wire SLC connection. Notifier
- V. Remote Fire Alarm Power Supply Notifier (Honeywell) HPF24S6.

Retain one of two "General Requirements for Notification Appliances" paragraphs below. Individually addressed notification appliances are not widely available

- Sound-level values in "Chimes, Low-Level Output," "Chimes, High-Level Output," and "Horns" paragraphs below are typical. Indicate sound output ratings on Drawings if values other than the ones listed below are used in complying with audibility requirements. Comply with interpretations of ADA-ABA Accessibility Guidelines by authorities having jurisdiction. See Editing Instruction No. 6 in the Evaluations for discussion about audible system sound levels.
- W. Horns Electric-vibrating-polarized type, 24-V dc; wall mounted, red color, with provision for housing the operating mechanism behind a grille. Comply with UL 464. Horns shall produce a sound-pressure level of 90 dBA, measured 10 feet from the horn, using the coded signal prescribed in UL 464 test protocol. Horns (only) - System Sensor HWL series. Horn/Strobes - System Sensor P2RL.
- X. <u>Visible Notification Appliances (Strobes):</u> Wall mounted, red finish, Xenon strobe lights complying with UL 1971, with clear or nominal white polycarbonate lens mounted on an aluminum faceplate. The word "FIRE" is engraved in minimum 1-inch-high letters on the lens. Flashing shall be in temporal pattern, synchronized with other units. Provide manufacturers standard wire guards for devices installed with the Apparatus Bay and other locations where the device will be subject to physical damage. Rated light output = 15/30/75/110 cd, selectable in the field. System Sensor SRL. Provide System Sensor
- "Sync Circuit" model MDL3 to synchronize the flash of strobe lights as required. Y. Outdoor, weatherproof horn/strobe: System Sensor P2RK.
- Retain "Rated Light Output" Subparagraph below if rated light output is not indicated on Drawings. Required light output for visible alarm strobe lights varies from 75 to 177 cd, depending on the floor area and ceiling height of the space, the mounting height of the device, and whether the space is a sleeping area. Requirements differ among various governing codes. Consult authorities having jurisdiction for each project. See Editing Instruction No. 7 in the Evaluations for discussion about determining the light output of visible notification appliances.
- Addressable Interface Module: Notifier (Honeywell) FMM-1(A).
- AA. Addressable Interface Relay Module: Notifier (Honeywell) FRM-1(A).
- BB. Addressable Interface Control Module: Notifier (Honeywell) FCM-1(A).
- CC. <u>Universal Digital Alarm Communicator Transmitter</u> device shall be acceptable to the remote central station and shall comply with UL 632. Unit shall be equipped with integral rechargeable battery, automatic charger and self-test feature. Self-test shall be conducted every 24-hours with report transmitted to the Central Station. Notifier (Honeywell) UDACT-2 DD. Comply with NFPA 72, NFPA 101, and requirements of Authorities Having Jurisdiction for installation and testing of fire-alarm equipment. Install all electrical wiring to comply with requirements in NFPA 70 including, but not limited to, Article 760, "Fire Alarm Systems."

Retain subparagraph below if Project requires seismic bracing. Coordinate with Section 270548.16 "Seismic Controls for

EE. Install wall-mounted equipment, with tops of cabinets not more than 72 inches above the finished floor.

2. The operable part of manual fire-alarm box shall be between 42 inches and 48 inches above floor level.

- FF. Manual Fire-Alarm Boxes:
- 1. Install manual fire-alarm box in the normal path of egress within 60 inches of the exit doorway.
- Retain "Smoke- or Heat-Detector Spacing" Paragraph below if spacing is not indicated on Drawings. It is recommended that detector spacing and location be determined by a professional engineer, based on the listing of detectors and on space/ceiling-plane configurations. See Editing Instruction No. 9 in the Evaluations for discussion about detector locations.

GG.Smoke- or Heat-Detector Spacing:

pendant mounted or indirect lighting.

- 1. Comply with the "Smoke-Sensing Fire Detectors" section in the "Initiating Devices" chapter in NFPA 72, for
- 2. Comply with the "Heat-Sensing Fire Detectors" section in the "Initiating Devices" chapter in NFPA 72, for heat-detector spacing.
- Revise first subparagraph below to indicate how Contractor shall determine detector spacing.
- 3. Spacing of detectors for irregular areas, for irregular ceiling construction, and for high ceiling areas shall be determined according to Annex A in NFPA 72.
- See Editing Instruction No. 10 in the Evaluations for discussion about placement of smoke detectors near HVAC air inlets and
- 4. HVAC: Locate detectors not closer than 36 inches from air-supply diffuser or return-air opening.
- 5. Lighting Fixtures: Locate detectors not closer than 12 inches from any part of a lighting fixture and not directly above

- HH.Duct Smoke Detectors: Comply with NFPA 72 and NFPA 90A. Install sampling tubes so they extend the full width of duct. Tubes more than 36 inches long shall be supported at both ends.
- II. Remote Status and Alarm Indicators: Install in a visible location near each smoke detector, sprinkler water-flow switch. and valve-tamper switch that is not readily visible from normal viewing position.
- Coordinate "Audible Alarm-Indicating Devices" Paragraph below with Drawings.
- JJ. Audible Alarm-Indicating Devices: Install not less than 6 inches below the ceiling. Install bells and horns on flush-mounted back boxes with the device-operating mechanism concealed behind a grille. Install all devices at the same height unless otherwise indicated.
- KK. Visible Alarm-Indicating Devices: Install adjacent to each alarm bell or alarm horn and at least 6 inches below the ceiling. Install all devices at the same height unless otherwise indicated.
- Coordinate "Antenna for Radio Alarm Transmitter" Paragraph below with Drawings. Wind speed is usually a requirement of the applicable building code.

Retain one of first two paragraphs below.

representative.

