GYMNASIUM HVAC RENOVATION COLLINWOOD MIDDLE SCHOOL

300 4TH Av. N. COLLINWOOD, TN 38450

MECHANICAL/ELECTRICAL: DW COLLIER ENGINEERING, INC.

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US AND MERCIS

ELECTRICAL:

CODE ANALYSIS:

- 1. 2012 INTERNATIONAL MECHANICAL CODE
- 2. 2012 INTERNATIONAL PLUMBING CODE
- 3. 2012 INTERNATIONAL FUEL & GAS CODE
- 4. 2011 NATIONAL ELECTRICAL CODE
- 5. 2012 NFPA 101 LIFE SAFETY CODE
- 6. 2010 AMERICANS WITH DISABILITIES ACT
- 7. 2012 INTERNATIONAL BUILDING CODE

SHEET INDEX

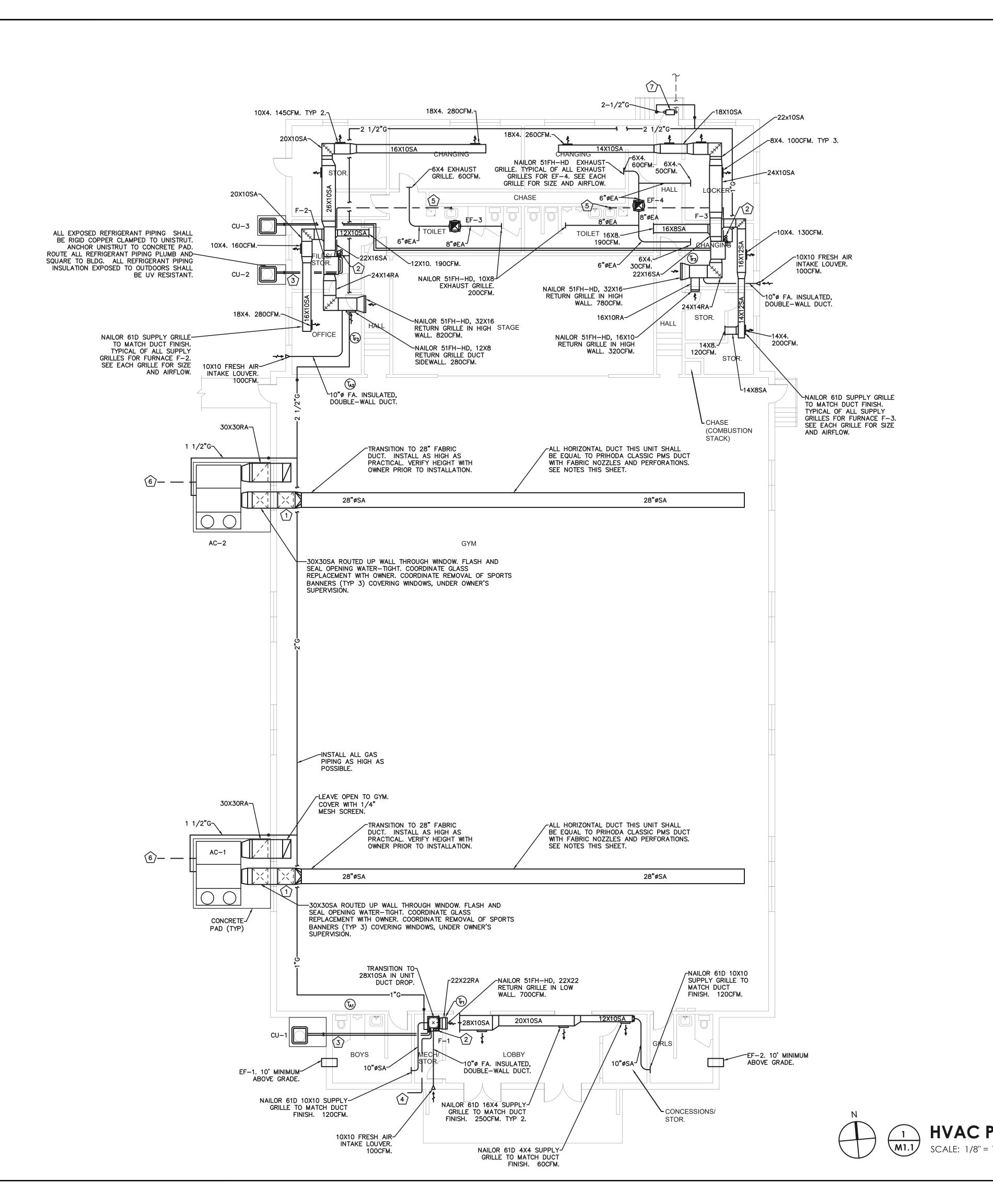
COVER SHEET

- M1.1 HVAC PLAN
- M1.2 HVAC DEMOLITION PLAN
- M2.1 HVAC SCHEDULES
- M2.2 HVAC DETAILS
- E1.1 POWER PLAN
- **E2.1 ONE-LINE AND SCHEDULES**
- E3.1 ELECTRICAL NOTES

REVISIONS:

COLLIER

DWCEI PROJECT NO. 21-051

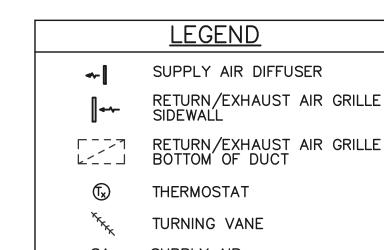


KEYED NOTES:

- 1 TURN 30X30SA METALLIC DUCT UP IN GYM TO ACHIEVE HIGHEST-PRACTICAL HEIGHT FOR CONNECTED FABRIC DUCT.
- 2 3"Ø (VERIFY SIZE WITH MANUFACTURER REQUIREMENTS) COMBUSTION AIR SUPPLY AND EXHAUST DUCTS, PVC OR APPROVED VENTING MATERIAL FOR CONDENSING APPLIANCES. CONNECT TO SINGLE, MANUFACTURER-APPROVED CONCENTRIC VENT THROUGH ROOF. SIZE BASED ON LENGTH OF RUN PER MANUFACTURER REQUIREMENTS. FLASH AND SEAL ALL ROOF PENETRATIONS, AND MAINTAIN ROOF WARRANTY. CONNECT TO FURNACE.
- 3 SPLIT A/C REFRIGERANT LINES FROM REMOTE GRADE MOUNTED CONDENSING LINET ROLLTE LINES AROUS COULDN'S OR LINET TO ST CONDENSING UNIT. ROUTE LINES ABOVE CEILING OR HIGH TO STRUCTURE, AS STRAIGHT AS POSSIBLE, PROVIDE WITH INSULATION PER SPECIFICATIONS. ROUTE TO INSIDE EVAPORATOR UNIT. SIZE PER MANUFACTURER REQUIREMENTS, BASED ON REFRIGERANT RISE AND RUN.
- CONDENSATE DRAIN THROUGH WALL TO FRENCH DRAIN. INSTALL FRENCH DRAIN PER DETAIL. SIZE PIPING PER MANUFACTURER.
- 5 CONDENSATE DRAIN TO HOUSE SIDE OF SINK. SIZE PIPING PER MANUFACTURER. SEE DETAIL.
- 6 CONDENSATE DRAIN TO FRENCH DRAIN. INSTALL FRENCH DRAIN PER DETAIL. SIZE PIPING PER MANUFACTURER.
- 2 EXISTING NATURAL GAS METER. EXISTING NATURAL GAS LOAD ESTIMATED AT 620CFH. NEW LOAD IS 920CFH. NEW PIPING IS SIZED AT LOW PRESSURE.

GENERAL NOTES:

- 1. DUCT SIZES INDICATED ARE ACTUAL SHEET METAL DIMENSIONS. ALLOWANCES HAVE BEEN MADE FOR THICKNESS OF INSULATION. ALL EXPOSED (RECTANGULAR AND ROUND) DUCTS TO BE LINED WITH 1 1/2" THICK, FIBERGLASS INSULATION EQUAL TO CERTAINTEED TOUGHGARD TYPE 150, R-6 MINIMUM. FRESH AIR INTAKE DUCTS SHALL BE DOUBLE-WALL DUCT INTERNALLY INSULATED (R-8 MINIMUM).
- 2. EXHAUST DUCTS DO NOT REQUIRE INSULATION. 3. ALL DUCTWORK EXPOSED INSIDE SHALL BE PAINTGRIP TYPE. ALL GRILLES IN SIDEWALL OF DUCTS SHALL MATCH FINAL DUCT COLOR. COORDINATE ALL GRILLE COLORS WITH ARCHITECT.
- 4. FABRIC DUCT TO BE UTILIZED WHERE POSSIBLE AS INDICATED. FABRIC DUCT SHALL BE EQUAL TO PRIHODA CLASSIC PMS DUCT WITH FABRIC NOZZLES AND PERFORATIONS. PROVIDE WITH CABLES AND SINGLE TRACK SUSPENSION SYSTEM WITH ALL-IN ONE HOOPS. VERIFY HEIGHTS AND COLORS WITH OWNER PRIOR INSTALLATION. COORDINATE EXACT LAYOUT WITH VENDOR PROVIDED DESIGN.
- 5. IN ADDITION TO INTERNAL LINER, ALL DUCTWORK INSTALLED OUTDOORS SHALL BE EXTERNALLY INSULATED WITH 1" RIGID BLUEBOARD POLYSTYRENE INSULATION ADHERED TO DUCT AND COVERED WITH POLYGUARD SELF-ADHESIVE, SELF-HEALING MEMBRANE.
- 6. WHERE HOLES LEFT BY REMOVAL OF EXISTING EQUIPMENT FROM THE DEMOLITION PLAN ARE USED FOR NEW EQUIPMENT OR SYSTEMS, PROPERLY PATCH, SEAL, RECONSTRUCT, AND PAINT (AS APPLICABLE) AROUND NEW COMPONENTS TO FINISH BUILDING AND GIVE IT A UNIFORM APPEARANCE.
- 7. COORDINATE EXCAVATION AND BURIAL OF PIPING WITH EXISTING UNDERGROUND AND ABOVE GROUND OBSTACLES.
- 8. COORDINATE ALL NEW ROOF PENETRATIONS WITH ROOFING CONTRACTOR. ENSURE ALL NEW PENETRATIONS ARE PROPERLY CUT AND FLASHED WEATHERTIGHT. ENSURE ANY EXISTING WARRANTY IS MAINTAINED.
- 9. VERIFY ALL EXISTING CONDITIONS PRIOR TO CONSTRUCTION. HVAC LAYOUT DETERMINED FROM SITE OBSERVATIONS AND AS BUILT DRAWINGS. CONTRACTOR SHALL NOTIFY ENGINEER SHOULD EXISTING CONDITIONS DIFFER FROM THESE DRAWINGS.
- 10. PROVIDE SEISMIC RESTRAINT FOR ANY DUCTWORK 6FT2 OR GREATER.



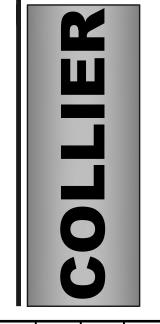
SA SUPPLY AIR

RA RETURN AIR FRESH AIR/OUTSIDE AIR EΑ EXHAUST AIR

SHEET NUMBER:

RENOVATION MTARY SCHOOL HVAC SIUM \triangleleft M Plan AC ¥

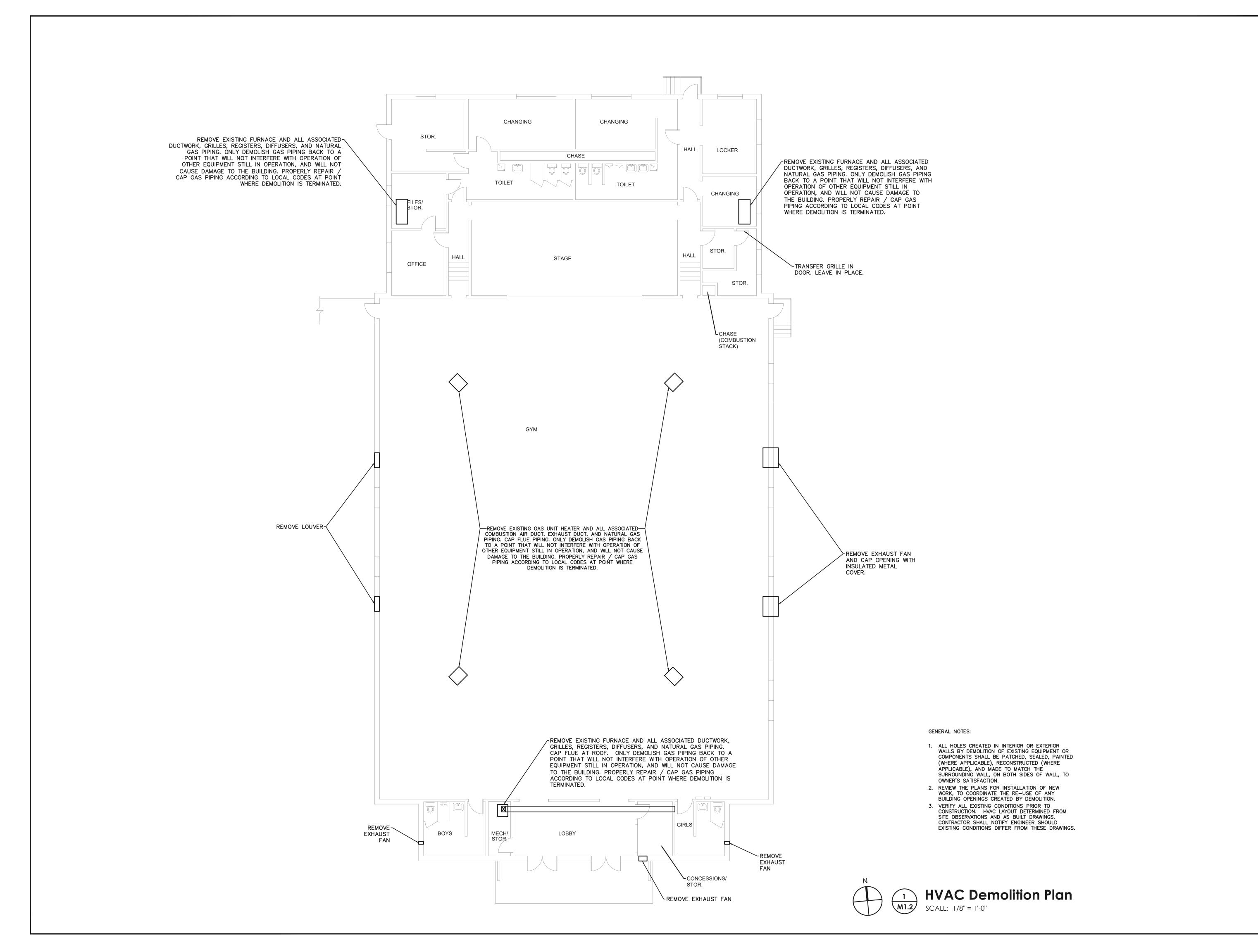
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ORIGINAL ISSUE DATE: 04/23	SCALE:	снескер: GAC	DRAWN BY:

