THE ADJUTANT GENERAL'S DEPARTMENT

AASF OPERATIONS RENOVATIONS

26 REGIONAL DRIVE • CONCORD, NH 03301

DATE: 19 FEBRUARY 2019

CONTACT LIST

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124 BEDFORD CENTER ROAD . UNIT E . BEDFORD, NH 03110 . P: 603.488.1959

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electrical
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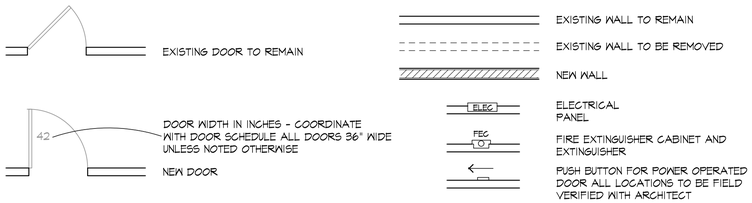
DRAWING INDEX

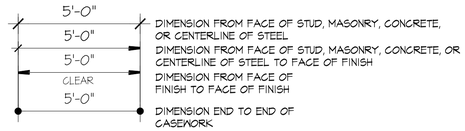
DRAWING KEY

NOTE: ALL SYMBOLS ARE NOT USED ON ALL PROJECTS.

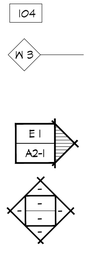
GRAPHIC CONVENTIONS - WALLS AND DOORS



DIMENSION CONVENTIONS



TAG MARKS

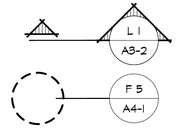


DOOR AND FRAME TAG- SEE DOOR 104 ON DOOR SCHEDULE FOR DOOR AND FRAME INFORMATION.

SEE PARTITION TYPE 'W 3' ON PARTITION TYPE DRAWING FOR WALL CONSTRUCTION OF THE WALL THAT THE LINE RUNS THROUGH.

- S USED FOR METAL STUDS
- W IS USED FOR WOOD STUDS
- M IS USED FOR MASONRY

ELEVATION TAG - SEE DETAIL NUMBER E1 ON DRAWING A2-1 FOR THE ELEVATION OF THE WALL THAT THE ARROW IS POINTING TO.



SECTION TAG - SEE DETAIL NUMBER L1 ON DRAWING A3-2 FOR BUILDING OR WALL SECTION [ARROWS DESIGNATE VIEW OF SECTION CUT]

DETAIL TAG - SEE DETAIL NUMBER F5 ON DRAWING A4-1 FOR AN ENLARGEMENT OF THE MATERIALS SHOWN IN THE DASHED AREA.

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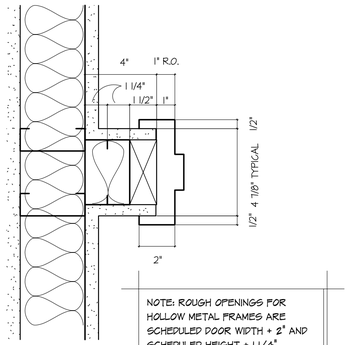
DOOR SCHEDULE

LEGEND:

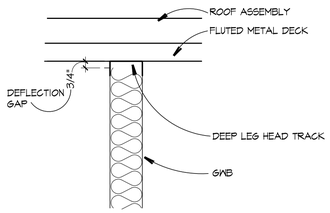
FL	FULL LITE
NL	NARROW LITE
3070	3'-0" X 7'-0" DOOR
HM	WELDED HOLLOW METAL FRAME OR DOOR
SCWD	SOLID CORE WOOD DOOR

		DOOR				FRAME					
DOOR NO.	LOCATION	TYPE	MAT'L	SIZE	THICK	TYPE	MAT'L	GLAZING	CLOSER	RATING	HARDWARE NOTES
201A	OFFICE	FL	SCWD	3070	1 3/4"	1	HM	TEMPERED			CLASSROOM LOCKSET, COORDINATE KEYING WITH OWNER
205	ALSE SHOP	NL	SCWD	3070	1 3/4"	1	HM	TEMPERED			180° HINGES, PASSAGE LOCKSET WITH DEADBOLT, COORDINATE KEYING WITH OWNER



HOLLOW METAL FRAME DETAIL

3" = 1'-0"



NON-RATED TOP OF WALL CONDITION

ALL PARTITIONS ARE TYPE S1 UNLESS NOTED OTHERWISE ON THE FLOOR PLANS.

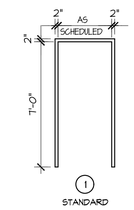
TYPICAL SOUND ATTENUATION DETAILS APPLY TO ALL FULL HEIGHT PARTITIONS

1 1/2" = 1'-0"

TYPICAL PARTITION

PARTITION TYPES

1/2" = 1'-0" U.N.O.



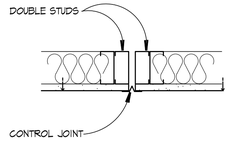
FRAME TYPES

1/4" = 1'-0"

GLAZING TYPE FOR EACH OPENING IS SCHEDULED ON THE DOOR AND FRAME SCHEDULE

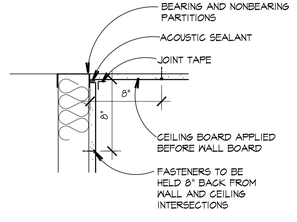
DOOR TYPES

1/4" = 1'-0"



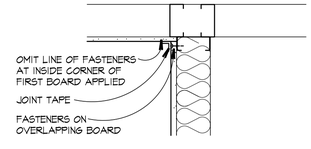
PLAN DETAIL

GWB CONTROL JOINT



SECTION DETAIL

CEILING/SOFFIT APPLICATION
(BEARING & NON BEARING PARITIONS)
"FLOATING INTERIOR ANGLE DETAIL"



PLAN DETAIL

WALL APPLICATION
"FLOATING INTERIOR ANGLE DETAIL"

GWB CRACK CONTROL DETAILS - STEEL FRAMING

1 1/2" = 1'-0"

CRACK CONTROL DETAILS AS RECOMMENDED BY THE US GYPSUM ASSOCIATION

[DETAILS SHALL APPLY ONLY AT CONDITIONS THAT ARE EXPOSED TO VIEW - NOT AT CONCEALED CONDITIONS]

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AASF OPERATIONS RENOVATIONS

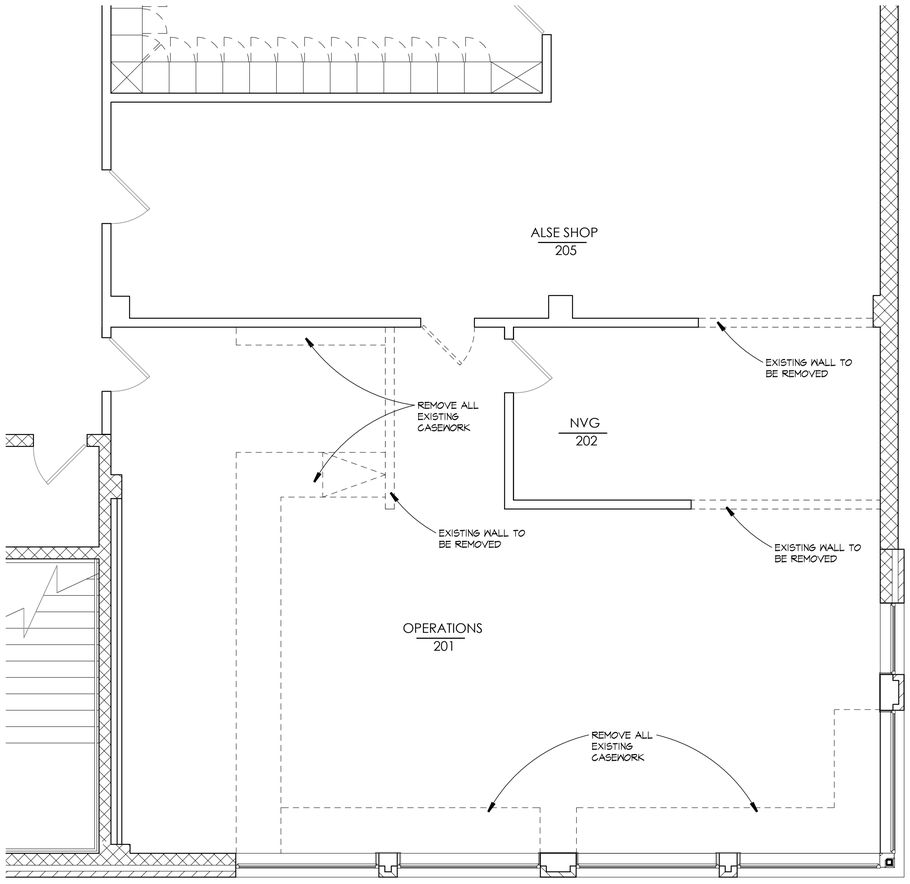
26 REGIONAL DRIVE · CONCORD, NEW HAMPSHIRE 03301

DATE:
19 FEBRUARY 2019
REVISIONS:

A0.1

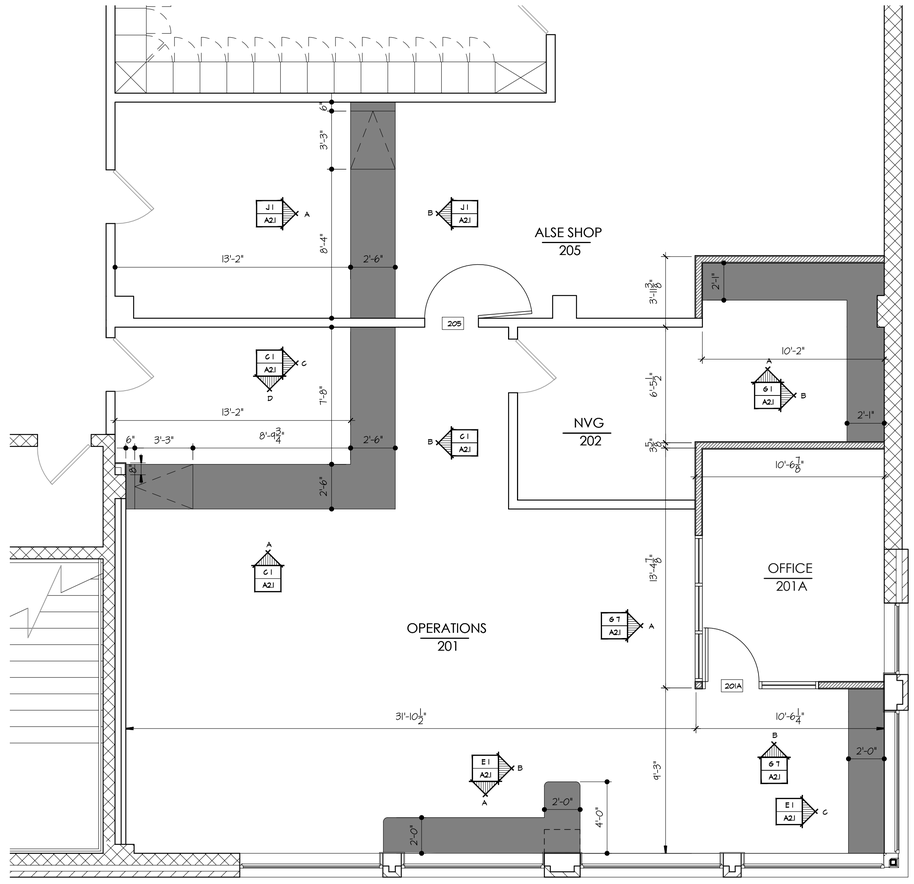
DETAILS & SCHEDULES

THIS DRAWING IS FORMATTED FOR A 24X36 SHEET



E1 / A1.1 **DEMOLITION PLAN**

1/4" = 1'-0"



E7 / A1.1 **PROPOSED PLAN**

1/4" = 1'-0"

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A1.1
FLOOR PLANS

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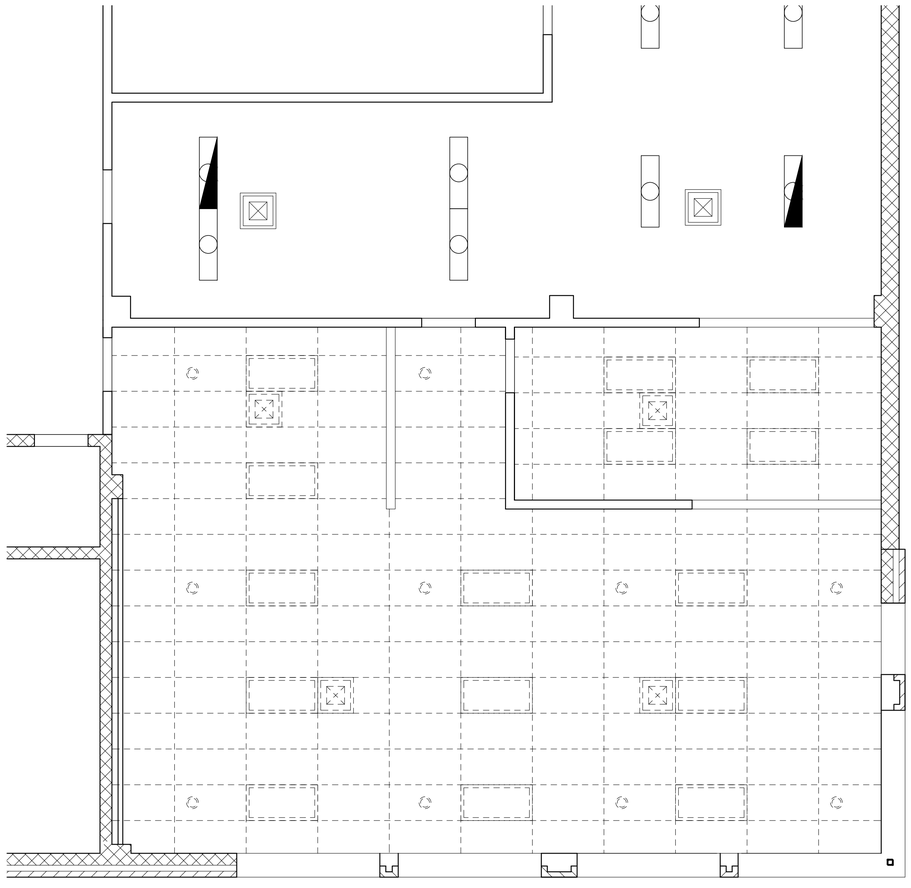
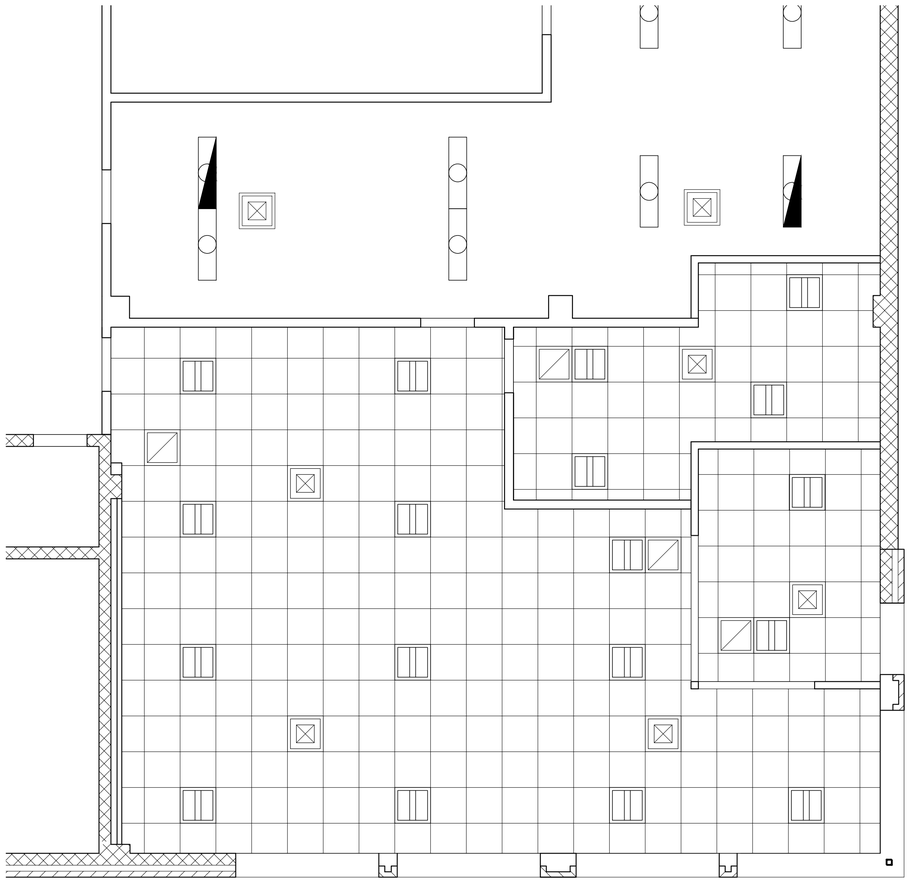


E1 / A1.2 **REFLECTED CEILING DEMOLITION PLAN**

1/4" = 1'-0"



E7 / A1.2 **REFLECTED CEILING PLAN**

1/4" = 1'-0"

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A1.2

R/C PLANS

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FINISH LEGEND

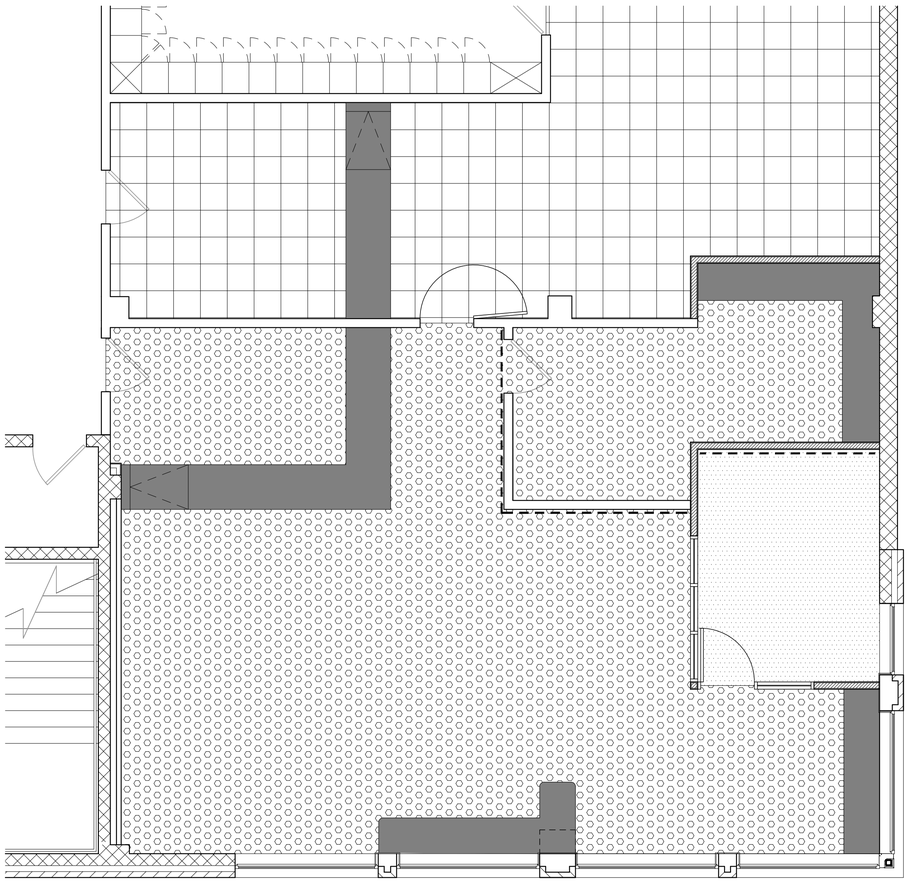
CARPET TILE:
MANNINGTON RAFIA
"SORREL" 43333

