SYMBOL LIST - DEVICES

φ	DUPLEX RECEPTACLE RATED AT 20-AMPS, 120 VOLTS. GFI = GROUND FAULT INTERRUPTOR
$	SINGLE POLE WALL SWITCH RATED AT 20 AMPS, 120 VOLTS. 'M' INDICATES MOTOR STARTER

SYMBOL LIST - DISTRIBUTION

———	CONDUIT
	PULL BOX
	UNFUSED DISCONNECT SWITCH; SWITCH SIZE TO BE GREATER THAN OR EQUAL TO OVER CURRENT PROTECTION. U.O.N.
M	MOTOR, NUMBER INDICATES HORSEPOWER RATING
PP-KIT/21,23,25 PANEL DESIGNATION CIRCUIT NUMBER	HOMERUN NOTATION

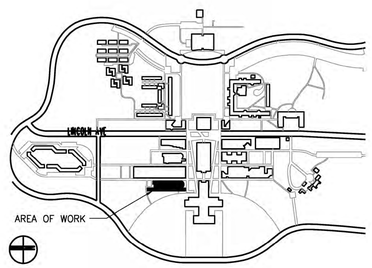
ABBREVIATIONS

@	"AT" OR "EACH AT"	JB	JUNCTION BOX
A	AMPERE	KV	KILOVOLT
AC	ABOVE COUNTER	KVA	KILOVOLT AMPERE
AF	AMPERE FRAME	KW	KILOWATT
AFF	ABOVE FINISHED FLOOR	LTG	LIGHTING
AL	ALUMINUM	LV	LOW VOLTAGE
AT	AMPERE TRIP	MAX	MAXIMUM
AWG	AMERICAN WIRE GAUGE	MCB	MAIN CIRCUIT BREAKER
C	CONDUIT	MCM	THOUSAND CIRCULAR MILS
°C	DEGREE CELSIUS	MIN	MINIMUM
CB	CIRCUIT BREAKER	MLO	MAIN LUGS ONLY
CKT	CIRCUIT	N	NEUTRAL
CLG	CEILING	NTS	NOT TO SCALE
CLOS	CLOSET	PB	PULLBOX
COMM	COMMUNICATION	ø	PHASE
CONT	CONTINUATION	PWR	POWER
CT	CURRENT TRANSFORMER	RECEP	RECEPTACLE
CU	COPPER	REQ	REQUIRED
DB	DECIBEL	RM	ROOM
DEG	DEGREE	SECT	SECTION
DN	DOWN	SP	SINGLE POLE
DP	DISTRIBUTION PANELBOARD	SPEC	SPECIFICATION
DWG	DRAWING	SW	SWITCH
EA	EACH	SYS	SYSTEMS
EC	ELECTRICAL CONTRACTOR	TBD	TO BE DETERMINED
°F	DEGREE FAHRENHEIT	TD	TIME DELAY
FDS	FUSED DISCONNECT SWITCH	TEL	TELEPHONE
FL	FLOOR	TEMP	TEMPERATURE
FT	FEET OR FOOT	TYP	TYPICAL
G	GROUND	UON	UNLESS OTHERWISE NOTED
GFI	GROUND FAULT INTERUPTER	V	VOLT OR VOLTAGE
HP	HORSEPOWER	VA	VOLT AMPERE
HV	HIGH VOLTAGE	W	WATT
HZ	HERTZ	WP	WEATHERPROOF

ELECTRICAL GENERAL NOTES

1. DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF SYSTEMS AND WORK. FOLLOW DRAWING IN LAYING OUT WORK AND CHECK DRAWINGS OF OTHER TRADES TO VERIFY SPACE CONDITIONS. MAINTAIN HEADROOM AND SPACE CONDITIONS.
2. HORIZONTAL OR CROSS RUNS IN PARTITIONS AND WALLS ARE NOT PERMITTED.
3. PROVIDE PULLBOXES AS INDICATED, REQUIRED BY CODE AND WHEREVER NECESSARY TO FACILITATE PULLING OF WIRE. COORDINATE PULLBOX LOCATIONS WITH OTHER TRADES.
4. COVERS OF JUNCTION AND PULLBOXES SHALL BE READILY ACCESSIBLE.
5. CONNECT CONDUIT TO MOTOR CONDUIT TERMINAL BOXES WITH FLEXIBLE CONDUIT; MINIMUM 18 IN. IN LENGTH AND 50% SLACK. DO NOT TERMINATE IN OR FASTEN RACEWAYS TO MOTOR FOUNDATION.
6. COORDINATE ALL EXPOSED CONDUIT RUNS WITH ARCHITECT PRIOR TO EXPOSED CONDUIT INSTALLATION.
7. WIRE COLOR CODING: AS PER CODE. WHERE COLOR-CODED CABLE IS NOT AVAILABLE, CERTIFY IN WRITING AND REQUEST PERMISSION FOR OVERLAP COLOR TAPING OF CONDUCTORS (MINIMUM LENGTH 6") IN ACCESSIBLE LOCATIONS. COLOR CODING, ONCE SELECTED, MUST BE USED CONSISTENTLY FOR THE ENTIRE PROJECT.
8. SECURE ALL SUPPORTS TO BUILDING STRUCTURE UTILIZING TOGGLE BOLTS (HOLLOW MASONRY), EXPANSION SHIELDS OR INSERTS (CONCRETE AND BRICK) OR MACHINE SCREWS (METAL). NAILS, RAWL PLUGS AND WOOD PLUGS ARE NOT PERMITTED. WHERE REQUIRED BY STRUCTURE, PROVIDE THRU BOLTS AND FISH PLATES. SUPPORT HORIZONTAL RUNS OF METALLIC RACEWAYS NOT MORE THAN 10 FT APART.
9. ALL LIGHT FIXTURES AND INSTRUMENTS THAT ARE REMOVED SHOULD BE CAREFULLY DISPOSED OF. COORDINATE REMOVAL ALL EQUIPMENT WITH FACILITIES MANAGER.
10. VERIFY LOCATIONS OF OUTLETS AND SWITCHES IN FINISHED ROOMS WITH ARCHITECTURAL DRAWINGS OF INTERIOR DETAILS AND FINISH. IN CENTERING OUTLETS AND LOCATING BOXES AND OUTLETS, ALLOW FOR OVERHEAD PIPES, DUCTS AND MECHANICAL EQUIPMENT, VARIATIONS IN FIREPROOFING AND PLASTERING, WINDOW AND DOOR TRIM, PANELING, HUNG CEILINGS AND THE LIKE. CORRECT ANY INACCURACY RESULTING FROM FAILURE TO DO SO WITHOUT EXPENSE TO OWNER.
11. LOCATIONS INDICATED FOR LOCAL WALL SWITCHES ARE SUBJECT TO MODIFICATIONS AT OR NEAR DOORS. COORDINATE WITH ARCHITECT AND INSTALL SWITCH ON SIDE OPPOSITE HINGE. VERIFY FINAL HINGE LOCATIONS IN FIELD PRIOR TO SWITCH OUTLET INSTALLATION.
12. POWER INTERRUPTIONS AND CORE DRILLING ONLY PERMITTED AS APPROVED BY FACILITIES MANAGER.
13. ALL OUTDOOR ELECTRICAL EQUIPMENT SHALL BE RATED NEMA-3R.
14. PRIOR TO CORING FOR CONDUIT PENETRATIONS, XRAY SLAB AND SUBMIT TO FACILITIES MANAGER FOR APPROVAL.
15. USE MC CABLE WHEREVER ELECTRICAL CONDUITS CROSS OVER ISOLATED CEILING OR WALLS.
16. CONTRACTOR SHALL REFER TO THE LATEST "CAMPUS NETWORK CABLE INSTALLATION SPECIFICATION" DOCUMENT FOR INFORMATION REGARDING THE INSTALLATION OF TELECOMMUNICATIONS CABLING AND PATHWAYS, AND ACCESS CONTROLS. CONTRACTOR TO PROVIDE ALL LABELING AND TESTING AS PER CAMPUS NETWORK CABLE INSTALLATION SPECIFICATION.
17.

PLOT PLAN



ELECTRICAL DRAWING LIST

E-001.00	ELECTRICAL COVER SHEET
E-002.00	ELECTRICAL PLAZA LEVEL PLAN
E-100.00	ELECTRICAL PART PLAN - PLAZA LEVEL
E-200.00	ELECTRICAL CONSTRUCTION PLAN
E-300.00	ELECTRICAL PANEL SCHEDULES
E-400.00	ELECTRICAL DETAILS
E-500.00	ELECTRICAL SPECIFICATIONS

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project name

MUSIC STUDIO A
AV ROOM AC INSTALLATION

project address

735 ANDERSON RD
PURCHASE, NY 10577

submission history

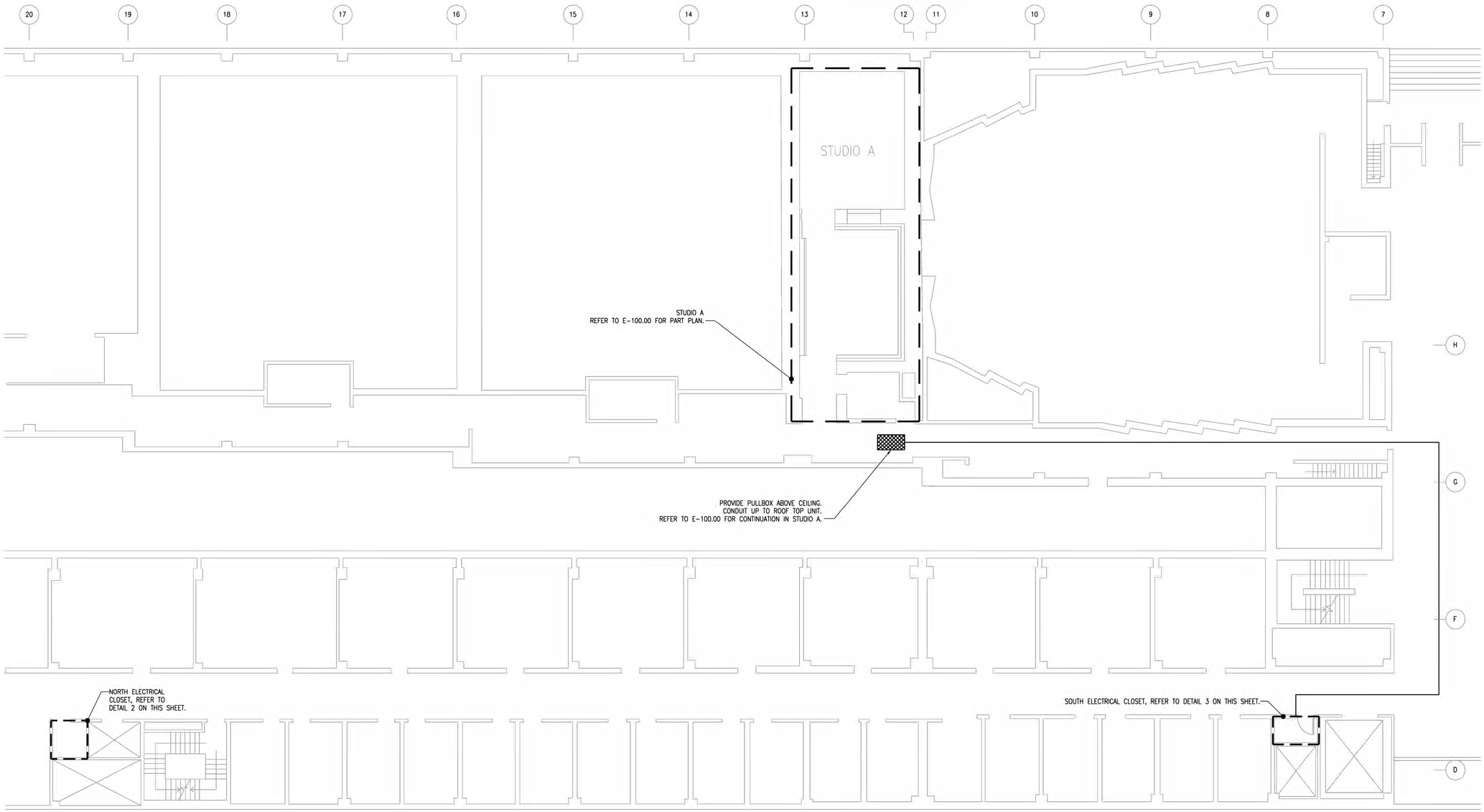
△	DATE	SUBMISSION / REVISION NAME
	07/15/2025	ISSUED FOR CLIENT REVIEW
	01/09/2026	ISSUED FOR BID

ce project #	22071	drawn by	MV
date	01/09/2026	checked by	MD

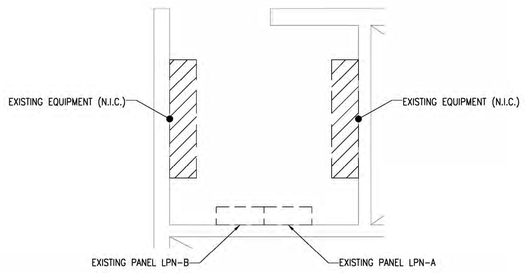
drawing title

ELECTRICAL COVER SHEET

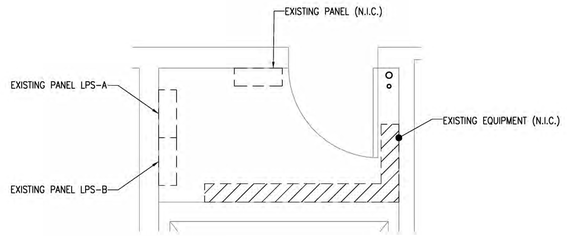
drawing no	scale	sheet no
E-001.00	As Noted	01 of 07



1 ELECTRICAL PLAZA LEVEL PLAN
SCALE: 1/8" = 1'-0"



2 NORTH ELECTRICAL CLOSET DETAIL
SCALE: 1/2" = 1'-0"



3 SOUTH ELECTRICAL CLOSET DETAIL
SCALE: 1/2" = 1'-0"

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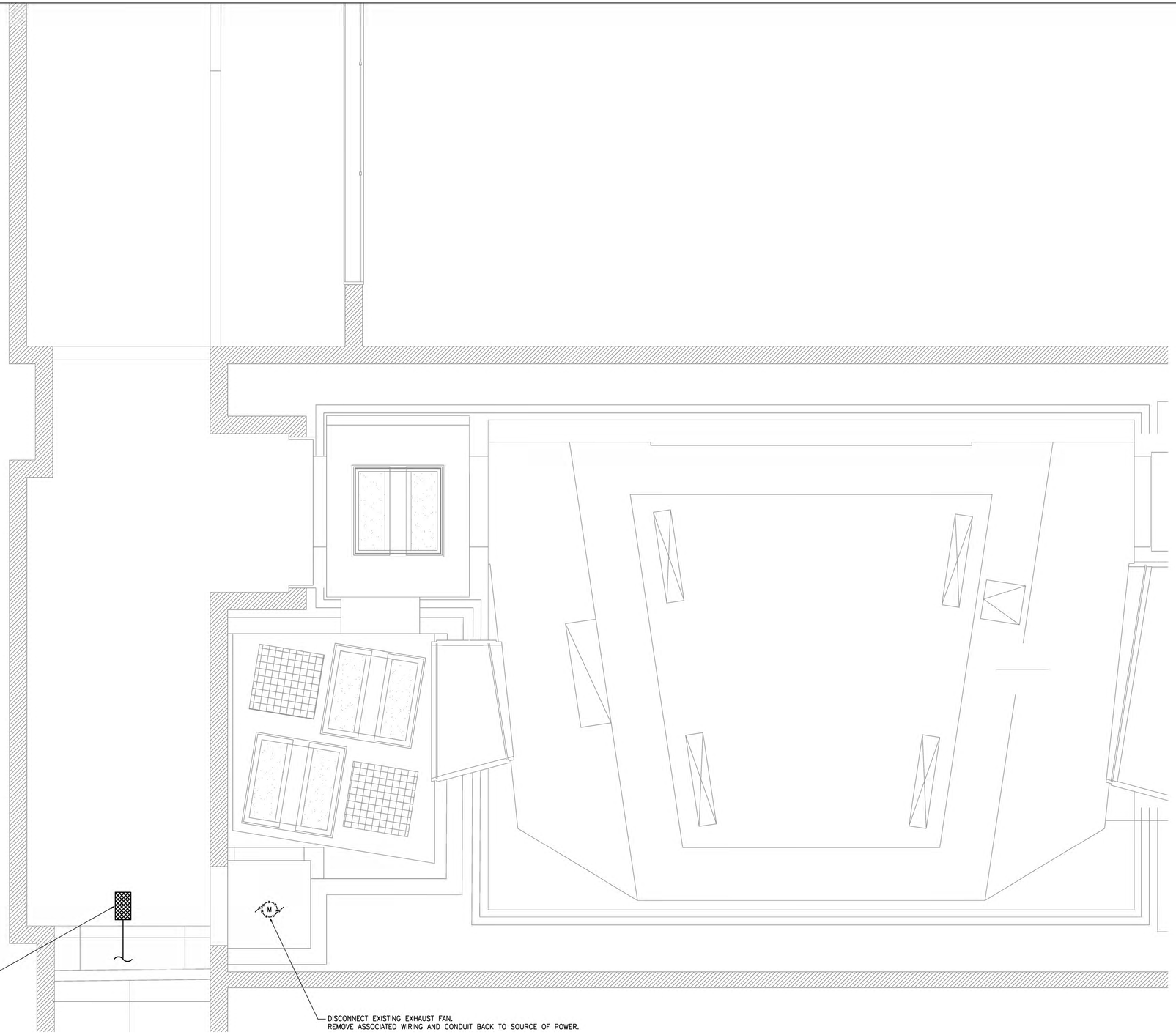
ELECTRICAL PLAZA LEVEL PLAN

drawing no	scale	sheet no
E-002.00	As Noted	02 of 07



GENERAL NOTES:

1. CONTRACTOR TO LIMIT CEILING DEMOLITION TO AREAS NECESSARY FOR MECHANICAL CONSTRUCTION. ALL REPLACEMENT OF CEILING TO BE IN KIND WITH EXISTING CEILING CONSTRUCTION. DEMOLITION AND CEILING REPLACEMENT TO BE COORDINATED WITH ACOUSTICAL CONSULTANT.