- LL. Fire alarm system wiring "drops" to wall mounted devices shall be installed within EMT. Wiring installed above accessible (lay-in) type ceilings shall be installed "open" (not within conduit). Open wiring shall be supported utilizing J-hooks and bridle rings UL listed and labeled for cable support. Wiring installed in spaces having an inaccessible ceiling or an exposed structure ceiling shall be installed within EMT conduit.
- MM. EMT and all associated conduit fittings, junction boxes and covers, etc. for service to fire alarm system wiring shall be factory finished, red in color.
- NN. Provide all fire alarm system addressable interface modules as may be required to interface the fire alarm system with other low voltage systems at the facility to achieve required system functionality. Coordinate requirements with Owner and
- OO. Ground fire-alarm control unit and associated circuits; comply with IEEE 1100. Install a ground wire from main service ground to fire-alarm control unit.
- PP. Ground shielded cables at the control panel location only. Insulate shield at device location.
- QQ. Perform the following tests and inspections with the assistance of a factory-authorized service representative:
- 1. Visual Inspection: Conduct visual inspection prior to testing.
- a. Inspection shall be based on completed record Drawings and system documentation that is required by the "Completion Documents, Preparation" table in the "Documentation" section of the "Fundamentals" chapter in
- b. Comply with the "Visual Inspection Frequencies" table in the "Inspection" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72; retain the "Initial/Reacceptance" column and list only the installed
- 2. System Testing: Comply with the "Test Methods" table in the "Testing" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
- 3. Test audible appliances for the public operating mode according to manufacturer's written instructions. Perform the
- test using a portable sound-level meter complying with Type 2 requirements in ANSI S1.4. 4. Test audible appliances for the private operating mode according to manufacturer's written instructions.
- Test visible appliances for the public operating mode according to manufacturer's written instructions. 6. Factory-authorized service representative shall prepare the "Fire Alarm System Record of Completion" in the "Documentation" section of the "Fundamentals" chapter in NFPA 72 and the "Inspection and Testing Form" in the "Records"
- RR. Reacceptance Testing: Perform reacceptance testing to verify the proper operation of added or replaced devices and
- SS. Prepare test and inspection reports in accordance with applicable requirements and standards

section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.

TT. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain fire-alarm system. Training sessions shall be conducted on site, at dates and times coordinated with the Owner's

Emergency Generator - Generac SG100 series (Basis of Design product)

Seismic Performance Requirements: Engine generator housing, engine generator, batteries, battery racks, silencers, sound attenuating equipment, accessories and components, etc. shall be installed to withstand the effects of earthquake motions determined in accordance with ASCE/SEI 7.

Utility Company Coordination: Coordinate generator and automatic transfer switch characteristics with the local serving electric utility company. All products and electrical work associated with the emergency power distribution system shall be provided and installed in accordance with all applicable requirements of the serving electric utility company.

NFPA compliance: NFPA 37, NFPA 70, NFPA 110.

UL Compliance: Comply with UL 2200.

Basis of Design - Generac Industrial gaseous engine-driven generator, 4.5L in-line 4 cylinder engine, consisting of the following features and accessories:

- Stationary Emergency-Standby rated
- 100 kW rating, wired for 120/240 VAC single phase, 60 Hz, 0.8 power factor (lagging)
- Permanent Magnet Excitation
- Induction method: Naturally aspirated
- Rated engine speed: 1800 rpm.
- Integral coolant system: Closed loop, liquid cooled with radiator factory mounted on generator mounting frame and
- Coolant: Solution of 50 percent ethylene glycol and 50 percent water, with anti-corrosion additives as recommended by the engine manufacturer, expansion tank and self-contained thermostatic control valve.
- MLCB, 100% rated thermal-magnetic
- 400 Amp, with AIC rating as determined by the power system study to be performed.
- Natural Gas fuel system. Gas train shall comply with NFPA 37.
- Standard Weather Protective, Sound Attenuated Enclosure, Steel
- Baked-On Powder Coat Finish
- Adjustable hinges to allow for door alignment Stainless steel hinges and exposed fasteners
- Each door equipped with lockable hardware and identical keys. Level 2 sound attenuation
- EPA Certified
- cETLus
- Power Zone Pro Digital Control Panel for Single Generators
- Meets NFPA 99 and 110 requirements
- O Temp Range -40 to 70 degrees C
- Humidity 2 95% (Non Condensing)
- o UL6200 o C-ETL-US
- o CE
- FCC IEC801 (Radiated Emissions, Susceptibility, and Surge Immunity)
- 4.3" Resistive Color Touchscreen Built-in Wi-Fi, Bluetooth, and Webserver (via Power Zone Connectivity Server)
- IP65 (front)
- Auto/Manual/Off key switch, Alarm Indication, Not in Auto Indication, audible alarm, emergency stop switch
- Dual Core Digital Microprocessor
- RS485. Ethernet and CANbus ports
- All engine sensors are 4-20ma for minimal interference • Sensors: Oil Pressure, optional Oil Temp, Coolant Temp and Level, Fuel Level/Pressure (where applicable), Engine
- Speed, DC Battery Voltage, Run-time Hours, Generator Voltages, Amps, Frequency, Power, Power Factor Alarm Status: Low or High AC Voltage, Low or High Battery Voltage, Low or High Frequency, Pre-low or Low Oil Pressure,
- Pre-high or High Oil Temp (optional), Low Water Level and Temp, Pre-high or High Engine Temp, High, Low, and Critical-low Fuel Level/Pressure (where applicable), Overcrank, Over and Under Speed, Unit Not in Automatic
- Programmable I/O Built-in PLC for special applications
 - Engine function monitoring and control: - Full range standby operation; programmable auto crank, Emergency Stop, Auto-Off-Manual switch

• 0.25% digital frequency regulation with: soft-start ramping - adjustable, gain - adjustable, overshoot limit -