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> PROJECT NUMBER: 21-051



RENOVATION **Demolition Plan**

YMNASIUM HVAC COLLINWOOD ELEMEN HVAC

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21-051 SHEET NUMBER:

|MECHANICAL NOTES:

- ALL WORK SHALL BE EXECUTED AND INSPECTED IN ACCORDANCE WITH ALL LOCAL AND STATE CODES, LAWS, ORDINANCES, RULES AND REGULATIONS APPLICABLE TO THE PARTICULAR CLASS OF WORK. IF, TO THE KNOWLEDGE OF THE CONTRACTOR, THE DRAWINGS AND SPECIFICATIONS ARE IN CONFLICT WITH THE ABOVE, HE SHALL PROMPTLY NOTIFY THE ENGINEER IN WRITING SO THAT ANY NECESSARY CHANGES CAN BE PROVIDED FOR IN HIS CONTRACT. IF THE CONTRACTOR PERFORMS ANY WORK WITHOUT NOTICE AS REQUIRED, HE SHALL BEAR ALL COSTS OF CORRECTIVE ACTION.
- THE CONTRACTOR SHALL INCLUDE IN HIS QUOTATION ALL APPLICABLE SERVICE CHARGES, FEES, PERMITS, ROYALTIES, AND OTHER SIMILAR COSTS IN CONNECTION WITH THE WORK. OBTAIN PERMITS, AND REQUEST INSPECTIONS FROM AUTHORITY HAVING JURISDICTION.
- INSTALL WORK IN LOCATIONS SHOWN ON DRAWINGS, UNLESS PREVENTED BY PROJECT CONDITIONS. FOR PURPOSES OF CLEARNESS AND LEGIBILITY, DRAWINGS ARE ESSENTIALLY DIAGRAMMATIC, AND ALTHOUGH SIZE AND LOCATION OF EQUIPMENT ARE DRAWN TO SCALE WHENEVER POSSIBLE, THE CONTRACTOR SHALL REVIEW THE STRUCTURAL, ELECTRICAL, ARCHITECTURAL, FIRE PROTECTIONS, ETC. DRAWINGS AND DETERMINE AREAS OF INTERFERENCE. THE CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER OF INTERFERENCE'S PRIOR TO FABRICATION OF DUCTWORK OR PIPING.
- THE DRAWINGS INDICATE REQUIRED SIZE AND POINTS OF TERMINATION OF PIPES AND DUCTS, AND SUGGEST PROPER ROUTES OF PIPE TO CONFORM TO STRUCTURE, AVOID OBSTRUCTIONS AND PRESERVE CLEARANCES. HOWEVER, IT IS NOT INTENDED THAT DRAWINGS INDICATE ALL NECESSARY OFFSETS, AND IT SHALL BE THE WORK OF THIS SECTION TO INSTALL PIPING AND DUCTS IN SUCH A MANNER AS TO CONFORM TO STRUCTURE, AVOID ALL OBSTRUCTIONS, PRESERVE HEADROOM AND KEEP OPENINGS AND PASSAGEWAYS CLEAR WITHOUT FURTHER INSTRUCTION OR COST TO THE OWNER.
- CONTRACTOR SHALL GUARANTEE ALL WORK PERFORMED UNDER THIS CONTRACT TO BE FREE FROM DEFECTS IN MATERIALS AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM DATE OF CERTIFICATE OF SUBSTANTIAL COMPLETION.
- THE MECHANICAL CONTRACTOR SHALL PREPARE SUBMITTALS ON ALL EQUIPMENT AND MATERIALS APPLICABLE TO THIS PROJECT AND SUBMIT TO ENGINEER FOR REVIEW PRIOR TO PROCUREMENT, FABRICATION OR ANY CONSTRUCTION. SUBMITTALS MAY BE MAILED VIA APPROPRIATE CHANNELS OR SUBMITTED IN PDF FORM VIA EMAIL. PARTIAL SUBMITTALS WILL NOT BE REVIEWED.
- MOTORS FOR ALL MECHANICAL EQUIPMENT SHALL BE FURNISHED BY SUPPLIERS OF SUCH EQUIPMENT AND SHALL BE THE TYPE THAT HAS CHARACTERISTICS SUITABLE FOR CONTINUOUS OPERATING CONDITIONS.
- TRANSPORT AND HANDLE PRODUCTS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
- 9. STORE AND PROTECT PRODUCTS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS, WITH SEALS AND LABELS INTACT AND LEGIBLE.
- 10. ALL MECHANICAL EQUIPMENT, AS APPLICABLE, SHALL HAVE U.L. LISTING OR EQUIVALENT. VERIFY THAT EACH PIECE OF EQUIPMENT OR SYSTEM HAS BEEN CHECKED FOR PROPER LUBRICATION, DRIVE ROTATION, BELT TENSION, CONTROL SEQUENCE, OR FOR OTHER CONDITIONS WHICH MAY CAUSE DAMAGE.
- I. DEMONSTRATE OPERATION AND MAINTENANCE OF PRODUCTS TO OWNER'S PERSONNEL ONE WEEK PRIOR TO DATE OF FINAL INSPECTION. 12. EXECUTE FINAL CLEANING PRIOR TO FINAL PROJECT ASSESSMENT.
- 13. SEISMICALLY RESTRAIN HVAC EQUIPMENT, GAS PIPING AND HYDRONIC PIPING AS REQUIRED BY LOCAL CODE. PROVIDE SUPPORT AND EQUIPMENT REQUIRED TO CONTROL EXPANSION AND CONTRACTION OF PIPING. PROVIDE LOOPS, PIPE OFFSETS, AND SWING JOINTS, OR EXPANSION JOINTS WHERE REQUIRED.
- 14. ENTIRE HVAC SYSTEM AND HYDRONIC SYSTEM (AS APPLICABLE) SHALL BE BALANCED BY A CERTIFIED TEST & BALANCE CONTRACTOR. ALL AIR FLOW RATES
- SHALL BE WITHIN 5% OF SPECIFIED FLOW RATE. PROVIDE CERTIFIED TEST & BALANCE REPORT AT END OF PROJECT. 15. DISPOSE OF CONDENSATE IN ACCORDANCE WITH LOCAL CODE REQUIREMENTS. PROVIDE TRAP IN CONDENSATE DRAIN LINE AT EACH COIL OR 90+ FURNACE IN ACCORDANCE WITH PUBLISHED MANUFACTURER'S INSTRUCTIONS. EACH TRAP SHALL BE PROVIDED WITH A TEE TO ALLOW FOR CLEANING. CONDENSATE PIPING SHALL BE SCH 40 PVC UNLESS NOTED OTHERWISE OR PROHIBITED BY CODES. INSULATE CONDENSATE DRAIN PIPING, SLOPE TO DRAIN, AND TERMINATE IN
- ACCORDANCE WITH CODE OR AS SHOWN ON THESE DRAWINGS. 16. PROVIDE NON—CONDUCTING DIELECTRIC CONNECTIONS WHEREVER JOINTING DISSIMILAR METALS.
- . ALL DUCTWORK SHALL BE FABRICATED AND INSTALLED IN ACCORDANCE WITH THE 2005 EDITION "SMACNA HVAC DUCT CONSTRUCTION STANDARDS METAL AND FLEXIBLE". AND AS INDICATED. PROVIDE RADIUS ELBOW OR TURNING VANES IN ALL 90° ELBOWS. PROVIDE DUCT MATERIAL. GAGES. REINFORCING. AND SEALING FOR OPERATING PRESSURES INDICATED. DUCTWORK SHALL BE FABRICATED FROM ASTM A525 AND ASTM A527 GALVANIZED STEEL SHEET, LOCK-FORMING QUALITY, HAVING G90 ZINC COATING OF IN CONFORMANCE WITH ASTM A90. ALL DUCTS SHALL BE GALVANIZED STEEL UNLESS OTHERWISE NOTED ON DRAWINGS. DUCTBOARD WILL NOT BE ACCEPTED.
- 18. PROVIDE TEMPORARY PROTECTION FOR EQUIPMENT DURING CONSTRUCTION TO PREVENT DAMAGE TO EQUIPMENT AND COILS. PROVIDE TEMPORARY FILTERS AT EACH RETURN AIR INLET DURING CONSTRUCTION. PROVIDE AND INSTALL A NEW, CLEAN SET OF FILTERS FOR EACH SYSTEM AT PROJECT COMPLETION.
- 19. FLEXIBLE DUCTWORK SHALL BE EQUIVALENT TO THERMAFLEX WITH R-6.0 MINIMUM, R-8.0 IF IN ATTIC SPACE, FIBERGLASS INSULATION AND VAPOR BARRIER. FLEXIBLE DUCTWORK SHALL BE U.L. LISTED AND APPROVED.
- 20. SEAL ALL LONGITUDINAL AND TRANSVERSE SEAMS BEFORE APPLYING INSULATION. SEALANT SHALL BE NON—HARDENING, WATER RESISTANT, FIRE RESISTIVE, COMPATIBLE WITH MATING MATERIALS, LIQUID USED ALONE OR WITH TAPE, OR HEAVY MASTIC.
- 21. LOCATE DUCTS WITH SUFFICIENT SPACE AROUND EQUIPMENT TO ALLOW NORMAL OPERATING AND MAINTENANCE ACTIVITIES.
- 22. PROVIDE CANVAS, FLAME RETARDENT DUCT CONNECTORS AT ALL CONNECTIONS OF FANS TO DUCTWORK.
- 23. ALL LOW VOLTAGE CONTROL WIRING SHALL BE PROVIDED BY MECHANICAL CONTRACTOR. CONTROL WIRING SHALL BE PROVIDED IN ACCORDANCE WITH ALL FEDERAL, STATE AND LOCAL CODES. CONTROL WIRING CONCEALED IN WALLS, LOCATED OUTDOORS, OR INSTALLED IN RETURN AIR PLENUM SHALL BE INSTALLED
- 24. ROUTE REFRIGERANT LINES FROM OUTDOOR UNITS TO COOLING COIL. SIZE PER MANUFACTURER'S RECOMMENDATIONS AND PROVIDE ADDITIONAL CHARGE AS REQUIRED. REFRIGERANT SUCTION PIPES LESS THAN 1 1/2" IN SIZE TO RECEIVE 1/2" ARMAFLEX INSULATION AND ALL LIQUID LINES TO RECEIVE 1" INSULATION. ALL EXPOSED REFRIGERANT PIPING INSTALLED OUTDOORS SHALL BE RIGID COPPER. ROUTE ALL REFRIGERANT PIPING PLUMB AND SQUARE WITH THE BUILDING AS POSSIBLE. EXTERIOR PIPING SHALL BE INSTALLED ON UNISTRUT AND SECURED WITH UNISTRUT CLAMPS. UNISTRUT TO BE ANCHORED TO CONCRETE PAD.
- 25. ROUND DUCT BRANCH SIZE SHALL BE SAME AS NECK SIZE SPECIFIED FOR DIFFUSER, UNLESS OTHERWISE NOTED ON DRAWINGS.
- 26. ALL EXTERIOR WALL LOUVERS USED FOR MECHANICAL EXHAUST, MECHANICAL FRESH AIR INTAKE, OR MECHANICAL COMBUSTION AIR SHALL BE EXTRUDED ALUMINUM, WITH 1/4" INSECT SCREEN. COORDINATE COLOR WITH ARCHITECT.
- 27. VERIFY FLOOR PLAN AND WALL/FLOOR/CEILING RATINGS WITH ARCHITECTURAL PLANS. PROVIDE RATED PENETRATIONS AT EACH INSTANCE WHERE MECHANICAL INSTALLATION PENETRATES A RATED ASSEMBLY. PENETRATIONS SHALL BE PER DETAILS ON THE DRAWINGS OR SOME OTHER U.L. LISTED DESIGN.
- 28. NATURAL GAS PIPING, IF SHOWN ON THESE DRAWINGS, SHALL BE SCH. 40 BLACK STEEL ABOVE GROUND WITH EITHER WELDED OR THREADED FITTINGS. PAINT PIPING LOCATED OUTDOORS. ALL NATURAL GAS PIPING PERMANENTLY CONCEALED IN WALLS, CHASES, ETC. SHALL HAVE WELDED CONNECTIONS. IF APPROVED BY THE LOCAL GAS UTILITY, PIPE BELOW GRADE MAY BE DRISCOPIPE 6500, OR APPROVED POLYETHYLENE TYPE, INSTALLED TO CONFORM TO MANUFACTURER'S RECOMMENDATIONS AND LOCAL UTILITY REQUIREMENTS. PROVIDE YELLOW COPPER TRACER WIRE OR OTHER APPROVED CONDUCTOR INSTALLED ADJACENT TO UNDERGROUND NONMETALLIC PIPING. ACCESS SHALL BE PROVIDED TO THE TRACER WIRE OR THE TRACER WIRE SHALL TERMINATE ABOVE GROUND AT EACH END OF THE NONMETALLIC PIPING. THE TRACER WIRE SHALL NOT BE LESS THAN 18 AWG AND THE INSULATION TYPE SHALL BE SUITABLE FOR DIRECT BURIAL ALL NEW OR MODIFIED NATURAL GAS SYSTEMS SHALL BE TESTED AND PURGED PER 2012 IFGC CHAPTER 406.
- 29. UNLESS OTHERWISE NOTED ON DRAWINGS, AIR DISTRIBUTION SHALL BE AS FOLLOWS OR EQUAL:
- CEILING SUPPLY, LAY-IN CEILINGS NAILOR 6500 SERIES, TYPE L FRAME, FULLY LOUVERED FACE, NO FILLER PANEL, FLUSH WITH CEILING, LESS DAMPER.
- SIDEWALL OR DRYWALL CEILING SUPPLY NAILOR 61D SERIES, DOUBLE DEFLECTION, WITH DAMPER AND PLASTER RING (AS APPLICABLE). CEILING RETURN AND EXHAUST, LAY-IN CEILINGS - NAILOR 4360 SERIES, FLUSH FACE, TYPE L FRAME.
- SIDEWALL OR DRYWALL CEILING RETURN NAILOR 51FH-HD WITH PLASTER RING.
- LINEAR BAR SUPPLY GRILLES NAILOR 49-240, LESS DAMPER, WITH PLASTER RING.
- INSTALL AIR DISTRIBUTION SYMMETRICALLY WHERE POSSIBLE. ALL AIR DISTRIBUTION MOUNTING FRAMES SHALL MATCH CEILING TYPE. VERIFY CEILING AND COLORS WITH ARCHITECTURAL DRAWINGS. ALL AIR DISTRIBUTION SHALL HAVE POWDER COAT FINISH. GRILLES INSTALLED IN SIDEWALL OF DUCT SHALL MATCH DUCT FINISH AND COLOR. PROVIDE PREINSULATED SUPPLY GRILLE. WHERE ADAPTERS ARE USED, PAINT TO MATCH GRILLE.
- 30. DUCT PENETRATIONS THROUGH RATED WALLS DO NOT REQUIRE FIRE DAMPERS PROVIDED THE FOLLOWING MINIMUM REQUIREMENTS ARE MET:
- a. THE DUCT DOES NOT EXCEED 100 SQ. INCHES.
- b. THE DUCT IS OF 0.0217 INCH MINIMUM STEEL.
- c. THE DUCT SHALL NOT HAVE OPENINGS THAT COMMUNICATE THE CORRIDOR WITH ADJACENT SPACES OR ROOMS.
- d. THE DUCT IS INSTALLED ABOVE A CEILING.
- e. THE DUCT SHALL NOT TERMINATE AT A WALL REGISTER IN THE FIRE RESISTANCE RATED WALL.
- f. A MIN. 12" LONG BY 0.06" THICK STEEL SLEEVE SHALL BE CENTERED IN EACH DUCT OPENING. THE SLEEVE SHALL BE SECURED TO BOTH SIDES OF THE WALL AND ALL FOUR SIDES OF THE SLEEVE WITH MIN. 1 1/2" X 1 1/2" X 0.06" STEEL RETAINING ANGLES. SECURE RETAINING ANGLES TO THE SLEEVE AND WALL WITH NO 10 SCREWS. FILL ANNULAR SPACE BETWEEN THE WALL AND SLEEVE WITH MINERAL WOOL.
- FIRE BARRIERS: a. WALL IS RATED 1 HR OR LESS
- b. WALLS ARE IN AREAS OTHER THAN GROUP H
- c. BUILDING IS EQUIPPED THROUGHOUT WITH AUTOMATIC FIRE PROTECTION SYSTEM
- d. THE DUCT IS OF 26GA (0.0217 INCH) STEEL MINIMUM.
- e. DUCT IS CONTINUOUS FROM THE AIR HANDLER TO THE AIR OUTLET.
- 11. UNLESS SHOWN OTHERWISE ON DRAWINGS, FRESH AIR DUCTWORK SHALL BE ROUND GALVANIZED DUCT WITH FOIL—BACKED INSULATION, R—6 MINIMUM. EXHAUST DUCTS DO NOT REQUIRE INSULATION. PROVIDE ACCESSIBLE BALANCING DAMPER. SIZE DUCT AS FOLLOWS: 1-100 CFM - 6", 101-200 CFM - 8", 201-400 CFM - 10". SEE NOTE 25 FOR INTAKE LOUVER REQUIREMENTS. EACH FRESH AIR INTAKE DUCT SHALL BE PROVIDED WITH AN ACCESSIBLE BALANCING DAMPER. EXHAUST DUCTS DO NOT REQUIRE INSULATION.
- 32. CONDENSATE DRAINS, ELECTRICAL CONDUIT AND NATURAL GAS PIPING SHALL NOT BE ROUTED IN THE ROOF CURB OR UNIT HOUSING. CONDENSATE PIPING, ELECTRICAL CONDUIT AND NATURAL GAS PIPING SHALL PENETRATE THE ROOF, AS APPLICABLE, ADJACENT TO THE ROOF CURB AND CONNECT TO THE UNIT
- 33. PROVIDE AND INSTALL HARDWIRED THERMOSTATS FOR EACH SYSTEM. VERIFY EXACT LOCATION WITH OWNER EQUIPMENT PRIOR TO ROUGH-IN. THERMOSTAT INSTALLATION SHALL BE IN ACCORDANCE WITH ALL LOCAL CODES. THERMOSTATS SHALL BE INSTALLED AT 48"AFF. THERMOSTATS SHALL BE 7-DAY PROGRAMMABLE STYLE. MERCURY OPERATED THERMOSTATS ARE NOT ACCEPTABLE.
- 34. ALL SHEETMETAL SURFACES VISIBLE BEHIND ANY HVAC GRILLE SHALL BE PAINTED FLAT BLACK.
- 35. CONTRACTOR SHALL IDENTIFY ALL SCHEDULED EQUIPMENT AND ASSOCIATED THERMOSTATS. IDENTIFICATION SHALL BE ENGRAVED TAG PERMANENTLY ADHERED TO EQUIPMENT. THERMOSTATS MAY BE IDENTIFIED WITH PERMANENT INK ON INSIDE OF REMOVABLE COVER.
- 36. THIS CONTRACTOR SHALL EXAMINE THE ENTIRE DRAWING PACKAGE AND INCLUDE ALL NECESSARY MATERIAL AND LABOR TO PROVIDE A COMPLETE AND OPERABLE SYSTEM AS INDICATED IN THE ENTIRE DRAWING SET FOR HIS RESPECTIVE SYSTEMS.
- 37. ALL RECTANGULAR OR SQUARE ELBOWS OR TEES SHALL BE INSTALLED WITH TURNING VANES AS PER SMACNA GUIDELINES.