RUBBER FLOORING:
NORA NORAMENT GRANO
"FRANKINCENSE" 5303

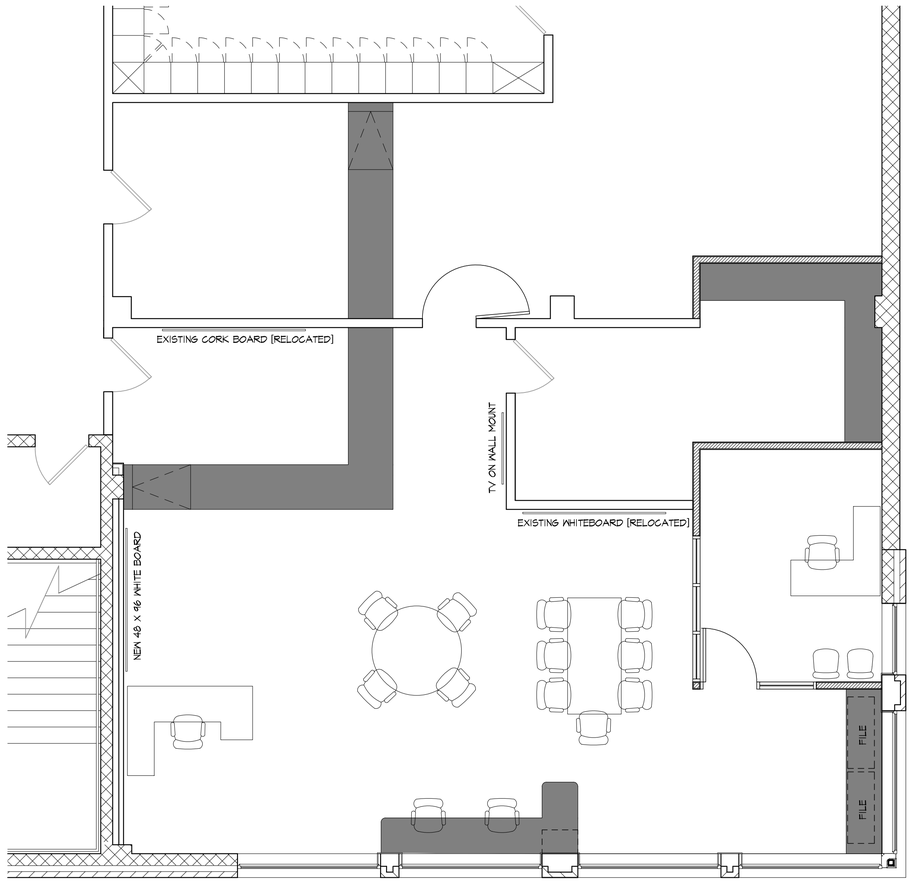
VCT (EXISTING TO REMAIN)
PATCH AND MATCH AS REQUIRED

ACCENT WALL PAINT:
SHERWIN WILLIAMS
ROOKWOOD BLUE GREEN SW2811

FIELD PAINT:
SHERWIN WILLIAMS
JOGGING PATH SW7638



J1 / A1.3 **FINISH PLAN**
1/4" = 1'-0"



NOTE: ALL FURNITURE PROVIDED BY OWNER AND IS SHOWN FOR LAYOUT PURPOSES ONLY

J7 / A1.3 **FURNITURE PLAN**
1/4" = 1'-0"

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A1.3
PLANS

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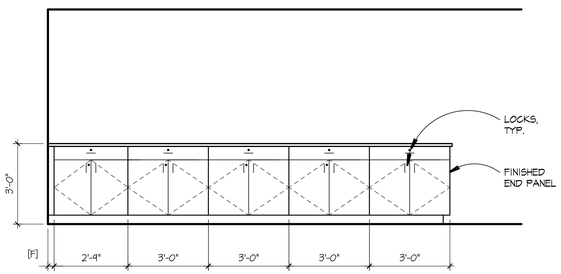
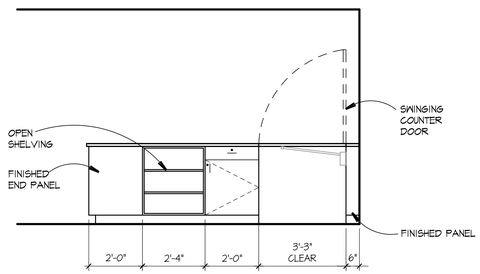
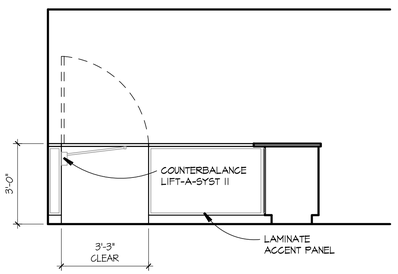


A



B



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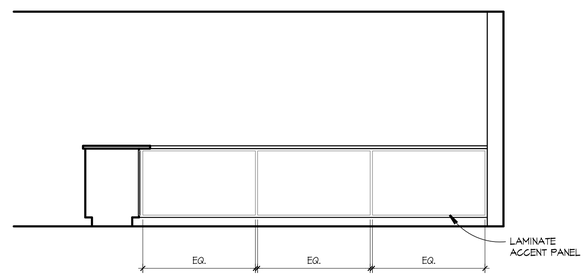
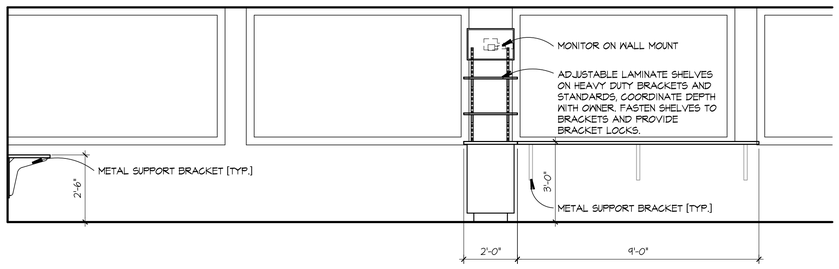


D

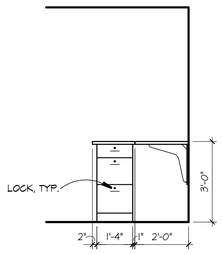
C1 / A2.1 OPERATIONS

3/8" = 1'-0"



NOTE: MONITOR & MOUNT FURNISHED BY OWNER AND INSTALLED BY GC. COORDINATE HEIGHT WITH OWNER

A



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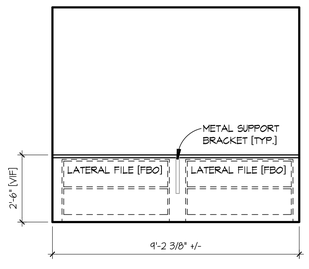
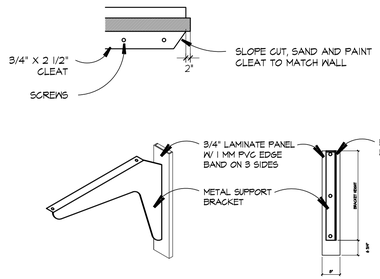


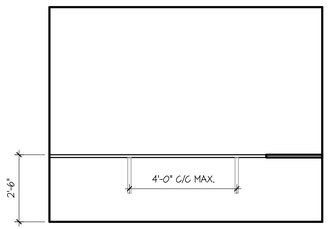
NOTE:COORDINATE BRACE LOCATIONS AND TOP HEIGHT WITH OWNER SUPPLIED LATERAL FILES

C



E1 / A2.1 OPERATIONS

3/8" = 1'-0"



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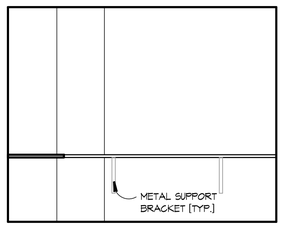


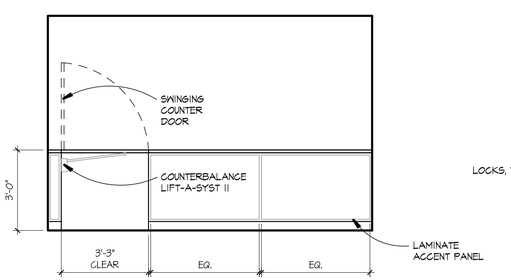
B

E9 / A2.1 SUPPORT BRACKET & WALL CLEAT

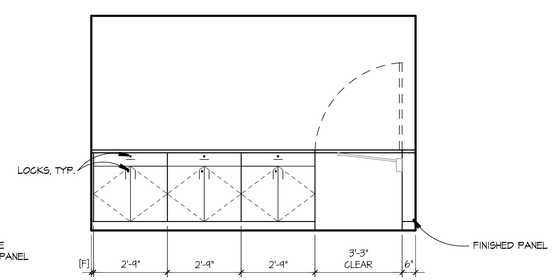
N.T.S.

G1 / A2.1 NIGHT VISION ROOM

3/8" = 1'-0"



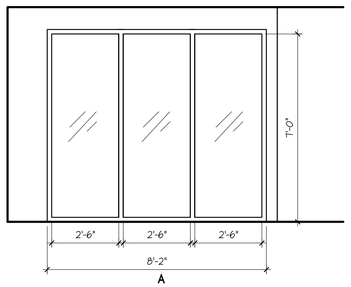
A



B

J1 / A2.1 ALSE SHOP

3/8" = 1'-0"



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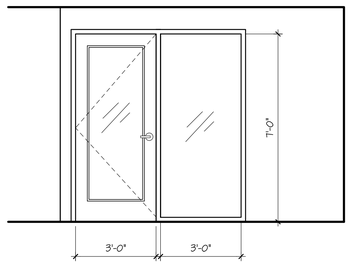

B

G7 / A2.1 OFFICE

3/8" = 1'-0"

GENERAL CASEWORK NOTES

ALL BASE AND WALL CABINET END PANELS THAT ARE EXPOSED TO VIEW SHALL BE FINISHED TO MATCH THE CABINET FACE.

ALL OPEN BOX CABINETS SHALL HAVE THEIR EXPOSED SURFACES FINISHED TO MATCH THE CABINET FACE.

PROVIDE ADEQUATE BLOCKING AT ALL BRACKETS, CLEATS, AND OTHER WALL-MOUNTED ITEMS.

DRAWER SIDES AND BACKS SHALL BE PROPORTIONATELY TALL WITH RESPECT TO THE DRAWER FRONT. [FOR EXAMPLE: A 12" DRAWER FRONT SHALL NOT HAVE 4" SIDES AND BACK]. USE FULL EXTENSION DRAWER SLIDES.

COORDINATE ALL POWER AND DATA LOCATIONS WITH ELECTRICAL DRAWINGS.

3R = 3" RADIUS; OVERHANG AND RADIUS THE EXPOSED CORNERS OF COUNTERTOPS.

F = FILLER; USE SCRIBED END FILLERS AS NECESSARY TO SNUGLY FIT STANDARD CABINET SIZES WITHIN WALL OPENINGS. ALWAYS INSTALL A NARROW FILLER STRIP BETWEEN A SIDE WALL AND THE CABINETS TO ENSURE THE PROPER OPERATION OF DOORS AND DRAWERS WITHOUT THEIR RUBBING AGAINST THAT WALL.

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A2.1

INTERIOR ELEVATIONS

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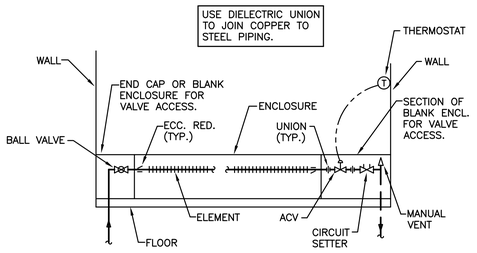
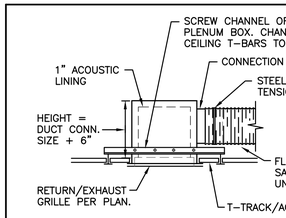
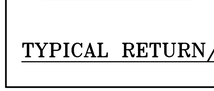


UP FEED (OPP. END) FTR PIPING DETAIL

N.T.S.



TYP. FLEX CONN.



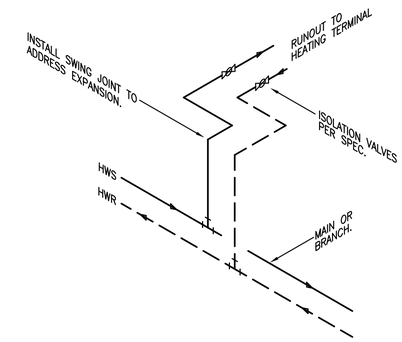
TYP. HARD CONN.

NOTES:

1. DOUBLE STRAPS ARE REQUIRED ON INSULATED FLEX DUCT. ONE OVER THE ACTUAL DUCT AND ONE OVER THE EXTERIOR INSULATION. TRIM EXCESS INSULATION TO PROVIDE A NEAT FINISHED PRODUCT.
2. FLEX DUCT MUST BE SUPPORTED AT INTERVALS NECESSARY TO AVOID EXCESSIVE SAGS WITH SHEET METAL BAND HANGERS.
3. GRILLES MUST BE SUPPORTED SEPARATE OF THE CEILING TILE IN WHICH PLACED TO AVOID WEIGHT INFLUENCE ON THE TILE.
4. ALL DUCTWORK THAT IS VISIBLE THROUGH THE GRILLE THAT DOES NOT HAVE ACOUSTIC LINING SHALL BE PAINTED FLAT BLACK.

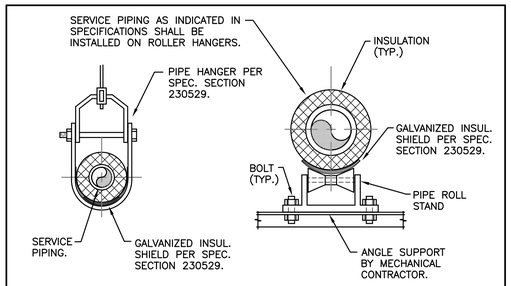
TYPICAL RETURN/EXHAUST GRILLE DETAIL

N.T.S.



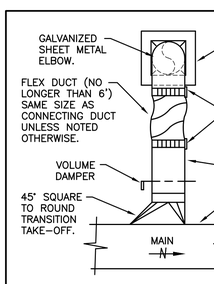
TYPICAL PIPING TAKE-OFF DETAIL

N.T.S.



TYPICAL PIPE HANGER & ROLLER DETAIL

N.T.S.

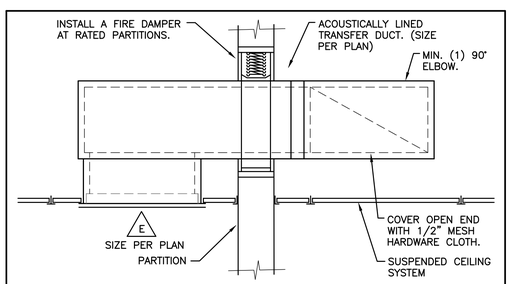


NOTES:

1. DOUBLE STRAPS ARE REQUIRED ON INSULATED FLEX DUCT. ONE OVER THE ACTUAL DUCT AND ONE OVER THE EXTERIOR INSULATION. TRIM EXCESS INSULATION TO PROVIDE A NEAT FINISHED PRODUCT.
2. FLEX DUCT MUST BE SUPPORTED AT INTERVALS NECESSARY TO AVOID EXCESSIVE SAGS WITH SHEET METAL BAND HANGERS.
3. DIFFUSERS MUST BE SUPPORTED SEPARATE OF THE CEILING TILE IN WHICH PLACED TO AVOID WEIGHT INFLUENCE ON THE TILE.

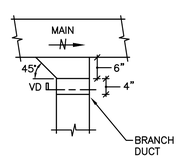
TYPICAL BRANCH TAKE-OFF DETAIL

N.T.S.



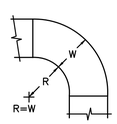
TYPICAL TRANSFER DETAIL

N.T.S.



TYPICAL TAKE-OFF DETAIL

N.T.S.



RADIUS ELBOW

N.T.S.

GENERAL NOTES

1. ALL EQUIPMENT AND DUCTWORK SHOWN DIAGRAMMATICALLY ONLY. EXACT LOCATION TO BE DETERMINED AND COORDINATED IN THE FIELD BY ALL TRADES INVOLVED.
2. COORDINATE ALL GRILLE, REGISTER AND DIFFUSER LOCATIONS WITH ARCHITECT'S REFLECTED CEILING PLANS.
3. FIRE AND MOISTURE SEAL ALL DUCT PENETRATIONS THRU GENERAL CONSTRUCTION IN ACCORDANCE WITH DIVISION 7.
4. FLEXIBLE DUCTS NOT TO BE OVER 6 FEET LONG WITH APPROVED TRANSITIONS AND SMOOTH BENDS TO TERMINAL CONNECTIONS.
5. FLEX DUCT TO MATCH RUNOUT SIZE UNLESS NOTED OTHERWISE.
6. DUCT DIMENSIONS ARE TO INSIDE OF LINER WHERE APPLICABLE.
7. MOUNTING HEIGHTS FOR THERMOSTATS, EQUIPMENT ON/OFF SWITCHES, ETC., LOCATED IN HANDICAP ACCESSIBLE SPACES SHALL BE 48" TO TOP OF CONTROL UNLESS NOTED OTHERWISE BY ARCHITECT. REFER TO ARCHITECTURAL ELEVATIONS FOR FURTHER DETAILS.
8. MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING OSHA GUARDRAILS AS/IF REQUIRED FOR ALL ROOF MOUNTED EQUIPMENT.

