STEAMBOAT SPRINGS

MIDDLE SCHOOL MECHANICAL UPGRADES

39610 Amethyst Drive
Steamboat Springs, CO 80487

Issue for Bidding & Construction

2018/03/30

COLORADO Division of Fire Prevention & Control, Department of Public Safety

8 CCR 1507-30
Code Enforcement & Certification of Inspectors Public Schools, Charter Schools, & Junior Colleges

Documents have been reviewed for compliance with adopted codes.

S. Joellen Thiel — Digitally signed by S. Joellen Thiel DN: cn=S. Joellen Thiel, o=Division of Fire Prevention and Control, ou=Building Code Branch, email=Joellen.thiel@state.co.us, c=US Date: 2018.06.12 11:16:20 -06'00'

Review shall not relieve the applicant of the responsibility to comply with adopted codes.

At least one accessible route shall connect accessible buildings, accessible facilities, accessible elements & accessible spaces that are on the site & shall not exceed the slope requirements for accessibility

Any air distribution systems with a design capacity of greater than 2,000 cfm, including where multiple air handling systems share common supply or return ducts or plenums with a combined design capacity of greater than 2,000 cfm, shall be provided with duct smoke detection in the return side of the systems.

Deferred shop drawing submission is required for any work on any fire protection system prior to the start of that work. Deferred submissions shall be provided to the authority having jurisdiction for review & approval

Any rough-in and/or final plumbing & electrical inspections shall be performed by the State of Colorado Department of Regulatory Agencies (DORA). They can be reached at (303)894 2300

Fire Inspection may be required for this project. Contact the local fire authority and/or DFPC (303)239 4100 for requirements. Approval from both entities may be required

All penetrations of fire rated assemblies shall be fire-stopped with an approved system & shall comply with ASTM E1966 or UL 2079. The fire-stop system shall have an F & T rating of not less than the fire-resistive rating of the assembly penetrated.

Review of these documents shall not be considered as approval of any conditions shown on the plans that are in violation of the applicable adopted codes

IECC/2015 Systems Commissioning Requirements = C408.2.4.1
Acceptance of Report. Buildings, or portions thereof, shall not be considered acceptable for a final inspections pursuant to Section C104.3 until the code official has received a letter of transmittal from the building owner acknowledging that the building owner or owner's authorized agent has received the Preliminary Commissioning Report.

This project requires rough-in inspection per Chapter 1 of the IBC. These inspections shall be performed by either a DFPC Certified 3rd Party inspector or the DFPC inspector. In all cases, DFPC shall do the final inspections. See the job card for required inspections.

Be advised that this project requires Special Inspections per Chapter 17 of the IBC. Documentation of these required Special Inspections shall be provided to the DFPC Inspector at the time of final inspections.

Approved Agencies shall provide written documentation to the building official the competence & relevant experience or training of the special inspectors who will perform the special inspection & tests during construction

CO detection is required per IBC 915.

ARCHITECTURAL ABBREVIATIONS

A

A/C	AIR CONDITIONING
ABV	ABOVE
ACST	ACOUSTIC, ACOUSTICAL
ADA	AMERICANS WITH DISABILITIES ACT
ADJ	ADJUSTABLE
ADJT	ADJACENT
AFF	ABOVE FINISH FLOOR
ALT	ALTERNATE
ALUM	ALUMINUM
ANOD	ANODIZED
ARCH	ARCHITECT, ARCHITECTURAL
ASPH	ASPHALT
ASSY	ASSEMBLY
AUTO	AUTOMATIC

B

BATT	BATT INSULATION
BKR	BACKER ROD
BD	BOARD
BF	BOTH FACES
BLDG	BUILDING
BLKG	BLOCKING
BLW	BELOW
BM	BEAM
BN	BULLNOSE
BOS	BOTTOM OF STEEL
BOT	BOTTOM
BRG	BEARING
BS	BOTH SIDES
BSMT	BASEMENT
BTWN	BETWEEN
BUR	BUILT UP ROOFING
BW	BOTH WAYS
BYND	BEYOND

C

CG	CORNER GUARD
CIP	CAST IN PLACE
CJ	CONTROL JOINT
CL	CENTER LINE
CLG	CEILING
CLST	CLOSET
CLR	CLEAR
CLRM	CLASSROOM
CMU	CONCRETE MASONRY UNIT
CO	COMPANY
COL	COLUMN
CONC	CONCRETE
CONT	CONTINUE
CONTR	CONTRACTOR
COORD	COORDINATE
CORR	CORRIDOR
CPT	CARPET
CRS	COURSE(S)
CSWK	CASEWORK
CT	CERAMIC TILE
CTR	CENTER
CTV	CABLE TELEVISION
CU	CUBIC
CUH	CABINET UNIT HEATER
CW	COLD WATER PIPING

D

DBL	DOUBLE
DEPT	DEPARTMENT
DTL	DETAIL
DF	DRINKING FOUNTAIN
DIA	DIAMETER
DIM	DIMENSION
DISP	DISPENSER
DL	DEAD LOAD
DMPF	DAMPROOFING
DN	DOWN
DR	DOOR
DS	DOWNSPOUT
DW	DISHWASHER
DWG	DRAWING

E

E	EAST
EA	EACH
ED	EDUCATION
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC	ELECTRICAL
ELEV	ELEVATOR
ENCL	ENCLOSURE
ENGR	ENGINEER
EPDM	ETHYLENE PROPYLENE DIENE MONOMER
EQ	EQUAL
EQUIP	EQUIPMENT
EWC	ELECTRIC WATER COOLER
EWH	ELECTRIC WATER HEATER
EXC	EXCAVATE
EXIST	EXISTING
EF	EXHAUST FAN
EXP	EXPANSION
EXT	EXTERIOR

F

F/F	FACE TO FACE
FA	FIRE ALARM
FAAP	FIRE ALARM ANNUNICATOR PANEL
FACP	FIRE ALARM CONTROL PANEL
FCO	FLOOR CLEAN OUT
FD	FLOOR DRAIN
FDC	FIRE DEPARTMENT CONNECTION
FDTN	FOUNDATION
FE	FIRE EXTINGUISHER
FEC	FIRE EXTINGUISHER CABINET
FF	FINISH FACE
FFE	FINISH FLOOR ELEVATION
FH	FIRE HYDRANT
FHC	FIRE HOSE CABINET
FIN	FINISH
FIXT	FIXTURE
FLR	FLOOR
FOF	FACE OF FINISH
FOS	FACE OF STUD
FR	FRAME
FRP	FIBERGLASS REINFORCED PLASTIC
FT	FOOT
FUR	FURRING

G

GA	GAGE
GALV	GALVANIZED
GB	GRAB BAR
GL	GLASS
GLU LAM	GLUED LAMINATED WOOD
GLAZ	GLAZING
GYP	GYPSUM

H

HB	HOSE BIB
HDR	HEADER
HDW	HARDWARE
HDWD	HARDWOOD
HM	HOLLOW METAL
HDRL	HANDRAIL
HORIZ	HORIZONTAL
HP	HORSEPOWER
HT	HEIGHT
HVAC	HEATING VENTILATING & AIR CONDITIONING
HW	HOT WATER
HYD	HYDRANT

I

ID	INSIDE DIAMETER
INCL	INCLUDED
INSUL	INSULATION
INT	INTERIOR

J

JST	JOIST

K

K	KELVIN
kW	KILOWATT

L

L	ANGLE
LAV	LAVATORY
LBR	LUMBER
LF	LINEAR FEET (FOOT)
LIB	LIBRARY
LINO	LINOLEUM
LKR	LOCKER
LL	LIVE LOAD
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LT	LIGHT
LVR	LOUVER

M

MAX	MAXIMUM
MECH	MECHANICAL
MEMB	MEMBRANE
MFD	MANUFACTURED
MFR	MANUFACTURER
MIN	MINIMUM
MIRR	MIRROR
MISC	MISCELLANEOUS
MLDG	MOLDING
MO	MASONRY OPENING
MTD	MOUNTED
MTL	METAL

N

NA	NOT APPLICABLE
NONCOM	NONCOMBUSTIBLE
NIC	NOT IN CONTRACT
NO	NUMBER
NOM	NOMINAL
NRC	NOISE REDUCTION COEFFICIENT
NTS	NOT TO SCALE

O

OA	OVERALL
OC	ON CENTER
OD	OUTSIDE DIAMETER
OF/CI	OWNER FURNISHED/CONTRACTOR INSTALLED
OF/OI	OWNER FURNISHED/OWNER INSTALLED
OH	OVERHEAD
OPP	OPPOSITE
OPNG	OPENING
ORD	OVERFLOW ROOF DRAIN

P

PBD	PARTICLEBOARD
PCF	POUNDS PER CUBIC FOOT
PCP	PORTLAND CEMENT PLASTER
PLAM	PLASTIC LAMINATE
PLBG	PLUMBING
PLYWD	PLYWOOD
PREFAB	PREFABRICATED
PREFIN	PREFINISHED
PRKG	PARKING
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	PAINT
PTD	PAPER TOWEL DISPENSER
PTN	PARTITION
PVC	POLYVINYL CHLORIDE

Q

QT	QUARRY TILE
QTB	QUARRY TILE BASE
QTY	QUANTITY

R

R	RADIUS, RISER
R-__	THERMAL RESISTANCE
RA	RETURN AIR
RB	RUBBER BASE
RD	ROOF DRAIN
RDL	ROOF DRAIN LEADER
RE:	REFER TO
REINF	REINFORCE
REQD	REQUIRED
REV	REVISION
RM	ROOM
RO	ROUGH OPENING
RPM	REVOLUTIONS PRE MINUTE
RTU	ROOF TOP UNIT

S

SECT	SECTION
SF	SQUARE FOOT, FEET
SA	SUPPLY AIR
SAT	SUSPENDED ACOUSTICAL TILE
SB	SPLASH BLOCK
SCHED	SCHEDULE
SCP	SCUPPER
SD	SOAP DISPENSER
SOG	SLAB ON GRADE
SGFT	STRUCTURAL GLAZED FACED TILE
SHT	SHEET
SHTHG	SHEATHING
SIM	SIMILAR
SJ	SLIP JOINT
SLDG	SLIDING
SLNT	SEALANT
SND	SANITARY NAPKIN DISPENSER
SNDU	SANITARY NAPKIN DISPOSAL UNIT
SPEC	SPECIFICATION
SQ	SQUARE
SST	STAINLESS STEEL
STC	SOUND TRANSMISSION CLASS
STD	STANDARD
STL	STEEL
STOR	STORAGE
STRUCT	STRUCTURAL
SUSP	SUSPEND(ED)
SYMM	SYMMETRICAL
SYS	SYSTEM

T

T&G	TONGUE & GROOVE
TD	TOWEL DISPENSER
TEL	TELEPHONE
THK	THICKNESS
TO	TOP OF
TOC	TOP OF CONCRETE
TOM	TOP OF MASONRY
TOS	TOP OF STEEL
TOW	TOP OF WALL
TPD	TOILET PAPER DISPENSER
TYP	TYPICAL

U

UNFIN	UNFINISHED
UON	UNLESS OTHERWISE NOTED
UR	URINAL

V

VAR	VARIES, VARIABLE
VCT	VINYL COMPOSITION TILE
VERT	VERTICAL
VEST	VESTIBULE
VIF	VERIFY IN FIELD
VTR	VENT THROUGH ROOF
VWC	VINYL WALL COVERING

W

W	WEST
W/	WITH
W/O	WITHOUT
WB	WOOD BASE
WBL	WOOD BLOCKING
WC	WATER CLOSET
WCO	WALL CLEAN OUT
WD	WOOD
WF	WIDE FLANGE
WP	WORKING POINT
WSCT	WAINSCOT
WWF	WELDED WIRE FABRIC

PROJECT TEAM

ARCHITECT:
Hord Coplan Macht
1331 19th St.
Denver, CO. 80202
Ph: 303-607-0977
URL: www.hcm2.com

STRUCTURAL:
JVA, Incorporated
1319 Spruce Street
Boulder, CO. 80302
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URL: www.jvajva.com

MECHANICAL:
MKK Consulting Engineers, Inc.
7600 E Orchard Road Suite 250-s
Greenwood Village, CO 80111
Ph: 303.796.6000
URL: www.mkkeng.com

ELECTRICAL:
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PLUMBING:
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7600 E Orchard Road Suite 250-s
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TECHNOLOGY:
EDI, Ltd.
8821 E. Hampden Ave. Suite 212
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Ph: 888.334.5831
URL: www.edltd.com

GENERAL CONTRACTOR:
FCI Constructors, Inc.
70 I-70 Business Loop, Bldg A
Grand Junction, CO 81504
Ph: 970.434.9093
URL: www.fciol.com

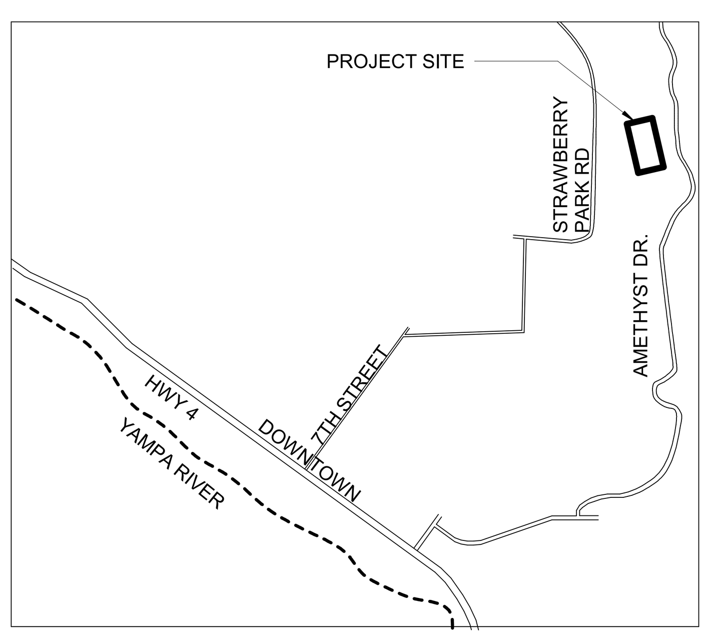
ARCHITECTURAL LEGEND

CONCRETE
BRICK
CMU
ROUGH LUMBER
PLYWOOD
FINISH LUMBER
GYPSUM
RIGID INSULATION
STEEL
BATT INSULATION

DETAIL NUMBER
XX
A-XXX
SHEET NUMBER
EXTERIOR ELEVATION
DETAIL NUMBER
BUILDING SECTION
DETAIL NUMBER
WALL SECTION
DETAIL NUMBER
INTERIOR ELEVATION

A — WINDOW TAG
101 — DOOR TAG
054000.D01 — KEYNOTE TAG
2-6A — PARTITION TAG
1 — REVISION TAG
DETAIL NUMBER
XX A-XXX — DETAIL CALLOUT
SHEET NUMBER

VICINITY MAP



SHEET INDEX

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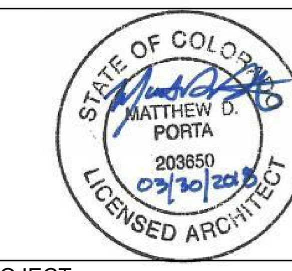
CONSULTANT:



PROJECT:

MIDDLE SCHOOL MECHANICAL UPGRADES

39610 Amethyst Drive
Steamboat Springs, CO 80487

OWNER:

Steamboat Springs School District Re-2

325 7th Street
Steamboat Springs, CO 80487

ISSUE:

2018/03/30 Issue for Bidding & Construction

DRAWING INFORMATION:

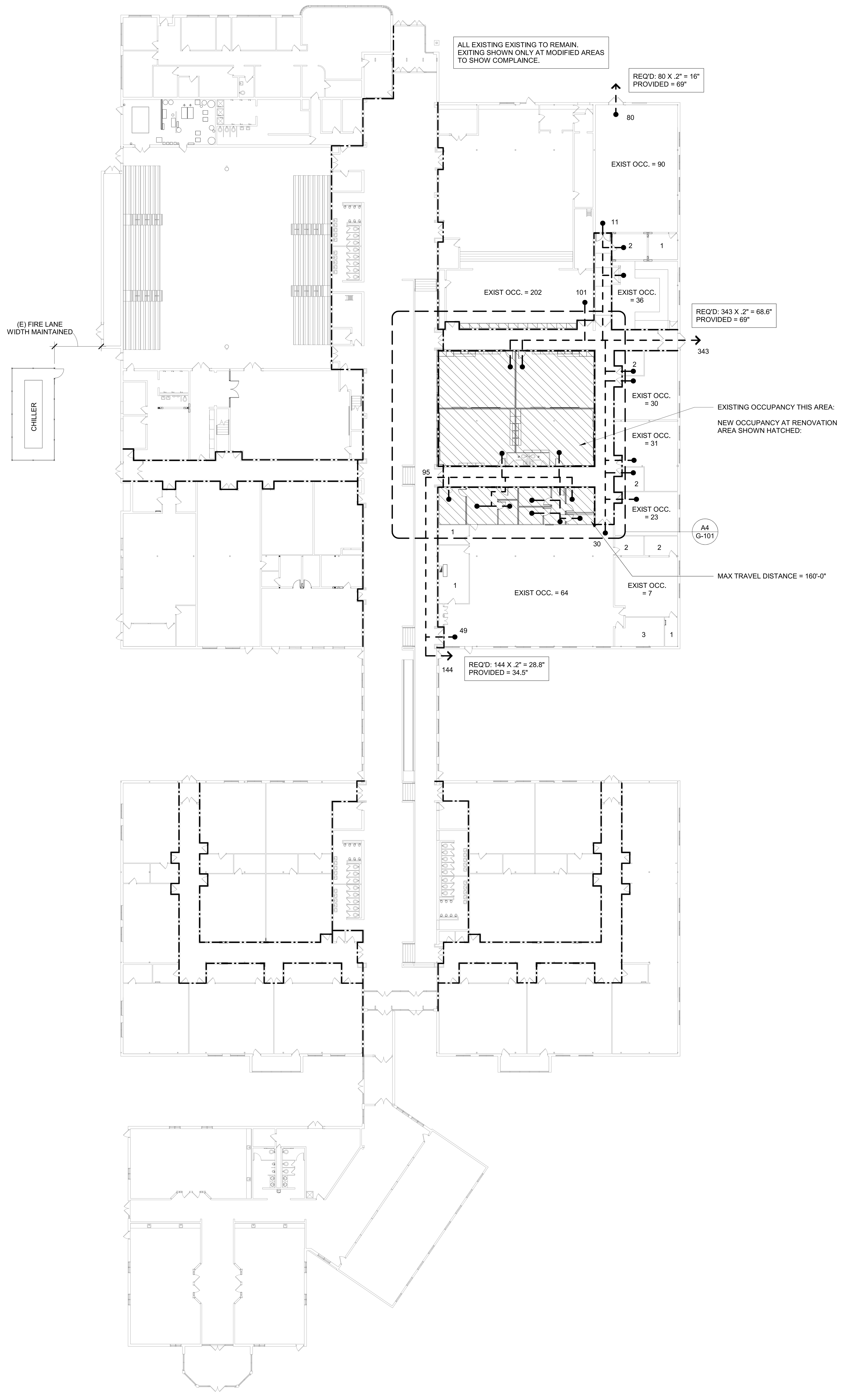
PROJECT NO:	11784.000
DRAWN BY:	MO
CHECKED BY:	LG
APPROVED BY:	MP

SHEET TITLE:

GENERAL INFORMATION AND SHEET INDEX

G-001

SHEET OF



A1 OVERALL CODE PLAN
3/64" = 1'-0"

DESIGN PARAMETERS

GOVERNING CODES:
2015 INTERNATIONAL BUILDING CODE
2015 INTERNATIONAL FIRE CODE
2015 INTERNATION MECHANICAL CODE
2015 INTERNATIONAL ENERGY CONSERVATION CODE
2015 INTERNATIONAL PLUMBING CODE
2014 NATIONAL ELECTRICAL CODE
COLORADO DEPT OF HEALTH 'RULES & REGULATIONS
GOVERNING SCHOOLS IN THE STATE OF COLORADO'
ACCESSIBILITY: CRS 9-5 & ICC/ANSI A117.1-2009

2017 NEC is adopted by DORA

REGULATORY & NON-REGULATORY AGENCIES:
STATE ELECTRICAL BOARD - Dept. of Regulatory Agencies
STATE PLUMBING BOARD - Dept. of Regulatory Agencies
LOCAL HEALTH DEPARTMENT
STATE BOILER INSPECTION
STATE FIRE INSPECTION

IECC COMPLIANCE METHOD: IECC C401.2 Option 2, requirements of sections C402 through C406 (Prescriptive Path per C402.1).

BUILDING AREA

CONSTRUCTION TYPE:	II-B
NUMBER OF STORIES:	1
OCCUPANCY:	E
FIRE PROTECTION:	NOT SPRINKLED
ALLOWABLE BUILDING AREA:	25,375 SQ.FT.
AREA CALCULATIONS: AREA INCREASE DUE TO FRONTAGE=	[2,340'/2,340' - 0.25] x 30/30 = 75%
ALLOWABLE AREA:	{14,500 + [14,500 x .75]}
25,375 =	14,500 + 10,875
TOTAL ALLOWABLE EACH FLOOR	25,375 SQ. FT.
ACTUAL TOTAL	101,050 SQ. FT.

ACTUAL > ALLOWABLE = EXISTING CONDITION TO REMAIN

CODE SUMMARY

GENERAL DESCRIPTION
Steamboat Springs Middle School was originally constructed in 1980. The building is constructed of load bearing masonry and steel frame on concrete slab on grade. The building was originally constructed as a one-story school, but a partial second floor was constructed over the original auxiliary gym at some time. The school was constructed with one-hour rated corridors per the original construction drawings. The school does not have a fire sprinkler system.

The school is classified as a Type II-B under the 2015 IBC. The existing school exceeds the allowable square footage for a non-sprinklered building. However, the scope of work in this project will not change the existing building square footage. The scope of work includes minimal interior renovation work (IEBC Alterations Level - 2), with the primary scope being the addition of a roof-top mounted mechanical system throughout the entire school.

ALTERATIONS - LEVEL 2

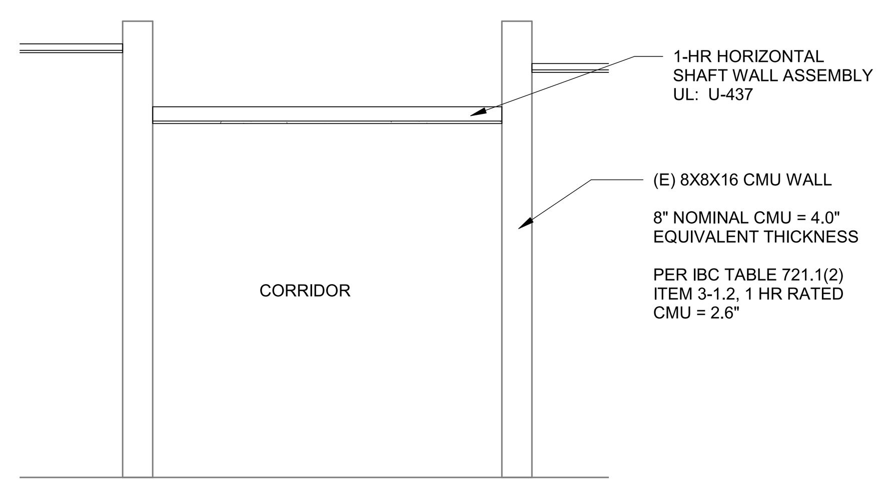
PER SECTION 504 OF IEBC 2015, LEVEL 2 ALTERATIONS INCLUDE THE RECONFIGURATION OF SPACE, ADDITION OR ELIMINATION OF ANY DOOR OR WINDOW, RECONFIGURATION OR EXTENSION OF ANY SYSTEM, OR THE INSTALLATION OF ANY ADDITIONAL EQUIPMENT.

PER SECTION 810, WHERE THE OCCUPANT LOAD OF THE STORY IS INCREASED BY MORE THAN 20%, PLUMBING FIXTURES FOR THE STORY SHALL BE PROVIDED IN QUANTITIES SPECIFIED IN THE IPC BASED ON THE INCREASED OCCUPANT LOAD.

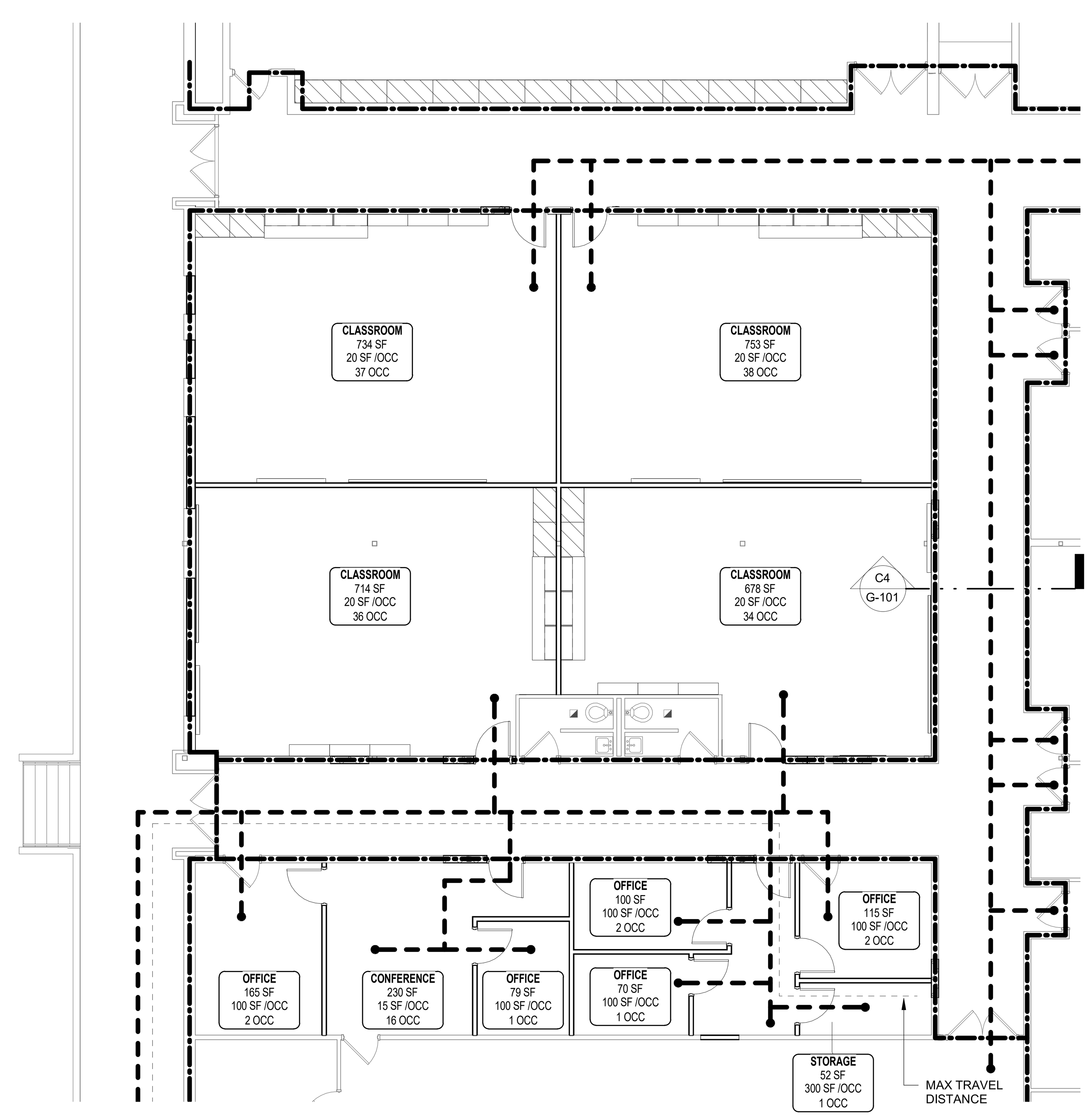
THE TOTAL SCHOOL OCCUPANT LOAD WAS INCREASE BY 61 OCCUPANTS WHICH DOES NOT EXCEED THE TOTAL OCCUPANT LOAD OF 20%. THEREFORE EXISTING PLUMBING FIXTURE COUNTS ARE EXISTING TO REMAIN.

PARTITION TYPE LEGEND

1-HOUR FIRE BARRIER
(E) CONCRETE MASONRY



C4 (E) 1-HR RATED CORRIDOR SECTION
3/8" = 1'-0"



A4 ENLARGED CODE PLAN
1/8" = 1'-0"

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CONSULTANT:

STATE OF COLORADO
MATTHEW D. PORTA
203650
03/30/2018
LICENSED ARCHITECT

PROJECT:
MIDDLE SCHOOL MECHANICAL UPGRADES
39610 Amethyst Drive
Steamboat Springs, CO 80487

OWNER:
Steamboat Springs School District Re-2
325 7th Street
Steamboat Springs, CO 80487

ISSUE:
2018/03/30 Issue for Bidding & Construction

DRAWING INFORMATION:

PROJECT NO:	11784.000
DRAWN BY:	MO
CHECKED BY:	LG
APPROVED BY:	MP

SHEET TITLE:
FIRST FLOOR CODE PLAN

G-101
SHEET OF

STRUCTURAL GENERAL NOTES

DESIGN LOADS:
1. DESIGN LOADS: 2015 INTERNATIONAL BUILDING CODE WITH TOWN OF STEAMBOAT SPRINGS AMENDMENTS, ASCE 7-10
2. RISK CATEGORY: III SUBSTANTIAL HAZARD
3. ROOFS:
   - A. GROUND SNOW LOAD, Pg 118 PSF
   - B. FLAT-ROOF SNOW LOAD, Pf 91 PSF
   - C. SNOW EXPOSURE FACTOR, Ce 1.0
   - D. SNOW IMPORTANCE FACTOR, Is 1.1
   - E. THERMAL FACTOR, Ct 1.0
4. FLOOR LIVE LOADS:

OCCUPANCY OR USE	UNIFORMLY DISTRIBUTED (PSF)	CONCENTRATED LOAD (LBS)	LIVE LOAD REDUCTION
CLASSROOM	40	1,000	YES
OFFICE	50	2,000	YES
OFFICE PARTITIONS	15	N/A	NO
PUBLIC SPACES	100	2,000	NO
FIRST FLOOR CORRIDORS	100	2,000 (1,000 SCHOOLS)	NO
CORRIDORS ABOVE FIRST FLOOR	80	2,000 (1,000 SCHOOLS)	YES
STORAGE AREAS	125	N/A	NO
GYMNASIUM	100	N/A	NO

5. WIND:
   - A. ULTIMATE DESIGN WIND SPEED, V_{ULT}, (3-SECOND GUST) 120 MPH
   - B. NOMINAL DESIGN WIND SPEED, V_{ASD}, (3-SECOND GUST) 90 MPH
   - C. INTERNAL PRESSURE COEFFICIENT 0.18 (ENCLOSED)
   - D. WIND EXPOSURE C
   - E. AIR DENSITY COEFFICIENT 0.84
   - F. COMPONENTS AND CLADDING ULTIMATE DESIGN WIND PRESSURES
     1. WALLS:
        - a. WITHIN 7 FEET OF CORNERS +25.8 PSF -34.4 PSF
        - b. AWAY FROM CORNERS +25.8 PSF -27.9 PSF
     2. PARAPETS:
        - a. WITHIN 7 FEET OF CORNERS +83.1 PSF -48.5 PSF
        - b. AWAY FROM CORNERS +60.6 PSF -42.4 PSF
     3. ROOFS:
        - a. WITHIN 7 FEET OF CORNERS +16 PSF -71.1 PSF
        - b. WITHIN 7 FEET OF EDGES +16 PSF -47.2 PSF
        - c. AWAY FROM EDGES +16 PSF -28.2 PSF
     4. PRESSURES MAY BE REDUCED FOR EFFECTIVE WIND AREAS LARGER THAN 10 SQUARE FEET, BUT NOT BELOW 16 PSF.
6. SEISMIC:
   - A. SPECTRAL RESPONSE ACCELERATION PARAMETERS
     1. SHORT PERIOD
        - a. S_S 0.205g
        - b. S_{DS} 0.219g
     2. ONE SECOND
        - a. S_1 0.057g
        - b. S_{D1} 0.091g
   - B. SOILS SITE CLASS D
   - C. SEISMIC IMPORTANCE FACTOR 1.25
   - D. SEISMIC DESIGN CATEGORY B
   - E. BASIC SEISMIC-FORCE-RESISTING SYSTEM(S)
     - STEEL SYSTEM NOT SPECIFICALLY DETAILED FOR SEISMIC RESISTANCE
   - F. DESIGN BASE SHEAR(S) 0.91W KIPS
   - G. SEISMIC RESPONSE COEFFICIENT(S), C_S 0.91
   - H. RESPONSE MODIFICATION COEFFICIENT(S), R 3
   - I. ANALYSIS PROCEDURE EQUIVALENT LATERAL FORCE

FOUNDATION DESIGN:
1. REFER TO SOILS REPORT NO. 17-092 BY CUSNMAN GEOSCIENCES, LLC, DATED OCT 2, 2017.
2. GEOTECHNICAL ENGINEER SHALL VERIFY SOIL CONDITIONS AND TYPES DURING EXCAVATION AND PRIOR TO PLACEMENT OF FORMWORK OR CONCRETE.
3. MINIMUM FROST DEPTH SHALL BE 3'-0 BELOW EXTERIOR GRADE.

DRILLED PIERS (CAST-IN-PLACE DEEP FOUNDATIONS):
1. STRAIGHT SHAFT DRILLED PIERS ARE DESIGNED FOR
   - A. MAXIMUM END BEARING PRESSURE 30,000 PSF
   - B. ALLOWABLE SIDE SHEAR 3,000 PSF
   - C. MINIMUM DEAD LOAD PRESSURE 25,000 PSF
   - D. UPLIFT SIDE SHEAR 2,250 PSF.
   - E. MINIMUM PENETRATION INTO BEDROCK 15 FEET
   - F. MINIMUM TOTAL LENGTH 30 FEET
2. SEE PLANS FOR ADDITIONAL PENETRATION AND LENGTH REQUIREMENTS.
3. ASSUMED AVERAGE USGS TOP OF BEDROCK ELEVATION, FOR BIDDING PURPOSES ONLY, SHALL BE 75'-0.
4. SEE BORING LOGS IN THE SOILS REPORT FOR INDICATED VARIATION IN BEDROCK SURFACE.
5. MUSHROOMING AT THE TOPS OF PIERS IS NOT PERMITTED.
6. PROVIDE FOR OVERRUN OR UNDERRUN IN DRILLING LENGTHS AND INSTALLED QUANTITIES OF CONCRETE AND REINFORCING.
7. PIER HOLES SHALL BE THOROUGHLY CLEANED AND DEWATERED AND SHALL BE INSPECTED BY THE GEOTECHNICAL ENGINEER PRIOR TO CONCRETE PLACEMENT. CASING OF DRILLED PIER HOLES MAY BE REQUIRED.

REINFORCED CONCRETE:
1. DESIGN IS BASED ON ACI 318 "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE."
2. CONCRETE WORK SHALL CONFORM TO ACI 301 "STANDARD SPECIFICATIONS FOR STRUCTURAL CONCRETE."
3. STRUCTURAL CONCRETE SHALL HAVE THE FOLLOWING PROPERTIES:

INTENDED USE	EXPOSURE CLASS	f'c, PSI 28 DAYS	MAX W/CM RATIO	MAXIMUM AGGREGATE	SLUMP, INCHES (+/- 1")	AIR CONTENT PERCENT (+/- 1.5%)	CEMENT TYPE	ADMIXTURES / COMMENTS
DRILLED PIERS	F0-S0-W0-C1	4000	0.55	3/4" STONE	7	2%	I/II	
GRADE BEAMS	F2-S0-W0-C1	4500	0.45	3/4" STONE	4	6%	I/II	
WALLS	F0-S0-W0-C0	4000	0.45	3/4" STONE	4	3%	I/II	
STRUCTURAL SLAB ON DECK	F0-S0-W0-C0	3500	0.50	3/4" STONE	4	3%	I/II	
EXTERIOR SLAB	F0-S0-W0-C1	4500	0.42	3/4" STONE	4	3%	I/II	

4. DETAILING, FABRICATION, AND PLACEMENT OF REINFORCING STEEL SHALL BE IN ACCORDANCE WITH ACI 315 "DETAILS AND DETAILING OF CONCRETE REINFORCEMENT."
5. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185.
6. REINFORCING BARS SHALL CONFORM TO ASTM A615, GRADE 60, EXCEPT TIES OR BARS SHOWN TO BE FIELD-BENT, WHICH SHALL BE GRADE 40.
7. EPOXY COATED REINFORCING BARS SHALL CONFORM TO ASTM A775 (STRAIGHT BARS) AND ASTM A934 (PRE-FABRICATED BARS).
8. ZINC COATED (GALVANIZED) REINFORCING BARS SHALL CONFORM TO ASTM A767.
9. BARS TO BE WELDED SHALL CONFORM TO ASTM A706.
10. UNLESS NOTED OTHERWISE ON THE STRUCTURAL DRAWINGS, LAP BARS 50 DIAMETERS (MINIMUM).
11. AT CORNERS AND INTERSECTIONS, MAKE HORIZONTAL BARS CONTINUOUS OR PROVIDE MATCHING CORNER BARS FOR EACH LAYER OF REINFORCEMENT.
12. TRIM OPENINGS IN WALLS AND SLABS WITH (2)-#5 FOR EACH LAYER OF REINFORCEMENT, FULLY DEVELOPED BY EXTENSION OR HOOK.
13. IN CONTINUOUS MEMBERS, SPLICE TOP BARS AT MID-SPAN AND SPLICE BOTTOM BARS OVER SUPPORTS.
14. FORM INTERMITTENT SHEAR KEYS AT ALL CONSTRUCTION JOINTS AND AS SHOWN ON THE STRUCTURAL DRAWINGS.
15. EXCEPT AS NOTED ON THE DRAWINGS, CONCRETE PROTECTION FOR REINFORCEMENT IN CAST-IN-PLACE CONCRETE SHALL BE AS FOLLOWS:
   - A. CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH: 3"
     1. EXPOSED TO EARTH OR WEATHER:
        - a. #6 THROUGH #18 BARS 2"
        - b. #5 BAR, W31 OR D31 WIRE, AND SMALLER 1-1/2"
   - B. NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND:
     1. SLABS, WALLS, JOISTS: #11 BARS AND SMALLER 3/4"
     2. BEAMS AND COLUMNS:
        - a. PRIMARY REINFORCEMENT 1-1/2"
        - b. STIRRUPS, TIES, SPIRALS 1-1/2"
16. ANCHOR BOLTS AND RODS FOR BEAM AND COLUMN-BEARING PLATES SHALL BE PLACED WITH SETTING TEMPLATES.

STRUCTURAL STEEL:
1. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED, AND ERECTED IN ACCORDANCE WITH THE "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS" (AISC 360) AND THE "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES" (AISC 303) BY THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC).
2. STRUCTURAL STEEL WIDE FLANGE BEAMS SHALL CONFORM TO ASTM A992, 50 KSI YIELD.
3. ROLLED STEEL FLOOR PLATES SHALL CONFORM TO ASTM A786, COMMERCIAL GRADE.
4. OTHER ROLLED SHAPES, INCLUDING PLATES, CHANNELS, WTS, AND ANGLES SHALL CONFORM TO ASTM A36, 36 KSI YIELD.
5. HOLLOW STRUCTURAL SECTION (HSS) RECTANGULAR SHAPES SHALL CONFORM TO ASTM A500, GRADE C, 50 KSI YIELD.
6. HSS ROUND SHAPES SHALL CONFORM TO ASTM A500, GRADE C, 46 KSI YIELD.
7. PIPE SHAPES SHALL CONFORM TO ASTM A53, GRADE B, 35 KSI YIELD.
8. EXCEPT AS NOTED, FRAMED BEAM CONNECTIONS SHALL BE BEARING-TYPE WITH 3/4" DIAMETER, SNUG TIGHT, ASTM A325 BOLTS, DETAILED IN CONFORMANCE WITH THE STRUCTURAL DRAWINGS AND THE "STEEL CONSTRUCTION MANUAL" BY THE AISC. INSTALL BOLTS IN ACCORDANCE WITH AISC'S "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS".
9. ALL BEAMS SHALL HAVE FULL DEPTH WEB STIFFENERS EACH SIDE OF WEBS ABOVE AND BELOW COLUMNS.
10. ANCHOR RODS SHALL CONFORM TO ASTM F1554, GRADE (36, 55, AND/OR 105) AS NOTED ON THE STRUCTURAL DRAWINGS WITH WELDABILITY SUPPLEMENT S1.
11. HEADED ANCHOR STUDS (HAS) SHALL CONFORM TO ASTM A108 AND SHALL BE CONNECTED TO STRUCTURAL STEEL WITH EQUIPMENT APPROVED BY THE STUD MANUFACTURER ACCORDING TO THE STUD MANUFACTURER'S RECOMMENDATIONS.
12. WELDING SHALL BE DONE BY A CERTIFIED WELDER IN ACCORDANCE WITH THE AISC DOCUMENTS LISTED ABOVE, THE AMERICAN WELDING SOCIETY (AWS) D1.1: STRUCTURAL WELDING CODE, AND THE RECOMMENDATIONS FOR USE OF WELD E70 ELECTRODES. WHERE NOT SPECIFICALLY NOTED, MINIMUM WELD SHALL BE 3/16" FILLET BY LENGTH OF CONTACT EDGE.
13. GROUT BENEATH COLUMN BASE AND BEAM BEARING PLATES SHALL HAVE A MINIMUM 28-DAY, COMPRESSIVE STRENGTH OF 7,500 PSI AND SHALL BE NON-SHRINK, NON-METALLIC, AND TESTED IN ACCORDANCE WITH ASTM C1107.

FIELD VERIFICATION OF EXISTING CONDITIONS:
1. THE GENERAL CONTRACTOR SHALL THOROUGHLY INSPECT AND SURVEY THE EXISTING STRUCTURE TO VERIFY CONDITIONS THAT AFFECT THE WORK SHOWN ON THE DRAWINGS.
2. THE GENERAL CONTRACTOR SHALL REPORT ANY VARIATIONS OR DISCREPANCIES TO THE ARCHITECT AND STRUCTURAL ENGINEER BEFORE PROCEEDING.

STRUCTURAL ERECTION AND BRACING REQUIREMENTS:
1. THE STRUCTURAL DRAWINGS ILLUSTRATE AND DESCRIBE THE COMPLETED STRUCTURE WITH ELEMENTS IN THEIR FINAL POSITIONS, PROPERLY SUPPORTED, CONNECTED, AND/OR BRACED.
2. THE STRUCTURAL DRAWINGS ILLUSTRATE TYPICAL AND REPRESENTATIVE DETAILS TO ASSIST THE GENERAL CONTRACTOR. DETAILS SHOWN APPLY AT ALL SIMILAR CONDITIONS UNLESS OTHERWISE INDICATED. ALTHOUGH DUE DILIGENCE HAS BEEN APPLIED TO MAKE THE DRAWINGS AS COMPLETE AS POSSIBLE, NOT EVERY DETAIL IS ILLUSTRATED AND NOT EVERY EXCEPTIONAL CONDITION IS ADDRESSED.
3. ALL PROPRIETARY CONNECTIONS AND ELEMENTS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS' RECOMMENDATIONS.
4. ALL WORK SHALL BE ACCOMPLISHED IN A WORKMANLIKE MANNER AND IN ACCORDANCE WITH THE APPLICABLE CODES AND LOCAL ORDINANCES.
5. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF ALL WORK, INCLUDING LAYOUT AND DIMENSION VERIFICATION, MATERIALS COORDINATION, SHOP DRAWING REVIEW, AND THE WORK OF SUBCONTRACTORS. ANY DISCREPANCIES OR OMISSIONS DISCOVERED IN THE COURSE OF THE WORK SHALL BE IMMEDIATELY REPORTED TO THE ARCHITECT AND STRUCTURAL ENGINEER FOR RESOLUTION.
6. CONTINUATION OF WORK WITHOUT NOTIFICATION OF DISCREPANCIES RELIEVES THE ARCHITECT AND STRUCTURAL ENGINEER FROM ALL CONSEQUENCES.
7. UNLESS OTHERWISE SPECIFICALLY INDICATED, THE STRUCTURAL DRAWINGS DO NOT DESCRIBE METHODS OF CONSTRUCTION.
8. THE GENERAL CONTRACTOR, IN THE PROPER SEQUENCE, SHALL PERFORM OR SUPERVISE ALL WORK NECESSARY TO ACHIEVE THE FINAL COMPLETED STRUCTURE, AND TO PROTECT THE STRUCTURE, WORKMEN, AND OTHERS DURING CONSTRUCTION. SUCH WORK SHALL INCLUDE, BUT NOT BE LIMITED TO TEMPORARY BRACING, SHORING FOR CONSTRUCTION EQUIPMENT, SHORING FOR EXCAVATION, FORMWORK, SCAFFOLDING, SAFETY DEVICES AND PROGRAMS OF ALL KINDS, SUPPORT AND BRACING FOR CRANES AND OTHER ERECTION EQUIPMENT.
9. DO NOT BACKFILL AGAINST BASEMENT OR RETAINING WALLS UNTIL SUPPORTING SLABS AND FLOOR FRAMING ARE IN PLACE AND SECURELY ANCHORED, UNLESS ADEQUATE TEMPORARY BRACING IS PROVIDED.
10. TEMPORARY BRACING SHALL REMAIN IN PLACE UNTIL ALL FLOORS, WALLS, ROOFS AND ANY OTHER SUPPORTING ELEMENTS ARE IN PLACE.
11. THE ARCHITECT AND STRUCTURAL ENGINEER BEAR NO RESPONSIBILITY FOR THE ABOVE ITEMS, AND OBSERVATION VISITS TO THE SITE DO NOT IN ANY WAY INCLUDE INSPECTIONS OF THESE ITEMS.

LETTERS OF CONSTRUCTION COMPLIANCE:
1. THE GENERAL CONTRACTOR SHALL DETERMINE FROM THE LOCAL BUILDING AUTHORITY, AT THE TIME THE BUILDING PERMIT IS OBTAINED, WHETHER ANY LETTERS OF CONSTRUCTION COMPLIANCE WILL BE REQUESTED FROM THE STRUCTURAL ENGINEER.
2. THE CONTRACTOR SHALL NOTIFY THE STRUCTURAL ENGINEER OF ALL SUCH REQUIREMENTS IN WRITING PRIOR TO THE START OF CONSTRUCTION.
3. TWO-DAY ADVANCE NOTICE SHALL BE GIVEN WHEN REQUESTING SITE VISITS NECESSARY AS THE BASIS FOR THE COMPLIANCE LETTER.
4. THE GENERAL CONTRACTOR SHALL PROVIDE COPIES OF ALL THIRD-PARTY TESTING AND INSPECTION REPORTS TO THE ARCHITECT AND STRUCTURAL ENGINEER A MINIMUM OF ONE WEEK PRIOR TO THE DATE THAT THE COMPLIANCE LETTER IS NEEDED.

SPECIAL INSPECTIONS - 2015:
1. THE FOLLOWING SPECIAL INSPECTIONS AND TESTING SHALL BE PERFORMED BY A QUALIFIED SPECIAL INSPECTOR, RETAINED BY THE OWNER, IN ACCORDANCE WITH THE FOLLOWING SECTIONS OF IBC CHAPTER 17:
   - A. SECTION 1704 SPECIAL INSPECTIONS, CONTRACTOR RESPONSIBILITY, AND STRUCTURAL OBSERVATIONS AND THE FOLLOWING SUB-SECTIONS:
     1. 1704.2 SPECIAL INSPECTIONS AND TESTS
     2. 1704.3 STATEMENT OF SPECIAL INSPECTIONS
   - B. SECTION 1705 REQUIRED VERIFICATION AND INSPECTION AND THE FOLLOWING SUB-SECTIONS:
     1. 1705.2 STEEL CONSTRUCTION
     2. 1705.3 CONCRETE CONSTRUCTION
     3. 1705.6 SOILS
     4. 1705.8 CAST-IN-PLACE DEEP FOUNDATIONS
2. THE SPECIAL INSPECTOR SHALL BE A QUALIFIED PERSON WHO SHALL DEMONSTRATE COMPETENCE, TO THE SATISFACTION OF THE BUILDING OFFICIAL, FOR INSPECTION OF THE PARTICULAR TYPE OF CONSTRUCTION OR OPERATION REQUIRING SPECIAL INSPECTION. THE APPROVED INSPECTOR MUST BE INDEPENDENT FROM THE CONTRACTOR RESPONSIBLE FOR THE WORK BEING INSPECTED.
3. DUTIES AND RESPONSIBILITIES OF THE SPECIAL INSPECTOR SHALL BE TO INSPECT AND/OR TEST THE WORK OUTLINED ABOVE AND WITHIN THE STATEMENT OF SPECIAL INSPECTIONS IN ACCORDANCE WITH CHAPTER 17 OF THE IBC FOR CONFORMANCE WITH THE APPROVED CONSTRUCTION DOCUMENTS.
4. ALL DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR FOR CORRECTION.
5. PER SECTION 1704.2.4 THE SPECIAL INSPECTOR SHALL FURNISH REGULAR REPORTS TO THE BUILDING OFFICIAL AND THE STRUCTURAL ENGINEER. PROGRESS REPORTS FOR CONTINUOUS INSPECTION SHALL BE FURNISHED WEEKLY. INDIVIDUAL REPORTS OF PERIODIC INSPECTIONS SHALL BE FURNISHED WITHIN ONE WEEK OF INSPECTION DATES. THE REPORTS SHALL NOTE UNCORRECTED DEFICIENCIES, CORRECTION OF PREVIOUSLY REPORTED DEFICIENCIES, AND CHANGES TO THE APPROVED CONSTRUCTION DOCUMENTS AUTHORIZED BY THE STRUCTURAL ENGINEER OF RECORD.
6. THE SPECIAL INSPECTOR SHALL SUBMIT A FINAL SIGNED REPORT WITHIN 10 DAYS OF THE FINAL SPECIAL INSPECTION STATING WHETHER THE WORK REQUIRING SPECIAL INSPECTION WAS, TO THE BEST OF THE INSPECTOR'S KNOWLEDGE, IN CONFORMANCE WITH THE APPROVED CONSTRUCTION DOCUMENTS AND THE APPLICABLE WORKMANSHIP PROVISIONS OF THE IBC. WORK NOT IN COMPLIANCE SHALL BE NOTED IN THE REPORT.
7. EXCEPT AS NOTED, THE SPECIAL INSPECTIONS OUTLINED ABOVE ARE IN ADDITION TO, AND BEYOND THE SCOPE OF, PERIODIC STRUCTURAL OBSERVATIONS AS DEFINED IN SECTION 1704.5. STRUCTURAL OBSERVATIONS ARE INCLUDED IN THE STRUCTURAL ENGINEERING DESIGN AND CONSTRUCTION ADMINISTRATION SERVICES PROVIDED BY THE STRUCTURAL ENGINEER.

MASONRY, STEEL, AND MECHANICAL SUB CONTRACTORS NOTE:
STRUCTURAL DRAWINGS DO NOT INDICATE ALL WALL, FLOOR, OR ROOF PENETRATIONS FOR MECH DUCTS, DRAINS, VENTS, ETC.; GENERAL CONTRACTOR AND SUB CONTRACTORS SHALL BE RESPONSIBLE FOR DETERMINING AND/OR MODIFYING OPENING LOCATIONS, ELEVATIONS AND DIMENSIONS FOR MECH UNLESS NOTED OTHERWISE. COORDINATION TO BE COMPLETED PRIOR TO FABRICATION OF STRUCTURAL STEEL AND ROOF JOISTS

FIELD VERIFICATION:
- ALL DIMENSIONS AND CONDITIONS SHALL BE FIELD VERIFIED BY CONTRACTOR
- IF DIMENSIONS AND CONDITIONS DIFFER THAN THOSE SHOWN ON DRAWINGS, NOTIFY ARCHITECT AND ENGINEER
- NOTIFY ARCHITECT AND ENGINEER ONCE FINISHES ARE REMOVED & FOUNDATION IS EXCAVATED TO ALLOW OBSERVATION

ABBREVIATIONS KEY

@	ON CENTER SPACING	DWG	DRAWING	LGS	LIGHT GAGE STEEL		
(E)	EXISTING	DWL	DOWEL	LL	LIVE LOAD	REINF	REINFORCE, -ED, -ING
(N)	NEW	EA	EACH	LLH	LONG LEG HORIZONTAL	REQ	REQUIRED
(R)	REMOVE	ECC	ECCENTRIC	LLV	LONG LEG VERTICAL	REQMT	REQUIREMENT
AB	ANCHOR ROD (BOLT)	E-E	END TO END	LOC	LOCATION	RET	RETAINING
ADDL	ADDITIONAL	EF	EACH FACE	LP	LOW POINT	RM	ROOM
ADJ	ADJUSTABLE	EJ	EXPANSION JOINT	LSL	LAMINATED STRAND LUMBER (GENERIC TERM)	RMO	ROUGH MASONRY OPENING
AESS	ARCHITECTURALLY EXPOSED STRUCTURAL STEEL	EL	ELEVATION	LT	LIGHT	RO	ROUGH OPENING
AFF	ABOVE FINISHED FLOOR	ELEC	ELECTRIC, ELECTRICAL	LVL	LAMINATED VENEER LUMBER (GENERIC TERM)	SC	SLIP-CRITICAL
ALT	ALTERNATE	EMBED	EMBEDMENT	MACH	MACHINE	SCH	SCHEDULE
AMT	AMOUNT	ENGR EOR	ENGINEER ENGINEER OF RECORD	MASY	MASONRY	SDST	SELF-DRILLING/ SELF-TAPPING
ANCH	ANCHOR, ANCHORAGE	EQ	EQUAL	MATL	MATERIAL	SECT	SECTION
APPROX	APPROXIMATE	EQUIP	EQUIPMENT	MAX	MAXIMUM	SF	SQUARE FEET, SUB-FLOOR
ARCH	ARCHITECT, -URAL	EQUIV	EQUIVALENT	MB	MACHINE BOLT	SHT	SHEET
ATR	ALL THREAD ROD	ES	EACH SIDE	MECH	MECHANICAL	SHTG	SHEATHING
AVG	AVERAGE	EST	ESTIMATE	MEZZ	MEZZANINE	SIM	SIMILAR
BC	BOTTOM OF CONCRETE	E-W	EAST TO WEST	MFR	MANUFACTURE, -ER, -ED	SLH	SHORT LEG HORIZONTAL
BL	BRICK LEDGE	EXC	EXCAVATE	MIN	MINIMUM	SLV	SHORT LEG VERTICAL
BLK	BLOCK	EXP	EXPANSION	ML	MICROLLAM (TRUS-JOIST BRAND LVL), MASONRY LINTEL	SOG	SLAB ON GRADE
BLKG	BLOCKING	EXT	EXTERIOR	MO	MASONRY OPENING	SP	SPACES, SPACED
BM	BEAM	FD	FLOOR DRAIN	MTL	METAL	SPEC	SPECIFICATIONS
BOT	BOTTOM	FDN	FOUNDATION	NF	NEAR FACE	SQ	SQUARE
BRG	BEARING	FF	FINISHED FLOOR, FAR FACE	NIC	NOT IN CONTRACT	SSR	SHEAR STUD RAIL
BW	BOTTOM OF WALL	F-F	FACE TO FACE	NS	NEAR SIDE	ST	SNUG-TIGHT
CB	COUNTERBORE	FIG	FIGURE	N-S	NORTH TO SOUTH	STD	STANDARD
CF	CUBIC FOOT	FL	FLUSH	NTS	NOT TO SCALE	STIFF	STIFFENER
CSF	COLD FORMED STEEL	FLG	FLANGE	OCJ	OSHA COLUMN JOIST	STL	STEEL
CG	CENTER OF GRAVITY	FLR	FLOOR	OD	OUTSIDE DIAMETER	STRUCT	STRUCTURE, -AL
CIP	CAST-IN-PLACE	FO	FACE OF	OH	OPPOSITE HAND	SUPT	SUPPORT
CJ	CONSTRUCTION JOINT, CONTROL JOINT	FP	FULL PENETRATION	OPNG	OPENING	SY	SQUARE YARD
CJP	COMPLETE JOINT PENETRATION	FS	FOOTING STEP, FAR SIDE	OPP	OPPOSITE	SYM	SYMMETRICAL
CL	CENTER LINE	FTG	FOOTING	OS	OUTSIDE FACE	T&B	TOP AND BOTTOM
CLG	CEILING	GA	GAGE, GAUGE	OSB	ORIENTED STRAND BOARD	T&G	TONGUE AND GROOVE
CLR	CLEAR	GALV	GALVANIZED	PAF	POWDER ACTUATED FASTENER	TB	TOP OF BEAM
CM	CONSTRUCTION MANAGER, -MENT	GC	GENERAL CONTRACTOR	PC	PRECAST	TC	TOP OF CONCRETE
CMU	CONCRETE MASONRY UNIT	GEN	GENERAL	PCF	POUNDS PER CUBIC FOOT	TCA	TORQUE-CONTROLLED ANCHOR
COL	COLUMN	GL	GLUED LAMINATED, GLULAM	PE	PRE-ENGINEERED	TD	TOP OF DECK
COM	COMMON	GND	GROUND	PEN	PENETRATION	THD	THREAD
COMB	COMBINATION	GR	GRADE	PERP	PERPENDICULAR	THK	THICK, -NESS
CONC	CONCRETE	GT	GIRDER TRUSS	PJP	PARTIAL JOINT PENETRATION	TJ	TOP OF JOIST
CONN	CONNECTION	GYP BD	GYPSUM BOARD	PL	PLATE	TL	TOTAL LOAD
CONT	CONTINUOUS, CONTINUE	HAS	HEADED ANCHOR STUD	PLF	POUND PER LINEAR FOOT	TPG	TOPPING
COORD	COORDINATE, COORDINATION	HDG	HOT-DIP GALVANIZED	PNL	PANEL	TRANS	TRANSVERSE
CS	COUNTERSINK	HDR	HEADER	PP	PANEL POINT	TW	TOP OF WALL
CTR	CENTER	HORIZ	HORIZONTAL	PS	PRESTRESSED	TYP	TYPICAL
CY	CUBIC YARD	HP	HIGH POINT	PSF	POUNDS PER SQUARE FOOT	ULT	ULTIMATE
DAB	DEFORMED ANCHOR BAR	HT	HEIGHT	PSI	POUNDS PER SQUARE INCH	UNO	UNLESS NOTED OTHERWISE
DET	DETAIL	ID	INSIDE DIAMETER	PSL	PARALLEL STRAND LUMBER (GENERIC TERM)	VERT	VERTICAL
DEV	DEVELOP	IF	INSIDE FACE	PT	POST TENSIONED, PRESSURE TREATED	VIF	VERIFY IN FIELD
DIAG	DIAGONAL	INT	INTERIOR, INTERMEDIATE	PTN	PARTITION	WP	WORK POINT
DIM	DIMENSION	IT	INVERTED TEE	PWD	PLYWOOD	WT	WEIGHT
DL	DEAD LOAD	JB	JOIST BEARING	QTY	QUANTITY	WWF	WELDED WIRE FABRIC
DN	DOWN	JST	JOIST	R	RADIUS	XS	EXTRA STRONG
DP	DRILLED PIER	JT	JOINT	RE	REFERENCE, REFER TO	XSECT	CROSS SECTION
DT	DOUBLE TEE	K	KIP (1,000 LBS)	RECT	RECTANGLE	XXS	DOUBLE EXTRA STRONG

SYMBOLS KEY

SYMBOL	DESCRIPTION
	DIRECTION OF DECK SPAN
GRID	GRID DESIGNATION
X	REVISION
X / SX	INDICATES STRUCTURAL ELEVATION
SWx	SHEAR WALL
	SHORING
	STEP IN FLOOR ELEVATION
	CMU (CONCRETE MASONRY UNIT)
	BRICK
	CIP CONCRETE
	PRECAST CONCRETE
	EXISTING CONCRETE
	EARTH
FX.X	ISOLATED SPREAD FOOTING MARK
FXX	SPREAD FOOTING MARK
STEP	STEP IN BOTTOM OF WALL/GRADE BEAM
Px {x}	DRILLED PIER Px = PIER MARK, {x} = Pier Penetration
XX:12	ROOF SLOPE
SLOPE	DIRECTION OF SLOPE (DOWN)
DN UP	STAIR OR RAMP DIRECTION
XXX'-X	TOP OF CONCRETE OR MASONRY ELEVATION
[XXX'-X]	TOP OF BEAM ELEVATION
JB XXX'-X	JOIST BEARING ELEVATION
BL XXX'-X	BRICK LEDGE ELEVATION
(XXX'-X)	TOP OF FOOTING ELEVATION
XXX'-X	TOP OF FLOOR ELEVATION
BUILDING COLUMN DESIGNATIONS	
CONT C	COLUMN CONTINUOUS FROM LEVEL BELOW
CXX	COLUMN STARTING AT THIS LEVEL
B	COLUMN STOPPING BELOW THIS LEVEL, SEE FRAMING PLAN AT NEXT LOWER LEVEL
CXX STUB	COLUMN STARTING AND ENDING AT THIS LEVEL OF FRAMING
CXX HGR	COLUMN CONNECTING A LOWER BEAM TO A HIGHER BEAM AT THIS LEVEL OF FRAMING
BRACED/FRAME BAY SYMBOLS	
B	INDICATES BRACED BAY MARK
X / SX	INDICATES BRACED BAY ELEVATION
	INDICATES CONFIGURATION OF INVERTED CHEVRON-TYPE BRACED BAY WITH HSS DIAGONAL BRACES
	INDICATES CONFIGURATION OF SINGLE DIAGONAL BRACED BAY WITH HSS DIAGONAL BRACE
RF	INDICATES RIGID (MOMENT) FRAME WITH FULL PENETRATION WELDED BEAM FLANGE TO COLUMN CONNECTIONS
X / SX	INDICATES RIGID (MOMENT) FRAME ELEVATION W/ FULL PENETRATION WELDED BEAM FLANGE TO COLUMN CONNECTIONS
	INDICATES BRACED BAY OR FRAMED BAY COLUMN BASE
	FULLY WELDED MOMENT CONNECTION
	LOCATION OF BEND IN BENT BEAM
<X>	NUMBER OF HEADED ANCHOR STUDS

STRUCTURAL DRAWING LIST

hord | coplan | macht
1331 Nineteenth Street
Denver, CO. 80202
P 303.607.0977
www.hcm2.com

CONSULTANT:
JVA CONSULTING ENGINEERS
JVA, Inc. 1319 Spruce Street
Boulder, CO 80302 303.444.1951
www.jvajva.com
Boulder ● Fort Collins ● Winter Park
Glenwood Springs ● Denver

PROJECT:
MIDDLE SCHOOL MECHANICAL UPGRADES
39610 Amethyst Drive
Steamboat Springs, CO 80487

OWNER:
Steamboat Springs School District Re-2

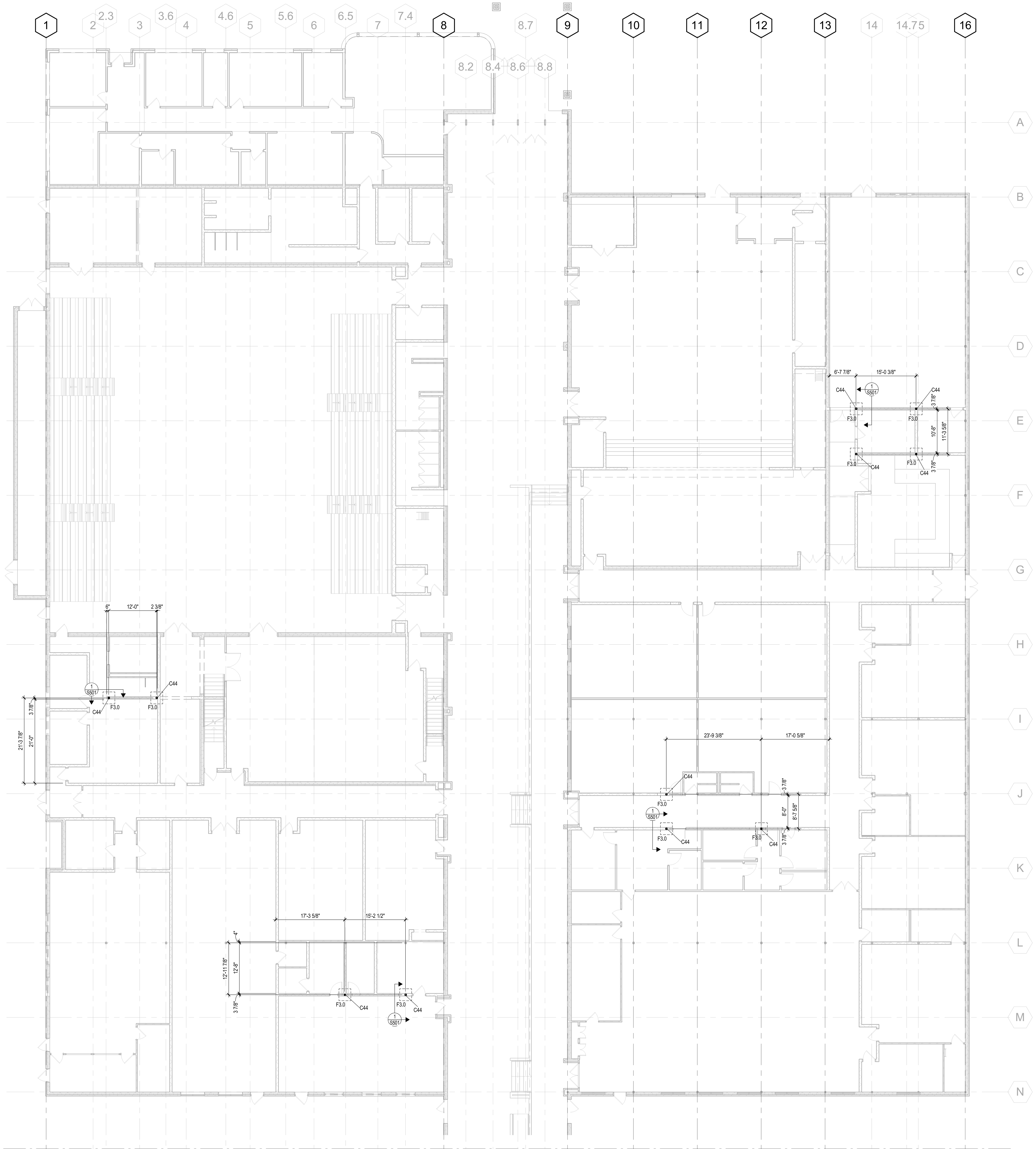
ISSUE:
2018/03/30 Issue for Bidding & Construction

DRAWING INFORMATION:

PROJECT NO:	19053
DRAWN BY:	KLB
CHECKED BY:	BAR
APPROVED BY:	MCC

SHEET TITLE:
GENERAL NOTES

S001
SHEET OF



MAIN LEVEL FOUNDATION PLAN AREA A

3/32" = 1'-0"

NORTH

0 1' 2' 4' 8'

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Denver, CO. 80202

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PROJECT:

MIDDLE SCHOOL MECHANICAL UPGRADES

39610 Amethyst Drive
Steamboat Springs, CO 80487

OWNER:

Steamboat Springs School District Re-2

ISSUE:

2018/03/30 Issue for Bidding & Construction

COLORADO LICENSED PROFESSIONAL ENGINEER 23790

DRAWING INFORMATION:

PROJECT NO:	19053
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CHECKED BY:	BAR
APPROVED BY:	MCC

SHEET TITLE:

FOUNDATION PLAN AREA A

S111A

SHEET OF

JVA #19053

19053 MIDDLE SCHOOL MECHANICAL UPGRADES
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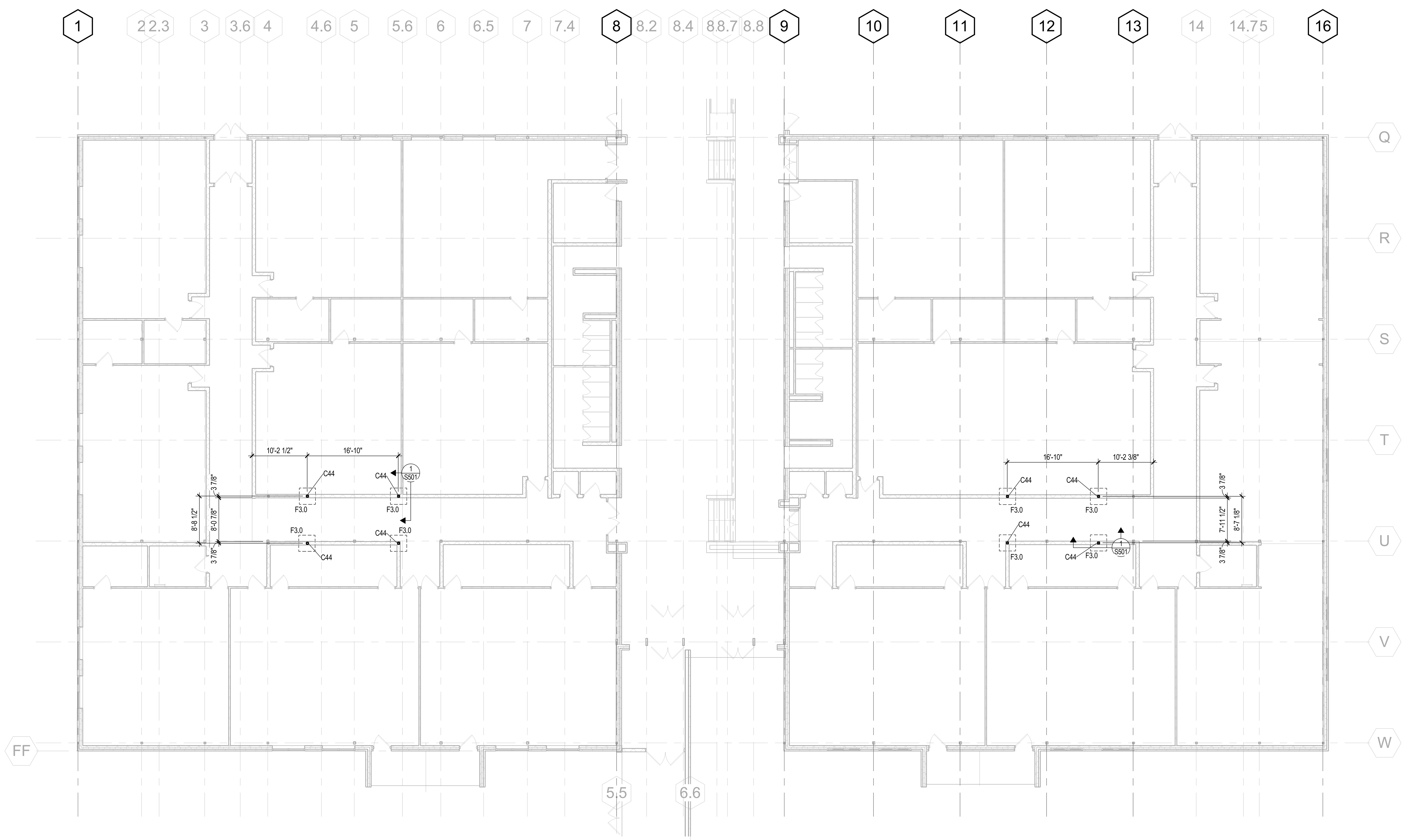

MAIN LEVEL FOUNDATION PLAN AREA B

3/32" = 1'-0"

NORTH

0 2' 4' 8' 16' 32'

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MIDDLE SCHOOL MECHANICAL UPGRADES

39610 Amethyst Drive
Steamboat Springs, CO 80487

OWNER:

Steamboat Springs
School District Re-2

ISSUE:

2018/03/30 Issue for Bidding & Construction

COLORADO LICENSED MARK C. CORMIER 23790 PROFESSIONAL ENGINEER

DRAWING INFORMATION:

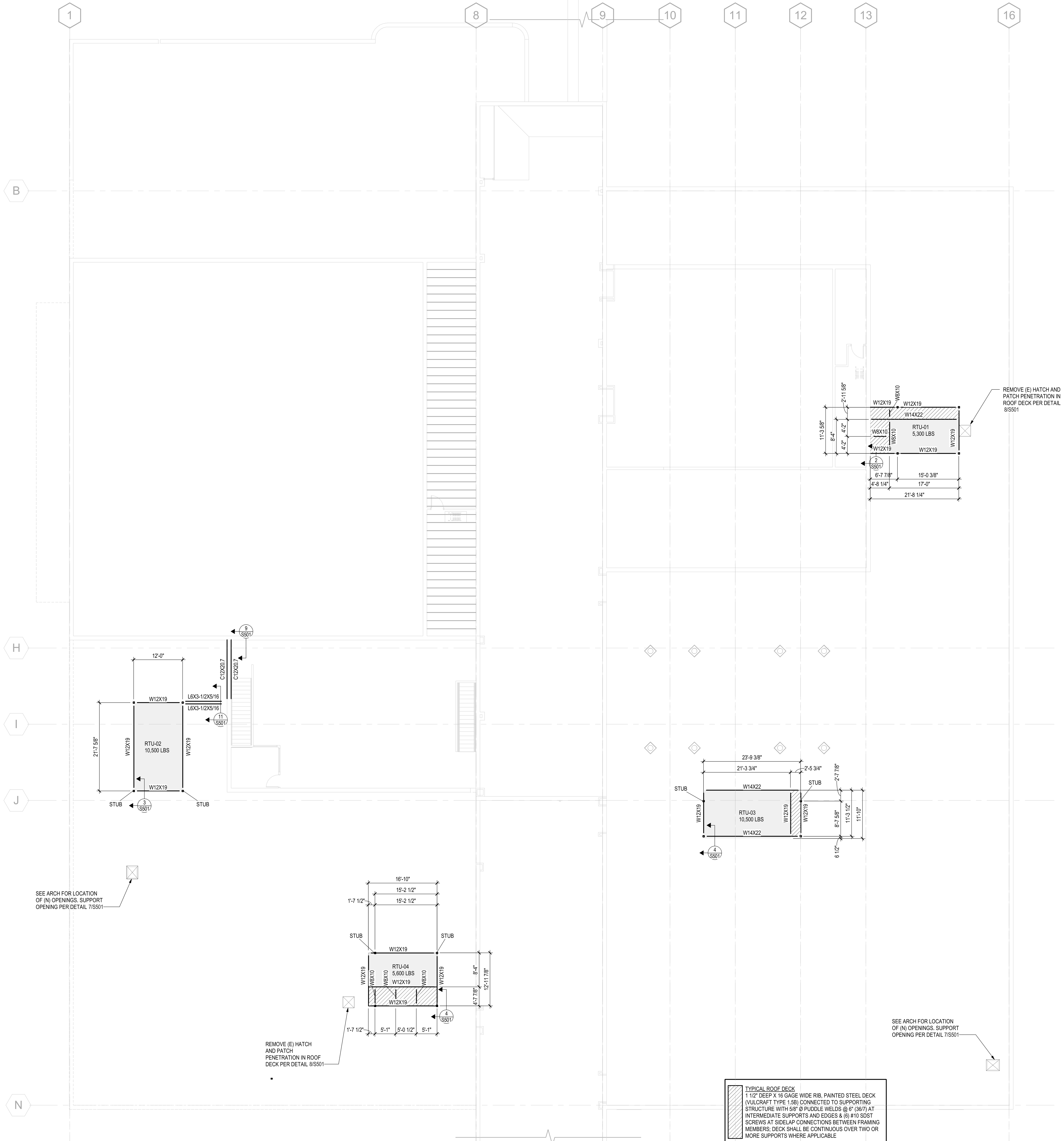
PROJECT NO:	19053
DRAWN BY:	KLB
CHECKED BY:	BAR
APPROVED BY:	MCC

SHEET TITLE:

FOUNDATION PLAN AREA B

S111B

SHEET OF



TYPICAL ROOF DECK
1 1/2" DEEP X 16 GAGE WIDE RIB, PAINTED STEEL DECK (VULCRAFT TYPE 1.5B) CONNECTED TO SUPPORTING STRUCTURE WITH 5/8" Ø PUDDLE WELDS @ 6" (36/7) AT INTERMEDIATE SUPPORTS AND EDGES & (6) #10 SDST SCREWS AT SIDELAP CONNECTIONS BETWEEN FRAMING MEMBERS; DECK SHALL BE CONTINUOUS OVER TWO OR MORE SUPPORTS WHERE APPLICABLE

ROOF FRAMING PLAN AREA A

3/32" = 1'-0"
NORTH
0 2' 4' 8' 16' 32'

hord | coplan | macht
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39610 Amethyst Drive
Steamboat Springs, CO 80487

OWNER:
Steamboat Springs School District Re-2

ISSUE:
2018/03/30 Issue for Bidding & Construction

COLORADO LICENSED PROFESSIONAL ENGINEER MARK C. CORMIER 23790 03-30-18

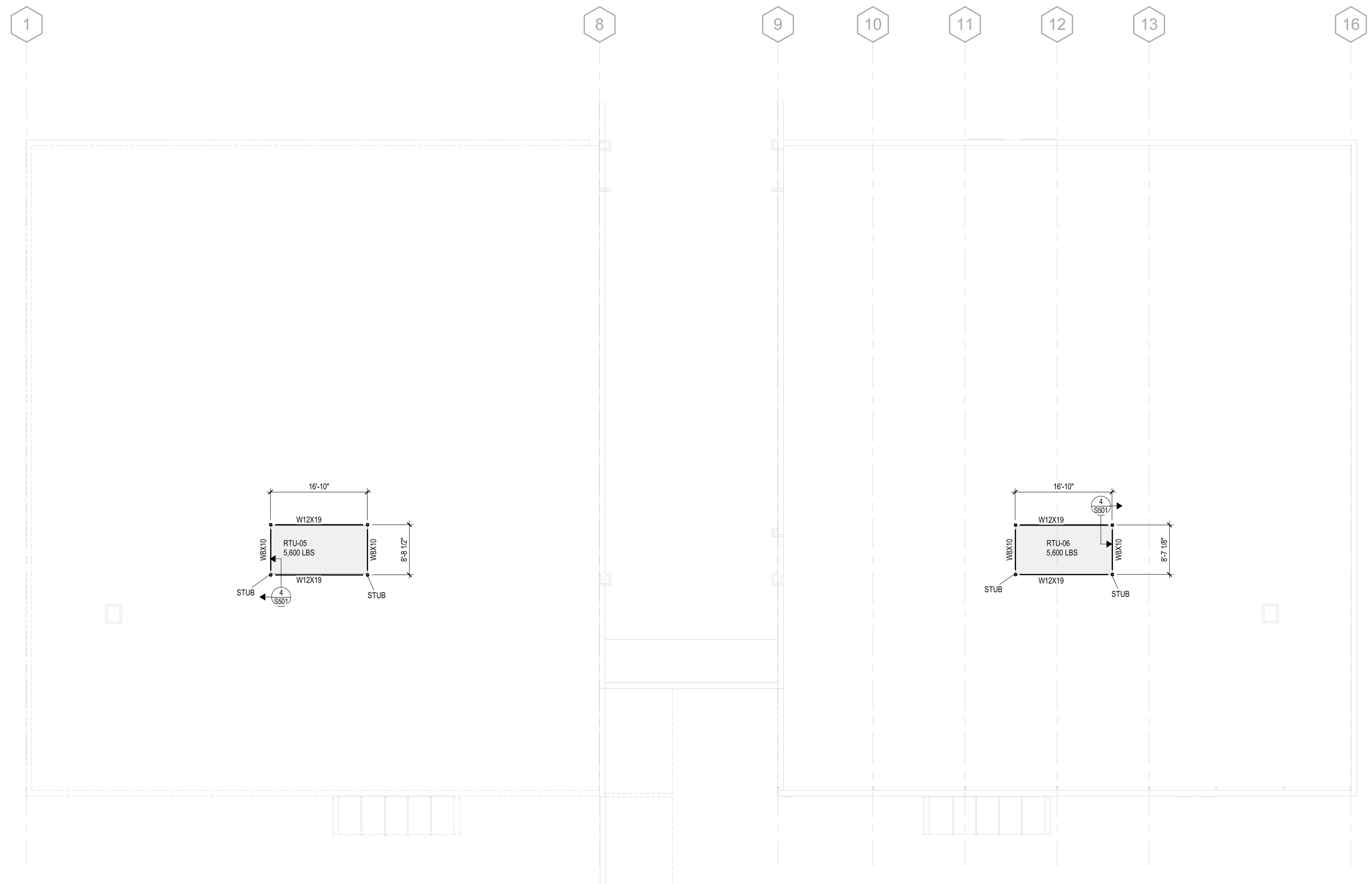
DRAWING INFORMATION:

PROJECT NO:	19053
DRAWN BY:	KLB
CHECKED BY:	BAR
APPROVED BY:	MCC

SHEET TITLE:
ROOF FRAMING PLAN AREA A

S112A

SHEET OF



ROOF FRAMING PLAN AREA B

NORTH

3/32" = 1'-0"

0 1' 2' 4' 8'

hord | coplan | macht

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Boulder, CO 80302 303.444.1951
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Boulder ● Fort Collins ● Winter Park
Glenwood Springs ● Denver

PROJECT:

MIDDLE SCHOOL
MECHANICAL
UPGRADES

39610 Amethyst Drive
Steamboat Springs, CO 80487

OWNER:

Steamboat Springs
School District Re-2

ISSUE:

2018/03/30	Issue for Bidding & Construction

COLORADO LICENSED
MARK C. CORMIER
23790
PROFESSIONAL ENGINEER
03-30-18

DRAWING INFORMATION:

PROJECT NO:	19053
DRAWN BY:	KLB
CHECKED BY:	BAR
APPROVED BY:	MCC

SHEET TITLE:

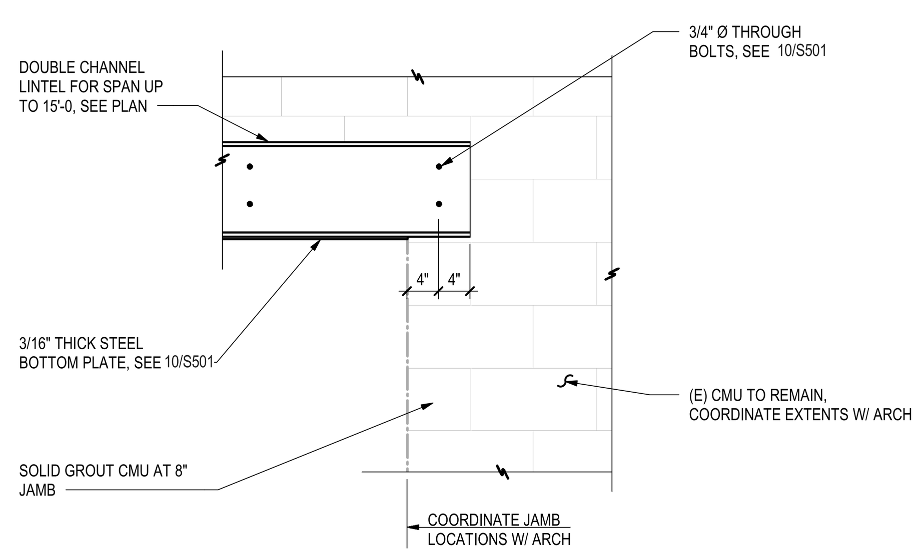
ROOF FRAMING PLAN
AREA B

S112B

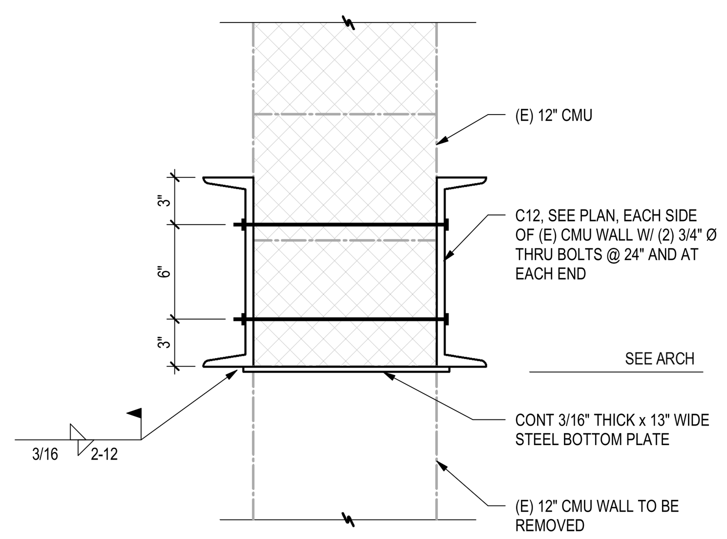
SHEET OF

JVA #19053

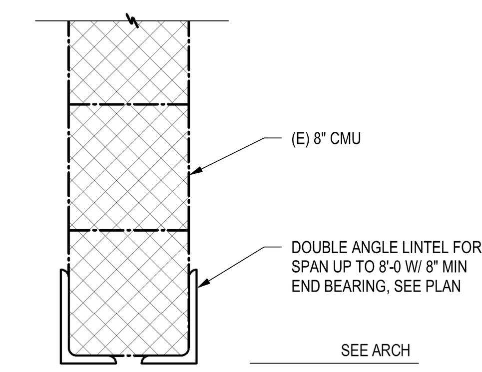
19053 MIDDLE SCHOOL MECHANICAL UPGRADES
3/30/2018 3:38:35 PM



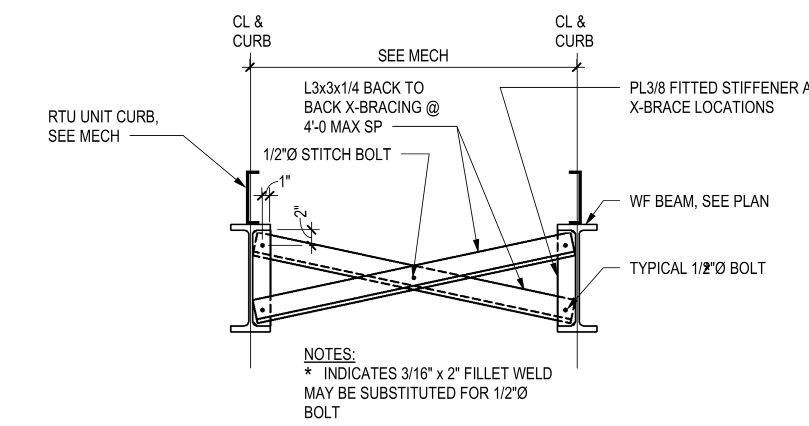
9 / S501 **SECTION**
3/4" = 1'-0"



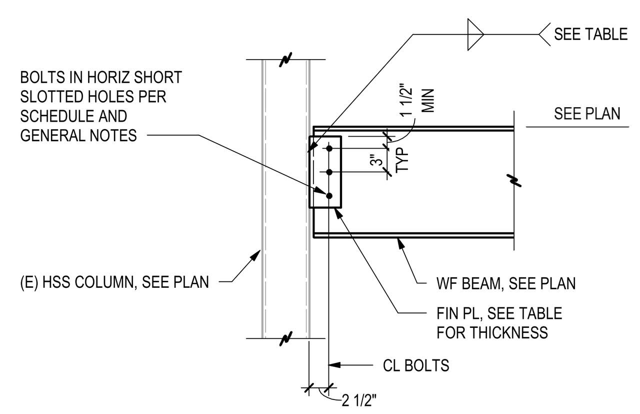
10 / S501 **SECTION**
1 1/2" = 1'-0"



11 / S501 **SECTION**
1 1/2" = 1'-0"



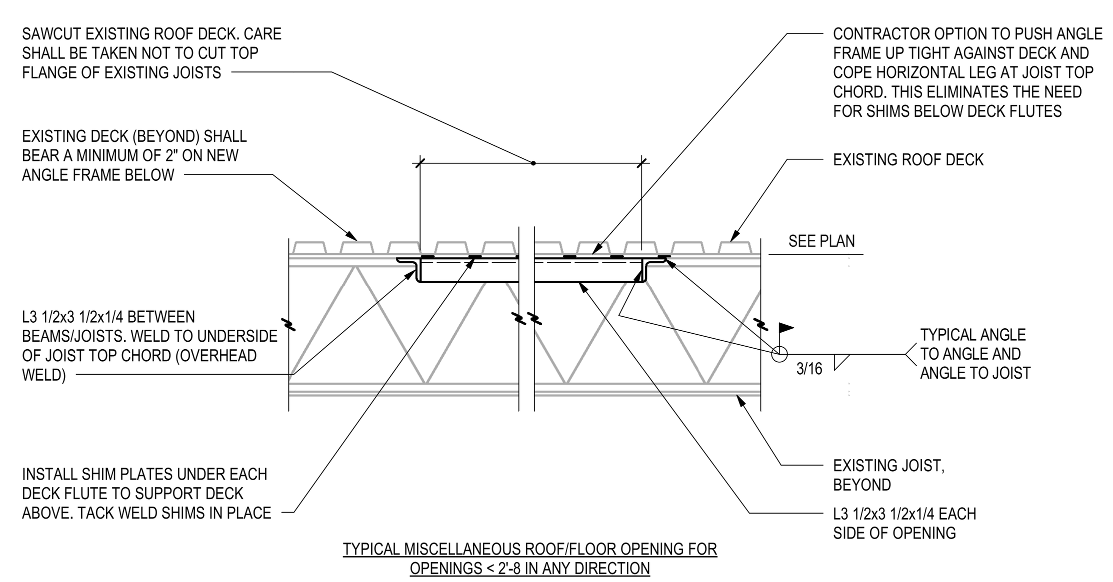
12 / S501 **SECTION**
3/4" = 1'-0"



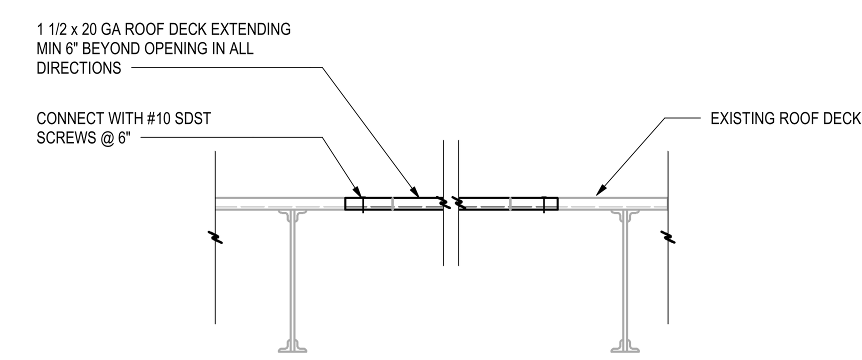
SHEAR TAB/BEAM TO HSS COLUMN CONNECTION SCHEDULE				
BEAM SIZE	# OF BOLTS	FIN PL THICKNESS, t	WELD	MINIMUM HSS WALL THICKNESS
W12, W14	3	1/4"	3/16"	3/16"
W8	2	1/4"	3/16"	3/16"

1. FLEXIBLE SUPPORT USING A325-N BOLTS IN SHORT SLOTTED HOLES
2. BOLTS ARE TO BE 3/4"Ø EXCEPT WHERE NOTED ON PLAN THAT 1"Ø BOLTS ARE REQUIRED
3. E70XX WELD ELECTRODES
4. Fy = 36 ksi FOR FIN PLATES

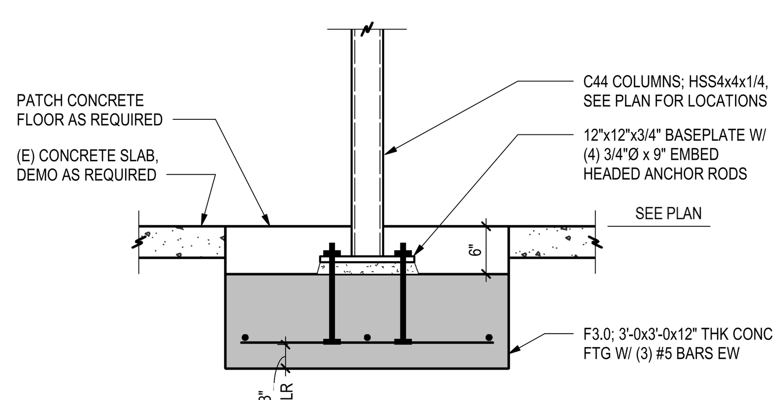
5 / S501 **SCHEDULE**
3/4" = 1'-0"



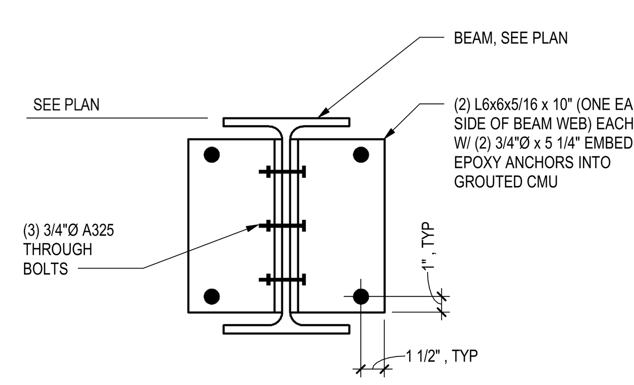
7 / S501 **SECTION**
3/4" = 1'-0"



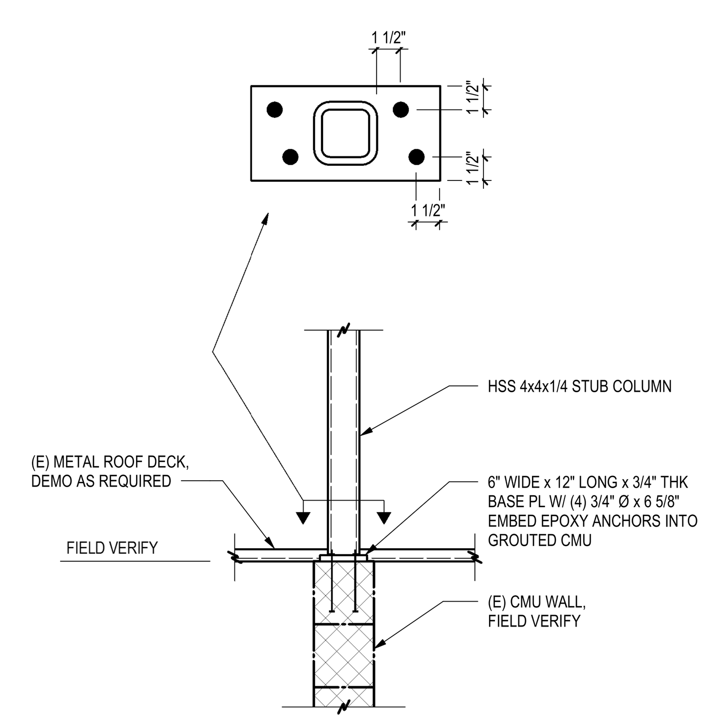
8 / S501 **SECTION**
3/4" = 1'-0"



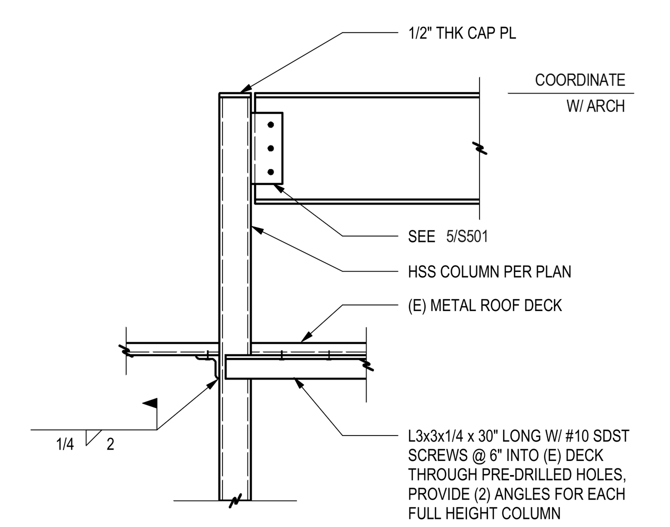
1 / S501 **SECTION**
3/4" = 1'-0"



2 / S501 **SECTION**
1 1/2" = 1'-0"



3 / S501 **SECTION**
3/4" = 1'-0"



4 / S501 **SECTION**
3/4" = 1'-0"

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CONSULTANT:

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JVA, Inc.
1319 Spruce Street
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Boulder • Fort Collins • Winter Park
Glenwood Springs • Denver

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DRAWING INFORMATION:

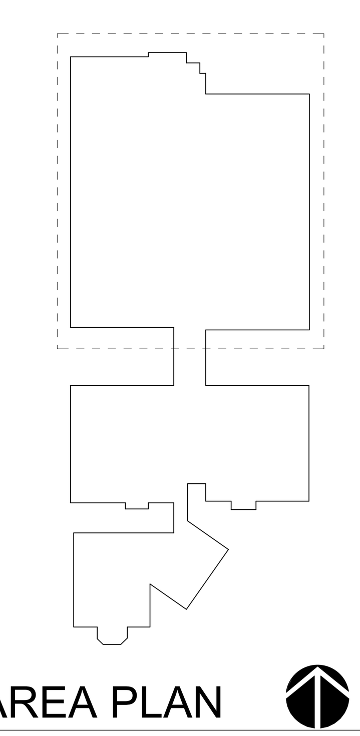
PROJECT NO:	19053
DRAWN BY:	KLB
CHECKED BY:	BAR
APPROVED BY:	MCC

SHEET TITLE:
DETAIL, SECTIONS & SCHEDULES

S501
SHEET OF

19053 MIDDLE SCHOOL MECHANICAL UPGRADES
3/30/2018 3:38:38 PM

A1 **AREA A FIRST FLOOR DEMOLITION PLAN**
3/32" = 1'-0"



AREA PLAN

DEMOLITION GENERAL NOTES

1. GENERAL CONTRACTOR TO COORDINATE SCHEDULING ALL WORK WITH OWNER.
2. WORK LABELED (NIC), OR OTHERWISE NOT NOTED IS NOT IN CONTRACT FOR ANY ARCHITECTURAL IMPROVEMENTS.
3. THE GENERAL CONTRACTOR & THEIR SUBCONTRACTORS SHALL VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS WITH CONDITIONS SHOWN IN THE CONTRACT DOCUMENTS AND SHALL REPORT ANY DEVIATIONS, DISCREPANCIES AND/OR CONFLICTS TO ARCHITECT.
4. THE GENERAL CONTRACTOR & SUBCONTRACTOR SHALL TAKE EXTREME CARE DURING DEMOLITION NOT TO DAMAGE OR DISTURB ANY EXISTING CONDITIONS THAT ARE TO REMAIN. GENERAL CONTRACTOR OR SUBCONTRACTOR SHALL REPAIR ANY DAMAGE OR DISTURBANCE TO EXISTING CONDITIONS AT NO COST TO THE OWNER.
5. PROVIDE PROTECTION FOR FLOORS, WALLS, & CEILING AT ALL EXISTING CONDITIONS TO REMAIN, INCLUDING TRAFFIC AREA FOR DEMOLITION REMOVAL IN COMMON BUILDING AREAS.
6. REMOVE ALL WALLS, DOORS (AND OTHER ITEMS) SHOWN DASHED - FIELD VERIFY CONSTRUCTION OF ALL WALLS TO BE REMOVED - PROVIDE SHORING AND BRACING AS REQUIRED.
7. GENERAL CONTRACTOR TO COORDINATE ABATEMENT CONSULTANT FOR ANY CONTAMINATED MATERIALS TO BE REMOVED BEFORE WORK TO BEGIN IN THIS AREA.
8. REFER TO SPECIFICATIONS REGARDING; EXISTING CONDITIONS, CUTTING AND PATCHING AND SELECTIVE DEMOLITION REQUIREMENTS THAT APPLY TO ALL WORK KEY NOTES DESCRIBED ON THIS SHEET.
9. REFER TO (ELECTRICAL, MECHANICAL, STRUCTURAL) DEMOLITION DRAWINGS FOR ADDITIONAL ITEMS.
10. COORDINATE W/ BUILDING OWNER DURING DEMOLITION TO DETERMINE WHETHER EXISTING FIRE & SMOKE DETECTION SYSTEMS ARE TO BE BAGGED, PROTECTED & REMAIN IN OPERATION OR TO BE TAKEN OFF LINE.
11. AREAS OF DEMOLITION SHALL BE FREE OF (FURNITURE AND MOBILE EQUIPMENT AND ACCESSORIES) PRIOR TO START OF WORK.

