Dover HS / Career Technical Center

VOLUME 2 OF 2

25 Alumni Drive, Dover, NH

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Peter Driscoll, Principal, Dover HS & Career Technical Center
Louise Paradis, Director, Career Technical Center
Karen Taylor, business Administrator, Dover Public Schools
Jeffrey White, Facilites Director

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Halvorson Design Partnership, Inc / Landscape Architect
Nobis Engineering / Civil Engineering / MEP, FP Engineers
Foley, Buhl, Roberts Assoicates, Inc.
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Kalin Associates, Inc. / Specifications Consultant
McPhail Associates, LLC / Geotechnical & Geoenvironmental Engineers
Crabtree McGrath Associate, Inc. / Food Service & Equipment Consultants
Cavanaugh Tocci Associates, Inc. / Acoustical & Theatrical Consultants

PC Construction Company / Construction Manager

100% DESIGN DEVELOPMENT

COST ESTIMATE SET

HMFH ARCHITECTS

FIRE PROTECTION

FP0.1	Legend, Notes and Details - Fire Protection
FP1.1A	Ground Floor Plan Part A Fire Protection
FP1.1B	Ground Floor Plan Part B Fire Protection
FP1.1C	Ground Floor Plan Part C Fire Protection
FP1.1F	Ground Floor Plan Part F Fire Protection
FP2.1A	1st Floor Ceiling Plan Part A Fire Protection
FP2.1B	1sf Floor Ceiling Plan Part B - Fire Protection
FP2.1C	1sf Floor Ceiling Plan Part C - Fire Protection
FP2.1D	1sf Floor Ceiling Plan Part D - Fire Protection
FP2.1E	1sf Floor Ceiling Plan Part E - Fire Protection
FP2.1F	1sf Floor Ceiling Plan Part F - Fire Protection
FP2.2A	2nd Floor Ceiling Plan Part A - Fire Protection
FP2.2B	2nd Floor Ceiling Plan Part B - Fire Protection
FP2.2C	2nd Floor Ceiling Plan Part C - Fire Protection
FP2.2D	2nd Floor Ceiling Plan Part D - Fire Protection
FP2.2E	2nd Floor Ceiling Plan Part E- Fire Protection
FP2.2F	2nd Floor Ceiling Plan Part F - Fire Protection
FP3.1	1st Floor Ceiling Plan Animal Science Fire Protection

PLUMBING

P0.01	Legend, Notes & Details - Plumbing
P0.02	Details - Plumbing
P1.0A	Below Sla Plan Part A Plumbing
P1.0B	Below Slab Plan Part B Plumbing
P1.0C	Below Slab Plan Part C Plumbing
P1.0D	Below Slab Plan Part D Plumbing
P1.0E	Below Slab Plan Part E Plumbing
P1.0F	Below Slab Plan Part F Plumbing
P1.1A	Ground Floor Plan Part A Plumbing
P1.1B	Ground Floor Plan Part B Plumbing
P1.1C	Ground Floor Plan Part C Plumbing
P1.1F	Ground Floor Plan Part F Plumbing
P2.1A	1st Floor Plan Part A Plumbing
P2.1B	1st Floor Plan Part B Plumbing
P2.1C	1st Floor Plan Part C Plumbing
P2.1D	1st Floor Plan Part D Plumbing
P2.1E	1st Floor Plan Part E Plumbing
P2.1F	1st Floor Plan Part F Plumbing
P2.2A	2nd Floor Plan Part A Plumbing
P2.2B	2nd Floor Plan Part B Plumbing
P2.2C	2nd Floor Plan Part C Plumbing
P2.2D	2nd Floor Plan Part D Plumbing
P2.2E	2nd Floor Plan Part E Plumbing
P2.2F	2nd Floor Plan Part F Plumbing
P3.1A	Roof Plan Part A Plumbing
P3.1B	Roof Plan Part B Plumbing
P3.1C	Roof Plan Part C Plumbing
P3.1D	Roof Plan Part D Plumbing
P3.1E	Roof Plan Part E Plumbing
P3.1F	Roof Plan Part F Plumbing
P4.0	Below Slab Plan Animal Science Plumbing
P4.1	First Floor Plan Animal Science Plumbing

HVAC

M1.0A	Ground Floor Duct Plan - Part A
M1.0B	Ground Floor Duct Plan - Part B
M1.0C	Ground Floor Duct Plan - Part C
M1.0F	Ground Floor Duct Plan - Part F
M1.1A	First Floor Ductwork Plan - Part A
M1.1B	First Floor Ductwork Plan - Part B
M1.1C	First Floor Ductwork Plan - Part C
M1.1D	First Floor Ductwork Plan - Part D
M1.1E	First Floor Ductwork Plan - Part E
M1.1F	First Floor Ductwork Plan - Part F
M1.1G	First Floor Ductwork Plan - Part G
M1.2A	Second Floor Duct Plan - Part A
M1.2B	Second Floor Duct Plan - Part B
M1.2C	Second Floor Duct Plan - Part C
M1.2D	Second Floor Duct Plan - Part D
M1.2E	Second Floor Duct Plan - Part E
M1.2F	Second Floor Duct Plan - Part F
M1.3A	Roof Plan - Part A
M1.3B	Roof Plan - Part B
M1.3C	Roof Plan - Part C
M1.3D	Roof Plan - Part D
M1.3E	Roof Plan - Part E
M1.3F	Roof Plan - Part F
M2.0A	Ground Floor Piping Plan - Part A
M2.0B	Ground Floor Piping Plan - Part B
M2.0C	Ground Floor Piping Plan - Part C
M2.0D	Ground Floor Piping Plan - Part D
M2.0F	Ground Floor Piping Plan - Part F
M2.1A	First Floor Piping Plan - Part A
M2.1B	First Floor Piping Plan - Part B
M2.1C	First Floor Piping Plan - Part C
M2.1D	First Floor Piping Plan - Part D
M2.1E	First Floor Piping Plan - Part E
M2.1F	First Floor Piping Plan - Part F
M2.1G	First Floor Piping Plan - Part G
M2.2A	Second Floor Piping Plan - Part A
M2.2B	Second Floor Piping Plan - Part B
M2.2C	Second Floor Piping Plan - Part C
M2.2D	Second Floor Piping Plan - Part D
M2.2E	Second Floor Piping Plan - Part E
M2.2F	Second Floor Piping Plan - Part F
M3.0	HVAC - Schedules I
M3.1	HVAC - Schedules II
M3.2	HVAC - Details I
M3.3	HVAC - Details II
M3.4	HVAC - Details III
M3.5	AHU Flow Diagrams I
M3.6	AHU Flow Diagrams II
M3.7	HHW & CHW Flow Diagrams
M4.0	HVAC - Controls I
M4.1	HVAC - Controls II
M4.2	HVAC - Controls III
M4.3	HVAC - Controls IV
M4.4	HVAC - Controls V
M4.5	HVAC - Controls VI
M4.6	HVAC - Controls VII
M4.7	HVAC - Controls VIII
M4.8	HVAC - Controls IX
M4.9	HVAC - Controls X
M4.10	HVAC - Controls XI
VS.1	Vibration & Seismic Details

ELECTRICAL

E0.1	Electrical Symbo List
E0.2	Lighting Fixture Schedule
E0.3	Electrical Site Plan
E0.4	Electrical Site Details
E0.5	Electrical Site Details
E1.0A	Ground Floor Plan Part A - Lighting
E1.0B	Ground Floor Plan Part B - Lighting
E1.0C	Ground Floor Planb Part C - Lighting
E1.0F	Ground Floor Plan Part F - Lighting
E1.1A	First Floor Plan Part A - Lighting
E1.1B	First Floor Plan Part B - Lighting
E1.1C	First Floor Plan Part C - Lighting
E1.1D	First Floor Plan Part D - Lighting
E1.1E	First Floor Plan Part E - Lighting

ELECTRICAL (Cont.)

E1.1F	First Floor Plan Part F - Lighting
E1.1G	Animal Science Floor Plan - Lighting
E1.2A	Second Floor Plan Part A - Lighting
E1.2B	Second Floor Plan Part B - Lighting
E1.2C	Second Floor Plan Part C - Lighting
E1.2D	Second Floor Plan Part D - Lighting
E1.2E	Second Floor Plan Part E - Lighting
E1.2F	Second Floor Plan Part F - Lighting
E2.0A	Ground Floor Plan Part A - Power
E2.0B	Ground Floor Plan Part B - Power
E2.0C	Ground Floor Plan Part C - Power
E2.0F	Ground Floor Plan Part F - Power
E2.1A	First Floor Plan Part A - Power
E2.1B	First Floor Plan Part B - Power
E2.1C	First Floor Plan Part C - Power
E2.1D	First Floor Plan Part D - Power
E2.1E	First Floor Plan Part E - Power
E2.1F	First Floor Plan Part F - Power
E2.1G	Animal Science Floor Plans - Power
E2.2A	Second Floor Plan Part A - Power
E2.2B	Second Floor Plan Part B - Power
E2.2C	Second Floor Plan Part C - Power
E2.2D	Second Floor Plan Part D - Power
E2.2E	Second Floor Plan Part E - Power
E2.2F	Second Floor Plan Part F - Power
E2.3	Roof Plan Part A,B, - Power & Lightning Protection
E2.4	Roof Plan Part C,D,E,F - Power & Lightning Protection
E3.0	Electrical Rooms Part Plans - Power
E3.1	One Line Power Riser
E3.2	Electrical Panel Schedules
E3.3	Electrical Panel Schedules (Cont.)
E3.4	Electrical Details
E3.5	Electrical Details
E3.6	Kitchen Part Plan - Power
E3.7	Kitchen Details
E3.8	Lab Equipment Connection Schedules
E3.9	Mechanical Equipment Connections Schedule
E3.10	Conduit & BDA Systems Risers
E4.0	Fire Alarm Riser
E4.0A	Ground Floor Plan Part A - Fire Alarm
E4.0B	Ground Floor Plan Part B - Fire Alarm
E4.0C	Ground Floor Plan Part C - Fire Alarm
E4.0F	Ground Floor Plan Part F - Fire Alarm
E4.1A	First Floor Plan Part A - Fire Alarm
E4.1B	First Floor Plan Part B - Fire Alarm
E4.1C	First Floor Plan Part C - Fire Alarm
E4.1D	First Floor Plan Part D - Fire Alarm
E4.1E	First Floor Plan Part E - Fire Alarm
E4.1F	First Floor Plan Part F - Fire Alarm
E4.1G	Animal Science Floor Plan - Fire Alarm
E4.2A	Second Floor Plan Part A - Fire Alarm
E4.2B	Second Floor Plan Part B - Fire Alarm
E4.2C	Second Floor Plan Part C - Fire Alarm
E4.2D	Second Floor Plan Part D - Fire Alarm
E4.2E	Second Floor Plan Part E - Fire Alarm
E4.2F	Second Floor Plan Part F - Fire Alarm
E5.0	Security Riser & Details
E5.0A	Ground Floor Plan Part A - Security
E5.0B	Ground Floor Plan Part B - Security
E5.0C	Ground Floor Plan Part C - Security
E5.0F	Ground Floor Plan Part E - Security
E5.1A	First Floor Plan Part A - Security
E5.1B	First Floor Plan Part B - Security
E5.1C	First Floor Plan Part C - Security
E5.1D	First Floor Plan Part D - Security
E5.1E	First Floor Plan Part E - Security
E5.1F	First Floor Plan Part F - Security
E5.1G	Animal Science Floor Plan - Security
E5.2A	Second Floor Plan Part A - Security
E5.2B	Second Floor Plan Part B - Security
E5.2C	Second Floor Plan Part C - Security
E5.2D	Second Floor Plan Part D - Security
E5.2E	Second Floor Plan Part E - Security
E5.2F	Second Floor Plan Part F - Security

TECHNOLOGY

T0.1	Technology Symbol List
T1.0A	Ground Floor Plan Part A - Technology
T1.0B	Ground Floor Plan Part B - Technology
T1.0C	Ground Floor Plan Part C - Technology
T1.0F	Ground Floor Plan Part F - Technology
T1.1A	First Floor Plan Part A - Technology
T1.1B	First Floor Plan Part B - Technology
T1.1C	First Floor Plan Part C - Technology
T1.1D	First Floor Plan Part D - Technology
T1.1E	First Floor Plan Part E - Technology
T1.1F	First Floor Plan Part F - Technology
T1.1G	Animal Science Floor Plan - Technology
T1.2A	Second Floor Plan Part A - Technology
T1.2B	Second Floor Plan Part B - Technology
T1.2C	Second Floor Plan Part C - Technology
T1.2D	Second Floor Plan Part D - Technology
T1.2E	Second Floor Plan Part E - Technology
T1.2F	Second Floor Plan Part F - Technology

AUDIOVISUAL DRAWINGS

AV0.0	Audiovisual Keys, Notes and Schedules
AV0.1	Audiovisual Conduit Risers
AV2.0A	Audiovisual Device Plan - Ground Level - Part A
AV2.0B	Audiovisual Device Plan - Ground Level - Part B
AV2.0C	Audiovisual Device Plan - Ground Level - Part C
AV2.1A	Audiovisual Device Plan - First Floor - Part A
AV2.1B	Audiovisual Device Plan - First Floor - Part B
AV2.1C	Audiovisual Device Plan - First Floor - Part C
AV2.2A	Audiovisual Device Plan - Second Floor - Part A
AV3.0A	Audiovisual RCP - Ground Floor - Part A
AV3.0B	Audiovisual RCP - Ground Floor - Part B
AV3.0C	Audiovisual RCP - Ground Floor - Part C
AV3.1A	Audiovisual RCP - First Floor - Part A
AV3.1B	Audiovisual RCP - First Floor - Part B
AV3.1C	Audiovisual RCP - First Floor - Part C
AV3.2A	Audiovisual RCP - Second Floor - Part A
AV3.2B	Audiovisual RCP - Second Floor - Part B
AV3.2C	Audiovisual RCP - Second Floor - Part C
AV4.1	Audiovisual Auditorium Sections
AV4.2	Audiovisual Gymnasium Sections
AV5.1	Audiovisual Functional Diagram - Auditorium
AV5.2	Audiovisual Functional Diagram - Auditorium
AV5.3	Audiovisual Functional Diagram - Auditorium

THEATRICAL LIGHTING DRAWINGS

TL1.0A	Theatrical Lighting Plan
TL1.1A	Theatrical Lighting Plan
TL1.2A	Theatrical Lighting Plan
TL1.2B	Theatrical Lighting Riser and Schedules

THEATRICAL RIGGING DRAWINGS

TR1.1	Theatrical Rigging Plans
TR1.2	Theatrical Rigging Plans
TR4.1	Theatrical Rigging Sections
TR5.1	Theatrical Rigging Schedule and Riser

LEGEND

SYMBOL	ABBREV	DESCRIPTION
FSP	FSP	STANDPIPE (WET)
F	F	FIRE MAIN ABOVEGROUND
F	F	FIRE MAIN UNDERGROUND
SPR	SPR	SPRINKLER LINE (WET)
PA	PA	PREACTION SPRINKLER LINE (DRY)
SD	SD	SPRINKLER DRAIN
DSP	DSP	DRY SPRINKLER PIPE (DRY)
EC		SIDEWALL SPRINKLER HEAD EXTENDED COVERAGE
		SIDEWALL SPRINKLER HEAD
EC		PENDANT SPRINKLER HEAD EXTENDED COVERAGE
		PENDANT SPRINKLER HEAD
I		INSTITUTIONAL PENDANT SPRINKLER HEAD
		EXPOSED UPRIGHT SPRINKLER HEAD
		CONCEALED PENDANT SPRINKLER HEAD IN CEILING
D		DRY SIDEWALL SPRINKLER HEAD
D		DRY PENDANT SPRINKLER HEAD IN CEILING
DP,DN		PIPE DROP OR DOWN
UP		PIPE RISE OR UP
		TEE LOOKING DOWN
		CAP ON END OF PIPE
		STRAINER
		UNION
PG		PRESSURE GAGE
CV		CHECK VALVE
SCV		SUPERVISED CONTROL VALVE
VIV		VALVE ON VERTICAL
FDC		FIRE DEPARTMENT CONNECTION
FS		FLOW SWITCH
PIV		POST INDICATOR VALVE
ABD		AUTOMATIC BALL DRIP
		PRESSURE RELIEF VALVE
		SLOPED PIPE
DACV		DRY ALARM CHECK VALVE
MACV		MAIN WET ALARM CHECK VALVE
PAV		PRE-ACTION VALVE
WMG		WATER MOTOR GONG
ITC		INSPECTORS TEST CONNECTION
TYP.		TYPICAL
AC		CONCEALED ABOVE CEILING
@C		EXPOSED AT CEILING
AP		ACCESS PANEL
AFF		ABOVE FINISHED FLOOR
F&I		FURNISH AND INSTALL
PC		PLUMBING CONTRACTOR
PA		PRE-ACTION
FPC		FIRE PROTECTION CONTRACTOR
GC		GENERAL CONTRACTOR
HVAC		HEAT, VENT & AIR CONDITIONER. CONTRACTOR
EC		ELECTRICAL CONTRACTOR
DCVA		DOUBLE CHECK VALVE ASSEMBLY
EXP		EXPOSED
LPD		LOW POINT DRAIN
FDV		FIRE DEPARTMENT VALVE
FDVC		FIRE DEPT. VALVE CABINET
FHC		FIRE HOSE CABINET
SCVA		SPRINKLER FLOOR CONTROL VALVE ASSEMBLY
NAS		NO AUTOMATIC SPRINKLERS
T	TS	TAMPER (SUPERVISORY) SWITCH
F	FS	FLOW SWITCH
A	AC	AIR COMPRESSOR
P	PS	PRESSURE SWITCH
	ITS	REMOTE INSPECTORS TEST STATION
1		HYDRAULIC NODE POINT DESIGNATION
S I		IONIZATION SMOKE DETECTOR
S P		PHOTOELECTRIC SMOKE DETECTOR

FLOOR	
ZONE	SYSTEM TYPE
HAZARD CLASSIFICATION	
DENSITY GPM	AREA OF APPLICATION SQ.FT.
HOSE ALLOWANCE GPM	COVERAGE PER HEAD (SQ.FT.)
REMARKS:	

DENOTES SPRINKLER DESIGN CRITERIA

DENOTES SPRINKLER ZONE BOUNDARY

NOTE: NOT ALL SYMBOLS LISTED ARE APPLICABLE TO THIS PROJECT.

GENERAL NOTES

1. THE WORK HEREIN REQUIRED INCLUDES A HYDRAULICALLY DESIGNED SPRINKLER SYSTEM AS SPECIFIED IN THE DOCUMENTS AND AS APPROVED BY THE ARCHITECT.
2. THE FIRE PROTECTION DRAWINGS ARE DIAGRAMMATIC AND ARE TO BE USED FOR THE PURPOSE OF ESTABLISHING GENERAL LOCATIONS OF PIPING RUNS, SIZES OF PIPING, AND QUANTITIES OF FIXTURES AND EQUIPMENT TO BE FURNISHED HEREIN. REFER TO ARCHITECTURAL DRAWINGS FOR DIMENSIONS FOR EXACT LOCATIONS OF ALL SPRINKLER HEADS, AND EQUIPMENT, INCLUDING MOUNTING HEIGHTS. IN THE EVENT OF CONFLICT OR IF DIMENSIONS ARE NOT SHOWN, OBTAIN FIELD DIRECTIVE FROM THE ARCHITECT AS TO THE LOCATIONS OF ALL VISIBLE EQUIPMENT.
3. ALL PIPING SHOWN ON THESE PLANS OR THOSE TO BE DESIGNED HEREIN SHALL BE RUN CONCEALED ABOVE SUSPENDED CEILINGS, IN CHASES, OR IN PARTITIONS UNLESS SPECIFICALLY NOTED OTHERWISE.
4. ALL SPRINKLER HEADS IN CEILING TILES SHALL BE LOCATED IN THE EXACT CENTER OF 2'x2' TILE OR FOR A 2'x4' TILE IN THE CENTER OF EITHER HALF, UNLESS SPECIFICALLY APPROVED OTHERWISE BY THE ARCHITECT.
5. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR CEILING HEIGHTS AND CEILING MATERIALS AND LAYOUTS. REFER TO THE RESPECTIVE PLUMBING, HVAC AND ELECTRICAL DRAWINGS FOR LIGHTING, DIFFUSER AND REGISTER LAYOUTS IN CEILINGS AND FOR PIPING, DUCTWORK AND EQUIPMENT ABOVE CEILINGS FOR COORDINATION PURPOSES. IN THE EVENT OF CONFLICT OR IF DIMENSIONS ARE NOT SHOWN, OBTAIN FIELD DIRECTIVE FROM THE ARCHITECT AS TO THE LOCATIONS OF ALL VISIBLE EQUIPMENT.
6. THE SPRINKLER CONTRACTOR SHALL PROVIDE AS PART OF THIS CONTRACT ALL SPRINKLERS BELOW FIXED OBSTRUCTIONS 48" AND LARGER AS REQUIRED BY NFPA 13, 8.6.5.3.3. IT IS THE RESPONSIBILITY OF THE SPRINKLER CONTRACTOR TO PROVIDE THE REQUIRED SPRINKLERS AND ALL ASSOCIATED PIPING, FITTINGS, HANGERS, ETC. FOR A COMPLETE INSTALLATION.
7. ATTENTION IS CALLED TO THE REQUIREMENT FOR THE PREPARATION OF COORDINATION DRAWINGS. IN ADDITION TO THE PREPARATION OF SHOP DRAWINGS ALSO PREPARE COORDINATION DRAWINGS AS OUTLINED IN THE SPECIFICATION. THE APPROVAL OF THE SHOP DRAWINGS INCLUDING DIMENSIONS SHOWN THEREIN DOES NOT RELIEVE THE CONTRACTOR.
8. SPECIFIC ATTENTION IS DIRECTED TO THE REQUIREMENTS OF MBC 914.7, 3305.3, 3306.1, AND NFPA 241-2004 REGARDING THE MAINTENANCE OF FIRE PROTECTION SYSTEMS INCLUDING STANDPIPES AND BULK FIRE MAINS BOTH DURING CONSTRUCTION AND DEMOLITION. MAINTAIN THE SYSTEMS AS REQUIRED BY THESE STANDARDS AS A MINIMUM.
9. THE SPRINKLER CONTRACTOR SHALL PROVIDE AS PART OF HIS CONTRACT AN INSPECTOR'S TEST STATION ON EACH SPRINKLER ZONE. THE INSPECTOR'S TEST STATION WILL BE LOCATED AT THE MOST HYDRAULICALLY REMOTE PART OF EACH ZONE AND SHALL BE IDENTIFIED ON THE SPRINKLER SHOP DRAWINGS.
10. REFER TO NFPA 13 TABLE 8.3.2.5(a) FOR TEMPERATURE RATING OF SPRINKLERS BASED ON DISTANCE FROM HEAT SOURCES SUCH AS HEATING DUCTS, DIFFUSERS AND UNIT HEATERS.

FIRE PROTECTION CRITERIA

1. THE PURPOSE OF THE FIRE PROTECTION DRAWINGS AND SPECIFICATIONS IS TO ESTABLISH THE CRITERIA FOR DESIGN, MATERIALS, AND LOCATIONS OF THE COMPLETE SPRINKLER SYSTEM. THE FIRE PROTECTION SUB-CONTRACTOR IS RESPONSIBLE FOR THE FINAL DESIGN OF THE SPRINKLER SYSTEM AND SAID DESIGN AND INSTALLATION SHALL INCLUDE ALL COMPONENTS TO PROVIDE FOR THE COMPLETE SYSTEM WITHOUT ANY ADDITIONAL EXPENSE TO THE OWNER. THE SUB-CONTRACTOR SHALL VERIFY THAT THE NUMBER OF HEADS SHOWN ON HIS WORKING PLANS AND HYDRAULIC CALCULATIONS ARE ADEQUATE TO PROTECT ALL AREAS OF THE BUILDING AND SHALL INCLUDE ANY COST FOR ADDITIONAL SPRINKLER HEADS AND PIPING NOT SHOWN ON THESE DRAWINGS IN HIS CONTRACT PRICE.
2. THE EXISTING HIGH SCHOOL BUILDING IS PROTECTED WITH AN AUTOMATIC SPRINKLER SYSTEM. THE BUILDING ADDITION IS TO BE 100% SPRINKLERED INCLUDING ALL CLOSETS AND TELEPHONE ROOMS. THE ELECTRIC ROOMS AND EMERGENCY ELECTRIC ROOMS SHALL BE CONSTRUCTED TO MEET THE EXCEPTIONS OF NFPA 13-2013 PARAGRAPH 8.15.11. THE ELEVATOR MACHINE ROOM AND ELEVATOR SHAFT ARE NOT SPRINKLERED.
3. THE BUILDING ADDITION IS GENERALLY MASONRY AND STEEL CONSTRUCTION. THE SPACE SHALL BE PROTECTED THROUGHOUT WITH A WET TYPE SPRINKLER SYSTEM AND THE HEADS LOCATED WHERE SHOWN.
4. CODE REQUIREMENTS:

   BUILDING USE: E - EDUCATIONAL (PRIMARY USE)

   FLOOR AREA: GROUND FLOOR = ---------- S.F. +/-
   FIRST FLOOR = ---------- S.F. +/-
   SECOND FLOOR = ---------- S.F. +/-
   TOTAL = ---------- S.F. +/-

   BUILDING HEIGHT = --'

   CONSTRUCTION = 2B

   CHAPTER 5sf-C 6000 - REQUIRES 1 1/2" HOSE LINES ON EACH SIDE OF THE STAGE WITH HOSE CABINETS.

   REFER TO ARCHITECT'S DRAWINGS FOR ADDITIONAL CODE SUMMARY INFORMATION AND DELINEATION OF FIRE SEPARATIONS.

   REFER TO ELECTRICAL DRAWINGS FOR DETAILS OF THE FIRE ALARM SYSTEM.

5. PROVIDE COMPLETE HYDRAULIC CALCULATIONS AND DISTRIBUTION SYSTEM DESIGN UTILIZING THE DESIGN CRITERIA ESTABLISHED ON THE CONTRACT DOCUMENTS. SYSTEM DESIGN SHALL BE BASED ON FLOW TEST PROVIDED HEREIN. THE TEST WAS CONDUCTED AT ON _____, 2015 BY _____. FLOW HYDRANT IS LOCATED _____, GAGE HYDRANT LOCATED AT _____, ELEVATION OF THE GAGE HYDRANT IS APPROXIMATELY __'

   STATIC PRESSURE = __ PSI
   RESIDUAL PRESSURE __ PSI
   FLOW = _____ GPM
   AVAILABLE FLOW @ 20 PSI = _____ GPM

6. REQUIRED DESIGN FLOWS:

   A. DESIGN HAZARDS:
   1. STAGE AREA = ORDINARY, GROUP 2
   2. TECHNICAL SHOPS = ORDINARY, GROUP 2
   3. AGRICULTURAL FACILITIES = ORDINARY, GROUP 2
   4. HORSE STABLES = ORDINARY, GROUP 2
   5. MECHANICAL ROOMS = ORDINARY, GROUP 1
   6. STORAGE ROOMS = ORDINARY, GROUP 1
   7. KITCHEN COOKING AREA = ORDINARY, GROUP 1
   8. SCIENCE CLASSROOMS = ORDINARY, GROUP 1
   9. AUDITORIUM = LIGHT
   10. CAFETERIA SEATING AREA = LIGHT
   11. ALL OTHER AREAS NOT LISTED = LIGHT
   * REFER TO DRAWINGS INDICATING THE DELINEATIONS.

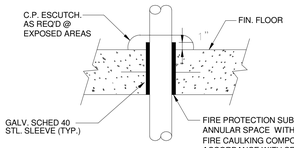
   B. REQUIRED DESIGN DENSITIES:

   1. LIGHT HAZARD AREAS = 0.10 GPM OVER 1,500 S.F.
   2. ORDINARY HAZARD GROUP 1 = 0.15 GPM OVER 1,500 S.F.
   3. ORDINARY HAZARD GROUP 2 = 0.20 GPM OVER 1,500 S.F.

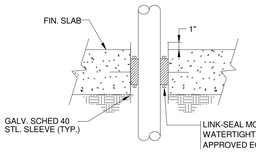
7. SPRINKLER SPACING (MAX.):

   LIGHT HAZARD AREAS = 225 S.F.
   ORDINARY HAZARD AREAS = 130 S.F.

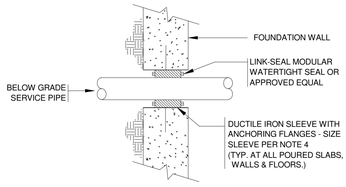
8. FOLLOW THE HEAD LAYOUTS SHOWN ON THE DRAWINGS IN FINISHED AREAS. ALL SPRINKLER HEADS SHALL BE LOCATED DEAD CENTER ON THE CEILING TILE AND SWING JOINTS IF REQUIRED MAY BE USED TO MEET THIS REQUIREMENT.
9. HYDRAULIC CALCULATIONS FOR THE SYSTEM SHALL INCLUDE A 10 PSI CUSHION AND SHALL LIMIT WATER FLOW VELOCITY TO A MAXIMUM OF 20 FT./SEC.



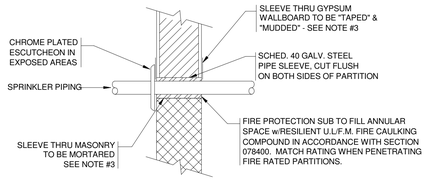
THRU CONC. FLOORS



THRU SLAB ON GRADE



BELOW GRADE

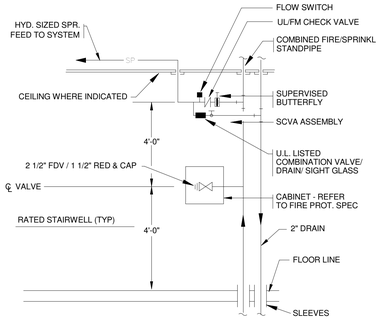


THRU PARTITIONS & WALLS

1 FP0.1 TYPICAL SLEEVE CONDITION DETAILS

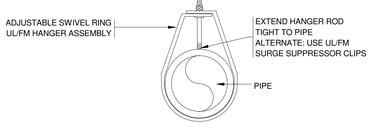
N.T.S.

NOTE:
1. ALL PIPING PENETRATING ALL PARTITIONS, WHETHER FIRE OR SMOKE RATED OR NOT, CONCEALED OR EXPOSED, SHALL BE SLEEVED AS DETAILED.
2. WHERE CONC. WALLS, SLABS, ETC., ARE CORE DRILLED, INSTALL SLEEVE FLUSH WITH BOTH SIDES, CAULKED & LEADED IN PLACE.
3. REFER TO DIVISION 4 & 9 FOR PROCEDURES & METHODS OF PATCHING AROUND SLEEVES AT GYPSUM, PLASTER & MASONRY. REFER TO SPECS FOR DELINEATION OF RESPONSIBILITY
4. SLEEVES SHALL BE SIZED TO PROVIDE MIN. 1" CLEARANCE BETWEEN PIPE O.D. & SLEEVE I.D. FOR PIPING UP TO 3" IN SIZE. PROVIDE 2" CLEARANCE BETWEEN PIPE O.D. & SLEEVE I.D. FOR PIPING 4" IN SIZE AND GREATER.



3 FP0.1 SPRINKLER CONTROL VALVE ASSEMBLY (SCVA) DETAIL

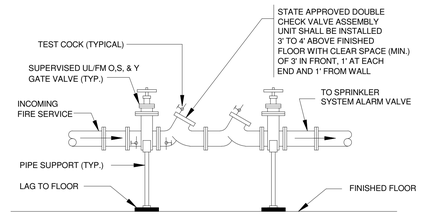
SCALE: N.T.S.



4 FP0.1 TYPICAL END-OF-LINE BRANCH PIPE HANGER DETAIL

N.T.S.

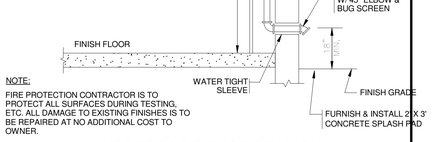
NOTE: TO BE USED AT ALL END-OF-LINE BRANCH HANGERS THROUGHOUT PROJECT



2 FP0.1 DOUBLE CHECK VALVE ASSEMBLY (DCVA) DETAIL

N.T.S.

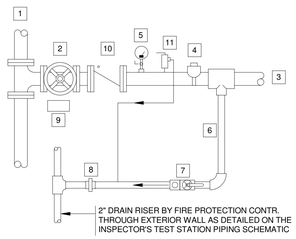
NOTES:
1. SUPPORT PIPING AND FITTINGS AS REQUIRED TO CONFORM TO MANUFACTURERS AND OR CODE REQUIREMENTS.
2. MATERIALS AND METHODS FOR THIS INSTALLATION SHALL CONFORM TO ALL STATE & U.S. PUBLIC HEALTH SERVICES CODES AND REGULATIONS
3. FILE FOR AND OBTAIN ALL REQUIRED APPROVALS & PERMITS PRIOR TO INSTALLATION



NOTE:
FIRE PROTECTION CONTRACTOR IS TO PROTECT ALL SURFACES DURING TESTING, ETC. ALL DAMAGE TO EXISTING FINISHES IS TO BE REPAIRED AT NO ADDITIONAL COST TO OWNER.

5 FP0.1 INSPECTOR'S TEST STATION PIPING SCHEMATIC

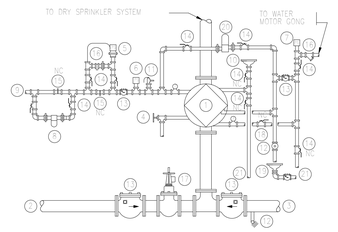
N.T.S.



1	COMBINATION F/SP. STANDPIPE	7	U.L. LISTED COMBINATION TEST DRAIN, AUX. DRAIN, AND SIGHT GLASS
2	UL/FM INDICATING TYPE CONTROL VALVE	8	UNION
3	TO SPRINKLER SYSTEM	9	IDENTIFICATION SIGN
4	WATERFLOW SWITCH	10	UL/FM CHECK VALVE
5	PRESSURE GAUGE WITH COCK	11	3/4" RELIEF VALVE PROVIDE ON ASSEMBLIES WITH PRESSURE REDUCING & CHECK VALVES
6	1" DRAIN LINE		

6 FP0.1 SPRINKLER CONTROL VALVE DETAIL ASSEMBLY (SCVA) DETAIL

N.T.S.



1 DRY PIPE VALVE
2 FIRE LINE SUPPLY
3 FIRE DEPT CONNECTION SUPPLY
4 2" DRAIN VALVE
5 COMPRESSOR PRESSURE SWITCH
6 HIGH-LOW PRESSURE SWITCH TROUBLE ALARM
7 FIRE ALARM PRESSURE SWITCH
8 AIR DRYER
9 AIR SUPPLY FROM COMPRESSOR
10 PRIMER FILL CUP
11 PRESSURE RELIEF VALVE
12 BALL DRIP
13 CHECK VALVE
14 BALL OR GATE VALVE
15 NORMALLY CLOSED BY-PASS
16 STRAINER
17 TAMPER ALARM SWITCH
18 INSPECTORS TEST VALVE
19 DRIP CUP
20 ACCELERATOR
21 SPILL INTO DRAIN

7 FP0.1 DRY PIPE VALVE WITH ACCELERATOR PIPING SCHEMATIC

N.T.S.

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Dover HS / CTC
Dover, NH

LEGEND, NOTES AND DETAILS - FIRE PROTECTION

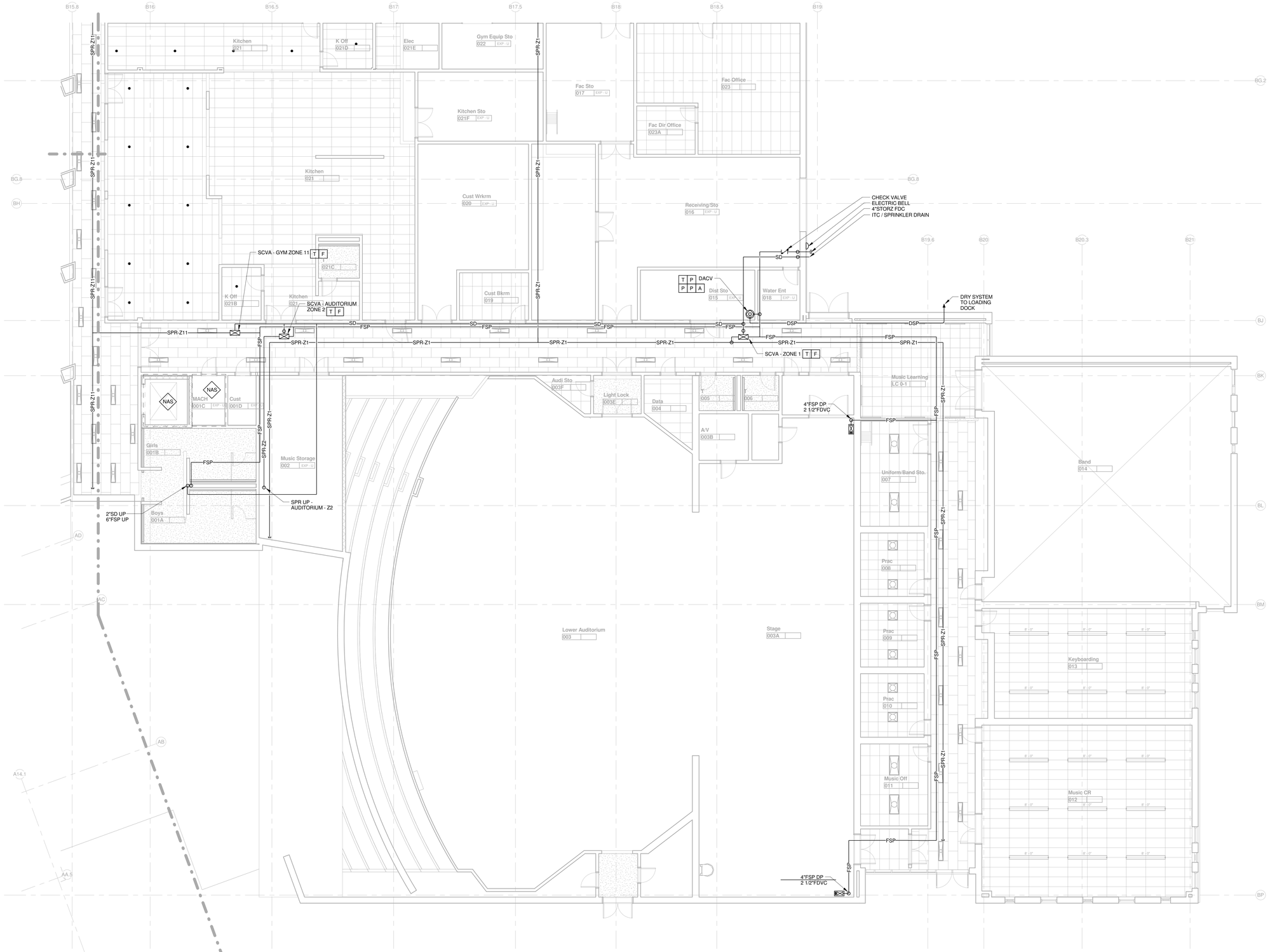
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SCALE:

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FP01

JOB NUMBER 403114

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1 FP1.1A GROUND LEVEL PLAN PART A - FIRE PROTECTION
1/8" = 1'-0"

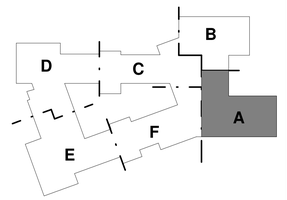
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KEYPLAN

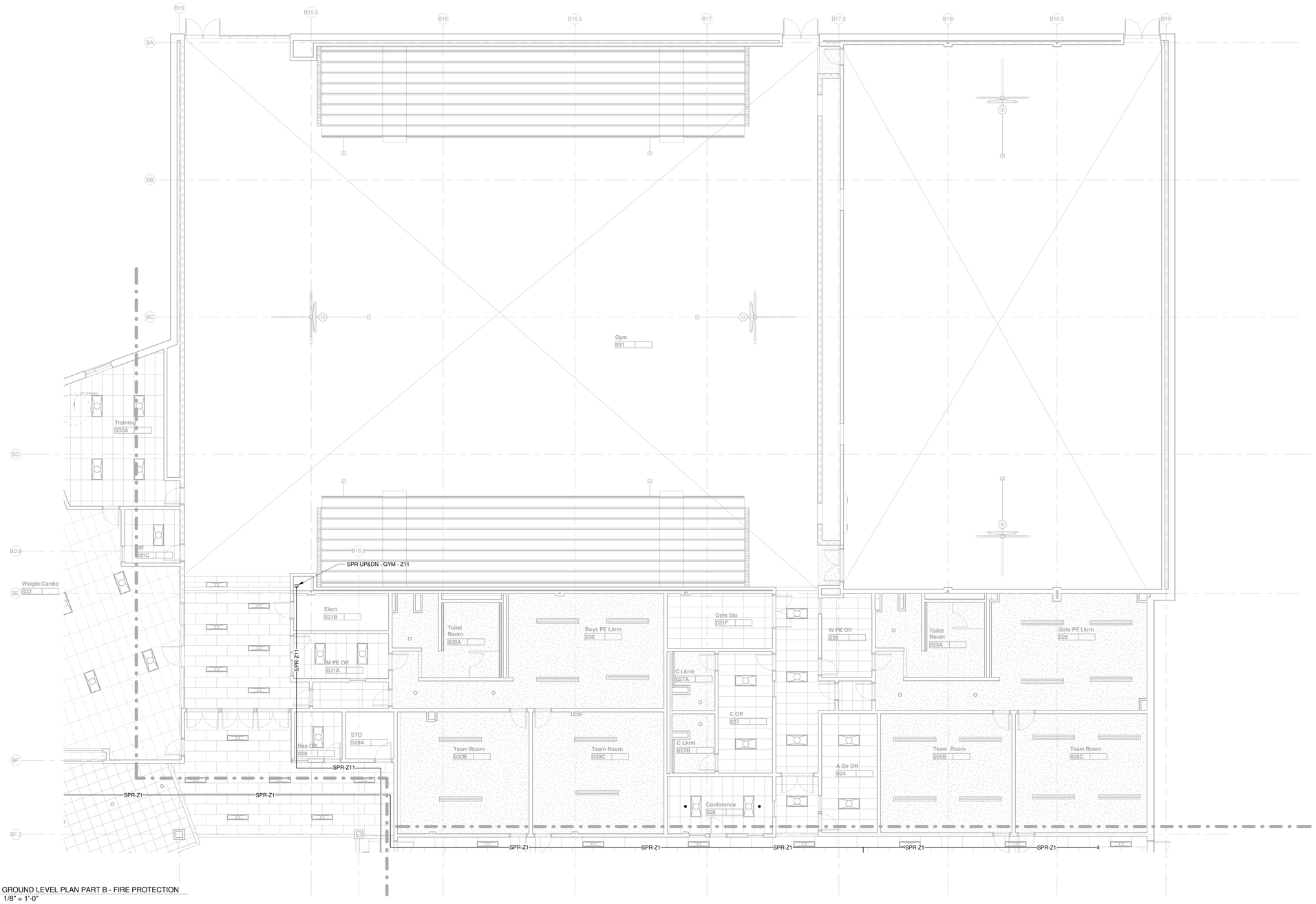


Dover HS / CTC
Dover, NH
GROUND FLOOR PLAN PART A
FIRE PROTECTION
SCALE: 1/8" = 1'-0" DRAWN BY: RSN CHECKED BY: CMG

DRAWING NUMBER
FP1.1A

JOB NUMBER 403114

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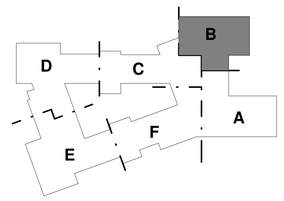
1 FP1.1B GROUND LEVEL PLAN PART B - FIRE PROTECTION
1/8" = 1'-0"

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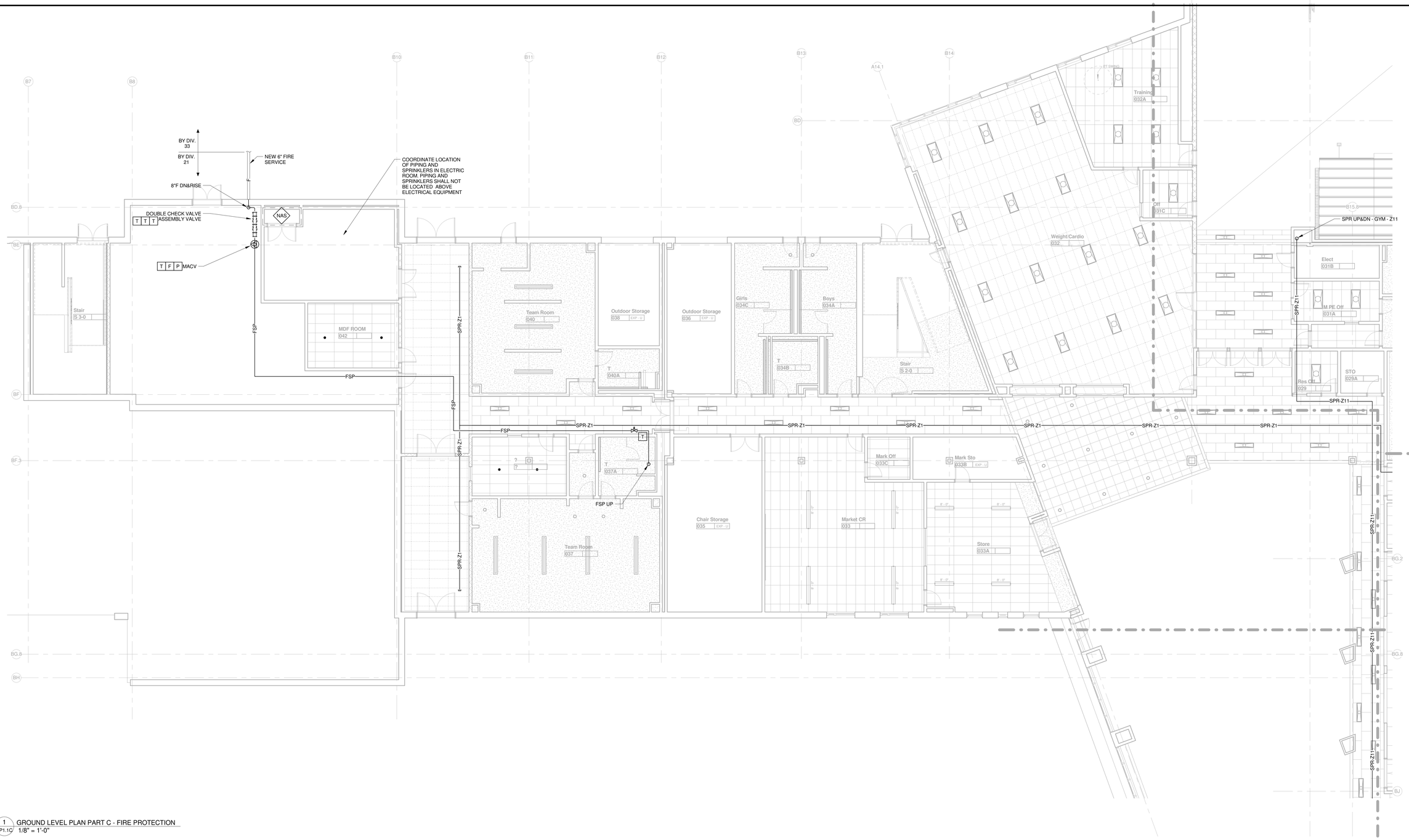
Dover HS / CTC
Dover, NH
GROUND FLOOR PLAN PART B
FIRE PROTECTION
SCALE: 1/8" = 1'-0"
DRAWN BY: RSN
CHECKED BY: CMG

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JOB NUMBER 403114

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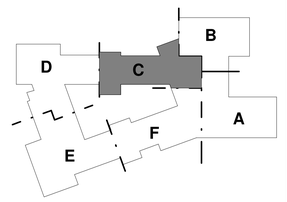
1 FP1.1C GROUND LEVEL PLAN PART C - FIRE PROTECTION
1/8" = 1'-0"

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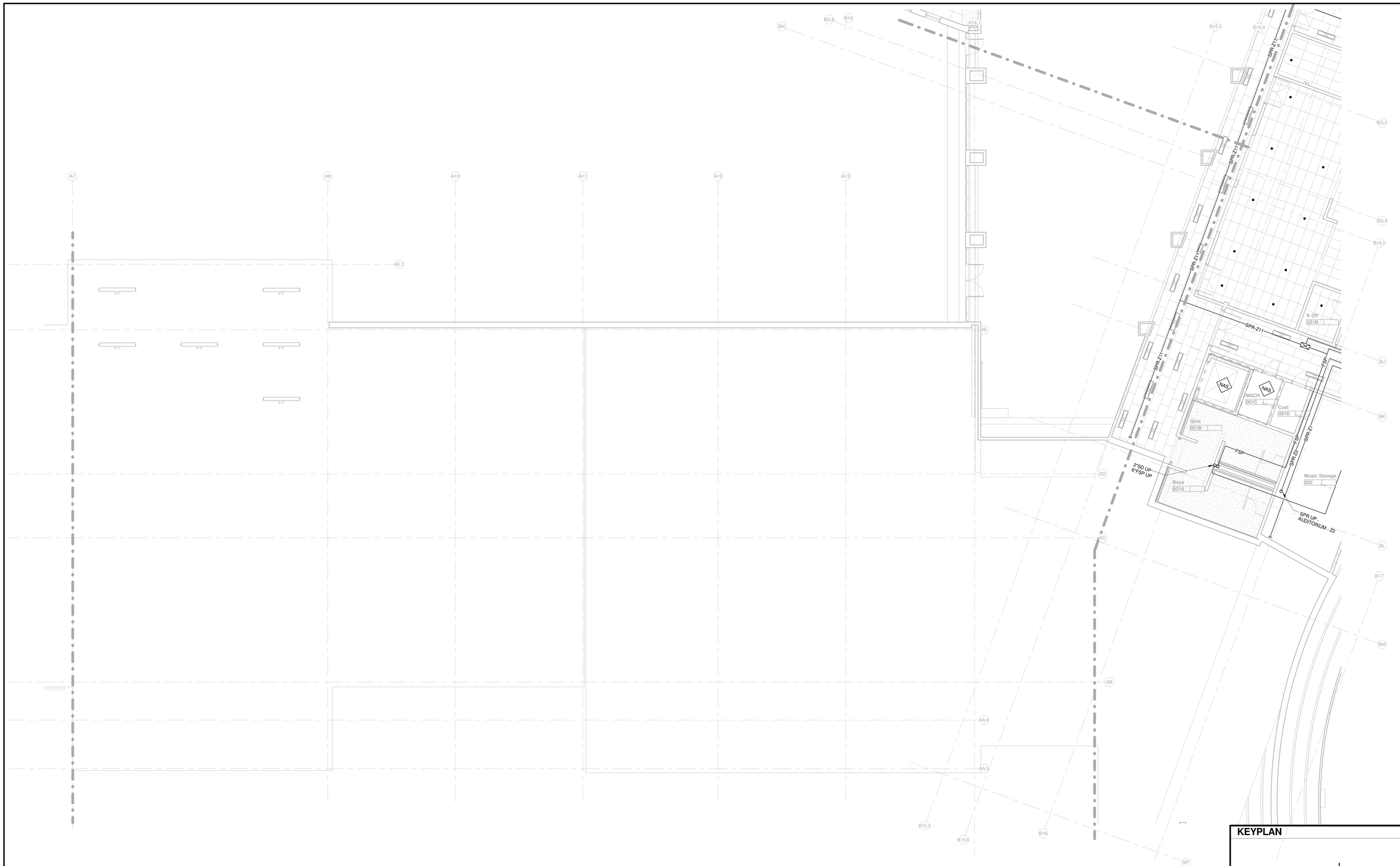
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Dover, NH
GROUND FLOOR PLAN PART C
FIRE PROTECTION
SCALE: 1/8" = 1'-0" DRAWN BY: RSN CHECKED BY: CMG

DRAWING NUMBER
FP1.1C

JOB NUMBER 403114

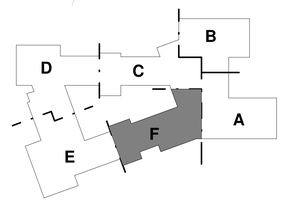
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1 FP1.1F GROUND LEVEL PLAN PART F - FIRE PROTECTION
1/8" = 1'-0"

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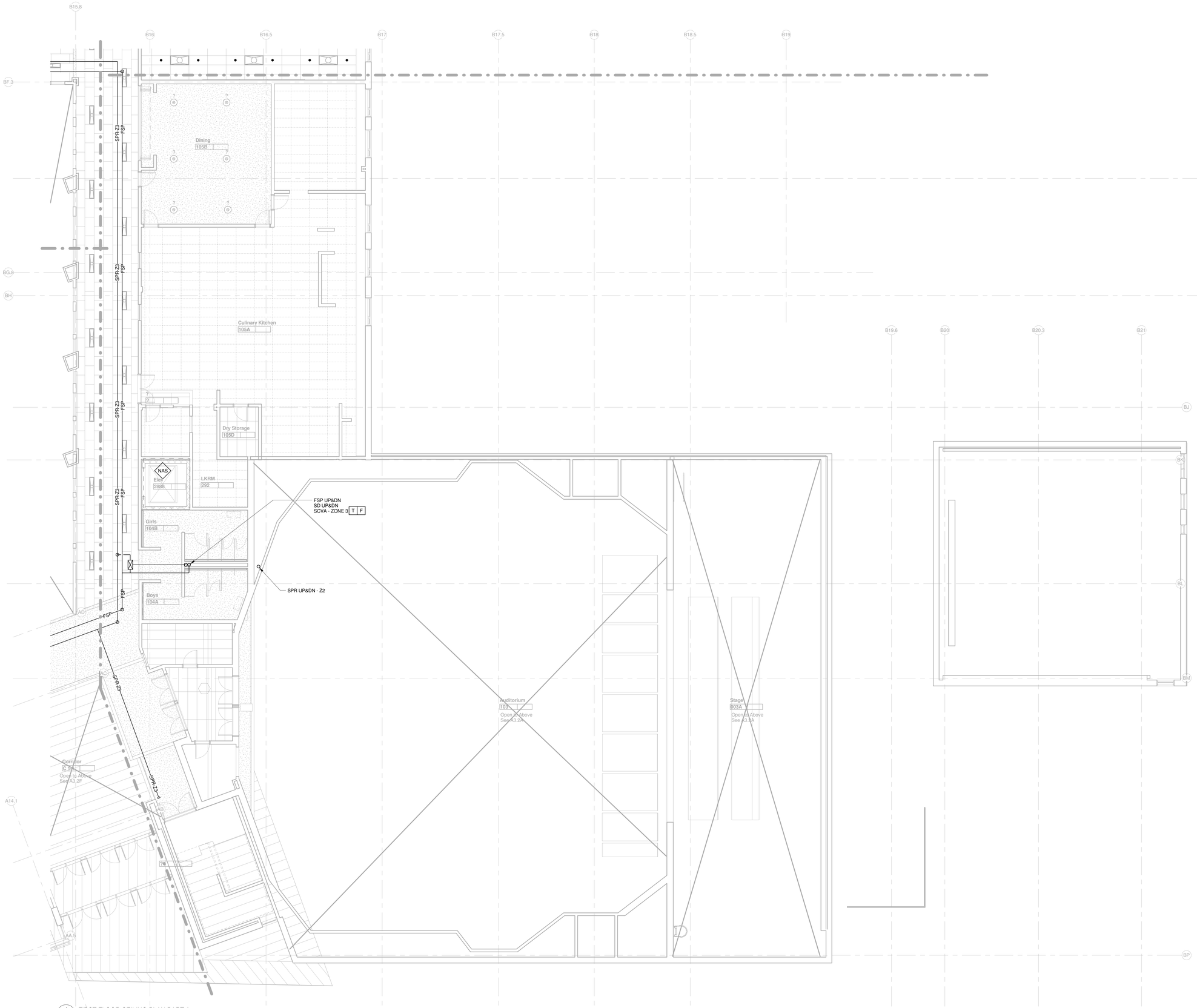
Dover HS / CTC
Dover, NH
GROUND FLOOR PLAN PART F FIRE PROTECTION
SCALE: 1/8" = 1'-0" DRAWN BY: RSN CHECKED BY: CMG

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JOB NUMBER 403114

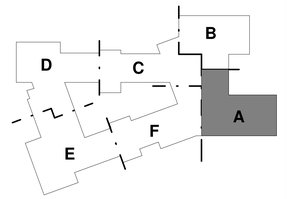
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1 FP2.1A FIRST FLOOR CEILING PLAN PART A
1/8" = 1'-0"

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1ST FLOOR CEILING PLAN PART A
FIRE PROTECTION

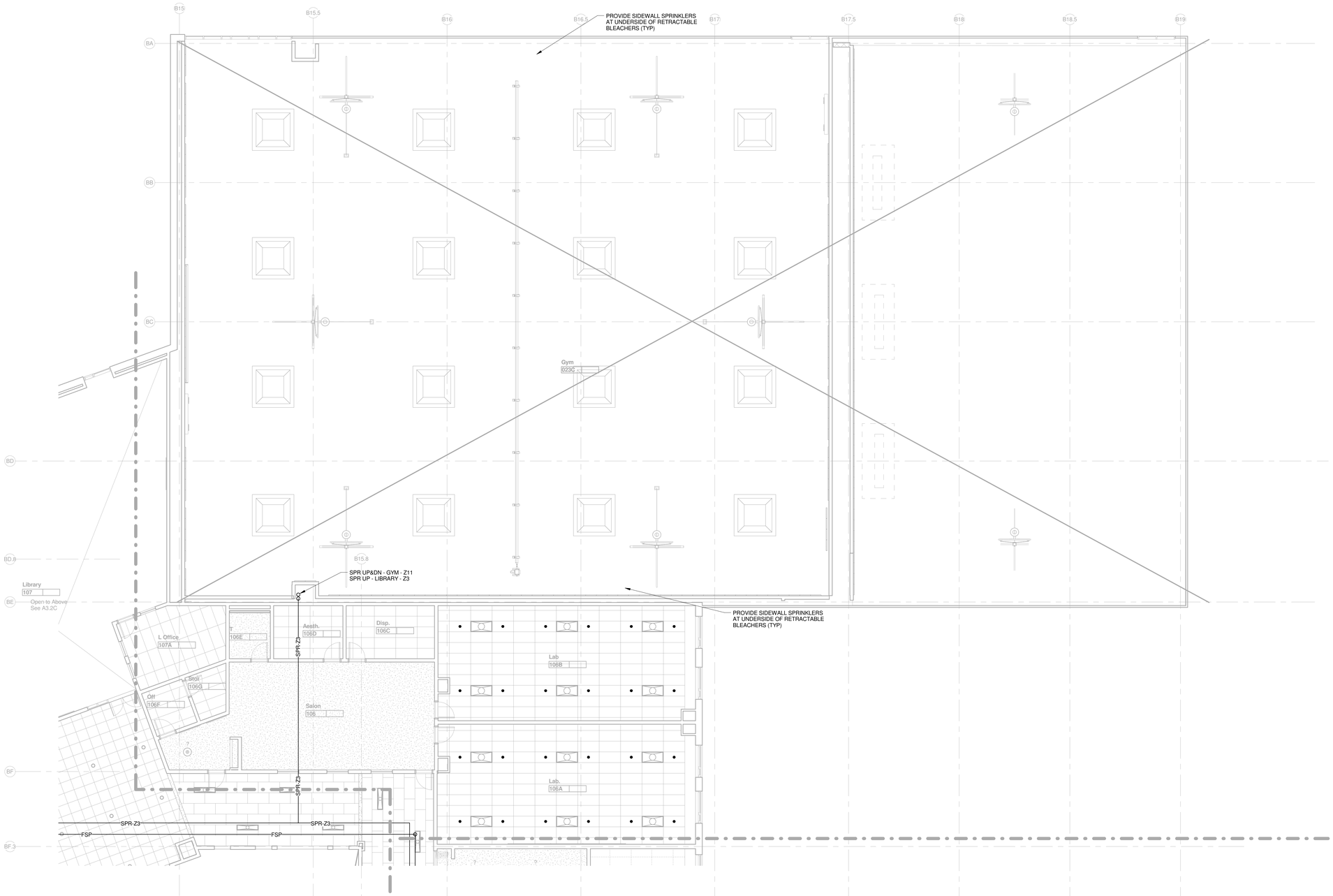
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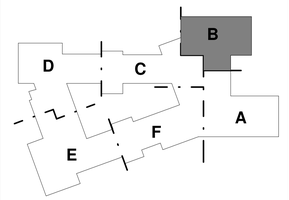
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1 FP2.1B FIRST FLOOR CEILING PLAN PART B
1/8" = 1'-0"

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1ST FLOOR CEILING PLAN PART B
FIRE PROTECTION
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SD / ITC 18" ABOVE GRADE
SPILL TO CONCRETE
SPLASH BLOCK

SD DP
ITC / SPRINKLER DRAIN

SPR UP&DN - GYM - Z11
SPR UP - LIBRARY - Z3

NJROTC March 117
OFF 117B
NJROTC STOR 117A
NJROTC CR 115 SLOPE
LKRM 113B
LKRM 113A
NJROTC CR 113 SLOPE
CR 111 SLOPE
ELEC 109B
DATA 109A
Stair S 2-1
Library 107
Open to Above
See A3.2C
L Office 107A
T 106E
Aesth. 106D
Disp. 106C
L Shop 106G
Off 106F
Salon 106

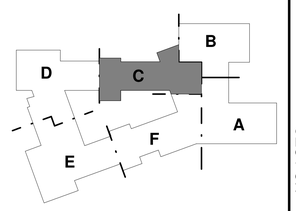
SPR-Z6
SPR-Z3
FSP
SD
FSP DN&RISE
SCVA - ZONE 6
FSP UP
SD UP

Speech 116A
TEST 114
PAX 110
Off 108L
Guid Off 6 108G
Wrkrm 108E
Guid Conf 108C
Dir. Office 112A
SPED Resources 112
Stor 108K EXP - U
Guidance 108
Living Room 116B
Life Skills 116
Conf 112B
Guid Off 5 108J
Guid Off 4 108H
Guid Off 3 108F
Guid Off 2 108D
Guid Off 1 108B
Guid Dir 108A
Bedroom 116C

Open to Above
See A3.2C & F

1 FP2.1C FIRST FLOOR CEILING PLAN PART C
1/8" = 1'-0"

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Dover, NH
1ST FLOOR CEILING PLAN PART C
FIRE PROTECTION
SCALE: 1/8" = 1'-0" DRAWN BY: RSN CHECKED BY: CMG

DRAWING NUMBER
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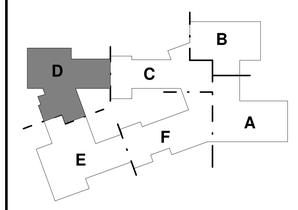
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SCIRNCE ROOMS	
ZONE 1	WET
ORDINARY HAZARD 1	
0.15 GPM	1500 SQ.FT.
150 GPM	130 SQ.FT.
REMARKS:	

1 FP2.1D FIRST FLOOR CEILING PLAN PART D
1/8" = 1'-0"

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1ST FLOOR CEILING PLAN PART D
FIRE PROTECTION

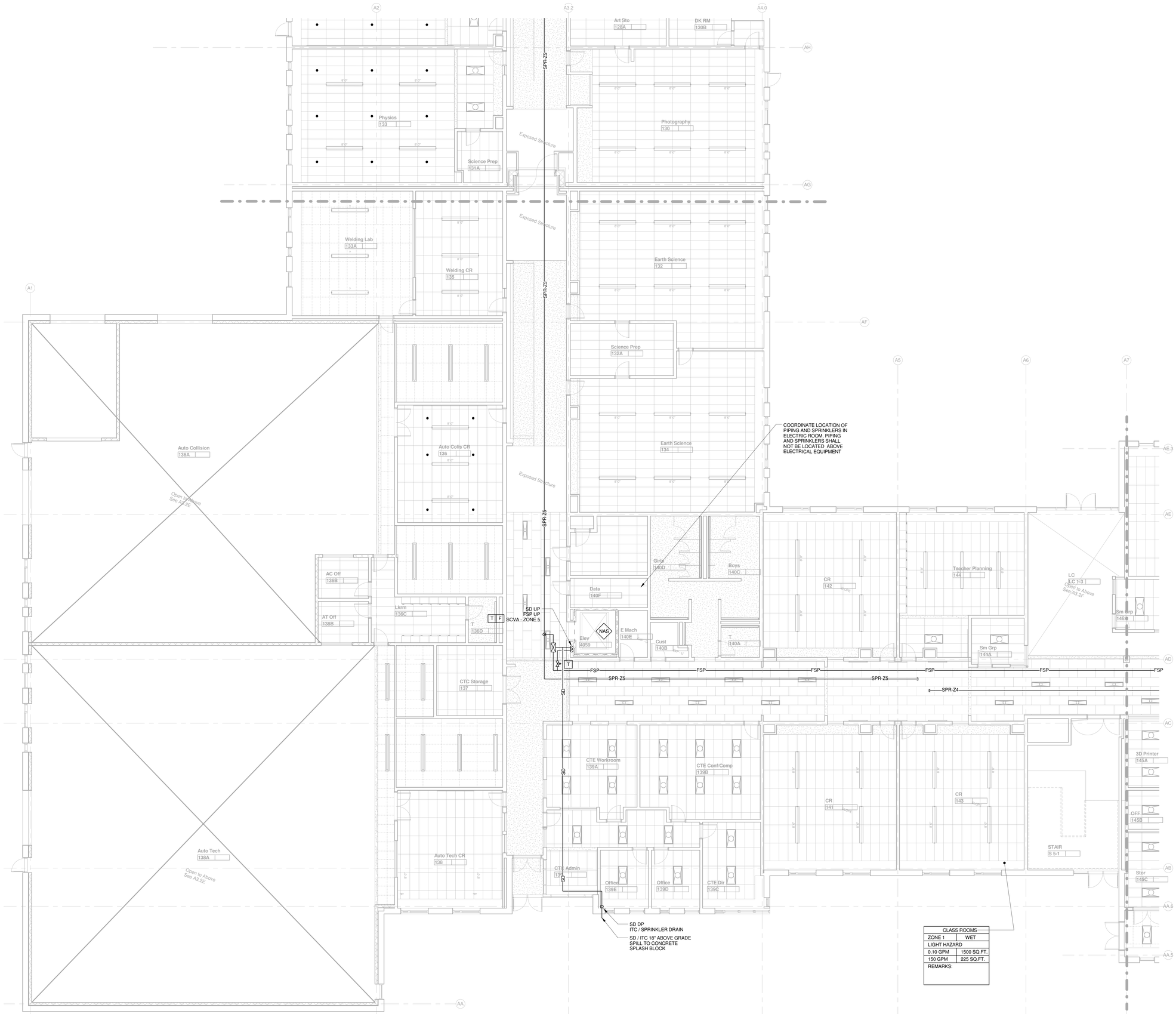
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JOB NUMBER 403114

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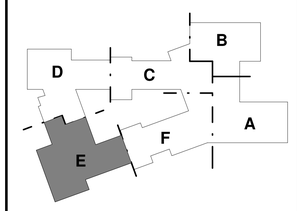
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CLASS ROOMS	
ZONE 1	WET
LIGHT HAZARD	
0.10 GPM	1500 SQ.FT.
150 GPM	225 SQ.FT.
REMARKS:	

1 / FP2.1E FIRST FLOOR CEILING PLAN PART E
1/8" = 1'-0"

KEYPLAN



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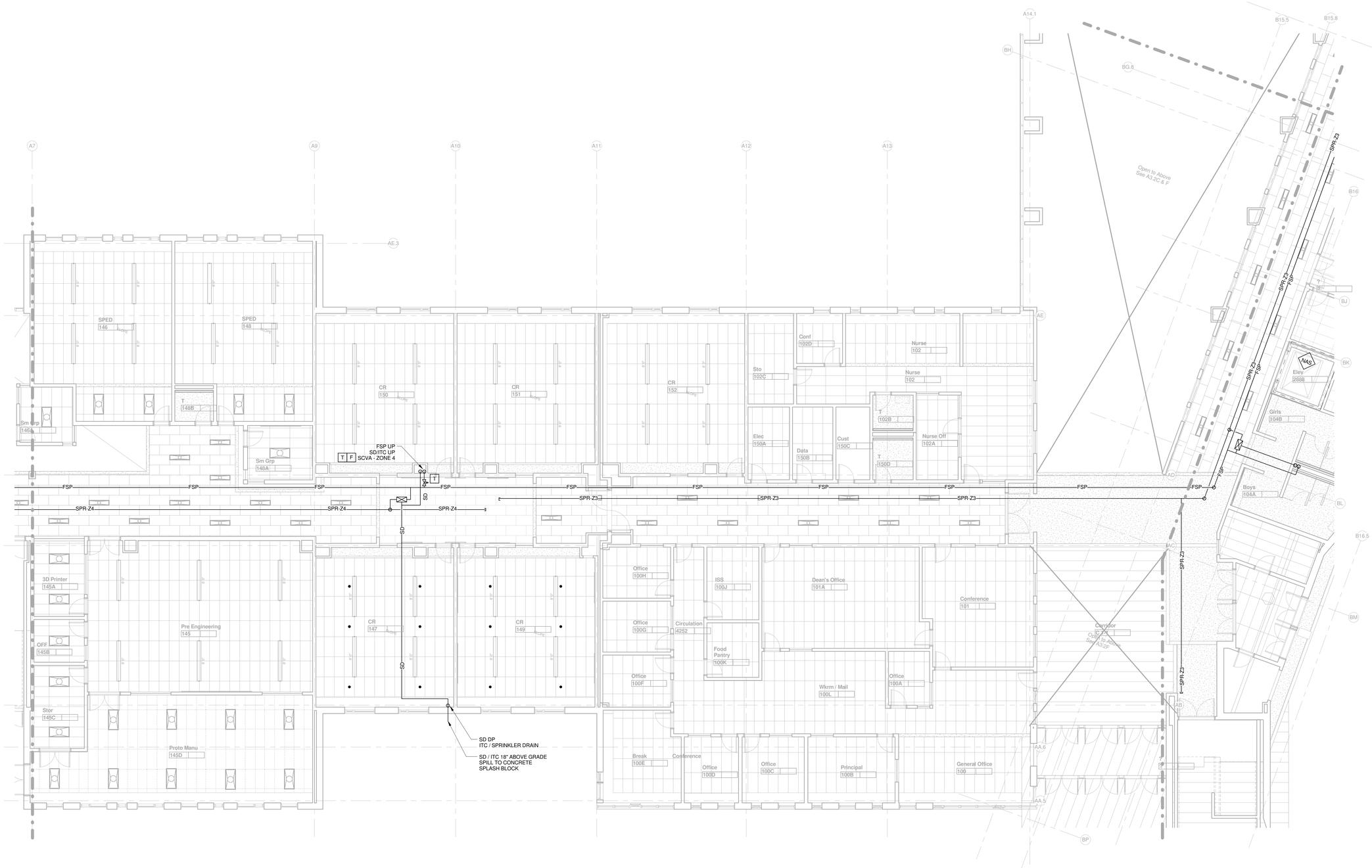
Dover HS / CTC
Dover, NH
1ST FLOOR CEILING PLAN PART E
FIRE PROTECTION
SCALE: 1/8" = 1'-0" DRAWN BY: RSN CHECKED BY: CMG

DRAWING NUMBER
FP2.1E

JOB NUMBER 403114

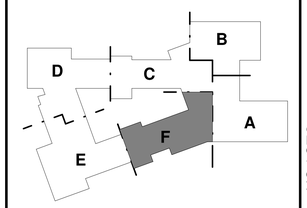
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1 FP2.1F FIRST FLOOR CEILING PLAN PART F
1/8" = 1'-0"

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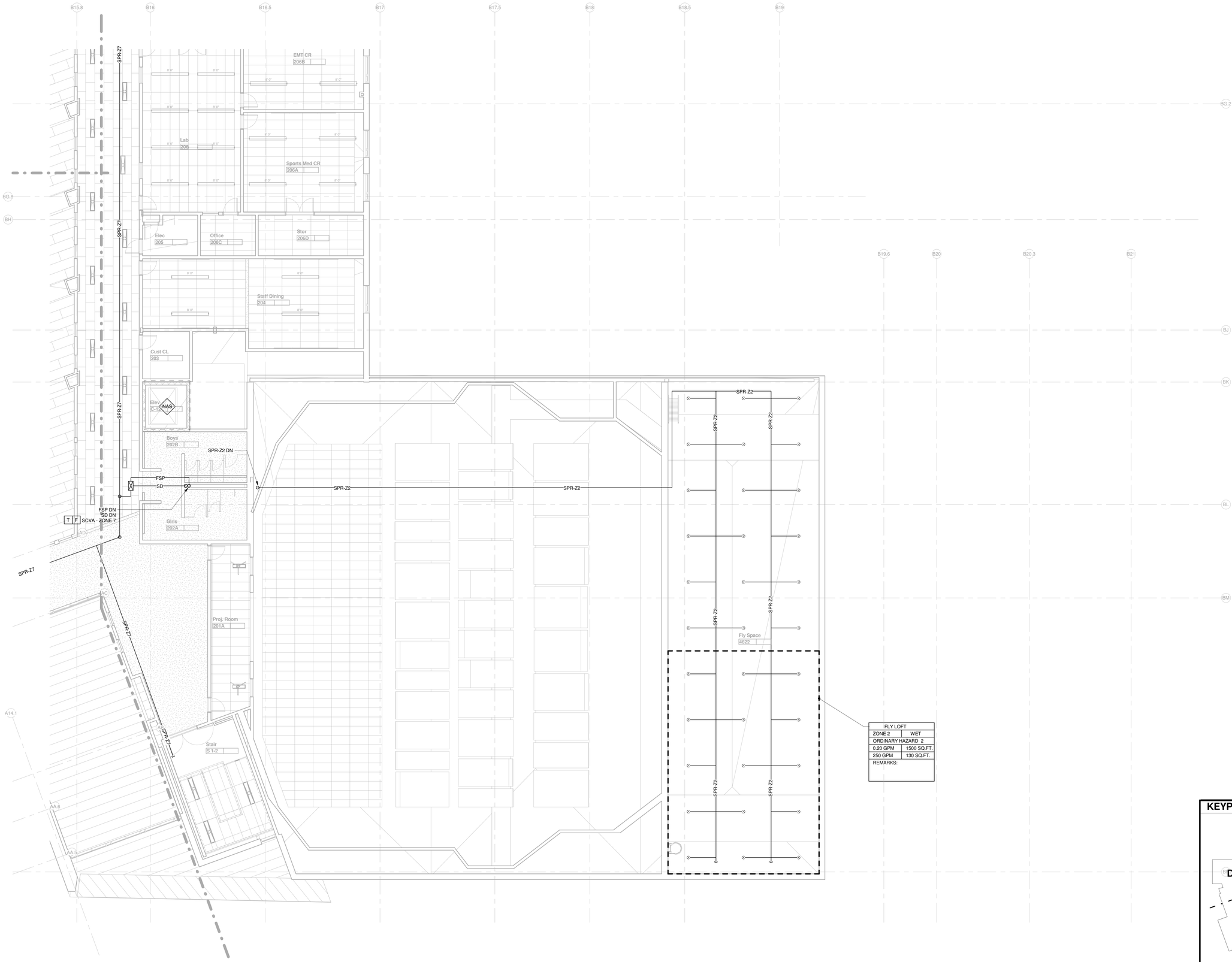
Dover HS / CTC
Dover, NH
1ST FLOOR CEILING PLAN PART F
FIRE PROTECTION
SCALE: 1/8" = 1'-0" DRAWN BY: RSN CHECKED BY: CMG

DRAWING NUMBER
FP2.1F

JOB NUMBER 403114

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1 FP2.2A SECOND FLOOR CEILING PLAN PART A
1/8" = 1'-0"

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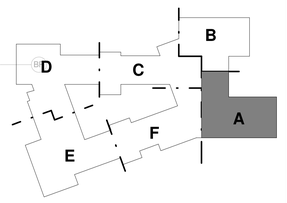
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KEYPLAN



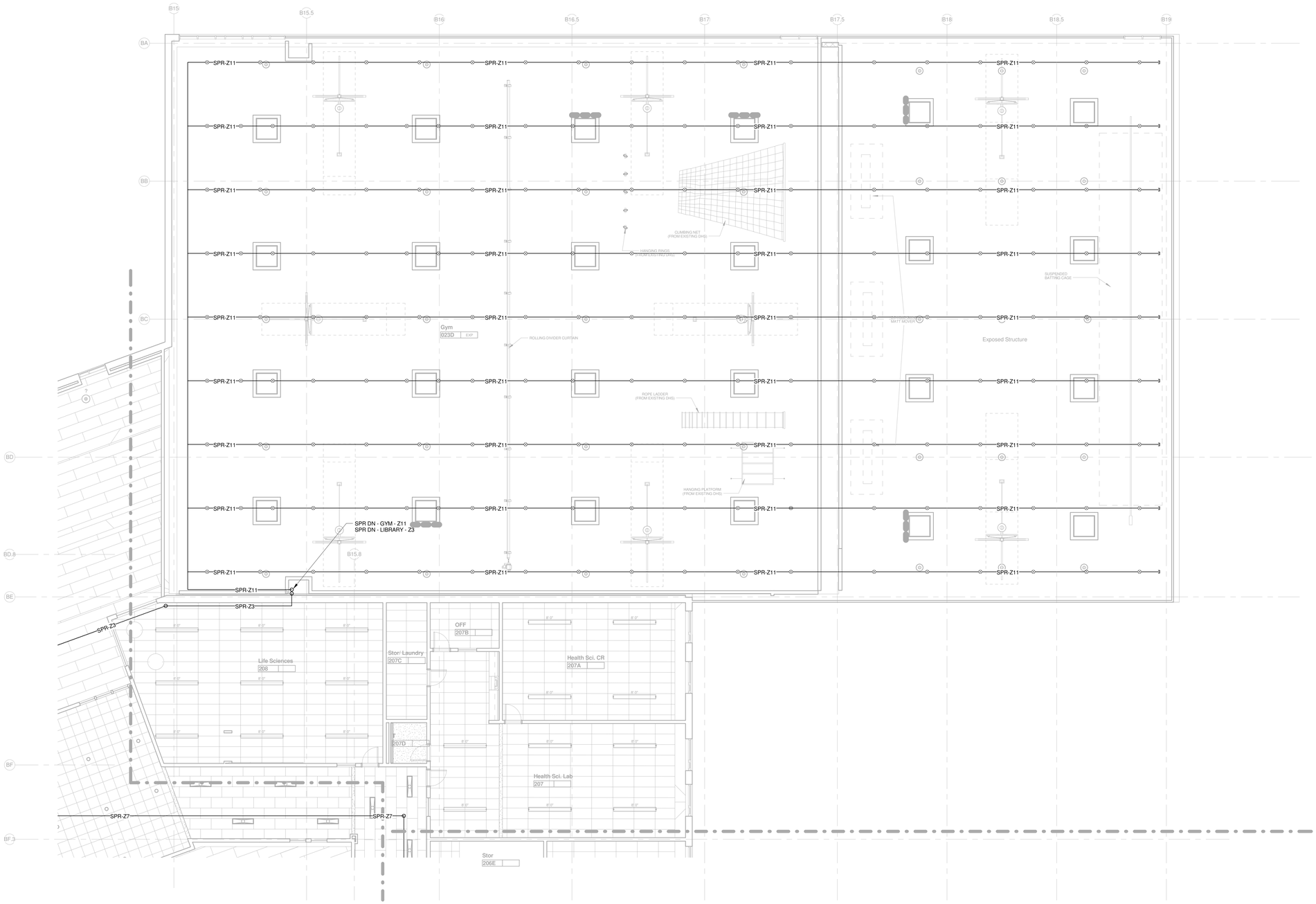
Dover HS / CTC
Dover, NH

2ND FLOOR CEILING PLAN PART A
FIRE PROTECTION

SCALE: 1/8" = 1'-0" DRAWN BY: RDN CHECKED BY: CMG

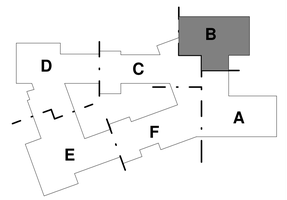
DRAWING NUMBER
FP2.2A

JOB NUMBER 403114



1 FP2.2B SECOND FLOOR CEILING PLAN PART B
1/8" = 1'-0"

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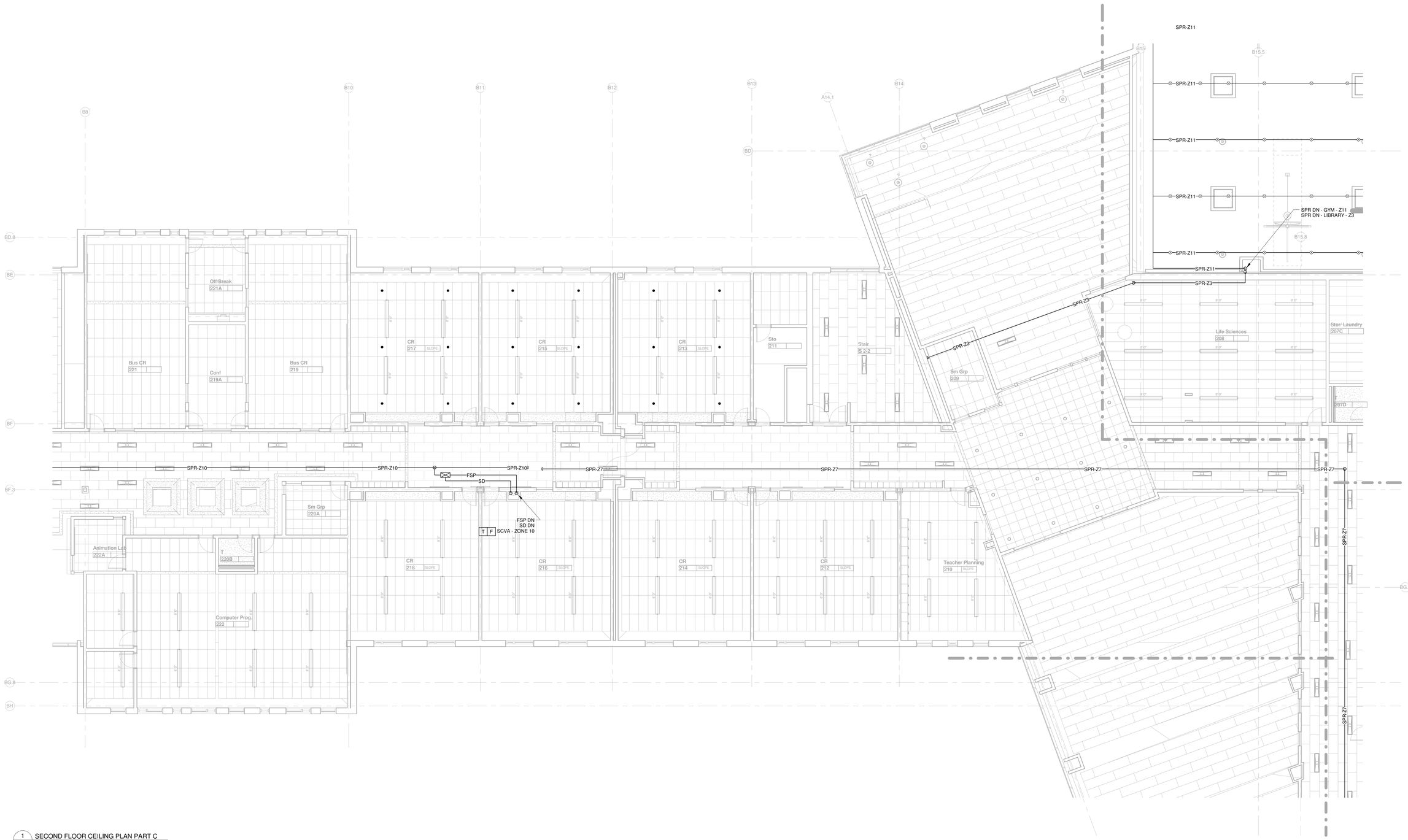
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JOB NUMBER 403114

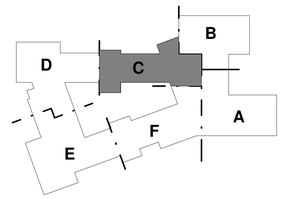
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1 FP2.2C SECOND FLOOR CEILING PLAN PART C
1/8" = 1'-0"

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2ND FLOOR CEILING PLAN PART C
FIRE PROTECTION
SCALE: 1/8" = 1'-0" DRAWN BY: RSN CHECKED BY: CMG

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1 FP2.2D SECOND FLOOR CEILING PLAN PART D
1/8" = 1'-0"

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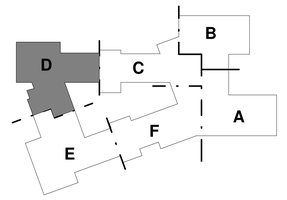
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2ND FLOOR CEILING PLAN PART D
FIRE PROTECTION
SCALE: 1/8" = 1'-0"
DRAWN BY: RSN
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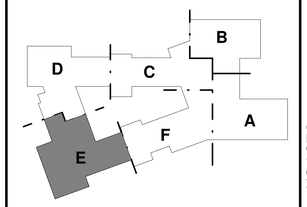
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FP2.2D

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1 FP2.2E SECOND FLOOR CEILING PLAN PART E
1/8" = 1'-0"

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2ND FLOOR CEILING PLAN PART E
FIRE PROTECTION

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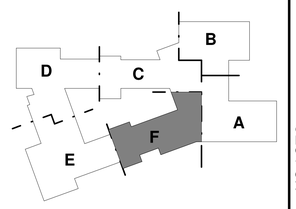
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1 FP2.2F SECOND FLOOR CEILING PLAN PART F
1/8" = 1'-0"

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2ND FLOOR CEILING PLAN PART F
FIRE PROTECTION
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FP2.2F

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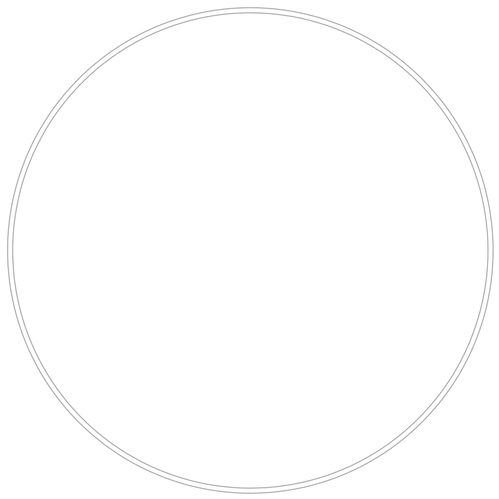
GARCIA GALLUSKA DESOUSA
CONSULTING ENGINEERS
Fire Protection Engineering
500 - 108 1212 - 710 - 730 - 1000 E. Main Ave. Suite 204 Morgantown, WV 26501

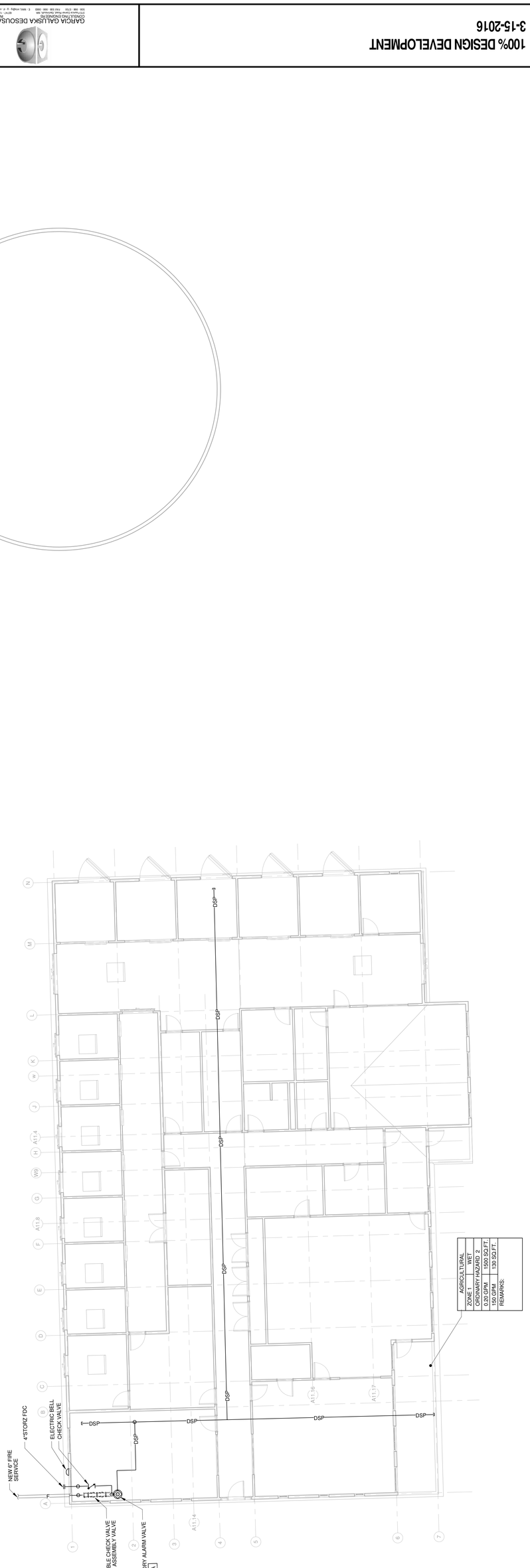
100% DESIGN DEVELOPMENT
3-15-2016

SCALE: 1/8" = 1'-0" DRAWN BY: Author CHECKED BY: Checker

Dover HS / CTC
Dover, NH
1ST FLOOR CEILING PLAN ANIMAL SCIENCE FIRE PROTECTION

DRAWING NUMBER FP3.1
JOB NUMBER 400114





1 FP3.1 FIRST FLOOR CEILING PLAN ANIMAL SCIENCE
1/8" = 1'-0"

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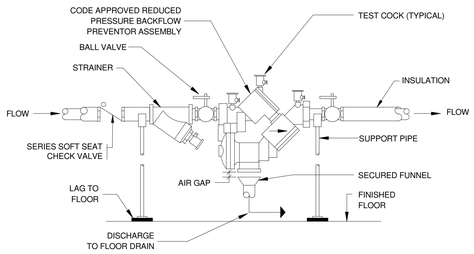
LEGEND

SYMBOL	ABBREV	DESCRIPTION
	NEW	NEW WORK (DARK)
	EX	EXISTING WORK (LIGHT)
	S/W	SOIL/WASTE ABV. GRADE
	S/W	SOIL/WASTE UNDERGROUND
	V	VENT ABV. GRADE
	V	VENT UNDERGROUND
AW	AW	ACID WASTE ABV. GRADE
AW	AW	ACID WASTE UNDERGROUND
AV	AV	ACID VENT ABV. GRADE
AV	AV	ACID VENT UNDERGROUND
KW	KW	KITCHEN WASTE ABV. GROUND
KW	KW	KITCHEN WASTE UNDERGROUND
KV	KV	KITCHEN VENT ABV. GRADE
KV	KV	KITCHEN VENT UNDERGROUND
IW	IW	INDIRECT WASTE
	RL	RAIN LEADER ABV. GRADE
	RL	RAIN LEADER UNDERGROUND
SSD	SSD	SUB-SOIL DRAIN
FD	FD	FOOTING DRAIN
	CW	COLD WATER
	HW	HOT WATER
	HWR	HOT WATER RETURN
140°	HW 140°	HOT WATER 140°F
140°	HWR 140°	HOT WATER RETURN 140°F
CA	CA	COMPRESSED AIR
G	G	FUEL GAS PIPING
HPG	HPG	HIGH PRESSURE GAS PIPING
NPCW	NPCW	NON-POTABLE COLD WATER
NPHW	NPHW	NON-POTABLE HOT WATER
NPHWR	NPHWR	NON-POTABLE HOT WATER RETURN
	DP,DN	PIPE DROP OR DOWN
	UP	PIPE RISE OR UP
		TEE LOOKING DOWN
		CAP ON END OF PIPE
RD AD	RD AD	FLOOR DRAIN, ROOF DRAIN, AREA DRAIN
		STRAINER
		UNION
	CO	CLEANOUT
	DCO	DANDY CLEANOUT
	FCO	FLOOR CLEANOUT
	PG/TG	PRESSURE GAGE/TEMPERATURE GAGE
	SA	SHOCK ABSORBER
		BALANCING VALVE
	BV	BALL VALVE
	CV	CHECK VALVE
		GAS COCK
		GAS PRESSURE REGULATOR
		SOLENOID VALVE
	GV	GATE VALVE
	PRV	PRESSURE REDUCING VALVE
		BUTTERFLY VALVE
		GAS COCK LUBRICATED
		GLOBE VALVE
	VOV	VALVE ON VERTICAL
	PT	P-TRAP
	S&W	STOP & WASTE VALVE
	EL	EXPANSION LOOP
		PIPE GUIDE
		PIPE ANCHOR
		FLOW IN DIRECTION OF ARROW
	HB/WH	HOSE BIBB/WALL HYDRANT
	EX	EXISTING
	CTE	CONNECT TO EXISTING
	ETR	EXISTING TO REMAIN
	TYP.	TYPICAL
	AC	CONCEALED ABOVE CEILING
	ACB	CONCEALED ABOVE CEILING BELOW
	@C	EXPOSED AT CEILING
	@CB	EXPOSED AT CEILING BELOW
	FFE	FINISHED FLOOR ELEVATION
	INV	INVERT ELEVATION
	VTR	VENT THRU ROOF
	AVTR	ACID VENT THRU ROOF
	AP	ACCESS PANEL
	AFF	ABOVE FINISHED FLOOR
	AFG	ABOVE FINISHED GRADE
	FG	FINISHED GRADE
	CI	CAST IRON
	CP	CHROME PLATED
	UC	UNDER COUNTER
	F&I	FURNISH AND INSTALL
	PC	PLUMBING CONTRACTOR
	FPC	FIRE PROTECTION CONTRACTOR
	GC	GENERAL CONTRACTOR
	HVAC	HEAT, VENT & AIR COND. CONTRACTOR
	DCVA	DOUBLE CHECK VALVE ASSEMBLY
	RPBP	REDUCED PRESSURE BACKFLOW PREVENTOR
	STK	STACK
	STP	STANDPIPE
	EXP	EXPOSED
	FBO	FURNISHED BY OTHERS
	O2ZV	OXYGEN ZONE VALVE
	VZV	VACUUM ZONE VALVE
	N2OZV	NITROUS OXIDE ZONE VALVE
	MAZV	MEDICAL AIR ZONE VALVE
	MGCV	MASTER FUEL GAS CONTROL VALVE
	ORD	OVERFLOW ROOF DRAIN
	ORL	OVERFLOW RAIN LEADER
	CR	CLASSROOM

NOTE: NOT ALL SYMBOLS LISTED ARE APPLICABLE TO THIS PROJECT

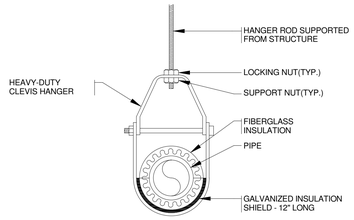
GENERAL NOTES

1. THE PLUMBING DRAWINGS ARE DIAGRAMMATIC AND ARE TO BE USED FOR THE PURPOSE OF ESTABLISHING GENERAL LOCATIONS OF PIPING RUNS, SIZES OF PIPING, AND QUANTITIES OF FIXTURES AND EQUIPMENT TO BE FURNISHED HEREIN. REFER TO ARCHITECTURAL DRAWINGS FOR DIMENSIONS FOR EXACT LOCATIONS OF ALL PLUMBING FIXTURES, AND EQUIPMENT, INCLUDING FLOOR DRAINS, AND MOUNTING HEIGHTS. IN THE EVENT OF CONFLICT OR IF DIMENSIONS ARE NOT SHOWN, OBTAIN FIELD DIRECTIVE FROM THE ARCHITECT AS TO THE LOCATIONS OF ALL VISIBLE EQUIPMENT. PAY PARTICULAR CARE TO COORDINATE WITH THE ARCHITECT'S FIELD REPRESENTATIVE ALL FLOOR DRAIN AND FLOOR CLEANOUT LOCATIONS.
2. ALL PIPING SHOWN ON PLUMBING PLANS SHALL BE RUN CONCEALED ABOVE SUSPENDED CEILINGS, IN CHASES, OR IN PARTITIONS UNLESS SPECIFICALLY NOTED OTHERWISE.
3. INSTALL ALL NEW VALVES SO AS TO BE EASILY ACCESSIBLE AND OPERABLE.
4. THE PLUMBING DRAWINGS ARE INTENDED TO INDICATE THE SIZING AND DESIGN FOR THE MAIN SUPPLY AND WASTE PIPING AND FOCUSES ON RUNS AND SIZES OF THE MAIN RISERS, STACKS AND VENT TERMINATION. IT IS NOT INTENDED TO INDICATE EVERY TRAP AND FIXTURE CONNECTION. PARTICULARLY IN THE CASE OF GANG TOILETS AND SCIENCE CLASSROOM CASEWORK. CONTRACTOR IS REQUIRED TO PROVIDE ALL CONNECTIONS, TO MAKE ALL CONNECTIONS TO ALL DRAINS AND FIXTURES WHICH ARE SHOWN AND SCHEDULED ON THE PLUMBING DRAWINGS.



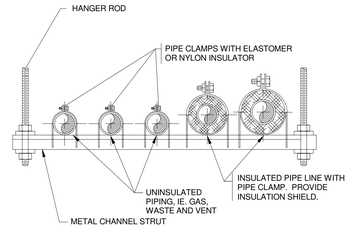
1 P0.1 **REDUCED PRESSURE BACKFLOW PREVENTOR ASSEMBLY(R.P.B.P.)**
N.T.S.

NOTES:
1. LOCATE BACKFLOW PREVENTOR 3' TO 4' ABOVE FINISHED FLOOR, 1' FROM WALL AND EASILY ACCESSIBLE.
2. MATERIALS AND METHODS FOR THIS INSTALLATION SHALL CONFORM TO ALL STATE AND U.S. PUBLIC HEALTH SERVICES CODES AND REGULATIONS.
3. FILE FOR AND OBTAIN ALL REQUIRED APPROVALS AND PERMITS PRIOR TO INSTALLATION

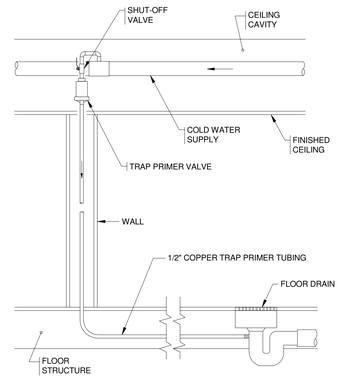


2 P0.1 **TYPICAL PIPE HANGER DETAIL**
N.T.S.

THIS DETAIL INDICATES HANGING OF INSULATED PIPING WHICH MAY BE EITHER WATER OR STORM DRAIN. CLEVIS HANGER DETAIL APPLIES TO ALL PLUMBING PIPING ON THIS PROJECT.

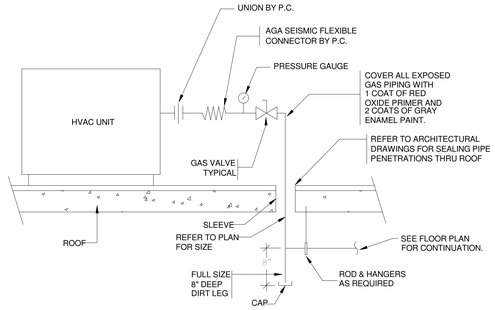


3 P0.1 **TRAPEZE PIPE HANGER**
N.T.S.

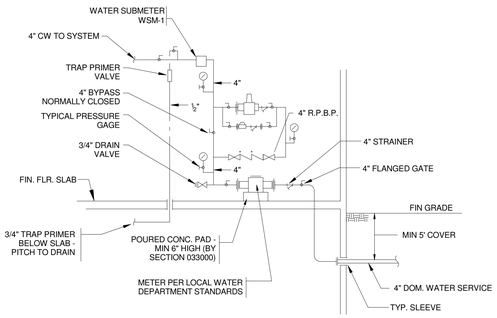


4 P0.1 **TRAP PRIMER PIPING DETAIL**
N.T.S.

NOTE:
PROVIDE TRAP PRIMERS ON ALL FLOOR DRAINS, KITCHEN FLOOR DRAINS, KITCHEN TROUGH DRAINS



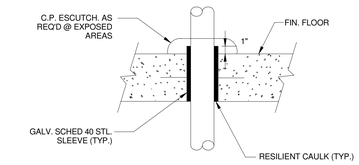
5 P0.1 **GAS PIPING THRU ROOF DETAIL**
N.T.S.



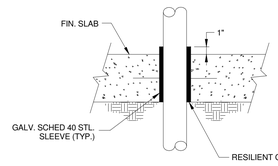
7 P0.1 **SCHEMATIC WATER SERVICE PIPING**
N.T.S.

SHOCK ABSORBER SCHEDULE

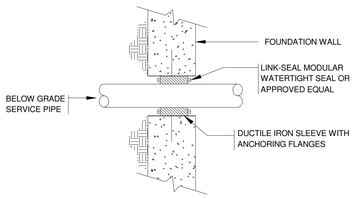
PDI SYMBOL	A	B	C	D	E	F
ZURN MODEL 1250-XL OR EQ.	A	B	C	D	E	F
FIXTURE UNITS	1-11	12-32	33-60	61-113	114-154	155-330



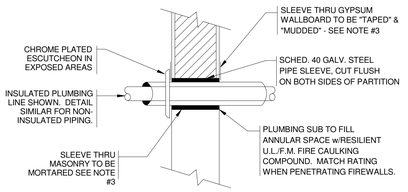
THRU CONC. FLOORS
N.T.S.



THRU SLAB ON GRADE
N.T.S.



BELOW GRADE



THRU PARTITIONS & WALLS

8 P0.1 **TYPICAL PLUMBING SLEEVE CONDITION DETAILS**
N.T.S.

NOTE:
1. ALL PIPING PENETRATING ALL PARTITIONS, WHETHER FIRE OR SMOKE RATED OR NOT, CONCEALED OR EXPOSED, SHALL BE SLEEVED AS DETAILED.
2. WHERE CONC. WALLS, SLABS, ETC., ARE CORE DRILLED, INSTALL SLEEVE FLUSH WITH BOTH SIDES, CAULKED & LEADED IN PLACE.
3. REFER TO DIVISION 4 & 9 FOR PROCEDURES & METHODS OF PATCHING AROUND SLEEVES AT GYPSUM, PLASTER & MASONRY. REFER TO SPECS FOR DELINEATION OF RESPONSIBILITY
4. SLEEVES SHALL BE SIZED TO PROVIDE MIN. 1" CLEARANCE BETWEEN PIPE O.D. & SLEEVE I.D.

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GARCIA GALLUSKA DESOUSA
CONSULTING ENGINEERS

Schematic Design
11/15/2015

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Dover, NH

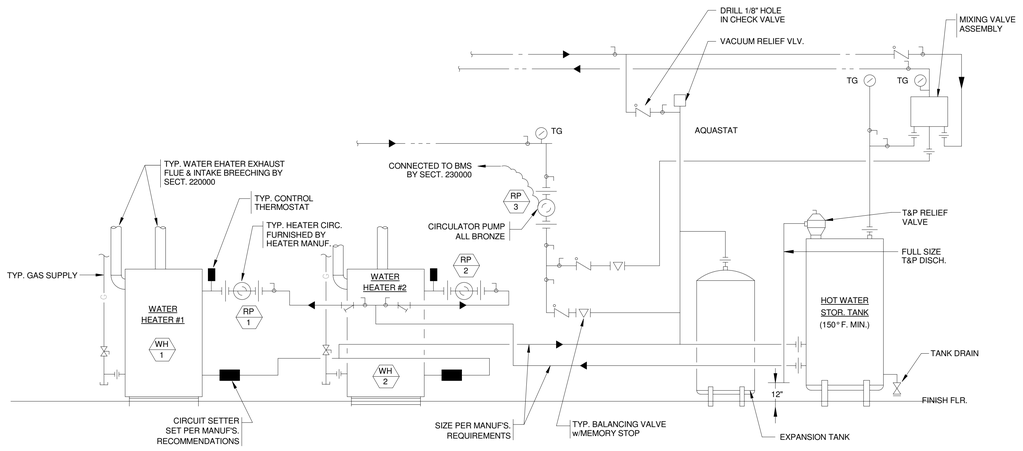
LEGEND, NOTES AND DETAILS - PLUMBING

SCALE:
DRAWN BY: RCD
CHECKED BY: CMG

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P0.01

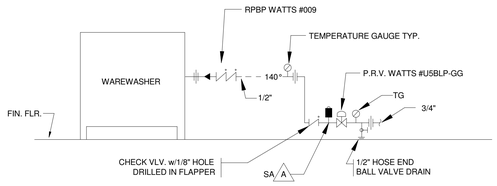
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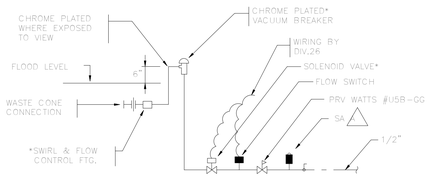


1 / P0.2 SCHEMATIC H.W. HEATER/STORAGE TANK PIPING
N.T.S.

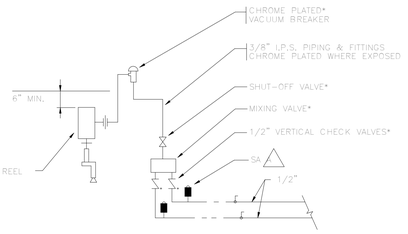
NOTE:
PROVIDE NEUTRALIZATION TUBE FOR EACH WATER HEATER AND EACH EXHAUST STACK.



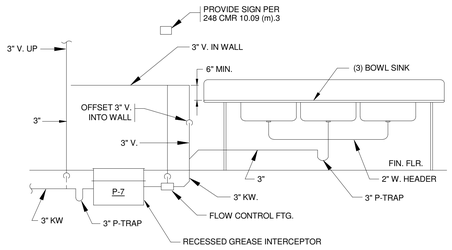
4 / P0.2 WAREWASHER w/ INTEGRAL BOOSTER HTR.
N.T.S.



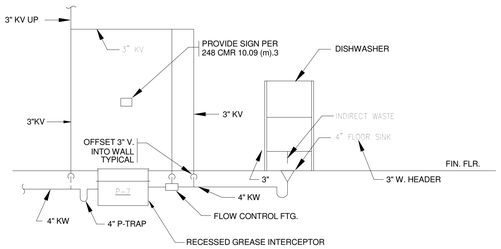
6 / P0.2 SCHEMATIC DISPOSER WATER PIPING
N.T.S.
*FURNISHED WITH DISPOSER & INSTALLED BY DIV. 22



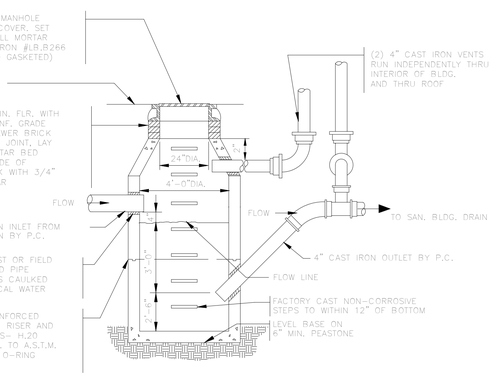
9 / P0.2 SCHEMATIC HOSE REEL PIPING
N.T.S.
*FURNISHED WITH HOSE REEL INSTALLED BY DIV. 22



2 / P0.2 SCHEMATIC PIPING @ POTWASH SINK
N.T.S.

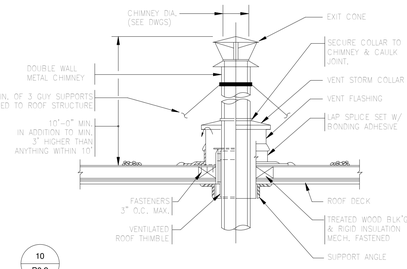


5 / P0.2 SCHEMATIC PIPING @ DISHWASHER
N.T.S.

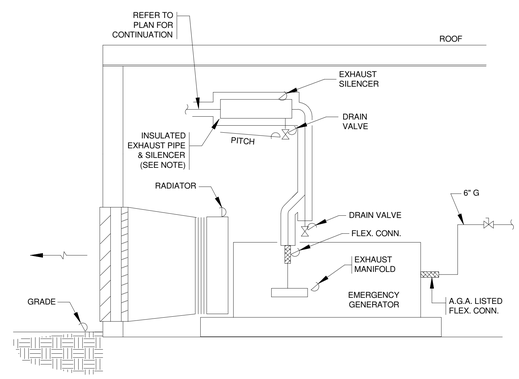


7 / P0.2 GAS/SAND INTERCEPTOR DETAIL
N.T.S.

NOTE:
INTERCEPTOR STRUCTURE AND COMPONENTS TO BE FURNISHED AND SET BY DIVISION 22. DIVISION 22 SHALL FURNISH AND INSTALL INLET, OUTLET AND VENT PIPING. CO-ORDINATE PIPING PENETRATION SIZES AND INVERTS WITH G.C.

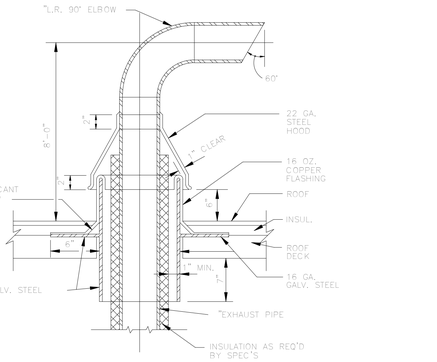


10 / P0.2 METAL CHIMNEY AIR INTAKE & EXHAUST BREECHING DETAIL
N.T.S.

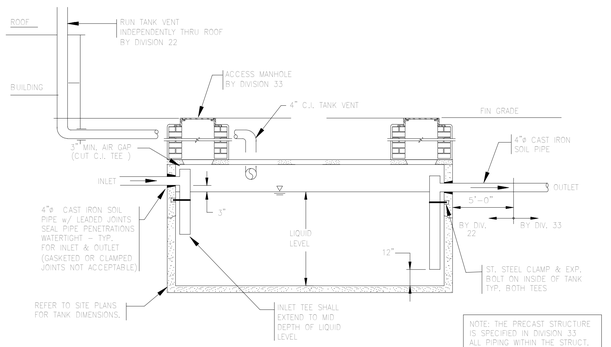


NOTE:
1. GENERATOR EXHAUST SHALL BE SCHED. 40 ANSI A-53 BLACK STEEL PIPING w/BUTT WELDED ENDS, w/ SCHED. 40 BUTT WELDED END FITTINGS. INSULATE w/3 LAYERS OF 2" THICK CALCIUM SILICATE BLOCK (6" TOTAL) WIRED IN PLACE & COVERED w/ 1/2" THICK CEMENT TROWELED SMOOTH & COVERED w/8 oz. CANVAS JACKET.
2. SILENCER & A.G.A. LISTED FLEX CONNECTOR FOR SUPPLY & EXHAUST TO BE BE SUPPLIED BY THE E.C. & INSTALLED BY THE P.C.

3 / P0.2 EMERGENCY GENERATOR EXHAUST PIPING SCHEMATIC
N.T.S.



8 / P0.2 EMERGENCY GENERATOR EXHAUST DETAIL
N.T.S.



11 / P0.2 EXTERIOR GREASE TRAP DETAIL
N.T.S.

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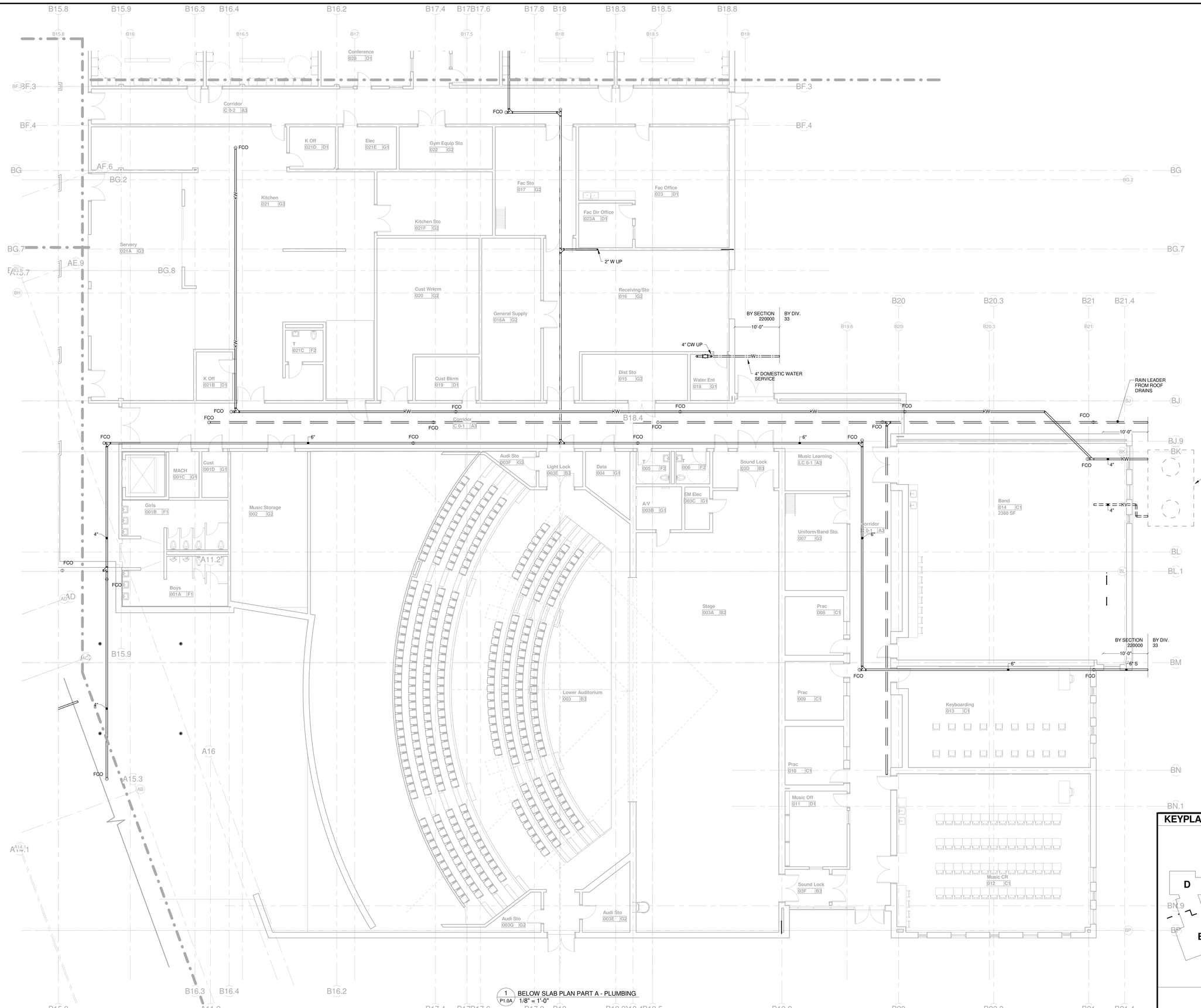
Dover HS / CTC
Dover, NH
DETAILS - PLUMBING

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CHECKED BY: CMG
SCALE:

DRAWING NUMBER
P0.02

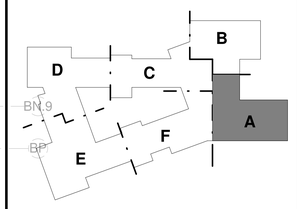
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1 P1.0A BELOW SLAB PLAN PART A - PLUMBING
1/8" = 1'-0"

KEYPLAN



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11/15/2015

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Dover, NH

BELOW SLAB PLAN PART A
PLUMBING

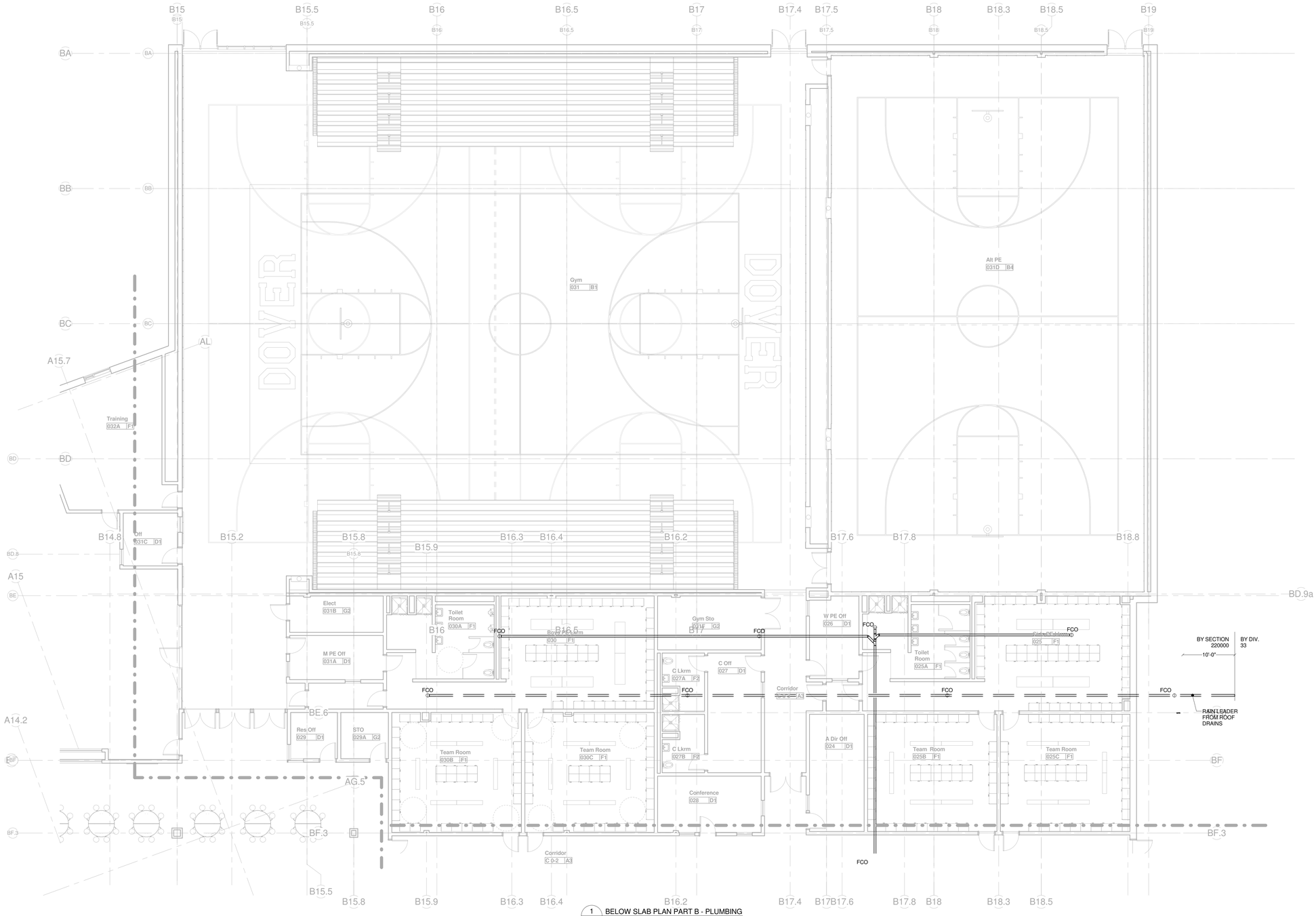
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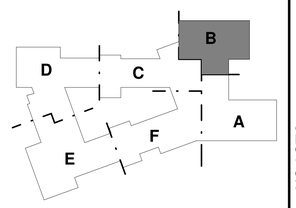
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1 P1.0B BELOW SLAB PLAN PART B - PLUMBING
1/8" = 1'-0"

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Dover, NH

BELOW SLAB PLAN PART B
PLUMBING

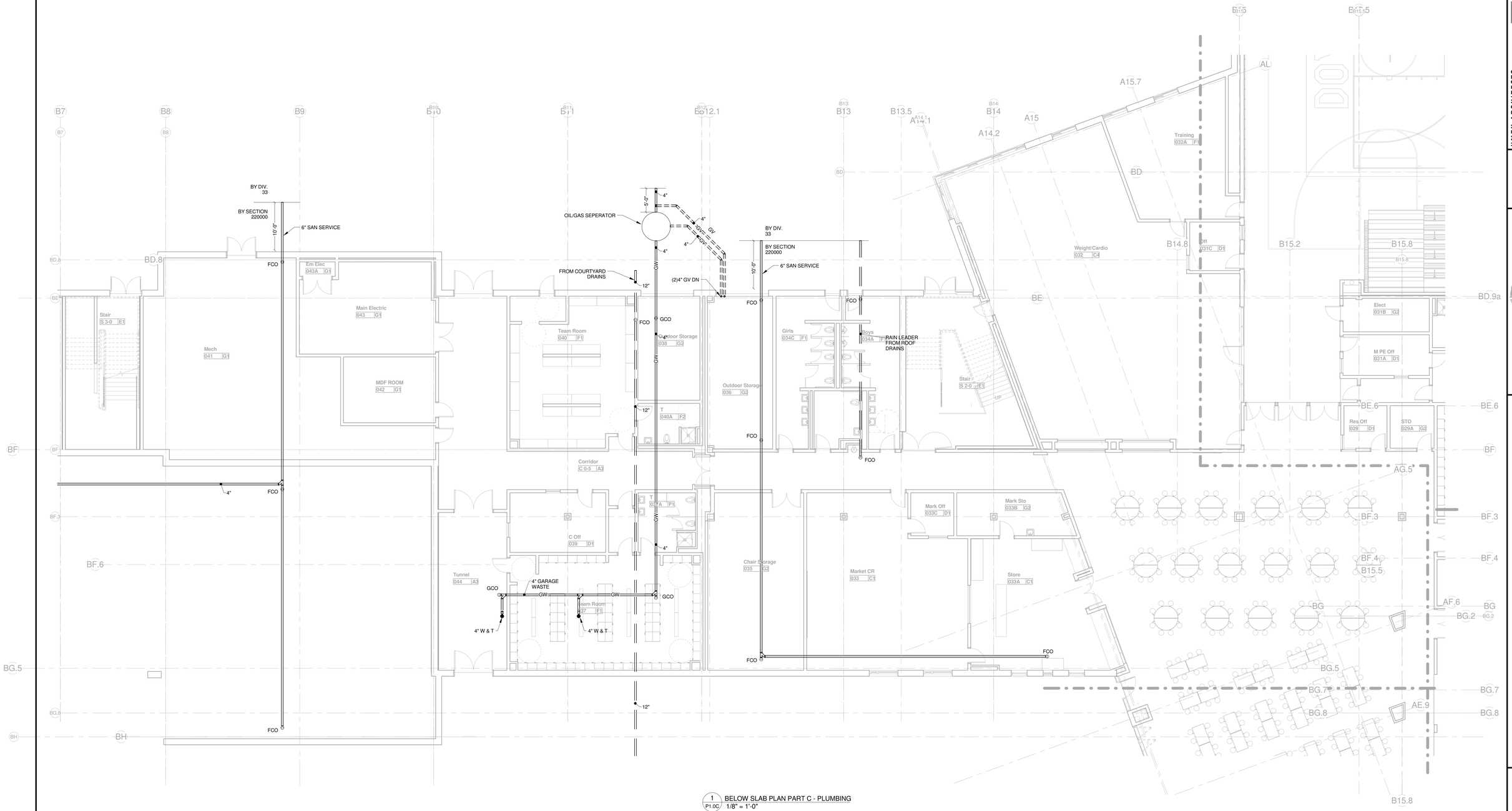
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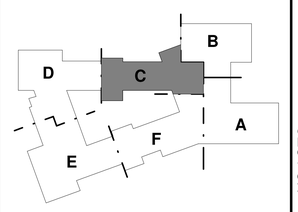
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1 P1.0C BELOW SLAB PLAN PART C - PLUMBING
1/8" = 1'-0"

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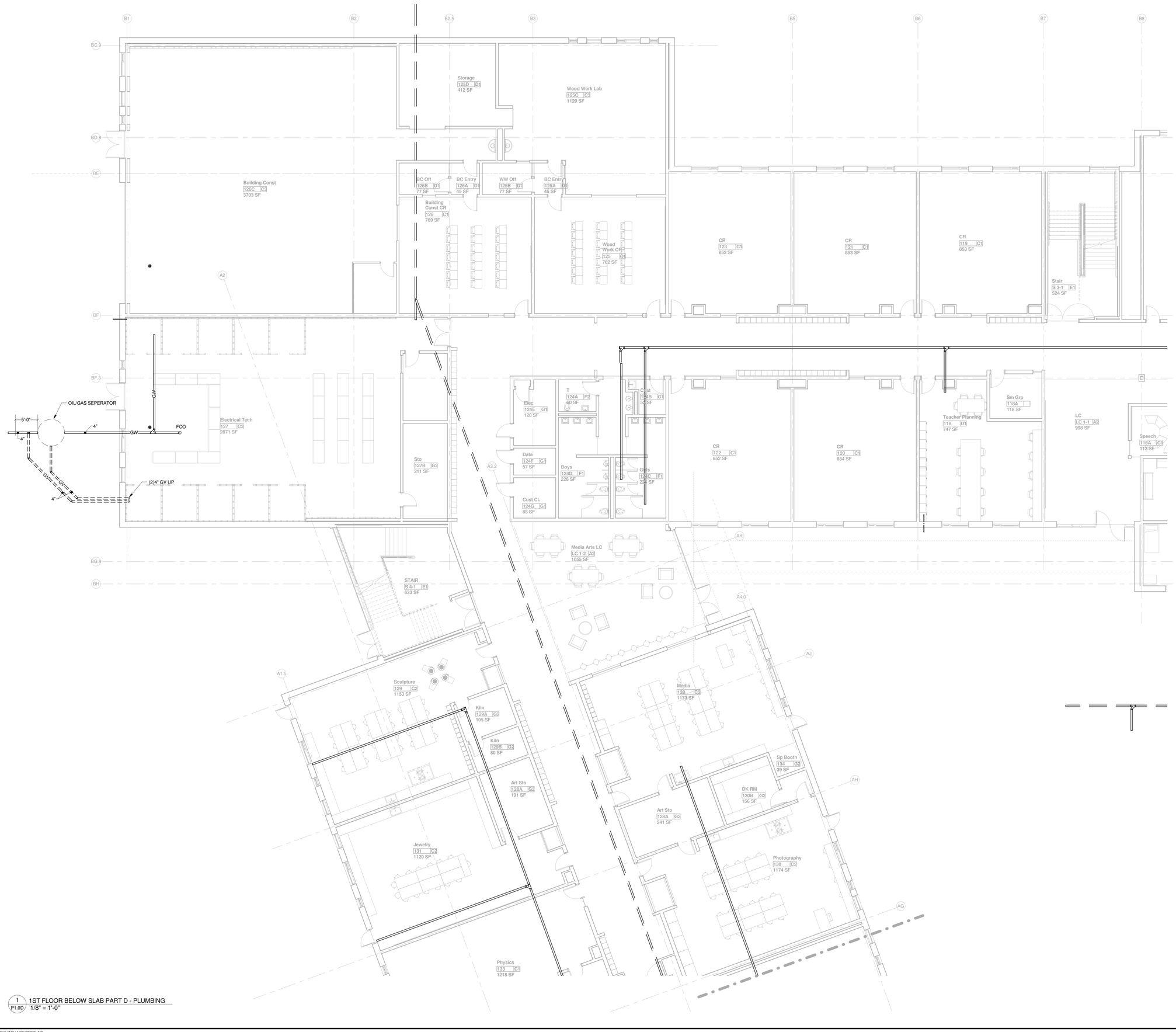
Schematic Design
11/15/2015

Dover HS / CTC
Dover, NH
BELOW SLAB PLAN PART C
PLUMBING
SCALE: 1/8" = 1'-0"
DRAWN BY: RCD
CHECKED BY: CMG

DRAWING NUMBER
P1.0C
JOB NUMBER 403114

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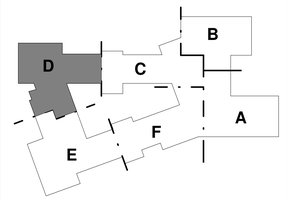


1 P1.0D 1ST FLOOR BELOW SLAB PART D - PLUMBING
1/8" = 1'-0"

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Dover HS / CTC
Dover, NH
BELOW SLAB PART D PLUMBING

SCALE: 1/8" = 1'-0" DRAWN BY: Author CHECKED BY: Checker

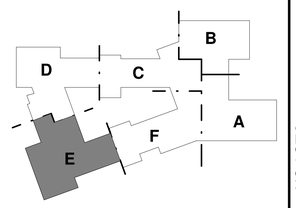
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JOB NUMBER 403114



1 P1.0E 1ST FLOOR BELOW SLAB PART E - PLUMBING
1/8" = 1'-0"

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BELOW SLAB PART E PLUMBING

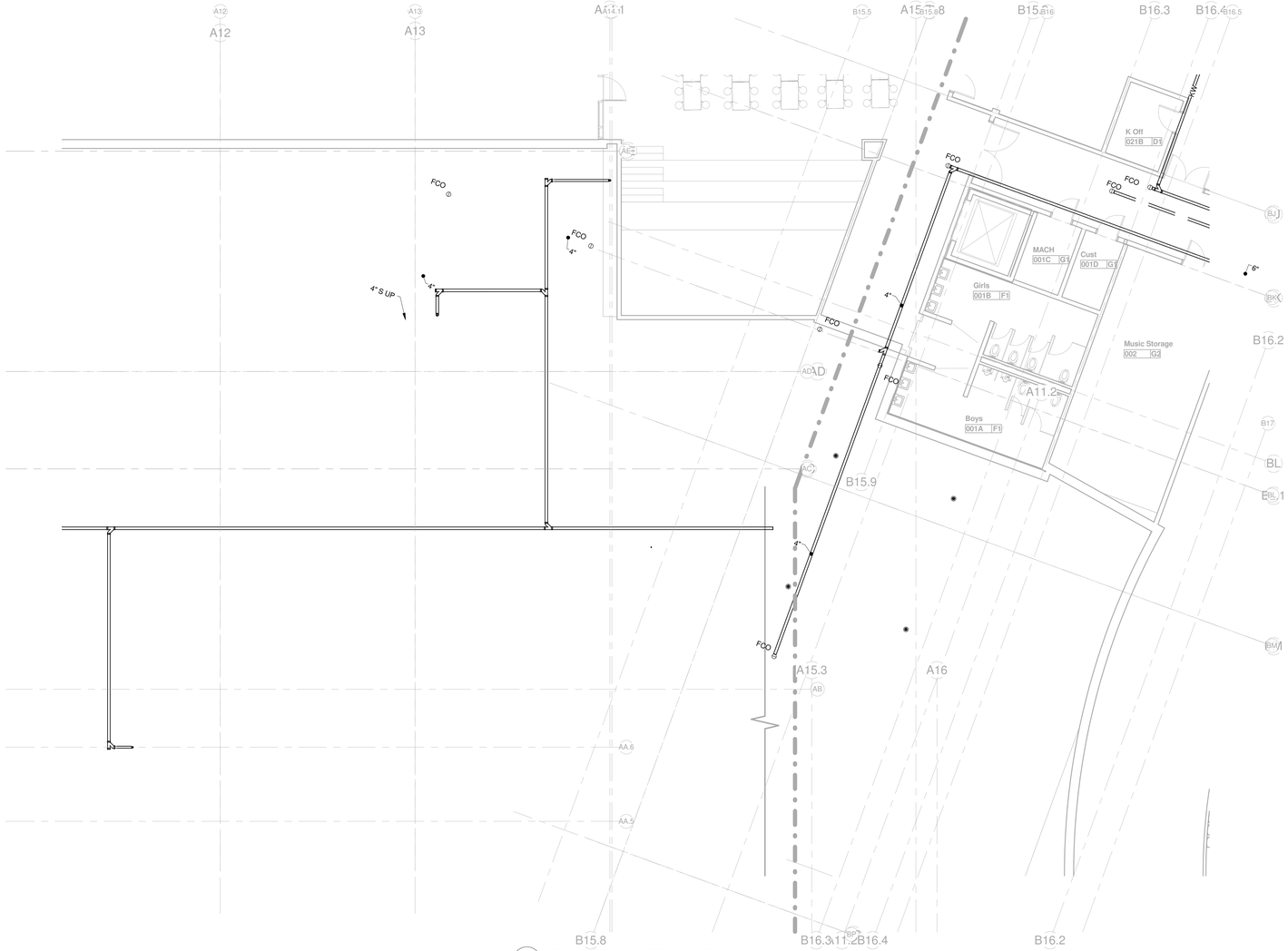
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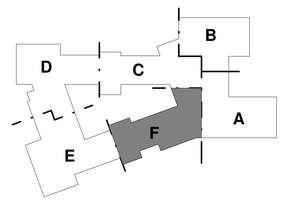
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1 P1.0F BELOW SLAB PLAN PART F - PLUMBING
1/8" = 1'-0"

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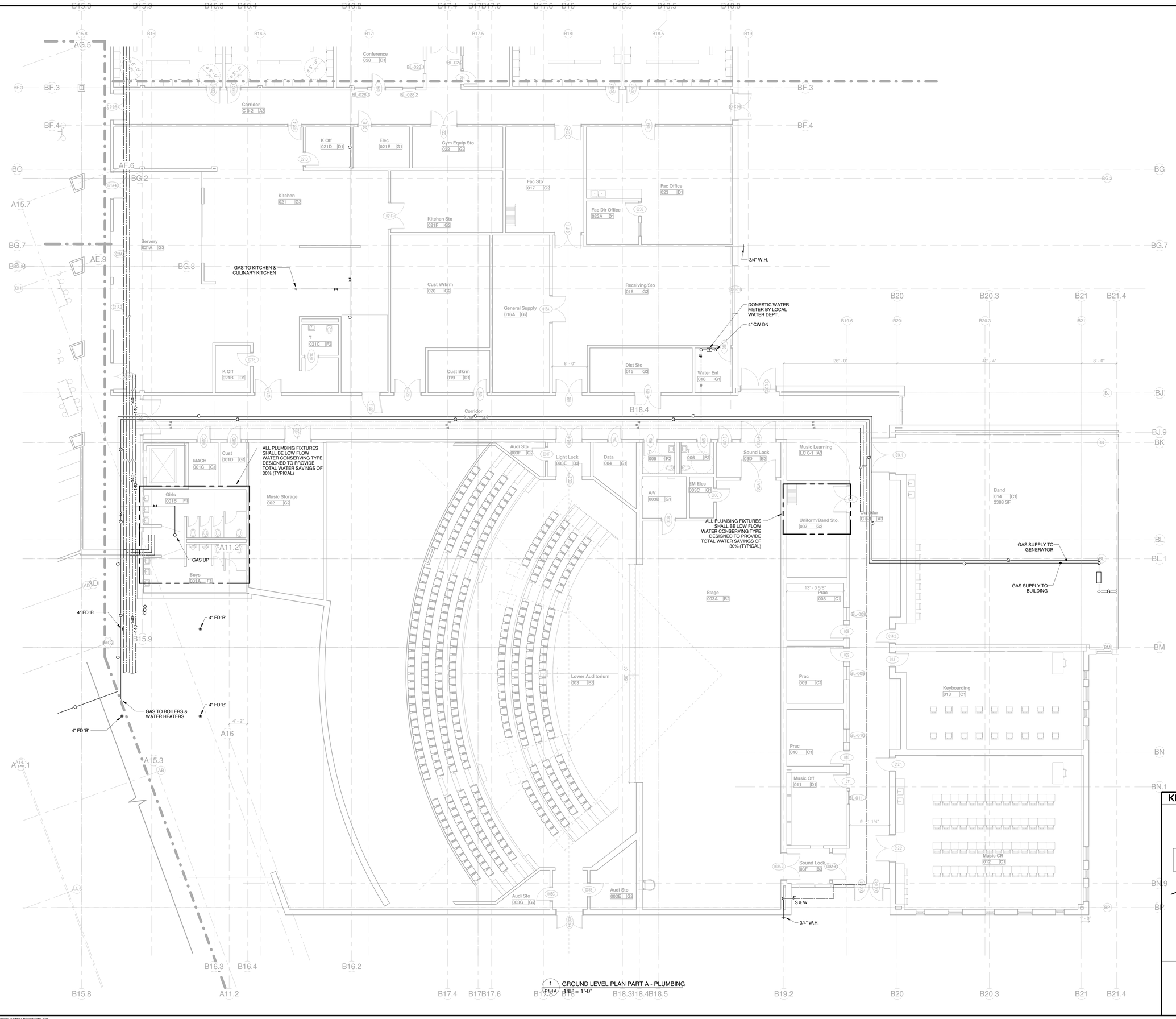
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BELOW SLAB PLAN PART F
PLUMBING
SCALE: 1/8" = 1'-0" DRAWN BY: RCD CHECKED BY: CMG

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JOB NUMBER 403114

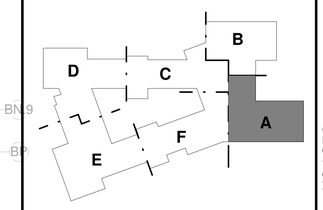
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1 GROUND LEVEL PLAN PART A - PLUMBING
P1.1A 1/8" = 1'-0"

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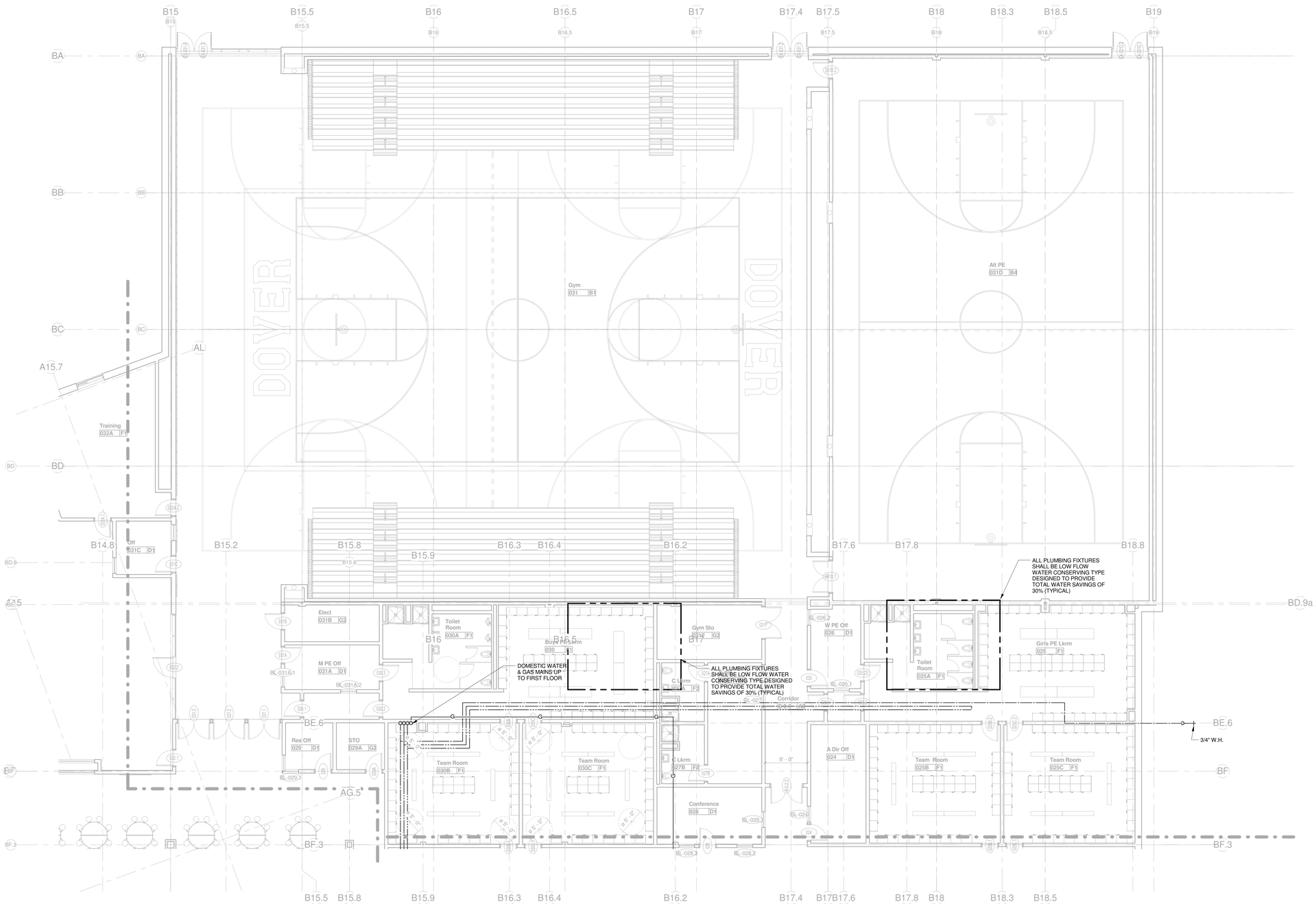
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GROUND FLOOR PLAN PART A PLUMBING
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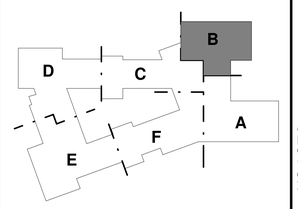
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1 / P1.1B GROUND LEVEL PLAN PART B - PLUMBING
1/8" = 1'-0"

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Dover HS / CTC
Dover, NH
GROUND FLOOR PLAN PART B
PLUMBING
SCALE: 1/8" = 1'-0"
DRAWN BY: RCD
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DRAWING NUMBER
P1.1B

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ALL PLUMBING FIXTURES SHALL BE LOW FLOW WATER CONSERVING TYPE DESIGNED TO PROVIDE TOTAL WATER SAVINGS OF 30% (TYPICAL)

3/4" W.H.

8' - 0 11/16"

4' - 3 1/8"

Stair S 3-0 E1

Em Elec 043A G1

Main Electric 043 G1

Mech 041 G1

MDF ROOM 042 G1

Team Room 040 F1

Outdoor Storage 038 G2

Outdoor Storage 036 G2

Girls 034C F1

Boys 034A F1

Stair S 2-0 E1

UP

Training 032A F1

Weight/Cardio 032 C4

Off 031C D1

Elect 031B G2

M PE Off 031A D1

Res Off 029 D1

STO 029A G2

Team Room 030B F1

Corridor C 0-5 A3

T 040A F2

T 037A F1

C Off 039 D1

Tunnel 044 A3

Chair Storage 035 G2

Market CR 033 C1

Mark Off 033C D1

Mark Sto 033B G2

Store 033A C1

4" FD

4" FD

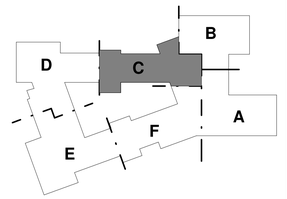
Team Room 037 C1

Servery 021A G3

B15 B15.5 B16 BC AL A15.7 A14.1 A14.2 A15 B13 B13.5 B14 B12.1 B11 B10 B9 B8 B7 BD BE BF BF.3 BF.6 BG BG.2 BG.5 BG.7 BG.8 BH AG.5 AF.6 AE.9 B15.2 B15.8 B15.9 B14.8 BE.6 BD.9a BD.8

1 P1.1C GROUND LEVEL PLAN PART C - PLUMBING
1/8" = 1'-0"

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11/15/2015

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Dover, NH

GROUND FLOOR PLAN PART C
PLUMBING

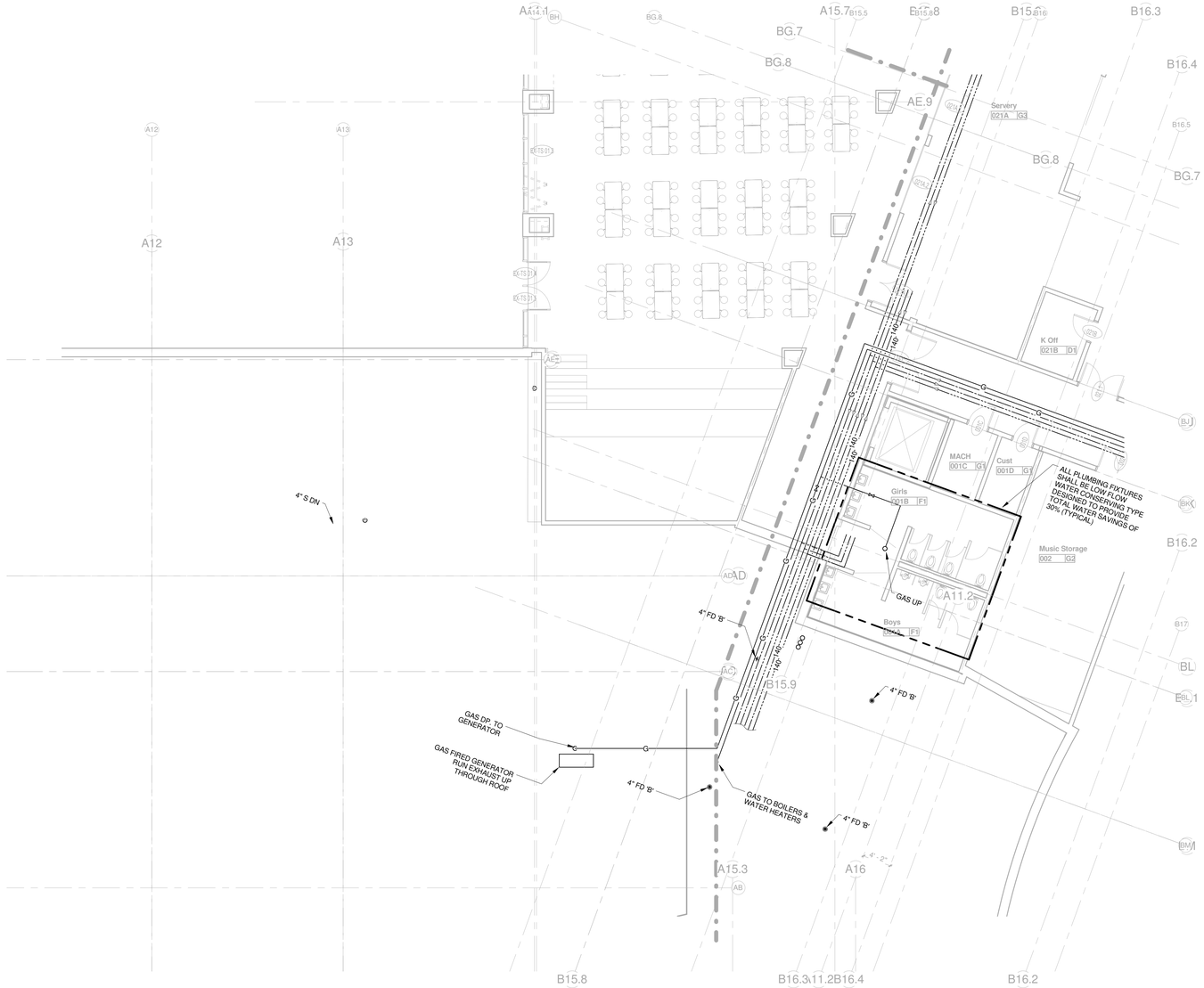
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DRAWING NUMBER
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JOB NUMBER 403114

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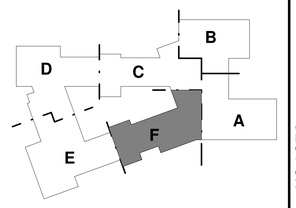
1 P1.1F GROUND LEVEL PLAN PART F - PLUMBING
1/8" = 1'-0"

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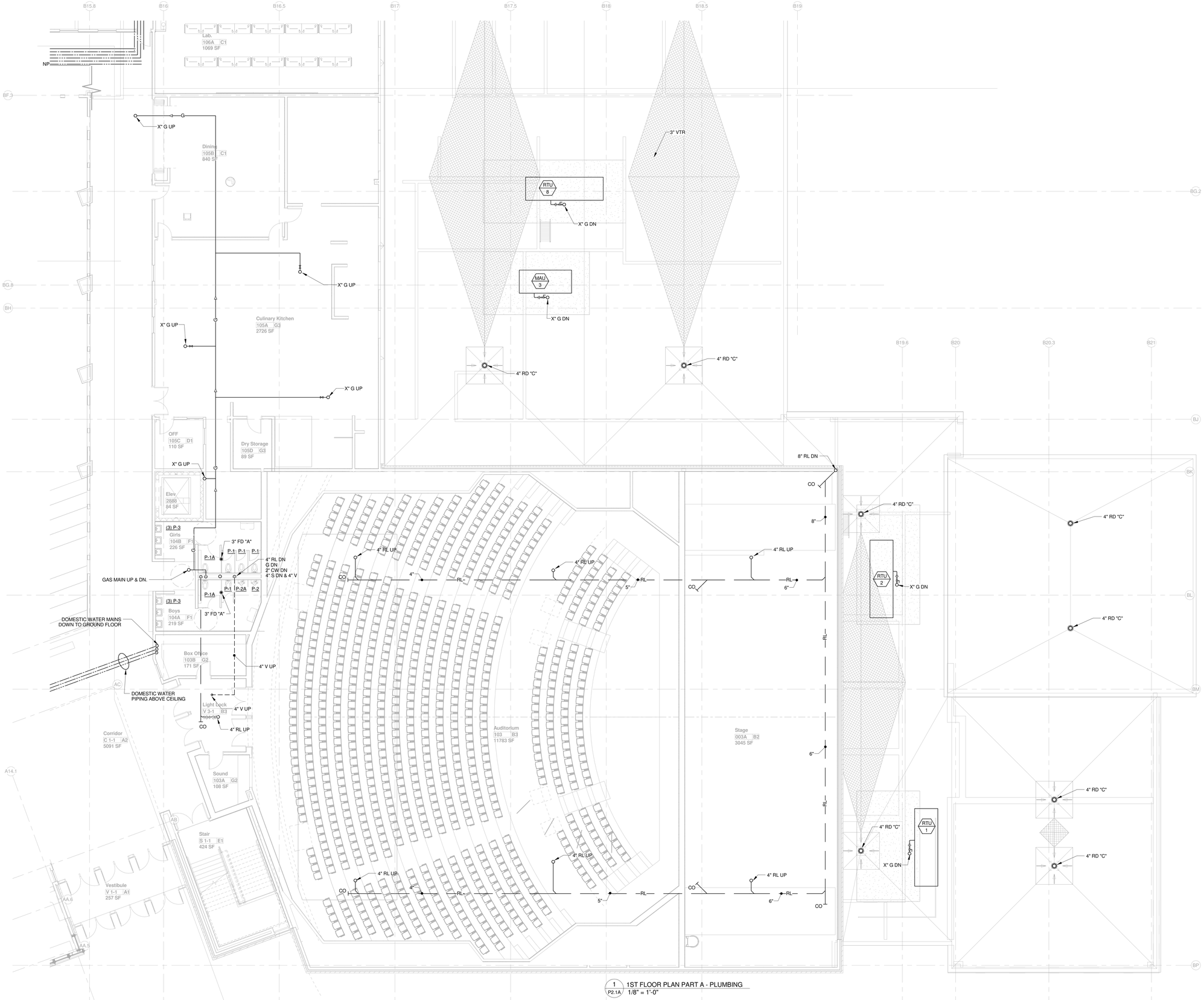
Dover HS / CTC
Dover, NH
GROUND FLOOR PLAN PART F
PLUMBING
SCALE: 1/8" = 1'-0"
DRAWN BY: RCD
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DRAWING NUMBER
P1.1F

JOB NUMBER 403114

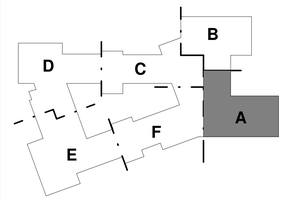
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1 P2.1A 1ST FLOOR PLAN PART A - PLUMBING
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Schematic Design
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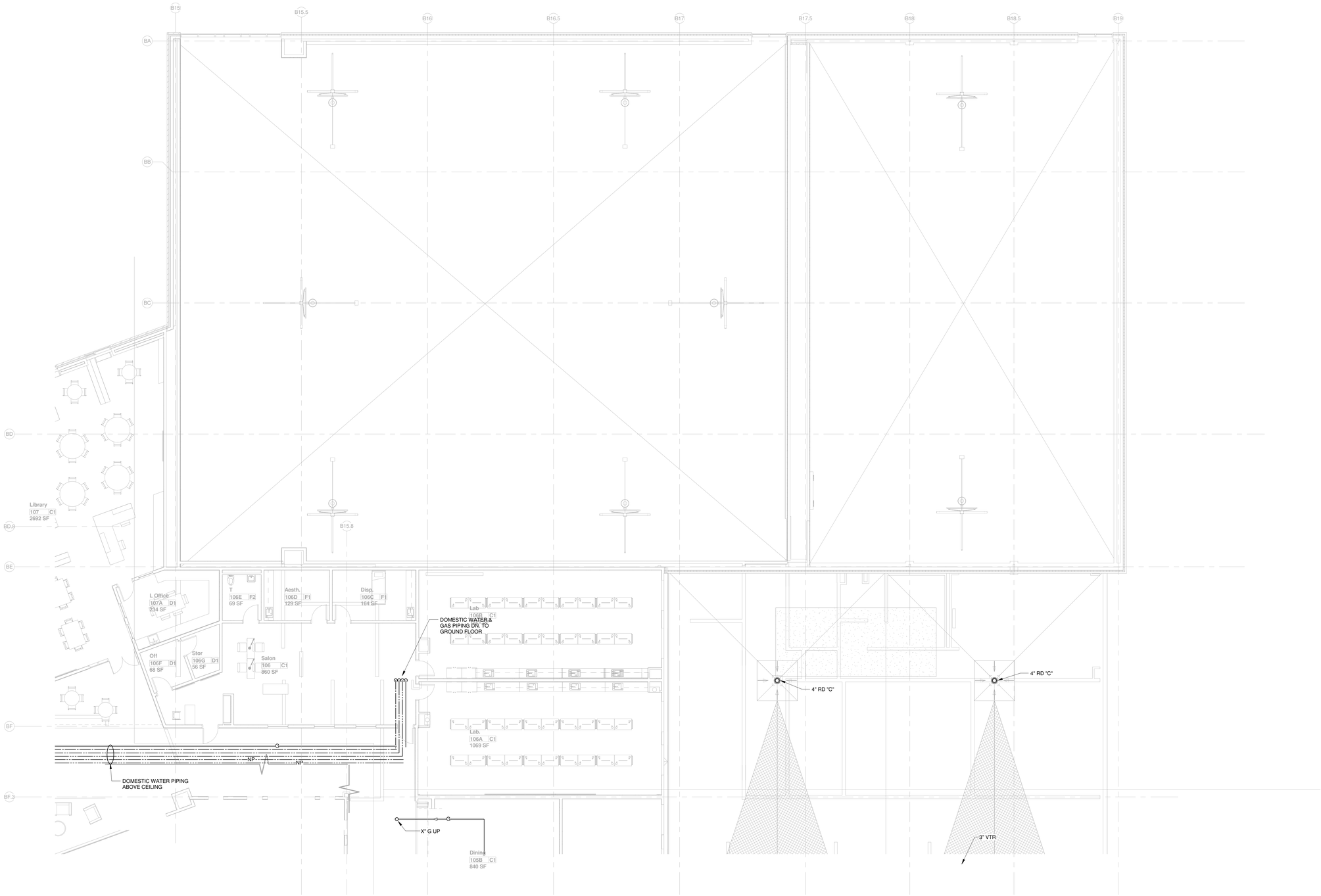
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PLUMBING

SCALE: 1/8" = 1'-0" DRAWN BY: RCD CHECKED BY: CMG

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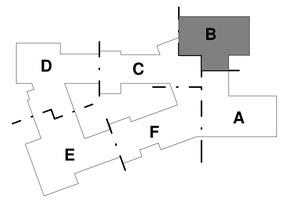
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1 P2.1B 1ST FLOOR PLAN PART B - PLUMBING
1/8" = 1'-0"

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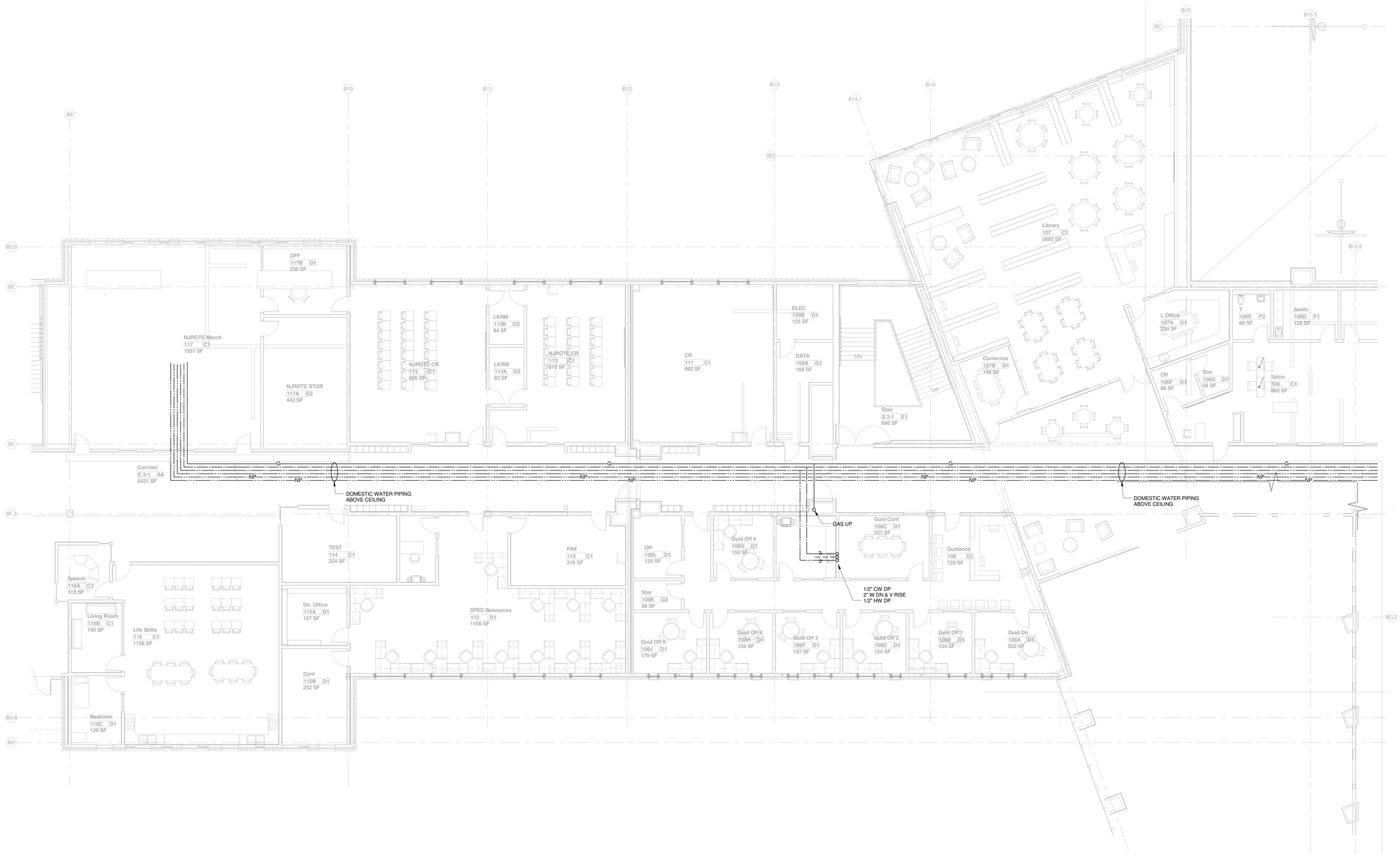
Dover HS / CTC
Dover, NH
1ST FLOOR PLAN PART B
PLUMBING
SCALE: 1/8" = 1'-0"
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DRAWING NUMBER
P2.1B

JOB NUMBER 403114

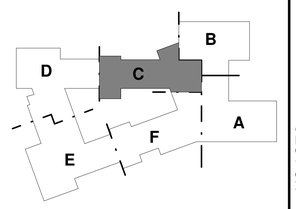
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1 P2.1C 1ST FLOOR PLAN PART C - PLUMBING
1/8" = 1'-0"

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Dover HS / CTC
Dover, NH

1ST FLOOR PLAN PART C
PLUMBING

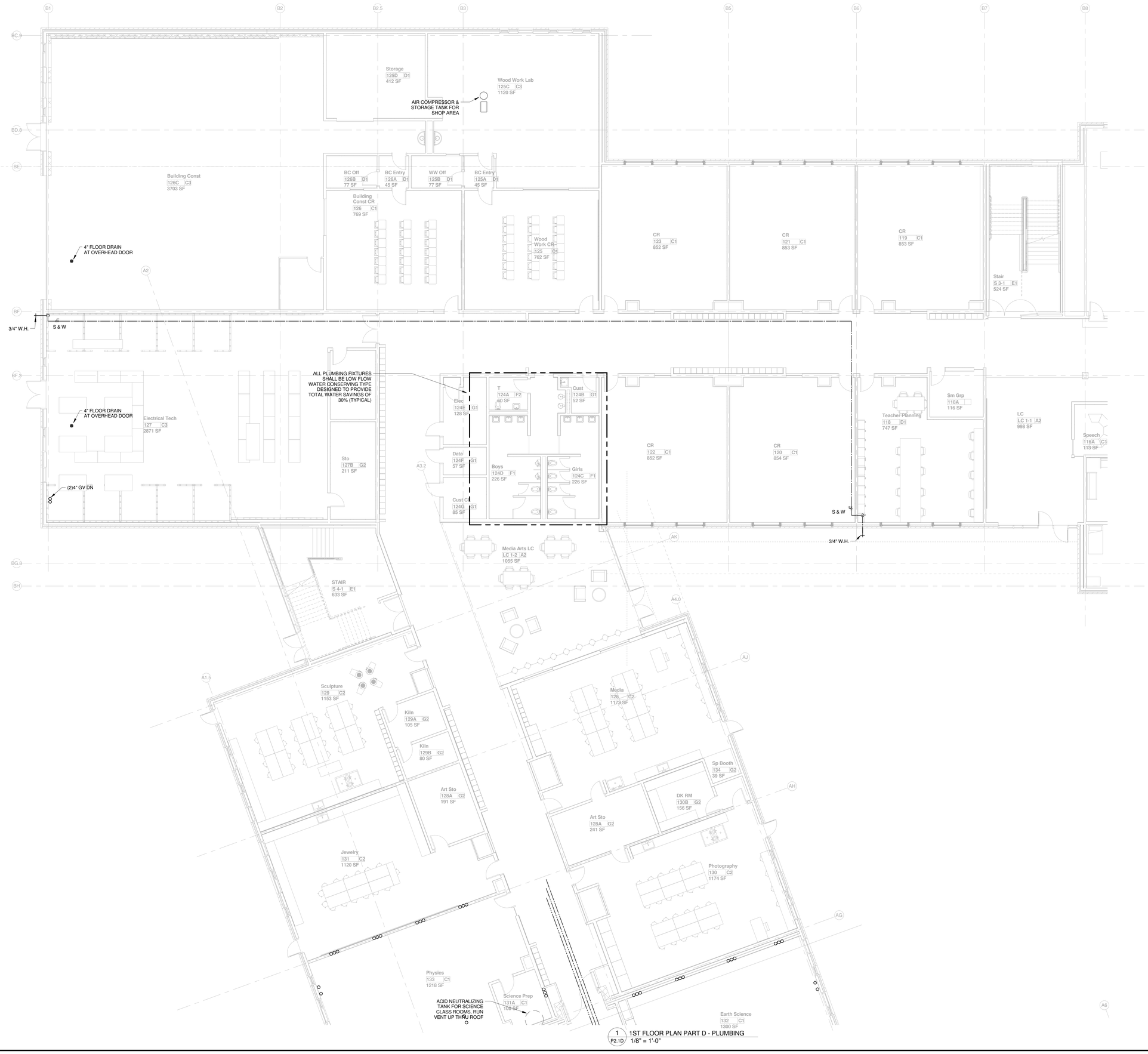
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JOB NUMBER 403114

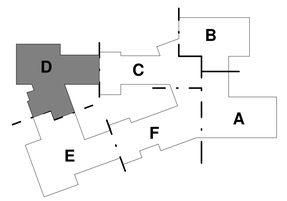
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1 P2.1D 1ST FLOOR PLAN PART D - PLUMBING
1/8" = 1'-0"

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60 A St Suite 100 Boston MA 02210

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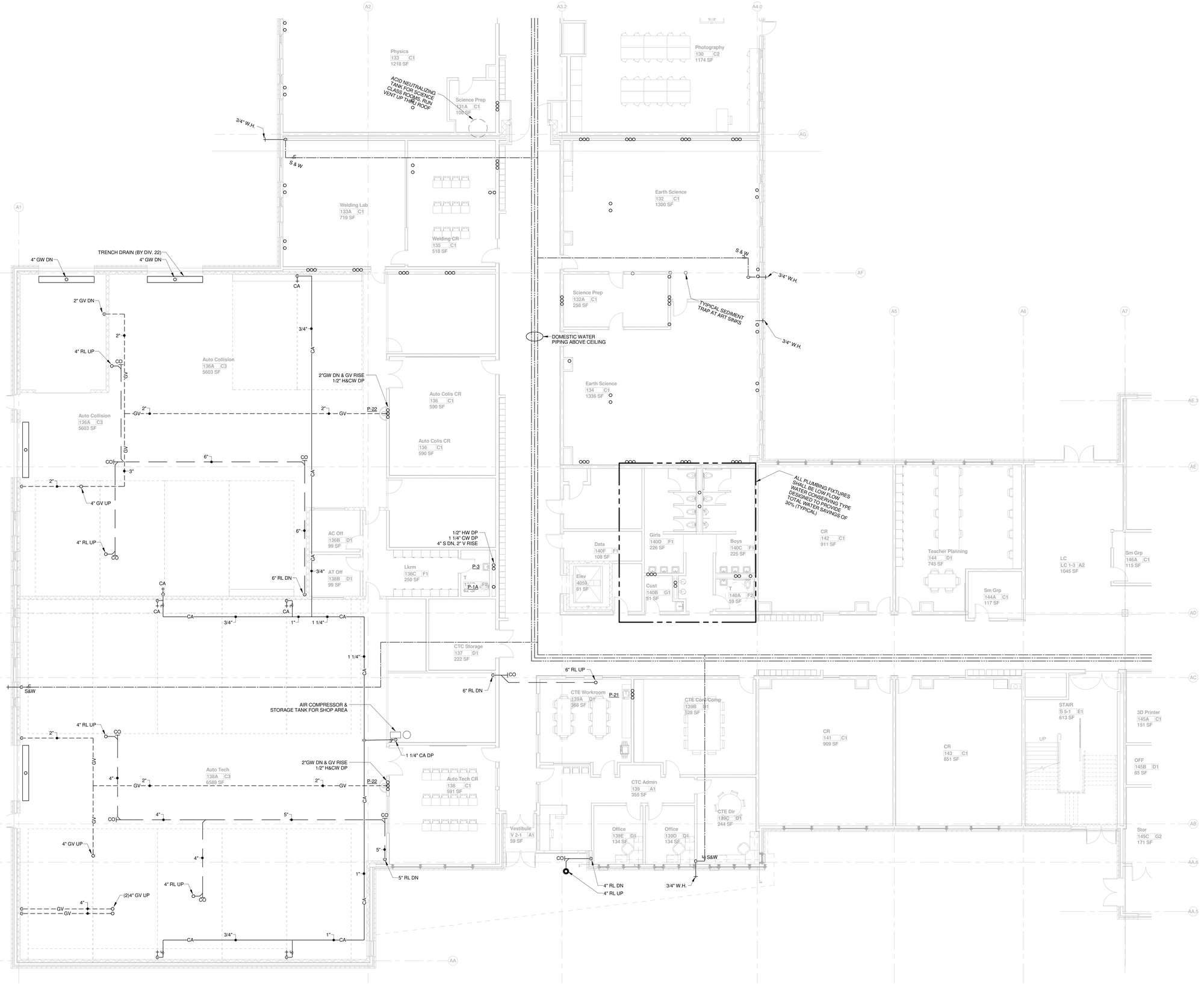
Dover HS / CTC
Dover, NH
1ST FLOOR PLAN PART D
PLUMBING
SCALE: 1/8" = 1'-0" DRAWN BY: RCD CHECKED BY: CMG

DRAWING NUMBER
P2.1D

JOB NUMBER 403114

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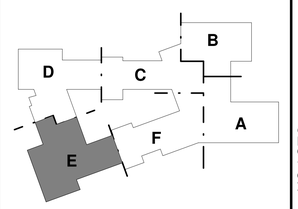
1 P2.1E 1ST FLOOR PLAN PART E - PLUMBING
1/8" = 1'-0"

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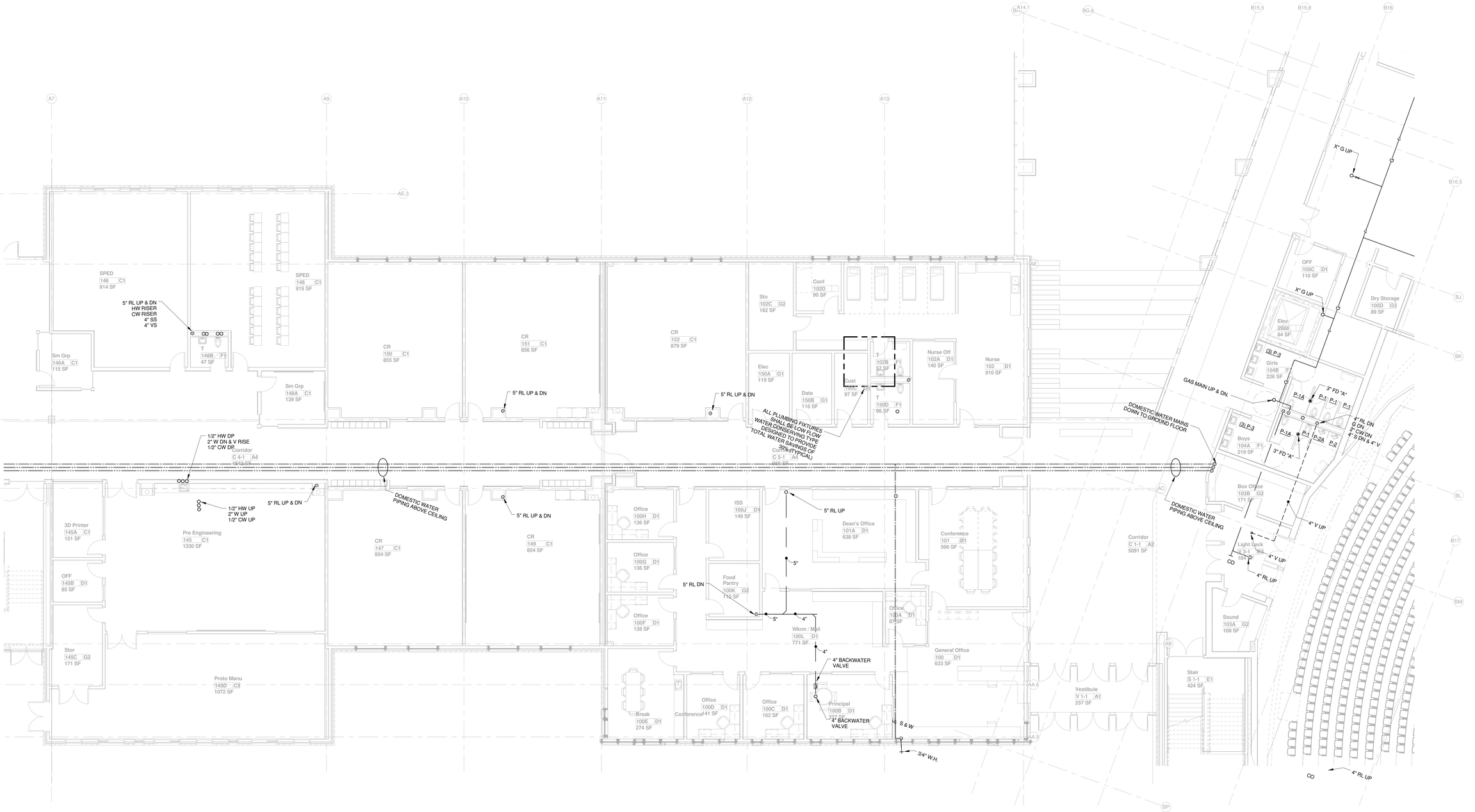
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1ST FLOOR PLAN PART E
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DRAWING NUMBER
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JOB NUMBER 403114

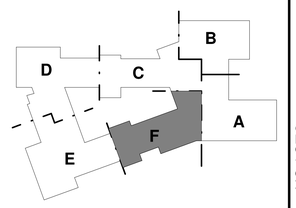
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1 P2.1F 1ST FLOOR PLAN PART F - PLUMBING
1/8" = 1'-0"

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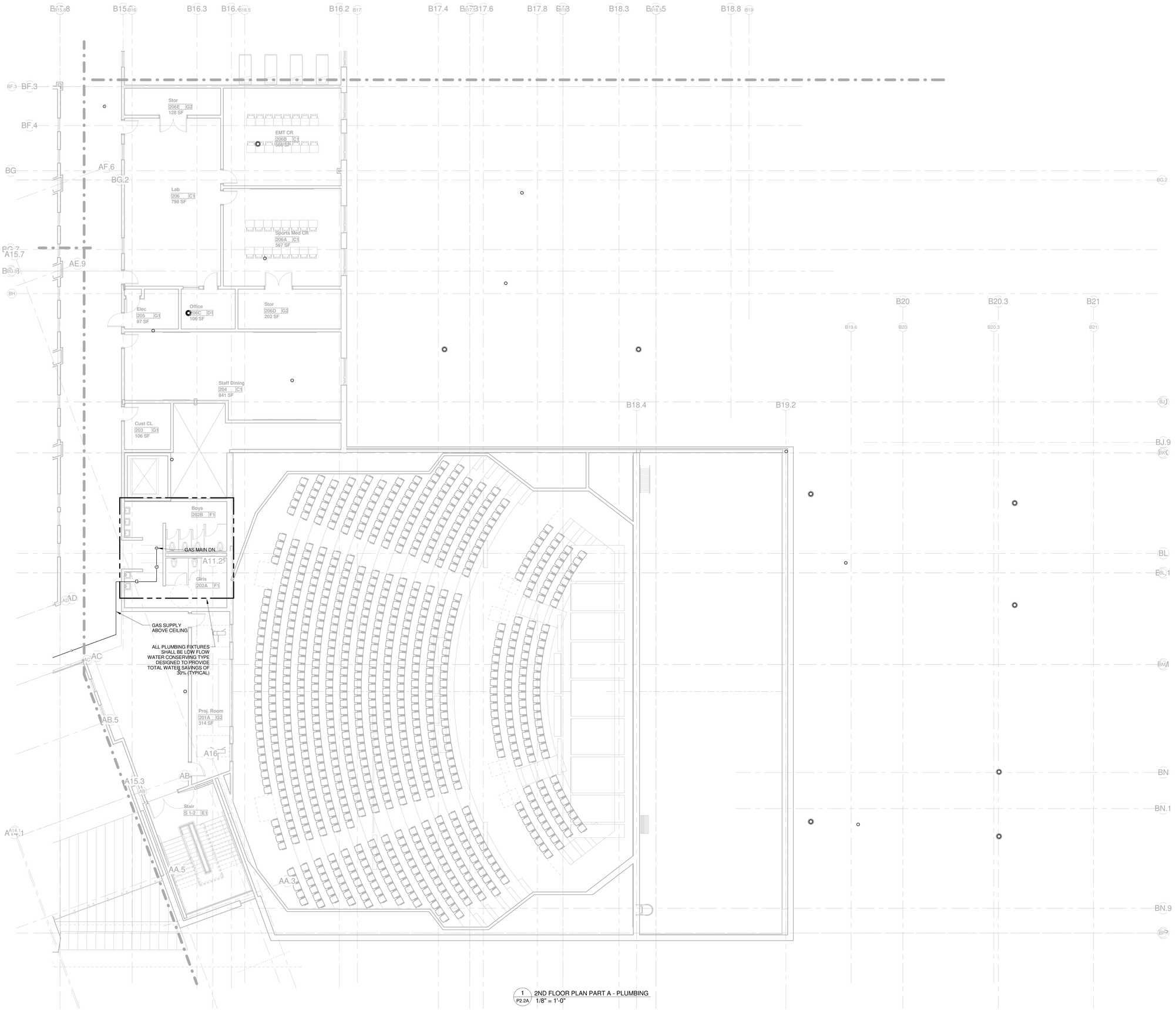
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Dover, NH
1ST FLOOR PLAN PART F
PLUMBING
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DRAWING NUMBER
P2.1F

JOB NUMBER 403114

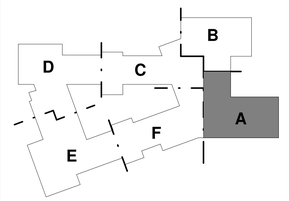
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1 P2.2A 2ND FLOOR PLAN PART A - PLUMBING
1/8" = 1'-0"

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11/15/2015

Dover HS / CTC
Dover, NH

2ND FLOOR PLAN PART A
PLUMBING

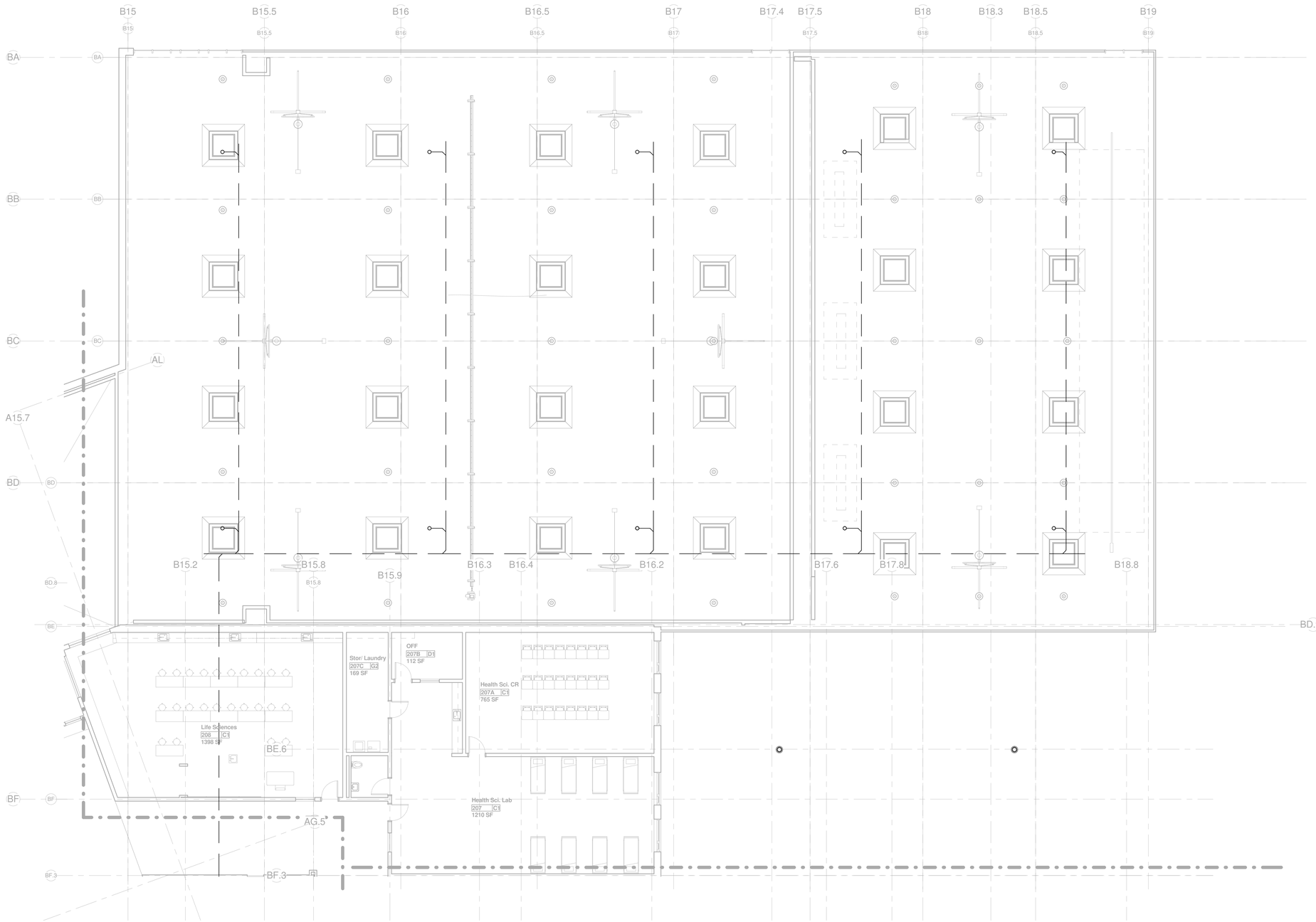
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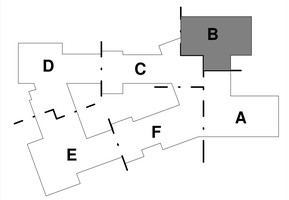
1 / P2.2B 2ND FLOOR PLAN PART B - PLUMBING
1/8" = 1'-0"

