NORTHWESTERN MICHIGAN COLLEGE

AUDIO-TECH ACOUSTIC UPGRADES

BID SET - 11.09.2026

GENERAL NOTES

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- ALL WORK AND MATERIALS SHALL BE IN FULL CONFORMANCE WITH THE LATEST FEDERAL, STATE AND LOCAL LAWS, CODES AND ORDINANCES, INCLUDING THEIR MOST RECENT REVISIONS, ADDITIONS, AMENDMENTS, AND INTERPRETATIONS. ALL SUCH CODES AND COMPLIANCE ARE TO BE DEEMED AS PART OF THIS CONTRACT AND PART OF THE CONSTRUCTION DOCUMENTS AS THEY HAVE BEEN WRITTEN IN FULL. IN THE EVENT OF CONFLICT, THE MOST STRINGENT REQUIREMENTS SHALL APPLY.
- ALL DIMENSIONS AND EXISTING CONDITIONS SHALL BE CHECKED AND VERIFIED BY THE CONTRACTOR AT THE SITE.
- HOLD INDICATED DIMENSIONS. DO NOT SCALE DRAWINGS. RESOLVE ANY DISCREPANCIES WITH THE ARCHITECT BEFORE BEGINNING WORK.
- IN THE CASE OF AN INCONSISTENCY BETWEEN THE DRAWINGS AND SPECIFICATIONS, OR WITHIN EITHER DOCUMENT NOT CLARIFIED BY ADDENDUM, THE BETTER QUALITY, MORE EXPENSIVE, OR GREATER QUANTITY OF WORK SHALL BE PROVIDED IN ACCORDANCE WITH THE ARCHITECTS INTERPRETATION.
- ALL CONSTRUCTION THAT IS ALREADY IN PLACE THAT IS TO REMAIN AS PART OF THE PROJECT SHALL BE PROTECTED FROM DAMAGE SHALL BE PROTECTED THROUGHOUT THE PERIOD OF CONSTRUCTION WORK. ANY DAMAGED CONSTRUCTION OR FEATURES SHALL BE REPLACED AT THE EXPENSE OF THE CONTRACTOR TO THE SATISFACTION OF THE OWNER WITH MATERIALS EQUIVALENT OR SUPERIOR TO THE ORIGINAL ITEM(S).
- IT SHALL BE THE RESPONSIBILITY OF EACH CONTRACTOR TO VERIFY ALL DIMENSIONS AND INSPECT CONDITIONS OF PRIOR WORK OF THE OTHER TRADES BEFORE STARTING WORK. PROCEEDING WITH THE WORK SHALL CONSTITUTE ACCEPTANCE OF PRIOR WORK.
- ALL ELECTRICAL OUTLETS, DATA & TELEPHONE OUTLETS/JACKS, SWITCHES, PULL STATIONS, THERMOSTATS, EXIT LIGHTS, AND ALL OTHER WALL MOUNTED ACCESSORIES SHALL BE ALIGNED VERTICALLY AND HORIZONTALLY WHEN IN PROXIMITY.
- UNLESS OTHERWISE SHOWN, PLACING OF ACCESS DOORS IN GYPSUM CEILINGS SHALL NOT BE ACCEPTED. LOCATE AND INSTALL ALL WORK AS REQUIRED TO PRECLUDE THE NEED FOR ACCESS THROUGH THE CEILINGS. COORDINATION OF THIS REQUIREMENT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
- PROVIDE BLOCKING IN PARTITIONS AS REQUIRED FOR ALL MILLWORK, CASEWORK, ACCESSORIES OR OTHER SIMILAR ITEMS ATTACHED TO WALLS. ALL WOOD BLOCKING TO BE FIRE-RETARDENT TREATED AS REQUIRED BY CODE, CONTINUOUS FROM STUD TO STUD.
- ALL MATERIALS AND EQUIPMENT SHALL BE INSTALLED PER MANUFACTURE'S WRITTEN INSTRUCTIONS.
- SEALANT, CAULKING, AND FLASHING LOCATIONS SHOWN ON DRAWINGS ARE NOT INTENDED TO BE INCLUSIVE. FOLLOW MANUFACTURE'S INSTALLATION RECOMMENDATIONS AND STANDARD INDUSTRY AND BUILDING PRACTICE.
- IN ALL CASES WHERE WORK DEPICTED IN THESE DRAWINGS REPRESENTS A COMPLETE SYSTEM COMPOSED OF SEPARATE PARTS, IT IS THE RESPONSIBILITY OF THE OMGENERAL CONTRACTOR TO PROVIDE ALL OF THE PARTS, COMPONENTS, ACCESSORIES, HARDWARE, FASTENERS, ETC. REQUIRED FOR A COMPLETE AND FULLY FUNCTIONING ASSEMBLY WITHIN THE DEFINITIONS OF NORMAL INDUSTRY STANDARDS, WHETHER OR NOT THESE MISCELLANEOUS ITEMS ARE DIRECTLY SPECIFIED IN THE CONSTRUCTION DOCUMENTS.

ABBREVIATIONS

A.F.F.	ABOVE FINISHED FLOOR	JST.	JOIST
ABV.	ABOVE	K.D.	KILN-DRIED
AC	AIR CONDITIONING	LAV.	LAVATORY
ADJ.	ADJUSTABLE	LT.	LIGHT
ALUM.	ALUMINUM	MAT	MATERIAL
ALT.	ALTERNATE	MAX	MAXIMUM
ASPH.	ASPHALT	MFR.	MANUFACTURER
B.O.	BOTTOM OF	MIN.	MINIMUM
BD.	BOARD	MO	MASONRY OPENING
BLDG.	BUILDING	MIR.	MIRROR
BLKG.	BLOCKING	MTL.	METAL
BLW.	BELOW	(N)	NEW
BM.	BEAM	N.T.S.	NOT TO SCALE
BTW.	BETWEEN	NIC	NOT IN CONTRACT
CMU	CONCRETE MASONRY UNIT	o/	OVER
		OC	ON CENTER
COL.	COLUMN	OPNG.	OPENING
CONC.	CONCRETE	OPP.	OPPOSITE
CAB.	CABINET	P.T.	PRESSURE TREATED
CLO.	CLOSET	PL.	PLATE
CLR.	CLEAR	PLAM.	PLASTIC LAMINATE
CONT.	CONTINUOUS	PLYWD	PLYWOOD
COORD.	COORDINATE	PNL.	PANEL
CTR	CENTER	PTD.	PAINTED
DEMO	DEMOLITION	RO	ROUGH OPENING
DIA.	DIAMETER	R.W.L.	RAINWATER LEADER
DR.	DOOR	RESIL.	RESILIENT
DN.	DOWN	REQ'D	REQUIRED
DIM.	DIMENSION	RM.	ROOM
DTL.	DETAIL	RTG	RATING
ELEV.	ELEVATINO	RAD./R.	RADIUS
EQ.	EQUAL	S.A.D.	SEE ARCHITECTURAL DWGS
EQUIP.	EQUIPMENT		
EXIST.	EXISTING	S.A.S.F.	SELF-ADHERED SHEET FLASHING
EXT.	EXTERIOR		
F.G.	FINISHED GRADE	S.C.	SOLID CORE
F.O.C.	FACE OF CONCRETE	S.C.D.	SEE CIVIL DRAWINGS
F.O.F.	FACE OF FINISH	S.L.D.	SEE LANDSCAPE DWGS
F.O.M.	FACE OF MASONRY	S.S.	STAINLESS STEEL
F.O.S.	FACE OF STUD	S.S.D.	SEE STRUCTURAL DWGS
FDN.	FOUNDATION	SIM.	SIMILAR
FR.	FRAME	SPEC	SPECIFICATIONS
FIN.	FINISH	STL.	STEEL
FLR.	FLOOR	STN.	STAIN
FRPR.	FIREPROOFING	SQ.	SQUARE
FTG.	FOOTING	SFTY	SAFETY
GALV.	GALVANIZED	T&G	TONGUE AND GROOVE
GWB	GYPSUM WALLBOARD	T.O.	TOP OF
GL.	GLASS	T.O.C.	TOP OF CONCRETE
GC	GENERAL CONTRACTOR	T.O.S.	TOP OF STEEL
H.W.	HOT WATER	T.O.P	TOP OF PLATE
H.C.	HOLLOW CORE	TYP.	TYPICAL
HM	HOLLOW METAL	U.O.N.	UNLESS OTHERWISE NOTED
HB	HOSEBIB		
HDR.	HEADER	V.I.F.	VERIFY IN FIELD
HDW	HARDWARE	W.O.	WHERE OCCURS
I.D.	INSIDE DIAMETER	w/	WITH
INSUL.	INSULATION	WC	WATER CLOSET
INT.	INTERIOR	WDW.	WINDOW
J.H.	JOIST HANGER	WD.	WOOD
JB	JUNCTION BOX	WH	WATER HEATER

LOCATION MAP



SHEET INDEX

REFERENCE

ATS	TITLE SHEET

ARCHITECTURAL

A100	DEMOLITION PLAN
A101	FLOOR PLAN
A200	REFLECTED CEILING PLAN & INT. ELEVATIONS
A300	DOOR & FRAME SCHEDULE

PLUMBING

PD100	PLUMBING DEMOLITION FLOOR PLAN

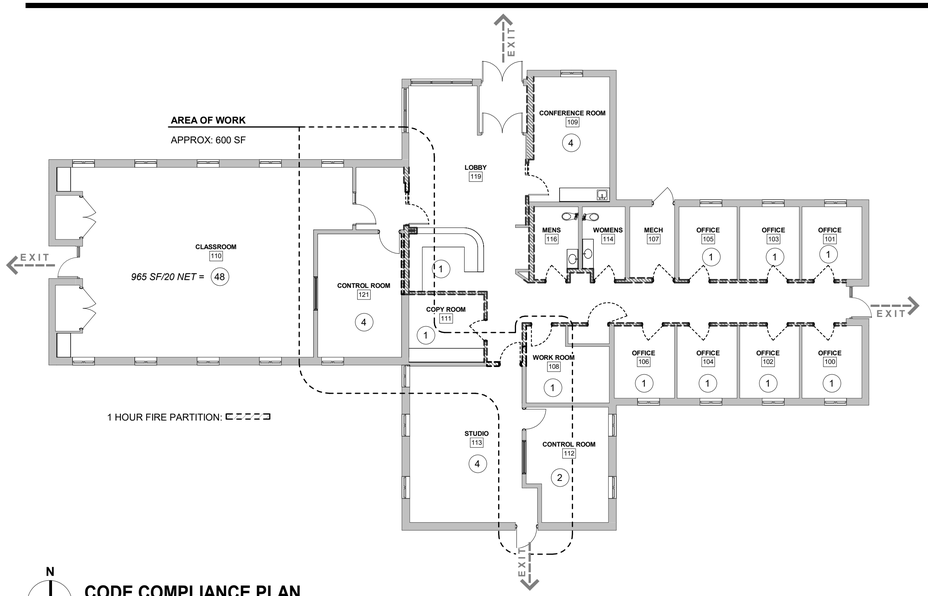
MECHANICAL

MD100	MECHANICAL DEMOLITION FLOOR PLAN
M100	MECHANICAL FLOOR PLAN
M200	MECHANICAL SCHEDULES & DETAILS

ELECTRICAL

E000	ELECTRICAL SCHEDULES & DETAILS
ED100	ELECTRICAL DEMOLITION FLOOR PLAN
E100	ELECTRICAL DEMOLITION FLOOR PLAN
E200	ELECTRICAL SCHEDULES & DETAILS
E900	ELECTRICAL SPECIFICATIONS
E901	ELECTRICAL SPECIFICATIONS
E902	ELECTRICAL SPECIFICATIONS
E903	LOW VOLTAGE SPECIFICATIONS

PROJECT INFORMATION



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CODE COMPLIANCE PLAN

SCALE: 3/32" = 1'-0"

PROJECT SCOPE:
ACOUSTIC UPGRADES TO EXISTING AUDIO-TECH DEPARTMENT SPACES WHICH INCLUDE THE RECORDING STUDIO, UPGRADES TO THE EXISTING CONTROL ROOM, AND A NEW CONTROL ROOM WITH A NEW SOUND VESTIBULE. RENOVATION WORK WILL ALSO INCLUDE DOOR REPLACEMENT, MODIFICATION TO EXISTING CEILINGS, AND NEW ACOUSTIC INTERIOR WINDOW ASSEMBLIES

THIS RENOVATION IS DESIGNED IN ACCORDANCE WITH THE FOLLOWING CODES THAT GOVERN STATE OF MICHIGAN PROJECTS:

MICHIGAN BUILDING CODE.....2021
MICHIGAN REHABILITATION CODE.....2021
MICHIGAN MECHANICAL CODE.....2021
MICHIGAN PLUMBING CODE.....2021
MICHIGAN ELECTRICAL CODE.....2023
NFPA 101.....2012

FIRE SUPRESSION SYSTEM: NONE

USE & OCCUPANCY CLASSIFICATION - ***CHAPTER 3***
BUSINESS: EDUCATION ABOVE 12TH GRADE

CONSTRUCTION TYPE (PER NFPA 101 LIFE SAFETY CODE, 2012 EDITION)
TYPE III(200)

CONSTRUCTION TYPE (PER MBC)
TYPE IIIB

BUILDING HEIGHT ABOVE GRADE PLANE - ***TABLE 504.3***
55' FOR B OCCUPANCY, IIIB CONSTRUCTION, NOT SPRINKLERED

ACTUAL: 15'-0" ABOVE GRADE PLANE

ALLOWABLE NUMBER OF STORIES ABOVE GRADE PLANE - ***TABLE 504.4***
3 STORY FOR B OCCUPANCY, IIIB CONSTRUCTION, NOT SPRINKLERED

ACTUAL: 1 STORIES ABOVE GRADE PLANE

ALLOWABLE BUILDING AREA
PER SECTION 202 EXISTING BUILDING AREA = 4,490 SF (NO CHANGE)

PER MBC TABLE 506.2, NON-SPRINKLERED IIIB (B) OCCUPANCY ALLOWABLE AREA = 19,000 SF

OCCUPANT LOAD (1004)
TOTAL OCCUPANT LOAD = **72**

CORRIDOR FIRE-RESISTANCE RATING - ***TABLE 1020.1***
1 HOUR FOR B OCCUPANCY, NOT SPRINKLERED

COMMON PATH OF TRAVEL DISTANCE - ***TABLE 1006.21***
75' w/o SPRINKLER SYSTEM.
(2) EXITS PROVIDED WITHIN 75' TRAVEL DISTANCE

EXIT ACCESS TRAVEL DISTANCE - ***SECTION 1017***
200' w/o SPRINKLER SYSTEM

M / E / P

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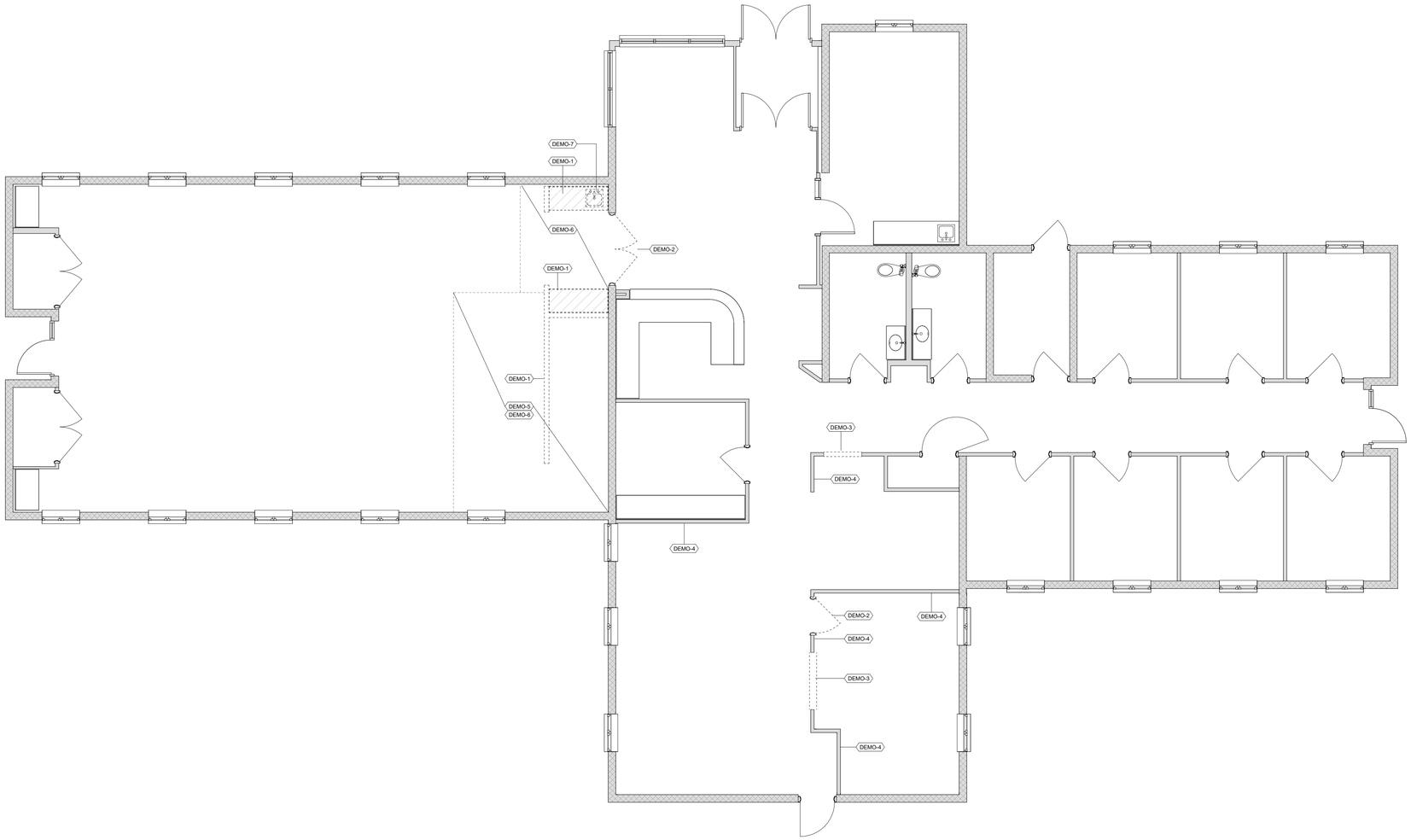
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JOHN DANCER
ARCHITECT
No. 1301044910
LICENSED ARCHITECT

PIC:
PM:
DRAFTS:
PROJECT NO:
26.503
SHEET TITLE:
TITLE SHEET
ATS

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DEMOLITION PLAN

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

GENERAL DEMO NOTES

- THE GENERAL CONTRACTOR SHALL FURNISH ALL LABOR AND MATERIALS REQUIRED TO COMPLETE DEMOLITION, REMOVAL AND RE-USE OF ALL ITEMS SHOWN ON DRAWINGS.
- OBTAIN PROPER PERMITS PRIOR TO THE COMMENCEMENT OF DEMOLITION. ALL SUBMITTAL AND FEES ARE THE RESPONSIBILITY OF THE G.C.
- ALL WORK DEMOLISHED SHALL BE REMOVED FROM THE PREMISES DAILY, EXCEPT ITEMS TO BE REUSED OR RETURNED TO THE OWNER, OR AS DIRECTED OTHERWISE. REMOVE AND DISPOSE OF ALL MATERIALS IN A LEGAL MANNER, USING LABOR, MATERIALS AND EQUIPMENT AS NECESSARY.
- REFER TO ATTACHED FLOOR PLANS FOR EXISTING CONSTRUCTION TO REMAIN, EXTENT OF DEMOLITION, AND SCHEDULED ITEMS FOR RELOCATION. THE OWNER RETAINS ALL SALVAGE RIGHTS. REVIEW WITH THE OWNER ALL ITEMS OF POTENTIAL SALVAGE AND STORE APPROPRIATELY. THE USE OF NON-SALVAGED ITEMS IN NEW CONSTRUCTION NOT PERMITTED WITHOUT WRITTEN PERMISSION FROM THE OWNER AND THE ARCHITECT. ITEMS NOT APPROVED FOR SALVAGE BY THE OWNER, ARE TO BE PROPERLY DISPOSED OF BY THE G.C. ALL EXISTING DOORS, FRAMES, HARDWARE, ELECTRICAL FIXTURES, CABINETRY, AND OTHER BUILDING STANDARD COMPONENTS REMOVED DURING DEMOLITION AND NOT REUSED FOR THIS PROJECT SHALL BE TAGGED AND STORED AS DIRECTED BY BUILDING MANAGEMENT/OWNER.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR TAKING ADEQUATE PRECAUTIONS TO PROTECT BUILDING OCCUPANTS, MATERIALS AND EXISTING FINISHES THROUGHOUT ALL PHASES OF CONSTRUCTION AREAS AND OCCUPIED OR PUBLIC AREAS TO BE MAINTAINED BY CONTRACTOR. PROTECT OR TEMPORARILY REMOVE ALL ITEMS THAT ARE EXISTING TO REMAIN. RESET TEMPORARY REMOVALS ACCURATELY AND SECURELY. DAMAGE TO EXISTING TO REMAIN CONSTRUCTION, MATERIALS OR EQUIPMENT TO BE RESTORED TO ORIGINAL CONDITION OR AS OUTLINED IN THE CONSTRUCTION DOCUMENTS.
- THE GENERAL CONTRACTOR SHALL ERECT ALL NECESSARY PLASTIC DROP CLOTH PARTITIONS, BARRICADES, AND OTHER METHODS OF DUST CONTROL TO ASSURE A SAFE AND NEAT DEMOLITION PROCESS AND TO PROTECT ADJACENT BUILDING PROPERTIES. THE USE OF EXPLOSIVES AND BURNING ARE NOT PERMITTED.
- TEMPORARILY SHORE AND SUPPORT ANY AREA OF DEMOLITION IN WALLS, FLOORS, CEILING ASSEMBLIES, THAT ARE STRUCTURAL. PROTECT ALL WORK IN PLACE.
- DEMOLITION AND TRENCHING, CUTTING, BORING, AND REPAIR ASSOCIATED WITH TRADES IS THE RESPONSIBILITY OF THAT TRADE. COORDINATE WITH THE G.C. PRIOR TO DEMOLITION WORK.
- ALL TRADES ARE TO REVIEW EXISTING CONDITIONS AND INCLUDE DEMOLITION OF EXISTING SYSTEMS AS REQUIRED BY SCOPE OF NEW WORK.
- THE GENERAL CONTRACTOR SHALL REMOVE ALL WALL CONDUITS, SWITCH PLATES, TELEPHONE OR ELECTRICAL WIRING OR EQUIPMENT, ETC.. TO THE SOURCE AFTER WALL DEMOLITION.
- REMOVE EXISTING MECHANICAL COMPONENTS AS REQUIRED TO ACCOMMODATE NEW HVAC DESIGN AND DUE TO CEILING RELATED WORK, SALVAGE DEVICES AS PRACTICAL FOR REUSE. CLEAN/REPLACE SUPPLY AIR DIFFUSERS AND RETURN AIR GRILLES, CALIBRATE AND RELOCATE THERMOSTATS, AND INSTALL NEW DUCTWORK AS REQUIRED.
- REMOVE EXISTING AND/OR RELOCATE EXISTING LIGHT FIXTURES AND OTHER CEILING DEVICES AS REQUIRED TO ACCOMMODATE REFLECTED CEILING PLAN, ALL EXISTING FIXTURES DEVICES SHALL BE CLEANED, (INCLUDING LENS), DAMAGED PARTS REPAIRED OR REPLACED, AND RELAMPED AS NECESSARY.
- REMOVE EXISTING CEILING AND FLOORING FINISH AS REQUIRED FOR INSTALLATION OF NEW.
- COORDINATE WALL DEMO WITH LOCATION OF NEW COLUMN GRID.

DEMOLITION LEGEND

THE FOLLOWING SCOPE OF WORK APPLIES TO ALL AREAS OF DEMOLITION WORK. CONSTRUCTION MANAGER TO FIELD VERIFY THE EXTENT OF THE WORK AND THE EXISITING CONDITIONS PRIOR TO THE START OF WORK

DEMO-1 REMOVE EXISTING WALLS, COLUMNS, DOORS, WINDOWS, ETC. AS SHOWN DASHED. PATCH AND REPAIR FLOORS, WALLS, CEILINGS, ETC TO REMAIN IN PREPARATION FOR NEW CONSTRUCTION. COORDINATE DEMO WORK w/ NEW CONSTRUCTION, REFER TO NEW CONSTRUCTION DRAWINGS

DEMO-2 REMOVE EXISTING DOOR FOR REPLACEMENT.