LEGEND

ACD	AUTOMATIC CONTROL DAMPER
AD	ACCESS DOOR
AFF	ABOVE FINISHED FLOOR
A.L.	ACOUSTICALLY LINED
APD	AIR PRESSURE DROP
ATC	AUTOMATIC TEMPERATURE CONTROL
CFM	CUBIC FEET PER MINUTE
C.M.	CONSTRUCTION MANAGER
EA	ENTERING AIR
EAT	ENTERING AIR TEMPERATURE
E.C.	ELECTRICAL CONTRACTOR
EF	EXHAUST FAN
ESP	EXTERNAL STATIC PRESSURE
EWT	ENTERING WATER TEMPERATURE
FC	FLEX CONNECTION
FD	FIRE DAMPER
FPM	FEET PER MINUTE
FTR	FIN-TUBE RADIATION
G.C.	GENERAL CONTRACTOR
GPM	GALLONS PER MINUTE
HP	HORSEPOWER
LAT	LEAVING AIR TEMPERATURE
LWT	LEAVING WATER TEMPERATURE
MBH	THOUSAND BTU'S PER HOUR
MOD	MOTOR OPERATED DAMPER
M.C.	MECHANICAL CONTRACTOR
N.I.C.	NOT IN CONTRACT
NTS	NOT TO SCALE
OA	OUTSIDE AIR
P.C.	PLUMBING CONTRACTOR
RA	RETURN AIR
RPM	REVOLUTIONS PER MINUTE
TYP.	TYPICAL
U/C	UNDER CUT DOOR
VD	VOLUME DAMPER
WPD	WATER PRESSURE DROP
WTD	WATER TEMPERATURE DROP
$	SWITCH
T	THERMOSTAT PER SPEC.
	CONN. POINT OF NEW WORK TO EXISTING

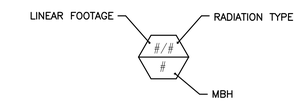
	SUPPLY DUCT
	RETURN DUCT
	EXHAUST DUCT
	GRILLE, REG., DIFF. & LOUVER SYMBOL
	SQUARE ELBOW W/TURNING VANES (T.V.)
	EQUIPMENT TAG / MBH HEAT
	PIPE RISE
	PIPE DROP
	DIRECTION OF FLOW (WATER)
	DIRECTION OF FLOW (AIR)
	CONCENTRIC REDUCER
	ECCENTRIC REDUCER
	UNION
	BALL VALVE
	BUTTERFLY VALVE
	CHECK VALVE
HWS	HOT WATER SUPPLY
HWR	HOT WATER RETURN
	EXISTING SUPPLY DUCT
	EXISTING EXHAUST OR RETURN DUCT

GRILLE & DIFFUSER SCHEDULE

SYMBOL	MANUFACTURER	TYPE & MODEL	REMARKS (SIZE AND CFM AS SHOWN ON PLANS)
A	METALAIRE	SUPPLY DIFFUSER SERIES 5000-6-S4 24"X24" PANEL	ALUMINUM CONSTRUCTION, WHITE FINISH
B	METALAIRE	SUPPLY DIFFUSER SERIES 5000-6-S3 24"X24" PANEL	ALUMINUM CONSTRUCTION, WHITE FINISH
C	METALAIRE	SUPPLY DIFFUSER SERIES 5000-6-SC 24"X24" PANEL	ALUMINUM CONSTRUCTION, WHITE FINISH
D	METALAIRE	SUPPLY DIFFUSER SERIES 5000-6-S2 24"X24" PANEL	ALUMINUM CONSTRUCTION, WHITE FINISH
E	METALAIRE	RETURN/EXHAUST GRILLE (LAY-IN) MODEL CC15-6	ALUMINUM CONSTRUCTION, WHITE FINISH

FIN-TUBE RADIATION SCHEDULE

TYPE-1 VULCAN LINOVECTOR-II SLOPE TOP MODEL VC34 WITH 1" TUBE, 3 1/4"X3 1/4"-40 FPF, .020 FIN, 980 BTUH/LF @ 180° AWT, 65° EAT, 1 ROW, 18" MOUNTING HEIGHT, 20' WTD. FURNISH WITH PARTIAL BACKPLATES, WATER BRACKETS WITH SLIDE CRADLES, ACCESS DOORS OR SECTIONS AND ENCLOSURE TRIM AS REQUIRED. FURNISH 14 GA. ENCLOSURES WITH BAKED ENAMEL FINISH. COLOR SELECTION BY ARCHITECT.



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THE ADJUTANT GENERAL'S DEPARTMENT
AASF OPERATIONS RENOVATIONS

26 REGIONAL DRIVE - CONCORD, NEW HAMPSHIRE 03301

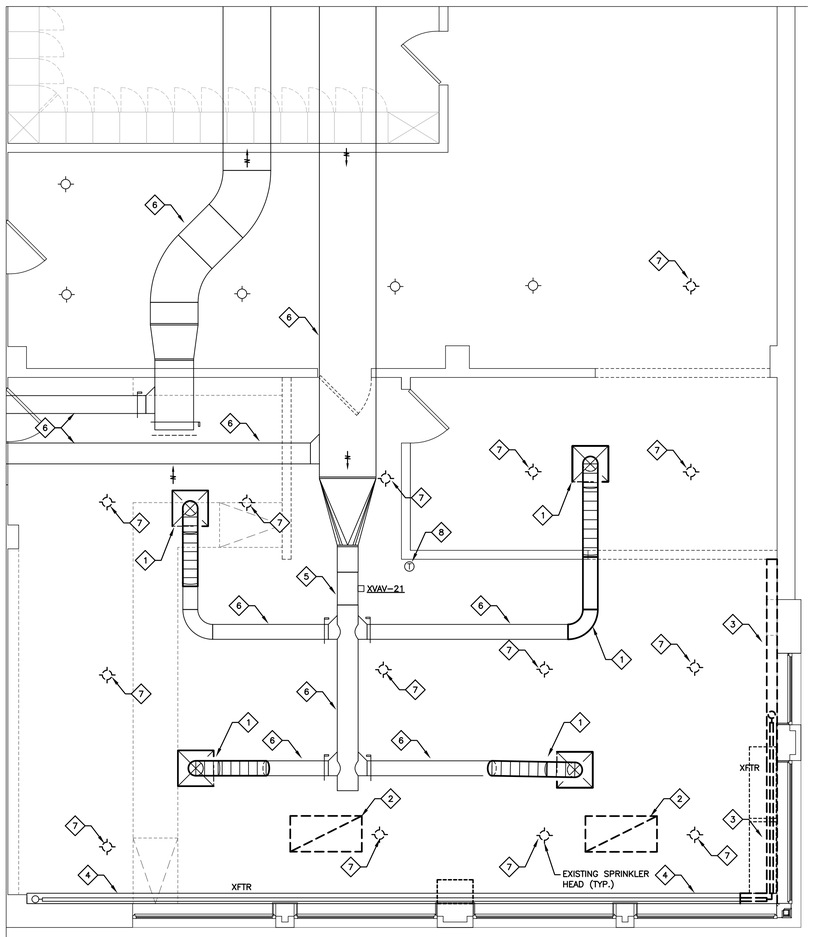
DATE:
19 FEBRUARY 2019
REVISIONS:

FINAL SUBMISSION

M0.1

MECHANICAL LEGEND, NOTES, DETAILS AND SCHEDULES

THIS DRAWING IS FORMATTED FOR A 24X36 SHEET

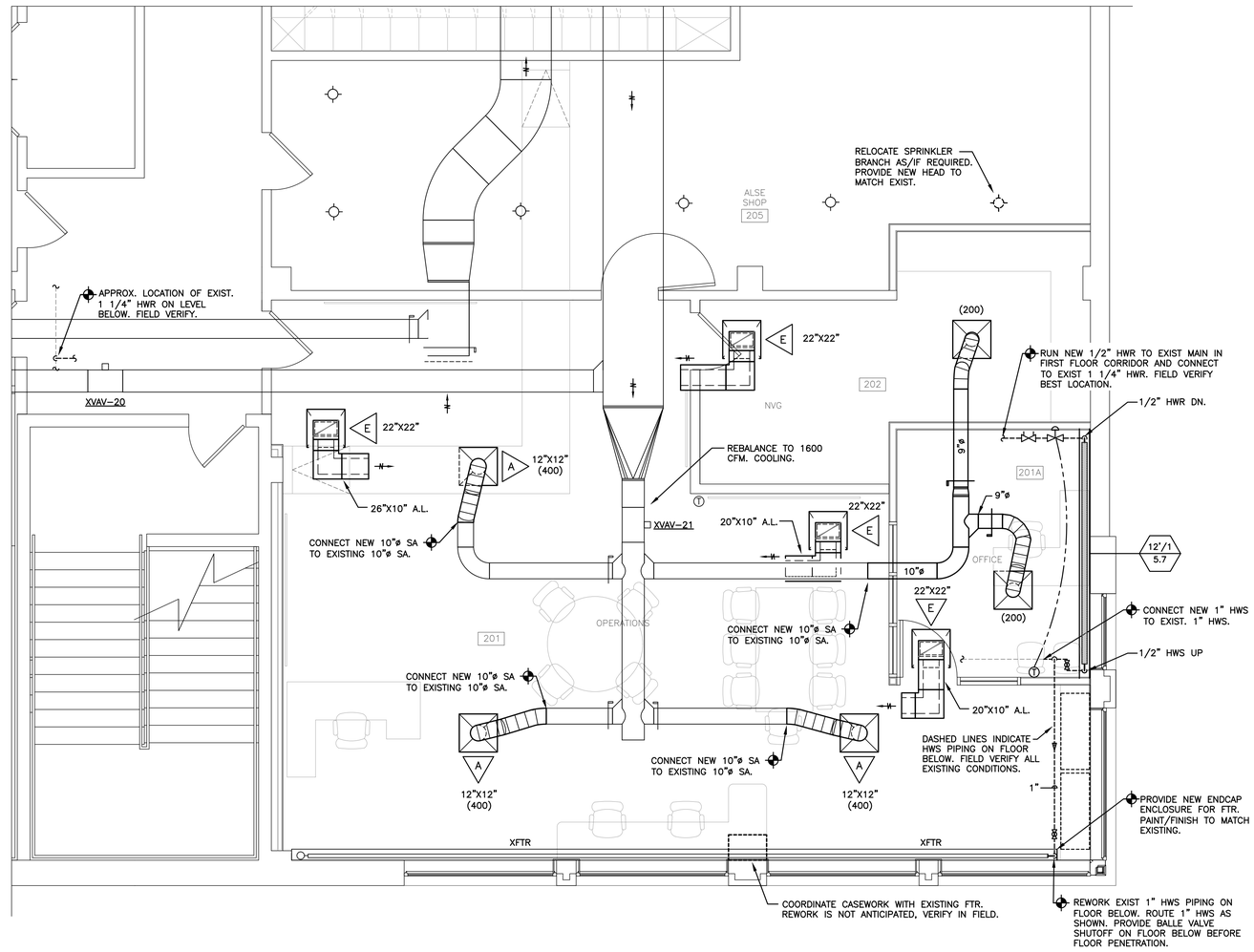


SECOND FLOOR DEMOLITION PLAN – MECHANICAL

SCALE: 1/4" = 1'–0"

MECHANICAL DEMOLITION KEYNOTES '◇'

1. REMOVE EXISTING AIR TERMINAL AND DUCTWORK COMPLETE TO POINTS INDICATED, INCLUDING ASSOCIATED INSULATION, HANGARS, FLEX DUCT AND ACCESSORIES. REWORK EXISTING DUCTWORK WITH NEW AS SHOWN ON NEW WORK PLANS.
2. REMOVE EXISTING CEILING RETURN GRILLES COMPLETE.
3. REMOVE EXISTING FIN–TUBE RADIATION COMPLETE TO POINTS INDICATED, INCLUDING PIPING, WALL HANGING HARDWARE, VALVES AND ACCESSORIES. REWORK EXISTING TO REMAIN WITH NEW AS SHOWN ON NEW WORK PLANS.
4. EXISTING FIN–TUBE RADIATION TO REMAIN AS IS. CLEAN RADIATION, COMB OUT AND VACUUM FINS, AND REWORK AS SHOWN ON NEW WORK PLANS. REPAINT TO MATCH ACHITECTURAL FINISH SCHEDULE.
5. REBALANCE EXISTING VAV UNIT AS SHOWN ON NEW WORK PLANS. FIELD VERIFY UNIT IS IN PROPER WORKING CONDITION, AND PROVIDE REPAIRS AS/IF REQUIRED.
6. EXISTING DUCTWORK TO REMAIN AS IS.
7. EXISTING SPRINKLER HEAD TO BE RELOCATED TO ACCOMMODATE NEW ARCHITECTURAL CEILING PLAN. PROVIDE NEW BRANCH PIPING AND HEADS.
8. EXISTING THERMOSTAT TO REMAIN AS IS.



SECOND FLOOR PART PLAN – MECHANICAL

SCALE: 1/4" = 1'–0"

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SECOND FLOOR PART PLANS - MECHANICAL DEMO AND NEW WORK

THIS DRAWING IS FORMATTED FOR A 24X36 SHEET

MECHANICAL SPECIFICATIONS

SECTION 210000 – SPRINKLER

1.01 SCOPE

A. THE EXISTING AUTOMATIC WET SPRINKLER SYSTEM SHALL BE REWORKED AND EXTENDED AS REQUIRED TO ADDRESS THE RENOVATED AREAS SHOWN ON THE ARCHITECT'S CONSTRUCTION DOCUMENTS, IN KEEPING WITH THE NFPA–13, FM GLOBAL CRITERIA AND CONCORD FIRE DEPARTMENT REQUIREMENTS AND AS INDICATED ON DRAWINGS.

B. THIS CONTRACTOR MUST HAVE FULL REGARD FOR THE ARCHITECT'S INTENT TO REARRANGE ANY PIPING AND/OR HEADS TO ACHIEVE AESTHETIC REQUIREMENTS. EXTRA HEADS OR PIPING NECESSARY TO SUITE THE DESIRED PLACEMENT SHALL BE PROVIDED AT NO ADDITIONAL COST.

C. ALL SPRINKLER WORK SHALL BE INSTALLED BY EXPERIENCED INSTALLERS IN KEEPING WITH CONCORD FIRE DEPARTMENT REQUIREMENTS, FM GLOBAL AND NFPA–13 CRITERIA.

D. PERMITS AND FEES SHALL BE OBTAINED AND PAID FOR BY THE SPRINKLER CONTRACTOR.

E. SUBMIT DETAILED WORKING STAMPED DRAWINGS PREPARED BY A DULY RECOGNIZED PROFESSIONAL ENGINEER OR NICET LEVEL 3 CERTIFIED DESIGNER, OR AS REQUIRED BY THE CITY OF CONCORD.

F. PROVIDE SHOP DRAWINGS OF ALL SPRINKLER HEADS FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION.

G. SPRINKLER CONTRACTOR SHALL REVIEW ALL ARCHITECTURAL DRAWINGS FOR THIS PROJECT FOR REFLECTED CEILING PLANS AND BUILDING SECTIONS.

SECTION 220000, 230000, & 250000 – GENERAL REQUIREMENTS

1.01 SCOPE

A. ALL WORK OF THIS SECTION IS SPECIFICALLY SUBJECT TO DIVISION 1 – GENERAL REQUIREMENTS FOR THE ENTIRE PROJECT.

B. PROVIDE ALL ITEMS, ARTICLES, MATERIALS, OPERATIONS OR METHODS LISTED, MENTIONED, SCHEDULED ON THE DRAWINGS AND/OR SPECIFIED HEREIN INCLUDING ALL LABOR, MATERIALS, EQUIPMENT AND INCIDENTALS NECESSARY AND REQUIRED FOR PROJECT COMPLETION.

C. THE INTENT OF THE SPECIFICATIONS AND DRAWINGS IS TO CALL FOR FINISH WORK, TESTED AND READY FOR OPERATION.

D. ALL WORK SHALL COMPLY WITH APPLICABLE PORTIONS OF ALL STATE OR LOCAL LAWS AND ORDINANCES, ALL RULES AND REGULATIONS OF LOCAL UTILITY COMPANIES AND THE CONCORD FIRE DEPARTMENT, INCLUDING NFPA, ALL OF THE INTERNATIONAL CODES (AS ADOPTED BY THE AUTHORITIES HAVING JURISDICTION [AHJ]), NATIONAL ELECTRIC CODE (N.E.C.), ADA WITH NH AMENDMENTS AND ALL OTHER STANDARDS SET FORTH BY THE (AHJ).

E. ALL REQUIRED PERMITS AND FEES RELATIVE TO THIS DIVISION SHALL BE OBTAINED AND PAID FOR BY THIS CONTRACTOR.

F. GUARANTEE/WARRANTY ALL MECHANICAL EQUIPMENT AND WORKMANSHIP FOR ONE (1) YEAR FROM THE DATE OF PROJECT FINAL ACCEPTANCE BY THE OWNER.

G. SUBMIT ELECTRONIC COPIES OF SHOP DRAWINGS OF EQUIPMENT PROPOSED FOR INSTALLATION UNDER THIS CONTRACT FOR REVIEW AND APPROVAL BY OWNER REPRESENTATIVES. ONE (1) HARD COPY OF EVERY APPROVED SHOP DRAWING SHALL BE KEPT IN A BINDER ON THE JOB SITE.

H. COORDINATE GENERAL CONSTRUCTION CUTTING, PATCHING, EXCAVATION, PAINTING AND SEALING WITH CONSTRUCTION MANAGER (C.M.). REVIEW RESPONSIBILITY FOR SAME PRIOR TO BID AND PRICE ACCORDINGLY.

SECTION 220500 & 230500 – SLEEVES AND FLASHINGS

1.01 SCOPE

A. PIPES PASSING THROUGH ALL MASONRY AND FIRE RATED GYPSUM BOARD WALLS SHALL PASS THROUGH CLEAN CUT HOLES FITTED WITH STEEL PIPE SLEEVES, THE INSIDE DIAMETER OF WHICH SHALL BE AT LEAST 1" GREATER THAN THE OUTSIDE OF THE PIPE PASSING THROUGH IT. PIPES PASSING THROUGH NON–RATED GYPSUM BOARD WALLS DO NOT REQUIRE SLEEVES, BUT THE VOID BETWEEN WALL OPENING AND PIPE MUST BE SEALED AND TAPED. WHERE UL APPROVED FOR THE APPLICATION, PIPE INSULATION SHALL BE CONTINUOUS THROUGH SLEEVE/HOLE. ALL SPACE BETWEEN INSULATION JACKET AND SLEEVE/HOLE SHALL BE CAULKED FULL WITH HILTI OR 3M SILICONE BASE ELASTOMERIC UL 1479 SEALANT. INSTALLATION DETAILS SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S PUBLISHED INSTRUCTIONS IN ORDER TO BEAR THE UL CLASSIFICATION MARKING.

