MECHANICAL NOTES: GENERAL:

- "VERIFY" SHALL MEAN CHECK CONDITIONS ON SITE AGAINST DRAWINGS AND SPECIFICATION AND ADJUST WORK TO MATCH EXISTING. OBTAIN RULING FROM OWNER ON ANY ITEMS REQUIRING CLARIFICATION
- 2. PROVIDE A COMPLETE FUNCTIONAL HVAC SYSTEM WITH ALL ACCESSORIES REQUIRED FOR PROPER OPERATION ALL IN ACCORDANCE WITH THE APPLICABLE STATE AND LOCAL AUTHORITY CODES, LAWS & ORDINANCES AND STATE AND LOCAL AUTHORITY ACCESSIBILITY LAWS AND ORDINANCES.

3. THE SYSTEMS SHALL BE FREE FROM ANY OBJECTIONABLE NOISES AND VIBRATIONS.

- 4. ALL MECHANICAL WORK & EQUIPMENT SHALL CONFORM TO THE CURRENT REQUIREMENTS OF ALL AUTHORITIES HAVING JURISDICTION. MECHANICAL WORK SHALL COMPLY WITH THE CURRENT EDITION OF THE INTERNATIONAL MECHANICAL CODE, STATE & LOCAL AMENDMENTS, NFPA-54, NFPA-90A, SMACNA & ASHRAE GUIDELINES.
- 5. CONTRACTOR SHALL SECURE ALL PERMITS, INSPECTION CERTIFICATES, AUTHORITY APPROVALS AND PAY ALL RELATED FEES AND CHARGES.
- 6. ALL NEW MECHANICAL EQUIPMENT AND SYSTEMS SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR AFTER ACCEPTANCE BY THE OWNER. COMPRESSORS SHALL HAVE AN EXTENDED 4 YEAR COMPRESSOR
- 7. THE CONTRACTOR SHALL CONFIRM AND ENSURE THAT ALL MECHANICAL WORK CONFORMS TO THE CURRENT REQUIREMENTS OF THE LOCAL BUILDING INSPECTION DEPARTMENT.
- 8. ALL MECHANICAL EQUIPMENT AND MATERIALS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS AND RECOMMENDATIONS.
- 9. THE CONTRACTOR SHALL PREPARE DUCT CONSTRUCTION SHOP DRAWINGS, TO SCALE, (MIN. SCALE 1/4" =1 FT). SUBMIT TO THE OWNER FOR REVIEW PRIOR TO FABRICATION AND INSTALLATION. DUCT SHOP DRAWINGS SHALL BE UPDATED, DURING CONSTRUCTION, TO SHOW ANY CHANGES MADE DURING CONSTRUCTION AND SUBMITTED TO THE OWNER AT THE END OF THE PROJECT FOR "AS-BUILT" RECORD.
- 10. THE MECHANICAL (SUB)CONTRACTOR SHALL COORDINATE THE SPACE REQUIREMENTS FOR ALL MECHANICAL EQUIPMENT AND DUCTWORK WITH THE GENERAL CONTRACTOR. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR ORDERING AND FABRICATION OF STRUCTURAL ELEMENTS, INCLUDING ROOF TRUSSES, TO SUIT THE PROPOSED ROUTING OF THE DUCTWORK AND LOCATION OF EQUIPMENT. PROVIDE ADEQUATE CLEARANCES AROUND, AND ACCESS TO, ALL EQUIPMENT FOR MAINTENANCE.
- 11. WALL, FLOOR OR CEILING SURFACES DISTURBED DURING THE COURSE OF THE MECHANICAL WORK SHALL BE REPAIRED TO MATCH NEW &/OR EXISTING SURROUNDING CONDITIONS.
- 12. REFER TO ARCHITECT'S REFLECTED CEILING PLANS FOR LOCATION OF LIGHTS AND OTHER CEILING MOUNTED DEVICES. COORDINATE AIR DISTRIBUTION DEVICES WITH THIS REFLECTED CEILING PLAN. IF A PARTICULAR ITEM CANNOT BE LOCATED APPROXIMATELY AS SHOWN ON THE HVAC LAYOUT THE CONTRACTOR SHALL PREPARE A DRAWING SHOWING A PROPOSED LOCATION AND SHALL SUBMIT IT TO THE OWNER FOR APPROVAL
- 13. COORDINATE THE INSTALLATION OF THE DUCTWORK, EQUIPMENT, PIPING, ETC., TO FIT WITHIN THE SPACE ALLOWED BY THE ARCHITECTURAL & STRUCTURAL CONDITIONS. CUTTING OR ALTERING ANY STRUCTURAL MEMBER SHALL NOT BE PERMITTED.
- 14. DO NOT SCALE DRAWINGS. THE CONTRACTOR SHALL VERIFY ALL SIZES, MATERIALS, TEMPERATURES AND PRESSURES BEFORE ORDERING OR FABRICATION OF ANY MATERIALS.
- 15. WHERE DUCT OR PIPE SECTION SIZE IS NOT INDICATED, IT SHALL BE THE SAME SIZE AS THE LAST SIZED UPSTREAM SECTION.
- 16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SAFETY OF OWN PERSONNEL EMPLOYED ON THIS PROJECT AND IN PARTICULAR WHEN WORKING IN CONFINED SPACES AND SHALL COMPLY WITH OSHA
- 17. PIPING, CONDUITS, CABLES, ETC. SHALL BE RUN NEATLY, PARALLEL TO NEW PIPING AND TO BUILDING
- (WALLS, FLOOR). 18. THE SCHEDULED "BASIS OF DESIGN" IS INTENDED TO INDICATE THE PERFORMANCE REQUIRED FOR THE PARTICULAR ITEM OF EQUIPMENT. SUBSTITUTIONS WILL BE PERMITTED. SUBSTITUTIONS SHALL BE DEEMED TO INCLUDE ALL ASSOCIATED CHANGES TO BUILDING, STRUCTURE & OTHER SERVICES WITHOUT ANY ADDITIONAL COST TO THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THAT

SUBSTITUTIONS SHALL FIT INTO THE SPACE AVAILABLE WITH PROVISIONS FOR PROPER ACCESS,

- MAINTENANCE, PARTS REPLACEMENT, WEIGHT ALLOWANCE & FOR COORDINATION WITH OTHER TRADES (INCLUDING ELECTRICAL, PLUMBING, STRUCTURAL AND ARCHITECTURAL). 19. MANUFACTURER CATALOG SHOP DRAWINGS SUBMITTED SHALL BE MARKED TO INDICATE PROJECT SPECIFIC INFORMATION. FULL MODEL NUMBERS; IDENTIFY AND HIGHLIGHT SCHEDULED ITEM CAPACITIES; HIGHLIGHT INCLUDED OPTIONS AND EDIT OUT THOSE THAT ARE NOT PROVIDED; CLEARLY IDENTIFY DEVIATIONS FROM
- 20. A TECHNICIAN, FACTORY TRAINED AND CERTIFIED BY THE MANUFACTURER OF THE HVAC EQUIPMENT PROVIDED SHALL PERFORM PRE START-UP CHECKS AND SHALL SUBMIT A REPORT TO THE OWNER ON EACH AIR HANDLING UNIT, RTU AND SPLIT SYSTEM. THIS REPORT SHALL INCLUDE CERTIFICATION, IN WRITING, THAT EQUIPMENT IS CORRECTLY INSTALLED, INCLUDING PROPER DRAINAGE FROM DRAIN PANS AND SEALING OF ALL AIR LEAKS, ELECTRICAL CONNECTIONS AND TERMINALS TIGHTNESS, INDOOR FILTER ARE CLEAN, IN PLACE AND EASILY REPLACEABLE, FANS AND COMPRESSORS ROTATE CORRECTLY, ELECTRICAL AMP DRAWS SHALL BE RECORDED AND CERTIFIED WITHIN MANUFACTURERS RECOMMENDED LIMITS, REFRIGERANT SUCTION AND DISCHARGE PRESSURES FOR ALL CIRCUITS WITH STATEMENT THAT SYSTEMS ARE CORRECTLY CHARGED.

ELECTRICAL/CONTROLS:

SPECIFIED AND SCHEDULED CAPACITIES.

- 21. THE CONTRACTOR SHALL VERIFY THE ELECTRICAL SUPPLY VOLTAGES AND PHASES ON THE ELECTRICAL PLANS AND ON SITE BEFORE ORDERING ANY ELECTRICALLY OPERATED EQUIPMENT. ALL MECHANICAL EQUIPMENT REQUIRING ELECTRICAL POWER SHALL BE PROVIDED & INSTALLED WITH SUITABLY PROTECTED AND RATED DISCONNECT SWITCHES.
- 22. MOUNT THERMOSTATS AS INDICATED ON PLANS 48" A.F.F. UNLESS OTHERWISE NOTED OR AS REQUIRED FOR ACCESSIBILITY CODE COMPLIANCE. COORDINATE LOCATION OF THERMOSTATS WITH CABINETRY AND OTHER SERVICES. THE THERMOSTATS SHALL NOT BE INSTALLED ON OUTSIDE WALLS, IN THE DIRECT AIR STREAM FROM ANY DIFFUSER OR WHERE IT MAY BE INFLUENCED BY HEAT GIVEN OFF FROM EQUIPMENT.
- 23. ALL CONTROL WIRING & TRANSFORMERS SHALL BE SUPPLIED UNDER THE MECHANICAL CONTRACT. ALL MECHANICAL CONTROLS SHALL BE SUPPLIED BY THE MECHANICAL CONTRACTOR.
- 24. SMOKE DETECTORS SHALL BE SIMPLEX, NOTIFIER, EDWARDS, FENWALL OR OTHER APPROVED BY THE LOCAL AUTHORITY. INSTALL IN THE SUPPLY AIR DUCTS AND WIRE TO AUTOMATICALLY SHUT DOWN THE AIR HANDLING EQUIPMENT UPON DETECTION OF SMOKE AS REQUIRED BY NFPA 90A. PROVIDE ACCESS FOR INSPECTION OF DUCT PROBES. PROVIDE AN AUXILIARY CONTACT FOR INTERLOCKING WITH A FIRE ALARM SYSTEM. REMOTE INTERLOCK WIRING SHALL BE DONE BY THE FIRE ALARM CONTRACTOR. IF THERE IS NO BUILDING FIRE ALARM SYSTEM PROVIDE AUDIBLE/VISIBLE INDICATION PER NFPA 90A.

DUCTWORK:

- 25. SUPPLY, RETURN, OUTDOOR AND EXHAUST AIR DUCTWORK SHALL BE GALVANIZED SHEET METAL, FABRICATED AND INSTALLED PER THE LATEST ISSUE OF THE SMACNA DUCT HVAC DUCT CONSTRUCTION STANDARDS, METAL AND FLEXIBLE, CURRENT EDITION, CONSTRUCTION MANUAL. SEAL ALL SUPPLY AIR DUCT JOINTS TO SMACNA SEAL CLASS "A". DUCT LEAKAGE SHALL NOT EXCEED 1 PERCENT OF THE SPECIFIED AIR FLOWS WHEN TESTED AT 1" WG.
- 26. SEAL ALL LONGITUDINAL & TRANSVERSE SEAMS ON ALL DUCTWORK WITH UL 181A OR 181B TAPES AND
- 27. ALL ROUND DUCTWORK SHALL COMPLY WITH THE STANDARD GAUGE AS LISTED BELOW: CDIDAL DIDE LONG CEAM DIDE FITTINGS

DIAMETER	SPIRAL PIPE	LUNG SEAM PIPE	FILLINGS
3" - 14"	28	26	26
15" - 26"	26	24	24
27" - 36"	24	22	22

- 37. MANUAL VOLUME DAMPERS:
- A. DAMPERS WITH LOCKING AND INDICATING QUADRANTS TO BE INSTALLED IN EACH BRANCH
- OF DUCTS INDICATED ON THE DRAWINGS IN ADDITION TO VOLUME CONTROL AT OUTLETS. B. AFTER FINAL ADJUSTMENT OF SYSTEM, LOCK QUADRANTS AND MARK CLEARLY SHOWING
- DAMPER POSITION, (OPEN AND SHUT POSITIONS). C. DAMPERS IN ROUND DUCT SHALL BE SINGLE BLADE TYPE.
- D. DAMPERS IN RECTANGULAR DUCTS: DUCTS EQUAL TO OR LESS THAN 11" SHALL BE SINGLE

BLADE; DUCTS 12" AND LARGER IN HEIGHT SHALL BE OPPOSED BLADE TYPE.

- 38. DUCT SIZES SHOWN ARE INSIDE CLEAR DIMENSIONS.
- 39. ALL DUCTWORK, AND EQUIPMENT SHALL BE SUPPORTED INDEPENDENTLY FROM STRUCTURAL MEMBERS. PROVIDE ADDITIONAL SUPPORT MEMBERS WHERE REQUIRED TO ACHIEVE SMACNA RECOMMENDED SUPPORT
- 40. PROVIDE TURNING VANES AT ALL 90-DEGREE ELEBOWS IN DUCTWORK EXCEEDING 20" WIDTH, 45 DEGREE SIDE TAKEOFF (STO) AT BRANCH DUCTS WITH VOLUME CONTROL (ONLY AS SHOWN ON DRAWINGS), SPLITTER DAMPERS, & ANY OTHER APPLICABLE DEVICES NECESSARY FOR MINIMUM DUCT RESISTANCE & PROPER AIR BALANCING. ALL DAMPERS OR SPLITTERS SHALL SUFFICIENTLY STIFFENED TO PREVENT NOISE OR VIBRATION & SHALL BE FITTED WITH ACCESSIBLY LOCATED ADJUSTER.
- 41. ALL DUCT TRANSITION FROM SQUARE TO ROUND SHALL BE SMOOTH SQUARE TO ROUND TRANSITIONS.
- SPIN-IN FITTINGS AT THE END OF CAPPED DUCTS ARE NOT ACCEPTABLE. 42. DUCTWORK SHALL BE RIGID SHEETMETAL EXCEPT FOR 8 FOOT MAXIMUM FLEXIBLE DUCTS AT AIR
- REGISTERS. 43. WHERE FLEXIBLE DUCT IS CONNECTED TO CEILING DIFFUSERS, THE CONTRACTOR SHALL USE ONE OF THESE THREE METHODS:
- A. INSULATED FLEXIBLE DUCT WITH TITUS FLEXRIGHT FLEXIBLE DUCT SUPPORT, UL LISTED, TO
- FORM DUCT ELBOW. B. A SHEET METAL ELBOW, EXTERNALLY INSULATED.
- C. INSULATED FLEXIBLE METAL DUCT CONSISTING OF FLEXIBLE METAL CORE OF CORRUGATED ALUMINUM WITH EXTERNAL INSULATION. IN ALL CASES DUCT CONNECTION/ELBOW SHALL BE MADE WITH A BEND THAT HAS NOT LESS THAN ONE DUCT DIAMETER CENTERLINE REDIAL.
- 44. TRANSITION RECTANGULAR DUCTWORK ON THE BOTTOM AND THE SIDES. MAINTAIN DUCTWORK LEVEL AND AS HIGH AS POSSIBLE UNLESS NOTED OTHERWISE.
- 45. THE FINISH ON DIFFUSERS, REGISTERS, GRILLES, LOUVERS, ETC., SHALL BE APPROVED BY THE
- 46. PORTIONS OF DUCTWORK OR PIPING VISIBLE THROUGH GRILLES AND REGISTERS IN FINISHED AREAS SHALL BE PAINTED FLAT BLACK.
- 47. CHANGES IN ELEVATION, ACCESS DOORS AND TRANSITIONS IN DUCT SIZES ARE, OR MAY NOT, ALL BE SHOWN ON THE DRAWINGS. DUCT CROSS-OVERS IMPLY CHANGES IN ELEVATION IN ONE OR BOTH DUCTS; TRANSITIONS IN DUCT SIZE AND SHAPE ARE IMPLIED BY SIZES SHOWN ON DRAWINGS. BIDDERS SHALL MAKE ALLOWANCE FOR THESE IN THEIR PRICE.
- 48. TRANSFORM DUCT SIZE SHOWN TO SUIT EQUIPMENT CONNECTION SIZE AT CONNECTIONS TO EQUIPMENT. 49. ALL DUCTWORK CONNECTED TO FAN OR VIBRATING EQUIPMENT SHALL BE FITTED WITH FLEXIBLE CANVASS CONNECTION, WHICH WILL PROVIDE MINIMUM 1" SPACE BETWEEN THE EQUIPMENT & THE DUCTWORK. FLEXIBLE CANVASS CONNECTORS SHALL BE SECURED IN PLACE WITH IRON BANDS WITH ROLL LOCK SEAM. & SHALL BE AIR LEAK TIGHT.
- 50. ALL NEW RIGID SHEETMETAL SUPPLY, RETURN AND OUTDOOR AIR DUCTWORK, SHALL BE INSULATED WITH 2" THICK. 1 LB DENSITY DUCT INSULATION WITH FIRE RATED VAPOR BARRIER (INSTALLED R=6).
- 51. ALL INSULATION SHALL HAVE FLAME AND SMOKE RATING OF 25 AND 50 RESPECTIVELY. OVERLAP BUTTING EDGES, FOLD, SEAL AND TAPE AND PROVIDE A CONTINUOUS VAPOR BARRIER.
- 52. EXHAUST DUCT SHALL NOT BE INSULATED UNLESS OTHERWISE NOTED. 53. FLEXIBLE DUCT BE UL LISTED, CLASSIFIED AS A CLASS 1 AIR DUCT, TESTED UNDER UL STANDARD 181 AND MEET LOCAL CODE REQUIREMENTS. FLEXIBLE SUPPLY DUCTS SHALL HAVE FACTORY INSTALLED FIBER GLASS INSULATION AND A FIRE RETARDANT VAPOR BARRIER JACKET WITH A PERM RATING OF NOT
- OVER 0.1, A MINIMUM "R" VALUE OF 6, AND WHICH COMPLY WITH NFPA STANDARD 90A. 54. SPIN-IN COLLARS SHALL BE PROVIDED AT ALL ROUND TAPPINGS FROM RECTANGULAR DUCTS; SHALL BE CONSTRUCTED OF GALVANIZED STEEL AND SHALL BE CONICAL TYPE EQUIPPED WITH A MANUAL BALANCING DAMPER. DO NOT PROVIDE AIR SCOOP.
- 55. DUCT BRANCH RUN-OUTS TO THE DIFFUSERS UNLESS OTHERWISE NOTED SHALL BE THE SAME AS THE DIFFUSER NECK SIZES.
- 56. THE CONTRACTOR SHALL PROVIDE ALL FRAMING REQUIRED FOR THE INSTALLATION OF CEILING, WALL AND FLOOR AIR REGISTERS TO SUIT THE CONSTRUCTION.
- 57. ROOF CURBS, RAILS AND PENETRATIONS: ALL ROOF PENETRATIONS SHALL BE WATERPROOF AND GUARANTEED FREE FROM LEAKS FOR ONE YEAR. USE CURBS AND RAILS MANUFACTURED BY THE MANUFACTURER OF THE EQUIPMENT PROVIDED OR BY PATE, CUSTOM CURBS OR APPROVED EQUAL. INSTALL ROOF MOUNTED AIR HOODS AND EQUIPMENT CURBS AND RAILS IN ACCORDANCE WITH THE EQUIPMENT MANUFACTURERS' INSTRUCTIONS AND THE "GUIDELINES FOR ROOF MOUNTED OUTDOOR AIR-CONDITIONER INSTALLATIONS" AS PREPARED BY ARI, SMACNA AND THE NATIONAL ROOFING CONTRACTORS ASSOCIATION., AUGUST 1985. THE CURBS FOR THE ROOF MOUNTED EQUIPMENT SHALL BE SELECTED BY THE MANUFACTURER OF THE CURB TO SUIT THE TYPE OF ROOF AND STRUCTURE AND SHALL BE FABRICATED TO MATCH THE
- FOOTPRINTS AND INSTALLATION REQUIREMENTS OF THE EQUIPMENT PROVIDED. ALL ROOFING WORK SHALL BE DONE IN ACCORDANCE WITH THE REQUIREMENTS, AND TO THE APPROVAL, OF THE MANUFACTURER OF THE BUILDING AND ROOFING SYSTEMS PROVIDED. 58. THE TOTAL CFMS AT DIFFUSERS MAY NOT ADD UP TO THE TOTAL CFM'S SCHEDULED FOR THE RTUS IN ALL CASES. WHERE THIS OCCURS ADJUST THE FAN DRIVES TO ACHIEVE THE DESIGN CFM'S AT THE
- 59. PRIOR TO FINAL CONNECTION TO EQUIPMENT, BRANCH DUCTS, DIFFUSERS, ETC. ALL OPENINGS IN DUCTWORK SHALL BE SEALED TO PREVENT DIRT, DUST, DEBRIS FROM ENTERING THE AIR DISTRIBUTION SYSTEM.

PIPING:

- 60. REFRIGERANT PIPING SHALL BE HARD-DRAWN TYPE K SEAMLESS COPPER TUBING, ASTM B88-74. FITTINGS SHALL BE WROUGHT, ANSI B16-22-63, COPPER WITH A WORKING PRESSURE OF NOT LESS THAN 300 PSIG. REFRIGERANT PIPING SHALL BE SIZED AND INSTALLED IN ACCORDANCE WITH THE EQUIPMENT MANUFACTURERS RECOMMENDATIONS. CONTRACTOR SHALL PROVIDE WRITTEN CERTIFICATION FORM EQUIPMENT MANUFACTURER AS TO THE CORRECTNESS OF THE LINE SIZES.
- 61. INSULATE ALL SUCTION LINES AND FITTINGS WITH PRE-FORMED ARMAFLEX AP INSULATION, 1/2" THICK. USE ARMAFLEX 520 ADHESIVE ON ALL JOINTS. ALL INSULATION MATERIALS SHALL HAVE A FLAME SPREAD RATING OF 25 OR LESS, SMOKE DEVELOPED RATING OF 50 OR LESS WHEN TESTED PER ASTM E 84 & THERMAL CONDUCTIVITY OF NO GREATER THAN 0.27 (BTU*IN)/(HR*FT2* F) PER ASTM C
- 62. PROVIDE PIPE SLEEVES FOR REFRIGERANT AND CONDENSATE LINES PENETRATING EXTERIOR WALLS. SEAL VOIDS WATER-TIGHT AROUND PIPING WITH A WEATHER TIGHT PERMANENT NON-SHRINKING SEALANT.
- 63. REFRIGERANT LINE SETS TO BE RUN CONTINUOUSLY BETWEEN FLOORS AND EXIST OUT OF BUILDING THROUGH EXTERIOR WALL 64. CONDENSATE DRAIN PIPING AND FITTINGS SHALL BE PVC. THE CONDENSATE DRAIN SHALL BE THE SAME
- SIZE AS THE UNIT DRAIN CONNECTION BUT SHALL NOT BE LESS THAN 3/4" DIAMETER PIPE. 65. ENSURE PROPER CONDENSATE REMOVAL FROM ALL FAN COIL UNIT DRAINS. INSTALL WITHOUT ANY
- SAGGING TO ENSURE COMPLETE DRAINAGE. SLOPE CONDENSATE DRAIN PIPING MIN. 1/8" PER FOOT TOWARD DRAIN. (VERIFY WITH PLUMBING CONTRACTOR LOCATION OF DRAIN). 66. SUPPORT CONDENSATE PIPING WITH SUPPORT HEIGHTS GRADED TO PROVIDE A TOTAL PITCH OF 6"
- FROM TRAP TO ROOF DRAIN OR GUTTER. DO NOT DISCHARGE CONDENSATE ONTO THE ROOF.
- 67. PROVIDE MIN. 1-1/2" SECONDARY DRAIN PANS UNDER EACH AIR HANDLING UNIT. PROVIDE A FLOAT SWITCH THAT WILL SHUT-DOWN UNIT IF CONDENSATE REACHES MAXIMIMUM 1/2" IN PAN.

MISCELLANEOUS:

- 68. ELECTRIC HEATERS: ELECTRIC HEATERS SHALL HAVE THERMAL CUTOUTS FOR PRIMARY AND SECONDARY OVER-TEMPERATURE PROTECTION SHALL BE PROVIDED TO MEET UL AND NEC SAFETY REQUIREMENTS. INTEGRAL SAFETY CONTROLS SHALL BE FURNISHED BY THE MANUFACTURER.
- 69. ALL WALL OPENINGS NOTED ON FLOOR PLANS SHALL BE LOCATED ABOVE THE CEILING. 70. CONTRACTOR SHALL PROVIDE OPENINGS IN WALLS ABOVE CEILING WHEREVER WALLS GO TO CEILING.
- REFER TO INTERIOR DESIGN DRAWINGS FOR PARTITION DESCRIPTION. 71. THE GENERAL CONTRACTOR SHALL ENSURE THAT THE BUILDING ENVELOPE AROUND THE AIR CONDITIONED SPACE IS SEALED. THE MECHANICAL CONTRACTOR SHALL ENSURE THAT RETURN AND EXHAUST AIR DUCT LOCATED OUTSIDE THE AIR CONDITIONED ENVELOPE, WHICH INCLUDES VERTICAL CHASES, CEILING SPACES,

OWNERS MANUAL:

ATTICS, ETC., ARE SEALED.

72. FOUR COPIES OF AN OWNERS MANUAL SHALL BE FORWARDED TO THE OWNER WITHIN 90 DAYS AFTER THE DATE OF SYSTEM ACCEPTABLE. OWNERS MANUAL SHALL INCLUDE AS MINIMUM:

- DATA STATING EQUIPMENT SIZE AND ALL INSTALLED OPTIONS FOR EACH ITEM OF MECHANICAL EQUIPMENT PROVIDED.
- b. COPIES OF THE INSTALLATION & PERFORMANCE REPORT BY THE REPRESENTATIVE OF THE ROOF TOP UNITS PROVIDED.
- c. COPIES OF THE TEST & BALANCE REPORT. NOTATIONS OF CORRECTIVE ACTION SHALL BE
- INCLUDED. d. COPIES OF THE MECHANICAL SUBCONTRACTOR'S FIRST YEAR INSTALLATION AND EQUIPMENT WARRANTIES. NOTATION SHALL BE INCLUDED TO SHOW THE EXPIRATION OF THE FIRST YEAR PARTS & LABOR GUARANTEE, & OF THE EXTENDED 4-YEAR COMPRESSOR (ONLY) WARRANTY.
- e. OPERATION AND MAINTENANCE MANUALS FOR EACH ITEM OF EQUIPMENT REQUIRING MAINTENANCE, EXCEPT FOR EQUIPMENT NOT FURNISHED AS PART OF THE PROJECT. REQUIRED ROUTINE MAINTENANCE ACTIONS SHALL BE CLEARLY IDENTIFIED
- NAMES AND ADDRESS OF AT LEAST ONE SERVICE AGENCY.
- q. HVAC CONTROLS SYSTEMS MAINTENANCE AND CALIBRATION INFORMATION, INCLUDING WIRING DIAGRAMS, SCHEMATICS AND CONTROL SEQUENCE DIAGRAM. DESIRED OR FIELD DETERMINED SET POINTS SHALL BE PERMANENTLY RECORDED ON CONTROL DRAWINGS AT CONTROL DEVICES OR FOR DIGITAL CONTROL SYSTEMS, IN THE PROGRAMMING COMMENTS.

TEST AND BALANCE:

- 73. THE CONTRACTOR SHALL OBTAIN THE SERVICES OF AN INDEPENDENT TEST, ADJUSTMENT AND BALANCE (TAB) AND COMMISSIONING AGENCY TO TEST, ADJUST, BALANCE AND COMMISSION:
 - EACH SUPPLY AIR, RETURN, EXHAUST AND OUTDOOR AIR DISTRIBUTION SYSTEM, EACH CONTROL SYSTEM INCLUDING CALIBRATE ALL CONTROL ELEMENTS AND CHECK
 - OPERATION INCLUDING ALL INTERLOCKS.
 - OVERALL BUILDING AIR BALANCE REPORT ON ALL OF THE ABOVE.
- 74. TESTING AND BALANCING OF AIR DISTRIBUTION SYSTEMS SHALL BE PERFORMED, AT MINIMUM, IN ACCORDANCE WITH AABC NATIONAL STANDARDS, CURRENT EDITION, TEST AND BALANCE SHALL INCLUDE ALL EQUIPMENT AND DISTRIBUTION SYSTEMS AND SHALL BE REPORTED. AS A MINIMUM. ON FORMS AS PUBLISHED BY THE AABC; NEBB EQUIVALENT OR OTHER APPROVED EQUAL
- 75. MEASURE AND RECORD THE DRY BULB AND WET BULB TEMPERATURES, HUMIDITIES (WHERE CONTROLLED), AND PRESSURES IN ALL SPACES SERVED WHEN THE OUTSIDE TEMPERATURE IS ABOVE 85 F (SUMMER TAB) AND BELOW 50 F (WINTER TAB). RECORD OUTSIDE DRY BULB AND WET BULB.
- 76. THE AGENCY SHALL, UNLESS APPROVED OTHERWISE BY THE OWNER, BE AN AABC OR NEBB MEMBER AND THE TAB WORK SHALL BE DONE BY AN AABC OR NEBB CERTIFIED TEST AND BALANCE TECHNICIAN AND COMMISSIONING AGENT.
- 77. THE CONTROLS SYSTEM OPERATION SHALL BE CHECKED FOR PROPER CALIBRATION AND OPERATION AND A REPORT ON THE OPERATION AND ADJUSTMENT SHALL BE SUBMITTED TO THE OWNER. THE TAB AGENCY SHALL VERIFY BY CHECK MEASUREMENTS USING INDEPENDENT INSTRUMENTS IN THE FIELD TO ENSURE THAT THE CONTROLS INDICATION IS ACCURATE; EVERY SAFETY AND ALARM INTERLOCK SHALL BE CHECKED. THE INTERFACE WITH THE BUILDING FIRE ALARM SYSTEM SHALL BE CHECKED.
- 78. THE TAB AGENCY SHALL CHECK ALL THE SYSTEMS OPERATING TOGETHER TO ENSURE THAT THE AIR CONDITIONED SPACES ARE UNDER AN OVERALL POSITIVE PRESSURE; SHALL CHECK AND REPORT THAT THE BUILDING ENVELOPE IS PROPERLY SEALED AND UNCONTROLLED AIR LEAKAGE INTO THE BUILDING DOES NOT OCCUR; SHALL CHECK THAT RETURN AND EXHAUST DUCTS LOCATED OUTSIDE THE AIR CONDITIONED SPACE ARE SEALED; SHALL CHECK SUPPLY AIR DUCTS FOR LEAKS TO ENSURE THAT COLD AIR LEAKAGE DOES NOT CAUSE CONDENSATION ON DUCT, EQUIPMENT AND BUILDING SURFACES ABOVE THE CEILING (DURING SUMMER TAB); SHALL CHECK RETURN AND EXHAUST GRILLES FOR PROPER SEAL AT DUCT CONNECTIONS TO ENSURE THAT AIR DOES NOT ENTER THESE DUCTS THROUGH UNCONDITIONED WALLS, CHASES, ETC.
- 79. THE CONTRACTOR AND THE TAB AGENCY SHALL REVIEW THE PROPOSED SYSTEMS INSTALLATIONS AND DETERMINE ALL MEASURING AND BALANCING DEVICES REQUIRED FOR PROPER TEST AND BALANCE OF THE SYSTEMS. THESE SHALL INCLUDE, BUT SHALL NOT BE LIMITED TO, MANUAL AIR VOLUME BALANCING DAMPERS, ETC. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING THESE IN THE LOCATIONS RECOMMENDED BY THE TAB AGENCY, IN ADDITION TO ANY SHOWN ON THE DRAWINGS. THESE DEVICES SHALL BE PROVIDED UNDER THE CONTRACT.
- 80. THE TAB AGENCY SHALL CHECK ALL REFRIGERATION LINES FOR COMPLIANCE WITH THE EQUIPMENT MANUFACTURER'S INSTALLATION INSTRUCTIONS AND RECOMMENDATIONS, SHALL CHECK SUPERHEAT SETTINGS ON ALL SYSTEMS WITH LINES LONGER THAN 50 FEET.
- 81. INSTRUMENTS USED FOR TESTING AND BALANCING SHALL HAVE BEEN CALIBRATED WITHIN A PERIOD OF SIX MONTHS OF THE TIME OF THE TESTING AND BALANCING AND SUCH INSTRUMENTS SHALL BE CHECKED FOR ACCURACY PRIOR TO START OF WORK. SUBMIT VERIFICATION OF CERTIFICATION TO THE OWNER.
- 82. FOUR COPIES OF THE COMPLETE TEST REPORT SHALL BE SUBMITTED TO THE OWNER PRIOR TO FINAL INSPECTION OF THE PROJECT.
- 83. THE TAB REPORT SHALL INCLUDE A LIST OF ALL DEFICIENCIES FOUND DURING THE PRELIMINARY TESTING AND A CONTRACTOR RESPONSE INDICATING REMEDIAL ACTION TAKEN FOR EACH ITEM. THE TAB WORK SHALL NOT BE DEEMED DONE WITHOUT THIS REPORT.