SHEET NOTES - DEMOLITION PLANS

NOTE #	NOTE
1	REMOVE ALL WALLS, DOORS, FLOOR FINISHES AND PLUMBING FIXTURES AT EXTENTS SHOWN DASHED, SALVAGE ALL DOOR HARDWARE FOR REINSTALLATION
2	REMOVE HOLLOW METAL WINDOW AND OVERHEAD COILING FIRE DOOR
3	SAW CUT PORTION OF MASONRY WALL FOR NEW DOOR
4	REMOVE HOLLOW METAL WINDOW
4A	REMOVE WOOD WINDOW
5	REMOVE AND SALVAGE EXISTING FIRE ALARM PANEL FOR RELOCATION, RE: ELECTRICAL DRAWINGS/SPECIFICATIONS
6	REMOVE WALL LADDER & SALVAGE FOR REINSTALLATION
7	SAWCUT CONCRETE SLAB FOR NEW STRUCTURAL COLUMN & FOOTER SIZES AND SAWCUT CMU WALL ACCORDINGLY. CUT CMU TO NEAREST MORTAR JOINT. REMOVE FLOOR FINISHES AS REQUIRED.
8	REMOVE DOOR LEAFS W/ HARDWARE AND SALVAGE AND REINSTALLATION
9	REMOVE 6'-8" X 5'-0" OPENING IN METAL STUD WALL
10	REMOVE CASEWORK
10A	EXIST CASEWORK TO REMAIN - PROTECT
11	REMOVE ACOUSTIC PARTITION IN DOOR OPENING. SALVAGE EQUIPMENT FOR REINSTALLATION
12	REMOVE CARPET

INTERIOR FINISH SYMBOL LEGEND

CPT	CARPET
VCT	VINYL COMPOSITION TILE
CT	CERAMIC TILE

ADD ALTERNATES

#

1. PRICE TO INCLUDE DEMOLITION OF WALLS, DOORS/FRAMES, CASEWORK, PLUMBING FIXTURES AND FLOOR FINISHES AT ALL ROOMS SHOWN DASHED. PROVIDE PRICE FOR NEW WALLS, DOORS/FRAMES, CASEWORK AND FINISHES AS NOTED. ALL CEILING DEMOLITION AND INSTALLATION TO BE IN BASE BID.
2. PRICE TO INCLUDE NEW FIRE SPRINKLER SYSTEM THROUGHOUT ENTIRE SCHOOL. PRICE TO INCLUDE NEW BACKFLOW PREVENTER LOCATED IN EXISTING WATER ENTRY ROOM, AND ALL REQUIRED PIPING TO PROVIDE A FUNCTIONAL FIRE SPRINKLER SYSTEM AT THE LOCATIONS SHOWN.

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CONSULTANT:

STATE OF COLORADO
MATTHEW D. PORTA
203650
03/30/2018
LICENSED ARCHITECT

PROJECT:
MIDDLE SCHOOL MECHANICAL UPGRADES
39610 Amethyst Drive
Steamboat Springs, CO 80487

OWNER:
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325 7th Street
Steamboat Springs, CO 80487

ISSUE:
2018/03/30 Issue for Bidding & Construction

DRAWING INFORMATION:

PROJECT NO:	11784.000
DRAWN BY:	MO
CHECKED BY:	LG
APPROVED BY:	MP

SHEET TITLE:
FIRST FLOOR DEMOLITION PLAN - AREA A

AD111A
SHEET OF

11784.000 MIDDLE SCHOOL MECHANICAL UPGRADES
3/30/2018 6:17:11 PM

A1 **AREA B FIRST FLOOR DEMOLITION PLAN**
3/32" = 1'-0"

DEMOLITION GENERAL NOTES

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SHEET NOTES - DEMOLITION PLANS

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12	REMOVE CARPET

ADD ALTERNATES

#

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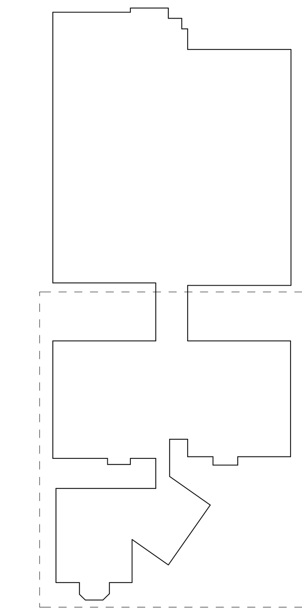

AREA PLAN

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1331 Nineteenth Street
Denver, CO. 80202
P 303.607.0977
www.hcm2.com

CONSULTANT:

STATE OF COLORADO
MATTHEW D. PORTA
203650
03/30/2018
LICENSED ARCHITECT

PROJECT:

MIDDLE SCHOOL MECHANICAL UPGRADES

39610 Amethyst Drive
Steamboat Springs, CO 80487

OWNER:

Steamboat Springs School District Re-2

325 7th Street
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2018/03/30 Issue for Bidding & Construction

DRAWING INFORMATION:

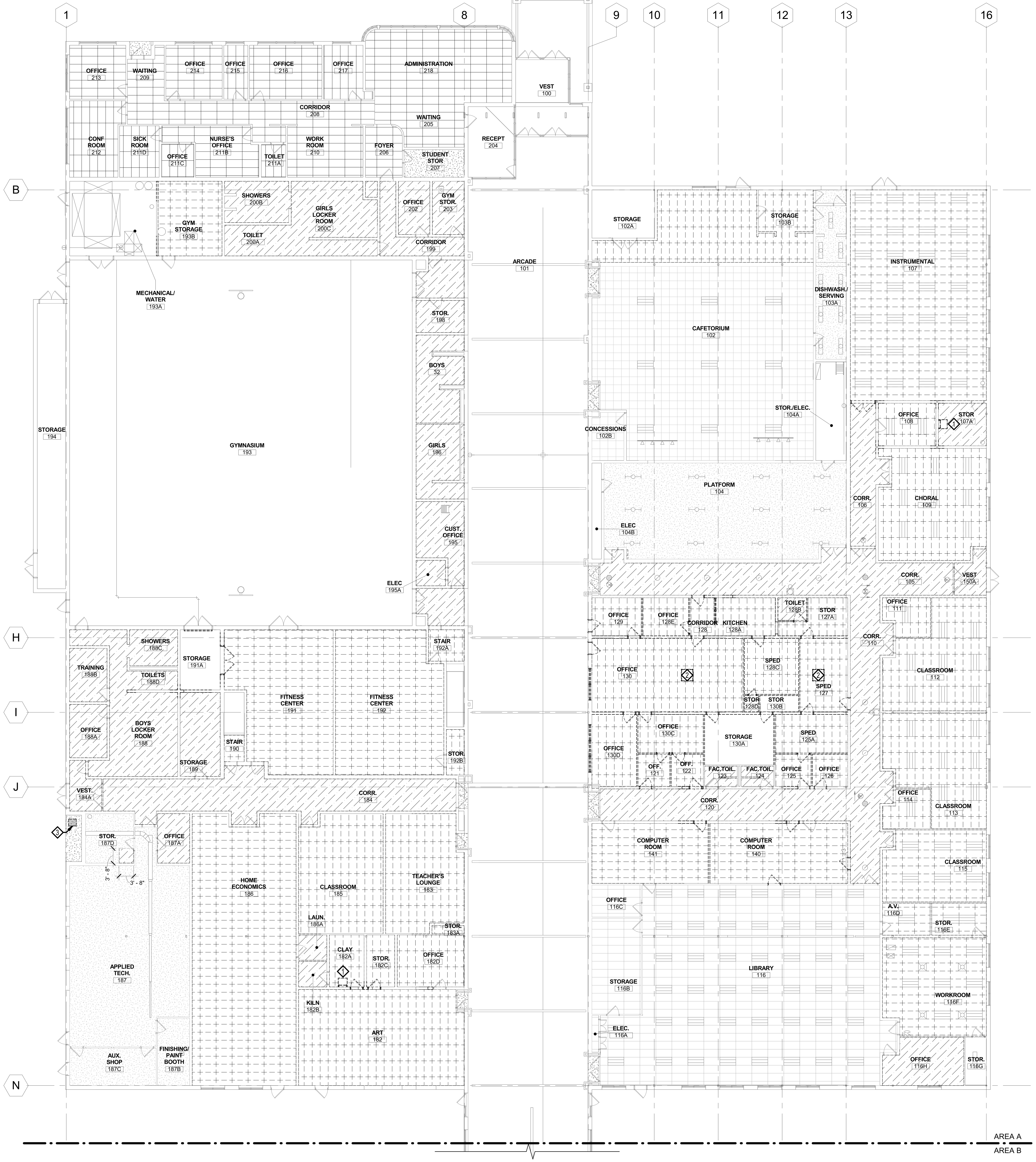
PROJECT NO:	11784.000
DRAWN BY:	MO
CHECKED BY:	LG
APPROVED BY:	MP

SHEET TITLE:

FIRST FLOOR DEMOLITION PLAN - AREA B

AD111B

SHEET OF



A1 **AREA A REFLECTED CEILING DEMO PLAN**
3/32" = 1'-0"

DEMOLITION RCP GENERAL NOTES

1. REMOVE ALL CEILINGS SHOWN DASHED - FIELD VERIFY CONSTRUCTION OF ALL CEILINGS TO BE REMOVED - PROVIDE SHORING AND BRACING AS REQUIRED. REFER TO ELECTRICAL,
2. MECHANICAL AND STRUCTURAL DRAWINGS FOR ADDITIONAL INFORMATION.
3. ALL EXISTING LIGHTS TO REMAIN IN PLACE AT DEMOLISHED CEILINGS, PROTECT FROM DAMAGE
4. REMOVE (AND SALVAGE) ALL CEILING MOUNTED EQUIPMENT PROJECTORS, PULL DOWN SCREENS, SPEAKERS, ETC). TURN OVER TO OWNER FOR REINSTALL AS INDICATED. SHOULD REMOVAL NOT BE NECESSARY, COVER AND PROTECT ELEMENTS DURING CONSTRUCTION.
5. GENERAL CONTRACTOR TO COORDINATE WITH ABATEMENT CONSULTANT FOR ANY CONTAMINATED MATERIALS TO BE REMOVED BEFORE WORK TO BEGIN IN THIS AREA.

RCP LEGEND

REMOVE 2' X 4' CEILING TILES, EXISTING GRID AND LIGHT FIXUTRES TO REMAIN, ASSUME 30% GRID REPLACEMENT

REMOVE 2' X 2' CEILING TILES, EXISTING GRID AND LIGHT FIXUTRES TO REMAIN, ASSUME 30% GRID REPLACEMENT

EXISTING SUSPENDED GRID & TILE TO REMAIN

1. NEW 2' X 4' SUSPENDED GRID & TILE - INSTALL IN SAME CONFIGURATION TO ALIGN WITH EXISTING LIGHTS

2. NEW 2' X 2' SUSPENDED GRID & TILE - INSTALL IN SAME CONFIGURATION TO ALIGN WITH EXISTING LIGHTS

REMOVE GYPSUM BOARD CEILING

3. NEW GYPSUM BOARD CEILING ON METAL STUD FRAMING - PATCH TO EXISTING CEILING AND PAINT ENTIRE CEILING

EXISTING GYPSUM BOARD CEILING TO REMAIN

NO CEILING - OPEN TO STRUCTURE ABOVE

SHEET NOTES - DEMOLITION RCP

NOTE #	NOTE
1	REMOVE ROOF HATCH - ROOMS 107A, 182A
2	REMOVE SKYLIGHT - ROOMS 127, 130
3	REMOVE UNUSED INTAKE SOFFIT LOUVER - ROOM 187D EXTERIOR

ADD ALTERNATES

#

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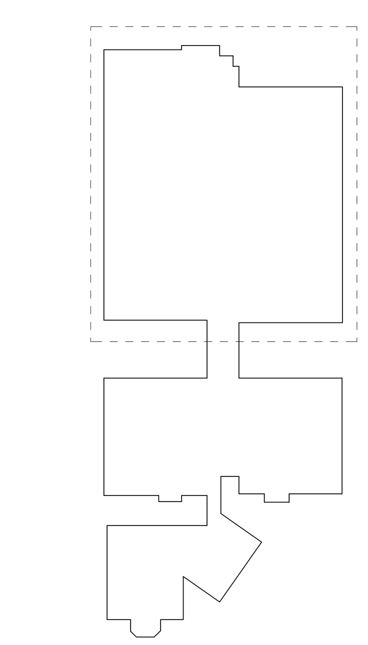

AREA PLAN

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Denver, CO. 80202
P 303.607.0977
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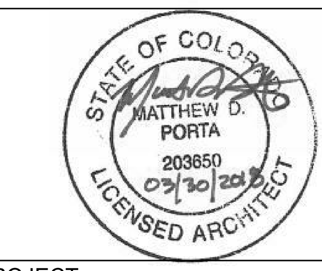
CONSULTANT:



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DRAWN BY:	MO
CHECKED BY:	LG
APPROVED BY:	MP

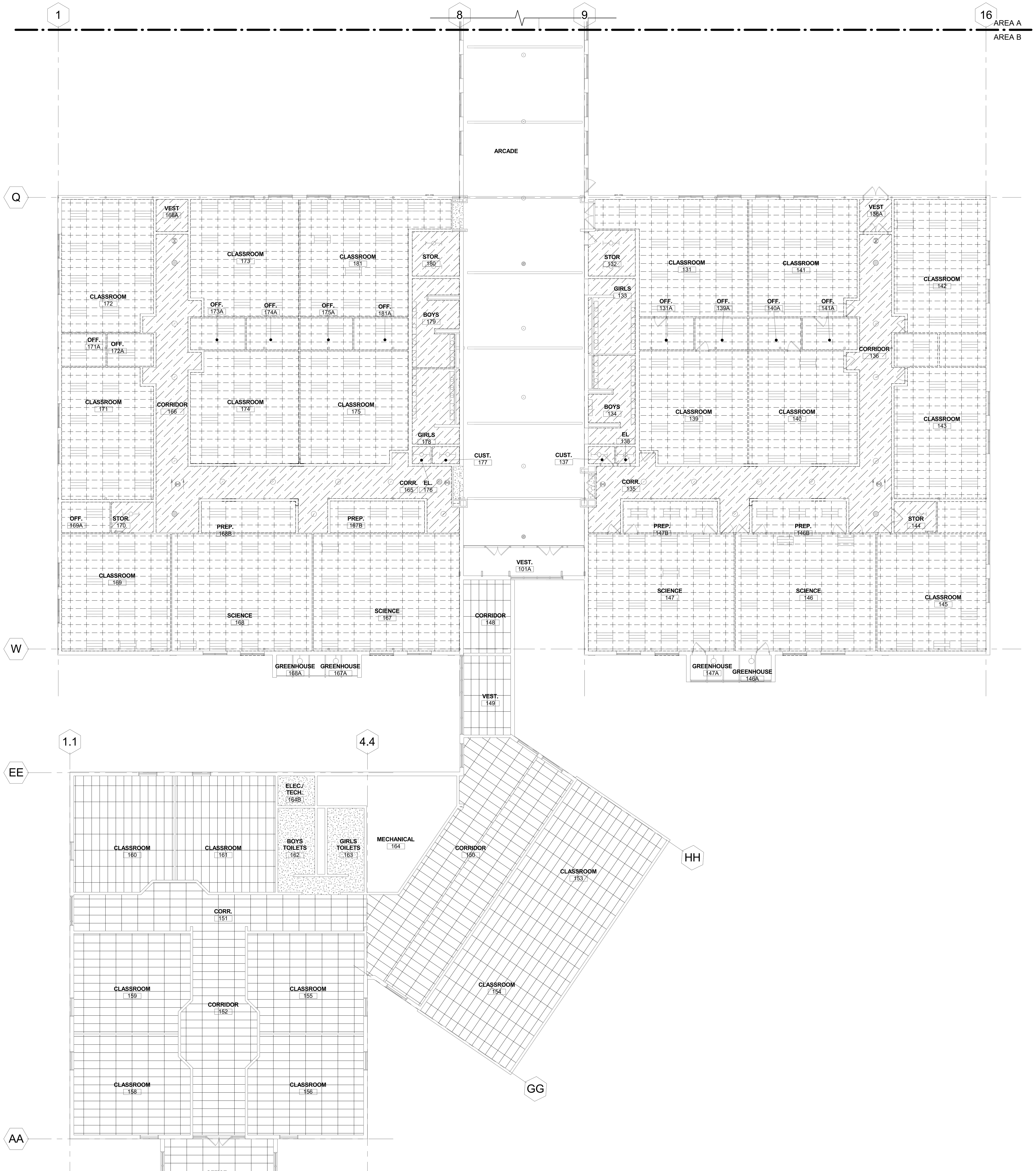
SHEET TITLE:

FIRST FLOOR REFLECTED CEILING DEMO PLAN - AREA A

AD121A

SHEET OF

11784.000 MIDDLE SCHOOL MECHANICAL UPGRADES
3/30/2018 6:19:12 PM



A1 **AREA B REFLECTED CEILING DEMO PLAN**
3/32" = 1'-0"

DEMOLITION RCP GENERAL NOTES

1. REMOVE ALL CEILINGS SHOWN DASHED - FIELD VERIFY CONSTRUCTION OF ALL CEILINGS TO BE REMOVED - PROVIDE SHORING AND BRACING AS REQUIRED. REFER TO ELECTRICAL,
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5. GENERAL CONTRACTOR TO COORDINATE WITH ABATEMENT CONSULTANT FOR ANY CONTAMINATED MATERIALS TO BE REMOVED BEFORE WORK TO BEGIN IN THIS AREA.

RCP LEGEND

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- REMOVE 2' X 2' CEILING TILES, EXISTING GRID AND LIGHT FIXUTRES TO REMAIN, ASSUME 30% GRID REPLACEMENT
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- 1. NEW 2' X 4' SUSPENDED GRID & TILE - INSTALL IN SAME CONFIGURATION TO ALIGN WITH EXISTING LIGHTS
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- REMOVE GYPSUM BOARD CEILING
- 3. NEW GYPSUM BOARD CEILING ON METAL STUD FRAMING - PATCH TO EXISTING CEILING AND PAINT ENTIRE CEILING
- EXISTING GYPSUM BOARD CEILING TO REMAIN
- NO CEILING - OPEN TO STRUCTURE ABOVE

ADD ALTERNATES

#

1. PRICE TO INCLUDE DEMOLITION OF WALLS, DOORS/FRAMES, CASEWORK, PLUMBING FIXTURES AND FLOOR FINISHES AT ALL ROOMS SHOWN DASHED. PROVIDE PRICE FOR NEW WALLS, DOORS/FRAMES, CASEWORK AND FINISHES AS NOTED. ALL CEILING DEMOLITION AND INSTALLATION TO BE IN BASE BID.
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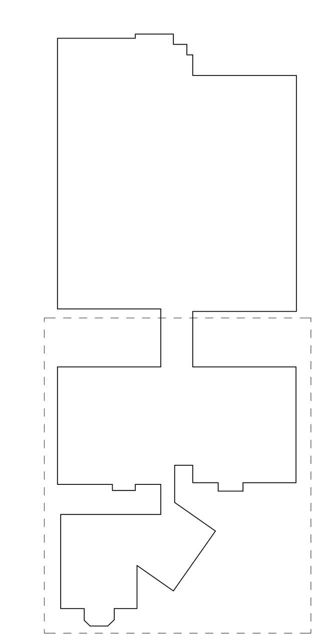

AREA PLAN

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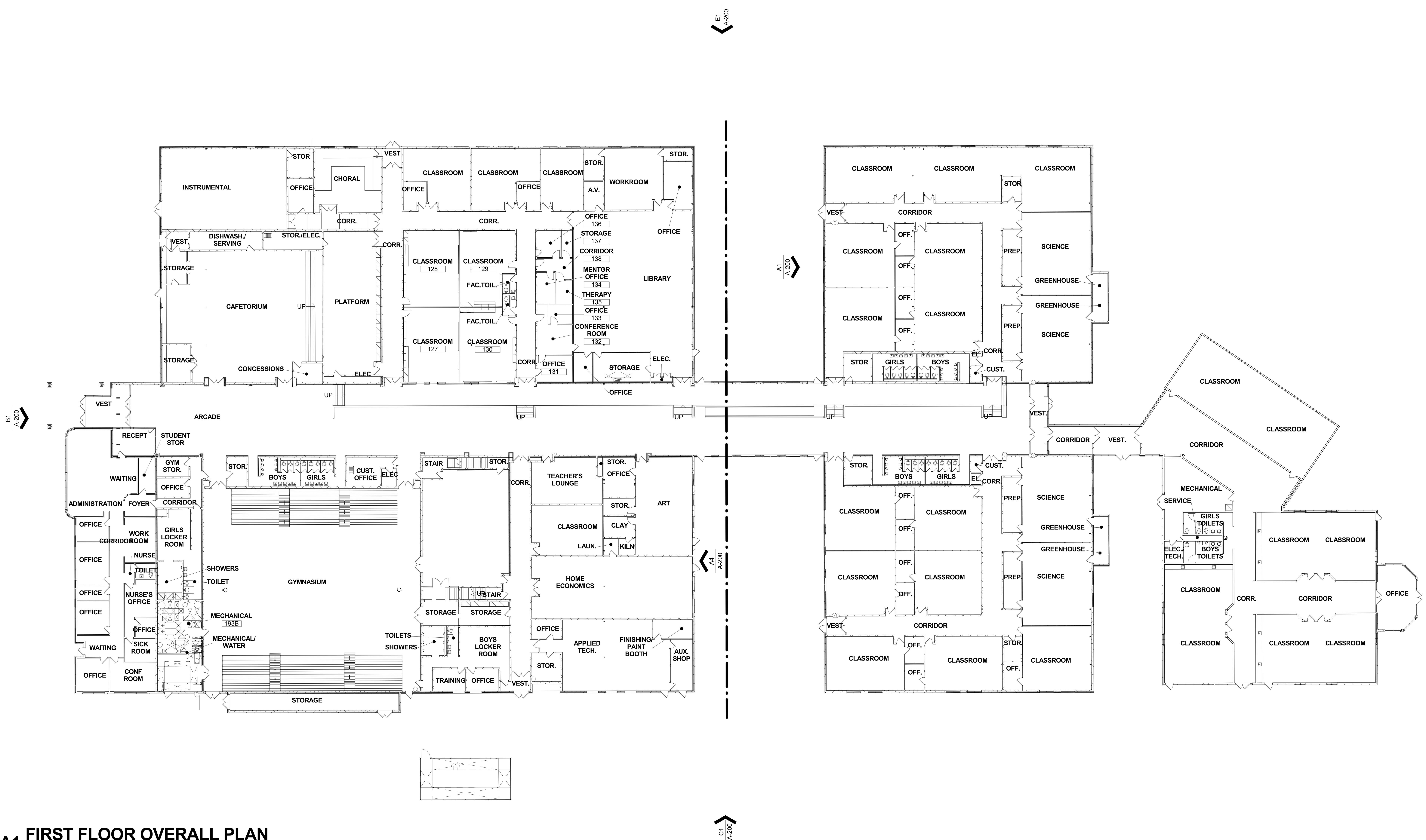
SHEET TITLE:

FIRST FLOOR REFLECTED CEILING DEMO PLAN - AREA B

AD121B

SHEET OF



A1 **FIRST FLOOR OVERALL PLAN**

1" = 20'-0"

hord | coplan | macht

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MATTHEW D. PORTA
203650
03/30/2018
LICENSED ARCHITECT

PROJECT:

MIDDLE SCHOOL MECHANICAL UPGRADES

39610 Amethyst Drive
Steamboat Springs, CO 80487

OWNER:

Steamboat Springs School District Re-2

325 7th Street
Steamboat Springs, CO 80487

ISSUE:

2018/03/30 Issue for Bidding & Construction

DRAWING INFORMATION:

PROJECT NO:	11784.000
DRAWN BY:	MO
CHECKED BY:	LG
APPROVED BY:	MP

SHEET TITLE:

OVERALL FLOORPLAN

A-111

SHEET OF

11784.000 MIDDLE SCHOOL MECHANICAL UPGRADES
3/30/2018 5:29:08 PM

A1 **FIRST FLOOR PLAN - AREA A**
3/32" = 1'-0"

FLOOR PLAN GENERAL NOTES

1. DIMENSIONS INDICATED ARE TO FACE OF FINISH MATERIAL OF PARTITION OR WALL AND GRID LINES, UON
2. REFER TO FINISH PLANS FOR INTERIOR ELEVATION CALLOUTS, ENLARGED PLAN CALLOUTS AND FLOOR PATTERNS.
3. REFER TO SHEET (A-510) FOR PARTITION TYPE INFORMATION
4. REFER TO FINISH PLANS FOR MARKER/TACK/SMART BOARD SIZES AND LOCATIONS.
5. VERIFY & COORDINATE ALL REQUIREMENTS FOR OWNER FURNISHED ITEMS PRIOR TO PERFORMANCE OF WORK THAT MAY INTERFACE WITH SUCH ITEMS.
6. PROVIDE PAINTED ACCESS PANELS IN WALLS & CEILINGS AT CONCEALED ITEMS, SUCH AS VALVES, CONTROLS, SWITCHES OR ANY OTHER ITEMS THAT REQUIRES ACCESS. GC TO DETERMINE ACCESS PANEL LOCATION W/ ARCHITECT PRIOR TO INSTALLATION.

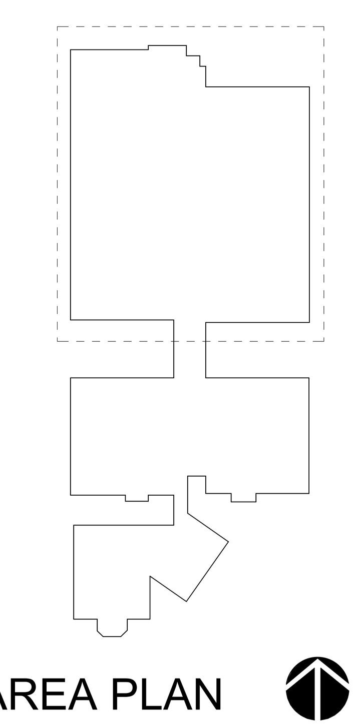
SHEET NOTES - CONSTRUCTION PLANS

NOTE #	NOTE
1	INFILL OPENING WITH 8" CMU AND PAINT
2	INFILL OPENING WITH METAL STUD AND GYPSUM WALL BOARD
5	4' X 12' MARKER BOARD
6	OWNER PROVIDED SMART BOARD
7	NEW MECHANICAL UNIT ON ROOF ABOVE. LOCATE STRUCTURAL FRAMING WITHIN (E) CMU WALL. RE: C1/A-420.
8	METAL STUD FRAMING W/ ACOUSTIC BATT INSULATINO & GYPSUM BOARD BOTH SIDES FROM TOP OF CMU WALL TO UNDERSIDE OF ROOF DECK ABOVE - WALL RATING REMOVED FROM PLAN FOR CLARITY
9	ALL NEW WALLS THIS SUITE TO BE PARTITION TYPE 2-3A
10	REINSTALL (E) ROOF LADDER
11	REPAINT ENTIRE WALL AFTER DOOR AND WINDOWS ARE REMOVED AND PATCHED
12	INFILL OPENING WITH METAL STUD AND GYPSUM WALL BOARD, JUSTIFY TO CLASSROOM SIDE

ADD ALTERNATES

#

1. PRICE TO INCLUDE DEMOLITION OF WALLS, DOORS/FRAMES, CASEWORK, PLUMBING FIXTURES AND FLOOR FINISHES AT ALL ROOMS SHOWN DASHED. PROVIDE PRICE FOR NEW WALLS, DOORS/FRAMES, CASEWORK AND FINISHES AS NOTED. ALL CEILING DEMOLITION AND INSTALLATION TO BE IN BASE BID.
2. PRICE TO INCLUDE NEW FIRE SPRINKLER SYSTEM THROUGHOUT ENTIRE SCHOOL. PRICE TO INCLUDE NEW BACKFLOW PREVENTER LOCATED IN EXISTING WATER ENTRY ROOM, AND ALL REQUIRED PIPING TO PROVIDE A FUNCTIONAL FIRE SPRINKLER SYSTEM AT THE LOCATIONS SHOWN.



AREA PLAN

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FIRST FLOOR PLAN - AREA A

A-111A

SHEET OF

11784.000 MIDDLE SCHOOL MECHANICAL UPGRADES
3/30/2018 5:49:30 PM

A1 FIRST FLOOR PLAN
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ADD ALTERNATES

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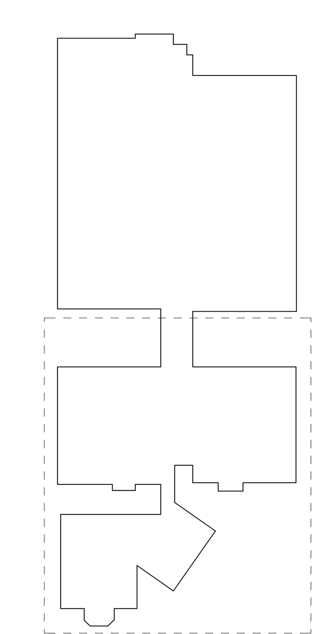

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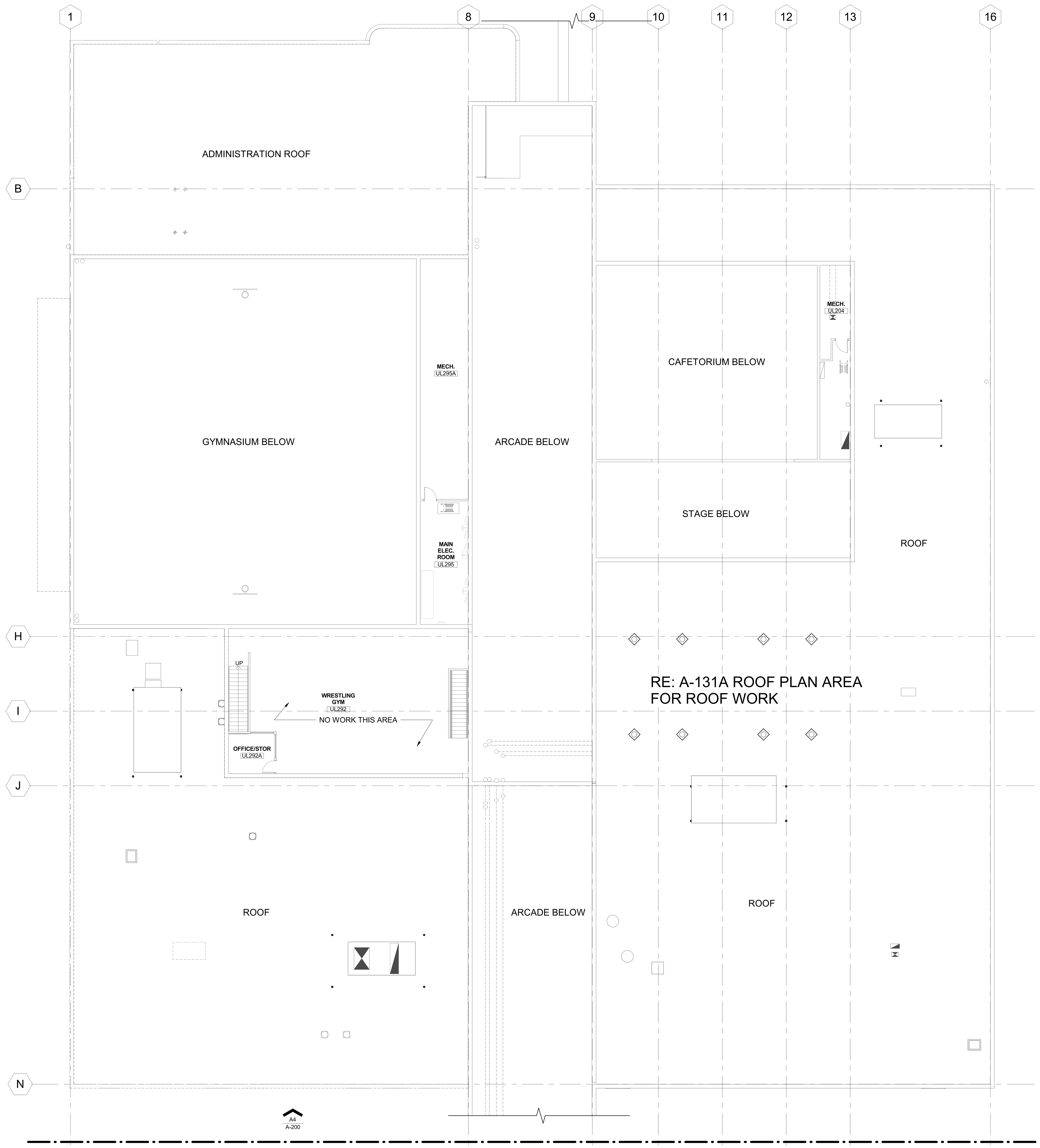
SHEET TITLE:

FIRST FLOOR PLAN - AREA B

A-111B

SHEET OF

11784.000 MIDDLE SCHOOL MECHANICAL UPGRADES
3/30/2018 5:50:12 PM



A1 **SECOND FLOOR PLAN - AREA A**
3/32" = 1'-0"

FLOOR PLAN GENERAL NOTES

1. DIMENSIONS INDICATED ARE TO FACE OF FINISH MATERIAL OF PARTITION OR WALL AND GRID LINES, UON
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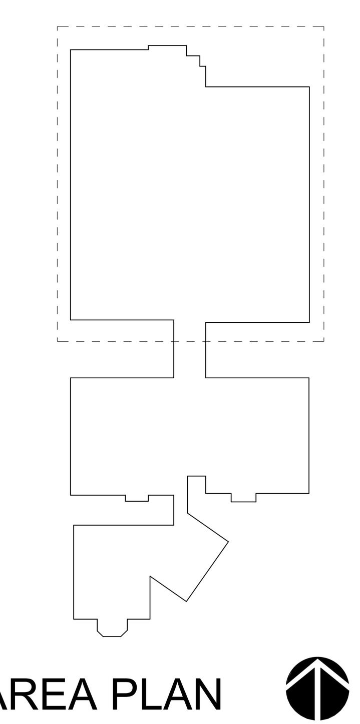

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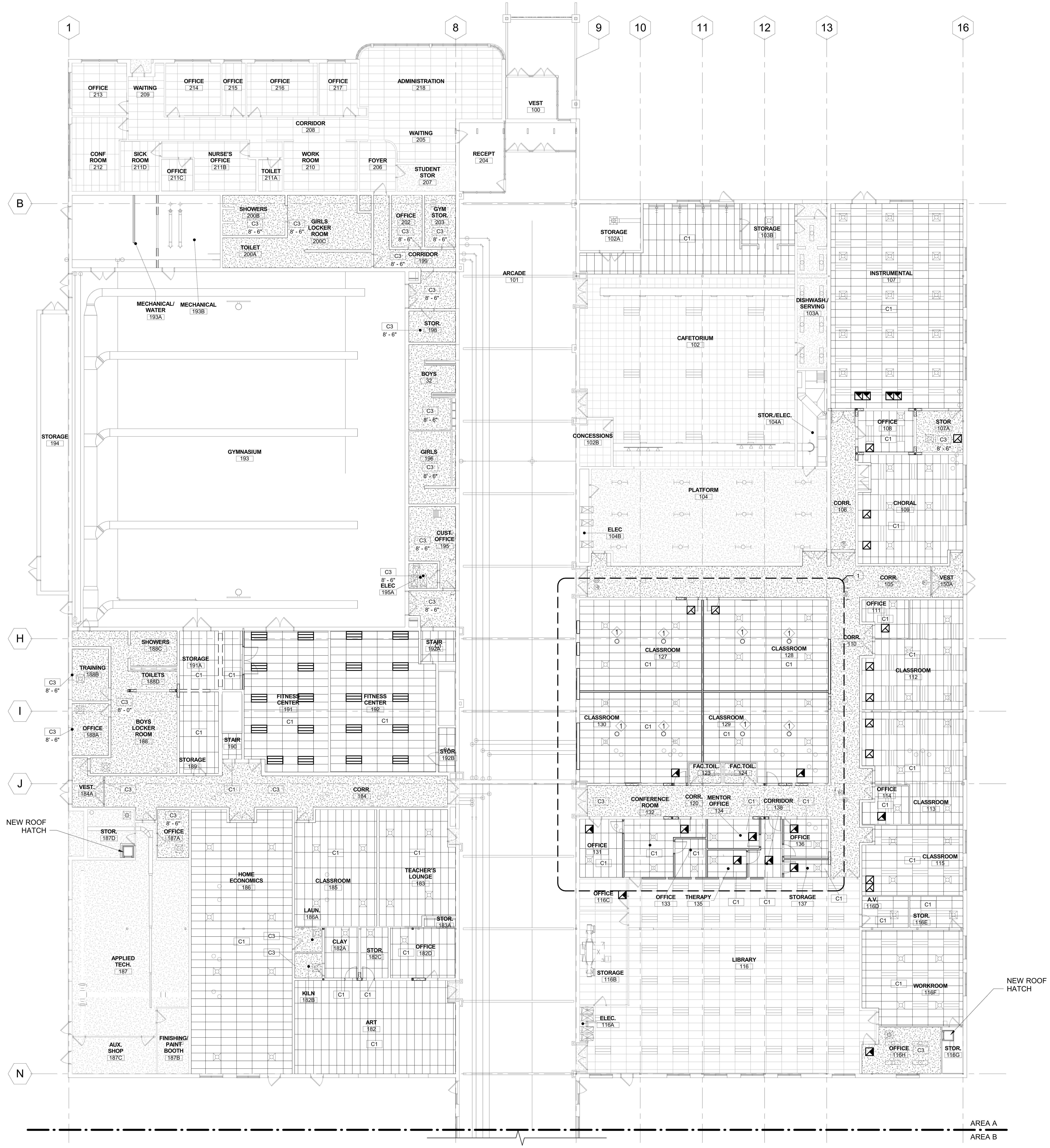
SHEET TITLE:

SECOND FLOOR PLAN

A-112A

SHEET OF

11784.000 MIDDLE SCHOOL MECHANICAL UPGRADES
3/30/2018 5:51:13 PM



A1 **FIRST FLOOR REFLECTED CEILING PLAN - AREA A**
3/32" = 1'-0"

RCP GENERAL NOTES

1. ALL CEILING ELEVATIONS DIMENSIONED FROM FINISH FLOOR BELOW
2. CENTER ALL DEVICES, ETC. IN CEILING TILE
3. PROVIDE CONTINUOUS SOUND BATT INSULATION ABOVE TOILET ROOM CEILINGS.

GYPSUM CEILINGS ARE 7'-6" A.F.F., SUPENDED GRID CEILINGS ARE 8'-6" A.F.F., U.N.O.

RCP LEGEND

- REMOVE 2' X 4' CEILING TILES, EXISTING GRID AND LIGHT FIXUTRES TO REMAIN, ASSUME 30% GRID REPLACEMENT
- REMOVE 2' X 2' CEILING TILES, EXISTING GRID AND LIGHT FIXUTRES TO REMAIN, ASSUME 30% GRID REPLACEMENT
- EXISTING SUSPENDED GRID & TILE TO REMAIN
- 1. NEW 2' X 4' SUSPENDED GRID & TILE - INSTALL IN SAME CONFIGURATION TO ALIGN WITH EXISTING LIGHTS
- 2. NEW 2' X 2' SUSPENDED GRID & TILE - INSTALL IN SAME CONFIGURATION TO ALIGN WITH EXISTING LIGHTS
- REMOVE GYPSUM BOARD CEILING
- 3. NEW GYPSUM BOARD CEILING ON METAL STUD FRAMING - PATCH TO EXISTING CEILING AND PAINT ENTIRE CEILING
- EXISTING GYPSUM BOARD CEILING TO REMAIN
- NO CEILING - OPEN TO STRUCTURE ABOVE

SHEET NOTES - CONSTRUCTION RCPs

NOTE #	NOTE
1	NEW 14" TUBULAR LIGHT

ADD ALTERNATES

#

1. PRICE TO INCLUDE DEMOLITION OF WALLS, DOORS/FRAMES, CASEWORK, PLUMBING FIXTURES AND FLOOR FINISHES AT ALL ROOMS SHOWN DASHED. PROVIDE PRICE FOR NEW WALLS, DOORS/FRAMES, CASEWORK AND FINISHES AS NOTED. ALL CEILING DEMOLITION AND INSTALLATION TO BE IN BASE BID.
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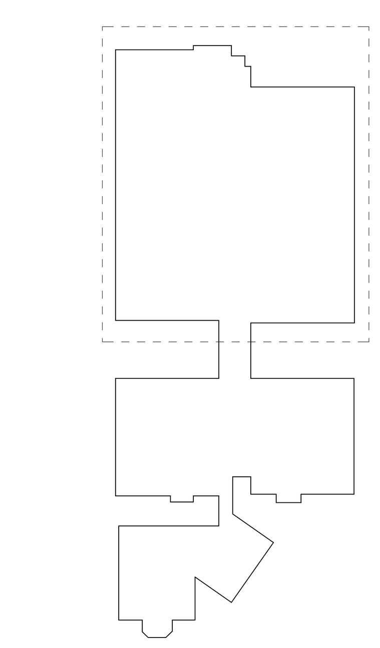

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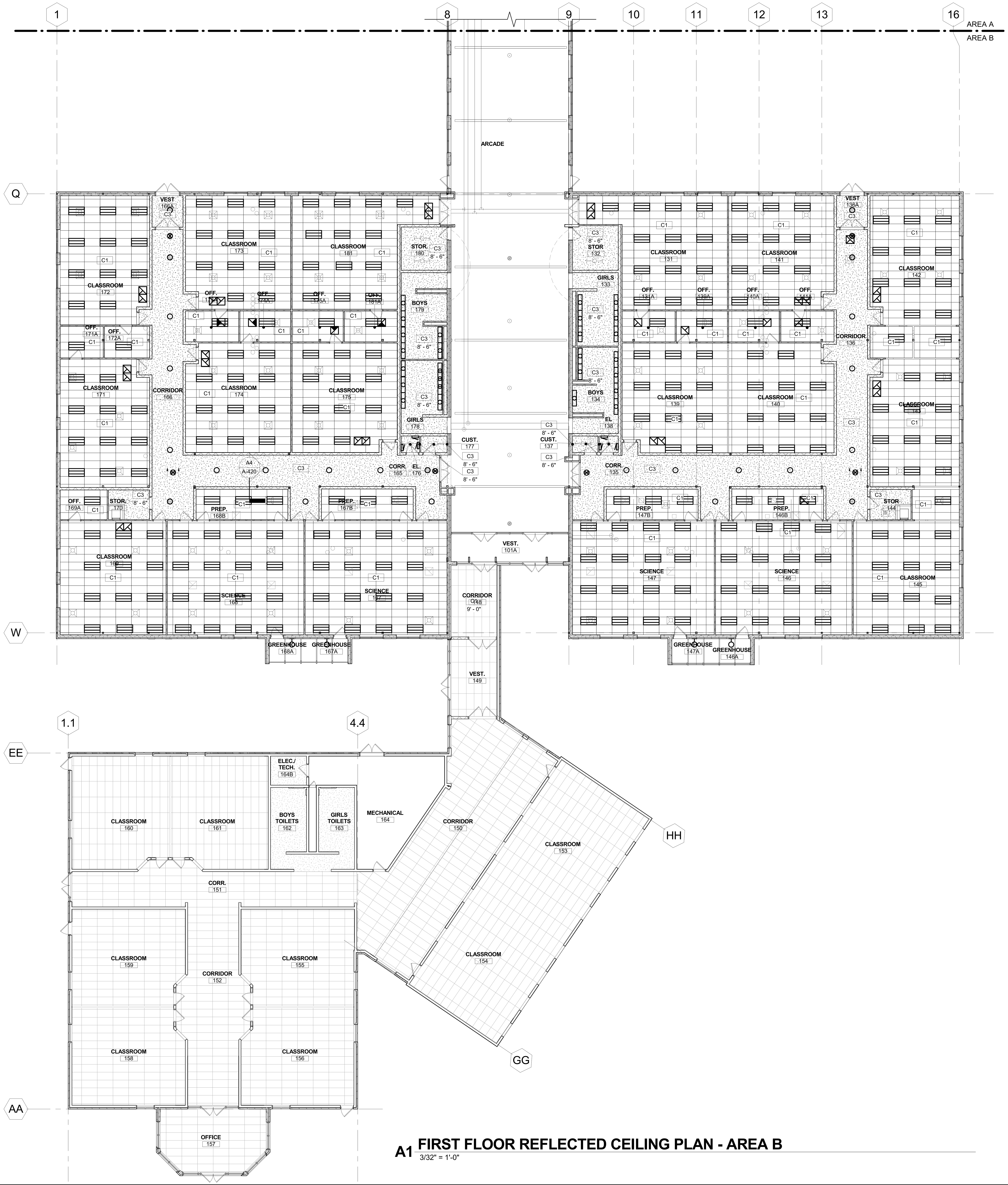
SHEET TITLE:
FIRST FLOOR REFLECTED CEILING PLAN - AREA A

A-121A

SHEET OF

11784.000 MIDDLE SCHOOL MECHANICAL UPGRADES
3/30/2018 6:01:08 PM



A1 FIRST FLOOR REFLECTED CEILING PLAN - AREA B
3/32" = 1'-0"

RCP GENERAL NOTES

1. ALL CEILING ELEVATIONS DIMENSIONED FROM FINISH FLOOR BELOW
2. CENTER ALL DEVICES, ETC. IN CEILING TILE
3. PROVIDE CONTINUOUS SOUND BATT INSULATION ABOVE TOILET ROOM CEILINGS.

GYPSUM CEILINGS ARE 7'-6" A.F.F., SUPENDED GRID CEILINGS ARE 8'-6" A.F.F., U.N.O.

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ADD ALTERNATES

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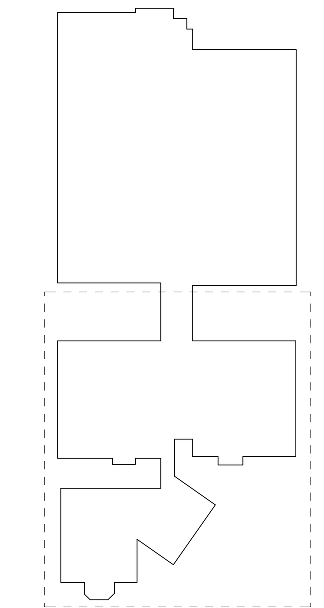

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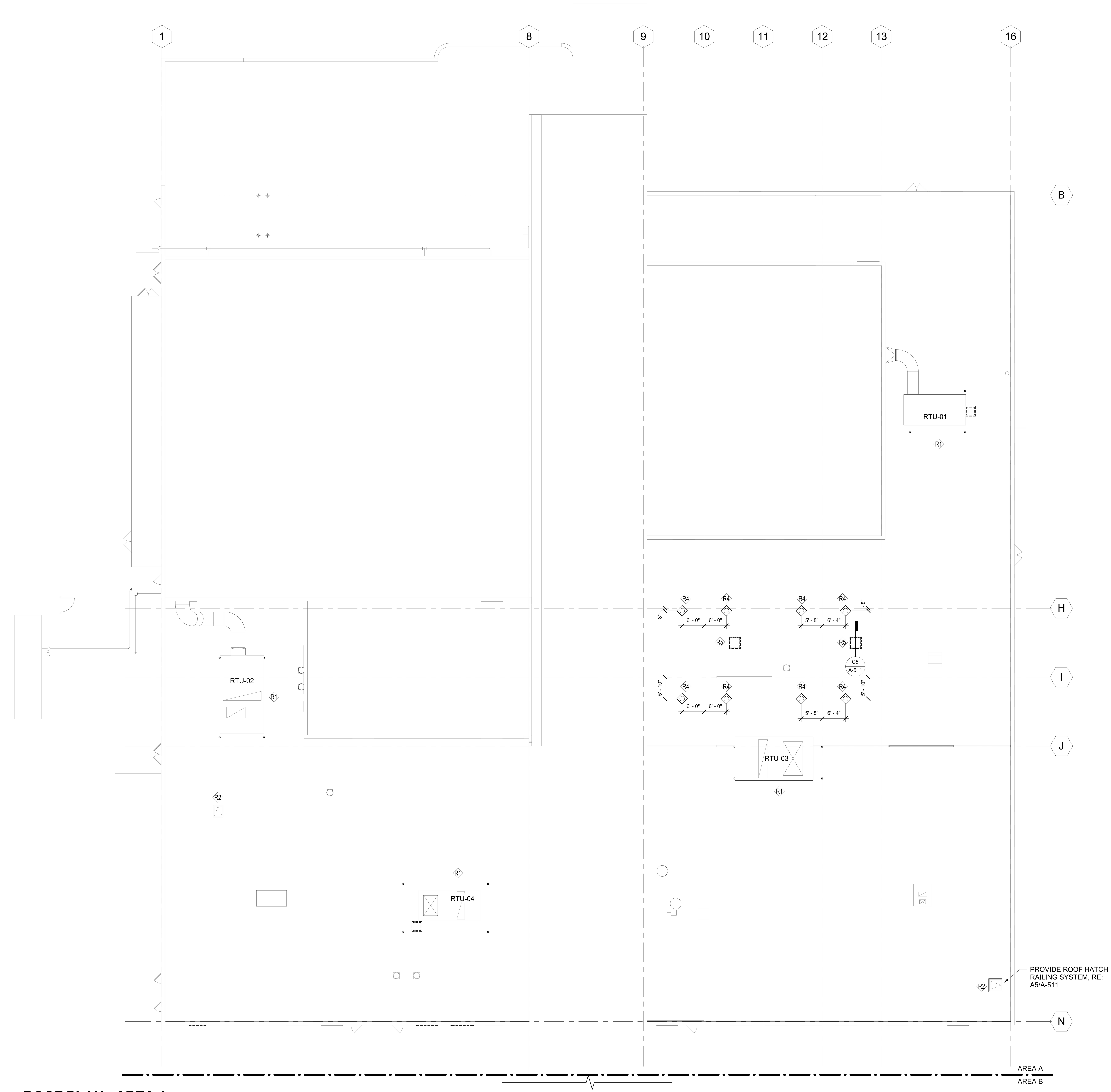
FIRST FLOOR REFLECTED CEILING PLAN - AREA B

A-121B

SHEET OF

11784.000 MIDDLE SCHOOL MECHANICAL UPGRADES
3/30/2018 6:03:08 PM



A1 ROOF PLAN - AREA A
3/32" = 1'-0"

ROOF PLAN GENERAL NOTES

1. INCLUDE 10' OF DUCT SILENCERS FOR EACH THE NEW ROOFTOP UNITS. THE 10' OF SILENCERS ARE TO BE INCLUDE ON BOTH THE SUPPLY AND RETURN DUCTWORK OF EACH UNIT. PLEASE REFER TO 233319 - DUCT SILENCERS

ADD ALTERNATES

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SHEET NOTES - ROOF PLANS

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R1	NEW RTU & CURB. ROOF PATCHING/REPLACEMENT UNDER SEPARATE CONTRACT. GC COORDINATE RTU INSTALLATION W/ ROOFING CONTRACTOR TO ALIGN SCOPES OF WORK.
R2	NEW ROOF HATCH
R3	EXISTING ROOF HATCH TO REMAIN
R4	NEW 14" TUBULAR SKYLIGHT
R5	SHEET METAL CAP FLASHING @ REMOVED SKYLIGHT

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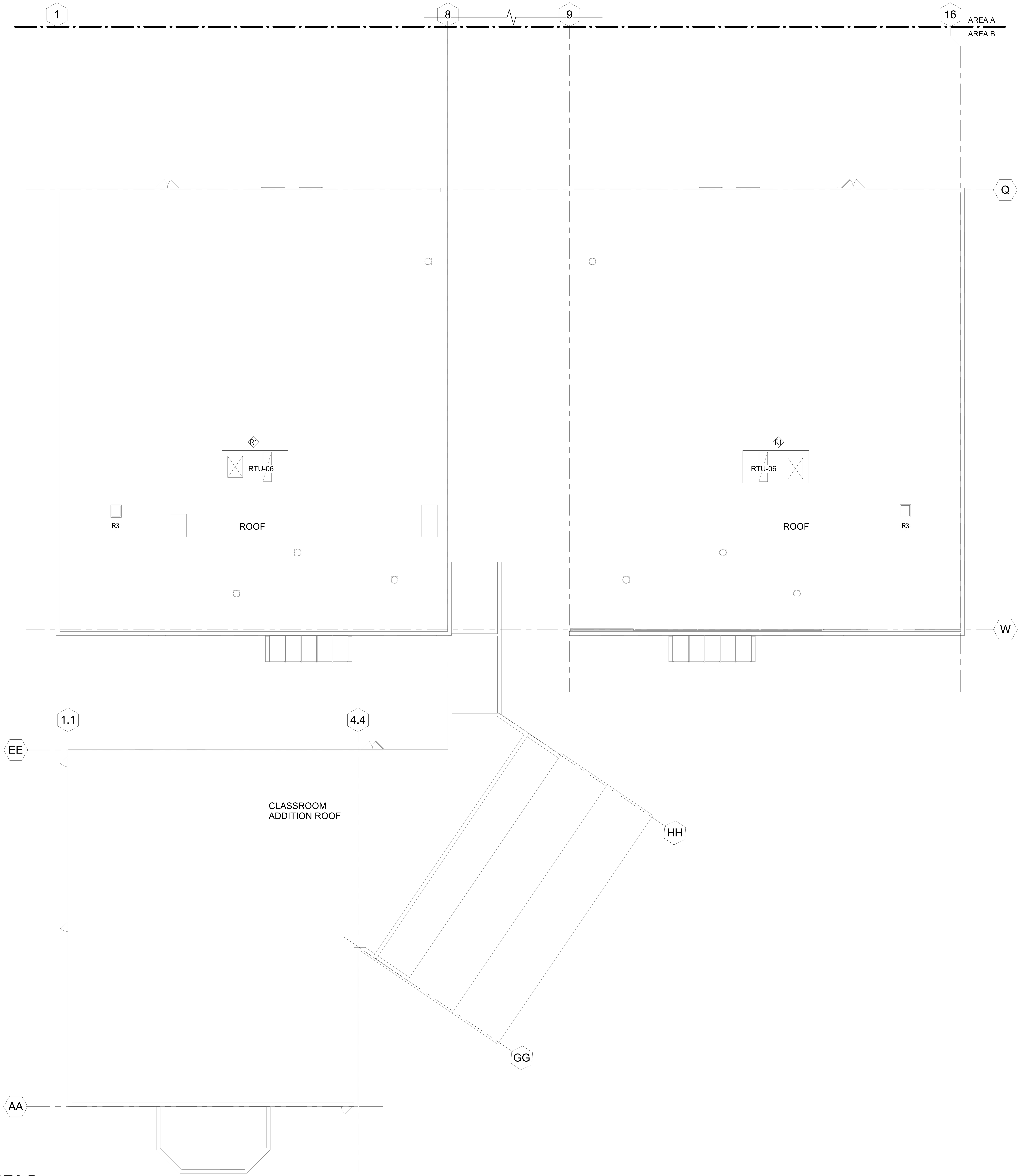
SHEET TITLE:

ROOF PLAN - AREA A

A-131A

SHEET OF



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ROOF PLAN - AREA B

A-131B

SHEET OF

11784.000 MIDDLE SCHOOL MECHANICAL UPGRADES
3/30/2018 6:05:42 PM

FINISH LEGEND

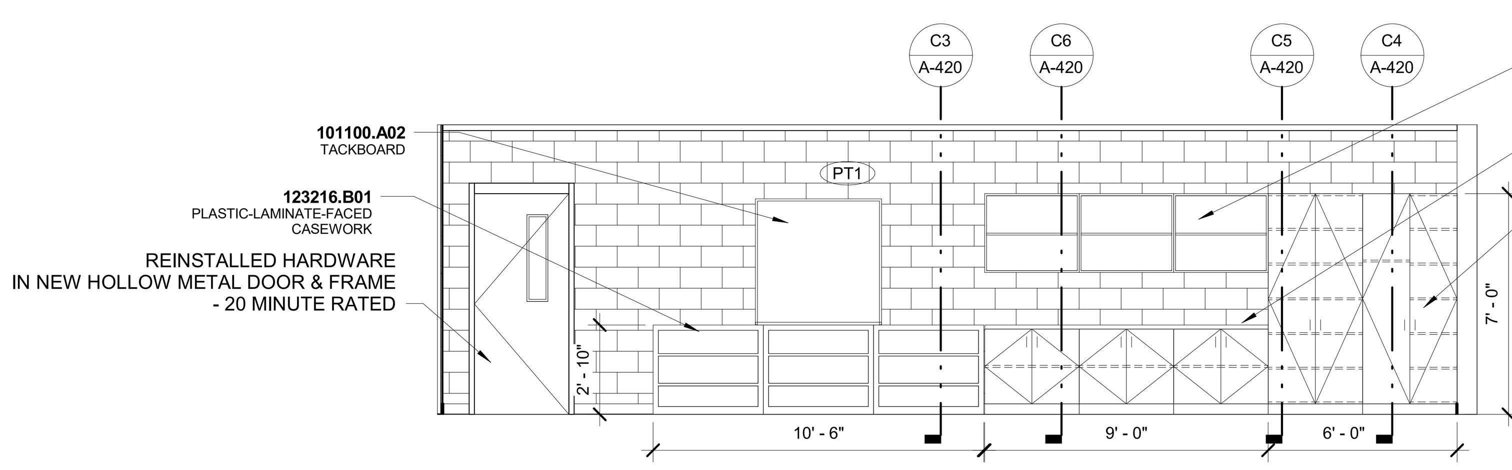
CSI DIVISION NUMBER	CSI SECTION NAME	TYPE	CODE	MANUFACTURER	PRODUCT	SIZE	COLOR	CONTACT	REMARKS
DIVISION 6									
06 4116	PLASTIC-LAMINATE FACED ARCHITECTURAL CABINETS	PLASTIC LAMINATE CABINETS (VERTICAL)	PL-1	TBD	TBD	-	TBD	-	
DIVISION 9									
09 6513	RESILIENT BASE AND ACCESSORIES	RESILIENT BASE	RB-1	ROPPE	RUBBER BASE	4" COVE, ROLLED GOODS	TBD		CLASSROOMS, OFFICES
09 6519	RESILIENT TILE FLOORING	VINYL COMPOSITION TILE	VCT	ARMSTRONG	STANDARD EXCELON	12X12	51869 HUMUS		
09 6813	TILE CARPETING	CARPET (FIELD)	CPT-1	SHAW	GRADIENT	24"X24"	34730 BRANCH		
09 6813		CARPET (ACCENT)	CPT-2	INTERFACE	VIVA COLORES	24"X24"	101173 PARDO		
09 9123	INTERIOR PAINTING	PAINT (FIELD)	P-1	TBD	SEMI-GLOSS	-	MATCH EXISTING	-	
09 9123		PAINT (ACCENT)	P-2	TBD	SEMI-GLOSS	-	TBD	-	
09 9123		PAINT (CEILING)	P-3	TBD	FLAT (SEMI-GLOSS AT TOILET ROOMS)	-	MATCH EXISTING	-	
09 9123		PAINT (DOOR FRAME & STAIR RAILING)	P-4	TBD	SEMI-GLOSS	-	MATCH EXISTING	-	
DIVISION 10									
10 1100	VISUAL DISPLAY UNITS	PORCELAIN MARKERBOARD	VD-1	CLARIDGE	800 SERIES	4' X 12'	WHITE		
10 1100		TACK PANEL	VD-2	CLARIDGE	800 SERIES	4' X 4', AS NOTED	NATURAL CORK		
DIVISION 12									
12 3623.13	PLASTIC-LAMINATE-CLAD COUNTERTOPS	PLASTIC LAMINATE COUNTERTOP	PL-2	TBD	TBD	-	TBD	-	

ELEVATION GENERAL NOTES

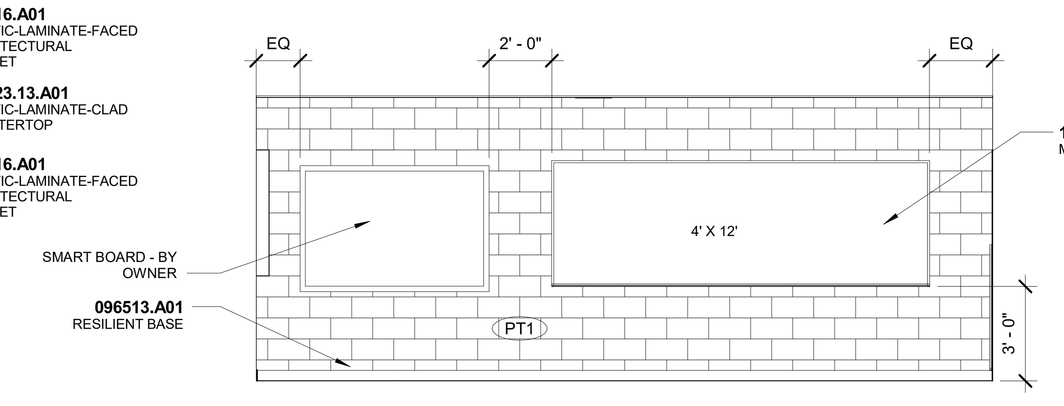
1. REFER TO HVAC & MEP DRAWINGS FOR ADDITIONAL INFORMATION.
2. REUSE ANY SALVAGED ELECTRICAL (& LIGHTING) AS INDICATED, RE: ELECTRICAL DWGS FOR ADDITIONAL INFORMATION.
3. INTERIOR WALL PARTITION & SOFFIT DIMENSIONS SHOWN ARE TO FACE OF FINISH MATERIALS UNLESS NOTED OTHERWISE.
4. ALL HEIGHTS AS SHOWN ARE FROM FINISHED FLOOR, UNLESS NOTED OTHERWISE.
5. ALL DIFFUSERS SHALL BE PAINTED TO MATCH ADJACENT SURFACE COLOR.
6. ALL (WARDROBE) CABINETS TO HAVE LOCKS PER SPECIFICATIONS
7. CONTROL JOINTS AT EACH EDGE OF ALL DOOR FRAMES (CORRIDOR SIDE AND ROOM SIDE) AND EVERY 30 LINEAR FEET

ROOM FINISH SCHEDULE

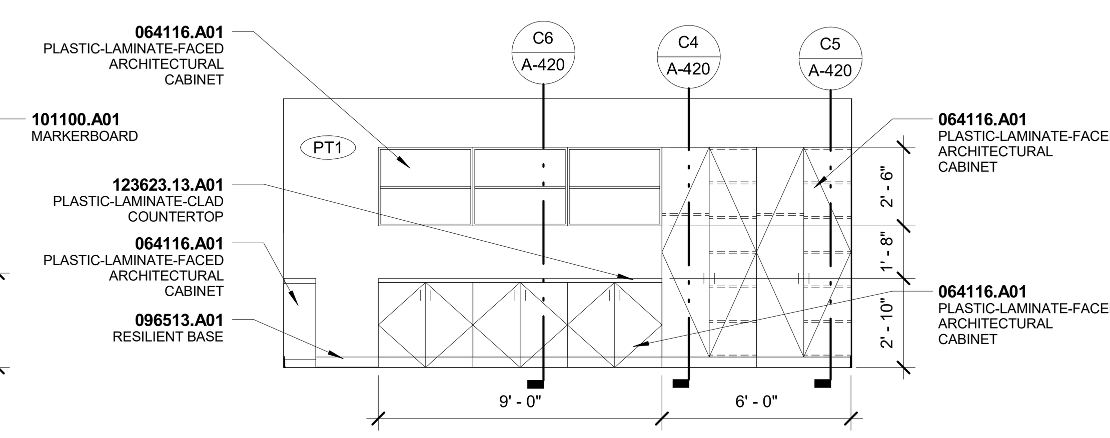
ROOM NUMBER	ROOM NAME	FINISH			MILLWORK		MISCELLANEOUS	REMARKS
		FLOOR	BASE	WALL	HORIZONTAL	VERTICAL		
127	CLASSROOM	CPT-1	RB-1	PT-1	PL-2	PL-1	VD-1, VD-2	
128	CLASSROOM	CPT-1	RB-1	PT-1	PL-2	PL-1	VD-1, VD-2	
129	CLASSROOM	CPT-1	RB-1	PT-1	PL-2	PL-1	VD-1, VD-2	
130	CLASSROOM	CPT-1	RB-1	PT-1	PL-2	PL-1	VD-1, VD-2	
131	OFFICE	CPT-1	RB-1	PT-1	-	-	-	
132	CONFERENCE ROOM	CPT-1	RB-1	PT-1	-	-	-	
133	OFFICE	CPT-1	RB-1	PT-1	-	-	-	
134	MENTOR OFFICE	CPT-1	RB-1	PT-1	-	-	-	
135	THERAPY	CPT-1	RB-1	PT-1	-	-	-	
136	OFFICE	CPT-1	RB-1	PT-1	-	-	-	
137	STORAGE	CPT-1	RB-1	PT-1	-	-	-	
138	CORRIDOR	CPT-1	RB-1	PT-1	-	-	-	
139	CLASSROOM	CPT-1	RB-1					
140	CLASSROOM	CPT-1	RB-1					
174	CLASSROOM	CPT-1	RB-1					
175	CLASSROOM	CPT-1	RB-1					
183	TEACHER'S LOUNGE	CPT-1	RB-1					
185	CLASSROOM	CPT-1	RB-1					



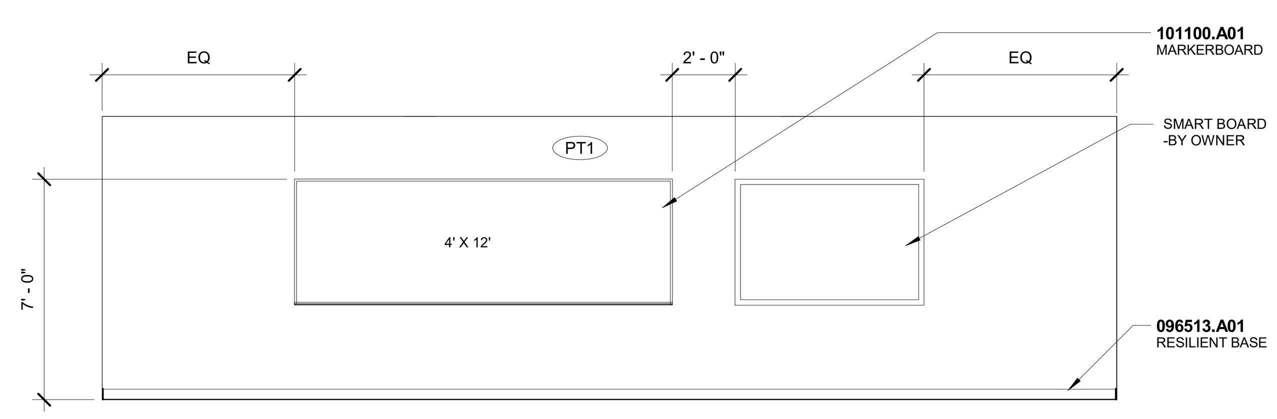
8 **CLASSROOMS 127, 128 CASEWORK ELEVATION - ADD ALTERNATE #1**
1/4" = 1'-0"



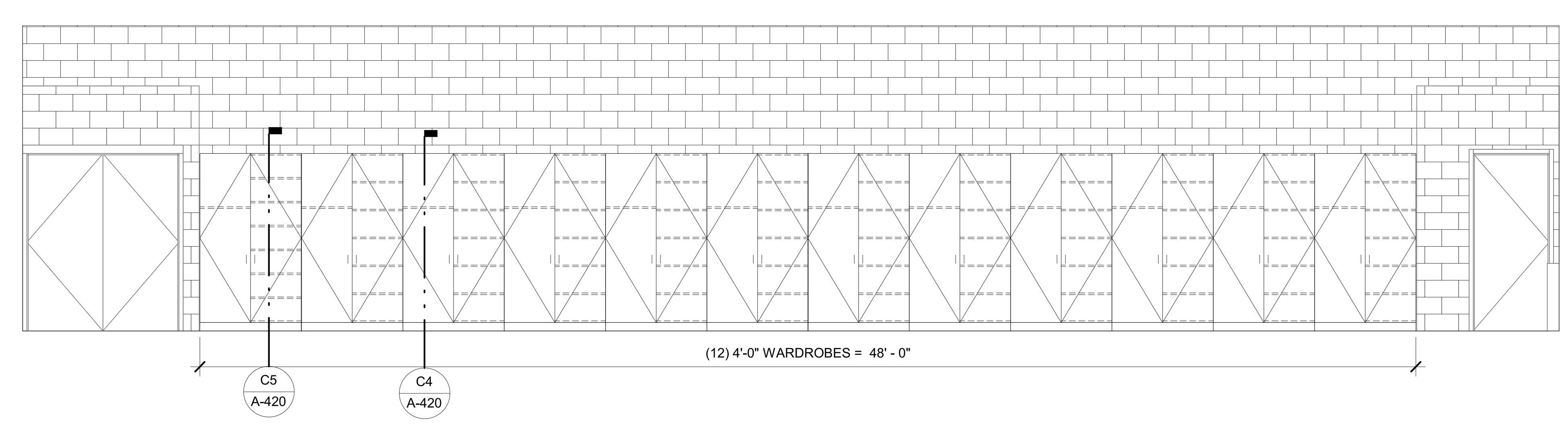
B4 **CLASSROOMS 129, 130 TEACHING WALL - ADD ALTERNATE #1**
1/4" = 1'-0"



B6 **CLASSROOMS 129, 130 CASEWORK - ADD ALTERNATE #1**
1/4" = 1'-0"



A2 **CLASSROOMS 127, 128 TEACHING WALL - ADD ALTERNATE #1**
1/4" = 1'-0"



A4 **PLATFORM 104 SOUTH ELEVATION**
1/4" = 1'-0"

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CONSULTANT:

STATE OF COLORADO
MATTHEW D. PORTA
203650
03/30/2018
LICENSED ARCHITECT

PROJECT:

MIDDLE SCHOOL MECHANICAL UPGRADES

39610 Amethyst Drive
Steamboat Springs, CO 80487

OWNER:

Steamboat Springs School District Re-2

325 7th Street
Steamboat Springs, CO 80487

ISSUE:

2018/03/30 Issue for Bidding & Construction

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SHEET TITLE:

FINISH LEGEND AND ROOM FINISH SCHEDULE

A-140

SHEET OF

11784.000 MIDDLE SCHOOL MECHANICAL UPGRADES
3/30/2018 6:06:22 PM

A1 **FIRST FLOOR FINISH PLAN - AREA A**
3/32" = 1'-0"

FINISH PLAN GENERAL NOTES

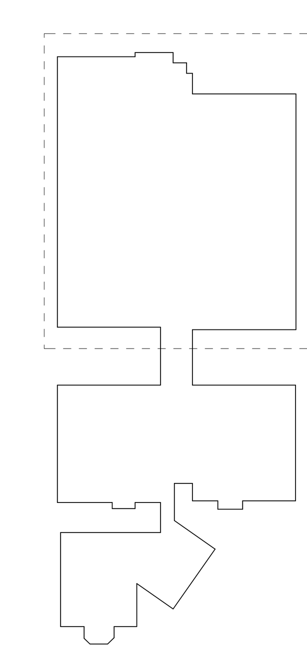
1. ALL FLOOR MATERIALS TO BE BUTT JOINTED AT TRANSITIONS ON CENTER OF DOOR LEAF WHERE APPLICABLE,UNO. PROVIDE EDGE PROTECTION AND TRANSITION PROFILES WHERE FLOOR MATERIAL CHANGES AND/OR STOPS. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.
2. PAINT ALL (EXPOSED PIPES, AIR GRILLES, ETC.) TO MATCH ADJACENT WALL COLOR.
3. ALL WALL (MOUNTED CASEWORK, MILLWORK, HARDWARE, EQUIPMENT, ETC.) SHALL BE ANCHORED TO METAL STRAPPING OR ½" FRT PLYWOOD BACKING BETWEEN STUDS, U.N.O. COORDINATE ACCORDINGLY.
4. REFER TO A-400 SHEETS AND OTHER DRAWINGS IN ADDITION TO THE FINISH PLANS AND KEYNOTE LEGEND FOR THE FULL EXTENT OF INTERIOR FINISHES.
5. ALL FLOORING MATERIALS CONTINUE UNDER CASEWORK TO TOE KICK OR IF OPEN, TO WALL.

INTERIOR FINISH SYMBOL LEGEND

PT-2 ACCENT WALL PAINT

SHEET NOTES - FINISH PLANS

NOTE #	NOTE
1	PATCH CARPET WITH CPT-2
2	SEAL CONCRETE SLAB PATCH TO MATCH (E) FINISH
3	PATCH VCT
4	REPLACE FLOOR FINISH THROUGHOUT ROOM, REFER TO ROOM FINISH SCHEDULE
5	REMOVE AND REINSTALL RISER WITH (E) CARPET



AREA PLAN

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STATE OF COLORADO
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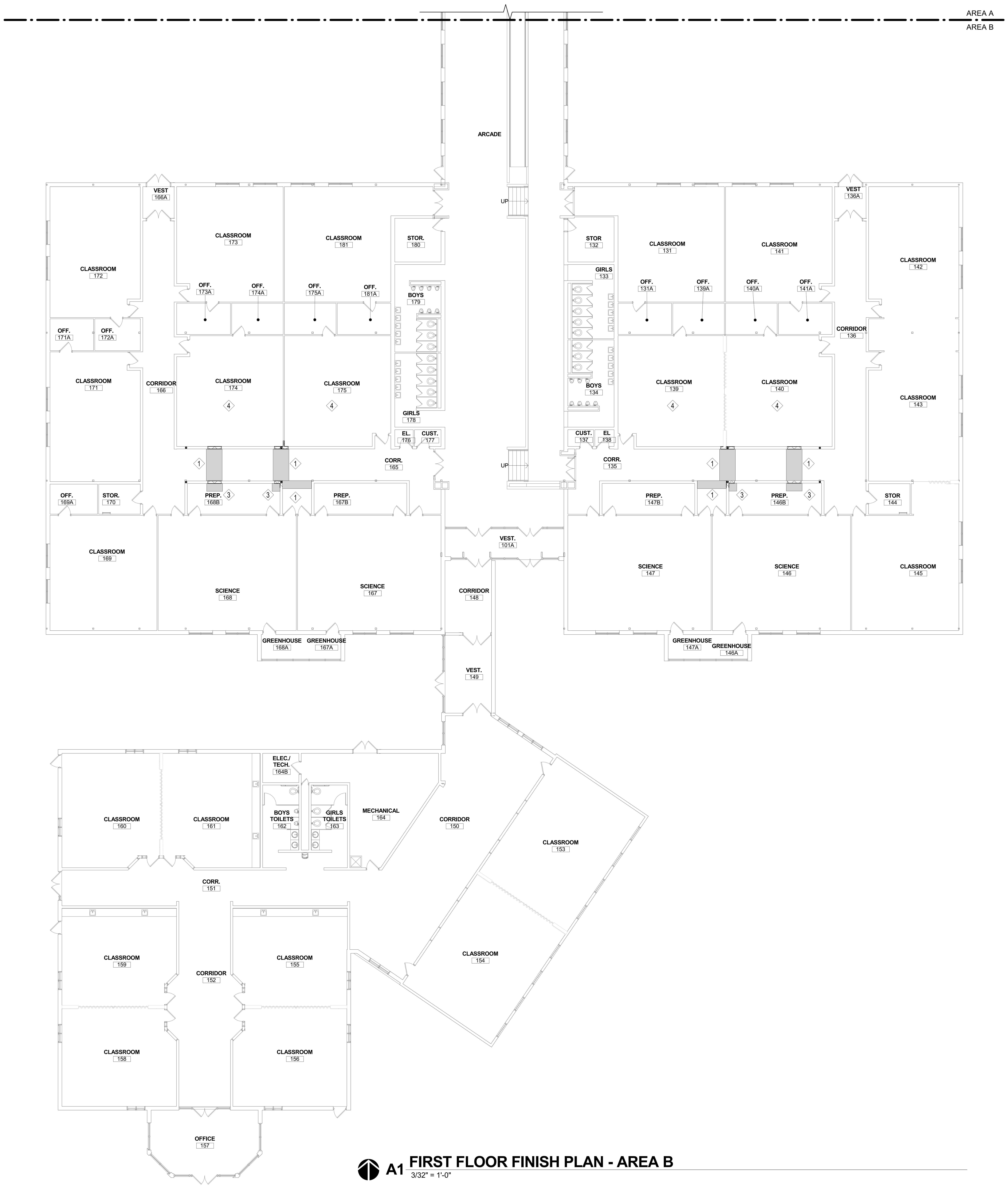
FIRST FLOOR FINISH PLAN - AREA A

A-141A

SHEET OF

11784.000 MIDDLE SCHOOL MECHANICAL UPGRADES
3/30/2018 6:07:50 PM



A1 **FIRST FLOOR FINISH PLAN - AREA B**

3/32" = 1'-0"

FINISH PLAN GENERAL NOTES

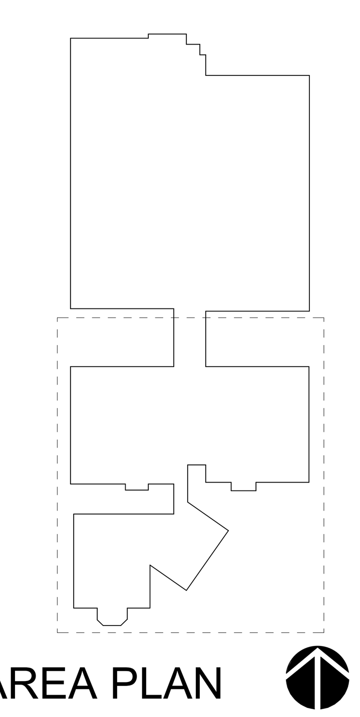
1. ALL FLOOR MATERIALS TO BE BUTT JOINTED AT TRANSITIONS ON CENTER OF DOOR LEAF WHERE APPLICABLE,UNO. PROVIDE EDGE PROTECTION AND TRANSITION PROFILES WHERE FLOOR MATERIAL CHANGES AND/OR STOPS. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.
2. PAINT ALL (EXPOSED PIPES, AIR GRILLES, ETC.) TO MATCH ADJACENT WALL COLOR.
3. ALL WALL (MOUNTED CASEWORK, MILLWORK, HARDWARE, EQUIPMENT, ETC.) SHALL BE ANCHORED TO METAL STRAPPING OR ½" FRT PLYWOOD BACKING BETWEEN STUDS, U.N.O. COORDINATE ACCORDINGLY.
4. REFER TO A-400 SHEETS AND OTHER DRAWINGS IN ADDITION TO THE FINISH PLANS AND KEYNOTE LEGEND FOR THE FULL EXTENT OF INTERIOR FINISHES.
5. ALL FLOORING MATERIALS CONTINUE UNDER CASEWORK TO TOE KICK OR IF OPEN, TO WALL.