B. EXPOSED PIPES PASSING THROUGH WALLS, FLOORS, PARTITIONS OR CEILINGS SHALL BE FITTED WITH CHROMIUM PLATED HEAVY GAUGE WROUGHT BRASS ESCUTCHEONS, FIT SNUGLY AND SECURELY HELD IN PLACE.

C. DUCTS PASSING THROUGH RATED WALLS SHALL BE CAULKED WITH A MINIMUM OF 1 1/4" THICKNESS OF FILL MATERIAL APPLIED WITHIN ANNULUS, FLUSH WITH BOTH SURFACES OF WALL ASSEMBLY. AT THE POINT CONTACT LOCATION BETWEEN DUCT AND WALLBOARD, A MINIMUM 1/4" DIAMETER BEAD OF CAULK SHALL BE APPLIED AT THE WALLBOARD/DUCT INTERFACE ON BOTH SURFACES OF WALL ASSEMBLY. VOID FILL MATERIAL MUST BEAR THE UL CLASSIFICATION MARKING, EQUAL TO 3M SYSTEM NO. W–L–7013.

D. PIPES AND DUCTS PASSING THROUGH FIRE RATED FLOORS SHALL BE SEALED IN KEEPING WITH PARAGRAPHS A., B. AND C.

E. THIS CONTRACTOR SHALL SUBMIT SLEEVE AND FIRE SEALING DETAILS FOR ALL CASES OF FIRE RATED WALL, SHAFT AND FLOOR DECK PENETRATIONS APPLICABLE TO THE PROJECT. THE SHOP DRAWING SHALL BE PROVIDED BY THE FIRE SEALANT MANUFACTURER AND CLEARLY IDENTIFY ALL PRODUCTS AND THE APPLICABLE UL CLASSIFICATION OR LISTING.

F. LINK–SEAL MODULAR SEALS IN CORED HOLES MAY BE USED WHERE CALLED FOR ON DRAWINGS OR DEEMED THE BEST APPLICATION.

SECTION 220000 – PLUMBING

1.01 SCOPE

A. FURNISH AND INSTALL ALL PLUMBING WORK OF THIS CONTRACT IN ACCORDANCE WITH GOVERNING CODES AND IN A WORKMANLIKE MANNER.

B. THE RUN AND ARRANGEMENT OF ALL PLUMBING PIPES SHALL BE APPROXIMATELY AS SHOWN ON THE DRAWINGS AND AS DIRECTED DURING INSTALLATION AND SHALL BE AS STRAIGHT AND DIRECT AS POSSIBLE, FORMING RIGHT ANGLES OR PARALLEL LINES WITH BUILDING WALLS AND OTHER PIPES, AND BE NEATLY SPACED.

C. ARRANGE WORK TO AVOID ALL INTERFERENCE WITH THE WORK OF ALL OTHER TRADES. CONSULT WITH OTHER CONTRACTORS, AND COORDINATE THE LOCATION OF THEIR WORK WITH THAT OF THE OTHERS.

1.02 COLD WATER SYSTEMS

A. COLD WATER DISTRIBUTION SYSTEMS SHALL SUPPLY WATER TO ALL FIXTURES AND OTHER WATER CONSUMING EQUIPMENT. VALVED OUTLETS FOR THE USE OF OTHER TRADES SHALL BE FURNISHED AND INSTALLED COMPLETE.

1.03 GENERAL INSTALLATION OF PLUMBING PIPING

A. ALL PIPE HANGERS ETC., LAYOUTS SHALL BE REVIEWED AND APPROVED BY THE ARCHITECT AND ENGINEER.

B. OFFSETS SHALL BE PERMITTED ONLY WHERE REQUIRED TO PERMIT THE PIPES TO FOLLOW WALLS, WHERE STANDARD FITTINGS SHALL BE USED.

C. ALL RISERS SHALL BE ERECTED PLUMB AND TRUE AND SHALL BE PARALLEL WITH WALLS AND OTHER PIPES AND BE NEATLY SPACED.

D. ALL ROUGHING, UNDERGROUND OR CONCEALED IN FLOORS OR WALL CONSTRUCTION, SHALL BE INSTALLED BEFORE THE CONSTRUCTION IS CLOSED UP.

E. HORIZONTAL RUNS OF PIPING, EXCEPT WHERE CONCEALED IN PARTITIONS, SHALL BE KEPT AS HIGH UP AS POSSIBLE AND CLOSE TO WALLS. CONSULT WITH OTHER TRADES SO THAT GROUPED LINES SHALL NOT INTERFERE WITH EACH OTHER.

F. THE ARRANGEMENT, POSITIONS AND CONNECTIONS OF PIPES, FIXTURES, DRAINS AND VALVES SHOWN ON THE DRAWINGS SHALL BE FOLLOWED AS CLOSELY AS POSSIBLE. HOWEVER, THE RIGHT IS RESERVED BY THE OWNER'S REPRESENTATIVE TO CHANGE LOCATIONS OF PIPES AND ASSOCIATED SPECIALTIES TO ACCOMMODATE ANY CONDITIONS WHICH MAY ARISE DURING THE PROGRESS OF THE WORK, WITHOUT ADDITIONAL COST. THE RESPONSIBILITY FOR ACCURATELY LAYING OUT THE WORK RESTS WITH THE CONTRACTOR.

G. PIPING SHALL BE INSTALLED CONCEALED IN BUILDING CONSTRUCTION IN ALL FINISHED AREAS.

1. SPECIAL PRECAUTION SHALL BE TAKEN IN THE INSTALLATION OF PIPING CONCEALED TO SEE THAT THE PIPING IS PROPERLY INSTALLED. SHOULD IT BE NECESSARY TO CORRECT PIPING SO INSTALLED, THIS SUBCONTRACTOR SHALL BE HELD LIABLE FOR ANY INJURY CAUSED TO OTHER WORK AND THE CORRECTION OF PIPING.

H. PIPE SHALL NOT BE BENT, FLATTENED OR OTHERWISE INJURED EITHER BEFORE INSTALLATION OR DURING INSTALLATION.

I. CONNECTIONS TO FIXTURES SHOWN TO BE INSTALLED CONCEALED IN BUILDING CONSTRUCTION SHALL, IN GENERAL, BE CARRIED CONCEALED TO A POINT ABOVE FLOOR AT WALL (NEAR FIXTURES), WHERE THEY SHALL BREAK OUT AND RISE EXPOSED TO FIXTURES, ALL AS REQUIRED. EXPOSED WASTE AND SUPPLIES (INCLUDING IN CABINETS) SHALL BE CHROME, EXCEPT FOR KITCHEN WORK SINKS. THE CHROME TAILPIECE CONNECTION TO PLUMBING ROUGHED BEHIND THE CABINET SHALL BE A THREADED COMPRESSION FITTING WITH EXTENDED ESCUTCHEON.

J. REDUCING FITTINGS, UNLESS OTHERWISE APPROVED IN SPECIAL CASES, SHALL BE USED IN MAKING REDUCTION IN SIZE OF PIPE. BUSHING SHALL NOT BE ALLOWED UNLESS SPECIFICALLY APPROVED.

1.04 PLUMBING WATER PIPING CONSTRUCTION DETAILS

A. PIPE SHALL BE SUPPORTED AS SPECIFIED HEREINAFTER.

B. PIPE LINES SHALL BE RUN PARALLEL AND SPACED TO PERMIT PROPER COVERING.

C. PIPING, FITTINGS, VALVES, SUPPORTS, HANGERS, ETC., EXPOSED TO VIEW SHALL BE PAINTED OR CHROME AS DIRECTED. THIS PROVISION SHALL APPLY TO ALL PIPING FROM THE POINT THAT IT LEAVES THE WALL TO THE POINT OF FINAL CONNECTION TO THE FIXTURE.

D. ANY EXPOSED PIPING AND TRIM SHOWING TOOL MARKS SHALL BE REMOVED AND REPLACED WITH NEW MATERIALS WITHOUT ADDITIONAL COST.

E. RISER CONTROL VALVES SHALL BE PROVIDED ON ALL RISERS. DRAIN VALVES SHALL BE PROVIDED AT THE HEEL OF EACH RISER INSIDE OF SHUT–OFF VALVES.

F. MAIN SHUT–OFF VALVES SHALL BE INSTALLED AT EACH WATER CONNECTION AT ALL TANKS AND OTHER PIECES OF EQUIPMENT.

G. VALVES SHALL GENERALLY BE PROVIDED ON ALL MAIN BRANCHES FROM RISERS TO GROUPS OF FIXTURES AND ACCESS DOORS SHALL BE PROVIDED TO ALL SUCH VALVES NOT READILY ACCESSIBLE.

H. PIPING SHALL PITCH TO LOW POINTS, ALL LOW POINTS AND ANY POCKETS CAUSED BY CHANGES IN ELEVATION REQUIRED BY STRUCTURAL OR OTHER INTERFERENCES SHALL BE PROVIDED WITH DRAIN VALVES.

I. BRANCHES TO INDIVIDUAL FIXTURES SHALL BE OF SIZES AS SHOWN IN THE FIXTURE SCHEDULE ON THE DRAWINGS.

J. VACUUM BREAKERS AND BACKFLOW PREVENTERS SHALL BE INSTALLED ON ALL EQUIPMENT AND FIXTURE CONNECTIONS AS REQUIRED BY CODE AND/OR LOCAL ORDINANCES.

K. CONNECTIONS TO EQUIPMENT SUCH AS TANKS, PUMPS, AND THE LIKE, SHALL BE MADE WITH FLANGED OR UNION CONNECTIONS.

L. WHERE HOT AND COLD WATER SUPPLY PIPES CONNECT TO A COMBINATION SUPPLY FITTING WITH A SHUT–OFF VALVE ON ITS DISCHARGE, OR THE COMBINATION SUPPLY FITTING IS EQUIPPED WITH MANUAL OR THERMOSTATIC MIXING VALVE, EACH HOT AND COLD WATER SUPPLY PIPE SHALL BE EQUIPPED WITH A COMPOSITION DISC SWING CHECK VALVE AHEAD OF THE SUPPLY FITTING.

1.05 SANITARY SEWER AND DRAINAGE SYSTEM

A. COMPLETE SYSTEM OF SANITARY SEWER AND DRAINAGE SHALL BE PROVIDED. THE SYSTEM SHALL INCLUDE ALL RISERS, BRANCHES WITH ALL PIPES, FITTINGS, HANGERS, ANCHORS, PLUMBING FIXTURES, SPECIAL FIXTURE WASTERS, ETC., TO MAKE THE SYSTEM COMPLETE.

B. BRANCH CONNECTIONS SHALL BE MADE WITH "WYE" AND LONG "TEE–WYE" FITTINGS. ALL FITTINGS SHALL CONFORM TO CODE REQUIREMENTS.

1. SHORT 1/4 BENDS, COMMON OFFSETS AND DOUBLE HUBS WILL NOT BE PERMITTED.

2. SHORT "TEE–WYE" FITTINGS ARE TO BE USED IN VERTICAL PIPING ONLY.

C. DRAINS SHALL BE RUN AT MINIMUM GRADE OF 1/8" PER FOOT DOWNWARD IN THE DIRECTION OF FLOW UNLESS OTHERWISE INDICATED. BRANCH CONNECTIONS TO STACKS FROM FIXTURES SHALL PITCH 1/4" PER FOOT. ATTENTION IS CALLED TO THE STRICT NECESSITY OF MAINTAINING THE CEILING HEIGHTS POSTED ON THE ARCHITECTURAL DRAWINGS, AS WELL AS KEEPING PIPING CLOSE TO STEAL BEAMS AND GIRDERS WHERE EXPOSED.

1.06 VENT SYSTEMS

A. COMPLETE SYSTEMS OF VENTILATING PIPES SHALL BE INSTALLED FROM THE VARIOUS NEW PLUMBING FIXTURES AND OTHER EQUIPMENT TO WHICH DRAINAGE CONNECTIONS ARE MADE.

1. VENTILATING PIPES SHALL BE CONNECTED TO THE DISCHARGE OF TRAPS AS SHOWN.

2. CARRY VENTS INDIVIDUALLY TO A POINT ABOVE THE ULTIMATE OVERFLOW LEVEL OF THE FIXTURES BEFORE CONNECTING WITH ANY OTHER VENT PIPE; IN GENERAL, THIS WILL BE APPROXIMATELY 42" ABOVE THE FINISHED FLOOR.

3. BRANCHES SHALL BE ARRANGED TO PITCH BACK TO FIXTURES.

B. INDIVIDUAL VENT PIPES SHALL BE COLLECTED TOGETHER IN BRANCH VENT LINES AND CONNECTED TO VENT STACKS IN GENERAL, PARALLELING SOIL AND WASTE STACKS.

1. WHEREVER POSSIBLE, VENT STACK OFFSETS SHALL BE CONNECTED TO ADJACENT SOIL STACKS FOR THE PURPOSE OF DRAINING CONDENSATION.

2. WHERE POSSIBLE, THE WASTE OF A FIXTURE SHALL BE CONNECTED TO THE BASE OF EACH VENT STACK FOR THE PURPOSE OF WASHING OUT ANY SCALE OR DIRT WHICH MAY ACCUMULATE.

3. THE SOIL STACK MAY BE USED TO WASH OUT THE HEEL OF THE VENT.

C. TOPS OF ALL SOIL AND WASTE STACKS SHALL BE EXTENDED AS ADDITIONAL VENTILATING PIPES.

1. PIPES SMALLER THAN 4" SIZE SHALL BE INCREASED TO 4" BY MEANS OF APPROVED INCREASERS BEFORE PASSING THROUGH THE ROOF.

2. THE TOPS OF ALL VENTILATING STACKS SHALL COLLECT TOGETHER AND RUN THROUGH THE ROOF IN SERIES OF LARGER PIPES AS SHOWN ON THE DRAWINGS.

SECTION 230593 – TESTING AND BALANCING

1.01 SCOPE

A. PROCURE THE SERVICES OF AN INDEPENDENT TESTING AND BALANCING AGENCY THAT SPECIALIZES IN THE TESTING AND BALANCING OF HEATING, VENTILATING AND AIR CONDITIONING SYSTEMS.

B. WORK SHALL NOT BEGIN UNTIL ALL SYSTEMS HAVE BEEN COMPLETED, CLEANED AND PLACED IN FULL WORKING OPERATION BY THE MECHANICAL CONTRACTOR.

C. TEST, BALANCE AND ADJUST ALL AIR MOVING EQUIPMENT, TERMINALS, SUPPLY, RETURN AND EXHAUST SYSTEMS. WORK TOGETHER WITH THE ATC CONTRACTOR TO ADJUST SETPOINTS OF DAMPERS WHERE APPLICABLE.

D. WHEN NOTIFIED THAT ALL CONTROL SYSTEMS ARE COMPLETE AND TESTED, THE TESTING AND BALANCING CONTRACTOR SHALL PERFORM AN INDEPENDENT TEST OF ALL SYSTEMS FOR SPECIFIED SEQUENCES OF OPERATION. REPORT FINDINGS PER H BELOW.

E. PERFORM ALL TESTS IN ACCORDANCE WITH STANDARD PROCEDURES INCLUDING THOSE OUTLINED BY THE ASSOCIATED AIR BALANCE COUNCIL (AABC) AND/OR SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION, INC., (SMACNA).

F. AT COMPLETION OF ALL TESTING AND BALANCING, LEAVE ALL EQUIPMENT SYSTEMS, COMPONENTS, ETC., ADJUSTED WITHIN THE LIMITS OF INSTALLED EQUIPMENT AND TO MEET ALL DESIGN REQUIREMENTS. MARK ALL SETPOINTS OF ALL DAMPERS WITH DISTINGUISHING MARKS. IF REQUESTED, CONDUCT TESTS IN THE PRESENCE OF THE OWNER'S REPRESENTATIVE.

G. WITHIN 15 DAYS AFTER COMPLETION OF TESTING BALANCING, SUBMIT TO THE OWNER'S REPRESENTATIVE ELECTRONIC COPIES TESTING AND BALANCING RESULTS ON APPROVED FORMS FOR REVIEW AND APPROVAL BY OWNER'S REPRESENTATIVE. ONE (1) HARD COPY OF EVERY APPROVED SHOP DRAWING SHALL BE KEPT IN A BINDER ON THE JOB SITE.

H. ALL REPORTS SHALL CLEARLY INDICATE THE FOLLOWING MINIMUM INFORMATION:

1. AIR – SYSTEM NAME, HVAC UNITS PARAMETERS, STATIC PROFILES OF UNITS, TOTAL SYSTEM FLOW RATE (SYSTEM TRAVERSE) AND INDIVIDUAL OUTLET FLOW RATES. DATA MUST SHOW LOCATION, MAKE, MODEL AND SIZE OF TERMINALS.

SECTION 230610 – PIPE AND PIPE FITTINGS

1.01 SCOPE

A. ALL PIPING SHALL BE INSTALLED IN ACCORDANCE WITH GOVERNING CODES AND IN A WORKMANLIKE MANNER.

B. PEX AND CPVC PRODUCTS MUST BE APPROPRIATE AND APPROVED FOR POTABLE WATER SERVICE AND PERMITTED BY THE AHJ.

1.02 SCHEDULE OF PIPE MATERIALS

SERVICE	LOCATION	SIZE	MATERIAL	TYPE	WEIGHT
HWS&R	BUILDING	ALL	COPPER	HARD	TYPE L

SECTION 220529 & 230529 – EQUIPMENT SUPPORTS

1.01 SCOPE

A. PROVIDE SUITABLE AND SUBSTANTIAL HANGERS AND SUPPORTS FOR ALL HORIZONTAL AND VERTICAL LINES AS MANUFACTURED BY B–LINE, ALLEGHENY INDUSTRIAL, ANVIL OR ITT GRINNELL, OR APPROVED EQUAL.

B. SUPPORT COPPER, STEEL, CAST IRON AND PVC PIPING IN ACCORDANCE WITH THE PIPE MANUFACTURER'S PUBLISHED INSTRUCTIONS, OR THE SCHEDULE BELOW, WHICHEVER IS MORE STRINGENT.

C. SUPPORT PIPING IN ACCORDANCE WITH THE FOLLOWING SCHEDULE:

PIPE MATERIAL	MAX. HORIZONTAL SPACING	MAX. VERTICAL SPACING
COPPER TUBING 1 1/4" & SMALLER	6'	10'
COPPER TUBING 1 1/2" & LARGER	10'	10'
STEEL PIPE	12'	15'

D. PIPING, DUCTWORK AND EQUIPMENT SHALL NOT BE HUNG FROM THE WORK OF OTHER TRADES.

E. HANG AND SUPPORT DUCTWORK IN ACCORDANCE WITH SMACNA STANDARDS AND BEST TRADE PRACTICES.

F. HANGERS SHALL BE OF HEAVY CONSTRUCTION SUITABLE FOR THE SIZE OF PIPE TO BE SUPPORTED. ALL MATERIALS, EXCEPT PIPE ROLLERS, SHALL BE WROUGHT OR MALLEABLE IRON OR STEEL. HANGERS SHALL BE ADJUSTABLE TYPE.