1 ELECTIRCAL PLAN – STUDIO A
SCALE: 1/2" = 1'-0"

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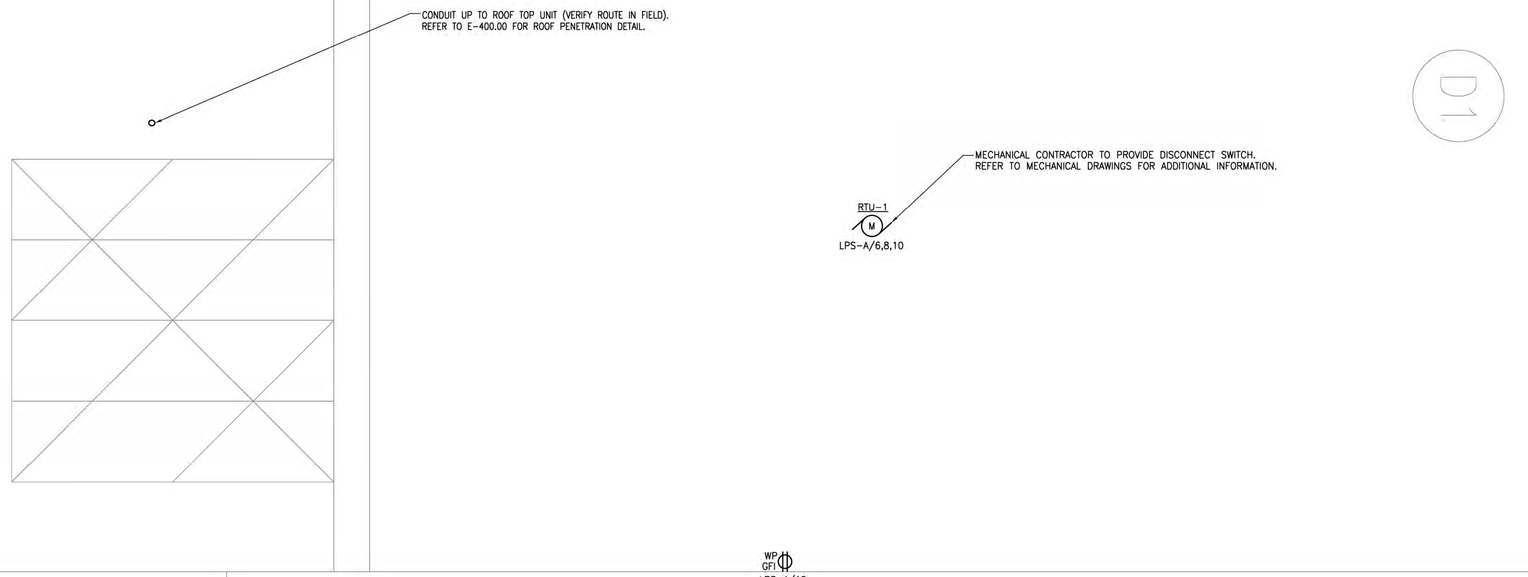
drawing title

ELECTRICAL PART PLAN - PLAZA LEVEL

drawing no	scale	sheet no
E-100.00	As Noted	03 of 07



1 ELECTRICAL CONSTRUCTION PLAN – ROOF
SCALE: 1/2" = 1'-0"

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date	01/09/2026	checked by	MD

drawing title
ELECTRICAL CONSTRUCTION PLAN

drawing no	scale	sheet no
E-200.00	As Noted	04 of 07

ELECTRICAL KEYED NOTES:

1. PROVIDE THREE POLE 30A CIRCUIT BREAKER.
2. PROVIDE SINGLE POLE 20A CIRCUIT BREAKER.

PANEL NO. LPS-A SECTION – EXISTING PANEL ☐ RECESSED ☐ MAIN LUG ONLY
VOLTS 120/208 PH 3 W 4 G 1 ☒ SURFACE MOUNTED ☒ MAIN CB
MAIN CB 225A BUS 225A MIN. INTERRUPTING RATING – SYMM. ☐ FEED THRU LUG

CKT NO.	GFCI BKR	TRIP (AMPS)	DESCRIPTION OF LOAD	LOAD (KVA)	PER PHASE KVA A	B	C	LOAD (KVA)	DESCRIPTION OF LOAD	TRIP (AMPS)	GFCI BKR	CKT NO.	
1	☐	20	EXISTING CIRCUIT	0	0			0	EXISTING CIRCUIT	20	☐	2	
3	☐	20	EXISTING CIRCUIT	0		0		0	EXISTING CIRCUIT	20	☐	4	
5	☐	20	EXISTING CIRCUIT	0			2.4	**2.4**			☐	6	
7	☐		EXISTING SPACE	0	2.4			**2.4**	**RTU-1 3/10 + 1/10G IN 3/4"C**	**30**	☐	8	⟨1⟩
9	☐		EXISTING SPACE	0		2.4		**2.4**			☐	10	
11	☐		EXISTING SPACE	0			0.18	**.18**	**RTU-1 SERVICE RECEPTACLE**	**20**	☐	12	⟨2⟩
ASCO 920 REMOTE CONTROL SWITCH					# # # # # #				ASCO 920 REMOTE CONTROL SWITCH				
13	☐	20	EXISTING CIRCUIT	0	0			0	EXISTING CIRCUIT	20	☐	14	
15	☐	20	EXISTING CIRCUIT	0		0		0	EXISTING CIRCUIT	20	☐	16	
17	☐	20	EXISTING CIRCUIT	0			0	0	EXISTING CIRCUIT	20	☐	18	
19	☐	20	EXISTING CIRCUIT	0	0			0	EXISTING CIRCUIT	20	☐	20	
21	☐	20	EXISTING CIRCUIT	0		0		0	EXISTING CIRCUIT	20	☐	22	
23	☐	20	EXISTING CIRCUIT	0			0	0	EXISTING CIRCUIT	20	☐	24	
25	☐	20	EXISTING CIRCUIT	0	0			0	EXISTING CIRCUIT	20	☐	26	
27	☐	20	EXISTING CIRCUIT	0		0		0	EXISTING CIRCUIT	20	☐	28	
29	☐	20	EXISTING CIRCUIT	0			0	0	EXISTING CIRCUIT	20	☐	30	
31	☐	20	EXISTING CIRCUIT	0	0			0	EXISTING CIRCUIT	20	☐	32	
33	☐	20	EXISTING CIRCUIT	0		0		0	EXISTING CIRCUIT	50	☐	34	
35	☐	20	EXISTING CIRCUIT	0			0	0			☐	36	
37	☐	20	EXISTING CIRCUIT	0	0			0			☐	38	
39	☐	20	EXISTING CIRCUIT	0		0		0	EXISTING CIRCUIT	20	☐	40	
41	☐	50	EXISTING CIRCUIT	0			0	0			☐	42	
43	☐			0	0			0	EXISTING CIRCUIT	20	☐	44	
45	☐			0		0		0			☐	46	
47	☐	20	EXISTING CIRCUIT	0			0	0			☐	48	
					2.4	2.4	2.58						

PANEL NO. LPS-B SECTION – EXISTING PANEL ☐ RECESSED ☐ MAIN LUG ONLY
VOLTS 120/208 PH 3 W 4 G 1 ☒ SURFACE MOUNTED ☒ MAIN CB
MAIN CB 225A BUS 225A MIN. INTERRUPTING RATING – SYMM. ☐ FEED THRU LUG

CKT NO.	GFCI BKR	TRIP (AMPS)	DESCRIPTION OF LOAD	LOAD (KVA)	PER PHASE KVA A	B	C	LOAD (KVA)	DESCRIPTION OF LOAD	TRIP (AMPS)	GFCI BKR	CKT NO.
1	☐	20	EXISTING CIRCUIT	0	0			0	EXISTING CIRCUIT	20	☐	2
3	☐	20	EXISTING CIRCUIT	0		0		0	EXISTING CIRCUIT	20	☐	4
5	☐	20	EXISTING SPARE	0			0	0	EXISTING CIRCUIT	20	☐	6
7	☐		EXISTING SPACE	0	0			0	EXISTING SPACE		☐	8
9	☐		EXISTING SPACE	0		0		0	EXISTING SPACE		☐	10
11	☐		EXISTING SPACE	0			0	0	EXISTING SPACE		☐	12
ASCO 920 REMOTE CONTROL SWITCH					# # # # # #				ASCO 920 REMOTE CONTROL SWITCH			
13	☐	20	EXISTING CIRCUIT	0	0			0	EXISTING CIRCUIT	20	☐	14
15	☐	20	EXISTING CIRCUIT	0		0		0	EXISTING CIRCUIT	20	☐	16
17	☐	20	EXISTING CIRCUIT	0			0	0			☐	18
19	☐	20	EXISTING CIRCUIT	0	0			0	EXISTING CIRCUIT	20	☐	20
21	☐	20	EXISTING CIRCUIT	0		0		0	EXISTING CIRCUIT	20	☐	22
23	☐			0			0	0	EXISTING CIRCUIT	20	☐	24
25	☐	20	EXISTING CIRCUIT	0	0			0	EXISTING CIRCUIT	20	☐	26
27	☐	20	EXISTING CIRCUIT	0		0		0	EXISTING CIRCUIT	20	☐	28
29	☐	20	EXISTING CIRCUIT	0			0	0	EXISTING CIRCUIT	20	☐	30
31	☐	20	EXISTING CIRCUIT	0	0			0	EXISTING CIRCUIT	20	☐	32
33	☐	20	EXISTING CIRCUIT	0		0		0	EXISTING CIRCUIT	20	☐	34
35	☐	20	EXISTING CIRCUIT	0			0	0	EXISTING CIRCUIT	20	☐	36
37	☐	20	EXISTING CIRCUIT	0	0			0	EXISTING CIRCUIT	20	☐	38
39	☐	20	EXISTING CIRCUIT	0		0		0	EXISTING CIRCUIT	20	☐	40
41	☐	20	EXISTING CIRCUIT	0			0	0	EXISTING CIRCUIT	20	☐	42
43	☐	20	EXISTING CIRCUIT	0	0			0	EXISTING CIRCUIT	20	☐	44
45	☐	20	EXISTING CIRCUIT	0		0		0	EXISTING CIRCUIT	20	☐	46
47	☐		EXISTING SPACE	0			0	0	EXISTING SPACE		☐	48
					0	0	0					

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ce project # 22071 drawn by MV
date 01/09/2026 checked by MD

drawing title
ELECTRICAL PANEL SCHEDULES

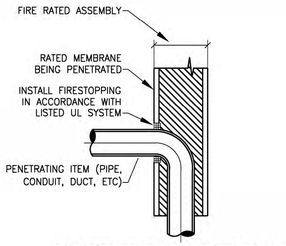
drawing no E-300.00 scale As Noted sheet no 05 of 07

GENERAL GUIDELINE FOR SELECTING APPROPRIATE FIRESTOPPING SYSTEMS:

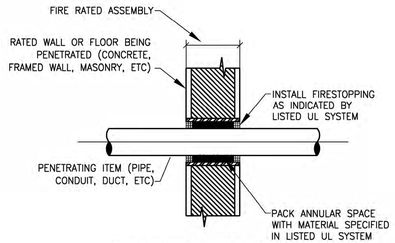
DETERMINE SYSTEM COMPONENTS:
- –TYPE OF PENETRATION (MEMBRANE OR THROUGH)
- –PENETRATING ITEM
- –ASSEMBLY BEING PENETRATED
- –MINIMUM AND MAXIMUM ANNULAR SPACES, POINTS OF CONTACT

DETERMINE RATING REQUIREMENTS:
- –F–RATING, T–RATING, L–RATING, AND W–RATING

FOR EACH PENETRATION, SELECT A SYSTEM LISTED BY AN APPROVED TESTING AGENCY (UL, FM, ETC) THAT MEETS ALL OF THE ABOVE PARAMETERS



MEMBRANE PENETRATION



THROUGH PENETRATION

F–RATING: THE AMOUNT OF TIME (IN HOURS) BEFORE FLAMES CAN PASS THROUGH A PENETRATION FROM THE SIDE OF A WALL OR FLOOR EXPOSED TO FLAMES TO THE UNEXPOSED SIDE

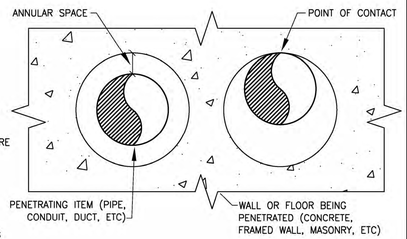
T–RATING: THE AMOUNT OF TIME (IN HOURS) BEFORE THE SURFACE OF AN ASSEMBLY AND/OR PENETRATING ITEM ON THE SIDE OF A WALL OR FLOOR NOT EXPOSED TO FLAMES RISES TO A TEMPERATURE OF 325°F

L–RATING: THE AMOUNT OF AIR/SMOKE (IN CUBIC FEET PER MINUTE PER SQUARE FOOT) THAT CAN LEAK THROUGH THE PENETRATION

W–RATING: A FIRESTOPPING PRODUCT'S ABILITY TO RESIST THE PASSAGE OF WATER THROUGH FLOOR ASSEMBLIES

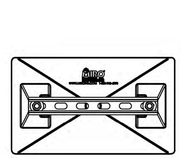
REFER TO PROJECT SPECIFICATIONS FOR RATINGS AND ADDITIONAL FIRESTOPPING REQUIREMENTS

DEFINITIONS AND NOTES

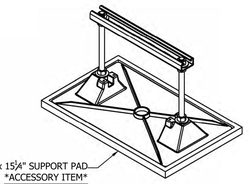


ANNULAR SPACE

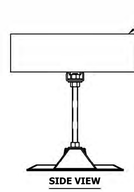
FIRESTOPPING PENETRATIONS GUIDELINE



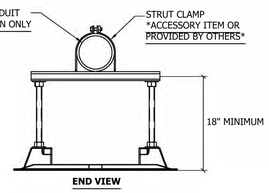
TOP VIEW



ISOMETRIC VIEW



SIDE VIEW



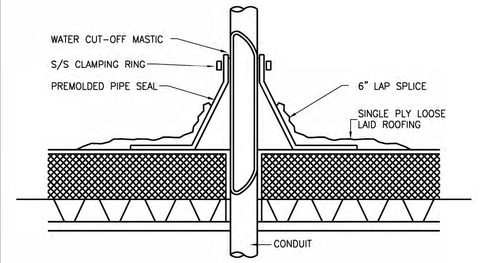
END VIEW

ACCESSORIES
- Strut Clamp - Order to Pipe O.D.
- 9" x 15¼" Support pad
- Eternabond® 2-sided tape

PRODUCT DESCRIPTION
A pipe support with "strut" used to support roof-mounted electrical conduit, solar piping, gas pipes and other mechanical piping. Pipes rest on a 12" length of strut which is mounted on the base. The pipes can be fastened by using the appropriate pipe clamp.

KEY INFORMATION
- Designed to support conduit (ganged) cable trays or other mechanical piping.
- Adjustable from the factory set maximum height of 9-1/4" down to a minimum height of 4-1/4"
- Maximum load is 335 lbs. (3.0 psi) Make certain each support is properly elevated to evenly distribute weight at all support locations.
- Unit Weight: 3.88 lbs.
- 8 per case, 30 lbs. per case, (DW= 36 lbs.)
- Recommended spacing is not to exceed 10' centers depending upon the load.
- Base Material: Polycarbonate
- All metal parts are either stainless steel or hot-dip galvanized.

CONDUIT ROOF SUPPORT DETAILS



CONDUIT ROOF PENETRATION DETAIL

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engineer's stamp

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submission history

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ELECTRICAL DETAILS

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E-400.00	As Noted	06 of 07

ELECTRICAL WORK

1.GENERAL:

A. THESE SPECIFICATIONS AS APPLICABLE ARE PART OF THIS CONTRACT.

B. ALL APPLICABLE CODES, LAWS AND REGULATIONS GOVERNING OR RELATING TO ANY PORTION OF THIS WORK ARE HEREBY INCORPORATED INTO AND MADE A PART OF THESE SPECIFICATIONS, AND THEIR PROVISIONS SHALL BE CARRIED OUT BY THE CONTRACTOR.

C. DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF SYSTEMS AND WORK. CONDUIT ROUTING IS SHOWN DIAGRAMMATICALLY AND DOES NOT SHOW ALL OFFSETS, DROPS AND RISES OF RUNS. THE CONTRACTOR SHALL ALLOW IN HIS PRICE FOR ROUTING OF CONDUIT TO AVOID OBSTRUCTIONS. COORDINATION WITH EXISTING SERVICES, INCLUDING THOSE OF OTHER TRADES, IS REQUIRED. MAINTAIN HEADROOM AND SPACE CONDITIONS.

D. INSTALL WORK SO AS TO BE READILY ACCESSIBLE FOR OPERATION, MAINTENANCE AND REPAIR. MINOR DEVIATIONS FROM DRAWINGS MAY BE MADE TO ACCOMPLISH THIS, BUT CHANGES WHICH INVOLVE EXTRA COST SHALL NOT BE MADE WITHOUT APPROVAL.

E. REMOVAL AND RELOCATION OF CERTAIN EXISTING WORK MAY BE NECESSARY FOR THE PERFORMANCE OF THE GENERAL WORK. ALL EXISTING CONDITIONS CANNOT BE COMPLETELY DETAILED ON THE DRAWINGS. THE CONTRACTOR SHALL SURVEY THE SITE AND INCLUDE ALL CHANGES AND CHARGES IN MAKING UP THE WORK PROPOSAL.

F. CONNECTIONS TO EXISTING WORK: INSTALL NEW WORK AND CONNECT TO EXISTING WORK WITH MINIMUM INTERFERENCE TO EXISTING FACILITIES. TEMPORARY SHUTDOWNS OF EXISTING SERVICES SHALL BE PERFORMED AT NO ADDITIONAL CHARGES, AT TIMES NOT TO INTERFERE WITH NORMAL OPERATION OF EXISTING FACILITIES AND ONLY WITH WRITTEN CONSENT OF OWNER. ALARM AND EMERGENCY SYSTEMS SHALL NOT BE INTERRUPTED. MAINTAIN CONTINUOUS OPERATION OF EXISTING FACILITIES AS REQUIRED WITH NECESSARY TEMPORARY CONNECTIONS BETWEEN NEW AND EXISTING WORK. CONNECT NEW WORK TO EXISTING WORK IN NEAT AND ACCEPTABLE MANNER. RESTORE EXISTING DISTURBED WORK TO ORIGINAL CONDITION, INCLUDING MAINTENANCE OF WIRING CONTINUITY AS REQUIRED.

G. DISCONNECT OR REMOVE EXISTING MATERIAL, EQUIPMENT AND OTHER WORK AS NOTED OR REQUIRED FOR PROPER INSTALLATION OF NEW WORK.

H. THE CONTRACTOR SHALL KEEP ALL EQUIPMENT AND MATERIALS, AND ALL PARTS OF THE BUILDING, EXTERIOR SPACES AND ADJACENT STREETS, SIDEWALKS AND PAVEMENTS, FREE FROM MATERIAL AND DEBRIS RESULTING FROM THE EXECUTION OF THIS WORK. EXCESS MATERIALS WILL NOT BE PERMITTED TO ACCUMULATE EITHER ON THE INTERIOR OR THE EXTERIOR.

I. SEAL OPENINGS THROUGH PARTITIONS, WALLS AND FLOORS WITH MINERAL WOOL OR OTHER NONCOMBUSTIBLE MATERIAL.

J. PROVIDE ALL NECESSARY FLASHING AND COUNTERFLASHING TO MAINTAIN THE WATERPROOFING INTEGRITY OF THE BUILDING AS REQUIRED BY THE INSTALLATION OR REMOVAL OF CONDUIT AND EQUIPMENT. PROVIDE EQUIPMENT CURBS AS REQUIRED.