- Isochronous Governor
 - 3 Phase RMS Voltage Sensing • +/-0.5% digital voltage regulation with: soft-start voltage ramping - adjustable, loss of sensing protection -
 - adjustable, negative power limit adjustable, Hi/Lo voltage limit adjustable, V/F slope and gain adjustable, fault protection
- Service reminders, trending, fault history (alarm log)
- I2T function for full generator protection Selectable low-speed exercise
- 2-wire start controls for any 2-wire transfer switch
- 21 Light Remote Annunciator, surface mount • Remote Emergency Stop Switch, Surface-Mount, shipped loose
- 110 AH, 925 CCA Group 31 Battery, with rack, installed Block Heater, 1500 watt
- Standard Heavy Duty Air Cleaner
- 12 Volt with negative ground starting system Lead acid battery
- Battery Charger, Current limiting, automatic equalizing, 10 Amp, NFPA 110 compliant, installed 120V GFCI and 240V service utlet
- Flex Fuel Hose, shipped loose • Critical Grade Silencer. Comply with applicable state and local government requirements for maximum noise level at

adjacent propoerty boundaries.

- Standard set of three (3) Manuals
- Standard 2-Year Limited Warranty Start-up and testing in accordance with NFPA 110 and all applicable industry standards.
- Four (4) hours of on-site training of Owner's personnel at date and times arranged with the Owner.
- Provide required levels of oil and antifreeze within the engine. Basis of Design - Generac SG0100AG264.5S18SPYYA
- Additional acceptable manufacturers: Cummins, Kohler, Caterpillar, or approved equal. Provide cast-in-place, steel reinforced concrete pad for support of generator and weather proof sound attenuated housing assembly. Pad shall be 12 inches larger than the equipment, all sides. Edge of pad shall be chamfered one inch to prevend chipping. Perimeter of cast-in-place pad shall be "turned down" to form a perimeter foundation 12 inches deep minimum.

• 400 Amp, 2 pole, solid neutral, open transition type, 120/240 VAC single phase, 60 Hz, with 2-Wire Start Circuit

- Generator shall not be grounded as a separately derived system.
- Automatic Transfer Switch Generac TX series (Basis of Design product)
- Utility Voltage Sensing Controls:

Adjustable Drop-out and Pick-up

Adjustable Utility Interrupt Delay

Adjustable Logic Controls:

- Minimum Standby Voltage
- Minimum Standby Frequency Engine Warmup

Return to Utility

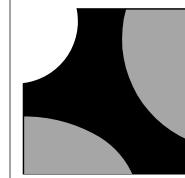
- Engine Cooldown Transfer on Exercise
- 3 Owner's Manuals • Double Set of Form C Aux Cont
- Double Set of Form C Auxiliary Contacts CSA - C22.2 No.178
- NEMA 1 Enclosure

UL Listed 1008 by ETL

• 22KA Contactor Withstand and Closing Rating, or higher rating as determined/required by the short circuit study

performed.

- Non-Service Entrance Rated
- In Phase Only Transfer Standard two year basic warranty
- Basis of Design Generac TX611NN0200A2AN
- Additional accceptable manufacturers: Kohler, Caterpillar, ASCO, Russellelectric or Zenith.



BAALMAN **ARCHITECTS**

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St. Charles, Missouri 63301 Phone: 636-928-5552 Contact: Mark Struckhoff, P.E. mstruckhoff@baxengineering.com STRUCTURAL, MECHANICAL PLUMBING & ELECTRICAL

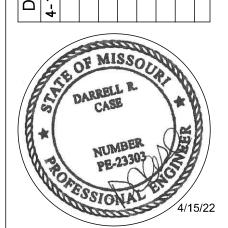
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C C