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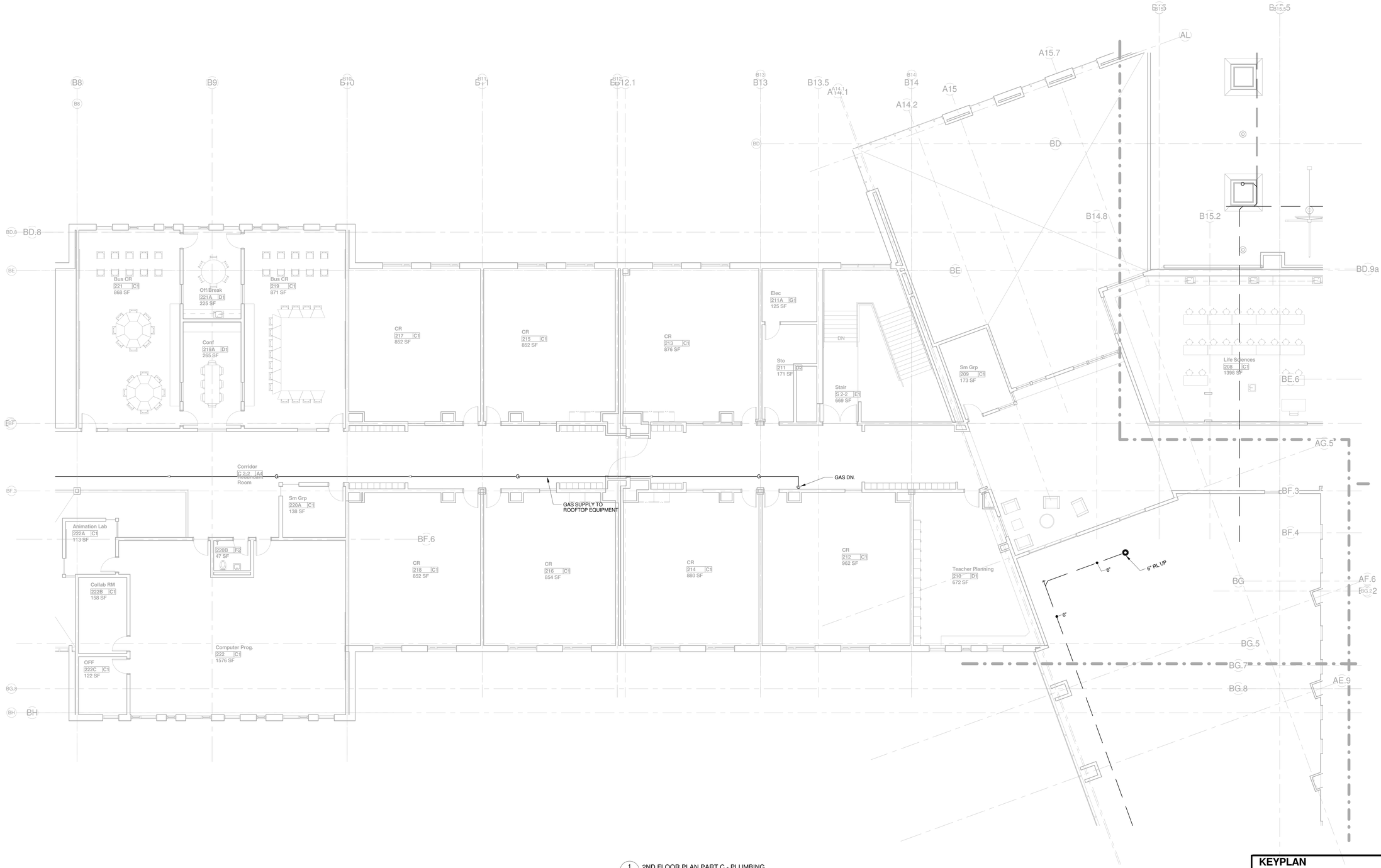


Dover HS / CTC
Dover, NH
2ND FLOOR PLAN PART B
PLUMBING
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DRAWN BY: RCD
CHECKED BY: CMG

DRAWING NUMBER
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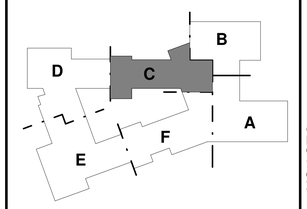
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1 / P2.2C 2ND FLOOR PLAN PART C - PLUMBING
1/8" = 1'-0"

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Schematic Design
11/15/2015

Dover HS / CTC
Dover, NH
2ND FLOOR PLAN PART C
PLUMBING
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DRAWN BY: ROD
CHECKED BY: CMG

DRAWING NUMBER
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JOB NUMBER 403114

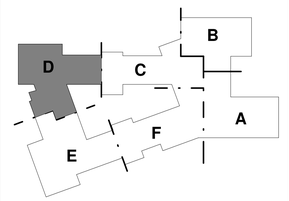
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1 P2.2D 2ND FLOOR PLAN PART D - PLUMBING
1/8" = 1'-0"

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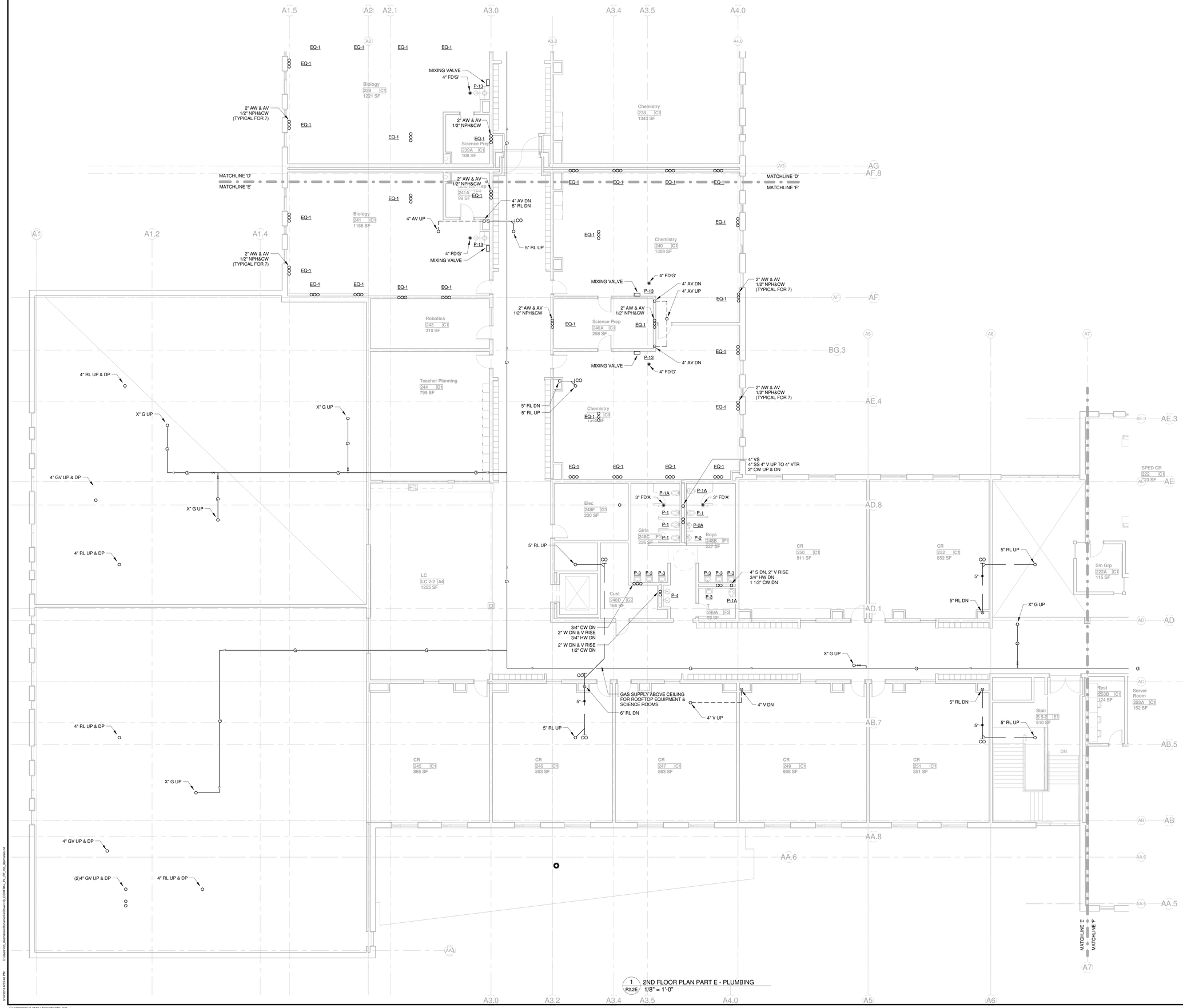
Dover HS / CTC
Dover, NH
2ND FLOOR PLAN PART D
PLUMBING
SCALE: 1/8" = 1'-0"
DRAWN BY: RCD
CHECKED BY: CMG

DRAWING NUMBER
P2.2D

JOB NUMBER 403114

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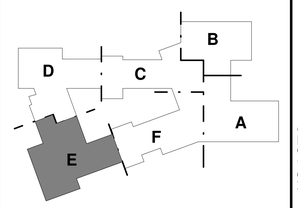
1 P2.2E 2ND FLOOR PLAN PART E - PLUMBING
1/8" = 1'-0"

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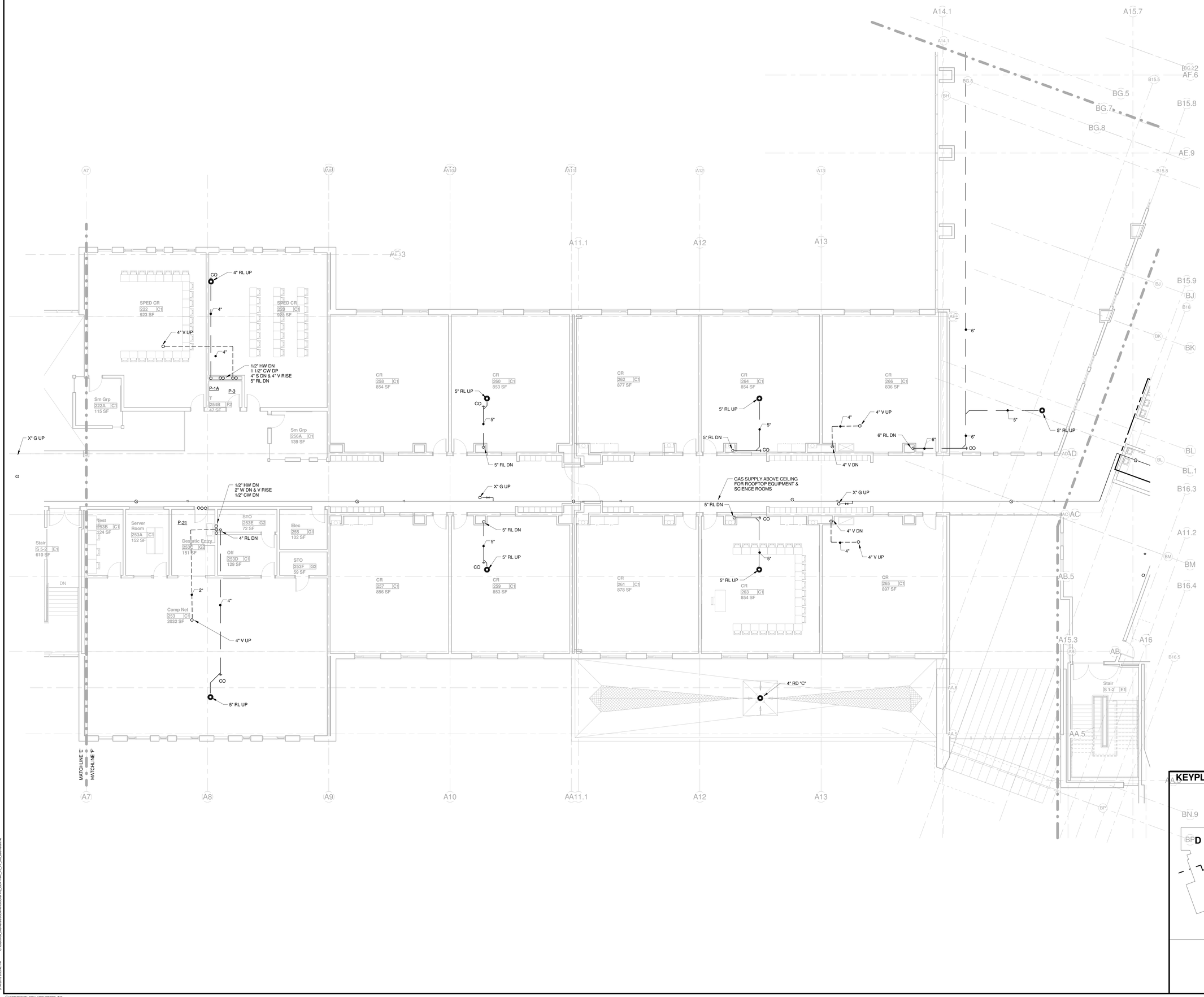


Dover HS / CTC
Dover, NH
2ND FLOOR PLAN PART E
PLUMBING
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DRAWN BY: RCD
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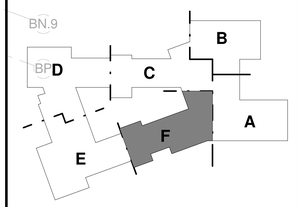
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JOB NUMBER 403114

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Dover, NH

2ND FLOOR PLAN PART F
PLUMBING

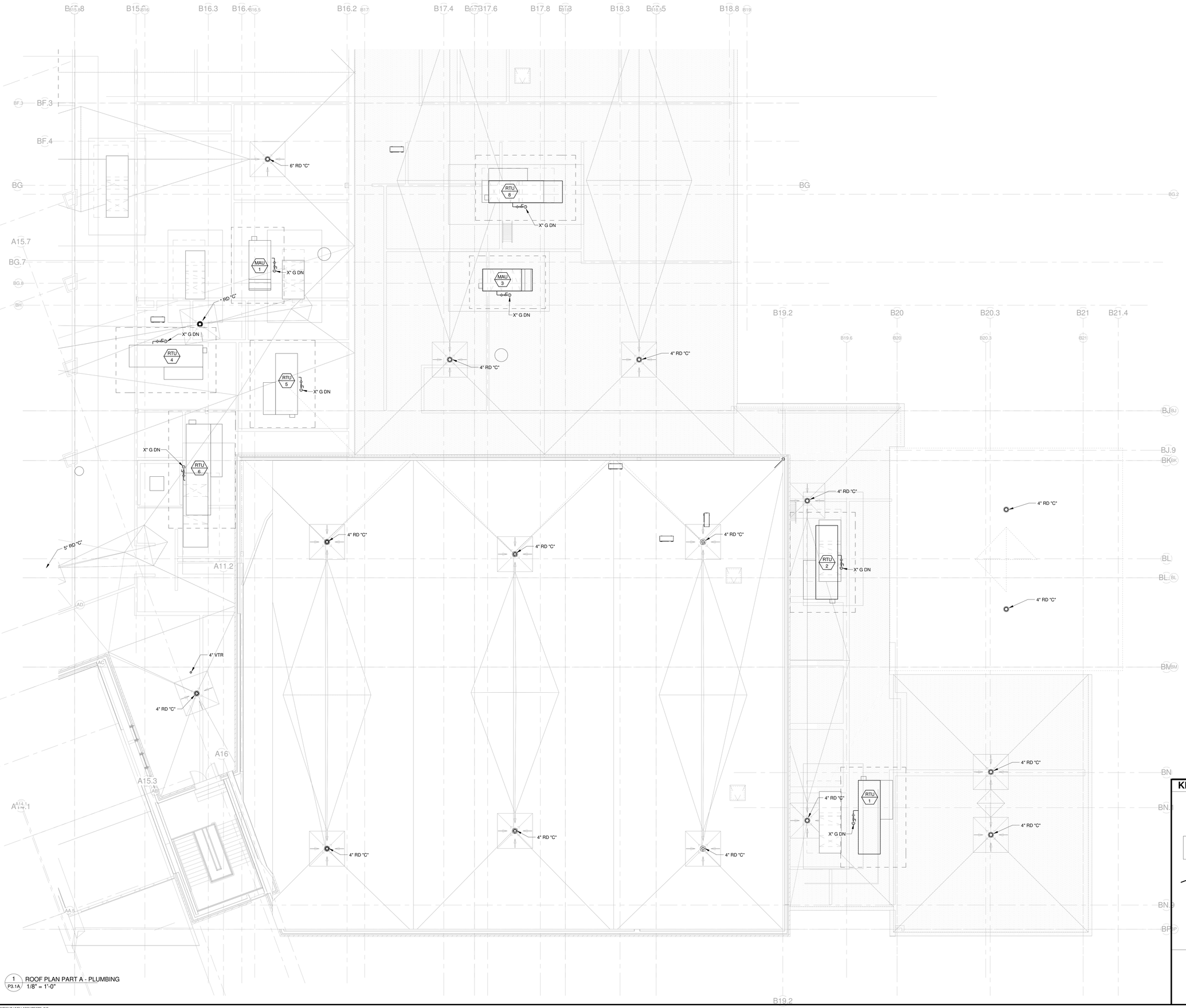
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JOB NUMBER 403114

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1 P3.1A ROOF PLAN PART A - PLUMBING
1/8" = 1'-0"

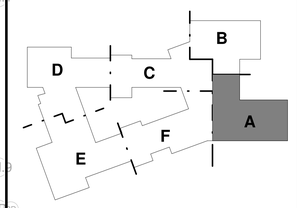
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Schematic Design
11/15/2015

KEYPLAN



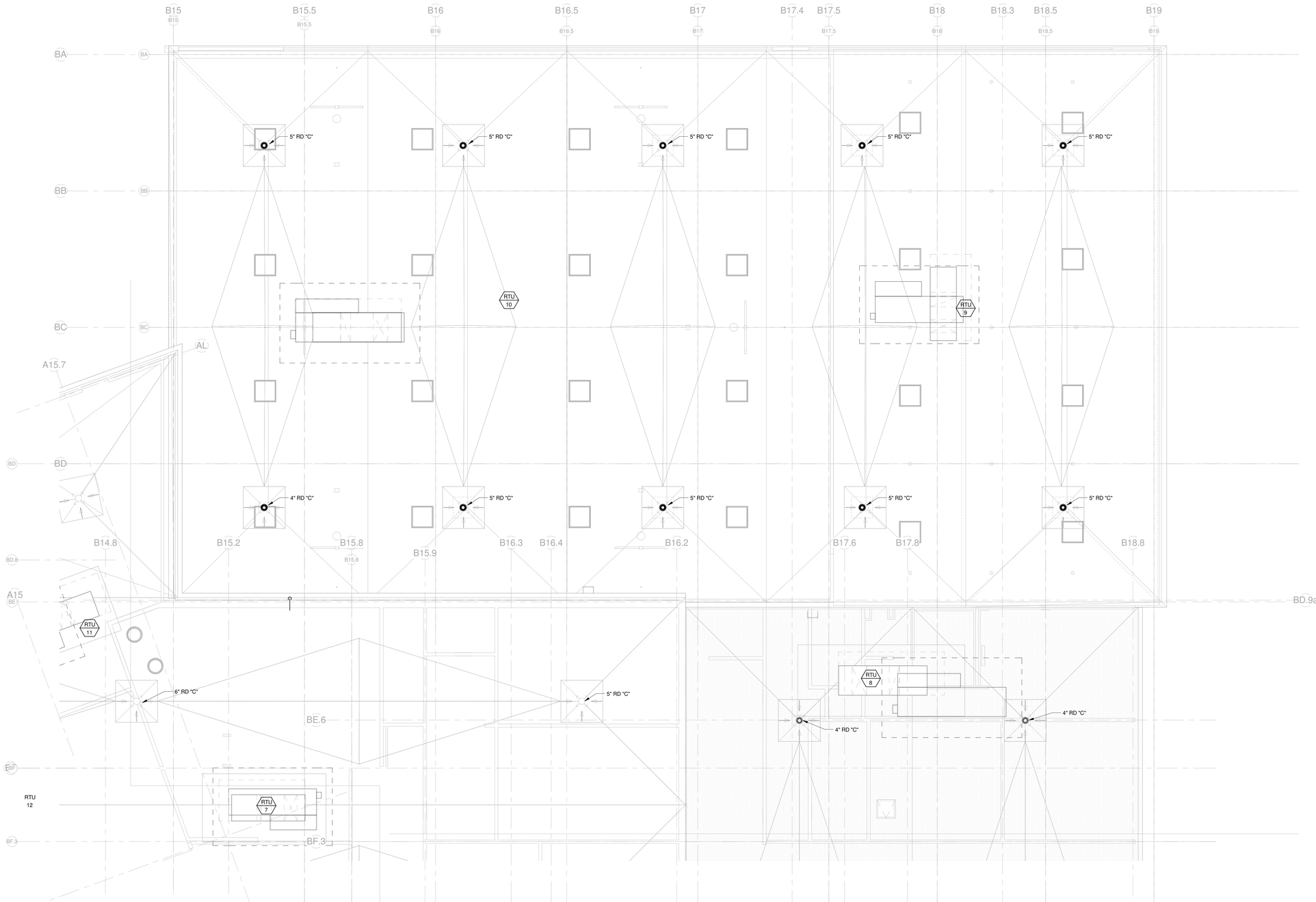
Dover HS / CTC
Dover, NH
ROOF PLAN PART A PLUMBING

SCALE: 1/8" = 1'-0" DRAWN BY: RCD CHECKED BY: CMG

DRAWING NUMBER
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JOB NUMBER 403114

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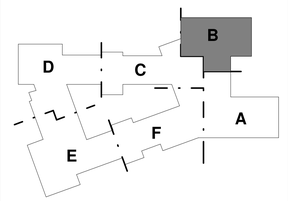
1 / P3.1B ROOF PLAN PART B - PLUMBING
1/8" = 1'-0"

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Dover HS / CTC
Dover, NH
ROOF PLAN PART B PLUMBING

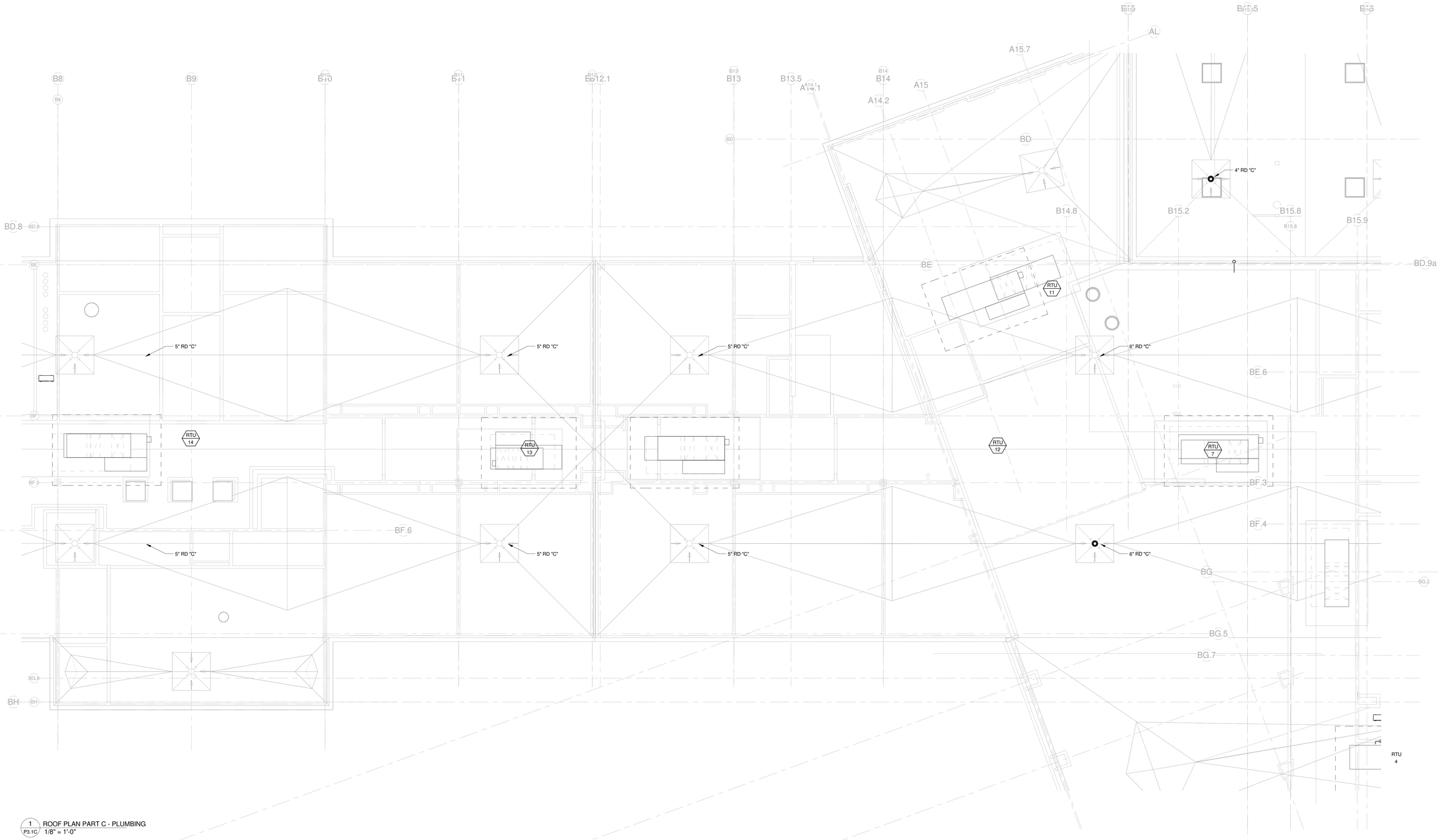
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JOB NUMBER 403114

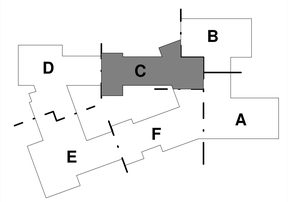
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1 / P3.1C ROOF PLAN PART C - PLUMBING
1/8" = 1'-0"

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Boston, MA 617.451.2007

Schematic Design
11/15/2015

Dover HS / CTC
Dover, NH
ROOF PLAN PART C PLUMBING

SCALE: 1/8" = 1'-0" DRAWN BY: RCD CHECKED BY: CMG

DRAWING NUMBER
P3.1C

JOB NUMBER 403114

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B1 B1.4 B2 B2.5 B2.6 B3 B4 B5 B6 B7 B8

BC.9 BD.8 BD.9 BE BF BF.3 BF.6 BG.5 BG.8 BH AK AJ AH AG AF.8 A1.5 A2 A2.1 A3.0 A3.2 A4.0 AJ.4

4" RD "C"

5" RD "C"

HV 2

HV 1

RTU 15

RTU 16

8

MATCHLINE 'D'

MATCHLINE 'E'

1 P3.1D ROOF PLAN PART D - PLUMBING
1/8" = 1'-0"

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11/15/2015

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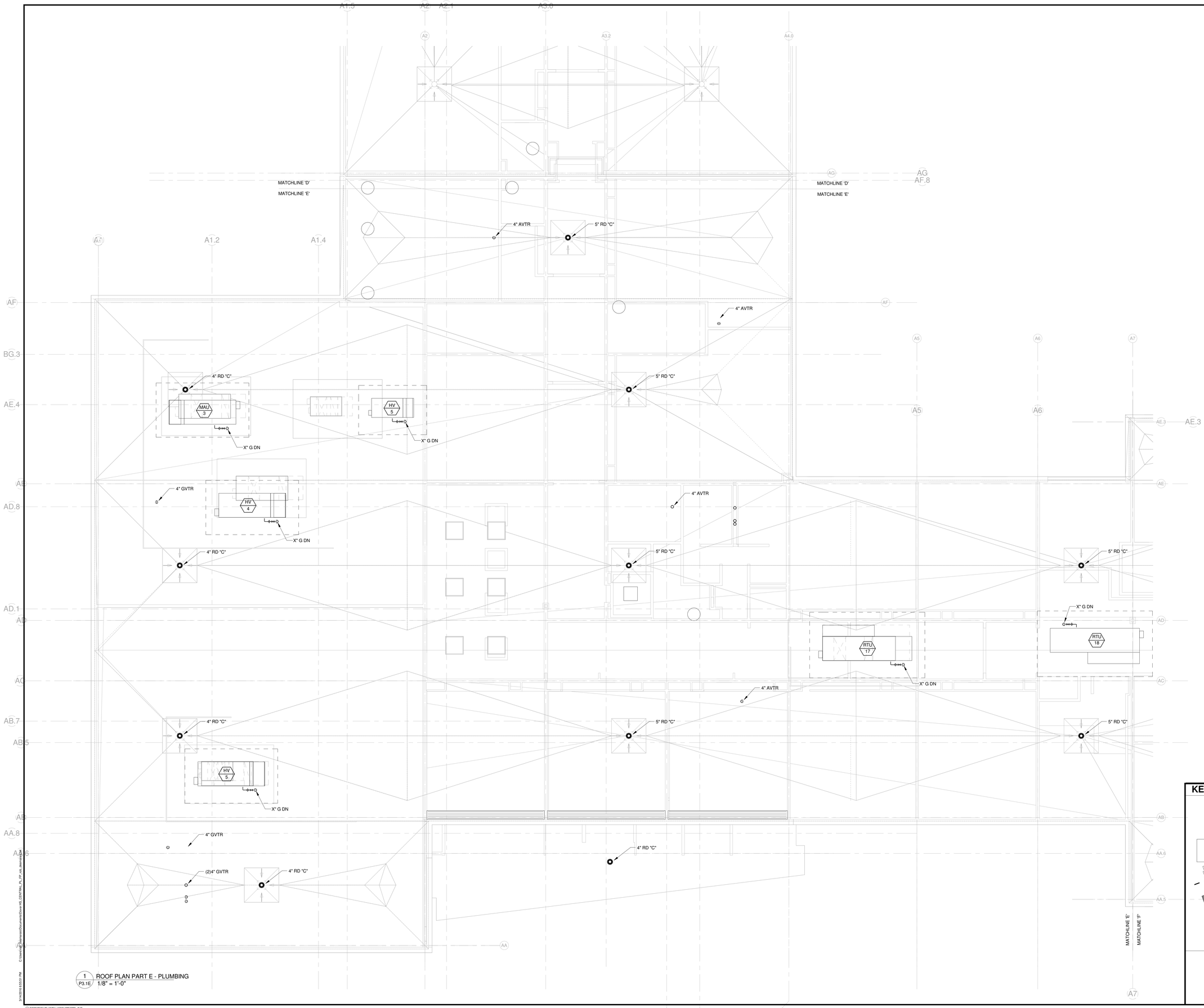
Dover HS / CTC
Dover, NH
ROOF PLAN PART D PLUMBING

SCALE: 1/8" = 1'-0" DRAWN BY: RCD CHECKED BY: CMG

DRAWING NUMBER
P3.1D

JOB NUMBER 403114

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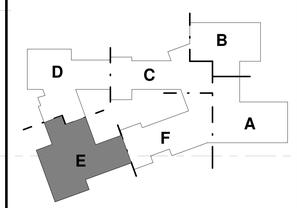
1 P3.1E ROOF PLAN PART E - PLUMBING
1/8" = 1'-0"

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CONSULTING ENGINEERS, PE
60 Lowell Street Manchester, NH 03101 Tel: 603 627 1500 Fax: 603 627 1805

KEYPLAN



Schematic Design
11/15/2015

Dover HS / CTC
Dover, NH
ROOF PLAN PART E PLUMBING

SCALE: 1/8" = 1'-0" DRAWN BY: RCD CHECKED BY: CMG

DRAWING NUMBER
P3.1E

JOB NUMBER 403114

3/14/2016 8:55:51 PM C:\Users\rdesousa\Documents\Dover HS_CENTRAL_R_RVT_rds_dsousa.rvt

4" RD "C"

4" VTR

5" RD "C"

5" RD "C"

4" VTR

X" G DN

5" RD "C"

X" G DN

5" RD "C"

4" VTR

5" RD "C"

4" VTR

4" RD "C"

5" RD "C"

4" RD "C"

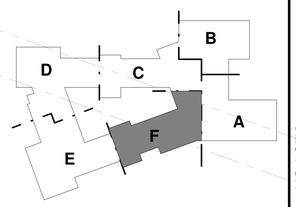
RTU 19

MATCHLINE 'E'

MATCHLINE 'F'

1 P3.1F ROOF PLAN PART F - PLUMBING
1/8" = 1'-0"

KEYPLAN



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617 367 1666 fax 617 367 2988

Schematic Design
11/15/2015

Dover HS / CTC
Dover, NH
ROOF PLAN PART F PLUMBING

SCALE: 1/8" = 1'-0" DRAWN BY: RCD CHECKED BY: CMG

DRAWING NUMBER
P3.1F

JOB NUMBER 403114

9/14/2015 8:55:03 PM C:\Users\rdc_dvenyan\Documents\Revit\HS_CENTRAL_R_F19_rdc_dvenyan.rvt

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e-mail: info@ggd.com

Schematic Design
11/15/2015

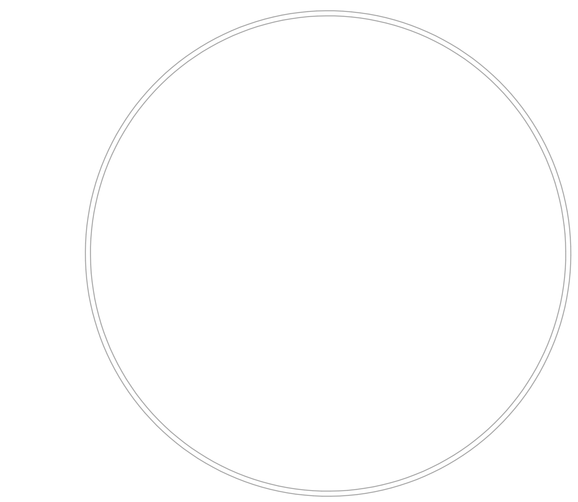
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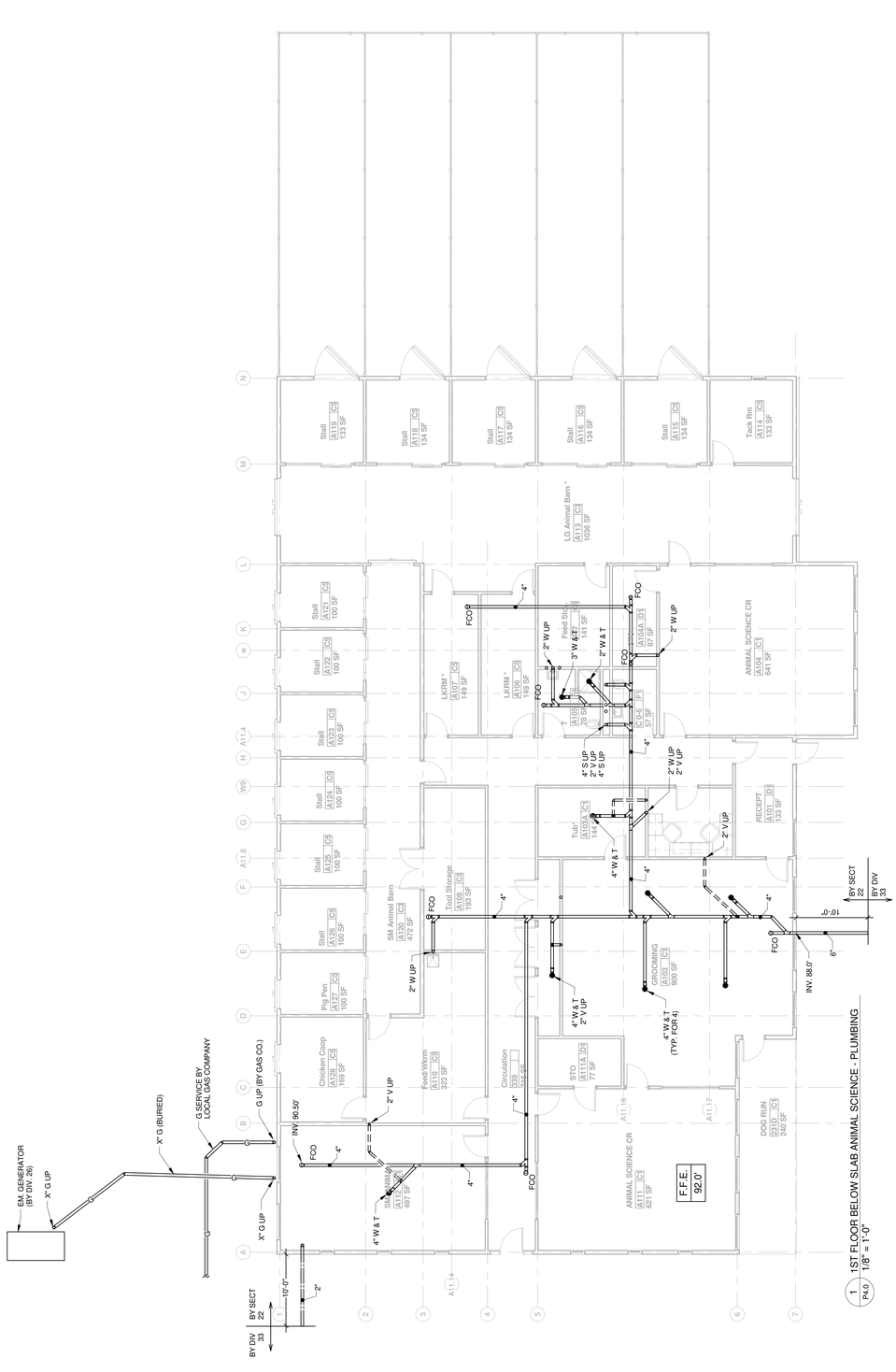
Dover HS / CTC
Dover, NH

BELOW SLAB PLAN ANIMAL SCIENCE PLUMBING

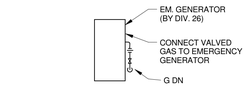
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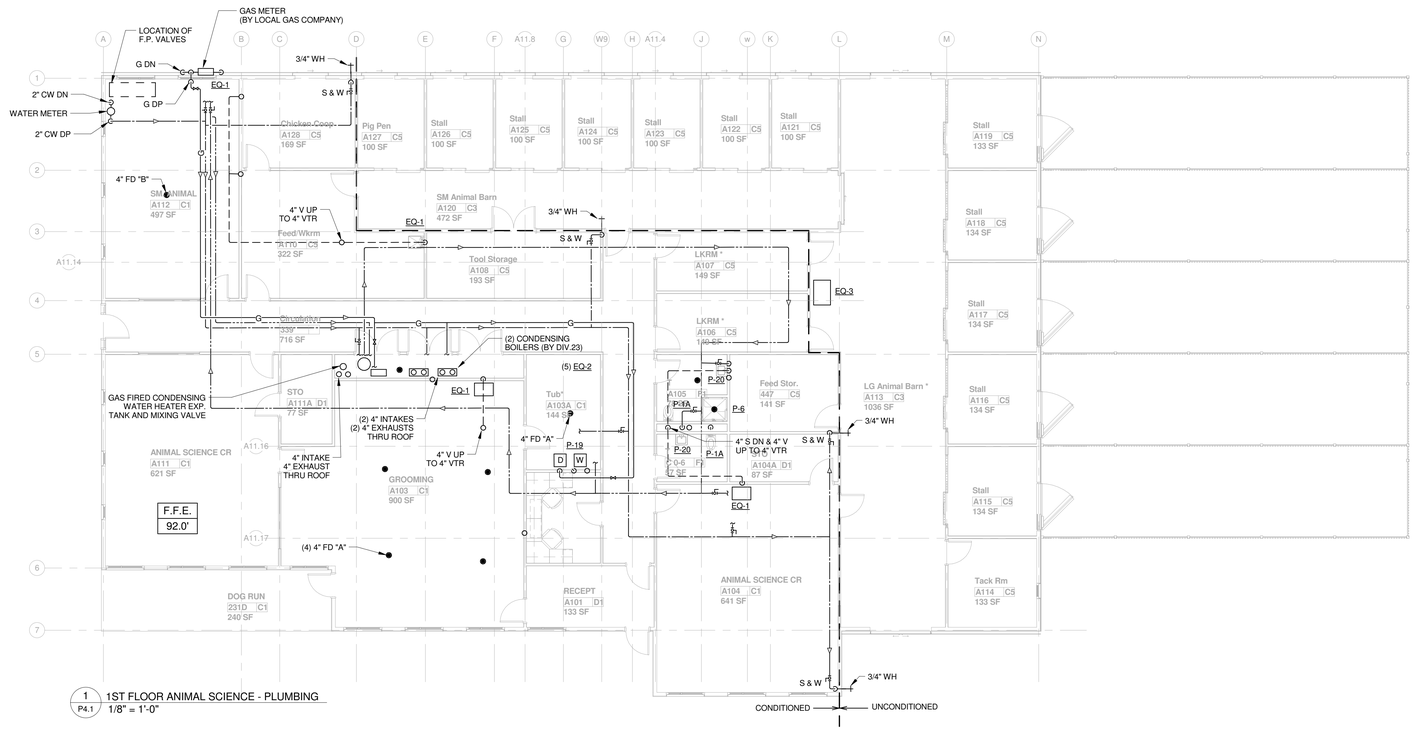
JOB NUMBER 403114





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1 P4.1 1ST FLOOR ANIMAL SCIENCE - PLUMBING
1/8" = 1'-0"

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Schematic Design
11/15/2015

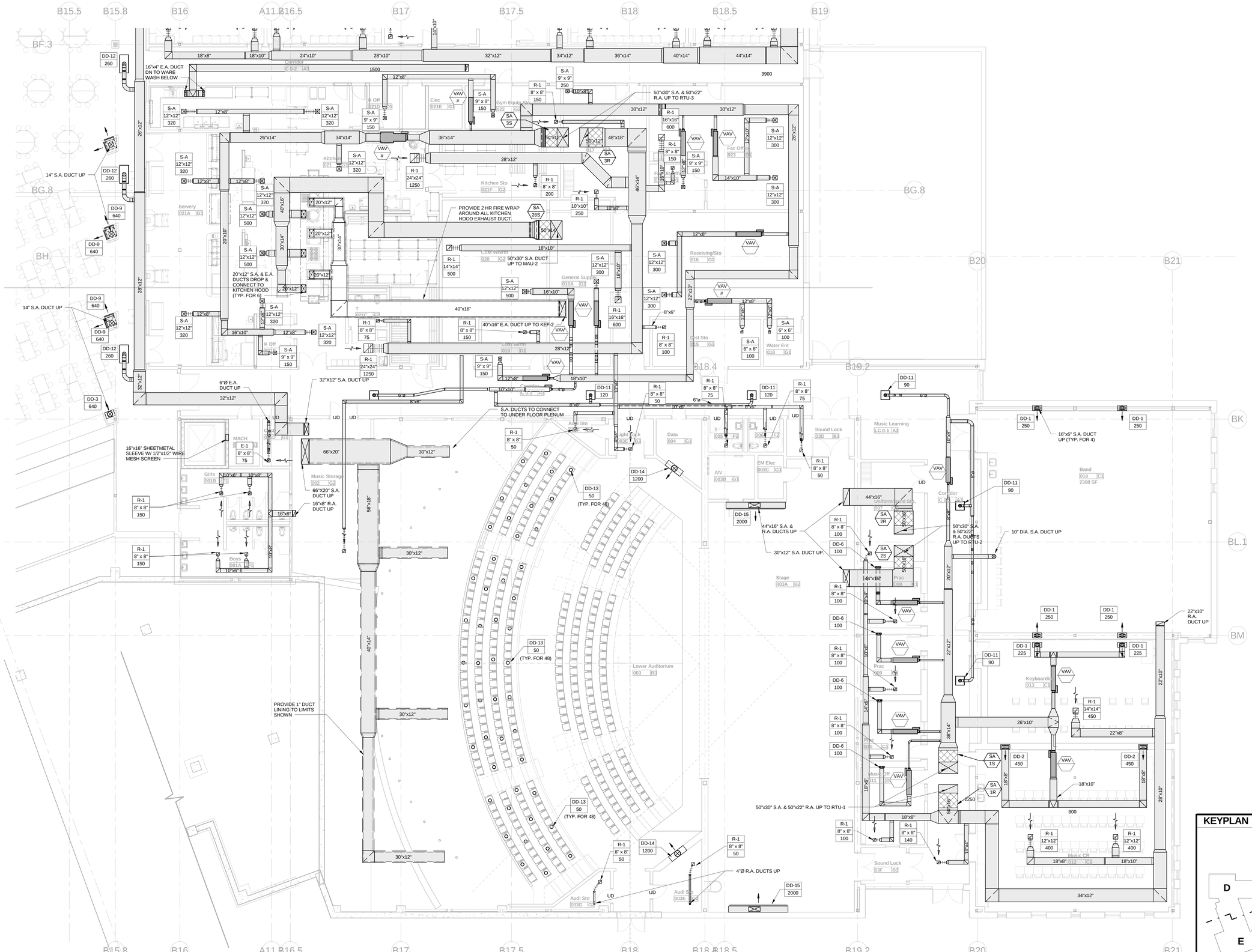
Dover HS / CTC
Dover, NH
1ST FLOOR PLAN ANIMAL SCIENCE
PLUMBING
SCALE: 1/8" = 1'-0"
DRAWN BY: Author
CHECKED BY: Checker

DRAWING NUMBER
P4.1

JOB NUMBER 403114

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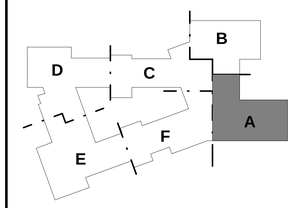
1 BASEMENT DUCT PLAN - PART A
1/8" = 1'-0"

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KEYPLAN



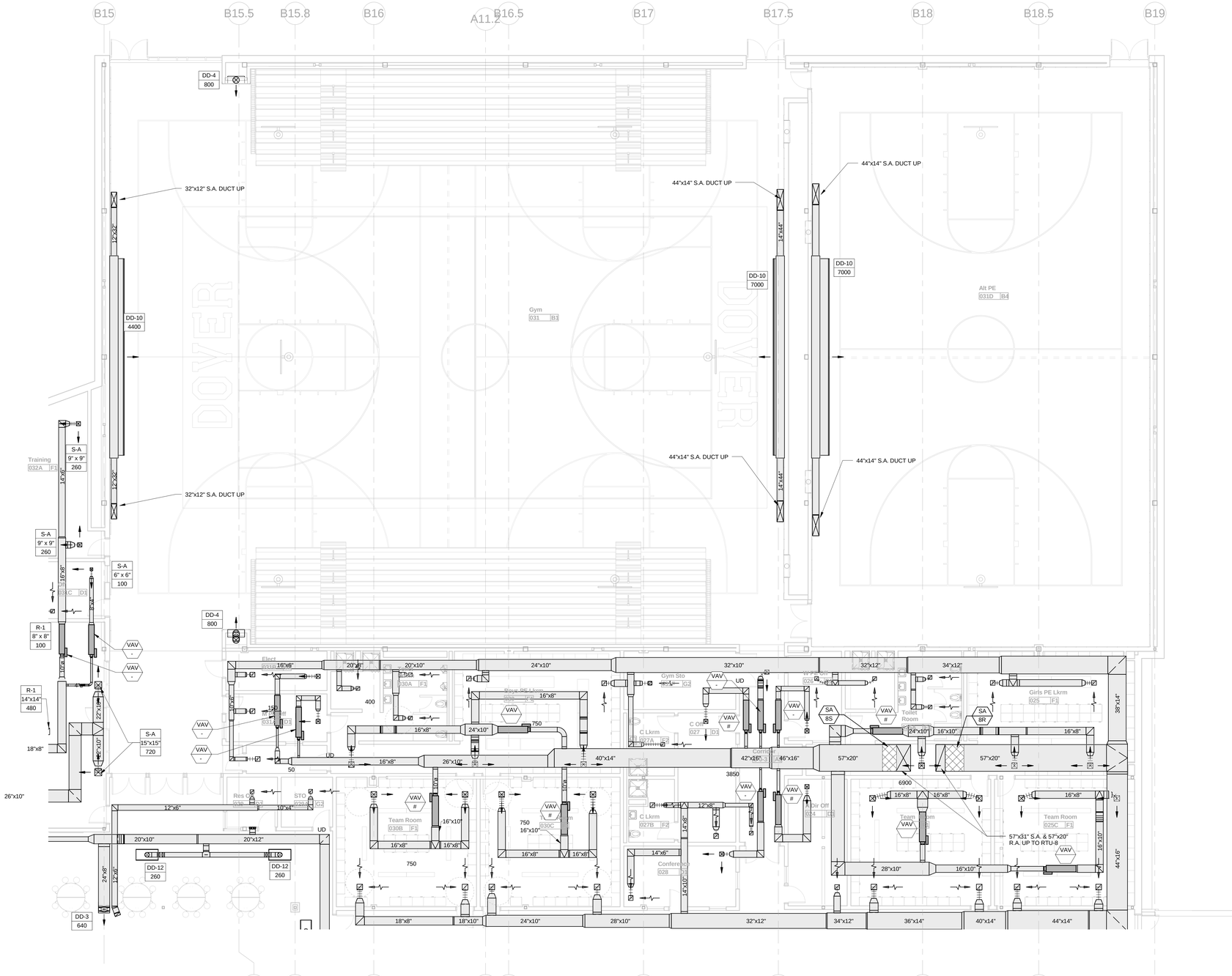
Dover HS / Career Technical Center
Dover, NH
GROUND FLOOR DUCT PLAN - PART A
SCALE: 1/8" = 1'-0"
DRAWN BY: RLP
CHECKED BY: DP

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DRAWING NUMBER
M1.0A
JOB NUMBER 403114

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1 BASEMENT DUCT PLAN - PART B
1/8" = 1'-0"

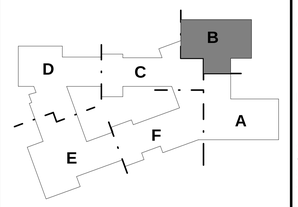
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CONSULTING ENGINEERS PC
617 451 1700 781 890 1800

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PLAN NORTH
TRUE NORTH

KEYPLAN



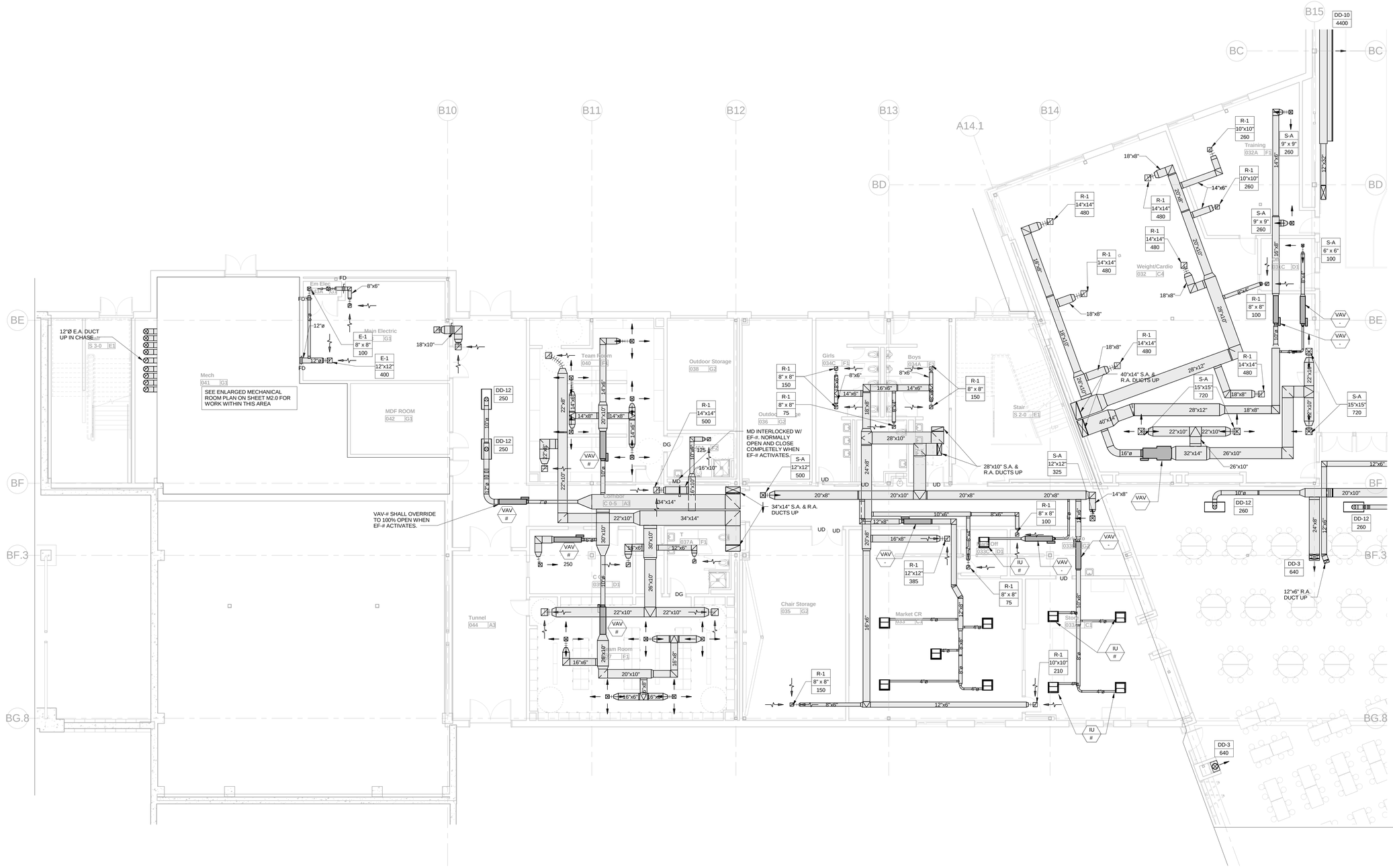
Dover HS / Career Technical Center
Dover, NH
GROUND FLOOR DUCT PLAN - PART B
SCALE: 1/8" = 1'-0"
DRAWN BY: RLP
CHECKED BY: DP

REVISIONS NO.	DATE	REMARKS	BY

DRAWING NUMBER
M1.0B
JOB NUMBER 403114

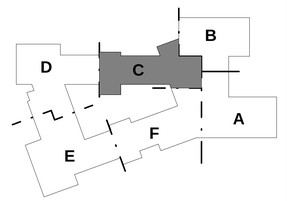
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1 BASEMENT DUCT PLAN - PART C
1/8" = 1'-0"

KEYPLAN



REVISIONS NO.	DATE	REMARKS	BY

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M1.0C

JOB NUMBER 403114

Dover HS / Career Technical Center
Dover, NH
GROUND FLOOR DUCT PLAN - PART C
SCALE 1/8" = 1'-0" DRAWN BY: RLP CHECKED BY: DP

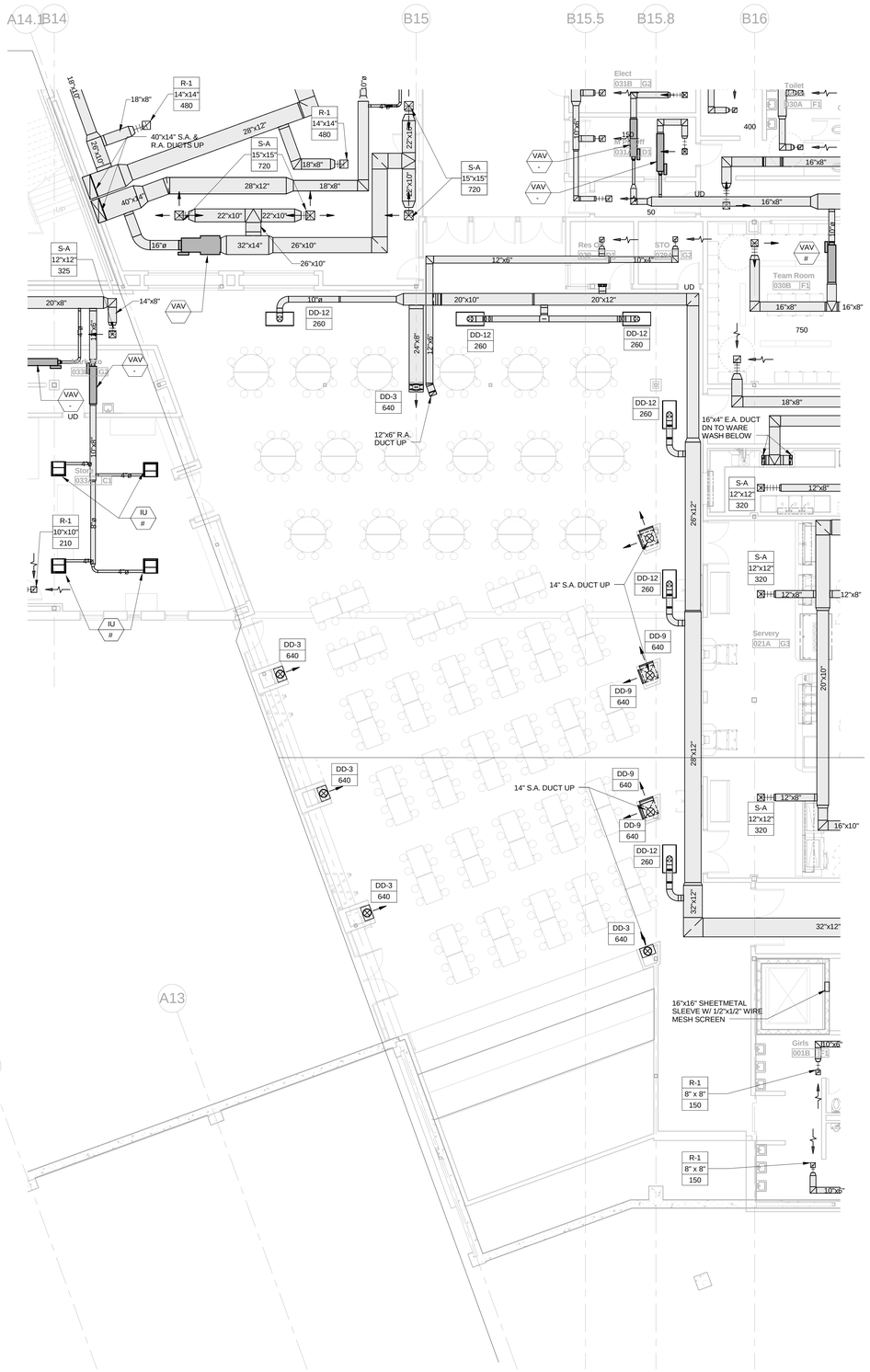
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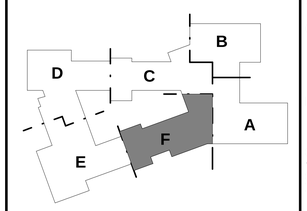
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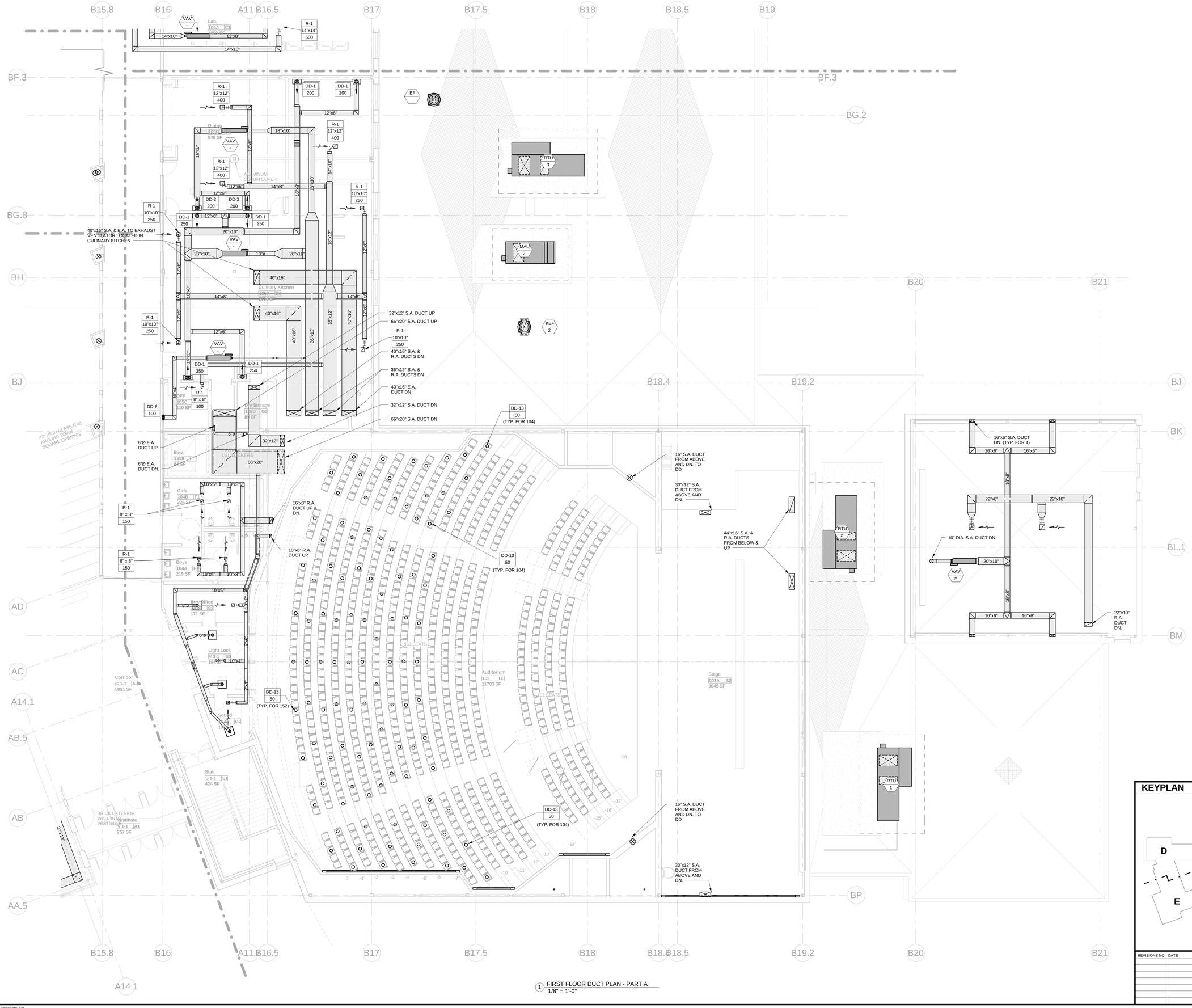
Dover HS / Career Technical Center
Dover, NH
GROUND FLOOR DUCT PLAN PART F

SCALE: 1/8" = 1'-0" DRAWN BY: RLP CHECKED BY: DP

DRAWING NUMBER
M1.0F

JOB NUMBER 403114

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1 FIRST FLOOR DUCT PLAN - PART A
1/8" = 1'-0"

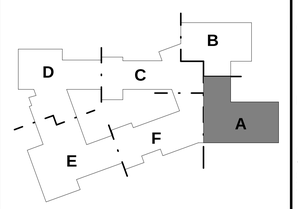
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60 A St Suite 100 Boston MA 02210 617 345 0099

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PLAN NORTH
TRUE NORTH
SCALE: 1/8" = 1'-0"

KEYPLAN



Dover HS / Career Technical Center
Dover, NH
FIRST FLOOR DUCTWORK PLAN - PART A
SCALE: 1/8" = 1'-0"
DRAWN BY: RLP
CHECKED BY: DP

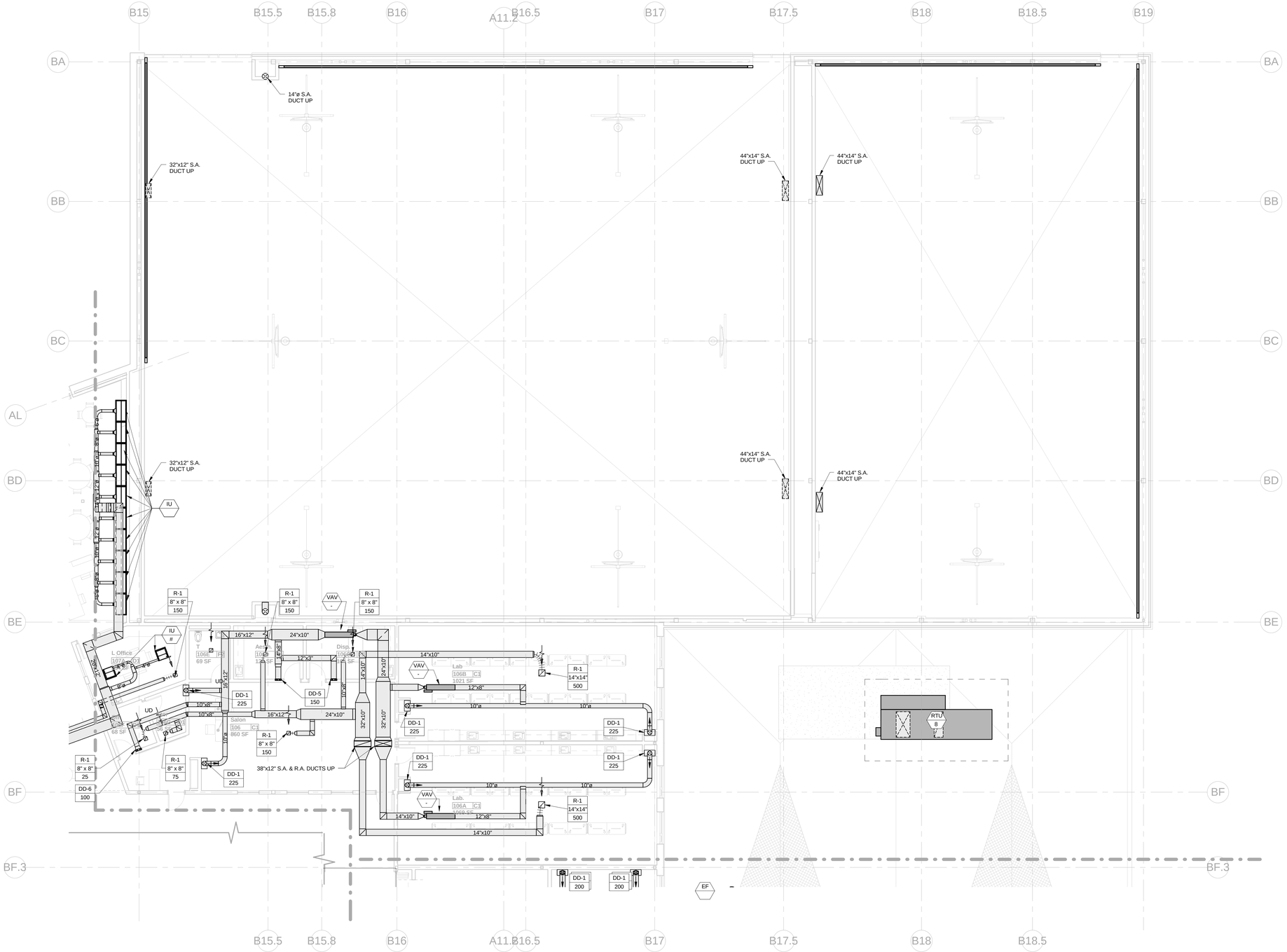
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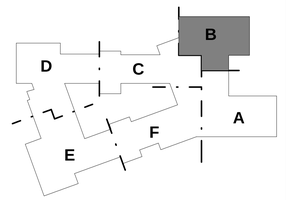
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1 FIRST FLOOR DUCT PLAN - PART B
1/8" = 1'-0"

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581 Main Street, Suite 810 Woburn, MA 01801 T: (781) 932-1776

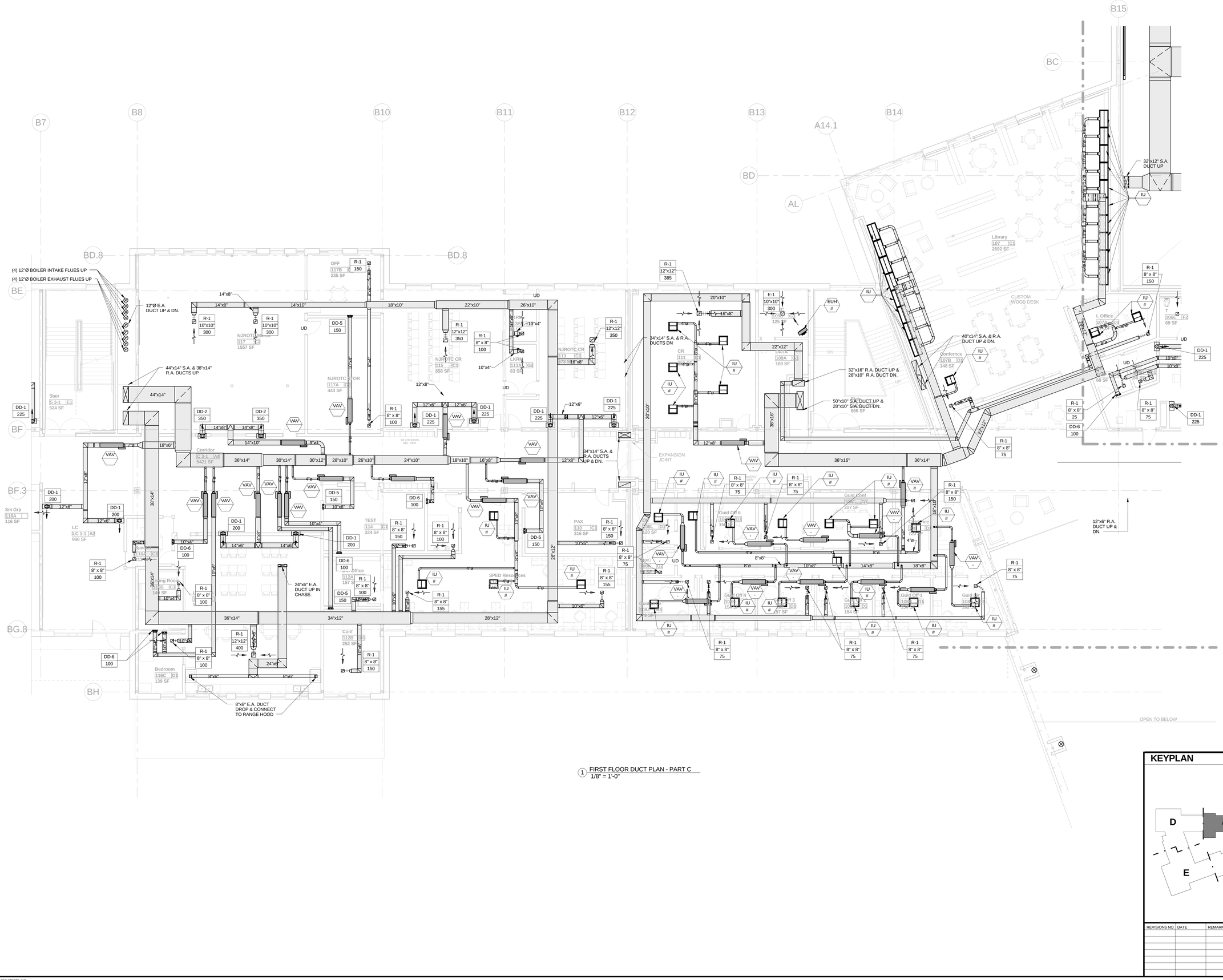
Dover HS / Career Technical Center
Dover, NH
FIRST FLOOR DUCTWORK PLAN - PART B
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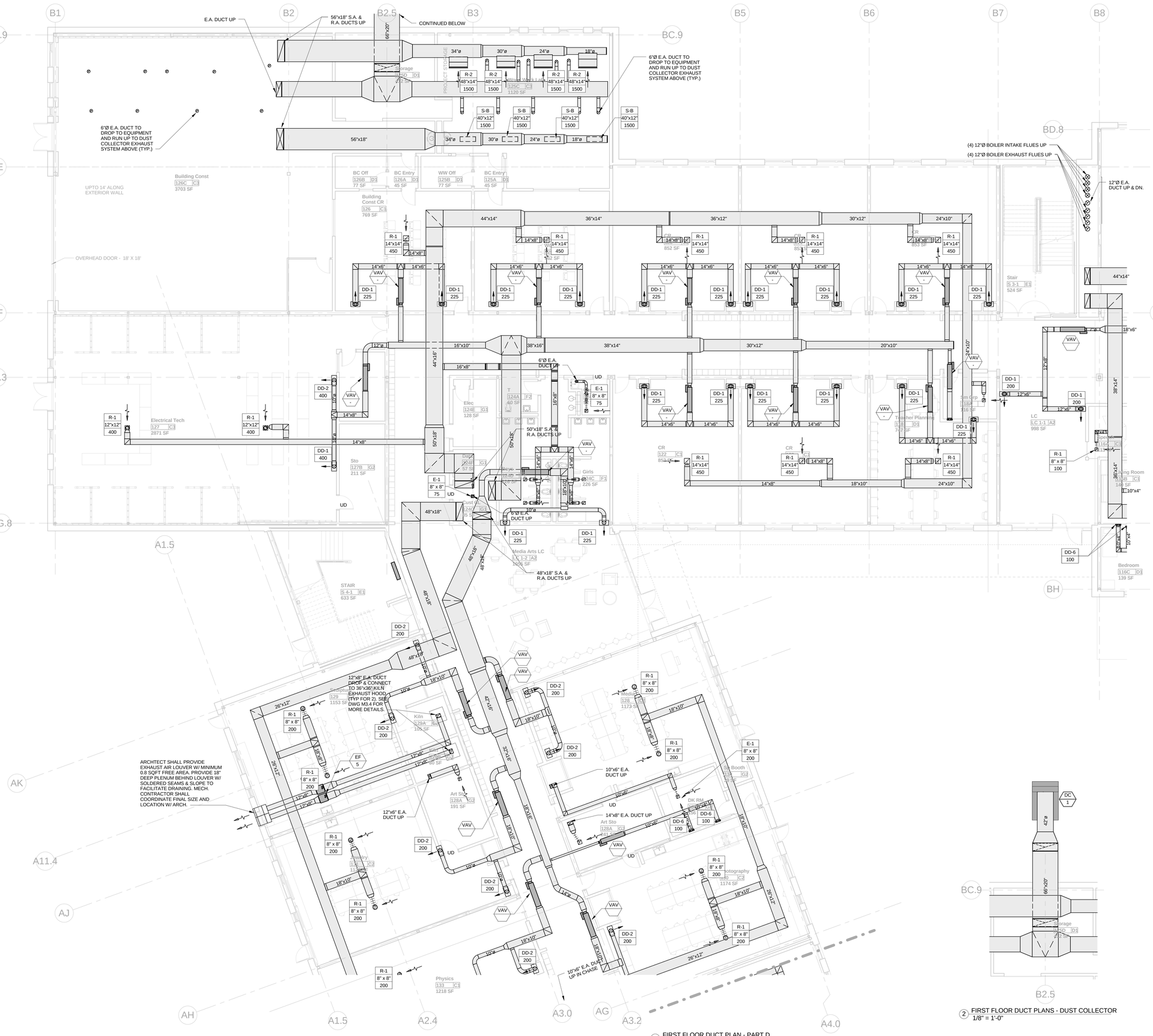
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JOB NUMBER 403114

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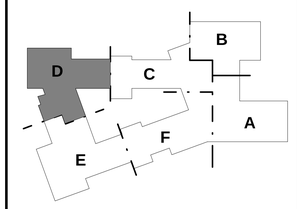

B7
B8
B10
B11
B12
B13
B14
B15
BC
BD
AL
A14.1
BE
BF
BF.3
BG.8
BH
BD.8
(4) 12"Ø BOILER INTAKE FLUES UP
(4) 12"Ø BOILER EXHAUST FLUES UP
12"Ø E.A. DUCT UP & DN.
44"x14" S.A. & 38"x14" R.A. DUCTS UP
24"x6" E.A. DUCT UP IN CHASE.
8"x6" E.A. DUCT DROP & CONNECT TO RANGE HOOD
34"x14" S.A. & R.A. DUCTS UP & DN.
84"x14" S.A. & R.A. DUCTS DN
32"x12" S.A. DUCT UP
40"x14" S.A. & R.A. DUCT UP & DN.
32"x16" R.A. DUCT UP & 28"x10" R.A. DUCT DN.
50"x18" S.A. DUCT UP & 28"x10" S.A. DUCT DN.
12"x6" R.A. DUCT UP & DN.
EXPANSION JOINT
OPEN TO BELOW
Stair 5 3-1 E1 524 SF
Corridor C 3-1 A4 5421 SF
LC LC 1-1 A2 998 SF
Sm Grp 118A 116 SF
Open Office 115A C2 1557 SF
Meeting Room 115B C2 146 SF
Bedroom 116C D1 139 SF
Conf 112B D1 252 SF
Office 112A C2 157 SF
TEST 114 C2 324 SF
PAX 110 C2 316 SF
SPED Resources
Library 107 C1 2692 SF
CUSTOM WOOD DESK
Conference 107B D1 148 SF
L Office 107A D1 88 SF
Guid Conf 109C D1 227 SF
Guid Off 6 109E D1 154 SF
Guid Off 5 109D D1 154 SF
Guid Off 4 109B D1 154 SF
Guid Off 3 109A D1 157 SF
Guid Off 2 108C D1 154 SF
Guid Off 1 108B D1 154 SF
OFF 117B C1 235 SF
NJROTC Admin 117 C1 1557 SF
NJROTC CR 115 C1 858 SF
NJROTC CR 117A C1 443 SF
NJROTC CR 113 C1 773 SF
LKRM 113A G2 83 SF
CR 111 C1 1125 SF
DN 109A D1 169 SF
E-1 10"x10" 300
R-1 12"x12" 385
R-1 12"x12" 350
R-1 12"x12" 400
R-1 10"x10" 300
R-1 8" x 8" 100
R-1 8" x 8" 150
R-1 8" x 8" 155
R-1 8" x 8" 75
R-1 8" x 8" 25
DD-1 225
DD-1 200
DD-2 350
DD-5 150
DD-6 100
DD-6 100
VAV
IU
EUH
UD
100% DESIGN DEVELOPMENT
3-15-2016
FIRST FLOOR DUCTWORK PLAN - PART C
Dover HS / Career Technical Center
Dover, NH
SCALE 1/8" = 1'-0"
DRAWN BY: RLP
CHECKED BY: DP
M1.1C
JOB NUMBER 403114
HMFH ARCHITECTS
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KEYPLAN
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PLAN NORTH
TRUE NORTH
1 FIRST FLOOR DUCT PLAN - PART C
1/8" = 1'-0"
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3/3/2016 10:21:15 AM
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1 FIRST FLOOR DUCT PLAN - PART D
1/8" = 1'-0"

2 FIRST FLOOR DUCT PLANS - DUST COLLECTOR
1/8" = 1'-0"

KEYPLAN



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617 547 4700
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Dover HS / Career Technical Center
Dover, NH
FIRST FLOOR DUCTWORK PLAN - PART D

100% DESIGN DEVELOPMENT
3-15-2016

SCALE: 1/8" = 1'-0" | DRAWN BY: RLP | CHECKED BY: DP

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VAV ASSOCIATED WITH PHYSICS 133 SHALL OVERRIDE TO 100% CFM WHEN EF-8 IS ACTIVATED.

MD INTERLOCKED W/ EF-8. NORMALLY OPEN & CLOSE TO 20% OPENED WHEN EF-8 IS ACTIVATED.

Physics 133 C1 1218 SF

MD

R-1 8" x 8" 200

14"x10" E.A. DUCT DROP & CONNECT TO FUME HOOD

14"x10" E.A. DUCT UP IN CHASE

10"x6" E.A. DUCT UP IN CHASE

Science Prep 131A C1 108 SF

Geography 130 C2 1174 SF

(3) 18"x8" E.A. DUCTS UP

6"Ø E.A. DUCTS DN TO EQUIPMENT.

R-2 32"x12" 750

(TYP. FOR 4)

Welding Lab 133A C1 718 SF

S-B 26"x10" 750

(TYP. FOR 4)

GAS FIRED RADIANT HEATER - REZNOR VCS

38"x14" S.A. & R.A. DUCTS UP

SPRAY BOOTH & PREP STATION BY OTHERS

70"x28" S.A. DUCT TO PROVIDE MUA FOR SPRAY BOOTH

WASH BAY

PRE FAB DOWN DRAFT SPRAY BOOTH & MIXING ROOM

CHAINLINK WITH DOOR

Auto Collision 136A C3 5603 SF

Auto Collision 136A C3 5603 SF

8" CMU UPTO 14' @ ALL WALLS

SEE M1.2E FOR WORK WITHIN THIS AREA

NOTE:

1. PROVIDE CO/NO MONITORING TO MAINTAIN 25 PPM CO/ 1 PPM NO. WHEN EXHAUST FAN IS ACTIVATED, RETURN DAMPERS ON HV-4 SHALL CLOSE.

Auto Colis CR 136 C3 590 SF

Earth Science 134 C1 1336 SF

Science Prep 132A C1 368 SF

Earth Science 132 C1 1300 SF

TYPICAL EARTH SCIENCE CLASSROOM
- 8 STUDENTS, 1 SINK @ TEACHERS DEMONSTRATION TABLE
- 12 STUDENTS, 1 GAS JET@ TEACHER DEMONSTRATION TABLE
- 4 FUME HOOD

TYPICAL EARTH SCIENCE PREP ROOM
- 2 SINKS
- 1 EYE WASH STATION
- 1 REFRIGERATOR
- CABINETS, CHEMICAL STORAGE
- TWO 6' WIDE FUME HOODS
- ACCESS TO PREP FROM BOTH CLASSROOMS
- DISHWASHER

Auto Colis CR 135 C3 1075 SF

Auto Colis CR 135 C3 1075 SF

CHAINLINK WITH DOOR

NOTE:

1. PROVIDE CO/NO MONITORING TO MAINTAIN 25 PPM CO/ 1 PPM NO. WHEN EXHAUST FAN IS ACTIVATED, RETURN DAMPERS ON HV-5 SHALL CLOSE.

SEE M1.2E FOR WORK WITHIN THIS AREA

8" CMU UPTO 14' @ ALL WALLS

Auto Tech 138A C3 6589 SF

Auto Service 138 C3 591 SF

Vestibule 139 C3 134 SF

Alignment Bay

ENLARGED BAY

50"x18" S.A. & R.A. DUCTS UP

Toilet 140D F3 226 SF

Boys 140C F1 146 SF

Toilet 140C F1 108 SF

Elev 4059 81 SF

Cust 140B C 51 SF

Toilet 140A F2 52 SF

16"x16" SHEETMETAL SLEEVE W/ 1/2"x1/2" WIRE MESH SCREEN

CTC Storage 137 D1 222 SF

CTC Classroom 135 D2 368 SF

CTC Classroom 136 D2 525 SF

CTC Storage 139 D1 252 SF

CTC Office 139C D1 134 SF

CTC Office 139D D1 134 SF

Toilet 139A F2 52 SF

Toilet 139B F1 52 SF

Janitor 139 C3 52 SF

CR 141 C1 909 SF

CR 143 C1 851 SF

Teacher Planning 144 C1 445 SF

TYPICAL TEACHER WORKROOM

LC LC 1-3 A2 1045 SF

Sm Grp 136A C3 155 SF

SPED 146 C3 914 SF

Toilet 145A F2 52 SF

Toilet 145B D 85 SF

Stor 145C F2 171 SF

GS 24"x10"

STAIR S 5-1 E1 613 SF

42"x20" S.A. & 46"x18" R.A. DUCTS UP

3D Print 135A C3 220 SF

Stor 145C F2 171 SF

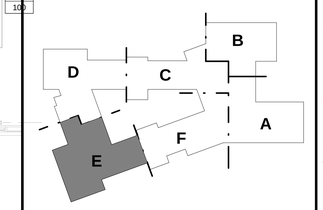
1 FIRST FLOOR DUCT PLAN - PART E
1/8" = 1'-0"

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3-15-2016

KEYPLAN



Dover HS / Career Technical Center
Dover, NH
FIRST FLOOR DUCTWORK PLAN - PART E

SCALE: 1/8" = 1'-0" | DRAWN BY: RLP | CHECKED BY: DP

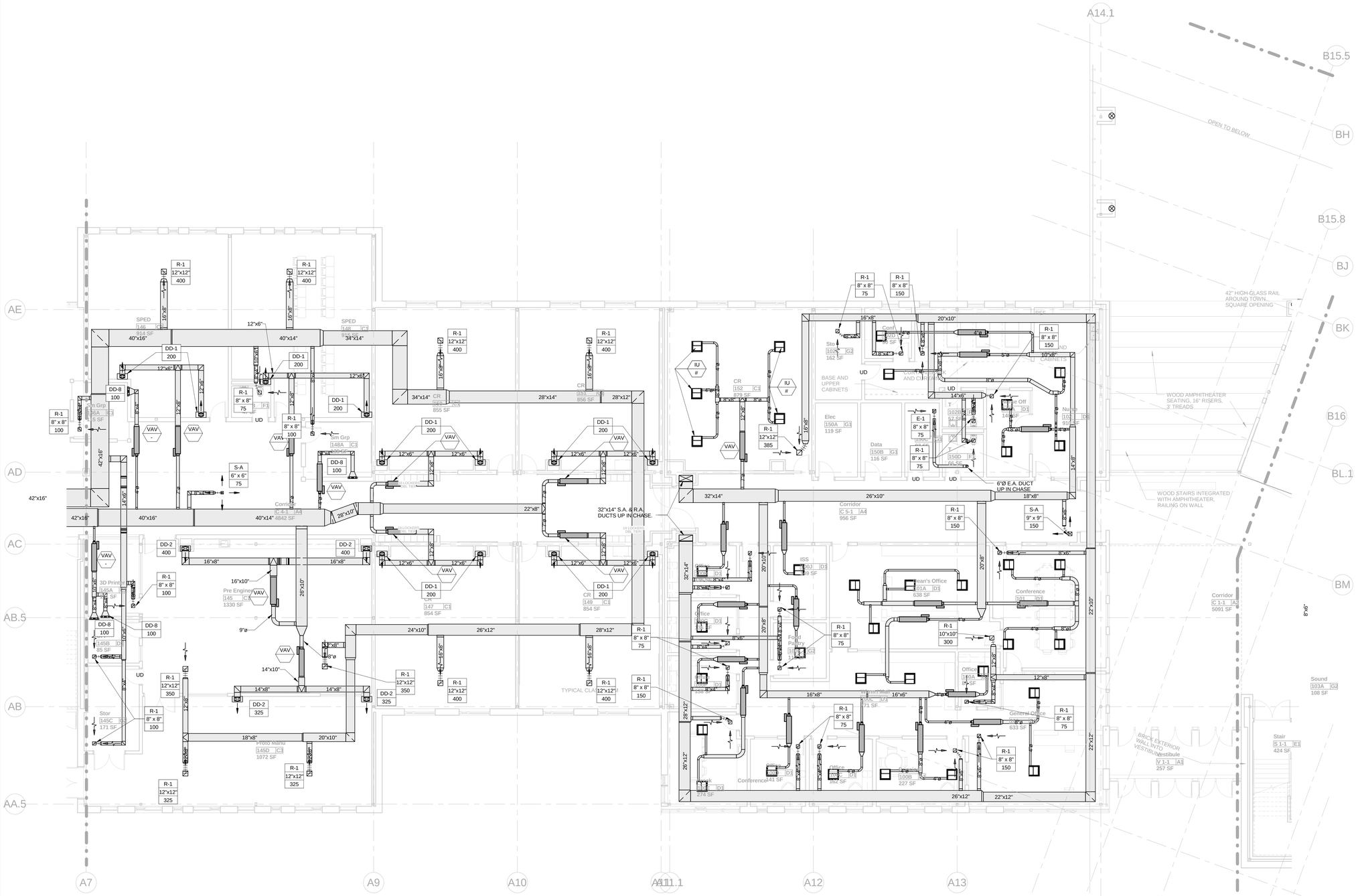
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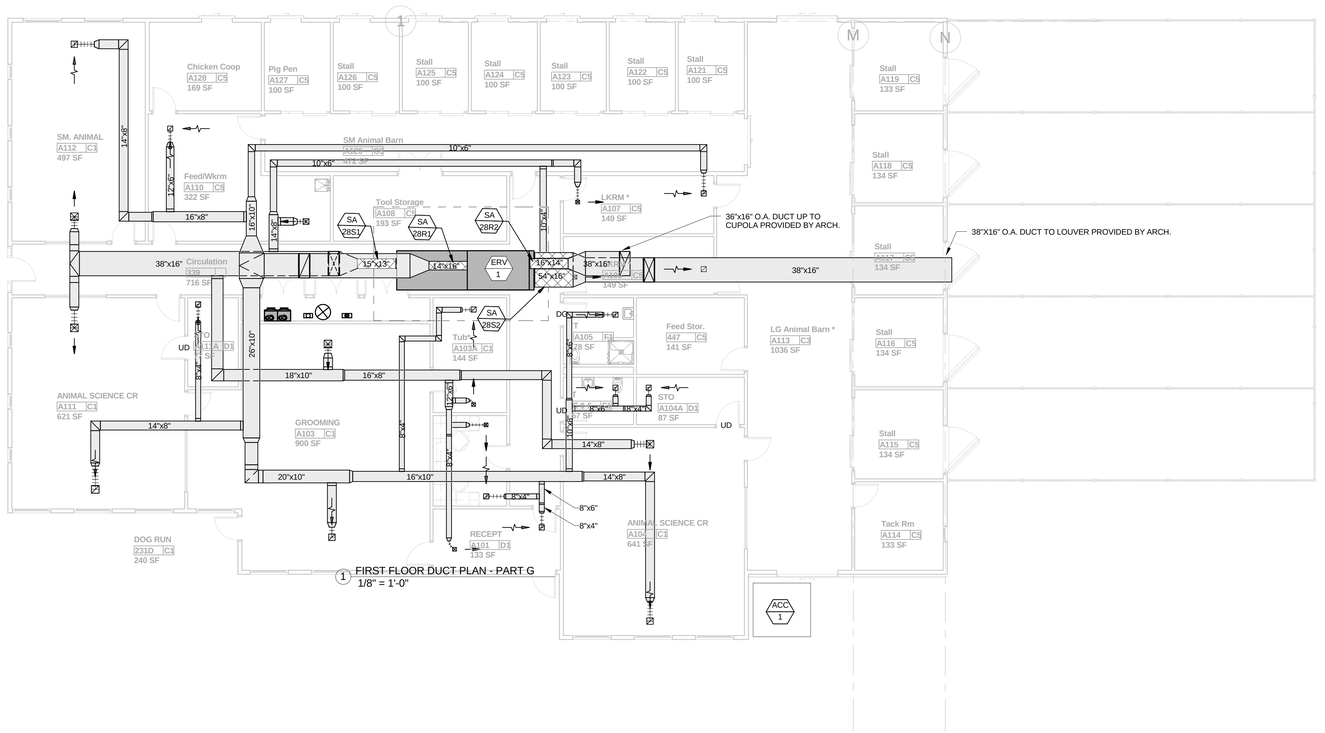
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A14.1
B15.5
BH
B15.8
BJ
BK
B16
BL.1
BM
BP
AE
AD
AC
AB.5
AB
AA.5
A7
A9
A10
A11
A11.1
A12
A13
R-1 12"x12" 400
R-1 8" x 8" 100
R-1 8" x 8" 75
R-1 8" x 8" 150
R-1 12"x12" 385
R-1 12"x12" 350
R-1 12"x12" 325
DD-1 200
DD-2 400
DD-2 325
DD-8 100
S-A 6" x 6" 75
S-A 9" x 9" 150
E-1 8" x 8" 75
R-1 10"x10" 300
VAV
IU #
914 SF
40'x16'
855 SF
34'x14'
856 SF
28'x14'
854 SF
28'x12'
4842 SF
40'x14'
956 SF
26'x10'
1330 SF
1072 SF
20'x10'
638 SF
20'x8'
633 SF
20'x6'
1071 SF
16'x8'
1028 SF
32'x14'
1102 SF
26'x10"
1028 SF
22'x8'
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18'x8'
1028 SF
14'x6'
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1028 SF
Corridor
C 4-1 A4
4842 SF
Corridor
C 5-1 A4
956 SF
Corridor
C 1-1 A2
5091 SF
Vestibule
V 1-1 A2
257 SF
Stair
S 1-1 E1
424 SF
Sound
103A G2
108 SF
Pre Engineer
145 C3
1330 SF
3D Printing
145A C3
95 SF
Stor
145B D3
35 SF
Stor
145C C3
171 SF
Photo Manip
145D C3
1072 SF
Sm Grp
148A C3
95 SF
Sm Grp
148A C3
95 SF
CR
147 C3
854 SF
CR
149 C3
854 SF
CR
152 C3
879 SF
Office
150C D3
95 SF
Work
150C D3
274 SF
Conference
150C D3
141 SF
Storage
150C G3
102 SF
Storage
150B G3
116 SF
Elec
150A G3
119 SF
Data
150B G3
116 SF
Sto
102C G2
162 SF
Comm
102B G2
95 SF
Dean's Office
101A D3
638 SF
Conference
101 D2
Food Pantry
102A G2
Office
102C D3
Office
102A D3
Work
102B D3
Storage
102A G3
Storage
100B G3
227 SF
General Office
103A G2
633 SF
Nursing
102C D3
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1 FIRST FLOOR DUCT PLAN - PART G
1/8" = 1'-0"

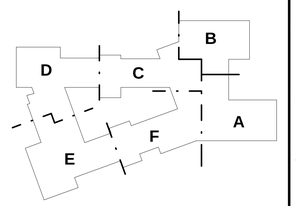
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PLAN NORTH
TRUE NORTH

KEYPLAN



Dover HS / Career Technical Center
Dover, NH
FIRST FLOOR DUCTWORK PLAN - PART G
SCALE 1/8" = 1'-0"
DRAWN BY RLP
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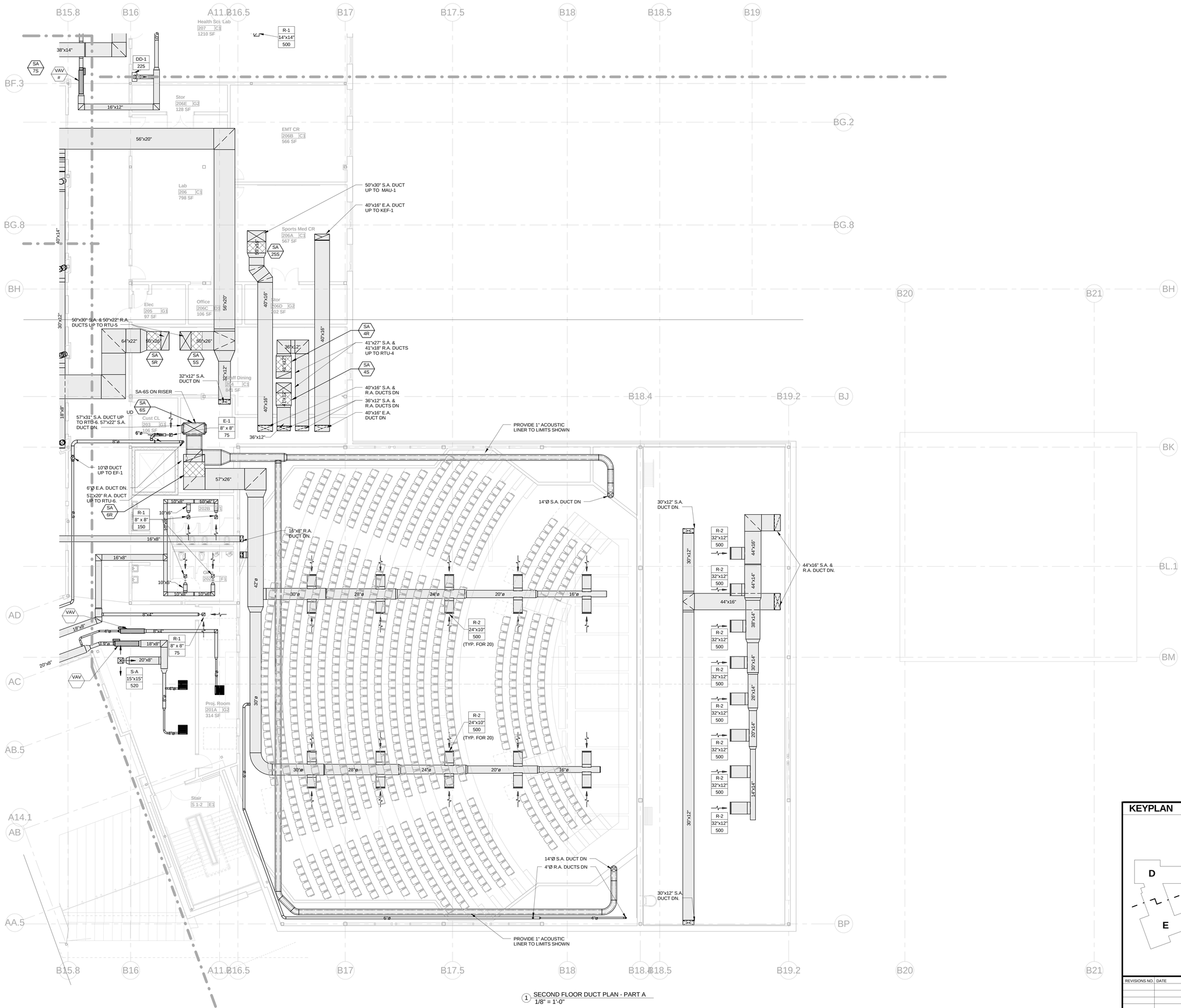
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1 SECOND FLOOR DUCT PLAN - PART A
1/8" = 1'-0"

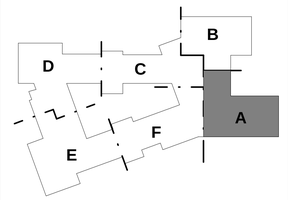
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PLAN NORTH
TRUE NORTH

KEYPLAN



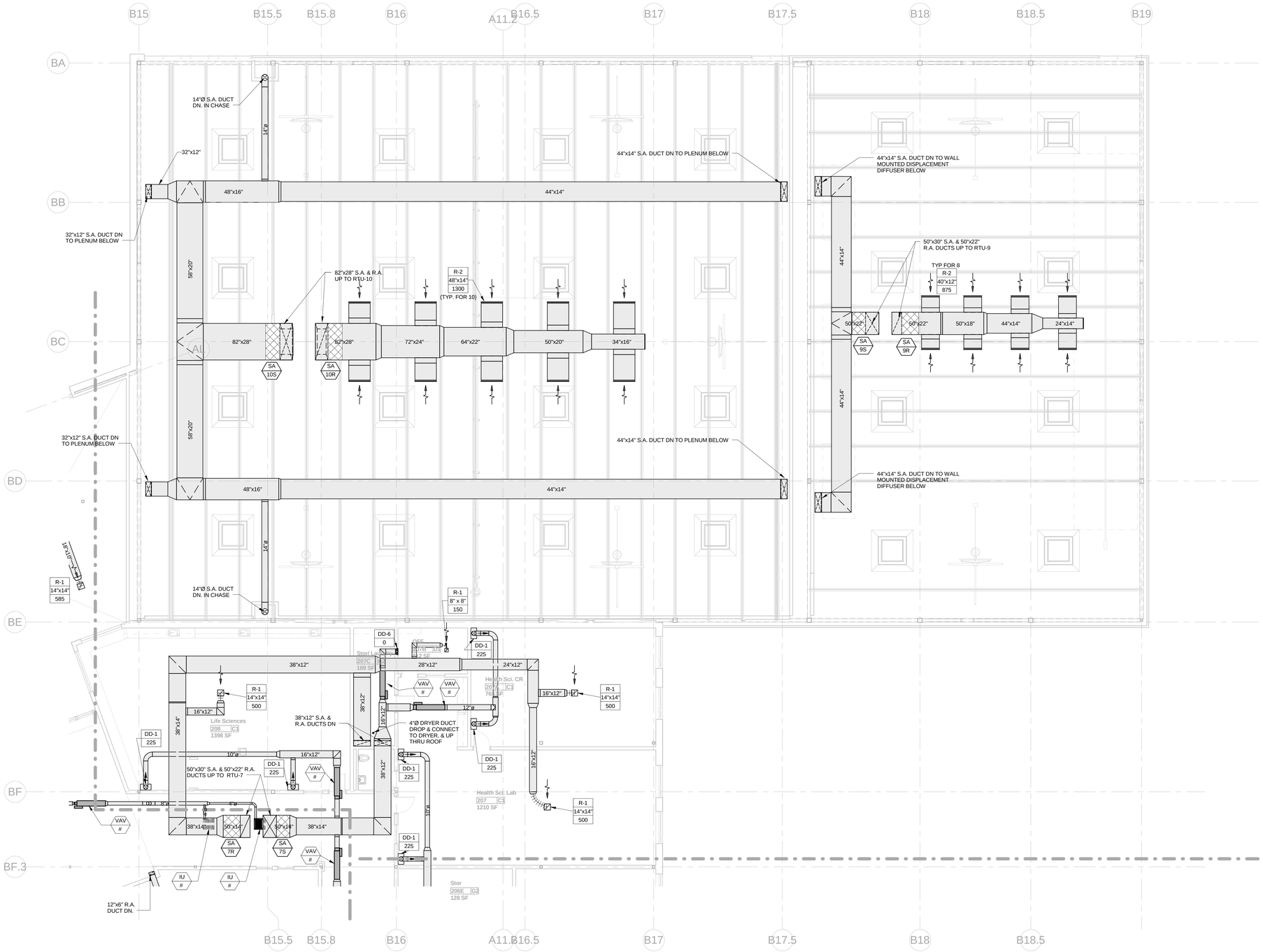
Dover HS / Career Technical Center
Dover, NH
SECOND FLOOR DUCT PLAN - PART A
SCALE: 1/8" = 1'-0"
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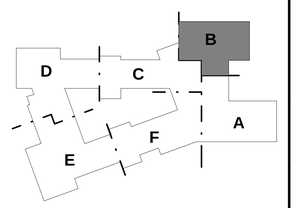
1 SECOND FLOOR DUCT PLAN - PART B
1/8" = 1'-0"

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KEYPLAN



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Dover, NH
SECOND FLOOR DUCT PLAN - PART B
SCALE 1/8" = 1'-0"
DRAWN BY: RLP
CHECKED BY: DP

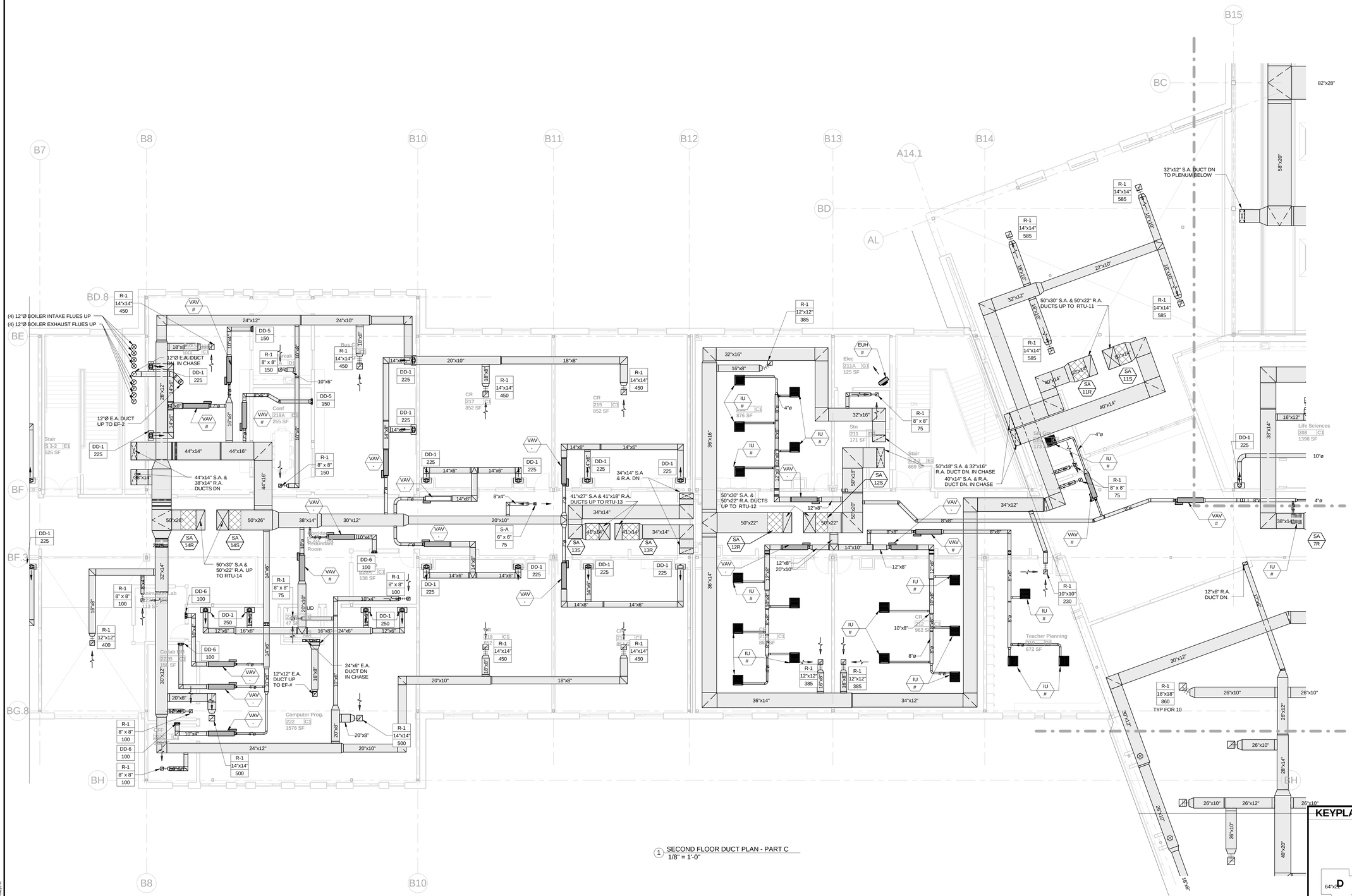
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B7
B8
B10
B11
B12
B13
B14
B15
A14.1
BC
BD
AL
BD.8
BE
BF
BF.3
BG.8
BH
(4) 12"Ø BOILER INTAKE FLUES UP
(4) 12"Ø BOILER EXHAUST FLUES UP
12"Ø E.A. DUCT UP TO EF-2
12"Ø E.A. DUCT IN CHASE
44"x14" S.A. & 38"x14" R.A. DUCTS DN
50"x30" S.A. & 50"x22" R.A. UP TO RTU-14
24"x6" E.A. DUCT DN IN CHASE
12"x12" E.A. DUCT UP TO EF-#
41"x27" S.A & 41"x18" R.A. DUCTS UP TO RTU-13
34"x14" S.A & R.A. DN
50"x30" S.A. & 50"x22" R.A. DUCTS UP TO RTU-12
50"x30" S.A. & 50"x22" R.A. DUCTS UP TO RTU-11
32"x12" S.A. DUCT DN TO PLENUM BELOW
50"x18" S.A. & 32"x16" R.A. DUCT DN. IN CHASE
40"x14" S.A. & R.A. DUCT DN. IN CHASE
12"x6" R.A. DUCT DN.
TYP FOR 10
Stair S-3-2 E1 526 SF
Cont 219A C1 265 SF
Bus Closet 219 C1 25 SF
Redundant Room 222B C1 138 SF
Computer Lab 222A C1 115 SF
Computer Prog. 222 C1 1576 SF
Elec 211A G1 125 SF
Sto 211 C1 171 SF
Stair S-3-1 G1 669 SF
Sto 211 C1 171 SF
Sto 211 C1 173 SF
Life Sciences 208 C1 1398 SF
Teacher Planning 210 C1 672 SF
CR 217 C1 852 SF
CR 215 C1 852 SF
CR 218 C1 852 SF
CR 214 C1 852 SF
CR 212 C1 962 SF
IU # C1 876 SF
Redundant Room 222C C1 47 SF
Redundant Room 222D C1 138 SF
Redundant Room 222E C1 138 SF
Redundant Room 222F C1 138 SF
Redundant Room 222G C1 138 SF
Redundant Room 222H C1 138 SF
Redundant Room 222I C1 138 SF
Redundant Room 222J C1 138 SF
Redundant Room 222K C1 138 SF
Redundant Room 222L C1 138 SF
Redundant Room 222M C1 138 SF
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Redundant Room 222AEZ C1 138

6'Ø E.A. DUCTS DN TO EQUIPMENT BELOW (TYP.)

MD INTERLOCKED W/ EF-#. NORMALLY OPEN & CLOSE TO 20% OPENED WHEN EF-11 IS ACTIVATED.

MD INTERLOCKED W/ EF-#. NORMALLY OPEN & CLOSE TO 20% OPENED WHEN EF-11 IS ACTIVATED.

R-2 48"x14" 1500 (TYP. FOR 4)

24"ø 24"ø 40"x14" 34"ø 56"x18"

SA 21R 50"x20" SA 20R 50"x20"

50"x30" S.A. & 50"x22" R.A. DUCTS UP TO HV-2

50"x30" S.A. & 50"x22" R.A. DUCTS UP TO HV-1

SA 21S 50"x20" SA 20S 50"x20"

S-B 40"x12" 1500 (TYP. FOR 4)

54"x18" 46"x18" 44"x18"

R-1 12"x12" 400 R-1 12"x12" 400 R-1 10"x10" 300 R-1 12"x12" 400 R-1 12"x12" 400

18"x8" 18"x8" 18"x10" 18"x10"

56"x18" S.A. & R.A. DUCTS DN

Science Prep 233 245 SF

14"x10" E.A. DUCT UP TO EF-#

14"x10" E.A. DUCT DROP & CONNECT TO FUME HOOD

14"x10" E.A. DUCT UP TO EF-#

Physics Science 232 1230 SF

DD-5 150 12"x4" 12"x4" DD-5 150 14"x6" 42"x16"

18"x8" 18"x8" 18"x8" 18"x8"

VAV DD-2 400 VAV DD-2 400 VAV DD-2 400

10"x4" 20"x10" 10"x4"

DD-11 90 DD-11 90 DD-11 90 8"x4" 30"x12"

Corridor LC 2.1 A4 1225 SF

R-1 10"x10" 300 18"x6"

Teacher Planning 229 109 SF

DD-11 90 DD-11 90 DD-5 150 10"x6"

54"x18" 26"x10" 30"x12"

38"x16" 38"x14" 38"x12"

20"x8" R-1 14"x14" 450 CR 227 C1 856 SF

CR 225 C1 854 SF

CR 223 C1 854 SF

30"x12"

14"x6" DD-1 225 VAV

Stair S 3-2 E1 526 SF

(4) 12"Ø BOILER INTAKE FLUES UP

(4) 12"Ø BOILER EXHAUST FLUES UP

18"x8" 12"Ø E.A. DUCT DN. IN CHASE

12"Ø E.A. DUCT UP TO EF-2

28"x12" 14"x6" 18"x14"

Prep 234C G2 276 SF

VAV # VAV - 10"x6" 10"x6" DD-5 150 R-1 8" x 8" 150

10"x6" Elec 233 E1 196 SF

12"x8" 14"x8" 20"x10" 14"x6"

R-1 10"x10" 300 DD-5 150 VAV - DD-5 150 50"x18"

Clean Room 234B C1 208 SF

R-1 12"x12" 400 VAV DD-2 400 10"x6" R-1 8" x 8" 150

Biology 231 C1 1512 SF

18"x8" 18"x10" 10"x4" 18"x8" 18"x10" 18"x8"

Clean Room 234A C1 410 SF

R-1 12"x12" 400 R-1 8" x 8" 100

12"x6" Chem Sto 235D G1 306 SF E-1 8" x 8" 200

DG

12"x6" E.A. DUCT UP TO EF-#

52"x18" S.A. & R.A. DUCTS DN

80"x26" 80"x26" 34"x14" 28"x12" 20"x10"

80"x26" S.A. & R.A. DUCTS UP TO RTU-15

6'Ø E.A. DUCT DN.

10"Ø E.A. DUCT UP TO EF-3

T 230B F1 60 SF UD C 230C F1 52 SF UD

R-1 8" x 8" 75 E-1 8" x 8" 75

Elec 230E G1 75 SF

Corridor 230D C1 Boys Toilet 226B C1 226 SF

R-1 8" x 8" 150 R-1 14"x14" 450

UD 50"x18" UD

12"x6" 12"x6" 16"x10" 24"x10" 30"x10"

CR 228 C1 852 SF CR 226 C1 854 SF CR 224 C1 855 SF

DD-1 225 VAV - S-A 12"x12" 375 16"x8"

R-1 8" x 8" 100 R-1 12"x12" 400

Chemistry 238 C1 713 SF

Collab RM 228 C1 1225 SF

16"x8" 32"x14" 50"x26" 22"x5" SA 14R

30"x12" 20"x8" 10"x4"

CFE 227 C1 DD-6 100 R-1 8" x 8" 100 12"x4"

48"x18" 48"x18" S.A. & R.A. DUCTS UP TO RTU-16. SA-16S1 LOCATED ON SUPPLY DUCT DROP

70"x24" 70"x24" 70"x24" S.A. & R.A. DUCTS UP TO RTU-16

SA 16R1 SA 16R2 SA 16S1 SA 16S2

Stair S 4-2 E1 634 SF

50"x18" 50"x18" 50"x18"

DD-2 400 36"x14" 32"x14" 44"x16" 28"x12"

14"x10" E.A. DUCT DROP & CONNECT TO FUME HOOD

Science Prep 222 SF

14"x10" E.A. DUCT UP TO EF-11

16"x8" E.A. DUCT UP & 12"x6" E.A. DUCT DN.

14"x10" E.A. DUCT DROP & CONNECT TO FUME HOOD

1225 SF

14"x10" E.A. DUCT UP TO EF-10

MD INTERLOCKED W/ EF-11. NORMALLY OPEN & CLOSE TO 20% OPENED WHEN EF-11 IS ACTIVATED.

MD INTERLOCKED W/ EF-10. NORMALLY OPEN & CLOSE TO 20% OPENED WHEN EF-10 IS ACTIVATED.

VAVs ASSOCIATED W/ A ROOM THAT CONTAINS A FUME HOOD SHALL OVERRIDE TO 100% CFM WHEN THE ASSOCIATED VEKTOR FAN IS ACTIVATED.

Chemistry 236 C1 1345 SF

MD INTERLOCKED W/ EF-12. NORMALLY OPEN & CLOSE TO 20% OPENED WHEN EF-12 IS ACTIVATED.

VAVs ASSOCIATED W/ A ROOM THAT CONTAINS A FUME HOOD SHALL OVERRIDE TO 100% CFM WHEN THE ASSOCIATED VEKTOR FAN IS ACTIVATED.

MD INTERLOCKED W/ EF-13. NORMALLY OPEN & CLOSE TO 20% OPENED WHEN EF-13 IS ACTIVATED.

14"x10" E.A. DUCT UP TO EF-13

14"x10" E.A. DUCT DROP & CONNECT TO FUME HOOD

10"x6" EXH. DUCT DN. IN CHASE & UP TO EF-6

Science Prep 236A C1 225 SF

14"x10" E.A. DUCT UP TO EF-12

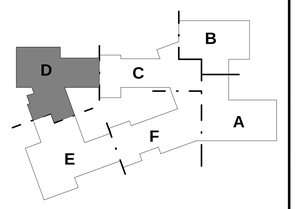
14"x10" E.A. DUCT DROP & CONNECT TO FUME HOOD

Chemistry 238 C1 1343 SF

Lobby 1 C1

1 SECOND FLOOR DUCT PLAN - PART D
1/8" = 1'-0"

KEYPLAN



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3-15-2016

Dover HS / Career Technical Center
Dover, NH
SECOND FLOOR DUCT PLAN - PART D
SCALE: 1/8" = 1'-0"
DRAWN BY: RLP
CHECKED BY: DP

REVISIONS NO.	DATE	REMARKS	BY

DRAWING NUMBER
M1.2D

JOB NUMBER 403114

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MD INTERLOCKED W/ EF-9. NORMALLY OPEN & CLOSE TO 20% OPENED WHEN EF-9 IS ACTIVATED.

(3) 18"x8" E.A. DUCTS DN.

18"x8" E.A. DUCTS UP TO EF-#

18"x8" E.A. DUCTS UP TO EF-#

18"x8" E.A. DUCTS UP TO EF-#

24"Ø S.A. & R.A. DUCTS DN

70"x28" S.A. DUCT DN

57"x31" S.A. DUCTS UP TO MAU-3

38"x14" S.A. & R.A. DUCTS UP TO HV-3

68"x31" S.A. & 68"x22" R.A. DUCTS UP TO HV-4

57"x31" S.A. & 57"x20" R.A. DUCTS UP TO HV-5

14"x10" E.A. DUCT UP TO EF-#

14"x10" E.A. DUCT DROP & CONNECT TO FUME HOOD

14"x10" E.A. DUCT UP TO EF-#

14"x10" E.A. DUCT DN. & UP TO EF-#

14"x10" E.A. DUCT UP TO EF-9

18"x8" E.A. DUCT UP TO EF-#. 14"x8" E.A. DUCT DN.

MD INTERLOCKED W/ EF-16. NORMALLY OPEN & CLOSE TO 20% OPENED WHEN EF-16 IS ACTIVATED.

14"x10" E.A. DUCT UP TO EF-15

14"x10" E.A. DUCT UP TO EF-14

14"x10" E.A. DUCT DROP & CONNECT TO FUME HOOD

50"x18" S.A. & R.A. DUCTS DN

6"Ø E.A. DUCT DN.

8"Ø E.A. DUCT UP TO EF-7

80"x26" S.A. & R.A. DUCTS UP TO RTU-17

54"x20" S.A. & 54"x18" R.A. DUCTS DN

57"x31" S.A. & 57"x28" R.A. DUCTS UP TO RTU-18

VAVs ASSOCIATED W/ A ROOM THAT CONTAINS A FUME HOOD SHALL OVERRIDE TO 100% CFM WHEN THE ASSOCIATED VEKTOR FAN IS ACTIVATED.

MD INTERLOCKED WITH EF-14. NORMALLY OPEN & CLOSE TO 20% OPENED WHEN EF-14 IS ACTIVATED.

MD INTERLOCKED WITH EF-15. NORMALLY OPEN & CLOSE TO 20% OPENED WHEN EF-15 IS ACTIVATED.

Biology 244 C3 1143 SF

Science Prep 244A C3 1255 SF

Biology 246 C3 1143 SF

Prep/Office 246A C3 258 SF

Teacher Planning 245 D3 795 SF

Chemistry 238 C3 1343 SF

Chemistry 240 C3 1309 SF

Science Prep 240A C3 258 SF

Chemistry 242 C3 1345 SF

Elec 248F G3 220 SF

248C F3 226 SF

248B F3 332 SF

Sm Grp 222A 115 SF

SPED 222 C3 923 SF

Server Room 253A C3 152 SF

Comp Net 253 C3 2032 SF

Stair 257 C3 1,309 SF

CR 245 C3 865 SF

CR 246 C3 853 SF

CR 247 C3 863 SF

CR 249 C3 908 SF

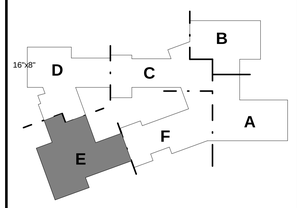
CR 251 C3 851 SF

CR 252 C3 832 SF

CR 250 C3 913 SF

CR 255 C3 1,255 SF

KEYPLAN



1 SECOND FLOOR DUCT PLAN - PART E
1/8" = 1'-0"

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60 State Street Boston, MA 02109
617 367 1666 fax 367 0888

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3-15-2016

Dover HS / Career Technical Center
Dover, NH
SECOND FLOOR DUCT PLAN - PART E
SCALE: 1/8" = 1'-0" DRAWN BY: RLP CHECKED BY: DP

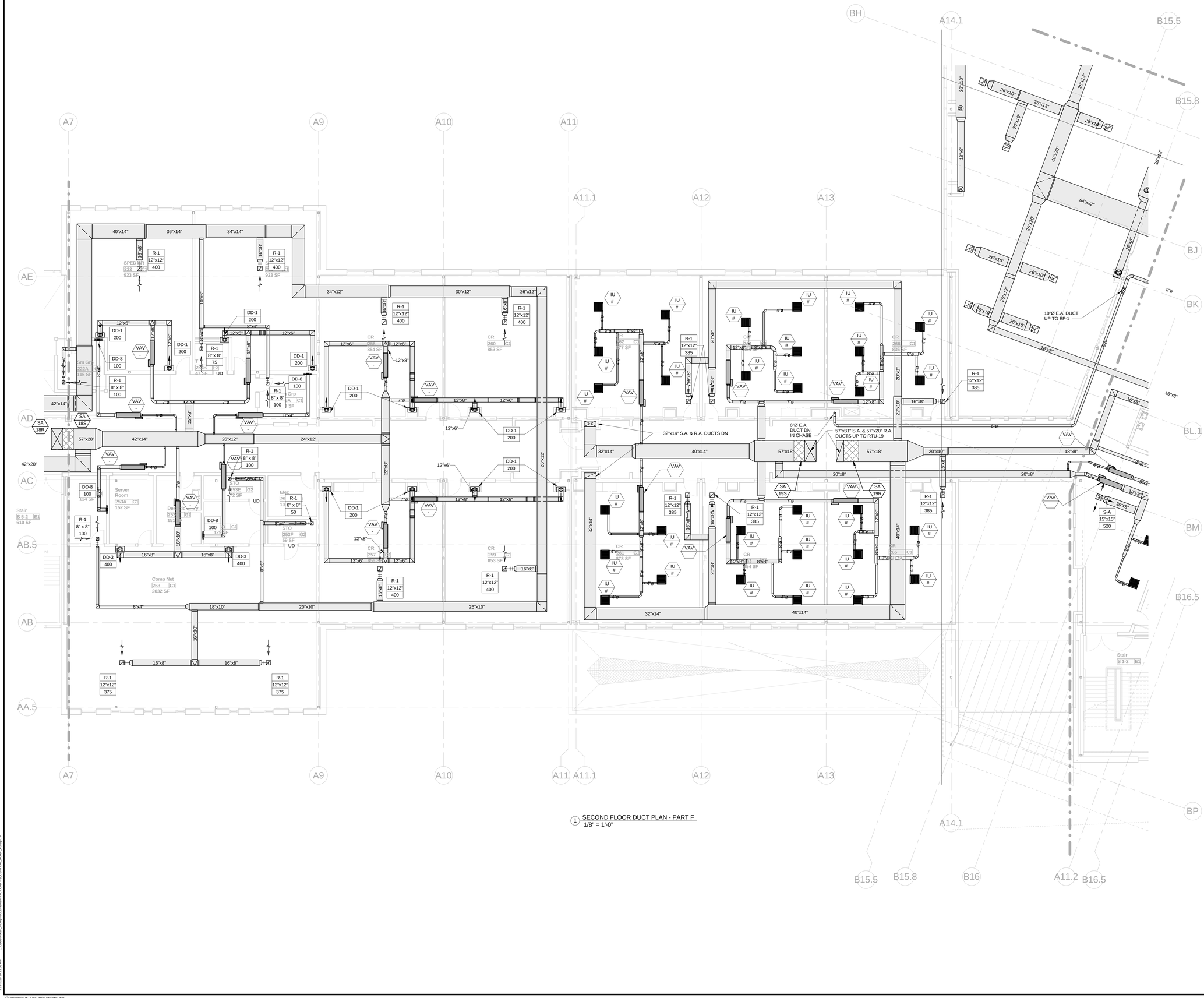
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M1.2E

JOB NUMBER 403114

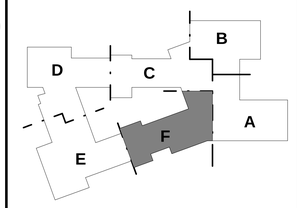
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1 SECOND FLOOR DUCT PLAN - PART F
1/8" = 1'-0"

KEYPLAN



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PLAN NORTH
TRUE NORTH

Dover HS / Career Technical Center
Dover, NH
SECOND FLOOR DUCT PLAN - PART F
SCALE: 1/8" = 1'-0" DRAWN BY: RLP CHECKED BY: DP

REVISIONS NO.	DATE	REMARKS	BY

DRAWING NUMBER
M1.2F
JOB NUMBER 403114

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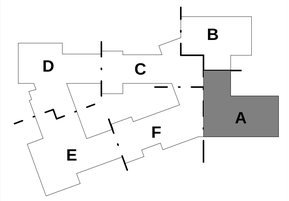
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PLAN NORTH
TRUE NORTH

KEYPLAN



Dover HS / Career Technical Center
Dover, NH
ROOF PLAN - PART A

SCALE: 1/8" = 1'-0"
DRAWN BY: RLP
CHECKED BY: DP

REVISIONS NO.	DATE	REMARKS	BY

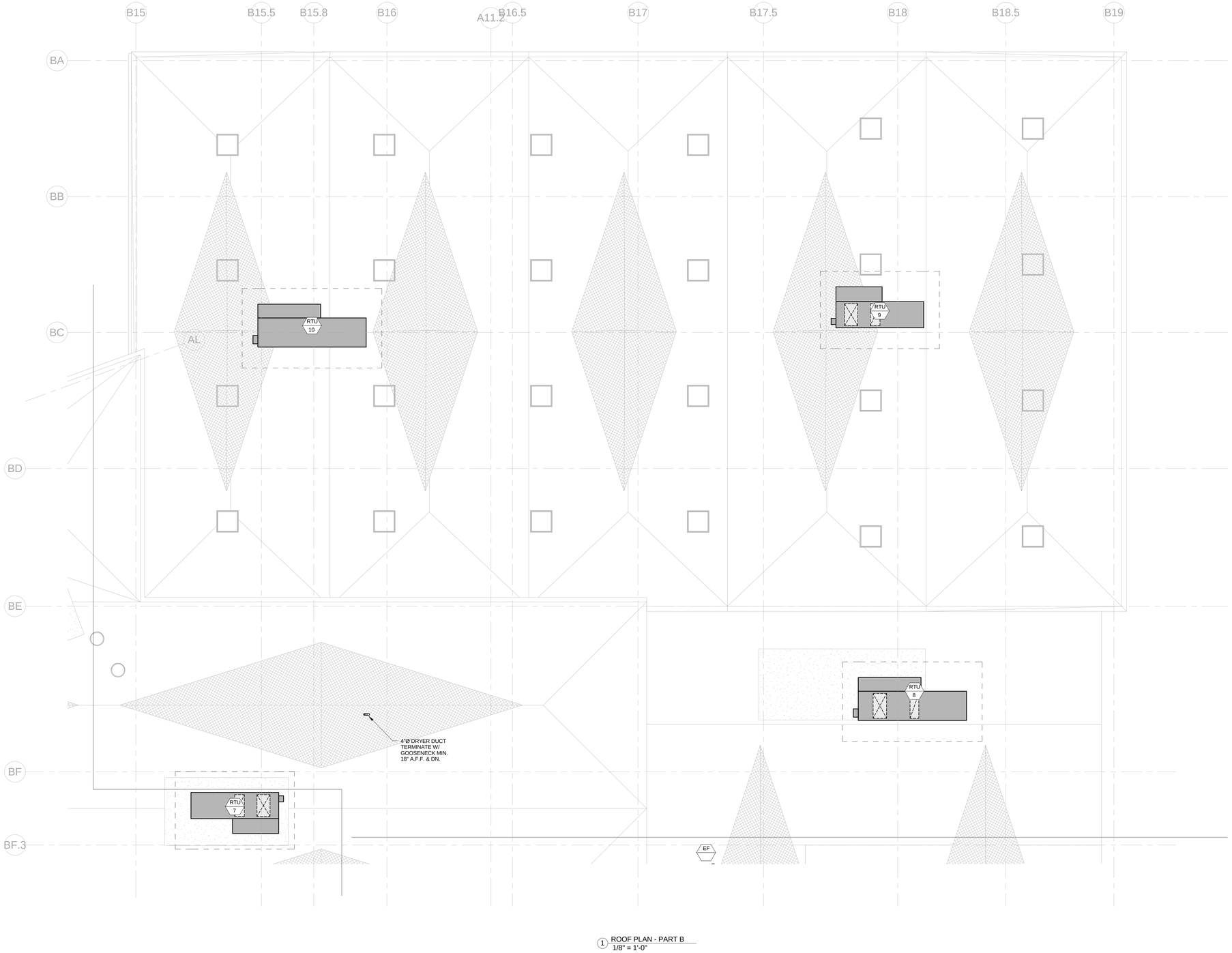
DRAWING NUMBER
M1.3A

JOB NUMBER 403114

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1 ROOF PLAN - PART A
1/8" = 1'-0"

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1 ROOF PLAN - PART B
1/8" = 1'-0"

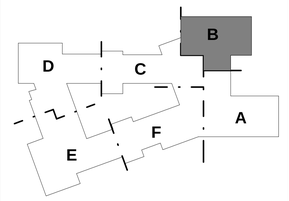
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PLAN NORTH
TRUE NORTH

KEYPLAN



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Dover, NH
ROOF PLAN - PART B

SCALE: 1/8" = 1'-0"
DRAWN BY: RLP
CHECKED BY: DP

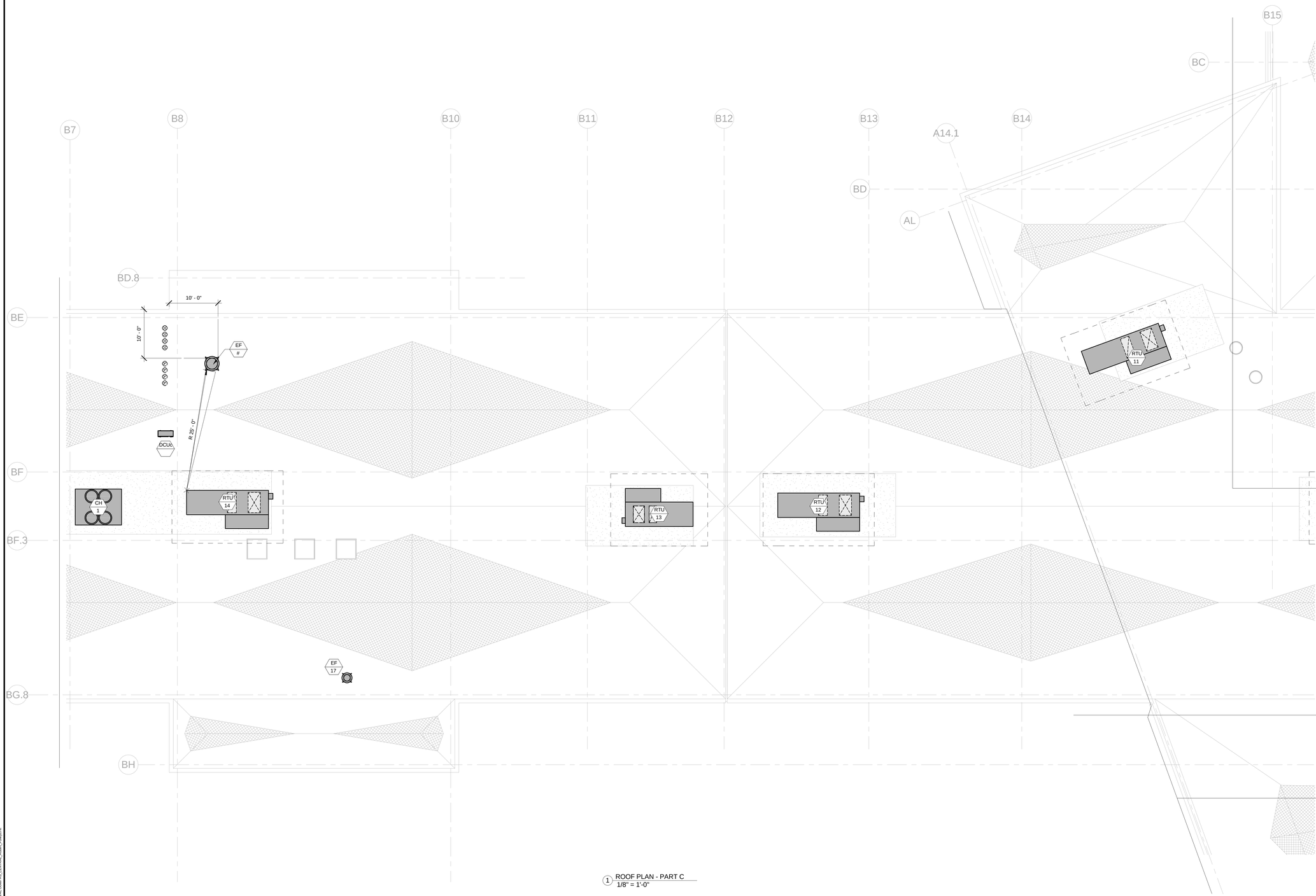
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1 ROOF PLAN - PART C
1/8" = 1'-0"

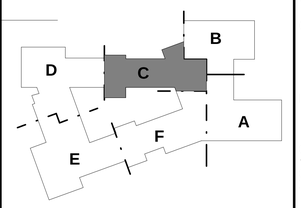
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PLAN NORTH
TRUE NORTH

KEYPLAN



Dover HS / Career Technical Center
Dover, NH
ROOF PLAN - PART C

SCALE: 1/8" = 1'-0"
DRAWN BY: RLP
CHECKED BY: DP

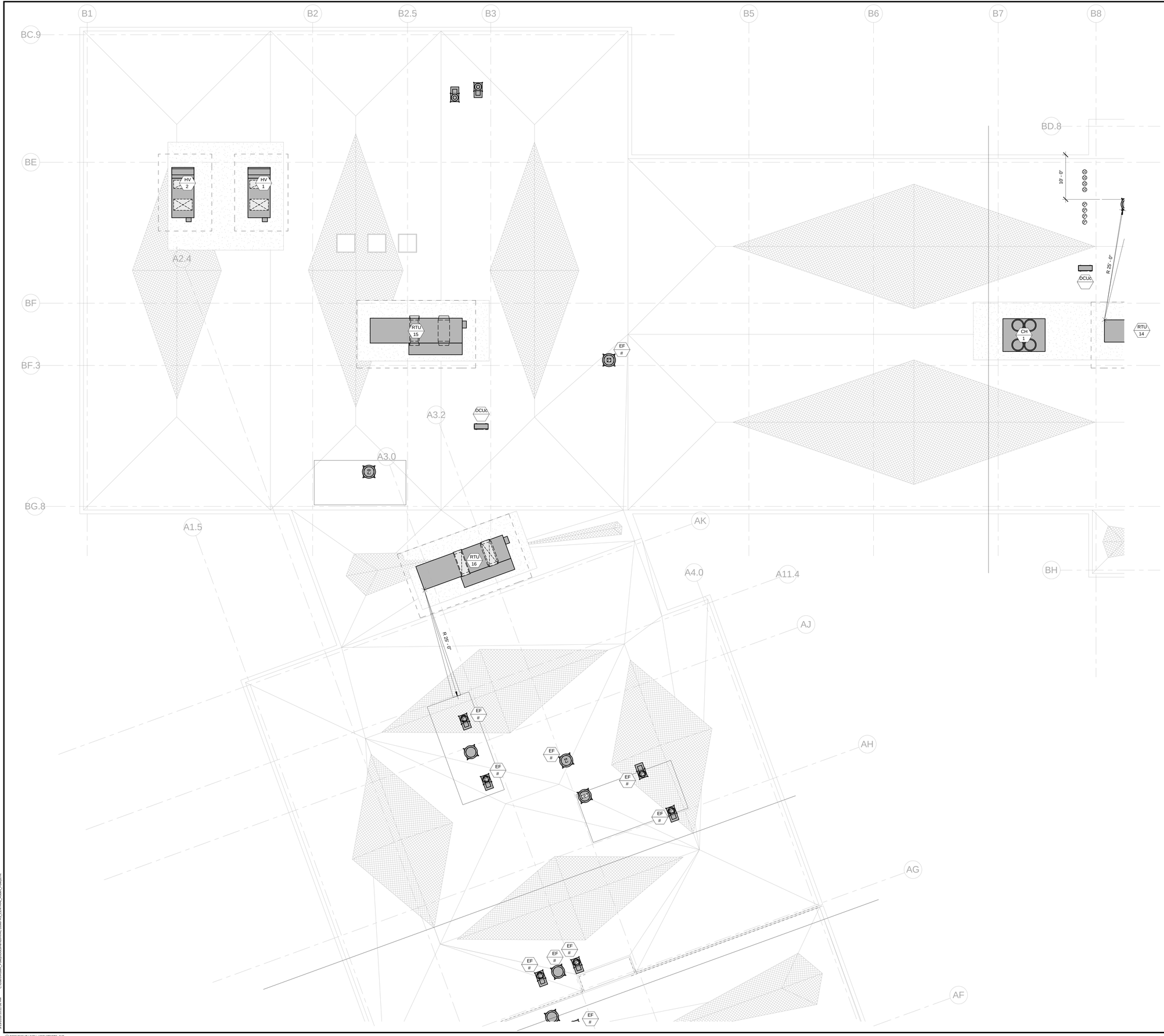
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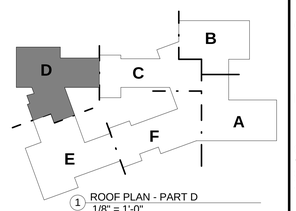
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KEYPLAN



1 ROOF PLAN - PART D
1/8" = 1'-0"

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Dover, NH

ROOF PLAN - PART D

SCALE: 1/8" = 1'-0" | DRAWN BY: RLP | CHECKED BY: DP

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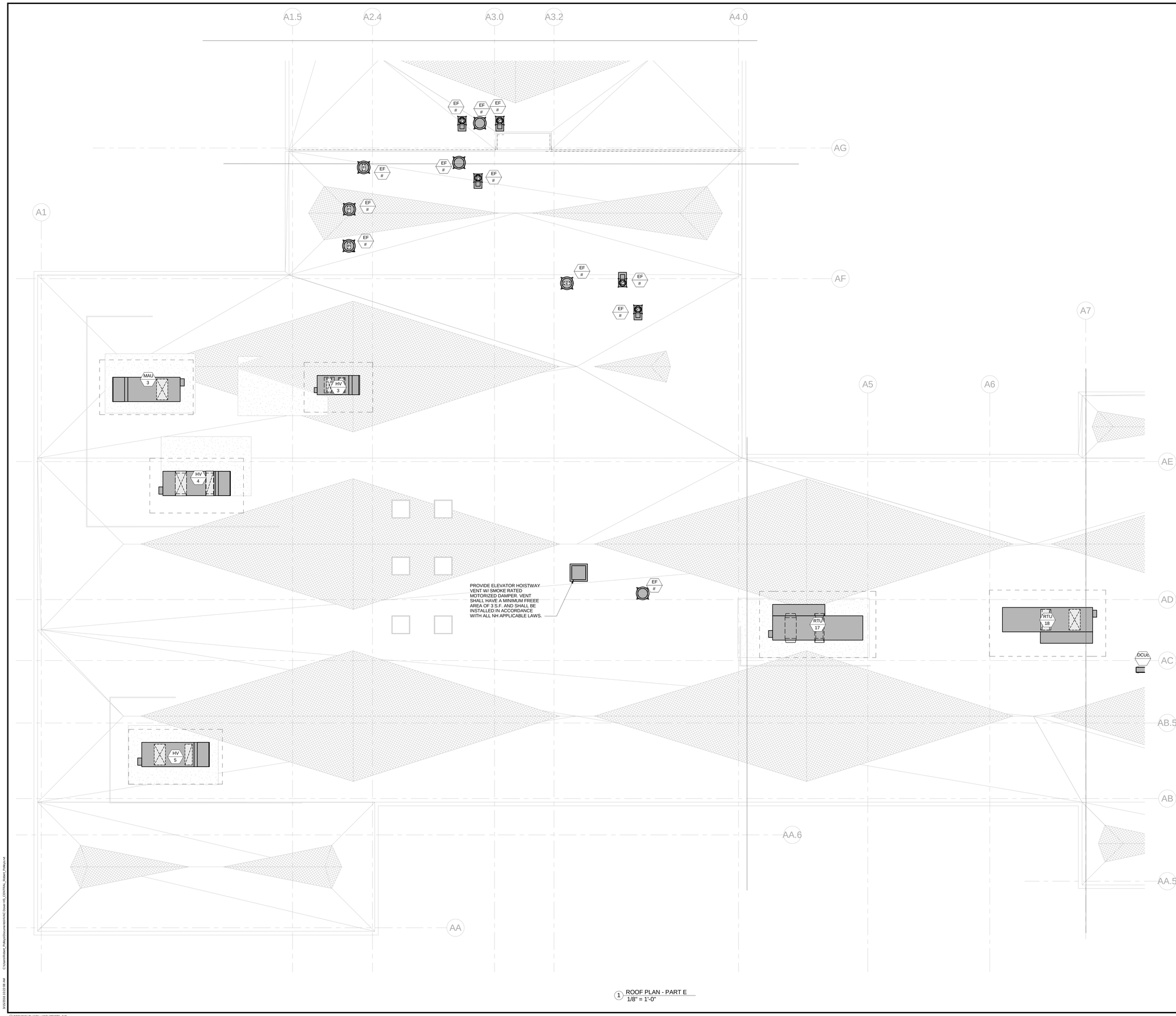
DRAWING NUMBER
M1.3D

JOB NUMBER 403114

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1 ROOF PLAN - PART E
1/8" = 1'-0"

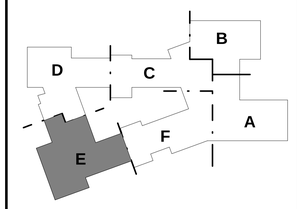
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PLAN NORTH
TRUE NORTH

KEYPLAN



Dover HS / Career Technical Center
Dover, NH
ROOF PLAN - PART E

SCALE: 1/8" = 1'-0"
DRAWN BY: RLP
CHECKED BY: DP

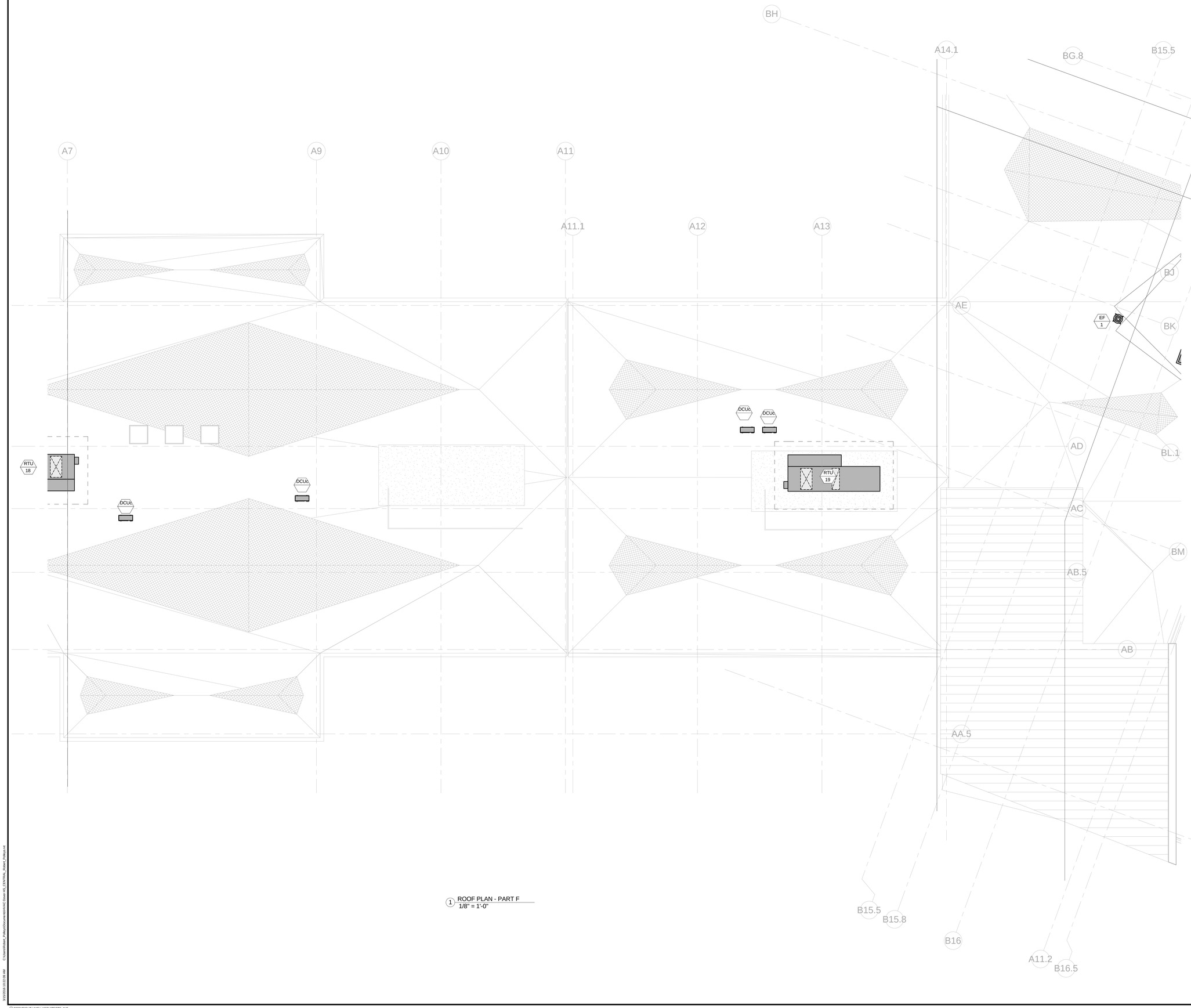
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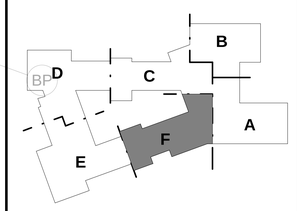
1 ROOF PLAN - PART F
1/8" = 1'-0"

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KEYPLAN



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ROOF PLAN - PART F

SCALE: 1/8" = 1'-0"
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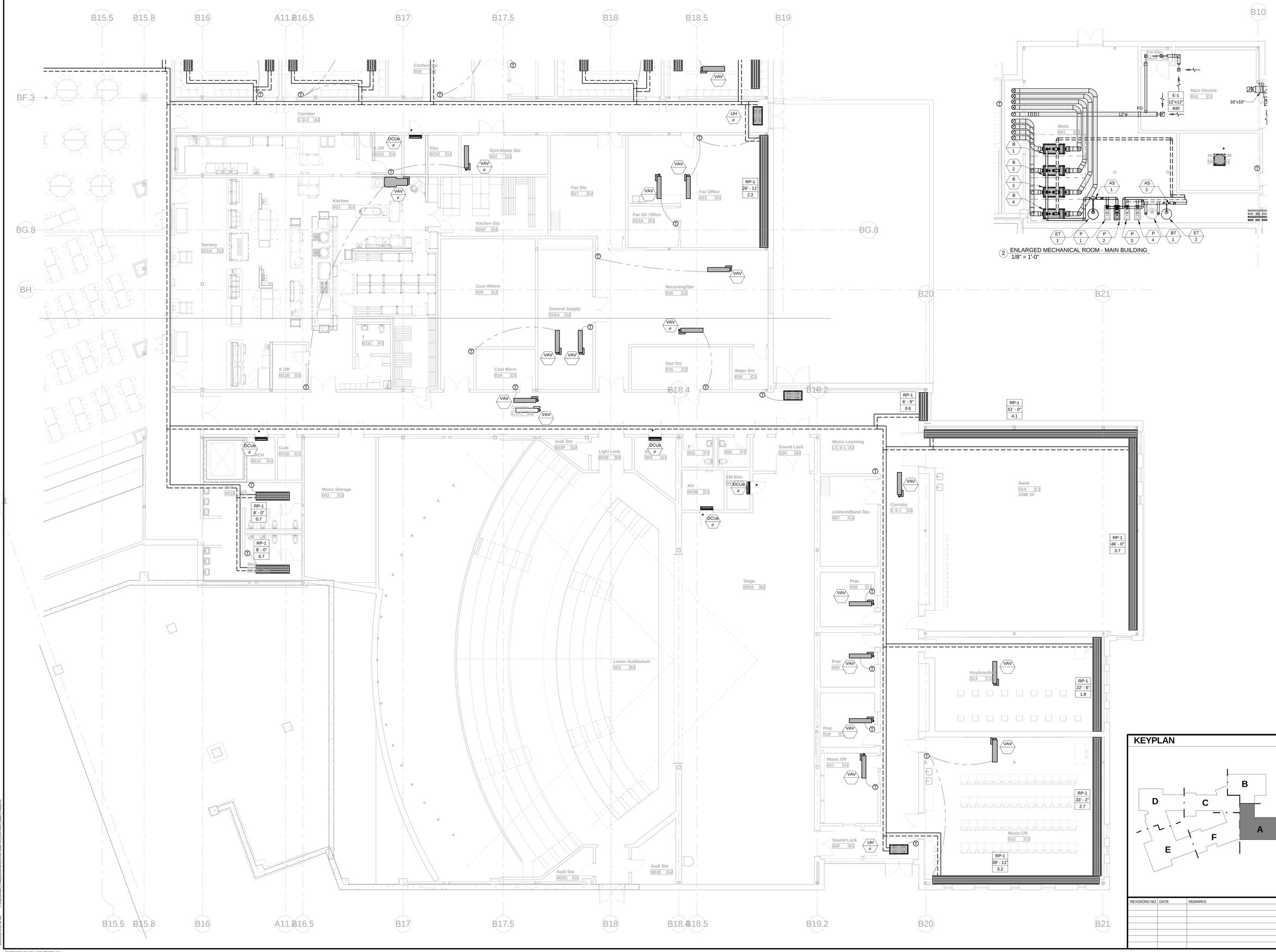
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2 ENLARGED MECHANICAL ROOM - MAIN BUILDING
1/8" = 1'-0"

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PLAN NORTH
TRUE NORTH

Dover HS / Career Technical Center
Dover, NH
GROUND FLOOR PIPING PLAN - PART A
SCALE: 1/8" = 1'-0"
DRAWN BY: RLP
CHECKED BY: DP

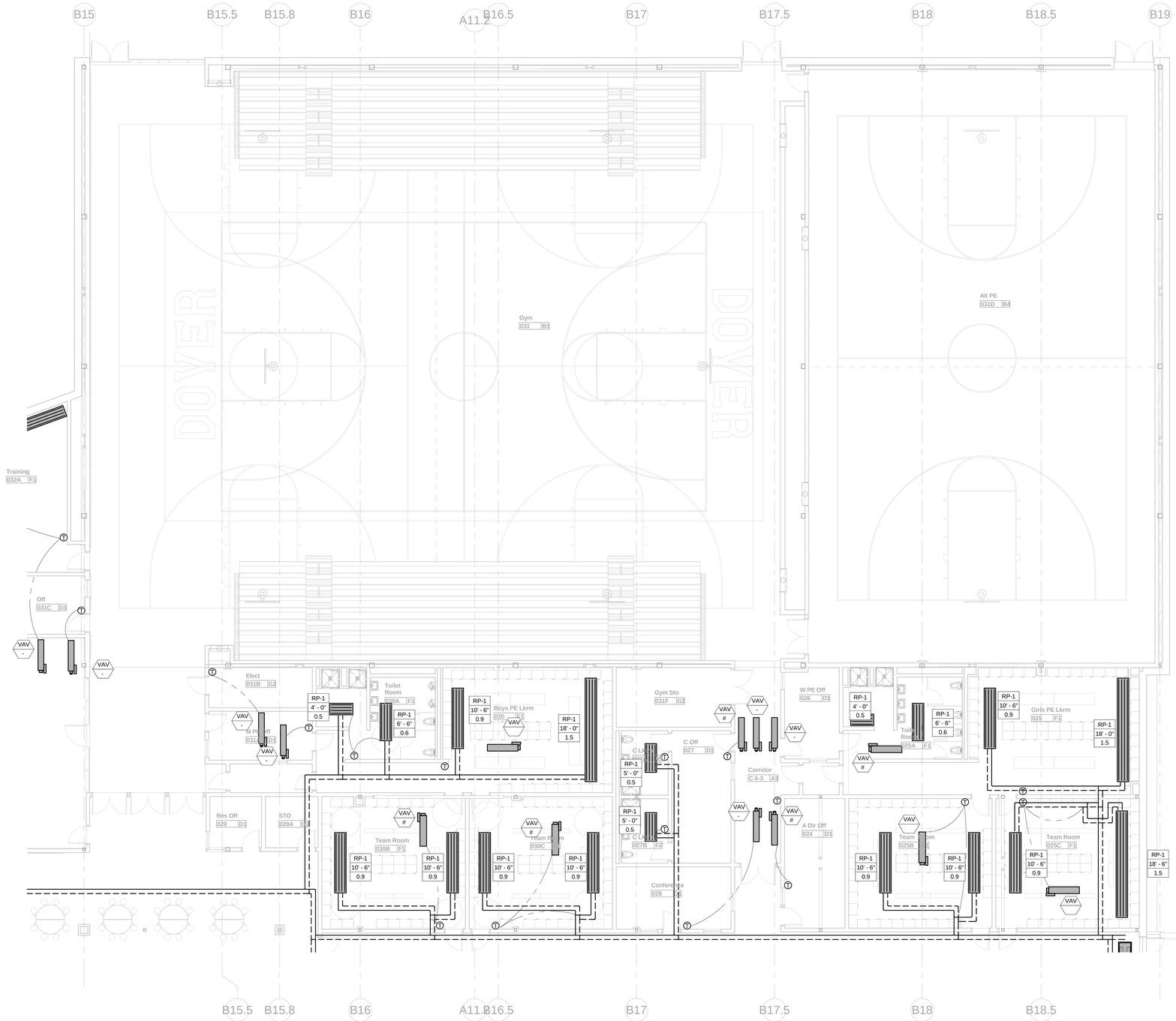
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DRAWING NUMBER
M2.0A

JOB NUMBER 403114

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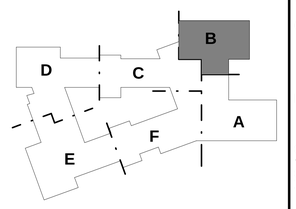
1 BASEMENT PIPING PLANS - PART B
1/8" = 1'-0"

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3-15-2016

KEYPLAN



Dover HS / Career Technical Center
Dover, NH
GROUND FLOOR PIPING PLAN - PART B
SCALE: 1/8" = 1'-0" DRAWN BY: RLP CHECKED BY: DP

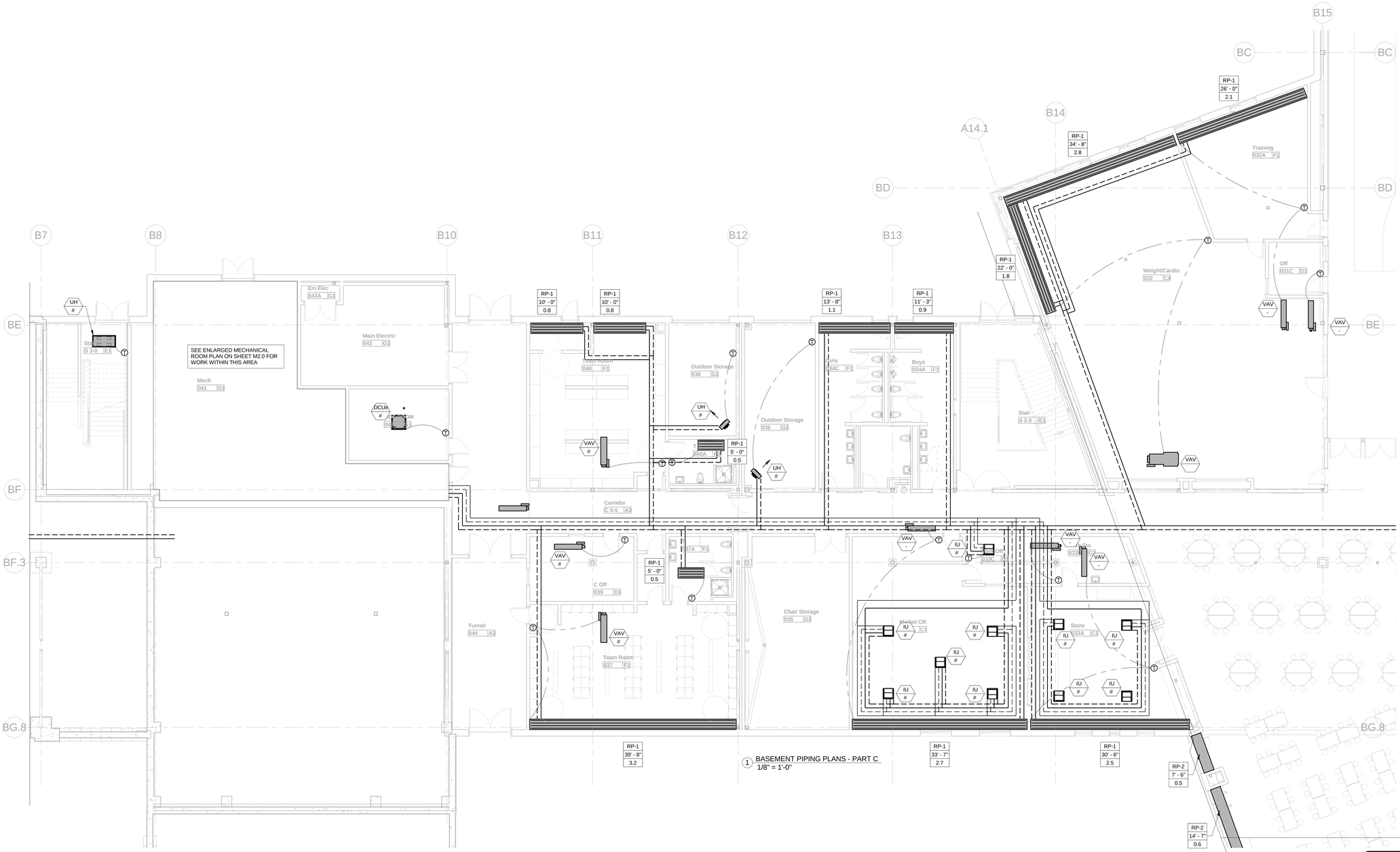
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JOB NUMBER 403114

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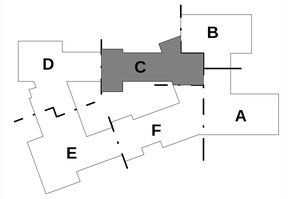
1 BASEMENT PIPING PLANS - PART C
1/8" = 1'-0"

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KEYPLAN



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Dover, NH
GROUND FLOOR PIPING PLAN - PART C
SCALE 1/8" = 1'-0"
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REVISIONS NO.	DATE	REMARKS	BY

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JOB NUMBER 403114

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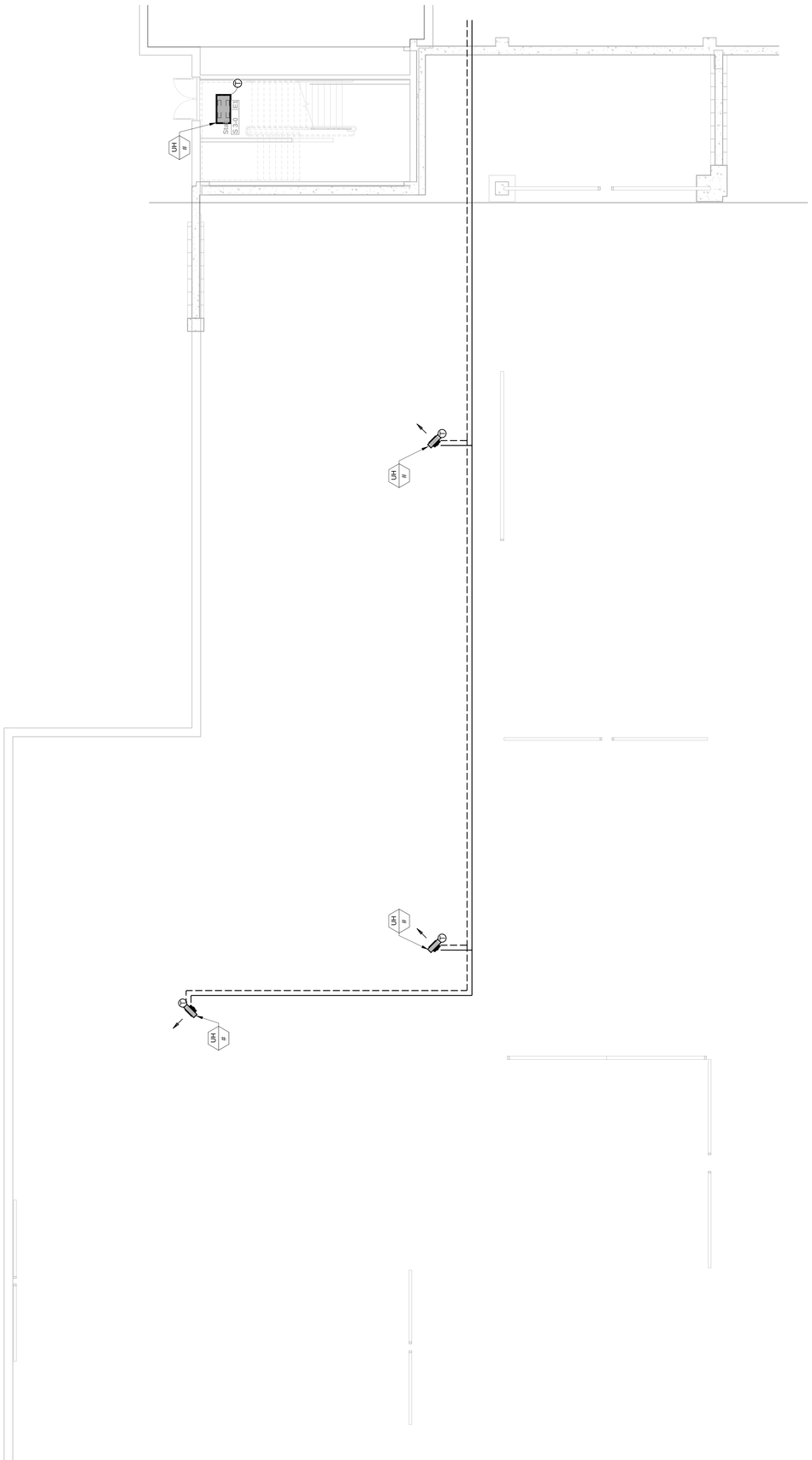
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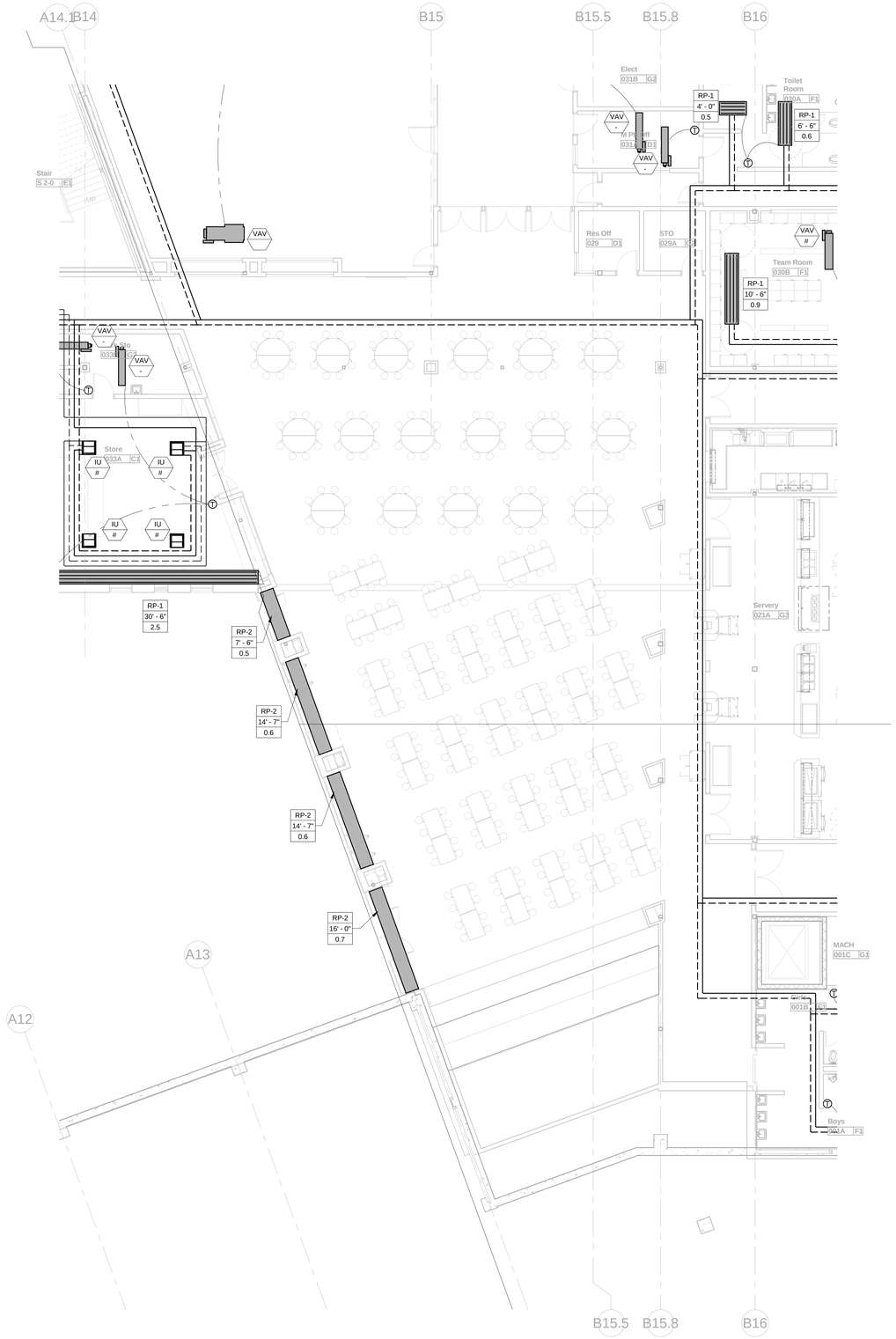
Dover HS / Career Technical Center
Dover, NH
GROUND FLOOR PIPING PLAN -
PART D

SCALE: 1/8" = 1'-0" DRAWN BY: Author CHECKED BY: Checker

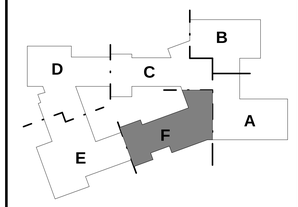
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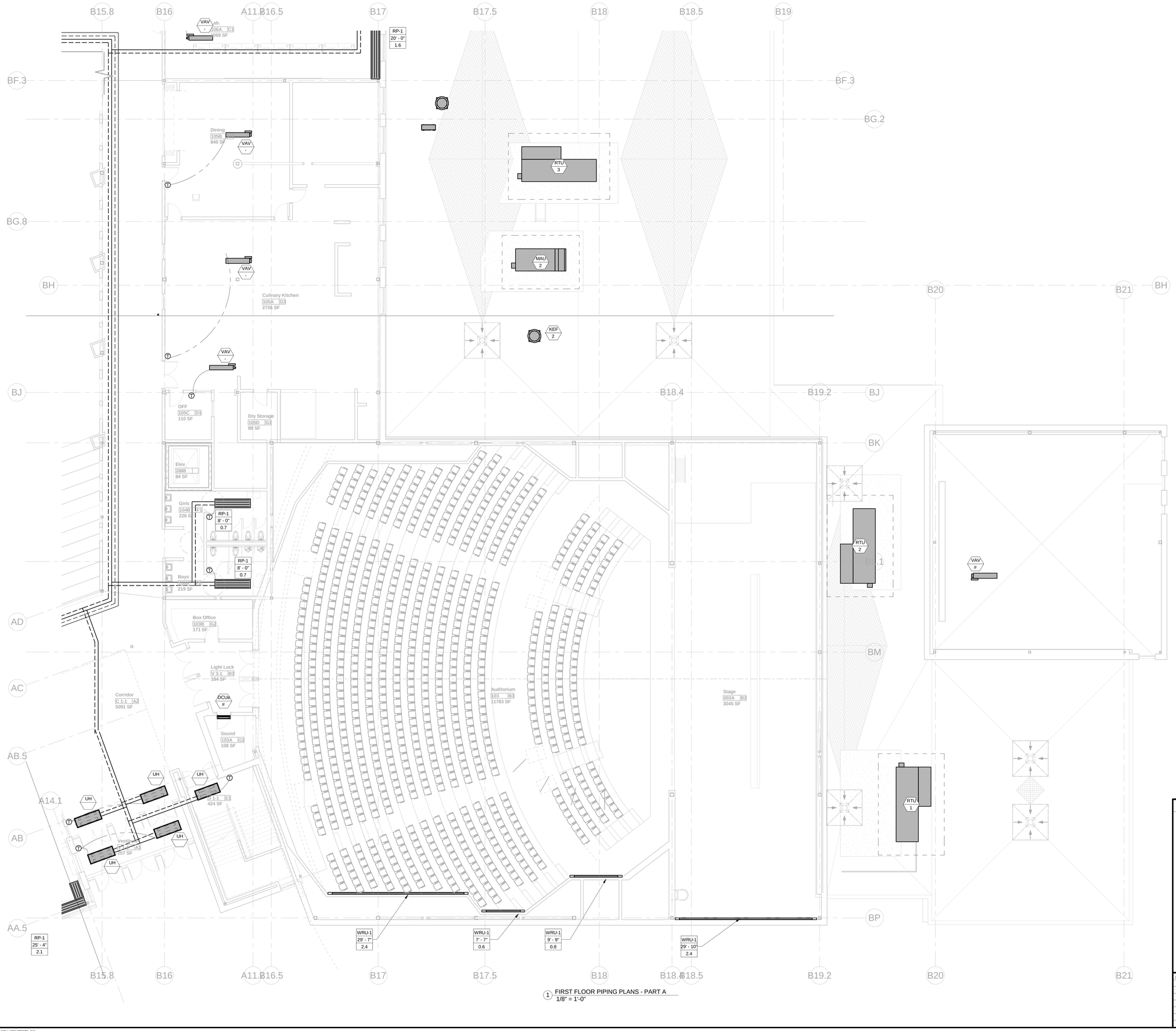
Dover HS / Career Technical Center
Dover, NH
GROUND FLOOR PIPING PLAN - PART F

SCALE: 1/8" = 1'-0" DRAWN BY: RLP CHECKED BY: DP

DRAWING NUMBER
M2.0F

JOB NUMBER 403114

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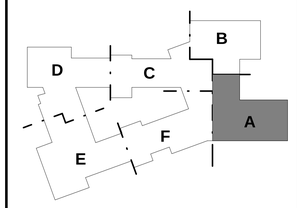
1 FIRST FLOOR PIPING PLANS - PART A
1/8" = 1'-0"

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KEYPLAN



Dover HS / Career Technical Center
Dover, NH
FIRST FLOOR PIPING PLAN - PART A

SCALE: 1/8" = 1'-0" DRAWN BY: RLP CHECKED BY: DP

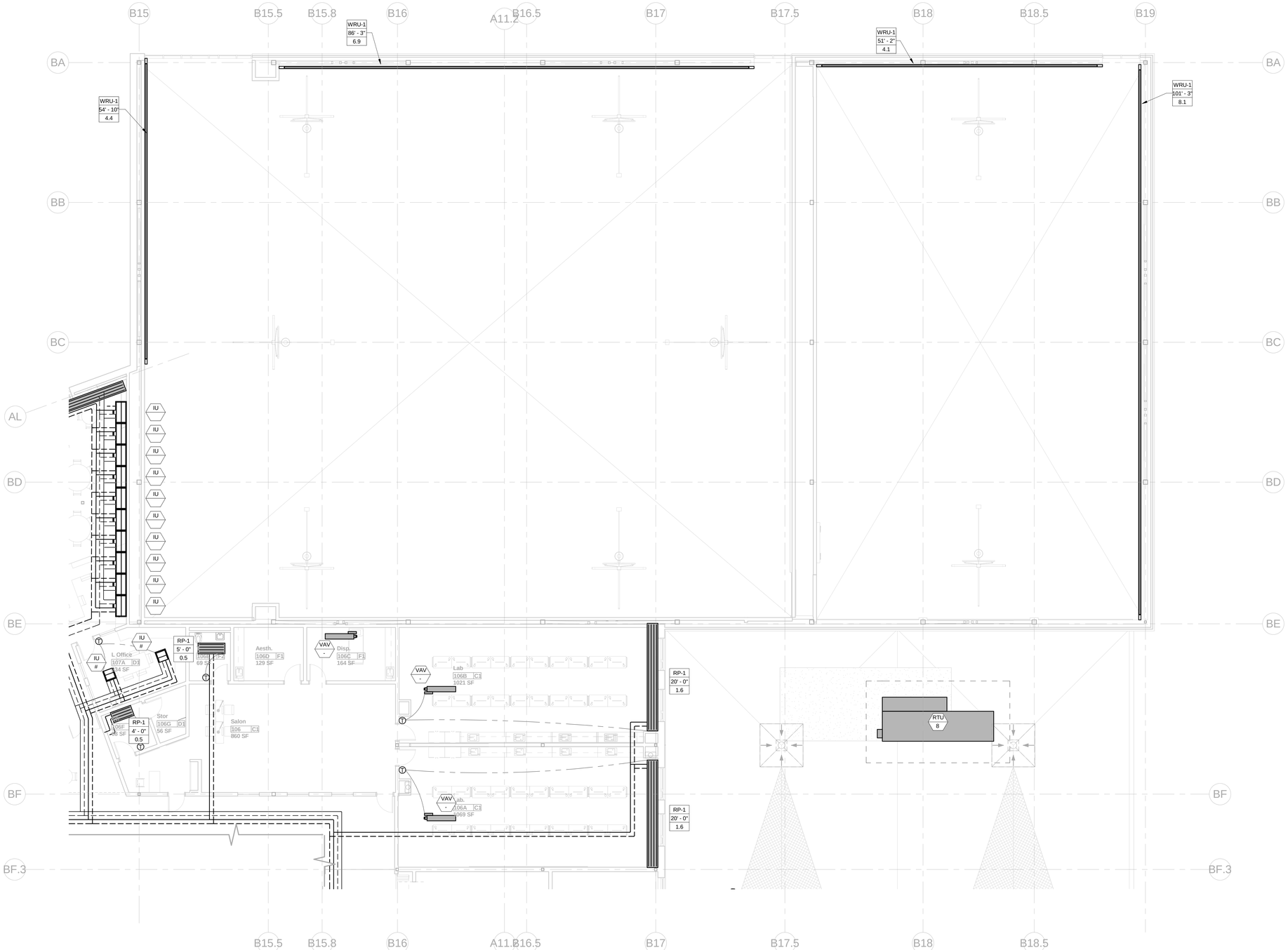
REVISIONS NO.	DATE	REMARKS	BY

DRAWING NUMBER
M2.1A

JOB NUMBER 403114

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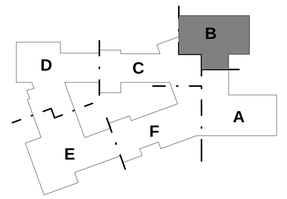
1 FIRST FLOOR PIPING PLANS - PART B
1/8" = 1'-0"

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KEYPLAN



Dover HS / Career Technical Center
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FIRST FLOOR PIPING PLAN - PART B

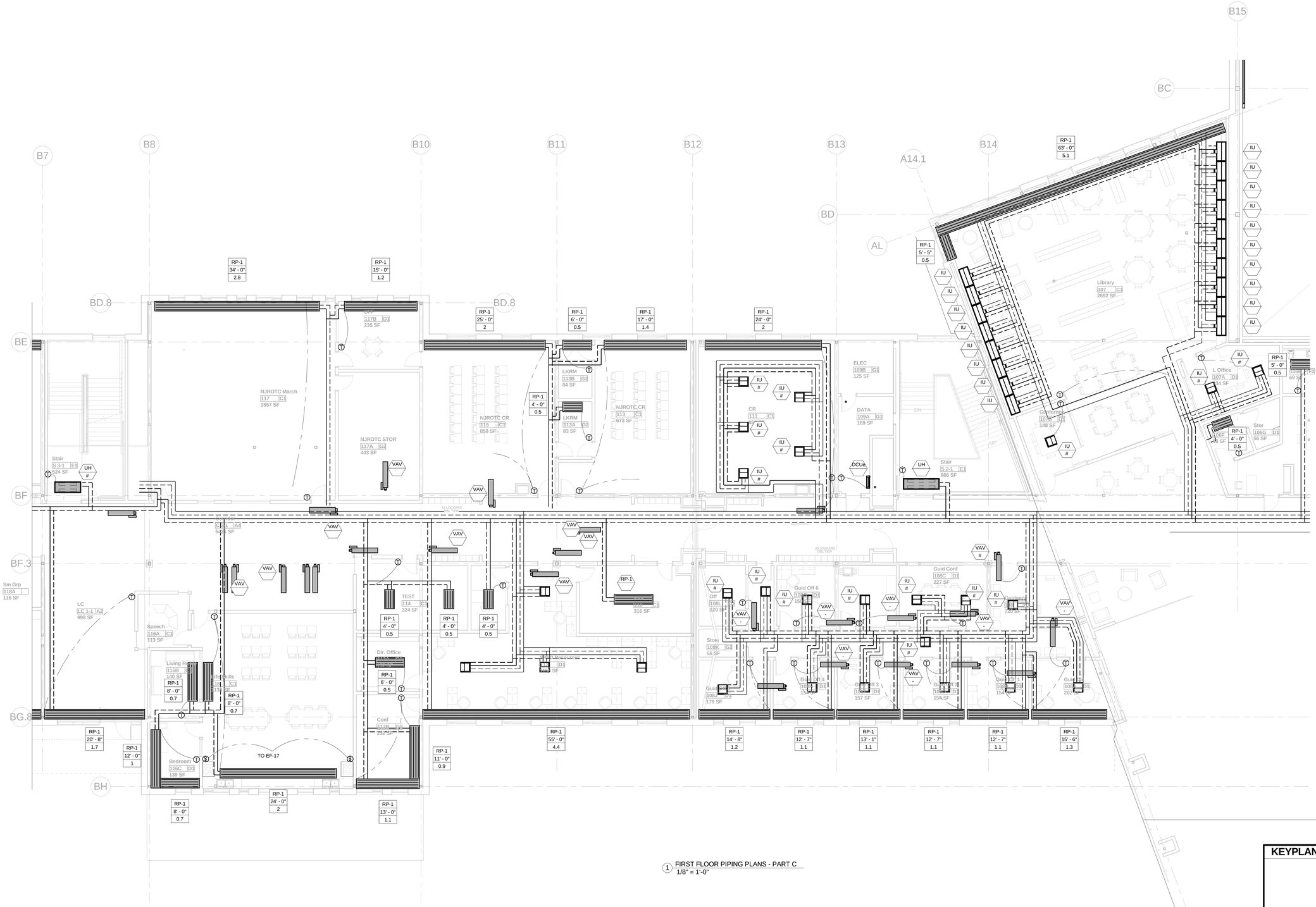
SCALE: 1/8" = 1'-0" DRAWN BY: RLP CHECKED BY: DP

REVISIONS NO.	DATE	REMARKS	BY

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M2.1B

JOB NUMBER 403114

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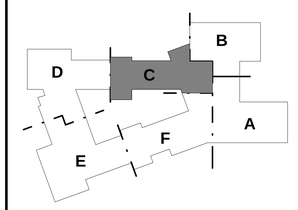
1 FIRST FLOOR PIPING PLANS - PART C
1/8" = 1'-0"

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Dover, NH
FIRST FLOOR PIPING PLAN - PART C