DEMO-3 REMOVE PORTION OF METAL FRAMED WALL FOR NEW DOOR/OPENING

DEMO-4 REMOVE DRYWALL LAYER TO EXPOSED STUD FRAMING FOR NEW CONSTRUCTION

DEMO-5 REMOVE EXISTING CEILING BACK TO ORIGINAL EXPOSED STRUCTURE FOR PREPARATION OF NEW CONSTRUCTION

DEMO-6 REMOVE EXISTING FLOOR FINISH TO EXISTING SUBFLOOR/SLAB. PREP SUBFLOOR FOR NEW FLOORING

DEMO-7 SAWCUT EXISTING SLAB TO DEMO/CAP EXISTING SANITARY BELOW SLAB. PATCH IN SLAB AS REQUIRED

DEMOLITION SYMBOL LEGEND

EXISTING TO BE DEMOLISHED

EXISTING WALL TO REMAIN

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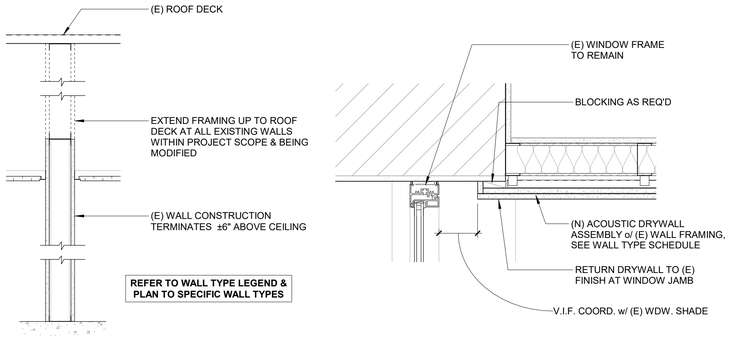
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SHEET TITLE:
DEMOLITION PLAN
A100

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6 TYP. WALL DETAIL
A101 SCALE: 1" = 1'-0"

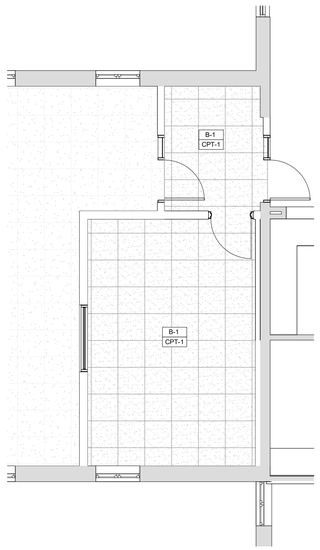
5 (E) WINDOW JAMB DETAIL
A101 SCALE: 1 1/2" = 1'-0"

INTERIOR WALL TYPE LEGEND

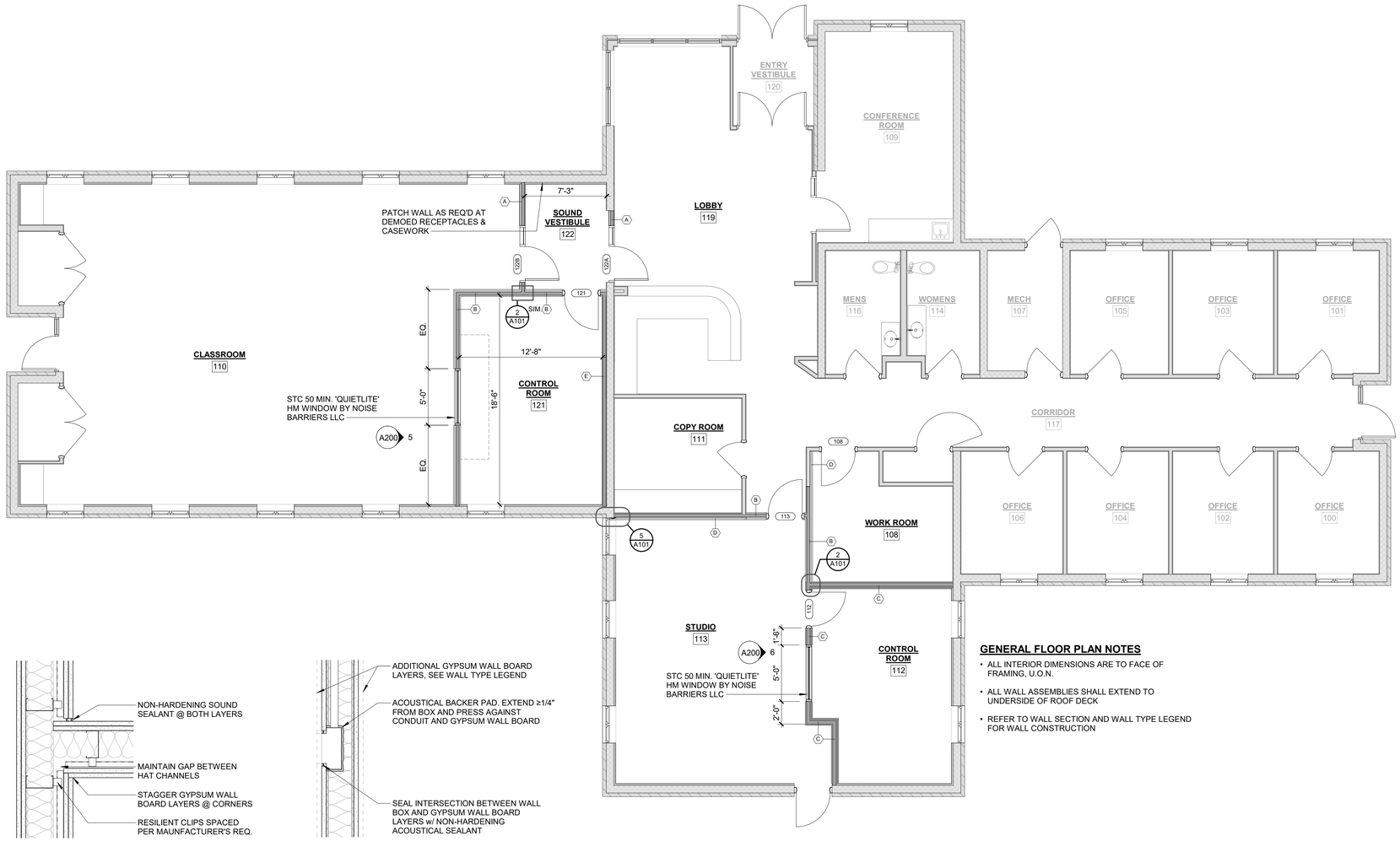
- DIMENSIONS SHOWN ARE TO FACE OF FRAMING, U.O.N.
- PROVIDE BLOCKING AT ALL CASEWORK, BATHROOM ACCESSORIES, MARKERBOARDS, DISPLAY CASES, ETC. AS PER PLANS & ELEVATIONS
- REFER TO INTERIOR ELEVATIONS AND DETAILS FOR FINISH AND FINISH BUILD UP
- ALL FIRE RATED PARTITIONS/SHAFTS SHALL BE CONSTRUCTED FULL HEIGHT TO AND SEALED AGAINST UNDERSIDE OF STRUCTURE. SEAL ALL EDGES w/ FIRE RATED SEALANT

WALL TYPE
A

TYPE A	TYPE B	TYPE C	TYPE D	TYPE E
STC 55 1 HOUR UL U465	STC 60 1 HOUR UL U411	STC 60 1 HOUR UL U411	STC 57 1 HOUR UL U465	
SEE **4/A200** FOR TOP OF WALL DETAILS 5/8" TYPE X GYPSUM WALL BOARD 6 1/4" 3 5/8" 20 GA. METAL STUDS AT 16" O.C. w/ 3 1/2" UNFACED BATT INSULATION 'ISOMAX' RESILIENT CLIP BY KINETICS w/ 7/8" HAT CHANNELS	SEE **4/A200** FOR TOP OF WALL DETAILS (2) LAYERS OF 5/8" TYPE X GYPSUM WALL BOARD, EA. SIDE 7 1/2" 3 5/8" 20 GA. METAL STUDS AT 16" O.C. w/ 3 1/2" UNFACED BATT INSULATION 'ISOMAX' RESILIENT CLIP BY KINETICS w/ 7/8" HAT CHANNELS	SEE **4/A200** FOR TOP OF WALL DETAILS ADD ADDITIONAL LAYER OF 5/8" TYPE X GYP. BOARD o/ EXISTING (2) LAYERS OF 5/8" TYPE X GYPSUM WALL BOARD 7 1/2" (E) METAL STUDS AT 16" O.C. w/ 3 1/2" UNFACED BATT INSULATION 'ISOMAX' RESILIENT CLIP BY KINETICS w/ 7/8" HAT CHANNELS	SEE **4/A200** FOR TOP OF WALL DETAILS (2) LAYERS OF 5/8" TYPE X GYPSUM WALL BOARD (E) METAL STUDS AT 16" O.C. 6 7/8" 3 1/2" UNFACED BATT INSULATION AT EX. STUD CAVITIES 'ISOMAX' RESILIENT CLIP BY KINETICS w/ 7/8" HAT CHANNELS	SEE **4/A200** FOR TOP OF WALL DETAILS 5/8" TYPE X GYPSUM WALL BOARD 3 5/8" METAL STUD FURRING AT 16" O.C. o (E) MASONRY WALL 3 1/2" UNFACED BATT INSULATION



4 121 CONTROL ROOM FINISH PLAN
A101 SCALE: 3/16" = 1'-0"



GENERAL FLOOR PLAN NOTES

- ALL INTERIOR DIMENSIONS ARE TO FACE OF FRAMING, U.O.N.
- ALL WALL ASSEMBLIES SHALL EXTEND TO UNDERSIDE OF ROOF DECK
- REFER TO WALL SECTION AND WALL TYPE LEGEND FOR WALL CONSTRUCTION

FINISH SCHEDULE

TYPE	PRODUCT	MANUFACTURER	STYLE	COLOR	SIZE	REMARKS
FLOOR						
CPT-1	CARPET TILE	INTERFACE	OPEN AIR 418 STRIA	TBD	24"x24"	QUARTER TURN
WALL BASE SCHEDULE						
TYPE	**PRODUCT**	**MANUFACTURER**	**STYLE**	**COLOR**	**SIZE**	**REMARKS**
B-2	RUBBER WALL BASE	TARKETT	TYPE TP	TBD	4" STD. TOE	

- PROVIDE WALL BASE AT ALL NEW WALLS & EXISTING WALLS RECEIVING NEW GYP. BOARD LAYERS
- ALL NEW WALL FINISHES TO BE PAINTED. COLOR SELECTION TO BE COORDINATED WITH OWNER

2 RESILIENT STUD PARTITION DETAIL
A101 SCALE: 1 1/2" = 1'-0"

1 TYP. OUTLET BOX DETAIL
A101 SCALE: 1 1/2" = 1'-0"

N

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

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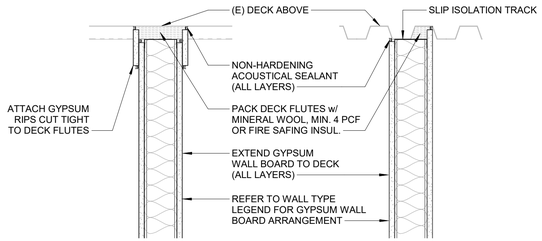
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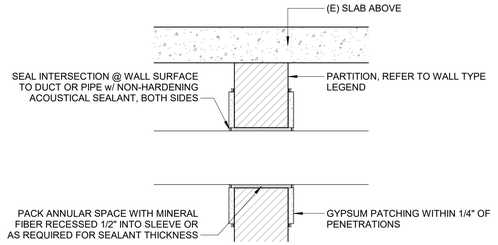
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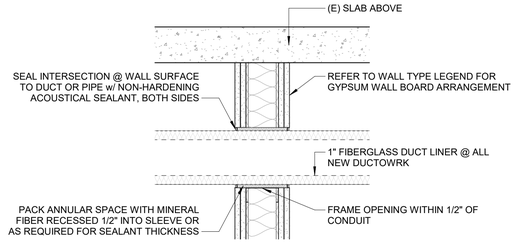
4 A200 TYP. PARTITION HEAD DETAILS

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



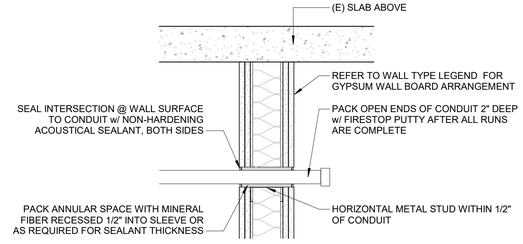
3 A200 TYP. MULTI-SYSTEM PENETRATION DETAIL

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



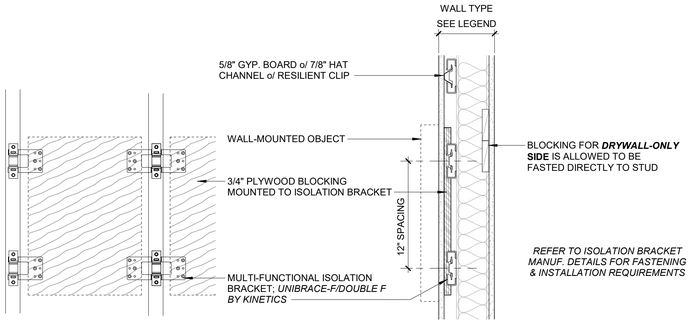
2 A200 TYP. DUCT/PIPE PENETRATION DETAIL

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



1 A200 TYP. CONDUIT PENETRATION DETAIL

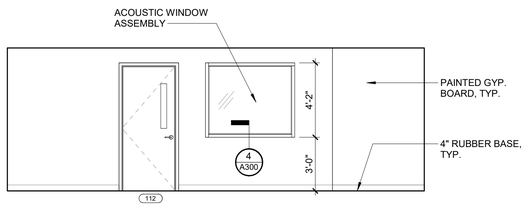
SCALE: 1 1/2" = 1'-0"



INTERMITTENT BLOCKING

7 A200 ISOLATION CLIP DETAIL AT BLOCKING

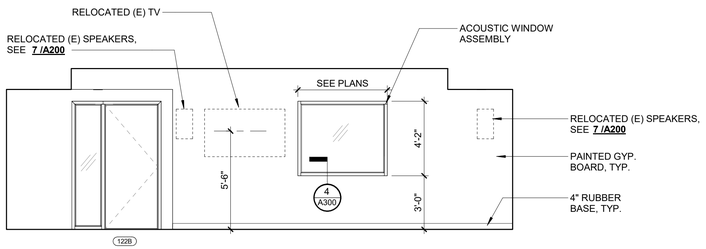
SCALE: 1 1/2" = 1'-0"





6 A200 STUDIO 113 E

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



5 A200 CLASSROOM 110 -E

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

N REFLECTED CEILING PLAN

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

CEILING FINISH LEGEND

CEILING TYPE

HEIGHT ABOVE FINISH FLOOR

-LIGHTING & HVAC SYMBOLS SHOWN FOR PLACEMENT AND REFERENCE. COORDINATE w/ ELEC. & MECH. DRAWINGS

A — PAINTED 5/8" GYPSUM BOARD o/ 1 5/8" SUSPENDED DRYWALL SYSTEM

B — (2) LAYERS PAINTED 5/8" GYPSUM BOARD o/ 1 5/8" SUSPENDED DRYWALL SYSTEM

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11/09/26	BID SET

STATE OF MICHIGAN JOHN DANCER ARCHITECT No. 1301044910 LICENSED ARCHITECT

PIC:
PM:
DRAFTS:
PROJECT NO: 26.503
SHEET TITLE: REFLECTED CEILING PLAN & INT. ELEVATIONS
A200

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DOOR AND FRAME SCHEDULE

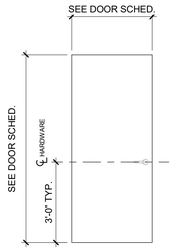
#	LOCATION	DOOR SIZE H	DOOR SIZE W	SINGLE/ PAIR	THICK.	TYPE	MATERIAL	FRAME TYPE	FRAME MATERIAL	STC	FIRE RATING	HW SETS	DETAILS HEAD	DETAILS JAMB	DETAILS THRESH.	CARD ACCESS	PWR.	REMARKS
FIRST FLOOR																		
108	WORK ROOM	7'-0"	3'-0"	SINGLE	1 3/4"	D1	WD	F1	HM		20 MIN.	04	1/A300	1/A300	--			
112	CONTROL ROOM	7'-0"	3'-0"	SINGLE	1 3/4"	D2	WD	F1	HM	STC 35		01	2/A300	3/A300	2/A300			NOTE (b)
113	STUDIO	7'-0"	3'-0"	SINGLE	1 3/4"	D2	WD	F1	HM	STC 35	20 MIN.	02	2/A300	3/A300	2/A300			NOTE (a)
121	CONTROL ROOM	7'-0"	3'-0	SINGLE	1 3/4"	D2	WD	F1	HM	STC 35		01	2/A300	3/A300	2/A300			NOTE (b)
122A	SOUND VESTIBULE	7'-0"	3'-0"	SINGLE	1 3/4"	D1	WD	F2	HM	STC 35	20 MIN.	03	2/A300	3/A300	2/A300			NOTE (a)
122B	SOUND VESTIBULE	7'-0"	3'-0"	SINGLE	1 3/4"	D1	WD	F2	HM			05	1/A300	1/A300	--			NOTE (b)

DOOR SCHEDULE GENERAL NOTES

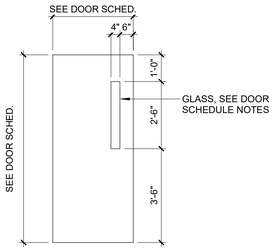
a. PROVIDE 20 MINUTE RATED FIRE-PROTECTIVE LAMINATED GLASS

b. ALL VISION LITES AT NON-ACOUSTIC-RATED DOORS TO BE 5/8" LAMINATED GLASS

- INCLUDE PROVISIONS FOR TEMPORARY DOORS AND FRAMES OF EQUAL FIRE-RATING FOR POTENTIAL PHASING OF WORK PER OWNER DIRECTION

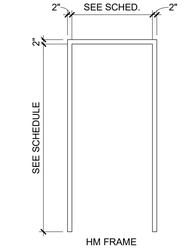


D1

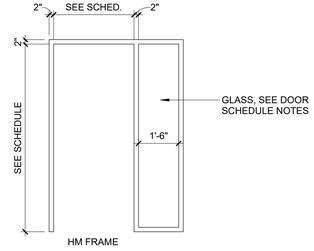


D2

DOOR LEGEND

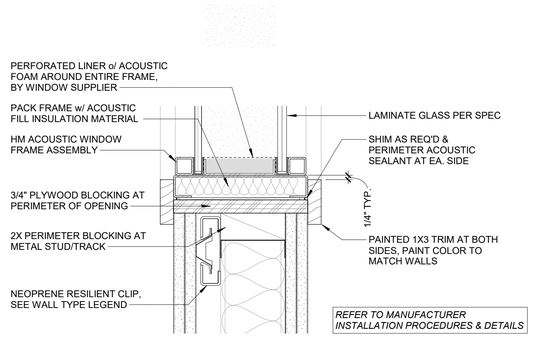


F1



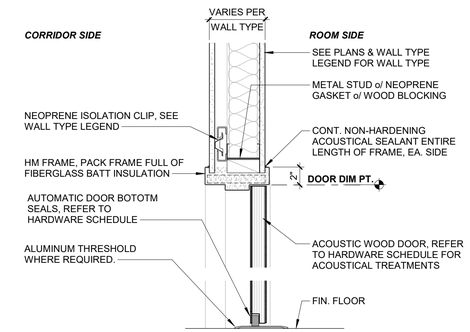
F2

FRAME LEGEND



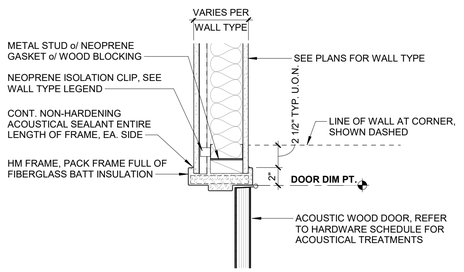
4 A300 **ACOUSTIC WINDOW FRAME DETAIL**

SCALE: 3" = 1'-0"



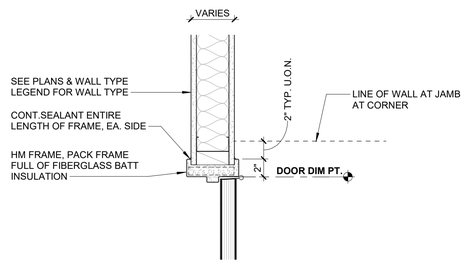
2 A300 **HEAD / SILL DETAIL**

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



3 A300 **JAMB DETAIL**

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



1 A300 **TYP. HEAD / JAMB**

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

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11/09/26	BID SET

STATE OF MICHIGAN
JOHN DANCER
ARCHITECT
No. 1301044910
LICENSED ARCHITECT

PIC:

PM:

DRAFTS:

PROJECT NO:

26.503

SHEET TITLE:

DOOR & FRAME SCHEDULE

A300

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PLUMBING SPECIFICATIONS

SECTION	
22 00 00 BASIC PLUMBING REQUIREMENTS	1. ALL WORK TO BE DONE AND MATERIALS FURNISHED COMPLYING WITH APPLICABLE LAWS AND REGULATIONS, INCLUDING THE STATE OF MICHIGAN MECHANICAL, PLUMBING AND FIRE SAFETY CODES. OBTAIN AND PAY FOR REQUIRED PERMITS AND FEES. 2. ALL MATERIALS USED SHALL BE NEW AND UNDAMAGED. 3. ALL WORK PERFORMED SHALL BE IN ACCORDANCE WITH CURRENT CONSTRUCTION INDUSTRY STANDARDS AND WORKMANSHIP. 4. MARK ALL NEW PIPING RUNS, IDENTIFYING TYPE AND DIRECTION OF FLOW. 5. FURNISH SHOP DRAWINGS TO ARCH/ENGINEER FOR APPROVAL PRIOR TO PLACING DELIVERY ORDERS. PROVIDE SHOP DRAWINGS OF ALL MANUFACTURED EQUIPMENT AND MATERIALS EXCEPT PIPE, PIPE FITTINGS AND GALVANIZED DUCTWORK. 6. FURNISH ACCESS DOORS (RATED OR NON-RATED AS REQUIRED) WHERE VALVES OR EQUIPMENT ARE CONCEALED BEHIND A NON-ACCESSIBLE CEILING OR WALL. FURNISH ACCESS DOORS TO GENERAL CONTRACTOR FOR INSTALLATION. 7. FURNISH STEEL PIPE SLEEVES WHERE PIPES PENETRATE RATED WALLS. PROVIDE FIRESTOPPING MATERIALS AND SYSTEM TO MAINTAIN THE REQUIRED RATING OF THE WALL PENETRATED. PROVIDE SHOP DRAWINGS SHOWING LISTING AND RATING OF FIRESTOPPING MATERIALS. 8. AT SUBSTANTIAL COMPLETION OF CONSTRUCTION FURNISH AS BUILT PLANS TO ARCH/ENGINEER FOR APPROVAL BEFORE THEY ARE TURNED OVER TO OWNER. 9. ALL MANUFACTURED EQUIPMENT, ACCESSORIES AND MATERIALS SHALL BE USED AS INTENDED BY THE MANUFACTURER IN STRICT ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS. 10. CONTRACTOR SHALL PROVIDE IN ADDITION TO ANY OTHER WARRANTIES SPECIFIED, A ONE YEAR FULL LABOR AND MATERIAL WARRANTY ON ALL WORKMANSHIP, MATERIAL AND EQUIPMENT FURNISHED FOR THIS PROJECT. 11. THE PLUMBING CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL OPENINGS AND REQUIRED LINTELS NEEDED FOR THE GENERAL CONTRACTOR, FOR THE INSTALLATION OF MECHANICAL EQUIPMENT. 12. SAWCUTS, LINTELS, HEADERS, AND STRUCTURAL MODIFICATIONS TO THE BUILDING STRUCTURE NEEDED FOR THE INSTALLATION OF MECHANICAL EQUIPMENT SHALL BE APPROVED BY THE GENERAL CONTRACTOR, BEFORE INSTALLATION. 13. IN GENERAL, OPENINGS AND REQUIRED LINTELS SHALL BE PROVIDED BY THE GENERAL CONTRACTOR. THE PLUMBING CONTRACTOR IS RESPONSIBLE FOR PROVIDING DETAILS AND TEMPLATES OF ALL OPENINGS NECESSARY FOR MECHANICAL EQUIPMENT INSTALLATION INCLUDING: HOUSING, ACCESS DOORS, INSPECTION DOORS, AND PASSAGEWAYS FOR MECHANICAL EQUIPMENT. THE PLUMBING CONTRACTOR IS RESPONSIBLE FOR SEALING CRACKS AND FINISHING ROUGH EDGES LEFT FOLLOWING MECHANICAL INSTALLATION. 14. APPROVAL EQUALS: PLUMBING ITEMS MANUFACTURED BY A COMPANY OTHER THAN THAT WHICH WAS SPECIFIED IN THE SCHEDULE MAY BE SUBSTITUTED BY APPROVED SHOP DRAWINGS CONTINGENT UPON MEETING THE DESIGN, APPEARANCE, AND FUNCTIONAL STANDARDS ESTABLISHED BY THE ORIGINALLY SPECIFIED ITEM(S). THE PLUMBING CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING DIMENSIONS, CLEARANCES, ASSEMBLY, FIT, ETC. OF THE APPROVED EQUAL (S), AND THEIR AFFECT ON OTHER EQUIPMENT FIT AND OPERATION. THE CONTRACTOR IS LIABLE FOR ANY ADDED COSTS TO HIMSELF OR OTHERS CAUSED BY THE APPROVED EQUALS.