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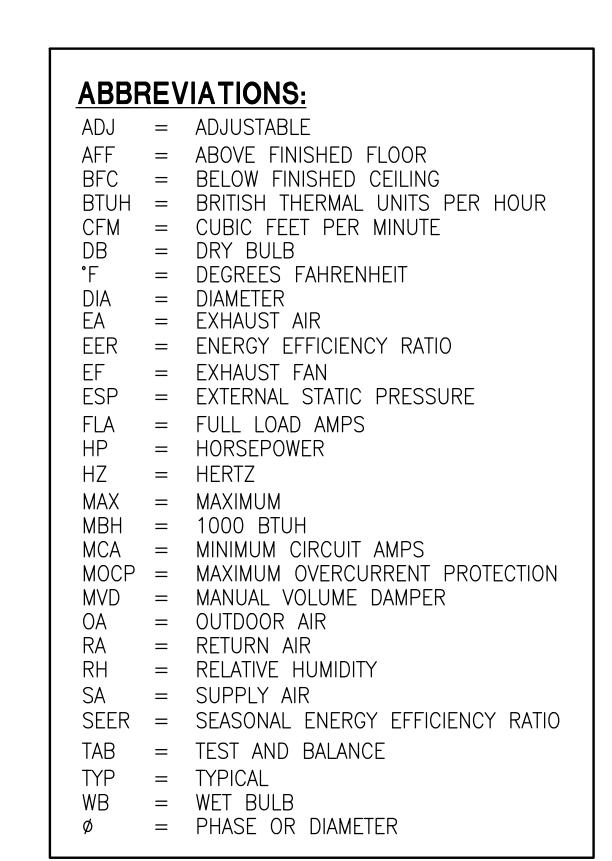
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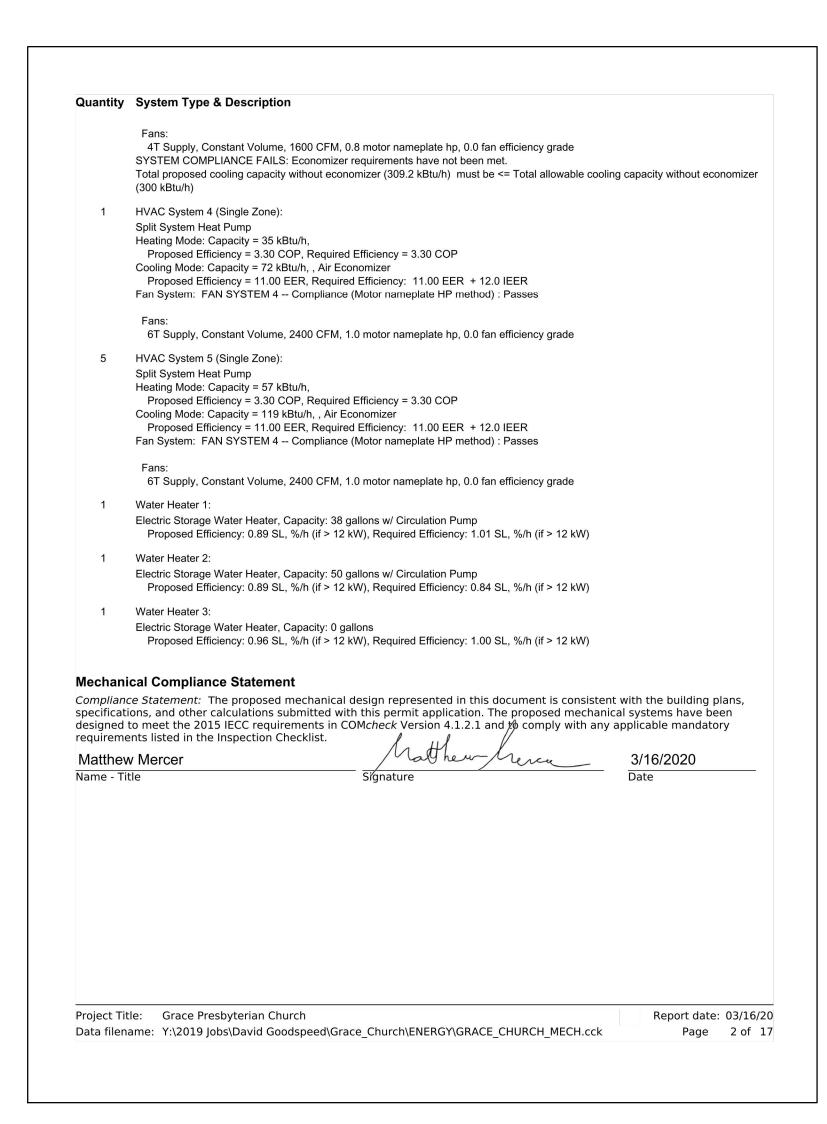


GAI PROJECT NO.	2019.08
DISTRIBUTION	
ISSUE DESCRIPTION	DATE
80% COORDINATION	2020 02 28
100% CONSTRUCTION	2020 03 16

SYMBOL	MECHANICAL LEGEND
<u> </u>	SIDE WALL SUPPLY REGISTER — SEE GRILLE & DIFFUSER SCHEDULE
	RETURN AIR GRILLE
\boxtimes	SUPPLY AIR DIFFUSER
	TRANSFER AIR GRILLE
	SIDE WALL RETURN GRILLE
Y WxD X	RIGID RECTANGULAR DUCTWORK (WIDTHxDEPTH)
	FLEXIBLE DUCT
Ū	ELECTRONIC PROGRAMMABLE THERMOSTAT WITH CLEAR LOCKING COVER
T	REMOTE TEMPERATURE SENSOR
SD	DUCT MOUNTED SMOKE DETECTOR
C02	CARBON DIOXIDE SENSOR
	MANUAL VOLUME CONTROL DAMPER (MVD)
(A) 150 12x6	GRILLE AIRFLOW & NECK SIZE TYPE (FACE SIZE) (SEE SCHEDULE)
	CEILING MOUNTED EXHAUST FAN
	WALL CAP
	ROOF HOOD
B	GRAVITY DAMPER
⊠ ^F	FLOOR MOUNTED SUPPLY REGISTER
-\- <u></u>	SIDEWALL MOUNTED EXHAUST/RETURN GRILLE
\Rightarrow	DUCT TAP WITH MANUAL VOLUME DAMPER
	EXHAUST/INTAKE LOUVER
	EXHAUST FAN







FOR CONSTRUCTION

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GA LICENSED CONNSULTING ENGINEERS

MECHANICAL / ELECTRICAL ENGINEER

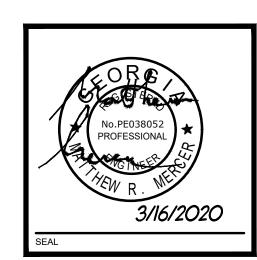
MARSHALL & BOLLWERK ENGINEERING, INC. 8681 HIGHWAY 92, SUITE 400 WOODSTOCK, GA 30189

GA LICENSED CONNSULTING ENGINEERS

P: 678.795.0333, F: 678.325.4559

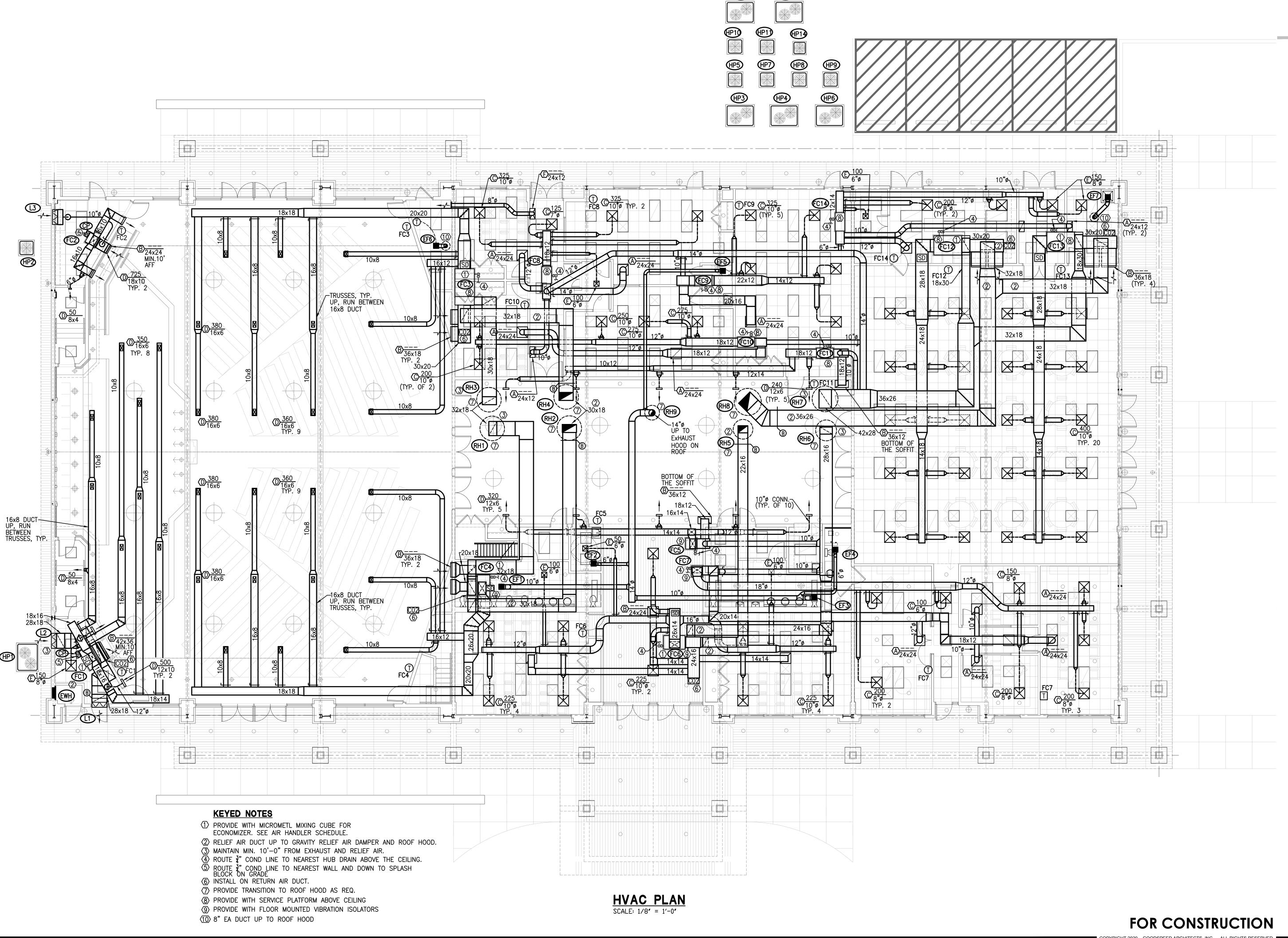
GRACE PCA PRESBYTERIAN CHURCH

HIGHWAY 76 BLAIRSVILLE, GEORGIA



GAI PROJECT NO.	2019.08
DISTRIBUTION	
ISSUE DESCRIPTION	DATE
80% COORDINATION	2020 02 28
100% CONSTRUCTION	2020 03 16
	_

M0.2





ARCHITECT OF RECORD DAVID R GOODSPEED, AIA

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C: 813.480.5519 T: 706.838.0331 DAVID@GOODSPEED-ARCHITECTS.COM GA REG. RA 006876

STRUCTURAL ENGINEER

SSE - SMILEY STRUCTURAL ENGINEEERING 410 PEACHTREE PARKWAY, SUITE 4245 CUMMING, GA 30041

678.720.8189 GA LICENSED CONNSULTING ENGINEERS

MECHANICAL / ELECTRICAL ENGINEER
MARSHALL & BOLLWERK
ENGINEERING, INC.

8681 HIGHWAY 92, SUITE 400 WOODSTOCK, GA 30189 P: 678.795.0333, F: 678.325.4559 GA LICENSED CONNSULTING ENGINEERS

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M1.0

	GRILLE & DIFFUSER SCHEDULE											
TAG	DUTY	FACE SIZE OR LENGTH	TYPE	MVD	MODEL	NOTES						
Α	RETURN	AS NOTED	EGGCRATE GRILLE	NO	50F	A,B,C						
В	RETURN	AS NOTED	SIDEWALL GRILLE	NO	355F	A,B,C,E						
C	SUPPLY	24x24	SQUARE PLAQUE	YES	OMNI	A,B,C,D						
ם	SUPPLY	AS NOTED	SIDEWALL GRILLE	YES	272F	A,B,C						
Ε	SUPPLY	12x12	SQUARE PLAQUE	YES	OMNI	A,B,C,D						
F	TRANSFER	AS NOTED	EGGCRATE GRILLE	NO	50F	A,B,C						
					·							

- A. SEE PLANS FOR NECK SIZES. SQUARE SUPPLY DIFFUSERS NECK SIZE SHALL BE SAME AS BRANCH DUCT.
- VERIFY FRAME TYPE WITH ARCH REFLECTED CEILING PLAN. VERIFY FINISH WITH ARCHITECT.
- PROVIDE WITH FACTORY APPLIED FOIL-FACED, R-6 INSULATION FORMED TO FIT CONTOUR OF DIFFUSER BACK. INSULATION SHALL BE CONTINUOUSLY GLUED & SEALED AROUND OUTER PERIMETER OF OUTER CONE TO FORM VAPOR SEAL.
- 35° FIXED DEFLECTION, 3/4" BLADE SPACING WITH BLADES PARALLEL TO THE LONG DIMENSION

SELECTIONS ARE BASED ON PRODUCTS BY TITUS EQUAL PRODUCTS: METAL-AIRE, KRUEGER, PRICE

					HEA1	r PUN	MP UNIT SCH	IEDULI	E		
MARK	TONS	TOTAL COOLING MBH	TOTAL HEATING MBH	SUCTION TEMP *F	SEER (EER)	HSPF (COP)	VOLTS/ø/HZ	MCA	MOCP	CARRIER BASIS OF DESIGN	NOTES
HP1	10	119.0	57.0	45	(11)	(3.3)	208/3/60	47	60	38AUQ12	1,2,3,4
HP2	4	46.8	24.1	45	14	8.2	208/3/60	25.2	40	25HCE448	1,2,3,4
HP3	10	119.0	57.0	45	(11)	(3.3)	208/3/60	47	60	38AUQ12	1,2,3,4
HP4	10	119.0	57.0	45	(11)	(3.3)	208/3/60	47	60	38AUQ12	1,2,3,4
HP5	4	46.8	24.1	45	14	8.2	208/3/60	25.2	40	25HCE448	1,2,3,4,5
HP6	6	72.0	35.1	45	(11)	(3.3)	208/3/60	28	45	38AUQ07	1,2,3,4,5
HP7	4	46.8	24.1	45	14	8.2	208/3/60	25.2	40	25HCE448	1,2,3,4,5
HP8	3	33.0	18.4	45	14	8.2	208/1/60	20	30	25HCE436	1,2,3,4,5
HP9	4	46.8	24.1	45	14	8.2	208/3/60	25.2	40	25HCE448	1,2,3,4,5
HP10	3	33.0	18.4	45	14	8.2	208/1/60	20	30	25HCE436	1,2,3,4,5
HP11	3	33.0	18.4	45	14	8.2	208/1/60	20	30	25HCE436	1,2,3,4
HP12	10	119.0	57.0	45	(11)	(3.3)	208/3/60	47	60	38AUQ12	1,2,3,4
HP13	10	119.0	57.0	45	(11)	(3.3)	208/3/60	47	60	38AUQ12	1,2,3,4
HP14	2	22.2	11.8	45	14	8.2	208/1/60	11.8	20	25HCE424	1,2,3,4

- 1. COOLING CAPACITY BASED ON 80°F DB/67°F WB INDOOR ENTERING AIR TEMPERATURE AND 95°F DB OUTDOOR TEMP. 2. PROVIDE WITH CRANKCASE HEATER, CYCLE PROTECTOR, FILTER DRYER, HIGH PRESSURE SWITCH, ISOLATION RELAY, LOW
- AMBIENT PRESSURE SWITCH, OUTDOOR THERMOSTAT, SUPPORT FEET AND TIME DELAY RELAY. 3. FOR TUBING LINE SETS BETWEEN 50' & 175' HORIZONTAL OR 20' VERTICAL DIFFERENTIAL SHALL BE SIZED &
- INSTALLED AS PER THE "RESIDENTIAL SPLIT-SYSTEM LONG-LINE APPLICATION GUIDELINE".
- 4. VERIFY LINE SET SIZES WITH SPLIT SYSTEM MANUFACTURER PRIOR TO INSTALLATION.

5. PROVIDE WITH APR CONTROL. (www.Rawal.com)

SELECTIONS ARE BASED ON CARRIER EQUAL PRODUCTS: LENNOX & TRANE

EXHAUST FAN SCHEDULE											
MARK	FAN CFM	ESP	WATTS	VOLTS/PH/HZ	MODEL	NOTES					
EF1	375	.50"	224	115/1/60	SP-A510	1,3					
EF2	75	.50"	80	115/1/60	SP-B110	1,2					
EF3	225	.50"	224	115/1/60	SP-A510	1,3					
EF4	100	.50"	80	115/1/60	SP-B110	1,2					
EF5	75	.50"	80	115/1/60	SP-B110	1,2					
EF6	150	.25"	80	115/1/60	SP-B150	1,4,5					
EF7	150	.25"	128	115/1/60	SP-B150	1,2,5					

- ROVIDE WITH BACKDRAFT DAMPER, VIBRATION HANGERS & DISCONNECT SWITCH. INTERLOCK WITH ROOM LIGHTS.
- 3. SHALL RUN CONTINUOUSLY WHILE BUILDING IS OCCUPIED.
- 4. INTERLOCK WITH THERMOSTAT SET TO ENERGIZE FAN AT 80°F 5. PROVIDE WITH ROOD CAP. GRSF-10
- SELECTIONS ARE BASED ON GREENHECK

EQUAL PRODUCTS: ACME, PENN, LOREN COOK

	ROOF HOOD SCHEDULE											
MARK	SERVICE	CFM	THROAT AREA (SF)	SIZE (DIA)	MODEL	NOTES						
RH1	OA	4000	5.03	48"	GRSI30	1,2,3						
RH2	RA	4000	5.03	48"	GRSR30	1,2,3,4						
RH3	OA	4000	5.03	48"	GRSI30	1,2,3						
RH4	RA	4000	5.03	48"	GRSR30	1,2,3,4						
RH5	RA	2400	2.25	35.5"	GRSR20	1,2,3,4						
RH6	OA	3610	5.03	48"	GRSI30	1,2,3						
RH7	OA	9440	12.8	72"	GRSI48	1,2,3						
RH8	RA	8000	9.77	63.5"	GRSR42	1,2,3,4						
RH9	EA	850	1.45	29"	GRSR16	1,2,3						

NOTES:

- PROVIDE WITH INSECT SCREEN.
- 2. VERIFY FINISH WITH ARCHITECT. 3. FLASH AND SEAL ROOF PENETRATION AS REQUIRED
- 4. PROVIDE WITH BAROMETRIC RELIEF DAMPER. SEE PLANS

SELECTIONS ARE BASED ON PENN EQUAL PRODUCTS: ARROW, NAILOR, RUSKIN

	FAN COIL SCHEDULE												
			FAN D	DATA	HEATING DATA	(COOLING DAT	A	ELECTRICA	L DATA	1		
MARK	SUPPLY CFM	O.A. CFM	ESP IN. WG	MOTOR HP	ELECTRIC HEAT (KW)	TOTAL CAPACITY MBH	SENSIBLE CAPACITY MBH	CARRIER BASIS OF DESIGN	V/PH/HZ	MCA	MOCP	WEIGHT LBS	NOTES
FC1	4000	870	1.00	2.5	15.0	119.0	90.3	40RUQA12	208/3/60	48.5	50	697	1,2,3,4,5,6,7,8,9
FC2	1600	270	0.70	3/4	10.0	48.0	33.6	FX4DNF049	208/1/60	57.5	60	172	1,2,3,4,5,6,7,8
FC3	4000	1310	1.50	2.5	15.0	119.0	90.3	40RUQA12	208/3/60	48.5	50	697	1,2,3,4,5,6,7,8,9
FC4	4000	1310	1.50	2.5	15.0	119.0	90.3	40RUQA12	208/3/60	48.5	50	697	1,2,3,4,5,6,7,8,9
FC5	1600	320	1.00	3/4	10.0	48.0	33.6	FX4DNF049	208/1/60	57.5	60	172	1,2,3,4,5,6,7,8
FC6	2400	655	1.00	1.0	15.0	72.0	56.1	40RUQA07	208/3/60	34.3	35	697	1,2,3,4,5,6,7,8,9
FC7	1600	255	1.00	3/4	10.0	48.0	33.6	FX4DNF049	208/1/60	57.5	60	172	1,2,3,4,5,6,7,8,1
FC8	1200	330	1.00	1/2	10.0	36.0	25.2	FX4DNF037	208/1/60	55.1	60	150	1,2,3,4,5,6,7,8
FC9	1600	395	1.00	3/4	10.0	48.0	33.6	FX4DNF049	208/1/60	57.5	60	172	1,2,3,4,5,6,7,8
FC10	1200	320	1.00	1/2	10.0	36.0	25.2	FX4DNF037	208/1/60	55.1	60	150	1,2,3,4,5,6,7,8
FC11	1200	320	1.00	1/2	10.0	36.0	25.2	FX4DNF037	208/1/60	55.1	60	150	1,2,3,4,5,6,7,8
FC12	4000	1170	1.00	2.0	15.0	119.0	90.3	40RUQA12	208/3/60	45.6	50	697	1,2,3,4,5,6,7,8,9
FC13	4000	1170	1.00	2.0	15.0	119.0	90.3	40RUQA12	208/3/60	45.6	50	697	1,2,3,4,5,6,7,8,9
FC14	800	75	1.00	1/3	5.0	24.0	19.2	FX4DNF025	208/1/60	28.5	30	135	1,2,3,4,5,6,7,8
				-									

- (1) SPECIFIED CAPACITIES ARE BASED ON 80°F DB/67°F WB ENTERING AIR AND 95°F OUTDOOR AMBIENT TEMPERATURE.
- 2 COMPLY WITH THE EQUIPMENT MANUFACTURERS "LONG LINE" INSTALLATION INSTRUCTIONS AND RECOMMENDATIONS. PROVIDE ALL ACCESSORIES RECOMMENDED
- STATIC PRESSURE (SP) SHOWN IS EXTERNAL TO FAN COILS, FOR SUPPLY & RETURN AIR DUCTING AND REGISTERS ONLY. COOLING COIL, FILTER PRESSURE DROP TO BE INCLUDED IN THE TOTAL PRESSURE DROP FOR EQUIPMENT PROVIDED TO ACHIEVE THE CFM'S SPECIFIED (AS MINIMUM).
- PROVIDE INTERNALLY, ACOUSTICALLY, LINED RETURN AIR INTAKE PLENUMS FOR ALL UNITS. PLENUMS SHALL MATCH THE CROSS SECTIONAL SIZE OF THE UNITS AND SHALL BE 24" HIGH MINIMUM, OR AS REQUIRED TO SUIT THE RETURN AIR DUCT CONNECTIONS. MOUNT ENTIRE ASSEMBLY OVER A 2" DEEP DRIP TRAY.
- © CONTRACTOR SHALL VERIFY SELECTION OF MODELS SELECTIONS FOR FAN COILS, COOLING COILS & CONDENSING UNITS WITH THE MANUFACTURERS REPRESENTATIVE TO ENSURE CORRECT MATCH. ADVISE OWNER OF ANY DISCREPANCY. PROVIDE DUCT ADAPTERS BETWEEN FAN COIL & COIL CASINGS AS REQUIRED & AS RECOMMENDED BY THE MANUFACTURER.
- (6) PROVIDE WITH CONCENTRIC VENT & CONDENSATE TRAP.
- 7 THERMOSTAT ELECTRONIC PROGRAMMABLE THERMOSTAT WITH REMOTE TEMPERATURE SENSOR & CLEAR LOCKING COVER.
- 8 SUPPLY FAN SHALL BE PROGRAMMED TO RUN BASED ON T-STAT DURING OPERATING HOURS AND DURING NON-OPERATING HOURS.
- (9) PROVIDE WITH MICROMETL CUBE ECONOMIZER. PROVIDE WITH JADE ECONOMIZER SYSTEM INCLUDING W7220 ECONOMIZER MODULE WITH 20K MIXED AIR SENSOR, DAMPER ACTUATOR,
- CO2 SENSER, AND SYLK BUS SENSER POWERED BY AIR HANDLER CONTROL WIRING. (10) WITH REMOTE TEMP. SENSOR AND T-STAT WITH SENSOR OVERRIDE AND AVERAGING SETTING.

SELECTIONS ARE BASED ON CARRIER **EQUAL PRODUCTS: LENNOX & TRANE**

CONDENSATE PUMP SCHEDULE										
MARK	GPH	TOTAL HEAD (FT)	HP	VOLTS/PH/HZ	FLA	MODEL	NOTES			
CP	0.5	15'	19 WATTS	115/1/60	0.24	EC-400	1			
NOTES:										

1. PROVIDE WITH SUCTION, VENT & DRAIN TUBING, TUBING ADAPTOR & SAFETY SWITCH. SELECTIONS ARE BASED ON PRODUCTS BY: LITTLE GIANT

ELECTRIC HEATER SCHEDULE												
MARK	KW	VOLTS/PH/HZ	AMPS	MODEL	NOTES							
EWH 2.0 208/1/60 9.6 3420 SERIES 1,2												
NOTES:												

I. PROVIDE WITH CIRCUIT BREAKER & BUILT—IN THERMOSTAT 2. PROVIDE WITH 2" SEMI-RECESSING MOUNTING SLEEVE.

SELECTIONS ARE BASED ON PRODUCTS BY: MARKEL **EQUAL MANUFACTURERS: QMARK, RAYWALL**

LOUVER SCHEDULE								
MARK TYPE FUNCTION MODEL SIZE FREE AREA NOTES (SF)								
L1	STATIONARY	RELIEF	ELF375DX	36X30	3.75	1,2,3		
L2	STATIONARY	INTAKE	ELF375DX	36X30	3.75	1,2		
L3	STATIONARY	INTAKE	ELF375DX	24X12	0.55	1,2		

OUTSIDE AIR REQUIREMENTS

ROOM NAME

CONFERENCE

OFFICE CORR.

JAN. ROOM

STORAGE

KITCHEN

PANTRY

CHECK IN

KID CORR

CLOSET

(ID CORR

ADULT LOBBY

ADULT CLASS 1

ADULT CLASS 2

A CLOSET 1

A CLOSET 2

SHR RM

COFFEE

MEN RR

MEN RR CORR

WM RR CORR

FAMILY RR

OUND

SANCTUARY

LOBBY CLOSET

STAIR ACCESS

SANCT. STORAGE

SANCT. STARI R

SANCT. STAIR L

** - EXHUAST ONLY

DEFINITIONS:

REAR SANT. STORE R

REAR SANT. STORE L

CODE: RATE PROVIDED BY ASHRAE CODE STANDARD

PPL: NUMBER OF PEOPLE CALCULATED FOR A DESIGNATED AREA

PER: PERSON (USED IN CALCULATING OUTSIDE OA RATE IN CFWPERSON)

YOUTH ROOM

CHILD CLASS 1

CHILD CLASS 2

ELLOWSHIP HALI

OFFICE 2 PASTOR

ZONE

C

1000 / B

33.333333

14.2857142

14.2857142

PPL

= A/C

PPL

ROUND

PPL RATE FT^2/PER

CODE CALC

PPL/1000

CODE CLASS

424 CONFERENCE

5 CORRIDOR

335 KITCHEN

51 RESTROOM

83 RECEPTION

6 CORRIDOR

3 MULTIUSE ASSEMBL

145 STORAGE ROOMS

44 STORAGE ROOMS

97 STORAGE ROOMS

497 CLASSROOM (0-4)

494 CLASSROOM (0-4)

CLASSROOM (9+)

CLASSROOM (5-8)

LASSROOM (5-8)

STORAGE ROOMS

CLASSROOM (9+)

CLASSROOM (9+)

TORAGE ROOMS

STORAGE ROOMS

OBBIES/REFUNCTION

ORRIDOR

650 CORRIDOR

62 RESTROOM

COFFEE

64 RESTROOM

72 CORRIDOR

245 RESTROOM 54 STORAGE ROOMS

CORRIDOR

RESTROOM

CORRIDOR

CORRIDOR

CORRIDOR

170 STORAGE ROOMS

170 STORAGE ROOMS

* (NOTE ASHRAE STANDARD 62.1-2007 DOES NOT INCLUDE VENTILATION RATE FOR KITCHENS OR GARAGES.)

CALC: NUMBER CALCULATED AS SHOWN IN COLUMN HEADINGS BASED ON SQUARE FOOTAGE, PEOPLE LOAD OR A COMBITATION THEREOF

200 STAGE

OMPUTER

STORAGE ROOMS

5064 RELIGIOUS WORSHIP

171 OFFICE

426 OFFICE

OA (CFM) SPACE OA

CACL CALC CODE CALC CODE CALC CALC

 $= F \times E \quad OA / FT^2 = H \times A$

RATE OA(CFM)

=J+G

2291.8

145.4

597.3

3343.8

8631.82

OUTSIDE AIR PROVIDED PER UNIT:

TOTAL: 8750 CFM OUTSIDE AIR

PROVIDED 8631.82 CFM OUTSIDE AIR REQUIRED

PROVIDED (CFM)

- PROVIDE WITH INSECT SCREEN. VERIFY FINISH WITH ARCHITECT.

PROVIDE WITH BAROMETRIC RELIEF DAMPER. SEE PLANS

SELECTIONS ARE BASED ON PRODUCTS BY RUSKIN EQUAL PRODUCTS BY: PENN VENTILATOR, NAILOR, ARROW UNITED.