SCALE: 1/8" = 1'-0" DRAWN BY: RLP CHECKED BY: DP

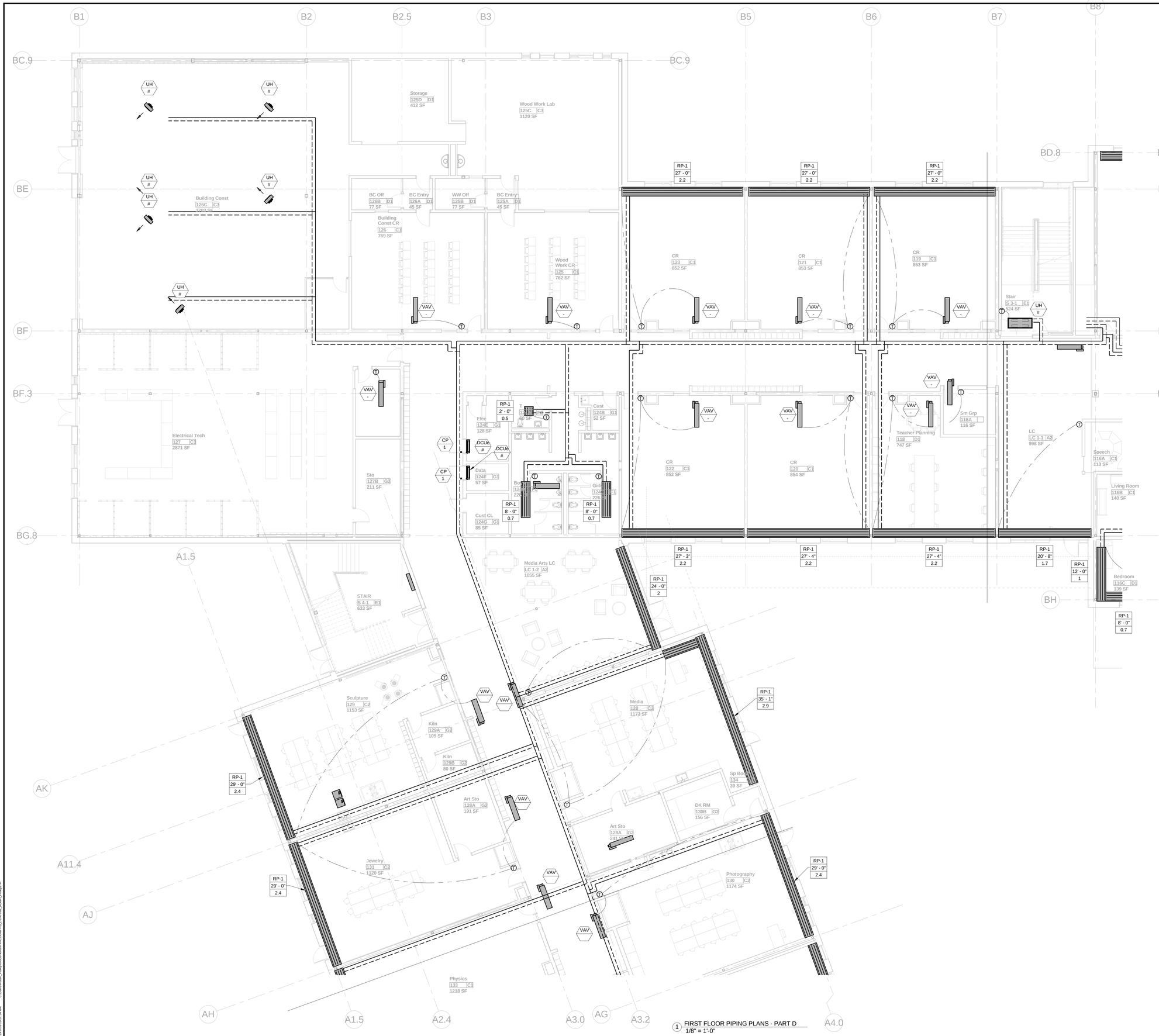
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1 FIRST FLOOR PIPING PLANS - PART D
1/8" = 1'-0"

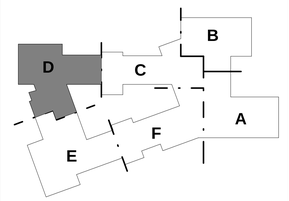
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PLAN NORTH
TRUE NORTH

KEYPLAN



Dover HS / Career Technical Center
Dover, NH
FIRST FLOOR PIPING PLAN - PART D

SCALE: 1/8" = 1'-0"
DRAWN BY: RLP
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REVISIONS NO.	DATE	REMARKS	BY

DRAWING NUMBER
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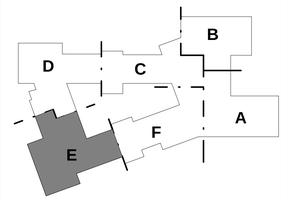
JOB NUMBER 403114

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1 FIRST FLOOR PIPING PLANS - PART E
1/8" = 1'-0"

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FIRST FLOOR PIPING PLAN - PART E

SCALE: 1/8" = 1'-0" DRAWN BY: RLP CHECKED BY: DP

REVISIONS NO.	DATE	REMARKS	BY

DRAWING NUMBER
M2.1E

JOB NUMBER 403114

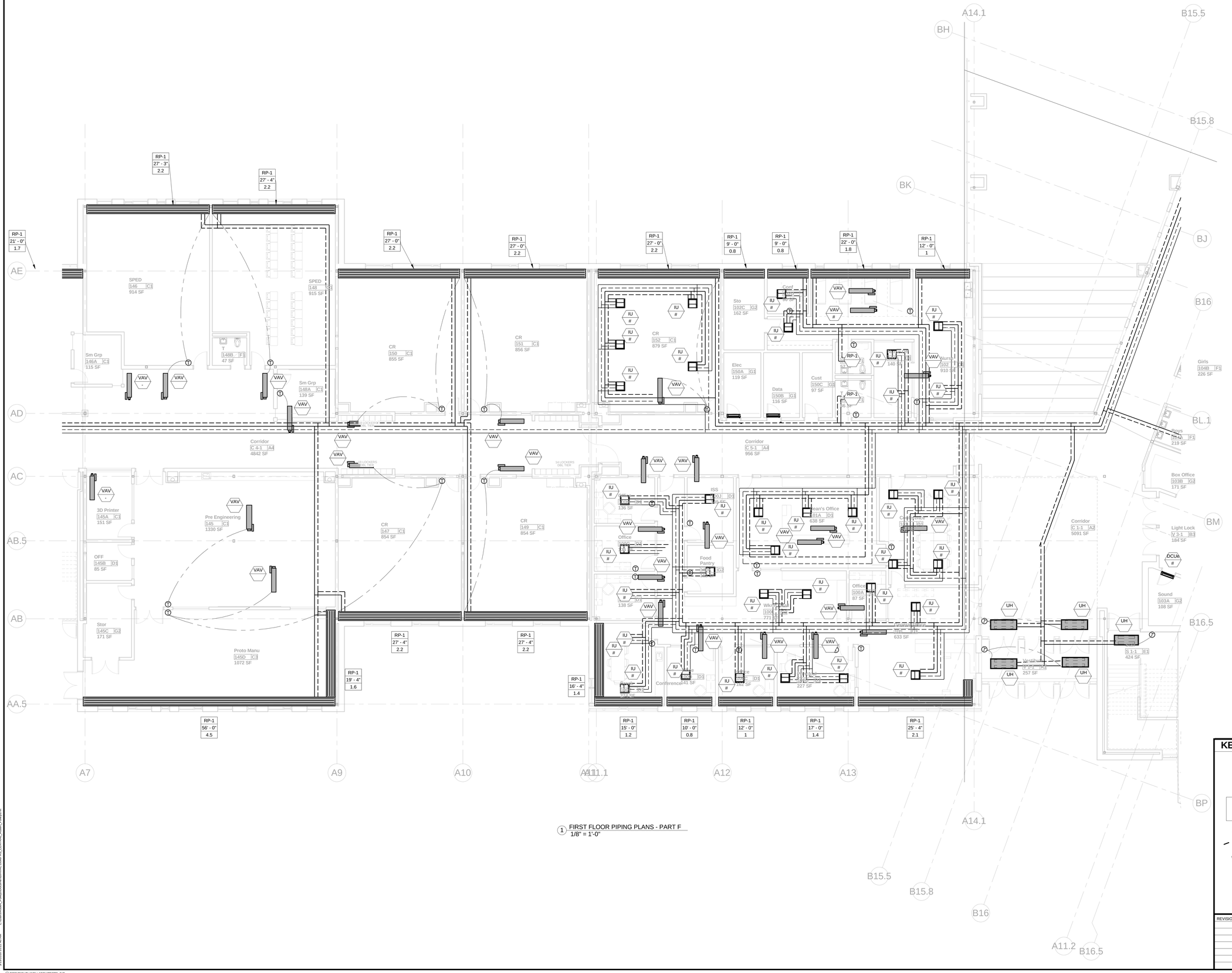
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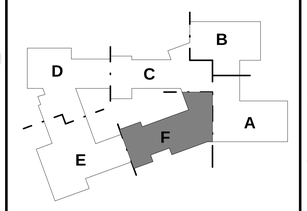
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1 FIRST FLOOR PIPING PLANS - PART F
1/8" = 1'-0"

KEYPLAN



Dover HS / Career Technical Center
Dover, NH
FIRST FLOOR PIPING PLAN - PART F

SCALE: 1/8" = 1'-0" | DRAWN BY: RLP | CHECKED BY: DP

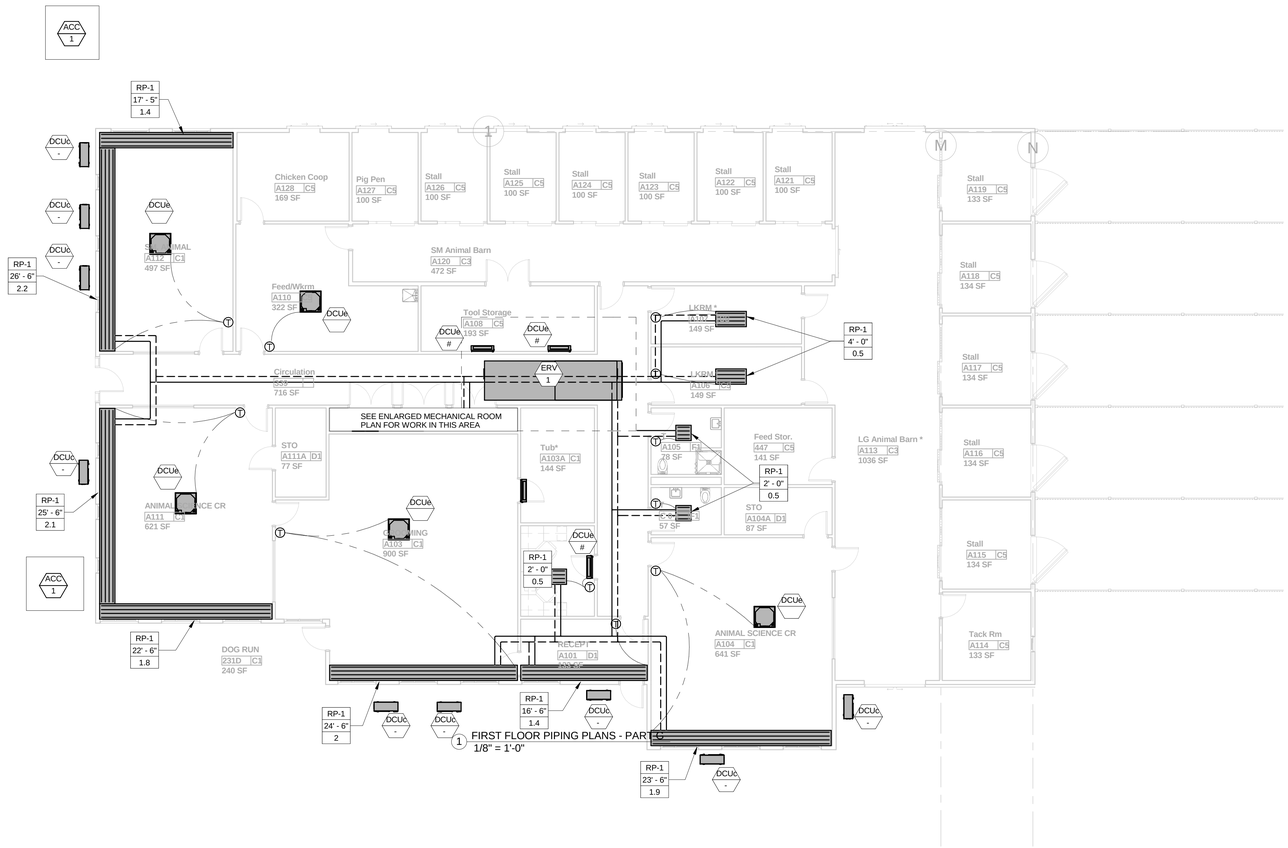
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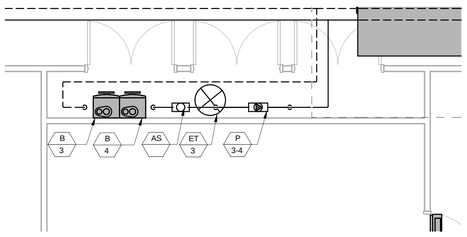
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1 FIRST FLOOR PIPING PLANS - PART
1/8" = 1'-0"



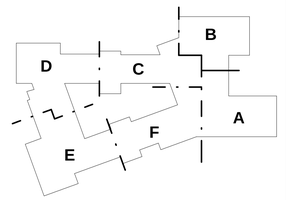
2 ENLARGED MECHANICAL ROOM - ANIMAL SCIENCE BUILDING
1/4" = 1'-0"

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KEYPLAN



Dover HS / Career Technical Center
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FIRST FLOOR PIPING PLAN - PART G

SCALE: As indicated DRAWN BY: RLP CHECKED BY: DP

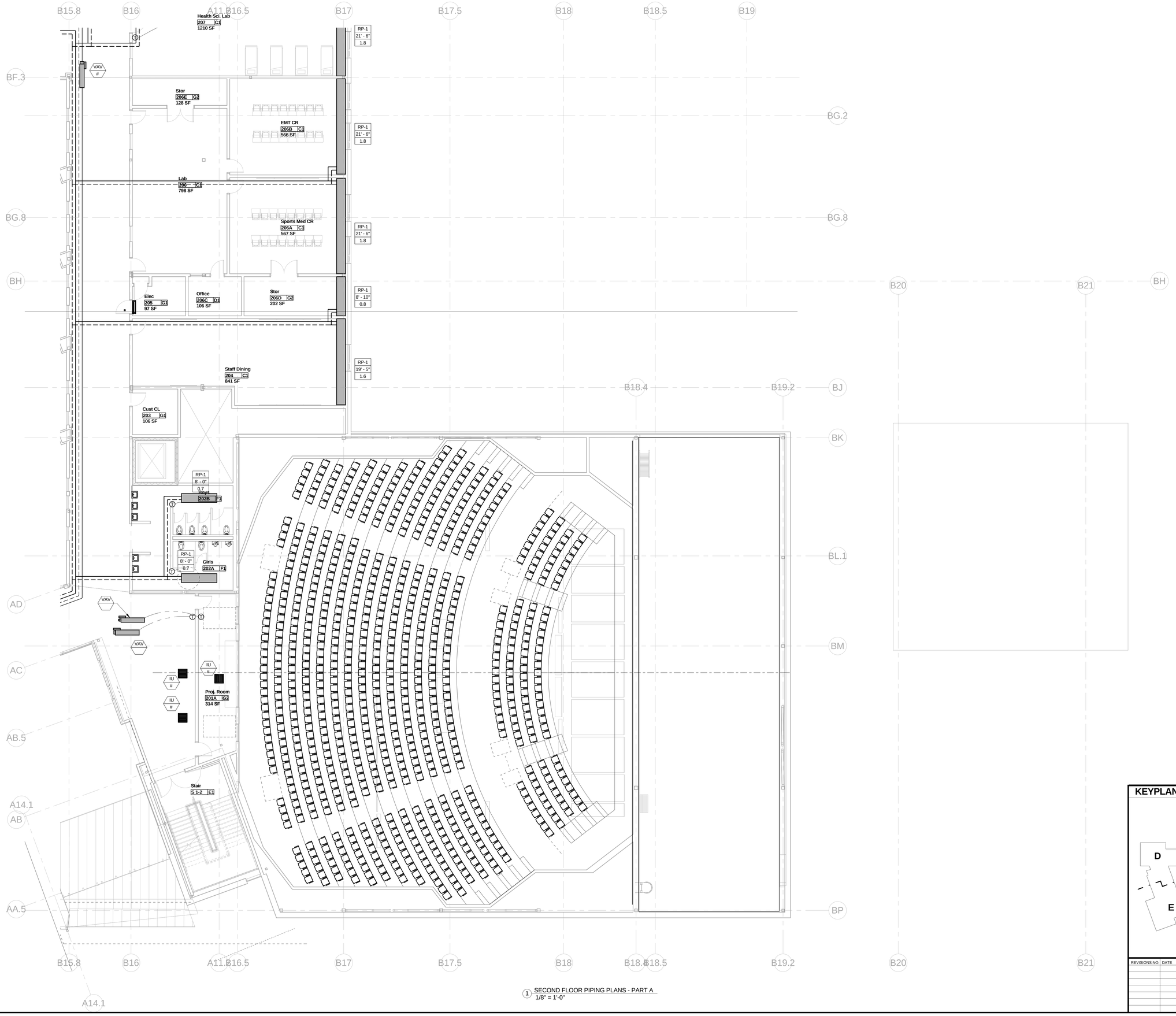
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DRAWING NUMBER
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JOB NUMBER 403114

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1 SECOND FLOOR PIPING PLANS - PART A
1/8" = 1'-0"

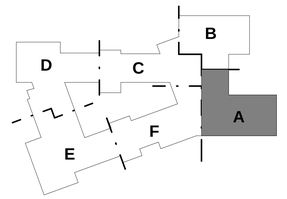
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PLAN NORTH
TRUE NORTH

KEYPLAN



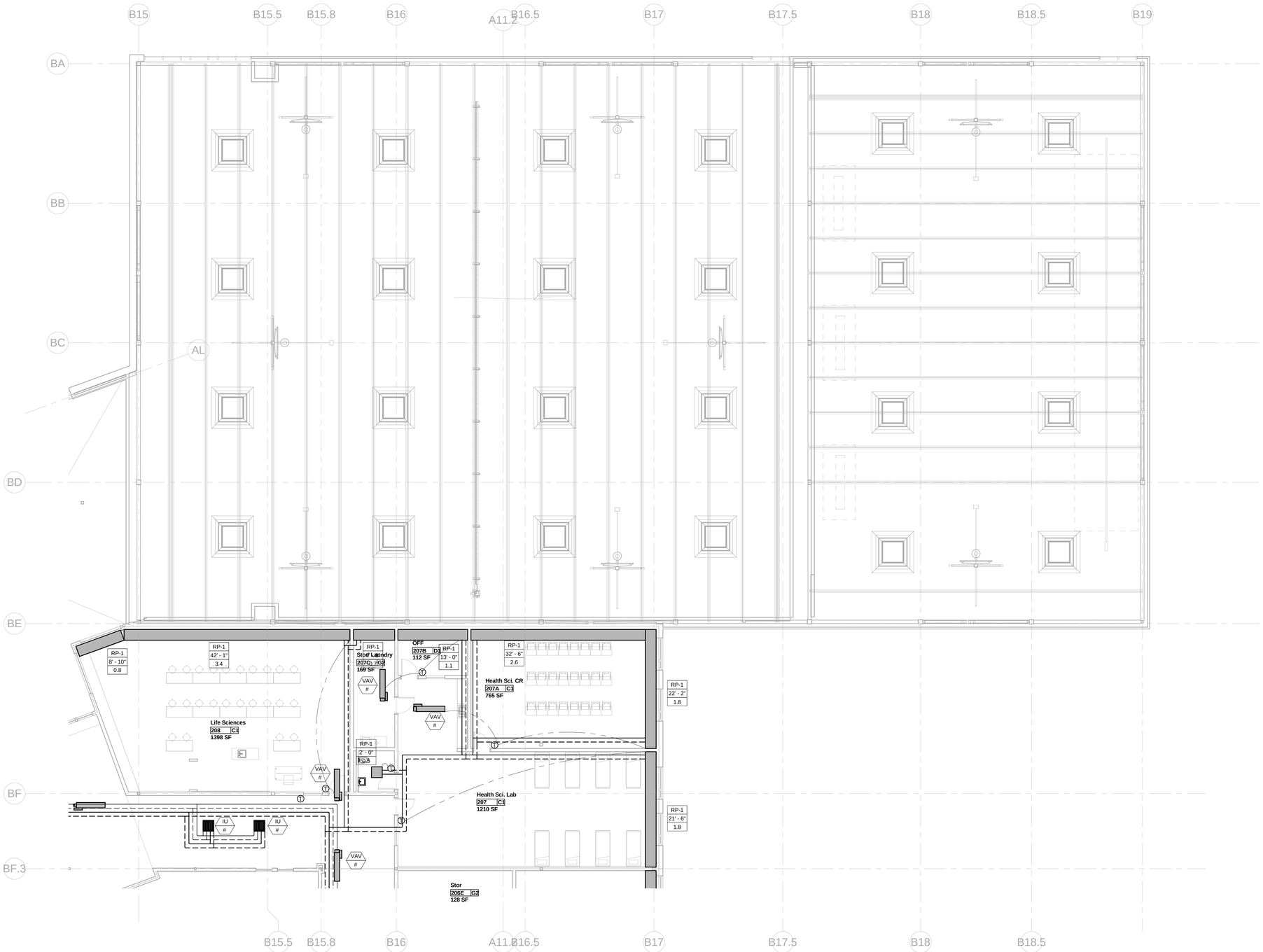
Dover HS / Career Technical Center
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SECOND FLOOR PIPING PLAN - PART A
SCALE: 1/8" = 1'-0"
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1 SECOND FLOOR PIPING PLANS - PART B
1/8" = 1'-0"

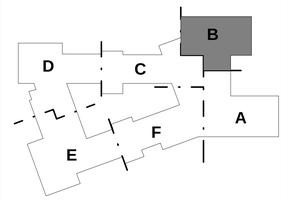
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Dover HS / Career Technical Center
Dover, NH
SECOND FLOOR PIPING PLAN - PART B
SCALE 1/8" = 1'-0"
DRAWN BY RLP
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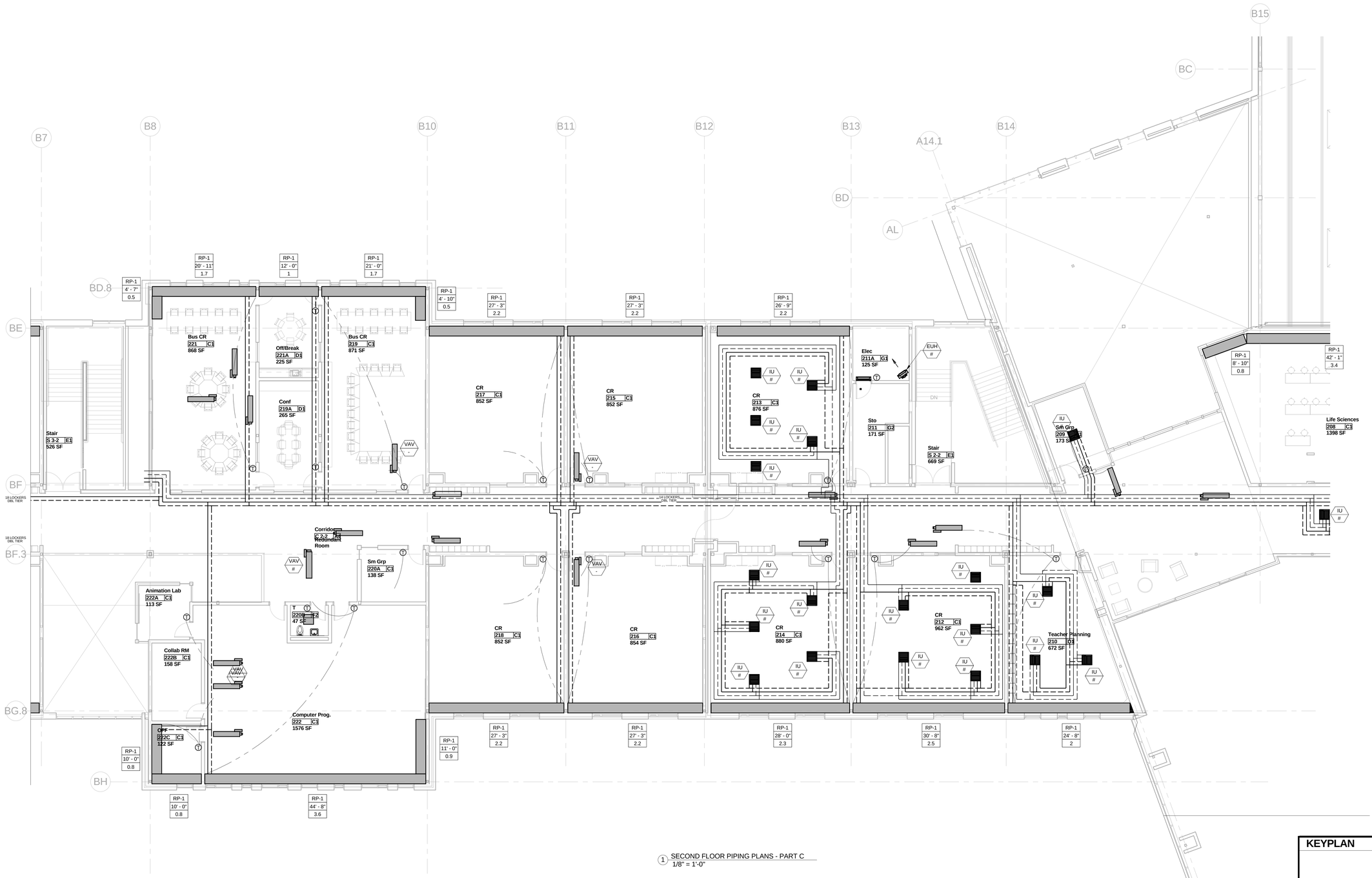
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DRAWING NUMBER
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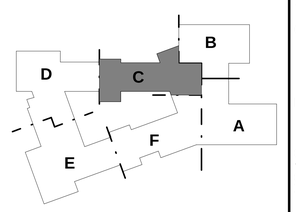
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1 SECOND FLOOR PIPING PLANS - PART C
1/8" = 1'-0"

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REVISIONS NO.	DATE	REMARKS	BY

DRAWING NUMBER
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JOB NUMBER 403114

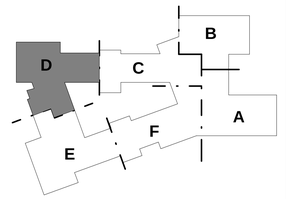
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1 SECOND FLOOR PIPING PLANS - PART D
1/8" = 1'-0"

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DRAWING NUMBER
M2.2D

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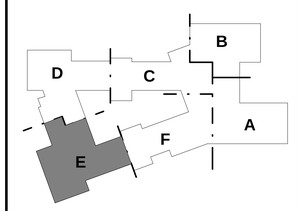
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1 SECOND FLOOR PIPING PLANS - PART E
1/8" = 1'-0"

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SCALE: 1/8" = 1'-0" DRAWN BY: RLP CHECKED BY: DP

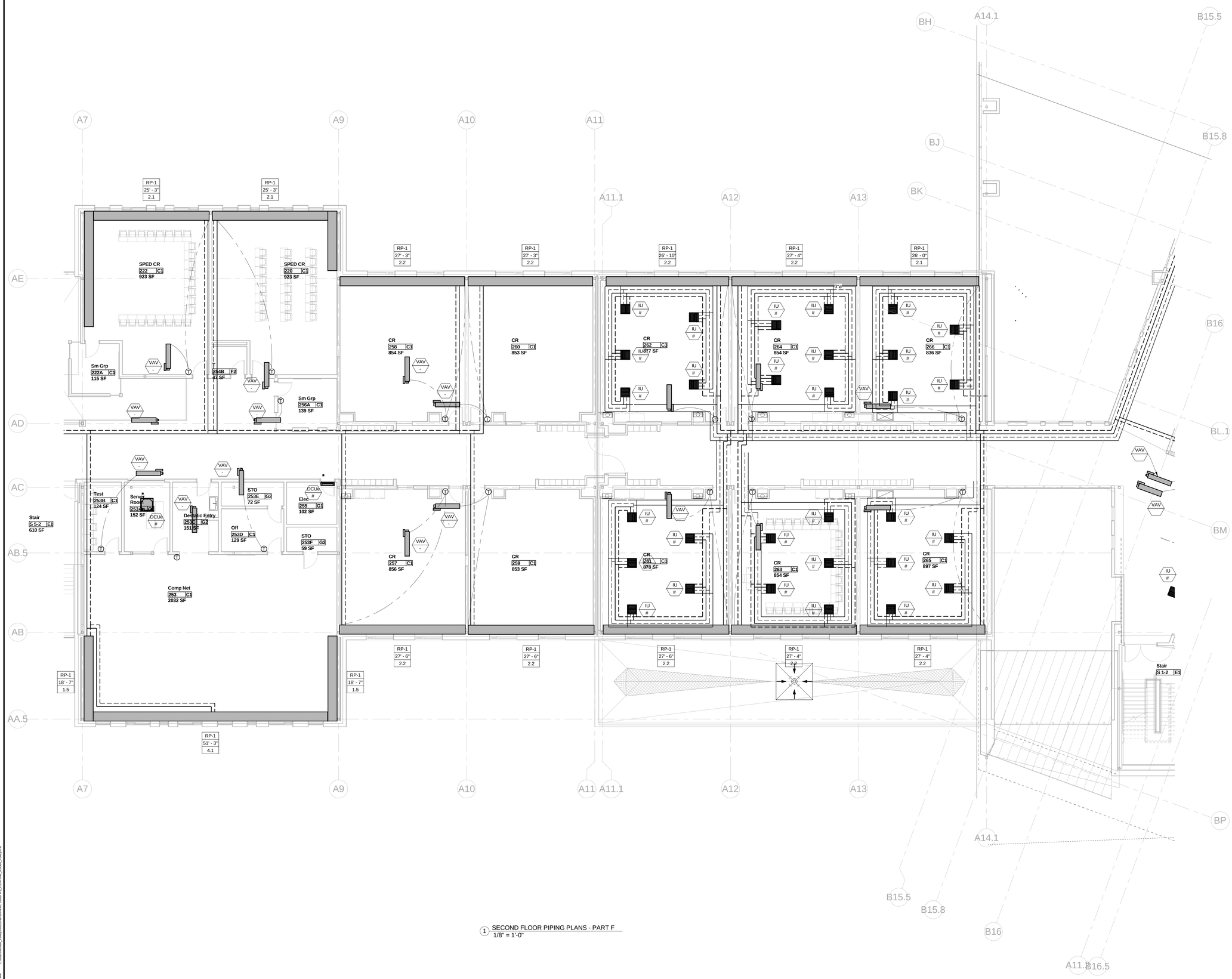
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JOB NUMBER 403114

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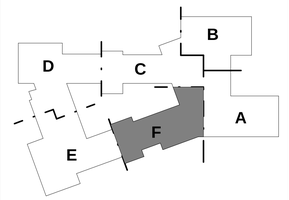
1 SECOND FLOOR PIPING PLANS - PART F
1/8" = 1'-0"

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SECOND FLOOR PIPING PLAN - PART F
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REVISIONS NO.	DATE	REMARKS	BY

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ROOFTOP UNITS

UNIT NO.	MANUF. NO.	AREA SERVED	TYPE	MIN EER	TOTAL C.F.M.	O.A. C.F.M.	MAX. COIL VEL.	GAS-FIRED HEATING SECTION						DX COOLING SECTION									HOT GAS REHEAT				SUPPLY AIR FAN							RETURN/EXHAUST AIR FAN						ELECTRICAL DATA					ENERGY WHEEL					REMARKS
								ENT. AIR°F	LVG. AIR°F	S.A. AIR°F	AIR P.D.	MIN GAS PRESS.	CFH INPUT	HTG. M.B.H.	ENT. COIL COND. D.B.°F	ENT. COIL COND. W.B.°F	LVG. COIL COND. D.B.°F	LVG. COIL COND. W.B.°F	LVG. UNIT COND. D.B.°F	LVG. UNIT COND. W.B.°F	AIR P.D.	M.B.H. SENS.	M.B.H. TOTAL	L.A.T. D.B.°F	L.A.T. W.B.°F	AIR P.D.	M.B.H.	VFD	T.S.P.	E.S.P.	H.P.	VOLT	PH.	R.P.M	T.S.P.	E.S.P.	H.P.	VOLT	PH.	R.P.M	MCA	MOP	VOLTAGE	PH	Y/N	WINTER TOTAL MBH	WINTER MIN EFF.	SUMMER TOTAL MBH	SUMMER MIN EFF.	HP	
RTU-1	K144	MUSIC CLASSROOMS	VAV	16.2	4,000	4,000	500	49.1	113.9	68	0.11	4.5 in WC	350	280	80.9	67.8	55.8	55.8	63.0	55.8	0.35	110.7	152.2	68.07	60.49	0.07	53.25	YES	3.49	2.0	5	208	3	1905	3.49	2.0	5	208	3	1905	77.9	90	208	3	YES	312.07	65%	77.72	65%	0.07	
RTU-2	K144	STAGE	VAV	14.1	4,000	2,000	500	62.0	117.6	68	0.14	4.5 in WC	300	240	79.1	66.0	53.8	53.8	63.0	53.8	0.34	111.4	147.9	65.73	58.54	0.07	51.77	YES	3.03	2.0	3	208	3	1808	3.03	2.0	3	208	3	1808	71.2	90	208	3	YES	174.22	76%	44.30	76%	0.07	
RTU-3	K210	KITCHEN/FACULTY	VAV	15.8	5,000	5,000	500	52.2	111.5	68	0.15	4.5 in WC	400	320	80.5	67.3	53.0	53.0	63.0	53.0	0.42	151.6	218.7	67.11	58.64	0.06	76.56	YES	3.39	2.0	5	208	3	1730	3.39	2.0	5	208	3	1730	105.8	125	208	3	YES	417.77	72%	105.71	72%	0.17	
RTU-4	D120	CULINARY/DINING	VAV	14.4	2,500	2,500	500	48.6	107.9	68	0.14	4.5 in WC	200	160	81.0	67.9	51.0	51.0	63.0	51.0	0.35	82.7	127.7	67.48	57.77	0.04	44.70	YES	3.69	2.0	3	208	3	2359	3.69	2.0	3	208	3	2359	62.7	80	208	3	YES	192.49	64%	47.90	64%	0.07	
RTU-5	K300	TOWN SQUARE/FORUM	VAV	13.3	7,400	7,400	500	50.2	110.3	68	0.94	4.5 in WC	600	480	80.8	67.6	53.7	53.7	63.0	53.7	0.33	221.1	317.7	67.55	59.17	0.17	111.19	YES	4.64	2.0	10	208	3	2200	4.64	2.0	10	208	3	2200	158.2	200	208	3	YES	591.77	67%	148.20	67%	0.17	
RTU-6	N420	AUDITORIUM	VAV	11.3	10,000	5,000	500	61.9	113.8	68	1.35	4.5 in WC	700	560	79.1	66.0	53.1	53.1	63.0	53.1	0.42	286.6	391.6	61.58	56.57	0.10	92.04	YES	4.54	2.0	15	208	3	2330	4.54	2.0	15	208	3	2330	209.3	250	208	3	YES	433.67	76%	110.39	76%	0.17	
RTU-7	K300	SALON/NJROTC/HEALTH	VAV	13.2	7,000	7,000	500	50.7	114.2	68	0.84	4.5 in WC	600	480	80.7	67.5	53.0	52.9	63.0	52.9	0.30	214.4	313.9	67.47	58.69	0.15	109.87	YES	4.39	2.0	10	208	3	2114	4.39	2.0	10	208	3	2114	158.2	200	208	3	YES	566.27	68%	142.07	68%	0.17	
RTU-8	N648	LOCKERS/TEAM ROOMS	VAV	11.5	9,110	9,110	500	45.8	102.7	68	1.12	4.5 in WC	700	560	81.4	68.3	54.4	54.3	63.0	54.3	0.37	271.6	400.0	63.91	58.08	0.09	93.98	YES	4.98	2.0	15	208	3	2356	4.98	2.0	15	208	3	2356	228.0	250	208	3	YES	654.55	58%	160.91	58%	0.17	
RTU-9	K144	SMALL GYM	VAV	12.8	7,000	5,565	500	55.2	118.7	95	0.84	4.5 in WC	600	480	80.1	67.0	52.4	52.3	55.0	52.3	0.30	213.9	311.4	66.75	58.11	0.15	108.99	YES	4.26	2.0	10	208	3	2096	4.26	2.0	10	208	3	2096	158.2	200	208	3	YES	457.05	70%	115.10	70%	0.17	
RTU-10	K300	LARGE GYM	VAV	11.1	13,000	10,640	500	53.5	110.5	95	0.98	4.5 in WC	1000	800	80.3	67.2	52.1	52.0	55.0	52.0	0.48	405.7	599.3	66.14	57.72	0.11	197.99	YES	4.89	2.0	20	208	3	2654	4.89	2.0	20	208	3	2654	301.7	400	208	3	YES	843.68	67%	210.91	67%	0.17	
RTU-11	K144	FITNESS ROOM	VAV	15.2	3,500	2,800	500	55.8	119.3	95	0.11	4.5 in WC	300	240	80.0	66.9	53.2	53.2	55.0	53.2	0.29	103.6	322.1	66.74	58.61	0.05	51.40	YES	3.07	2.0	3	208	3	1763	3.07	2.0	3	208	3	1763	71.2	90	208	3	YES	234.27	72%	59.23	72%	0.07	
RTU-12	K300	LIBRARY/GUID./MARKETING	VAV	12.7	8,000	8,000	500	49.4	114.2	68	0.86	4.5 in WC	700	560	80.9	67.7	54.9	54.9	63.0	54.9	0.37	230.1	130.8	67.89	59.94	0.20	112.73	YES	4.78	2.0	10	208	3	2296	4.78	2.0	10	208	3	2296	164.9	200	208	3	YES	628.36	66%	156.94	66%	0.17	
RTU-13	D120	TEAM ROOMS	VAV	14.7	2,755	2,755	500	47.4	101.2	68	0.17	4.5 in WC	200	160	81.2	68.0	52.6	52.6	63.0	52.6	0.40	87.1	322.1	67.92	58.74	0.05	45.80	YES	3.93	2.0	5	208	3	2603	3.93	2.0	5	208	3	2603	67.8	80	208	3	YES	205.91	61%	51.05	61%	0.07	
RTU-14	K300	CLASSROOMS (C/D)	VAV	13.0	8,000	8,000	500	49.4	114.2	68	0.86	4.5 in WC	700	560	80.9	67.7	54.9	54.9	63.0	54.9	0.37	230.1	467.4	67.89	59.94	0.20	112.73	YES	4.77	2.0	10	208	3	2294	4.77	2.0	10	208	3	2294	158.2	200	208	3	YES	628.36	66%	156.94	66%	0.17	
RTU-15	N480	CLASSROOMS (D)	VAV	11.8	12,500	12,500	500	48.0	107.3	68	0.91	4.5 in WC	1000	800	81.0	67.9	56.2	56.1	63.0	56.1	0.42	343.0	404.0	64.30	59.23	0.19	109.88	YES	5.02	2.0	20	208	3	2626	5.02	2.0	20	208	3	2626	247.9	250	208	3	YES	949.34	63%	236.00	63%	0.17	
RTU-16	N420	CLASSROOMS (D)	VAV	12.9	10,500	10,500	500	50.0	120.5	68	0.64	4.5 in WC	1000	800	80.8	67.6	55.5	55.4	63.0	55.4	0.45	293.7	467.4	63.84	58.67	0.12	94.97	YES	4.36	2.0	15	208	3	2338	4.36	2.0	15	208	3	2338	228.1	250	208	3	YES	834.80	67%	208.92	67%	0.17	
RTU-17	N480	CLASSROOMS (E)	VAV	11.8	12,500	12,500	500	48.0	107.3	68	0.91	4.5 in WC	1000	800	81.0	67.9	56.2	56.1	63.0	56.1	0.42	343.0	464.9	64.30	59.23	0.19	109.88	YES	5.02	2.0	20	208	3	2626	5.02	2.0	20	208	3	2626	247.9	250	208	3	YES	949.34	63%	236.00	63%	0.17	
RTU-18	N480	CLASSROOMS (E/F)	VAV	12.0	12,000	12,000	500	48.5	110.2	68	0.83	4.5 in WC	1000	800	81.0	67.9	55.7	55.7	63.0	55.7	0.39	335.6	341.0	64.09	58.98	0.17	109.25	YES	4.80	2.0	20	208	3	2546	4.80	2.0	20	208	3	2546	247.9	250	208	3	YES	922.49	64%	229.21	64%	0.17	
RTU-19	N360	ADMIN/CLASSROOMS (F)	VAV	12.3	8,000	8,000	500	50.9	115.7	68	0.86	4.5 in WC	700	560	80.6	67.5	53.7	53.7	63.0	53.7	0.30	237.4	149.3	67.45	59.14	0.09	119.35	YES	4.15	2.0	10	208	3	2212	4.15	2.0	10	208	3	2212	177.2	225	208	3	YES	649.97	69%	163.40	69%	0.17	

SELECTIONS BASE ON "TRANE" HORIZON - OUTDOOR AIR UNIT (D/K/N).
ROOFTOP AIR HANDLING UNITS SHALL HAVE VARIABLE FREQUENCY DRIVE FOR SUPPLY, EXHAUST, & ENERGY WHEEL MOTORS PROVIDED BY RTU MANUFACTURER IN ACCORDANCE WITH DIV 260000 REQUIREMENTS.
PROVIDE OUTSIDE AIR INTAKE WEATHER HOOD AND EXHAUST HOOD DISCHARGE SOUND ATTENUATOR.

ENERGY RECOVERY UNIT

UNIT NO.	MANUF. NO.	AREA SERVED	TOTAL C.F.M.	O.A. C.F.M.	MAX. COIL VEL. F.P.M.	HEATING COIL DATA							DX COOLING SECTION								HOT GAS REHEAT				SUPPLY FAN MOTOR							EXHAUST FAN MOTOR						ENERGY WHEEL				REMARKS
						ENT. AIR°F	LVG. AIR°F	EWT.	LWT.	WAT. PD MAX	AIR P.D.	GPM	HEATING M.B.H.	ENT. COIL COND. D.B.°F	ENT. COIL COND. W.B.°F	LVG. COIL COND. D.B.°F	LVG. COIL COND. W.B.°F	LVG. UNIT COND. D.B.°F	LVG. UNIT COND. W.B.°F	AIR P.D.	M.B.H. SENS.	M.B.H. TOTAL	L.A.T. D.B.°F	L.A.T. W.B.°F	AIR P.D.	M.B.H.	VFD DRIVE	E.S.P.	HP	V	PH	RPM	E.S.P.	H.P.	V	PH.	R.P.M.	EFFECTIVENESS COOLING	EFFECTIVENESS HEATING	VFD	HP	
ERV-1	K144	ANIMAL SCIENCE BUILDING	3,600	3,600				150	130					80.8	67.6	54.3	54.3	69.7	54.3	0.30	105.4	149.3	67.68	59.54	0.06	52.26	YES	2.0"	3	208	3	1820	2.0"	3	208	3	1820	67%	67%	YES	0.07	

SELECTION BASED ON "TRANE" HORIZON - OUTDOOR AIR UNIT (D/K/N).
UNIT MANUFACTURER SHALL PROVIDE FACTORY-INSTALLED VARIABLE FREQUENCY DRIVES IN ACCORDANCE WITH DIV 260000 REQUIREMENTS.
ENTERING DRY BULB TEMPERATURES OCCUR AFTER THE AIR IS TEMPERED BY THE RECOVERY WHEEL.

AIR CONDITIONING DESIGN DATA

DESIGN AREA	SUMMER				WINTER	
	OUT		IN		OUT	IN
	D.B.	W.B.	D.B.	%RH	D.B.	D.B.
DOVER, NEW HAMPSHIRE	88	73	75	55	-2	70

MAKEUP AIR UNIT

UNIT NO.	MANUF. NO.	AREA SERVED	TOTAL CFM	O.A. CFM	E.D.B.	L.D.B.	CFH	OUTPUT MBH	GAS PRESS	EXT. IN W.G.	MOTOR HP	MOTOR V	MOTOR PH	RPM	REMARKS
MAU-1	K180	CULINARY	4,000	4,000	-2.0	72.1	400	320	4.5"	2.0"	3	208	3	1401	
MAU-2	K180	KITCHEN	4,000	4,000	-2.0	72.1	400	320	4.5"	2.0"	3	208	3	1401	
MAU-3	N420	AUTO COLLISION SPRAY BOOTH	12,000	12,000	-2.0	59.7	1000	800	4.5"	2.0"	15	208	3	2322	

SELECTIONS BASE ON "TRANE" HORIZON - OUTDOOR AIR UNIT (D/K/N).
THIS CONTRACTOR TO PROVIDE ADDITIONAL DROP DOWN REGULATORS TO MEET REQUIRED OPERATING PRESSURE
VARIABLE FREQUENCY DRIVE PROVIDED BY UNIT MANUF. IN ACCORDANCE W/ DIV. 260000 REQUIREMENTS.

DIFFUSERS

NO.	STYLE
A	AMX
B	910
C	HCD2
D	LBPH 25C

SELECTION BASED ON "PRICE"
PROVIDE HEAVY DUTY NARROW FACE BORDER OPTION FOR ALL TYPE D GRILLES

REGISTER

NO.	STYLE
1	80
2	96
3	LBPH 25C

SELECTION BASED ON "PRICE"
PROVIDE HEAVY DUTY NARROW FACE BORDER OPTION FOR ALL TYPE 3 GRILLES

GAS-FIRED HEATING AND VENTILATING UNITS

UNIT NO.	MANUF. NO.	AREA SERVED	MAX CFM	O.A. CFM	GAS-FIRED HEATING SECTION						SUPPLY FAN MOTOR					EXHAUST FAN MOTOR					ENERGY WHEEL				REMARKS
					E.D.B.	L.D.B.	CFH INPUT	HEATING MBH	AIR P.D.	GAS PRESS	VFD DRIVE	E.S.P.	HP	V	PH	RPM	E.S.P.	H.P.	V	PH.	R.P.M.	EFFECTIVENESS MBH	EFFICIENCY	VFD	HP	
HV-1	K210	WOOD WORK LAB	6,000	6,000	50.8	124.9	600	480	0.62	4.5"	YES	1.0"	5	208	3	1724	1.0"	5	208	3	1724	485.86	69%	YES	0.17	
HV-2	K210	BUILDING CONSTRUCTION	6,000	6,000	50.8	124.9	600	480	0.62	4.5"	YES	1.0"	5	208	3	1724	1.0"	5	208	3	1724	485.86	69%	YES	0.17	
HV-3	D120	WELDING LAB	3,000	3,000	49.7	123.8	300	240	0.08	4.5"	YES	1.0"	2	208	3	1873	1.0"	2	208	3	1873	236.93	66%	YES	0.07	
HV-4	N360	AUTO COLLISION	8,000	8,000	47.6	112.4	700	560	0.86	4.5"	YES	1.0"	7.5	208	3	2080	1.0"	7.5	208	3	2080	602.05	62%	YES	0.17	
HV-5	D072	AUTO TECH SHOP	6,000	6,000	50.8	124.9	600	480	0.62	4.5"	YES	1.0"	5	208	3	1724	1.0"	5	208	3	1724	485.86	69%	YES	0.17	

SELECTIONS BASE ON "TRANE" HORIZON - OUTDOOR AIR UNIT (D/K/N).
UNITS SHALL HAVE VARIABLE FREQUENCY DRIVE FOR SUPPLY, EXHAUST, & ENERGY WHEEL MOTORS PROVIDED BY RTU MANUFACTURER IN ACCORDANCE WITH DIV 260000 REQUIREMENTS.
ENTERING DRY BULB TEMPERATURES OCCUR AFTER THE AIR IS TEMPERED BY THE RECOVERY WHEEL.

HOT WATER BOILER

UNIT NO.	MANUF. NO.	NET I.B.R. OUTPUT	MIN. EFF.	MIN TURN DOWN	AIR INLET	FLUE SIZE	GAS INPUT C.F.H.	MIN. GAS PRESS. (IN W.C.)	MAX. GAS PRESS. (IN W.C.)	HW GPM	BURNER FAN HP.	BURNER FAN V	BURNER FAN PH.	REMARKS
B-1	BMK3000	2,610	93.5%	15:1	8"	8"	3,000	4.0	14.0	261		120	1	
B-2	BMK3000	2,610	93.5%	15:1	8"	8"	3,000	4.0	14.0	261		120	1	
B-3	BMK3000	2,610	93.5%	15:1	8"	8"	3,000	4.0	14.0	261		120	1	
B-4	BMK3000	2,610	93.5%	15:1	8"	8"	3,000	4.0	14.0	261		120	1	
B-5	EST399	379	95.1%	3.6:1	4"	4"	399	5.0	13.0	38		120	1	
B-6	EST399	379	95.1%	3.6:1	4"	4"	399	5.0	13.0	38		120	1	

SELECTION BASED ON "AERCO"
PROVIDE 30% BY WEIGHT PROPYLENE GLYCOL SOLUTION FOR FREEZE PROTECTION FOR HEATING HOT WATER SYSTEM

BOILERS SHALL EXCEED 2012 IECC CODE REQUIREMENTS AT 95% THERMAL EFFICIENCY AND 94% COMBUSTION EFFICIENCY PER DOE 10 CFR PART 431 TEST PROCEDURES.

WATER PUMPS

UNIT NO.	PUMP SERIES	MANUF. NO.	BUILDING LOCATION	SERVICE	G.P.M.	T.D.H. FT.	MOTOR HP.	MOTOR VOLT	MOTOR PH.	REMARKS
P-1			MAIN BLDG MECH. ROOM	HHW	680					VFD
P-2			MAIN BLDG MECH. ROOM	HHW	680					VFD
P-3			MAIN BLDG MECH. ROOM	CHW	88					VFD
P-4			MAIN BLDG MECH. ROOM	CHW	88					VFD
P-5			ANIMAL SCI. MECH. ROOM	HHW	76					VFD
P-6			ANIMAL SCI. MECH. ROOM	HHW	76					VFD
BP-1			MAIN BLDG MECH. ROOM	BOILER						VFD
BP-2			MAIN BLDG MECH. ROOM	BOILER						VFD
BP-3			MAIN BLDG MECH. ROOM	BOILER						VFD
BP-4			MAIN BLDG MECH. ROOM	BOILER						VFD
BP-5			ANIMAL SCI. MECH. ROOM	BOILER						VFD
BP-6			ANIMAL SCI. MECH. ROOM	BOILER						VFD

SELECTIONS BASED ON "TACO"
PROVIDE 30% BY WEIGHT PROPYLENE GLYCOL SOLUTION FOR FREEZE PROTECTION FOR CHILLED WATER SYSTEMS

DISPLACEMENT DIFFUSERS

UNIT NO.	MANUF. NO.	SIZE W x H x D	MAX FACE VELOCITY	DUCT CONNECTION	REMARKS
DD-1	DF1	24"x48"x13"	40 FPM	10"□ TOP	
DD-2	DF1	24"x60"x13"	40 FPM	10"□ TOP	
DD-3	DF1	24"x96"x13"	40 FPM	10"□ TOP	
DD-4	DF1	36"x84"x16"	40 FPM	12"□ TOP	
DD-5	DF1W	14.5"x47.5"	40 FPM	12"x2.5" TOP	
DD-6	DF1W	14.5"x29.5"	40 FPM	12"x2.5" TOP	
DD-7	DF1W	14.5"x23.5"	40 FPM	12"x2.5" TOP	
DD-8	DF1W	22.5"x35.5"	40 FPM	18"x2.5" TOP	
DD-9	DF1R	24"x96"	40 FPM		
DD-10	DF1R	60"x420"	40 FPM		
DD-11	DF1L	24"x24"	40 FPM	8"□ TOP	
DD-12	DF1L	24"x48"	40 FPM	10"□ TOP	
DD-13	RFDD	8"Ø	40 FPM	8"□	
DD-14	DF1	48"x96"x16"	40 FPM	14"□	
DD-15	DF1R	48"x150"	40 FPM		

SELECTION BASED ON "PRICE" FINISH AND COLOR TO BE BY ARCH.
REFER TO FLOOR PLANS FOR CFM
NOTE #1: PROVIDE 4" SUB BASE FOR ALL DF1 MODELS

DUCTLESS COOLING UNIT SYSTEMS

UNIT NO.	MANUF. NO.	EVAP. LOCATION	EVAPORATOR UNITS COND. PUMP	EVAPORATOR UNITS CFM	EVAPORATOR UNITS COOLING BTUH	ASSOCIATED CONDENSER	CONDENSER MODEL	ELECTRICAL DATA V	ELECTRICAL DATA PH	ELECTRICAL DATA MCA	ELECTRICAL DATA MOP	MIN SEER @ ARI	REMARKS
DCUe-1			CP-1			DCUc-1							
DCUe-2			CP-1			DCUc-2							
DCUe-3			CP-1			DCUc-3							
DCUe-4			CP-1			DCUc-4							
DCUe-5			CP-1			DCUc-5							
DCUe-6			CP-1			DCUc-6							
DCUe-7			CP-1			DCUc-7							
DCUe-8			CP-1			DCUc-8							

SELECTION BASED ON "MITSUBISHI" PROVIDE WIRED T'STAT, LOW AMBIENT CONTROL AND INTERNAL MOUNTED CONDENSATE PUMP OF MODEL LISTED ABOVE. CFM BASED ON FANS SET AT LOW SPEED. PROVIDE WITH MATCHING AIR COOLED CONDENSING UNIT. ALL REFRIGERANT TUBING SHALL BE SIZED BY UNIT MANUFACTURER. PROVIDE ALL NECESSARY JOINT KITS, FITTINGS AND ACCESSORIES FOR A COMPLETE OPERATING SYSTEM PER MANUFACTURER'S RECOMMENDATIONS. PROVIDE BAS (BACNET) INTERFACE FOR INTEGRATION TO BMS SYSTEM. PROVIDE SERVICE ISOLATION VALVES FOR EACH INDOOR UNIT.

UNIT HEATERS (ELECTRIC)

UNIT NO.	MANUF. NO.	CFM	COIL KW	COIL MBH	POWER V	POWER PH	FAN HP	REMARKS
EUH-1								
EUH-2								
EUH-3								

SELECTION BASED ON "Q-MARK"
CAPACITIES LISTED ABOVE ARE TYPICAL FOR ALL UNITS.
REFER TO FLOOR PLAN DRAWINGS FOR QUANTITIES.

SOUND ATTENUATORS

UNIT NO.	MANUF NO.	MAX PD	AIRFLOW (CFM)	INLET LEG LENGTH	OUTLET LEG LENGTH	INLET SIZE	OUTLET SIZE	MAX VEL FPM	DYNAMIC INSERTION LOSS (dB) 63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	SERVICE	REMARKS
SA-1S	ERMT															RTU-1 SA	
SA-1R	ERMT															RTU-1 RA	
SA-2S	ERMT															RTU-2 SA	
SA-2R	ERMT															RTU-2 RA	
SA-3S	ERMT															RTU-3 SA	
SA-3R	ERMT															RTU-3 RA	
SA-4S	ERMT															RTU-4 SA	
SA-4R	ERMT															RTU-4 RA	
SA-5S	ERMT															RTU-5 SA	
SA-5R	ERMT															RTU-5 RA	
SA-6S	ERMT															RTU-6 SA	
SA-6R	ERMT															RTU-6 RA	
SA-7S	ERMT															RTU-7 SA	
SA-7R	ERMT															RTU-7 RA	
SA-8S	ERMT															RTU-8 SA	
SA-8R	ERMT															RTU-8 RA	
SA-9S	ERMT															RTU-9 SA	
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SA-11R	ERMT															RTU-11 RA	
SA-12S	ERMT															RTU-12 SA	
SA-12R	ERMT															RTU-12 RA	
SA-13S	ERMT															RTU-13 SA	
SA-13R	ERMT															RTU-13 RA	
SA-14S	ERMT															RTU-14 SA	
SA-14R	ERMT															RTU-14 RA	
SA-15S	ERMT															RTU-15 SA	
SA-15R	ERMT															RTU-15 RA	
SA-16S1	ERMT															RTU-16 SA	
SA-16S2	ERMT															RTU-16 SA	
SA-16R1	ERMT															RTU-16 RA	
SA-16R2	ERMT															RTU-16 RA	
SA-17S	ERMT															RTU-17 SA	
SA-17R	ERMT															RTU-17 RA	
SA-18S	ERMT															RTU-18 SA	
SA-18R	ERMT															RTU-18 RA	
SA-19S	ERMT															RTU-19 SA	
SA-19R	ERMT															RTU-19 RA	
SA-20S	ERMT															HV-1 SA	
SA-20R	ERMT															HV-1 RA	
SA-21S	ERMT															HV-2 SA	
SA-21R	ERMT															HV-2 RA	
SA-22S	ERMT															HV-3 SA	
SA-22R	ERMT															HV-3 RA	
SA-23S	ERMT															HV-4 SA	
SA-23R	ERMT															HV-4 RA	
SA-24S	ERMT															HV-5 SA	
SA-24R	ERMT															HV-5 RA	
SA-25S	ERMT															MAU-1 SA	
SA-26S	ERMT															MAU-2 SA	
SA-27S	ERMT															MAU-3 SA	
SA-28S1	ERMT															ERV-1 SA	
SA-28S2	ERMT															ERV-1 OA	
SA-28R1	ERMT															ERV-1 RA	
SA-28R2	ERMT															ERV-1 EA	

SELECTION BASED ON "PRICE."
PROVIDE MANUFACTURER'S "MOLD-BLOCK" CLOTH LINING, OR EQUAL.

AIR COOLED LIQUID CHILLER

UNIT NO.	MANUF. NO.	NOMINAL TONS	AMB. TEMP.	EVAPORATOR E.W.T.	EVAPORATOR L.W.T.	EVAPORATOR G.P.M.	EVAPORATOR P.D.	COMP NO./STEPS	FANS NO./kW	ELECTRICAL K.W.	ELECTRICAL V	ELECTRICAL PH.	ELECTRICAL MCA	ELECTRICAL MOP	EER @AHRI	REMARKS
CH-1	CGAM40	40.0	95	55	45	88.0	10.4	4 / 4	4 / 5.1	43.2	480	3	94.6	110	13.6	

SELECTION BASED ON "TRANE".
PROVIDE 30% BY WEIGHT PROPYLENE GLYCOL SOLUTION FOR FREEZE PROTECTION FOR HEATING HOT WATER SYSTEM

DUST COLLECTION UNIT

UNIT NO.	MODEL NO.	ESP	CFM	FAN MOTOR HP	FAN MOTOR V	FAN MOTOR PH	REMARKS
DC-1	DFE-4-24-EX	10.0"	7500	25	208	3	SEE NOTES 1 THRU 4

SELECTION BASED ON "DONALDSON TORIT"
NOTE #1: PROVIDED W/ REMOTE CONTROL PANEL INCLUDING VFD.
NOTE #2: PROVIDE COMPRESSED AIR FOR PULSE CLEANING (90 PSI).
NO

VARIABLE AIR VOLUME BOXES

UNIT NO.	MANUF. NO.	CFM		MAX NC @ 1.5" PD	APD	INLET DIA	HW COIL						REMARKS
		MAX	MIN				H.CFM	MBH	GPM	WTD	EAT	LAT	
VAV-1	SDVQ												
VAV-2	SDVQ												
VAV-3	SDVQ												
VAV-4	SDVQ												
VAV-5	SDVQ												
VAV-6	SDVQ												
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VAV-120	SDVQ												
VAV-121	SDVQ												
VAV-209	SDVQ												

SELECTION BASED ON "PRICE" W/ HOSPITAL-GRADE LINER IN ATTENUATOR.
CONTROLS SHALL BE PROVIDED BY ATC CONTRACTOR & FIELD INSTALLED.

INDUCTION UNITS

UNIT NO.	MANUF. NO.	SERVICE	INLET S.P.	PRIMARY AIR	TOTAL AIR	QTY	HEATING COIL						COOLING COIL								REMARKS
							EAT	LAT	EWT	LWT	COIL SEN MBH	G.P.M.	EAT DB	EAT WB	LAT DB	LAT WB	EWT	LWT	COIL SEN MBH	TOTAL ROOM MBH	GPM	
IU-1																						
IU-2																						
IU-3																						
IU-4																						
IU-5																						
IU-6																						
IU-7																						
IU-8																						
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IU-39																						

PRIMARY ENTERING AIR TEMPS ARE AS FOLLOWS: 60°F DB & 52°F WB IN THE COOLING SEASON, 68°F DB & 56°F WB IN THE HEATING SEASON.
PRIMARY ENTERING AIR TEMPS ARE TYPICAL FOR ALL INDUCTION UNITS. PROVIDE CP-1 FOR EACH INDUCTION UNIT. BOTH THE HHW & CHW SYSTEMS CONTAIN 35% BY WEIGHT PROPYLENE GLYCOL. ALL SCHEDULED PERFORMANCE VALUES ARE PER UNIT (QTY REQUIRED IS PROVIDED ABOVE).
TOTAL QTY = 153

EXHAUST HOOD DISCHARGE SOUND ATTENUATOR

UNIT NO.	MANUF NO.	MAX PD	AIRFLOW (CFM)	INLET LEG LENGTH	OUTLET LEG LENGTH	INLET SIZE	OUTLET SIZE	MAX VEL FPM	DYNAMIC INSERTION LOSS (dB)							SERVICE	REMARKS
									63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz		
EHSA-1	ERMT															RTU-1 EA	
EHSA-2	ERMT															RTU-2 EA	
EHSA-3	ERMT															RTU-3 EA	
EHSA-4	ERMT															RTU-4 EA	
EHSA-5	ERMT															RTU-5 EA	
EHSA-6	ERMT															RTU-6 EA	
EHSA-7	ERMT															RTU-7 EA	
EHSA-8	ERMT															RTU-8 EA	
EHSA-9	ERMT															RTU-9 EA	
EHSA-10	ERMT															RTU-10 EA	
EHSA-11	ERMT															RTU-11 EA	
EHSA-12	ERMT															RTU-12 EA	
EHSA-13	ERMT															RTU-13 EA	
EHSA-14	ERMT															RTU-14 EA	
EHSA-15	ERMT															RTU-15 EA	
EHSA-16	ERMT															RTU-16 EA	
EHSA-17	ERMT															RTU-17 EA	
EHSA-18	ERMT															RTU-18 EA	
EHSA-19	ERMT															RTU-19 EA	

SELECTION BASED ON "PRICE."
PROVIDE MANUFACTURER'S "MOLD-BLOCK" CLOTH LINING, OR EQUAL.

EXHAUST FANS

UNIT NO.	MANUF. NO.	BUILDING LOCATION	DRIVE TYPE	TIP SPEED	SP	CFM	RPM	SONES	MOTOR			CONTROL		REMARKS
									HP	V	PH	TYPE	SYST.	
EF-1		SEE PLANS												
EF-2		SEE PLANS												
EF-3		SEE PLANS												
EF-4		SEE PLANS												
EF-5		SEE PLANS												
EF-6		SEE PLANS												
EF-7		SEE PLANS												
EF-8		SEE PLANS												
EF-9		SEE PLANS												
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EF-25														
EF-26														
EF-27														
EF-28														
KEF-1		SEE PLANS												
KEF-2		SEE PLANS												

SELECTION BASED ON "GREENHECK"
NOTE #1: UL LISTED FOR EMERGENCY SMOKE EXHAUST

AIR SEPARATOR

UNIT NO.	MANUF. NO.	SERVICE	GPM	WPD	REMARKS
AS-1	ACT	HHW			-
AS-2	ACT	CHW			-
AS-3	ACT	HHW			

SELECTION BASED ON "TACO"

CONDENSATE PUMPS

UNIT NO.	MANUF. NO.	SERVICE	G.P.H.	T.D.H. FT WATER	MOTOR			REMARKS
					WATTS	VOLT	PH.	
CP-1								

SELECTION BASED ON "SAUERMANN"
PROVIDE OVERFLOW SAFETY SWITCH FOR EACH PUMP W/ ALARM, ALSO EACH PUMP SHALL BE FURNISHED WITH PROVISIONS FOR DIRECT CONNECTION (HARD WIRE) WITH PIGTAIL READY FOR CONNECTION BY ELECTRICAL CONTRACTOR.

EXPANSION TANKS

UNIT NO.	MANUF. NO.	SERVICE	ACCEPT. VOL.	TOTAL VOL.	TANK SIZE		SYSTEM PRESSURES (PSIG)		
					HEIGHT	DIA.	MIN.	MAX.	RELEIF
ET-1		HHW							
ET-2		HHW							
ET-3		CHW							

SELECTION BASED ON "AMTROL"

BUFFER TANKS

UNIT NO.	MANUF. NO.	SERVICE	TOTAL VOL.	TANK SIZE		
				HEIGHT	DIA.	INSUL THICK.
BT-1	BTH	CHW	75 GAL	53"	24"	1.5"

SELECTION BASED ON "TACO"

FIN-TUBE RADIATION SCHEDULE

TAG NO.	MANUFACTURER MODEL NUMBER	BTU PER FT	EWT (°F)	LWT (°F)	PIPE SIZE (IN)	PIPE MTRL	FIN SIZE	FINS PER FOOT	FIN MTRL	ROWS	REMARKS
FTR-1											

SELECTION BASED ON "RITTLING" EWT 150°, 20° ΔT

FTR-1
LENGTH
GPM

GLYCOL MAKE-UP

UNIT NO.	MODEL	SYSTEM	MAKE-UP CAP (GPM@PSI)	DIMENSIONS	PRESURE RANGE(PSI)	ELECTRICAL DATA		
						HP	VOLTS	PH
GF-1								

RADIANT HEATING PANELS

UNIT NO.	MANUF MODEL	PANEL WIDTH	# OF TUBES	BTUH/LF	GPM	REMARKS
RP-1	RPL	2"	8	376	SEE PLANS	

SELECTION BASED ON "PRICE," 160°F EWT, 20°F WTD, 150°F AWT. REFER TO DRAWINGS FOR PANEL LENGTH. CONFIRM MOUNTING LOCATIONS WITH ARCHITECT. PROVIDE END CAP TRIM ON EACH SIDE OF PANEL. PROVIDE TRIMMABLE PANEL, FOIL BACKED INSULATION, INTERCONNECTING PIPING, HEADERS FOR LOWER PRESSURE DROPS, CASTELLATED FINISH & CORNER WALL STYLE FOR WALL UNITS.

WALL RADIATION UNITS

UNIT NO.	PANEL HEIGHT	# OF TUBES	BTUH/LF	GPM/FT	REMARKS
WRU-1	17.25"	6	1880	0.2	MODEL R3F-6

SELECTION BASED ON "RUNITAL", 160° EWT, 20° WTD, 150° AWT. REFER TO DRAWINGS FOR PANEL LENGTH. CONFIRM MOUNTING LOCATIONS WITH ARCHITECT. PROVIDE END CAP & FULL TRIM COVERS AS NEEDED.

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100% DESIGN DEVELOPMENT
3-15-2016

Dover HS / Career Technical Center
Dover, NH
HVAC - SCHEDULES II

SCALE: 1/8" = 1'-0"
DRAWN BY: RLP
CHECKED BY: DP

DRAWING NUMBER
M3.1

JOB NUMBER 403114

3/3/2016 10:53:17 AM C:\Users\Rose.Pafford\Documents\HVAC\Dover HS_CENTRAL_Rose_Pafford.rvt
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LEGEND

SYMBOL	ABBREV	DESCRIPTION
⌀	DIA	DIAMETER
	HHWS	HEATING HOT WATER SUPPLY
	HHWR	HEATING HOT WATER RETURN
	CHWS	CHILLED WATER SUPPLY
	CHWR	CHILLED WATER RETURN
	RL	REFRIGERANT LIQUID
	RS	REFRIGERANT SUCTION
	HG	HOT GAS LINE
	D	DRAIN
		PRESSURE REDUCING VALVE
		GATE VALVE
		GLOBE VALVE
		CHECK VALVE
		BUTTERFLY VALVE
		BALL VALVE
		THREE-WAY CONTROL VALVE
		TWO-WAY CONTROL VALVE
		FLOW METERING ELEMENT
		CIRCUIT SETTER VALVE
		TRIPLE DUTY VALVE
		DRAIN VALVE
		PLUG VALVE
		SAFETY VALVE
		STRAINER
		UNION
		AUTOMATIC AIR VENT
		PIPE UP (ELBOW)
		PIPE DOWN (ELBOW)
		PRESSURE GAGE WITH GAGE COCK
		THERMOMETER
		BRANCH CONNECTION OUT OF TOP
		BRANCH CONNECTION OUT OF BOTTOM
		BRANCH CONNECTION OUT OF SIDE
		CAP ON END OF PIPE
		FLOW IN DIRECTION OF ARROW
T		COMBINATION TEMP/CO2/HUMIDITY SENSOR
C		CARBON DIOXIDE SENSOR (DUCT MOUNTED)
		SUPPLY AIR DUCT SECTION
		RETURN/EXHAUST AIR DUCT SECTION
		SUPPLY AIR
		RETURN/EXHAUST AIR
	SD	SMOKE DAMPER
	MD	MOTORIZED DAMPER
	FD	FIRE DAMPER
	VD	VOLUME DAMPER
	BD	BACKDRAFT DAMPER
	FSD	COMBINATION SMOKE AND FIRE DAMPER
S		SMOKE DETECTOR
		CONNECT TO EXISTING
	TYP.	TYPICAL
	HV	HEATING & VENTILATING UNIT
	RH	ROOF HOOD
	ET	EXPANSION TANK
	A.H.U.	AIR HANDLING UNIT
	R.T.U.	ROOF TOP UNIT
	EF	EXHAUST FAN
	UH	UNIT HEATER (CABINET OR HORIZONTAL)
	O.A.	OUTSIDE AIR
	CFM	CUBIC FEET PER MINUTE
	VEL	VELOCITY
	E.A.T.	ENTERING AIR TEMPERATURE
	L.A.T.	LEAVING AIR TEMPERATURE
	D.B.	DRY BULB
	W.B.	WET BULB
	E.D.B.	ENTERING DRY BULB
	E.W.B.	ENTERING WET BULB
	L.D.B.	LEAVING DRY BULB
	L.W.B.	LEAVING WET BULB
	E.W.T.	ENTERING WATER TEMPERATURE
	L.W.T.	LEAVING WATER TEMPERATURE
	T.S.P.	TOTAL STATIC PRESSURE
	E.S.P.	EXTERNAL STATIC PRESSURE
	T.D.H.	TOTAL DYNAMIC HEAD
	P.D.	PRESSURE DROP
	C.P.	CONDENSATE PUMP
	RP	RADIANT PANEL
	A.S.	AIR SEPERATOR
	HP	HORSEPOWER
	CAF	COMBUSTION AIR FAN
	UH	UNIT HEATER
	V	VOLTS
	PH	PHASE
	MANUF	MANUFACTURER
	T'STAT	THERMOSTAT
	A.F.F.	ABOVE FINISHED FLOOR
	DG	DOOR GRILLE
	MAU	MAKE-UP AIR UNIT
	U.D.	UNDERCUT DOOR
	N.T.S.	NOT TO SCALE
	CO	CLEANOUT
	B	BOILER
	DD	DISPLACEMENT DIFFUSER
	H.V.A.C.	HEATING,VENTILATING AND AIR COND.
	A.T.C.	AUTOMATIC TEMP. CONTROL
	G.C.	GENERAL CONTRACTOR
	P.C.	PLUMBING CONTRACTOR
	E.C.	ELECTRICAL CONTRACTOR
	L.H.C.	LIMIT OF HEATING CONTRACT
	L.P.C.	LIMIT OF PLUMBING CONTRACT
	P	PUMP
	CH	CHILLER
	FC	FAN COIL UNIT
	EUH	ELECTRIC UNIT HEATER
	EXH.	EXHAUST
	DCU	DUCTLESS COOLING UNIT
	DCUc	DUCTLESS COOLING UNIT CONDENSER (OUTDOOR)
	DCUe	DUCTLESS COOLING UNIT EVAPORATOR (INDOOR)
	DG	DOOR GRILLE
C		ACTIVE FIN TUBE LENGTH
	R.A.	RETURN AIR
	HV	HEATING AND VENTILATING UNIT
	S.A.	SUPPLY AIR
	RHC	REHEAT COIL
	CLG.	CEILING
	O.C.	ON CENTER
	MBH	1000 BTUH
	WTD	WATER TEMPERATURE DROP
	CFH	CUBIC FEET PER HOUR
	FRPM	FAN RPM
	VFD	VARIABLE FREQUENCY DRIVE
	WPD	WATER PRESSURE DROP
	C	CONVECTOR
	HGS	HOT WATER GLYCOL LOOP
	GFS	GLYCOL FEED STATION
	OED	OPEN ENDED DUCT
	WMS	WIRE MESH SCREEN

##/# — EQUIPMENT TYPE / EQUIPMENT NUMBER

S-A	GRD DESIGNATION (REFER TO SCHEDULE)
12x12	GRD SIZE
500	GRD CFM
DD-1	DD DESIGNATION (REFER TO SCHEDULE)
400	DD CFM
RP-1	RADIANT PANEL DESIGNATION (REFER TO SCHEDULES)
0.5	RADIANT PANEL GPM
4'-0"	RADIANT PANEL LENGTH

GENERAL NOTES

1 ALL PIPING AND DUCTWORK UNLESS DIMENSIONED IS SHOWN DIAGRAMATICALLY ONLY, EXACT LOCATION SHALL BE DETERMINED IN FIELD AFTER COORDINATING WITH OTHER WORK. DUCTWORK WILL HAVE OFFSETS TO PASS AROUND SUPPLEMENTAL STRUCTURES AND OTHER WORK.

2 FOR TYPICAL PIPING DIAGRAMS AND CONNECTIONS AT EQUIPMENT, SEE DETAIL DRAWINGS.

3 EXACT LOCATION OF ALL CEILING DIFFUSERS, REGISTERS, AND GRILLES SHALL BE COORDINATED WITH LIGHTING FIXTURES. REFER TO REFLECTED CEILING PLAN.

4 FOR DETAILS OF ROOF CURBS, FLASHING, PIPING, AND VENTS THRU ROOF REFER TO ARCHITECTURAL DRAWINGS.

5 FOR LOCATION OF OPENINGS IN ROOF AND FLOORS REFER TO STRUCTURAL AND ARCHITECTURAL DRAWINGS.

6 AUTOMATIC VENTS, VALVES, ETC. THAT MUST BE SERVICED SHALL BE LOCATED IN ACCESSIBLE POSITIONS.

7 THIS CONTRACTOR SHALL COORDINATE CONCRETE HOUSE KEEPING PADS W/ G.C. CONCRETE BASES SHALL BE MIN 4" IN HEIGHT AND 6" LARGER THAN EQUIPMENT. LOCATION AND DIMENSIONS ARE APPROXIMATE. PROVIDE TO SUIT EQUIPMENT.

8 THIS CONTRACTOR SHALL PROVIDE REMOVABLE PANELS AT LOCATIONS WHERE ACCESS TO VALVES, DAMPERS, FIRE DAMPERS, SMOKE DAMPERS ETC. ARE REQUIRED.

9 ALL DUCTWORK SHALL HAVE JOINTS AND SEAMS FILLED WITH SEALANT FOR AIR TIGHT INSTALLATIONS.

10 PROVIDE SWING JOINTS AT ALL PIPING TAKEOFFS FROM MAINS (MINIMUM OF 3 ELBOWS), AND PROVIDE ISOLATION VALVES ON SUPPLY AND RETURN PIPING BRANCHES SERVING 2 OR MORE PIECES OF EQUIPMENT.

11 ALL AIR VENTS & PRESSURE GAUGES SHALL BE INSTALLED WITH COCKS SUCH THAT THE DEVICE CAN BE REMOVED WITHOUT DRAINING PIPING SYSTEM.

12 PROVIDE DUCT ACCESS DOORS FOR ALL FIRE AND CONTROL DAMPERS LOCATED IN DUCTWORK RUNS.

13 H.V.A.C. CONTRACTOR SHALL COORDINATE ALL WORK WITH PLUMBING AND ELECTRICAL CONTRACTORS.

14 H.V.A.C. CONTRACTOR SHALL INFORM G.C. AS TO THE LOCATION AND SIZE OF ALL ACCESS PANELS.

15 ALL DOOR GRILLES SHALL BE BY G.C.

16 ALL SUPPORT STEEL UNLESS SHOWN ON STRUCTURAL DRAWINGS SHALL BE PROVIDED BY H.V.A.C. CONTRACTOR.

17 ALL DUCT ELBOWS SHALL BE LONG RADIUS (R=1.5), OR SQUARE TYPE WITH DOUBLE THICKNESS TURNING VANES.

18 DUCT SMOKE DETECTORS INDICATED ARE TO BE FURNISHED & WIRED BY ELECTRICAL CONTRACTOR AND INSTALLED BY THIS CONTRACTOR. ATC CONTRACTOR TO SHUT DOWN UNIT UPON ACTIVATION.

19 FOR ALL CONNECTIONS TO BUILDING STEEL REFER TO STRUCTURAL DRAWINGS.

20 TOTAL DYNAMIC HEAD AND STATIC PRESSURE INDICATED IN THE SCHEDULES IS BASED ON ENGINEERING ANALYSIS AND MAY NOT NECESSARILY MATCH ACTUAL INSTALLED CONDITIONS. THIS CONTRACTOR SHALL PROVIDE REQUIRED SHEEVES, BELTS AND DRIVES TO MEET VOLUME FLOW CHARACTERISTICS SPECIFIED.

21 PROVIDE 4" FLEXIBLE CONNECTION AT EACH DUCT CONNECTION TO FAN OR AIR HANDLING UNIT.

22 THE MANUFACTURER LISTED IN THE SCHEDULES REFLECTS THE BASIS OF DESIGN AS INDICATED ON THE CONTRACT DRAWINGS AND IS NOT INTENDED TO SUGGEST THE REQUIRED PROVIDER. REFER TO THE SPECIFICATIONS FOR A COMPLETE DESCRIPTION OF EACH PRODUCT REQUIRED AND REFERENCE "OR EQUAL" REQUIREMENTS.

23 REFER TO ARCHITECTURAL DRAWING FOR EXACT LOCATION OF WALL MOUNTED MOUNTED GRILLES, REGISTERS, DIFFUSERS, ETC.

24 FINTUBE & RADIANT PANEL LENGTHS INDICATED ARE GROSS ELEMENT REQUIRED FOR THE ROOM. PROVIDE PIPING OFFSETS AND BLANK COVERS AROUND SUPPLEMENTAL STRUCTURES & STEEL. PROVIDE TRIM PIECES AT EACH END SO THE RADIANT PANELS APPEAR CONTINUOUS FROM WALL TO WALL

25 COORDINATE WITH SUPPLEMENTAL STRUCTURES IN WALL WHERE PIPING IS RUN INSIDE STUD CAVITIES. THE PIPING SHALL BE INSTALLED ON THE WARM SIDE OF THE INSULATION. PROVIDE OPENINGS THROUGH WALL STUDS SO THE INSULATION CAN BE CARRIED FULL SIZE THROUGH THE STUD.

26 ALL CONDENSATE DRAINS THAT PENETRATE EXTERIOR WALLS SHALL BE PROVIDED W/ ESCUTCHEONS.

27 ALL PIPING AND / OR DUCTWORK THAT PENETRATES A WALL OR FLOOR THAT IS VISIBLE SHALL BE PROVIDED W/ AN ESCUTCHEON.

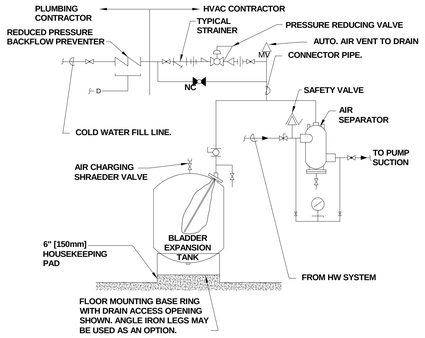
28 ALL KITCHEN EXHAUST DUCTWORK SHALL BE 2-HOUR CONSTRUCTION WELDED BLACK STEEL OR EQUAL PER NFPA 90 REQUIREMENTS.

29 ALL HOT WATER VALVE ACTUATORS SHALL FAIL OPEN UPON LOSS OF POWER W/ SPRING RETURN & SHALL BE PROVIDED W/ FEEDBACK COMMUNICATION. ALL VALVES WITH A GPM VALUE LESS THAN THAT OF 1 SHALL BE 2 POSITION, FOR GPM VALUES OF 1 GPM & ABOVE THE VALVE SHALL BE MODULATING.

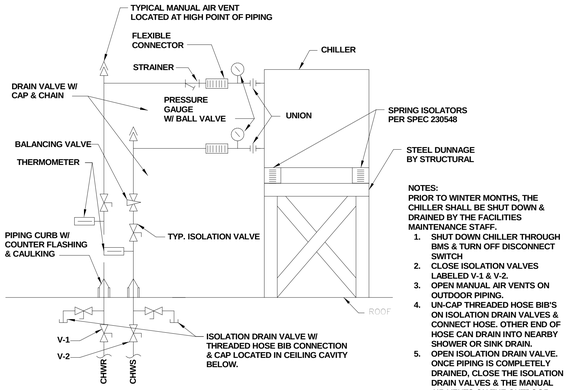
30 ALL LOCKER ROOM EXHAUST/RETURN DUCTWORK SHALL BE ALUMINUM

31 ALL THERMOSTATS SHALL BE COMBINATION SENSORS, PROVIDING TEMPERATURE, CO2 & HUMIDITY. IF COMBINATION SENSORS CANNOT BE PROVIDED THEN INDIVIDUAL SENSORS ARE ACCEPTABLE. EACH SPACE SHALL BE PROVIDED WITH THESE COMBINATION SENSORS. ALL SENSORS SHALL BE BACNET TYPE.

32 IF NEW ROOFTOP EQUIPMENT IS UTILIZED FOR TEMPORARY HEATING/COOLING THEN HVAC CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING FILTERS AS NEEDED THROUGHOUT THEIR TEMPORARY USE. ALSO PRIOR TO TURNING THE EQUIPMENT OVER TO THE OWNER AT SUBSTANTIAL COMPLETION THE HVAC CONTRACTOR SHALL INTERNALLY CLEAN THE UNIT & VACUUM THE COILS. REFER TO THE SPECIFICATIONS FOR FURTHER REQUIREMENTS.



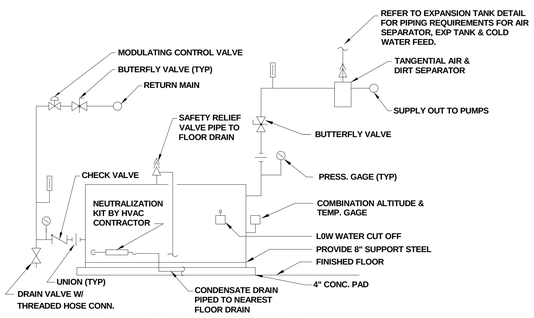
EXPANSION TANK DETAIL
(NOT TO SCALE)



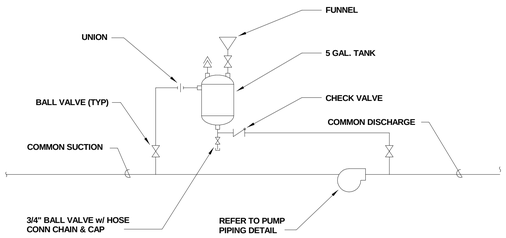
CHILLER PIPING DIAGRAM
(NOT TO SCALE)

NOTES:
PRIOR TO WINTER MONTHS, THE CHILLER SHALL BE SHUT DOWN & DRAINED BY THE FACILITIES MAINTENANCE STAFF.

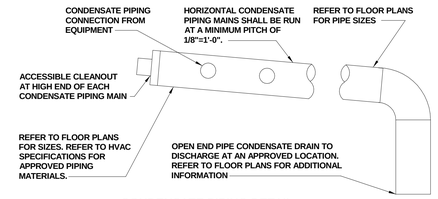
1. **SHUT DOWN CHILLER THROUGH BMS & TURN OFF DISCONNECT SWITCH.**
2. **CLOSE ISOLATION VALVES LABELED V-1 & V-2.**
3. **OPEN MANUAL AIR VENTS ON OUTDOOR PIPING.**
4. **UN-CAP THREADED HOSE BIB'S ON ISOLATION DRAIN VALVES & CONNECT HOSE. OTHER END OF HOSE CAN DRAIN INTO NEARBY SHOWER OR SINK DRAIN.**
5. **OPEN ISOLATION DRAIN VALVE. ONCE PIPING IS COMPLETELY DRAINED, CLOSE THE ISOLATION DRAIN VALVES & THE MANUAL AIR VENTS ON THE OUTDOOR PIPING.**
6. **PRIOR TO RESTARTING CHILLER, OPEN ISOLATION VALVES LABELED V-1 & V-2, TURN ON DISCONNECT SWITCH AND ENABLE CHILLER ON BMS SYSTEM**



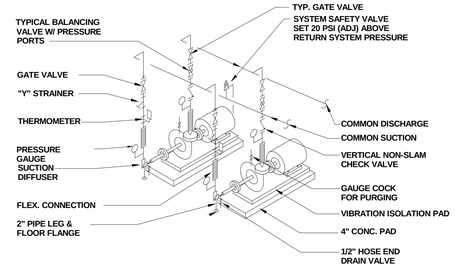
TYPICAL BOILER PIPING DETAIL
(NOT TO SCALE)



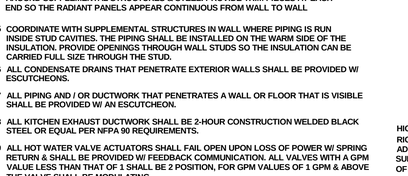
CHEMICAL SHOT FEEDER PIPING DETAIL
(NOT TO SCALE)



CONDENSATE PIPING DETAIL
NO SCALE

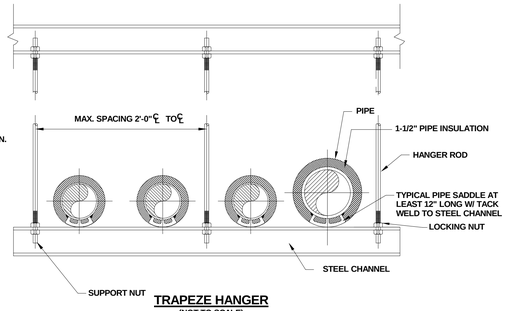


PIPING DETAILS AT WATER PUMPS
(NOT TO SCALE)



TYPICAL PIPE HANGER DETAIL

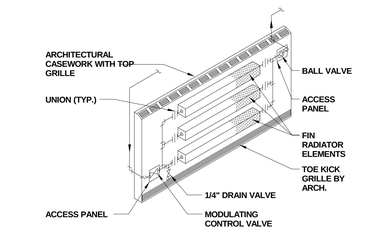
NOTE:
REFER TO SPECIFICATIONS FOR HANGER ROD SIZE & SPACING.
REFER TO SPEC SECTION 230548 FOR SEISMIC & VIBRATION ISOLATION REQUIREMENTS.



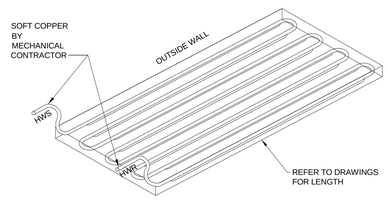
TRAPEZE HANGER
(NOT TO SCALE)

NOTES:
PIPING TYPICAL FOR SURFACE MTD & RECESSED UNITS.

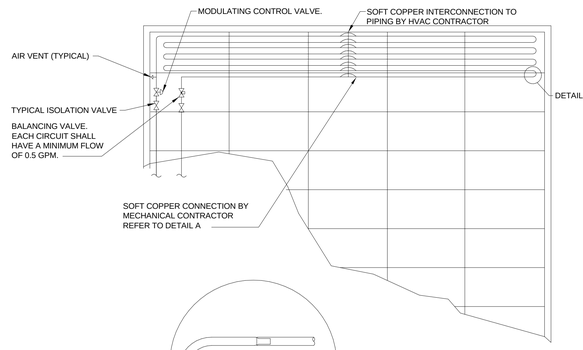
TYPICAL CABINET UNIT HEATER PIPING DETAIL
(NOT TO SCALE)



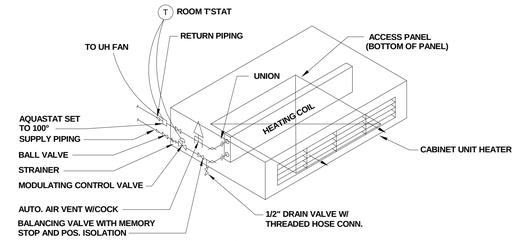
TYPICAL FIN RADIATOR PIPING DETAIL(3 TIER)
HOT WATER
(NOT TO SCALE)



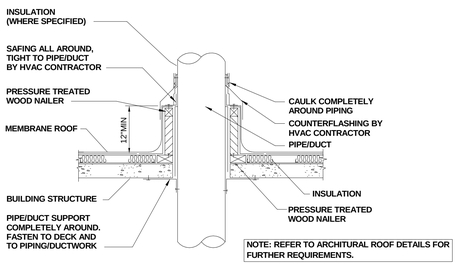
RADIANT HEATING PANEL & LIGHT SHELF
PANEL SUPPLY, RETURN CONNECTION DETAIL
(NOT TO SCALE)



SINGLE CIRCUIT RADIANT HEATING PANEL PIPING DETAIL
(NOT TO SCALE)

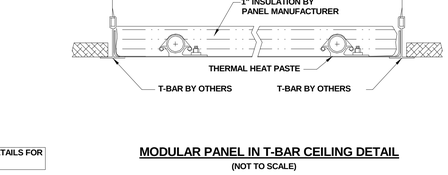


TYPICAL CABINET UNIT HEATER
CEILING TYPE-PIPING DETAIL-HOT WATER
(NOT TO SCALE)

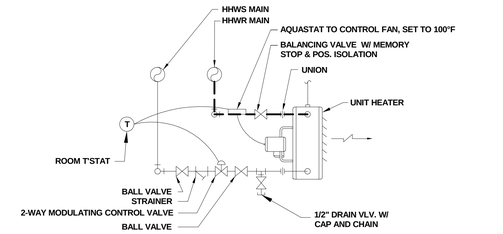


NOTE: REFER TO ARCHITURAL ROOF DETAILS FOR FURTHER REQUIREMENTS.

PIPE / DUCT PENETRATION THROUGH ROOF DETAIL
(NOT TO SCALE)



MODULAR PANEL IN T-BAR CEILING DETAIL
(NOT TO SCALE)



TYPICAL HORIZONTAL UNIT HEATER
PIPING DETAIL-HEATING-HOT WATER
(NOT TO SCALE)

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603.472.4488 FAX 603.472.4477

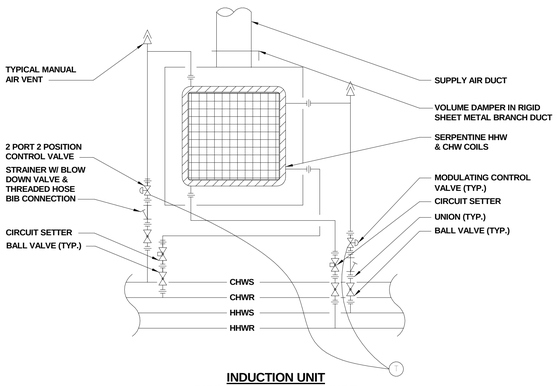
Dover HS / Career Technical Center
Dover, NH
HVAC - DETAILS I

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DRAWING NUMBER
M3.2

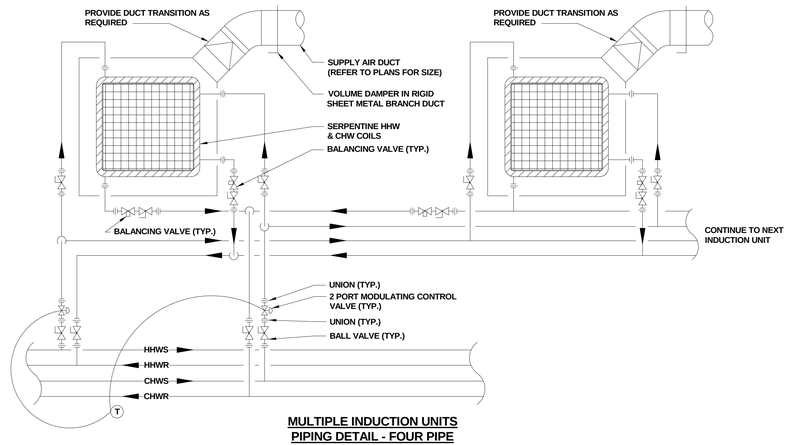
JOB NUMBER 403114

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©COPYRIGHT HMFH ARCHITECTS, INC.



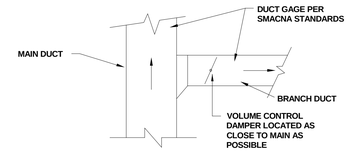
INDUCTION UNIT PIPING DETAIL - FOUR PIPE

(NOT TO SCALE)



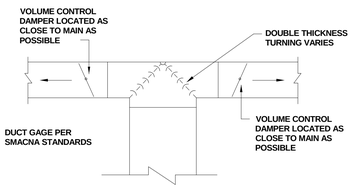
MULTIPLE INDUCTION UNITS PIPING DETAIL - FOUR PIPE

(NOT TO SCALE)



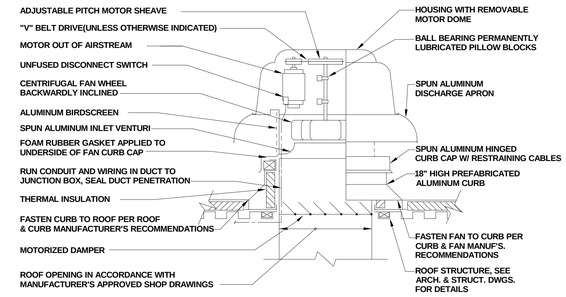
BRANCH DUCT CONNECTION TO MAIN

(NOT TO SCALE)



TYPICAL TEE DUCT CONNECTION

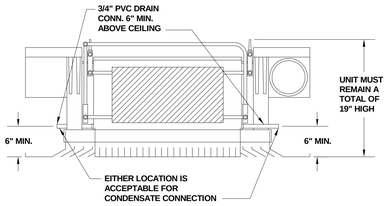
(NOT TO SCALE)



TYPICAL DETAIL-ROOF EXHAUST FAN

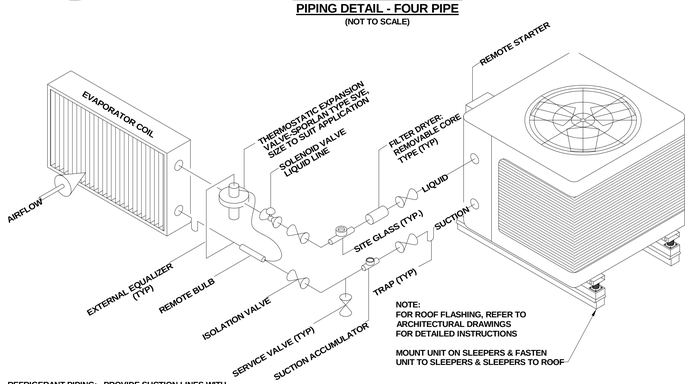
(NOT TO SCALE)

NOTE: REFER TO ARCHITECTURAL ROOF DETAILS FOR FURTHER INFO AND SCOPE RESPONSIBILITY CLARIFICATION



INDUCTION UNIT DRAIN DETAIL

(NOT TO SCALE)

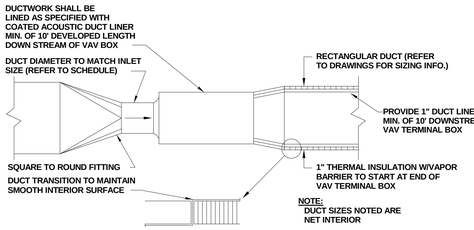


AIR COOLED CONDENSING UNIT REFRIGERANT PIPING DIAGRAM

(NOT TO SCALE)

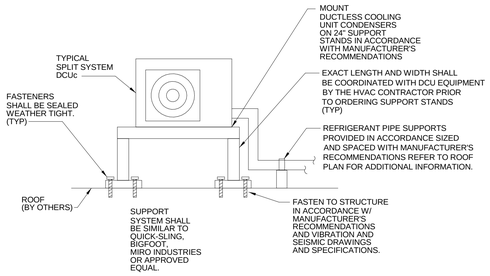
REFRIGERANT PIPING: PROVIDE SUCTION LINES WITH ISOLATION VALVE, SUCTION ACCUMULATOR AND CHARGING CONNECTION. PROVIDE LIQUID LINE WITH SITE GLASS HAVING DOUBLE PORTS WITH CAPS, FILTER DRYER, ISOLATION VALVES AND CHARGING CONNECTION. INSULATE PER SPECIFICATIONS. COVER ALL REFRIGERANT PIPING WITH ULTRA VIOLET PROTECTED PVC COVERING (COLOR= GRAY)

PIPING INDICATED IS FOR SINGLE CIRCUIT; CONTRACTOR SHALL PIPE UNITS WITH MULTIPLE CIRCUITS (AND HOT GAS BYPASS CIRCUIT WHERE SPECIFIED) IN SIMILAR MANNER IN ACCORDANCE WITH MANUFACTURE'S RECOMMENDATIONS AND GUIDELINE REQUIREMENTS.



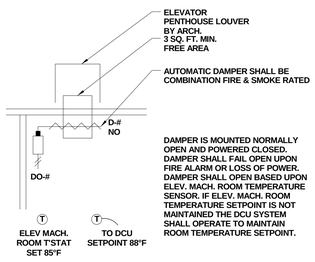
TYPICAL VAV BOX DETAIL

(NOT TO SCALE)



OUTDOOR EQUIPMENT SUPPORT SYSTEM

(NOT TO SCALE)



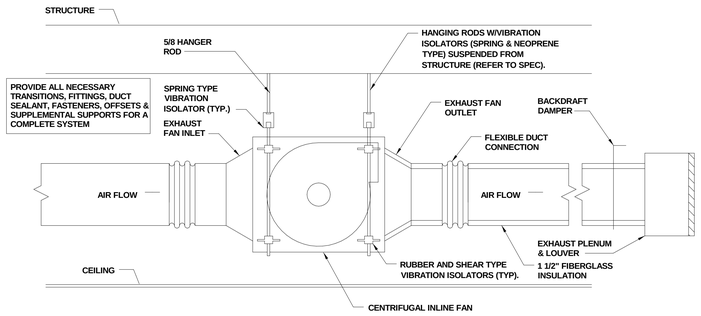
ELEVATOR SHAFT & MACHINE ROOM VENT DETAIL

(NOT TO SCALE)



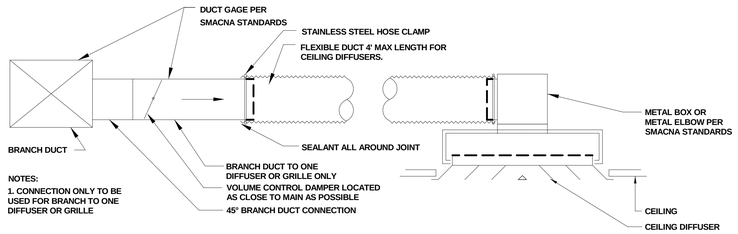
DUCTLESS COOLING UNIT (DCU) DRAIN DETAIL

(NOT TO SCALE)



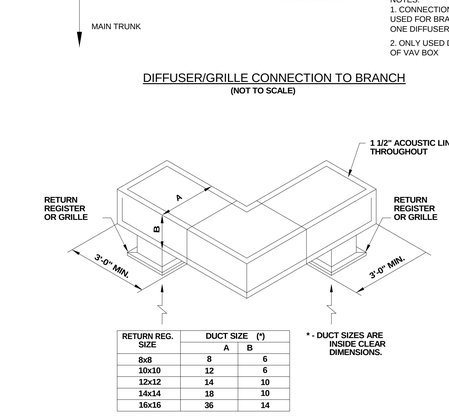
INLINE FAN MOUNTING DETAIL

(NOT TO SCALE)



DIFFUSER/GRILLE CONNECTION TO BRANCH

(NOT TO SCALE)

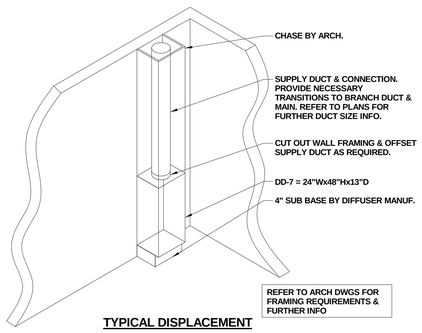


RETURN REG. SIZE	DUCT SIZE (*) A	B
8x8	8	6
10x10	12	6
12x12	14	10
14x14	18	10
16x16	36	14

* - DUCT SIZES ARE INSIDE CLEAR DIMENSIONS.

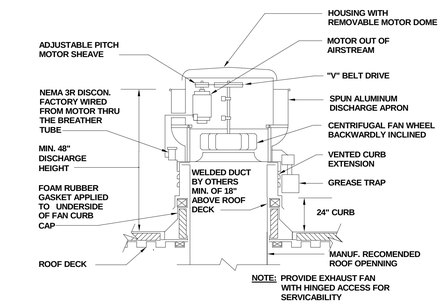
TYPICAL RETURN/TRANSFER DETAIL

(NOT TO SCALE)



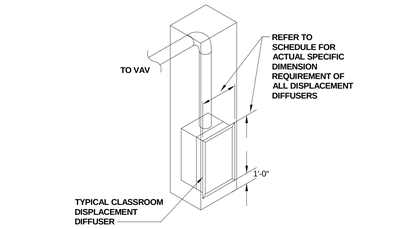
TYPICAL DISPLACEMENT DIFFUSER DETAIL

(NOT TO SCALE)



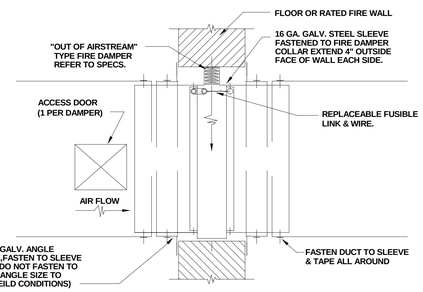
TYPICAL KITCHEN UPBLAST ROOF EXHAUST

(NOT TO SCALE)



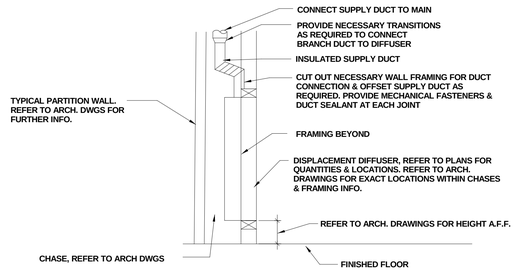
TYPICAL CLASSROOM DISPLACEMENT DIFFUSER DETAIL - TOP CONNECTION

(NOT TO SCALE)



AUTOMATIC FIRE DAMPER

(NOT TO SCALE)



TYPICAL WALL MOUNTED DISPLACEMENT DIFFUSER DETAIL

(NOT TO SCALE)

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HVAC - DETAILS II

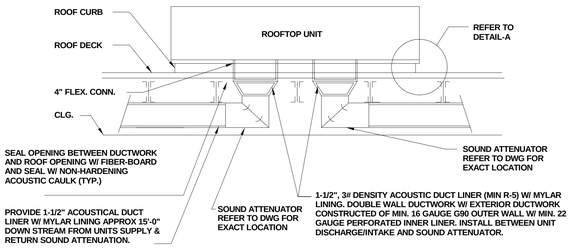
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DRAWING NUMBER
M3.3

JOB NUMBER 403114

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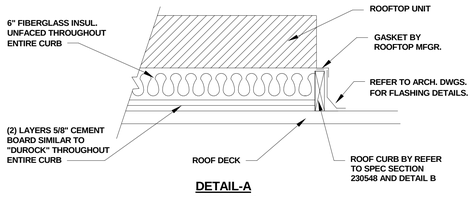
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NOTE: THERMAL DUCT INSULATION TO START AT TERMINATION OF ACOUSTIC INSUL.

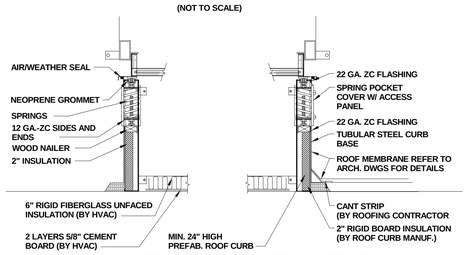
ROOFTOP AND H&V UNIT DETAIL

(NOT TO SCALE)

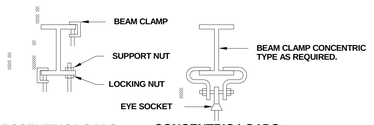


DETAIL-A

(NOT TO SCALE)

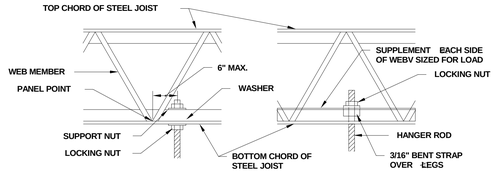


SEISMIC SPRING ROOF CURB DETAIL - DETAIL B



ECCENTRIC LOADS CONCENTRIC LOADS

BEAM ATTACHMENTS



BOTTOM CHORD CONCENTRIC LOAD AT PANEL POINT

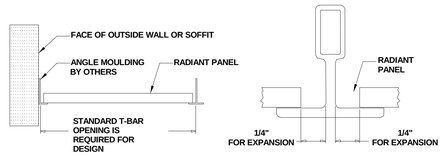
BOTTOM CHORD CONCENTRIC LOAD BETWEEN PANEL POINTS

JOIST ATTACHMENTS

NOTE: THE DETAILS ABOVE INDICATE ALLOWABLE CONNECTIONS TO BUILDING STRUCTURAL STEEL SUPPLEMENTAL STEEL SHALL BE PROVIDED WHERE THE ABOVE CONDITIONS ARE NOT POSSIBLE.

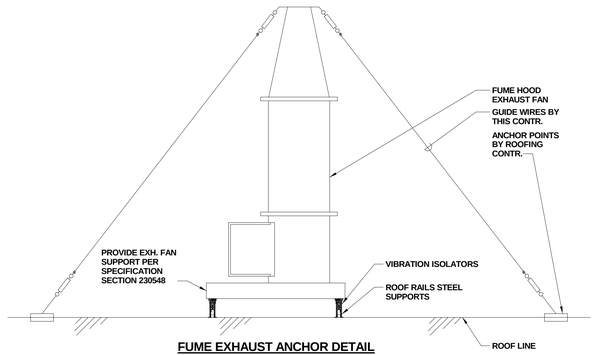
JOIST AND BEAM ATTACHMENTS

(NOT TO SCALE)



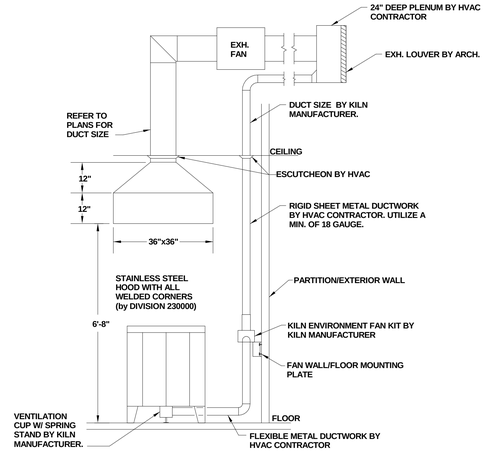
EXPANSION GAP DETAIL

(NOT TO SCALE)



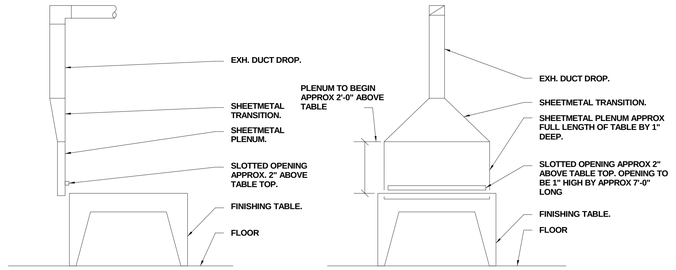
FUME EXHAUST ANCHOR DETAIL

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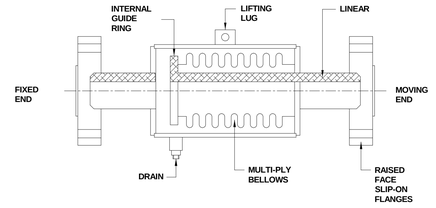
SECTION THRU KILN

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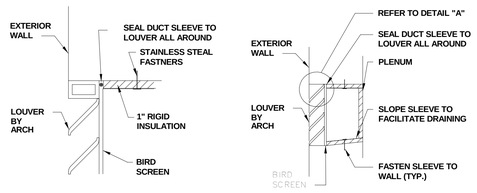
SPECIALTY FUME HOOD DETAIL

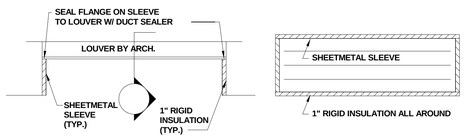
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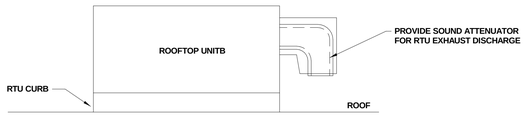
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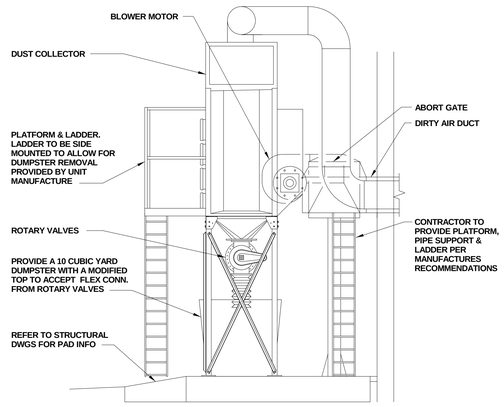
DETAIL OF LOUVER AND SLEEVE

(NOT TO SCALE)



RTU EXHAUST DISCHARGE SOUND ATTENUATOR DETAIL

(NOT TO SCALE)



DUST COLLECTOR DETAIL

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HVAC - DETAILS III

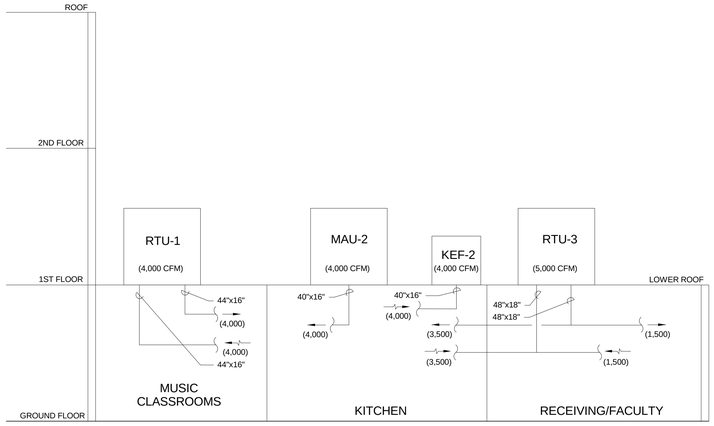
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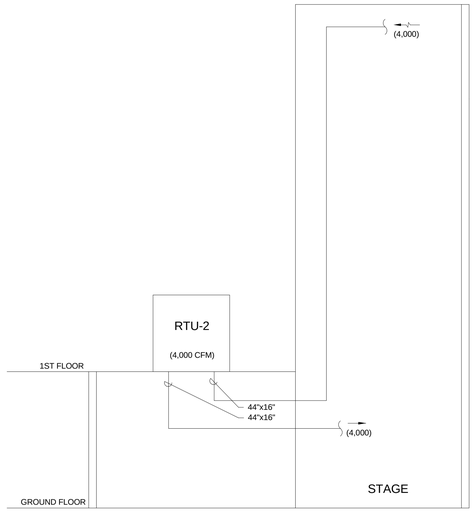
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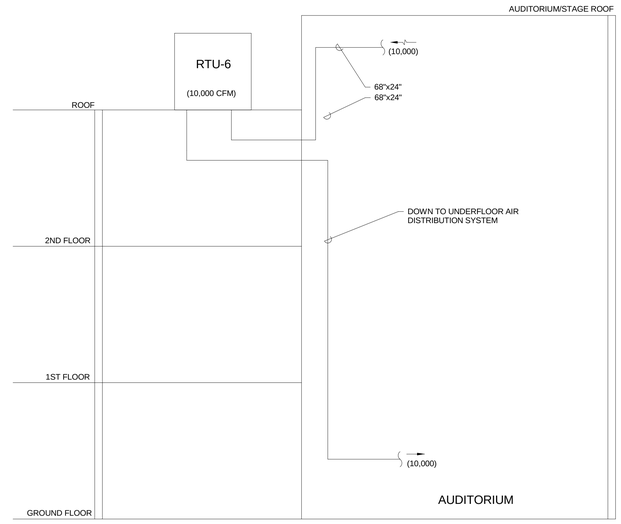
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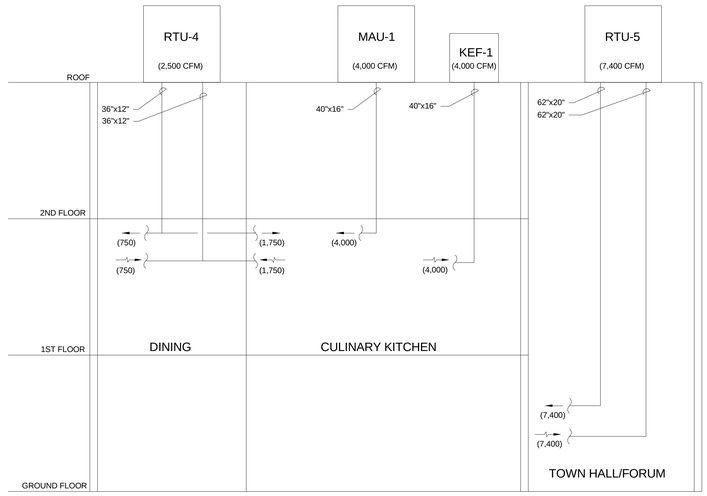
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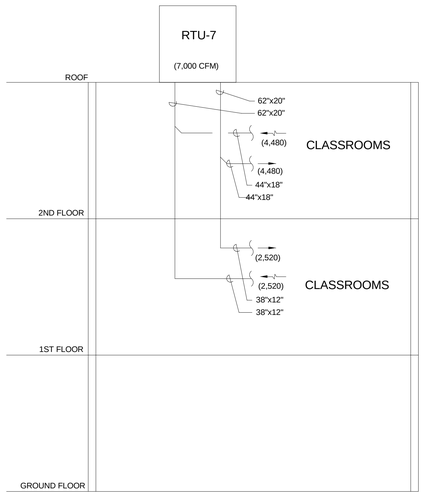
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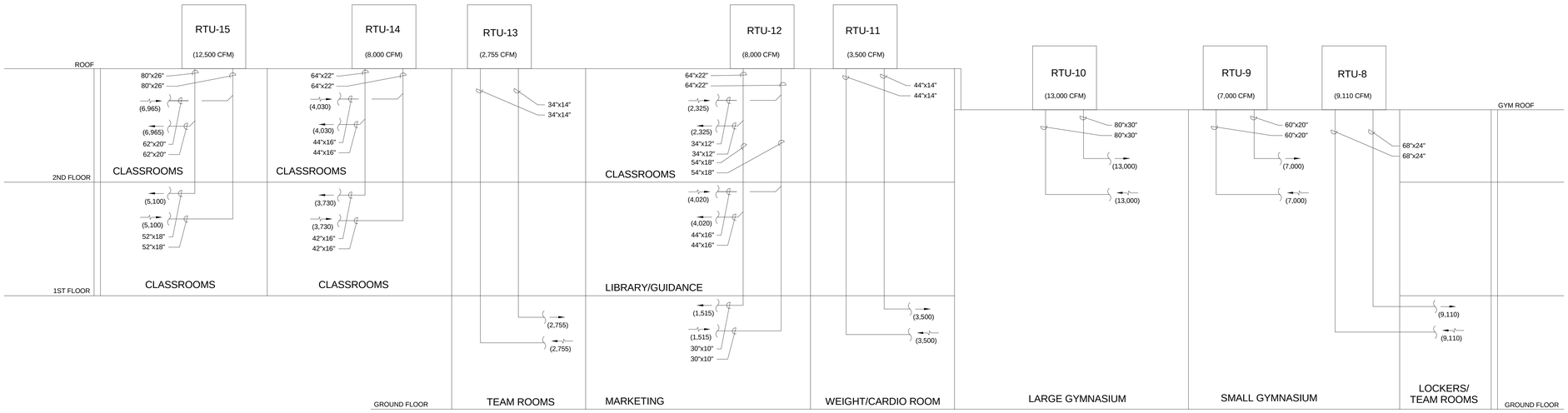












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AHU FLOW DIAGRAMS I

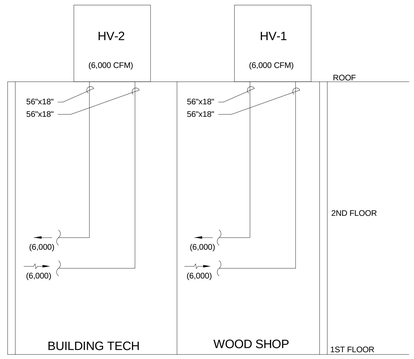
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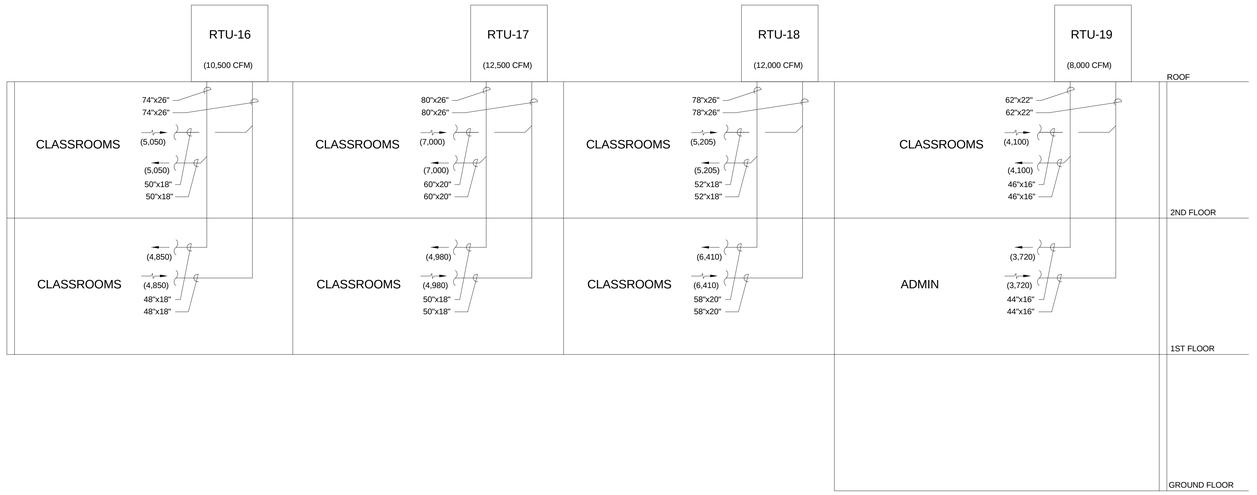
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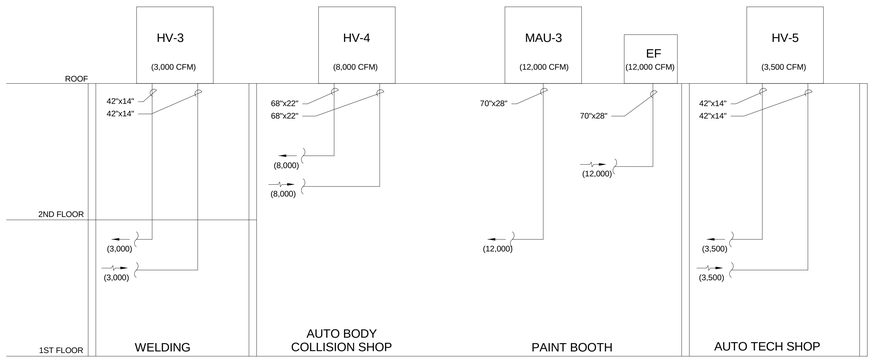
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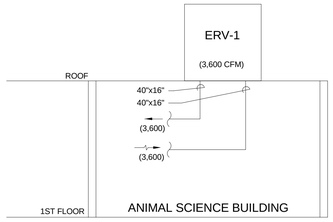
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AHU FLOW DIAGRAMS II

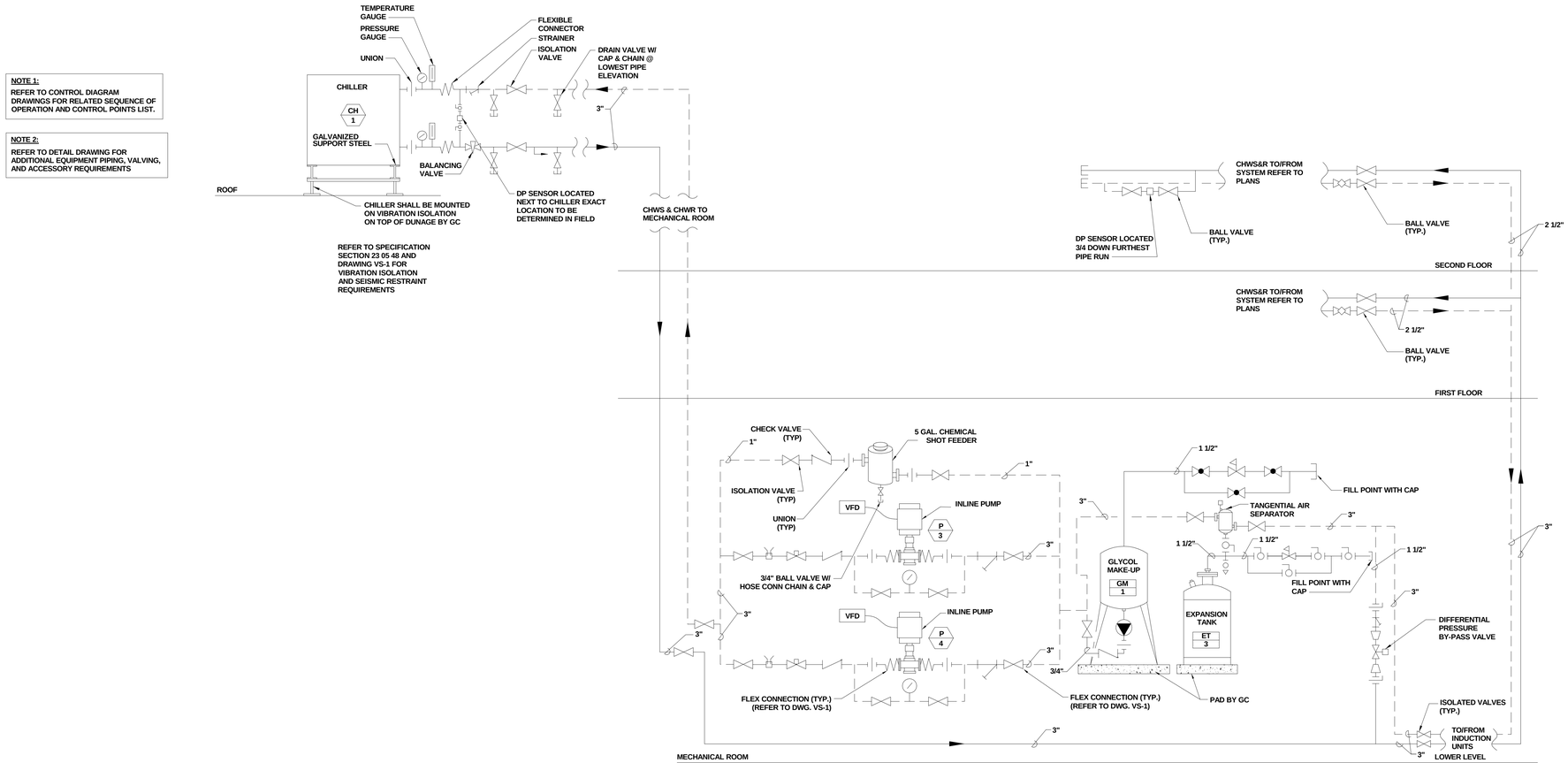
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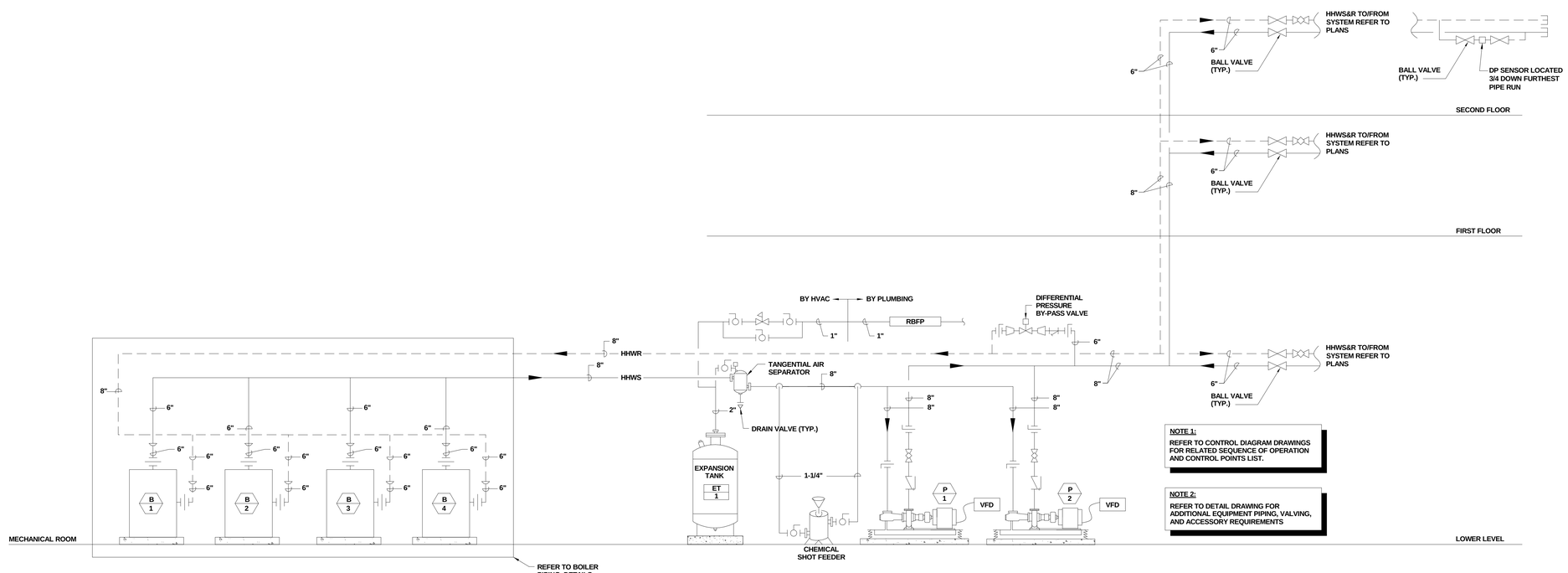
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CHILLED WATER FLOW DIAGRAM

(NOT TO SCALE)



HOT WATER FLOW DIAGRAM

(NOT TO SCALE)

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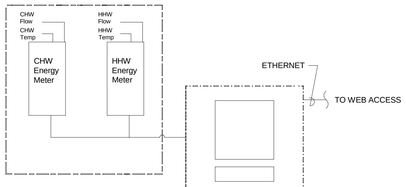
HHW & CHW FLOW DIAGRAMS

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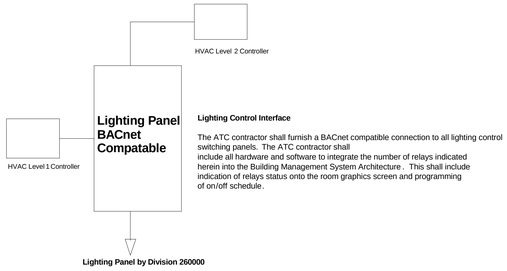
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BMS Interface

Meters and sensors shall be furnished by the ATC Contractor to input energy consumption (Btuh, gpm, temperature,etc.) data to the (BMS) Building Management System for trending energy usage.

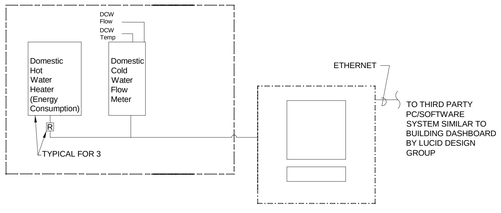


Lighting Control Interface

The ATC contractor shall furnish a BACnet compatible connection to all lighting control switching panels. The ATC contractor shall include all hardware and software to integrate the number of relays indicated herein into the Building Management System Architecture . This shall include indication of relays status onto the room graphics screen and programming of on/off schedule.

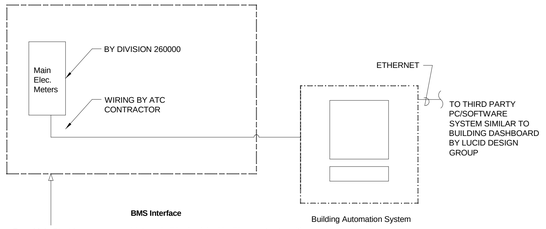
Lighting Panel by Division 260000

Building Management (Automatic Temperature Control) System Network
The light control system shall be capable of panel-to-panel communications over a high speed, hardwired data network. The network shall consist of wiring as required by the manufacturer to the BMS/ATC system for operator control at a single location.



BMS Interface

Meters, sensors, & relays shall be furnished by the ATC contractor to input energy consumption (Btuh, gpm, on/off status) data to the (BMS) Building Management System for trending energy useage. ATC contractor to provide programming required for DHW heater relays to determine energy consumed by on/off status of water heater.

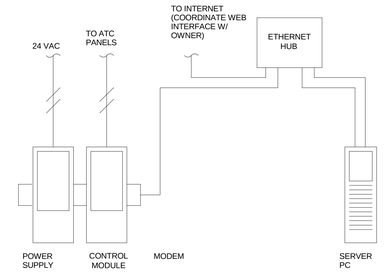


BMS Interface

Meters shall be furnished by Elec. contractor with pulsed output (proportional to kWh consumed) to input electrical consumption data (kWh) to the (BMS) Building Management System for trending energy usage of HVAC systems. programming & wiring from meter to BMS shall be by the atc contractor.

BUILDING ENERGY METERING SYSTEM

CONTROL POINT	AI	AO	DI	DO	ALARM	REMARKS
BTU ENERGY METER	X	X				
ELECTRICAL METER			X			ELEC. METER BY E.C.; PROVIDE POINTS VIA METER



REFER TO SPECIFICATION FOR COMPUTER EQUIPMENT REQUIREMENTS; FIELD COORDINATE LOCATION W/ ARCHITECT/OWNER

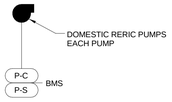


BUILDING ENERGY INFORMATION KIOSK

AN OWNER INFORMATION KIOSK FOR USE BY GENERAL PUBLIC SHALL BE FURNISHED BY ATC. THE WORKSTATION SHALL BE FULLY PASSWORD PROTECTED SO THAT THE INFORMATION ON THIS WORKSTATION SHALL BE MADE AS EASY AS POSSIBLE FOR THE PUBLIC USER AND SHALL FOCUS ON DISPLAYING SYSTEM OPERATIONAL STATUS AND ENERGY CONSUMPTION OF BOILER, AIR HANDLERS AND SYSTEM BTU LOADS. THE SYSTEM SHALL ALSO BE INTERFACED WITH THE LIGHT CONTROL PANEL TO REPORT LIGHTING POWER CONSUMPTION IN BTU, WATTS AND KW OVER TIME. THE OWNERS MAIN WORKSTATION SHALL ALSO REFLECT THIS DATA.



ATC FRONT END INTERFACE DIAGRAM



DOMESTIC RECIRC PUMPS

A DDC CONTROLLER USING ELECTRIC ACTUATION CONTROLS THE DOMESTIC RERIC PUMPS. THE PUMPS SHALL BE ENABLED BASED ON SCHEDULE.

CONTROL POINT	AI	AO	DI	DO	ALARM	REMARKS
START	X			X		
STOP	X			X		
STATUS	X			X		

MISCELLANEOUS CONTROL POINTS

DESCRIPTION		REMARKS
SUMP PUMP ALARM		FROM DRY CONTACT/ COORDINATE W/ DIV. 220000
FREEZER TEMP ALARM		FROM DRY CONTACT/ COORDINATE W/ OWNER
GENERATOR ALARM		COORDINATE W/ DIV. 260000
WEATHER STATION	• OA TEMP (DB/WB) • OA HUMIDITY (% RH) • BAROMETRIC PRESSURE • WIND SPEED	

ABBREVIATIONS

ALM	ALARM
AQ	AQUASTAT
ATC	AUTOMATIC TEMPERATURE CONTROLS
BLDG	BUILDING
BMS	BUILDING MANAGEMENT SYSTEM (ENERGY & AUTOMATION)
COMB	COMBUSTION
CO2	CARBON DIOXIDE
CR	CONTROL RELAY
CS	CURRENT SENSOR
CUV	CABINET UNIT VENTILATOR
D	DAMPER
DA	DISCHARGE AIR
DAS	DISCHARGE AIR SENSOR
DCW	DOMESTIC COLD WATER
DHW	DOMESTIC HOT WATER
DDC	DIRECT DIGITAL CONTROL
DO	DAMPER OPERATOR
DP	DIFFERENTIAL PRESSURE
DPR	DAMPER
EA	EXHAUST AIR
EF	EXHAUST FAN
F	FLOW/FARENHEIT (AS APPLICABLE)
FB	FACE & BYPASS
FD	FIRE DAMPER
H	HUMIDITY
HT	HIGH TEMPERATURE
HTG	HEATING
HR	HEAT RECOVERY
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
LT	LOW TEMPERATURE
M	MOTOR
MAT	MIXED AIR TEMPERATURE
NAC	NETWORK APPLICATION CONTROLLER
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
OA	OUTSIDE AIR
OVR	OVERRIDE
P	PRESSURE
PB	PUSH BUTTON
PNL	PANEL
RA	RETURN AIR
REL	RELIEF AIR
RF	RETURN FAN
RFC	RETURN FAN CONTROLLER
RM	ROOM
SA	SUPPLY AIR
SD	SMOKE DAMPER OR SMOKE DETECTOR
SF	SUPPLY FAN
SFC	SUPPLY FAN CONTROLLER
SP	STATIC PRESSURE
T	TEMPERATURE
TEC	TERMINAL EQUIPMENT CONTROLLER
UV	UNIT VENTILATOR
VAC	VOLTS - ALTERNATING CURRENT
VDC	VOLTS - DIRECT CURRENT
VFD	SEE VSD
VLV	VALVE
VP	VELOCITY PROBE (AIRFLOW)
VSD	VARIABLE SPEED (FREQUENCY) DRIVE
XFMR	TRANSFORMER

ATC/BMS GENERAL NOTES

1. ALL SETPOINTS INDICATED IN THE SEQUENCE OF OPERATIONS SHALL BE ADJUSTABLE.

2. THE CONTROL POINTS LISTED IN THE SUMMARY MATRIX ARE THE MINIMUM CONTROL POINTS REQUIRED. PROVIDE ALL CONTROL POINTS AS REQUIRED FOR COMPLETE SYSTEM CONTROL PER THE SEQUENCE OF OPERATIONS.

3. ALL CONTROL WORK INDICATED ON THE CONTROL DIAGRAMS SHALL BE PROVIDED BY THE ATC CONTRACTOR UNLESS NOTED OTHERWISE.

4. ALL ATC CONTROLS SHALL BE POWERED BY EMERGENCY POWER CIRCUITS COORD W/ DIV 260000

5. ALL HW VALVES SJALL BE FAIL OPEN ON LOSS OF POWER

6. ALL HW RADIATION VALVES SHALL BE MODULATING TYPE FOR GPM > 1 GPM, 2-POSITION ACCEPTABLE FOR RADIATION HW FLOW < 1GPM.

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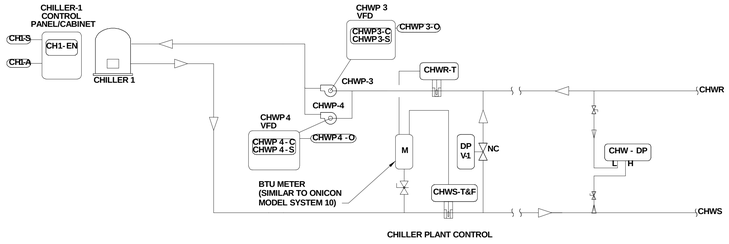
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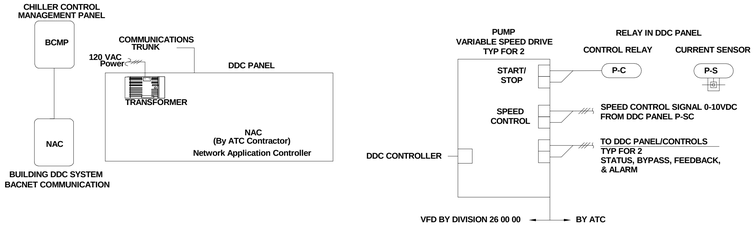
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CHILLER PLANT CONTROL



CHILLER PLANT CONTROL

A DDC CONTROLLER USING ELECTRIC ACTUATION CONTROLS THE CHILLER PUMP AS FOLLOWS:

THROUGH THE CENTRAL AUTOMATIC TEMPERATURE CONTROL SYSTEM AND/OR WHEN THE OUTSIDE TEMPERATURE IS ABOVE 65 DEGREES, THE LEAD PUMP FOR EACH PRIMARY & SECONDARY CHW LOOP SHALL START. IF THE LEAD CHILLED WATER PUMP IN EITHER SYSTEM SHALL FAIL TO START, THE STANDBY PUMP SHALL START IN IT'S PLACE. EACH PUMP SHALL ALSO BE CAPABLE OF DUTY CYCLING WHICH WILL BE AUTOMATICALLY CONTROLLED THROUGH THE DDC SYSTEM. THE DIFFERENTIAL PRESSURE SENSORS LOCATED IN THE SUPPLY AND RETURN PIPING SYSTEMS SHALL MODULATE THE ECM MOTOR TO MAINTAIN A SYSTEM PRESSURE EQUAL TO 2 PSI ABOVE THE SYSTEM PRESSURE SETPOINT. THE CHILLER PLANT SHALL CONTROL BUILDING CHILLED WATER SUPPLY TEMPERATURE. WHEN COMMANDED BY THE BMS DUE TO A COOLING DEMAND, AND THE CHILLED WATER FLOW HAS BEEN PROVEN IN THE SUPPLY WATER SYSTEM, THE CHILLER SHALL START.

RESET SCHEDULE:
AN ADJUSTABLE CHILLED WATER TEMPERATURE WATER RESET SCHEDULE BASED ON OUTDOOR AIR DRYBULB & WETBULB CONDITIONS, THROUGH THE CHILLED WATER SUPPLY SYSTEM, SHALL RESET THE CHILLED WATER SUPPLY TEMPERATURE. THE CHILLER SHALL SUPPLY CHILLED WATER AT A SUPPLY TEMPERATURE OF 45 DEGREES FAHRENHEIT (ADJ.) AT A DESIGN OUTDOOR AIR TEMPERATURE. AS THE OUTDOOR AIR TEMPERATURE DROPS BELOW 75 DEGREES F DB/ 50% RH, THE CHILLER SUPPLY WATER TEMPERATURE WILL BE INCREASED BY THE CHILLER MANAGEMENT CONTROL SYSTEM TO RUN AT A SUPPLY WATER TEMPERATURE OF 55 DEGREES F (ADJ.)

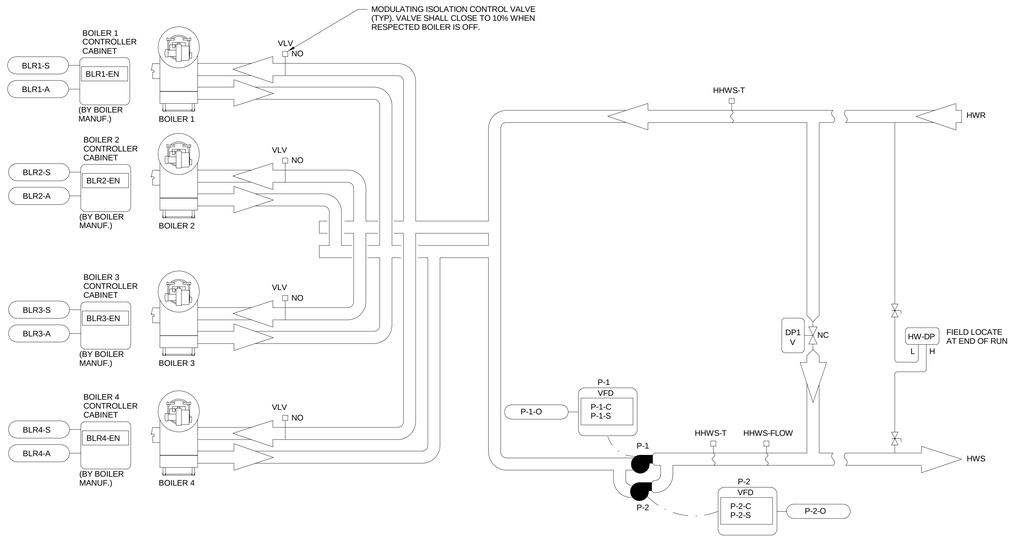
SAFETY:
IF THE CHILLER GOES OFFLINE ON A HIGH OR LOW WATER TEMPERATURE OR FLOW (ADJ.) FAILURE, AN ALARM WILL BE INDICATED BY THE CENTRAL AUTOMATIC CONTROL SYSTEM.

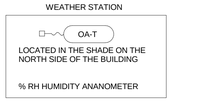
THE DIFFERENTIAL BYPASS VALVE ON THE PRIMARY LOOP SHALL MODULATE OPEN UPON A VFD FAILURE OR AS REQUIRED TO MEET MINIMUM CHILLED WATER FLOW REQUIREMENTS. THE DIFFERENTIAL PRESSURE CONTROL SETPOINTS FOR BOTH LOOPS SHALL BE FIELD DETERMINED BY ATC/TAB CONTRACTOR AND SHALL BE ADJUSTABLE.

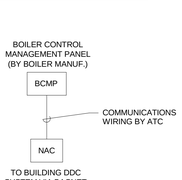
THE THREE WAY VALVE ON THE SECONDARY INDUCTION LOOP SHALL MODULATE TO MAINTAIN A SUPPLY TEMP OF 55 DEGREES F. IN THE EVENT THAT THE SPACE THERMOSTAT SENSES A HIGH RETURN AIR HUMIDITY LEVEL OF 70RH(ADJ.) FOR A PERIOD OF 30 MIN. (ADJ.) , THE DIVERGING VALVE SHALL RESET TO 50 DEGREES F (ADJ.)

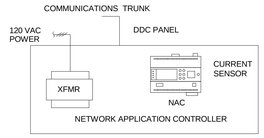
CONTROL POINT	AI	AO	DI	DO	ALARM	SHOW ON GRAPHICS	REMARKS
CHILLER S/S & STATUS			X	X	X	X	
PUMP S/S & STATUS (EACH)			X	X	X	X	
CHWS TEMPERATURE	X	X				X	
CHWR TEMPERATURE	X					X	
CHWS/R FLOW	X				X	X	
VFD/ECM (EACH)	X	X			X	X	
CHW DIFF. PRESS. BYPASS	X	X			X	X	
PUMP SPEED (EACH)	X	X			X	X	
OUTSIDE AIR TEMP. (DB & WB)	X					X	FROM WEATHER STATION
OUTSIDE AIR HUMIDITY (% RH)	X					X	FROM WEATHER STATION
SECONDARY CHWS TEMPERATURE	X	X				X	
SECONDARY CHWR TEMPERATURE	X					X	
SECONDARY CHW DIFF PRESS BYPASS	X	X				X	
SECONDARY THREE WAY MIXING VALVE	X	X			X	X	

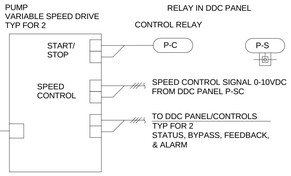
ATC CONTRACTOR TO PROVIDE ALL NECESSARY SENSORS, WIRING, PROGRAMMING, & MAPPING AS REQUIRED TO ACHIEVE SEQUENCE & OBTAIN ALL POINTS INDICATED ABOVE. ATC CONTRACTOR TO COORD. W/ UNIT MANUFACTURER TO PROVIDE SEAMLESS COMMUNICATION BETWEEN UNIT CONTROLS, INPUTS/OUTPUTS TO BMS SYSTEM GRAPHICS, & PROVIDE ALL READABLE/WRITEABLE POINTS.











BOILER PLANT CONTROL

A DDC CONTROLLER USING ELECTRIC ACTUATION CONTROLS THE BOILER PLANT OPERATION AS FOLLOWS:

THROUGH THE CENTRAL AUTOMATIC TEMPERATURE CONTROL SYSTEM, WHEN THE OUTSIDE AIR TEMPERATURE IS BELOW 65 DEGREES, THE PRIMARY HEATING HOT WATER PUMP SHALL START. IF THE PRIMARY PUMP SHALL FAIL TO START, THE STANDBY PUMP SHALL START IN ITS PLACE. EACH PUMP SHALL ALSO BE CAPABLE OF DUTY CYCLING WHICH WILL BE AUTOMATICALLY CONTROLLED THROUGH THE DDC SYSTEM BASED UPON PUMP OPERATION TIME. THE DIFFERENTIAL PRESSURE SENSORS LOCATED IN THE SUPPLY AND RETURN PIPING SYSTEM SHALL MODULATE THE HOT WATER SYSTEM PUMPS FLOW VIA THE VARIABLE FREQUENCY DRIVE TO MAINTAIN A SYSTEM PRESSURE EQUAL TO 2 PSI ABOVE THE DIFFERENTIAL PRESSURE SETPOINT (ADJ.). UPON A PUMP VFD FAILURE, THE SYSTEM DIFFERENTIAL PRESSURE CONTROL VALVE SHALL MODULATE OPEN TO MAINTAIN MINIMUM FLOW THROUGH THE BOILER SYSTEM AND TO MAINTAIN A MINIMUM OF 2 PSI ABOVE THE DIFFERENTIAL PRESSURE SETPOINT. DIFFERENTIAL PRESSURE CONTROL SETPOINTS SHALL BE FIELD DETERMINED BY ATC/TAB CONTRACTORS.

THE BOILER PLANT SHALL ALLOW FOR FOUR BOILERS TO CONTROL BUILDING HEATING HOT WATER SUPPLY TEMPERATURE. EACH BOILER SHALL BE ALLOWED TO RUN AND STAGE AS DETERMINED BY THE BOILER BURNER MANAGEMENT CONTROL SYSTEM (FURNISHED BY ATC CONTRACTOR, COORDINATED WITH BOILER/BURNER MANUFACTURE FOR A COMPLETE AND FUNCTIONAL CONTROL SYSTEM WHILE MAINTAINING ALL REQUIRED POINTS INDICATED ON POINTS LIST) SUBJECT TO THE INDIVIDUAL BOILER SAFETY AND LIMIT CONTROLS. WHEN THE OUTSIDE TEMPERATURE IS BELOW 65 DEGREES AND THE FLOW HAS BEEN PROVEN IN THE SUPPLY WATER SYSTEM, THE LEAD BOILER SHALL START. IF THE LEAD BOILER FAILS TO START, THE SECOND BOILER SHALL START IN ITS PLACE AND AN ALARM SHALL SOUND ON THE BOILER CONTROL PANEL AS WELL AS SEND AN INDICATION TO THE DDC SYSTEM INDICATING FAILURE OF THE LEAD BOILER.

EACH BOILER SHALL BE CAPABLE OF CYCLING WHICH BOILER WILL BE SELECTED AS LEAD, THIS WILL BE AUTOMATICALLY CONTROLLED THROUGH THE BOILER BURNER MANUFACTURER CONTROLLER BASED UPON A DETERMINED SCHEDULE. THE BOILER BURNER MANAGEMENT CONTROL SYSTEM SHALL DETERMINE WHEN EACH BOILER WILL OPERATE AT WHICH FIRING RATE SO THAT THE BOILER PLANT OPERATES AT ITS HIGHEST EFFICIENCY. THE COMBUSTION AIR DAMPER SHALL OPEN PRIOR TO OPERATING EITHER BOILER. WHEN BOTH BOILERS ARE OFF, THE COMBUSTION AIR DAMPER SHALL CLOSE.

RESET SCHEDULE
AN ADJUSTABLE BOILER TEMPERATURE WATER RESET SCHEDULE, THROUGH THE BURNER MANAGEMENT CONTROL SYSTEM, WILL RESET THE HEATING HOT WATER SUPPLY TEMPERATURE TO MAINTAIN A SUPPLY WATER OF 150 DEGREES AT A 7 DEGREE OUTSIDE AIR TEMPERATURE. AS THE OUTSIDE AIR TEMPERATURE RISES, THE BOILER SUPPLY WATER TEMPERATURE WILL BE REDUCED BY THE BURNER MANAGEMENT CONTROL SYSTEM TO RUN AT A SUPPLY WATER TEMPERATURE OF 110 DEGREES AT AN OUTSIDE AIR TEMPERATURE OF 65 DEGREES.

GAS METER
ATC CONTRACTOR SHALL WIRE AND INTEGRATE GAS METER CONSUMPTION DATA (VIA PULSED INPUT OR 4-20 MA SIGNAL). COORDINATE WITH PLUMBING CONTRACTOR FOR TRENDING AND INFORMATIONAL PURPOSES.

HEATING WATER PUMPING OPTIMIZATION
THE POSITION OF THE HEATING WATER VALVES WILL BE MONITORED AND THROUGH THIS FEEDBACK LOOP, HEATING WATER PUMP SPEED AND DIFFERENTIAL PRESSURE WILL BE MODULATED. IF A HEATING WATER VALVE IS 95% OPEN, THEN THE DIFFERENTIAL PRESSURE WILL BE SLOWLY INCREASED. IF A HEATING WATER VALVE IS LESS THAN 90% OPEN, THEN THE DIFFERENTIAL PRESSURE WILL BE SLOWLY REDUCED (ALTERNATE: HOT WATER SUPPLY TEMPERATURE WILL BE REDUCED UNTIL AT LEAST ONE HEATING VALVE IS 90% OPEN)

CONTROL POINT	AI	AO	DI	DO	ALARM	REMARKS
BOILER S/S & STATUS (EACH)			X	X	X	
BOILER ISOLATION/CONTROL VALVE (MODULATING)	X	X				W/ POS. FEEDBACK
PUMP S/S & STATUS (EACH)			X	X	X	W/ POS. FEEDBACK
HHWS TEMPERATURE	X					
HHWR TEMPERATURE	X					
HHW FLOW	X					
OUTSIDE AIR TEMP.	X					
HHW DIFF PRES BYPASS VALVE	X	X			X	W/ POS. FEEDBACK
VFD - EACH PUMP	X		X	X	X	
COMBUSTION AIR SYSTEM			X	X	X	REFER TO DIAGRAM BELOW

ATC CONTRACTOR TO PROVIDE ALL NECESSARY SENSORS, WIRING, PROGRAMMING, & MAPPING AS REQUIRED TO ACHIEVE SEQUENCE & OBTAIN ALL POINTS INDICATED ABOVE. ATC CONTRACTOR TO COORD. W/ UNIT MANUFACTURER TO PROVIDE SEAMLESS COMMUNICATION BETWEEN UNIT CONTROLS, INPUTS/OUTPUTS TO BMS SYSTEM GRAPHICS, & PROVIDE ALL READABLE/WRITEABLE POINTS.

ABBREVIATIONS

ALM	ALARM
AQ	AQUASTAT
ATC	AUTOMATIC TEMPERATURE CONTROLS
BLDG	BUILDING
BMS	BUILDING MANAGEMENT SYSTEM (ENERGY & AUTOMATION)
COMB	COMBUSTION
CO2	CARBON DIOXIDE
CR	CONTROL RELAY
CS	CURRENT SENSOR
CUV	CABINET UNIT VENTILATOR
D	DAMPER
DA	DISCHARGE AIR
DAS	DISCHARGE AIR SENSOR
DCW	DOMESTIC COLD WATER
DHW	DOMESTIC HOT WATER
DDC	DIRECT DIGITAL CONTROL
DO	DAMPER OPERATOR
DP	DIFFERENTIAL PRESSURE
DPR	DAMPER
EA	EXHAUST AIR
EF	EXHAUST FAN
F	FLOW/FARENHEIT (AS APPLICABLE)
FB	FACE & BYPASS
FD	FIRE DAMPER
H	HUMIDITY
HT	HIGH TEMPERATURE
HTG	HEATING
HR	HEAT RECOVERY
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
LT	LOW TEMPERATURE
M	MOTOR
MAT	MIXED AIR TEMPERATURE
NAC	NETWORK APPLICATION CONTROLLER
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
OA	OUTSIDE AIR
OVR	OVERRIDE
P	PRESSURE
PB	PUSH BUTTON
PNL	PANEL
RA	RETURN AIR
REL	RELIEF AIR
RF	RETURN FAN
RFC	RETURN FAN CONTROLLER
RM	ROOM
SA	SUPPLY AIR
SD	SMOKE DAMPER OR SMOKE DETECTOR
SF	SUPPLY FAN
SFC	SUPPLY FAN CONTROLLER
SP	STATIC PRESSURE
T	TEMPERATURE
TEC	TERMINAL EQUIPMENT CONTROLLER
UV	UNIT VENTILATOR
VAC	VOLTS - ALTERNATING CURRENT
VDC	VOLTS - DIRECT CURRENT
VFD	SEE VSD
VLV	VALVE
VP	VELOCITY PROBE (AIRFLOW)
VSD	VARIABLE SPEED (FREQUENCY) DRIVE
XFMR	TRANSFORMER

ATC/BMS GENERAL NOTES

1. ALL SETPOINTS INDICATED IN THE SEQUENCE OF OPERATIONS SHALL BE ADJUSTABLE.

2. THE CONTROL POINTS LISTED IN THE SUMMARY MATRIX ARE THE MINIMUM CONTROL POINTS REQUIRED. PROVIDE ALL CONTROL POINTS AS REQUIRED FOR COMPLETE SYSTEM CONTROL PER THE SEQUENCE OF OPERATIONS.

3. ALL CONTROL WORK INDICATED ON THE CONTROL DIAGRAMS SHALL BE PROVIDED BY THE ATC CONTRACTOR UNLESS NOTED OTHERWISE.

4. ALL ATC CONTROLS SHALL BE POWERED BY EMERGENCY POWER CIRCUITS COORD W/ DIV 260000

5. ALL HW VALVES SJALL BE FAIL OPEN ON LOSS OF POWER

6. ALL HW RADIATION VALVES SHALL BE MODULATING TYPE FOR GPM > 1 GPM, 2-POSITION ACCEPTABLE FOR RADIATION HW FLOW < 1GPM

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100% DESIGN DEVELOPMENT
3-15-2016

Dover HS / Career Technical Center
Dover, NH
HVAC - CONTROLS II

SCALE: 1/8" = 1'-0" DRAWN BY: RLP CHECKED BY: DP

DRAWING NUMBER
M4.1

JOB NUMBER 403114

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100% OUTSIDE AIR DEHUMIDIFICATION DISPLACEMENT VENTILATION UNIT CONTROL SEQUENCE - RTU-1, 4, 7, 14, 15, 16, 17, & 18

THE VARIABLE VOLUME AIR HANDLING UNIT CONSISTS OF A SUPPLY AIR AND EXHAUST AIR SECTION WITH OUTDOOR AIR AND EXHAUST AIR DAMPERS, EXHAUST AIR AND OUTSIDE AIR FILTERS, ENERGY (HEAT) RECOVERY WHEEL, GAS FIRED HEATING, DIRECT EXPANSION COOLING AND SUPPLY AND EXHAUST FANS. THE UNIT SHALL BE DDC CONTROLLED USING ELECTRIC ACTUATION.

THE UNIT IS SCHEDULED FOR AUTOMATIC OPERATION ON A TIME-OF-DAY BASIS FOR OCCUPIED AND UNOCCUPIED MODES.

THE UNIT OPERATES IN OCCUPIED, UNOCCUPIED, WARM-UP AND SAFETY MODES AS FOLLOWS (ALL SUGGESTED SET POINTS AND SETTINGS ARE ADJUSTABLE).

WARM-UP (DURING UNOCCUPIED TIME PERIOD)
THE OUTSIDE AND EXHAUST AIR DAMPERS ARE CLOSED AND THE RE-CIRC AIR DAMPER IS OPEN AND THE DX COOLING & THE ENERGY WHEEL IS OFF. THE SUPPLY AND EXHAUST FANS START, AND THE HEATING SECTION IS ACTIVATED TO ACHIEVE THE DESIRED AVERAGE OCCUPIED SETPOINT OF 70°F (ADJ). THE SYSTEM IS PREVENTED FROM ENTERING THE WARM UP MODE MORE THAN ONCE PER DAY. THE UNIT SHALL UTILIZE OPTIMAL START TO DETERMINE EXACTLY WHEN TO ACTIVATE BASED ON HISTORICAL DATA.

COOL-DOWN
THE OUTSIDE AND EXHAUST AIR DAMPERS CLOSE AND THE GAS FIRED FURNACE & THE ENERGY WHEEL IS OFF. RE-CIRC DAMPER OPENS AND THE SUPPLY AND EXHAUST FANS START, AND COOLING SYSTEM SHALL MODULATE TO ACHIEVE THE DESIRED AVERAGE OCCUPIED SETPOINT OF 78° (ADJ). MORNING COOL-DOWN SHALL OCCUR (1 HR. ADJ.) PRIOR TO UNIT SCHEDULED OCCUPIED START TIME (TIME PERIOD SHALL BE ADJUSTED THRU CONTROLLER'S OPTIMIZED START LOGIC UTILIZING UNIT TREND DATA). ECONOMIZER MODE OF OPERATION SHALL OVER-RIDE NORMAL COOL-DOWN MODE OF OPERATION.

OCCUPIED
THE FANS START OR CONTINUE TO RUN AND THE UNIT IS CONTROLLED AS FOLLOWS:
THE SUPPLY FAN SHALL RUN CONTINUOUSLY. THE OUTSIDE & EXHAUST AIR DAMPERS SHALL OPEN AND THE ENERGY RECOVERY WHEEL WILL ACTIVATE & TRANSFER HEAT TO PREHEAT THE OUTSIDE AIR OR EXTRACT HEAT FROM THE OUTSIDE AIR TO PRECOOL THE SUPPLY AIR WHEN THE OUTSIDE AIR TEMPERATURE IS ABOVE 65°F (ADJ). THE DIRECT EXPANSION COIL CONTROL VALVE SHALL MODULATE TO DEHUMIDIFY THE INCOMING AIR TO 50°F (ADJ.). AFTER THE AIR IS DEHUMIDIFIED IT WILL PASS OVER THE HOT GAS REHEAT COIL TO RAISE THE DISCHARGE AIR TEMPERATURE TO THE SUMMER SET POINT CONDITION OF 63°F (ADJ). WHEN THE OUTSIDE AIR IS BELOW 65° (ADJ). THE GAS FURNACE SHALL MODULATE, AS REQUIRED TO PROVIDE HEAT TO THE SUPPLY AIR STREAM TO MAINTAIN THE WINTER DISCHARGE AIR SET POINT OF 68°F (ADJ.).

THE ENERGY WHEEL, HEATING SECTION & DX COOLING SHALL MODULATE IN SEQUENCE WITHOUT OVERLAP TO MAINTAIN THE SUPPLY AIR TEMPERATURE SETPOINT.

WHEEL DEFROST CYCLE
IF THE WHEEL DIFFERENTIAL PRESSURE RISES 1 INCH (ADJ.) ABOVE ITS STANDARD PRESSURE DROP AND THE OUTSIDE AIR TEMPERATURE IS BELOW 30°F, THE WHEEL SPEED SHALL BE REDUCED VIA WHEEL VARIABLE FREQUENCY DRIVE, OR THE ENERGY RECOVERY WHEEL FACE & BYPASS DAMPERS SHALL MODULATE OPEN TO BYPASS THE WHEEL UNTIL THE PRESSURE RETURNS TO NORMAL. WHEEL DEFROST CONTROL SEQUENCE SHALL BE CHOSEN PER MANUFACTURER'S RECOMMENDATIONS.

UNOCCUPIED (AS DETERMINED BY BMS TIMECLOCK)
THE UNIT SUPPLY AND EXHAUST FANS & ENERGY RECOVERY WHEEL SHALL BE OFF & THE EXHAUST & OUTSIDE AIR DAMPERS SHALL BE CLOSED. IN THE EVENT THAT MORE THAN 30% (ADJ.) OF THE CLASSROOM HUMIDITY LEVEL RISES ABOVE 70% (ADJ.) OR MORE THAN 30% (ADJ.) OF THE CLASSROOMS TEMPERATURES RISE ABOVE 85°F (ADJ.) THE UNIT SHALL REVERT TO COOL-DOWN MODE UNTIL SPACE HUMIDITY AND TEMPERATURE SETPOINT ARE MAINTAINED FOR 30 MINUTES. (ADJ.). DURING THE HEATING SEASON THE RADIANT PANELS WITHIN THE SPACES SHALL MAINTAIN NIGHT SETBACK TEMPERATURES. IF SPACE TEMPERATURES BEGIN TO DROP BELOW THE UNOCCUPIED SETPOINT OF 60°F (ADJ.) THE RTU SHALL BE ACTIVATED AND OPERATE IN WARM-UP MODE UNTIL SPACE TEMPERATURES REACH THEIR UNOCCUPIED SETPOINT FOR A TIME PERIOD OF 30 MIN (ADJ).

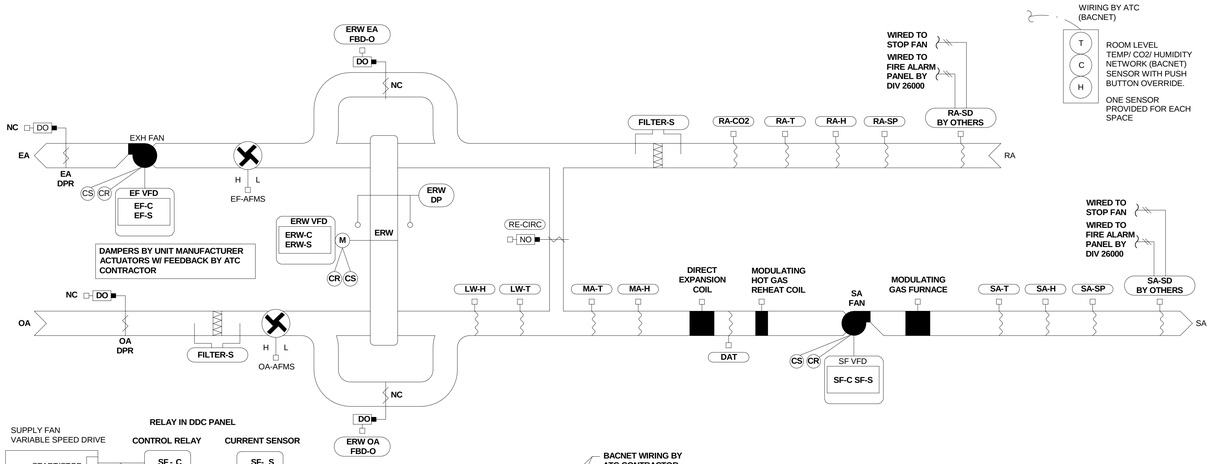
SAFETY
SMOKE DETECTOR IN SUPPLY & RETURN AIR STREAMS (AS INDICATED) DE-ENERGIZES THE SUPPLY AND RETURN FAN UPON ACTIVATION. THE HEATING SECTION IS OFF. ALL OTHER DAMPERS AND VALVES POSITION TO THEIR NORMAL UNIT OFF POSITION AFTER THE FANS ARE DE-ENERGIZED.

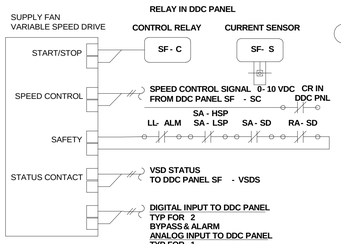
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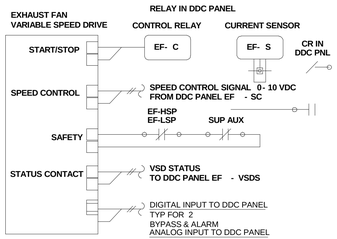
ECONOMIZER MODE
THE UNIT SHALL BE EQUIPPED WITH A COMPARATIVE ENTHALPY ECONOMIZER MODE OF OPERATION. DURING ECONOMIZER MODE OF OPERATION, THE ENERGY RECOVERY WHEEL BYPASS DAMPERS SHALL OPEN OR THE WHEEL ROTATION SHALL STOP AND MECHANICAL COOLING AND GAS-FIRED HEATING SHALL BE DE-ENERGIZED. ECONOMIZER MODE OF OPERATION SHALL OVER-RIDE NORMAL MORNING COOL-DOWN AND UNOCCUPIED RE-CIRC MODE OF OPERATION.

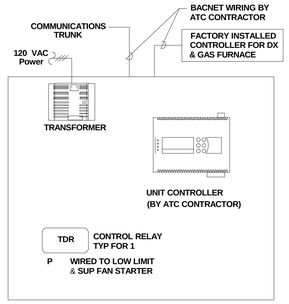
LOW LEAVING TEMPERATURE
UPON A LOW LEAVING TEMPERATURE CONDITION (38°F ADJ.) FOR A PERIOD OF 10 MIN, SENSED BY THE SA-T SENSOR, THE OUTSIDE AIR AND EXHAUST AIR DAMPERS SHALL CLOSE, AND THE SUPPLY AND EXHAUST AIR FANS SHALL SHUT DOWN AND AN ALARM SHALL BE GENERATED.

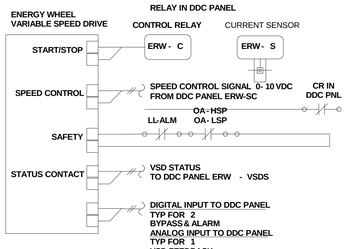
CO2 CONTROL
IF THE SPACE CO2 LEVELS VARY BY 10% OR MORE FROM THE DESIGN VALUE (900 PPM, ADJ.), AN ALARM SHALL GENERATE THE BMS TO ALERT THE BUILDING OPERATOR.











FULL AIR CONDITIONING DISPLACEMENT VENTILATION UNIT CONTROL SEQUENCE - RTU-2, 5, 6, 9, 10

THE VARIABLE VOLUME AIR HANDLING UNIT CONSISTS OF A SUPPLY AIR AND EXHAUST AIR SECTION WITH OUTDOOR AIR AND EXHAUST AIR DAMPERS, EXHAUST AIR AND OUTSIDE AIR FILTERS, ENERGY (HEAT) RECOVERY WHEEL, GAS FIRED HEATING, DIRECT EXPANSION COOLING AND SUPPLY AND EXHAUST FANS. THE UNIT SHALL BE DDC CONTROLLED USING ELECTRIC ACTUATION.

THE UNIT IS SCHEDULED FOR AUTOMATIC OPERATION ON A TIME-OF-DAY BASIS FOR OCCUPIED AND UNOCCUPIED MODES.

THE UNIT OPERATES IN OCCUPIED, UNOCCUPIED, WARM-UP AND SAFETY MODES AS FOLLOWS (ALL SUGGESTED SET POINTS AND SETTINGS ARE ADJUSTABLE).

WARM-UP (DURING UNOCCUPIED TIME PERIOD)
THE OUTSIDE AND EXHAUST AIR DAMPERS ARE CLOSED AND THE RE-CIRC AIR DAMPER IS OPEN AND THE DX COOLING & THE ENERGY WHEEL IS OFF. THE SUPPLY AND EXHAUST FANS START, AND THE HEATING SECTION IS ACTIVATED TO ACHIEVE THE DESIRED AVERAGE OCCUPIED SETPOINT OF 70°F (ADJ). THE SYSTEM IS PREVENTED FROM ENTERING THE WARM UP MODE MORE THAN ONCE PER DAY. THE UNIT SHALL UTILIZE OPTIMAL START TO DETERMINE EXACTLY WHEN TO ACTIVATE BASED ON HISTORICAL DATA.

COOL-DOWN
THE OUTSIDE AND EXHAUST AIR DAMPERS CLOSE AND THE GAS FIRED FURNACE & THE ENERGY WHEEL IS OFF. RE-CIRC DAMPER OPENS AND THE SUPPLY AND EXHAUST FANS START, AND COOLING SYSTEM SHALL MODULATE TO ACHIEVE THE DESIRED AVERAGE OCCUPIED SETPOINT OF 75° (ADJ). MORNING COOL-DOWN SHALL OCCUR (1 HR. ADJ.) PRIOR TO UNIT SCHEDULED OCCUPIED START TIME (TIME PERIOD SHALL BE ADJUSTED THRU CONTROLLER'S OPTIMIZED START LOGIC UTILIZING UNIT TREND DATA). ECONOMIZER MODE OF OPERATION SHALL OVER-RIDE NORMAL COOL-DOWN MODE OF OPERATION.

OCCUPIED
THE FANS START OR CONTINUE TO RUN AND THE UNIT IS CONTROLLED AS FOLLOWS:
THE SUPPLY FAN SHALL RUN CONTINUOUSLY. THE OUTSIDE & EXHAUST AIR DAMPERS SHALL OPEN AND THE ENERGY RECOVERY WHEEL WILL ACTIVATE & TRANSFER HEAT TO PREHEAT THE OUTSIDE AIR OR EXTRACT HEAT FROM THE OUTSIDE AIR TO PRECOOL THE SUPPLY AIR WHEN THE OUTSIDE AIR TEMPERATURE IS ABOVE 65°F (ADJ). THE DIRECT EXPANSION COIL CONTROL VALVE SHALL MODULATE TO DEHUMIDIFY THE INCOMING AIR TO 50°F (ADJ.). AFTER THE AIR IS DEHUMIDIFIED IT WILL PASS OVER THE HOT GAS REHEAT COIL TO RAISE THE DISCHARGE AIR TEMPERATURE TO THE SUMMER SET POINT CONDITION OF 63°F (ADJ). WHEN THE OUTSIDE AIR IS BELOW 65° (ADJ). THE GAS FURNACE SHALL MODULATE, AS REQUIRED TO PROVIDE HEAT TO THE SUPPLY AIR STREAM TO MAINTAIN THE WINTER DISCHARGE AIR SET POINT OF 68°F (ADJ.).

THE ENERGY WHEEL, HEATING SECTION & DX COOLING SHALL MODULATE IN SEQUENCE WITHOUT OVERLAP TO MAINTAIN THE SUPPLY AIR TEMPERATURE SETPOINT.

WHEEL DEFROST CYCLE
IF THE WHEEL DIFFERENTIAL PRESSURE RISES 1 INCH (ADJ.) ABOVE ITS STANDARD PRESSURE DROP AND THE OUTSIDE AIR TEMPERATURE IS BELOW 30°F, THE WHEEL SPEED SHALL BE REDUCED VIA WHEEL VARIABLE FREQUENCY DRIVE, OR THE ENERGY RECOVERY WHEEL FACE & BYPASS DAMPERS SHALL MODULATE OPEN TO BYPASS THE WHEEL UNTIL THE PRESSURE RETURNS TO NORMAL. WHEEL DEFROST CONTROL SEQUENCE SHALL BE CHOSEN PER MANUFACTURER'S RECOMMENDATIONS.

UNOCCUPIED (AS DETERMINED BY BMS TIMECLOCK)
THE UNIT SUPPLY AND EXHAUST FANS & ENERGY RECOVERY WHEEL SHALL BE OFF & THE EXHAUST & OUTSIDE AIR DAMPERS SHALL BE CLOSED. IN THE EVENT THAT MORE THAN 30% (ADJ.) OF THE CLASSROOM HUMIDITY LEVEL RISES ABOVE 70% (ADJ.) OR MORE THAN 30% (ADJ.) OF THE CLASSROOMS TEMPERATURES RISE ABOVE 85°F (ADJ.) THE UNIT SHALL REVERT TO COOL-DOWN MODE UNTIL SPACE HUMIDITY AND TEMPERATURE SETPOINT ARE MAINTAINED FOR 30 MINUTES. (ADJ.). DURING THE HEATING SEASON THE RADIANT PANELS WITHIN THE SPACES SHALL MAINTAIN NIGHT SETBACK TEMPERATURES. IF SPACE TEMPERATURES BEGIN TO DROP BELOW THE UNOCCUPIED SETPOINT OF 60°F (ADJ.) THE RTU SHALL BE ACTIVATED AND OPERATE IN WARM-UP MODE UNTIL SPACE TEMPERATURES REACH THEIR UNOCCUPIED SETPOINT FOR A TIME PERIOD OF 30 MIN (ADJ).

SAFETY
SMOKE DETECTOR IN SUPPLY & RETURN AIR STREAMS (AS INDICATED) DE-ENERGIZES THE SUPPLY AND RETURN FAN UPON ACTIVATION. THE HEATING SECTION IS OFF. ALL OTHER DAMPERS AND VALVES POSITION TO THEIR NORMAL UNIT OFF POSITION AFTER THE FANS ARE DE-ENERGIZED.

CURRENT SWITCHES ARE INSTALLED IN THE SUPPLY AND RETURN FAN STARTERS. THE DDC SYSTEM USES THESE SWITCHES TO CONFIRM THE FANS ARE IN THE DESIRED STATE (I.E. ON OR OFF) AND GENERATES AN ALARM IF STATUS DEVIATES FROM DDC START / STOP CONTROL..

ECONOMIZER MODE
THE UNIT SHALL BE EQUIPPED WITH A COMPARATIVE ENTHALPY ECONOMIZER MODE OF OPERATION. DURING ECONOMIZER MODE OF OPERATION, THE ENERGY RECOVERY WHEEL BYPASS DAMPERS SHALL OPEN OR THE WHEEL ROTATION SHALL STOP AND MECHANICAL COOLING AND GAS-FIRED HEATING SHALL BE DE-ENERGIZED. ECONOMIZER MODE OF OPERATION SHALL OVER-RIDE NORMAL MORNING COOL-DOWN AND UNOCCUPIED RE-CIRC MODE OF OPERATION.

LOW LEAVING TEMPERATURE
UPON A LOW LEAVING TEMPERATURE CONDITION (38°F ADJ.) FOR A PERIOD OF 10 MIN, SENSED BY THE SA-T SENSOR, THE OUTSIDE AIR AND EXHAUST AIR DAMPERS SHALL CLOSE, AND THE SUPPLY AND EXHAUST AIR FANS SHALL SHUT DOWN AND AN ALARM SHALL BE GENERATED.

CO2 CONTROL
IF THE SPACE CO2 LEVELS VARY BY 10% OR MORE FROM THE DESIGN VALUE (900 PPM, ADJ.), AN ALARM SHALL GENERATE THE BMS TO ALERT THE BUILDING OPERATOR.

CONTROL POINT	AI	AO	DI	DO	ALARM	REMARKS
SUPPLY FAN S/S & STATUS		X	X	X	X	
SUPPLY FAN VFD	X	X			X	
RETURN AIR TEMP.	X				X	
RETURN AIR %RH	X				X	
RC/EA/OA DAMPER POS. (EACH)	X	X			X	**W/ POSITION AND FEED BACK**
FILTER STATUS OA/EA			X		X	
SUPPLY S.P.	X				X	
RETURN FAN S/S & STATUS		X	X	X	X	
RETURN FAN VFD	X	X			X	
RETURN S.P.	X				X	
SUPPLY AIR TEMP.	X	X				
SUPPLY AIR HUMIDITY %RH	X	X				
AIRFLOW CFM (OA & EA)	X				X	
MIXED AIR TEMP.	X					
MIXED AIR HUMIDITY %RH	X					
ENERGY RECOVERY WHEEL S/S & STATUS		X	X	X	X	
ENERGY RECOVERY WHEEL VFD	X	X			X	
ENERGY RECOVERY WHEEL BYPASS DAMPER (AS EQUIPPED)			X	X	X	
DISCHARGE AIR TEMP	X	X			X	
ENERGY RECOVERY WHEEL ΔP	X				X	
COOLING CAPACITY CONTROL	X	X			X	
HOT GAS REHEAT CAPACITY CONTROL	X	X			X	
GAS HEATING CONTROL	X	X			X	
OUTSIDE AIR TEMP.	X					**FROM WEATHER STATION**
OUTSIDE AIR %RH	X					**FROM WEATHER STATION**
SMOKE DETECTORS - SA & RA			X	X	X	
RA DUCT CO2 LEVEL	X				X	**MONITORING ONLY**
LEAVING WHEEL AIR TEMP.	X					
LEAVING WHEEL AIR %RH	X					
EACH SPACE CO2	X				X	**ALARM IF LEVEL IS +10% 900 PPM**
EACH SPACE HUMIDITY	X				X	
EACH SPACE TEMPERATURE	X				X	

ATC CONTRACTOR TO PROVIDE ALL NECESSARY SENSORS, WIRING, PROGRAMMING, & MAPPING AS REQUIRED TO ACHIEVE SEQUENCE & OBTAIN ALL POINTS INDICATED ABOVE. ATC CONTRACTOR TO COORD. W/ UNIT MANUFACTURER TO PROVIDE SEAMLESS COMMUNICATION BETWEEN UNIT CONTROLS, INPUTS/OUTPUTS TO BMS SYSTEM GRAPHICS, & PROVIDE ALL READABLE/WRITEABLE POINTS.

ABBREVIATIONS

ALM	ALARM
AQ	AQUASTAT
ATC	AUTOMATIC TEMPERATURE CONTROLS
BLDG	BUILDING
BMS	BUILDING MANAGEMENT SYSTEM (ENERGY & AUTOMATION)
COMB	COMBUSTION
CO2	CARBON DIOXIDE
CR	CONTROL RELAY
CS	CURRENT SENSOR
CUV	CABINET UNIT VENTILATOR
D	DAMPER
DA	DISCHARGE AIR
DAS	DISCHARGE AIR SENSOR
DCW	DOMESTIC COLD WATER
DHW	DOMESTIC HOT WATER
DDC	DIRECT DIGITAL CONTROL
DO	DAMPER OPERATOR
DP	DIFFERENTIAL PRESSURE
DPR	DAMPER
EA	EXHAUST AIR
EF	EXHAUST FAN
F	FLOW/FARENHEIT (AS APPLICABLE)
FB	FACE & BYPASS
FD	FIRE DAMPER
H	HUMIDITY
HT	HIGH TEMPERATURE
HTG	HEATING
HR	HEAT RECOVERY
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
LT	LOW TEMPERATURE
M	MOTOR
MAT	MIXED AIR TEMPERATURE
NAC	NETWORK APPLICATION CONTROLLER
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
OA	OUTSIDE AIR
OVR	OVERRIDE
P	PRESSURE
PB	PUSH BUTTON
PNL	PANEL
RA	RETURN AIR
REL	RELIEF AIR
RF	RETURN FAN
RFC	RETURN FAN CONTROLLER
RM	ROOM
SA	SUPPLY AIR
SD	SMOKE DAMPER OR SMOKE DETECTOR
SF	SUPPLY FAN
SFC	SUPPLY FAN CONTROLLER
SP	STATIC PRESSURE
T	TEMPERATURE
TEC	TERMINAL EQUIPMENT CONTROLLER
UV	UNIT VENTILATOR
VAC	VOLTS - ALTERNATING CURRENT
VDC	VOLTS - DIRECT CURRENT
VFD	SEE VSD
VLV	VALVE
VP	VELOCITY PROBE (AIRFLOW)
VSD	VARIABLE SPEED (FREQUENCY) DRIVE
XFMR	TRANSFORMER

ATC/BMS GENERAL NOTES

1. ALL SETPOINTS INDICATED IN THE SEQUENCE OF OPERATIONS SHALL BE ADJUSTABLE.

2. THE CONTROL POINTS LISTED IN THE SUMMARY MATRIX ARE THE MINIMUM CONTROL POINTS REQUIRED. PROVIDE ALL CONTROL POINTS AS REQUIRED FOR COMPLETE SYSTEM CONTROL PER THE SEQUENCE OF OPERATIONS.

3. ALL CONTROL WORK INDICATED ON THE CONTROL DIAGRAMS SHALL BE PROVIDED BY THE ATC CONTRACTOR UNLESS NOTED OTHERWISE.

4. ALL ATC CONTROLS SHALL BE POWERED BY EMERGENCY POWER CIRCUITS COORD W/ DIV 260000

5. ALL HW VALVES SJALL BE FAIL OPEN ON LOSS OF POWER

6. ALL HW RADIATION VALVES SHALL BE MODULATING TYPE FOR GPM > 1 GPM, 2-POSITION ACCEPTABLE FOR RADIATION HW FLOW < 1GPM

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HVAC - CONTROLS III

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DRAWING NUMBER
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100% OUTSIDE AIR DEHUMIDIFICATION VENTILATION UNIT CONTROL SEQUENCE - RTU-3, 8, & 13

THE VARIABLE VOLUME AIR HANDLING UNIT CONSISTS OF A SUPPLY AIR AND EXHAUST AIR FAN WITH VFD, OUTDOOR, RETURN AND EXHAUST AIR DAMPERS, RETURN AND OUTSIDE AIR FILTERS, ENERGY RECOVERY WHEEL WITH VFD & MODULATING GAS FURNACE. THE UNIT SHALL BE DDC CONTROLLED USING ELECTRIC ACTUATION.

THE UNIT IS SCHEDULE FOR AUTOMATIC OPERATION ON A TIME OF DAY BASIS FOR OCCUPIED AND UNOCCUPIED MODES. COORDINATE WITH OWNER & OWNER'S PROJECT REQUIREMENTS FOR BUILDING OCCUPIED/UNOCCUPIED SCHEDULES.