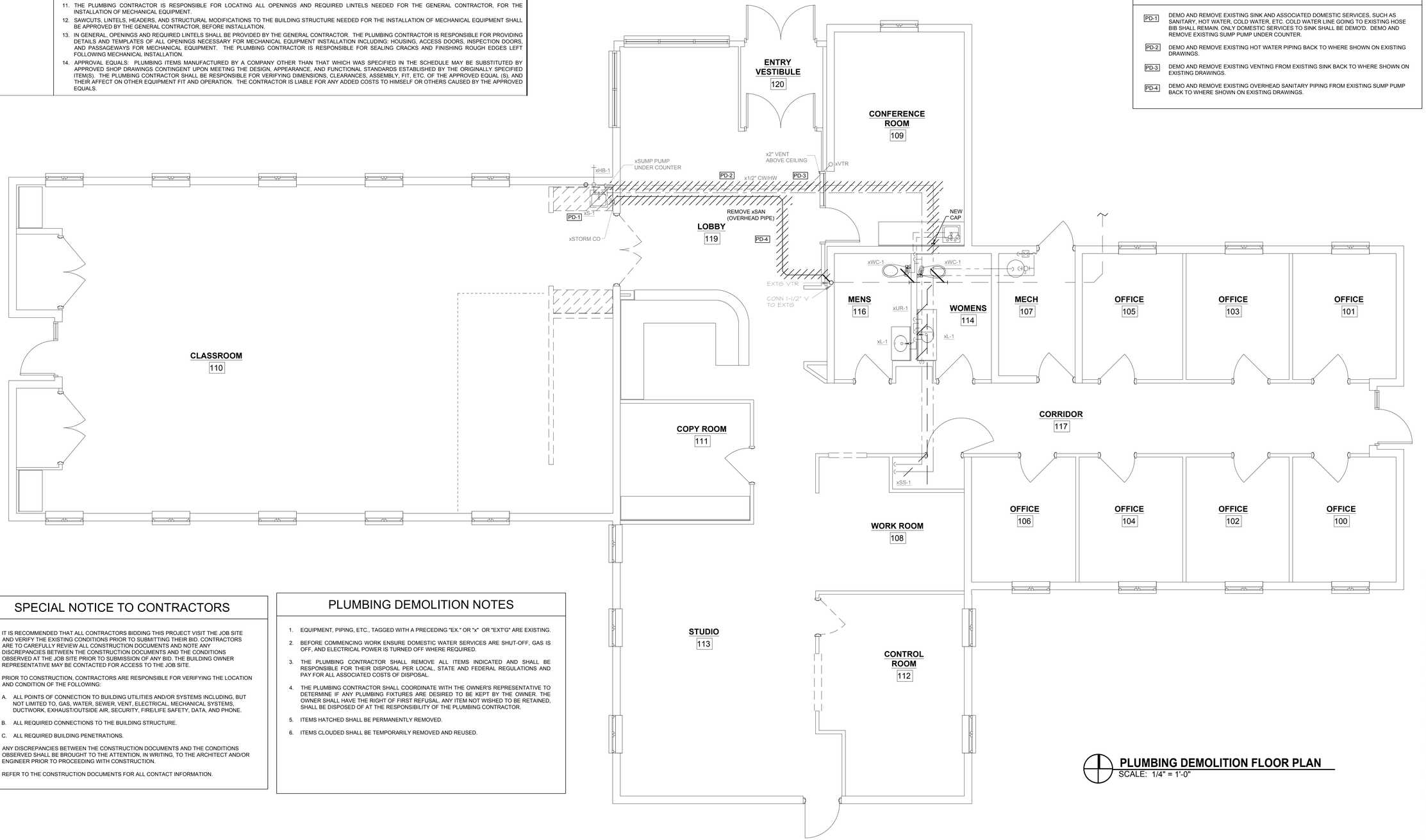
PLUMBING LEGEND

- COLD WATER PIPE
- HOT WATER PIPE
- HOT WATER RETURN
- SANITARY PIPE BELOW GRADE
- SANITARY VENT PIPING
- TIE TO EXISTING

EQUIPMENT, PIPING, DUCTWORK, ETC., TAGGED WITH A PRECEDING 'x' IS EXISTING. EXAMPLE, 'x6"Ø' IS "EXISTING 6" ROUND".

DEMOLITION KEYED NOTES PD-#

- PD-1 DEMO AND REMOVE EXISTING SINK AND ASSOCIATED DOMESTIC SERVICES, SUCH AS SANITARY, HOT WATER, COLD WATER, ETC. COLD WATER LINE GOING TO EXISTING HOSE BIB SHALL REMAIN. ONLY DOMESTIC SERVICES TO SINK SHALL BE DEMO'D. DEMO AND REMOVE EXISTING SUMP PUMP UNDER COUNTER.
- PD-2 DEMO AND REMOVE EXISTING HOT WATER PIPING BACK TO WHERE SHOWN ON EXISTING DRAWINGS.
- PD-3 DEMO AND REMOVE EXISTING VENTING FROM EXISTING SINK BACK TO WHERE SHOWN ON EXISTING DRAWINGS.
- PD-4 DEMO AND REMOVE EXISTING OVERHEAD SANITARY PIPING FROM EXISTING SUMP PUMP BACK TO WHERE SHOWN ON EXISTING DRAWINGS.



SPECIAL NOTICE TO CONTRACTORS

1. IT IS RECOMMENDED THAT ALL CONTRACTORS BIDDING THIS PROJECT VISIT THE JOB SITE AND VERIFY THE EXISTING CONDITIONS PRIOR TO SUBMITTING THEIR BID. CONTRACTORS ARE TO CAREFULLY REVIEW ALL CONSTRUCTION DOCUMENTS AND NOTE ANY DISCREPANCIES BETWEEN THE CONSTRUCTION DOCUMENTS AND THE CONDITIONS OBSERVED AT THE JOB SITE PRIOR TO SUBMISSION OF ANY BID. THE BUILDING OWNER REPRESENTATIVE MAY BE CONTACTED FOR ACCESS TO THE JOB SITE.
2. PRIOR TO CONSTRUCTION, CONTRACTORS ARE RESPONSIBLE FOR VERIFYING THE LOCATION AND CONDITION OF THE FOLLOWING:
   A. ALL POINTS OF CONNECTION TO BUILDING UTILITIES AND/OR SYSTEMS INCLUDING, BUT NOT LIMITED TO, GAS, WATER, SEWER, VENT, ELECTRICAL, MECHANICAL SYSTEMS, DUCTWORK, EXHAUST/OUTSIDE AIR, SECURITY, FIRE/LIFE SAFETY, DATA, AND PHONE.
   B. ALL REQUIRED CONNECTIONS TO THE BUILDING STRUCTURE.
   C. ALL REQUIRED BUILDING PENETRATIONS.
3. ANY DISCREPANCIES BETWEEN THE CONSTRUCTION DOCUMENTS AND THE CONDITIONS OBSERVED SHALL BE BROUGHT TO THE ATTENTION, IN WRITING, TO THE ARCHITECT AND/OR ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.
4. REFER TO THE CONSTRUCTION DOCUMENTS FOR ALL CONTACT INFORMATION.

PLUMBING DEMOLITION NOTES

1. EQUIPMENT, PIPING, ETC., TAGGED WITH A PRECEDING "EX." OR "x" OR "EXT'G" ARE EXISTING.
2. BEFORE COMMENCING WORK ENSURE DOMESTIC WATER SERVICES ARE SHUT-OFF, GAS IS OFF, AND ELECTRICAL POWER IS TURNED OFF WHERE REQUIRED.
3. THE PLUMBING CONTRACTOR SHALL REMOVE ALL ITEMS INDICATED AND SHALL BE RESPONSIBLE FOR THEIR DISPOSAL PER LOCAL, STATE AND FEDERAL REGULATIONS AND PAY FOR ALL ASSOCIATED COSTS OF DISPOSAL.
4. THE PLUMBING CONTRACTOR SHALL COORDINATE WITH THE OWNER'S REPRESENTATIVE TO DETERMINE IF ANY PLUMBING FIXTURES ARE DESIRED TO BE KEPT BY THE OWNER. THE OWNER SHALL HAVE THE RIGHT OF FIRST REFUSAL. ANY ITEM NOT WISHED TO BE RETAINED, SHALL BE DISPOSED OF AT THE RESPONSIBILITY OF THE PLUMBING CONTRACTOR.
5. ITEMS HATCHED SHALL BE PERMANENTLY REMOVED.
6. ITEMS CLOUDED SHALL BE TEMPORARILY REMOVED AND REUSED.

PLUMBING DEMOLITION FLOOR PLAN

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

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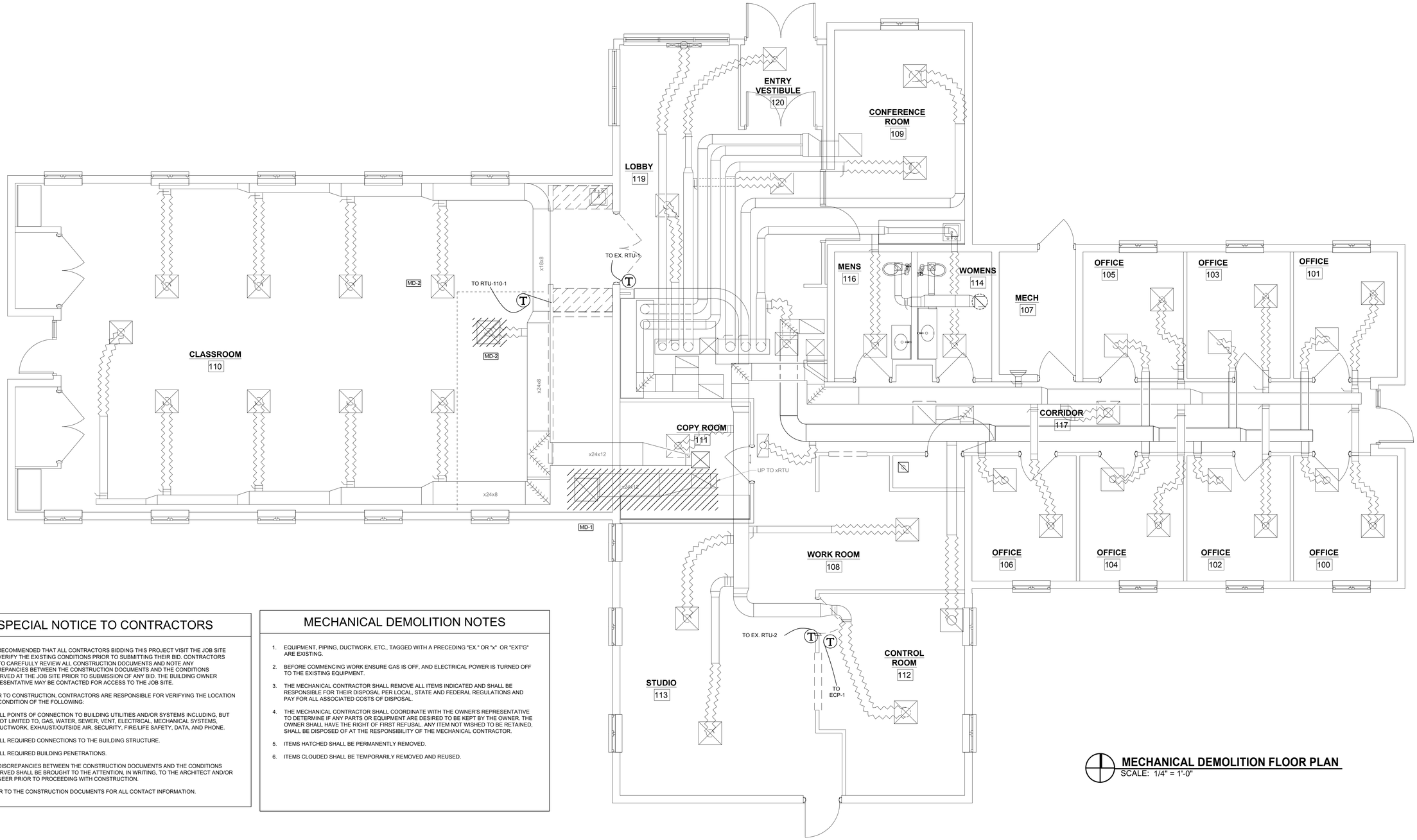
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PROJECT NO: 26.503
SHEET TITLE: PLUMBING DEMOLITION FLOOR PLAN
PD100

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DEMOLITION KEYED NOTES MD-#

MD-1 DEMO AND REMOVE EXISTING RETURN AIR DUCTWORK AND RETURN GRILLE. REMOVE BACK TO VERTICAL DUCT AS SHOWN ON PLANS.

MD-2 DEMO AND REMOVE EXISTING LAY-IN SUPPLY DIFFUSER. 8"Ø DUCT TO REMAIN.



SPECIAL NOTICE TO CONTRACTORS

1. IT IS RECOMMENDED THAT ALL CONTRACTORS BIDDING THIS PROJECT VISIT THE JOB SITE AND VERIFY THE EXISTING CONDITIONS PRIOR TO SUBMITTING THEIR BID. CONTRACTORS ARE TO CAREFULLY REVIEW ALL CONSTRUCTION DOCUMENTS AND NOTE ANY DISCREPANCIES BETWEEN THE CONSTRUCTION DOCUMENTS AND THE CONDITIONS OBSERVED AT THE JOB SITE PRIOR TO SUBMISSION OF ANY BID. THE BUILDING OWNER REPRESENTATIVE MAY BE CONTACTED FOR ACCESS TO THE JOB SITE.
2. PRIOR TO CONSTRUCTION, CONTRACTORS ARE RESPONSIBLE FOR VERIFYING THE LOCATION AND CONDITION OF THE FOLLOWING:
   A. ALL POINTS OF CONNECTION TO BUILDING UTILITIES AND/OR SYSTEMS INCLUDING, BUT NOT LIMITED TO, GAS, WATER, SEWER, VENT, ELECTRICAL, MECHANICAL SYSTEMS, DUCTWORK, EXHAUST/OUTSIDE AIR, SECURITY, FIRE/LIFE SAFETY, DATA, AND PHONE.
   B. ALL REQUIRED CONNECTIONS TO THE BUILDING STRUCTURE.
   C. ALL REQUIRED BUILDING PENETRATIONS.
3. ANY DISCREPANCIES BETWEEN THE CONSTRUCTION DOCUMENTS AND THE CONDITIONS OBSERVED SHALL BE BROUGHT TO THE ATTENTION, IN WRITING, TO THE ARCHITECT AND/OR ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.
4. REFER TO THE CONSTRUCTION DOCUMENTS FOR ALL CONTACT INFORMATION.

MECHANICAL DEMOLITION NOTES

1. EQUIPMENT, PIPING, DUCTWORK, ETC., TAGGED WITH A PRECEDING "EX." OR "x" OR "EXT'G" ARE EXISTING.
2. BEFORE COMMENCING WORK ENSURE GAS IS OFF, AND ELECTRICAL POWER IS TURNED OFF TO THE EXISTING EQUIPMENT.
3. THE MECHANICAL CONTRACTOR SHALL REMOVE ALL ITEMS INDICATED AND SHALL BE RESPONSIBLE FOR THEIR DISPOSAL PER LOCAL, STATE AND FEDERAL REGULATIONS AND PAY FOR ALL ASSOCIATED COSTS OF DISPOSAL.
4. THE MECHANICAL CONTRACTOR SHALL COORDINATE WITH THE OWNER'S REPRESENTATIVE TO DETERMINE IF ANY PARTS OR EQUIPMENT ARE DESIRED TO BE KEPT BY THE OWNER. THE OWNER SHALL HAVE THE RIGHT OF FIRST REFUSAL. ANY ITEM NOT WISHED TO BE RETAINED, SHALL BE DISPOSED OF AT THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR.
5. ITEMS HATCHED SHALL BE PERMANENTLY REMOVED.
6. ITEMS CLOUDED SHALL BE TEMPORARILY REMOVED AND REUSED.

MECHANICAL DEMOLITION FLOOR PLAN
SCALE: 1/4" = 1'-0"

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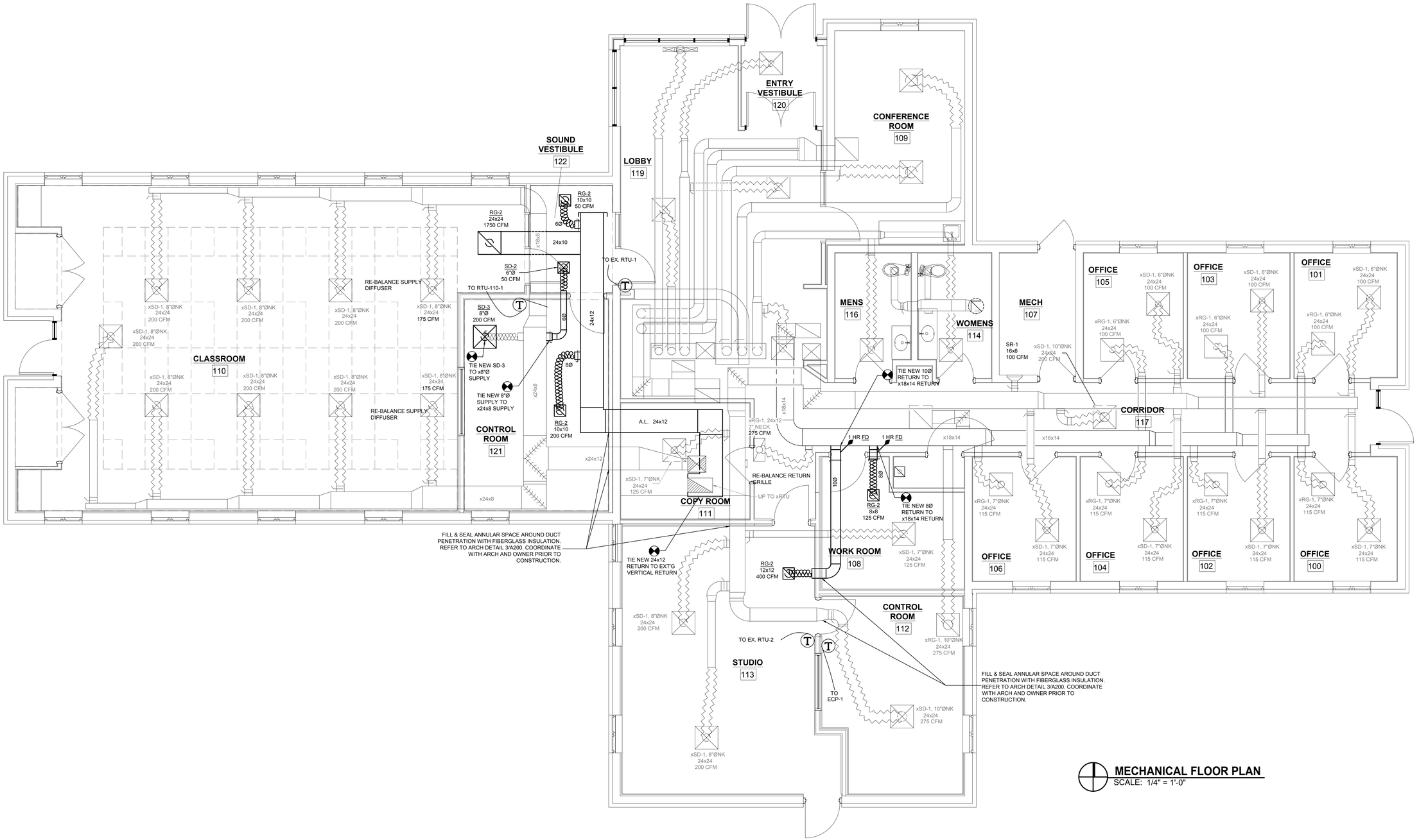
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MECHANICAL DEMOLITION FLOOR PLAN
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MECHANICAL FLOOR PLAN
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PROJECT NO:
26.503

SHEET TITLE:
MECHANICAL FLOOR PLAN

M100

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MECHANICAL SPECIFICATIONS

SECTION 23 00 00 — BASIC MECHANICAL REQUIREMENTS

1. ALL WORK TO BE DONE AND MATERIALS FURNISHED COMPLYING WITH THE LATEST ENFORCEABLE LOCAL AND STATE CODES, ORDINANCES, LAWS AND REGULATIONS, INCLUDING BUT NOT LIMITED TO THE MICHIGAN MECHANICAL CODE (M.M.C.), ASHRAE 90.1 "ENERGY STANDARDS FOR BUILDINGS EXCEPT LOW-RISE RESIDENTIAL BUILDINGS", ASHRAE 62.1 "VENTILATION FOR ACCEPTABLE INDOOR AIR QUALITY", MICHIGAN PLUMBING CODE (M.P.C.), MICHIGAN BUILDING CODE (M.B.C.), INTERNATIONAL FUEL GAS CODE (I.F.G.C.), THE OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA), ADA GUIDELINES, AND LOCAL, STATE, AND FEDERAL FIRE SAFETY CODES (NFPA).
2. ALL MATERIALS USED SHALL BE NEW AND UNDAMAGED.
3. ALL WORK PERFORMED SHALL BE IN ACCORDANCE WITH CURRENT CONSTRUCTION INDUSTRY STANDARDS AND WORKMANSHIP.
4. LABEL PIPING AND EQUIPMENT USING PROFESSIONAL MARKERS PER THE LATEST VERSION OF ASME A13.1:
   - 4.1. PROVIDE PROFESSIONAL PIPE STICKERS ON ALL NEW PIPING 1" AND GREATER IDENTIFYING TYPE AND DIRECTION OF FLOW.
   - 4.2. PROVIDE PROFESSIONAL ENGRAVED PLASTIC EQUIPMENT NAMEPLATES FOR ALL HVAC EQUIPMENT IDENTIFYING EQUIPMENT TAG AND NUMBER. SEE PLANS FOR EQUIPMENT TAG NUMBERS (FOR EXAMPLE, B-1, P-1, AHU-1, ... ETC.)
5. FURNISH ALL ACCESS DOORS (RATED OR NON-RATED AS REQUIRED) WHERE VALVES OR EQUIPMENT ARE CONCEALED BEHIND A NON-ACCESSIBLE CEILING OR WALL. FURNISH ACCESS DOORS TO GENERAL CONTRACTOR FOR INSTALLATION.
6. FURNISH STEEL SLEEVES WHERE PIPES PENETRATE RATED WALLS. PROVIDE FIRESTOPPING MATERIALS AND SYSTEM TO MAINTAIN THE REQUIRED RATING OF THE WALL PENETRATED. PROVIDE SHOP DRAWINGS SHOWING LISTING AND RATING OF FIRESTOPPING MATERIALS.
7. THE CONTRACTOR SHALL ARRANGE TO MEET AND INSTRUCT THE OWNER IN THE USE AND MAINTENANCE OF SYSTEMS AND EQUIPMENT. THIS INSTRUCTION SHALL BE FOR A MINIMUM OF (4) HOURS. AN ADDITIONAL (2) HOURS OF INSTRUCTION FOR THE OWNER WILL BE GIVEN IN THE OPERATION OF THE TEMPERATURE CONTROLS BY THE INSTALLER OF THE TEMPERATURE CONTROLS.
8. ALL MANUFACTURED EQUIPMENT, ACCESSORIES AND MATERIALS SHALL BE USED AS INTENDED BY THE MANUFACTURER, IN STRICT ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS.
9. THE CONTRACTOR SHALL PROVIDE, IN ADDITION TO ANY OTHER WARRANTIES SPECIFIED, A ONE (1) YEAR FULL LABOR AND MATERIAL WARRANTY ON ALL WORKMANSHIP, MATERIAL AND EQUIPMENT FURNISHED FOR THIS PROJECT.
10. THE MECHANICAL CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL OPENINGS AND REQUIRED LINTELS NEEDED FOR THE GENERAL CONTRACTOR FOR THE INSTALLATION OF MECHANICAL EQUIPMENT.
11. SAWCUTS, LINTELS, HEADERS, AND STRUCTURAL MODIFICATIONS TO THE BUILDING STRUCTURE NEEDED FOR THE INSTALLATION OF MECHANICAL EQUIPMENT SHALL BE APPROVED BY THE GENERAL CONTRACTOR, BEFORE INSTALLATION.
12. IN GENERAL, OPENINGS AND REQUIRED LINTELS SHALL BE PROVIDED BY THE GENERAL CONTRACTOR. THE MECHANICAL CONTRACTOR IS RESPONSIBLE FOR PROVIDING DETAILS AND TEMPLATES OF ALL OPENINGS NECESSARY FOR MECHANICAL EQUIPMENT INSTALLATION INCLUDING: HOUSING, ACCESS DOORS, INSPECTION DOORS, AND PASSAGEWAYS FOR MECHANICAL EQUIPMENT. THE MECHANICAL CONTRACTOR IS RESPONSIBLE FOR SEALING CRACKS AND FINISHING ROUGH EDGES LEFT FOLLOWING MECHANICAL INSTALLATION.
13. THE USE OF THE MECHANICAL EQUIPMENT FOR HEATING, COOLING, OR DRYING DURING CONSTRUCTION IS PROHIBITED, UNLESS APPROVED BY WRITTEN DOCUMENTATION BY THE OWNER.
14. APPROVED EQUALS: MECHANICAL EQUIPMENT MANUFACTURED BY A COMPANY OTHER THAN THAT WHICH WAS SPECIFIED IN THE SCHEDULE MAY BE SUBSTITUTED BY APPROVED SHOP DRAWINGS CONTINENT UPON MEETING THE DESIGN, APPEARANCE, AND FUNCTIONAL STANDARDS ESTABLISHED BY THE ORIGINALLY SPECIFIED ITEM(S). THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING DIMENSIONS, CLEARANCES, ASSEMBLY, FIT, ETC. OF THE APPROVED EQUAL(S) AND THEIR AFFECT ON OTHER EQUIPMENT FIT AND OPERATION. THE MECH. CONTRACTOR IS LIABLE FOR ANY ADDED COSTS TO HIMSELF OR OTHERS CAUSED BY THE APPROVED EQUALS.
15. SUBMITTALS
   - 15.1. FURNISH SHOP DRAWINGS TO ARCH/ENGINEER FOR APPROVAL PRIOR TO PLACING DELIVERY ORDERS. PROVIDE SHOP DRAWINGS OF ALL MANUFACTURED EQUIPMENT AND MATERIALS EXCEPT PIPE, PIPE FITTINGS, AND GALVANIZED DUCTWORK.
   - 15.2. AT SUBSTANTIAL COMPLETION OF CONSTRUCTION, FURNISH AS-BUILT PLANS TO ARCH/ENGINEER FOR APPROVAL, AT THE TIME OF PROJECT CLOSEOUT, APPROVED AS-BUILT PLANS SHALL BE PROVIDED TO THE BUILDING OWNER. RECORD DRAWINGS SHALL INCLUDE, AS A MINIMUM, THE LOCATION AND PERFORMANCE DATA ON EACH PIECE OF EQUIPMENT, GENERAL CONFIGURATION OF DUCT AND PIPE DISTRIBUTION SYSTEM INCLUDING SIZES, AND THE TERMINAL AIR OR WATER DESIGN FLOW RATES.
   - 15.3. AN OPERATING MANUAL AND MAINTENANCE MANUAL SHALL BE PROVIDED TO THE BUILDING OWNER AT THE TIME OF PROJECT CLOSEOUT. THESE MANUALS SHALL BE IN ACCORDANCE WITH INDUSTRY-ACCEPTED STANDARDS AND SHALL INCLUDE, AT THE MINIMUM:
     - 15.3.1. SUBMITTAL DATA STATING EQUIPMENT SIZE AND SELECTED OPTIONS FOR EACH PIECE OF EQUIPMENT REQUIRING MAINTENANCE.
     - 15.3.2. OPERATION AND MAINTENANCE MANUALS FOR EACH PIECE OF EQUIPMENT REQUIRING MAINTENANCE. REQUIRED ROUTINE MAINTENANCE ACTIONS SHALL BE CLEARLY IDENTIFIED.
     - 15.3.3. NAMES AND ADDRESSES OF AT LEAST ONE SERVICE AGENCY.
     - 15.3.4. HVAC CONTROLS SYSTEM MAINTENANCE AND CALIBRATION INFORMATION, INCLUDING WIRING DIAGRAMS, SCHEMATICS, AND CONTROL SEQUENCE DESCRIPTIONS. DESIRED OR FIELD-DETERMINED SET POINTS SHALL BE PERMANENTLY RECORDED ON CONTROL DRAWINGS AT CONTROL DEVICES OR IN PROGRAMMING COMMENTS.
     - 15.3.5. A COMPLETE NARRATIVE OF HOW EACH SYSTEM IS INTENDED TO OPERATE, INCLUDING SUGGESTED SET POINTS.