K. ALL EXISTING MATERIAL, EQUIPMENT AND CONSTRUCTION DEBRIS TO BE REMOVED UNDER THIS CONTRACT SHALL BECOME THE PROPERTY OF THE CONTRACTOR WITH THE EXCEPTION OF SPECIFIC EQUIPMENT AND APPARATUS REQUESTED BY THE BUILDING REPRESENTATIVE, ARCHITECT OR AS NOTED TO BE RELOCATED ON THE DRAWINGS. REMOVED EQUIPMENT SHALL BE PROPERLY DISPOSED OF BY THIS CONTRACTOR.

L. THE CONTRACTOR'S PROPOSAL FOR ALL WORK SHALL BE PREDICATED ON THE PERFORMANCE OF THE WORK DURING REGULAR WORKING HOURS. WHEN SO DIRECTED, HOWEVER, THE CONTRACTOR SHALL INSTALL WORK DURING OVERTIME HOURS AND THE ADDITIONAL COST TO BE CHARGED THEREFORE SHALL BE ONLY THE "PREMIUM" PORTION OF THE WAGES PAID.

M. UNLESS OTHERWISE SPECIFICALLY NOTED OR SPECIFIED, INCLUDE ALL CUTTING AND PATCHING OF EXISTING FLOORS, WALLS, PARTITIONS AND OTHER MATERIALS IN THE EXISTING BUILDING. THE CONTRACTOR SHALL RESTORE THESE AREAS TO ORIGINAL CONDITION.

N. ALL MATERIAL AND EQUIPMENT SHALL BE NEW UNLESS OTHERWISE NOTED AND SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.

O. SUBMISSION OF A PROPOSAL SHALL BE CONSTRUED AS EVIDENCE THAT A CAREFUL EXAMINATION OF THE PORTIONS OF THE EXISTING BUILDING, EQUIPMENT, ETC., WHICH AFFECT THIS WORK, AND THE ACCESS TO SUCH SPACES, HAS BEEN MADE AND THAT THE CONTRACTOR IS FAMILIAR WITH EXISTING CONDITIONS AND DIFFICULTIES THAT WILL AFFECT THE EXECUTION OF THE WORK. THE CONTRACTOR IS RESPONSIBLE TO INDICATE ANY DISCREPANCIES BETWEEN THE CONTRACT DRAWINGS AND ACTUAL FIELD CONDITIONS PRIOR TO SUBMITTAL OF BID. SUBMISSION OF A PROPOSAL WILL BE CONSTRUED AS EVIDENCE THAT SUCH AN EXAMINATION HAS BEEN MADE. LATER CLAIMS SHALL NOT BE MADE FOR LABOR, EQUIPMENT OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN DURING SUCH AN EXAMINATION. THE ON-SITE INSPECTION SHALL VERIFY EXISTING CONDUIT (SIZES, CLEARANCES, ETC) AND CONDITIONS.

P. INSURANCE: IN ACCORDANCE WITH BUILDING REQUIREMENTS AND SHALL INCLUDE A HOLD HARMLESS CLAUSE FOR OWNER AND ENGINEER.

Q. THE FINAL ACCEPTANCE SHALL BE MADE AFTER THE CONTRACTOR HAS ADJUSTED HIS EQUIPMENT, TESTED THE VARIOUS SYSTEMS, DEMONSTRATED THAT IT FULFILLS THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS AND HAS FURNISHED ALL THE REQUIRED CERTIFICATES OF INSPECTION AND APPROVAL.

2. SCOPE OF WORK:

A. SCOPE OF WORK SHALL CONSIST OF PROVIDING LABOR, MATERIALS, EQUIPMENT, SERVICES AND FEES NECESSARY FOR COMPLETE AND SAFE INSTALLATION IN CONFORMITY WITH THE NATIONAL ELECTRICAL CODE (NEC) AND ALL OTHER APPLICABLE INDUSTRY, NATIONAL AND LOCAL CODES AND AUTHORITIES HAVING JURISDICTION, AS INDICATED ON DRAWINGS AND HEREIN SPECIFIED.

B. ALL DRAWINGS, PLANS, DETAILS, SPECIFICATIONS AND SPECIFICATION ADDENDA ARE MADE PART OF THIS CONTRACT AND SHALL APPLY TO ALL WORK UNDER THE CONTRACT UNLESS OTHERWISE AMENDED, MODIFIED, SUPPLEMENTED OR SPECIFIED HEREIN.

C. THE CONTRACTOR SHALL FURNISH A WRITTEN GUARANTEE TO REPLACE OR REPAIR PROMPTLY AND ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED FOR ANY WORKMANSHIP AND EQUIPMENT IN WHICH DEFECTS DEVELOP WITHIN ONE YEAR FROM THE DATE OF FINAL CERTIFICATE FOR PAYMENT AND/OR FROM DATE OR ACTUAL USE OF EQUIPMENT OR OCCUPANCY OF SPACES BY OWNER INCLUDED UNDER THE VARIOUS PARTS OF THE WORK, WHICHEVER DATE IS EARLIER. THIS WORK SHALL BE DONE AS DIRECTED BY THE OWNER. THIS GUARANTEE SHALL ALSO PROVIDE THAT WHERE DEFECTS OCCUR, THE CONTRACTOR WILL ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED IN REPAIRING AND REPLACING WORK OF OTHER TRADES AFFECTED BY DEFECTS, REPAIRS OR REPLACEMENTS IN EQUIPMENT SUPPLIED BY THE CONTRACTOR.

D. THE CONTRACTOR SHALL GIVE NECESSARY NOTICE, FILE DRAWINGS AND SPECIFICATIONS WITH ALL DEPARTMENTS HAVING JURISDICTION, OBTAIN PERMITS OR LICENSES NECESSARY TO CARRY OUT THIS WORK AND PAY ALL FEES THEREFORE. THE CONTRACTOR SHALL ARRANGE FOR INSPECTION AND TESTS OF ANY OR ALL PARTS OF THE WORK IF SO REQUIRED BY AUTHORITIES AND PAY ALL CHARGES FOR SAME. THE CONTRACTOR SHALL PAY ALL COSTS FOR, AND FURNISH TO THE OWNER BEFORE FINAL BILLING, ALL CERTIFICATES NECESSARY AS EVIDENCE THAT THE WORK INSTALLED CONFORMS WITH ALL REGULATIONS WHERE THEY APPLY TO THIS WORK.

3. SHOP DRAWINGS

A. PRIOR TO THE INSTALLATION OF ANY WORK AND PROCUREMENT OF EQUIPMENT, CONTRACTOR SHALL PROVIDE COMPLETE SETS OF COORDINATED SHOP DRAWINGS OF ALL NEW AND EXISTING EQUIPMENT, INDICATING CAPACITY, DIMENSIONS AND SEQUENCE OF OPERATION FOR WRITTEN APPROVAL BY THE ARCHITECT AND ENGINEER.

B. INDICATE ON EACH SHOP DRAWING SUBMITTED:

1) PROJECT NAME AND LOCATION
2) NAME OF ARCHITECT AND ENGINEER
3) ITEM IDENTIFICATION
4) APPROVAL STAMP OF PRIME CONTRACTOR

C. SUBMISSIONS:

1) CONTRACTOR SHALL SUBMIT A PDF FILE TO ARCHITECT THROUGH PREVIOUSLY DISCUSSED AND APPROVED METHOD (EMAIL, SUBMITTAL EXCHANGE PROGRAM, ETC). SUBMITTAL WILL THEN BE FORWARDED TO RELEVANT PARTIES FOR REVIEW.
2) UNLESS OTHERWISE DISCUSSED & AGREED, PROVIDE ALL EQUIPMENT SUBMITTALS AND SHOP DRAWINGS AT ONE TIME, THE SAME TIME; AT LEAST, THREE WEEKS BEFORE A RESPONSE IS REQUIRED.
3) PROVIDE A SEPARATE TRANSMITTAL FOR EACH SUBMITTAL ITEM. TRANSMITTALS SHALL INDICATE PRODUCT BY SPECIFICATION SECTION NAME AND NUMBER. SEPARATE ALL SUBMITTALS INTO APPROPRIATE SPECIFICATION SECTION NUMBER. DO NOT COMBINE SPECIFICATION SECTIONS.
4) DO NOT SUBMIT ENTIRE MANUFACTURER'S CATALOG; IT WILL NOT BE REVIEWED. SUBMIT ONLY PAGES WHICH ARE PERTINENT TO THE PROJECT. ALL OPTIONS WHICH ARE INDICATED ON THE PRODUCT DATA SHALL BECOME PART OF THE CONTRACT AND SHALL BE REQUIRED WHETHER SPECIFIED ARE NOT.
5) MARK EACH COPY OF STANDARD PRINTED DATA TO IDENTIFY PERTINENT PRODUCTS, REFERENCED TO SPECIFICATION SECTION AND ARTICLE NUMBER.
6) SHOW REFERENCE STANDARDS, PERFORMANCE CHARACTERISTICS AND CAPACITIES; WIRING AND PIPING DIAGRAMS AND CONTROLS; COMPONENT PARTS; FINISHES; DIMENSIONS AND REQUIRED CLEARANCES.
7) MODIFY MANUFACTURER'S STANDARD SCHEMATIC DRAWINGS AND DIAGRAMS TO SUPPLEMENT STANDARD INFORMATION AND TO PROVIDE INFORMATION SPECIFICALLY APPLICABLE TO THE WORK. DELETE INFORMATION NOT APPLICABLE.
8) THE ENGINEER WILL REVIEW THE ORIGINAL SUBMITTAL AND ONE RESUBMITTAL FOR THE SAME PRODUCT. ADDITIONAL RESUBMITTALS WILL BE REVIEWED ON A HOURLY RATE, PAYABLE BY THE CONTRACTOR.
9) PARTIAL SUBMITTALS OR SUBMITTALS NOT PROPERLY FORMATTED AS INDICATED ABOVE, ARE SUBJECT TO RETURN WITHOUT REVIEW FOR THE CONTRACTOR TO CORRECT.

D. SUBMIT SHOP DRAWINGS FOR THE FOLLOWING:

1) SWITCHES
2) CIRCUIT BREAKERS
3) RACEWAYS
4) WIRE AND CABLE
5) RECEPTACLES
6) TESTED AND LISTED FIRESTOPPING SYSTEMS

4. AS-BUILT DRAWINGS AND EQUIPMENT OPERATIONAL INSTRUCTIONS

A. UPON COMPLETION AND ACCEPTANCE OF WORK, CONTRACTOR SHALL FURNISH WRITTEN INSTRUCTIONS AND EQUIPMENT MANUALS AND DEMONSTRATE TO THE OWNER THE PROPER OPERATION AND MAINTENANCE OF ALL EQUIPMENT AND APPARATUS FURNISHED UNDER THIS CONTRACT.

B. THESE INSTRUCTIONS SHALL BE TYPED ON 8-1/2 IN. X 11 IN. PAPER AND BOUND IN THREE RING BINDERS WITH CLEAR ACETATE COVERS. CONTRACTOR SHALL GIVE THREE COPIES OF THE INSTRUCTIONS TO THE OWNER AND ONE COPY TO THE ENGINEER.

C. THE INSTRUCTION BOOKLET SHALL BEAR THE NAME, ADDRESS AND TELEPHONE NUMBER OF THE PROJECT, ARCHITECT AND ENGINEER.

D. REPRODUCIBLE "AS-BUILT" DRAWINGS SHALL BE PROVIDED INDICATING THE AS INSTALLED CONDITIONS OF THE WORK. "AS-BUILT" DRAWINGS SHALL BE PROVIDED TO THE ARCHITECT AFTER COMPLETION OF THE INSTALLATION.

5. GENERAL PROVISIONS FOR ELECTRICAL WORK:

A. SPECIFICATIONS ARE OF SIMPLIFIED FORM AND INCLUDE INCOMPLETE SENTENCES. WORDS OR PHRASES SUCH AS "THE CONTRACTOR SHALL," "SHALL BE," "FURNISH," "PROVIDE," "A," "THE," AND "ALL" HAVE BEEN OMITTED FOR BREVITY.

B. DEFINITIONS:

1) "PROVIDE": TO SUPPLY, INSTALL AND CONNECT UP COMPLETE AND READY FOR SAFE AND REGULAR OPERATION THE PARTICULAR WORK REFERRED TO UNLESS SPECIFICALLY OTHERWISE NOTED.
2) "INSTALL": TO ERECT, MOUNT AND CONNECT COMPLETE WITH RELATED ACCESSORIES.
3) "FURNISH" OR "SUPPLY": TO PURCHASE, PROCURE, ACQUIRE AND DELIVER COMPLETE WITH RELATED ACCESSORIES.
4) "WORK": LABOR, MATERIALS, EQUIPMENT, APPARATUS, CONTROLS, ACCESSORIES AND OTHER ITEMS REQUIRED FOR PROPER AND COMPLETE INSTALLATION.
5) "WIRING": RACEWAY, FITTINGS, WIRE, BOXES AND RELATED ITEMS.
6) "CONCEALED": EMBEDDED IN MASONRY OR OTHER CONSTRUCTION, INSTALLED IN FURRED SPACES, WITHIN DOUBLE PARTITIONS OR HUNG CEILINGS, IN TRENCHES, IN CRAWL SPACES, OR IN ENCLOSURES.
7) "EXPOSED": NOT INSTALLED UNDERGROUND OR "CONCEALED" AS DEFINED ABOVE.
8) "SIMILAR" OR "EQUAL": EQUAL IN MATERIALS, WEIGHT, SIZE, DESIGN AND EFFICIENCY OF SPECIFIED PRODUCT.

C. QUALITY ASSURANCE

1) QUALITY AND GAUGE OF MATERIALS: NEW, BEST OF THEIR RESPECTIVE KINDS, FREE FROM DEFECTS AND LISTED BY UNDERWRITERS LABORATORIES, INC., OR OTHER NATIONALLY APPROVED TESTING AGENCY AND BEARING THEIR LABEL. MATERIALS AND EQUIPMENT OF SIMILAR APPLICATION SHALL BE OF SAME MANUFACTURER, EXCEPT AS NOTED.
2) GUARANTEE: ALL MATERIALS AND WORKMANSHIP SHALL BE GUARANTEED AS DEFINED IN PARAGRAPH 2.C.
3) CURRENT CHARACTERISTICS:
   a. DISTRIBUTION: 277/480 VOLT (AND 120/208 VOLT), 3 PHASE, 4 WIRE, 60 HERTZ WITH GROUNDED NEUTRAL
4) HEIGHTS OF OUTLETS: FROM FINISHED FLOOR TO CENTERLINE OF OUTLETS FOR:
   a. RECEPTACLES: 1 FT-6 IN. UNLESS OTHERWISE NOTED BY ARCHITECT
   b. WALL SWITCHES: 4 FT-0 IN.

EXCEPTIONS: AT JUNCTION OF DIFFERENT WALL FINISH MATERIALS, ON MOLDING OR BREAK IN WALL SURFACE, IN VIOLATION OF CODE, OR AS NOTED OR DIRECTED.

E. PRODUCT DELIVERY, STORAGE AND HANDLING

1) ACCESSIBILITY: FOR OPERATION, MAINTENANCE AND REPAIR. MINOR DEVIATIONS SHALL BE PERMITTED. CHANGES OF MAGNITUDE OR INVOLVING EXTRA COST ARE NOT PERMISSIBLE WITHOUT REVIEW. GROUP CONCEALED ELECTRICAL EQUIPMENT REQUIRING ACCESS WITH EQUIPMENT FREELY ACCESSIBLE THROUGH ACCESS DOORS.

F. MATERIALS

1) NAMEPLATES: PROVIDE BLACK LAMICOID SHEET WITH 3/4 IN. WHITE LETTERING, FASTENED WITH EPOXY CEMENT FOR EACH DISCONNECT SWITCH, CIRCUIT BREAKER, PANEL, CABINET, TRANSFORMER AND THE LIKE. NAMEPLATES SHALL DESCRIBE THE NAME AND NUMBER OF EACH COMPONENT.
2) CABLE TAGS: TAG EACH CONDUCTOR PASSING THROUGH SPLICE OR PULLBOX WITH A WHITE LINEN TAG, INDICATING POINT OF ORIGIN AND TERMINATION OF THE CIRCUIT.
3) INSERTS AND SUPPORTS:
   a. INSERTS: STEEL, SLOTTED TYPE, FACTORY PAINTED.
   - SINGLE ROD: SIMILAR TO GRINNELL FIG. 281.
   - MULTI-ROD: SIMILAR TO FEE AND MASON SERIES 9000 WITH END CAPS AND CLOSURE STRIPS.
   - CLIP FORM NAILS FLUSH WITH INSERTS.
   - MAXIMUM LOADING 75 PERCENT OF RATING.
   b. SUPPORTS FROM BUILDING CONSTRUCTION: INSERTS, BEAM CLAMPS, STEEL FISHPLATES (IN CONCRETE FILL ONLY), CANTILEVER BRACKETS OR OTHER MEANS. SUBMIT FOR REVIEW.
   c. GROUPED LINES AND SERVICES: TRAPEZE HANGERS OF BOLTED ANGLES OR CHANNELS.
   d. WHERE BUILDING CONSTRUCTION IS INADEQUATE: PROVIDE ADDITIONAL FRAMING. SUBMIT FOR REVIEW.

G. PAINT SHALL BE THE BEST GRADE FOR ITS PURPOSE. DELIVER IN ORIGINAL SEALED CONTAINERS AND APPLY IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. COLORS SHALL BE AS SELECTED BY ARCHITECT OR ENGINEER. UTILIZE GALVANIZED IRON PRIMER ON PANEL AND PULL BOXES, AFTER FABRICATION. UTILIZE HOT DIPPED GALVANIZED OR DIPPED IN ZINC BASED PRIMER FOR: OUTLET BOXES, JUNCTION BOXES, CONDUIT HANGERS, RODS, INSERTS AND SUPPORTS. ZINC BASED PRIMER WITH FINISH TO MATCH SURROUNDINGS SHALL BE USED FOR MARRED SURFACES OF STEEL EQUIPMENT AND RACEWAYS. A FIELD-APPLIED ZINC BASED PRIME COAT SHALL BE UTILIZED FOR STEEL OR IRONWORK.

H. BRUSH AND CLEAN WORK PRIOR TO CONCEALING, PAINTING AND ACCEPTANCE. PAINTED EXPOSED WORK SOILED OR DAMAGED; CLEAN AND REPAIR TO MATCH ADJOINING WORK BEFORE FINAL ACCEPTANCE. REMOVE DEBRIS FROM INSIDE AND OUTSIDE OF MATERIAL AND EQUIPMENT.

6. LOW-VOLTAGE DISTRIBUTION EQUIPMENT:

A. PROVIDE COMPLETE EQUIPMENT INCLUDING: SWITCHES, FUSES, AND CIRCUIT BREAKERS.

B. ALL EQUIPMENT SHALL CONFORM TO NEMA, ANSI AND IEEE STANDARDS.

C. DISCONNECT SWITCHES SHALL BE NONFUSED AS NOTED. VOLTAGE SHALL BE AS REQUIRED. SWITCHES SHALL BE HEAVY DUTY, EXCEPT AS NOTED, AND HORSEPOWER RATED FOR MOTOR LOADS. TOGGLE TYPE SWITCHES SHALL BE NONFUSED, LOAD BREAK, HAVING MAXIMUM RATINGS OF 20 AMP AT 600 VOLTS AND 30 AMP AT 240 VOLTS. TWO-POLE SWITCHES SHALL BE SIMILAR TO HART AND HEGEMAN NO. 6808F. THREE-POLE SWITCHES SHALL BE SIMILAR TO HART AND HEGEMAN NO. 7810F.