INTERIOR FINISH SYMBOL LEGEND

PT-2 ACCENT WALL PAINT

SHEET NOTES - FINISH PLANS

NOTE #	NOTE
1	PATCH CARPET WITH CPT-2
2	SEAL CONCRETE SLAB PATCH TO MATCH (E) FINISH
3	PATCH VCT
4	REPLACE FLOOR FINISH THROUGHOUT ROOM, REFER TO ROOM FINISH SCHEDULE
5	REMOVE AND REINSTALL RISER WITH (E) CARPET



AREA PLAN

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FIRST FLOOR FINISH PLAN - AREA B

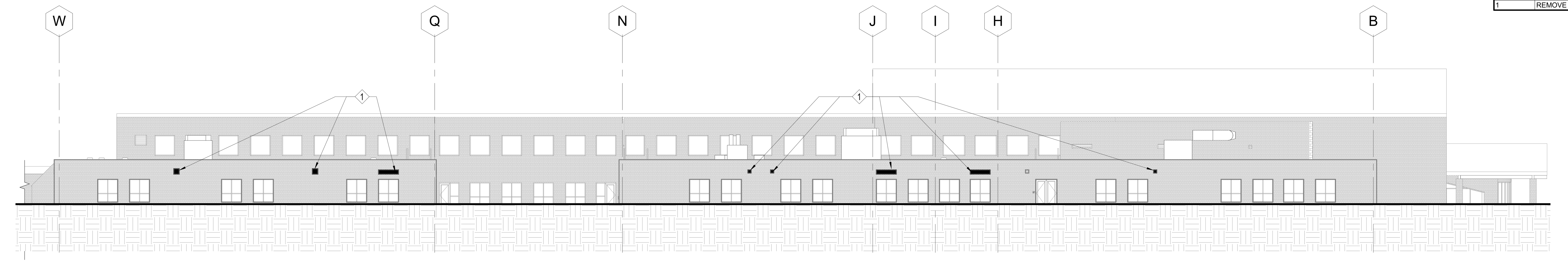
A-141B

SHEET OF

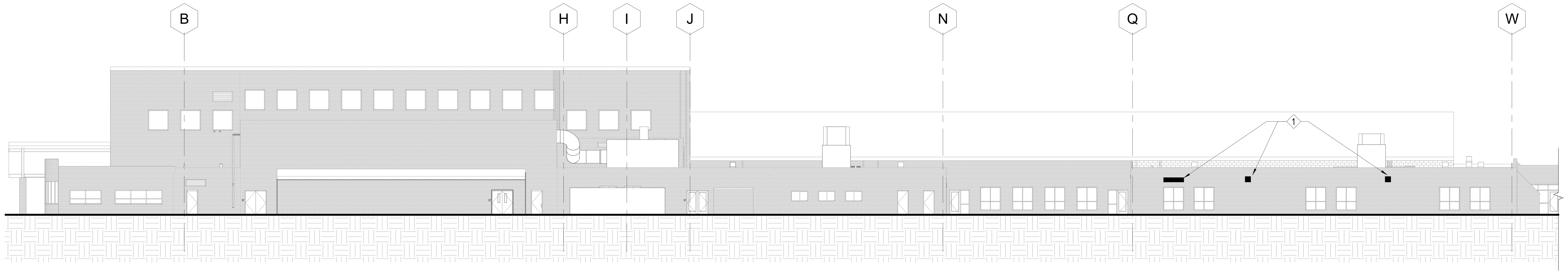
11784.000 MIDDLE SCHOOL MECHANICAL UPGRADES
3/30/2018 6:08:10 PM

SHEET NOTES - EXTERIOR ELEVATIONS

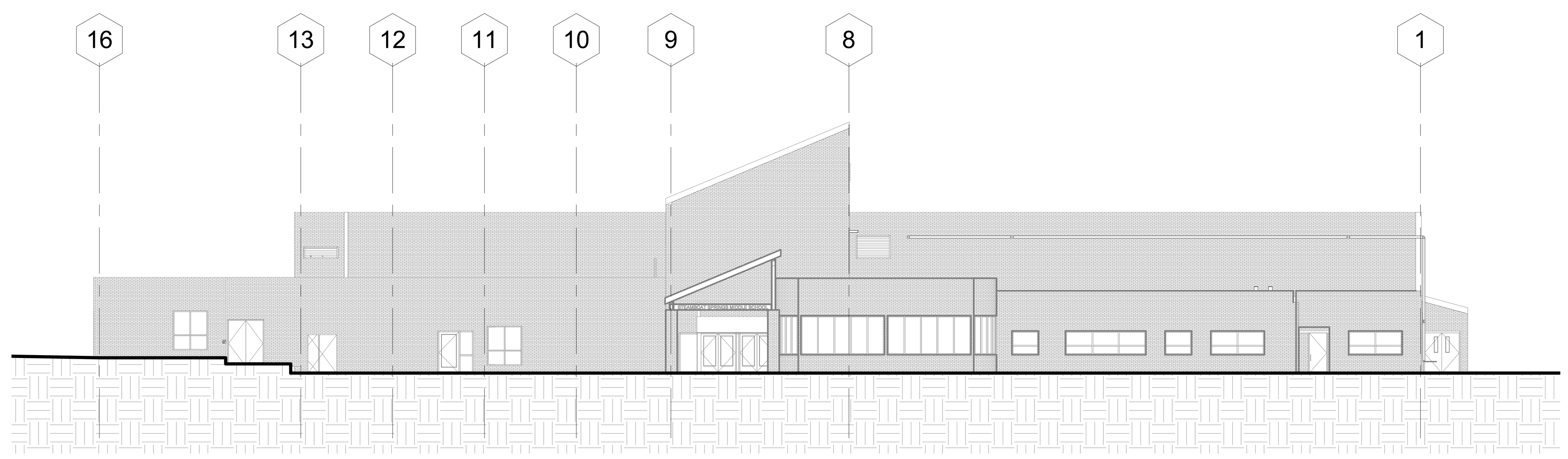
NOTE #	NOTE
1	REMOVE (E) MECHANICAL LOUVER & INFILL. RE: A2/A-140



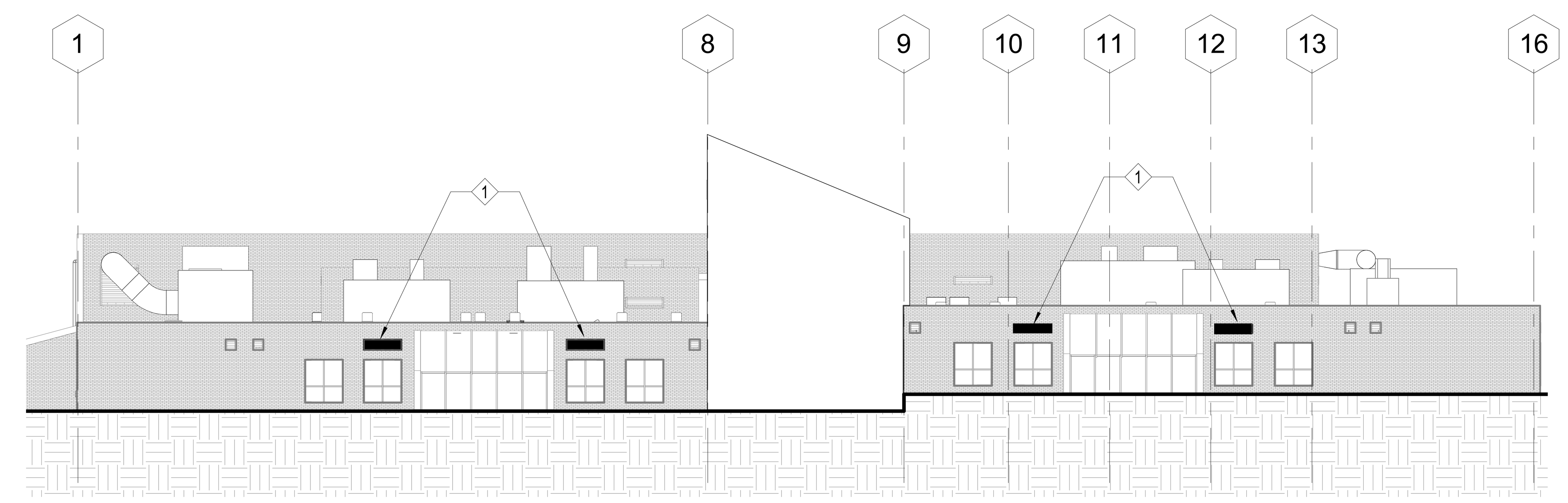
E1 EAST ELEVATION - OVERALL
1/16" = 1'-0"



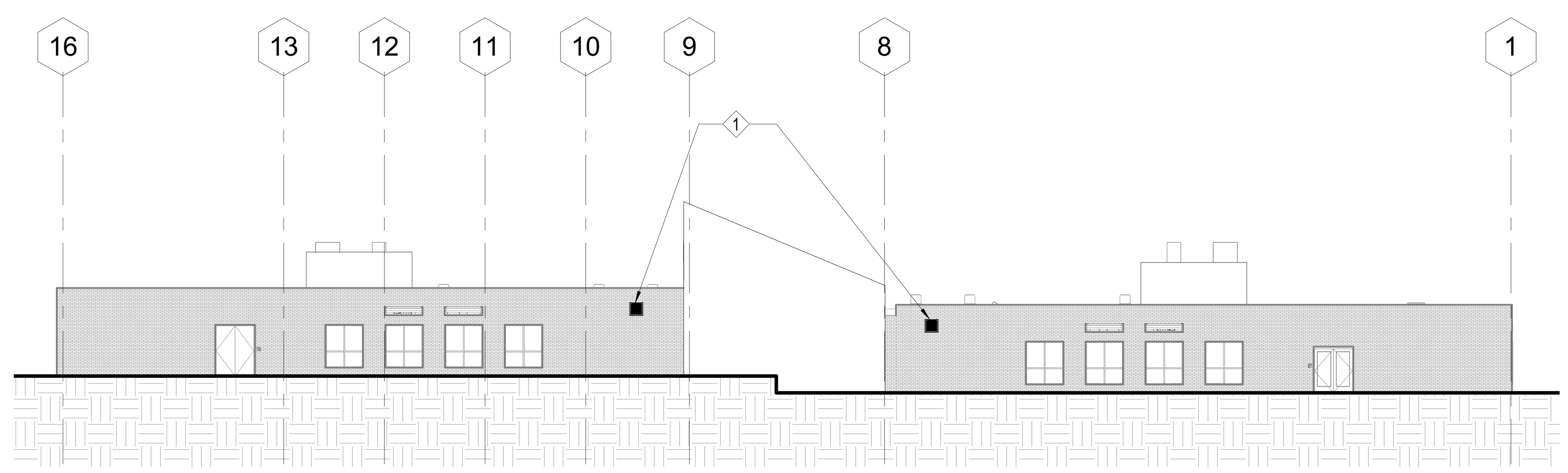
C1 WEST ELEVATION - OVERALL
1/16" = 1'-0"



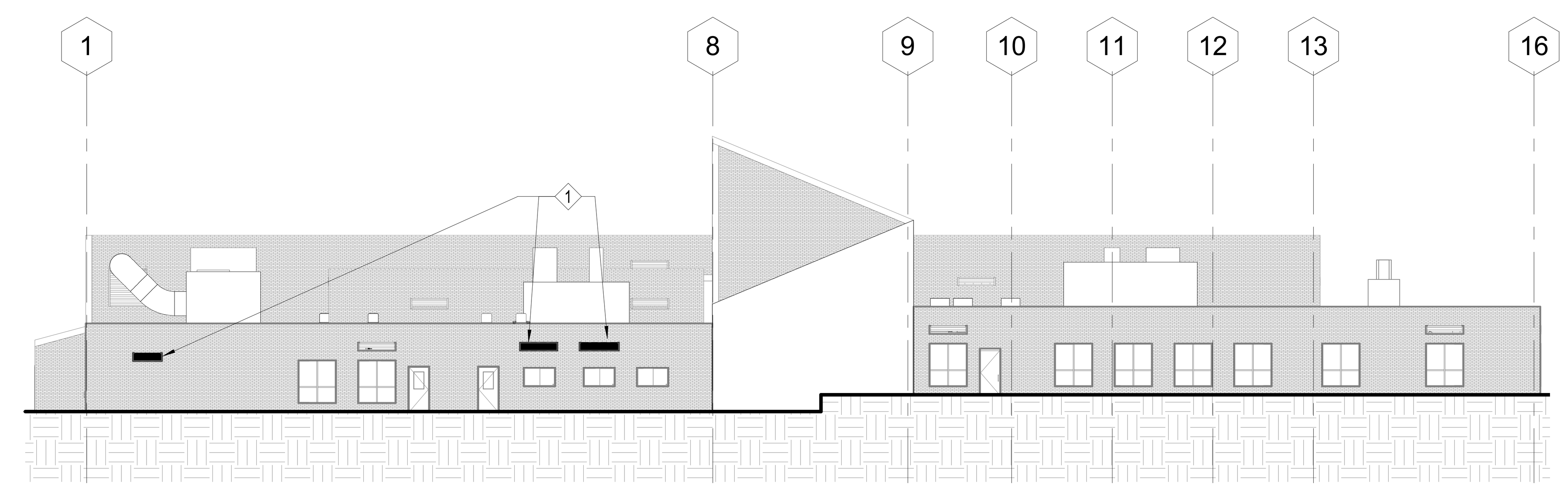
B1 NORTH ELEVATION - AREA A
1/16" = 1'-0"



B4 SOUTH ELEVATION - AREA B
1/16" = 1'-0"



A1 NORTH ELEVATION - AREA B
1/16" = 1'-0"



A4 SOUTH ELEVATION - AREA A
1/16" = 1'-0"

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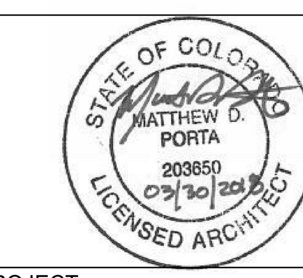

PROJECT:

MIDDLE SCHOOL MECHANICAL UPGRADES

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325 7th Street
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SHEET TITLE:

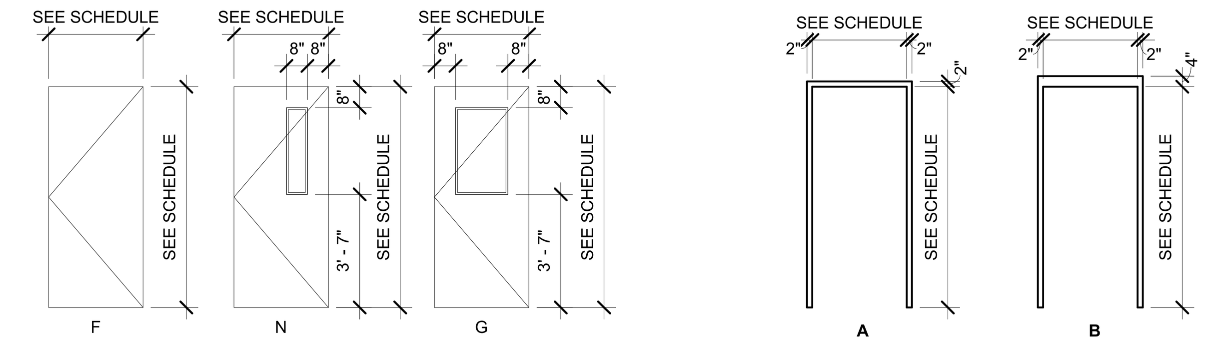
EXTERIOR ELEVATIONS

A-200

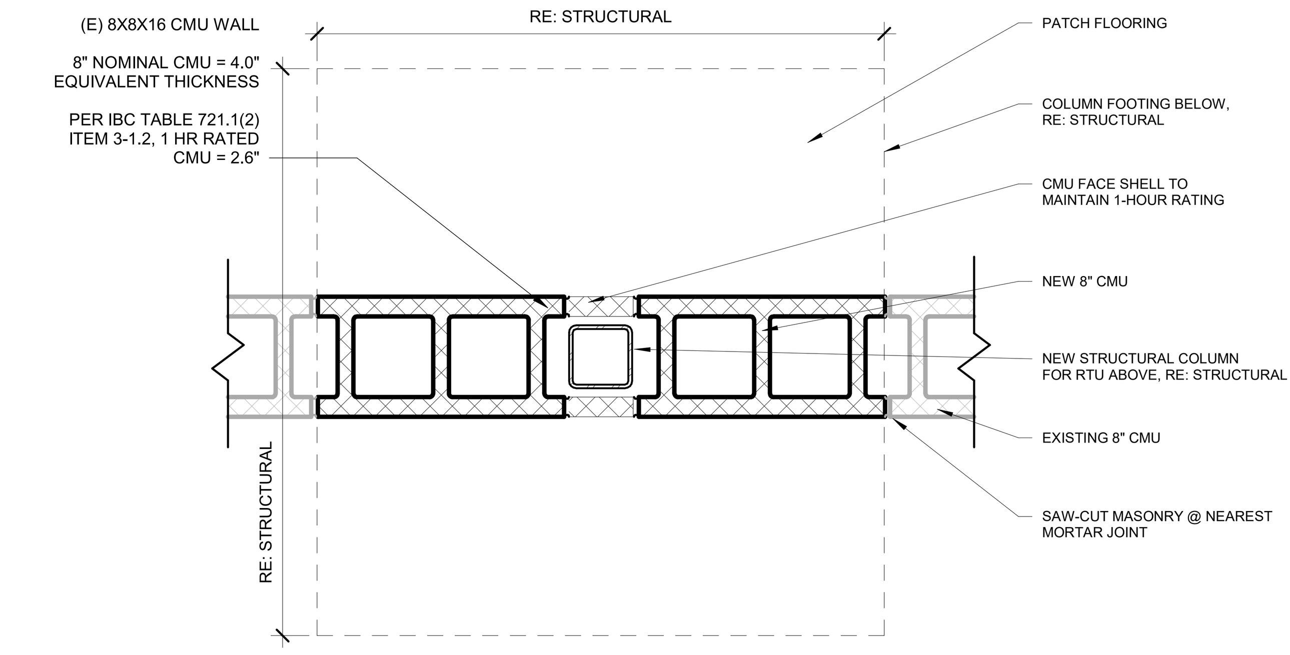
SHEET OF

DOOR SCHEDULE

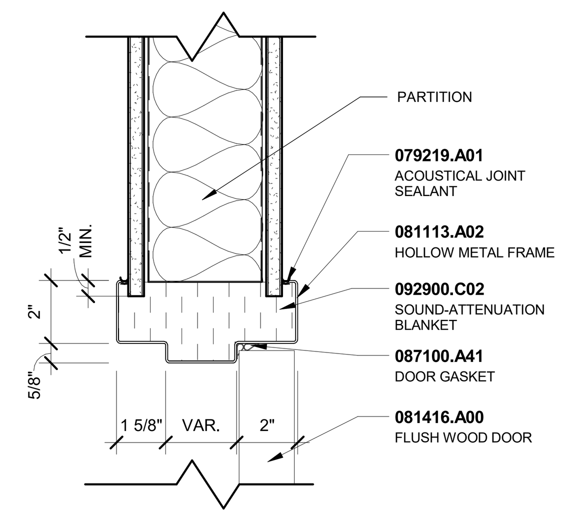
DOOR #	ROOM NAME	DOOR WIDTH	DOOR HEIGHT	DOOR THICKNESS	DOOR MATERIAL	LEAF 1 TYPE	LEAF 1 WIDTH	HARDWARE SET	FRAME TYPE	FRAME MATERIAL	FIRE RATING	DETAILS HEAD	DETAILS JAMB	DETAILS SILL	COMMENTS
107	INSTRUMENTAL	6' - 0"	8' - 0"	1 3/4"	WD	N	3' - 0"	EXIST	B	HM	20 MIN.	C2/A-420	B2/A-420	-	SALVAGE BOTH DOOR LEAFS FROM EXISTING (E)107 DOORS
127	CLASSROOM	3' - 0"	7' - 0"	1 3/4"	WD	N	3' - 0"	EXIST	B	HM	20 MIN.	C2/A-420	B2/A-420	-	
128	CLASSROOM	3' - 0"	7' - 0"	1 3/4"	WD	N	3' - 0"	EXIST	B	HM	20 MIN.	C2/A-420	B2/A-420	-	
129	CLASSROOM	3' - 0"	7' - 0"	1 3/4"	WD	N	3' - 0"	EXIST	B	HM	20 MIN.	C2/A-420	B2/A-420	-	
130	CLASSROOM	3' - 0"	7' - 0"	1 3/4"	WD	N	3' - 0"	EXIST	B	HM	20 MIN.	B2/A-420	B2/A-420	-	
131	OFFICE	3' - 0"	7' - 0"	1 3/4"	WD	F	3' - 0"	EXIST	A	HM	-	C1/A-420	B1/A-420	-	
132	CONFERENCE ROOM	3' - 0"	7' - 0"	1 3/4"	WD	G	3' - 0"	EXIST	A	HM	20 MIN.	C2/A-420	B2/A-420	-	
133	OFFICE	3' - 0"	7' - 0"	1 3/4"	WD	F	3' - 0"	EXIST	A	HM	-	C1/A-420	B1/A-420	-	
134	MENTOR OFFICE	3' - 0"	7' - 0"	1 3/4"	WD	F	3' - 0"	EXIST	A	HM	-	C1/A-420	B1/A-420	-	
135	THERAPY	3' - 0"	7' - 0"	1 3/4"	WD	F	3' - 0"	EXIST	A	HM	-	C1/A-420	B1/A-420	-	
136	OFFICE	3' - 0"	7' - 0"	1 3/4"	WD	F	3' - 0"	EXIST	A	HM	-	C1/A-420	B1/A-420	-	
137	STORAGE	3' - 0"	7' - 0"	1 3/4"	WD	F	3' - 0"	EXIST	A	HM	-	C1/A-420	B1/A-420	-	
138	CORRIDOR	3' - 0"	7' - 0"	1 3/4"	WD	G	3' - 0"	EXIST	B	HM	20 MIN.	C2/A-420	B2/A-420		
182A		3' - 0"	7' - 0"	1 3/4"	WD	F	3' - 0"	EXIST	B	HM		C2/A-420	B2/A-420		
182C		3' - 0"	7' - 0"	1 3/4"	WD	F	3' - 0"	EXIST	B	HM		C2/A-420	B2/A-420		SALVAGE EXISTING DOOR LEAF AND HARDWARE FOR REINSTALLATION
190A	STORAGE	7' - 0"	7' - 0"	1 3/4"	HM	F	3' - 6"	EXIST	A	HM	-	C1/A-420	B1/A-420	-	SALVAGE BOTH DOOR LEAFS FROM EXISTING (E)190A DOORS



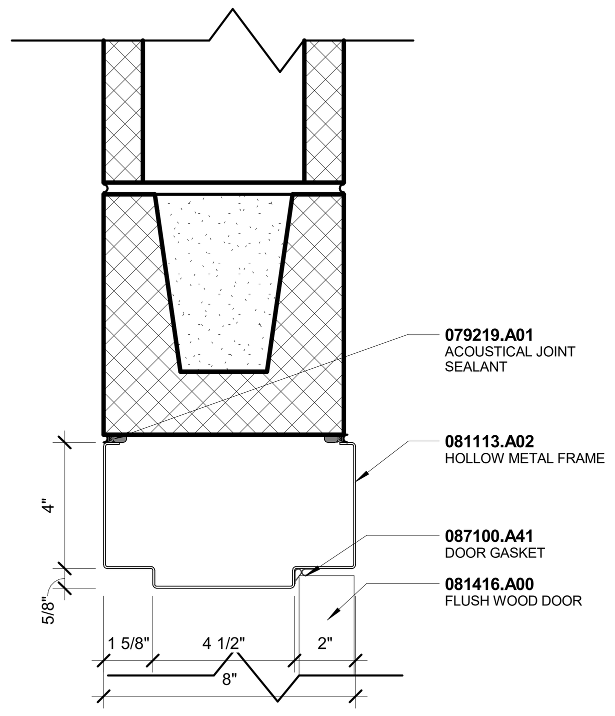
? DOOR & FRAME TYPES
1/4" = 1'-0"



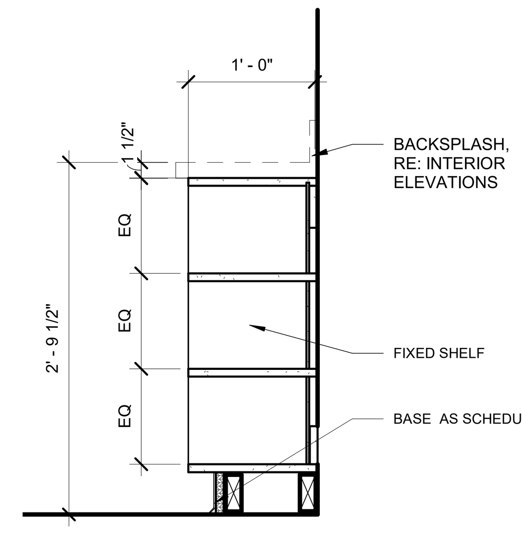
E6 NEW COLUMN WRAP DETAIL
1 1/2" = 1'-0"



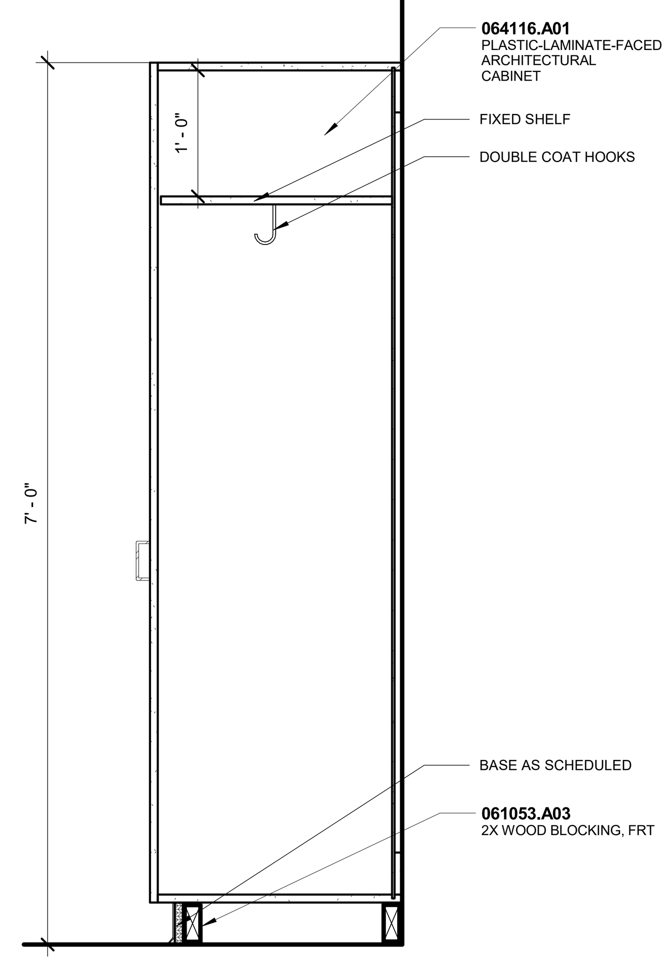
C1 DOOR HEAD HM @ GYP. BD WALL
3" = 1'-0"



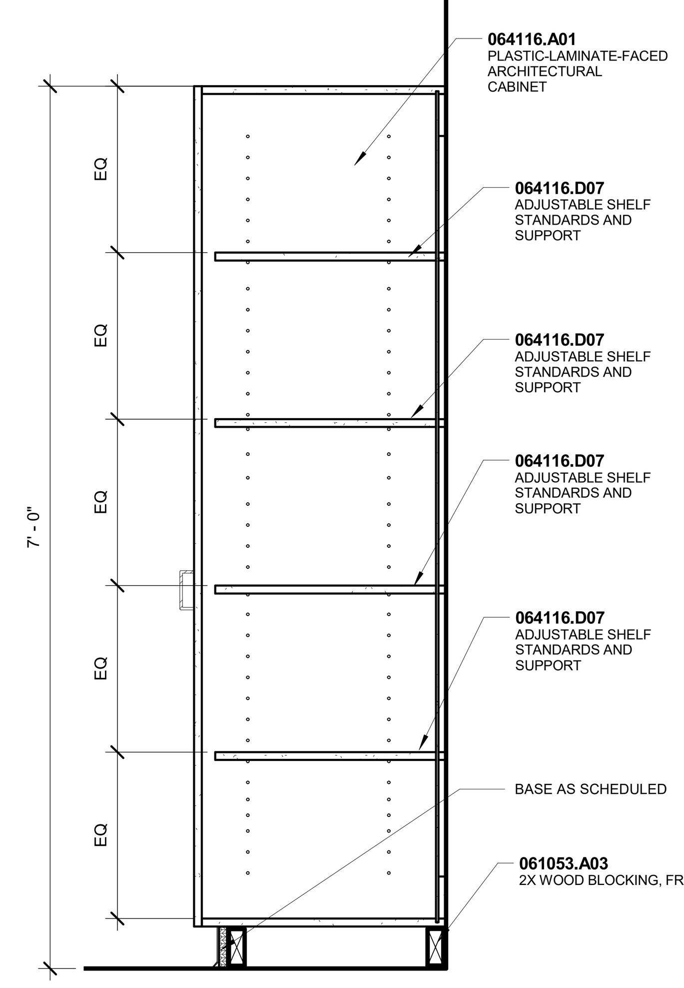
C2 DOOR HEAD HM @ CMU
3" = 1'-0"



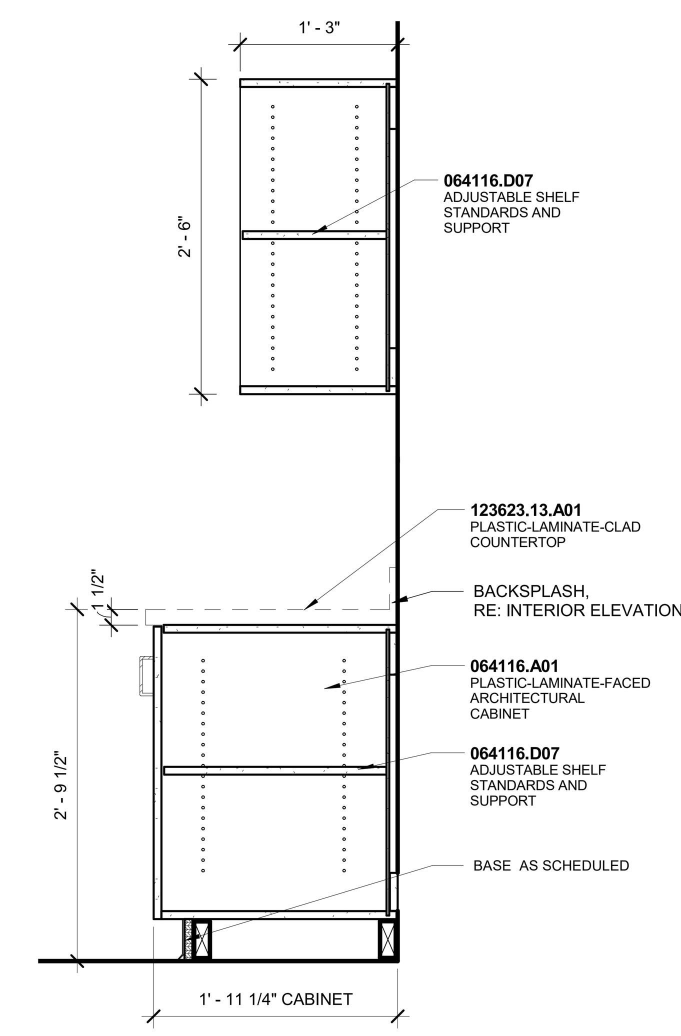
C3 BASE OPEN-SHELF DETAIL
1" = 1'-0"



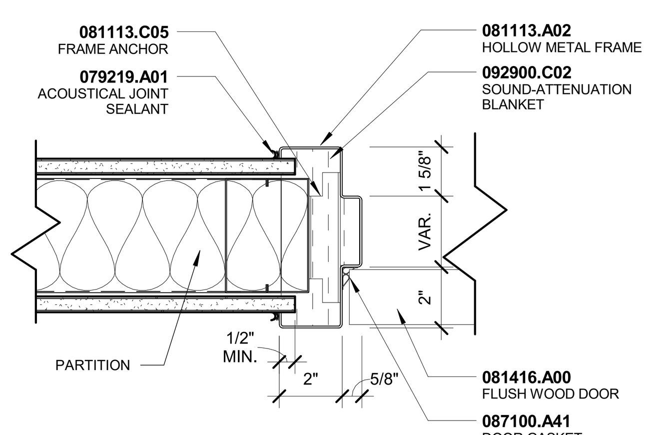
C4 TALL CABINET WARDROBE W/ COAT ROD SECTION DETAIL
1" = 1'-0"



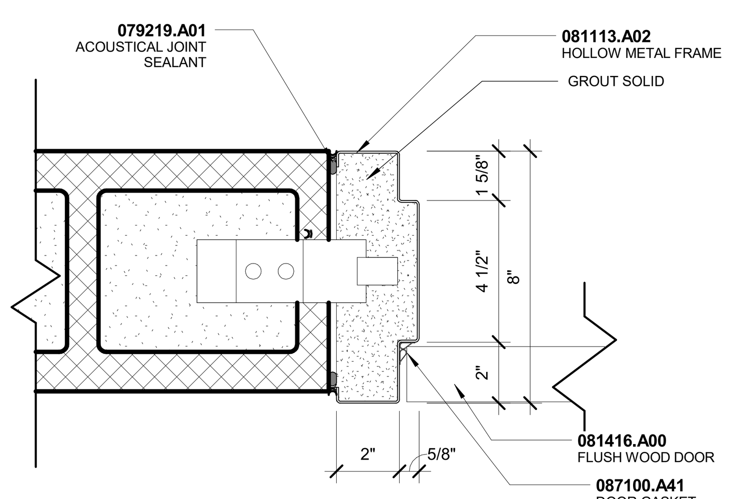
C5 TALL CABINET W/ ADJUSTABLE SHELVES SECTION DETAIL
1" = 1'-0"



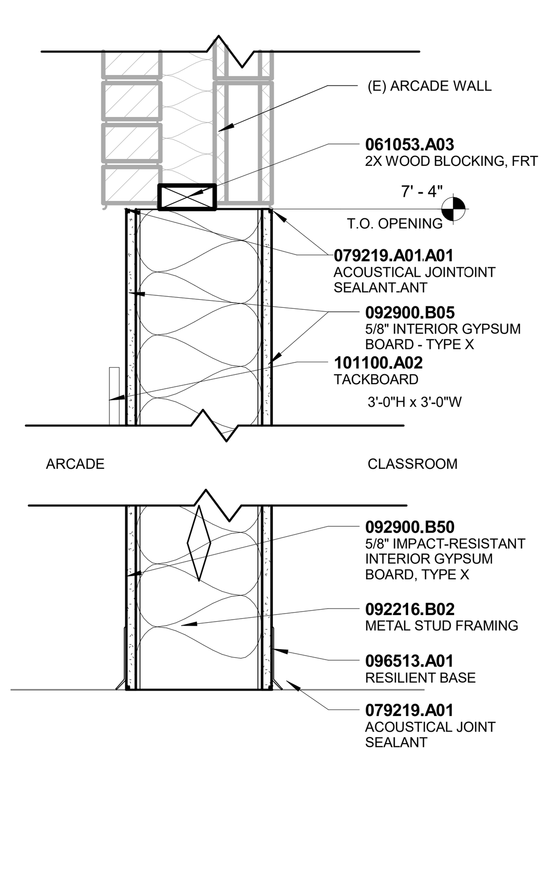
C6 BASE CABINET AND WALL CABINET SECTION DETAILS
1" = 1'-0"



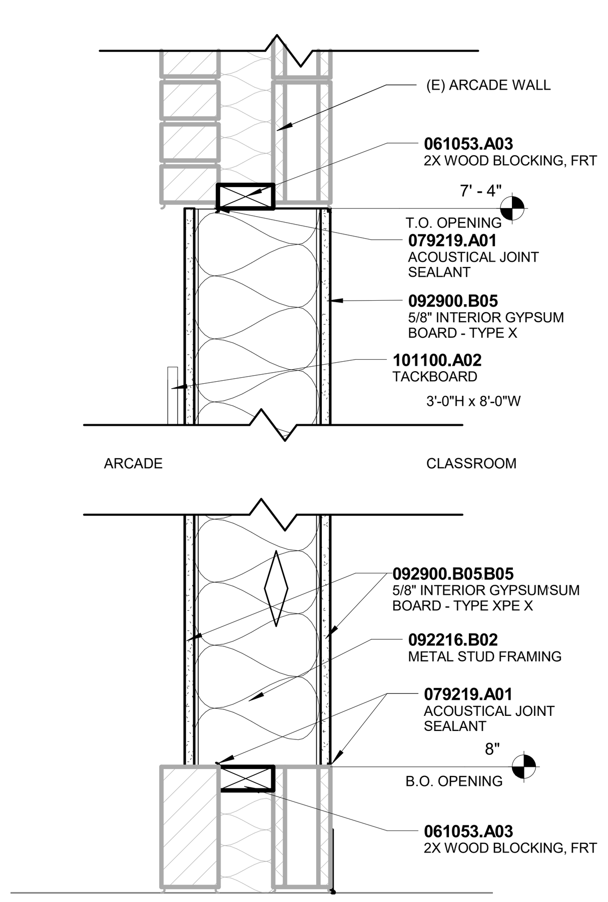
B1 DOOR JAMB HM @ GYP. BD WALL
3" = 1'-0"



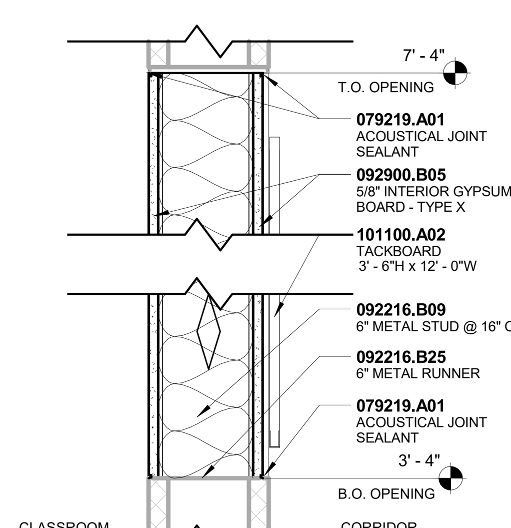
B2 DOOR JAMB HM @ CMU
3" = 1'-0"



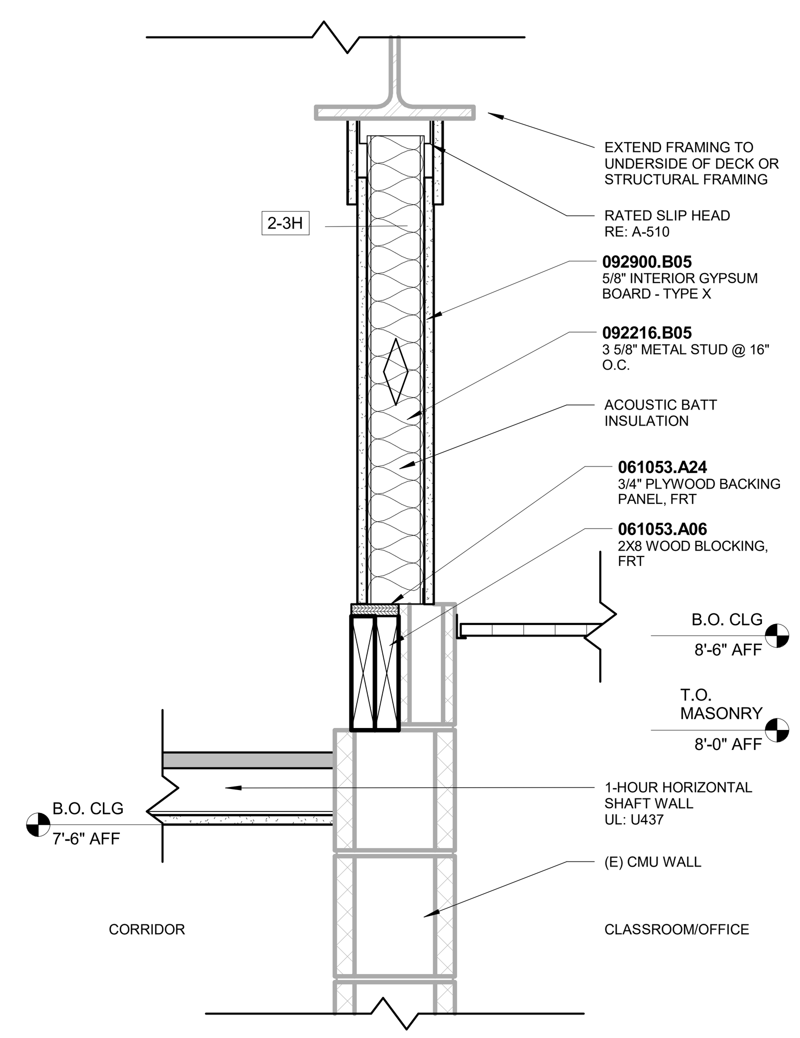
A1 DOOR INFILL AT BRICK
1 1/2" = 1'-0"



A2 WINDOW INFILL AT BRICK
1 1/2" = 1'-0"



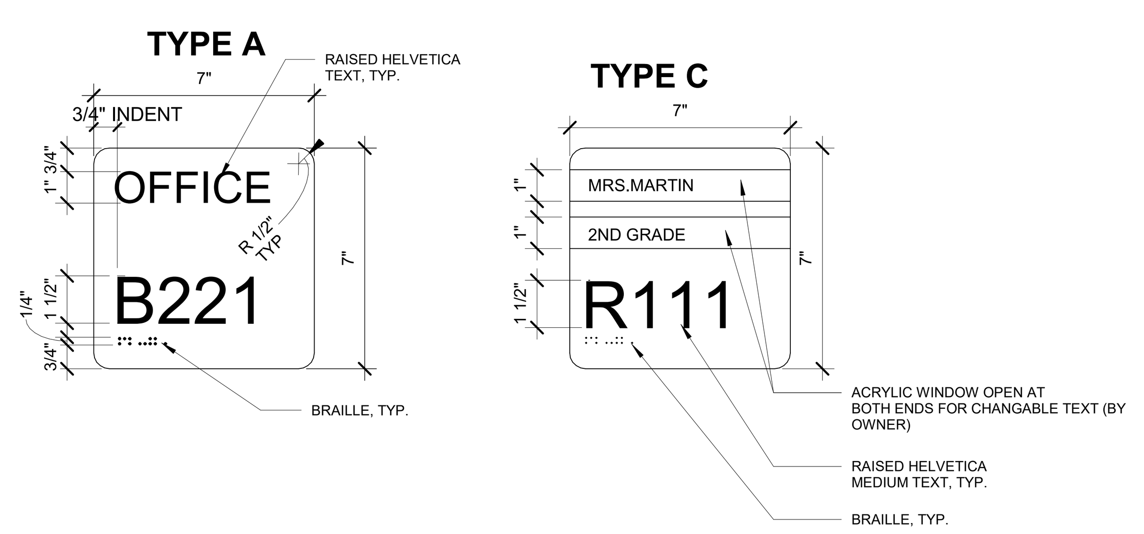
A3 WINDOW INFILL AT CMU
1 1/2" = 1'-0"



A4 DETAIL @ TOP OF CORRIDOR WALL
1 1/2" = 1'-0"

SIGNAGE SCHEDULE

Signage Door Mark	Signage Type	Signage Number	Signage Text	Signage Placement	Comments
127	C	127	CLASSROOM	CORRIDOR	
128	C	128	CLASSROOM	CORRIDOR	
129	C	129	CLASSROOM	CORRIDOR	
130	C	130	CLASSROOM	CORRIDOR	
131	A	131	OFFICE	CONFERENCE ROOM	
132	A	132	CONFERENCE	CORRIDOR	
133	A	133	OFFICE	CONFERENCE ROOM	
134	A	134	MENTOR OFFICE	CORRIDOR	
136	A	136	OFFICE	CORRIDOR	
138	A	138	COUNCELING	CORRIDOR	
190A	A	190A	STORAGE	FITNESS CENTER	



A5 SIGNAGE TYPES
3" = 1'-0"

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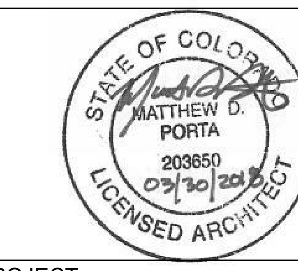

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APPROVED BY:	MP

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INTERIOR DETAILS, DOOR/SIGNAGE SCHEDULES & DETAILS

A-420

SHEET OF

11784.000 MIDDLE SCHOOL MECHANICAL UPGRADES
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Denver, CO. 80202

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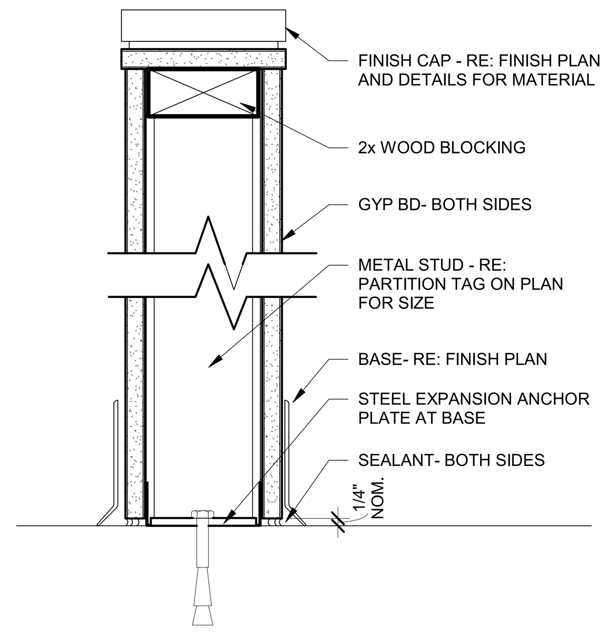
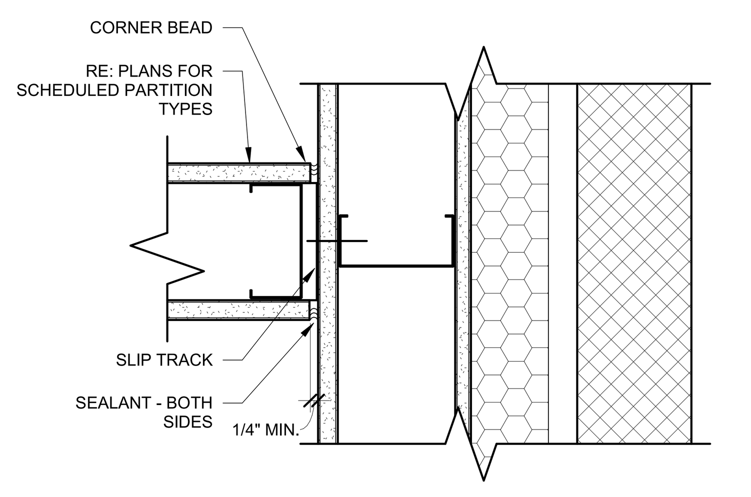
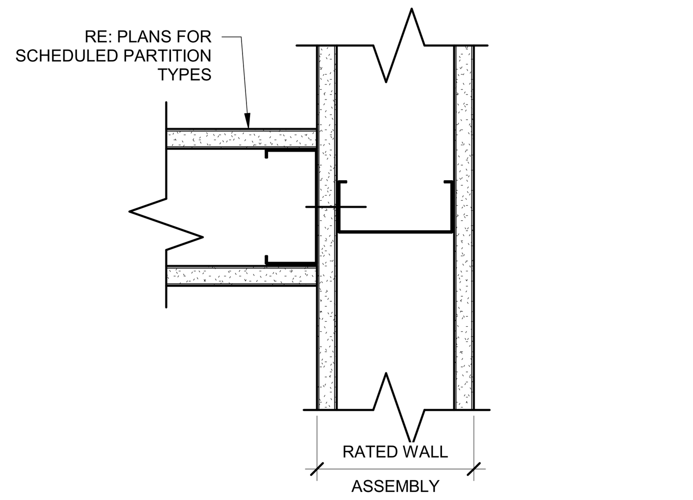
CONSULTANT:



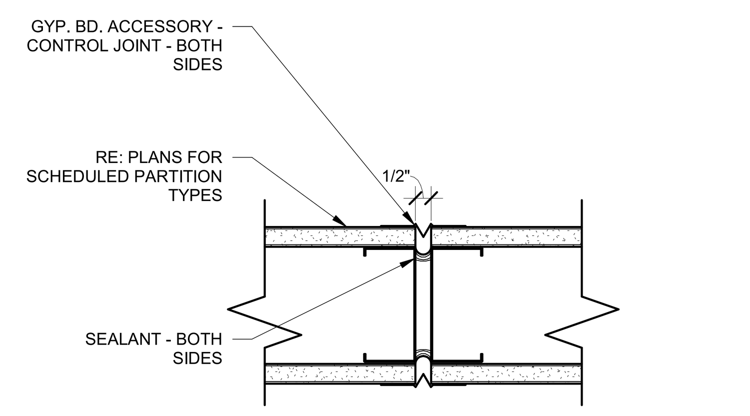
PARTIAL HEIGHT PARTITION



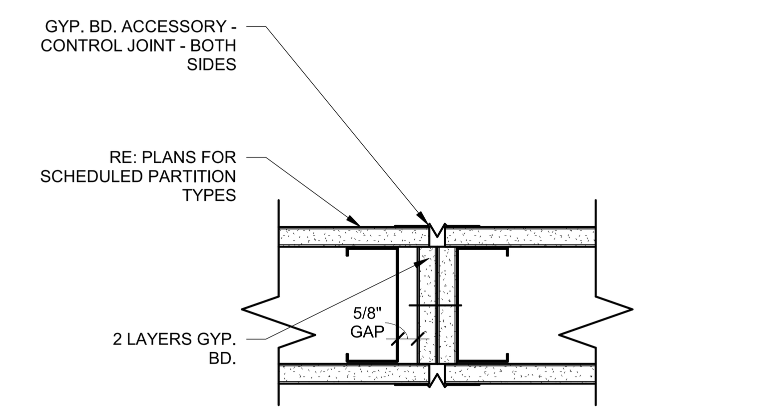
PLAN DETAIL @ EXTERIOR PERIMETER WALL



PLAN DETAIL @ PARTITION INTERSECTION



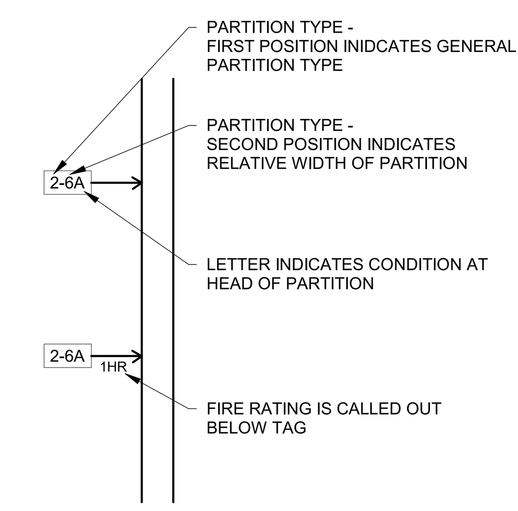
PLAN DETAIL - NON-RATED CONTROL JOINT

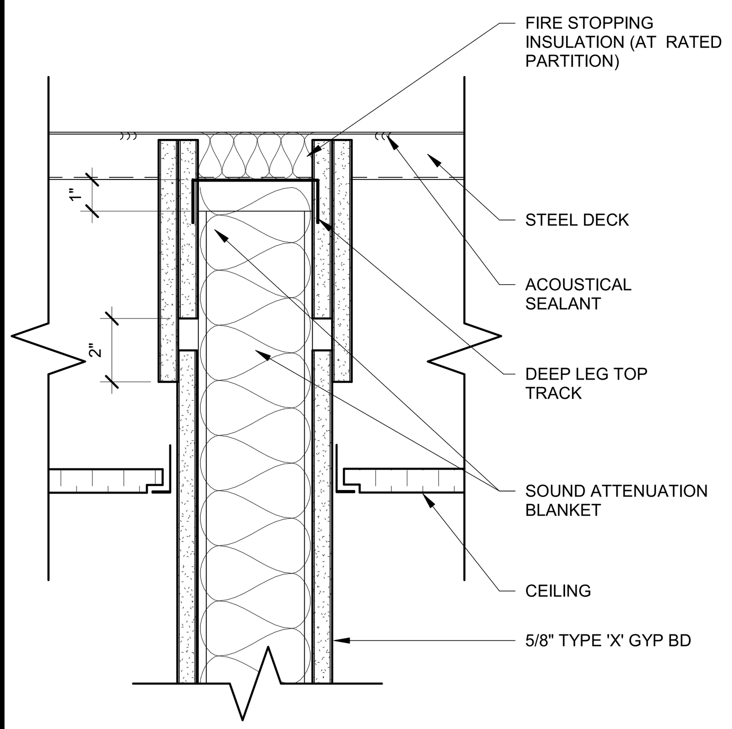


PLAN DETAIL - 1 HOUR RATED CONTROL JOINT

UL# ...-8024, 9-20-90

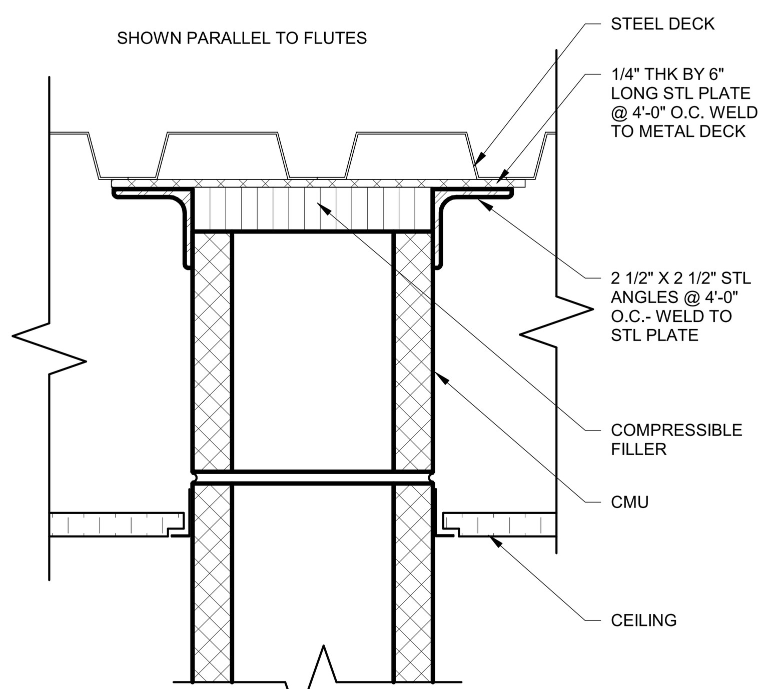
PARTITION TYPES LEGEND

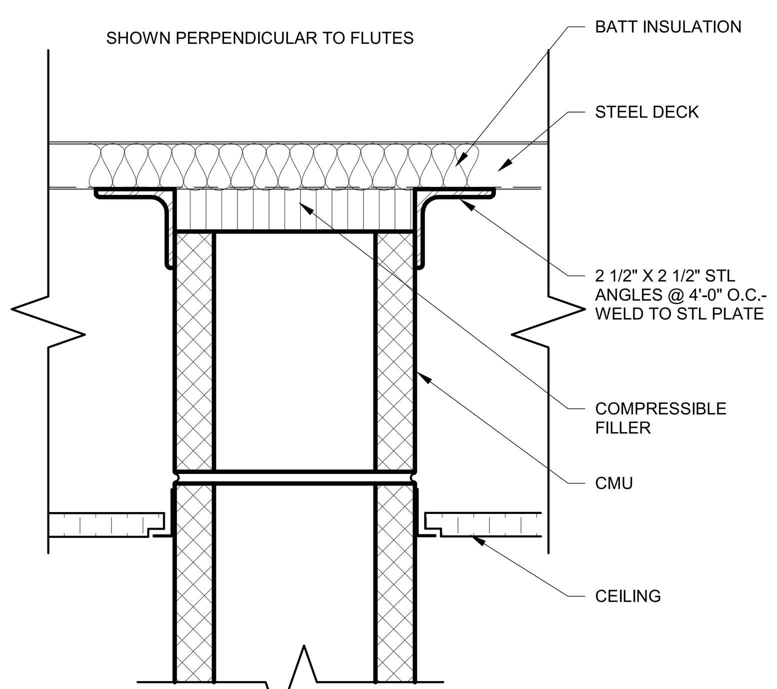


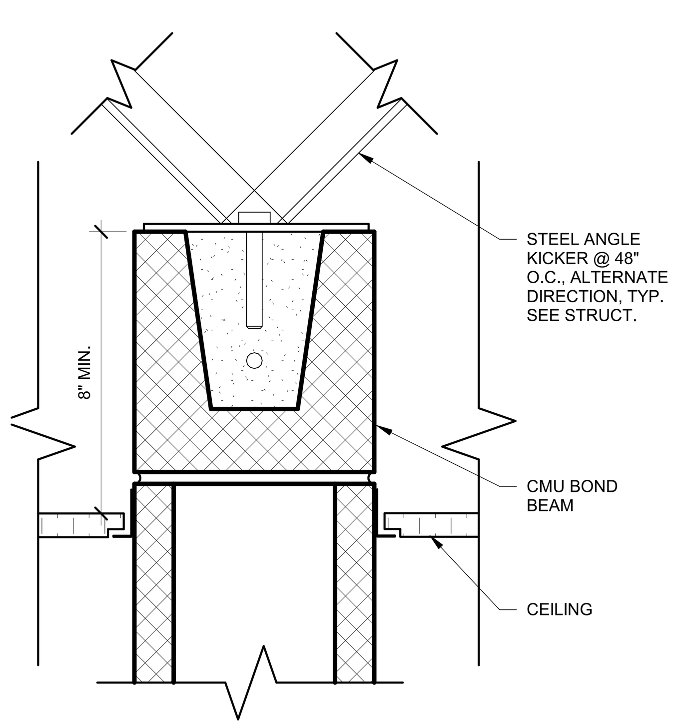


---A ACOUSTICAL PARTITION HEAD

SEE GENERAL PARTITION TYPE FOR REQUIRED STUD SIZE AND LAYERS OF GYP. BD. (4 LAYERS SHOWN)

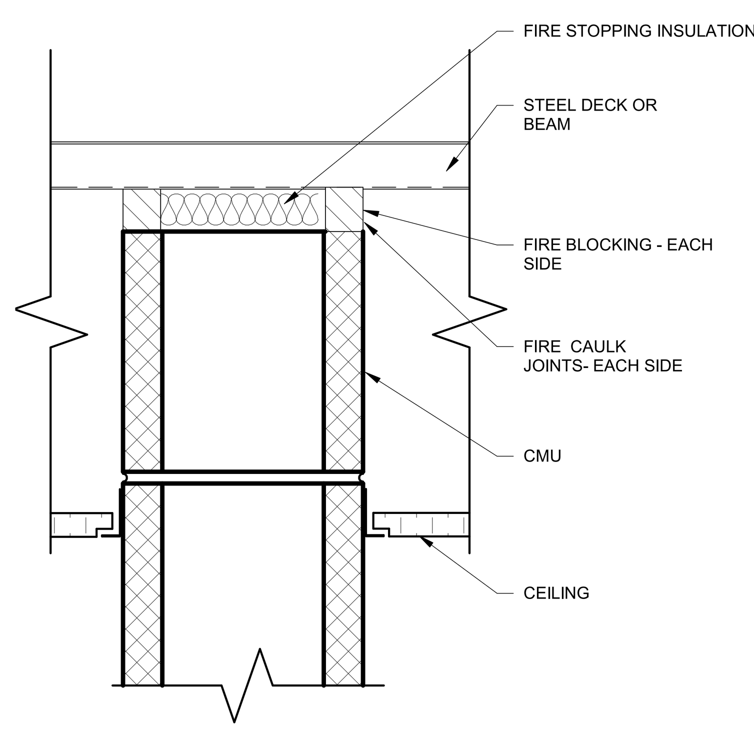






---D NON-RATED CMU PARTITION HEAD

SEE GENERAL PARTITION TYPE FOR MASONRY WIDTH



---E RATED CMU PARTITION HEAD

SEE GENERAL PARTITION TYPE FOR MASONRY WIDTH

PARTITION TYPES NOTES

1. PARTITION TYPES ARE INDICATED ON THE FLOOR PLANS.
2. ALL PARTITIONS SHALL EXTEND STRUCTURE TO STRUCTURE UNLESS NOTED OTHERWISE.
3. CONSTRUCTION OF FIRE-RATED PARTITIONS, INCLUDING TAPING AND FINISHING OF GYP. BD. FOR FULL HEIGHT TO STRUCTURE ABOVE, SHALL BE IN ACCORDANCE WITH MANUFACTURER'S DIRECTIONS TO ACHIEVE THE RATING INDICATED.
4. SOUND ISOLATION PARTITIONS SHALL BE SEALED AIRTIGHT FOR FULL HEIGHT TO PREVENT PASSAGE OF AIRBORNE SOUND. TAPE AND FINISH ALL GYP. BD. JOINTS AND FASTENERS, PROVIDE SEALANT AT PERIMETER AND AT ALL PENETRATIONS.
5. PROVIDE FIRE-RETARDANT TREATED WOOD BLOCKING FOR PARTITION MOUNTED EQUIPMENT AND CASEWORK.
6. PARTITION TYPES DESCRIBE THE PRIMARY MEMBER AND SHEATHING. REFER TO FINISH SCHEDULE FOR ALL PARTITION FINISH DESIGNATIONS.
7. PROVIDE TYPE 'WR' WATER RESISTANT GYP. BD. IN ALL WET AREAS SUCH AS TOILET, LOCKER, AND SHOWER ROOMS. PROVIDE 5/8" CONCRETE BACKER BOARD AT ALL CERAMIC TILE FINISHES TO ALIGN WITH 5/8" TYPE 'WR' GYP. BD. ABOVE.
8. PROVIDE SLIP JOINT CONNECTIONS AT THE TOPS OF ALL PARTITIONS WHICH INTERSECT THE STRUCTURE ABOVE. PROVIDE FIRE SAFING AT ALL SLIP JOINT CONNECTIONS IN FIRE RATED PARTITIONS.
9. ALL PARTITIONS TO BE PARTITION TYPE (3-5/8" METAL STUD WITH SOUND ATTENUATION INSULATION AND (1) LAYER OF 5/8" GYP. BD. ON BOTH SIDES) AND SHALL EXTEND STRUCTURE TO STRUCTURE, UNLESS NOTED OTHERWISE WITH A PARTITION TYPE TAG. THIS DEFAULT PARTITION TYPE IS NON-RATED. THIS SAME PARTITION TYPE IN A RATED CONDITION IS TAGGED ON THE FLOOR PLANS.
10. PROVIDE GYP. BD. CONTROL JOINTS WHERE DESIGNATED ON THE INTERIOR ELEVATIONS (A-400 SHEETS) AND ANYWHERE THERE IS A CONTINUOUS RUN OF GYP. BD. THAT IS GREATER THAN 30'-0" IN LENGTH. CONFIRM THE LOCATION OF ADDITIONAL CONTROL JOINTS WITH THE ARCHITECT PRIOR TO INSTALLATION.

STATE OF COLORADO
MATTHEW G. PORTA
203650
03/30/2018
LICENSED ARCHITECT

PROJECT:

MIDDLE SCHOOL MECHANICAL UPGRADES

39610 Amethyst Drive
Steamboat Springs, CO 80487

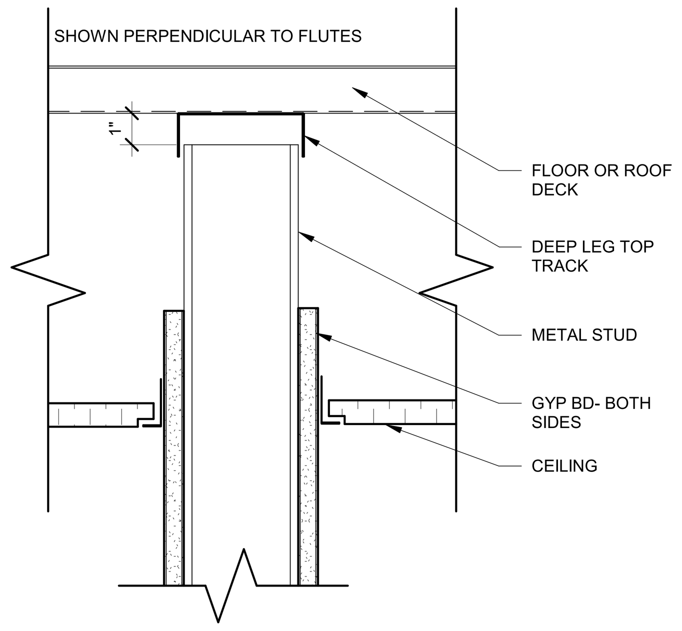
OWNER:

Steamboat Springs School District Re-2

325 7th Street
Steamboat Springs, CO 80487

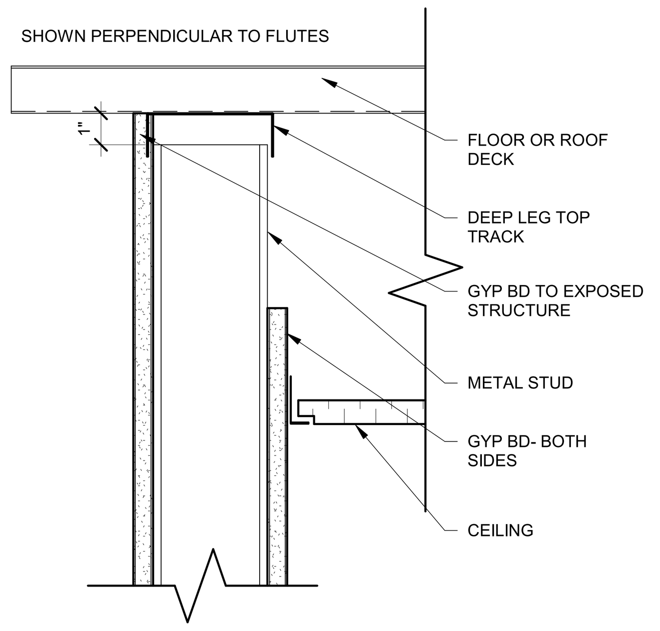
ISSUE:

2018/03/30 Issue for Bidding & Construction



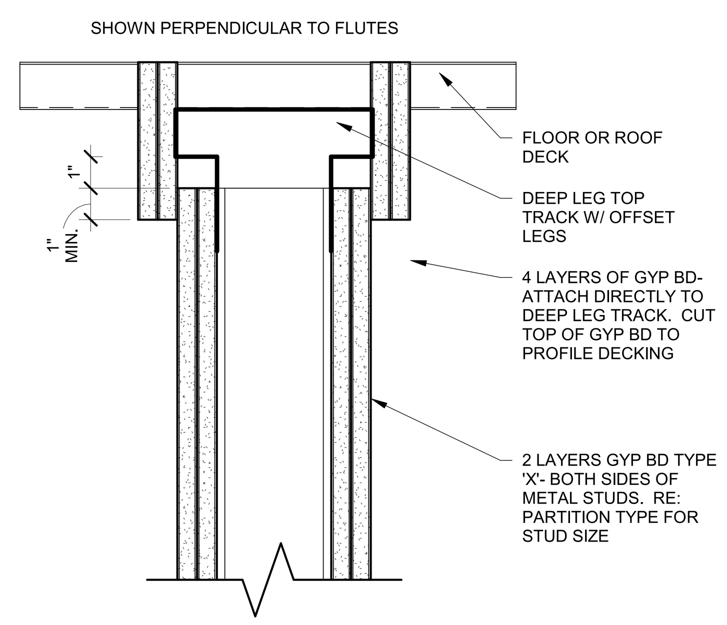
---F NON-RATED PARTITION HEAD

SEE GENERAL PARTITION TYPE FOR REQUIRED STUD SIZE AND LAYERS OF GYP. BD. (2 LAYERS SHOWN)



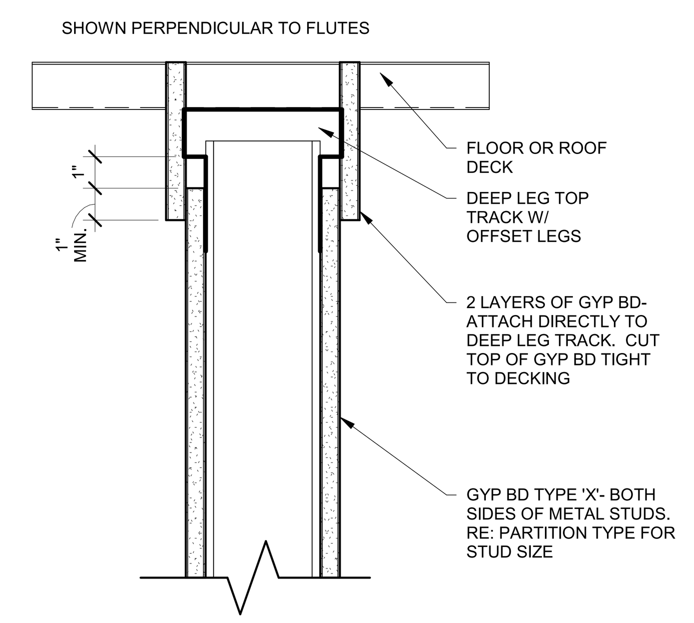
---F1 NON-RATED PARTITION HEAD

SEE GENERAL PARTITION TYPE FOR REQUIRED STUD SIZE AND LAYERS OF GYP. BD. (2 LAYERS SHOWN)



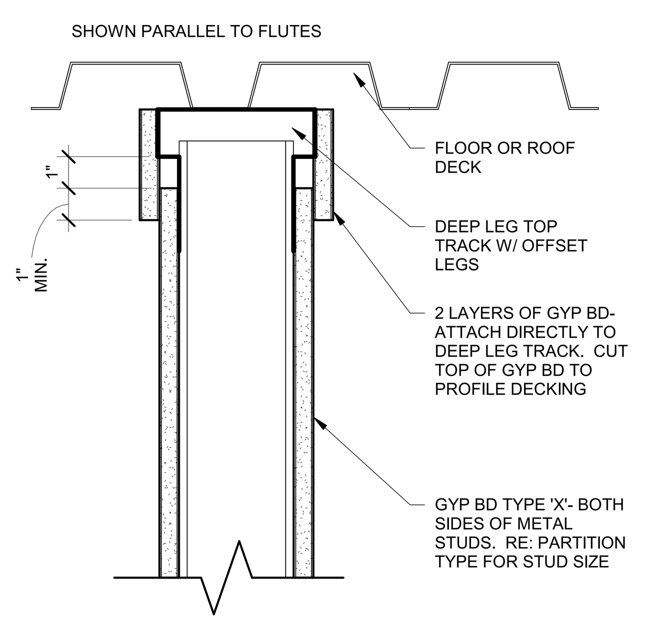
---G 2 HOUR RATED PARTITION HEAD

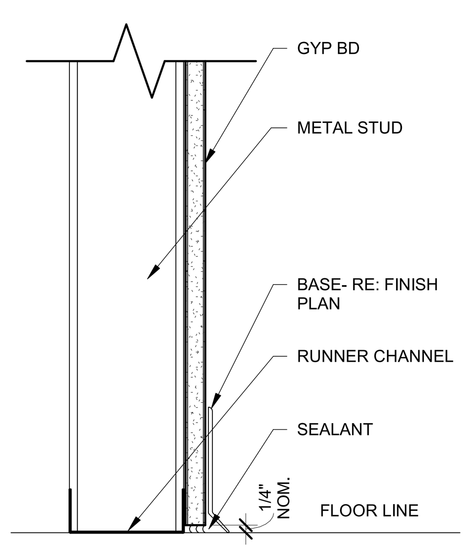
SEE GENERAL PARTITION TYPE FOR REQUIRED STUD SIZE AND LAYERS OF GYP. BD. (4 LAYERS SHOWN)
UL HW-D-0060 CONFIGURATION C - 1 OR 2 HOUR FIRE RATING



---H 1 HOUR RATED PARTITION HEAD/ SMOKE PARTITION

SEE GENERAL PARTITION TYPE FOR REQUIRED STUD SIZE AND LAYERS OF GYP. BD. (2 LAYERS SHOWN) UL HW-D-0060 CONFIGURATION C - 1 OR 2 HOUR FIRE RATING



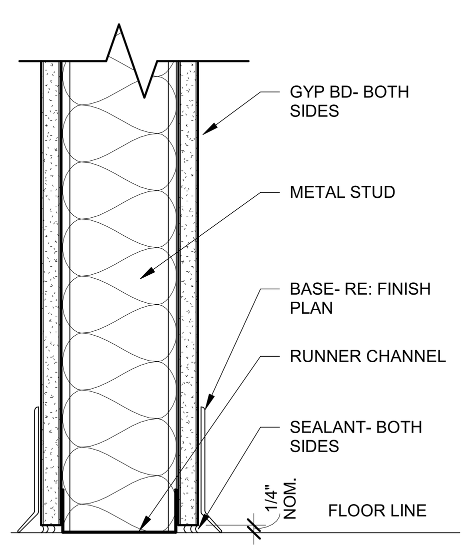


1-2- PARTITION
WITH 2-1/2" METAL STUD
PARTITION WIDTH = 3-1/8"

1-3- PARTITION
WITH 3-5/8" METAL STUD
PARTITION WIDTH = 4-1/4"

1-6- PARTITION
WITH 6" METAL STUD
PARTITION WIDTH = 6-5/8"

1-8- PARTITION
WITH 8" METAL STUD
PARTITION WIDTH = 8-5/8"



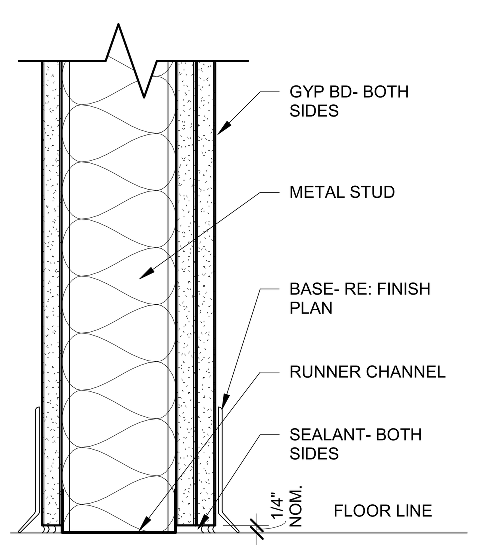
2-2- PARTITION
WITH 2-1/2" METAL STUD
PARTITION WIDTH = 3-3/4"

2-3- PARTITION
WITH 3-5/8" METAL STUD
PARTITION WIDTH = 4-7/8"
STC: 45

2-6- PARTITION
WITH 6" METAL STUD
PARTITION WIDTH = 7-1/4"
STC: 45

2-8- PARTITION
WITH 8" METAL STUD
PARTITION WIDTH = 9-1/4"
STC: 45

2-X- 1-HR PARTITION
WITH STUD AS INDICATED
U.L. DESIGN = U419



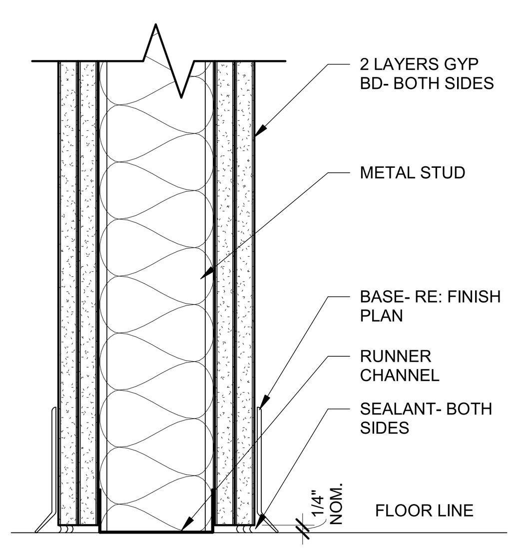
3-2- PARTITION
WITH 2-1/2" METAL STUD
PARTITION WIDTH = 4-3/8"

3-3- PARTITION
WITH 3-5/8" METAL STUD
PARTITION WIDTH = 5-1/2"
STC: 50

3-6- PARTITION
WITH 6" METAL STUD
PARTITION WIDTH = 7-7/8"
STC: 50

3-8- PARTITION
WITH 8" METAL STUD
PARTITION WIDTH = 9-7/8"
STC: 50

3-X- 1-HR PARTITION
WITH STUD AS INDICATED
U.L. DESIGN = U419



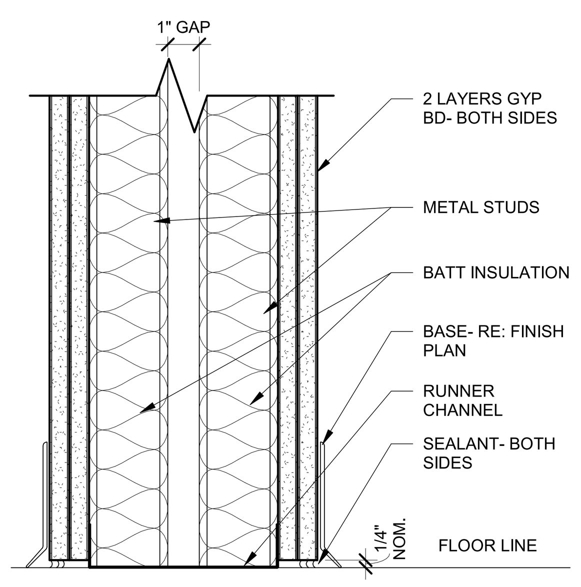
4-2- PARTITION
WITH 2-1/2" METAL STUD
PARTITION WIDTH = 5"

4-3- PARTITION
WITH 3-5/8" METAL STUD
PARTITION WIDTH = 6-1/8"
STC: 53

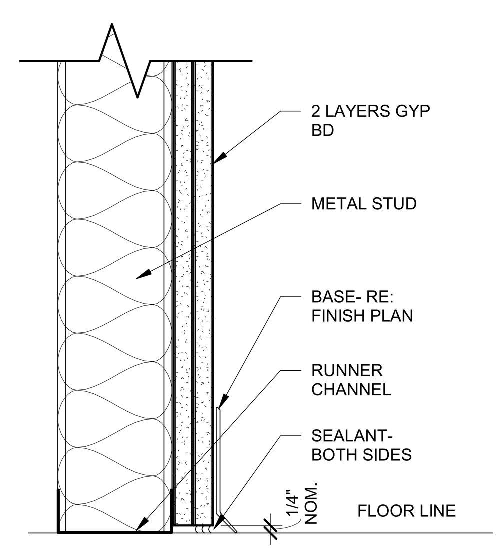
4-6- PARTITION
WITH 6" METAL STUD
PARTITION WIDTH = 8-1/2"
STC: 53

4-8- PARTITION
WITH 8" METAL STUD
PARTITION WIDTH = 10-1/2"
STC: 53

4-X- 2-HR PARTITION
WITH STUD AS INDICATED
U.L. DESIGN = U419



5-2- PARTITION
WITH DOUBLE 2 1/2" METAL STUD
PARTITION WIDTH = 8 1/2"
STC: 60

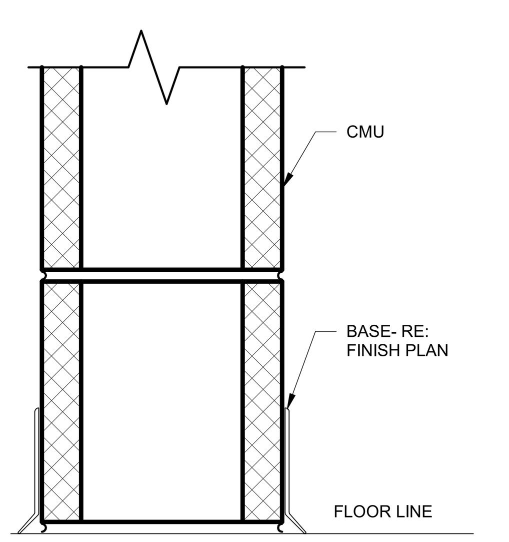


6-2- PARTITION
WITH 2-1/2" METAL STUD
PARTITION WIDTH = 3 3/4"

6-3- PARTITION
WITH 3-5/8" METAL STUD
PARTITION WIDTH = 4 7/8"

6-6- PARTITION
WITH 6" METAL STUD
PARTITION WIDTH = 7 1/4"

6-8- PARTITION
WITH 8" METAL STUD
PARTITION WIDTH = 9 1/4"



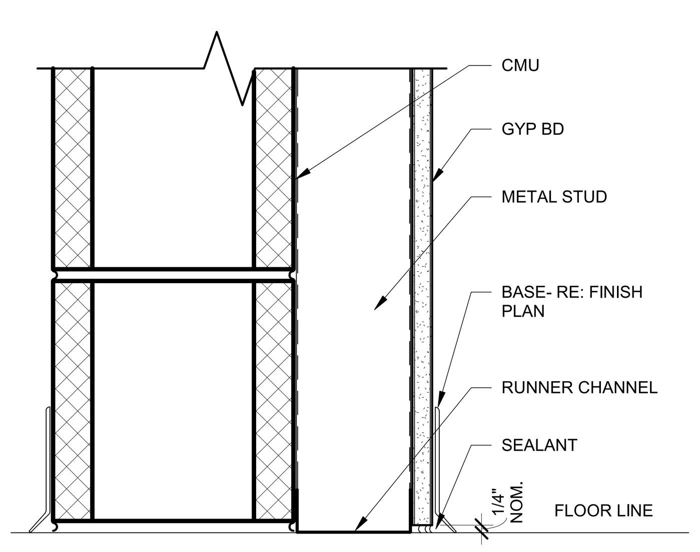
7-4- C.M.U. PARTITION
4"x8"x16" C.M.U.

7-6- C.M.U. PARTITION
6"x8"x16" C.M.U.

7-8- C.M.U. PARTITION
8"x8"x16" C.M.U.

7-12- C.M.U. PARTITION
12"x8"x16" C.M.U.

7-X- C.M.U. PARTITION
WITH CMU AS INDICATED
U.L. DESIGN = U906



8-4- C.M.U. PARTITION
4"x8"x16" C.M.U.

8-8- C.M.U. PARTITION
8"x8"x16" C.M.U.

8-12- C.M.U. PARTITION
12"x8"x16" C.M.U.

DRAWING INFORMATION:

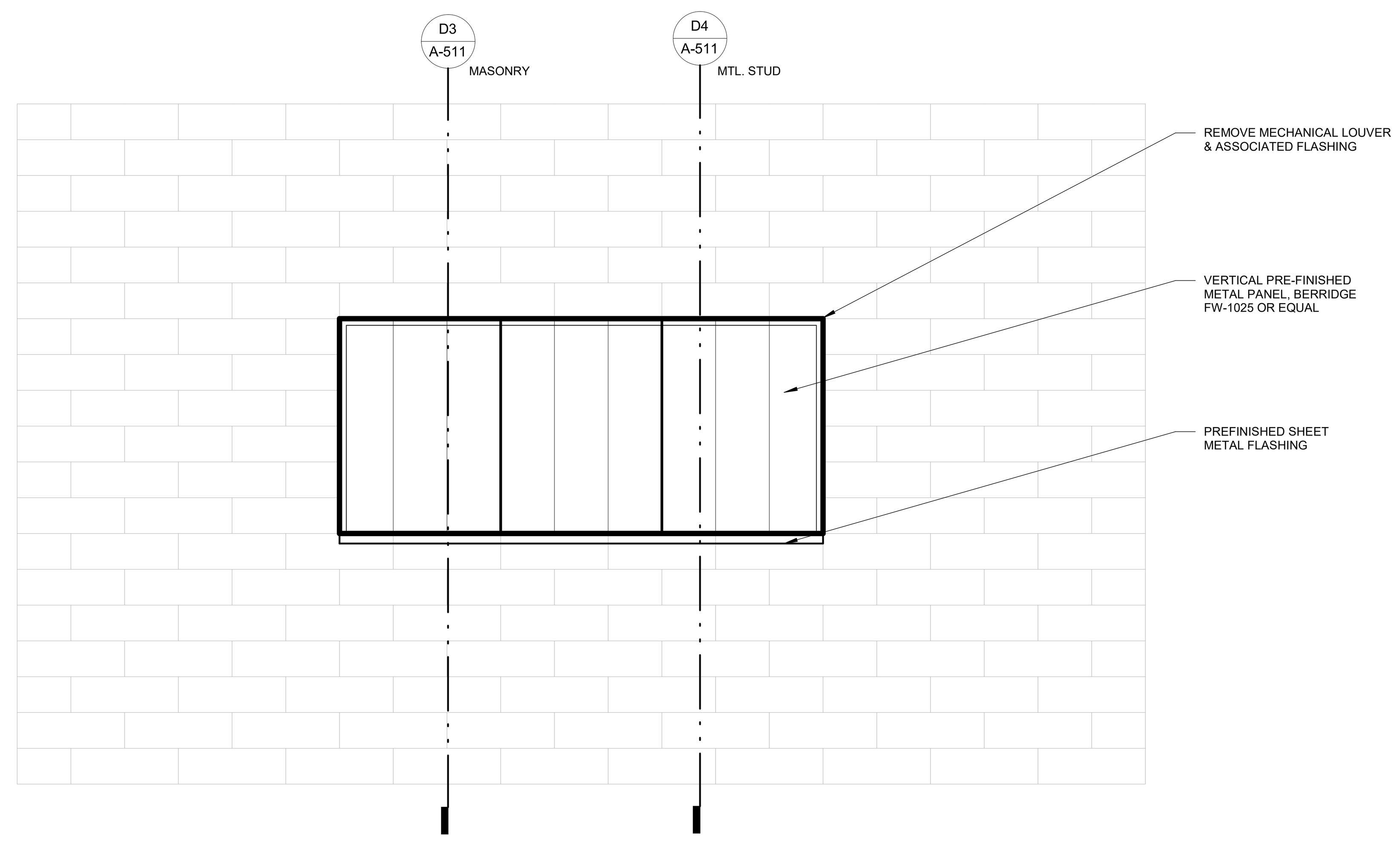
PROJECT NO:	11784.000
DRAWN BY:	MO
CHECKED BY:	LG
APPROVED BY:	MP

SHEET TITLE:

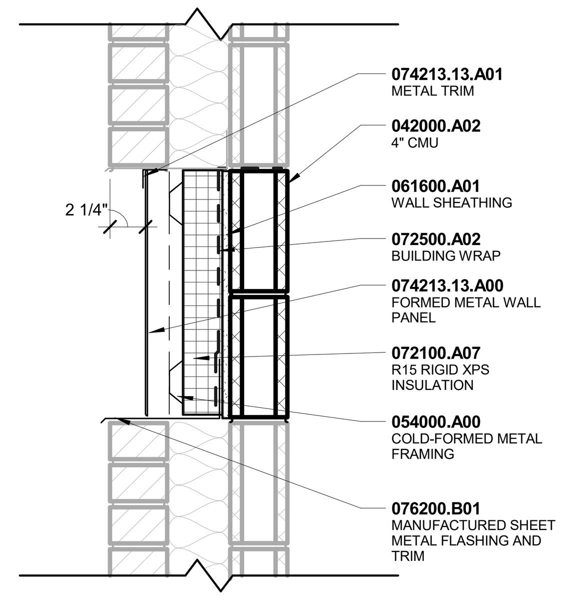
PARTITION TYPES

A-510

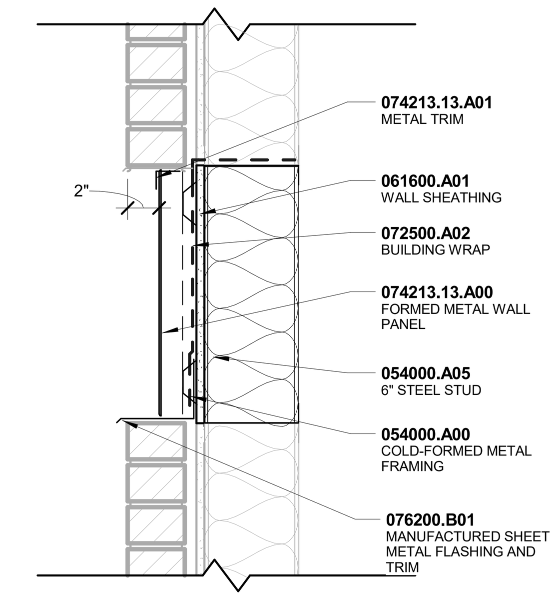
SHEET OF



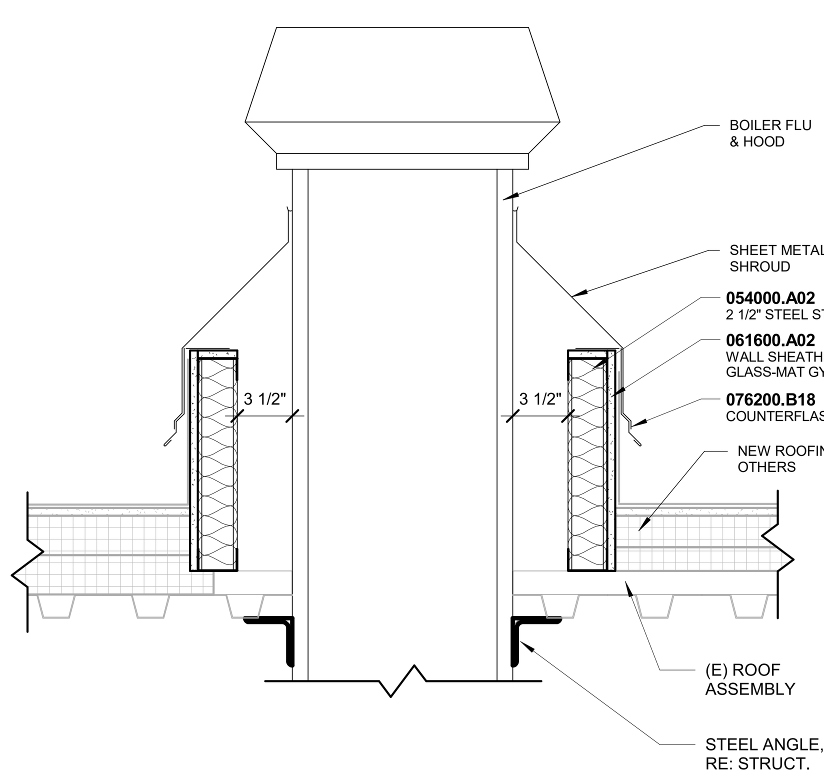
D1 **LOUVER INFILL ELEVATION**
1 1/2" = 1'-0"



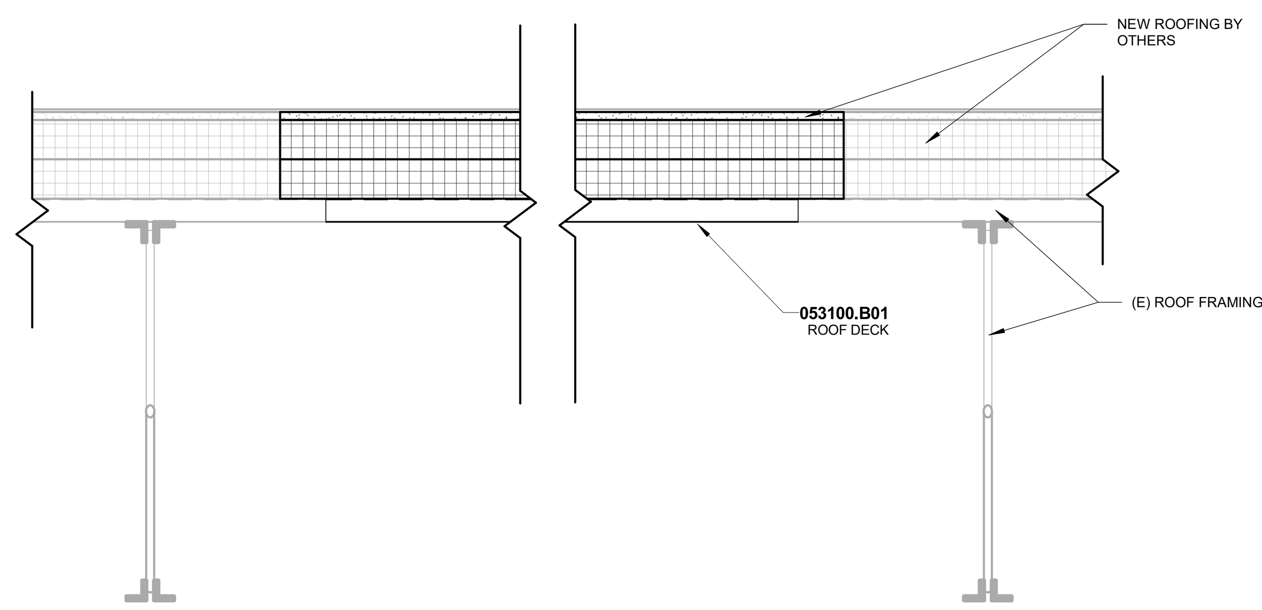
D3 **LOUVER INFILL DETAIL @ MASONRY**
1 1/2" = 1'-0"



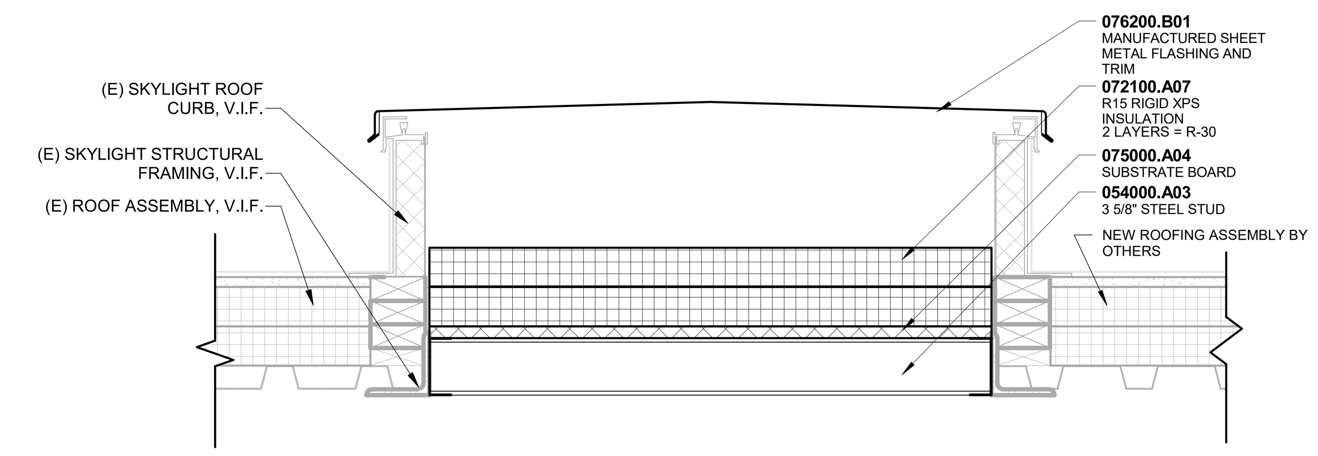
D4 **LOUVER INFILL DETAIL @ METAL STUD**
1 1/2" = 1'-0"



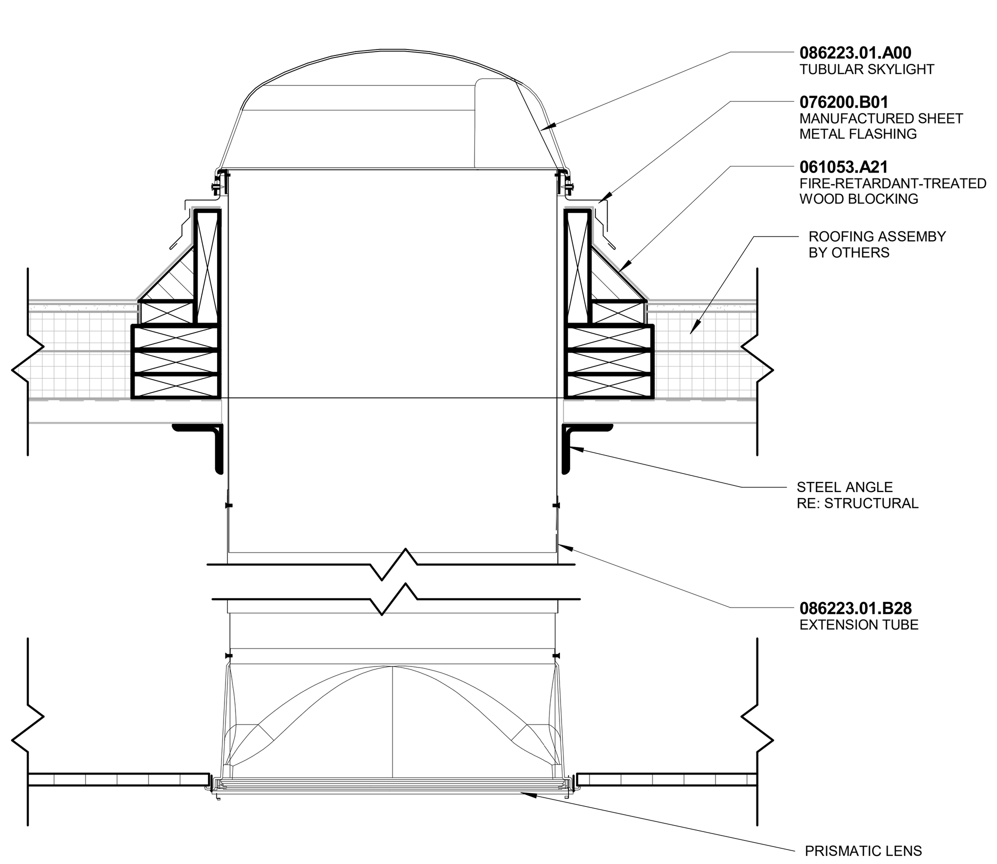
C1 **BOILER FLUE SECTION DETAIL**
1 1/2" = 1'-0"



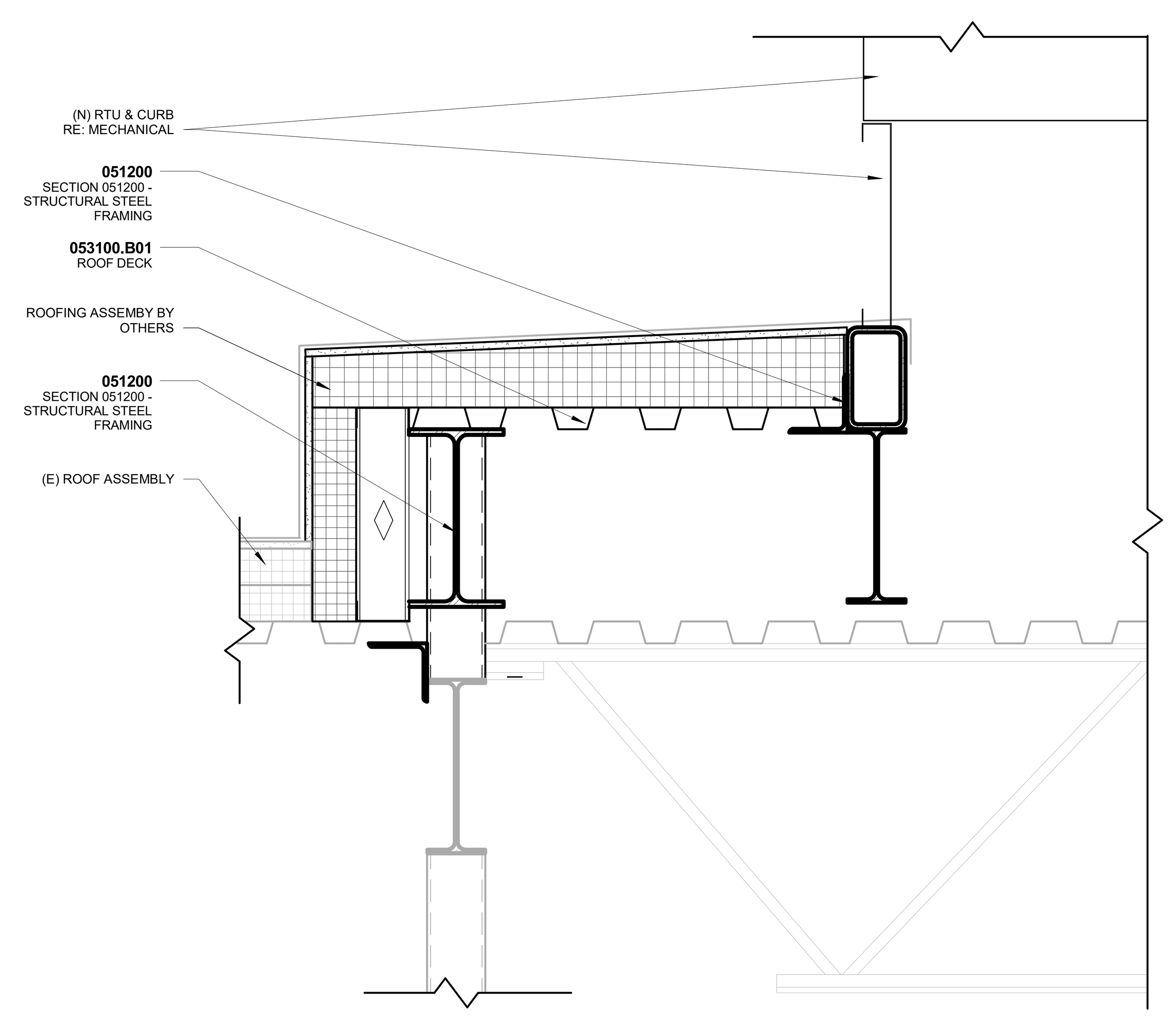
C3 **ROOF HATCH INFILL SECTION DETAIL**
1 1/2" = 1'-0"



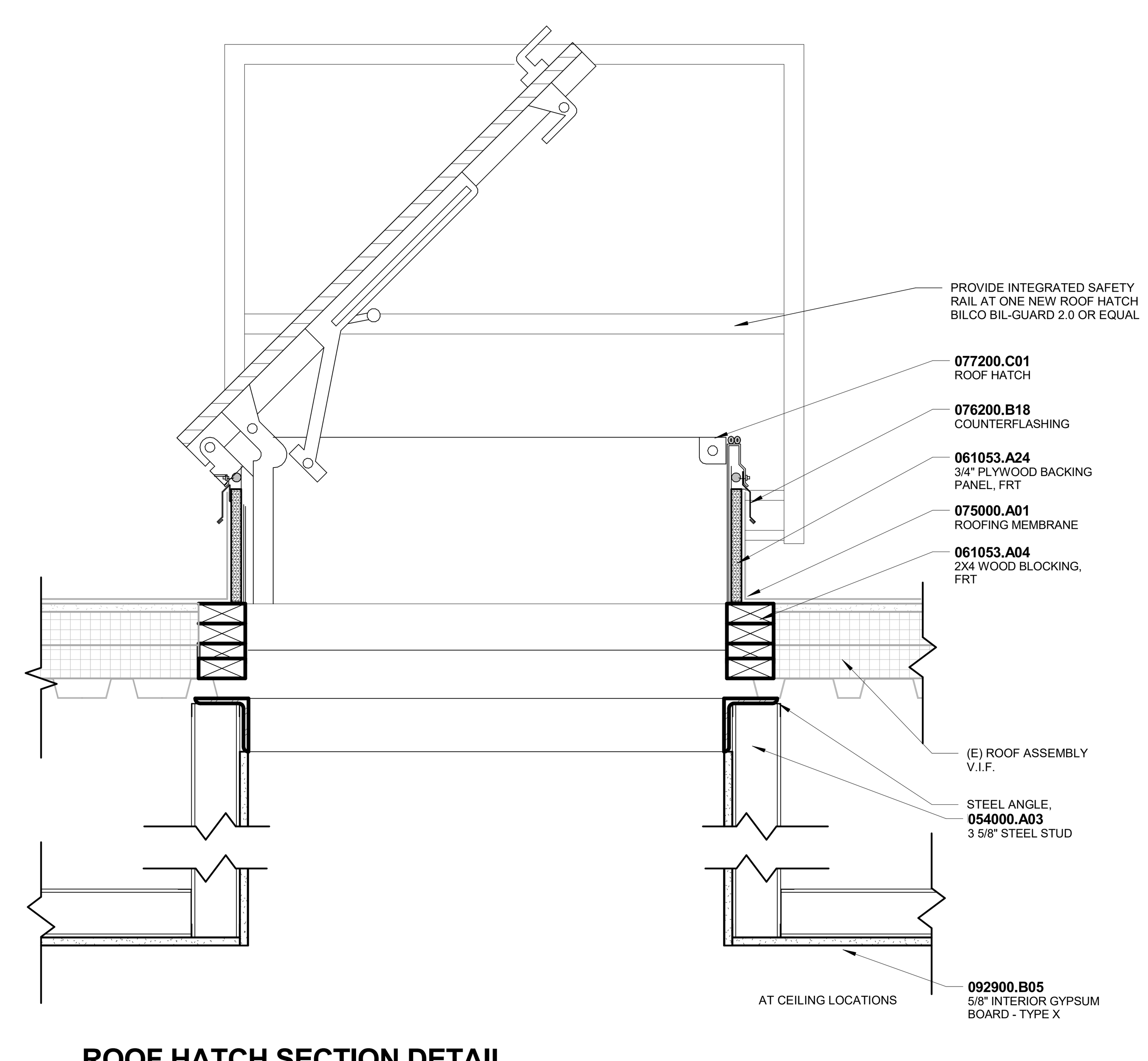
C5 **SKYLIGHT INFILL SECTION DETAIL**
1 1/2" = 1'-0"



A1 **TUBULAR SKYLIGHT SECTION DETAIL**
1 1/2" = 1'-0"



A3 **RTU CURB SECTION DETAIL**
1 1/2" = 1'-0"



A5 **ROOF HATCH SECTION DETAIL**
1 1/2" = 1'-0"

hord | coplan | macht
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CONSULTANT:

STATE OF COLORADO
MATTHEW D. PORTA
203850
03/30/2018
LICENSED ARCHITECT

PROJECT:
MIDDLE SCHOOL MECHANICAL UPGRADES
39610 Amethyst Drive
Steamboat Springs, CO 80487

OWNER:
Steamboat Springs School District Re-2
325 7th Street
Steamboat Springs, CO 80487

ISSUE:
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DRAWING INFORMATION:

PROJECT NO:	11784.000
DRAWN BY:	MO
CHECKED BY:	LG
APPROVED BY:	MP
SHEET TITLE:	

EXTERIOR DETAILS

A-511

SHEET OF

11784.000 MIDDLE SCHOOL MECHANICAL UPGRADES
3/30/2018 6:13:54 PM

MECHANICAL LEGEND

PIPING

Symbol	Description
HWS	HEATING WATER SUPPLY
HWR	HEATING WATER RETURN
CWS	CHILLED WATER SUPPLY
CWR	CHILLED WATER RETURN
CS	CONDENSER WATER SUPPLY
CR	CONDENSER WATER RETURN
CHS	DUAL TEMPERATURE SUPPLY
CHR	DUAL TEMPERATURE RETURN
D	DRAIN PIPE
HPS	HIGH PRESSURE STEAM
HPR	HIGH PRESSURE COND. RETURN
LPS	LOW PRESSURE STEAM
LPR	LOW PRESSURE COND. RETURN
CP	CONDENSATE PUMP DISCHARGE
FOS	FUEL OIL SUPPLY
FOR	FUEL OIL RETURN
FOV	FUEL OIL VENT
RS	REFRIGERANT SUCTION
RL	REFRIGERANT LIQUID
RD	REFRIGERANT DISCHARGE

VALVES & SPECIALTIES

FLOW INDICATOR
SHUT-OFF VALVE
GLOBE VALVE
CHECK VALVE
FLOW CONTROL VALVE W/ CHECK
CALIBRATED BALANCING SHUT-OFF VALVE.
PLUG VALVE.
BALL VALVE
PRESSURE INDEPENDENT AUTOMATIC BALANCING VALVE
N.O. VALVE W/ LOCKING COVER
PLUG OR BALANCING SHUT-OFF VALVE IN RISER
SHUT OFF VALVE IN RISER
DRAIN VALVE W/ HOSE END
STRAINER W/ BLOW-OFF VALVE & HOSE END
TEMPERATURE CONTROL VALVE, 3-WAY
TEMPERATURE CONTROL VALVE, 2-WAY
PRESSURE INDEPENDENT 2-WAY CONTROL VALVE
PRESSURE REDUCING VALVE
SAFETY OR RELIEF VALVE
MANUAL AIR VENT
AUTOMATIC AIR VENT
PRESSURE - TEMP. TAP
PRESSURE GAUGE W/ PIG TAIL & COCK
THERMOMETER
VACUUM BREAKER
PIPE EXPANSION JOINT
FLEXIBLE PIPE CONNECTOR (STAINLESS STEEL BRAIDED)
FLEXIBLE EQUIPMENT CONNECTOR (RUBBER DOUBLE BELLOWS)
PIPE UNION
PIPE CAP
PIPE ANCHOR
PIPE GUIDE
1.5" PREMANUFACTURED PIPE EXPANSION LOOP. REQUIRED EXPANSION COMPENSATION LISTED, PROVIDE GUIDES & ANCHORS AS RECOMMENDED BY MANUFACTURER.