FURNACE SCHEDULE: TAG	F-1	F-2	F-3
AREA SERVED	ENTRY	REAR	REAR
MANUFACTURER	TRANE	TRANE	TRANE
MODEL NUMBER	S9X1B060	S9X1B080	S9X1B080
CFM	800	1200	1200
OUTSIDE AIR CFM	100	100	100
TOTAL COOLING (MBH)	24	36	36
SENSIBLE COOLING (MBH)	15.9	20	20
ENTERING AIR (DB/WB)	79/66	79/66	77/66
HEAT INPUT (MBH)	60	80	80
HEAT OUTPUT (MBH)	58.3	77.2	77.2
ELECTRICAL	120/1/60	120/1/60	120/1/60
MCA	11.8	11.8	11.8
MOCP	15	15	15
WEIGHT (LB)	122	127	127
NOTES	1,2,3,4,6	1-5	1–5

HONEYWELL, VISION PRO 8300 MODEL TH8321WF1001 PROGRAMMABLE

WI-FI THERMOSTAT WITH LOCKING GYM RATED COVER.

2" PLEATED RETURN AIR FILTER FACTORY CONCENTRIC VENT KIT

4.	FACTORY CONCENTRIC	١
5.	HORIZONTAL FLOW	

FAN SCHEDULE				
TAG	EF-1	EF-2	EF-3	EF-4
AREA SERVED	BOYS	GIRLS	TOILET	TOILET
QUANTITY	1	1	1	1
USE	EXHAUST	EXHAUST	EXHAUST	EXHAUST
MANUFACTURER	GREENHECK	GREENHECK	GREENHECK	GREENHECK
MODEL NUMBER	AER-E20C-600-VG	AER-E20C-600-VG	CUE-090-D	CUE-090-D
CFM	130	130	260	340
STATIC PRESSURE	0.4"	0.4"	0.5"	0.5"
TYPE	PROP	PROP	UPBLAST	UPBLAST
ELECTRICAL	115/1/60	115/1/60	115/1/60	115/1/60
POWER	1/4 HP	1/4 HP	1/15 HP	1/15 HP
SONES	10	10	6.3	6.6
INTERLOCK			F-2	F-3
WEIGHT	83	83	34	34
NOTES	1–7	1–7	1,2,3,4,8,9	1,2,3,4,8,9

- SPEED CONTROLLER PROVIDED BY DIVISION 15, MOUNTED AND WIRED BY DIVISION 16.
- INCLUDE SERVICE DISCONNECT DIRECT DRIVE INSECT SCREEN

SCHEDULE.

- ON WITH LIGHTS FLASH AND SEAL ALL WALL PENETRATIONS.
- FLASH AND SEAL ALL ROOF PENETRATIONS. MAINTAIN ROOF WARRANTY. ON WITH WALL SENSOR AS PROVIDED BY ELECTRICAL

WI-FI THERMOSTAT CONTROLS NOTE: THE INSTALLING CONTRACTOR SHALL INSTALL HONEYWELL "TOTAL CONNECT COMFORT" APPLICATION ON A OWNER PROVIDED SMART DEVICE AND CONFIGURE THE DEVICE TO COMMUNICATE WITH THE OWNER'S WI-FI. ALL UNITS SHALL BE PROVIDED WITH A HONEYWELL, VISION PRO 8300 MODEL TH8321WF1001 PROGRAMMABLE WI-FI THERMOSTAT WITH LOCKING COVER AS SPECIFIED IN THE UNIT SCHEDULES. THE CONTRACTOR SHALL SET UP EACH NEW THERMOSTAT TO COMMUNICATE WITH THE OWNER-PROVIDED WI-FI SIGNAL, CONFIGURE THE NEW THERMOSTATS, NAME AND GROUP EQUIPMENT AS DIRECTED BY THE OWNER WITHIN THE HONEYWELL APP ON THE SMART DEVICE. THE CONTRACTOR SHALL PROVIDE AN INITIAL SET-BACK PROGRAM FOR EACH SYSTEM AS DIRECTED BY THE OWNER. AT THE CONCLUSION OF THE PROJECT, EACH NEW UNIT SHALL BE SET UP IN THE APP AND THE OWNER'S PERSONNEL SHALL BE SUFFICIENTLY TRAINED BY THE CONTRACTOR SUCH THAT THE OWNER IS ABLE TO UTILIZE THE APP TO MONITOR EACH HVAC SYSTEM AND MAKE CHANGES TO THE

CONDENSING UNIT SCHEDULE:									
TAG	CU-1	CU-2	CU-3						
AIR SYSTEM	F-1	F-2	F-3						
MANUFACTURER	TRANE	TRANE	TRANE						
MODEL NUMBER	4TTR4024	4TTA4036	4TTA4036						
NOMINAL TONS	2	3	3						
COND'R ENTERING AIR TEMP.	98°	98°	98°						
ELECTRICAL	208/230/1/60	208/230/1/60	208/230/1/60						
MCA	14	12	12						
MOCP	20	20	20						
WEIGHT (LB)	133	156	156						
NOTES	1-10	1–10	1-10						

- INSTALL ON LEVEL PAD
- HIGH AND LOW PRESSURE SWITCHES CRANKCASE HEATER
- LOW AMBIENT CONTROL
- 5-YEAR COMPRESSOR WARRANTY SIGHT GLASS AND LIQUID LINE DRIER
- INSTALL PER MANUFACTURER'S RECOMMENDATIONS FOR CLEARANCES

CONTROLS, LENNOX, AMERICAN STANDARD, BRYANT.

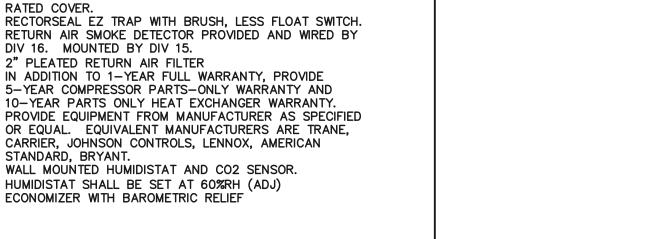
- SIZE REFRIGERANT LINE IN EXCESS OF 50' (HORIZONTAL) OR 20'
- (VERTICAL) AS PER MANUFACTURER'S RECOMMENDATION ALL REFRIGERANT PIPING INSTALLED OUTDOORS SHALL BE RIGID

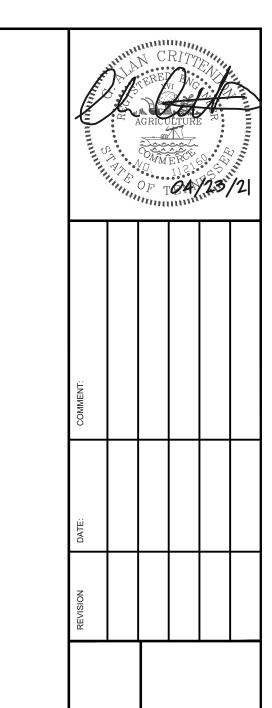
COPPER CLAMPED TO UNISTRUT. ANCHOR UNISTRUT TO CONCRETE

PAD. ROUTE PIPING PLUMB AND SQUARE TO BLDG. . PROVIDE EQUIPMENT FROM MANUFACTURER AS SPECIFIED OR EQUAL. EQUIVALENT MANUFACTURES ARE TRANE, CARRIER, JOHNSON

AIR CONDITIONING	UNIT SCHEDULE:	
TAG	AC-1	AC-2
AREA SERVED	GYM	GYM
MANUFACTURER	TRANE	TRANE
MODEL NUMBER	YSH180	YSH180
NOMINAL TONS	15	15
SUPPLY AIR CFM	6000	6000
OUTSIDE AIR CFM	750	750
ENTERING AIR (DB/WB)	78/66	78/66
SENSIBLE COOLING (MBH)	145	145
TOTAL COOLING (MBH)	186	186
HEAT INPUT (MBH)	250	250
HEAT OUTPUT (MBH)	203	203
ELECTRICAL	208-230/3/60	208-230/3/60
MCA	75	75
MOCP	100	100
WEIGHT (LB)	1925	1925
NOTES	1–11	1–11
NOTES:		