KNIFE-BLADE TYPE SWITCHES SHALL BE LOAD BREAK, QUICK-MAKE-QUICK-BREAK, UL CLASS R UP TO 600 AMP. MAXIMUM RATING EXCEPT AS NOTED SHALL BE 800 AMP. ARC QUENCHERS SHALL BE PROVIDED. SWITCHES SHALL BE SIMILAR TO GENERAL ELECTRIC QMR. ALL SWITCH ENCLOSURES SHALL BE DEAD FRONT, NEMA TYPE 1, EXCEPT AS NOTED.

D. CIRCUIT BREAKERS: MOLDED CASE BREAKERS SHALL BE THERMAL-MAGNETIC, QUICK-MAKE-QUICK-BREAK, BOLT-ON TYPE, MANUALLY OPERATED WITH INSULATED TRIP-FREE HANDLE. MULTI-POLE TYPE BREAKERS SHALL CONTAIN INTERNAL TRIP BAR. TERMINALS SHALL BE SUITABLE FOR COPPER OR ALUMINUM CABLE. FURNISH AUXILIARY DEVICES WHERE REQUIRED FOR SHUNT-TRIPPING, OPEN AND CLOSE MOTOR OPERATOR AND ALARM INDICATION. ENCLOSURES SHALL BE DEAD FRONT, NEMA TYPE 1, EXCEPT AS NOTED. FRAMES, IC AND INTERCHANGEABLE TRIPS SHALL BE AS FOLLOWS, UNLESS OTHERWISE NOTED:

1) 120 VOLTS, 100-AMP FRAME: 10,000 AMPS, 1 POLE.
2) 240 VOLTS, 100-AMP FRAME: 18,000 AMPS, 2 AND 3 POLES.

E. BALANCE THE LOAD OVER PHASES WHEN NEW CIRCUITS ARE ADDED TO NEW OR EXISTING PANELS. PROVIDE MULTI-CABLE LUGS WHERE REQUIRED. DOUBLE LUGGING SHALL NOT BE PERMITTED. MOUNTING HEIGHT SHALL BE A MAXIMUM OF 6 FT-6 IN. FROM FLOOR TO TOP SWITCH UNIT. UPDATE DIRECTORIES ON EXISTING PANELBOARDS WHERE CIRCUITING IS CHANGED.

F. TESTS: OPEN AND CLOSE LOAD BREAK SWITCHING DEVICES UNDER LOAD.

7. RACEWAYS:

A. PROVIDE RACEWAYS COMPLETE WITH BOXES, FITTINGS AND ACCESSORIES. CONDUIT OR TUBING SIZES REFERRED TO IN SPECIFICATIONS AND ON DRAWINGS ARE NOMINAL DIAMETERS. MINIMUM DIAMETER SHALL BE 3/4 IN.

B. MATERIALS

1) RACEWAYS:
   a. RIGID STEEL CONDUIT: FULL-WEIGHT PIPE, GALVANIZED, THREADED.
   b. ELECTROMETALLIC TUBING (EMT): THIN WALL PIPE, GALVANIZED, THREADLESS.
   c. WIREWAYS: WIRE SHALL BE AS NOTED, MINIMUM NO. 16 GAUGE STEEL WITH GROUND CONTINUITY. FINISH SHALL BE BAKED ENAMEL. COVERS SHALL BE SCREW-ON.
   d. SURFACE METAL RACEWAY: SIZE AS NOTED. BASE 0.04 IN., COVER 0.25 IN. MATERIAL SHALL BE STEEL. FINISH SHALL BE BAKED ENAMEL. COVERS SHALL BE SCREW-ON.
2) FITTINGS AND ACCESSORIES:
   a. RIGID STEEL: NONSPLIT, THREADED, STEEL OR MALLEABLE IRON. ZINC DIE CAST NOT PERMITTED.
   b. ELECTROMETALLIC TUBING: COMPRESSION TYPE. GALVANIZED RIGID STEEL ELBOWS, 2 IN. OR LARGER.
   c. FLEXIBLE METALLIC CONDUIT: ANGLE WEDGE TYPE WITH INSULATED THROAT.
   d. BUSHINGS: METALLIC INSULATED TYPE.
3) BOXES:
   a. OUTLET BOXES: EXCEPT AS OTHERWISE REQUIRED BY CONSTRUCTION, DEVICES OR WIRING, BOXES SHALL BE STAMPED STEEL, 4 IN. SQUARE OR OCTAGON FOR FIXTURES. BOXES ABOVE CEILING SHALL BE 1-1/2 IN. DEEP. BOXES IN CEILING OR SLAB SHALL BE 3 IN. DEEP. BOXES IN WALL FOR FIXTURES SHALL BE 2-3/4 IN. DEEP. BOXES IN WALL FOR RECEPTACLES AND SWITCHES SHALL BE 1-1/2 IN. DEEP. FURNISH WITH RAISED COVERS AND FIXTURE STUDS WHERE REQUIRED. WITHOUT FIXTURE OR DEVICE: FURNISH BLANK COVER. OFFSET BACK-TO-BACK OUTLETS WITH MINIMUM 6 IN. SEPARATION.
   b. JUNCTION AND PULL BOXES: GALVANIZED SHEET STEEL WITH SCREW-ON COVERS, EXCEPT AS NOTED. FURNISH WITH INSULATED SUPPORTS FOR CABLES. LOCATIONS SHALL BE AS NOTED OR REQUIRED AND ACCESSIBLE. PROVIDE BARRIERS IN NEW AND RENOVATED BOXES BETWEEN 120/208 VOLT AND 265/460 VOLT WIRING. FLOOR BOXES SHALL BE SUITABLE FOR CONDUIT AND DEVICES NOTED.

C. PROVIDE RACEWAYS ONLY AS HEREIN SPECIFIED, EXCEPT AS NOTED. RACEWAYS SHALL BE RUN CONCEALED, EXCEPT AS NOTED.

PROVIDE RACEWAY SUPPORT UTILIZING CEILING TRAPEZE, STRAP HANGERS, OR WALL BRACKETS. PROVIDE U-BOLTS AT EACH FLOOR LEVEL OF RISER RACEWAYS AND CONNECTED TO ACCEPTABLE SUPPORTS. PROVIDE RISER CLAMPS AT EACH FLOOR LEVEL OF RISER RACEWAYS AND RESTING ON SLAB. FOR ABOVE FLOOR FITTINGS, POWER SHALL BE DUPLEX RECEPTACLE OR OTHER AS NOTED.

SECURE ALL RACEWAYS TO SUPPORTS WITH PIPE STRAPS OR U-BOLTS. SPACING OF SUPPORTS SHALL BE A MINIMUM OF 10 FT ON CENTER FOR METALLIC RACEWAY AND AS REQUIRED FOR NONMETALLIC RACEWAY. SPACING SHALL BE 5 FT ON CENTER FOR WIREWAYS AND PER CODE AND AS NOTED FOR OTHERS. MOUNT SUPPORTS TO STRUCTURE MASONRY WITH TOGGLE BOLTS ON HOLLOW MASONRY, EXPANSION SHIELDS OR INSERTS IN CONCRETE AND BRICK AND MACHINE SCREWS ON METAL. NAILS, RAWL PLUGS OR WOOD PLUGS SHALL NOT BE PERMITTED. WHERE REQUIRED BY STRUCTURE, FURNISH THROUGH BOLTS AND FISHPLATES.

EXPOSED RACEWAYS SHALL BE RUN PARALLEL WITH OR AT RIGHT ANGLES TO WALLS. PROVIDE CLEARANCE WITH WATER, STEAM OR OTHER PIPING (MINIMUM 3 IN. SEPARATION FROM STEAM AND HOT WATER PIPES, EXCEPT 1 IN. FROM PIPE COVER AT CROSSINGS AND 18 IN. FOR PARALLEL RUNS). FOR HUNG CEILING OUTLETS, RUN IN HUNG CEILING AND CONNECT TO CEILING SUPPORT CHANNELS.

MAINTAIN GROUNDING CONTINUITY OF INTERRUPTED METALLIC RACEWAYS WITH GROUND CONDUCTOR, AND IN FLEXIBLE CONDUIT FOR FEEDERS AND MOTOR TERMINAL CONNECTIONS.

RIGID STEEL CONDUIT SHALL BE PERMITTED FOR FEEDERS AND BRANCH CIRCUITS. PAINT MALE THREADS OF FIELD-THREADED CONDUIT WITH GRAPHITE-BASE PIPE COMPOUND AND BUTT CONDUIT ENDS. TOUCH UP MARRED SURFACES AND FIELD-CUT THREADS, CRC-COLD GALVANIZED.

EMT SHALL BE PERMITTED FOR BRANCH CIRCUITS ONLY, IN DRY LOCATIONS, DRY WALLS, HUNG CEILINGS, HOLLOW BLOCK WALLS AND FURRED SPACES. EMT SHALL NOT BE PERMITTED IN RAISED FLOORS.

FLEXIBLE STEEL CONDUIT SHALL BE UTILIZED FOR SHORT CONNECTIONS WHERE RIGID CONDUIT IS IMPRACTICAL. FROM OUTLET BOX TO RECESSED LIGHTING FIXTURE: PROVIDE MINIMUM 4 FT AND MAXIMUM 6 FT LENGTHS. FOR FINAL CONNECTION TO MOTOR TERMINAL BOX, TRANSFORMER AND OTHER VIBRATING EQUIPMENT: PROVIDE WITH POLYVINYL SHEATHING AND GROUND CONDUCTOR. MINIMUM LENGTH: 18 IN. WITH SLACK. CONNECT GROUND CONDUCTOR TO ENCLOSURE OR RACEWAY AT EACH END. FOR EXPANSION JOINT CROSSINGS, CROSS AT RIGHT ANGLES AND ANCHOR ENDS.

CUT CONDUIT ENDS SQUARE. REAM SMOOTH. PAINT MALE THREADS OF FIELD THREADED RACEWAYS WITH GRAPHITE BASE PIPE COMPOUND. DRAW UP TIGHT WITH RACEWAY COUPLING.

ALL COUPLINGS SHALL BE COMPRESSION TYPE. NO SET SCREW FITTINGS.

EXPANSION FITTINGS SHALL BE INSTALLED AT RIGHT ANGLES WITH CLIP JOINT CENTERED IN EXPANSION JOINT. PROVIDE A LENGTH OF RUN IN ACCORDANCE MANUFACTURER'S RECOMMENDATIONS. PRESET FITTINGS SHALL ALLOW FOR TEMPERATURE VARIATION.

RACEWAYS PASSING THROUGH FIRE-RATED CONSTRUCTION: SEAL OPENING WITH FIRE SEALANT.

D. ERECT WALL AND SWITCH OUTLETS IN ADVANCE OF FURRING AND FIREPROOFING. OUTLET BOXES SHALL BE SET SQUARE AND TRUE WITH BUILDING FINISH. SECURE TO BUILDING STRUCTURE BY ADJUSTABLE STRAP IRON OR GROUT IN WITH MASONRY. VERIFY OUTLET LOCATIONS IN FINISHED SPACES WITH ARCHITECTURAL DRAWINGS OF INTERIOR DETAILS AND FINISHES. PROVIDE BARRIERS BETWEEN SWITCHES CONNECTED TO DIFFERENT PHASES FOR VOLTAGES EXCEEDING 150 VOLTS TO GROUND.

E. PANEL, JUNCTION AND PULL BOXES SHALL BE LOCATED CLEAR OF OTHER TRADES. CONCEAL JUNCTION AND PULL BOXES IN FINISHED SPACES. WHERE NECESSARY, REROUTE RACEWAYS OR MAKE OTHER ARRANGEMENTS FOR CONCEALMENT. BOXES SHALL BE ACCESSIBLE. SUPPORT BOXES FROM BUILDING STRUCTURE, INDEPENDENT OF CONDUIT. PROVIDE FLOOR-TO-CEILING CHANNELS FOR MOUNTING ON DRYWALL AND LIGHTWEIGHT CONSTRUCTION. OUTLET BOXES FOR FIXTURES RECESSED IN HUNG CEILINGS SHALL BE ACCESSIBLE THROUGH OPENING CREATED BY REMOVAL OF FIXTURE. SECURE TO BLACK IRON SUPPORT. MOTOR TERMINAL BOXES: COORDINATE WITH MOTOR BRANCH CIRCUIT CONDUIT AND WIRING; ADD BOX VOLUME WHERE REQUIRED.

F. PERFORM CONTINUITY TESTS OF RESISTANCE OF FEEDER CONDUITS FROM SERVICE TO POINT OF FINAL DISTRIBUTION USING 1 CONDUCTOR RETURN. MAXIMUM RESISTANCE SHALL BE 25 OHMS.

8. WIRE AND CABLE:

A. PROVIDE WIRE AND CABLE COMPLETE WITH ACCESSORIES. SIZE REFERENCE SHALL BE AWG EXCEPT AS NOTED.

B. CONDUCTORS SHALL BE COPPER, ASTM STANDARD SOLID (NO. 10 AND SMALLER) OR STRANDED (NO. 8 AND LARGER). GENERAL USE CABLING SHALL BE NO. 12 MINIMUM. AT 120 VOLTS AND OVER 100 FT CIRCUIT LENGTH PROVIDE NO. 10 MINIMUM. AT 265 VOLTS AND OVER 200 FT CIRCUIT LENGTH PROVIDE NO. 10 MINIMUM.

CONTROL AND ALARM CABLING, EXCEPT AS NOTED, SHALL BE NO. 14 MINIMUM. AT 120 VOLTS AND OVER 200 FT CIRCUIT LENGTH PROVIDE NO. 12 MINIMUM.

OTHER VOLTAGES AND PHASES: ADJUST CABLE SIZING AS REQUIRED TO MAINTAIN VOLTAGE DROP. INCREASE RACEWAY SIZES FOR LARGER WIRE AS REQUIRED.

C. INSULATION SHALL BE RUBBER AND THERMOPLASTIC MEETING ASTM AND IPCEA STANDARDS. TYPE THW OR THWN SHALL BE UTILIZED FOR FEEDERS AND BRANCH CIRCUITS EXCEPT AS NOTED. TYPE SFF-2 SHALL BE UTILIZED FOR BRANCH CIRCUITS LOCATED IN WIRING CHANNELS OF CONTINUOUS FLUORESCENT FIXTURES AND IN AMBIENT TEMPERATURES OVER 90 °C. FOR UNGROUNDED ISOLATED BRANCH CIRCUITS, PROVIDE CROSS-LINKED POLYETHYLENE INSULATION (TYPE XHHW).

D. METAL CLAD CABLE CABLE (MC) SHALL

SYMBOL LIST

	SINGLE LINE DUCTWORK OR EQUIPMENT – NEW
	SINGLE LINE DUCTWORK OR EQUIPMENT – EXISTING
—X— —X— —X—	DUCTWORK OR EQUIPMENT TO BE REMOVED
	DUCTWORK WITH ACOUSTICAL LINING
	DUCTWORK UNDER POSITIVE PRESSURE (SUPPLY AIR OR FAN DISCHARGE)
	DUCT UNDER NEGATIVE PRESSURE (RETURN,EXHAUST, OR OUTSIDE AIR)
VD	VOLUME DAMPER
FD/AD	FIRE DAMPER AND ACCESS DOOR
BDD	BACK DRAFT DAMPER
M	MOTORIZED DAMPER
M FSD/AD	COMBINATION SMOKE AND FIRE DAMPER (ELECTRIC) AND ACCESS DOOR
℄	CENTER LINE
∮	CUBIC FEET PER MINUTE
⌀	DIAMETER
	AIRFLOW DIRECTION
□	SQUARE FEET
1.0 □ F.A.	LOUVER IN DOOR – MIN. 1.0 SF FREE AREA
UC	UNDERCUT DOOR
	POINT OF CONNECTION
	POINT OF DISCONNECTION
CD-A 400	TYPE A CEILING DIFFUSER (400 CFM SUPPLY AIR)
	RECTANGULAR DIFFUSER WITH BLANKING PLATE
	VANED ELBOW
	RADIUS ELBOW
	SEE DUCT DETAILS FOR TYPE OF BRANCH CONNECTION
	DUCT FLEXIBLE CONNECTION
	VERTICAL DUCT DROP (IN DIRECTION OF AIRFLOW)
	VERTICAL DUCT RISE (IN DIRECTION OF AIRFLOW)
T	THERMOSTAT
DET	DUCT SMOKE DETECTOR
	SECTION DESIGNATION SHEET NO. WHERE SECTION IS SHOWN
	NEW PIPE WITH DIRECTION OF FLOW
	EXISTING PIPING
	PIPING TO BE REMOVED
	PIPE DROP
	PIPE RISE

ABBREVIATIONS

A	AMPERES	FPS	FEET PER SECOND
AV	AUTOMATIC AIR VENT	FT	FEET
AC	AIR CONDITIONING	FTR	FINNED TUBE RADIATION
ACCU	AIR COOLED CONDENSING UNIT	G	GAUGE
AD	ACCESS DOOR	GAL	GALLON
AFF	ABOVE FINISHED FLOOR	HC	HEATING COIL
AHU	AIR HANDLING UNIT	HD	HEAD
AL	ACOUSTICAL LINING	HR	HOUR
AP	ACCESS PANEL	HT	HEIGHT
BDD	BACK DRAFT DAMPER	HV	HEATING AND VENTILATING
BHP	BRAKE HORSEPOWER	HWR	HOT WATER RETURN
BMS	BUILDING MANAGEMENT SYSTEM	HWS	HOT WATER SUPPLY
BTU	BRITISH THERMAL UNIT	HZ	FREQUENCY
BTUH	BTUH PER HOUR	IN	INCH OR INCHES
CCW	COUNTER CLOCKWISE	KW	KILOWATT
CD	CEILING DIFFUSER	L	LENGTH
CFM	CUBIC FEET PER MINUTE	LAT	LEAVING AIR TEMPERATURE
CG	CEILING GRILLE	LBS	POUNDS
CHWR	CHILLED WATER RETURN	LBD	LEAVING DRY BULB TEMPERATURE
CHWS	CHILLED WATER SUPPLY	LIN FT	LINEAR FEET
CLG	CEILING	LPS	LOW PRESSURE SUPPLY
COND	CONDENSATE	LPR	LOW PRESSURE RETURN
CP	CONDENSATE PUMP	LRA	LOCKED ROTOR AMPS
CR	CEILING REGISTER	LWB	LEAVING WET BULB TEMPERATURE
CU FT	CU FT	LWT	LEAVING WATER TEMPERATURE
CU IN	CU IN	MAV	MANUAL AIR VENT
CWR	CONDENSER WATER RETURN	MAX	MAXIMUM
CWS	CONDENSER WATER SUPPLY	MBH	THOUSAND BTUH PER HOUR
DWG	DRAWING	MER	MECHANICAL EQUIPMENT ROOM
CV	CONSTANT VOLUME	MHP	MOTOR HORSEPOWER
CW	CLOCKWISE	MIN	MINIMUM
D	DROP	NO.	NUMBER
DB	DRY BULB	NTS	NOT TO SCALE
DX	DIRECT EXPANSION	OA	OUTSIDE AIR
DHW	DOMESTIC HOT WATER	OAI	OUTSIDE AIR INTAKE
DIAM	DIAMETER	OED	OPEN ENDED DUCT
DN	DOWN	PD	PRESSURE DROP
(E)	EXISTING TO REMAIN	PRV	PRESSURE REDUCING VALVE
EAT	ENTERING AIR TEMPERATURE	PSI	POUNDS PER SQUARE INCH
EDB	ENTERING DRY BULB TEMPERATURE	PSIA	PSI ABSOLUTE
EF	EXHAUST FAN	PSIG	PSI GAUGE
EG	EXHAUST GRILLE	R	RISE
EL	ELEVATION	RA	RETURN AIR
ELEC	ELECTRIC	RG	RETURN GRILLE
EQ	EQUAL	RLA	RUNNING LOAD AMPS
(ER)	EXISTING TO BE REMOVED	RM	ROOM
(ERR)	EXISTING TO REMOVED AND RELOCATED	ROT	ROTATION
EWB	ENTERING WET BULB	RPM	REVOLUTIONS PER MINUTE
EWT	ENTERING WATER TEMPERATURE	(RRO)	EXIST TO BE REMOVED AND RETURNED TO OWNER
EXH	EXHAUST	SA	SUPPLY AIR
EXP	EXPANSION	SP	STATIC PRESSURE
EXIST	EXISTING	SPEC	SPECIFICATION
°F	DEGREES FAHRENHEIT	TEMP	TEMPERATURE
F&T	FLOAT AND THERMOSTATIC	TR	TOP REGISTER
FA	FREE AREA (SQ.FT.)	TRD	TRANSFER DUCT
FC	FLEXIBLE CONNECTION	TYP	TYPICAL
FD	FIRE DAMPER	TX	TOILET EXHAUST
FLA	FULL LOAD AMPERES	V	VOLTS
FPI	FINS PER INCH	VA	VENTILATION AIR
FPM	FEET PER MINUTE	WMS	WIRE MESH SCREEN