FIRE PROTECTION

FS FLOW SWITCH
F.A. HORN/STROBE FIRE ALARM
F FIRE PIPE
EXISTING FIRE SPRINKLER
EXISTING FIRE SPRINKLER TO BE RELOCATED
NEW FIRE SPRINKLER
EXISTING FIRE SPRINKLER TO BE REMOVED
O.S. & Y VALVE
SHUT-OFF VALVE W/TAMPER SWITCH
FIRE DEPARTMENT CONNECTION-WALL TYPE

MISCELLANEOUS

POINT OF DUCT OR PIPE DISCONNECTION
POINT OF DUCT OR PIPE CONNECTION NEW TO EXISTING
POINT OF PIPE CONNECTION NEW TO EXISTING
A / 1 SECTION CUT: (A) SECTION I.D. (1) SHEET NO. WHERE SHOWN.
1" UNDERCUT DOOR, 1".
X REFERENCE DESIGNATION FOR PLUMBING ISOMETRIC
+##'-##" SPOT ELEVATION TAG. TAG INDICATES BOTTOM OF DIFFUSER OR EQUIPMENT ABOVE FINISHED FLOOR.

PLUMBING

Symbol	Description
	DOMESTIC COLD WATER
	DOMESTIC HOT WATER
180	DOMESTIC HOT WATER (TEMP. SHOWN)
	DOMESTIC HOT WATER CIRCULATING
T	TEMPERED WATER
NP	NON-POTABLE WATER
NG # PSIG	NATURAL GAS, PRESSURE AS IDENTIFIED
V	PLUMBING VENT PIPE
SOW	SAND AND OIL WASTE PIPE
SAN	SANITARY WASTE PIPE
GW	GREASE WASTE PIPE
ST	STORM DRAIN/ BUILDING STORM SEWER PIPE
OST	OVERFLOW STORM DRAIN PIPE
CA	COMPRESSED AIR PIPE
	HORIZONTAL CLEANOUT
	VERTICAL CLEANOUT

HVAC DUCTWORK

FIRE DAMPER
S SMOKE DAMPER
FS COMBINATION FIRE / SMOKE DAMPER
TURNING VANES SHOWN IN 90° ELBOW.
OPPOSED BLADE DAMPER (O.B.D.)
24/12 DUCT SIZES ARE OUTSIDE SHEET METAL DIMENSIONS. 1st NO. IS SIZE OF SURFACE SHOWN. 2nd NO. IS DUCT DEPTH. LETTERS AFTER DIM. CORRESPOND TO FOLLOWING:

- ø - ROUND DUCTWORK
- D - DOUBLE WALL CONSTRUCTION
- UL - UNLINED DUCTWORK
- V - OVAL DUCTWORK

SIZE / CFM (A) TYPE — SUPPLY DIFFUSER. ALL DIFFUSERS FOUR-WAY THROW UNLESS NOTED OR THROWS SHOW IN PLAN. SEE SCHEDULE FOR TYPE.
SIZE / CFM — RETURN/TRANSFER/EXHAUST AIR TAG. SEE SCHEDULE FOR TYPE.
SECTION THRU OUTSIDE AIR INTAKE OR SUPPLY AIR DUCT
SECTION THRU RETURN AIR OR EXHAUST DUCT
OA, RA OR EXH DUCT DOWN
SUPPLY AIR DUCT DOWN
UP — CHANGE OF ELEVATION UP (UP) DOWN (DN) IN DIRECTION OF AIR FLOW
FLEXIBLE CONNECTION
BACKDRAFT DAMPER
24x24 TYPE J RETURN AIR GRILLE W/SOUND BOOT. SHADING INDICATES OPEN END.
24x12 TYPE J RETURN AIR GRILLE W/SOUND BOOT. SHADING INDICATES OPEN END.
24x24 TYPE J RETURN AIR GRILLE
24x12 TYPE J RETURN AIR GRILLE
OR FLEXIBLE DUCT

CONTROLS (IN PLAN)

T THERMOSTAT/TEMP SENSOR
T S TEMP SENSOR W/STAINLESS STEEL COVER
T A TEMP SENSOR W/SETPOINT ADJUSTMENT
T I TEMP SENSOR W/TEMP INDICATION
T AI TEMP SENSOR W/SET POINT ADJUSTMENT AND TEMP INDICATION
T G THERMOSTAT/TEMP SENSOR WITH LOCKING GUARD
T N NIGHT THERMOSTAT
CO CARBON MONOXIDE SENSOR
CO2 CARBON DIOXIDE SENSOR
NO2 NITROGEN DIOXIDE SENSOR
IAQ INDOOR AIR QUALITY SENSOR
HUMIDISTAT/SENSOR
STARTER
PS PRESSURE SWITCH
APS DIFFERENTIAL AIR PRESSURE SENSOR
S SWITCH
FM FLOW METER
LT LOW LIMIT THERMOSTAT
CONTROL DAMPER
SD SMOKE DETECTOR (DUCT)
PDS PRESSURE DIFFERENTIAL SENSOR
EPO EMERGENCY POWER OFF SWITCH

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Bogota, Colombia
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Bogota D.C. 110231 Colombia
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PROJECT INFORMATION

PROJECT LOCATION:	STEAMBOAT, COLORADO
PROJECT ALTITUDE:	6735 FEET ABOVE SEA LEVEL
SUMMER DESIGN TEMPERATURE:	94°F DRY BULB, 61°F WET BULB (ASHRAE #% DESIGN)
WINTER DESIGN TEMPERATURE:	-15°F DRY BULB, 0%RH (ASHRAE ##.#%)
SUMMER ROOM DESIGN TEMP:	75°F DRY BULB - NO HUMIDITY REQUIREMENT
WINTER ROOM DESIGN TEMP:	70°F DRY BULB - NO HUMIDITY REQUIREMENT
SUMMER ROOM SETBACK TEMP:	90°F DRY BULB - NO HUMIDITY REQUIREMENT (ASHRAE 90.1)
WINTER ROOM SETBACK TEMP:	55°F DRY BULB - NO HUMIDITY REQUIREMENT (ASHRAE 90.1)

CONTROLS LEGEND

(SYMBOLS LOCATED IN BUILDING AUTOMATION SYSTEM SCHEMATICS)

FLOW
CONTROL WIRING
CONTROL AIR PIPING
M MAIN AIR
PUMP
FAN
FLOW AIR FLOW MEASURING STATION
FILTER
C COIL
MOTOR STARTER
VFD VARIABLE FREQUENCY DRIVE
BFV 3-WAY BUTTERFLY VALVE
BFV 2-WAY BUTTERFLY VALVE
M M MODULATING 3-WAY & 2-WAY VALVES
2P 2P 2 POSITION 3-WAY & 2-WAY VALVES
F D DUCT SMOKE DETECTOR
LT LOW TEMPERATURE DETECTION THERMOSTAT
REF REFRIGERANT DETECTOR
CONTROL DAMPER
GAUGE
DA DAMPER ACTUATOR
T REMOTE BULB SENSOR/CONTROLLER
H HUMIDISTAT/HUMIDITY SENSOR
ICE SNOW/ICE SENSOR
CO CARBON MONOXIDE SENSOR
CO2 CARBON DIOXIDE SENSOR
NO2 NITROGEN DIOXIDE SENSOR
IAQ INDOOR AIR QUALITY SENSOR
T ROOM THERMOSTAT/TEMP SENSOR
SUBSCRIPTS:

- S - W/STAINLESS STEEL COVER
- A - W/SETPOINT ADJUSTMENT
- I - W/TEMP INDICATION
- AI - W/TEMP AND ADJUSTMENT
- G - W/LOCKING GUARD

T DUCT AVERAGING TEMPERATURE SENSOR
LU PS HI LO WATER DIFFERENTIAL PRESSURE SENSOR/CONTROLLED
HI LO DSP DUCT STATIC PRESSURE SENSOR
BSD LO HI BUILDING STATIC PRESSURE SENSOR
T WATER TEMPERATURE SENSOR WITH WELL
DP HI LOW DIFFERENTIAL PRESSURE SENSOR
CT CURRENT SENSOR
XXX XXX ANALOG INPUT OR OUTPUT SYMBOL
XXX XXX BINARY INPUT OR OUTPUT SYMBOL
EMER EMERGENCY PULL SWITCH
EPO EMERGENCY POWER OFF SWITCH
ES END SWITCH
S SWITCH
PS PRESSURE SWITCH
FS FLOW SWITCH
FLOW FLOW METER

GENERAL NOTES (FOR ALL MECHANICAL DRAWINGS)

1. ON DEMOLITION PLANS EXISTING MECHANICAL SYSTEMS TO BE REMOVED ARE SHOWN HEAVY LINE WEIGHT, EXISTING MECHANICAL SYSTEMS TO REMAIN ARE SHOWN LIGHT LINE WEIGHT. ON ALL OTHER PLANS NEW MECHANICAL SYSTEMS ARE SHOWN HEAVY LINE WEIGHT.
2. THE INSTALLATION OR REMOVAL OF DUCTS, PIPES AND EQUIPMENT MAY REQUIRE THE REMOVAL OF EXISTING WALLS AND CEILINGS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PATCHING AND REPAIRING THESE WALLS AND/OR CEILINGS SO THEY MATCH THE EXISTING WHERE NOT REPLACED UNDER ARCHITECTURAL DIVISION.
3. SCHOOL DISTRICT SHALL HAVE FIRST RIGHT OF REFUSAL ON ALL FIXTURES AND EQUIPMENT REMOVED AND NOT REUSED. ANY SUCH FIXTURE AND EQUIPMENT THAT GOES UNCLAIMED BY THE SCHOOL DISTRICT SHALL BE REMOVED AND PROPERLY DISPOSED OF.
4. PATCH OPENINGS (AIR TIGHT) IN DUCTS WHICH ARE TO REMAIN ACTIVE AND HAVE HAD A SECTION REMOVED. ALSO REPAIR DUCT INSULATION SO THAT IT IS CONTINUOUS.
5. INFORMATION ON THE DRAWINGS HAS BEEN ASCERTAINED FROM EXISTING DRAWINGS AND FIELD OBSERVATIONS. THIS INFORMATION IS AS ACCURATE AS CONDITIONS WOULD ALLOW. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VISIT THE SITE, PRIOR TO BID, AND BECOME FAMILIAR WITH THE EXTENT OF THE REMODEL WORK REQUIRED. NO EXTRAS WILL BE ALLOWED FOR ALTERATIONS OF A FORESEEABLE NATURE REQUIRED TO ACHIEVE THE END RESULT AS INDICATED BY CONTRACT DOCUMENTS.
6. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO REVIEW THE ENTIRE PROJECT CONSTRUCTION DOCUMENT PACKAGE, PRIOR TO BID, AND BECOME FAMILIAR WITH THE EXTENT OF THE WORK AND COORDINATION REQUIRED. NO EXTRAS WILL BE ALLOWED FOR ALTERATIONS OF A FORESEEABLE NATURE REQUIRED TO ACHIEVE THE END RESULT AS INDICATED BY CONTRACT DOCUMENTS.
7. CONTRACTOR TO SEAL ALL AUDIBLE AND VISIBLE LEAKS ON ALL REUSED SUPPLY DUCTWORK.
8. CONTRACTOR IS TO PROVIDE COMPLETE CONNECTIONS TO ALL NEW AND RELOCATED OWNER FURNISHED EQUIPMENT.
9. ALL PIPING AND DUCTS INDICATED TO BE REMOVED UNDER THIS CONTRACT SHALL BE REMOVED COMPLETELY TO POINTS OF CONNECTION AT THE MAINS OR BRANCHES AND CAPPED OR MAINTAINED FOR REUSE AS SHOWN ON NEW PLAN.
10. WORK UNDER THIS CONTRACT IS IN OCCUPIED SPACES, STORAGE ROOMS AND EQUIPMENT ROOMS. CONTRACTOR IS TO SCHEDULE AND COORDINATE THE WORK AND ANY EXISTING EQUIPMENT DOWNTIME WITH THE OWNER OR PROPERTY MANAGER PRIOR TO BEGINNING WORK.
11. CONTRACTOR SHALL MAKE ARRANGEMENTS FOR PARKING, COORDINATE ANY EQUIPMENT DOWNTIME, AND COORDINATE GENERAL WORK SCHEDULE WITH THE SCHOOL DISTRICT.
12. THE DRAWINGS INDICATE THE GENERAL ARRANGEMENT OF THE EXISTING EQUIPMENT LOCATIONS, EXISTING PIPE ROUTING AND EXISTING DUCT ROUTING. CONTRACTOR IS TO INSTALL NEW EQUIPMENT, DUCTS, AND PIPING IN LOCATIONS REQUIRED TO AVOID INTERFERENCE WITH EXISTING FACILITIES, EQUIPMENT, DUCTS AND PIPING. CONTRACTOR IS RESPONSIBLE FOR RAISING AND LOWERING EXISTING EQUIPMENT AND MAKING PROPER OFFSETS IN DUCTS AND PIPING TO AVOID CONFLICTS.
13. CONTRACTOR SHALL VISIT THE SITE BEFORE SUBMITTING BID, AND VERIFY DIMENSIONS AND EXISTING CONDITIONS RELATED TO THE WORK.
14. ALL CUTTING, PATCHING AND CORE DRILLING FOR THE INSTALLATION OF NEW EQUIPMENT, DUCTS, HANGERS, ETC. SHALL BE HELD TO A MINIMUM AND BE ACCOMPLISHED IN A CAREFUL MANNER. ALL PATCHING SHALL MATCH EXISTING CONSTRUCTION, TEXTURE AND FINISH AND BE DONE BY SKILLED CRAFTSMAN OF THE TRADES INVOLVED AT THE CONTRACTOR'S EXPENSE.
15. CONTRACTOR TO COORDINATE THE LOCATION OF ALL DUCTWORK, CEILING DEVICES, GRILLES, REGISTERS AND DIFFUSERS WITH REFLECTED CEILING PLAN AND STRUCTURE PRIOR TO BEGINNING WORK.
16. DUCT DIMENSIONS GIVEN ARE OUTSIDE SHEET METAL DIMENSIONS.
17. MECHANICAL DRAWINGS ARE DIAGRAMMATIC AND DO NOT NECESSARILY INDICATE EVERY REQUIRED OFFSET, FITTING, ETC. DRAWINGS ARE NOT TO BE SCALED FOR DIMENSIONS. TAKE ALL DIMENSIONS FROM ARCHITECTURAL DRAWINGS, CERTIFIED EQUIPMENT DRAWINGS AND FROM THE STRUCTURE ITSELF BEFORE FABRICATING ANY WORK, VERIFY ALL SPACE REQUIREMENTS COORDINATING WITH OTHER TRADES, AND INSTALL THE SYSTEMS IN THE SPACE PROVIDED WITHOUT EXTRA CHARGES TO THE OWNER.
18. THE OWNER AND ENGINEER ARE NOT RESPONSIBLE FOR THE CONTRACTOR'S SAFETY PRECAUTIONS OR TO MEANS, METHODS, TECHNIQUES, CONSTRUCTION SEQUENCES, OR PROCEDURES REQUIRED TO PERFORM HIS WORK.
19. ALL WORK SHALL BE INSTALLED IN ACCORDANCE WITH ALL APPLICABLE STATE CODES, LOCAL CODES AND OWNER'S STANDARDS INDICATED BY THE CONSTRUCTION DOCUMENTS.
20. ALL EXTERIOR WALL AND ROOF PENETRATIONS SHALL BE SEALED WATERPROOF.
21. ALL MECHANICAL WORK UNDER THIS CONTRACT IS TO FIVE (5) FEET OUTSIDE THE BUILDING.
22. XX-## REFERS TO EQUIPMENT DESIGNATION. SEE SPECIFICATIONS AND EQUIPMENT SCHEDULES FOR FURTHER INFORMATION IN REFERENCE TO THAT DESIGNATED PIECE OF EQUIPMENT.

MECHANICAL/ELECTRICAL EQUIPMENT SCHEDULE

CONTROLS (NOTE B. BELOW) REFERENCES THE "CONTROLS" COLUMN OF THE EQUIPMENT SCHEDULES.

NOTES:

A. SEE SPECIFICATIONS DIVISION 26 "ELECTRICAL EQUIPMENT AND WIRING FOR MECHANICAL DIVISION" FOR FURTHER INFORMATION.

B. CONTROLS: (1) FROM LIGHT SWITCH (2) SEPARATE WALL SWITCH (3) SWITCH WITH PILOT LIGHT (4) RUNS CONTINUOUSLY (5) INTERLOCK TO RUN WITH OTHER EQUIPMENT (6) CONTROLLED BY DIVISION 23 (7) CYCLE FROM REMOTE THERMOSTAT (8) INTERGRAL TO UNIT (9) FIRE ALARM (10) OTHER; SEE REMARKS * CARRIES FULL CURRENT. WIRING DONE BY DIVISION 26 FOR CONTROL. SEE SPECIFICATIONS. ALSO SEE "TEMPERATURE CONTROL" SPECIFICATIONS.

C. MAGNETIC STARTERS TO HAVE MAINTAIN CONTACT UNLESS NOTED. ALL STARTERS BY MECHANICAL UNLESS NOTED TO BE BY ELECTRICAL.

D. MOTORS 1/2 HP AND LESS TO BE 1750 RPM, 115/60/1, MOTORS 3/4 HP AND ABOVE TO BE AS NOTED IN SCHEDULES.

E. THREE PHASE STARTERS ON MOTORS 5 HP OR GREATER TO HAVE PHASE MONITOR CONTROL RELAY, SEE SPECIFICATION.

ABBREVIATIONS

ADA	AMERICANS WITH DISABILITIES ACT	FLA	FULL LOAD AMPS	LF	LINEAR FEET	RH	RELATIVE HUMIDITY
AFF	ABOVE FINISHED FLOOR	FPM	FEET PER MINUTE	LRA	LOCKED ROTOR AMPS	RLA	RUNNING LOAD AMPS
AFG	ABOVE FINISHED GRADE	FPS	FEET PER SECOND	LWT	LEAVING WATER TEMPERATURE	RPM	REVOLUTIONS PER MINUTE
ALT	ALTITUDE	FT	FOOT, FEET, FEET WATER COLUMN	MAX	MAXIMUM	SA	SUPPLY AIR
BHP	BRAKE HORSEPOWER	FU	FIXTURE UNITS	MBH	BTU PER HOUR (THOUSAND)	SENS	SENSIBLE
BTU	BRITISH THERMAL UNIT	GA	GAUGE	MCA	MINIMUM CIRCUIT AMPS	SL	SEA LEVEL
C	COMMON PORT	GAL	GALLONS	MIN	MINIMUM	SP	STATIC PRESSURE
CFM	CUBIC FEET PER MINUTE	GPH	GALLONS PER HOUR	N/A	NOT APPLICABLE	SPEC	SPECIFICATION
SCFM	CFM, STANDARD CONDITIONS	GPM	GALLONS PER MINUTE	N.C.	NORMALLY CLOSED	SQ	SQUARE
CU FT	CUBIC FEET	HD	HEAD	N.O.	NORMALLY OPEN	STD	STANDARD
CU IN	CUBIC INCH	HG	MERCURY	NC	NOISE CRITERIA	TD	TEMPERATURE DIFFERENCE
Cv	COEFFICIENT, VALVE FLOW	HGT	HEIGHT	NIC	NOT IN CONTRACT	TEMP	TEMPERATURE
dB	DECIBEL	HORZ	HORIZONTAL	NO OR #	NUMBER	THRU	THROUGH
DB	DRY BULB	HP	HORSEPOWER	NTS	NOT TO SCALE	TJO	THROUGH JOIST OPENINGS
DCW	DOMESTIC COLD WATER	HR	HOUR(S)	OA	OUTSIDE AIR	TONS	TONS OF REFRIGERATION
DEG OR °	DEGREE	HWC	HOT WATER CIRCULATING (DOMESTIC)	OD	OUTSIDE DIAMETER	TSP	TOTAL STATIC PRESSURE
DHW	DOMESTIC HOT WATER	HZ	HERTZ	%	PERCENT	TSTAT	THERMOSTAT
DIA	DIAMETER	ID	INSIDE DIAMETER	PH OR	PHASE (ELECTRICAL)	TYP	TYPICAL
DN	DOWN	IE	INVERT ELEVATION	PPM	PARTS PER MILLION	V	VOLT
(E)	EXISTING	IJS	IN JOIST SPACE	PRESS	PRESSURE	VAV	VARIABLE AIR VOLUME
EAT	ENTERING AIR TEMP.	IN	INCHES	PSF	POUNDS PER SQUARE FOOT	VEL	VELOCITY
EFF	EFFICIENCY	IN W.C.	INCHES IN INCHES WATER COLUMN	PSI	POUNDS PER SQUARE INCH	VERT	VERTICAL
ELEV	ELEVATION	KW	KILOWATT	PSIA	PSI ABSOLUTE	VOL	VOLUME
ESP	EXTERNAL STATIC PRESSURE	KWH	KILOWATT HOUR	PSIG	PSI GAUGE	W	WATT
EWT	ENTERING WATER TEMP.	LAT	LEAVING AIR TEMPERATURE	RA	RETURN AIR	WB	WET-BULB
EXH	EXHAUST	LBS OR #	POUNDS	RECIRC	RECIRCULATE	WPD	WATER PRESSURE DROP
F	FAHRENHEIT					WT	WEIGHT

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COLORADO LICENSED PROFESSIONAL ENGINEER 41793 3/30/18

PROJECT:

MIDDLE SCHOOL MECHANICAL UPGRADES

39610 Amethyst Drive
Steamboat Springs, CO 80487

OWNER:

Steamboat Springs School District Re-2

325 7th Street
Steamboat Springs, CO 80487

ISSUE:

2018/03/30 Issue for Bidding & Construction

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CHECKED BY:	EJS
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MECHANICAL COVER SHEET

M-000

SHEET OF

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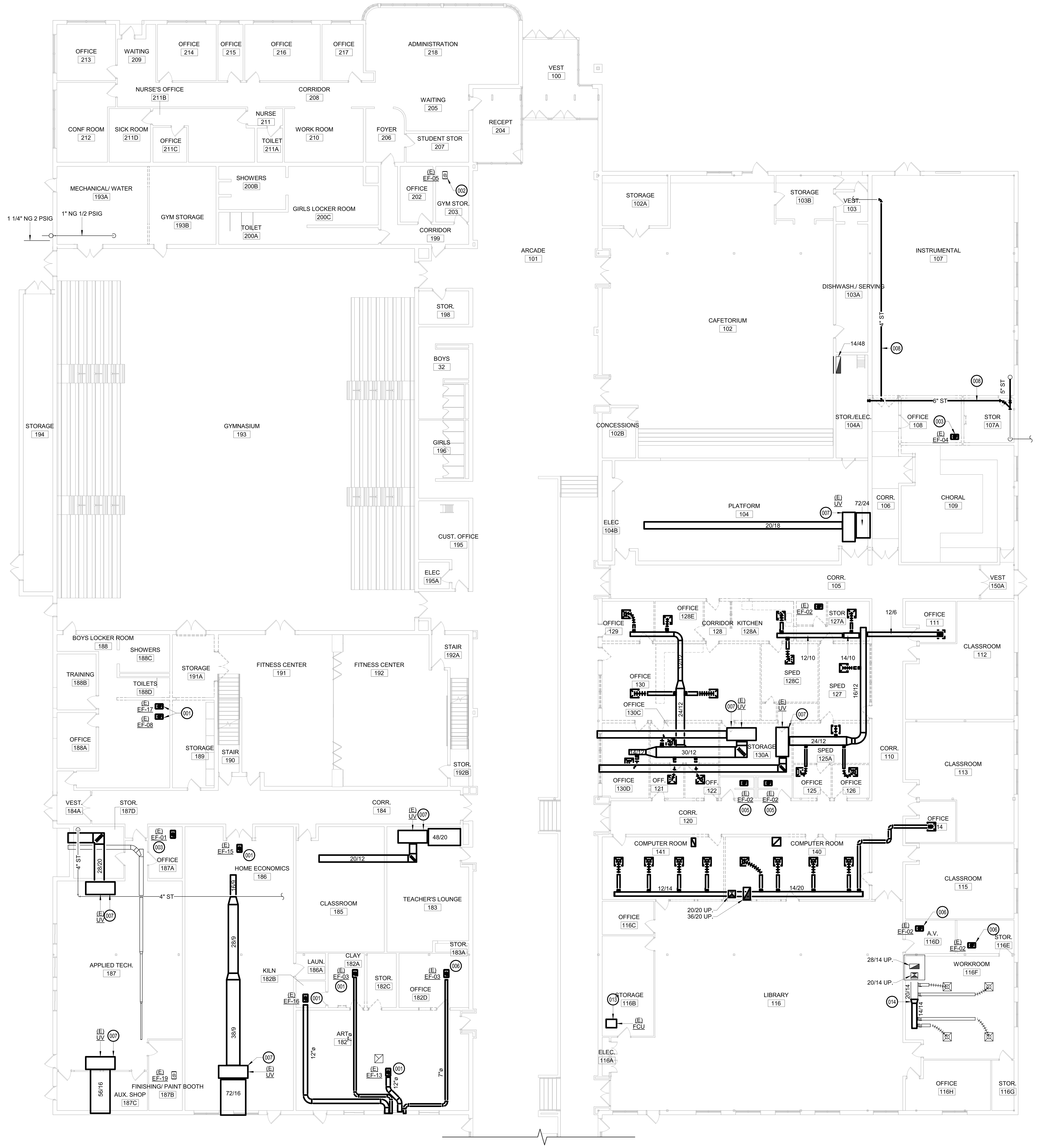
3/30/2018 11:17:11 AM

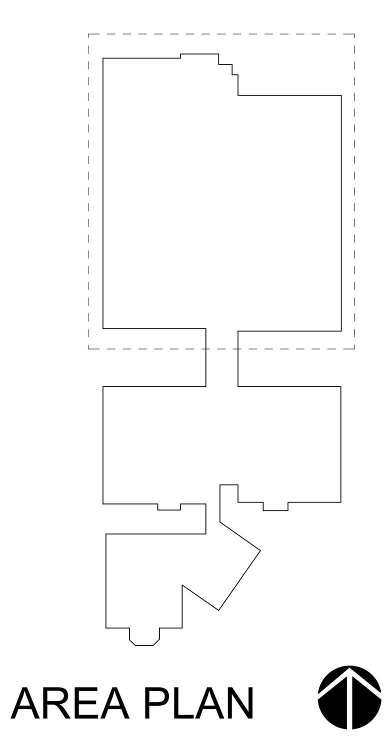


1 FIRST FLOOR MECHANICAL DEMOLITION PLAN - AREA A

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

FLAG NOTES (THIS SHEET)

001	REMOVE EXHAUST FAN AND DUCTWORK FROM FAN TO WALL OR ROOF. RETAIN AND MAINTAIN DUCTWORK FROM FAN TO ROOM TO RECONNECT INTO NEW DUCTWORK GOING TO NEW FAN LOCATED ON ROOF.
002	EXHAUST FAN AND DUCTWORK TO BE MAINTAINED AND REUSED.
003	REMOVE EXHAUST FAN AND ALL DUCTWORK. PATCH EXTERIOR WALL LOUVERS AND PENETRATIONS.
005	REMOVE EXHAUST FAN AND DUCTWORK FROM FAN TO WALL. RETAIN AND MAINTAIN DUCTWORK FROM FAN TO ROOM TO RECONNECT INTO NEW DUCTWORK GOING TO NEW FAN LOCATED ON ROOF.
006	REMOVE EXHAUST FAN AND ALL DUCTWORK. PATCH EXTERIOR WALL LOUVERS AND PENETRATIONS.
007	REMOVE EXISTING UNIT VENTILATOR/ FAN COIL AND ASSOCIATED DUCTWORK, THERMOSTAT, AND OTHER ASSOCIATED COMPONENTS.
008	REMOVE SECTIONS OF EXISTING STORM DRAIN PIPE AND MAINTAIN FOR CONNECTION TO NEW PIPE ROUTING SHOWN ON NEW DRAWINGS.
009	REMOVE ELBOW AND WALL PENETRATION TO UPPER FLOOR MEZZANINE SPACE. OTHER DUCTWORK AND RETURN GRILLE TO SPACE TO BE MAINTAINED FOR RECONNECTION INTO NEW DUCTWORK SHOWN ON NEW PLANS.
013	REMOVE EXISTING FAN COIL SERVING STORAGE/SERVER ROOM AND ASSOCIATED EXTERIOR UNIT.
014	MAINTAIN DUCTWORK FOR RECONNECTION.



AREA PLAN

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COLORADO LICENSED PROFESSIONAL ENGINEER 41793 3/30/18

PROJECT:

MIDDLE SCHOOL MECHANICAL UPGRADES

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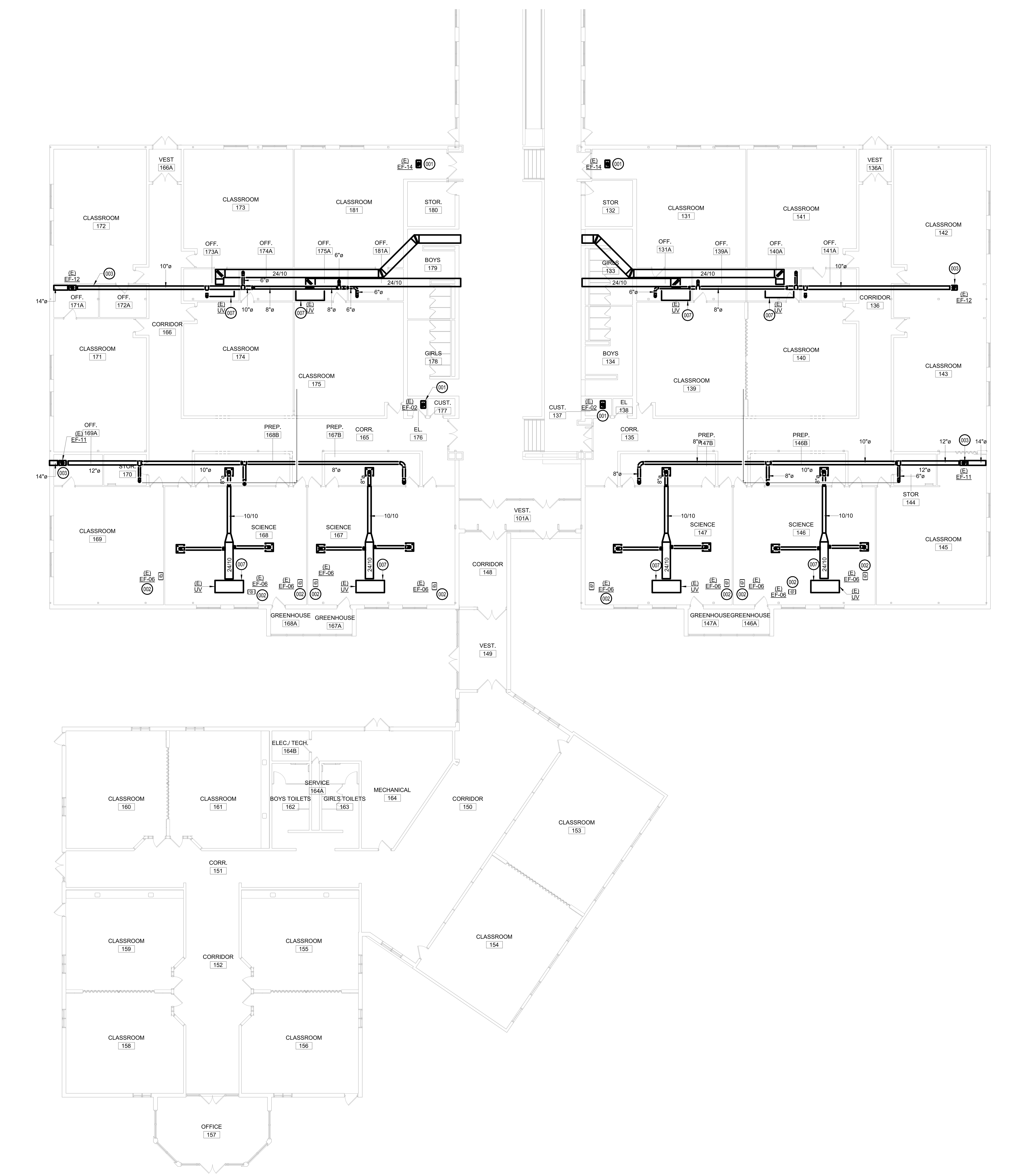
FIRST FLOOR MECHANICAL DEMOLITION PLAN - AREA A

MD111A

SHEET OF

11784.000 MIDDLE SCHOOL MECHANICAL UPGRADES
3/30/2018 11:17:48 AM



FLAG NOTES (THIS SHEET)

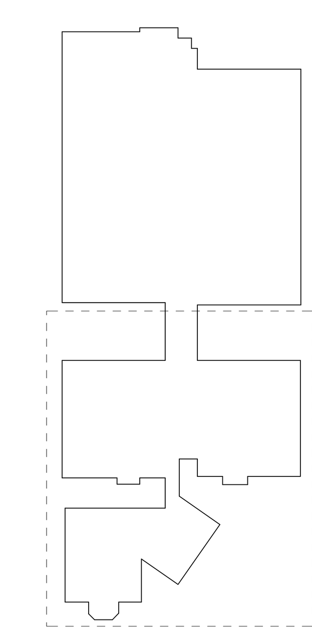
001 REMOVE EXHAUST FAN AND DUCTWORK FROM FAN TO WALL OR ROOF. RETAIN AND MAINTAIN DUCTWORK FROM FAN TO ROOM TO RECONNECT INTO NEW DUCTWORK GOING TO NEW FAN LOCATED ON ROOF.

002 EXHAUST FAN AND DUCTWORK TO BE MAINTAINED AND REUSED.

003 REMOVE EXHAUST FAN AND ALL DUCTWORK. PATCH EXTERIOR WALL LOUVERS AND PENETRATIONS.

007 REMOVE EXISTING UNIT VENTILATOR/ FAN COIL AND ASSOCIATED DUCTWORK, THERMOSTAT, AND OTHER ASSOCIATED COMPONENTS.

1 **FIRST FLOOR MECHANICAL DEMOLITION PLAN - AREA B**
SCALE: 3/32" = 1'-0"



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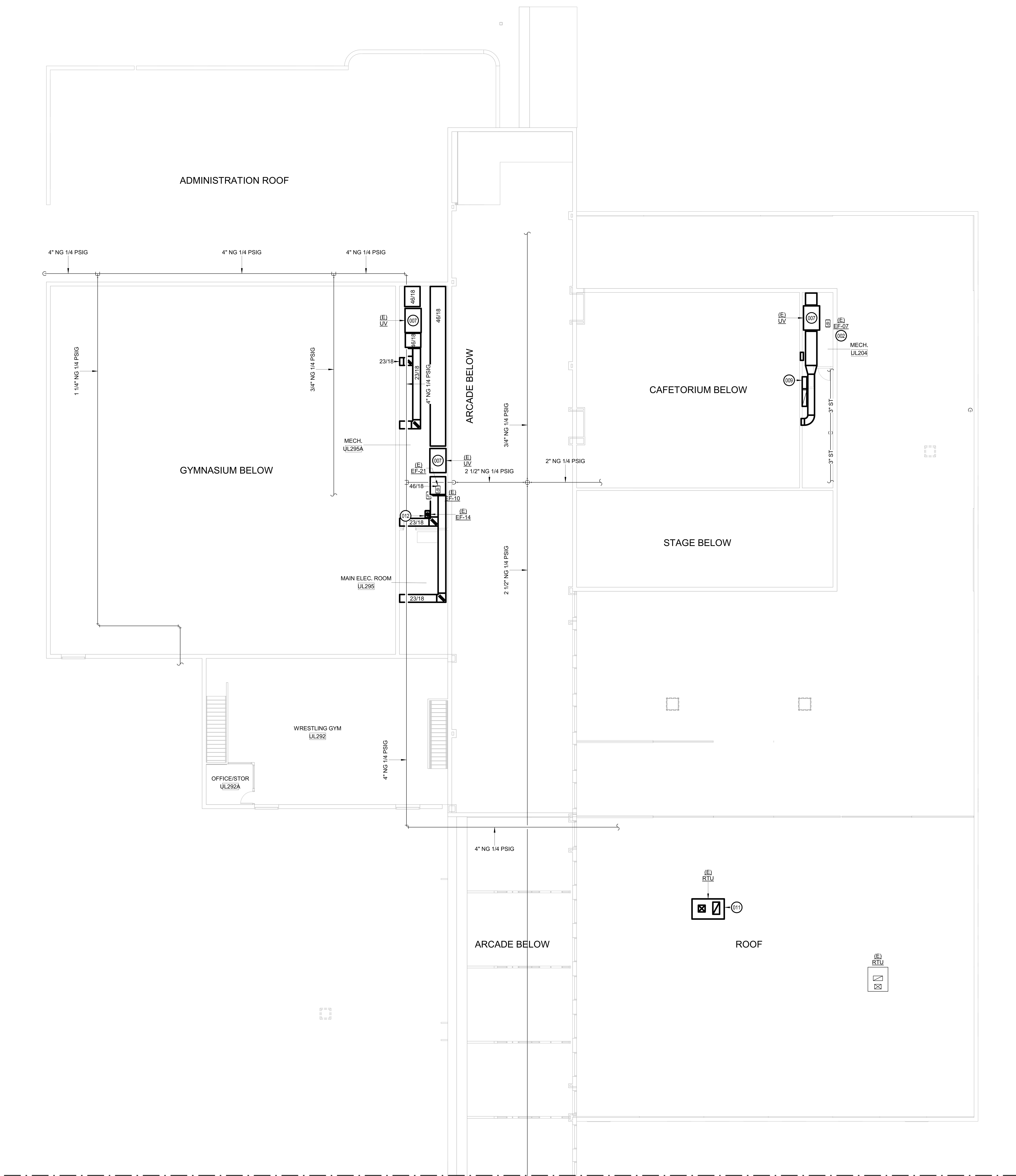
FIRST FLOOR MECHANICAL DEMOLITION PLAN - AREA B

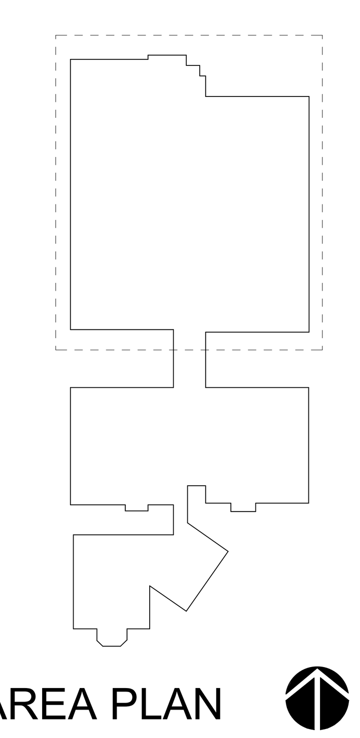
MD111B
SHEET OF



1 SECOND FLOOR/ROOF MECHANICAL DEMOLITION PLAN - AREA B
SCALE: 3/32" = 1'-0"

FLAG NOTES (THIS SHEET)

002	EXHAUST FAN AND DUCTWORK TO BE MAINTAINED AND REUSED.
007	REMOVE EXISTING UNIT VENTILATOR/ FAN COIL AND ASSOCIATED DUCTWORK, THERMOSTAT, AND OTHER ASSOCIATED COMPONENTS.
009	REMOVE ELBOW AND WALL PENETRATION TO UPPER FLOOR MEZZANINE SPACE. OTHER DUCTWORK AND RETURN GRILLE TO SPACE TO BE MAINTAINED FOR RECONNECTION INTO NEW DUCTWORK SHOWN ON NEW PLANS.
011	EXISTING ROOFTOP UNIT TO BE REMOVED. REMOVE GAS PIPING FROM UNIT BACK TO PIPING MAIN.
012	REMOVE EXHAUST FAN AND MAINTAIN DUCTWORK FOR NEW FAN BEING PROVIDED. SEE NEW DRAWINGS.



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COLORADO LICENSED 41793 3/30/18 PROFESSIONAL ENGINEER

PROJECT:
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Steamboat Springs, CO 80487

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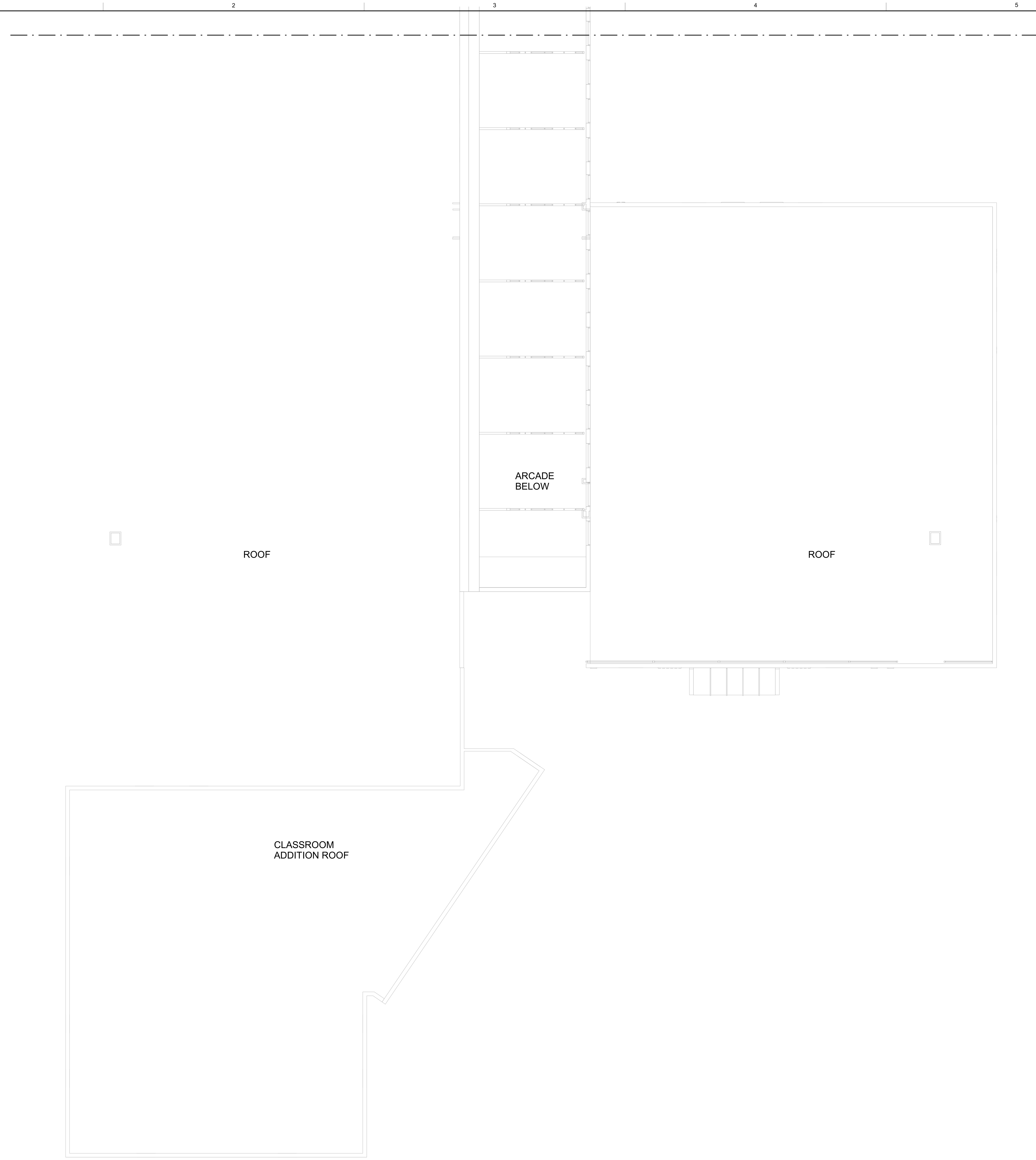
SECOND FLOOR/ ROOF MECHANICAL DEMOLITION PLAN - AREA A

MD112A

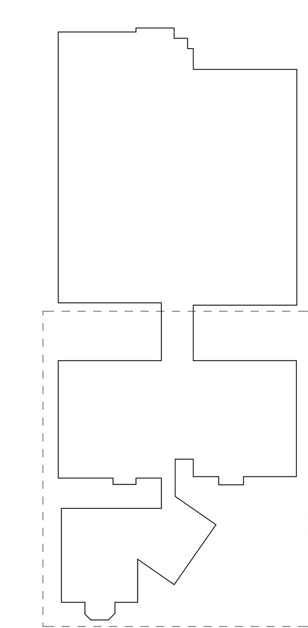
SHEET OF

11784.000 MIDDLE SCHOOL MECHANICAL UPGRADES
3/30/2018 11:17:52 AM

FLAG NOTES (THIS SHEET)



1 **ROOF MECHANICAL DEMOLITION PLAN - AREA B**
SCALE: 3/32" = 1'-0"



AREA PLAN

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COLORADO LICENSED PROFESSIONAL ENGINEER 41793 3/30/18

PROJECT:

MIDDLE SCHOOL MECHANICAL UPGRADES

39610 Amethyst Drive
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Steamboat Springs School District Re-2

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ROOF MECHANICAL DEMOLITION PLAN - AREA B

MD131B

SHEET OF

11784.000 MIDDLE SCHOOL MECHANICAL UPGRADES
3/30/2018 11:17:53 AM

FLAG NOTES (THIS SHEET)

100 ROUND DUCT TAKE-OFF. SEE DETAIL. TYPICAL.

101 RETURN AIR GRILLE WITH SOUND BOOT. SEE DETAIL. TYPICAL.

102 TRANSFER AIR DUCT. SEE Z DUCT DETAIL. TYPICAL.

103 45 DEGREE RECTANGULAR TAKEOFF. SEE DETAIL. TYPICAL.

106 SHIFT DUCTWORK UP IN STRUCTURE BRIEFLY TO COORDINATE AROUND EXISTING ROOF DRAIN TO REMAIN.

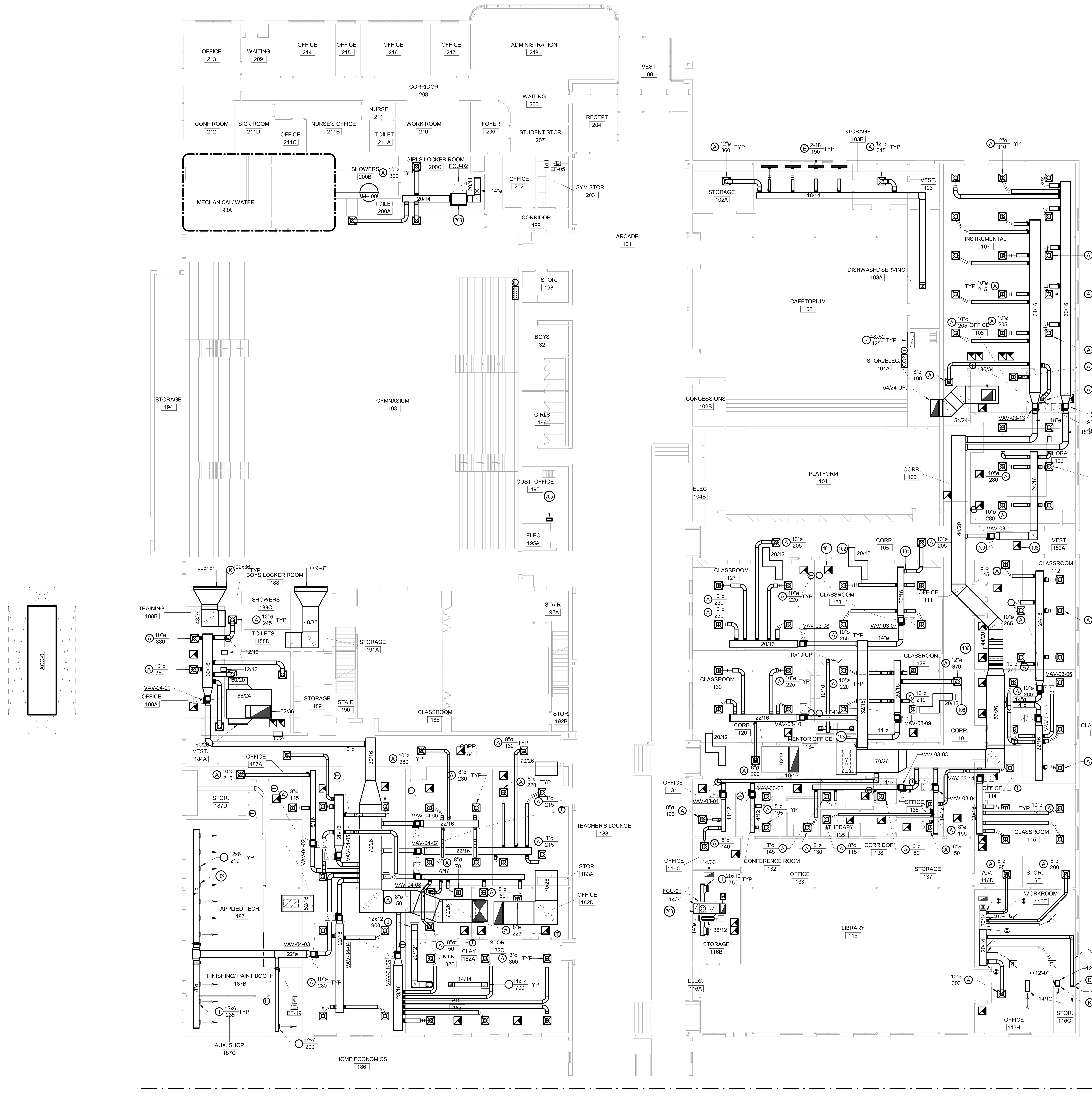
108 SUPPLY DIFFUSER OR RETURN GRILLE IN FIRE RATED CORRIDOR CEILING TO BE PROVIDED WITH DIFFUSER/GRILLE FIRE RADIATION DAMPER ACCESSORY. TYPICAL ALL CEILING DEVICES IN CORRIDOR.

109 DUCT MOUNTED DIFFUSERS IN THIS ROOM TO BE POINTED DIRECTLY OUT AT 0 DEGREES FROM HORIZONTAL.

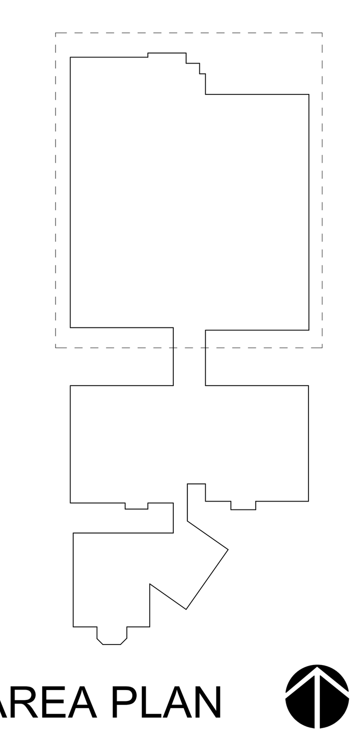
700 VAV-#-# MAINTAIN CLEARANCE OF 3' TO ACCESS UNIT. CLEARANCE SHOWN AS DASHED LINE. MOUNT ABOVE AREAS WITH CEILING TILE ONLY UNLESS SPECIFICALLY CALLED OUT TO HAVE AN ACCESS PANEL. COORDINATE WITH ARCHITECTURAL CEILING PLANS. DUCT AND PIPE CONNECTION SIZES IN VAV SCHEDULE.

703 FAN COIL UNIT, FCU-#. SEE SCHEDULE. ROUTE CONDENSATE DRAIN FROM UNIT TO LOCATION OF EXISTING FAN COIL UNIT CONDENSATE DRAIN. MAINTAIN CLEARANCES FROM EXISTING IDF ROOM EQUIPMENT. PROVIDE TYPE K RETURN GRILLE DUCTED TO RETURN DUCT ON UNIT AND OUTSIDE AIR DUCT DUCTED FROM INTAKE HOOD ABOVE AS SHOWN ON PLANS.

705 PROVIDE REMOTE ALARM PANELS FOR EACH CARBON MONOXIDE SENSOR AT THIS LOCATION.



1 **FIRST FLOOR MECHANICAL PLAN - AREA A**
SCALE: 3/32" = 1'-0"



AREA PLAN

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CONSULTANT:
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COLORADO LICENSED PROFESSIONAL ENGINEER 41793 3/30/18

PROJECT:
MIDDLE SCHOOL MECHANICAL UPGRADES
39610 Amethyst Drive
Steamboat Springs, CO 80487

OWNER:
Steamboat Springs School District Re-2
325 7th Street
Steamboat Springs, CO 80487

ISSUE:
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DRAWING INFORMATION:

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CHECKED BY:	EJS
APPROVED BY:	EJS

SHEET TITLE:
FIRST FLOOR MECHANICAL PLAN - AREA A

M-111A
SHEET OF

11784.000 MIDDLE SCHOOL MECHANICAL UPGRADES
3/30/2018 11:17:19 AM

FLAG NOTES (THIS SHEET)

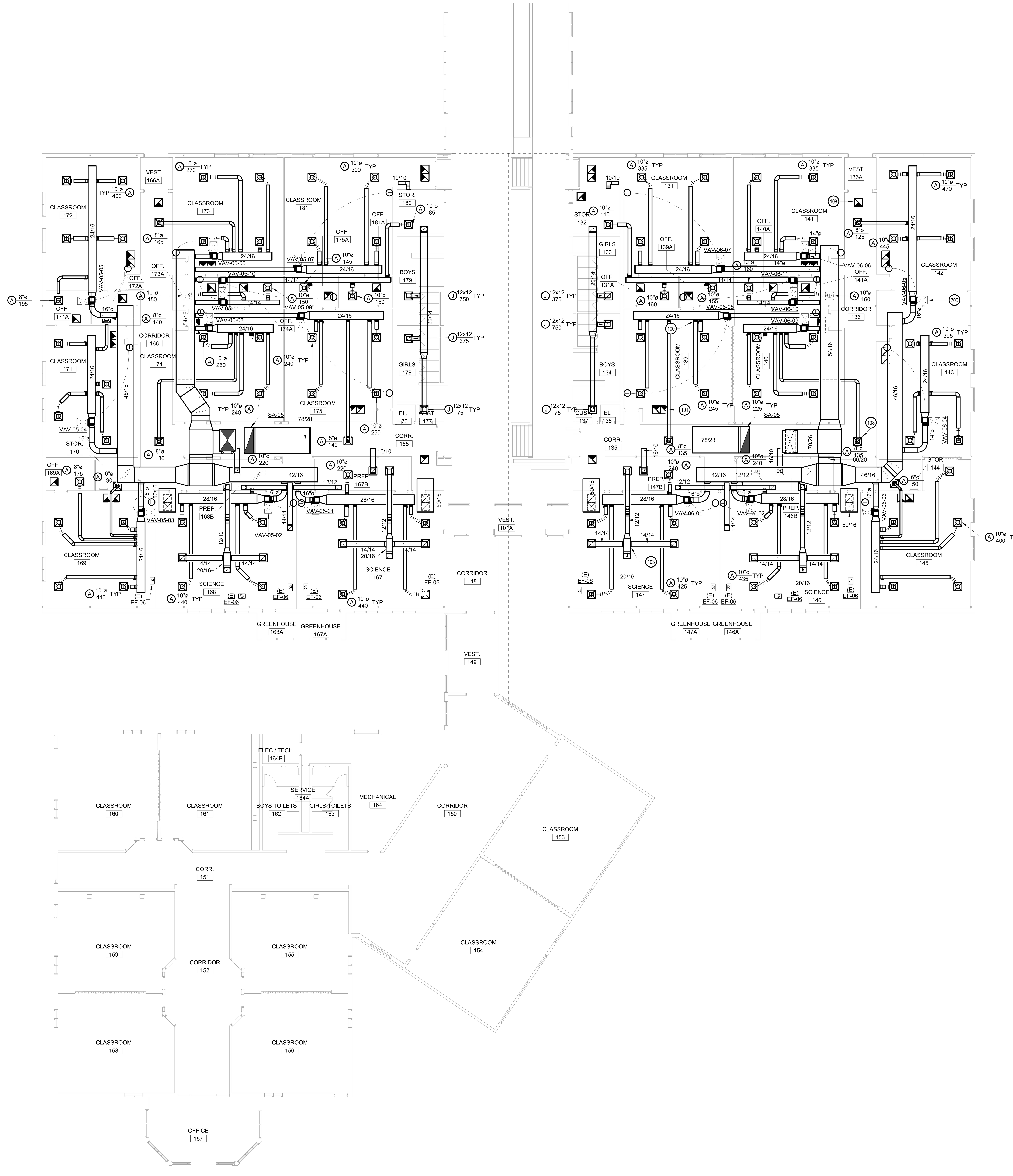
100 ROUND DUCT TAKE-OFF. SEE DETAIL. TYPICAL.

101 RETURN AIR GRILLE WITH SOUND BOOT. SEE DETAIL. TYPICAL.

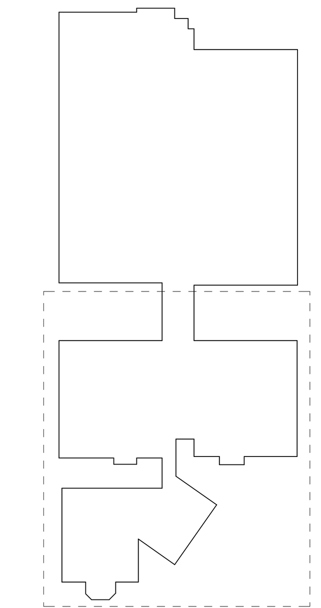
103 45 DEGREE RECTANGULAR TAKEOFF. SEE DETAIL. TYPICAL.

108 SUPPLY DIFFUSER OR RETURN GRILLE IN FIRE RATED CORRIDOR CEILING TO BE PROVIDED WITH DIFFUSER/GRILLE FIRE RADIATION DAMPER ACCESSORY. TYPICAL ALL CEILING DEVICES IN CORRIDOR.

700 VAV-#-# MAINTAIN CLEARANCE OF 3' TO ACCESS UNIT. CLEARANCE SHOWN AS DASHED LINE. MOUNT ABOVE AREAS WITH CEILING TILE ONLY UNLESS SPECIFICALLY CALLED OUT TO HAVE AN ACCESS PANEL. COORDINATE WITH ARCHITECTURAL CEILING PLANS. DUCT AND PIPE CONNECTION SIZES IN VAV SCHEDULE.



1 FIRST FLOOR MECHANICAL PLAN - AREA B
SCALE: 3/32" = 1'-0"



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SHEET TITLE:

FIRST FLOOR MECHANICAL PLAN - AREA B

M-111B

SHEET OF

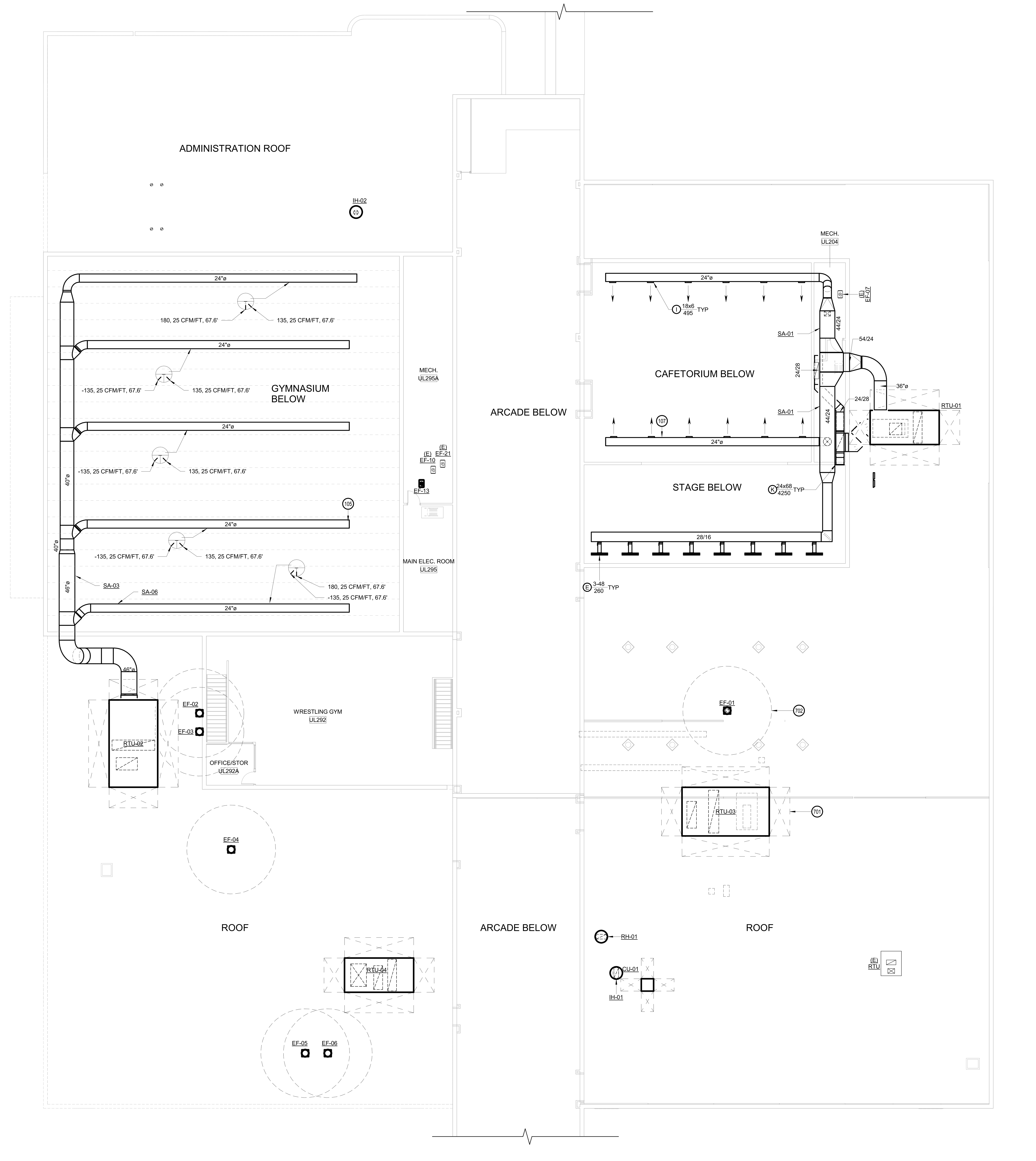
11784.000 MIDDLE SCHOOL MECHANICAL UPGRADES
3/30/2018 11:17:23 AM

FLAG NOTES (THIS SHEET)

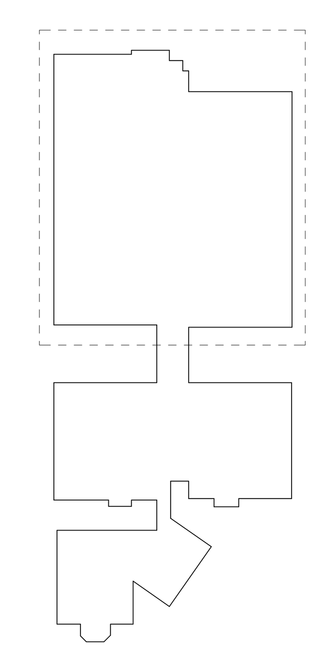
105 GYM DUCTWORK TO ALL BE FABRIC DUCTWORK WITH LINEAR VENTING AS SHOWN ON ROUND RUN OUTS FROM THE MAIN ALONG THE WEST SIDE OF THE GYM. SEE FABRIC DISPERSION DETAIL FOR ANGLED VENTING. DOTTED LINES NOTATE EXISTING STRUCTURAL JOISTS. DUCTS TO GO BELOW STRUCTURE AT THE LOCATIONS INDICATED. TYPICAL.

701 RTU-# ROOFTOP UNIT. SEE SCHEDULE AND TWO-WAY COIL DETAIL UNLESS OTHERWISE NOTED. ALL PIPING TO BE INTERIOR TO UNIT. SEE SCHEDULE FOR PIPING CONNECTION. TRANSITION FROM DUCT SIZE SHOWN ON DRAWINGS TO ROOFTOP CONNECTION SIZE AS NECESSARY. ROOFTOP UNITS TO HAVE PLENUM CURB FOR RETURN PATH. CURB MANUFACTURER TO COORDINATE UNIT OPENING, CURB STRUCTURE, AND ROOF PENETRATION. TYPICAL.

702 EF-# EXHAUST FAN. SEE SCHEDULE. MAINTAIN 10'-0" CLEARANCE FROM ALL ROOF EDGES AND OUTSIDE AIR INTAKES. DASHED LINE REPRESENTS CLEARANCE. SEE SPECIFICATIONS FOR MOUNTING INSTRUCTIONS. TYPICAL.



1 **SECOND FLOOR/ROOF MECHANICAL PLAN - AREA A**
SCALE: 3/32" = 1'-0"



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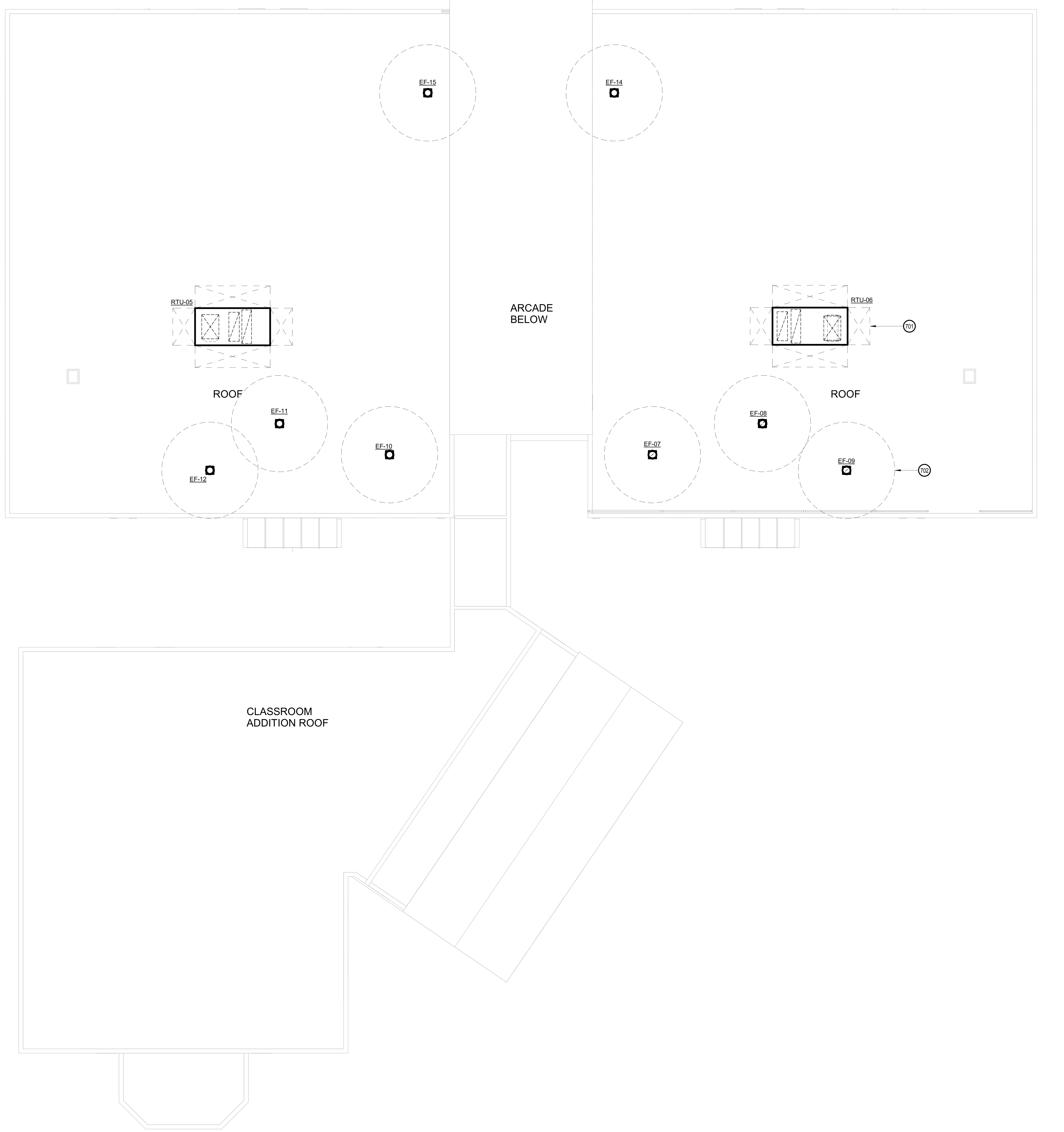
SHEET TITLE:

SECOND FLOOR/ROOF MECHANCIAL PLAN - AREA A

M-112A

SHEET OF

11784.000 MIDDLE SCHOOL MECHANICAL UPGRADES
3/30/2018 11:17:24 AM

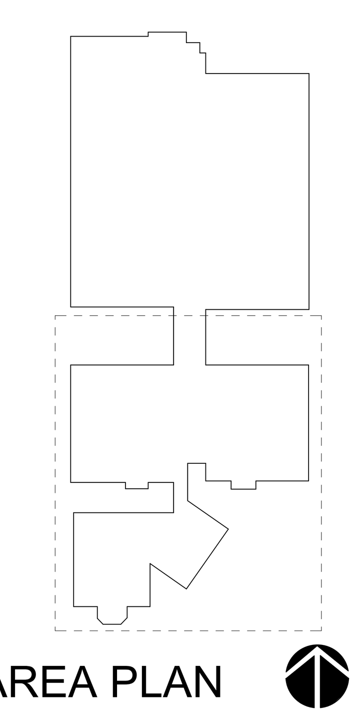


FLAG NOTES (THIS SHEET)

701 RTU-# ROOFTOP UNIT. SEE SCHEDULE AND TWO-WAY COIL DETAIL UNLESS OTHERWISE NOTED. ALL PIPING TO BE INTERIOR TO UNIT. SEE SCHEDULE FOR PIPING CONNECTION. TRANSITION FROM DUCT SIZE SHOWN ON DRAWINGS TO ROOFTOP CONNECTION SIZE AS NECESSARY. ROOFTOP UNITS TO HAVE PLENUM CURB FOR RETURN PATH. CURB MANUFACTURER TO COORDINATE UNIT OPENING, CURB STRUCTURE, AND ROOF PENETRATION. TYPICAL.

702 EF-# EXHAUST FAN. SEE SCHEDULE. MAINTAIN 10'-0" CLEARANCE FROM ALL ROOF EDGES AND OUTSIDE AIR INTAKES. DASHED LINE REPRESENTS CLEARANCE. SEE SPECIFICATIONS FOR MOUNTING INSTRUCTIONS. TYPICAL.

1 **ROOF MECHANICAL PLAN - AREA B**
SCALE: 3/32" = 1'-0"



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SHEET TITLE:
ROOF MECHANICAL PLAN - AREA B

M-131B

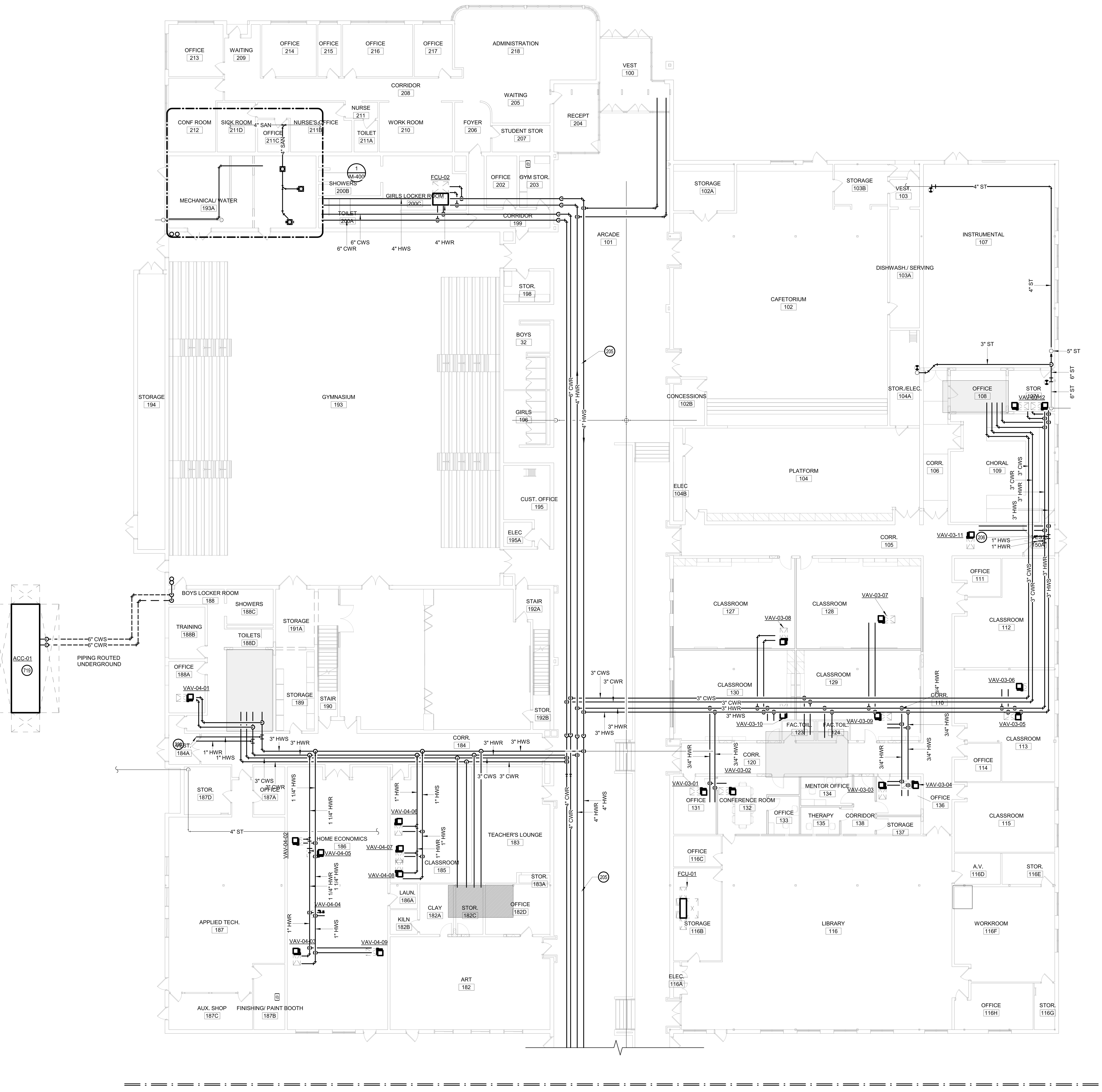
SHEET OF

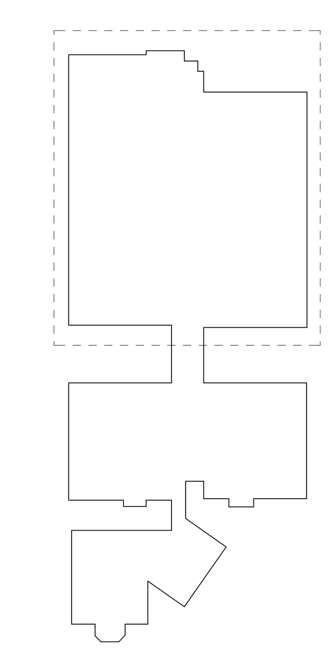
FLAG NOTES (THIS SHEET)

205 SUPPORT PIPING FROM STRUCTURE, PROVIDE INTERMEDIATE PIPING SUPPORT RACKS OFF THE WALL.

206 PROVIDE 1" HWS/R PIPING TO FUTURE HEATER IN VESTIBULE. PROVIDE WITH BALL VALVES AND CAP.

719 AIR COOLED CHILLER, ACC-#. REFER TO CHILLED WATER SCHEMATIC ON TEMPERATURE CONTROLS DRAWINGS AND SCHEDULE. PIPING EXTERIOR TO THE BUILDING TO BE ROUTED UNDERGROUND UNTIL ROUTED INTO THE BUILDING AS SHOWN. DEPTH TO BE A MINIMUM OF 4' BELOW GRADE.





AREA PLAN

1 FIRST FLOOR PIPING PLAN - AREA A

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

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PROJECT:

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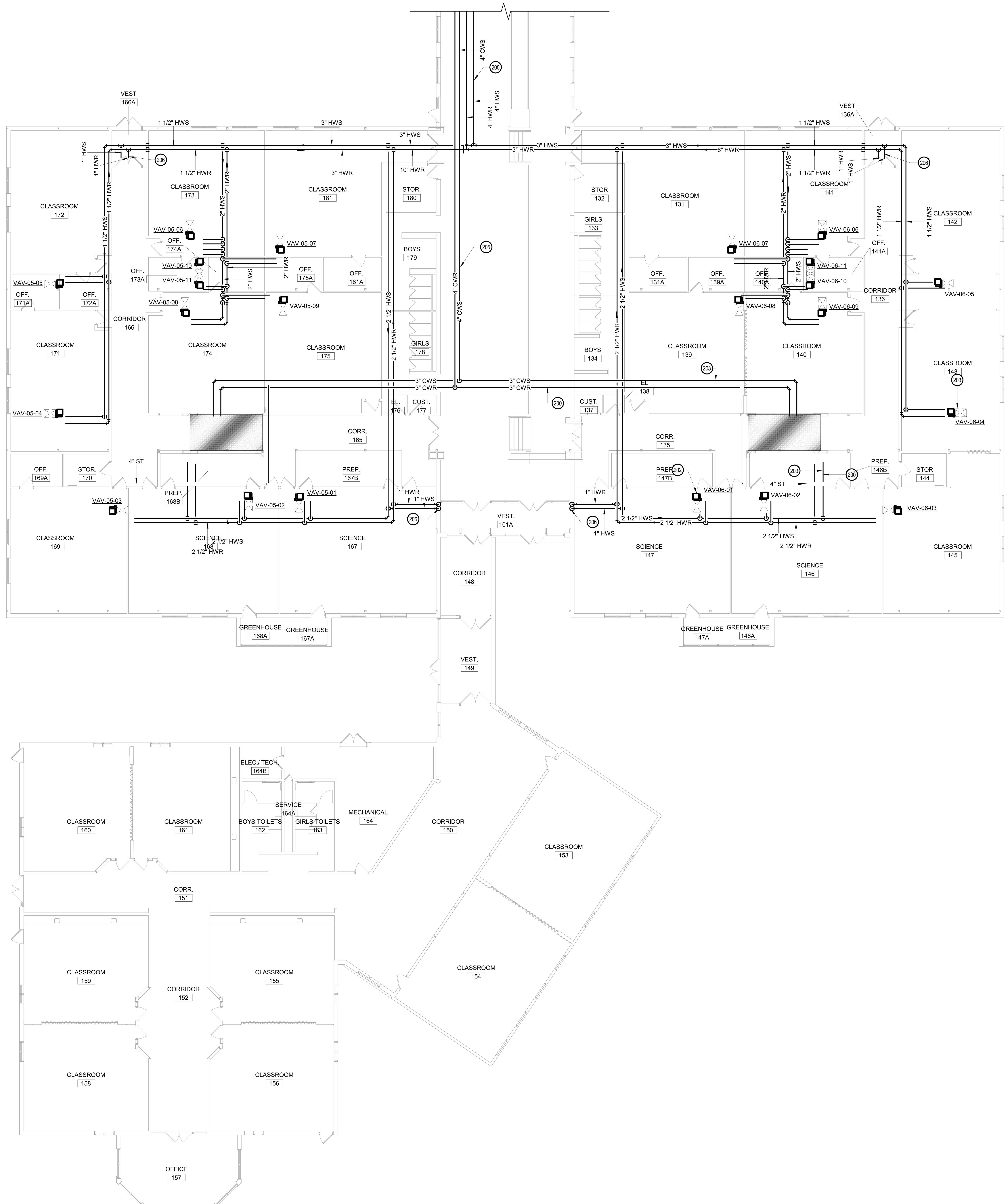
FIRST FLOOR PIPING PLAN - AREA A

M-211A

SHEET OF

11784.000 MIDDLE SCHOOL MECHANICAL UPGRADES
3/30/2018 11:17:33 AM



FLAG NOTES (THIS SHEET)

200 PROVIDE ISOLATION AND DRAIN VALVES AT THE BASE OF THE PIPING TAKEOFFS TO ALL RTU'S

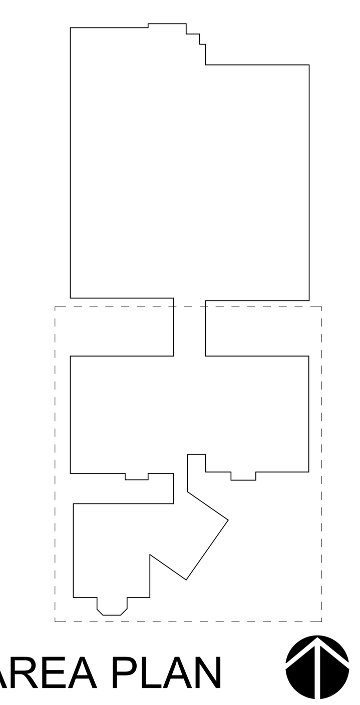
202 PROVIDE EQUIPMENT PIPING PER TWO WAY COIL DETAIL. TYPICAL.