G. HANGERS AND PIPE CLAMPS USED ON COPPER PIPING SHALL BE SOLID COPPER OR COPPER PLATED. WHERE TUBE IS IN CONTACT WITH DISSIMILAR METAL, PROTECT WITH SHIELD OR PLASTIC COVER.

SECTION 220523 – VALVES AND COCKS

1.01 SCOPE

A. PROVIDE SHUT–OFF VALVES TO ISOLATE SECTIONS OF PIPING, EVERY FIXTURE AND EQUIPMENT. VALVES SHALL BE AT THE INLET AND OUTLET OF EQUIPMENT AND FIXTURES TO PERMIT REMOVAL FOR REPAIRS WITHOUT INTERFERING WITH THE REMAINDER OF THE SYSTEM.

B. DO NOT LOCATE VALVES WITH STEMS BELOW HORIZONTAL. PROVIDE BALL, CHECK, BALANCING COCKS, PLUS AIR VENTS AND OTHER TYPE OF VALVES AS REQUIRED FOR COMPLETE AND PROPER VALVING OF THE ENTIRE INSTALLATION, TO CONTROL FLOW, SHUT–OFF, PREVENT BACKFLOW, PROVIDE DRAINAGE AND CONTROL PRESSURE AND TEMPERATURES.

C. VALVES SHALL BE AS MANUFACTURED BY WATTS, APOLLO, NIBCO, VICTAULIC, ANVIL INTERNATIONAL OR MILWAUKEE VALVE CO.

1.02 MATERIAL

A. DRAIN VALVES SHALL BE INSTALLED AT LOW POINTS IN PIPING AND AS OTHERWISE REQUIRED TO COMPLETELY DRAIN PIPING SYSTEM AND EQUIPMENT. DRAIN VALVES SHALL BE BALL VALVES OF SIZE AS SHOWN OR REQUIRED, IN NO CASE SMALLER THAN 1/2" I.P.S., EQUAL TO WATTS SERIES B–6000–CC OR APOLLO 70–HC SERIES WITH 3/4" HOSE MALE THREADED END OUTLET WITH CAP AND CHAIN.

B. APPROVED STRAINERS SHALL BE INSTALLED IN THE INLET CONNECTIONS TO EQUIPMENT TO PROTECT ALL APPARATUS OR ANY AUTOMATIC CHARACTER WHOSE PROPER FUNCTION WOULD BE INTERFERED WITH BY DIRT ON THE SEAT OR BY SCORING OF THE SEAT. STRAINERS SHALL BE EQUAL TO WATTS SERIES LF777S AND LFS777S.

C. VALVES USED IN DOMESTIC WATER LINES SHALL BE CLASSIFIED LEAD FREE BRASS CONSTRUCTION APPROPRIATE FOR POTABLE WATER APPLICATIONS, EQUAL TO WATTS LFB 6080 OR APOLLO 77CLF–100/200 SERIES.

D. PRESSURE REDUCING VALVES FOR DOMESTIC WATER SHALL BE OF ANTI–SIPHON CHECK TYPE WITH BUILT–IN STRAINER EQUAL TO LFUSB AND LF223.

E. VALVES USED IN NATURAL GAS LINES FOR ISOLATION SHALL BE EQUAL TO WATTS B–6000–UL–YRPV OR APOLLO 80–100–YRPV SERIES.

F. ALL VALVES USED FOR DOMESTIC WATER SERVICES SHALL BE "LEAD FREE" CONSTRUCTION AND CLASSIFIED AS SUCH.

SECTION 230700 – THERMAL INSULATION

1.01 SCOPE

A. PROVIDE ALL INSULATING MATERIALS REQUIRED FOR PIPING AND MECHANICAL EQUIPMENT. THE EXECUTION OF THE WORK SHALL BE BY AN EXPERIENCED INSULATION CONTRACTOR IN STRICT ACCORDANCE WITH BEST PRACTICE OF THE TRADE AND THE INTENT OF THE SPECIFICATIONS.

B. INSULATION THERMAL PROPERTIES AND THICKNESS SHALL COMPLY WITH THE INTERNATIONAL ENERGY CONSERVATION CODE 2009 – CHAPTER 5.

C. INSULATE ALL FRESH AIR INTAKE DUCTWORK, VENTILATION AIR DUCTWORK, EXHAUST FANS DISCHARGE DUCTWORK, AIR CONDITIONING SUPPLY AIR DUCTWORK CONCEALED ABOVE CEILING OR IN CHASES, AND LOUVER CONNECTION DUCTWORK EXTERNALLY WITH 1½" FOIL FACED (FSK) 7.5 PCF (R = 5.2) FIBERGLASS INSULATION. INSULATION SHALL BE WRAPPED TIGHTLY ON DUCTWORK WITH ALL CIRCUMFERENTIAL JOINTS BUTTED TOGETHER AND LONGITUDINAL JOINTS OVERLAPPED 2".

D. ALL EXTERNAL INSULATION SYSTEMS ON DUCTWORK SHALL BE APPLIED IN STRICT ACCORDANCE WITH THE INSULATION MANUFACTURER'S PUBLISHED INSTRUCTIONS.

SECTION 233100 – DUCTWORK

1.01 SCOPE

A. FURNISH AND INSTALL ALL DUCTWORK, GRILLE BOXES, DAMPERS AND ALL AUXILIARY WORK OF ANY KIND NECESSARY TO MAKE THE VARIOUS AIR HANDLING SYSTEMS OF THE PROJECT COMPLETE AND READY FOR SATISFACTORY OPERATING. ALL DUCTWORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH SMACNA STANDARDS FOR APPLICABLE PRESSURE CLASSIFICATION.

B. THROUGHOUT CONSTRUCTION, ALL OPEN END SUPPLY/RETURN AIR DUCTWORK (INCLUDING GRILLES, REGISTERS AND DIFFUSERS) SHALL BE SEALED WITH PLASTIC AND TAPE UNTIL PROJECT AREA IS FREE OF DUST.

C. SEAL ALL JOINTS WITH A WATER BASED SEALANT, EQUAL TO DUCTMATE PROSEAL OR APPROVED EQUAL, APPLIED PER MANUFACTURER'S RECOMMENDATIONS. TRANSVERSE JOINTS IN LOW PRESSURE DUCTWORK SHALL BE SEALED TO MEET SMACNA SEAL CLASS C–2" w.g.

D. FLEXIBLE DUCT SHALL BE COATED, FIBERGLASS CLOTH FABRIC LINER AS MANUFACTURED BY BUCKLEY "FABRI–FLEX TYPE 4", THERMAFLEX, NOVAFLEX OR EQUAL, UNINSULATED FOR VENTILATING APPLICATIONS (EXHAUST AND RETURN) AND INSULATED FOR HEATING AND COOLING APPLICATIONS (SUPPLY)

E. ACCESS DOORS: ACCESS DOORS SHALL BE PROVIDED IN DUCTWORK OF THE SIZE REQUIRED TO COMPLETELY ACCESS AND FUNCTIONALLY SERVICE EQUIPMENT CONTAINED WITHIN THE DUCTWORK. ACCESS DOORS SHALL MEET ASHRAE STANDARDS CRITERIA, AND BE EQUAL TO RUSKIN MODEL ADH22 FOR RECTANGULAR DUCTWORK, OR UNITED MCGILL BOLTED ACCESS DOORS FOR SPIRAL DUCTWORK. ACCESS DOORS SHALL BE INSTALLED IN DUCTWORK UPSTREAM AND DOWNSTREAM OF ALL HEATING COILS AND AS REQUIRED TO RESET FIRE DAMPERS.

F. SPIRAL DUCT SHALL BE SMACNA RECOMMENDED GAUGE, LOW PRESSURE UNISEAL DUCT AND FITTINGS AS MANUFACTURED BY UNITED SHEET METAL OR APPROVED EQUAL. DUCT SHALL BE MACHINE FORMED, MADE FROM STANDARD GAUGE PREMIUM GRADE, COILED, GALVANIZED SHEET METAL IN A SERIES OF CONTINUOUS AUTOMATIC OPERATIONS. DUCT SHALL BE MANUFACTURED FROM GALVANIZED STEEL MEETING ASTM A–527–71 IN MANUFACTURER'S GAUGES. FITTINGS SHALL BE DIE–STAMPED SMACNA RECOMMENDED GAUGE GALVANIZED STEEL, CONTINUOUSLY WELDED SEAMS. JOINTS SHALL BE SLIP COUPLING TYPE SEALED WITH DUCTMATE PROSEAL OR EQUAL. LOW PRESSURE DUCTWORK SHALL BE SEALED TO MEET SMACNA SEAL CLASS C–2" W.G.

G. LONGITUDINAL SNAP–LOCK GALVANIZED DUCTWORK (ASTM A653 AND A924) WITH G–60 GALVANIZED COATING OF SMACNA RECOMMENDED GAUGE, EQUAL TO DUCTMATE GREENSEAM PIPE, AND ASSOCIATED FITTINGS, INCLUDING ADJUSTABLE ELBOWS AND VOLUME DAMPERS, MAY BE USED FOR CONCEALED LOW PRESSURE (–1" W.G. TO 2" W.G.) APPLICATIONS. INSTALL (1) ONE MECHANICAL FASTENER (SCREW) IN LONGITUDINAL SEAM OF EACH STRAIGHT RUN. SPIRAL DUCT SHALL BE USED FOR ALL EXPOSED AND MEDIUM PRESSURE APPLICATIONS.

SECTION 250000 – AUTOMATIC TEMPERATURE CONTROLS

1.01 SCOPE

A. THE INTENT IS TO EXPAND THE EXISTING CONTROLS SYSTEM AS REQUIRED TO ACCOMMODATE NEW CONTROL VALVE(S) FOR FIN–TUBE RADIATION AND CHANGE AIRFLOW SETPOINTS TO EXISTING VAV'S. ALL NEW WORK SHALL BE MAINTAIN STANDARDS ESTABLISHED BY THE RECENTLY COMPLETED CONTROL UPGRADES IN THE BUILDING. ALL GRAPHICS, EQUIPMENT AND SEQUENCES SHALL FOLLOW ESTABLISHED SEQUENCES AND GRAPHICS SHALL BE ADDED AND UPDATED TO ACCOMMODATE THIS RENOVATION.

B. THE CONTROL SYSTEM SHALL BE INSTALLED BY TECHNICIANS WHO REGULARLY INSTALL, SET–UP AND COMMISSION CONTROL SYSTEMS, HEREINAFTER REFERRED TO AS THE ATC CONTRACTOR. ALL CONTROL EQUIPMENT SHALL BE COMPATIBLE.

C. THE CONTROL SYSTEM SHALL INCLUDE SENSORS, CONTROLLERS, SWITCHES, PANELS AND OTHER ACCESSORY EQUIPMENT ALONG WITH SOFTWARE, COMMUNICATION WIRING AND PROGRAMMING TO SATISFY THE INTENT OF THE SPECIFICATION AND PROVIDE COMPLETE AND OPERABLE HVAC SYSTEMS. ALL EQUIPMENT SHALL BE FULLY PROPORTIONING UNLESS NOTED OTHERWISE.

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DATE:
19 FEBRUARY 2019
REVISIONS:

FINAL SUBMISSION

M7.1
MECHANICAL SPECIFICATIONS

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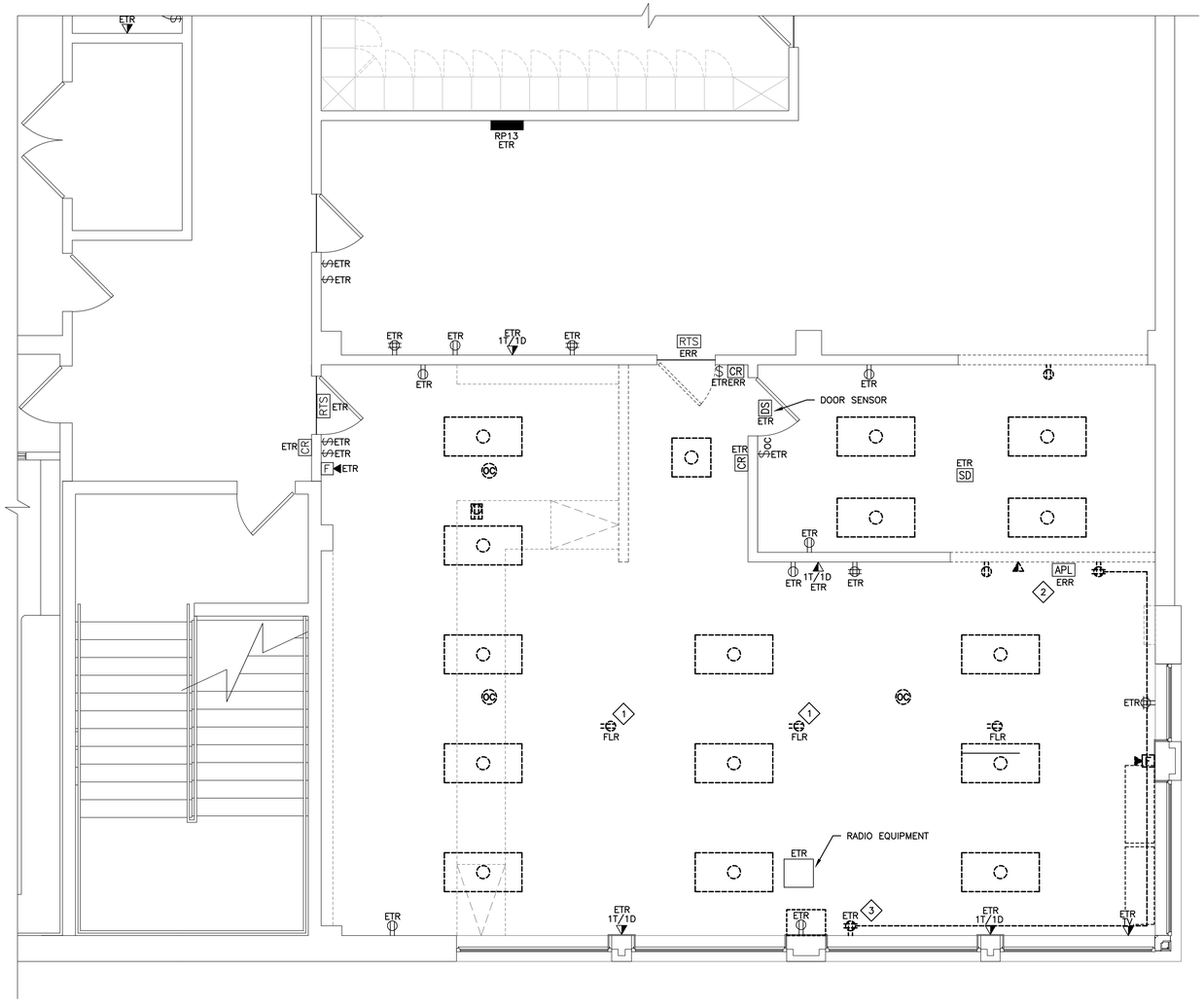

SECOND FLOOR PART PLAN – ELECTRICAL DEMOLITION

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

ELECTRICAL GENERAL NOTES

1. THE SCOPE OF ELECTRICAL DEMOLITION INCLUDES BUT IS NOT LIMITED TO THE DISCONNECTION AND REMOVAL OF LIGHTING, EMERGENCY LIGHTING, EXIT SIGNS, RECEPTACLES, POWER, FIRE ALARM AND OTHER WIRING SYSTEMS ASSOCIATED WITH THE RENOVATION OF THE BUILDING. EXISTING ELECTRICAL AND WIRING SYSTEMS TO REMAIN ARE NOTED AS 'ETR', EXISTING TO REMAIN, AND 'ERR', EXISTING TO BE RELOCATED. REFER TO DEMOLITION KEYNOTES FOR ADDITIONAL INFORMATION. PROVIDE FOR REMOVAL OF DEVICES FROM EXISTING FLUSH CMU WALL INSTALLED DEVICES AND PROVIDE BLANK STAINLESS STEEL PLATE THE ABANDONED WALL BOX AS REQUIRED.
2. ELECTRICAL DEMOLITION SHALL INCLUDE REMOVAL OF WIRING ASSOCIATED WITH THE REMOVAL OF ELECTRICALLY POWERED MECHANICAL AND PLUMBING EQUIPMENT. REFER TO MECHANICAL AND PLUMBING DEMOLITION DRAWINGS FOR ADDITIONAL INFORMATION.
3. DEMOLITION OF EXISTING FLUORESCENT LIGHTING FIXTURES SHALL INCLUDE COMPLETE REMOVAL OF LIGHT FIXTURES, AND THE LEGALLY COMPLIANT DISPOSAL AND RECYCLING ALL LINEAR, COMPACT AND TWIN TUBE FLUORESCENT LAMPS AND BALLASTS COMPLETE.
4. WHERE EXISTING WIRING IS BEING REMOVED, THE WIRING SHALL INCLUDE THE REMOVAL OF ASSOCIATED BRANCH CIRCUIT WIRING BACK TO THE ORIGINATING PANELBOARD, UNLESS DOING SO, INTERRUPTS POWER TO EXISTING AREAS SCHEDULED TO REMAIN INTACT. IN THIS CASE, REMOVAL OF WIRING SHALL BE TO THE CLOSEST ACTIVE JUNCTION BOX OR PIECE OF EQUIPMENT. RELABEL THE PANELBOARD DIRECTORY WITH APPROPRIATE IDENTIFICATION OF REMAINING ACTIVE EQUIPMENT OR CIRCUIT.
5. LOCATIONS SHOWN OR NOTED FOR EXISTING EQUIPMENT ARE APPROXIMATE.
6. SEE MECHANICAL DEMOLITION DRAWINGS FOR THE ACTUAL LOCATION OF MECHANICAL EQUIPMENT THAT IS BEING DEMOLISHED, IS TO REMAIN OR IS TO BE RELOCATED.

ELECTRICAL KEYNOTES '◇'

1. DISCONNECT AND REMOVE EXISTING FLOOR BOXES AND ASSOCIATED WIRING. EXTEND EXISTING POWER WIRING TO FEED TWO NEW FLOOR BOXES SHOWN ON DRAWING E1.2. FLOOR BOX POWER IS PRESENTLY FED FROM EXISTING PANEL IG2. SEE NEW WORK DRAWINGS FOR ADDITIONAL INFORMATION.
2. DISCONNECT, REMOVE AND RELOCATE EXISTING APRON LIGHTING CONTROL PANEL AND EXTEND EXISTING WIRING. PANEL APPEARS TO REQUIRE A SIX GANG WALL BOX. SEE NEW WORK DRAWINGS FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
3. DISCONNECT AND REMOVE EXISTING ISOLATED GROUND QUAD RECEPTACLE AND ASSOCIATED WIRING COMPLETE. WIRING IS INSTALLED IN 1/2 " CONDUIT SURFACE MOUNTED AROUND THE ROOM. REMOVE CONDUIT COMPLETE.