Darrell R Case

DRAWN BY: CK

ENGINEER MO# E-23303 PROJECT MANAGER: JE

PROJECT NUMBER 21-079 DATE April 15, 2022

ELECTRICAL

SPECIFICATIONS

GENERAL FIRE PROTECTION NOTES

- 1. THE FIRE PROTECTION WORK SHALL BE "DESIGN/BUILD". THE FIRE PROTECTION CONTRACTOR (FPC) SHALL PROVIDE A COMPLETE FIRE PROTECTION INSTALLATION FOR THE SPACES SHOWN. PROVIDE ENGINEERED DRAWINGS SIGNED AND SEALED BY A MISSOURI LICENSED PROFESSIONAL ENGINEER.
- 2. THE FPC SHALL PROCURE AND PAY FOR ALL REQUIRED PERMITS, TESTS, INSPECTIONS, ETC.
- 3. PROVIDE FIRE PROTECTION SYSTEM COMPLETE PER THE REQUIREMENTS OF THE OWNER'S FIRE INSURANCE UNDERWRITER, ALL APPLICABLE CODES, AND IN STRICT ACCORDANCE WITH ALL AHJs.
- 4. FPC SHALL PERFORM FLOW TEST AND DETERMINING AVAILABLE WATER PRESSURE AT SITE.
- 5. ALL OF THE FIRE PROTECTION WORK IS NOT NECESSARILY SHOWN OR NOTED ON THESE DRAWINGS. THE CONTRACTOR SHALL VISIT THE JOB SITE AND VERIFY ALL EXISTING CONDITIONS RELATED TO THEIR WORK BEFORE BIDDING. THOSE ITEMS NOT SHOWN OR NOTED BUT WHICH ARE DEEMED NECESSARY FOR REMOVAL OR RELOCATION BY OWNER'S REPRESENTATIVE SHALL BE PART OF THIS CONTRACT.
- 6. FPC SHALL REVIEW ALL SCHEDULING REQUIREMENTS BEFORE SUBMITTING BID. SUBMISSION OF PROPOSAL SHALL BE CONSIDERED EVIDENCE THAT THE CONTRACTOR HAS VISITED THE SITE. NO EXTRA PAYMENTS WILL BE ALLOWED THIS CONTRACTOR'S CLAIMS FOR EXTRA WORK MADE NECESSARY BY FPC'S FAILURE TO VISIT
- 7. INSTALLATION SHALL NOT EXPOSE ANY WET PIPE TO FREEZING CONDITIONS.
- 8. UNLESS NOTED OTHERWISE, ALL EQUIPMENT AND PIPING SHALL BE CONCEALED.
- 9. INITIAL DESIGN OF FIRE PROTECTION SYSTEM SHALL INCLUDE MEETING AND COORDINATING WITH ALL OTHER TRADES AND G.C. SPRINKLER PIPE ROUTES, MOUNTING HEIGHTS, AND EQUIPMENT SHALL BE FULLY COORDINATED TO AVOID ALL CONFLICTS. SUBMISSION OF FIRE PROTECTION SHOP DRAWINGS SHALL REFLECT THIS COORDINATION.
- 10. THE PROCEDURES USED SHALL PROVIDE FOR THE SAFE CONDUCT OF THE WORK, CAREFUL DISPOSITION AND INSTALLATION OF ALL MATERIALS, PROTECTION OF PROPERTY AND PERSONNEL, AND COORDINATION WITH OTHER WORK IN PROGRESS.
- 11. DURING CONSTRUCTION OPERATIONS, ALL PERSONS AND PROPERTY SHALL BE PROTECTED. THE WORK SHALL PROCEED IN SUCH A MANNER SO AS TO MINIMIZE ANY SPREAD OF DEBRIS AND FLYING PARTICLES, AND SO THAT THE EFFECTS OF THE CONSTRUCTION DO NOT INTERFERE WITH OTHER WORK IN PROGRESS.
- 12. REFER TO ARCHITECT'S PLANS FOR ALL CEILING HEIGHTS.
- 13. ALL PIPING AND HEADS SHALL BE INSTALLED PER LATEST EDITION OF NFPA 13. HEAD SPACING SHALL BE BASED UPON THE APPLICABLE HAZARD GROUP.
- 14. FPC SHALL PREPARE AND SUBMIT HYDRAULIC CALCULATION AND SHOP DRAWINGS. SHOP DRAWINGS SHALL INDICATE CALCULATION REFERENCE POINTS (NODES). SUBMIT SHOP DRAWINGS TO THE ARCHITECT/ENGINEER FOR REVIEW AND APPROVAL PRIOR TO FABRICATION.
- 15. COORDINATE LOCATION OF ALL NEW SPRINKLER HEADS WITH CEILING AND LIGHTING LAYOUT. REPORT ANY DISCREPANCIES TO THE ENGINEER/ ARCHITECT FOR CLARIFICATION. LOCATE SPRINKLER HEADS CENTERED IN CEILING TILES AND SYMMETRICAL. FINAL SPRINKLER HEAD LOCATIONS ARE SUBJECT TO (OWNER'S) APPROVAL. (OWNER) HEAD LOCATIONS MAY EXCEED NFPA REQUIREMENTS.
- 16. PROVIDE ACCESS TO AND CEILING-MOUNTED LABELS FOR ALL ZONE VALVES LOCATED OTHER THAN IN THE SPRINKLER CLOSET.
- 17. COORDINATE SPRINKLER PIPING INSTALLATION SO THAT THE PIPING DOES NOT HINDER ACCESS TO ANY NEW OR EXISTING DEVICES, JUNCTION BOXES, EQUIPMENT, ETC.
- 18. ALL SPRINKLER LINES PASSING THROUGH FIRE RATED WALLS (SEE ARCHITECTURAL PLANS FOR EXACT EXTENT OF NEW RATED WALLS) SHALL BE SLEEVED AND SHALL HAVE THEIR PENETRATIONS THROUGH SUCH WALLS FIRE STOPPED WITH AN APPROVED PENETRATION SEALING SYSTEM EQUAL TO 3M CP-25 CAULKING IN A DEPTH AS REQUIRED TO MEET THE RESPECTIVE HOUR RATING OF THE WALL.
- 19. SPRINKLER CONTRACTOR SHALL INSTALL ALL NEW UPRIGHT SPRINKLER HEADS ON MINIMUM 1" DIAMETER
- 20. PIPING 2" & SMALLER SHALL BE SCHEDULE 40 GALVANIZED STEEL WITH STANDARD WEIGHT BLACK CAST OR DUCTILE IRON THREADED FITTINGS.
- 21. PIPE $2\frac{1}{2}$ " & LARGER SHALL BE SCHEDULE 10 GALVANIZED STEEL WITH ROLL GROOVED JOINTS.
- 22. ARM OVERS EXCEEDING 1'-0" LENGTH SHALL BE PROVIDED WITH PIPE HANGER.
- 23. PIPE HANGERS AT THE END OF BRANCH LINES SHALL BE PROVIDED WITH AN APPROVED VERTICAL RESTRAINT.
- 24. ALL PIPING SHALL BE SUPPORTED FROM THE STRUCTURE. DO NOT SUPPORT PIPE FROM ROOF OR FLOOR DECK. THERE SHALL BE NO EXCEPTIONS TO THIS. ANY HANGERS ATTACHED TO BAR JOISTS SHALL BE ATTACHED TO THE JOIST BOTTOM CHORD WITHIN 6" MAXIMUM DISTANCE FROM THE CHORD POINT OF THE
- 25. PROVIDE LATERAL AND LONGITUDINAL SEISMIC RESTRAINTS FOR SPRINKLER SYSTEM, AS REQUIRED. REFER TO ARCHITECTURAL PLANS FOR BUILDING SEISMIC CLASSIFICATION. IF REQUIRED BY AHJ, PROVIDE SEISMIC RESTRAINT DETAILS SIGNED AND SEALED BY A PROFESSIONAL ENGINEERING LICENSED IN THE JURISDICTION.
- 26. AT PROJECT COMPLETION, PROVIDE SIGNED CERTIFICATE OF COMPLETION, SUBMIT COPIES TO OWNER'S REPRESENTATIVE, INSURANCE REPRESENTATIVE, AND PROJECT OFFICE.