203 PROVIDE EQUIPMENT PIPING PER THREE WAY COIL DETAIL.

205 SUPPORT PIPING FROM STRUCTURE. PROVIDE INTERMEDIATE PIPING SUPPORT RACKS OFF THE WALL.

206 PROVIDE 1" HWS/R PIPING TO FUTURE HEATER IN VESTIBULE. PROVIDE WITH BALL VALVES AND CAP.

1 **FIRST FLOOR PIPING PLAN - AREA B**
SCALE: 3/32" = 1'-0"



AREA PLAN

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SHEET TITLE:

FIRST FLOOR PIPING PLAN - AREA B

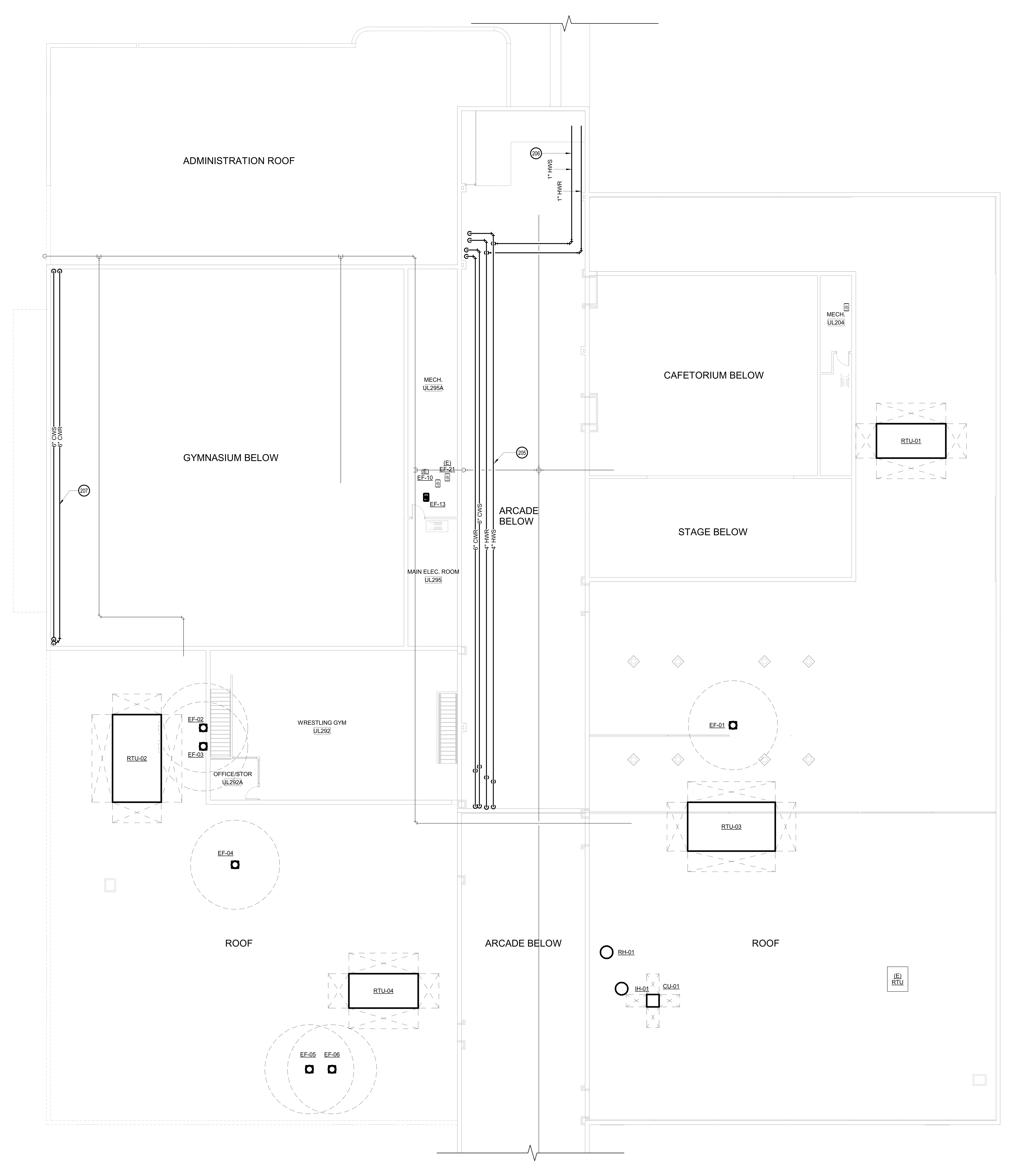
M-211B

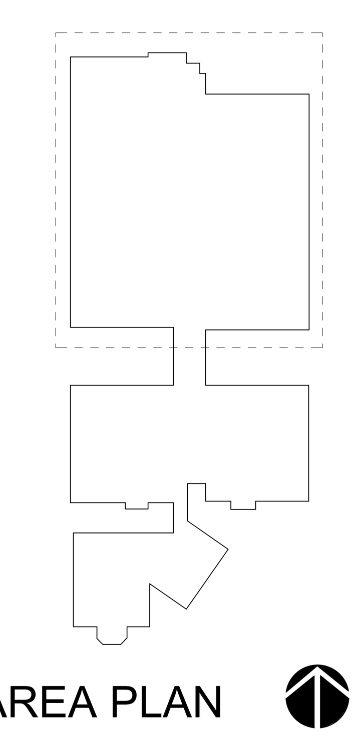
SHEET OF

11784.000 MIDDLE SCHOOL MECHANICAL UPGRADES
3/30/2018 11:17:35 AM

FLAG NOTES (THIS SHEET)

205	SUPPORT PIPING FROM STRUCTURE. PROVIDE INTERMEDIATE PIPING SUPPORT RACKS OFF THE WALL.
206	PROVIDE 1" HWS/R PIPING TO FUTURE HEATER IN VESTIBULE. PROVIDE WITH BALL VALVES AND CAP.
207	PROVIDE PIPING WITHIN STRUCTURE.





AREA PLAN

1 **SECOND FLOOR/ROOF PIPING PLAN - AREA A**
SCALE: 3/32" = 1'-0"

11784.000 MIDDLE SCHOOL MECHANICAL UPGRADES
3/30/2018 11:17:37 AM

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COLORADO LICENSED 41793 3/30/18 PROFESSIONAL ENGINEER

PROJECT:
MIDDLE SCHOOL MECHANICAL UPGRADES
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Steamboat Springs, CO 80487

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325 7th Street
Steamboat Springs, CO 80487

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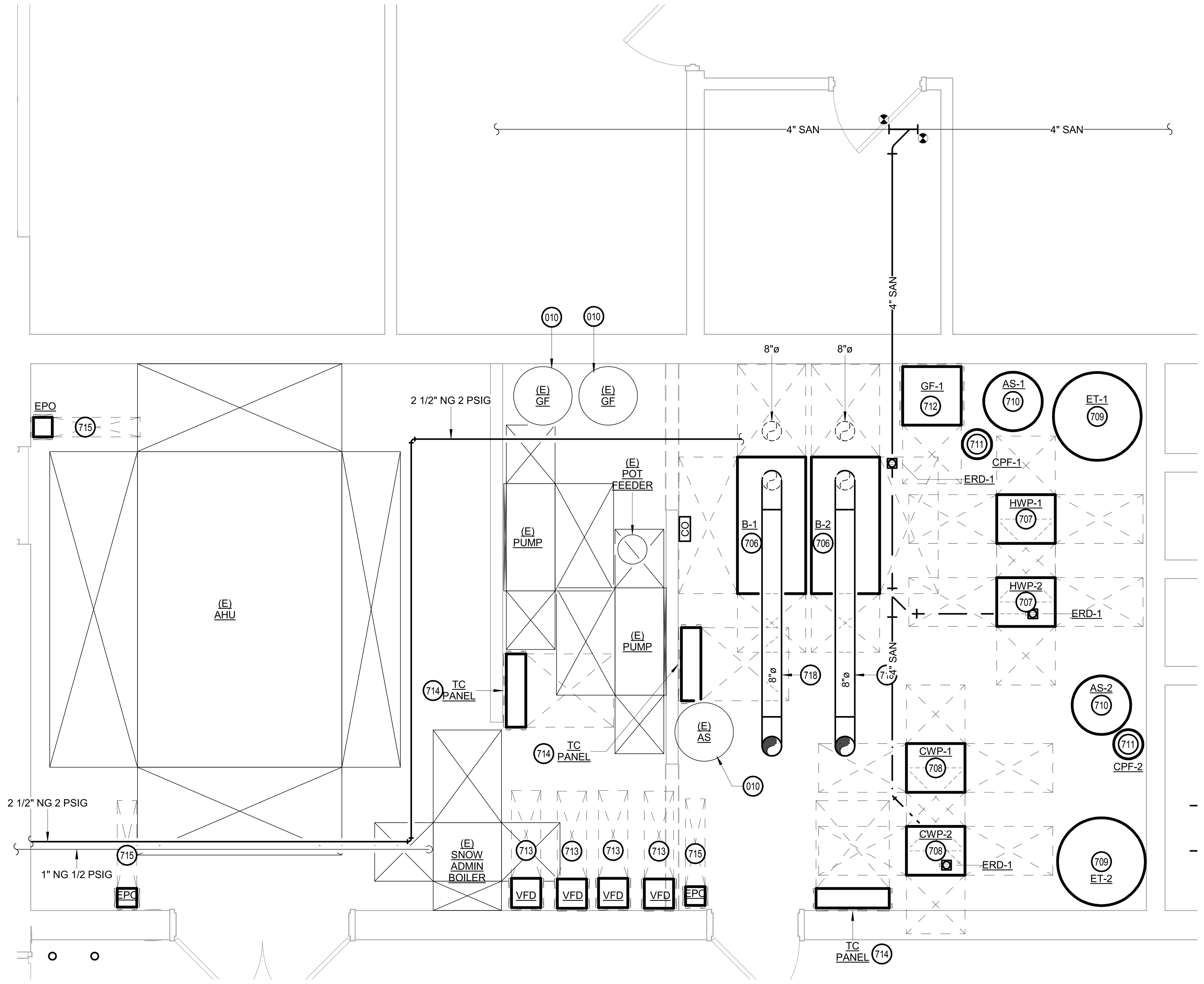
SHEET TITLE:
SECOND FLOOR/ROOF PIPING PLAN - AREA A

M-212A

SHEET OF



1 ENLARGED MECHANICAL ROOM

SCALE: 3/8" = 1'-0"

FLAG NOTES (THIS SHEET)

010 EXISTING MECHANICAL EQUIPMENT ON WALL WITH NEW OPENINGS BEING PLACED TO BE RELOCATED TO THIS LOCATION. MODIFY PIPING AS REQUIRED TO ACHIEVE RELOCATED LOCATION.

706 B-#. CONDENSING BOILER. SEE BOILER PIPING DETAIL AND SCHEDULE. MAINTAIN ALL BOILER CLEARANCES. ROUTE FLUE AND INTAKE PIPING TO ROOF PER MANUFACTURER'S WRITTEN INSTRUCTIONS. BCP-#. BOILER CIRCULATING PUMP. SEE INLINE PUMP DETAIL AND SCHEDULE. REFER TO HEATING WATER SCHEMATIC ON TEMPERATURE CONTROLS DRAWINGS.

707 HWP-#. INLINE PUMP. SEE INLINE PUMP DETAIL AND SCHEDULE. REFER TO HEATING WATER SCHEMATIC ON TEMPERATURE CONTROLS DRAWINGS.

708 CWP-#. INLINE PUMP. SEE INLINE PUMP DETAIL AND SCHEDULE. REFER TO CHILLED WATER SCHEMATIC ON TEMPERATURE CONTROLS DRAWINGS.

709 ET-#. EXPANSION TANK. SEE SCHEDULE AND DETAIL. REFER TO HEATING OR CHILLED WATER SCHEMATIC ON TEMPERATURE CONTROLS DRAWINGS.

710 AS-#. AIR SEPARATOR. SEE DETAIL. REFER TO HEATING OR CHILLED WATER SCHEMATIC ON TEMPERATURE CONTROLS DRAWINGS.

711 CPF-#. CHEMICAL POT FEEDER. SEE DETAIL. REFER TO HEATING OR CHILLED WATER SCHEMATIC ON TEMPERATURE CONTROLS DRAWINGS.

712 GF-#. GLYCOL FEEDER. SEE DETAIL. REFER TO HEATING WATER SCHEMATIC ON TEMPERATURE CONTROLS DRAWINGS.

713 VFD-# VARIABLE FREQUENCY DRIVE FOR THE PUMPS. MAINTAIN ALL REQUIRED CLEARANCES.

714 TEMPERATURE CONTROL PANEL. MAINTAIN ALL REQUIRED CLEARANCES.

715 EPO. EMERGENCY POWER OFF FOR THE BOILERS. MAINTAIN ALL REQUIRED CLEARANCES.

718 COMBUSTION AIR AND FLUE PIPING. ROUTE, SIZE, AND TERMINATE PER MANUFACTURER'S WRITTEN INSTRUCTIONS. MATERIAL OF EACH TO BE PROVIDED PER MANUFACTURER'S WRITTEN INSTRUCTIONS. BASIS OF DESIGN SHOWN ON FLOOR PLAN AND BOILER SCHEDULE.

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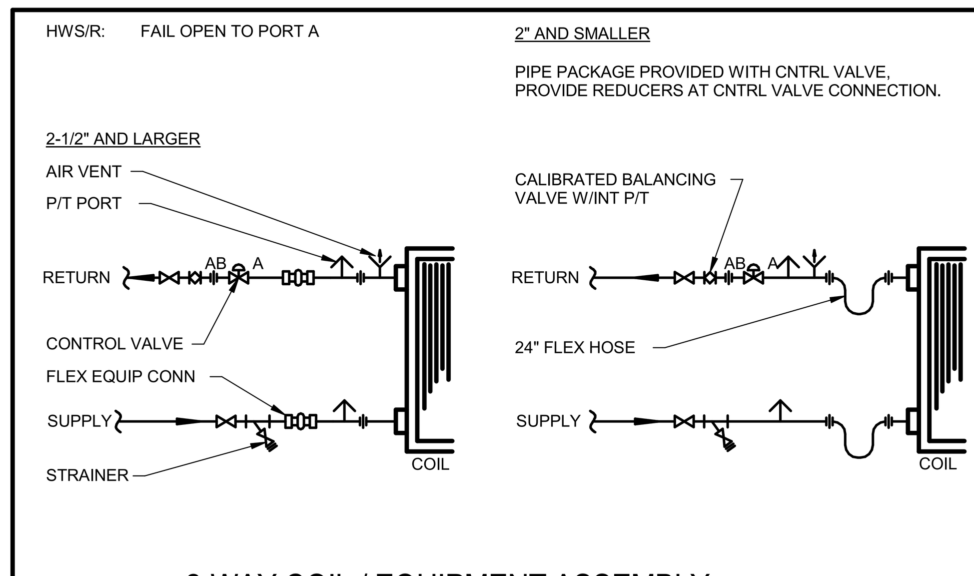
SHEET TITLE:

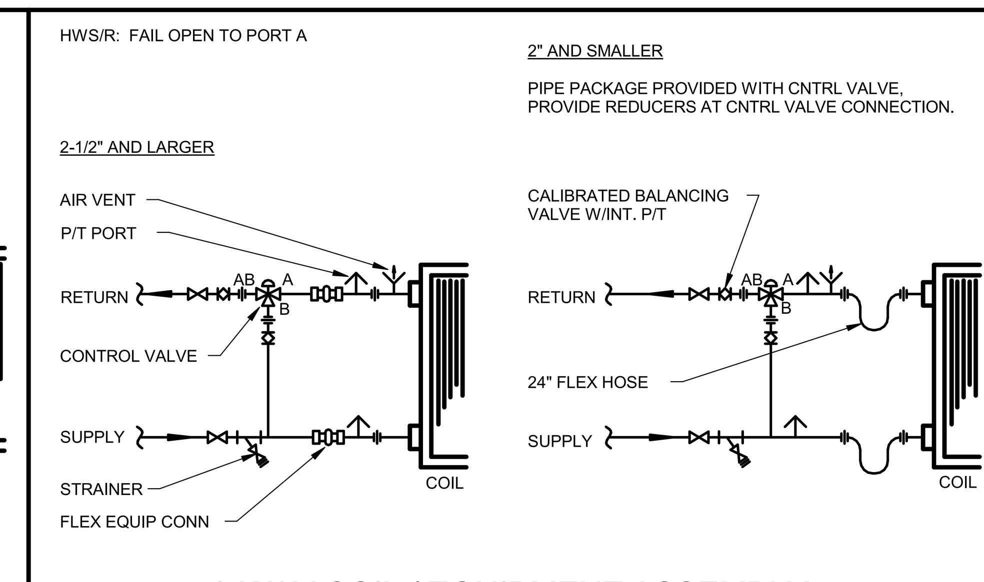
MECHANICAL ENLARGED PLAN

M-400

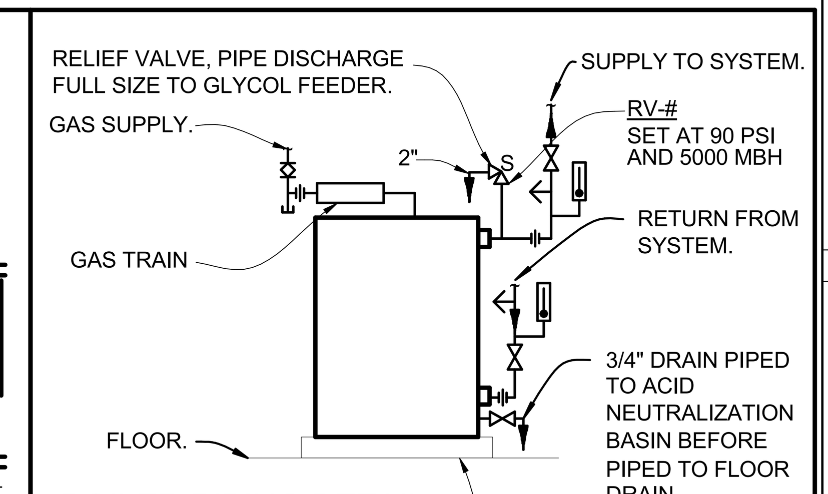
SHEET OF



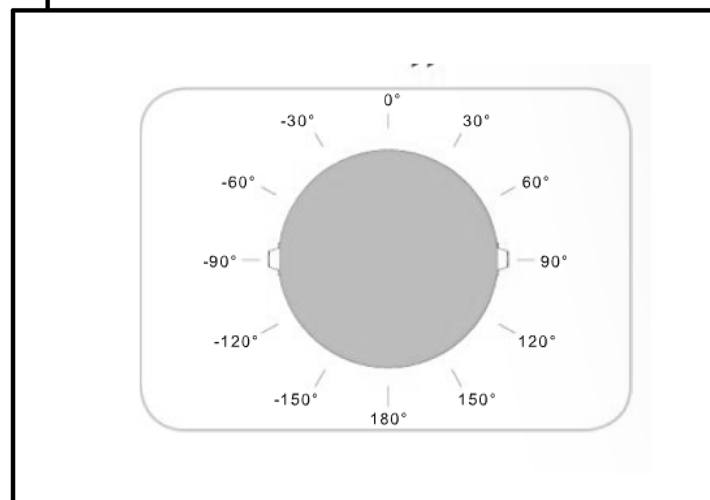
2-WAY COIL / EQUIPMENT ASSEMBLY
NO SCALE



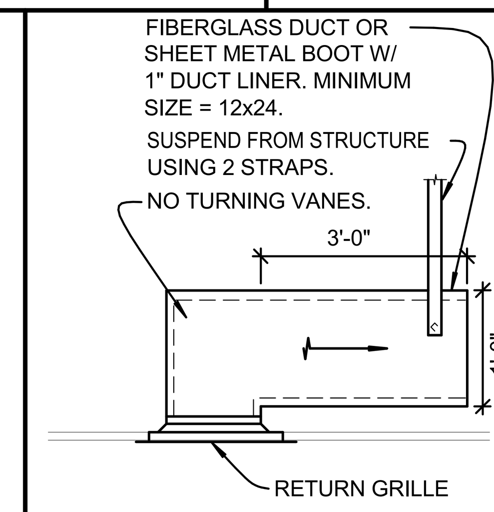
3-WAY COIL / EQUIPMENT ASSEMBLY
NO SCALE



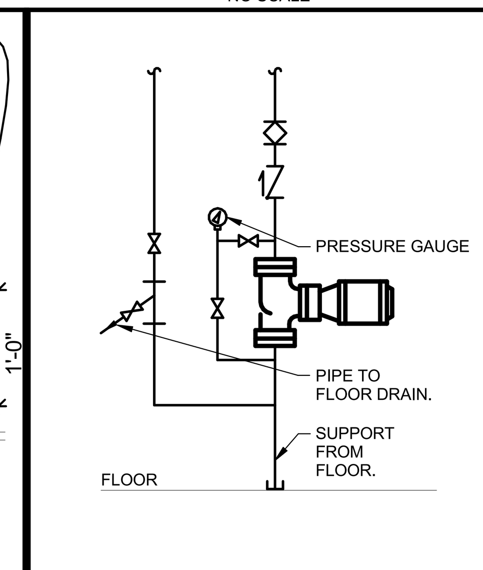
BOILER PIPING DETAIL (HEATING WATER)
NO SCALE



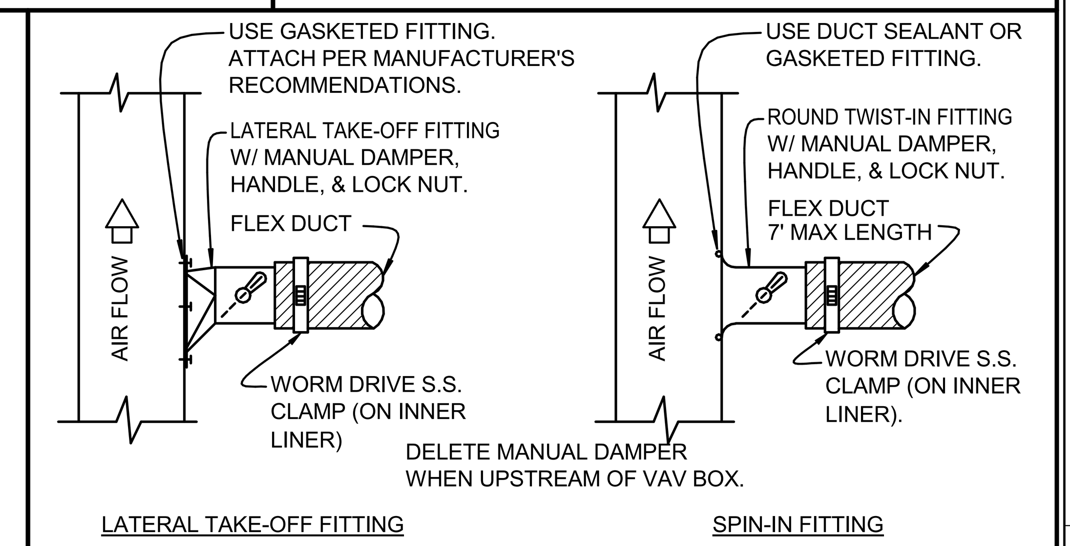
FABRIC DUCTWORK DISPERSION NOZZLE LOCATION DETAIL
NO SCALE



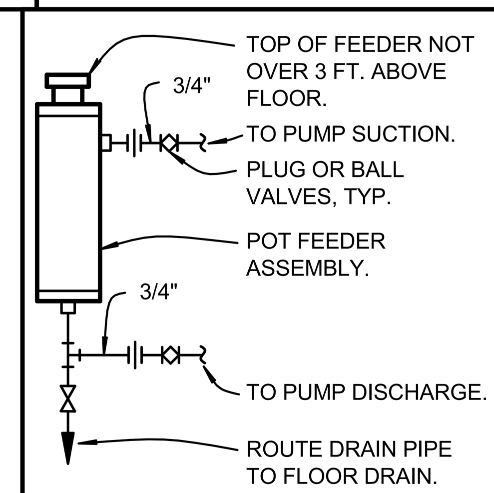
RETURN AIR GRILLE SOUND BOOT
NO SCALE



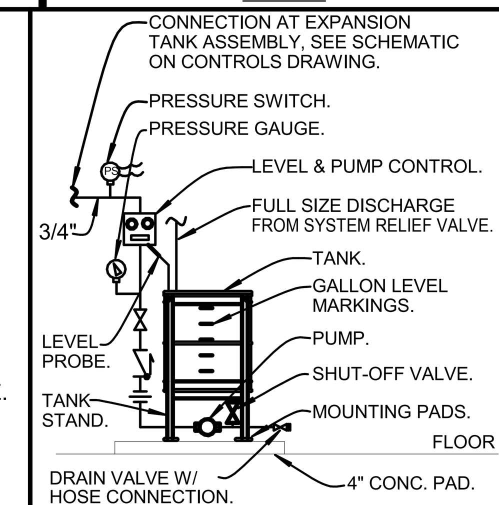
IN-LINE PUMP DETAIL
NO SCALE



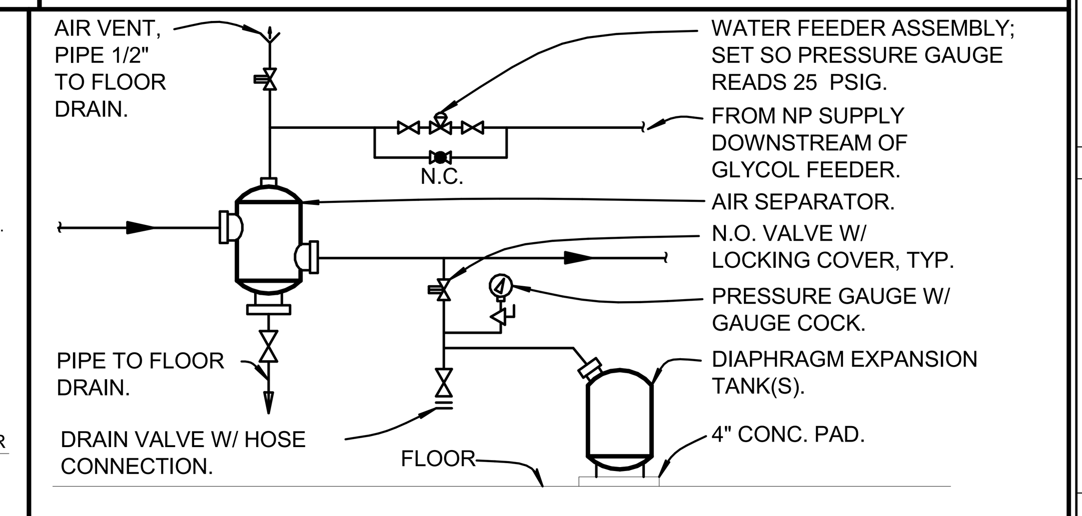
ROUND DUCT TAKE-OFF FITTINGS
NO SCALE



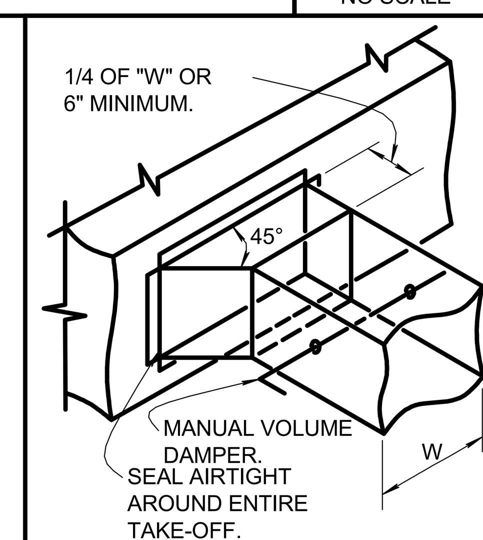
CHEMICAL FEEDER DETAIL
NO SCALE



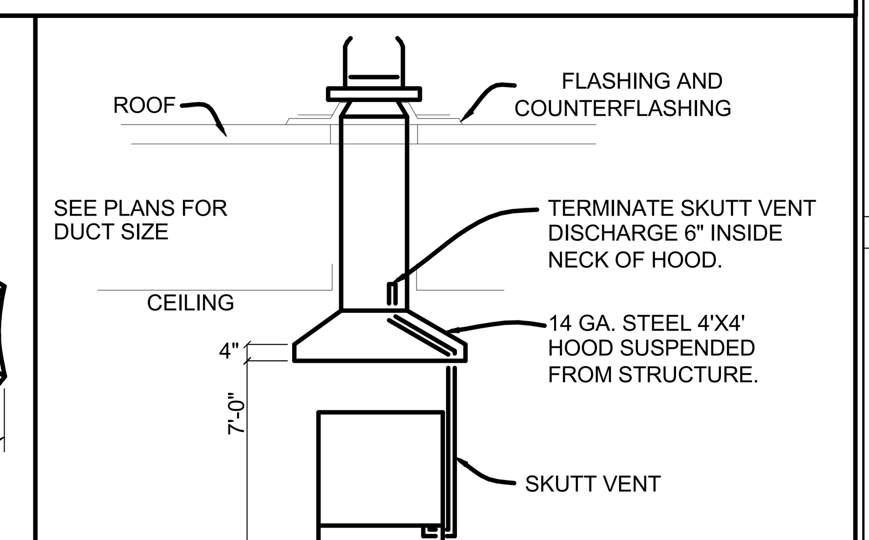
GLYCOL FEEDER ASSEMBLY
NO SCALE



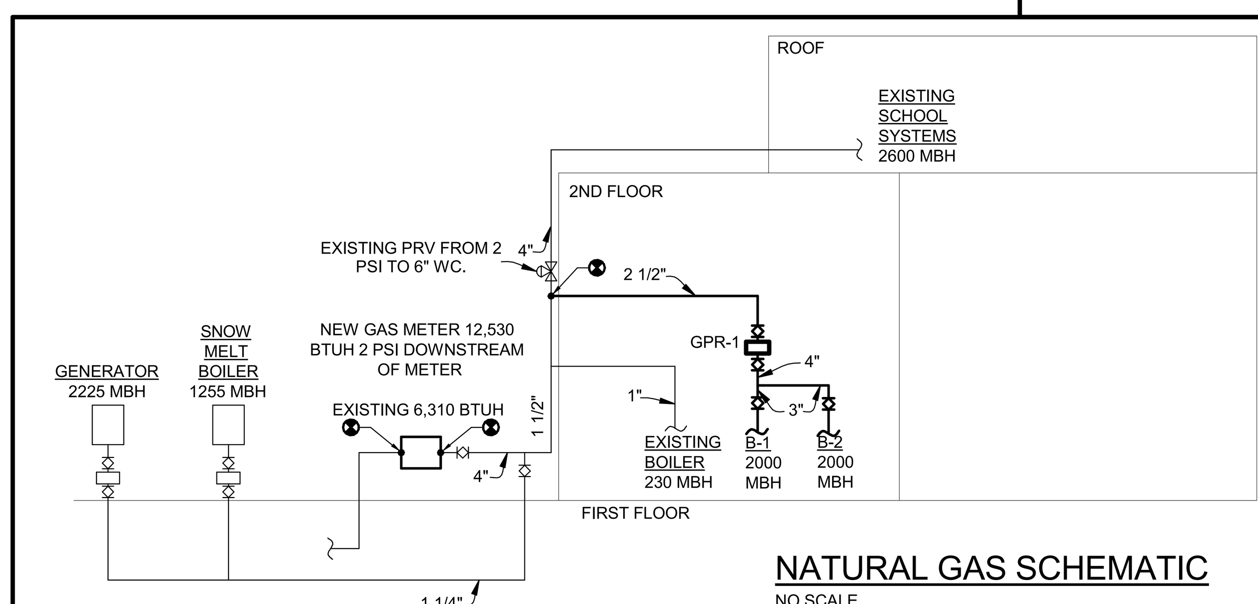
AIR CONTROL & EXPANSION TANK DETAIL (AIR SEPARATOR)
NO SCALE



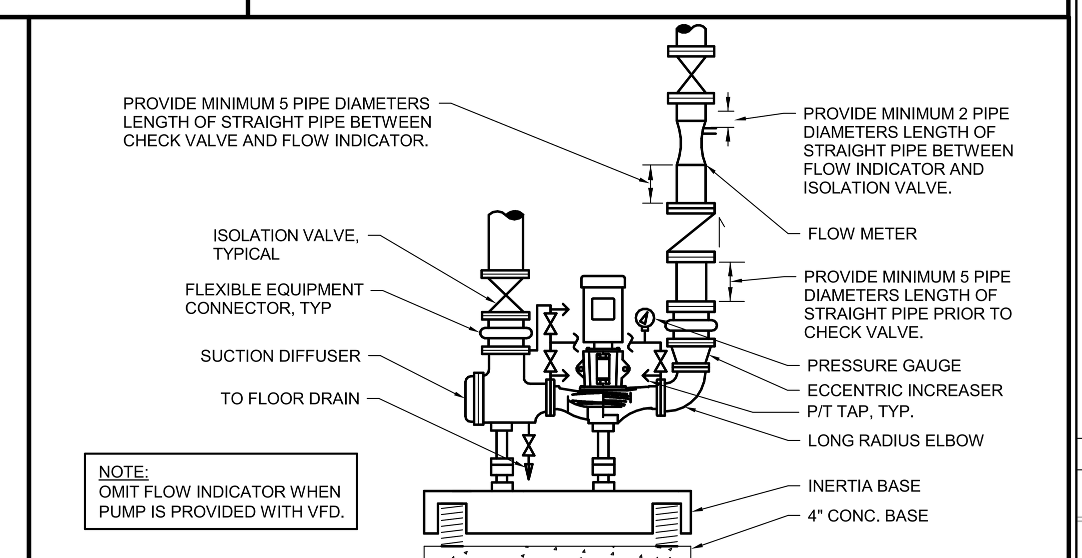
45° DUCT TAKE-OFF
NO SCALE



KILN HOOD
NO SCALE



NATURAL GAS SCHEMATIC
NO SCALE



VERTICAL IN-LINE PUMP ASSEMBLY (FLOOR MOUNTED)
NO SCALE

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PROJECT:
MIDDLE SCHOOL MECHANICAL UPGRADES
39610 Amethyst Drive
Steamboat Springs, CO 80487

OWNER:
Steamboat Springs School District Re-2
325 7th Street
Steamboat Springs, CO 80487

ISSUE:
2018/03/30 Issue for Bidding & Construction

DRAWING INFORMATION:	
PROJECT NO:	11784.000
DRAWN BY:	BRE
CHECKED BY:	EJS
APPROVED BY:	EJS

SHEET TITLE:
MECHANICAL DETAILS

M-500
SHEET OF

11784.000 MIDDLE SCHOOL MECHANICAL UPGRADES
3/30/2018 11:17:38 AM

AIR HANDLING UNIT SCHEDULE (DX)

ITEM	SERVICE	SUPPLY AIR FAN DATA: CLG CFM	OSA CFM	MIN CFM	HTG CFM	FAN TYPE	ESP IN. WC @ ALT	RPM	MOTOR DATA: HP	BHP	QTY	V-PH	STRTR
RTU-01	CAFETERIA	8,500	5,700	5,700	7,900	AF	1.25	1750	10	6.72	1	460-3	VFD
RTU-02	GYM	16,900	6,595	6,595	8,200	AF	1.25	1750	7.5	6.5	2	460-3	VFD
RTU-03	NW CLASSROOMS	15,900	7,200	7,200	9,900	AF	1.25	1750	7.5	5.84	2	460-3	VFD
RTU-04	NE CLASSROOMS	11,000	4,000	4,000	8,125	AF	1.25	1750	15	8.8	1	460-3	VFD
RTU-05	SW CLASSROOMS	14,200	6,000	6,000	10,820	AF	1.50	1750	20	14.12	1	460-3	VFD
RTU-06	SE CLASSROOMS	13,500	6,100	6,100	12,615	AF	1.50	1750	20	12.75	1	460-3	VFD

ITEM	EXHAUST FAN DATA: CFM	FAN TYPE	ESP IN. WC @ ALT	RPM	MOTOR DATA: HP	BHP	QTY	V-PH	STRTR	MAX TOTAL BHP ALLOWED	COOLING CAPACITY: TOTAL MBH	SENS MBH	EAT DB/WB °F	LAT DB °F	GPM	EWT °F	LWT °F	GLYCOL %	MAX dP WATER FT	MAX dP AIR IN	MIN. SEER
RTU-01	8,500	AF	0.75	1750	2	1.67	2	460-3	VFD	11.05	171	171	77.0	55.0	36	45.0	55.0	30.0	12.50	0.15	13.0
RTU-02	16,900	AF	0.75	1750	10	2.89	2	460-3	VFD	21.97	327	327	76.0	55.0	68	45.0	55.0	30.0	7.00	0.15	13.0
RTU-03	15,900	AF	0.75	1750	7.5	2.97	2	460-3	VFD	21.54	314	307	76.0	55.0	64	45.0	55.0	30.0	14.00	0.15	13.0
RTU-04	11,000	AF	0.75	1750	3	1.92	2	460-3	VFD	14.3	222	203	75.0	55.0	43	45.0	55.0	30.0	10.00	0.15	13.0
RTU-05	14,200	AF	0.75	1750	5	2.88	2	460-3	VFD	19.91	290	274	76.0	55.0	58	45.0	55.0	30.0	24.00	0.15	13.0
RTU-06	13,500	-	0.75	1750	5	2.84	2	460-3	VFD	18.73	270	261	76.0	55.0	55	45.0	55.0	30.0	12.00	0.15	13.0

ITEM	HEATING COIL DATA: CAP. MBH	EAT °F	LAT °F	GPM	EWT °F	LWT °F	GLYCOL %	MAX dP WATER FT	MAX dP AIR IN	ELECTRICAL: MCA	MOCP	FLA	DIMENSIONS: W (IN)	L (IN)	H (IN)	OP WGT LBS	MANUFACTURER & MODEL NO.	NOTES	CON-TROLS
RTU-01	365	35	90	26	150.0	120.0	30.0	4	0.15	22.0	30.0	19.0	100.0	202.0	87.0	5,295	AAON RN	1,2	6
RTU-02	379	35	90	26	150.0	120.0	30.0	2	0.15	56.0	60.0	52.0	142.0	255.0	105.0	10,495	AAON RN	1,2	6
RTU-03	166	35	55	12	150.0	120.0	30.0	1	0.15	49.0	60.0	46.0	142.0	255.0	105.0	10,420	AAON RN	1,2	6
RTU-04	137	35	55	10	150.0	120.0	30.0	1	0.15	37.0	50.0	32.0	100.0	202.0	87.0	5,535	AAON RN	1,2	6
RTU-05	182	35	55	13	150.0	120.0	30.0	2	0.15	50.0	70.0	43.0	100.0	202.0	87.0	5,545	AAON RN	1,2	6
RTU-06	212	35	55	15	150.0	120.0	30.0	4	0.15	50.0	70.0	43.0	100.0	202.0	87.0	5,535	AAON RN	1,2	6

NOTES: 1. HEATING COIL CAPACITY SIZED AT A MINIMUM FOR MORNING WARMUP. COIL TO TAKE HEATING CFM FROM 70 TO 90 °F.
2. SEE HEAT WHEEL SCHEDULE FOR INFORMATION ON INTEGRAL HEAT WHEEL.

AIR/DIRT SEPARATOR SCHEDULE

ITEM	DEVICE-TYPE	SERVICE	UNIT PIPE SIZE IN.	SEPERATOR PROCESS	DESIGN FLOW GPM	MAX PRESS. DROP FT WC	DIMENSIONS: W (FLANGE TO FLANGE) IN.	HT. IN.	OP. WT. LBS.	MANUFACTURER & MODEL	NOTES
AS-1	AIR AND DIRT SEPARATOR	HEATING WTR	4	High Velocity Coalescing	215	0	22	46	350	SPIROTHERM VHN400	1
AS-2	AIR AND DIRT SEPARATOR	CHILLED WTR	6	High Velocity Coalescing	505	0	28	62	600	SPIROTHERM VHN600	1

GENERAL NOTES:

1) BASIS OF DESIGN USES COALESCING SEPARATOR PROCESS; ANY TANGENTIAL ALTERNATES WOULD NEED TO BE SIZED AT 2 FPS MAX VELOCITY.

2) CONTRACTOR SHALL PROVIDE ECENTRIC TRANSITIONS AT UNIT CONNECTION AS REQUIRED.

SPECIFIC NOTES:

1) PROVIDE AIR/DIRT SEPARATOR WITH REMOVABLE LOWER HEAD TO FACILITATE CLEANING. PROVIDE WITH SOLENOID VALVE FOR AUTOMATED PURGING; CONTROLLED VIA DDC SYSTEM ON ADJUSTABLE TIME INTERVAL.

HEAT WHEEL SCHEDULE

ITEM	ENTHALPY WHEEL – HEATING CAPACITY: OSA CFM	OSA EDB OF	EXHAUST LDB OF	EXHAUST LWB OF	EXHAUST CFM	RETURN AIR EDB OF	RETURN AIR EWB OF	DEFROST LDB OF	SA LDB OF	COOLING CAPACITY: OSA CFM	OSA EDB/EWB OF	EXHAUST LDB OF	EXHAUST LWB OF	EXHAUST CFM	RETURN AIR EDB OF	RETURN AIR EWB OF	SA LDB OF	NOTES:
RTU-01	5,700	19	28	27	5700	70	55	19	61	5700	105/59	88	59	5700	75	62	77	1
RTU-02	6,595	19	28	27	6595	70	55	19	64	6595	105/61	88	59	6595	75	62	76	1
RTU-03	7,200	19	28	27	7200	70	55	19	63	7200	105/59	88	59	7200	75	62	76	1
RTU-04	4,000	19	27	26	4000	70	55	19	65	4000	105/59	88	59	4000	75	62	75	1
RTU-05	6,000	19	28	27	6000	70	55	19	63	6000	105/59	87	59	6000	75	62	76	1
RTU-06	6,100	19	29	27	6100	70	55	19	63	6100	105/59	88	59	6100	75	62	76	1

NOTES:

1. HEAT WHEEL TO BE PROVIDED IN THE ASSOCIATED AHU/RTU AND NOT AS A SEPARATE UNIT.

BOILER SCHEDULE (HOT WATER)

ITEM	SERVICE	TYPE	CAPACITY: INPUT MBH @ S.L.	INPUT MBH @ ELEV.	OUTPUT MBH @ ELEV.	EFF. @ 50%	EFF. @ 100%	TURN-DOWN RATIO	E.W.T. °F	L.W.T. °F	GLY %	DESIGN FLOW GPM	MIN. FLOW GPM	MAX PRESS. DROP FT WC	BOLER RELIEF PRESS PSI	FUEL TYPE	GAS PRESSURE: MIN IN WC	MAX IN WC	FLUE: MAT'L	RUN OUT SIZE	COMB. AIR: MAT'L	RUN OUT SIZE	ELECTRICAL: V-PH	FLA	MOCP	DIMENSIONS: L IN.	W IN.	HT. IN.	OP. WT. LBS.	MANUFACTURER & MODEL NO.	NOTES	CONTROLS
B-1	BUILDING	CONDENSING	2000	1990	1771	90%	89%	20/1	120.00	150	30	125	25	4	125	NG	4	14	AL29-4C	8"	PP	8"	115-1	16	20	44	28	78	1800	AERCO BMK 2000	1,2,3	6
B-2	BUILDING	CONDENSING	2000	1990	1771	90%	89%	20/1	120.00	150	30	125	25	4	125	NG	4	14	AL29-4C	8"	PP	8"	115-1	16	20	44	28	78	1800	AERCO BMK 2000	1,2,3	6

GENERAL NOTES (APPLY TO ALL PRODUCT):

1) CONTROLS: DDC = DIRECT DIGITAL CONTROLS BY 23 0900, BMS = BOILER MANAGEMENT SYSTEM PROVIDED BY BOILER MANUFACTURER, OTHER = SEE NOTES

2) TYPE: FD = FORCED DRAFT, AT = ATMOSPHERIC, FA = FAN ASSISTED

3) INSTALL BOILER AND PIPING TO BOILER PER SELECTED MANUFACTURERS WRITTTEN INSTRUCTIONS

4) PROVIDE CSD-1 COMPLIANT GAS TRAIN

5) INSTALL BAROMETRIC DAMPER ON FLUE IF REQUIRED BY THE BOILER MANUFACTURER.

6) THE FULL FIRE BOILER EFFICIENCY NOTED ARE AT THE TEMPERATURES LISTED IN THE SCHEDULE.

7) COORDINATE FINAL FULL FLOW AND SHUT OFF GAS PRESSURES PROVIDED BY UTILITY. CHANGE OUT AND/OR PROVIDE ADDITIONAL GAS PRESSURE REGULATORS AS REQUIRED TO SATISFY MAXIMUM GAS PRESSURE REQUIREMENTS.

8) PROVIDE SINGLE POINT ELECTRICAL POWER CONNECTION WITH FACTORY INSTALLED FUSED DISCONNECT FOR PUMPS (WHERE INDICATED), BURNER ASSEMBLY AND CONTROLS.

SPECIFIC NOTES (APPLY WHERE NOTED):

1) PROVIDE WITH CONDENSATE NEUTRALIZATION KIT; AXIOM INDUSTRIES NC-# OR APPROVED EQUIVALENT. SIZE AT 4 GPH / 1,000 MBH OF BOILER CAPACITY.

2) INSTALL WITH BOILER MANUFACTURERS RECOMMENDED COMBUSTION INTAKE AND FLUE EXHAUST COMPONENTS.

3) INSTALL FM GLOBAL COMPLIANT GAS TRAIN.

ADDITIONAL NOTES (APPLY WHERE NOTED):

A) LOCAL UTILITY NATURAL GAS HEAT CONTENT = 840 BTU/CF

B) PP IS POLYPROPELENE PIPING

GLYCOL FEEDER & RELIEF VALVE SCHEDULE

GLYCOL FEEDER: ITEM	SERVICE	TANK CAPACITY GAL.	% GLY	FILL PRESS. PSI	V-Ø	OP. WT. LBS.	MANUFACTURER & MODEL NO.	NOTES	CONTROLS	RELIEF VALVE: ITEM	RELIEF VALVE CAP. MBTUH	RELIEF VALVE SIZE, IN	RELIEF VALVE SETTING, PSIG	MANUFACTURER & MODEL NO.	NOTES
GF-1	HTG AND CLD WTR	50	30	20	115-1	550	AXIOM SF100-2PRV	1,2	6	RV-1	2,400	2	55	WATTS 174A M	
-	-	-	-	-	-	-	-	-	-	RV-2	4000	2	90	WATTS 174A M	2

GENERAL NOTES:

1) USE PROPYLENE GLYCOL, SOLUTION CONCENTRATION AS INDICATED.

2) CONTRACTOR SHALL FIELD VERIFY FILL PRESSURE AND RELIEF VALVE PRESSURE SETTING WITH ALL COMPONENTS INCLUDING TOP OF SYSTEM AIR VENTS TO ENSURE PROPER SYSTEM OPERATION.

SPECIFIC NOTES:

1) UNIT SHALL BE CONTROLLED THROUGH IT'S INTERNAL CONTROLS, DDC TO MONITOR ALARMS.

2) SEE BOILER INFORMATION FOR HOT WATER SYSTEM RELIEF VALVE SETTINGS.

EXPANSION TANK SCHEDULE

ITEM	SERVICE	TYPE	TANK MIN. ACCEPTANCE VOL [GAL]	TANK VOL [GAL]	BRANCH PIPE SIZE [IN]	GLYCOL %	FILL PRESS [PSI]	DIMENSIONS: DIAMETER [IN]	HEIGHT [IN]	OP. WT. [LBS]	MANUFACTURER & MODEL NO.	NOTES
ET-1	HTG WTR	BLADDER	64.6	80	1	30%	25.0	24	52	1000	AMTROL 300-L	1
ET-2	CLD WTR	BLADDER	79.1	80	1	30%	25.0	24	52	1000	AMTROL 300-L	1

GENERAL NOTES:

1) ALL THERMAL EXPANSION ABSORBERS USED ON DOMESTIC WATER SYSTEMS SHALL BE NSF LISTED.

2) ALL BLADDER TANKS SHALL BE FULL ACCEPTANCE WITH REPLACEABLE BLADDER.

SPECIFIC NOTES:

1) PROVIDE ASME RATED TANK

AIR COOLED CHILLER SCHEDULE

ITEM	TYPE	NOM CAP TONS	CAP TONS	MCA	MOCP	UNIT KW	FULL LOAD KW/TON	NLPV	V-PH	EVAPORATOR: EWT °F	LWT °F	GPM	dP FTWC	% GLY	COMPRESSOR: NO	STRTR	RLA	LRA	COND FAN #	COND TEMP °F	OP WT LBS	MANUFACTURER & MODEL #	CONTROLS
ACC-01	SCREW	200	168	383	500	190.9	1	16.74	480-3	55	45	388	8.3	30	2	WYE-DELTA	313.4	-	2	95	13000	TRANE RTAE200	6

NOTES: 1. PROVIDE SPRING ISOLATORS, W/SEPARATE 115-1 CONNECTION FOR HEAT TAPE, COIL GUARDS, CONTROL TRANSFORMER

2. PROVIDE SINGLE POINT POWER CONNECTION WITH UNIT MOUNTED FUSED DISCONNECT.

3. PROVIDE SEPARATE 115-1 CONNECTION FOR UNIT FREEZE PROTECTION.

4. LISTED PRESSURE DROP FOR EVAPORATOR WATER FLOW INCLUDES STRAINER PROVIDED WITH UNIT.

ELECTRIC HEATER SCHEDULE

ITEM	TYPE	CAP. KW	V-PH	CFM	AIR: EAT °F	LAT °F	MANUFACTURER & MODEL #	NOTES	CONTROLS
RTU-01	ELECTRIC DUCT COIL	50.0	460-3	5700	-15	19	RAYWALL HF	1,2	6
RTU-02	ELECTRIC DUCT COIL	60.0	460-3	6595	-15	19	RAYWALL HF	1,2	6
RTU-03	ELECTRIC DUCT COIL	65.0	460-3	7200	-15	19	RAYWALL HF	1,2	6
RTU-04	ELECTRIC DUCT COIL	35.0	460-3	4000	-15	19	RAYWALL HF	1,2	6
RTU-05	ELECTRIC DUCT COIL	55.0	460-3	6000	-15	19	RAYWALL HF	1,2	6
RTU-06	ELECTRIC DUCT COIL	55.0	460-3	6100	-15	19	RAYWALL HF	1,2	6

NOTES: 1. PROVIDE SINGLE POINT ELECTRICAL POWER CONNECTION WITH FACTORY INSTALLED FUSED DISCONNECT ELECTRIC HEATING AND CONTROLS.

2. COORDINATE SIZE WITH ROOFTOP UNIT MANUFACTURER'S OUTSIDE AIR OPENING.

PUMP SCHEDULE

ITEM	TYPE	SERVICE	GPM (GPH)	GLY. %	TOTAL HEAD FT. W.C.	NPSH FT. W.C.	EFF %	MOTOR DATA: HP (WATTS)	RPM	V-PH	STRTR	OP. WT. LBS.	MANUFACTURER & MODEL NO.	NOTES	CONTROLS
HWP-1	INLINE	HEATING WTR	215	30	95	-	64	15	1750	460-3	VFD	500	PENTAIR 380 3x3x12		DDC
HWP-2	INLINE	HEATING WTR	215	30	95	-	64	15	1750	460-3	VFD	500	PENTAIR 380 3x3x12		DDC
BCP-1	INLINE	HEATING WTR	125	30	30	-	74	3	1750	460-3	MAG-HOA	75	PENTAIR 380 3x3x9B		DDC
BCP-2	INLINE	HEATING WTR	125	30	30	-	74	3	1750	460-3	MAG-HOA	75	PENTAIR 380 3x3x9B		DDC
CWP-1	INLINE	CHILLED WTR	505	30	125	-	58.1	30	3500	460-3	VFD	750	PENTAIR 380 3x3x9B	3	DDC
CWP-2	INLINE	CHILLED WTR	505	30	125	-	58.1	30	3500	460-3	VFD	750	PENTAIR 380 3x3x9B	3	DDC

GENERAL NOTES:

1) CONTROLS: DDC = DIRECT DIGITAL CONTROLS BY 23 0900, INT = INTEGRAL, INTRL = INTER LOCKED WITH OTHER EQUIPMENT (SEE NOTES)

SPECIFC NOTES:

1) PUMP TO BE U.L. 2043 PLENUM RATED.

2) PUMP TO HAVE 1 GALLON RESERVOIR.

3) PUMP SUBMITTAL TO ALSO INCLUDE VARIABLE SPEED CURVE INDICATING A PART LOAD OPERATING POINT OF 255 GPM AND 110 FT WC. SELECT PUMP SUCH THAT THIS POINT IS MOST EFFICIENT.

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M-501
SHEET OF

GRILLES, REGISTERS, & DIFFUSERS SCHEDULE

EQUIP TAG	TYPE	FACE SIZE IN.	MOUNTING TYPE	DAMPER REQUIRED	MATERIAL	MANUFACTURER & MODEL NO.	PLAN INFO	SPECIFIC NOTES
A	LOUVER FACE CEILING DIFFUSER	24" x 24"	TILE CLG	YES	STEEL	KRUEGER SH	NECK / CFM	14
B	LOUVER FACE CEILING DIFFUSER	---	HARD CLG	YES	STEEL	KRUEGER SH	NECK / CFM	2, 14
D	SUPPLY REGISTER	---	---	YES	STL/ALUM	KRUEGER AF880	NECK / CFM	2
E	LINEAR SLOT DIFFUSER	SEE PLANS	---	YES	ALUMINUM	KRUEGER 1975	#SLOTS-LENGTH / CFM	5, 6
I	DRUM LOUVER DIFFUSER	---	---	YES	ALUMINUM	KRUGER DPL	NECK / CFM	2
J	PERFORATED FACE CEILING RETURN GRILLE	---	---	SEE NOTES	STEEL	KRUEGER 6490/6690	NECK / CFM*	3, 4, 8
K	RETURN GRILLE	---	---	SEE NOTES	STEEL	KRUEGER S80H	NECK / CFM*	2, 3

GENERAL NOTES:

1. SEE PLANS FOR NECK SIZE
2. ALL GRDs REQUIRING DAMPERS SHALL BE EQUIPPED WITH A REMOTE BALANCING DAMPER THAT IS ADJUSTABLE THROUGH THE GRD FACE OR ANOTHER APPROVED LOCATION UNLESS SUPPLIED FROM AN ACCESSIBLE TAKE-OFF WITH LOCKING DAMPER. FACE DAMPERS SUCH AS INTEGRAL OBDs ARE NOT ACCETABLE.
3. VERIFY GRD FINISH AND CLG/WALL/SILL/FLOOR MOUNTING TYPE WITH ARCHITECT FOR EACH APPLICATION PRIOR TO ORDERING.
4. PROVIDE 4-WAY THROW FOR DIFFUSERS UNLESS OTHERWISE SHOWN ON PLANS.
5. PROVIDE MANUFACTURERS ROUND TO RECTANGULAR ADAPTIVE COLLAR FOR DIFFUSERS AND GRILLES AS REQUIRED, MATCH DUCT SIZE AND TYPE
6. MATERIAL SHALL BE STEEL UNLESS OTHERWISE INDICATED OR SPECIFIED. MATERIAL SHALL BE SUITABLE FOR INSTALLED ENVIRONMENT. FOR WET LOCATIONS SUCH AS LOCKER ROOMS, RESTROOMS, SHOWER ROOMS, KITCHENS, POOL ROOMS, ETC....PROVIDE ALUMINUM IN LIEU OF THE STEEL NOTED.
7. WHERE MULTIPLE DIFFUSERS ARE LOCATED IN A SINGLE ROOM; FACE SIZES SHALL BE THE SAME UNLESS NOTED OTHERWISE.
8. AFTER INSTALLATION, ADJUST DIFFUSERS, REGISTERS AND GRILLES TO AIR PATTERNS INDICATED, OR AS DIRECTED, BEFORE STARTING AIR BALANCING.

* WHERE CFM IS INDICATED ON PLANS FOR RETURN AND TRANSFERS, BALANCE TO AIRFLOW INDICATED.

SPECIFIC NOTES:

1. PROVIDE FULLY ADJUSTABLE CONE FOR HORIZONTAL OR VERTICAL APPLICATIONS, INSTALL SAFETY CABLE/CHAIN.
2. PROVIDE SMALLEST FACE AVAILABLE FOR NECK LISTED IN PLANS
3. PROVIDE DAMPER FOR A DUCTED RETURN/TRANSFER AIR SYSTEM THAT REQUIRES AIR BALANCE AT RETURN/TRANSFER OPENINGS AS INDICATED BY AIRFLOW (CFMs) ON DRAWINGS.
4. AS IDENTIFIED ON THE PLANS PROVIDE 12"x24" FACE FOR 10"x22" NECKS, PROVIDE 24"x24" FACE FOR 22"x22" NECKS
5. PROVIDE THE MANUFACTURERS INSULATED SUPPLY PLENUM OVER THE ACTIVE SECTIONS OF THE DIFFUSER UNLESS NOTED OTHERWISE ON THE PLAN. PROVIDE DUCT TRANSITIONS TO ACCOMMODATE ANY PLENUM WITH OVAL DUCT CONNECTIONS. WHERE REQUIRED PROVIDE BLANK-OFF ON NON-ACTIVE SECTIONS.
6. PROVIDE 3/4" SLOT WIDTH.
7. PROVIDE 1" SLOT WIDTH.
8. PROVIDE BACKPAN WHERE CONNECTED TO DUCT OR SOUND BOOT; WHERE NOT DUCT OR SOUND BOOT IS PRESENT PROVIDE PERFORATED PANEL ONLY.
9. PROVIDE MANUFACTURERS INSULATED LIGHT SHIELD IN NON-DUCTED PLENUM APPLICATIONS ELSE PROVIDE MANUFACTURERS INSULATED PLENUM BOX WHERE CONNECTED TO A DUCTED RETURN.
10. PROVIDE 7/32" BARS WITH 1/2" BAR SPACING, 0º DEFLECTION
11. PROVIDE 7/32" BARS WITH 1/2" BAR SPACING, 15º DEFLECTION, UNLESS MOUNTED IN SILL. IF SILL MOUNTED PROVIDE 7/16" BAR SPACING (PENCIL PROOF) AND 0º DEFLECTION
12. PROVIDE 1/8" BARS WITH 1/4" BAR SPACING (HEAVY DUTY/PENCIL PROOF), 0º DEFLECTION
13. PROVIDE WITH ADJUSTABLE CONTROL ELEMENT.
14. FOR THE INLET (NECK) SIZE CALLED FOR ON THE PLAN PROVIDE THE FOLLOWING BACKPAN SIZES: 6" (9x9"), 8" (9x9"), 10" (12x12"), 12" (15x15")

VAV CONTROL BOX SCHEDULE

ITEM	TYPE	AIR FLOW MAX CLG CFM	AIR FLOW MIN CFM	AIR FLOW MAX HTG CFM	HEATING COIL CAPACITY CAP. MBH	EAT °F	LAT °F	HTG WATER EWT °F	LWT °F NOTE 2	GPM	WPD FT	GLY %	RUNOUT SIZE	DUCT INLET SIZE IN	MANUFACTURER & MODEL NO.	NOTES	CON-TROLS
VAV-03-01	REHEAT	335	100	110	3.4	55	90	150	120	0.5	0.13	30	3/4	6	PRICE SDV	2	6
VAV-03-02	REHEAT	390	115	120	3.8	55	90	150	120	0.5	0.13	30	3/4	6	PRICE SDV	2	6
VAV-03-03	REHEAT	355	100	150	4.7	55	90	150	120	0.5	0.13	30	3/4	6	PRICE SDV	2	6
VAV-03-04	REHEAT	510	200	250	7.8	55	90	150	120	1.0	0.70	30	3/4	8	PRICE SDV	2	6
VAV-03-05	REHEAT	1360	605	920	28.7	55	90	150	120	2.5	1.41	30	3/4	12	PRICE SDV	2	6
VAV-03-06	REHEAT	1485	635	1130	35.2	55	90	150	120	2.5	1.41	30	3/4	12	PRICE SDV	2	6
VAV-03-07	REHEAT	1205	690	765	23.9	55	90	150	120	2.0	0.90	30	3/4	12	PRICE SDV	2	6
VAV-03-08	REHEAT	1115	685	765	23.9	55	90	150	120	2.0	0.70	30	3/4	10	PRICE SDV	2	6
VAV-03-09	REHEAT	1240	665	820	25.6	55	90	150	120	2.0	0.90	30	3/4	12	PRICE SDV	2	6
VAV-03-10	REHEAT	1190	670	790	24.6	55	90	150	120	2.0	0.70	30	3/4	10	PRICE SDV	2	6
VAV-03-11	REHEAT	1700	925	1000	31.2	55	90	150	120	2.5	0.94	30	3/4	14	PRICE SDV	2	6
VAV-03-12	REHEAT	1880	2140	2140	66.7	55	90	150	120	5.0	3.75	30	1	16	PRICE SDV	2	6
VAV-03-13	REHEAT	2350	2240	2240	69.9	55	90	150	120	5.0	3.75	30	1	16	PRICE SDV	2	6
VAV-03-14	REHEAT	1300	570	640	20.0	55	90	150	120	1.5	0.51	30	3/4	12	PRICE SDV	2	6
VAV-04-01	REHEAT	1670	525	1110	34.6	55	90	150	120	2.5	0.94	30	3/4	14	PRICE SDV	2	6
VAV-04-02	REHEAT	235	100	360	11.2	55	90	150	120	1.0	0.50	30	3/4	6	PRICE SDV	2	6
VAV-04-03	REHEAT	2150	755	2350	73.3	55	90	150	120	5.5	4.54	30	1	16	PRICE SDV	2	6
VAV-04-04	REHEAT	1120	885	885	27.6	55	90	150	120	2.0	0.70	30	3/4	10	PRICE SDV	2	6
VAV-04-05	REHEAT	1280	965	965	30.1	55	90	150	120	2.5	1.41	30	3/4	12	PRICE SDV	2	6
VAV-04-06	REHEAT	1080	685	850	26.5	55	90	150	120	2.0	0.70	30	3/4	10	PRICE SDV	2	6
VAV-04-07	REHEAT	1030	355	400	12.5	55	90	150	120	1.0	0.18	30	3/4	10	PRICE SDV	2	6
VAV-04-08	REHEAT	475	200	270	8.4	55	90	150	120	1.0	0.70	30	3/4	8	PRICE SDV	2	6
VAV-04-09	REHEAT	1800	615	1320	41.2	55	90	150	120	3.0	1.35	30	3/4	14	PRICE SDV	2	6
VAV-05-01	REHEAT	1980	720	1000	31.2	55	90	150	120	2.5	0.94	30	3/4	14	PRICE SDV	2	6
VAV-05-02	REHEAT	1980	710	990	30.9	55	90	150	120	2.5	0.94	30	3/4	14	PRICE SDV	2	6
VAV-05-03	REHEAT	1905	685	1785	55.7	55	90	150	120	4.0	2.40	30	1	14	PRICE SDV	2	6
VAV-05-04	REHEAT	1880	660	1090	34.0	55	90	150	120	2.5	0.94	30	3/4	14	PRICE SDV	2	6
VAV-05-05	REHEAT	1730	665	1795	56.0	55	90	150	120	4.0	2.40	30	1	14	PRICE SDV	2	6
VAV-05-06	REHEAT	1245	675	1015	31.7	55	90	150	120	2.5	1.41	30	3/4	12	PRICE SDV	2	6
VAV-05-07	REHEAT	1140	650	1200	37.4	55	90	150	120	3.0	1.58	30	3/4	10	PRICE SDV	2	6
VAV-05-08	REHEAT	1100	690	875	27.3	55	90	150	120	2.0	0.70	30	3/4	10	PRICE SDV	2	6
VAV-05-09	REHEAT	1110	700	875	27.3	55	90	150	120	2.0	0.70	30	3/4	10	PRICE SDV	2	6
VAV-05-10	REHEAT	380	100	150	4.7	55	90	150	120	0.5	0.13	30	3/4	6	PRICE SDV	2	6
VAV-05-11	REHEAT	300	100	100	3.1	55	90	150	120	0.5	0.13	30	3/4	6	PRICE SDV	2	6
VAV-06-01	REHEAT	1940	725	1660	51.8	55	90	150	120	4.0	2.40	30	1	14	PRICE SDV	2	6
VAV-06-02	REHEAT	1980	710	1140	35.6	55	90	150	120	2.5	0.94	30	3/4	14	PRICE SDV	2	6
VAV-06-03	REHEAT	1695	675	2050	63.9	55	90	150	120	4.5	3.04	30	1	14	PRICE SDV	2	6
VAV-06-04	REHEAT	1580	640	1280	39.9	55	90	150	120	3.0	2.03	30	3/4	12	PRICE SDV	2	6
VAV-06-05	REHEAT	1730	695	1980	61.8	55	90	150	120	4.5	3.04	30	1	14	PRICE SDV	2	6
VAV-06-06	REHEAT	1340	630	1040	32.4	55	90	150	120	2.5	1.41	30	3/4	12	PRICE SDV	2	6
VAV-06-07	REHEAT	1160	645	1340	41.8	55	90	150	120	3.0	1.58	30	3/4	12	PRICE SDV	2	6
VAV-06-08	REHEAT	1115	695	930	29.0	55	90	150	120	2.5	1.09	30	3/4	10	PRICE SDV	2	6
VAV-06-09	REHEAT	1035	700	930	29.0	55	90	150	120	2.5	1.09	30	3/4	10	PRICE SDV	2	6
VAV-06-10	REHEAT	320	100	110	3.4	55	90	150	120	0.5	0.13	30	3/4	6	PRICE SDV	2	6
VAV-06-11	REHEAT	425	200	200	6.2	55	90	150	120	0.5	0.18	30	3/4	8	PRICE SDV	2	6

NOTES:

1) STAGES SHOWN SHALL BE THE MINIMUM ACCEPTABLE NUMBER. WHERE "SCR" IS NOTED PROVIDE THE MANUFACTURER'S PACKAGED PULSE MODULATION CONTROL.
2) THE NOTED LWT IS A DESIRED TARGET ONLY AND AS SUCH DURING ACTUAL COIL SUBMITTAL THIS VALUE CAN VARY WITHIN A +/- 10 °F RANGE OF THE LISTED VALUE

HOOD SCHEDULE

ITEM	TYPE	SERVICE	CFM	MAX S.P. DROP IN.	MAX VELOCITY FPM	MIN HOOD FREE AREA (SQFT)	THROAT SIZE WIDTH IN.	THROAT SIZE HEIGHT IN.	HOOD SIZE WIDTH IN.	HOOD SIZE HEIGHT IN.	WEIGHT LBS.	MANUFACTURER & MODEL NO.	NOTES
IH-01	INTAKE	FCU-1 INTAKE	2,000	0.025	400	8.4	36	-	56	-	100.0	GREENHECK GRSI	
RH-01	RELIEF	FCU-1 RELIEF	2,000	0.025	400	8.4	36	-	56	-	100.0	GREENHECK GRSR	2
IH-02	INTAKE	FCU-2 INTAKE	900	0.040	400	2.1	18	-	36	-	100.0	GREENHECK GRSR	
RH-02	RELIEF	FCU-2 RELIEF	900	0.040	400	2.1	18	-	36	-	100.0	GREENHECK GRSR	2

GENERAL NOTES:

1. PROVIDE WITH 14" INSULATED ROOF CURB.
2. PROVIE WITH 1/2"x1/2" BRIDSCREEN ON HOOD OPENING.
3. HOODS SHALL HAVE HINGED AND SEALED TOP FOR DAMPER ACCESS FROM ROOF.

SPECIFIC NOTES:

1. PROVIDE WITH ON/OFF DAMPER AND COUNTER BALANCED LOW PRESSURE DROP RELIEF AIR DAMPER SET TO 0.10 IN.W.C.
2. PROVIDE WITH MOTORIZED MODULATING RELIEF AIR DAMPER SET TO 0.10 IN.W.C.

FAN SCHEDULE

ITEM	TYPE	AREA SERVED	ROOM NUMBERS SERVED	MAX CFM	MIN CFM	ESP INWC	DRIVE TYPE	FAN RPM	SONES	MOTOR DATA BHP	H.P.	RPM	V-PH	STRTR	OP WT LBS	MANUFACTURER & MODEL NO.	NOTES	CONTROLS
EF-1	DOWNBLAST	RESTROOMS	123	150	-	0.50	DIRECT	1,323	6.2	0.05	1/4	1323	120-1	ECM	50	GREENHECK G-097-VG	1	6
EF-2	UPBLAST	BOYS LOCKER ROOM	188	1490	-	0.50	DIRECT	1,665	17.3	0.35	1/2	1665	120-1	ECM	70	GREENHECK CUE-121-VG	1	6
EF-3	UPBLAST	LAUNDRY	189	420	-	0.50	DIRECT	1,688	8.9	0.11	1/6	1688	120-1	ECM	50	GREENHECK CUE-095-VG	1	6
EF-4	UPBLAST	HOME ECONOMICS	186	840	-	0.50	DIRECT	1,642	10.3	0.18	1/4	1642	120-1	ECM	50	GREENHECK CUE-099-VG	1	2
EF-5	UPBLAST	KILN	182B	900	-	0.50	DIRECT	1,711	11.2	0.20	1/4	1711	120-1	ECM	50	GREENHECK CUE-099-VG	1	5
EF-6	DOWNBLAST	ART ROOM	182	700	-	0.50	DIRECT	1,257	8.9	0.11	1/4	1257	120-1	ECM	60	GREENHECK G-143HP-VG	1	6
EF-7	UPBLAST	GENERAL SCIENCE	147	1300	-	0.50	DIRECT	1,523	14.6	0.27	1/2	1523	120-1	ECM	70	GREENHECK CUE-121-VG	1	6
EF-8	UPBLAST	PREP HOODS	147B	500	-	0.50	DIRECT	1,063	7.5	0.08	1/4	1063	120-1	ECM	80	GREENHECK CUE-141HP-VG	1	2
EF-9	UPBLAST	GENERAL SCIENCE	146	1300	-	0.50	DIRECT	1,523	14.6	0.27	1/2	1523	120-1	ECM	70	GREENHECK CUE-121-VG	1	6
EF-10	UPBLAST	GENERAL SCIENCE	167	1300	-	0.50	DIRECT	1,523	14.6	0.27	1/2	1523	120-1	ECM	70	GREENHECK CUE-121-VG	1	6
EF-11	UPBLAST	PREP HOODS	167B	500	-	0.50	DIRECT	1,063	7.5	0.08	1/4	1063	120-1	ECM	80	GREENHECK CUE-141HP-VG	1	2
EF-12	UPBLAST	GENERAL SCIENCE	168	1300	-	0.50	DIRECT	1,523	14.6	0.27	1/2	1523	120-1	ECM	70	GREENHECK CUE-121-VG	1	6
EF-13	INLINE	BOYS AND GIRLS	196	1125	-	0.75	DIRECT	1,393	8.4	0.21	1/2	1393	120-1	ECM	70	GREENHECK SQ-120-VG	2	6
EF-14	DOWNBLAST	BOYS AND GIRLS	133	1200	-	0.50	DIRECT	1,445	12.0	0.24	1/2	1445	120-1	ECM	60	GREENHECK G-123-VG	1	6
EF-15	DOWNBLAST	BOYS AND GIRLS	179	1200	-	0.50	DIRECT	1,445	12.0	0.24	1/2	1445	120-1	ECM	60	GREENHECK G-123-VG	1	6

NOTES:

1. PROVIDE ROOF CURB, BACKDRAFT DAMPER, BIRDSCREEN, FAN SPEED CONTROLLER, AND DISCONNECT SWITCH.
2. PROVIDE INTEGRAL DISCONNECT SWITCH, BACKDRAFT DAMPER, VIBRATION ISOLATORS, AND FLEX CONNECTIONS ON INLET AND OUTLET.

SPLIT SYSTEM AC OR HEAT PUMP UNIT

INDOOR UNIT DATA (FAN COIL)

ITEM - INDOOR	ITEM - OUTDOOR	NOMMINAL SIZE TONS	TYPE	FAN DATA SUPPLY (CFM)	OSA (CFM)	ESP IN.W.C.	MOTOR DATA DRIVE	HP	BHP	COOLING CAPACITY TOTAL CAP (MBH)	SENS CAP (MBH)	EAT (F) DB	EAT (F) WB	LAT (F) DB	LAT (F) WB	OP. WT. LBS.	DIMENSIONS W IN	D IN	H IN
FCU-01	CU-1	-	VERTICAL	1,500	-	0.40	ECM	2x 1/4	-	43	43	75.0	63.0	51.0	51.0	230.0	46.0	18.0	48.0

EXTERIOR UNIT DATA (CONDENSING UNIT) / ELECTRICAL DATA

ITEM - INDOOR	AMBIENT TEMP (F) WINTER	SUMMER	COMPRESSOR MODULATION	REFR. TYPE	SEER	OP. WT. LBS.	DIMENSIONS W IN	D IN	H IN	INTERIOR ELECTRICAL V-PH	MCA	MOCP	EXTERIOR ELECTRICAL V-PH	MCA	MOCP	MANUFACTURER & MODEL NO.	NOTES	CONTROLS
FCU-01	-15.0	91.0	SINGLE	R410A	17.0	300.0	38.0	35.0	43.0	277-1	3.6	15	460-3	10.3	15	JCI FCC 20 / GUARDIAN TCD60B41S	1,2,3	6

GENERAL NOTES:

1) PROVIDE MANUFACTURERS WIRED PROGRAMMABLE THERMOSTAT
2) PROVIDE UNIT WITH MANUFACTURERS LINE SET AND REQUIRED ACCESSORIES; INSTALL PER MANUFACTURERS WRITTEN INSTRUCTONS.
3) PROVIDE MANUFACTURERS STANDARD FILTER
4) FOR DUCT UNITS PROVIDE FIELD FABRICATED LINED SHEET METAL ELBOW, WITH NO LINE OF SITE, ON RETURN CONNECTION FOR SOUND ATTENTION; CONNECT TO UNIT/FILTER HOUSING WITH FLEXIBLE DUCT CONNECTION. PROVIDE FLEXIBLE DUCT CONNECTION ON SUPPLY.
5) SEET, EER & COP NOTED ARE AT RATED CONDITIONS.
6) PROVIDE CONDENSATE DRAIN WITH TRAP AND CLEANOUT; CONNECT TO CONDENSATE PUMP WHERE NOTED.
7) PROVIDE WITH UNIT MOUNTED FUSED DISCONNECT; FIELD COORDINATE UNIT INSTALLATION TO MAINTAIN MAINTENANCE CLEARANCE PER NEC IN FRONT OF DISCONNECT.
8) PROVIDE MANUFACTURERS LOW AMBIENT COOLING KIT TO ALLOW FOR OPERATION DOWN TO LISTED WINTER TEMPERATURE.

SPECIFIC NOTES:

1) PROVIDE PLENUM RATED CONDENSATE PUMP HARTELL A2-X-1965, 115V, 1/10 HP, 3.5 AMPS. COORDINATE 120V POWER.
2) UNIT REQUIRES DUCT DETECTOR THAT SHALL BE PROVIDED BY ELECTRICAL CONTRACTOR WITH FIRE ALARM SYSTEM (COORD WITH EC). INSTALLATION OF DETECTOR SHALL BE IN RETURN DUCTWORK BY MECHANICAL CONTRACTOR. FIELD VERIFY FINAL LOCATION.
3) PROVIDE MANUFACTURERS FIELD INSTALLED FILTER HOUSING IN THE RETURN AIR DUCT CAPABLE OF ACCEPTING 2" FILTERS (PROVIDE MERV 8 FILTERS)
4) POWER TO INDOOR UNIT COMES FROM EXTERIOR UNIT, COORDINATE WITH EC ROUTING OF POWER FROM EXTERIOR UNIT TO INDOOR UNIT.

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41793
3/30/18
PROFESSIONAL ENGINEER

PROJECT:

MIDDLE SCHOOL MECHANICAL UPGRADES

39610 Amethyst Drive
Steamboat Springs, CO 80487

OWNER:

Steamboat Springs School District Re-2

325 7th Street
Steamboat Springs, CO 80487

ISSUE:

2018/03/30 Issue for Bidding & Construction

DRAWING INFORMATION:

PROJECT NO:	11784.000
DRAWN BY:	BRE
CHECKED BY:	EJS
APPROVED BY:	EJS

SHEET TITLE:

MECHANICAL SCHEDULES

M-502

SHEET OF

IEBC 2015 VENTILATION RATE PROCEDURE CALCULATIONS

UNIT	ROOM NUMBER	ROOM NAME	ZONE TYPE	AREA SQ FT	OCCUPANT OUTDOOR AIRFLOW RATE CFM/PER	AREA OUTDOOR AIRFLOW RATE CFM/SQ FT	OCCUPANT DENSITY PEOPLE PER 1000 SQ FT	OCCUPANT QUANTITY	BREATHING ZONE OUTDOOR AIRFLOW RATE CFM	TABLE 6-2 ZONE AIR DISTRIBUTION EFFECTIVENESS (Ez)	TOTAL SUPPLY AIR TO ZONE AT CONDITION ANALYZED CFM - NOTE 1	ZONE VENTILATION EFFICIENCY (Evz)	SYSTEM VENTILATION EFFICIENCY NOTE 2 (Ev)	MINIMUM PERCENTAGE AIRFLOW AT UNIT	MINIMUM OUTSIDE AIRFLOW AT UNIT NOTE 3
RTU-01	102B	CONCESSIONS	Office Space	117	5.0	0.06	5	0	7	0.8	50	1.23	0.57	-	-
RTU-01	104	PLATFORM	Office Space	1584	5.0	0.06	5	40	295	0.8	2080	1.23	0.57	-	-
RTU-01	103A	DISHWASH./SERVING	Office Space	244	5.0	0.06	5	0	15	0.8	810	1.39	0.57	-	-
RTU-01	102A	STORAGE	Storage rooms	216	0.0	0.12	0	0	26	0.8	365	1.32	0.57	-	-
RTU-01	103B	STORAGE	Storage rooms	185	0.0	0.12	0	0	22	0.8	315	1.32	0.57	-	-
RTU-01	102	CAFETORIUM	Cafeteria/fast-food dining	3332	7.5	0.18	100	300	2850	0.8	4260	0.57	0.57	-	-
RTU-01											7880	-	0.57	71%	5625

SPECIFIC NOTES:

1. TOTAL SUPPLY AIR AT CONDITION ANALYZED USES THE MAXIMUM AIRFLOW PROVIDED TO THE ZONE DURING THE HEATING OR COOLING MODE, WHICHEVER IS BEING ANALYZED.
2. AS DETERMINED USING THE ASHRAE 62.1-2010 "62 MZ Calc" SPREADSHEET. SYSTEM VENTILATION EFFICIENCY IS EQUAL TO THE LOWEST ZONE VENTILATION EFFICIENCY OF ALL ROOMS SERVED BY THE UNIT.
3. SEE UNIT EQUIPMENT SCHEDULE FOR ACTUAL OUTSIDE AIR SETPOINT FOR BALANCING; WHICH WILL MEET OR EXCEED THE MINIMUM REQUIREMENT NOTED HEREIN.
4. OCCUPANT QUANTITY MAY VARY FROM OCCUPANT DENSITY FROM IMC. IN THOSE CASES OCCUPANT QUANTITY IS ADJUSTED TO MEET DATA PROVIDIDED BY THE CLIENT. THIS IS ACCEPTABLE PER IMC 403.3 EXCEPTION.

IEBC 2015 VENTILATION RATE PROCEDURE CALCULATIONS

UNIT	ROOM NUMBER	ROOM NAME	ZONE TYPE	AREA SQ FT	OCCUPANT OUTDOOR AIRFLOW RATE CFM/PER	AREA OUTDOOR AIRFLOW RATE CFM/SQ FT	OCCUPANT DENSITY PEOPLE PER 1000 SQ FT	OCCUPANT QUANTITY	BREATHING ZONE OUTDOOR AIRFLOW RATE CFM	TABLE 6-2 ZONE AIR DISTRIBUTION EFFECTIVENESS (Ez)	TOTAL SUPPLY AIR TO ZONE AT CONDITION ANALYZED CFM - NOTE 1	ZONE VENTILATION EFFICIENCY (Evz)	SYSTEM VENTILATION EFFICIENCY NOTE 2 (Ev)	MINIMUM PERCENTAGE AIRFLOW AT UNIT	MINIMUM OUTSIDE AIRFLOW AT UNIT NOTE 3
RTU-02	193	GYMNASIUM	Auditorium seating area	8031	5.0	0.06	150	1000	5482	0.8	6900	0.80	0.80	-	-
RTU-02											6900	-	0.80	99%	6845

SPECIFIC NOTES:

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IEBC 2015 VENTILATION RATE PROCEDURE CALCULATIONS

UNIT	ROOM NUMBER	ROOM NAME	ZONE TYPE	AREA SQ FT	OCCUPANT OUTDOOR AIRFLOW RATE CFM/PER	AREA OUTDOOR AIRFLOW RATE CFM/SQ FT	OCCUPANT DENSITY PEOPLE PER 1000 SQ FT	OCCUPANT QUANTITY	BREATHING ZONE OUTDOOR AIRFLOW RATE CFM	TABLE 6-2 ZONE AIR DISTRIBUTION EFFECTIVENESS (Ez)	TOTAL SUPPLY AIR TO ZONE AT CONDITION ANALYZED CFM - NOTE 1	ZONE VENTILATION EFFICIENCY (Evz)	SYSTEM VENTILATION EFFICIENCY NOTE 2 (Ev)	MINIMUM PERCENTAGE AIRFLOW AT UNIT	MINIMUM OUTSIDE AIRFLOW AT UNIT NOTE 3
RTU-03	109	CHORAL	Classrooms (age 9 plus)	838	10.0	0.12	35	54	645	0.8	1000	0.72	0.72	-	-
RTU-03	108	OFFICE	Office Space	168	5.0	0.06	5	3	25	0.8	65	1.05	0.72	-	-
RTU-03	106	CORRIDOR	Corridors	304	0.0	0.06	0	0	18	0.8	60	1.15	0.72	-	-
RTU-03	105	CORRIDOR	Corridors	749	0.0	0.06	0	0	45	0.8	130	1.10	0.72	-	-
RTU-03	107A	STOR	Storage rooms	155	0.0	0.12	0	0	19	0.8	255	1.44	0.72	-	-
RTU-03	107	INSTRUMENTAL	Classrooms (age 9 plus)	1942	10.0	0.12	35	126	1496	0.8	2680	0.83	0.72	-	-
RTU-03	113	CLASSROOM	Classrooms (age 9 plus)	672	10.0	0.12	35	34	421	0.8	920	0.96	0.72	-	-
RTU-03	114	OFFICE	Office Space	126	5.0	0.06	5	3	23	0.8	100	1.25	0.72	-	-
RTU-03	111	OFFICE	Office Space	121	5.0	0.06	5	3	22	0.8	50	0.97	0.72	-	-
RTU-03	116C	OFFICE	Office Space	112	5.0	0.06	5	3	22	0.8	50	0.99	0.72	-	-
RTU-03	112	CLASSROOM	Classrooms (age 9 plus)	656	10.0	0.12	35	34	419	0.8	1080	1.04	0.72	-	-
RTU-03	120	CORRIDOR	Corridors	526	0.0	0.06	0	0	32	0.8	90	1.09	0.72	-	-
RTU-03	110	CORRIDOR	Corridors	610	0.0	0.06	0	0	37	0.8	105	1.09	0.72	-	-
RTU-03	130	CLASSROOM	Classrooms (age 9 plus)	763	10.0	0.12	35	34	432	0.8	700	0.76	0.72	-	-
RTU-03	129	CLASSROOM	Classrooms (age 9 plus)	714	10.0	0.12	35	34	426	0.8	700	0.77	0.72	-	-
RTU-03	127	CLASSROOM	Classrooms (age 9 plus)	781	10.0	0.12	35	34	434	0.8	700	0.75	0.72	-	-
RTU-03	128	CLASSROOM	Classrooms (age 9 plus)	793	10.0	0.12	35	34	435	0.8	700	0.75	0.72	-	-
RTU-03	131	OFFICE	Office Space	190	5.0	0.06	5	3	26	0.8	60	0.98	0.72	-	-
RTU-03	132	CONFERNECE ROOM	Conference/meeting	250	5.0	0.06	50	12	77	0.8	120	0.72	0.72	-	-
RTU-03	133	OFFICE	Office Space	87	5.0	0.06	5	3	20	0.8	50	1.02	0.72	-	-
RTU-03	134	OFFICE	Office Space	114	5.0	0.06	5	3	22	0.8	50	0.98	0.72	-	-
RTU-03	136	OFFICE	Office Space	132	5.0	0.06	5	3	23	0.8	50	0.96	0.72	-	-
RTU-03	137	STORAGE	Storage rooms	59	0.0	0.12	0	0	7	0.8	50	1.35	0.72	-	-
RTU-03	138	CORRIDOR	Corridors	116	0.0	0.06	0	0	7	0.8	50	1.35	0.72	-	-
RTU-03	135	THERAPY	Office Space	74	5.0	0.06	5	3	19	0.8	50	1.04	0.72	-	-
RTU-03											10505	-	0.72	73%	7695

SPECIFIC NOTES:

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3. SEE UNIT EQUIPMENT SCHEDULE FOR ACTUAL OUTSIDE AIR SETPOINT FOR BALANCING; WHICH WILL MEET OR EXCEED THE MINIMUM REQUIREMENT NOTED HEREIN.
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IEBC 2015 VENTILATION RATE PROCEDURE CALCULATIONS

UNIT	ROOM NUMBER	ROOM NAME	ZONE TYPE	AREA SQ FT	OCCUPANT OUTDOOR AIRFLOW RATE CFM/PER	AREA OUTDOOR AIRFLOW RATE CFM/SQ FT	OCCUPANT DENSITY PEOPLE PER 1000 SQ FT	OCCUPANT QUANTITY	BREATHING ZONE OUTDOOR AIRFLOW RATE CFM	TABLE 6-2 ZONE AIR DISTRIBUTION EFFECTIVENESS (Ez)	TOTAL SUPPLY AIR TO ZONE AT CONDITION ANALYZED CFM - NOTE 1	ZONE VENTILATION EFFICIENCY (Evz)	SYSTEM VENTILATION EFFICIENCY NOTE 2 (Ev)	MINIMUM PERCENTAGE AIRFLOW AT UNIT	MINIMUM OUTSIDE AIRFLOW AT UNIT NOTE 3
RTU-04	188A	OFF	Office Space	150	5.0	0.06	5	0	9	0.8	370	1.27	0.61	-	-
RTU-04	188B	TRAINING	Office Space	151	5.0	0.06	5	0	9	0.8	380	1.27	0.61	-	-
RTU-04	188	BOYS LOCKER ROOM	Corridors	604	0.0	0.06	0	40	36	0.8	600	1.22	0.61	-	-
RTU-04	184	CORRIDOR	Corridors	878	0.0	0.06	0	0	53	0.8	150	0.86	0.61	-	-
RTU-04	183	TEACHER'S LOUNGE	Office Space	613	5.0	0.06	5	31	190	0.8	350	0.62	0.61	-	-
RTU-04	185	CLASSROOM	Classrooms (age 9 plus)	671	10.0	0.12	35	34	421	0.8	800	0.64	0.61	-	-
RTU-04	182	ART	Classrooms (age 9 plus)	1067	10.0	0.12	35	30	428	0.8	1320	0.89	0.61	-	-
RTU-04	182D	OFFICE	Office Space	234	5.0	0.06	5	3	29	0.8	70	0.78	0.61	-	-
RTU-04	182C	STOR	Storage rooms	103	0.0	0.12	0	0	12	0.8	50	0.99	0.61	-	-
RTU-04	182A	CLAY	Office Space	127	5.0	0.06	5	0	8	0.8	50	1.11	0.61	-	-
RTU-04	182B	KILN	Storage rooms	53	0.0	0.12	0	0	6	0.8	50	1.14	0.61	-	-
RTU-04	186A	LAUN	Storage rooms	52	0.0	0.12	0	0	6	0.8	50	1.14	0.61	-	-
RTU-04	186	HOME ECONOMICS	Classrooms (age 9 plus)	1816	10.0	0.12	35	40	618	0.8	1120	0.61	0.61	-	-
RTU-04	187A	OFF	Office Space	110	5.0	0.06	5	3	22	0.8	50	0.76	0.61	-	-
RTU-04	187D	STOR	Storage rooms	225	0.0	0.12	0	0	27	0.8	305	1.19	0.61	-	-
RTU-04	187	APPLIED TECH.	Classrooms (age 9 plus)	1427	10.0	0.12	35	30	471	0.8	1400	0.88	0.61	-	-
RTU-04	187B	FINISHING/PAINT BOOTH	Office Space	153	5.0	0.06	5	3	24	0.8	200	1.15	0.61	-	-
RTU-04	187C	AUX. SHOP	Office Space	235	5.0	0.06	5	3	29	0.8	745	1.25	0.61	-	-
RTU-04											8060	-	0.61	49%	3945

SPECIFIC NOTES:

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2. AS DETERMINED USING THE ASHRAE 62.1-2010 "62 MZ Calc" SPREADSHEET. SYSTEM VENTILATION EFFICIENCY IS EQUAL TO THE LOWEST ZONE VENTILATION EFFICIENCY OF ALL ROOMS SERVED BY THE UNIT.
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PROJECT:

MIDDLE SCHOOL MECHANICAL UPGRADES

39610 Amethyst Drive
Steamboat Springs, CO 80487

OWNER:

Steamboat Springs School District Re-2

325 7th Street
Steamboat Springs, CO 80487

ISSUE:

2018/03/30 Issue for Bidding & Construction

DRAWING INFORMATION:

PROJECT NO: 11784.000

DRAWN BY: BRE

CHECKED BY: EJS

APPROVED BY: EJS

SHEET TITLE:

MECHANICAL SCHEDULES

M-503

SHEET OF

11784.000 MIDDLE SCHOOL MECHANICAL UPGRADES
3/30/2018 11:17:39 AM

IEBC 2015 VENTILATION RATE PROCEDURE CALCULATIONS

UNIT	ROOM NUMBER	ROOM NAME	ZONE TYPE	AREA SQ FT	OCCUPANT OUTDOOR AIRFLOW RATE CFM/PER	AREA OUTDOOR AIRFLOW RATE CFM/SQ FT	OCCUPANT DENSITY PEOPLE PER 1000 SQ FT	OCCUPANT QUANTITY	BREATHING ZONE OUTDOOR AIRFLOW RATE CFM	TABLE 6-2 ZONE AIR DISTRIBUTION EFFECTIVENESS (Ez)	TOTAL SUPPLY AIR TO ZONE AT CONDITION ANALYZED CFM - NOTE 1	ZONE VENTILATION EFFICIENCY (Evz)	SYSTEM VENTILATION EFFICIENCY NOTE 2 (Ev)	MINIMUM PERCENTAGE AIRFLOW AT UNIT	MINIMUM OUTSIDE AIRFLOW AT UNIT NOTE 3
RTU-05	180	STOR	Storage rooms	145	0.0	0.12	0	0	17	0.8	50	0.97	0.72	-	-
RTU-05	181	CLASSROOM	Classrooms (age 9 plus)	934	10.0	0.12	35	34	452	0.8	1200	0.93	0.72	-	-
RTU-05	175A	OFFICE	Office Space	110	5.0	0.06	5	3	22	0.8	50	0.86	0.72	-	-
RTU-05	181A	OFFICE	Office Space	115	5.0	0.06	5	3	22	0.8	50	0.85	0.72	-	-
RTU-05	175	CLASSROOM	Classrooms (age 9 plus)	784	10.0	0.12	35	34	434	0.8	800	0.72	0.72	-	-
RTU-05	173	CLASSROOM	Classrooms (age 9 plus)	808	10.0	0.12	35	34	437	0.8	920	0.81	0.72	-	-
RTU-05	174	CLASSROOM	Classrooms (age 9 plus)	753	10.0	0.12	35	34	430	0.8	800	0.73	0.72	-	-
RTU-05	173A	OFFICE	Office Space	119	5.0	0.06	5	3	22	0.8	50	0.85	0.72	-	-
RTU-05	174A	OFFICE	Office Space	113	5.0	0.06	5	3	22	0.8	50	0.86	0.72	-	-
RTU-05	172	CLASSROOM	Classrooms (age 9 plus)	816	10.0	0.12	35	34	438	0.8	1540	1.05	0.72	-	-
RTU-05	171A	OFFICE	Office Space	105	5.0	0.06	5	3	21	0.8	195	1.26	0.72	-	-
RTU-05	172A	OFFICE	Office Space	105	5.0	0.06	5	3	21	0.8	50	0.87	0.72	-	-
RTU-05	171	CLASSROOM	Classrooms (age 9 plus)	796	10.0	0.12	35	34	435	0.8	1040	0.88	0.72	-	-
RTU-05	170	STOR	Storage rooms	87	0.0	0.12	0	3	10	0.8	50	1.14	0.72	-	-
RTU-05	169A	OFFICE	Office Space	104	5.0	0.06	5	3	21	0.8	175	1.25	0.72	-	-
RTU-05	169	CLASSROOM	Classrooms (age 9 plus)	863	10.0	0.12	35	34	444	0.8	1560	1.05	0.72	-	-
RTU-05	168B	PREP.	Office Space	208	5.0	0.06	5	3	27	0.8	70	0.91	0.72	-	-
RTU-05	168	SCIENCE	Classrooms (age 9 plus)	1074	10.0	0.12	35	34	469	0.8	920	0.76	0.72	-	-
RTU-05	167	SCIENCE	Classrooms (age 9 plus)	1124	10.0	0.12	35	34	475	0.8	920	0.76	0.72	-	-
RTU-05	167B	PREP.	Office Space	207	5.0	0.06	5	3	27	0.8	80	0.97	0.72	-	-
RTU-05	165	CORRIDOR	Corridors	850	0.0	0.06	0	0	51	0.8	150	0.98	0.72	-	-
RTU-05	166	CORRIDOR	Corridors	537	0.0	0.06	0	0	32	0.8	95	0.98	0.72	-	-
RTU-05											10815	-	0.72	55%	6000

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IEBC 2015 VENTILATION RATE PROCEDURE CALCULATIONS

UNIT	ROOM NUMBER	ROOM NAME	ZONE TYPE	AREA SQ FT	OCCUPANT OUTDOOR AIRFLOW RATE CFM/PER	AREA OUTDOOR AIRFLOW RATE CFM/SQ FT	OCCUPANT DENSITY PEOPLE PER 1000 SQ FT	OCCUPANT QUANTITY	BREATHING ZONE OUTDOOR AIRFLOW RATE CFM	TABLE 6-2 ZONE AIR DISTRIBUTION EFFECTIVENESS (Ez)	TOTAL SUPPLY AIR TO ZONE AT CONDITION ANALYZED CFM - NOTE 1	ZONE VENTILATION EFFICIENCY (Evz)	SYSTEM VENTILATION EFFICIENCY NOTE 2 (Ev)	MINIMUM PERCENTAGE AIRFLOW AT UNIT	MINIMUM OUTSIDE AIRFLOW AT UNIT NOTE 3
RTU-06	147	SCIENCE	Classrooms (age 9 plus)	1122	10.0	0.12	35	34	475	0.8	1580	0.97	0.71	-	-
RTU-06	146	SCIENCE	Classrooms (age 9 plus)	1050	10.0	0.12	35	34	466	0.8	1060	0.79	0.71	-	-
RTU-06	144	STOR	Storage rooms	90	0.0	0.12	0	0	11	0.8	50	1.07	0.71	-	-
RTU-06	132	STOR	Storage rooms	158	0.0	0.12	0	0	19	0.8	50	0.87	0.71	-	-
RTU-06	131	CLASSROOM	Classrooms (age 9 plus)	925	10.0	0.12	35	34	451	0.8	1340	0.92	0.71	-	-
RTU-06	139A	OFFICE	Office Space	111	5.0	0.06	5	3	22	0.8	50	0.80	0.71	-	-
RTU-06	131A	OFFICE	Office Space	114	5.0	0.06	5	3	22	0.8	60	0.89	0.71	-	-
RTU-06	141	CLASSROOM	Classrooms (age 9 plus)	824	10.0	0.12	35	34	439	0.8	1040	0.81	0.71	-	-
RTU-06	147B	PREP.	Office Space	217	5.0	0.06	5	3	28	0.8	80	0.90	0.71	-	-
RTU-06	146B	PREP.	Office Space	215	5.0	0.06	5	3	28	0.8	80	0.90	0.71	-	-
RTU-06	142	CLASSROOM	Classrooms (age 9 plus)	912	10.0	0.12	35	34	449	0.8	1880	1.04	0.71	-	-
RTU-06	141A	OFFICE	Office Space	117	5.0	0.06	5	3	22	0.8	60	0.88	0.71	-	-
RTU-06	140A	OFFICE	Office Space	114	5.0	0.06	5	3	22	0.8	50	0.79	0.71	-	-
RTU-06	140	CLASSROOM	Classrooms (age 9 plus)	758	10.0	0.12	35	34	431	0.8	850	0.71	0.71	-	-
RTU-06	139	CLASSROOM	Classrooms (age 9 plus)	745	10.0	0.12	35	34	429	0.8	850	0.71	0.71	-	-
RTU-06	136	CORRIDOR	Corridors	544	0.0	0.06	0	0	33	0.8	95	0.91	0.71	-	-
RTU-06	135	CORRIDOR	Corridors	906	0.0	0.06	0	0	54	0.8	160	0.92	0.71	-	-
RTU-06	143	CLASSROOM	Classrooms (age 9 plus)	889	10.0	0.12	35	34	447	0.8	1280	0.90	0.71	-	-
RTU-06	145	CLASSROOM	Classrooms (age 9 plus)	963	10.0	0.12	35	34	456	0.8	2000	1.06	0.71	-	-
RTU-06											12615	-	0.71	48%	6085

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PROJECT:

MIDDLE SCHOOL MECHANICAL UPGRADES

39610 Amethyst Drive
Steamboat Springs, CO 80487

OWNER:

Steamboat Springs School District Re-2

325 7th Street
Steamboat Springs, CO 80487

ISSUE:

2018/03/30 Issue for Bidding & Construction

DRAWING INFORMATION:

PROJECT NO:	11784.000
DRAWN BY:	BRE
CHECKED BY:	EJS
APPROVED BY:	EJS

SHEET TITLE:

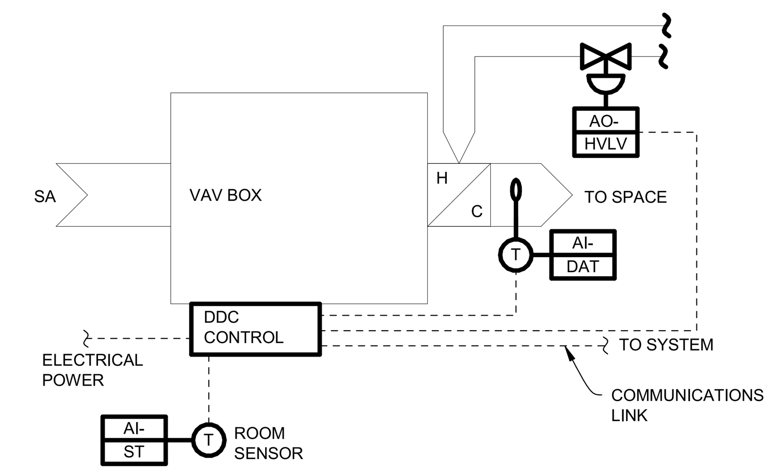
MECHANICAL SCHEDULES

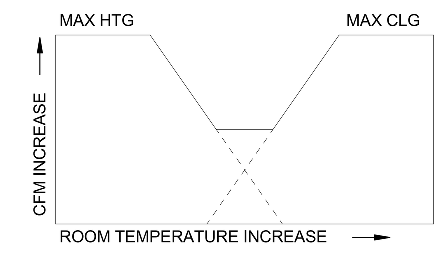
M-504

SHEET OF

11784.000 MIDDLE SCHOOL MECHANICAL UPGRADES
3/30/2018 11:17:40 AM

Point Name	Point Description	Binary Inputs	Binary Outputs	Analog Inputs	Analog Outputs	Schedule	Trend (duration)*	Alarm (hi/lo)	Show on Graphic
BDP	BUILDING DIFF PRESSURE			X					X
CO2O	CO2 OUTDOOR AIR CONCENTRATION			X			X		X
CO2S	CO2 SPACE CONCENTRATION			X			X		X
CWV	CHILLED WATER VALVE				X				X
DAT	DISCHARGE AIR TEMPERATURE			X			X		X
EAD	EXHAUST AIR DAMPER				X				X
EAT	EXHAUST AIR TEMP			X			X	X	X
EAT2	EXHAUST AIR TEMP			X			X	X	X
EFMOD	EXHAUST FAN MODULATE				X				X
EFSS	EXHAUST FAN START/STOP		X			X			X
EFST	EXHAUST FAN STATUS	X						X	X
EHMOD	ELECTRIC HEAT MODULATION				X		X		X
EHSS	ELECTRIC HEAT START/STOP		X			X			X
EHST	ELECTRIC HEAT STATUS	X						X	X
EHT	ELECTRIC HEAT LEAVING AIR TEMPERATURE			X			X		X
HSA	HIGH STATIC ALARM	X						X	X
HWV	HEATING WATER VALVE				X		X		X
LTA	LOW TEMP ALARM	X						X	X
MAD	MIXED AIR DAMPER				X				X
MAT	MIXED AIR TEMPERATURE			X			X		X
OAD	OUTSIDE AIR DAMPER				X				X
OAFL	OUTSIDE AIRFLOW STATION				X		X		X
OAT	OUTSIDE AIR TEMPERATURE			X			X		X
SDA	SMOKE DETECTOR ALARM	X						X	X
SFMOD	SUPPLY FAN MODULATE				X				X
SFSS	SUPPLY FAN START/STOP		X			X			X
SFST	SUPPLY FAN STATUS	X						X	X
SPT	SPACE TEMPERATURE			X			X		X
WSS	WHEEL START/STOP		X			X			X
WST	WHEEL STATUS	X						X	X
*SCHOOL DISTRICT TO CONFIRM FREQUENCY AND DURATION OF TRENDING REQUIREMENTS.									