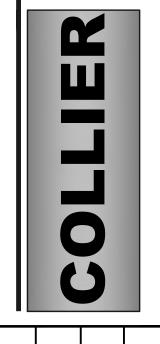
- INSTALL ON LEVEL PAD
- HONEYWELL, VISION PRO 8300 MODEL TH8321WF1001 PROGRAMMABLE WI-FI THERMOSTAT WITH LOCKING GYM
- RECTORSEAL EZ TRAP WITH BRUSH, LESS FLOAT SWITCH.
- RETURN AIR SMOKE DETECTOR PROVIDED AND WIRED BY
- DIV 16. MOUNTED BY DIV 15. 2" PLEATED RETURN AIR FILTER
- IN ADDITION TO 1-YEAR FULL WARRANTY, PROVIDE 5-YEAR COMPRESSOR PARTS-ONLY WARRANTY AND
- 10-YEAR PARTS ONLY HEAT EXCHANGER WARRANTY. PROVIDE EQUIPMENT FROM MANUFACTURER AS SPECIFIED OR EQUAL. EQUIVALENT MANUFACTURERS ARE TRANE,
- STANDARD, BRYANT. WALL MOUNTED HUMIDISTAT AND CO2 SENSOR.
- HUMIDISTAT SHALL BE SET AT 60%RH (ADJ)





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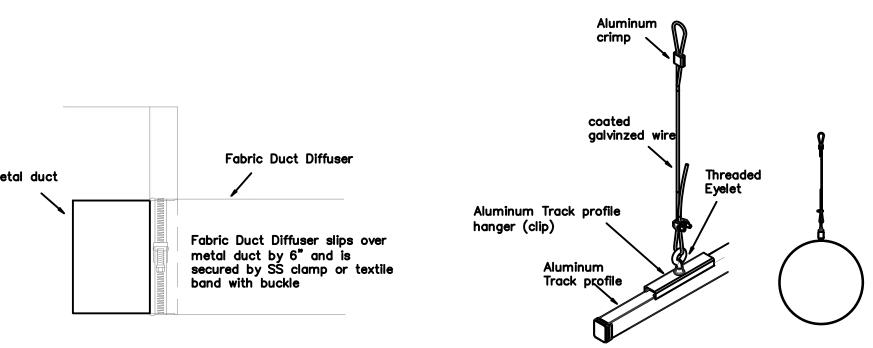


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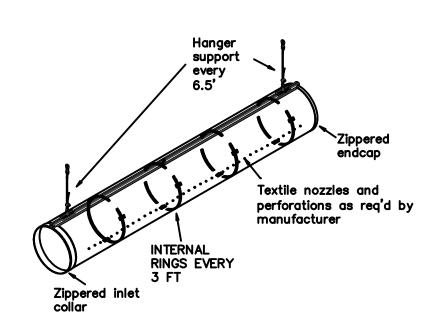
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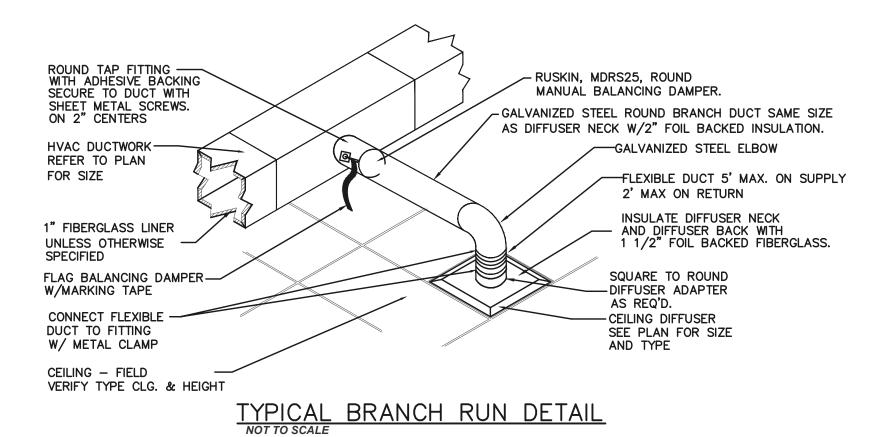


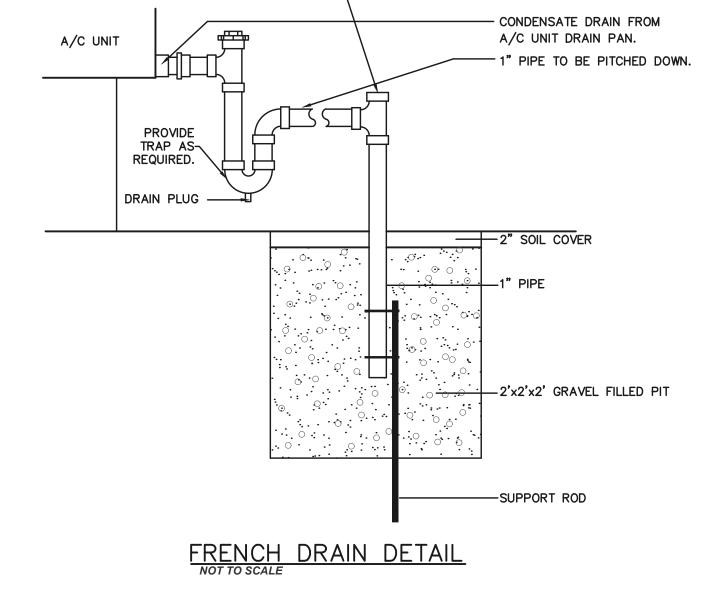
Fabric Duct Inlet connection Detail

Fabric Duct Hanger Detail Single Track Profile

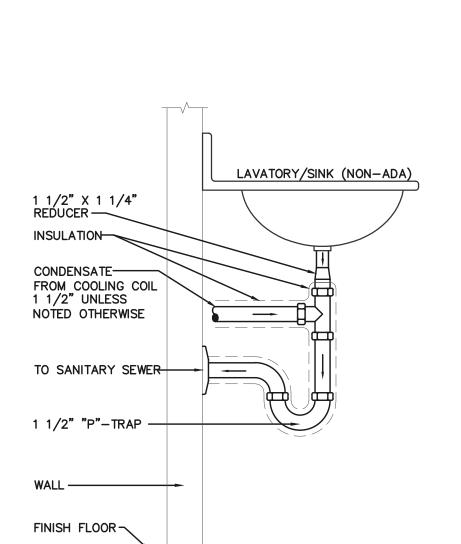


Fabric duct Installation Detail Single Track Profile

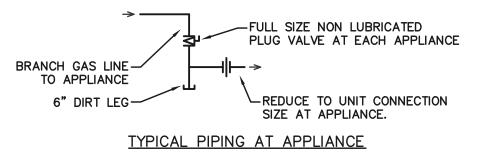




OPEN TEE



CONDENSATE DRAIN DETAIL



GENERAL GAS PIPING NOTES:

1) BALL VALVES ARE NOT ACCEPTABLE. ALL VALVES TO BE NON-LUBRICATED PLUG VALVES RATED FOR GAS SERVICE.

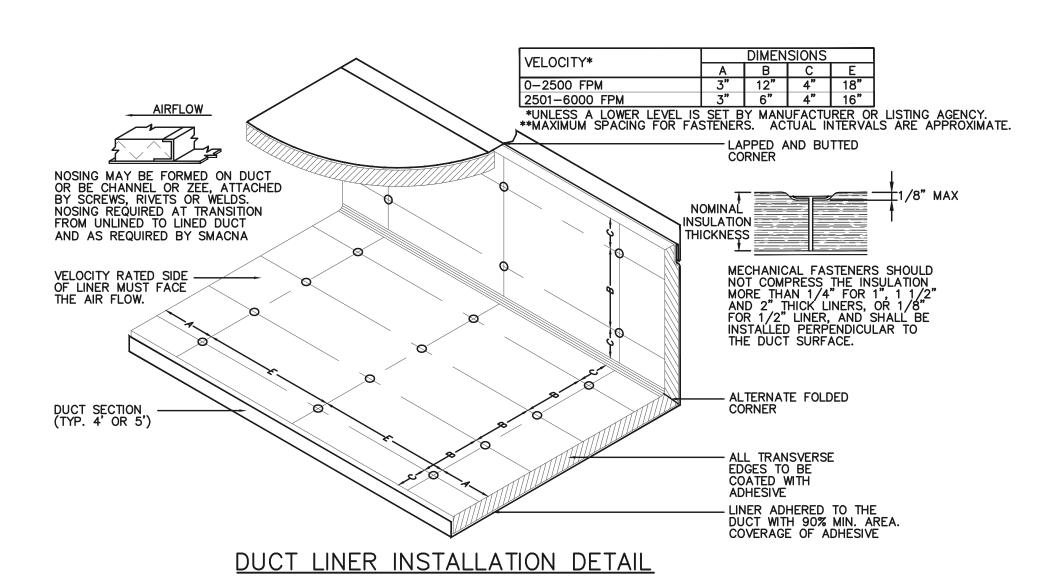
2) PIPING, VALVES, UNION, ETC. SHALL REMAIN FULL—SIZE AND SHALL NOT REDUCE TO UNIT CONNECTION SIZE UNTIL WITHIN 6" OF APPLIANCE.

3) ANCHOR GAS PIPING TO APPLIANCE PAD OR BUILDING STRUCTURE WITHIN 36" OF TERMINATION. DIRT LEG AND SHUTOFF VALVE SHALL BE EXPOSED ON ROOF. GAS PIPING SHALL NOT BE INSTALLED IN ROOF CURB OF ANY GAS—FIRED, ROOF—MOUNTED MECHANICAL EQUIPMENT.

4) DIRT LEGS SHALL BE INSTALLED AS SHOWN IN DETAIL, FORMED BY A 6" CAPPED NIPPLE IN THE RUN OF A TEE.

5) PAINT ALL EXPOSED GAS PIPING YELLOW OR GRAY OR SOME OTHER APPROVED COLOR AS DIRECTED BY ARCHITECT OR ENGINEER. WHERE GAS PIPING CAN BE EASILY SEEN AT GRADE, VERIFY COLOR WITH ARCHITECT OR ENGINEER. LABEL ALL GAS PIPING.

6) SYSTEMS INSPECTED AND FOUND TO NOT COMPLY WITH THESE REQUIREMENTS WILL REQUIRE CORRECTION AT NO ADDITIONAL COST TO THE OWNER.



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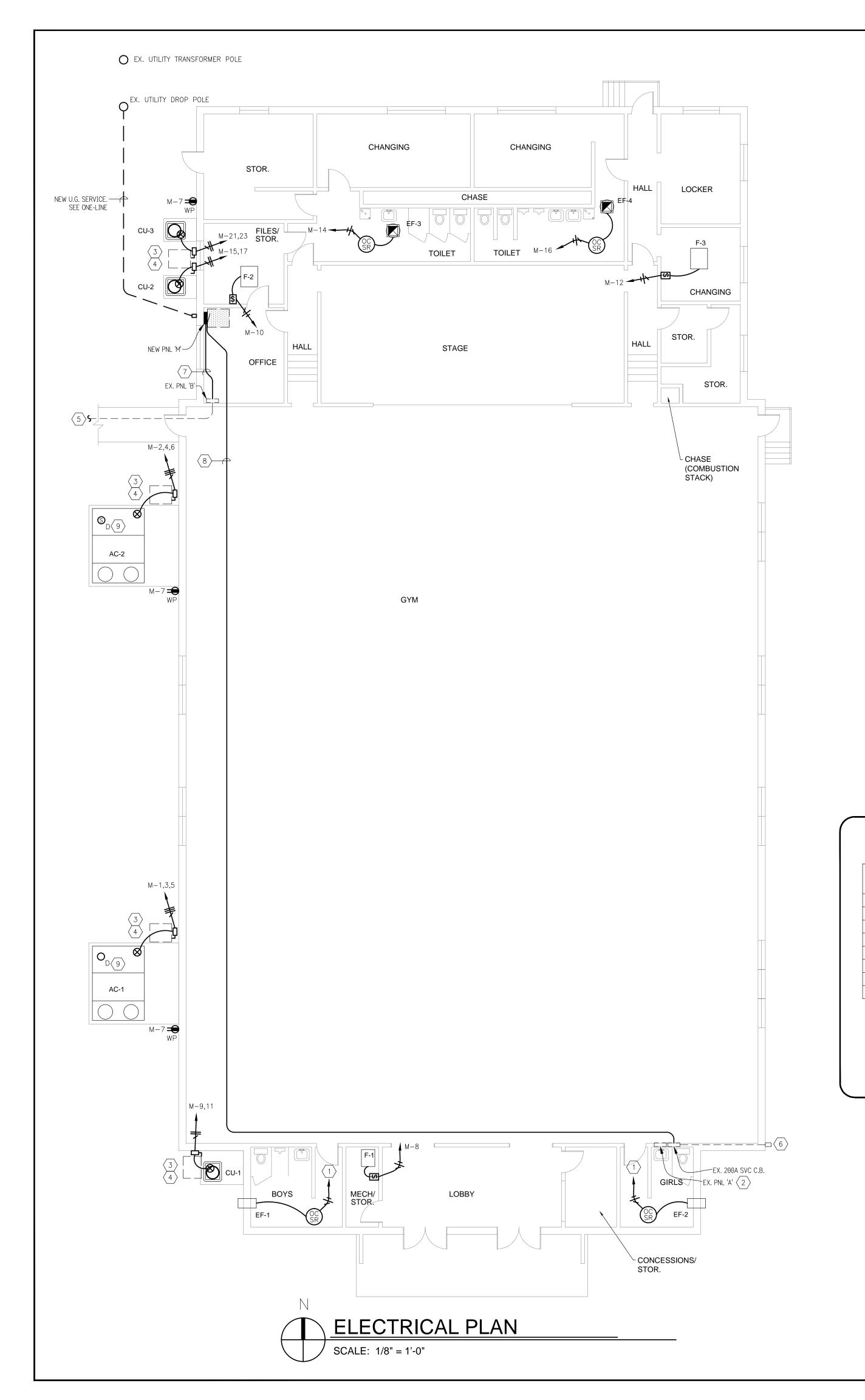
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M2.2

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DEMOLITION NOTE:

PROVIDE ELECTRICAL SUPPORT FOR REMOVAL OF EXISTING MECHANICAL EQUIPMENT. REFER TO MECHANICAL DEMOLITION PLAN FOR QUANTITIES AND LOCATIONS OF ALL EQUIPMENT TO BE REMOVED. U.O.N., REMOVE ALL WIRING BACK TO BRANCH CIRCUIT SOURCE EQUIPMENT. REMOVE ANY EXPOSED OR ACCESSIBLE CONDUITS. UPDATE PANEL CIRCUIT INDEX DENOTING C.B.'S AS SPARES. REFER TO DEMOLITION SPEC. FOR ADDITIONAL INFORMATION.