GOODSPEED **ARCHITECTS**

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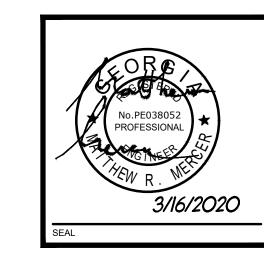
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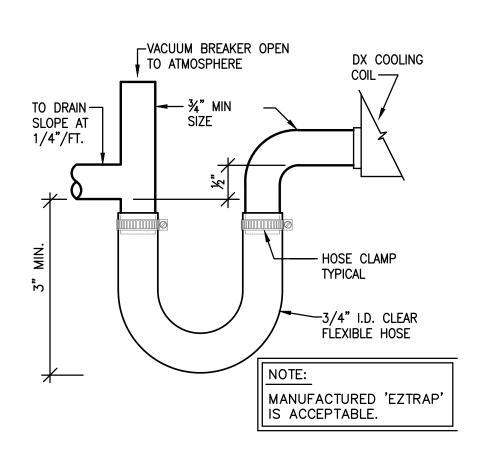
GRACE PCA PRESBYTERIAN **CHURCH**

HIGHWAY 76 BLAIRSVILLE, GEORGIA

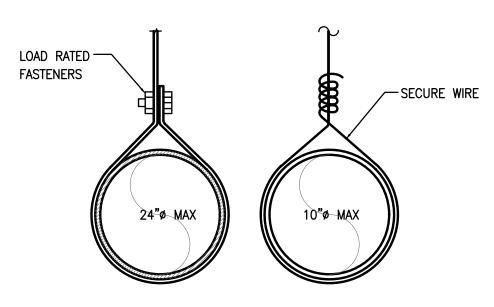


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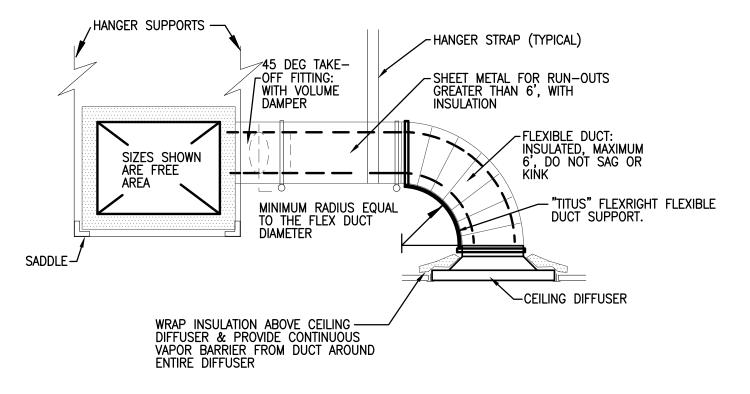


COOLING COIL CONDENSATE DRAIN DETAIL NOT TO SCALE



	MINIMUM HANG	HANGER SIZE FOR ROUND DUC				
DIA.	WIRE DIA.	MAXIMUM SPACING	STRAPS	RODS		
10" dn	(1) 12 GA.	12'	1"x 22 GA	1/4"		
11–18"	(2) 12 GA.	12'	1"x 22 GA	1/4"		
19-24"	(2) 10 GA	12'	1"x 22 GA	1/4"		
25-36"	(2) 8 GA.	12'	1"x 20 GA	3/8"		

ROUND DUCT HANGERS: NOT TO SCALE



- NOTE:
 HANGER SUPPORTS SHALL BE PER SMACNA AND APPLICABLE SPECIFICATIONS. . ELBOWS SHALL BE SQUARE NECK (SAME IN AND OUT DIMENSION) WITH 2" DOUBLE THICKNESS TURNING VANES.
- OFFSETS SHALL NOT EXCEED 30° ANGLE, AND SHALL NOT REDUCE THE FREE AREA OF THE DUCT.
 TRANSITIONS SHALL NOT EXCEED 1:3 RATIO (4" TRANSITION PER FOOT SINGLE SIDED TRANSITION, AND 8" PER FOOT DOUBLE SIDED TRANSITION).
 RECTANGULAR BRANCH CONNECTIONS SHALL BE 45° ENTRY TYPE, WITH METAL SLEEVE
- AND CLINCH LOCK CONNECTION. ENTRY LENGTH SHALL BE 25% OF BRANCH DUCT WIDTH.

 6. ROUND BRANCH DUCT CONNECTIONS SHALL BE SPIN—IN FITTINGS, DAMPER AND HANDLE.

- DISCONNECT SWITCH.

INSTALL BY

ELECTRICAL

SUBCONTRACTOR.

CONDENSING UNIT **BOLT TO CONCRETE**

- REFRIGERANT PIPING. CONCEAL IN WALL.

6" THICK CONCRETE

(10/10) W.W.F.

BOLT TO WALL.

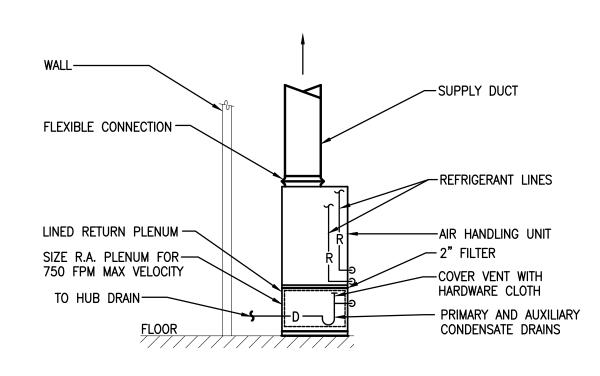
DUCT DETAIL NOT TO SCALE

-MINIMUM 12" (3) SIDES

MINIMUM 30" ON SERVICE SIDE

HEAT PUMP UNIT DETAIL:

COORDINATE LOCATION WITH OWNER

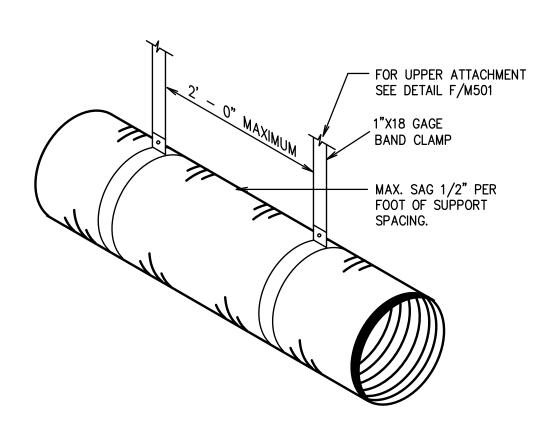


VERTICAL FAN COIL UNIT DETAIL:

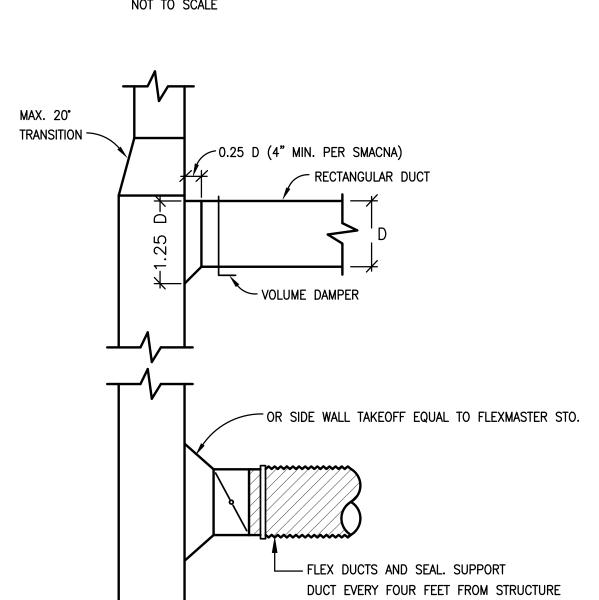
NOT TO SCALE

CONNECTOR LIQUID LINE — BAROMETRIC -SUCTION LINE RELIEF AIR DUCT CONDENSATE -ECONOMIZER-WITH MIN. 3" 100% OUTSIDE AIR INTAKE DUCT AUXILLARY COND. PAN-WITH OVERFLOW SWITCH

10 TON VERTICALLY INSTALLED FAN COIL UNIT DETAIL:

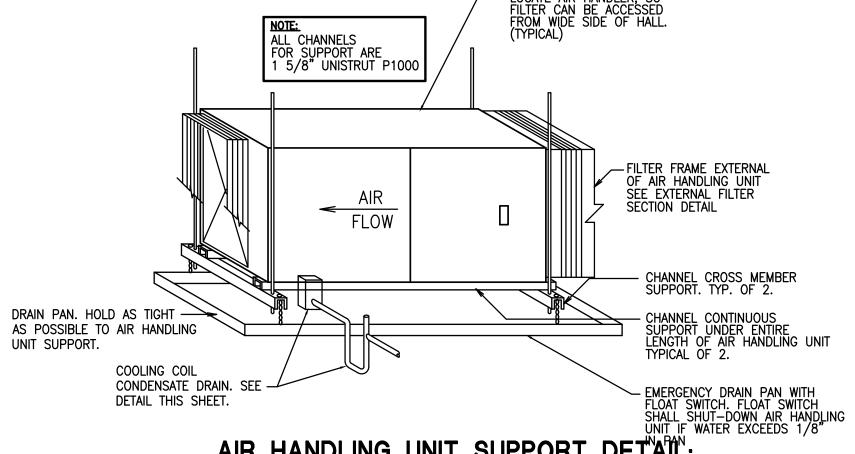


FLEXIBLE DUCT SUPPORT DETAIL



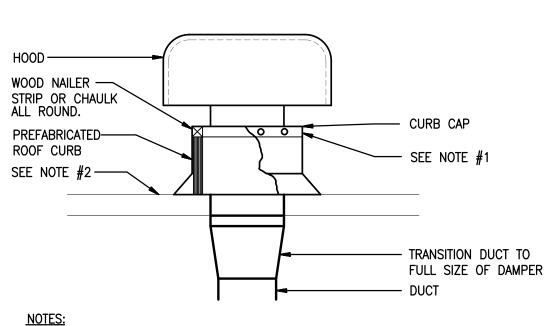
BRANCH DUCT DETAILS

NOT TO SCALE



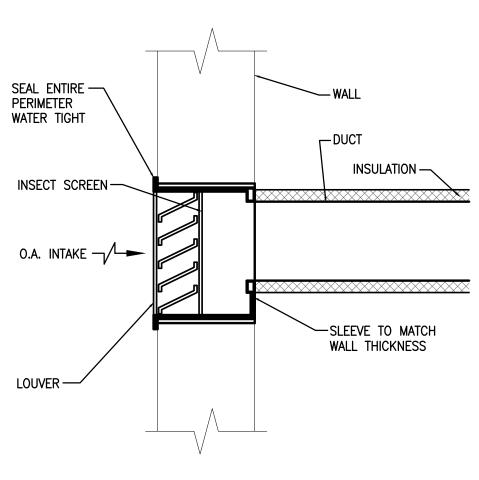
AIR HANDLING UNIT SUPPORT DETAIL:

AIR HANDLING UNIT NOTE AIR HANDLING UNITS SHALL BE INSTALLED AS CLOSE TO METAL DECK AS POSSIBLE. NO WIRES, BOLTS, SUPPORTS, ETC. TO BE EXPOSED TO INTERFERE WITH MOVING FURNITURE, BOXES, ETC.

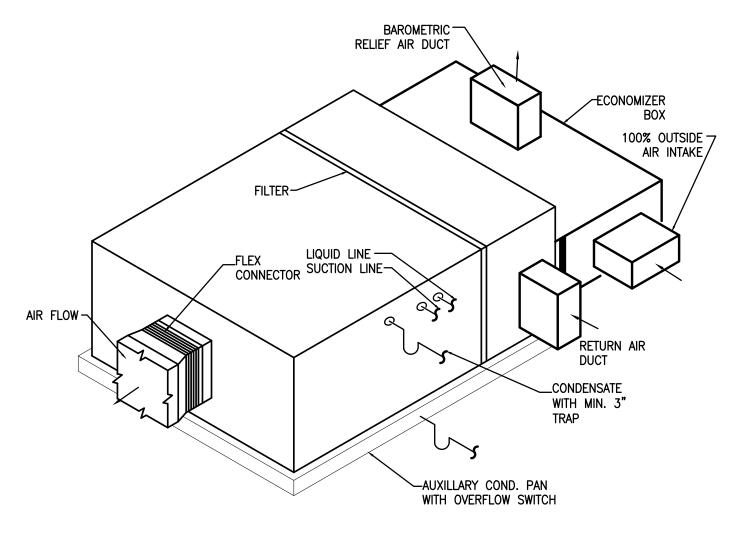


- 1. SECURE HOOD TO WOOD NAILING STRIP PER MANUFACTURER'S DETAILS
- 2. SECURE ROOF CURB, DUCTWORK AND DAMPER TO ROOF TO ARCHITECT'S APPROVAL. SEE MECHANICAL NOTES. PROVIDE ROOF CURB TO SUIT PITCH

INTAKE/EXHAUST WEATHER HOOD DETAIL:
NOT TO SCALE



LOUVER INSTALLATION:



10 TON HORIZONTALLY INSTALLED FAN COIL UNIT DETAIL:

FOR CONSTRUCTION

GOODSPEED ARCHITECTS INC.

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GRACE PCA PRESBYTERIAN CHURCH

HIGHWAY 76 BLAIRSVILLE, GEORGIA



GAI PROJECT NO.	2019.08
DISTRIBUTION	_
ISSUE DESCRIPTION	DATE
80% COORDINATION	2020 02 28
100% CONSTRUCTION	2020 03 16

PLUMBING NOTES:

GENERAL:

- 1. VERIFY" SHALL MEAN CHECK CONDITIONS ON SITE AGAINST DRAWINGS AND SPECIFICATION AND ADJUST WORK TO MATCH EXISTING. OBTAIN RULING FROM OWNER ON ANY ITEMS REQUIRING CLARIFICATION
- 2. THE NEW PLUMBING SYSTEMS (DOMESTIC COLD & HOT WATER, GREASY WASTE, SANITARY WASTE & VENT AND GAS) SHALL BE INSTALLED COMPLETE AND IN ACCORDANCE WITH ALL APPLICABLE CODES, LAWS AND REGULATIONS, LOCAL HEALTH DEPARTMENT STANDARDS AND THE OWNER'S REQUIREMENTS.
- THE SYSTEMS SHALL BE FREE OF ANY NOISE AND VIBRATIONS.
 THE PLUMBING WORK SHALL COMPLY WITH THE 2018 INTERNATIONAL PLUMBING & GAS CODES, GA STATE AMENDMENTS, THE GEORGIA STATE ACCESSIBILITY CODE & ALL APPLICABLE SECTIONS OF NFPA AND ANSI AND
- THE GUIDELINES OF ASPE.

 5. THE CONTRACTOR SHALL CONFIRM AND ENSURE THAT ALL PLUMBING WORK CONFORMS TO THE CURRENT REQUIREMENTS OF THE LOCAL BUILDING INSPECTION DEPARTMENT.
- 6. ALL PLUMBING EQUIPMENT AND MATERIALS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS AND RECOMMENDATIONS.
- 7. ALL FIXTURES AND EQUIPMENT SHALL BE INSTALLED LEVEL, PLUMB AND RUN PARALLEL OR PERPENDICULAR TO THE BUILDING WALLS UNLESS INDICATED OTHERWISE.
- 8. CONTRACTOR SHALL SECURE ALL PERMITS, INSPECTION CERTIFICATES,
- AUTHORITY APPROVALS AND PAY ALL RELATED FEES AND CHARGES.

 9. ALL NEW PLUMBING EQUIPMENT AND SYSTEMS SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR AFTER ACCEPTANCE BY THE OWNER.
- 10. IT IS THE INTENT OF THESE SPECIFICATIONS TO PROVIDE FINISHED WORK, TESTED AND READY FOR OPERATION. ANY APPARATUS, APPLIANCE OR MATERIAL WHICH MAY BE NECESSARY TO MAKE THE WORK COMPLETE AND FULLY OPERATIONAL, EVEN IF NOT EXPLICITLY STATED, SHALL BE PROVIDED FOR BY THE CONTRACTOR.
- 11. ALL PLUMBING WORK SHALL BE INSTALLED SO AS TO AVOID INTERFERENCE WITH ALL ELECTRICAL AND MECHANICAL WORK AND STRUCTURAL MEMBERS.
- 12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PATCHING AND REPAIRING ALL AREAS WHICH WERE DAMAGED BY HIS OPERATION.
- 13. ALL HORIZONTAL PIPING LINES EXTENDED AND CONNECTED TO EQUIPMENT SHALL BE RUN AT THE HIGHEST POSSIBLE ELEVATION AND NOT LESS THAN 6" ABOVE FINISHED FLOOR TO PROVIDE CLEARANCE FOR CLEANING.
- 14. EXACT LOCATIONS & ROUGH-IN REQUIREMENTS FOR ALL FIXTURES & EQUIPMENT SHALL BE DETERMINED FORM ARCHITECTURAL DRAWINGS. LARGE SCALE ARCHITECTURAL DETAILS & APPROVED MANUFACTURER'S SHOP DRAWINGS. PARTICULAR ATTENTION SHALL BE DIRECTED TO FIXTURES OR EQUIPMENT FURNISHED BY OTHER TRADES.
- 15. PIPING IS SHOWN IN ITS GENERAL LOCATION (UNLESS DIMENSIONED). EXACT LOCATIONS SHALL BE DETERMINED BY JOB CONDITIONS. CONTRACTOR SHALL COORDINATE THE INSTALLATION OF HIS WORK WITH THAT OF OTHER TRADES & ARRANGE PIPING TO CLEAR STRUCTURAL MEMBERS & DUCTWORK. DO NOT RESTRICT ACCESS TO ANY EQUIPMENT.

SANITARY & VENT PIPING:

- 16. ALL SANITARY WASTE & VENT PIPING & FITTINGS INSIDE THE BUILDING, ABOVE & BELOW GRADE, SHALL BE SOLID WALL SCHEDULE 40 PVC DWV AS MANUFACTURED BY CHARLOTTE PIPE & MEET ASTM D-1784, D-1785 & D-2665.
- 17. FOAM CORE &/OR CELLULAR CORE PVC PIPING SHALL NOT BE ALLOWED.
 18. PVC PIPING OUTSIDE THE BUILDING, BELOW GRADE, SHALL BE TYPE PVC SDR-35 MEETING ASTM-D3034.
- 19. PVC-DWV FITTINGS FOR PIPING SHALL BE SOLVENT WELD TYPE INSIDE & UNDERSLAB MEETING ASTM D-1784, D-2665 & D-3311. CEMENTS SHALL MEET ASTM D-2565 & PRIMER MEETING ASTM F-656. CURE TIME MUST COMPLY WITH MANUFACTURER'S RECOMMENDATIONS. EXTERIOR PIPING JOINTS SHALL BE NEOPRENE PUSH-ON TYPE.
- 20. PROVIDE MINIMUM COVER OF 30" FOR ALL LINES OR AS OTHERWISE NOTED ON THE DRAWINGS.
- ON THE DRAWINGS.

 21. COORDINATE WITH THE MECHANICAL CONTRACTOR TO ENSURE THAT SANITARY VENTS THROUGH ROOF MAINTAIN A MINIMUM OF 12" FROM ANY VERTICAL SURFACE AND 10'-0" FROM ANY FRESH AIR INTAKE TO THE BUILDING.
- 22. INVERT ELEVATIONS OF THE SANITARY PIPING SHOWN ON THE CIVIL UTILITY PLANS SHALL BE VERIFIED ON THE JOB BEFORE INSTALLING ANY PIPE.
- 23. REFER TO ARCHITECTURAL FINISH SCHEDULE & ELEVATIONS FOR DETAILS OF FLOORS WHERE FLOOR DRAINS & CLEAN—OUTS ARE LOCATED.
- 24. ALL CLEAN-OUTS SHALL BE INSTALLED WHERE READILY ACCESSIBLE. THE CONTRACTOR SHALL COORDINATE ALL CLEAN-OUT LOCATIONS WITH EQUIPMENT, CABINETS, ETC. AND ARCHITECT PRIOR TO INSTALLATION.

DOMESTIC WATER PIPING:

- 26. DOMESTIC WATER PIPING BELOW GRADE SHALL BE TYPE "K" COPPER TUBING, WITH NO PIPE JOINTS BELOW GRADE. UNDERGROUND PIPES SHALL BE INSIDE A PVC PIPE LINER AND INSTALL A UNION ABOVE GRADE AT EACH END OF THE BURIED PIPE. UNDERGROUND PIPE SHALL BE DRAWN EXCEPT ANNEALED (SOFT) PIPE MAY BE USED WHERE INDICATED.
- 27. DOMESTIC (HOT & COLD) WATER PIPING ABOVE GRADE SHALL BE TYPE "L" COPPER TUBING. FITTINGS SHALL BE WROUGHT COPPER WITH LEAD FREE SOLDER. PIPING SHALL NOT TOUCH FERROUS MATERIALS. FIRMLY SUPPORT PIPING USING NON FERROUS PIPE SUPPORTS.
- 28. IF APPROVED BY THE OWNER, DOMESTIC WATER PIPING ABOVE GRADE MAY BE CPVC PER ASTM D2846; ASTM F 441; ASTM F442; CSA B137.6. FITTINGS SHALL BE CPVC PER ASSE 1061; ASTM D2846; ASTM F 437 ASTM F 438, ASTM F 439; CSA B137.6.
- 29. IF APPROVED BY THE OWNER, DOMESTIC WATER PIPING ABOVE GRADE MAY BE CROSS—LINKED POLYETHYLENE (PEX) PER ASTM F 876; ASTM F 877; CSA B137.5. FITTINGS SHALL BE PEX PER ASSE 1061; ASTM F 877; ASTM F 1807; ASTM F1960; ASTM F2080; ASTM F 2098; ASTM F2159; ASRM F2434; ASTM F 2735; CAS B137.5.
- 30. SHUT-OFF VALVES SHALL BE FULL PORT, THREADED OR SOLDER-END TYPE, RATED AT NOT LESS THAN 200 LB. NON-SHOCK COLD WATER WORKING PRESSURE. PROVIDE VALVES IN EACH BRANCH LINE WHETHER SHOWN ON THE DRAWINGS OR NOT.
- 31. PROVIDE A BALL-COCK STOP ON WATER SUPPLY IN BRANCH PIPE TO EACH PLUMBING FIXTURE WHETHER SHOWN ON THE DRAWINGS OR NOT.
- 32. UNIONS SHALL BE PROVIDED AFTER EACH SCREW TYPE VALVE AND AT EQUIPMENT CONNECTIONS. PROVIDE ISOLATION UNIONS ON ALL CONNECTIONS BETWEEN DISSIMILAR METALS.
- 33. COLD & HOT WATER RISERS FOR FIXTURES, UNLESS NOTED OTHERWISE SHALL BE CONCEALED IN WALLS OR PIPE CHASES.

- 34. EXPOSED PIPING IN FINISHED AREAS SHALL BE CHROME PLATED WITH CHROME PLATED ESCUTCHEON AT PIPE ENTRY TO FINISHED AREA.
- 35. ALL DOMESTIC WATER PIPING (HOT, COLD, HOT WATER CIRCULATION) SHALL BE LOCATED WITHIN THE BUILDING ENVELOPE. PIPING LOCATED ABOVE CEILING SHALL BE LOCATED BETWEEN THE CEILING & ROOF/CEILING INSULATION. PIPING LOCATED IN EXTERIOR WALL SHALL BE LOCATED BETWEEN THE WALL INSULATION & INTERIOR SHEATHING
- 35. THE HOT & COLD WATER SUPPLY BRANCHES FOR ALL EQUIPMENT & FIXTURES HAVING QUICK CLOSING VALVES OF ANY TYPE SHALL HAVE WATER HAMMER ARRESTORS. SEE WATER HAMMER ARRESTOR DETAIL FOR LOCATIONS.

INSULATION:

- 36. INSULATE ALL ABOVE GROUND HOT AND COLD WATER PIPING AND FITTINGS
- WITH ONE OF THE FOLLOWING METHODS:

 A. PRE-FORMED ARMAFLEX AP INSULATION, 1" THICK. USE ARMAFLEX 520 ADHESIVE ON ALL JOINTS. INSULATION CONDUCTIVITY SHALL BE MAXIMUM
- 0.27 (BTU*IN)/(HR*FT2*?F) PER ASTM C 177.

 B. PRE—FORMED NOMALOCK EPFI INSULATION INSULATION, 1" THICK. WITH A PRE—GLUED PRESSURE SENSITIVE ADHESIVE CLOSURE SYSTEM. INSULATION CONDUCTIVITY SHALL BE MAXIMUM 0.27 (BTU*IN)/(HR*FT2*?F)
- PER ASTM C 177.

 C. PRE-FORMED MICRO-LOK FIBER GLASS INSULATION, 1" THICK. WITH FACTORY APPLIED LONGITUDINAL ACRYLIC CLOSURE SYSTEM & FACTORY SUPPIED BUTT STRIPS. INSULATION CONDUCTIVITY SHALL BE MAXIMUM 0.24 (BTU*IN)/(HR*FT2*?F) PER ASTM C 177.
- 37. THE DRAINAGE, HÓT AND COLD PIPEWORK BELOW ALL LAVATORIES IN THE TOILETS WILL BE INSULATED WITH "HANDI-LAV" GUARD" INSULATING KITS AS MANUFACTURED BY TRUEBRO. INC (203) 875-2868 OR EQUAL.
- 38. INSULATE ALL RAIN LEADER PIPING INSIDE THE BUILDING WITH ARMAFLEX AP INSULATION, MINIMUM 1" THICK, USE ARMAFLEX 520 ADHESIVE ON ALL JOINTS. THERMAL CONDUCTIVITY SHALL NOT EXCEED 0.27 BTU—IN/HR—SQ. FT.— DEG F AT 75 DEG F. ALL INSULATION MATERIALS SHALL HAVE A FLAME SPREAD RATING OF 25 OR LESS, SMOKE DEVELOPED RATING OF 50 OR LESS.

SUPPORT SPACING:

39. SPACING OF HANGERS AND SUPPORTS FOR ABOVE GROUND HORIZONTAL PIPING AND TUBING SHALL NOT EXCEED THE FOLLOWING HORIZONTAL SPACING (PER IPC TABLE 308.5):

A.	COPPER TUBING PIPE SIZE	MAX. SPACING (F
	34" & SMALLER	_
	74 & SMALLER	5
	1 IN. THRU 3 IN	6
В.	PVC PIPE	4
C.	PEX PIPE	2.67 (32")
D.	CPVC	` '
	1" & SMALLER	3
		•
	1¼" & LARGER	4

- 40. SUPPORT PIPES FROM STRUCTURE. WHERE SPACING OF STRUCTURAL MEMBERS EXCEEDS THE MAXIMUM SPACING NOTED ABOVE PROVIDE ADDITIONAL SUPPORTS OF SUFFICIENT SIZE TO SUPPORT PIPES WITHOUT EXCESSIVE DEFLECTION.
- 41. ADDITIONAL HANGERS SHALL BE PROVIDED ADJACENT TO ALL VALVES AND FITTINGS SIZE 6 INCHES AND LARGER.
- 42. ADJUST HANGERS AND SUPPORTS TO SLOPE PIPE TO CODE OR AS OTHERWISE REQUIRED FOR PROPER OPERATION OF THE SYSTEM(S).
- 43. UNDERGROUND PIPING SHALL BE LAID ON A FIRM BED FOR ITS ENTIRE

MISCELLANEOUS:

- 44. THE SCHEDULED "BASIS OF DESIGN" IS INTENDED TO INDICATE THE PERFORMANCE REQUIRED FOR THE PARTICULAR ITEM OF EQUIPMENT. SUBSTITUTIONS WILL BE PERMITTED. SUBSTITUTIONS SHALL BE DEEMED TO INCLUDE ALL ASSOCIATED CHANGES TO BUILDING, STRUCTURE & OTHER SERVICES WITHOUT ANY ADDITIONAL COST TO THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THAT SUBSTITUTIONS SHALL FIT INTO THE SPACE AVAILABLE WITH PROVISIONS FOR PROPER ACCESS, MAINTENANCE, PARTS REPLACEMENT, WEIGHT ALLOWANCE & FOR COORDINATION WITH OTHER TRADES (INCLUDING ELECTRICAL, MECHANICAL, STRUCTURAL AND ARCHITECTURAL).
- 45. NON-FREEZE HOSE BIBBS SHALL BE MOUNTED 18" ABOVE FINISHED FLOOR OR AS OTHERWISE NOTED ON THE DRAWINGS. VERIFY PRIOR TO INSTALLATIONS.
- 46. PROVIDE SLEEVES FOR PIPES THRU FLOORS, MASONRY WALLS & FIRE OR SMOKE PARTITIONS. PENETRATIONS THROUGH FIRE RATED FLOORS, WALLS AND PARTITIONS SHALL BE FIRE STOPPED TO COMPLY WITH THE APPLICABLE EDITION, INCLUDING REVISIONS, OF THE STANDARD BUILDING CODE, STANDARD MECHANICAL CODE AND LOCAL FIRE MARSHALL REQUIREMENTS. FIRE STOP SYSTEM USED SHALL BE UL LISTED AND SHALL BE SUITABLE FOR THE PENETRATING AND PENETRATED MATERIALS. THE WORK SHALL BE INSPECTED AND CERTIFIED BY THE MANUFACTURER'S AUTHORIZED REPRESENTATIVE. PENETRATIONS THROUGH WALLS AND FLOORS BELOW GRADE AND OUTSIDE WALLS SHALL BE SEALED AND CAULKED WATER, MOISTURE AND AIR TIGHT TO ARCHITECT APPROVAL.
- 47. THE PRV PROVIDED SHALL BE SUITABLE FOR THE APPLICATION. THE PLUMBER SHALL CHECK THE PREVAILING MAINS WATER PRESSURE AND SHALL CONSULT THE MANUFACTURER'S ENGINEERING DEPARTMENT TO VERIFY THE CORRECT SELECTION OF THE PRV PROVIDED IRRESPECTIVE OF ANY MODEL SPECIFIED ON THE DRAWINGS.
- 48. BACK FLOW PREVENTORS SHALL BE PROVIDED ON ALL BEVERAGE MACHINES AND ICE MAKERS WHETHER SHOWN ON THE DRAWINGS OR NOT.
- 49. BACK FLOW PREVENTER AT THE BUILDING SERVICE ENTRY SHALL BE LOCAL AUTHORITY APPROVED TYPE IRRESPECTIVE OF WHAT IS SHOWN ON THE DRAWINGS. THE REQUIRED TYPE SHALL BE VERIFIED PRIOR TO BID. INSTALL IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS WITH RECOMMENDED CLEARANCES FOR TESTING AND SERVICE. PROVIDE AN UPSTREAM STRAINER IF INSTALLED AHEAD OF THE PRV. PROVIDE COMPLETE WITH TEST PORTS AND FULL PORT QUARTER TURN BALL VALVES.