SEQUENCE OF OPERATION:

GENERAL:
THE SPACE TEMPERATURE SENSOR SHALL BE PROVIDED WITH AN OCCUPANT ADJUSTABLE WARMER/COOLER SLIDER AND OCCUPANT OVERRIDE BUTTON. THE SLIDER SHALL ALLOW FOR TEMPERATURE CONTROL OF +/- 2 DEG. F (ADJ.).

OCCUPIED CYCLE:
WHEN DUCT PRESSURE IS SENSED, INDICATING THAT THE PRIMARY SYSTEM AIR IS OPERATING, THE PRIMARY AIR VOLUME DAMPER SHALL OPEN AND MODULATE THE PRIMARY AIR TO SATISFY THE OCCUPIED SPACE COOLING SETPOINT.

AS THE ROOM SENSOR SENSES A NEED FOR NO COOLING, THE CONTROL SYSTEM SHALL CLOSE THE PRIMARY AIR VOLUME DAMPER DOWN TO THE MINIMUM PRIMARY AIR POSITION. BEFORE HEATING IS INITIATED, THE CONTROLS SHALL ENTER A NO LOAD BAND.

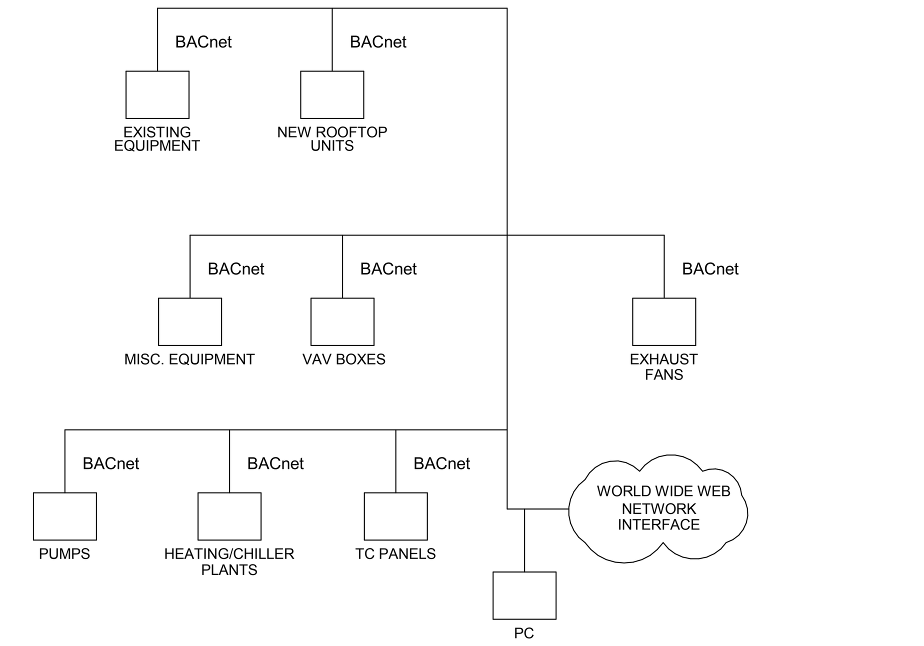
ON SENSING A NEED FOR HEAT, THE HEATING HOT WATER CONTROL VALVE SHALL BE MODULATED AS REQUIRED TO SATISFY THE SPACE HEATING SETPOINT. DISCHARGE AIR TEMPERATURE SHALL BE LIMITED TO 90 DEG. F (ADJ.). IF SPACE TEMPERATURE CANNOT BE MET WITH 90 DEG. F AIR WITH THE DAMPER AT MINIMUM POSITION, THE AIRFLOW RATE SHALL BE INCREASED UP TO THE SCHEDULED MAXIMUM HEATING AIRFLOW RATE. IF THE SPACE TEMPERATURE STILL CANNOT BE MET, AFTER 5 MINUTES (ADJ.) THE HEATING HOT WATER CONTROL VALVE SHALL BE ALLOWED TO MODULATE TO THE FULLY OPEN POSITION AS REQUIRED TO MEET THE SPACE TEMPERATURE SETPOINT. UPON A RISE ABOVE SPACE TEMPERATURE SETPOINT, THE OPPOSITE SEQUENCE SHALL OCCUR.

UNOCCUPIED CYCLE:
THE PRIMARY AIR VOLUME DAMPER SHALL POSITIVELY CLOSE. WHEN DUCT PRESSURE IS SENSED, INDICATING THAT THE PRIMARY SYSTEM AIR IS OPERATING, THE DDC SYSTEM SHALL MODULATE THE PRIMARY AIR VOLUME DAMPER TO MAINTAIN THE UNOCCUPIED SPACE COOLING SETPOINT OR WITH THE PRIMARY AIR VOLUME DAMPER IN IT'S MINIMUM POSITION MODULATE THE HEATING COIL TO MAINTAIN THE UNOCCUPIED SPACE HEATING SETPOINT.

SHUTOFF VAV CONTROL DRAWING AND SEQUENCE OF OPERATION

NO SCALE

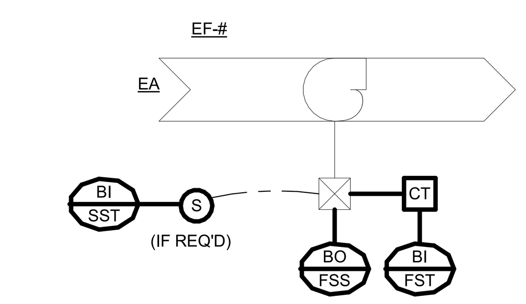
Point Name	Point Description	Digital Inputs	Digital Outputs	Analog Inputs	Analog Outputs	Analog Virtual	Digital Virtual	Schedule	Trend (duration)*	Alarm (hi/lo)	Show on Graphic
DAT	DISCHARGE AIR TEMP			X						X	X
ST	SPACE TEMP.			X					X		X
AFV	AIR FLOW VOLUME			X							X
HVLV	HEATING COIL VALVE				X						X
AVD	AIR VOLUME DAMPER				X						
*SCHOOL DISTRICT TO CONFIRM TRENDING REQUIREMENTS											



TEMPERATURE CONTROLS SYSTEM SYSTEM ARCHITECTURE

NO SCALE

TEMPERATURE CONTROLS SYSTEM ARCHITECTURE
UNIT CONTROLLERS AND SYSTEM LEVEL CONTROLLERS SHALL BE PROVIDED WITH A COMMUNICATIONS NETWORK THAT SHALL OPERATE ON BACNET IP PLATFORM.



EXHAUST FAN CONTROL DRAWING AND SEQ. OF OPERATION

NO SCALE

Point Name	Point Description	Binary Inputs	Binary Outputs	Analog Inputs	Analog Outputs	Analog Virtual	Binary Virtual	Schedule	Trend (duration)*	Alarm (hi/lo)	Show on Graphic
FST	FAN STATUS	X								X	X
FSS	FAN START/STOP		X					X			X
SST	SWITCH STATUS	X								X	X
*SCHOOL DISTRICT TO CONFIRM FREQUENCY AND DURATION OF TRENDING REQUIREMENTS											

EXHAUST FANS SEQUENCE OF OPERATION **

EF-1,13,14,15 RESTROOM/CUST. CLOSET GENERAL EXHAUST:

THE EXHAUST FAN SHALL BE ENABLED DURING BUILDING OCCUPIED HOURS.

EF-5 KILN EXHAUST:

FAN TO BE INTERLOCKED WITH KILN. IF FAN FAILS TO START WITH KILN. KILN SHALL BE DISABLED. DDC SYSTEM TO ONLY MONITOR STATUS OF EXHAUST FAN. DDC CONTRACTOR TO HARDWIRE INTERLOCK.

EF-6,7,9,10,12 SCIENCE/ART GENERAL EXHAUST:

THE EXHAUST FAN SHALL BE ENABLED DURING BUILDING OCCUPIED HOURS.

EF-4,8,11 HOOD EXHAUST:

THE EXHAUST FAN SHALL BE ENABLED BY A BAS SCHEDULE SYSTEM AND MANUAL SWITCH IN ROOM. FOR FANS WITH MULTIPLE HOODS AND SWITCHES, ALL SWITCHES TO ENABLE EXHAUST FAN.BAS TO BE AWARE OF MANUAL SWITCH STATUS. EXHAUST FANS WILL NOT RUN DURING MORNING WARM UP OR NIGHT SIGHT BACK. AN OVERRIDE ON/OFF POINT ALONG WITH FAN STATUS WILL BE AVAILABLE ON THE DDC GRAPHICS. (FAN TO BE ABLE TO BE OVERRIDDEN OFF EVEN IF MANUAL SWITCH IS PLACED IN THE ON POSITION)

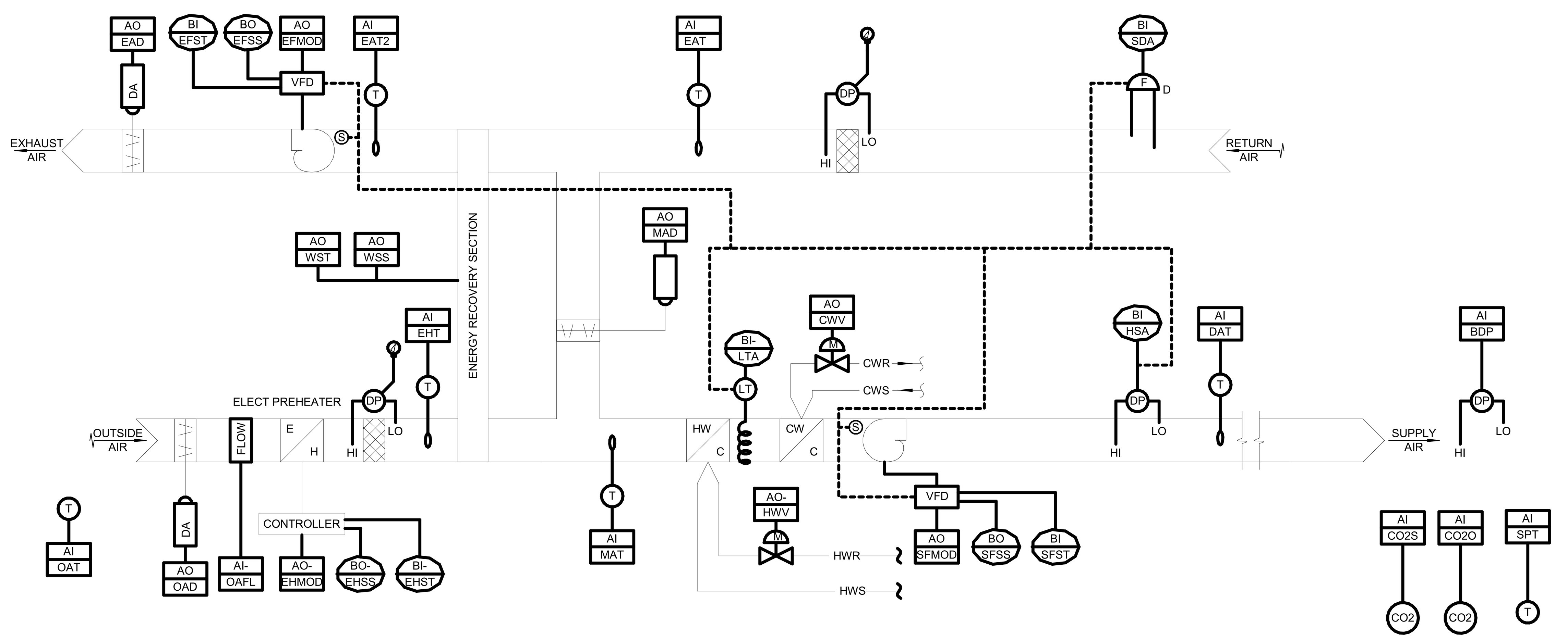
EF-2 LOCKER ROOM EXHAUST:

THE EXHAUST FAN SHALL BE ENABLED DURING BUILDING OCCUPIED HOURS.

EF-3 LAUNDRY ROOM EXHAUST:

THE EXHAUST FAN SHALL BE ENABLED DURING BUILDING OCCUPIED HOURS.

**UPON FAILURE OF ANY EXHAUST FAN AN ALARM SHALL BE DISPLAYED AT THE OPERATOR'S WORKSTATION.



RTU-1,2 CONTROL DRAWING AND SEQ. OF OPERATION

NO SCALE

SEQUENCE OF OPERATION

SINGLE ZONE AIR HANDLING UNIT W/ ENERGY RECOVERY WHEEL.

GENERAL SECTION:
OUTSIDE AIR, MIXED AIR, BYPASS, AND EXHAUST AIR DAMPERS ARE PROVIDED WITH THE ENERGY RECOVERY UNIT.

THE OUTSIDE AIR AND EXHAUST AIR DAMPERS SHALL CLOSE WHENEVER THE SUPPLY FAN STOPS UNDER ANY CONDITION. THE MIXED AIR DAMPER SHALL OPEN.

ALL CONTROL POINTS SHOWN SHALL REPORT TO THE DDC SYSTEM.

PROVIDE ALARM AT DDC WORKSTATION IF THE DISCHARGE AIR TEMPERATURE FALLS BELOW 45 DEG F, OR ABOVE F 110 DEG F

PROVIDE MANUFACTURE'S RECOMMENDED FROST PROTECTION SEQUENCE FOR THE HEAT WHEEL UTILIZING THE ELECTRIC PREHEATER. MODULATE PREHEATER AS REQUIRED. ELECTRIC HEAT IS TO BE ENABLED AND MODULATE BELOW NEGATIVE (-) 5 DEG. F. PROVIDE ALL ALARMS AT DDC WORKSTATION.

LIFE SAFETY SECTION:
SHOULD THE SMOKE DETECTOR, FREEZE STAT, OR DOOR SWITCH ACTIVATE, THE DETECTOR,STAT, OR DOOR SWITCH SHALL STOP THE SUPPLY FAN AND EXHAUST FANS IN BOTH THE MANUAL OR AUTOMATIC MODE, INDEPENDENT OF THE CONTROL SYSTEM. AN ALARM SIGNAL SHALL BE INDICATED AT THE DDC CONTROL PANEL.

UNIT START / STOP CONTROL:
THE DDC SYSTEM TIME AND OPTIMUM START/STOP PROGRAMS SHALL CONTROL THE SYSTEM IN THE FOLLOWING CONTROL CYCLES (INITIALLY START AT 6:30 A.M. AND INITIALLY STOP AT 4:30 P.M.) (ADJ).

WARM UP / COOL DOWN CYCLE:
AS CALCULATED BY THE DDC OPTIMUM START PROGRAM, THE WARM UP / COOL DOWN CYCLE SHALL START AS LATE AS POSSIBLE TO BRING THE SPACE TO ITS PROGRAMMED SETPOINT BY THE PROGRAMMED OCCUPIED TIME.

WARM UP:
DURING THE WARM UP CYCLE, THE SUPPLY FAN SHALL BE ON, THE OUTSIDE AIR AND EXHAUST AIR DAMPERS SHALL BE 100% CLOSED AND THE MIXED AIR DAMPER SHALL BE 100% OPEN. WHEN THE SPACE TEMPERATURE REACHES THE OCCUPIED SETPOINT, THE SYSTEM SHALL GO TO THE OCCUPIED CYCLE.

COOL DOWN:
THE COOL DOWN CYCLE SHALL BE THE SAME AS THE OCCUPIED CYCLE.

OCCUPIED CYCLE:
THE SUPPLY AND EXHAUST FANS SHALL START AT MINIMUM SPEED AND RUN CONTINUOUSLY. CO2 CONTROL SHALL BE FIRST STAGE OF CONTROL FOR THE OUTSIDE AIR DAMPER AND MIXED AIR DAMPER. EXHAUST AIR DAMPER SHALL BE 100% OPEN.

BASED ON SPACE TEMPERATURE SENSOR INPUT, THE VFD SHALL MODULATE THE SPEED OF THE SUPPLY FAN TO MAINTAIN THE SPACE TEMPERATURE WHILE THE OUTSIDE AIR DAMPER IS AT 10% (CO2 MIN.)

WHEN THE CO2 LEVEL RAISES ABOVE THE SETPOINT, THE OUTSIDE AIR SHALL BE OPEN TO THE MINIMUM POSITION AND EXHAUST AIR DAMPER SHALL BE 100% OPEN. THE MIXED AIR DAMPER SHALL MODULATE WITH THE OUTSIDE AIR DAMPER.

BASED ON SPACE TEMPERATURE SENSOR INPUT, THE VFD SHALL CONTROL THE SPEED OF THE SUPPLY FAN TO THE COOLING AIRFLOW OR HEATING AIRFLOW TO MAINTAIN THE SPACE TEMPERATURE WITH THE OUTSIDE AIR AND MIXED AIR DAMPERS IN EITHER THE COOLING POSITION OR HEATING POSITIONS.

THE EXHAUST FAN SPEED SHALL BE PROVIDED WITH AN OFFSET BASED ON SUPPLY FAN SPEED TO MAINTAIN PLENUM STATIC PRESSURE OF 0.05 IN.W. C. (ADJUSTABLE).

THE DISCHARGE AIR TEMPERATURE SHALL BE MAINTAINED AT A MAXIMUM TEMPERATURE SETPOINT OF 55 DEG F. IN THE COOLING MODE AND 90 DEG. F.IN THE HEATING MODE BY:

1ST STAGE OF HEATING: ENABLING THE HEAT WHEEL.
2ND STAGE OF HEATING: WHEN THE 1ST STAGE OF HEATING CANNOT MAINTAIN THE SPACE TEMPERATURE FOR TEN MINUTES (ADJ) THEN THE HEATING HEATING WATER CONTROL VALVE SHALL OPEN AND MODULATE TO MAINTAIN THE SPACE TEMPERATURE.
LESS HEATING SHALL BE OPPOSITE OF ABOVE.

1ST STAGE COOLING. MODULATING THE MIXED AIR DAMPER, BYPASS DAMPERS, AND OUTSIDE AIR DAMPER FOR ECONOMIZER COOLING WITH THE HEAT WHEEL OFF. (SEE BELOW FOR ECONOMIZER COOLING)
2ND STAGE OF COOLING: WHEN THE 1ST STAGE OF COOLING CANNOT MAINTAIN THE SPACE TEMPERATURE FOR TEN MINUTES (ADJ) THEN THE HEAT WHEEL SHALL BE ENABLED.
3RD STAGE OF COOLING: WHEN THE 2ND STAGE OF COOLING CANNOT MAINTAIN THE SUPPLY AIR TEMPERATURE FOR TEN MINUTES (ADJ) THEN CHILLED WATER COIL CONTROL VALVE SHALL OPEN AND MODULATE TO MAINTAIN SUPPLY AIR TEMPERATURE.
LESS COOLING SHALL BE OPPOSITE OF ABOVE.

ECONOMIZER COOLING IS ENABLED WHENEVER THE OUTSIDE AIR DRY-BULB TEMPERATURE IS LESS THAN THE RETURN AIR DRY-BULB TEMPERATURE PLUS DEADBAND. WHEN THE OUTSIDE AIR DRY-BULB TEMPERATURE IS GREATER THAN THE RETURN AIR DRY-BULB TEMPERATURE, ECONOMIZER COOLING IS DISABLED ECONOMIZER COOLING IS DISABLED AND THE OUTSIDE AIR DAMPER SHALL RETURN TO MINIMUM POSITION. THE OUTSIDE AIR DAMPERS SHALL MODULATE IN RESPONSE TO THE GREATER OF THE ECONOMIZER AND THE DEMAND CONTROLLED VENTILATION SEQUENCE.

ELECTRIC PREHEAT COIL: ELECTRIC PREHEAT COIL TO BE ENABLED AND MODULATED TO MAINTAIN A PREHEAT ELECTRIC COIL LEAVING AIR TEMPERATURE (EHT) OF 19 DEG. F.

OUTSIDE AIR DAMPER CONTROL: THE OUTSIDE AIR DAMPER SHALL OPEN TO MINIMUM POSITION IN EITHER THE COOLING OR HEATING MODE USING THE OA FLOW MEASURING STATION. THE OUTSIDE DAMPER SHALL BE PROVIDED WITH A LINEAR RESET FOR HEATING TO COOLING BASED ON OUTSIDE AIR TEMPERATURE. OUTSIDE AIR DAMPER SHALL BE SET AT THE HEATING OUTSIDE AIR POSITION AT 30 DEG. F. AND RESET TO COOLING POSITION AT 70 DEG. F. OUTSIDE AIR.

THE DISCHARGE AIR TEMPERATURE SHALL BE LIMITED TO A MINIMUM OF 55 DEG F, AND A MAXIMUM OF 90 DEG F.

SHOULD THE SUPPLY FAN OR EXHAUST FAN FAIL TO START OR FAIL DURING OPERATION FOR ANY REASON, AN ALARM SHALL BE INDICATED AT THE DDC CONTROL PANEL.

UNOCCUPIED CYCLE:
THE OUTSIDE AIR AND EXHAUST AIR DAMPERS SHALL BE CLOSED. THE MIXED AIR DAMPER SHALL BE OPEN. THE SUPPLY AND EXHAUST FANS SHALL BE OFF.

BASED ON SPACE SENSOR INPUT, THE SUPPLY FAN SHALL START AT MINIMUM SPEED WHEN SPACE TEMPERATURE DROPS BELOW 60 DEG F. THE OUTSIDE AIR DAMPER SHALL REMAIN CLOSED. THE HEATING WATER VALVE SHALL MODULATE TO MAINTAIN SPACE TEMPERATURE SETPOINT . WHEN THE SPACE TEMPERATURE REACHES 65 DEG F, THE SUPPLY FAN SHALL STOP, THE HEATING WATER VALVE SHALL CLOSE AND THE UNIT SHALL CYCLE OFF.

BASED ON SPACE SENSOR INPUT, THE SUPPLY FAN SHALL START AT MINIMUM SPEED WHEN SPACE TEMPERATURE RISES ABOVE 85 DEG F (ADJ.). ECONIMIZER COOLING SHALL BE FIRST STAGE OF COOLING WITH THE FAN SPEED AT THE HEATING AIRFLOW AND FULL FAN SPEED FOR 2ND STAGE OF COOLING. WHEN THE SPACE TEMPERATURE REACHES 80 DEG F (ADJ.), THE SUPPLY FAN SHALL STOP, THE OUTSIDE AIR DAMPER SHALL CLOSE, THE MIXED AIR DAMPER SHALL OPEN AND THE UNIT SHALL CYCLE OFF.

WHEN THE MIXED AIR TEMPERATURE DROPS BELOW 30 DEG.F. THE HEATING WATER VALVE SHALL MODULATE OPEN UNTIL THE MIXED AIR TEMPERATURE IS GREATER THAN 45 DEG. F.THE HEATING WATER VALVE SHALL THEN CLOSE. THE CHILLED WATER VALVE SHALL ALSO OPEN AND CLOSE WITH THE HEATING WATER VALVE FOR COIL PROTECTION.

VALVES SHALL OPEN UPON UNIT FAILURE, LOSS OF POWER OR IF THE UNIT IS SHUTDOWN DURING NORMAL OPERATION. DAMPERS SHALL CLOSE UPON A UNIT FAILURE, LOSS OF POWER OR IF THE UNIT IS SHUTDOWN DURING NORMAL OPERATION.

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PROJECT:

MIDDLE SCHOOL MECHANICAL UPGRADES

39610 Amethyst Drive
Steamboat Springs, CO 80487

OWNER:

Steamboat Springs School District Re-2

325 7th Street
Steamboat Springs, CO 80487

ISSUE:

2018/03/30 Issue for Bidding & Construction

DRAWING INFORMATION:

PROJECT NO:	11784.000
DRAWN BY:	BRE
CHECKED BY:	EJS
APPROVED BY:	EJS

SHEET TITLE:

MECHANICAL CONTROLS

M-600

SHEET OF

Point Name	Point Description	Binary Inputs	Binary Outputs	Analog Inputs	Analog Outputs	Schedule	Trend (duration)*	Alarm (hi/lo)	Show on Graphic
BDP	BUILDING DIFF PRESSURE			X					X
CWV	CHILLED WATER VALVE				X				X
DAT	DISCHARGE AIR TEMPERATURE			X			X		X
DDP	DUCT DIFFERENTIAL PRESSURE			X					X
EAD	EXHAUST AIR DAMPER				X				X
EAT	EXHAUST AIR TEMP			X			X	X	X
EAT2	EXHAUST AIR TEMP			X			X	X	X
EFMOD	EXHAUST FAN MODULATE				X				X
EFSS	EXHAUST FAN START/STOP		X			X			X
EFST	EXHAUST FAN STATUS	X						X	X
EHMOD	ELECTRIC HEAT MODULATION				X		X		X
EHSS	ELECTRIC HEAT START/STOP		X			X			X
EHST	ELECTRIC HEAT STATUS	X						X	X
EHT	ELECTRIC HEAT LEAVING AIR TEMPERATURE			X			X		X
HSA	HIGH STATIC ALARM	X						X	X
HWV	HEATING WATER VALVE				X		X		X
LTA	LOW TEMP ALARM	X						X	X
MAD	MIXED AIR DAMPER				X				X
MAT	MIXED AIR TEMPERATURE			X			X		X
OAD	OUTSIDE AIR DAMPER				X				X
OAFL	OUTSIDE AIRFLOW STATION				X		X		X
OAT	OUTSIDE AIR TEMPERATURE			X			X		X
SDA	SMOKE DETECTOR ALARM	X						X	X
SFMOD	SUPPLY FAN MODULATE				X				X
SFSS	SUPPLY FAN START/STOP		X			X			X
SFST	SUPPLY FAN STATUS	X						X	X
WSS	WHEEL START/STOP		X			X			X
WST	WHEEL STATUS	X						X	X
*SCHOOL DISTRICT TO CONFIRM FREQUENCY AND DURATION OF TRENDING REQUIREMENTS.									

SEQUENCE OF OPERATION

FAN COIL UNIT COOLING SHALL BE LOCKED OUT WHENEVER THE SUPPLY FAN IS OFF.

PROVIDE A MOISTURE SENSOR IN THE OVERFLOW DRAIN PAN. SEND ALARM TO OPERATORS WORK STATION.

SHOULD THE SMOKE DETECTOR ACTIVATE. THE FAN SHALL BE DISABLED.

DCC SYSTEM TO GENERATE ALARM AT DDC WORK STATION AND SEND NOTIFICATIONS TO SCHOOL DISTRICT STAFF IF SPACE RISES ABOVE 80 DEG. F. (ADJ.)

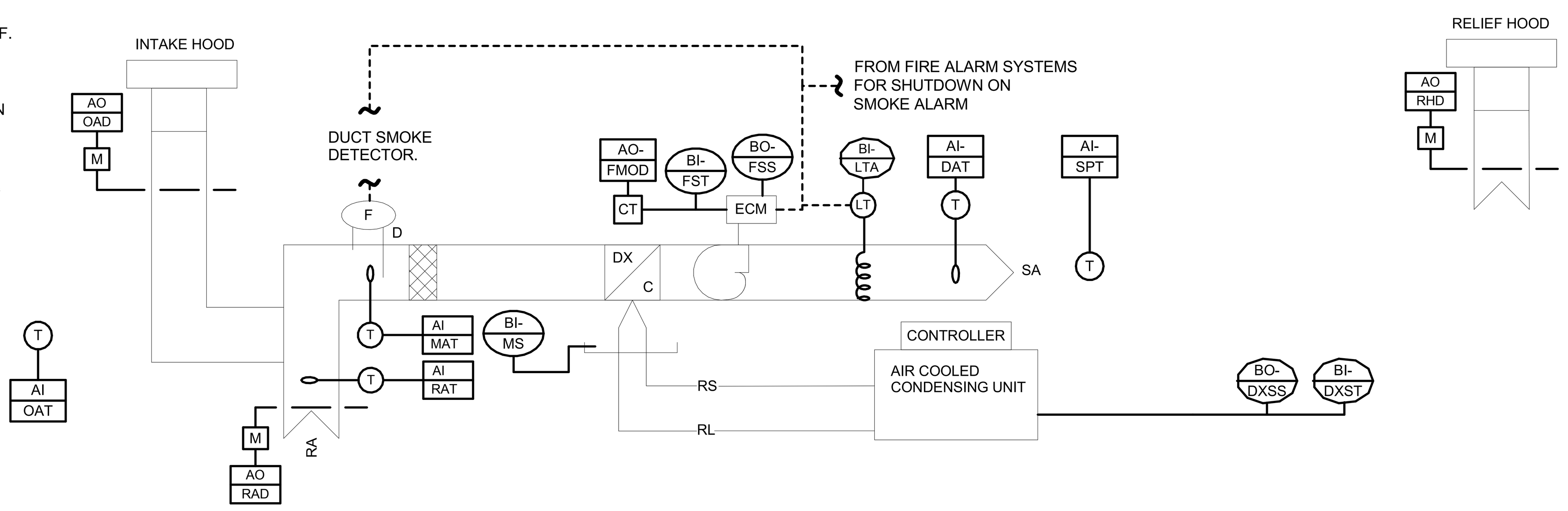
UNIT START / STOP CONTROL:
THE SUPPLY FAN SHALL START AND CYCLE TO MAINTAIN SPACE TEMPERATURE SETPOINT. ENABLE WHEN SPACE TEMP RISES ABOVE 76F AND DISABLE AND SHUTOFF FAN WHEN SPACE DROPS BELOW 74F.

ON SENSING A NEED FOR COOLING, 1ST STAGE COOLING: MODULATING THE RETURN AIR DAMPER AND OUTSIDE AIR DAMPER FOR ECONOMIZER COOLING. 2ND STAGE OF COOLING: WHEN THE 1ST STAGE OF COOLING CANNOT MAINTAIN THE SUPPLY AIR TEMPERATURE FOR TEN MINUTES (ADJ) THEN DX COLLING SHALL BE ENABLED TO MAINTAIN SPACE TEMPERATURE. OUTSIDE AIR DAMPER SHOULD BE SHUT AND RETURN AIR DAMPER FULLY OPEN. LESS COOLING SHALL BE OPPOSITE OF ABOVE.

THE DISCHARGE AIR TEMPERATURE SHALL BE LIMITED TO A MINIMUM OF 50 DEG F.

ECONOMIZER COOLING IS ENABLED WHENEVER THE OUTSIDE AIR DRY-BULB TEMPERATURE IS LESS THAN THE RETURN AIR DRY-BULB TEMPERATURE PLUS DEADBAND. WHEN THE OUTSIDE AIR DRY-BULB TEMPERATURE IS GREATER THAN THE RETURN AIR DRY-BULB TEMPERATURE, ECONOMIZER COOLING IS DISABLED AND THE OUTSIDE AIR DAMPER SHALL RETURN TO MINIMUM POSITION. IF NO MINIMUM OUTSIDE AIR CONDITION IS SCHEDULED DAMPER SHALL CLOSE. RELIEF HOOD SHALL TRACK OA DAMPER SIGNAL AND RETURN DAMPER SHALL TRACK OA DAMPER IN OPPOSITION.

Point Name	Point Description	Binary Inputs	Binary Outputs	Analog Inputs	Analog Outputs	Schedule	Trend (duration)*	Alarm (hi/lo)	Show on Graphic
DAT	DISCHARGE AIR TEMPERATURE			X			X		X
DXSS	DX START/STOP		X			X			X
DXST	DX STATUS	X						X	X
FMOD	SUPPLY FAN MODULATE				X				
FSS	SUPPLY FAN START/STOP		X			X			X
FST	SUPPLY FAN STATUS	X						X	X
LTA	LOW TEMPERATURE ALARM	X						X	X
MAT	MIXED AIR TEMPERATURE			X			X		X
MS	MOISTURE SENSOR	X						X	X
OAD	OUTSIDE AIR DAMPER				X				X
OAT	OUTSIDE AIR TEMPERATURE			X			X		X
RAD	RETURN AIR DAMPER				X				X
RAT	RETURN AIR TEMP			X			X		X
RHD	RELIEF HOOD DAMPER				X				X
SPT	SPACE TEMPERAATURE			X			X		X
*SCHOOL DISTRICT TO CONFIRM FREQUENCY AND DURATION OF TRENDING REQUIREMENTS.									



FCU-1/CU-1 (MDF UNIT) CONTROL DRAWING AND SEQ. OF OPERATION

NO SCALE

SEQUENCE OF OPERATION

VAV AIR HANDLING UNIT W/ ENERGY RECOVERY WHEEL.

GENERAL SECTION:
OUTSIDE AIR, MIXED AIR, AND EXHAUST AIR DAMPERS ARE PROVIDED WITH THE UNIT.

THE OUTSIDE AIR AND EXHAUST AIR DAMPERS SHALL CLOSE WHENEVER THE SUPPLY FAN STOPS UNDER ANY CONDITION. THE MIXED AIR DAMPER SHALL OPEN.

ALL CONTROL POINTS SHOWN SHALL REPORT TO THE DDC SYSTEM.

PROVIDE ALARM AT DDC WORKSTATION IF THE DISCHARGE AIR TEMPERATURE FALLS BELOW 45 DEG F, OR ABOVE F 95 DEG F

PROVIDE MANUFACTURE'S RECOMMENDED FROST PROTECTION SEQUENCE FOR THE HEAT WHEEL UTILIZING THE ELECTRIC PREHEATER. MODULATE PREHEATER AS REQUIRED. ELECTRIC HEAT IS TO BE ENABLED AND MODULATE BELOW 19 DEG. F. PROVIDE ALL ALARMS AT DDC WORKSTATION.

LIFE SAFETY SECTION:
SHOULD THE SMOKE DETECTOR, FREEZE STAT, OR DOOR SWITCH ACTIVATE, THE DETECTOR,STAT, OR DOOR SWITCH SHALL STOP THE SUPPLY FAN AND EXHAUST FANS IN BOTH THE MANUAL OR AUTOMATIC MODE, INDEPENDENT OF THE CONTROL SYSTEM. AN ALARM SIGNAL SHALL BE INDICATED AT THE DDC CONTROL PANEL.

PROVIDE A HIGH LIMIT DUCT STATIC PRESSURE SENSOR IMMEDIATELY DOWNSTREAM OF THE SUPPLY AIR FAN. UPON TRIPPING (4 IN. W.C.), THE HIGH LIMIT DUCT STATIC PRESSURE CONTROLLER SHALL STOP THE SUPPLY FAN INDEPENDENT OF THE CONTROL SYSTEM.

UNIT START / STOP CONTROL:
THE DDC SYSTEM TIME AND OPTIMUM START/STOP PROGRAM SHALL CONTROL THE SYSTEM IN THE FOLLOWING CONTROL CYCLES (INITIALLY START AT 6:30 A.M. AND INITIALLY STOP AT 4:30 P.M.) (ADJ).

WARM UP / COOL DOWN CYCLE:
AS CALCULATED BY THE DDC OPTIMUM START PROGRAM, THE WARM UP / COOL DOWN CYCLE SHALL START AS LATE AS POSSIBLE TO BRING THE SPACE TO ITS PROGRAMMED SETPOINT BY THE PROGRAMMED OCCUPIED TIME.

WARM UP:
DURING THE WARM UP CYCLE, THE SUPPLY FAN SHALL BE ON, THE OUTSIDE AIR AND EXHAUST AIR DAMPER SHALL BE 100% CLOSED AND THE MIXED AIR DAMPER SHALL BE 100% OPEN. WHEN THE SPACE TEMPERATURE REACHES THE OCCUPIED SETPOINT, THE SYSTEM SHALL GO TO THE OCCUPIED CYCLE.

COOL DOWN:
THE COOL DOWN CYCLE SHALL BE THE SAME AS THE OCCUPIED CYCLE.

OCCUPIED CYCLE:
THE EXHAUST AIR DAMPER SHALL OPEN AND THE MIXED AIR AND OUTSIDE AIR DAMPER SHALL OPEN TO MINIMUM POSITION IN EITHER THE HEATING MODE OR COOLING MODE. THE SUPPLY FAN SHALL BE ENERGIZED. THE SUPPLY FAN SHALL BE SLOWLY RAMPED FROM ZERO TO MINIMUM SPEED AFTER THE SUPPLY FAN IS STARTED. THE AIR HANDLING UNIT SUPPLY FAN SPEED SHALL MODULATE TO MAINTAIN DUCT STATIC PRESSURE SETPOINT OF 0.75 IN WG (OR AS REQUIRED AS DETERMINED BY THE BALANCING CONTRACTOR). THE SUPPLY FAN SPEED SHALL NOT DROP BELOW 30% TO ASSURE ADEQUATE FAN MOTOR COOLING. THE STATIC PRESSURE SETPOINT SHALL BE RESET SO THAT AT LEAST ONE OF THE VAV BOXES IS AT 90% OPEN.

IN THE EVENT OF LOSS OF COMMUNICATION WITH ONE OR MORE VAV CONTROLLERS THE SYSTEM SHALL REVERT TO MODULATING THE FAN SPEED TO MAINTAIN THE DUCT STATIC PRESSURE SETPOINT OF 0.75 IN.W.C. A HIGH LIMIT FUNCTION SHALL REDUCE THE SUPPLY FAN SPEED TO KEEP THE SUPPLY DUCT PRESSURE FROM EXCEEDING 1.5 IN.W.C. OF WATER REGARDLESS OF THE DEMAND FROM THE VAV BOXES. THE FINAL DUCT STATIC PRESSURE SETPOINT SHALL BE DETERMINED IN CONSULTATION WITH THE BALANCING CONTRACTOR. WHEN THE SUPPLY FAN IS DE-ENERGIZED THE STATIC SETPOINT SHALL BE ZERO.

THE EXHAUST FAN SPEED SHALL BE PROVIDED WITH AN OFFSET BASED ON SUPPLY FAN SPEED TO MAINTAIN PLENUM STATIC PRESSURE OF 0.05 IN.W. C. (ADJUSTABLE).

THE DISCHARGE AIR TEMPERATURE SHALL BE MAINTAINED AT A MAXIMUM TEMPERATURE SETPOINT OF 55 DEG F. IN BOTH THE HEATING AND COOLING MODES BY:

ELECTRIC PREHEAT COIL: ELECTRIC PREHEAT COIL TO BE ENABLED AND MODULATED TO MAINTAIN A PREHEAT ELECTRIC COIL LEAVING AIR TEMPERATURE (EHT) OF 19 DEG. F.

1ST STAGE OF HEATING: ENABLING THE HEAT WHEEL.
2ND STAGE OF HE HEATING: WHEN THE 1ST STAGE OF HEATING CANNOT MAINTAIN THE SUPPLY AIR TEMPERATURE FOR TEN MINUTES (ADJ) THEN THE HEATING HEATING WATER CONTROL VALVE SHALL OPEN AND MODULATE TO MAINTAIN THE SUPPLY AIR TEMPERATURE.
LESS HEATING SHALL BE OPPOSITE OF ABOVE.

1ST STAGE COOLING. MODULATING THE MIXED AIR DAMPER
AND OUTSIDE AIR DAMPER FOR ECONOMIZER COOLING WITH THE HEAT WHEEL OFF. (SEE BELOW FOR ECONOMIZER COOLING)
2ND STAGE OF COOLING: WHEN THE 1ST STAGE OF COOLING CANNOT MAINTAIN THE SUPPLY AIR TEMPERATURE FOR TEN MINUTES (ADJ) THEN THE HEAT WHEEL SHALL BE ENABLED.
3RD STAGE OF COOLING: WHEN THE 2ND STAGE OF COOLING CANNOT MAINTAIN THE SUPPLY AIR TEMPERATURE FOR TEN MINUTES (ADJ) THEN CHILLED WATER COIL CONTROL VALVE SHALL OPEN AND MODULATE TO MAINTAIN SUPPLY AIR TEMPERATURE.
LESS COOLING SHALL BE OPPOSITE OF ABOVE.

THE SUPPLY AIR TEMPERATURE SETPOINT SHALL BE RESET FROM T-MIN (55 DEG. F) WHEN THE OUTSIDE AIR TEMPERATURE IS 70 DEG. F AND ABOVE, UP TO T-MAX WHEN THE OUTSIDE AIR TEMPERATURE IS 65 DEG. F AND BELOW. T-MAX SHALL RANGE FROM 55 DEG. F TO 65 DEG. F. T-MAX SHALL VARY SUCH THAT THE VAV BOX WITH THE HIGHEST COOLING DEMAND IS AT 90% OF ITS COOLING MAX SETPOINT. THE SUPPLY AIR TEMPERATURE SETPOINT SHALL CHANGE SLOWLY; NO MORE THAN 1 DEG. F PER 15 MINUTE PERIOD.

ECONOMIZER COOLING IS ENABLED WHENEVER THE OUTSIDE AIR DRY-BULB TEMPERATURE IS LESS THAN THE RETURN AIR DRY-BULB TEMPERATURE PLUS DEADBAND. WHEN THE OUTSIDE AIR DRY-BULB TEMPERATURE IS GREATER THAN THE RETURN AIR DRY-BULB TEMPERATURE, ECONOMIZER COOLING IS DISABLED AND THE OUTSIDE AIR DAMPER SHALL RETURN TO MINIMUM POSITION.

OUTSIDE AIR DAMPER CONTROL:

THE OUTSIDE AIR DAMPER SHALL OPEN TO MINIMUM POSITION IN EITHER THE COOLING OR HEATING MODE USING THE OA FLOW MEASURING STATION. THE OUTSIDE DAMPER SHALL BE PROVIDED WITH A LINEAR RESET FOR HEATING TO COOLING BASED ON OUTSIDE AIR TEMPERATURE. OUTSIDE AIR DAMPER SHALL BE SET AT THE HEATING OUTSIDE AIR POSITING AT 30 DEG. F. AND RESET TO COOLING POSITION AT 70 DEG. F. OUTSIDE AIR.

THE DISCHARGE AIR TEMPERATURE SHALL BE LIMITED TO A MINIMUM OF 55 DEG F, AND A MAXIMUM OF 95 DEG F.

SHOULD THE SUPPLY FAN OR EXHAUST FAN FAIL TO START OR FAIL DURING OPERATION FOR ANY REASON, AN ALARM SHALL BE INDICATED AT THE DDC CONTROL PANEL.

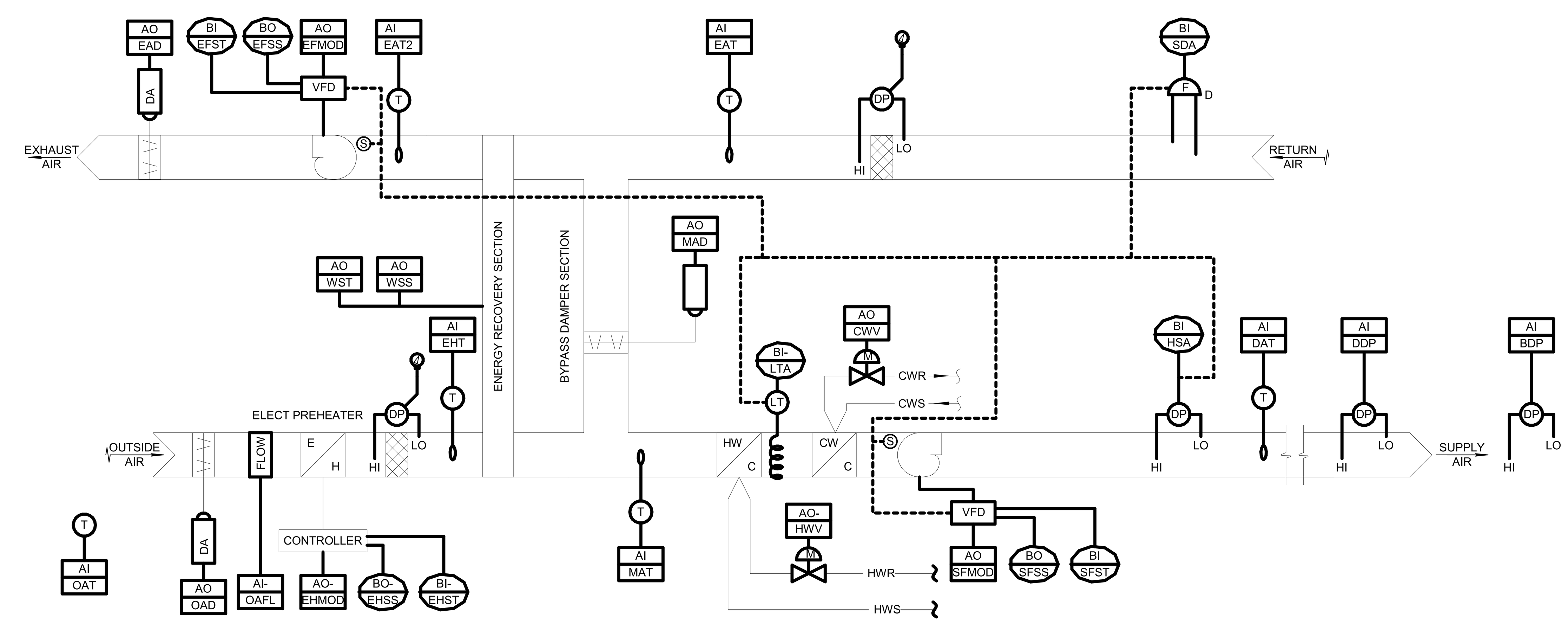
CO2 CONTROL:
PROVIDE A CARBON DIOXIDE SENSOR WHICH SHALL MODULATE THE OUTSIDE AIR DAMPERS BETWEEN THE CO2 MIN AND THE OSA MIN. DAMPER POSITION (UNLESS UNIT IS IN ECONOMIZER CYCLE) TO MAINTAIN A MAX CARBON DIOXIDE LEVEL IN THE SPACE OF 650 PPM (ADJ.) ABOVE AMBIENT AS REFERENCED BY THE EXTERIOR SENSOR. THE CO2 MIN DAMPER POSITION SHALL BE 10% OF THE TOTAL UNIT AIRFLOW. THE CARBON DIOXIDE SENSOR SHALL BE LOCATED PER THE FLOOR PLANS. THE CO2 SENSOR SHALL CONTROL THE OSA DAMPER. IF THE CO2 LEVEL SENSED DROPS BELOW 500 PPM (ADJ.) ABOVE AMBIENT. AS REFERENCED BY THE EXTERIOR SENSRO. THE OUTSIDE AIR DAMPERS SHALL RETURN TO ITS CO2 MINIMUM POSITION.

UNOCCUPIED CYCLE:
THE OUTSIDE AIR AND EXHAUST AIR DAMPERS SHALL BE CLOSED. THE MIXED AIR DAMPER SHALL BE OPEN. THE SUPPLY AND EXHAUST FANS SHALL BE OFF.

BASED ON SPACE SENSOR INPUT, THE SUPPLY FAN SHALL START WHEN SPACE TEMPERATURE DROPS BELOW 60 DEG F. THE OUTSIDE AIR DAMPER SHALL REMAIN CLOSED. THE HEATING WATER VALVE SHALL OPEN IN THE HEATING MODE. WHEN THE SPACE TEMPERATURE REACHES 65 DEG F, THE SUPPLY FAN SHALL STOP, THE HEATING WATER VALVE SHALL CLOSE AND THE UNIT SHALL CYCLE OFF.

BASED ON SPACE SENSOR INPUT, THE SUPPLY FAN SHALL START WHEN SPACE TEMPERATURE RISES ABOVE 85 DEG F (ADJ.). ECONIMIZER COOLING SHALL BE FIRST STAGE OF COOLING AND THE CHILLED WATER VALVE SHALL BE THE SECOND STAGE OF COOLING. WHEN THE SPACE TEMPERATURE REACHES 80 DEG F (ADJ.), THE SUPPLY FAN SHALL STOP, THE OUTSIDE AIR DAMPER AND CHILLED WATER VALVE SHALL CLOSE, THE MIXED AIR DAMPER SHALL OPEN AND THE UNIT SHALL CYCLE OFF.

WHEN THE MIXED AIR TEMPERATURE DROPS BELOW 30 DEG.F. THE HEATING WATER VALVE SHALL MODULATE OPEN UNTIL THE MIXED AIR TEMPERATURE IS GREATER THAN 45 DEG. F.THE HEATING WATER VALVE SHALL THEN CLOSE. THE CHILLED WATER VALVE SHALL ALSO OPEN AND CLOSE WITH THE HEATING WATER VALVE FOR COIL PROTECTION.



RTU-3,4,5,6 CONTROL DRAWING AND SEQ. OF OPERATION

NO SCALE

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MIDDLE SCHOOL MECHANICAL UPGRADES
39610 Amethyst Drive
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OWNER:
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ISSUE:
2018/03/30 Issue for Bidding & Construction

DRAWING INFORMATION:

PROJECT NO:	11784.000
DRAWN BY:	BRE
CHECKED BY:	EJS
APPROVED BY:	EJS

SHEET TITLE:
MECHANICAL CONTROLS

M-601

SHEET OF

11784.000 MIDDLE SCHOOL MECHANICAL UPGRADES
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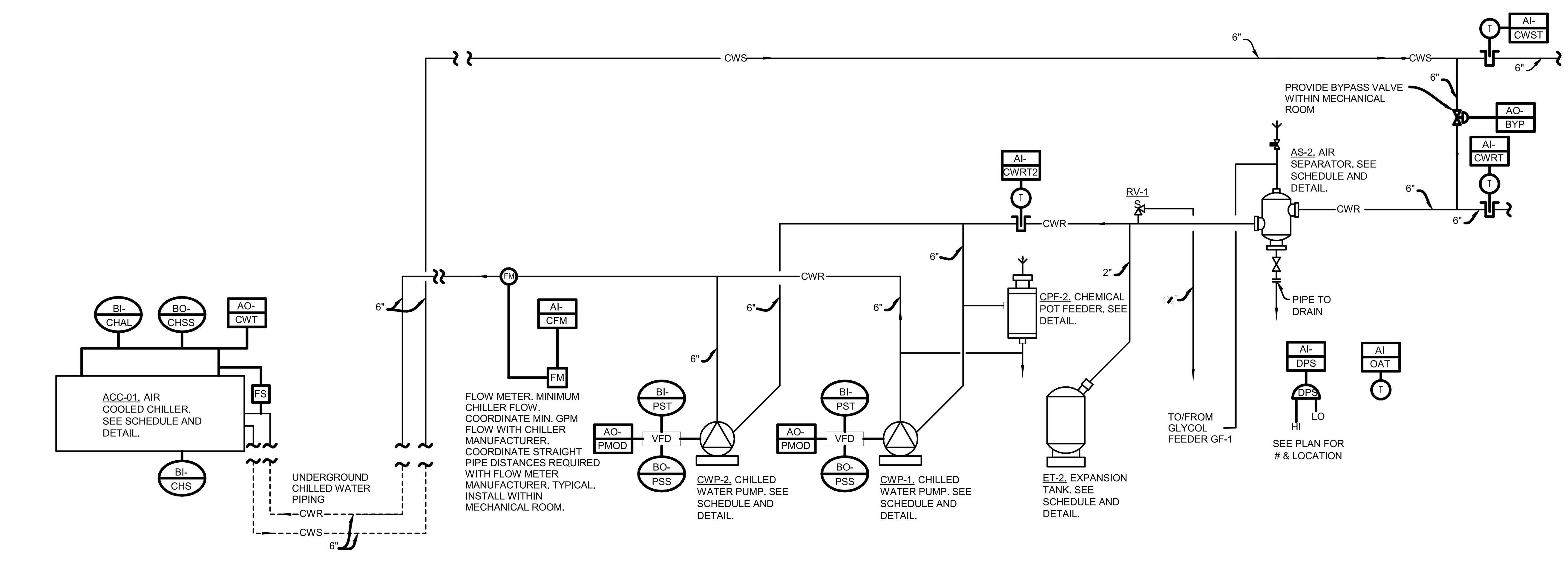


CHILLED WATER SYSTEM PIPING SCHEMATIC, CONTROL DRAWING, AND SEQ. OF OPERATION

NO SCALE

CHILLED WATER SYSTEM CONTROL SEQUENCE OF OPERATION:

THE CHILLED WATER SYSTEM SHALL CONSIST OF ONE AIR COOLED CHILLER WITH PACKAGED CONTROLS, PRIMARY AND SECONDARY CHILLED WATER PUMPS, A GLYCOL FEEDER AND SENSORS. DDC SYSTEM SHALL ALTERNATE LEAD PUMPS WEEKLY EVERY MONDAY AT 10AM.

THE CHILLED WATER SUPPLY TEMPERATURE SETPOINT SHALL RESET BASED ON OUTSIDE AIR TEMPERATURE. AS OUTSIDE AIR TEMPERATURE DROPS FROM 75°F (ADJ.) TO 35°F (ADJ.) THE CHILLED WATER SUPPLY TEMPERATURE SETPOINT SHALL RESET UPWARDS BY ADDING FROM 0°F (ADJ.) TO 10°F (ADJ.) TO THE CURRENT SETPOINT. AS A BASELINE, PROVIDE 45°F CHILLED WATER.

CHILLER SEQUENCE OF OPERATION:

THE DDC SYSTEM SHALL START THE CHILLED WATER PUMP AND ESTABLISH MINIMUM FLOW THROUGH THE CHILLER. THE DDC SHALL THEN PROVIDE A START TO THE CHILLER CONTROL PANEL.

ONCE MINIMUM FLOW IS ESTABLISHED THROUGH THE CHILLER, THE CHILLER CONTROL SHALL MODULATE THE CHILLERS OPERATION TO MAINTAIN THE CHILLED WATER DISCHARGE TEMPERATURE AT THE CHILLED WATER SETPOINT OF 45 DEG. F.

AT CHILLER INITIALIZATION. THE DDC SYSTEM SHALL KEEP THE SYSTEM BY-PASS VALVE IN THE CLOSED POSITION SUCH THAT ALL WATER FLOW IS SENT OUT TO THE SYSTEM. THE FLOW SHALL BE MEASURED AFTER A 1 MINUTE INTERVAL. IF THE FLOW IS LESS THAN THE MINIMUM CHILLER FLOW, THE BYPASS VALVE SHALL BE FULLY OPENED. IF THE FLOW IS GREATER THAN THE MINIMUM CHILLER FLOW THE BYPASS, SHALL REMAIN CLOSED.

AFTER THE INITIALIZATION PERIOD, THE DIFFERENTIAL PRESSURE SENSOR AND FLOW METER SHALL BE CHECKED. THE PUMP VFD WILL MODULATE THE PUMP TO MAINTAIN A MINIMUM DIFFERENTIAL PRESSURE SETPOINT OF 10 PSI. (COORDINATE ACTUAL SETPOINT WITH TEMPERATURE CONTROLS CONTRACTOR) IF THE MEASURED FLOW IS ABOVE THE CHILLER MINIMUM FLOW THE BYPASS VALVE SHALL REMAIN CLOSED. IF THE MEASURED FLOW FALLS BELOW THE MINIMUM CHILLER FLOW THE BYPASS VALVE SHALL MODULATE OPEN TO MAINTAIN THE MINIMUM CHILLER FLOW.

WHEN THE OUTSIDE AIR TEMPERATURE DROPS BELOW 60 DEG F. (ADJ) FOR A PERIOD OF 4 HOURS. THE CHILLER SHALL BE DISABLED.

CHILLER WATER TEMPERATURE SHALL ALSO BE RESET BASED ON DEMAND. THE DDC SYSTEM SHALL MONITOR ALL CHILLED WATER CONTROL VALVES. WHEN ONE OR MORE VALVES ARE FULLY OPEN FOR MORE THAN 5 MINUTES (ADJ.) AND RESPECTIVE ZONE IS NOT MEETING SPACE TEMPERATURE SET POINT, CHILLED WATER SYSTEM TO RESET TEMPERATURE. CHILLED WATER SUPPLY TEMPERATURE RESET SHALL OCCUR BY DECREASING THE TEMPERATURE BY 2 DEGREES F EVERY 10 MINUTES (ADJ.) UNTIL ALL CHILLED WATER CONTROL VALVES AND RESPECTIVE ZONES ARE SATISFIED. MINIMUM SUPPLY TEMPERATURE SHALL NOT FALL BELOW 45 DEGREES F (ADJ.).

WHEN ALL CHILLED WATER CONTROL VALVES ARE NO LONGER 100% FULLY OPEN FOR 30 MINUTES (ADJ.) THE CHILLED WATER SYSTEM TEMPERATURE SHALL BE RESET UP AT A RATE OF 2 DEGREES F EVERY 10 MINUTES (ADJ.) UNTIL ONE OR MORE VALVES ARE FULLY OPEN FOR MORE THAN 5 MINUTES (ADJ.). MINIMUM RETURN TEMPERATURE SHALL NOT RISE ABOVE 65 DEGREES F (ADJ.).
WHEN CHILLED WATER SYSTEM DIFFERENTIAL TEMPERATURE DROPS BELOW 5 DEGREES F (ADJ.) AND NO VALVES ARE GREATER THAN 25% OPEN (ADJ.), THEN THE CHILLED WATER PLANT SHALL SHUT DOWN. AS 2 OR MORE CHILLED WATER VALVES START TO OPEN CHILLER START SEQUENCE SHALL COMMENCE.
THE LOAD RESET SHALL HAVE PRIORITY OVER OUTSIDE AIR RESET.
ALARMS AND SAFETIES

THE DDC SYSTEM SHALL MONITOR THE STATUS OF THE CHILLER, PUMPS AND GLYCOL FEEDER AND CREATE AN ALARM SHOULD ANY STATUS NOT EQUAL THE COMMANDED CONDITION. TEMPERATURE SENSORS IN THE SUPPLY, RETURN AND ENTERING CHILLER WATER SHALL REPORT TO THE DDC SYSTEM FOR SYSTEM MONITORING AND ALARM CONDITIONS SHALL BE PROVIDED FOR EACH TEMPERATURE. SUPPLY WATER TEMPERATURE SHALL GENERATE AN ALARM WHEN THE SUPPLY TEMPERATURE HAS RAISED 5 DEG. F ABOVE SETPOINT OR DROPPED 5 DEG. BELOW SETPOINT. RETURN WATER ALARM SHALL BE GENERATED IF THE RETURN TEMPERATURE HAS EQUALED SUPPLY TEMPERATURE.

AN ALARM SHALL BE GENERATED AT THE DDC PANEL IF THE GPM DROPS BELOW MINIMUM FLOW THROUGH THE CHILLER AS MEASURED BY THE SYSTEM FLOW METER. A TIME DELAY OF 8 MINUTES (ADJ.) SHALL BE PROVIDED TO AVOID TRIPS AT START-UP.

CHILLER PIPING PROTECTION

WHEN THE OUTDOOR AIR TEMPERATURE HAS FALLEN BELOW 20 DEG. F.(ADJ) THE DDC SYSTEM SHALL OPEN THE BYPASS VALVE AND ENABLE THE CHILLED WATER PUMP AT MINIMUM SPEED. WHEN THE OUTDOOR TEMPERATURE HAS RISEN ABOVE 25 DEG. F. THE CHILLED WATER PUMP SHALL BE DISABLED AND ALL VALVES SHALL CLOSE IF THERE IS NOT A CALL FOR COOLING.

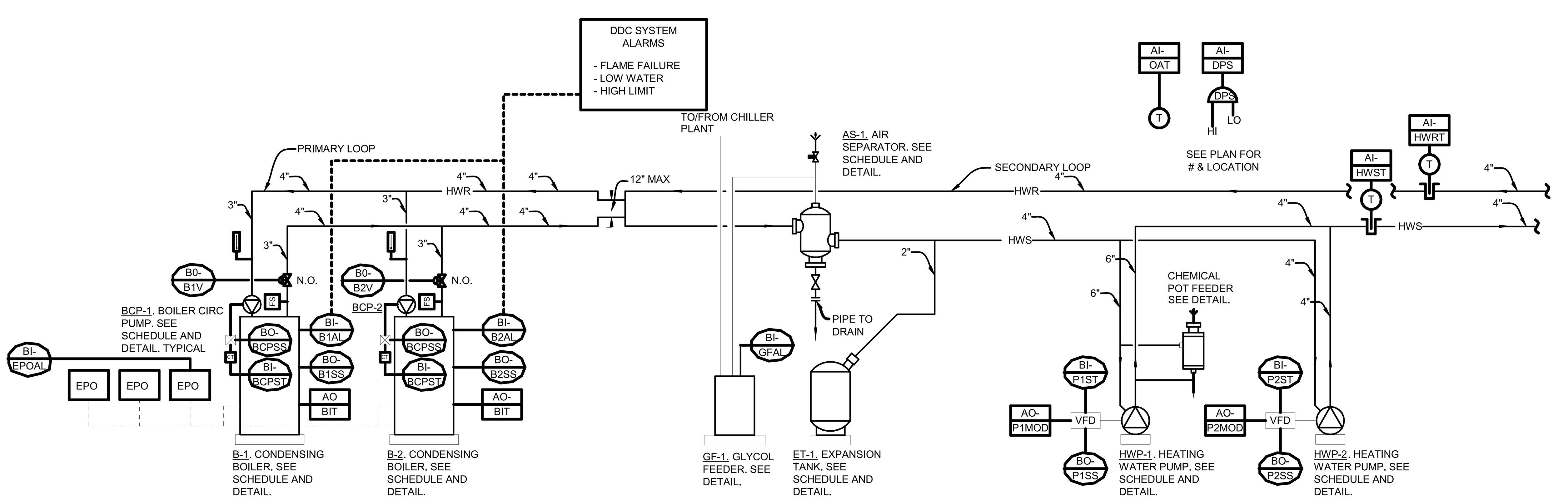
CONTRACTOR SHALL COORDINATE WITH THE CHILLER MANUFACTURER FOR INTERFACE OF THE DDC SYSTEM AND CHILLER CONTROLS.

Point Name	Point Description	Binary Inputs	Binary Outputs	Analog Inputs	Analog Outputs	Analog Virtual	Digital Virtual	Schedule	Trend (duration)*	Alarm (hi/lo)	Show on Graphic
PST	PUMP STATUS	X								X	X
CHAL	CHILLER ALARM	X								X	X
GFAL	GLYCOL FEEDER ALARM	X								X	X
CHS	CHILLER STATUS	X								X	X
PSS	PUMP START/STOP		X					X			X
CHSS	CHILLER START/STOP		X					X			X
CWST	CHILLED WATER SUPPLY TEMP			X					X		X
CWRT	CHILLED WATER RETURN TEMP			X					X		X
CWRT2	CHILLED WATER RETURN TEMP 2			X					X		X
CWT	CHILLED WATER TEMP				X				X		X
DPS	DIFFERENTIAL PRESSURE SENSOR			X							X
OAT	OUTSIDE AIR TEMP.			X							X
CFM	CHILLED WATER FLOW METER			X					X	X	X
BYP	BYPASS VALVE				X						X
CHV	CHILLED WATER VALVE				X						X
PMOD	PUMP MODULATE				X						

*SCHOOL DISTRICT TO CONFIRM FREQUENCY AND DURATION OF TRENDING REQUIREMENTS

Point Name	Point Description	Binary Inputs	Binary Outputs	Analog Inputs	Analog Outputs	Analog Virtual	Digital Virtual	Schedule	Trend (duration)*	Alarm (hi/lo)	Show on Graphic
P#ST	PUMP STATUS	X								X	X
BCP#ST	CIRC PUMP STATUS	X								X	X
B#AL	BOILER ALARM	X								X	X
EPOAL	EPO ALARM	X								X	X
GFAL	GLYCOL FEEDER ALARM	X								X	X
P#SS	PUMP START/STOP		X					X			X
BCP#SS	CIRC PUMP START/STOP		X					X			X
B#SS	BOILER START/STOP		X					X			X
HWST	HEATING WATER SUPPLY TEMP			X					X		X
HWRT	HEATING WATER RETURN TEMP			X					X		X
DPS	DIFFERENTIAL PRESSURE SENSOR			X							X
OAT	OUTSIDE AIR TEMP.			X							X
B#V	BOILER VALVE				X						X
BIT	BOILER TEMP SETTING				X						X
P#MOD	PUMP MODULATE				X						

*SCHOOL DISTRICT TO CONFIRM FREQUENCY AND DURATION OF TRENDING REQUIREMENTS



HEATING WATER SYSTEM PIPING SCHEMATIC CONTROL DRAWING AND SEQ. OF OPERATION

NO SCALE

HOT WATER HEATING SYSTEM CONTROL SEQUENCE OF OPERATION

LIFE SAFETY SECTION:

AN EMERGENCY POWER OFF (EPO) SHALL BE PROVIDED THAT DISABLES THE HEATING WATER BOILERS. EPO(S) TO BE LOCATED PER CODE AT EACH BOILER ROOM EXIT DOOR.

ALL SAFETIES SPECIFIED WITH BOILER SHALL BE LEFT IN OPERATION AS RECOMMENDED BY THE BOILER MANUFACTURER.

GENERAL SECTION:

SYSTEM PUMPS TO BE CONTROLLED BY THE DDC SYSTEM. BOILERS TO BE CONTROLLED BY THE DDC SYSTEM. THE DDC SYSTEM WILL PROVIDE THE BOILERS WITH ALL REQUIRED INPUTS TO INCLUDE BUT BE NOT LIMITED TO THE FOLLOWING: REQUIRED WATER SUPPLY TEMPERATURE, ENABLE/DISABLE COMMAND.

THE DDC SYSTEM SHALL BE CAPABLE OF MONITORING THE STATUS OF ALL ALARMS INCLUDING THOSE FROM THE BOILERS. AS A MINIMUM THE DDC WILL PULL THE FOLLOWING BOILER ALARMS TO THE DISTRICT WORKSTATION: FLAME FAILURE, LOW WATER, HIGH TEMPERATURE LIMIT, INDIVIDUAL BOILER SUPPLY TEMPERATURE.

SYSTEM PUMPING:

THE DDC SYSTEM SHALL START THE LEAD HEATING WATER PUMP WHEN OAT < 65 DEG. F (ADJ.). THE DDC SYSTEM SHALL STOP THE LEAD HEATING WATER PUMP WHEN OAT > 68 DEG. F (ADJ.). PUMPS SHALL DUTY CYCLE ON A PRIMARY/STANDBY SEVEN DAY CYCLE (INITIALLY 4:00 PM ON MONDAYS). ON FAILURE AS INDICATED VIA THE VFD INTERFACE, THE LAG PUMP SHALL START AND AN ALARM SHALL BE DISPLAYED AT THE DISTRICT OPERATOR'S WORKSTATION.

PUMP VFD SHALL MODULATE TO MAINTAIN DIFFERENTIAL PRESSURE IN THE SYSTEM AT A MINIMUM OF 10 PSIG (ADJ.,) (CONTROLS CONTRACTOR TO COORDINATE WITH BALANCER TO DETERMINE ACTUAL SET POINT) AT ALL DIFFERENTIAL PRESSURE TRANSMITTERS. PUMP SHALL NOT MODULATE BELOW MINIMUM MOTOR SPEED AS DETERMINED BY THE MANUFACTURER.

AFTER PROOF OF WATER FLOW, AS DETERMINED BY PUMP STATUS, THE DDC SYSTEM SHALL ENABLE THE BOILERS AND CORRESPONDING CIRCULATING PUMPS WHEN THE OAT < 65 DEG. F (ADJ). THE DDC SYSTEM SHALL DISABLE THE BOILER PLANT WHEN THE OAT > 68 DEG. F (ADJ.). AS 2 OR MORE HEATING VALVES START TO OPEN BOILER START SEQUENCE SHALL COMMENCE.

BOILER CONTROL:

DDC SYSTEM SHALL PROVIDE THE BOILERS WITH THE REQUIRED SUPPLY WATER TEMPERATURE AS DETERMINED FROM THE TEMPERATURE RESET SEQUENCE SHOWN BELOW. THE DDC SYSTEM WILL MODULATE THE BOILERS AND CORRESPONDING CIRCULATING PUMPS IN TANDEM TO MAINTAIN HIGHEST PLANT EFFICIENCY (STAGING DETERMINED BY THE BOILER MANUFACTURER) THAT WILL PROVIDE REQUIRED SUPPLY WATER TEMPERATURE AS CALLED FOR BY DDC SYSTEM. BOILER ISOLATION VALVES SHALL BE OPENED 1 MINUTE (ADJ.) BEFORE BOILER IS FIRED. PROOF OF FLOW THROUGH THE BOILER SHALL BE ESTABLISHED BEFORE BOILER IS FIRED. BOILER ISOLATION VALVES SHALL CLOSE 5 MINUTES (ADJ.) AFTER BOILER IS DISABLED.

PROVIDE SUPPLY AND RETURN HEATING WATER TEMPERATURE SENSORS LOCATED WHERE SHOWN SCHEMATICALLY FOR DDC MONITORING.

HEATING WATER TEMPERATURE RESET:

THE HEATING WATER NOMINAL SUPPLY TEMPERATURE SHALL BE BASED UPON THE FOLLOWING:

10 DEG. F OSA 150 DEG. F HWS
65 DEG. F OSA 110 DEG. F HWS

HEATING WATER TEMPERATURE SHALL ALSO BE RESET BASED ON DEMAND. THE DDC SYSTEM SHALL MONITOR ALL HEATING CONTROL VALVES. WHEN ONE OR MORE VALVES ARE FULLY OPEN FOR MORE THEN 5 MINUTES (ADJ.) AND RESPECTIVE ZONE IS NOT MEETING SPACE TEMPERATURE SET POINT, HEATING WATER SYSTEM TO RESET TEMPERATURE. HEATING WATER SUPPLY TEMPERATURE RESET SHALL OCCUR BY INCREASING TEMPERATURE BY 2 DEGREES F EVERY 10 MINUTES (ADJ.) UNTIL ALL HEATING CONTROL VALVES AND RESPECTIVE ZONES ARE SATISFIED. MAXIMUM SUPPLY TEMPERATURE SHALL NOT RISE ABOVE 140 DEGREES F (ADJ.).

WHEN ALL HEATING CONTROL VALVES ARE NO LONGER 100% FULLY OPEN FOR 30 MINUTES (ADJ.) THE HEATING WATER SYSTEM TEMPERATURE SHALL BE RESET DOWN AT A RATE OF 2 DEGREES F EVERY 10 MINUTES (ADJ.) UNTIL ONE OR MORE VALVES ARE FULLY OPEN FOR MORE THAN 5 MINUTES (ADJ.). MINIMUM RETURN TEMPERATURE SHALL NOT DROP BELOW 80 DEGREES F (ADJ.).

WHEN HEATING WATER SYSTEM DIFFERENTIAL TEMPERATURE DROPS BELOW 5 DEGREES F (ADJ.) AND NO VALVES ARE GREATER THEN 25% OPEN (ADJ.), THEN BOILER PLANT SHALL SHUT DOWN. AS 2 OR MORE HEATING VALVES START TO OPEN BOILER START SEQUENCE SHALL COMMENCE.

THE LOAD RESET SHALL HAVE PRIORITY OVER OUTSIDE AIR RESET.

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COLORADO LICENSED PROFESSIONAL ENGINEER 41793 3/30/18

PROJECT:
MIDDLE SCHOOL MECHANICAL UPGRADES
39610 Amethyst Drive
Steamboat Springs, CO 80487

OWNER:
Steamboat Springs School District Re-2
325 7th Street
Steamboat Springs, CO 80487

ISSUE:
2018/03/30 Issue for Bidding & Construction

DRAWING INFORMATION:

PROJECT NO:	11784.000
DRAWN BY:	BRE
CHECKED BY:	EJS
APPROVED BY:	EJS

SHEET TITLE:
MECHANICAL CONTROLS

M-602
SHEET OF

COM*check* Software Version 4.0.7.2 Review

Mechanical Compliance Certificate

Project Information

Energy Code:	2015 IECC
Project Title:	
Location:	Denver, Colorado
Climate Zone:	5b
Project Type:	New Construction

Construction Site: Owner/Agent: Designer/Contractor:

Additional Efficiency Package

Unspecified

Mechanical Systems List

Quantity   System Type & Description

1   RTU-01 (Single Zone):
Heating: 1 each - Hydronic or Steam Coil, Hot Water, Capacity = 365000 kBtu/h
No minimum efficiency requirement applies
Cooling: 1 each - Hydronic Coil, Capacity = 171000 kBtu/h, Air Economizer
No minimum efficiency requirement applies
Fan System: RTU-01 -- Compliance (Brake HP method) : Passes

Fans:
FAN 1 Supply, Single-Zone VAV, 8500 CFM, 7.5 motor nameplate hp, 6.0 design brake hp (6.0 max. BHP), 0.0 fan efficiency grade
FAN 2 Exhaust, Single-Zone VAV, 8500 CFM, 4.0 motor nameplate hp, 3.3 design brake hp (3.3 max. BHP), 0.0 fan efficiency grade
Pressure Drop Credits:
Energy recover device, other than Coil Runaround Loop, 3.3745 credit

1   RTU-02 (Single Zone):
Heating: 1 each - Hydronic or Steam Coil, Hot Water, Capacity = 379000 kBtu/h
No minimum efficiency requirement applies
Cooling: 1 each - Hydronic Coil, Capacity = 327000 kBtu/h, Air Economizer
No minimum efficiency requirement applies
Fan System: RTU-02 -- Compliance (Brake HP method) : Passes

Fans:
FAN 3 Supply, Single-Zone VAV, 16900 CFM, 20.0 motor nameplate hp, 13.2 design brake hp (13.2 max. BHP), 0.0 fan efficiency grade
FAN 4 Exhaust, Single-Zone VAV, 16900 CFM, 10.0 motor nameplate hp, 5.8 design brake hp (5.8 max. BHP), 0.0 fan efficiency grade
Pressure Drop Credits:
Energy recover device, other than Coil Runaround Loop, 6.7093 credit

1   RTU-03 (Multiple-Zone):
Heating: 1 each - Hydronic or Steam Coil, Hot Water, Capacity = 166000 kBtu/h
No minimum efficiency requirement applies
Cooling: 1 each - Hydronic Coil, Capacity = 314000 kBtu/h, Air Economizer
No minimum efficiency requirement applies
Fan System: RTU-03 -- Compliance (Brake HP method) : Passes

Fans:
FAN 5 Supply, Multi-Zone VAV, 15900 CFM, 15.0 motor nameplate hp, 11.7 design brake hp (11.7 max. BHP), 0.0 fan efficiency grade
FAN 6 Exhaust, Multi-Zone VAV, 15900 CFM, 10.0 motor nameplate hp, 5.9 design brake hp (5.9 max. BHP), 0.0 fan efficiency

Quantity   System Type & Description

grade
Pressure Drop Credits:
Energy recover device, other than Coil Runaround Loop, 6.3123 credit

1   RTU-04 (Multiple-Zone):
Heating: 1 each - Hydronic or Steam Coil, Hot Water, Capacity = 137000 kBtu/h
No minimum efficiency requirement applies
Cooling: 1 each - Hydronic Coil, Capacity = 222000 kBtu/h, Air Economizer
No minimum efficiency requirement applies
Fan System: RTU-04 -- Compliance (Brake HP method) : Passes

Fans:
FAN 7 Supply, Multi-Zone VAV, 11000 CFM, 15.0 motor nameplate hp, 9.5 design brake hp (9.5 max. BHP), 0.0 fan efficiency grade
FAN 8 Exhaust, Multi-Zone VAV, 11000 CFM, 6.0 motor nameplate hp, 3.8 design brake hp (3.8 max. BHP), 0.0 fan efficiency grade

1   RTU-05 (Multiple-Zone):
Heating: 1 each - Hydronic or Steam Coil, Hot Water, Capacity = 182000 kBtu/h
No minimum efficiency requirement applies
Cooling: 1 each - Hydronic Coil, Capacity = 290000 kBtu/h, Air Economizer
No minimum efficiency requirement applies
Fan System: RTU-05 -- Compliance (Brake HP method) : Passes

Fans:
FAN 9 Supply, Multi-Zone VAV, 14200 CFM, 20.0 motor nameplate hp, 14.1 design brake hp (14.1 max. BHP), 0.0 fan efficiency grade
FAN 10 Exhaust, Multi-Zone VAV, 14200 CFM, 10.0 motor nameplate hp, 5.8 design brake hp (5.8 max. BHP), 0.0 fan efficiency grade
Pressure Drop Credits:
Energy recover device, other than Coil Runaround Loop, 5.6374 credit

1   RTU-06 (Multiple-Zone):
Heating: 1 each - Hydronic or Steam Coil, Hot Water, Capacity = 212000 kBtu/h
No minimum efficiency requirement applies
Cooling: 1 each - Hydronic Coil, Capacity = 270000 kBtu/h, Air Economizer
No minimum efficiency requirement applies
Fan System: RTU-06 -- Compliance (Brake HP method) : Passes

Fans:
FAN 11 Supply, Multi-Zone VAV, 13500 CFM, 20.0 motor nameplate hp, 12.8 design brake hp (12.8 max. BHP), 0.0 fan efficiency grade
FAN 13 Return, Multi-Zone VAV, 13500 CFM, 10.0 motor nameplate hp, 5.7 design brake hp (5.7 max. BHP), 0.0 fan efficiency grade
Pressure Drop Credits:
Energy recover device, other than Coil Runaround Loop, 5.3595 credit

1   FCU-01 (Single Zone):
Cooling: 1 each - Split System, Capacity = 43000 kBtu/h, Air-Cooled Condenser, Air Economizer
Proposed Efficiency = 13.00 EER, Required Efficiency: 9.70 EER + 11.2 IEER
Fan System: FCU-01 -- Compliance (Motor nameplate HP method) : Passes

Fans:
FAN 14 Supply, Constant Volume, 1500 CFM, 0.3 motor nameplate hp, 0.0 fan efficiency grade

1   B-1:
Heating: Hot Water Boiler, Capacity 200000 kBtu/h, Gas
Proposed Efficiency: 89.00 % Ec, Required Efficiency: 82.00 % Ec

1   ACC-01:
Cooling: Water Chiller, Capacity 200 tons, Condenser Air-Cooled, Rotary Screw or Scroll Chiller
Proposed Efficiency: 10.11 EER-FL (Refer to mech. plans for proposed IPLV),
Required Efficiency: 10.100 EER-FL + 14.000 EER-IPLV or 9.700 EER-FL + 16.100 EER-IPLV

1   B-2:
Heating: Hot Water Boiler, Capacity 200000 kBtu/h, Gas

Quantity   System Type & Description

Proposed Efficiency: 89.00 % Ec, Required Efficiency: 82.00 % Ec

Mechanical Compliance Statement

Compliance Statement: The proposed mechanical design represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed mechanical systems have been designed to meet the 2015 IECC requirements in COM*check* Version 4.0.7.2 Review and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

Ryan Whitted	Ryan Whitted	03-30-2018
Name - Title	Signature	Date

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41793
3/30/18
PROFESSIONAL ENGINEER

PROJECT:
MIDDLE SCHOOL MECHANICAL UPGRADES

39610 Amethyst Drive
Steamboat Springs, CO 80487

OWNER:
Steamboat Springs School District Re-2

325 7th Street
Steamboat Springs, CO 80487

ISSUE:
2018/03/30 Issue for Bidding & Construction

DRAWING INFORMATION:	
PROJECT NO:	11784.000
DRAWN BY:	BRE
CHECKED BY:	EJS
APPROVED BY:	EJS

SHEET TITLE:
MECHANICAL COMCHECK

M-700

SHEET OF

11784.000 MIDDLE SCHOOL MECHANICAL UPGRADES
3/30/2018 11:17:42 AM

ELECTRICAL LEGEND

NOTE: ALL SYMBOLS SHOWN ON LEGEND ARE NOT NECESSARILY USED.

LIGHTING

UPPER CASE LETTER AT LUMINAIRES (EX: F1) INDICATES LUMINAIRE TYPE.

F1 = ALL LUMINAIRES IN AREA ARE TYPE F1, UNO

SHADING WITHIN LUMINAIRE DENOTES SECTION ON EMERGENCY POWER.