FIRE ALARM SYSTEM

REQUIRED ADDITIONS TO EXISTING FIRE ALARM SYSTEM SHALL BE DONE BY LICENSED FIRE ALARM INSTALLER. THE INSTALLER SHALL BE RESPONSIBLE FOR ANY REQUIRED SUBMITTALS, TESTING, AND RE—CERTIFICATIONS.

KEYED CONSTRUCTION NOTES:

- 1 CONNECT TO AN EXISTING 20A,1P C.B. IN PANEL 'A'.
- PROVIDE A NEW TYPEWRITTEN CIRCUIT INDEX FOR PANEL INCLUDING UPDATES FROM DEMOLITION & NEW CIRCUITS.
- MAINTAIN NEC 110.26 WORKING CLEARANCES IN FRONT OF DISCONNECT. COORDINATE WITH EQUIPMENT INSTALLER PRIOR TO LOCATING DISC. TO ENSURE CLEARANCES FROM ANY DUCTWORK, PIPING, UNITS.
- USE METALLIC CONDUIT FROM DISC. TO WITHIN 2FT OF UNIT CONNECTION THEN TRANSITION TO FLEXIBLE. AT NO POINT SHALL CONDUITS BE IN CONTACT WITH CONCRETE PAD. FURNISH SUPPORTS UNDER CONDUITS TO KEEP ELEVATED FROM PAD
- (5) EXISTING FEEDER FROM OTHER BUILDING TO PANEL 'B'. DISCONNECT AND REMOVE FEEDER INCLUDING ALL CONDUIT & WIRE.
- 6 EXISTING SERVICE ENTRANCE UNDERGROUND. DISCONNECT AND REMOVE EXISTING
- $\overline{\langle 7 \rangle}$ NEW FEEDER TO PANEL 'B'. SEE ONE LINE DIAGRAM.
- 8 NEW FEEDER TO PANEL 'A'. SEE ONE LINE DIAGRAM.
- FURNISH A NEW RETURN AIR DUCT SMOKE DETECTOR FOR EACH UNIT. FURNISH CONDUIT, WIRING, & MODULES TO CONNECT TO EXISTING BUILDING FIRE ALARM SYSTEM AND UNIT SHUT DOWN INTERLOCK.

MECHANICAL EQUIPMENT CONNECTION SCHEDULE

				LOAD		HACR	LOCAL	DISCONN	ECTING ME.	ANS		5	STARTERS (F	PER UNIT)		CIRCUITRY					
EQUIPMENT DESIGNATION	VOLTAGE & PHASE	LOCATION	kW	hp	MCA	CIRCUIT BREAKER	N.F.D.S. SIZE	F.D.S. SIZE	FUSE SIZE	NEMA ENCL.	MAGNETIC (SIZE)	COMBINATION (SIZE)	MANUAL (SIZE)	MANUAL W/ NO O.L.	NEMA ENCL.	PANEL	CONDUIT SIZE MIN.	WIRE QTY& SIZE	GROUND QTY& SIZE	METHOD OF CONTROL	REMARKS
AC-1,2	208V/3ø	OUTSIDE			75	3P100	3P100			3R						М	1-1/2"	3 #1	1 #8	SEE MECH. SPEC	
CU-1	208V/1ø	OUTSIDE			14	2P20	2P30			3R						М	1/2"	2 #10	1 #10	SEE MECH. SPEC	
CU-2,3	208V/1ø	OUTSIDE			12	2P20	2P30			3R						М	1/2"	2 #12	1 #12	SEE MECH. SPEC	
F-1	120V/1ø	MECH			11.8	1P15				-			1P20		1	М	1/2"	2 #8	1 #8	SEE MECH. SPEC	
F-2	120V/1ø	FILES			11.8	1P15							1P20		1	М	1/2"	2 #12	1 #12	SEE MECH. SPEC	
F-3	120V/1ø	CHNGING			11.8	1P15							1P20		1	М	1/2"	2 #10	1 #10	SEE MECH. SPEC	
EF-1,2	120V/1ø	RR'S		1/4		1P20										А	1/2"	2 #12	1 #12	OCC. SENSOR	
EF-3,4	120V/1ø	RR'S		1/15		1P15				1						М	1/2"	2 #12	1 #12	OCC. SENSOR	

- 1. REFER TO ELECTRICAL DRAWINGS AND BUSSING DIAGRAMS FOR UNIT QUANTITIES. REFER TO MECHANICAL DRAWINGS TO VERIFY QUANTITIES AND EXACT PLACEMENT. PLACEMENT OF ELECTRICAL DEVICES SERVING EQUIPMENT SHALL NOT INTERFERE WITH MANUFACTURER'S SERVICE CLEARANCES. MAINTAIN PROPER N.E.C. WORKING CLEARANCES FOR ELECTRICAL DEVICES INSTALLED ON OR NEAR UNIT.
- 2. SEE TYPICAL CONNECTION DETAIL.

 3. FURNISH AND INSTALL A NEW WEATHERPROOF, 120V, 20A, G.F.C.I. DUPLEX RECEPTACLE MOUNTED ON SUITABLE SUPPORT NEAR UNIT. CONNECT TO NEAREST 120V GENERAL RECEPTACLE CIRCUIT, UNLESS OTHERWISE NOTED. VERIFY LOADING.
- 3. FURNISH AND INSTALL A NEW WEATHERPROOF, 120V, 20A, G.F.C.I. DUPLEX RECEPTACLE MOUNTED ON SUITABLE SUPPORT NEAR L 4. FURNISH AND INSTALL ALL FIELD AND/OR INTERLOCK WIRING REQUIRED TO COMPLETELY CONNECT SYSTEM FOR FUNCTIONALITY.
- 5. CONTRACTOR SHALL INSTALL ANY ELECTRICAL DEVICES THAT ARE SHIPPED LOOSE WITH EQUIPMENT, UNLESS OTHERWISE NOTED.
 6. COORDINATE WITH MECHANICAL CONTRACTOR FOR CONTROL WIRING REQUIREMENTS AND/OR CONDUITS THAT NEED TO BE FURNISHED AND INSTALLED BY A LICENSED ELECTRICIAN THAT ARE RELATED TO THIS SYSTEM.
 7. DUCT SMOKE DETECTORS SHALL BE TIED TO AND SUPERVISED BY THE FIRE ALARM SYSTEM. CONTRACTOR SHALL FURNISH AND INSTALL DUCT SMOKE DETECTORS. SEE DRAWINGS FOR LOCATIONS. COORDINATE WITH MECHANICAL CONTRACTOR.
- 8. FOR RESTROOM/TOILET EXHAUST FANS THAT ARE CONNECTED TO SWITCHED LIGHTING CIRCUITS AND CONTROLLED BY OCCUPANCY SENSORS SHALL RUN FOR A MINIMUM OF TEN (10) MINUTES AFTER NO OCCUPANCY IS DETECTED. CONTRACTOR SHALL ADJUST OCCUPANCY SENSOR SETTINGS TO ACCOMPLISH THIS.

AGRICULTURA OF TENNIA

NOVATION

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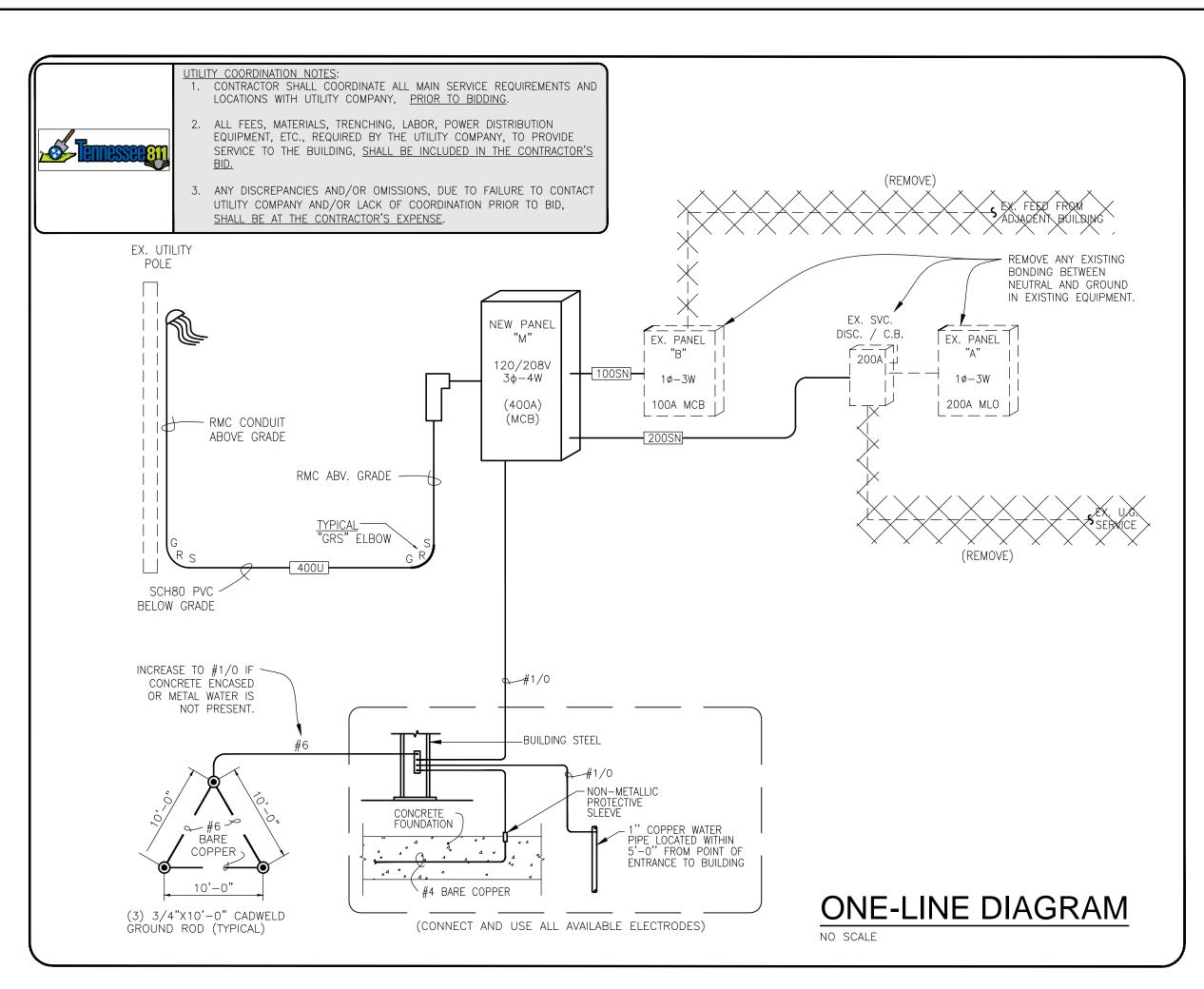
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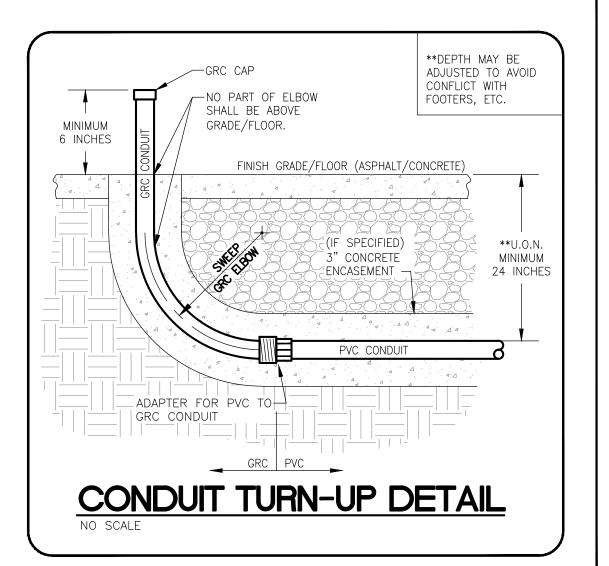
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E1.1



	CC	OPPER FEEDER SCHEE	DULE	
	CONDUIT	PHASE COND. QTY & SIZE	NEUTRAL COND. QTY & SIZE	GND COND. QTY & SIZE
FEEDER CODE	QTY & SIZE	PER RACEWAY	PER RACEWAY	PER RACEWAY
3 PHASE UTILITY	T	1	1	1
400U	1@4"	(3) #600 MCM	(1) #600 MCM	(NONE)
SINGLE PHASE W/	 'NEUTRAL			
100SN	1 @ 1-1/2"	(2) #1 AWG	(1) #1 AWG	(1) #8 AWG
200SN	1 @ 2-1/2"	(2) #3/0 AWG	(1) #3/0 AWG	(1) #6 AWG



EQUIPMENT LABELING REQUIREMENTS

ALL ELECTRICAL EQUIPMENT, INCLUDING BUT NOT LIMITED TO SWITCHBOARDS, PANELBOARDS, ENCLOSED C.B.'S, FUSED AND NON-FUSED DISC. SW., MOTOR CONTROLS, ETC., SHALL BE LABELED IN ACCORDANCE WITH THE FOLLOWING:

- 1. LABEL SHALL BE AN ENGRAVED BAKELITE TAG BLACK BACKGROUND WITH WHITE LETTERING.
- 2. LABEL SHALL BE ATTACHED TO EQUIPMENT WITH SILICONE ADHESIVE.
- 3. ALL LABELS SHALL HAVE AN EQUIPMENT NAME AT THE TOP IN SLIGHTLY LARGER LETTERING THAN OTHER TEXT ON THE LABEL. FOR PANELBOARDS OR SWITCHBOARDS, THE NAME SHALL BE THE NAME OF SAID EQUIPMENT. FOR DISCONNECTS, STARTERS, ETC., THE NAME SHALL BE THE EQUIPMENT BEING FED.
- 4. ALL LABELS SHALL INCLUDE THE UPSTREAM EQUIPMENT NAME AND CIRCUIT # THAT IS PROVIDING POWER TO SAID EQUIPMENT. IN THE CASE OF SERVICE EQUIPMENT, JUST REPLACE THIS LINE WITH THE WORDS "SERVICE EQUIPMENT"
- 5. ALL LABELS SHALL INCLUDE THE FOLLOWING INFORMATION: VOLTAGE(S), PHASES, 3 OR 4 WIRE, MAIN OC DEVICE OR MAIN LUG, AMP RATING, AND PHASE AND NEUTRAL WIRE COLORS.