THE UNIT OPERATES IN OCCUPIED, UNOCCUPIED, WARM-UP, COOL-DOWN AND SAFETY MODES AS FOLLOWS (ALL SUGGESTED SET POINTS AND SETTINGS ARE ADJUSTABLE)

1. WARM-UP: THE OUTSIDE AND EXHAUST AIR DAMPERS CLOSE AND THE RE-CIRC DAMPER OPENS. THE ENERGY RECOVERY WHEEL IS OFF. THE SUPPLY FAN IS ACTIVATED WHILE THE EXHAUST FAN REMAINS OFF. THE DX COOLING SHALL BE DISABLED. THE GAS FURNACE MODULATES TO 100% FOR RAPID RISE IN SPACE TEMPERATURE TO MEET THE OCCUPIED SPACE SETPOINT OF 70 DEGREES (ADJ). MORNING WARM UP SHALL OCCUR (1HR ADJ) PRIOR TO UNIT SCHEDULED OCCUPIED TIME (TIME PERIOD SHALL BE ADJUSTED THRU THE CONTROLLERS OPTIMIZED LOGIC SOFTWARE UTILIZING UNIT TREND DATA).

2. COOL-DOWN : THE OUTSIDE AND EXHAUST AIR DAMPERS CLOSE AND THE RE-CIRC DAMPER OPENS. THE ENERGY RECOVERY WHEEL IS OFF. THE SUPPLY FAN IS ACTIVATED WHILE THE EXHAUST FAN REMAINS OFF. THE GAS FIRED FURNACE SHALL BE DISABLED. THE DX COOLING COIL MODULATES TO MAINTAIN A SUPPLY AIR TEMP OF 55°F FOR A RAPID DECREASE IN SPACE TEMPERATURE TO MEET THE OCCUPIED SPACE SETPOINT OF 78°F (ADJ). MORNING COOL-DOWN SHALL OCCUR (1 HR. ADJ.) PRIOR TO UNIT SCHEDULED OCCUPIED START TIME (TIME PERIOD SHALL BE ADJUSTED THRU THE CONTROLLER'S OPTIMIZED LOGIC SOFTWARE UTILIZING UNIT TREND DATA). ECONOMIZER MODE OF OPERATION SHALL OVER-RIDE NORMAL COOL-DOWN MODE OF OPERATION.

3. OCCUPIED : THE FANS START OR CONTINUE TO RUN AND THE UNIT IS CONTROLLED AS FOLLOWS: THE SUPPLY FAN SHALL RUN CONTINUOUSLY AND THE EXHAUST FAN SHALL START. BOTH FANS SHALL MODULATE THEIR SPEEDS TO ACHIEVE THE DESIRED CFM AS INDICATED IN THE SCHEDULE. THE OUTSIDE AND EXHAUST AIR DAMPERS SHALL OPEN, THE RECIRCULATION DAMPER CLOSES AND THE ENERGY RECOVERY WHEEL TRANSFERS HEAT TO PREHEAT THE OUTSIDE AIR DURING THE WINTER MONTHS OR EXTRACT HEAT FROM THE OUTSIDE AIR DURING THE COOLING MONTHS TO PRECOOL THE SUPPLY AIR, THE MODULATING GAS FURNACE DEPENDING ON THE AVERAGE SPACE TEMPERATURE WILL MODULATE AS REQUIRED TO MAINTAIN THE AVERAGE SPACE SET POINT OF 70°F (ADJ) IN THE WINTER.

   THE ENERGY WHEEL, GAS FURNACE AND, DX COOLING SHALL MODULATE IN SEQUENCE WITHOUT OVERLAP TO MAINTAIN THE AVERAGE SPACE TEMPERATURE SET POINT.

4. UNOCCUPIED : UNITS SHALL BE NORMALLY OFF. IF THE SPACE UNOCCUPIED SETBACK TEMPERATURE OF 60°F (ADJ.) IS NOT MAINTAINED, THE RE-CIRC DAMPER SHALL OPEN, THE OUTDOOR AIR DAMPER AND EXHAUST AIR DAMPERS REMAIN CLOSED AND THE ENERGY RECOVERY WHEEL SHALL BE OFF. THE UNIT SUPPLY FAN SHALL START AND MODULATE DOWN TO APPROXIMATELY 60% (ADJ.) OF TOTAL AIR FLOW THROUGH THE CONTROL OF FANS VARIABLE FREQUENCY DRIVE. IN THE EVENT THAT EITHER UNIT DOES NOT MAINTAIN THE AVERAGE SPACE NIGHT SETBACK SETPOINTS FOR 30 MINUTES (ADJ.) THE UNITS SHALL MODULATE ITS FAN SPEED TO 100% UNTIL THE SPACE HUMIDITY OR TEMPERATURE SETPOINT IS ACHIEVED AND MAINTAINED FOR 30 MINUTES. (ADJ.).

5. ECONOMIZER (DUAL ENTHALPY CONTROL) : THE CONTROLLER SHALL MEASURE THE RETURN AIR AND OUTSIDE AIR ENTHALPY TEMPERATURES AND MODULATE THE OUTSIDE AIR DAMPER, RETURN AIR DAMPER, AND VFD OF THE ENERGY RECOVERY WHEEL TO MAINTAIN A SETPOINT 2°F LESS THAN THE COOLING SUPPLY AIR TEMPERATURE SETPOINT. THE ECONOMIZER SHALL BE ENABLED WHENEVER:
   - OUTSIDE AIR TEMPERATURE IS LESS THAN 65°F (ADJ.).
   - AND THE OUTSIDE AIR ENTHALPY IS LESS THAN 22 BTU/LB (ADJ).
   - AND THE OUTSIDE AIR TEMPERATURE IS LESS THAN THE RETURN AIR TEMPERATURE.
   - AND THE OUTSIDE AIR ENTHALPY IS LESS THAN THE RETURN AIR ENTHALPY.
   - AND THE SUPPLY FAN STATUS IS ON.

   THE ECONOMIZER SHALL BE DISABLED WHENEVER:
   - OUTSIDE AIR TEMPERATURE DROPS BELOW 40°F (ADJ.).
   - OR ON LOSS OF SUPPLY FAN STATUS.

6. EMERGENCY SHUTDOWN : THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON RECEIVING AN EMERGENCY SHUTDOWN SIGNAL FROM DDC SYSTEM.

7. SMOKE DETECTION : THE UNIT SHALL SHUT DOWN ALL COMPONENTS AND GENERATE AN ALARM IN THE DDC SYSTEM UPON RECEIVING A SMOKE DETECTOR STATUS

8. ENERGY RECOVERY WHEEL - VARIABLE SPEED:

   THE CONTROLLER SHALL MODULATE THE ENERGY RECOVERY WHEEL AS FOLLOWS:

9. COOLING RECOVERY MODE : THE CONTROLLER SHALL MEASURE THE WHEEL DISCHARGE AIR TEMPERATURE AND MODULATE THE WHEEL SPEED TO MAINTAIN A SETPOINT 3°F (ADJ.) LESS THAN THE COOLING SUPPLY AIR TEMPERATURE SETPOINT. THE WHEEL SHALL RUN FOR COOL RECOVERY WHENEVER:
   - THE UNIT RETURN AIR TEMPERATURE IS 5°F (ADJ.) OR MORE BELOW THE OUTSIDE AIR TEMPERATURE
   - AND THE ECONOMIZER IS OFF
   - AND THE SUPPLY FAN IS ON.

9. HEATING RECOVERY MODE : THE CONTROLLER SHALL MEASURE THE WHEEL DISCHARGE AIR TEMPERATURE AND MODULATE THE WHEEL SPEED TO MAINTAIN A SETPOINT 3°F (ADJ.) LESS THAN THE HEATING SUPPLY AIR TEMPERATURE SETPOINT. THE WHEEL SHALL RUN FOR HEAT RECOVERY WHENEVER:
   - THE UNIT RETURN AIR TEMPERATURE IS 5°F (ADJ.) OR MORE ABOVE THE OUTSIDE AIR TEMPERATURE
   - AND THE ECONOMIZER IS OFF
   - AND THE SUPPLY FAN IS ON.

10. WHEEL DEFROST CYCLE : IF THE WHEEL DIFFERENTIAL PRESSURE RISES TO 1 INCH OF H2O (ADJ.) AND THE OUTSIDE AIR TEMPERATURE IS BELOW 30°F, THE WHEEL SPEED SHALL BE REDUCED VIA THE WHEEL VARIABLE FREQUENCY DRIVE, UNTIL THE PRESSURE RETURNS TO NORMAL. WHEEL DEFROST CONTROL SEQUENCE SHALL BE CHOSEN PER MANUFACTURER'S RECOMMENDATIONS. ALARMS SHALL BE PROVIDED AS FOLLOWS:
   - RECOVERY WHEEL ROTATION FAILURE: COMMANDED ON, BUT THE STATUS IS OFF OR VICE VERSA.
   - RECOVERY WHEEL DP RISES ABOVE 1.5" (ADJ.)
   - RECOVER WHEEL VFD IN FAULT

11. SUPPLY FAN: THE SUPPLY FAN SHALL RUN ANYTIME THE UNIT IS COMMANDED TO RUN. TO PREVENT SHORT CYCLING, THE SUPPLY FAN SHALL HAVE A USER DEFINABLE (ADJ.) MINIMUM RUNTIME, UNLESS SHUT DOWN ON SAFETIES. ALARMS SHALL BE PROVIDED AS FOLLOWS:
   - SUPPLY FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF OR VICE VERSA.
   - SUPPLY FAN VFD: IN FAULT.

12. EXHAUST FAN : THE EXHAUST FAN SHALL RUN WHENEVER ENERGY WHEEL RUNS OR THE UNIT IS IN OCCUPIED AND/OR ECONOMIZER MODE, UNLESS SHUT DOWN ON SAFETIES. ALARMS SHALL BE PROVIDED AS FOLLOWS:
   - EXHAUST FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF
   - EXHAUST FAN VFD IN FAULT

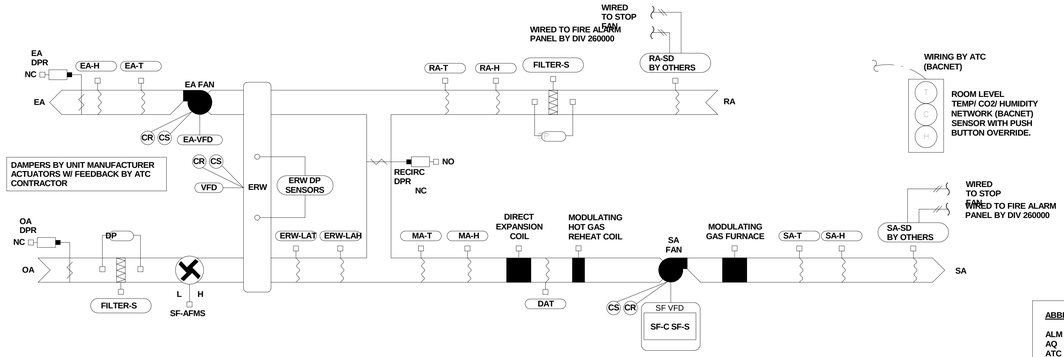
   CURRENT SENSORS SHALL BE INSTALLED ON THE SUPPLY AND EXHAUST FANS. THE DDC SYSTEM USES THESE SENSORS TO CONFIRM THE FANS ARE IN THE DESIRED STATE (I.E. ON OR OFF) AND GENERATES AN ALARM IF STATUS DEVIATES FROM DDC START/STOP CONTROL. IF EITHER SUPPLY OR EXHAUST FAN FAILS, THE OTHER FAN SHALL SHUTDOWN AND AN ALARM SHALL BE GENERATED.

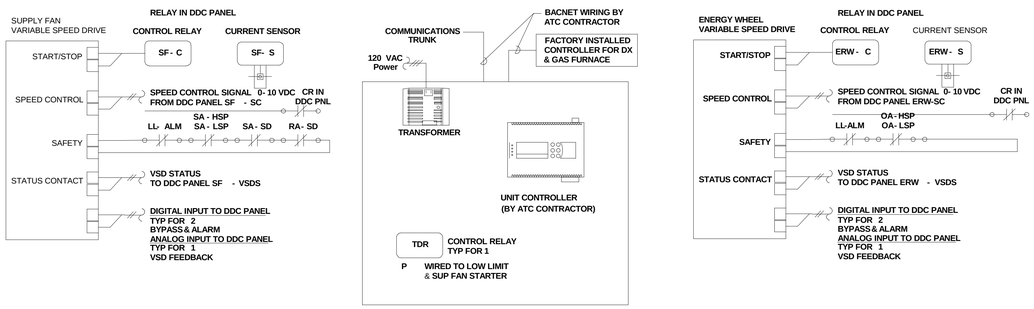
13. OA FILTER DIFFERENTIAL PRESSURE MONITOR : THE CONTROLLER SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE FINAL FILTER. ALARMS SHALL BE PROVIDED AS FOLLOWS:
   - FINAL FILTER CHANGE REQUIRED: FINAL FILTER DIFFERENTIAL PRESSURE EXCEEDS A USER DEFINABLE LIMIT OF 1" W.C. (ADJ.).

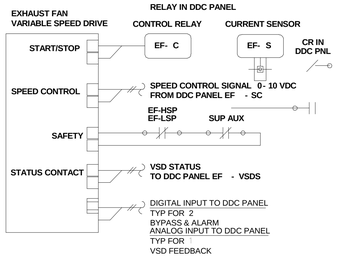
14. RETURN FILTER DIFFERENTIAL PRESSURE MONITOR : THE CONTROLLER SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE FINAL FILTER. ALARMS SHALL BE PROVIDED AS FOLLOWS:
   - RETURN FILTER CHANGE REQUIRED: FINAL FILTER DIFFERENTIAL PRESSURE EXCEEDS A USER DEFINABLE LIMIT OF 1" W.C. (ADJ.).

15. CO2 CONTROL

IF THE SPACE CO2 LEVELS VARY BY 10% OR MORE FROM THE DESIGN VALUE (900 PPM, ADJ.), AN ALARM SHALL GENERATE THE BMS TO ALERT THE BUILDING OPERATOR.







CONTROL POINT	AI	AO	DI	DO	ALARM	REMARKS
OUTSIDE AIR TEMP	X					FROM WEATHER STATION
OUTSIDE AIR HUMIDITY	X					FROM WEATHER STATION
SUPPLY AIR TEMP	X					
SUPPLY AIR HUMIDITY	X					
ENERGY RECOVERY WHEEL LEAVING AIR TEMP	X					
ENERGY RECOVERY WHEEL LEAVING HUMIDITY	X					
OUTSIDE AIR FILTER DIFFERENTIAL PRESSURE	X					ALARM IF SP INCREASE OF 1" ABOVE SETPOINT
RETURN FILTER DIFFERENTIAL PRESSURE	X					
ENERGY RECOVERY DIFFERENTIAL PRESSURE	X				X	ALARM IF DP INCREASES OF 1"
RETURN AIR HUMIDITY	X					
RETURN AIR TEMP	X					
MIXED AIR HUMIDITY	X					
MIXED AIR TEMP	X					
MODULATING GAS FURNACE	X	X			X	
MODULATING DX	X	X			X	
OUTSIDE AIR DAMPER	X	X			X	
EXHAUST AIR DAMPER	X	X			X	
RECIRCULATION AIR DAMPER	X	X			X	
SUPPLY AIR SMOKE DETECTOR			X		X	
RETURN AIR SMOKE DETECTOR			X		X	
SUPPLY FAN STATUS			X			
EXHAUST FAN STATUS			X			
ENERGY RECOVERY WHEEL STATUS			X			
ENERGY RECOVERY WHEEL VFD	X	X			X	
SUPPLY FAN VFD	X	X				
EXHAUST FAN VFD	X	X				
SUPPLY FAN START/STOP				X		
EXHAUST FAN START/STOP				X		
ENERGY RECOVERY WHEEL START/STOP				X		
AVERAGE SPACE TEMP	X					
EMERGENCY SHUT DOWN					X	
SUPPLY FAN VFD FAILURE					X	
SUPPLY FAN VFD IN HAND					X	
EXHAUST FAN VFD FAILURE					X	
EXHAUST FAN VFD IN HAND					X	
ENERGY RECOVERY WHEEL VFD FAILURE					X	
ENERGY RECOVERY WHEEL VFD IN HAND					X	
HIGH AVERAGE SPACE TEMP					X	10° ABOVE SPACE SETPOINT
LOW AVERAGE SPACE TEMP					X	10° BELOW SPACE SETPOINT
RETURN FILTER CHANGE REQUIRED					X	DP INCREASE OF 1"
OUTSIDE AIR FILTER CHANGE REQUIRED					X	DP INCREASE OF 1"
EACH SPACE CO2	X				X	ALARM IF +/- 10% OF 900 PPM
EACH SPACE HUMIDITY	X				X	
EACH SPACE TEMPERATURE	X				X	
AIRFLOW CFM OA	X				X	

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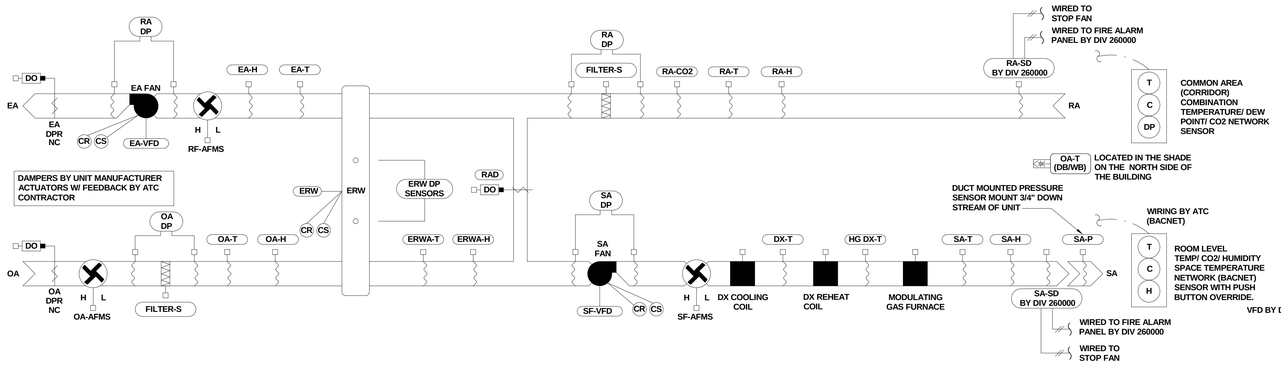
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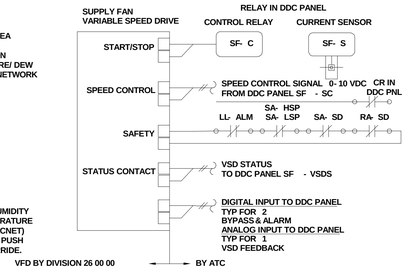
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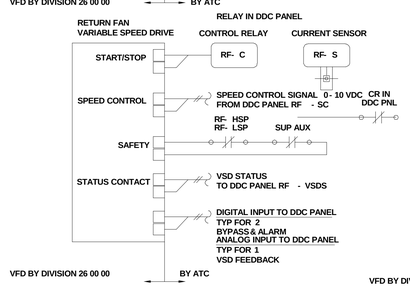
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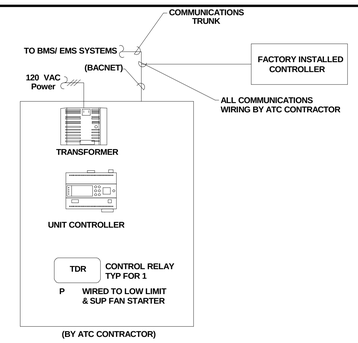
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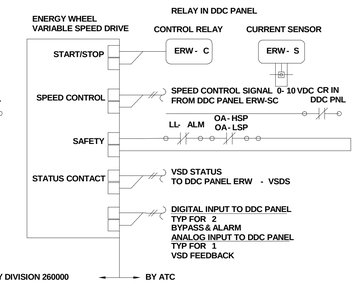
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INDUCTION UNIT 100% OUTSIDE AIR VENTILATION UNIT CONTROL SEQUENCE - RTU-12 & 19

A DDC CONTROLLER USING ELECTRIC ACTUATION CONTROLS THE AIR HANDLING UNIT OPERATION AS FOLLOWS:

RUN CONDITIONS - SCHEDULED:
THE UNIT SHALL RUN BASED UPON AN OPERATOR ADJUSTABLE SCHEDULE. THE UNIT SHALL RUN WHEN THE ISOLATION DAMPERS ARE PROVEN OPEN.

OCCUPIED MODE:

THE FANS START OR CONTINUE TO RUN AND THE UNIT IS CONTROLLED AS FOLLOWS:

THE SUPPLY AND EXHAUST FAN SHALL RUN AND ADJUST SPEED BASE ON THE DUCT MOUNT PRESSURE SENSOR. THE OUTSIDE AND EXHAUST AIR DAMPERS SHALL BE OPEN AND RE-CIRC DAMPERS SHALL BE CLOSED. THE CO2 SENSOR LOCATED IN THE RETURN DUCTWORK SHALL BE FOR MONITORING AND TRENDING. THE ENERGY RECOVERY WHEEL SHALL OPERATE BASED ON DESCRIPTION BELOW.

THE DIRECT EXPANSION COIL CONTROL VALVE SHALL MODULATE TO DEHUMIDIFY THE INCOMING AIR. THE HOT GAS REHEAT VALVE SHALL MODULATE TO REHEAT THE SUB COOLER SUPPLY AIR FROM THE DX COIL TO 65°F (ADJ SUMMER). THE GAS FURNACE SHALL MODULATE AS REQUIRED TO PROVIDED ADDITIONAL HEAT TO THE SUPPLY AIR TO MAINTAIN THE DISCHARGE AIR TEMPERATURE OF 68°F (ADJ WINTER)

WARM-UP:
THE OUTSIDE AND EXHAUST AIR DAMPERS SHALL CLOSE, THE DX COOLING SHALL BE LOCKED OUT, THE RE-CIR DAMPER SHALL OPEN, THE SUPPLY FAN SHALL START, AND THE GAS FIRED FURNACE SHALL MODULATE TO MAINTAIN SPACE DISCHARGE SETPOINT. DISCHARGE AIR TEMPERATURE DURING WARM-UP SHALL BE 85°F (ADJ). THE SYSTEM SHALL BE PREVENTED FROM ENTERING THE WARM-UP MODE MORE THAN ONCE PER DAY.

COOL-DOWN:
THE OUTSIDE AND EXHAUST AIR DAMPERS SHALL CLOSE, THE GAS FURNACE SHALL BE LOCKED OUT, THE HOT GAS REHEAT SHALL BE LOCKED OUT, THE RE-CIRC DAMPER SHALL OPEN, THE SUPPLY FAN SHALL START, AND DX COOLING SHALL MODULATE TO MAINTAIN DISCHARGE SETPOINT OF 55°F (ADJ). MORNING COOL-DOWN SHALL OCCUR (1 HR. ADJ.) PRIOR TO UNIT SCHEDULED OCCUPIED START TIME (TIME PERIOD SHALL BE ADJUSTED THRU CONTROLLER'S OPTIMIZEDSTART LOGIC UTILIZING UNIT TREND DATA). ECONOMIZER MODE OF OPERATION SHALL OVER-RIDE NORMAL COOL-DOWN MODE OF OPERATION. OPTIMIZE START LOGIC SHALL ALLOW 55°F SUPPLY AIR TEMPERATURE TO BE UTILIZED TO MINIMIZE THE COOL DOWN PERIOD AND MINIMIZE USE OF REHEAT.

ECONOMIZER (DUAL ENTHALPY CONTROL):
THE CONTROLLER SHALL MEASURE THE RETURN AIR ENTHALPY TEMPERATURE AND MODULATE THE OUTSIDE AIR DAMPER, RETURN AIR DAMPER, AND VFD OF THE TOTAL WHEEL TO MAINTAIN A SETPOINT 2°F LESS THAN THE COOLING SUPPLY AIR TEMPERATURE SETPOINT.

THE ECONOMIZER SHALL BE ENABLED WHENEVER:

- OUTSIDE AIR TEMPERATURE IS LESS THAN 65°F (ADJ.).
- AND THE OUTSIDE AIR ENTHALPY IS LESS THAN 22 BTU/LB (ADJ).
- AND THE OUTSIDE AIR TEMPERATURE IS LESS THAN THE RETURN AIR TEMPERATURE.
- AND THE OUTSIDE AIR ENTHALPY IS LESS THAN THE RETURN AIR ENTHALPY.
- AND THE SUPPLY FAN STATUS IS ON.

THE ECONOMIZER SHALL BE DISABLED WHENEVER:

- OUTSIDE AIR TEMPERATURE DROPS FROM 40°F TO 35°F (ADJ.).
- OR ON LOSS OF SUPPLY FAN STATUS.
- OR THE FREEZESTAT IS ON.

EMERGENCY SHUTDOWN:
THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON RECEIVING AN EMERGENCY SHUTDOWN SIGNAL.

LOW LEAVING TEMPERATURE:
UPON A LOW LEAVING TEMPERATURE CONDITION (38°F ADJ) SENSED BY THE SA-T SENSOR. THE OUTSIDE AIR AND EXHAUST AIR DAMPER SHALL CLOSE, AND THE SUPPLY AND EXHAUST AIR FAN SHALL SHUT DOWN AND AN ALARM SHALL BE GENERATED.

SMOKE DETECTION:
THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON RECEIVING A SMOKE DETECTOR STATUS.

TOTAL RECOVERY WHEEL - VARIABLE SPEED:

THE CONTROLLER SHALL MODULATE THE HEAT RECOVERY WHEEL FOR ENERGY RECOVERY AS FOLLOWS.

COOLING RECOVERY MODE:

THE CONTROLLER SHALL MEASURE THE TOTAL WHEEL DISCHARGE AIR TEMPERATURE AND MODULATE THE TOTAL WHEEL SPEED TO MAINTAIN A SETPOINT 3°F (ADJ.) LESS THAN THE COLD DECK SUPPLY AIR TEMPERATURE SETPOINT. THE TOTAL WHEEL SHALL RUN FOR COOL RECOVERY WHENEVER:

- THE UNIT RETURN AIR TEMPERATURE IS 5°F (ADJ.) OR MORE BELOW THE OUTSIDE AIR TEMPERATURE.
- AND THE ECONOMIZER IS OFF.
- AND THE SUPPLY FAN IS ON.

HEATING RECOVERY MODE:

THE CONTROLLER SHALL MEASURE THE TOTAL WHEEL DISCHARGE AIR TEMPERATURE AND MODULATE THE TOTAL WHEEL SPEED TO MAINTAIN A SETPOINT 3°F (ADJ.) LESS THAN THE HOT DECK SUPPLY AIR TEMPERATURE SETPOINT. THE TOTAL WHEEL SHALL RUN FOR HEAT RECOVERY WHENEVER:

- THE UNIT RETURN AIR TEMPERATURE IS 5°F (ADJ.) OR MORE ABOVE THE OUTSIDE AIR TEMPERATURE.
- AND THE ECONOMIZER IS OFF.
- AND THE SUPPLY FAN IS ON.

HOT GAS REHEAT:

THE CONTROLLER SHALL MODULATE THE HOT GAS REHEAT FOR ENERGY RECOVERY AS FOLLOWS.

COOLING RECOVERY MODE:

THE CONTROLLER SHALL ACTIVATE THE HOT GAS REHEAT WHENEVER THE TOTAL WHEEL IS ACTIVATED IN COOLING

MODE. THE HOT GAS REHEAT SHALL BE ENABLED AND MODULATE TO REHEAT THE SUPPLY AIR WHENEVER:

- THE UNIT RETURN AIR TEMPERATURE IS 5°F (ADJ.) OR MORE BELOW THE OUTSIDE AIR TEMPERATURE.
- AND THE ECONOMIZER IS OFF.
- AND THE TOTAL WHEEL IS ON IN COOLING MODE.

HEATING RECOVERY MODE:

THE CONTROLLER SHALL DEACTIVATE THE HOT GAS REHEAT WHENEVER THE TOTAL WHEEL IS ACTIVATED IN HEATING MODE. THE HOT GAS REHEAT SHALL BE OFF FOR HEATING RECOVERY WHENEVER:

- THE UNIT RETURN AIR TEMPERATURE IS 5°F (ADJ.) OR MORE ABOVE THE OUTSIDE AIR TEMPERATURE.
- AND THE ECONOMIZER IS ON.
- AND THE TOTAL WHEEL IS ON IN HEATING MODE.

UNOCCUPIED MODE:

THE OUTSIDE AIR DAMPER, EXHAUST FAN, AND ERW SHALL BE OFF. THE RETURN AIR DAMPER SHALL BE OPEN. IN HEATING MODE THE SUPPLY FAN SHALL ENGAGE AND OPERATE AT 60% SPEED (ADJ.) AND THE HEATING SECTION SHALL MODERATE UPON A CALL FOR HEAT UNTIL THE NIGHT SETBACK SETPOINT (60°F ADJ.) HAS BEEN SATISFIED. IN COOLING MODE THE SUPPLY FAN SHALL ENGAGE AND OPERATE AT 60% SPEED (ADJ.), THE COOLING SECTION SHALL MODULATE COOLING OUTPUT UPON A CALL FOR COOLING UNTIL THE NIGHT SETBACK SETPOINT (85°F ADJ., 60% RH) HAS BEEN SATISFIED.

PERIODIC SELF-CLEANING:
THE HEAT WHEEL SHALL RUN AT 5% SPEED (ADJ.) FOR 10 SEC (ADJ.) EVERY 4 HRS (ADJ.) THE UNIT RUNS.

TOTAL WHEEL FROST PROTECTION:
THE HEAT WHEEL SHALL RUN AT 5% SPEED (ADJ.) WHENEVER:

- OUTSIDE AIR TEMPERATURE DROPS BELOW 15°F (ADJ.)
- OR WHENEVER EXHAUST AIR TEMPERATURE DROPS BELOW 20°F (ADJ.).

WHEEL DEFROST CYCLE

IF THE WHEEL DIFFERENTIAL PRESSURE RISES 1 INCH. (ADJ) AND THE OUTSIDE AIR TEMPERATURE IS BELLOW 30°F, HE WHEEL SPEED SHALL BE REDUCED VIA WHEEL VARIABLE FREQUENCY DRIVE, OR THE ENERGY RECOVERY WHEEL FACE & BYPASS DAMPERS SHALL MODULATE OPEN TO BYPPASS THE WHEEL UNTIL THE PRESSURE RETURNS TO NORMAL. WHEEL DEFROST CONTROL SEQUENCE SHALL BE CHOSEN PER MANUFACTURER'S RECOMMENDATIONS.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- RECOVERY WHEEL ROTATION FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
- RECOVERY WHEEL IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.
- RECOVERY WHEEL RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT (ADJ.).
- RECOVERY WHEEL VFD IN FAULT

SUPPLY FAN:
THE SUPPLY FAN SHALL RUN ANYTIME THE UNIT IS COMMANDED TO RUN. TO PREVENT SHORT CYCLING, THE SUPPLY FAN SHALL HAVE A USER DEFINABLE (ADJ.) MINIMUM RUNTIME, UNLESS SHUTDOWN ON SAFETIES.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- SUPPLY FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
- SUPPLY FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.
- SUPPLY FAN RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT (ADJ.).

EXHAUST FAN:
THE EXHAUST FAN SHALL RUN WHENEVER THE TOTAL ENERGY WHEEL RUNS OR THE UNIT IS IN ECONOMIZER, UNLESS SHUTDOWN ON SAFETIES.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- EXHAUST FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
- EXHAUST FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.
- EXHAUST FAN RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT (ADJ.).

CURRENT SWITCHES SHALL BE INSTALLED IN THE SUPPLY AND EXHAUST FAN STARTERS. THE DDC SYSTEM USES THESE SWITCHES TO CONFIRM THE FANS ARE IN THE DESIRED STATE (I.E. ON OR OFF) AND GENERATES AN ALARM IF STATUS DEVIATES FROM DDC START/STOP CONTROL.

DX COOLING:
THE CONTROLLER SHALL MEASURE THE SUPPLY AIR TEMPERATURE AND SHALL STAGE THE COMPRESSOR AND MODULATE THE VARIABLE SCROLL COMPRESSOR TO MAINTAIN REQUIRED COOLING AND/OR DEHUMIDIFICATION SETPOIN 52°F ADJ PRE-HEAT COIL. THE HOT GAS REHEAT SHALL MODULATE TO MAINTAIN A DISCHARGE AIR TEMPERATURE OF 65° ADJ.

THE COOLING SHALL BE ENABLED WHENEVER:

- OUTSIDE AIR TEMPERATURE IS GREATER THAN 60°F (ADJ.).
- AND THE SUPPLY AIR TEMPERATURE IS ABOVE COOLING SETPOINT.
- AND THE FAN STATUS IS ON.
- SPACE TEMPERATURE CALL FOR COOLING

GAS FIRED FURNACE:
THE CONTROLLER SHALL MEASURE THE SUPPLY AIR TEMPERATURE AND MODULATE THE GAS FIRED FURNACE TO MAINTAIN ITS HEATING SETPOINT TO MAINTAIN DISCHARGE AIR TEMPERATURE SET POINT OF 68°F (ADJ).

THE HEATING SHALL BE ENABLED WHENEVER:

- OUTSIDE AIR TEMPERATURE IS LESS THAN 65°F (ADJ.).
- AND THE SUPPLY AIR TEMPERATURE IS BELOW HEATING SETPOINT.
- AND THE FAN STATUS IS ON.
- HOT GAS REHEAT IS INOPERABLE (ALARM SHALL BE GENERATED)

THE HEATING SHALL NORMALLY BE DISABLED WHENEVER COOLING SYSTEM IS ENERGIZED AND HOT GAS REHEATING IS UTILIZED TO PROVIDE RE-HEAT.

OUTSIDE AIR FILTER DIFFERENTIAL PRESSURE MONITOR:
THE CONTROLLER SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE PREFILTER.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- PREFILTER CHANGE REQUIRED: PREFILTER DIFFERENTIAL PRESSURE EXCEEDS A USER DEFINABLE LIMIT (ADJ.).

RETURN AIR FILTER DIFFERENTIAL PRESSURE MONITOR:
THE CONTROLLER SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE FINAL FILTER.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- FINAL FILTER CHANGE REQUIRED: FINAL FILTER DIFFERENTIAL PRESSURE EXCEEDS A USER DEFINABLE LIMIT (ADJ.).

SUPPLY AIR TEMPERATURE:
THE CONTROLLER SHALL MONITOR THE SUPPLY AIR TEMPERATURE.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- HIGH SUPPLY AIR TEMP: IF THE SUPPLY AIR TEMPERATURE IS GREATER THAN 120°F (ADJ.).
- LOW SUPPLY AIR TEMP: IF THE SUPPLY AIR TEMPERATURE IS LESS THAN 45°F (ADJ.).

SPACE HUMIDITY SENSOR

THE DDC SYSTEM SHALL MONITOR THE SYSTEM ZONE HUMIDITY SENSORS AND REPORT THE INFORMATION TO THE BUILDING DDC SYSTEM ROOM GRAPHICS.

CARBON DIOXIDE LEVELS:

IF THE SPACE CARBON DIOXIDE LEVELS VARY BY 10% OR MORE FROM THE DESIGN VALUE OF 900 PPM (ADJ.), AN ALARM SHALL GENERATE AT THE BMS TO ALERT THE BUILDING OPERATOR.

CONTROL POINT	AI	AO	BI	BO	AV	BV	LOOP	SCHED	TREND	ALARM	REMARKS
OUTSIDE AIR FLOW MEASURING STATION	X								X		
SUPPLY AIR FLOW MEASURING STATION	X								X		
EXHAUST AIR FLOW MEASURING STATION	X								X		
OUTSIDE AIR TEMP	X								X		
OUTSIDE AIR HUMIDITY	X								X		
EXHAUST AIR TEMP	X								X		
EXHAUST AIR HUMIDITY	X								X		
ENERGY RECOVERY HEAT WHEEL DISCHARGE AIR TEMP	X								X		
ENERGY RECOVERY WHEEL DISCHARGE AIR HUMIDITY	X								X		
DX SUPPLY AIR TEMP	X								X		
HOT GAS DX REHEAT	X								X		
SUPPLY AIR TEMP	X								X		
SUPPLY AIR HUMIDITY	X								X		
OUTSIDE AIR FILTER DIFFERENTIAL PRESSURE	X								X		
RETURN AIR FILTER DIFFERENTIAL PRESSURE	X								X		
SUPPLY FAN DIFFERENTIAL PRESSURE	X								X		
EXHAUST FAN DIFFERENTIAL PRESSURE	X								X		
RETURN AIR CARBON DIOXIDE PPM	X								X		
RETURN AIR HUMIDITY	X								X		
RETURN AIR TEMP	X								X		
ENERGY RECOVERY WHEEL VFD SPEED	X								X		
SUPPLY FAN VFD SPEED	X								X		
RETURN FAN VFD SPEED	X								X		
DX COOLING STAGES/MODULATION		X							X		
HOT GAS REHEAT MODULATION		X							X		
GAS FURNACE MODULATION		X							X		
RE-CIRC AIR DAMPER		X							X		
OUTSIDE AIR DAMPER		X							X		
EXHAUST AIR DAMPER		X							X		
RETURN AIR SMOKE DETECTOR			X						X	X	
SUPPLY AIR SMOKE DETECTOR			X						X	X	
SUPPLY FAN STATUS			X						X		
EXHAUST FAN STATUS			X						X		
ENERGY RECOVERY WHEEL STATUS			X						X		
ENERGY RECOVERY WHEEL VFD FAULT			X						X	X	
SUPPLY FAN VFD FAULT			X						X	X	
RETURN FAN VFD FAULT			X						X	X	
SUPPLY FAN START/STOP				X					X		
EXHAUST FAN START/STOP				X					X		
ENERGY RECOVERY WHEEL START/STOP				X					X		
COOLING SUPPLY AIR SET POINT					X				X		
HEATING SUPPLY AIR SET POINT					X				X		
EMERGENCY SHUT DOWN						X			X	X	
SCHEDULE								X			
SUPPLY FAN FAILURE										X	
SUPPLY FAN IN HAND										X	
SUPPLY FAN RUNTIME EXCEEDED										X	
EXHAUST FAN FAILURE										X	
EXHAUST FAN IN HAND										X	
EXHAUST FAN RUNTIME EXCEEDED										X	
ENERGY RECOVERY WHEEL ROTATION FAILURE										X	
ENERGY RECOVERY WHEEL IN HAND										X	
TOTAL WHEEL RUNTIME EXCEEDED										X	
HIGH COOLING SUPPLY AIR TEMP										X	
HIGH HEATING SUPPLY AIR TEMP										X	
LOW HEATING SUPPLY AIR TEMP										X	
OUTSIDE AIR FILTER CHANGE REQUIRED										X	
RETURN AIR FILTER CHANGE REQUIRED										X	
HIGH RETURN AIR CARBON DIOXIDE CONCENTRATION										X	
HIGH RETURN AIR HUMIDITY										X	
LOW RETURN AIR TEMP										X	
HIGH RETURN AIR TEMP										X	
SPACE CARBON DIOXIDE PPM	X									X	

ATC CONTRACTOR TO PROVIDE ALL NECESSARY SENSORS, WIRING, PROGRAMMING, & MAPPING AS REQUIRED TO ACHIEVE SEQUENCE & OBTAIN ALL POINTS INDICATED ABOVE. ATC CONTRACTOR TO COORD. W/ UNIT MANUFACTURER TO PROVIDE SEAMLESS COMMUNICATION BETWEEN UNIT CONTROLS, INPUTS/OUTPUTS TO BMS SYSTEM GRAPHICS, & PROVIDE ALL READABLE/WRITEABLE POINTS.

ABBREVIATIONS

ALM	ALARM
AQ	AQUASTAT
ATC	AUTOMATIC TEMPERATURE CONTROLS
BLDG	BUILDING
BMS	BUILDING MANAGEMENT SYSTEM (ENERGY & AUTOMATION)
COMB	COMBUSTION
CO2	CARBON DIOXIDE
CR	CONTROL RELAY
CS	CURRENT SENSOR
CUV	CABINET UNIT VENTILATOR
D	DAMPER
DA	DISCHARGE AIR
DAS	DISCHARGE AIR SENSOR
DCW	DOMESTIC COLD WATER
DHW	DOMESTIC HOT WATER
DDC	DIRECT DIGITAL CONTROL
DO	DAMPER OPERATOR
DP	DIFFERENTIAL PRESSURE
DPR	DAMPER
EA	EXHAUST AIR
EF	EXHAUST FAN
F	FLOW/FARENHEIT (AS APPLICABLE)
FB	FACE & BYPASS
FD	FIRE DAMPER
H	HUMIDITY
HT	HIGH TEMPERATURE
HTG	HEATING
HR	HEAT RECOVERY
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
LT	LOW TEMPERATURE
M	MOTOR
MAT	MIXED AIR TEMPERATURE
NAC	NETWORK APPLICATION CONTROLLER
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
OA	OUTSIDE AIR
OVR	OVERRIDE
P	PRESSURE
PB	PUSH BUTTON
PNL	PANEL
RA	RETURN AIR
REL	RELIEF AIR
RF	RETURN FAN
RFC	RETURN FAN CONTROLLER
RM	ROOM
SA	SUPPLY AIR
SD	SMOKE DAMPER OR SMOKE DETECTOR
SF	SUPPLY FAN
SFC	SUPPLY FAN CONTROLLER
SP	STATIC PRESSURE
	TEMPERATURE
TEC	TERMINAL EQUIPMENT CONTROLLER
UV	UNIT VENTILATOR
VAC	VOLTS - ALTERNATING CURRENT
VDC	VOLTS - DIRECT CURRENT
VFD	SEE VSD
VLV	VALVE
VP	VELOCITY PROBE (AIRFLOW)
VSD	VARIABLE SPEED (FREQUENCY) DRIVE
XFMR	TRANSFORMER

ATC/BMS GENERAL NOTES

1. ALL SETPOINTS INDICATED IN THE SEQUENCE OF OPERATIONS SHALL BE ADJUSTABLE.

2. THE CONTROL POINTS LISTED IN THE SUMMARY MATRIX ARE THE MINIMUM CONTROL POINTS REQUIRED. PROVIDE ALL CONTROL POINTS AS REQUIRED FOR COMPLETE SYSTEM CONTROL PER THE SEQUENCE OF OPERATIONS.

3. ALL CONTROL WORK INDICATED ON THE CONTROL DIAGRAMS SHALL BE PROVIDED BY THE ATC CONTRACTOR UNLESS NOTED OTHERWISE.

4. ALL ATC CONTROLS SHALL BE POWERED BY EMERGENCY POWER CIRCUITS COORD W/ DIV 260000

5. ALL HW VALVES SJALL BE FAIL OPEN ON LOSS OF POWER

6. ALL HW RADIATION VALVES SHALL BE MODULATING TYPE FOR GPM > 1 GPM, 2-POSITION ACCEPTABLE FOR RADIATION HW FLOW < 1GPM

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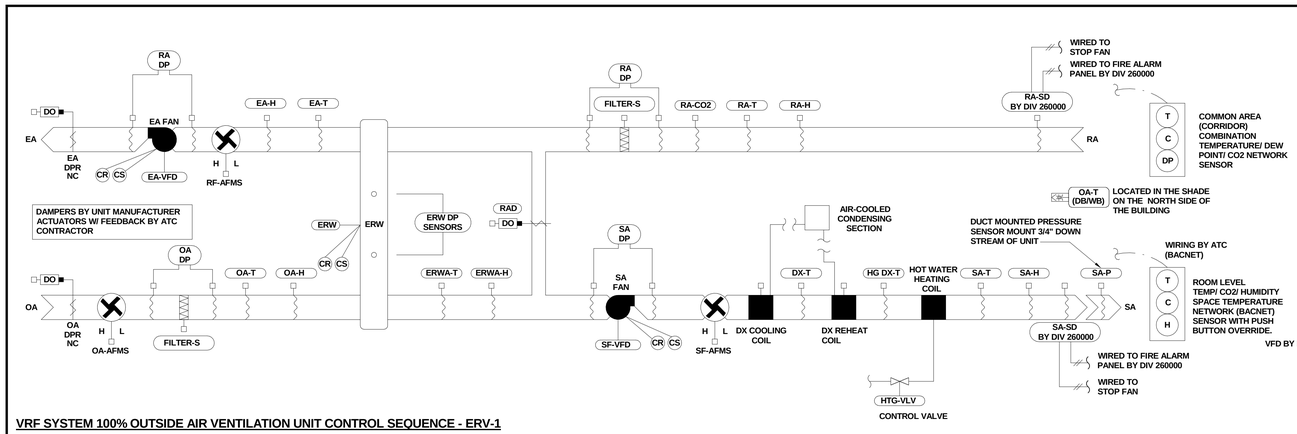
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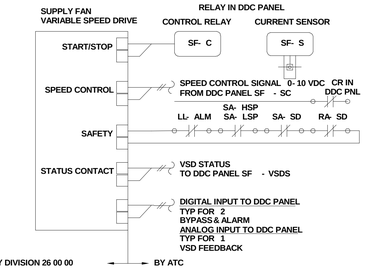
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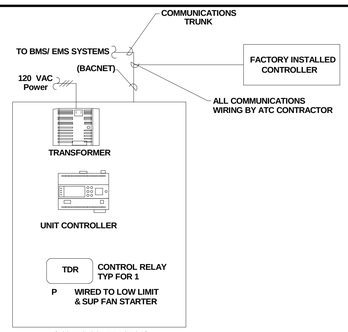
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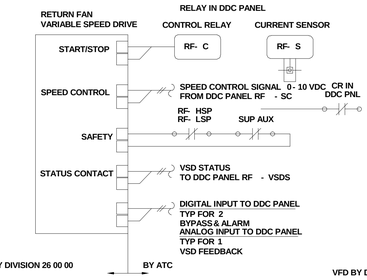
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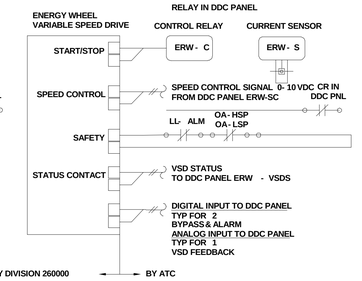
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VRF SYSTEM 100% OUTSIDE AIR VENTILATION UNIT CONTROL SEQUENCE - ERV-1

A DDC CONTROLLER USING ELECTRIC ACTUATION CONTROLS THE AIR HANDLING UNIT OPERATION AS FOLLOWS:

RUN CONDITIONS - SCHEDULED:
THE UNIT SHALL RUN BASED UPON AN OPERATOR ADJUSTABLE SCHEDULE. THE UNIT SHALL RUN WHEN THE ISOLATION DAMPERS ARE PROVEN OPEN.

OCCUPIED MODE:

THE FANS START OR CONTINUE TO RUN AND THE UNIT IS CONTROLLED AS FOLLOWS:

THE SUPPLY AND EXHAUST FAN SHALL RUN AND ADJUST SPEED BASE ON THE DUCT MOUNT PRESSURE SENSOR. THE OUTSIDE AND EXHAUST AIR DAMPERS SHALL BE OPEN AND RE-CIRC DAMPERS SHALL BE CLOSED. THE CO2 SENSOR LOCATED IN THE RETURN DUCTWORK SHALL BE FOR MONITORING AND TRENDING. THE ENERGY RECOVERY WHEEL SHALL OPERATE BASED ON DESCRIPTION BELOW.

THE DIRECT EXPANSION COIL CONTROL VALVE SHALL MODULATE TO DEHUMIDIFY THE INCOMING AIR. THE HOT GAS REHEAT VALVE SHALL MODULATE TO REHEAT THE SUB COOLER SUPPLY AIR FROM THE DX COIL TO 65°F (ADJ SUMMER). THE GAS FURNACE SHALL MODULATE AS REQUIRED TO PROVIDED ADDITIONAL HEAT TO THE SUPPLY AIR TO MAINTAIN THE DISCHARGE AIR TEMPERATURE OF 68°F (ADJ WINTER)

WARM-UP:
THE OUTSIDE AND EXHAUST AIR DAMPERS SHALL CLOSE, THE DX COOLING SHALL BE LOCKED OUT, THE RE-CIR DAMPER SHALL OPEN, THE SUPPLY FAN SHALL START, AND THE HOT WATER HEATING COIL CONTROL VALVE SHALL MODULATE TO MAINTAIN SPACE DISCHARGE SETPOINT. DISCHARGE AIR TEMPERATURE DURING WARM-UP SHALL BE 85°F (ADJ). THE SYSTEM SHALL BE PREVENTED FROM ENTERING THE WARM-UP MODE MORE THAN ONCE PER DAY.

COOL-DOWN:
THE OUTSIDE AND EXHAUST AIR DAMPERS SHALL CLOSE, THE GAS FURNACE SHALL BE LOCKED OUT, THE HOT GAS REHEAT SHALL BE LOCKED OUT, THE RE-CIRC DAMPER SHALL OPEN, THE SUPPLY FAN SHALL START, AND DX COOLING SHALL MODULATE TO MAINTAIN DISCHARGE SETPOINT OF 55°F (ADJ). MORNING COOL-DOWN SHALL OCCUR (1 HR. ADJ.) PRIOR TO UNIT SCHEDULED OCCUPIED START TIME (TIME PERIOD SHALL BE ADJUSTED THRU CONTROLLER'S OPTIMIZEDSTART LOGIC UTILIZING UNIT TREND DATA). ECONOMIZER MODE OF OPERATION SHALL OVER-RIDE NORMAL COOL-DOWN MODE OF OPERATION. OPTIMIZE START LOGIC SHALL ALLOW 55°F SUPPLY AIR TEMPERATURE TO BE UTILIZED TO MINIMIZE THE COOL DOWN PERIOD AND MINIMIZE USE OF REHEAT.

ECONOMIZER (DUAL ENTHALPY CONTROL):
THE CONTROLLER SHALL MEASURE THE RETURN AIR ENTHALPY TEMPERATURE AND MODULATE THE OUTSIDE AIR DAMPER, RETURN AIR DAMPER, AND VFD OF THE TOTAL WHEEL TO MAINTAIN A SETPOINT 2°F LESS THAN THE COOLING SUPPLY AIR TEMPERATURE SETPOINT.

THE ECONOMIZER SHALL BE ENABLED WHENEVER:

- OUTSIDE AIR TEMPERATURE IS LESS THAN 65°F (ADJ.).
- AND THE OUTSIDE AIR ENTHALPY IS LESS THAN 22 BTU/LB (ADJ).
- AND THE OUTSIDE AIR TEMPERATURE IS LESS THAN THE RETURN AIR TEMPERATURE.
- AND THE OUTSIDE AIR ENTHALPY IS LESS THAN THE RETURN AIR ENTHALPY.
- AND THE SUPPLY FAN STATUS IS ON.

THE ECONOMIZER SHALL BE DISABLED WHENEVER:

- OUTSIDE AIR TEMPERATURE DROPS FROM 40°F TO 35°F (ADJ.).
- OR ON LOSS OF SUPPLY FAN STATUS.
- OR THE FREEZESTAT IS ON.

EMERGENCY SHUTDOWN:
THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON RECEIVING AN EMERGENCY SHUTDOWN SIGNAL.

LOW LEAVING TEMPERATURE:
UPON A LOW LEAVING TEMPERATURE CONDITION (38°F ADJ) SENSED BY THE SA-T SENSOR. THE OUTSIDE AIR AND EXHAUST AIR DAMPER SHALL CLOSE, AND THE SUPPLY AND EXHAUST AIR FAN SHALL SHUT DOWN AND AN ALARM SHALL BE GENERATED.

SMOKE DETECTION:
THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON RECEIVING A SMOKE DETECTOR STATUS.

TOTAL RECOVERY WHEEL - VARIABLE SPEED:

THE CONTROLLER SHALL MODULATE THE HEAT RECOVERY WHEEL FOR ENERGY RECOVERY AS FOLLOWS.

COOLING RECOVERY MODE:

THE CONTROLLER SHALL MEASURE THE TOTAL WHEEL DISCHARGE AIR TEMPERATURE AND MODULATE THE TOTAL WHEEL SPEED TO MAINTAIN A SETPOINT 3°F (ADJ.) LESS THAN THE COLD DECK SUPPLY AIR TEMPERATURE SETPOINT. THE TOTAL WHEEL SHALL RUN FOR COOL RECOVERY WHENEVER:

- THE UNIT RETURN AIR TEMPERATURE IS 5°F (ADJ.) OR MORE BELOW THE OUTSIDE AIR TEMPERATURE.
- AND THE ECONOMIZER IS OFF.
- AND THE SUPPLY FAN IS ON.

HEATING RECOVERY MODE:

THE CONTROLLER SHALL MEASURE THE TOTAL WHEEL DISCHARGE AIR TEMPERATURE AND MODULATE THE TOTAL WHEEL SPEED TO MAINTAIN A SETPOINT 3°F (ADJ.) LESS THAN THE HOT DECK SUPPLY AIR TEMPERATURE SETPOINT. THE TOTAL WHEEL SHALL RUN FOR HEAT RECOVERY WHENEVER:

- THE UNIT RETURN AIR TEMPERATURE IS 5°F (ADJ.) OR MORE ABOVE THE OUTSIDE AIR TEMPERATURE.
- AND THE ECONOMIZER IS OFF.
- AND THE SUPPLY FAN IS ON.

HOT GAS REHEAT:

THE CONTROLLER SHALL MODULATE THE HOT GAS REHEAT FOR ENERGY RECOVERY AS FOLLOWS.

COOLING RECOVERY MODE:

THE CONTROLLER SHALL ACTIVATE THE HOT GAS REHEAT WHENEVER THE TOTAL WHEEL IS ACTIVATED IN COOLING

MODE. THE HOT GAS REHEAT SHALL BE ENABLED AND MODULATE TO REHEAT THE SUPPLY AIR WHENEVER:

- THE UNIT RETURN AIR TEMPERATURE IS 5°F (ADJ.) OR MORE BELOW THE OUTSIDE AIR TEMPERATURE.
- AND THE ECONOMIZER IS OFF.
- AND THE TOTAL WHEEL IS ON IN COOLING MODE.

HEATING RECOVERY MODE:

THE CONTROLLER SHALL DEACTIVATE THE HOT GAS REHEAT WHENEVER THE TOTAL WHEEL IS ACTIVATED IN HEATING MODE. THE HOT GAS REHEAT SHALL BE OFF FOR HEATING RECOVERY WHENEVER:

- THE UNIT RETURN AIR TEMPERATURE IS 5°F (ADJ.) OR MORE ABOVE THE OUTSIDE AIR TEMPERATURE.
- AND THE ECONOMIZER IS ON.
- AND THE TOTAL WHEEL IS ON IN HEATING MODE.

UNOCCUPIED MODE:

THE OUTSIDE AIR DAMPER, EXHAUST FAN, AND ERW SHALL BE OFF. THE RETURN AIR DAMPER SHALL BE OPEN. IN HEATING MODE THE SUPPLY FAN SHALL ENGAGE AND OPERATE AT 60% SPEED (ADJ.) AND THE HEATING SECTION SHALL MODERATE UPON A CALL FOR HEAT UNTIL THE NIGHT SETBACK SETPOINT (60°F ADJ.) HAS BEEN SATISFIED. IN COOLING MODE THE SUPPLY FAN SHALL ENGAGE AND OPERATE AT 60% SPEED (ADJ.), THE COOLING SECTION SHALL MODULATE COOLING OUTPUT UPON A CALL FOR COOLING UNTIL THE NIGHT SETBACK SETPOINT (85°F ADJ., 60% RH) HAS BEEN SATISFIED.

PERIODIC SELF-CLEANING:
THE HEAT WHEEL SHALL RUN AT 5% SPEED (ADJ.) FOR 10SEC (ADJ.) EVERY 4HRS (ADJ.) THE UNIT RUNS.

TOTAL WHEEL FROST PROTECTION:
THE HEAT WHEEL SHALL RUN AT 5% SPEED (ADJ.) WHENEVER:

- OUTSIDE AIR TEMPERATURE DROPS BELOW 15°F (ADJ.)
- OR WHENEVER EXHAUST AIR TEMPERATURE DROPS BELOW 20°F (ADJ.).

WHEEL DEFROST CYCLE

IF THE WHEEL DIFFERENTIAL PRESSURE RISES 1 INCH. (ADJ) AND THE OUTSIDE AIR TEMPERATURE IS BELLOW 30°F, HE WHEEL SPEED SHALL BE REDUCED VIA WHEEL VARIABLE FREQUENCY DRIVE, OR THE ENERGY RECOVERY WHEEL FACE & BYPASS DAMPERS SHALL MODULATE OPEN TO BYPASS THE WHEEL UNTIL THE PRESSURE RETURNS TO NORMAL. WHEEL DEFROST CONTROL SEQUENCE SHALL BE CHOSEN PER MANUFACTURER'S RECOMMENDATIONS.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- RECOVERY WHEEL ROTATION FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
- RECOVERY WHEEL IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.
- RECOVERY WHEEL RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT (ADJ.).
- RECOVERY WHEEL VFD IN FAULT

SUPPLY FAN:
THE SUPPLY FAN SHALL RUN ANYTIME THE UNIT IS COMMANDED TO RUN. TO PREVENT SHORT CYCLING, THE SUPPLY FAN SHALL HAVE A USER DEFINABLE (ADJ.) MINIMUM RUNTIME, UNLESS SHUTDOWN ON SAFETIES.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- SUPPLY FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
- SUPPLY FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.
- SUPPLY FAN RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT (ADJ.).

EXHAUST FAN:
THE EXHAUST FAN SHALL RUN WHENEVER THE TOTAL ENERGY WHEEL RUNS OR THE UNIT IS IN ECONOMIZER, UNLESS SHUTDOWN ON SAFETIES.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- EXHAUST FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
- EXHAUST FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.
- EXHAUST FAN RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT (ADJ.).

CURRENT SWITCHES SHALL BE INSTALLED IN THE SUPPLY AND EXHAUST FAN STARTERS. THE DDC SYSTEM USES THESE SWITCHES TO CONFIRM THE FANS ARE IN THE DESIRED STATE (I.E. ON OR OFF) AND GENERATES AN ALARM IF STATUS DEVIATES FROM DDC START/STOP CONTROL.

DX COOLING:
THE CONTROLLER SHALL MEASURE THE SUPPLY AIR TEMPERATURE AND SHALL STAGE THE COMPRESSOR AND MODULATE THE VARIABLE SCROLL COMPRESSOR TO MAINTAIN REQUIRED COOLING AND/OR DEHUMIDIFICATION SETPOIN 52°F ADJ PRE-HEAT COIL. THE HOT GAS REHEAT SHALL MODULATE TO MAINTAIN A DISCHARGE AIR TEMPERATURE OF 65° ADJ.

THE COOLING SHALL BE ENABLED WHENEVER:

- OUTSIDE AIR TEMPERATURE IS GREATER THAN 60°F (ADJ.).
- AND THE SUPPLY AIR TEMPERATURE IS ABOVE COOLING SETPOINT.
- AND THE FAN STATUS IS ON.
- SPACE TEMPERATURE CALL FOR COOLING

HOT WATER HEATING COIL:
THE CONTROLLER SHALL MEASURE THE SUPPLY AIR TEMPERATURE AND MODULATE THE HOT WATER HEATING CONTROL VALVE TO MAINTAIN ITS HEATING SETPOINT TO MAINTAIN DISCHARGE AIR TEMPERATURE SET POINT OF 68°F (ADJ).

THE HEATING SHALL BE ENABLED WHENEVER:

- OUTSIDE AIR TEMPERATURE IS LESS THAN 65°F (ADJ.).
- AND THE SUPPLY AIR TEMPERATURE IS BELOW HEATING SETPOINT.
- AND THE FAN STATUS IS ON.
- HOT GAS REHEAT IS INOPERABLE (ALARM SHALL BE GENERATED)

THE HEATING SHALL NORMALLY BE DISABLED WHENEVER COOLING SYSTEM IS ENERGIZED AND HOT GAS REHEATING IS UTILIZED TO PROVIDE RE-HEAT.

OUTSIDE AIR FILTER DIFFERENTIAL PRESSURE MONITOR:
THE CONTROLLER SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE PREFILTER.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- PREFILTER CHANGE REQUIRED: PREFILTER DIFFERENTIAL PRESSURE EXCEEDS A USER DEFINABLE LIMIT (ADJ.).

RETURN AIR FILTER DIFFERENTIAL PRESSURE MONITOR:
THE CONTROLLER SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE FINAL FILTER.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- FINAL FILTER CHANGE REQUIRED: FINAL FILTER DIFFERENTIAL PRESSURE EXCEEDS A USER DEFINABLE LIMIT (ADJ.).

SUPPLY AIR TEMPERATURE:
THE CONTROLLER SHALL MONITOR THE SUPPLY AIR TEMPERATURE.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- HIGH SUPPLY AIR TEMP: IF THE SUPPLY AIR TEMPERATURE IS GREATER THAN 120°F (ADJ.).
- LOW SUPPLY AIR TEMP: IF THE SUPPLY AIR TEMPERATURE IS LESS THAN 45°F (ADJ.).

SPACE HUMIDITY SENSOR

THE DDC SYSTEM SHALL MONITOR THE SYSTEM ZONE HUMIDITY SENSORS AND REPORT THE INFORMATION TO THE BUILDING DDC SYSTEM ROOM GRAPHICS.

CARBON DIOXIDE LEVELS:

IF THE SPACE CARBON DIOXIDE LEVELS VARY BY 10% OR MORE FROM THE DESIGN VALUE OF 850 PPM, AN ALARM SHALL GENERATE AT THE BMS TO ALERT THE BUILDING OPERATOR.

CONTROL POINT	AI	AO	BI	BO	AV	BV	LOOP	SCHED	TREND	ALARM	REMARKS
OUTSIDE AIR FLOW MEASURING STATION	X								X		
SUPPLY AIR FLOW MEASURING STATION	X								X		
EXHAUST AIR FLOW MEASURING STATION	X								X		
OUTSIDE AIR TEMP	X								X		
OUTSIDE AIR HUMIDITY	X								X		
EXHAUST AIR TEMP	X								X		
EXHAUST AIR HUMIDITY	X								X		
ENERGY RECOVERY HEAT WHEEL DISCHARGE AIR TEMP	X								X		
ENERGY RECOVERY WHEEL DISCHARGE AIR HUMIDITY	X								X		
DX SUPPLY AIR TEMP	X								X		
HOT GAS DX REHEAT	X								X		
SUPPLY AIR TEMP	X								X		
SUPPLY AIR HUMIDITY	X								X		
OUTSIDE AIR FILTER DIFFERENTIAL PRESSURE	X								X		
RETURN AIR FILTER DIFFERENTIAL PRESSURE	X								X		
SUPPLY FAN DIFFERENTIAL PRESSURE	X								X		
EXHAUST FAN DIFFERENTIAL PRESSURE	X								X		
RETURN AIR CARBON DIOXIDE PPM	X								X		
RETURN AIR HUMIDITY	X								X		
RETURN AIR TEMP	X								X		
ENERGY RECOVERY WHEEL VFD SPEED	X								X		
SUPPLY FAN VFD SPEED	X								X		
RETURN FAN VFD SPEED	X								X		
DX COOLING STAGES/MODULATION		X							X		
HOT GAS REHEAT MODULATION		X							X		
HOT WATER HEATING CONTROL VALVE		X							X		
RE-CIRC AIR DAMPER		X							X		
OUTSIDE AIR DAMPER		X							X		
EXHAUST AIR DAMPER		X							X		
RETURN AIR SMOKE DETECTOR			X						X	X	
SUPPLY AIR SMOKE DETECTOR			X						X	X	
SUPPLY FAN STATUS			X						X		
EXHAUST FAN STATUS			X						X		
ENERGY RECOVERY WHEEL STATUS			X						X		
ENERGY RECOVERY WHEEL VFD FAULT			X						X	X	
SUPPLY FAN VFD FAULT			X						X	X	
RETURN FAN VFD FAULT			X						X	X	
SUPPLY FAN START/STOP				X					X		
EXHAUST FAN START/STOP				X					X		
ENERGY RECOVERY WHEEL START/STOP				X					X		
COOLING SUPPLY AIR SET POINT					X				X		
HEATING SUPPLY AIR SET POINT					X				X		
EMERGENCY SHUT DOWN						X			X	X	
SCHEDULE								X			
SUPPLY FAN FAILURE										X	
SUPPLY FAN IN HAND										X	
SUPPLY FAN RUNTIME EXCEEDED										X	
EXHAUST FAN FAILURE										X	
EXHAUST FAN IN HAND										X	
EXHAUST FAN RUNTIME EXCEEDED										X	
ENERGY RECOVERY WHEEL ROTATION FAILURE										X	
ENERGY RECOVERY WHEEL IN HAND										X	
TOTAL WHEEL RUNTIME EXCEEDED										X	
HIGH COOLING SUPPLY AIR TEMP										X	
HIGH HEATING SUPPLY AIR TEMP										X	
LOW HEATING SUPPLY AIR TEMP										X	
OUTSIDE AIR FILTER CHANGE REQUIRED										X	
RETURN AIR FILTER CHANGE REQUIRED										X	
HIGH RETURN AIR CARBON DIOXIDE CONCENTRATION										X	
HIGH RETURN AIR HUMIDITY										X	
LOW RETURN AIR TEMP										X	
HIGH RETURN AIR TEMP										X	
SPACE CARBON DIOXIDE PPM	X									X	

ATC CONTRACTOR TO PROVIDE ALL NECESSARY SENSORS, WIRING, PROGRAMMING, & MAPPING AS REQUIRED TO ACHIEVE SEQUENCE & OBTAIN ALL POINTS INDICATED ABOVE. ATC CONTRACTOR TO COORD. W/ UNIT MANUFACTURER TO PROVIDE SEAMLESS COMMUNICATION BETWEEN UNIT CONTROLS, INPUTS/OUTPUTS TO BMS SYSTEM GRAPHICS, & PROVIDE ALL READABLE/WRITEABLE POINTS.

ABBREVIATIONS

ALM	ALARM
AQ	AQUASTAT
ATC	AUTOMATIC TEMPERATURE CONTROLS
BLDG	BUILDING
BMS	BUILDING MANAGEMENT SYSTEM (ENERGY & AUTOMATION)
COMB	COMBUSTION
CO2	CARBON DIOXIDE
CR	CONTROL RELAY
CS	CURRENT SENSOR
CUV	CABINET UNIT VENTILATOR
D	DAMPER
DA	DISCHARGE AIR
DAS	DISCHARGE AIR SENSOR
DCW	DOMESTIC COLD WATER
DHW	DOMESTIC HOT WATER
DDC	DIRECT DIGITAL CONTROL
DO	DAMPER OPERATOR
DP	DIFFERENTIAL PRESSURE
DPR	DAMPER
EA	EXHAUST AIR
EF	EXHAUST FAN
F	FLOW/FARENHEIT (AS APPLICABLE)
FB	FACE & BYPASS
FD	FIRE DAMPER
H	HUMIDITY
HT	HIGH TEMPERATURE
HTG	HEATING
HR	HEAT RECOVERY
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
LT	LOW TEMPERATURE
M	MOTOR
MAT	MIXED AIR TEMPERATURE
NAC	NETWORK APPLICATION CONTROLLER
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
OA	OUTSIDE AIR
OVR	OVERRIDE
P	PRESSURE
PB	PUSH BUTTON
PNL	PANEL
RA	RETURN AIR
REL	RELIEF AIR
RF	RETURN FAN
RFC	RETURN FAN CONTROLLER
RM	ROOM
SA	SUPPLY AIR
SD	SMOKE DAMPER OR SMOKE DETECTOR
SF	SUPPLY FAN
SFC	SUPPLY FAN CONTROLLER
SP	STATIC PRESSURE
T	TEMPERATURE
TEC	TERMINAL EQUIPMENT CONTROLLER
UV	UNIT VENTILATOR
VAC	VOLTS - ALTERNATING CURRENT
VDC	VOLTS - DIRECT CURRENT
VFD	SEE VSD
VLV	VALVE
VP	VELOCITY PROBE (AIRFLOW)
VSD	VARIABLE SPEED (FREQUENCY) DRIVE
XFMR	TRANSFORMER

ATC/BMS GENERAL NOTES

1. ALL SETPOINTS INDICATED IN THE SEQUENCE OF OPERATIONS SHALL BE ADJUSTABLE.

2. THE CONTROL POINTS LISTED IN THE SUMMARY MATRIX ARE THE MINIMUM CONTROL POINTS REQUIRED. PROVIDE ALL CONTROL POINTS AS REQUIRED FOR COMPLETE SYSTEM CONTROL PER THE SEQUENCE OF OPERATIONS.

3. ALL CONTROL WORK INDICATED ON THE CONTROL DIAGRAMS SHALL BE PROVIDED BY THE ATC CONTRACTOR UNLESS NOTED OTHERWISE.

4. ALL ATC CONTROLS SHALL BE POWERED BY EMERGENCY POWER CIRCUITS COORD W/ DIV 260000

5. ALL HW VALVES SJALL BE FAIL OPEN ON LOSS OF POWER

6. ALL HW RADIATION VALVES SHALL BE MODULATING TYPE FOR GPM > 1 GPM, 2-POSITION ACCEPTABLE FOR RADIATION HW FLOW < 1GPM

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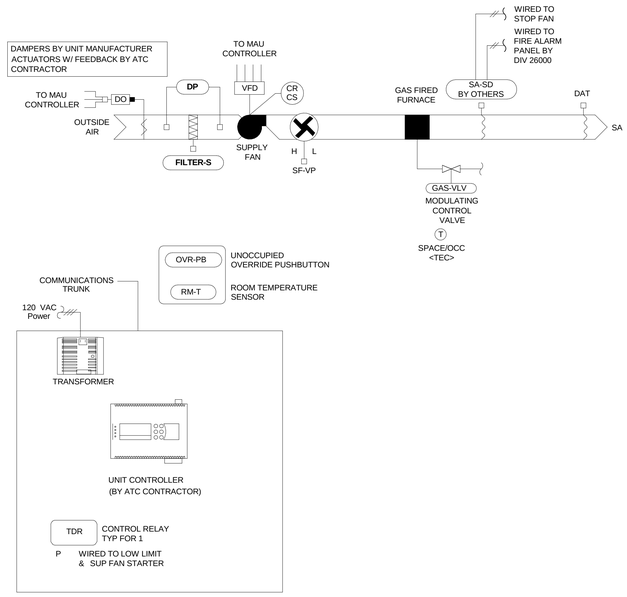
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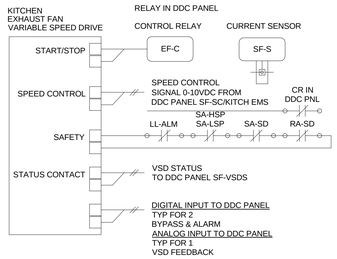
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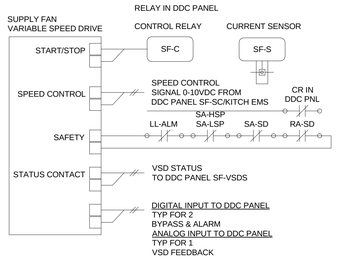
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KITCHEN & CULINARY KITCHEN HOOD MAKE UP AIR UNIT CONTROL SEQUENCE - MAU-1 & 2

DDC CONTROLLER USING ELECTRIC ACTUATION CONTROLS THE MAU AND IS CONTROLLED AS FOLLOWS:

THE ROOFTOP UNIT CONSISTS OF AN OUTDOOR AIR DAMPER, FILTER, GAS FIRED FURNACE AND SUPPLY FAN.

THE ROOFTOP UNIT IS SCHEDULED FOR ON/OFF OPERATION BASED ON A PUSH TO START BUTTON IN THE KITCHEN AND PROVIDES TEMPERED MAKE UP AIR FOR THE KITCHEN HOOD.

THE MAU OPERATES IN OCCUPIED - HOOD OFF, OCCUPIED - HOOD ON, UNOCCUPIED AND SAFETY MODES AS FOLLOWS: (ALL SUGGESTED SETPOINTS AND SETTINGS ARE ADJUSTABLE.)

OCCUPIED - HOOD OFF
THE OUTDOOR AIR DAMPER IS CLOSED AND THE UNIT IS OFF.

OCCUPIED - HOOD ON
THE OUTDOOR AIR DAMPER OPENS TO ITS DESIGN "HOOD ON" POSITION, FULL OPEN AND THE GAS FURNACE CONTROL VALVE OR THE DX COOLING MODULATES TO MAINTAIN THE DISCHARGE AIR TEMPERATURE SETPOINT OF 68° WHEN OAT IS BELOW 60° & 60° WHEN OAT IS ABOVE 60°. THE KITCHEN EXHAUST FAN IS ACTIVATED & MODULATES ITS SPEED BASED ON A SIGNAL FROM THE KITCHEN MANAGEMENT SYSTEM CONTROLLER PROVIDED BY THE KITCHEN CONSULTANT. THE SUPPLY FAN MODULATES AND TRACKS THE EXHAUST FAN SPEED (HTZ) TO A SLIGHT NEGATIVE PRESSURE. THE OUTSIDE AIR DAMPER REMAINS OPEN WHILE THE MAU IS ON. THE ATC CONTRACTOR SHALL PROVIDE ALL THE NECESSARY PROGRAMMING, INTEGRATION, WIRING AND GRAPHICS FOR A COMPLETE AND FUNCTIONAL SYSTEM ASSOCIATED WITH THE KITCHEN MANAGEMENT SYSTEM CONTROLLER. COORDINATE WITH KITCHEN VENDOR FOR WIRING AND PROGRAMMING INFORMATION.

UNOCCUPIED
THE SUPPLY FAN STOPS AND THE OUTDOOR AIR DAMPER CLOSES.

SAFETY
THE SMOKE DETECTOR IN THE SUPPLY AIRSTREAM DE-ENERGIZES THE SUPPLY FAN UPON ACTIVATION. OUTSIDE AIR DAMPER POSITIONS TO THE CLOSED POSITION AFTER THE FAN IS DE-ENERGIZED.

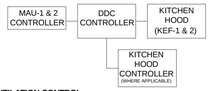
UPON ACTIVATION OF THE ANSUL SYSTEM THE MAU WILL ENTER THE UNOCCUPIED MODE & SHUT DOWN. THE KITCHEN EXHAUST FAN WILL ALSO SHUT DOWN. ATC CONTRACTOR TO PROVIDE RELAY WIRING & PROGRAMMING WITH THE ANSUL SYSTEM TO ACKNOWLEDGE ACTIVATION & SEQUENCE HVAC EQUIPMENT.

UPON SENSING A HIGH CO LEVEL THROUGH THE FIRE ALARM SYSTEM THE MAU WILL ENTER THE UNOCCUPIED MODE & SHUT DOWN. THE KITCHEN EXHAUST FAN WILL START OR CONTINUE TO RUN TO REMOVE ANY RESIDUAL CO. ONCE CO LEVELS RETURN TO NORMAL THE MAU & KEF WILL REVERT TO THEIR NORMAL MODE OF OPERATION.

A CURRENT SWITCH IS INSTALLED IN THE SUPPLY FAN STARTER. THE DDC SYSTEM USES THE SWITCH TO CONFIRM THE FAN IS IN THE DESIRED STATE (I.E. ON OR OFF) AND GENERATES AN ALARM IF STATUS DEVIATES FROM DDC START/STOP CONTROL.

CONTROL POINT	AI	AO	DI	DO	ALARM
SUPPLY FAN S/S & STATUS			X	X	X
OA DAMPER POS.	X	X			X
FILTER STATUS					X
DISCHARGE AIR TEMP.	X	X			
AIRFLOW CFM (SA & RA)	X	X			
GAS FURNACE (MODULATING CONTROL VALVE)		X			
OUTSIDE AIR TEMP. (FROM DDC)	X				
OUTSIDE AIR %RH (FROM DDC)	X				
SMOKE DETECTOR			X		X
SUPPLY FAN VFD	X		X	X	X
KITCHEN EXHAUST FAN VFD	X		X	X	X
ANSUL SYSTEM			X		X
CO LEVEL ALARM			X		X

ATC CONTRACTOR TO PROVIDE ALL NECESSARY SENSORS, WIRING, PROGRAMMING, & MAPPING AS REQUIRED TO ACHIEVE SEQUENCE & OBTAIN ALL POINTS INDICATED ABOVE. ATC CONTRACTOR TO COORD. W/ UNIT MANUFACTURER TO PROVIDE SEAMLESS COMMUNICATION BETWEEN UNIT CONTROLS, INPUTS/OUTPUTS TO BMS SYSTEM GRAPHICS, & PROVIDE ALL READABLE/WRITEABLE POINTS.



MAIN KITCHEN HOOD VENTILATION CONTROL

THROUGH THE "PUSH-TO-START" CONTROL PROVIDED ON THE KITCHEN HOOD THE EXHAUST FAN SHALL START.

WHEN THE KITCHEN HOOD IS OFF THE REVERSE SHALL OCCUR.

THE CONTROL OF THE MAU SUPPLY AND KITCHEN EXHAUST FAN FOR THE KITCHEN HOOD SHALL BE CONTROLLED BY A "KITCHEN HOOD ENERGY MANAGEMENT CONTROL SYSTEM."

AUTO COLLISION SPRAY BOOTH MAKE UP AIR UNIT CONTROL SEQUENCE - MAU-3

DDC CONTROLLER USING ELECTRIC ACTUATION CONTROLS THE MAU AND IS CONTROLLED AS FOLLOWS:

THE ROOFTOP UNIT CONSISTS OF AN OUTDOOR AIR DAMPER, FILTER, GAS FIRED FURNACE AND SUPPLY FAN.

THE ROOFTOP UNIT IS SCHEDULED FOR ON/OFF OPERATION BASED ON A PUSH TO START BUTTON FOR THE SPRAY BOOTH EXHAUST SYSTEM AND PROVIDES TEMPERED MAKE UP AIR FOR THE SPRAY BOOTH.

THE MAU OPERATES IN OCCUPIED - BOOTH OFF, OCCUPIED - BOOTH ON, UNOCCUPIED AND SAFETY MODES AS FOLLOWS: (ALL SUGGESTED SETPOINTS AND SETTINGS ARE ADJUSTABLE.)

OCCUPIED - BOOTH OFF
THE OUTDOOR AIR DAMPER IS CLOSED AND THE UNIT IS OFF.

OCCUPIED - BOOTH ON
THE OUTDOOR AIR DAMPER OPENS TO ITS DESIGN "BOOTH ON" POSITION, FULL OPEN AND THE GAS FURNACE CONTROL VALVE OR THE DX COOLING MODULATES TO MAINTAIN THE DISCHARGE AIR TEMPERATURE SETPOINT OF 68° WHEN OAT IS BELOW 60° & 60° WHEN OAT IS ABOVE 60°. THE EXHAUST FAN IS ACTIVATED WHEN THE SPRAY BOOTH EXHAUST SYSTEM IS ACTIVATED. THE OUTSIDE AIR DAMPER REMAINS OPEN WHILE THE MAU IS ON. THE ATC CONTRACTOR CONTRACTOR SHALL PROVIDE ALL THE NECESSARY PROGRAMMING, INTEGRATION, WIRING AND GRAPHICS FOR A COMPLETE AND FUNCTIONAL SYSTEM.

UNOCCUPIED
THE SUPPLY FAN STOPS AND THE OUTDOOR AIR DAMPER CLOSES.

SAFETY
THE SMOKE DETECTOR IN THE SUPPLY AIRSTREAM DE-ENERGIZES THE SUPPLY FAN UPON ACTIVATION. OUTSIDE AIR DAMPER POSITIONS TO THE CLOSED POSITION AFTER THE FAN IS DE-ENERGIZED.

UPON ACTIVATION OF THE ANSUL SYSTEM THE MAU WILL ENTER THE UNOCCUPIED MODE & SHUT DOWN. THE KITCHEN EXHAUST FAN WILL ALSO SHUT DOWN. ATC CONTRACTOR TO PROVIDE RELAY WIRING & PROGRAMMING WITH THE ANSUL SYSTEM TO ACKNOWLEDGE ACTIVATION & SEQUENCE HVAC EQUIPMENT.

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CONTROL POINT	AI	AO	DI	DO	ALARM
SUPPLY FAN S/S & STATUS			X	X	X
OA DAMPER POS.	X	X			X
FILTER STATUS					X
DISCHARGE AIR TEMP.	X	X			
AIRFLOW CFM (SA & RA)	X	X			
GAS FURNACE (MODULATING CONTROL VALVE)		X			
OUTSIDE AIR TEMP. (FROM DDC)	X				
OUTSIDE AIR %RH (FROM DDC)	X				
SMOKE DETECTOR			X		X
SUPPLY FAN VFD	X		X	X	X
BOOTH EXHAUST FAN VFD	X		X	X	X
CO LEVEL ALARM			X		X

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DO	DAMPER OPERATOR
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DPR	DAMPER
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EF	EXHAUST FAN
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FB	FACE & BYPASS
FD	FIRE DAMPER
H	HUMIDITY
HT	HIGH TEMPERATURE
HTG	HEATING
HR	HEAT RECOVERY
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
LT	LOW TEMPERATURE
M	MOTOR
MAT	MIXED AIR TEMPERATURE
NAC	NETWORK APPLICATION CONTROLLER
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
OA	OUTSIDE AIR
OVR	OVERRIDE
P	PRESSURE
PB	PUSH BUTTON
PNL	PANEL
RA	RETURN AIR
REL	RELIEF AIR
RF	RETURN FAN
RFC	RETURN FAN CONTROLLER
RM	ROOM
SA	SUPPLY AIR
SD	SMOKE DAMPER OR SMOKE DETECTOR
SF	SUPPLY FAN
SFC	SUPPLY FAN CONTROLLER
SP	STATIC PRESSURE
T	TEMPERATURE
TEC	TERMINAL EQUIPMENT CONTROLLER
UV	UNIT VENTILATOR
VAC	VOLTS - ALTERNATING CURRENT
VDC	VOLTS - DIRECT CURRENT
VFD	SEE VSD
VLV	VALVE
VP	VELOCITY PROBE (AIRFLOW)
VSD	VARIABLE SPEED (FREQUENCY) DRIVE
XFMR	TRANSFORMER

ATC/BMS GENERAL NOTES

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HEATING & VENTILATING UNIT CONTROL SEQUENCE - HVU-1, 2, 3, 4, & 5

THE HEATING AND VENTILATING UNIT CONSISTS OF A SUPPLY AIR AND EXHAUST AIR FAN WITH VFD, OUTDOOR, RETURN AND EXHAUST AIR DAMPERS, RETURN AND OUTSIDE AIR FILTERS, ENERGY RECOVERY WHEEL WITH VFD & MODULATING GAS FURNACE. THE UNIT SHALL BE DDC CONTROLLED USING ELECTRIC ACTUATION.

THE UNIT IS SCHEDULE FOR AUTOMATIC OPERATION ON A TIME OF DAY BASIS FOR OCCUPIED AND UNOCCUPIED MODES. COORDINATE WITH OWNER & OWNER'S PROJECT REQUIREMENTS FOR BUILDING OCCUPIED/UNOCCUPIED SCHEDULES.

THE UNIT OPERATES IN OCCUPIED, UNOCCUPIED, WARM-UP, COOL-DOWN AND SAFETY MODES AS FOLLOWS (ALL SUGGESTED SET POINTS AND SETTINGS ARE ADJUSTABLE)

1. WARM-UP : THE OUTSIDE AND EXHAUST AIR DAMPERS CLOSE AND THE RE-CIRC DAMPER OPENS. THE ENERGY RECOVERY WHEEL IS OFF. THE SUPPLY FAN IS ACTIVATED WHILE THE EXHAUST FAN REMAINS OFF. THE DX COOLING SHALL BE DISABLED. THE GAS FURNACE MODULATES TO 100% FOR RAPID RISE IN SPACE TEMPERATURE TO MEET THE OCCUPIED SPACE SETPOINT OF 70 DEGREES (ADJ). MORNING WARM UP SHALL OCCUR (1HR ADJ) PRIOR TO UNIT SCHEDULED OCCUPIED TIME (TIME PERIOD SHALL BE ADJUSTED THRU THE CONTROLLERS OPTIMIZED LOGIC SOFTWARE UTILIZING UNIT TREND DATA).

2. OCCUPIED : THE FANS START OR CONTINUE TO RUN AND THE UNIT IS CONTROLLED AS FOLLOWS: THE SUPPLY FAN SHALL RUN CONTINUOUSLY AND THE EXHAUST FAN SHALL START. BOTH FANS SHALL MODULATE THEIR SPEEDS TO ACHIEVE THE DESIRED CFM AS INDICATED IN THE SCHEDULE. THE OUTSIDE AND EXHAUST AIR DAMPERS SHALL OPEN, THE RECIRCULATION DAMPER CLOSES AND THE ENERGY RECOVERY WHEEL TRANSFERS HEAT TO PREHEAT THE OUTSIDE AIR DURING THE WINTER MONTHS OR EXTRACT HEAT FROM THE OUTSIDE AIR DURING THE COOLING MONTHS TO PRECOOL THE SUPPLY AIR. THE MODULATING GAS FURNACE DEPENDING ON THE AVERAGE SPACE TEMPERATURE WILL MODULATE AS REQUIRED TO MAINTAIN THE AVERAGE SPACE SET POINT OF 70°F (ADJ) IN THE WINTER.

   THE ENERGY WHEEL AND GAS FURNACE SHALL MODULATE IN SEQUENCE WITHOUT OVERLAP TO MAINTAIN THE AVERAGE SPACE TEMPERATURE SET POINT.

3. UNOCCUPIED : UNITS SHALL BE NORMALLY OFF. IF THE SPACE UNOCCUPIED SETBACK TEMPERATURE OF 60°F (ADJ.) IS NOT MAINTAINED, THE RE-CIRC DAMPER SHALL OPEN, THE OUTDOOR AIR DAMPER AND EXHAUST AIR DAMPERS REMAIN CLOSED AND THE ENERGY RECOVERY WHEEL SHALL BE OFF. THE UNIT SUPPLY FAN SHALL START AND MODULATE DOWN TO APPROXIMATELY 60% (ADJ.) OF TOTAL AIR FLOW THROUGH THE CONTROL OF FANS VARIABLE FREQUENCY DRIVE. IN THE EVENT THAT EITHER UNIT DOES NOT MAINTAIN THE AVERAGE SPACE NIGHT SETBACK SETPOINTS FOR 30 MINUTES (ADJ.) THE UNITS SHALL MODULATE ITS FAN SPEED TO 100% UNTIL THE SPACE HUMIDITY OR TEMPERATURE SETPOINT IS ACHIEVED AND MAINTAINED FOR 30 MINUTES. (ADJ.).

4. ECONOMIZER (DUAL ENTHALPY CONTROL) : THE CONTROLLER SHALL MEASURE THE RETURN AIR AND OUTSIDE AIR ENTHALPY TEMPERATURES AND MODULATE THE OUTSIDE AIR DAMPER, RETURN AIR DAMPER, AND VFD OF THE ENERGY RECOVERY WHEEL TO MAINTAIN A SETPOINT 2°F LESS THAN THE COOLING SUPPLY AIR TEMPERATURE SETPOINT. THE ECONOMIZER SHALL BE ENABLED WHENEVER:
   - OUTSIDE AIR TEMPERATURE IS LESS THAN 65°F (ADJ.),
   - AND THE OUTSIDE AIR ENTHALPY IS LESS THAN 22 BTU/LB (ADJ).
   - AND THE OUTSIDE AIR TEMPERATURE IS LESS THAN THE RETURN AIR TEMPERATURE.
   - AND THE OUTSIDE AIR ENTHALPY IS LESS THAN THE RETURN AIR ENTHALPY.
   - AND THE SUPPLY FAN STATUS IS ON.

   THE ECONOMIZER SHALL BE DISABLED WHENEVER:
   - OUTSIDE AIR TEMPERATURE DROPS BELOW 40°F (ADJ.).
   - OR ON LOSS OF SUPPLY FAN STATUS.

6. EMERGENCY SHUTDOWN : THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON RECEIVING AN EMERGENCY SHUTDOWN SIGNAL FROM DDC SYSTEM.

7. SMOKE DETECTION : THE UNIT SHALL SHUT DOWN ALL COMPONENTS AND GENERATE AN ALARM IN THE DDC SYSTEM UPON RECEIVING A SMOKE DETECTOR STATUS

8. ENERGY RECOVERY WHEEL - VARIABLE SPEED:
THE CONTROLLER SHALL MODULATE THE ENERGY RECOVERY WHEEL AS FOLLOWS:

9. HEATING RECOVERY MODE : THE CONTROLLER SHALL MEASURE THE WHEEL DISCHARGE AIR TEMPERATURE AND MODULATE THE WHEEL SPEED TO MAINTAIN A SETPOINT 3°F (ADJ.) LESS THAN THE HEATING SUPPLY AIR TEMPERATURE SETPOINT. THE WHEEL SHALL RUN FOR HEAT RECOVERY WHENEVER:
   - THE UNIT RETURN AIR TEMPERATURE IS 5°F (ADJ.) OR MORE ABOVE THE OUTSIDE AIR TEMPERATURE
   - AND THE ECONOMIZER IS OFF
   - AND THE SUPPLY FAN IS ON.

10. WHEEL DEFROST CYCLE : IF THE WHEEL DIFFERENTIAL PRESSURE RISES TO 1 INCH OF H2O (ADJ.) AND THE OUTSIDE AIR TEMPERATURE IS BELOW 30°F, THE WHEEL SPEED SHALL BE REDUCED VIA THE WHEEL VARIABLE FREQUENCY DRIVE, UNTIL THE PRESSURE RETURNS TO NORMAL. WHEEL DEFROST CONTROL SEQUENCE SHALL BE CHOSEN PER MANUFACTURER'S RECOMMENDATIONS. ALARMS SHALL BE PROVIDED AS FOLLOWS:
   - RECOVERY WHEEL ROTATION FAILURE: COMMANDED ON, BUT THE STATUS IS OFF OR VICE VERSA.
   - RECOVERY WHEEL DP RISES ABOVE 1.5" (ADJ.)
   - RECOVER WHEEL VFD IN FAULT

11. SUPPLY FAN : THE SUPPLY FAN SHALL RUN ANYTIME THE UNIT IS COMMANDED TO RUN. TO PREVENT SHORT CYCLING, THE SUPPLY FAN SHALL HAVE A USER DEFINABLE (ADJ.) MINIMUM RUNTIME, UNLESS SHUT DOWN ON SAFETIES. ALARMS SHALL BE PROVIDED AS FOLLOWS:
   - SUPPLY FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF OR VICE VERSA.
   - SUPPLY FAN VFD: IN FAULT.

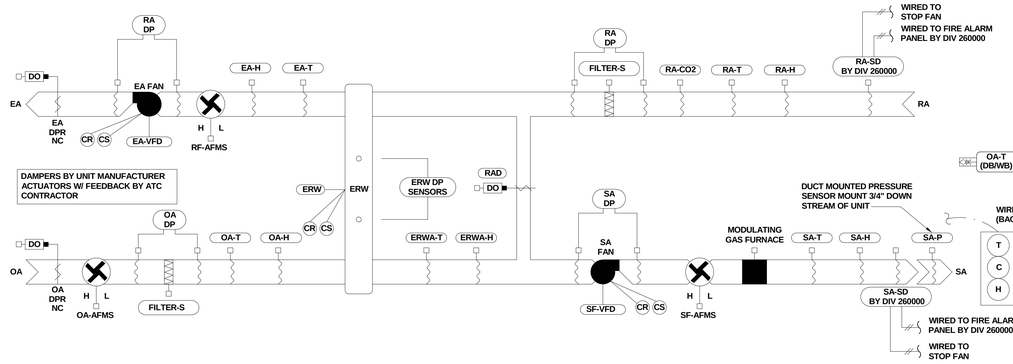
12. EXHAUST FAN : THE EXHAUST FAN SHALL RUN WHENEVER ENERGY WHEEL RUNS OR THE UNIT IS IN OCCUPIED AND/OR ECONOMIZER MODE, UNLESS SHUT DOWN ON SAFETIES. ALARMS SHALL BE PROVIDED AS FOLLOWS:
   - EXHAUST FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF
   - EXHAUST FAN VFD IN FAULT

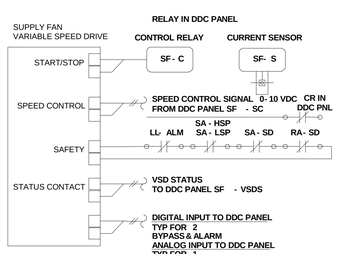
   CURRENT SENSORS SHALL BE INSTALLED ON THE SUPPLY AND EXHAUST FANS. THE DDC SYSTEM USES THESE SENSORS TO CONFIRM THE FANS ARE IN THE DESIRED STATE (I.E. ON OR OFF) AND GENERATES AN ALARM IF STATUS DEVIATES FROM DDC START/STOP CONTROL. IF EITHER SUPPLY OR EXHAUST FAN FAILS, THE OTHER FAN SHALL SHUTDOWN AND AN ALARM SHALL BE GENERATED.

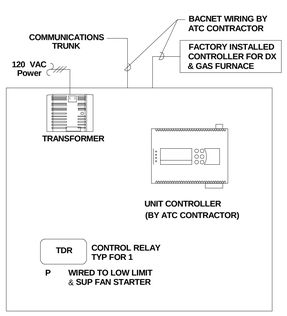
13. OA FILTER DIFFERENTIAL PRESSURE MONITOR : THE CONTROLLER SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE FINAL FILTER. ALARMS SHALL BE PROVIDED AS FOLLOWS:
   - FINAL FILTER CHANGE REQUIRED: FINAL FILTER DIFFERENTIAL PRESSURE EXCEEDS A USER DEFINABLE LIMIT OF 1" W.C. (ADJ.).

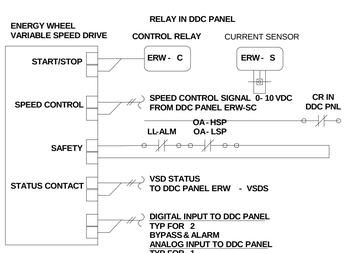
14. RETURN FILTER DIFFERENTIAL PRESSURE MONITOR : THE CONTROLLER SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE FINAL FILTER. ALARMS SHALL BE PROVIDED AS FOLLOWS:
   - RETURN FILTER CHANGE REQUIRED: FINAL FILTER DIFFERENTIAL PRESSURE EXCEEDS A USER DEFINABLE LIMIT OF 1" W.C. (ADJ.).

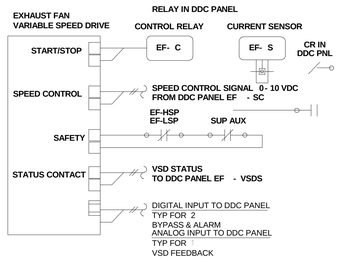
15. CO2 CONTROL
IF THE SPACE CO2 LEVELS VARY BY 10% OR MORE FROM THE DESIGN VALUE (900 PPM, ADJ.), AN ALARM SHALL GENERATE THE BMS TO ALERT THE BUILDING OPERATOR.











CONTROL POINT	AI	AO	BI	BO	AV	BV	LOOP	SCHED	TREND	ALARM	REMARKS
OUTSIDE AIR FLOW MEASURING STATION	X								X		
SUPPLY AIR FLOW MEASURING STATION	X								X		
EXHAUST AIR FLOW MEASURING STATION	X								X		
OUTSIDE AIR TEMP	X								X		
OUTSIDE AIR HUMIDITY	X								X		
EXHAUST AIR TEMP	X								X		
EXHAUST AIR HUMIDITY	X								X		
ENERGY RECOVERY HEAT WHEEL DISCHARGE AIR TEMP	X								X		
ENERGY RECOVERY WHEEL DISCHARGE AIR HUMIDITY	X								X		
SUPPLY AIR TEMP	X								X		
SUPPLY AIR HUMIDITY	X								X		
OUTSIDE AIR FILTER DIFFERENTIAL PRESSURE	X								X		
RETURN AIR FILTER DIFFERENTIAL PRESSURE	X								X		
SUPPLY FAN DIFFERENTIAL PRESSURE	X								X		
EXHAUST FAN DIFFERENTIAL PRESSURE	X								X		
RETURN AIR CARBON DIOXIDE PPM	X								X		
RETURN AIR HUMIDITY	X								X		
RETURN AIR TEMP	X								X		
ENERGY RECOVERY WHEEL VFD SPEED	X								X		
SUPPLY FAN VFD SPEED	X								X		
RETURN FAN VFD SPEED	X								X		
GAS FURNACE MODULATION		X							X		
RE-CIRC AIR DAMPER		X							X		
OUTSIDE AIR DAMPER		X							X		
EXHAUST AIR DAMPER		X							X		
RETURN AIR SMOKE DETECTOR			X						X	X	
SUPPLY AIR SMOKE DETECTOR			X						X	X	
SUPPLY FAN STATUS			X						X		
EXHAUST FAN STATUS			X						X		
ENERGY RECOVERY WHEEL STATUS			X						X		
ENERGY RECOVERY WHEEL VFD FAULT			X						X	X	
SUPPLY FAN VFD FAULT			X						X	X	
RETURN FAN VFD FAULT			X						X	X	
SUPPLY FAN START/STOP				X					X		
EXHAUST FAN START/STOP				X					X		
ENERGY RECOVERY WHEEL START/STOP				X					X		
HEATING SUPPLY AIR SET POINT					X				X		
EMERGENCY SHUT DOWN						X			X	X	
SCHEDULE								X			
SUPPLY FAN FAILURE										X	
SUPPLY FAN IN HAND										X	
SUPPLY FAN RUNTIME EXCEEDED										X	
EXHAUST FAN FAILURE										X	
EXHAUST FAN IN HAND										X	
EXHAUST FAN RUNTIME EXCEEDED										X	
ENERGY RECOVERY WHEEL ROTATION FAILURE										X	
ENERGY RECOVERY WHEEL IN HAND										X	
TOTAL WHEEL RUNTIME EXCEEDED										X	
HIGH COOLING SUPPLY AIR TEMP										X	
HIGH HEATING SUPPLY AIR TEMP										X	
LOW HEATING SUPPLY AIR TEMP										X	
OUTSIDE AIR FILTER CHANGE REQUIRED										X	
RETURN AIR FILTER CHANGE REQUIRED										X	
HIGH RETURN AIR CARBON DIOXIDE CONCENTRATION										X	
HIGH RETURN AIR HUMIDITY										X	
LOW RETURN AIR TEMP										X	
HIGH RETURN AIR TEMP										X	
SPACE CARBON DIOXIDE PPM	X									X	

ATC CONTRACTOR TO PROVIDE ALL NECESSARY SENSORS, WIRING, PROGRAMMING, & MAPPING AS REQUIRED TO ACHIEVE SEQUENCE & OBTAIN ALL POINTS INDICATED ABOVE. ATC CONTRACTOR TO COORD. W/ UNIT MANUFACTURER TO PROVIDE SEAMLESS COMMUNICATION BETWEEN UNIT CONTROLS, INPUTS/OUTPUTS TO BMS SYSTEM GRAPHICS, & PROVIDE ALL READABLE/WRITEABLE POINTS.

ABBREVIATIONS

ALM	ALARM
AQ	AQUASTAT
ATC	AUTOMATIC TEMPERATURE CONTROLS
BLDG	BUILDING
BMS	BUILDING MANAGEMENT SYSTEM (ENERGY & AUTOMATION)
COMB	COMBUSTION
CO2	CARBON DIOXIDE
CR	CONTROL RELAY
CS	CURRENT SENSOR
CUV	CABINET UNIT VENTILATOR
D	DAMPER
DA	DISCHARGE AIR
DAS	DISCHARGE AIR SENSOR
DCW	DOMESTIC COLD WATER
DHW	DOMESTIC HOT WATER
DDC	DIRECT DIGITAL CONTROL
DO	DAMPER OPERATOR
DP	DIFFERENTIAL PRESSURE
DPR	DAMPER
EA	EXHAUST AIR
EF	EXHAUST FAN
F	FLOW/FARENHEIT (AS APPLICABLE)
FB	FACE & BYPASS
FD	FIRE DAMPER
H	HUMIDITY
HT	HIGH TEMPERATURE
HTG	HEATING
HR	HEAT RECOVERY
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
LT	LOW TEMPERATURE
M	MOTOR
MAT	MIXED AIR TEMPERATURE
NAC	NETWORK APPLICATION CONTROLLER
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
OA	OUTSIDE AIR
OVR	OVERRIDE
P	PRESSURE
PB	PUSH BUTTON
PNL	PANEL
RA	RETURN AIR
REL	RELIEF AIR
RF	RETURN FAN
RFC	RETURN FAN CONTROLLER
RM	ROOM
SA	SUPPLY AIR
SD	SMOKE DAMPER OR SMOKE DETECTOR
SF	SUPPLY FAN
SFC	SUPPLY FAN CONTROLLER
SP	STATIC PRESSURE
T	TEMPERATURE
TEC	TERMINAL EQUIPMENT CONTROLLER
UV	UNIT VENTILATOR
VAC	VOLTS - ALTERNATING CURRENT
VDC	VOLTS - DIRECT CURRENT
VFD	SEE VSD
VLV	VALVE
VP	VELOCITY PROBE (AIRFLOW)
VSD	VARIABLE SPEED (FREQUENCY) DRIVE
XFMR	TRANSFORMER

ATC/BMS GENERAL NOTES

1. ALL SETPOINTS INDICATED IN THE SEQUENCE OF OPERATIONS SHALL BE ADJUSTABLE.

2. THE CONTROL POINTS LISTED IN THE SUMMARY MATRIX ARE THE MINIMUM CONTROL POINTS REQUIRED. PROVIDE ALL CONTROL POINTS AS REQUIRED FOR COMPLETE SYSTEM CONTROL PER THE SEQUENCE OF OPERATIONS.

3. ALL CONTROL WORK INDICATED ON THE CONTROL DIAGRAMS SHALL BE PROVIDED BY THE ATC CONTRACTOR UNLESS NOTED OTHERWISE.

4. ALL ATC CONTROLS SHALL BE POWERED BY EMERGENCY POWER CIRCUITS COORD W/ DIV 260000

5. ALL HW VALVES SJALL BE FAIL OPEN ON LOSS OF POWER

6. ALL HW RADIATION VALVES SHALL BE MODULATING TYPE FOR GPM > 1 GPM, 2-POSITION ACCEPTABLE FOR RADIATION HW FLOW < 1GPM

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100% DESIGN DEVELOPMENT
3-15-2016

Dover HS / Career Technical Center
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HVAC - CONTROLS VIII

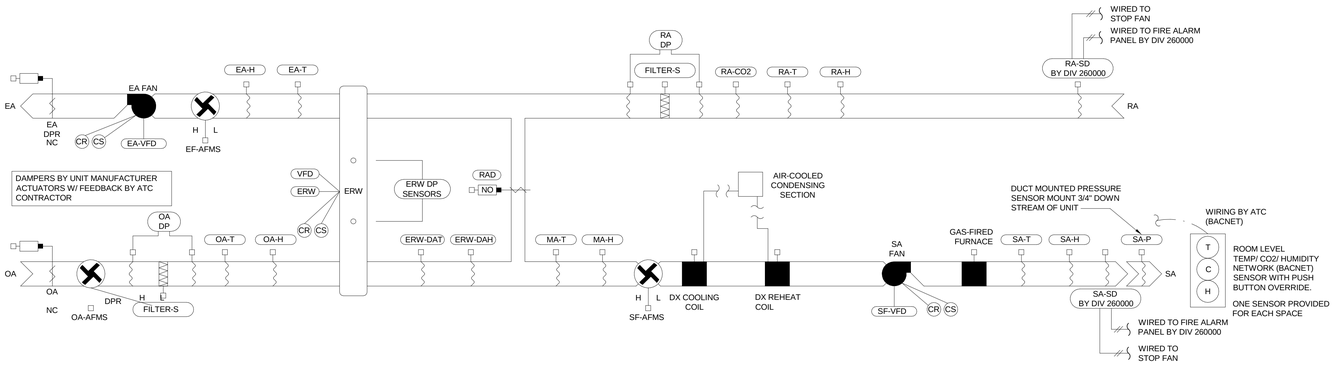
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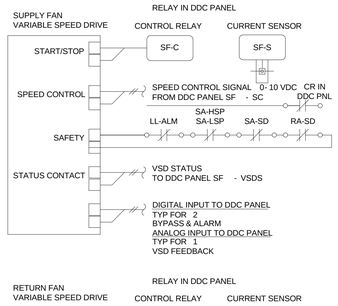
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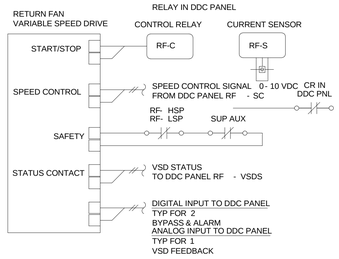
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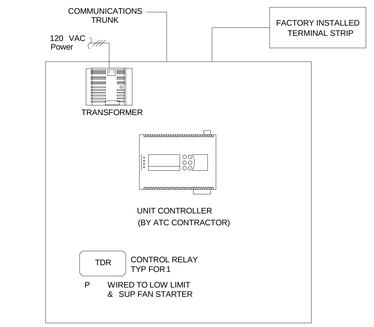
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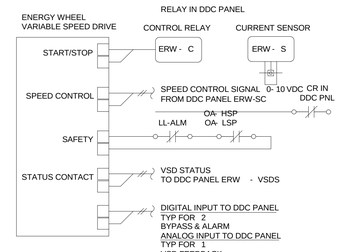
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FULL AIR CONDITIONING RECIRCULATION ROOFTOP UNIT CONTROL SEQUENCE - RTU-11

THE VARIABLE VOLUME ENERGY RECOVERY UNIT CONSISTS OF A SUPPLY AIR AND EXHAUST AIR SECTION WITH OUTDOOR AIR AND EXHAUST AIR DAMPERS AS WELL AS A RE-CIRCULATION DAMPER, RETURN AIR AND OUTSIDE AIR FILTERS, ENERGY RECOVERY WHEEL, MODULATING GAS-FIRED FURNACE, MODULATING DIRECT EXPANSION COOLING SECTION, SUPPLY FANS AND EXHAUST FANS. THE UNIT SHALL BE DDC CONTROLLED USING ELECTRIC ACTUATION.

A DDC CONTROLLER USING ELECTRIC ACTUATION CONTROLS THE AIR HANDLING UNIT OPERATION AS FOLLOWS:

1. RUN CONDITIONS - SCHEDULED : COORDINATE W/ OWNER & OWNER'S PROJECT REQUIREMENTS FOR BUILDING OCCUPIED/UNOCCUPIEDSCHEDULE

2. WARM-UP: THE OUTSIDE AND EXHAUST AIR DAMPERS SHALL CLOSE, THE DIRECT EXPANSION COOLING SHALL BE DISABLED, THE RE-CIR DAMPER SHALL OPEN, THE SUPPLY FAN SHALL START, THE EXHAUST FAN REMAINS OFF, AND THE ENERGY RECOVERY WHEEL SHALL BE OFF. THE GAS FURNACE SHALL MODULATE UP TO 100% TO MAINTAIN A DISCHARGE AIR TEMPERATURE OF 85°F (ADJ.) FOR A RAPID RISE IN SPACE TEMPERATURE AND VAV BOXES ASSOCIATED WITH THE UNIT WILL GO TO 100% OPEN. THE SYSTEM SHALL BE PREVENTED FROM ENTERING THE WARM-UP MODE MORE THAN ONCE PER DAY. THE BMS SHALL MONITOR THE RATE OF TEMPERATURE RISE TO DETERMINE WHEN TO USE THE ROOFTOP UNIT FOR WARM-UP THROUGH THE OPTIMIZED START PROGRAM LOGIC WITHIN THE DDC SYSTEM SOFTWARE.

3. COOLDOWN: THE OUTSIDE AND EXHAUST AIR DAMPERS SHALL CLOSE, THE GAS FURNACE SHALL BE DISABLED, THE ENERGY RECOVERY WHEEL SHALL BE OFF, THE RE-CIR DAMPER SHALL OPEN, VAV BOXES SHALL OPEN TO MAX POSITION, THE SUPPLY FAN SHALL START, AND DX COOLING SECTION SHALL MODULATE TO MAINTAIN DISCHARGE SETPOINT OF 55°F (ADJ). MORNING COOLDOWN SHALL OCCUR (1 HR. ADJ.) PRIOR TO UNIT SCHEDULED OCCUPIED START TIME (TIME PERIOD SHALL BE ADJUSTED THRU THE DDC OPTIMIZED START LOGIC UTILIZING UNIT TREND DATA). ECONOMIZER MODE OF OPERATION SHALL OVERRIDE NORMAL COOLDOWN MODE OF OPERATION.

4. OCCUPIED: THE FANS START OR CONTINUE TO RUN AND THE UNIT IS CONTROLLED AS FOLLOWS: THE SUPPLY AND EXHAUST FAN SHALL RUN AND ADJUST THEIR SPEED BASED ON THE DUCT MOUNTED PRESSURE SENSOR. THE TAB CONTRACTOR SHALL DETERMINE THE EXACT SYSTEM PRESSURE & UTILIZE THIS VALUE AS THE SYSTEM SETPOINT. THE OUTSIDE AIR DAMPER SHALL OPEN TO ITS MINIMUM POSITION OF 25%OF THE SCHEDULED OUTSIDE AIR FLOW. THE EXHAUST DAMPER SHALL RECEIVE THE SAME SIGNAL AS THE OUTSIDE AIR DAMPER & BOTH SHALL MODULATE IN UNISON. THE RETURN AIR DAMPER SHALL RECEIVE THE OPPOSITE SIGNAL AS THE OUTSIDE AIR DAMPER. ALL THREE DAMPERS WILL MODULATE IN SEQUENCE WITHOUT OVERLAP. THE UNIT SHALL BE PROVIDED WITH PROGRAMMING TO ALLOW THE MODULATION OF THE SUPPLY & EXHAUST FANS TO MAINTAIN THE SYSTEM STATIC PRESSURE AS THE ASSOCIATED VAV BOXES MODULATE TO MAINTAIN SPACE TEMPERATURE. THE ENERGY RECOVERY WHEEL WILL PRE-HEAT OR PRE-COOL THE INCOMING OUTSIDE AIR DEPENDING ON THE SEASON. THE DX COOLING OR GAS-FIRED FURNACE SECTION SHALL MODULATE AS REQUIRED TO MAINTAIN THE SPACE TEMPERATURE SETPOINT OF 75°F (SUMMER) & 70°F (WINTER). THE UNIT SHALL UTILIZE THE AVERAGE SPACE TEMPERATURE TO MODULATE THE GAS FURNACE OR DX COOLING.

5. UNOCCUPIED: UNDER THIS MODE ALL UNITS SHALL BE OFF & DAMPERS CLOSED. THE ROOFTOP UNITS SHALL BE ACTIVATED TO MAINTAIN THE UNOCCUPIED NIGHT SETBACK TEMPERATURE OF 60°F (WINTER) & 80°F (SUMMER). THE UNITS WILL FUNCTION AS INDICATED IN THE WARM UP MODE W/ THE EXCEPTION THAT THE FAN SPEED WOULD BE REDUCED TO 60% OF THEIR TOTAL CAPACITY. DURING THE SUMMER MONTHS WHEN OAT IS ABOVE 80° (ADJ) AND/OR RH IS ABOVE 70% (ADJ) & THE SPACES UNOCCUPIED TEMPERATURE SETPOINTS OF 80° (ADJ) & UNOCCUPIED HUMIDITY SETPOINT OF 70% RH ARE NOT MAINTAINED, THEN THE UNITS WILL BE ACTIVATED & FUNCTION AS INDICATED IN THE COOLDOWN MODE W/ THE EXCEPTION THAT THE FAN SPEED WOULD BE REDUCED TO 60% OF THEIR TOTAL CAPACITY.

6. ECONOMIZER (DUAL ENTHALPY CONTROL) : THE CONTROLLER SHALL MEASURE THE RETURN AIR AND OUTSIDE AIR ENTHALPY TEMPERATURES AND MODULATE THE OUTSIDE AIR DAMPER, RETURN AIR DAMPER, AND VFD OF THE ENERGY RECOVERY WHEEL TO MAINTAIN THE SPACE TEMPERATURE SETPOINT. THE ECONOMIZER SHALL BE ENABLED WHENEVER:
   - OUTSIDE AIR TEMPERATURE IS LESS THAN 65°F (ADJ.).
   - AND THE OUTSIDE AIR ENTHALPY IS LESS THAN 22 BTU/LB (ADJ).
   - AND THE OUTSIDE AIR TEMPERATURE IS LESS THAN THE RETURN AIR TEMPERATURE.
   - AND THE OUTSIDE AIR ENTHALPY IS LESS THAN THE RETURN AIR ENTHALPY.
   - AND THE SUPPLY FAN STATUS IS ON.

   THE ECONOMIZER SHALL BE DISABLED WHENEVER:
   - OUTSIDE AIR TEMPERATURE DROPS BELOW 40°F (ADJ.).
   - OR ON LOSS OF SUPPLY FAN STATUS.

7. EMERGENCY SHUTDOWN : THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON RECEIVING AN EMERGENCY SHUTDOWN SIGNAL FROM DDC SYSTEM.

8. SMOKE DETECTION: THE UNIT SHALL SHUT DOWN ALL COMPONENTS AND GENERATE AN ALARM IN THE DDC SYSTEM UPON RECEIVING A SMOKE DETECTOR STATUS.

9. ENERGY RECOVERY WHEEL:
   THE CONTROLLER SHALL MODULATE THE ENERGY RECOVERY WHEEL AS FOLLOWS:

   COOLING RECOVERY MODE : THE WHEEL SHALL RUN FOR COOL RECOVERY WHENEVER:
   - THE UNIT RETURN AIR TEMPERATURE IS 5°F (ADJ.) OR MORE BELOW THE OUTSIDE AIR TEMPERATURE
   - AND THE ECONOMIZER IS OFF
   - AND THE SUPPLY FAN IS ON.

   HEATING RECOVERY MODE : THE WHEEL SHALL RUN FOR HEAT RECOVERY WHENEVER:
   - THE UNIT RETURN AIR TEMPERATURE IS 5°F (ADJ.) OR MORE ABOVE THE OUTSIDE AIR TEMPERATURE
   - AND THE ECONOMIZER IS OFF
   - AND THE SUPPLY FAN IS ON.

   WHEEL DEFROST CYCLE : IF THE WHEEL DIFFERENTIAL PRESSURE RISES TO 1 INCH OF H2O (ADJ.) AND THE OUTSIDE AIR TEMPERATURE IS BELOW 30°F, THE WHEEL SPEED SHALL BE REDUCED VIA THE WHEEL VARIABLE FREQUENCY DRIVE, UNTIL THE PRESSURE RETURNS TO NORMAL. WHEEL DEFROST CONTROL SEQUENCE SHALL BE CHOSEN PER MANUFACTURER'S RECOMMENDATIONS. ALARMS SHALL BE PROVIDED AS FOLLOWS:
   - RECOVERY WHEEL ROTATION FAILURE: COMMANDED ON, BUT THE STATUS IS OFF OR VICE VERSA.
   - RECOVERY WHEEL DP RISES ABOVE 1.5" (ADJ.)
   - RECOVER WHEEL VFD IN FAULT

10. SUPPLY FAN: THE SUPPLY FAN SHALL RUN ANYTIME THE UNIT IS COMMANDED TO RUN. TO PREVENT SHORT CYCLING, THE SUPPLY FAN SHALL HAVE A USER DEFINABLE (ADJ.) MINIMUM RUNTIME, UNLESS SHUT DOWN ON SAFETIES. ALARMS SHALL BE PROVIDED AS FOLLOWS:
    - SUPPLY FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF OR VICE VERSA.
    - SUPPLY FAN VFD: IN FAULT;

11. EXHAUST FAN:THE EXHAUST FAN SHALL RUN WHENEVER THE ENERGY RECOVERY WHEEL RUNS OR THE UNIT IS IN OCCUPIED AND/OR ECONOMIZER MODE, UNLESS SHUT DOWN ON SAFETIES. ALARMS SHALL BE PROVIDED AS FOLLOWS:
    - EXHAUST FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF
    - EXHAUST FAN VFD IN FAULT

    CURRENT SENSORS SHALL BE INSTALLED ON THE SUPPLY AND EXHAUST FANS. THE DDC SYSTEM USES THESE SENSORS TO CONFIRM THE FANS ARE IN THE DESIRED STATE (I.E. ON OR OFF) AND GENERATES AN ALARM IF STATUS DEVIATES FROM DDC START/STOP CONTROL. IF EITHER SUPPLY OR EXHAUST FAN FAILS, THE OTHER FAN SHALL SHUTDOWN AND AN ALARM SHALL BE GENERATED.

12. OA FILTER DIFFERENTIAL PRESSURE MONITOR : THE CONTROLLER SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE FINAL FILTER. ALARMS SHALL BE PROVIDED AS FOLLOWS:
    - FINAL FILTER CHANGE REQUIRED: FINAL FILTER DIFFERENTIAL PRESSURE EXCEEDS A USER DEFINABLE LIMIT OF 1" W.C. (ADJ.).

13. RETURN FILTER DIFFERENTIAL PRESSURE MONITOR : THE CONTROLLER SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE FINAL FILTER. ALARMS SHALL BE PROVIDED AS FOLLOWS:
    - RETURN FILTER CHANGE REQUIRED: FINAL FILTER DIFFERENTIAL PRESSURE EXCEEDS A USER DEFINABLE LIMIT OF 1" W.C. (ADJ.).

14. REFER TO ROOFTOP AIRFLOW DIAGRAM FOR SUPPLY AIR AND RETURN AIR AIRFLOW (CFM) OFFSETS.

15. CO2 CONTROL: AS THE ROOM CO2 LEVEL RISES, THE MINIMUM OUTSIDE AIR-FLOW SET POINT SHALL BE RESET. THE OUTSIDE AIR DAMPER WILL BE OVERRIDDEN TO MODULATE OPEN TO ITS MAX POSITION WHICH IS THE SCHEDULED OUTSIDE AIR FLOW & INTRODUCE AN INCREASED AMOUNT OF FRESH AIR TO REDUCE CO2 LEVELS BACK TO LEVELS BELOW SET POINT. WHILE THE EXHAUST AIR DAMPER TRACKS AND MAINTAINS THE SAME POSITION AS THE OUTSIDE AIR DAMPER. THE RETURN AIR DAMPER RECEIVES THE OPPOSITE SIGNAL. ONCE THE LEVEL OF CO2 IS REDUCED BELOW SET POINT (750 PPM ADJ.) FOR A PERIOD OF 30 MIN (ADJ), THE DMAPER WILL REVERT TO NORMAL OCCUPIED OPERATION.

CONTROL POINT	AI	AO	DI	DO	ALARM	SHOW ON GRAPHIC	REMARKS
OUTSIDE AIR FLOW MEASURING STATION	X					X	
SUPPLY AIR FLOW MEASURING STATION	X					X	
EXHAUST AIR FLOW MEASURING STATION	X					X	
OUTSIDE AIR TEMP	X					X	FROM WEATHER STATION
OUTSIDE AIR HUMIDITY	X					X	FROM WEATHER STATION
EXHAUST AIR TEMP	X					X	
EXHAUST AIR HUMIDITY	X					X	
ENERGY RECOVERY WHEEL DISCHARGE AIR TEMP	X					X	
ENERGY RECOVERY WHEEL DISCHARGE AIR HUMIDITY	X					X	
SUPPLY AIR TEMP	X					X	
SUPPLY AIR HUMIDITY	X					X	
MIXED AIR TEMP	X					X	
MIXED AIR HUMIDITY	X					X	
OUTSIDE AIR FILTER DIFFERENTIAL PRESSURE	X					X	
RETURN AIR FILTER DIFFERENTIAL PRESSURE	X					X	
SUPPLY DUCT STATIC PRESSURE SENSOR	X	X				X	
ENERGY RECOVERY WHEEL DIFFERENTIAL PRESSURE	X					X	
RETURN AIR CARBON DIOXIDE PPM	X					X	
RETURN AIR HUMIDITY	X					X	
RETURN AIR TEMP	X					X	
ENERGY RECOVERY WHEEL VFD SPEED	X	X				X	
SUPPLY FAN VFD SPEED	X	X				X	
RETURN FAN VFD SPEED	X	X				X	
DX COOLING STAGES/MODULATION	X	X				X	
HOT GAS REHEAT MODULATION	X	X				X	
GAS FURNACE MODULATION	X	X				X	
RE-CIRC AIR DAMPER	X	X				X	
OUTSIDE AIR DAMPER	X	X				X	
EXHAUST AIR DAMPER	X	X				X	
RETURN AIR SMOKE DETECTOR			X		X	X	
SUPPLY AIR SMOKE DETECTOR			X		X	X	
SUPPLY FAN STATUS			X			X	
EXHAUST FAN STATUS			X			X	
ENERGY RECOVERY WHEEL STATUS			X			X	
ENERGY RECOVERY WHEEL VFD FAULT			X		X	X	
SUPPLY FAN VFD FAULT			X		X	X	
RETURN FAN VFD FAULT			X		X	X	
SUPPLY FAN START/STOP				X		X	
EXHAUST FAN START/STOP				X		X	
ENERGY RECOVERY WHEEL START/STOP				X		X	
SUPPLY AIR SET POINT						X	
EMERGENCY SHUT DOWN					X	X	
SUPPLY FAN FAILURE					X	X	
SUPPLY FAN VFD IN HAND					X	X	
EXHAUST FAN FAILURE					X	X	
EXHAUST FAN VFD IN HAND					X	X	
ENERGY RECOVERY WHEEL ROTATION FAILURE					X	X	
ENERGY RECOVERY WHEEL VFD IN HAND					X	X	
HIGH SUPPLY AIR TEMP					X	X	10° ABOVE SETPOINT
LOW SUPPLY AIR TEMP					X	X	10° BELOW SETPOINT
OUTSIDE AIR FILTER CHANGE REQUIRED					X	X	
RETURN AIR FILTER CHANGE REQUIRED					X	X	
HIGH RETURN AIR CARBON DIOXIDE CONCENTRATION					X	X	ABOVE 1100 PPM
HIGH RETURN AIR HUMIDITY					X	X	ABOVE 75% RH
LOW RETURN AIR TEMP					X	X	BELOW 50°
HIGH RETURN AIR TEMP					X	X	ABOVE 90°
SPACE CO2	X				X	X	
SPACE TEMP	X				X	X	
SPACE HUMIDITY	X				X	X	

ATC CONTRACTOR TO PROVIDE ALL NECESSARY SENSORS, WIRING, PROGRAMMING, & MAPPING AS REQUIRED TO ACHIEVE SEQUENCE & OBTAIN ALL POINTS INDICATED ABOVE. ATC CONTRACTOR TO COORD. W/ UNIT MANUFACTURER TO PROVIDE SEAMLESS COMMUNICATION BETWEEN UNIT CONTROLS, INPUTS/OUTPUTS TO BMS SYSTEM GRAPHICS, & PROVIDE ALL READABLE/WRITEABLE POINTS.

ABBREVIATIONS

ALM	ALARM
AQ	AQUASTAT
ATC	AUTOMATIC TEMPERATURE CONTROLS
BLDG	BUILDING
BMS	BUILDING MANAGEMENT SYSTEM (ENERGY & AUTOMATION)
COMB	COMBUSTION
CO2	CARBON DIOXIDE
CR	CONTROL RELAY
CS	CURRENT SENSOR
CUV	CABINET UNIT VENTILATOR
D	DAMPER
DA	DISCHARGE AIR
DAS	DISCHARGE AIR SENSOR
DCW	DOMESTIC COLD WATER
DHW	DOMESTIC HOT WATER
DDC	DIRECT DIGITAL CONTROL
DO	DAMPER OPERATOR
DP	DIFFERENTIAL PRESSURE
DPR	DAMPER
EA	EXHAUST AIR
EF	EXHAUST FAN
F	FLOW/FARENHEIT (AS APPLICABLE)
FB	FACE & BYPASS
FD	FIRE DAMPER
H	HUMIDITY
HT	HIGH TEMPERATURE
HTG	HEATING
HR	HEAT RECOVERY
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
LT	LOW TEMPERATURE
M	MOTOR
MAT	MIXED AIR TEMPERATURE
NAC	NETWORK APPLICATION CONTROLLER
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
OA	OUTSIDE AIR
OVR	OVERRIDE
P	PRESSURE
PB	PUSH BUTTON
PNL	PANEL
RA	RETURN AIR
REL	RELIEF AIR
RF	RETURN FAN
RFC	RETURN FAN CONTROLLER
RM	ROOM
SA	SUPPLY AIR
SD	SMOKE DAMPER OR SMOKE DETECTOR
SF	SUPPLY FAN
SFC	SUPPLY FAN CONTROLLER
SP	STATIC PRESSURE
T	TEMPERATURE
TEC	TERMINAL EQUIPMENT CONTROLLER
UV	UNIT VENTILATOR
VAC	VOLTS - ALTERNATING CURRENT
VDC	VOLTS - DIRECT CURRENT
VFD	SEE VSD
VLV	VALVE
VP	VELOCITY PROBE (AIRFLOW)
VSD	VARIABLE SPEED (FREQUENCY) DRIVE
XFMR	TRANSFORMER

ATC/BMS GENERAL NOTES

1. ALL SETPOINTS INDICATED IN THE SEQUENCE OF OPERATIONS SHALL BE ADJUSTABLE.

2. THE CONTROL POINTS LISTED IN THE SUMMARY MATRIX ARE THE MINIMUM CONTROL POINTS REQUIRED. PROVIDE ALL CONTROL POINTS AS REQUIRED FOR COMPLETE SYSTEM CONTROL PER THE SEQUENCE OF OPERATIONS.

3. ALL CONTROL WORK INDICATED ON THE CONTROL DIAGRAMS SHALL BE PROVIDED BY THE ATC CONTRACTOR UNLESS NOTED OTHERWISE.

4. ALL ATC CONTROLS SHALL BE POWERED BY EMERGENCY POWER CIRCUITS COORD W/ DIV 260000

5. ALL HW VALVES SJALL BE FAIL OPEN ON LOSS OF POWER

6. ALL HW RADIATION VALVES SHALL BE MODULATING TYPE FOR GPM > 1 GPM, 2-POSITION ACCEPTABLE FOR RADIATION HW FLOW < 1GPM

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HVAC - CONTROLS IX

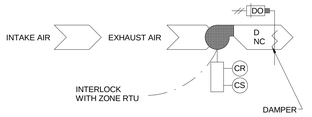
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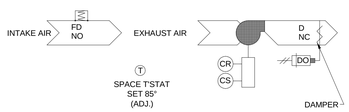
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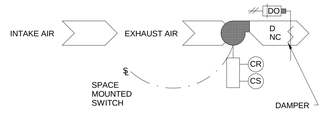
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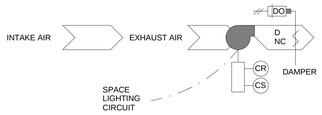
EXHAUST FAN - TYPE I CONTROLS



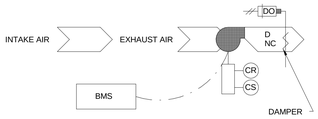
EXHAUST FAN - TYPE II CONTROLS



EXHAUST FAN - TYPE III CONTROLS



EXHAUST FAN - TYPE IV CONTROLS



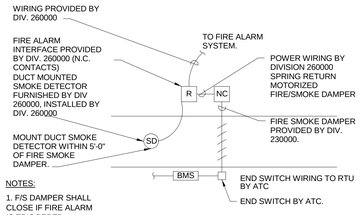
EXHAUST FAN - TYPE V CONTROLS

CONTROL POINT	AI	AO	DI	DO	ALARM	REMARKS
FAN S/S & STATUS			X	X	X	ALL TYPES
EA DAMPER			X		X	INTERLOCK W/ FAN
SPACE TEMP.	X					TYPE II CONTROL
SPACE OCCUPANCY SENSOR			X			TYPE IV CONTROL
FLOW STATION			X			TYPE VII CONTROL

EXHAUST FAN CONTROL

REFER TO DRAWINGS AND SCHEDULES FOR TYPE OF CONTROL REQUIRED FOR EACH FAN. WHERE DETAILS ON THE DRAWINGS CALL FOR MOTOR OPERATED DAMPERS, THESE DAMPERS SHALL BE PROVIDED AND WIRED BY THIS CONTRACTOR TO OPEN DURING THE OCCUPIED CYCLE AND CLOSE DURING THE UNOCCUPIED CYCLE, UNLESS OTHERWISE NOTED. ATC CONTRACTOR SHALL REFER TO EXHAUST FAN SCHEDULE FOR ALL DIRECT DRIVE FANS WITH ECM (GREENHECK VARI-GREEN OR EQUAL) MOTORS. ATC CONTRACTOR SHALL PROVIDE SPEED CONTROL SIGNAL POINT (0-10V - COORDINATED W/ MFGR) AND ASSOCIATED WIRING FROM FAN TO BMS SYSTEM.

1. TYPE I: EXHAUST FAN SHALL BE INTERLOCKED WITH NOTED AIR HANDLING UNIT (REFER TO SCHEDULE) TO RUN WHEN AIR HANDLING UNIT RUNS, AND DE-ENERGIZE WHEN AIR HANDLING UNIT IS OFF.
2. TYPE II: EXHAUST FAN IS CONTROLLED BY SPACE THERMOSTAT. ON A RISE IN SPACE TEMPERATURE, THE EXHAUST FAN SHALL START AND MAKE-UP AIR DAMPERS SHALL OPEN.
3. TYPE III: EXHAUST FAN IS CONTROLLED FROM A WALL MOUNTED SWITCH WITH PILOT LIGHT. SWITCH AND PILOT LIGHT PROVIDED BY DIVISION 230000, WIRED BY DIVISION 260000.
4. TYPE IV: EXHAUST FAN IS WIRED INTO LIGHTING CIRCUIT TO OPERATE WHEN LIGHTS ARE ON. WIRED BY DIVISION 260000.
5. TYPE V: EXHAUST FAN SHALL BE WIRED INTO BUILDING (OR ZONE) TIME CLOCK TO OPERATE DURING OCCUPIED CONDITIONS AND OFF DURING UNOCCUPIED CONDITIONS.

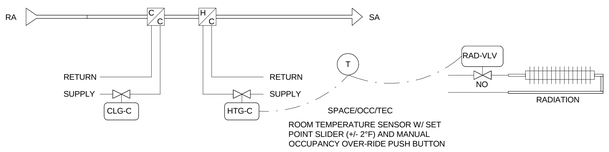


NOTES:

1. F/S DAMPER SHALL CLOSE IF FIRE ALARM IS TRIGGERED AND/OR LOSS OF POWER.
2. ACTIVATED END SWITCH SHALL SHUT DOWN ASSOCIATED RTU.

FIRE/SMOKE DAMPER DETAIL

(NOT TO SCALE)



4-PIPE INDUCTION UNIT CONTROL W/ RADIATION

A DDC TEC CONTROLLER USING ELECTRIC ACTUATION CONTROLS THE INDUCTION UNIT. THE CONTROLS WILL OPERATE ON COOLING CYCLES BASED ON CONTROL SYSTEM INTERLOCK TO INDICATE WHETHER COOLING IS AVAILABLE. WHEN COOLING IS AVAILABLE CHILLER(S) IS OFF (IN HEATING-ONLY MODE), CHILLED WATER VALVES SHALL REMAIN CLOSED. THE SPACE SERVED BY THE INDUCTION UNIT IS CONTROLLED IN OCCUPIED AND UNOCCUPIED MODE AS FOLLOWS:

OCCUPIED
THE INDUCTION UNIT CONTROLLER MONITORS THE ROOM TEMPERATURE SENSOR. INDUCTION UNIT HEATING OR COOLING VALVE SHALL MODULATE OPEN BASED ON ROOM TEMPERATURE TO MAINTAIN THE SPACE TEMPERATURE SET POINT. IN THE HEATING SEASON THE SPACE THERMOSTAT SHALL MODULATE THE RADIATION VALVE OPEN UPON A DECREASE IN SPACE TEMPERATURE. ON A CONTINUED DROP IN SPACE TEMPERATURE, THE INDUCTION UNIT HOT WATER VALVE WILL MODULATE OPEN TO MAINTAIN SPACE TEMPERATURE.UPON A RISE IN SPACE TEMPERATURE ABOVE SET POINT THE REVERSE SHALL OCCUR. THE UNIT REMAINS IN OCCUPIED MODE AS LONG AS THE SPACE MOUNTED OCCUPANCY SENSOR SENSES MOTION AT LEAST ONCE EVERY 10 MINUTES, IF NOT THE UNIT WILL GO INTO STANDBY MODE.

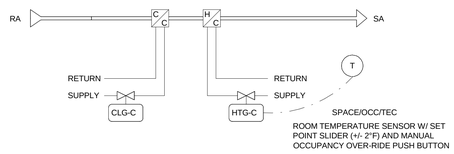
STANDBY MODE (DURING THE DAY)
THE INDUCTION UNIT VALVES REMAIN IN THE UNOCCUPIED MODE UNTIL THE SPACE MOUNTED OCCUPANCY SENSOR INDICATES MOTION IN THE SPACE OR THE SPACE TEMPERATURE IS GREATER THAN 77°F OF LESS THAN 67°F WHICH CAUSES THE VALVES TO OPEN AND THE INDUCTION UNIT TO GO BACK INTO OCCUPIED MODE.

UNOCCUPIED (AT NIGHT)
THE INDUCTION UNIT IS CONTROLLED USING THE UNOCCUPIED SPACE TEMPERATURE SET POINT. THE CONTROLLER MAY RESET TO THE OCCUPIED MODE FOR A PREDETERMINED TIME PERIOD UPON A SIGNAL FROM THE CONTROL SYSTEM OR MANUALLY FROM THE SWITCH AT THE ROOM SENSOR. HOT WATER RADIATION HEATING SHALL BE THE FIRST STAGE OF UNOCCUPIED HEATING. NIGHT SETBACK TEMPERATURE SETPOINTS SHALL BE 60°F FOR HEATING AND 80°F FOR COOLING.

ROOM/ZONE TEMPERATURE SENSORS SHALL HAVE PUSH BUTTON OCCUPIED OVER-RIDE BUTTON CAPABILITY TO MANUALLY CHANGE TO UNIT OCCUPIED MODE FOR A PERIOD OF 3 HOURS (ADJ.)

SAFETY
UPON A HIGH FLOAT CONDITION CHILLED WATER VALVE SHALL CLOSE.

CONTROL POINT	AI	AO	DI	DO	ALARM	REMARKS
SPACE TEMP.	X	X			X	
HHW COIL VALVE	X	X			X	2-PIPE (RETURN), 4-PIPE (SUPPLY)
CHW COIL VALVE	X	X			X	2-PIPE (RETURN), 4-PIPE (SUPPLY)
HHW/CHW COIL VALVE (MODULATING 3-WAY VALVE)	X	X			X	2-PIPE ONLY
RADIATION HHW VALVE	X	X			X	
CONDENSATE OVERFLOW ALARM			X		X	VIA FLOAT SENSOR



4-PIPE INDUCTION UNIT CONTROL

A DDC TEC CONTROLLER USING ELECTRIC ACTUATION CONTROLS THE INDUCTION UNIT. THE CONTROLS WILL OPERATE ON COOLING CYCLES BASED ON CONTROL SYSTEM INTERLOCK TO INDICATE WHETHER COOLING IS AVAILABLE. WHEN COOLING IS AVAILABLE CHILLER(S) IS OFF (IN HEATING-ONLY MODE), CHILLED WATER VALVES SHALL REMAIN CLOSED. THE SPACE SERVED BY THE INDUCTION UNIT IS CONTROLLED IN OCCUPIED AND UNOCCUPIED MODE AS FOLLOWS:

OCCUPIED
THE INDUCTION UNIT CONTROLLER MONITORS THE ROOM TEMPERATURE SENSOR. INDUCTION UNIT HEATING OR COOLING VALVE SHALL MODULATE OPEN BASED ON ROOM TEMPERATURE TO MAINTAIN THE SPACE TEMPERATURE SET POINT. IN THE HEATING SEASON THE SPACE THERMOSTAT SHALL MODULATE THE RADIATION VALVE OPEN UPON A DECREASE IN SPACE TEMPERATURE. ON A CONTINUED DROP IN SPACE TEMPERATURE, THE INDUCTION UNIT HOT WATER VALVE WILL MODULATE OPEN TO MAINTAIN SPACE TEMPERATURE.UPON A RISE IN SPACE TEMPERATURE ABOVE SET POINT THE REVERSE SHALL OCCUR. THE UNIT REMAINS IN OCCUPIED MODE AS LONG AS THE SPACE MOUNTED OCCUPANCY SENSOR SENSES MOTION AT LEAST ONCE EVERY 10 MINUTES, IF NOT THE UNIT WILL GO INTO STANDBY MODE.

STANDBY MODE (DURING THE DAY)
THE INDUCTION UNIT VALVES REMAIN IN THE UNOCCUPIED MODE UNTIL THE SPACE MOUNTED OCCUPANCY SENSOR INDICATES MOTION IN THE SPACE OR THE SPACE TEMPERATURE IS GREATER THAN 77°F OF LESS THAN 67°F WHICH CAUSES THE VALVES TO OPEN AND THE INDUCTION UNIT TO GO BACK INTO OCCUPIED MODE.

UNOCCUPIED (AT NIGHT)
THE INDUCTION UNIT IS CONTROLLED USING THE UNOCCUPIED SPACE TEMPERATURE SET POINT. THE CONTROLLER MAY RESET TO THE OCCUPIED MODE FOR A PREDETERMINED TIME PERIOD UPON A SIGNAL FROM THE CONTROL SYSTEM OR MANUALLY FROM THE SWITCH AT THE ROOM SENSOR. NIGHT SETBACK TEMPERATURE SETPOINTS SHALL BE 60°F FOR HEATING AND 80°F FOR COOLING.

ROOM/ZONE TEMPERATURE SENSORS SHALL HAVE PUSH BUTTON OCCUPIED OVER-RIDE BUTTON CAPABILITY TO MANUALLY CHANGE TO UNIT OCCUPIED MODE FOR A PERIOD OF 3 HOURS (ADJ.)

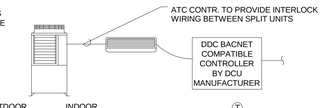
SAFETY
UPON A HIGH FLOAT CONDITION CHILLED WATER VALVE SHALL CLOSE.

CONTROL POINT	AI	AO	DI	DO	ALARM	REMARKS
SPACE TEMP.	X	X			X	
HHW COIL VALVE	X	X			X	2-PIPE (RETURN), 4-PIPE (SUPPLY)
CHW COIL VALVE	X	X			X	2-PIPE (RETURN), 4-PIPE (SUPPLY)
HHW/CHW COIL VALVE (MODULATING 3-WAY VALVE)	X	X			X	2-PIPE ONLY
CONDENSATE OVERFLOW ALARM			X		X	VIA FLOAT SENSOR

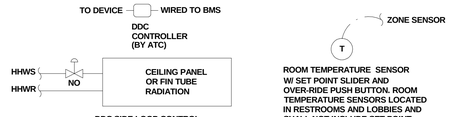
DUCTLESS COOLING UNITS (DCU)

ALL CONDENSATE DRAIN PANS ASSOCIATED WITH DCU'S TO BE PROVIDED WITH EQUIPMENT MANUFACTURER'S OVERFLOW SENSORS WHICH ARE TO BE INTERLOCKED WITH THE BUILDING MANAGEMENT SYSTEM FOR MONITORING ONLY. PROVIDE ROOM TEMPERATURE AND HI/LOW ALARM.

ON AN OVERFLOW ALARM CONDITION COOLING UNIT SHALL BE DE-ACTIVATED



CONTROL POINT	AI	AO	DI	DO	ALARM
DCU SYSTEM S/S & STATUS			X	X	X
SPACE TEMPERATURE	X				X
CONDENSATE OVERFLOW ALARM			X		X



RADIATION

A DDC CONTROLLER USING ELECTRIC ACTUATION CONTROLS THE UNIT OPERATION AS FOLLOWS:

RUN CONDITIONS - SCHEDULED:
THE UNIT SHALL RUN ACCORDING TO A USER DEFINABLE TIME SCHEDULE IN THE FOLLOWING MODES:

- **OCCUPIED MODE: THE UNIT SHALL MAINTAIN A HEATING SETPOINT OF 70°F (ADJ.).**
- **UNOCCUPIED MODE (NIGHT SETBACK): THE UNIT SHALL MAINTAIN A HEATING SETPOINT OF 55°F (ADJ.).**

HEATING COIL VALVE:
THE CONTROLLER SHALL MEASURE THE ZONE TEMPERATURE AND OPEN/CLOSE THE HEATING COIL VALVE TO MAINTAIN ITS HEATING SETPOINT.

THE HEATING SHALL BE ENABLED WHENEVER:

- **OUTSIDE AIR TEMPERATURE IS LESS THAN 65°F (ADJ.).**
- **AND THE ZONE TEMPERATURE IS BELOW HEATING SETPOINT.**

SUMMER OPERATIONS:

- **THE CONTROL VALVE IS CLOSED**

CONTROL POINT	AI	AO	BI	BO	AV	BV	LOOP	SCHED	TREND	ALARM	SHOW ON GRAPHIC	REMARKS
ZONE TEMP	X										X	
HEATING VALVE		X							X		X	
HEATING SETPOINT								X				

ABBREVIATIONS

ALM	ALARM
AQ	AQUASTAT
ATC	AUTOMATIC TEMPERATURE CONTROLS
BLDG	BUILDING
BMS	BUILDING MANAGEMENT SYSTEM (ENERGY & AUTOMATION)
COMB	COMBUSTION
CO2	CARBON DIOXIDE
CR	CONTROL RELAY
CS	CURRENT SENSOR
CUV	CABINET UNIT VENTILATOR
D	DAMPER
DA	DISCHARGE AIR
DAS	DISCHARGE AIR SENSOR
DCW	DOMESTIC COLD WATER
DHW	DOMESTIC HOT WATER
DDC	DIRECT DIGITAL CONTROL
DO	DAMPER OPERATOR
DP	DIFFERENTIAL PRESSURE
DPR	DAMPER
EA	EXHAUST AIR
EF	EXHAUST FAN
F	FLOW/FARENHEIT (AS APPLICABLE)
FB	FACE & BYPASS
FD	FIRE DAMPER
H	HUMIDITY
HT	HIGH TEMPERATURE
HTG	HEATING
HR	HEAT RECOVERY
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
LT	LOW TEMPERATURE
M	MOTOR
MAT	MIXED AIR TEMPERATURE
NAC	NETWORK APPLICATION CONTROLLER
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
OA	OUTSIDE AIR
OVR	OVERRIDE
P	PRESSURE
PB	PUSH BUTTON
PNL	PANEL
RA	RETURN AIR
REL	RELIEF AIR
RF	RETURN FAN
RFC	RETURN FAN CONTROLLER
RM	ROOM
SA	SUPPLY AIR
SD	SMOKE DAMPER OR SMOKE DETECTOR
SF	SUPPLY FAN
SFC	SUPPLY FAN CONTROLLER
SP	STATIC PRESSURE
T	TEMPERATURE
TEC	TERMINAL EQUIPMENT CONTROLLER
UV	UNIT VENTILATOR
VAC	VOLTS - ALTERNATING CURRENT
VDC	VOLTS - DIRECT CURRENT
VFD	SEE VSD
VLV	VALVE
VP	VELOCITY PROBE (AIRFLOW)
VSD	VARIABLE SPEED (FREQUENCY) DRIVE
XFMR	TRANSFORMER

ATC/BMS GENERAL NOTES

1. ALL SETPOINTS INDICATED IN THE SEQUENCE OF OPERATIONS SHALL BE ADJUSTABLE.
2. THE CONTROL POINTS LISTED IN THE SUMMARY MATRIX ARE THE MINIMUM CONTROL POINTS REQUIRED. PROVIDE ALL CONTROL POINTS AS REQUIRED FOR COMPLETE SYSTEM CONTROL PER THE SEQUENCE OF OPERATIONS.
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6. ALL HW RADIATION VALVES SHALL BE MODULATING TYPE FOR GPM > 1 GPM, 2-POSITION ACCEPTABLE FOR RADIATION HW FLOW < 1GPM

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100% DESIGN DEVELOPMENT
3-15-2016

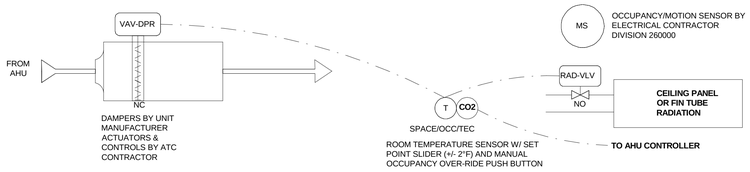
Dover HS / Career Technical Center
Dover, NH
HVAC - CONTROLS X

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DRAWING NUMBER
M4.9

JOB NUMBER 403114

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VARIABLE AIR VOLUME BOX WITH HOT WATER REHEAT AND RADIATION HEATING

A. THE SPACE THERMOSTAT SHALL MODULATE THE NORMALLY OPEN VARIABLE AIR VOLUME BOX DAMPER BETWEEN THE MAXIMUM AND MINIMUM POSITIONS AS INDICATED IN THE DRAWINGS. AT THE MINIMUM POSITION IF THE SPACE TEMPERATURE CONTINUES TO FALL, THE MODULATING FIN TUBE RADIATION VALVE SHALL MODULATE OPEN AS THE FIRST STAGE OF HEATING, FOLLOWED BY MODULATING THE HOT WATER COIL VALVE IN SEQUENCE TO MAINTAIN THE SPACE SET-POINT. AS THE SPACE TEMPERATURE IS SATISFIED THE REVERSE SHALL OCCUR.

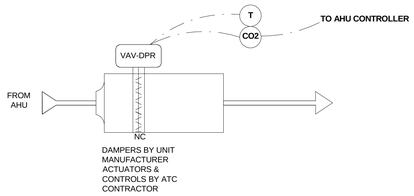
B. DURING UNOCCUPIED THE DAMPER SHALL BE FULL OPEN AND THE HEATING HOT WATER CONTROL VALVE SHALL MODULATE TO MAINTAIN UNOCCUPIED SPACE THERMOSTAT SETPOINT.

C. WHEN THE BOILER IS NOT OPERATING, THE AIR VOLUME DAMPER SHALL MODULATE TO THE COOLING MINIMUM POSITION.

D. ROOM/ZONE TEMPERATURE SENSORS SHALL HAVE PUSH BUTTON OCCUPIED OVER-RIDE BUTTON CAPABILITY TO MANUALLY CHANGE TO UNIT OCCUPIED MODE FOR A PERIOD OF 3 HOURS (ADJ.)

E. THE CO2 SENSOR SHALL MODULATE THE VAV BOX DAMPER TO KEEP THE ROOM CARBON DIOXIDE LEVELS BELOW 1000 PPM. THE CO2 SENSOR SHALL ALSO INTERFACE WITH THE AIR HANDLING UNIT OUTSIDE AIR DAMPER TO CONTROL CARBON DIOXIDE LEVELS AT THE AIR HANDLER LEVEL.

CONTROL POINT	AI	AO	DI	DO	ALARM
DAMPER POS./COMMAND (EACH)	X	X			X
SUPPLY AIR TEMP.	X				
SUPPLY AIR VOLUME (CFM)	X				
ROOM TEMPERATURE	X				
HHW CONTROL VALVE	X	X			
HH W RADIATION VALVE	X	X			
CO2 SENSOR	X				X



VARIABLE AIR VOLUME BOX

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B. DURING UNOCCUPIED THE DAMPER SHALL BE FULL OPEN AND THE HEATING HOT WATER CONTROL VALVE SHALL MODULATE TO MAINTAIN UNOCCUPIED SPACE THERMOSTAT SETPOINT.

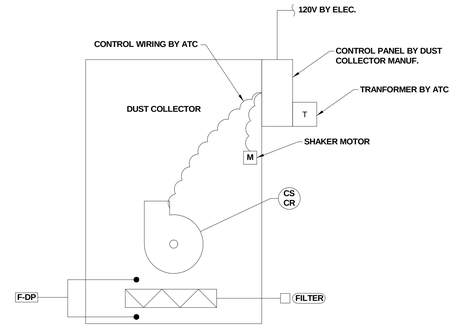
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CONTROL POINT	AI	AO	DI	DO	ALARM	REMARKS
DAMPER POS./COMMAND (EACH)	X	X			X	
SUPPLY AIR TEMP.	X					
SUPPLY AIR VOLUME (CFM)	X					
ROOM TEMPERATURE	X					NOTE #1
CO2 SENSOR	X				X	

NOTE #1: +/- 5°F (ADJ.) FROM SETPOINT.



DUST COLLECTOR UNIT

CONTROL POINT	AI	AO	DI	DO	ALARM	REMARKS
FILTER DP	X				X	
MOTORIZED DAMPER POSITION	X		X	X	X	

ABBREVIATIONS

ALM	ALARM
AQ	AQUASTAT
ATC	AUTOMATIC TEMPERATURE CONTROLS
BLDG	BUILDING
BMS	BUILDING MANAGEMENT SYSTEM (ENERGY & AUTOMATION)
COMB	COMBUSTION
CO2	CARBON DIOXIDE
CR	CONTROL RELAY
CS	CURRENT SENSOR
CUV	CABINET UNIT VENTILATOR
D	DAMPER
DA	DISCHARGE AIR
DAS	DISCHARGE AIR SENSOR
DCW	DOMESTIC COLD WATER
DHW	DOMESTIC HOT WATER
DDC	DIRECT DIGITAL CONTROL
DO	DAMPER OPERATOR
DP	DIFFERENTIAL PRESSURE
DPR	DAMPER
EA	EXHAUST AIR
EF	EXHAUST FAN
F	FLOW/FARENHEIT (AS APPLICABLE)
FB	FACE & BYPASS
FD	FIRE DAMPER
H	HUMIDITY
HT	HIGH TEMPERATURE
HTG	HEATING
HR	HEAT RECOVERY
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
LT	LOW TEMPERATURE
M	MOTOR
MAT	MIXED AIR TEMPERATURE
NAC	NETWORK APPLICATION CONTROLLER
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
OA	OUTSIDE AIR
OVR	OVERRIDE
P	PRESSURE
PB	PUSH BUTTON
PNL	PANEL
RA	RETURN AIR
REL	RELIEF AIR
RF	RETURN FAN
RFC	RETURN FAN CONTROLLER
RM	ROOM
SA	SUPPLY AIR
SD	SMOKE DAMPER OR SMOKE DETECTOR
SF	SUPPLY FAN
SFC	SUPPLY FAN CONTROLLER
SP	STATIC PRESSURE
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ATC/BMS GENERAL NOTES

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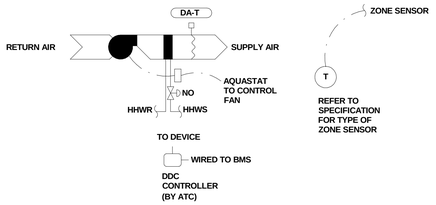
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6. ALL HW RADIATION VALVES SHALL BE MODULATING TYPE
FOR GPM > 1 GPM, 2-POSITION ACCEPTABLE FOR RADIATION
HW FLOW < 1GPM



UNIT HEATER CONTROL: (CABINET, CONCEALED, & WALL TYPE)

A DDC CONTROLLER USING ELECTRIC ACTUATION CONTROLS THE UNIT OPERATION AS FOLLOWS:

RUN CONDITIONS - SCHEDULED:
THE UNIT SHALL RUN ACCORDING TO A USER DEFINABLE TIME SCHEDULE IN THE FOLLOWING MODES:

- OCCUPIED MODE: THE UNIT SHALL MAINTAIN A HEATING SETPOINT OF 68°F (ADJ.).
- UNOCCUPIED MODE (NIGHT SETBACK): THE UNIT SHALL MAINTAIN A HEATING SETPOINT OF 55°F (ADJ.).

FAN:
THE FAN SHALL RUN ANYTIME THE AQUASTAT SENSES WATER TEMPERATURE IS ABOVE 90°F (ADJ) UNLESS SHUTDOWN ON SAFETIES.

HEATING COIL VALVE:
THE CONTROLLER SHALL MEASURE THE ZONE TEMPERATURE AND OPEN/CLOSE THE HEATING COIL VALVE TO MAINTAIN ITS HEATING SETPOINT.

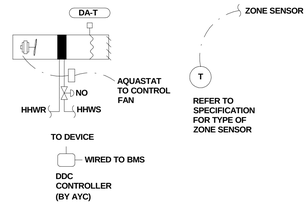
THE HEATING SHALL BE ENABLED WHENEVER:

- OUTSIDE AIR TEMPERATURE IS LESS THAN 65°F (ADJ.).
- AND THE ZONE TEMPERATURE IS BELOW HEATING SETPOINT.

SUMMER OPERATIONS:

- THE FAN IS OFF
- AND THE CONTROL VALVE IS CLOSED

CONTROL POINT	AI	AO	BI	BO	AV	BV	LOOP	SCHED	TREND	ALARM	SHOW ON GRAPHIC	REMARKS
ZONE TEMP	X									X		
HEATING VALVE		X							X	X		
HEATING SETPOINT								X				



UNIT HEATER CONTROL: (PROPELLER TYPE)

A DDC CONTROLLER USING ELECTRIC ACTUATION CONTROLS THE UNIT OPERATION AS FOLLOWS:

RUN CONDITIONS - SCHEDULED:
THE UNIT SHALL RUN ACCORDING TO A USER DEFINABLE TIME SCHEDULE IN THE FOLLOWING MODES:

- OCCUPIED MODE: THE UNIT SHALL MAINTAIN A HEATING SETPOINT OF 68°F (ADJ.).
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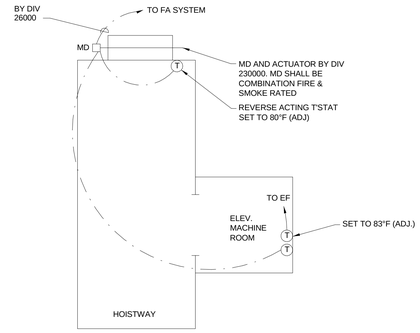
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- AND THE ZONE TEMPERATURE IS BELOW HEATING SETPOINT.

SUMMER OPERATIONS:

- THE FAN IS OFF
- AND THE CONTROL VALVE IS CLOSED

CONTROL POINT	AI	AO	BI	BO	AV	BV	LOOP	SCHED	TREND	ALARM	SHOW ON GRAPHIC	REMARKS
ZONE TEMP	X									X		
HEATING VALVE		X							X	X		
HEATING SETPOINT								X				



ELEVATOR MACHINE ROOM VENTILATION/AC CONTROL

MOTORIZED DAMPER SHALL MODULATE OPEN TO MAINTAIN ELEVATOR MACHINE ROOM SPACE TEMP OF (80° F, ADJ.); MD SHALL FAIL OPEN UPON LOSS OF POWER OR OPEN AS COMMANDED BY FIRE ALARM SYSTEM.

IF ELEVATOR MACHINE ROOM TEMPERATURE RISES ABOVE 83°F, THE RELATED EF SHALL OPERATE TO MAINTAIN SPACE TEMPERATURE SETPOINT AND HOISTWAY MD SHALL CLOSE DURING NORMAL OPERATION.

CONTROL POINT	AI	AO	DI	DO	ALARM	REMARKS
SPACE TEMPERATURE SENSOR	X				X	
MOTORIZED DAMPER POSITION			X	X	X	

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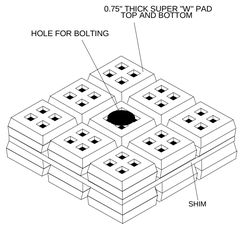
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JOB NUMBER 403114

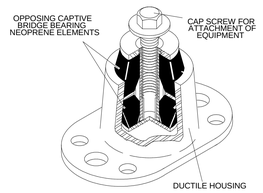
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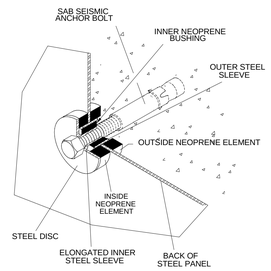
LAYERED SUPER "W" PADS
WITH STEEL SHIM

SPECIFICATION 1



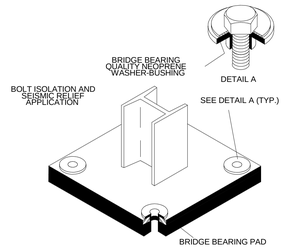
RESTRAINED BR MOUNT

SPECIFICATION 2



PB BUSHING

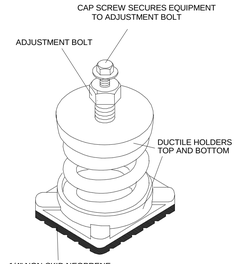
SPECIFICATION 3



THIS VIEW SHOWN WITHOUT BOLTS
AND STEEL WASHERS FOR CLARITY

HG NEOPRENE BUSHING

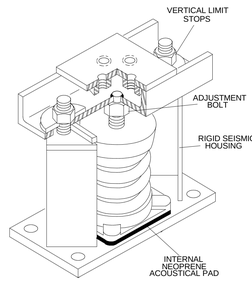
SPECIFICATION 4



1/4" NON-SKID NEOPRENE
ACOUSTICAL ISOLATION PAD

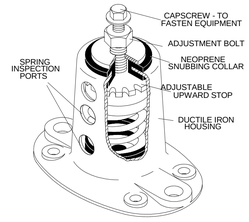
SLF SPRING MOUNT

SPECIFICATION 5



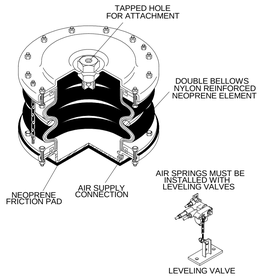
SLR SPRING MOUNT

SPECIFICATION 6



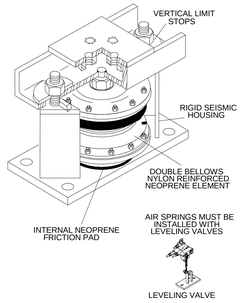
SSLFH HOUSED SPRING MOUNT

SPECIFICATION 7



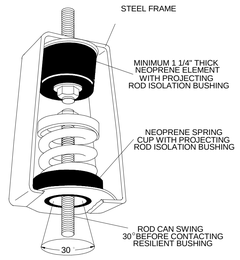
MT AIR SPRING MOUNT

SPECIFICATION 8



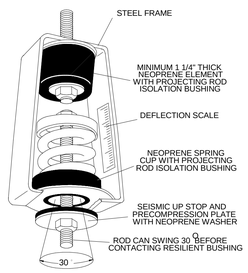
SLR AIR SPRING MOUNT

SPECIFICATION 9



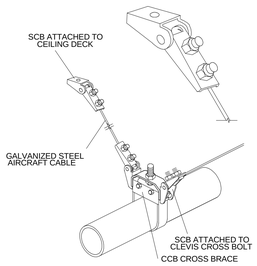
30N SPRING AND NEOPRENE HANGER

SPECIFICATION 10



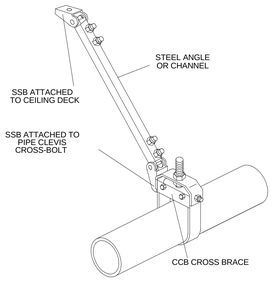
PC30N PRECOMPRESSED
SPRING AND NEOPRENE HANGER

SPECIFICATION 11



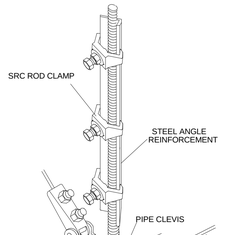
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OSPD PRE-APPROVAL NO. 0202

SPECIFICATION 12



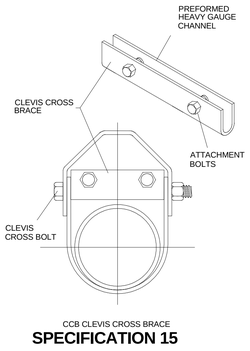
SEISMIC SOLID BRACE

SPECIFICATION 13



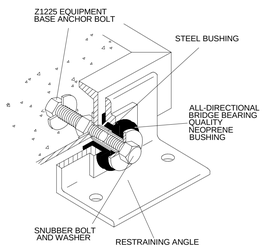
SRC SEISMIC ROD CLAMPS

SPECIFICATION 14



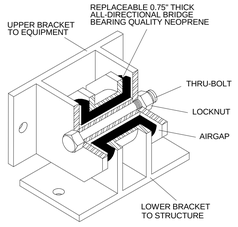
CCB CLEVIS CROSS BRACE

SPECIFICATION 15



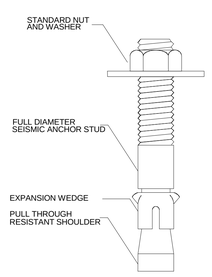
Z1225 ALL DIRECTIONAL SEISMIC SNUBBER

SPECIFICATION 16



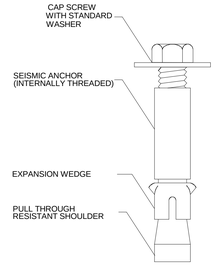
Z1011 ALL DIRECTIONAL SEISMIC SNUBBER

SPECIFICATION 17



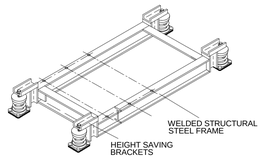
SAS SEISMIC ANCHOR STUD

SPECIFICATION 18



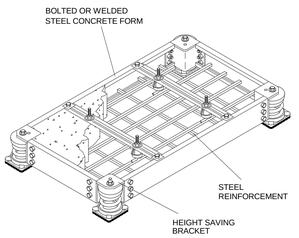
SAB SEISMIC ANCHOR BOLT

SPECIFICATION 19



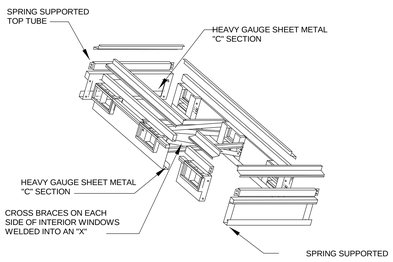
WF WIDE FLANGE STEEL BASE

SPECIFICATION 20



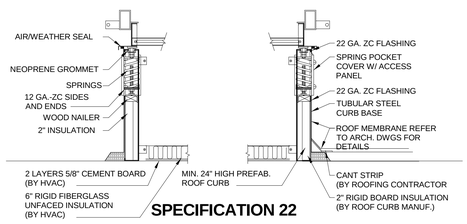
BMK CONCRETE FORM BASE

SPECIFICATION 21



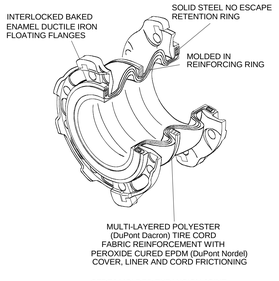
RCS SEISMIC ROOFTOP CURB

SPECIFICATION 22



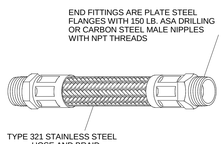
SPECIFICATION 22

SEISMIC SPRING ROOF CURB DETAIL



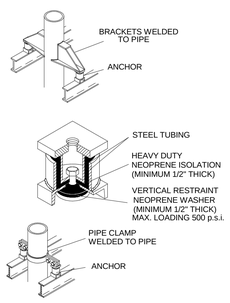
SFDEJ MOLDED EXPANSION JOINT

SPECIFICATION 23



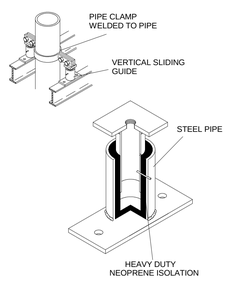
BSS STAINLESS STEEL HOSE

SPECIFICATION 24



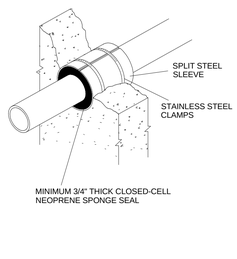
ADA ALL DIRECTIONAL ANCHOR

SPECIFICATION 25



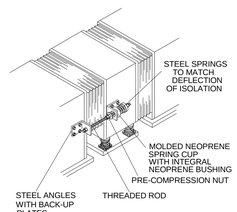
VSG VERTICAL SLIDING GUIDES

SPECIFICATION 26



SWS ACOUSTICAL WALL, CEILING
OR FLOOR SEAL

SPECIFICATION 27



WB HORIZONTAL THRUST RESTRAINTS
USED IN PAIRS

SPECIFICATION 28

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GARCIA GALUSKA DESOUSA
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100% DESIGN DEVELOPMENT
3-15-2016

Dover HS / Career Technical Center
Dover, NH

VIBRATION & SEISMIC DETAILS

SCALE: 1/8" = 1'-0" | DRAWN BY: RLP | CHECKED BY: DP

DRAWING NUMBER
VS.1

JOB NUMBER 403114

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SYMBOL LIST

LIGHTING FIXTURES (see lighting fixture schedule)

OR RECESSED.

FIXTURE WIRED TO NORMAL/EMERGENCY CIRCUIT.

FLUORESCENT BARE LAMP CHANNEL STRIP OR INDUSTRIAL STRIP.

SINGLE FACE INTERNALLY LIT EXIT SIGN, DIRECTIONAL INDICATORS OF THE 'CHEVRON' TYPE AS INDICATED ON DRAWINGS.

DOUBLE FACE INTERNALLY LIT EXIT SIGN, DIRECTIONAL INDICATORS OF THE 'CHEVRON' TYPE AS INDICATED ON DRAWINGS.

CEILING MOUNTED FIXTURE-RECESSED, SURFACE OR PENDANT.

WALL MOUNTED FIXTURE.

FIXTURE KEYING SYSTEM

A1 — 32b — A1 = FIXTURE TYPE 32= CIRCUIT #, b= SWITCH CONTROL

EB — EMERGENCY BATTERY UNIT WITH INTEGRAL HEADS.

TRACK MOUNTED FIXTURES-LENGTH OF TRACK AS INDICATED ON DRAWINGS.

POLE MOUNTED FIXTURE-DOUBLE OR SINGLE HEAD.

SWITCHES (typically mtd 48" AFF ℄ u.n.o)

S_a SINGLE POLE SWITCH-"a" DESIGNATES SWITCH CONTROL (LOWER CASE).

S_2 TWO POLE SWITCH

S_3 THREE-WAY SWITCH.

S_P SINGLE POLE SWITCH WITH PILOT LIGHT-GLOWS IN "OFF" POSITION WHEN IN VIEW OF LIGHTS. GLOWS IN "ON" POSITION WHEN REMOTE FROM LIGHTS.

S_4 FOUR-WAY SWITCH.

S_D DIMMER SWITCH; 0-10V TYPE.

S_K KEY OPERATED SWITCH.

S_T TIMER SWITCH-DIGITAL PROGRAMMABLE TYPE.

S_{WP} WEATHERPROOF SINGLE POLE SWITCH.

S_{XP} EXPLOSION PROOF SINGLE POLE SWITCH.

S_{DT} SINGLE POLE/DOUBLE THROW SWITCH.

S_F FAN SPEED SWITCH.

S_{MC} THREE POSITION MOMENTARY CONTACT SWITCH-UP/DOWN/CENTER OFF.

LIGHTING CONTROLS

SSU — ALCS SYSTEM SERVER UNIT - REFER TO ALCS ONE-LINE DIAGRAM.

ECU — ALCS ENERGY CONTROL UNIT - REFER TO ALCS ONE-LINE DIAGRAM.

NES — ALCS NETWORK ETHERNET SWITCH - REFER TO ALCS ONE-LINE DIAGRAM.

L — ALCS MULTI-ZONE LOCAL STATION - REFER TO ALCS RISER DIAGRAM

L RS — ALCS SINGLE ZONE LOCAL ROUGH SERVICE STATION - REFER TO ALCS RISER DIAGRAM

M — ALCS MULTI-ZONE MASTER STATION - REFER TO ALCS RISER DIAGRAM

MTS — ALCS MASTER TOUCH SCREEN - REFER TO ALCS ONE-LINE DIAGRAM.

LTS — ALCS LOCAL TOUCH SCREEN - REFER TO ALCS ONE-LINE DIAGRAM.

I/O DMX — ALCS DMX512 CONTROL INTERFACE - REFER TO ALCS ONE-LINE DIAGRAM.

PC H — ALCS EXTERIOR PHOTOCELL - REFER TO ALCS ONE-LINE DIAGRAM.

OS — ALCS CEILING OCCUPANCY SENSOR - REFER TO ALCS ONE-LINE DIAGRAM.

PS — ALCS CEILING PHOTO SENSOR - REFER TO ALCS ONE-LINE DIAGRAM.

OS — ALCS WALL OCCUPANCY SENSOR - REFER TO ALCS ONE-LINE DIAGRAM.

I/O — ALCS INPUT/OUTPUT MODULE - REFER TO ALCS ONE-LINE DIAGRAM.

ER — EMERGENCY BY-PASS RELAY - REFER TO EMERGENCY SUPERVISORY BY-PASS RELAY DETAIL

FIRE ALARM SYSTEM

F — MANUAL PULL STATION - MTD 48" AFF TO ℄.

V F — HORN/VISUAL "ADA" COMPLIANT SIGNAL - MTD 80" AFF TO ℄.

V F — VISUAL "ADA" COMPLIANT SIGNAL - MTD 80" AFF TO ℄.

F S — SPEAKER/VISUAL "ADA" COMPLIANT SIGNAL - MTD 80" AFF TO ℄.

F — SPEAKER/VISUAL "ADA" COMPLIANT SIGNAL - CEILING MTD.

S — CEILING MOUNTED PHOTOELECTRIC SMOKE DETECTOR.

S E — SMOKE DETECTOR ALSO USED FOR ELEVATOR RECALL.

S SC — SELF-CONTAINED 120 VOLT SMOKE DETECTOR.

S D — DUCT TYPE SMOKE DETECTOR WITH SAMPLING TUBE. FURNISHED BY EC, INSTALLED BY HVAC, WIRED BY EC.

S D/FSD — DUCT TYPE SMOKE DETECTOR WITH SAMPLING TUBE FOR CONTROL OF ASSOCIATED FSD AND UNIT SHUTDOWN FURNISHED BY EC, INSTALLED BY HVAC, WIRED BY EC.

F H 135° — THERMAL DETECTOR - 135°F FIXED TEMPERATURE AND RATE OF RISE. "F" INDICATES FIXED TEMPERATURE ONLY.

H 200° — THERMAL DETECTOR - 200°F FIXED TEMPERATURE.

REMOTE ALARM INDICATOR-LABEL.

T BD — BEAM SMOKE DETECTOR -"T" DESIGNATES TRANSMITTER, "R" RECEIVER.

RT — KEY OPERATED REMOTE TEST STATION WITH LED-LABEL.

FS — SPRINKLER FLOW SWITCH - F&I BY F.P.C. WIRED BY E.C.

TS — SPRINKLER TAMPER SWITCH - F&I BY F.P.C. WIRED BY E.C.

PS — SPRINKLER PRESSURE SWITCH - F&I BY F.P.C. WIRED BY E.C.

LPS — SPRINKLER LOW PRESSURE SWITCH - F&I BY F.P.C. WIRED BY E.C.

FSD — FIRE SMOKE DAMPER - F&I BY HVAC CONTRACTOR, WIRED BY E.C. CONTROL MODULE AND FIRE ALARM INTERLOCK WIRED BY ELECTRICAL CONTRACTOR.

DH — MAGNETIC DOOR HOLDER - MTD 80" AFF TO ℄.

DC — ELECTRIC DOOR CLOSER-F&I BY HARDWARE, WIRED BY EC.

FACP — FIRE ALARM CONTROL PANEL.

ANN — FIRE ALARM ANNUNCIATOR.

RED FIRE ALARM BEACON - WEATHERPROOF.

WHITE FIRE ALARM BEACON - WEATHERPROOF.

RED FIRE ALARM LIGHT OVER MASTER BOX - WEATHERPROOF.

MM — MONITOR MODULE

CM — CONTROL MODULE

IM — ISOLATION MODULE

K — KEY REPOSITORY BOX (KNOX BOX)

FATC — FIRE ALARM TERMINAL CABINET

EVAC — FIRE ALARM VOICE EVACUATION PANEL.

FCC — FIRE COMMAND CENTER

FIRE FIGHTERS PHONE (PHONE AND CABINET).

PIV — POST INDICATOR VALVE - F&I BY FPC, WIRED BY EC.

CO — WALL MOUNTED CARBON MONOXIDE DETECTOR, MOUNTING HEIGHT PER MANUFACTURERS RECOMMENDATION. PROVIDE ONE MONITOR MODULE PER SENSOR.

E — FIRE ALARM ELECTRIC BELL (120 VOLTS), MOUNTED ABOVE FIRE DEPARTMENT SPRINKLER CONNECTION. FURNISHED BY F.P.C., INSTALLED & WIRED BY E.C.

TECHNOLOGY

W — VOICE OUTLET - AT 18" A.F.F., UNO - SINGLE GANG OPENING WITH SINGLE GANG PLASTER RING AND PULL LINE TO NEAREST ACCESSIBLE CEILING SPACE. MOUNTING DESIGNATIONS: "C"=ABOVE COUNTER, "W" WALL PHONE AT 48" A.F.F. WIRING AND JACKS BY I.T. SUBCONTRACTOR

VOICE/DATA OUTLET - AT 18" A.F.F., UNO - SINGLE GANG OPENING WITH SINGLE GANG PLASTER RING AND PULL LINE TO NEAREST ACCESSIBLE CEILING SPACE. MOUNTING DESIGNATIONS: "C"=ABOVE COUNTER, WIRING AND JACKS BY I.T. SUBCONTRACTOR.

DATA OUTLET - AT 18" A.F.F. UNO-SINGLE GANG OPENING WITH SINGLE GANG PLASTER RING AND PULL LINE TO NEAREST ACCESSIBLE CEILING SPACE. MOUNTING DESIGNATIONS: "C"=ABOVE COUNTER, "AN"=WIRELESS ACCESS POINT MTD. AT 84"A.F.F. JACKS AND WIRING BY I.T. SUBCONTRACTOR.

DATA OUTLET FLUSH FLOOR MOUNTED - PROVIDE FLOOR BOX WITH SINGLE GANG OPENING WITH 1"C. WITH PULL LINE TO NEAREST ACCESSIBLE CEILING OR SAME FLOOR. WIRING AND JACKS BY I.T. SUBCONTRACTOR.

CLOCK, WALL MOUNTED - 120V PIGTAIL CONNECTOR FURNISHED BY I.T. SUBCONTRACTOR AND CONNECTED BY E.C. COORDINATE M.H. WITH I.T. SUBCONTRACTOR. CONNECT TO NEAREST 120V RECEPTACLE CIRCUIT OR AS SHOWN ON DRAWINGS. CLOCK FURNISHED & INSTALLED BY I.T. SUBCONTRACTOR.

72" TVC — VIDEO OUTLET & (2) 20AMP 120VOLT DUPLEX RECEPTACLE OUTLET PROVIDE WIREMOLD SERIES EFSB4 WALL BOX MODEL# EFSB4 OR EQUAL- AT 72"A.F.F., UNO-WITH (1)1"C. FOR DATA AND (1)2"C FOR FUTURE A/V WIRING WITH PULL LINE TO NEAREST ACCESSIBLE CEILING SPACE. DATA WIRING AND JACK BY I.T. SUBCONTRACTOR. SEE DETAIL 6/E4.4

54" TVE — VIDEO OUTLET & (2) 20AMP 120VOLT DUPLEX RECEPTACLE OUTLET PROVIDE WIREMOLD SERIES EFSB4 WALL BOX MODEL# EFSB4 OR EQUAL- AT 54"A.F.F., UNO-WITH (1)1"C. FOR DATA AND (1)2"C FOR FUTURE A/V WIRING WITH PULL LINE TO NEAREST ACCESSIBLE CEILING SPACE. DATA WIRING AND JACK BY I.T. SUBCONTRACTOR. SEE DETAIL 6/E4.4

VOICE/DATA OUTLET - AT 18" A.F.F., UNO - (1)DOUBLE GANG OPENING AND (1) 4"SQ.X4"DEEP J.B. WITH (2) 1"C. WITH PULL LINE TO NEAREST ACCESSIBLE CEILING SPACE. (2) SINGLE GANG OPENINGS AND (2) 4"SQ. X 2 1/2"DP J.B. WITH (2) 1"C. WITH PULL LINE TO NEAREST ACCESSIBLE CEILING SPACE. MOUNTING DESIGNATIONS: "C"=ABOVE COUNTER. WIRING AND JACKS BY I.T. SUBCONTRACTOR.

S — CEILING FLUSH MOUNTED IP SPEAKER. BACKBOX FURNISHED BY IT SUBCONTRACTOR, INSTALLED BY E.C.

H S — FLUSH MOUNTED WALL MOUNTED IP SPEAKER. BACKBOX FURNISHED BY IT SUBCONTRACTOR, INSTALLED BY E.C.

H S WP — FLUSH MOUNTED EXTERIOR IP SPEAKER - BACKBOX FURNISHED BY I.T. CONTRACTOR, INSTALLED BY E.C.

S S — CEILING SURFACE MOUNTED IP SPEAKER. BACKBOX FURNISHED BY IT SUBCONTRACTOR, INSTALLED BY E.C.

V — WALL MOUNTED VOLUME CONTROL OUTLET AS DESIGNATED- SINGLE GANG FACE PLATE WITH SINGLE GANG PLASTER RING AND PULL LINE TO ACCESSIBLE CEILING SPACE. MOUNTING HEIGHT AT 48" A.F.F. UNLESS OTHERWISE NOTED. WIRING AND JACKS BY I.T. SUBCONTRACTOR.

SRP — SMART RESCUE PHONE. CUSTOM BACK BOX FURNISHED BY IT SUBCONTRACTOR AND INSTALL BY E.C. 1" CONDUIT W/PULL STRING TO NEAREST ACCESSIBLE CEILING SPACE BY E.C.. DEVICE AND WIRING BY I.T. SUBCONTRACTOR.

ARA — AREA OF RESCUE ASSISTANCE BUTTON. CUSTOM BACK BOX FURNISHED BY IT SUBCONTRACTOR AND INSTALL BY E.C. 1" CONDUIT W/PULL STRING TO NEAREST ACCESSIBLE CEILING SPACE BY E.C.. DEVICE AND WIRING BY I.T. SUBCONTRACTOR.

M — MICROPHONE OUTLET AS DESIGNATED- SINGLE GANG FACE PLATE AND 4"SQ.X2 1/2"DPJ. BOX. E.C. SHALL PROVIDE 1"C. WITH PULL LINE TO ACCESSIBLE CEILING SPACE. OR DIRECTLY TO AMPLIFIER WHERE EXPOSED STRUCTURE OR NON-ACCESSIBLE CLG. WIRING AND JACKS BY IT SUBCONTRACTOR.

S LS — CEILING MOUNTED LOCAL SOUND SYSTEM SPEAKER. BACKBOX FURNISHED BY IT SUBCONTRACTOR, INSTALLED BY E.C. 1" CONDUIT WITH PULL LINE & RUN TO AMPLIFIER BY E.C..

GS — CEILING MOUNTED GYMNASIUM LOUDSPEAKER. BACKBOX FURNISHED BY IT SUBCONTRACTOR, INSTALLED BY E.C. PROVIDE 1" CONDUIT WITH PULL LINE TO AMPLIFIER.

H A1 — ANTENNA WALL PLATE - AT 9'-0" A.F.F. UNO-SINGLE GANG OPENING AND 4"SQ. X 2 1/2"DP J.B. WITH 1" CONDUIT WITH PULL LINE & RUN TO AMPLIFIER BY E.C.. JACKS AND WIRING BY I.T. SUBCONTRACTOR.

H A — AUDIO INPUT PLATE - AT 18" A.F.F. UNO-SINGLE GANG OPENING AND 4"SQ. X 2 1/2"DP J.B. WITH 1" CONDUIT WITH PULL LINE & RUN TO AMPLIFIER BY E.C.. JACKS AND WIRING BY I.T. SUBCONTRACTOR.

ALS — ASSISTIVE LISTENING SYSTEM. F & I BY I.T. CONTRACTOR.

R — PRIORITY RELAY. F & I BY I.T. CONTRACTOR.

AMP — SOUND SYSTEM AMPLIFIER SYSTEM FURNISHED BY IT SUBCONTRACTOR, INSTALLED AND WIRED BY E.C.

CR — PROVIDE UNI-STRUT GRID MOUNTED DATA OUTLET PROVISION AND AMETEK MODEL # D201057-3 DATA (CAT6) SERIES DATA CORD REELS OR SIMILAR BY LIGHTCAST, VULCAN OR EQUAL BY E.C., ADJACENT TO DATA OUTLET (TYPICAL FOR "CR" DATA OUTLETS) UNI-STRUT GRID MOUNTED DATA OUTLET WIRING AND JACK BY IT SUBCONTRACTOR.

IC — EXTERIOR DOOR VIDEO INTERCOM STATION AT 48"A.F.F. BY E.C. INTERFACE TO INTERCOM SYSTEM TO ALLOW FOR RECORDING, CAMERA CALL-UP IF EXTERIOR INTERCOM STATIONS ARE ACTIVATED. COORDINATE AS REQUIRED WITH SUPPLIER. DUAL GANG BOX, 3/4" CONDUIT & PULL STRING TO NEAREST ACCESSIBLE CEILING SPACE BY E.C. WIRING AND DEVICE BY IT CONTRACTOR.