FIRE PROTECTION NOTES:

- 1. THE CONTRACTOR SHALL DESIGN & INSTALL AN AUTOMATIC FIRE SPRINKLER SYSTEM(S) IN FULL COMPLIANCE WITH NFPA 13, NFPA 24 AND NFPA 20 AS APPLICABLE. REFER TO ARCHITECTURAL DRAWINGS FOR NAMES OF ALL AREAS, FIRE RATINGS, ETC.
- 2. DESIGN CRITERIA: THE CONTRACTOR SHALL DETERMINE THE SPECIFIC REQUIREMENTS OF THE OWNER'S INSURERS AND THE AUTHORITY HAVING JURISDICTION, INCLUDING DESIGN DENSITIES, AREA OF OPERATION AND REQUIRED HAZARD CLASSIFICATION AND OTHER ADDITIONAL SPECIAL REQUIREMENTS AND PROVIDE A SYSTEM TO SUIT. THE CONTRACTOR SHALL PROVIDE THE ARCHITECT WITH DOCUMENTED VERIFICATION OF ALL REQUIREMENTS.
- 3. THE INSTALLATION SHALL BE DESIGNED IN ACCORDANCE WITH APPLICABLE NFPA STANDARDS UNLESS MODIFIED BY THE OWNER'S FIRE INSURANCE CARRIERS INTERPRETATION GUIDE. ALL PLANS AND FINAL INSTALLATIONS ARE SUBJECT TO ACCEPTANCE BY THE FIRE INSURANCE CARRIER AND THE AUTHORITY HAVING JURISDICTION.
- 4. THE CONTRACTOR SHALL PREPARE AND SUBMIT DRAWINGS AND CALCULATIONS THAT COMPLY WITH AND PROVIDE ALL THE INFORMATION ITEMIZED UNDER NFPA 13, "WORKING PLANS", "HYDRAULIC CALCULATION FORMS", "WATER SUPPLIES". DRAWINGS SHALL BE PREPARED BY A REGISTERED FIRE PROTECTION PROFESSIONAL ENGINEER OR BY A FIRE PROTECTION CONTRACTOR CERTIFIED IN THE STATE AND COUNTY TO DO SUCH WORK AND SHALL BE SUBMITTED FOR PERMITTING APPROVAL BY THE OWNER'S INSURANCE UNDERWRITERS AND THE AUTHORITY HAVING JURISDICTION. CERTIFICATION NUMBER AND DATE OF EXPIRY SHALL BE IDENTIFIED ON THE DRAWINGS AND CALCULATIONS. CONFIRMATION OF REGISTRATION/CERTIFICATION SHALL BE SUBMITTED TO THE GENERAL CONTRACTOR AND OWNER PRIOR TO COMMENCING WORK ON SITE. THE SYSTEM INSTALLER SHALL BE CERTIFIED BY THE COUNTY LOCAL AUTHORITY AND THE AUTHORITY HAVING JURISDICTION TO DO FIRE SPRINKLER PROTECTION WORK IN THE COUNTY. THE PIPING LAYOUT SHALL BE COORDINATED WITH THE BUILDING AND OTHER SERVICES. HVAC DUCTS, RAIN AND SANITARY LINES SHALL HAVE PRIORITY OVER SPRINKLER LINE ROUTING. SPRINKLER LINES SHALL NOT RESTRICT ACCESS TO ANY EQUIPMENT.
- 5. IT SHALL BE THE RESPONSIBILITY OF THE FIRE PROTECTION DESIGNER AND INSTALLING CONTRACTOR TO VERIFY THAT ADEQUATE WATER SUPPLY IS AVAILABLE TO ENSURE PROPER OPERATION OF THE SYSTEM. THE DESIGN SHALL BE BASED ON WATER SUPPLY (PRESSURE/FLOW) INFORMATION THAT IS NO MORE THAN 6 MONTHS OLD OR AS OTHERWISE REQUIRED BY THE AUTHORITY HAVING JURISDICTION. THE FLOW TEST DATA AND A 24 HOUR GRAPH SHALL BE INCLUDED IN THE SHOP DRAWING SUBMITTAL. THE DESIGN FACTOR OF SAFETY SHALL NOT BE LESS THAN 5 % ABOVE THE LOWEST AVAILABLE WATER SUPPLY (PRESSURE/FLOW) OVER 24 HOURS OR AS OTHERWISE REQUIRED BY THE AUTHORITY HAVING JURISDICTION.
- 6. THE CONTRACTOR SHALL PROVIDE ALL SWITCHES, ALL AUDIO VISUAL SIGNALING DEVICES, CONNECTION TO THE FIRE ALARM SYSTEM, OFF—SITE MONITORING, COMMUNICATION WITH THE FIRE DEPARTMENT, ETC., AS REQUIRED BY THE OWNER'S INSURANCE UNDERWRITERS AND THE AUTHORITY HAVING JURISDICTION. THE CONTRACTOR SHALL COORDINATE THE ELECTRICAL CHARACTERISTICS AND REQUIREMENTS OF ALL FIRE PROTECTION EQUIPMENT WITH THE ELECTRICAL CONTRACTOR AND SHALL PROVIDE, AND BE RESPONSIBLE, FOR THE COMPLETE WIRING OF THE SYSTEM.
- 7. HYDRAULIC CALCULATIONS SHALL INCLUDE AN ALLOWANCE FOR INSIDE AND OUTSIDE HOSE STREAMS AS REQUIRED BY THE OWNER'S INSURANCE UNDERWRITERS AND THE AUTHORITY HAVING JURISDICTION.
- 8. THE CONTRACTOR SHALL DETERMINE THE NEED FOR, AND SHALL BE RESPONSIBLE FOR PROVIDING PERMANENT, FREEZE PROTECTION ON ALL SUSCEPTIBLE PARTS OF THE SYSTEM. PROVIDE A DRY PIPE SYSTEM FOR ANY EXTERIOR PROTECTION REQUIRED. SPRINKLER PIPING IN CEILING SPACES, ATTICS, ETC., SHALL, IN ADDITION TO ANY OTHER FREEZE PROTECTION REQUIRED, BE LOCATED ON THE HEATED SIDE OF THE BUILDING INSULATION ENVELOPE AND SHALL BE INSULATED WITH 1" THICK PREFORMED FIBER GLASS PIPE INSULATION WITH ASJ.
- 9. PROVIDE CONCEALED SPACE PROTECTION ABOVE CEILINGS, IN CLOSETS, ETC. AS REQUIRED BY NFPA 13.
- 10. THE CONTRACTOR SHALL PAY ALL FEES REQUIRED. THE CONTRACTOR SHALL ARRANGE FOR ALL INSPECTIONS REQUIRED BY THE LOCAL AUTHORITY HAVING JURISDICTION PRIOR TO ACCEPTANCE.
- 11. SPRINKLER HEADS SHALL BE TEMPERATURE RATED TO SUIT THE APPLICATION AND LOCATION. THE SPRINKLER HEADS SHALL BE UPRIGHT TYPE WITH BRASS FINISH IN AREAS WITHOUT CEILINGS. SIDEWALL TYPE CAN BE USED WHERE USE OF UPRIGHT TYPE IS IMPRACTICAL. PROVIDE PENDANT TYPE CHROME PLATED HEADS AND ESCUTCHEON PLATES IN AREAS WITH CEILINGS. OBTAIN ARCHITECT APPROVAL OF ALL HEADS PRIOR TO INSTALLATION. CONCEALED TYPE HEADS MAY BE REQUIRED IN SOME AREAS. VERIFY WITH ARCHITECT PRIOR TO BID. SPRINKLER HEADS INSTALLED IN LAY—IN ACOUSTICAL TILE CEILINGS SHALL BE INSTALLED ON THE CENTER LINE OF THE 2 FT DIMENSION AND NOT BEYOND THE QUARTER POINTS OF THE 4 FT DIMENSIONS OF 2' X 4' TILES.
- 12. ALL PIPING ABOVE GRADE SHALL BE SUPPORTED FROM THE BUILDING STRUCTURE AND SHALL NOT REST ON CEILINGS TEES AND TILES, DUCTS, LIGHT FIXTURES, ETC. THE CONTRACTOR SHALL SUPPORT THE SPRINKLER SYSTEM COMPONENTS TO MEET THE SEISMIC BRACING REQUIREMENT FOR MECHANICAL COMPONENTS AND SYSTEMS AS DEFINED IN THE INTERNATIONAL BUILDING CODE. THE EFFECTIVE PEAK VELOCITY RELATED ACCELERATION, BUILDING GROUP AND BUILDING SEISMIC PERFORMANCE CATEGORY SHALL BE VERIFIED WITH THE STRUCTURAL ENGINEER OF RECORD PRIOR TO BID. SUPPORT SIZE AND LOCATION SHALL BE IN ACCORDANCE WITH THE GUIDELINES OF SMACNA "SEISMIC RESTRAINT MANUAL GUIDELINES FOR MECHANICAL SYSTEMS". SUPPORT AND BRACING OF FIRE SPRINKLER SYSTEMS SHALL BE PERMITTED TO BE IN ACCORDANCE WITH NFPA 13 IN BUILDINGS SITES WHERE THE EFFECTIVE PEAK VELOCITY RELATED ACCELERATION, AV, IS LESS THAN 0.20.
- 13. ALL EQUIPMENT AND PIPING USED SHALL BE UL LISTED AND FM APPROVED FOR USE IN FIRE SPRINKLER SYSTEMS. ALL MAJOR VALVES SHALL HAVE UL LISTED SUPERVISORY SWITCHES. THESE SHALL BE COMPATIBLE WITH ANY EXISTING CENTRAL ALARM SYSTEM.
- 14. GROOVED (VICTAULIC) COUPLINGS SHALL NOT BE INSTALLED ABOVE OR NEAR ELECTRICAL SWITCHGEAR, PANELS, TRANSFORMERS, ETC.
- 15. SPRINKLER PIPING SHALL BE ROUTED TO MAINTAIN CLEAR HEIGHTS IMPLIED ON ARCHITECTURAL DRAWINGS (CEILING, DOOR, WINDOW, ETC., HEIGHTS).
- 16. SPRINKLER SYSTEMS SHALL HAVE ALL APPURTENANCES REQUIRED BY NFPA 13 AND LOCAL AUTHORITIES HAVING JURISDICTION AND SHALL INCLUDE AN ALARM—CHECK VALVE, WATER MOTOR GONG, FLOW SWITCH, TEST VALVE ASSEMBLIES, ETC.
- 17. RECOMMENDATIONS IN THE NFPA STANDARDS ("SHOULD") SHALL BE DEEMED MANDATORY ("SHALL") FOR PURPOSES OF THIS WORK.
- 18. EACH STORAGE UNIT SHALL HAVE MIN. ONE SPRINKLER HEAD.

SYMBOL	PLUMBING LEGEND
	DOMESTIC (COLD) WATER PIPING
	HOT WATER PIPING
<u> </u>	HOT WATER CIRCULATION LINE
	SANITARY DRAINAGE PIPING
	NEW VENT PIPING
	TRAP PRIMER LINE
e—	PIPING TURNING DOWN
∞—	P-TRAP
*	VENT THROUGH ROOF
X	SHUT-OFF VALVE
\otimes	FLOOR/GRADE CLEAN OUT
© -	FLOOR DRAIN
2	BACKFLOW PREVENTER
\bigcirc	HOT WATER CIRCULATION PUMP

ABBREVIATIONS:

<u> </u>		
AD	=	ACCESS DOOR
AFF	=	ABOVE FINISHED FLOOR
BFP	=	BACK FLOW PREVENTER
CMP	=	COMPRESSOR
CW	=	COLD WATER
° F	=	DEGREES FAHRENHEIT
DIA	=	DIAMETER
FD	=	FLOOR DRAIN
FS	=	FLOOR SINK
GCO	=	GROUND CLEAN OUT
HD	=	HUB DRAIN
HP	=	HORSEPOWER
HW	=	HOT WATER

IM = ICE MAKER BOX
IPC = INTERNATIONAL PLUMBING CODE
LAV = LAVATORY

PRV = PRESSURE REDUCING VALVE
RD = ROOF DRAIN
SAN = SANITARY
TYP = TYPICAL

VTR = VENT THROUGH ROOF

WHA = WATER HAMMER ARRESTOR

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P0.1

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WATER HEATER SIZING CALCULATION:

CALCULATION OF HOT WATER DEMAND

ITEM	GPH PER ITEM	# ON Plans	TOTAL GPH
LAVATORY/HAND SINKS	2	8	16
SHOWER	3	1	3
SINK TOTAL			19
SINK TOTAL GPH/2 = 10		10 HOT DEM	WATER
PEAK HOUR DEMAND REQUIRED:10	GPH • 10	0 F RISE	
MANUFACTURER: A.O. SMITH	MODEL: D	RE-52	
STORAGE CAPACITY: 50	GALLONS		
RECOVERY RATE • 100 F RISE: 2	5 дрн		
RECOVERY NATE & 100 F RISE:			

WATER HEATER SIZING CALCULATION: CALCULATION OF HOT WATER DEMAND

2-COMPARTMENT PREP SINK MOP/CAN WASH SINK TOTAL	4 20	1	4
MOP/CAN WASH	•	1	4
	20	_	
SINK TOTAL		1 1	20
0			24
SINK TOTAL GPH/2 = 12 +	3	<u>.</u> 15	
	DW FLOW RATE (DEMAN	
PEAK HOUR DEMAND REQUIRED:15_	GPH • 10	00 F RISE	
MANUFACTURER: A.O. SMITH	MODEL: E	NL-40	
00	ALLONS		
RECOVERY RATE • 100 F RISE:2	1 _{GPH}		
	#BTUs/HR =	24600	

1. PROVIDE EXPANSION TANK & T & P VALVE.

	PLUMBING FIXTURE SCHEDULE									
TAG	BASIS OF DESIGN	MODEL	DESCRIPTION	ACCESSORIES						
HWC	AMERICAN STANDARD	3461-001	"MADERA" FLOOR MOUNTED (1.28 GPF) FLUSH VALVE HANDICAPPED TOILET WITH 1½" TOP SPUD & ELONGATED BOWL. WATER CLOSET RIM TO BE 16½" AFF.	PROVIDE WITH ELONGATED OPEN FRONT SEAT WITHOUT LID. SLOAN "REGAL" FLUSH VALVE MODEL: 111-1.28 FLUSH HANDLES SHALL BE ON WIDE SIDE OF WATER CLOSET COMPARTMENT						
WC1	AMERICAN STANDARD	2234.511	"MADERA" FLOOR MOUNTED (1.28 GPF) FLUSH VALVE TOILET WITH 1½" TOP SPUD & ELONGATED BOWL. WATER CLOSET RIM TO BE 15" AFF.	PROVIDE WITH ELONGATED OPEN FRONT SEAT WITHOUT LID. SLOAN "REGAL" FLUSH VALVE MODEL: 111-1.28 FLUSH HANDLES SHALL BE ON WIDE SIDE OF WATER CLOSET COMPARTMENT						
WC2	AMERICAN STANDARD	215CB	"CADET PRO" FLOOR MOUNTED (1.28 GPF) FLUSH TANK WATER CLOSET WITH ELONGATED BOWL. WATER CLOSET RIM TO BE 15" AFF.	PROVIDE WITH ELONGATED OPEN FRONT SEAT WITHOUT LID.						
UR	AMERICAN STANDARD	6590.505	"WASHBROOK" WALL MOUNTED (0.5 GPF) URINAL WITH ¾" TOP SPUD, VITREOUS CHINA & ELONGATED RIM .	PROVIDE WITH SELECTRONIC HANDS FREE FLUSH VALVE MODEL: 6063.051.						
L1	AMERICAN STANDARD	9024	"DECORUM" ADA COMPLIANT, WALL HUNG LAVATORY. CONCEALED FRONT OVERFLOW, VITREOUS CHINA, WITH FAUCET HOLES ON 4" CENTERS.	PROVIDE WITH AMERICAN STANDARD MODEL: 1480.150 "SEVA" LAVATORY FAUCET WITH SINGLE LEVER HANDLE, 0.5 GPM AERATOR, McGUIRE 1-1/4" P-TRAP, SUPPLIES & STOPS.						
L2	AMERICAN STANDARD	0476.028	"AQUALYN" ADA COMPLIANT, COUNTER MOUNTED LAVATORY. VITREOUS CHINA, WITH FRONT OVERFLOW & FAUCET HOLES ON 4" CENTERS.	PROVIDE WITH AMERICAN STANDARD MODEL: 7075.054 LAVATORY FAUCET WITH SINGLE LEVER HANDLE, 0.5 GPM AERATOR, McGUIRE 1-1/4" P-TRAP, SUPPLIES & STOPS.						
SHR	BY ARCHITECT		SHOWER (SEE ARCHITECTURAL PLANS)	HANDICAPPED SHOWER FAUCET AND HEAD: SYMMONS S-96-300-B30-L-V TEMPTROL PRESSURE BALANCING MIXING VALVE, POLISHED CHROME FINISH, WALL/HAND SHOWER WITH 60" METAL HOSE, 30" SLIDE BAR, SET OUTPUT WATER TEMPERATURE AT 110°F, FLOOR DRAIN & SHOWER PAN.						
SCS	ELKAY	PSRADQ1919	SINGLE COMPARTMENT SINK, 20 GAUGE STAINLESS STEEL, SELF RIMMING. OVERALL DIMENSIONS 19½"x 19"x 5½" DEEP. PROVIDE WITH 2 FAUCET HOLES ON 4" CENTERS.							
BS	ELKAY	CR172113		PROVIDE WITH ELKAY FAUCET MODEL: LK2477CR WITH LEVER HANDLE, GOOSENECK SPOUT WITH (1.5 GPM) AERATOR. PROVIDE WITH LK18 PERF. GRID DRAINS, McGUIRE 1-1/2" P-TRAP & SUPPLIES AND STOPS.						
DCS	ELKAY	CR33211	DOUBLE COMPARTMENT SINK, 20 GAUGE STAINLESS STEEL, SELF RIMMING. OVERALL DIMENSIONS 33"x 21¼"x 6½" DEEP. PROVIDE WITH 4 FAUCET HOLES ON 4" CENTERS.	PROVIDE WITH DELTA FAUCET MODEL: 4353—AR—DST WITH LEVER HANDLE, GOOSENECK SPOUT/PULL—OUT SPRAYER WITH (1.5 GPM) AERATOR. PROVIDE WITH LK18 PERFORATED GRID DRAINS, McGUIRE 1—1/2" P—TRAP & SUPPLIES AND STOPS.						
MS	FIAT	MSB 2424	24x24 MOLDED STONE MOP SERVICE BASING. OVERALL DIMENSIONS 24"x24"x10".	PROVIDE WITH FIAT MODEL: 830—AA FAUCET WITH VACUUM BREAKER, HOSE & HOSE BRACKET, STAINLESS STEEL BUMPER GUARD & STAINLESS STEEL WALL GUARD.						
MV	LAWLER	TMM-1000	UNDER-THE-COUNTER THERMOSTATIC MIXING VALVE WITH A THERMOSTATIC HIGH TEMPERATURE LIMIT STOP @ 110°F.	3/8" INLETS & 3/8" OUTLET INTEGRAL RUBBER DUCK-BILL CHECKS SET TO DELIVER MAX. 105°F TEMPERED WATER						
FD	ZURN	Z-415	FLOOR DRAIN, DURACOATED CAST IRON BODY WITH BOTTOM OUTLET, COMBINATION INVERTIBLE MEMBRANE CLAMP & ADJUSTIBLE COLLAR WITH TYPE "B" POLISHED, NICKEL BRONZE STRAINER.	6" DIAMETER NICKEL-BRONZE FINISH WITH STRAINER, TRAP PRIMER CONNECTION & VANDAL PROOF SECURED TOP.						
TG	MIFAB	MI-GARD	FLOOR DRAIN TRAP SEAL WITH UV RESISTANT ABS PLASTIC FRAME, SILICON RUBBER SEALING FLAPPER & FOUR SEALING RIBS. TESTED & CERTIFIED TO ASSE 1072 STANDARD.							
HD	ZURN	Z-415	HUB DRAIN, DURACOATED CAST IRON BODY WITH BOTTOM OUTLET, COMBINATION INVERTIBLE MEMBRANE CLAMP & ADJUSTIBLE COLLAR.	6" DIAMETER NICKEL-BRONZE FINISH WITH TYPE "I" STRAINER WITH RAISED LIP. 3" PIPE SIZE WITH TRAP PRIMER CONNECTION.						
FCO	ZURN	Z-1400	ADJUSTABLE FLOOR CLEANOUT, DURA—COATED CAST IRON BODY, WITH GAS & WATER TIGHT ABS TAPERED THREAD PLUG & ROUND SCORIATED TOP ADJUSTABLE TO FINISHED FLOOR.	PROVIDE WITH CARPET MARKER TOP OR RECESSED SQUARE TOP FOR TILE AS REQUIRED.						
GCO	ZURN	Z-1403	NON-ADJUSTABLE FLOOR CLEANOUT, DURA-COATED CAST IRON BODY, WITH GAS & WATER TIGHT ABS TAPERED THREAD COUNTERSUNK PLUC							
wco	ZURN	Z-1446	CLEANOUT TEE, CAST IRON BODY, GAS & WATER TIGHT ABS TAPERED THREAD PLUG, & ROUND, SMOOTH STAINLESS STEEL WALL ACCESS COVER WITH SECURING SCREW.							
NFWH	WOODFORD	65 SERIES	AUTOMATIC DRAINING, FREEZELESS HOSE BIBB WITH ANTI-SIPHON VACUUM BREAKER.	PROVIDE WITH TWO ADDITIONAL LOOSE KEY. VERIFY FINISH WITH OWNER & ARCHITECT.						
CP	TACO	009	HOT WATER CIRCULATION PUMP. IN-LINE, LEAD-FREE BRONZE, WET ROTOR CIRCULATOR. DUTY: 3 GPM @ 25 FT OF HEAD. ELECTRICAL: 115 VOLT, SINGLE PHASE, 1/8 HP.	PROVIDE WITH AQUASTAT.						

	ELECTRIC WATER HEATER SCHEDULE									
TAG	MANUFACTURER	MODEL		ELEMENT	RECOVERY RATE (@ 100°F RISE)	UEF	ELECTRICAL	NOTES.	WEIGHT	
IAG	MANUFACTURER	MODEL		WATTAGE			V/PH/HZ	NOTES:	(LBS)	
EWH1	A.O. SMITH	ENL-40	38	6000	21 GPH	0.89	208/1/60	1	118	
EWH2	A.O. SMITH	DRE-52	50	6000	25 GPH	0.90	208/1/60	1	265	
NOTES:										

11	NSTANTAN	EOUS	WATER	R HEATE	R SCHED	JLE
TAG	MANUFACTURER	MODEL	ELEMENT WATTAGE	TEMP. RISE (°F) @ 0.5 GPM	ELECTRICAL V/PH/HZ	NOTES:
IWH1	CHRONOMITE	CM-20L	2400	33	120/1/60	1
IWH2	CHRONOMITE	CM-20L	2400	33	120/1/60	1
NOTES:	HEATER WITH FACTOR	RY PRESET SE	Iting to deli'	VER MAX. 104°F H	OT WATER.	



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GA LICENSED CONNSULTING ENGINEERS

MECHANICAL / ELECTRICAL ENGINEER

MARSHALL & BOLLWERK

ENGINEERING INC

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GRACE PCA PRESBYTERIAN CHURCH

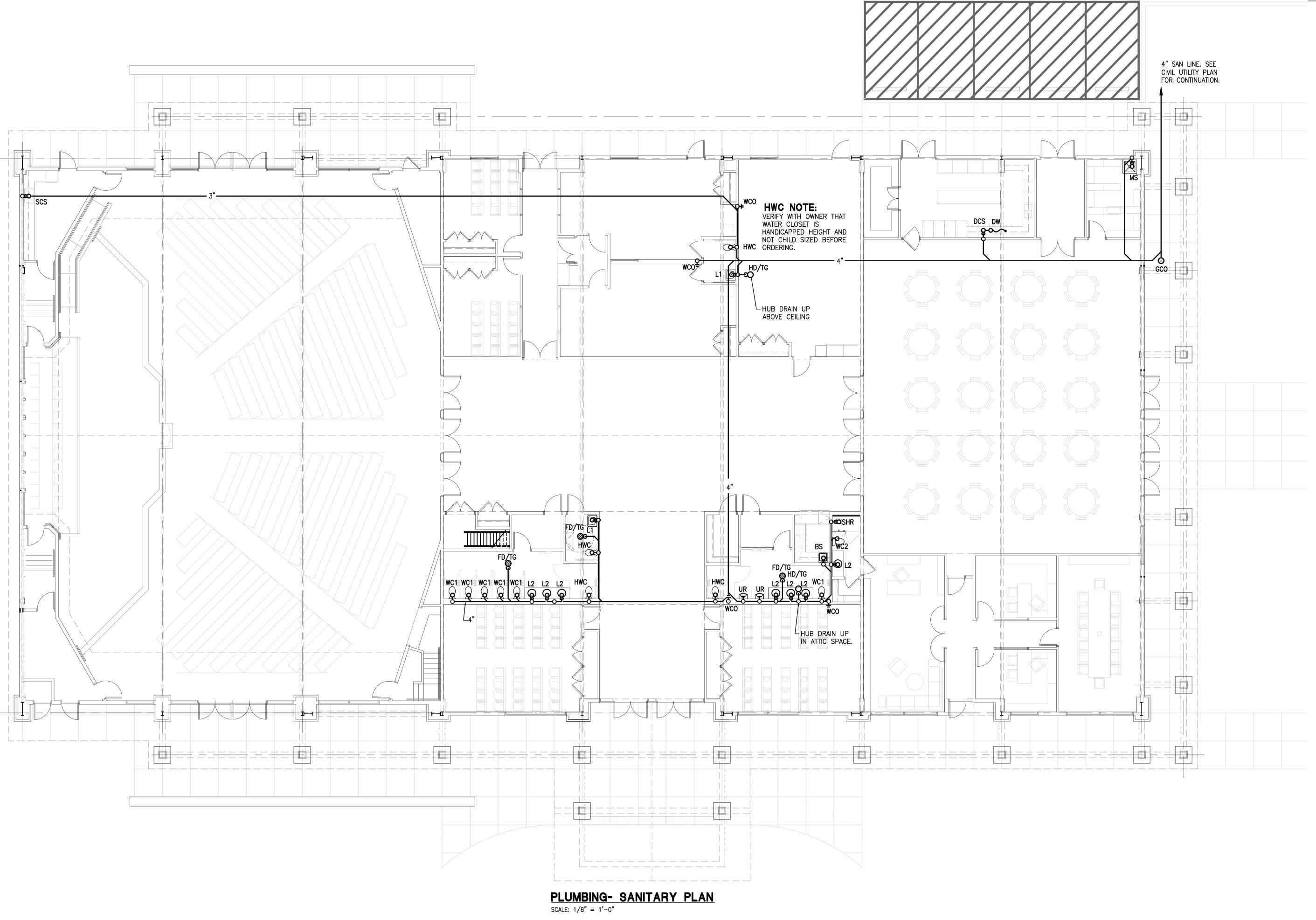
HIGHWAY 76 BLAIRSVILLE, GEORGIA



GAI PROJECT NO.	2019.08
DISTRIBUTION	
ISSUE DESCRIPTION	DATE
80% COORDINATION	2020 02 28
100% CONSTRUCTION	2020 03 16

P0.2





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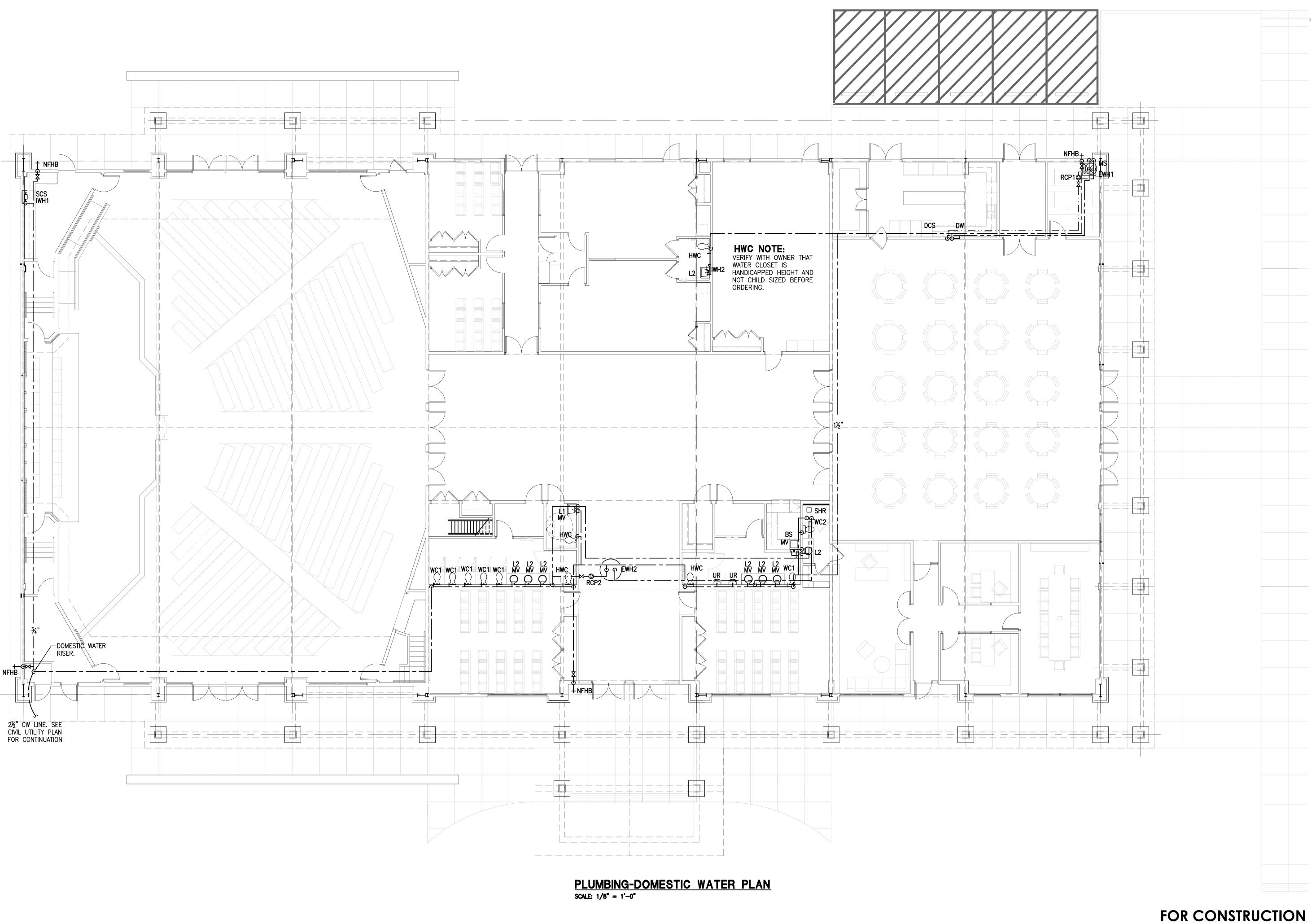
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80% COORDINATION 2020 02 28	DISTRIBUTION	
	ISSUE DESCRIPTION	DATE
100% CONSTRUCTION 2020 03 16	80% COORDINATION	2020 02 28
	100% CONSTRUCTION	2020 03 16
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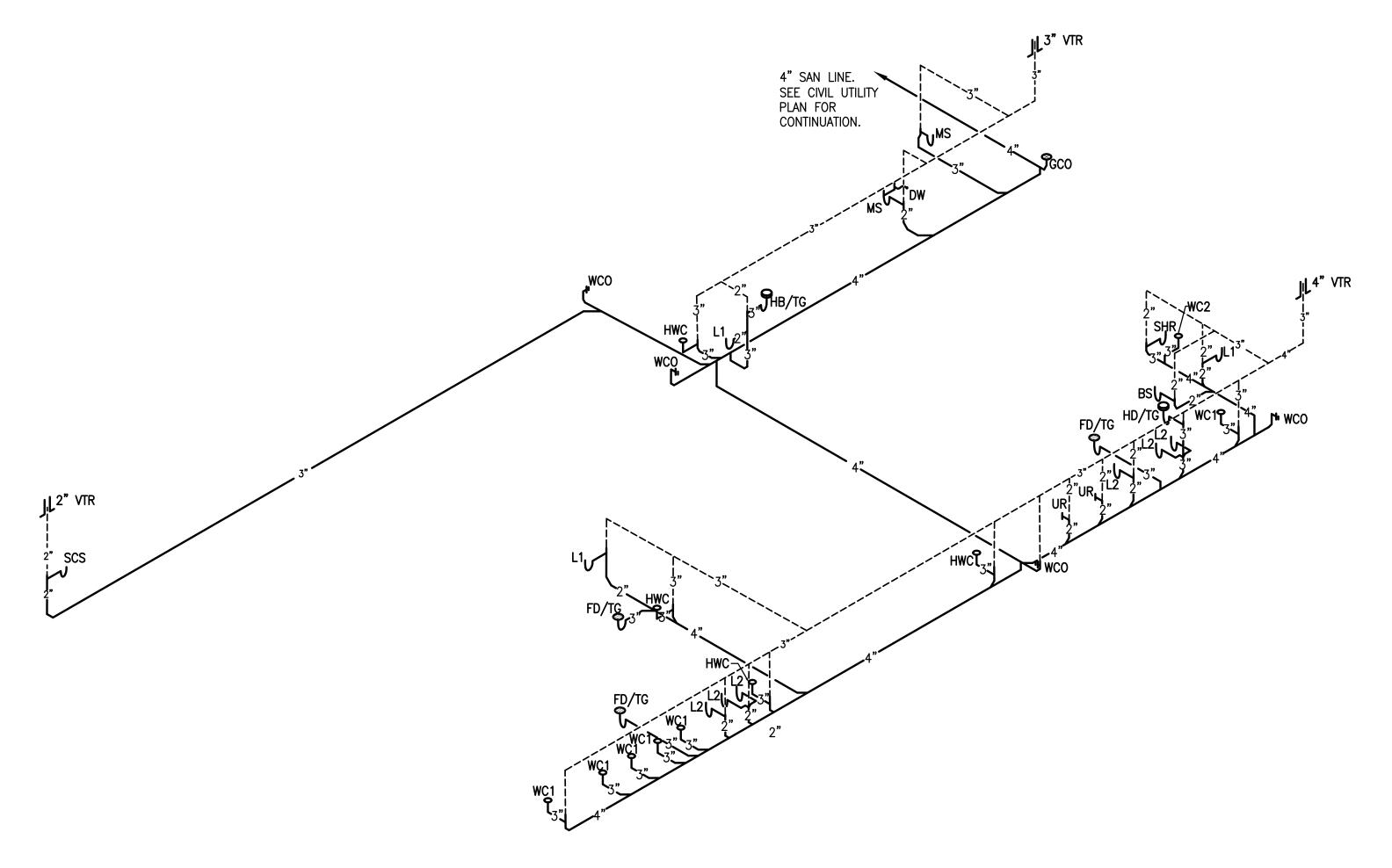
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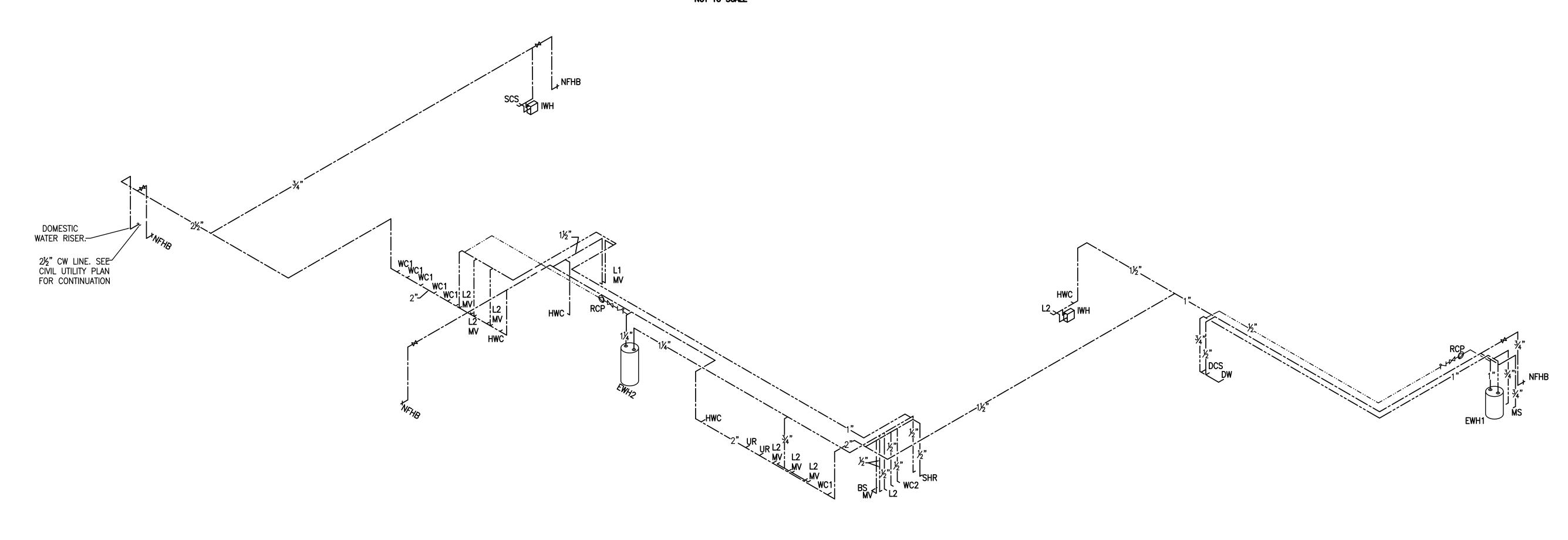