MECHANICAL GENERAL NOTES

1. GENERAL NOTES, SYMBOL LIST AND DETAILS ARE APPLICABLE TO ALL HVAC/MECHANICAL DRAWINGS.
2. DRAWINGS ARE DIAGRAMMATIC. DETERMINE EXACT LOCATIONS OF SYSTEMS AND COMPONENTS IN FIELD. RELOCATE EXISTING WORK THAT INTERFERES WITH WORK OF THIS CONTRACT.
3. COORDINATE THIS WORK WITH THAT OF OTHER TRADES.
4. DIMENSIONS SHOWN ON PLAN ARE HORIZONTAL. DIMENSIONS SHOWN IN ELEVATION ARE VERTICAL EXCEPT IN WAY OF STRUCTURAL STEEL, DIMENSIONS ARE MEASURED PERPENDICULAR TO FLANGE.
5. NEITHER ACCURACY NOR COMPLETENESS OF SERVICES AND UTILITY LOCATIONS SHOWN ON DRAWINGS IS GUARANTEED. DETERMINE EXACT LOCATIONS OF EXISTING SERVICES AND UTILITIES IN FIELD, WHETHER OR NOT SHOWN ON DRAWINGS. EXERCISE CAUTION AND IDENTIFY LOCATIONS OF UNMARKED UTILITY LINES AS NECESSARY TO PERFORM WORK OF THIS SECTION.
6. PRODUCT INSTALLATION SHALL ADHERE TO MANUFACTURER'S REQUIREMENTS.
7. PROVIDE ACCESS PANELS FOR EQUIPMENT THAT REQUIRES SERVICE OR MAINTENANCE.
8. PROVIDE HANGERS, ANCHORS, INSERTS, SUPPLEMENTAL STEEL, AND SUPPORTS AS REQUIRED TO SUPPORT DUCTWORK, PIPING, AND EQUIPMENT FROM STRUCTURE.
9. RUN DUCTS AND PIPING CONCEALED WITHIN WALLS, CEILINGS, OR SOFFITS, UNLESS OTHERWISE SPECIFIED AND CLEAR OF CEILING INSERTS. COORDINATE ROUTING WITH ARCHITECT AND CONSTRUCTION METHODS.
10. INSTALL THERMOSTATS 4'-6" ABOVE FINISHED FLOOR UNLESS OTHERWISE DIRECTED BY ARCHITECT.
11. SPECIFICATIONS ARE PART OF THESE DOCUMENTS AND SCOPE OF WORK.
12. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATIONS OF AIR DEVICES.
13. PROVIDE 36" CLEARANCE IN FRONT OF ALL ELECTRIC CONTROL PANELS PER N.E.C. AND MFG. REQUIREMENTS.

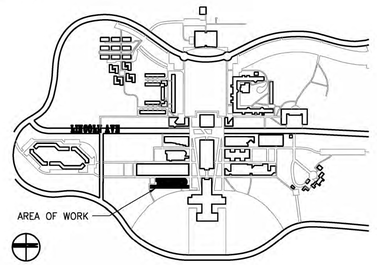
MECHANICAL DEMOLITION NOTES

1. THE CONTRACTOR SHALL INCLUDE IN HIS PRICE ALL COSTS ASSOCIATED WITH REMOVALS AND RELOCATIONS OF HVAC WORK AS DESCRIBED ON THE DRAWINGS AND IN THE SPECIFICATIONS WITH ALLOWANCES FOR EXPECTED OR UNFORESEEN DIFFICULTIES WHEN CONCEALED WORK HAS BEEN OPENED. NO CLAIMS FOR ADDITIONAL WORK ASSOCIATED WITH DEMOLITION WILL BE ACCEPTED, EXCEPT IN CERTAIN CASES CONSIDERED JUSTIFIABLE BY THE OWNER/ENGINEER.
2. THE CONTRACTOR SHALL PERFORM DEMOLITION AND REMOVAL WORK WITH MINIMUM INTERFERENCE TO FUNCTIONING HVAC SYSTEMS. ALL AFFECTED SYSTEMS SHALL BE RECONNECTED AND RESTORED.
3. DEMOLITION AND REMOVAL WORK SHALL BE PERFORMED IN A NEAT AND WORKMANLIKE MANNER. THE CONTRACTOR SHALL PATCH, REPAIR OR OTHERWISE RESTORE ANY DAMAGED INTERIOR OR EXTERIOR BUILDING SURFACE TO ITS ORIGINAL CONDITION.
4. THE CONTRACTOR SHALL REMOVE ALL DUCT AND PIPING SUPPORTS, ETC. FROM PARTITIONS THAT ARE TO BE REMOVED. WHERE THE REMOVAL OF THESE ITEMS DISRUPTS EXISTING PIPING THAT IS TO REMAIN, THE CONTRACTOR SHALL INSTALL AND PROVIDE BYPASS CONNECTIONS AS NECESSARY.
5. ALL PIPING WHICH BECOMES EXPOSED DURING THE ALTERATION WORK SHALL BE REMOVED AND REROUTED CONCEALED BEHIND FINISHED SURFACES.
6. PORTIONS OF PIPING AND DUCTWORK TO BE REMOVED OR ABANDONED AS A RESULT OF DEMOLITION WORK, BUT WHICH ARE REQUIRED TO REMAIN ACTIVE, SHALL BE CUT AT CONVENIENT LOCATIONS, REROUTED AND RECONNECTED.
7. THE CONTRACTOR SHALL NOTIFY THE OWNER, AT THE APPROPRIATE TIME, OF THE PROJECTED DEMOLITION AND PHASING SCHEDULE SO THAT REMOVAL OR RELOCATION OF AFFECTED UTILITIES MAY BE CARRIED OUT IN COORDINATION WITH THE PROJECT REQUIREMENTS.
8. ALL EXISTING MATERIAL AND EQUIPMENT IN USABLE CONDITION, WHICH IS TO BE REMOVED UNDER THIS CONTRACTOR, SHALL REMAIN THE PROPERTY OF THE OWNER OR SHALL BE DISPOSED OF BY THE HVAC CONTRACTOR, AS DIRECTED BY THE OWNER.
9. ARRANGE TO WORK CONTINUOUSLY, INCLUDING OVERTIME IF REQUIRED, TO ASSURE THAT SYSTEMS WILL BE SHUT DOWN ONLY DURING THE TIME ACTUALLY REQUIRED TO MAKE THE NECESSARY CONNECTIONS TO THE EXISTING SYSTEMS.
10. THE SHUTDOWN OF EXISTING BUILDING HVAC SERVICES SHALL BE COORDINATED WITH THE OWNER. MAKE ARRANGEMENTS AT LEAST 5 BUSINESS DAYS PRIOR TO A SHUTDOWN.
11. CONTRACTOR SHALL COMPLY WITH ALL FEDERAL, STATE AND LOCAL REQUIREMENTS REGARDING DISPOSAL OR REFRIGERANTS.

INSPECTIONS AND TESTING OF MECHANICAL SYSTEMS

1. THE FOLLOWING INSPECTIONS, TESTS, PROGRESS INSPECTIONS AND SPECIAL INSPECTIONS SHALL BE CONSIDERED PART OF THE CONTRACT WORK.
2. UPON COMPLETION OR PARTIAL COMPLETION OF THE PERMITTED MECHANICAL WORK, INSPECTIONS, PROGRESS INSPECTIONS, SPECIAL INSPECTIONS AND TESTS SHALL BE CONDUCTED BY APPROVED AGENCIES OR SPECIAL INSPECTORS QUALIFIED TO CONDUCT SUCH INSPECTIONS AND TESTS. INSPECTIONS AND PROGRESS INSPECTIONS SHALL BE PERFORMED IN COMPLIANCE WITH SECTION BC 109 OF THE NEW YORK STATE BUILDING CODE. SPECIAL INSPECTIONS SHALL BE PERFORMED IN COMPLIANCE WITH SECTIONS BC 1704 AND BC 1707 OF THE NEW YORK STATE BUILDING CODE, REFER TO ARTICLE 116 OF CHAPTER 1 OF TITLE 28 OF THE ADMINISTRATIVE CODE FOR ADDITIONAL PROVISIONS RELATED TO INSPECTIONS.
3. CONTRACTOR SHALL NOTIFY THE SPECIAL INSPECTION AGENCY (SIA) 1 WEEK IN ADVANCE OF PROPOSED INSTALLATIONS AND/OR CONCEALMENT OF INSTALLATIONS THAT REQUIRE VISUAL OR INTRUSIVE/DESTRUCTIVE TESTING, SUCH AS FIRESTOPPING. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING SUFFICIENT OPENINGS FOR THE SIA TO PERFORM THEIR REQUIRED VISUAL AND PHYSICAL INSPECTION AT NO ADDITIONAL COST, INCLUDING OPENING AND REPAIRING COMPLETED MILLWORK OR GENERAL CONSTRUCTION FINISHES CONCEALING INSTALLATIONS TO BE INSPECTED. CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIR/RESTORATION OF INSTALLATIONS THAT REQUIRE DESTRUCTIVE TESTING.
4. SPECIAL INSPECTIONS OF MECHANICAL SYSTEMS SHALL INCLUDE THE FOLLOWING AS APPLICABLE TO THE SYSTEM:
   - A. VISUAL CERTIFICATION THAT REQUIRED COMPONENTS OF SUCH SYSTEMS ARE COMPLETE IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION GUIDELINES AND THE APPROVED CONSTRUCTION DOCUMENTS.
   - B. SUPPORTS, HANGERS, SEISMIC BRACING, AND VIBRATION ISOLATION EQUIPMENT ARE PROPERLY SPACED AND ANCHORED TO SUPPORTING STRUCTURE.
   - C. INSTALLATION OF REQUIRED SIGNAGE AND SAFETY INSTRUCTIONS.
   - D. ELECTRICAL COMPONENTS ARE INSTALLED AND ELECTRICAL SIGN– OFF ISSUED.
   - E. VENTILATION BALANCING REPORT IS COMPLETE AND IN ACCORDANCE WITH DESIGN DOCUMENTS, AND THE SYSTEM IS OPERATING AS DESIGNED.
   - F. REQUIRED LABELING, OPERATIONAL INSTRUCTIONS AND SAFETY SIGNAGE PROPERLY POSTED.
   - G. ALL RELATED SPECIAL INSPECTIONS FOR SUCH SYSTEMS ARE COMPLETE.

PLOT PLAN



MECHANICAL DRAWING LIST

M-001.00	MECHANICAL SYMBOL LIST, GENERAL NOTES, ABBREVIATIONS, AND DRAWING LIST
M-100.00	MECHANICAL DEMOLITION FLOOR PLAN
M-200.00	MECHANICAL CONSTRUCTION FLOOR PLAN
M-201.00	MECHANICAL CONSTRUCTION ROOF PLAN
M-300.00	MECHANICAL SCHEDULES
M-400.00	MECHANICAL DETAILS
M-500.00	MECHANICAL SPECIFICATIONS

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MUSIC STUDIO A
AV ROOM AC INSTALLATION

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submission history

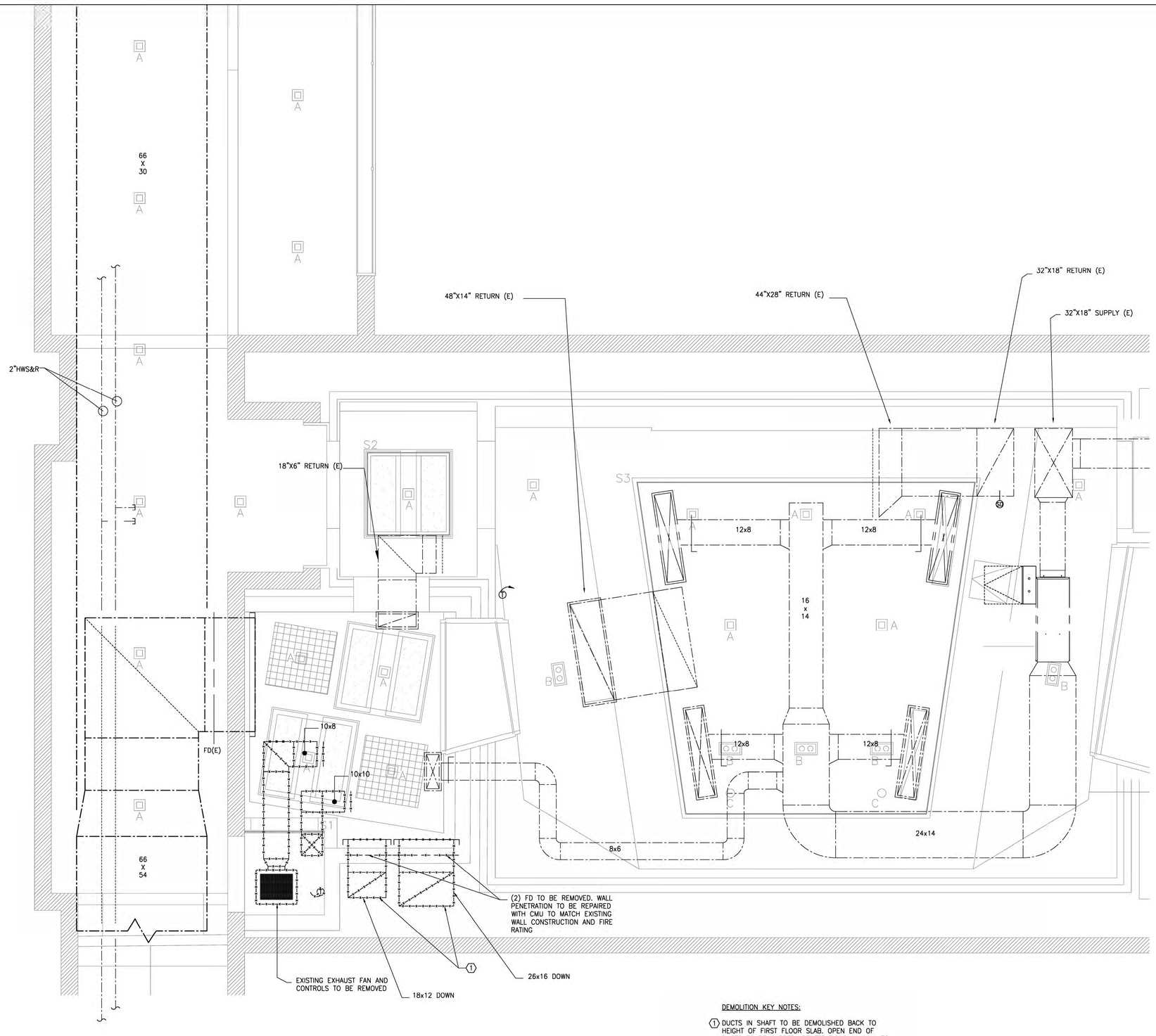
△	DATE	SUBMISSION / REVISION NAME
	07/15/2025	ISSUED FOR CLIENT REVIEW
	01/09/2026	ISSUED FOR BID

ce project #	22071	drawn by	AF
date	01/09/2026	checked by	CM

drawing title

MECHANICAL COVER SHEET

drawing no	scale	sheet no
M-001.00	As Noted	01 of 07



DEMOLITION KEY NOTES:

(1) DUCTS IN SHAFT TO BE DEMOLISHED BACK TO HEIGHT OF FIRST FLOOR SLAB. OPEN END OF DUCTS TO BE CAPPED. PENETRATIONS IN WALL TO BE FILLED TO MATCH EXISTING WALL CONSTRUCTION.