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SECOND FLOOR PART PLAN - ELECTRICAL DEMOLITION

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ELECTRICAL ABBREVIATIONS

ABBREVIATION	DESCRIPTION
XX"	MOUNTED XX" AFF
AFF OR A.F.F.	ABOVE FINISHED FLOOR HEIGHT NOTED
AIC	AMPERES INTERRUPTING CAPACITY SYMMETRICAL
APL	APRON LTG CONTROL PANEL
ARCH.	ARCHITECTURAL
ATS	AUTOMATIC TRANSFER SWITCH
C/B	CIRCUIT BREAKER
CLG.	CEILING
COAX	COAXIAL CABLE
COMP	COMPOSITE VIDEO CABLE
EC OR E.C.	ELECTRICAL CONTRACTOR
ELEC.	ELECTRIC, ELECTRICAL
EMERG.	EMERGENCY
ERR	EXISTING TO REMAIN RELOCATED
ETR	EXISTING TO REMAIN
EWC	ELECTRIC WATER COOLER
EXH.	EXHAUST
FBO OR F.B.O.	FURNISHED BY OTHERS
F&IBO OR F.&I.B.O.	FURNISHED AND INSTALLED BY OTHERS
GF, GFI OR GFCI	GROUND FAULT INTERRUPTER
GND.	GROUND
HDMI	HIGH DEFINITION MULTIMEDIA INTERFACE
HP	HORSEPOWER
HV	HIGH VOLTAGE
ID NO.	IDENTIFICATION NUMBER
IG	ISOLATED GROUND
KW	KILOWATTS
KVA	KILOVOLTS AMPERES
MCC	MOTOR CONTROLLER CENTER
NEC	NATIONAL ELECTRICAL CODE
NF	NOT FUSED
N.I.C.	NOT IN CONTRACT
N.T.S.	NOT TO SCALE
PH	PHASE
P.F.	POWER FACTOR
ST OR S.T.	SHUNT TRIP
SWGR.	SWITCHGEAR
SV	S-VIDEO (SEPARATE VIDEO) CABLE
TEL.	TELEPHONE
TP	TAMPER PROOF
UG OR U.G.	UNDERGROUND
U.N.O.	UNLESS OTHERWISE NOTED
USB	UNIVERSAL SERIAL BUS
V	VOLTS
VA	VOLT AMPERES
VGA	VIDEO GRAPHIC ARRAY
WP	WEATHERPROOF
VFD	VARIABLE FREQUENCY DRIVE

FIRE ALARM SYMBOLS

SYMBOL	DESCRIPTION	MOUNTING	HEIGHT
F	MANUAL PULL STATION	WALL	48" A.F.F.
F	VISUAL FLASHING LIGHT UNIT (ADA)	WALL	80" A.F.F.
F	AUDIO/VISUAL DEVICE COMBINATION UNIT (ADA)	WALL	80" A.F.F.
F	BELL UNIT	WALL	80" A.F.F.
F	BELL AND FLASHING LIGHT COMBINATION UNIT	WALL	80" A.F.F.
MH	MAGNETIC DOOR HOLD OPEN DEVICE	WALL/ CEILING	
HDE	HEAT DETECTOR ('E' INDICATES STAND ALONE)	CEILING	
SDE	SMOKE DETECTOR ('E' INDICATES STAND ALONE)	CEILING	
DDE	SMOKE DETECTOR FOR DUCTWORK ('E' INDICATES STAND ALONE)	IN DUCT	
FA	FIRE ALARM INTERFACE SYSTEM	CEILING	
FAAP	FIRE ALARM ANNUNCIATOR PANEL (REMOTE)	WALL	
FACP	FIRE ALARM CONTROL PANEL (RECESSED)	WALL	
NAC	AUXILIARY POWER SUPPLY	WALL	
FS	SPRINKLER FLOW SWITCH		
TS	SPRINKLER TAMPER SWITCH		
PS	SPRINKLER PRESSURE SWITCH		
F	FIREFIGHTERS' PHONE JACK	WALL	54" A.F.F.
F	FIREFIGHTERS' TELEPHONE	WALL	54" A.F.F.
SF	FIRE ALARM SPEAKER	CEILING	
RI	REMOTE INDICATOR	CEILING	
FEC	FIRE EXTINGUISHER CABINET		

LIGHTING SYMBOLS

SYMBOL	DESCRIPTION	MOUNTING
	CEILING MOUNTED LIGHT FIXTURE	CEILING
	WALL-MOUNTED LIGHT FIXTURE	WALL
	1'x4' SURFACE MOUNT LIGHT FIXTURE	
	2'x4' LIGHT FIXTURE	CEILING
	2'x2' LIGHT FIXTURE	CEILING
	WALL-MOUNTED LIGHT FIXTURE	WALL
	STRIP LIGHT FIXTURE	CEILING/ PENDANT
	UNDERCOUNTER LIGHT FIXTURE (SIZE VARIES). SERVE FROM THE NEAREST (120V) CONVENIENCE RECEPTACLE CIRCUIT IN THE AREA.	SURFACE
	EMERGENCY EGRESS LIGHT FIXTURE	WALL
	CEILING MOUNTED EXIT LIGHT	CEILING
	WALL MOUNTED EXIT LIGHT	WALL
	TRACK LIGHTING FIXTURE WITH FIXTURE QUANTITY, TYPE, AND LENGTH AS INDICATED ON PLANS	CEILING
	SINGLE UNIT POLE LIGHT (SITE PLAN)	POLE
PC	PHOTOCELL	VARIES
LR	LIGHTING RELAY (POWER PACK, ROOM CONTROLLER)	
EPC	EMERGENCY POWER CONTROLLER	

COMMUNICATION AND SECURITY SYMBOLS

SYMBOL	DESCRIPTION	MOUNTING	HEIGHT
1V1D	TELEPHONE/DATA OUTLET WITH TELECOM WIRING FROM OUTLET BOX TO DATA/TELECOM ROOM. ('1V1D' INDICATES 1 VOICE, 1 DATA JACKS.	WALL	18" AFF
W	TELEPHONE AND/OR DATA OUTLET; ROUTE 3/4" CONDUIT FROM OUTLET BOX TO ACCESSIBLE CEILING SPACE	WALL	48" A.F.F.
	PUSH BUTTON	WALL	
	CCTV CAMERA (SEE ARCHITECTURAL DOCUMENTS FOR MOUNTING HEIGHT)	CEILING/ WALL	
CCTV	CCTV MONITOR	DESK	
VC	VOLUME CONTROL	WALL	48"
M	MICROPHONE JACK	CEILING/ WALL	18" A.F.F.
IC	INTERCOM STATION	WALL	*
ICM	INTERCOM MASTER STATION	WALL	*
CR	CARD READER	WALL	48"
GB	GLASS BREAK DETECTOR	CEILING	
ES	ELECTRIC STRIKE	WALL	
DC	DOOR CONTACT	WALL	
ML	MAGNETIC LOCK	WALL	
MD	MOTION DETECTOR	WALL	
EL	ELECTRIC LATCH	WALL	
PB	PUSH BUTTON	WALL	
D	DURESS BUTTON	WALL	
RL	DOOR RELEASE	WALL	
RTE	REQUEST-TO-EXIT	WALL	
CK	CLOCK	WALL	
WAP	WIRELESS ACCESS POINT	WALL	
KP	KEY PAD	WALL	
DB	DOOR BELL	WALL	48"
S	SPEAKER	WALL	48"
SV	SPEAKER (INTEGRAL VOLUME CONTROL)	CEILING	
S	SPEAKER-HORN STYLE	VARIES	
TV	CABLE TV OUTLET	WALL	18"

* PROVIDE 3/4" CONDUIT WITH PULL STRING TO ACCESSIBLE CEILING SPACE.

POWER AND CIRCUITRY SYMBOLS

SYMBOL	DESCRIPTION	MOUNTING	HEIGHT
	20A, 125V, 2 POLE, 3 WIRE GROUNDING SINGLE RECEPTACLE, NEMA 5-20R	WALL	18" A.F.F.
	20A, 125V, 2 POLE, 3 WIRE GROUNDING DUPLEX RECEPTACLE, NEMA 5-20R	WALL	18" A.F.F.
A	20A, 125V, 2 POLE, 3 WIRE GROUNDING DUPLEX RECEPTACLE, NEMA 5-20R. 'A' INDICATES HORIZONTALLY MOUNTED 8" ABOVE COUNTER. VERTICALLY MOUNTED IN BATHROOMS.	WALL	8" ABOVE COUNTER
	QUADRAPLEX RECEPTACLE 20A, 125V, 3 WIRE GROUNDING TYPE, NEMA 5-20R	WALL	18" A.F.F.
EWC	ELECTRIC WATER COOLER OUTLET, GFCI. COORDINATE OUTLET LOCATION WITH WATER COOLER CUT SHEET.	WALL	
	SPECIAL POWER OUTLET (NEMA CONFIGURATION AS NOTED ON DOCUMENTS)	WALL	18" A.F.F.
C	CLOCK OUTLET AND CONDUIT FOR CONTROL CABLING	WALL	12" BELOW CEILING 8'-0" A.F.F. TO C.L.
	PLUGMOLD/SURFACE RACEWAY	WALL	
J	WALL-MOUNTED JUNCTION BOX	WALL	48" A.F.F.
J	JUNCTION BOX		
$	SINGLE POLE SWITCH	WALL	48" A.F.F.
$2	DOUBLE POLE SWITCH	WALL	48" A.F.F.
$3	THREE WAY SWITCH	WALL	48" A.F.F.
$4	FOUR WAY SWITCH	WALL	48" A.F.F.
$P	SWITCH WITH PILOT LIGHT	WALL	48" A.F.F.
$K	KEY OPERATED SWITCH	WALL	48" A.F.F.
$Rxx LV	LIGHTING LOW VOLTAGE SWITCH (Rxx INDICATES CONTROL RELAY)	WALL	48" A.F.F.
$OC	OCCUPANCY SENSOR	WALL	48" A.F.F.
OC	OCCUPANCY SENSOR	CEILING	
$D	DIMMER SWITCH	WALL	48" A.F.F.
$abc	SWITCHES IN GANG "abc" DENOTES (3) SWITCHES IN GANG AND LIGHT FIXTURES CONTROLLER	WALL	
$a	SINGLE POLE SWITCH (LOWER CASE LETTER INDICATES OUTLET OR FIXTURE CONTROLLED BY SWITCH)	WALL	48" A.F.F.
$M	MOTOR RATED SWITCH	WALL	48" A.F.F.
$T	TIMER SWITCH	VARIES	48" A.F.F.
PP	SINGLE POLE AUTOMATIC DOOR OPERATING SWITCH (PUSH PLATE)	WALL	
K	KEYPAD	WALL	48" A.F.F.
GAP	GENERATOR ALARM PANEL	WALL	48" A.F.F.
ET	ELAPSED TIMER	WALL	
	NON-FUSED DISCONNECT SWITCH (SIZED TO MATCH OVER CURRENT PROTECTION DEVICE)	VARIES	
30/30	FUSED DISCONNECT SWITCH, SUBSCRIPT INDICATES AMPS/FUSE SIZE	VARIES	
30/30/3	MOTOR STARTER WITH DISCONNECT SWITCH, SUBSCRIPT INDICATES AMPS/FUSE SIZE/STARTER SIZE	VARIES	
1	MOTOR STARTER, SUBSCRIPT INDICATES STARTER SIZE	VARIES	
	MOTOR. SUBSCRIPT INDICATES HORSEPOWER		
	CONTROL PANEL FURNISHED BY OTHERS		
	NEW LIGHTING/POWER PANELBOARD (277/480V)	VARIES	
	NEW LIGHTING/POWER PANELBOARD (120/208V)	VARIES	
	EXISTING LIGHTING/POWER PANELBOARD (120/208V)		
	DISTRIBUTION PANEL	VARIES	
T	DRY TYPE TRANSFORMER	VARIES	
ATS	AUTOMATIC TRANSFER SWITCH	VARIES	
JPP	TELE-POWER POLE	VARIES	
FF	FURNITURE FEED	WALL	
FB	FLOOR BOX	FLOOR	
	EQUIPMENT CONNECTION		
AO	AUTOMATIC DOOR OPERATOR	WALL	
	FLUSH MOUNTED FIRE RATED POKE THRU FLOOR BOX WITH TWO 20AMP, ISOLATED GROUND DUPLEX RECEPTACLES AND TWO DATA DROPS	FLOOR	

ELECTRICAL SYMBOL NOTES

1. ALL SYMBOLS ARE NOT NECESSARILY USED.
2. ALL MOUNTING HEIGHTS SHOWN IN SYMBOL LEGEND SHALL BE AS PER ADA REQUIREMENTS UNLESS OTHERWISE NOTED ON THE DRAWINGS.
3. REFERENCE ARCHITECTURAL DOCUMENTS FOR DIMENSIONED LOCATION AND MOUNTING HEIGHT OF LIGHT FIXTURES AND MISCELLANEOUS ELECTRICAL DEVICES.

GENERAL ELECTRICAL NOTES

1. DO NOT SCALE THESE DRAWINGS. SEE ARCHITECTURAL DOCUMENTS FOR EXACT LOCATIONS AND MOUNTINGS FOR FIXTURES, DEVICES, ETC. EXCEPT AS SPECIFICALLY NOTED.
2. PROVIDE BRANCH CIRCUITING AND FINAL CONNECTION FOR ALL FIXTURES, OUTLETS AND EQUIPMENT.
3. INSTALLATION SHALL COMPLY WITH 2017 EDITION OF NEC, INCLUDING LOCAL AMMENDMENTS.
4. LOW VOLTAGE SIGNAL AND COMMUNICATION SYSTEMS CABLING WILL BE RUN IN RACEWAYS EXCEPT WHERE CONCEALED ABOVE AN ACCESSIBLE CEILING SPACE.
5. MINIMUM CIRCUIT SIZE IS 1P-20A, 2 #12, 1 #12 GND. MINIMUM CONDUIT SIZE IS 3/4" UNLESS OTHERWISE NOTED.
6. PROVIDE SEPARATE GREEN GROUND WIRE (SIZE PER NEC) FOR ALL CIRCUITS INCLUDING LIGHTING.
7. HOMERUN CONDUITS SHALL CONTAIN SIX (6) UNGROUNDED PHASE CONDUCTORS MAXIMUM. VOLTAGE DROP AS PER N.E.C.
8. WHERE INDIVIDUAL BRANCH CIRCUITS AS SHOWN ON PLANS ARE COMBINED AS MULTI-WIRE BRANCH CIRCUITS, THE MULTIWIRE BRANCH CIRCUITS SHALL BE INSTALLED ACCORDING TO REQUIREMENTS OF NEC 2017 ARTICLE 210.4(B).
9. RECEPTACLES WITHIN 6'-0" OF SINKS SHALL BE G.F.C.I. TYPE.
10. PROVIDE ROUGH-IN, FINAL CONNECTION, BRANCH CIRCUITS, PANELBOARDS, ETC. FOR ALL DEVICES AND EQUIPMENT SHOWN ON THESE DOCUMENTS. THIS INCLUDES, BUT IS NOT LIMITED TO FIRE ALARM, SECURITY, MECHANICAL CONTROLS AND ACCESSORIES.
11. CONTRACTOR SHALL VERIFY ROUGH-IN REQUIREMENTS FOR ALL EQUIPMENT (MECHANICAL, OWNER PROVIDED, OTHER VENDOR PROVIDED, ETC.) PRIOR TO BEGINNING ROUGH-IN. ANY DISCREPANCIES WITH THESE PLANS SHALL BE BROUGHT TO THE ARCHITECT/ENGINEER'S ATTENTION IMMEDIATELY.
12. THE MECHANICAL, ELECTRICAL AND PLUMBING DRAWINGS INCLUDED IN THIS SET WERE ORIGINALLY PREPARED TO THE SCALE SHOWN ON THE TITLE BLOCK OF EACH SPECIFIC DRAWING. HOWEVER, BECAUSE OF THE INACCURACIES INHERENT TO THE ELECTRONIC PLOTTING AND/OR REPROGRAPHIC PROCESSES USED TO OBTAIN FINAL PRINTS, SPECIFIC DIMENSIONS SHOULD NOT BE OBTAINED BY SCALING OF THESE DRAWINGS. REFER TO ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR ACTUAL DIMENSIONS.
13. ANY PENETRATIONS THROUGH PANS, WEBBS, OR OTHER STRUCTURAL COMPONENTS SHALL NOT BE MADE WITHOUT PRIOR APPROVAL OF THE STRUCTURAL ENGINEER.
14. BACK TO BACK OUTLETS: NO BACK TO BACK OUTLETS INSTALLATION WILL BE PERMITTED. OUTLETS TO BE OFFSET 12", SOUND BARRIER TO BE PROVIDED.
15. IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY AND PROVIDE AS REQUIRED FOR ALL THE FIRE DAMPERS AND MOTORIZED DAMPERS, AS SHOWN ON THE DOCUMENTS UNDER DIVISION 23 AND 26.
16. IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE FOR THE MAGNETIC HOLD DOOR OPENER, ELECTRONIC LOCK AND THE AUTOMATIC DOOR OPENER AS SHOWN ON OR SPECIFIED UNDER THE ARCHITECTURAL SECTIONS AS FOLLOWS:
    A) POWER AS REQUIRED; COORDINATE WITH SUPPLIER.
    B) FIRE ALARM INTERFACE INCLUDING WIRING AND FINAL CONNECTIONS FOR AN OPERATIONAL COMPLETE SYSTEM AS REQUIRED BY THE AUTHORITY HAVING JURISDICTION.