IN ADDITION TO THE ABOVE LABEL, ANY EQUIPMENT THAT CONTAINS OVERCURRENT OR SWITCHING DEVICES SHALL HAVE ADDITIONAL INFORMATION ACCORDANCE WITH THE FOLLOWING:

- 1. ENGRAVED BAKELITE TAG EITHER A SECOND LABEL OR ADD TO THE FIRST LABEL ABOVE.
- 2. LABEL SHALL INCLUDE, AT MINIMUM, THE FOLLOWING INFORMATION:
- a. AVAILABLE FAULT CURRENT
 b. DATE THE LABEL WAS CREATED
- 3. THE ENGINEER OF RECORD WILL PROVIDE THE ABOVE INFORMATION TO CONTRACTOR PRIOR TO PROJECT COMPLETION. CONTRACTOR SHALL PROVIDE A MINIMUM OF ONE WEEK'S NOTICE TO ENGINEER FOR TIME TO PERFORM CALCULATIONS.
- 4. TO ASSIST THE ENGINEER IN PROVIDING ACCURATE DATA, AT THE TIME OF REQUEST, THE CONTRACTOR SHALL PROVIDE THE FOLLOWING INFORMATION TO THE ENGINEER: THE LENGTH AND SIZE OF ALL SERVICE AND FEEDER CONDUCTORS AND BRANCH CONDUCTORS TO UTILIZATION EQUIPMENT REQUIRING LABELS, TYPE OF WIRING METHOD USED, CU OR AL CONDUCTORS.

PANELBOARD NAME:		VOL	.TAGE:	208	/120								-	MAIN:	400	MCB		FEATURES:
M (NEW)		Р	HASE:	3									MOUN	ITING:	SURFA	CE		
LOCATION:		٧	VIRES:	4								N	EUTRA	L BUS:	COPP	ER-100	%	
COACH'S OFFICE		BUS /	AMPS:	400			A.I.C.	25,00	0			G	ROUNI	BUS:	COPP	ER		
FED FROM:						_					1:	SOLATED G	ROUNI	BUS:	NO			
UTILITY		CONI	NECTED	KVA										CONN	NECTE	KVA		
CIRCUIT DESCRIPTION	LTG	REC	HVAC	EQ	KIT	AMP/POLE	WIRE	ССТ	PHASE	ССТ	WIRE	AMP/POLE	LTG	REC	HVAC	EQ	KIT	CIRCUIT DESCRIPTION
			8.1					1	Α	2					8.1			
AC-1			8.1			100/3	1	3	В	4	1	100/3			8.1			AC-2
			8.1					5	С	6					8.1			
RECEPTS - EXTERIOR		0.54				20/1	10	7	Α	8	8	15/1			1.42			F-1
CU-1			1.31			20/2	10	9	В	10	12	15/1			1.42			F-2
			1.31			20/2	10	11	С	12	10	15/1			1.42			F-3
SPARE						20/1		13	Α	14	12	15/1			0.2			EF-3
CU-2			1.13			20/2	12	15	В	16	12	15/1			0.2			EF-4
20-2			1.13			20/2	12	17	С	18	1	100/2	0	1.5	0	10	0	EXISTING PANEL 'B'
SPARE						20/1		19	Α	20		100/ 2	0	3	0	6	0	LAISTING PAINLE B
CU-3			1.13			20/2	12	21	В	22		20/1						SPARE
20-3			1.13			20/2	12	23	С	24		20/1						SPARE
								25	Α	26		20/1						SPARE
								27	В	28								
								29	С	30								
								31	Α	32								
								33	В	34								
								35	С	36								
								37	Α	38								
								39	В	40								
								41	С	42								
SHALL BE A GFCI TYPE BREAKER													5.2	4.7	0	8	(SUB-FEED BREAKER TO EXIS
													5.7	5.34	0	7.5	(PANEL 'A' - 200A, 2P
																		LARGEST MOTOR KVA
CONNECTED KV	LOAD		DEMA	NDED	KVA LO	DAD												
LIGHTING	10.9	125%	13.63	(PER N	IEC TA	BLE 220.12))		CONNECT	ED KV	/A/PHA	NSE						
RECEPTACLE	15.08	50%	12.54	(50% [DEMAI	ND ABOVE :	10KVA)	45.26	PHAS	SE A							TOTAL LOADS
HVAC	60.4	100%	60.4						39.9304	PHAS	SE B						117.9	TOTAL CONNECTED KVA
EQUIPMENT										PHAS							118.1	TOTAL DEMAND KVA
KITCHEN		100%		/DED N	IEC TA	BLE 220.56)	١	ı	·			D	ANEL D	ECICN	V VVDC	400		TOTAL DEMAND AMPS

SCHEDS.

& PANEL

-LINE

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SYMNASIUM HVAC F

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ELECTRICAL GENERAL NOTES

- 1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE JURISDICTION'S ADOPTED EDITION OF THE N.E.C. AND ALL APPLICABLE STATE AND LOCAL CODES.
- 2. ALL MATERIAL SHALL BEAR THE PROPER U.L., E.T.L., OR OTHER RECOGNIZED NRTL LABEL ACCEPTABLE TO THE AHJ.
- 3. ALL WIRING SHALL BE IN CONDUIT OR OTHER N.E.C. APPROVED RACEWAYS.
- 4. G.F.I. TYPE RECEPTACLES SHALL BE SELF-CONTAINED UNITS WITH CLASS "A" SENSITIVITY.
- 5. WHERE SINGLE POLE BRANCH CIRCUIT CONDUCTORS HAVE BEEN INCREASED ABOVE THE SIZE OF THE CIRCUIT BREAKER TO COMPENSATE FOR VOLTAGE DROP, THE INCREASED SIZE SHALL EXTEND THROUGHOUT THE ENTIRE CIRCUIT, EXCEPT WHERE IT IS NECESSARY TO REDUCE THE SIZE FOR CONNECTION TO SWITCH AND RECEPTACLE TERMINALS, ETC. EQUIPMENT GROUNDING CONDUCTORS SHALL ALSO BE ADJUSTED PROPORTIONATELY PER N.E.C. 250.122 (B).
- 6. EXERCISE EXTREME CAUTION TO ENSURE THAT THERMAL INSULATION IS NOT INSTALLED CLOSE ENOUGH TO RECESSED LIGHTING FIXTURES TO PREVENT PROPER VENTILATION AND COOLING OF THE UNITS. FIXTURES SHALL COMPLY WITH ARTICLE 410 OF THE N.E.C. ALL RECESSED INCANDESCENT FIXTURES SHALL HAVE THERMAL CUT-OUT PROTECTION.
- 7. UNLESS OTHERWISE NOTED OR DIRECTED, ALL CONDUIT SHALL BE CONCEALED BELOW FLOORS, IN WALLS, OR ABOVE CEILING. PRIOR AUTHORIZATION MUST BE ACQUIRED FROM THE ARCHITECT OR ENGINEER BEFORE USING ANY TYPE OF SURFACE MOUNTED RACEWAYS IN FINISHED AREAS.
- 8. ELECTRICAL CONTRACTOR SHALL VERIFY SERVICE AND VOLTAGE REQUIREMENTS FOR ALL EQUIPMENT TO BE CONNECTED (BOTH NEW AND EXISTING) PRIOR TO MAKING CONNECTIONS.
- 9. DUPLEX RECEPTACLES SHALL BE MOUNTED AT 16" ABOVE THE FINISHED FLOOR, EXCEPT WHERE OTHERWISE NOTED, AND EXCEPT WHERE RECEPTACLES ARE SHOWN ABOVE CABINETS, COUNTERS, ETC. WHERE RECEPTACLES ARE SHOWN AT COUNTERS OR CABINETS, THEY SHALL BE INSTALLED 6" TO BOTTOM ABOVE THE CABINET TOP. WHERE THERE IS A BACKSPLASH, THE RECEPTACLES SHALL BE JUST ABOVE THE BACKSPLASH. WHERE RECEPTACLES ARE SHOWN ADJACENT TO LAVATORIES, THE RECEPTACLE SHALL BE MOUNTED AT APPROXIMATELY 6" TO BOTTOM ABOVE THE LAVATORY
- 10. TELEPHONE OUTLETS DESIGNATED AS BEING MOUNTED AT 16" A.F.F. SHALL BE ARRANGED FOR DESK TYPE TELEPHONE(S). TELEPHONE OUTLETS DESIGNATED AS BEING MOUNTED AT 44" A.F.F. SHALL BE SUITABLE FOR A WALL MOUNTED TELEPHONE (WHERE SHOWN ADJACENT TO LIGHT SWITCH, MOUNT AT SAME HEIGHT AS LIGHT SWITCH). WHERE TELEPHONE OUTLETS ARE SHOWN AT OR ABOVE CABINETS/COUNTERS, THE OUTLET SHALL BE MOUNTED AT 6" ABOVE THE COUNTER TOP. WHERE THERE IS A BACKSPLASH, THE OUTLETS SHALL BE MOUNTED ABOVE THE BACKSPLASH.
- 11. SURFACE MOUNTED LIGHTING FIXTURES INSTALLED IN AREAS THAT DO NOT HAVE AN ACCESSIBLE CEILING SPACE ABOVE THEM SHALL BE INSTALLED IN COMPLIANCE WITH ARTICLE 410 OF THE
- 12. COORDINATE ALL CEILING MOUNTED EQUIPMENT, (i.e. LIGHTING FIXTURES, SPEAKERS, GRILLES, ETC.) WITH ALL OTHER EQUIPMENT & TRADES PRIOR TO & DURING INSTALLATION TO AVOID CONFLICTS. SHOULD IT BECOME NECESSARY TO REPOSITION SMOKE DETECTORS, EXERCISE CAUTION NOT TO EXCEED THE 30' AND 15' SPACINGS AS REQUIRED BY THE LIFE SAFETY CODE.
- 13. FIRE AND SMOKE STOP AROUND ALL CONDUIT, EQUIPMENT, ETC. WHICH PENETRATES FLOORS, WALLS, AND CEILINGS.
- 14. EACH CONTRACTOR SHALL BE RESPONSIBLE FOR VISITING THE SITE PRIOR TO BIDDING IN ORDER TO BECOME FAMILIAR WITH THE EXISTING CONDITIONS AND ANY DISCREPANCIES OR QUESTIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT/ENGINEER PRIOR TO BIDDING.
- 15. COMPLY WITH ALL CODES AND REGULATIONS, ETC. REGARDING PENETRATION OF THE CEILING FOR THIS TYPE OF CONSTRUCTION.
- 16. WHERE LIGHTING SWITCHES, RECEPTACLES, & FIRE ALARM DEVICES ARE TO BE SURFACE MOUNTED IN FINISHED AREAS, USE OUTLET BOXES EQUAL TO "WIREMOLD". ALL SURFACE MOUNTED RACEWAY IN FINISHED AREAS SHALL BE WIREMOLD TYPE. NO EXPOSED CONDUIT WILL BE ALLOWED IN FINISHED AREAS.
- 17. ALL LIGHTING AND RECEPTACLE CIRCUITS SHALL HAVE A SEPARATE GROUND WIRE CONTINUOUS THROUGHOUT THE CIRCUIT. THE CONDUIT SHALL NOT BE CONSIDERED ADEQUATE.
- 18. JUNCTION BOXES SHALL NOT BE MOUNTED BACK TO BACK.
- 19. WHERE DEVICE BACKBOXES ARE LOCATED IN A RATED WALL, THESE BOXES SHALL BE RATED FOR SUCH USE.
- 20. JUNCTION OR BACKBOXES MOUNTED IN RATED WALLS SHALL NOT BE LOCATED IN A COMMON CAVITY BETWEEN STUDS. COORDINATE WITH ARCHITECTURAL DRAWINGS.
- 21. ALL ELECTRICAL WORK SHALL BE ACCOMPLISHED BY ELECTRICIANS LICENSED BY THE JURISDICTION IN WHICH THE WORK WILL BE PERFORMED.
- 22. WHERE A RECEPTACLE OR LIGHTING FIXTURE, REMOVED DURING DEMOLITION, INTERRUPTS POWER TO DOWNSTREAM ELECTRICAL DEVICES THAT ARE EXISTING TO REMAIN, THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT DOWNSTREAM DEVICES ARE RECONNECTED AND REMAIN ACTIVE.
- 23. RECEPTACLES AND COMPUTER OUTLETS SHOWN AT CASEWORK LOCATIONS SHALL BE MOUNTED AT 16" TO BOTTOM A.F.F. WHERE A DEDICATED KNEE SPACE IS PROVIDED. CENTER DEVICES IN KNEE SPACE. WHERE NO KNEE SPACE IS PROVIDED, RECEPTACLES SHALL BE MOUNTED ABOVE COUNTER AT 6" TO BOTTOM, U.O.N. REFER TO ARCHITECTURAL CASEWORK ELEVATIONS.
- 24. SMOKE DETECTORS SHALL NOT BE LOCATED WITHIN THREE (3) FEET OF SUPPLY/RETURN AIR GRILLES OR CEILING FANS.
- 25. CONTRACTOR SHALL MAINTAIN ACCURATE "AS-BUILT" DRAWINGS DURING CONSTRUCTION. THESE DRAWINGS SHALL BE SUBMITTED TO THE GENERAL CONTRACTOR UPON COMPLETION OF THE
- 26. THESE DRAWINGS ARE DIAGRAMMATIC IN NATURE AND INDICATE THE GENERAL ARRANGEMENT OF SYSTEMS, EQUIPMENT AND COMPONENTS AND THEIR RELATED ELECTRICAL CONNECTIONS. DEVICE AND PATHWAY PLACEMENT/ROUTING IS ONLY REPRESENTATIVE OF A GENERAL LOCATION UNLESS OTHERWISE INDICATED BY DIMENSIONS. SYMBOLS ARE USED EXTENSIVELY WHICH MAY NOT EXACTLY REPRESENT ACTUAL SIZES.
- 27. THESE DRAWINGS DO NOT SHOW ALL OFFSETS, TRANSITIONS AND/OR DEVICES NECESSARY FOR A COMPLETE AND FUNCTIONAL SYSTEM AS REQUIRED BY THE CONTRACT DOCUMENTS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PLACE THESE DEVICES AND PATHWAYS SUCH THAT THEY OFFER FULL FUNCTIONALITY WITHOUT HINDRANCE FROM CASEWORK, FURNITURE, WINDOWS AND DOORS, HVAC, PLUMBING, ELECTRICAL, AND OTHER BUILDING SYSTEMS.
- 28. NO PIPING, DUCTS OR EQUIPMENT FOREIGN TO ELECTRICAL EQUIPMENT SHALL BE PERMITTED TO BE LOCATED WITHIN THE DEDICATED SPACE ABOVE ELECTRICAL EQUIPMENT.
- 29. ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL TEMPORARY POWER TO FIELD OFFICE AND JOBSITE AND REMOVE UPON COMPLETION OF CONSTRUCTION. COORDINATE WITH LOCAL UTILITY.
- 30. ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL TEMPORARY LIGHTING INSIDE FACILITY DURING CONSTRUCTION AND SHALL REMOVE TEMPORARY LIGHTING ONCE PERMANENT POWER AND LIGHTING ARE OPERATIONAL.
- 31. SHARED NEUTRAL CONDUCTORS ON MULTI-WIRE BRANCH CIRCUITS <u>SHALL NOT BE ALLOWED</u>. FURNISH AND INSTALL DEDICATED NEUTRALS PER CIRCUIT.