SECTION 23 05 29 — HANGERS AND SUPPORTS OF HVAC PIPING AND EQUIPMENT

1. FURNISH PIPE AND DUCT HANGERS, WHERE REQUIRED, FIRMLY SUPPORTED FROM THE BUILDING CONSTRUCTION, IN AN APPROVED MANNER.
2. SUPPORT DUCTWORK WITH APPROVED DUCT HANGERS AT INTERVALS NOT EXCEEDING 10'-0" OR BY OTHER APPROVED DUCT SUPPORT SYSTEMS DESIGNED IN ACCORDANCE WITH THE M.B.C.
3. FLEXIBLE AND OTHER FACTORY-MADE DUCTWORK SHALL BE SUPPORTED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
4. FURNISH MECHANICAL EQUIPMENT SUPPORTS AS DETAILED OR AS REQUIRED TO SAFELY AND PERMANENTLY CARRY THE WEIGHT OF THE EQUIPMENT.

SECTION 23 05 93 — TESTING, ADJUSTING, AND BALANCING

1. THE MECHANICAL CONTRACTOR SHALL SUBCONTRACT A TEST AND BALANCE CONTRACTOR TO BALANCE THE SYSTEMS DESCRIBED BELOW.
2. THE BALANCING SHALL BE COMPLETED BY AN INDEPENDENT TEST AND BALANCE CONTRACTOR WHO IS NOT AN EMPLOYEE OF THE MECHANICAL CONTRACTOR.
3. PER COMPLIANCE WITH ASHRAE 90.1-2019, THE BALANCER SHALL SUBMIT AN AIR BALANCE REPORT TO THE ENGINEER AND STATE OR COUNTY INSPECTOR.
4. THE BALANCE REPORT SHALL SHOW PROOF THAT THE SYSTEM HAS BEEN BALANCED TO +/- 10% OF THE DESIGNED FLOW RATE. IT IS THE MECHANICAL CONTRACTOR AND TEST AND BALANCER'S DUTY TO PROVIDE ACCURATE DATA, SO AREAS OF INCORRECT FLOW MAY BE DISCLOSED TO THE ENGINEER, INSPECTOR, AND OWNER.
5. ALL AIRSIDE SYSTEMS, COMPONENTS, ETC. INCLUDING SUPPLY, RETURN, OUTDOOR, AND EXHAUST AIR SYSTEMS SHALL BE BALANCED. THE BALANCER SHALL PROVIDE SHEAVES AND BELTS AS NEEDED TO PROPERLY BALANCE EQUIPMENT TO +/- 10% OF THE DESIGNED AIRFLOWS. ALL DIFFUSERS, REGISTERS, GRILLES, AND LOUVERS SHALL BE INDIVIDUALLY BALANCED AND LISTED IN THE BALANCE REPORT. ALL AIRSIDE EQUIPMENT, SUPPLY, RETURN, AND OUTDOOR AIR FLOWRATES SHALL BE LISTED IN THE BALANCE REPORT.
6. ALL HVAC MOTOR DATA INCLUDING FREQUENCY (RPM), AMP DRAW, HORSEPOWER, EXTERNAL STATIC PRESSURE, HEAD PRESSURE, ETC., SHALL BE INCLUDED IN THE BALANCE REPORT.

SECTION 23 07 13 — DUCT INSULATION

1. ALL DUCTWORK SHALL HAVE MINIMUM INSULATION PER ASHRAE 90.1-2019 TABLE 6.8.2.B. INSULATION SHALL BE INSTALLED IN ACCORDANCE WITH NAIMA NATIONAL INSULATION STANDARDS AND MANUFACTURER'S INSTRUCTIONS.
2. ALL INSULATION MATERIALS SHALL HAVE SURFACE BURNING CHARACTERISTICS MEETING FLAME SPREAD INDEX/SMOKE DEVELOPED INDEX OF 25/50, MAXIMUM, WHEN TESTED IN ACCORDANCE WITH ASTM E84, OR UL 723.
3. GLASS FIBER, FLEXIBLE INSULATION
   - 3.1. ALL INSULATION IN RETURN AIR PLENUMS SHALL BE FORMALDEHYDE-FREE
   - 3.2. ASTM C553; FLEXIBLE, NONCOMBUSTIBLE BLANKET.
     - 3.2.1. 'K' ('KSI') VALUE: 0.36 AT 75 DEGREES F (0.052 AT 24 DEGREES C), WHEN TESTED IN ACCORDANCE WITH ASTM C518.
     - 3.2.2. MAXIMUM SERVICE TEMPERATURE: 250 DEGREES F (121 DEGREES C).
     - 3.2.3. MAXIMUM WATER VAPOR SORPTION: 5.0 PERCENT BY WEIGHT.
   - 3.3. VAPOR BARRIER JACKET
     - 3.3.1. KRAFT PAPER WITH GLASS FIBER YARN AND BONDED TO ALUMINIZED FILM.
     - 3.3.2. MOISTURE VAPOR PERMEANCE: 0.02 PERM, WHEN TESTED IN ACCORDANCE WITH ASTM E96/E96M.
     - 3.3.3. SECURE WITH PRESSURE SENSITIVE TAPE.
4. DUCT LINER
   - 4.1. INSULATION: NON-CORROSIVE, INCOMBUSTIBLE GLASS FIBER COMPLYING WITH ASTM C1071; FLEXIBLE BLANKET, RIGID BOARD, AND PREFORMED ROUND LINER BOARD; IMPREGNATED SURFACE AND EDGES COATED WITH POLY VINYL ACETATE POLYMER, ACRYLIC POLYMER, OR BLACK COMPOSITE.
   - 4.2. FUNGAL RESISTANCE: NO GROWTH WHEN TESTED ACCORDING TO ASTM G21.
   - 4.3. LINER FASTENERS: GALVANIZED STEEL, SELF-ADHESIVE PAD OR IMPACT APPLIED WITH INTEGRAL HEAD.
   - 4.4. APPLICATION:
     - 4.4.1. ADHERE INSULATION WITH ADHESIVE FOR 90 PERCENT COVERAGE.
     - 4.4.2. SECURE INSULATION WITH MECHANICAL LINER FASTENERS. REFER TO SMACNA (DCS) FOR SPACING.
     - 4.4.3. SEAL AND SMOOTH JOINTS. SEAL AND COAT TRANSVERSE JOINTS.
     - 4.4.4. SEAL LINER SURFACE PENETRATIONS WITH ADHESIVE.
5. MINIMUM SUPPLY AIR DUCT INSULATION:
   - 5.1. VENTILATED ATTIC: R-6
   - 5.2. IN FLOOR/CEILING ASSEMBLY: R-3.5
6. INSULATE ALL OUTDOOR AIR AND/OR COMBUSTION AIR DUCTWORK WITH R-6, FOIL-BACKED, FIBERGLASS DUCT INSULATION.
7. ALL EXHAUST DUCTWORK THAT PASSES THROUGH AN UNHEATED ATTIC OR CRAWLSPACE SHALL BE INSULATED WITH R-3.5, FOIL-BACKED, FIBERGLASS INSULATION.
8. IN VENTILATED AND UNVENTED ATTICS, INSULATION CONTRACTOR SHALL INSULATE OVER TOP OF OF INSULATED DUCTWORK.
9. DUCT DIMENSIONS INDICATED ARE NET INSIDE DIMENSIONS REQUIRED FOR AIR-FLOW. INCREASE DUCT SIZE TO ALLOW FOR INSULATION THICKNESS.

SECTION 23 31 00 — HVAC DUCTS AND CASINGS

1. ALL DUCTWORK SHALL BE FABRICATED AND INSTALLED IN COMPLIANCE WITH 2021 M.M.C. CHAPTER 6, AND SMACNA HVAC DUCT CONSTRUCTION STANDARDS. ALL DUCTWORK SHALL BE SEALED AND INSULATED IN ACCORDANCE WITH ASHRAE 90.1-2019.
2. ROUND FLEX DUCT MAY BE USED FOR DIFFUSER-GRILLE CONNECTIONS ABOVE LAY-IN CEILINGS. FLEX DUCT MAY BE USED IN OTHER AREAS WHERE THE DUCT AND GRILLE ARE PERMANENTLY AND REASONABLY ACCESSIBLE. MAXIMUM FLEX DUCT LENGTH IS 6'-0". PERFORMANCE OF FLEXIBLE DUCT SHALL MEET OR EXCEED THE RIGID DUCTWORK.
3. UNLESS OTHERWISE NOTED ON PLANS, ALL SUPPLY AND RETURN DUCTWORK LOCATED WITHIN TEN (10) FEET OF THE EQUIPMENT FAN SHALL BE LINED WITH 1" ACOUSTICAL DUCT LINER. DUCT DIMENSIONS SHOWN ON MECHANICAL PLANS ARE INTERIOR DIMENSIONS.
4. ALL DUCT LINER SHALL HAVE A FLAME SPREAD AND SMOKE DEVELOPMENT 25 OR LESS AND 50 OR LESS WHEN TESTED BY ASTM E-84 (NFPA 255) METHOD.

MECHANICAL LEGEND

- SOLID ROUND DUCT
- FLEX DUCT
- TIE TO EXISTING
- V.I.F. — VERIFY IN FIELD
- VOLUME DAMPER
- VERTICAL FIRE DAMPER
- SUPPLY AIR DIFF/REG, SD-X, SR-X
  SUPPLY AIR DUCT, SA
- RETURN AIR GRILLE, RG-X
  RETURN AIR DUCT, RA

EQUIPMENT, PIPING, DUCTWORK, ETC., TAGGED WITH A PRECEDING 'x' IS EXISTING. EXAMPLE, 'x6"Ø' IS "EXISTING 6" ROUND".

DIFFUSER AND GRILLE SCHEDULE

TAG	DESCRIPTION	MANUFACTURER & MODEL	SIZE	VOLUME DAMPER (TYPE, LOCATION)	MATERIAL	COLOR & FINISH
SD-2	SUPPLY AIR DIFFUSER 4-WAY THROW, PLAQUE STYLE SURFACE MOUNT	TITUS OMNI	12" x 12" NECK SIZE ON PLANS	CABLE OPERATED VOLUME DAMPER	STEEL	#26 WHITE
SD-3	SUPPLY AIR DIFFUSER 4-WAY THROW, PLAQUE STYLE SURFACE MOUNT	TITUS OMNI	24" x 24" NECK SIZE ON PLANS	VOLUME DAMPER AT NECK DUE TO DRY WALL CEILING	STEEL	#26 WHITE
RG-2	RETURN AIR GRILLE EGGCRATE STYLE, 1"x1"x1" CORE SIZE DUCT MOUNTED	TITUS 50F	SIZE ON PLANS	CABLE OPERATED VOLUME DAMPER	ALUMINUM	#26 WHITE

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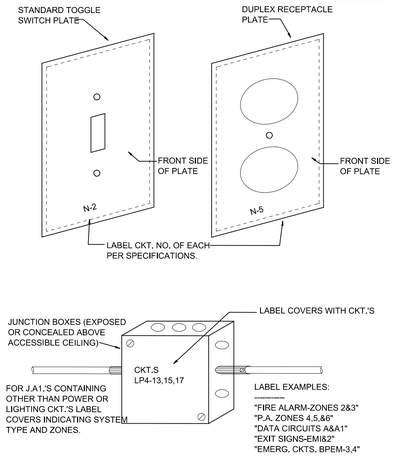
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ABBREVIATIONS

1-21	PANEL 1, CIRCUIT 21	KVA	KILOVOLT-AMPERES
A	AMPERES	KW	KILOWATTS
AC	ABOVE COUNTER	MC	MECHANICAL CONTRACTOR
AFF	ABOVE FINISH FLOOR	MCB	MAIN CIRCUIT BREAKER
AFG	ABOVE FINISH GRADE	MDP	MAIN DISTRIBUTION PANEL
BC	BELOW COUNTER	MLO	MAIN LUG ONLY
C	CONDUIT	MM	MULTIMEDIA OUTLETS (HI & LOW RECEPT. & LOW VOLT. OUTLETS)
C/A1, CB	CIRCUIT BREAKER	NL	NIGHT LIGHT
DF	DRINK'G FOUNTAIN/H20 COOLER	NTS	NOT TO SCALE
DWG	DRAWING	P	PUMP
E	EXISTING TO REMAIN	PNL	PANEL
EC	ELECTRICAL CONTRACTOR	PS	PRIMARY SWITCH
EF	EXHAUST FAN	PT	PRIMARY TRANSFORMER
EGC	EQUIPMENT GROUNDING CONDUCTOR	PVC	POLYVINYL CHLORIDE
EH	ELECTRIC HEATER	Q	QUAD-PLEX (DOUBLE DUPLEX)
EMT	ELECTRICAL METALLIC TUBING	RGS	RIGID GALVANIZED STEEL
ERV	ENERGY RECOVERY VENTILATOR	TR	TAMPER RESISTANT
E-R	EXISTING TO BE RELOCATED	TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSION
ETR	EXISTING TO REMAIN	UGRD	UNDERGROUND
EWC	ELECTRIC WATER COOLER	UON	UNLESS OTHERWISE NOTED
EWH	ELECTRIC WATER HEATER	V	VOLT
G	GROUND	VFD	VARIABLE FREQUENCY DRIVE
GEC	GROUNDING ELECTRODE CONDUCTOR	W	WIRE
GFI	GROUND FAULT CIRCUIT INTERRUPTER	WG	WIREGUARD
GTD	GENERATOR TRANSFER DEVICE	WP	WEATHERPROOF
HOR	HORIZONTAL	XFMR	TRANSFORMER
KCMIL	THOUSAND CIRCULAR MILS		

ELECTRICAL IDENTIFICATION



WIRE SIZE REQUIREMENTS

NOTE:
BASED ON A MAXIMUM OF 3,6-VOLT DROP (3%) ON 120V CIRCUITS.
WIRES FOR RUNS OVER 100'-0" SHALL BE DETERMINED ON THIS
A MAXIMUM OF A 3% DROP ALLOWED.

BRANCH CIRCUIT AMPS	LENGTH OF RUN - FROM PANEL TO FIRST CONNECTION - FEET								
AMPS	50'	60'	70'	80'	90'	100'	110'	120'	130'
15	#12	#12	#12	#10	#10	#10	#10	#10	#8
20	#12	#10	#10	#10	#10	#8	#8	#8	#8
30	#10	#10	#8	#8	#8	#6	#6	#6	#6

ELECTRICAL SYMBOL LEGEND

SYMBOL	DESCRIPTION	NOTES
S	SINGLE POLE SWITCH	MOUNT @ 44" A.F.F. TO BOTTOM OF BOX, UNLESS OTHERWISE NOTED
S_3	THREE-WAY SWITCH	MOUNT @ 44" A.F.F. TO BOTTOM OF BOX, UNLESS OTHERWISE NOTED
S_D	DIMMER SWITCH, MATCHED TO LIGHTING LOAD	MOUNT @ 44" A.F.F. TO BOTTOM OF BOX, UNLESS OTHERWISE NOTED
S_{SD}	DUAL TECH (PIR & US) OCCUPANCY SENSOR 0-10V DIMMER SWITCH (GREENGATE #OSW-D-010-X)	MOUNT @ 44" A.F.F. TO BOTTOM OF BOX, UNLESS OTHERWISE NOTED
PC	BUTTON STYLE PHOTOCONTROL, 120V	
OSI	PIR OCCUPANCY SENSOR, GREENGATE #OAC-P-1500	SEE LIGHTING FIXTURE SCHEDULE FOR TYPES
SP	SWITCHPACK LIGHTING CONTROL (GREENGATE #SP20-MV)	CONNECT TO OCC. SENSORS (PER MANUFACTURER)
X	2'x4' FIXTURE, TYPE X	SEE LIGHTING FIXTURE SCHEDULE FOR TYPES
X	1'x4' FIXTURE, TYPE X	SEE LIGHTING FIXTURE SCHEDULE FOR TYPES
X	ROUND FIXTURE, TYPE X	SEE LIGHTING FIXTURE SCHEDULE FOR TYPES
X	EXIT SIGN, TYPE X	SEE LIGHTING FIXTURE SCHEDULE FOR TYPES
X	EMERGENCY ONLY FIXTURE, TYPE X	SEE LIGHT FIXTURE SCHEDULE FOR TYPES
	DUPLEX OUTLET - 20 AMP	MOUNT @ 16" A.F.F. TO BOTTOM OF BOX, UNLESS OTHERWISE NOTED
	DOUBLE DUPLEX (QUAD) OUTLET - (2) 20 AMP	MOUNT @ 16" A.F.F. TO BOTTOM OF BOX, UNLESS OTHERWISE NOTED
	GROUND FAULT CIRCUIT INTERRUPTER DUPLEX OUTLET 20 AMP	MOUNT @ 16" A.F.F. TO BOTTOM OF BOX, UNLESS OTHERWISE NOTED
WP	GFCI WEATHER-RESISTANT DUPLEX OUTLET	MOUNT @ 24" A.F.F. TO BOTTOM OF BOX, UNLESS OTHERWISE NOTED
	20 AMP SPLIT WIRED DUPLEX RECEPTACLE OUTLET TOP HALF CONTROLLED; BOTTOM HALF ALWAYS POWERED (LEVITON #16352-1Px)	MOUNT @ 16" A.F.F. TO BOTTOM OF BOX, UNLESS OTHERWISE NOTED
	DOUBLE DUPLEX - (2) 20 AMP SPLIT WIRED DUPLEX RECEPTACLE OUTLETS; TOP HALF CONTROLLED; BOTTOM HALF ALWAYS POWERED; (LEVITON #16352-1Px)	MOUNT @ 16" A.F.F. TO BOTTOM OF BOX, UNLESS OTHERWISE NOTED
	SINGLE-PHASE SPECIAL PURPOSE OUTLET, AS NOTED	REFER TO SHOP DRAWINGS FOR CONNECTION REQUIREMENTS
J	JUNCTION BOX	
	SINGLE-PHASE MOTOR, AS SPECIFIED	
	SINGLE-PHASE FUSED OR NON-FUSED DISCONNECT	
	SINGLE-PHASE MANUAL STARTER OR COMB. DISC./STARTER	
S_M	MOTOR TOGGLE SWITCH WITH THERMAL OVERLOAD AND LOCKOUT	SQUARE-D #CLASS 2510 FGJ5P (SINGLE POLE)
	LIGHTING/BRANCH CIRCUIT PANELS	REFER TO SPECIFICATIONS AND RISER DIAGRAM.

SYMBOL	DESCRIPTION	NOTES
SPK	WALL MOUNTED SPEAKER OUTLET	E.C. TO PROVIDE AND INSTALL 4" SQ. x 2-1/8" DEEP BOX WITH 2" DEEP PLASTER RING @ 12" BCL, UNLESS OTHERWISE NOTED, AND 3/4" CONDUIT STUBBED TO THE NEAREST ACCESSIBLE CEILING.
V	LOW VOLTAGE OUTLET WITH A MINIMUM OF ONE (1) CAT6a CABLE TERMINATION, UNLESS OTHERWISE NOTED WITH A QUANTITY OF "X" CABLES.	x DENOTES THE NUMBER OF CAT6A CABLES TO BE RUN FROM THE OUTLET TO THE NEAREST EXISTING IDF/MDF, E.C. TO PROVIDE AND INSTALL 4" SQ. x 2-1/8" DEEP BOX WITH SINGLE GANG PLASTER RING @ 16" AFF AND 1" CONDUIT STUBBED ABOVE NEAREST ACCESSIBLE CEILING, DIVISION 270000 CONTRACTOR TO PROVIDE AND INSTALL QUANTITY OF CAT6A CABLES AND TERMINATE ACCORDING TO SPEC. 271006.
V	LOW VOLTAGE OUTLET WITH CABLES AS NOTED	E.C. TO PROVIDE AND INSTALL 4-11/16" SQ. x 2-1/8" DEEP BOX WITH SINGLE GANG PLASTER RING @ 16" AFF AND TWO (2) 1-1/4" CONDUITS STUBBED ABOVE NEAREST ACCESSIBLE CEILING, DIVISION 270000 CONTRACTOR TO PROVIDE AND INSTALL QUANTITY AND TYPE OF CABLES AS NOTED.
TV	TELEVISION MONITOR LOCATION	E.C. TO PROVIDE AND INSTALL ONE (1) 4" SQ. x 2-1/8" DEEP BOX WITH 2" DEEP PLASTER RING @ 72" AFF FOR A DOUBLE DUPLEX (QUAD) RECEPTACLE AND ONE (1) 4-11/16" SQ. x 2-1/8" DEEP BOX WITH 2" DEEP PLASTER RING @ 72" AFF WITH TWO (2) 1-1/4" CONDUITS STUBBED TO LOW VOLTAGE OUTLETS BELOW ON BOTH SIDES OF THE WALL FOR HDMI CABLES. DIV. 27 CONTRACTOR TO PROVIDE AND INSTALL ONE (1) CAT6A CABLE ACCORDING TO DIV. 27 SPECIFICATIONS
F	FIRE ALARM PULL STATION	EXISTING SIMPLEX SYSTEMS DEVICE
FH	FIRE ALARM HORN/STROBE	MOUNT @ MIN. 80", MAX. 96" A.F.F., EXISTING SIMPLEX SYSTEMS DEVICE
FH	FIRE ALARM VISIBLE DEVICE	MOUNT @ MIN. 80", MAX. 96" A.F.F., EXISTING SIMPLEX SYSTEMS DEVICE
SD	SMOKE DETECTOR	EXISTING SIMPLEX SYSTEMS DEVICE
FAP	FIRE ALARM CONTROL PANEL	EXISTING SIMPLEX SYSTEM TO REMAIN
	OVERHEAD ELECTRICAL CONDUIT, SIZED AS SHOWN	ONE
	UNDERGROUND ELECTRICAL CONDUIT, SIZED AS SHOWN	UGE
OHT	OVERHEAD TELEPHONE CONDUIT, SIZED AS SHOWN	OHT
UGT	UNDERGROUND TELEPHONE CONDUIT, SIZED AS SHOWN	UGT

GENERAL ELECTRICAL DEMOLITION NOTES

1. SEE THIS SHEET FOR ELECTRICAL DEMOLITION KEY NOTE LEGEND.
2. ELECTRICAL CONTRACTOR (E.C.) SHALL REMOVE ALL LIGHT FIXTURES AS INDICATED ON DRAWINGS. IF ANY LIGHT FIXTURE BALLASTS ARE FOUND TO CONTAIN PCBs THE ELECTRICAL CONTRACTOR SHALL REMOVE BALLAST FROM LIGHT FIXTURES AND DISPOSE OF IN APPROVED DISPOSAL CONTAINERS PROVIDED BY THE OWNER. THE OWNER SHALL BE RESPONSIBLE FOR PROPER DISPOSAL PER LOCAL, STATE, AND FEDERAL LAWS AND PAY FOR ALL ASSOCIATED COSTS OF DISPOSAL.
3. E.C. SHALL BE RESPONSIBLE FOR DISPOSAL OF REMAINING LUMINAIRE PARTS & ANY NON-PCB FIXTURES PER LOCAL, STATE, AND FEDERAL REGULATIONS AND PAY FOR ALL ASSOCIATED COSTS OF DISPOSAL.
4. CAUTION!!!!
   E.C. SHALL DISCONNECT AND REMOVE ALL ELECTRICAL EQUIPMENT, (WHICH INCLUDES BUT IS NOT LIMITED TO DEVICES, FIXTURES, WIRING (CIRCUITRY), CABLING, CONDUIT, ETC.), AS DESCRIBED AND SHALL GIVE THE OWNER AN OPPORTUNITY TO KEEP DEMOLISHED ELECTRICAL EQUIPMENT PRIOR TO THEM BEING DISCARDED.
5. EXISTING ELECTRICAL AND LOW VOLTAGE DEVICES SHOWN ON PLANS WITH AN "xR" ARE TO BE RELOCATED, AS INDICATED. REUSE EXISTING CIRCUITRY (WIRING) AND CONDUIT AND PROVIDE NEW AS REQUIRED TO CONNECT TO ELECTRICAL AND LOW VOLTAGE DEVICES PER THE NEW ELECTRICAL FLOOR PLANS. PROVIDE BLANK COVER PLATES FOR EMPTY GANG BOXES.
6. EXISTING ELECTRICAL AND LOW VOLTAGE DEVICES SHOWN ON PLANS WITH AN "xRP" ARE TO BE REPLACED WITH NEW DEVICES, AS INDICATED. REUSE EXISTING CIRCUITRY (WIRING) AND CONDUIT AND PROVIDE NEW AS REQUIRED TO CONNECT TO ELECTRICAL AND LOW VOLTAGE DEVICES PER THE NEW ELECTRICAL FLOOR PLANS. PROVIDE BLANK COVER PLATES FOR EMPTY GANG BOXES.
7. DEVICES SHOWN ON PLANS WITH AN "E" NEXT TO IT INDICATE THE DEVICE IS EXISTING FROM OLD DRAWINGS OR A TAKEOFF. E.C. IS TO VERIFY ACTUAL LOCATIONS OF DEVICES WHICH ARE TO REMAIN.
8. CIRCUITS SHOWN ON PLANS WITH AN " AFTER IT, INDICATE THE CIRCUIT NUMBER IS FROM AN OLD DRAWING OR A TAKEOFF. E.C. IS TO VERIFY THE ACTUAL CIRCUIT AND USE IT IF DIFFERENT THAN CIRCUIT INDICATED.