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	ISSUE DESCRIPTION	DATE
100% CONSTRUCTION 2020 03 16	80% COORDINATION	2020 02 28
	100% CONSTRUCTION	2020 03 16
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WASTE & VENT RISER DIAGRAM NOT TO SCALE



DOMESTIC WATER RISER DIAGRAM
NOT TO SCALE

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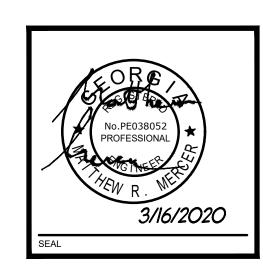
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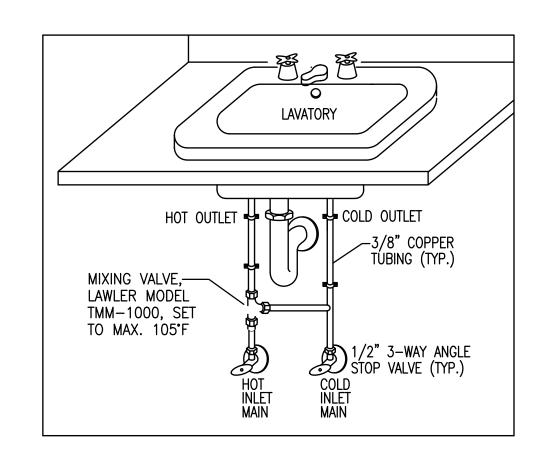
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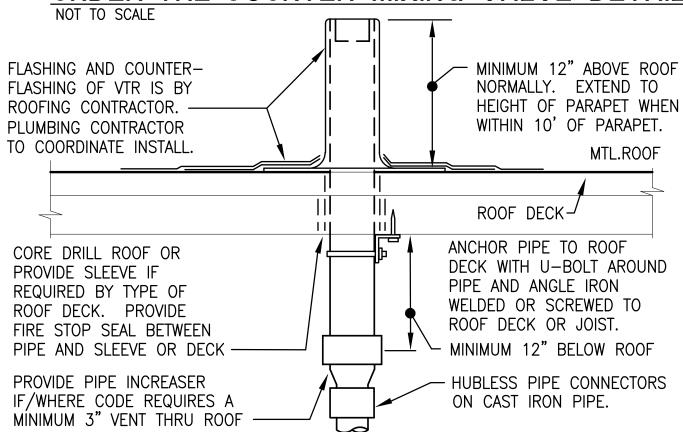


GAI PROJECT NO.	2019.08
DISTRIBUTION	
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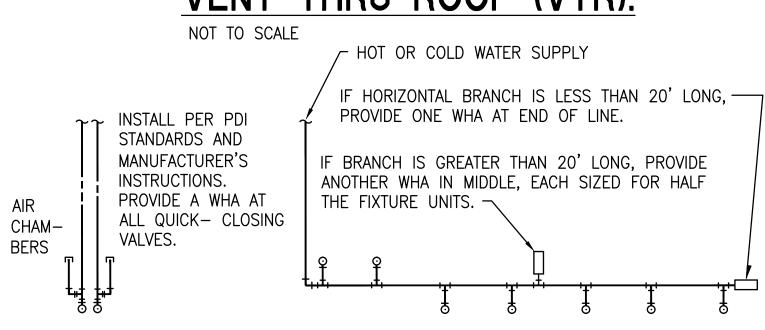


UNDER-THE-COUNTER MIXING VALVE DETAIL



REFER TO PLANS FOR VTR PIPE SIZES AND LOCATIONS. LOCATE VTR MINIMUM THREE FEET FROM PROPERTY LINE, OR TEN FEET HORIZONTAL OR THREE FEET VERTICAL ABOVE ANY BUILDING OPENING OR FRESH AIR INTAKE, OR ONE FOOT FROM ANY VERTICAL SURFACE. LOCATE VTR MINIMUM 18" FROM PARAPET, EXPANSION JOINT, EQUIPMENT CURB, ETC. OFFSET IN CEILING SPACE WHERE REQUIRED TO MEET THESE CONDITIONS.

VENT THRU ROOF (VTR):



SINGLE	/DOUBLE	FIXTURE

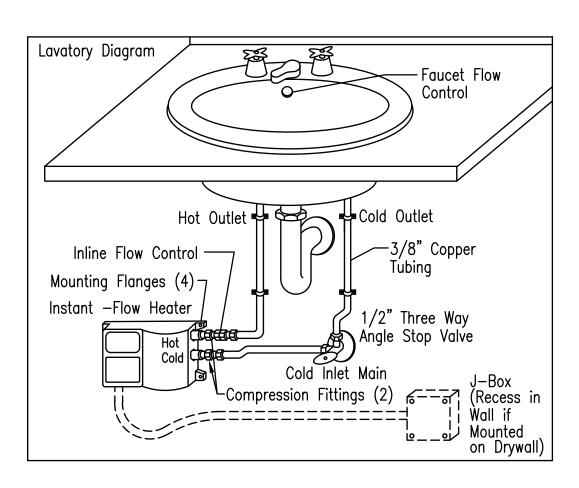
			<u></u>		
PDI	PIPE	FIXTURE	FIXTURE UNIT TABULATION		
SIZE	SIZE	UNIT LOAD	FIXTURE	COLD	HOT
А	1/2"	1–11	VALVE WATER CLOSET	10	
В	3/4"	12-32	TANK WATER CLOSET	5	-
С	1"	33-60	URINAL	5	
D	1-1/4"	61–113	LAVATORY/SINK	1.5	1.5
E	1-1/2"	114-154	JANITOR'S SINK	3	3
F	2"	154–330			

MULTIPLE FIXTURES

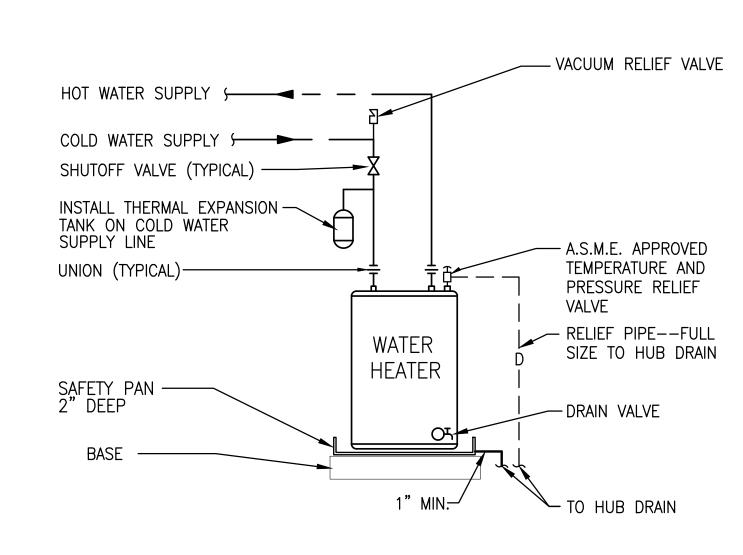
FOR BATTERIES OF FIXTURES, PROVIDE WATER HAMMER ARRESTERS BY SIOUX CHIEF, PRECISION PLUMBING PRODUCTS, WATTS OR APPROVED EQUIVALENT WITH PISTON AND 0-RING CONSTRUCTION, HAVING PDI # WH- 201, ASSE # 1010 AND ANSI # A112.26.1M CERTIFICATION. INSTALL IN HORIZONTAL OR VERTICAL POSITION, BUT NEVER UPSIDE DOWN. INSTALL IN LINE WITH WATER FLOW DIRECTION IF POSSIBLE. SIZE THE UNITS AS SHOWN ON THE DRAWINGS AND/OR PER THE TABLES SHOWN ABOVE. PROVIDE ACCESSIBILITY TO "WHA" WHERE REQUIRED BY LOCAL CODE.

WATER HAMMER ARRESTERS

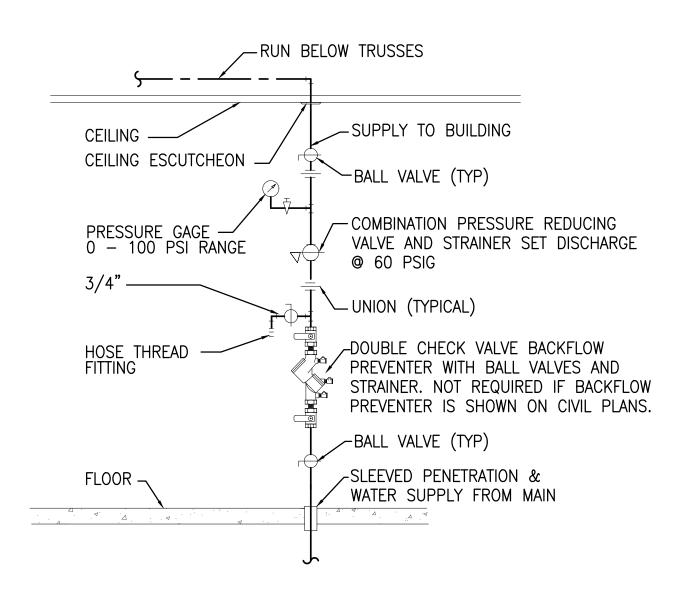
NOT TO SCALE



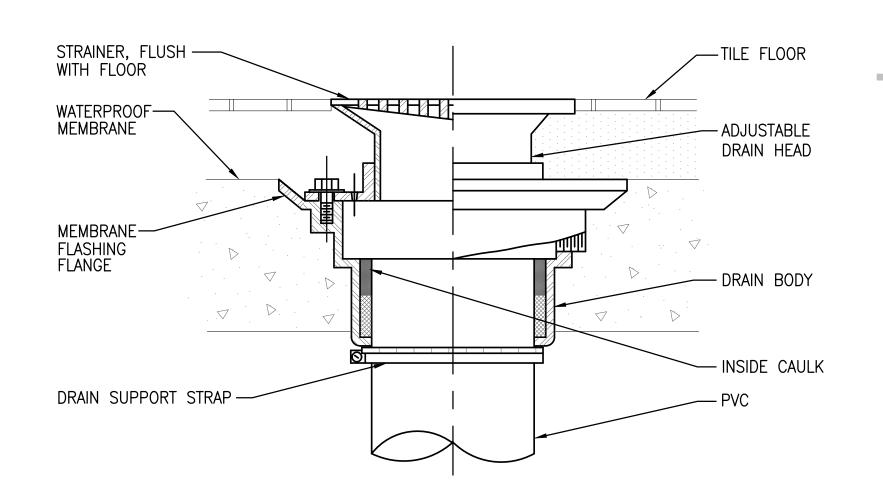
INSTANTANEOUS WATER HEATER DETAIL NOT TO SCALE



ELECTRIC WATER HEATER PIPING DETAIL NO SCALE



DOMESTIC WATER SERVICE ENTRANCE NOT TO SCALE



FLOOR DRAIN DETAIL:

NOT TO SCALE

SEE HOLDRITE INSTALLATION

ATTACHMENT TO VARIOUS

SEE HOLDRITE INSTALLATION

ATTACHMENT TO VARIOUS

INSTRUCTIONS FOR

WALL TYPE. (TYPICAL)

SEE STRUCTURAL

ATTACHMENT METHOD.

PLANS FOR

INSTRUCTIONS FOR

WALL TYPE. (TYPICAL)

DRAIN & RELIEF VALVE DIRECTED —

PARTITION WALL -

PER LOCAL CODE REQUIREMENTS

VACUUM RELIEF VALVE—

EXPANSION TANK-

TEMPERATURE & -

VALVE WITH 3/4"

WATER HEATER-

SHUT-OFF VALVE -

SUPPLY TO WATER

2" HOLDRITE -

QUICKSTAND

#40-SWHP-WM

3'-Ø"

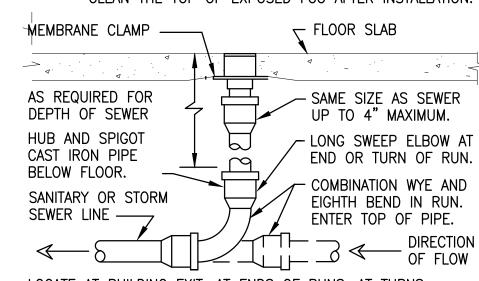
MOP SINK

ON COLD WATER

COPPER DRAIN

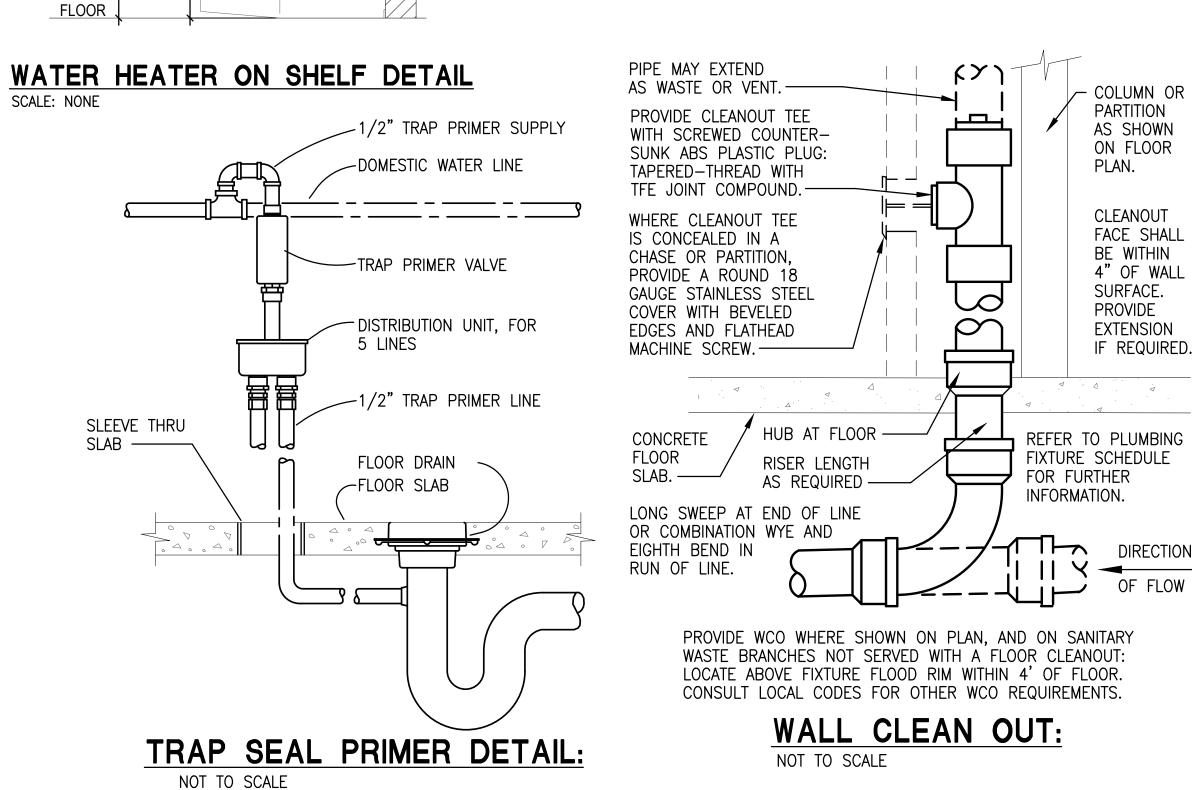
PRESSURE RELIEF

ROUND SECURED GASKETED NICKEL BRONZE ADJUSTABLE TOP WITH "CO" CAST IN COVER. PROVIDE CLEANOUT TOP WITH VARIATIONS SUITABLE FOR FLOOR COVERING (CARPET MARKER, RECESSED FOR TILE, SCORIATED FOR UNFINISHED FLOORS). PROVIDE GASKETED PLASTIC PLUG IN CAST IRON BODY. USE TEFLON JOINT COMPOUND ON PLUG THREADS. CLEAN THE TOP OF EXPOSED FCO AFTER INSTALLATION.



LOCATE AT BUILDING EXIT, AT ENDS OF RUNS, AT TURNS
OF PIPE GREATER THAN 45 DEGREES, AT 50' INTERVALS
ON STRAIGHT RUNS, AND/OR WHERE SHOWN ON PLANS.
PROVIDE BACKFILL PER ARCHITECTURAL SPECIFICATIONS.
LOCATE CLEANOUTS WHERE THERE IS 18" CLEAR AROUND.
CONSULT LOCAL CODES FOR OTHER FCO REQUIREMENTS.

FLOOR CLEAN OUT:



FOR CONSTRUCTION



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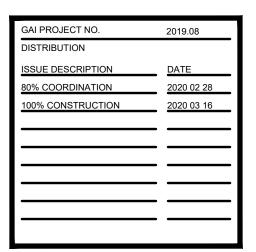
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ELECTRICAL SPECIFICATIONS AND NOTES:

- 1. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE 2017 NATIONAL ELECTRICAL CODE (NFPA 70), AS MODIFIED BY THE STATE, COUNTY, CITY AND/OR OTHER LOCAL CODES. THE SERVICE AND METERING SHALL COMPLY WITH THE REQUIREMENTS OF THE ELECTRICAL UTILITY. PRIOR TO DISTURBING THE SOIL, CONTACT THE UNDERGROUND UTILITY LOCATION SERVICE TO LOCATE AND FLAG ALL EXISTING UNDERGROUND
- PIPING, COMMUNICATION AND ELECTRICAL DISTRIBUTION CABLES/CONDUIT.

 2. THE CONTRACTOR SHALL PROVIDE ALL MATERIAL, LABOR, AND EQUIPMENT NECESSARY TO FURNISH A COMPLETE AND OPERABLE ELECTRICAL SYSTEM. ALL WORK SHALL BE PERFORMED IN A NEAT AND PROFESSIONAL MANNER.
- 3. THE CONTRACTOR SHALL VERIFY THE FOLLOWING ITEMS WITH THE ELECTRICAL UTILITY AND THE OWNER AND REPORT ANY DISCREPANCY TO THE ARCHITECT PRIOR TO THE START OF WORK:

 A. LOCATION, SIZE, NUMBER AND TYPE OF SERVICE TRANSFORMERS AND SERVICE LATERALS
- A. LOCATION, SIZE, NUMBER AND TYPE OF SERVICE TRANSFORMERS AND SERVICE LATERALS
 B. AVAILABLE VOLTAGE, PHASE, AND CAPACITY
 C. AVAILABLE FAULT CURRENT AT RATED VOLTAGE, SUBMIT THIS INFORMATION WITH THE SHOP DRAWINGS ON PANELBOARDS, ALONG WITH LETTER FROM THE POWER COMPANY. THIS INFORMATION SHALL BE
- D. METERING EQUIPMENT
 E. THAT THE REQUIRED NUMBER OF SER

COMPLETED PROJECT.

E. THAT THE REQUIRED NUMBER OF SERVICE CONDUCTORS SHOWN CAN BE CONNECTED TO THE TRANSFORMER LUGS

USED FOR LABELING OF PANELBOARDS PER NEC 110.24(A).

- F. WORK REQUIRED BY THE CONTRACTOR, IF ANY, TO MEET THE NEEDS AND/OR REQUIREMENTS OF THE UTILITY COMPANY FOR THIS PROJECT.
- G. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AND PAYING THE COST FOR ALL NECESSARY TEMPORARY ELECTRICAL POWER FOR CONSTRUCTION USE.

 4. THE CONTRACTOR SHALL OBTAIN, PURCHASE, AND MAINTAIN ALL PERMITS, AND INSPECTIONS REQUIRED BY
- THE GOVERNING AUTHORITIES FOR THE DURATION OF THIS PROJECT.

 THE CONTRACTOR SHALL COORDINATE ALL ELECTRICAL REQUIREMENTS, AND MAKE ALL FINAL CONNECTIONS, TO EQUIPMENT FURNISHED BY OTHER TRADES. THE CONTRACTOR SHALL GUARANTEE ALL MATERIALS, EQUIPMENT, AND WORKMANSHIP FOR A PERIOD OF ONE YEAR AFTER FINAL ACCEPTANCE OF THE
- 6. PANELBOARDS AND OTHER ELECTRICAL EQUIPMENT SHALL BE INSTALLED AS SHOWN ON THE PLANS, UNLESS NOTED OTHERWISE. MOUNT ALL WALL—MOUNTED, SURFACE TYPE, GROUPED ELECTRICAL EQUIPMENT ON 3/4" THICK EXTERIOR GRADE PLYWOOD, PAINTED GRAY, OR CONCRETE BLOCK WALLS, WHERE APPROVED BY THE STRUCTURAL ENGINEER. VERIFY THE DEPTH OF RECESSED PANELS AND WALL CAVITIES, AND COORDINATE THE INSTALLATION WITH THE ARCHITECTURAL DRAWINGS, AND THE GENERAL CONTRACTOR. WORKING CLEARANCES SHALL BE 36" (FOR 240 VOLT SYSTEM) MINIMUM, AND WIDTH OF EQUIPMENT OR 30" MINIMUM, WHICHEVER IS GREATER, WIDE, PER NEC ARTICLE 110.26. WHERE A PANELBOARD IS LOCATED IN A STORAGE OR EQUIPMENT ROOM (NOT A CORRIDOR) THAT IS NOT PARTITIONED FROM OTHER USES. PAINT THE LIMITS OF THE WORKING CLEARANCES FROM NEC ARTICLE
- 110.26 ON THE FLOOR IN FRONT OF THE EQUIPMENT.

 7. THE CONTRACTOR SHALL VERIFY AND COORDINATE WITH OTHER TRADES THE INSTALLATION OF ALL OVERCURRENT DEVICES COMPLY WITH NEC 240.24. THE CONTRACTOR SHALL TAKE THE PROPER ACTION AS
- REQUIRED TO COMPLY WITH THIS REQUIREMENT.

 8. THE CONTRACTOR SHALL COORDINATE THE WIDTH, DEPTH, HEIGHT, DOOR SWINGS, AND NEC ARTICLE 110.26 CLEARANCES FOR ALL PANELS, TRANSFORMERS, STARTERS, AND SAFETY SWITCHES TO INSURE THAT ALL
- EQUIPMENT FITS WITHIN THE SPACE ALLOWED.

 9. IDENTIFY PANELBOARDS, SAFETY SWITCHES, STARTERS, CONTROLS, AND OTHER ELECTRICAL EQUIPMENT WITH ENGRAVED PLASTIC NAMEPLATES HAVING CONTRASTING 1/4" HIGH (OR LARGER) LETTERS, WITH NAMES TO MATCH THE SCHEDULES OR OTHER DRAWING REFERENCES. TYPEWRITTEN PANEL DIRECTORIES SHALL BE PROVIDED IN ALL PANELBOARDS IN ACCORDANCE w/ NEC 408.4(A), AND SHALL REFLECT AS—BUILT
- CONDITIONS. ALSO, LABEL ALL PANELBOARDS IN ACCORDANCE w/ NEC 110.24(A) AND 408.4(B).

 10. ALL WIRING, CONSISTING OF INDIVIDUAL CONDUCTORS, SHALL BE INSTALLED IN CONDUIT, EXCEPT WHERE SPECIFICALLY SHOWN ON THE DRAWINGS. ALL EXTERIOR CONDUITS AND EXPOSED CONDUITS SHALL BE RIGID GALVANIZED STEEL, OR INTERMEDIATE METAL CONDUIT, BUT THEY SHALL NOT BE MIXED ON THIS PROJECT. WHERE USED INDOORS MAY BE EMT. CONCEALED CIRCUITS MAY BE RUN IN EMT OR BE TYPE MC CABLE (BX). NON-METALLIC SHEATHED (TYPE NM) CABLE IS PERMITTED AS APPROVED BY AUTHORITY HAVING JURISDICTION, AND OWNER. WHERE NON-METALLIC SHEATHED (TYPE NM) CABLE IS PERMITTED AND WALL CONSTRUCTION CONSISTS OF METAL STUDS, THEN LISTED BUSHINGS AND LISTED GROMMETS SHALL BE INSTALLED IN THE OPENINGS WHERE THE CABLE PASSES THROUGH. IN FINISHED AREAS WITH CAVITY TYPE WALL CONSTRUCTION, ALL CONDUIT SHALL BE CONCEALED, UNLESS NOTED OTHERWISE. IN FINISHED AREAS WITH NON-CAVITY TYPE WALL CONSTRUCTION, SURFACE MOUNTED GRS, IMC, OR EMT SHALL BE USED. ALL EMPTY CONDUITS SHALL BE PROVIDED WITH A NYLON PULL CORD RATED FOR 200 POUND TENSION. ANY OF THE FOLLOWING TYPES OF RACEWAYS MAY BE USED, SUBJECT TO THE NEC AND THE ADDITIONAL RESTRICTIONS LISTED, IF ANY.
- A. CONCEALED: 1). GRS, OR IMC.
- 2). EMT. COMPRESSION, OR SET SCREW FITTINGS, BUT NOT BOTH TYPES
- 3). PVC. SCHEDULE 40. SCHEDULE 80 WHERE INDICATED ON THE DRAWINGS. UNDERGROUND ONLY.4). TYPE MC CABLE. ONLY ABOVE ACCESSIBLE CEILINGS, IN WALL CAVITIES, AND ADDITIONAL
- 1). GRS, OR IMC.
- 2). EMT. COMPRESSION, OR SET SCREW FITTINGS. ONLY WHERE USED INDOORS AND NOT SUBJECT TO PHYSICAL DAMAGE.3). FLEXIBLE METAL CONDUIT.

USAGES AS APPROVED BY AUTHORITY HAVING JURISDICTION, AND OWNER.

- 4). LIQUIDTIGHT FLEXIBLE METAL CONDUIT. OUTSIDE AND WHERE MOISTURE IS PRESENT
- 11. PROVIDE EXPANSION FITTINGS IN ALL RIGID RACEWAYS CROSSING STRUCTURAL EXPANSION JOINTS. FURNISH AND INSTALL ALL SUPPORTS REQUIRED FOR CONDUIT, MATERIALS, DEVICES, EQUIPMENT AND THE LIKE, WHERE THE BUILDING STRUCTURE IS NOT ADAPTED OR SUITABLE FOR MOUNTING SAME DIRECTLY THEREON. RACEWAYS SHALL NOT BE USED AS SUPPORTS FOR BOXES OR OTHER ELECTRICAL EQUIPMENT. PLENUM CABLE SUPPORT BRACKETS SHALL BE OPEN ON ONE SIDE, AND CABLES SHALL BE ATTACHED WITH PLASTIC CABLE TIES. ALL RACEWAY PENETRATIONS, THROUGH FIREWALLS, SHALL BE SEALED WITH UL LISTED SEALING COMPOUNDS TO MAINTAIN THE FIRE RATING OF THE WALL. ALL RACEWAYS/SLEEVES PASSING THROUGH AREAS OF DIFFERENT TEMPERATURES, I.E. FROM INSIDE TO OUTSIDE OF BUILDINGS AND CONNECTIONS TO REFRIGERATED EQUIPMENT, SHALL BE SEALED WITH AN APPROVED PUTTY OR DUCT—SEAL TO PREVENT THE CIRCULATION OF WARM AIR TO A COLDER SECTION OF THE RACEWAY OR SLEEVE. ALL RACEWAY PENETRATIONS THROUGH EXTERIOR AND INTERIOR WALLS AND FLOORS SHALL BE PROPERLY
- 12. THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF RACEWAY SYSTEMS AND ROUGHING-IN FOR ALL LOW VOLTAGE (LV) EQUIPMENT [COMPUTER, DATA, SECURITY, POINT-OF-SALE (POS), MUSIC, PAGING, INTERCOM, FIRE DETECTION, TV, AND TELEPHONE] WITH THE OWNER AND EQUIPMENT SUPPLIER(S) PRIOR TO THE INSTALLATION OF CONDUITS, JUNCTION BOXES, WIRING DEVICES, AND WIRING. ALL EMPTY CONDUITS SHALL BE PROVIDED WITH A NYLON PULL CORD. ALL PULL BOXES, DEVICE BOXES, AND JUNCTION BOXES SHALL BE SIZED PER JIC, NEMA, AND THE NATIONAL ELECTRICAL CODE. ALL WIRING WITHIN BOXES SHALL BE TAGGED WITH PANEL AND CIRCUIT NUMBERS.
- 13. TWENTY AMP BRANCH CIRCUITS MAY BE SHOWN WITH EITHER SINGLE CIRCUIT OR TWO CIRCUIT (MULTIWIRE BRANCH CIRCUIT) HOME RUNS. MULTIWIRE BRANCH CIRCUIT HOME RUNS SHARE A COMMON NEUTRAL, UNLESS NOTED OTHERWISE AND GROUND IN A SINGLE CONDUIT. THE CONTRACTOR MAY ELECT TO COMBINE SINGLE CIRCUIT HOME RUNS TO MAKE MULTIWIRE BRANCH CIRCUIT HOME RUNS, OR TO CHANGE MULTIWIRE BRANCH CIRCUIT HOME RUNS TO SINGLE CIRCUIT HOME RUNS. ALL MULTIWIRE BRANCH CIRCUITS SHALL HAVE A MEANS TO SIMULTANEOUSLY DISCONNECT ALL UNGROUNDED CONDUCTORS AT THE PANEL TO COMPLY w/ NEC 210.4(B).
- 14. PROVIDE SEPARATE GREEN, INSULATED GROUND WIRE IN ALL RACEWAYS.
- 15. REFER TO SINGLE LINE DIAGRAM, GROUND THE FULL SIZE SERVICE GROUNDING ELECTRODE CONDUCTOR TO THE BUILDING STEEL (IF AVAILABLE), A METALLIC COLD WATER PIPE (IF AVAILABLE) AHEAD OF THE WATER METER AND WITHIN 5' OF ITS ENTRANCE INTO THE BUILDING, THE BURIED GROUND RING (IF ONE IS TO BE PROVIDED), THEN CONNECT TO A 6 AWG (MIN.) CONNECTED TO TWO, 3/4" BY TEN FOOT COPPERCLAD STEEL GROUND RODS SEPARATED BY 7' MINIMUM, AND THEN CONNECT TO A 4 AWG (MIN.) CONNECTED TO A 1/2" DIAMETER (MIN.) BY 20' REBAR IN THE FLOOR SLAB OR FOUNDATION (IF AVAILABLE/ACCESSIBLE), ALL PER NEC ARTICLE 250.66, UNLESS NOTED OTHERWISE.
- 16. BONDING OF METAL PIPING SYSTEMS AND EXPOSED STRUCTURAL METAL SHALL COMPLY WITH NEC
- 250.104(A) THRU (D).

 17. ALL WIRING SHALL BE 600 VOLT, COPPER, STRANDED, WITH TYPE XHHW OR THHN/THWN INSULATION.

 MINIMUM SIZE FOR POWER AND LIGHTING CIRCUITS BE 12 AWG. SIZES 10 AWG AND SMALLER SHALL BE

 SOLID. PROVIDE AN EQUIPMENT GROUND WIRE IN ALL RACEWAYS, AND CABLE ASSEMBLIES. SIZE EQUIPMENT
- GROUNDS PER TABLE 250.122 OF THE NATIONAL ELECTRICAL CODE.