IMS — DOOR INTERCOM MASTER STATION, PROVIDED BY E.C. SINGLE GANG BOX, 3/4" CONDUIT & PULL STRING TO NEAREST ACCESSIBLE CEILING SPACE BY E.C. WIRING AND DEVICE BY IT CONTRACTOR.

WIRE AND RACEWAYS

WIRING AND RACEWAY - NO. OF DIAGONAL LINES INDICATES NO. #12 AWG CONDUCTORS. ABSENCE OF DIAGONAL LINES INDICATES 2 #12 AWG+#12AWG GROUND UNLESS NOTED OTHERWISE. GROUND WIRE IS NOT SHOWN IN COUNT BUT SHALL BE PROVIDED.

HOMERUN TO PANEL - NO. OF ARROWS INDICATES NO. OF 20 AMP/1 POLE CIRCUITS TO PANEL - UNLESS NOTED OTHERWISE.

NE — NORMAL/EMERGENCY WIRING - MIN. 2#10 AWG + #10 AWG GROUND. RUN IN SEPARATE RACEWAY.

4F — FIRE ALARM WIRING - "4F" INDICATES 4 #14 THHN SOLID IN 3/4" MIN. SIZE CONDUIT.

E — EMERGENCY ONLY WIRING-MINIMUM 2#10 AWG IN SEPARATE RACEWAY.

P — UNDERGROUND PRIMARY ELECTRIC SERVICE

SE — UNDERGROUND SECONDARY ELECTRIC SERVICE

T — UNDERGROUND TELEPHONE SERVICE

CTV — UNDERGROUND CABLE TV SERVICE

F — UNDERGROUND FIRE ALARM SERVICE

4" CONDUIT SLEEVE THRU-WAY, ACROSS CORRIDOR OR BETWEEN ROOMS FOR TEL/DATA - LOCATE ABOVE CEILING.

1" CONDUIT SLEEVE THRU-WAY, ACROSS CORRIDOR OR BETWEEN ROOMS FOR TEL/DATA - LOCATE ABOVE CEILING.

CONDUIT SLEEVE EXTENDED TO NEAREST ACCESSIBLE CEILING- TERMINATE WITH INSULATED BUSHING.

FLEXIBLE CONNECTION TO EQUIPMENT

CABLE TRAY-CONCEALED ABOVE CEILING IN FINISHED AREAS. PROVIDE LATERAL SUPPORT AS REQUIRED.

WW — WIREWAY-SIZE AS REQUIRED.

RECEPTACLES (typically mtd. at 18" a.f.f., uno)

TYPICAL OUTLET NOTATIONS

"a" =SWITCHED OUTLET, "a" - INDICATES SWITCH CONTROL.

"C" = MOUNTED 8" ABOVE COUNTER OR 44" AFF. COORDINATE EXACT MOUNTING HEIGHT WITH ARCHITECTURAL DRAWINGS.

"F" =FURNITURE MTD, COORDINATE EXACT LOCATION WITH FURNITURE PLANS.

"GFC" =GROUND FAULT INTERRUPTER TYPE MOUNTED AT 42" AFF.

"GFI" = GROUND FAULT INTERRUPTER TYPE.

"H" =HORIZONTALLY MOUNTED.

"IG" = ISOLATED GROUND RECEPTACLE WITH SEPARATE GREEN GROUND CONDUCTOR WITH YELLOW STRIPE TO ISOLATED GROUND BUS IN PANEL.

"M" = MODULAR FURNITURE SERVICE - PROVIDE FLEXIBLE CONNECTION, COORDINATE EXACT LOCATION WITH FURNITURE PLANS.

"SP" = SURGE PROTECTION RECEPTACLE

"T" = TAMPER RESISTANT SAFETY RECEPTACLE.

"TL" = TWIST LOCK TYPE.

"WP" = WEATHERPROOF RECEPTACLE WITH "NRTL" LISTED COVERPLATE FOR WET LOCATION WITH GFI TYPE RECEPTACLE INSTALLED IN NEMA 4 ENCLOSURE W/KEY LOCK.

"CD" = CABLE DROP RECEPTACLE- REFER TO CABLE DROP DETAIL.

"P" = PEDESTAL MOUNTED ON CASEWORK WITH GFI RECEPTACLE. COORDINATE WITH EQUIPMENT DRAWINGS FOR EXACT LOCATION.

"E" = RECEPTACLE CONNECTED TO NORMAL/EMERGENCY CIRCUIT.

"G" = OUTLET FOR GOGGLE CABINET, MOUNTED 6'-6" A.F.F. (REFER TO ARCHITECTURAL ELEVATIONS)

20AMP, 120 VOLT SINGLE RECEPTACLE

2 — 20 AMP, 120 VOLT DUPLEX RECEPTACLE; "2" INDICATES CIRCUIT NUMBER.

20AMP, 120 VOLT DOUBLE DUPLEX RECEPTACLE.

SPECIAL PURPOSE OUTLET - RATING AS INDICATED ON DRAWINGS. EXAMPLE; ELECTRIC DRYER= 30A, 125/250V, 3 POLE, 4 WIRE, NEMA 14-30R ELECTRIC RANGE= 50A, 125/250V, 3 POLE, 4 WIRE, NEMA 14-50R

20 AMP, 120 VOLT DUPLEX RECEPTACLE FLUSH FLOOR MOUNTED WITH COVER.

20 AMP, 120 VOLT DOUBLE DUPLEX RECEPTACLE FLUSH FLOOR MOUNTED WITH COVER.

EWC — ELECTRIC WATER COOLER OUTLET - 20 AMP, 120 VOLT. GROUND FAULT INTERRUPTER TYPE

20AMP, 120VOLT DUPLEX RECEPTACLE CONNECTED TO NORMAL/ EMERGENCY CIRCUIT.

SURFACE RACEWAY WITH BASE, COVER, AND DIVIDER "B,C&D". IVORY FINISH. PROVIDE FIBER READY 2" RADIUS FITTINGS. SOLID END INDICATES RISE TO ABOVE ACCESSIBLE CEILING SPACE WITH B,C&D.

20 AMP, 120 VOLT GFI, HORIZONTALLY MOUNTED ON FURNITURE DUPLEX RECEPTACLE INTENDED FOR COMPUTER USE. COLOR OF OUTLET TO BE SELECTED BY OWNER.

20 AMP, 120 VOLT DUPLEX RECEPTACLE INTENDED FOR COMPUTER USE. COLOR OF OUTLET TO BE SELECTED BY OWNER.

20AMP, 120VOLT DOUBLE DUPLEX RECEPTACLE INTENDED FOR COMPUTER USE. COLOR OF OUTLET TO BE SELECTED BY OWNER.

TWO DUPLEX RECEPTACLES, MOUNTED AT 18" AFF AND 84" AFF.

RECESSED FLOOR BOX WITH (2) 20A, 120V DUPLEX RECEPTACLES AND PROVISIONS FOR (4) RJ45 JACKS EQUAL TO WIREMOLD #RFB4-XX - FPCTCBS (CARPET), FPBTCBS (WOOD FLOOR), HUBBELL, FSR OR EQUAL. PROVIDE 1"C FOR TEL/DATA TO NEAREST ACCESSIBLE CEILING SPACE.

RECESSED FLOOR BOX WITH (2) 20A, 120V DUPLEX RECEPTACLES AND PROVISIONS FOR (4) RJ45 JACKS EQUAL TO WIREMOLD #RFB8S-XX - FPCTCBS (CARPET), FPBTCBS (WOOD FLOOR), HUBBELL, FSR OR EQUAL. PROVIDE (6)1"C FOR TEL/DATA TO NEAREST ACCESSIBLE CEILING SPACE.

1V/3D/4D — FLUSH MOUNTED 2 HOUR RATED POKE-THRU ASSEMBLY WITH (2) DUPLEX RECEPTACLES & (4) COMMUNICATION DEVICES WITH SOLID BRASS FINISH RING. REQUIRES 6" CORED HOLE. EQUAL TO WIREMOLD, HUBBELL, FSR.

2V/4D — FLUSH MOUNTED 2 HOUR RATED POKE-THRU ASSEMBLY WITH (2) DUPLEX RECEPTACLES & (6) COMMUNICATION DEVICES WITH SOLID BRASS FINISH RING. REQUIRES 6" CORED HOLE. EQUAL TO WIREMOLD, HUBBELL, FSR.

FLUSH MOUNTED 2 HOUR RATED POKE-THRU ASSEMBLY WITH (2) DUPLEX RECEPTACLES & (2) COMMUNICATION DEVICES WITH SOLID BRASS FINISH RING. REQUIRES 8" CORED HOLE. EQUAL TO WIREMOLD, HUBBELL, FSR.

CR — PROVIDE UNI-STRUT GRID MOUNTED RECEPTACLE ON UNI-STRUT GRID. PROVIDE KH INDUSTRIES MODEL # RTBB3LW-1GD520-H12F SERIES ELECTRIC CORD REEL OR SIMILAR BY REELCRAFT, GLEASON OR EQUAL AND MOUNT ADJACENT TO RECEPTACLE. (TYPICAL FOR "CR" RECEPTACLES)

POWER

120/208 VOLT, 3 PHASE, 4 WIRE PANELBOARD.

277/480 VOLT, 3 PHASE, 4 WIRE, PANELBOARD.

120/208 VOLT, 3 PHASE, 4 WIRE NORMAL/EMERGENCY SYSTEM PANELBOARD.

277/480 VOLT 3 PHASE, 4 WIRE NORMAL/EMERGENCY SYSTEM PANELBOARD.

PANELBOARD FLUSH MOUNTED.

T5 T — DRY TYPE TRANSFORMER - REFER TO TRANSFORMER SCHEDULE FOR RATINGS "T5"-INDICATES 45KVA TRANSFORMER. "K13" INDICATES TRANSFORMER WITH A K13 RATING.

E — ELECTRIC MANHOLE

T — TELEPHONE MANHOLE

C — CATV MANHOLE

M — METER SOCKET

J J — JUNCTION BOX - SIZE AS REQUIRED.

DW J — JUNCTION BOX - WITH FLEXIBLE CONNECTION TO EQUIPMENT-"DW" DENOTES DISHWASHER, "H" HOOD, "WO" WALL OVEN, "D" DISPOSER, "HD" HAND DRYER.

3R — FUSED DISCONNECT SWITCH HEAVY DUTY TYPE-"3R" INDICATES NEMA 3R
20 — INDICATES TIME DELAY FUSE SIZE.
30 — INDICATES SAFETY SWITCH SIZE

3R — UNFUSED DISCONNECT SWITCH HEAVY DUTY TYPE-"3R" INDICATES NEMA 3R

RV — MAGNETIC MOTOR STARTER, "RV" INDICATES REDUCED VOLTAGE.

COMBINATION FUSED DISCONNECT AND MOTOR STARTER

TS — HORSEPOWER RATED THERMAL SWITCH WITH PILOT LIGHT

VFD — VARIABLE FREQUENCY DRIVE.

C — MULTI-POLE CONTACTOR IN NEMA I ENCLOSURE-RATINGS AND NUMBER OF POLES AS REQUIRED.

CP — EQUIPMENT CONTROL PANEL.

UCP — UTILITY CONTROL PANEL (LABS)

ATS — AUTOMATIC TRANSFER SWITCH.

HOA — HAND-OFF-AUTOMATIC SELECTOR SWITCH.

THREE FUNCTION PUSHBUTTON SWITCH (UP/DOWN/STOP)-FURNISHED BY EQUIPMENT SUPPLIER, INST. & WIRED BY EC.

ON/OFF PUSHBUTTON SWITCH.

70AT 100AF CB — ENCLOSED CIRCUIT BREAKER-"70AT" INDICATES 70 AMP TRIP, "100AF" INDICATES 100 AMP FRAME.

PB — PULL BOX-SIZE AS REQUIRED.

G — GENERATOR.

ONE LINE POWER

LOAD-BREAK SWITCH.

CIRCUIT BREAKER.

CURRENT TRANSFORMER

POTENTIAL TRANSFORMER.

LA — LIGHTNING ARRESTER AND GROUNDING TO PROTECT ALL PHASES.

CONTACT, NORMALLY OPEN (NO).

CONTACT, NORMALLY CLOSED (NC).

ST — SHUNT TRIP COIL.

CM — CUSTOMER METERING, ELECTRONIC SOLID STATE, UNLESS OTHERWISE INDICATED.

POWER TRANSFORMER.

FUSE, SIZE AS INDICATED.

GF — GROUND FAULT SENSOR & RELAY.

400A / 300A — SWITCH AND FUSE "400A" - INDICATES AMPERE SWITCH SIZE. "300A" - INDICATES AMPERE FUSE SIZE.

SYSTEM GROUND OR EQUIPMENT GROUND.

N NORM / E EMERG / LOAD — AUTOMATIC TRANSFER SWITCH.

K_1 — KIRK-KEY INTERLOCK

MISCELLANEOUS-DEVICES

EPO — EMERGENCY POWER SHUNT TRIP - RED MUSHROOM HEAD WITH EXTENDED GUARD WITH EMERGENCY OFF LEGEND. MOUNT AT 48" AFF., U.O.I. PROVIDE NAMEPLATE INDICATING LOAD CONTROLLED "B" - INDICATES BREAK GLASS STATION WITH HAMMER SUPPORT CLIP AND FIVE REPLACEMENT DISCS STORED INSIDE BOX SUPPORTING DEVICE.

O — HANDICAP DOOR ACTIVATE SWITCH-FURN. & INST. BY SYSTEM SUPPLIER. PROVIDE 4"SQ X 2 1/2"DP JB AND 1"C WITH PULL LINE TO ELECTRIC DOOR OPERATOR.

SV — SOLENOID VALVE - F&I BY P.C., WIRED BY E.C.

TC — TIMECLOCK - 7 DAY DIGITAL WITH BATTERY BACK-UP.

EFS — EYE WASH FLOW SWITCH-F&I BY P.C., 120 VOLT BY E.C., MONITORING WIRING TO BMS BY ATC CONTRACTOR.

TPD — TEMPERATURE SENSOR - CONNECT TO SECURITY SYSTEM.

LS — LIMIT SWITCH.

B — DOOR BELL-COORDINATE MH WITH ARCHITECT.

LOW VOLTAGE PUSHBUTTON.

1 / E-3 — DETAIL IDENTIFIER-INDICATES DETAIL #1 ON DWG. E-3.

GROUND BAR 24W" X 1/8" THICK X 18" LONG COPPER BUS, U.N.O.

A A / E-3 — SECTION IDENTIFIER- INDICATES SECTION A-A, DETAIL #2 ON DWG. E-3.

K2 — EQUIPMENT TAG NUMBER, REFER TO EQUIPMENT SCHEDULE, "K" INDICATES KITCHEN "C" INDICATES COMPUTER.

1 — KEYED SHEET NOTE SYMBOL, "1" INDICATES TO REFER TO NOTE #1

3 — CIRCUIT SIZE NUMBER, REFER TO "CIRCUIT SIZE SCHEDULE".

SB — SCOREBOARD CONTROL OUTLET - WALL MOUNTED AT 18" A.F.F. OR FLOOR BOX. UNO - SINGLE GANG OPENING AND 4"SQ. X 2 1/2"DP J.B. WITH 1"C. WIRING AND JACKS BY I.T. CONTRACTOR.

ADA CS — ADA "CALL STATION", HANDS FREE. MOUNT AT 48"AFF.

ADA MCS — ADA "MASTER CALL STATION", HANDS FREE. MOUNT AT 48"AFF.

P — EMERGENCY CALL STATION - LOCATE WITHIN 3' OF WATER CLOSET WITH PULL CORD EXTENDING TO WITHIN 12" OF THE FLOOR.

AV — AUDIO/VISUAL SIGNAL FOR SINGLE TOILETS. MOUNT OVER DOOR.

E — ELECTRIC DOOR-OPERATOR. FURN. & INST. BY GC, WIRED BY EC.

CO — WALL MOUNTED COMBUSTIBLE GAS DETECTOR (CH4) . PROVIDE A FIRE ALARM CONTROL MODULE PER DETECTOR FOR MONITORING BY THE FACP. MOUNT 1' BELOW CEILING.

LS — LIMIT SWITCH FURNISHED BY SYSTEM SUPPLIER, WIRED BY E.C.

MECHANICAL EQUIPMENT

(REFER TO MECHANICAL EQUIPMENT SCHEDULE)

BB — ELECTRIC BASEBOARD-FURNISHED BY HVAC, INSTALLED AND WIRED BY EC.

CH — CABINET HEATER - F & I BY HVAC, WIRED BY E.C.

UH — UNIT HEATER - F & I BY HVAC, WIRED BY E.C.

EF — EXHAUST FAN - F & I BY HVAC, WIRED BY E.C.

C.O. J — CONNECTION TO CARBON MONOXIDE MONITOR MIN. 3#14 AWG. PER MONITOR.

TB — TERMINAL BOX-F&I BY HVAC WIRED BY E.C.

FS D — MOTORIZED FIRE/SMOKE DAMPER-F&I BY HVAC, WIRED BY E.C. TO POWER & FIRE ALARM SYSTEM.

2 — MOTOR - NUMERAL INDICATES HORSEPOWER

EXISTING EQUIPMENT

DOTTED DENOTES EXISTING EQUIPMENT.

X — EXISTING EQUIPMENT TO BE REMOVED AND CIRCUIT PULLED BACK TO NEXT ACTIVE OUTLET/BACK TO PANEL.

XM — EXISTING EQUIPMENT TO REMAIN.

XR — EXISTING EQUIPMENT TO BE REMOVED AND RELOCATED.

XL — NEW LOCATION OF RELOCATED EXISTING EQUIPMENT.

XN — EXISTING EQUIPMENT TO BE REMOVED AND NEW EQUIPMENT INSTALLED IN VICINITY OF EXISTING LOCATION. REFER TO DETAILS FOR MOUNTING HEIGHTS.

SECURITY SYSTEM

REFER TO DWG. E5.0 FOR SECURITY SYMBOL LIST

A/V SYSTEM

REFER TO DWG. -/- FOR A/V SYMBOL LIST

ABBREVIATIONS

A	AMPERE
AL	ALUMINUM
AF	AMP. FRAME
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AIC	INTERRUPTING CAPACITY
ALCS	AUTOMATED LIGHTING CONTROL SYSTEM
ARCH	ARCHITECT
AT	AMP TRIP
ATC	AUTO-TEMP CONTROL CONTRACTOR
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
C	CONDUIT (GENERIC TERM FOR RACEWAY, PROVIDE AS SPECIFIED)
CATV	CABLE TELEVISION
CB	CIRCUIT BREAKER
CKT	CIRCUIT
CLG	CEILING
CM	CONSTRUCTION MANAGER
CU	COPPER
℄	CENTERLINE
DEP	DEPARTMENT OF ENVIRONMENTAL PROTECTION
DP	DEEP
EPA	ENVIRONMENTAL PROTECTION AGENCY
DWG	DRAWING
EC	ELECTRICAL CONTRACTOR
EWC	ELECTRIC WATER COOLER
EMT	ELECTRIC METALLIC TUBING
FA	FIRE ALARM
FPC	FIRE PROTECTION SYSTEM CONTRACTOR
F&I	FURNISHED AND INSTALLED
G,GND	GROUND
CM	GENERAL CONTRACTOR| CONSTRUCTION MANAGER
GFI	GROUND FAULT INTERRUPTER
HVAC	HEATING, VENTILATING, AND AIR CONDITIONING CONTRACTOR
HP	HORSEPOWER
IG	ISOLATED GROUND
IMC	INTERMEDIATE METALLIC CONDUIT
IT	INFORMATION TECHNOLOGY CONTRACTOR
JB	JUNCTION BOX
KCMIL	THOUSAND CIRCULAR MILS
KES	KITCHEN EQUIPMENT SUPPLIER
KVA	KILO-VOLT AMPERE
KW	KILO-WATT
LTG	LIGHTING
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MDP	MAIN DISTRIBUTION PANEL
MH	MOUNTING HEIGHT
MLO	MAIN LUGS ONLY
MTD	MOUNTED
MTG	MOUNTING
MTS	MANUAL TRANSFER SWITCH
NIC	NOT IN CONTRACT
NO,#	NUMBER
NTS	NOT TO SCALE
P	POLE(S)
PB	PULL BOX
PC	PLUMBING CONTRACTOR
PH, ϕ	PHASE
PVC	POLY-VINYL CHLORIDE CONDUIT
PWR	POWER
REF	REFRIGERATOR
RGS	RIGID GALVANIZED STEEL CODUIT
SN	SOLID NEUTRAL
SWBD	SWITCHBOARD
TEL/DATA	TELEPHONE/DATA
TGP	TELECOMMUNICATIONS GROUND BUS
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
WG	WIRE GUARD
WP	WEATHERPROOF
XFMR	TRANSFORMER
XP	EXPLOSION PROOF
@72"	MOUNT 72 INCHES TO CENTERLINE ABOVE FINISHED FLOOR OR GRADE

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LIGHTING FIXTURE SCHEDULE

	TYPE	MANUFACTURER	MODEL / SERIES	MTG.	VOLTAGE	LIGHT SOURCE			DESCRIPTION
						LUMENS	WATTS	TYPE	
A	DR	HEALTHCARE	HDR112-G-F1	R	UNIVERSAL	1/1	15/25	A15	1' X 2' DARKROOM LIGHT CONFIRM FILTER TYPE WITH OWNER
B	EL	PARAMOUNT	C41L44-S3-D3-120/277	S	UNIVERSAL	4800	40	LED/3000K	4' LINEAR UTILITY FIXTURE WITH FROSTED ACRYLIC DIFFUSER WET LOCATION.
C	ILB	CELESTIAL	GEM-1800-A-6/GEM-SSR	S	UNIVERSAL	-	.6W/FT	LED	CARPET TO FLOOR STAIR NOSE LIGHT STRIP WITH END CAP, RACEWAY, ETC.
C	ILC	CELESTIAL	GEM-1900-A-12	S	UNIVERSAL	-	.3W/FT	LED	CARPET TO FLOOR STAIR NOSE LIGHT STRIP.
D	IU	SIGNTEX	RPRO-NB-1-R-W-W-TW-REC-"DARKROOM IN USE"	U	UNIVERSAL	N/A	1.5	LED	"DARKROOM IN USE" SIGNAGE
E	J	SPECTRUM	WJ1LEDGV-14W-35K-E1-FJ1-CGI-GB	W	UNIVERSAL	1460	14	LED/3000K	UTILITY FIXTURE WITH GLOBE AND CAST GLOBE GUARD
-	JB	SPECTRUM	WJ1LEDGV-14W-35K-DS101-BLJ1-CGI-GB	W	UNIVERSAL	1460	14	LED/3000K	UTILITY FIXTURE WITH BLUE GLASS GLOBE AND CAST GLOBE GUARD
-	JW	SPECTRUM	WJ1LEDGV-14W-35K-SD101-FJ1-CGI-GB	W	UNIVERSAL	1460	14	LED/3000K	UTILITY FIXTURE WITH WHITE GLASS GLOBE AND CAST GLOBE GUARD
-	LBS	AXIS	BWDLED-B1-7-35-50-SH-NL-M11LED-C	W	UNIVERSAL	700/FT	12.2/FT	LED 3000K	WALL MOUNTED DIRECT BEAM 2 CONTINUOUS RUN
-	LDC	BARTCO	BSS840-XX-35-12-SM-SIN-CF	S	UNIVERSAL	950/FT	12 / FT.	LED/3000K	LINEAR DISPLAY FIXTURE WITH REMOTE DRIVER- FIELD CONFIRM LENGTH
-	LDG	BARTCO	BSS840-XX-35-7-HM-WH	S	UNIVERSAL	500/FT	7.2/FT	LED 3000K	LINEAR LED STRIP WITH FROSTED ACRYLIC LENS, ADJUSTABLE. LENGTHS PER FIELD MEASUREMENTS.
-	LGS2	METALUMEN	RML-LED-35K-2-N-M-C-D700-RTF-MVOLT	R	UNIVERSAL	940/FT	40	LED 3000K	2' RECESSED LINEAR FIXTURE
-	LGS4	METALUMEN	RML-LED-35K-4-N-M-C-D700-RTF-MVOLT	R	UNIVERSAL	940/FT	80	LED 3000K	4' RECESSED LINEAR FIXTURE
-	LGS8	METALUMEN	RML-LED-35K-8-N-M-C-D700-RTF-MVOLT	R	UNIVERSAL	940/FT	160	LED 3000K	8' RECESSED LINEAR FIXTURE.
-	LK14	KENALL	CSEDI-14-45L35K-DCC-DV-PAF-2H-SYM	R	UNIVERSAL	4388	50	LED 3000K	RECESSED 1'X4' TROFFER
-	LK24	KENALL	CSEDI-24-90L35K-DCC-DV-PAF-2H-SYM	R	UNIVERSAL	9800	98	LED 3000K	RECESSED 2'X4' TROFFER
-	LK22	KENALL	CSEDI-22-45L-35K-DCC-DV-PAF-2H-SYM	R	UNIVERSAL	4358	50	LED/3000K	2'X2' FIXTURE WITH PRISMATIC ACRYLIC LENS , ALUMINUM DOOR FRAME, 3 LEVEL GASKETING, AND NSF LISTING
-	LP4	LITECONTROL	P-ID-L65-04-SGL-LPA-35K-IDO90-CWM-D10-1CWQ	AC	UNIVERSAL	875/FT	31	LED/3000K	4' LINEAR DIRECT / INDIRECT FIXTURE WITH FROSTED ACRYLIC DIFFUSER
-	LP8	LITECONTROL	P-ID-L65-08-SGL-LPA-35K-IDO90-CWM-D10-1CWQ-MVOLT	AC	UNIVERSAL	875/FT	62	LED/3000K	8' LINEAR DIRECT / INDIRECT FIXTURE WITH FROSTED ACRYLIC DIFFUSER
-	LPD2	VISA	CP2020L-35K-MED-FBA-MVOLT	AC	UNIVERSAL	1600	22	LED/3000K	4'X2' LUMINOUS CYLINDER FIXTURE WITH FROSTED ACRYLIC LENS
-	LPG	METEOR	WS-90-30K-U-V-60-B-AD8-WG	P	UNIVERSAL	16,611	240	LED/3000K	GYMNASIUM COMPACT HIGH BAY FIXTURE WITH 0-10V DIMMING AND WIRE GUARD
-	LPG2	VISA	CP2000-CBL-LNW12200-PTD-MVOLT-UP10	AC	UNIVERSAL	12,200	150	LED/3000K	30" DIA. SKYLIGHT FIXTURE WITH FROSTED ACRYLIC LENS AND 100% UPLIGHT
-	LR14	LITHONIA	VTL4-30L-ADP-EZ1-LP835	R	UNIVERSAL	3000	29	LED/3000K	1'X4' TROFFER FIXTURE WITH FROSTED ACRYLIC DIFFUSER
-	LR22	LITHONIA	2VTL2-30L-ADP-EZ1-LP835	R	UNIVERSAL	3300	34	LED 3000K	RECESSED 2'X2' TROFFER
-	LR24	LITHONIA	2VTL4-48L-ADP-EZ1-LP835	R	UNIVERSAL	5000	47	LED/3000K	2'X4' TROFFER FIXTURE WITH FROSTED ACRYLIC DIFFUSER
-	LS2	LITHONIA	ZL1N-L24-1500LM-FST-MVOLT-35K-80CRI-WH	S/AC	UNIVERSAL	1500	26	LED/3000K	2' UTILITY FIXTURE WITH FROSTED ACRYLIC DIFFUSER
-	LS4	LITHONIA	ZL1N-L48-5000LM-FST-MVOLT-35K-80CRI-WH	S/AC	UNIVERSAL	4085	41	LED/3000K	4' UTILITY FIXTURE WITH FROSTED ACRYLIC DIFFUSER
-	LS8	LITHONIA	TZL1N-L96-10000LM-FST-MVOLT-35K-80CRI-WH	S/AC	UNIVERSAL	8170	82	LED/3000K	8' UTILITY FIXTURE WITH FROSTED ACRYLIC DIFFUSER
-	LSV4	KENALL	MLHAS-4B-R-CC-PP-1-50L35K-DCC-1-DV-CDF-DL	W	UNIVERSAL	N/A	50	LED/3000K	4' UTILITY FIXTURE WITH VANDAL RESISTANT FROSTED WRAPAROUND ACRYLIC LENS - WET LOCATIONS UNDER COVER
-	LSV8	KENALL	MLHAS-9B-R-CC-PP-1-50L35K-DCC-1-DV-CDF-DL	W	UNIVERSAL	N/A	100	LED/3000K	8' UTILITY FIXTURE WITH VANDAL RESISTANT FROSTED WRAPAROUND ACRYLIC LENS - WET LOCATIONS UNDER COVER
-	LW4	PEERLESS	SQW4-LO/HI-4FT-R4-277-EZB-SCT-LP835-XX	W	UNIVERSAL	N/A	1850 UP 3000 DN	LED/3000K	4' X 4" SQ. LINEAR DIRECT/INDIRECT FIXTURE WITH FROSTED ACRYLIC DIFFUSER
-	LWS	FOCAL POINT	FAVBL-SR-LL3-35K-1C-UNIV-LD1-XXX-WH	R	UNIVERSAL	2769	42	LED/3000K	CONTINUOUS LINEAR WALL SLOT FIXTURE; LENGTHS PER FIELD MEASUREMENTS
-	PC1	GOTHAM	ICO-CYL-35/50-6AR-40D-MVOLT-ACC-XX-EZB	AC	UNIVERSAL	5000	73	LED/3000K	6" CYLINDER FIXTURE WITH SEMI-SPECULAR REFLECTOR
-	PC2	GOTHAM	ICO-CYL-35/35-6AR-40D-MVOLT-ACC-XX	AC	UNIVERSAL	3500	48	LED/3000K	6" CYLINDER DOWNLIGHT FIXTURE WITH SEMI-SPECULAR REFLECTOR
-	RC1	GOTHAM	EVOSQ-35/25-6AR-LSS-MVOLT-EZ1	R	UNIVERSAL	2500	29.5	LED/3000K	6" SQUARE DOWNLIGHT FIXTURE WITH SEMI-SPECULAR REFLECTOR
-	RC2	GOTHAM	EVOSQ35/20-6AR-MD-LD-MVOLT-EZ1	R	UNIVERSAL	2000	23	LED/3000K	6" SQUARE DOWNLIGHT FIXTURE WITH SEMI-SPECULAR REFLECTOR
-	RC3	GOTHAM	EVOSQ35/15-4AR-LSS-MVOLT-EZ1	R	UNIVERSAL	1500	17.3	LED/3000K	4" SQUARE APERTURE DOWNLIGHT WITH SEMI-SPECULAR REFLECTOR
-	RC4	GOTHAM	EVOSQ-35/45-6AR-LSS-MVOLT-EZ1	R	UNIVERSAL	4555	47	LED/3000K	6" SQUARE DOWNLIGHT FIXTURE WITH MEDIUM DISTRIBUTION AND SEMI-SPECULAR REFLECTOR
-	RSH	GOTHAM	EVO-35/15-6-DFR-MVOLT	R	UNIVERSAL	N/A	25	LED/3000K	6" SQUARE DOWNLIGHT FIXTURE WITH DEAD-FRONT GASKETED TRIM AND FROSTED ACYLIC LENS
-	RSV1	KENALL	HRDL6L-26L30K-DV-SC-FW-LGW-G	R	UNIVERSAL	N/A	26	LED/3000K	6" SQUARE DOWNLIGHT FIXTURE WITH IMPACT RESISTANT TRIM AND LENS
-	S1	METEOR	CS-115-30K-U-60-SV-B-STD	S	UNIVERSAL	9390	107	LED/3000K	16" CYLINDER DOWNLIGHT FIXTURE FOR HIGH CEILING APPLICATIONS
-	SC1	EUREKA	4800-24	S	UNIVERSAL	1120	24	LED/3000K	24" DIAMETER LED LUMINOUS RING WITH 2 CIRCUIT OPTION AND 0-10V DIMMING CAPABILITY.
-	SL1/2H	LITHONIA	DSXO-LED-40C-700-40K-T2M-MVOLT-RPA-DMG-HS-DDBXD/RSA-18-5C-DM28-DDBXD	POLE	UNIVERSAL	N/A	91	LED/4000K	SINGLE AREA LIGHTING FIXTURE WITH TYPE II OPTICS AND 18' ROUND ALUMINUM POLE WITH ANCHOR BOLT COVER BASE
-	SL1/4H	LITHONIA	DSXO-LED-40C-700-40K-T4M-MVOLT-RPA-DMG-HS-DDBXD/RSA-18-5C-DM19-DDBXD	POLE	UNIVERSAL	N/A	91	LED4000K	SINGLE AREA LIGHTING FIXTURE WITH TYPE IV OPTICS AND 18' ROUND ALUMINUM POLE WITH ANCHOR BOLT COVER BASE
-	SL1/4HS	LITHONIA	DSXO-LED-40C-700-40K-T4M-MVOLT-RPA-DMG-HS-DDBXD/RSA-18-5C-DM19-DDBXD	POLE	UNIVERSAL	N/A	91	LED4000K	SINGLE AREA LIGHTING FIXTURE W/ TYPE IV OPTICS & 18' ROUND ALUM. POLE W/ ANCHOR BOLT COVER BASE & HOUSE SIDE SHIELD
-	SL2/4H	LITHONIA	(2)DSXO-LED-40C-700-40K-T4M-MVOLT-RPA-DMG-HS-DDBXD/RSA-18-5C-DM28-DDBXD	POLE	UNIVERSAL	N/A	182	LED/4000K	TWIN AREA LIGHTING (90° HEAD) FIXTURE WITH TYPE IV OPTICS AND 18' ROUND ALUMINUM POLE W/ ANCHOR BOLT COVER BASE
-	SL2/5H	LITHONIA	(2)DSXO-LED-40C-700-40K-T4M-MVOLT-RPA-DMG-HS-DDBXD/RSA-18-5C-DM28-DDBXD	POLE	UNIVERSAL	N/A	182	LED/4000K	TWIN AREA LIGHTING FIXTURE WITH TYPE IV OPTICS AND 18' ROUND ALUMINUM POLE WITH ANCHOR BOLT COVER BASE
-	SL1/2L	SELUX	SACL-1-LG3500-R5-35-XX-SP-277-DS-DM / A35-12-BC1	POLE	UNIVERSAL	N/A	60	LED/4000K	SINGLE AREA LIGHTING FIXTURE WITH TYPE II OPTICS AND 12' ROUND ALUMINUM POLE WITH ANCHOR BOLT COVER BASE
-	SL1/4L	SELUX	SACL-1-LG3500-R5-35-XX-SP-277-DS-DM / A35-12-BC1	POLE	UNIVERSAL	N/A	60	LED/4000K	SINGLE AREA LIGHTING FIXTURE WITH TYPE V OPTICS AND 12' ROUND ALUMINUM POLE WITH ANCHOR BOLT COVER BASE
-	SL4	LITHONIA	DSXW1-LED-10C-700-40K-T3M-MVOLT-DMG-DDBXD	W	UNIVERSAL	2358	27	LED/4000K	WALL FIXTURE WITH TYPE III OPTICS
-	SL5	LITHONIA	DSXW1-LED-20C-700-40K-T3M-MVOLT-DMG-DDBXD	W	UNIVERSAL	4675	47	LED 4000K	WALL FIXTURE WITH TYPE III OPTICS
-	SL6	HYDREL	PDX10-SS-18LED-WHT41-MVOLT-NSP-FLC-34S-IHL-RG-LP	R	UNIVERSAL	N/A	18	LED/4000K	INGRADE ACCENT FIXTURE WITH INTERNAL GLARE LOUVER AND AND EXTERNAL ROCK GUARD
-	TH1	INTENSE	MBHL3-35-DIM-W-16-PFLMB-16	T	UNIVERSAL	1900	25	LED/3000K	TRACK HEAD WITH SPOT DISTRIBUTION AND HEX CELL LOUVER
-	TH2	INTENSE	MBHL3-35-DIM-W-16- PL-CL9-S16/PFLMB-16	T	UNIVERSAL	1900	25	LED/3000K	TRACK HEAD WITH SPOT DISTRIBUTION, HEX CELL LOUVER, AND BLUE LENS
-	TR2	INTENSE	IPS-XX-W SERIES	S	UNIVERSAL	N/A	N/A	N/A	TWO CIRCUIT, TWO NEUTRAL, SURFACE TRACK WITH ACCESSORIES REQUIRED FOR RUNS INDICATED
-	UC	CONTECH	LPL22430K-P	S	UNIVERSAL	N/A	500 / FT	LED/3000K	24" UNDERCABINET FIXTURE
-	X	EELP	EDG-1-G-C-W	U	UNIVERSAL	N/A	1.5	LED	SINGLE FACED EXIT SIGN
-	X	EELP	EDG-2-G-C-W	U	UNIVERSAL	N/A	1.5	LED	DOUBLE FACED EXIT SIGN
-	X HC	EELP	SWXECT-EDGU-1-G-C-W-XX	U	UNIVERSAL	N/A	1.5	LED	SINGLE FACED EXIT SIGN WITH HANDICAP ACCESSIBLE GRAPHIC
-	X RS	EELP	CA-S-1-G-W/PCS-2	U	UNIVERSAL	N/A	1.5	LED	LOW PROFILE, SINGLE FACED EXIT SIGN WITH POLYCARBOANTE SHIELD FOR ROUGH SERVICE APPLICATION
-	X H	EELP	CA-S-1-G-W	U	UNIVERSAL	N/A	1.5	LED	SINGLE FACED DIECAST EXIT SIGN
-	X L	EELP	CA-S-1-G-W/PCS-2	U	UNIVERSAL	N/A	1.5	LED	FLOOR PROXIMITY SINGLE FACED DIECAST EXIT SIGN FOR ROUGH SERVICE APPLICATION.
-	EB	LITHONIA	ELM1254-H2012-DL-ELAVS2	W	UNIVERSAL	2	20	MR16/HAL	SELF-CONTAINED EMERGENCY LIGHTING FIXTURE WITH TWIN ADJUSTABLE HEADS

LIGHTING FIXTURE SCHEDULE NOTES (○)

1. LIGHTING FIXTURE PACKAGE SUBMITTALS SHALL BE FULLY COORDINATED BETWEEN THE ELECTRICAL CONTRACTOR, LIGHTING FIXTURE REPRESENTATIVE(S), AND LIGHTING MANUFACTURERS TO ENSURE ALL PRODUCT, INSTALLATION, AND CONTROL REQUIREMENTS ARE MET PRIOR TO SUBMISSION FOR REVIEW. IT IS THE ELECTRICAL CONTRACTORS RESPONSIBILITY TO PROVIDE A PACKAGE MEETING ALL REQUIREMENTS OF THE PROJECT FOR A COMPLETE AND FULLY FUNCTIONAL LIGHTING SYSTEM.
2. PROVIDE EXIT SIGN THAT COMPLIES WITH NFPA 101, UL 924, 521 CMR 26.1.2 AND ALL REFERENCED STANDARDS AND CODES.
3. PROVIDE FLOOR PROXIMITY SIGN IN ADDITION TO STANDARD SIGN ABOVE DOOR; MOUNT SIGN AT 18" A.F.F. TO THE TOP ON THE STRIKE SIDE OF DOOR. SIGN SHALL BE RECESSED MOUNTED AND PROVIDED WITH FLUSH POLYCARBONATE SHIELD.
4. SITE LIGHTING HAS BEEN SPECIFIED WITH THE FOLLOWING BACKLIGHT, UPLIGHT, AND GLARE RATINGS AS DEFINED BY IES TM-15-07:

SC1 = Bx/Ux/Gx, SL1 = Bx/Ux/Gx, SL2 = Bx/Ux/Gx

5. SITE LIGHTING POLES SHALL BE PROVIDED WITH FULL BASE COVERS TO MATCH PROFILE OF POLE; NUT COVERS ONLY ARE NOT ACCEPTABLE.
6. PROVIDE FIXTURE WITH 0-10V DIMMING BALLAST, DRIVER, OR LIGHT ENGINE REQUIRED FOR LAMP OR LED SOURCE SPECIFIED.
7. PROVIDE ALCS ADDRESSABLE INPUT/OUTPUT (I/O) MODULE FOR EVERY FIXTURE (EXCEPT WHERE EXPLICITLY CALLED OUT ON PLANS) AND LIGHTING CONTROL DEVICE. WHERE FIXTURES OR CONTROL DEVICES ARE LOCATED IN HARD CEILING AREAS THE I/O MODULE SHALL BE REMOTE MOUNTED IN ACCESSIBLE AREA ABOVE AN A.C.T. CEILING OR EXPOSED IN AN UNFINISHED UTILITY SPACE. WHERE FIXTURES ARE LOCATED OUTDOORS THE I/O MODULE SHALL BE LOCATED IMMEDIATELY ADJACENT TO THE PANEL SERVING THE FIXTURES. REFER TO "AUTOMATED LIGHTING CONTROL SYSTEM TYPICAL ONE-LINE DIAGRAM" AND SPECIFICATIONS FOR FURTHER INFORMATION.
8. FIXTURES WITH "D" AT THE END OF THE TYPE LABEL (EX.: FP8D, RC1D) ON PLANS SHALL BE PROVIDED WITH 0-10V DIMMING BALLAST(S), DRIVER(S), OR LIGHT ENGINE(S) AS REQUIRED FOR LAMPS / LED SOURCES SPECIFIED TO BE CONTROLLED VIA A 0-10V SIGNAL FROM THE ALCS, DAYLIGHT HARVESTING PHOTOSENSORS, THEATRICAL DIMMING SYSTEM OR OTHER DIMMING CONTROLS INDICATED.

FIXTURE MANUFACTURER OPTIONS (OR EQUAL)

- (A) -
- (B) -
- (C) -
- (D) -
- (E) -
- (F) -
- (G) -
- (H) -
- (I) -
- (J) -

MOUNTING DESIGNATIONS

C	COVE	U	UNIVERSAL
P	PENDANT	W	WALL
R	RECESSED	AC	AIRCRAFT CABLE
S	SURFACE	BOL	BOLLARD
T	TRACK / RAIL / CABLE	POLE	POLE

LIGHTING GENERAL NOTES

1. MANUFACTURERS AND CATALOG NUMBERS IDENTIFIED IN THE "LIGHTING FIXTURE SCHEDULE" SHALL SERVE TO ESTABLISH THE BASIS OF DESIGN FOR EACH LIGHTING FIXTURE TYPE. PRODUCTS OF EQUAL APPEARANCE, CONSTRUCTION, PERFORMANCE, AND WARRANTY COVERAGE FROM MANUFACTURERS OTHER THAN THOSE IDENTIFIED MAY BE PROPOSED FOR USE ON THIS PROJECT, SUBJECT TO REVIEW AND APPROVAL BY THE ARCHITECT AND ENGINEER. THE "FIXTURE MANUFACTURER OPTIONS (OR EQUAL)" LISTING IS PROVIDED FOR GUIDANCE IN IDENTIFYING MANUFACTURERS CAPABLE OF PROVIDING EQUAL PRODUCTS, BUT IN NOW WAY LIMITS MANUFACTURERS OR PRODUCTS THAT MAY BE PROPOSED AS EQUALS FOR THE PROJECT.
2. "LIGHTING FIXTURE SCHEDULE" REMARKS, "LIGHTING FIXTURE SCHEDULE NOTES", "LIGHTING GENERAL NOTES", AND NOTATIONS ELSEWHERE MAY INDICATE FEATURES AND ACCESSORIES THAT ARE NOT INDICATED IN THE CATALOG NUMBER BUT ARE REQUIRED FOR THE PROJECT. PRODUCTS OTHER THAN THOSE SPECIFIED SUBMITTED SHALL BE DOCUMENTED FOR CONFORMANCE IN PERFORMANCE, CONSTRUCTION, AND APPEARANCE WITH THE CRITERIA ESTABLISHED BY THE SPECIFIED PRODUCT.
3. FURNISH ALL LIGHTING FIXTURES COMPLETE WITH MOUNTING ACCESSORIES TO MEET THE JOB REQUIREMENTS. VERIFY ROOM SURFACE CONSTRUCTION AND FINISHES PRIOR TO ORDERING FIXTURES TO ENSURE PROPER MOUNTING PROVISIONS AND FIXTURE FITTINGS. REFER TO LATEST ARCHITECTURAL DRAWINGS.
4. VERIFY ALL FIXTURE MOUNTING HEIGHTS AND LOCATIONS WITH LATEST ARCHITECTURAL DRAWINGS. EXACT LOCATION OF FIXTURES SHALL BE CONFIRMED WITH THE ARCHITECT PRIOR TO START OF ROUGHING.
5. COMPACT FLUORESCENT LAMPS SHALL HAVE KELVIN COLOR TEMPERATURE AS SCHEDULED WITH A MINIMUM COLOR RENDERING INDEX (CRI) OF 82. COMPACT FLUORESCENT LAMPS SHALL BE THE AMALGAM TYPE AS MANUFACTURED BY SYLVANIA (DULUX T/E/IN SERIES), PHILIPS, GENERAL ELECTRIC, OR EQUAL.
6. STANDARD COMPACT FLUORESCENT BALLASTS SHALL AS MANUFACTURED BY SYLVANIA (QUICKTRONIC PROSTART CF SERIES), PHILIPS, GENERAL ELECTRIC, UNIVERSAL, OR EQUAL. DIMMING COMPACT FLUORESCENT BALLASTS SHALL AS MANUFACTURED BY SYLVANIA (QUICKTRONIC HELIOS CF SERIES(0-10V)), PHILIPS, GENERAL ELECTRIC, UNIVERSAL, OR EQUAL.
7. LINEAR FLUORESCENT LAMPS SHALL HAVE KELVIN COLOR TEMPERATURE AS SCHEDULED WITH A MINIMUM COLOR RENDERING INDEX (CRI) OF 85. T5HO LAMPS SHALL BE THE ENERGY SAVER TYPE AS MANUFACTURED BY SYLVANIA (PENTRON HO SUPERSAVER ECOLOGIC SERIES), PHILIPS, GENERAL ELECTRIC OR EQUAL. T5 LAMPS SHALL BE THE ENERGY SAVER TYPE AS MANUFACTURED BY SYLVANIA (PENTRON SUPERSAVER ECOLOGIC SERIES), PHILIPS, GENERAL ELECTRIC, OR EQUAL.
8. STANDARD T5 AND T5HO LINEAR FLUORESCENT BALLASTS SHALL BE HIGH EFFICIENCY TYPE AS MANUFACTURED BY SYLVANIA (QHE PROSTART SERIES), PHILIPS, GENERAL ELECTRIC, UNIVERSAL, OR EQUAL. T5 AND T5HO DIMMING LINEAR FLUORESCENT BALLASTS SHALL BE AS MANUFACTURED BY SYLVANIA (QUICKTRONIC QHE POWERSENSE SERIES (0-10V)), PHILIPS, GENERAL ELECTRIC, UNIVERSAL, OR EQUAL.
9. LED ARRAYS, MODULES, AND LIGHT ENGINES SHALL HAVE KELVIN COLOR TEMPERATURE AS SCHEDULED HAVING A MINIMUM COLOR RENDERING INDEX (CRI) OF 82 AND A MINIMUM L70 LIFETIME RATING OF 50,OOO HOURS AT 25°C AMBIENT. LED DRIVERS SHALL HAVE 0-10V DIMMING CONTROL WITH FULLY ISOLATED CONTROL INPUTS AND MINIMUM POWER LEVEL OF 10%. LED FIXTURES WITH ARRAY / MODULE AND DRIVER PACKAGES OR LIGHT ENGINES SHALL HAVE PUBLISHED IESNA LM-79 AND LM-80 TESTING DATA AS A STANDARD MANUFACTURED OFFERING. INDIVIDUAL COMPONENT TESTING DATA WILL NOT BE ACCEPTED. ALL FIXTURES SHALL BE "DESIGN LIGHTS CONSORTIUM" (DLC) OR "ENERGYSTAR" LISTED, OR FURNISHED WITH DATA INDICATING CONFORMANCE WITH LATEST APPLICABLE LISTING CRITERIA.
10. FIXTURE LETTERS SHOWN ONCE ON A CONTINUOUS ROW OF FIXTURES SHALL BE TYPICAL FOR THAT ROW UNLESS OTHERWISE INDICATED. PROVIDE RUN LENGTH AS INDICATED (NUMERICALLY OR GRAPHICALLY) OR CONTINUOUS WHERE SHOWN BETWEEN TWO ARCHITECTURAL ELEMENTS (WALLS, SOFFITS, COLUMNS, ETC.).
11. LINEAR ROWS OF RECESSED, SURFACE, OR SUSPENDED FLUORESCENT FIXTURES SHALL BE INSTALLED TO PROVIDE CONTINUOUS RUN LENGTHS AS INDICATED ON THE DRAWINGS. PROVIDE ALL REQUIRED FITTINGS, CONNECTORS, SUPPORTS, TRIMS, ETC. SO THAT RUNS ARE A COMPLETE ASSEMBLY WITH THE APPEARANCE OF A SINGLE UNIT. ROWS SHALL BE CONFIGURED FOR MINIMUM NUMBER OF FEEDS, JOINTS, AND MOUNTINGS. PROVIDE ROW AND PATTERN CONFIGURATION DRAWINGS FOR REVIEW PRIOR AND APPROVAL PRIOR TO RELEASE OF MATERIAL ORDER.
12. PROVIDE FLAT ROUND CANOPIES FOR SUSPENDED FIXTURE LOCATIONS WHERE SUSPENSIONS MOUNTS TO UNFINISHED CEILING STRUCTURE (WHERE LOCATED IN FINISHED SPACES) AND WHERE PASSING THROUGH SUSPENDED CEILINGS (CONFIRM WHETHER IN TILE OR AT GRID). PROVIDE SWIVEL ALIGNERS FOR SUSPENSIONS WHERE REQUIRED FOR SLOPED CEILINGS. ENTIRE SUSPENSION ASSEMBLY SHALL BE SUPPLIED BY MANUFACTURER OF FIXTURES.
13. FIXTURES WITH LOUVERS SHALL BE PROVIDED WITH HIGH TRANSMISSION (95% OR BETTER) DIFFUSING LENSES OR FILMS TO OBSCURE DIRECT LAMP VIEWING.
14. FIXTURES SHALL BE SUPPORTED FROM THE BUILDING STRUCTURE, INDEPENDENT OF HUNG CEILINGS. DO NOT TAP METAL ROOF DECK FOR SUPPORT OF ANY ELECTRICAL EQUIPMENT. PROVIDE UNISTRUT AS REQUIRED FOR SUPPORT OF ALL ELECTRICAL EQUIPMENT.
15. REFER TO SPECIFICATIONS FOR SEISMIC SUPPORT, RESTRAINT, AND BRACING REQUIREMENTS OF THIS PROJECT.
16. PROVIDE TYPE AND QUANTITY OF BALLASTS, DRIVERS, AND TRANSFORMERS AS REQUIRED TO PROVIDE CONTROL METHOD INDICATIONS ON THE PLANS, INCLUDING BUT NOT LIMITED TO THE FOLLOWING: SWITCHING SUBSCRIPTS, NOTES, SCHEDULE REMARKS / DESCRIPTIONS, AND DETAILS. QUANTITY OF BALLASTS, DRIVERS, AND/OR TRANSFORMERS SHALL BE THE MINIMUM REQUIRED TO PROVIDE CONTROL INDICATED TO MAINTAIN THE LOWEST CONNECTED LOAD OF LIGHTING SYSTEM POSSIBLE. TANDEM WIRING OF FIXTURES SHALL BE PROVIDED WHERE NECESSARY AND WITHIN THE WIRING DISTANCE RESTRICTIONS OF THE MANUFACTURER'S INSTALLATION REQUIREMENTS.
17. WHERE BI-LEVEL SWITCHING IS INDICATED, DESIGNATED 'a' CONTROL SHALL BE ARRANGED FOR 50% LIGHT OUTPUT OR 'OFF' BY CIRCUIT NUMBER AS SHOWN. DESIGNATED 'b' CONTROL SHALL BE ARRANGED FOR THE OTHER 50% LIGHT OUTPUT OR 'OFF' BY CIRCUIT NUMBER AS SHOWN. BOTH CIRCUITS MUST BE ON SAME PHASE. FIXTURES ARE PROVIDED WITH (1) BALLAST WITH DUAL LEVEL CONTROL WHEN AVAILABLE FOR LAMPING SPECIFIED, TWO BALLASTS OTHERWISE.
18. EVERY SPACE ENCLOSED BY FLOOR TO CEILING WALLS SHALL BE PROVIDED WITH A MINIMUM OF ONE MANUAL LIGHTING SWITCH AND ONE CEILING MOUNTED OCCUPANCY SENSOR. ADDITIONAL CONTROLS SHALL BE AS INDICATED ON THE PLAN OR AS SPECIFIED ELSEWHERE.
19. ALL LAMPS, BALLASTS, LED SOURCES, DRIVERS, AND CONTROLS SHALL MEET THE LATEST UTILITY COMPANY INCENTIVE REQUIREMENTS. REFER TO THE LATEST PROGRAM REQUIREMENTS DOCUMENTATION AND COORDINATE WITH THE UTILITY COMPANY TO ENSURE COMPLIANCE.
20. ALL EXIT SIGNS SHALL BE CIRCUITED AHEAD OF ANY LOCAL SWITCH CONTROL. WHERE CONTROLLABLE CIRCUIT BREAKER CONTROL SYSTEMS ARE UTILIZED THE CIRCUITS SERVING EXIT SIGNS SHALL BE SWITCHED "OFF" WHENEVER THE BUILDING IS UNOCCUPIED.
21. EXIT SIGNS TO BE PROVIDED WITH ARROWS AS INDICATED ON DRAWINGS. TYPICALLY MOUNT ON CEILING WHERE VISIBLE OR ON WALL WHERE CEILING MOUNTING IS NOT PRACTICAL. EDGE-LIT SIGNS SHALL GENERALLY HAVE CLEAR PANELS EXCEPT FOR DOUBLE FACED UNITS AND SINGLE FACED UNITS ABLE TO BE VIEWED FROM BEHIND WHICH SHALL HAVE OPAQUE / MIRRORED PANELS. REFER TO ARCHITECTURAL DRAWINGS FOR INDICATION OF MOUNTING REQUIREMENTS.
22. PROVIDE SPARE EXIT SIGNS FOR INSTALLATION DURING CONSTRUCTION. INCLUDE 100' OF TYPE MC CABLE BRANCH CIRCUITING AND INSTALLATION LABOR. REFER TO ELECTRICAL SPECIFICATIONS FOR QUANTITIES AND INSTALLATION REQUIREMENTS.
23. EXIT SIGNS SHALL BE THE SELF-CONTAINED TYPE WITH INTEGRAL BATTERY BACK-UP AND SELF-DIAGNOSTICS WHERE NO LIFE SAFETY POWER SOURCE IS AVAILABLE, REGARDLESS OF MODEL / SERIES SPECIFIED.
24. EXIT SIGNS INSTALLED IN GYMNASIUMS, LOCKER ROOMS, AND ANY OTHER DESIGNATED AREAS SHALL BE PROVIDED WITH POLYCARBONATE FACE PLATE / SHIELD AS PART OF EXIT SIGN PACKAGE FROM SAME MANUFACTURER.
25. PROVIDE A SELF CONTAINED EMERGENCY LIGHTING UNIT WITH TWIN ADJUSTABLE HEADS (TYPE "EB" WHERE SCHEDULED) AT EACH FIRE ALARM CONTROL PANEL AND REMOTE ANNUNCIATOR. EXACT MOUNTING TO BE COORDINATED IN FIELD WITH ARCHITECT OR ENGINEER.
26. SELF-CONTAINED EMERGENCY LIGHTING UNITS SHALL BE WIRED TO LIGHTING CIRCUIT SERVING ROOM OR SPACE TO BE ILLUMINATED AHEAD OF ANY SWITCHING CONTROLS.
27. FIXTURES WITH MULTI WATTAGE BALLASTS OR DRIVERS SHALL BE LABELED FROM THE FACTORY FOR THE WATTAGE SPECIFIED TO ENSURE COMPLIANCE WITH ENERGY CODE CALCULATIONS.
28. FINISH FOR ALL FIXTURES SHALL BE SELECTED BY THE ARCHITECT FROM THE MANUFACTURER'S CATALOG OPTIONS.
29. WHERE FIXTURES OTHER THAN THE SPECIFIED PRODUCTS ARE PROPOSED, THE CONTRACTOR SHALL PROVIDE LIGHT LEVEL CALCULATIONS (WHEN REQUESTED BY ENGINEER) IN ACCORDANCE WITH IESNA STANDARDS TO JUSTIFY THAT THE SUBSTITUTED FIXTURES ARE OF EQUAL PERFORMANCE TO THE SPECIFIED PRODUCTS (APPLIES TO ALL FIXTURES IN ALL SPACES.)

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100% Design Development
3-15-2016

Dover HS / CTC
Dover, NH
LIGHTING FIXTURE SCHEDULE

SCALE: DRAWN BY: MM CHECKED BY: DMP

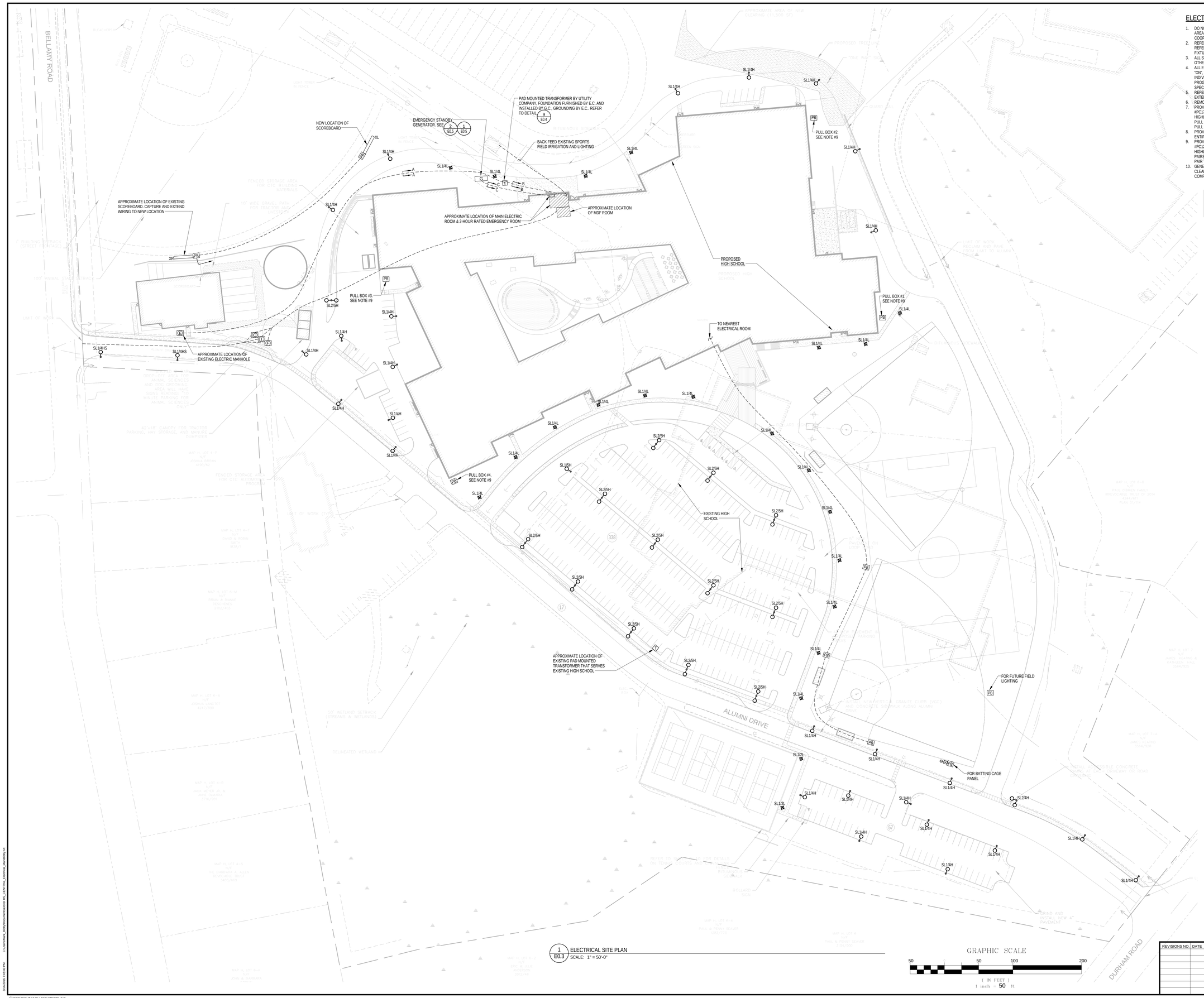
REVISIONS NO.	DATE	REMARKS	BY

DRAWING NUMBER
E0.2

JOB NUMBER 403114

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ELECTRICAL SITE NOTES:

1. DO NOT RUN ANY UNDERGROUND RACEWAYS WITHIN PLANTING AREAS OR LEACHING FIELDS. REFER TO DRAWINGS FOR LOCATIONS. COORDINATE ROUTING WITH LANDSCAPE ARCHITECT.
2. REFER TO CIVIL DRAWINGS FOR EXACT ROUTING OF UTILITIES. REFER TO LANDSCAPE DRAWINGS FOR EXACT LOCATION OF SITE FIXTURES.
3. ALL SITE WIRING SHALL BE 2#8&#10G,1"C MINIMUM UNLESS SHOWN OTHERWISE.
4. ALL EXTERIOR LIGHTING TO BE PROGRAMMED FOR PHOTOCELL "ON", TIMED "OFF" AND DIMMED LEVELS (VIA 0-10V SIGNAL). PROVIDE INDIVIDUAL CONTROL FOR EACH CIRCUIT. COORDINATE PROGRAMMING WITH OWNER. (REFER TO ALCS ONE-LINE DIAGRAM & SPECIFICATIONS).
5. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATION OF EXTERIOR WALL MOUNTED LIGHTING.
6. REMOVE ALL SITE ELECTRICS WHEN NO LONGER REQUIRED.
7. PROVIDE 17"x30"x12"D GROUND MOUNTED PULL BOX (QUAZITE #PC1730BA12 WITH COVER #PC1730CA17 OR SAME BY CARSON, HIGHLINE, STRONGWELL OR EQUAL. RUN ALL SITE LIGHTING VIA PULL BOX. ALSO PROVIDE (1) 1"SPARE WITH PULL LINE BETWEEN PULL BOX AND NEAREST ELECTRIC ROOM. LABEL @ EACH END.
8. PROVIDE LIGHTNING PROTECTION SYSTEM FOR COVERAGE OF ENTIRE FACILITY.
9. PROVIDE 12"x12"x12"D GROUND MOUNTED PULL BOX (QUAZITE #PC1212BG12 WITH #PC1212HG00 COVER OR SAME BY CARSON, HIGHLINE, STRONGWELL, OR EQUAL) AT ALL POLES WITH THREE PAIRS OF 1" CONDUITS APPROACHING BASE TO ALLOW FOR SINGLE PAIR TO ENTER BASE.
10. GENERATOR EMISSIONS EXHAUST SHALL MAINTAIN 25 FEET CLEARANCE FROM ANY OPERABLE WINDOWS OR INTAKE LOUVERS. COMPLY WITH ALL FEDERAL EPA AND STATE DEP REQUIREMENTS.

SITE WIRING LEGEND:

1. 2#8, 1#10G, 1"C, 24" BELOW GRADE & 2#12 SHIELDED CABLE (0-10V DC) 1"C., 24" BELOW GRADE.

1/E0.3 ELECTRICAL SITE PLAN
SCALE: 1" = 50'-0"

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100% Design Development
3-15-2016

Dover HS / CTC
Dover, NH
ELECTRICAL SITE PLAN

SCALE: As indicated | DRAWN BY: AD | CHECKED BY: DMP

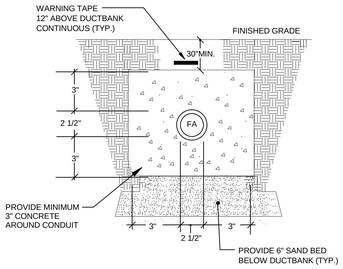
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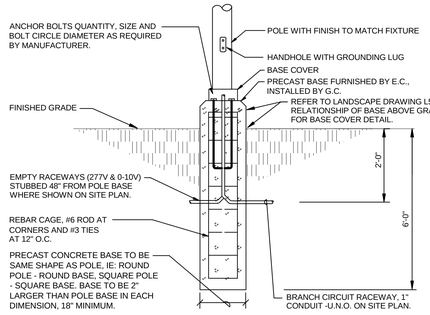
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1 E0.4 FIRE ALARM DUCT BANK

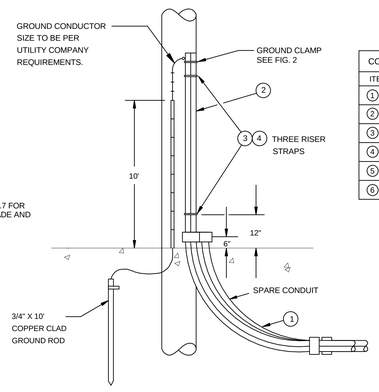
SCALE: N.T.S.

FA 2" FIRE ALARM - SCHEDULE 40 P.V.C. WITH IMSA CABLE



2 E0.4 SITE LIGHTING POLE BASE DETAIL

SCALE: N.T.S.



CODE NUMBERS FOR PIPE SIZES OF:	
ITEM	DESCRIPTION
1	36" RADIUS SWEEP
2	CONDUIT-10' LENGTH-GALV. STEEL
3	RISER STRAPS
4	LAG SCREWS 3/8" x 3"
5	RISER PIPE CONNECTOR
6	#6 COPPER SOLID BARE (24" LONG)

NOTES:

1. RISER CONDUITS SHALL BE LOCATED ON THE STREET QUARTER OF THE POLE, AND, WHEN POSSIBLE ON THE QUARTER AWAY FROM APPROACHING TRAFFIC.

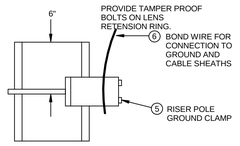
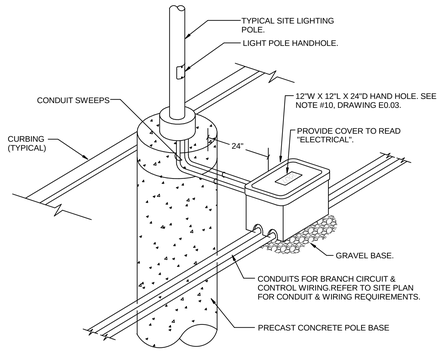


FIGURE 2 - RISER GROUND CLAMP

INSTALL GROUND CLAMP AS SHOWN. CONNECT TO POLE EQUIPMENT GROUNDING CONDUCTOR. INSTALL GROUND ROD AND RUN MINIMUM #6 SOLID COPPER UP POLE AND CONNECT TO COMMON NEUTRAL. INSTALL 8 FEET OF MOLDING OVER WIRE AND CONNECT RISER GROUND CLAMP TO GROUND WIRE ABOVE MOLDING AS SHOWN.

3 E0.4 POLE RISER DETAIL

SCALE: N.T.S.

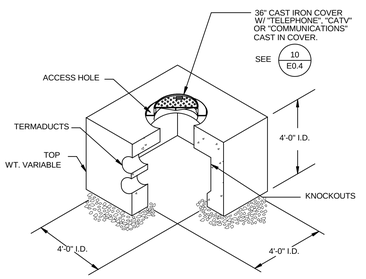


NOTES:

1. INSTALLATION TYPICAL FOR LANDSCAPED OR PAVED SIDEWALK AREAS. HANDHOLE SHALL NOT BE LOCATED IN TRAFFIC AREAS. COORDINATE COVER AND FRAME COLOR OF HANDHOLE WITH ARCHITECT.
2. REFER TO TYPICAL LIGHT POLE BASE DETAILS.

4 E0.4 UNDERGROUND HANDHOLE @ SITE LIGHTING POLE

SCALE: N.T.S.

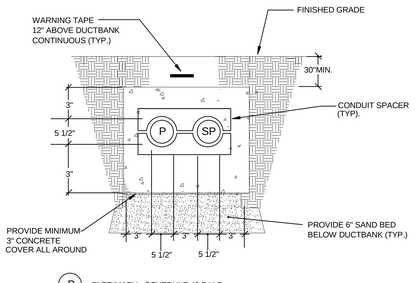


ELECTRICAL, TELEPHONE & C.A.T.V. & COMMUNICATIONS HANDHOLE

TMH # TVMH # CMH #

5 E0.4

SCALE: N.T.S.

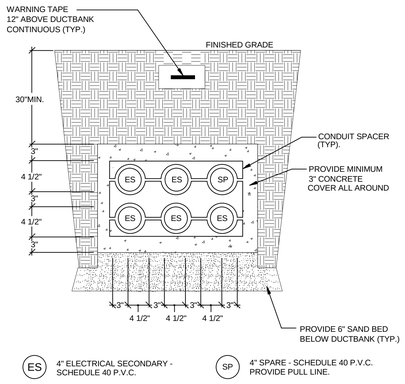


P 5" PRIMARY - SCHEDULE 40 P.V.C. (PROVIDE PULL LINE)

SP 5" SPARE - SCHEDULE 40 P.V.C. (PROVIDE PULL LINE)

6 E0.4 PRIMARY DUCT BANK SECTION "A-A"

SCALE: N.T.S.

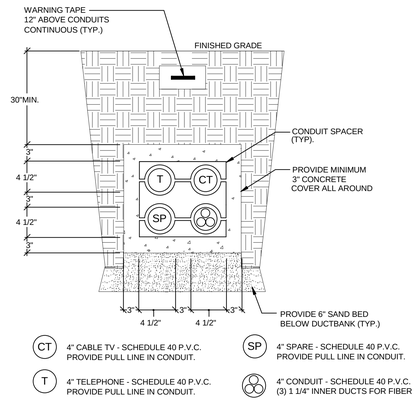


ES 4" ELECTRICAL SECONDARY - SCHEDULE 40 P.V.C.

SP 4" SPARE - SCHEDULE 40 P.V.C. PROVIDE PULL LINE.

7 E0.4 SECONDARY DUCT-BANK DETAIL "B-B"

SCALE: N.T.S.



CT 4" CABLE TV - SCHEDULE 40 P.V.C. PROVIDE PULL LINE IN CONDUIT.

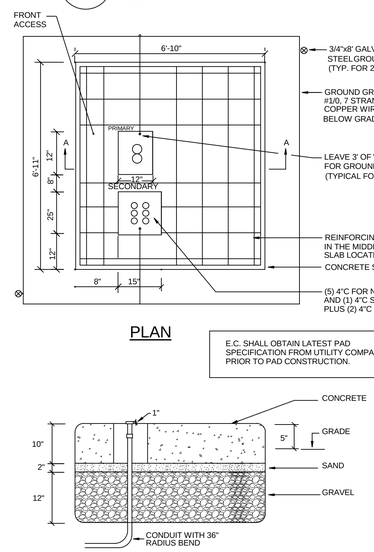
SP 4" SPARE - SCHEDULE 40 P.V.C. PROVIDE PULL LINE IN CONDUIT.

T 4" TELEPHONE - SCHEDULE 40 P.V.C. PROVIDE PULL LINE IN CONDUIT.

4" CONDUIT - SCHEDULE 40 P.V.C. (3) 1 1/4" INNER DUCTS FOR FIBER

8 E0.4 DUCT-BANK DETAIL "C-C"

SCALE: N.T.S.



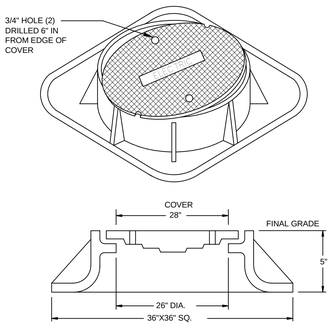
PLAN

E.C. SHALL OBTAIN LATEST PAD SPECIFICATION FROM UTILITY COMPANY PRIOR TO PAD CONSTRUCTION.

SECTION A-A

9 E0.4 PADMOUNT TRANSFORMER PAD DETAIL

SCALE: N.T.S.



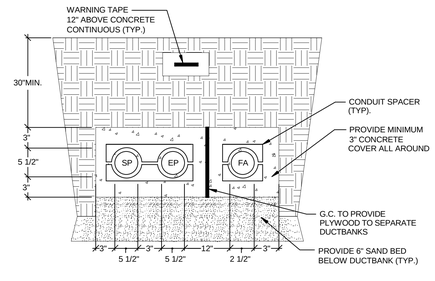
10 E0.4 FRAME AND COVER DETAIL

SCALE: N.T.S.

NOTES:

1. COVERS WILL HAVE "ELECTRIC", "TELEPHONE", OR "CATV" CAST IN THEM IN 3 INCH LETTERS.
2. FRAME AND COVER TO SUPPORT H2O WHEEL LOAD.
3. NO VAULT MANHOLE SHALL BE BURIED DEEPER THAN 18" BELOW FINISHED GRADE.
4. COVER SHALL BE FLUSH TO FINAL GRADE (CONCRETE, ASPHALT, GRAVEL, GRASS, ETC..)

	SUPPLIER & CATALOG#	STOCK CODE
FRAME	NACIP AE 124 LEBARON LE-285L OR APPROVED EQUAL	07-29-229
COVER	NACIP LEBARON LE-28C5 ELECTRIC OR APPROVED EQUAL	07-15-530



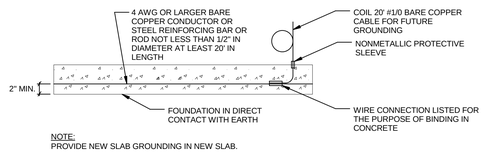
EP 5" PRIMARY - SCHEDULE 40 P.V.C. (PROVIDE PULL LINE)

FA 2" FIRE ALARM - SCHEDULE 40 P.V.C. WITH IMSA CABLE

SP 5" SPARE - SCHEDULE 40 P.V.C. (PROVIDE PULL LINE)

11 E0.4 PRIMARY DUCT BANK SECTION "F-F"

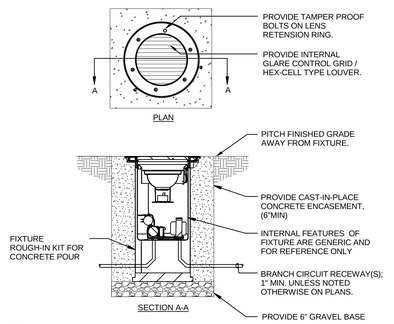
SCALE: N.T.S.



NOTE:
PROVIDE NEW SLAB GROUNDING IN NEW SLAB.

12 E0.4 UFER GROUNDING DETAIL

SCALE: N.T.S.



13 E0.4 GROUND MOUNTED LIGHT DETAIL

SCALE: N.T.S.

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100% Design Development
3-15-2016

Dover HS / CTC
Dover, NH
ELECTRICAL SITE DETAILS

SCALE:
DRAWN BY: AD
CHECKED BY: DMP

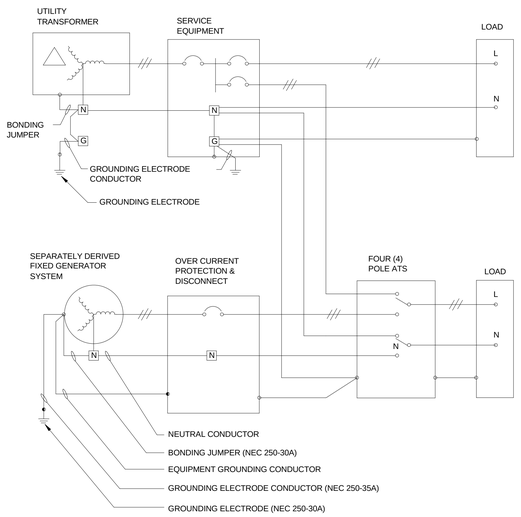
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JOB NUMBER 403114

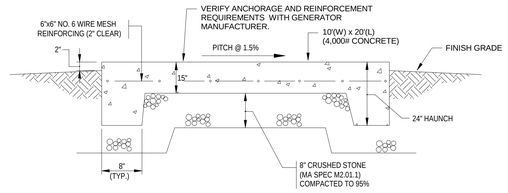
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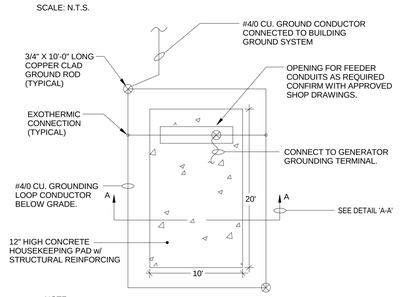
1 E0.5 SEPARATELY DERIVED GENERATOR SYSTEM

SCALE: N.T.S.



GENERATOR PAD DETAIL 'A-A'

SCALE: N.T.S.

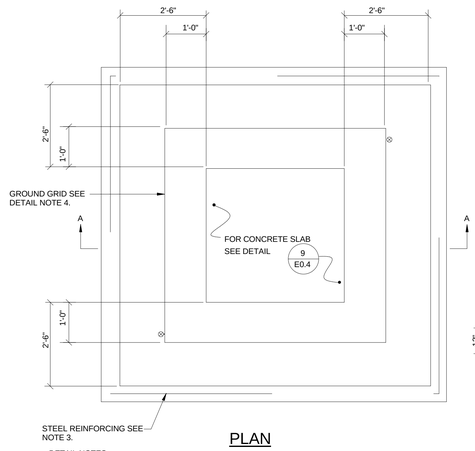


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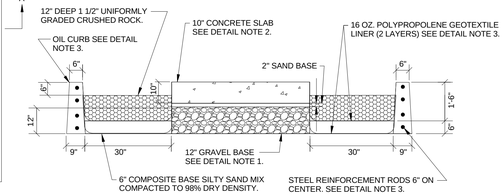
1. PAD SHALL BE PROVIDED IN ACCORDANCE WITH APPROVED SHOP DRAWINGS. PAD SHALL BE PROVIDED BY G.C.
2. PAD DIMENSIONS ARE APPROXIMATE. PROVIDE 12" OF PAD ALL AROUND GENERATOR.

2 E0.5 GENERATOR PAD DETAIL (SEPARATELY DERIVED SYSTEM)

SCALE: N.T.S.



PLAN



SECTION A-A

DETAIL NOTES:

1. PLACE CONCRETE SLAB ON A BASE OF 2" SAND AND 12" GRAVEL. THE GRAVEL SHALL BE THOROUGHLY PACKED AND SAND THOROUGHLY WETTED IMMEDIATELY BEFORE PLACING CONCRETE.
2. UPON COMPLETION OF THE SLAB AND THE INSTALLATION OF CONDUIT, FILL THE OPEN AREA AROUND THE CONDUIT WITH CONCRETE AND GROUT AROUND THE CONDUIT TO SEAL THIS AREA.
3. REINFORCE WITH FOUR 1/2" RODS, SIX INCHES ON CENTER AS SHOWN. BEND RODS AROUND CORNERS. FILL AREA BETWEEN SLAB AND CURB WITH 1-1/2" UNIFORMLY GRADED CRUSHED ROCK AND LINE WITH 2 LAYERS OF GEOTEXTILE LINER AS SHOWN. GEOTEXTILE LINERS (16 OZ.) TO BE SEPARATED BY A 6" LAYER OF COMPACTED, SILTY SAND AND GRAVEL MIX. ALL SEAMS TO OVERLAP 12" MINIMUM.
4. GROUND GRID TO BE INSTALLED 1" BELOW UNDISTURBED EARTH AND THE GROUND GRID SHALL BE PLACED 1" IN FRONT OF THE SLAB RATHER THAN 2". IN NO CASE SHALL ANY PORTION OF GROUND GRID OR GROUND RODS LIE WITHIN THE GRAVEL OR STONE LAYERS.
5. REFER TO NGRID STANDARDS FOR OIL CONTAIMMENT BARRIER STANDARDS AND REQUIREMENTS.
6. CONFIRM WITH LOCAL UTILITY CO. INSPECTOR.

3 E0.5 OIL CONTAINMENT DETAIL

SCALE: N.T.S.

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ELECTRICAL SITE DETAILS

SCALE:

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E0.5

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GENERAL LIGHTING NOTES:

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FOR LIGHTING IN THIS AREA SEE ELECTRICAL SHEET E1.2A

FOR LIGHTING IN THIS AREA SEE ELECTRICAL SHEET E1.1A

1 E1.0A GROUND FLOOR PLAN PART A - LIGHTING
SCALE: 1/8" = 1'-0"

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Dover, NH
GROUND FLOOR PLAN PART A-LIGHTING
SCALE: As indicated
DRAWN BY: MM
CHECKED BY: DMP

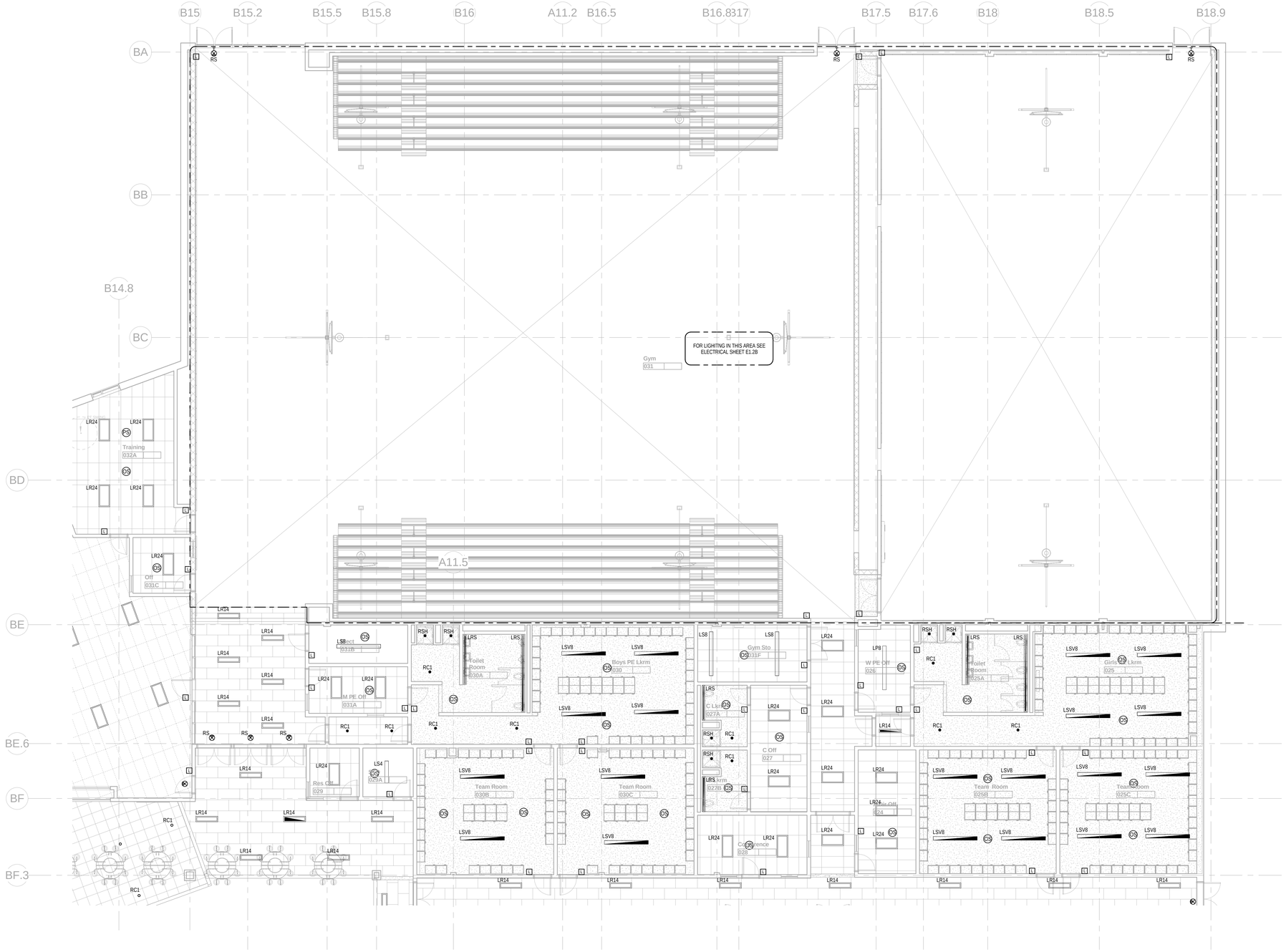
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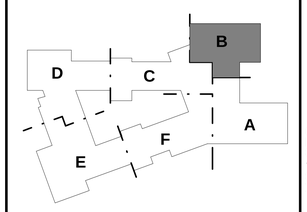


1 E1.0B GROUND FLOOR PLAN PART B - LIGHTING
SCALE: 1/8" = 1'-0"

GENERAL LIGHTING NOTES:

1. EXACT LOCATIONS OF ALL FIXTURES AND DEVICES SHALL BE FULLY COORDINATED WITH ARCHITECTURAL PLANS, ELEVATIONS, SECTIONS AND THE WORK OF OTHER TRADES PRIOR TO ROUGH-IN. FULLY COORDINATED WITH ARCHITECTURAL PLANS, ELEVATIONS, SECTIONS AND THE WORK OF OTHER TRADES PRIOR TO ROUGH-IN. EXACT LOCATIONS OF ALL FIXTURES AND DEVICES SHALL BE FULLY COORDINATED WITH ARCHITECTURAL PLANS, ELEVATIONS, SECTIONS AND THE WORK OF OTHER TRADES PRIOR TO ROUGH-IN.
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KEYPLAN



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Dover, NH
GROUND FLOOR PLAN PART B - LIGHTING
SCALE: As Indicated
DRAWN BY: MM
CHECKED BY: DMP

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E1.0B

JOB NUMBER 403114

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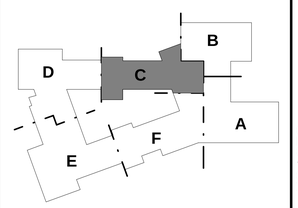
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1 E1.0C GROUND FLOOR PLAN PART C - LIGHTING
SCALE: 1/8" = 1'-0"

KEYPLAN



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GROUND FLOOR PLAN PART C - LIGHTING
SCALE: As indicated DRAWN BY: MM CHECKED BY: DMP

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1 / E1.0F GROUND FLOOR PLAN PART F - LIGHTING
SCALE: 1/8" = 1'-0"

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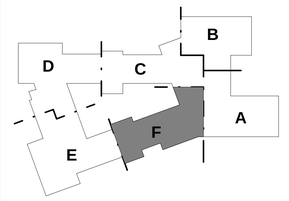
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PLAN NORTH / TRUE NORTH

KEYPLAN



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Dover, NH
GROUND FLOOR PLAN PART F- LIGHTING
SCALE: As indicated
DRAWN BY: MM
CHECKED BY: DMP

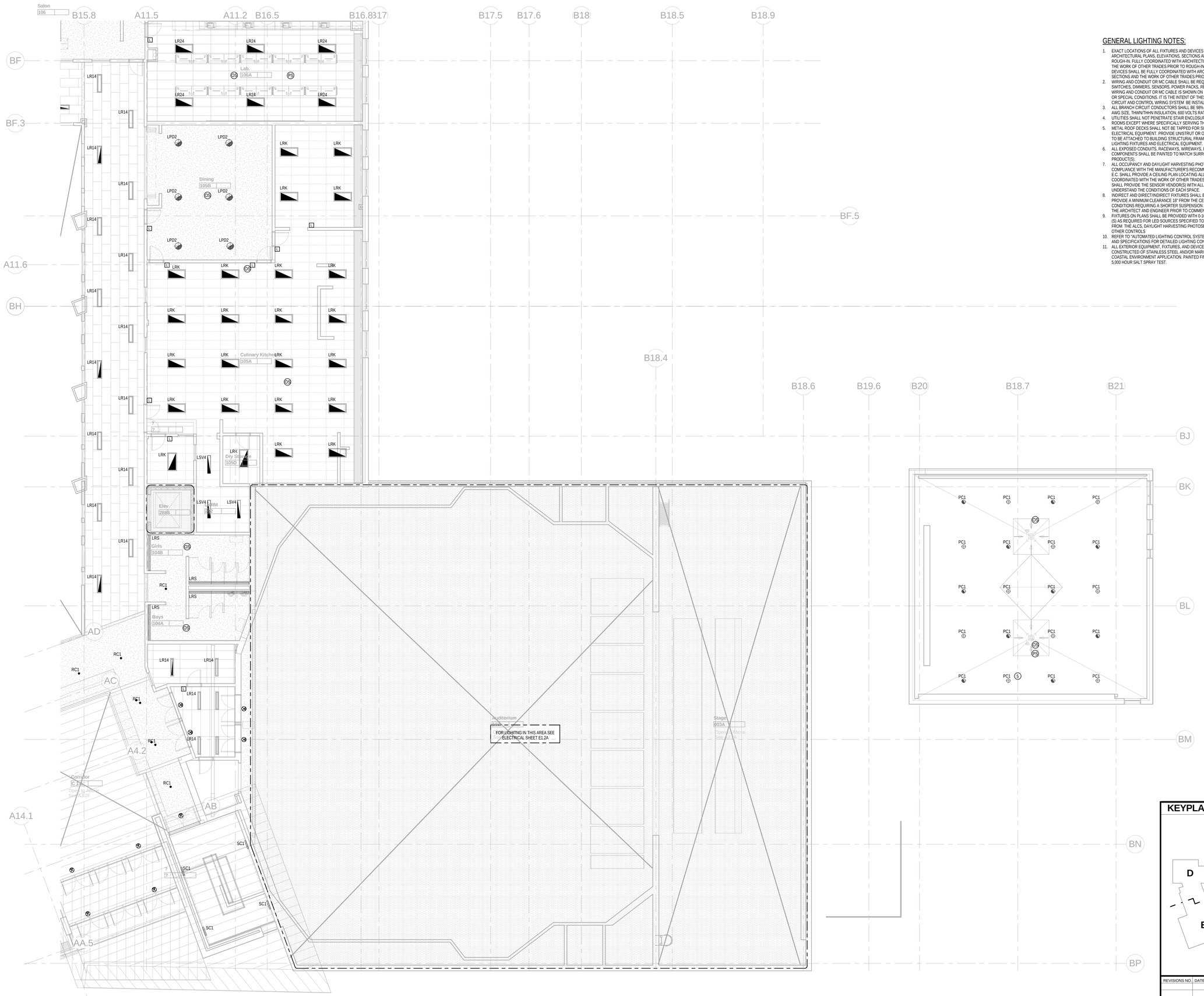
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GENERAL LIGHTING NOTES:

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1 E1.1A FIRST FLOOR PLAN PART A - LIGHTING
SCALE: 1/8" = 1'-0"

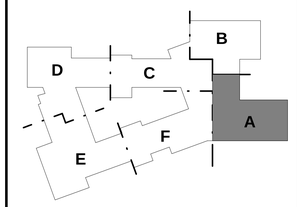
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PLAN NORTH
TRUE NORTH

KEYPLAN



Dover HS / CTC
Dover, NH
FIRST FLOOR PLAN PART A - LIGHTING
SCALE: As indicated
DRAWN BY: MM
CHECKED BY: DMP

REVISIONS NO.	DATE	REMARKS	BY

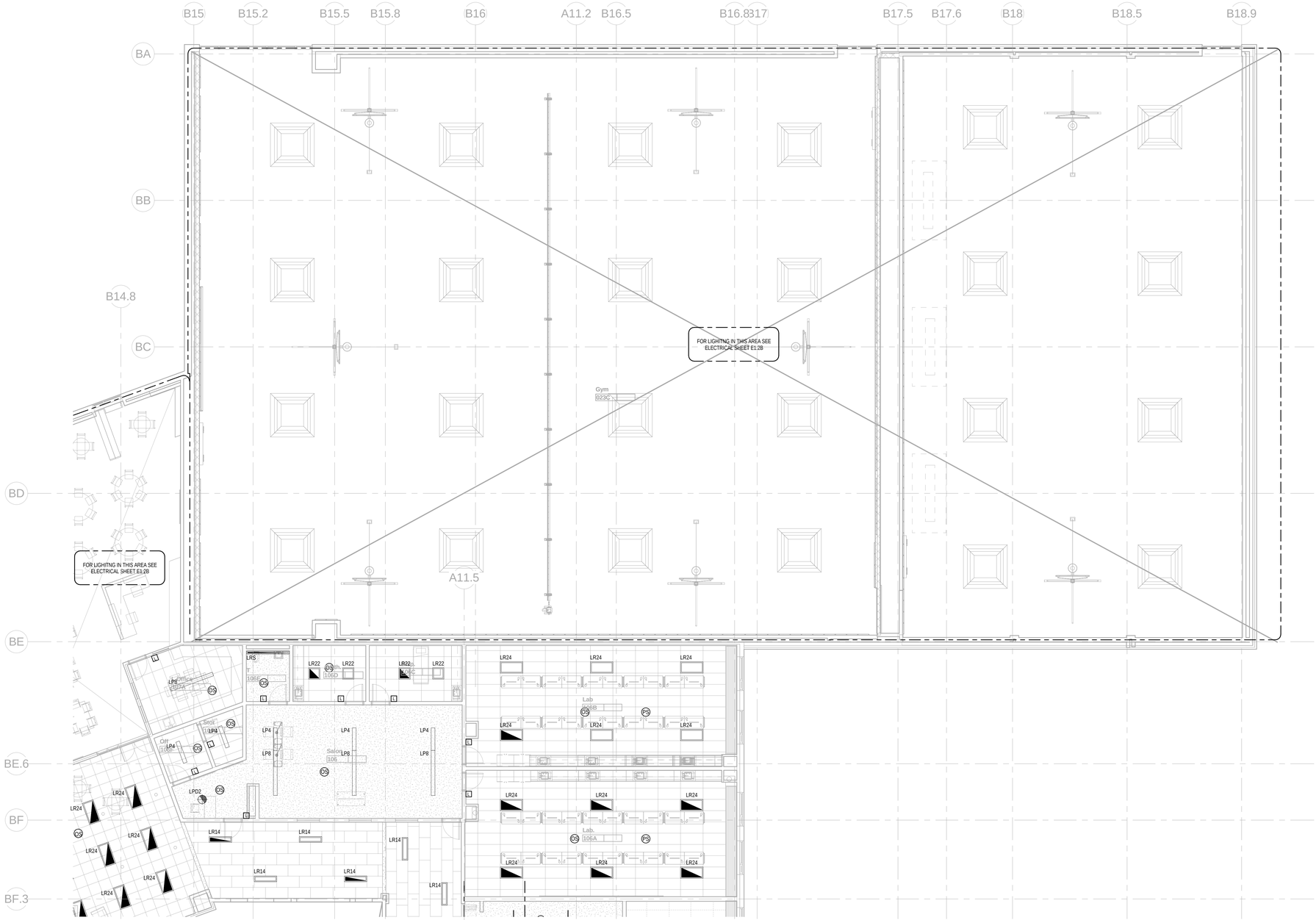
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E1.1A

JOB NUMBER 403114

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1 E1.1B FIRST FLOOR PLAN PART B - LIGHTING
SCALE: 1/8" = 1'-0"

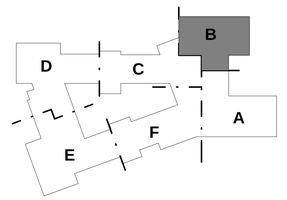
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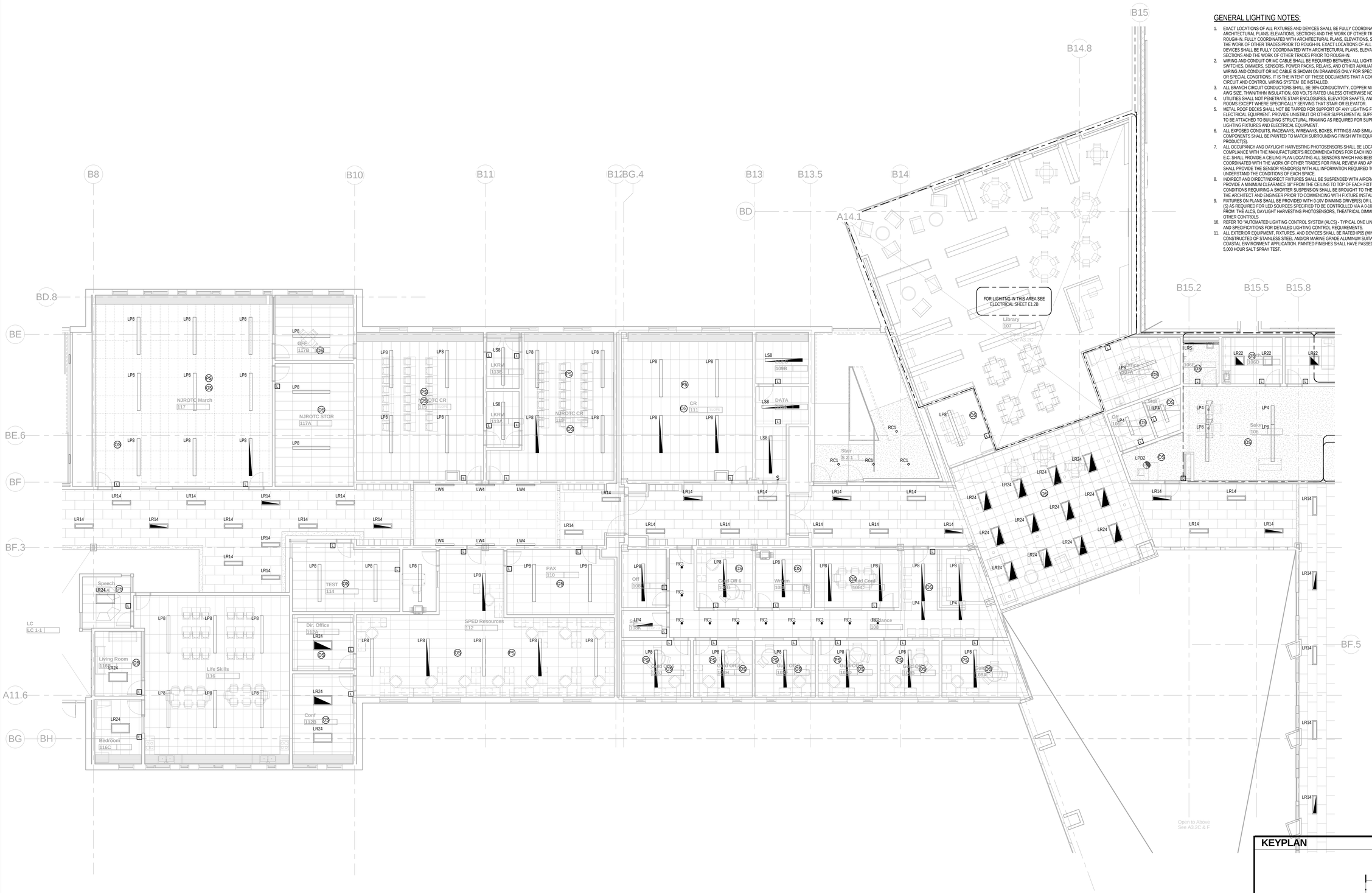
Dover HS / CTC
Dover, NH
FIRST FLOOR PLAN PART B - LIGHTING
SCALE: As indicated
DRAWN BY: MM
CHECKED BY: DMP

REVISIONS NO.	DATE	REMARKS	BY

DRAWING NUMBER
E1.1B
JOB NUMBER 403114

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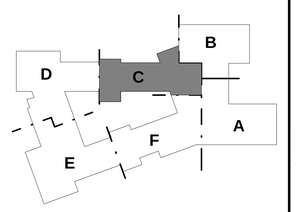


1 E1.1C FIRST FLOOR PLAN PART C - LIGHTING
SCALE: 1/8" = 1'-0"

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KEYPLAN



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Dover HS / CTC
Dover, NH
FIRST FLOOR PLAN PART C - LIGHTING
SCALE: As indicated
DRAWN BY: MM
CHECKED BY: DMP

DRAWING NUMBER
E1.1C

JOB NUMBER 403114

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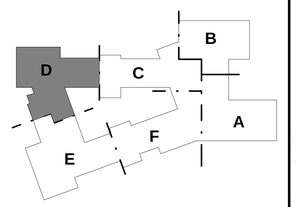
1 E1.1D FIRST FLOOR PLAN PART D - LIGHTING
SCALE: 1/8" = 1'-0"

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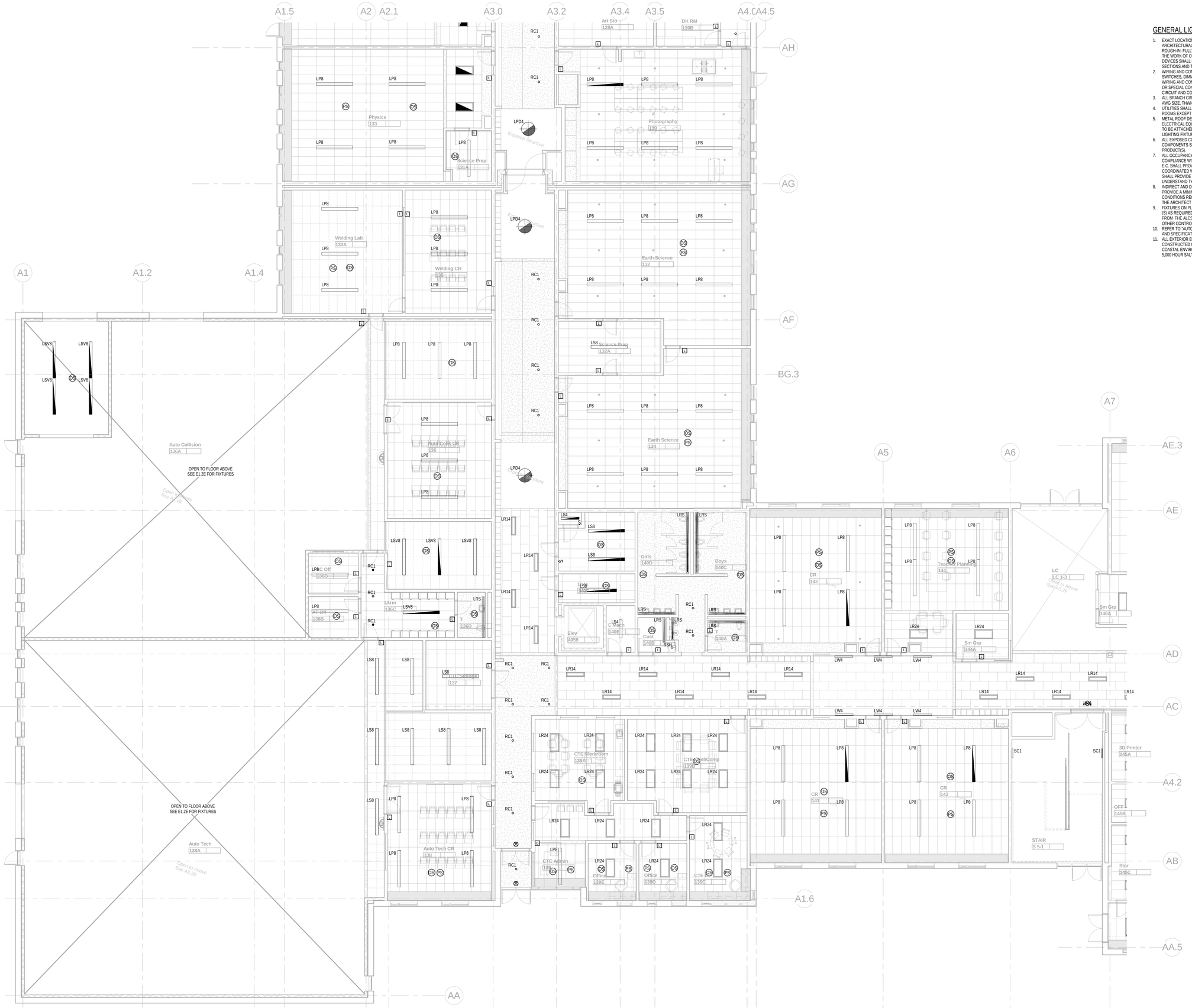
Dover HS / CTC
Dover, NH
FIRST FLOOR PLAN PART D - LIGHTING
SCALE: As indicated
DRAWN BY: MM
CHECKED BY: DMP

REVISIONS NO.	DATE	REMARKS	BY

DRAWING NUMBER
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JOB NUMBER 403114

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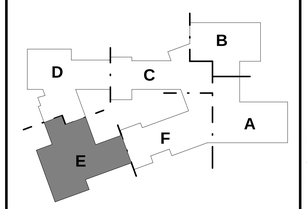


1 E1.1E FIRST FLOOR PLAN PART E - LIGHTING
SCALE: 1/8" = 1'-0"

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Dover, NH
FIRST FLOOR PLAN PART E - LIGHTING
SCALE: As Indicated
DRAWN BY: MM
CHECKED BY: DMP

REVISIONS NO.	DATE	REMARKS	BY

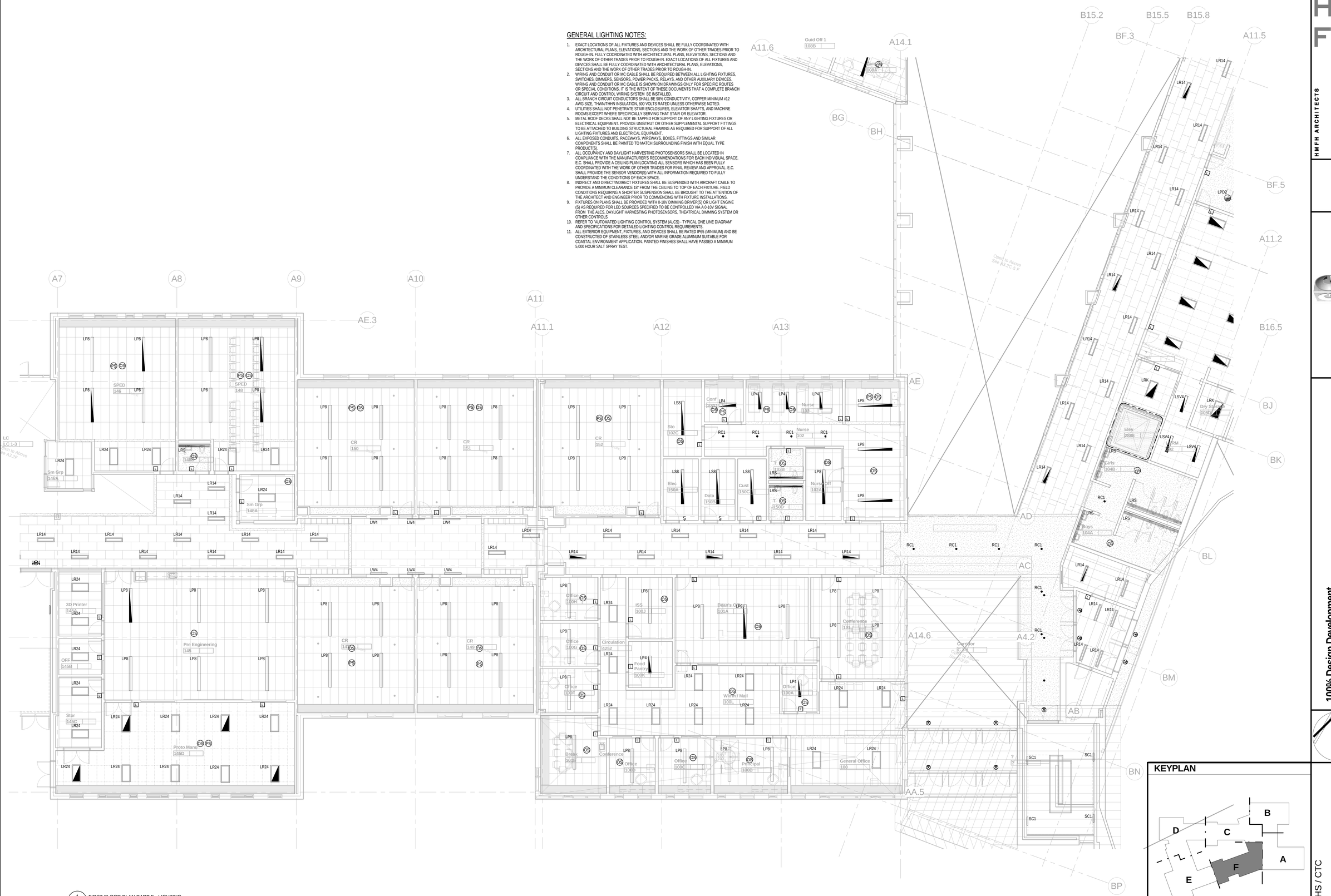
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1 E1.1F FIRST FLOOR PLAN PART F - LIGHTING
SCALE: 1/8" = 1'-0"

KEYPLAN

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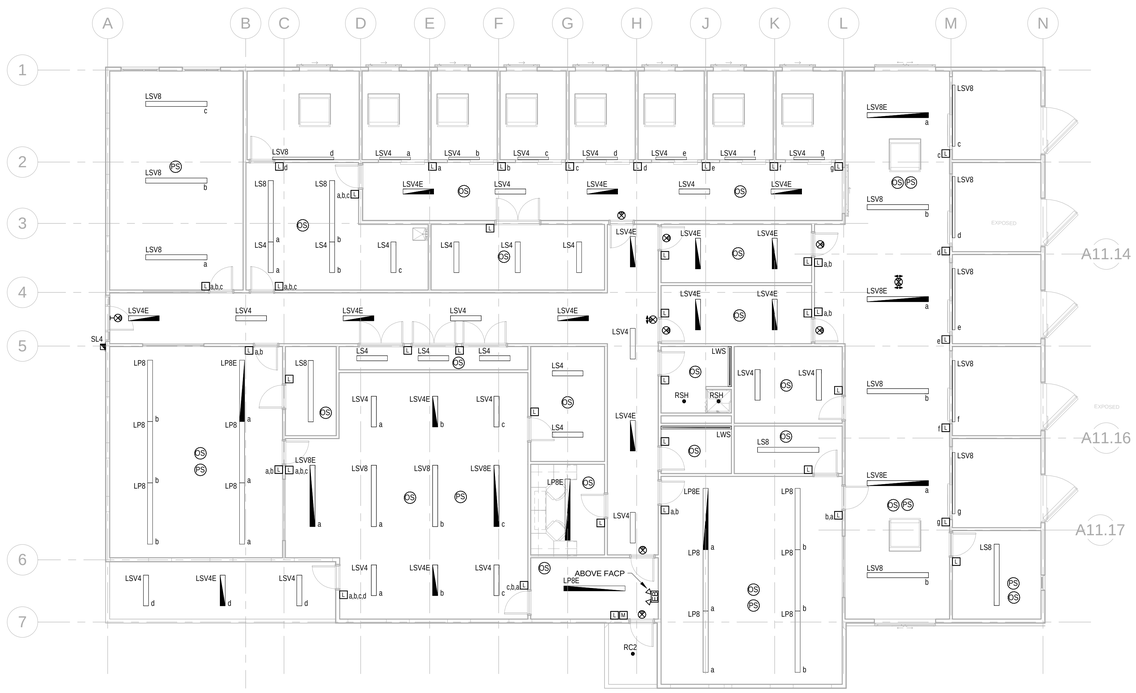
Dover HS / CTC
Dover, NH
FIRST FLOOR PLAN PART F - LIGHTING
SCALE: As Indicated
DRAWN BY: MM
CHECKED BY: DMP

REVISIONS NO.	DATE	REMARKS	BY

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1 E1.1G FIRST FLOOR PLAN ANIMAL SCIENCE - LIGHTING
SCALE: 1/8" = 1'-0"

LIGHTNING PROTECTION NOTES:

1. THE LIGHTNING PROTECTION SYSTEM AS SHOWN ON DRAWING HAS BEEN DESIGNED IN ACCORDANCE WITH UL96A & NFPA-780 LIGHTNING PROTECTION SYSTEM STANDARDS.
2. CONDUCTORS SHALL MAINTAIN A HORIZONTAL OR DOWNWARD COURSE, FREE FROM "U" OR "V" (DOWN AND UP) POCKETS.
3. NO BEND OF CONDUCTOR SHALL FORM AN ANGLE OF LESS THAN 90° NOR SHALL HAVE A RADIUS OF BEND LESS THAN 8".
4. AIR TERMINALS SHALL BE SPACED EVERY 20'-0" MAXIMUM AROUND THE ROOF PERIMETER AND/OR ALONG ROOF RIDGES. AIR TERMINALS SHALL BE LOCATED WITHIN 2'-0" OF OUTSIDE CORNERS.
5. AIR TERMINALS SHALL BE SPACED EVERY 50'-0" MAXIMUM IN CENTER ROOF AREAS.
6. ACTUAL JOBSITE CONDITIONS MAY REQUIRE SLIGHT ALTERATIONS IN AIR TERMINAL, DOWN CONDUCTOR AND GROUND ROD LOCATIONS.
7. BARE COPPER MATERIALS SHALL NOT BE INSTALLED ON ALUMINUM OR GALVALUM SURFACES, AND ALUMINUM MATERIALS SHALL NOT BE INSTALLED ON COPPER SURFACES.
8. ALL LIGHTNING PROTECTION CONDUCTORS SHALL BE FASTENED EVERY 3'-0" MAX.
9. ALL BOLTS ON BOLT-PRESSURE CONNECTORS SHALL BE TORQUED AT 150 POUND-INCHES.
10. ALL CONNECTIONS MUST BE USED WITH UL LISTED CABLE OF SAME METAL TYPE.
11. SMALL METALLIC BODIES OF INDUCTANCE SITUATED WITHIN 6'-0" OF A LIGHTNING CONDUCTOR OR ANOTHER BONDED METAL BODY SHALL BE INTERCONNECTED TO THE LIGHTNING CONDUCTOR SYSTEM, UNLESS INHERENTLY GROUNDED.
12. ALL LARGE METAL BODIES SHALL BE BONDED TO THE MAIN LIGHTNING PROTECTION CONDUCTOR. (I.E.: EXHAUST FANS, ROOF VENTS, METAL COOLING TOWERS, HVAC UNITS, LADDERS, RAILINGS, ANTENNAS, SKYLIGHTS, METAL STACKS AND ANY OTHER LARGE METAL BODY WHOSE HEIGHT EXCEEDS THAT OF THE AIR TERMINAL IN USE, UNLESS PROTECTED BY HIGHER ROOF ELEVATIONS).
13. CONNECTIONS TO GROUND RODS SHALL BE MADE AT A POINT NOT LESS THAN 1'-0" BELOW FINISHED GRADE AND 2'-0" AWAY FROM FOUNDATION WALL.
14. BOND TO WATERLINES (DOMESTIC & FIRE).
15. A LIGHTNING ARRESTOR, PROTECTOR OR ANTENNA DISCHARGE UNIT SHALL BE INSTALLED ON EACH ELECTRIC AND TELEPHONE SERVICE AND RADIO AND TELEVISION ANTENNA LEAD-IN BY THE ELECTRICAL CONTRACTOR, IN ACCORDANCE WITH NFPA-70.
16. TRANSIENT VOLTAGE SURGE SUPPRESSION (TVSS) OF SERVICES SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR. (I.E. COMPUTERS, COPIERS , TELEPHONE, ETC.).
17. PROVIDE CERTIFICATION (UL, ARL OR EQUAL) UPON COMPLETION OF INSTALLATION.

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ANIMAL SCIENCE FLOOR PLAN - LIGHTING

SCALE: As indicated | DRAWN BY: MM | CHECKED BY: DMP

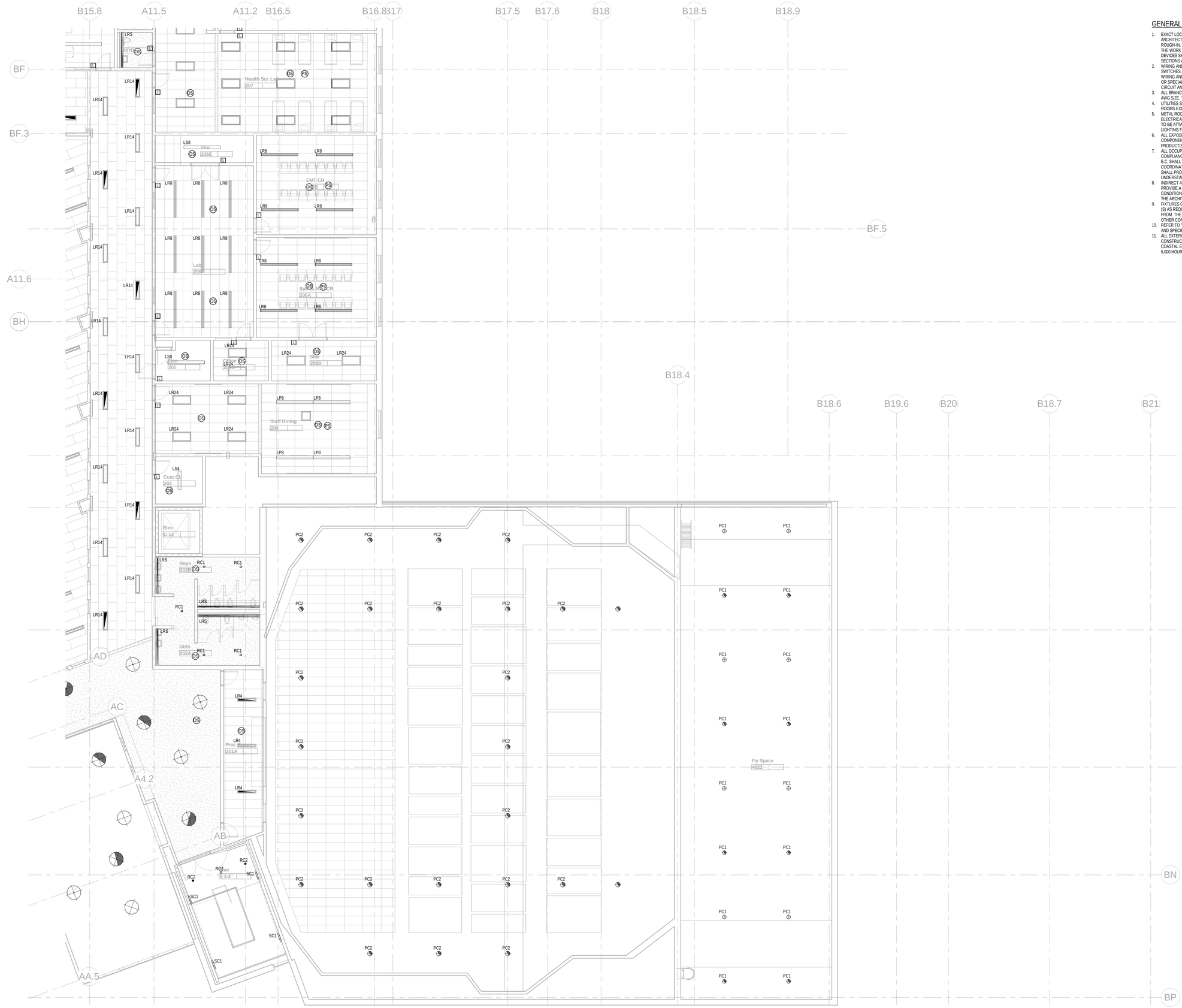
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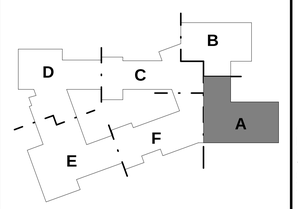
1 E1.2A SECOND FLOOR PLAN PART A - LIGHTING
SCALE: 1/8" = 1'-0"

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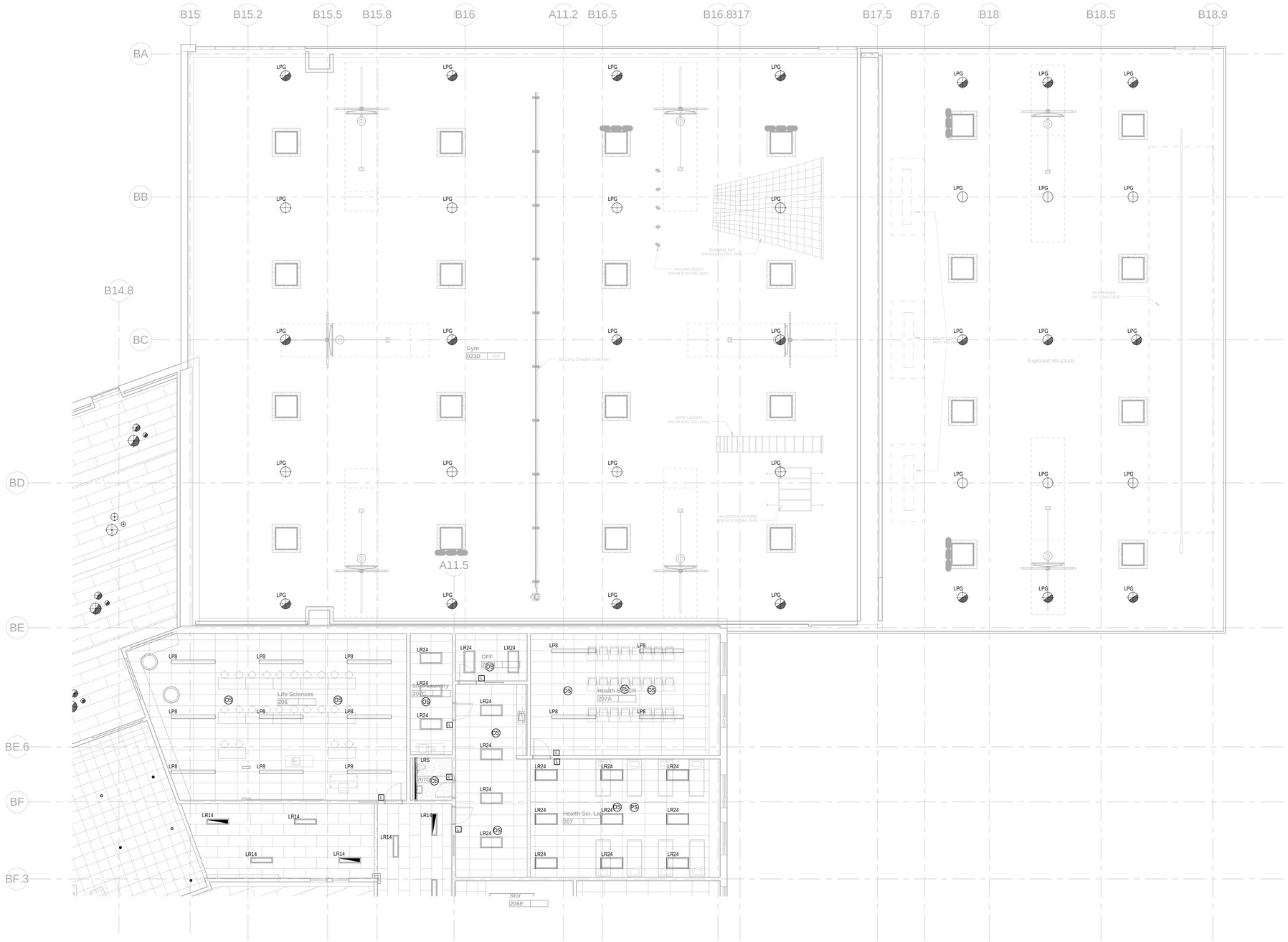
Dover HS / CTC
Dover, NH
SECOND FLOOR PLAN PART A - LIGHTING
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JOB NUMBER 403114

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1 E1.2B SECOND FLOOR PLAN PART B - LIGHTING
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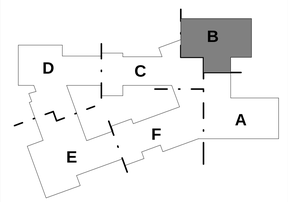
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TRUE NORTH

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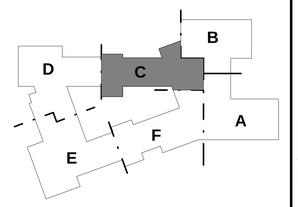
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1 E1.2C SECOND FLOOR PLAN PART C - LIGHTING
SCALE: 1/8" = 1'-0"

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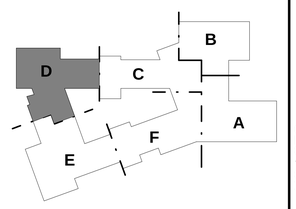


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9. FIXTURES ON PLANS SHALL BE PROVIDED WITH 0-10V DIMMING DRIVER(S) OR LIGHT ENGINE (S) AS REQUIRED FOR LED SOURCES SPECIFIED TO BE CONTROLLED VIA A 0-10V SIGNAL FROM THE ALCS, DAYLIGHT HARVESTING PHOTOSENSORS, THEATRICAL DIMMING SYSTEM OR OTHER CONTROLS
10. REFER TO "AUTOMATED LIGHTING CONTROL SYSTEM (ALCS) - TYPICAL ONE LINE DIAGRAM" AND SPECIFICATIONS FOR DETAILED LIGHTING CONTROL REQUIREMENTS.
11. ALL EXTERIOR EQUIPMENT, FIXTURES, AND DEVICES SHALL BE RATED IP65 (MINIMUM) AND BE CONSTRUCTED OF STAINLESS STEEL AND/OR MARINE GRADE ALUMINUM SUITABLE FOR COASTAL ENVIRONMENT APPLICATION. PAINTED FINISHES SHALL HAVE PASSED A MINIMUM 5,000 HOUR SALT SPRAY TEST.

1 E1.2D SECOND FLOOR PLAN PART D - LIGHTING
SCALE: 1/8" = 1'-0"

KEYPLAN



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3-15-2016

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Dover, NH
SECOND FLOOR PLAN PART D - LIGHTING
SCALE: As indicated
DRAWN BY: MM
CHECKED BY: DMP

REVISIONS NO.	DATE	REMARKS	BY

DRAWING NUMBER
E1.2D
JOB NUMBER 403114

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GENERAL LIGHTING NOTES:

1. EXACT LOCATIONS OF ALL FIXTURES AND DEVICES SHALL BE FULLY COORDINATED WITH ARCHITECTURAL PLANS, ELEVATIONS, SECTIONS AND THE WORK OF OTHER TRADES PRIOR TO ROUGH-IN. FULLY COORDINATED WITH ARCHITECTURAL PLANS, ELEVATIONS, SECTIONS AND THE WORK OF OTHER TRADES PRIOR TO ROUGH-IN. EXACT LOCATIONS OF ALL FIXTURES AND DEVICES SHALL BE FULLY COORDINATED WITH ARCHITECTURAL PLANS, ELEVATIONS, SECTIONS AND THE WORK OF OTHER TRADES PRIOR TO ROUGH-IN.
2. WIRING AND CONDUIT OR MC CABLE SHALL BE REQUIRED BETWEEN ALL LIGHTING FIXTURES, SWITCHES, DIMMERS, SENSORS, POWER PACKS, RELAYS, AND OTHER AUXILIARY DEVICES. WIRING AND CONDUIT OR MC CABLE IS SHOWN ON DRAWINGS ONLY FOR SPECIFIC ROUTES OR SPECIAL CONDITIONS. IT IS THE INTENT OF THESE DOCUMENTS THAT A COMPLETE BRANCH CIRCUIT AND CONTROL WIRING SYSTEM BE INSTALLED.
3. ALL BRANCH CIRCUIT CONDUCTORS SHALL BE 98% CONDUCTIVITY, COPPER MINIMUM #12 AWG SIZE. THWN/THWN INSULATION, 600 VOLTS RATED UNLESS OTHERWISE NOTED.
4. UTILITIES SHALL NOT PENETRATE STAIR ENCLOSURES, ELEVATOR SHAFTS, AND MACHINE ROOMS EXCEPT WHERE SPECIFICALLY SERVING THAT STAIR OR ELEVATOR.
5. METAL ROOF DECKS SHALL NOT BE TAPPED FOR SUPPORT OF ANY LIGHTING FIXTURES OR ELECTRICAL EQUIPMENT. PROVIDE UNISTRUT OR OTHER SUPPLEMENTAL SUPPORT FITTINGS TO BE ATTACHED TO BUILDING STRUCTURAL FRAMING AS REQUIRED FOR SUPPORT OF ALL LIGHTING FIXTURES AND ELECTRICAL EQUIPMENT.
6. ALL EXPOSED CONDUITS, RACEWAYS, WIREWAYS, BOXES, FITTINGS AND SIMILAR COMPONENTS SHALL BE PAINTED TO MATCH SURROUNDING FINISH WITH EQUAL TYPE PRODUCT(S).
7. ALL OCCUPANCY AND DAYLIGHT HARVESTING PHOTOSENSORS SHALL BE LOCATED IN COMPLIANCE WITH THE MANUFACTURER'S RECOMMENDATIONS FOR EACH INDIVIDUAL SPACE. E.C. SHALL PROVIDE A CEILING PLAN LOCATING ALL SENSORS WHICH HAS BEEN FULLY COORDINATED WITH THE WORK OF OTHER TRADES FOR FINAL REVIEW AND APPROVAL. E.C. SHALL PROVIDE THE SENSOR VENDOR(S) WITH ALL INFORMATION REQUIRED TO FULLY UNDERSTAND THE CONDITIONS OF EACH SPACE.
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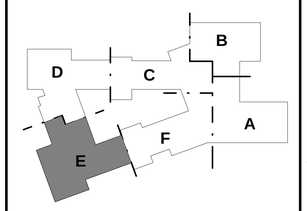
1 E1.2E SECOND FLOOR PLAN PART E - LIGHTING
SCALE: 1/8" = 1'-0"

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3-15-2016

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Dover HS / CTC
Dover, NH
SECOND FLOOR PLAN PART E - LIGHTING
SCALE: As indicated
DRAWN BY: AMI
CHECKED BY: DMP

REVISIONS NO.	DATE	REMARKS	BY

DRAWING NUMBER
E1.2E

JOB NUMBER 403114

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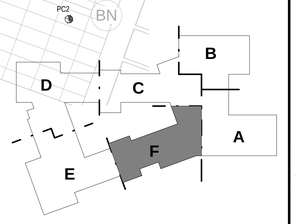
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1 E1.2F SECOND FLOOR PLAN PART F - LIGHTING
SCALE: 1/8" = 1'-0"

KEYPLAN



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3-15-2016

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Dover, NH
SECOND FLOOR PLAN PART F - LIGHTING
SCALE: AS INDICATED
DRAWN BY: MM
CHECKED BY: DMP

REVISIONS NO.	DATE	REMARKS	BY

DRAWING NUMBER
E1.2F
JOB NUMBER 403114

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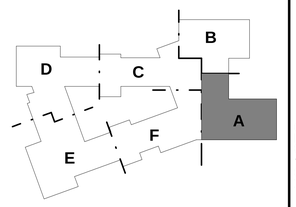
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GENERAL POWER NOTES:

1. COORDINATE EXACT LOCATION OF ALL DEVICES AND EQUIPMENT WITH ARCHITECT PRIOR TO INSTALLATION.
2. REFER TO MECHANICAL PLANS FOR ANY CHANGES AND FOR EXACT LOCATION OF ALL HVAC EQUIPMENT.
3. WIRING IS SHOWN ON DRAWINGS ONLY FOR SPECIFIC ROUTES OR SPECIAL CONDITIONS.
4. WIRING AND CONDUIT SHALL BE REQUIRED BETWEEN ALL OUTLETS INDICATED WITH CIRCUIT NUMBERS AND PANEL DESIGNATIONS.
5. ALTHOUGH ALL BRANCH CIRCUIT WIRE AND CONDUIT IS NOT SHOWN, IT IS THE INTENT OF THESE DOCUMENTS THAT A COMPLETE BRANCH CIRCUIT WIRING SYSTEM BE INSTALLED.
6. ALL BRANCH CIRCUIT CONDUCTORS SHALL BE TYPE MC 98% CONDUCTIVITY, COPPER MINIMUM #12 AWG SIZE, THWN/THHN INSULATION, 600 VOLTS RATED UNLESS OTHERWISE NOTED.
7. REFER TO FIRE PROTECTION PLANS FOR ANY CHANGES AND FOR EXACT LOCATION OF ALL FLOW SWITCH, TAMPER SWITCH, ETC.
8. DO NOT PENETRATE STAIRS WITH ANY UTILITIES EXCEPT FOR UTILITIES SPECIFICALLY SERVING THAT STAIR.
9. WHERE CONDUITS AND/OR BOXES CANNOT BE FLUSH MOUNTED IN BUILDING PROVIDE A SYSTEM OF SURFACE METAL RACEWAYS AND BOXES IN ACCORDANCE WITH ARTICLE 386, EQUAL TO WIREMOLD FOR ALL FINISH SPACES WHERE PUBLIC HAS ACCESS, INCLUDING CORRIDORS, CLASSROOMS, OFFICES, ETC.
10. CONFIRM RATINGS & FINAL LOCATIONS OF EQUIPMENT WITH OWNER PRIOR TO ROUGHING.
11. ALL OUTLETS ON EXTERIOR WALLS WITH CASEWORK SHALL BE MOUNTED 6" ABOVE CASEWORK. CONFIRM HEIGHT OF CASEWORK WITH HVAC AND ARCHITECT PRIOR TO ROUGHING.
12. TYPICALLY PROVIDE GROUND FAULT INTERRUPTER TYPE RECEPTACLES WITHIN 6 FEET OF WATER SOURCES.
13. PROVIDE ALL EMPTY CONDUITS WITH PULL-STRINGS.
14. TYPICALLY PROVIDE (2) 4" SLEEVES OVER EACH CORRIDOR DOOR.
15. ROVIDE (2) 2" THROUGH-WALL SLEEVE ABOVE CEILING OVER THE DOORS INTO EACH ROOM LEADING FROM THE CORRIDOR FOR COMMUNICATIONS/DATA WIRING.
16. LOCATE ALL WALL TELEPHONE OUTLETS 12 INCHES AWAY FROM ALL OTHER OUTLETS/DEVICES.
17. PROVIDE (2) 1" SLEEVES OVER EACH DOOR FOR TEL./DATA SECURITY AND SOUND SYSTEM WIRING. TEL./DATA SHALL BE DEDICATED TO (1) OF THE CONDUITS.
18. ELECTRICAL CONTRACTOR SHALL PROVIDE ALL BOXES AND CONDUITS REQUIRED FOR AUDIO/VISUAL SYSTEMS SECTION 274100 DEVICES AS SHOWN ON AV DRAWINGS. ALL LOCATIONS OF POWER AND A/V OUTLET BOXES SHALL BE COORDINATED WITH ARCHITECT PRIOR TO ROUGHING.

1 E2.0A GROUND FLOOR PLAN PART A - POWER
SCALE: 1/8" = 1'-0"

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Dover, NH
GROUND FLOOR PLAN PART A - POWER
SCALE: As indicated
DRAWN BY: MB
CHECKED BY: DMP

REVISIONS NO.	DATE	REMARKS	BY

DRAWING NUMBER
E2.0A

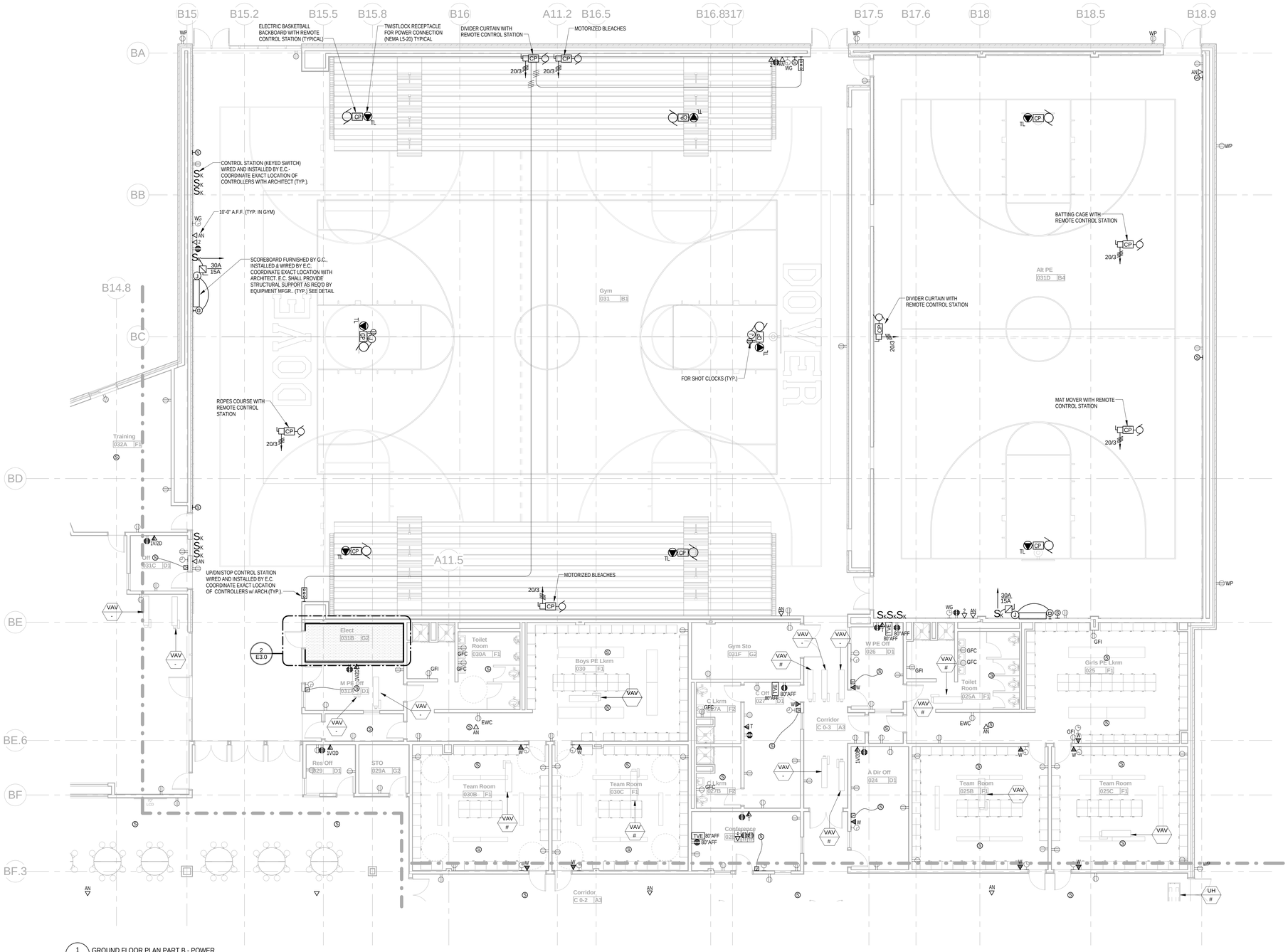
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GENERAL POWER NOTES:

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10. CONFIRM RATINGS & FINAL LOCATIONS OF EQUIPMENT WITH OWNER PRIOR TO ROUGHING.
11. ALL OUTLETS ON EXTERIOR WALLS WITH CASEWORK SHALL BE MOUNTED 6" ABOVE CASEWORK. CONFIRM HEIGHT OF CASEWORK WITH HVAC AND ARCHITECT PRIOR TO ROUGHING.
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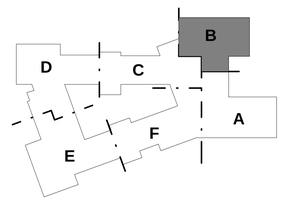
1 E2.0B GROUND FLOOR PLAN PART B - POWER
SCALE: 1/8" = 1'-0"

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3-15-2016

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Dover HS / CTC
Dover, NH
GROUND FLOOR PLAN PART B - POWER
SCALE: As indicated DRAWN BY: MB CHECKED BY: DMP

REVISIONS NO.	DATE	REMARKS	BY

DRAWING NUMBER
E2.0B

JOB NUMBER 403114

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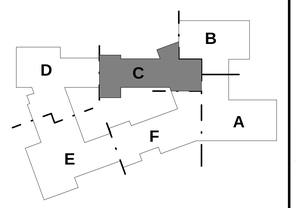
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GENERAL POWER NOTES:

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1 E3.0 GROUND FLOOR PLAN PART C - POWER
SCALE: 1/8" = 1'-0"

KEYPLAN



REVISIONS NO.	DATE	REMARKS	BY

DRAWING NUMBER **E2.0C**

JOB NUMBER 403114

Dover HS / CTC
Dover, NH
GROUND FLOOR PLAN PART C - POWER
SCALE: As indicated

DRAWN BY: MB CHECKED BY: DMP

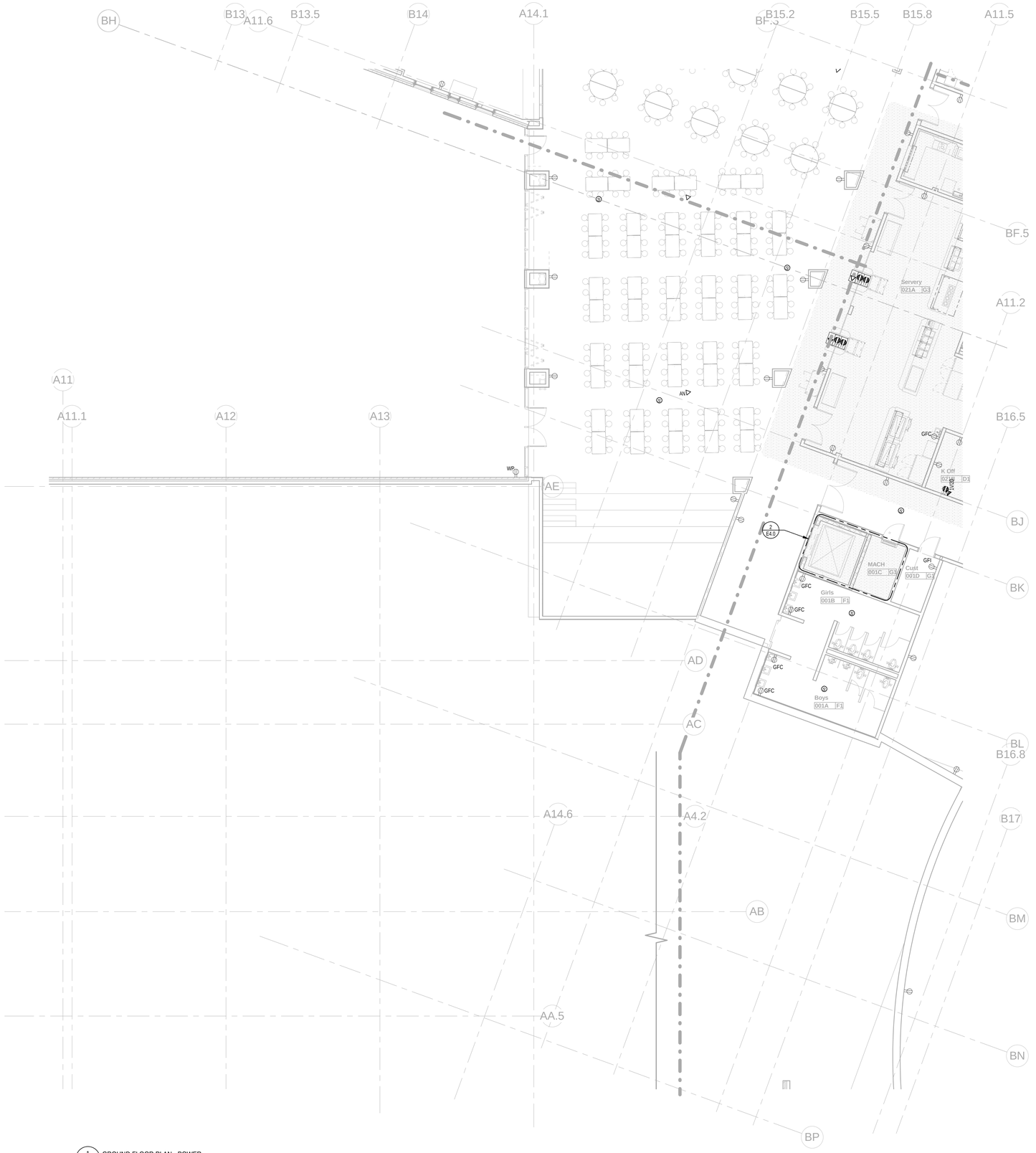
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1 E2.0F GROUND FLOOR PLAN - POWER
SCALE: 1/8" = 1'-0"

GENERAL POWER NOTES:

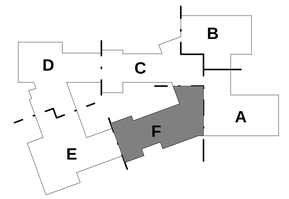
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10. CONFIRM RATINGS & FINAL LOCATIONS OF EQUIPMENT WITH OWNER PRIOR TO ROUGHING.
11. ALL OUTLETS ON EXTERIOR WALLS WITH CASEWORK SHALL BE MOUNTED 6" ABOVE CASEWORK. CONFIRM HEIGHT OF CASEWORK WITH HVAC AND ARCHITECT PRIOR TO ROUGHING.
12. TYPICALLY PROVIDE GROUND FAULT INTERRUPTER TYPE RECEPTACLES WITHIN 6 FEET OF WATER SOURCES.
13. PROVIDE ALL EMPTY CONDUITS WITH PULL-STRINGS.
14. TYPICALLY PROVIDE (2) 4" SLEEVES OVER EACH CORRIDOR DOOR.
15. ROVIDE (2) 2" THROUGH-WALL SLEEVE ABOVE CEILING OVER THE DOORS INTO EACH ROOM LEADING FROM THE CORRIDOR FOR COMMUNICATIONS/DATA WIRING.
16. LOCATE ALL WALL TELEPHONE OUTLETS 12 INCHES AWAY FROM ALL OTHER OUTLETS/DEVICES.
17. PROVIDE (2) 1" SLEEVES OVER EACH DOOR FOR TEL./DATA SECURITY AND SOUND SYSTEM WIRING. TEL./DATA SHALL BE DEDICATED TO (1) OF THE CONDUITS.
18. ELECTRICAL CONTRACTOR SHALL PROVIDE ALL BOXES AND CONDUITS REQUIRED FOR AUDIOVISUAL SYSTEMS SECTION 274100 DEVICES AS SHOWN ON AV DRAWINGS. ALL LOCATIONS OF POWER AND A/V OUTLET BOXES SHALL BE COORDINATED WITH ARCHITECT PRIOR TO ROUGHING.

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100% Design Development
3-15-2016

KEYPLAN



Dover HS / CTC
Dover, NH
GROUND FLOOR PLAN PART F - POWER
SCALE: As Indicated DRAWN BY: MB CHECKED BY: DMP

REVISIONS NO.	DATE	REMARKS	BY

DRAWING NUMBER
E2.0F
JOB NUMBER 403114

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GENERAL POWER NOTES:

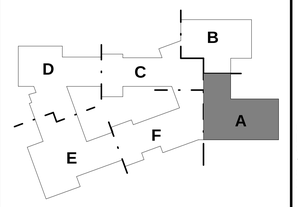
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EXACT LOCATION OF PROJECTOR SCREEN & ASSOCIATED WALL CONTROL TOBE COORDINATED WITH ARCHITECT PRIOR TO ROUGH-IN

MAIN DRAW CURTAIN ELECTRICALLY OPERATED

1 E2.1A FIRST FLOOR PLAN PART A - POWER
SCALE: 1/8" = 1'-0"

KEYPLAN



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3-15-2016

PLAN NORTH
TRUE NORTH

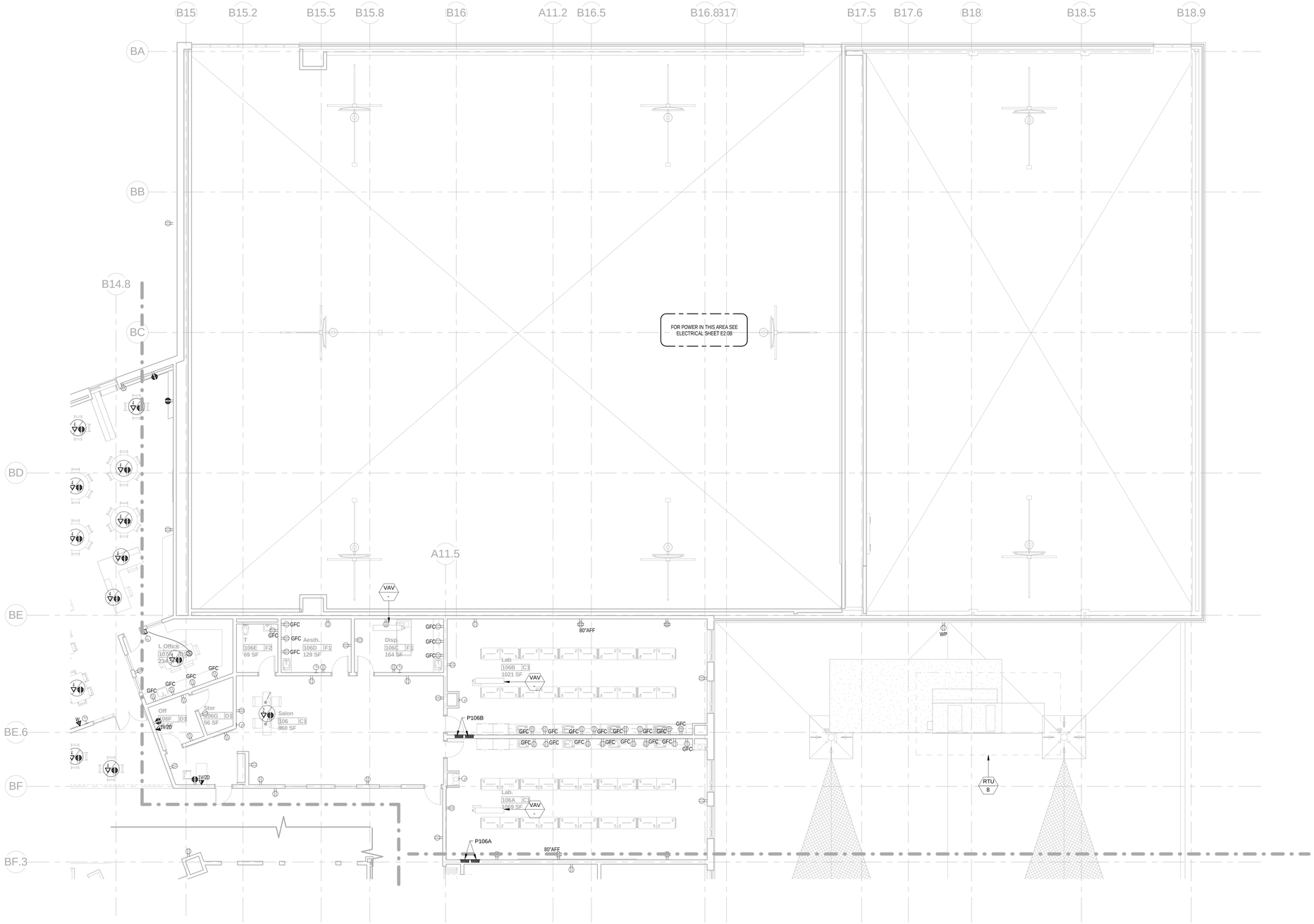
Dover HS / CTC
Dover, NH
FIRST FLOOR PLAN PART A - POWER
SCALE: As indicated
DRAWN BY: MB
CHECKED BY: DMP

REVISIONS NO.	DATE	REMARKS	BY

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E2.1A
JOB NUMBER 403114

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1 E2.1B FIRST FLOOR PLAN PART B - POWER
SCALE: 1/8" = 1'-0"

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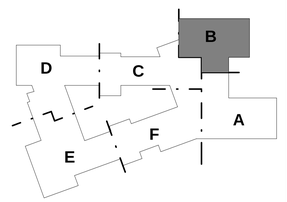
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PLAN NORTH
TRUE NORTH

KEYPLAN



REVISIONS NO.	DATE	REMARKS	BY

Dover HS / CTC
Dover, NH
FIRST FLOOR PLAN PART B - POWER
SCALE: As Indicated
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DRAWING NUMBER
E2.1B

JOB NUMBER 403114

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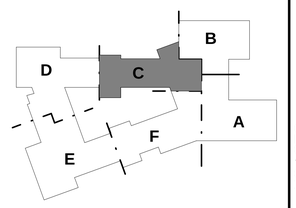
1 E2.1C FIRST FLOOR PLAN PART C - POWER
SCALE: 1/8" = 1'-0"

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Dover, NH
FIRST FLOOR PLAN PART C - POWER
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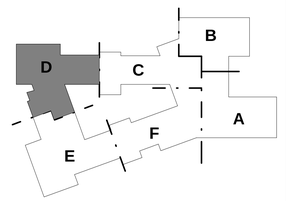
1 E2.1D FIRST FLOOR PLAN PART D - POWER
SCALE: 1/8" = 1'-0"

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Dover HS / CTC
Dover, NH
FIRST FLOOR PLAN PART D - POWER
SCALE: As indicated
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REVISIONS NO.	DATE	REMARKS	BY

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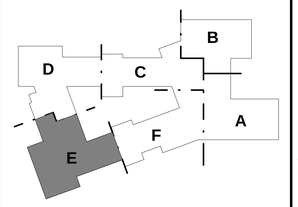
1 E2.1E FIRST FLOOR PLAN PART E - POWER
SCALE: 1/8" = 1'-0"

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Dover HS / CTC
Dover, NH
FIRST FLOOR PLAN PART E - POWER
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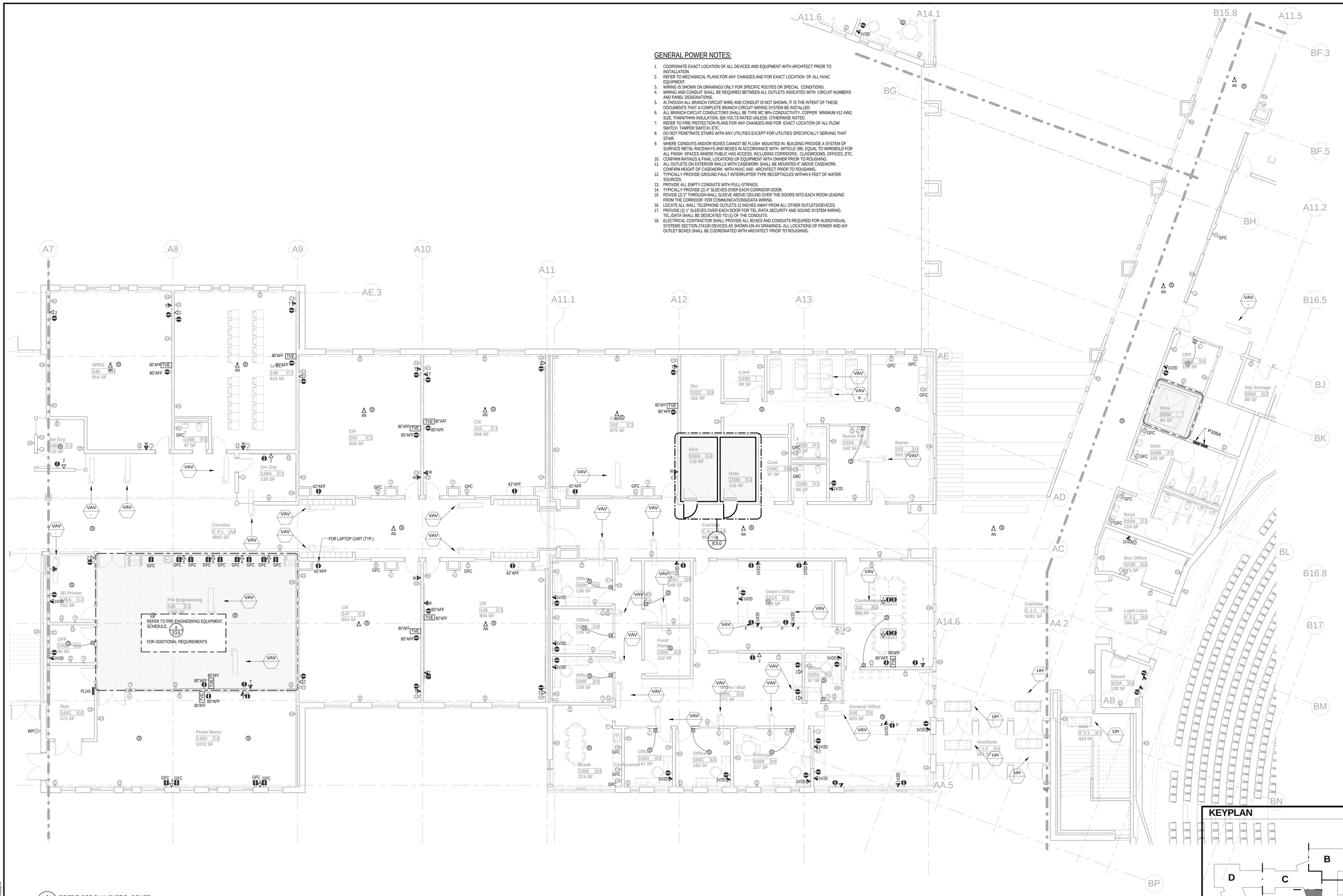
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JOB NUMBER 403114

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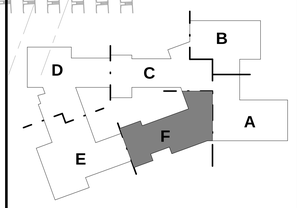
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18. ELECTRICAL CONTRACTOR SHALL PROVIDE ALL BOXES AND CONDUITS REQUIRED FOR AUDIOVISUAL SYSTEMS SECTION 274100 DEVICES AS SHOWN ON AV DRAWINGS. ALL LOCATIONS OF POWER AND A/V OUTLET BOXES SHALL BE COORDINATED WITH ARCHITECT PRIOR TO ROUGHING.



1 / E2.1F FIRST FLOOR PLAN PART F - POWER
SCALE: 1/8" = 1'-0"

KEYPLAN



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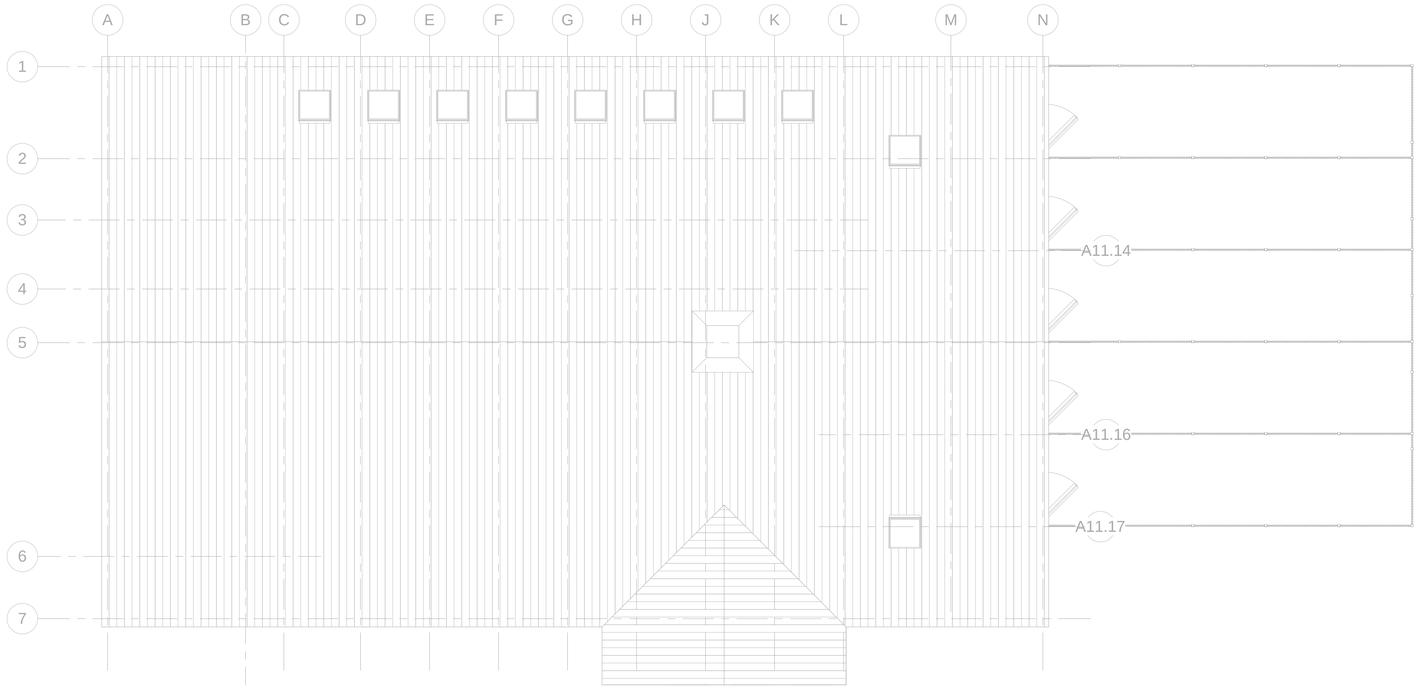
PLAN NORTH
TRUE NORTH

Dover HS / CTC
Dover, NH
FIRST FLOOR PLAN PART F - POWER
SCALE: As indicated
DRAWN BY: MB
CHECKED BY: DMP

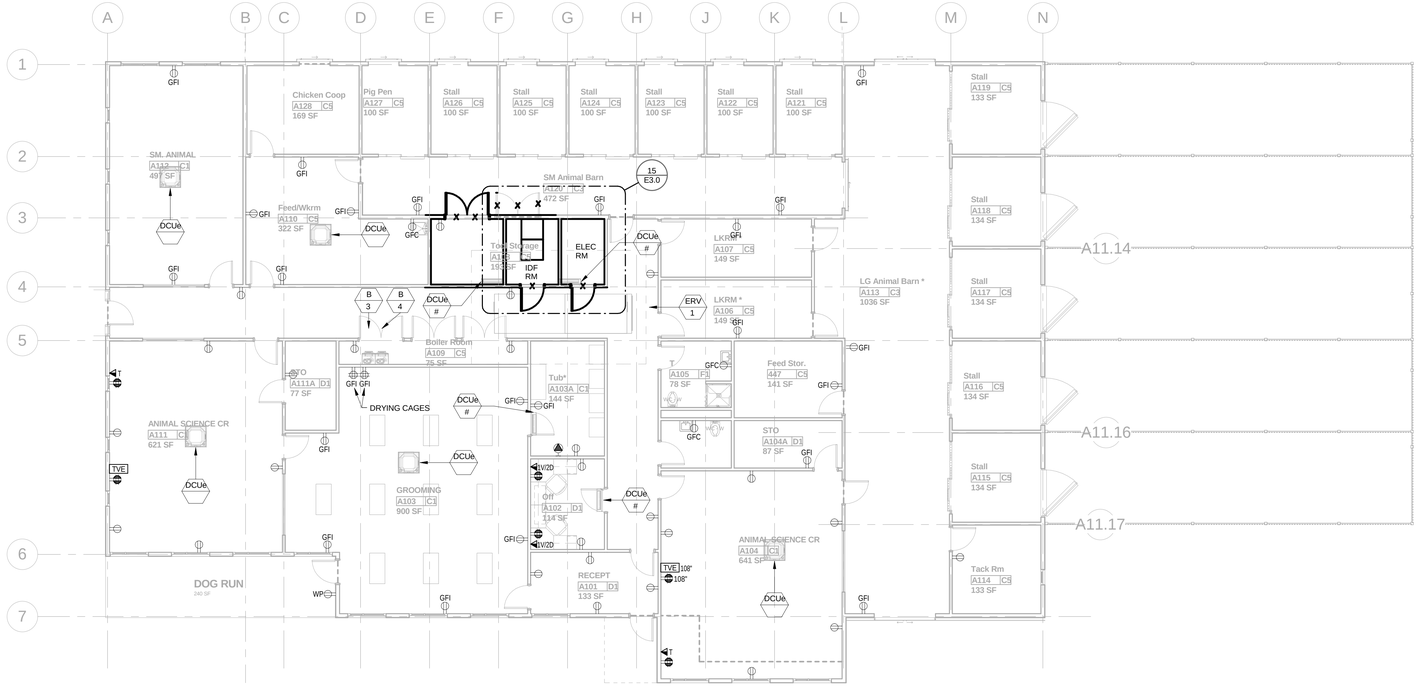
REVISIONS NO.	DATE	REMARKS	BY

DRAWING NUMBER
E2.1F
JOB NUMBER 403114

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2 E2.1G ROOF PLAN ANIMAL SCIENCE - POWER
SCALE: 1/8" = 1'-0"



1 E2.1G FIRST FLOOR PLAN ANIMAL SCIENCE - POWER
SCALE: 1/8" = 1'-0"

GENERAL POWER NOTES:

1. COORDINATE EXACT LOCATION OF ALL DEVICES AND EQUIPMENT WITH ARCHITECT PRIOR TO INSTALLATION.
2. REFER TO MECHANICAL PLANS FOR ANY CHANGES AND FOR EXACT LOCATION OF ALL HVAC EQUIPMENT.
3. WIRING IS SHOWN ON DRAWINGS ONLY FOR SPECIFIC ROUTES OR SPECIAL CONDITIONS.
4. WIRING AND CONDUIT SHALL BE REQUIRED BETWEEN ALL OUTLETS INDICATED WITH CIRCUIT NUMBERS AND PANEL DESIGNATIONS.
5. ALTHOUGH ALL BRANCH CIRCUIT WIRE AND CONDUIT IS NOT SHOWN, IT IS THE INTENT OF THESE DOCUMENTS THAT A COMPLETE BRANCH CIRCUIT WIRING SYSTEM BE INSTALLED.
6. ALL BRANCH CIRCUIT CONDUCTORS SHALL BE TYPE MC 98% CONDUCTIVITY, COPPER MINIMUM #12 AWG SIZE, THWN/THHN INSULATION, 600 VOLTS RATED UNLESS OTHERWISE NOTED.
7. REFER TO FIRE PROTECTION PLANS FOR ANY CHANGES AND FOR EXACT LOCATION OF ALL FLOW SWITCH, TAMPER SWITCH, ETC.
8. DO NOT PENETRATE STAIRS WITH ANY UTILITIES EXCEPT FOR UTILITIES SPECIFICALLY SERVING THAT STAIR.
9. WHERE CONDUITS AND/OR BOXES CANNOT BE FLUSH MOUNTED IN BUILDING PROVIDE A SYSTEM OF SURFACE METAL RACEWAYS AND BOXES IN ACCORDANCE WITH ARTICLE 386, EQUAL TO WIREMOLD FOR ALL FINISH SPACES WHERE PUBLIC HAS ACCESS, INCLUDING CORRIDORS, CLASSROOMS, OFFICES, ETC.
10. CONFIRM RATINGS & FINAL LOCATIONS OF EQUIPMENT WITH OWNER PRIOR TO ROUGHING.
11. ALL OUTLETS ON EXTERIOR WALLS WITH CASEWORK SHALL BE MOUNTED 6" ABOVE CASEWORK. CONFIRM HEIGHT OF CASEWORK WITH HVAC AND ARCHITECT PRIOR TO ROUGHING.
12. TYPICALLY PROVIDE GROUND FAULT INTERRUPTER TYPE RECEPTACLES WITHIN 6 FEET OF WATER SOURCES.
13. PROVIDE ALL EMPTY CONDUITS WITH PULL-STRINGS.
14. TYPICALLY PROVIDE (2) 4" SLEEVES OVER EACH CORRIDOR DOOR.
15. ROVIDE (2) 2" THROUGH-WALL SLEEVE ABOVE CEILING OVER THE DOORS INTO EACH ROOM LEADING FROM THE CORRIDOR FOR COMMUNICATIONS/DATA WIRING.
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3-15-2016

Dover HS / CTC
Dover, NH
ANIMAL SCIENCE FLOOR PLANS - POWER
SCALE: As indicated
DRAWN BY: MB
CHECKED BY: DMP

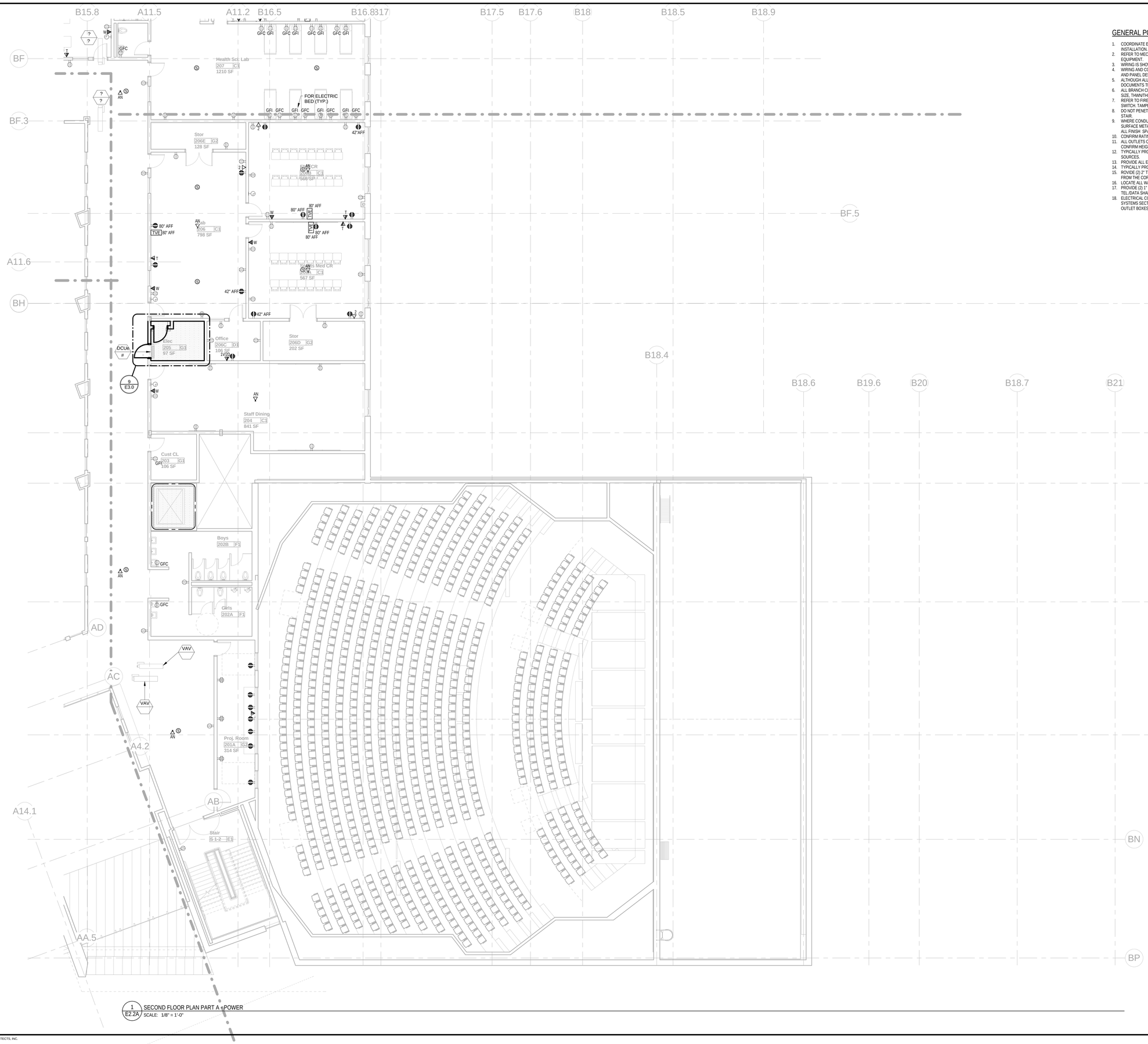
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JOB NUMBER 403114

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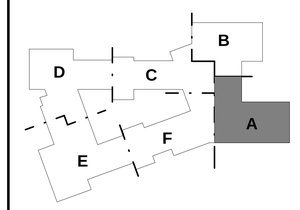
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PLAN NORTH
TRUE NORTH

KEYPLAN



Dover HS / CTC
Dover, NH

SECOND FLOOR PLAN PART A - POWER

SCALE: As indicated | DRAWN BY: MB | CHECKED BY: DMP

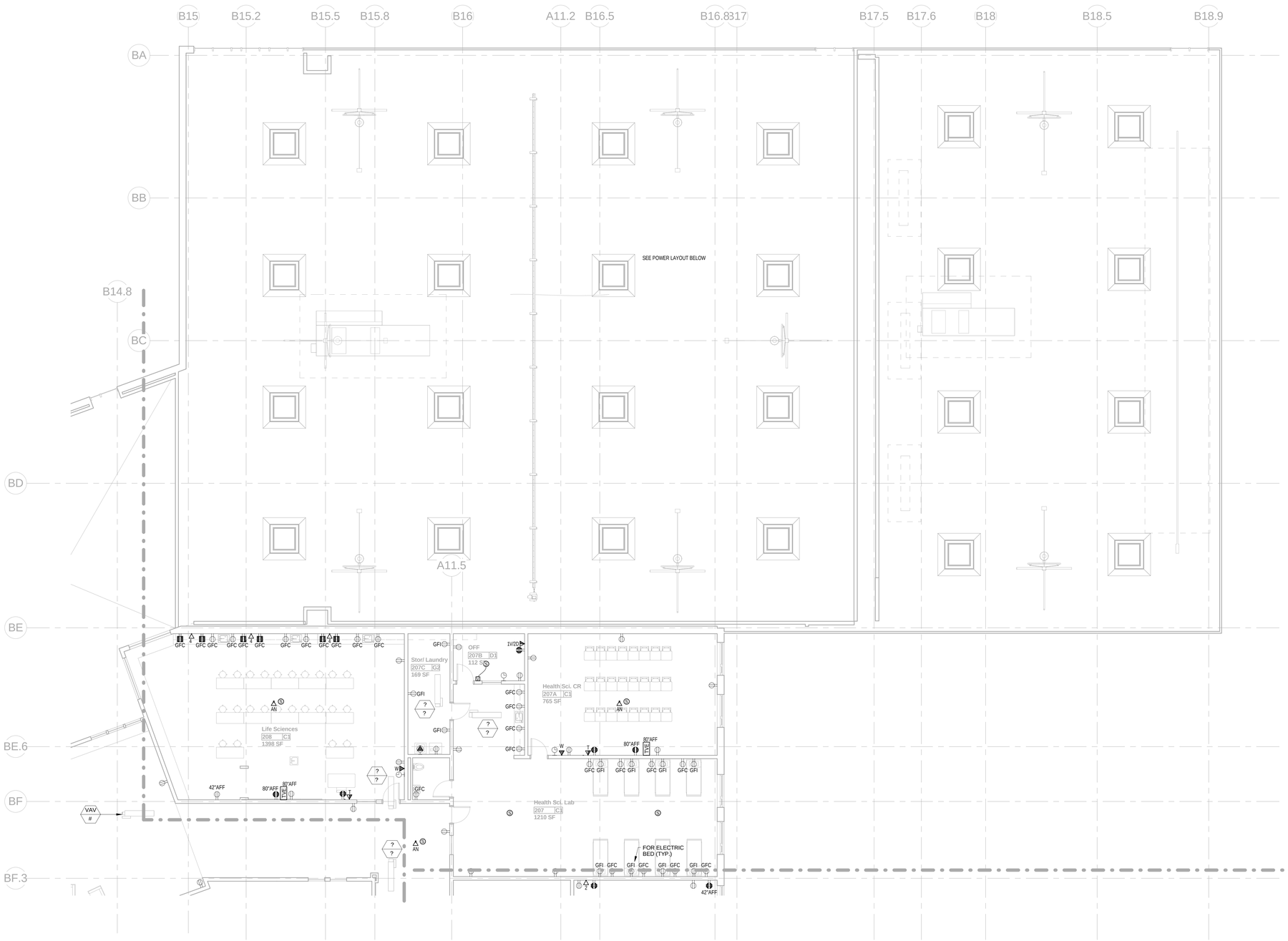
REVISIONS NO.	DATE	REMARKS	BY

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E2.2A

JOB NUMBER 403114

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1 E2.2B SECOND FLOOR PLAN PART B - POWER
SCALE: 1/8" = 1'-0"

GENERAL POWER NOTES:

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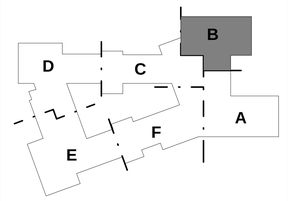
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3-15-2016

PLAN NORTH
TRUE NORTH

KEYPLAN



Dover HS / CTC
Dover, NH
SECOND FLOOR PLAN PART B - POWER
SCALE: As indicated
DRAWN BY: MB
CHECKED BY: DMP

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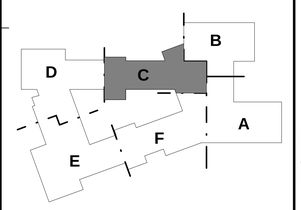
1 E2.2C SECOND FLOOR PLAN PART C - POWER
SCALE: 1/8" = 1'-0"

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KEYPLAN



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Dover, NH
SECOND FLOOR PLAN PART C - POWER
SCALE: As Indicated
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JOB NUMBER 403114

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GENERAL POWER NOTES:

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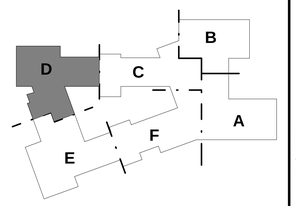
1 E2.2D SECOND FLOOR PLAN PART D - POWER
SCALE: 1/8" = 1'-0"

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KEYPLAN



Dover HS / CTC
Dover, NH
SECOND FLOOR PLAN PART D - POWER
SCALE: As indicated
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CHECKED BY: DMP

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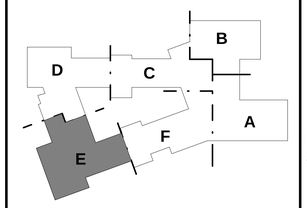


1 E2.2E SECOND FLOOR PLAN PART E - POWER
SCALE: 1/8" = 1'-0"

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KEYPLAN



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100% Design Development
3-15-2016

Dover HS / CTC
Dover, NH
SECOND FLOOR PLAN PART E - POWER
SCALE: As Indicated
DRAWN BY: MB
CHECKED BY: DMP

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E2.2E
JOB NUMBER 403114

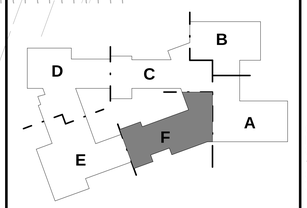
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GENERAL POWER NOTES:

1. COORDINATE EXACT LOCATION OF ALL DEVICES AND EQUIPMENT WITH ARCHITECT PRIOR TO INSTALLATION.
2. REFER TO MECHANICAL PLANS FOR ANY CHANGES AND FOR EXACT LOCATION OF ALL HVAC EQUIPMENT.
3. WIRING IS SHOWN ON DRAWINGS ONLY FOR SPECIFIC ROUTES OR SPECIAL CONDITIONS.
4. WIRING AND CONDUIT SHALL BE REQUIRED BETWEEN ALL OUTLETS INDICATED WITH CIRCUIT NUMBERS AND PANEL DESIGNATIONS.
5. ALTHOUGH ALL BRANCH CIRCUIT WIRE AND CONDUIT IS NOT SHOWN, IT IS THE INTENT OF THESE DOCUMENTS THAT A COMPLETE BRANCH CIRCUIT WIRING SYSTEM BE INSTALLED.
6. ALL BRANCH CIRCUIT CONDUCTORS SHALL BE TYPE MC 98% CONDUCTIVITY, COPPER MINIMUM #12 AWG SIZE. THWN/THHN INSULATION, 600 VOLTS RATED UNLESS OTHERWISE NOTED.
7. REFER TO FIRE PROTECTION PLANS FOR ANY CHANGES AND FOR EXACT LOCATION OF ALL FLOW SWITCH, TAMPER SWITCH, ETC.
8. DO NOT PENETRATE STAIRS WITH ANY UTILITIES EXCEPT FOR UTILITIES SPECIFICALLY SERVING THAT STAIR.
9. WHERE CONDUITS AND/OR BOXES CANNOT BE FLUSH MOUNTED IN BUILDING PROVIDE A SYSTEM OF SURFACE METAL RACEWAYS AND BOXES IN ACCORDANCE WITH ARTICLE 386, EQUAL TO WIREMOLD FOR ALL FINISH SPACES WHERE PUBLIC HAS ACCESS, INCLUDING CORRIDORS, CLASSROOMS, OFFICES, ETC.
10. CONFIRM RATINGS & FINAL LOCATIONS OF EQUIPMENT WITH OWNER PRIOR TO ROUGHING.
11. ALL OUTLETS ON EXTERIOR WALLS WITH CASEWORK SHALL BE MOUNTED 6" ABOVE CASEWORK. CONFIRM HEIGHT OF CASEWORK WITH HVAC AND ARCHITECT PRIOR TO ROUGHING.
12. TYPICALLY PROVIDE GROUND FAULT INTERRUPTER TYPE RECEPTACLES WITHIN 6 FEET OF WATER SOURCES.
13. PROVIDE ALL EMPTY CONDUITS WITH PULL-STRINGS.
14. TYPICALLY PROVIDE (2) 4" SLEEVES OVER EACH CORRIDOR DOOR.
15. ROVIDE (2) 2" THROUGH-WALL SLEEVE ABOVE CEILING OVER THE DOORS INTO EACH ROOM LEADING FROM THE CORRIDOR FOR COMMUNICATIONS/DATA WIRING.
16. LOCATE ALL WALL TELEPHONE OUTLETS 12 INCHES AWAY FROM ALL OTHER OUTLETS/DEVICES.
17. PROVIDE (2) 1" SLEEVES OVER EACH DOOR FOR TEL./DATA SECURITY AND SOUND SYSTEM WIRING. TEL./DATA SHALL BE DEDICATED TO (1) OF THE CONDUITS.
18. ELECTRICAL CONTRACTOR SHALL PROVIDE ALL BOXES AND CONDUITS REQUIRED FOR AUDIO/VISUAL SYSTEMS SECTION 274100 DEVICES AS SHOWN ON AV DRAWINGS. ALL LOCATIONS OF POWER AND A/V OUTLET BOXES SHALL BE COORDINATED WITH ARCHITECT PRIOR TO ROUGHING.