FIRE PROTECTION SYSTEM SPECIFICATION AND NOTES

WET-PIPE SPRINKLER SYSTEM: AUTOMATIC SPRINKLERS ARE ATTACHED TO PIPING CONTAINING WATER AND THAT IS CONNECTED TO WATER SUPPLY THROUGH ALARM VALVE. WATER DISCHARGES IMMEDIATELY FROM SPRINKLERS WHEN THEY ARE OPENED. SPRINKLERS OPEN WHEN HEAT MELTS FUSIBLE LINK OR DESTROYS FRANGIBLE DEVICE. HOSE CONNECTIONS ARE INCLUDED IF INDICATED.

DRY-PIPE SPRINKLER SYSTEM: AUTOMATIC SPRINKLERS ARE ATTACHED TO PIPING CONTAINING COMPRESSED AIR. OPENING OF SPRINKLERS RELEASES COMPRESSED AIR AND PERMITS WATER PRESSURE TO OPEN DRY-PIPE VALVE. WATER THEN FLOWS INTO PIPING AND DISCHARGES FROM SPRINKLERS THAT ARE OPEN.

PIPING SYSTEM COMPONENTS SHALL BE LISTED FOR 175-PSIG MINIMUM WORKING PRESSURE.

FLOW TEST DATA: AVAILABLE FIRE-HYDRANT FLOW TEST RECORDS INDICATE THE FOLLOWING CONDITIONS:

- a. DATE: 02/08/2022
- b. TIME: 2:00 P.M.
- c. PERFORMED BY: TONY HAKENWORTH OF HFS DESIGN
- d. LOCATION OF RESIDUAL FIRE HYDRANT #1: FIRST BAPTIST CHURCH.
- e. LOCATION OF FLOW FIRE HYDRANT F: GRACIE & WALTER CT.
- f. STATIC PRESSURE: 49 PSIG.
- g. RESIDUAL PRESSURE AT RESIDUAL FIRE HYDRANT: 43 PSIG.
- h. RESIDUAL FLOW AT RESIDUAL FIRE HYDRANT: 584 GPM.

SPRINKLER SYSTEM DESIGN SHALL BE APPROVED BY AUTHORITIES HAVING JURISDICTION.

MARGIN OF SAFETY FOR AVAILABLE WATER FLOW AND PRESSURE SHALL BE A MINIMUM OF: 5 PSIG, INCLUDING LOSSES THROUGH WATER-SERVICE PIPING, VALVES, AND BACKFLOW PREVENTERS. VERIFY ALL REQUIRED FLOW TEST REDUCTION SAFETY FACTORS WITH AHJ AND INSURANCE UNDERWRITER PRIOR TO BIDDING.

SPRINKLER OCCUPANCY HAZARD CLASSIFICATIONS: PER NFPA 13 REQUIREMENTS

MINIMUM DENSITY FOR AUTOMATIC-SPRINKLER PIPING DESIGN: PER NFPA 13 REQUIREMENTS

MAXIMUM PROTECTION AREA PER SPRINKLER: PER UL LISTING.

TOTAL COMBINED HOSE-STREAM DEMAND REQUIREMENT: ACCORDING TO NFPA 13 UNLESS OTHERWISE

ORDINARY-HAZARD OCCUPANCIES: 250 GPM

SEISMIC PERFORMANCE: SPRINKLER PIPING SHALL WITHSTAND THE EFFECTS OF EARTHQUAKE MOTIONS DETERMINED ACCORDING TO NFPA 13 AND ALL STATE AND LOCAL CODES.

SUBMITTALS

PROVIDE PRODUCT DATA: FOR EACH TYPE OF PRODUCT INDICATED. INCLUDE RATED CAPACITIES, OPERATING CHARACTERISTICS, ELECTRICAL CHARACTERISTICS, AND FURNISHED SPECIALTIES AND ACCESSORIES.

PROVIDE SHOP DRAWINGS: FOR SPRINKLER SYSTEMS. INCLUDE PLANS, ELEVATIONS, SECTIONS, DETAILS, AND ATTACHMENTS TO OTHER WORK.

CLOSEOUT SUBMITTALS

CONTRACTOR TO PROVIDE OPERATION AND MAINTENANCE DATA TO OWNER: FOR SPRINKLER SPECIALTIES TO INCLUDE IN EMERGENCY, OPERATION, AND MAINTENANCE MANUALS.

FURNISH AND INSTALL SPRINKLER CABINETS: FINISHED, WALL-MOUNTED, STEEL CABINET WITH HINGED COVER, AND WITH SPACE FOR MINIMUM OF SIX SPARE SPRINKLERS PLUS SPRINKLER WRENCH. INCLUDE NUMBER OF SPRINKLERS REQUIRED BY NFPA 13 AND SPRINKLER WRENCH. INCLUDE SEPARATE CABINET WITH SPRINKLERS AND WRENCH FOR EACH TYPE OF SPRINKLER USED ON PROJECT.

INSTALLER QUALIFICATIONS:

INSTALLER'S RESPONSIBILITIES INCLUDE DESIGNING. FABRICATING. AND INSTALLING SPRINKLER SYSTEMS AND PROVIDING PROFESSIONAL ENGINEERING SERVICES NEEDED TO ASSUME ENGINEERING RESPONSIBILITY. BASE CALCULATIONS ON RESULTS OF FIRE-HYDRANT FLOW TEST.

- A. ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, BY STANDARD: UL 405. A QUALIFIED TESTING AGENCY, AND MARKED FOR INTENDED LOCATION AND APPLICATION.
- B. NFPA STANDARDS: SPRINKLER SYSTEM EQUIPMENT, SPECIALTIES, ACCESSORIES, INSTALLATION, AND PRESSURE RATING: 175 PSIG MINIMUM.
- TESTING SHALL COMPLY WITH THE FOLLOWING:
- 1. NFPA 13, "INSTALLATION OF SPRINKLER SYSTEMS."
- 2. NFPA 24, "INSTALLATION OF PRIVATE FIRE SERVICE MAINS AND THEIR APPURTENANCES."