 18. VOLTAGE DROP: THE CONTRACTOR FIELD VERIFY ACTUAL CONDUCTOR LENGTHS FOR FEEDERS AND BRANCH CIRCUITS AND IF NECESSARY ADJUST THE WIRE GAGE SUCH THAT THE VOLTAGE DROP ON FEEDERS DOES NOT EXCEED 2% AND THE VOLTAGE DROP ON BRANCH CIRCUITS DOES NOT EXCEED 3%.
- 19. CONDUCTOR COLOR CODES SHALL BE AS FOLLOWS:

BLACK, RED, BLUE:

WHITE:

GREEN:

BARE:

208/120 VOLT PHASE A,B,C

NEUTRAL

ALL EQUIPMENT GROUNDS

ALL NON-ISOLATED GROUNDS

BARE:

GREEN WITH YELLOW STRIPE:

ALL NON-ISOLATED GROUNDS

ALL ISOLATED GROUND

LISE CONDUCTORS 48 AND SMALLER WITH COLOR FACTORY APPLIED THE

USE CONDUCTORS #8 AND SMALLER WITH COLOR FACTORY—APPLIED THE ENTIRE LENGTH OF THE CONDUCTORS. COLOR CODING FOR THE LARGER SIZES MAY BE ACCOMPLISHED BY USING COLORED, 1 INCH WIDE, PRESSURE—SENSITIVE PLASTIC TAPE IN HALF—LAPPED TURN FOR A DISTANCE OF 6 INCHES FROM TERMINAL POINTS. APPLY THE LAST TWO LAPS OF TAPE WITH NO TENSION TO PREVENT POSSIBLE UNWINDING.

POST IDENTIFICATION MEANS IN ACCORDANCE WITH NEC 210.5 (C).

- 20. ALL ELECTRICAL EQUIPMENT SHALL BE LISTED BY UNDERWRITERS LABORATORIES (OR OTHER INDEPENDENT NATIONALLY RECOGNIZED TESTING AGENCY, WHERE APPLICABLE), AND SHALL BE RATED FOR THE MAXIMUM AVAILABLE VOLTAGE AND AVAILABLE FAULT CURRENT FOR THIS PROJECT.
- 21. ALL DEVICE BOXES SHALL BE INSTALLED FLUSH, AND CONDUITS RUN CONCEALED IN FINISHED AREAS, EXCEPT AS SPECIFICALLY SHOWN OR NOTED OTHERWISE. VERIFY ALL DOOR SWINGS BEFORE INSTALLING SWITCH BOXES. SEE ARCHITECTURAL DRAWINGS FOR CABINET WORK, WALL SECTIONS, ELEVATIONS, AND OTHER DETAILS AFFECTING THE MOUNTING HEIGHT AND LOCATION OF OUTLET BOXES.
- WIRING DEVICES: DUPLEX RECEPTACLES SHALL BE 20A, 125 VOLTS, CONSTRUCTION SERIES, HEAVY DUTY, SPECIFICATION GRADE, BACK AND SIDE WIRED, WITH GROUNDING TERMINAL AND SHALL BE IVORY UNLESS NOTED OTHERWISE, HUBBELL CR5362I OR APPROVED EQUAL, CONTINGENT UPON FULL COMPLIANCE WITH ALL CRITERIA. ISOLATED GROUND DUPLEX RECEPTACLES SHALL BE 20A, 125 VOLTS, HUBBELL IG5362I OR APPROVED EQUAL, CONTINGENT UPON FULL COMPLIANCE WITH ALL CRITERIA. AC TOGGLE SWITCHES SHALL BE 20A, 120-277 VOLTS, CONSTRUCTION SERIES, HEAVY DUTY, SPECIFICATION GRADE, BACK AND SIDE WIRED, WITH GROUNDING TERMINAL AND SHALL BE IVORY UNLESS NOTED OTHERWISE, HUBBELL CS1221I, TWO POLE, HUBBELL CS1222I, THREE WAY, HUBBELL CS1223I, FOUR WAY, HUBBELL CS1224I OR APPROVED EQUAL, CONTINGENT UPON FULL COMPLIANCE WITH ALL CRITERIA. GROUND FAULT CIRCUIT INTERRUPTER DUPLEX RECEPTACLES SHALL BE 20A, 125 VOLTS, COMMERCIAL SPECIFICATION GRADE, HUBBELL GF5352I OR APPROVED EQUAL. CONTINGENT UPON FULL COMPLIANCE WITH ALL CRITERIA. GROUND FAULT CIRCUIT INTERRUPTER DUPLEX RECEPTACLES SHALL NOT BE THE FEED THROUGH TYPE BUT STAND ALONE GROUND FAULT CIRCUIT INTERRUPTER DUPLEX RECEPTACLES. NEW INTERIOR EXPOSED DEVICE PLATES, IN ALL BOARDING, TREATMENT, STORAGE, GROOMING, AND EXAM LOCATIONS AND/OR WHERE SPECIFIED SHALL BE TYPE 302/304 STAINLESS STEEL, ALL OTHER INTERIOR PLATES SHALL BE NYLON. STANDARD SIZE, AND GANGED FOR MULTIPLE DEVICES AT A SINGLE LOCATION. VERIFY THE DECOR THEME WITH THE ARCHITECT AND COORDINATE COLOR AS REQUIRED. WHERE USED OUTDOORS OR IN WET LOCATIONS ALL 15 OR 20A 125 OR 250V NON-LOCKING RECEPTACLES SHALL BE WEATHER-RESISTANT LISTED, IN DAMP AREAS, THE OUTLET COVERS FOR 15 OR 20A, 125 OR 250V DEVICES SHALL BE "WEATHERPROOF WHILE IN USE", HUBBELL WP26MH OR APPROVED EQUAL, CONTINGENT UPON FULL COMPLIANCE WITH ALL CRITERIA
- 23. ALL WALL OUTLETS THAT ARE SHOWN BACK TO BACK, IN FIRE RATED WALLS, SHALL BE INSTALLED WITH A MINIMUM OF 24" OF HORIZONTAL SEPARATION (TWO STUDS) PER NEC ARTICLE 300.21, AND UL REQUIREMENTS. IN WALL SPACES WHERE THE 24" SEPARATION IS NOT POSSIBLE, BLOCKING AND GYPSUM BOARD PROVISIONS, TO MAINTAIN THE FIRE RATING OF THE WALL, SHALL BE PROVIDED BY OTHERS, NOT
- 24. ALL 125 VOLT, 15 OR 20 AMP NON-LOCKING RECEPTACLES WITHIN 6'-0" OF ANY PLUMBING FIXTURE, AND/OR WHERE INDICATED, SHALL BE 20A, 125 VOLTS, COMMERCIAL SERIES, HEAVY DUTY, SPECIFICATION GRADE, BACK AND SIDE WIRED, WITH GROUNDING TERMINAL GROUND FAULT INTERRUPTER OUTLETS, HUBBELL GF20ILA, OR APPROVED EQUAL, CONTINGENT UPON FULL COMPLIANCE WITH ALL CRITERIA.
- 25. ALL SINGLE-PHASE RECEPTACLES RATED 150 VOLTS TO GROUND OR LESS, 50 AMPERES OR LESS AND THREE PHASE RECEPTACLES RATED 150 VOLTS TO GROUND OR LESS, 100 AMPERES OR LESS INSTALLED IN NON-DWELLING UNIT KITCHENS SHALL BE GROUND FAULT PROTECTED AS REQUIRED BY NEC 210.8(B) 26. ALL 125 VOLT, 15 OR 20 AMP CIRCUITS SERVING A DISHWASHER, VENDING MACHINE, OR ELECTRIC
- DRINKING FOUNTAIN SHALL BE PROTECTED WITH A GROUND FAULT TYPE BRANCH CIRCUIT BREAKER.

 27. ALIGN ALL SIMILAR WIRING DEVICES IN THE SAME ROOM AT THE SAME HEIGHTS AND DISTANCES FROM ARCHITECTURAL FEATURES, UNLESS NOTED OTHERWISE. GANG ALL DEVICE BOXES AT THE SAME LOCATION, WHERE ALLOWED BY CODE. PROVIDE DIVIDERS TO SEPARATE LOW VOLTAGE (I.E., THERMOSTAT) DEVICES FROM POWER DEVICES (I.E., SWITCHES). ALL EXTERIOR WIRING DEVICES SHALL BE BLACK, GRAY, OR BROWN, UNLESS NOTED OTHERWISE.
- 28. ALL UNIT EQUIPMENT FOR EMERGENCY LIGHTING SHALL BE CONNECTED TO BRANCH CIRCUITS FOR NORMAL LIGHTING IN THE SAME AREA, UNLESS NOTED OTHERWISE, AHEAD OF ANY LOCAL SWITCHES OR CONTACTORS PER NEC ARTICLE 700.12(F).
- 29. LUMINAIRES INSTALLED IN INSULATED CEILINGS SHALL BE IC RATED, AND INSTALLED PER THE LUMINAIRE MANUFACTURER'S AND UL LISTING REQUIREMENTS.
- 30. THIS PROJECT MAY UTILIZE BOTH ACCESSIBLE AND NON-ACCESSIBLE TYPE CEILINGS. REFER TO ARCHITECTURAL DRAWINGS FOR ACTUAL CEILING TYPES IN EACH AREA. LIGHTING CIRCUITS IN NON-ACCESSIBLE CEILINGS MUST UTILIZE FIXTURE-MOUNTED JUNCTION BOXES WHICH ARE USUALLY LIMITED TO EIGHT (8) WIRES IN THEIR CAPACITY. CIRCUITING FOR THE LIGHTING IS SCHEMATIC, BUT GENERALLY ATTEMPTS TO SHOW THESE CONSIDERATIONS. HOWEVER, CONTRACTOR MAY WANT TO PROVIDE SUPPLEMENTARY JUNCTION BOXES IN ACCESSIBLE AREAS, OR OVERSIZE FIXTURE BOXES TO OPTIMIZE THE
- 31. ELECTRICAL DRAWINGS ARE IN PART DIAGRAMMATIC. LOCATE LIGHTING FIXTURES SYMMETRICALLY OR IN PROPER RELATION TO FINISHED AREAS UNLESS OTHERWISE DIMENSIONED OR DETAILED. THE CONTRACTOR SHALL COORDINATE ALL LUMINAIRE LOCATIONS AND CLEARANCES WITH THE DUCTWORK, THE REFLECTED CEILING PLAN, HVAC PLAN, AND OTHER DRAWINGS TO AVOID CONFLICTS.
- 32. A NUMERAL BESIDE BRANCH CIRCUIT OUTLET INDICATES PANELBOARD CIRCUIT CONNECTION. UPPER-CASE LETTER OR LETTER-GROUP BESIDE LIGHTING FIXTURE INDICATES FIXTURE TYPE. LOWER-CASE LETTER BESIDE LIGHTING FIXTURE OUTLET INDICATES LOCAL SWITCH LEG CONNECTION. ELECTRICAL SYMBOLS USED ARE APPLICABLE GENERALLY; FOR EXACT REQUIREMENTS REFER TO APPLICABLE SCHEDULES AND DETAILS AND TO THE SPECIFICATIONS. HOWEVER, COMBINING OF CIRCUITS IN RACEWAYS, OTHER THAN DETAILED, WILL NOT BE PERMITTED. RUNNING OF BRANCH CIRCUITS, OTHER THAN THE ONE SERVING THE FIXTURE, THROUGH LIGHTING FIXTURE CHANNELS OR HOUSINGS WILL NOT BE PERMITTED.
- 33. ALL SAFETY SWITCHES SHALL BE FURNISHED BY THE CONTRACTOR, UNLESS NOTED OTHERWISE AND SHALL NOT BE MOUNTED ON ACCESS PANELS OF EQUIPMENT. SAFETY SWITCHES SHALL BE GENERAL ELECTRIC, SQUARE D, CUTLER—HAMMER, SIEMENS ENERGY & AUTOMATION, OR APPROVED EQUAL, CONTINGENT UPON FULL COMPLIANCE WITH ALL CRITERIA, AND SHALL BE FUSED AND/OR NOT FUSED AS INDICATED, 240 VOLT, THREE POLE, HEAVY DUTY, IN A NEMA 3R ENCLOSURE FOR OUTDOOR USE OR WHERE MOISTURE IS PRESENT, AND NEMA 1 ENCLOSURE FOR INDOOR USE. UNLESS NOTED OTHERWISE, ALL FUSES SHALL BE NON—RENEWABLE, DUAL ELEMENT, TIME DELAY, CURRENT LIMITING, CLASS J, L, RK—5, OR RK—1, WITH A
- 200,000 AMP AC RMS INTERRUPTING RATING, AND SHALL MEET UL STANDARD 198E.

 34. ALL PANELBOARDS SHALL BE CIRCUIT BREAKER TYPE, AS MANUFACTURED BY SQUARE D, EATON CORP., ABB-GENERAL ELECTRIC, OR SIEMENS ENERGY & AUTOMATION.
- A. POWER DISTRIBUTION PANELBOARDS SHALL BE CUTLER—HAMMER POW—R—LINE 4B, SIEMENS TYPE S4 OR S5, ABB—GENERAL ELECTRIC TYPE SCP PLUS OR SPECTRA, SQUARE D I—LINE, OR APPROVED EQUAL, CONTINGENT UPON FULL COMPLIANCE WITH ALL CRITERIA. THE HIGHEST OPERATING HANDLE SHALL BE A MAXIMUM OF 78" AFF. POWER PANELS SHALL BE UL LISTED, AND MEET UL 67, UL 50, AND FEDERAL SPECIFICATION W—P—115B AS TYPE 1, CLASS 1, WITH SERIES RATED, BOLT—ON CIRCUIT BREAKERS, ALL BUS BARS (POWER BUS, NEUTRAL BUS, GROUND BUS, & ISOLATED GROUND BUS (WHERE REQUIRED)) SHALL BE EITHER SOLID COPPER OR TIN—PLATED SOLID ALUMINUM, AND A HINGED LOCKABLE DOOR.
- B. LIGHTING AND APPLIANCE PANELBOARDS SHALL BE OF PANELBOARD CONSTRUCTION, 20 INCHES WIDE (MINIMUM), 5-3/4" TO 6-1/2" DEEP, UL LISTED, AND MEET UL 67, UL 50, UL CLASS CTL, AND FEDERAL SPECIFICATION W-P-115B AS TYPE 1, CLASS 1, WITH SERIES RATED, BOLT-ON CIRCUIT BREAKERS, COPPER OR TIN-PLATED ALUMINUM BUS BARS, NEUTRAL BUS, GROUND BUS, ISOLATED GROUND BUS(WHERE REQUIRED) AND A HINGED LOCKABLE DOOR.

UNLESS OTHERWISE STATED THE AMP INTERRUPTING CAPACITY (AIC) RATING OF THE PANELS SHALL BE 65kAIC. WHEN PANEL SHOP DRAWING ARE SUBMITTED WITH A FAULT CURRENT LETTER FROM THE UTILITY THE RATING MAY BE REDUCED TO THE NEXT AIC RATING ABOVE THE AVAILABLE FAULT CURRENT.

PROVIDE THE NUMBER OF SPACES AND SPARE CIRCUIT BREAKERS AS SHOWN IN THE PANELBOARD SCHEDULES.

- 35. ALL CIRCUIT BREAKERS w/ A TRIP RATING OF 1,200 AMPS OR GREATER THAT IS FIXED OR ADJUSTABLE SHALL COMPLY WITH NEC 240.87.

 36. THE BRANCH CIRCUITS SHALL BE PHASE ADJUSTED TO PROVIDE APPROXIMATE BALANCED LOADING ON FA
- 36. THE BRANCH CIRCUITS SHALL BE PHASE ADJUSTED TO PROVIDE APPROXIMATE BALANCED LOADING ON EACH PANEL, AND THE SERVICE.

 37. BECORDS AND SUBMITTALS: BROWING THE OWNER A MINIMUM OF THREE CODIES OF SHOP DRAWINGS WITH
- 37. RECORDS AND SUBMITTALS: PROVIDE THE OWNER A MINIMUM OF THREE COPIES OF SHOP DRAWINGS WITH TECHNICAL DATA HIGH—LIGHTED, INDICATING THAT IT MEETS THE REQUIREMENTS FOR ELECTRICAL EQUIPMENT INSTALLED ON THIS PROJECT. SHOP DRAWINGS ARE REQUIRED FOR: PANELBOARDS, SAFETY SWITCHES, LUMINAIRES, EMERGENCY LIGHTING EQUIPMENT, RACEWAYS, CONDUCTORS, ISOLATED GROUND RECEPTACLES, LIGHTING CONTROLS AND WIRING DEVICES. CONTRACTOR SHALL VERIFY AVAILABLE FAULT CURRENT WITH UTILITY COMPANY FOR PROPER PANEL ASYMMETRICAL INTERRUPTING RATINGS. SUBMIT THIS INFORMATION WITH THE SHOP DRAWINGS ON PANELBOARDS, ALONG WITH LETTER FROM THE POWER COMPANY. SHOP DRAWINGS SHALL BE BOUND HARD COPIES, ELECTRONIC COPIES ARE NOT ACCEPTABLE.

SUBSTITUTIONS FOR LIGHTING FIXTURES SHALL BE PRE-APPROVED PRIOR TO BID. THE CONTRACTOR SHALL PROVIDE THE PHOTOMETRIC CALCULATIONS FOR THE EXTERIOR LIGHTING TO INDICATED THE LIGHTING COMPLIES w/ THE LOCAL REQUIREMENTS. THE REVISED PHOTOMETRIC PLANS MAY BE REQUIRED TO BE APPROVED BY THE AHJ PRIOR TO INSTALLATION. IF THE WATTAGE OF THE SUBSTITUTED FIXTURES INCREASE FROM THE SPECIFIED FIXTURES THE CONTRACTOR MAY BE REQUIRED TO PROVIDE THE ENERGY CODE CALCULATIONS FOR THE LIGHTING AND SUBMIT TO THE AHJ FOR APPROVAL.

CONTRACTOR SHALL VERIFY AVAILABLE FAULT CURRENT WITH UTILITY COMPANY FOR PROPER PANEL ASYMMETRICAL INTERRUPTING RATINGS. SUBMIT THIS INFORMATION WITH THE SHOP DRAWINGS ON PANELBOARDS, ALONG WITH LETTER FROM THE POWER COMPANY.

SHOP DRAWINGS SHALL BE BOUND HARD COPIES, ELECTRONIC COPIES ARE NOT ACCEPTABLE.

38. SUBSTITUTIONS: ALL COSTS INCURRED BY THE ACCEPTANCE OF SUBSTITUTIONS SHALL BE BORNE BY THE

CONTRACTOR. THE ONUS SHALL BE ON THE CONTRACTOR TO PROVE THAT THE SUBSTITUTIONS ARE EQUAL TO THE BASIS OF DESIGN SPECIFIED.

- 39. MAINTAIN AS-BUILT DRAWINGS, UPDATED DAILY DURING CONSTRUCTION, AND PRESENT THE OWNER, WITHIN 30 DAYS AFTER THE DATE OF SYSTEM ACCEPTANCE, WITH TWO SETS OF AS-BUILT DRAWINGS.

 PROVIDE THE OWNER'S PERSONNEL WITH ON-SITE INSTRUCTION IN THE OPERATION AND MAINTENANCE OF THE COMPLETED ELECTRICAL SYSTEM PRIOR TO SYSTEM ACCEPTANCE.
- 40. PROVIDE THE OWNER WITH TWO SETS OF OPERATIONS AND MAINTENANCE (O & M) MANUALS IN ACCORDANCE WITH ASHRAE/IESNA STANDARD 90.1—2001. THE MANUALS SHALL INCLUDE, AT A MINIMUM, THE FOLLOWING:
- A. SUBMITTAL DATA STATING EQUIPMENT RATING AND SELECTED OPTIONS FOR EACH PIECE OF EQUIPMENT REQUIRING MAINTENANCE.
- B. OPERATION MANUALS AND MAINTENANCE MANUALS FOR EACH PIECE OF EQUIPMENT REQUIRING
- MAINTENANCE. REQUIRED ROUTINE MAINTENANCE ACTIONS SHALL BE CLEARLY IDENTIFIED. NAMES AND ADDRESSES OF AT LEAST ONE QUALIFIED SERVICE AGENCY.
- A COMPLETE NARRATIVE OF HOW EACH SYSTEM IS INTENDED TO OPERATE.
- EQUIPMENT FOR CONSIDERATION, BUT NOT LIMITED TO, IS AS FOLLOWS:

 EMERGENCY LIGHTING EQUIPMENT AND LIGHTING CONTROLS.
- 41. ALL COMMUNICATIONS [CONDUITS] CABLES SHALL BE ROUTED AND SECURED AT LEAST 12" FROM FLUORESCENT FIXTURES AND POWER CIRCUITS. CROSS OTHER CIRCUITS AT 90 DEGREE ANGLE.
- 42. MOUNT OUTLET BOXES, ABOVE ACCESSIBLE CEILINGS FOR RECESSED LUMINAIRES, ON THE BOTTOM OF BAR JOISTS, WOOD JOISTS, OR BEAMS, AND ROUTE FOUR TO SIX FOOT (4' TO 6'), TYPE MC CABLE WHIPS TO EACH FIXTURE, AS REQUIRED. COORDINATE THE LOCATIONS OF OUTLET/JUNCTION BOXES WITH THE HYAC CONTRACTOR AND OTHER TRADES TO AVOID INTERPERPENCE WITH THE INSTALLATION OF DUCT WORK
- CONTRACTOR AND OTHER TRADES TO AVOID INTERFERENCE WITH THE INSTALLATION OF DUCT WORK.

 43. WHERE RECESSED, OUTLET BOXES ARE INDICATED LOCATED IN FIRE RATED CEILINGS, COORDINATE THE LOCATIONS OF OUTLETS WITH THE ARCHITECTURAL REFLECTED CEILING PLAN, CEILING FINISH PLAN, HVAC CONTRACTOR AND OTHER TRADES TO AVOID INTERFERENCE WITH THE INSTALLATION OF DUCT WORK. PROVIDE FIRE RATED ENCLOSURES LOCATED OVER THE OUTLET TO MAINTAIN THE SPECIFIED FIRE RATING
- OF THE CEILING.

 44. VERIFY THE AMPACITY REQUIREMENTS (FLA, MCA, AND MOCP), POLES (1 OR 2), AND VOLTAGE FOR ALL EQUIPMENT FURNISHED BY OTHER TRADES WITH THE FURNISHING CONTRACTOR PRIOR TO THE PURCHASE AND INSTALLATION OF THE SAFETY SWITCHES, RACEWAYS, WIRING, AND BRANCH CIRCUIT BREAKERS.
- 45. PROVIDE A 2'X4'X3/4" EXTERIOR GRADE PLYWOOD COMMUNICATIONS BACKBOARD, PAINTED WITH TWO COATS, FIRE RESISTANT GRAY PAINT. PROVIDE A QUADRUPLEX OUTLET MOUNTED ON THE BOARD, AND A 4 AWG GROUND WIRE CONNECTED TO THE SERVICE GROUND FOR THE TELEPHONE SERVICE EQUIPMENT.
- 46. DURING TRENCH BACKFILLING, FOR ELECTRICAL EXTERIOR, UNDERGROUND DUCTS AND CONDUIT(S), INSTALL CONTINUOUS, STANDARD, 4-MIL, POLYETHYLENE, 3 INCH WIDE, DETECTABLE TYPE, BURIED CONDUIT MARKER, RED WITH BLACK LETTERS, AND IMPRINTED WITH "CAUTION BURIED ELECTRIC LINE BELOW". LOCATE DIRECTLY ABOVE DUCT AND CONDUITS AT 12 INCHES BELOW FINISHED GRADE.
- 47. TEST: UPON COMPLETION OF THE WORK, PERFORM A TEST OF THE INDIVIDUAL SYSTEMS INCLUDING FEEDERS, BRANCHES, OUTLETS, LIGHTING, MOTOR APPARATUS AND APPLIANCES, TO ASSURE COMPLIANCE WITH THESE SPECIFICATIONS AND DRAWINGS. A LETTER WITH ALL PERTINENT TEST DATA RESULTS SHALL BE SUBMITTED TO THE ARCHITECT AT LEAST FIVE(5) DAYS PRIOR TO THE COMPLETION OF THE PROJECT. THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL INSTRUMENTS, LABOR, AND MATERIALS FOR ANY ESSENTIAL INTERMEDIATE AND FINAL TESTS TO PROVIDE COMPLIANCE WITH THESE SPECIFICATIONS.

GENERAL ELECTRICAL NOTES:

 ALL LOW VOLTAGE SYSTEMS SHALL BE PROVIDED AS "DESIGN BUILD" UNDER THE GENERAL CONTRACTOR SEPARATE FROM THE ELECTRICAL DESIGN DOCUMENTS. SEE ELECTRICAL SPECIFICATION NOTE 11 AND "LOW VOLTAGE COORDINATION" NOTES THIS SHEET FOR ADDITIONAL INFORMATION.

LEGEND

SINGLE POLE SWITCH, 48" A.F.F. TO CENTER THREE OR FOUR WAY SWITCH, 48" A.F.F. TO CENTER OCCUPANCY SENSOR SWITCH, 48" A.F.F. TO CENTER MOTOR RATED SWITCH JUNCTION OUTLET BOX. SIZED PER N.E.C. REQUIREMENTS DUPLEX RECEPTACLE, 20A, 125V, 18" A.F.F. U.N.O. DUPLEX RECEPTACLE, 20A, 125V, MOUNT 42" AFF OR 6" ABOVE COUNTER. QUAD OUTLET, 15A OR 20A, 125V. SPECIAL OUTLET AS NOTED. TV OUTLET, JUNCTION BOX w/ 1 1/4"C STUBBED TO ACCESSIBLE LOCATION ABOVE CEILING. TELEPHONE/DATA OUTLET, MOUNT 18"AFF U.N.O., JUNCTION BOX w/ 1 1/4"C STUBBED TO ACCESSIBLE LOCATION ABOVE CEILING. FUSED DISCONNECT SWITCH. RATING AND FUSE INDICATED MOTOR - EXHAUST FAN PANELBOARD CONDUIT RUN CONCEALED IN WALL OR ABOVE CEILING.

CONDUIT RUN CONCEALED IN WALL OR BELOW SLAB.

CIRCUIT HOME RUN (TO THE PANEL AND CIRCUIT INDICATED).

KEYED NOTE

ABBREVIATIONS

U.N.O. UNLESS NOTED OTHERWISE

WP WEATHERPROOF

GFI GROUND FAULT CIRCUIT INTERRUPTER

A.F.F. ABOVE FINISHED FLOOR

FWE FURNISHED WITH EQUIPMENT

EF EXHAUST FAN

AHJ AUTHORITY HAVING JURISDICTION

NEC NATIONAL ELECTRICAL CODE

LOW VOLTAGE COORDINATION:

ALL LOW VOLTAGE SYSTEMS FOR THIS PROJECT SHALL BE PROVIDED BY THE GENERAL CONTRACTOR (GC) AS "DESIGN BUILD" UNDER SEPARATE CONTRACT(S) FROM THE ELECTRICAL DESIGN. THESE MAY INCLUDE BUT ARE NOT LIMITED TO THE FOLLOWING SYSTEMS:

- -- FIRE ALARM SYSTEM
- ACCESS CONTROL SYSTEMVIDEO SURVEILLANCE
- -- SECURITY ALARM-- TELEPHONE
- -- INTERCOM-- SOUND SYSTEMS

THE ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE GC TO DETERMINE SERVICES TO BE PROVIDED IN ACCORDANCE w/ ELECTRICAL SPECIFICATION NOTE 12. THIS SHEET TO ASSURE BIDS INCLUDE ALL COST FOR COMPLETE FUNCTIONING SYSTEMS.

WIRING SIZE CHART

CONTRACTOR SHALL PROVIDE WIRING FOR 120 V, 15 & 20 A CIRCUITS (LINE TO NEUTRAL) OF SIZES BELOW DEPENDING UPON CIRCUIT LENGTH BELOW:

< 100 FT #12 AWG (CU) 100-160 FT #10 AWG (CU) 160-250 FT #8 AWG (CU)

WHERE #8 AWG CONDUCTORS ARE REQUIRED USE #8 FOR ALL TRAVELERS AND SPLICE w/ #10 IN A CODE SIZED JUNCTION BOX WITHIN 10' OF DEVICE &/OR BREAKER FOR FINAL CONNECTIONS.

OTHER THAN AS NOTED ABOVE THE ENTIRE LENGTH OF FEEDER SHALL BE THE SAME CONDUCTOR SIZE.

NOTE

IF THE CONTRACTOR ELECTS TO PROVIDE AND/OR INSTALL ELECTRICAL SYSTEMS, INCLUDING LOW VOLTAGE SYSTEMS, AND EQUIPMENT FOR THIS PROJECT, DIFFERENTLY FROM THESE CONTRACT DOCUMENTS, WHICH REQUIRES AN APPROVAL LETTER OR DRAWING REVISIONS FROM MARSHALL & BOLLWERK ENGINEERING, INC.(MBE), TO THE AUTHORITY HAVING JURISDICTION, THERE WILL BE A MINIMUM FEE OF \$1,000.00, MADE PAYABLE TO MARSHALL & BOLLWERK, IN ADVANCE BY THE CONTRACTOR. ACTUAL FEE WILL DEPEND ON THE COMPLEXITY OF THE DEVIATION. ALLOW MINIMUM OF TEN(10) WORKING DAYS FOR LETTER AND/OR REVISED DRAWINGS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL NECESSARY INFORMATION BEFORE ANY EVALUATION WILL BE STARTED.

FOR CONSTRUCTION



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 GAI PROJECT NO.
 2019.08

 DISTRIBUTION
 DATE

 80% COORDINATION
 2020 02 28

 100% CONSTRUCTION
 2020 03 16

E1.0

FIRE ALARM SYSTEM SPECIFICATION:

- 1. PROVIDE A MANUALLY/AUTOMATICALLY INITIATED FIRE ALARM SYSTEM THAT COMPLIES WITH THE REQUIREMENTS OF NFPA ARTICLE 72; NFPA ARTICLE 90A; NFPA ARTICLE 101 AND THE AMERICANS WITH DISABILITIES ACT (ADA).
- 2. SEE THE ARCHITECTURAL PROJECT SUMMARY SHEET FOR THE PROJECT CLASSIFICATION.
- 3. INITIATION OF AN ALARM CONDITION SHALL BE IN ACCORDANCE WITH NFPA CODES AS STATED ABOVE, AND SHALL BE IN THE FORM OF MANUALLY OPERATED PULL STATIONS, SMOKE/HEAT DETECTORS AND AUTOMATIC SPRINKLER OPERATION AS REQUIRED.
- 4. THE FIRE ALARM SYSTEM SHALL COMPLY WITH THE REQUIREMENTS STATED IN PARAGRAPH 3. ABOVE AND, THE REQUIREMENTS OF STATE AND LOCAL AUTHORITIES HAVING JURISDICTION (AHJ). THIS MAY BE THE CITY FIRE MARSHAL. COVERAGE OF PROTECTION AFFORDED SHALL BE 100%.
- 5. ALARM INITIATION DEVICES SHALL CONSIST OF (BUT NOT LIMITED TO) MANUAL PULL STATIONS LOCATED AT EACH BUILDING ENTRANCE/EXIT, SPRINKLER MAIN FLOW SWITCH, HVAC DUCT SMOKE DETECTORS AND PHOTOELECTRIC/ULTRAVIOLET SMOKE DETECTORS AND HEAT DETECTORS. ALARM INITIATION DEVICES SHALL BE SUPERVISED FOR ALARM CONDITIONS AS WELL AS FOR MALFUNCTIONING CONDITIONS. THE ALARM INITIATION DEVICES SHALL BE FULLY ADDRESSABLE FOR SIMPLIFICATION OF MONITORING AND ALARM INITIATION. THE SPRINKLER MAIN PRIMARY SHUT—OFF VALVE AND PIV SHALL ALSO BE MONITORED AND SUPERVISED FOR EVIDENCE OF TAMPERING. ALL ALARM INITIATION DEVICES SHALL BE FROM THE SAME MANUFACTURER AND COMPATIBLE WITH THE FIRE ALARM CONTROL PANEL. ALL ALARM INITIATING DEVICES SHALL BE UL LISTED FOR THE INTENDED PURPOSE.
- 6. OCCUPANT NOTIFICATION DEVICES SHALL CONSIST OF (BUT NOT LIMITED TO) AUDIBLE SIGNALING DEVICES, VISUAL SIGNALING DEVICES AND COMBINATION AUDIBLE/VISUAL SIGNALING DEVICES. THESE DEVICES SHALL COMPLY WITH THE REQUIREMENTS OF NFPA AND ADA FOR OPERATION, AUDIBLE INTENSITY AS WELL AS VISUAL INTENSITY. ALL OCCUPANT NOTIFICATION DEVICES SHALL BE FULLY ADDRESSABLE FOR SIMPLIFICATION OF SUPERVISION FOR MALFUNCTIONING CONDITIONS. ALARM NOTIFICATION DEVICES SHALL BE FROM THE SAME MANUFACTURER AND COMPATIBLE WITH THE FIRE ALARM CONTROL PANEL. ALL OCCUPANT NOTIFICATION DEVICES SHALL BE UL LISTED FOR THE INTENDED PURPOSE.
- 7. PROVIDE A COMPLETE FIRE ALARM CONTROL PANEL WHICH SHALL PROVIDE FOR SUPERVISION OF ALL ZONED ALARM INITIATION DEVICES, DETECTION OF ALARM CONDITIONS, DETECT OPERATION OF FIRE SPRINKLER TAMPER AND FLOW SWITCHES AND DRIVE ALL OCCUPANT NOTIFICATION DEVICES. THE FIRE ALARM CONTROL PANEL SHALL BE PROVIDED WITH AUTOMATIC BATTERY BACK—UP. THE FIRE ALARM CONTROL PANEL SHALL BE PROVIDED WITH AN AUTOMATIC TELEPHONE DIALER THAT SHALL NOTIFY THE DESIGNATED INDIVIDUAL(S) UPON DETECTION OF AN ALARM CONDITION.