1 E2.2F SECOND FLOOR PLAN PART F - POWER
SCALE: 1/8" = 1'-0"

KEYPLAN



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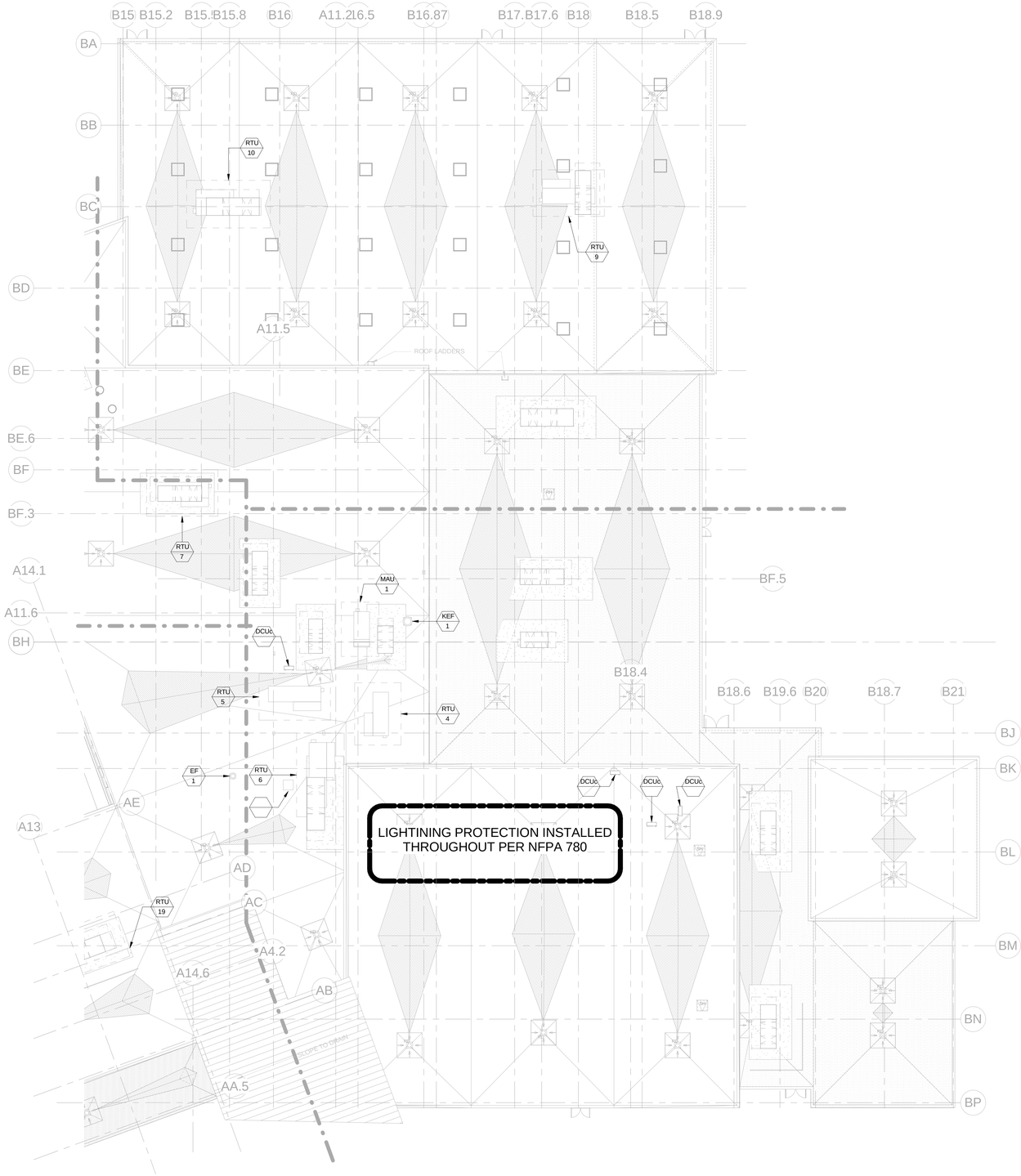
DRAWING NUMBER
E2.2F

JOB NUMBER 403114

Dover HS / CTC
Dover, NH
SECOND FLOOR PLAN PART F - POWER
SCALE: As Indicated DRAWN BY: MB CHECKED BY: DMP

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1 / E2.3 ROOF PLAN PARTS A,B - POWER
SCALE: 1/16" = 1'-0"

LIGHTNING PROTECTION NOTES:

1. THE LIGHTNING PROTECTION SYSTEM AS SHOWN ON DRAWING HAS BEEN DESIGNED IN ACCORDANCE WITH UL96A & NFPA-780 LIGHTNING PROTECTION SYSTEM STANDARDS.
2. CONDUCTORS SHALL MAINTAIN A HORIZONTAL OR DOWNWARD COURSE, FREE FROM "U" OR "V" (DOWN AND UP) POCKETS.
3. NO BEND OF CONDUCTOR SHALL FORM AN ANGLE OF LESS THAN 90° NOR SHALL HAVE A RADIUS OF BEND LESS THAN 8".
4. AIR TERMINALS SHALL BE SPACED EVERY 20'-0" MAXIMUM AROUND THE ROOF PERIMETER AND/OR ALONG ROOF RIDGES. AIR TERMINALS SHALL BE LOCATED WITHIN 2'-0" OF OUTSIDE CORNERS.
5. AIR TERMINALS SHALL BE SPACED EVERY 50'-0" MAXIMUM IN CENTER ROOF AREAS.
6. ACTUAL JOBSITE CONDITIONS MAY REQUIRE SLIGHT ALTERATIONS IN AIR TERMINAL, DOWN CONDUCTOR AND GROUND ROD LOCATIONS.
7. BARE COPPER MATERIALS SHALL NOT BE INSTALLED ON ALUMINUM OR GALVALUM SURFACES, AND ALUMINUM MATERIALS SHALL NOT BE INSTALLED ON COPPER SURFACES.
8. ALL LIGHTNING PROTECTION CONDUCTORS SHALL BE FASTENED EVERY 3'-0" MAX.
9. ALL BOLTS ON BOLT-PRESSURE CONNECTORS SHALL BE TORQUED AT 150 POUND-INCHES.
10. ALL CONNECTIONS MUST BE USED WITH UL LISTED CABLE OF SAME METAL TYPE.
11. SMALL METALLIC BODIES OF INDUCTANCE SITUATED WITHIN 6'-0" OF A LIGHTNING CONDUCTOR OR ANOTHER BONDED METAL BODY SHALL BE INTERCONNECTED TO THE LIGHTNING CONDUCTOR SYSTEM, UNLESS INHERENTLY GROUNDED.
12. ALL LARGE METAL BODIES SHALL BE BONDED TO THE MAIN LIGHTNING PROTECTION CONDUCTOR. (I.E.: EXHAUST FANS, ROOF VENTS, METAL COOLING TOWERS, HVAC UNITS, LADDERS, RAILINGS, ANTENNAS, SKYLIGHTS, METAL STACKS AND ANY OTHER LARGE METAL BODY WHOSE HEIGHT EXCEEDS THAT OF THE AIR TERMINAL IN USE, UNLESS PROTECTED BY HIGHER ROOF ELEVATIONS).
13. CONNECTIONS TO GROUND RODS SHALL BE MADE AT A POINT NOT LESS THAN 1'-0" BELOW FINISHED GRADE AND 2'-0" AWAY FROM FOUNDATION WALL.
14. BOND TO WATERLINES (DOMESTIC & FIRE).
15. A LIGHTNING ARRESTOR, PROTECTOR OR ANTENNA DISCHARGE UNIT SHALL BE INSTALLED ON EACH ELECTRIC AND TELEPHONE SERVICE AND RADIO AND TELEVISION ANTENNA LEAD-IN BY THE ELECTRICAL CONTRACTOR, IN ACCORDANCE WITH NFPA-70.
16. TRANSIENT VOLTAGE SURGE SUPPRESSION (TVSS) OF SERVICES SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR, (I.E. COMPUTERS, COPIERS, TELEPHONE, ETC.).
17. PROVIDE CERTIFICATION (UL, ARL OR EQUAL) UPON COMPLETION OF INSTALLATION.

GENERAL POWER NOTES:

1. COORDINATE EXACT LOCATION OF ALL DEVICES AND EQUIPMENT WITH ARCHITECT PRIOR TO INSTALLATION.
2. REFER TO MECHANICAL PLANS FOR ANY CHANGES AND FOR EXACT LOCATION OF ALL HVAC EQUIPMENT.
3. WIRING IS SHOWN ON DRAWINGS ONLY FOR SPECIFIC ROUTES OR SPECIAL CONDITIONS.
4. WIRING AND CONDUIT SHALL BE REQUIRED BETWEEN ALL OUTLETS INDICATED WITH CIRCUIT NUMBERS AND PANEL DESIGNATIONS.
5. ALTHOUGH ALL BRANCH CIRCUIT WIRE AND CONDUIT IS NOT SHOWN, IT IS THE INTENT OF THESE DOCUMENTS THAT A COMPLETE BRANCH CIRCUIT WIRING SYSTEM BE INSTALLED.
6. ALL BRANCH CIRCUIT CONDUCTORS SHALL BE TYPE MC 98% CONDUCTIVITY, COPPER MINIMUM #12 AWG SIZE. THWN/THHN INSULATION, 600 VOLTS RATED UNLESS OTHERWISE NOTED.
7. REFER TO FIRE PROTECTION PLANS FOR ANY CHANGES AND FOR EXACT LOCATION OF ALL FLOW SWITCH. TAMPER SWITCH, ETC.
8. DO NOT PENETRATE STAIRS WITH ANY UTILITIES EXCEPT FOR UTILITIES SPECIFICALLY SERVING THAT STAIR.
9. WHERE CONDUITS AND/OR BOXES CANNOT BE FLUSH MOUNTED IN BUILDING PROVIDE A SYSTEM OF SURFACE METAL RACEWAYS AND BOXES IN ACCORDANCE WITH ARTICLE 386, EQUAL TO WIREMOLD FOR ALL FINISH SPACES WHERE PUBLIC HAS ACCESS, INCLUDING CORRIDORS, CLASSROOMS, OFFICES, ETC.
10. CONFIRM RATINGS & FINAL LOCATIONS OF EQUIPMENT WITH OWNER PRIOR TO ROUGHING.
11. ALL OUTLETS ON EXTERIOR WALLS WITH CASEWORK SHALL BE MOUNTED 6" ABOVE CASEWORK. CONFIRM HEIGHT OF CASEWORK WITH HVAC AND ARCHITECT PRIOR TO ROUGHING.
12. TYPICALLY PROVIDE GROUND FAULT INTERRUPTER TYPE RECEPTACLES WITHIN 6 FEET OF WATER SOURCES.
13. PROVIDE ALL EMPTY CONDUITS WITH PULL-STRINGS.
14. TYPICALLY PROVIDE (2) 4" SLEEVES OVER EACH CORRIDOR DOOR.
15. ROVIDE (2) 2" THROUGH-WALL SLEEVE ABOVE CEILING OVER THE DOORS INTO EACH ROOM LEADING FROM THE CORRIDOR FOR COMMUNICATIONS/DATA WIRING.
16. LOCATE ALL WALL TELEPHONE OUTLETS 12 INCHES AWAY FROM ALL OTHER OUTLETS/DEVICES.
17. PROVIDE (2) 1" SLEEVES OVER EACH DOOR FOR TEL./DATA SECURITY AND SOUND SYSTEM WIRING. TEL./DATA SHALL BE DEDICATED TO (1) OF THE CONDUITS.
18. ELECTRICAL CONTRACTOR SHALL PROVIDE ALL BOXES AND CONDUITS REQUIRED FOR AUDIOVISUAL SYSTEMS SECTION 274100 DEVICES AS SHOWN ON AV DRAWINGS. ALL LOCATIONS OF POWER AND A/V OUTLET BOXES SHALL BE COORDINATED WITH ARCHITECT PRIOR TO ROUGHING.

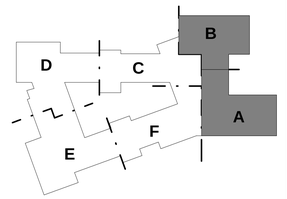
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3-15-2016

PLAN NORTH
TRUE NORTH
GRID NORTH

KEYPLAN



Dover HS / CTC
Dover, NH
ROOF PLAN PARTS A,B - POWER & LIGHTNING PROTECTION
SCALE: As indicated
DRAWN BY: MB
CHECKED BY: DMP

REVISIONS NO.	DATE	REMARKS	BY

DRAWING NUMBER
E2.3

JOB NUMBER 403114

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LIGHTINING PROTECTION INSTALLED THROUGHOUT PER NFPA 780

LIGHTNING PROTECTION NOTES:

1. THE LIGHTNING PROTECTION SYSTEM AS SHOWN ON DRAWING HAS BEEN DESIGNED IN ACCORDANCE WITH UL96A & NFPA-780 LIGHTNING PROTECTION SYSTEM STANDARDS.
2. CONDUCTORS SHALL MAINTAIN A HORIZONTAL OR DOWNWARD COURSE, FREE FROM "U" OR "V" (DOWN AND UP) POCKETS.
3. NO BEND OF CONDUCTOR SHALL FORM AN ANGLE OF LESS THAN 90° NOR SHALL HAVE A RADIUS OF BEND LESS THAN 8".
4. AIR TERMINALS SHALL BE SPACED EVERY 20'-0" MAXIMUM AROUND THE ROOF PERIMETER AND/OR ALONG ROOF RIDGES. AIR TERMINALS SHALL BE LOCATED WITHIN 2'-0" OF OUTSIDE CORNERS.
5. AIR TERMINALS SHALL BE SPACED EVERY 50'-0" MAXIMUM IN CENTER ROOF AREAS.
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12. ALL LARGE METAL BODIES SHALL BE BONDED TO THE MAIN LIGHTNING PROTECTION CONDUCTOR. (I.E., EXHAUST FANS, ROOF VENTS, METAL COOLING TOWERS, HVAC UNITS, LADDERS, RAILINGS, ANTENNAS, SKYLIGHTS, METAL STACKS AND ANY OTHER LARGE METAL BODY WHOSE HEIGHT EXCEEDS THAT OF THE AIR TERMINAL IN USE, UNLESS PROTECTED BY HIGHER ROOF ELEVATIONS).
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1 E2.4 ROOF PLAN PARTS C, D, E, F - POWER
SCALE: 1/16" = 1'-0"

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3-15-2016

KEYPLAN

Dover HS / CTC
Dover, NH
ROOF PLAN PARTS C,D,E,F - POWER & LIGHTNING PROTECTION
SCALE: AS INDICATED
DRAWN BY: MB
CHECKED BY: DMP

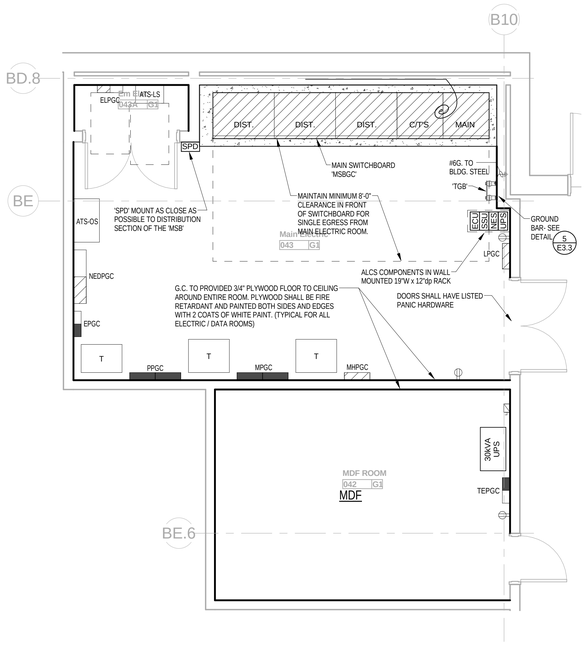
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DRAWING NUMBER
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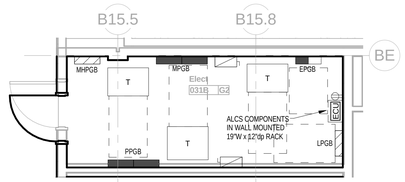
JOB NUMBER 403114

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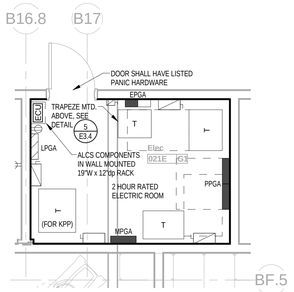
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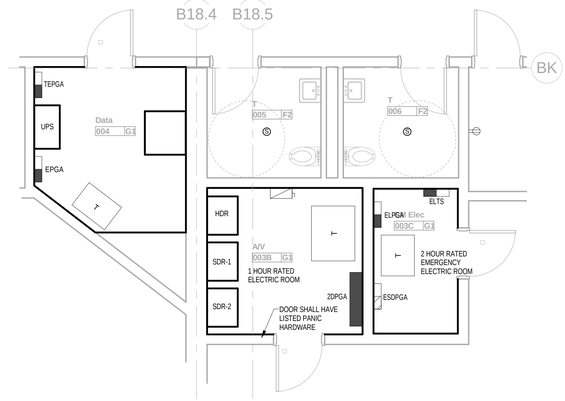
1 E3.0 GROUND FLOOR PART C - MAIN ELECTRIC RM. & MDF ROOM - POWER
SCALE: 1/4" = 1'-0"



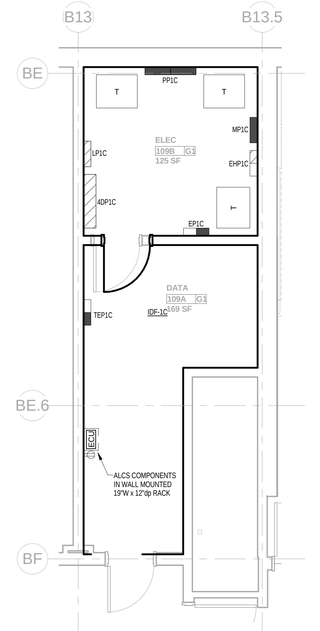
2 E3.0 GROUND FLOOR PART B - ELECTRIC RM. 031B
SCALE: 1/4" = 1'-0"



3 E3.0 GROUND FLOOR PART A - ELECTRIC RM. 021
SCALE: 1/4" = 1'-0"



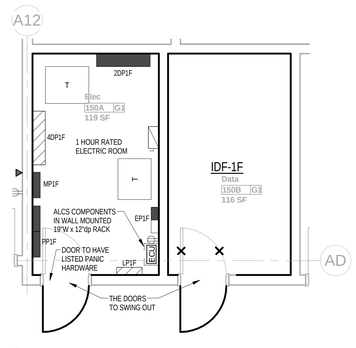
4 E3.0 GROUND FLOOR PART A - ELECTRIC RMS @ STAGE & IDF - POWER
SCALE: 1/4" = 1'-0"



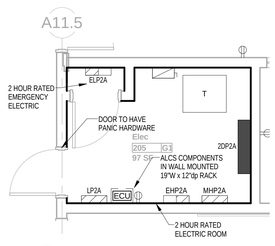
5 E3.0 FIRST FLOOR PART C - ELECTRIC RM. 109 & DATA - POWER
SCALE: 1/4" = 1'-0"

6 E3.0 FIRST FLOOR PART D - ELECTRIC RM.132D, DATA RM.132E - POWER
SCALE: 1/4" = 1'-0"

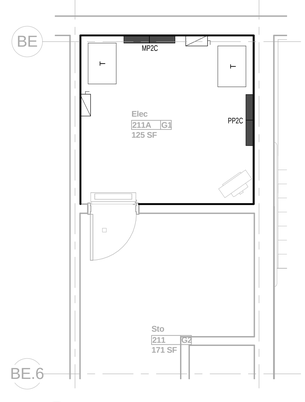
7 E3.0 FIRST FLOOR PART E - ELECTRIC RM.136 & DATA - POWER
SCALE: 1/4" = 1'-0"



8 E3.0 FIRST FLOOR PART F - ELECTRIC RM. & DATA RM. - POWER
SCALE: 1/4" = 1'-0"



9 E3.0 SECOND FLOOR PART A - ELECTRIC RM. 205
SCALE: 1/4" = 1'-0"



10 E3.0 SECOND FLOOR PART C - ELECTRIC RM. - POWER
SCALE: 1/4" = 1'-0"

11 E3.0 SECOND FLOOR PART D - ELECTRIC RM.228 - POWER
SCALE: 1/4" = 1'-0"

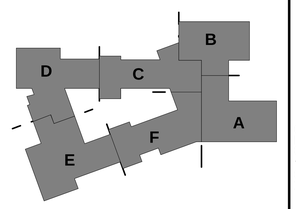
12 E3.0 SECOND FLOOR PART E - ELECTRIC RM.248F - POWER
SCALE: 1/4" = 1'-0"

13 E3.0 SECOND FLOOR PART F - ELECTRIC RM.255 - POWER
SCALE: 1/4" = 1'-0"

14 E3.0 SECOND FLOOR PART F - SERVER RM.253A - POWER
SCALE: 1/4" = 1'-0"

15 E3.0 ANIMAL SCIENCE - ELECTRIC & IDF ROOMS
SCALE: 1/4" = 1'-0"

KEYPLAN



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3-15-2016

PLAN NORTH
TRUE NORTH

Dover HS / CTC
Dover, NH
ELECTRICAL ROOMS PART PLANS - POWER
SCALE: 1/4" = 1'-0"
DRAWN BY: MB
CHECKED BY: DMP

REVISIONS NO.	DATE	REMARKS	BY

DRAWING NUMBER
E3.0
JOB NUMBER 403114

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SEE FLOOR PLANS FOR QUANTITIES (TYP.)

EPO

PANEL PL239 (BIO.) ST
PANEL PL241 (BIO.) ST
PANEL PL240 (SCI.) ST
PANEL PL242 (SCI.) ST

PANEL PL230 (EARTH SCI.) ST
PANEL PL231 (EARTH SCI.) ST
PANEL PL233 (BIO MED.) ST
PANEL PL235 (BIO.) ST
PANEL PL237 (BIO.) ST
PANEL PL236 (CHEM.) ST
PANEL PL238 (CHEM.) ST

ELEC. ROOM 2nd Flr. "E"

PANEL LP2E
PANEL MHP2E
PANEL PP2E — SPD — SEC 1 — SEC 2
PANEL PP2E
PANEL MP2E
PANEL EHP2E

2DP2E - SEE SCHEDULE
T-8
K-13

ELEC. ROOM 2nd Flr. "D"

PANEL EHP2D
PANEL MHP2D
PANEL LP2D
PANEL PP2D — SPD — SEC 1 — SEC 2
PANEL MP2D

2DP2D - SEE SCHEDULE
T-9
K-13
SEE 7 E3.4 (TYP.)

ELEC. ROOM 2nd Flr. "F"

PANEL MP2F
T-5
T-6
PANEL PP2F — SPD — SEC 1 — SEC 2
TO DISTRIBUTION PANEL 2DP1F IN ELEC. ROOM 1ST FLR. "F"

ELEC. ROOM 2nd Flr. "A"

PANEL LP2A
PANEL MHP2A
PANEL EHP2A
PANEL ELP2A
MI CABLE FEEDER TO PANEL ELPGC @ EMERGENCY ELEC. ROOM GRND FLR. "C"
MSBGC
NEDPGC
T-7
2DP2A - SEE SCHEDULE

ELEC. ROOM 2nd Flr. "C"

PANEL MP2C
T-5
T-6
PANEL PP2C — SEC 1 — SEC 2

SERVER ROOM 2nd Flr. "F"

15KVA UPS
PANEL TEP2F — SEC 1 — SEC 2

2ND FLOOR

EPO

PANEL PL145D (PRE ENG.) ST
PANEL PL105A (CLNRY. KITCH.) ST — SEC 1 — SEC 2
PANEL PL106A (LAB) ST — SEC 1 — SEC 2
PANEL PL106B (LAB) ST — SEC 1 — SEC 2

PANEL PL— (WELD) ST
PANEL PL135A (AUTO COLL.) ST
PANEL PL137A (AUTO TECH.) ST

PANEL PL125C (WOOD WRK.) ST
PANEL PL126C (BLDG. CONST.) ST
PANEL PL127 (ELEC. TECH.) ST
PANEL PL116 (LIFE SKILLS) ST

ELEC. ROOM 1st Flr. "E"

PANEL PP1E — SPD — SEC 1 — SEC 2
PANEL PP1E
2DP1E - SEE SCHEDULE
T-9
K-13
1600A MSB2 - SEE SCHEDULE

PANEL EHP1E
PANEL EP1E
T-6

IDF ROOM 1st Flr. "E"

30KVA UPS
PANEL TEP1E

PANEL ELP1E
MI CABLE FEEDER TO PANEL ELPGC @ EMERGENCY ELEC. ROOM GRND FLR. "C"

ELEC. ROOM 1st Flr. "D"

PANEL LP1D
PANEL MP1D
PANEL PP1D — SPD — SEC 1 — SEC 2
4DP1D - SEE SCHEDULE
2DP1D - SEE SCHEDULE
T-9
K-13
PANEL EP1D
T-5
PANEL ELP1D
MI CABLE FEEDER TO PANEL ELPGC @ EMERGENCY ELEC. ROOM GRND FLR. "C"

IDF ROOM 1st Flr "D"

PANEL TEP1D

ELEC. ROOM 1st Flr. "C"

PANEL LP1C
PANEL MP1C
T-5
T-6
PANEL PP1C — SPD — SEC 1 — SEC 2
SEE 6 E3.4 (TYPICAL)
PANEL EHP1C
PANEL EP1C
4DP1C - SEE SCHEDULE

IDF ROOM 1st Flr "C"

PANEL TEP1C

ELEC. ROOM 1st Flr. "F"

PANEL LP1F
PANEL PP1F — SPD — SEC 1 — SEC 2
PANEL MP1F
T-7
2DP1F - SEE SCHEDULE
PANEL EP1F
T-5
4DP1F - SEE SCHEDULE

1ST FLOOR

EMERGENCY ELEC. ROOM Grnd Flr. "A" (Stage)

PANEL ELPGA
PANEL ESDPGA
ELTS
T-6
MI CABLE FEEDER TO PANEL ELPGC @ EMERGENCY ELEC. ROOM GRND FLR. "C"

A/V ROOM Grnd Flr. "A" (Stage)

HDR HOUSE DIMMING RACK
SDR-1 RACK #1 (THEATER)
SDR-2 RACK #2 (THEATER)
2DPGA - SEE SCHEDULE
T-9

ELEC. ROOM @ Grnd Flr "B"

PANEL LPGB
PANEL PPGB — SPD — SEC 1 — SEC 2
PANEL MHPGB
PANEL MPGB — SEC 1 — SEC 2
PANEL EPGB
T-6
K-13
T-5
TO PANEL NEDPGC @ MAIN ELEC. ROOM GRND FLR. "C"

ELEC. ROOM Grnd Flr. "A"

PANEL LPGA
PANEL PPGA — SPD — SEC 1 — SEC 2
PANEL MPGA — SEC 1 — SEC 2
T-6
K-13
T-5
T-9

KITCHEN Grnd Flr. "A"

PANEL KPPGA — SEC 1 — SEC 2

IDF ROOM Grnd Flr "A"

PANEL EPGA
30KVA UPS
PANEL TEPGA
T-5

TO MSBGC
EP1E
100A 100A
ELEVATOR CONTROLLER
20A 30A
30
ELEV. AREA E (PASSENGER)

SEE 2 E4.0 (TYPICAL)
TO MSBGC
EP1A
100A 100A
ELEVATOR CONTROLLER
20A 30A
30
ELEV. AREA A (PASSENGER)

800A/4P AUTOMATIC TRANSFER SWITCH
ATS-OS
N E
n L
2#14AWG, 3/4"C TO ELEVATOR ROOM
2#14AWG 1"C START CKT.
NEDPGC - SEE SCHEDULE

350KW, 437.5KVA, 0.8PF 277/480, 3PH, 4W NATURAL GAS GENERATOR SET IN SOUND ATTENUATED, WEATHERPROOF ENCLOSURE; REFER TO SITE PLAN FOR LOCATION.
4#1/0 + #6G, 2"C
4#3/0 + #6G, 3"C AND (1) 3"C SPARE
SEE 11 E3.4
SEE 8 E3.4
EP1A
REMOTE ANN.
800A,T 800A,F
200A,T 225A,F

SURGE PROTECTIVE DEVICE "SPD" MOUNT AS CLOSE AS POSSIBLE TO DISTRIBUTION SECTION OF "MSB"
SPD
NIPPLE TO BOARD

10 SETS OF: 4# 600KCMIL IN (10) 4"C. PLUS (1) 4"C. SPARE w/ PULL LINE
TR 1
SEE 11 E3.4
SEE ELECTRICAL SITE PLAN E0.3 FOR PRIMARY SERVICE CONDUIT REQUIREMENTS.
UTILITY COMPANY METER. METER SOCKET WILL BE FURNISHED & INSTALLED BY UTILITY COMPANY.
2#14, 3/4"C. FOR KYZ OUTPUT WIRING TO BMS SYSTEM IN BOILER / WATER ROOM
4000A,T. 4000A,F
GF
C.T.
P.T.
M
1"C. FOR KYZ OUTPUT WIRING TO BAS SYSTEM IN BOILER ROOM
DIGITAL MONITORING WITH BACKNET/IP OUTPUT EQUAL TO SQUARE D POWER LOGIC CM4000 SERIES. PROVIDE IN SEPARATE NEMA 1 ENCLOSURE.
4000A, 277/480V, 3 PHASE, 4W
N
G
MAIN BONDING JUMPER
PROVIDE SERVICE GROUND ELECTRODE IN ACCORDANCE WITH CODE.
SEE DETAIL 11 E3.4
SEE MSBGC SCHED. FOR CONT.
MAIN SWITCHBOARD "MSBGC", SEE SCHEDULE

PANEL MHPGC
PANEL PPGC — SPD — SEC 1 — SEC 2
PANEL MPGC — SEC 1 — SEC 2
PANEL LPGC
PANEL EPGC
T-6
K-13
T-5

MDF ROOM Grnd Flr "C"

30KVA UPS
PANEL TEPGC

150A/4P AUTOMATIC TRANSFER SWITCH
N E
L
ATS-LS
UNDERSLAB OR MI CABLE FEEDER
PROVIDE CONTACT CLOSURE INTERFACE (LOSS OF NORMAL SOURCE) TO ALCS VIA 2#14 CONDUCTORS.
MI CABLE FEEDERS TO ELP PANELS
PANEL ELPGC
2#14AWG, 1"C START CKT.
4#1/0+#6G, 2"C
EMERGENCY ELEC. ROOM Grnd Flr. "C"
PROVIDE CONTACT CLOSURE INTERFACE TO AUTOMATED LIGHTING CONTROL SYSTEM (ALCS) VIA A SINGLE PAIR OF 2#18 CONDUCTORS. UPON TRANSFER FROM NORMAL SOURCE TO EMERGENCY SOURCE A SIGNAL SHALL BE ISSUED TO THE ALCS TO TURN ALL INTERIOR AND EXTERIOR LIGHTING "ON".

1ST FLOOR (MAIN ELEC.ROOM UNLESS NOTED OTHERWISE)

1 / E3.1 ONE LINE RISER DIAGRAM
SCALE: N.T.S.

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100% Design Development
3-15-2016

Dover HS / CTC
Dover, NH
ONE-LINE POWER RISER

DRAWN BY: AD CHECKED BY: DMP SCALE:

REVISIONS NO.	DATE	REMARKS	BY

DRAWING NUMBER E3.1

JOB NUMBER #03114

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277/480V, 3 PHASE, 4W, 65 KAIC — FRONT ACCESSIBLE
2500A BUS

MAIN SWITCHBOARD "MSBGC" SCHEDULE ④

OVER CURRENT DEVICES No.	TRIP	FRAME	CIRCUIT	FEEDER SIZE	COND. SIZE	REMARKS
-	-	-	FULLY BUSSED PULL SECTION	-	-	
-	4000	4000	MAIN BREAKER	SEE RISER		100% RATED WITH GFI PROTECTION
1	60	100	SURGE PROTECTION DEVICE (SPD)	4#6+#6G	1 1/4"	PER MFGR. REQUIREMENTS
2	200	225	ESDPGA VIA ELTS	-	-	-
3	400	400	2DPGA VIA T-9	-	-	-
4	100	100	LPGB	-	-	-
5	150	225	PPGB VIA T-6	-	-	-
6	150	225	MHPGB	-	-	-
7	100	100	LPGA	-	-	-
8	150	225	PPGA VIA-T-6	-	-	-
9	100	100	MPGA VIA T-5	-	-	-
10	400	400	KPPGA VIA T-9	-	-	-
11	1600	1600	MSB2	-	-	-
12	600	600	4DP1C	-	-	-
13	600	600	4DP1F	-	-	-
14	800	800	ATS-OS	-	-	-
15	150	225	ATS-LS	-	-	-
16	100	100	LPGC	-	-	-
17	100	100	MPGC VIA T-5	-	-	-
18	150	225	PPGC VIA T-6	-	-	-
19	100	100	ELEVATOR "A"	-	-	-
20	100	100	ELEVATOR "E"	-	-	-
21	400	400	MHPGC	-	-	-
22	400	400	MHP2A	-	-	-
23	225	225	ATS-OS-AS (ANIMAL SCI. BLDG.)	-	-	-
24	150	225	SPARE	-	-	-
25	150	225	SPARE	-	-	-
26	100	100	SPARE	-	-	-
27	100	100	SPARE	-	-	-
28	-	225	SPACE PROVISIONS	-	-	
29	-	400	SPACE PROVISIONS	-	-	
30	-	100	FUTURE PV SYSTEM	-	-	FUTURE PHOTOVOLTAICS
31	-	100	FUTURE PV SYSTEM	-	-	FUTURE PHOTOVOLTAICS
32	-	100	FUTURE PV SYSTEM	-	-	FUTURE PHOTOVOLTAICS

① UL LISTED SERIES RATED FOR 65,000A RMS @ RATED VOLTAGE WITH DOWNSTREAM BREAKERS IS ACCEPTABLE.
② PROVIDE CURRENT LIMITING BREAKER.
③ SEE TRANSFORMER SCHEDULE FOR WIRE AND CONDUIT SIZE
④ PROVIDE ENERGY-REDUCING MAINTENANCE SWITCHING WITH LOCAL STATUS INDICATOR FOR ARC ENERGY REDUCTION.

800A MLO, 277/480V, 3 PHASE, 4W, 22 KAIC — LOCATION: ELECTRICAL ROOM

DISTRIBUTION PANEL NEDPGC SCHEDULE

OVER CURRENT DEVICES No.	TRIP	FRAME	CIRCUIT	FEEDER SIZE	COND. SIZE	REMARKS
1	400	400	EHP1E	-	-	-
2	400	400	EHP1C	-	-	-
3	400	400	EHP2A	-	-	-
4	100	100	EPGA VIA T-5	-	-	-
5	100	100	EP1F VIA T-5	-	-	-
6	100	100	EPGC VIA T-5	-	-	-
7	150	225	SPARE	-	-	-
8	100	100	SPARE	-	-	-
9	-	100	SPACE PROVISIONS	-	-	-
10	-	225	SPACE PROVISIONS	-	-	-
11	-	400	SPACE PROVISIONS	-	-	-
12						

① PROVIDE CURRENT LIMITING BREAKERS. UL LISTED SERIES RATED FOR 65,000A RMS @ RATED VOLTAGE WITH DOWNSTREAM BREAKERS IS ACCEPTABLE.

1600A MAIN BREAKER, 277/480V, 3 PHASE, 4W, 65 KAIC — LOCATION: ELECTRICAL ROOM

SWITCHBOARD MSB2 SCHEDULE

	OVER CURRENT DEVICES No.	TRIP	FRAME	CIRCUIT	FEEDER SIZE	COND. SIZE	REMARKS
①	1	400	400	2DP1E VIA T-9	-	-	-
①	2	100	100	LP2E	-	-	-
	3	400	400	MHP2E	-	-	-
	4	300	400	2DP2E VIA T-8	-	-	-
	5	400	400	4DP1D	-	-	-
	6	100	100	SPARE	-	-	-
	7	150	225	SPARE	-	-	-
	8	-	225	SPACE PROVISIONS	-	-	-
	9	-	400	SPACE PROVISIONS	-	-	-
	10						
	11			-	-	-	-
	12			-	-	-	-

① PROVIDE CURRENT LIMITING BREAKERS. UL LISTED SERIES RATED FOR 65,000A RMS @ RATED VOLTAGE WITH DOWNSTREAM BREAKERS IS ACCEPTABLE.
② SEE TRANSFORMER SCHEDULE FOR WIRE AND CONDUIT SIZE

600A MLO, 277/480V, 3 PHASE, 4W, 22 KAIC — LOCATION: ELECTRICAL ROOM

DISTRIBUTION PANEL 4DP1C SCHEDULE

OVER CURRENT DEVICES No.	TRIP	FRAME	CIRCUIT	FEEDER SIZE	COND. SIZE	REMARKS
1	100	100	LP1C	-	-	-
2	100	100	MP1C VIA T-5	-	-	-
3	100	100	MP2C VIA T-5	-	-	-
4	150	225	PP2C VIA T-6	-	-	-
5	150	225	PP1C VIA T-6	-	-	-
6	150	225	SPARE	-	-	-
7	100	100	SPARE	-	-	-
8	-	100	SPACE PROVISIONS	-	-	-
9	-	225	SPACE PROVISIONS	-	-	-
10	-	400	SPACE PROVISIONS	-	-	-
11						
12						

① PROVIDE CURRENT LIMITING BREAKERS. UL LISTED SERIES RATED FOR 65,000A RMS @ RATED VOLTAGE WITH DOWNSTREAM BREAKERS IS ACCEPTABLE.

800A MLO, 277/480V, 3 PHASE, 4W, 22 KAIC — LOCATION: ELECTRICAL ROOM

DISTRIBUTION PANEL 4DP1D SCHEDULE

OVER CURRENT DEVICES No.	TRIP	FRAME	CIRCUIT	FEEDER SIZE	COND. SIZE	REMARKS
1	150	225	MHP2D	-	-	-
2	100	100	LP2D	-	-	-
3	400	400	2DP2D VIA T-9	-	-	-
4	100	100	LP1D	-	-	-
5	400	400	2DP1D VIA T-9	-	-	-
6	150	225	SPARE	-	-	-
7	100	100	SPARE	-	-	-
8	-	100	SPACE PROVISIONS	-	-	-
9	-	225	SPACE PROVISIONS	-	-	-
10	-	400	SPACE PROVISIONS	-	-	-
11						
12						

① PROVIDE CURRENT LIMITING BREAKERS. UL LISTED SERIES RATED FOR 65,000A RMS @ RATED VOLTAGE WITH DOWNSTREAM BREAKERS IS ACCEPTABLE.

600A MLO, 277/480V, 3 PHASE, 4W, 22 KAIC — LOCATION: ELECTRICAL ROOM

DISTRIBUTION PANEL 4DP1F SCHEDULE

OVER CURRENT DEVICES No.	TRIP	FRAME	CIRCUIT	FEEDER SIZE	COND. SIZE	REMARKS
1	100	100	LP1F	-	-	-
2	100	100	LP2F	-	-	-
3	200	225	2DP2A VIA T-7	-	-	-
4	200	225	2DP1F VIA T-7	-	-	-
5	150	225	PP2C VIA T-6	-	-	-
6	150	225	PP1C VIA T-6	-	-	-
7	150	225	SPARE	-	-	-
8	100	100	SPARE	-	-	-
9	-	100	SPACE PROVISIONS	-	-	-
10	-	225	SPACE PROVISIONS	-	-	-
11	-	400	SPACE PROVISIONS	-	-	-
12						

① PROVIDE CURRENT LIMITING BREAKERS. UL LISTED SERIES RATED FOR 65,000A RMS @ RATED VOLTAGE WITH DOWNSTREAM BREAKERS IS ACCEPTABLE.

800A MCB, 120/208V, 3 PHASE, 4W, 22 KAIC — LOCATION: ELECTRICAL ROOM

DISTRIBUTION PANEL 2DPGA SCHEDULE

OVER CURRENT DEVICES No.	TRIP	FRAME	CIRCUIT	FEEDER SIZE	COND. SIZE	REMARKS
1	800	800	MAIN BREAKER	-	-	-
2	400	400	HOUSE DIMMING RACK	-	-	-
3	400	400	STAGE DIMMING RACK 1	-	-	-
4	400	400	STAGE DIMMING RACK 2	-	-	-
5	150	225	SPARE	-	-	-
6	100	100	SPARE	-	-	-
7	-	100	SPACE PROVISIONS	-	-	-
8	-	225	SPACE PROVISIONS	-	-	-
9	-	400	SPACE PROVISIONS	-	-	-
10						
11						
12						

① PROVIDE CURRENT LIMITING BREAKERS. UL LISTED SERIES RATED FOR 65,000A RMS @ RATED VOLTAGE WITH DOWNSTREAM BREAKERS IS ACCEPTABLE.

800A MCB, 120/208V, 3 PHASE, 4W, 22 KAIC — LOCATION: ELECTRICAL ROOM

DISTRIBUTION PANEL 2DP1D SCHEDULE

OVER CURRENT DEVICES No.	TRIP	FRAME	CIRCUIT	FEEDER SIZE	COND. SIZE	REMARKS
1	800	800	MAIN BREAKER	-	-	-
2	150	225	PL116	-	-	-
3	400	400	PL125C	-	-	-
4	400	400	PL126C	-	-	-
5	400	400	PL127	-	-	-
6	150	225	MP1D	-	-	-
7	200	225	PP1D	-	-	-
8	150	225	SPARE	-	-	-
9	100	100	SPARE	-	-	-
10	-	100	SPACE PROVISIONS	-	-	-
11	-	225	SPACE PROVISIONS	-	-	-
12	-	400	SPACE PROVISIONS	-	-	-

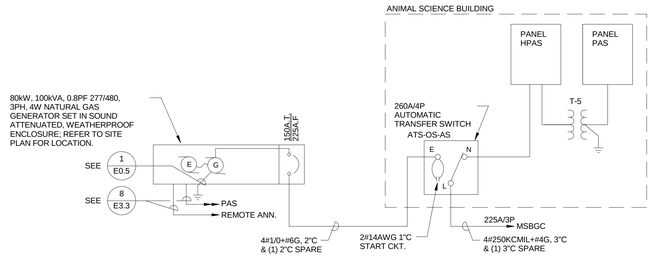
① PROVIDE CURRENT LIMITING BREAKERS. UL LISTED SERIES RATED FOR 65,000A RMS @ RATED VOLTAGE WITH DOWNSTREAM BREAKERS IS ACCEPTABLE.

800A MCB, 120/208V, 3 PHASE, 4W, 22 KAIC — LOCATION: ELECTRICAL ROOM

DISTRIBUTION PANEL 2DP1E SCHEDULE

OVER CURRENT DEVICES No.	TRIP	FRAME	CIRCUIT	FEEDER SIZE	COND. SIZE	REMARKS
1	800	800	MAIN BREAKER	-	-	-
2	200	225	PP1E	-	-	-
3	400	400	PL-- (WELD)	-	-	-
4	400	400	PL135A	-	-	-
5	400	400	PL137A	-	-	-
6	150	225	SPARE	-	-	-
7	100	100	SPARE			
8	-	100	SPACE PROVISIONS	-	-	-
9	-	225	SPACE PROVISIONS	-	-	-
10	-	400	SPACE PROVISIONS	-	-	-
11						
12						

① PROVIDE CURRENT LIMITING BREAKERS. UL LISTED SERIES RATED FOR 65,000A RMS @ RATED VOLTAGE WITH DOWNSTREAM BREAKERS IS ACCEPTABLE.



1 E3.2 ONE LINE RISER DIAGRAM (Cont.)
SCALE: N.T.S.

400A MCB, 120/208V, 3 PHASE, 4W, 22 KAIC — LOCATION: ELECTRICAL ROOM

DISTRIBUTION PANEL 2DP1F SCHEDULE

OVER CURRENT DEVICES No.	TRIP	FRAME	CIRCUIT	FEEDER SIZE	COND. SIZE	REMARKS
1	400	400	MAIN BREAKER	-	-	-
2	200	225	PP1F	-	-	-
3	150	225	MP1F	-	-	-
4	100	100	PL145D	-	-	-
5	150	225	SPARE	-	-	-
6	100	100	SPARE	-	-	-
7	-	100	SPACE PROVISIONS	-	-	-
8	-	225	SPACE PROVISIONS	-	-	-
9	-	400	SPACE PROVISIONS	-	-	-
10						
11						
12						

① PROVIDE CURRENT LIMITING BREAKERS. UL LISTED SERIES RATED FOR 65,000A RMS @ RATED VOLTAGE WITH DOWNSTREAM BREAKERS IS ACCEPTABLE.

400A MCB, 120/208V, 3 PHASE, 4W, 22 KAIC — LOCATION: ELECTRICAL ROOM

DISTRIBUTION PANEL 2DP2A SCHEDULE

OVER CURRENT DEVICES No.	TRIP	FRAME	CIRCUIT	FEEDER SIZE	COND. SIZE	REMARKS
1	400	400	MAIN BREAKER	-	-	-
2	400	400	PL105A	-	-	-
3	100	100	PL106A	-	-	-
4	100	100	PL106B	-	-	-
5	100	100	SPARE	-	-	-
6	-	100	SPACE PROVISIONS	-	-	-
7	-	225	SPACE PROVISIONS	-	-	-
8	-	400	SPACE PROVISIONS	-	-	-
9						
10						
11						
12						

① PROVIDE CURRENT LIMITING BREAKERS. UL LISTED SERIES RATED FOR 65,000A RMS @ RATED VOLTAGE WITH DOWNSTREAM BREAKERS IS ACCEPTABLE.

800A MCB, 120/208V, 3 PHASE, 4W, 22 KAIC — LOCATION: ELECTRICAL ROOM

DISTRIBUTION PANEL 2DP2D SCHEDULE

OVER CURRENT DEVICES No.	TRIP	FRAME	CIRCUIT	FEEDER SIZE	COND. SIZE	REMARKS
1	800	800	MAIN BREAKER	-	-	-
2	200	225	PP2D	-	-	-
3	150	225	MP2D	-	-	-
4	100	100	PL230	-	-	-
5	100	100	PL231	-	-	-
6	100	100	PL233	-	-	-
7	100	100	PL235	-	-	-
8	100	100	PL236	-	-	-
9	100	100	PL237	-	-	-
10	100	100	PL238	-	-	-
11	150	225	SPARE	-	-	-
12	100	100	SPARE	-	-	-
13	-	100	SPACE PROVISIONS	-	-	-
14	-	225	SPACE PROVISIONS	-	-	-
15	-	400	SPACE PROVISIONS	-	-	-
16						

① PROVIDE CURRENT LIMITING BREAKERS. UL LISTED SERIES RATED FOR 65,000A RMS @ RATED VOLTAGE WITH DOWNSTREAM BREAKERS IS ACCEPTABLE.

500A MCB, 120/208V, 3 PHASE, 4W, 22 KAIC — LOCATION: ELECTRICAL ROOM

DISTRIBUTION PANEL 2DP2E SCHEDULE

OVER CURRENT DEVICES No.	TRIP	FRAME	CIRCUIT	FEEDER SIZE	COND. SIZE	REMARKS
1	500	600	MAIN BREAKER	-	-	-
2	200	225	PP2E	-	-	-
3	150	225	MP2E	-	-	-
4	100	100	PL239	-	-	-
5	100	100	PL240	-	-	-
6	100	100	PL241	-	-	-
7	100	100	PL242	-	-	-
8	100	100	SPARE	-	-	-
9	150	225	SPARE	-	-	-
10	-	100	SPACE PROVISIONS	-	-	-
11	-	225	SPACE PROVISIONS	-	-	-
12						

① PROVIDE CURRENT LIMITING BREAKERS. UL LISTED SERIES RATED FOR 65,000A RMS @ RATED VOLTAGE WITH DOWNSTREAM BREAKERS IS ACCEPTABLE.

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100% Design Development
3-15-2016

Dover HS / CTC
Dover, NH
ELECTRICAL PANEL SCHEDULES

DRAWN BY: MB CHECKED BY: DMP
SCALE:

DRAWING NUMBER
E3.2

JOB NUMBER 403114

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THREE PHASE TRANSFORMER SCHEDULE (K13 RATED) COPPER CONDUCTORS

ID NO	KVA	PRIMARY 480 VOLT					SECONDARY 208 VOLT					GROUNDING ELECTRODE CONDUCTOR (250-66)*
		AMPS	WIRE (THHN)	COND.	C.B.	FUSE	AMPS	WIRE (THHN)	COND.	C.B.	FUSE	
T-1	3	3.6	3#12+#12EG	1/2"	15/3	10	8.3	4#12+#12(EG)	1/2"	15/3	15	#8
T-2	9	10.8	3#12+#12EG	1/2"	20/3	20	25	4#10+#10(EG)	3/4"	30/3	30	#8
T-3	15	18	3#10+#10EG	1/2"	30/3	30	41.6	3#6(PH)+2#2(N)+1#6(IG)+1#8(EG)	1 1/2"	50/3	50	#8
T-4	30	36	3#6+#10EG	3/4"	60/3	45	83.3	3#2(PH)+#3/0(N)+1#2(IG)+1#8(EG)	2"	100/3	100	#8
T-5	45	54.3	3#2+#8EG	1 1/4"	90/3	80	125	3#1/0(PH)+2#1/0(N) +1#1/0(IG)+1#6(EG)	3"	150/3	150	#6
T-6	75	90.2	3#1/0+#6EG	1 1/2"	150/3	150	208	3#250 KCMIL(PH)+2#250 KCMIL(N) +1#250 KCMIL(IG)+1#4(EG)	4"	250/3	250	#2
T-7	112.5	135.3	3#3/0+#6EG	2"	200/3	200	311	3#600 KCMIL(PH)+2#600 KCMIL(N) +1#3(IG)+1#3(EG)	4"	400/3	400	#1/0
T-8	150	180.6	3#350+#4EG	3"	300/3	300	416.8	2 SETS 3#250 KCMIL(PH)+2#250 KCMIL(N) +1#250KCMIL(IG)+1#2(EG)	2 - 3"	500/3	500	#2/0
T-9	225	270.7	3#500+#3EG	3"	400/3	400	625	2 SETS 3#600 KCMIL(PH)+2#600 KCMIL(N) +1#3(IG)+1#1/0(EG)	2 - 4"	800/3	800	#2/0
T-10	300	360.8	2 SETS 3#350& #1EG	2-3"	600/3	600	833	3 SETS 3#400KCMIL(PH)+2#400 KCMIL (N) +1#400KCMIL(IG)+1#2/0(EG)	3 - 3"	1000/3	1000	#3/0

* RUN IN CODE SIZE CONDUIT TO CODE APPROVED GROUNDING ELECTRODE, i.e., BUILDING STEEL, ETC. "EG" INDICATES EQUIPMENT GROUNDING CONDUCTOR, "IG" INDICATES ISOLATED GROUNDING CONDUCTOR, "N" INDICATES NEUTRAL CONDUCTOR AND "PH" INDICATES PHASE CONDUCTOR.

THREE PHASE TRANSFORMER SCHEDULE (K1 RATED) COPPER CONDUCTORS

ID NO	KVA	PRIMARY 480 VOLT					SECONDARY 208 VOLT					GROUNDING ELECTRODE CONDUCTOR (250-66)*
		AMPS	WIRE (THHN)	COND.	C.B.	FUSE	AMPS	WIRE (THHN)	COND.	C.B.	FUSE	
T-1	3	3.6	3#12+#12EG	1/2"	15/3	10	8.3	4#12+#12(EG)	1/2"	15/3	15	#8
T-2	9	10.8	3#12+#12EG	1/2"	20/3	20	25	4#10+#10(EG)	3/4"	30/3	30	#8
T-3	15	18	3#10+#10EG	1/2"	30/3	30	41.6	4#6+2#10(EG)	1 1/2"	50/3	50	#8
T-4	30	36	3#6+#10EG	3/4"	60/3	45	83.3	4#2+2#8(EG)	2"	100/3	100	#8
T-5	45	54.3	3#2+#8EG	1 1/4"	90/3	80	125	4#1/0+2#6(EG)	3"	150/3	150	#6
T-6	75	90.2	3#1/0+#6EG	1 1/2"	150/3	150	208	4#250KCMIL+#4(EG)	4"	250/3	250	#2
T-7	112.5	135.3	3#3/0+#6EG	2"	200/3	200	311	4#500KCMIL+#3(EG)	4"	400/3	400	#1/0
T-8	150	180.6	3#350KCMIL+#4EG	3"	300/3	300	416.8	2 SETS 4#250KCMIL+#2(EG)	2 - 3"	500/3	500	#2/0
T-9	225	270.7	3#500KCMIL+ #3EG	3"	400/3	400	625	2 SETS 4#600KCMIL+#1/0(EG)	2 - 4"	800/3	800	#3/0
T-10	300	360.8	2 SETS 3#350KCMIL+#1EG	2-3"	600/3	600	833	3 SETS 4#400KCMIL+#2/0(EG)	3 - 3"	1000/3	1000	#3/0

* RUN IN CODE SIZE CONDUIT TO CODE APPROVED GROUNDING ELECTRODE, i.e., BUILDING STEEL, ETC. "EG" INDICATES EQUIPMENT GROUNDING CONDUCTOR, "IG" INDICATES ISOLATED GROUNDING CONDUCTOR, "N" INDICATES NEUTRAL CONDUCTOR AND "PH" INDICATES PHASE CONDUCTOR.

277/480V, 3 PHASE, 4W, 65 KAIC

PANEL SCHEDULE

PANEL NO.	LOCATION	MTG	MAIN BUS AMPS	MAIN CB	BRANCH CKT BREAKER (AMPS)										TOTAL POLES	OTHERS
					1 POLE			2 POLE			3 POLE					
					15	20	30	15	20	30	15	20	30	60		
ELPGA	EMERGENCY ELEC. RM.	-	100	-	-	-	-	-	-	-	-	-	-	-	30	-
ELPGC	EMERGENCY ELEC. RM.	-	400	-	-	-	-	-	-	-	-	-	-	-	30	(4) 100A/3P
ELP1D	EMERGENCY ELEC. RM.	-	100	-	-	-	-	-	-	-	-	-	-	-	30	-
ELP1E	EMERGENCY ELEC. RM.	-	100	-	-	-	-	-	-	-	-	-	-	-	30	-
ELP2A	EMERGENCY ELEC. RM.	-	100	-	-	-	-	-	-	-	-	-	-	-	30	-
EHP1C	ELECTRIC ROOM	-	400	-	-	-	-	-	-	-	-	-	-	-	42	-
EHP1E	ELECTRIC ROOM	-	400	-	-	-	-	-	-	-	-	-	-	-	42	-
EHP2A	ELECTRIC ROOM	-	400	-	-	-	-	-	-	-	-	-	-	-	42	-
EHP2D	ELECTRIC ROOM	-	400	-	-	-	-	-	-	-	-	-	-	-	42	-
EHP2E	ELECTRIC ROOM	-	400	-	-	-	-	-	-	-	-	-	-	-	42	-
LPGA	ELECTRIC ROOM	-	100	-	-	-	-	-	-	-	-	-	-	-	30	-
LPGB	ELECTRIC ROOM	-	100	-	-	-	-	-	-	-	-	-	-	-	30	-
LPGC	ELECTRIC ROOM	-	100	-	-	-	-	-	-	-	-	-	-	-	30	-
LP1C	ELECTRIC ROOM	-	100	-	-	-	-	-	-	-	-	-	-	-	30	-
LP1D	ELECTRIC ROOM	-	100	-	-	-	-	-	-	-	-	-	-	-	30	-
LP1F	ELECTRIC ROOM	-	100	-	-	-	-	-	-	-	-	-	-	-	30	-
LP2A	ELECTRIC ROOM	-	100	-	-	-	-	-	-	-	-	-	-	-	30	-
LP2D	ELECTRIC ROOM	-	100	-	-	-	-	-	-	-	-	-	-	-	30	-
LP2E	ELECTRIC ROOM	-	100	-	-	-	-	-	-	-	-	-	-	-	30	-
MHPGB	ELECTRIC ROOM	-	400	-	-	-	-	-	-	-	-	-	-	-	42	-
MHPGC	ELECTRIC ROOM	-	400	-	-	-	-	-	-	-	-	-	-	-	42	-
MHP2A	ELECTRIC ROOM	-	400	-	-	-	-	-	-	-	-	-	-	-	42	-
MHP2D	ELECTRIC ROOM	-	400	-	-	-	-	-	-	-	-	-	-	-	42	-
MHP2E	ELECTRIC ROOM	-	400	-	-	-	-	-	-	-	-	-	-	-	42	-
HPAS	ELECTRIC ROOM (ANIMAL SCI.)	-	400	-	-	-	-	-	-	-	-	-	-	-	42	-

(1) FEED FROM CURRENT LIMITING BREAKERS. UL LISTED SERIES RATED FOR 65,000A RMS @ RATED VOLTAGE WITH UPSTRAM BREAKERS IS ACCEPTABLE.
(2) AUTOMATED LIGHTING SYSTEM PANEL WITH INTEGRAL, SOLENOID DRIVEN, ADDRESSABLE CIRCUIT BREAKERS. REFER TO "AUTOMATED LIGHTING CONTROL SYSTEM ONE-LINE DIAGRAM" AND SPECIFICATIONS FOR REQUIREMENTS.
(3) SINGLE TUB PANEL BUT TALLER IN HEIGHT.
(4) PROVIDE PANEL WITH SUBFEED LUGS.

120/208V, 3 PHASE, 4W, 10 KAIC

PANEL SCHEDULE

	PANEL NO.	LOCATION	MTG	MAIN BUS AMPS	MAIN CB	BRANCH CKT BREAKER (AMPS)										TOTAL POLES	OTHERS
						1 POLE			2 POLE			3 POLE					
						15	20	30	15	20	30	15	20	30	60		
	ESDPG	EMERGENCY ELEC. RM.	S	225	150	-	-	-	-	-	-	-	-	-	-	30	-
	EPGA	ELECTRIC ROOM	S	225	150	-	-	-	-	-	-	-	-	-	-	42	-
	EPGB	ELECTRIC ROOM	S	400	250	-	-	-	-	-	-	-	-	-	-	42	-
	EPGC	ELECTRIC ROOM	S	225	150	-	-	-	-	-	-	-	-	-	-	42	-
	EP1C	ELECTRIC ROOM	S	400	250	-	-	-	-	-	-	-	-	-	-	42	-
	EP1D	ELECTRIC ROOM	S	225	150	-	-	-	-	-	-	-	-	-	-	42	-
	EP1E	ELECTRIC ROOM	S	400	250	-	-	-	-	-	-	-	-	-	-	42	-
	EP1F	ELECTRIC ROOM	S	225	150	-	-	-	-	-	-	-	-	-	-	42	-
(1)	TEPGC	MDF ROOM	S	100	100	-	-	-	-	-	-	-	-	-	-	42	-
(1)	TEPGA	IDF ROOM	S	100	100	-	-	-	-	-	-	-	-	-	-	42	-
(1)	TEP1D	IDF ROOM	S	100	100	-	-	-	-	-	-	-	-	-	-	42	-
(1)	TEP1E	IDF ROOM	S	100	100	-	-	-	-	-	-	-	-	-	-	42	-
(1)	TEP1F	IDF ROOM	S	100	100	-	-	-	-	-	-	-	-	-	-	42	-
(1)	TEP2F	SERVER ROOM	S	100	100	-	-	-	-	-	-	-	-	-	-	30	-
	MPGA	ELECTRIC ROOM	S	225	150	-	-	-	-	-	-	-	-	-	-	42	-
	MPGB	ELECTRIC ROOM	S	225	150	-	-	-	-	-	-	-	-	-	-	42	-
	MPGC	ELECTRIC ROOM	S	225	150	-	-	-	-	-	-	-	-	-	-	42	-
	MP1C	ELECTRIC ROOM	S	225	150	-	-	-	-	-	-	-	-	-	-	42	-
	MP1D	ELECTRIC ROOM	S	225	150	-	-	-	-	-	-	-	-	-	-	42	-
	MP1F	ELECTRIC ROOM	S	225	150	-	-	-	-	-	-	-	-	-	-	42	-
	MP2C	ELECTRIC ROOM	S	225	150	-	-	-	-	-	-	-	-	-	-	42	-
	MP2D	ELECTRIC ROOM	S	225	150	-	-	-	-	-	-	-	-	-	-	42	-
	MP2E	ELECTRIC ROOM	S	225	150	-	-	-	-	-	-	-	-	-	-	42	-
	MP2F	ELECTRIC ROOM	S	225	150	-	-	-	-	-	-	-	-	-	-	42	-
(1)	KPPGA	ELECTRIC ROOM	S	800	800	-	-	-	-	-	-	-	-	-	-	84	-
(3) (2)	PPGA	ELECTRIC ROOM	S	400	250	-	-	-	-	-	-	-	-	-	1	84	-
(3) (2)	PPGB	ELECTRIC ROOM	S	400	250	-	-	-	-	-	-	-	-	-	1	84	-
(3) (2)	PPGC	ELECTRIC ROOM	S	400	250	-	-	-	-	-	-	-	-	-	1	84	-
(3) (2)	PP1C	ELECTRIC ROOM	S	400	250	-	-	-	-	-	-	-	-	-	1	84	-
(3) (2)	PP1D	ELECTRIC ROOM	S	400	250	-	-	-	-	-	-	-	-	-	1	84	-
(3) (2)	PP1E	ELECTRIC ROOM	S	400	250	-	-	-	-	-	-	-	-	-	1	84	-
(3) (2)	PP1F	ELECTRIC ROOM	S	400	250	-	-	-	-	-	-	-	-	-	1	84	-
(3) (2)	PP2C	ELECTRIC ROOM	S	400	250	-	-	-	-	-	-	-	-	-	1	84	-
(3) (2)	PP2D	ELECTRIC ROOM	S	400	250	-	-	-	-	-	-	-	-	-	1	84	-
(3) (2)	PP2E	ELECTRIC ROOM	S	400	250	-	-	-	-	-	-	-	-	-	1	84	-
(3) (2)	PP2F	ELECTRIC ROOM	S	400	250	-	-	-	-	-	-	-	-	-	1	84	-
(1)	PL116	LIFE SKILLS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(1)	PL--	WELDING LAB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(1)	PL135A	AUTO COLLISION LAB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(1)	PL137A	AUTO TECH LAB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(1)	PL125C	WOOD WORKING LAB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(1)	PL126C	BUILDING CONST. LAB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(1)	PL127	ELECTRICAL TECH. LAB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(1)	PL145D	PRE ENGINEERING LAB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(1)	PL105A	CULINARY LAB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(1)	PL106A	LAB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(1)	PL106B	LAB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(1)	PL230	EARTH SCIENCE LAB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(1)	PL231	EARTH SCIENCE LAB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(1)	PL233	BIOLOGY MED. LAB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(1)	PL235	BIOLOGY LAB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(1)	PL237	BIOLOGY LAB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(1)	PL236	CHEMISTRY LAB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(1)	PL238	CHEMISTRY LAB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(1)	PL239	BIOLOGY LAB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(1)	PL241	BIOLOGY LAB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(1)	PL240	SCIENCE LAB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(1)	PL242	SCIENCE LAB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(3) (2)	PPAS	ELECTRIC ROOM (ANIMAL SCI.)	S	225	150	-	-	-	-	-	-	-	-	-	1	84	-

(1) PROVIDE SHUNT TRIP MAIN CIRCUIT BREAKER.
(2) 200% NEUTRAL BUS.
(3) DOUBLE NEUTRAL BUS AND IG BUS. IG BUS SHALL BE SIZED FOR SAME SIZE AS PHASE CONDUCTOR.
(4) SINGLE TUB PANEL BUT TALLER IN HEIGHT.
(5) DOUBLE TUB PANEL BUT TALLER IN HEIGHT.
(6) PROVIDE GFCI TYPE 20A-1P CIRCUIT BREAKERS FOR CIRCUITS SERVING ELECTRIC WATER COOLER. (QTY. OF -).

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Dover HS / CTC
Dover, NH
PANEL SCHEDULES (Cont.)

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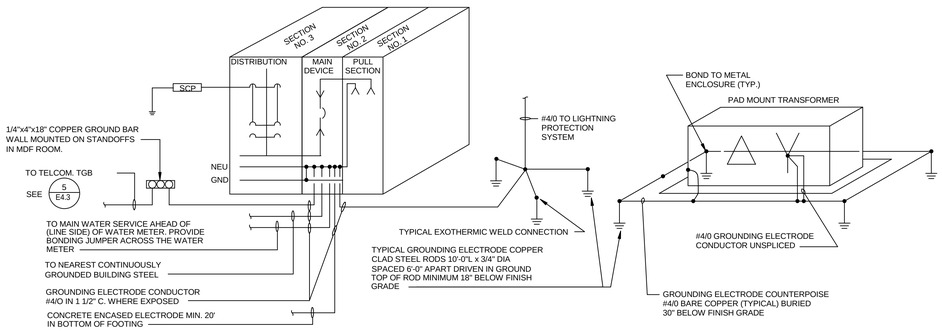
REVISIONS NO.	DATE	REMARKS	BY

DRAWING NUMBER
E3.3

JOB NUMBER 403114

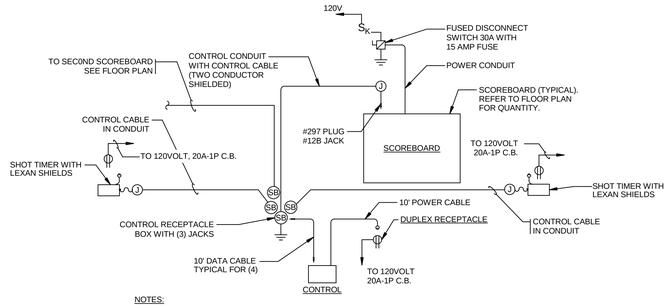
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1 E3.4 MAIN SWITCHBOARD GROUNDING DETAIL (TYPICAL)

SCALE: N.T.S.

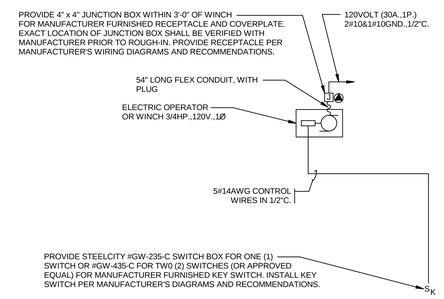


NOTES:

1. POWER WIRING SHOULD BE ROUTED IN SEPARATE CONDUIT FROM CONTROL CABLING. PROVIDE 3/4" CONDUIT FOR POWER AND 3/4" CONDUIT FOR CONTROL.
2. SCOREBOARD SHALL BE FURNISHED UNDER SECTION 116620 BY GC, INSTALLED AND WIRED BY E.C.

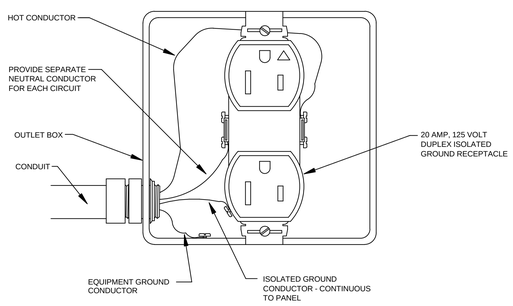
2 E3.4 BASKETBALL SCOREBOARD WIRING DIAGRAM

SCALE: N.T.S.



3 E3.4 TYPICAL ELECTRICAL WINCH WIRING FOR BACKBOARD, CURTAIN OR BLEACHER

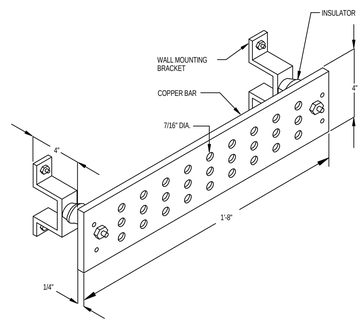
SCALE N.T.S.



4 E3.4 I.G. RECEPTACLE DETAIL

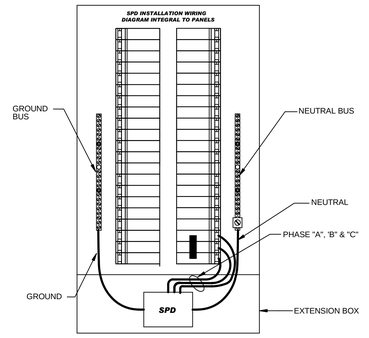
SCALE: N.T.S.

NOTE:
MAXIMUM OF (2) I.G. RECEPTACLES OR (1) QUADRUPLEX I.G. RECEPTACLES PER CIRCUIT



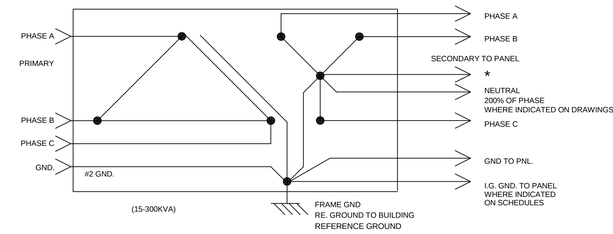
5 E3.4 TELECOM BAR DETAIL (TGB)

SCALE: NONE



6 E3.4 SPD WIRING DIAGRAM

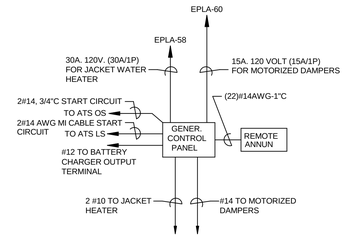
SCALE: N.T.S.



7 E3.4 TRANSFORMER CONNECTIONS WIRING DETAIL

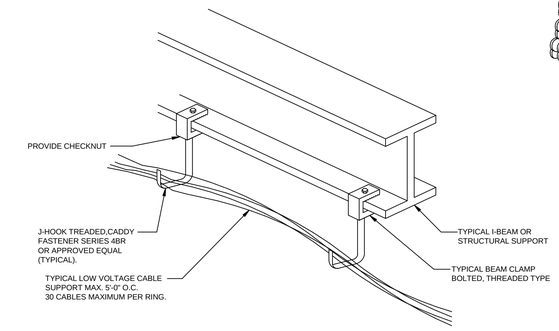
SCALE: N.T.S.

* NEUTRAL CONNECTORS #1/0 OR LARGER MAY BE PARALLELLED



8 E3.4 TYPICAL EMERGENCY GENERATOR CONTROL WIRING

SCALE: N.T.S. (NOTE: MAY VARY BY MANUFACTURER)

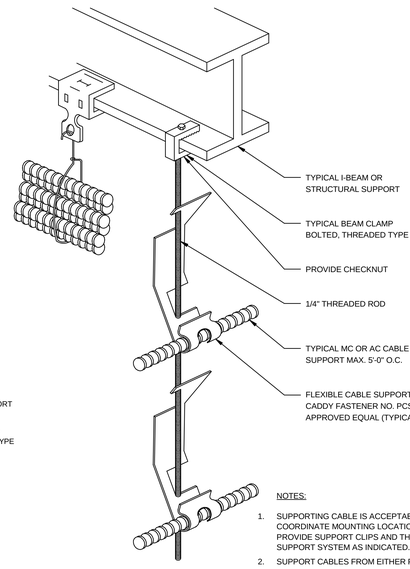


9 E3.4 TYPICAL LOW VOLTAGE CABLE SUPPORT DETAIL

N.T.S.

NOTES:

1. SUPPORTING CABLE IS ACCEPTABLE BELOW SUPPORT STEEL OR ABOVE STEEL. COORDINATE MOUNTING LOCATIONS WITH OTHER TRADES AND FIELD CONDITIONS. PROVIDE SUPPORT CLIPS AND THREADED RODS AS REQUIRED FOR A COMPLETE SUPPORT SYSTEM AS INDICATED.
2. SUPPORT CABLE EITHER PARALLEL OR PERPENDICULAR TO SUPPORT STEEL.

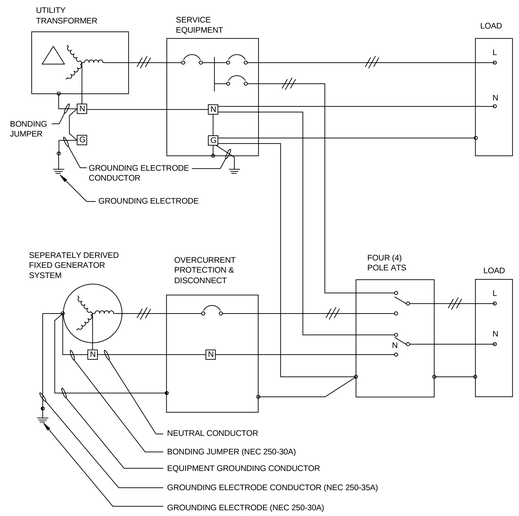


NOTES:

1. SUPPORTING CABLE IS ACCEPTABLE BELOW SUPPORT STEEL OR ABOVE STEEL. COORDINATE MOUNTING LOCATIONS WITH OTHER TRADES AND FIELD CONDITIONS. PROVIDE SUPPORT CLIPS AND THREADED RODES AS REQUIRED FOR A COMPLETE SUPPORT SYSTEM AS INDICATED.
2. SUPPORT CABLES FROM EITHER PARALLEL OR PERPENDICULAR SUPPORT STEEL.
3. BUNDLE A UP TO A MAXIMUM OF (6) SIX CABLES.

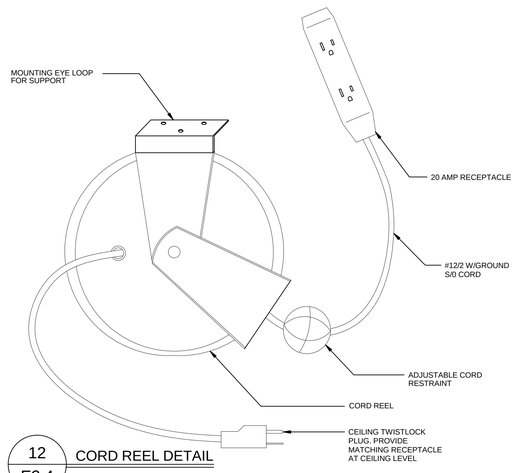
10 E3.4 TYPICAL MC CABLE SUPPORTING DETAIL

SCALE: N.T.S.



11 E3.4 SEPARATELY DERIVED GENERATOR SYSTEM

SCALE: N.T.S.



12 E3.4 CORD REEL DETAIL

SCALE: N.T.S.

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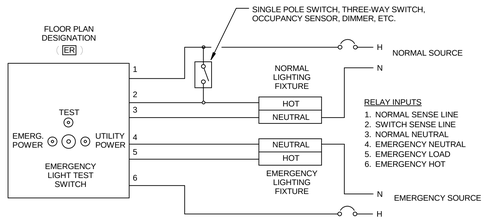
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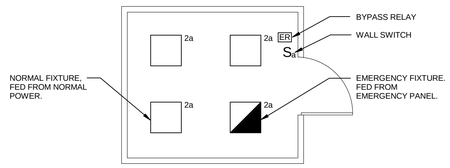
NOTES:

1. ALL SWITCH AND SENSOR CONTROLLED EMERGENCY LIGHTING IN PUBLIC AREAS, EGRESS ROUTES AND ALL "NORMALLY-OFF" EMERGENCY LIGHTING SHALL BE CONTROLLED BY AN EMERGENCY SUPERVISORY RELAY TO AUTOMATICALLY ENERGIZE EMERGENCY LIGHTS WHEN NORMAL (UTILITY) POWER FAILS. WHERE MORE THAN THREE CIRCUITS SERVE AN AREA, PROVIDE A HOMERUN(S) FROM RESPECTIVE LIGHTING PANEL(S) TO SENSING COIL.

2. THE EMERGENCY BYPASS RELAY TIES TO THE NORMAL CIRCUIT AND SWITCH TO MONITOR THE NORMAL SOURCE AND MIMIC THE SWITCH POSITION. THE RELAY ALLOWS THE ROOM SWITCH TO CONTROL THE EMERGENCY FIXTURE(S) DURING NORMAL OPERATION AND BYPASS THE SWITCH TO TURN LIGHTS ON DURING EMERGENCY OPERATION REGARDLESS OF THE SWITCH POSITION.

3. RELAY SHALL BE UL 924 LISTED, SOLID STATE, AND HAVE MECHANICALLY HELD RELAYS IN COMPLIANCE WITH NEC 700 AS MANUFACTURED BY BODINE, SCHNEIDER, BLTC, OR EQUAL.

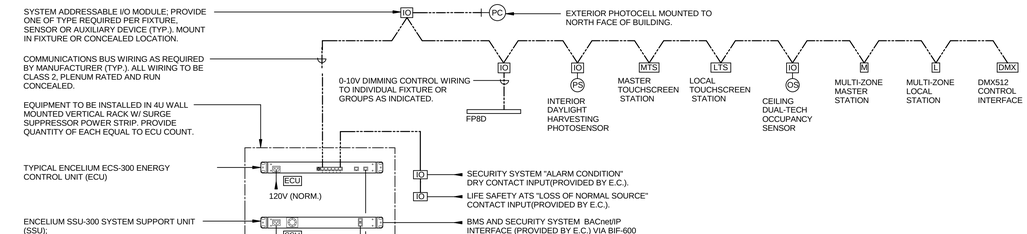
4. MOUNT RELAY IN A SQUARE 4 11/16" JUNCTION BOX TO BE LOCATED ABOVE THE CEILING DIRECTLY ABOVE THE WALL SWITCH LOCATION OR IN A REMOTE LOCATION WHERE HARD CEILINGS WOULD PREVENT ACCESS. COORDINATE FINAL LOCATION WITH BUILDING CONSTRUCTION AND THE WORK OF OTHER TRADES TO ENSURE A READILY ACCESSIBLE MOUNTING LOCATION..



APPLICATION EXAMPLE

1 / E3.5 EMERGENCY SUPERVISORY BY-PASS RELAY DETAIL

SCALE: N.T.S.



AUTOMATED LIGHTING CONTROL SYSTEM NOTES:

1. PROVIDE SWITCHING AND/OR 0-10V DIMMING CONTROL FOR ALL LIGHTING (REFER TO PLANS) WITH PRESETS VIA I/O MODULES, ACCESSORY POWER PACKS, AND RELAY PANELS.
2. PROVIDE ALL SYSTEM COMPONENTS (AND WARRANTIES) FROM A SINGLE MANUFACTURER EXCEPT WHERE OTHERWISE SPECIFIED.
3. PROVIDE GANGED MASTER AND LOCAL SWITCHES AT LOCATION AS INDICATED FOR USER CONTROL OF LIGHTING (UNDER COMMON MULTI-GANG PLATE).ALL SWITCHES SHALL BE PROVIDED WITH ENGRAVED LABELS ON PLATES DESIGNATING THEIR FUNCTION. FILL FOR ENGRAVED LETTERING SHALL BE AS DIRECTED BY THE ARCHITECT.
4. PROVIDE ENERGY MONITORING AND REPORTING MODULE TO ALLOW FOR ALL LIGHTING ELECTRICAL CONSUMPTION TO BE RECORDED, TRENDED, AND PASSED TO THE BMS SYSTEM VIA THE BACNET/IP INTERFACE.
5. THE BASIS-OF-DESIGN FOR THIS SYSTEM IS THE OSRAM ENCELIUM SYSTEM (W/ POLARIS 3D AND PCS SOFTWARE) INCLUDING THE FOLLOWING COMPONENTS:

MASTER TOUCHSCREEN STATION:	#RTI-K4-M-BZW-K4-CO
LOCAL TOUCHSCREEN STATION:	#RTI-K4-L-BZW-K4-CO
MULTI-ZONE LOCAL STATION:	#EN-WS-SC3D-GB2-WT
MULTI-ZONE MASTER STATION:	#EN-WS-ZC3-GB2-WT
SINGLE ZONE LOCAL ROUGH SERVICE STATION:	#EN-WS-INDPB-GB2-DR
CEILING DUAL-TECH OCCUPANCY SENSORS:	#SCM-2000
WALL DUAL-TECH OCCUPANCY SENSORS	#SCM-2000-W
CEILING PHOTOSENSOR:	#CES/I
EXTERIOR PHOTOCELL:	#CES/O

6. REFER TO THE "ALCS METHODS OF OPERATION NOTES" FOR SYSTEM SETUP REQUIREMENTS..
7. ALCS VENDOR SHALL ASSIST THE BMS SUB-SUB CONTRACTOR WITH ALL MAPPING OF BACNET DEVICES / POINTS.
8. LUTRON, SENSOR SWITCH, CRESTRON, PHILLIPS OR EQUAL ARE ACCEPTABLE MANUFACTURER OPTIONS.

ALCS METHODS OF OPERATION NOTES

ZONING & PRESET LEVELS :

1. INTERIOR SPACES SHALL BE PROGRAMMED FOR ZONES, SCENES, AND LEVELS TO BE ACTIVATED VIA LOCAL SWITCH STATIONS. LEVELS MAY BE ADJUSTED OUTSIDE OF THESE PRESETS VIA THE LOCAL WALL STATION. HOWEVER, WHERE PHOTOSENSORS ARE PRESENT THE LIGHTING SHALL NOT BE ALLOWED EXCEED THE FOOTCANDLE LEVEL ESTABLISHED BY THE SPACE'S PHOTOSENSOR BASED ON AVAILABLE DAYLIGHT CONTRIBUTION AT ANY GIVEN TIME.
2. LIGHTING WITHIN THE DAYLIGHT ZONE ADJACENT TO OPENINGS TO THE EXTERIOR SUCH AS WINDOWS AND SKYLIGHTS (DEPTH OF EACH DAYLIGHT ZONE RELATIVE TO THE DAYLIGHT OPENING SHALL BE AS DEFINED BY THE USGBC LEED 2009 SCHOOLS PROGRAM REQUIREMENTS AND COMMONWEALTH OF MASSACHUSETTS ENERGY CODE SHALL BE PROVIDED WITH SWITCHING AND PROGRAMMED TO ALLOW FOR CONTROL SEPARATE FROM THE REMAINDER OF THE SPACE.
3. EXTERIOR LIGHTING SHALL BE PROGRAMMED FOR 50% (POST-CURFEW) AND 100% (PRE-CURFEW) DIMMED LEVELS TO BE ACTIVATED VIA PHOTOCELL SETPOINTS AND TIMED SCHEDULES.
4. INTERIOR AND EXTERIOR PATHS OF EGRESS SHALL BE PROGRAMMED TO ACTIVATE AT 100% LEVELS UPON RECEIPT OF AN ALARM SIGNAL FROM THE LIFE SAFETY AUTOMATIC TRANSFER SWITCH, FIRE ALARM SYSTEM, AND SECURITY SYSTEM. LIGHTING LEVELS SHALL BE MAINTAINED AT 100% LEVELS REGARDLESS OF SUBSEQUENT INPUT REQUESTS UNTIL THE ORIGINATING ALARM SIGNAL IS RESTORED TO A NORMAL CONDITION. CONTACT CLOSURE OUTPUTS FROM EACH PIECE OF EQUIPMENT / SYSTEM SHALL BE PROVIDED BY THE RESPECTIVE VENDOR WITH COORDINATION OF ALL PROGRAMMING REQUIRED TO PROVIDE THE FUNCTIONALITY DESCRIBED.
5. REFER TO SPECIFICATIONS FOR FURTHER CONTROL SCENARIOS SUCH AS LOAD SHEDDING, PEAK LIMITING, TASK TUNING, ETC..
6. EXACT ZONING AND LEVEL PROGRAMMING SHALL BE TO MAPPED OUT (VIA BUILDING FLOOR & SITE GRAPHICS IN SYSTEM SOFTWARE) WITH THE OWNER OR THEIR REPRESENTATIVE PRIOR TO SYSTEM SETUP AND PROGRAMMING OF THE SYSTEM. ALL PROGRAMMING SHALL BE CONFIRMED AND COMPLETED PRIOR TO COMMISSIONING. NO OWNER REQUESTED PROGRAMMING SHALL BE ALLOWED WHICH WILL VIOLATE THE LEED PROGRAM REQUIREMENTS OR COMMONWEALTH OF MASSACHUSETTS BUILDING, ELECTRICAL, AND ENERGY CODES OR ANY CODES REFERENCED THEREIN.

SWITCH STATION OPERATIONS :

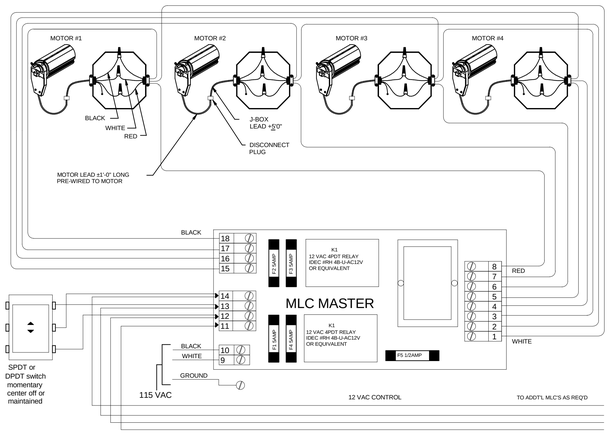
1. INTERIOR SPACES SHALL BE PROVIDED WITH SWITCH STATIONS OF THE 4 BUTTON + RAISE/LOWER TYPE. BUTTONS SHALL BE PROGRAMMED GENERALLY AS FOLLOWS: BUTTON 1 = "ON" 100%, BUTTON 2 = "ON" 50%, BUTTON 3 = "ON" 25%, BUTTON 4 = "ON/OFF".RAISE/LOWER WHERE PHOTOSENSORS ARE PRESENT THE LIGHTING SHALL NOT BE ALLOWED EXCEED THE FOOTCANDLE LEVEL ESTABLISHED BY THE SPACE'S PHOTOSENSOR BASED ON AVAILABLE DAYLIGHT CONTRIBUTION AT ANY GIVEN TIME.
2. SWITCH STATIONS SHALL BE PROGRAMMED FOR OVERRIDE OF TIMED SCHEDULE "OFF" PERIODS FOR A MAXIMUM OF 90 MINUTES.

SENSOR OPERATIONS :

1. INTERIOR PHOTOSENSORS (ADDRESSABLE): EACH PHOTOSENSOR SHALL BE PROGRAMMED TO MAINTAIN FOOTCANDLE SETPOINTS ESTABLISHED FOR EACH SPACE DURING SYSTEM SETUP AND COMMISSIONING. DIMMING DEADBANDS AND FADE/RISE RATES SHALL BE ESTABLISHED TO PROVIDE SMOOTH, NON-INTRUSIVE, CHANGES IN SPACE LIGHT LEVELS IN RESPONSE TO CHANGING DAYLIGHT CONTRIBUTIONS AT ANY GIVEN TIME.
2. EXTERIOR PHOTOCELLS (ADDRESSABLE): SENSOR SHALL BE PROGRAMMED TO TURN SITE LIGHTING "ON" AT DUSK AND TURN LIGHTS "OFF" AT DAWN. TIMED SCHEDULE PRESETS WILL DETERMINE OUTPUT LEVELS.
3. OCCUPANCY SENSORS (ADDRESSABLE): EACH OCCUPANCY SENSOR SHALL BE PROGRAMMED TO OPERATE IN A "VACANCY" MODE UNLESS OTHERWISE NOTED (CORRIDORS, STAIRS, AND ALL PORTIONS OF THE EGRESS PATH ARE GENERAL EXCEPTIONS) SO THAT MANUAL ACTIVATION OF THE LIGHTING VIA LOCAL SWITCH STATIONS IS REQUIRED. WHEN OCCUPANCY IS NO LONGER SENSED, FIXTURES SHALL SWITCH TO THE LEVELS ASSOCIATED WITH EACH TIME PERIOD: 5 MINUTES = 50%, 15 MINUTES = OFF. MOTION DETECTED AT ANYTIME PRIOR TO THE 15 MINUTE FULL TIME-OUT SHALL RETURN THE LIGHTING TO THE 100% LEVEL.
4. SENSOR ADJUSTMENTS FOR ALL FUNCTIONS SHALL BE TURNED TO THE MINIMUM ON EACH DEVICE AND ADJUSTED SOLELY THROUGH THE SYSTEM SOFTWARE.

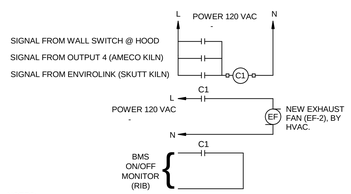
2 / E3.5 AUTOMATED LIGHTING CONTROL SYSTEM ONE-LINE DIAGRAM

SCALE: N.T.S.



3 / E3.5 MOTOR LOGIC CONTROLLER (MLC) WIRING DIAGRAM

SCALE: N.T.S.

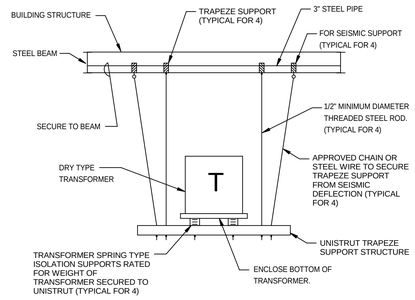


NOTES:

1. C1 = DPDT WITH 120V COIL RATED AT 1 HP, 120 VOLT, NEMA 1 ENCLOSURE, BY E.C.
2. ENVIROLINK ACCESSORY FOR SKUTT KILN UNITS SHALL BE PROVIDED BY THE OWNER.
3. OWNER SHALL ADD INTERFACE SEQUENCE AND ENVIROLINK FOR EXHAUST FAN INTERFACE. WHEN EITHER KILN IS ON, EXHAUST FAN IS ON AND REMAINS ON FOR 20 MIN. TIME DELAY AFTER KILNS ARE TURNED "OFF".

4 / E3.5 KILN EXHAUST FAN TIE-IN DETAIL

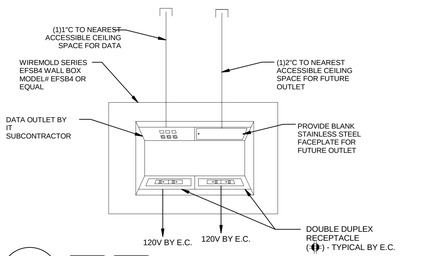
N.T.S.



5 / E3.5 TRAPEZE MOUNTED TRANSFORMER DETAIL

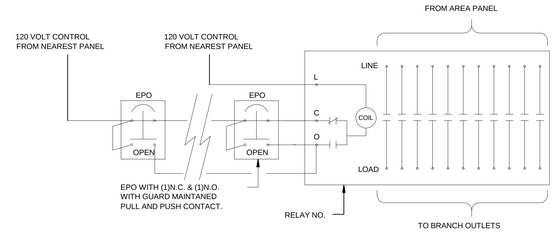
SCALE: N.T.S.

NOTE: CONFIRM WITH STRUCTURAL ENGINEER.



6 / E3.5 TVE / TVC BOX AND CONDUIT PROVISION DETAIL

SCALE: N.T.S.



7 / E3.5 EMERGENCY EPO SHUT DOWN (SCIENCE LAB)

SCALE: N.T.S.

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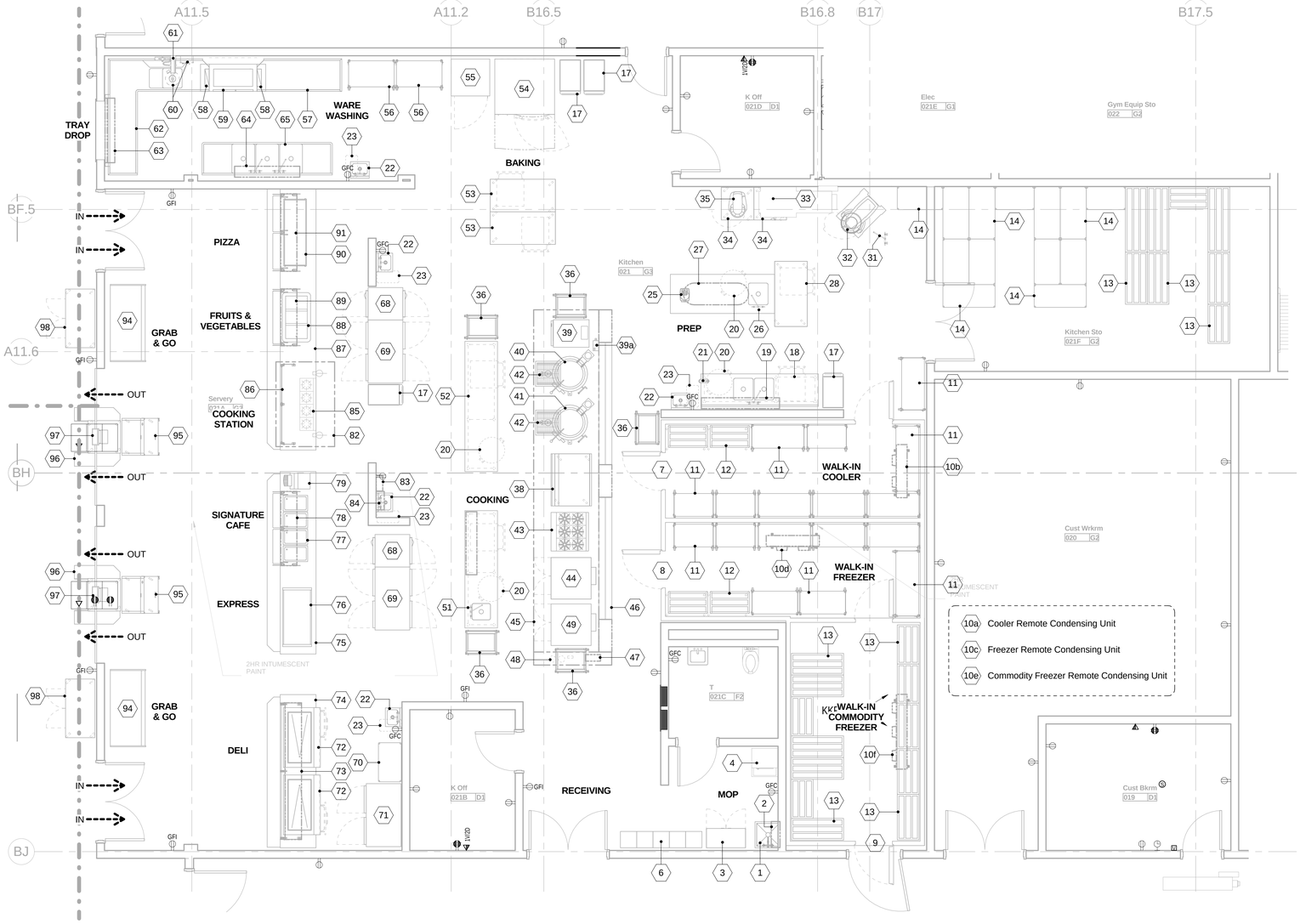
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1 E3.6 GROUND PLAN PART A - KITCHEN 3804 - POWER
SCALE: 1/4" = 1'-0"

GENERAL POWER NOTES:

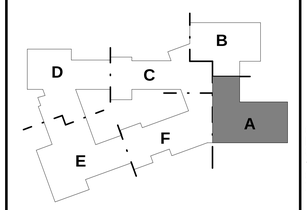
1. COORDINATE EXACT LOCATION OF ALL DEVICES AND EQUIPMENT WITH ARCHITECT PRIOR TO INSTALLATION.
2. REFER TO MECHANICAL PLANS FOR ANY CHANGES AND FOR EXACT LOCATION OF ALL HVAC EQUIPMENT.
3. WIRING IS SHOWN ON DRAWINGS ONLY FOR SPECIFIC ROUTES OR SPECIAL CONDITIONS.
4. WIRING AND CONDUIT SHALL BE REQUIRED BETWEEN ALL OUTLETS INDICATED WITH CIRCUIT NUMBERS AND PANEL DESIGNATIONS.
5. ALTHOUGH ALL BRANCH CIRCUIT WIRE AND CONDUIT IS NOT SHOWN, IT IS THE INTENT OF THESE DOCUMENTS THAT A COMPLETE BRANCH CIRCUIT WIRING SYSTEM BE INSTALLED.
6. ALL BRANCH CIRCUIT CONDUCTORS SHALL BE TYPE MC 99% CONDUCTIVITY, COPPER MINIMUM #12 AWG SIZE, THWN/THHN INSULATION, 600 VOLTS RATED UNLESS OTHERWISE NOTED.
7. REFER TO FIRE PROTECTION PLANS FOR ANY CHANGES AND FOR EXACT LOCATION OF ALL FLOW SWITCH, TAMPER SWITCH, ETC.
8. DO NOT PENETRATE STAIRS WITH ANY UTILITIES EXCEPT FOR UTILITIES SPECIFICALLY SERVING THAT STAIR.
9. WHERE CONDUITS AND/OR BOXES CANNOT BE FLUSH MOUNTED IN BUILDING PROVIDE A SYSTEM OF SURFACE METAL RACEWAYS AND BOXES IN ACCORDANCE WITH ARTICLE 386, EQUAL TO WIREMOLD FOR ALL FINISH SPACES WHERE PUBLIC HAS ACCESS, INCLUDING CORRIDORS, CLASSROOMS, OFFICES, ETC.
10. CONFIRM RATINGS & FINAL LOCATIONS OF EQUIPMENT WITH OWNER PRIOR TO ROUGHING.
11. ALL OUTLETS ON EXTERIOR WALLS WITH CASEWORK SHALL BE MOUNTED 6" ABOVE CASEWORK. CONFIRM HEIGHT OF CASEWORK WITH HVAC AND ARCHITECT PRIOR TO ROUGHING.
12. TYPICALLY PROVIDE GROUND FAULT INTERRUPTER TYPE RECEPTACLES WITHIN 6 FEET OF WATER SOURCES.
13. PROVIDE ALL EMPTY CONDUITS WITH PULL-STRINGS.
14. TYPICALLY PROVIDE (2) 4" SLEEVES OVER EACH CORRIDOR DOOR.
15. ROVIDE (2) 2" THROUGH-WALL SLEEVE ABOVE CEILING OVER THE DOORS INTO EACH ROOM LEADING FROM THE CORRIDOR FOR COMMUNICATIONS/DATA WIRING.
16. LOCATE ALL WALL TELEPHONE OUTLETS 12 INCHES AWAY FROM ALL OTHER OUTLETS/DEVICES.
17. PROVIDE (2) 1" SLEEVES OVER EACH DOOR FOR TEL./DATA SECURITY AND SOUND SYSTEM WIRING. TEL./DATA SHALL BE DEDICATED TO (1) OF THE CONDUITS.
18. ELECTRICAL CONTRACTOR SHALL PROVIDE ALL BOXES AND CONDUITS REQUIRED FOR AUDIOVISUAL SYSTEMS SECTION 274100 DEVICES AS SHOWN ON AV DRAWINGS. ALL LOCATIONS OF POWER AND A/V OUTLET BOXES SHALL BE COORDINATED WITH ARCHITECT PRIOR TO ROUGHING.

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KEYPLAN



Dover HS / CTC
Dover, NH
KITCHEN PART PLAN - POWER

SCALE: As indicated
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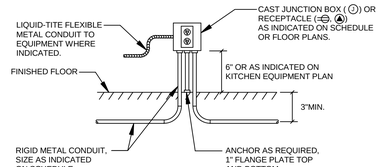
KITCHEN EQUIPMENT SCHEDULE

EQUIP NO.	EQUIPMENT	QTY	HP	K.W.	AMPS.	VOLT Ø	PANEL	CKT. NO.	BRKR.	WIRE & COND.	EQUIPMENT AND CONNCECTIONS (TS)								REMARKS
4	WASHER	1	-	-	-	120/1	KPPGA	-	20A-1P	2#12+1#12G-3/4"C	-	-	-	-	-	X	-	-	CONVENIENCE "GFI" OUTLET
4	DRYER	1	-	-	-	208/3	KPPGA	-,-	30A-2P	3#10+1#10G-3/4"C	-	-	-	-	-	-	X	-	-
7	WALK-IN COOLER - LIGHTS	1	-	1.1	-	120/1	EPGA	-	20A-1P	2#12+1#12G-3/4"C	X	-	X	-	X	-	-	X	-
8	WALK-IN FREEZER - LIGHTS	1	-	1.3	-	120/1	EPGA	-	20A-1P	2#12+1#12G-3/4"C	X	-	X	-	X	-	-	X	-
9	WALK-IN COMMODITY FREEZER - LIGHTS	1	-	1.3	-	120/1	EPGA	-	20A-1P	2#12+1#12G-3/4"C	X	-	X	-	X	-	-	X	-
10a	COOLER - CONDENSING UNIT	1	-	-	-	208/3	EPGA	-,-,-	20A-3P	4#12+1#12G-3/4"C	-	-	-	X	X	-	-	X	-
10b	COOLER - EVAPORATOR COIL	1	-	-	-	120/1	EPGA	-	20A-1P	2#12+1#12G-3/4"C	-	-	-	X	X	-	-	X	PROVIDE 6 #14 FOR INTERLOCK TO CONDENSING UNIT
10c	FREEZER - CONDENSING UNIT	1	-	-	-	208/3	EPGA	-,-,-	20A-3P	4#12+1#12G-3/4"C	-	-	-	X	X	-	-	X	-
10d	FREEZER - EVAPORATOR COIL	1	-	-	-	208/1	EPGA	-,-	20A-2P	3#12+1#12G-3/4"C	-	-	-	X	X	-	-	X	PROVIDE 6 #14 FOR INTERLOCK TO CONDENSING UNIT
10e	COMMODITY FREEZER - CONDENSING UNIT	1	-	-	-	208/3	EPGA	-,-,-	20A-3P	4#12+1#12G-3/4"C	-	-	-	X	X	-	-	X	-
10f	COMMODITY FREEZER - EVAPORATOR COIL	1	-	-	-	208/1	EPGA	-,-	20A-2P	3#12+1#12G-3/4"C	-	-	-	X	X	-	-	X	PROVIDE 6 #14 FOR INTERLOCK TO CONDENSING UNIT
18	PREP COUNTER WITH SINKS	1	-	-	-	120/1	KPPGA	-	(2) 20A-1P	(2) 2#12+1#12G-3/4"C	-	-	-	-	-	(2) X	-	-	CONVENIENCE "GFI" OUTLETS
25	FOOD PROCESSOR	1	-	-	-	120/1	KPPGA	-	20A-1P	2#12+1#12G-3/4"C	-	-	-	-	-	X	-	-	CONVENIENCE "GFI" OUTLETS
26	PREP TABLE WITH SINKS	1	-	-	-	120/1	KPPGA	-	(2) 20A-1P	(2) 2#12+1#12G-3/4"C	-	-	-	-	-	(2) X	-	-	CONVENIENCE "GFI" OUTLETS
32	SIXTY-QUART MIXER	1	-	-	10.0	208/3	KPPGA	-,-,-	20A-3P	4#12+1#12G-3/4"C	-	-	X	-	X	-	-	X	-
33	SLICER	1	-	-	-	120/1	KPPGA	-	20A-1P	2#12+1#12G-3/4"C	-	-	-	-	-	X	-	-	-
35	TWENTY-QUART MIXER	1	-	-	8.0	120/1	KPPGA	-	20A-1P	2#12+1#12G-3/4"C	-	-	-	-	-	X	-	-	-
38	GRIDDLE WITH MOBILE STAND	1	-	-	1.0	120/1	KPPGA	-	20A-1P	2#12+1#12G-3/4"C	-	-	-	-	-	X	-	-	-
39	EXISTING STEAMER	1	-	-	1.25	120/1	KPPGA	-	20A-1P	2#12+1#12G-3/4"C	-	-	-	-	-	X	-	-	-
40	FORTY-GALLON KETTLE	1	-	-	5.0	120/1	KPPGA	-	20A-1P	2#12+1#12G-3/4"C	-	-	-	-	-	X	-	-	-
41	FORTY-GALLON KETTLE	1	-	-	5.0	120/1	KPPGA	-	20A-1P	2#12+1#12G-3/4"C	-	-	-	-	-	X	-	-	-
43	GRATE TOP RANGE WITH OVEN	1	-	-	0.1	120/1	KPPGA	-	20A-1P	2#12+1#12G-3/4"C	-	-	-	-	-	X	-	-	-
44	DOUBLE CONVECTION OVEN	1	-	-	(2) 8.0	120/1	KPPGA	-	(2) 20A-1P	(2) 2#12+1#12G-3/4"C	-	-	-	-	-	(2) X	-	-	-
45	EXHAUST VENTILATOR - LIGHTS	1	-	-	-	120/1	KPPGA	-	20A-1P	2#12+1#12G-3/4"C	-	-	-	-	-	X	-	-	-
46	UTILITY DISTRIBUTION SYSTEM	1	-	-	-	120/208/3	KPPGA	-	50A-3P	4#6+1#10G-1"C	-	-	-	-	-	-	-	-	-
47	VENTILATOR DEMAND CONTROL SYSTEM	1	-	-	-	120/1	KPPGA	-	20A-1P	2#12+1#12G-3/4"C	-	-	-	-	-	-	-	-	-
48	FIRE SUPPRESSION SYSTEM	1	-	-	-	120/1	KPPGA	-	20A-1P	2#12+1#12G-3/4"C	-	-	-	-	-	-	-	-	-
49	EXISTING CONVECTION OVEN	1	-	-	(2) 6.0	120/1	KPPGA	-	(2) 20A-1P	(2) 2#12+1#12G-3/4"C	-	-	-	-	-	(2) X	-	-	-
51	PREP COUNTER WITH SINKS	1	-	-	-	120/1	KPPGA	-	(2) 20A-1P	(2) 2#12+1#12G-3/4"C	-	-	-	-	-	(2) X	-	-	CONVENIENCE "GFI" OUTLETS
51	PREP TABLE	1	-	-	-	120/1	KPPGA	-	(2) 20A-1P	(2) 2#12+1#12G-3/4"C	-	-	-	-	-	(2) X	-	-	CONVENIENCE "GFI" OUTLETS
54	ROTATING SINGLE RACK OVEN																		
55	PROOFER																		
59	WAREWASHER																		
60	DISPOSER																		
68	PASS-THRU HOT FOOD HOLDING CABINET	2	-	-	-	120/1	KPPGA	-	(2) 20A-1P	(2) 2#12+1#12G-3/4"C	-	-	-	-	-	(2) X	-	-	-
69	PASS-THRU REFRIGERATOR	2	-	-	-	120/1	KPPGA	-	(2) 20A-1P	(2) 2#12+1#12G-3/4"C	-	-	-	-	-	(2) X	-	-	-
72	PREP TOP REFRIGERATOR	2	-	-	-	120/1	KPPGA	-	(2) 20A-1P	(2) 2#12+1#12G-3/4"C	-	-	-	-	-	(2) X	-	-	-
73	FOOD PROTECTOR CASE	3	-	-	-	120/1	KPPGA	-	(3) 20A-1P	(3) 2#12+1#12G-3/4"C	-	-	-	-	-	(3) X	-	-	-
75																			
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REFER TO FOOD SERVICE DRAWINGS FOR EXACT EQUIPMENT LOCATION & ROUGHING REQUIREMENTS.

KITCHEN EQUIPMENT NOTES:

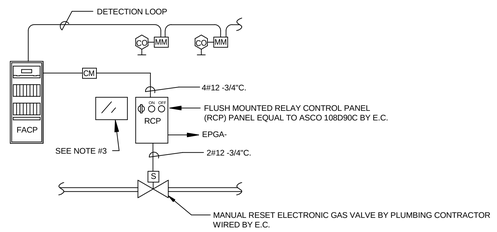
1. REFER TO KITCHEN EQUIPMENT DRAWINGS AND ARCHITECTURAL DRAWINGS FOR KITCHEN EQUIPMENT LAYOUT, ELECTRICAL CHARACTERISTICS, AND EXACT LOCATION, ROUGH-IN AND CONNECTION REQUIREMENTS.
2. COORDINATE WITH THE KITCHEN EQUIPMENT INSTALLER'S FINAL ELECTRICAL REQUIREMENTS PRIOR TO ROUGHING IN OF ANY ELECTRICAL WORK.
3. PROVIDE ALL DISCONNECTING DEVICES FOR ALL KITCHEN EQUIPMENT REQUIRED BY ELECTRICAL CODE ART. 422, PART D UNLESS PROVIDED AS PART OF KITCHEN EQUIPMENT.
4. GROUND CONDUCTORS SIZED PER ELECTRIC CODE GROUNDING CONDUCTOR TABLE 250-95 SHALL BE INCLUDED IN ALL KITCHEN BRANCH CIRCUITS.
5. PROVIDE CONTROL CONNECTION FROM AUTOMATIC FIRE SUPPRESSION SYSTEM TO SHUNT TRIP AND SOLENOID CONTROLS.
6. ALL DIRECT CONNECTIONS TO KITCHEN EQUIPMENT SHALL BE MADE PER KITCHEN EQUIPMENT MANUFACTURER'S REQUIREMENTS. VERIFY LIQUITITE FLEXIBLE CONDUIT/CORD LENGTHS REQUIRED.
7. ALL SWITCHES INSTALLED AS AN EQUIPMENT DISCONNECTING MEANS SHALL BE LABELED WITH THE DESCRIPTION OF THE EQUIPMENT BEING SERVED. EXAMPLE: WALK-IN COOLER.
8. EXPOSED WIRING SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS FOR A WET AREA. MOUNT WORK OFF SURFACES TO ALLOW CLEANING. ALL WORK SHALL USE GALVANIZED OR CORROSIVE RESISTANT MATERIALS. CONDUITS PENETRATING FLOOR SHALL BE RIGID GALVANIZED STEEL.
9. CIRCUIT SIZE SHALL MATCH THE CIRCUIT BREAKER AMPACITY, REFER TO SCHEDULES.
10. TO HOOD SUPPLIED JB @ CEILING TO FEED HOOD LIGHTING FROM REMOTE SWITCH PROVIDED BY E.C. & CONTROL SWITCH FOR REMOTE FAN PROVIDED BY E.C.
11. JB MTD CEILING TO LIGHTS FROM REMOTE SWITCHES PROVIDED BY E.C. (EACH SIDE CONTROLLED SEPARATELY) CONTROL SW FOR REMOTE FANS PROVIDED BY E.C. (EACH SIDE CONTROLLED SEPARATELY).
12. INSTALL AND CONNECT LIGHT FIXTURES IN COOLER & FREEZER, FURNISHED BY KITCHEN EQUIPMENT SUPPLIER.
13. TRENCH FLOOR AS REQUIRED TO FEED KITCHEN ISLANDS.
14. UNLESS OTHERWISE NOTED ALL CIRCUITS SHALL BE FED FROM PANEL "KPPLA".
15. ALL FLOOR BOXES IN KITCHEN SHALL BE INSTALLED 6" AFF. FLOOR BOXES SHALL BE WATERTIGHT.
16. PROVIDE SHUTDOWN WIRING FOR GAS SOLENOID IN KITCHEN. FROM ANSUL SYSTEM.
17. CONNECT KITCHEN WALK-IN COOLER & FREEZER ALARMS TO LOCAL DDC SYSTEM IN BOILER/WATER 003 WITH 2 #14 - 3/4"C FOR EACH ALARM. ALSO REFER TO KITCHEN DRAWINGS FOR FURTHER CLARIFICATION. FINAL CONNECTION AT BMS BY ATC CONTRACTOR.
18. ALL DISCONNECT SWITCHES LOCATED IN THE KITCHEN AREA SHALL BE NEMA 4X STAINLESS STEEL.



2 E3.7 TYPICAL KITCHEN RAISED JUNCTION/OUTLET BOX INSTALLATION

SCALE: N.T.S.

NOTE:
THIS DETAIL DOES NOT APPLY TO P.O.S. FLOOR BOXES.

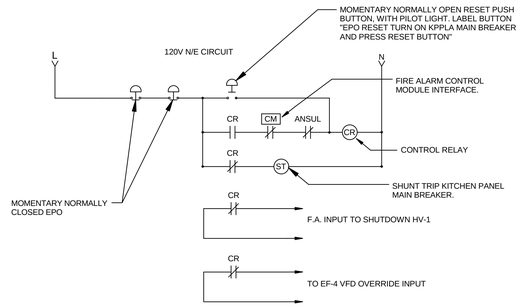


3 E3.7 CARBON MONOXIDE GAS SOLENOID SHUT DOWN DETAIL

SCALE: NTS

NOTES:

1. CARBON MONOXIDE (CO) DETECTORS SHALL BE PROGRAMMED AS SUPERVISORY POINTS IN THE FACP. UPON DETECTION OF CO, POWER SHALL BE INTERRUPTED TO THE (RCP) AND THE GAS SHUTOFF WILL CLOSE.
2. GAS FLOW MAY BE RESTARTED AFTER THE CO DETECTION AND THE FACP ARE RESET WHICH WILL RE-POWER THE (RCP). TURNING THE KEY SWITCH TO "ON" WILL ENERGIZE THE SOLENOID.
3. YELLOW ENGRAVED WARNING PLACARD, MOUNTED ADJACENT TO THE (RCP), WITH THE FOLLOWING"CAUTION- GAS FLOW IS RE-ESTABLISHED WHEN "ON" KEY SWITCH IS TURNED AND GAS VALVE IS MANUALLY RESET. RELIGHT ALL ASSOCIATED PILOTS IMMEDIATELY UPON RESET. CO DETECTORS AND THE FIRE ALARM SYSTEM CONTROL PANEL MUST CLEAR OF ANY CO ALARMS PRIOR TO RESET".



SEQUENCE OF OPERATIONS:

1. PROVIDE ALL RELAYS, PUSH BUTTONS, TRANSFORMERS, CONTACTORS SHUNT TRIP CIRCUIT BREAKERS, WIRING AND CONDUITS FOR A COMPLETE POWER OFF SYSTEM AND ALARM NOTIFICATION DESCRIBED IN PARAGRAPHS 2 & 3 BELOW.
2. THE ACT OF PUSHING ANY EMERGENCY POWER OFF PUSH-BUTTON, SHALL CAUSE THE FOLLOWING TO OCCUR:
   a. TURN OFF POWER TO THE GAS SOLENOID.
   b. TURN OFF POWER TO ALL ITEMS UNDER KITCHEN HOOD REQUIRING ELECTRICAL CONNECTION OR CONTROL BY TURNING OFF POWER TO KITCHEN PANEL VIA SHUNT TRIP MAIN BREAKER.
3. THE ACTIVATION OF HOOD FIRE SUPPRESSION SYSTEM, SHALL CAUSE THE FOLLOWING TO OCCUR:
   a. TURN OFF POWER TO THE GAS SOLENOID.
   b. TURN OFF POWER TO ALL ITEMS UNDER KITCHEN HOOD REQUIRING ELECTRICAL CONNECTION OR CONTROL BY TURNING OFF POWER TO KITCHEN PANEL VIA SHUNT TRIP MAIN BREAKER.
   c. SEND A SIGNAL TO THE FIRE ALARM CONTROL PANEL TO INITIATE (FACP) SYSTEM OPERATION.
4. COORDINATE WITH INSTALLERS OF FIRE SUPPRESSION SYSTEM, & KITCHEN EQUIPMENT SUPPLIER.
5. ONE SYSTEM REQUIRED PER HOOD.
6. KITCHEN HOOD SUMMARY: THE HOOD FIRE SUPPRESSION SYSTEM CONTROL PANEL, UPON ACTIVATION, SHALL PUT THE FACP INTO "AUTO" ALARM MODE AND SHALL ALSO SHUTDOWN THE HOOD'S SUPLLY FAN, TURN OFF POWER TO THE GAS SOLENOID AND TURN OFF POWER TO ALL ITEMS UNDER THE KITCHEN HOOD. THE HOOD EXHAUST FAN SHALL CONTINUE TO OPERATE. FIRE ACTUATED DAMPERS IF INSTALLED IN THE EXHAUST OUTLET SHALL SHUT DOWN THE EXHAUST FAN UPON ACTUATION. IT SHALL NOT BE REQUIRED TO RESTART THE HOOD EXHAUST FAN WHEN THE EXTINGUISHING SYSTEM IS ACTIVATED IF THE EXHAUST FAN AND ALL COOKING EQUIPMENT SERVED BY THE FAN HAD PREVIOUSLY BEEN SHUTDOWN. SHUTOFF DEVICES SHALL REQUIRE MANUAL RESET.

4 E3.7 KITCHEN EQUIPMENT EMERGENCY POWER OFF WIRING DIAGRAM

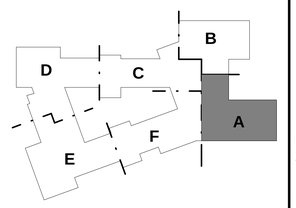
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KEYPLAN



Dover HS / CTC
Dover, NH
KITCHEN DETAILS

DRAWN BY: AD
CHECKED BY: DMP
SCALE:

REVISIONS NO.	DATE	REMARKS	BY

DRAWING NUMBER
E3.7

JOB NUMBER 403114

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AUTO COLLISION EQUIPMENT SCHEDULE - ROOM 135A

EQUIP NO.	EQUIPMENT	QTY	NEW	EXIST	HP	K.W.	AMPS.	VOLT PHASE	PANEL	CKT. NO.	BRKR.	WIRE & COND.	EQUIPMENT AND CONNECTIONS	REMARKS
1	Dual Bladder Bubble Jack	1		X										
2	Combination Shear Brake Roll Machine	1		X										
3	English Wheel	1		X										
4	Portable Scissor Lift	2		X				208,1	PL135A	-	30A/2P	3#10+#10G, 3/4"C		
5	Sand Blasting Cabinet	1		X										
6	Rim Clamp Tire Changer	1		X										
7	Wheel Balancer	1		X										
8	Dual Arm Weld Fume Extraction	1		X										
9	Frame Rack	1		X										
10	Two Post Lift	1		X										
11	Planishing Hammer	1		X										
12	Steel Metal Hand Break	1		X										
13	Hand Operated Finger Break	1		X										
14	Work Bench	1	X											
15	Flammable Storage Cabinet	1	X											
16	NATEF Prep Station	1	X											
17	Spray Booth	1	X											

1. FIELD CONFIRM EXACT EQUIPMENT LOCATION.
2. TYPICALLY INSTALL CEILING MOUNTED RECEPTACLE AND PROVIDE REELCRAFT ITEM #LG3040 123 9, MEDIUM DUTY POWER CORD REEL. INSTALL CORD REEL ADJACENT TO RECEPTACLE.

1 / E3.8 AUTO COLLISION EQUIPMENT SCHEDULE - ROOM 135A

SCALE: N.T.S.

AUTO TECH EQUIPMENT SCHEDULE - ROOM 137A

EQUIP NO.	EQUIPMENT	QTY	NEW	EXIST	HP	K.W.	AMPS.	VOLT PHASE	PANEL	CKT. NO.	BRKR.	WIRE & COND.	EQUIPMENT AND CONNECTIONS	REMARKS
1	Strut Compressor	1		X										No Power Required
2	Tool Set	4		X										
3	Foldable Engine Crane	1		X										
4	8" Bench Grinder w/ Light	1		X				120,1	PL137A	-	20A/1P	2#12+#12G, 3/4"C		
5	Sandblasting Cabinet	1		X										
6	Two Post Lift - Rotary	1		X										
7	Four Post Alignment Rack	1		X										
8	Oil Lift Drain	4		X										
9	Shop Press	1		X										
10	Tire Changer	1		X										
11	Wheel Balancer	1		X										
12	Break Lathe	1		X										
13	Alignment System	1		X										
14	Solvent Part Washer	1		X										
15	Mig Welder	1		X										
16	AC Recovery / Recharge Machine	1		X										
17	Break Lathe with DRO	1		X										
18	Tool Chest	1		X										
19	Transmission Jack	1		X										
20	Two Post Lift - Bend Pack	1		X										
21	Engine Stand	10		X										
22	Two Post Lift - Challenger	3		X										
23	Work Bench	8	X											
24	Flammable Storage Cabinet	1	X											
25	Environmental Lift	1	X											
26	Two Post Lift	3	X											
27	Tool Set	4	X											
28	Waste Oil Storage Tank	1	X											No Power Required

1. FIELD CONFIRM EXACT EQUIPMENT LOCATION.
2. TYPICALLY INSTALL CEILING MOUNTED RECEPTACLE AND PROVIDE REELCRAFT ITEM #LG3040 123 9, MEDIUM DUTY POWER CORD REEL. INSTALL CORD REEL ADJACENT TO RECEPTACLE.

2 / E3.8 AUTO COLLISION EQUIPMENT SCHEDULE - ROOM 137A

SCALE: N.T.S.

BUILDING CONSTRUCTION EQUIPMENT SCHEDULE - ROOM 125A

EQUIP NO.	EQUIPMENT	QTY	NEW	EXIST	HP	K.W.	AMPS.	VOLT PHASE	PANEL	CKT. NO.	BRKR.	WIRE & COND.	EQUIPMENT AND CONNECTIONS	REMARKS
1	Industrial Cabinet Saw	2		X										
2	Compound Miter Saw	2		X				120,1	PL125A	-	(2)20A/1P	(2)2#12+#12G, 3/4"C	(2)X	
3	Jet Disc Sander	1		X				120,1	PL125A	-	(2)20A/1P	(2)2#12+#12G, 3/4"C	(2)X	
4	15" Drill Press	1		X										
5	10" Band Saw w/ Stand	2		X										
6	20" Planer	1		X										
7	6" Jointer w/ Helical Cutterhead	1		X										
8	Flammable Storage Cabinet	1	X											
9	Panel Saw	1	X											
10	Heavy Duty Steel Shelving	13	X											

1. FIELD CONFIRM EXACT EQUIPMENT LOCATION.
2. TYPICALLY INSTALL CEILING MOUNTED RECEPTACLE AND PROVIDE REELCRAFT ITEM #LG3040 123 9, MEDIUM DUTY POWER CORD REEL. INSTALL CORD REEL ADJACENT TO RECEPTACLE.

3 / E3.8 AUTO COLLISION EQUIPMENT SCHEDULE - ROOM 137A

SCALE: N.T.S.

WOOD WORKING EQUIPMENT SCHEDULE - ROOM 125C

EQUIP NO.	EQUIPMENT	QTY	NEW	EXIST	HP	K.W.	AMPS.	VOLT PHASE	PANEL	CKT. NO.	BRKR.	WIRE & COND.	EQUIPMENT AND CONNECTIONS	REMARKS
1	Drill Press	1		X										
2	Large Lathe	1		X										
3	Industrial Cabinet Saw	1		X										
4	Mini Lathe	2		X				208,1	PL125C	-	30A/2P	3#10+#10G, 3/4"C		
5	Band Saw	1		X										
6	10" Table Saw	1		X										
7	Buffer / Grinder	1		X										
8	Band Saw	1		X										
9	Combination Belt / Disc Sander	1		X										
10	15" HD Floor Drill Press	1		X										
11	Flammable Storage Cabinet	1		X										
12	8" Jointer w/ Spiral Cutterhead	1		X										
13	20-inch Planer	1		X										
14	Shaper	1	X											
15	Oscillating Spindle Sander	1	X											

1. FIELD CONFIRM EXACT EQUIPMENT LOCATION.
2. TYPICALLY INSTALL CEILING MOUNTED RECEPTACLE AND PROVIDE REELCRAFT ITEM #LG3040 123 9, MEDIUM DUTY POWER CORD REEL. INSTALL CORD REEL ADJACENT TO RECEPTACLE.

4 / E3.8 WOOD WORKING EQUIPMENT SCHEDULE - ROOM 135A

SCALE: N.T.S.

ELECTRICAL TECH EQUIPMENT SCHEDULE - ROOM 126

EQUIP NO.	EQUIPMENT	QTY	NEW	EXIST	HP	K.W.	AMPS.	VOLT PHASE	PANEL	CKT. NO.	BRKR.	WIRE & COND.	EQUIPMENT AND CONNECTIONS	REMARKS
1	4" One Shot 90 Deg. Conduit Bender	1		X				120,1	PL126	-	20A/1P	2#12+#12G, 3/4"C		
2	Job Box	1		X										No Power Required
3	Pipe Threader	1		X	1/2			120,1	PL126	-	20A/1P	2#12+#12G, 3/4"C		
4	Pipe Vise	1		X										No Power Required

1. FIELD CONFIRM EXACT EQUIPMENT LOCATION.
2. TYPICALLY INSTALL CEILING MOUNTED RECEPTACLE AND PROVIDE REELCRAFT ITEM #LG3040 123 9, MEDIUM DUTY POWER CORD REEL. INSTALL CORD REEL ADJACENT TO RECEPTACLE.

5 / E3.8 ELECTRICAL TECH EQUIPMENT SCHEDULE - ROOM 137A

SCALE: N.T.S.

PRE-ENGINEERING EQUIPMENT SCHEDULE - ROOM 145D

EQUIP NO.	EQUIPMENT	QTY	NEW	EXIST	HP	K.W.	AMPS.	VOLT PHASE	PANEL	CKT. NO.	BRKR.	WIRE & COND.	EQUIPMENT AND CONNECTIONS	REMARKS
1	CNC Trainer / Prototype Machine	1		X				120,1	PL145D	-	20A/1P	2#12+#12G, 3/4"C		
2	Robotic Arm Slide Base Controller	1		X										
3	Robo Interface	12		X										
4	Laser Engraving System	1		X										
5	Structural Stress Analyzer	1		X										
6	3D Printer	1		X										
7	Plotter	1		X										
8	CNC Bench Mill	1		X										
9	Sign Maker	1		X										
10	Wind Tunnel	1		X										
11	Horizontal Band Saw	1		X										
12	TEC Lathe	1		X										
13	Bench Lathe w/ Stand	1		X										
14	Hardness Tester	1		X										
15	Turret Milling Machine	1		X										
16	Lathe	1		X										
17	CNC Mill	1		X										
18	CNC Router	1		X										
19	Industrial Cabinet Saw	1		X										
20	Surface Plate w/ Stand	1		X										No Power Required
21	3D Printer	2	X											
22	Band Saw	1	X											
23	15" HD Floor Drill Press	1	X											

1. FIELD CONFIRM EXACT EQUIPMENT LOCATION.
2. TYPICALLY INSTALL CEILING MOUNTED RECEPTACLE AND PROVIDE REELCRAFT ITEM #LG3040 123 9, MEDIUM DUTY POWER CORD REEL. INSTALL CORD REEL ADJACENT TO RECEPTACLE.

6 / E3.8 PRE-ENGINEERING EQUIPMENT SCHEDULE - ROOM 145D

SCALE: N.T.S.

WELDING LAB EQUIPMENT SCHEDULE - ROOM 145D

EQUIP NO.	EQUIPMENT	QTY	NEW	EXIST	HP	K.W.	AMPS.	VOLT PHASE	PANEL	CKT. NO.	BRKR.	WIRE & COND.	EQUIPMENT AND CONNECTIONS	REMARKS
1	Portable Welder	1		X				120,1	PL145D	-	20A/1P	2#12+#12G, 3/4"C		
2	Mig Welder - Wire	1		X										
3	Mig Welder	4		X										
4	Mig Welder - Spool	1		X										
5	Plasma Cutter	1		X										
6	Grinder, 12"	1	X											
7	Dual Arm Fume Extraction	1		X										
8	Band Saw	1	X											
9	15" HD Floor Dill Press	1	X											
10	Smoke Extractor	4	X											
11	Welding Booth	8	X											
12	Welding Cart	8	X											
13	Welding Table	6	X											
14	Welding Table, Large	2	X											

1. FIELD CONFIRM EXACT EQUIPMENT LOCATION.
2. TYPICALLY INSTALL CEILING MOUNTED RECEPTACLE AND PROVIDE REELCRAFT ITEM #LG3040 123 9, MEDIUM DUTY POWER CORD REEL. INSTALL CORD REEL ADJACENT TO RECEPTACLE.

7 / E3.8 PRE-ENGINEERING EQUIPMENT SCHEDULE - ROOM 145D

SCALE: N.T.S.

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LAB EQUIPMENT CONNECTION SCHEDULES

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SCHEDULE OF MECHANICAL EQUIPMENT

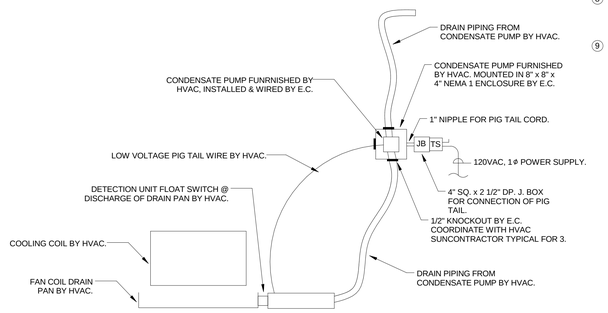
UNIT NO.	DESCRIPTION	LOCATION	LOAD CHARACTERISTICS	VOLT	PH	PANEL CIRCUIT	CIRCUIT BREAKER	FEEDER	EQUIPMENT AND CONNCECTIONS										REMARKS
									TS					S D	WP		J	S WP J	VFD	
B-1	BOILER																			
B-2	BOILER																			
	BOILER CONTROLS																			
EF-1	EXHAUST FAN								X				X				X			
EF-2	EXHAUST FAN								X				X				X			
EF-3	EXHAUST FAN								X				X				X			
EF-4	EXHAUST FAN								X				X				X			
EF-5	EXHAUST FAN								X				X				X			
EF-6	EXHAUST FAN								X				X				X			
EF-7	EXHAUST FAN									X	X		X				X			
EF-8	EXHAUST FAN									X	X		X				X			
EF-9	EXHAUST FAN								X				X				X			
EF-10	EXHAUST FAN								X				X				X			
EF-11	EXHAUST FAN								X				X				X			
EF-12	EXHAUST FAN								X				X				X			
EF-13	EXHAUST FAN								X				X				X			
EF-14	EXHAUST FAN								X				X				X			
EF-15	EXHAUST FAN								X				X				X			
EF-16	EXHAUST FAN								X				X				X			
EF-17	EXHAUST FAN								X				X				X			
EF-18	EXHAUST FAN								X				X				X			
EF-19	EXHAUST FAN								X				X				X			
EF-20	EXHAUST FAN								X				X				X			
EF-21	EXHAUST FAN								X				X				X			
EF-22	EXHAUST FAN								X											
EF-23	EXHAUST FAN								X				X				X			
EF-24	EXHAUST FAN									X	X		X				X			
EF-25	EXHAUST FAN								X				X				X			
EF-26	EXHAUST FAN								X				X				X			
EF-27	EXHAUST FAN								X				X				X			
EF-28	EXHAUST FAN								X				X				X			
EF-29	EXHAUST FAN								X				X				X			
EF-30	EXHAUST FAN								X				X				X			
DCUc-1	COOLING OUTDOOR UNIT																			
DCUe-1	COOLING INDOOR UNIT																			
DCUc-2	COOLING OUTDOOR UNIT																			
DCUe-2	COOLING INDOOR UNIT																			
DCUc-3	COOLING OUTDOOR UNIT																			
DCUe-3	COOLING INDOOR UNIT																			
DCUc-4	COOLING OUTDOOR UNIT																			
DCUe-4	COOLING INDOOR UNIT																			
DCUc-5	COOLING OUTDOOR UNIT																			
DCUe-5	COOLING INDOOR UNIT																			
DCUc-6	COOLING OUTDOOR UNIT																			
DCUe-6	COOLING INDOOR UNIT																			
DCUc-7	COOLING OUTDOOR UNIT																			
DCUe-7	COOLING INDOOR UNIT																			
DCUc-8	COOLING OUTDOOR UNIT																			
DCUe-8	COOLING INDOOR UNIT																			
DCUc-9	COOLING OUTDOOR UNIT																			
DCUe-9	COOLING INDOOR UNIT																			
DCUc-10	COOLING OUTDOOR UNIT																			
DCUe-10	COOLING INDOOR UNIT																			
DCUc-11	COOLING OUTDOOR UNIT																			
DCUe-11	COOLING INDOOR UNIT																			
DCUc-12	COOLING OUTDOOR UNIT																			
DCUe-12	COOLING INDOOR UNIT																			
DCUc-13	COOLING OUTDOOR UNIT																			
DCUe-13	COOLING INDOOR UNIT																			
DCUc-14	COOLING OUTDOOR UNIT																			
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DCUc-15	COOLING OUTDOOR UNIT																			
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DCUe-22	COOLING INDOOR UNIT																			
DCUc-23	COOLING OUTDOOR UNIT																			
DCUc-23	COOLING OUTDOOR UNIT																			
UH-1	UNIT HEATER																			
UH-2	UNIT HEATER																			
UH-3	UNIT HEATER																			
UH-4	UNIT HEATER																			
UH-5	UNIT HEATER																			
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UH-24	UNIT HEATER																			
UH-25	UNIT HEATER																			
UH-26	UNIT HEATER																			
UH-27	UNIT HEATER																			
UH-28	UNIT HEATER																			
VAV- #	VAR. AIR VOL. BOX								209(X)				(209)X				(209)X			TOTAL OF 209, REFER TO FLOOR PLANS FOR CIRCUITING
P-1	WATER PUMP																			
P-2	WATER PUMP																			
RTU-1	ROOFTOP UNIT																			
RTU-2	ROOFTOP UNIT																			
RTU-3	ROOFTOP UNIT																			
RTU-4	ROOFTOP UNIT																			
RTU-5	ROOFTOP UNIT																			
RTU-6	ROOFTOP UNIT																			
RTU-7	ROOFTOP UNIT																			
RTU-8	ROOFTOP UNIT																			
RTU-9	ROOFTOP UNIT																			
RTU-10	ROOFTOP UNIT																			
RTU-11	ROOFTOP UNIT																			
RTU-12	ROOFTOP UNIT																			
EUH-1	ELECTRIC UNIT HEATER																			
EUH-2	ELECTRIC UNIT HEATER																			
EUH-3	ELECTRIC UNIT HEATER																			
EUH-4	ELECTRIC UNIT HEATER																			
EUH-5	ELECTRIC UNIT HEATER																			
EUH-6	ELECTRIC UNIT HEATER																			
EUH-7	ELECTRIC UNIT HEATER																			
EUH-8	ELECTRIC UNIT HEATER																			
FC-1	FAN COIL																			
ACC-1	AIR COOLED COND.	ANIMAL SCIENCE BLDG.																		

MECHANICAL SCHEDULE GENERAL NOTES:

1. DUCT SMOKE DETECTORS SHALL BE PROVIDED ON RETURN DUCT FOR ALL MECHANICAL UNITS OVER 2000CFM. PROVIDE DUCT SMOKE ON RETURN AND SUPPLY DUCTWORK FOR ALL MECHANICAL UNITS OVER 15000 CFM. PROVIDE REMOTE TEST STATION WITH EACH DETECTOR. LOCATION OF TEST STATION SHALL BE ADJACENT TO THE FACP. DUCT SMOKES TO INITIATE ALARM.
2. PROVIDE FLEXIBLE CONNECTION TO EQUIPMENT REFER TO SPECIFICATIONS.
3. CONTROLLERS AND DISCONNECT DEVICES SHALL BE NRTL RATED FOR USE WITH A DESIGN E MOTOR WITH A HORSE POWER RATING NOT LESS THAN 1.4 TIMES THE MOTOR HORSE POWER. (REFER TO ELECTRICAL CODE ARTICLE 430).
4. TWO SPEED MOTORS SHALL HAVE TWO MOTOR BRANCH CIRCUITS AND SIX POLE DISCONNECTS.
5. WHERE INDICATED PROVIDE WEATHERPROOF DUPLEX RECEPTACLES AT MECHANICAL EQUIPMENT. PROVIDE 3/4"C. WITH 2#12+#12G AWG TO NEAREST PANEL AND CONNECT TO 20A/1P CIRCUIT BREAKER UNLESS OTHERWISE INDICATED.
6. TYPICALLY LOCATE STARTERS IN ELECTRIC ROOM (NEAR PANEL).
7. ALL EXTERIOR MOUNTED DISCONNECT SWITCHES, JUNCTION/PULL BOXES, RACEWAYS, FLEXIBLE CONNECTION TO EQUIPMENT, ETC. SHALL BE NEMA "3R."
8. THE E.C. SHALL PROVIDE NEMA 7 DISCONNECT SWITCHES AND SEAL FITTINGS AT EXPLOSION PROOF FANS.
9. WHERE INDICATED PROVIDE 120 VOLT CIRCUIT FOR RECEPTACLE AND LIGHT FIXTURE TYPE "J" AT ROOF TOP UNIT AS NOTED. TYPICALLY CONNECT TO NEAREST 120 VOLT RECEPTACLE CIRCUIT UNLESS OTHERWISE INDICATED.

MECHANICAL SCHEDULE KEY NOTES:

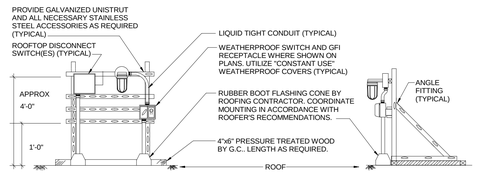
1. PROVIDE 3/4"CONDUIT W/PULL WIRE BETWEEN INDOOR UNIT & OUTDOOR UNIT FOR EACH SPLIT SYSTEM.
2. PROVIDE HARD CONNECTION FOR CONDENSATE PUMP (CP-1). CONNECT TO NEAREST 120V, 1Ø BRANCH CIRCUIT UNLESS OTHERWISE INDICATED. PROVIDE THERMAL SWITCH AT UNIT. FIELD COORDINATE EXACT LOCATION WITH HVAC. SEE DETAIL 1/E3.8
3. VFD FURNISHED INTEGRAL WITH UNIT BY HVAC EQUIPMENT SUPPLIER. SINGLE POINT CONNECTION BY E.C.
4. E.C. SHALL F&I UNI-STRUT, FOR MOUNTING OF DISCONNECT SWITCH, ATTACHED TO ROOF STRUCTURE INDEPENDENT OF HVAC ROOF-TOP EQUIPMENT TO PREVENT EXCESSIVE WEAR DUE TO VIBRATIONS. LOCATE ADJACENT TO ROOFTOP UNIT BEING SERVED. SEE DETAIL 4/E3.8
5. PROVIDE HARD CONNECTION FOR CONDENSATE PUMP (CP-1) FOR INDUCTION UNITS IU-1 THRU IU-32, 50 TOTAL. CONNECT TO NEAREST 120V, 1Ø CONVENIENCE RECEPTACLE CIRCUIT UNLESS OTHERWISE INDICATED. PROVIDE THERMAL SWITCH AT UNIT. FIELD COORDINATE EXACT LOCATION WITH HVAC. SEE DETAIL 1/E3.8
6. REFER TO MECHANICAL DRAWINGS FOR EXACT LOCATION OF CONDENSATE PUMPS CP-1.
7. CARBON MONOXIDE DETECTOR SHALL BE MOUNTED ON SUPPLY DUCT. PROVIDE REMOTE TEST STATION WITH EACH CO DETECTOR. FIELD CONFIRM LOCATION OF REMOTE TEST STATION. ACTIVATION OF CO DETECTOR TO REPORT SUPERVISORY ALARM OF SHUT DOWN RESPECTIVE ROOF TOP UNIT.
8. FINAL VAV BOX CONNECTION BY ATC CONTRACTOR. ALSO REFER TO MECHANICAL DRAWINGS FOR UNIT EXACT LOCATIONS AND QUANTITIES. COORDINATE WITH HVAC CONTRACTOR FOR EXACT LOCATION OF JUNCTION BOXES.
9. POWER CONNECTION FOR INDOOR UNIT IS DERIVED FROM THE OUTDOOR UNIT IN LIEU OF DEDICATED CIRCUIT.



1/E3.9 CONDENSATE PUMP (CP-1) WIRING DETAIL

SCALE: N.T.S.

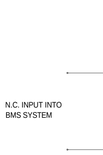
NOTE:
(1) WIRING MAY VARY BY MANUFACTURER. FIELD CONFIRM WITH APPROVED SHOP DRAWINGS PRIOR TO ROUGHING.



FRONT ELEVATION SIDE ELEVATION

2/E3.9 TYPICAL ROOFTOP DISCONNECT SWITCHE(ES) DETAIL

SCALE : N.T.S.



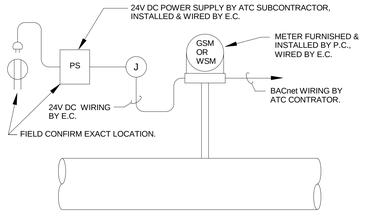
NOTES:
FS = FLOW SWITCH BY P.C.
SK = KEY SWITCH FOR TESTING. LABEL SWITCH "TEST" & "NORMAL" BY E.C.

KEY SWITCH FOR EMERGENCY SHOWER

3/E3.9 FLOW SWITCH OVER-RIDE

SCALE : N.T.S.

NOTE:
THE PURPOSE OF KEY SWITCH IS FOR OWNER TESTING.



4/E3.9 GAS/WATER SUB METER DETAIL

SCALE : N.T.S.

SCHEDULE OF PLUMBING EQUIPMENT

UNIT NO.	DESCRIPTION	LOCATION	LOAD CHARACTERISTICS	VOLT	PH	PANEL CIRCUIT	CIRCUIT BREAKER	FEEDER	EQUIPMENT AND CONNCECTIONS							REMARKS
									TS					S D	J	
WH-1	DOMESTIC HOT WATER	-							X				X		X	
WH-2	DOMESTIC HOT WATER	-							X				X		X	
WH-3	NON-POTABLE HOT WATER	-										X	X		X	
WH-3A	NON-POTABLE HOT WATER	-										X	X		X	
RP-1	RECIRCULATION PUMP	-							X				X		X	
RP-2	RECIRCULATION PUMP	-							X				X		X	(1) (2)
RP-3	RECIRCULATION PUMP	-							X				X		X	(1) (2)
RP-4	RECIRCULATION PUMP	-							X				X		X	(1) (2)
NT-1	NEUTRALIZATION TANK CONTROL PANEL	-							X				X		X	CONNECT HI/LO ALARM TO BMS SYSTEM (4) (2)
NT-2	NEUTRALIZATION TANK CONTROL PANEL	-							X				X		X	CONNECT HI/LO ALARM TO BMS SYSTEM (4)
EFS	EYE FLOW SWITCH (FS-1 THRU FS-6)	REFER TO FLOOR PLANS	-	-	-	-	-	3/4" TO ABOVE CEILING					X		X	CONNECT TO BMS SYSTEM, SEE DETAIL 3/E4.6 (4) (5)
GSM-1	GAS SUB-METER	-	-	120	1	MP1D-24	20A-1P	2#12+1#12G-3/4"C						X		REFER TO DETAIL 4/E3.05
GSM-2	GAS SUB-METER	-	-	120	1	MP1G-5	20A-1P	2#12+1#12G-3/4"C						X		REFER TO DETAIL 4/E3.05
WSM-1	WATER SUB-METER	-	-	120	1	MP1D-24	-	2#12+1#12G-3/4"C						X		REFER TO DETAIL 4/E3.05
MGV-1	MASTER GAS VALVE	-	-	120	1	-	-	-	X				X		X	REFER TO FLOOR PLAN FOR CONNECTION & CIRCUITRY
MGV-2	MASTER GAS VALVE	-	-	120	1	-	-	-	X				X		X	REFER TO FLOOR PLAN FOR CONNECTION & CIRCUITRY
MGV-3	MASTER GAS VALVE	-	-	120	1	-	-	-	X				X		X	REFER TO FLOOR PLAN FOR CONNECTION & CIRCUITRY
MGV-4	MASTER GAS VALVE	-	-	120	1	-	-	-	X				X		X	REFER TO FLOOR PLAN FOR CONNECTION & CIRCUITRY
MGV-5	MASTER GAS VALVE	-	-	120	1	-	-	-	X				X		X	REFER TO FLOOR PLAN FOR CONNECTION & CIRCUITRY
MGV-6	MASTER GAS VALVE	-	-	120	1	-	-	-	X				X		X	REFER TO FLOOR PLAN FOR CONNECTION & CIRCUITRY
MGV-7	MASTER GAS VALVE	-	-	120	1	-	-	-	X				X		X	REFER TO FLOOR PLAN FOR CONNECTION & CIRCUITRY
MGV-8	MASTER GAS VALVE	-	-	120	1	-	-	-	X				X		X	REFER TO FLOOR PLAN FOR CONNECTION & CIRCUITRY
MGV-9	MASTER GAS VALVE	-	-	120	1	-	-	-	X				X		X	REFER TO FLOOR PLAN FOR CONNECTION & CIRCUITRY
MGV-10	MASTER GAS VALVE	-	-	120	1	-	-	-	X				X		X	REFER TO FLOOR PLAN FOR CONNECTION & CIRCUITRY
EWC	ELECTRIC WATER COOLER (P4 & P4A)	REFER TO FLOOR PLANS	-	120	1		(3)						X		X	REFER TO FLOOR PLAN FOR CONNECTION & CIRCUITRY (5)
SV-1	GAS SOLENOID VALVE	KITCHEN	-	120	1	-	-	2#12+1#12G-3/4"C					X		X	MANUALLY RESET GAS SHUTOFF VALVE TO KITCHEN, REFER TO DETAIL 3/E3.7
AC-1	AIR COMPRESSOR	AUTO SHOP									X		X		X	

PLUMBING SCHEDULE KEY NOTES:

1. PUMPS WILL RUN VIA DDC SYSTEM.
2. AQUASTATS FURNISHED AND INSTALLED BY PC, 120V CONNECTION BY EC.
3. PROVIDE GFCI TYPE CIRCUIT BREAKER TO FEED EWC CIRCUITS.
4. CONNECT TO BMS SYSTEM WITH 3#14 - 3/4"C. FINAL CONNECTION TO BMS SYSTEM BY ATC CONTRACTOR.
5. REFER TO PLUMBING DRAWINGS FOR EXACT UNIT LOCATIONS AND TOTAL QUANTITIES.

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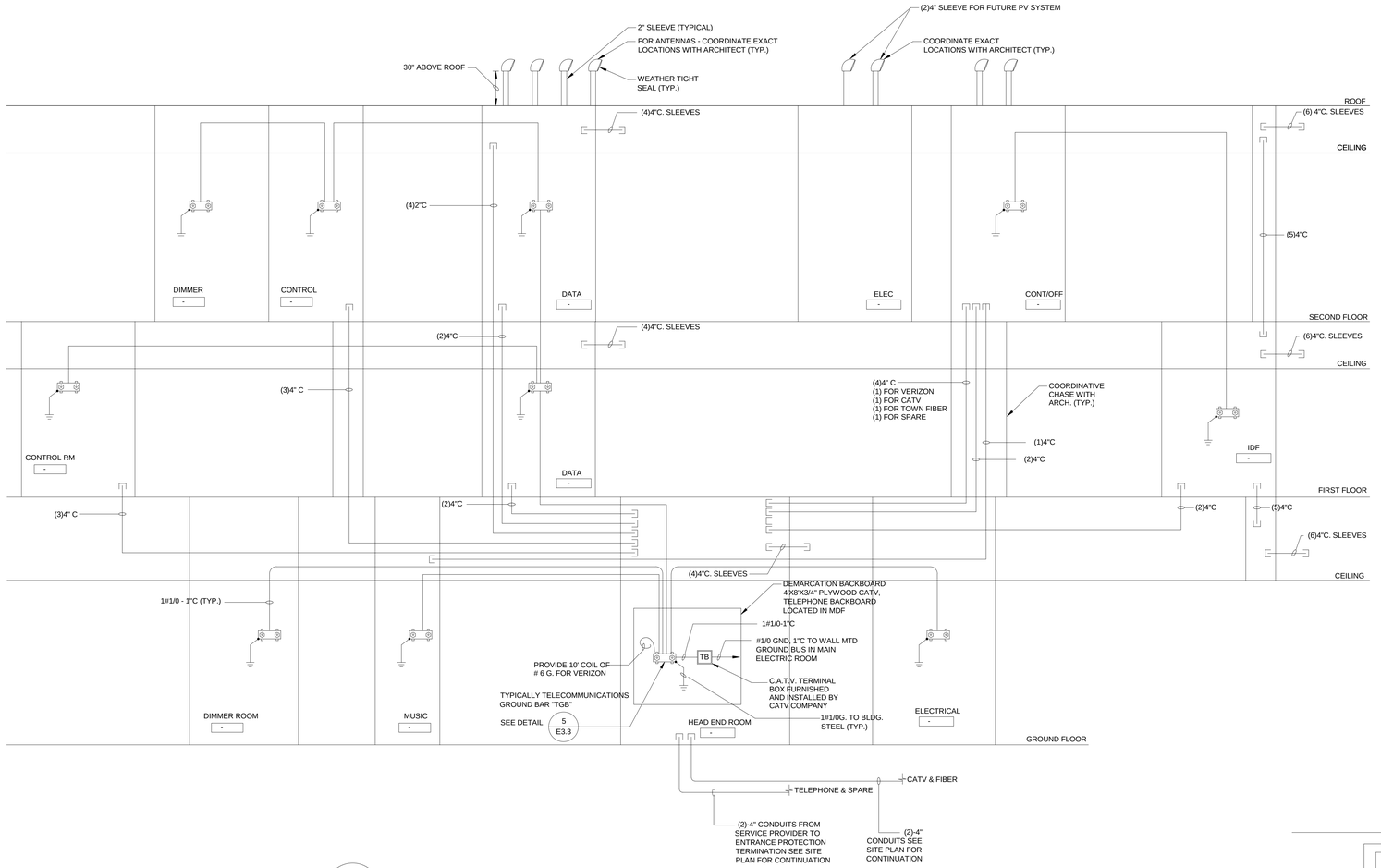
Dover HS / CTC
Dover, NH
MECHANICAL EQUIPMENT CONNECTIONS SCHEDULE
DRAWN BY: AJD CHECKED BY: DMP
SCALE:

DRAWING NUMBER
E3.9

JOB NUMBER 403114

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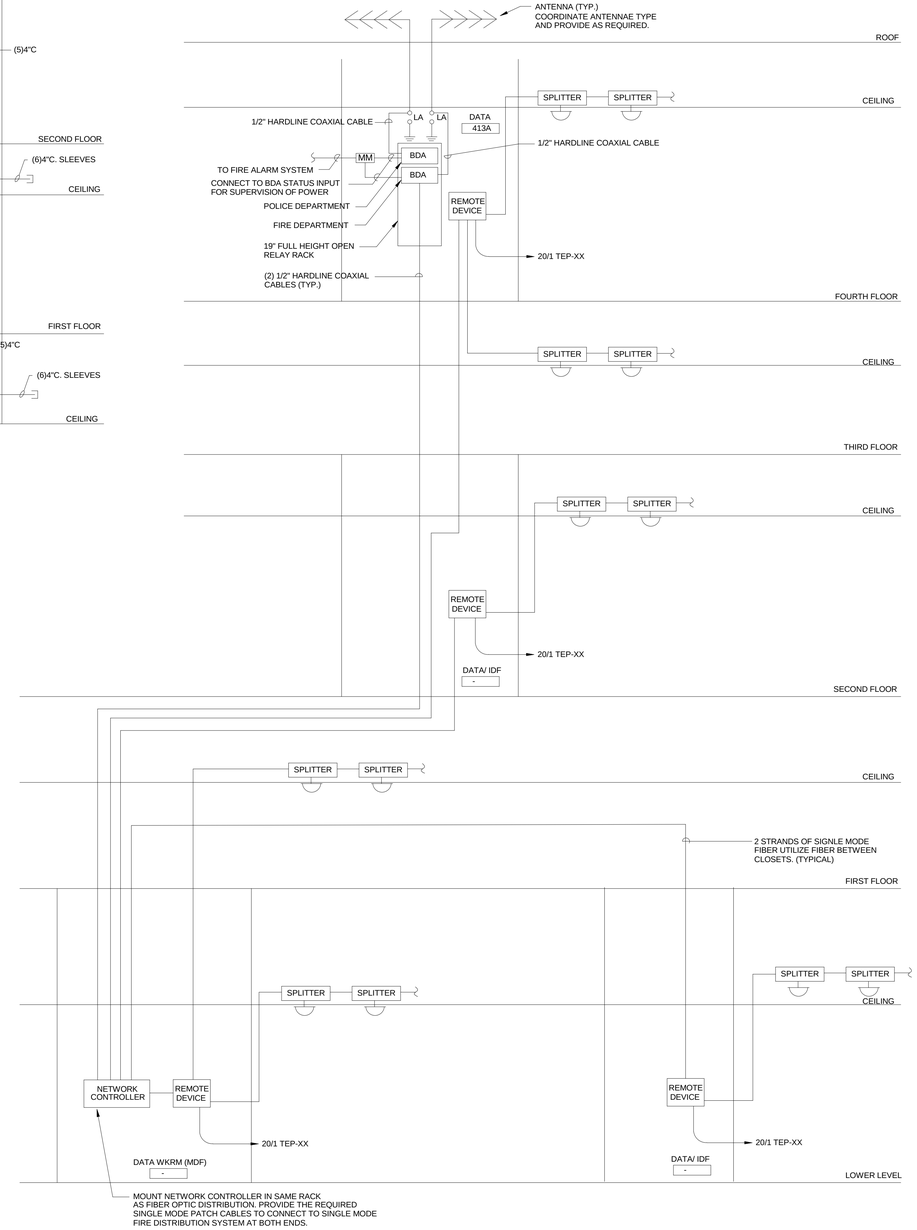


1 E3.10 TELECOMMUNICATIONS CONDUIT & GROUNDING RISER DIAGRAM

SCALE: NTS

NOTES:

1. COORDINATE ALL SLEEVE LOCATIONS WITH TELECOMMUNICATIONS CONTRACTOR PRIOR TO INSTALLATION.
2. COORDINATE ALL CONDUIT ROUTING WITH TELECOMMUNICATIONS CONTRACTOR. PROVIDE PULL BOXES WHERE CONDUIT BEND EXCEEDS A TOTAL OF 180 DEGREES OR DISTANCE EXCEEDS 150'. ALWAYS ALIGN CONDUITS ON OPPOSITE ENDS OF PULL BOX.
3. PULL BOX SIZES FOR 4" CONDUITS SHALL BE MINIMUM 15" WIDE X 60" LONG X 8" DEEP. INCREASE WIDTH OF PULL BOX 8" FOR EVERY ADDITIONAL 4" CONDUIT.
4. ALL CONDUIT BENDS SHALL BE MINIMUM 36" RADIUS.
5. DO NOT RUN CONDUITS PARALLEL WITH POWER CONDUITS. MAINTAIN MINIMUM OF 4' CLEARANCE.
6. E.C. SHALL BOND ALL CABLE TRAY TO "TGB" IN RESPECTIVE DATA ROOM WITH #6 GROUND. THE CABLE TRAY SHALL BE ELECTRICALLY CONTINUOUS THROUGH, ENTIRE RUN INCLUDING ALL FITTINGS.
7. PROVIDE #8 GROUND AND BUSHING AT ALL SLEEVES AND THROUGH ROOF CONDUITS FOR ANTENNAS.



2 E3.10 DISTRIBUTED ANTENNA SYSTEM (DAS)

SCALE: N.T.S.

DAS NOTES:

1. PROVIDE ALL BONDING HARDWARE REQUIRED FOR A COMPLETE GROUNDING SYSTEM TO ASSOCIATED PANELS, EQUIPMENT, SHELVES, RACKS, AND ANY OTHER METALLIC COMPONENTS TO ENSURE ELECTRICAL CONTINUITY BETWEEN METALIC COMPONENTS AND THE GROUNDED RACK OR CABINET.
2. MAXIMUM FOUR ANTENNAE PER REMOTE DEVICE. PROVIDE AND LOCATE DEVICES IN SUFFICIENT QUANTITY TO PROVIDE A MINIMUM SIGNAL COVERAGE OF 95% AT NEG. 85dBM WITHIN THE BUILDING.
3. PRIORITY AREAS OF COVERAGE INCLUDE THE GYMNASIUM, AUDITORIUM, COMMONS, CAFETERIA, CORRIDORS, MAIN ENTRANCE LOBBY AND STAIR WELLS.
4. ALL COMPONENTS THAT REQUIRE 120V SHALL BE FED FROM CONDITIONED/UPS POWER NEAREST "TEP" PANEL.
5. PUBLIC SAFTEY BI-DIRECTIONAL AMPLIFIERS, ANTENNAE "POLICE" AND "FIRE" SHALL BE PROVIDED. COORDINATE EXACT FREQUENCIES WITH THE GRAFTON PUBLIC SAFETY AUTHORITIES. AMPLIFIED DISTRIBUTION OF PUBLIC SAFETY FREQUENCIES SHALL BE OPERATIONAL AT SUBSTANTIAL COMPLETION OF THE PROJECT.
6. PROVIDE ADEQUATE RACK SPACE FOR FUTURE CELLULAR CARRIER BIDIRECTIONAL AMPLIFIERS, OWNER SHALL BE RESPONSIBLE FOR SELECTING AND NEGOTIATION WITH CELLULAR CARRIER.

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CONDUIT & BDA SYSTEM RISERS

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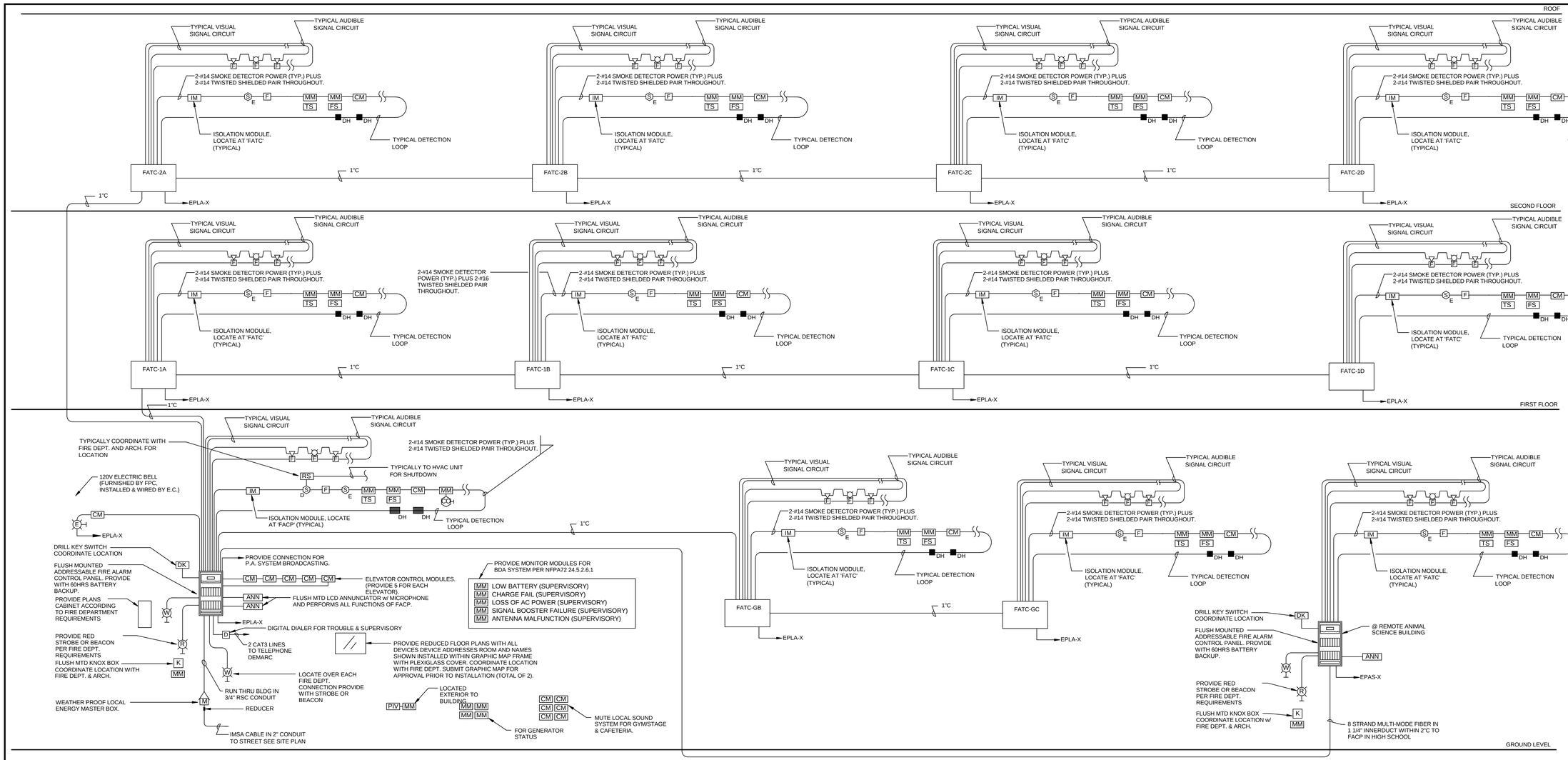
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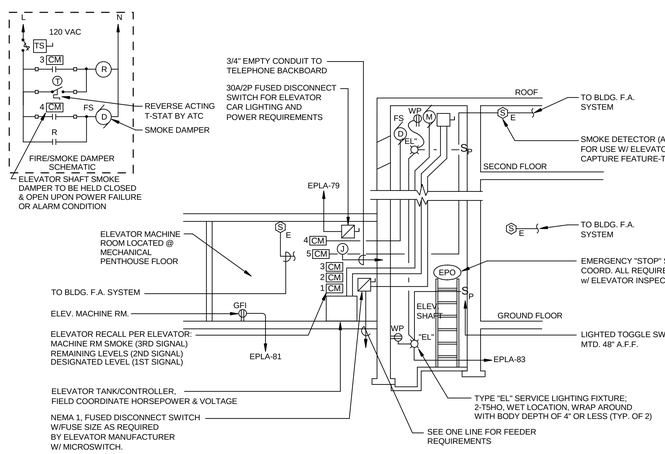
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SEQUENCE OF OPERATION

1. SMOKE DETECTORS LOCATED IN EACH ELEVATOR LOBBY, MACHINE ROOM AND A FIXED TEMPERATURE HEAT DETECTOR AT TOP OF HOISTWAY SHALL INITIATE ELEVATOR RECALL IN ADDITION TO SENDING SYSTEM INTO "AUTO" ALARM MODE FOR FIRE FIGHTERS SERVICE.
2. FIVE (5) CONTROL MODULES WILL BE LOCATED IN THE ELEVATOR MACHINE ROOM.
3. THE SMOKE DETECTOR LOCATED ON THE DESIGNATED LEVEL WILL ACTUATE THE FIRST CONTROL MODULE OF EACH ELEVATOR AND INITIATE THE ALTERNATE LEVEL RECALL.
4. THE SMOKE DETECTORS ON THE REMAINING ELEVATOR LEVELS WILL ACTUATE THE SECOND CONTROL MODULE FOR DESIGNATED LEVEL RECALL FOR EACH ELEVATOR.
5. THE THIRD CONTROL MODULE WILL BE ACTUATED BY A FIRE ALARM INITIATING DEVICE IN THE MACHINE ROOM, CONTROL SPACE, CONTROL ROOM AND/OR HOISTWAY AND WILL ILLUMINATE THE ASSOCIATED FIREFIGHTERS HAT.
6. WHERE THE ELEVATOR MACHINE ROOM IS LOCATED AT THE DESIGNATED LEVEL, THAT MACHINE ROOM SMOKE DETECTOR WILL ALSO ACTUATE THE FIRST CONTROL MODULE TO RECALL ELEVATOR TO THE ALTERNATE LEVEL.
7. THE FOURTH CONTROL MODULE WILL BE ACTUATED BY A FIRE ALARM INITIATING DEVICE IN THE MACHINE ROOM, CONTROL SPACE, CONTROL ROOM AND/OR HOISTWAY AND WILL ENERGIZE THE MACHINE ROOM EXHAUST FAN.
8. THE FIFTH CONTROL MODULE WILL BE ACTUATED BY A FIRE ALARM INITIATING DEVICE IN THE MACHINE ROOM, CONTROL SPACE, CONTROL ROOM AND/OR HOISTWAY AND WILL DE-ENERGIZE THE FIRE/SMOKE DAMPER CAUSING IT TO OPEN.
9. THE HEAT DETECTOR AT THE TOP OF THE HOISTWAY WILL ALSO ACTUATE THE THIRD CONTROL MODULE IF NEEDED BY ELEVATOR MANUFACTURER OR REQUIRED BY AUTHORITY HAVING JURISDICTION.

2 / E4.0 ELEVATOR SHAFT AND MACHINE ROOM (NO SPRINKLER) DETAIL

N.T.S.

1 / E4.0 FIRE ALARM RISER DIAGRAM

N.T.S.

NOTES

1. E.C. SHALL REFER TO SPECIFICATIONS AND DRAWINGS FOR QUANTITY OF DEVICES, SPARE CAPACITY, PARTS, ETC.
2. E.C. SHALL REFER TO HVAC DRAWINGS FOR EXACT LOCATION OF UNITS AND FOR LOCATIONS OF DUCT MOUNTED SMOKE DETECTORS. DUCT DETECTORS FURNISHED AND WIRED BY E.C.; INSTALLED BY HVAC.
3. TYPICALLY FIRE ALARM SYSTEM SIGNAL CONDUCTORS SHALL BE #14 AWG MINIMUM, TYPE THHN SOLID. ALL FIRE ALARM WIRING SHALL BE INSTALLED IN CONDUIT. MC CABLE IS ALLOWED WHERE CONCEALED AND ALLOWED BY CODE.
4. TYPICALLY ALL SPEAKER/STROBE UNITS SHALL BE WIRED SO THAT THE SPEAKER/STROBES CAN BE SILENCED SIMULTANEOUSLY.
5. ALL SPEAKER/STROBES WITHIN ALL CLASSROOMS . SHALL BE MULTI-TAPPED TYPE. E.C. SHALL OWN dB AJUSTING DURING FIRE DEPARTMENT TESTING.
6. ALL SPEAKER/STROBES SHALL BE MOUNTED IN ACCORDANCE WITH ADA ROOM SPACING ALLOCATION TABLES FOR VISUAL SIGNALING DEVICES.
7. PROVIDE CONTROL MODULES TO OVERRIDE MAGLOCKS FOR CARD ACCESS. REFER TO SECURITY FLOOR PLANS FOR EXACT LOCATION AND QUANTITIES.
8. ALL DEVICES SHALL BE LABELED WITH CLEAR TAPE WITH BLACK INK. LABEL SHALL IDENTIFY LOOP# AND DEVICE NUMBER.
9. ALL REMOTE TEST STATIONS SHALL BE KEYED AND MOUNTED ADJACENT TO FACP OR AS DIRECTED BY LOCAL FIRE DEPT. LABEL EACH UNIT.
10. PULL STATIONS SHALL BE DOUBLE ACTION. PROVIDE TAMPER RESISTANT PLASTIC COVERS ON ALL PULL STATIONS.
11. A/V DEVICES SHALL NOT BE INSTALLED WITHIN CHALK BOARDS. COORDINATE EXACT LOCATION OF ALL A/V DEVICES W/ARCH. PRIOR TO INSTALLING.
12. ALL TAMPER AND SUPERVISORY SWITCHES SHALL BE WIRED AS LOCAL SUPERVISORY ALARM CONDITION UPON ACTIVATION. TROUBLE OR SUPERVISORY SHALL BE SELF RESTORING. TRANSMIT SIGNAL TO FIRE DEPT. BUT DO NOT ALARM BUILDING.
13. PRIOR TO SUBMITTING SHOP DRAWINGS, COORDINATE WITH LOCAL FIRE DEPT. FOR EXACT REQUIREMENTS. OBTAIN FIRE PREVENTION RULES AND REGULATIONS WHEN AVAILABLE AND COMPLY IN FULL.
14. COORDINATE WITH SELECTED SYSTEM MANUFACTURER FOR WIRING REQUIREMENTS.
15. ALL DETECTION & SIGNAL WIRING SHALL BE CLASS "A".
16. SUBMIT AS PART OF SHOP DRAWINGS COMPLETE FLOOR PLANS & RISERS WITH ALL DEVICES SHOWN AND WITH DEVICE ADDRESSES.
17. PROVIDE ISOLATION MODULE FOR EVERY 25 DEVICES, TYPICAL.
18. DUCT TYPE SMOKE DETECTORS SHALL REPORT AS GENERAL ALARM, PER LOCAL FIRE DEPARTMENTS REQUIREMENTS.

LOOP NUMBER	ADDRESSABLE LOOP SCHEDULE
1	FIRST FLOOR
2	SECOND FLOOR
3	SPARE
4	SPACE

LOOP NUMBER	ADDRESSABLE LOOP SCEDULE
1	GROUND LEVEL
2	FIRST FLOOR
3	SECOND FLOOR
4	SPARE
5	SPARE
6	SPARE
7	**SPARE**
8	SPARE

ROOM SPACING FOR CEILING-MOUNTED VISIBLE APPLIANCES

MAXIMUM ROOM SIZE	MAXIMUM LENS HEIGHT	MINIMUM REQUIRED LIGHT OUTPUT (EFFECTIVE INTENSITY) ; ONE LIGHT (cd)
20' x 20'	10	15
30' x 30'	10	30
40' x 40'	10	60
44' x 44'	10	75
50' x 50'	10	95
53' x 53'	10	110
55' x 55'	10	115
59' x 59'	10	135
63' x 63'	10	150
68' x 68'	10	177
70' x 70'	10	185
20' x 20'	20	30
30' x 30'	20	45
40' x 40'	20	75
44' x 44'	20	80
50' x 50'	20	95
53' x 53'	20	110
55' x 55'	20	115
59' x 59'	20	135
63' x 63'	20	150
68' x 68'	20	177
70' x 70'	20	185
20' x 20'	30	55
30' x 30'	30	75
50' x 50'	30	95
53' x 53'	30	110
55' x 55'	30	115
59' x 59'	30	135
63' x 63'	30	150
68' x 68'	30	177
70' x 70'	30	185

ROOM SPACING FOR WALL-MOUNTED VISIBLE APPLIANCES

MAXIMUM ROOM SIZE	MINIMUM REQUIRED LIGHT OUTPUT EFFECTIVE INTENSITY (cd) ONE LIGHT PER ROOM (CEILING HEIGHT)	TWO LIGHTS PER ROOM (LOCATED ON OPPOSITE WALLS)	FOUR LIGHTS PER ROOM ONE LIGHT PER WALLS
20' x 20'	15	NA	NA
28' x 28'	30	UNKNOWN	NA
30' x 30'	34	15	NA
40' x 40'	60	30	15
45' x 45'	75	UNKNOWN	19
50' x 50'	94	60	30
54' x 54'	110	UNKNOWN	30
55' x 55'	115	UNKNOWN	28
60' x 60'	135	95	30
63' x 63'	150	UNKNOWN	37
68' x 68'	177	UNKNOWN	43
70' x 70'	184	95	60
80' x 80'	240	135	60
90' x 90'	304	185	95
100' x 100'	375	240	95
110' x 110'	455	240	135
120' x 120'	540	305	135
130' x 130'	635	375	185

F.A. RADIO BOX ZONE SCHEDULE

ZONE	
1	SPRINKLER ZONE 1
2	SPRINKLER ZONE 2
3	SPRINKLER ZONE 3
4	PULL STATIONS
5	SMOKES AND HEATS (AUTOMATIC DEVICES)
6	DUCT SMOKE DETECTORS
7	HOOD FIRE SUPPRESSION
8	SUPERVISORY & TROUBLE

NOTE: CONFIRM ALL ZONES WITH FIRE DEPARTMENT PROIR TO SHOP DRAWING SUBMITTAL.

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3-15-2016

Dover HS / CTC
Dover, NH
FIRE ALARM RISER

DRAWN BY: AD
CHECKED BY: DMP
SCALE:

REVISIONS NO.	DATE	REMARKS	BY

DRAWING NUMBER
E4.0
JOB NUMBER 403114

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GENERAL FIRE ALARM NOTES:

1. E.C. SHALL REFER TO SPECIFICATIONS AND DRAWINGS FOR QUANTITY OF DEVICES, SPARE CAPACITY, PARTS, ETC.
2. E.C. SHALL REFER TO HVAC DRAWINGS FOR EXACT LOCATION OF HVAC UNITS AND FOR LOCATIONS OF DUCT MOUNTED SMOKE DETECTORS. DUCT DETECTORS FURNISHED AND WIRED BY E.C., INSTALLED BY HVAC.
3. PROVIDE EACH FIRE ALARM TERMINAL CABINET AND FIRE ALARM CONTROL PANEL WITH AN ADA POWER SUPPLY TO SERVE ALL SPEAKER/STROBE UNITS ON RESPECTIVE FLOORS.
4. TYPICALLY FIRE ALARM SYSTEM POWER CONDUCTORS SHALL BE #14 AWG, TYPE THHN SOLID. ALL WIRING SHALL BE INSTALLED IN CONDUIT OR SURFACE METAL RACEWAY. MC CABLE IS ALLOWED WHERE CONCEALED.
5. TYPICALLY ALL SPEAKER/STROBE UNITS SHALL BE WIRED IN A FASHION THAT THE SPEAKER & STROBE IS SILENCED SIMULTANEOUSLY.
6. ALL ELECTRICAL ROOMS ARE (2) HOUR RATED. FIREPROOF PENETRATIONS AS REQUIRED.
7. TYPICALLY REFER TO DOOR HARDWARE, SCHEDULES & DRAWINGS FOR LOCATIONS & QUANTITIES OF HARDWARE EQUIPMENT AFFECTING THIS SECTION. PROVIDE ALL WORK AS REQUIRED.
8. COORDINATE FINAL LOCATIONS OF MAGNETIC DOOR HOLDERS AND OTHER HARDWARE DEVICES WITH HARDWARE SUPPLIER PRIOR TO ROUGHING.
9. TYPICALLY PROVIDE (1) MONITOR MODULE FOR EACH CARBON MONOXIDE DETECTOR. ALSO CONNECT CO DETECTORS TO SECURITY SYSTEM FOR REMOTE CENTRAL STATION REPORTING.
10. MECHANICAL EQUIPMENT, MOTORIZED FIRE/SMOKE DAMPER - FURNISHED & INSTALLED BY HVAC CONTRACTOR, WIRED BY E.C., FIRE ALARM INTERLOCK WIRING BY E. C. PROVIDE A CONTROL MODULE FOR EACH UNIT AND INTERLOCK EACH DAMPER SO THAT DAMPER IS POWERED OPEN AND IS SPRING CLOSED. LOCATE CONTROL MODULES ADJACENT TO DAMPERS. REFER TO HVAC DRAWINGS FOR DAMPER LOCATIONS. CONNECT TO THE NEAREST 120 VOLT BRANCH CIRCUIT.
11. ALL PULL STATIONS TO BE PROVIDED WITH TAMPERPROOF COVERS WITH LOCAL ALARM.
12. CONNECT CONTROL MODULE TO FIRE SHUTTER CONTROL PANEL TO RELEASE UPON ANY FIRE ALARM CONDITION OR AS DIRECTED BY FIRE DEPT. COORDINATE LOCATIONS OF FIRE SHUTTERS WITH ARCHITECT.
13. MECHANICAL EQUIPMENT, MOTORIZED FIRE/SMOKE DAMPER - FURNISHED AND INSTALLED BY HVAC CONTRACTOR 120V AND FIRE ALARM INTERLOCK WIRING BY E. C. PROVIDE A CONTROL MODULE, FOR EACH UNIT AND INTERLOCK EACH DAMPER SO THAT DAMPER IS POWERED OPEN AND IS SPRING CLOSED. LOCATE CONTROL MODULES ADJACENT TO DAMPERS. REFER TO HVAC DRAWINGS FOR DAMPER LOCATIONS.
14. SMOKE DETECTORS WITH (*) SHALL BE LOCATED WITHIN 5' OF HVAC DIFFUSER SERVING THE ROOM VIA DUCT-WORK WITH FIRE/SMOKE DAMPER INSTALLED WITHIN IT.
15. ALL PULL STATIONS IN GYMS, LOCKER ROOMS, MECH RMS, ETC. TO HAVE STOPPER II COVERS. (*)
16. E.C. SHALL FURNISH DUCT TYPE SMOKE DETECTOR FOR INSTALLATION BY HVAC. E.C. SHALL WIRE FOR ACTUATION OF ADJACENT SMOKE DAMPER PER INTERNATIONAL MECHANICAL CODE (IMC) 2009, 607.3.3.2.1.

CONTROL MODULE FOR ELECTRIC BELL

DRY SPRINKLER SYSTEM COMPRESSOR

2HR INTUMESCENT PAINT

FOUNDATION WALL SEE STRUCTURE. PROVIDE WATER PROOFING ON THIS SIDE

853 SEATS

-14'

typ.

1 E4.0A GROUND FLOOR PLAN PART A - FIRE ALARM
SCALE: 1/8" = 1'-0"

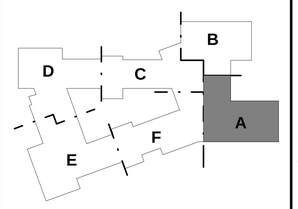
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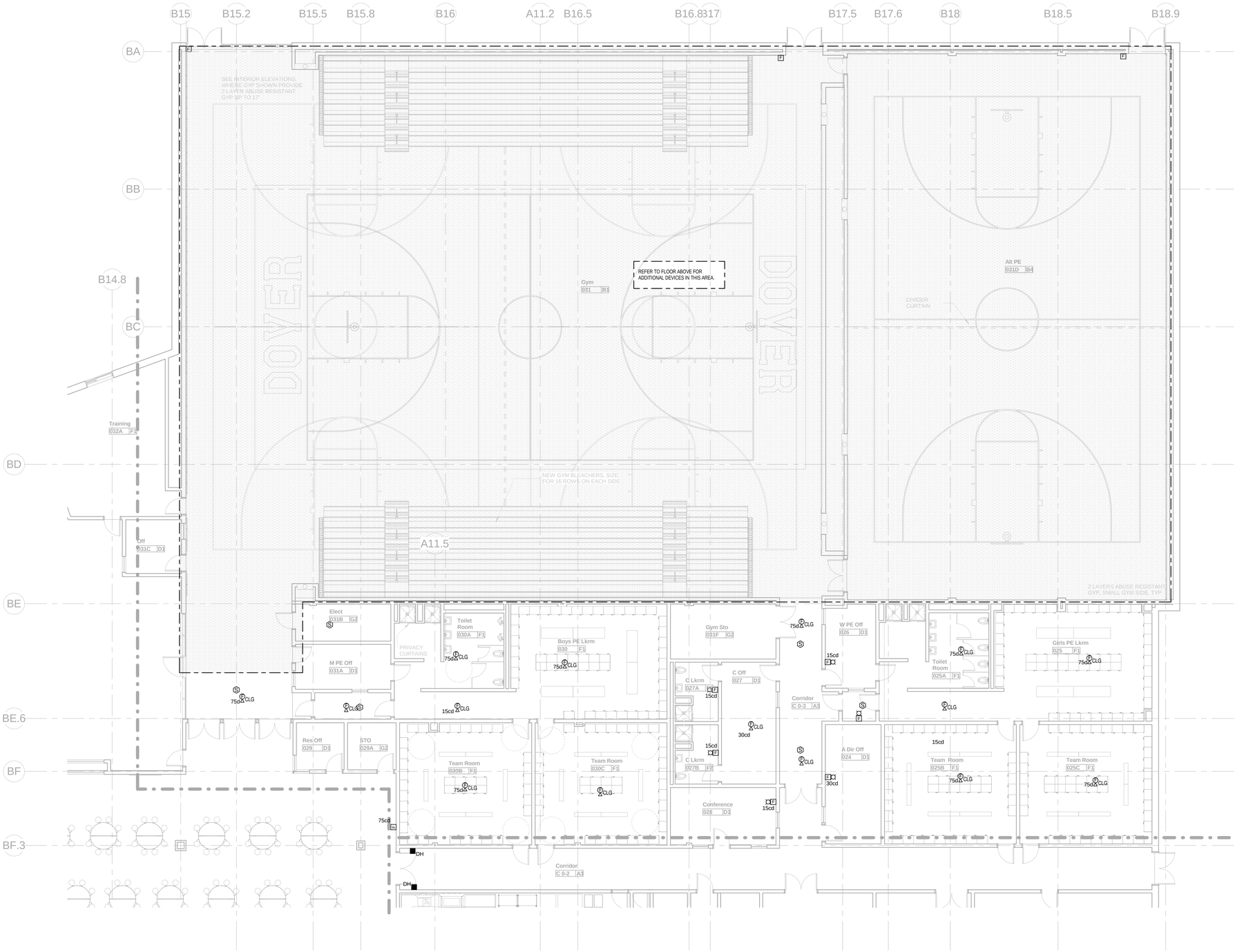


Dover HS / CTC
Dover, NH
GROUND FLOOR PLAN PART A - FIRE ALARM
SCALE: As indicated
DRAWN BY: MB
CHECKED BY: DMP

REVISIONS NO.	DATE	REMARKS	BY

DRAWING NUMBER
E4.0A
JOB NUMBER 403114

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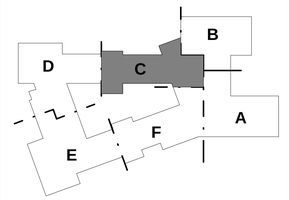


1 / E4.0B GROUND FLOOR PLAN PART B - FIRE ALARM
SCALE: 1/8" = 1'-0"

GENERAL FIRE ALARM NOTES:

1. E.C. SHALL REFER TO SPECIFICATIONS AND DRAWINGS FOR QUANTITY OF DEVICES, SPARE CAPACITY, PARTS, ETC.
2. E.C. SHALL REFER TO HVAC DRAWINGS FOR EXACT LOCATION OF HVAC UNITS AND FOR LOCATIONS OF DUCT MOUNTED SMOKE DETECTORS. DUCT DETECTORS FURNISHED AND WIRED BY E.C.; INSTALLED BY HVAC.
3. PROVIDE EACH FIRE ALARM TERMINAL CABINET AND FIRE ALARM CONTROL PANEL WITH AN ADA POWER SUPPLY TO SERVE ALL SPEAKER/STROBE UNITS ON RESPECTIVE FLOORS.
4. TYPICALLY FIRE ALARM SYSTEM POWER CONDUCTORS SHALL BE #14 AWG, TYPE THHN SOLID. ALL WIRING SHALL BE INSTALLED IN CONDUIT OR SURFACE METAL RACEWAY. MC CABLE IS ALLOWED WHERE CONCEALED.
5. TYPICALLY ALL SPEAKER/STROBE UNITS SHALL BE WIRED IN A FASHION THAT THE SPEAKER & STROBE IS SILENCED SIMULTANEOUSLY.
6. ALL ELECTRICAL ROOMS ARE (2) HOUR RATED. FIREPROOF PENETRATIONS AS REQUIRED.
7. TYPICALLY REFER TO DOOR HARDWARE, SCHEDULES & DRAWINGS FOR LOCATIONS & QUANTITIES OF HARDWARE EQUIPMENT AFFECTING THIS SECTION. PROVIDE ALL WORK AS REQUIRED.
8. COORDINATE FINAL LOCATIONS OF MAGNETIC DOOR HOLDERS AND OTHER HARDWARE DEVICES WITH HARDWARE SUPPLIER PRIOR TO ROUGHING.
9. TYPICALLY PROVIDE (1) MONITOR MODULE FOR EACH CARBON MONOXIDE DETECTOR. ALSO CONNECT CO DETECTORS TO SECURITY SYSTEM FOR REMOTE CENTRAL STATION REPORTING.
10. MECHANICAL EQUIPMENT, MOTORIZED FIRE/SMOKE DAMPER - FURNISHED & INSTALLED BY HVAC CONTRACTOR, WIRED BY E.C.. FIRE ALARM INTERLOCK WIRING BY E. C. PROVIDE A CONTROL MODULE FOR EACH UNIT AND INTERLOCK EACH DAMPER SO THAT DAMPER IS POWERED OPEN AND IS SPRING CLOSED. LOCATE CONTROL MODULES ADJACENT TO DAMPERS. REFER TO HVAC DRAWINGS FOR DAMPER LOCATIONS. CONNECT TO THE NEAREST 120 VOLT BRANCH CIRCUIT.
11. ALL PULL STATIONS TO BE PROVIDED WITH TAMPERPROOF COVERS WITH LOCAL ALARM.
12. CONNECT CONTROL MODULE TO FIRE SHUTTER CONTROL PANEL TO RELEASE UPON ANY FIRE ALARM CONDITION OR AS DIRECTED BY FIRE DEPT. COORDINATE LOCATIONS OF FIRE SHUTTERS WITH ARCHITECT.
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15. ALL PULL STATIONS IN GYMS, LOCKER ROOMS, MECH RMS, ETC. TO HAVE STOPPER II COVERS. (*)
16. E.C. SHALL FURNISH DUCT TYPE SMOKE DETECTOR FOR INSTALLATION BY HVAC. E.C. SHALL WIRE FOR ACTUATION OF ADJACENT SMOKE DAMPER PER INTERNATIONAL MECHANICAL CODE (IMC) 2009, 607.3.3.2.1.