LUMINAIRE SCHEDULE

TYPE	MANUFACTURER & CATALOG #	DESCRIPTION	MOUNTING	TOTAL LUMENS	WATTS	VOLTS	NOTES
A	FLUXWERX #TRI 24 C 35 E2 M	2X2 LOW GLARE VOLUMETRIC	SUSPENDED CEILING	4220	38	277V 1P 2W	

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THE ADJUTANT GENERAL'S DEPARTMENT

AASF OPERATIONS RENOVATIONS

26 REGIONAL DRIVE . CONCORD, NEW HAMPSHIRE 03301

DATE:
19 FEBRUARY 2019
REVISIONS:

FINAL SUBMISSION

E0.1

ELECTRICAL LEGENDS & NOTES

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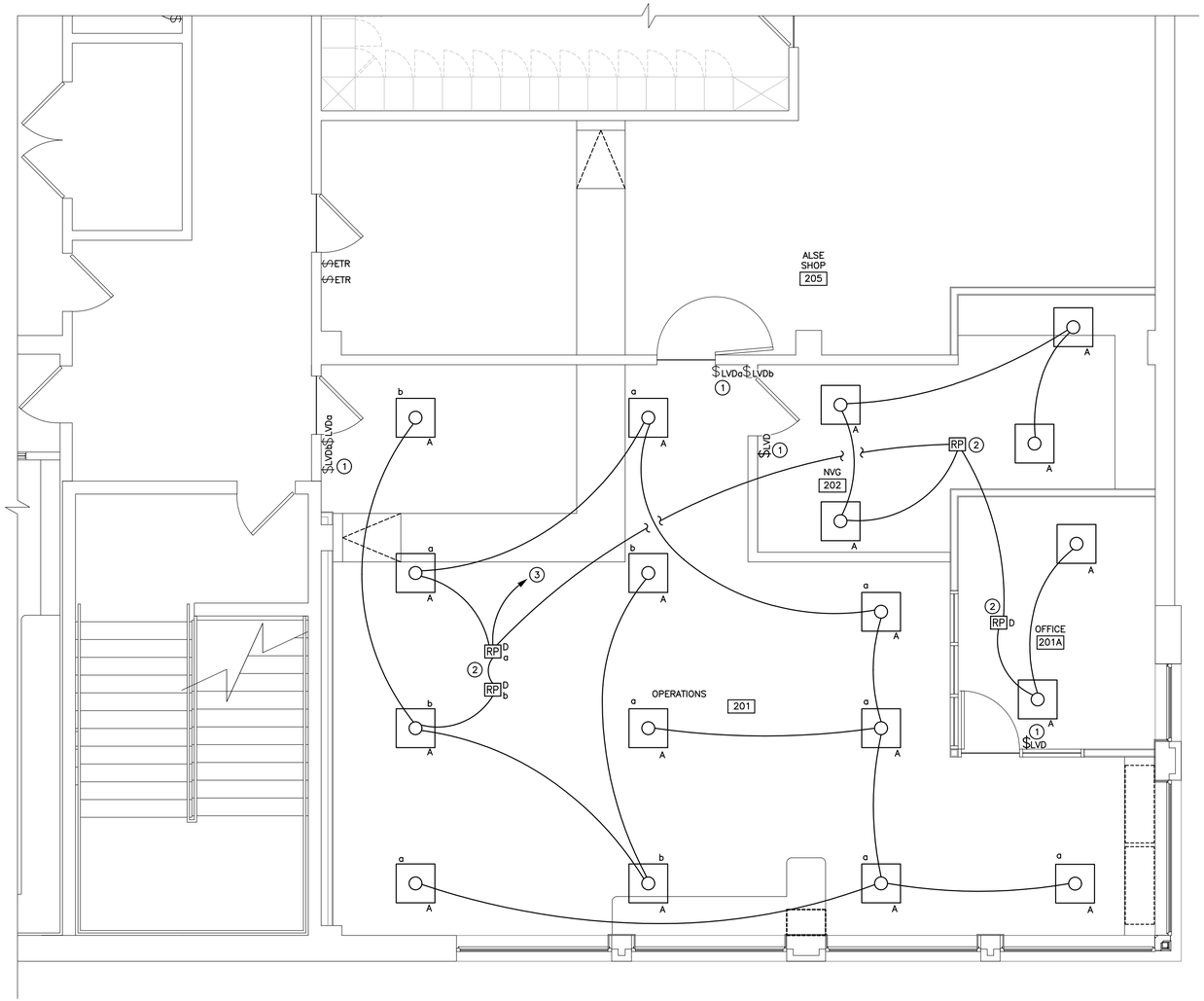

LIGHTING KEYNOTES 'O'

1. PROVIDE LOW VOLTAGE, ON-OFF, RAISE-LOWER WALL STATIONS EQUAL TO NLIGHT NPOD PRODUCT FOR 0-10 VOLT DIMMING. WIRE TO DIMMABLE RELAY PACKS WITH NILIGHT CAT 5 CABLE SETS. COLOR SHALL BE IVORY TO MATCH DEVICES IN THE ROOM. PROVIDE ALL WIRING ASSOCIATED WITH THE INSTALLATION AND REUSE EXISTING DEVICE BOXES AS DEEMED APPROPRIATE. LOWER CASE "a" INDICATES CONTROL OF "a" CHANNEL LIGHT
2. PROVIDE DIMMABLE RELAY PACK FOR ON-OFF, RAISE-LOWER CONTROL OF THE NEW LIGHTING. RELAY PACK SHALL BE EQUAL TO NLIGHT NPP16D. WIRE TO WALL STATIONS AND OCCUPANCY SENSORS WITH NLIGHT CAT 5 CABLE SETS. PROVIDE 0-10 VOLT WIRING FROM RELAY PACK TO LIGHT FIXTURES WITH LOW VOLTAGE CABLING AND SUPPORT.
3. WIRE TO EXISTING UNSWITCHED LIGHTING CIRCUIT SERVING THIS AREA. FIELD VERIFY OPERATING VOLTAGE AND WIRE ACCORDINGLY. LIGHTING WAS OBSERVED AS 277 VOLTS.

SECOND FLOOR PART PLAN - LIGHTING

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

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SECOND FLOOR PART PLAN - LIGHTING

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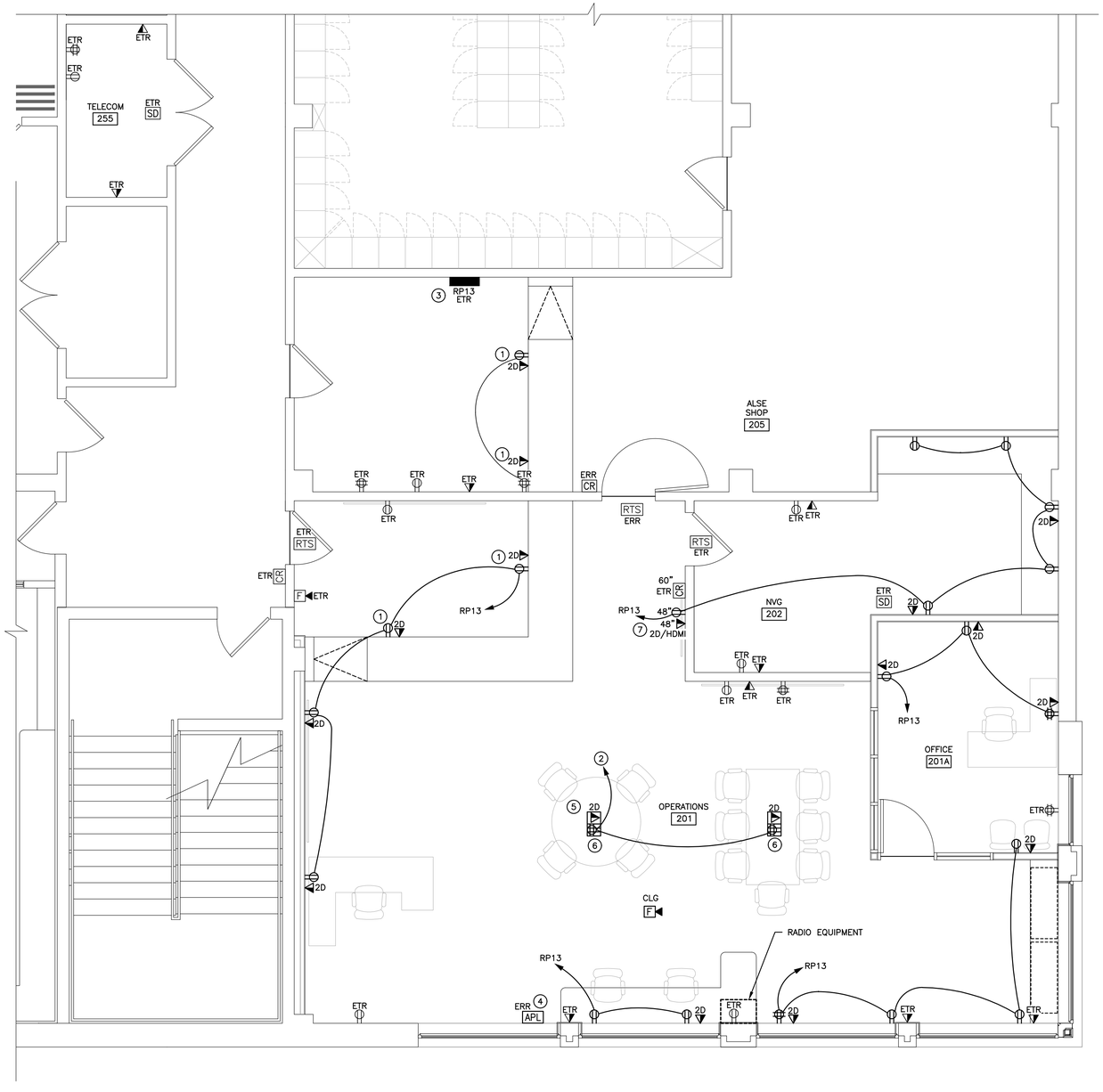

POWER KEYNOTES 'O'

1. ELECTRICAL CONTRACTOR SHALL COORDINATE MOUNTING OF POWER AND DATA OUTLETS IN THE NEW CASEWORK WITH THE ARCHITECT AND OWNER.
2. WIRE TO EXISTING UNSWITCHED ISOLATED GROUND PANEL CIRCUIT PREVIOUSLY FEEDING THE EXISTING, BUT REMOVED FLOOR BOXES.
3. PROVIDE ANY REQUIRED ADDITIONAL 20 AMPERE, SINGLE POLE , 125 VOLT CIRCUIT BREAKERS TO FEED NEW RECEPTACLE CIRCUITS . CONTRACTOR USE ANY SPARE CIRCUIT BREAKERS AS DEEMED APPROPRIATE.
4. NEW LOCATION FOR EXISTING APRON LIGHTING CONTROL PANEL. PROVIDE BACK BOX AND ASSOCIATED WIRING TO PROVIDE AN OPERATIONAL SYSTEM TO CONTROL FOR THE EXISTING APRON LIGHTING. CONTRACTOR SHALL FIELD VERIFY THE EXISTING CONTROL WIRING AND PROVIDE AS REQUIRED. CONTROL SHALL BE INSTALLED JUST BELOW WINDOWS, OR AS DIRECTED BY THE OWNER. TEST WIRING CONTROLS FOR PROPER OPERATION BEFORE AND AFTER RELOCATION.
5. PROVIDE TWO CAT 6A STP JACKS AND CABLING FOR EACH OF THE NEW DATA JACKS SHOWN ON THE DRAWING TYPICAL. PROVIDE IVORY BEZEL PLATE FOR TWO PORTS. RUN CABLES IN CONDUIT IN THE WALL CAVITY AND TRANSITION TO EXISTING CABLE TRAY, ROUTING BACK TO THE EXISTING TELECOM ROOM 255, OFF THE ADJACENT CORRIDOR. PROVIDE NEW CAT 6 STP PATCH PANELS IN THE EXISTING RACK TO TERMINATE NEW CABLES. COORDINATE ALL WORK WITH THE OWNER AND TEST TO TIA STANDARDS. CABLE SHALL BE PLENUM RATED CAT 6 STP WITH GREEN JACKET. CONFIRM JACKET COLOR AND JACK COLOR WITH THE OWNER.
6. PROVIDE FIRE RATED POKE THRU FLOOR BOX ASSEMBLY, WITH TWO 20 AMPERE, ISOLATED GROUND DUPLEX RECEPTACLES AND TWO CAT 6 STP DATA JACKS. PROVIDE FLUSH MOUNTED PRODUCT WITH BLACK FINISH AND TRIM. PROVIDE ASSEMBLY AS A 6 INCH CORE DEVICE AND SCRUB WATER RATED.
7. PROVIDE TWO DATA/AV OUTLET BOXES, ONE AT 60" AND ONE AT 18" AFF. THE UPPER BOX SHALL BE EQUIPPED WITH 2 DATA JACKS AND ONE HDMI JACK WITH MICRO ADAPTER CORD. THE LOWER BOX SHALL BE INSTALLED WITH A 1" EMPTY CONDUIT TO THE UPPER BOX FOR FUTURE HDMI CABLING AND FITTINGS. PROVIDE BLANK PLATE ON LOWER BOX AND FINISH PLATE WITH JACKS FOR THE UPPER BOX. BOXES SHALL BE FLUSH WALL MOUNTED 4" SQUARE DEEP WITH SINGLE DEVICE RINGS.

SECOND FLOOR PART PLAN - POWER

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

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SECOND FLOOR PART PLAN - POWER

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DIVISION 260000 – ELECTRICAL SPECIFICATIONS

SECTION 260020 – DEMOLITION AND RENOVATION

A. THIS CONTRACTOR SHALL REMOVE ALL EXISTING DEVICES, LIGHTING, SPECIALTIES AND INCIDENTALS AS REQUIRED TO ACHIEVE THE INTENT OF THIS CONTRACT. ALL REMOVED EQUIPMENT SHALL BECOME THE PROPERTY OF THIS CONTRACTOR, UNLESS DIRECTED OTHERWISE BY THE OWNER, AND SHALL BE HAULED AWAY FROM THE SITE AND DISPOSED OF PROPERLY. THE OWNER RESERVES THE RIGHT OF FIRST REFUSAL.

B. PROVIDE OWNER WITH THE OPTION OF RETAINING ANY ITEM OF MATERIAL REMOVED UNDER THIS CONTRACT, INCLUDING LIGHT FIXTURES, REMOVE AND LEGALLY DISPOSE OF ITEMS OR MATERIALS NOT RETAINED BY OWNER.

C. STORE ALL OF THE EXISTING LIGHT FIXTURES TO BE REUSED AT A LOCATION DESIGNATED BY THE OWNER.

D. EXISTING WIRING, FIXTURES AND EQUIPMENT SHALL REMAIN AS INSTALLED EXCEPT WHERE REMOVAL IS CALLED FOR IN DRAWINGS AND SPECIFICATIONS OR IS MADE NECESSARY BY THE ALTERATIONS TO THE BUILDING STRUCTURE OR FINISH IN REMODELED AREAS.

E. PRESERVE SAFE OPERATING CONDITION OF EXISTING WORK ALTERED DURING THE COURSE OF REMODELING, WHICH SHALL REMAIN IN SERVICE, UNLESS OTHERWISE NOTED. RESTORE TO SATISFACTORY OPERATING CONDITION.

F. REROUTE EXISTING WIRING AND RACEWAYS THAT BECOME EXPOSED FROM REMOVAL OF EXISTING CONSTRUCTIONS TO CONCEALED LOCATIONS AND REWIRE CIRCUITS AFFECTED AS REQUIRED.

G. WHERE CONDUIT OR OUTLETS ARE REMOVED, RECONNECT RUNS OF RACEWAY TO FORM CONTINUOUS RACEWAYS WITH NEW CONDUCTORS INSTALLED FROM LAST REMAINING OUTLET BOX.

H. WHERE AN EXISTING DEVICE IS REMOVED OR A CIRCUIT IS INTERRUPTED, REWIRE AS REQUIRED TO MAINTAIN SERVICE AND CONTINUITY TO REMAINING SERVICES.

I. INCLUDE ALL TEMPORARY CONNECTIONS NECESSARY FOR OWNER OCCUPATION OF BUILDING AREAS NOT PRESENTLY UNDER CONSTRUCTION.

SECTION 260010 – ELECTRICAL GENERAL PROVISIONS

PART 1 – GENERAL

1.01 SCOPE

A. THIS SECTION INCLUDES ALL LABOR, MATERIAL, EQUIPMENT AND SERVICES NECESSARY AND INCIDENTAL AS SHOWN ON THE DRAWINGS OR AS REQUIRED BY NATIONAL ELECTRICAL CODE (NEC) AND ALL APPLICABLE STATE AND LOCAL CODES AS FOLLOWS.

1. COMPLETE THE DEMOLITION AND REMOVAL OF ELECTRICAL WORK. NO PORTION OF ELECTRICAL SYSTEMS SHOWN FOR DEMOLITION MAY BE ABANDONED IN PLACE.
2. RELOCATE AND REWIRE EXISTING ELECTRICAL EQUIPMENT AND LIGHTING.
3. FURNISH AND INSTALL NEW ELECTRICAL EQUIPMENT AND LIGHTING.

B. EXAMINE THE BUILDING TO DETERMINE THE ACTUAL CONDITIONS AND EXTENT OF THE WORK. REFER ANY DETAILS NOT CLEAR TO THE ARCHITECT/ENGINEER FOR CLARIFICATION PRIOR TO BIDDING.

1.02 SUBMITTALS

A. SUBMIT PRODUCT DATA FOR THE FOLLOWING ELECTRICAL EQUIPMENT:

1. WALL CONTROLS
2. CONVENIENCE OUTLETS
3. SAFETY/DISCONNECT SWITCHES
4. LIGHTING FIXTURES & ASSOCIATED CONTROLS
5. TELECOMMUNICATIONS RACKS, JACKS AND CABLING

1.03 QUALITY ASSURANCE

A. SUBMIT A CONSTRUCTION SEQUENCE SCHEDULE OF WORK PRIOR TO THE START OF WORK. DO NOT PROCEED UNTIL RECEIVING WRITTEN APPROVAL.

B. THIS CONTRACTOR SHALL KEEP AS–BUILT DRAWINGS ON SITE AND TO MAKE MODIFICATIONS TO THE THESE DRAWINGS AS NECESSARY TO DOCUMENT THE ACTUAL INSTALLATION OF THE ELECTRICAL EQUIPMENT AND SYSTEM.

1.04 COORDINATION

A. PREVENT DISRUPTION TO THE OWNER AND MINIMIZE THE DOWNTIME BY COORDINATING SCOPE OF WORK AMONG ALL AFFECTED ELECTRICAL SYSTEMS AND WITH OTHER DIVISIONS.

SECTION 260050 – BASIC MATERIALS AND METHODS

PART 1 – GENERAL

1.01 SUMMARY

A. THIS SECTION INCLUDES THE FOLLOWING:

1. RACEWAYS
2. BOXES
3. CONDUCTORS
4. WALL SWITCHES & CONTROLS
5. CONVENIENCE OUTLETS
6. LABELS
7. ELECTRICAL PANELBOARDS (EXISTING AND NEW)
8. FIRE ALARM SYSTEM (EXISTING)

PART 2 – PRODUCTS

2.01 SUBSTITUTIONS

A. MATERIALS SHALL BE AS SPECIFIED HEREIN, EXCEPT, CONSIDERATION SHALL BE GIVEN TO OTHER PRODUCTS THAT MEET OR EXCEED THOSE SPECIFIED IF REQUESTED FIVE (5) BUSINESS DAYS PRIOR TO THE DATE OF BID OPENING IN ACCORDANCE WITH SECTION 01600– PRODUCT REQUIREMENTS.