COORDINATION

COORDINATE LAYOUT AND INSTALLATION OF SPRINKLERS WITH OTHER CONSTRUCTION THAT PENETRATES CEILINGS, INCLUDING LIGHT FIXTURES, HVAC EQUIPMENT, AND PARTITION ASSEMBLIES.

SERVICE-ENTRANCE PIPING

INSTALL SHUTOFF VALVE, BACKFLOW PREVENTER, PRESSURE GAGE, DRAIN, AND OTHER ACCESSORIES INDICATED AT CONNECTION TO WATER-SERVICE PIPING.

PIPING INSTALLATION

ALL PIPING SHALL COMPLY WITH REQUIREMENTS FOR INSTALLATION OF SPRINKLER PIPING IN NFPA 13.

PROVIDE AND INSTALL SEISMIC RESTRAINTS ON PIPING. COMPLY WITH REQUIREMENTS FOR SEISMIC-RESTRAINT DEVICE MATERIALS AND INSTALLATION IN NFPA 13 AND LOCAL CODE. PROVIDE SEISMIC BRACING CALCULATIONS IF REQUIRED BY LOCAL AUTHORITIES.

USE LISTED FITTINGS TO MAKE CHANGES IN DIRECTION, BRANCH TAKEOFFS FROM MAINS, AND REDUCTIONS IN

INSTALL "INSPECTOR'S TEST CONNECTIONS" IN SPRINKLER SYSTEM PIPING, COMPLETE WITH SHUTOFF VALVE, AND SIZED AND LOCATED ACCORDING TO NFPA 13

INSTALL SPRINKLER PIPING WITH DRAINS FOR COMPLETE SYSTEM DRAINAGE.

INSTALL SPRINKLER CONTROL VALVES, TEST ASSEMBLIES, AND DRAIN RISERS ADJACENT TO STANDPIPES WHEN SPRINKLER PIPING IS CONNECTED TO STANDPIPES.

INSTALL AUTOMATIC (BALL DRIP) DRAIN VALVE AT EACH CHECK VALVE FOR FIRE-DEPARTMENT CONNECTION, TO DRAIN PIPING BETWEEN FIRE-DEPARTMENT CONNECTION AND CHECK VALVE. INSTALL DRAIN PIPING TO AND SPILL OVER FLOOR DRAIN OR TO OUTSIDE BUILDING. IT IS THE FIRE SPRINKLER CONTRACTORS RESPONSIBILITY TO COORDINATE ALL DRAIN LOCATIONS IF REQUIRED.

INSTALL ALARM DEVICES IN PIPING SYSTEMS.

INSTALL HANGERS AND SUPPORTS FOR SPRINKLER SYSTEM PIPING ACCORDING TO NFPA 13. COMPLY WITH REQUIREMENTS FOR HANGER MATERIALS IN NFPA 13.

ALL PIPING BE SUPPORTED FROM THE STRUCTURE AND SHALL NOT BE SUPPORTED FROM THE ROOF DECK. THERE SHALL BE NO EXCEPTIONS TO THIS. ANY HANGERS ATTACHED TO JOISTS SHALL BE ATTACHED TO THE JOIST WITHIN 6" MAXIMUM FROM THE CHORD POINT OF THE BEAM.

HANGER ATTACHMENTS TO CONCRETE SHALL NOT BE ALLOWED WITHOUT WRITTEN APPROVAL FROM THE BUILDING OWNER, AND STRUCTURAL ENGINEER PRIOR TO INSTALLATION.

INSTALL PRESSURE GAGES ON RISER OR FEED MAIN, AT EACH SPRINKLER TEST CONNECTION, AND AT TOP OF EACH STANDPIPE. INSTALL GAGES TO PERMIT REMOVAL, AND INSTALL WHERE THEY WILL NOT BE SUBJECT TO

PRESSURIZE AND CHECK PREACTION, DRYPIPE, AND/OR DELUGE SPRINKLER SYSTEM PIPING TRIM, AIR-PRESSURE MAINTENANCE DEVICES, AND AIR COMPRESSORS.

VALVE AND SPECIALTIES INSTALLATION

INSTALL LISTED FIRE-PROTECTION VALVES, TRIM AND DRAIN VALVES, SPECIALTY VALVES AND TRIM, CONTROLS, AND SPECIALTIES TO PROVIDE A FULLY FUNCTIONAL SPRINKLER SYSTEM ACCORDING TO NFPA 13 AND AUTHORITIES HAVING JURISDICTION.

INSTALL LISTED FIRE-PROTECTION SHUTOFF VALVES SUPERVISED OPEN. LOCATED TO CONTROL SOURCES OF WATER SUPPLY EXCEPT FROM FIRE-DEPARTMENT CONNECTIONS. INSTALL PERMANENT IDENTIFICATION SIGNS INDICATING PORTION OF SYSTEM CONTROLLED BY EACH VALVE.

SPRINKLER INSTALLATION

INSTALL SPRINKLERS IN SUSPENDED CEILINGS IN CENTER OF ACOUSTICAL CEILING PANELS

DRY-TYPE SPRINKLERS CAN BE USED WITH WET-PIPE SPRINKLER SYSTEMS IN ACCORDANCE WITH THEIR COMPLY WITH FM GLOBAL'S "APPROVAL GUIDE" FOR FIRE-SERVICE-MAIN PRODUCTS. LISTING. TYPICAL APPLICATIONS WOULD BE IN FREEZER BOXES AND AT LOADING DOCKS WHERE DRY-TYPE SPRINKLER SUPPLY PIPE EXTENDS INTO A HEATED PLACE AND CONNECTS TO WET-PIPE SYSTEM. INSTALL

COMPLY WITH NFPA 24 FOR MATERIALS, INSTALLATIONS, TESTS, FLUSHING, AND VALVE AND HYDRANT DRY-TYPE SPRINKLERS WITH WATER SUPPLY FROM HEATED SPACE. DO NOT INSTALL PENDENT OR SIDEWALL, SUPERVISION FOR FIRE-SUPPRESSION WATER-SERVICE PIPING. WET-TYPE SPRINKLERS IN AREAS SUBJECT TO FREEZING.