KEYPLAN



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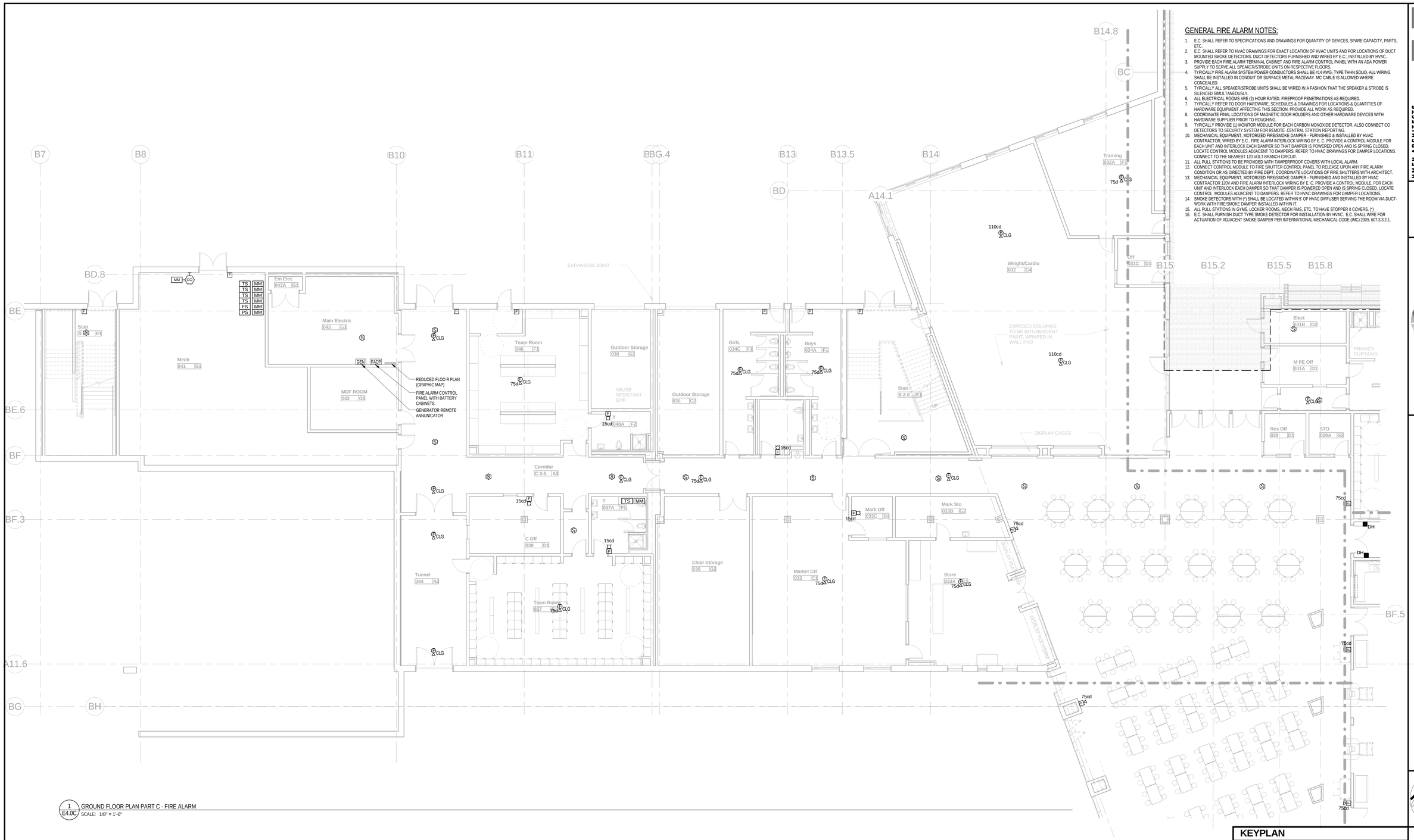
DRAWING NUMBER
E4.0B

JOB NUMBER 403114

Dover HS / CTC
Dover, NH
GROUND FLOOR PLAN PART B - FIRE ALARM
SCALE: As indicated
DRAWN BY: MB
CHECKED BY: DMP

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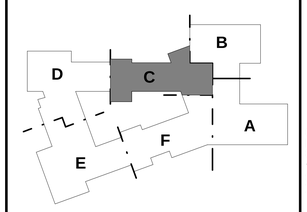


1 E4.0C GROUND FLOOR PLAN PART C - FIRE ALARM
SCALE: 1/8" = 1'-0"

GENERAL FIRE ALARM NOTES:

1. E.C. SHALL REFER TO SPECIFICATIONS AND DRAWINGS FOR QUANTITY OF DEVICES, SPARE CAPACITY, PARTS, ETC.
2. E.C. SHALL REFER TO HVAC DRAWINGS FOR EXACT LOCATION OF HVAC UNITS AND FOR LOCATIONS OF DUCT MOUNTED SMOKE DETECTORS. DUCT DETECTORS FURNISHED AND WIRED BY E.C., INSTALLED BY HVAC.
3. PROVIDE EACH FIRE ALARM TERMINAL CABINET AND FIRE ALARM CONTROL PANEL WITH AN ADA POWER SUPPLY TO SERVE ALL SPEAKER/STROBE UNITS ON RESPECTIVE FLOORS.
4. TYPICALLY FIRE ALARM SYSTEM POWER CONDUCTORS SHALL BE #14 AWG, TYPE THHN SOLID. ALL WIRING SHALL BE INSTALLED IN CONDUIT OR SURFACE METAL RACEWAY. MC CABLE IS ALLOWED WHERE CONCEALED.
5. TYPICALLY ALL SPEAKER/STROBE UNITS SHALL BE WIRED IN A FASHION THAT THE SPEAKER & STROBE IS SILENCED SIMULTANEOUSLY.
6. ALL ELECTRICAL ROOMS ARE (2) HOUR RATED. FIREPROOF PENETRATIONS AS REQUIRED.
7. TYPICALLY REFER TO DOOR HARDWARE, SCHEDULES & DRAWINGS FOR LOCATIONS & QUANTITIES OF HARDWARE EQUIPMENT AFFECTING THIS SECTION. PROVIDE ALL WORK AS REQUIRED.
8. COORDINATE FINAL LOCATIONS OF MAGNETIC DOOR HOLDERS AND OTHER HARDWARE DEVICES WITH HARDWARE SUPPLIER PRIOR TO ROUGHING.
9. TYPICALLY PROVIDE (1) MONITOR MODULE FOR EACH CARBON MONOXIDE DETECTOR. ALSO CONNECT CO DETECTORS TO SECURITY SYSTEM FOR REMOTE CENTRAL STATION REPORTING.
10. MECHANICAL EQUIPMENT, MOTORIZED FIRE/SMOKE DAMPER - FURNISHED & INSTALLED BY HVAC CONTRACTOR, WIRED BY E.C.. FIRE ALARM INTERLOCK WIRING BY E. C. PROVIDE A CONTROL MODULE FOR EACH UNIT AND INTERLOCK EACH DAMPER SO THAT DAMPER IS POWERED OPEN AND IS SPRING CLOSED. LOCATE CONTROL MODULES ADJACENT TO DAMPERS. REFER TO HVAC DRAWINGS FOR DAMPER LOCATIONS. CONNECT TO THE NEAREST 120 VOLT BRANCH CIRCUIT.
11. ALL PULL STATIONS TO BE PROVIDED WITH TAMPERPROOF COVERS WITH LOCAL ALARM.
12. CONNECT CONTROL MODULE TO FIRE SHUTTER CONTROL PANEL TO RELEASE UPON ANY FIRE ALARM CONDITION OR AS DIRECTED BY FIRE DEPT. COORDINATE LOCATIONS OF FIRE SHUTTERS WITH ARCHITECT.
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15. ALL PULL STATIONS IN GYMS, LOCKER ROOMS, MECH RMS, ETC. TO HAVE STOPPER II COVERS. (*)
16. E.C. SHALL FURNISH DUCT TYPE SMOKE DETECTOR FOR INSTALLATION BY HVAC. E.C. SHALL WIRE FOR ACTUATION OF ADJACENT SMOKE DAMPER PER INTERNATIONAL MECHANICAL CODE (IMC) 2009, 607.3.3.2.1.

KEYPLAN



REVISIONS NO.	DATE	REMARKS	BY

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3-15-2016

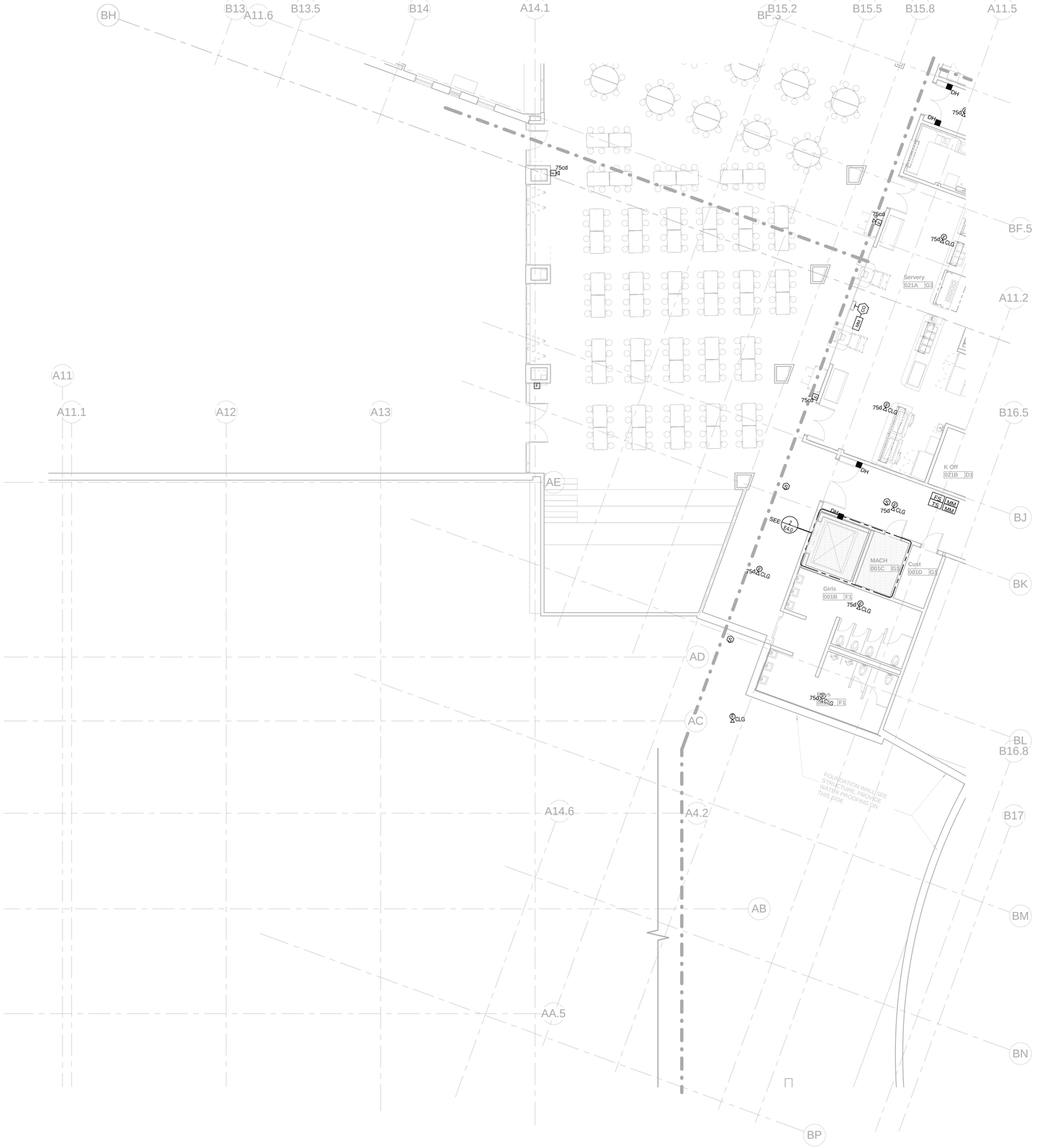
Dover HS / CTC
Dover, NH
GROUND FLOOR PLAN PART C - FIRE ALARM
SCALE: AS INDICATED DRAWN BY: MB CHECKED BY: DMP

DRAWING NUMBER
E4.0C

JOB NUMBER 403114

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GENERAL FIRE ALARM NOTES:

1. E.C. SHALL REFER TO SPECIFICATIONS AND DRAWINGS FOR QUANTITY OF DEVICES, SPARE CAPACITY, PARTS, ETC.
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6. ALL ELECTRICAL ROOMS ARE (2) HOUR RATED. FIREPROOF PENETRATIONS AS REQUIRED.
7. TYPICALLY REFER TO DOOR HARDWARE. SCHEDULES & DRAWINGS FOR LOCATIONS & QUANTITIES OF HARDWARE EQUIPMENT AFFECTING THIS SECTION. PROVIDE ALL WORK AS REQUIRED.
8. COORDINATE FINAL LOCATIONS OF MAGNETIC DOOR HOLDERS AND OTHER HARDWARE DEVICES WITH HARDWARE SUPPLIER PRIOR TO ROUGHING.
9. TYPICALLY PROVIDE (1) MONITOR MODULE FOR EACH CARBON MONOXIDE DETECTOR. ALSO CONNECT CO DETECTORS TO SECURITY SYSTEM FOR REMOTE CENTRAL STATION REPORTING.
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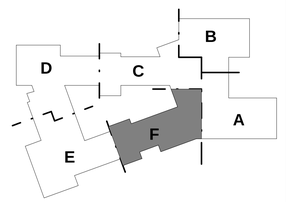
1 / E4.0F GROUND FLOOR PLAN - POWER
SCALE: 1/8" = 1'-0"

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100% Design Development
3-15-2016

KEYPLAN



Dover HS / CTC
Dover, NH
GROUND FLOOR PLAN PART F - FIRE ALARM
SCALE: As indicated
DRAWN BY: MB
CHECKED BY: DMP

REVISIONS NO.	DATE	REMARKS	BY

DRAWING NUMBER
E4.0F

JOB NUMBER 403114

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GENERAL FIRE ALARM NOTES:

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1 E4.1A FIRST FLOOR PLAN PART A - FIRE ALARM
SCALE: 1/8" = 1'-0"

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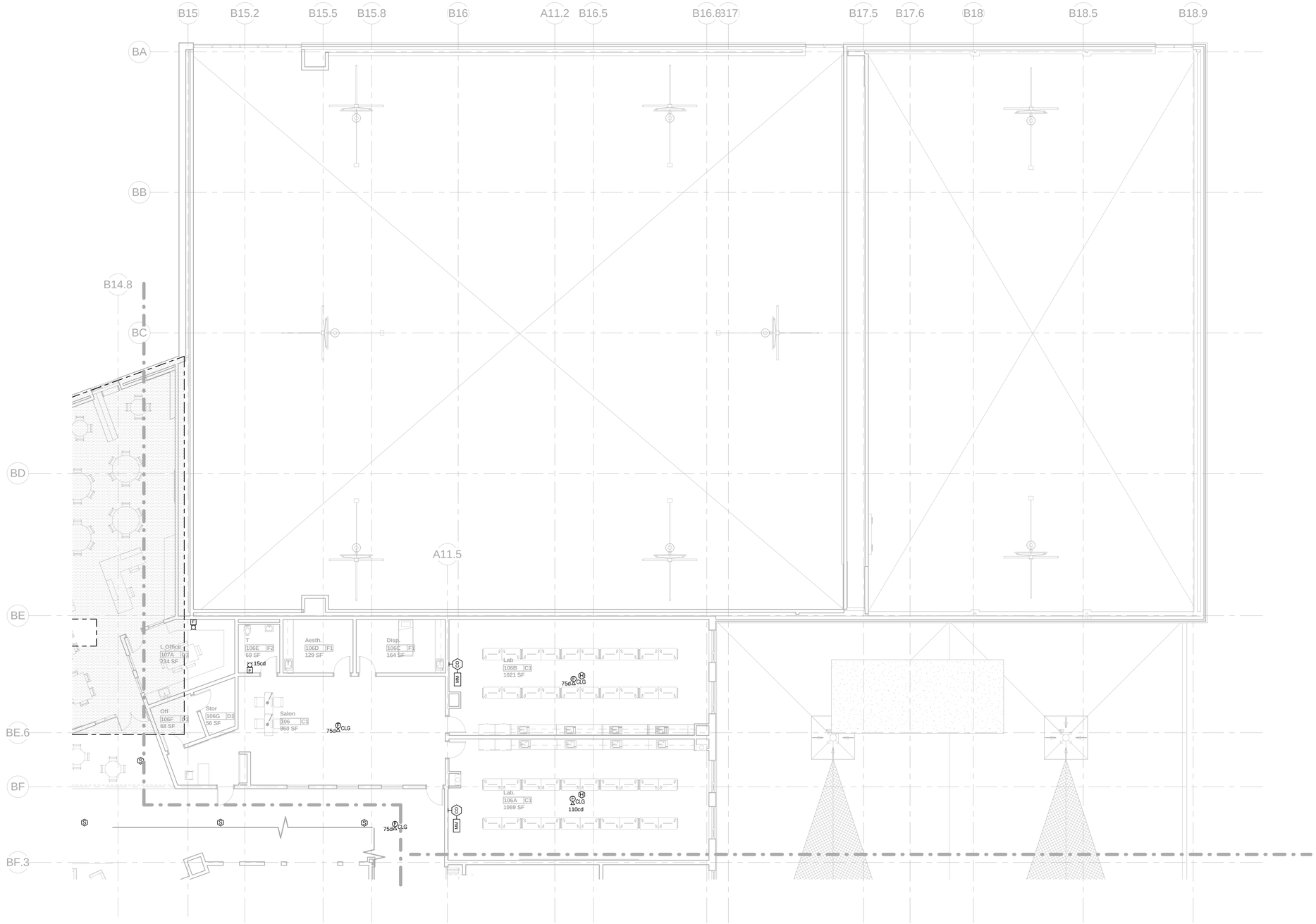
KEYPLAN

Dover HS / CTC
Dover, NH
FIRST FLOOR PLAN PART A - FIRE ALARM
SCALE: As indicated DRAWN BY: MB CHECKED BY: DMP

REVISIONS NO.	DATE	REMARKS	BY

DRAWING NUMBER
E4.1A
JOB NUMBER 403114

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1 / E4.1B FIRST FLOOR PLAN PART B - FIRE ALARM
SCALE: 1/8" = 1'-0"

GENERAL FIRE ALARM NOTES:

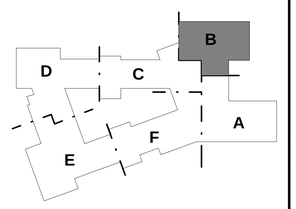
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3-15-2016

KEYPLAN



Dover HS / CTC
Dover, NH
FIRST FLOOR PLAN PART B - FIRE ALARM
SCALE: As indicated
DRAWN BY: MB
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REVISIONS NO.	DATE	REMARKS	BY

DRAWING NUMBER
E4.1B

JOB NUMBER 403114

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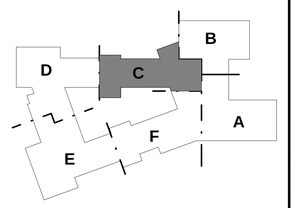
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1 E4.1C FIRST FLOOR PLAN PART C - FIRE ALARM
SCALE: 1/8" = 1'-0"

KEYPLAN



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3-15-2016

Dover HS / CTC
Dover, NH
FIRST FLOOR PLAN PART C - FIRE ALARM
SCALE: As Indicated DRAWN BY: MB CHECKED BY: DMP

REVISIONS NO.	DATE	REMARKS	BY

DRAWING NUMBER
E4.1C

JOB NUMBER 403114

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1 E4.1D FIRST FLOOR PLAN PART D - FIRE ALARM
SCALE: 1/8" = 1'-0"

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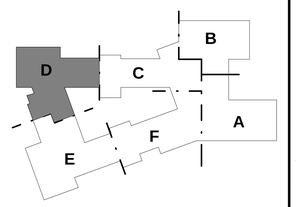
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PLAN NORTH
TRUE NORTH

KEYPLAN



Dover HS / CTC
Dover, NH
FIRST FLOOR PLAN PART D - FIRE ALARM
SCALE: As indicated
DRAWN BY: MB
CHECKED BY: DMP

REVISIONS NO.	DATE	REMARKS	BY

DRAWING NUMBER
E4.1D
JOB NUMBER 403114

GENERAL FIRE ALARM NOTES:

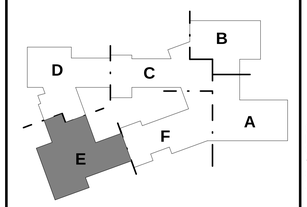
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REDUCED FLOOR PLAN (GRAPHIC MAP)

FIRE ALARM REMOTE ANNUNCIATOR

1 E4.1E FIRST FLOOR PLAN PART E - FIRE ALARM
SCALE: 1/8" = 1'-0"

KEYPLAN



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Dover, NH
FIRST FLOOR PLAN PART E - FIRE ALARM
SCALE: As Indicated
DRAWN BY: MB
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REVISIONS NO.	DATE	REMARKS	BY

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E4.1E

JOB NUMBER 403114

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GENERAL FIRE ALARM NOTES:

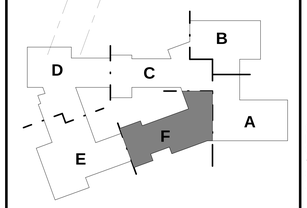
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15. ALL PULL STATIONS IN GYMS, LOCKER ROOMS, MECH RMS, ETC. TO HAVE STOPPER II COVERS. (*)
16. E.C. SHALL FURNISH DUCT TYPE SMOKE DETECTOR FOR INSTALLATION BY HVAC. E.C. SHALL WIRE FOR ACTUATION OF ADJACENT SMOKE DAMPER PER INTERNATIONAL MECHANICAL CODE (IMC) 2009, 607.3.3.2.1.

REDUCED FLOOR PLAN (GRAPHIC MAP)

FIRE ALARM REMOTE ANNUNCIATOR

1 E4.1F FIRST FLOOR PLAN PART F - FIRE ALARM
SCALE: 1/8" = 1'-0"

KEYPLAN



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FIRST FLOOR PLAN PART F - FIRE ALARM
SCALE: As Indicated DRAWN BY: MB CHECKED BY: DMP

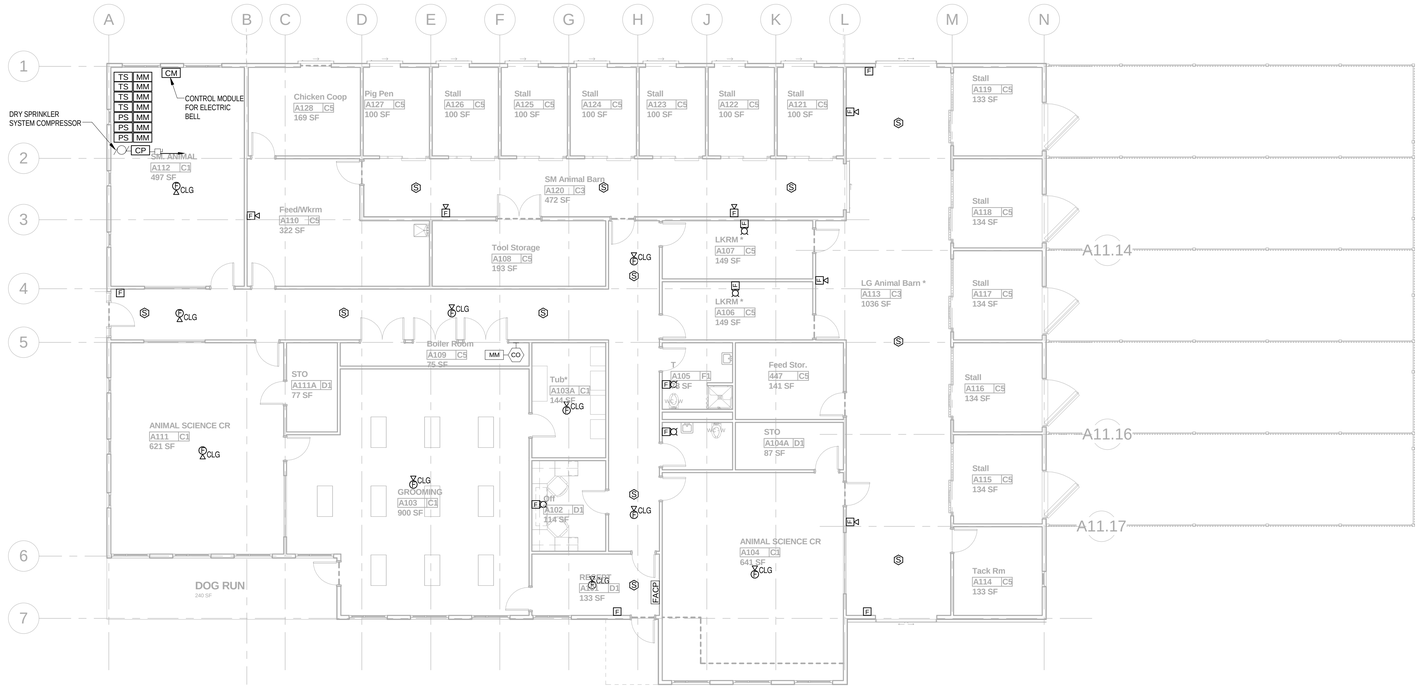
REVISIONS NO.	DATE	REMARKS	BY

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E4.1F

JOB NUMBER 403114

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1 E4.1G FIRST FLOOR PLAN ANIMAL SCIENCE - FIRE ALARM
SCALE: 1/8" = 1'-0"

GENERAL FIRE ALARM NOTES:

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3. PROVIDE EACH FIRE ALARM TERMINAL CABINET AND FIRE ALARM CONTROL PANEL WITH AN ADA POWER SUPPLY TO SERVE ALL SPEAKER/STROBE UNITS ON RESPECTIVE FLOORS.
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6. ALL ELECTRICAL ROOMS ARE (2) HOUR RATED. FIREPROOF PENETRATIONS AS REQUIRED.
7. TYPICALLY REFER TO DOOR HARDWARE, SCHEDULES & DRAWINGS FOR LOCATIONS & QUANTITIES OF HARDWARE EQUIPMENT AFFECTING THIS SECTION. PROVIDE ALL WORK AS REQUIRED.
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9. TYPICALLY PROVIDE (1) MONITOR MODULE FOR EACH CARBON MONOXIDE DETECTOR. ALSO CONNECT CO DETECTORS TO SECURITY SYSTEM FOR REMOTE CENTRAL STATION REPORTING.
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PLAN NORTH
GRID NORTH

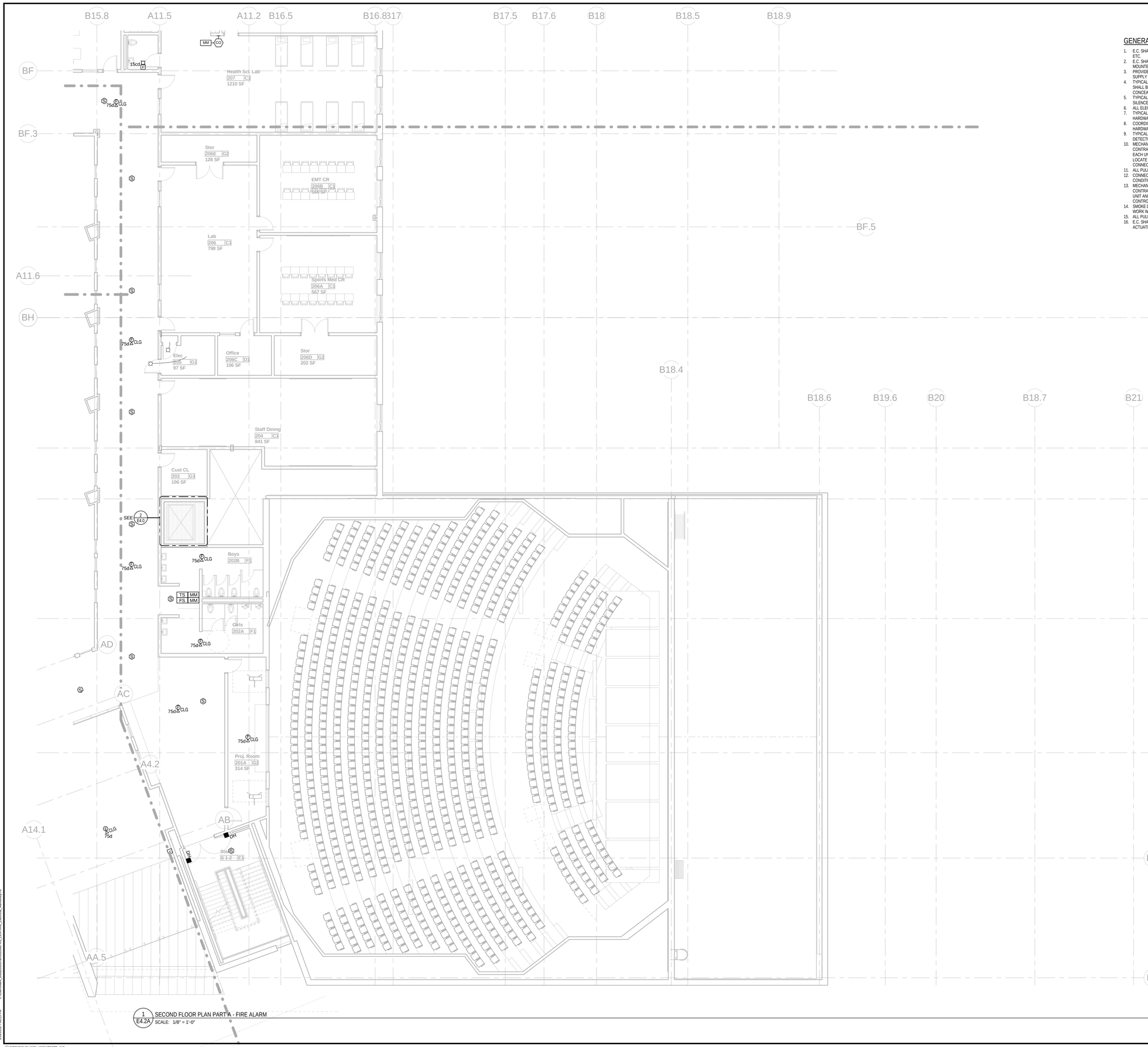
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Dover, NH
ANIMAL SCIENCE FLOOR PLAN - FIRE ALARM
SCALE: As indicated DRAWN BY: MB CHECKED BY: DMP

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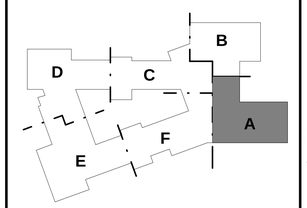


1 E4.2A SECOND FLOOR PLAN PART A - FIRE ALARM
SCALE: 1/8" = 1'-0"

GENERAL FIRE ALARM NOTES:

1. E.C. SHALL REFER TO SPECIFICATIONS AND DRAWINGS FOR QUANTITY OF DEVICES, SPARE CAPACITY, PARTS, ETC.
2. E.C. SHALL REFER TO HVAC DRAWINGS FOR EXACT LOCATION OF HVAC UNITS AND FOR LOCATIONS OF DUCT MOUNTED SMOKE DETECTORS. DUCT DETECTORS FURNISHED AND WIRED BY E.C., INSTALLED BY HVAC.
3. PROVIDE EACH FIRE ALARM TERMINAL CABINET AND FIRE ALARM CONTROL PANEL WITH AN ADA POWER SUPPLY TO SERVE ALL SPEAKER/STROBE UNITS ON RESPECTIVE FLOORS.
4. TYPICALLY FIRE ALARM SYSTEM POWER CONDUCTORS SHALL BE #14 AWG, TYPE THHN SOLID. ALL WIRING SHALL BE INSTALLED IN CONDUIT OR SURFACE METAL RACEWAY. MC CABLE IS ALLOWED WHERE CONCEALED.
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6. ALL ELECTRICAL ROOMS ARE (2) HOUR RATED. FIREPROOF PENETRATIONS AS REQUIRED.
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KEYPLAN



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Dover, NH

SECOND FLOOR PLAN PART A - FIRE ALARM

SCALE: As Indicated | DRAWN BY: MB | CHECKED BY: DMP

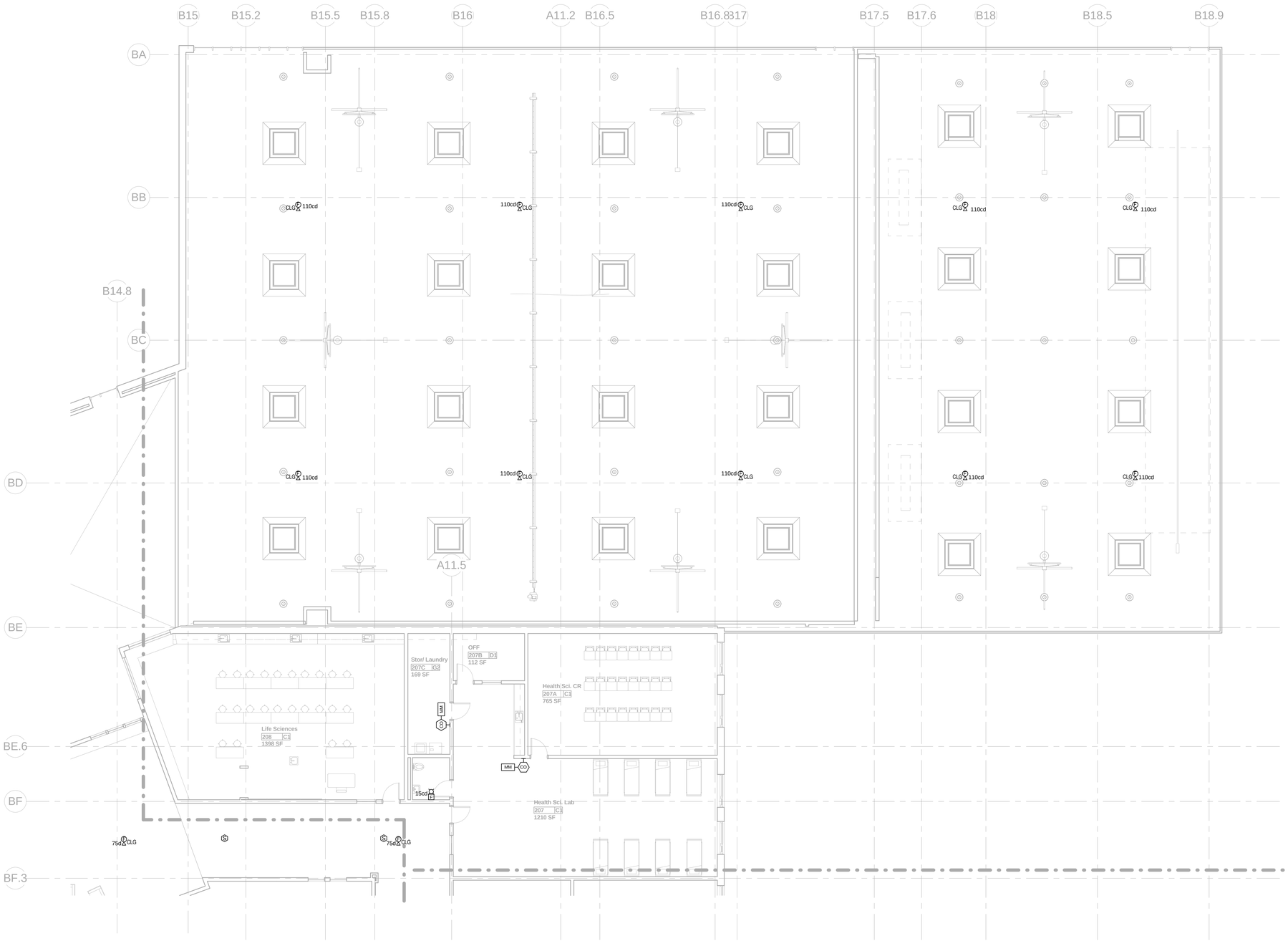
REVISIONS NO.	DATE	REMARKS	BY

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JOB NUMBER 403114

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1 E4.2B SECOND FLOOR PLAN PART B - FIRE ALARM
SCALE: 1/8" = 1'-0"

GENERAL FIRE ALARM NOTES:

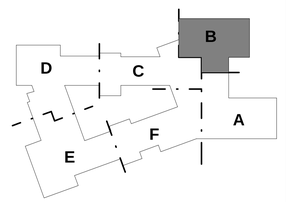
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Dover, NH
SECOND FLOOR PLAN PART B - FIRE ALARM
SCALE: As indicated
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JOB NUMBER 403114

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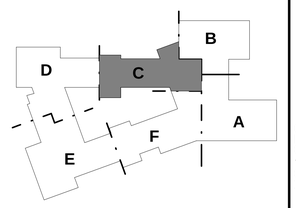
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1 / E4.2C SECOND FLOOR PLAN PART C - FIRE ALARM
SCALE: 1/8" = 1'-0"

KEYPLAN



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Dover, NH
SECOND FLOOR PLAN PART C - FIRE ALARM
SCALE: AS INDICATED
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1 E4.2D SECOND FLOOR PLAN PART D - FIRE ALARM
SCALE: 1/8" = 1'-0"

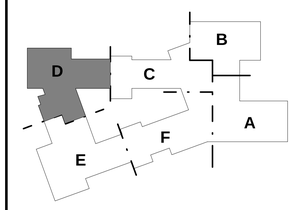
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PLAN NORTH
TRUE NORTH

KEYPLAN



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SECOND FLOOR PLAN PART D - FIRE ALARM
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1. E.C. SHALL REFER TO SPECIFICATIONS AND DRAWINGS FOR QUANTITY OF DEVICES, SPARE CAPACITY, PARTS, ETC.
2. E.C. SHALL REFER TO HVAC DRAWINGS FOR EXACT LOCATION OF HVAC UNITS AND FOR LOCATIONS OF DUCT MOUNTED SMOKE DETECTORS. DUCT DETECTORS FURNISHED AND WIRED BY E.C.; INSTALLED BY HVAC.
3. PROVIDE EACH FIRE ALARM TERMINAL CABINET AND FIRE ALARM CONTROL PANEL WITH AN ADA POWER SUPPLY TO SERVE ALL SPEAKER/STROBE UNITS ON RESPECTIVE FLOORS.
4. TYPICALLY FIRE ALARM SYSTEM POWER CONDUCTORS SHALL BE #14 AWG, TYPE THHN SOLID. ALL WIRING SHALL BE INSTALLED IN CONDUIT OR SURFACE METAL RACEWAY. MC CABLE IS ALLOWED WHERE CONCEALED.
5. TYPICALLY ALL SPEAKER/STROBE UNITS SHALL BE WIRED IN A FASHION THAT THE SPEAKER & STROBE IS SILENCED SIMULTANEOUSLY.
6. ALL ELECTRICAL ROOMS ARE (2) HOUR RATED. FIREPROOF PENETRATIONS AS REQUIRED.
7. TYPICALLY REFER TO DOOR HARDWARE, SCHEDULES & DRAWINGS FOR LOCATIONS & QUANTITIES OF HARDWARE EQUIPMENT AFFECTING THIS SECTION. PROVIDE ALL WORK AS REQUIRED.
8. COORDINATE FINAL LOCATIONS OF MAGNETIC DOOR HOLDERS AND OTHER HARDWARE DEVICES WITH HARDWARE SUPPLIER PRIOR TO ROUGHING.
9. TYPICALLY PROVIDE (1) MONITOR MODULE FOR EACH CARBON MONOXIDE DETECTOR. ALSO CONNECT CO DETECTORS TO SECURITY SYSTEM FOR REMOTE CENTRAL STATION REPORTING.
10. MECHANICAL EQUIPMENT, MOTORIZED FIRE/SMOKE DAMPER - FURNISHED & INSTALLED BY HVAC CONTRACTOR, WIRED BY E.C.. FIRE ALARM INTERLOCK WIRING BY E. C. PROVIDE A CONTROL MODULE FOR EACH UNIT AND INTERLOCK EACH DAMPER SO THAT DAMPER IS POWERED OPEN AND IS SPRING CLOSED. LOCATE CONTROL MODULES ADJACENT TO DAMPERS. REFER TO HVAC DRAWINGS FOR DAMPER LOCATIONS. CONNECT TO THE NEAREST 120 VOLT BRANCH CIRCUIT.
11. ALL PULL STATIONS TO BE PROVIDED WITH TAMPERPROOF COVERS WITH LOCAL ALARM.
12. CONNECT CONTROL MODULE TO FIRE SHUTTER CONTROL PANEL TO RELEASE UPON ANY FIRE ALARM CONDITION OR AS DIRECTED BY FIRE DEPT. COORDINATE LOCATIONS OF FIRE SHUTTERS WITH ARCHITECT.
13. MECHANICAL EQUIPMENT, MOTORIZED FIRE/SMOKE DAMPER - FURNISHED AND INSTALLED BY HVAC CONTRACTOR 120V AND FIRE ALARM INTERLOCK WIRING BY E. C.. PROVIDE A CONTROL MODULE. FOR EACH UNIT AND INTERLOCK EACH DAMPER SO THAT DAMPER IS POWERED OPEN AND IS SPRING CLOSED. LOCATE CONTROL MODULES ADJACENT TO DAMPERS. REFER TO HVAC DRAWINGS FOR DAMPER LOCATIONS.
14. SMOKE DETECTORS WITH (*) SHALL BE LOCATED WITHIN 5' OF HVAC DIFFUSER SERVING THE ROOM VIA DUCT-WORK WITH FIRE/SMOKE DAMPER INSTALLED WITHIN IT.
15. ALL PULL STATIONS IN GYMS, LOCKER ROOMS, MECH RMS, ETC. TO HAVE STOPPER II COVERS. (*)
16. E.C. SHALL FURNISH DUCT TYPE SMOKE DETECTOR FOR INSTALLATION BY HVAC. E.C. SHALL WIRE FOR ACTUATION OF ADJACENT SMOKE DAMPER PER INTERNATIONAL MECHANICAL CODE (IMC) 2009, 607.3.3.2.1.

1 E4.2E SECOND FLOOR PLAN PART E - FIRE ALARM
SCALE: 1/8" = 1'-0"

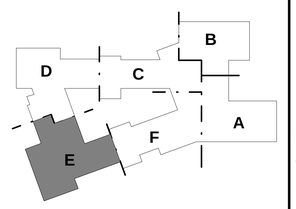
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3-15-2016

KEYPLAN



Dover HS / CTC
Dover, NH
SECOND FLOOR PLAN PART E - FIRE ALARM
SCALE: As indicated
DRAWN BY: MB
CHECKED BY: DMP

REVISIONS NO.	DATE	REMARKS	BY

DRAWING NUMBER
E4.2E
JOB NUMBER 403114

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GENERAL FIRE ALARM NOTES:

1. E.C. SHALL REFER TO SPECIFICATIONS AND DRAWINGS FOR QUANTITY OF DEVICES, SPARE CAPACITY, PARTS, ETC.
2. E.C. SHALL REFER TO HVAC DRAWINGS FOR EXACT LOCATION OF HVAC UNITS AND FOR LOCATIONS OF DUCT MOUNTED SMOKE DETECTORS. DUCT DETECTORS FURNISHED AND WIRED BY E.C.; INSTALLED BY HVAC.
3. PROVIDE EACH FIRE ALARM TERMINAL CABINET AND FIRE ALARM CONTROL PANEL WITH AN ADA POWER SUPPLY TO SERVE ALL SPEAKER/STROBE UNITS ON RESPECTIVE FLOORS.
4. TYPICALLY FIRE ALARM SYSTEM POWER CONDUCTORS SHALL BE #14 AWG, TYPE THHN SOLID. ALL WIRING SHALL BE INSTALLED IN CONDUIT OR SURFACE METAL RACEWAY. MC CABLE IS ALLOWED WHERE CONCEALED.
5. TYPICALLY ALL SPEAKER/STROBE UNITS SHALL BE WIRED IN A FASHION THAT THE SPEAKER & STROBE IS SILENCED SIMULTANEOUSLY.
6. ALL ELECTRICAL ROOMS ARE (2) HOUR RATED. FIREPROOF PENETRATIONS AS REQUIRED.
7. TYPICALLY REFER TO DOOR HARDWARE, SCHEDULES & DRAWINGS FOR LOCATIONS & QUANTITIES OF HARDWARE EQUIPMENT AFFECTING THIS SECTION. PROVIDE ALL WORK AS REQUIRED.
8. COORDINATE FINAL LOCATIONS OF MAGNETIC DOOR HOLDERS AND OTHER HARDWARE DEVICES WITH HARDWARE SUPPLIER PRIOR TO ROUGHING.
9. TYPICALLY PROVIDE (1) MONITOR MODULE FOR EACH CARBON MONOXIDE DETECTOR. ALSO CONNECT CO DETECTORS TO SECURITY SYSTEM FOR REMOTE CENTRAL STATION REPORTING.
10. MECHANICAL EQUIPMENT, MOTORIZED FIRE/SMOKE DAMPER - FURNISHED & INSTALLED BY HVAC CONTRACTOR, WIRED BY E.C.. FIRE ALARM INTERLOCK WIRING BY E. C. PROVIDE A CONTROL MODULE FOR EACH UNIT AND INTERLOCK EACH DAMPER SO THAT DAMPER IS POWERED OPEN AND IS SPRING CLOSED. LOCATE CONTROL MODULES ADJACENT TO DAMPERS. REFER TO HVAC DRAWINGS FOR DAMPER LOCATIONS. CONNECT TO THE NEAREST 120 VOLT BRANCH CIRCUIT.
11. ALL PULL STATIONS TO BE PROVIDED WITH TAMPERPROOF COVERS WITH LOCAL ALARM.
12. CONNECT CONTROL MODULE TO FIRE SHUTTER CONTROL PANEL TO RELEASE UPON ANY FIRE ALARM CONDITION OR AS DIRECTED BY FIRE DEPT. COORDINATE LOCATIONS OF FIRE SHUTTERS WITH ARCHITECT.
13. MECHANICAL EQUIPMENT, MOTORIZED FIRE/SMOKE DAMPER - FURNISHED AND INSTALLED BY HVAC CONTRACTOR 120V AND FIRE ALARM INTERLOCK WIRING BY E. C. PROVIDE A CONTROL MODULE, FOR EACH UNIT AND INTERLOCK EACH DAMPER SO THAT DAMPER IS POWERED OPEN AND IS SPRING CLOSED. LOCATE CONTROL MODULES ADJACENT TO DAMPERS. REFER TO HVAC DRAWINGS FOR DAMPER LOCATIONS.
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15. ALL PULL STATIONS IN GYMS, LOCKER ROOMS, MECH RMS, ETC. TO HAVE STOPPER II COVERS. (*)
16. E.C. SHALL FURNISH DUCT TYPE SMOKE DETECTOR FOR INSTALLATION BY HVAC. E.C. SHALL WIRE FOR ACTUATION OF ADJACENT SMOKE DAMPER PER INTERNATIONAL MECHANICAL CODE (IMC) 2009, 607.3.3.2.1.

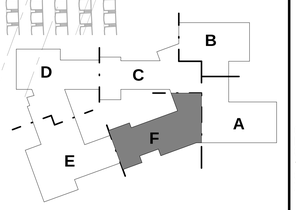
1 E4.2F SECOND FLOOR PLAN - POWER
SCALE: 1/8" = 1'-0"

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KEYPLAN



Dover HS / CTC
Dover, NH
SECOND FLOOR PLAN PART F - FIRE ALARM
SCALE: As indicated
DRAWN BY: MB
CHECKED BY: DMP

REVISIONS NO.	DATE	REMARKS	BY

DRAWING NUMBER
E4.2F
JOB NUMBER 403114

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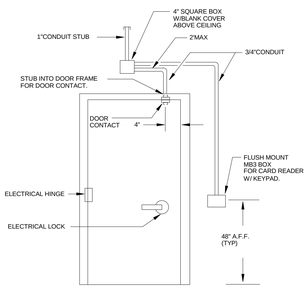
SYMBOL LIST

LEGEND NOTES:

A. THIS SHEET IS A GENERAL LIST OF SYMBOLS AND ABBREVIATIONS AND SHALL BE USED AS A DICTIONARY TO DEFINE ITEMS INDICATED ON DRAWINGS. NOT ALL SYMBOLS OR ABBREVIATIONS ARE NECESSARILY USED ON THIS PROJECT. ALL EQUIPMENT IS TO BE PROVIDED UNDER THIS SECTION UNLESS SPECIFICALLY INDICATED OTHERWISE.

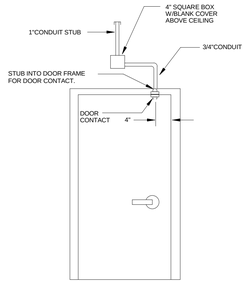
SECURITY SYSTEM

- DOME IP CAMERA. E.C. TO PROVIDE SINGLE GANG OPENING AND 4"SQ.X2 1/2"DP. J.B. & 3/4" CONDUIT WITH PULL STRING TO ACCESSIBLE ABOVE CEILING SPACE AT EACH LOCATION. WP = WEATHERPROOF AND HAVE INFRARED ILLUMINATOR PTZ = PAN/TILT/ZOOM
- INTRUSION ALARM LCD KEYPAD SINGLE GANG BOX AT 48" A.F.F., 3/4" CONDUIT W/ PULL STRING TO NEAREST ACCESSIBLE CEILING SPACE BY E.C.
- PT — POWER SUPPLY FOR ELECTRIFIED HARDWARE FURNISHED BY DOOR HARDWARE CONTRACTOR. INSTALLED & WIRED BY E.C. 120VAC EMERGENCY BY E.C. INTERFACE WIRING BY E.C.
- REX — REQUEST TO EXIT PANIC DEVICE SHALL BE CRASH BAR W/BUILT IN MICROSWITCH. CRASH BAR FURNISHED AND INSTALLED BY DOOR HARDWARE CONTRACTOR AND WIRED BY E.C. PROVIDE 3/4" CONDUIT W/ PULL STRING TO NEAREST ACCESSIBLE CEILING SPACE BY E.C.
- DC — DOOR POSITION SWITCH - GE/SENTROL 1076DB DOUBLE POLE DEVICE ONE POLE TO ACCESS CONTROL, SECOND POLE TO INTRUSION, COORDINATE HOLE WITH DOOR HARDWARE. PROVIDE 3/4" CONDUIT w/ PULL STRING TO NEAREST ACCESSIBLE CEILING SPACE BY E.C.
- CR — HID iCLASS RK40 COMBINATION iCLASS READER AND KEYPAD AT 48" A.F.F.. CUSTOM BACK BOX FURNISHED AND INSTALL BY E.C. 3/4" CONDUIT W/PULL STRING TO NEAREST ACCESSIBLE CEILING SPACE BY E.C..
- EFS — EYE WASH FOW SWITH- F&I BY PLUMBING CONTRACTOR WIRED TO SECURITY SYSTEM BY E.C. SINGLE GANG BOX, 3/4" CONDUIT W/ PULL STRING TO NEAREST ACCESSIBLE CEILING SPACE BY E.C.
- AM — ADDRESSABLE INPUT MODULE - SEE ONE LINE FOR REQUIRED ADDRESSING - EACH DEVICE COMES WITH THE APPROPRIATE EOL RESISTOR. DOES NOT REQ' BACK BOX
- M — MOTION SENSOR - WALL MOUNTED 6" BELOW CEILING SINGLE GANG BACK BOX W/3/4"C WITH PULL STRING TO NEAREST ACCESSIBLE CEILING SPACE BY E.C. WIRING BY E.C.
- M — MOTION SENSOR - CEILING MOUNTED, 360° SINGLE GANG BACK BOX AND 3/4"C WITH PULL STRING TO NEAREST ACCESSIBLE CEILING SPACE BY E.C. WIRING BY E.C.
- M — MOTION SENSOR - CORNER MOUNTED FOR 90° PATTERN SINGLE GANG BACK BOX AND 3/4"C WITH PULL STRING TO NEAREST ACCESSIBLE CEILING SPACE BY E.C. WIRING BY E.C.
- M — MOTION SENSOR - FOR LONG RANGE, CEILING MOUNTED SINGLE GANG BACK BOX AND 3/4"C WITH PULL STRING TO NEAREST ACCESSIBLE CEILING SPACE BY E.C. WIRING BY E.C.
- M — MOTION SENSOR - FOR 360° PATTERN SINGLE GANG BACK BOX AND 3/4"C WITH PULL STRING TO NEAREST ACCESSIBLE CEILING SPACE BY E.C. WIRING BY E.C.
- 7/4 — INTRUSION ALARM REMOTE ADDRESSABLE MODULE IN ENCLOSURE SURFACE MOUNT ENCLOSURE - INCLUDE IN LOOP AS REQUIRED/AS SHOWN
- IACP — INTRUSION ALARM CONTROL PANEL WITH BUILD IN DIGITAL COMMUNICATOR DMP XR500-L-G, REQUIRES 120VAC, INTERFACE TO ACCESS CONTROL AND TELEPHONE CONNECTION TO POD WITH BATTERIES BY E.C.
- IAPS — INTRUSION ALARM POWER SUPPLY - ONE LOCATED AT EACH IDF DESIGNATED - SUPPORT MOTION DETECTOR DC VOLTAGE - REQUIRES 120VAC, MODEL DMP 500-12-G W/ BATTERIES BY E.C.
- B — BLUE SECURITY ALARM BEACON, WEATHERPROOF, PROVIDED BY E.C. SINGLE GANG BOX, 3/4" CONDUIT W/ PULL STRING TO NEAREST ACCESSIBLE CEILING SPACE BY E.C.
- SECURITY PANIC BUTTON, PROVIDED BY E.C. SINGLE GANG BOX, 3/4" CONDUIT & PULL STRING TO NEAREST ACCESSIBLE CEILING SPACE BY E.C.
- IESS — INTEGRATED ELECTRONIC SAFETY & SECURITY SYSTEM HEADEND
- ACP — WALL MOUNTED ACCESS CONTROLLER. E.C. SHALL PROVIDE 20A EMERGENCY CIRCUIT AND DOUBLE DUPLEX RECEPTACLE. (SEE SPECS)
- KVM — RACK MOUNTED MONITOR AND KVM SWITCH
- ACS — ACCESS CONTROL SYSTEM SERVER RACK MOUNT. E.C. SHALL PROVIDE 20A EMERGENCY CIRCUIT AND DOUBLE DUPLEX RECEPTACLE. (SEE SPECIFICATIONS)
- TVM — 42" LCD CCTV COLOR MONITOR W/ WALL/CEILING MOUNT BRACKET BY E.C. E.C. TO PROVIDE 120 VAC EMERGENCY POWER RECEPTACLE, & 3/4" CONDUIT IN SINGLE GANG BOX W/ PULL STRING. MOUNT OUTLET AND BOX AT 96" A.F.F. U.N.O.
- EH — ELECTRIC HINGE OR ELECTRONIC POWER TRANSFER BETWEEN DOOR AND FRAME. FURNISHED AND INSTALLED BY DOOR HARDWARE CONTRACTOR (SEE DOOR HARDWARE SECTIONS FOR DETAILS), WIRED BY E.C. 4"SQ.X2 1/2"DP. J.B. WITH 3/4" CONDUIT W/ PULL STRING TO NEAREST ACCESSIBLE CEILING SPACE BY E.C.
- EL — ELECTRIC LOCK FURNISHED AND INSTALLED BY HARDWARE CONTRACTOR, WIRED BY E.C. 4"SQ.X2 1/2"DP. J.B. WITH 3/4" CONDUIT W/ PULL STRING TO NEAREST ACCESSIBLE CEILING SPACE BY E.C.
- DJ — 4" SQ. DOOR JUNCTION BOX BY EC.
- SC — SECURITY MONITOR MODULE
- UPS — RACK MOUNTED UNINTERRUPTIBLE POWER SUPPLY



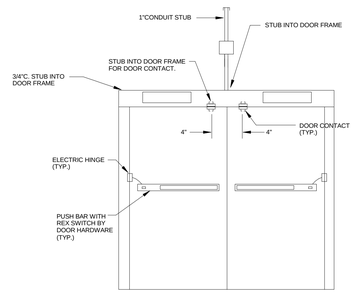
1 E5.5 TYPICAL DOOR WITH ACCESS CONTROL

SCALE: N.T.S.



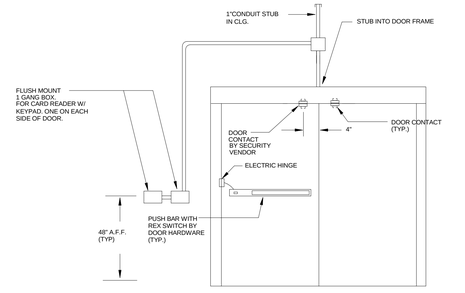
2 E5.5 TYPICAL DOOR WITHOUT ACCESS CONTROL

SCALE: N.T.S.



3 E5.5 TYPICAL DOOR WITHOUT ACCESS CONTROL

SCALE: N.T.S.

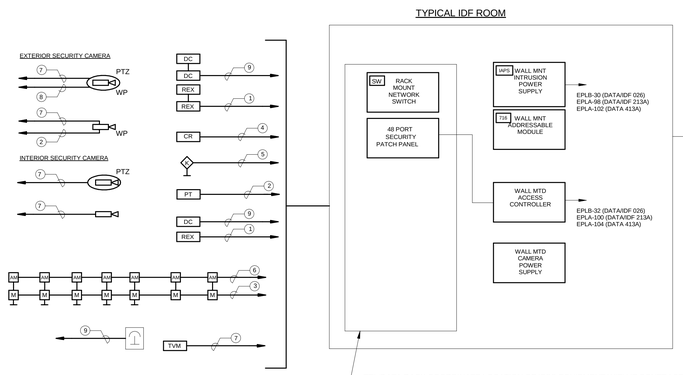


4 E5.5 TYPICAL EXTERIOR DOOR W/ ACCESS CONTROL

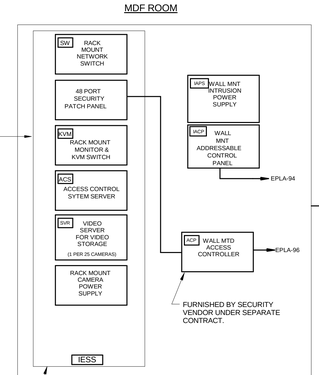
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GENERAL NOTES

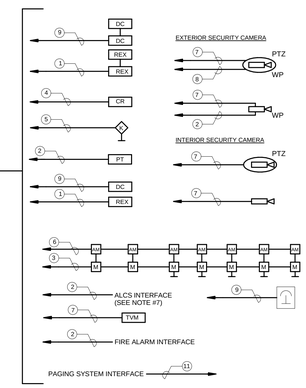
1. ALL HARDWARE SETS SHALL CONTAIN INTEGRAL REQUEST TO EXIT DEVICE. E.C. SHALL TIE INTO THESE DEVICES AND INSURE PROPER OPERATION.
2. ALL BOX, CONDUIT AND 120V WIRING PROVISIONS FOR SECURITY SYSTEM SHALL BE PROVIDED BY SECTION 260000. REFER TO FLOOR PLANS FOR QUANTITIES AND LOCATIONS OF EQUIPMENT.
3. REFER TO FLOOR PLAN FOR PROPOSED LOCATIONS OF ALL EQUIPMENT.



TEL/DATA RACK COORDINATE LOCATION OF IESS EQUIPMENT WITH IT CONTRACTOR. PROVIDE ADEQUATE PDU'S POWER DISTRIBUTION UNITS TO PLUG INTO TWIST LOCK RECEPTACLES ON RACK ABOVE TO POWER RACK MTD SECURITY EQUIPMENT. MOUNT PDU'S WITHIN RACK.



IESS RACK PROVIDE 4 POST ENCLOSED RACK WITH VENTILATION ENCLOSURE PROVIDE ADEQUATE PDU'S POWER DISTRIBUTION UNITS TO PLUG INTO TWIST LOCK RECEPTACLES ON RACK ABOVE TO POWER RACK MTD SECURITY EQUIPMENT. MOUNT PDU'S WITHIN RACK.



5 E5.5 INTEGRATED ELECTRONIC SECURITY SYSTEM PARTIAL RISER DIAGRAM

SCALE: N.T.S.

SECURITY SYSTEM NOTES

1. LOCAL AREA NETWORK IS BY OTHERS.E.C. SHALL INTERFACE IESS TO NETWORK TO ALLOW ANY NETWORKED PC TO VIEW ALARM EVENTS, LIVE OR RECORDED VIDEO AND SYSTEM SCHEDULES. VIEWING SOFTWARE TO BE WEB-BASED. SYSTEMS THAT REQUIRE CLIENT SOFTWARE TO BE USED WILL NOT BE ACCEPTABLE.
2. ALL DOOR CONTACTS SHALL BE INDIVIDUALLY ADDRESSED AND ANNUNCIATED ON CONTROL PANEL.
3. TYPICALLY EXTERIOR CAMERA LOCATIONS FURNISH AND INSTALL DAY/NIGHT DOME CAMERAS WITH HEATER BLOWERS AT THESE LOCATIONS. SEE SPECIFICATIONS FOR ADDITIONAL DETAILS.
4. INTERFACE IESS TO INTERCOM SYSTEM TO ALLOW FOR RECORDING, CAMERA CALL-UP IF EXTERIOR INTERCOM STATIONS ARE ACTIVATED. COORDINATE AS REQUIRED WITH SUPPLIER.
5. PROVIDE DIGITAL COMMUNICATOR CONNECTION TO UL CENTRAL STATION. PROVIDE CONTACT ID FOR ALL POINTS TO MONITORING STATION. PROVIDE 1 YEAR MONITORING WITH CONTRACT.
6. PROVIDE FIRE ALARM INTERFACE. PROVIDE FIRE ALARM OVERRIDE AS REQUIRED, (2#18GAUGE WIRES BY E.C.)
7. PROVIDE CONTACT CLOSURE INTERFACE TO AUTOMATED LIGHTING CONTROL SYSTEM (ALCS) VIA A SINGLE PAIR OF 2#18 CONDUCTORS. WHEN INTRUSION SYSTEM GOES INTO ALARM A SIGNAL SHALL BE ISSUED TO DIRECT THE ALCS TO TURN ALL INTERIOR AND EXTERIOR LIGHTING "ON".
8. PROVIDE INTEGRATION WITH FIRE ALARM SYSTEM TO RELEASE DOOR HOLDERS DURING LOCK DOWN AND ON A SCHEDULE.
9. INTEGRATE THE INTRUSION SYSTEM WITH THE ACCESS CONTROL SYSTEM SO THAT THE KEY FOB PRESENTED AT THE EXTERIOR CARD READER CAN DISARM THE COMMON ZONE, AND INTERIOR CARD READERS WILL DISARM THE ZONE THAT ARE ASSOCIATED WITH THEIR LOCATION. THE SYSTEM SHALL BE CAPABLE OF EIGHT (8) PARTITIONS.
10. INTEGRATE THE ACCESS CONTROL SYSTEM WITH THE BUILDING PAGING SYSTEM TO GIVE (2) DISTINCT INPUTS TO TONE GENERATOR (PART OF PAGING SYSTEM) FOR ALARMS TO BE SELECTED BY OWNER SUCH AS PANIC AND LOCK DOWN.
11. ALL WIRING SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL SUB-CONTRACTOR.
12. THE ACCESS CONTROL SYSTEM AND VIDEO SURVEILLANCE SYSTEM HEAD END WILL BE PROVIDED BY THE OWNERS SECURITY VENDOR. ALL CABLING SHOWN FOR ACCESS CONTROL DEVICES AND ANY REFERENCE TO INTEGRATION WITH ACCESS CONTROL SYSTEM SHALL MEAN WIRING TO BE PROVIDED BY E.C. AND 20' OF WIRING COILED IN THE NEAREST IDF/MDF ROOM. ALL CABLING SHALL BE CLEARLY LABELED BY THE E.C. AND TESTED FOR CONTINUITY.

WIRING LEGEND (ALL WIRING BY E.C.)

1. INPUT - CABLE REQUIREMENTS 18AWG FOUR CONDUCTOR STRANDED NON-SHIELDED FOR DPS ONE PAIR PER POLE, FOR REX ONE PAIR SPARE
2. OUTPUT - CABLE REQUIREMENTS 18AWG TWO CONDUCTOR STRANDED, NON-SHIELDED
3. MOTION DETECTOR - CABLE REQUIREMENTS 18AWG TWO CONDUCTOR STRANDED NON SHIELDED (THIS IS FOR DC POWER ONLY IN DESIGN)
4. READER - CABLE REQUIREMENTS 20AWG THREE PAIR SHIELDED REFERENCE MODEL BELDEN 82777 FOR PLENUM RATED APPLICATIONS
5. KEYPAD - CABLE REQUIREMENTS 18AWG FOUR CONDUCTOR STRANDED NON SHIELDED
6. INTRUSION ALARM BUS - CABLE REQUIREMENT 18AWG FOUR CONDUCTOR STRANDED NON SHIELDED
7. CAT 6 PLENUM RATED UTP CABLE TO SECURITY PATCH PANEL
8. POWER SUPPLY CABLE AND CONTROL FOR EXTERIOR PTZ CAMERA. 2#18&2#18TSP.
9. INPUT - CABLE REQUIREMENTS 18AWG FOUR CONDUCTOR STRANDED NON-SHIELDED
10. (2)CAT 6 PLENUM RATED UTP CABLE TO SECURITY PATCH PANEL
11. OUTPUT - CABLE REQUIREMENTS 14AWG TWO CONDUCTOR STRANDED, NON-SHIELDED
12. 2 STRAND OUTSIDE PLANT MULTI MODE FIBER OPTIC CABLE

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Dover HS / CTC
Dover, NH
SECURITY RISER & DETAILS

DRAWN BY: MNK CHECKED BY: DMP SCALE:

REVISIONS NO.	DATE	REMARKS	BY

DRAWING NUMBER E5.0

JOB NUMBER 403114

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GENERAL SECURITY NOTES:

1. PROVIDE CORNER MOUNTED MOTION SENSOR WHENEVER POSSIBLE.
2. IESS TO COORDINATE FINAL SECURITY ZONES WITH OWNER. PROGRAM PER OWNER'S DIRECTIONS.
3. COORDINATE FINAL LOCATIONS OF MAGNETIC DOOR HOLDERS AND OTHER HARDWARE DEVICES WITH HARDWARE SUPPLIER PRIOR TO ROUGHING.
4. SECURITY PANIC SWITCH. DOOR SHALL REMAIN SECURED UPON ACTIVATION OF PANIC STATION. SECURITY PERSONEL SHALL BE NOTIFIED.
5. INTERFACE HANDICAP DOOR CONTROLLER WITH RESPECTIVE ACCESS CONTROL HARDWARE AT EACH DOOR WITH EITHER POWER ASSIST OR HANDICAP PUSH PLATE.

1 E5.0A GROUND FLOOR PLAN PART A - SECURITY
SCALE: 1/8" = 1'-0"

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KEYPLAN

Dover HS / CTC
Dover, NH
GROUND FLOOR PLAN PART A - SECURITY
SCALE: As Indicated
DRAWN BY: WMK
CHECKED BY: DMP

REVISIONS NO.	DATE	REMARKS	BY

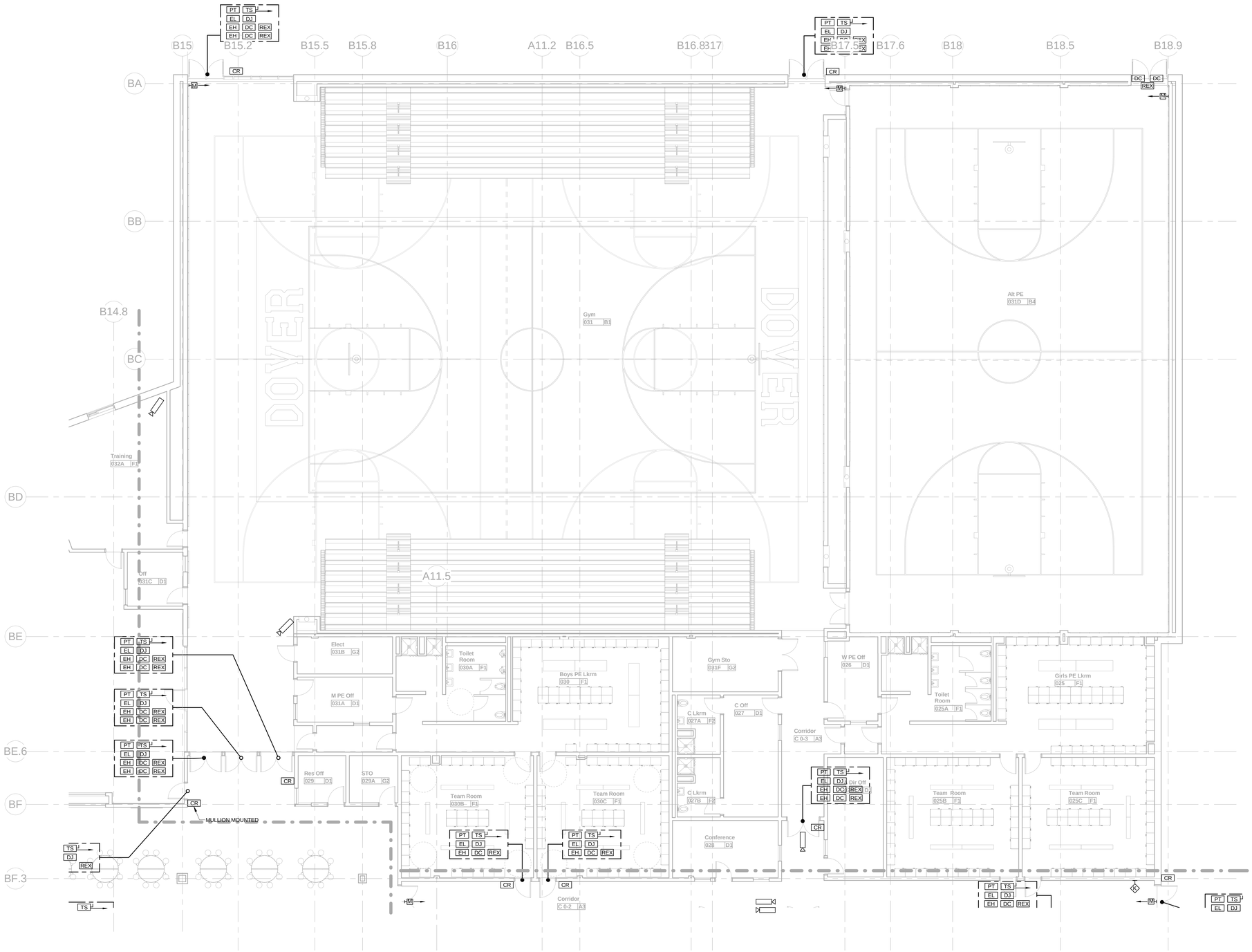
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E5.0A
JOB NUMBER 403114

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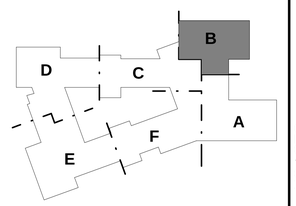
GENERAL SECURITY NOTES:

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2. IESS TO COORDINATE FINAL SECURITY ZONES WITH OWNER. PROGRAM PER OWNER'S DIRECTIONS.
3. COORDINATE FINAL LOCATIONS OF MAGNETIC DOOR HOLDERS AND OTHER HARDWARE DEVICES WITH HARDWARE SUPPLIER PRIOR TO ROUGHING.
4. SECURITY PANIC SWITCH. DOOR SHALL REMAIN SECURED UPON ACTIVATION OF PANIC STATION. SECURITY PERSONEL SHALL BE NOTIFIED.
5. INTERFACE HANDICAP DOOR CONTROLLER WITH RESPECTIVE ACCESS CONTROL HARDWARE AT EACH DOOR WITH EITHER POWER ASSIST OR HANDICAP PUSH PLATE.



1 E5.0B GROUND FLOOR PLAN PART B - SECURITY
SCALE: 1/8" = 1'-0"

KEYPLAN



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Dover, NH
GROUND FLOOR PLAN PART B - SECURITY
SCALE: As indicated
DRAWN BY: VHK
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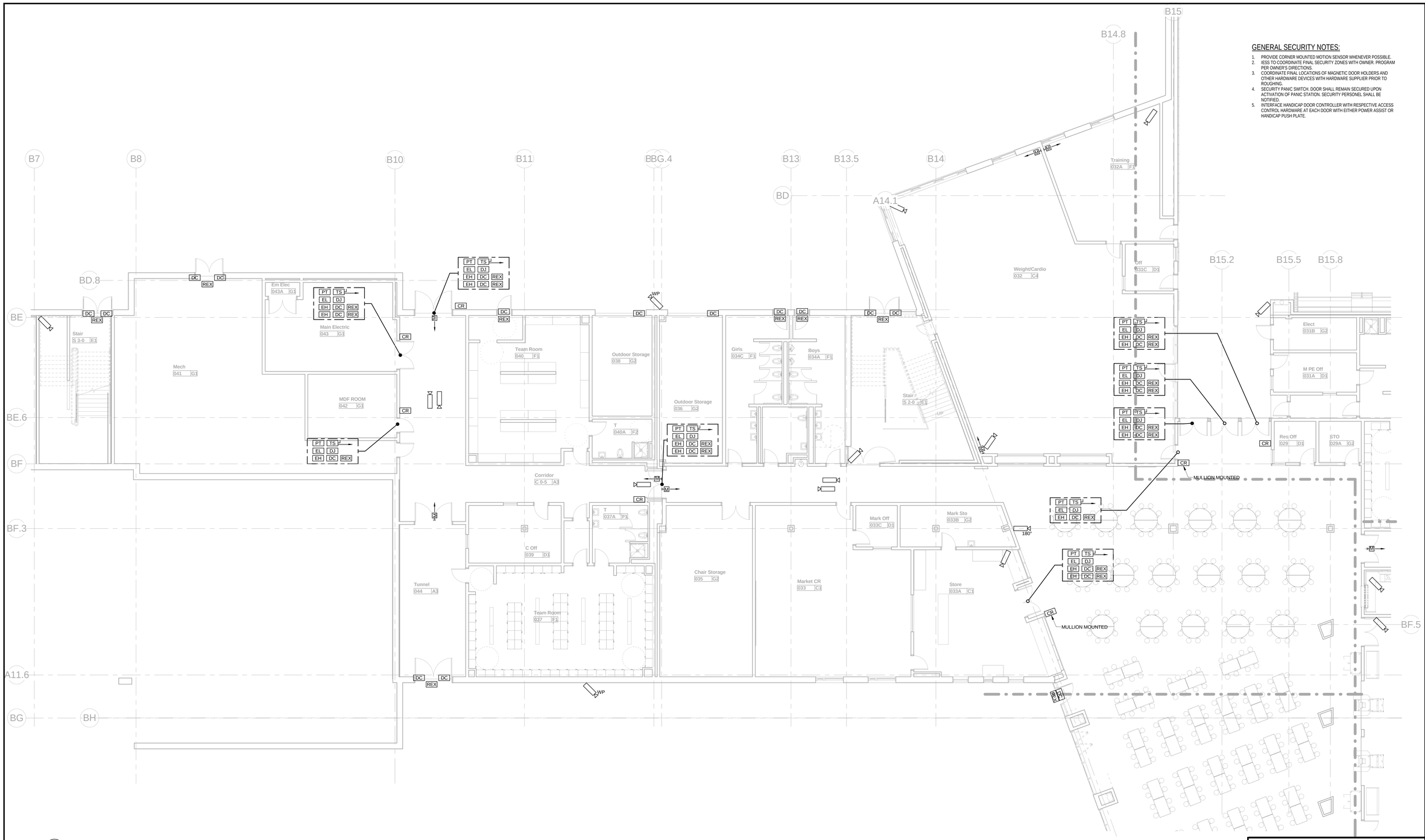
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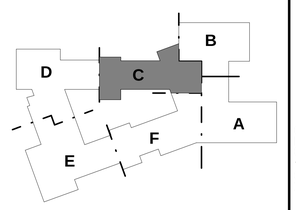
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1 E5.0C GROUND FLOOR PLAN PART C - SECURITY
SCALE: 1/8" = 1'-0"

KEYPLAN



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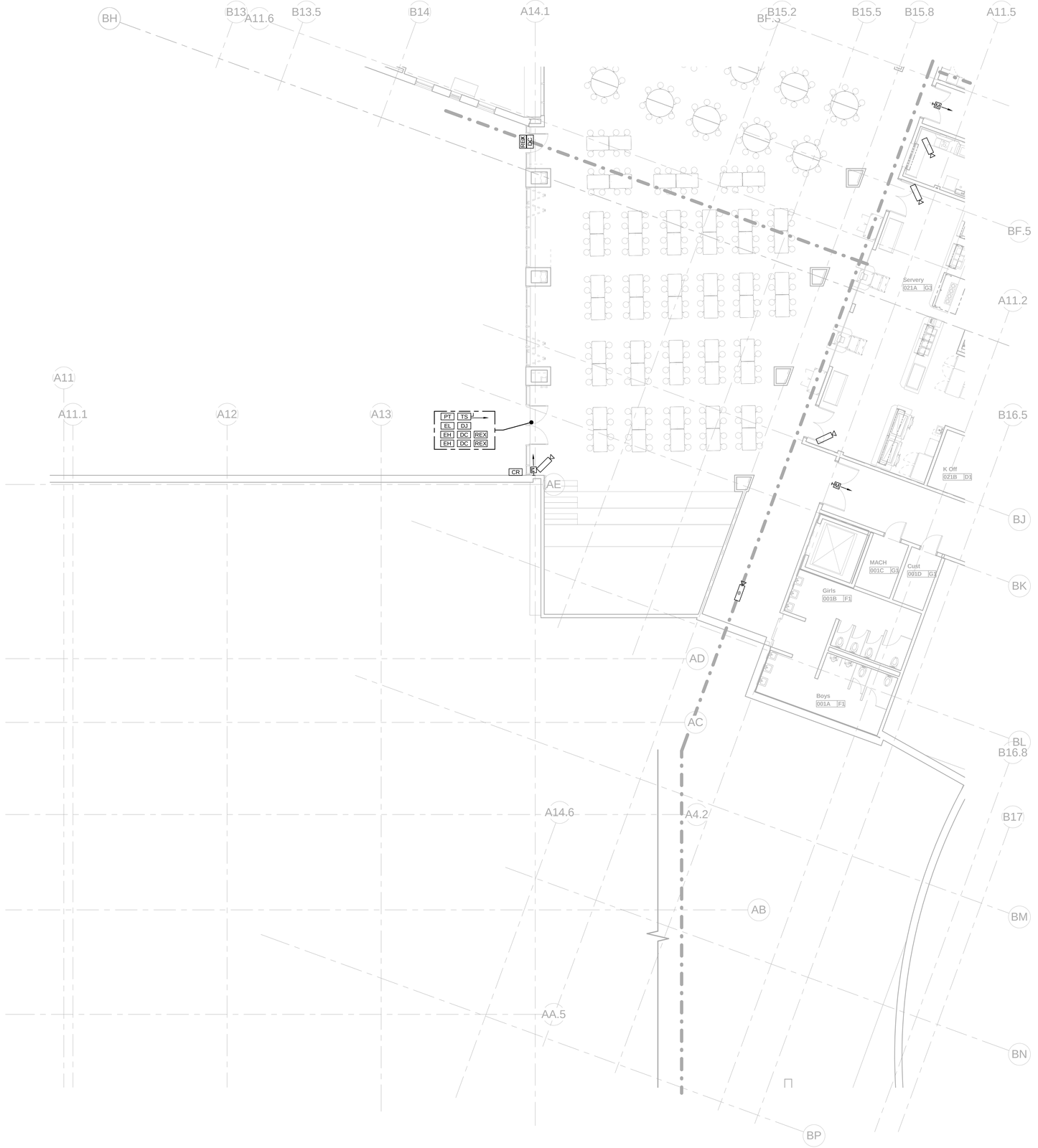
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Dover, NH
GROUND FLOOR PLAN PART C - SECURITY
SCALE: As indicated
DRAWN BY: VNK CHECKED BY: DMP

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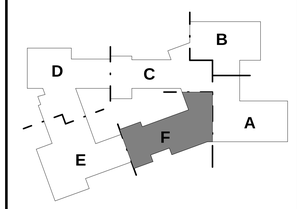


1 E5.0F GROUND FLOOR PLAN - POWER
SCALE: 1/8" = 1'-0"

GENERAL SECURITY NOTES:

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KEYPLAN



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PLAN NORTH
TRUE NORTH

Dover HS / CTC
Dover, NH
GROUND FLOOR PLAN PART F - SECURITY
SCALE: As Indicated
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BF BF.3 BF.5 A11.6 BH A14.1 A4.2 AD AC AB AA.5 BJ BK BL BM BN BP B18.4 B18.6 B19.6 B20 B18.7 B21

Lab.
106A C1
1069 SF

Dining
105B C1
840 SF

Culinary Kitchen
105A G3
2726 SF

OFF
105C D1
110 SF

Dry Storage
105D G3
89 SF

Elev.
2/B8
94 SF

Girls
104B F1
226 SF

Boys
104A F1
219 SF

Box Office
103B G2
171 SF

Light Lock
V 1-1 B3
184 SF

Corridor
C 1-1 A2
5091 SF

Sound
103A G2
108 SF

Stair
S 1-1 E1
424 SF

Vestibule
V 1-1 A1
257 SF

Auditorium
103 B3
11783 SF

Stage
003A B2
3045 SF

PT TS EL DJ EH DC REX CR IMS WP

GENERAL SECURITY NOTES:

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1 E5.1A FIRST FLOOR PLAN PART A - SECURITY
SCALE: 1/8" = 1'-0"

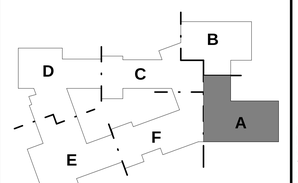
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PLAN NORTH
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KEYPLAN



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Dover, NH
FIRST FLOOR PLAN PART A - SECURITY
SCALE: As Indicated DRAWN BY: VNK CHECKED BY: DMP

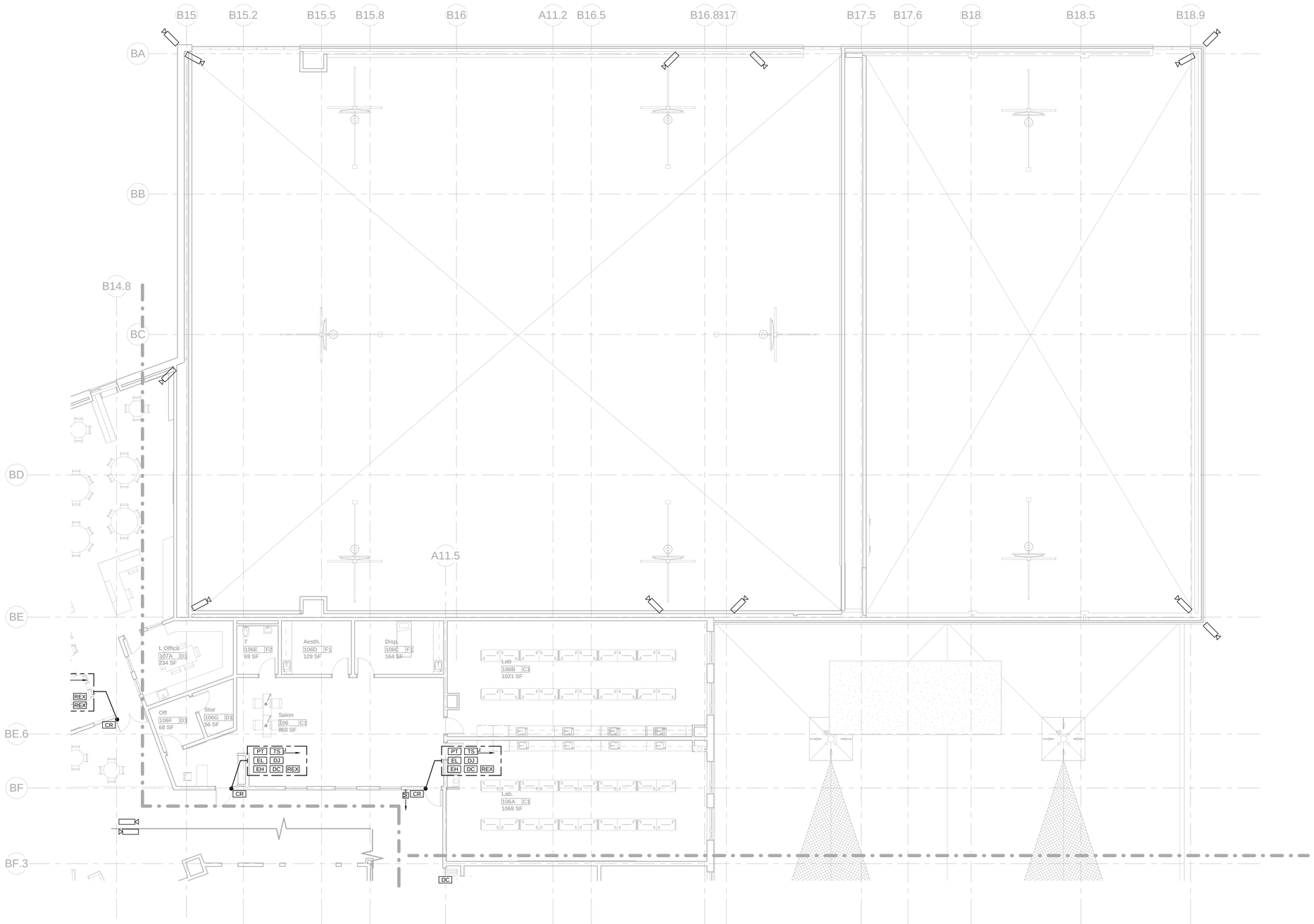
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JOB NUMBER 403114

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1 E5.1B FIRST FLOOR PLAN PART B - SECURITY
SCALE: 1/8" = 1'-0"

GENERAL SECURITY NOTES:

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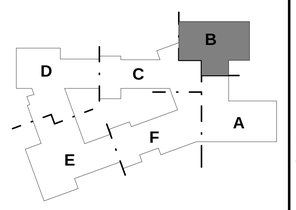
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PLAN NORTH
TRUE NORTH

KEYPLAN



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FIRST FLOOR PLAN PART B - SECURITY
SCALE: As Indicated
DRAWN BY: VNK
CHECKED BY: DMP

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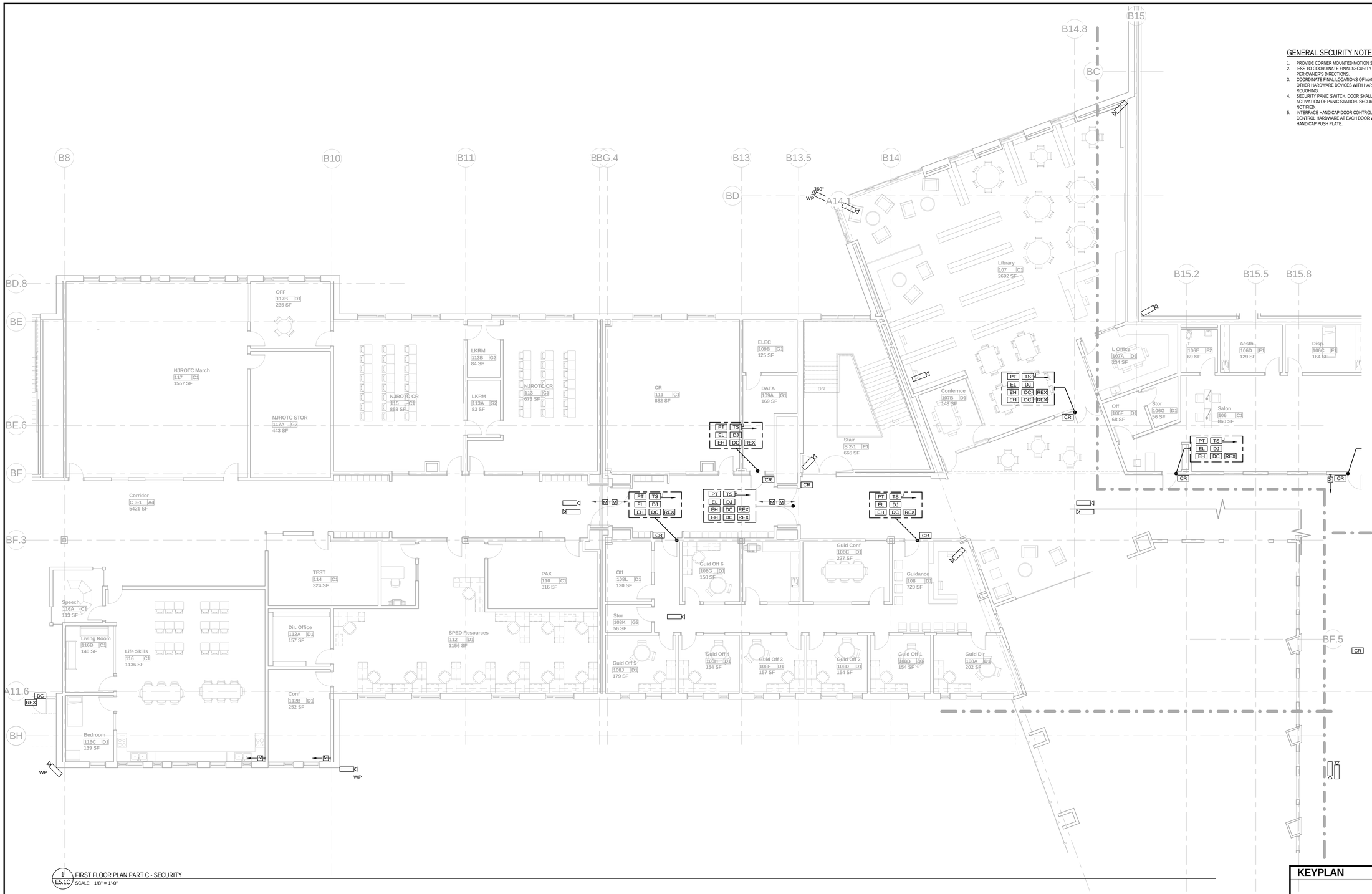
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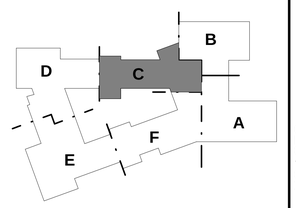
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1 / E5.1C FIRST FLOOR PLAN PART C - SECURITY
SCALE: 1/8" = 1'-0"

KEYPLAN



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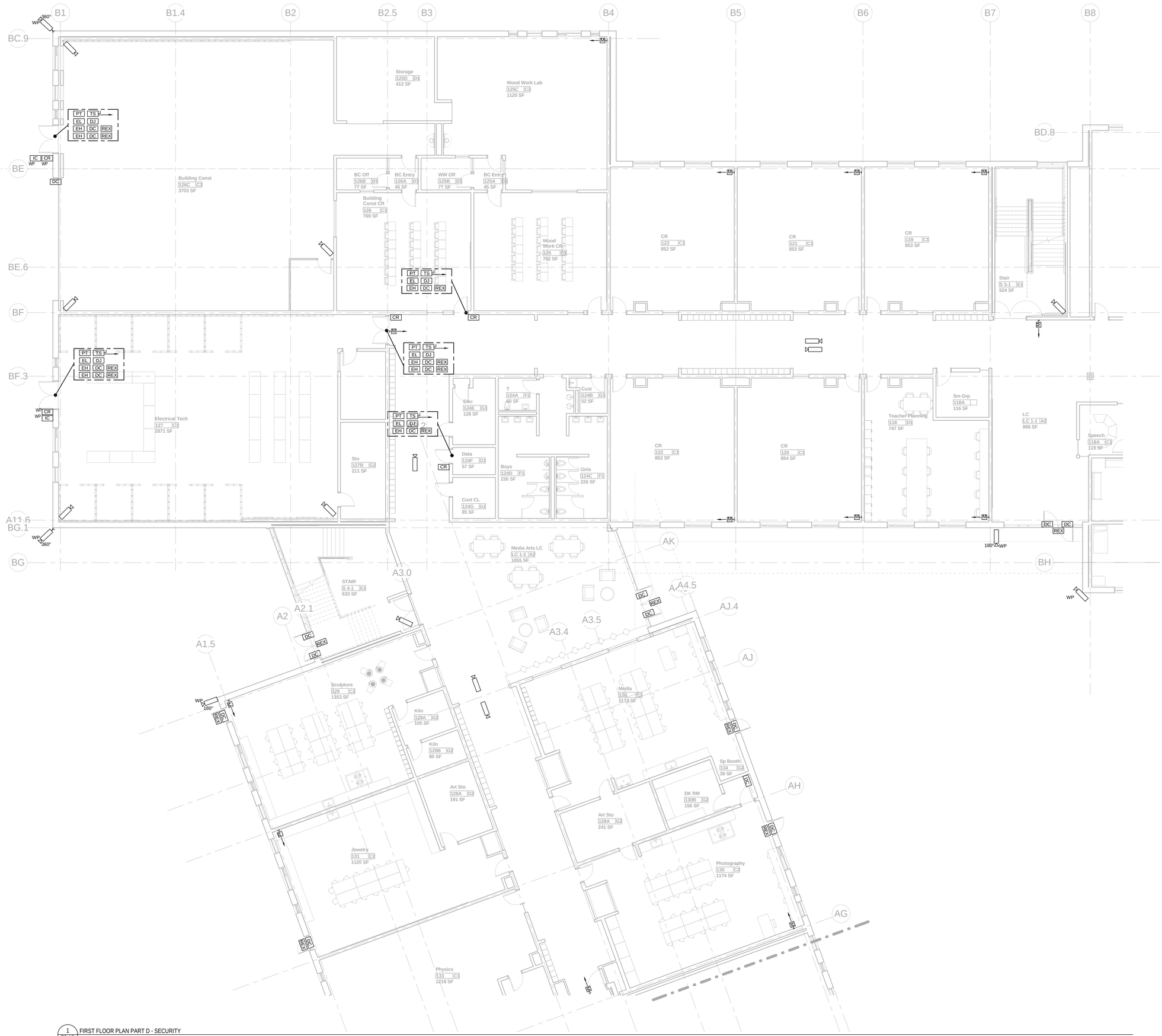
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JOB NUMBER 403114

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Dover, NH
FIRST FLOOR PLAN PART C - SECURITY
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1 / E5.1D FIRST FLOOR PLAN PART D - SECURITY
SCALE: 1/8" = 1'-0"

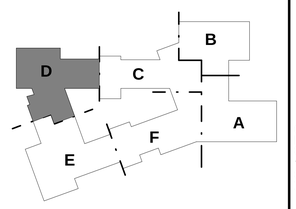
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Dover, NH
FIRST FLOOR PLAN PART D - SECURITY
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1 E5.1E FIRST FLOOR PLAN PART E - SECURITY
SCALE: 1/8" = 1'-0"

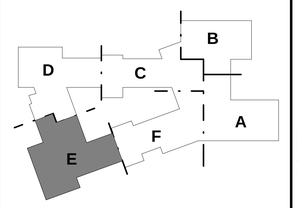
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PLAN NORTH
TRUE NORTH

KEYPLAN



Dover HS / CTC
Dover, NH
FIRST FLOOR PLAN PART E - SECURITY
SCALE: AS INDICATED
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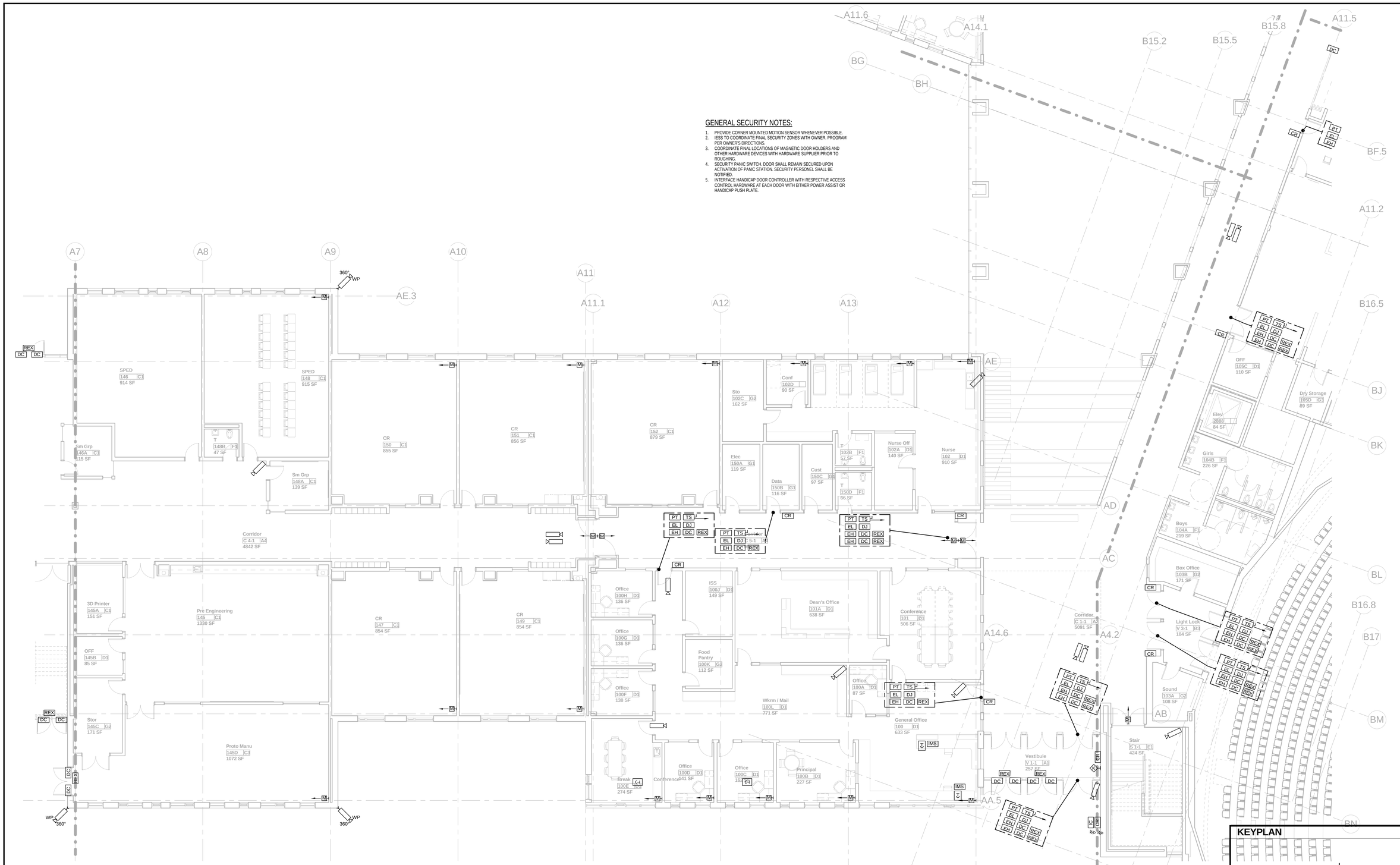
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GENERAL SECURITY NOTES:

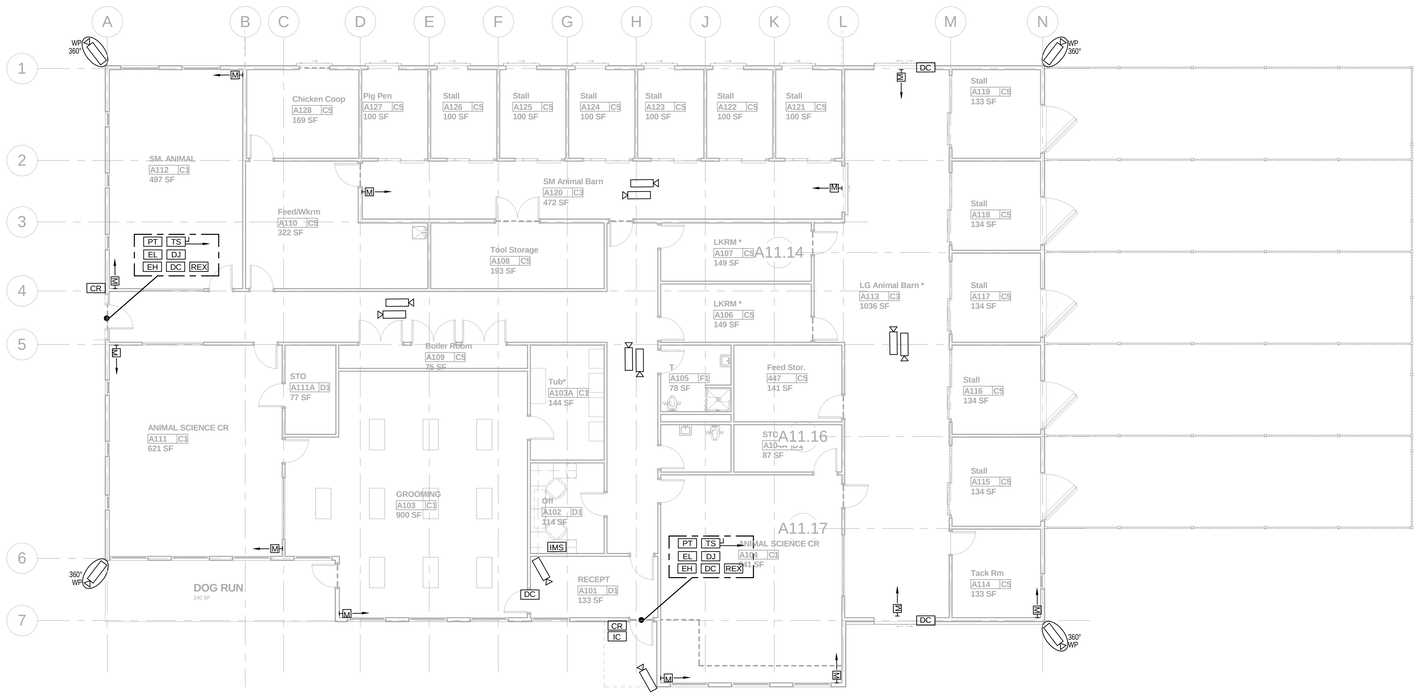
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1 E5.1F FIRST FLOOR PLAN PART F - SECURITY
SCALE: 1/8" = 1'-0"



GENERAL SECURITY NOTES:

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1 / E5.1G FIRST FLOOR PLAN ANIMAL SCIENCE - SECURITY
SCALE: 1/8" = 1'-0"

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Dover, NH

ANIMAL SCIENCE FLOOR PLAN - SECURITY

SCALE: As Indicated | DRAWN BY: VINK | CHECKED BY: DMP

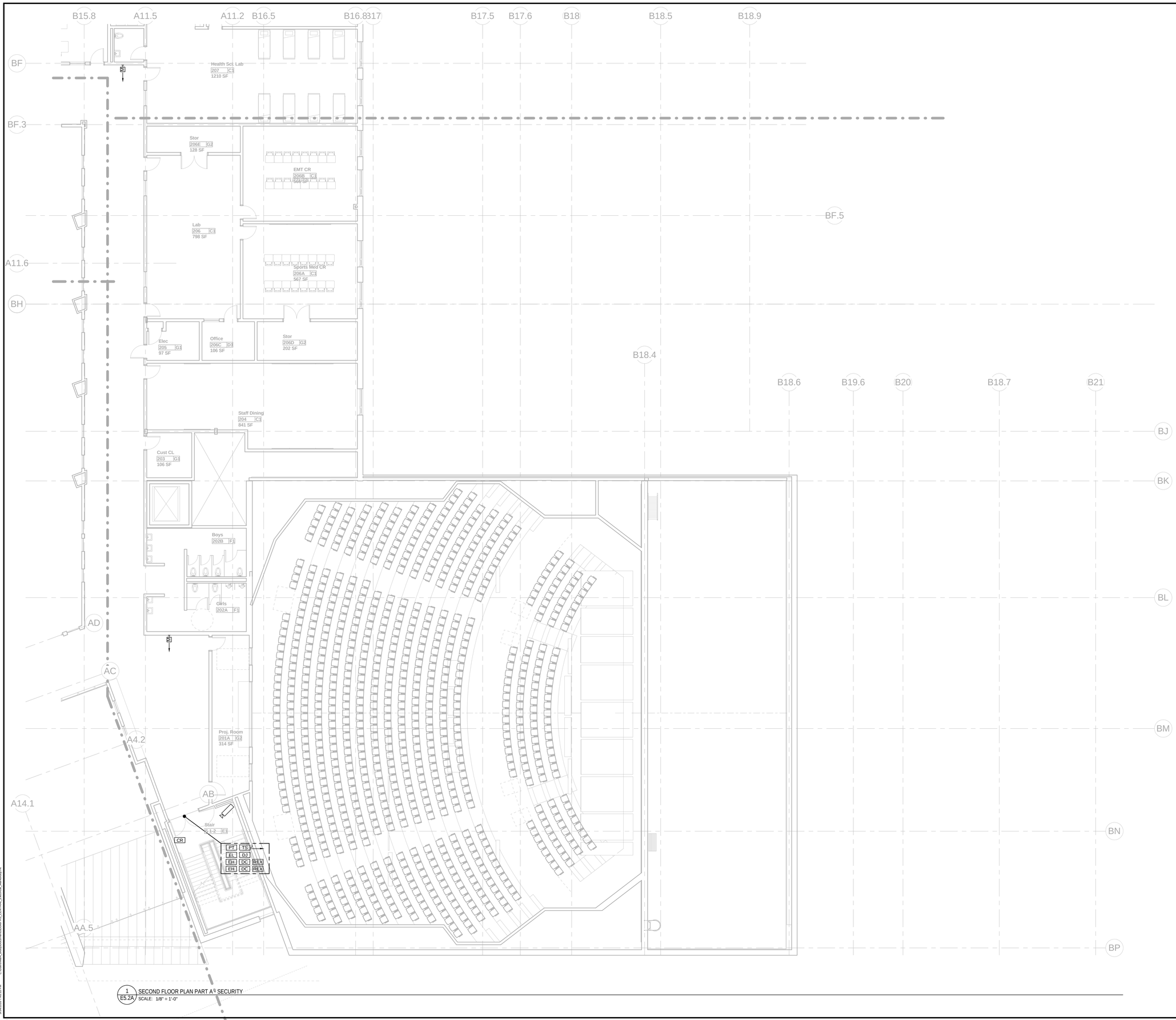
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1 E5.2A SECOND FLOOR PLAN PART A - SECURITY
SCALE: 1/8" = 1'-0"

GENERAL SECURITY NOTES:

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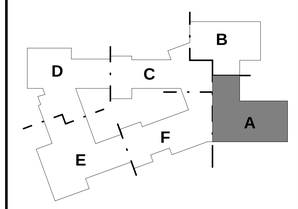
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PLAN NORTH
TRUE NORTH

KEYPLAN



Dover HS / CTC
Dover, NH
SECOND FLOOR PLAN PART A - SECURITY
SCALE: As indicated
DRAWN BY: VHK
CHECKED BY: DMP

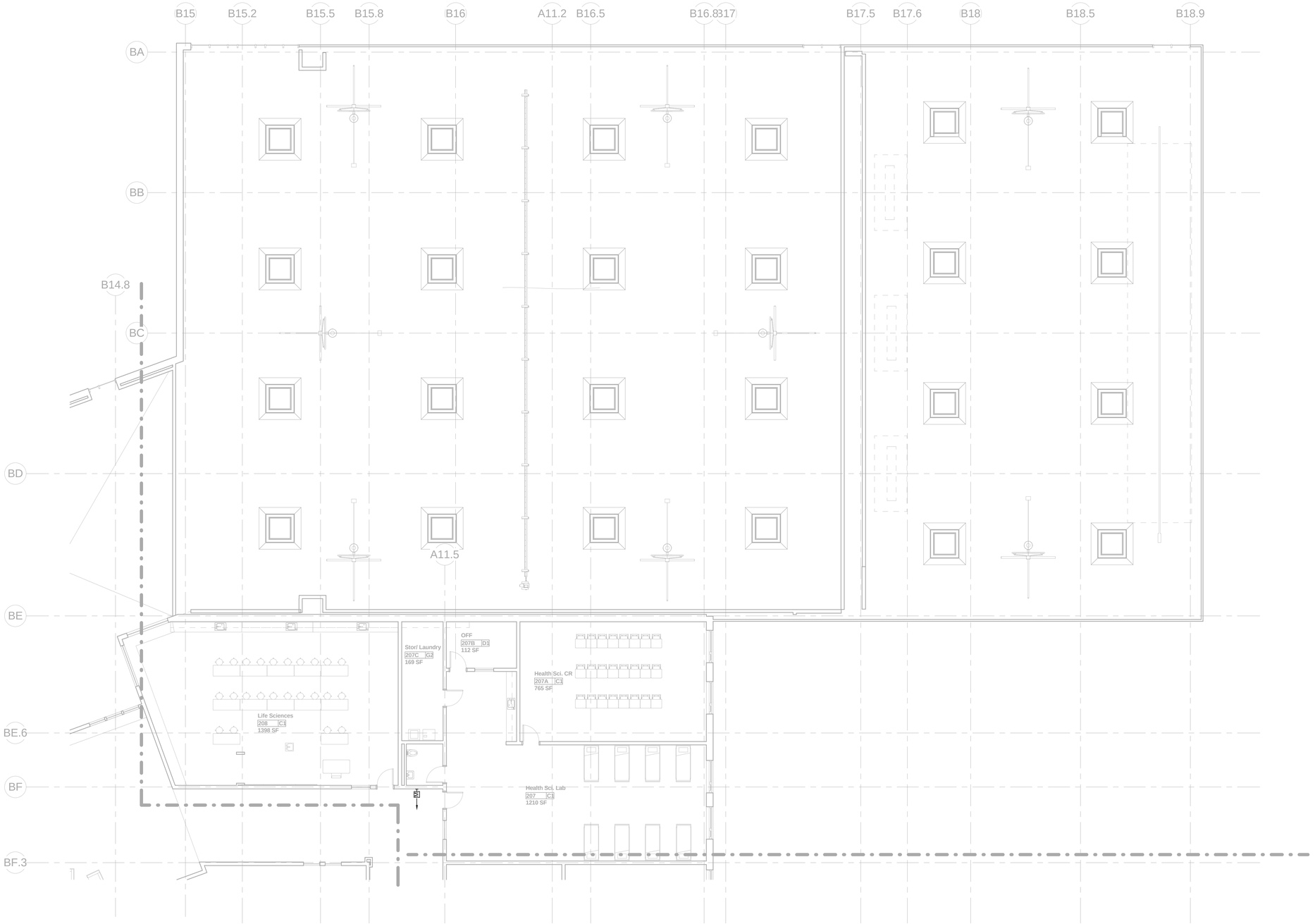
REVISIONS NO.	DATE	REMARKS	BY

DRAWING NUMBER
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1 E5.2B SECOND FLOOR PLAN PART B - SECURITY
SCALE: 1/8" = 1'-0"

GENERAL SECURITY NOTES:

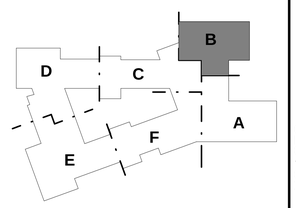
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4. SECURITY PANIC SWITCH. DOOR SHALL REMAIN SECURED UPON ACTIVATION OF PANIC STATION. SECURITY PERSONEL SHALL BE NOTIFIED.
5. INTERFACE HANDICAP DOOR CONTROLLER WITH RESPECTIVE ACCESS CONTROL HARDWARE AT EACH DOOR WITH EITHER POWER ASSIST OR HANDICAP PUSH PLATE.

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617.367.1666 fax 617.367.2988

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3-15-2016

KEYPLAN



Dover HS / CTC
Dover, NH
SECOND FLOOR PLAN PART B - SECURITY
SCALE: As Indicated
DRAWN BY: WNK
CHECKED BY: DMP

REVISIONS NO.	DATE	REMARKS	BY

DRAWING NUMBER
E5.2B

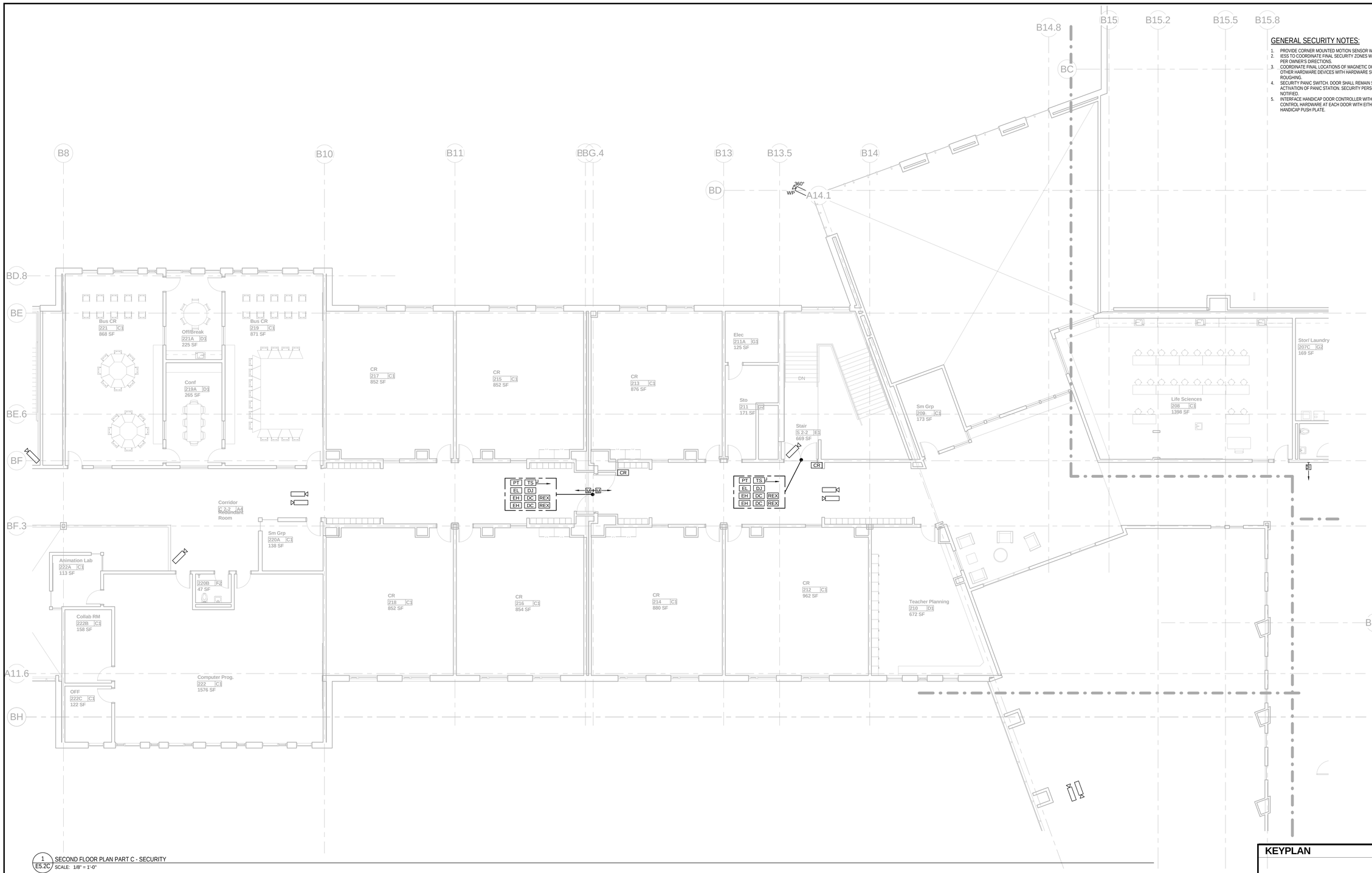
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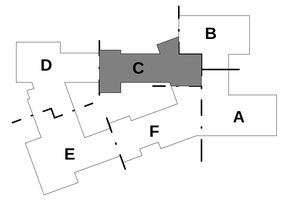
GENERAL SECURITY NOTES:

1. PROVIDE CORNER MOUNTED MOTION SENSOR WHENEVER POSSIBLE.
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1 / E5.2C SECOND FLOOR PLAN PART C - SECURITY
SCALE: 1/8" = 1'-0"

KEYPLAN



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TRUE NORTH

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SECOND FLOOR PLAN PART C - SECURITY
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DRAWING NUMBER
E5.2C

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GENERAL SECURITY NOTES:

1. PROVIDE CORNER MOUNTED MOTION SENSOR WHENEVER POSSIBLE.
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1 E5.2D SECOND FLOOR PLAN PART D - SECURITY
SCALE: 1/8" = 1'-0"

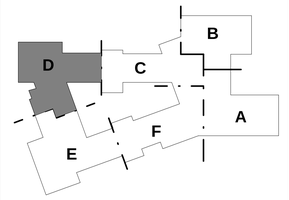
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Dover, NH
SECOND FLOOR PLAN PART D - SECURITY
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1 E5.2E SECOND FLOOR PLAN PART E - SECURITY
SCALE: 1/8" = 1'-0"

GENERAL SECURITY NOTES:

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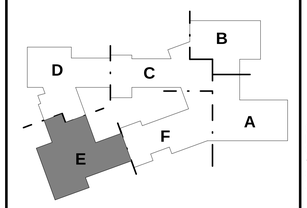
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PLAN NORTH
TRUE NORTH

KEYPLAN



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Dover, NH
SECOND FLOOR PLAN PART E - SECURITY
SCALE: As indicated
DRAWN BY: WNK
CHECKED BY: DMP

REVISIONS NO.	DATE	REMARKS	BY

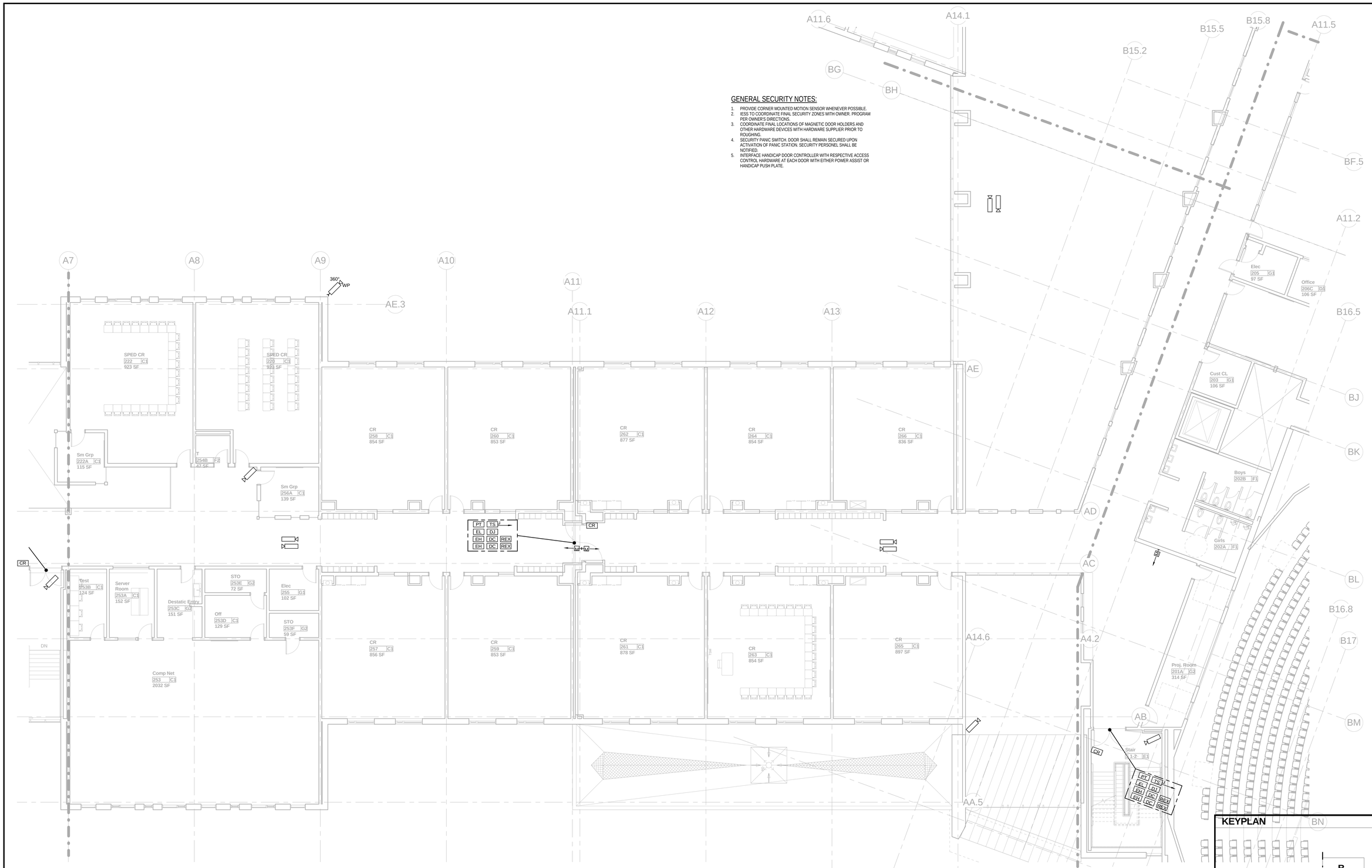
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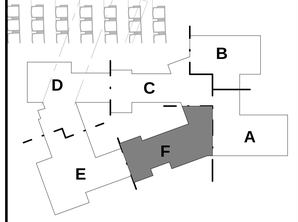
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1 / E5.2F SECOND FLOOR PLAN PART F - SECURITY
SCALE: 1/8" = 1'-0"

KEYPLAN



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SECOND FLOOR PLAN PART F - SECURITY
SCALE: As indicated
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SYMBOL LIST

TEL/DATA OUTLETS

W — WALL MOUNTED TELEPHONE OUTLET @ 48" A.F.F. REFER TO TEL/DATA RISER FOR WIRING REQUIREMENTS. COVER PLATES SHALL BE STAINLESS STEEL.

— WALL MOUNTED DATA OUTLET @ 18" A.F.F.
REFER TO TEL/DATA RISER FOR WIRING REQUIREMENTS.
NUMERAL INDICATES NUMBER OF RJ45 JACKS ON SAME FACEPLATE.
COVER PLATES SHALL BE STAINLESS STEEL.

#V/#D — COMBINATION TEL/DATA OUTLET @ 18" A.F.F.
#V INDICATES NUMBER OF RJ45 VOICE JACKS, #D INDICATES NUMBER OF RJ45 DATA JACKS ON SAME FACEPLATE.
(1) VOICE & (1) DATA IF #V/#D IS NOT SHOWN (TYPICAL).
REFER TO TEL/DATA RISER FOR WIRING REQUIREMENTS.
COVER PLATES SHALL BE STAINLESS STEEL.

AN — WIRELESS ACCESS NODE - DATA
REFER TO TEL/DATA RISER FOR WIRING REQUIREMENTS.
COVER PLATES SHALL BE STAINLESS STEEL.
MOUNTED AT 92" A.F.F. U.N.O.

TVC — CABLE/DATA OUTLET
REFER TO TEL/DATA RISER FOR WIRING REQUIREMENTS
COVER PLATES SHALL BE STAINLESS STEEL.
MOUNTED @ 18" A.F.F. U.N.O.

TVE — VIDEO PROJECTOR OUTLET
REFER TO TEL/DATA RISER FOR WIRING REQUIREMENTS. COVER PLATES SHALL BE STAINLESS STEEL. CEILING MOUNTED U.N.O.

T — TEACHER'S STATION
REFER TO TEL/DATA RISER FOR WIRING REQUIREMENTS
COVER PLATES SHALL BE STAINLESS STEEL. MOUNTED @ 18" A.F.F. U.N.O.

SRP — SMART RESCUE PHONE

ARA — AREA OF RESCUE ASSISTANCE BUTTON

IDF — INTERMEDIATE DISTRIBUTION FRAME

MDF — MAIN DISTRIBUTION FRAME

WIRELESS SYSTEM CLOCK

S — FLUSH MOUNTED CEILING SPEAKER

S — FLUSH WALL MOUNTED SPEAKER

S WP — WEATHER PROOF FLUSH MOUNTED SPEAKER. CUSTOM PAINT FINISH TO BE SELECTED BY ARCH.

S (S) — SPEAKER CEILING TYPE
SUBSCRIPT 'S' DENOTES SURFACE MOUNTED

RECEPTACLES

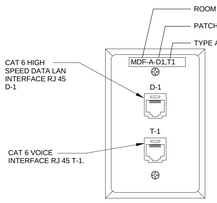
FLUSH FLOOR OUTLET BOXES WITH BOTH 120 VOLT & TELE/DATA COMPARTMENTS
FLOOR BOX BY OTHERS. BRASS COVER PLATE BY I.T. CONTRACTOR.

FLUSH FLOOR OUTLET BOXES WITH BOTH 120 VOLT & DATA COMPARTMENTS.
FLOOR BOX BY OTHERS. BRASS COVER PLATE BY I.T. CONTRACTOR.

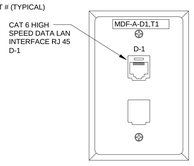
WIREMOLD RACEWAY PROVIDED UNDER SECTION 260000

ABBREVIATIONS

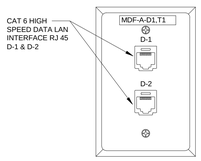
A.F.F.	ABOVE FINISHED FLOOR	P.C.	PLUMBING CONTRACTOR
A.F.G.	ABOVE FINISHED GRADE	M.H.	MOUNTING HEIGHT
APC	ANGLE POLISHED CONNECTOR	W.P.	WEATHER PROOF
ARCH.	ARCHITECT	U.N.O.	UNLESS NOTED OTHERWISE
A.T.C.	AUTO-TEMP CONTROL CONTRACTOR	WG	WIRE GUARD
℄	CENTERLINE	CATV	CABLE TELEVISION
CLG.	CEILING	DH	DOOR HOLDER
E.C.	ELECTRICAL CONTRACTOR	F.A.C.P.	FIRE ALARM CONTROL PANEL
F&I	FURNISHED AND INSTALLED	PAC	PUBLIC ACCESS COMPUTER
F.P.C.	FIRE PROTECTION CONTRACTOR	MAC	MACINTOSH COMPUTER
G.C.	GENERAL CONTRACTOR	I.T.	INFORMATION TECHNOLOGY
H.V.A.C.	HEATING, VENTILATION, AND AIR CONDITIONING CONTRACTOR	IESS	INTEGRATED ELECTRONIC SECURITY SYSTEM INTEGRATOR



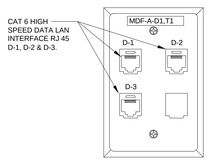
G3 TYPICAL WALL MTD VOICE/DATA OUTLET (W) DETAIL
SCALE: NTS



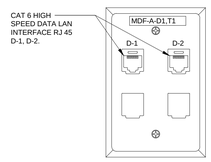
G4 TYPICAL DATA OUTLET (▽) DETAIL
SCALE: NTS



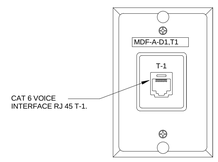
G5 TYPICAL DATA OUTLET (2▽) DETAIL
SCALE: NTS



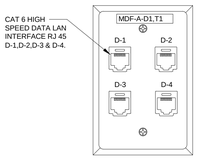
G6 TYPICAL DATA OUTLET (3▽) DETAIL
SCALE: NTS



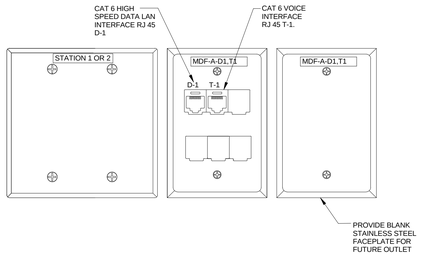
G7 TYPICAL CABLE/DATA JACK OUTLET (TVC) DETAIL
SCALE: NTS



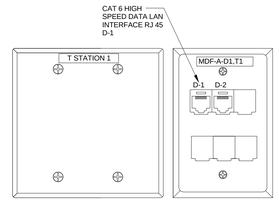
G9 TYPICAL WALL PHONE OUTLET (W▼) DETAIL
SCALE: NTS



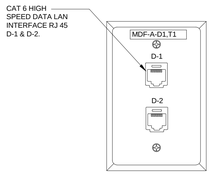
E3 TYPICAL DATA OUTLET (4▽) DETAIL
SCALE: NTS



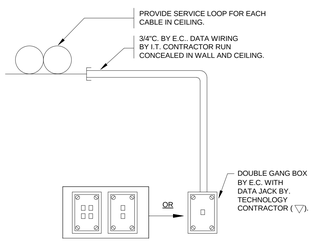
E5 TYPICAL TEACHER STATION OUTLET(T▼) DETAIL
SCALE: NTS



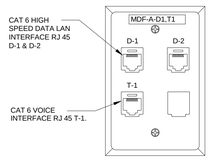
E7 LCD PROJECTOR JACK OUTLET(TVE) DETAIL
SCALE: NTS



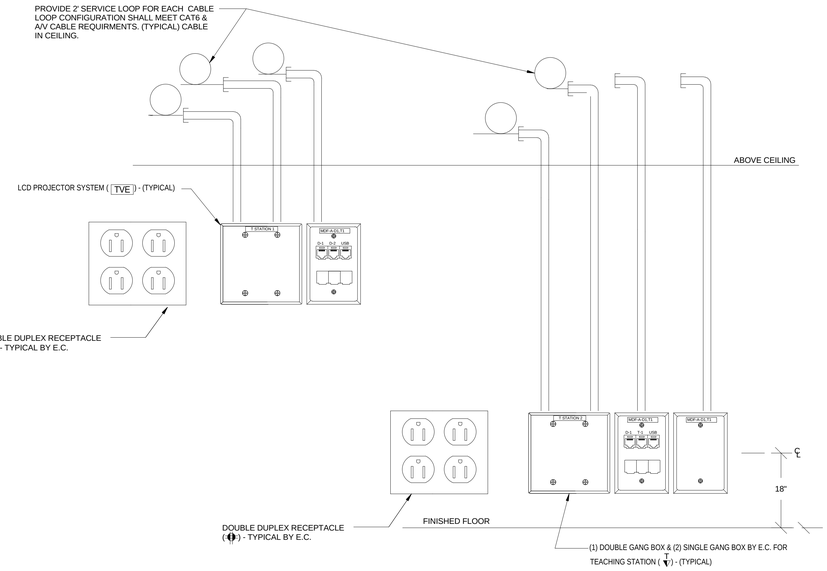
E9 TYPICAL OUTLET (AN▽) DETAIL
SCALE: NTS



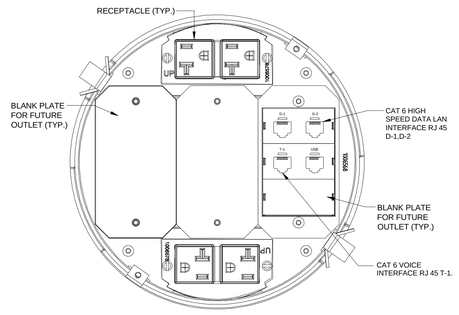
D3 DATA OUTLET DETAIL
SCALE: NTS



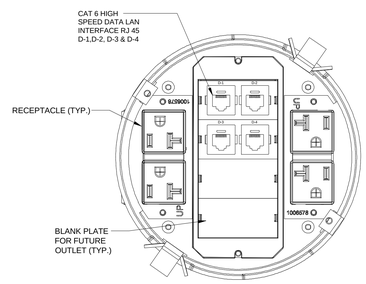
D5 TYPICAL DATA OUTLET (1V/2D▼) DETAIL
SCALE: NTS



B8 TYPICAL TEACHER STATION JACK OUTLET(T▽ TVE) DETAIL
SCALE: NTS



B3 TYPICAL 8" POKE THRU DATA & VOICE OUTLET (T▼) DETAIL
SCALE: NTS



B5 TYPICAL 6"POKE THRU DATA & VOICE OUTLET (2▽, 4▽) DETAIL
SCALE: NTS

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Dover, NH
TECHNOLOGY SYMBOL LIST

SCALE:
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GENERAL TECHNOLOGY NOTES:

1. COMMUNICATIONS OUTLETS ARE SHOWN FOR REFERENCE PURPOSES. EXACT LOCATIONS WILL BE AS SHOWN ON ELECTRICAL DRAWINGS. COORDINATE INSTALLATION OF ALL CABLING WITH ELECTRICAL SUBCONTRACTOR.
2. KEEP COMMUNICATIONS CABLING AT LEAST 12" AWAY FROM POWER WIRING.
3. ALL CONDUITS AND JUNCTION BOXES TO BE PROVIDED UNDER DIVISION 260000. CONDUITS SHOWN ARE FOR REFERENCE ONLY.

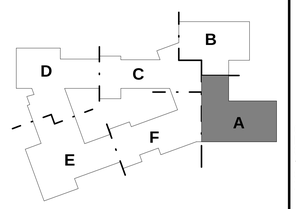
1 T1.0A GROUND FLOOR PLAN PART A - TECHNOLOGY
SCALE: 1/8" = 1'-0"

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GROUND FLOOR PLAN PART A - TECHNOLOGY
SCALE: As indicated DRAWN BY: VNK CHECKED BY: DMP

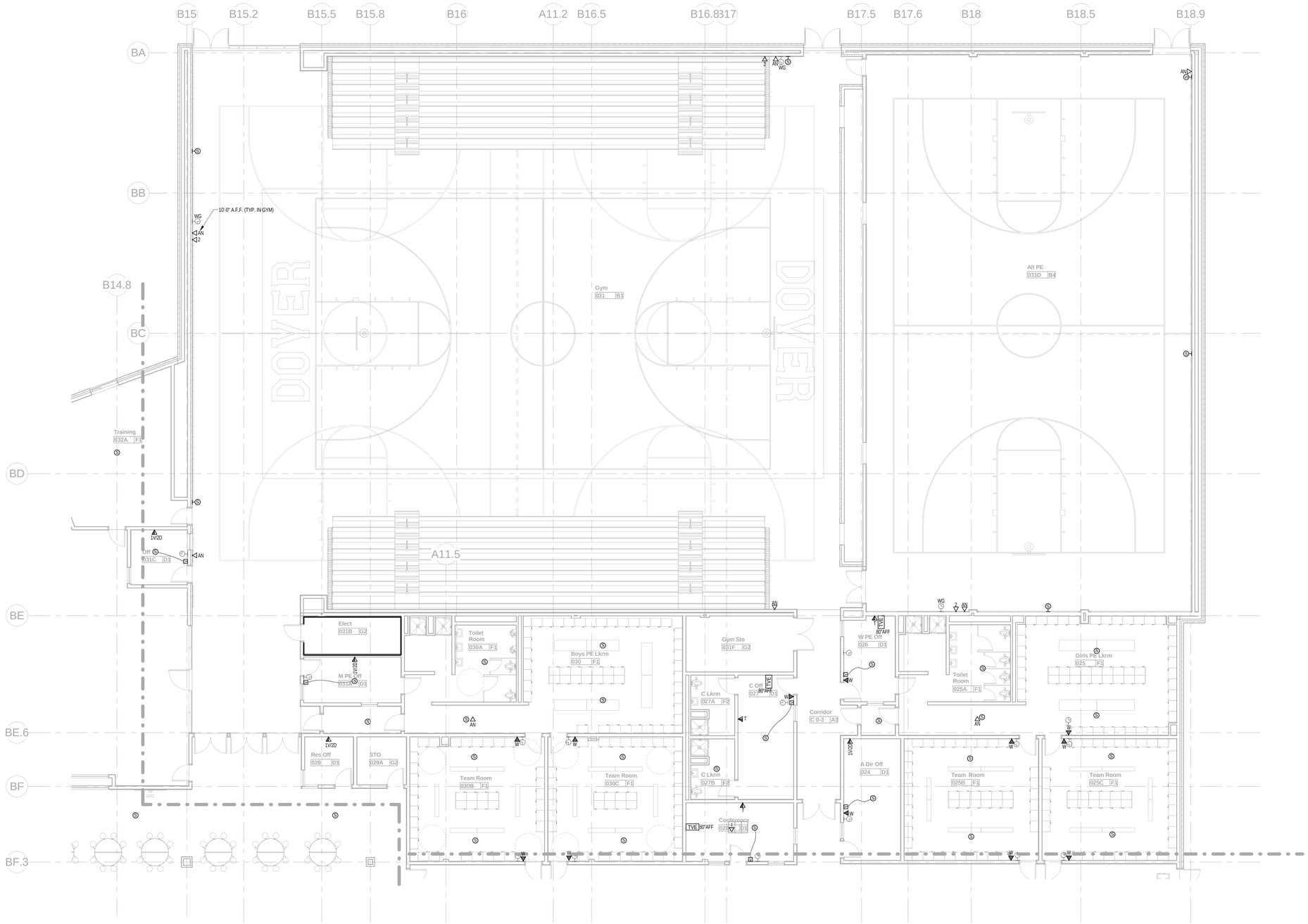
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1 / T1.0B GROUND FLOOR PLAN PART B - TECHNOLOGY
SCALE: 1/8" = 1'-0"

GENERAL TECHNOLOGY NOTES:

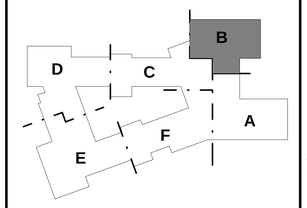
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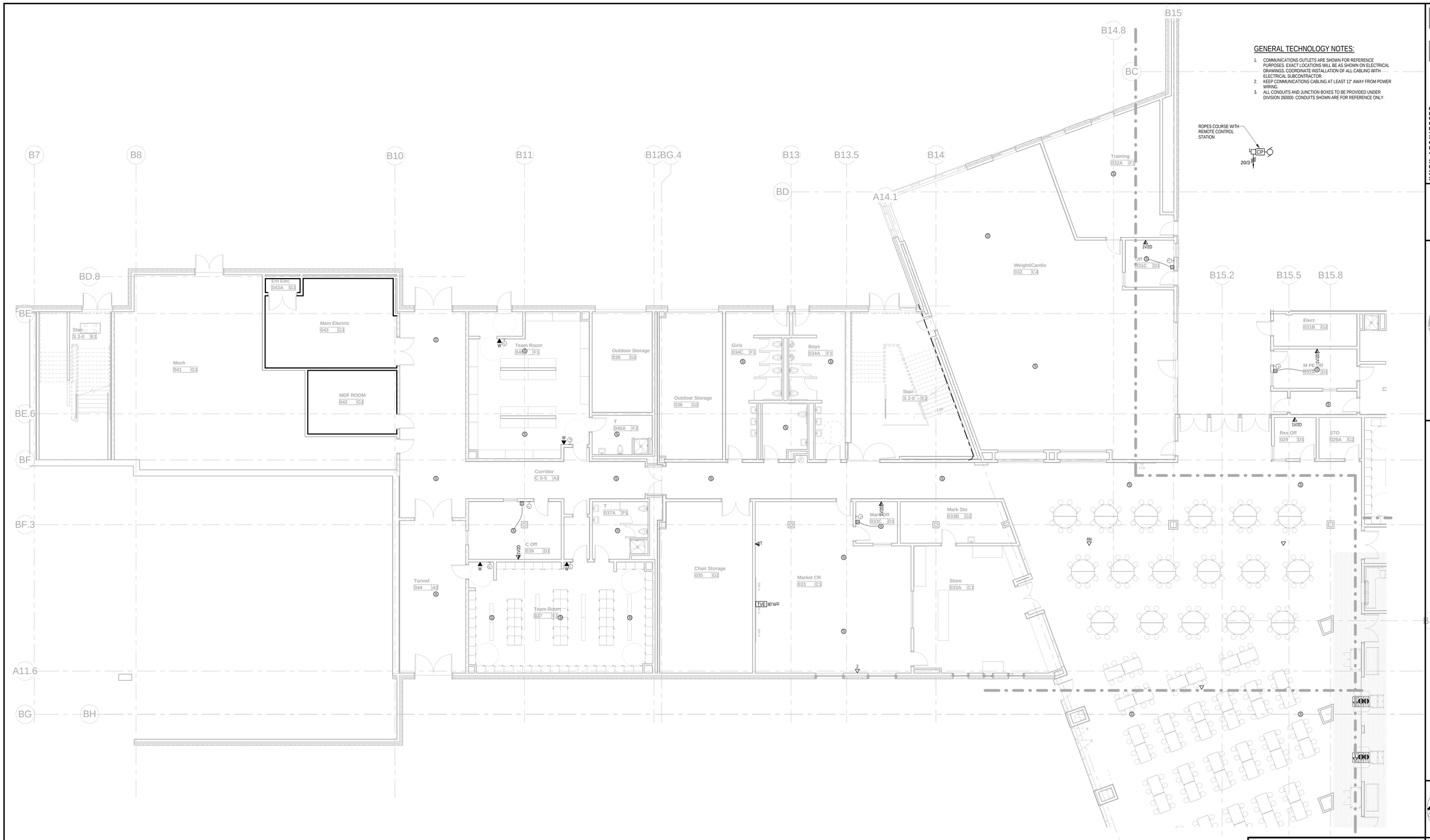
Dover HS / CTC
Dover, NH
GROUND FLOOR PLAN PART B - TECHNOLOGY
SCALE: As indicated DRAWN BY: VNK CHECKED BY: DMP

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T1.0B

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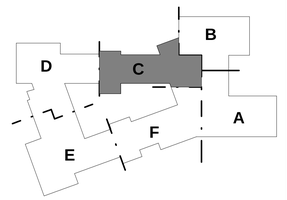


GENERAL TECHNOLOGY NOTES:

1. COMMUNICATIONS OUTLETS ARE SHOWN FOR REFERENCE PURPOSES. EXACT LOCATIONS WILL BE AS SHOWN ON ELECTRICAL DRAWINGS. COORDINATE INSTALLATION OF ALL CABLING WITH ELECTRICAL SUBCONTRACTOR.
2. KEEP COMMUNICATIONS CABLING AT LEAST 12" AWAY FROM POWER WIRING.
3. ALL CONDUITS AND JUNCTION BOXES TO BE PROVIDED UNDER DIVISION 260000. CONDUITS SHOWN ARE FOR REFERENCE ONLY.

1 / T1.0C GROUND FLOOR PLAN PART C - TECHNOLOGY
SCALE: 1/8" = 1'-0"

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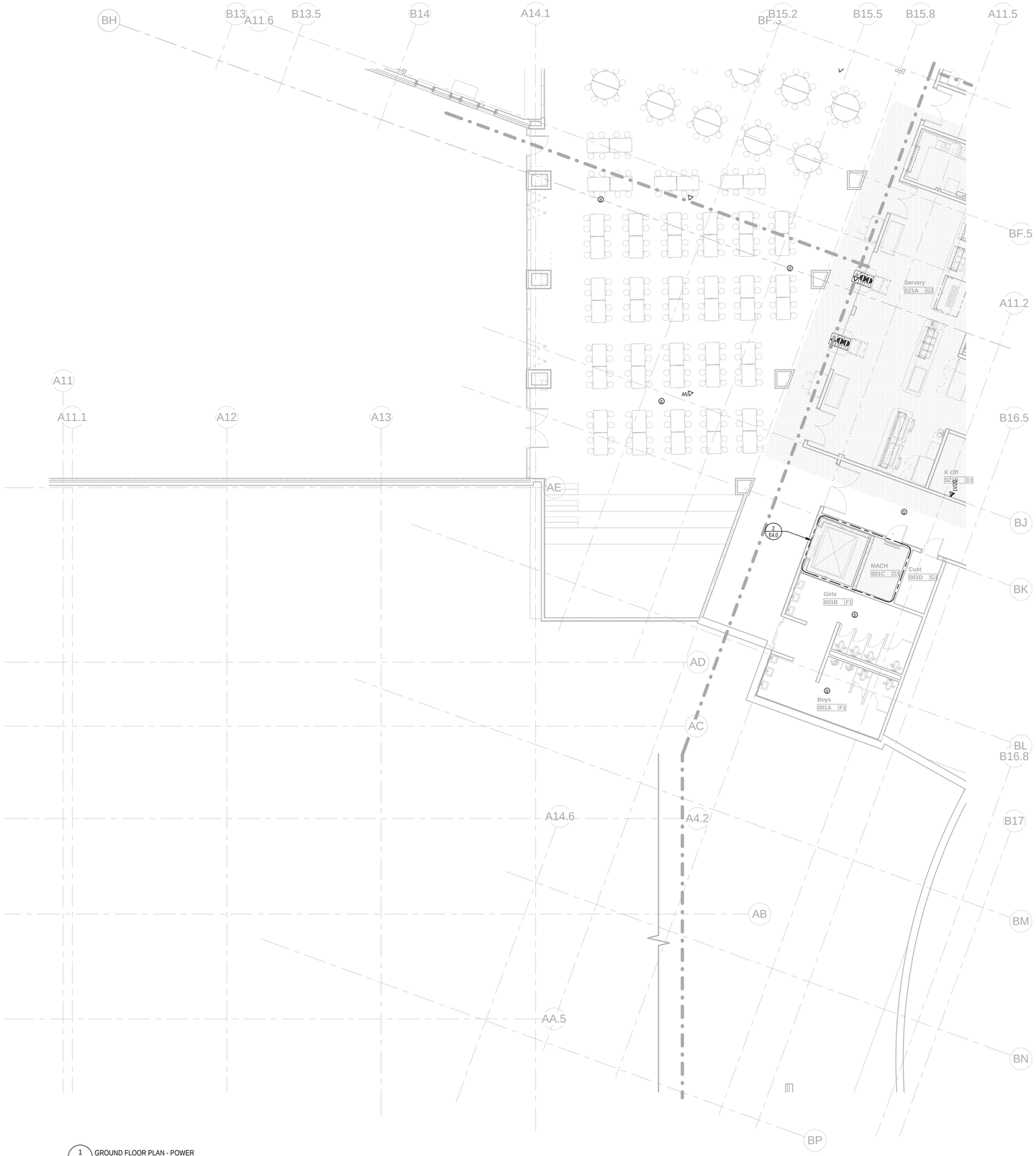
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1 T1.0F GROUND FLOOR PLAN - POWER
SCALE: 1/8" = 1'-0"

GENERAL TECHNOLOGY NOTES:

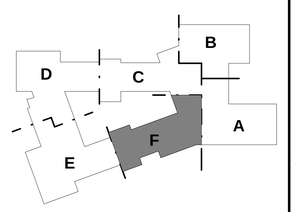
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GROUND FLOOR PLAN PART F - TECHNOLOGY
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B15.8 A11.5 A11.2 B16.5 B16.8 317 B17.5 B17.6 B18 B18.5 B18.9

BF BF.3 A11.6 BH BF.5 B18.4 B18.6 B19.6 B20 B18.7 B21 BJ BK BL BM BN BP AD AC A4.2 AB AA.5

Lab.
106A C1
1069 SF

Dining
105B C1
849 SF

Culinary Kitchen
105A G3
2726 SF

OFF
105C D1
118 SF

Dry Storage
105D G3
89 SF

Elev.
226G
94 SF

Girls
104B F1
226 SF

Boys
104A F1
219 SF

Box Office
103B G2
171 SF

Light Lock
V 1-1 B3
184 SF

Corridor
C 1-1 A2
5091 SF

Sound
103A G2
108 SF

Stair
S 1-1 E1
424 SF

Vestibule
V 1-1 A3
257 SF

Auditorium
103 B3
11783 SF

Stage
003A B2
3045 SF

1V/2D

AN

1 T1.1A FIRST FLOOR PLAN PART A - TECHNOLOGY
SCALE: 1/8" = 1'-0"

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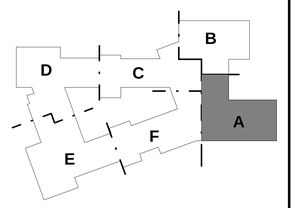
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PLAN NORTH
TRUE NORTH

KEYPLAN



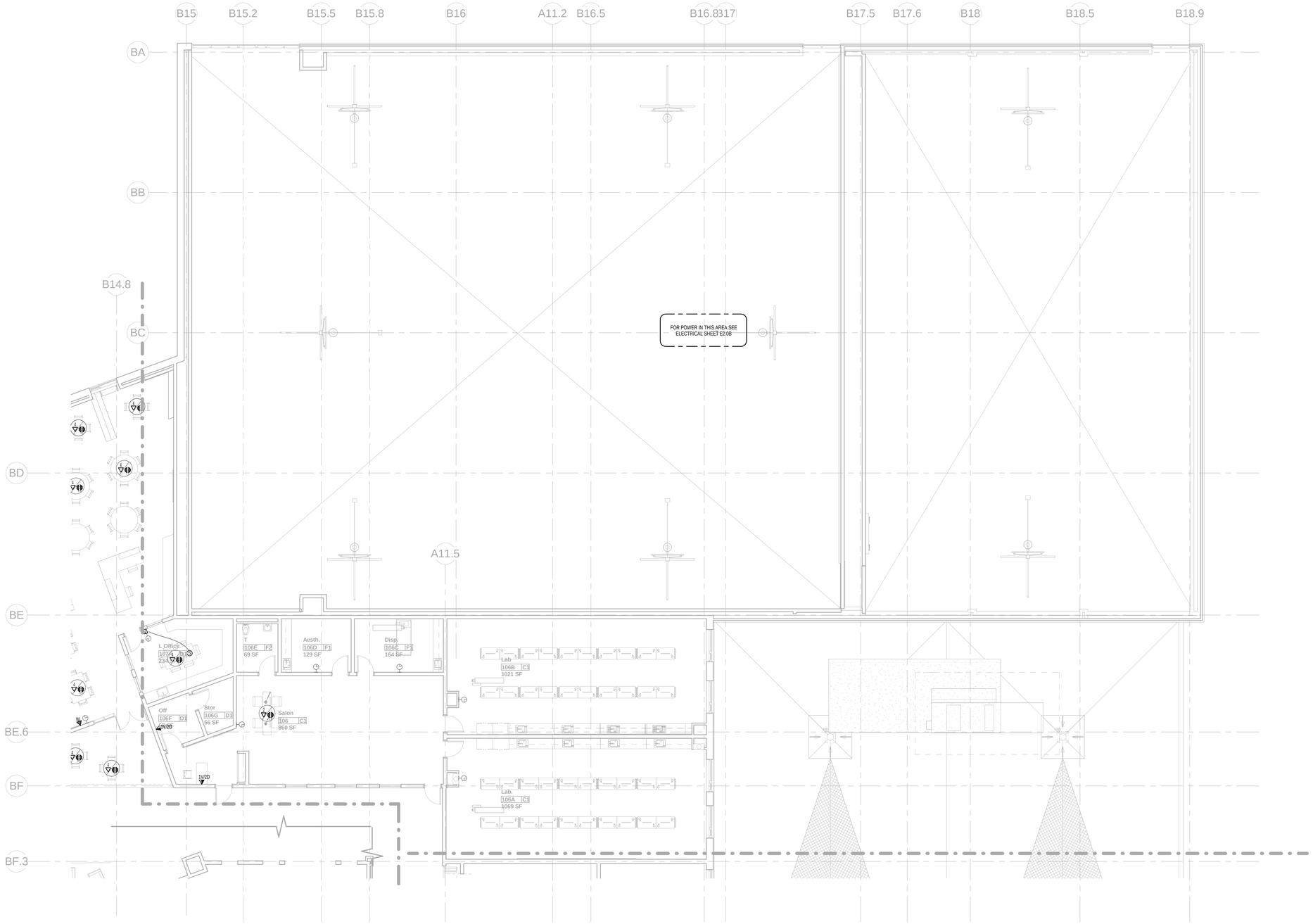
Dover HS / CTC
Dover, NH
FIRST FLOOR PLAN PART A - TECHNOLOGY
SCALE: As indicated DRAWN BY: WNK CHECKED BY: DMP

REVISIONS NO.	DATE	REMARKS	BY

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T1.1A

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1 / T1.1B FIRST FLOOR PLAN PART B - TECHNOLOGY
SCALE: 1/8" = 1'-0"

GENERAL TECHNOLOGY NOTES:

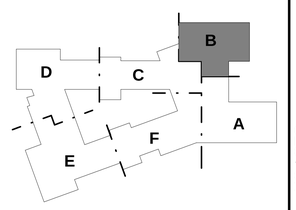
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Dover, NH
FIRST FLOOR PLAN PART B - TECHNOLOGY
SCALE: As indicated DRAWN BY: VINK CHECKED BY: DMP

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T1.1B

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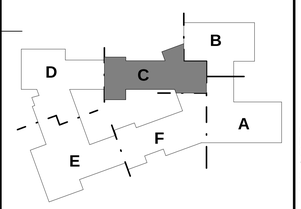
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OFF 117B D1 255 SF
NJROTC March 117 C1 1557 SF
NJROTC STOR 117A G2 443 SF
NJROTC CR 115 C1 858 SF
LKRM 113B G2 84 SF
LKRM 113A G1 83 SF
NJROTC CR 113 C1 673 SF
CR 111 C1 882 SF
ELEC 109B C1 125 SF
DATA 109A G1 169 SF
Stair S 2-1 E1 666 SF
Corridor C 3-1 A4 5421 SF
Library 107 C1 2692 SF
Conference 107B D1 148 SF
L Office 107A D1 234 SF
T 106E F2 69 SF
Aesth. 106D F1 129 SF
Disp. 106C F1 164 SF
Off 106F D1 56 SF
Stor 106G D1 56 SF
Salon 106 C1 960 SF
TEST 114 C1 324 SF
PAX 110 C1 316 SF
Off 108L D1 120 SF
Guid Off 6 108G D1 150 SF
Guid Conf 108C D1 227 SF
Guidance 108 D1 720 SF
Stor 108K G2 56 SF
SPED Resources 112 D1 1156 SF
Guid Off 5 108J D1 179 SF
Guid Off 4 108H D1 154 SF
Guid Off 3 108F D1 157 SF
Guid Off 2 108D D1 154 SF
Guid Off 1 108B D1 154 SF
Guid Dir 105 D1 202 SF
Speech 116A C1 113 SF
Living Room 116B C1 140 SF
Life Skills 116 C1 1136 SF
Dir. Office 112A D1 157 SF
Conf 112B D1 252 SF
Bedroom 116C D1 139 SF

1 T1.1C FIRST FLOOR PLAN PART C - TECHNOLOGY
SCALE: 1/8" = 1'-0"

KEYPLAN



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FIRST FLOOR PLAN PART C - TECHNOLOGY
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GENERAL TECHNOLOGY NOTES:

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REFER TO BUILDING CONSTRUCTION EQUIPMENT SCHEDULE, 1/E3.5, FOR ADDITIONAL REQUIREMENTS

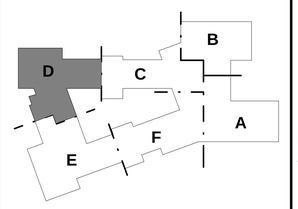
REFER TO WOOD WORKING EQUIPMENT SCHEDULE, 4/E3.8, FOR ADDITIONAL REQUIREMENTS

REFER TO ELECTRICAL TECHNOLOGIES EQUIPMENT SCHEDULE, 5/E3.8, FOR ADDITIONAL REQUIREMENTS

Storage 125D D1 412 SF
Wood Work Lab 125C C3 1120 SF
Building Const 126C C3 3703 SF
BC Off 126B D1 77 SF
BC Entry 126A D1 45 SF
WW Off 125B D1 77 SF
BC Entry 125A D1 45 SF
Building Const CR 126 C2 769 SF
Wood Work CR 125 C2 762 SF
CR 123 C1 852 SF
CR 121 C1 853 SF
CR 119 C1 853 SF
Stair S 3-1 E1 524 SF
Electrical Tech 127 C3 2871 SF
Sto 127B G2 211 SF
Elec 124E G3 128 SF
T 124A F2 60 SF
Cust 124B G3 52 SF
Data 124F G3 57 SF
Toys 124D F1 226 SF
Girls 124C F1 226 SF
Cust CL 124G G3 85 SF
CR 122 C1 852 SF
CR 120 C1 854 SF
Teacher Planning 118 D2 747 SF
Sm Grp 118A 116 SF
LC LC 1-1 A2 998 SF
Speech 116A C3 113 SF
Media Arts LC LC 1-2 A2 1055 SF
STAIR S 4-1 E1 633 SF
Sculpture 129 C2 1153 SF
Kiln 129A 105 SF
Kiln 129B G2 80 SF
Art Sto 128A G2 191 SF
Jewelry 131 C2 1120 SF
Physics 133 C1 1218 SF
Media 128 C2 1173 SF
Sp Booth 134 G3 39 SF
DK RM 130B G2 156 SF
Art Sto 128A G2 241 SF
Photography 130 C2 1174 SF

1 T1.1D FIRST FLOOR PLAN PART D - TECHNOLOGY
SCALE: 1/8" = 1'-0"

KEYPLAN



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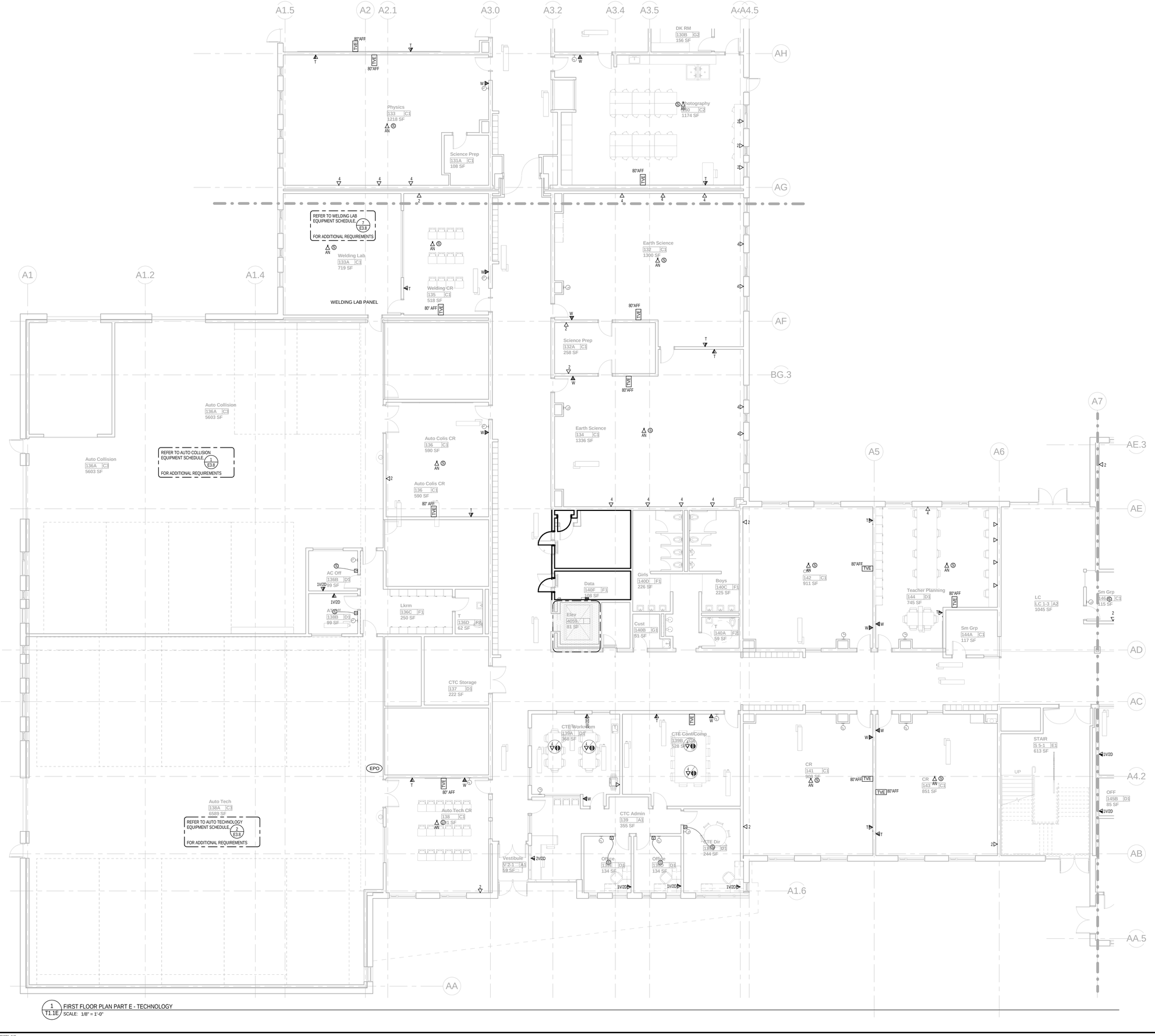
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Dover, NH
FIRST FLOOR PLAN PART D - TECHNOLOGY
SCALE: As indicated
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1 FIRST FLOOR PLAN PART E - TECHNOLOGY
T1.1E SCALE: 1/8" = 1'-0"

GENERAL TECHNOLOGY NOTES:

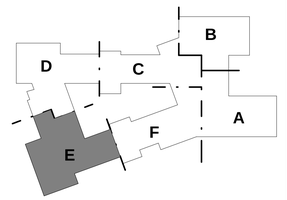
1. COMMUNICATIONS OUTLETS ARE SHOWN FOR REFERENCE PURPOSES. EXACT LOCATIONS WILL BE AS SHOWN ON ELECTRICAL DRAWINGS. COORDINATE INSTALLATION OF ALL CABLING WITH ELECTRICAL SUBCONTRACTOR.
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GENERAL TECHNOLOGY NOTES:

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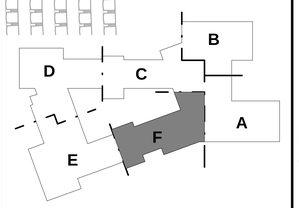
1 T1.1F FIRST FLOOR PLAN PART F - TECHNOLOGY
SCALE: 1/8" = 1'-0"

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FIRST FLOOR PLAN PART F - TECHNOLOGY
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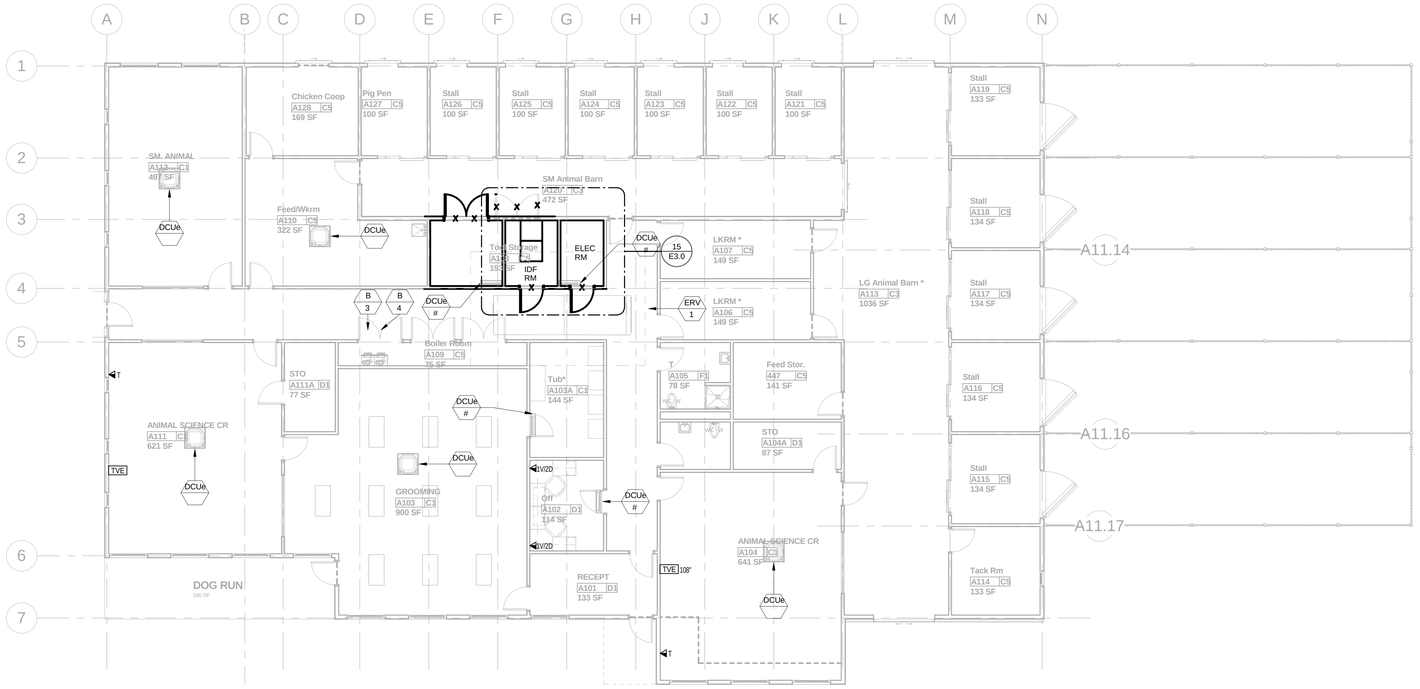
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JOB NUMBER 403114

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1 T1.1G FIRST FLOOR PLAN ANIMAL SCIENCE - TECHNOLOGY
SCALE: 1/8" = 1'-0"

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ANIMAL SCIENCE FLOOR PLAN - TECHNOLOGY
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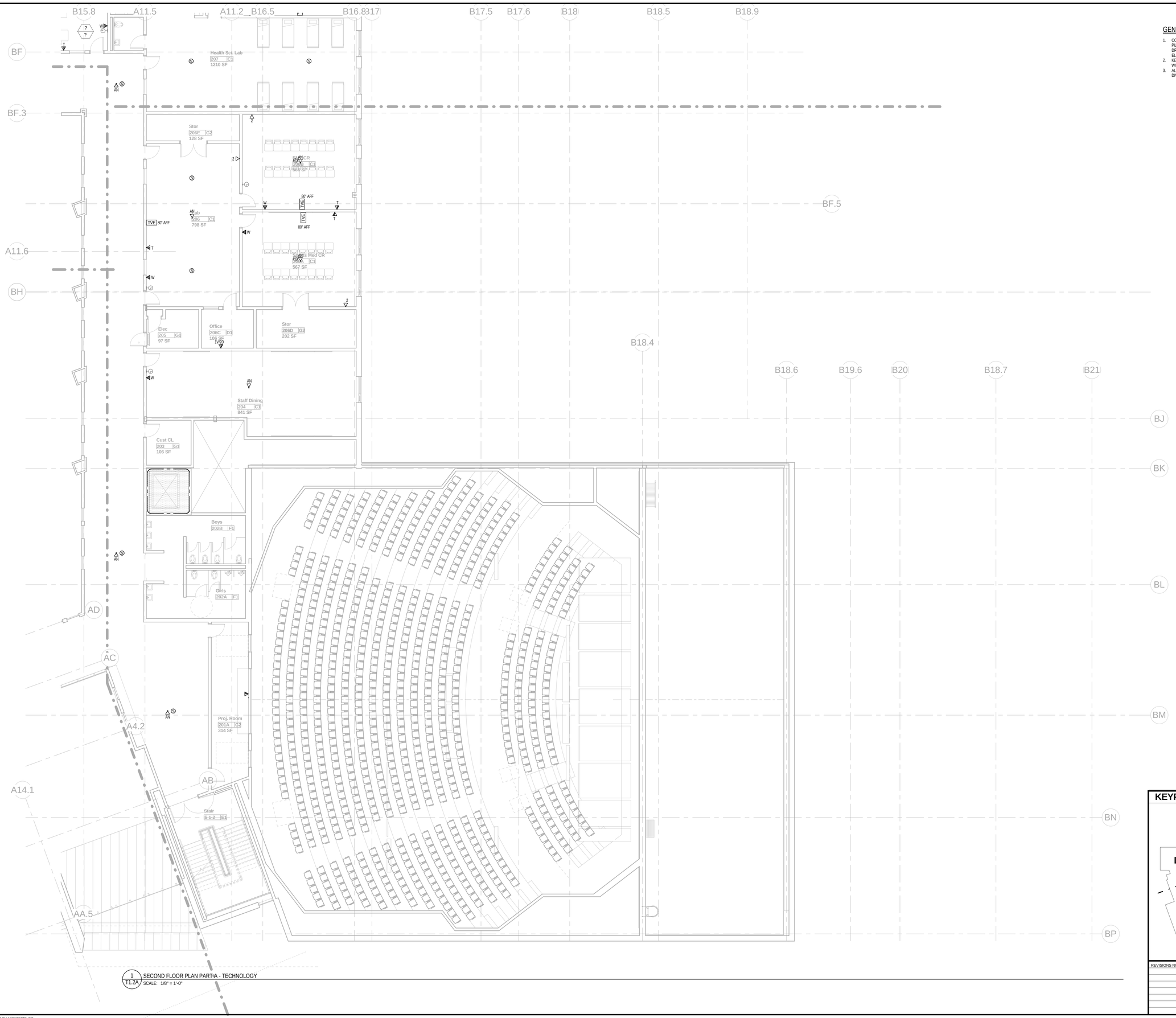
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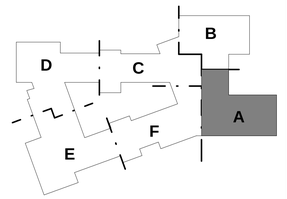
1 T1.2A SECOND FLOOR PLAN PART A - TECHNOLOGY
SCALE: 1/8" = 1'-0"

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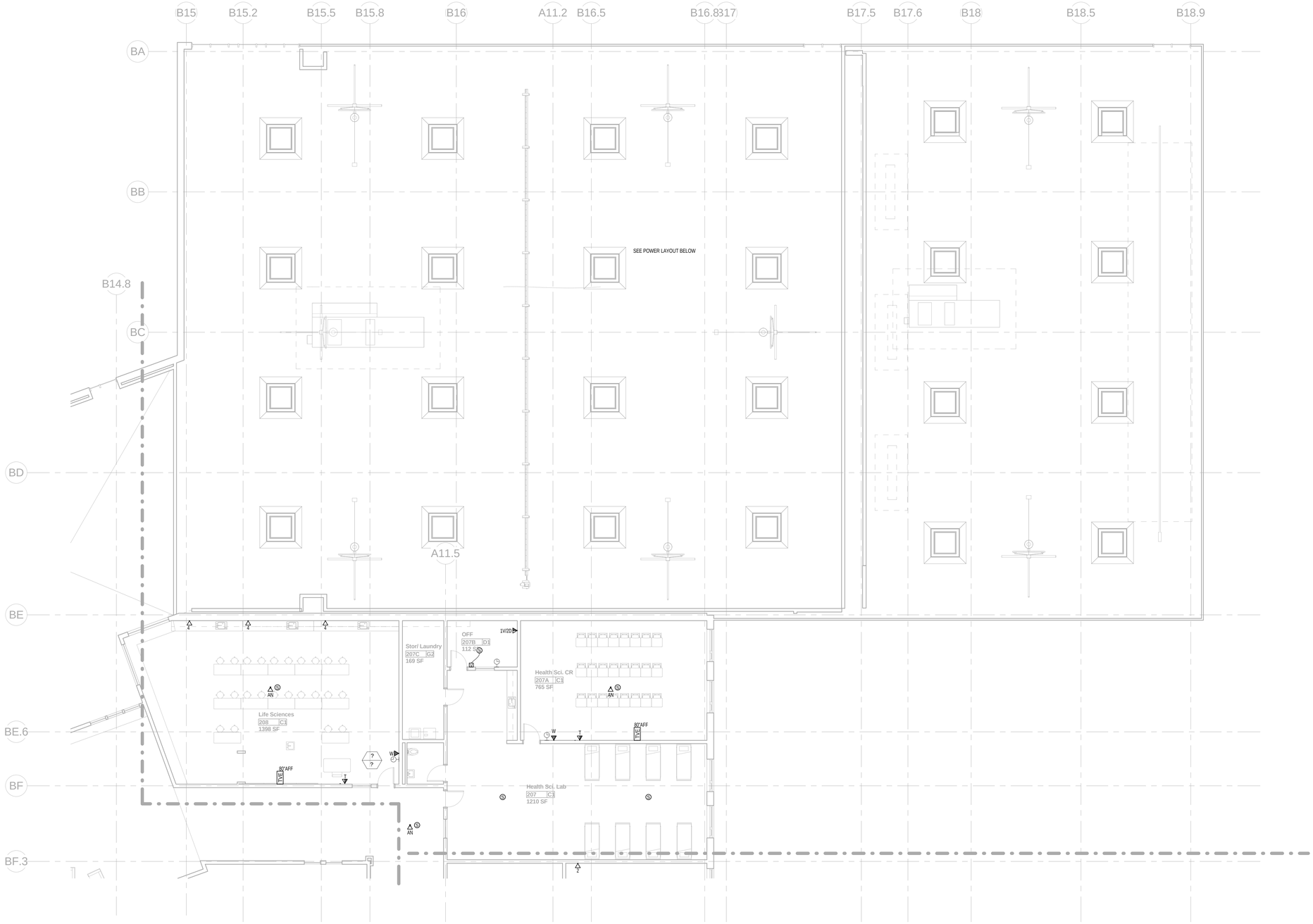
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Dover, NH
SECOND FLOOR PLAN PART A - TECHNOLOGY
SCALE: As Indicated DRAWN BY: VHK CHECKED BY: DMP

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JOB NUMBER 403114

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1 T1.2B SECOND FLOOR PLAN PART B - TECHNOLOGY
SCALE: 1/8" = 1'-0"

GENERAL TECHNOLOGY NOTES:

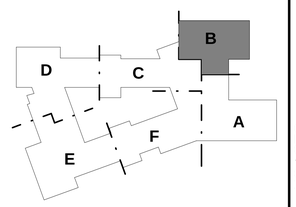
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SECOND FLOOR PLAN PART B - TECHNOLOGY
SCALE: As indicated
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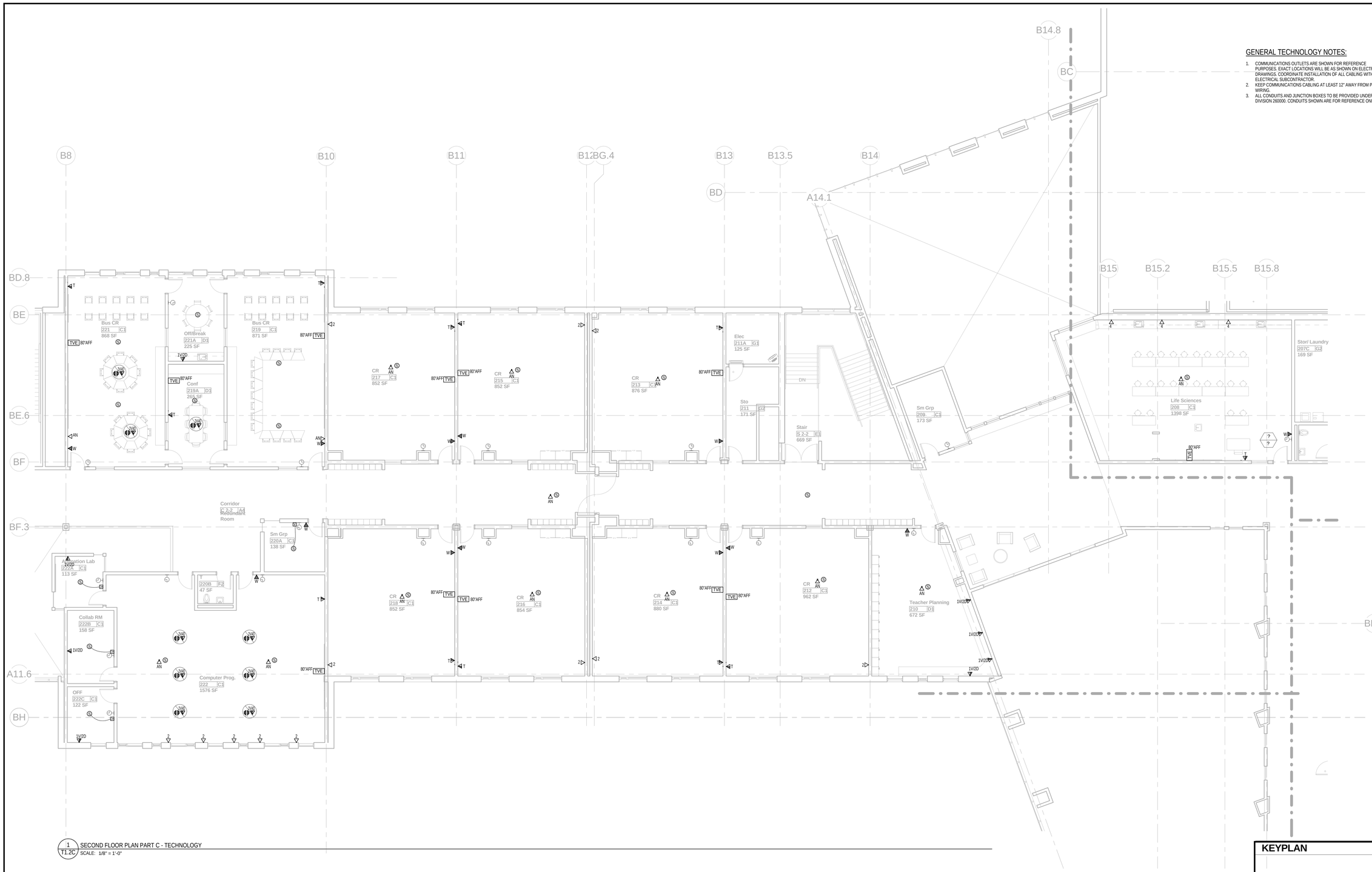
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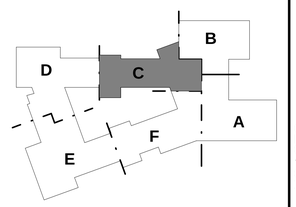
GENERAL TECHNOLOGY NOTES:

1. COMMUNICATIONS OUTLETS ARE SHOWN FOR REFERENCE PURPOSES. EXACT LOCATIONS WILL BE AS SHOWN ON ELECTRICAL DRAWINGS. COORDINATE INSTALLATION OF ALL CABLING WITH ELECTRICAL SUBCONTRACTOR.
2. KEEP COMMUNICATIONS CABLING AT LEAST 12" AWAY FROM POWER WIRING.
3. ALL CONDUITS AND JUNCTION BOXES TO BE PROVIDED UNDER DIVISION 260000. CONDUITS SHOWN ARE FOR REFERENCE ONLY.