- RECESSED DOWNLIGHT
- SHADING INDICATES EMERGENCY LUMINAIRE
- SURFACE MOUNTED NON-LINEAR LUMINAIRE
- DIRECTIONAL ACCENT OR WALL-WASH LUMINAIRE
- WALL MOUNTED LUMINAIRE
- STEP LIGHT OR RECESSED WALL LUMINAIRE
- RECESS MOUNTED DIRECTIONAL LUMINAIRE
- SURFACE MOUNTED RECTALINEAR LUMINAIRE
- WALL MOUNTED LINEAR LUMINAIRE
- RECESS MOUNTED LUMINAIRE
- SURFACE MOUNTED LUMINAIRE HIDDEN UNDER COVE, CABINET, ETC.
- PENDANT MOUNTED LINEAR LUMINAIRE
- STRIP LUMINAIRE
- J TRACK LIGHT
- J TAPE LIGHT
- POLE LUMINAIRE
- EXTERIOR POLE MOUNTED LUMINAIRE
- BOLLARD
- NON-LINEAR PENDANT LUMINAIRE
- LANDSCAPE LUMINAIRE
- CEILING OR WALL MOUNTED EXIT SIGN
- X CEILING OR WALL MOUNTED EMERGENCY LIGHT

LIGHTING CONTROLS:

- a LOWER CASE LETTER INDICATES ZONING
- S WALL-MOUNTED LINE VOLTAGE SWITCH
- SS INDICATES TWO SWITCHES, ONE FACEPLATE

LINE VOLTAGE SWITCH SUBSCRIPTS:
- 3 = 3-WAY
- 4 = 4-WAY
- D = DIMMER
- K = KEY-OPERATED
- DS = DOOR SWITCH
- T = THERMAL OVERLOAD

- WALL MOUNTED LOW VOLTAGE CONTROL STATION. REFER TO THE LIGHTING CONTROL MATRIX FOR MORE INFORMATION. LOWER CASE LETTERS INDICATE SWITCH LEG.
- CEILING MOUNTED OCCUPANCY SENSOR OR DAYLIGHT SENSOR AS DESIGNATED BELOW, UNO:
- CORNER OR WALL MOUNTED OCCUPANCY SENSOR OR DAYLIGHT SENSOR AS DESIGNATED BELOW, UNO:
  - V = PIR OR DUAL TECH OCCUPANCY SENSOR - SET TO VACANCY MODE, UNO
  - D = DUAL-TECH OCCUPANCY SENSOR - SET TO VACANCY MODE, UNO
  - P = PHOTOCELL

POWER

- STRAIGHT BLADE DUPLEX RECEPTACLE

SUBSCRIPTS:
- HG = HOSPITAL GRADE
- HGT = HOSPITAL GRADE TAMPER RESISTANT
- GFI = GROUND FAULT INTERRUPTER
- SS = SURGE SUPPRESSION
- AC = 6" ABOVE COUNTER

- STRAIGHT BLADE DOUBLE DUPLEX RECEPT. (FOURPLEX)
- STRAIGHT BLADE SINGLE RECEPTACLE
- STRAIGHT BLADE DUPLEX RECEPT. HALF-SWITCHED
- STRAIGHT BLADE DUPLEX RECEPT. ON EMERGENCY CIRCUIT
- OUTLET WITH SPECIAL DEVICE, AS NOTED
- WALL MOUNTED OUTLET WITH SPECIAL DEVICE, AS NOTED
- FLOOR MOUNTED RECEPTACLE, AS NOTED
- FLOOR MOUNTED COMBINATION OUTLET BOX, AS NOTED
- POKE THROUGH, AS NOTED
- PEDESTAL OUTLET, AS NOTED
- J JUNCTION BOX, AS NOTED
- J JUNCTION BOX
- J WALL MOUNTED JUNCTION BOX
- SURFACE RACEWAY, AS NOTED
- C CLOCK HANGER OUTLET
- TELE-POWER POLE
- PB PULL BOX
- M CONNECTION TO MOTOR
- MAGNETIC MOTOR STARTER

SUBSCRIPTS:
- MS = MULTISPEED
- SSRV = SOLID-STATE, REDUCED VOLTAGE
- VF = VARIABLE FREQUENCY

- N SAFETY DISCONNECT SWITCH
- F FUSED DISCONNECT SWITCH
- COMBINATION DISCONNECT AND STARTER
- ENCLOSED CIRCUIT BREAKER, MOLDED-CASE, THERMAL-MAGNETIC FIXED

SUBSCRIPTS:
- ST = SHUNT TRIP

- CONNECTION TO PRE-WIRED EQUIPMENT
- PANELBOARD
- MCC MOTOR CONTROL CENTER
- EPO EMERGENCY POWER OFF SWITCH
- SPD SURGE PROTECTIVE DEVICE
- T TRANSFORMER
- G ENGINE GENERATOR

PLUS (+) SIGN WITH DIMENSION AT OUTLET INDICATES HEIGHT ABOVE FINISHED FLOOR OR GRADE TO CENTERLINE OF OUTLET.

SCHEMATIC WIRING GRAPHICS

- M METER
- GROUND CONNECTION AS NOTED
- DISCONNECT SWITCH
- FUSES
- MAGNETIC MOTOR STARTER

SUBSCRIPTS:
- MS = MULTISPEED
- SSRV = SOLID-STATE, REDUCED VOLTAGE
- VF = VARIABLE FREQUENCY

- CIRCUIT BREAKER, MOLDED-CASE, THERMAL-MAGNETIC FIXED

SUBSCRIPTS:
- AT = ADJUSTABLE INSTANTANEOUS TRIP
- EAT = ELECTRONIC ADJUSTABLE TRIP
- CL = CURRENT LIMITING
- IC = INSULATED CASE
- GFCI = GROUND FAULT CIRCUIT INTERRUPTER
- ST = SHUNT TRIP
- KI = KEY INTERLOCK
- ZSI = ZONE-SELECTIVE INTERLOCKING

- ENCLOSED CIRCUIT BREAKER, MOLDED-CASE, THERMAL-MAGNETIC FIXED
- ENCLOSED FUSED DISCONNECT SWITCH
- POWER TRANSFORMER
- CURRENT TRANSFORMER
- A AMMETER
- V VOLT METER
- TRANSFER SWITCH
- GF GROUND FAULT PROTECTION
- G GENERATOR
- 3 MOTOR, NUMBER INDICATES HORSEPOWER

FIRE ALARM

- FACP FIRE ALARM CONTROL PANEL
- FSGP FIRE ALARM GRAPHICS PANEL
- FSCP FIREFIGHTERS SMOKE CONTROL PANEL
- APS BOOSTER POWER SUPPLY
- GANN POINT LED GRAPHIC ANNUNCIATOR
- F MANUAL PULL STATION
- P PHOTOELECTRIC SMOKE DETECTOR
- C HEAT DETECTOR
- RT D DUCT DETECTOR WITH TEST SWITCH
- SPEAKER/STROBE
- SPEAKER
- STROBE
- HORN/STROBE
- WP WEATHERPROOF HORN/STROBE
- WP WEATHERPROOF SPEAKER/STROBE
- FIREFIGHTER'S TELEPHONE JACK
- W WARDEN'S TELEPHONE
- SPRINKLER WATER FLOW SWITCH
- SPRINKLER VALVE TAMPER SWITCH
- I/O INPUT/OUTPUT MODULE
- CR CONTROL RELAY
- CC SIGNAL MODULE
- CM SIGNAL MONITOR MODULE
- CT2 DUAL INPUT MODULE
- FIRE/SMOKE DAMPER
- DH DOOR HOLDER (120V)
- CO CARBON MONOXIDE DETECTOR
- CP TWO-WAY COMMUNICATION PANEL
- CS TWO-WAY COMMUNICATION STATION

COMMUNICATION SYSTEM

- FLOOR MOUNTED TELEPHONE AND/OR DATA OUTLET BOX, AS NOTED
- WALL MOUNTED TELEPHONE OUTLET
- WALL MOUNTED DATA OUTLET
- WALL MOUNTED COMBINATION TELEPHONE/DATA OUTLET BOX
- W WALL MOUNTED TELEPHONE OUTLET, +48" AFF
- P PAY PHONE
- TELEPHONE TERMINAL BOARD - TTB
- S S CEILING OR WALL MOUNTED SPEAKER
- V VOLUME CONTROL
- M M FLOOR OR WALL MOUNTED MICROPHONE OUTLET
- C CALL-IN SWITCH
- S TIME-TONE UNIT
- CEILING OR WALL MOUNTED CLOCK
- B PROGRAM BELL
- B BUZZER
- I HOUSE PHONE/INTERCOM
- I M MASTER INTERCOM STATION
- TV TELEVISION OUTLET
- CC CLOSED CIRCUIT TV OUTLET
- A AMPLIFIER

CIRCUITING

- CONDUIT RUN
- CIRCUIT HOMERUN TO PANEL OR CABINET, NO. OF ARROWS INDICATE NO. OF CIRCUITS
- CIRCUIT TURNED UP
- CIRCUIT TURNED DOWN
- CONDUIT STUB-OUT - CAP & MARK
- SEALOFF

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ABBREVIATIONS

NOTE: ALL ABBREVIATIONS SHOWN ARE NOT NECESSARILY USED.

AC	- ABOVE COUNTER
ADA	- AMERICANS WITH DISABILITIES ACT
AFC	- ABOVE FINISHED CEILING
AFF	- ABOVE FINISHED FLOOR
AFG	- ABOVE FINISHED GRADE
AIC	- AMPS INTERRUPTING CURRENT
AL	- ALUMINUM
BFG	- BELOW FINISHED GRADE
CB	- CIRCUIT BREAKER
CR	- CORROSION RESISTANT
CPT	- CONTROL POWER TRANSFORMER
CT	- CURRENT TRANSFORMER
CU	- COPPER
DS	- DOOR SWITCH
ELR	- END OF LINE RESISTOR
EM	- EMERGENCY
EF	- ELECTRONIC LOW VOLTAGE FORWARD PHASE
ER	- ELECTRONIC LOW VOLTAGE REVERSE PHASE
ES	- EMERGENCY STOP
ETM	- ELAPSED TIME METER
EWC	- ELECTRIC WATER COOLER
FLA	- FULL LOAD AMPS
FVNR	- FULL VOLTAGE, NON-REVERSING
FVR	- FULL VOLTAGE, REVERSING
FWE	- FURNISHED WITH EQUIPMENT
GFI	- GROUND FAULT INTERRUPTER
GRC	- GALVANIZED RIGID CONDUIT
HOA	- HAND-OFF-AUTOMATIC
HP	- HORSEPOWER
IG	- ISOLATED GROUND
LC	- LIGHTING CONTACTOR
LOR	- LOCAL-OFF-REMOTE
LS	- LEVEL SWITCH
LT	- LET THROUGH
MCA	- MINIMUM CIRCUIT AMPS
MCB	- MAIN CIRCUIT BREAKER
MCC	- MOTOR CONTROL CENTER
MCCB	- MOLDED CASE CIRCUIT BREAKER
MCP	- MOTOR CIRCUIT PROTECTION
MLO	- MAIN LUGS ONLY
NC	- NORMALLY CLOSED
NIC	- NOT IN CONTRACT
NL	- NIGHT LIGHT
NO	- NORMALLY OPEN
NTS	- NOT TO SCALE
OC	- OVER CURRENT
OL	- OVERLOAD
PT	- POTENTIAL TRANSFORMER
RVNR	- REDUCED VOLTAGE, NON-REVERSING
SC	- SHORT CIRCUIT
SPD	- SURGE PROTECTIVE DEVICE
SR	- SAFE OR STOP/RUN
TTB	- TELEPHONE TERMINAL BOARD
TVSS	- TRANSIENT VOLTAGE SURGE SUPPRESSOR
UG	- UNDERGROUND
UNO	- UNLESS NOTED OTHERWISE
VFD	- VARIABLE FREQUENCY DRIVE
WG	- WIREGUARD
WP	- WEATHERPROOF
XFMR	- TRANSFORMER
XP	- EXPLOSION PROOF

GENERAL NOTES (FOR ALL ELECTRICAL SHEETS)

1. THESE DRAWINGS ARE DIAGRAMMATIC. REFER TO THE ARCHITECTURAL DRAWINGS FOR EXACT DIMENSIONS.
2. REFER TO THE ARCHITECTURAL PLANS, ELEVATIONS, AND DIAGRAMS FOR LOCATIONS OF THE FLOOR AND WALL DEVICES. IF DEVICES ARE NOT NOTED OTHERWISE THEY SHALL BE MOUNTED LONG AXIS VERTICAL AT THE FOLLOWING HEIGHTS AFF TO CENTER OF DEVICE: SWITCHES +42", RECEPTACLES +18", VOICE/DATA JACKS +18".
3. COORDINATE ALL EQUIPMENT LOCATIONS WITH THE OWNER PRIOR TO ROUGH-IN. COORDINATE THE WIRING DEVICE LOCATIONS WITH THE ARCHITECTURAL ELEVATIONS, CASEWORK SHOP DRAWINGS, AND EQUIPMENT INSTALLATION DRAWINGS. COORDINATE THE LOCATION OF THE MECHANICAL EQUIPMENT WITH THE MECHANICAL PLANS AND THE MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN. COORDINATE THE LOCATION OF THE LUMINAIRES WITH THE ARCHITECTURAL REFLECTED CEILING PLANS.
4. ANY ITEMS DAMAGED BY THE CONTRACTOR SHALL BE REPLACED BY THE CONTRACTOR, AT NO ADDITIONAL COST TO THE OWNER.
5. ALL 120V BRANCH CIRCUITS SHALL BE 3-WIRE (PHASE,NEUTRAL,GROUND). PHASE, NEUTRAL, AND GROUND CONDUCTORS SHALL BE SIZE 12 AWG UNLESS OTHERWISE NOTED. BRANCH CIRCUITS SHOWN AS A SINGLE HOMERUN SHALL NOT BE COMBINED WITH OTHER CIRCUITS. ALL BRANCH CIRCUITS AND FEEDERS SHALL HAVE EQUIPMENT GROUNDING CONDUCTORS INSTALLED IN THE RACEWAY.
6. TRANSFORMERS INDICATED TO BE SUSPENDED FROM THE STRUCTURE SHALL BE SUPPORTED BY A UNISTRUT FRAME THAT IS ATTACHED TO THE STRUCTURE.
7. PROVIDE (1) 3/4"C WITH BUSHING AND PULL WIRE FROM EACH TELEPHONE, DATA, COMMUNICATION, AND THERMOSTAT OUTLET TO ABOVE THE ACCESSIBLE CEILING, UNLESS NOTED OTHERWISE.
8. THE CONTRACTOR SHALL MAINTAIN FIRE-RATINGS FOR ALL CONDUIT PENETRATIONS THROUGH FIRE-RATED CONSTRUCTION.
9. COORDINATE THE LOCATIONS AND CONTROLS OF ALL APPLICABLE FIRE/SMOKE DAMPERS WITH THE MECHANICAL CONTRACTOR, PRIOR TO CONSTRUCTION.
10. ALL MOUNTING OF ELECTRICAL DEVICES (LUMINAIRES, TRANSFORMERS, PANELS, OUTLETS, CONDUIT RUNS, ETC.) SHALL COMPLY WITH STATE AND LOCAL SEISMIC REQUIREMENTS. ALL LUMINAIRES SHALL BE SUPPORTED INDEPENDENTLY OF THE CEILING SUPPORT HANGERS IN COMPLIANCE WITH IBC AND NEC REQUIREMENTS.
11. ADA COMPLIANCE: ELECTRICAL DEVICES PROJECTING FROM THE WALLS WITH THEIR LEADING EDGES BETWEEN 27" AND 80" AFF SHALL PROTRUDE NO MORE THAN 4" INTO WALKWAYS OR CORRIDORS.
12. BACK TO BACK MOUNTING OF RECEPTACLES OR COMMUNICATION OUTLETS IS NOT PERMITTED. THE MINIMUM SEPARATION BETWEEN DEVICES SHALL BE 6" O.C. IN COMMON WALLS AND 24" O.C. IN SOUND-RATED WALLS.
13. GFCI DEVICES SHALL BE PROVIDED AS NOTED AND SHALL COMPLY WITH NEC AND LOCAL REQUIREMENTS. NO FEED-THRU GFCI PROTECTION SHALL BE PERMITTED FOR DOWNSTREAM DEVICES. GFCI DUPLEX RECEPTACLES SHALL BE UL 943 2006 "LOCK-OUT" ACTION OR "NOTIFICATION" COMPLIANT.
14. SWITCHES CONTROLLING LIGHTING LOADS: WHERE SWITCHES CONTROL LIGHTING LOADS SUPPLIED BY A GROUNDED GENERAL PURPOSE BRANCH CIRCUIT, THE GROUNDED CIRCUIT CONDUCTOR (NEUTRAL WIRE) FOR THE CONTROLLED LIGHTING CIRCUIT SHALL BE PROVIDED AT THE SWITCH LOCATION. EXISTING SWITCHES IN REMODELED SPACES SHALL NOT BE EXEMPT FROM THIS REQUIREMENT.
15. WHERE DIMMING CONTROL IS SPECIFIED AS A PORTION OF A CIRCUIT THAT ALSO HAS SWITCHED LIGHTING IN ADJACENT SPACES, PROVIDE A SEPARATE, DEDICATED NEUTRAL WIRE FROM THE DIMMING DEVICE BACK TO THE ORIGINATING PANEL.
16. IN REMODEL AREAS WHERE OCCUPANCY SENSING DEVICES ARE SPECIFIED AND ARE REPLACING EXISTING MANUAL SNAP SWITCH CONTROL OF THE LIGHTING, PROVIDE A NEUTRAL CONDUCTOR FROM THE LIGHTING CIRCUIT BEING CONTROLLED TO THE OCCUPANCY SENSING DEVICE (OR SWITCH/POWER PACK, WHERE LOW VOLTAGE SENSORS ARE SPECIFIED). FOR BIDDING PURPOSES, ASSUME THAT THE EXISTING SNAP SWITCHES ARE WIRED WITHOUT A NEUTRAL CONDUCTOR, AND A NEW NEUTRAL CONDUCTOR WILL BE REQUIRED.
17. COORDINATE THE INSTALLATION OF COMMUNICATIONS CABLING, ROUTING, MOUNTING BOXES, AND TERMINATIONS WITH THE OWNER OR IT MANAGER, PRIOR TO CONSTRUCTION.
18. ALL LOW VOLTAGE AND SYSTEMS CABLING LOCATED ABOVE THE ACCESSIBLE CEILING SHALL BE PROPERLY RATED FOR THE APPLICATION. WITHOUT EXCEPTION, ALL CABLING SHALL BE HUNG FROM BRIDLE-TYPE RINGS OR PLACED IN CABLE TRAYS BY THE ELECTRICAL CONTRACTOR. IN EXPOSED CEILING AREAS, ALL CABLING SHALL BE RUN IN CONDUIT TO THE NEAREST ACCESSIBLE CEILING LOCATION.
19. THE INFORMATION ON THESE DRAWINGS HAS BEEN ASCERTAINED FROM EXISTING DRAWINGS AND FIELD OBSERVATIONS. THIS INFORMATION IS AS ACCURATE AS CONDITIONS WOULD ALLOW. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VISIT THE SITE, PRIOR TO BID, AND BECOME FAMILIAR WITH THE EXTENT OF THE WORK REQUIRED. NO EXTRAS WILL BE ALLOWED FOR ALTERATIONS OF A FORESEEABLE NATURE THAT ARE REQUIRED TO ACHIEVE THE END RESULT AS INDICATED BY THE CONTRACT DOCUMENTS.
20. ON DEMOLITION PLANS: ALL ITEMS SHOWN IN LIGHT LINE WEIGHT ARE EXISTING TO REMAIN, UNLESS NOTED OTHERWISE. ALL ITEMS SHOWN IN HEAVY LINE WEIGHT SHALL BE REMOVED, UNLESS NOTED OTHERWISE.
21. ON NEW FLOOR PLANS: ALL ITEMS SHOWN IN LIGHT LINE WEIGHT ARE EXISTING TO REMAIN, UNLESS NOTED OTHERWISE. ALL ITEMS SHOWN IN HEAVY LINE WEIGHT ARE NEW OR RELOCATED AS NOTED.
22. THE NEW WIRING REQUIRED IN REMODELED AREAS SHALL BE FISHED THROUGH EXISTING WALLS OR CONCEALED IN NEW WALLS OR ABOVE CEILINGS. SURFACE MOUNTED CONDUIT SHALL NOT BE USED IN ANY FINISHED AREAS. CONTRACTOR SHALL NOT ROUTE ANY CONDUIT WITHIN STRUCTURAL OR TOPPING SLABS OF FLOORS UNLESS NOTED TO DO SO.
23. ITEMS THAT ARE SHOWN TO BE REMOVED SHALL BE REMOVED IN THEIR ENTIRETY INCLUDING ALL ASSOCIATED CONDUIT, WIRE, AND HANGERS BACK TO THE POINT OF ORIGIN OR THE NEAREST EXISTING ITEM THAT IS REMAINING, UNLESS NOTED OTHERWISE. WHERE EXISTING DEVICES, SWITCHES, MOTOR CONNECTIONS, ETC. ARE TO BE REMOVED FROM WALLS WHICH ARE REMAINING, WALLS SHALL BE PATCHED TO MATCH ORIGINAL FINISH, AFTER CONDUCTORS HAVE BEEN REMOVED. BLANK COVERPLATES OVER EXISTING BOXES ARE NOT ACCEPTABLE. IF EXISTING CONDUITS ARE ROUTED IN CONCRETE FLOOR SLABS, WALLS OR CEILINGS, THEY SHALL BE CUT BACK TO WITHIN CONCRETE AND FILLED WITH GROUT TO ACHIEVE A SMOOTH AND EVEN FINISH FLUSH WITH CONCRETE SURFACE AFTER CONDUCTORS HAVE BEEN REMOVED.
24. MAINTAIN CIRCUIT CONTINUITY FOR EXISTING ITEMS THAT ARE REMAINING OR BEING RELOCATED.
25. ELECTRICAL DEVICE IDENTIFICATION LABELS: PROVIDE ADHESIVE FILM LABEL, MACHINE PRINTED, IN BLACK, BY THERMAL TRANSFER OR EQUIVALENT PROCESS WITH MINIMUM LETTER HEIGHT OF 3/8" ON ALL ELECTRICAL DEVICES. LABEL SHALL IDENTIFY ORIGINATING PANEL AND CIRCUIT NUMBER IN THE FOLLOWING FORMAT: PANEL-CKT. REFERENCE SPECIFICATIONS FOR ADDITIONAL LABELING REQUIREMENTS. WHERE THE PROJECT SPECIFICATIONS INDICATE MORE STRINGENT LABELING REQUIREMENTS, THOSE REQUIREMENTS SHALL TAKE PRECEDENCE.
26. PROVIDE TYPED UPDATED PANEL DIRECTORIES FOR EXISTING PANELS AFFECTED BY REMODEL WORK. PROVIDE NEW CIRCUIT BREAKER NUMBER IDENTIFICATION AS REQUIRED.

GENERAL NOTES FOR FIRE ALARM

A. FIRE ALARM SYSTEM:
- CONTRACTOR SHALL VERIFY THAT THE EXISTING FIRE ALARM SYSTEM IS OPERATING PROPERLY AND DOCUMENT ALL DEFICIENCIES PRIOR TO ANY CONSTRUCTION.
- AT SUBSTANTIAL COMPLETION PHASE, CONTRACTOR SHALL FINAL TEST FOR A COMPLETE AND FULLY OPERATIONAL SYSTEM. PROVIDE A COMPLETE WRITTEN LOG OF THE TEST RESULTS TO THE DISTRICTS ELECTRICAL DEPARTMENT. IF IT IS NOT FUNCTIONING PROPERLY AFTER CONSTRUCTION IT IS THE THE RESPONSIBILITY OF THE CONTRACTOR TO CORRECT AND RESTORE THE SYSTEM TO THE PROPER WORKING ORDER.

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COLORADO LICENSED PROFESSIONAL ENGINEER 39569 3/30/18

PROJECT:

MIDDLE SCHOOL MECHANICAL UPGRADES

39610 Amethyst Drive
Steamboat Springs, CO 80487

OWNER:

Steamboat Springs School District Re-2

325 7th Street
Steamboat Springs, CO 80487

ISSUE:

03/30/18 Issue for Bidding & Construction

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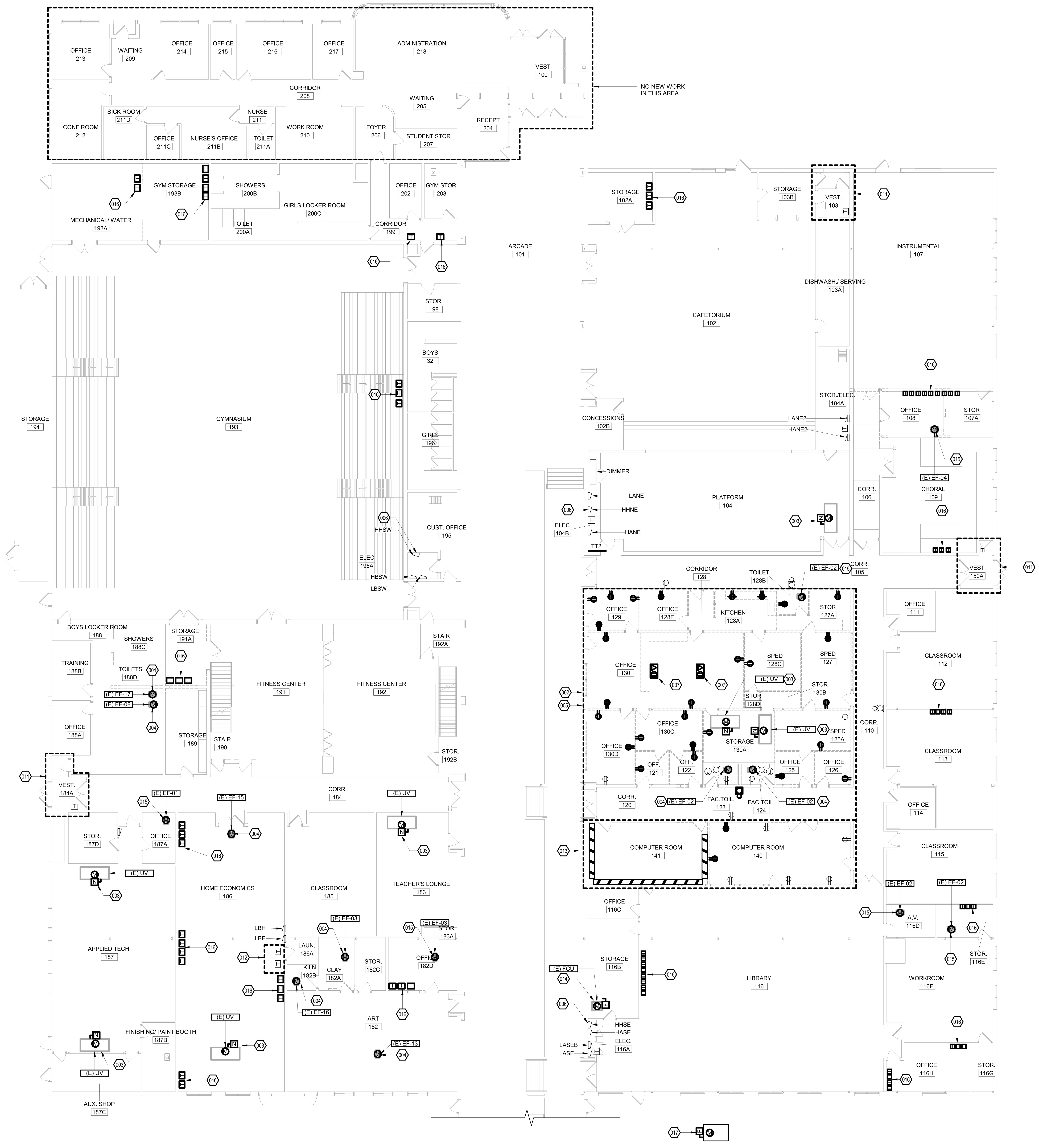
SHEET TITLE:

ELECTRICAL COVER SHEET

E-000

SHEET OF



1 FIRST FLOOR POWER DEMOLITION PLAN - AREA A
SCALE: 3/32" = 1'-0"

FLAG NOTES (THIS SHEET)

002 DISCONNECT AND REMOVE ELECTRICAL DEVICES IN THIS AREA. SAVE AND PROTECT BRANCH CIRCUIT WIRES FOR REUSE.

003 DISCONNECT MECHANICAL UNIT VENTILATOR TO BE REMOVED IN ITS ENTIRETY. REMOVE WIRES BACK TO SOURCE AND LABEL CIRCUIT BREAKER SPARE, UNO. CONDUIT TO REMAIN FOR POSSIBLE USE IN NEW WORK, CAP AND MARK BOTH ENDS IF NOT USED.

004 DISCONNECT EXHAUST FAN IN CEILING SPACE TO BE REPLACED WITH NEW OF SAME SIZE TO BE LOCATED ON ROOF. SAVE AND PROTECT WIRES FOR REUSE.

005 DISCONNECT AND REMOVE FIRE ALARM DEVICES IN THIS AREA. SAVE AND PROTECT DEVICES AND WIRES FOR REUSE.

006 UNDERFLOOR ELECTRIC HEATING SYSTEM TO BE DISCONNECTED AND REMOVED AS SHOWN. DISCONNECT 277V HEATING BRANCH CIRCUITS FED FROM PANELBOARD OUT TO THE ASSOCIATED TRANSFORMERS, SEE FLAG NOTE 016. REMOVE BRANCH CIRCUIT WIRE BACK TO SOURCE AND ABANDON CONDUITS IN PLACE, CAP AND MARK. PANELBOARD TO REMAIN AND UPDATE DIRECTORY CARD.

007 DISCONNECT EXISTING FLOOR BOX, REMOVE WIRES AND CABLE BACK TO NEAREST SOURCE. INSTALL COVER PLATE AND ABANDON. GC TO PATCH FLOOR AS REQUIRED TO MATCH FINISH.

011 EXISTING IN-FLOOR HEATING TO REMAIN, SAVE AND PROTECT.

012 CONTRACTOR TO RELOCATE THE (2) EXISTING 112.5 KVA TRANSFORMERS CURRENTLY SUSPEND FROM STRUCTURE THAT FEED THE PANELBOARDS SHOWN TO ACCOMMODATE THE NEW MECHANICAL UNIT AND DUCTWORK TO BE INSTALLED AT THIS LOCATION. COORDINATE NEW LOCATION IN FIELD WITH EXISTING CONDITIONS AND WITH MECHANICAL CONTRACTOR PIROR TO WORK. CONTRACTOR TO EXTEND EXISTING FEEDER AS REQUIRED AND PROVIDED ALL NECESSARY COMPONENTS FOR MOVING THE UNITS.

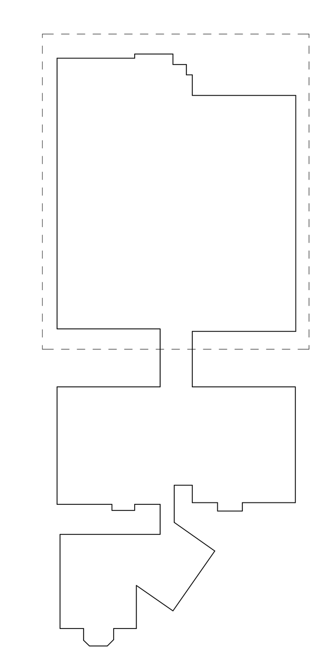
013 DISCONNECT AND REMOVE EXISTING RECEPTACLES, POWER POLES AND SURFACE RACEWAY IN EXISTING COMPUTER ROOMS TO BE REMOVED. SAVE AND PROTECT BRANCH CIRCUIT WIRES FOR REUSE. ALL UNUSED WIRES TO BE REMOVED BACK TO NEAREST SOURCE AND CIRCUIT BREAKERS LABELED AS SPARE.

014 DISCONNECT EXISTING 480V-3PHASE SERVER ROOM INDOOR AC UNIT TO BE REPLACED WITH NEW 208V-1PAHSE.. REMOVE WIRES AND CONDUIT BACK TO SOURCE AND ABEL CIRCUIT BREAKER SPARE.

015 DISCONNECT EXHAUST FAN TO BE REMOVED IN ITS ENTIRETY. REMOVE WIRES BACK TO SOURCE. CAP AND MARK BOTH ENDS OF CONDUIT FOR FUTURE USE. UPDATE PANELBOARD DIRECTORY CARD.

016 UNDERFLOOR ELECTRIC HEATING SYSTEM 277V TRANSFORMERS LOCATED ABOVE CEILING TO BE DISCONNECTED AND REMOVED. REMOVE ALL ASSOCIATED DEVICES AND WIRES ABOVE CEILING AND ABANDON UNDERFLOOR COMPONENTS.

017 DISCONNECT EXISTING 480V-3PHASE SERVER ROOM OUTDOOR DRY COOLER UNIT TO BE REMOVED IN ITS ENTIRETY. REMOVE WIRES BACK TO SOURCE AND ABANDON CONDUIT. LABEL CIRCUIT BREAKER AS SPARE.



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COLORADO LICENSED PROFESSIONAL ENGINEER 39569 3/30/18

PROJECT:

MIDDLE SCHOOL MECHANICAL UPGRADES

39610 Amethyst Drive
Steamboat Springs, CO 80487

OWNER:

Steamboat Springs School District Re-2

325 7th Street
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ISSUE:

03/30/18 Issue for Bidding & Construction

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CHECKED BY:	SJB
APPROVED BY:	MRZ

SHEET TITLE:

FIRST FLOOR POWER DEMOLITION PLAN - AREA A

ED111A

SHEET OF

11784.000 MIDDLE SCHOOL MECHANICAL UPGRADES
3/30/2018 9:51:37 AM

1 **FIRST FLOOR POWER DEMOLITION PLAN - AREA B**
SCALE: 3/32" = 1'-0"

FLAG NOTES (THIS SHEET)

003 DISCONNECT MECHANICAL UNIT VENTILATOR TO BE REMOVED IN ITS ENTIRETY. REMOVE WIRES BACK TO SOURCE AND LABEL CIRCUIT BREAKER SPARE, UNO. CONDUIT TO REMAIN FOR POSSIBLE USE IN NEW WORK, CAP AND MARK BOTH ENDS IF NOT USED.

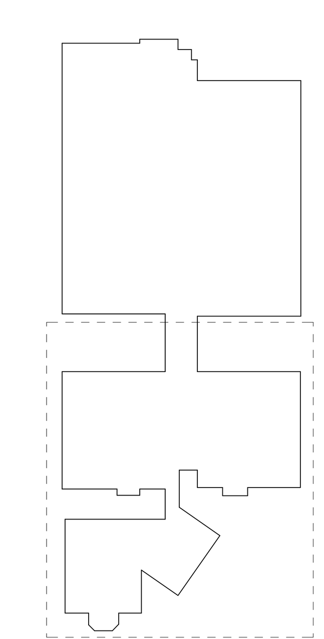
004 DISCONNECT EXHAUST FAN IN CEILING SPACE TO BE REPLACED WITH NEW OF SAME SIZE TO BE LOCATED ON ROOF. SAVE AND PROTECT WIRES FOR REUSE.

006 UNDERFLOOR ELECTRIC HEATING SYSTEM TO BE DISCONNECTED AND REMOVED AS SHOWN. DISCONNECT 277V HEATING BRANCH CIRCUITS FED FROM PANELBOARD OUT TO THE ASSOCIATED TRANSFORMERS, SEE FLAG NOTE 016. REMOVE BRANCH CIRCUIT WIRE BACK TO SOURCE AND ABANDON CONDUITS IN PLACE, CAP AND MARK. PANELBOARD TO REMAIN AND UPDATE DIRECTORY CARD.

011 EXISTING IN-FLOOR HEATING TO REMAIN, SAVE AND PROTECT.

015 DISCONNECT EXHAUST FAN TO BE REMOVED IN ITS ENTIRETY. REMOVE WIRES BACK TO SOURCE. CAP AND MARK BOTH ENDS OF CONDUIT FOR FUTURE USE. UPDATE PANELBOARD DIRECTORY CARD.

016 UNDERFLOOR ELECTRIC HEATING SYSTEM 277V TRANSFORMERS LOCATED ABOVE CEILING TO BE DISCONNECTED AND REMOVED. REMOVE ALL ASSOCIATED DEVICES AND WIRES ABOVE CEILING AND ABANDON UNDERFLOOR COMPONENTS.



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SHEET TITLE:
FIRST FLOOR POWER DEMOLITION PLAN - AREA B

ED111B
SHEET OF

1 **SECOND FLOOR/ROOF POWER DEMOLITION PLAN - AREA B**

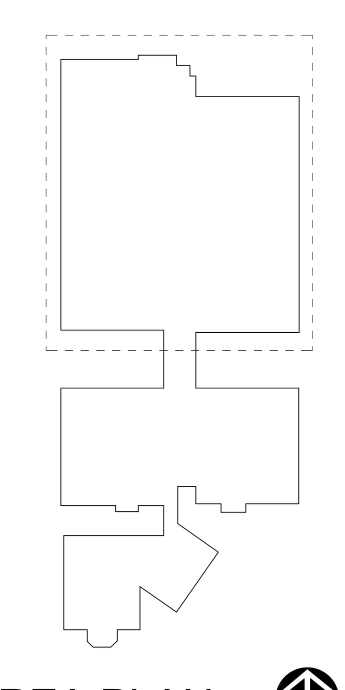
SCALE: 3/32" = 1'-0"

FLAG NOTES (THIS SHEET)

008 DISCONNECT COMPUTER ROOM ROOF TOP UNIT TO BE REMOVED IN ITS ENTIRETY. REMOVE WIRES BACK TO SOURCE AND LABEL CIRCUIT BREAKER SPARE. CONDUIT TO REMAIN FOR POSSIBLE USE IN NEW WORK, CAP AND MARK BOTH END IF NOT USED.

009 DISCONNECT 480V-3PHASE, 3HP SUPPLY FAN TO BE REMOVED IN ITS ENTIRETY. REMOVE WIRES BACK TO SOURCE AND LABEL CIRCUIT BREAKER SPARE. CONDUIT TO REMAIN FOR POSSIBLE USE IN NEW WORK, CAP AND MARK BOTH END IF NOT USED.

018 DISCONNECT EXHAUST FAN TO BE REPLACED WITH NEW IN SAME LOCATION AND OF SAME SIZE. SAVE AND PROTECT BRANCH CIRCUIT WIRES FOR REUSE.



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SECOND FLOOR/ ROOF POWER DEMOLITION PLAN - AREA A

ED112A

SHEET OF

11784.000 MIDDLE SCHOOL MECHANICAL UPGRADES
3/30/2018 9:51:42 AM

GENERAL NOTES (LIGHTING)

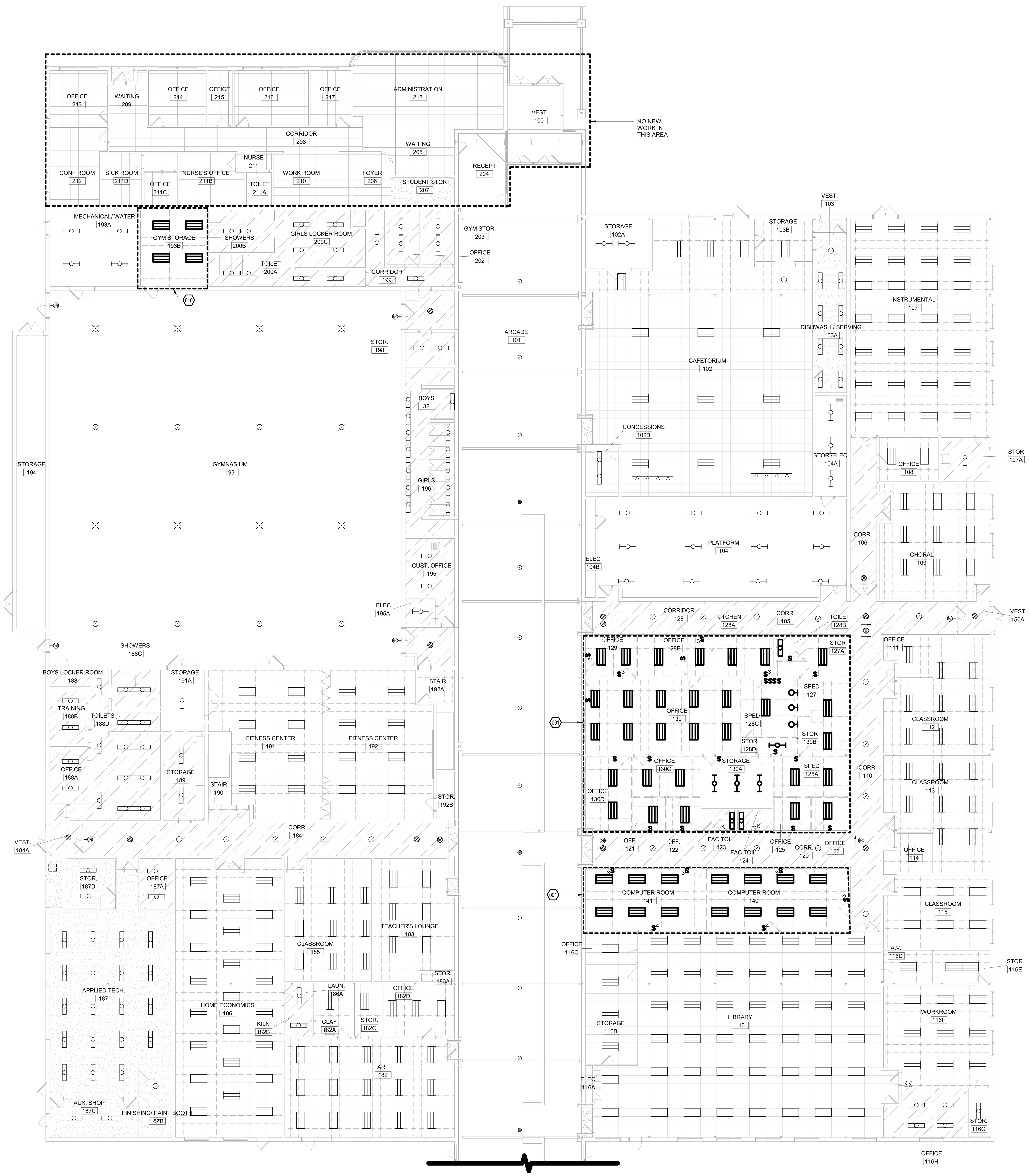
A. CONTRACTOR SHALL TEMPORARILY DISCONNECT AND REMOVE EXISTING LIGHTS, EXIT SIGNS, CEILING MOUNTED LIGHTING CONTROLS, FIRE ALARM DEVICES, SPEAKERS AND ALL CEILING MOUNTED ELECTRICAL DEVICES AS REQUIRED TO ACCOMMODATE THE INSTALLATION OF NEW MECHANICAL EQUIPEMENT AND DUCTWORK. COORDINATE REQUIREMENTS WITH THE MECHANICAL AND ARCHITECTURAL DRAWINGS FOR AREAS AFFECTED. NOT ALL DEVICES ARE SHOWN.

B. INSTALL AND RECONNECT ALL EXISTING LIGHTING AND CEILING MOUNTED DEVICES ONCE NEW OR EXISTING CEILINGS ARE INSTALLED AND MECHANICAL WORK IS COMPLETE.

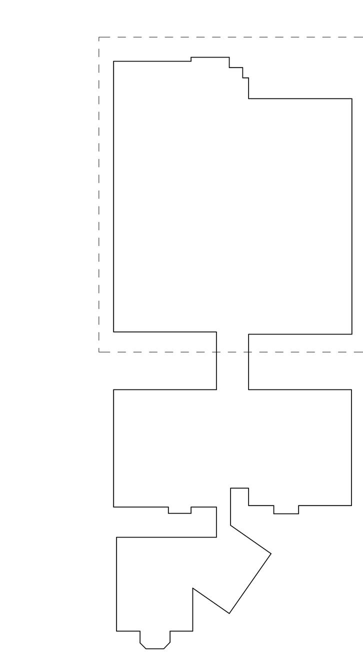
FLAG NOTES (THIS SHEET)

001 DISCONNECT AND REMOVE LED TYPE LIGHTS, CEILING MOUNTED LIGHTING CONTROLS AND ASSOCIATED SWITCHES IN THIS AREA. SAVE AND PROTECT LIGHT FIXTURES AND BRANCH CIRCUITS FOR REUSE.

010 DISCONNECT AND REMOVE LIGHTS IN THIS AREA TO BE REPLACED WITH NEW. SAVE AND PROTECT BRANCH CIRCUIT WIRES FOR REUSE.



1 **FIRST FLOOR LIGHTING DEMOLITION PLAN - AREA A**
SCALE: 3/32" = 1'-0"



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FIRST FLOOR LIGHTING DEMOLITON PLAN - AREA A

ED211A

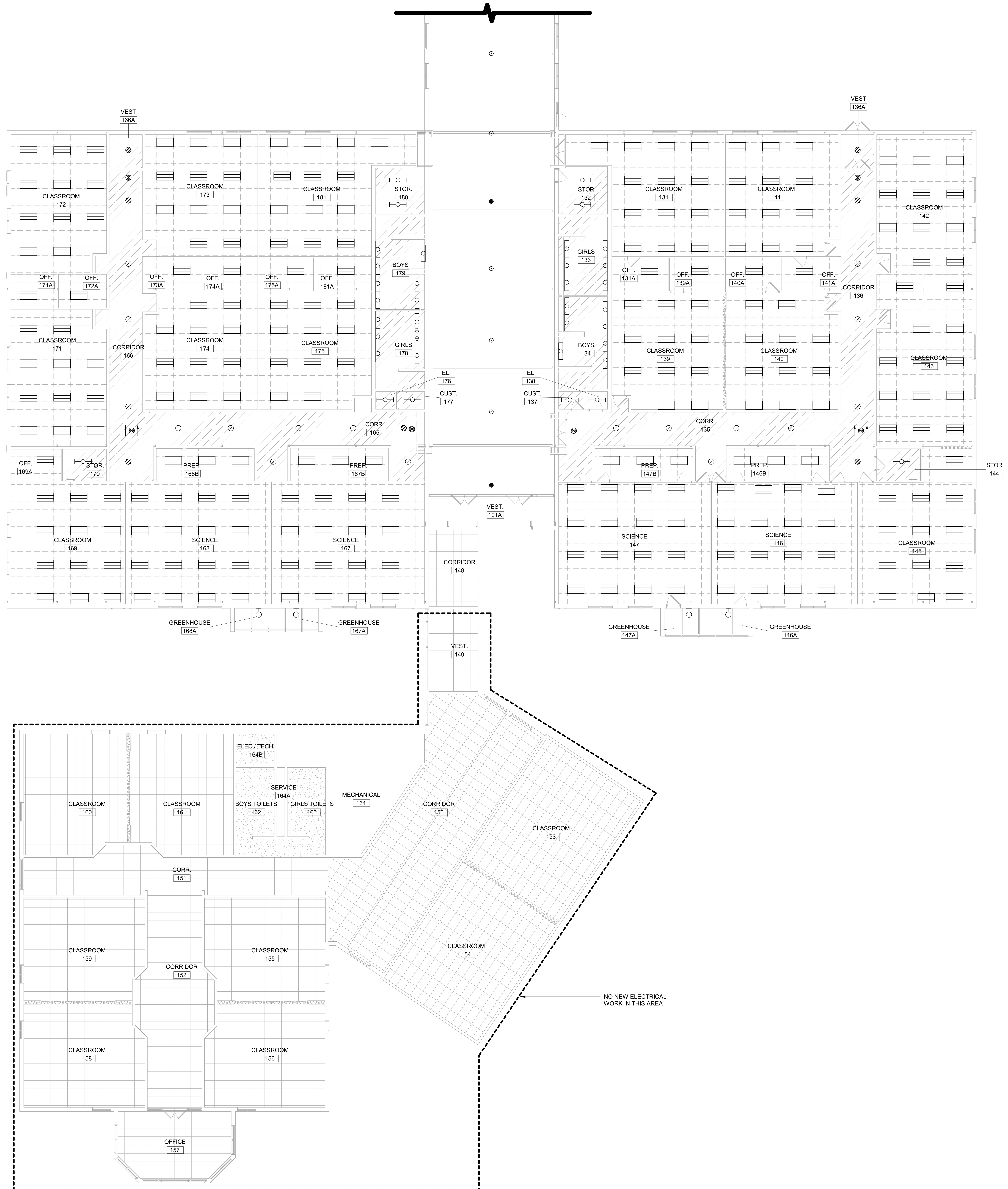
SHEET OF

11784.000 MIDDLE SCHOOL MECHANICAL UPGRADES
3/30/2018 9:51:45 AM

GENERAL NOTES (LIGHTING)

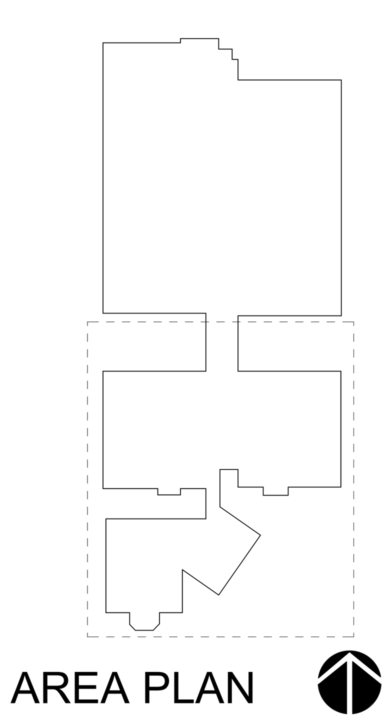
A. CONTRACTOR SHALL TEMPORARILY DISCONNECT AND REMOVE EXISTING LIGHTS, EXIT SIGNS, CEILING MOUNTED LIGHTING CONTROLS, FIRE ALARM DEVICES, SPEAKERS AND ALL CEILING MOUNTED ELECTRICAL DEVICES AS REQUIRED TO ACCOMMODATE THE INSTALLATION OF NEW MECHANICAL EQUIPEMENT AND DUCTWORK. COORDINATE REQUIREMENTS WITH THE MECHANICAL AND ARCHITECTURAL DRAWINGS FOR AREAS AFFECTED. NOT ALL DEVICES ARE SHOWN.

B. INSTALL AND RECONNECT ALL EXISTING LIGHTING AND CEILING MOUNTED DEVICES ONCE NEW OR EXISTING CEILINGS ARE INSTALLED AND MECHANICAL WORK IS COMPLETE.



1 FIRST FLOOR LIGHTING DEMOLITION PLAN - AREA B

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



AREA PLAN

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Denver, CO. 80202

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www.hcm2.com

CONSULTANT:

MKK CONSULTING ENGINEERS, INC.

7600 E. Orchard Rd
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Greenwood Village, CO 80111
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COLORADO LICENSED PROFESSIONAL ENGINEER 39569 3/30/18

PROJECT:

MIDDLE SCHOOL MECHANICAL UPGRADES

39610 Amethyst Drive
Steamboat Springs, CO 80487

OWNER:

Steamboat Springs School District Re-2

325 7th Street
Steamboat Springs, CO 80487

ISSUE:

03/30/18 Issue for Bidding & Construction

DRAWING INFORMATION:

PROJECT NO:	11784.000
DRAWN BY:	CW
CHECKED BY:	SJB
APPROVED BY:	MRZ

SHEET TITLE:

FIRST FLOOR LIGHTING DEMOLITION PLAN - AREA B

ED211B

SHEET OF

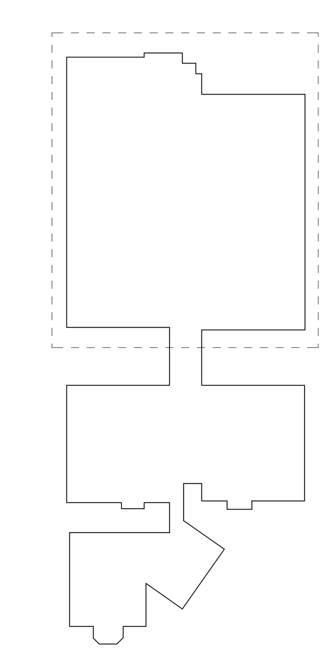
11784.000 MIDDLE SCHOOL MECHANICAL UPGRADES
3/30/2018 9:51:47 AM

FLAG NOTES (THIS SHEET)

200	PROVIDE DUPLEX RECEPTACLE AT 55"AFF FOR AV SYSTEM. SMARTBOARD COORDINATE LOCATION AND REQUIREMENTS WITH THE "T" SERIES DRAWINGS PRIOR TO ROUGH-IN.
202	REPLACE EXISTING RECEPTACLE WITH NEW DEVICE AND COVERPLATE AND CONNECT AS SHOWN.
203	CONNECT TO EXISTING 120V CIRCUIT SAVED DURING DEMOLITION AND UPDATE PANELBOARD DIRECTORY CARD AS NEEDED. LOAD ADDED TO CIRCUIT IS LESS THAN LOAD REMOVED.
205	PROVIDE ROUGH-IN FOR FUTURE CABINET UNIT, INSTALL JUNCTION BOX ABOVE CEILING WITH 1/2"C WITH PULL WIRE TO PANELBOARD AS SHOWN. STUB-OUT, CAP AND MARK BOTH ENDS.
207	PROVIDE 120V FOR CONNECTION OF CARBON MONOXIDE SENSOR REMOTE ALARM PANEL.
208	NEW 277/480V PANELBOARD, SEE ONE-LINE DIAGRAM ON E-501 FOR REQUIREMENTS.
300	PROVIDE NEW FIRE ALARM DEVICES AS SHOWN TO MATCH EXISTING MANUFACTURER AND CONNECT TO EXISTING FACP. PROVIDE ALL NECESSARY COMPONENTS, WIRES AND CONNECTIONS FOR A COMPLETE AND OPERATIONAL INSTALL.

1 FIRST FLOOR POWER PLAN - AREA A

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



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APPROVED BY:	MRZ

SHEET TITLE:

FIRST FLOOR POWER PLAN - AREA A

E-111A

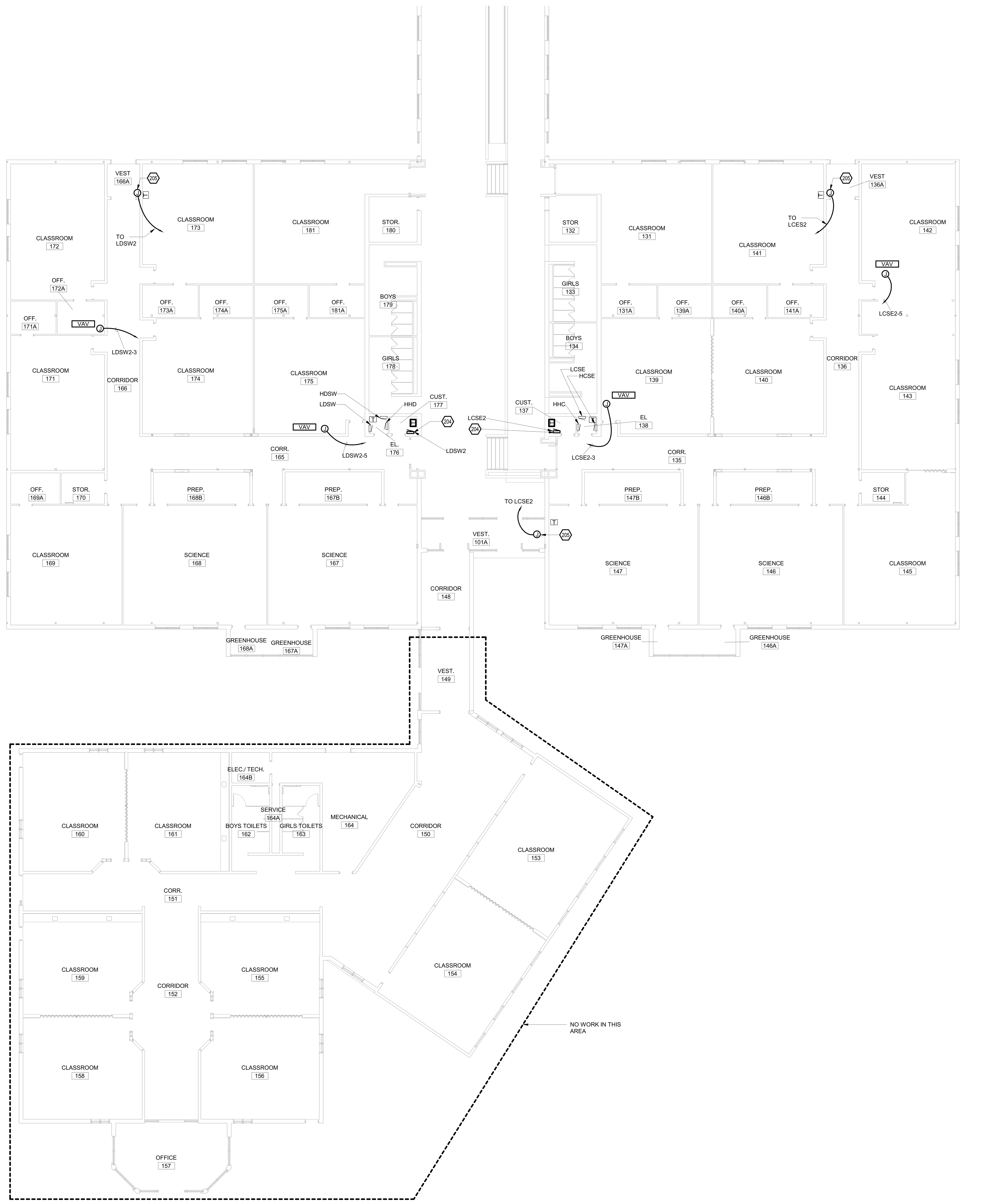
SHEET OF

11784.000 MIDDLE SCHOOL MECHANICAL UPGRADES
3/30/2018 9:51:20 AM

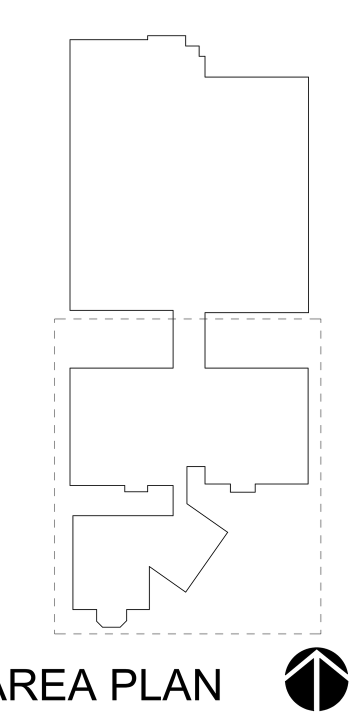
FLAG NOTES (THIS SHEET)

204 NEW 120/208V PANELBOARD, SEE ONE-LINE ON E-501 FOR REQUIREMENTS.

205 PROVIDE ROUGH-IN FOR FUTURE CABINET UNIT, INSTALL JUNCTION BOX ABOVE CEILING WITH 1/2"C WITH PULL WIRE TO PANELBOARD AS SHOWN. STUB-OUT, CAP AND MARK BOTH ENDS.



1 **FIRST FLOOR POWER PLAN - AREA B**
SCALE: 3/32" = 1'-0"



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CHECKED BY:	SJB
APPROVED BY:	MRZ

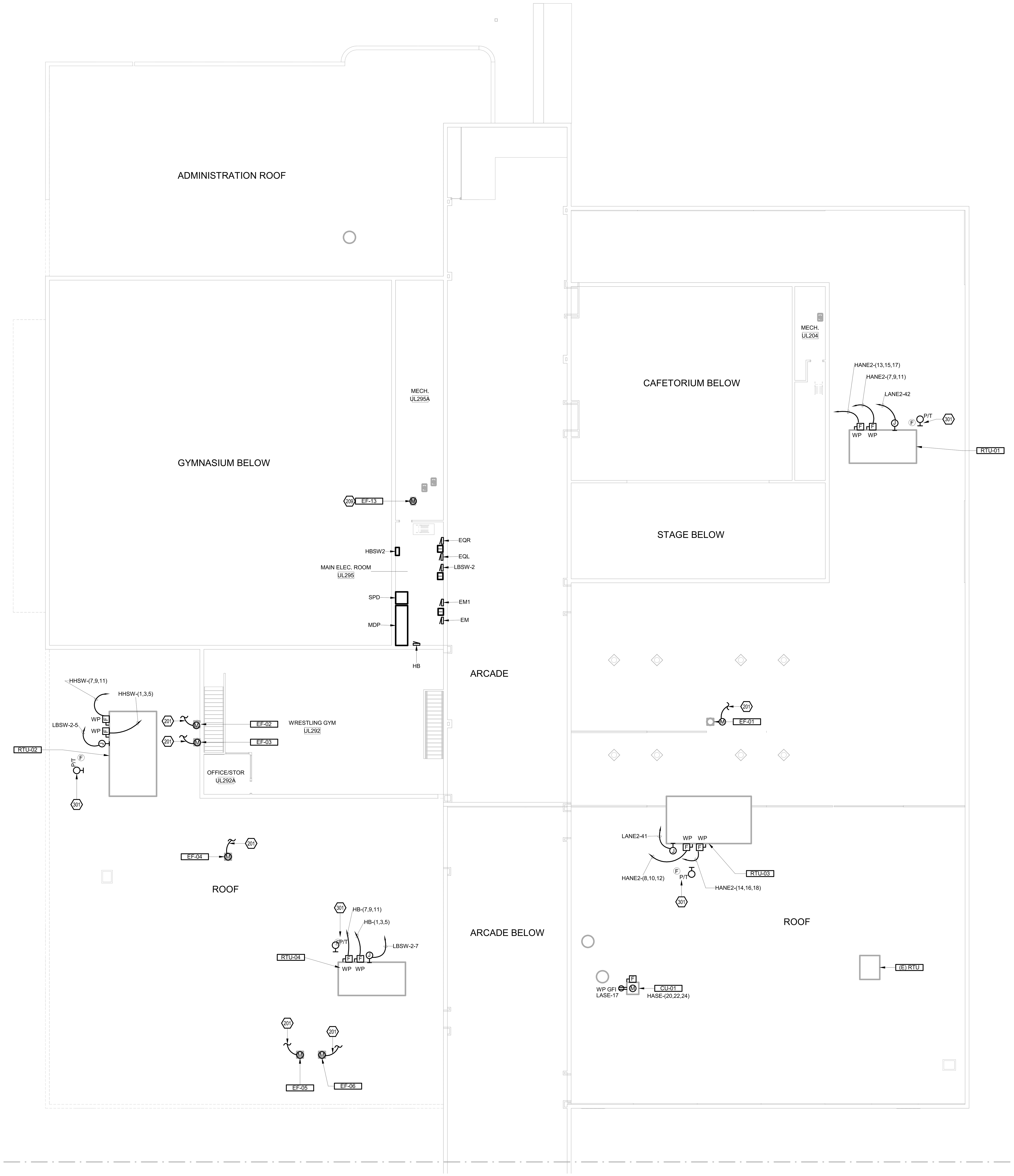
SHEET TITLE:

FIRST FLOOR POWER PLAN - AREA B

E-111B

SHEET OF

11784.000 MIDDLE SCHOOL MECHANICAL UPGRADES
3/30/2018 9:51:23 AM



1 **SECOND FLOOR/ROOF POWER PLAN - AREA A**

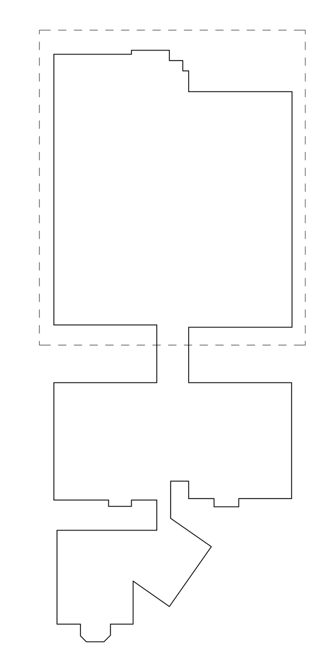
SCALE: 3/32" = 1'-0"

FLAG NOTES (THIS SHEET)

201 CONNECT NEW EXHAUST FAN TO EXISTING WIRES FROM BELOW SAVED DURING DEMOLITION. EXTEND WIRES AS REQUIRED TO LOCATION OF NEW FAN ON ROOF. UPDATE PANELBOARD DIRECTORY CARD WITH NEW EXHAUST FAN DESIGNATION.

209 CONNECT NEW FAN TO EXISTING WIRES SAVED DURING DEMOLITION. UPDATE PANELBOARD DIRECTORY CARD WITH NEW FAN DESIGNATION.

301 PROVIDE NEW DUCT SMOKE DETECTOR IN RETURN SIDE OF ROOF TOP DUCTWORK AND CONNECT TO EXISTING FACP. PROVIDE ALL NECESSARY COMPONENTS, WIRES AND CONNECTIONS FOR A COMPLETE AND OPERATIONAL INSTALL.



AREA PLAN

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ISSUE:

03/30/18 Issue for Bidding & Construction

DRAWING INFORMATION:

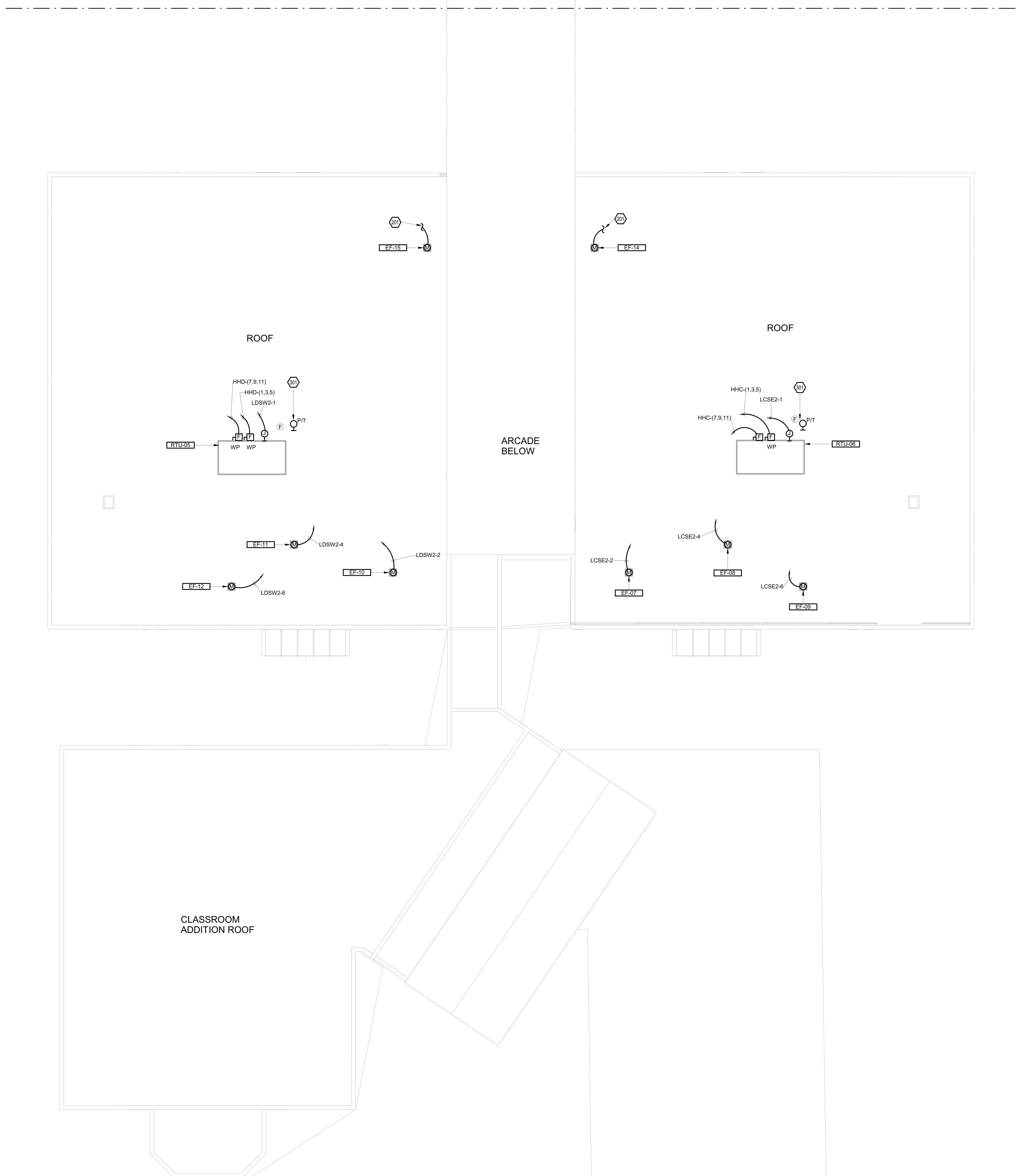
PROJECT NO:	11784.000
DRAWN BY:	CW
CHECKED BY:	SJB
APPROVED BY:	MRZ

SHEET TITLE:

SECOND FLOOR/ROOF POWER PLAN - AREA A

E-112A

SHEET OF



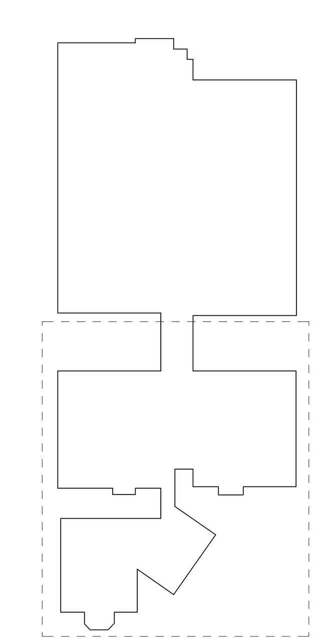
1 **ROOF POWER PLAN - AREA B**

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

FLAG NOTES (THIS SHEET)

201 CONNECT NEW EXHAUST FAN TO EXISTING WIRES FROM BELOW SAVED DURING DEMOLITION. EXTEND WIRES AS REQUIRED TO LOCATION OF NEW FAN ON ROOF. UPDATE PANELBOARD DIRECTORY CARD WITH NEW EXHAUST FAN DESIGNATION.

301 PROVIDE NEW DUCT SMOKE DETECTOR IN RETURN SIDE OF ROOF TOP DUCTWORK AND CONNECT TO EXISTING FACP. PROVIDE ALL NECESSARY COMPONENTS, WIRES AND CONNECTIONS FOR A COMPLETE AND OPERATIONAL INSTALL.



AREA PLAN

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COLORADO LICENSED PROFESSIONAL ENGINEER 39569 3/30/18

PROJECT:

MIDDLE SCHOOL MECHANICAL UPGRADES

39610 Amethyst Drive
Steamboat Springs, CO 80487

OWNER:

Steamboat Springs School District Re-2

325 7th Street
Steamboat Springs, CO 80487

ISSUE:

03/30/18 Issue for Bidding & Construction

DRAWING INFORMATION:

PROJECT NO:	11784.000
DRAWN BY:	CW
CHECKED BY:	SJB
APPROVED BY:	MRZ

SHEET TITLE:

ROOF POWER PLAN - AREA B

E-131B

SHEET OF

11784.000 MIDDLE SCHOOL MECHANICAL UPGRADES
3/30/2018 9:51:25 AM

FLAG NOTES (THIS SHEET)

100 INSTALL EXISTING LED LIGHTS SAVED DURING DEMOLITION (UNO) IN NEW LAY-IN CEILING AND CONNECT TO EXISTING LIGHTING BRANCH CIRCUIT. NO NEW LOAD ADDED TO CIRCUIT.

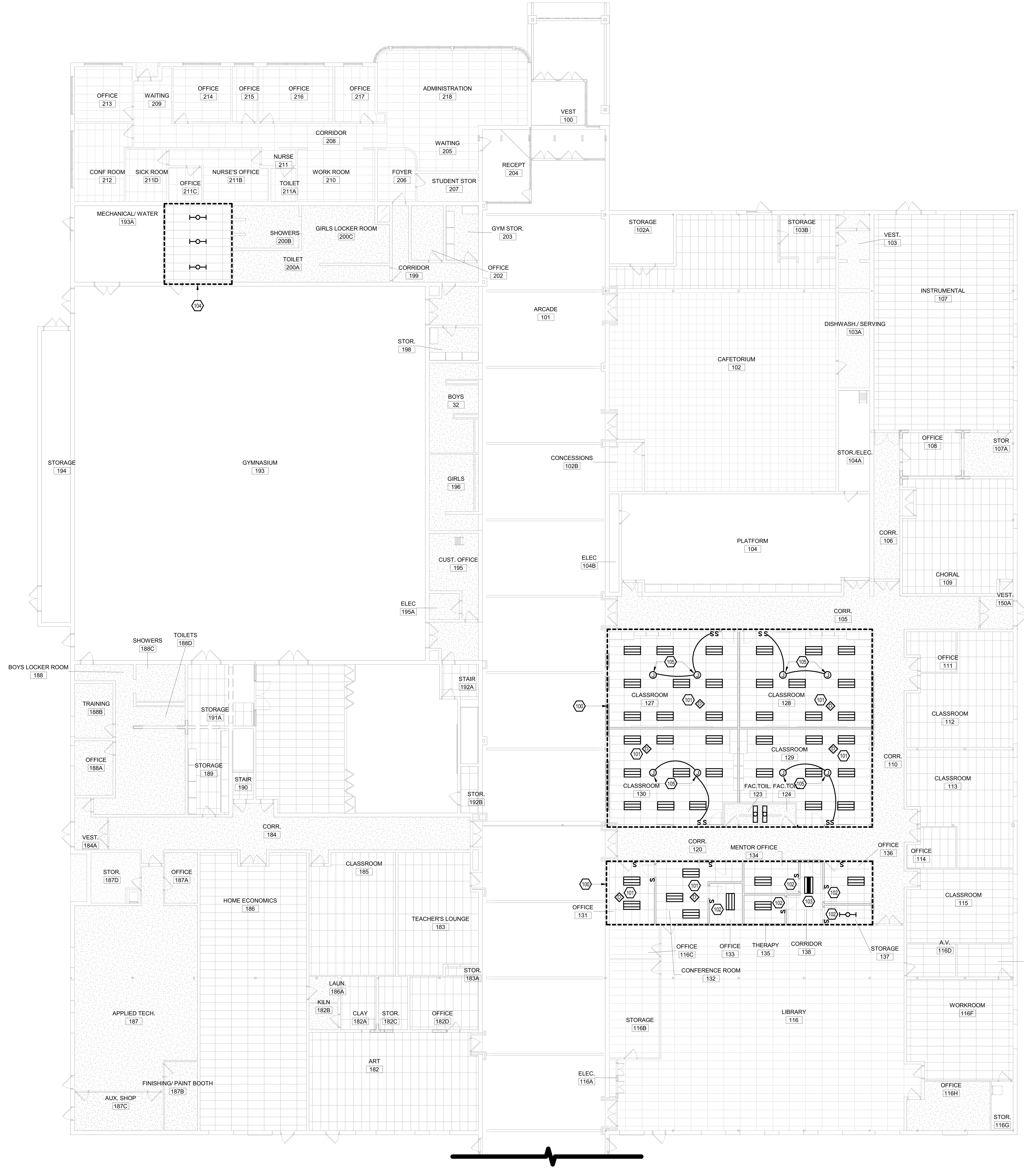
101 CEILING DUAL TECH MOUNTED OCCUPANCY SENSOR. SET TO 20MIN VACANCY MODE.

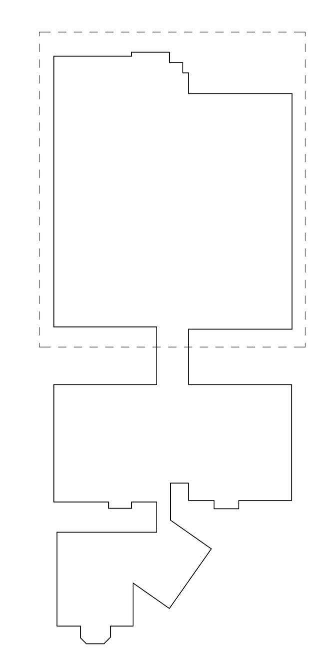
102 WALL SWITCH DUAL TECH MOUNTED OCCUPANCY SENSOR. SET TO 20MIN VACANCY MODE.

103 CONTROL CORRIDOR LIGHT WITH THE EXISTING CORRIDOR LIGHTS IN THE ADJACENT SPACE.

104 PROVIDE NEW LED STRIP LIGHTS IN THIS AREA AND CONNECT TO EXISTING LIGHTING CIRCUIT WIRES SAVED DURING DEMOLITION. CONNECT TO EXISTING LIGHT SWITCHES AS REQUIRED FOR CONTROL. PHILLIPS DAYBRITE #FSS-4-55L840-UNV OR EQUAL.

105 NEW LIGHT TUBES. PROVIDE 120V FOR CONNECTION OF MOTORIZED DAMPER FROM THE 120V RECEPTACLE CIRCUIT IN ROOM. PROVIDE WALL MOUNTED J-BOX WITH A 1/2" FOR CONTROL.





AREA PLAN

1 **FIRST FLOOR LIGHTING PLAN - AREA A**
SCALE: 3/32" = 1'-0"

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03/30/18 Issue for Bidding & Construction

DRAWING INFORMATION:

PROJECT NO:	11784.000
DRAWN BY:	CW
CHECKED BY:	SJB
APPROVED BY:	MRZ

SHEET TITLE:
FIRST FLOOR NEW LIGHTING PLAN - AREA A

E-211A
SHEET OF

11784.000 MIDDLE SCHOOL MECHANICAL UPGRADES
3/30/2018 9:51:28 AM

LOAD SUMMARY "HBSW2 "

EXISTING *	=		170.2 KVA
NEW LOAD ADDED			
RTU-1	=		15.8 KVA
RTU-1 HTG	=	50.0 KVA	
RTU-2	=		48.2 KVA
RTU-2 HTG	=	60.0 KVA	
RTU-3	=		38.2 KVA
RTU-3 HTG	=	65.0 KVA	
RTU-5	=		35.7 KVA
RTU-5 HTG	=	55.0 KVA	
RTU-6	=		35.7 KVA
RTU-6 HTG	=	55.0 KVA	
PANEL RA	=		7.7 KVA
PANEL LANE2	=		2.6 KVA
PANEL LBSW-2	=		4.1 KVA
PANEL RA	=		7.7 KVA
TOTALS			+480.7 KW
EXISTING	=		170.2 KVA
NEW	=		+480.7 KVA
TOTAL	=		650.9 KVA
	480V-3PHASE = 783 AMPS		

LOAD SUMMARY PANEL "HANE2"

PANELBOARD LANE2 *	=	43.6	KVA
NEW LOADS ADDED			
RTU-1	=	18.3	KVA
RTU-1 HTG	=	50.0	KVA
RTU-3	=	40.8	KVA
RTU-3 HTG	=	65.0	KVA
TOTAL	=	217.7	KVA
480V-3PHASE	=	262	AMPS

LOAD SUMMARY PANEL "LANE2"

EXISTING LOAD *	=	41.0	KVA
NEW LOAD ADDED	=	2.6	KVA
TOTAL	=	43.6	KVA
208V-3PHASE	=	121.1	AMPS

LOAD SUMMARY PANEL "LBSW-2"

EXISTING LOAD *	=	11.2	KVA
NEW LOAD ADDED	=	4.1	KVA
TOTAL	=	15.3	KVA
208V-3PHASE	=	42.5	AMPS

LOAD SUMMARY PANEL "LA"

EXISTING LOAD *	=	118.9	KVA
NEW LOAD ADDED TO 'RA'	=	7.7	KVA
TOTAL	=	126.6	KVA
480V-3PHASE	=	152.3	AMPS

LOAD SUMMARY PANEL "RA"

EXISTING LOAD *	=	35.5	KVA
NEW LOAD ADDED	=	7.7	KVA
TOTAL	=	143.2	KVA
208V-3PHASE	=	120A	AMPS

* EXISTING LOAD BASED ON RECORD DRAWINGS AND/OR 80% OF CIRCUIT BREAKER SIZE.

TRANSFORMER FEEDER SCHEDULE

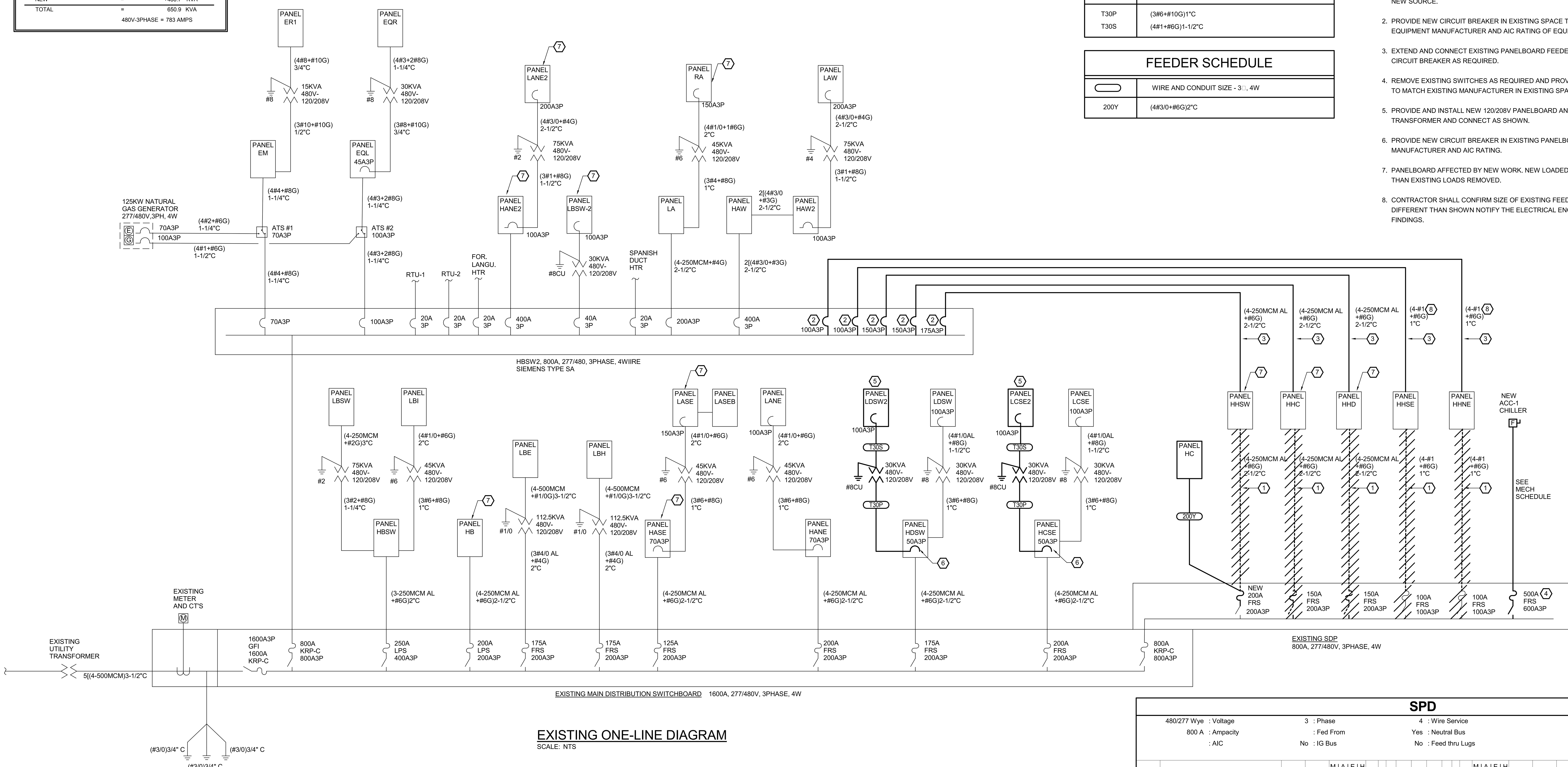
	WIRE AND CONDUIT SIZE - 3PHASE
T30P	(3#6+#10G)1"C
T30S	(4#1+#6G)1-1/2"C

FEEDER SCHEDULE

	WIRE AND CONDUIT SIZE - 3□, 4W
200Y	(4#3/0+#6G)2"C

FLAG NOTES (THIS SHEET):

1. DISCONNECT EXISTING PANELBOARD FEEDER AND REMOVE EXISTING SWITCH IN SERVICE. SAVE AND PROTECT FEEDER FOR CONNECTION TO NEW SOURCE.
2. PROVIDE NEW CIRCUIT BREAKER IN EXISTING SPACE TO MATCH EQUIPMENT MANUFACTURER AND AIC RATING OF EQUIPMENT.
3. EXTEND AND CONNECT EXISTING PANELBOARD FEEDER TO NEW CIRCUIT BREAKER AS REQUIRED.
4. REMOVE EXISTING SWITCHES AS REQUIRED AND PROVIDE NEW SWITCH TO MATCH EXISTING MANUFACTURER IN EXISTING SPACES.
5. PROVIDE AND INSTALL NEW 120/208V PANELBOARD AND ASSOCIATED TRANSFORMER AND CONNECT AS SHOWN.
6. PROVIDE NEW CIRCUIT BREAKER IN EXISTING PANELBOARD TO MATCH MANUFACTURER AND AIC RATING.
7. PANELBOARD AFFECTED BY NEW WORK. NEW LOADED ADDED IS LESS THAN EXISTING LOADS REMOVED.
8. CONTRACTOR SHALL CONFIRM SIZE OF EXISTING FEEDER AND IF DIFFERENT THAN SHOWN NOTIFY THE ELECTRICAL ENGINEER OF FINDINGS.



EXISTING ONE-LINE DIAGRAM

SCALE: NTS

SPD

480/277 Wye	: Voltage	3	: Phase	4	: Wire Service	MCB	: Mains Type (MLO or MCB)
800 A	: Ampacity		: Fed From	Yes	: Neutral Bus	Surface	: Mounting
	: AIC	No	: IG Bus	No	: Feed thru Lugs		: Modifications

Notes	Description	L	R	M | A | E | H | C | EL | EX | KE				A	B	C				M | A | E | H | C | EL | EX | KE	R	L	Description	Notes
NEW	ACC-01 CHILLER			M 318273	600	3	1				2	3	200	104840			PANELBOARD HC	
							3				4							
							5				6							
	Spare			-- --	100	3	7				8	3	100	-- --			Spare	
							9				10							
							11				12							
							13				14							
							15				16							
							17				18							
							19				20							
							21				22							
							23				24							
							25				26							
							27				28							
							29				30							

Load Type Abbreviations: A = Appliance; C = Cooling; D = Dryer; E = Equipment; EL = Elevator; EX = Existing; H = Heating; KE = Kitchen Equipment; L = Lighting; M = Motor; R = Receptacle; RA = Electric Range

Phase A: 141038
Phase B: 141038
Phase C: 141038

Load Classification	Connected Load	Demand Factor	Demand Load		Panel Totals	
Lighting	0	0.00%	0		KVA	
Receptacle	0	0.00%	0		Connected	423.1
Motor	423113	118.81%	502681		Design:	664.8
Appliance	0	0.00%	0		Demand:	502.7
Equipment	0	0.00%	0		Spare:	162.1
Cooling	0	0.00%	0			
Heating	0	0.00%	0		Amperes	
Elevator	0	0.00%	0		Load:	604.6
Kitchen Equipment	0	0.00%	0		Design:	800
Existing Load	0	0.00%	0		Spare:	195.4
Electric Clothes Dryer	0	0.00%	0			
Electric Range Small	0	0.00%	0		Phase Balance	
Electric Range Large	0	0.00%	0		A TO B:	1
					B TO C:	1
					C TO A:	1

Notes:

LOAD SUMMARY "MAIN SWITCHBOARD "

EXISTING LOAD BASED ON MAXIMUM UTILITY DEMAND			
316 KW X 125%sf AND .90 pf	=		439 KVA
439 KVA AT 480V-3PHASE	=		528 AMPS
LOADS REMOVED			
IN-FLOOR HEATING	=		396.0 KVA
(16) UNIT VENTILATORS	=		211.3 KVA
(3) SUPPLY FANS	=		11.5 KVA
AC FOR SERVER RM	=		8.5 KVA
ROOF TOP UNIT	=		6.1 KVA
TOTAL	=		-633.4 KVA
NEW LOAD ADDED			
ACC-1	=		318.3 KVA
RTU-1	=		15.8 KVA
RTU-1 HTG	=	50.0 KVA	
RTU-2	=		48.2 KVA
RTU-2 HTG	=	60.0 KVA	
RTU-3	=		38.2 KVA
RTU-3 HTG	=	65.0 KVA	
RTU-4	=		26.6 KVA
RTU-4 HTG	=	35.0 KVA	
RTU-5	=		35.7 KVA
RTU-5 HTG	=	55.0 KVA	
RTU-6	=		35.7 KVA
RTU-6 HTG	=	55.0 KVA	
PANEL LANE2	=		2.6 KVA
PANEL LBSW-2	=		4.1 KVA
PANEL RA	=		7.7 KVA
NEW PANEL HC	=		117.3 KVA
TOTALS			+838.5 KW
EXISTING	=		439.0 KVA
TOTAL REMOVED	=		-633.4 KVA
TOTAL NEW	=		+838.5 KVA
TOTAL	=		644.1 KVA
	480V-3PHASE = 775 AMPS		

LOAD SUMMARY PANEL "HB"

LOAD REMOVED			
(4) UNIT VENTILATORS	=	-89.8	KVA
(2) SUPPLY FANS	=	-7.6	KVA
TOTAL	=	-97.4	KVA
NEW LOADS ADDED			
RTU-4	=	+30.8	KVA
RTU-4 HTG	=	+35.0	KVA
TOTAL	=	+65.8	KVA

NEW LOADS ADDED IS LESS THAN LOADS REMOVED

LOAD SUMMARY PANEL "HASE"

LOAD REMOVED			
HEATING	=	-17.0	KVA
AC FOR SERVER RM	=	-8.5	KVA
TOTAL	=	-25.5	KVA
NEW LOAD ADDED	=	4.1	KVA
FC-1 AND CU-2	=	15.3	KVA

LOAD SUMMARY PANEL "LASE"

LOAD REMOVED	=	17.6	KVA
NEW LOAD ADDED	=	7.3	KVA

NEW LOADS ADDED IS LESS THAN LOADS REMOVED

LOAD SUMMARY PANEL "HDSW"

LOAD REMOVED (4) UV'S	=	-46.7	KVA
NEW PANELBOARD 'LDSW2'	=	+5.2	KVA

NEW LOADS ADDED IS LESS THAN LOADS REMOVED

LOAD SUMMARY PANEL "HCSE"

LOAD REMOVED (4) UV'S	=	-46.7	KVA
NEW PANELBOARD 'LCSE2'	=	+5.7	KVA

NEW LOADS ADDED IS LESS THAN LOADS REMOVED

* EXISTING LOAD BASED ON RECORD DRAWINGS AND/OR 80% OF CIRCUIT BREAKER SIZE.

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COLORADO LICENSED PROFESSIONAL ENGINEER 39569 3/30/18

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DRAWING INFORMATION:

PROJECT NO:	11784.000
DRAWN BY:	CW
CHECKED BY:	SJB
APPROVED BY:	MRZ

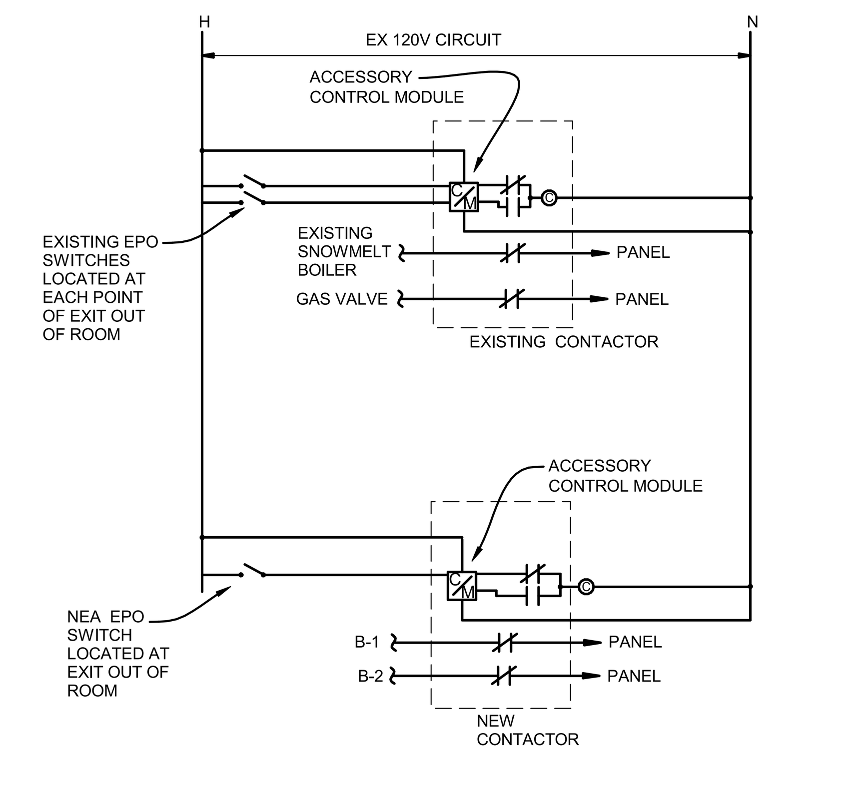
SHEET TITLE:

ELECTRICAL ONE-LINE DIAGRAM

E-401

SHEET OF

1 2 3 4 5 6



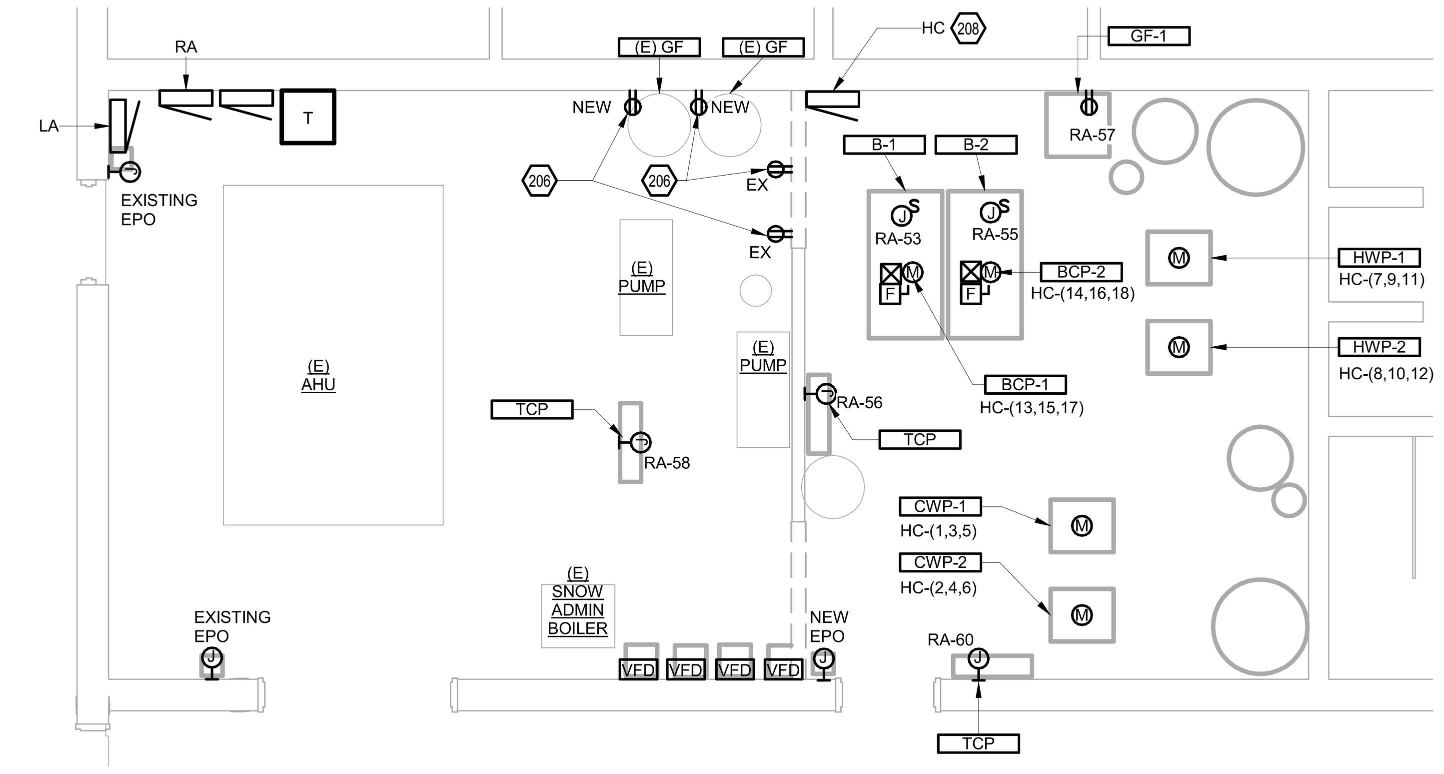
EMERGENCy GAS SHUT-DOWN WIRING DIAGRAM

NO SCALE

FLAG NOTES (THIS SHEET)

206 DISCONNECT THE EXISTING 120V CONNECTION FOR THE (2) GLYCOL FEEDERS TO BE RELOCATED TO EAST WALL AS SHOWN. PROVIDE NEW 20A DUPLEX RECEPTACLE AND EXTEND EXISTING BRANCH CIRCUIT WIRES TO NEW LOCATION AS REQUIRED.