ELECTRICAL DEMOLITION NOTES

FOR THE ELECTRICAL EQUIPMENT TO BE DISCONNECTED AND REMOVED, THE OWNER SHALL BE GIVEN THE OPPORTUNITY OF HAVING ANY OF IT TURNED OVER TO THEM

1. DISCONNECT AND REMOVE ELECTRICAL DEVICE(S) WHICH WILL INTERFERE WITH THE DEMOLITION AND REMOVAL OF WALLS, FLOORING, AND/OR CEILING AS DESCRIBED IN THE ARCHITECTURAL DEMOLITION PLANS. REMOVE EXISTING CIRCUITRY (WIRING) AND CONDUIT BACK TO PANEL AND DISCARD. IN THE EVENT THAT THE ELECTRICAL DEVICE THAT IS REMOVED FEEDS OTHER DOWNSTREAM DEVICES, PROVISIONS SHALL BE MADE FOR THE DOWNSTREAM DEVICES TO REMAIN FUNCTIONAL.
2. DISCONNECT AND REMOVE (OR RELOCATE AS NOTED) ALL EXISTING LIGHTS AND CONTROLS IN THIS AREA, AS INDICATED. REMOVE EXISTING CIRCUITRY (WIRING) AND CONDUIT BACK TO SOURCE AND DISCARD, UNLESS IT CAN BE OR IS SHOWN TO BE REUSED. INSTALL NEW LIGHTS AND LIGHTING CONTROLS AS SHOWN ON NEW PROPOSED FLOOR PLANS. CIRCUIT TO NEW PANEL AND NEW CIRCUIT AS SHOWN ON NEW PROPOSED FLOOR PLANS. PROVIDE BLANK COVER PLATES FOR EMPTY GANG BOXES.
3. DISCONNECT AND REMOVE (OR RELOCATE AS NOTED) ALL EXISTING RECEPTACLES AND POWER DEVICES IN THIS AREA, AS INDICATED. REMOVE EXISTING CIRCUITRY (WIRING) AND CONDUIT BACK TO SOURCE AND DISCARD, UNLESS IT CAN BE OR IS SHOWN TO BE REUSED. INSTALL NEW RECEPTACLES AND POWER DEVICES AS SHOWN ON NEW PROPOSED FLOOR PLANS. CIRCUIT TO NEW PANEL AND NEW CIRCUIT AS SHOWN ON THE NEW PROPOSED FLOOR PLANS. PROVIDE BLANK COVER PLATES FOR EMPTY GANG BOXES.
4. DISCONNECT AND REMOVE ALL EXISTING ELECTRICAL CONNECTIONS AND EQUIPMENT FOR THE EXISTING MECHANICAL EQUIPMENT THAT IS TO BE REMOVED. REMOVE EXISTING CIRCUITRY (WIRING) AND CONDUIT BACK TO SOURCE AND DISCARD.
5. DISCONNECT AND REMOVE (OR RELOCATE AS NOTED) ALL EXISTING DATA, TELEPHONE/PAGING, TELEVISION, SECURITY, CLOCK, AND FIRE ALARM SYSTEMS DEVICES WIRING AND EQUIPMENT, AS INDICATED. REMOVE EXISTING WIRING AND CONDUIT AND DISCARD. REPLACE WITH NEW BOXES AND CONDUIT AS SHOWN ON NEW PROPOSED FLOOR PLANS. PROVIDE BLANK COVER PLATES FOR EMPTY GANG BOXES. NEW WIRING AND NEW TERMINATIONS BY THE OWNER'S LOW VOLTAGE CONTRACTOR. COORDINATE WITH THE OWNER.
6. EXISTING ELECTRICAL DEVICE TO REMAIN. NEW DRYWALL WILL BE ADDED TO THE EXISTING WALL, SO THE EXISTING ELECTRICAL DEVICE WILL NEED ADJUSTING OR A NEW EXTENSION RING MAY BE REQUIRED TO BRING THE EXISTING DEVICE FLUSH WITH THE NEW SURFACE.

GENERAL ELECTRICAL NOTES:

1. CAUTION !!!!!!!!
   E.C. SHALL VERIFY ALL ROUGH-IN ELEVATIONS, LOCATIONS AND/OR HEIGHTS OF ALL LIGHT FIXTURES, RECEPTACLE OUTLETS, T.V., COMPUTER, CLOCK OUTLETS, ETC. WITH ARCHITECT/ENGINEER. FAILURE TO DO SO WILL REQUIRE E.C. TO RELOCATE RESPECTIVE ITEMS AT THE E.C.'S EXPENSE.

   COMMUNICATION OUTLET LOCATIONS SHALL BE COORDINATED WITH OWNER AND OWNER FURNITURE PLAN PRIOR TO ROUGH-IN.
2. THE LIGHTS THAT ARE SHADED REPRESENT LIGHTS THAT HAVE A CONNECTION TO AN EMERGENCY INVERTER OR AN INTEGRAL EMERGENCY BATTERY AND SHALL OPERATE AT LOSS OF NORMAL POWER, BY HAVING A DIRECT (HOT) CONNECTION TO THE EMERGENCY INVERTER OR THE EMERGENCY BATTERY.

   ALL CONDUIT AND CONDUCTORS FOR THE EMERGENCY LIGHTING SYSTEM SHALL COMPLY WITH NEC ARTICLES 700 & 701, AS REQUIRED.
3. CONNECT ALL EXIT SIGNS AHEAD OF THE LOCAL AREA LIGHTING'S CONTROL DEVICE (i.e., HAVING A DIRECT (HOT) CONNECTION TO THE INTEGRAL BATTERY).
4. FEEDS TO NEW POWER, LIGHTING, LOW VOLTAGE AND FIRE ALARM DEVICES SHALL BE ATTEMPTED IN EVERY WAY TO BE INSTALLED FLUSH-MOUNT (RECESSED BEHIND THE WALL SURFACE).

   THERE SHALL BE NO EXPOSED CONDUITS, EXCEPT IN MECHANICAL AND ELECTRICAL ROOMS.
5. COORDINATE LOCATIONS AND MOUNTING HEIGHTS OF LIGHT FIXTURES WITH THE INTERIOR ELEVATIONS AND REFLECTED CEILING PLANS.
6. ALL PENDANT MOUNTED FIXTURES SHALL BE SECURELY HUNG FROM BUILDING STRUCTURE.
7. ALL 2'x4' AND LARGER FIXTURES SHALL BE SECURELY HUNG FROM THE BUILDING STRUCTURE, REGARDLESS OF BEING RECESSED, SURFACE OR PENDANT MOUNTED.
8. PROVIDE KEVLAR PULL STRINGS IN ALL SPARE CONDUITS.
9. E.C. SHALL COORDINATE FEEDER ROUTING WITH PLUMBING, MECHANICAL AND LOW VOLTAGE CONTRACTORS.
10. ANY NEW CONDUIT PENETRATIONS THROUGH WALLS SHALL BE APPROPRIATELY FIRE-STOPPED, SMOKE-STOPPED OR CAULKED WHEN PENETRATION SIZE EXCEEDS CONDUIT SIZE.
11. CIRCUIT'S SHOWN ON PLANS WITH AN " AFTER IT, INDICATE THE CIRCUIT NUMBER FROM OLD DRAWINGS OR A TAKEOFF. E.C. IS TO VERIFY ACTUAL CIRCUIT AND USE IT IF DIFFERENT THAN CIRCUIT INDICATED.
12. E.C. SHALL FIELD VERIFY THAT ALL ADDITIONS AND CHANGES SHALL NOT OVERLOAD EXISTING CIRCUITS, PANELS OR TOTAL SERVICE.
13. OWNER RESERVES THE RIGHT TO ADJUST LOCATIONS OF DEVICES A MAXIMUM OF 6' FROM WHERE SHOWN ON PLANS.
14. FIRE RATED CONSTRUCTION:
    E.C. TO VERIFY ALL FIRE RATED CONSTRUCTION LOCATIONS AND REQUIREMENTS WITH ARCHITECTURAL DRAWINGS.

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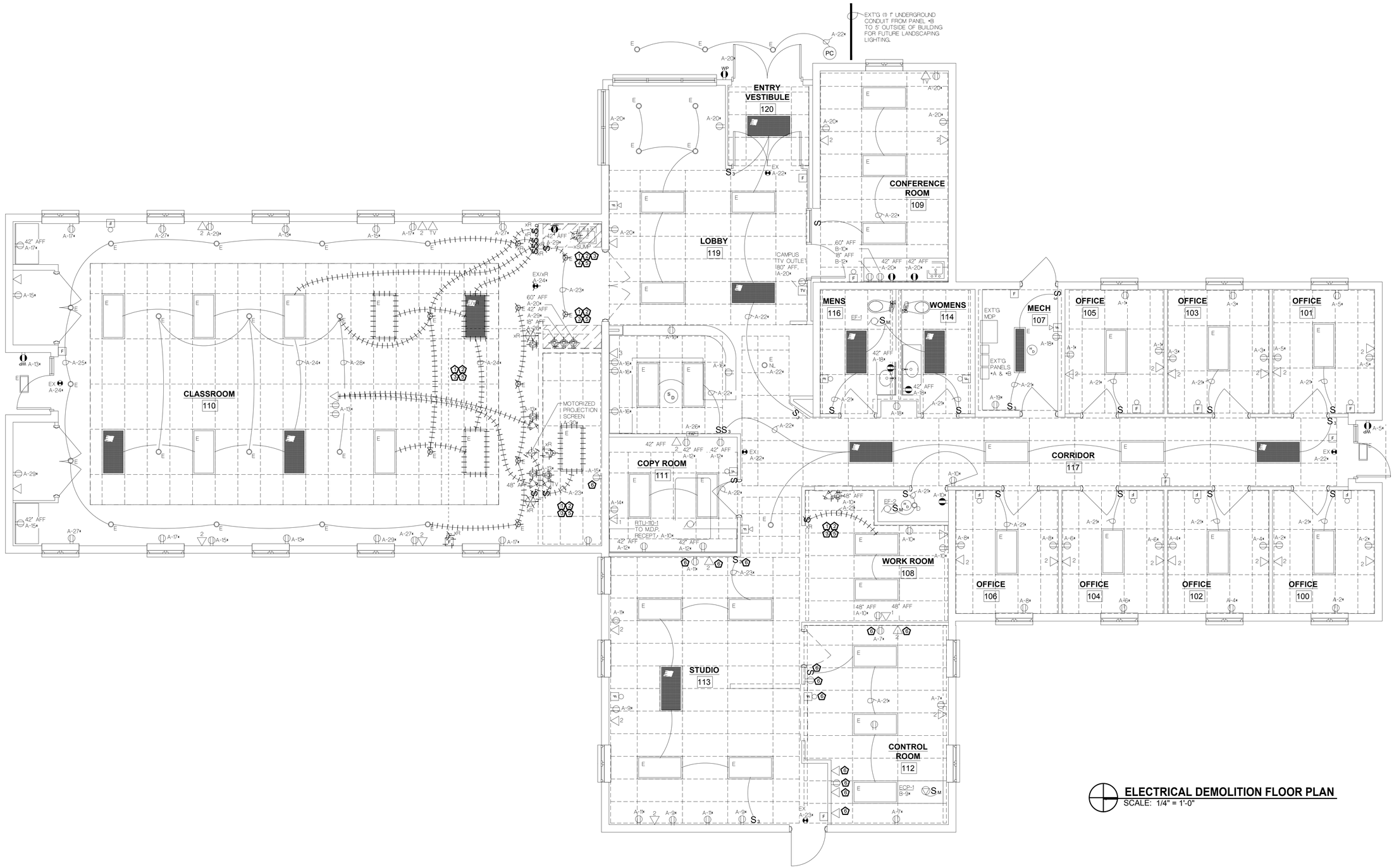
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SHEET TITLE:
ELECTRICAL SCHEDULES & DETAILS

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ELECTRICAL DEMOLITION FLOOR PLAN
SCALE: 1/4" = 1'-0"

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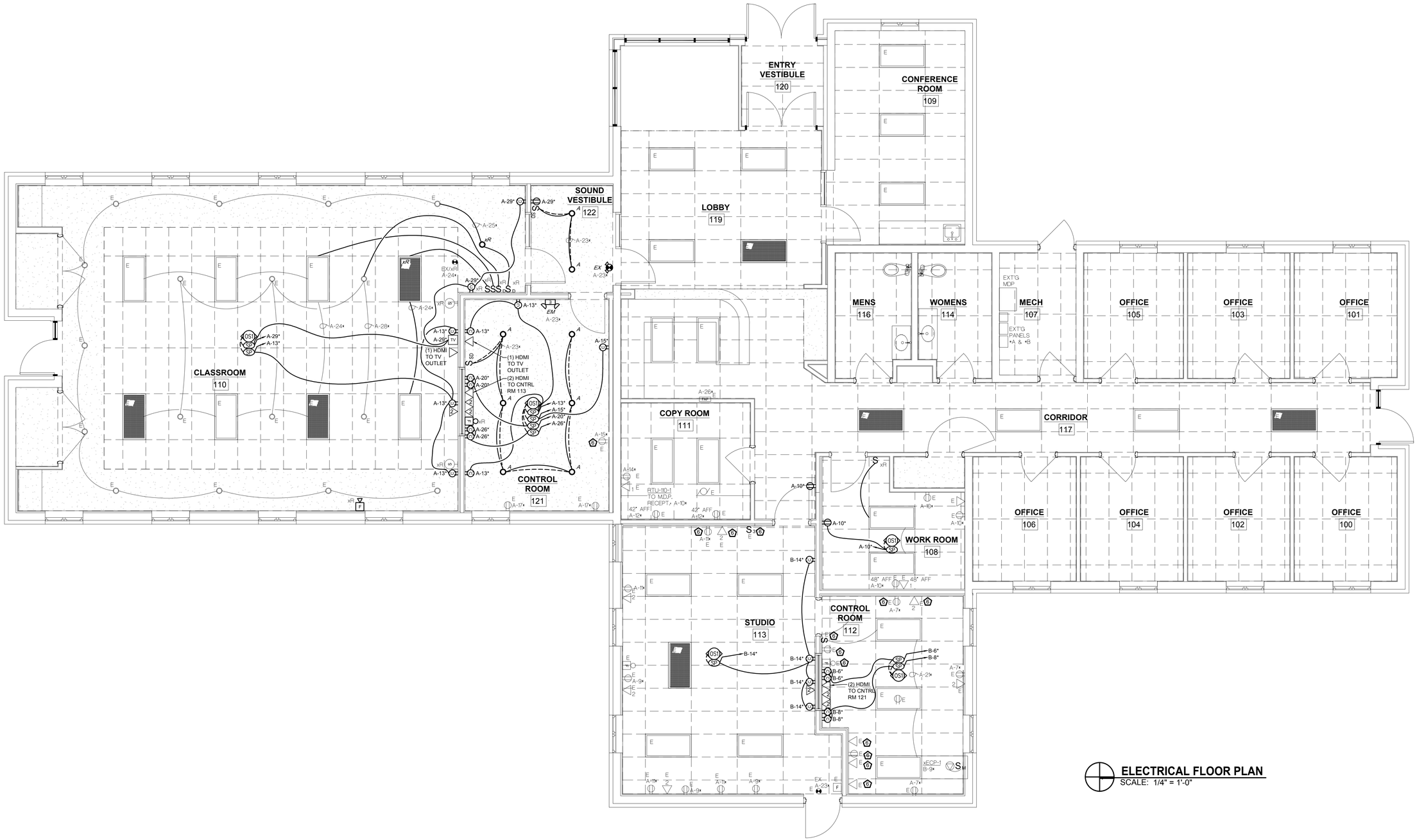
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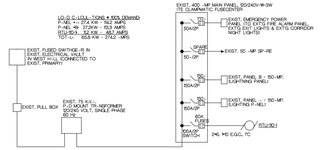
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LIGHT FIXTURE SCHEDULE

Type	Mount	Description	Lumen	Temp	CRI	Watts	Volt	Dim	Manufacturer	Catalog#	Notes
A	Recessed / Ceiling	6" Round Recessed LED Downlight fixture	1,990	3500K	80	15.8	120-277V	0-10V	Alphabet	#NU6-RD-SW-20LM-35K-80-50D-CL-WH-WH-ICAT-UNV-DIM10	White trim, white bezel, 50 degree beam, with dimming to 1%
EX	Universal	Exit / Em Combo Unit	---	---	---	---	UNV	---	Isolite	RLP-R-U-WH-MTEB-SD	Combo Unit - Remote Capacity - Red Letters / White Frame.
EM	Ceiling/Wall	Compact LED Emergency Light	250	--	--	4	120/277	N/A	Isolite	RL2LED-4-WH-MBC-SD	

EXISTING ELECTRICAL RISER DIAGRAM



xPANEL #A

VOLTAGE: 120/240V-1PH-3W **MOUNTING:** SURFACE
AMPERAGE: 225 MLO
FED FROM: MDP WITH A 150A/2P SWITCH

KEY	CIR.	CB/P	DESCRIPTION	LOAD	P	LOAD	DESCRIPTION	CB/P	CIR.	KEY
	1	20/1	RECEPT - #105	600	A	600	RECEPT - #100	20/1	2	
	3	20/1	RECEPT - #103	600	B	600	RECEPT - #102	20/1	4	
	5	20/1	RECEPT - #101	800	A	600	RECEPT - #104	20/1	6	
	7	20/1	RECEPT - #112	900	B	600	RECEPT - #106	20/1	8	
	9	20/1	PHOTO-EYE	800	A	1100	RECEPT - #108,115,117	20/1	10	
	11	20/1	RECEPT - #110	900	B	800	RECEPT - #111	20/1	12	
	13	20/1	RECEPT - #110	1100	A	1000	RECEPT COPIER - #111	20/1	14	
	15	20/1	RECEPT - #110	900	B	900	RECEPT - #118	20/1	16	
	17	20/1	RECEPT - #110	900	A	1000	RECEPT - #107,114,116	20/1	18	
	19	20/1	RECEPT - TELE. BOARD	800	B	900	RECEPT - #110	20/1	20	
	21	20/1	LIGHTS - #100-108,112,114,116	1500	A	1500	LIGHTS - #109,111,117-120	20/1	22	
	23	20/1	LIGHTS - #110, 113	800	B	1000	LIGHTS - #110	20/1	24	
	25	20/1	LIGHTS - #110	1500	A	1000	RECEPT - #110	20/1	26	
	27	20/1	RECEPT - #110	800	B	800	LIGHTS - #110	20/1	28	
	29	20/1	RECEPT - #110	900	A	1200	MOTORIZED PROJECTION SCREEN	20/1	30	

REVISED PANEL #A

VOLTAGE: 120/240V-1PH-3W **MOUNTING:** SURFACE
AMPERAGE: 225 MLO
FED FROM: MDP WITH 150A/2P SWITCH

KEY	CIR.	CB/P	DESCRIPTION	LOAD	P	LOAD	DESCRIPTION	CB/P	CIR.	KEY
	1	20/1	RECEPT - #105	***	A	***	RECEPT - #100	20/1	2	
	3	20/1	RECEPT - #103	***	B	***	RECEPT - #102	20/1	4	
	5	20/1	RECEPT - #101	***	A	***	RECEPT - #104	20/1	6	
	7	20/1	RECEPT - #112	***	B	***	RECEPT - #106	20/1	8	
	9	20/1	PHOTO-EYE	***	A	+180	RECEPT - #108,115,117	20/1	10	
	11	20/1	RECEPT - #110	***	B	***	RECEPT - #111	20/1	12	
	13	20/1	RECEPT - #110	+540	A	***	RECEPT COPIER - #111	20/1	14	
	15	20/1	RECEPT - #110	+180	B	***	RECEPT - #118	20/1	16	
	17	20/1	RECEPT - #110	***	A	***	RECEPT - #107,114,116	20/1	18	
	19	20/1	RECEPT - TELE. BOARD	***	B	+360	RECEPT - #110	20/1	20	
	21	20/1	LIGHTS - #100-108,112,114,116	***	A	***	LIGHTS - #109,111,117-120	20/1	22	
	23	20/1	LIGHTS - #110, 113	***	B	***	LIGHTS - #110	20/1	24	
	25	20/1	LIGHTS - #110	***	A	+360	RECEPT - #110	20/1	26	
	27	20/1	RECEPT - #110	***	B	***	LIGHTS - #110	20/1	28	
	29	20/1	RECEPT - #110	+180	A	***	MOTORIZED PROJECTION SCREEN	20/1	30	

xPANEL #B

VOLTAGE: 120/240V-1PH-3W **MOUNTING:** SURFACE
AMPERAGE: 225 MLO
FED FROM: MDP WITH A 150A/2P SWITCH

KEY	CIR.	CB/P	DESCRIPTION	LOAD	P	LOAD	DESCRIPTION	CB/P	CIR.	KEY
	1	60/2	EXT'G RTU-1 TO REMAIN	11200	A	11200	EXT'G TRU-2 TO REMAIN	60/2	2	
	3				B				4	
	5	40/2	SPARE	---	A	---	SPARE	20/1	6	
	7				B	---	SPARE	20/1	8	
	9	20/1	RECEPT - #113	***	A	1000	MICROWAVE - #109	20/1	10	
	11	20/1	RECEPT - #113	***	B	1000	REFRIGERATOR - #109	20/1	12	
	13	20/1	ECP-1	800	A	---	SPARE	20/1	14	
	15	20/1	SPARE	---	B	---	SPARE	20/1	16	
	17	20/1	SPARE	---	A	---	SPARE	20/1	18	
	19	20/1	SPARE	---	B	***	RECEPT - #109	20/1	20	
	21	20/1	SPARE	---	A	***	RECEPT - #119	20/1	22	
	23	20/1	EXT RECEPT #1	---	B	---	SPARE	20/1	24	
	25	20/1	EXT RECEPT #2	---	A	---	FIRE ALARM PANEL	20/1	26	B
	27	20/1	EXT RECEPT #3	---	B	---	EXT RECEPT - #5	20/1	28	
	29	20/1	EXT RECEPT #4	---	A	---	EXT RECEPT - #6	20/1	30	

REVISED PANEL #B

VOLTAGE: 120/240V-1PH-3W **MOUNTING:** SURFACE
AMPERAGE: 225 MLO
FED FROM: MDP WITH 150A/2P SWITCH

KEY	CIR.	CB/P	DESCRIPTION	LOAD	P	LOAD	DESCRIPTION	CB/P	CIR.	KEY
	1	60/2	EXT'G RTU-1 TO REMAIN	***	A	***	EXT'G TRU-2 TO REMAIN	60/2	2	
	3				B				4	
	5	40/2	SPARE	---	A	+540	RECEPT - #112	20/1	6	
	7				B	+540	RECEPT - #112	20/1	8	
	9	20/1	RECEPT - #113	***	A	***	MICROWAVE - #109	20/1	10	
	11	20/1	RECEPT - #113	***	B	***	REFRIGERATOR - #109	20/1	12	
	13	20/1	ECP-1	***	A	720	RECEPT - #113	20/1	14	
	15	20/1	SPARE	---	B	---	SPARE	20/1	16	
	17	20/1	SPARE	---	A	---	SPARE	20/1	18	
	19	20/1	SPARE	---	B	***	RECEPT - #109	20/1	20	
	21	20/1	SPARE	---	A	***	RECEPT - #119	20/1	22	
	23	20/1	EXT RECEPT #1	***	B	---	SPARE	20/1	24	
	25	20/1	EXT RECEPT #2	***	A	***	FIRE ALARM PANEL	20/1	26	B
	27	20/1	EXT RECEPT #3	***	B	***	EXT RECEPT - #5	20/1	28	
	29	20/1	EXT RECEPT #4	***	A	***	EXT RECEPT - #6	20/1	30	

PANEL SCHEDULE KEY NOTES

A	DENOTES ARC FAULT CIRCUIT INTERRUPTER (AFCI) CIRCUIT BREAKER REQUIRED
B	DENOTES BREAKER LOCK REQUIRED ON CIRCUIT BREAKER
E	DENOTES 30mA GROUND FAULT EQUIPMENT PROTECTION (GFEP) CIRCUIT BREAKER REQUIRED
G	DENOTES GROUND FAULT CIRCUIT INTERRUPTER (GFCI) CIRCUIT BREAKER REQUIRED
N	DENOTES THAT A NEW CIRCUIT BREAKER IS REQURIED, SIZED AS NOTED
S	DENOTES CIRCUIT BREAKER WILL REQUIRE SHUNT-TRIP OR TO BE RUN THRU SHUNT-TRIP CONTACTOR
x	DENOTES AN EXISTING CIRCUIT BREAKER THAT IS TO REMAIN AND BE REUSED
*	DENOTES ESTIMATED LOAD AND/OR CIRCUIT BREAKER SIZE. E.C. SHALL CONFIRM EXACT REQUIREMENTS WITH SHOP DRAWINGS PRIOR TO ORDERING CIRCUIT BREAKERS
R	DENOTES TO REPLACE THE EXISTING CIRCUIT BREAKERS WITH A NEW CIRUIT BREAKER, SIZED AS NOTED IN THE REVISED PANEL SCHEDULE

NOTE: PROVIDE GFCI PROTECTION FOR ALL NEW RECEPTACLES AND FOR ALL NEW EQUIPMENT IN LOCATIONS AND AS SPECFICALLLY NOTED IN NEC 210.8(B). CONFIRM EQUIPMENT CONNECTION REQUIREMENTS WITH EQUIPMENT CUT SHEETS.