1 T1.2C SECOND FLOOR PLAN PART C - TECHNOLOGY
SCALE: 1/8" = 1'-0"

KEYPLAN



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GENERAL TECHNOLOGY NOTES:

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Science Prep 231A C3 245 SF
Physical Science 232 C3 1230 SF
Physical Science 231 C3 1237 SF
Corridor LC 2.1 A4 7187 SF
Corridor LC 2.1 A4 7187 SF
Teacher Planning 229 C3 469 SF
CR 227 C3 856 SF
CR 225 C3 854 SF
CR 223 C3 854 SF
Stair S 3-2 E1 526 SF
Prep 234C G2 276 SF
Sm Grp 233 A4 196 SF
Bio MED 234 C3 1522 SF
Clean Room 234B C3 267 SF
Clean Room 234A C3 110 SF
Chem Sto 234D C3 206 SF
T 230E G2 60 SF
C 230C G3 52 SF
Elec 230E G3
Cust 230F G3 57 SF
Boys 230D F1 226 SF
Girls 230C F1 226 SF
CR 228 C3 852 SF
CR 226 C3 854 SF
CR 224 C3 855 SF
Addition Lab 222A C3 113 SF
OFF 222C C3 122 SF
Stair S 4-2 E1 634 SF
Biology 235 C3 1253 SF
Science Prep 235A C3 222 SF
Corridor 237B A4 Redundant Room
Biology 237 C3 1225 SF
Biology 239 C3 1221 SF
Chemistry 236 C3 1345 SF
Science Prep 236A C3 258 SF
Chemistry 238 C3 1343 SF

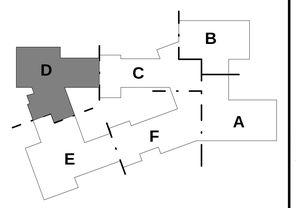
1 T1.2D SECOND FLOOR PLAN PART D - TECHNOLOGY
SCALE: 1/8" = 1'-0"

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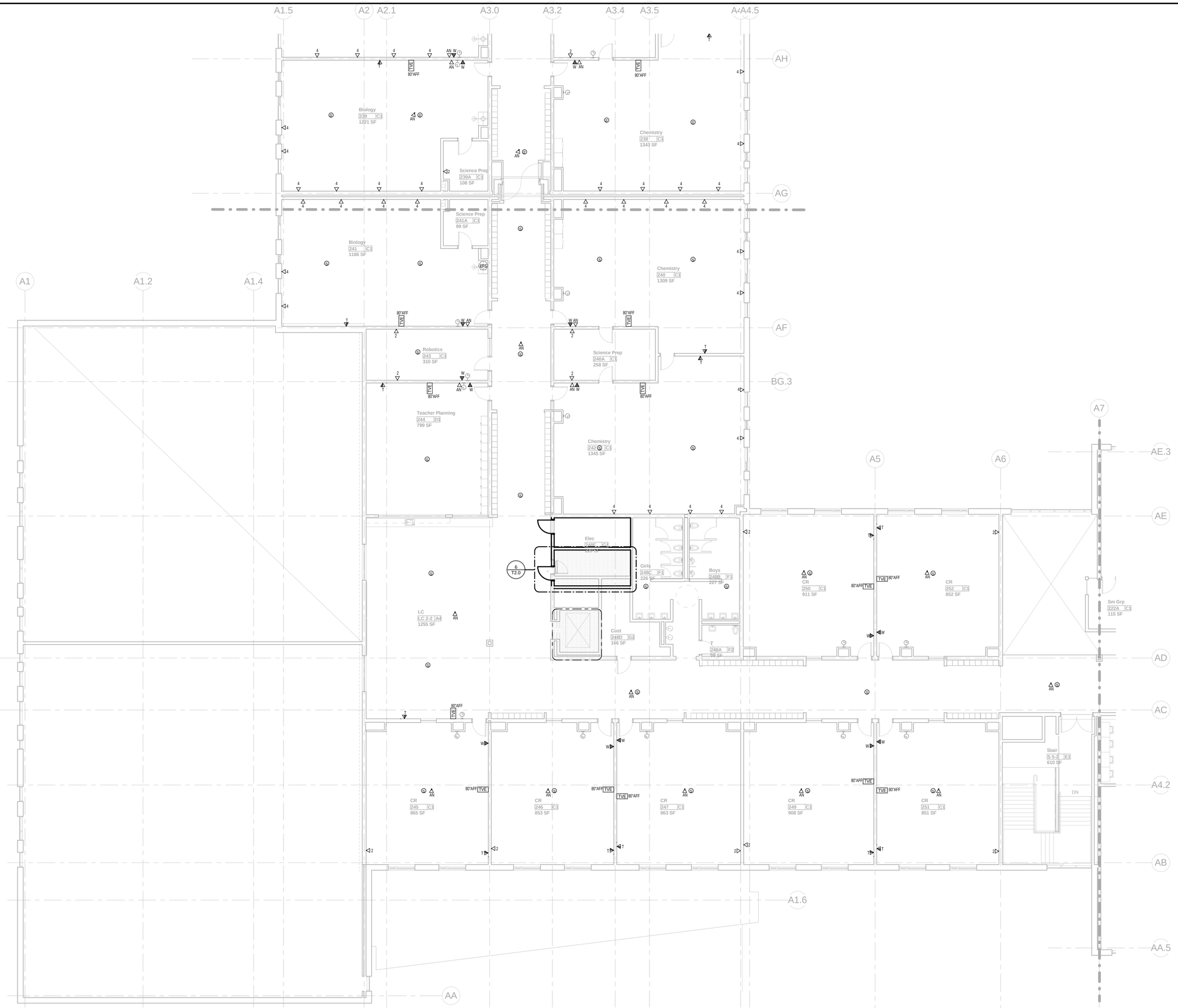
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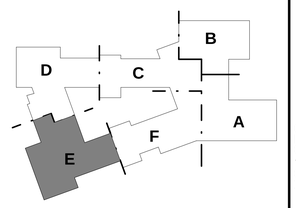
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1 T1.2E SECOND FLOOR PLAN PART E - TECHNOLOGY
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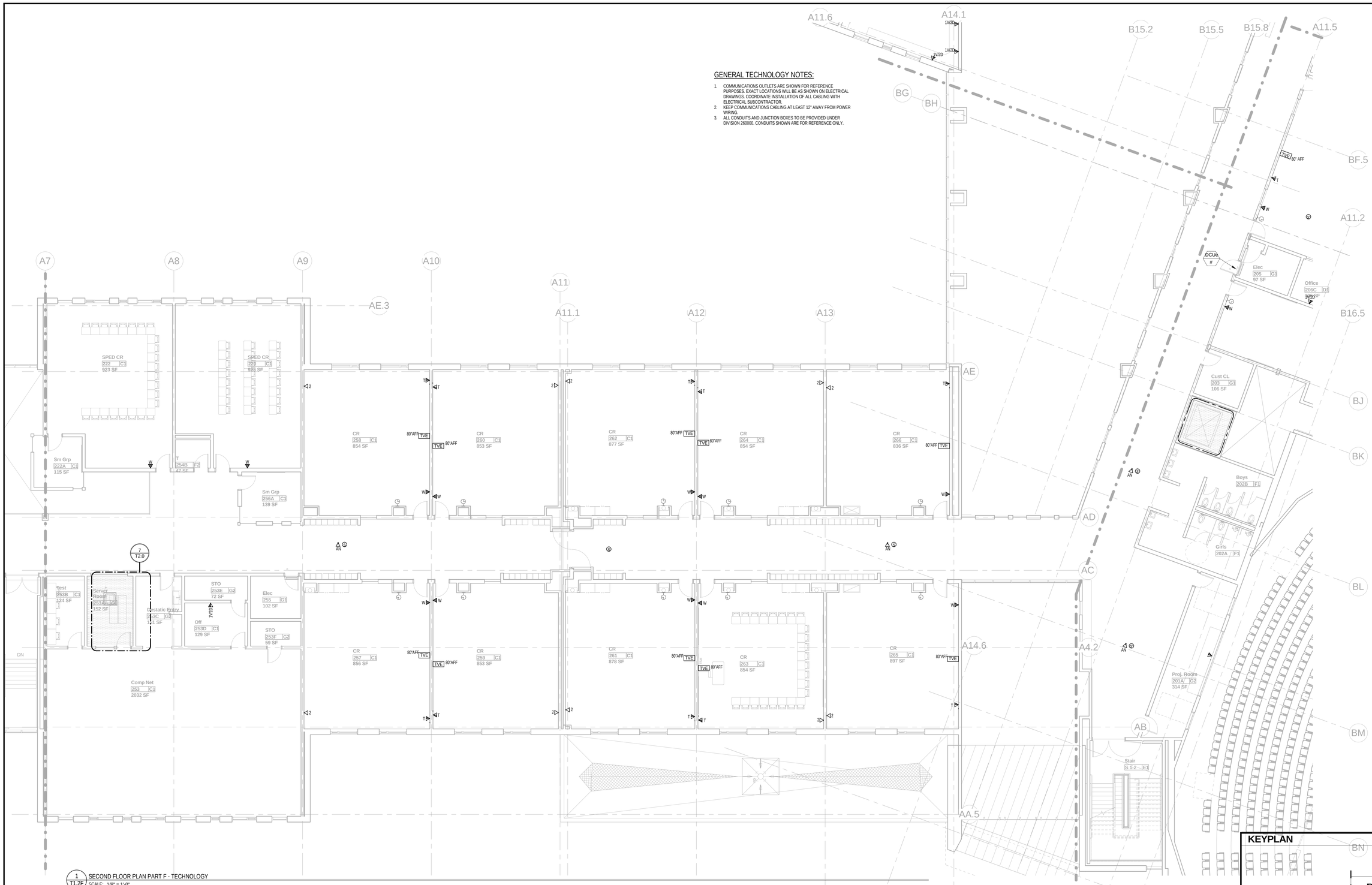
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GENERAL TECHNOLOGY NOTES:

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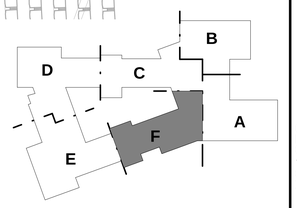
1 T1.2F SECOND FLOOR PLAN PART F - TECHNOLOGY
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AUDIOVISUAL DEVICE KEY

DEVICE	DESCRIPTION	BACK BOX DESCRIPTION	MOUNTING HEIGHT ADVISE	COMMENTS
AL				
AV	AUDIO CONNECTION PANEL	TWO GANG ELECTRICAL BOX	PROJECT RECEPTACLE HEIGHT	
BCP	BLEACHER CONNECTION PANEL	TWO GANG ELECTRICAL BOX	PROJECT RECEPTACLE HEIGHT	
CA	CAMERA CONNECTION PANEL	TWO GANG ELECTRICAL BOX	PER ARCHITECT	
CC	CENTER CLUSTER LOUDSPEAKER WIRING	4"X4"X4" ELECTRICAL BOX	ABOVE LOUDSPEAKER LOCATION	
CT1	CABLE TRAY	N/A	ABOVE MAIN AUDITORIUM EQUIPMENT RACKS	
D	DELAY LOUDSPEAKER WIRING	4"X4"X4" ELECTRICAL BOX	ABOVE LOUDSPEAKER LOCATION	
DC	DIMMER CONTROL WIRING	ONE GANG ELECTRICAL BOX	IN BACKPAN OF EQUIPMENT RACK	
FB1	FLOOR BOX - LARGE	6" DEEP		
FB2	FLOOR BOX - MEDIUM	6" DEEP		
FF	FRONT FILL LOUDSPEAKER	FRAMED CAVITY IN WALL, NO BACK BOX	PER ARCHITECT	STUB CONDUIT INTO CAVITY
I	INTERCOM CONNECTION PANEL	ONE GANG ELECTRICAL BOX	PROJECT RECEPTACLE HEIGHT	
IS	PRODUCTION INTERCOM SPEAKER STATION	THREE OR FOUR GANG ELECTRICAL BOX	PROJECT SWITCH HEIGHT	
JB1	JUNCTION BOX FOR RACK WIRING	AS REQUIRED	ABOVE EQUIPMENT RACK	STAGE EQUIPMENT RACK
JB2	JUNCTION BOX FOR RACK WIRING	AS REQUIRED	ABOVE EQUIPMENT RACK	SOUND BOOTH EQUIPMENT RACK
JB3	JUNCTION BOX FOR RACK WIRING	AS REQUIRED	ABOVE EQUIPMENT RACK	GYM EQUIPMENT RACK
JB4	JUNCTION BOX FOR RACK WIRING	AS REQUIRED	ABOVE EQUIPMENT RACK	WEIGHT/CARDIO EQUIPMENT RACK
L	LINE OUTPUT PANEL	ONE GANG ELECTRICAL BOX	PROJECT RECEPTACLE HEIGHT	
L2	LINE OUTPUT PANEL	TWO GANG ELECTRICAL BOX	PROJECT RECEPTACLE HEIGHT	
LG	LOUDSPEAKER WIRING DEVICE	4" X 4" X 4" SURFACE MOUNT BOX	ABOVE LOUDSPEAKER LOCATION	
M	MICROPHONE CONNECTION PANEL	ONE GANG ELECTRICAL BOX	PROJECT RECEPTACLE HEIGHT	
M2	MICROPHONE CONNECTION PANEL - DUAL	ONE GANG ELECTRICAL BOX	PROJECT RECEPTACLE HEIGHT	
M4	MICROPHONE CONNECTION PANEL	TWO GANG ELECTRICAL BOX	PROJECT RECEPTACLE HEIGHT	
MM	MONITOR MICROPHONE CONNECTION PANEL	ONE GANG ELECTRICAL BOX	ABOVE MICROPHONE LOCATION	
MX	MIX POSITION CONNECTION PANEL	12x12x6 WALL BOX	PROJECT RECEPTACLE HEIGHT	
MXP	PROJECTION ROOM CONNECTION PANEL	8" X 8" X 4" WALL BOX	PROJECT RECEPTACLE HEIGHT	
OR	ORCHESTRA CONNECTION BOX	12x12x6 WALL BOX	PROJECT RECEPTACLE HEIGHT	
PF	PRESS FEED PANEL	ONE GANG ELECTRICAL BOX	PROJECT RECEPTACLE HEIGHT	
PL	PROGRAM LOUDSPEAKER	ONE GANG ELECTRICAL BOX	BEHIND LOUDSPEAKER	LOUDSPEAKER HEIGHT AS INDICATED ON SECTION
PS	PROJECTION SCREEN CONTROL CONNECTION	ONE GANG ELECTRICAL BOX	MOUNT TO SCREEN CASE	
R	RECORDING MICROPHONE CONNECTION	ONE GANG ELECTRICAL BOX	FLUSH IN CEILING	
RC	EQUIPMENT RACK CONNECTION	THREE GANG ELECTRICAL BOX	PROJECT SWITCH HEIGHT	
S	CEILING LOUDSPEAKER, FLUSH	CEILING LOUDSPEAKER		
S6	LARGE CEILING LOUDSPEAKER, FLUSH	LOUDSPEAKER-SPECIFIC BACK BOX		
S9	LARGE CEILING LOUDSPEAKER, FLUSH	LOUDSPEAKER-SPECIFIC BACK BOX		
SB	CEILING SUBWOOFER LOUDSPEAKER, FLUSH	LOUDSPEAKER-SPECIFIC BACK BOX		
SP	STAGE CONNECTION PANEL	12" X 12" X 6" WALL BOX	PROJECT RECEPTACLE HEIGHT	
SW	CEILING LOUDSPEAKER, FLUSH	LOUDSPEAKER-SPECIFIC BACK BOX		
USP	UPSTAGE CONNECTION PANEL	12" X 12" X 6" WALL BOX	PROJECT RECEPTACLE HEIGHT	
V	CONNECTION PANEL - ONE GANG	ONE GANG ELECTRICAL BOX	PROJECT SWITCH HEIGHT	
VC	VOLUME CONTROL	ONE GANG ELECTRICAL BOX	PROJECT SWITCH HEIGHT	
VC2	VOLUME CONTROL - DUAL	TWO GANG ELECTRICAL BOX	PROJECT SWITCH HEIGHT	
VP	VIDEO PROJECTOR CONNECTION PANEL	TWO GANG ELECTRICAL BOX	AT OR ABOVE PROJECTOR LOCATION	
WA	ANTENNA	ONE GANG ELECTRICAL BOX		
WBG	WALL BOX, GYM	12x12x6 WALL BOX	PROJECT RECEPTACLE HEIGHT	

AUDIOVISUAL SHEET LIST

SHEET NUMBER	SHEET NAME
AV0.0	AUDIOVISUAL KEYS, NOTES AND SCHEDULES
AV0.1	AUDIOVISUAL CONDUIT RISERS
AV2.0A	AUDIOVISUAL DEVICE PLAN - GROUND LEVEL - PART A
AV2.0B	AUDIOVISUAL DEVICE PLAN - GROUND LEVEL - PART B
AV2.0C	AUDIOVISUAL DEVICE PLAN - GROUND LEVEL - PART C
AV2.1A	AUDIOVISUAL DEVICE PLAN - FIRST FLOOR - PART A
AV2.2A	AUDIOVISUAL DEVICE PLAN - SECOND FLOOR - PART A
AV3.0A	AUDIOVISUAL RCP - GROUND LEVEL - PART A
AV3.0B	AUDIOVISUAL RCP - GROUND FLOOR - PART B
AV3.0C	AUDIOVISUAL RCP - GROUND LEVEL - PART C
AV3.1A	AUDIOVISUAL RCP - FIRST FLOOR - PART A
AV3.2A	AUDIOVISUAL RCP - SECOND FLOOR - PART A
AV3.2B	AUDIOVISUAL RCP - SECOND FLOOR - PART B
AV4.1	AUDIOVISUAL - AUDITORIUM SECTIONS
AV4.2	AUDIOVISUAL - GYMNASIUM SECTIONS
AV5.1	AUDIOVISUAL FUNCTIONAL DIAGRAM - AUDITORIUM
AV5.2	AUDIOVISUAL FUNCTIONAL DIAGRAM - AUDITORIUM
AV5.3	AUDIOVISUAL FUNCTIONAL DIAGRAMS - AUDITORIUM
AV5.4	AUDIOVISUAL FUNCTIONAL DIAGRAMS - AUDITORIUM
AV5.5	AUDIOVISUAL FUNCTIONAL DIAGRAM - TOWN SQUARE
AV5.6	AUDIOVISUAL FUNCTIONAL DIAGRAM - GYM
AV5.7	AUDIOVISUAL FUNCTIONAL DIAGRAMS - CLASSROOM AND CARDIO

AUDIOVISUAL POWER REQUIREMENTS

LOCATION	SERVING	IG RECEPTACLES	NON-IG RECEPTACLE	20A CIRCUITS	NOTES
AUDITORIUM A/V ROOM	AV EQUIPMENT RACKS	4		4	L5-20 OUTLETS MOUNTED TO CABLE TRAY ABOVE RACKS
AUDITORIUM STAGE	AV EQUIPMENT	5		1	ADJACENT TO SP AND USP DEVICES
AUDITORIUM STAGE APRON	AV EQUIPMENT	5		1	EVENLY SPACED ON STAGE APRON
AUDITORIUM STAGE	FLOOR BOXES	1		1	MOUNTED IN FLOOR BOX
AUDITORIUM SOUND ROOM	AV EQUIPMENT RACK	3		3	MOUNT IN BACKPAN OF RACK
AUDITORIUM SOUND ROOM	AV EQUIPMENT	2		1	UNDER COUNTER
AUDITORIUM SEATING	AV EQUIPMENT	3		1	HOUSE REAR AND CENTER
AUDITORIUM CAMERA LOCATIONS	PTZ CAMERAS	3		1	ADJACENT TO CA DEVICES
AUDITORIUM PROJECTION ROOM	AV EQUIPMENT	3		1	UNDER COUNTER
AUDITORIUM PROJECTION SCREEN	PROJECTION SCREEN		1	1	FLEXIBLE WHIP TO PROJECTION SCREEN CASE
AUDITORIUM REAR	VIDEO PROJECTOR	1		1	ADJACENT TO VP DEVICE
TOWN SQUARE	AV EQUIPMENT	1		1	ADJACENT TO AV DEVICE
GYM STORAGE	AV EQUIPMENT RACK	4		4	MOUNT IN BACKPAN OF RACK
GYMNASIUM	AV EQUIPMENT	5		1	ADJACENT TO BCP AND WBG DEVICES
WEIGHT/CARDIO ROOM	AV EQUIPMENT RACK	2		2	MOUNT IN BACKPAN OF RACK
MUSIC CLASSROOM	AV EQUIPMENT	1		1	ADJACENT TO RC DEVICE
KEYBOARDING CLASSROOM	AV EQUIPMENT	1		1	ADJACENT TO RC DEVICE
BAND CLASSROOM	AV EQUIPMENT	1		1	ADJACENT TO RC DEVICE

PROJECTION SCREEN SCHEDULE

LOCATION	IMAGE HEIGHT	IMAGE WIDTH	TOP BLACK DROP LENGTH	SCREEN MATERIAL
PSE				
AUDITORIUM	156"	277 1/4"	36"	PER SPEC
TOWN SQUARE	90"	144"	6"	PER SPEC

AUDIOVISUAL EQUIPMENT RACK SCHEDULE

LOCATION	HEAT LOAD, ACTIVE (BTU)	HEAT LOAD, STANDBY (BTU)	DESCRIPTION	COMMENTS
BAND CLASSROOM	1,500	1,000	ROLLING EQUIPMENT RACK	
KEYBOARDING CLASSROOM	1,500	1,000	ROLLING EQUIPMENT RACK	
MUSIC CLASSROOM	1,500	1,000	ROLLING EQUIPMENT RACK	
GYM STORAGE	5,000	3,000	19" PIVOTING EQUIPMENT RACK	SERVES BOTH GYMNS
AUDITORIUM AV ROOM	6,000	3,500	19" GANGABLE EQUIPMENT RACK	
AUDITORIUM AV ROOM	6,000	3,500	19" GANGABLE EQUIPMENT RACK	
AUDITORIUM - STAGE LEFT	2,000	2,000	19" PIVOTING EQUIPMENT RACK	
AUDITORIUM SOUND ROOM	5,000	3,000	19" PIVOTING EQUIPMENT RACK	SERVES AUDITORIUM AND TOWN SQUARE
WEIGHT/CARDIO	3,000	1,500	19" PIVOTING EQUIPMENT RACK	

AUDIOVISUAL CONDUIT SEPARATION DISTANCES...

GROUP	SIGNALS TYPES	GROUP A	GROUP B	GROUP C	GROUP D
A	MICROPHONE	ADJACENT	6"	18"	12"
B	LINE LEVEL ANALOG AUDIO AND VIDEO	6"	ADJACENT	12"	12"
C	LOUDSPEAKER LEVEL	18"	12"	ADJACENT	3"
D	DATA, CONTROL, DIGITAL VIDEO	12"	12"	3"	ADJACENT
120VAC POWER		24"	18"	9"	9"
277VAC POWER		38"	24"	12"	12"
DIMMED POWER		36"	24"	12"	12"
NON-AV LOW-VOLTAGE		12"	6"	ADJACENT	ADJACENT

ELECTRICAL NOTES

1. ALL CONDUIT TO BE FERROUS METAL (E.G., STEEL). ALL CONDUIT IN PLENUM SPACES TO BE RIGID STEEL.
2. CONDUIT RUN IN AND BELOW CONCRETE SLABS ON GRADE TO BE PVC COATED STEEL.
3. ALL CONDUIT TO BE HOME RUNE TO JUNCTION BOXES UNLESS OTHERWISE NOTED.
4. INTERMEDIATE MARSHALLING BOXES FOR THE GROUPING OF HOME RUN CONDUITS ARE ACCEPTABLE. CONTRACTOR RESPONSIBLE FOR MAINTAINING CONDUIT CAPACITY AND PULL BOX SIZE. USE 30% FILL FOR CONDUIT SIZE CALCULATIONS.
5. FOR RECESS-MOUNTED GANG BOXES USE RACO 3-1/2" DEEP STEEL BACK BOXES OR EQUAL.
6. FOR SURFACE- AND PIPE-MOUNTED GANG BOXES USE FSR SMWB, LEVITON BKBOX SERIES SURFACE MOUNT POWDER-COATED STEEL BOX OR EQUAL BY ELECTRONIC THEATRE CONTROLS.
7. USE SEPARATE STEEL CONDUITS FOR MICROPHONE-LEVEL CIRCUITS (BELOW -20 DBM), LINE-LEVEL CIRCUITS (UP TO +30 DBM), LOUDSPEAKER CIRCUITS (ABOVE +30 DBM), CONTROL CIRCUITS, DATA CIRCUITS, VIDEO CIRCUITS AND POWER CIRCUITS. USE AUDIO CONDUIT THAT IS SPACED AT LEAST 12 INCHES AWAY FROM POWER CONDUIT. INSULATE ALL CONDUIT FROM THE EQUIPMENT RACK(S); GROUND CONDUIT ONLY TO POWER SYSTEM GROUND. DO NOT SPLICE LINES IN CONDUIT. CONNECT EACH INPUT RECEPTACLE BY AN INDIVIDUAL, INSULATED LINE TO THE SYSTEM EQUIPMENT RACK.
8. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFICATION OF ALL DIMENSIONS AND CONDUIT SIZE.
9. PROVIDE ALL EMPTY CONDUITS WITH PULL-STRINGS.
10. PROVIDE PULL BOX AFTER 180 DEGREES OF CONDUIT BEND.
11. ELECTRICAL CONTRACTOR TO PROVIDE ALL STANDARD ELECTRICAL BACK BOXES AND FLOOR BOXES.
12. AUDIOVISUAL CONTRACTOR TO PROVIDE CUSTOM AUDIOVISUAL FACEPLATES.
13. REFERENCE ARCHITECTURAL DRAWINGS FOR MOUNTING HEIGHTS AND DETAILS.

ELECTRICAL DEVICE KEY

GENERAL NOTE: SUBSCRIPT AT RECEPTACLE INDICATES CIRCUIT ASSIGNMENT; DO NOT SHARE CIRCUITS BETWEEN ROOMS, AND DO NOT SHARE WITH OTHER LOADS UNLESS INDICATED. WHERE CIRCUIT ASSIGNMENT IS INDICATED, FEED CIRCUITS WITHIN A ROOM FROM A COMMON PANEL AND FROM A COMMON PHASE IN THAT PANEL. WHERE SUBSCRIPT NOT SHOWN, ASSIGN CIRCUITS PER CODE REQUIREMENTS.

- A — DUPLEX 120VAC 20A 5-20 RECEPTACLE FLUSH MOUNTED IN WALL AT STANDARD RECEPTACLE HEIGHT UNLESS OTHERWISE INDICATED.
- QUAD 120VAC 20A 5-20 RECEPTACLE FLUSH MOUNTED IN WALL AT STANDARD RECEPTACLE HEIGHT UNLESS OTHERWISE INDICATED.
- SINGLE NEMA TYPE L5-20 120VAC 20A TWIST-LOCK RECEPTACLE MOUNTED AT PROJECT RECEPTACLE HEIGHT, UNLESS OTHERWISE NOTED.
- A — DUPLEX 120VAC 20A 5-20 RECEPTACLE FLUSH MOUNTED IN CEILING.
- QUAD 120VAC 20A 5-20 RECEPTACLE FLUSH MOUNTED IN CEILING.
- SINGLE NEMA TYPE L5-20 120VAC 20A TWIST-LOCK RECEPTACLE MOUNTED IN CEILING.
- FLEXIBLE CONNECTION TO 120VAC SERVICE. CIRCUIT PER CODE REQUIREMENTS.
- G — RAISED FLOOR GROMMET FOR AUDIOVISUAL CABLE PATHWAY, SIZE AS REQUIRED
- $ — PROJECTION SCREEN UP/DOWN SWITCH, 120V

AUDIOVISUAL DEVICE LEGEND

- 1D A — AUDIOVISUAL DEVICE WITH POWER AND DATA DEVICES MOUNTED ADJACENT TO AUDIOVISUAL DEVICE
- 1D — AUDIOVISUAL DEVICE WITH DATA DROP WITHIN AUDIOVISUAL DEVICE BOX
- XXX — FLOOR MOUNTED DEVICE
- XXX — WALL MOUNTED DEVICE, FLUSH
- XXX — WALL MOUNTED DEVICE, SURFACE
- XX A — CEILING MOUNTED DEVICE SUBSCRIPT INDICATES ZONE
- VIDEO PROJECTOR
- PSE H" X W" — ELECTRIC, ROLL-DOWN FRONT PROJECTION SCREEN, IMAGE SIZE INDICATED
- PSM H" X W" — MANUAL ROLL-DOWN FRONT PROJECTION SCREEN, IMAGE SIZE INDICATED
- PSS H" X W" — STATIC FRONT PROJECTION SCREEN IMAGE SIZE INDICATED
- FP - XX" — FLAT PANEL DISPLAY NOMINAL DIAGONAL IMAGE SIZE INDICATED
- VIDEO CAMERA, WALL MOUNTED
- AV RACK — AUDIOVISUAL EQUIPMENT RACK

AUDIOVISUAL DEVICE KEY NOTES

1. ABBREVIATIONS
   P.S.H. = PROJECT SWITCH HEIGHT
   P.R.H. = PROJECT RECEPTABLE HEIGHT

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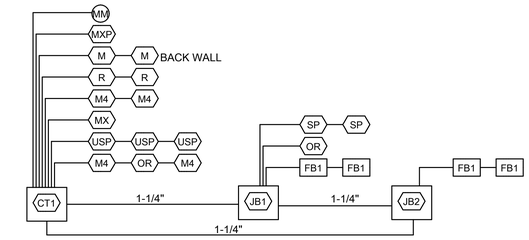
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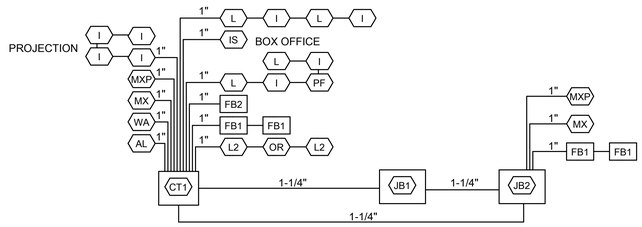
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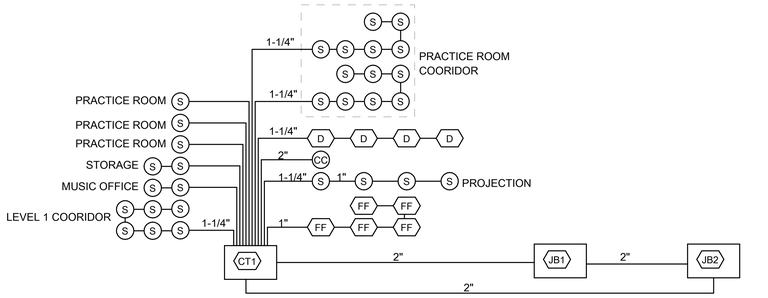
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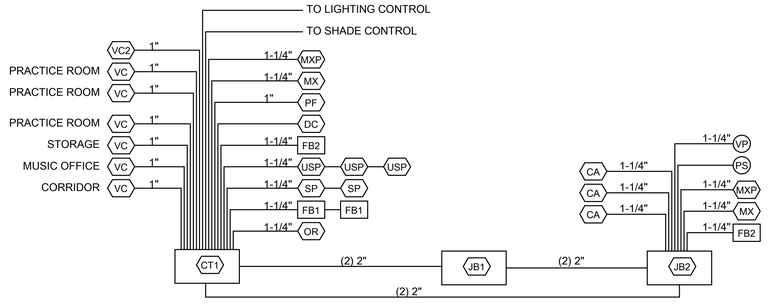
GROUP A CONDUIT



GROUP B CONDUIT

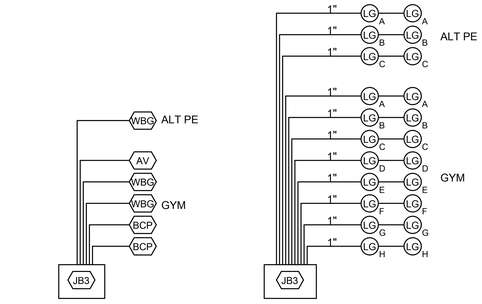


GROUP C CONDUIT



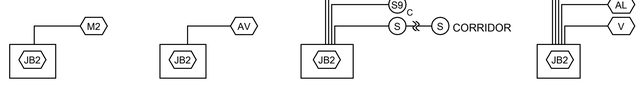
GROUP D CONDUIT

1 CONDUIT RISER - AUDITORIUM
NTS



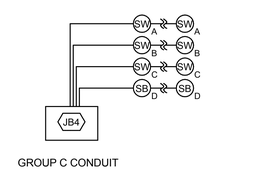
GROUP B CONDUIT GROUP C CONDUIT GROUP D CONDUIT

2 CONDUIT RISER - GYMNASIUMS
NTS



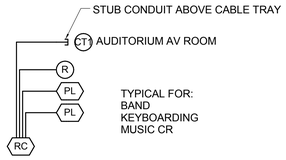
GROUP A CONDUIT GROUP B CONDUIT GROUP C CONDUIT GROUP D CONDUIT

3 CONDUIT RISER - TOWN SQUARE
NTS



GROUP C CONDUIT

4 CONDUIT RISER - WEIGHT/CARDIO ROOM
NTS



5 CONDUIT RISER - MUSIC CLASSROOM
NTS

ELECTRICAL NOTES

1. ALL CONDUIT TO BE FERROUS METAL (E.G., STEEL). ALL CONDUIT IN PLENUM SPACES TO BE RIGID STEEL.
2. CONDUIT RUN IN AND BELOW CONCRETE SLABS ON GRADE TO BE PVC COATED STEEL.
3. ALL CONDUIT TO BE HOME RUNE TO JUNCTION BOXES UNLESS OTHERWISE NOTED.
4. INTERMEDIATE MARSHALLING BOXES FOR THE GROUPING OF HOME RUN CONDUITS ARE ACCEPTABLE. CONTRACTOR RESPONSIBLE FOR MAINTAINING CONDUIT CAPACITY AND PULL BOX SIZE. USE 30% FILL FOR CONDUIT SIZE CALCULATIONS.
5. FOR RECESS-MOUNTED GANG BOXES USE RACO 3-1/2" DEEP STEEL BACK BOXES OR EQUAL.
6. FOR SURFACE- AND PIPE-MOUNTED GANG BOXES USE FSR SMWB, LEVITON BKBOX SERIES SURFACE MOUNT POWDER-COATED STEEL BOX OR EQUAL BY ELECTRONIC THEATRE CONTROLS.
7. USE SEPARATE STEEL CONDUITS FOR MICROPHONE-LEVEL CIRCUITS (BELOW -20 DBM), LINE-LEVEL CIRCUITS (UP TO +30 DBM), LOUDSPEAKER CIRCUITS (ABOVE +30 DBM), CONTROL CIRCUITS, DATA CIRCUITS, VIDEO CIRCUITS AND POWER CIRCUITS. USE AUDIO CONDUIT THAT IS SPACED AT LEAST 12 INCHES AWAY FROM POWER CONDUIT. INSULATE ALL CONDUIT FROM THE EQUIPMENT RACK(S); GROUND CONDUIT ONLY TO POWER SYSTEM GROUND. DO NOT SPLICE LINES IN CONDUIT. CONNECT EACH INPUT RECEPTACLE BY AN INDIVIDUAL, INSULATED LINE TO THE SYSTEM EQUIPMENT RACK.
8. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFICATION OF ALL DIMENSIONS AND CONDUIT SIZE.
9. PROVIDE ALL EMPTY CONDUITS WITH PULL-STRINGS.
10. PROVIDE PULL BOX AFTER 180 DEGREES OF CONDUIT BEND.
11. ELECTRICAL CONTRACTOR TO PROVIDE ALL STANDARD ELECTRICAL BACK BOXES AND FLOOR BOXES.
12. AUDIOVISUAL CONTRACTOR TO PROVIDE CUSTOM AUDIOVISUAL FACEPLATES.
13. REFERENCE ARCHITECTURAL DRAWINGS FOR MOUNTING HEIGHTS AND DETAILS.

AUDIOVISUAL CONDUIT SEPARATION DISTANCES...

GROUP	SIGNALS TYPES	GROUP A	GROUP B	GROUP C	GROUP D
A	MICROPHONE	ADJACENT	6"	18"	12"
B	LINE LEVEL ANALOG AUDIO AND VIDEO	6"	ADJACENT	12"	12"
C	LOUDSPEAKER LEVEL	18"	12"	ADJACENT	3"
D	DATA, CONTROL, DIGITAL VIDEO	12"	12"	3"	ADJACENT
120VAC POWER		24"	18"	9"	9"
277VAC POWER		38"	24"	12"	12"
DIMMED POWER		36"	24"	12"	12"
NON-AV LOW-VOLTAGE		12"	6"	ADJACENT	ADJACENT

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AUDIOVISUAL CONDUIT RISERS

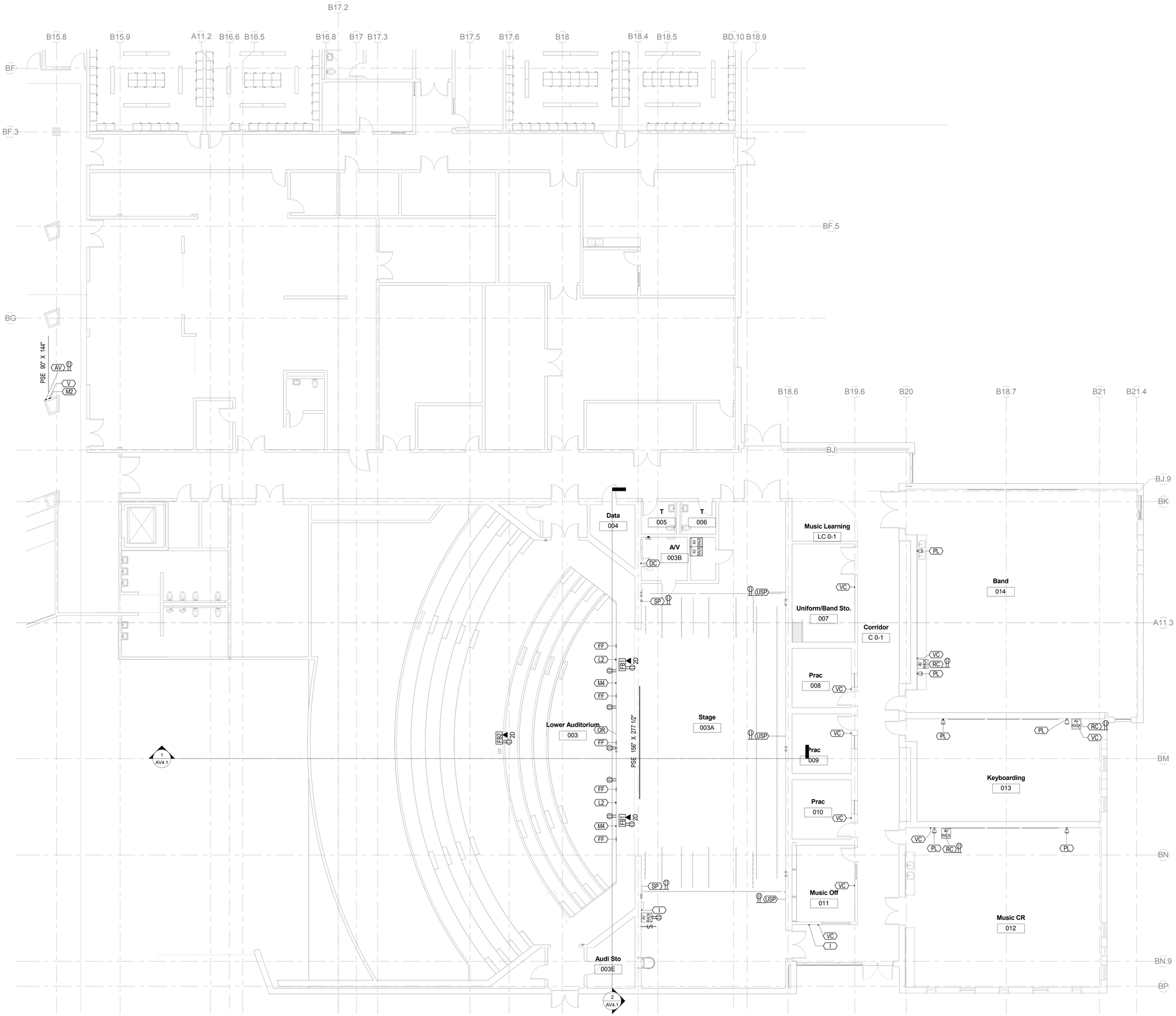
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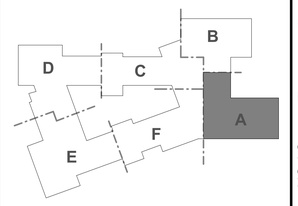
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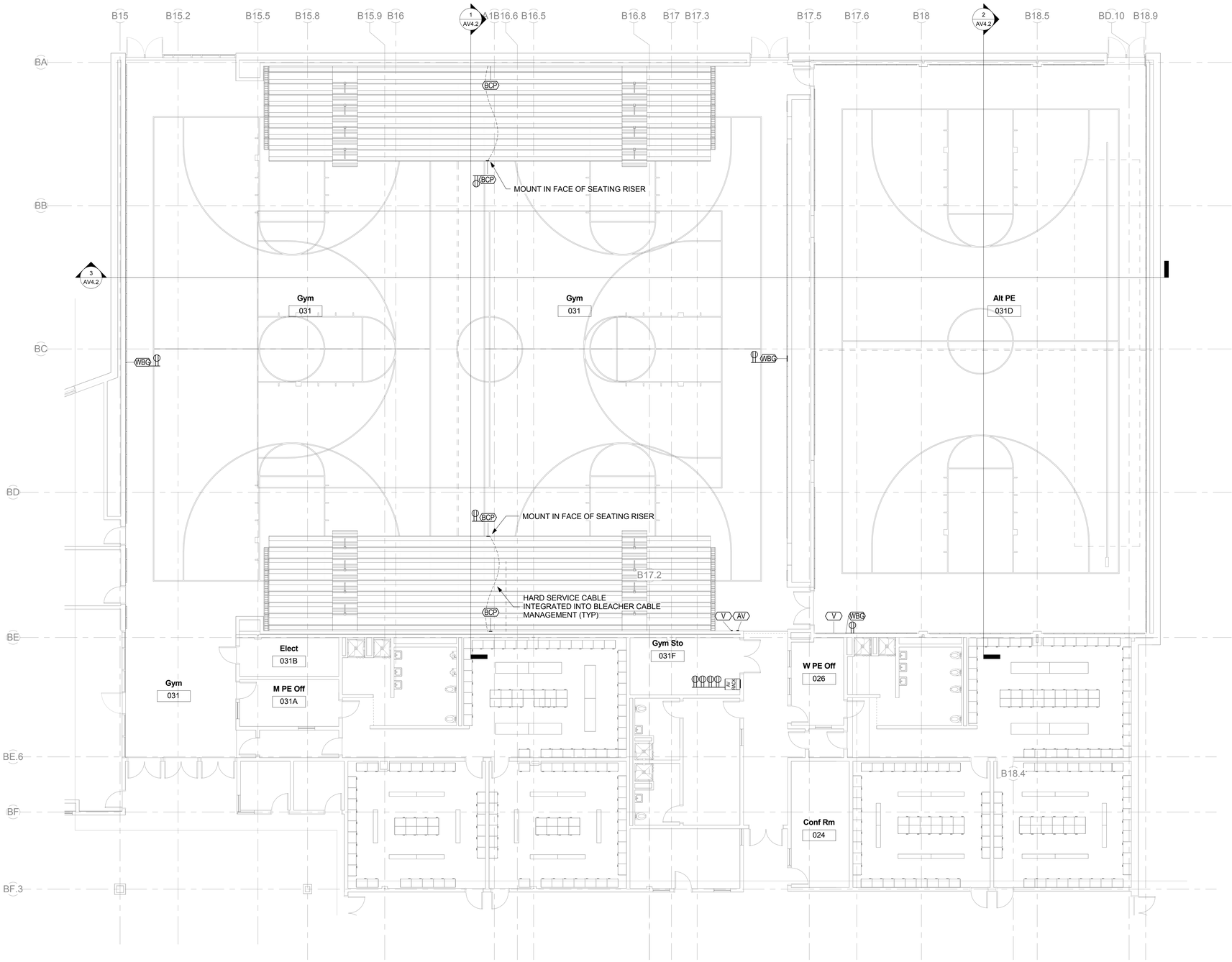
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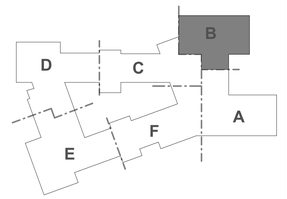
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GRAPHIC SCALE

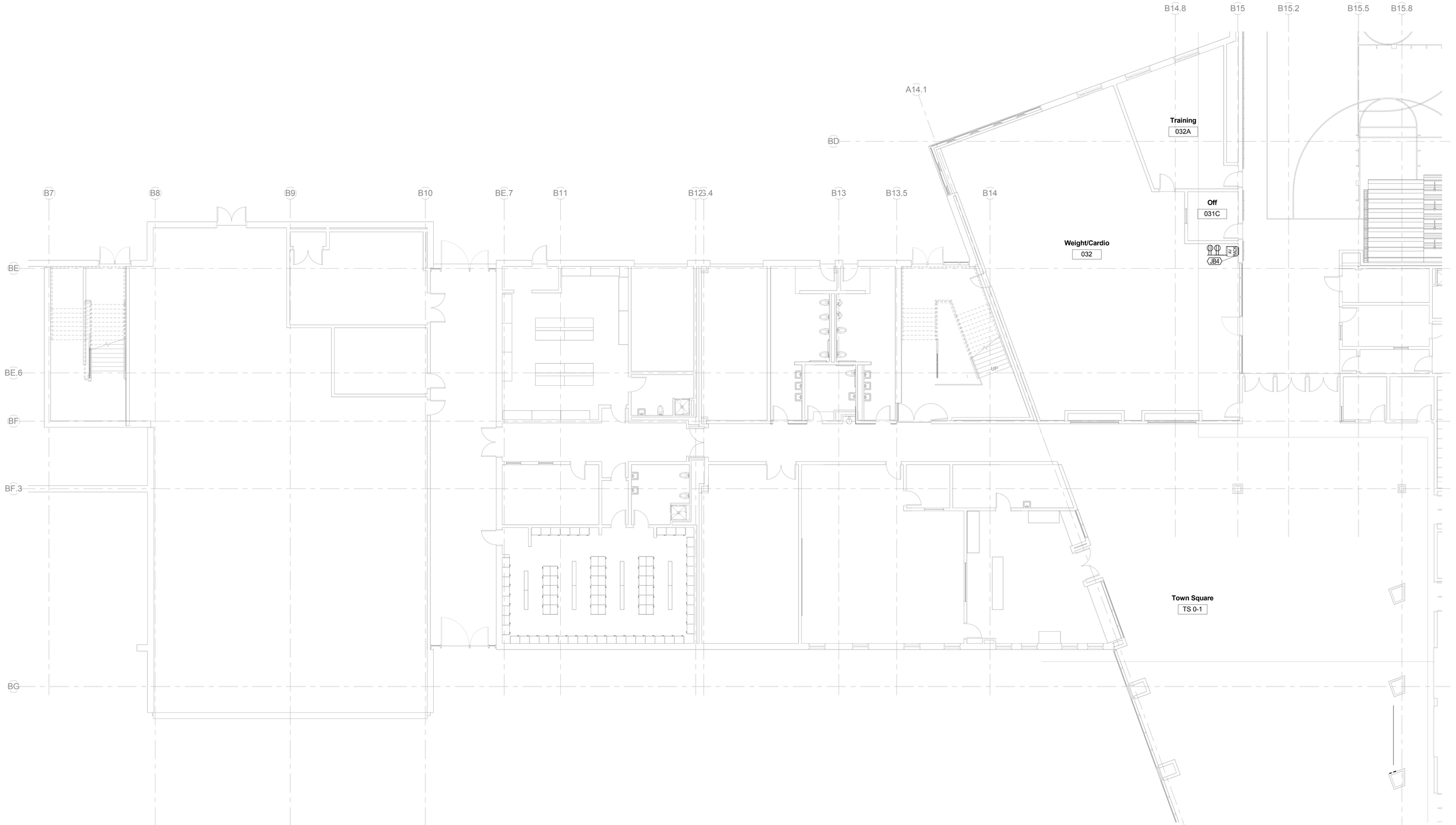
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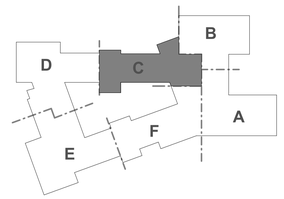
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BF

BF.3

BF.5

BG

B18.6

BJ

BJ.9

BK

A11.3

BM

BN

BN.9

BP

AD

AC

A4.2

Lab.
106A

Dining
105B

Culinary Kitchen
105A

Corridor
C 1-1

Box Office
103B

Auditorium
103

Stage
003A

Sound
103A

WA

AL

WA

IS

PF

VC2

MX

AV RACK

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M4

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AV4.1

2
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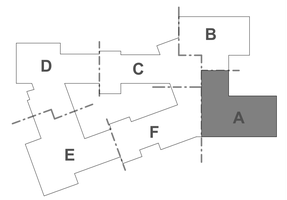
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AUDIOVISUAL DEVICE PLAN - FIRST FLOOR - PART A

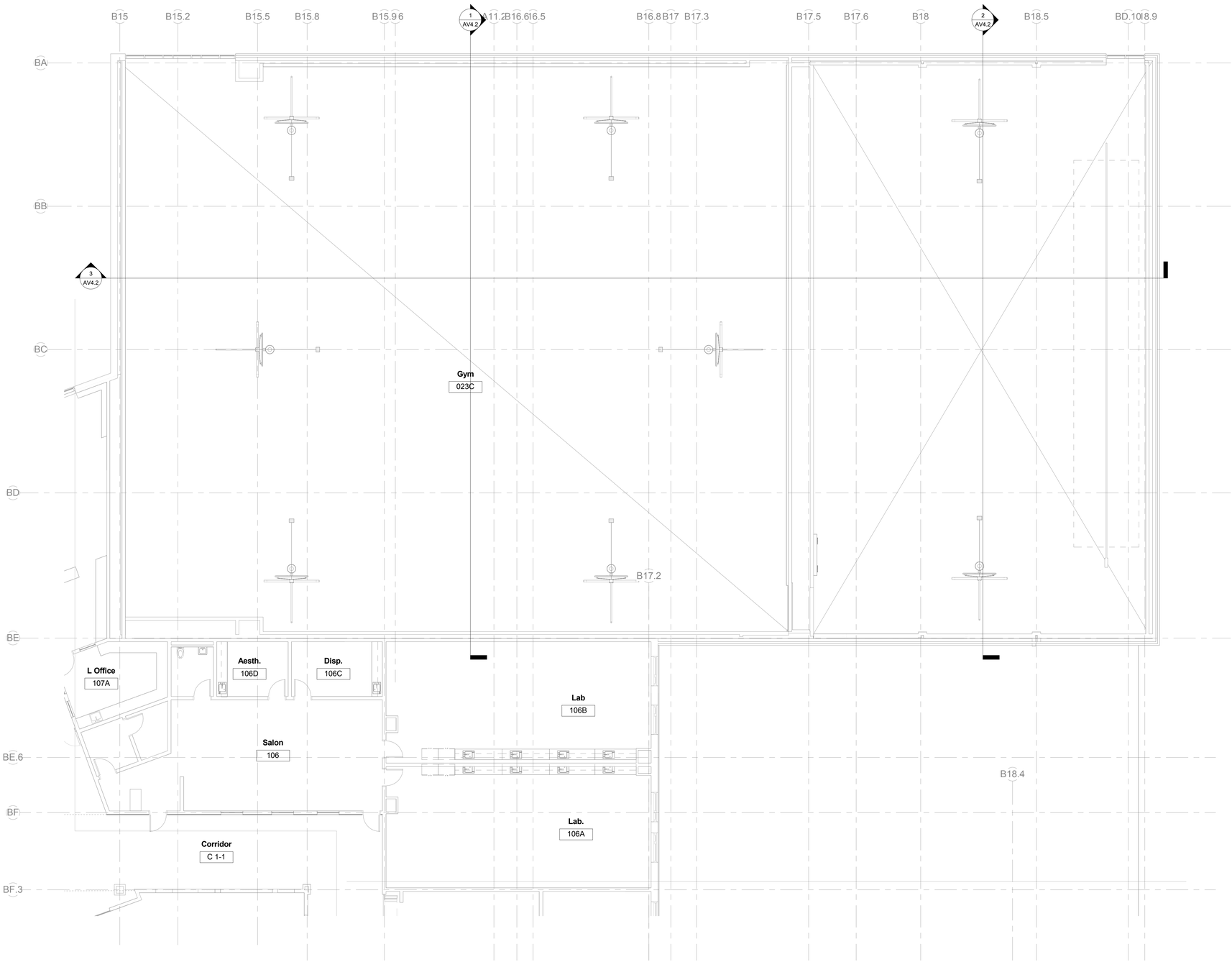
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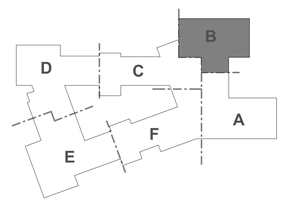
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AUDIO/VISUAL DEVICE PLAN - FIRST FLOOR - PART B
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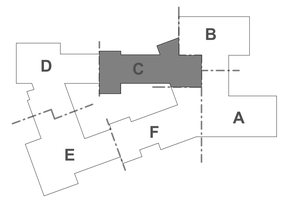
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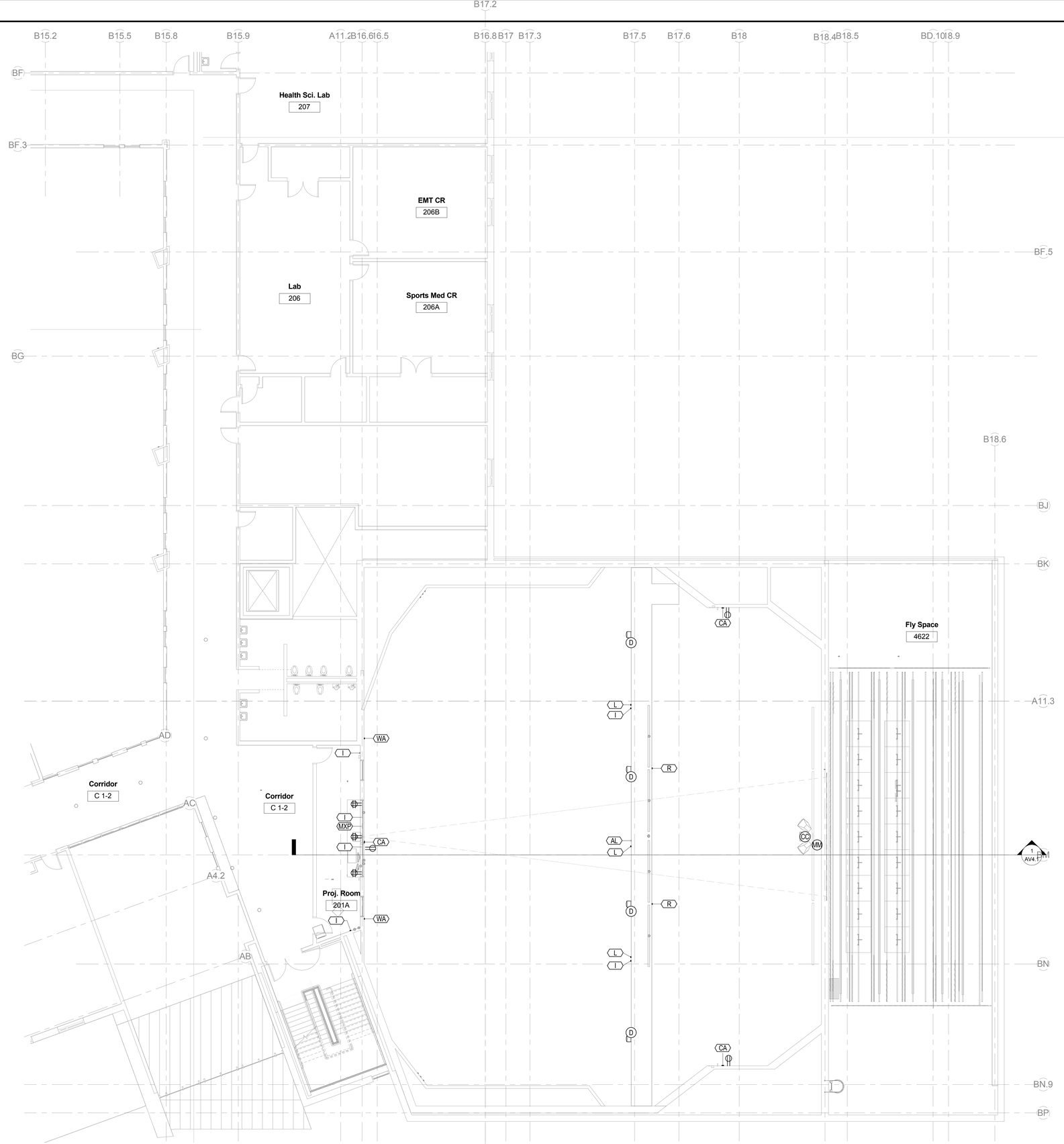
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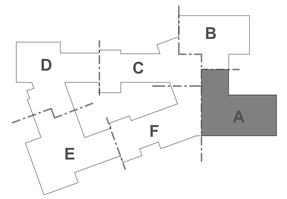


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AUDIOVISUAL DEVICE PLAN - SECOND FLOOR - PART A
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BF BF.3 BF.5 BG

B18.6 B19.6 B20 B18.7 B21 B21.4 BJ BJ.9 BK

AD AC A4.2 AB A11.3 BM BN BN.9 BP

Corridor
C 0-1

Audi Sto
003F

Light Lock
003E

Data
004

T
005

T
006

EM Elec
003C

A/V
003B

2
AV4.1

CT

Music Learning
LC 0-1

Uniform/Band Sto.
007

Band
014

Prac
008

Lower Auditorium
003

Stage
003A

Prac
009

1
AV4.1

Keyboarding
013

Prac
010

Music Off
011

Corridor
C 0-1

Music CR
012

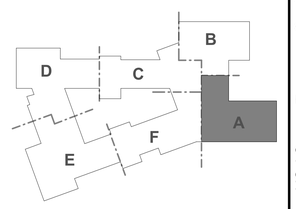
JB1

Lower Auditorium
003

Audi Sto
003E

Audi Sto
003G

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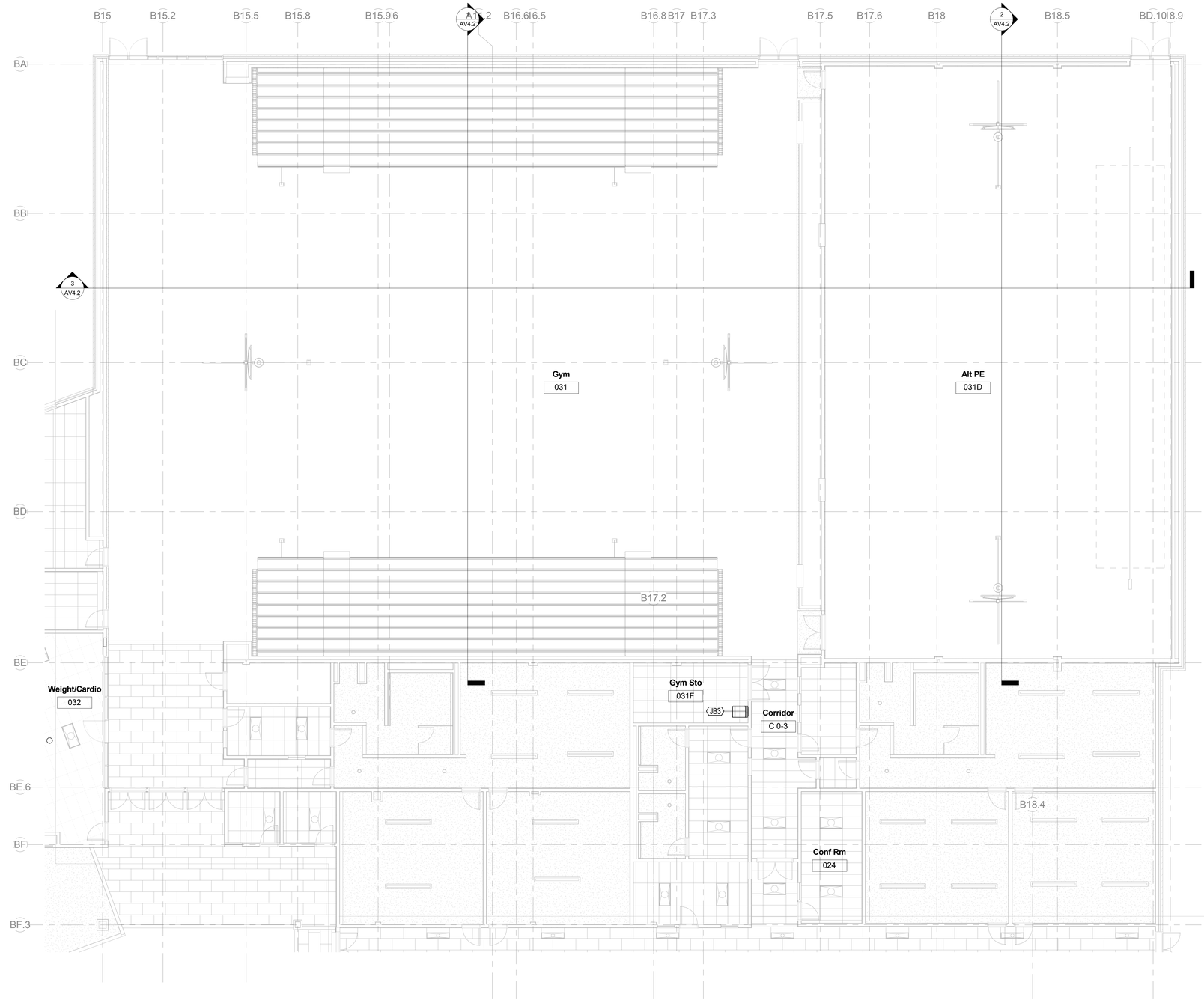
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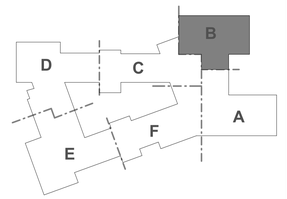
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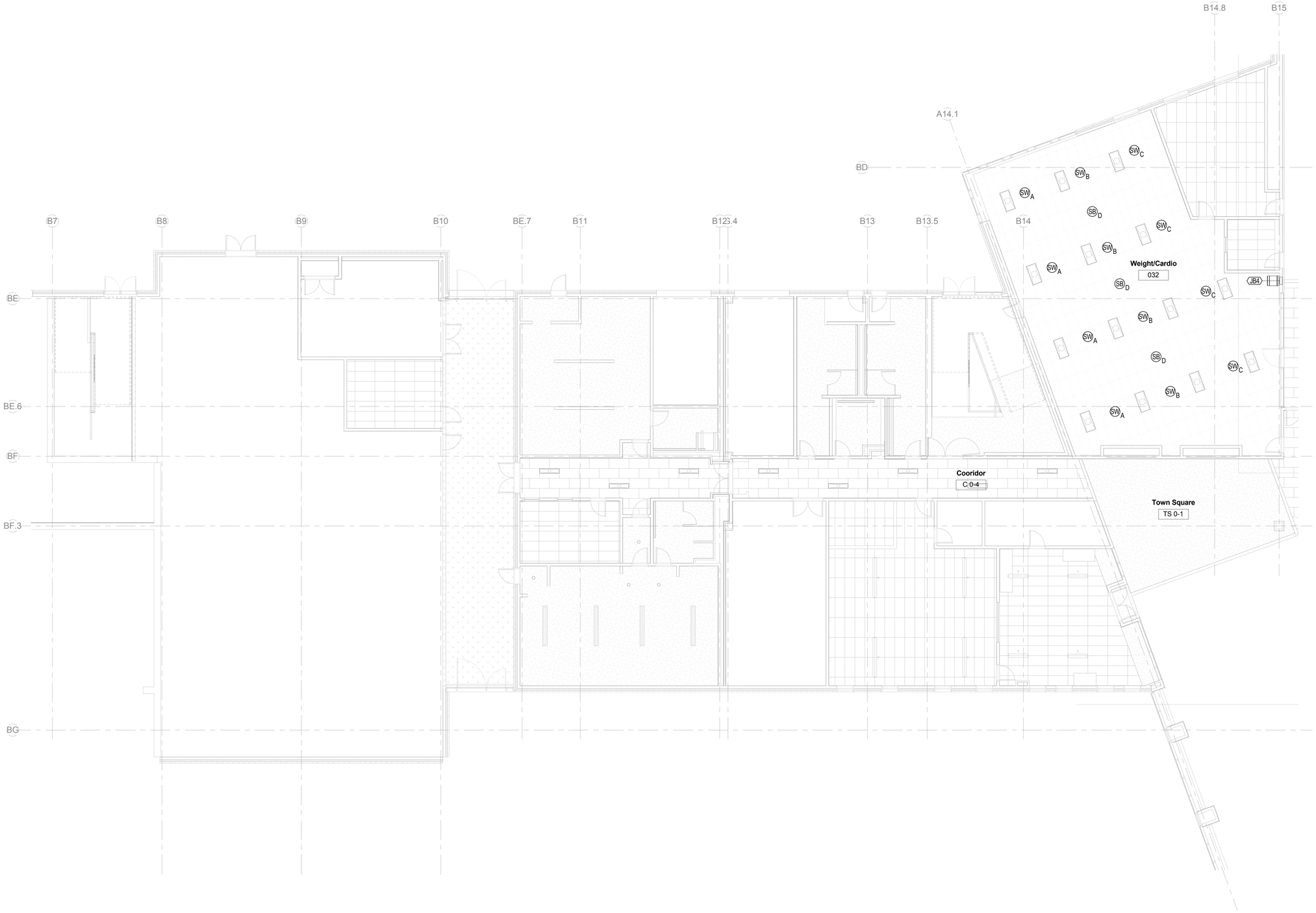
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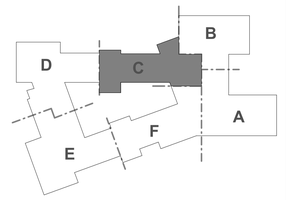
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AUDIOVISUAL RCP - GROUND
LEVEL - PART C
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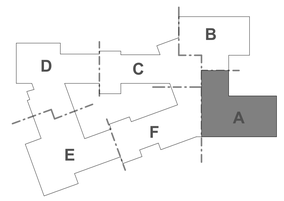
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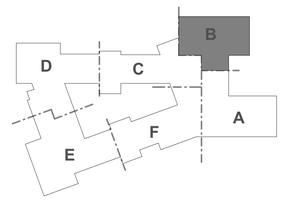
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3/14/2016

PLAN NORTH
TRUE NORTH

KEYPLAN



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Dover, NH
AUDIOVISUAL RCP - FIRST FLOOR - PART B

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DRAWING NUMBER
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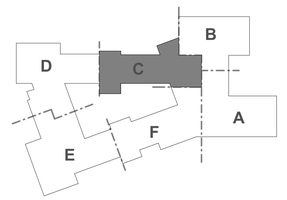
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PLAN NORTH
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KEYPLAN



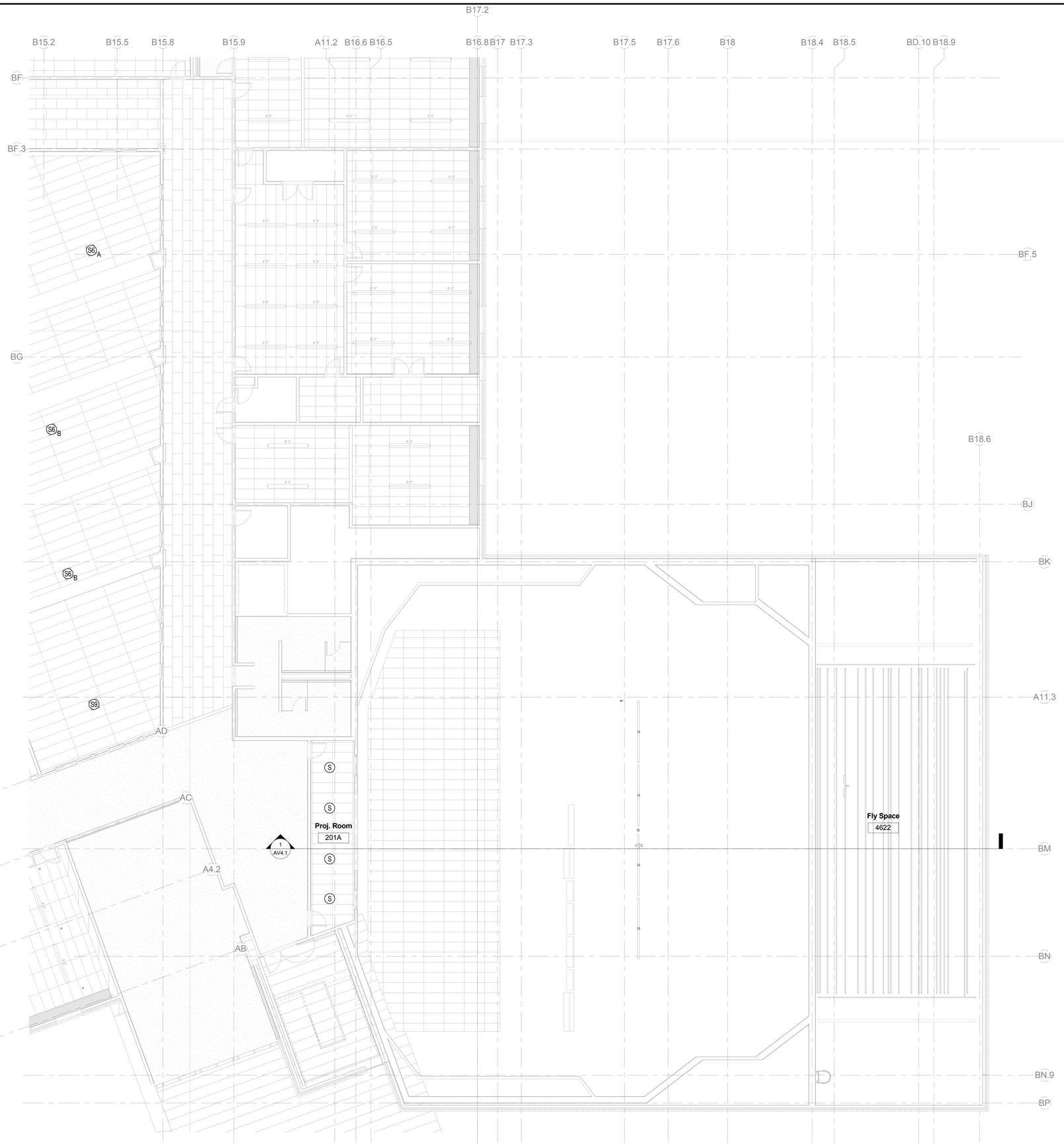
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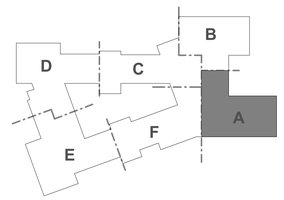
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PLAN NORTH
TRUE NORTH

KEYPLAN



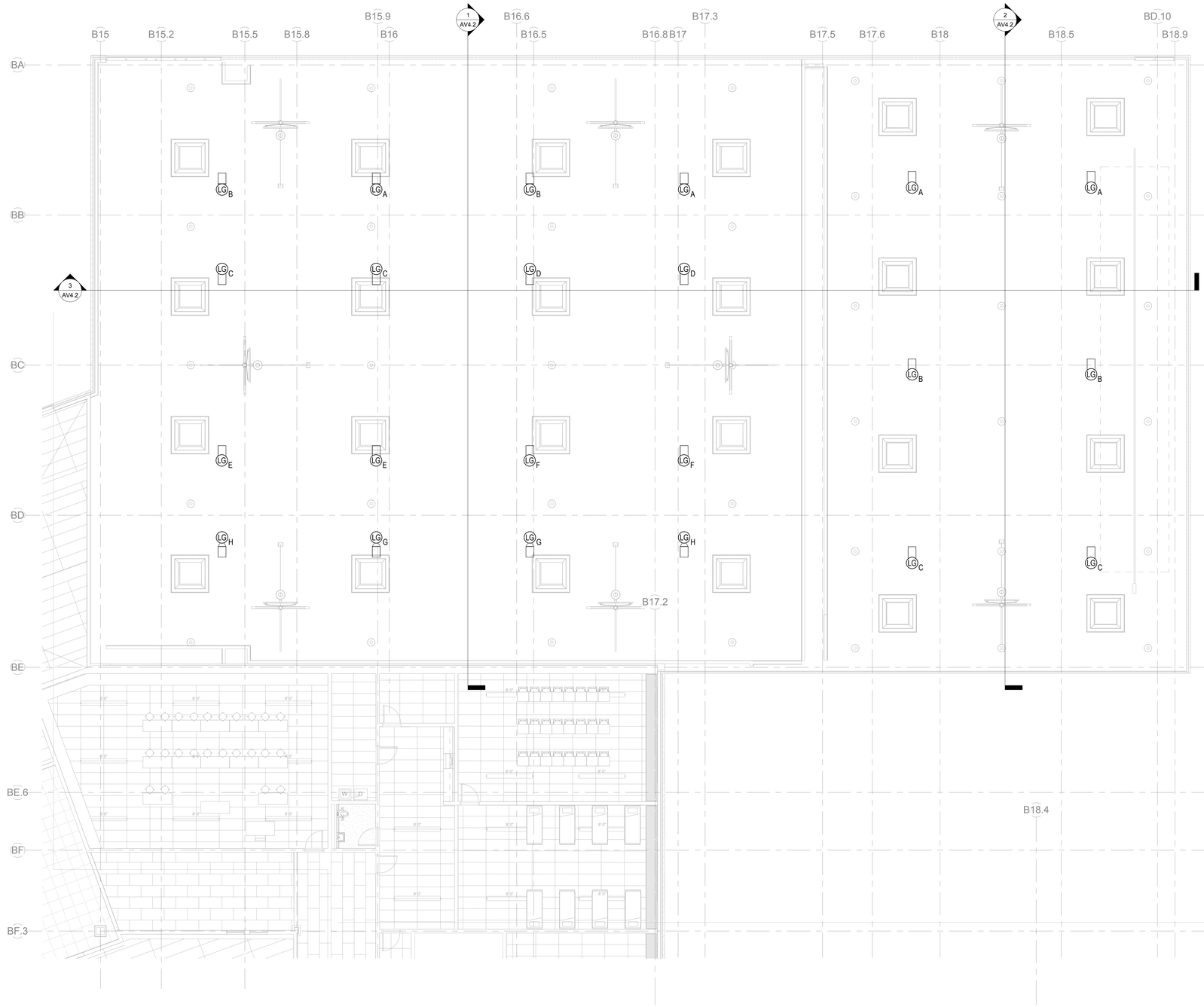
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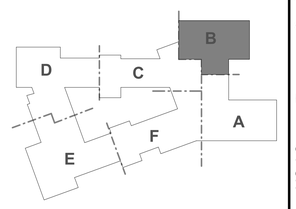
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PLAN NORTH
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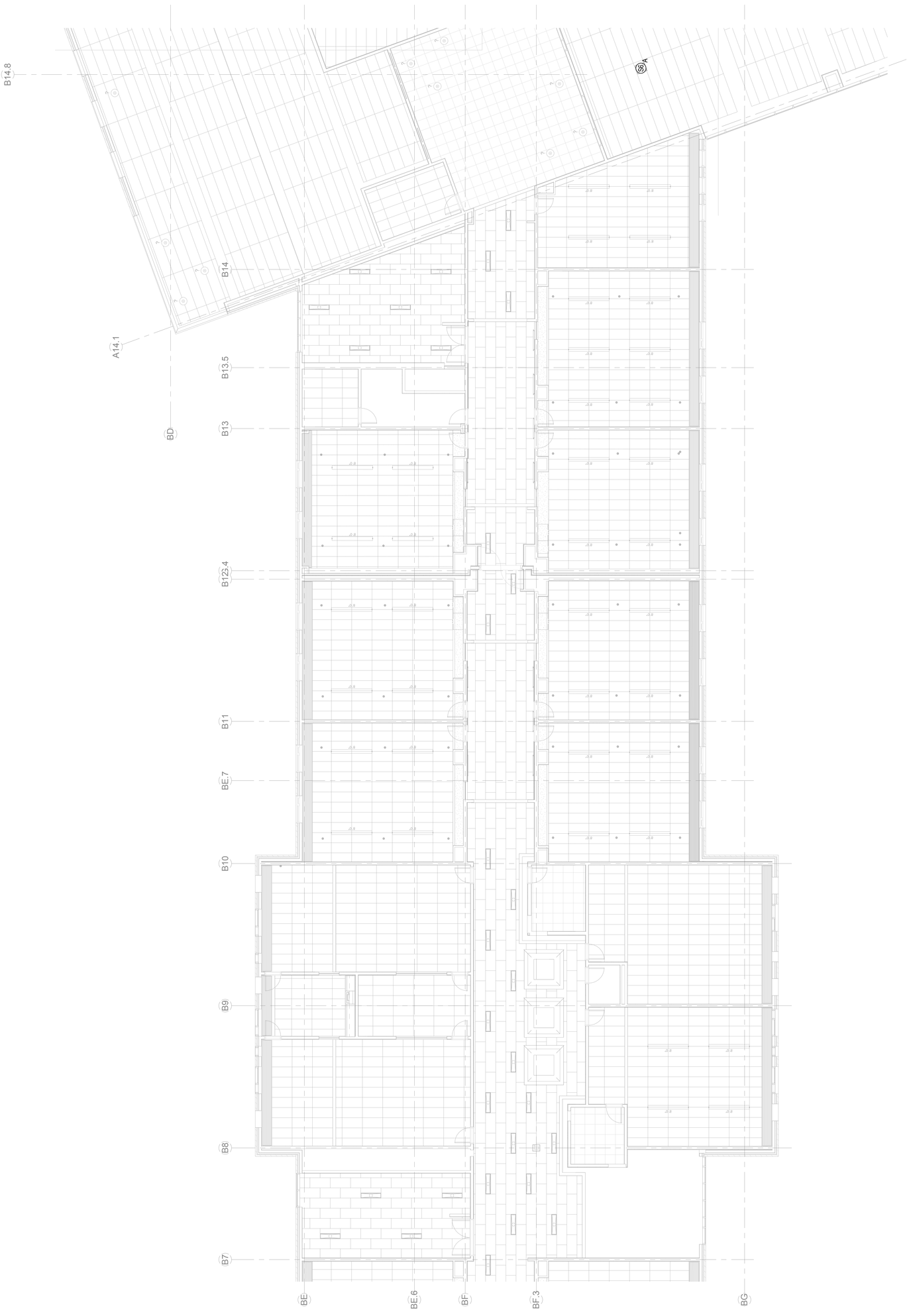
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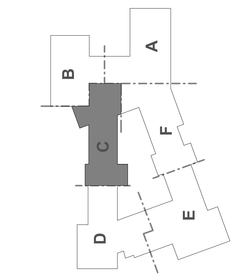
TRUE NORTH
PLAN NORTH

SCALE: 1/8" = 1'-0" DRAWN BY: Author CHECKED BY: Checker

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AUDIOVISUAL RCP - SECOND FLOOR - PART C

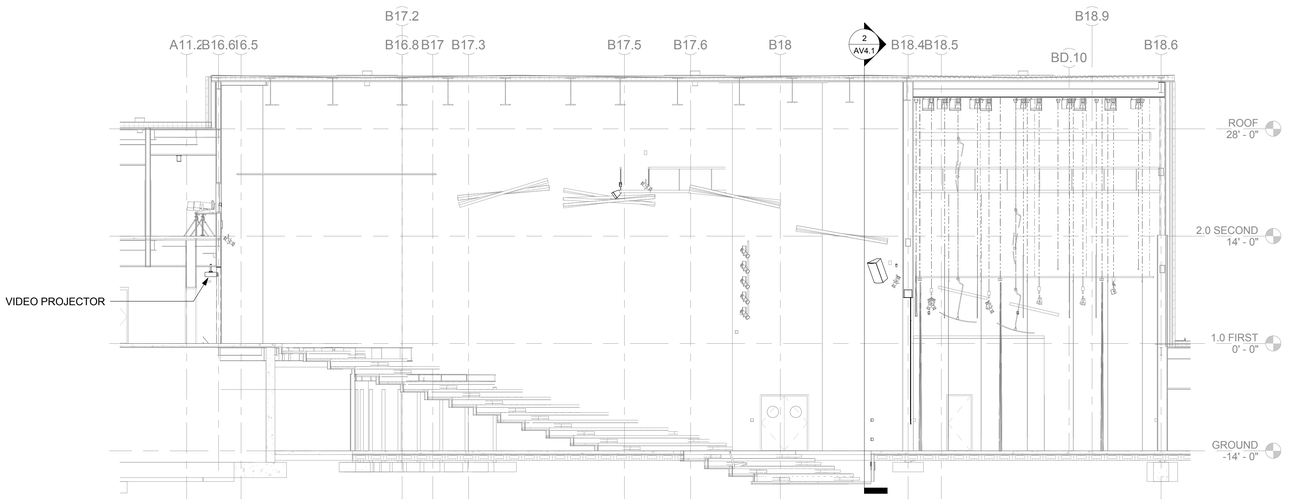
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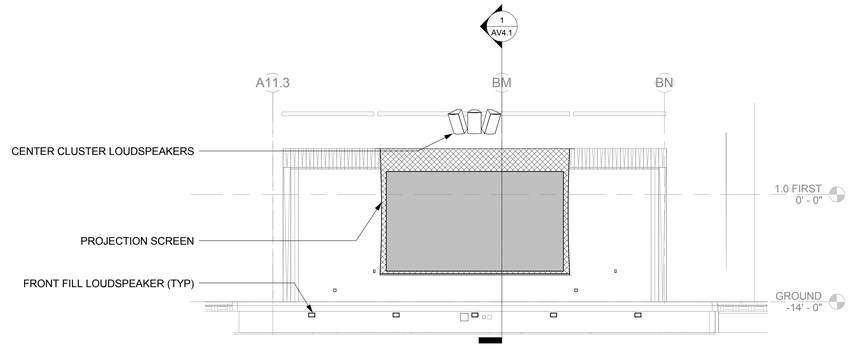


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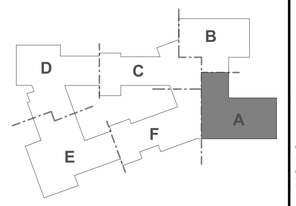


1 AUDITORIUM CENTERLINE SECTION
1/8" = 1'-0"



2 AUDITORUM - SECTION LOOKING AT PROSCENIUM
1/8" = 1'-0"

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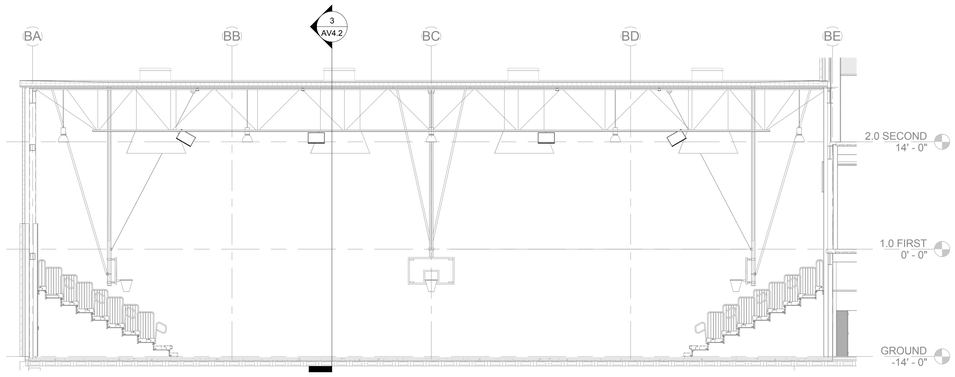
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AUDIOVISUAL - AUDITORIUM
SECTIONS
SCALE: 1/8" = 1'-0" DRAWN BY: Author CHECKED BY: Checker

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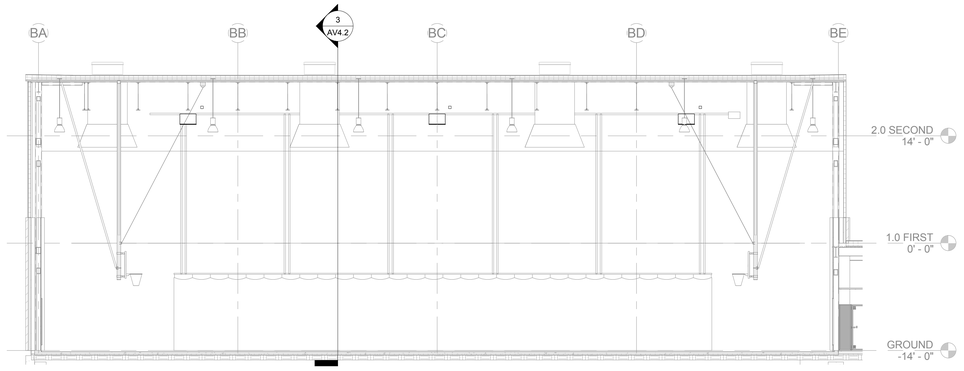
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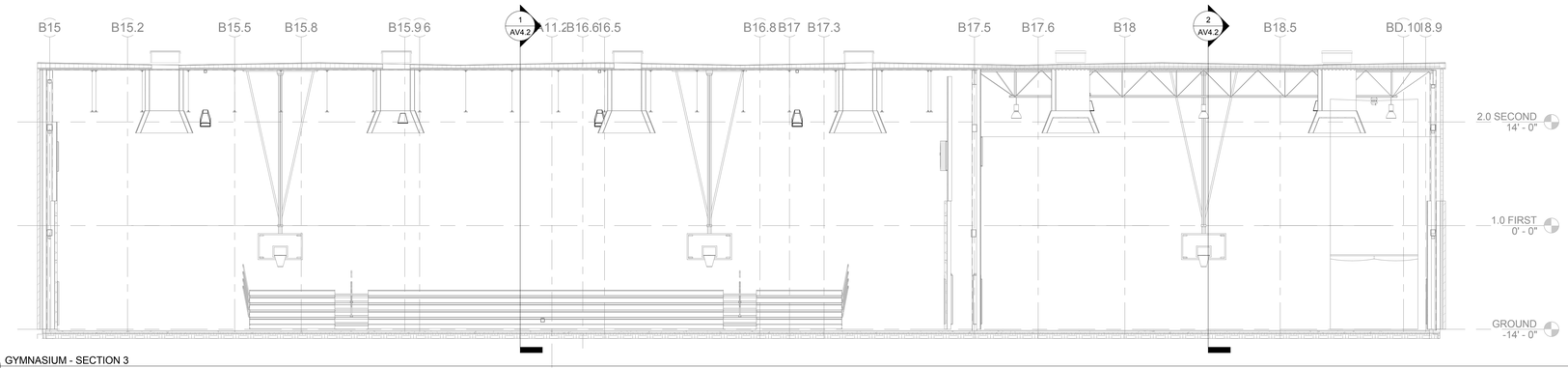
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1 GYMNASIUM - SECTION 1
1/8" = 1'-0"

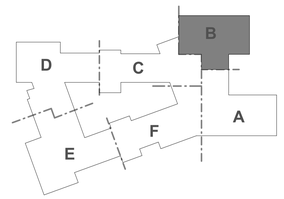


2 GYMNASIUM - SECTION 2
1/8" = 1'-0"



3 GYMNASIUM - SECTION 3
1/8" = 1'-0"

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AUDIOVISUAL - GYMNASIUM
SECTIONS
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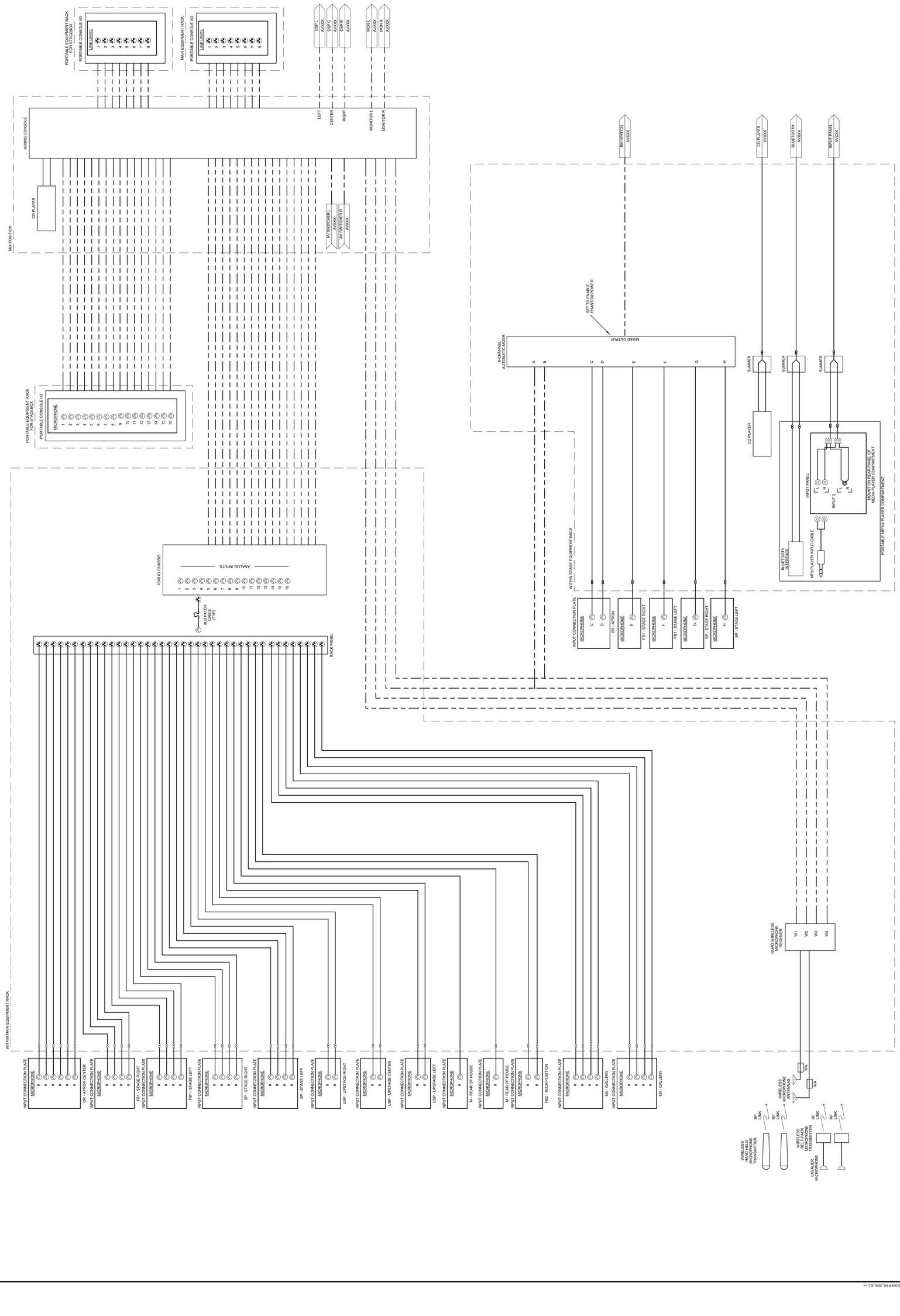
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AUDIOVISUAL FUNCTIONAL DIAGRAM - AUDITORIUM
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WITHIN MAIN EQUIPMENT RACK A4 EXCEPT WHERE NOTED

DIGITAL SIGNAL PROCESSING (CONCEPTUAL ANALOG EQUIVALENT SHOWN)

MATRIX MIXER

AV1.01
AVX.XX
AV1.01
AVX.XX
CONSOLE MONO
AVX.XX
BM SPEECH
AVX.XX
CD PLAYER
AVX.XX
BLUETOOTH
AVX.XX
INPUT PANEL
AVX.XX
AV SWITCHER L
AVX.XX
AV SWITCHER R
AVX.XX

STAGE EQUIPMENT RACK

TOUCH PANEL CONTROL

FUNCTIONS:
OVERFLOW VOLUME
OVERFLOW SELECT
MUTING PRESETS
AUDIO SOURCE SELECT
VIDEO SOURCE SELECT
CHIME

MUTE
BASIC MIX SYSTEM
MIXING CONSOLE

FUNCTIONS PER SPECIFICATION
MATCHES LECTERN PANEL

CONFIGURE FOR CONTINUOUS OPERATION' (TYPICAL)

CHIME GENERATOR
CONT
GND
OUT

CONTROL SYSTEM

LOW-PASS FILTER
HIGH-PASS FILTER
9-BAND PARAMETRIC EQUALIZER
DIGITAL DELAY
COMPRESSOR/ LIMITER

ACTIVE CROSSOVER
HI
LOW

1A 300W
2A 600W
1B 300W
2B 600W
1C 300W
2C 600W

CENTER
LEFT
RIGHT
CENTER CLUSTER LOUDSPEAKERS

1A 4 OHM 200W
3B 4 OHM 200W
3B 4 OHM 200W
FRONT FILL LOUDSPEAKERS

2C 8 OHM 200W
3D 4 OHM 200W
DELAY LOUDSPEAKERS

1D 70 VOLT 200W

MX - CONTROL BOOTH
CONTROL ROOM MONITOR LOUDSPEAKERS

SYMBOL | SIGNAL CONTENT

1 — STANDARD OPERATION: CONSOLE MONO; BASIC MIX PROGRAM & SPEECH; AV SWITCHER (SUM L&R); HOUSE ANNOUNCE
OVERFLOW: SELECTED OVERFLOW FEED

2 — STANDARD: BACKSTAGE ANNOUNCE; MONITOR MICROPHONE

3 — STANDARD: CHIME

PAGING MIC CONSOLE
ANNOUNCE
HOUSE BACKSTAGE
MICROPHONE
CONTROL
ON CONTROL ROOM COUNTER
CUE MICROPHONE

INPUT CONNECTION PANEL
PAGE/ANNOUNCE
MXP - PROJECTION ROOM

INPUT CONNECTION PANEL
PAGE/ANNOUNCE
FB2 - MID AISLE CENTER (TECH POSITION)

CONTROL INPUT
CONTROL INPUT

MICROPHONE PREAMPLIFIER
1x2 SWITCHER
2X1 MIXER
3X1 MIXER
DUCKER

STAGE RACK
MICROPHONE
MOUNT ON CUSTOM RECESSED RACK PANEL
CUE MICROPHONE
BACKSTAGE PAGE

MONITOR MICROPHONE SUSPENDED BY PROSCENIUM
MICROPHONE
MM - GRID

TERMINATE ON ISOLATION TRANSFORMER
AUDIO FEED FROM BUILDING-WIDE P.A.

MUTE ALL ON CONTACT CLOSURE FROM FIRE ALARM (EXCEPT BUILDING-WIDE P.A.)

GYM OVERFLOW
AVX.XX

OUTPUT CONNECTION PANEL
AUDIO FEED
PRO
HI-FI
LOW-Z HI-Z
PF - CENTER HOUSE REAR

OUTPUT CONNECTION PANEL
AUDIO FEED
PRO
HI-FI
LOW-Z HI-Z
FB2 - MID AISLE CENTER (TECH POSITION)

ASSISTIVE LISTENING TRANSMITTER
AL
MX - CONTROL BOOTH
RACK PANEL

REMOTE ANTENNA MOUNT TO OUTSIDE OF CATWALK
ASSISTIVE LISTENING ANTENNA
RF LINK
ASSISTIVE LISTENING SYSTEM RECEIVER
CONNECT TO EARPHONE OR NECKLOOP
TYPICAL FOR QUANTITY AS SPECIFIED

INTERCOM
AV1.03

25W
VC - CONTROL ROOM
CONTROL ROOM
TAP AT 4 WATTS (TYP)

50W
VC - HALLWAY
BACKSTAGE HALLWAY

10W
VC - MUSIC OFFICE
MUSIC OFFICE

10W
VC - PRACTICE
PRACTICE (TYP OF 3)

50W
VC
BAND/UNIFORM STORAGE

TOWN SQUARE LOBBY
AVX.XX
AUD. OVERFLOW
AVX.XX

NOTE: ALL AMPLIFIERS AND DIGITAL SIGNAL PROCESSING DEVICES TO BE ON CONSTANT POWER AND PROVIDED WITH SECURITY COVERS

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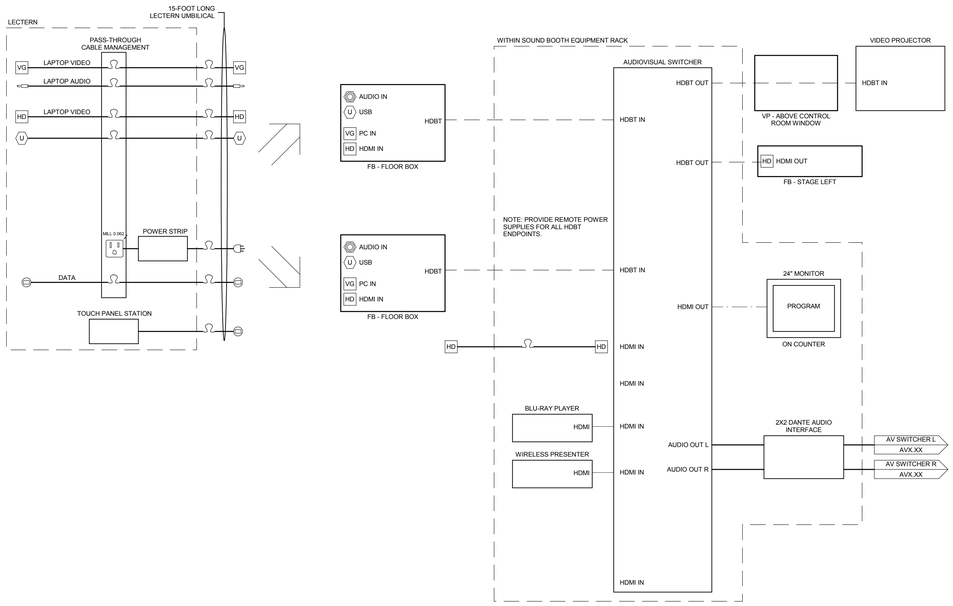
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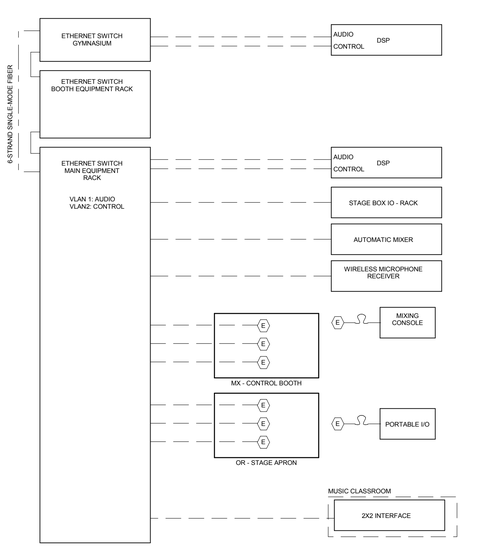
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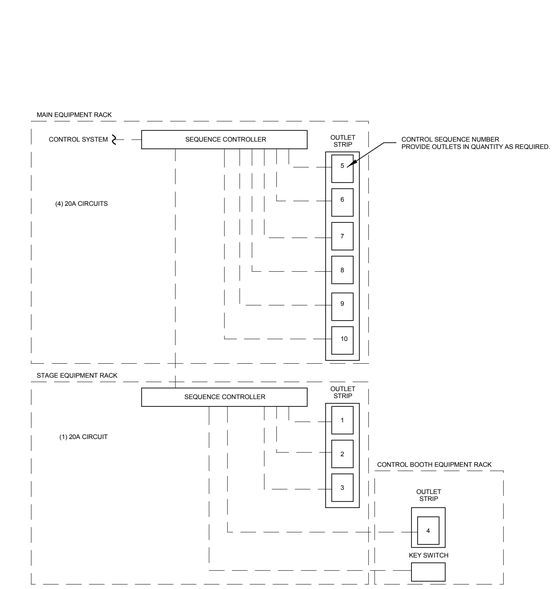
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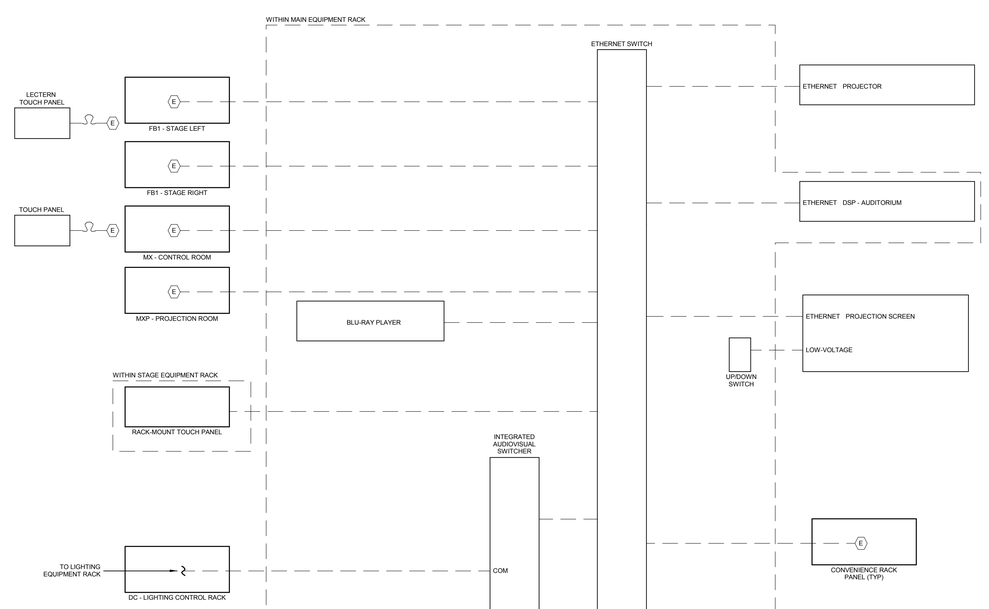
1 AUDITORIUM VIDEO PRESENTATION SYSTEM
NTS



3 DIGITAL AUDIO NETWORK
NTS



4 AUDITORIUM POWER SEQUENCING
NTS



2 AUDITORIUM CONTROL SYSTEM
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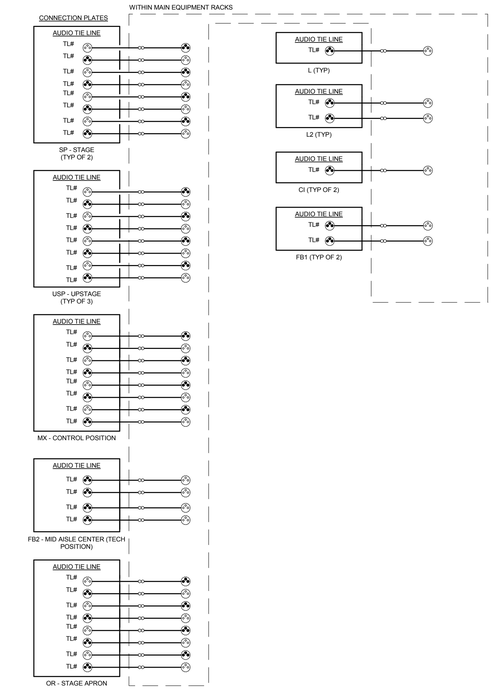
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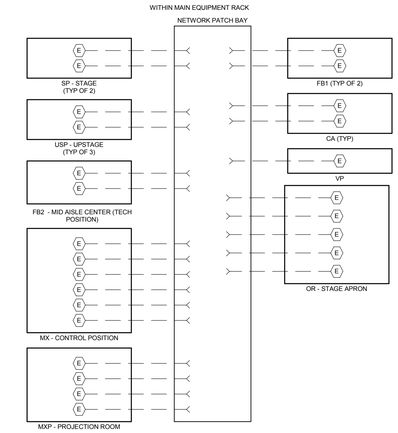
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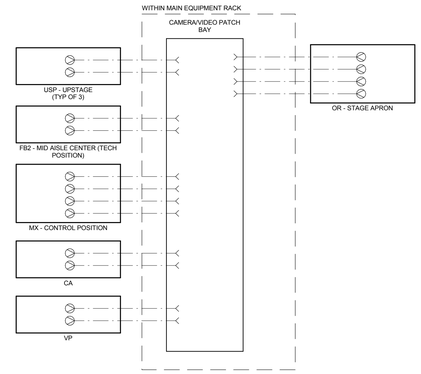
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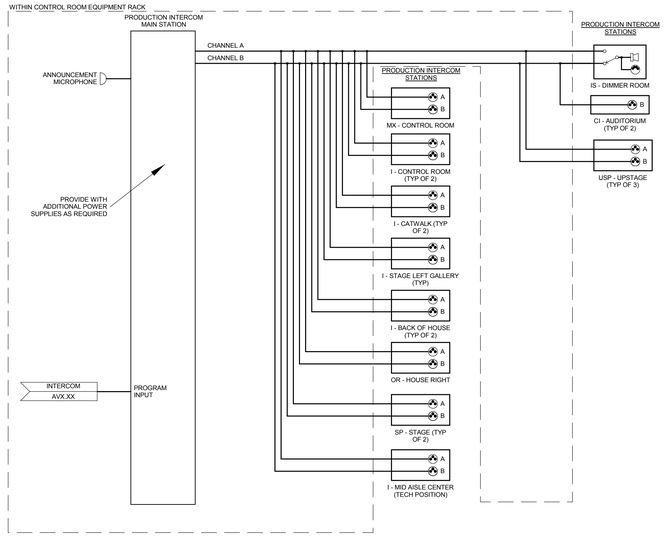
1 AUDITORIUM AUDIO TIE LINES
NTS



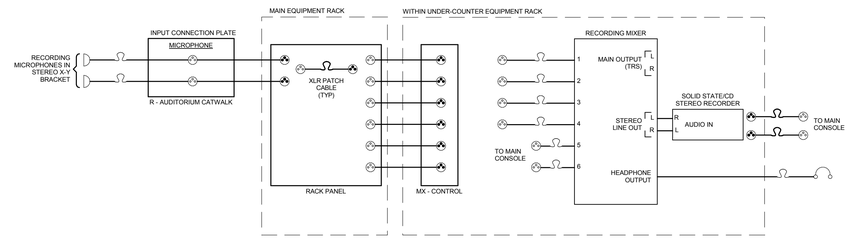
2 AUDITORIUM CATEGORY TIE LINES
NTS



3 AUDITORIUM VIDEO TIE LINES
NTS



4 AUDITORIUM PRODUCTION INTERCOM SYSTEM
NTS



5 AUDITORIUM PRODUCTION AUDIO RECORDING
NTS

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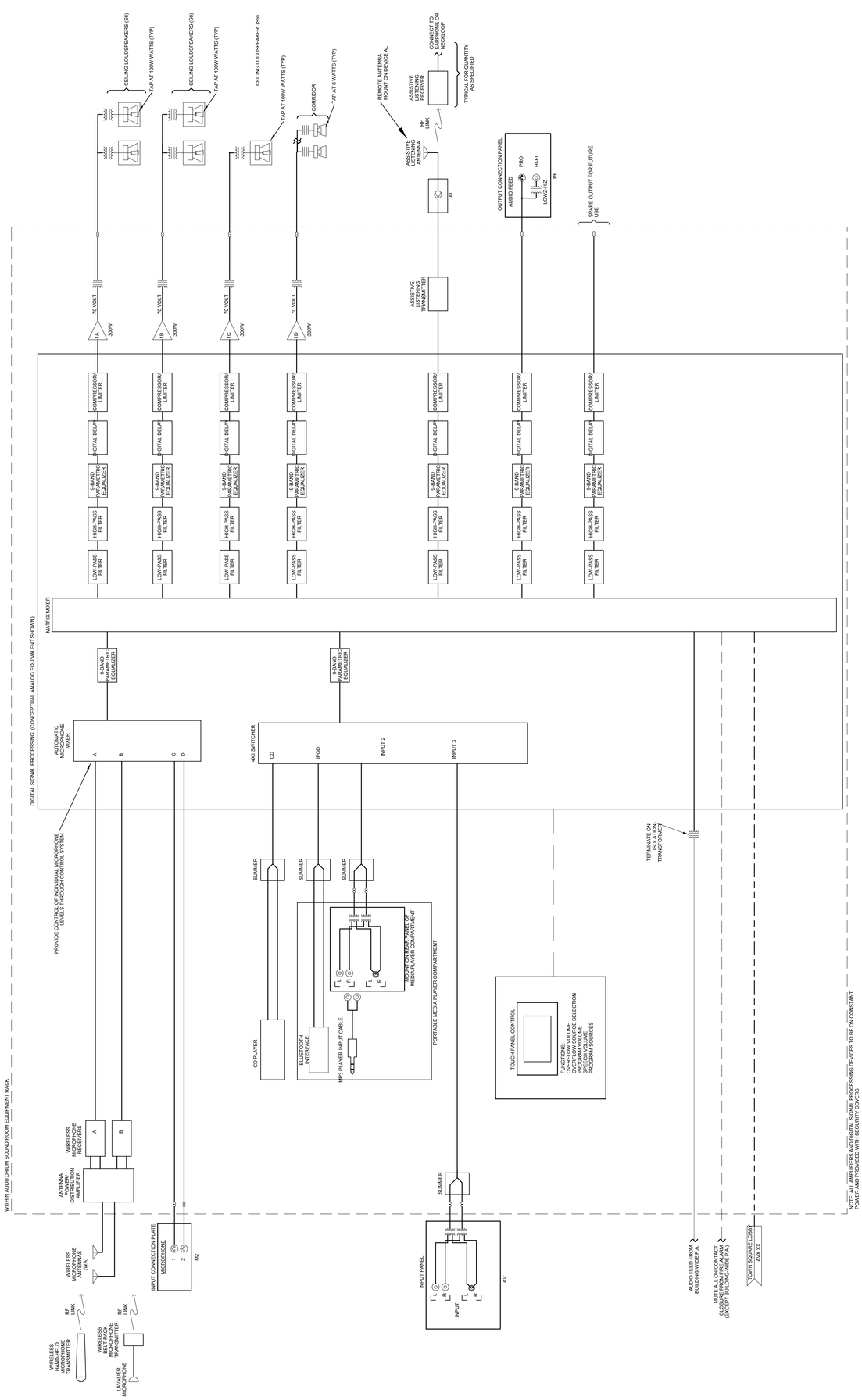
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		SCALE: NTS DRAWN BY: Author CHECKED BY: Checker	

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Dover, NH

AUDIOVISUAL FUNCTIONAL DIAGRAM - GYM

SCALE: NTS DRAWN BY: Author CHECKED BY: Checker

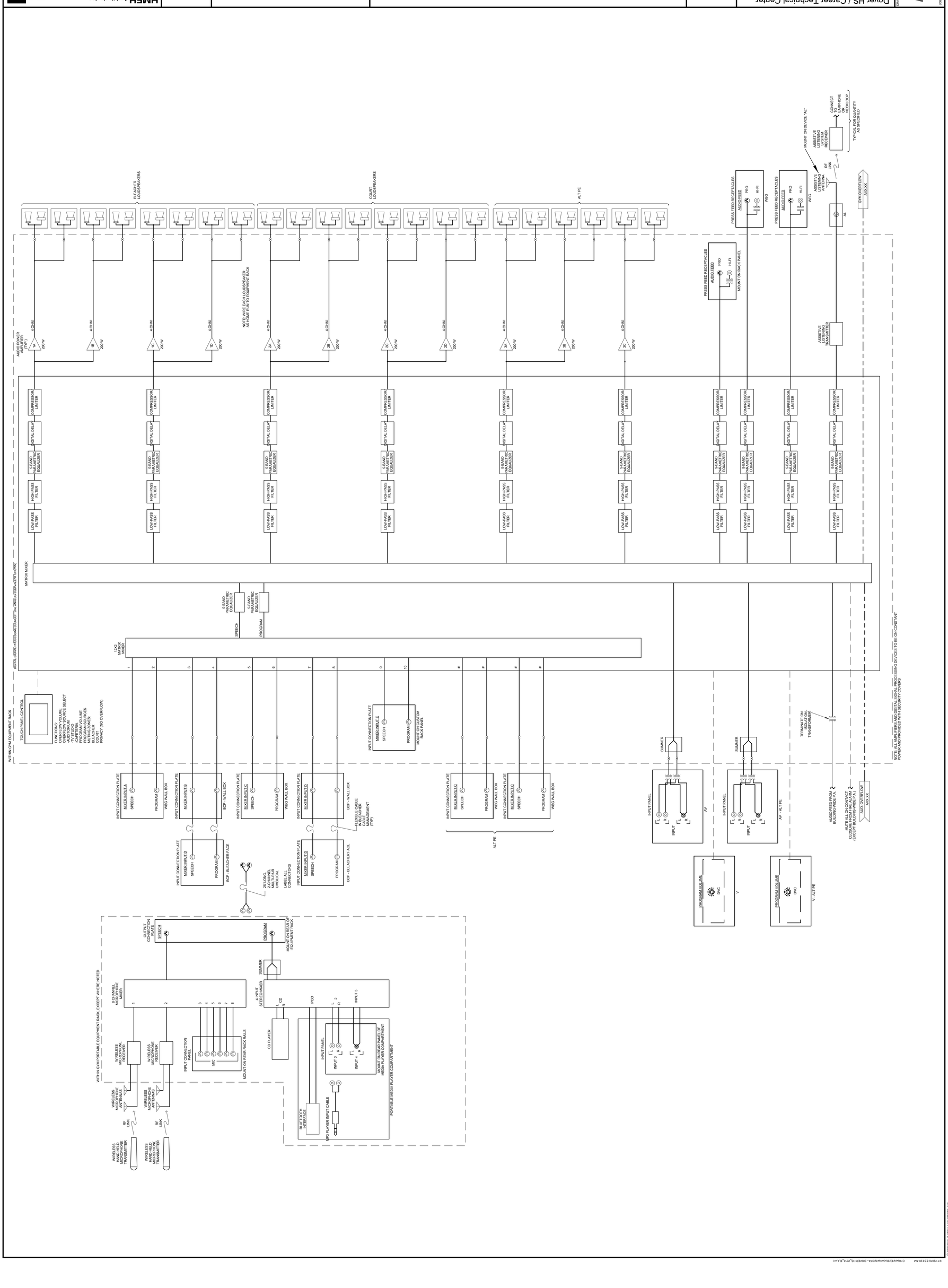
DESIGN DEVELOPMENT
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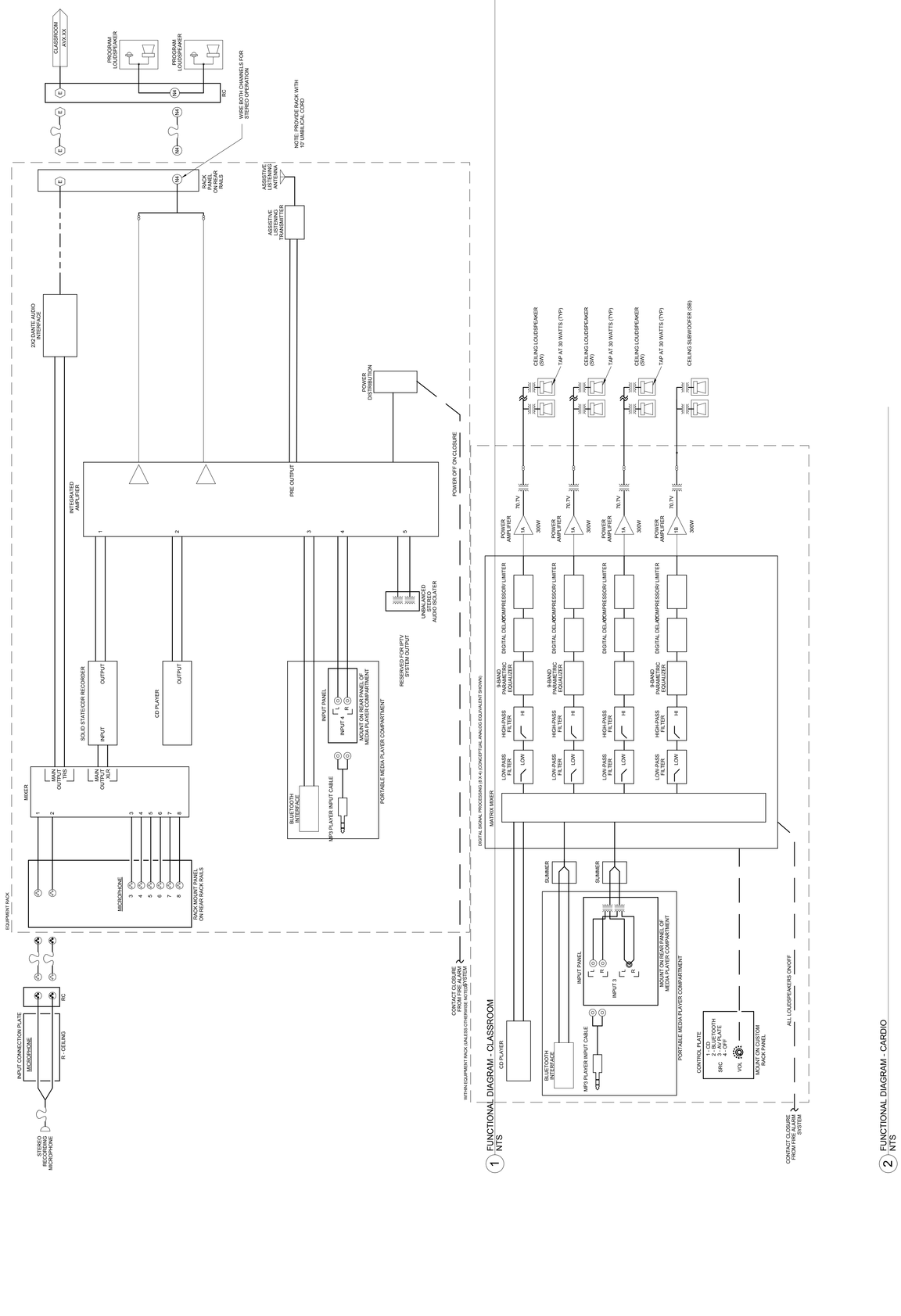
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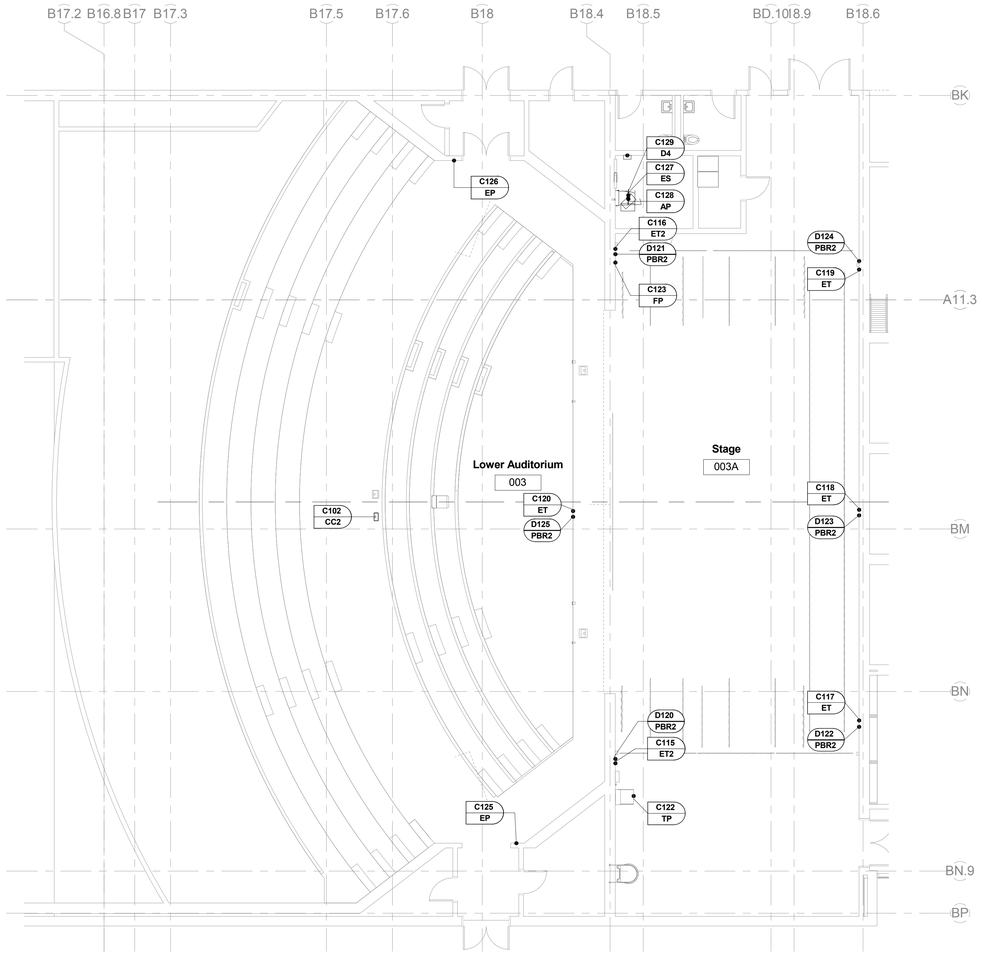
CAVANAUGHTOCCI
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DESIGN DEVELOPMENT

SCALE: NTS DRAWN BY: AJ/RO CHECKED BY: Checker
AUDIOVISUAL FUNCTIONAL DIAGRAMS - CLASSROOM AND CARDIO
Dover, NH
Dover HS / Career Technical Center

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1 THEATRICAL LIGHTING DEVICE PLAN - AUDITORIUM - GROUND FLOOR
1/8" = 1'-0"

DEVICE KEY

D### PSR — DEVICE NUMBER / DEVICE TYPE

CONTROL DEVICES

C### ET	ETHERNET TAP MOUNT AT RECEPTACLE HEIGHT UNLESS OTHERWISE NOTED.
C### ET2	DUAL ETHERNET TAP MOUNT AT RECEPTACLE HEIGHT UNLESS OTHERWISE NOTED.
C### CC1	CONSOLE CONNECTION PANEL. MOUNT AT PROJECT RECEPTACLE HEIGHT.
C### CC2	FLOOR BOX TECH TABLE CONNECTION PANEL.
C### EP	ENTRY STATION. MOUNT AT PROJECT SWITCH HEIGHT UNLESS OTHERWISE NOTED.
C### TP	TOUCH PANEL LIGHTING CONTROL. RACK MOUNTED.
C### FP	FADER PANEL. MOUNT AT SWITCH HEIGHT UNLESS OTHERWISE NOTED.
C### AP	ARCHITECTURAL LIGHTING PROCESSOR RACK MOUNTED.
C### ES	ETHERNET SWITCH AND PATCHBAY RACK MOUNTED
C### EN	FOUR-PORT ETHERNET NODE.

DISTRIBUTION DEVICES

D### PSR	PLUG-IN STRIP WITH RECEPTACLES
D### PSP	PLUG-IN STRIP WITH PIGTAILS
D### PBR	PLUG-IN BOX WITH RECEPTACLES
D### PBP	PLUG-IN BOX WITH PIGTAILS
D### HL	JUNCTION BOX FOR ARCHITECTURAL LIGHTING POWER CONNECTIONS
	COMPANY SWITCH AMPERAGE INDICATED

DIVISION 26 DEVICES

5-20 20A 120VAC DUPLEX RECEPTACLE INTEGRATED WITH CONTROL DEVICE

CEILING / WALL — ELECTRICAL OUTLET - SPECIAL TYPE INDICATED ADJACENT TO OUTLET
TYPE A - L5-20 - 20A, 120VAC
TYPE B - L21-20 - 20A, 120/208VAC

RISER DIAGRAM WIRING KEY

———— POWER

– – – – – – – – CONTROL

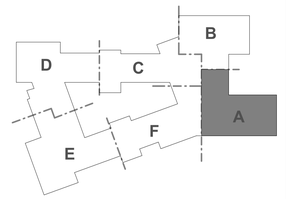
CONTROL WIRING LEGEND

TYPE	WIRE TYPE(S)	SIGNAL
A	(1) BELDEN 8471 (1) #14 AWG. STRANDED WIRE (2) #16 AWG	ARCH. CTRL.
B	(1) BELDEN 1583A	NETWORK
C	(1) BELDEN 9729	DMX

NOTES

1. ALL CIRCUITS HOME-RUN TO PANELS FOR TERMINATION.
2. NO COMMON NEUTRALS PERMITTED. EACH CIRCUIT MUST HAVE DEDICATED NEUTRAL.
3. ALL DEVICES MOUNTED AT 18" AFF UNLESS OTHERWISE NOTED.
4. ALL EXPOSED SURFACES ON ON-STAGE DEVICES FINISHED MATTE BLACK UNLESS OTHERWISE NOTED.
5. PROVIDE BRACKETS AND HARDWARE FOR MOUNTING CONTRL AND DISTRIBUTION DEVICES AS REQUIRED.
6. ALL LOW-VOLTAGE CONTROL WIRING INSTALLED IN METAL CONDUIT.
7. FINAL CONTROL WIRING TYPES TO BE CONFIRMED BY LIGHTING SYSTEM MANUFACTURER.

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DESIGN DEVELOPMENT
3/14/2016

PLAN NORTH
TRUE NORTH

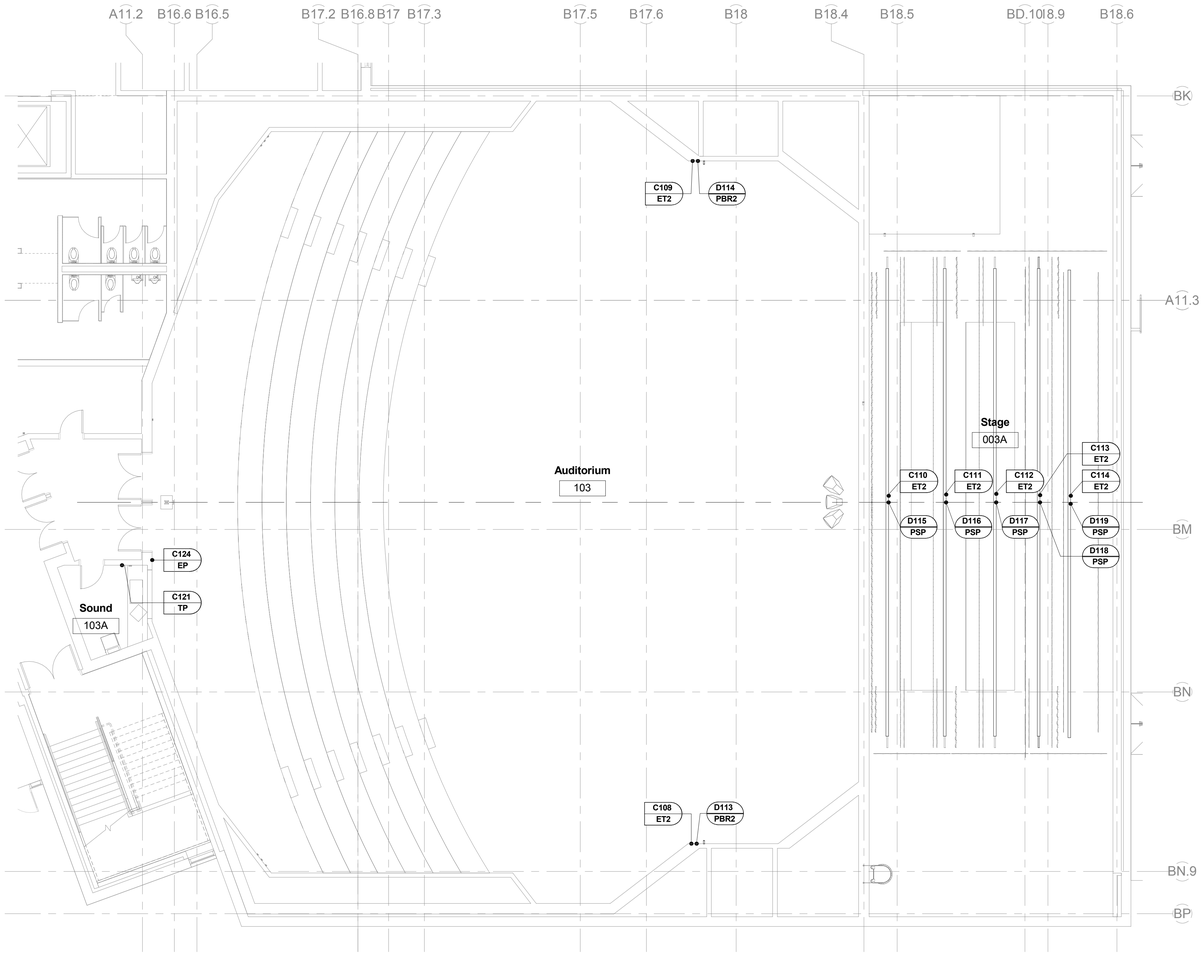
Dover HS / Career Technical Center
Dover, NH
THEATRICAL LIGHTING PLAN

SCALE: As Indicated
DRAWN BY: Author
CHECKED BY: Checker

DRAWING NUMBER
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1 THEATRICAL LIGHTING DEVICE PLAN - AUDITORIUM - FIRST FLOOR
1/8" = 1'-0"

DEVICE KEY

D### PSR — DEVICE NUMBER; DEVICE TYPE

CONTROL DEVICES

C### ET	ETHERNET TAP MOUNT AT RECEPTACLE HEIGHT UNLESS OTHERWISE NOTED.
C### ET2	DUAL ETHERNET TAP MOUNT AT RECEPTACLE HEIGHT UNLESS OTHERWISE NOTED.
C### CC1	CONSOLE CONNECTION PANEL. MOUNT AT PROJECT RECEPTACLE HEIGHT.
C### CC2	FLOOR BOX TECH TABLE CONNECTION PANEL.
C### EP	ENTRY STATION. MOUNT AT PROJECT SWITCH HEIGHT UNLESS OTHERWISE NOTED.
C### TP	TOUCH PANEL LIGHTING CONTROL. RACK MOUNTED.
C### FP	FADER PANEL. MOUNT AT SWITCH HEIGHT UNLESS OTHERWISE NOTED.
C### AP	ARCHITECTURAL LIGHTING PROCESSOR RACK MOUNTED.
C### ES	ETHERNET SWITCH AND PATCHBAY RACK MOUNTED
C### EN	FOUR-PORT ETHERNET NODE.

DISTRIBUTION DEVICES

D### PSR	PLUG-IN STRIP WITH RECEPTACLES
D### PSP	PLUG-IN STRIP WITH PIGTAILS
D### PBR	PLUG-IN BOX WITH RECEPTACLES
D### PBP	PLUG-IN BOX WITH PIGTAILS
D### HL	JUNCTION BOX FOR ARCHITECTURAL LIGHTING POWER CONNECTIONS
	COMPANY SWITCH AMPERAGE INDICATED

DIVISION 26 DEVICES

5-20 20A 120VAC DUPLEX RECEPTACLE INTEGRATED WITH CONTROL DEVICE

CEILING / WALL — ELECTRICAL OUTLET - SPECIAL TYPE INDICATED ADJACENT TO OUTLET
TYPE A - L5-20 - 20A, 120VAC
TYPE B - L21-20 - 20A, 120/208VAC

RISER DIAGRAM WIRING KEY

———— POWER

– – – – – – – – CONTROL

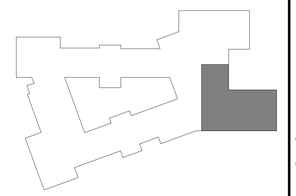
CONTROL WIRING LEGEND

TYPE	WIRE TYPE(S)	SIGNAL
A	(1) BELDEN 8471 (1) #14 AWG. STRANDED WIRE (2) #16 AWG	ARCH. CTRL.
B	(1) BELDEN 1583A	NETWORK
C	(1) BELDEN 9729	DMX

NOTES

1. ALL CIRCUITS HOME-RUN TO PANELS FOR TERMINATION.
2. NO COMMON NEUTRALS PERMITTED. EACH CIRCUIT MUST HAVE DEDICATED NEUTRAL.
3. ALL DEVICES MOUNTED AT 18" AFF UNLESS OTHERWISE NOTED.
4. ALL EXPOSED SURFACES ON ON-STAGE DEVICES FINISHED MATTE BLACK UNLESS OTHERWISE NOTED.
5. PROVIDE BRACKETS AND HARDWARE FOR MOUNTING CONTRL AND DISTRIBUTION DEVICES AS REQUIRED.
6. ALL LOW-VOLTAGE CONTROL WIRING INSTALLED IN METAL CONDUIT.
7. FINAL CONTROL WIRING TYPES TO BE CONFIRMED BY LIGHTING SYSTEM MANUFACTURER.

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DESIGN DEVELOPMENT
3/14/2016

PLAN NORTH / TRUE NORTH

Dover HS / Career Technical Center
Dover, NH
THEATRICAL LIGHTING PLAN

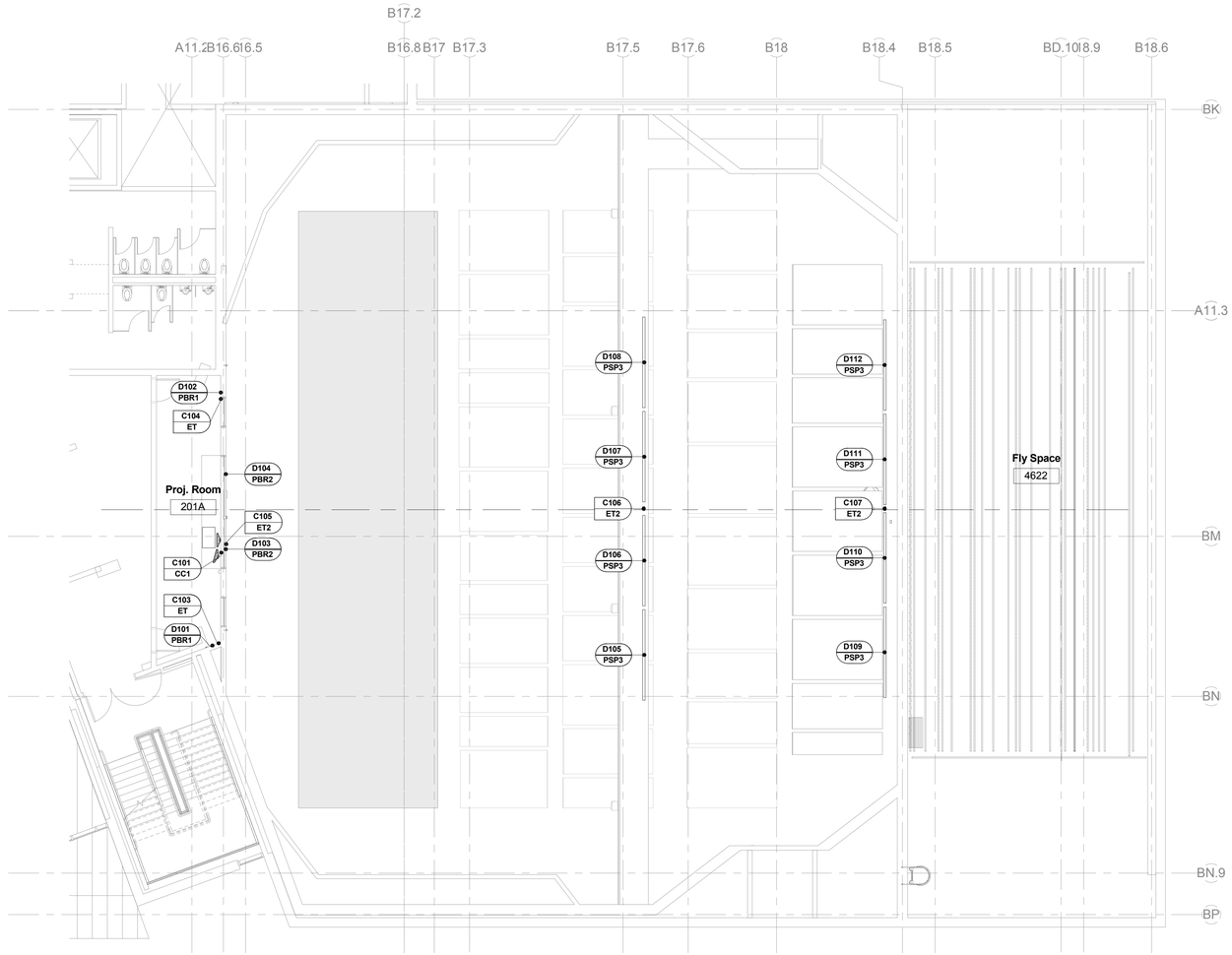
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1 THEATRICAL LIGHTING DEVICE PLAN - AUDITORIUM - SECOND FLOOR
1/8" = 1'-0"

DEVICE KEY

D### PSR — DEVICE NUMBER / DEVICE TYPE

CONTROL DEVICES

- C### ET — ETHERNET TAP MOUNT AT RECEPTACLE HEIGHT UNLESS OTHERWISE NOTED.
- C### ET2 — DUAL ETHERNET TAP MOUNT AT RECEPTACLE HEIGHT UNLESS OTHERWISE NOTED.
- C### CC1 — CONSOLE CONNECTION PANEL. MOUNT AT PROJECT RECEPTACLE HEIGHT.
- C### CC2 — FLOOR BOX TECH TABLE CONNECTION PANEL.
- C### EP — ENTRY STATION. MOUNT AT PROJECT SWITCH HEIGHT UNLESS OTHERWISE NOTED.
- C### TP — TOUCH PANEL LIGHTING CONTROL. RACK MOUNTED.
- C### FP — FADER PANEL. MOUNT AT SWITCH HEIGHT UNLESS OTHERWISE NOTED.
- C### AP — ARCHITECTURAL LIGHTING PROCESSOR RACK MOUNTED.
- C### ES — ETHERNET SWITCH AND PATCHBAY RACK MOUNTED
- C### EN — FOUR-PORT ETHERNET NODE.

DISTRIBUTION DEVICES

- D### PSR — PLUG-IN STRIP WITH RECEPTACLES
- D### PSP — PLUG-IN STRIP WITH PIGTAILS
- D### PBR — PLUG-IN BOX WITH RECEPTACLES
- D### PBP — PLUG-IN BOX WITH PIGTAILS
- D### HL — JUNCTION BOX FOR ARCHITECTURAL LIGHTING POWER CONNECTIONS
- COMPANY SWITCH AMPERAGE INDICATED

DIVISION 26 DEVICES

- 5-20 20A 120VAC DUPLEX RECEPTACLE INTEGRATED WITH CONTROL DEVICE
- CEILING / WALL — ELECTRICAL OUTLET - SPECIAL TYPE INDICATED ADJACENT TO OUTLET
  TYPE A - L5-20 - 20A, 120VAC
  TYPE B - L21-20 - 20A, 120/208VAC

RISER DIAGRAM WIRING KEY

- POWER
- CONTROL

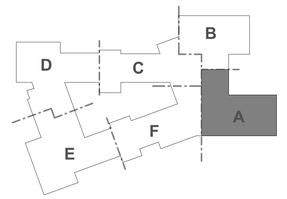
CONTROL WIRING LEGEND

TYPE	WIRE TYPE(S)	SIGNAL
A	(1) BELDEN 8471 (1) #14 AWG. STRANDED WIRE (2) #16 AWG	ARCH. CTRL.
B	(1) BELDEN 1583A	NETWORK
C	(1) BELDEN 9729	DMX

NOTES

1. ALL CIRCUITS HOME-RUN TO PANELS FOR TERMINATION.
2. NO COMMON NEUTRALS PERMITTED. EACH CIRCUIT MUST HAVE DEDICATED NEUTRAL.
3. ALL DEVICES MOUNTED AT 18" AFF UNLESS OTHERWISE NOTED.
4. ALL EXPOSED SURFACES ON ON-STAGE DEVICES FINISHED MATTE BLACK UNLESS OTHERWISE NOTED.
5. PROVIDE BRACKETS AND HARDWARE FOR MOUNTING CONTRL AND DISTRIBUTION DEVICES AS REQUIRED.
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7. FINAL CONTROL WIRING TYPES TO BE CONFIRMED BY LIGHTING SYSTEM MANUFACTURER.

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Dover HS / Career Technical Center
Dover, NH
THEATRICAL LIGHTING PLAN

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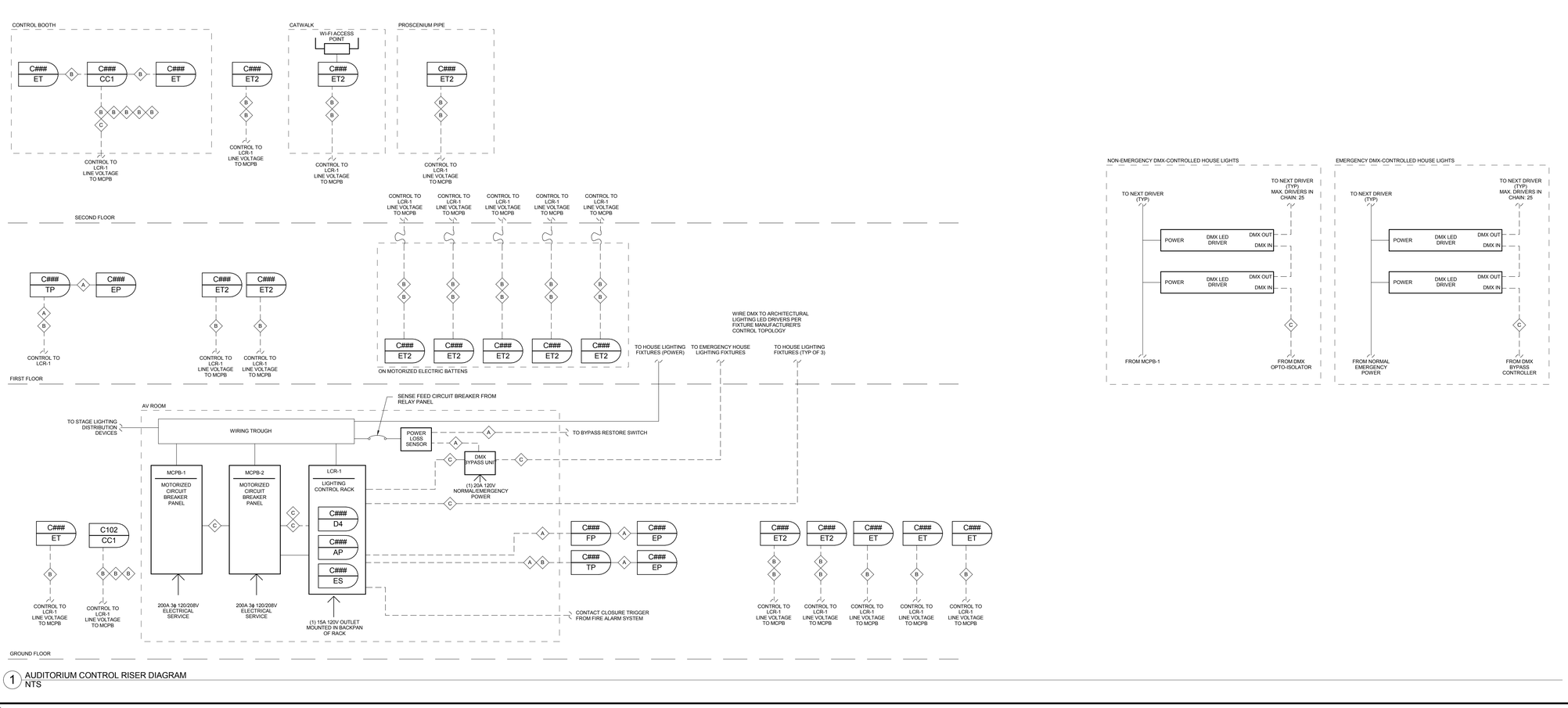
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THEATRICAL LIGHTING CONTROL DEVICE SCHEDULE

Device ID (C)	Device Type	Description	Location	Finish	Mount Type	Mounting Height	Type Comments
101	CC1	CONTROL CONSOLE PLUG-IN	CONTROL BOOTH	BLACK		P.R.H.	FIVE GANG ELECTRICAL BOX
102	CC2	FLOOR BOX CONTROL PLUG-IN	TECH POSITION	PER ARCHITECT			FLOOR BOX
103	ET	ETHERNET TAP, SINGLE	CONTROL BOOTH	BLACK		P.R.H.	TWO GANG ELECTRICAL BOX
104	ET	ETHERNET TAP, SINGLE	CONTROL BOOTH	BLACK		P.R.H.	TWO GANG ELECTRICAL BOX
105	ET2	ETHERNET TAP, DUAL	BOOTH PIPE	PER ARCHITECT		P.R.H.	THREE GANG ELECTRICAL BOX
106	ET2	ETHERNET TAP, DUAL	CATWALK	BLACK		P.R.H.	THREE GANG ELECTRICAL BOX
107	ET2	ETHERNET TAP, DUAL	PROSCENIUM PIPE	BLACK		P.R.H.	THREE GANG ELECTRICAL BOX
108	ET2	ETHERNET TAP, DUAL	HOUSE RIGHT WALL PIPE	PER ARCHITECT		P.R.H.	THREE GANG ELECTRICAL BOX
109	ET2	ETHERNET TAP, DUAL	HOUSE LEFT WALL PIPE	PER ARCHITECT		P.R.H.	THREE GANG ELECTRICAL BOX
110	ET2	ETHERNET TAP, DUAL	ELECTRIC #1	BLACK	INTEGRATED INTO CONNECTOR STRIP	P.R.H.	THREE GANG ELECTRICAL BOX
111	ET2	ETHERNET TAP, DUAL	ELECTRIC #2	BLACK	INTEGRATED INTO CONNECTOR STRIP	P.R.H.	THREE GANG ELECTRICAL BOX
112	ET2	ETHERNET TAP, DUAL	ELECTRIC #3	BLACK	INTEGRATED INTO CONNECTOR STRIP	P.R.H.	THREE GANG ELECTRICAL BOX
113	ET2	ETHERNET TAP, DUAL	ELECTRIC #4	BLACK	INTEGRATED INTO CONNECTOR STRIP	P.R.H.	THREE GANG ELECTRICAL BOX
114	ET2	ETHERNET TAP, DUAL	ELECTRIC #5	BLACK	INTEGRATED INTO CONNECTOR STRIP	P.R.H.	THREE GANG ELECTRICAL BOX
115	ET2	ETHERNET TAP, DUAL	DOWNSTAGE LEFT	BLACK		P.R.H.	THREE GANG ELECTRICAL BOX
116	ET2	ETHERNET TAP, DUAL	DOWNSTAGE RIGHT	BLACK		P.R.H.	THREE GANG ELECTRICAL BOX
117	ET	ETHERNET TAP, SINGLE	UPSTAGE LEFT	BLACK		P.R.H.	TWO GANG ELECTRICAL BOX
118	ET	ETHERNET TAP, SINGLE	UPSTAGE CENTER	BLACK		P.R.H.	TWO GANG ELECTRICAL BOX
119	ET	ETHERNET TAP, SINGLE	UPSTAGE RIGHT	BLACK		P.R.H.	TWO GANG ELECTRICAL BOX
120	ET	ETHERNET TAP, SINGLE	STAGE APRON	PER ARCHITECT		P.R.H.	TWO GANG ELECTRICAL BOX
121	TP	TOUCH PANEL	SOUND BOOTH	BLACK		P.S.H.	CUSTOM BACK BOX
122	TP	TOUCH PANEL	STAGE EQUIPMENT RACK	BLACK	RACK	P.S.H.	CUSTOM BACK BOX
123	FP	FADER PANEL	DOWNSTAGE RIGHT	BLACK	FLUSH	P.S.H.	FOUR GANG ELECTRICAL BOX
124	EP	ENTRY PANEL	HOUSE REAR ENTRY	PER ARCHITECT	FLUSH	P.S.H.	ONE GANG ELECTRICAL BOX
125	EP	ENTRY PANEL	HOUSE RIGHT ENTRY	PER ARCHITECT	FLUSH	P.S.H.	ONE GANG ELECTRICAL BOX
126	EP	ENTRY PANEL	HOUSE LEFT ENTRY	PER ARCHITECT	FLUSH	P.S.H.	ONE GANG ELECTRICAL BOX
127	ES	ETHERNET SWITCH	LIGHTING CONTROL RACK	N/A	RACK		
128	AP	ARCHITECTURAL LIGHTING PROCESSOR	LIGHTING CONTROL RACK	N/A	RACK		
129	D4	4-PORT DMX NODE	LIGHTING CONTROL RACK	N/A	RACK		

THEATRICAL LIGHTING DISTRIBUTION DEVICE SCHEDULE

Device ID (D)	Device Type	Description	Location	Finish	Mount Type	Switched Circuits (20A)
101	PBR1	PLUG-IN BOX WITH RECEPTACLES	CONTROL BOOTH	BLACK	FLUSH	2
102	PBR1	PLUG-IN BOX WITH RECEPTACLES	CONTROL BOOTH	BLACK	FLUSH	2
103	PBR2	PLUG-IN BOX WITH RECEPTACLES	BOOTH PIPE	PER ARCHITECT	FLUSH	2
104	PBR2	PLUG-IN BOX WITH RECEPTACLES	BOOTH PIPE	PER ARCHITECT	FLUSH	2
105	PSP3	PLUG-IN STRIP WITH PIGTAILS	CATWALK	BLACK	SURFACE	3
106	PSP3	PLUG-IN STRIP WITH PIGTAILS	CATWALK	BLACK	SURFACE	3
107	PSP3	PLUG-IN STRIP WITH PIGTAILS	CATWALK	BLACK	SURFACE	3
108	PSP3	PLUG-IN STRIP WITH PIGTAILS	CATWALK	BLACK	SURFACE	3
109	PSP3	PLUG-IN STRIP WITH PIGTAILS	PROSCENIUM PIPE	BLACK	PIPE MOUNT	3
110	PSP3	PLUG-IN STRIP WITH PIGTAILS	PROSCENIUM PIPE	BLACK	PIPE MOUNT	3
111	PSP3	PLUG-IN STRIP WITH PIGTAILS	PROSCENIUM PIPE	BLACK	PIPE MOUNT	3
112	PSP3	PLUG-IN STRIP WITH PIGTAILS	PROSCENIUM PIPE	BLACK	PIPE MOUNT	3
113	PBR2	PLUG-IN BOX WITH RECEPTACLES	HOUSE RIGHT WALL PIPE	PER ARCHITECT	FLUSH	2
114	PBR2	PLUG-IN BOX WITH RECEPTACLES	HOUSE LEFT WALL PIPE	PER ARCHITECT	FLUSH	2
115	PSP	PLUG-IN STRIP WITH PIGTAILS	ELECTRIC #1	BLACK	BATTEN	5
116	PSP	PLUG-IN STRIP WITH PIGTAILS	ELECTRIC #2	BLACK	BATTEN	5
117	PSP	PLUG-IN STRIP WITH PIGTAILS	ELECTRIC #3	BLACK	BATTEN	5
118	PSP	PLUG-IN STRIP WITH PIGTAILS	ELECTRIC #4	BLACK	BATTEN	5
119	PSP	PLUG-IN STRIP WITH PIGTAILS	ELECTRIC #5	BLACK	BATTEN	5
120	PBR2	PLUG-IN BOX WITH RECEPTACLES	DOWNSTAGE LEFT	BLACK	FLUSH	2
121	PBR2	PLUG-IN BOX WITH RECEPTACLES	DOWNSTAGE RIGHT	BLACK	FLUSH	2
122	PBR2	PLUG-IN BOX WITH RECEPTACLES	UPSTAGE LEFT	BLACK	FLUSH	2
123	PBR2	PLUG-IN BOX WITH RECEPTACLES	UPSTAGE CENTER	BLACK	FLUSH	2
124	PBR2	PLUG-IN BOX WITH RECEPTACLES	UPSTAGE RIGHT	BLACK	FLUSH	2
125	PBR2	PLUG-IN BOX WITH RECEPTACLES	STAGE APRON	PER ARCHITECT	FLUSH	2
125	HL	HOUSE LIGHTING POWER				6
						79



1 AUDITORIUM CONTROL RISER DIAGRAM
NTS

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3/14/2016

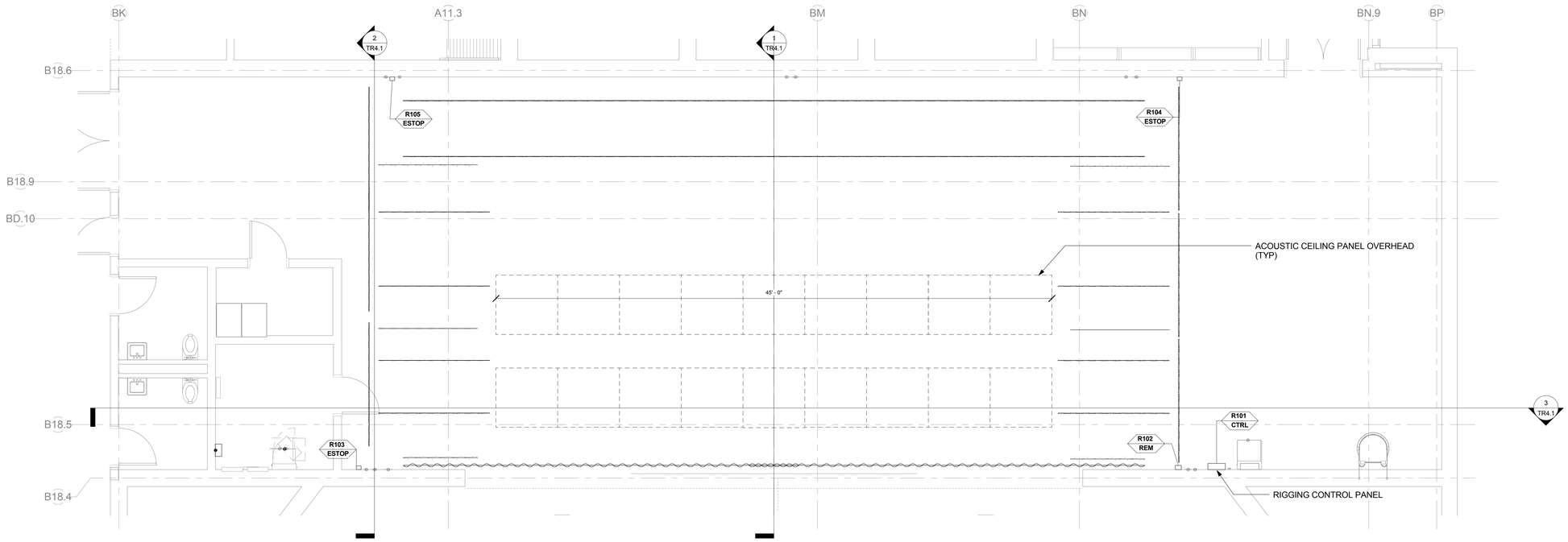
Dover HS / Career Technical Center
Dover, NH
THEATRICAL LIGHTING RISER AND SCHEDULES
SCALE: 6" = 1'-0" DRAWN BY: Author CHECKED BY: Checker

DRAWING NUMBER
TL5.1

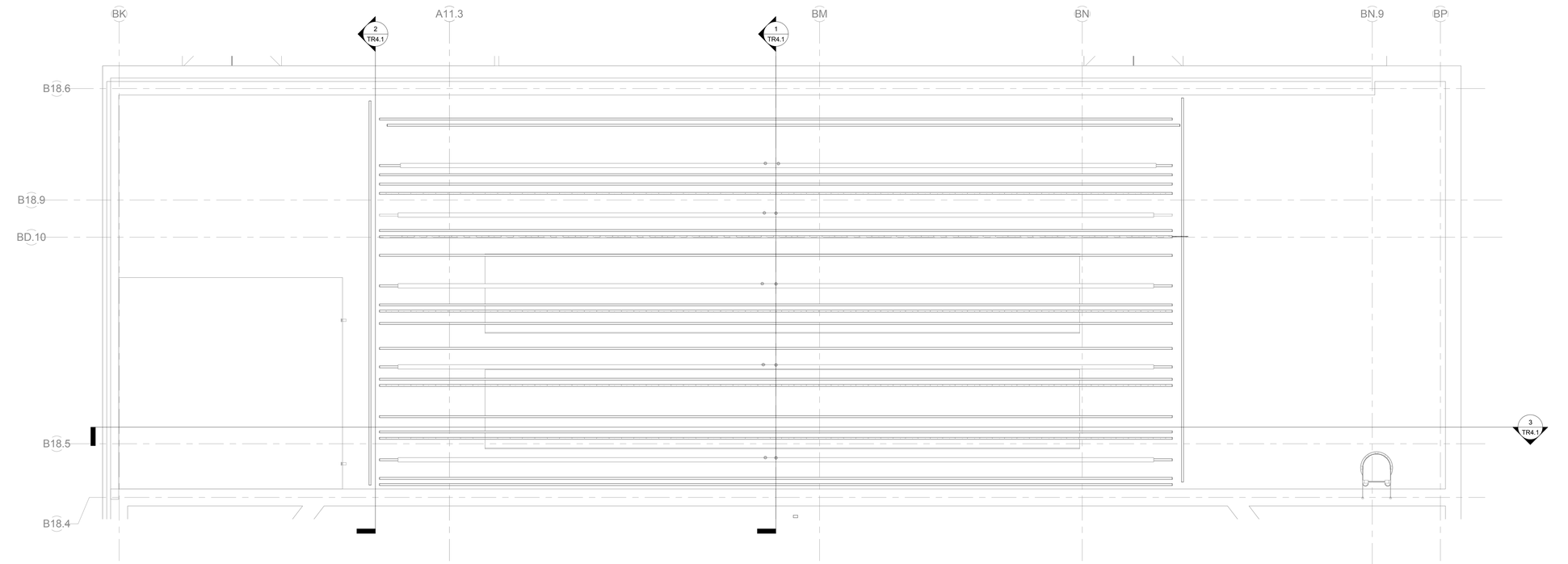
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1 THEATRICAL RIGGING - AUDITORIUM - GROUND FLOOR PLAN
1/4" = 1'-0"



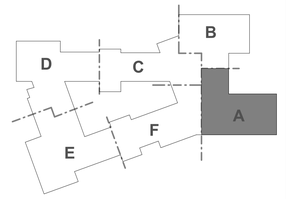
2 THEATRICAL RIGGING - AUDITORIUM - BATTEN PLAN
1/4" = 1'-0"

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THEATRICAL RIGGING PLANS

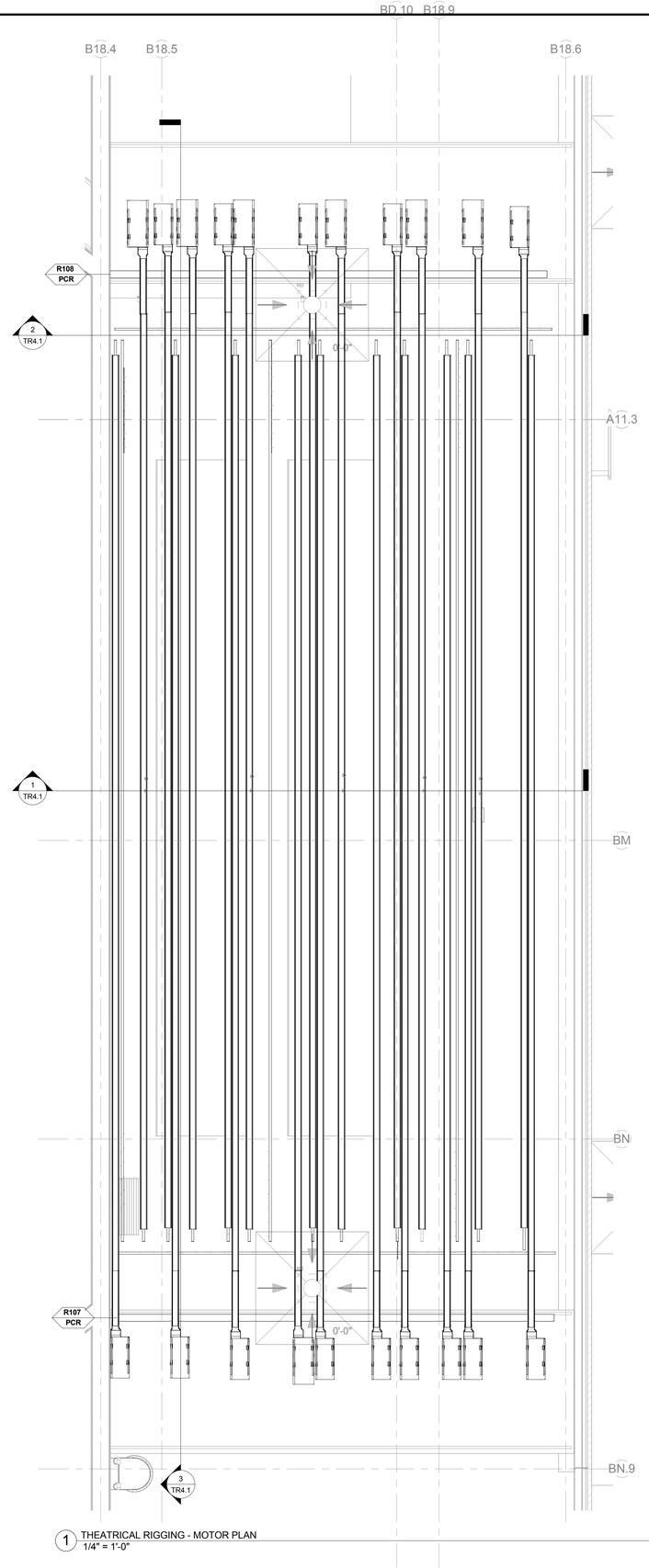
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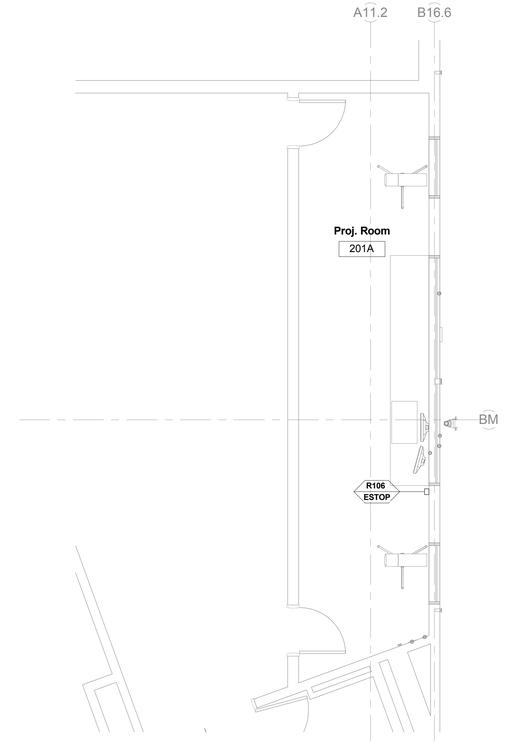
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1 THEATRICAL RIGGING - MOTOR PLAN
1/4" = 1'-0"



2 THEATRICAL RIGGING PLAN - PROJECTION BOOTH
1/4" = 1'-0"

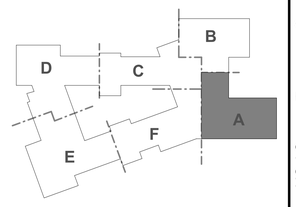
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PLAN NORTH
TRUE NORTH

KEYPLAN



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Dover, NH
THEATRICAL RIGGING PLANS

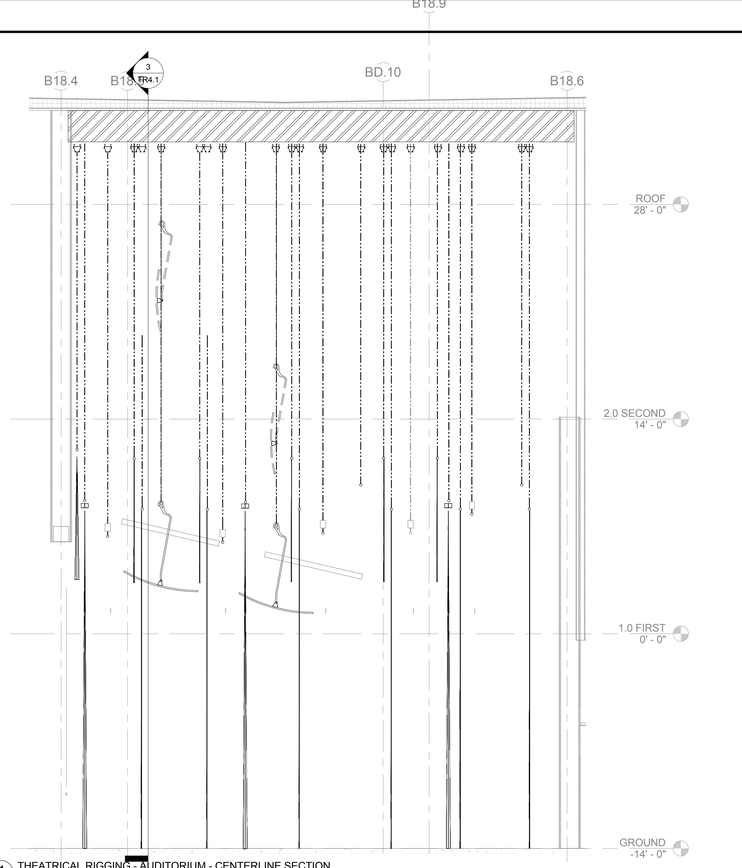
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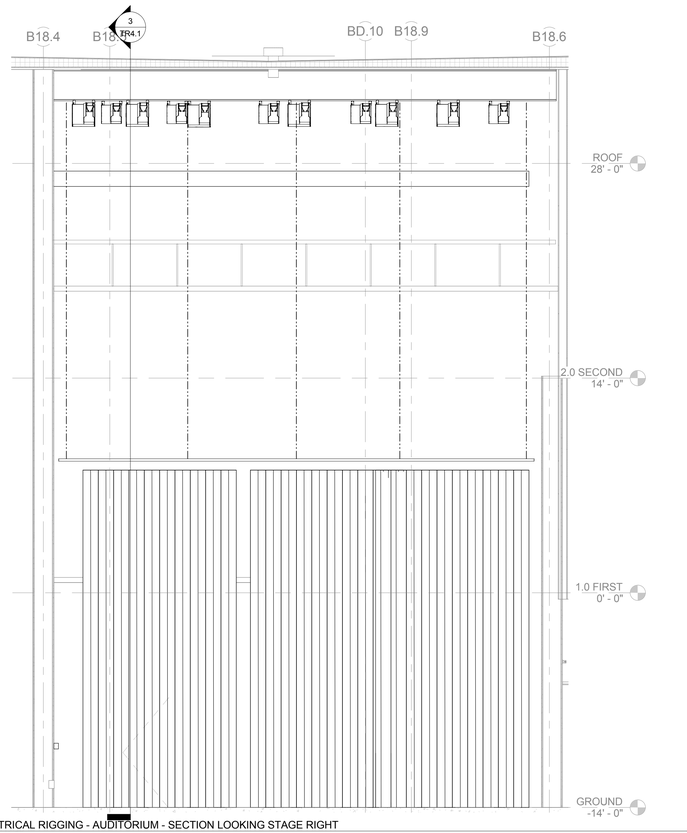
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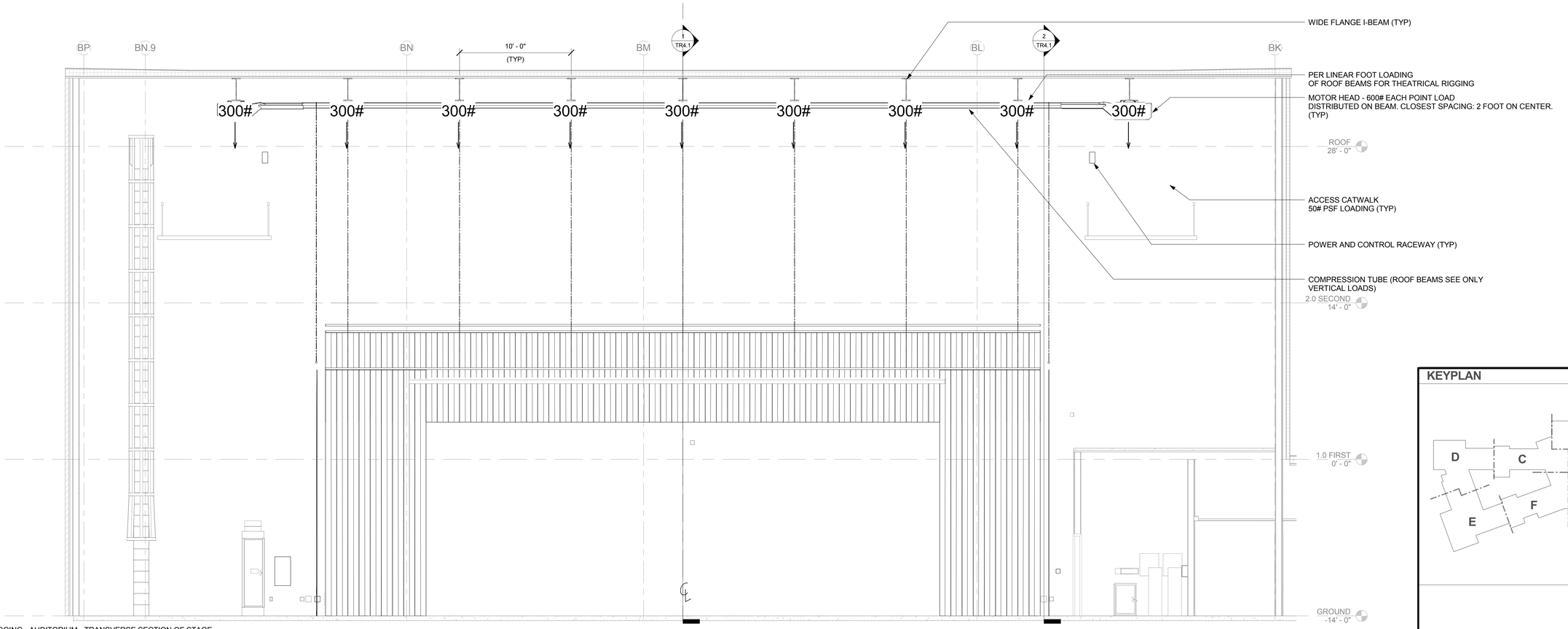
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1 THEATRICAL RIGGING - AUDITORIUM - CENTERLINE SECTION
1/4" = 1'-0"



2 THEATRICAL RIGGING - AUDITORIUM - SECTION LOOKING STAGE RIGHT
1/4" = 1'-0"

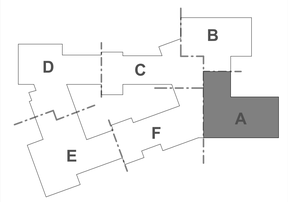


3 THEATRICAL RIGGING - AUDITORIUM - TRANSVERSE SECTION OF STAGE
LOOKING DOWNSTAGE
1/4" = 1'-0"

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THEATRICAL RIGGING SECTIONS

SCALE: 1/4" = 1'-0" DRAWN BY: Author CHECKED BY: Checker

DRAWING NUMBER
TR4.1

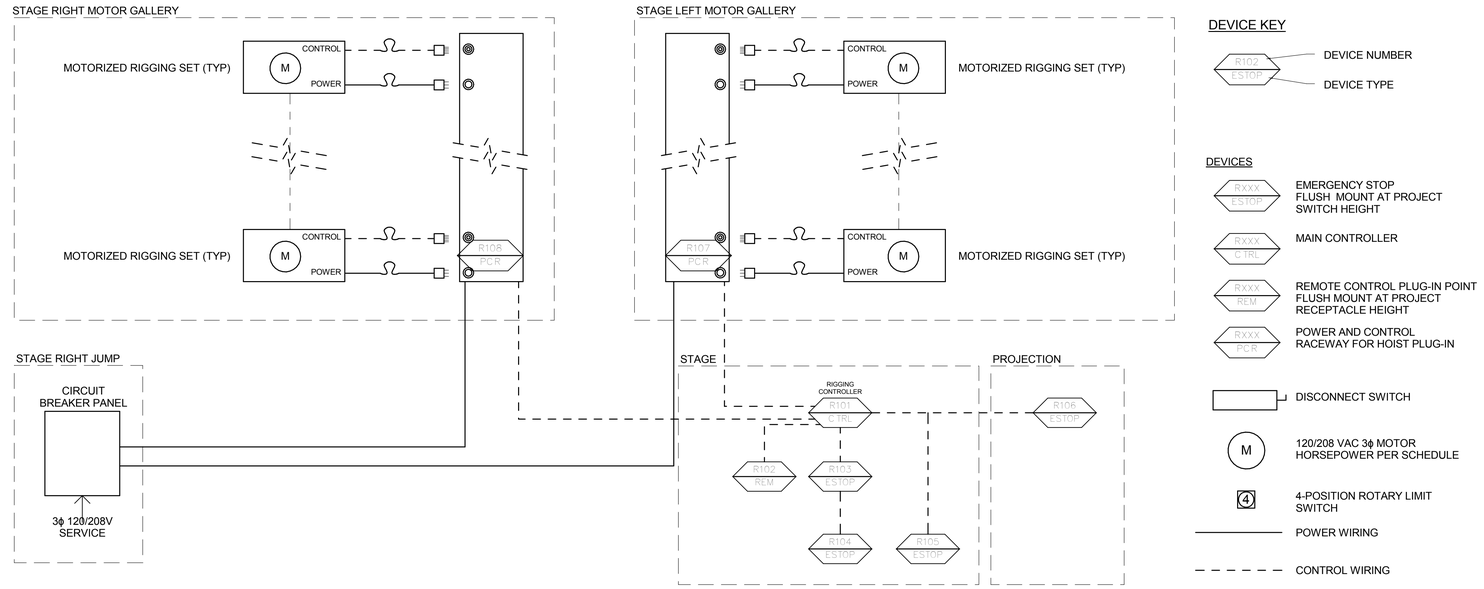
JOB NUMBER 403114

THEATRICAL RIGGING DEVICE SCHEDULE

DEVICE ID (R)	DEVICE TYPE	DESCRIPTION	LOCATION	COMMENTS
101	CTRL	HOIST CONTROLLER	DOWNSTAGE LEFT	
102	REM	REMOTE CONTROL PLUG-IN POINT	DOWNSTAGE LEFT	
103	ESTOP	EMERGENCY STOP	DOWNSTAGE RIGHT	
104	ESTOP	EMERGENCY STOP	UPSTAGE LEFT	
105	ESTOP	EMERGENCY STOP	UPSTAGE RIGHT	
106	ESTOP	EMERGENCY STOP	PROJECTION ROOM	
107	PCR	POWER AND CONTROL RACEWAY	STAGE LEFT MOTOR GALLERY	
108	PCR	POWER AND CONTROL RACEWAY	STAGE RIGHT MOTOR GALLERY	

LINESET SCHEDULE

SET NUMBER	DISTANCE FROM PLASTER	USAGE	WEIGHT (DEAD)	CAPACITY (LIVE)	HORSEPOWER	PIPE LENGTH	COMMENTS
1	0' - 6"	MAIN VALANCE	400.00 lbf	800.00 lbf	1.5	64' - 0"	MOTORIZED, FIXED SPEED
2	1' - 0"	MAIN CURTAIN	900.00 lbf	0.00 lbf		64' - 0"	DEAD HUNG
3	2' - 6"	ELECTRIC BATTEN #1	1600.00 lbf	1500.00 lbf	2	64' - 0"	MOTORIZED, FIXED SPEED
4	4' - 3"	BORDER	500.00 lbf	800.00 lbf	1.5	64' - 0"	MOTORIZED, FIXED SPEED
5	4' - 9"	LEG	500.00 lbf	800.00 lbf	1.5	64' - 0"	MOTORIZED, FIXED SPEED
6	6' - 0"	ACOUSTIC CEILING PANEL	750.00 lbf	1300.00 lbf	1.5	64' - 0"	MOTORIZED, FIXED SPEED
7	8' - 6"	BORDER	500.00 lbf	800.00 lbf	1.5	64' - 0"	MOTORIZED, FIXED SPEED
8	9' - 0"	LEG	500.00 lbf	800.00 lbf	1.5	64' - 0"	MOTORIZED, FIXED SPEED
9	10' - 0"	ELECTRIC BATTEN #2	1600.00 lbf	1500.00 lbf	2	64' - 0"	MOTORIZED, FIXED SPEED
10	11' - 6"	MID-STAGE TRAVELER	800.00 lbf	0.00 lbf		64' - 0"	DEAD HUNG
11	13' - 6"	ACOUSTIC CEILING PANEL	750.00 lbf	1300.00 lbf	1.5	64' - 0"	MOTORIZED, FIXED SPEED
12	14' - 6"	BORDER	500.00 lbf	800.00 lbf	1.5	64' - 0"	MOTORIZED, FIXED SPEED
13	15' - 0"	LEG	500.00 lbf	800.00 lbf	1.5	64' - 0"	MOTORIZED, FIXED SPEED
14	16' - 6"	ELECTRIC BATTEN #3	1600.00 lbf	1500.00 lbf	2	64' - 0"	MOTORIZED, FIXED SPEED
15	19' - 0"	GENERAL PURPOSE	1000.00 lbf	1000.00 lbf	7.5	64' - 0"	MOTORIZED, VARIABLE SPEED
16	20' - 6"	BORDER	500.00 lbf	800.00 lbf	1.5	64' - 0"	MOTORIZED, FIXED SPEED
17	21' - 0"	LEG	500.00 lbf	800.00 lbf	1.5	64' - 0"	MOTORIZED, FIXED SPEED
18	22' - 3"	ELECTRIC BATTEN #4	1600.00 lbf	1500.00 lbf	2	64' - 0"	MOTORIZED, FIXED SPEED
19	24' - 0"	BORDER	500.00 lbf	800.00 lbf	1.5	64' - 0"	MOTORIZED, FIXED SPEED
20	24' - 9"	UPSTAGE TRAVELER	800.00 lbf	0.00 lbf		64' - 0"	DEAD HUNG
21	25' - 6"	SCRIM	500.00 lbf	800.00 lbf	1.5	64' - 0"	MOTORIZED, FIXED SPEED
22	26' - 3"	ELECTRIC BATTEN #5	1600.00 lbf	1500.00 lbf	2	64' - 0"	MOTORIZED, FIXED SPEED
23	29' - 6"	GENERAL PURPOSE	1000.00 lbf	1000.00 lbf	7.5	64' - 0"	MOTORIZED, VARIABLE SPEED
24	30' - 0"	CYCLORAMA	1000.00 lbf	1000.00 lbf	7.5	64' - 0"	MOTORIZED, VARIABLE SPEED
0		SIDE MASKING TRAVELER	500.00 lbf	0.00 lbf		31' - 0"	DEAD HUNG - UPSTAGE/DOWNSTAGE
0		SIDE MASKING TRAVELER	500.00 lbf	0.00 lbf		31' - 0"	DEAD HUNG - UPSTAGE/DOWNSTAGE



DEVICE KEY

R102 / ESTOP
- DEVICE NUMBER
- DEVICE TYPE

DEVICES

- RXXX / ESTOP — EMERGENCY STOP FLUSH MOUNT AT PROJECT SWITCH HEIGHT
- RXXX / CTRL — MAIN CONTROLLER
- RXXX / REM — REMOTE CONTROL PLUG-IN POINT FLUSH MOUNT AT PROJECT RECEPTACLE HEIGHT
- RXXX / PCR — POWER AND CONTROL RACEWAY FOR HOIST PLUG-IN
- DISCONNECT SWITCH
- M — 120/208 VAC 3ϕ MOTOR HORSEPOWER PER SCHEDULE
- 4 — 4-POSITION ROTARY LIMIT SWITCH
- POWER WIRING
- CONTROL WIRING

NOTES

1. THREADED FASTENERS TO HAVE LOCK-WASHERS OR LOCK-NUTS.
2. ALL FASTENERS TO BE GRADE 8 OR BETTER.

1 THEATRICAL RIGGING RISER DIAGRAM
NTS

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3/14/2016

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THEATRICAL RIGGING SCHEDULE AND RISER
SCALE: 6" = 1'-0"
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TR5.1

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