1 MECHANICAL DEMOLITION REFLECTED CEILING PLAN
SCALE: 1/2" = 1'-0"

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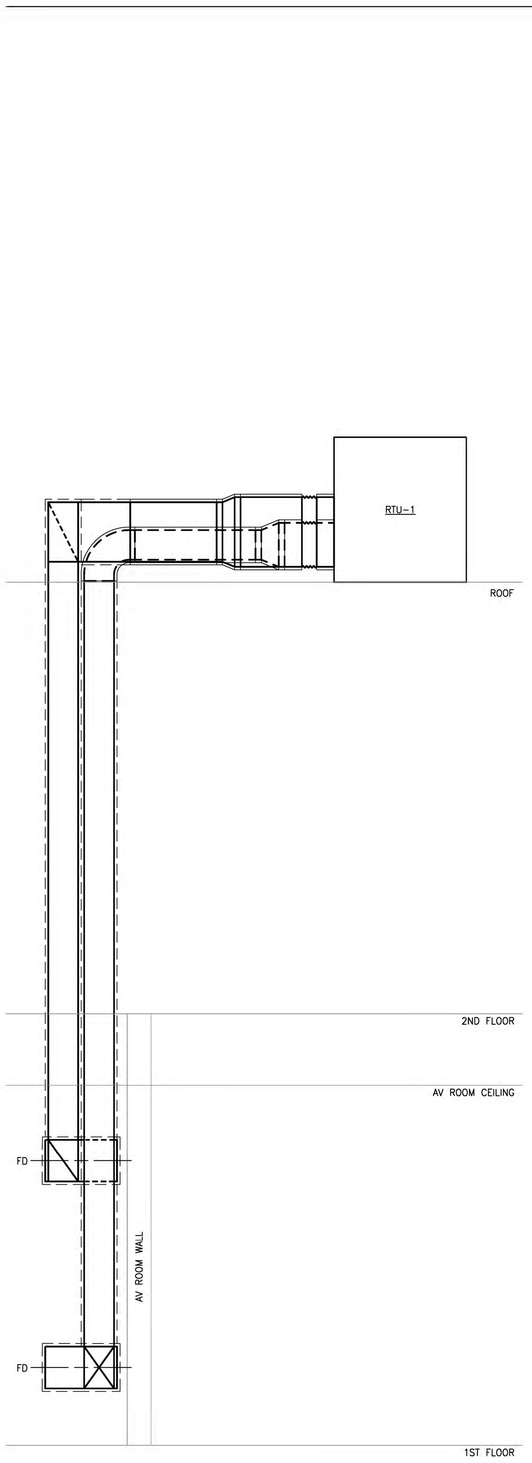
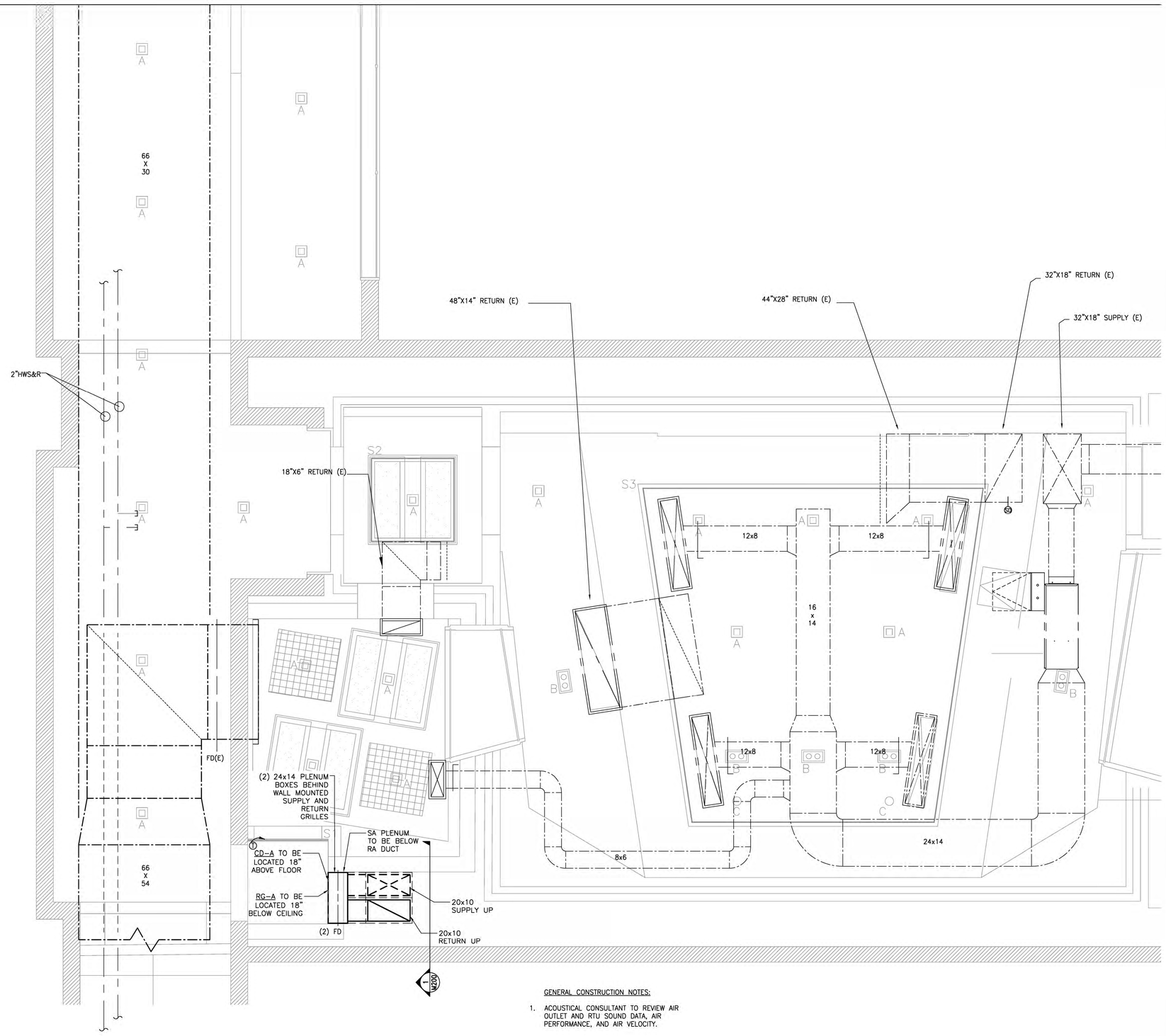
MECHANICAL
DEMOLITION FLOOR
PLAN

drawing no	scale	sheet no
M-100.00	As Noted	02 of 07



1 MECHANICAL SECTION VIEW
SCALE: 1/2" = 1'-0"



2 MECHANICAL CONSTRUCTION REFLECTED CEILING PLAN
SCALE: 1/2" = 1'-0"

GENERAL CONSTRUCTION NOTES:

1. ACOUSTICAL CONSULTANT TO REVIEW AIR OUTLET AND RTU SOUND DATA, AIR PERFORMANCE, AND AIR VELOCITY.

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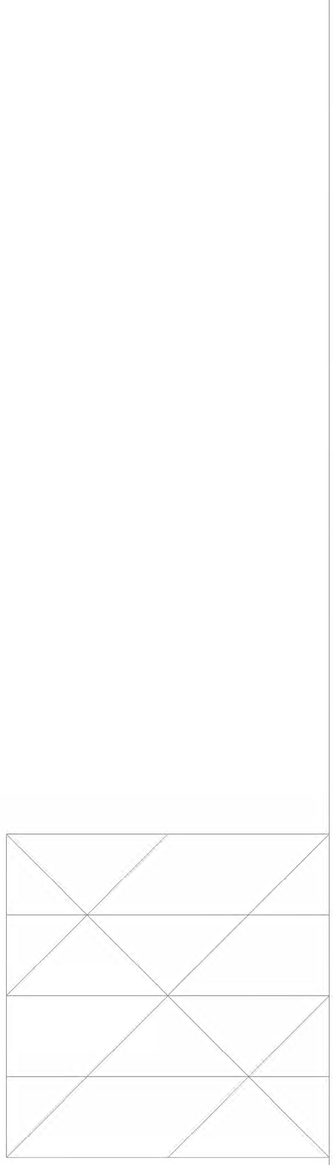
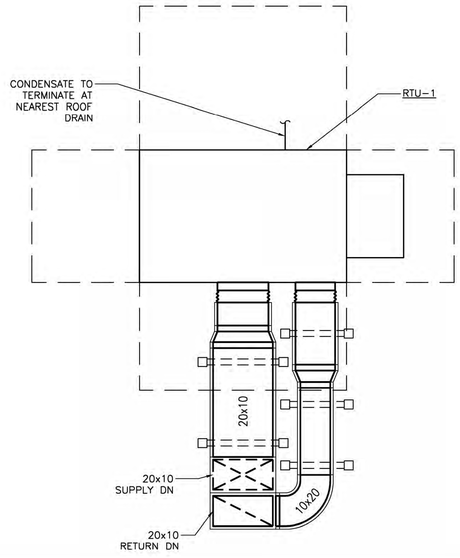
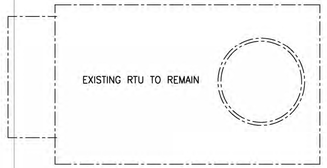
MECHANICAL CONSTRUCTION FLOOR PLAN

drawing no	scale	sheet no
M-200.00	As Noted	03 of 07







GENERAL CONSTRUCTION NOTES:

1. COORDINATE FINAL LOCATION AND SUPPORTS WITH STRUCTURAL ENGINEER.

1 MECHANICAL CONSTRUCTION ROOF PLAN
SCALE: 1/2" = 1'-0"

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MECHANICAL CONSTRUCTION ROOF PLAN

drawing no	scale	sheet no
M-201.00	As Noted	04 of 07

DIFFUSER, GRILLE & REGISTER SCHEDULE

TAG	SERVICE	CEILING TYPE	CFM RANGE	NO. OF SLOTS	NECK SIZE (IN.)	MAX NOISE CRITERIA (NC)	MAX THROW (FT)	FACE OVERALL DIMENSIONS WXL (IN.)	MATERIAL	BORDER TYPE	COLOR AND FINISH	MAX P.D	MANUFACTURER AND MODEL	NOTES
CD-A	SUPPLY	SEE PLANS	0-1200	-	24X14	20	39	24X14	ALUMINUM	PER ARCHITECT	PER ARCHITECT	0.03	TITUS 272RL	1-4
RG-A	RETURN	SEE PLANS	0-1200	-	24X14	20	-	24X14	ALUMINUM	PER ARCHITECT	PER ARCHITECT	0.024	TITUS 50F	2-4

NOTES:
1. FURNISH AND INSTALL DIFFUSERS WITH DOUBLE DEFLECTION BLADES SET AT 22.5 DEGREE DEFLECTION.
2. FURNISH WITH NO SCREW HOLES.
3. COORDINATE BORDERS WITH WALL CONSTRUCTION.
4. COORDINATE COLOR AND FINISH WITH ARCHITECT.

ROOF TOP AIR CONDITIONING UNIT SCHEDULE

TAG	LOCATION	SERVICE	SUPPLY FAN DATA					COOLING DATA						ELECTRICAL DATA				WEIGHT (LBS.)	MANUFACTURER AND MODEL NUMBER	NOTES
			CFM	FAN QTY.	ESP (IN. W.C.)	RPM	BHP	EAT (°F)		LAT (°F)		TOTAL CAPACITY (MBH)	SENSIBLE CAPACITY (MBH)	EER/SEER	V/PH/HZ	FLA	MCA	MOP			
								DB	WB	DB	WB									
RTU-1	ROOF	AV ROOM	1200	1	1.0	1006	0.47	80	67	57.3	56.3	37.85	28.13	12.0/14.0	208/60/3	19.3	23.0	30.0	RTU-1	TRANE TSK036A3S00	1-5

NOTES:
1. PROVIDE WITH DISCONNECT SWITCH MOUNTED IN/ON UNIT.
2. PROVIDE WITH VIBRATION ISOLATION. REFER TO SCHEDULE.
3. PROVIDE WITH AIRSIDE ECONOMIZER AND COMPARATIVE DUAL ENTHALPY OPERATION CONTROLS.
4. PROVIDE LOW AMBIENT KIT.
5. PROVIDE SIMBIO 700 CONTROLLER WITH OPEN BACNET PROTOCOL TO TIE INTO SIEMEN BMS.
6. PROVIDE WITH SUPPLY AIR FILTERS (2" MERV 8, 4-20X20X2).

VIBRATION ISOLATION

EQUIPMENT	BASE	ISOLATOR	DEFLECTION	NOTES
ROOF MOUNTED AHU	ROOF CURB	-	2"	-

NOTES:
1. ALL ISOLATION IS IN ADDITION TO ISOLATION PROVIDED INTEGRAL TO THE EQUIPMENT.
2. ALL EQUIPMENT TO BE SECURED TO AVOID TIPPING, SHIFTING, LATERAL MOVEMENT, OR MISALIGNMENT WITHOUT HINDERING ISOLATION.
3. ISOLATORS SHALL BE THE SAME TYPE FOR EACH PIECE OF EQUIPMENT. COORDINATE SIZE OF ISOLATOR WITH FINAL APPROVED SUBMITTAL AND MANUFACTURERS WEIGHT DISTRIBUTION INFORMATION.
4. COORDINATE ADDITIONAL ISOLATION REQUIREMENTS WITH ACOUSTICAL AND OR STRUCTURAL ENGINEER.
5. PROVIDE SEISMIC RESTRAINTS WHERE REQUIRED BY CODE.
6. ALL ISOLATORS TO BE TUNED BY THE CONTRACTOR SO THAT UNITS SIT PROPERLY AND ALLOW FOR SPECIFIED DEFLECTIONS, WITH MOVEMENT IN BOTH DIRECTIONS.
7. ISOLATORS TO BE RATED OR THE ENVIRONMENT THAT IT IS MOUNTED IN (EXTERIOR, MOISTURE, ETC.).
8. ALL DUCTWORK CONNECTED TO EQUIPMENT WITH A MOTOR SHALL HAVE FLEXIBLE DUCT CONNECTIONS.

DUCTWORK INSULATION

SYSTEM	TYPE	MINIMUM THICKNESS	DENSITY	NOTES
CONCEALED SA/RA/OA IN UNCONDITIONED SPACE	FIBERGLASS BLANKET	2", MINIMUM R-6.0	1 LB/FT^3	SIMILAR TO MANVILLE MICROLITE FSK
EXPOSED SA/RA/OA	FIBERGLASS BOARD	1.5", MINIMUM R-6.0	3 LB/FT^3	SIMILAR TO MANVILLE TYPE 814 SPIN-GLASS ALL PURPOSE

NOTES:
1. OUTDOOR DUCTWORK SHALL INCLUDE PROVISIONS TO PROPERLY SEAL/COAT THE INSULATION AGAINST UV DAMAGE, WATER/MOISTURE, PHYSICAL DAMAGE, ETC. REFER TO SPECIFICATIONS. ALL OUTDOOR DUCT INSULATION TO BE PAINTED WHITE.
2. INSTALL ACOUSTICAL DUCT LINING A MINIMUM OF 10' DOWNSTREAM OF ALL TERMINAL BOXES, 20' ON EACH SIDE OF FANS AND FCU'S, TRANSFER DUCTS, PLENUMS, AND ANYWHERE NOTED SPECIFICALLY ON PLANS.
3. ACOUSTICAL LINING SHALL NOT BE INSTALLED 15' DOWNSTREAM OF HUMIDIFIERS OR WITHIN MOISTURE LADEN AIRSTREAMS.
4. PREP SURFACES OF INSULATION FOR PAINTING OR VISUAL TREATMENTS. COORDINATE WITH ARCHITECT.
5. WHERE DUCTS ARE PROVIDED WITH ACOUSTICAL LINING, EXTERNAL INSULATION MAY BE REDUCED IN THICKNESS PROVIDED THE OVERALL R-VALUE OF THE DUCT (WHEN INCLUDING BOTH INTERNAL LINING AND EXTERNAL INSULATION) MEETS THE MINIMUM STATED.
6. REFER TO SPECIFICATIONS FOR INSTALLATION METHODS.
7. INSULATION SHALL NOT BE BROKEN OR FOREGONE FOR ANY REASON. PROVIDE INSULATION SHIELDS, CARRIERS, ETC. AS NEEDED. ACCESS DOORS ARE TO BE CLEARLY MARKED AND PROVIDED WITH AN ACCESSIBLE, REMOVABLE INSULATION PANEL (OR USE INSULATED ACCESS DOORS WITH EQUIVALENT R VALUE).
8. ADEQUATE SPACE FOR SPECIFIED INSULATION SHALL BE MADE DURING THE INSTALLATION. INSULATION SHALL NOT BE CRUSHED LESS THAN THICKNESS REQUIRED BY MANUFACTURER TO MEET THE R VALUE SPECIFIED.
9. INSTALL INSULATION PER MANUFACTURERS REQUIREMENTS.

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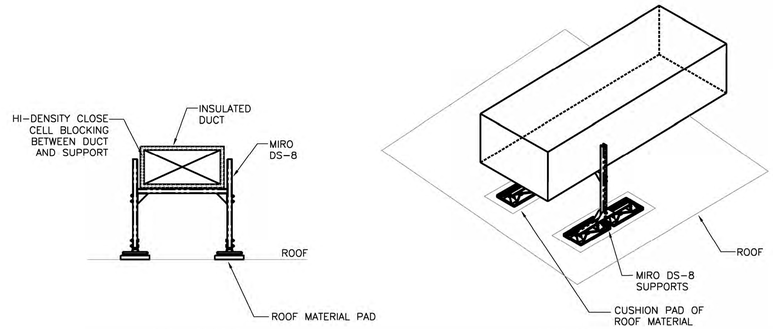
submission history

△	DATE	SUBMISSION / REVISION NAME
	07/15/2025	ISSUED FOR CLIENT REVIEW
	01/09/2026	ISSUED FOR BID

ce project #	22071	drawn by	AF
date	01/09/2026	checked by	CM

drawing title
MECHANICAL SCHEDULES

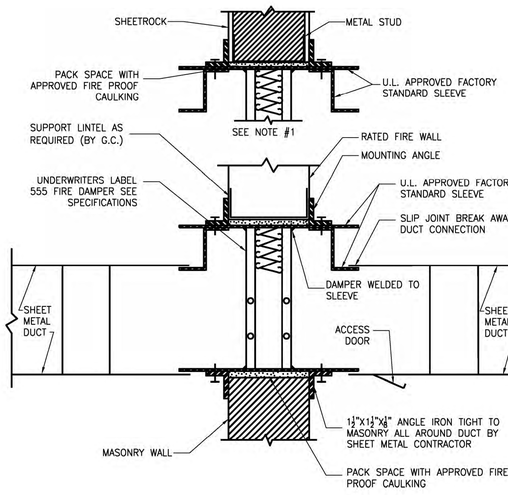
drawing no	scale	sheet no
M-300.00	As Noted	05 of 07



SECTION VIEW

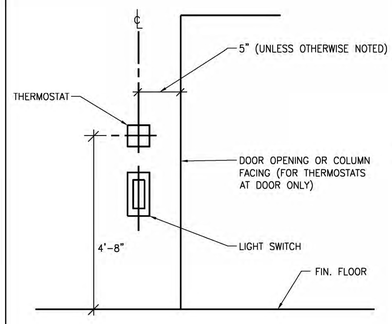
ISOMETRIC VIEW

DUCT SUPPORT DETAIL ON ROOF

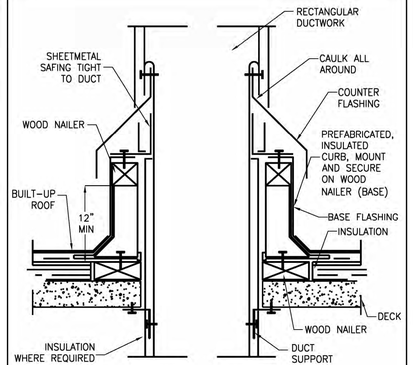


NOTES:
1. IN RATED SHEETROCK WALLS, METAL STUD FRAME PROVIDED BY GENERAL CONTRACTOR.
2. TYPICAL FOR DUCTS 12" OR LESS IN DEPTH.
3. INSTALL DAMPER PER MANUFACTURERS INSTRUCTION AND U.L. LISTING.