- THE ZONES FOR THE FIRE ALARM SYSTEM SHALL BE DIVIDED TO COINCIDE WITH THE BUILDING FUNCTIONAL AREAS. MANUAL INITIATION DEVICES SHALL BE LOCATED AT EACH ENTRANCE/EXIT. AS A MINIMUM, THERE SHALL BE PROVIDED ONE (1) MANUAL ALARM INITIATION DEVICES FOR EACH BUILDING ENTRANCE\EXIT DOOR. THE HVAC DUCT SMOKE DETECTORS SHALL BE TREATED AS A SEPARATE ZONE AND SUPERVISED ACCORDINGLY BY THE FIRE ALARM CONTROL PANEL. THE AUTOMATIC SPRINKLER SYSTEM SHUT-OFF VALVE TAMPER SWITCHES AND THE AUTOMATIC SPRINKLER FIRE MAIN FLOW SWITCH SHALL BE PROVIDED WITH SEPARATE SUPERVISED INPUTS TO THE FIRE ALARM CONTROL PANEL. THE TAMPER SWITCHES SHALL INITIATE A MALFUNCTION ALARM UPON ACTUATION. OR MALFUNCTION. THE FLOW SWITCHES SHALL INITIATE AN ALARM SIGNAL UPON ACTUATION. ALL INPUT DEVICES SHALL BE NORMALLY OPEN WITH NO DETECTION OF FIRE, SMOKE OR FLOW. ALARM CONDITIONS SHALL BE INITIATED BY CONTACT CLOSURE. ABNORMAL\MALFUNCTION CONDITIONS SHALL BE INITIATED BY LOW SUPERVISORY CURRENT FLOW, OR OPEN CIRCUIT CONDITIONS. THE FIRE ALARM SYSTEM PROVIDER SHALL COORDINATE WITH THE FIRE SPRINKLER DESIGN AND SUPPLY CONTRACTOR TO DETERMINE THE NUMBER AND LOCATION OF
- 9. THE FIRE ALARM SYSTEM SHALL BE A DESIGN AND SUPPLY SUBCONTRACT TO THE GENERAL CONTRACTOR. THE INSTALLATION SHALL BE DONE BY A FIRM SPECIALIZING IN THIS TYPE OF WORK. THE WORK SHALL INCLUDE PREPARATION OF COMPLETE LAYOUT DRAWINGS AND SHALL BE APPROVED BY THE AUTHORITY HAVING JURISDICTION. ALL FEES INCLUDING PERMITTING AND INSPECTIONS SHALL BE PAID BY THE CONTRACTOR. COORDINATE SYSTEM REQUIREMENTS WITH THE AHJ PRIOR TO DESIGN.
- 10. THE FIRE ALARM CONTRACTOR SHALL SUBMIT TO THE AUTHORITY HAVING JURISDICTION DRAWINGS FOR APPROVAL AND PERMITTING. THE SUBMITTAL PACKAGE SHALL CONTAIN THE FOLLOWING:
 - A. POINT TO POINT DIAGRAM
 - . RISER DIAGRAM
 . SEQUENCE OF OPERATION
 - D. BATTERY LOCATIONS
 - E. A POINT LEDGER
 - F. MANUFACTURERS CUT SHEETS
 - G. COPY OF CONTRACTOR LICENSE(S)
 H. COPY OF FM PLACARD OR UL LISTING FOR MONITORING
 - STATION
- 11. APPROVED MANUFACTURERS:
 - A. SILENT KNIGHT B. SIEMENS
 - C. CERBERUS PYROTRONICS

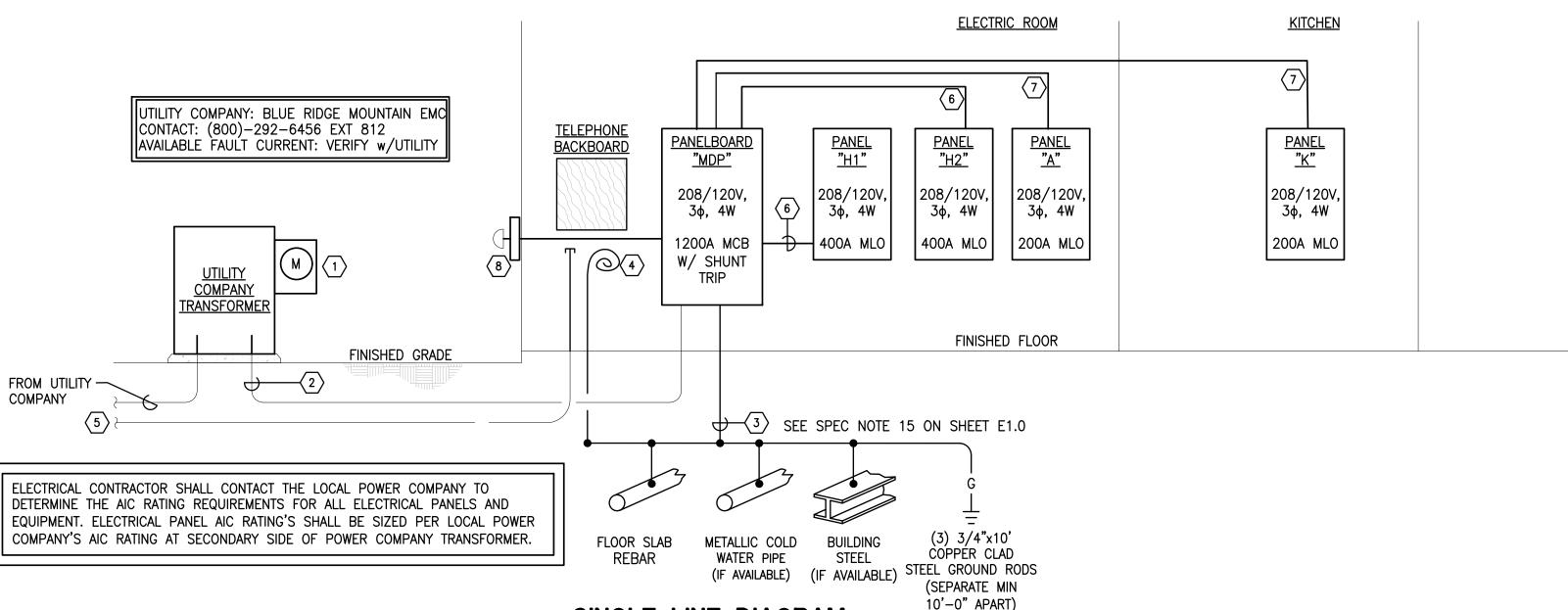
COORDINATE WITH THE GENERAL CONTRACTOR THE INSTALLATION OF A KNOX BOX KEY LOCK AT LOCATION DESIGNATED BY THE FIRE MARSHAL. RECEIVE FROM FIRE PREVENTION DIVISION.

12. SYSTEM SHALL BE FOR THE ENTIRE BUILDING AS APPROVED BY THE AUTHORITY HAVING JURISDICTION.

FIRE ALARM SYSTEM

PROVIDE FIRE ALARM MANUAL PULL STATIONS (48" AFF), COMBINATION HORN/STROBES (80" AFF) & RTU SMOKE DETECTOR CONNECTIONS THROUGHOUT THE BUILDING AS REQUIRED BY THE AHJ APPROVED SHOP DRAWINGS. REFER TO SPECIFICATIONS ON E1.1.

	PANEL:	MDP	M	IAIN DISTRIE	BUTION PANEL	
	MAINS:	1200A	VOLTAGE:	120/208	VAC	
M	ILO/MCB:	MCB	PHASE:	3		
	W/ SHU	JNT TRIP	WIRE:	4		MOUNTING: SURFACE
POLE	FRAME	TRIP	FEEDER	CONDUIT	SERVES	CONNECTED LOAD (VA
3	400	400	SEE RISER	4"	PANEL "H1"	163,790
3	400	400	SEE RISER	4"	PANEL "H2"	167,822
3	225	200	SEE RISER	2-1/2"	PANEL "A"	40,112
3	225	200	SEE RISER	2-1/2"	PANEL "K"	54,955
3	100	60	4#4, 1#10G	1-1/4"	SPD	0
NOTES:					TOTAL CONNECTED LOAD	426,679
						,
410	65,000					



SINGLE LINE DIAGRAM SCALE: NONE

NOTE:

BASIS OF DESIGN ABB-GENERAL ELECTRIC. ALL CONDUCTORS COPPER.

KEYED NOTES: (SINGLE LINE DIAGRAM ONLY)

- 1. POWER COMPANY REVENUE METER & METERING CABINET MOUNTED ON TRANSFORMER.
- 2. 4-SETS 4-350KCM IN 4"C.
- 3. PROVIDE A #3/0 STRANDED BARE COPPER GROUNDING ELECTRODE CONDUCTOR IN A 1" PVC CONDUIT TO 6" BELOW FINISHED GRADE. BOND TO THE GROUNDING ELECTRODE SYSTEM PER NEC 250.
- 4. 1#4 CU GREEN INSULATED CONDUCTOR IN 1" PVC CONDUIT. COIL 10' FOR CONNECTION TO TELEPHONE BACKBOARD. BOND TO GROUNDING ELECTRODE SYSTEM.
- 5. MINIMUM 2" PVC CONDUIT w/ PULL CORD TO TELEPHONE PEDESTAL, COORDINATE CONDUIT SIZES w/ OWNER & TELEPHONE CO. PRIOR TO INSTALLATION. COORDINATE LOCATION OF TELEPHONE PEDESTAL w/ CIVIL PLANS & UTILITY.
- 6. 4-600KCM, 1-#3G, 4°C.
- 7. 4-3/0, 1#6G, 2-1/2°C.
- 8. "FIRE DEPARTMENT MAIN DISCONNECT". PROVIDE A SHUNT—TRIP PUSH BUTTON IN A FIRE MARSHAL APPROVED LOCKABLE ENCLOSURE. LOCATE AND LABEL AS DIRECTED BY THE FIRE MARSHAL.

	MAINS:			VOLTAGE:	208/120	VAC		
ML	LO/MCB:	MLO		PHASE:	3			
	TRIP/	_		WIRE:	4	MOUNTING:	SUR TRIP/	FACE
BRKE		DESCRIPTION	LOAD(VA)	PHASE	LOAD(VA)	DESCRIPTION	POLES	BRKR
1		LTS- CHILD /BABY /TODDLEF	, ,	A	540	REC-TODDLER RM	20/1	2
3	20/1	LTS-BACK OF SANCTUARY	361	В	540	REC-BABY RM	20/1	4
5	20/1	LTS-BATH/ADULT WO. ,EF,2	1,049	C	540	REC- CORRIDOR	20/1	6
7	20/1	LTS-SANCTUARY	1,192	Α	540	REC-CHILDREN 1	20/1	8
9	20/1	LTS-SANCTUARY	1,032	В	540	REC-CHILDREN 2	20/1	10
11	20/1	LTS-SANCTUARY	1,032	С	540	REC-ENTRY HALL	20/1	12
13	20/1	LTS-SANCTUARY	352	Α	540	REC-ENTRY HALL	20/1	14
15	20/1	LTS GRAND HALL	1,020	В	360	REC-GRAND HALL	20/1	16
17	20/1	LTS GRAND HALL	1,296	С	540	REC-ADULT WOMEN	20/1	18
19	20/1	UC REFRIGERATOR	500	Α	360	REC-ADULT WOMEN	20/1	20
21	20/1	UC REFRIGERATOR	500	В	360	REC-SANCTUARY	20/1	22
23	20/1	REC-TODDLER RM	180	С	540	REC-SANCTUARY	20/1	24
25	20/1	REC-BABY RM	180	Α	360	REC-SANCTUARY	20/1	26
27	20/1	LTS- CANOPY	862	В	540	REC-STORAGE	20/1	28
29	20/1	LTS- CANOPY	901	С	540	REC-SANCTUARY	20/1	30
31	20/1	LTS- CANOPY / WALLPACKS	269	Α	360	REC-SANCTUARY	20/1	32
33	20/1	LTS- MECHANICAL RM	295	В	720	REC-SANCTUARY	20/1	34
35	20/1	REC-MECHANICAL RM	540	С	2,400	IWH1	25/1	36
37	20/1	REC-MECHANICAL RM	360	Α	360	REC-EXTERIOR	20/1	38
39	20/1	ELECTRIC HOIST	924	В	540	REC-EXTERIOR	20/1	40
41	20/1	LTS-PARKING LOT	670	С	360	REC-EXTERIOR	20/1	42
43	20/1	LTS-PARKING LOT	670	Α	360	REC-TELE BOARD	20/1	44
45	20/1	LTS-PARKING LOT	670	В	500	FIRE ALARM	20/1	46
47	20/1	LIGHTING CONTROLS	500	С	3,000	EWH2	30/2	48
49	20/1	SIGN	1,200	Α	3,000	LVVIIZ	30/2	50
51	20/1	LIGHTING CONTROLS	500	В	360	RECEPTACLES	20/1	52
53	15/2	EWH	998	С		SPARE	20/1	54
55	10/2	E VVIII	998	A-53,55		SPARE	20/1	56
57	20/1	SPARE		В		SPARE	20/1	58
59	20/1	SPARE		С		SPARE	20/1	60
		TOTAL PHASE A:	13,861					
		TOTAL PHASE B:	10,625			TOTAL CONNECTED:	40,	112
		TOTAL PHASE C:	15,626			TOTAL DEMAND:	32,	089
	C: 65,000							
NOTE	S: PROV	IDE WITH EQUIPMENT GROU	ND BUS.					
1	# PROV	IDE LOCK-ON BREAKER						

	MAINS: 400 D/MCB: ML			VOLTAGE: PHASE:	208/120 3	VAC		
WILC	MIOD. ME			WIRE:		MOUNTING:	SUR	FACE
	TRIP/			VVII (L.	-	Wiccivino.	TRIP/	I
BRKR	POLES	DESCRIPTION	LOAD(VA)	PHASE	LOAD(VA)	DESCRIPTION	POLES	BRK
1			5,640	Α	2,080	HP8	30/2	2
3	60/3	HP1	5,640	В	2,080	TIFO	30/2	4
5	1		5,640	С	3,024			6
7			3,024	Α	3,024	HP9	40/3	8
9	40/3	HP2	3,024	В	3,024		1	10
11			3,024	С	2,080	HP10	30/2	12
13			5,640	Α	2,080	ne io	30/2	14
15	60/3	HP3	5,640	В	2,080	HP11	30/2	16
17	1		5,640	С	2,080	HPII	30/2	18
19			5,640	Α	5,640			20
21	60/3	HP4	5,640	В	5,640	HP12	60/3	22
23	1		5,640	С	5,640		1	24
25			3,024	Α	5,640			26
27	40/3	HP5	3,024	В	5,640	HP13	60/3	28
29			3,024	С	5,640			30
31			3,360	Α	1,227	LID44		32
33	45/3	HP6	3,360	В	1,227	HP14	20/2	34
35	1		3,360	С	2,964	5044	00/0	36
37			3,024	Α	2,964	FC14	30/2	38
39	40/3	HP-7	3,024	В	5,980	F02	00/0	40
41	1		3,024	С	5,980	FC2	60/2	42
		TOTAL PHASE A:	52,007				1	1
		TOTAL PHASE B:	55,023			TOTAL CONNECTED:	163	3,790
		TOTAL PHASE C:	56,760			TOTAL DEMAND:		,032
AIC:	65,000	A 100 TO	,			1		

N	PANEL H MAINS: 4 D/MCB: N	.00A		VOLTAGE: PHASE: WIRE:	208/120 3 4	VAC MOUNTING:	SLID	FACE
	TRIP/				69		TRIP/	
BRKR	POLES	DESCRIPTION	LOAD(VA)		LOAD(VA)	DESCRIPTION	POLES	
1	50,0	504	5,820	A	5,980	FC9	60/2	2
3	50/3	FC1	5,820	В	5,980			4
5			5,820	С	5,730	FC10	60/2	6
7	20	ODA OF		A	5,730			8
9	3P	SPACE		В	5,730	FC11	60/2	10
11			F 000	С	5,730			12
13	E0/2	FC3	5,820	A	5,472	FC42	E0/2	14
15	50/3	FC3	5,820	В	5,472	FC12	50/3	16
17			5,820	С	5,472			18
19	50/3	FC4	5,820	A	5,472	FC13	50/3	20
21 23	30/3	FC4	5,820	B C	5,472	FC13	30/3	22
1000			5,820		5,472	ODAGE	40	24
25	60/2	FC5	5,980	A		SPACE	1P	26
27			5,980	В		SPACE	1P	28
29	35/3	FC6	4,116	С		SPACE	1P	30
31 33	33/3	FC6	4,116	A B		SPACE SPACE	1P 1P	32 34
			4,116	С			1P	
35 37	60/2	FC7	5,980 5,980	A		SPACE SPACE	1P	36 38
100,1				В		SPACE	1P	222
39 41	60/2	FC8	5,730 5,730	С		SPACE	1P	40 42
41	, , ,	TOTAL PHASE A:	56,190	C		SPACE	IP	42
		TOTAL PHASE A.				TOTAL CONNECTED:	167	7 000
		TOTAL PHASE C:	55,941 55,691			TOTAL CONNECTED.		7,822 1,258
AIC:	65,000	TOTAL PHASE C.	35,691			TOTAL DEMAND.	134	,200

FOR CONSTRUCTION



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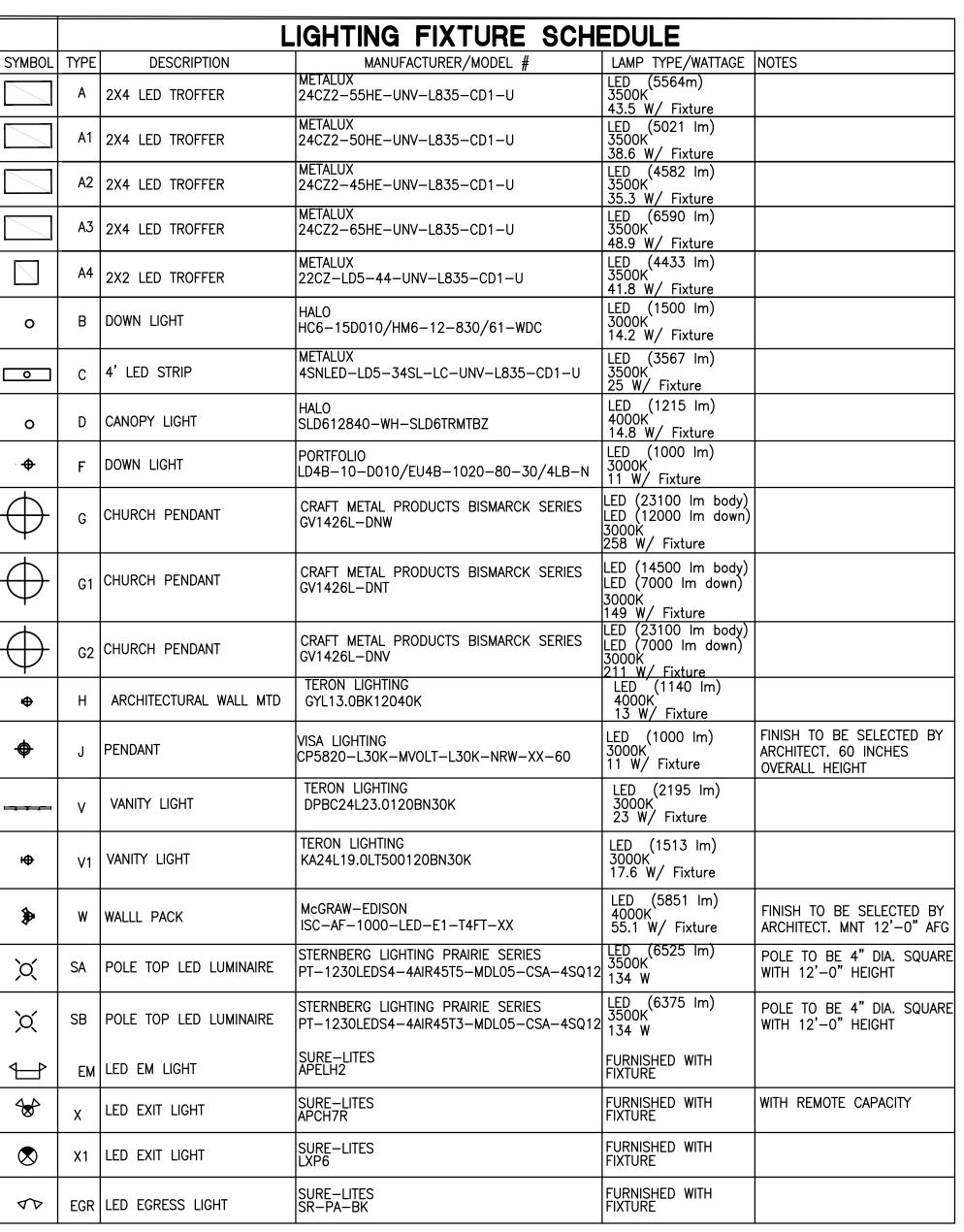
GRACE PCA PRESBYTERIAN CHURCH

HIGHWAY 76 BLAIRSVILLE, GEORGIA



GAI PROJECT NO.	2019.08
DISTRIBUTION	
ISSUE DESCRIPTION	DATE
80% COORDINATION	2020 02 28
100% CONSTRUCTION	2020 03 16
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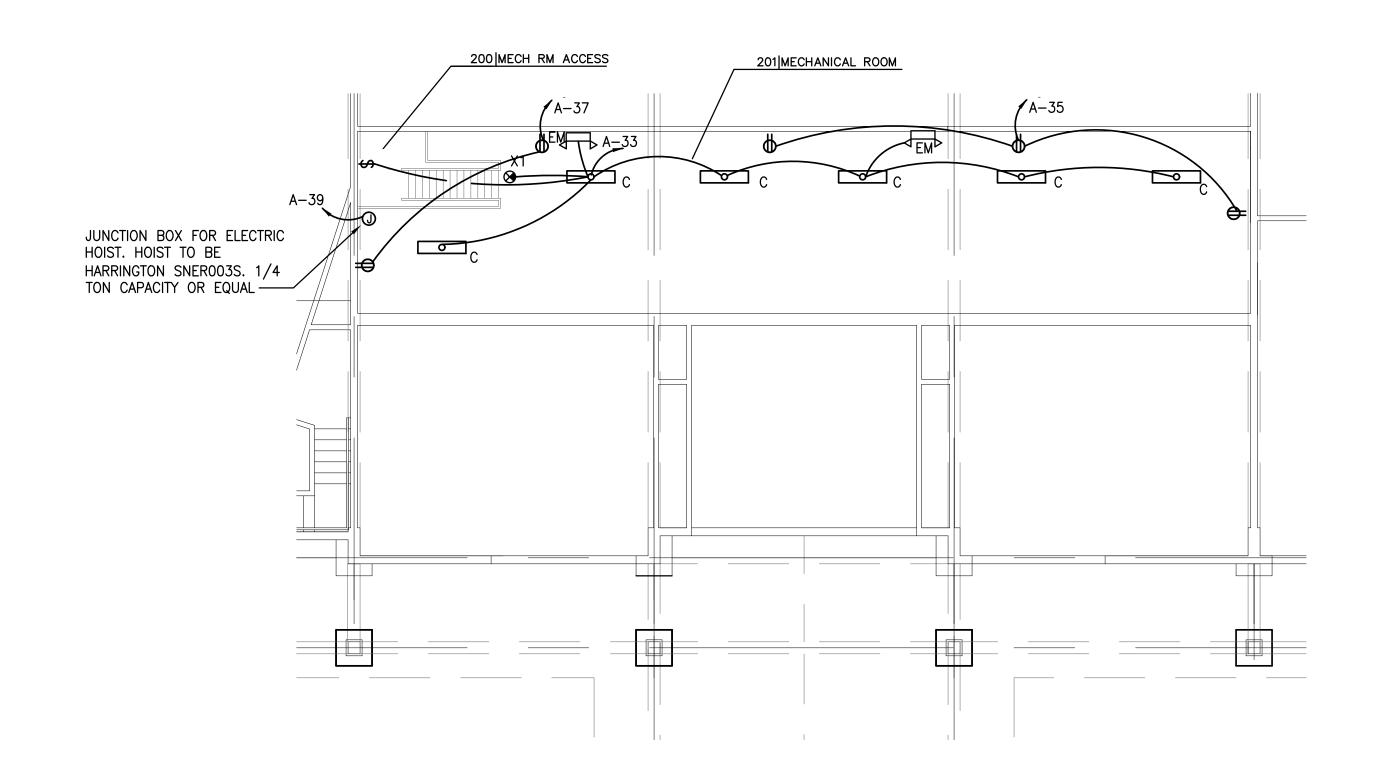
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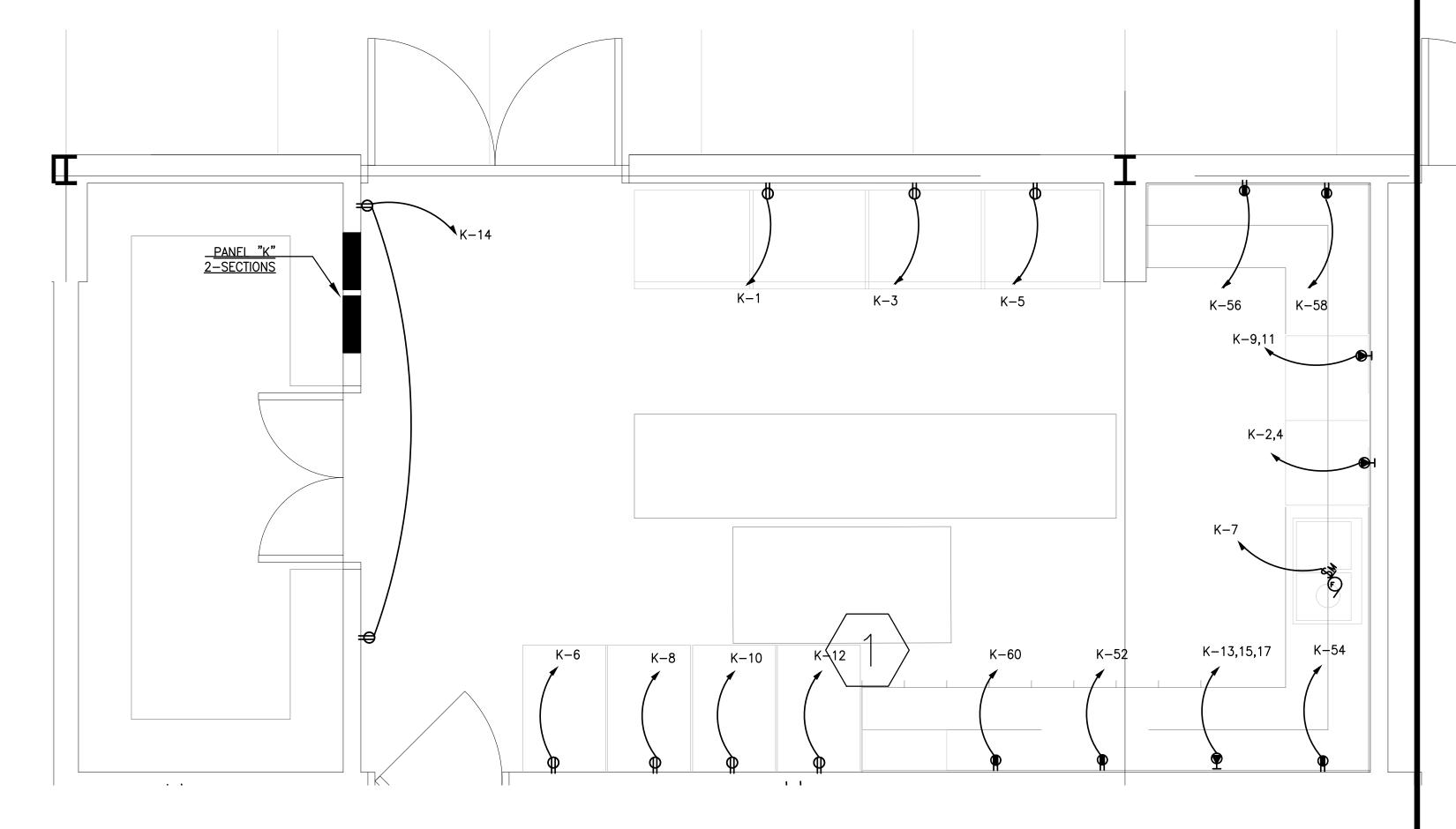
ALL LIGHTING FIXTURE MODEL NUMBERS ARE BASIS OF DESIGN. OWNER APPROVED EQUALS MAY BE PROVIDED.

VIA LIGHTING CONTROL SYSTEM.