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ELECTRICAL SPECIFICATIONS

SECTION 26 00 00
ELECTRICAL GENERAL PROVISIONS

PART 1 GENERAL

1.01 DESCRIPTION OF WORK:

A. Work included in this Division consists of providing all demolition, labor, materials, equipment, tools, supervision, start-up services, Owner's instructions, including all incidental and related items necessary to complete installation, and successfully test, start up and operate building in a practical and efficient manner. Electrical Systems indicated on Drawings and described in each Section of Division 26 Specification and conforming with all Contract Documents.

B. Work not included under this Division:
1. Low voltage temperature control wiring. Refer to Part 2, Paragraph 2.03 of this Section.
2. Field painting of equipment, except for repair to damaged factory finishes.

C. The General Provisions of this Contract, including General and Supplementary Conditions and other General Requirements Sections, apply to the Work specified in this Section.

D. This Section is not intended to supersede, but to clarify, the definitions in Division 1, General Requirements and Supplementary Conditions.

E. The Contractor shall coordinate directly with the Owner and the General Contractor to complete the necessary documentation for eligible energy rebates from Traverse City Light & Power Energy Efficiency Program as a result of this project.

1.02 DRAWINGS AND SPECIFICATIONS:

A. Drawings are diagrammatic and indicate general arrangement of systems and work included in Contract, and shall serve only as design drawings, and not as working drawings, for general layout of various equipment and systems.

B. Drawings and Specifications are intended to supplement each other, and all work specified or indicated in either shall be provided. Should drawings disagree in themselves or with Specifications, the better quality or greater quantity of work shall be provided.

C. Drawings and Specifications are intended to include all work and materials necessary for completion of the work. Any incidental item of material, labor or detail required for the proper execution and completion of the work and omitted from either the drawings and specifications or both, but required by governing codes local regulations, trade practices, operational functions, and good workmanship, shall be provided as part of the Contract Work without extra charge, even though not specifically detailed or specified.

1.03 SITE AND PROJECT DOCUMENT EXAMINATION:

A. Submission of a proposal is considered evidence the Contractor has visited site, examined Drawings and Specifications of all trades including Architectural, Structural and Mechanical, and fully informed himself with all project and site conditions, and is proficient, experienced and knowledgeable of all standards, codes, ordinances, permits and regulations which affect his respective trade, and that all costs are included in his proposal.

B. The Electrical Contractor and/or Sub-Contractor shall insure all required permits, and assessments have been obtained prior to any work beginning. Contractor shall verify requirement to include privilege fees, plan review fees, and permits as part of his formal bid.

1.04 STANDARDS, CODES AND PERMITS:

A. Refer to Division 1, General Requirements and Supplementary Conditions.

B. All work under Electrical Sections shall comply with latest edition of applicable standards and codes of the following, including local codes and variances:
1. NECA - Standards for Installation
2. NFPA - National Fire Protection Association
3. NEC - Latest edition of NFPA 70
4. UL - Underwriter's Laboratories
5. NEMA - National Electric Manufacturers Association
6. NESC - National Electric Safety Code (H13)
7. OSHA - Occupational Safety and Health Act
8. IEEE - Institute of Electrical and Electronics Engineers

C. All work shall be provided and tested in accordance with all applicable local, county, state laws, ordinances, code rules and regulations, including Michigan Department of Labor, General Rules, Part 8-Electrical Code Rules.

D. No work shall be covered or enclosed until work is tested in accordance with applicable codes and regulations, and successful tests witnessed and approved by authorized inspection authority. Written approvals shall be secured by Contractor and submitted to Engineer before final acceptance of work.

1.05 SUBMITTALS:

A. Proposal Supplement:
1. Contractor to submit one (1) copy of Proposal Supplement - SECTION 26 00 10 - ELECTRICAL EQUIPMENT AND MATERIALS, at the time of Bid opening, listing the manufacturers upon which his bid was based, including all items being provided by Sub-Contractors.
2. After Proposal Supplement and Sub-Contractors are approved, no deviation shall be permitted without written approval of Engineer.

B. Shop Drawings:
1. Submit electronic copies of shop drawings in PDF file format on all equipment and materials indicated in the specifications or on drawings.
2. At the time of submittal for review by the Engineer, shop drawings shall include signatures or stamps indicating that the Contractor and/or the Sub-Contractor has reviewed the submittals and has coordinated the required space, quantities required, services and work of other trades for the equipment or system being submitted.
3. Submittals shall include a title page with the name of the Project, Architect, Engineer and the submitting Contractor and Supplier(s), indicated on the cover.
4. Submit complete manufacturer's shop drawings of all equipment, accessories and controls, including dimensions, weights, capacities, construction details, installation, controls, wiring diagrams, and motor data.
5. Engineer's approval of shop drawings is for general application only and is a service only and not considered as a guarantee of total compliance with or as relieving Contractor of basic responsibilities under all Contract Documents, and does not approve changes in quantities, time or cost.
6. After approval, each Contractor is responsible to provide information to all other trades involved in, or affected by, installation of his equipment and work.
7. Within thirty (30) days after the bid has been awarded, submit to the engineer each of the following drawings and/or data sheets for review. All equipment for which shop drawings are being submitted shall not be ordered until approved shop drawing submittals have been returned. Shop Drawings to submit include:
   - WIRING DEVICES, INCLUDING RECEPTACLES, SWITCHES, CONTROLLED RECEPTACLES, ETC.
   - INTERIOR LIGHT FIXTURES
   - LIGHTING CONTROL, INCLUDING WALL SWITCHES, ETC.
   - FIRE ALARM SYSTEM DEVICES, WIRING DIAGRAMS, CALCULATIONS, ETC.

C. Operating and Maintenance Instructions and Manuals:
1. Electrical Contractor shall provide for all items of equipment three (3) bound and indexed sets of operating/installation and maintenance instructions to Engineer for approval. After approval, manuals will be given to Owner by the Engineer.
2. Manuals shall include a complete set of shop drawings submitted, indexed with tabs for each section.

1.06 ELECTRICAL SERVICE REQUIREMENTS:

A. Permanent Electrical Service:
1. The existing electrical system is to remain and be used for all new and renovated circuits.
2. The Electrical Contractor is to verify with the Electrical Utility the electrical system amperage, voltage and phase and report any variations from what is indicated on the drawings to the Engineer. Electrical Contractor is to obtain written verification of the available symmetrical and asymmetrical RMS fault current from the Electrical Utility. Basis of design and bidding shall be a minimum of 10,000 system integrated A.I.C.on "MDP" overcurrent devices and branch circuit panelboard overcurrent devices.
3. The Electrical Contractor shall select the over current protection devices and coordinate with the fault current. Submit a list of the devices and how coordination will be achieved. This submittal shall be in the form of a shop drawing.

PART 2 PRODUCTS

2.01 STANDARDS:

A. All products shall be of established manufacturers regularly engaged in making type of materials to be provided and complete with all parts, accessories, trimmings, connections, etc. as specified in detail or as described in manufacturer's catalog.

B. All material shall be labeled or listed by Underwriter's Laboratories, Inc. Assembled electrical equipment supplied to the job site shall be listed or labeled and/or approved by the authority having jurisdiction.

2.02 SUBSTITUTION AND CHANGES:

A. Contractor and/or Equipment Supplier may propose alternate equipment or materials of EQUAL or better quality, function, performance, durability, and appearance. This information is to be submitted to the Engineer's Office ten (10) working days prior to bid due date to allow for proper review time and to issue an addendum incorporating the acceptable substitution(s). It is the submitter's responsibility to provide sufficient material for review as required by Engineer's Office. Acceptance and approval are the responsibility of the Engineer.

B. Contractor and/or Equipment Supplier is liable for any added costs to himself or others and is responsible for verifying dimensions, clearance, and roughing-in requirements, when product not named as the basis of design are used and is responsible for advising other Contractors of variations and submit revised drawing layout for approval of Engineer.

C. See Section 26 00 10 for voluntary alternates.
1. No substitutions will be accepted after bids are received. The lighting or electrical equipment specified herein has been carefully chosen for it's ability to meet the luminous performance and/or design criteria of this project. Substitutions likely will be unable to meet all of the same requirements as the specified equipment.
2. When only one manufacturer is listed within the description of the luminaire or electrical equipment, the design engineering or architectural aesthetics will not allow substitution of other manufacturer.
3. When two or more manufacturers are listed within the description of the luminaire or electrical equipment, the Contractor may elect to submit to the Engineer a substitute fixture for review. All submittals must follow paragraph 2.02.A of this section.
4. Substitution submittals shall consist of a physical description, dimensioned drawing and complete photometric and electric data of the proposed lamp, luminaire, or electrical equipment. Working samples may be requested and shall be supplied to the Engineer for a visual check of finish and operating characteristics.
5. Contractor will be responsible for ALL costs (engineering time, manufacturer's costs, distributor costs, etc.) incurred to replace equipment not approved if substitutions are made by the distributor, manufacturer's rep., contractor, or subcontractor.

PART 3 EXECUTION

3.01 COORDINATION OF ELECTRICAL WORK:

A. The Electrical Contractor shall be responsible for all Sub-Contractors and Suppliers, and include in his bid all materials, labor and equipment involved in accordance with all local customs, rules, regulations, jurisdictional awards, decisions, and secure compliance of all parts of the Specifications and Drawings regardless of Sectional inclusion in these Specifications.

B. The Electrical Contractor and Sub-Contractor shall be responsible for all parts applicable to his trade in accordance with the Specifications and Drawings and shall be responsible for coordinating locations and arrangements of his work with all other relevant Mechanical, Architectural, Structural and Electrical Contractor's Specifications, Drawings and Shop Drawings.

3.02 EQUIPMENT CLEARANCE:

A. Electrical Contractor to coordinate with the Mechanical Contractor's equipment location to ensure adequate clearance is maintained as required by the National Electrical Code and applicable state and local codes, as well as accessibility for future maintenance and operation.

B. Electrical work shall be arranged with building construction to provide minimum 6'-8" overhead clearance where possible.

3.03 WALL, FLOOR AND CEILING OPENINGS:

A. Locate all openings and advise the General Contractor of details and templates of all openings necessary for inspection of electrical work.

B. In general, openings and required lintels shall be provided through the General Contractor. Size and location is the responsibility of this Contractor. Cracks and rough edges left following installation of equipment shall be caulked or covered by Electrical Contractor.

C. Perform or pay for all cutting, fitting, repairing, patching, and finishing of work of other sections where it is necessary to disturb such work to permit installation of electrical work.
1. Repair or replace existing or new work disturbed.

3.04 FIELD CHANGES:

A. The Contractor shall not make any field changes that affect timing, costs, or performance without written approval from the Architect/Engineer in the form of a Change Order, Field Change Order or a Supplemental Instruction. The Contractor assumes liability for any additional costs for changes made without such instruction or approval. Should any unauthorized change be determined by the Architect/Engineer as lessening the value of the project, a credit will be determined and issued as a change to the Contract.

3.05 PROJECT CLOSEOUT:

A. Final Acceptance and payment will only be made after final punchlist completion and receipt at the Engineer's Office of:
1. All Guarantees/Warranties
2. Operating and Maintenance Instruction Manuals
3. Record Drawings (As Builts)
4. Certificates of Inspection
5. Test Reports

3.06 CERTIFICATES OF INSPECTION AND TEST REPORTS:

A. Submit to the Engineer's Office evidence that installation has been inspected and approved by local or state electrical inspector and/or the authority having jurisdiction.

3.07 GUARANTEES AND WARRANTIES:

A. At the end of a one-year period of continuous operation, make a complete inspection of all systems, fixtures, equipment, safety devices and controls to ensure equipment is operating properly, and report to Engineer in writing.

3.08 RECORD DRAWINGS:

A. Maintain a white-print set of Electrical Contract Drawings in clean, undamaged condition for markup of actual installation on Electrical Contract Drawings which vary substantially from the work as shown. These drawings are to be available for inspection by the Engineer on a weekly basis. Drawings shall indicate at a minimum the routing of all conduits over 2" on size, revised circuiting, revised panel schedules, emergency lighting controller (EPCs, BLTCs, etc.) locations, and addendum, bulletin, and field changes.

3.09 OPERATING AND MAINTENANCE INSTRUCTIONS:

A. Provide instruction of Owner's personnel in operation and maintenance procedures for all systems equipment.

B. Provide 3 - bound & tabbed sets of operating & maintenance instruction manuals for all electrical equipment.

3.10 PLACING SYSTEMS INTO OPERATION:

A. Electrical Contractor shall be responsible for all startup procedures, system checks, and balancing associated with his equipment.

B. All equipment shall be installed, tested, and operated in accordance with manufacturer's recommendations at normal operating conditions.

C. All permanent electrical equipment operated during construction periods shall be cleaned and damaged equipment replaced.

3.11 ADJUSTMENTS AND BALANCING:

A. Contractor shall make all necessary adjustments to equipment installed or connected by him under this contract to insure proper operation of the same.

B. PROVIDE WRITTEN VERIFICATION TO NEALIS ENGINEERING, INC. OF TEST DATA ON ALL TRANSFORMERS AND PANELS. TEST DATA SHALL INCLUDE VOLTAGE AND AMPERAGE.

3.12 GUARANTEES AND WARRANTIES:

A. All labor, materials and equipment shall be guaranteed by Contractor and/or warranted by Manufacturer for one year after acceptance date and/or one normal continuous complete season operation applicable to equipment or system except where specified longer for special equipment. Contractor shall secure such warranty from all Suppliers (not one year from shipment date), or Contractor to assume warranty.

B. Acceptance date of substantial completion shall be Owner occupancy as determined by Architect/Engineer.

C. Contractor shall make all necessary alterations, repairs, adjustments, replacements during guarantee periods as directed by Architect/Engineer to comply with Drawings and Specifications at no cost to Owner.

D. Repair or replacements made under guarantee bear further one year guarantee from date of acceptance of repair or replacement.

3.13 IDENTIFICATION:

A. All primary equipment, main switchboards, distribution and branch panelboards, transformers, safety switches, motor disconnects, controllers, etc., whether or not furnished under this Division shall be marked to identify the equipment served and the origin of the power source. Distribution panels, branch panels and switchboards shall be identified as to the designation indication on the Contract Drawings and voltage characteristics. Individual switches in Distribution Panels and Switchboards shall be identified as to equipment being fed.

B. All identification shall be done with engraved 2-ply lamacoid plates with ¼" white lettering on a black background. "Dymo" or tape markers ARE NOT acceptable.

C. Concisely and clearly type out all branch panel schedules indicating room or area served along with the item(s) connected to each circuit.

D. See Electrical Drawing Detail for additional identification requirements.

3.14 TRAINING:

A. The option of videotaping any and all training sessions shall be given to the Owner at no additional cost, with the Contractor conducting the videotaping and with two (2) copies of all tapes being turned over to the Owner for future use.

B. E.C. shall conduct 2 - 2-hour training session on the operation and controls of all electrical equipment. Notify owner 72 hours prior to session.

C. E. C. shall conduct 2 - 2 hr. training session on the operation & control of the lighting control systems, which includes the occupancy sensors, the over-ride switches, and the lighting control panels. Notify owner 72 hours prior to session.

END OF SECTION

SECTION 26 00 10
ELECTRICAL EQUIPMENT AND MATERIALS

PART 1 GENERAL

1.01INSTRUCTION:

A. The Electrical Contractor is to either copy or remove this specification section from the spec book and complete as follows:
1. Indicate the specific manufacturer on which the bidder's base bid price is based in the blank space provided.
2. All equipment is to be bid as specified. Material or equipment from another manufacturer may be bid as a Voluntary Alternate, but the dollar amount must be shown as an "Add" or "Deduct" to the base bid. Provide the name of the alternate manufacturer in the space provided.
3. Insert the name(s) of each subcontractor used in your bid in the space provided in Part 3.
4. This form shall be submitted with the bid.

1.02RELATED DOCUMENTS:

A. The other Contract Documents complement the requirements of this Section. The General Requirements apply to the work of this section.

1.03DEVIATIONS FROM SPECIFIED MATERIAL:

A. See Section 26 00 00, Part 2, Paragraph 2.02 - Substitutions and Changes. Base bid shall be based on manufacturers listed in this specification or on the drawings.

PART 2 PRODUCTS

2.01 THE FOLLOWING IS A LIST OF APPROVED MANUFACTURERS, GROUPED ACCORDING TO TYPES OF MATERIALS OR EQUIPMENT.

A. Wiring Devices:
1. Legrand, Pass & Seymour, Hubbell, Leviton, and Cooper
   a. Voluntary alternate_____
   b. Add $_____ Deduct $_____

B. Lighting and Receptacle Controls Systems
1. Cooper Lighting Controls (Basis of Design), and Acuity
   a. Voluntary alternate_____
   b. Add $_____ Deduct $_____

M. Fire Alarm System Devices
1. Simplex (basis of Design - to match existing).
   a. Voluntary alternate_____
   b. Add $_____ Deduct $_____

N. Lighting Fixtures:
1. Tag A series: Cooper-Metalux (Basis of Design), and Acuity
   a. Voluntary alternate_____ Add $_____ Deduct $_____
3. Tag EM series: Isolite(Basis of Design), and Even-Lite
   a. Voluntary alternate_____ Add $_____ Deduct $_____
4. Tag EX series: Isolite(Basis of Design), and Even-Lite
   a. Voluntary alternate_____ Add $_____ Deduct $_____
4. Tag SP & OS1 series: Cooper Lighting Controls (Basis of Design), and Acuity
   a. Voluntary alternate_____ Add $_____ Deduct $_____

PART 3 SUBCONTRACTORS

3.01 INSERT THE NAME OF EACH SUBCONTRACTOR AND WORK TO BE PERFORMED BELOW:

A. Subcontractor_____
Work Performed_____

B. Subcontractor_____
Work Performed_____

C. Subcontractor_____
Work Performed_____

END OF SECTION

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NORTHWESTERN MICHIGAN COLLEGE
NMC AUDIO TECH
ACOUSTIC UPGRADES
1701 E. FRONT ST. TRAVERSE CITY, MI 49686

Date	Issued For
11/09/26	BID SET

PIC:
PM:
DRAFTS:
PROJECT NO: 26.503

SHEET TITLE:
ELECTRICAL SPECIFICATIONS

E900

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ELECTRICAL SPECIFICATIONS

SECTION 26 00 50
BASIC MATERIALS AND METHODS

PART 1 GENERAL

1.01 MATERIALS:

A. All materials and equipment furnished for installation on this project shall be new and in strict accordance with Contract Documents. All packaged materials shall be delivered in their original containers which shall show the manufacturer's name and the identifying designations as to size, quality, etc. Materials delivered to the project unmarked or mutilated packages will be ordered to be removed from the site at once. Materials or equipment judged as "damaged" by the Architect/Engineer shall be removed from the project and site.

B. Should any dispute arise to the quality of any material, the decision shall rest entirely with the Architect/Engineer and shall be based on the requirement that all materials furnished shall be first class in every respect, and what is usual or customary in erecting other buildings shall in no way enter into the consideration or decision whatever as it pertains to the project under consideration.

C. All materials and equipment furnished under work of all Division 26 sections shall be UL approved and listed, and shall bear the Underwriter's Label.

PART 2 PRODUCTS

2.01 RACEWAYS:

A. Aluminum conduit is acceptable in this Contract.

B. Rigid Metal Conduit:

1. Rigid metal conduit shall be hot dipped galvanized steel, meeting Federal Standard WW-C-581.
2. Threaded fittings shall be used on rigid metal conduit.

C. Electric Metallic Tubing:

1. Electrical metallic tubing shall be standard weight, meeting Federal Standard WW- C-563 and bear the manufacturer's name and Underwriter's Label on each length. Maximum permissible size tubing shall be 4".
2. Provide compression-type steel fittings or set screw-type steel fittings. Crimp-type connectors are not acceptable.

D. Flexible Metal Conduit:

1. Flexible metallic conduit shall meet Federal Standard WW-C-566 and is to have separate grounding conductor. Minimum permissible size shall be 1/2".
2. Fittings shall be malleable iron, threaded type.

E. Liquid-Tight Flexible Metal Conduit:

1. Liquid-tight flexible metal conduit shall be single strip, flexible, continuous, interlocked, and double-wrapped steel. It shall be galvanized inside and outside, with a liquid-tight jacket of flexible polyvinyl chloride (PVC). Minimum permissible size shall be 1/2".
2. Connectors shall be insulated throat, malleable iron.

F. Liquid-Tight Flexible Non-Metallic Conduit:

1. Liquid-tight flexible non-metallic conduit shall be single strip, flexible polyvinyl chloride (PVC). Minimum permissible size shall be 1/2".
2. Connectors shall be non-metallic (PVC) compression type UL labeled and listed to be used on liquid-tight flexible non-metallic conduit.

G. Rigid Non-Metallic Conduit:

1. Rigid non-metallic conduit (PVC) shall be Schedule 40, rigid heavy wall polyvinyl chloride, 90 degrees C., UL rated.
2. Fittings shall be solvent weld type of the same material as the conduit.
3. All 45 degree bends or greater shall be made with rigid metal conduit fittings on all conduit larger than 1-1/4" diameter.

H. Surface Metal Raceways:

1. Exposed (Surface Mounted) raceways noted on the drawings as "Wiremold" shall be equal to Wiremold Series 4000 or as shown on drawings. Provide required anchors, fittings, and outlet boxes as required.

I. Wireways:

1. Wireways shall be lay-in type and shall be UL listed as a wireway or auxiliary gutter. It shall be constructed with a hinged cover and knockouts. It shall be primed with a corrosion resistant primer and gray epoxy finish.

I. Metal-Clad Cable:

1. Metal-clad cable shall be U.L. labeled and have a smooth, weld or corrugated metallic sheath. Type MC cable shall provide an adequate path for equipment grounding as required by N.E.C.
2. All fitting shall be of the same metallic composition as cable and U.L. labeled for use on cable.

2.02 WIRE AND CABLE:

A. All wiring shall be copper and shall be installed in conduit or tubing unless specified otherwise.

B. All wire shall be new and in the original cartons or on manufacturer's shipping reels.

C. No wire smaller than #14 may be used unless specified under descriptions of special systems. Wire #14 and larger shall be stranded.

D. All neutral runs including feeders shall be white full length of conductor and/or identified per NEC.

E. Select from the following wire types to comply with the project's installation requirements and NEC standards.

1. Type THHN/THWN rated installation. 600 volt, 90 degrees C., in conduit, stranded copper, size No. 14 AWG up to and including No. 10 AWG.
2. Type THWN-2 rated insulation, 600 volt, 90 degrees C., in conduit, stranded copper, size No. 8 AWG up to No. 750 MCM AWG.

F. Select from the following cable types to comply with the project's installation requirements and NEC standards.

1. Metal-Clad Cable: Type MC. Use in **existing** concealed locations only. (above ceilings, in walls etc.) for final connections to light fixtures, or between downstream devices of the same circuit (Circuit homeruns shall be in conduit). Maximum length of ten feet.

2.03 WIRE CONNECTORS AND JOINTS:

F. All conductors #8 AWG and smaller shall be joined with electrical spring connectors with vinyl insulating cap. Conductors larger than #8 shall be joined by compression type connectors.

2.04 OUTLET BOXES:

A. Ceiling outlet boxes shall be 4" octagon, 2 1/8" deep, with fixture hickey, and supported to withstand 50 pounds.

B. Convenience outlet and switch boxes shall be a minimum 4"sq. x 2 1/8" deep with 1 or 2 gang, 2" deep plaster ring. When installed in poured walls, 3 1/8" minimum deep masonry box shall be used; when installed in masonry blocks, minimum 4"sq. x 2 1/8" deep with 1 or 2 gang, 2" deep plaster ring shall be used.

C. Floor outlet boxes shall be as shown on plans.

2.05 JUNCTION BOXES AND PULL BOXES:

A. When used, pull boxes and junction boxes shall be galvanized and have flat steel covers fastened with screws and set flush with the finished surface and located in an accessible area. When installed in damp locations, gaskets and seals shall be provided. Junction boxes shall be sized to meet N.E.C. Standards based on conduit and conductors. Provide identifying labels on each box.

2.06 WIRING DEVICES:

A. Receptacles:

1. Receptacles shall be commercial specification grade. (All device finishes shall be determined during shop drawing submittal review).
   a. 20 Amp, 125 Volt, duplex, controlled (NEMA 5-20R).
   b. 20 Amp, 125 Volt, duplex, ground fault (NEMA 5-20R).

B. Wall Switches (Snap Switches):

1. Switches shall be specification grade, totally enclosed molded composition, silent type, spring action silver contacts, and rated 120/277 volts A.C. All switches shall be binding screw type.
2. Switches shall be rated at 20 Amp.
3. Finish to be determined during shop drawing submittal review for all locations.

C. Device Plates:

1. Plates shall be brushed smooth stainless steel, except plates used on surface mounted boxes. Surface mounted outlets plates shall be raised, pressed metal type. Mounting screws shall be metal with same finish as plate and with countersunk head. Plates shall be single ganged, or combination, to accommodate arrangement indicated on drawings.