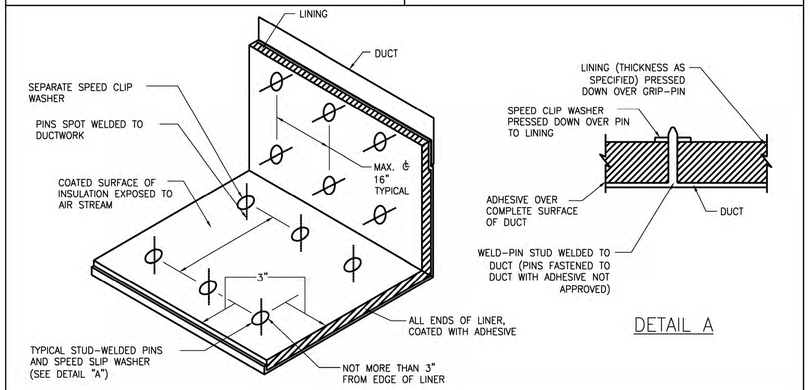
OUT OF AIR STREAM FIRE DAMPER



THERMOSTAT LOCATION



DUCT PENETRATION THROUGH ROOF



DETAIL A

SOUND LINING INSTALLATION

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M-400.00	As Noted	06 of 07

1. GENERAL

A. ALL APPLICABLE CODES, LAWS AND REGULATIONS GOVERNING OR RELATING TO ANY PORTION OF THIS WORK ARE HEREBY INCORPORATED INTO AND MADE A PART OF THESE SPECIFICATIONS, AND THEIR PROVISIONS SHALL BE CARRIED OUT BY THE CONTRACTOR WHO SHALL INFORM THE OWNER, PRIOR TO SUBMITTING A PROPOSAL, OF ANY WORK OR MATERIALS WHICH VIOLATE ANY OF THE ABOVE LAWS AND REGULATIONS. ANY WORK DONE BY THE CONTRACTOR CAUSING SUCH VIOLATION SHALL BE CORRECTED BY THE CONTRACTOR.

B. INVESTIGATE EACH SPACE THROUGH WITH EQUIPMENT MUST BE MOVED. WHERE NECESSARY, EQUIPMENT SHALL BE SHIPPED FROM MANUFACTURER IN SECTIONS OF SIZE SUITABLE FOR MOVING THROUGH AVAILABLE RESTRICTIVE SPACES. ASCERTAIN FROM BUILDING OWNER AT WHAT TIMES OF DAY EQUIPMENT MAY BE MOVED THROUGH ALL AREAS.

C. DUCTWORK AND PIPING IS SHOWN DIAGRAMMATICALLY AND DOES NOT SHOW ALL OFFSETS, DROPS AND RISES OF RUNS. THE CONTRACTOR SHALL ALLOW IN HIS PRICE FOR ROUTING OF DUCTWORK AND PIPING TO AVOID OBSTRUCTIONS. EXACT LOCATIONS ARE SUBJECT TO APPROVAL OF ARCHITECT. COORDINATION WITH THE EXISTING SERVICES, INCLUDING THOSE OF OTHER TRADES IS REQUIRED.

D. SUPPORT ALL DUCTWORK AND PIPING FROM BUILDING STRUCTURE AND/OR FRAMING IN AN APPROVED MANNER. WHERE OVERHEAD CONSTRUCTION DOES NOT PERMIT FASTENING OR SUPPORTS FOR EQUIPMENT, FURNISH ADDITIONAL FRAMING. INSERTS SHALL BE STEEL, SLOTTED TYPE AND FACTORY PAINTED. SINGLE ROD SHALL BE SIMILAR TO GRINNELL FIG. 281. MULTI-ROD SHALL BE SIMILAR TO FEE & MASON SERIES 9000 WITH END CAPS AND CLOSURE STRIPS. MAXIMUM LOADING INCLUDING PIPES, DUCTWORK CONTENTS AND COVERING SHALL NOT EXCEED 75% OF RATED INSERT CAPABILITY. WHEN SUPPORTING FROM BUILDING USE BEAM CLAMPS IN APPROVED MANNER.

E. INSTALL WORK SO AS TO BE READILY ACCESSIBLE FOR OPERATION, MAINTENANCE AND REPAIR. MINOR DEVIATIONS FROM DRAWINGS MAY BE MADE TO ACCOMPLISH THIS, BUT CHANGES WHICH INVOLVE EXTRA COST SHALL NOT BE MADE WITHOUT APPROVAL.

F. REMOVAL AND RELOCATION OF CERTAIN EXISTING WORK WILL BE NECESSARY FOR THE PERFORMANCE OF THE GENERAL WORK. ALL EXISTING CONDITIONS CANNOT BE COMPLETELY DETAILED ON THE DRAWINGS. THE CONTRACTOR SHALL SURVEY THE SITE AND INCLUDE ALL CHANGES IN MAKING UP THE WORK PROPOSAL.

G. PLAN INSTALLATION OF NEW WORK AND CONNECTIONS TO EXISTING WORK TO ENSURE MINIMUM INTERFERENCE WITH REGULAR OPERATION OF EXISTING FACILITIES. ALL SYSTEM SHUTDOWNS AFFECTING OTHER AREAS SHALL BE COORDINATED WITH BUILDING OWNER. INSTALL ISOLATION VALVES AT POINT OF CONNECTION TO THE EXISTING PIPING. PROVIDE TEMPORARY DUCT CAPS AND/OR CONNECTIONS TO MINIMIZE SHUTDOWN TIME.

H. CONNECT NEW WORK TO EXISTING WORK IN NEAT AND APPROVED MANNER. RESTORE EXISTING WORK DISTURBED WHILE INSTALLING NEW WORK TO ACCEPTABLE CONDITION AS DETERMINED BY ARCHITECT.

I. DISCONNECT, REMOVE AND/OR RELOCATE EXISTING MATERIAL, EQUIPMENT AND OTHER WORK AS NOTED OR REQUIRED FOR PROPER INSTALLATION OF NEW SYSTEM.

J. THE CONTRACTOR SHALL KEEP ALL EQUIPMENT AND MATERIALS, AND ALL PARTS OF THE BUILDING, EXTERIOR SPACES AND ADJACENT STREETS, SIDEWALKS AND PAVEMENTS, FREE FROM MATERIAL AND DEBRIS RESULTING FROM THE EXECUTION OF THIS WORK. EXCESS MATERIALS WILL NOT BE PERMITTED TO ACCUMULATE EITHER ON THE INTERIOR OR THE EXTERIOR.

K. SEAL OPENINGS AROUND DUCTS AND PIPING THROUGH PARTITIONS, WALLS AND FLOORS (NOT IN SHAFTS) WITH APPROVED FIRESTOPPING METHODS.

L. PROVIDE ALL NECESSARY FLASHING AND COUNTER FLASHING TO MAINTAIN THE WATERPROOFING INTEGRITY OF THIS BUILDING AS REQUIRED BY THE INSTALLATION OR REMOVAL OF PIPES, DUCTS, LOUVERS, CONDUIT, AND EQUIPMENT. PROVIDE EQUIPMENT CURBS AND DUNNAGE STEEL AS REQUIRED.

M. ALL PRESENT MATERIAL, EQUIPMENT AND CONSTRUCTION DEBRIS TO BE REMOVED UNDER THIS CONTRACT SHALL BECOME THE PROPERTY OF THE CONTRACTOR WITH THE EXCEPTION OF SPECIFIC EQUIPMENT AND APPARATUS REQUESTED BY THE BUILDING REPRESENTATIVE, ARCHITECT OR AS NOTED TO BE RELOCATED ON THE DRAWINGS SHALL BE PROPERLY DISPOSED OF BY THIS CONTRACTOR.

N. MATERIALS AND WORKMANSHIP, UNLESS OTHERWISE NOTED, SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.

O. THE WORK IN THE BUILDING SHALL BE DONE WHEN AND AS DIRECTED, AND IN A MANNER SATISFACTORY TO THE OWNER. THE WORK SHALL BE PERFORMED SO AS TO CAUSE THE LEAST POSSIBLE INCONVENIENCE AND DISTURBANCE TO THE PRESENT OCCUPANTS.

P. THE CONTRACTOR'S PROPOSAL FOR ALL WORK SHALL BE PREDICATED ON THE PERFORMANCE OF THE WORK DURING REGULAR WORKING HOURS. WHEN SO DIRECTED, HOWEVER, THE CONTRACTOR SHALL INSTALL WORK IN OVERTIME AND THE ADDITIONAL COST TO BE CHARGED THEREFORE SHALL BE ONLY THE "PREMIUM" PORTION OF THE WAGES PAID.

Q. UNLESS OTHERWISE SPECIFICALLY SPECIFIED, INCLUDE ALL CUTTING AND PATCHING OF EXISTING FLOORS, WALLS, PARTITIONS AND OTHER MATERIALS IN THE EXISTING BUILDING. THE CONTRACTOR SHALL RESTORE THESE AREAS TO ORIGINAL CONDITION.

R. REMOVABLE ACCESS TILE AND/OR ACCESS DOOR ARE REQUIRED IN HUNG CEILINGS, SHAFTS AND WALLS FOR ALL VOLUME AND FIRE DAMPERS, AUTOMATIC DAMPERS AND ALL OTHER MECHANICAL EQUIPMENT AND DEVICES. HVAC CONTRACTOR TO FURNISH ACCESS LOCATION REQUIREMENTS TO GENERAL CONTRACTOR. ACCESS TILE IDENTIFICATION: PROVIDE BUTTONS, TABS, AND MARKERS TO IDENTIFY LOCATION OF CONCEALED VALVES, DAMPERS AND EQUIPMENT.

S. ALL MATERIAL AND EQUIPMENT SHALL HAVE A UL, CSA, OR OTHER TESTING APPROVED AGENCY NUMBER. THIS INFORMATION MUST BE INCLUDED IN THE SUBMITTAL PACKAGE.

T. ALL MATERIAL AND EQUIPMENT TO BE NEW UNLESS OTHERWISE NOTED AND SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.

U. SUBMISSION OF A PROPOSAL SHALL BE CONSTRUED AS EVIDENCE THAT A CAREFUL EXAMINATION OF THE PORTIONS OF THE EXISTING BUILDING, EQUIPMENT, ETC., WHICH AFFECT THIS WORK, AND THE ACCESS TO SUCH SPACES, HAS BEEN MADE AND THAT THE CONTRACTOR IS FAMILIAR WITH EXISTING CONDITIONS AND DIFFICULTIES THAT WILL AFFECT THE EXECUTION OF THE WORK. LATER CLAIMS SHALL NOT BE MADE FOR LABOR, EQUIPMENT OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN DURING SUCH AN EXAMINATION. THE ON-SITE INSPECTION SHALL VERIFY EXISTING DUCTWORK, PIPING (SIZES, CLEARANCES, ETC) AND CONDITIONS.

V. INSURANCE COVERAGE SHALL BE IN ACCORDANCE WITH BUILDING REQUIREMENTS AND SHALL INCLUDE A HOLD HARMLESS CLAUSE FOR OWNER AND ENGINEER.

W. THE FINAL ACCEPTANCE WILL BE MADE AFTER THE CONTRACTOR HAS ADJUSTED HIS EQUIPMENT, BALANCED THE VARIOUS SYSTEMS, DEMONSTRATED THAT IT FULFILLS THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS AND HAS FURNISHED ALL THE REQUIRED CERTIFICATES OF INSPECTION AND APPROVAL.

X. SPECIFICATIONS ARE OF SIMPLIFIED FORM AND INCLUDE INCOMPLETE SENTENCES. WORDS OR PHRASES SUCH AS "THE CONTRACTOR SHALL," "SHALL BE," "FURNISH," "PROVIDE," "A," "THE," AND "ALL" HAVE BEEN OMITTED FOR BREVITY.

Y. DEFINITIONS:

1) "PROVIDE": TO SUPPLY, INSTALL AND CONNECT UP COMPLETE AND READY FOR SAFE AND REGULAR OPERATION THE PARTICULAR WORK REFERRED TO UNLESS SPECIFICALLY OTHERWISE NOTED.

2) "INSTALL": TO ERECT, MOUNT AND CONNECT COMPLETE WITH RELATED ACCESSORIES.

3) "FURNISH" OR "SUPPLY": TO PURCHASE, PROCURE, ACQUIRE AND DELIVER COMPLETE WITH RELATED ACCESSORIES.

4) "WORK": LABOR, MATERIALS, EQUIPMENT, APPARATUS, CONTROLS, ACCESSORIES AND OTHER ITEMS REQUIRED FOR PROPER AND COMPLETE INSTALLATION.

5) "CONCEALED": EMBEDDED IN MASONRY OR OTHER CONSTRUCTION, INSTALLED IN FURRED SPACES, WITHIN DOUBLE PARTITIONS OR HUNG CEILINGS, IN TRENCHES, IN CRAWL SPACES, OR IN ENCLOSURES.

6) "EXPOSED": NOT INSTALLED UNDERGROUND OR "CONCEALED" AS DEFINED ABOVE.

7) "SIMILAR" OR "EQUAL": EQUAL IN MATERIALS, WEIGHT, SIZE, DESIGN AND EFFICIENCY OF SPECIFIED PRODUCT.

2. SCOPE OF WORK

A. THE WORK UNDER CONTRACT INCLUDES ALL LABOR, MATERIALS AND APPLIANCES NECESSARY FOR THE FURNISHING, INSTALLING AND TESTING, COMPLETE AND READY FOR SAFE OPERATION OF THE SYSTEMS. WORK SHALL BE INSTALLED IN A NEAT, WORKMANLIKE MANNER.

B. THE CONTRACTOR SHALL GIVE NECESSARY NOTICE, OBTAIN PERMITS OR LICENSES NECESSARY TO CARRY OUT THIS WORK AND PAY ALL FEES THEREFORE. THE CONTRACTOR SHALL ARRANGE FOR INSPECTION AND TESTS OF ANY OR ALL PARTS OF THE WORK IF SO REQUIRED BY AUTHORITIES AND PAY ALL CHARGES FOR SAME EXCEPT REQUIRED PROGRESS AND SPECIAL INSPECTIONS. THE CONTRACTOR SHALL PAY ALL COSTS FOR, AND FURNISH TO THE OWNER BEFORE FINAL BILLING, ALL CERTIFICATES NECESSARY AS EVIDENCE THAT THE WORK INSTALLED CONFORMS WITH ALL REGULATIONS WHERE THEY APPLY TO THIS WORK.

C. THE CONTRACTOR SHALL FURNISH A WRITTEN GUARANTEE TO REPLACE OR REPAIR PROMPTLY AND ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED FOR ANY WORKMANSHIP AND EQUIPMENT IN WHICH DEFECTS DEVELOP WITHIN ONE YEAR FROM THE DATE OF FINAL CERTIFICATE FOR PAYMENT AND/OR FROM DATE OR ACTUAL USE OF EQUIPMENT OR OCCUPANCY OF SPACES, BY OWNER, INCLUDED UNDER THE VARIOUS PARTS OF THE WORK, WHICHEVER DATE IS EARLIER. THIS WORK SHALL BE DONE AS DIRECTED BY THE OWNER. THIS GUARANTEE SHALL ALSO PROVIDE THAT WHERE DEFECTS OCCUR, THE CONTRACTOR WILL ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED IN REPAIRING AND REPLACING WORK OF OTHER TRADES AFFECTED BY DEFECTS, REPAIRS OR REPLACEMENTS IN EQUIPMENT SUPPLIED BY THE CONTRACTOR.

D. PROGRESS AND SPECIAL INSPECTIONS SHALL BE PERFORMED BY A LICENSED SPECIAL INSPECTION AGENCY OR A PROFESSIONAL ENGINEER TO BE HIRED BY THE OWNER.

E. PRIOR TO THE INSTALLATION OF ANY WORK AND PROCUREMENT OF EQUIPMENT PROVIDE COMPLETE SET OF COORDINATED SHOP DRAWINGS OF ALL NEW AND EXISTING EQUIPMENT, DUCTWORK, PIPING AND CONTROL SYSTEMS INDICATING CAPACITY DIMENSIONS AND SEQUENCE OF OPERATION FOR WRITTEN APPROVAL BY THE ARCHITECT AND ENGINEER.

3. SHOP DRAWINGS

A. INDICATE ON EACH SUBMISSION: PROJECT NAME AND LOCATION, ARCHITECT AND ENGINEER, ITEM IDENTIFICATION AND APPROVAL STAMP OF PRIME CONTRACTOR.

B. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AND SUBMITTALS INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING:

1) DUCTWORK LAYOUT AND SHEET METAL DESIGNS.

2) AIR OUTLETS.

3) AIR CONDITIONING UNITS.

4) PUMPS.

5) PIPING LAYOUT.

6) OPERATING SEQUENCES.

7) VIBRATION ISOLATION.

C. CONTRACTOR SHALL SUBMIT A PDF OR TIFF FILE TO ARCHITECT THROUGH PREVIOUSLY DISCUSSED AND APPROVED METHOD (EMAIL, SUBMITTAL EXCHANGE PROGRAM, ETC). SUBMITTAL WILL THEN BE FORWARDED TO RELEVANT PARTIES FOR REVIEW.

D. UNLESS OTHERWISE APPROVED, PROVIDE ALL MECHANICAL EQUIPMENT SUBMITTALS AND SHOP DRAWINGS AT ONE TIME.

E. PROVIDE A SEPARATE TRANSMITTAL FOR EACH SUBMITTAL ITEM. TRANSMITTALS SHALL INDICATE PRODUCT BY SPECIFICATION SECTION NAME AND NUMBER. SEPARATE ALL SUBMITTALS INTO APPROPRIATE SPECIFICATION SECTION NUMBER. DO NOT COMBINE SPECIFICATION SECTIONS.

F. SUBMIT ONLY PAGES WHICH ARE PERTINENT TO THE PROJECT. ALL OPTIONS WHICH ARE INDICATED ON THE PRODUCT DATA SHALL BECOME PART OF THE CONTRACTOR AND SHALL BE REQUIRED WHETHER SPECIFIED OR NOT.

G. MARK EACH COPY OF STANDARD PRINTED DATA TO IDENTIFY PERTINENT PRODUCTS. REFERENCED TO SPECIFICATION SECTION AND ARTICLE NUMBER.

H. SHOW REFERENCE STANDARDS, PERFORMANCE CHARACTERISTICS AND CAPACITIES; WIRING AND PIPING DIAGRAMS AND CONTROLS; COMPONENT PARTS; FINISHES; DIMENSIONS AND REQUIRED CLEARANCES.

I. MODIFY MANUFACTURER'S STANDARD SCHEMATIC DRAWINGS AND DIAGRAMS TO SUPPLEMENT STANDARD INFORMATION AND TO PROVIDE INFORMATION SPECIFICALLY APPLICABLE TO THE WORK. DELETE INFORMATION NOT APPLICABLE.

J. THE ENGINEER WILL REVIEW THE ORIGINAL SUBMITTAL AND ONE RESUBMITTAL FOR THE SAME PRODUCT. ADDITIONAL RESUBMITTALS WILL BE REVIEW ON AN HOURLY RATE, PAYABLE BY THE CONTRACTOR.

K. PARTIAL SUBMITTALS OR SUBMITTALS NOT PROPERLY FORMATTED AS INDICATED ABOVE, ARE SUBJECT TO RETURN WITHOUT REVIEW FOR THE CONTRACTOR TO CORRECT.

4. DELIVERY, STORAGE, AND HANDLING

5. SHEET METAL WORK

A. EXCEPT AS OTHERWISE SHOWN OR NOTED, ALL DUCTWORK AND OTHER SHEET METAL WORK SHALL BE RECTANGULAR GALVANIZED SHEET STEEL AND SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION, INC. DUCT CONSTRUCTION STANDARDS, PRESSURE CLASSIFICATION 2 IN. W.G., SEALANT CLASS A.