INSTALL LABELING AND PIPE MARKERS ON EQUIPMENT AND PIPING ACCORDING TO REQUIREMENTS IN NFPA 13.

IDENTIFY SYSTEM COMPONENTS, WIRING, CABLING, AND TERMINALS

QUALITY CONTROL

PERFORM TESTS AND INSPECTIONS PER NFPA REQUIREMENTS

RETAIN FIRST PARAGRAPH BELOW TO DESCRIBE TESTS AND INSPECTIONS TO BE PERFORMED.

TESTS AND INSPECTIONS:

- 1. LEAK TEST: AFTER INSTALLATION, CHARGE SYSTEMS AND TEST FOR LEAKS. REPAIR LEAKS AND RETEST
- 2. TEST AND ADJUST CONTROLS AND SAFETIES. REPLACE DAMAGED AND MALFUNCTIONING CONTROLS
- 3. FLUSH, TEST, AND INSPECT SPRINKLER SYSTEMS ACCORDING TO NFPA 13, "SYSTEMS ACCEPTANCE" CHAPTER.
- 4. ENERGIZE CIRCUITS TO ELECTRICAL EQUIPMENT AND DEVICES.
- COORDINATE WITH FIRE-ALARM TESTS. OPERATE AS REQUIRED.
- VERIFY THAT EQUIPMENT HOSE THREADS ARE SAME AS LOCAL FIRE-DEPARTMENT EQUIPMENT.

SPRINKLER PIPING SYSTEM WILL BE CONSIDERED DEFECTIVE IF IT DOES NOT PASS TESTS AND INSPECTIONS.

PREPARE TEST AND INSPECTION REPORTS

CLEAN DIRT AND DEBRIS FROM SPRINKLERS.

REMOVE AND REPLACE SPRINKLERS WITH PAINT OTHER THAN FACTORY FINISH

ENGAGE A FACTORY-AUTHORIZED SERVICE REPRESENTATIVE TO TRAIN OWNER'S MAINTENANCE PERSONNEL TO ADJUST, OPERATE, AND MAINTAIN ALL VALVES AND PRESSURE-MAINTENANCE PUMPS.

FIRE DEPARTMENT CONNECTION

1. EXPOSED-TYPE FIRE-DEPARTMENT CONNECTIONS.

BODY MATERIAL: CORROSION-RESISTANT METAL

INLETS: BRASS WITH THREADS ACCORDING TO NFPA AND MATCH LOCAL FIRE-DEPARTMENT SIZES AND THREADS INCLUDE EXTENSION PIPE NIPPLES, BRASS LUGGED SWIVEL CONNECTIONS, AND CHECK DEVICES OR CLAPPERS.

CAPS: BRASS, LUGGED TYPE, WITH GASKET AND CHAIN.

ESCUTCHEON PLATE: ROUND, BRASS, WALL TYPE WITH FINISH TO MATCH SPECIFIED FDC FINISH.

OUTLET: BACK, WITH PIPE THREADS.

NUMBER OF INLETS: TWO

ESCUTCHEON PLATE MARKING: SIMILAR TO "AUTO SPKR & STANDPIPE."

FINISH: ROUGH BRASS OR BRONZE.

OUTLET SIZE: TO MEET NFPA MINIMUM REQUIREMENT.

INSTALLER TO EXAMINE CONDITIONS AND VERIFY EXACT LOCATION AND RECIEVE APPROVAL FROM AHJ FOR COMPLIANCE WITH REQUIREMENTS FOR INSTALLATION TOLERANCES AND OTHER CONDITIONS AFFECTING PERFORMANCE OF FIRE-DEPARTMENT CONNECTIONS.

EXAMINE ROUGHING-IN FOR FIRE-SUPPRESSION STANDPIPE SYSTEM TO VERIFY ACTUAL LOCATIONS OF PIPING CONNECTIONS BEFORE FIRE-DEPARTMENT CONNECTION INSTALLATION.

PROCEED WITH INSTALLATION ONLY AFTER UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.

INSTALL PROTECTIVE PIPE BOLLARDS AROUND EACH FIRE-DEPARTMENT CONNECTION.

FIRE SUPPRESSION WATER SERVICE PIPING

FIRE PROTECTION CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL NECESSARY EQUIPMENT AND LABOR FOR A FULLY FUNCTIONING FIRE-SUPPRESSION WATER-SERVICE PIPING AND RELATED COMPONENTS OUTSIDE THE BUILDING AND SERVICE ENTRANCE PIPING THROUGH FLOOR INTO THE BUILDING INCLUDING BUT NOT LIMITED TO THE FOLLOWING:

- 1. PIPES, FITTINGS, AND SPECIALTIES.
- 2. FIRE-SUPPRESSION SPECIALTY VALVES CONCRETE VAULTS.
- PROTECTIVE ENCLOSURES.
- ALARM DEVICES.

REFER TO CIVIL DRAWINGS FOR ADDITIONAL INFORMATION, AND COMPLETE SCOPE OF WORK.

SHOP DRAWINGS AND SUBMITTALS ARE TO INCLUDE: DETAIL PRECAST CONCRETE VAULT ASSEMBLIES AND INDICATE DIMENSIONS, METHOD OF FIELD ASSEMBLY, AND

COMPONENTS.

INCLUDE DIAGRAMS FOR POWER, SIGNAL, AND CONTROL WIRING.