2.02 RACEWAYS

A. ELECTRICAL METALLIC TUBING (EMT): STEEL WITH STEEL COMPRESSED FITTINGS. DOUBLE SET SCREW TYPE FITTINGS FOR EMT NOT LESS THAN 2 INCHES DIA. MEETS UL 797 AND ANSI C80.3. TRADE SIZE 3/4" MINIMUM.

B. MC (MC CABLE)

C. FLEXIBLE CONDUIT: LIQUID–TIGHT FLEXIBLE CONDUIT WITH WATERTIGHT CONNECTORS FOR OUTDOOR LOCATIONS. CONTINUOUS LENGTH, NO COUPLINGS. 1/2" MINIMUM EXCEPT 3/8" CONNECTIONS PERMITTED IN LENGTHS OF 6 FEET OR LESS AS PART OF A LISTED ASSEMBLY OR FOR TAP CONNECTIONS TO LIGHTING FIXTURES AS REQUIRED IN NEC SECTION 410–67(C).

D. RACEWAY FITTINGS:

1. ALL BOX CONNECTORS TO BE INSULATED THROAT TYPE.
2. CONDUIT STRAPS: GALVANIZED STEEL, 2–HOLE STRAPS, 1–HOLE STRAPS MAY BE USED FOR CONDUIT SIZES 1" AND SMALLER
3. METALLIC CONDUITS RACEWAYS AND FITTINGS SHALL BE LISTED AND APPROVED AS A GROUNDING MEANS. CONCEALED IN WALL OR ABOVE CEILING.

2.03 BOXES

1. GALVANIZED ONE–PIECE OR WELDED PRESSED STEEL TYPE. PROVIDE BLANK COVER FOR ALL BOXES WITHOUT FIXTURE OR DEVICE.

2.04 CONDUCTORS

A. WIRE SHALL BE COPPER ONLY, TYPES THHN/THWN.

B. WIRE SHALL BE CODE TYPE COPPER WIRE. WIRES #8 GAUGE AND LARGER SHALL BE STRANDED. WIRES SHALL BEAR THE UNDERWRITERS' LABEL, BE COLOR CODED AND BE MARKED WITH GAUGE, TYPE AND MANUFACTURER'S NAME ON 24" CENTERS. WIRES SMALLER THAN #8 MAY BE SOLID OR STRANDED.

C. COLOR CODING:

	120/208–VOLT	480/277–VOLT
PHASE A	BLACK	BROWN
PHASE B	RED	ORANGE
PHASE C	BLUE	YELLOW
NEUTRAL	WHITE	GREY
GROUND	GREEN	GREEN

D. MC CABLE INSTALLATION:

1. THE USE OF MC CABLE SHALL BE ALLOWED ONLY AS DESCRIBED BELOW.
2. TYPE MC CABLE SHALL NOT BE UTILIZED FOR HOMERUNS TO A PANELBOARD. PROVIDE CONDUCTORS IN CONDUIT FOR ALL HOMERUNS.
3. MC CABLE SHALL BE INSTALLED IN CONCEALED LOCATIONS ONLY. IT SHALL NOT BE RUN EXPOSED OR VISIBLY IN SIGHT IN FINISHED SPACES.
4. MC CABLE SHALL BE PROPERLY RUN THROUGH THE CENTER OF WALL STUDS AND UPPER AND LOWER PLATES. NO CABLE SHALL BE RUN AROUND THE FACE OF THE STUD, PLATE, OR STRUCTURAL MEMBER.
5. MC CABLE SHALL BE PROPERLY SUPPORTED IN BOTH VERTICAL AND HORIZONTAL INSTALLATIONS. FASTENING SUPPORTS SHALL BE AS APPROVED FOR TYPE MC CABLE, BY CADDY OR EQUIVALENT. PLASTIC TIES SHALL NOT BE USED AS A SUPPORTING METHOD FOR THE CABLE. MC CABLE SHALL BE RUN PARALLEL TO, AND ATTACHED TO, BUILDING STRUCTURAL STEEL; IT SHALL NOT BE RUN ACROSS OPEN SPACES.
6. STRIPPING OF THE ARMOR JACKET SHALL BE DONE BY OF AN APPROVED TOOL, OR BY SCORING AND BREAKING THE JACKET. STRIPPING AND REMOVAL OF THE JACKET SHALL BE DONE WITHOUT DAMAGE TO THE INTERIOR CONDUCTORS OR THEIR INSULATION.
7. FITTINGS APPROVED FOR TYPE MC CABLE SHALL BE USED TO TERMINATE THE CABLE AS REQUIRED.
8. MC CABLE SHALL NOT BE INSTALLED IN, OR NEAR, THE RIBS OF STEEL ROOF DECK.
9. TYPE MC CABLE SHALL ONLY BE PERMITTED FOR WIRING CONCEALED IN WALLS AND ACCESSIBLE LAY–IN CEILINGS, AND FOR LIGHTING FIXTURE WHIPS NOT EXCEEDING 6'–0" IN LENGTH. NO MC CABLE ALLOWED WHERE FINISHED SPACE IS OPEN AND EXPOSED TO SIGHT.
10. CONDUCTORS IN CONDUIT SHALL BE USED IN ALL OTHER LOCATIONS UNLESS NOTED OTHERWISE. CONDUITS FOR BRANCH CIRCUIT WIRING SHALL BE RUN DIRECTLY RUN DIRECTLY FROM THE PANELBOARD TO THE ROOM WHERE THE LOAD IS TO BE CONNECTED, OR TO THE FIRST IN ROOM OUTLET, LIGHTING JUNCTION OR SWITCHBOX. TYPE MC CABLE CAN THEN BE USED CONCEALED WITHIN THE LIMITS OF THAT ROOM AND ADJACENT ROOMS FOR EXTENSION OF NORMALLY POWERED BRANCH CIRCUIT WIRING AS ALLOWED.
11. MC CABLE SHALL BE RUN CONCEALED IN NON–CMU WALLS AND ABOVE ACCESSIBLE LAY–IN STYLE CEILINGS.

2.05 CONVENIENCE OUTLETS

A. SHALL BE "COMMERCIAL SPECIFICATION GRADE" RATED 20 AMPERES AT 125 VOLTS, COMPOSITION BASE WITH SLOTS TO ACCOMMODATE PARALLEL PLUG CAPS WITH GROUNDING PEG. OUTLET SHALL BE UL LISTED. PLATES SHALL BE .302 STAINLESS STEEL TYPE TO MATCH EXISTING.

B. COLOR SHALL BE IVORY TO MATCH EXISTING. UNLESS OTHERWISE NOTED. PROVIDE DEVICES WITH COMPATIBLE PLATES.

C. GFIC DUPLEX RECEPTACLE SHALL BE OF THE 5mA TYPE AND PROVIDED WITH A LED INDICATOR LIGHT.

D. PROVIDE A SEPARATE GFI DUPLEX RECEPTACLE AT EACH LOCATION IDENTIFIED ON THE DRAWINGS. THROUGH WIRING IS NOT ACCEPTABLE.

2.06 LABELS

A. LABEL SHALL BE ENGRAVED PLASTIC WITH BLACK LETTERING AND WHITE BACKGROUND. 1/2" LETTERS ON 3/4" LABEL FOR EQUIPMENT IDENTIFICATION ON DISCONNECT SWITCHES.

B. TAPE LABEL WITH TYPED BLACK LETTERING ON WHITE BACKGROUND. LABEL SHALL BE PRINTED LABELS INDICATING PANEL AND CIRCUIT NUMBERS FOR WIRING DEVICES AND LIGHTING.

2.07 PANELBOARDS – (EXISTING AND NEW)

A. CIRCUIT BREAKERS PROVIDED SHALL BE COMPATIBLE WITH MANUFACTURER PANEL STYLE AND AIC RATING.

2.08 FIRE ALARM SYSTEM (EXISTING)

A. CONTRACTOR SHALL FURNISH, INSTALL AND WIRE FIRE ALARM DEVICES THAT SHALL BE AN EXTENSION OF THE EXISTING SIMPLEX FIRE ALARM CONTROL SYSTEM.
B. PROVIDE DEVICES THAT MATCH EXISTING DEVICES ON SITE.
C. FIRE ALARM SYSTEM SHALL MEET ADA REQUIREMENTS FOR VISUAL NOTIFICATION.
D. FIRE ALARM SYSTEM WIRING SHALL COMPLY WITH NFPA 72, NEC ARTICLE 760 AND STATE AND LOCAL CODES.

PART 3 – EXECUTION

3.01 CONDUITS

A. UNLESS NOTED OTHERWISE, ALL CONDUITS SHALL BE RIGID STEEL OR IMC EXCEPT EMT MAY BE USED IN FOLLOWING LOCATIONS:

1. IN DRY LOCATIONS IN FURRED SPACES.
2. IN PARTITIONS OTHER THAN CONCRETE, CONCRETE BLOCK, OR SOLID MASONRY.
3. FOR EXPOSED WORK INDOORS AND OUTDOORS ABOVE 8 FT, EXCEPT IN SPECIAL LOCATIONS PROHIBITED BY CODE.
4. CONCEALED ABOVE SUSPENDED CEILINGS.
5. CONDUITS EXPOSED ON/ABOVE THE ROOF SHALL BE RIGID STEEL.

B. PROVIDE FLEXIBLE CONNECTIONS OF SHORT LENGTH TO EQUIPMENT SUBJECT TO VIBRATION OR MOVEMENT AND TO ALL MOTORS. PROVIDE A SEPARATE BONDING CONDUCTOR IN ALL FLEXIBLE CONNECTIONS. FLEXIBLE CONDUIT SHALL BE ONE CONTINUOUS LENGTH WITHOUT COUPLINGS.

C. RUN CONDUIT CONCEALED IN AREAS HAVING FINISHED CEILINGS AND IN FURRED WALLS. RUN ALL CROSS CONDUITS AND VERTICAL RISERS OR DROPS CONCEALED IN WALL AND/OR PARTITIONS. RUN VERTICAL RISERS OR DROPS UP OR DOWN BETWEEN WALL STUDS. SHOULD IT BE NECESSARY TO NOTCH ANY FRAMING MEMBERS, MAKE SUCH NOTCHING ONLY AT LOCATIONS AND IN A MANNER AS APPROVED BY THE ARCHITECTS. CONDUIT MAY BE RUN EXPOSED IN UNFINISHED AREAS WHERE SO PERMITTED BY THE ARCHITECT. INSTALL EXPOSED CONDUIT RUN NEATLY, PARALLEL TO OR AT RIGHT ANGLES TO STRUCTURAL MEMBERS. MAINTAIN A MINIMUM OF 6" CLEARANCE FROM STEAM OR HOT WATER PIPES.

D. SUPPORT CONDUIT WITH STRAPS AND SECURE TO WOOD STRUCTURE BY MEANS OF BOLTS OR LAG SCREWS, TO CONCRETE BY MEANS OF INSERT OR EXPANSION BOLTS, TO BRICKWORK BY MEANS OF EXPANSION BOLTS, AND TO HOLLOW MASONRY BY MEANS OF TOGGLE BOLTS. EXPANDERS AND SHIELDS SHALL BE STEEL OR MALLEABLE IRON.

E. SPACING FOR ALL EMT AND RIGID STEEL CONDUIT SUPPORTS SHALL BE AS FOLLOWS:

1. SURFACE CONDUITS, ROOF MOUNTED:
   a. ROUTE CONDUITS PARALLEL WITH MECHANICAL PIPING AND ALONG BUILDING LINES.
   b. PROVIDE GROUND WIRE IN CONDUITS.
   G. DO NOT INSTALL IN CONCRETE SLABS.

F. HORIZONTAL RUNS OF CONDUIT ABOVE SUSPENDED WIRE LAY–IN CEILINGS SHALL BE MOUNTED NO LOWER THAN NECESSARY.

G. ALL PENETRATIONS THROUGH WALLS AND CEILING STRUCTURES SHALL BE SEALED AROUND THE CONDUIT OPENING.

3.02 ACCESS DOORS

A. FURNISH AND INSTALL ACCESS DOORS WHEREVER REQUIRED WHETHER SHOWN OR NOT FOR EASY MAINTENANCE OF ELECTRICAL SYSTEMS; FOR EXAMPLE, INACCESSIBLE AREAS AND ATTICS CONTAINING HEAT DETECTORS, JUNCTION BOXES, ETC. ACCESS DOORS SHALL PROVIDE FOR COMPLETE REMOVAL AND REPLACEMENT OF EQUIPMENT.

3.03 BOXES

A. BOXES MUST BE ACCURATELY PLACED FOR FINISH, INDEPENDENTLY AND SECURELY SUPPORTED BY ADEQUATE WOOD BACKING OR BY MANUFACTURED ADJUSTABLE CHANNEL TYPE HEAVY–DUTY BOX HANGERS. BOXES WITH METAL BOX HANGERS SHALL BE ATTACHED TO METAL STUDS. BOXES INSTALLED IN MASONRY TILE OR CONCRETE BLOCK CONSTRUCTION SHALL BE SECURED WITH AUXILIARY PLATES, BARS OR CLIPS AND BE GROUTED IN PLACE.

B. INSTALL PULL BOXES OR JUNCTION BOXES AS REQUIRED IN ACCESSIBLE SPACES BUT DO NOT INSTALL IN FINISHED AREAS UNLESS APPROVED BY ARCHITECT.

C. WHERE FIRE RATED CONSTRUCTION IS REQUIRED (REFER TO ARCHITECTURAL DRAWINGS), DO NOT LOCATE ELECTRICAL OUTLET BOXES BACK–TO–BACK. PROVIDE A MINIMUM OF 24" HORIZONTAL SEPARATION BETWEEN OUTLET BOXES ON OPPOSITE SIDE OF THE SAME WALL.

3.04 CONDUCTORS

A. #12 AWG WIRE SHALL BE MINIMUM SIZE WIRE USED FOR LIGHTING AND POWER CIRCUITS. LOW VOLTAGE CONTROL CIRCUITS MAY BE #14 EXCEPT AS MARKED ON DRAWINGS, UNLESS SHOWN.

B. 120 VOLT BRANCH CIRCUITS LONGER THAN 75 FEET SHALL BE INCREASED TO #10.

C. ALL CONDUCTORS SHALL BE IN CONDUIT UNLESS OTHERWISE INDICATED.

3.05 COVER PLATES

A. SWITCH, RECEPTACLE, AND DEVICE COVER PLATES SHALL BE SMOOTH NYLON PLASTIC TYPE, COLOR TO MATCH EXISTING.

3.06 GROUNDING AND BONDING

A. EQUIPMENT GROUNDING CONDUCTOR SHALL BE COPPER HAVING A CURRENT CAPACITY SIZED IN ACCORDANCE WITH NEC.

B. COMPLETELY GROUND ALL EQUIPMENT CASES, MOTOR FRAMES, ETC., TO SATISFY REQUIREMENTS OF NEC. INSTALL BOND WIRE IN FLEXIBLE CONDUIT. INSTALL COPPER BOND WIRE, SIZED IN ACCORDANCE WITH NEC, IN ALL RACEWAYS AND BOND TO ALL METALLIC PARTS USING APPROVED FITTINGS.

C. ALL CONNECTIONS SHALL BE MADE WITH SOLDERLESS CONNECTORS OR MOLDED FUSION–WELDING PROCESS.

D. MC CABLE SHALL BE EQUIPPED WITH FULL SIZE, GREEN INSULATED EQUIPMENT GROUNDING CONDUCTOR.

3.07 DISCONNECTS & SAFETY SWITCHES

A. ALL DISCONNECT AND SAFETY SWITCHES SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR.

B. ALL DISCONNECT SWITCHES AND SAFETY SWITCHES SHALL BE HEAVY DUTY TYPE WITH QUICK BREAK, QUICK MAKE MECHANISMS, FULL COVER INTERLOCKS, EXTERNAL INDICATOR HANDLE FOR MANUAL OPERATION AND RATED AMPACITY, NUMBER OF POLE, VOLTAGE AND NEMA ENCLOSURE TYPE AS SHOWN ON THE DRAWINGS.

C. FUSIBLE SAFETY SWITCHES SHALL INCLUDE PROVISIONS FOR CARTRIDGE TYPE FUSES AND FURNISHED WITH CLASS R FUSE CLIPS. CLASS R FUSE CLIPS SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR.

D. ENCLOSURES SHALL BE NEMA–3R FOR ALL OUTDOOR INSTALLATIONS. ENCLOSURES SHALL BE NEMA–1 FOR ALL INDOOR INSTALLATIONS, EXCEPT AS OTHERWISE NOTED. LUGS SHALL BE UL LISTED FOR USE WITH BOTH COPPER AND ALUMINUM CONDUCTORS.

E. DISCONNECT AND SAFETY SWITCHES SHALL BE MANUFACTURED BY SQUARE D, GE, SIEMENS OR EATON.

3.08 PANELBOARDS – EXISTING

A. EXISTING PANELBOARDS AS NOTED. PROVIDE UPDATED TYPEWRITTEN CIRCUIT DIRECTORIES FOR ALL ADDED AND REMOVED BRANCH CIRCUITS.

B. PROVIDE CIRCUIT BREAKERS AS REQUIRED FOR THE PROJECT AND PROVIDE COMPATIBLE PRODUCT TO MATCH MANUFACTURER PANEL STYLE AND AIC RATING.

3.09 FIRE ALARM SYSTEM – EXISTING

A. NEW NOTIFICATION DEVICES SHALL BE WIRED WITH MATCHING CONDUIT AND FIRE ALARM CABLING TO EXISTING NEAREST NOTIFICATION CIRCUIT WITH SUFFICIENT CAPACITY.
B. NEW INITIATING DEVICES SHALL BE WIRED WITH MATCHING CONDUIT AND FIRE ALARM CABLING TO EXISTING NEAREST INITIATION OR ADDRESSABLE LOOP CIRCUIT WITH SUFFICIENT CAPACITY.

3.10 LIGHTING, EXIT SIGNS AND LIGHTING CONTROLS

A. SUPPORT ALL LUMINAIRE HOUSINGS FROM STRUCTURAL MEMBERS WITH GALVANIZED STEEL WIRES.

B. ALL MOUNTING SHALL BE INSTALLED TO RESIST SEISMIC FORCES.

C. LED'S SHALL BE 3500K COLOR TEMPERATURE, UNLESS OTHERWISE NOTED.

3.11 TELECOMMUNICATIONS CABLING AND TERMINATIONS

A. ALL TELECOM CABLING JACKS AND PATCH PANELS SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR AS DESCRIBED ON THE DRAWINGS.

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THE ADJUTANT GENERAL'S DEPARTMENT

AASF OPERATIONS RENOVATIONS

26 REGIONAL DRIVE . CONCORD, NEW HAMPSHIRE 03301

DATE:
19 FEBRUARY 2019
REVISIONS:

FINAL SUBMISSION

E7.1

ELECTRICAL SPECIFICATIONS

THIS DRAWING IS FORMATTED FOR A 24X36 SHEET