N	MAINS:			VOLTAGE:	208/120	VAC		
MLC)/MCB:	MCB		PHASE:	3			
1	TRIP/	T		WIRE:	4	MOUNTING:	FLU TRIP/	<u>USH</u>
BRKR	POLES	DESCRIPTION	LOAD(VA)	PHASE	LOAD(VA)	DESCRIPTION	POLES	BRK
1	20/1	DOUBLE DOOR REFRIGER.	840	Α	2,080		05/0	2
3	20/1	FREEZER	1,440	В	2,080	DISHWASHER	25/2	4
5	20/1	FREEZER	1,440	С	1,440	STANDING WARMER	20/1	6
7	20/1	GARBAGE DISPOSAL	1,440	Α	1,440	STANDING WARMER	20/1	8
9	05/0	DIOLIMA OLIED	2,080	В	1,440	STANDING WARMER	20/1	10
11	25/2	DISHWASHER	2,080	С	1,440	STANDING WARMER	20/1	12
13			2,880	Α	360	REC-KITCHEN	20/1	14
15	30/3	COFFEE BREWER	2,880	В	360	REC-STORAGE	20/1	16
17			2,880	С	600	REC-UTILITY / RCP1	20/1	18
19	20/1	REC-YOUTH	360	Α	360	REC-FELLOWSHIP HALL	20/1	20
21	20/1	REC-YOUTH	360	В	360	REC-FELLOWSHIP HALL	20/1	22
23	20/1	REC-YOUTH	360	С	360	REC-FELLOWSHIP HALL	20/1	24
25	20/1	REC-GRAND HALL	360	Α	360	REC-FELLOWSHIP HALL	20/1	26
27	20/1	UC REFRIGERATOR	500	В	360	REC-FELLOWSHIP HALL	20/1	28
29	20/1	COFFEE MAKER	1,200	С	540	REC- PASTOR OFFICE	20/1	30
31	20/1	REC-GRAND HALL/ BATH	360	Α	540	REC- PASTOR OFFICE	20/1	32
33	20/1	REC-ADULT MEN	540	В	540	REC-ASSIST. OFFICE	20/1	34
35	20/1	REC-ADULT MEN	360	С	540	REC-ASSIST. OFFICE	20/1	36
37	20/1	REC-EXTERIOR	540	Α	360	REC-CONF. RM	20/1	38
39	20/1	REC-EXTERIOR	360	В	360	REC-CONF. RM	20/1	40
41	20/1	REC-EXTERIOR	360	С	360	REC-CONF. RM	20/1	42
43	20/1	REC-EXTERIOR	360	Α	1,143	LTS-YOUTH/KITCHEN	20/1	44
45	20/0	E14/114	3,000	В	1,199	LTS- FELLOWSHIP HALL	20/1	46
47	30/2	EWH1	3,000	С	961	LTS-CONFERENCE / OFFICE	20/1	48
49	25/2	IWH2	2,400	A	1,052	LTS-BATH / ADULT MEN,EF3,	20/1	50
51	20/1	LIGHTING CONTROLS	500	В	180	REC-KITCHEN	20/1	52
53	20/1	REC-YOUTH	540	С	180	REC-KITCHEN	20/1	54
55	20/1	SPARE		Α	180	REC-KITCHEN	20/1	56
57	20/1	SPARE		В	180	REC-KITCHEN	20/1	58
59	20/1	SPARE		С	180	REC-KITCHEN	20/1	60
		TOTAL PHASE A:	17,415					
		TOTAL PHASE B:	18,719			TOTAL CONNECTED:	54,	955
		TOTAL PHASE C:	18,821			TOTAL DEMAND:		964



SECOND FLOOR MECHANICAL ROOM - LIGHTING & POWER SCALE: 1/8" = 1'-0"



KITCHEN ENLARGED PLAN SCALE: 1/2" = 1'-0"

GENERAL NOTES:

- 1. ALL SINGLE PHASE RECEPTACLES RATED 150V TO GROUND OR LESS, 50 AMPERES OR LESS AND THREE PHASE RECEPTACLES RATED 150V TO GROUND OR LESS, 100A OR LESS INSTALLED IN KITCHEN SHALL BE GROUND FAULT PROTECTED AS REQUIRED BY NEC 210.8(B)(2).
- 2. FINAL LOCATIONS OF KITCHEN RECEPTACLES TO BE ADJUSTED IN THE FIELD AFTER CONSULTATION WITH OWNER/ARCHITECT.

FOR CONSTRUCTION

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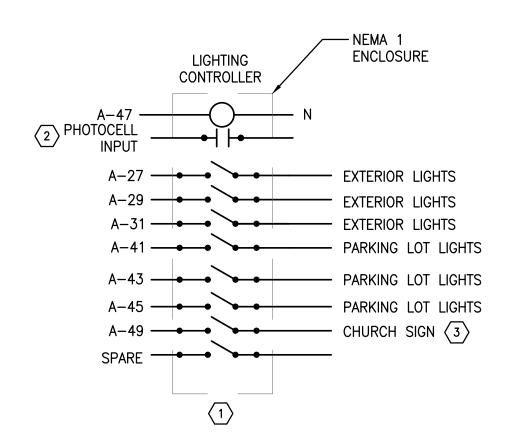
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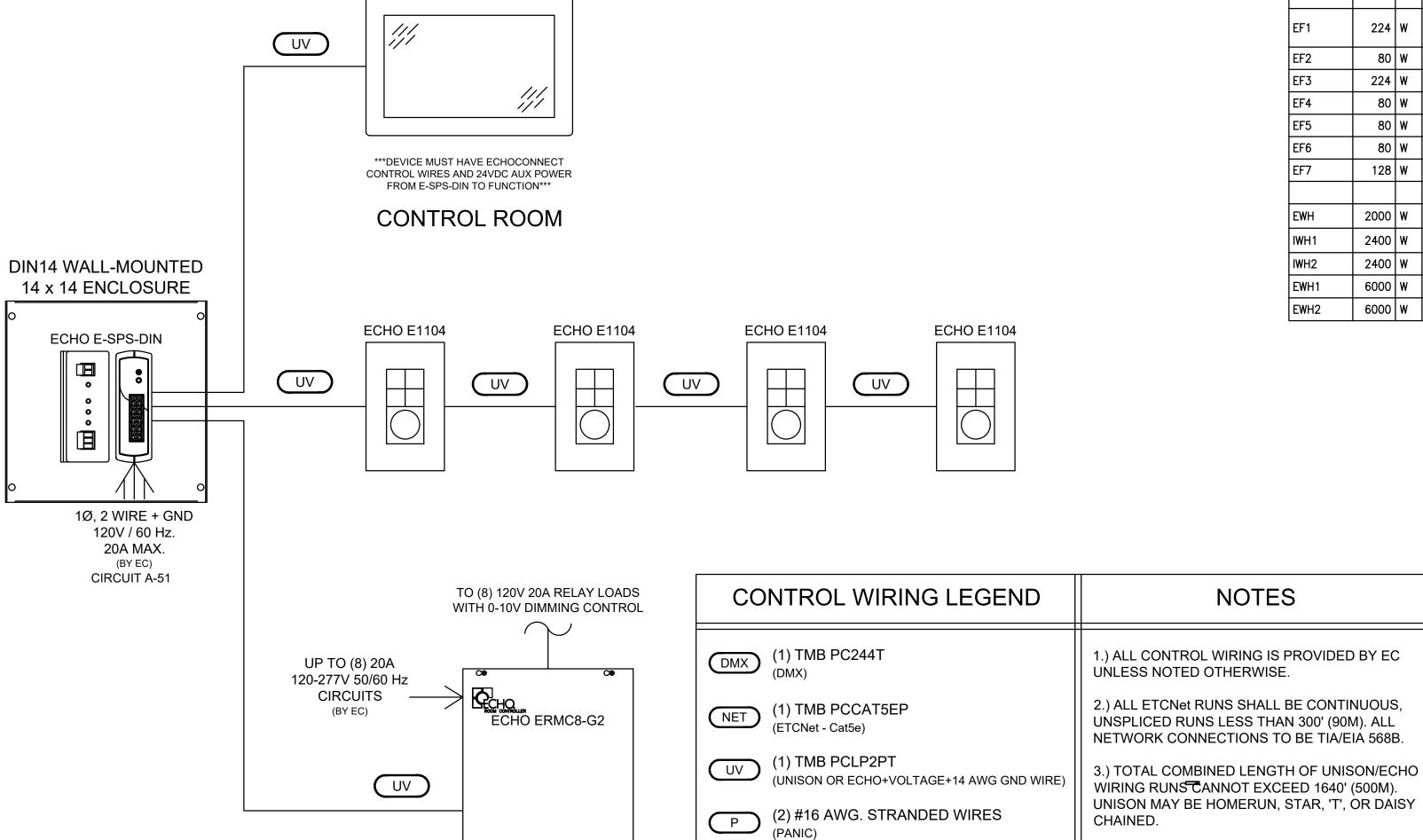


KEYED NOTES:

- 1 8 POLE PROGRAMMABLE LIGHTING CONTROL PANEL. BASIS OF DESIGN DOUGLAS MODEL WPAK8-3351-S. SET CONTROLS PER OWNER'S REPRESENTATIVE'S INSTRUCTIONS.
- FIELD LOCATE PHOTOCELL ON ROOF FACING NORTHEAST FOR BEST CONTROL.
- FIELD LOCATE CHURCH SIGN IN ACCORDANCE WITH ARCHITECTURAL DRAWINGS. PROVIDE WEATHER PROOF JUNCTION BOX FOR THE

EXTERIOR LIGHTING CONTROL WIRING DIAGRAM

ECHO ETS



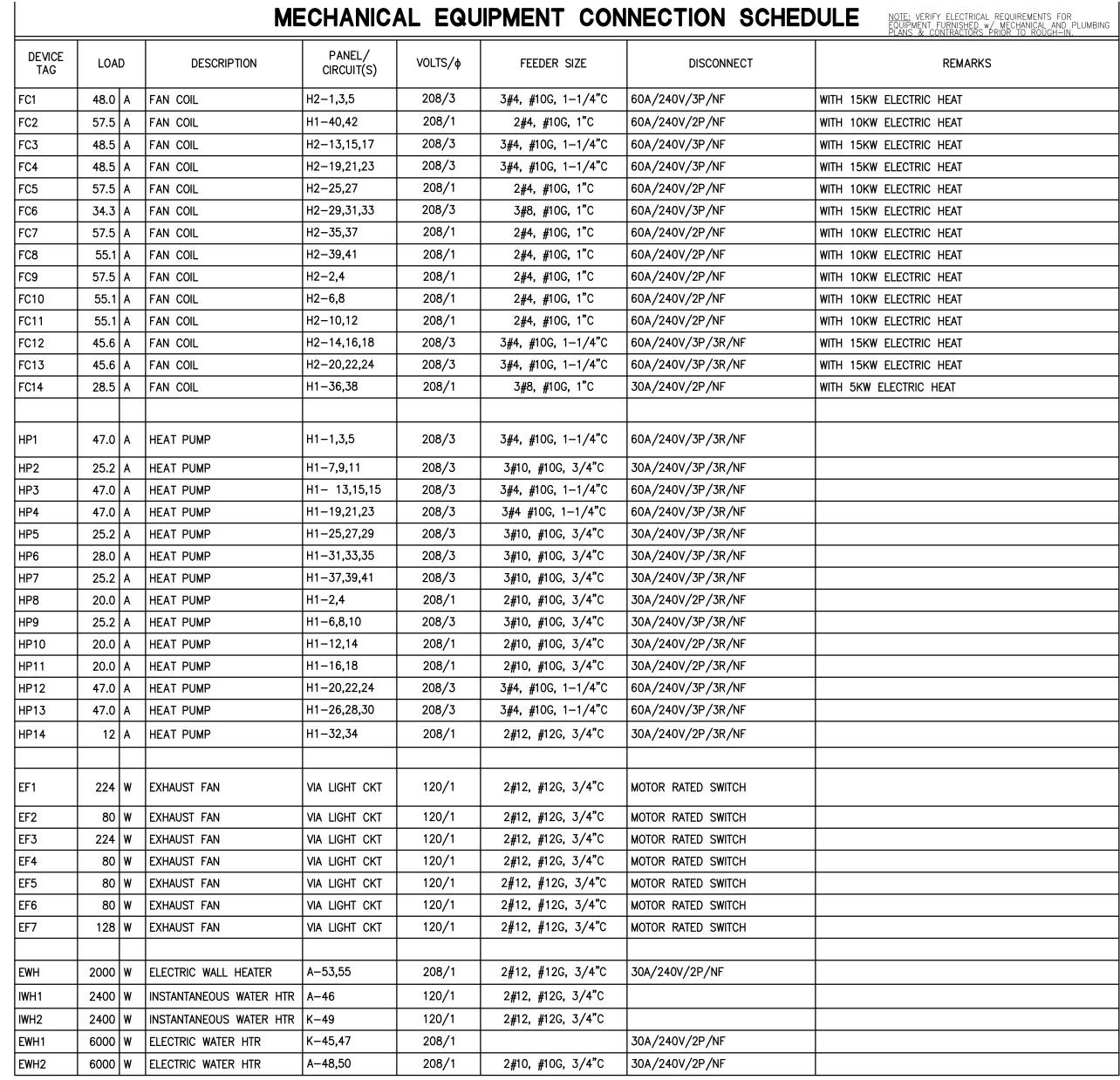
(1) 120V 20A. RELAY CIRCUIT (TO R20 MODULE)

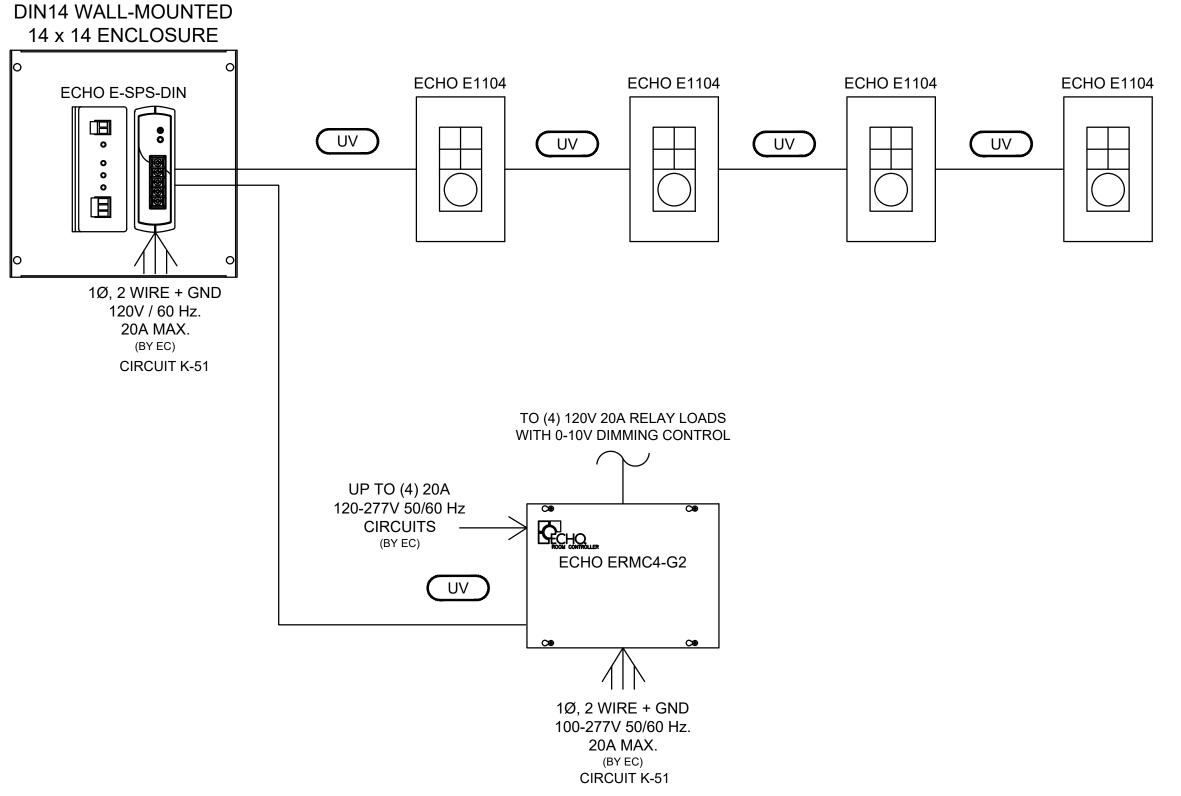
(1) 120V 20A. DIMMER CIRCUIT (TO D20 MODULE)

(1) 120V 20A. THRU POWER CIRCUIT (TO TR20SAF MODULE)

DIN14 WALL-MOUNTED 14 x 14 ENCLOSURE ECHO E-SPS-DIN 1Ø, 2 WIRE + GND 120V / 60 Hz. 20A MAX. CIRCUIT K-51 BASIS OF DESIGN IS ETC (ELECTRONIC THEATRE CONTROLS). REP. IS "ARDD & WINTER " MONIQUE NORMAN, TEL:

770-368-2740





LIGHTING CONTROL RISER (GRAND & FELLOWSHIP HALL)

FOR CONSTRUCTION

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STRUCTURAL ENGINEER

SSE - SMILEY STRUCTURAL **ENGINEEERING** 410 PEACHTREE PARKWAY, SUITE 4245 CUMMING, GA 30041

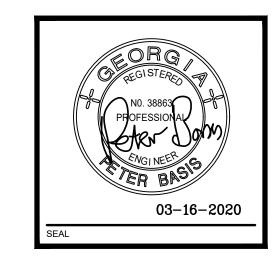
GA LICENSED CONNSULTING ENGINEERS

MECHANICAL / ELECTRICAL ENGINEER MARSHALL & BOLLWERK ENGINEERING, INC. 8681 HIGHWAY 92, SUITE 400

WOODSTOCK, GA 30189 P: 678.795.0333, F: 678.325.4559 GA LICENSED CONNSULTING ENGINEERS

GRACE PCA PRESBYTERIAN CHURCH

HIGHWAY 76 BLAIRSVILLE, GEORGIA



80% COORDINATION 2020	DATE
80% COORDINATION 2020	DATE
100% CONSTRUCTION 2020	2020 02 28
	2020 03 16

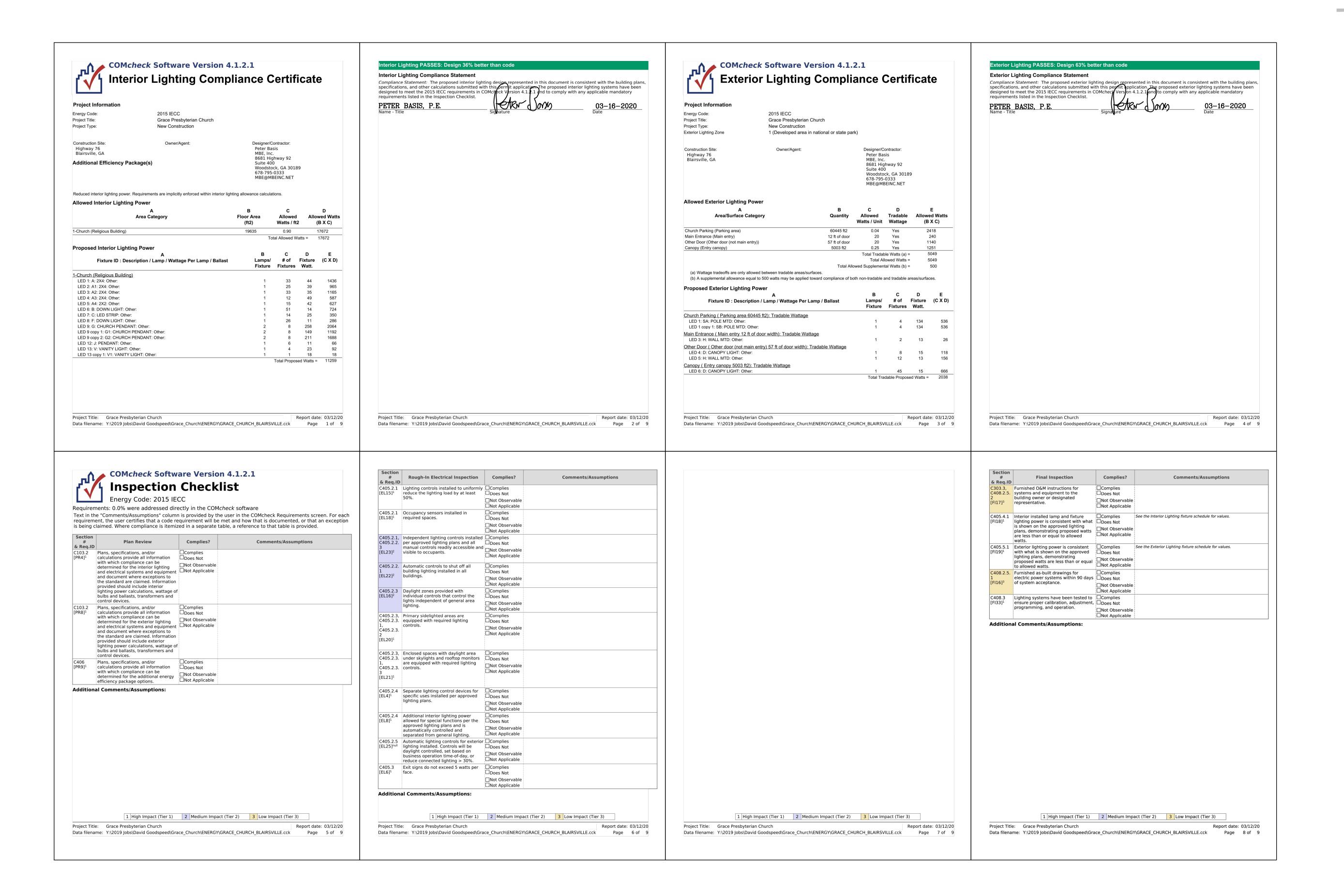
LIGHTING CONTROL RISER (SANCTUARY)

1Ø, 2 WIRE + GND

100-277V 50/60 Hz.

20A MAX. (BY EC)

CIRCUIT A-51





ARCHITECT OF RECORD DAVID R GOODSPEED, AIA

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PO BOX 145

STRUCTURAL ENGINEER

SSE - SMILEY STRUCTURAL
ENGINEEERING

410 PEACHTREE PARKWAY, SUITE 4245

CUMMING, GA 30041
678.720.8189
GA LICENSED CONNSULTING ENGINEERS
MECHANICAL / ELECTRICAL ENGINEER

MARSHALL & BOLLWERK ENGINEERING, INC.

8681 HIGHWAY 92, SUITE 400
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P: 678.795.0333, F: 678.325.4559
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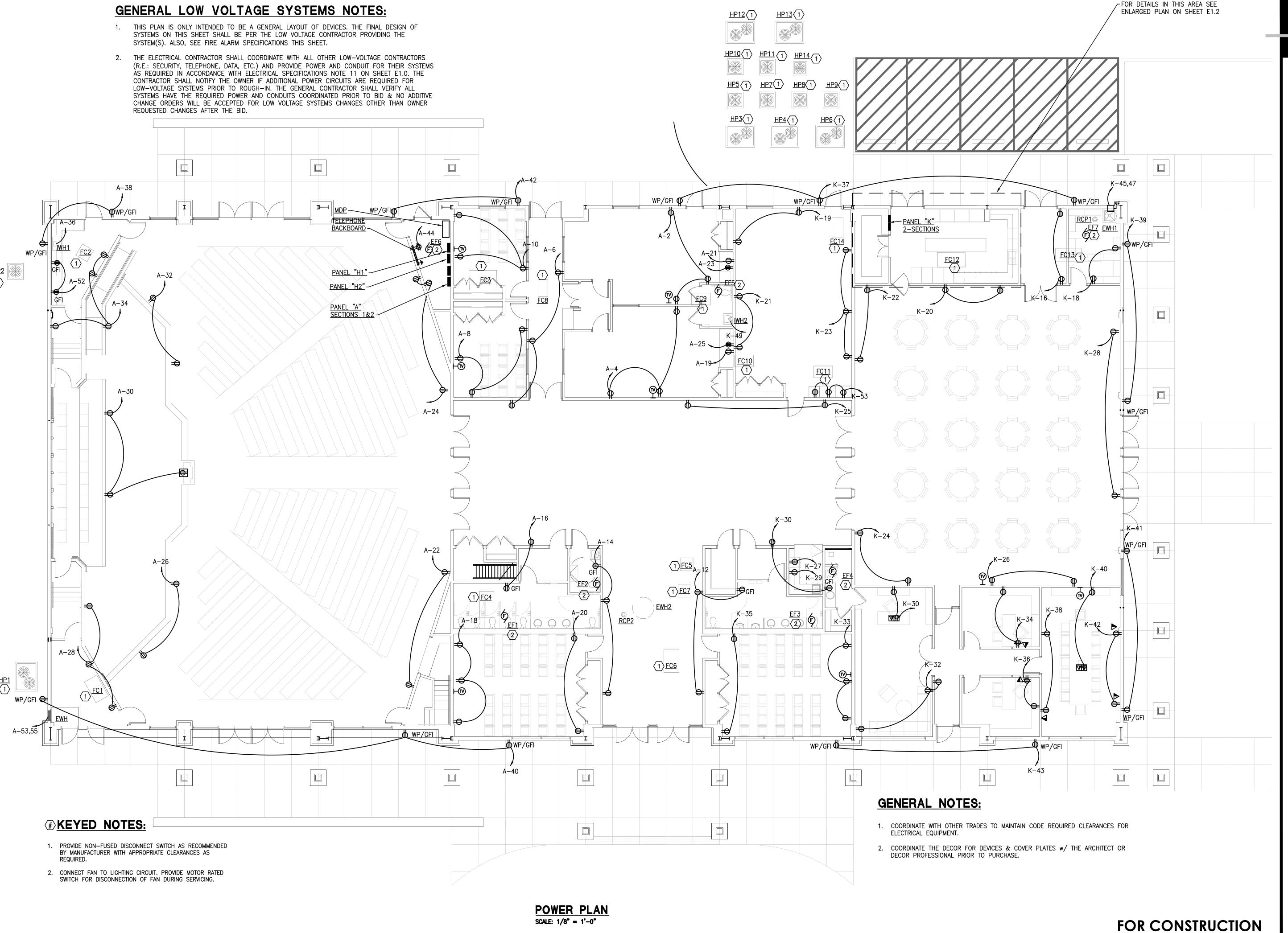
HIGHWAY 76 BLAIRSVILLE, GEORGIA



2019.08 DATE 2020 02 28
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2020 02 20
2020 02 20
2020 03 16
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E1.4

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ENGINEERING, INC.

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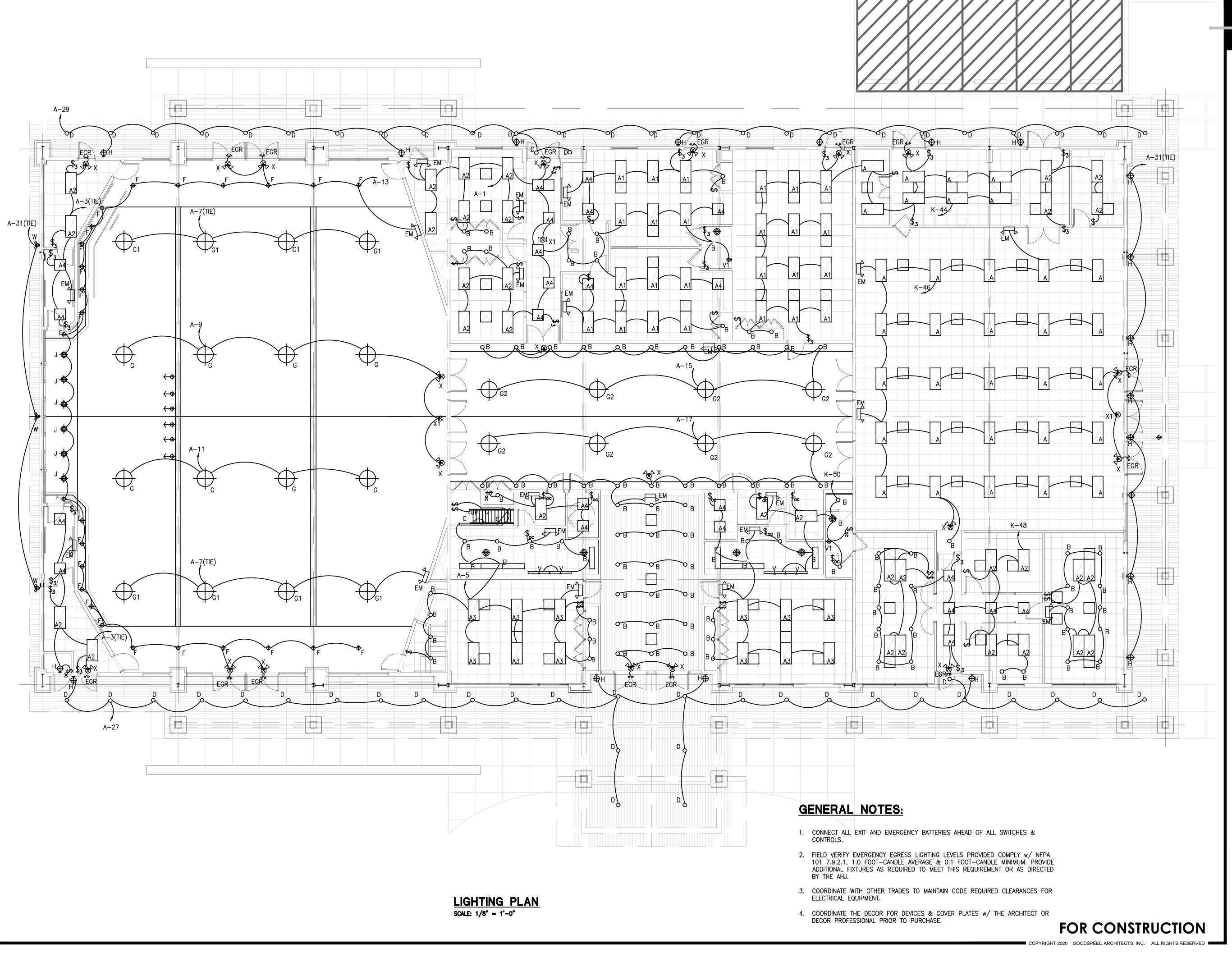
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HIGHWAY 76 BLAIRSVILLE, GEORGIA



GAI PROJECT NO.	2019.08
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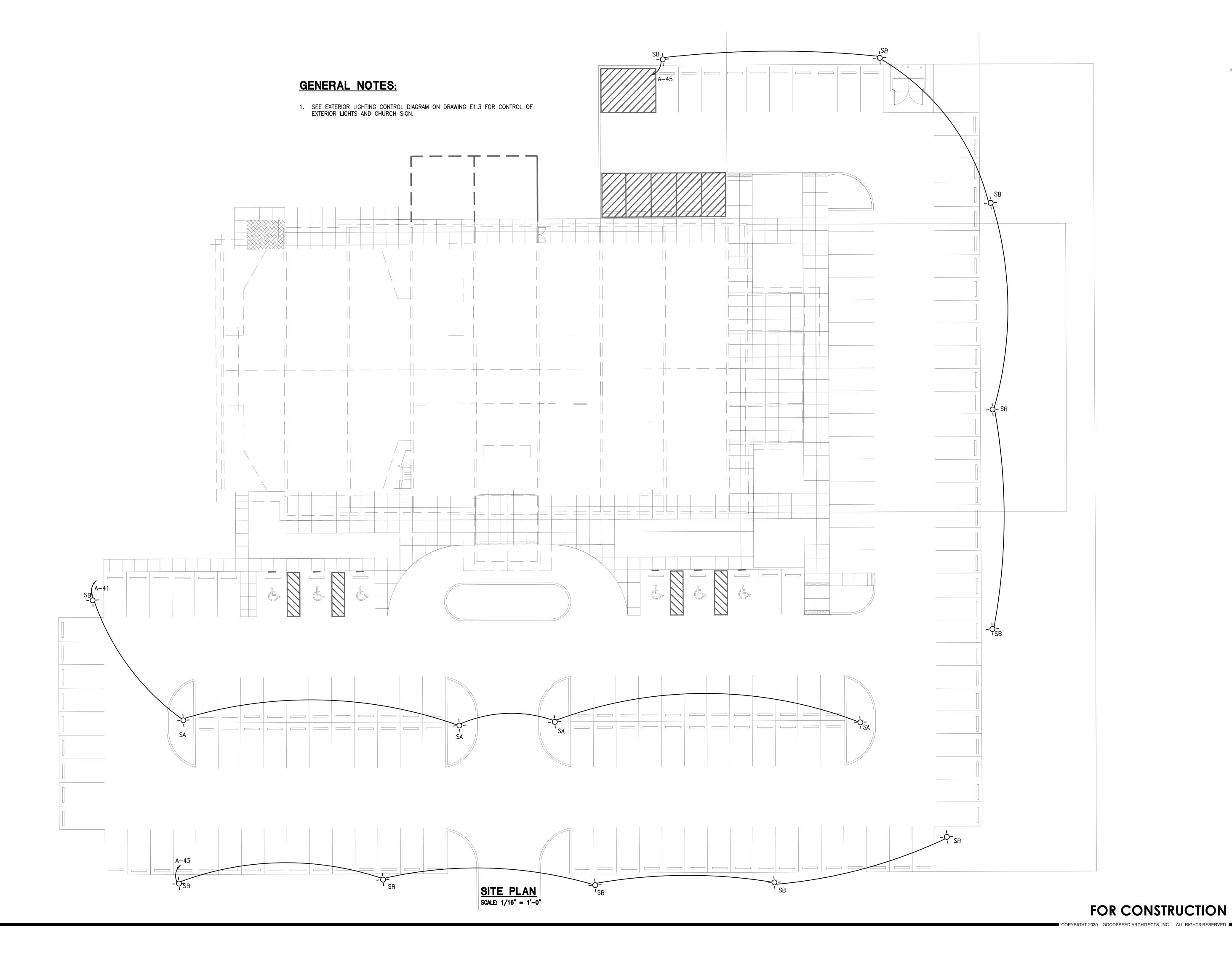
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HIGHWAY 76 BLAIRSVILLE, GEORGIA



GAI PROJECT NO.	2019.08
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80% COORDINATION 2020	DATE
100% CONSTRUCTION 2020	2020 02 28
	2020 03 16

E4.0