COORDINATION DRAWINGS: FOR PIPING AND SPECIALTIES INCLUDING RELATION TO OTHER SERVICES IN SAME AREA, DRAWN TO SCALE. SHOW PIPING AND SPECIALTY SIZES AND VALVES, METER AND SPECIALTY LOCATIONS, AND ELEVATIONS.

ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH STANDARDS OF UTILITY COMPANY AND AUTHORITIES

PIPING MATERIALS SHALL BEAR LABEL, STAMP, OR OTHER MARKINGS OF SPECIFIED TESTING AGENCY.

ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, BY A QUALIFIED TESTING AGENCY, AND MARKED FOR INTENDED LOCATION AND APPLICATION.

#2 Daniel Drive O'Fallon, MO 63366 ph: 314.640.6212

Michael J. Baalman ARCHITECT License#: A-2012004035 Certificate of Authority:

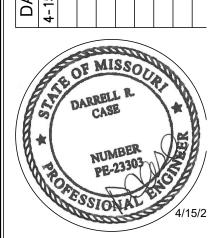
2014003655 CIVIL ENGINEER BAX ENGINEERING CO., INC. 221 Point West Blvd St. Charles, Missouri 63301 Phone: 636-928-5552 Contact: Mark Struckhoff, P.E. mstruckhoff@baxengineering.com

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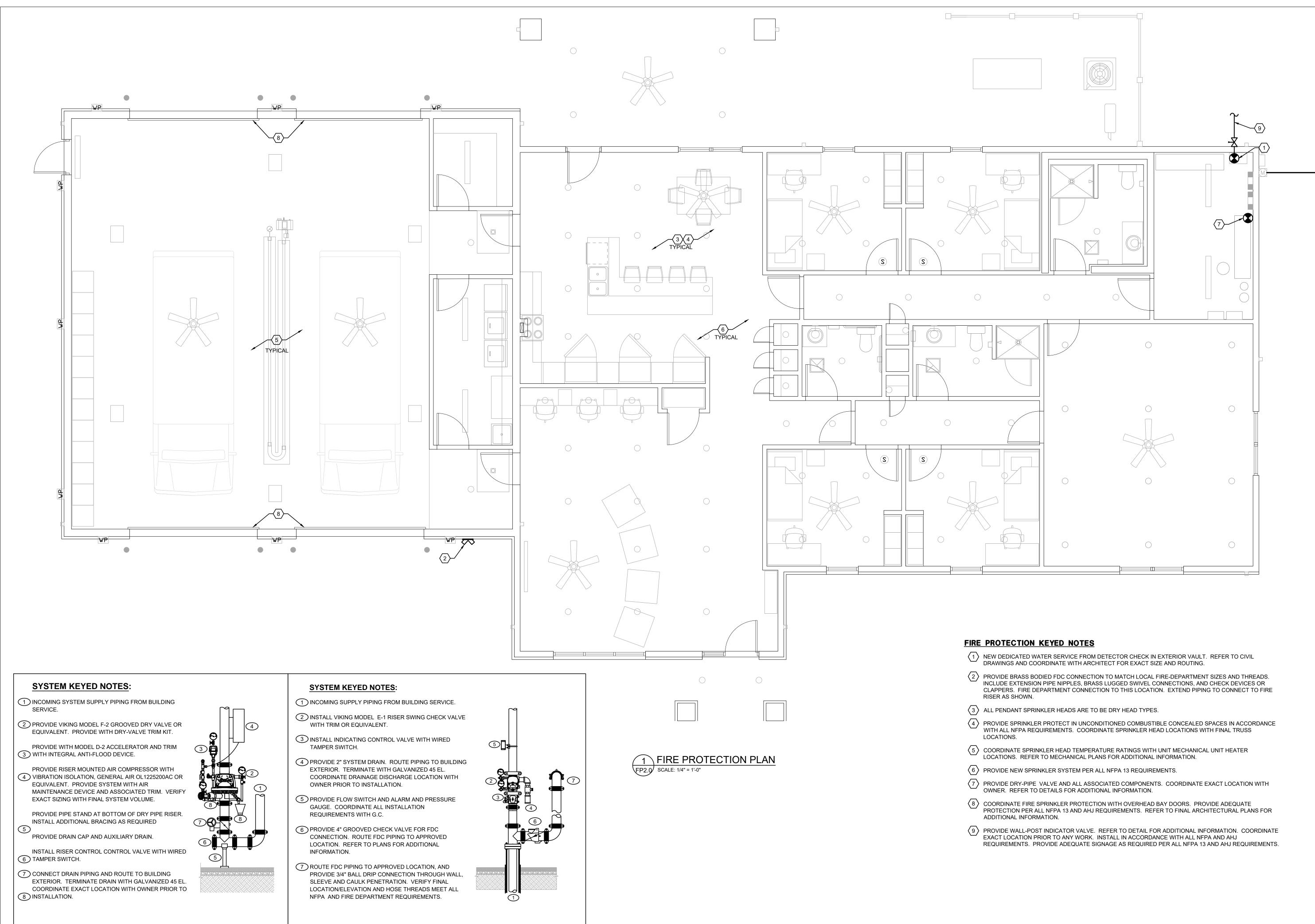
PROJECT MANAGER: JE DRAWN BY: CK

PROJECT NUMBER 21-079 DATE

April 15, 2022

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PROTECTION NOTES & SPECIFICATIONS



FIRE PROTECTION DRY PIPE VALVE DETAIL:

SCALE: NTS.

FIRE PROTECTION RISER CHECK SERVICE ENTRANCE DETAIL:

BAALMAN ARCHITECTS

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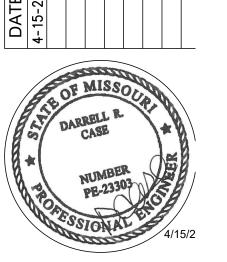
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FIRE PROTECTION