ELECTRICAL SPECIFICATIONS

EXCAVATING, TRENCHING, AND BACKFILL

- A. <u>GENERAL</u>: LAY ALL RACEWAYS IN OPEN TRENCH. OPEN THE TRENCH SUFFICIENTLY AHEAD OF RACEWAY LAYING TO REVEAL OBSTRUCTIONS. MAINTAIN EASY ACCESS TO FIRE HYDRANTS BY FIRE FIGHTING APPARATUS. PROVIDE TRENCH CROSSINGS AS NECESSARY TO ACCOMMODATE PUBLIC TRAVEL. ALL EXCAVATIONS SHALL BE FULLY PROTECTED.
- B. <u>SEPARATE TRENCHES</u>: UNLESS OTHERWISE SHOWN OR REQUIRED, PROVIDE SEPARATE TRENCHES FOR COMMUNICATION LINES AND POWER LINES, RESPECTIVELY, WITH A MINIMUM OF THREE (3) FEET OF UNDISTURBED EARTH BETWEEN TRENCHES. GAS AND ELECTRICAL LINES SHALL ALWAYS BE PLACED IN SEPARATE TRENCHES.
- C. <u>WIDTH OF TRENCH</u>: EXCAVATE TRENCHES OF SUFFICIENT WIDTH FOR PROPER INSTALLATION OF
- D. <u>WATER REMOVAL</u>: KEEP TRENCHES FREE FROM WATER WHILE CONSTRUCTION THEREIN IS IN PROGRESS. <u>UNDER NO CIRCUMSTANCES LAY CONDUIT OR APPURTENANCES IN WATER</u>. PUMP OR BAIL HOLES TO PERMIT PROPER JOINTING OF THE RACEWAYS. CONDUCT THE DISCHARGE FROM TRENCH DEWATERING TO DRAINS OR NATURAL DRAINAGE CHANNELS.
- E. <u>DISPOSITION OF UTILITIES:</u>

 1. RULES AND REGULATIONS GOVERNING THE RESPECTIVE UTILITIES SHALL BE OBSERVED IN EXECUTING ALL WORK UNDER THIS HEADING.
- 2. ACTIVE UTILITIES SHOWN ON THE DRAWINGS SHALL BE ADEQUATELY PROTECTED FROM DAMAGE AND REMOVED OR RELOCATED ONLY IN ACCORDANCE WITH WRITTEN INSTRUCTIONS FROM THE ARCHITECT. UTILITIES SHOWN ARE LOCATED AS NEAR AS POSSIBLE TO ASCERTAIN IN CORRECT LOCATIONS BUT SOME VARIANCE IN LOCATION MAY BE EXPECTED.
- 3. ACTIVE UTILITIES NOT SHOWN ON THE DRAWINGS NOR EVIDENT DURING INSPECTION, SHALL BE PROTECTED OR RELOCATED IN ACCORDANCE WITH WRITTEN INSTRUCTION OF THE ENGINEER.
- . INACTIVE AND ABANDONED UTILITIES ENCOUNTERED IN TRENCHING OPERATIONS SHALL BE REMOVED, PLUGGED, OR CAPPED. IN ABSENCE OF SPECIFIED REQUIREMENTS, PLUG OR CAP SUCH UTILITY LINES AT LEAST THREE FEET FROM UTILITY LINES TO BE INSTALLED, OR AS
- F. <u>EXCAVATION</u>: MATERIALS TO BE EXCAVATED SHALL INCLUDE EARTH OR ANY OTHER MATERIAL ENCOUNTERED WITHIN THE LIMITS OF TRENCH EXCAVATION FOR THE UTILITIES HEREUNDER TO THE DEPTH AND EXTENT INDICATED ON THE DRAWINGS AND HEREIN SPECIFIED.

REQUIRED BY LOCAL REGULATIONS.

- G. TREE PROTECTION: EXERCISE CARE TO PROTECT THE ROOTS OF TREES TO REMAIN. WITHIN THE BRANCH SPREAD OF SUCH TREES, PERFORM ALL TRENCHING BY HAND. OPEN THE TRENCH ONLY WHEN THE UTILITY CAN BE INSTALLED IMMEDIATELY; PRUNE INJURED ROOTS CLEANLY AND BACKFILL AS SOON AS POSSIBLE. PERFORM ALL THIS WORK UNDER THE DIRECTION OF THE ARCHITECT.
- H. <u>BACKFILLING</u>: BACKFILL TRENCHES ONLY AFTER CONDUIT HAS BEEN INSPECTED, CHECKED AND LOCATIONS OF UTILITIES AND APPURTENANCES HAVE BEEN RECORDED. BACKFILL ONLY WITH SUITABLE MATERIAL FREE FROM DEBRIS WHICH COULD DAMAGE THE CONDUIT(S). IN AREAS SUBJECT TO VEHICULAR TRAFFIC, BACKFILL WITH COMPACTED CRUSHED LIMESTONE OR FLOWABLE FILL CONCRETE. REPLACE SURFACE TO ORIGINAL CONDITION.

CONDUIT

- A. RIGID GALVANIZED STEEL CONDUIT SHALL BE USED FOR ALL ABOVE GROUND EXTERIOR APPLICATIONS OR WHERE CONDUIT MAY BE SUBJECTED TO PHYSICAL DAMAGE. ANY EXCEPTION TO THE ABOVE WILL BE SPECIFICALLY NOTED.
- B. PVC CONDUIT SHALL BE USED FOR ALL UNDERGROUND OR UNDERSLAB APPLICATIONS. SCH 80 SHALL BE USED FOR FEEDERS AND SERVICES AND 2" RED CONCRETE ENCASEMENT SHALL BE REQUIRED WHERE THESE CONDUIT PASS UNDER AREAS OF VEHICLE TRAFFIC. SCH 40 SHALL BE USED FOR BRANCH CIRCUITS NO CONCRETE.
- C. EMT CONDUIT OR MC CABLE SHALL BE EMPLOYED FOR ALL INTERIOR APPLICATIONS OTHER THAN THOSE LISTED ABOVE FOR RIGID CONDUIT.
- D. ALUMINUM CONDUIT SHALL NOT BE PERMITTED FOR ANY APPLICATIONS.
- E. WHERE CONDUITS CROSS BUILDING EXPANSION JOINTS, USE SUITABLE SLIDING OR OFFSETTING FITTINGS. UNLESS SPECIFICALLY APPROVED FOR BONDING, USE A SUITABLE BONDING JUMPER.
- F. THE MINIMUM SIZE OF CONDUIT SHALL BE 1/2" UNLESS OTHERWISE NOTED ON THE DRAWINGS.

WIRE

- A. ALL WIRING SHALL BE COPPER, CODE GRADE, TYPE THW OR THHN/THWN EQUIVALENT, RATED 600V.
- B. ALL WIRING SHALL BE INSTALLED IN CONDUIT OR OTHER N.E.C. APPROVED RACEWAY.
- C. ALL SPLICES SHALL BE PRESSURE TYPE AND SHALL BE MADE IN ACCESSIBLE JUNCTION OR SPLICE BOXES. WIRING, FLUORESCENT FIXTURES, ETC., SHALL BE OF THE PROPER TEMPERATURE RATING PER THE N.E.C.
- D. ALL CONDUCTORS #8 AWG AND LARGER SHALL BE STRANDED.

WIRING DEVICES

- A. WIRING DEVICES SHALL BE SPECIFICATION GRADE BY PASS & SEYMOUR, BYRANT, LEVITON OR
- B. RECEPTACLES SHALL BE 20 AMPERE, 125 VOLT DUPLEX WITH GROUNDING SLOT, UNLESS OTHERWISE
- C. SWITCHES SHALL BE 20 AMPERE, 120/277 VOLT.
- D. ALL WIRING DEVICES SHALL BE PROVIDED WITH COMMERCIAL SPECIFICATION GRADE FINISHING
- E. CONTRACTOR SHALL FURNISH AND INSTALL ALL RECEPTACLES & LIGHTING CONTROLS WITH A SELF-ADHESIVE LABEL STATING PANELBOARD NAME AND CIRCUIT NUMBER FEEDING DEVICE. APPLY TO COVERPLATE.

DISCONNECT SWITCHES

- A. ALL DISCONNECT SWITCHES SHALL BE HEAVY DUTY TYPE WITH QUICK-MAKE, QUICK-BREAK MECHANISM. GENERAL DUTY SWITCHES SHALL NOT BE ACCEPTABLE.
- B. DISCONNECT SWITCHES SHALL BE NEMA 1 UNLESS OTHERWISE NOTED OR DICTATED BY APPLICATIONS. EXTERIOR DISCONNECT SWITCHES SHALL BE A MINIMUM OF NEMA 3R.
- C. DISCONNECT SWITCHES SHALL BE SQUARE "D", CUTLER-HAMMER, GENERAL ELECTRIC, OR SIEMENS.

PANELBOARDS

- A. ALL BRANCH PANELS SHALL BE PANELBOARD TYPE CONSTRUCTION WITH DISTRIBUTED PHASE BUSSING AND BOLT-IN TYPE BREAKERS. ALL MULTI-POLE BREAKERS SHALL HAVE COMMON TRIP AND A SINGLE OPERATING HANDLE. PANELBOARDS SHALL BE U.L. APPROVED.
- B. PANELBOARDS SHALL HAVE LOCKING TYPE DOORS AND ALL LOCKS SHALL BE KEYED ALIKE. PANELS SHALL HAVE AN INDEX OF CIRCUITRY WHICH SHALL BE TYPED IN BY THE CONTRACTOR TO INDICATE WHAT EACH CIRCUIT FEEDS. MINOR REARRANGEMENT OF CIRCUITRY TO OBTAIN A BALANCED LOAD SHALL BE PERMITTED.
- C. PANELBOARDS SHALL BE SQUARE "D", CUTLER-HAMMER, GENERAL ELECTRIC, OR SIEMENS.

FITTINGS

- A. THINWALL CONDUIT (EMT) FITTINGS SHALL BE ALL STEEL, RAINTIGHT, AND SET-SCREW TYPE UP TO AND INCLUDING 2" CONDUIT. SET- SCREW TYPE SHALL BE USED ON SIZES LARGER THAN 2".
- B. RIGID CONDUIT FITTINGS SHALL BE METALLIC HEAVY DUTY TYPE.
- C. FLEXIBLE CONDUIT FITTINGS SHALL BE ALL STEEL.
- D. DIE-CAST AND INDENTER TYPE FITTINGS SHALL NOT BE ACCEPTABLE.
- E. FURNISH TYPE AS MANUFACTURED BY T & B, STEEL CITY, APPLETON, RACO OR APPROVED EQUAL.

ELECTRICAL SPECIFICATIONS

DEMOLITION

- A. CONTRACTOR SHALL BE RESPONSIBLE FOR ELECTRICAL DEMOLITION. ELECTRICAL EQUIPMENT, (LIGHT FIXTURES, RECEPTACLES, SWITCHES, HVAC EQUIPMENT, ETC.) MADE OBSOLETE BY DEMOLITION AND NOT DESIGNATED AS BEING REUSED, SHALL BE DISCONNECTED AND REMOVED. WIRING, NO LONGER REQUIRED, SHALL BE DISCONNECTED AND REMOVED.
- B. ELECTRICAL EQUIPMENT, NOT DESIGNATED AND/OR SHOWN TO BE REMOVED OR OTHERWISE NOTED, SHALL REMAIN IN PLACE AND REMAIN ACTIVE. <u>DO NOT LEAVE ABANDONED WIRING IN CONDUITS</u>.
- EXISTING CONDUITS NO LONGER REQUIRED MAY BE ABANDONED AND LEFT IN PLACE PROVIDED THE WIRING IS REMOVED AND THE PLACEMENT OF THE CONDUIT IS SUCH THAT IT DOES NOT CONFLICT WITH NEW CONSTRUCTION.
- D. WHERE THE DEMOLITION OF ELECTRICAL EQUIPMENT INTERRUPTS POWER TO OTHER DOWNSTREAM ELECTRICAL EQUIPMENT, THAT ARE EXISTING TO REMAIN, THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT DOWNSTREAM DEVICES REMAIN ACTIVE AND ARE PROPERLY RECONNECTED.
- E. EQUIPMENT REMOVED AND NOT REUSED SHALL BE THE PROPERTY OF THE OWNER. ANY EXCEPTION TO THE ABOVE SHALL BE SO NOTED ON THE DRAWINGS.