B. VOLUME DAMPERS: GALVANIZED STEEL, PER SMACNA "LOW VELOCITY MANUAL," EXCEPT PROVIDE BEARING AT ONE END OF DAMPER ROD AND QUADRANT, WITH LEVER AND LOCKSCREW AT OTHER END. FOR INSULATED DUCTS, QUADRANTS MOUNTED ON COLLAR TO CLEAR INSULATION. INSTALL WITH LEVERS ACCESSIBLE.

C. ACCESS DOORS: INSULATED OR UNINSULATED, SAME AS DUCT.

1) PROVIDE MINIMUM 20 IN. X 14 IN. ON MAIN DUCTS, AND 12 IN. X 6 IN. ON BRANCH DUCTS, UNLESS OTHERWISE APPROVED, AT FIRE DAMPERS, AND AT ALL DUCT ACCESSORIES SUCH AS HUMIDIFIERS, DUCT SMOKE DETECTORS, AUTO DAMPERS, AND LOUVERS.

2) ALL ACCESS DOORS TO BE HINGED, WITH LATCH SIMILAR TO VENTLOCK NO. 100.

D. FLEXIBLE CONNECTIONS: NEOPRENE-COATED GLASS FABRIC, 30 OZ PER SQ YD WITH SEWED AND CEMENTED SEAMS, SIMILAR TO VENT FABRICS. PROVIDE WITH METAL COLLARS. ALLOW MINIMUM MOVEMENT OF 1 IN.

E. TURNING VANES: GALVANIZED STEEL SMALL DOUBLE-THICKNESS VANES WITH 2 IN. INSIDE RADIUS.

F. ALL DUCT DIMENSIONS INDICATED ON PLANS ARE INSIDE CLEAR DIMENSIONS.

G. LOW PRESSURE FLEXIBLE DUCT: SHALL BE A FACTORY FABRICATED HIGH TEMPERATURE COPOLYMER IMPREGNATED GLASS FABRIC, LOCKED TO COLD ROLLED FLAT STEEL SPIRAL. SIMILAR TO WIREMOLD 57. MAXIMUM INSTALLED LENGTH SHALL NOT EXCEED 18 IN.

6. AIR OUTLETS

A. GENERAL:

1) MARGIN TYPES, COLORS, FINISH AND METHODS OF ATTACHMENT FOR ALL DIFFUSERS, GRILLES AND REGISTERS SHALL BE COORDINATED WITH ARCHITECTURAL CEILING AND WALL DETAILS AND SPECIFICATIONS.

2) FRAME TYPE SUITABLE FOR MOUNTING IN CEILING OR WALL CONSTRUCTION AS INDICATED ON ARCHITECTURAL PLANS.

3) EXACT LOCATION OF ALL AIR OUTLETS AS PER ARCHITECTURAL PLANS.

4) SUITABLE FOR OPERATION AT 20% EXCESS AND 20% LESS THAN NOTED CAPACITY FOR CONSTANT VOLUME SYSTEMS AND AT 20% EXCESS AND 60% LESS THAN NOTED CAPACITY FOR VARIABLE VOLUME SYSTEMS. MANUFACTURER RESPONSIBLE FOR EXAMINING APPLICATION OF EACH OUTLET AND GUARANTEE THAT EACH WILL PROVIDE REQUIRED NC LEVELS AND COMFORT SPACE CONDITIONS WITHOUT DRAFTS THROUGHOUT OPERATING RANGE.

5) ALL REGISTERS AND DIFFUSERS SHALL BE PROVIDED WITH OPPOSED BLADE VOLUME DAMPERS. DAMPER OPERATING LEVERS SHALL BE ACCESSIBLE AT THE FACE OF AIR OUTLETS.

B. SQUARE DIFFUSERS: DIFFUSERS SHALL BE STEEL CONSTRUCTION PAINTED WHITE SIMILAR TO ANEMOSTAT DDC SUITABLE FOR THE TYPE OF CEILING.

C. REGISTERS AND GRILLES:

1) RETURN AND EXHAUST REGISTERS: STEEL CONSTRUCTION WITH VOLUME DAMPER. SIMILAR TO TITUS 23-RL5.

2) SUPPLY REGISTERS: ALUMINUM CONSTRUCTION ADJUSTABLE DOUBLE DEFLECTION ALUMINUM AIRFOIL LOUVERS, WITH VOLUME DAMPER. SIMILAR TO ANEMOSTAT X3HOD. PROVIDE AIR EQUALIZING DEFLECTOR WHERE REGISTER COLLAR DUCT IS LESS THAN 2 FT LONG.

3) TRANSFER GRILLES: STEEL CONSTRUCTION WITHOUT VOLUME DAMPER. SIMILAR TO TITUS 23-RL.

7. NOISE CONTROL

A. ALL ROOM NC LEVELS SHALL BE 35 OR LESS.

B. PROVIDE SOUNDLINING FOR THE FOLLOWING DUCTWORK:

1) ALL DUCTWORK WITHIN MECHANICAL ROOMS AND NOT LESS THAN 20 FT ON EACH SIDE OF ALL FANS AND AC UNITS.

2) AIR TRANSFER DUCTS.

3) DOWNSTREAM OF ALL VARIABLE AIR VOLUME AND CONSTANT VOLUME BOXES FOR A MINIMUM OF 10 FT.

4) ALL MIXED AIR PLENUMS, EXCEPT WHERE MOISTURE CARRYOVER FROM OUTDOOR AIR LOUVER WILL OCCUR.

5) ALSO WHERE NOTED ON A DRAWING.

C. SOUNDLINING IN DUCTWORK: FIBROUS GLASS, MINIMUM 3 LB DENSITY, 1 IN. THICKNESS, MAXIMUM 0.25 K FACTOR AT 75 DEG F MEAN TEMPERATURE WITH ACRYLIC COATED FINISH FACTORY APPLIED EDGE COATING AND STENCILED IN ACCORDANCE WITH NFPA 90. FLAMESPREAD SHALL BE A MAXIMUM OF 25. LINING SHALL NOT SUPPORT MICROBIAL GROWTH AND SHALL BE TESTED IN ACCORDANCE WITH ASTM C 1071 AND ASTM G21/G22. SIMILAR TO MANVILLE PERMACOTE LINA COUSTIC.

D. ALL SOUNDLINING, ADHESIVES, FACES AND ACCESSORIES TO BE APPLIED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, EXCEPT AS OTHERWISE NOTED.

8. TESTING AND BALANCING

A. AIR BALANCING SHALL BE ACCOMPLISHED BY ADJUSTMENT OF FANS AND BRANCH DAMPERS FOR MAJOR ADJUSTMENTS. ADJUSTMENT OF TERMINAL DAMPERS AND DEVICES SHALL BE FOR TRIM OR MINOR ADJUSTMENT ONLY. THIS SHALL BE DONE TO PERMIT THE LEAST NOISE GENERATION IN THE TERMINAL AREAS AND UTILIZE MINIMUM FAN ENERGY.

B. WATER BALANCING SHALL BE ACCOMPLISHED BY ADJUSTMENT OF BALANCING VALVES AT PUMPS FOR PROPER FLOW. ADJUST FLOW THROUGH BOILERS, CHILLERS, HEAT EXCHANGERS AND COILS AS REQUIRED.

C. UPON COMPLETION OF THE INSTALLATION, THE CONTRACTOR SHALL REBALANCE ANY EXISTING PORTIONS OF AIR DISTRIBUTION SYSTEM AND WATER DISTRIBUTION SYSTEM AFFECTED BY THE RENOVATION AND ALSO BALANCE ALL NEW WORK.

D. THE CONTRACTOR SHALL PROVIDE ALL LABOR, PRESSURE GAUGES, FLOW METERS, SHEAVES, TEST PORTS, ACCESS, AND BELTS REQUIRED TO BALANCE SYSTEMS.

E. BALANCING REPORT SHALL BE PROVIDED ON AABC-TYPE FORMS.

F. FANS, AIR HANDLING UNITS, PUMPS, CHILLERS, HEAT EXCHANGERS AND COILS SHALL BE BALANCED TO WITHIN +5% OF THEIR DESIGN CAPACITIES. ALL OTHER AIR AND WATER QUANTITIES SHALL BE BALANCED TO WITHIN +10% OF THE DESIGN QUANTITIES.

G. BALANCING AND TESTING SHALL BE PERFORMED AND SUPERVISED BY A COMPANY WITH ONE OF THE FOLLOWING CERTIFICATIONS AND AT LEAST 5 YEARS' EXPERIENCE:

1) AABC, ASSOCIATED AIR BALANCE COUNCIL

2) NEBB, NATIONAL ENVIRONMENTAL BALANCING BUREAU

3) TABB, THE TESTING, ADJUSTING, AND BALANCING BUREAU OF NATIONAL ENERGY MANAGEMENT INSTITUTE

H. THE PERFORMANCE AND CAPACITY OF ALL SYSTEMS AND EQUIPMENT TO BE DEMONSTRATED BY THE CONTRACTOR.

9. INSULATION - GENERAL REQUIREMENTS

A. ALL INSULATION MATERIALS, INCLUDING JACKETS, FACING, ADHESIVE, COATINGS, AND ACCESSORIES ARE TO BE FIRE HAZARD RATED AND LISTED BY UNDERWRITERS LABORATORIES, INC. USING STEINER TUNNEL TEST METHOD FOR FIRE HAZARD CLASSIFICATION OF BUILDING MATERIALS, STANDARD UL 723 (ASTM E-84), (ASA A2.5-1963). FLAMESPREAD: MAXIMUM 25. FUEL CONTRIBUTED AND SMOKE DEVELOPED: MAXIMUM 50. FLAMEPROOFING TREATMENTS SUBJECT TO DETERIORATION FROM MOISTURE OR HUMIDITY ARE NOT ACCEPTABLE.

B. DEFINITIONS:

1) EXPOSED: INDOOR DUCTS, PIPING OR EQUIPMENT LOCATED IN MECHANICAL EQUIPMENT ROOMS AND IN AREAS WHICH WILL BE VISIBLE WITHOUT REMOVING CEILINGS OR OPENING ACCESS PANELS.

2) CONCEALED: INDOOR DUCTS, PIPING OR EQUIPMENT WHICH IS NOT EXPOSED.

3) OUTDOOR: DUCTS, PIPING OR EQUIPMENT WHICH IS EXPOSED TO THE WEATHER.

10. DUCTWORK INSULATION

A. INSULATE ALL DUCTWORK IN ACCORDANCE WITH INSULATION SCHEDULE EXCEPT AS OTHERWISE NOTED.

B. REINSULATE ALL DUCTWORK AND PIPING WHICH IS EXISTING AND DAMAGED DURING CONSTRUCTION OR SHOWN OR REQUIRED TO BE RELOCATED. INSULATE WITH SAME MATERIAL AND THICKNESS IN ACCORDANCE WITH INSULATION SCHEDULE.

C. NON-INSULATED DUCTWORK:

1) WHERE SOUNDLINING IS OF MINIMUM THICKNESS SPECIFIED FOR INSULATION.

2) AIR CONDITIONING SUPPLY AIR DUCTWORK EXPOSED ON GROUND FLOOR, MEZZANINE LEVEL AND CONCOURSE LEVEL, SALES AREA ONLY.

3) AIR CONDITIONING RETURN AIR DUCTWORK EXPOSED IN AIR CONDITIONED SPACES AND INSTALLED IN HUNG CEILINGS WHERE SPACE IMMEDIATELY ABOVE AND BELOW ARE BOTH AIR CONDITIONED.

D. INSTALLATION:

1) FIBERGLASS BLANKET: 2 IN. LAP STRIPS AT ALL SEAMS. SECURE BOTTOM OF ALL DUCTS OVER 24 IN. WIDE WITH MIN. 2 ROWS OF WELD PINS 12 IN. ON CENTER. SECURE ALL SEAMS WITH FOIL VAPOR BARRIER TAPE AND VAPORSEAL ADHESIVE.

2) FIBERGLASS BOARD: SEAL JOINTS AND BREAKS IN FACING WITH 3 IN. WIDE TAPE TO MATCH FACING AND ADHERE WITH VAPOR SEAL ADHESIVE. APPLY 5 IN. WIDE TAPE AT CORNERS, WELD PINS ON TOP, SIDES AND BOTTOM.

11. PIPING INSULATION

A. INSULATE ALL PIPING IN ACCORDANCE WITH PIPE INSULATION DETAIL EXCEPT AS OTHERWISE NOTED.

B. PIPING, VALVES AND FITTINGS TO BE INSULATED:

a. CONDENSATE DRAIN PIPING.

b. REFRIGERANT PIPING.

C. OUTDOOR PIPING:

3) FOR ALL PIPING, FITTINGS AND VALVES LOCATED OUTDOORS, INCREASE SCHEDULED INSULATION THICKNESS BY A MINIMUM OF 1 IN. AND PROVIDE VAPORSEAL ON ALL OUTDOOR PIPES, VALVES AND FITTINGS SUBJECT TO CONDENSATION.

F. INSTALLATION:

1) BEFORE APPLYING INSULATION ALL PRESSURE AND LEAK TESTS SHALL BE COMPLETED AND APPROVED.

2) ALL INSULATION SHALL BE BUTTED FIRMLY TOGETHER. PROVIDE 2 IN. LAP STRIPS AT ALL SEAMS SECURED WITH ADHESIVE. USE VAPOR BARRIER TAPE AND VAPORSEAL ADHESIVE WHERE REQUIRED. STAPLES NOT PERMITTED. REFRIGERANT PIPING INSULATION SHALL HAVE MITERED FITTINGS.

3) ALL INSULATION AND VAPOR BARRIERS SHALL BE CONTINUOUS PASSING THROUGH SLEEVES, HANGERS, ETC., OR OTHER OPENINGS. PROVIDE SADDLES OR SHIELDS FOR PROTECTION.

4) INSULATION FOR STRAINERS OR OTHER FITTINGS OR ACCESSORIES REQUIRING SERVICING OR INSPECTION SHALL HAVE INSULATION REMOVABLE AND REPLACEABLE WITHOUT DAMAGE.

12. VIBRATION ISOLATION

A. GENERAL:

1) PROVIDE ISOLATION FOR EQUIPMENT, PIPING AND DUCTWORK.

2) INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

3) PROVIDE LEVELING DEVICES AND APPROVED RESILIENT RESTRAINING DEVICES AS REQUIRED TO LIMIT EQUIPMENT AND PIPING MOTION IN EXCESS OF 1/4 IN.

4) ACCEPTABLE MANUFACTURERS:

a. MASON INDUSTRIES, INC.

b. VIBRATION ELIMINATOR CO.

c. KORFUND DYNAMICS CORP.

B. CEILING-HUNG FANS AND EQUIPMENT:

1) PROVIDE SPRING HANGER ROD ISOLATORS. STEEL COMPRESSION SPRING AND NEOPRENE SOUND PAD WITHIN A STEEL RETAINER BOX. SIMILAR TO MASON TYPE PCHS.

2) 1 IN. MINIMUM STATIC DEFLECTION. 1/2 IN. MINIMUM RESERVE DEFLECTION. FACTORY-PRELOADED TO 75% OF RATED LOAD.

3) PROVIDE SUPPLEMENTAL STEEL AS REQUIRED WHERE EQUIPMENT OR STRUCTURE CANNOT SUPPORT POINT LOADS.

C. FLOOR MOUNTED EQUIPMENT HAVING INTERNAL ISOLATION:

1) PROVIDE 5/16 IN.-THICK NEOPRENE ACOUSTICAL BASE PADS OF RIBBED OR WAFFLE CONSTRUCTION. SIMILAR TO MASON TYPE W.

2) 50 PSI MAXIMUM LOADING. PROVIDE STEEL BEARING PLATE TO DISTRIBUTE LOAD WHERE REQUIRED.

13. PIPING - GENERAL REQUIREMENTS

A. COMPLETE WITH: PIPE, FITTINGS, VALVES, STRAINERS, MOTORIZED VALVE OPERATORS, STRAINERS, HANGERS, SUPPORTS, GUIDE, SLEEVES, AND ACCESSORIES.

B. ALL ITEMS SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH THE LATEST EDITIONS OF THE FOLLOWING CODES AND STANDARDS:

4) AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME).

5) AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM).

6) AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI).

7) MANUFACTURERS STANDARDIZATION SOCIETY OF THE VALVE AND FITTING INDUSTRY (MSS).

C. ALL PRESSURIZED PIPING TO BE TESTED HYDROSTATICALLY TO 150 PSI OR 150% OF OPERATING PRESSURE, WHICHEVER IS GREATER, BUT NEVER EXCEED TEST PRESSURE ANSI B16.1 BASIS. TEST DURATION TO BE 2 HOURS WITH NO PRESSURE CHANGE CORRECTED FOR TEMPERATURE CHANGE. REPAIR OR REPLACE LEAKS OR DEFECTS WITHOUT ADDITIONAL COST.

D. PROVIDE DIELECTRIC FITTINGS WHERE DISSIMILAR METALS ARE TO BE JOINED.

E. PIPE SUPPORTS:

1) PROVIDE ADEQUATE SUPPORT FOR PIPE AND CONTENTS TO PREVENT SAGGING, VIBRATION, OR SWAYING AND ALLOW FOR EXPANSION AND CONTRACTION. PROVIDE SUPPLEMENTAL STEEL AS REQUIRED WHERE STRUCTURE CANNOT SUPPORT POINT LOADS.

2) HORIZONTAL PIPING TO BE SUPPORTED BY FORGED STEEL ADJUSTABLE CLEVIS TYPE HANGER. MAXIMUM SPACING AS FOLLOWS:

a. STEEL 1 IN. AND SMALLER: 7 FT.

b. STEEL 1-1/4 IN. AND LARGER: 10 FT.

c. COPPER 3 IN. AND SMALLER: 7 FT.

d. ADDITIONAL SUPPORTS AT CHANGES IN DIRECTION, RUNOUTS, AND CONCENTRATED LOADS DUE TO VALVES, ETC.

3) VERTICAL PIPING:

a. BASE ELBOW SUPPORT WITH BEARING PLATE ON STRUCTURAL SUPPORT.

b. GUIDES AT EVERY SECOND FLOOR (SPACING NOT TO EXCEED 25 FT).

c. TOP SUPPORT HANGER OR SADDLE IN HORIZONTAL CONNECTION WITH PROVISIONS FOR EXPANSION.

d. INTERMEDIATE STEEL RISER CLAMP SUPPORT BOLTED AND WELDED TO PIPE BEARING ON STRUCTURAL STEEL OR BEARING PLATE AT FLOOR.

14. CONDENSATE DRAIN PIPING

A. PIPE: ASTM B88, HARD DRAWN COPPER TUBING TYPE "L".

B. FITTINGS: SOLDERED JOINT FITTINGS, 95/5 SOLDER.

C. PITCH, EXCEPT AS NOTED:

1) 1 IN. IN 4 FT PREFERRED.

2) 1 IN. IN 8 FT MINIMUM.

D. SWING CHECK VALVES: AT CONDENSATE PUMP DISCHARGE. 300 LB WOG, BRONZE BODY SOLDER ENDS, REGRIND BRONZE DISC TO BE USED WITH