PART 3 EXECUTION

3.01 RACEWAYS:

A. Conduit or tubing shall be installed in a manner which complies with all applicable provisions of the National Electrical Code and at least six inches from parallel runs of steam pipes, flues, or hot water pipes.

B. Ends of all conduit or tubing shall terminate in a bushing or fitting having factory installed insulating liners. Provide plastic bushings on all conduit or tubing with wire larger than #4 AWG. Exposed runs shall be supported by hangers, clamps, or straps secured by toggle bolts in hollow construction or expansion bolts or inserts in poured or brick walls. No lead anchors shall be allowed

C. Every precaution shall be taken to protect the conduit from damage and from water, dirt, concrete, etc.., getting into the system during construction. Capped bushings shall be used on all conduit terminations until wire is installed. If, in the opinion of the Engineer, conduit or tubing has become damaged or contains unremovable foreign matter, it shall be replaced at the Contractor's expense.

D. Rigid metal conduit shall be used in all poured construction, fill, outside masonry walls, areas exposed to weather, under drives and walks, and in areas where tubing may become damaged..

E. Rigid non-metallic conduit (PVC) may be used in lieu of rigid metal conduit below grade or where concealed in concrete. Provide a separate bare stranded copper grounding conductor in the raceway sized in accordance with Table 250.122 of the NEC.

F. Electrical metallic conduit (EMT) shall be used for feeders and branch circuits above ground & above suspended accessible ceilings; for switch and receptacle legs which terminate above suspended accessible ceilings; for exposed feeders and branch circuits; for switch legs in moveable partitions.

G. Flexible metal conduit shall be used for connections to the following equipment: lighting fixtures only. Maximum length of flexible metallic conduit shall be 6'-0". Longer length may be permitted at the discretion of the Owner or as indicated on the plans. Minimum size shall be ½". Flexible metal conduit used for lighting fixture connections shall be "Greenfield" type. Fittings shall be insulated throat, flex-steel connectors.

H. Use liquid-tight flexible steel conduit and liquid-tight flexible non-metallic conduit for final connections to all indoor and outdoor motors and mechanical equipment with a length not to exceed 36".

I. At all wall penetrations, space around circuits shall be filled with mortar or other approved filler. Penetrations through walls, floors or ceilings must not alter the fire rating of the assembly.

J. All conduit and boxes shall be flush mounted and concealed. No exposed conduit will be allowed, except in mechanical type spaces.

3.02 WIRE AND CABLE:

A. All wiring shall be installed in approved raceways. Conductors shall be continuous between outlets or junction boxes with splice made only within such boxes.

B. Any branch circuits over 50 feet in length shall be installed with one wire size larger than the circuit rating. Example: 1P/20amp breaker with #12 THHN wire run 50'+ shall be increased to a #10 THHN wire.

C. ALL NEW BRANCH WIRING SHALL BE COLOR CODED BY THE FOLLOWING VOLTAGE SYSTEMS AND LABELED AT THEIR SOURCE PER 2017 NEC SECTIONS #110.5 & #210.5:

120/208V-3Ø-4W SYSTEM:	277/480V-3Ø-4W SYSTEM:
ØA - BLACK	ØA - BROWN
ØB - RED	ØB - ORANGE
ØC - BLUE	ØC - YELLOW
NEUTRAL - WHITE	NEUTRAL - GRAY
E.G.C. - GREEN	E.G.C. - GREEN w/ YELLOW STRIPE

3.03 OUTLET BOXES:

A. Set boxes squarely with faces flush to finished surfaces. The exact location of all outlets shall be approved by the Architect/Engineer before same are place and Contractor shall consult Architect/Engineer at all times relative to the location of outlets. No outlets shall be placed behind plumbing or heating pipes or where they will interfere with ducts, pipes, equipment, or other work.

B. Each outlet shall be rigidly supported from the building construction (independent of the raceway system).

3.04 WIRING DEVICES:

A. Receptacles shall be mounted approximately 16" above finished floor to the bottom of the box or at other heights indicated on drawings.

B. E.C. shall be responsible for protection of receptacles from painting, plastering, etc.

C. Wall switches shall be mounted approximately 44" above finished floor to the bottom of the box unless they interfere with wainscoting or trim.

D. E.C. shall be responsible for masking switches for protection from painting, plastering, etc.

E. E.C. shall confirm all door swings with Building Trades Contractor before installing switches.

F. Wall plates shall be installed plumb and level with all edges in contact with attaching surface.

G. E.C. shall confirm all ADA and barrier free requirements are meant and install according to their regulations.

3.05 SUPPORTS AND HANGERS:

A. Provide and install necessary steel brackets, rods, clamps, etc., for support of all work under this contract. All supports shall be plated or painted and shall be secured to structural members after Architect's approval.

3.06 SLEEVES AND INSERTS:

A. This Contractor shall be responsible for the proper location of all sleeves, chases, openings and inserts for the installation of his equipment.

B. Holes through walls, floors or structural members shall be located only where permitted by the Architect.

3.07 UNDERGROUND WORK:

A. Prior to any underground excavating, trenching, pole base augering, etc. call MISS DIG at 1-800-482-7171 no less than 72 hours in advance of any earthwork.

END OF SECTION

SECTION 26 05 05
ELECTRICAL DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Electrical demolition.

PART 2 PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. Materials and equipment for patching and extending work: As specified in individual sections.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that abandoned wiring and equipment serve only abandoned facilities.

B. Demolition drawings are based on casual field observation and existing record documents.

C. Report discrepancies to Architect/Engineer before disturbing existing installation.

D. Beginning of demolition means installer accepts existing conditions.

3.02 PREPARATION

A. Disconnect electrical systems in walls, floors, and ceilings to be removed.

B. Coordinate service outages with the Owner and/or the utility company.

C. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits, use personnel experienced in such operations.

D. Existing Electrical Service: Maintain existing system in service. Disable system only to make switchovers and connections. Minimize outage duration.

1. Obtain permission from Owner at least 24 hours before partially or completely disabling system.

E. Existing Fire Alarm System: Maintain existing system in service. Disable system only to make switchovers and connections. Minimize outage duration.

1. Notify Owner before partially or completely disabling system.
2. Notify local fire service.
3. Make notifications at least 24 hours in advance.

3.03 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

A. Perform work for removal and disposal of equipment and materials containing toxic substances regulated under the Federal Toxic Substances Control Act (TSCA) in accordance with applicable federal, state, and local regulations. Applicable equipment and materials include, but are not limited to:

1. PCB-containing electrical equipment, including transformers, capacitors, and switches.
2. PCB- and DEHP-containing lighting ballasts.
3. Mercury-containing lamps and tubes, including fluorescent lamps, high intensity discharge (HID), arc lamps, ultra-violet, high pressure sodium, mercury vapor, ignitron tubes, neon, and incandescent.

B. Remove, relocate, and extend existing installations to accommodate new construction.

C. Remove abandoned wiring to source of supply.

D. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes, unless reuseable. Cut conduit flush with walls and floors, and patch surfaces.

E. Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit servicing them is abandoned and removed. Provide blank cover for abandoned outlets that are not removed.

F. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.

G. Disconnect and remove abandoned luminaires. Remove brackets, stems, hangers, and other accessories.

H. Repair adjacent construction and finishes damaged during demolition and extension work.

I. Maintain access to existing electrical installations that remain active. Modify installation or provide access panel as appropriate.

J. Extend existing installations using materials and methods compatible with existing electrical installations, or as specified.

3.04 CLEANING AND REPAIR

A. See Section 01 74 19 - Construction Waste Management and Disposal for additional requirements.

B. Clean and repair existing materials and equipment that remain or that are to be reused.

C. Panelboards: Clean exposed surfaces and check tightness of electrical connections. Replace damaged circuit breakers and provide closure plates for vacant positions. Provide typed circuit directory showing revised circuiting arrangement.

END OF SECTION

SECTION 26 05 26
GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Grounding and bonding requirements.

B. Conductors for grounding and bonding.

C. Connectors for grounding and bonding.

1.02 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

39. Verify exact locations of underground metal water service pipe entrances to building.
40. Coordinate the work with other trades to provide steel reinforcement complying with specified requirements for concrete-encased electrode.
41. Notify Architect/Engineer of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

PART 2 PRODUCTS

2.01 GROUNDING AND BONDING REQUIREMENTS

A. Unless specifically indicated to be excluded, provide all required components, conductors, connectors, conduit, boxes, fittings, supports, accessories, etc. as necessary for a complete grounding and bonding system.

D. Bonding and Equipment Grounding:

1. Provide bonding for equipment grounding conductors, equipment ground busses, metallic equipment enclosures, metallic raceways and boxes, device grounding terminals, and other normally non-current-carrying conductive materials enclosing electrical conductors/equipment or likely to become energized as indicated and in accordance with NFPA 70.
2. Provide insulated equipment grounding conductor in each feeder and branch circuit raceway. Do not use raceways as sole equipment grounding conductor.
3. Where circuit conductor sizes are increased for voltage drop, increase size of equipment grounding conductor proportionally in accordance with NFPA 70.
4. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.
5. Terminate branch circuit equipment grounding conductors on solidly bonded equipment ground bus only. Do not terminate on neutral (grounded) or isolated/insulated ground bus.
6. Provide bonding jumper across expansion or expansion/deflection fittings provided to accommodate conduit movement.
7. Provide bonding for interior metal piping systems in accordance with NFPA 70. This includes, but is not limited to:
   a. Metal water piping where not already effectively bonded to metal underground water pipe used as grounding electrode.
8. Provide bonding for metal building frame.
9. Provide bonding for metal siding not effectively bonded through attachment to metal building frame.

2.02 GROUNDING AND BONDING COMPONENTS

A. General Requirements:

1. Provide products listed, classified, and labeled as suitable for the purpose intended.
2. Provide products listed and labeled as complying with UL 467 where applicable.

B. Conductors for Grounding and Bonding, in Addition to Requirements of Section 26 05 26:

1. Use insulated copper conductors unless otherwise indicated.
   e. Exceptions:
      1) Use bare copper conductors where installed underground in direct contact with earth.
      2) Use bare copper conductors where directly encased in concrete (not in raceway).

C. Connectors for Grounding and Bonding:

1. Description: Connectors appropriate for the application and suitable for the conductors and items to be connected; listed and labeled as complying with UL 467.
2. Unless otherwise indicated, use exothermic welded connections for underground, concealed and other inaccessible connections.
3. Unless otherwise indicated, use mechanical connectors, compression connectors, or exothermic welded connections for accessible connections.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Perform work in accordance with NECA 1 (general workmanship).

D. Make grounding and bonding connections using specified connectors.

1. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors. Do not remove conductor strands to facilitate insertion into connector.
2. Remove nonconductive paint, enamel, or similar coating at threads, contact points, and contact surfaces.
3. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.
4. Irriversable Compression Connectors: Secure connections using manufacturer's recommended tools and dies.

E. Provide bonding to meet requirements described in Quality Assurance.

3.02 FIELD QUALITY CONTROL

A. Perform ground electrode resistance tests under normally dry conditions. Precipitation within the previous 48hours does not constitute normally dry conditions.

B. Investigate and correct deficiencies where measured ground resistances do not comply with specified requirements.

END OF SECTION

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Date	Issued For
11/09/26	BID SET

PIC:
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DRAFTS:
PROJECT NO:
26.503

SHEET TITLE:
ELECTRICAL SPECIFICATIONS

E901

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ELECTRICAL SPECIFICATIONS

SECTION 26 51 00
INTERIOR LIGHTING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Interior luminaires.

B. Emergency lighting units.

C. Exit signs.

1.02 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate the installation of luminaires with mounting surfaces installed under other sections or by others. Coordinate the work with placement of supports, anchors, etc. required for mounting. Coordinate compatibility of luminaires and associated trims with mounting surfaces at installed locations.
2. Coordinate the placement of luminaires with structural members, ductwork, piping, equipment, diffusers, fire suppression system components, and other potential conflicts installed under other sections or by others.
3. Coordinate the placement of exit signs with furniture, equipment, signage or other potential obstructions to visibility installed under other sections or by others.
4. Notify Engineer of any conflicts or deviations from Contract Documents to obtain direction prior to proceeding with work.

1.03 SUBMITTALS

A. Product Data: Provide manufacturer's standard catalog pages and data sheets including detailed information on luminaire construction, dimensions, ratings, finishes, mounting requirements, listings, service conditions, photometric performance, installed accessories, and ceiling compatibility; include model number nomenclature clearly marked with all proposed features.

1. LED Luminaires:
   a. Include estimated useful life, calculated based on IES LM-80 test data.
   b. Include IES LM-79 test report upon request.
2. Provide electronic files of photometric data certified by a National Voluntary Laboratory Accreditation Program (NVLAP) lab or independent testing agency in IES LM-63 standard format upon request.

B. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

C. Operation and Maintenance Data: Instructions for each product including information on replacement parts.

D. Project Record Documents: Record actual connections and locations of luminaires and any associated remote components.

PART 2 PRODUCTS

2.01 LUMINAIRES

A. Provide products listed, classified, and labeled as suitable for the purpose intended.

B. Unless otherwise indicated, provide complete luminaires including lamp(s) and all sockets, ballasts, reflectors, lenses, housings and other components required to position, energize and protect the lamp and distribute the light.

C. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, hardware, supports, trims, accessories, etc. as necessary for a complete operating system.

D. Luminaires Mounted in Continuous Rows: Provide quantity of units required for length indicated, with all accessories required for joining and aligning.

2.02 EMERGENCY LIGHTING UNITS

A. Description: Emergency lighting units complying with NFPA 101 and all applicable state and local codes, and listed and labeled as complying with UL 924.

B. Operation: Upon interruption of normal power source or brownout condition exceeding 20 percent voltage drop from nominal, solid-state control automatically switches connected lamps to integral battery power for minimum of 90 minutes of rated emergency illumination, and automatically recharges battery upon restoration of normal power source.

C. Battery:

1. Size battery to supply all connected lamps, including emergency remote heads where indicated.

D. Diagnostics: Provide power status indicator light and accessible integral test switch to manually activate emergency operation.

E. Provide low-voltage disconnect to prevent battery damage from deep discharge.

2.03 EXIT SIGNS

A. Description: Exit signs and similar signs for special purpose applications such as area of refuge/rescue assistance.

B. Description: Internally illuminated exit signs with LEDs unless otherwise indicated; complying with NFPA 101 and all applicable state and local codes, and listed and labeled as complying with UL 924.

1. Number of Faces: Single or double as indicated or as required for the installed location.
2. Directional Arrows: As indicated or as required for the installed location.

C. Powered Exit Signs: Internally illuminated with LEDs unless otherwise indicated.

1. Self-Powered Exit Signs:
   a. Operation: Upon interruption of normal power source or brownout condition exceeding 20 percent voltage drop from nominal, solid-state control automatically switches connected lamps to integral battery power for minimum of 90 minutes of rated emergency illumination, and automatically recharges battery upon restoration of normal power source.
   b. Diagnostics: Provide power status indicator light and accessible integral test switch to manually activate emergency operation.
   c. Provide low-voltage disconnect to prevent battery damage from deep discharge.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Install luminaires securely, in a neat and workmanlike manner, as specified in NECA 500 (commercial lighting) and NECA 502 (industrial lighting).

C. Install luminaires plumb and square and aligned with building lines and with adjacent luminaires.

D. Suspended Ceiling Mounted Luminaires:

1. Do not use ceiling tiles to bear weight of luminaires.
2. Do not use ceiling support system to bear weight of luminaires unless ceiling support system is certified as suitable to do so.

E. Recessed Luminaires:

1. Install trims tight to mounting surface with no visible light leakage.

F. Suspended Luminaires:

1. Unless otherwise indicated, specified mounting heights are to bottom of luminaire.
2. Install using the suspension method indicated, with support lengths and accessories as required for specified mounting height.
3. Unless otherwise indicated, support pendants from swivel hangers.

G. Wall-Mounted Luminaires: Unless otherwise indicated, specified mounting heights are to bottom of luminaire.

H. Support luminaires 2 x 4 foot (600 x 1200 mm) and larger size independent of ceiling framing.

I. Lighting in equipment rooms and electric/mechanical type spaces is diagrammatic, indicating type, quantity and general circuiting of fixtures. Modify locations and mounting to suit conditions, allowing clearances for equipment, piping and ductwork.

J. Install accessories furnished with each luminaire.

K. Bond products and metal accessories to branch circuit equipment grounding conductor.

L. Emergency Lighting Units:

1. Unless otherwise indicated, connect unit to unswitched power from same circuit feeding normal lighting in same room or area. Bypass local switches, contactors, or other lighting controls.
2. Install lock-on device on branch circuit breaker serving units.

M. Exit Signs:

1. Unless otherwise indicated, connect unit to unswitched power from same circuit feeding normal lighting in same room or area. Bypass local switches, contactors, or other lighting controls.

3.02 FIELD QUALITY CONTROL

A. Inspect each product for damage and defects.

B. Operate each luminaire after installation and connection to verify proper operation.

C. Test self-powered exit signs, emergency lighting units, and fluorescent emergency power supply units to verify proper operation upon loss of normal power supply.

D. Correct wiring deficiencies and repair or replace damaged or defective products. Repair or replace excessively noisy ballasts as determined by Owner/Engineer.

3.03 ADJUSTING

A. Aim and position adjustable luminaires to achieve desired illumination as indicated or as directed by Architect/Engineer. Secure locking fittings in place.

B. Aim and position adjustable emergency lighting unit lamps to achieve optimum illumination of egress path as required or as directed by Engineer or authority having jurisdiction.

C. Exit Signs with Field-Selectable Directional Arrows: Set as indicated or as required to properly designate egress path as directed by Engineer or authority having jurisdiction.

3.04 CLEANING

A. Clean surfaces according to NECA 500 (commercial lighting), NECA 502 (industrial lighting), and manufacturer's instructions to remove dirt, fingerprints, paint, or other foreign material and restore finishes to match original factory finish.

3.05 SCHEDULE - SEE DRAWINGS

END OF SECTION

SECTION 26 60 50
TELEPHONE, TELEVISION AND DATA CABLING BOX AND RACEWAY SYSTEM

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. The Telephone, Television and Data Cabling Box and Raceway System shall include, but not be limited to, the following:

1. Complete box and raceway system including conduit as indicated on the drawings.
2. Provide all electrical power outlets as indicated on the drawings.
3. Installation of the box and raceway system shall be closely coordinated with the Owner and the Contractor performing the wiring and termination of the Telephone, Television and Data Cabling systems. The electrical contractor shall provide any miscellaneous power and work required to complete the box and raceway system to facilitate installation of the Telephone, Television and Data Cabling system.

B. The Telephone, Television and Data Cabling System components will be provided under a separate contract.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.01 INSTALLATION

C. All floor or wall penetrations shall be core drilled with a maximum ¼" size greater than the exterior dimension of the riser conduit, and sleeve.

END OF SECTION

SECTION 28 31 01
FIRE ALARM SYSTEM ADDITIONS

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. The requirements of the Contract Documents, including the General and Supplementary General Condition and Division 1 - General Requirements shall apply to the work of this section.

B. At the time of bid, all exceptions taken to these Specifications, all variances from these Specifications and all substitutions of operating capabilities or equipment called for in these Specifications shall be listed in writing and forwarded to the Engineer. Any such exception, variances or substitutions which were not listed at the time of bid and are identified in the submittal, shall be grounds for immediate disapproval without comment.

C. The installing company shall prepare and submit appropriate plans and documentation for fire alarm protection supervisory plan review(s) to the Authority(ies) Having Jurisdiction. All associated plan review fees shall be included.

1.02 SCOPE

A. The work covered by this Section of the Specification shall include all labor, equipment, materials and services to furnish, install, relocate, and connect new devices associated with the renovations taking place to the existing fire alarm system. It shall be complete with all necessary hardware, software, memory and monitoring equipment changes to support the new fire suppression system. The system shall consist of, but not be limited to, the following:

1. Relocating and providing and installing new devices.

1.03 APPLICABLE CODES AND STANDARDS

A. All equipment shall be UL listed for its intended use.

B. NFPA Standards 72 and 101.

C. The National Electric Code 2011.

D. All other local codes and authorities having jurisdiction.

1.04 RELATED DOCUMENTS

A. Secure permits and approvals prior to installation.

B. Prior to commencement and after completion of work, notify authorities having jurisdiction.

C. Submit letter of approval for installation before requesting acceptance of system.

1.05 SUBMITTALS

A. Provide list of all types of equipment and components provided.

B. Provide description of operation of the system, similar to that provided in Part 2 of this Section of the Specifications, to include any and all exceptions, variances or substitutions listed at the time of bid. Any such exceptions, variances or substitutions which were not listed at the time of bid and are identified in the submittal, shall be grounds for immediate disapproval without comment.

C. Provide manufacturer's printed product data, catalog cuts and description of any special installation procedures.

D. Provide samples of various items when requested.

E. Provide shop drawings as follows:

1. Single line riser diagram showing all equipment and type, number and size of all conductors.

1.06 WARRANTY

A. Manufacturer shall guarantee the system equipment for a period of one (1) year from date of final acceptance of the system.

B. The contractor shall guarantee all wiring and raceways to be free from inherent mechanical or electrical defects for one (1) year from date of final acceptance of the system.

C. Upon completion of the installation of new fire alarm system equipment, the electrical contractor shall provide to the architect a signed written statement, substantially in form as follows: "The undersigned, having engaged as the Electrical Contractor on the NMC Foundation Renovation project in Traverse City, Michigan confirms that the fire alarm system equipment was installed in accordance with the wiring diagrams, instructions and directions provided to us by the manufacturer."

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. The equipment and materials used as the basis of design are those of JCI/Tyco/Simplex, and constitute the type and quality of equipment to be furnished.

B. If equipment of another manufacturer is to be submitted for approval as equal, the contractor shall, at the time of bid, list all exceptions taken to these Specifications, all variances from these Specification and all substitutions of operating capabilities or equipment called for in these Specifications and forward said list to the Engineer. Any such exceptions, variances or substitutions which were not listed at the time of bid and are identified in the submittal, shall be grounds for immediate disapproval without comment. Final determination of compliance with this Specification shall rest with the Engineer, who, at his discretion, may require proof of performance.

PART 3 EXECUTION

3.01 INSTALLATION

A. The additions to the system shall be installed in a workmanlike manner, in accordance with approved manufacturer's wiring diagram. The contractor shall furnish all conduit, wiring, outlet boxes, junction boxes, cabinets and similar devices necessary for the complete installation. All wiring shall be of the type recommended by the manufacturer, approved by the local Fire Department, and shall be installed in accordance with NEC requirements for power limited systems (Article 760).

B. All penetration of floor slabs and fire walls shall be fire stopped in accordance with all local fire codes.

C. End of Line Resistors shall be furnished as required for mounting as directed by the manufacturer.

D. All wiring shall be color coded throughout, to National Electrical Code standards. Install plenum rated cable where noted on the drawings.

3.02 FIELD QUALITY CONTROL

A. The system shall be installed and fully tested under the supervision of a trained manufacturer's representative. The system shall be demonstrated to perform all of the function as specified.

3.03 TESTS

A. Reports of any field testing during installation shall be forwarded to the Engineer.

B. Each individual system operation on a circuit by circuit basis shall be tested for its complete operation. The procedure for testing the entire system shall be set forth with the consent of the code enforcement official, the Engineer and the manufacturer.

3.04 DOCUMENTATION AND TRAINING

A. The contractor shall compile and provide to the owners three (3) complete manuals on the completed system to include operating and maintenance instruction, catalog cuts of all equipment and components, as-built wiring diagrams and a manufacturer's suggested spare parts list.

B. In addition to the above manuals, the contractor shall provide the services of the manufacturer's trained representative for a period of two (2) hours to instruct the owners designated personnel on the operation and maintenance of the entire system.

END OF SECTION

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Date	Issued For
11/09/26	BID SET

PIC:
PM:
DRAFTS:
PROJECT NO:
26.503

SHEET TITLE:
ELECTRICAL SPECIFICATIONS

E902

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LOW VOLTAGE SPECIFICATIONS

SECTION 27 00 00
COMMUNICATIONS GENERAL PROVISIONS

PART 1 GENERAL

1.01DESCRIPTION OF WORK:

A. Work included in this Division consists of providing all demolition, labor, materials, equipment, tools, supervision, start-up services, Owner's instructions, including all incidental and related items necessary to complete installation, and successfully test, start up and operate building in a practical and efficient manner. Communications Systems indicated on Drawings and described in each Section of Division 27 Specification and conforming with all Contract Documents.

B. Work not included under this Division:
1. Low voltage temperature control wiring. Refer to Part 2, Paragraph 2.03 of this Section.
2. Field painting of equipment, except for repair to damaged factory finishes.

C. The General Provisions of this Contract, including General and Supplementary Conditions and other General Requirements Sections, apply to the Work specified in this Section.

D. This Section is not intended to supersede, but to clarify, the definitions in Division 1, General Requirements and Supplementary Conditions.

1.02DRAWINGS AND SPECIFICATIONS:

A. Drawings are diagrammatic and indicate general arrangement of systems and work included in Contract, and shall serve only as design drawings, and not as working drawings, for general layout of various equipment and systems.

B. Drawings and Specifications are intended to supplement each other, and all work specified or indicated in either shall be provided. Should drawings disagree in themselves or with Specifications, the better quality or greater quantity of work shall be provided.

C. Drawings and Specifications are intended to include all work and materials necessary for completion of the work. Any incidental item of material, labor or detail required for the proper execution and completion of the work and omitted from either the drawings and specifications or both, but required by governing codes local regulations, trade practices, operational functions, and good workmanship, shall be provided as part of the Contract Work without extra charge, even though not specifically detailed or specified.