SUBMITTALS

- A. AT MINIMUM, SUBMITTALS SHALL BE SUBMITTED FOR LUMINAIRES, LIGHTING CONTROLS, SWITCHGEAR/PANELBOARDS, FIRE ALARM SYSTEM/COMPONENTS, AND TRANSFORMERS WHERE APPLICABLE TO THE PROJECT. OTHERS ARE NOT REQUIRED BUT WILL BE ACCEPTED AND REVIEWED SUCH AS WIRING DEVICES, CONDUIT, WIRE, BOXES.
- B. SUBMIT MANUFACTURER'S SPECIFICATION SHEETS, CATALOG SHEETS, OR SHOP DRAWINGS COVERING ALL PHASES OF WORK INCLUDED IN THE PROJECT.
- C. HARD COPY SUBMITTALS SHALL BE ARRANGED IN SETS AND BOUND. IF MULTIPLE SUBMITTALS ARE SENT TOGETHER, EACH SECTION SHALL ORGANIZED IN SEPARATE INDEXED SECTIONS. NO LOOSE LEAF SHEETS WILL BE ACCEPTED.
- D. ELECTRONIC SUBMITTALS SHALL BE IN PDF FORMAT WITH EACH SECTION IN A SEPARATE FILE. <u>ALL SECTIONS MERGED INTO A SINGLE LARGE FILE WILL NOT BE ACCEPTED.</u>
- E. ALL SUBMITTALS SHALL BEAR WRITTEN CERTIFICATION TO THE EFFECT THAT THE CONTRACTOR HAS EXAMINED THEM AND FOUND THEM TO BE IN ACCORDANCE WITH SPECIFICATIONS & DRAWINGS AND TO BE DIMENSIONALLY CORRECT WITH REFERENCE TO AVAILABLE SPACE AND OTHER TRADES. EACH SUBMITTAL SHALL BE SIGNED AND DATED BY CONTRACTOR.
- F. SUBMITTALS ARE REQUIRED EVEN WHEN EQUIPMENT BEING FURNISHED IS EXACTLY AS SPECIFIED.

TESTING

- THE CONTRACTOR SHALL PERFORM MEGGER TESTING OF EACH CONDUCTOR MAKING UP SERVICE ENTRANCE, IF INSTALLED BY CONTRACTOR, AND ALL FEEDERS. ANY CONDUCTORS INSTALLED OR OWNED BY THE SERVING UTILITY ARE EXEMPT FROM SAID TESTING.
- THE TEST SHALL BE PERFORMED WITH AN APPLIED POTENTIAL OF 1000 VOLTS DC FOR 1 MIN. CONTRACTOR SHALL PERFORM TESTS WITH CONDUCTORS DISCONNECTED AT BOTH ENDS. THE MINIMUM INSULATION RESISTANCE VALUES SHALL NOT BE LESS THAN TWO MEGAOHMS.
- C. THE CONTRACTOR SHALL RECORD ALL READINGS AND SUBMIT A TEST REPORT WITH CLOSE OUT
- D. ALL TERMINATIONS SHALL BE MADE WITH A PROPERLY CALIBRATED TORQUE WRENCH TO BE WITHIN

FEEDERS, CONTRACTOR SHALL MARK A LINE ACROSS THE TOP OF THE LUG AFTER PROPER

CONTRACTOR SHALL SUBMIT COPIES OF MOST RECENT CALIBRATION CERTIFICATES FOR ALL TORQUE WRENCHES TO BE USED ON SITE. CALIBRATION MUST HAVE BEEN DONE WITHIN 12 MONTHS OF THE TIME OF USE ON PROJECT SITE.

EQUPMENT MANUFACTURER'S RECOMMENDED VALUES. FOR LUG TERMINATIONS ON SERVICES &

PERMITS AND INSPECTIONS

- A. CONTRACTOR SHALL PAY ALL FEES & OBTAIN ALL PERMITS REQUIRED.
- B. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH ALL AUTHORITIES GOVERNING THE PROJECT AND PROVIDING PROPER NOTICE TO SAID AUTHORITIES FOR ALL REQUIRED INSPECTIONS. ANY LACK OF COORDINATION REQUIRING THE REMOVAL OF INSTALLED BUILDING COMPONENTS TO SATISFY REQUIRED INSPECTIONS WILL BE AT CONTRACTOR'S EXPENSE TO REPAIR.
- C. CONTRACTOR SHALL NOTIFY THE ENGINEER OF RECORD AT THE FOLLOWING PROGRESS POINTS IN THE PROJECT FOR ENGINEERING INSPECTIONS:
 C.1. UNDERGROUND SERVICE ENTRANCE AND FEEDERS PRIOR TO CONCRETE ENCASING OR BACKFILLING.
- DOES NOT INCLUDE ANY UTILITY SIDE CONDUITS.

 C.2. INTERIOR ROUGH-IN PRIOR TO ANY WALL COVERINGS BEING IN PLACE.

 C.3. PANELBOARD/SWITCHGEAR/TRANSFORMER TERMINATIONS BEFORE SECURING COVERS

C.4. ABOVE CEILING AFTER LUMINAIRE INSTALLATION PRIOR TO CEILING TILES BEING INSTALLED.

- D. CONTRACTOR SHALL NOTIFY ENGINEER ATLEAST ONE WEEK PRIOR TO REQUIRED INSPECTION. IF ENGINEER CANNOT PERFORM INSPECTION IN A TIMELY MANNER AS TO NO DELAY CONSTRUCTION, THE CONTRACTOR SHALL SUBMIT DIGITAL PHOTOGRAPHIC EVIDENCE OF THE INSTALLATION. ENGINEER SHALL REVIEW PHOTOGRAPHS AND GIVE NOTICE OF ACCEPTANCE AT WHICH TIME THE CONTRACTOR MAY PROCEED.
- E. FAILURE TO NOTIFY ENGINEER OF INSPECTIONS SHALL RESULT IN CONTRACTOR REMOVING ALL COVERINGS TO ALLOW INSPECTION AND REPLACING TO PREVIOUS CONDITION AT CONTRACTOR'S OWN EXPENSE.

SUBSTITUTIONS

- A. THE PROPOSED SUBSTITUTION SHALL BE FULLY INVESTIGATED AND DETERMINED TO BE EQUAL OR SUPERIOR IN ALL RESPECTS TO THE SPECIFIED PRODUCT.
- B. THE SAME WARRANTY SHALL BE FURNISHED FOR THE PROPOSED SUBSTITUTION AS FOR THE SPECIFIED
- C. THE PROPOSED PRODUCT SHALL HAVE THE SAME MAINTENANCE SERVICE AND AVAILABILITY OF SPARE
- D. THE PROPOSED SUBSTITUTION SHALL NOT AFFECT DIMENSIONS AND/OR FUNCTIONAL REQUIRED CLEARANCES PER THE MANUFACTURER OR THE LATEST APPLICABLE CODES.
- THE PROPOSED SUBSTITUTION SHALL HAVE NO ADVERSE EFFECT ON OTHER TRADES AND SHALL NOT AFFECT AND/OR DELAY THE PROGRESS SCHEDULE.
- F. THE CONTRACTOR SHALL BE RESPONSIBLE TO PAY FOR ANY CHANGES TO BUILDING DESIGN, INCLUDING ARCHITECTURAL/ENGINEERING DESIGN, DETAILING AND CONSTRUCTION COST CAUSED BY THE SUBSTITUTION
- THE CONTRACTOR SHALL TAKE SOLE RESPONSIBILITY FOR SUBSTITUTIONS THAT ARE DEEMED "VALUE ENGINEERING" AND DETERMINED NOT EQUAL OR SUPERIOR TO THE PRODUCT SPECIFIED.

ELECTRICAL LEGEND

MOUNTING

ITEM DESCRIPTION

	POWER DEVICES	
-	120V, 20 AMP G.F.C.I. DUPLEX RECEPTACLE WITH LONG DIMENSION PERPENDICULAR TO FLOOR.	16" TO E
	DISCONNECT SWITCH AS SPECIFIED	ABOVE FLOOR
\$	TYPICAL 120V, SIZE 0 FRACTIONAL H.P., TOGGLE TYPE, MANUAL STARTER WITH THERMAL OVERLOAD PROTECTION. UON	ABOVE FLOOR
8	TYPICAL EQUIPMENT MOUNTED JUNCTION BOX	ABOVE FLOOR
0	TYPICAL JUNCTION BOX	ABOVE FLOOR
	ELECTRICAL PANELBOARD — SEE FEEDER DIAGRAM. DASHED AREA REPRESENTS N.E.C. REQUIRED WORKSPACE CLEARANCE	WALL

CONDUIT/CABLING

SHORT SLASH INDICATES NEUTRAL WIRE
LONG SLASH INDICATES PHASE WIRE
SLASH AT DISSIMILAR ANGLE INDICATES INSULATED
GROUND WIRE

	METALLIC CONDUIT MINIMUM 1/2"	ABOVE FLOOR
	METALLIC CONDUIT, UNLESS OTHERWISE NOTED. MINIMUM 3/4"	BELOW FLOOR
	FLEXIBLE CONDUIT (LIQUID-TIGHT) MINIMUM 1/2"	ABOVE FLOOR
	SWITCHED 120VAC LIGHTING WITH 0-10V DIMMING SIGNAL. USE SEPARATE CONDUITS OR A SHIELDED CABLE - CLASS 1 WIRING	ABOVE FLOOR
-00	CAT 5e OR 6 CABLE USED FOR DIGITAL LIGHT CONTROLS EXPOSED ABOVE ACCESSIBLE CEILING OR IN CONDUIT ELSEWHERE	ABOVE FLOOR

DUCT TYPE SMOKE DETECTOR

				ABBREVIATIONS		
AFF	ABOVE	FINISHED	FLOOR		TV	TEI

- INDIVIDUAL G.F.C.I. DEVICE —

 MASTER / SLAVE CONFIGURATIONS

 ARE NOT ACCEPTABLE)
- WP WEATHERPROOF DEVICE
 FDS FUSED DISCONNECT SWITCH
- NFDS NON-FUSED DISCONNECT SWITCH
 UON UNLESS OTHERWISE NOTED
- IG ISOLATED GROUND DEVICE

 HACR HEATING AND AIR—CONDITIONING
 RATED DEVICE
- EGFCI 30mA EQUIPMENT GROUND FAULT CIRCUIT INTERRUPTOR
- LOC EQUIPMENT LOCK OUT CLIP

MLO MAIN LUGS ONLY

ST SHUNT TRIP DEVICE

MB MAIN CIRCUIT BREAKER

- TV TELEVISION
- GROUND FAULT INTERRUPTING DEVICE
 (FURNISH SELF—CONTAINED,
 INDIVIDUAL G.F.C.I. DEVICE —

 MASTER / SLAVE CONFIGURATIONS

 GROUND FAULT INTERRUPTING DEVICE

 C RED DEVICE, CONNECTED TO
 EMERGENCY POWER

 EAFC

 ESTIMATED AVAILABLE FAULT
 CURRENT
 - BKR CIRCUIT BREAKER
 FMT ELECTRICAL METAL
 - EMT ELECTRICAL METALLIC TUBING
 - FLA FULL LOAD AMPS G GROUND (ALSO "GND")

DUCT

- GRS GALVANIZED RIGID STEEL CONDUIT
 HP HORSEPOWER
- KVA KILOVOLT-AMPS

 KW KILOWATT
- MCA MINIMUM CIRCUIT AMPS

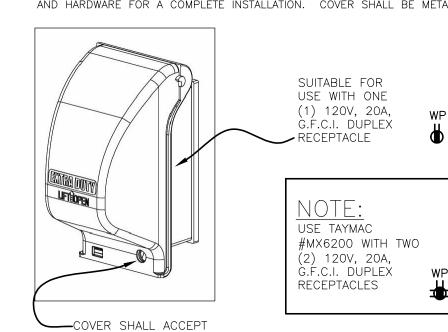
 MOCP MAXIMUM OVERCURRENT PROTECTION

 NIC NOT IN CONTRACT
- PVC POLYVINYLCHLORIDE CONDUIT.
 CLASSIFIED AS RIGID NONMETALLIC
 CONDUIT PER N.E.C. SCHEDULE 40
 U.O.N.

NIGHT LIGHT - LUMINAIRE SHALL BE

UNSWITCHED EXCEPT FOR CIRCUIT

PER N.E.C. 406.9(B), FURNISH AND INSTALL ALL EXTERIOR AND GARAGE RECEPTACLES WITH A EXTRA—DUTY GRADE "WHILE IN USE" WET LOCATION COVER. THE COVER SHALL BE U.L. 514D LISTED. EQUAL TO TAYMAC #MX3200 FOR SINGLE GANG G.F.C.I. RECEPTACLE. COVER INCLUDE GASKETS AND HARDWARE FOR A COMPLETE INSTALLATION. COVER SHALL BE METALLIC.



EXTRA-DUTY DEVICE COVER

STANDARD SIZE PADLOCK

SHEFTTILE:

NOTES, SPECS, LEGEND

PROJECT:

GYMNASIUM HVAC RENOVATION

COLLINWOOD ELEMENTARY SCHOOL

COLLINWOOD ELEMENTARY SCHOOL

ORIGINAL ISSUE DATE:

04/23/21

SCALE:

CHECKED:

TSL
DBS

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PROJECT NUMBER: 21-051

SHEET NUMBER:

E3.1