1.03SITE AND PROJECT DOCUMENT EXAMINATION:

A. Submission of a proposal is considered evidence the Contractor has visited site, examined Drawings and Specifications of all trades including Architectural, Structural, Mechanical and Electrical, and fully informed himself with all project and site conditions, and is proficient, experienced and knowledgeable of all standards, codes, ordinances, permits and regulations which affect his respective trade, and that all costs are included in his proposal.

B. The Communications Contractor and/or Sub-Contractor shall insure all required permits, and assessments have been obtained prior to any work beginning. Contractor shall verify requirement to include privilege fees, plan review fees, and permits as part of his formal bid.

1.04STANDARDS, CODES AND PERMITS:

A. Refer to Division 1, General Requirements and Supplementary Conditions.

B. All work under Communications Sections shall comply with latest edition of applicable standards and codes of the following, including local codes and variances:
1. NECA - Standards for Installation
2. NFPA - National Fire Protection Association
3. NEC - Latest edition of NFPA 70
4. UL - Underwriter's Laboratories
5. NEMA - National Electric Manufacturers Association
6. NESC - National Electric Safety Code (H13)
7. OSHA - Occupational Safety and Health Act
8. IEEE - Institute of Electrical and Electronics Engineers

C. All work shall be provided and tested in accordance with all applicable local, county, state laws, ordinances, code rules and regulations, including Michigan Department of Labor, General Rules, Part 8-Electrical Code Rules.

D. No work shall be covered or enclosed until work is tested in accordance with applicable codes and regulations, and successful tests witnessed and approved by authorized inspection authority. Written approvals shall be secured by Contractor and submitted to Engineer before final acceptance of work.

1.05SUBMITTALS:

A. Proposal Supplement:
1. Contractor to submit one (1) copy of Proposal Supplement - SECTION 27 00 10 - COMMUNICATIONS EQUIPMENT AND MATERIALS, at the time of Bid opening, listing the manufacturers upon which his bid was based, including all items being provided by Sub-Contractors.
2. After Proposal Supplement and Sub-Contractors are approved, no deviation shall be permitted without written approval of Engineer.

B. Shop Drawings:
1. Submit nine (9) hard copies or one (1) electronic set of shop drawings on all equipment and materials indicated in the specifications or on drawings.
2. At the time of submittal for review by the Engineer, shop drawings shall include signatures or stamps indicating that the Contractor and/or the Sub-Contractor has reviewed the submittals and has coordinated the required space, quantities required, services and work of other trades for the equipment or system being submitted.
3. Submittals shall be in the form of bound folders with the name of the Project, Architect, Engineer and the submitting Contractor indicated on the cover. Submittals requiring drawings too large to be bound into the folder shall be folded and inserted in pockets bound into the folder.
4. Submit complete manufacturer's shop drawings of all equipment, accessories and controls, including dimensions, weights, capacities, construction details, installation, controls, wiring diagrams, and motor data.
5. Engineer's approval of shop drawings is for general application only and is a service only and not considered as a guarantee of total compliance with or as relieving Contractor of basic responsibilities under all Contract Documents, and does not approve changes in quantities, time or cost.
6. After approval, each Contractor is responsible to provide information to all other trades involved in, or affected by, installation of his equipment and work.

C. Operating and Maintenance Instructions and Manuals:
1. Communications Contractor shall provide for all items of equipment three (3) bound and indexed sets of operating/installation and maintenance instructions to Engineer for approval. After approval, manuals will be given to Owner by the Engineer.
2. Manuals shall include a complete set of shop drawings submitted, indexed with tabs for each section.

D. Submit shop drawings for the following: (See 27 00 00 1.05 B 1 thru 6)
3. Vertical and Horizontal Wire Management Panels
4. Category 6 Cabling and Patch Cords
5. Category 6 Faceplates
6. Category 6 Patch Panels
7. J-hooks
8. HDMI Cabling
9. Additional equipment/materials listed in specifications 274100, 274110, 274116, 274125 and 275126.

PART 2 PRODUCTS

2.01 STANDARDS:

A. All products shall be of established manufacturers regularly engaged in making type of materials to be provided and complete with all parts, accessories, trimmings, connections, etc. as specified in detail or as described in manufacturer's catalog.

B. All material shall be labeled or listed by Underwriter's Laboratories, Inc. Assembled electrical equipment supplied to the job site shall be listed or labeled and/or approved by the authority having jurisdiction.

2.02 SUBSTITUTION AND CHANGES:

A. Contractor and/or Equipment Supplier may propose alternate equipment or materials of EQUAL or better quality, function, performance, durability and appearance. This information is to be submitted to the Engineer's Office ten (10) working days prior to bid due date to allow for proper review time and to issue an addendum incorporating the acceptable substitution(s). It is the submitter's responsibility to provide sufficient material for review as required by Engineer's Office. Acceptance and approval is the responsibility of the Engineer.

B. Contractor and/or Equipment Supplier is liable for any added costs to himself or others and is responsible for verifying dimensions, clearance and roughing-in requirements, when product not named as the basis of design are used and is responsible for advising other Contractors of variations and submit revised drawing layout for approval of Engineer.

C. See Section 27 00 10 for approved manufacturers.
1. No substitutions will be accepted after bids are received. The communications equipment specified herein has been carefully chosen for it's ability to meet the performance and/or design criteria of this project. Substitutions in all likelihood will be unable to meet all of the same requirements as the specified equipment.
2. When only one manufacturer is listed within the description of the communications equipment, the design engineering or architectural aesthetics will not allow substitution of other manufacturer.
3. When two or more manufacturers are listed within the description of the communications equipment, the Contractor may elect to submit to the Engineer a substitute fixture for review. All submittals must follow paragraph 2.02.A of this section.
4. Substitution submittals shall consist of a physical description, dimensioned drawing and complete data of the proposed communications equipment. Working samples may be requested and shall be supplied to the Engineer for a visual check of finish and operating characteristics.
5. Contractor will be responsible for ALL costs (engineering time, manufacturer's costs, distributor costs, etc.) incurred to replace equipment not approved if substitutions are made by the distributor, manufacturer's rep., contractor or subcontractor.

PART 3 EXECUTION

3.01 COORDINATION OF ELECTRICAL WORK:

A. The Communications Contractor shall be responsible for all Sub-Contractors and Suppliers, and include in his bid all materials, labor and equipment involved in accordance with all local customs, rules, regulations, jurisdictional awards, decisions and secure compliance of all parts of the Specifications and Drawings regardless of Sectional inclusion in these Specifications.

B. The Communications Contractor and Sub-Contractor shall be responsible for all parts applicable to his trade in accordance with the Specifications and Drawings, and shall be responsible for coordinating locations and arrangements of his work with all other relevant Mechanical, Architectural, Structural, Electrical Contractor's Specifications, Drawings and Shop Drawings.

3.02 EQUIPMENT CLEARANCE:

A. Communications Contractor to coordinate with the Mechanical and Electrical Contractor's equipment location to insure adequate clearance is maintained as required by the National Electrical Code and applicable state and local codes, as well as accessibility for future maintenance and operation.

B. Work shall be arranged with building construction to provide minimum 6'-8" overhead clearance where possible.

3.03 WALL, FLOOR AND CEILING OPENINGS:

A. Locate all openings and advise the General Contractor of details and templates of all openings necessary for inspection of electrical work.

B. In general, openings and required lintels shall be provided through the General Contractor. Size and location is the responsibility of this Contractor. Cracks and rough edges left following installation of equipment shall be caulked or covered by Communications Contractor.

C. Perform or pay for all cutting, fitting, repairing, patching and finishing of work of other sections where it is necessary to disturb such work to permit installation of electrical work.
1. Repair or replace existing or new work disturbed.

3.04 FIELD CHANGES:

A. The Contractor shall not make any field changes that affect timing, costs or performance without written approval from the Architect/Engineer in the form of a Change Order, Field Change Order or a Supplemental Instruction. The Contractor assumes liability for any additional costs for changes made without such instruction or approval. Should any unauthorized change be determined by the Architect/Engineer as lessening the value of the project, a credit will be determined and issued as a change to the Contract.

3.05 PROJECT CLOSEOUT:

A. Final Acceptance and payment will only be made after final punchlist completion and receipt at the Engineer's Office of:
1. All Guarantees/Warranties
2. Operating and Maintenance Instruction Manuals
3. Record Drawings (As Builts)
4. Certificates of Inspection
5. Test Reports

3.06 CERTIFICATES OF INSPECTION AND TEST REPORTS:

A. Submit to the Engineer's Office evidence that installation has been inspected and approved by local or state electrical inspector and/or the authority having jurisdiction.

3.07 GUARANTEES AND WARRANTIES:

A. At the end of a one year period of continuous operation, make a complete inspection of all systems, fixtures, equipment, safety devices and controls to insure equipment is operating properly, and report to Engineer in writing.

3.08 RECORD DRAWINGS:

A. Maintain a white-print set of Communications Contract Drawings in clean, undamaged condition for markup of actual installation on Communications Contract Drawings which vary substantially from the work as shown. These drawings are to be available for inspection by the Engineer on a weekly basis. Drawings shall indicate at a minimum the circuiting, and addendum, bulletin and field changes.

3.09 OPERATING AND MAINTENANCE INSTRUCTIONS:

A. Provide instruction of Owner's personnel in operation and maintenance procedures for all systems equipment.

B. Provide 3 - bound & tabbed sets of operating & maintenance instruction manuals for all electrical equipment

3.10 PLACING SYSTEMS INTO OPERATION:

A. Communications Contractor shall be responsible for all startup procedures, system checks and balancing associated with his equipment.

B. All equipment shall be installed, tested and operated in accordance with manufacturer's recommendations at normal operating conditions.

C. All permanent communications equipment operated during construction periods shall be cleaned and damaged equipment replaced.

3.11 ADJUSTMENTS AND BALANCING:

A. Contractor shall make all necessary adjustments to equipment installed or connected by him under this contract so as to insure proper operation of the same.

3.12 GUARANTEES AND WARRANTIES:

A. All labor, materials and equipment shall be guaranteed by Contractor and/or warranted by Manufacturer for one year after acceptance date and/or one normal continuous complete seasons operation applicable to equipment or system except where specified longer for special equipment. Contractor shall secure such warranty from all Suppliers (not one year from shipment date), or Contractor to assume warranty.

B. Acceptance date of substantial completion shall be Owner occupancy as determined by Architect/Engineer.

C. Contractor shall make all necessary alterations, repairs, adjustments, replacements during guarantee periods as directed by Architect/Engineer to comply with Drawings and Specifications at no cost to Owner.

D. Repair or replacements made under guarantee bear further one year guarantee from date of acceptance of repair or replacement.

3.13 IDENTIFICATION:

A. All cables shall be labeled with typewritten labels at each end detailing the cabling run number. Identification shall be by means of wrap around "brady" type labels. All workstation outlets must be labeled and all circuits clearly identified utilizing designation strips in compliance with TIA/EIA 606 standards. Labels shall include room/area number and identified as an Access Point (i.e., 513-WAP), Data Outlet, Telephone Outlet, etc.. Each end of new and existing re-routed cabling shall be labeled.

3.14 TRAINING:

A. The option of video taping any and all training sessions shall be given to the Owner at no additional cost, with the Contractor conducting the video taping and with two (2) copies of all tapes being turned over to the Owner for future use.

B. Communications Contractor shall conduct 2 - 2 hour training session on the operation and controls of all communications equipment. Notify owner 72 hours prior to session.

END OF SECTION

SECTION 27 00 10
COMMUNICATIONS EQUIPMENT AND MATERIALS

PART 1 GENERAL

1.01INSTRUCTION:

A. The Communications Contractor(s) is to either copy or remove this specification section from the spec book and complete as follows:
1. Indicate the specific manufacturer on which the bidder's base bid price is based in the blank space provided.
2. All equipment is to be bid as specified. Material or equipment from an unlisted manufacturer may be submitted for review by the Engineer by following the substitution instructions in 270000-2.02.
3. Insert the name(s) of each subcontractor used in your bid in the space provided in Part 3.
4. This form shall be submitted with the bid.

1.02RELATED DOCUMENTS:

A. The other Contract Documents complement the requirements of this Section. The General Requirements apply to the work of this section.

PART 2 PRODUCTS

2.01 THE FOLLOWING IS A LIST OF APPROVED MANUFACTURERS, GROUPED ACCORDING TO TYPES OF MATERIALS OR EQUIPMENT.

C. CAT6A Cabling and Patch Cords:
1. Commscope/Systimax, Nordx, Belden/CDT and General Cable

D. CAT6A Faceplates and Patch Panels:
1. Commscope/Systimax, Nordx, Belden/CDT and Hubbell

E. J-hooks:
1. Caddy Cat and Pandult J-Pro

PART 3 SUBCONTRACTORS

3.01 INSERT THE NAME OF EACH SUBCONTRACTOR AND WORK TO BE PERFORMED BELOW:

A. Subcontractor_____ Work Performed_____

B. Subcontractor_____ Work Performed_____

C. Subcontractor_____ Work Performed_____

END OF SECTION

SECTION 27 10 07
LOCAL AREA NETWORK (LAN) CABLING SYSTEM

PART 1 - GENERAL

1.01DESCRIPTION OF WORK

A. The intent is to provide a state-of-the art Local Area Network (LAN) cabling infrastructure as specified in this specified in this specification and on the contract drawings.

B. The Contractor shall provide Category 6 cables from the MDF rack to the designated outlets in within the building as indicated on the Drawings. The work includes, but is not limited to, installation of patch panels, cables, and associated hardware.

C. The installation shall be executed in accordance with this specification, contract drawings, and shall meet TIA/EIA 568-B "Commercial Building Wiring Standard".

1.02SUBMITTALS

A. Submit all materials and equipment for review. Each sheet of descriptive literature submitted shall be clearly marked to identify the material or equipment as follows:
1. Submit manufacturer's product data for all cable, termination, equipment, connectors, frames, faceplates, electronic components, and other material and connective hardware. A manufacturer's standard flyer showing the specific item highlighted will be accepted.
2. Equipment and materials descriptive literature not readily cross-referenced with the drawings or specifications shall be identified by a suitable notation.
3. Equipment and materials descriptive literature and drawings shall show the specification paragraph for which the equipment applies.
4. The Contractor shall submit within thirty (30) days of the award of the contract for the Owner/Engineer's approval and prior to any purchase or installation of the items, six (6) bound and indexed copies or one (1) electronic copy of materials, equipment, devices, wire, and other pertinent items proposed to be incorporated within the work. where manufacturers are indicated for an item in the drawings or specifications, only designated by catalog number of the manufacturer of the item to be used shall be required. All other items shall be listed with catalog numbers and descriptive information. The list must be complete to receive consideration. Items judged by the Owner/Engineer to be in non-conformance will be rejected.

B. Shop Drawings:
1. Composite wiring and/or schematic diagrams of the complete system to be installed showing cable run number.
2. Complete data rack detail layout.

C. Product Data:
1. Catalog sheets, factory assembly drawings, specifications and installations for all products. Documents will not be accepted for review unless they are submitted as a package where they pertain to related items, and clearly identified or highlighted to indicate all items which are applicable.

D. Sample: Provide sample for each of the following items:
1. Category 6 Cable
2. Cable connector
3. Wiring device plate complete with label
4. Identification label

1.03CABLE DELIVERY

A. No cable over one (1) year old when delivered to the site will be accepted.

1.04QUALITY ASSURANCE

A. Installer's Qualifications:
1. Installer(s) must be certified installer for the proposed cabling solution and have minimum 2-years experience. Installer must provide Northwestern Michigan College with proof of certification.

PART 2 - PRODUCT

2.01 MANUFACTURERS

A. All equipment shall be the product of one manufacturer for compatibility and shall fully meet all the requirements of this specification.

2.02 LOCAL AREA NETWORK

B. Local area network cabling system described herein are based upon TAI/EIA 568B Commercial Building Wiring standard. The installation shall include but not be limited to the following:
1. Existing Data Rack (MDF)
   a. Cabling connection patch panels and equipment shall be dressed such that the labeling of the patch panels on equipment is readily visible and access to said items are not obstructed.
2. Category 6A Patch Panel:
   a. Patch panels shall be Category 6A with 24 or 48 ports, as necessary with modular PS6, 2.4 GIG jacks. Panels shall be TIA/EIA 568B wiring standards. Patch panels by Commscope/Systimax, Nordx, Belden/CDT or Hubbell are acceptable.
3. Category 6A Cabling/Wiring
   a. Work Station Horizontal voice, data and wireless access point cable
      1) Cabling shall be plenum rated in areas as indicated on the electrical plans.
      2) All station wiring shall have legible color-coding of conductors and be four (4) pair, Unshielded Twisted Pair (UTP), 24 gauge. Data cable must adhere to all performance specifications indicated for TIA/EIA Category 6A media as cited in TIA/EIA 568 standard. The cable shall meet the following performance requirements in addition to other standard Cat 6A performance requirements.
         (a) Frequency - 100 MHz
         (b) Max. Attenuation - 22-db/100 meter
         (c) NEXT - 40 db minimum tolerance
         (d) ACR - 27.2 db at 90 meter
      3) Horizontal work station data cable color shall be **GREEN** in color, or as directed by the Owner.
      4) Cable must be Commscope/ Systimax, Nordx, Belden/CDT, Berk-Tek or General Cable and must bear exterior jacket markings of "Verified Level 6A" or "Classified Level 6A".
   b. Work Station Faceplates
      1) Faceplates shall consist of one (6) port, single gang plate populated with the number of Category 6A voice and data drops notated on the contract drawings. Populate the unused ports with matching blank inserts.
      2) Faceplate finish to be determined in the field and coordinated with the Architect/Owner.
      3) Faceplate shall be by Commscope/Systimax, Nordx, Belden/CDT or Hubbell suitable for mounting on single device box.
   c. Work Station Voice, Data and Wireless Access Point Outlets
      1) Terminate all voice and data Category 6A outlets using T568B convention
      2) Terminate in accordance with BICSI ANSI/TIA/EIA installation guidelines
      3) Cable terminations shall be free of stress or tension when complete.
      4) Provide sufficient slack and manage cables accordingly.
      5) Terminate data drops using a Category 6A **ORANGE** colored insert.
      6) Data jack shall be by Commscope/Systimax, Nordx, Belden/CDT or Hubbell
   d. UTP Patch Cords
      1) The contractor is to provide Category 6A patch cods according to the percentages of the final NEW work station data cable drop count listed below.
         (a) 3' patch cords = 40% of the total data drop count
         (b) 7' patch cords = 40% of the total data drop count
         (c) 12' patch cords = 20% of the total data drop count
      2) All patch cords shall be rated category 6A, and shall have a certified bandwidth of 250 MHz and shall meet or exceed all BICSI ANSI/TIA/EIA requirements for the category 6 standard.
      3) All RJ-45 patch cord connectors shall be booted.
      4) The patch cord color shall be green in color, or as directed by the Owner.
4. Supply Cable Locator Chart.
5. Label each cable within 4 inches of each termination, where it is accessible in a cabinet or junction or outlet box, and elsewhere as indicated.
6. A 3 foot service loop of cable shall be secured with a cable tie above the ceiling tile (or under the floor) immediately before entering the conduit leading to the switch box where the cable is terminated. A 10 foot service loop shall be provided at the MDF end to allow for re-termination or repositioning of the cable at a later date.

2.03 RACEWAY AND CABLE SUPPORT

A. Refer to Specification and Engineered Drawings, Basic Materials and Methods, for the routing of the telephone and data cable.

B. Do not fill communications raceway beyond 40% capacity for conduit and sleeves

C. Support cable every 4 feet horizontally with "J" hooks. Approved manufacturers: Caddy CAT series and Pandult J-Pro.

D. Observe manufacturer recommended load ratio and do not over fill support to minimize pressure on cables.

E. If cable supports are installed on ceiling support wires, the contractor MUST install an additional support wire painted orange to comply with the NEC.

F. Sleeves shall be installed by the electrical contractor and must include nylon bushings for cable protection.

G. Do not exceed manufacturers minimum bend radius

H. Do not tie-wrap cable. Provide UL approved Velcro cable ties and leave cable loose in ties

2.04 FIRE STOPPING

A. Comply with Chapter 7 of the Telecommuncations Distribution Methods manual 11th edition

B. Comply with EIA/TIA-569-A, Annex A "Firestopping"

C. Install firestopping label in to each side of penetrated fire barrier within 12 inches of firestopping material. Labeling shall comply with TIA/EIA-606 latest revision.

2.05 LABELS

A. Provide typewritten labels on all cables detailing cable run number. Identification shall be by means of wrap around "brady" type labels. All workstation outlets must be labeled and all circuits clearly identified utilizing designation strips in compliance with TIA/EIA 606 standards.

2.06 TERMINATIONS

A. Cable Runs shall terminate as follows:
1. Each station shall have the quantity of four pair cables as indicated on the drawings terminated on an Commscope/ Systimax, Nordx, Belden/CDT or Hubbell faceplate with eight conductor modular outlet configured as per TIA/EIA jack designation T568B terminating the four pairs of Category 6 cable. Connecting hardware shall be marked and comply with TIA/EIA performance levels associated with the particular cable being terminated.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Work Station Drops:
1. All voice and data drops shall originate out of the MDF and observe the BICSI ANSI/TIA/EIA convention for distance and care. A 10' service loop shall be installed in the MDF and neatly stored above the ceiling or in the installed cable tray.
2. The installation contractor is responsible for verifying all distance measurements on the contract drawings including the service loop.
3. Data drops shall be terminated on Commscope/ Systimax, Nordx, Belden/CDT or Hubbell patch panels and may be 24 or 48 port pre-configured Category 6, or configurable with color coordinated category 6A connectors.
4. The new Patch panel shall be rack mounted in an existing 19" four post rack secured to the floor.

B. Horizontal Distribution Cable Installation:
1. Maintain the twist of horizontal and backbone cables to within 0.5" at the point of termination.
2. When running cable through dropped ceiling space, the Contractor shall assure proper cable strain relief at all times. After the cable is installed, the installer shall make sure that all parts of the cable are supported every 4 foot and shall be stress free at both ends and throughout their length.
3. Cable shall be installed so that there are no bends less than four times the cable's outside diameter (4X Cable O.D.) for copper or ten (10) times the diameter of the fiber at any point in the run.
4. Horizontal distribution cables shall not be bundled in groups of greater than 40 cables. Cable bundle quantities in excess of 40, may cause deformation of the bottom cables within the bundle.
5. Pulling tension on 4-pai UTP cables shall not exceed 25-pounds for a single cable.

D. Labeling of Cables, Jacks, and Panels:
1. Contractor shall indicate the run number assigned to each cable on a separate data communication shop drawings. The contractor shall submit these shop drawings for the Engineer's approval prior to cable installation. The intent of this system is to provide a grounding system that is equal in potential to the building electrical ground system.
2. Patch panel numbering scheme and labels:
   a. The modular patch panels are pre-numbered. In lieu of using these numbering schemes, the number from the wall outlets (i.e. room number) shall be used to label the corresponding port on the patch panels. Where there are more than one data outlet in a room, identify them as A, B, C etc. Identification of all equipment, racks, patch panels etc. shall be by means of engraved lamacoid nameplates showing ¼" high white lettering on a black background fastened in a upper left-hand corner of the equipment. Identification for the cables shall be by means of wrap around "brady" type labels.
3. Provide riser diagram framed under glass or laminated and mounted on wall near Main Rack.

3.02 TESTING

A. All tests are to be performed after installation of the complete system.

B. The equipment indicated below represents test equipment utilized to develop this test specification. Substitute test equipment may be used only upon approval be the Owner's Engineer provided the same level and quality of testing is performed.

C. Test Equipment:
1. MICRO-TEST PENTA SCANNER 350 or equal.

D. All tests are to be performed on the following aspects of data cabling system:
1. Form Telecommunication room's data rack (LDF) patch panel to corresponding telecommunication closets' patch panel (backbone cable). For fiber optic backbone see section 16728.
2. From each telecommunication closet's patch panel to each and every workstation termination (workstation cable).

E. Tests to be performed:
1. The test equipment shall be configured to test the maximum transmission performance for which the cable is rated (i.e. for category 6 cable is 2400 Megabits per second).
2. The following minimum information shall be provided for each cable link:
   a. Length: Total length from LDF to workstation termination. The cable length shall conform to the maximum distance set forth in the TIA/EIA 568-B standard.
   b. Resistance: measure for each cable pair.
   c. Noise: measure for each pair at the following frequencies: 150KHZ to 16MHZ, 16MHZ-100 MHZ.
   d. Attenuation: (db loss): measure cable for proper attenuation according to manufacturer specifications at 10 MHZ and 100 MHZ. Expected result is 21.6 db at 100 MHz.
   e. Near End Cross talk (NEXT): Measure NEXT in dB and the associated frequency. Expected result is 32.0 db at 100 MHz.
   f. Wire Map: Indicate that the wiring at the near end and the far end meets manufacturer specification.
   g. Attenuation to Cross-talk Ratio (ACR): Expected result is 10.4 db.

F. All test results shall be provided in the following formats:
1. Printed (3 bound copies) -or-
2. Electronic in PDF form.

G. All tests shall be coordinated with and performed in the presence of the Owners Representative.

H. Upon completion of testing and problem resolution, all corrections tested are to be 100% error free.

3.03 EQUIPMENT INSTALLATION AND TESTING:

A. The Contractor shall be available during LAN equipment (i.e. wiring concentrators, server, and workstations) installation and testing and assist computer integrator to isolate faults, which may exist in the cabling system installation.

3.04 TRAINING & WARRANTY

A. Components, parts and assemblies supplied by a manufacturer shall be warranted against defects in material and workmanship for a period of 12 months from the date of completion. Warranty services shall be provided by a qualified factory-trained representative of the equipment manufacturer during normal working hours. The Representative shall be based in a fully staffed branch office and located within a reasonable distance from the job site.

B. The warranty stated in the preceding paragraph shall be the minimum warranty for all material and installation. Certain systems shall have additional warranty requirements which shall be listed under their individual sections.

END OF SECTION

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