208 NEW 277/480V PANELBOARD, SEE ONE-LINE DIAGRAM ON E-501 FOR REQUIREMENTS.



2 **ENLARGED MECHANICAL ROOM PLAN**

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

E
D
C
B
A

HC

480/277 Wye : Voltage	3 : Phase	4 : Wire Service	MLO : Mains Type (MLO or MCB)
225 A : Ampacity	SPD : Fed From	Yes : Neutral Bus	Surface : Mounting
14,000 : AIC	No : IG Bus	No : Feed thru Lugs	: Modifications

Notes	Description	L	R	M | A | E | H | EL | EX | KE					A	B	C				M | A | E | H | EL | EX | KE		R	L	Description	Notes
								1				2								
	CWP-1			M	31870	100	3	3				4	3	100	31870	M			CWP-2	
								5				6								
								7				8								
	HWP-1			M	16730	50	3	9				10	3	50	16730	M			HWP-2	
								11				12								
								13				14								
	BCP-1			M	3820	15	3	15				16	3	15	3820	M			BCP-2	
								17				18								
--	Space			--	--	--	--	19				20	--	--	--	--			Space	--
--	Space			--	--	--	--	21				22	--	--	--	--			Space	--
--	Space			--	--	--	--	23				24	--	--	--	--			Space	--
--	Space			--	--	--	--	25				26	--	--	--	--			Space	--
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--	Space			--	--	--	--	29				30	--	--	--	--			Space	--
--	Space			--	--	--	--	31				32	--	--	--	--			Space	--
--	Space			--	--	--	--	33				34	--	--	--	--			Space	--
--	Space			--	--	--	--	35				36	--	--	--	--			Space	--
--	Space			--	--	--	--	37				38	--	--	--	--			Space	--
--	Space			--	--	--	--	39				40	--	--	--	--			Space	--
--	Space			--	--	--	--	41				42	--	--	--	--			Space	--

Load Type Abbreviations: A = Appliance; D = Dryer; E = Equipment; EL = Elevator;
EX = Existing; H = Heating; KE = Kitchen Equipment;
L = Lighting; M = Motor; R = Receptacle; RA = Electric Range

Phase A: 34947
Phase B: 34947
Phase C: 34947

Load Classification	**Connected Load**	**Demand Factor**	**Demand Load**		**Panel Totals**	
Lighting	0	0.00%	0		**KVA**	
Receptacle	0	0.00%	0		**Connected**	104.8
Motor	104840	107.60%	112808		**Design:**	166.2
Appliance	0	0.00%	0		**Demand:**	112.8
Equipment	0	0.00%	0		**Spare:**	53.4
Cooling	0	0.00%	0			
Heating	0	0.00%	0		**Amperes**	
Elevator	0	0.00%	0		**Load:**	135.7
Kitchen Equipment	0	0.00%	0		**Design:**	200
Existing Load	0	0.00%	0		**Spare:**	64.3
Electric Clothes Dryer	0	0.00%	0			
Electric Range Small	0	0.00%	0		**Phase Balance**	
Electric Range Large	0	0.00%	0		**A TO B:**	1
HVAC	0	0.00%	0		**B TO C:**	1
					C TO A:	1

Notes:

MECHANICAL EQUIPMENT CONNECTION SCHEDULE

KEY	DESCRIPTION	LOAD (VA)	VOLT	PHASE	FEEDER	O.C. PROTECTION C.B.	O.C. PROTECTION FUSE	REMARKS
ACC-01	CHILLER, 383 MCA	318273	480 V	3	2[(3#3/0+#3G)2-1/2"C]	600A3P	500A FRS-RK	PROVIDE (3) 120V CIRCUITS, (1) HEATER, (1) FOR CONTROLS, (1) FOR WATER TREATMENT AND 120V GFI RECEPTACLE AT UNIT.
B-1	BOILER, 16A	1920	120 V	1	(2#12+#12G)1/2"C	20A1P	-	PROVIDE SAFETY DISCONNECT SWITCH AT UNIT.
B-2	BOILER, 16A	1920	120 V	1	(2#12+#12G)1/2"C	20A1P	-	PROVIDE SAFETY DISCONNECT SWITCH AT UNIT.
BCP-1	BOILER CIRC. PUMP, 3HP	3820	480 V	3	(3#12+#12G)1/2"C	15A3P	8A LPS-RK	MAG-HOA STARTER PROVIDED BY MECHANICAL, INSTALLED AND CONNECTED BY ELECTRICAL.
BCP-2	BOILER CIRC. PUMP, 3HP	3820	480 V	3	(3#12+#12G)1/2"C	15A3P	8A LPS-RK	MAG-HOA STARTER PROVIDED BY MECHANICAL, INSTALLED AND CONNECTED BY ELECTRICAL.
CP-1	CIRC PUMP AT FCU-1	100	120 V	1	(2#12+#12G)1/2"C	20A1P		PROVIDE MANUAL MOTOR STARTER WITH THERMAL OVERLOADS AT UNIT.
CU-1	CONDENSING UNIT	6740	480 V	3	(3#10+#10G)1/2"C	30A3P	25A LPS-RK	PROVIDE WP FUSED DISCONNECT SWITCH AT UNIT.
CWP-1	COLD WATER PUMP, 30HP	31870	480 V	3	(3#6+#8G)1"C	100A3P	-	VFD WITH DISCONNECT SWITCH PROVIDED BY MECHANICAL, INSTALLED AND CONNECTED BY THE ELECTRICAL.
CWP-2	COLD WATER PUMP, 30HP	31870	480 V	3	(3#6+#8G)1"C	100A3P	-	VFD WITH DISCONNECT SWITCH PROVIDED BY MECHANICAL, INSTALLED AND CONNECTED BY THE ELECTRICAL.
EF-01	EXHAUST FAN, 1/4HP	670	120 V	1	(2#12+#12G)1/2"C	20A1P		DISCONNECT SWITCH PROVIDED INTEGRAL WITH UNIT.
EF-02	EXHAUST FAN, 1/2HP	1130	120 V	1	(2#12+#12G)1/2"C	20A1P		DISCONNECT SWITCH PROVIDED INTEGRAL WITH UNIT.
EF-03	EXHAUST FAN, 1/6HP	510	120 V	1	(2#12+#12G)1/2"C	20A1P		DISCONNECT SWITCH PROVIDED INTEGRAL WITH UNIT.
EF-04	EXHAUST FAN, 1/4HP	670	120 V	1	(2#12+#12G)1/2"C	20A1P		DISCONNECT SWITCH PROVIDED INTEGRAL WITH UNIT. CONNECT TO EXISTING 120V SWITCH IN ROOM FAN SERVES.
EF-05	EXHAUST FAN, 1/4HP	670	120 V	1	(2#12+#12G)1/2"C	20A1P		DISCONNECT SWITCH PROVIDED INTEGRAL WITH UNIT. CONNECT TO EXISTING 120V SWITCH IN ROOM FAN SERVES.
EF-06	EXHAUST FAN, 1/4HP	670	120 V	1	(2#12+#12G)1/2"C	20A1P		DISCONNECT SWITCH PROVIDED INTEGRAL WITH UNIT.
EF-07	EXHAUST FAN, 1/2HP	1130	120 V	1	(2#12+#12G)1/2"C	20A1P		DISCONNECT SWITCH PROVIDED INTEGRAL WITH UNIT.
EF-08	EXHAUST FAN, 1/4HP	670	120 V	1	(2#12+#12G)1/2"C	20A1P		DISCONNECT SWITCH PROVIDED INTEGRAL WITH UNIT. CONNECT TO EXISTING 120V SWITCH IN ROOM FAN SERVES.
EF-09	EXHAUST FAN, 1/2HP	1130	120 V	1	(2#12+#12G)1/2"C	20A1P		DISCONNECT SWITCH PROVIDED INTEGRAL WITH UNIT.
EF-10	EXHAUST FAN, 1/2HP	1130	120 V	1	(2#12+#12G)1/2"C	20A1P		DISCONNECT SWITCH PROVIDED INTEGRAL WITH UNIT.
EF-11	EXHAUST FAN, 1/4HP	670	120 V	1	(2#12+#12G)1/2"C	20A1P		DISCONNECT SWITCH PROVIDED INTEGRAL WITH UNIT. CONNECT TO EXISTING 120V SWITCH IN ROOM FAN SERVES.
EF-12	EXHAUST FAN, 1/2HP	1130	120 V	1	(2#12+#12G)1/2"C	20A1P		DISCONNECT SWITCH PROVIDED INTEGRAL WITH UNIT.
EF-13	EXHAUST FAN, 1/2HP	1130	120 V	1	(2#12+#12G)1/2"C	20A1P		DISCONNECT SWITCH PROVIDED INTEGRAL WITH UNIT.
EF-14	EXHAUST FAN, 1/2HP	1130	120 V	1	(2#12+#12G)1/2"C	20A1P		DISCONNECT SWITCH PROVIDED INTEGRAL WITH UNIT.
EF-15	EXHAUST FAN, 1/2HP	1130	120 V	1	(2#12+#12G)1/2"C	20A1P		DISCONNECT SWITCH PROVIDED INTEGRAL WITH UNIT.
FCU-1	FAN COIL UNIT (2)1/4HP	870	277 V	1	(2#12+#12G)1/2"C	20A1P		PROVIDE MANUAL MOTOR STARTER WITH THERMAL OVERLOADS AT UNIT.
FCU-2	FAN COIL UNIT, (2)1/4HP	1130	120 V	1	(2#12+#12G)1/2"C	20A1P		PROVIDE MANUAL MOTOR STARTER WITH THERMAL OVERLOADS AT UNIT.
GF-1	GLYCOL FEEDER, 1/3HP	830	120 V	1	(2#12+#12G)1/2"C	20A1P		PROVIDE 20A DUPLEX RECEPTACLE FOR CORD AND PLUG CONNECTION.
HWP-1	HOT WATER PUMP, 15HP	16730	480 V	3	(3#10+#10G)3/4"C	50A3P	-	VFD WITH DISCONNECT SWITCH PROVIDED BY MECHANICAL, INSTALLED AND CONNECTED BY THE ELECTRICAL.
HWP-2	HOT WATER PUMP, 15HP	16730	480 V	3	(3#10+#10G)3/4"C	50A3P	-	VFD WITH DISCONNECT SWITCH PROVIDED BY MECHANICAL, INSTALLED AND CONNECTED BY THE ELECTRICAL.
RTU-01	ROOF TOP UNIT, 19A, 22MCA	15789	480 V	3	(3#10+#10G)3/4"C	40A3P	30A LPS-RK	PROVIDE 120V FOR LIGHTS AND RECEPTACLE. PROVIDE FIRE ALARM DUCT SMOKE DETECTOR IN RETURN SIDE DUCTWORK WITH REMOTE TEST STATION.
RTU-01 HTR	ROOF TOP UNIT -HEATER	50000	480 V	3	(3#3+#8G)1-1/4"C	80A3P	75A LPS-RK	
RTU-02	ROOF TOP UNIT-58A, 62MCA	48198	480 V	3	(3#4+#10G)1"C	80A3P	70A LPS-RK	PROVIDE 120V FOR LIGHTS AND RECEPTACLE. PROVIDE FIRE ALARM DUCT SMOKE DETECTOR IN RETURN SIDE DUCTWORK WITH REMOTE TEST STATION.
RTU-02 HTR	ROOF TOP UNIT -HEATER	60000	480 V	3	(3#2+#8G)1-1/4"C	100A3P	90A LPS-RK	
RTU-03	ROOF TOP UNIT-46A, 49MCA	38226	480 V	3	(3#6+#10G)3/4"C	70A3P	60A LPS-RK	PROVIDE 120V FOR LIGHTS AND RECEPTACLE. PROVIDE FIRE ALARM DUCT SMOKE DETECTOR IN RETURN SIDE DUCTWORK WITH REMOTE TEST STATION.
RTU-03 HTR	ROOF TOP UNIT -HEATER	65000	480 V	3	(3#1+#8G)1-1/2"C	100A3P	100A LPS-RK	
RTU-04	ROOF TOP UNIT-32A, 37MCA	26592	480 V	3	(3#8+#10G)3/4"C	60A3P	50A LPS-RK	PROVIDE 120V FOR LIGHTS AND RECEPTACLE. PROVIDE FIRE ALARM DUCT SMOKE DETECTOR IN RETURN SIDE DUCTWORK WITH REMOTE TEST STATION.
RTU-04 HTR	ROOF TOP UNIT -HEATER	35000	480 V	3	(3#6+#10G)3/4"C	60A3P	55A LPS-RK	
RTU-05	ROOF TOP UNIT- 43A, 50MCA	35733	480 V	3	(3#6+#10G)3/4"C	80A3P	70A LPS-RK	PROVIDE 120V FOR LIGHTS AND RECEPTACLE. PROVIDE FIRE ALARM DUCT SMOKE DETECTOR IN RETURN SIDE DUCTWORK WITH REMOTE TEST STATION.
RTU-05 HTR	ROOF TOP UNIT -HEATER	55000	480 V	3	(3#3+#8G)1-1/4"C	90A3P	85A LPS-RK	
RTU-06	ROOF TOP UNIT - 43A, 50MCA	35733	480 V	3	(3#6+#10G)3/4"C	80A3P	70A LPS-RK	PROVIDE 120V FOR LIGHTS AND RECEPTACLE. PROVIDE FIRE ALARM DUCT SMOKE DETECTOR IN RETURN SIDE DUCTWORK WITH REMOTE TEST STATION.
RTU-06 HTG	ROOF TOP UNIT -HEATER	55000	480 V	3	(3#3+#8G)1-1/4"C	90A3P	85A LPS-RK	
TCP	MECHANICAL CONTROL PANEL	1000	120 V	1	(2#12+#12G)1/2"C	20A1P		
VAV	MECHANCIAL VAV LV CONTROLS	500	120 V	1	(2#12+#12G)1/2"C	20A1P		

EM. GAS SHUT DOWN	ENLARGED MECH RM PLAN	
PANEL HC	MECH SCHED.	

hord | coplan | macht

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Greenwood Village, CO 80111
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COLORADO LICENSED 39569 3/30/18 PROFESSIONAL ENGINEER

PROJECT:

MIDDLE SCHOOL MECHANICAL UPGRADES

39610 Amethyst Drive
Steamboat Springs, CO 80487

OWNER:

Steamboat Springs School District Re-2

325 7th Street
Steamboat Springs, CO 80487

ISSUE:

03/30/18 Issue for Bidding & Construction

DRAWING INFORMATION:

PROJECT NO:	11784.000
DRAWN BY:	Author
CHECKED BY:	Checker
APPROVED BY:	Approver

SHEET TITLE:

ELECTRICAL DETAILS AND SCHEDULES

E-501

SHEET OF

11784.000 MIDDLE SCHOOL MECHANICAL UPGRADES
3/30/2018 9:51:29 AM

1 2 3 4 5 6

HANE2

480/277 Wye : Voltage — 3 : Phase — 4 : Wire Service — MLO : Mains Type (MLO or MCB)
400 A : Ampacity — : Fed From — Yes : Neutral Bus — Surface : Mounting
: AIC — No : IG Bus — No : Feed thru Lugs — : Modifications

Notes	Description	L	R	M | A | E | H | EL | EX | KE				A	B	C				M | A | E | H | EL | EX | KE	R	L	Description	Notes
							1				2							
	PANELBOARD LANE2			0	100	3	3				4	3	20	-- --			Spare	
							5				6							
							7				8							
[1]	RTU-01			M 15789	40	3	9				10	3	70	38226 M			RTU-03	[1]
							11				12							
							13				14							
[1]	RTU-01, HEATER			H 50000	80	3	15				16	3	100	65000 H			RTU-03, HEATER	[1]
							17				18							
--	Space			-- --	--	--	19				20	--	--	-- --			Space	--
--	Space			-- --	--	--	21				22	--	--	-- --			Space	--
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--	Space			-- --	--	--	37				38	--	--	-- --			Space	--
--	Space			-- --	--	--	39				40	--	--	-- --			Space	--
--	Space			-- --	--	--	41				42	--	--	-- --			Space	--

Load Type Abbreviations: A = Appliance; D = Dryer; E = Equipment; EL = Elevator;
EX = Existing; H = Heating; KE = Kitchen Equipment;
L = Lighting; M = Motor; R = Receptacle; RA = Electric Range

Phase A: 56338
Phase B: 56338
Phase C: 56338

Load Classification	Connected Load	Demand Factor	Demand Load	Panel Totals	
Lighting	0	0.00%	0	**KVA**	
Receptacle	0	0.00%	0	**Connected**	169
Motor	54015	117.69%	63572	**Design:**	332.4
Appliance	0	0.00%	0	**Demand:**	178.6
Equipment	0	0.00%	0	**Spare:**	153.8
Cooling	0	0.00%	0		
Heating	115000	100.00%	115000	**Amperes**	
Elevator	0	0.00%	0	**Load:**	214.8
Kitchen Equipment	0	0.00%	0	**Design:**	400
Existing Load	0	0.00%	0	**Spare:**	185.2
Electric Clothes Dryer	0	0.00%	0		
Electric Range Small	0	0.00%	0	**Phase Balance**	
Electric Range Large	0	0.00%	0	**A TO B:**	1
HVAC	0	0.00%	0	**B TO C:**	1
				C TO A:	1

Notes:
[1] REPLACE EXISTING CIRCUIT BREAKER WITH NEW TO MATCH MANUFACTURER AND AIC RATING.

HASE

480/277 Wye : Voltage — 3 : Phase — 4 : Wire Service — : Mains Type (MLO or MCB)
: Ampacity — : Fed From — Yes : Neutral Bus — Recessed : Mounting
: AIC — No : IG Bus — No : Feed thru Lugs — : Modifications

Notes	Description	L	R	M | A | E | H | C | EL | EX | KE				A	B	C				M | A | E | H | C | EL | EX | KE	R	L	Description	Notes
	EXISTING			-- --	20	1	1				2	1	20	-- --			EXISTING	
	EXISTING			-- --	20	1	3				4	1	20	-- --			EXISTING	
	EXISTING			-- --	20	1	5				6	1	20	-- --			EXISTING	
	EXISTING			-- --	20	1	7				8	1	20	-- --			EXISTING	
	EXISTING			-- --	20	1	9				10	1	20	-- --			EXISTING	
	EXISTING			-- --	20	1	11				12	1	20	-- --			EXISTING	
[1]	FAN COIL, FCU-1 SERVER RM			M 870	20	1	13				14							
--	Space			-- --	--	--	15				16	3	20	-- --			Spare	
--	Space			-- --	--	--	17				18							
							19				20							
	PANELBOARD LASE			-- --	100	3	21				22	3	30	6740 M			CONDENSER UNIT, CU-1	[1]
							23				24							
							25				26							
	Spare			-- --	15	3	27				28	3	15	-- --			Spare	
							29				30							

Load Type Abbreviations: A = Appliance; C = Cooling; D = Dryer; E = Equipment; EL = Elevator;
EX = Existing; H = Heating; KE = Kitchen Equipment;
L = Lighting; M = Motor; R = Receptacle; RA = Electric Range

Phase A: 3117
Phase B: 2247
Phase C: 2247

Load Classification	Connected Load	Demand Factor	Demand Load	Panel Totals	
Lighting	0	0.00%	0	**KVA**	
Receptacle	0	0.00%	0	**Connected**	7.6
Motor	7610	122.14%	9295	**Design:**	103.9
Appliance	0	0.00%	0	**Demand:**	9.3
Equipment	0	0.00%	0	**Spare:**	94.6
Cooling	0	0.00%	0		
Heating	0	0.00%	0	**Amperes**	
Elevator	0	0.00%	0	**Load:**	11.2
Kitchen Equipment	0	0.00%	0	**Design:**	125
Existing Load	0	0.00%	0	**Spare:**	113.8
Electric Clothes Dryer	0	0.00%	0		
Electric Range Small	0	0.00%	0	**Phase Balance**	
Electric Range Large	0	0.00%	0	**A TO B:**	0.72
				B TO C:	1
				C TO A:	0.7

Notes:
[1] REPLACE EXISTING CIRCUIT BREAKER MADE SPARE DURING DEMOLITION WITH NEW TO MATCH MANUFACTURER AND AIC RATING.

HB

480/277 Wye : Voltage — 3 : Phase — 4 : Wire Service — MLO : Mains Type (MLO or MCB)
200 A : Ampacity — : Fed From — Yes : Neutral Bus — Surface : Mounting
: AIC — No : IG Bus — No : Feed thru Lugs — : Modifications

Notes	Description	L	R	M | A | E | H | C | EL | EX | KE				A	B	C				M | A | E | H | C | EL | EX | KE	R	L	Description	Notes
							1				2							
[1]	RTU-04			M 26592	60	3	3				4	3	50	-- --			Spare	
							5				6							
							7				8							
[1]	RTU-04 HEATER			H 35000	60	3	9				10	3	30	-- --			Spare	
							11				12							
							13				14							
	Spare			-- --	20	3	15				16	3	30	-- --			CENTER ARCADE EXHAUST FAN	EX
							17				18							
							19				20							
	Spare			-- --	20	3	21				22	3	20	-- --			Spare	
							23				24							
							25				26							
	Spare			-- --	20	3	27				28	3	20	-- --			Spare	
							29				30							
							31				32							
	AIR COMPRESSOR			-- --	20	3	33				34	3	20	-- --			Spare	
							35				36							
							37				38							
	DUST COLLECTOR			-- --	20	3	39				40	3	20	-- --			NO. ARCADE EXHAUST FAN	EX
							41				42							

Load Type Abbreviations: A = Appliance; C = Cooling; D = Dryer; E = Equipment; EL = Elevator;
EX = Existing; H = Heating; KE = Kitchen Equipment;
L = Lighting; M = Motor; R = Receptacle; RA = Electric Range

Phase A: 20531
Phase B: 20531
Phase C: 20531

Load Classification	Connected Load	Demand Factor	Demand Load	Panel Totals	
Lighting	0	0.00%	0	**KVA**	
Receptacle	0	0.00%	0	**Connected**	61.6
Motor	26592	125.00%	33240	**Design:**	166.2
Appliance	0	0.00%	0	**Demand:**	68.2
Equipment	0	0.00%	0	**Spare:**	98
Cooling	0	0.00%	0		
Heating	35000	100.00%	35000	**Amperes**	
Elevator	0	0.00%	0	**Load:**	82.1
Kitchen Equipment	0	0.00%	0	**Design:**	200
Existing Load	0	0.00%	0	**Spare:**	117.9
Electric Clothes Dryer	0	0.00%	0		
Electric Range Small	0	0.00%	0	**Phase Balance**	
Electric Range Large	0	0.00%	0	**A TO B:**	1
				B TO C:	1
				C TO A:	1

Notes:
[1] REPLACE EXISTING CIRCUIT BREAKER WITH NEW TO MATCH MANUFACTURER AND AIC RATING.

HHC

480/277 Wye : Voltage — 3 : Phase — 4 : Wire Service — MLO : Mains Type (MLO or MCB)
200 A : Ampacity — : Fed From — Yes : Neutral Bus — Surface : Mounting
: AIC — No : IG Bus — No : Feed thru Lugs — : Modifications

Notes	Description	L	R	M | A | E | H | EL | EX | KE				A	B	C				M | A | E | H | EL | EX | KE	R	L	Description	Notes
							1				2	1	20	-- --			Spare	
[1]	ROOF TOP UNIT, RTU-06			M 35733	80	3	3				4	1	20	-- --			Spare	
							5				6	1	20	-- --			Spare	
							7				8	1	20	-- --			Spare	
[1]	RTU-06 HEATER			H 55000	90	3	9				10	1	20	3000 H			HEATING VESTIBULE C100	EX
							11				12	1	20	-- --			Spare	
	Spare			-- --	20	1	13				14	1	20	-- --			Spare	
	Spare			-- --	20	1	15				16	1	20	-- --			Spare	
	Spare			-- --	20	1	17				18	1	20	-- --			Spare	
	Spare			-- --	20	1	19				20	1	20	-- --			Spare	
	Spare			-- --	20	1	21				22	1	20	-- --			Spare	
	Spare			-- --	20	1	23				24	1	20	-- --			Spare	
	Spare			-- --	20	1	25				26	1	20	-- --			Spare	
	Spare			-- --	20	1	27				28	1	20	-- --			Spare	
	Spare			-- --	20	1	29				30	1	20	3000 H			HEATING ENTRY 116	EX
	Spare			-- --	20	1	31				32	1	20	-- --			Spare	
--	Space			-- --	--	--	33				34	--	--	-- --			Space	--
--	Space			-- --	--	--	35				36	--	--	-- --			Space	--
--	Space			-- --	--	--	37				38	--	--	-- --			Space	--
--	Space			-- --	--	--	39				40	--	--	-- --			Space	--
--	Space			-- --	--	--	41				42	--	--	-- --			Space	--

Load Type Abbreviations: A = Appliance; D = Dryer; E = Equipment; EL = Elevator;
EX = Existing; H = Heating; KE = Kitchen Equipment;
L = Lighting; M = Motor; R = Receptacle; RA = Electric Range

Phase A: 30244
Phase B: 33244
Phase C: 33244

Load Classification	Connected Load	Demand Factor	Demand Load	Panel Totals	
Lighting	0	0.00%	0	**KVA**	
Receptacle	0	0.00%	0	**Connected**	96.7
Motor	35733	125.00%	44666	**Design:**	124.7
Appliance	0	0.00%	0	**Demand:**	105.7
Equipment	0	0.00%	0	**Spare:**	19
Cooling	0	0.00%	0		
Heating	61000	100.00%	61000	**Amperes**	
Elevator	0	0.00%	0	**Load:**	127.1
Kitchen Equipment	0	0.00%	0	**Design:**	150
Existing Load	0	0.00%	0	**Spare:**	22.9
Electric Clothes Dryer	0	0.00%	0		
Electric Range Small	0	0.00%	0	**Phase Balance**	
Electric Range Large	0	0.00%	0	**A TO B:**	0.91
HVAC	0	0.00%	0	**B TO C:**	1
				C TO A:	0.9

Notes:
[1] REPLACE EXISTING CIRCUIT BREAKER WITH NEW TO MATCH MANUFACTURER AND AIC RATING.

HHD

480/277 Wye : Voltage — 3 : Phase — 4 : Wire Service — MLO : Mains Type (MLO or MCB)
200 A : Ampacity — : Fed From — Yes : Neutral Bus — Surface : Mounting
: AIC — No : IG Bus — No : Feed thru Lugs — : Modifications

Notes	Description	L	R	M | A | E | H | EL | EX | KE				A	B	C				M | A | E | H | EL | EX | KE	R	L	Description	Notes
							1				2	1	20	-- --			Spare	
[1]	RTU-05			M 35733	80	3	3				4	1	20	-- --			Spare	
							5				6	1	20	-- --			Spare	
							7				8	1	20	-- --			Spare	
[1]	RTU-05 HEATER			H 55000	90	3	9				10	1	20	-- --			Spare	
							11				12	1	20	-- --			Spare	
	Spare			-- --	20	1	13				14	1	20	-- --			Spare	
	Spare			-- --	20	1	15				16	1	20	-- --			Spare	
	Spare			-- --	20	1	17				18	1	20	-- --			Spare	
	Spare			-- --	20	1	19				20	1	20	3000 H			HEATING ENTRY 113	EX
	Spare			-- --	20	1	21				22	1	20	-- --			Spare	
	Spare			-- --	20	1	23				24	1	20	-- --			Spare	
	Spare			-- --	20	1	25				26	1	20	-- --			Spare	
	Spare			-- --	20	1	27				28	1	20	-- --			Spare	
	Spare			-- --	20	1	29				30	1	20	-- --			Spare	
	Spare			-- --	20	1	31				32	--	--	-- --			Space	--
--	Space			-- --	--	--	33				34	--	--	-- --			Space	--
--	Space			-- --	--	--	35				36	--	--	-- --			Space	--
--	Space			-- --	--	--	37				38	--	--	-- --			Space	--
--	Space			-- --	--	--	39				40	--	--	-- --			Space	--
--	Space			-- --	--	--	41				42	--	--	-- --			Space	--

Load Type Abbreviations: A = Appliance; D = Dryer; E = Equipment; EL = Elevator;
EX = Existing; H = Heating; KE = Kitchen Equipment;
L = Lighting; M = Motor; R = Receptacle; RA = Electric Range

Phase A: 33244
Phase B: 30244
Phase C: 30244

Load Classification	Connected Load	Demand Factor	Demand Load	Panel Totals	
Lighting	0	0.00%	0	**KVA**	
Receptacle	0	0.00%	0	**Connected**	93.7
Motor	35733	125.00%	44666	**Design:**	124.7
Appliance	0	0.00%	0	**Demand:**	102.7
Equipment	0	0.00%	0	**Spare:**	22
Cooling	0	0.00%	0		
Heating	58000	100.00%	58000	**Amperes**	
Elevator	0	0.00%	0	**Load:**	123.5
Kitchen Equipment	0	0.00%	0	**Design:**	150
Existing Load	0	0.00%	0	**Spare:**	26.5
Electric Clothes Dryer	0	0.00%	0		
Electric Range Small	0	0.00%	0	**Phase Balance**	
Electric Range Large	0	0.00%	0	**A TO B:**	0.91
HVAC	0	0.00%	0	**B TO C:**	1
				C TO A:	0.9

Notes:
[1] REPLACE EXISTING CIRCUIT BREAKER WITH NEW TO MATCH MANUFACTURER AND AIC RATING.

HHSW

480/277 Wye : Voltage — 3 : Phase — 4 : Wire Service — MLO : Mains Type (MLO or MCB)
200 A : Ampacity — : Fed From — Yes : Neutral Bus — Surface : Mounting
: AIC — No : IG Bus — No : Feed thru Lugs — : Modifications

Notes	Description	L	R	M | A | E | H | EL | EX | KE				A	B	C				M | A | E | H | EL | EX | KE	R	L	Description	Notes
							1				2	1	20	-- --			Spare	
[1]	RTU-02			M 48198	80	3	3				4	1	20	-- --			Spare	
							5				6	1	20	-- --			Spare	
							7				8	1	20	-- --			Spare	
[1]	RTU-02 HEATER			H 60000	100	3	9				10	1	20	-- --			Spare	
							11				12	1	20	-- --			Spare	
	Spare			-- --	20	1	13				14	1	20	-- --			Spare	
	Spare			-- --	20	1	15				16	1	20	-- --			Spare	
	Spare			-- --	20	1	17				18	1	20	-- --			Spare	
	Spare			-- --	20	1	19				20	1	20	-- --			Spare	
	Spare			-- --	20	1	21				22	1	20	-- --			Spare	
	Spare			-- --	20	1	23				24	1	20	-- --			Spare	
	Spare			-- --	20	1	25				26	1	20	-- --			Spare	
	Spare			-- --	20	1	27				28	1	20	-- --			Spare	
	Spare			-- --	20	1	29				30	1	20	3000 H			HEATING B115 VESTIBULE	EX
	Spare			-- --	20	1	31				32	1	20	-- --			Spare	
	Spare			-- --	20	1	33				34	1	20	-- --			Spare	
	Spare			-- --	20	1	35				36	1	20	-- --			Spare	
	Spare			-- --	20	1	37				38	1	20	-- --			Spare	
	Spare			-- --	20	1	39				40	1	20	-- --			Spare	
	Spare			-- --	20	1	41				42	1	20	-- --			Spare	

Load Type Abbreviations: A = Appliance; D = Dryer; E = Equipment; EL = Elevator;
EX = Existing; H = Heating; KE = Kitchen Equipment;
L = Lighting; M = Motor; R = Receptacle; RA = Electric Range

Phase A: 36066
Phase B: 36066
Phase C: 39066

Load Classification	Connected Load	Demand Factor	Demand Load	Panel Totals	
Lighting	0	0.00%	0	**KVA**	
Receptacle	0	0.00%	0	**Connected**	111.2
Motor	48198	125.00%	60248	**Design:**	145.4
Appliance	0	0.00%	0	**Demand:**	123.2
Equipment	0	0.00%	0	**Spare:**	22.2
Cooling	0	0.00%	0		
Heating	63000	100.00%	63000	**Amperes**	
Elevator	0	0.00%	0	**Load:**	148.2
Kitchen Equipment	0	0.00%	0	**Design:**	175
Existing Load	0	0.00%	0	**Spare:**	26.8
Electric Clothes Dryer	0	0.00%	0		
Electric Range Small	0	0.00%	0	**Phase Balance**	
Electric Range Large	0	0.00%	0	**A TO B:**	1
HVAC	0	0.00%	0	**B TO C:**	0.9
				C TO A:	0.9

Notes:
[1] REPLACE EXISTING CIRCUIT BREAKER WITH NEW TO MATCH EXISTING MANUFACTURER AND AIC RATING.

HANE2	HASE	HB
HHC	HHD	HHSW

hord | coplan | macht
1331 Nineteenth Street
Denver, CO. 80202
P 303.607.0977
www.hcm2.com

CONSULTANT:
MKK
CONSULTING ENGINEERS, INC.
7600 E. Orchard Rd
Suite 250-S
Greenwood Village, CO 80111
p: 303.796.6000
f:303.796.6099

COLORADO LICENSED PROFESSIONAL ENGINEER 39569 3/30/18

PROJECT:
MIDDLE SCHOOL MECHANICAL UPGRADES
39610 Amethyst Drive
Steamboat Springs, CO 80487

OWNER:
Steamboat Springs School District Re-2
325 7th Street
Steamboat Springs, CO 80487

ISSUE:
03/30/18 Issue for Bidding & Construction

DRAWING INFORMATION:

PROJECT NO:	11784.000
DRAWN BY:	Author
CHECKED BY:	Checker
APPROVED BY:	Approver

SHEET TITLE:
PANELBOARD SCHEDULES

E-601
SHEET OF

11784.000 MIDDLE SCHOOL MECHANICAL UPGRADES
3/30/2018 9:51:29 AM

LANE2

120/208 Wye	: Voltage	3	: Phase	4	: Wire Service
200 A	: Ampacity		: Fed From	Yes	: Neutral Bus
	: AIC	No	: IG Bus	No	: Feed thru Lugs

MCB : Mains Type (MLO or MCB)
Surface : Mounting
: Modifications

Notes	Description	L	R	M|A|E|H|C|EL|EX|KE				A	B	C				M|A|E|H|C|EL|EX|KE	R	L	Description	Notes
							1				2							
	OVEN 1			-- --	20	3	3				4	3	40	-- --			OVEN 2	
							5				6							
	SODA REF.			-- --	20	1	7				8	1	20	-- --			KITCHEN OUTLET	
	REFRIGERATOR			-- --	20	1	9				10	1	20	-- --			ICE MACHINE	
	FREEZER			-- --	20	1	11				12	1	20	-- --			EAST SOFFIT RECPT 7 ICE CREAM...	
	EXHAUST FAN			-- --	20	1	13				14	1	20	-- --			MIDDLE SOFFIT RECPT	
	KITCHEN APPLIANCE OUTLET			-- --	20	1	15				16	1	20	-- --			WEST SOFFIT RECPT	
	KITCHEN APPLIANCE OUTLET			-- --	20	1	17				18	1	20	-- --			SIGN EAST EXIT	
	Spare			-- --	30	2	19				20	1	20	-- --			Spare	
							21				22	1	20	-- --			Spare	
	DISHWASHER			-- --	60	2	23				24	--	--	-- --			Space	--
							25				26							
	DISHWASHER CONTROLS			-- --	20	2	27				28	3	20	-- --			GRILL TOP	
							29				30							
--	Space			-- --	--	--	31				32	--	--	-- --			Space	--
--	Space			-- --	--	--	33				34	--	--	-- --			Space	--
--	Space			-- --	--	--	35				36	--	--	-- --			Space	--
[1]	FUTURE KITCHEN VESTIBULE HTR			M 500	20	1	37				38	--	--	-- --			Space	--
[1]	FUTURE EAST VESTIBULE HTR			M 500	20	1	39				40	1	20	500 E			VAV CONTROLS	[1]
[1]	RTU-03 120V			E 500	20	1	41				42	1	20	500 E			RTU-01 RECEPT	[1]

Load Type Abbreviations: A = Appliance; C = Cooling; D = Dryer; E = Equipment; EL = Elevator;
EX = Existing; H = Heating; KE = Kitchen Equipment;
L = Lighting; M = Motor; R = Receptacle; RA = Electric Range

Phase A: 500
Phase B: 1000
Phase C: 1000

ZE

Load Classification	Connected Load	Demand Factor	Demand Load
Lighting	0	0.00%	0
Receptacle	0	0.00%	0
Motor	1000	112.50%	1125
Appliance	0	0.00%	0
Equipment	1500	100.00%	1500
Cooling	0	0.00%	0
Heating	0	0.00%	0
Elevator	0	0.00%	0
Kitchen Equipment	0	0.00%	0
Existing Load	0	0.00%	0
Electric Clothes Dryer	0	0.00%	0
Electric Range Small	0	0.00%	0
Electric Range Large	0	0.00%	0

Panel Totals	
KVA	
Connected	2.5
Design:	72
Demand:	2.6
Spare:	69.4
Amperes	
Load:	7.3
Design:	200
Spare:	192.7
Phase Balance	
A TO B:	0.5
B TO C:	1
C TO A:	0.5

Notes:
[1] PROVIDE NEW CIRCUIT BREAKER IN EXISTING SPACE TO MATCH MANUFACTURER AND AIC RATING.

LASE

120/208 Wye	: Voltage	3	: Phase	4	: Wire Service
	: Ampacity		: Fed From	Yes	: Neutral Bus
	: AIC	No	: IG Bus	No	: Feed thru Lugs

MCB : Mains Type (MLO or MCB)
Surface : Mounting
: Modifications

Notes	Description	L	R	M|A|E|H|C|EL|EX|KE				A	B	C				M|A|E|H|C|EL|EX|KE	R	L	Description	Notes
	Spare			-- --	20	1	1				2	1	20	-- --			TECH RM DED RECEPTACLE	
	Spare			-- --	20	1	3				4	1	20	-- --			TECH RM RECEPTACELS	
	Spare			-- --	20	1	5				6	1	20	-- --			MEDIA SOUTH POLES	
[1]	RECEPTACLES-OFFICE 131		540	0	20	1	7				8	1	20	500 E			VAV CONTROLS	[1]
[1]	RECEPTACLES-CONF 132 OFFICE 133		900	0	20	1	9				10	1	20	0	900		RECEPTACLES-MENTOR 134, THERAP...	[1]
	Spare			-- --	20	1	11				12	1	20	0	900		RECEPTACLES-OFFICE 136, STG 137	[1]
	Spare			-- --	20	1	13				14	1	20	-- --			DEDICATED POST RECEPTACLE COMP	
	MOTOR			100	20	1	15				16	1	20	-- --			LIBRARY EAST WALL RECEPT	
[1]	RECEPTACLE ON ROOF AT CU-1		180	0	20	1	17				18	1	20	-- --			LIBRARY POST RECEPTACLES COMP	
[1]	RECEPTACLES-CR 129		900	E 300	20	1	19				20	1	20	-- --			BATTERY BACK-UP	
	Spare			-- --	20	1	21				22	1	20	-- --			BATTERY BACK-UP	
[1]	RECEPTACLES-CR 130		900	E 300	20	1	23				24	1	20	-- --			DEDICATED POST RECEPTACLE	
[1]	RECEPTACLES-CR 127		900	E 300	20	1	25				26	1	20	-- --			DEDICATED POST RECEPTACLE	
	RR HAND DRYER			-- --	20	1	27				28	1	20	-- --			Spare	
[1]	RECEPTACLES-CR 128		900	E 300	20	1	29				30	1	20	-- --			POST RECEPTACLE COMP	
	RECEPTACLE RM 119			-- --	20	1	31				32	1	20	-- --			TIMECLOCK	
	RM 119 PLUG MOLD			-- --	20	1	33				34	1	20	-- --			POST RECEPTACLE COMP	
	RECEPTACLES RM 119/HALL			-- --	20	1	35				36	1	20	-- --			RECEPTACLES RM 113 EAST WALL	
							37				38	1	20	-- --			RECEPTACLES 115/116	
	PANEL LASE-B			-- --	20	3	39				40	2	20	-- --			TELECOM RM FAN	
							41				42							

Load Type Abbreviations: A = Appliance; C = Cooling; D = Dryer; E = Equipment; EL = Elevator;
EX = Existing; H = Heating; KE = Kitchen Equipment;
L = Lighting; M = Motor; R = Receptacle; RA = Electric Range

Phase A: 3440
Phase B: 1900
Phase C: 3480

Load Classification	Connected Load	Demand Factor	Demand Load
Lighting	0	0.00%	0
Receptacle	7020	100.00%	7020
Motor	100	125.00%	125
Appliance	0	0.00%	0
Equipment	1700	100.00%	1700
Cooling	0	0.00%	0
Heating	0	0.00%	0
Elevator	0	0.00%	0
Kitchen Equipment	0	0.00%	0
Existing Load	0	0.00%	0
Electric Clothes Dryer	0	0.00%	0
Electric Range Small	0	0.00%	0
Electric Range Large	0	0.00%	0

Panel Totals	
KVA	
Connected	8.8
Design:	36
Demand:	8.8
Spare:	27.2
Amperes	
Load:	24.6
Design:	100
Spare:	75.4
Phase Balance	
A TO B:	0.55
B TO C:	0.5
C TO A:	1

Notes:
[1] EXISTING CIRCUIT BREAKER, REVISED LOAD.

LBSW-2

120/208 Wye	: Voltage	3	: Phase	4	: Wire Service
100 A	: Ampacity		: Fed From	Yes	: Neutral Bus
	: AIC	No	: IG Bus	No	: Feed thru Lugs

MCB : Mains Type (MLO or MCB)
Surface : Mounting
: Modifications

Notes	Description	L	R	M|A|E|H|C|EL|EX|KE				A	B	C				M|A|E|H|C|EL|EX|KE	R	L	Description	Notes
	EXISTING			-- --	20	1	1				2	1	20	-- --			EXISTING	
	EXISTING			-- --	20	1	3				4	1	20	-- --			EXISTING	
[1]	RTU-02 120V			E 500	20	1	5				6	1	20	500 E			VAV CONTROLS	[1]
[1]	RTU-04 120V			E 500	20	1	7				8	1	20	500 E			VAV CONTROLS	[1]
[1]	CHILLER, ACC-1 CONTROLS		180	E 500	20	1	9				10	1	20	500 M			FUTURE CABINET HEATER IN WEST...	[1]
[1]	CHILLER, ACC-1 RECEPT & MISC			E 500	20	1	11				12	1	20	500 E			CARBON MONOXIDE DETECTION PANEL	[1]
[1]	CHILLER, ACC-1 HEATER			H 1800	20	1	13				14	1	20	-- --			Spare	
	Spare			-- --	20	1	15				16	1	20	-- --			Spare	
	Spare			-- --	20	1	17				18	1	20	-- --			Spare	
	Spare			-- --	20	1	19				20	1	20	-- --			Spare	
	Spare			-- --	20	1	21				22	1	20	-- --			Spare	
	SOLAR BACK-FEED			-- --	20	2	23				24	--	--	-- --			Space	--
							25				26	--	--	-- --			Space	--
--	Space			-- --	--	--	27				28	--	--	-- --			Space	--
--	Space			-- --	--	--	29				30	--	--	-- --			Space	--
--	Space			-- --	--	--	31				32	--	--	-- --			Space	--
--	Space			-- --	--	--	33				34	--	--	-- --			Space	--
--	Space			-- --	--	--	35				36	--	--	-- --			Space	--
--	Space			-- --	--	--	37				38	--	--	-- --			Space	--
--	Space			-- --	--	--	39				40	--	--	-- --			Space	--
--	Space			-- --	--	--	41				42	--	--	-- --			Space	--

Load Type Abbreviations: A = Appliance; C = Cooling; D = Dryer; E = Equipment; EL = Elevator;
EX = Existing; H = Heating; KE = Kitchen Equipment;
L = Lighting; M = Motor; R = Receptacle; RA = Electric Range

Phase A: 2800
Phase B: 1180
Phase C: 2000

Load Classification	Connected Load	Demand Factor	Demand Load
Lighting	0	0.00%	0
Receptacle	180	100.00%	180
Motor	500	125.00%	625
Appliance	0	0.00%	0
Equipment	3500	100.00%	3500
Cooling	0	0.00%	0
Heating	1800	100.00%	1800
Elevator	0	0.00%	0
Kitchen Equipment	0	0.00%	0
Existing Load	0	0.00%	0
Electric Clothes Dryer	0	0.00%	0
Electric Range Small	0	0.00%	0
Electric Range Large	0	0.00%	0

Panel Totals	
KVA	
Connected	6
Design:	36
Demand:	6.1
Spare:	29.9
Amperes	
Load:	16.9
Design:	100
Spare:	83.1
Phase Balance	
A TO B:	0.42
B TO C:	0.6
C TO A:	0.7

Notes:
[1] PROVIDE NEW CIRCUIT BREAKER IN EXISTING SPACE TO MATCH MANUFACTURER AND AIC RATING.

RA

120/208 Wye	: Voltage	3	: Phase	4	: Wire Service
150 A	: Ampacity		: Fed From	Yes	: Neutral Bus
	: AIC	No	: IG Bus	No	: Feed thru Lugs

MCB : Mains Type (MLO or MCB)
Surface : Mounting
: Modifications

Notes	Description	L	R	M|A|E|H|C|EL|EX|KE				A	B	C				M|A|E|H|C|EL|EX|KE	R	L	Description	Notes
	EXISTING			-- --	20	1	1				2	1	20	-- --			EXISTING	
	EXISTING			-- --	20	1	3				4	1	20	-- --			EXISTING	
	EXISTING			-- --	20	1	5				6	1	20	-- --			EXISTING	
	EXISTING			-- --	20	1	7				8	1	20	-- --			EXISTING	
	EXISTING			-- --	20	1	9				10	1	20	-- --			EXISTING	
	EXISTING			-- --	20	1	11				12	1	20	-- --			EXISTING	
	EXISTING			-- --	20	1	13				14	1	20	-- --			EXISTING	
	EXISTING			-- --	20	1	15				16	1	20	-- --			EXISTING	
	EXISTING			-- --	20	1	17				18	1	20	-- --			EXISTING	
	EXISTING			-- --	20	1	19				20	1	20	-- --			EXISTING	
	EXISTING			-- --	20	1	21				22	1	20	-- --			EXISTING	
	EXISTING			-- --	20	1	23				24	1	20	-- --			EXISTING	
	EXISTING			-- --	20	1	25				26	1	20	-- --			EXISTING	
	EXISTING			-- --	20	1	27				28	1	20	-- --			EXISTING	
	EXISTING			-- --	20	1	29				30	1	20	-- --			EXISTING	
	EXISTING			-- --	20	1	31				32	1	20	-- --			EXISTING	
	EXISTING			-- --	20	1	33				34	1	20	-- --			EXISTING	
	EXISTING			-- --	20	1	35				36	1	20	-- --			EXISTING	
	EXISTING			-- --	20	1	37				38	1	20	-- --			EXISTING	
	EXISTING			-- --	20	1	39				40	1	20	-- --			EXISTING	
	EXISTING			-- --	20	1	41				42	1	20	-- --			EXISTING	
	EXISTING			-- --	20	1	43				44	--	--	-- --			Space	--
	EXISTING			-- --	20	1	45				46	--	--	-- --			Space	--
--	Space			-- --	--	--	47				48	--	--	-- --			Space	--
--	Space			-- --	--	--	49				50	--	--	-- --			Space	--
--	Space			-- --	--	--	51				52	--	--	-- --			Space	--
[1]	BOILER, B-1			E 1920	20	1	53				54	--	--	-- --			Space	--
[1]	BOILER, B-2			E 1920	20	1	55				56	1	20	1000 E			TCP, MECHANICAL CONTROLS	[1]
[1]	GLYCOL FEEDER, GF-1			M 830	20	1	57				58	1	20	1000 E			TCP, MECHANICAL CONTROLS	[1]
[1]	FAN COIL, FCU-2			M 1130	20	1	59				60	1	20	1000 E			TCP, MECHANICAL CONTROLS	[1]

Load Type Abbreviations: A = Appliance; C = Cooling; D = Dryer; E = Equipment; EL = Elevator;
EX = Existing; H = Heating; KE = Kitchen Equipment;
L = Lighting; M = Motor; R = Receptacle; RA = Electric Range

Phase A: 2920
Phase B: 1830
Phase C: 4050

Load Classification	Connected Load	Demand Factor	Demand Load
Lighting	0	0.00%	0
Receptacle	0	0.00%	0
Motor	1130	125.00%	1413
Appliance	0	0.00%	0
Equipment	7670	100.00%	7670
Cooling	0	0.00%	0
Heating	0	0.00%	0
Elevator	0	0.00%	0
Kitchen Equipment	0	0.00%	0
Existing Load	0	0.00%	0
Electric Clothes Dryer	0	0.00%	0
Electric Range Small	0	0.00%	0
Electric Range Large	0	0.00%	0

Panel Totals	
KVA	
Connected	8.8
Design:	45
Demand:	9.1
Spare:	35.9
Amperes	
Load:	25.2
Design:	125
Spare:	99.8
Phase Balance	
A TO B:	0.63
B TO C:	0.5
C TO A:	0.7

Notes:
[1] PROVIDE NEW CIRCUIT BREAKER IN EXISTING SPACE TO MATCH MANUFACTURER AND AIC RATING.

LCSE2

120/208 Wye	: Voltage	3	: Phase	4	: Wire Service
100 A	: Ampacity		: Fed From	Yes	: Neutral Bus
10,000	: AIC	No	: IG Bus	No	: Feed thru Lugs

MCB : Mains Type (MLO or MCB)
Surface : Mounting
: Modifications

Notes	Description	L	R	M|A|E|H|C|EL|EX|KE				A	B	C				M|A|E|H|C|EL|EX|KE	R	L	Description	Notes
	RTU-03 RECEPTACLE			E 500	20	1	1				2	1	20	1130 M			EXHAUST FAN, EF-07	
	VAV CONTROLS			E 500	20	1	3				4	1	20	670 M			EXHAUST FAN, EF-08	
	VAV CONTROLS			E 500	20	1	5				6	1	20	1130 M			EXHAUST FAN, EF-09	
	FUTURE VESTIBULE CABINET...			M 500	20	1	7				8	1	20	-- --			Spare	
	FUTURE VESTIBULE CABINET...			M 500	20	1	9				10	1	20	-- --			Spare	
	Spare			-- --	20	1	11				12	1	20	-- --			Spare	
	Spare			-- --	20	1	13				14	1	20	-- --			Spare	
	Spare			-- --	20	1	15				16	1	20	-- --			Spare	
	Spare			-- --	20	1	17				18	1	20	-- --			Spare	
--	Space			-- --	--	--	19				20	--	--	-- --			Space	--
--	Space			-- --	--	--	21				22	--	--	-- --			Space	--
--	Space			-- --	--	--	23				24	--	--	-- --			Space	--
--	Space			-- --	--	--	25				26	--	--	-- --			Space	--
--	Space			-- --	--	--	27				28	--	--	-- --			Space	--
--	Space			-- --	--	--	29				30	--	--	-- --			Space	--
--	Space			-- --	--	--	31				32	--	--	-- --			Space	--
--	Space			-- --	--	--	33				34	--	--	-- --			Space	--
--	Space			-- --	--	--	35				36	--	--	-- --			Space	--
--	Space			-- --	--	--	37				38	--	--	-- --			Space	--
--	Space			-- --	--	--	39				40	--	--	-- --			Space	--
--	Space			-- --	--	--	41				42	--	--	-- --			Space	--

Load Type Abbreviations: A = Appliance; C = Cooling; D = Dryer; E = Equipment; EL = Elevator;
EX = Existing; H = Heating; KE = Kitchen Equipment;
L = Lighting; M = Motor; R = Receptacle; RA = Electric Range

Phase A: 2130
Phase B: 1670
Phase C: 1630

Load Classification	Connected Load	Demand Factor	Demand Load
Lighting	0	0.00%	0
Receptacle	0	0.00%	0
Motor	3930	107.19%	4213
Appliance	0	0.00%	0
Equipment	1500	100.00%	1500
Cooling	0	0.00%	0
Heating	0	0.00%	0
Elevator	0	0.00%	0
Kitchen Equipment	0	0.00%	0
Existing Load	0	0.00%	0
Electric Clothes Dryer	0	0.00%	0
Electric Range Small	0	0.00%	0
Electric Range Large	0	0.00%	0

Panel Totals	
KVA	
Connected	5.4
Design:	36
Demand:	5.7
Spare:	30.3
Amperes	
Load:	15.9
Design:	100
Spare:	84.1
Phase Balance	
A TO B:	0.78
B TO C:	1
C TO A:	0.8

Notes:

LDSW2

120/208 Wye	: Voltage	3	: Phase	4	: Wire Service
100 A	: Ampacity		: Fed From	Yes	: Neutral Bus
10,000	: AIC	No	: IG Bus	No	: Feed thru Lugs

MCB : Mains Type (MLO or MCB)
Surface : Mounting
: Modifications

Notes	Description	L	R	M|A|E|H|C|EL|EX|KE				A	B	C				M|A|E|H|C|EL|EX|KE	R	L	Description	Notes
	RTU-05 120V			E 500	20	1	1				2	1	20	1130 M			EXHAUST FAN, EF-10	
	VAV CONTROLS			E 500	20	1	3				4	1	20	670 M			EXHAUST FAN, EF-11	
	VAV CONTROLS			E 500	20	1	5				6	1	20	1130 M			EXHAUST FAN, EF-12	
	FUTURE HEATER IN VESTIBULE			M 500	20	1	7				8	1	20	-- --			Spare	
	Spare			-- --	20	1	9				10	1	20	-- --			Spare	
	Spare			-- --	20	1	11				12	1	20	-- --			Spare	
	Spare			-- --	20	1	13				14	1	20	-- --			Spare	
	Spare			-- --	20	1	15				16	1	20	-- --			Spare	
	Spare			-- --	20	1	17				18	1	20	-- --			Spare	
	Spare			-- --	20	1	19				20	1	20	-- --			Spare	
--	Space			-- --	--	--	21				22	--	--	-- --			Space	--
--	Space			-- --	--	--	23				24	--	--	-- --			Space	--
--	Space			-- --	--	--	25				26	--	--	-- --			Space	--
--	Space			-- --	--	--	27				28	--	--	-- --			Space	--
--	Space			-- --	--	--	29				30	--	--	-- --			Space	--
--	Space			-- --	--	--	31				32	--	--	-- --			Space	--
--	Space			-- --	--	--	33				34	--	--	-- --			Space	--
--	Space			-- --	--	--	35				36	--	--	-- --			Space	--
--	Space			-- --	--	--	37				38	--	--	-- --			Space	--
--	Space			-- --	--	--	39				40	--	--	-- --			Space	--
--	Space			-- --	--	--	41				42	--	--	-- --			Space	--

Load Type Abbreviations: A = Appliance; C = Cooling; D = Dryer; E = Equipment; EL = Elevator;
EX = Existing; H = Heating; KE = Kitchen Equipment;
L = Lighting; M = Motor; R = Receptacle; RA = Electric Range

Phase A: 2130
Phase B: 1170
Phase C: 1630

Load Classification	Connected Load	Demand Factor	Demand Load
Lighting	0	0.00%	0
Receptacle	0	0.00%	0
Motor	3430	108.24%	3713
Appliance	0	0.00%	0
Equipment	1500	100.00%	1500
Cooling	0	0.00%	0
Heating	0	0.00%	0
Elevator	0	0.00%	0
Kitchen Equipment	0	0.00%	0
Existing Load	0	0.00%	0
Electric Clothes Dryer	0	0.00%	0
Electric Range Small	0	0.00%	0
Electric Range Large	0	0.00%	0

Panel Totals	
KVA	
Connected	4.9
Design:	36
Demand:	5.2
Spare:	30.8
Amperes	
Load:	14.5
Design:	100
Spare:	85.5
Phase Balance	
A TO B:	0.55
B TO C:	0.7
C TO A:	0.8

Notes:

LANE2	LASE	LBSW-2
LCSE2 (NEW)	LDSW2 (NEW)	RA

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PROFESSIONAL ENGINEER

PROJECT:
MIDDLE SCHOOL MECHANICAL UPGRADES
39610 Amethyst Drive
Steamboat Springs, CO 80487

OWNER:
Steamboat Springs School District Re-2
325 7th Street
Steamboat Springs, CO 80487

ISSUE:
03/30/18 Issue for Bidding & Construction

DRAWING INFORMATION:	
PROJECT NO:	11784.000
DRAWN BY:	CW
CHECKED BY:	SJB
APPROVED BY:	MRZ

SHEET TITLE:
PANELBOARD SCHEDULES

E-602
SHEET OF

11784.000 MIDDLE SCHOOL MECHANICAL UPGRADES
3/30/2018 9:51:31 AM

EXISTING TECHNOLOGY SYSTEMS LEGEND

EXISTING SYSTEMS LEGEND

SYMBOL	DESCRIPTION	NOTES
WALL MOUNTED DEVICES		
#	EXISTING DATA/VOICE OUTLET	#D/#V INDICATES NUMBER OF EXISTING DATA AND VOICE CABLES IN THE FACEPLATE. REFER TO NOTES ON DRAWINGS FOR MORE INFORMATION.
	EXISTING DATA OUTLET - TYPICAL	# NEXT TO SYMBOL INDICATES QUANTITY OF EXISTING CABLES OTHER THAN TYPICAL. REFER TO NOTES ON DRAWINGS FOR MORE INFORMATION.
AC	EXISTING DATA OUTLET ABOVE COUNTER	# NEXT TO SYMBOL INDICATES QUANTITY OF EXISTING CABLES OTHER THAN TYPICAL. REFER TO NOTES ON DRAWINGS FOR MORE INFORMATION.
TV	EXISTING TELEVISION OUTLET	(1) EXISTING COAX CABLE AND FACEPLATE TO BE DEMOLISHED. REFER TO NOTES ON DRAWINGS FOR MORE INFORMATION.
W	EXISTING WALL PHONE OUTLET	EXISTING WALL PHONE CABLE AND FACEPLATE TO BE DEMOLISHED. REMOVE PHONE AND RETURN TO OWNER. REFER TO NOTES ON DRAWINGS FOR MORE INFORMATION.
AV	EXISTING AUDIO VISUAL INPUT	EXISTING AV INPUT (VGA/AUDIO OR RCA). REFER TO DRAWINGS FOR MORE INFORMATION.
SMART BOARD	EXISTING SMART BOARD	REFER TO NOTES ON DRAWINGS FOR MORE INFORMATION.
	EXISTING WALL MOUNTED DISPLAY	REFER TO NOTES ON DRAWINGS FOR MORE INFORMATION.
S	EXISTING WALL MOUNTED SPEAKER	EXISTING WALL MOUNTED SPEAKER. REFER TO NOTES ON DRAWINGS FOR MORE INFORMATION.
CEILING/ABOVE CEILING MOUNTED DEVICES		
	EXISTING WIRELESS ACCESS POINT OUTLET	(2) EXISTING CABLES FOR EACH ACCESS POINT TO REMAIN. WIRELESS ACCESS POINT TO REMAIN. REFER TO NOTES ON DRAWINGS FOR MORE INFORMATION.
	EXISTING SECURITY CAMERA AND DATA OUTLET	(1) EXISTING CABLE FOR EACH CAMERA TO REMAIN. SECURITY CAMERA TO REMAIN. REFER TO NOTES ON DRAWINGS FOR MORE INFORMATION.
	EXISTING PULL DOWN MANUAL PROJECTION SCREEN	EXISTING PROJECTION SCREEN TO REMAIN. PROTECT OR REMOVE AND REINSTALL IF IN THE WAY OF CEILING DEMO WORK. REFER TO NOTES ON DRAWINGS FOR MORE INFORMATION.
	EXISTING CEILING POLE MOUNTED PROJECTOR	EXISTING PROJECTOR TO REMAIN. PROJECTOR PROJECTS ONTO WHITEBOARD, SMARTBOARD OR ONTO THE WALL UNLESS A MANUAL PULL DOWN SCREEN IS SHOWN ON THE DRAWINGS. PROTECT OR REMOVE AND REINSTALL IF IN THE WAY OF CEILING DEMO WORK. REFER TO NOTES ON DRAWINGS FOR MORE INFORMATION.
S	EXISTING CEILING SPEAKER	EXISTING CEILING SPEAKER TO REMAIN. REFER TO NOTES ON DRAWINGS FOR MORE INFORMATION.
	EXISTING DROP TILE OVERHEAD PAGING SYSTEM SPEAKER	EXISTING PAGING SPEAKER TO REMAIN. REFER TO NOTES ON DRAWINGS FOR MORE INFORMATION.
	EXISTING HARD-LID OVERHEAD PAGING SYSTEM SPEAKER	EXISTING PAGING SPEAKER TO REMAIN. REFER TO NOTES ON DRAWINGS FOR MORE INFORMATION.
	EXISTING WALL MOUNTED OVERHEAD PAGING SYSTEM SPEAKER	EXISTING PAGING SPEAKER. PAGING SPEAKER LOCATED IN WALL MOUNT ENCLOSURE WITH CLOCK. REFER TO NOTES ON DRAWINGS FOR MORE INFORMATION.
C	EXISTING WIRELESS CLOCK	EXISTING CLOCK TO REMAIN. PROTECT OR REMOVE AND REINSTALL. CLOCK LOCATED IN WALL MOUNT ENCLOSURE WITH PAGING SPEAKER. REFER TO NOTES ON DRAWINGS FOR MORE INFORMATION.

NEW WORK TECHNOLOGY SYSTEMS LEGEND

NEW WORK - STRUCTURED CABLING LEGEND

				BY CABLING CONTRACTOR				ROUGH-IN AND SUPPORT BY ELECTRICAL CONTRACTOR							
SYMBOL	DESCRIPTION	DETAIL	MOUNTING HEIGHT ABOVE FINISHED FLOOR, UNLESS NOTED OTHERWISE ON PLANS	# OF UTP CABLES	# OF UTP JACKS	# OF FACEPLATE OPENINGS	NOTES	PROVIDE 1-GANG BACKBOX	PROVIDE 2-GANG BACKBOX	PROVIDE 3-GANG BACKBOX	PROVIDE 1-GANG PLASTER RING	PROVIDE 2-GANG PLASTER RING	PROVIDE 3-GANG PLASTER RING	PROVIDE CONDUIT	NOTES
WALL MOUNTED DEVICES															
	DATA OUTLET - TYPICAL	--	+18"	(2)	(2)	(4)	# NEXT TO SYMBOL INDICATES QUANTITY OF CABLES OTHER THAN TYPICAL.	--	✓	--	✓	--	--	(1) 1"	PROVIDE CONDUIT FROM BOX UP INTO CLOSEST ACCESSIBLE CEILING SPACE AND CAP WITH NYLON BUSHING. PROVIDE PULL STRING.
AC	DATA OUTLET ABOVE COUNTER	--	ABOVE COUNTER	(2)	(2)	(4)	# NEXT TO SYMBOL INDICATES QUANTITY OF CABLES OTHER THAN TYPICAL.	--	✓	--	✓	--	--	(1) 1"	PROVIDE CONDUIT FROM BOX UP INTO CLOSEST ACCESSIBLE CEILING SPACE AND CAP WITH NYLON BUSHING. PROVIDE PULL STRING.
CEILING/ABOVE CEILING MOUNTED DEVICES															
	CABLE SUPPORT PATHWAY	--	ABOVE ACCESSIBLE CEILING	--	--	--	PROVIDE J-HOOKS AS NECESSARY FOR PROPER ROUTING OF CABLES FROM EACH DEVICE TO THE MAIN RUNS.	--	--	--	--	--	--	--	--

NEW WORK - AUDIO VISUAL LEGEND

					ROUGH-IN AND SUPPORT BY ELECTRICAL CONTRACTOR							
SYMBOL	DESCRIPTION	DETAIL	MOUNTING HEIGHT ABOVE FINISHED FLOOR, UNLESS NOTED OTHERWISE ON PLANS	NOTES	PROVIDE 1-GANG BACKBOX	PROVIDE 2-GANG BACKBOX	PROVIDE 3-GANG BACKBOX	PROVIDE 1-GANG PLASTER RING	PROVIDE 2-GANG PLASTER RING	PROVIDE 3-GANG PLASTER RING	PROVIDE CONDUIT	NOTES
WALL MOUNTED DEVICES												
AV 1	2-GANG AUDIO VISUAL ROUGH-IN BOX	--	AS NOTED ON DRAWINGS	PROVIDE FACEPLATE, CABLING AND INSTALLATION.	--	✓	--	✓	--	--	(1) 1"	PROVIDE CONDUIT FROM BOX UP INTO CLOSEST ACCESSIBLE CEILING SPACE AND CAP WITH NYLON BUSHING. PROVIDE PULL STRING.
AV 2	2-GANG AUDIO VISUAL ROUGH-IN BOX	--	AS NOTED ON DRAWINGS	PROVIDE FACEPLATE, CABLING AND INSTALLATION.	--	✓	--	--	✓	--	(1) 1"	PROVIDE CONDUIT FROM BOX UP INTO CLOSEST ACCESSIBLE CEILING SPACE AND CAP WITH NYLON BUSHING. PROVIDE PULL STRING.
SMART BOARD	NEW SMART BOARD LOCATION. +#" = MOUNTING HEIGHT TO CENTER OF DISPLAY	--	+#" AS INDICATED WITH SYMBOL	SMARTBOARD PROVIDED BY OWNER. PROVIDE CABLE CONNECTIONS FROM TEACHER PC TO SMARTBOARD.	--	--	--	--	--	--	--	PROVIDE ROUGH-IN FOR AV, DATA AND POWER AS SHOWN ON DRAWING AND DETAIL. PROVIDE WALL BACKING.

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PROJECT:
MIDDLE SCHOOL MECHANICAL UPGRADES
39610 Amethyst Drive
Steamboat Springs, CO 80487

OWNER:
Steamboat Springs School District Re-2
325 7th Street
Steamboat Springs, CO 80487

ISSUE:
2018/03/30 Issue for Bidding & Construction

DRAWING INFORMATION:	
PROJECT NO:	11784.000
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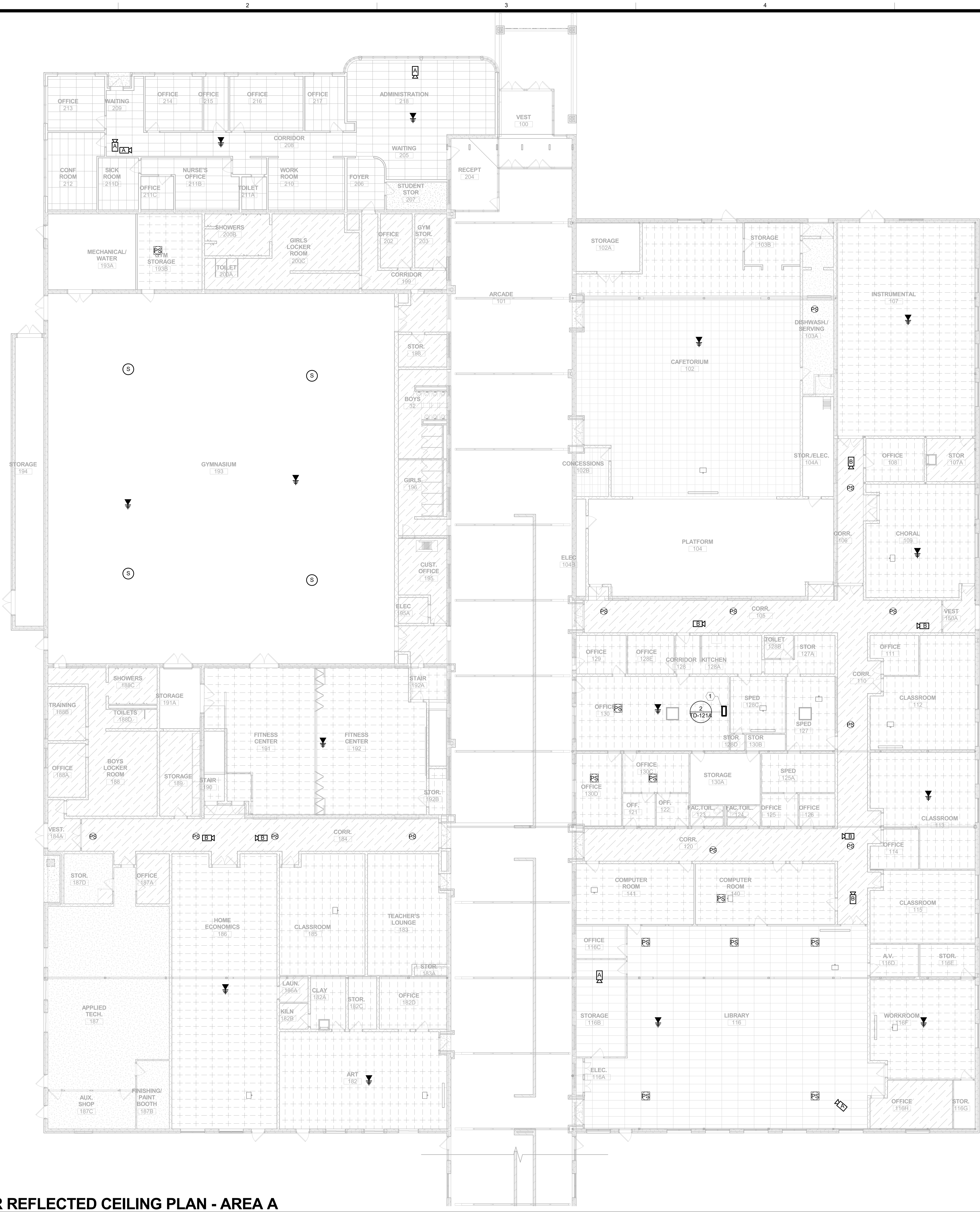
CHECKED BY:	ADP
APPROVED BY:	ADP

SHEET TITLE:
TECHNOLOGY SYSTEMS LEGEND

T-010

SHEET OF



1 FIRST FLOOR REFLECTED CEILING PLAN - AREA A

3/32" = 1'-0"

GENERAL NOTES:

1. REFER TO ARCHITECTURAL DEMOLITION DRAWINGS FOR ADDITIONAL INFORMATION.

2. REFER TO ALTERNATE PLANS FOR ADDITIONAL SCOPE INFORMATION.

3. ALL CABLING FOR WIRELESS ACCESS POINTS AND SECURITY CAMERAS IS EXISTING TO REMAIN. IN CEILINGS WHERE THERE IS RENOVATION, OWNER TO REMOVE AND SALVAGE EQUIPMENT FOR REINSTALL. SHOULD REMOVAL NOT BE NECESSARY, COVER AND PROTECT ELEMENTS DURING CONSTRUCTION.

4. ALL CABLING FOR OVERHEAD PAGING SYSTEM SPEAKERS IN HALLWAYS, GYMNASIUM AND LIBRARY IS EXISTING TO REMAIN. PROTECT SPEAKER AND CABLING DURING DEMOLITION. IF GRID IS REMOVED, SUSPEND SPEAKER IN PLACE VIA ALTERNATE METHODS.

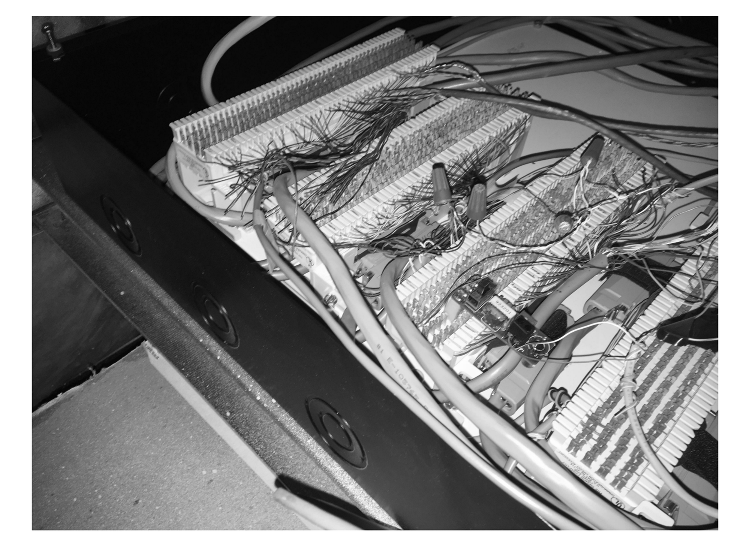
5. CONSOLIDATE AND APPROPRIATELY MANAGE ANY DATA CABLING IN CEILING SPACE. ROUTE CABLING IN ROOM TO A CONSOLIDATED MAIN PATHWAY IN THE CORRIDOR BACK TO CORRESPONDING IDF/MDF LOCATION. PROVIDE NEW J-HOOKS TO SUPPORT CABLING SO IT DOES NOT TOUCH THE GRID, PIPING, DUCTWORK OR OTHER ITEMS ABOVE THE CEILING. BUNDLE AND VELCRO CABLING TOGETHER FOR NEAT ROUTING ABOVE THE CEILING.

6. PROTECT OVERHEAD PAGING SYSTEM HEADEND DURING DEMOLTION SHOWN IN DETAIL 2 ON THIS SHEET. THIS IS THE HEADEND SERVING THE REMAINING ANALOG SPEAKERS IN THE BUILDING.

7. PROTECT ANY AUDIO VISUAL CEILING MOUNTED EQUIPMENT DURING DEMOLITION (PULL DOWN MANUAL PROJECTOR SCREENS, CEILING MOUNTED PROJECTORS, ETC.) AS THEY ARE EXISTING TO REMAIN. IF THE DEVICE IS IN THE WAY OF DEMOLITION, COORDINATE WITH OWNER TO REMOVE AND REINSTALL EQUIPMENT.

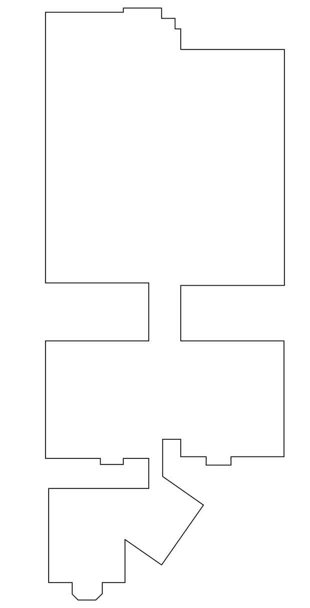
KEYED NOTES:

1 OVERHEAD PAGING SYSTEM HEADEND LOCATION. JUNCTION BOX IS LOCATED ABOVE CEILING. PROTECT BOX, EQUIPMENT AND CABLE TERMINATIONS DURING DEMOLITION.



2 OFFICE 130 PAGING HEADEND

3/16" = 1'-0"



AREA PLAN

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PROJECT:

MIDDLE SCHOOL MECHANICAL UPGRADES

39610 Amethyst Drive
Steamboat Springs, CO 80487

OWNER:

Steamboat Springs School District Re-2

325 7th Street
Steamboat Springs, CO 80487

ISSUE:

2018/03/30 Issue for Bidding & Construction

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SHEET TITLE:

FIRST FLOOR REFLECTED CEILING DEMO PLAN - AREA A

TD-121A

SHEET OF

1 **FIRST FLOOR REFLECTED CEILING PLAN - AREA B**
3/32" = 1'-0"

GENERAL NOTES:

1. REFER TO ARCHITECTURAL DEMOLITION DRAWINGS FOR ADDITIONAL INFORMATION.

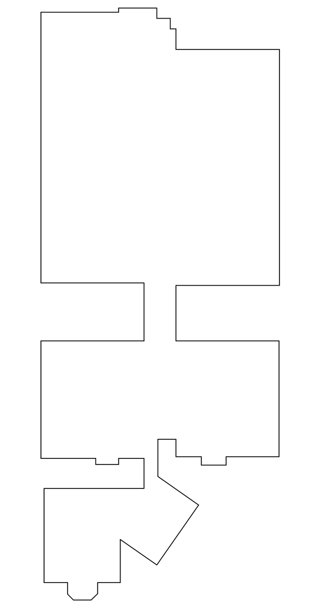
2. REFER TO ALTERNATE PLANS FOR ADDITIONAL SCOPE INFORMATION.

3. ALL CABLING FOR WIRELESS ACCESS POINTS AND SECURITY CAMERAS IS EXISTING TO REMAIN. IN CEILINGS WHERE THERE IS RENOVATION, OWNER TO REMOVE AND SALVAGE EQUIPMENT FOR REINSTALL. SHOULD REMOVAL NOT BE NECESSARY, COVER AND PROTECT ELEMENTS DURING CONSTRUCTION.

4. ALL CABLING FOR OVERHEAD PAGING SYSTEM SPEAKERS IN HALLWAYS, GYMNASIUM AND LIBRARY IS EXISTING TO REMAIN. PROTECT SPEAKER AND CABLING DURING DEMOLITION. IF GRID IS REMOVED, SUSPEND SPEAKER IN PLACE VIA ALTERNATE METHODS.

5. CONSOLIDATE AND APPROPRIATELY MANAGE ANY DATA CABLING IN CEILING SPACE. ROUTE CABLING IN ROOM TO A CONSOLIDATED MAIN PATHWAY IN THE CORRIDOR BACK TO CORRESPONDING IDF/MDF LOCATION. PROVIDE NEW J-HOOKS TO SUPPORT CABLING SO IT DOES NOT TOUCH THE GRID, PIPING, DUCTWORK OR OTHER ITEMS ABOVE THE CEILING. BUNDLE AND VELCRO CABLING TOGETHER FOR NEAT ROUTING ABOVE THE CEILING.

6. PROTECT ANY AUDIO VISUAL CEILING MOUNTED EQUIPMENT DURING DEMOLITION (PULL DOWN MANUAL PROJECTOR SCREENS, CEILING MOUNTED PROJECTORS, ETC.) AS THEY ARE EXISTING TO REMAIN. IF THE DEVICE IS IN THE WAY OF DEMOLITION, COORDINATE WITH OWNER TO REMOVE AND REINSTALL EQUIPMENT.



AREA PLAN

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PROJECT:
MIDDLE SCHOOL MECHANICAL UPGRADES
39610 Amethyst Drive
Steamboat Springs, CO 80487

OWNER:
Steamboat Springs School District Re-2
325 7th Street
Steamboat Springs, CO 80487

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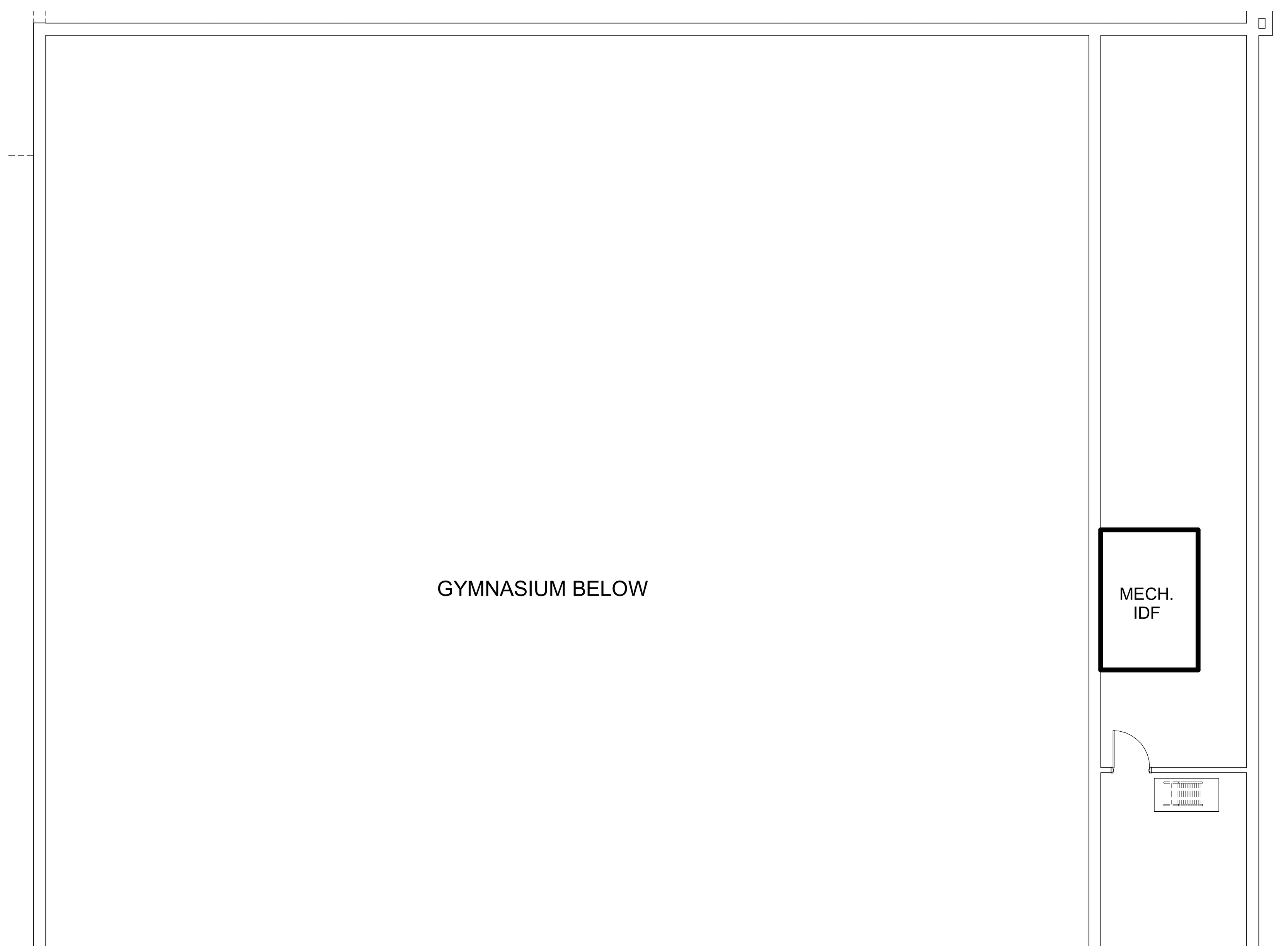
APPROVED BY:	ADP

SHEET TITLE:
FIRST FLOOR REFLECTIVE CEILING DEMO PLAN - AREA B

TD-121B
SHEET OF

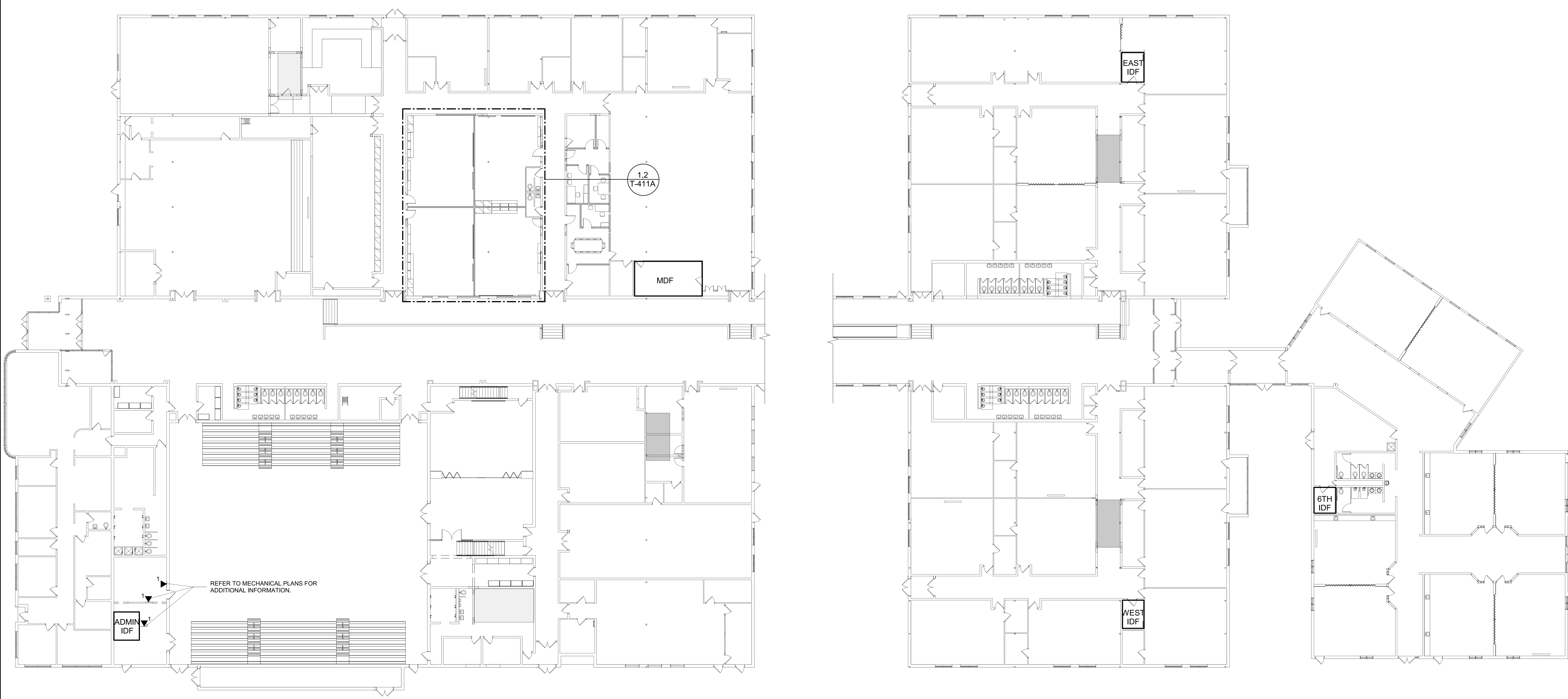
11784.000 MIDDLE SCHOOL MECHANICAL UPGRADES
3/29/2018 12:44:24 PM



2 SECOND FLOOR TELECOM PLAN
1/8" = 1'-0"

GENERAL NOTES:

1. REFER TO ARCHITECTURAL DEMOLITION DRAWINGS FOR ADDITIONAL INFORMATION.
2. REFER TO ENLARGED PLANS FOR ALTERNATES.



1 FIRST FLOOR TELECOM PLAN
1/16" = 1'-0"

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SHEET TITLE:

OVERALL TECHNOLOGY PLANS

T-111
SHEET OF

ALTERNATE #1 NEW WORK GENERAL NOTES:

1. REFER TO ARCHITECTURAL DRAWINGS FOR ADDITIONAL INFORMATION.

2. ROUTE ANY NEW CABLING SHOWN ON THIS SHEET TO MDF LOCATION. ROUTE NEW CABLING IN EXISTING CONDUIT PATHWAYS. REUSE EXISTING DATA CBALING IN ROOM WHERE POSSIBLE.

3. CONSOLIDATE AND APPROPRIATELY MANAGE ANY DATA CABLING IN CEILING SPACE. ROUTE CABLING IN ROOM TO A CONSOLIDATED MAIN PATHWAY IN THE CORRIDOR BACK TO CORRESPONDING IDF/MDF LOCATION. PROVIDE NEW J-HOOKS TO SUPPORT CABLING SO IT DOES NOT TOUCH THE GRID, PIPING, DUCTWORK OR OTHER ITEMS ABOVE THE CEILING. BUNDLE AND VELCRO CABLING TOGETHER FOR NEAT ROUTING ABOVE THE CEILING.

4. WIRELESS ACCESS POINTS SHOWN IN GRAY HAVE EXISTING CABLING TO REMAIN. OWNER TO REPLACE ALL WIRELESS ACCESS POINTS IN CEILING WHERE REMOVED DURING CONSTRUCTION.

5. WHERE WALL MOUNTED PAGING SPEAKERS WERE REMOVED, REPAIR AND PAINT WALL PER ARCHITECT'S INSTRUCTIONS.

6. OWNER TO REPLACE WALL CLOCK.

7. OWNER TO PROVIDE SMART BOARDS FOR CLASSROOMS.

ALTERNATE #1 NEW WORK KEYED NOTES:

N1 LOCATION FOR TEACHER PC. COORDINATE EXACT LOCATION WITH ARCHITECT AND MEP ENGINEER. TERMINATE EXISTING CABLE IN SURFACE MOUNT BISCUIT JACK ABOVE CEILING AND PROVIDE PATCH CORD FOR CONNECTION TO PC. INSTALL GROMMET HOLE IN SURFACE MOUNT WIREMOLD 4000 SERIES RACEWAY.

N2 EXISTING TO REMAIN.

ALTERNATE #1 DEMOLITION GENERAL NOTES:

1. REFER TO ARCHITECTURAL DEMOLITION DRAWINGS FOR ADDITIONAL INFORMATION.

2. ALL CABLING FOR WIRELESS ACCESS POINTS AND SECURITY CAMERAS IS EXISTING TO REMAIN. IN CEILINGS WHERE THERE IS RENOVATION, OWNER TO REMOVE AND SALVAGE EQUIPMENT FOR REINSTALL. SHOULD REMOVAL NOT BE NECESSARY, COVER AND PROTECT ELEMENTS DURING CONSTRUCTION.

3. REMOVE ALL EXISTING AUDIO VISUAL EQUIPMENT (SPEAKERS, TV DISPLAYS, SMART BOARDS, PROJECTORS, PULL DOWN MANUAL PROJECTION SCREENS, ETC.) AND RETURN TO OWNER. DISCONNECT AND REMOVE SYSTEM CABLING.

4. DISCONNECT AND REMOVE ALL EXISTING OVERHEAD PAGING SYSTEM SPEAKERS AND PAGING SPEAKER/CLOCK WALL ENCLOSURES. REMOVE ALL VOLUME CONTROL FACEPLATES AND DEMO CABLING. RETURN CLOCKS TO OWNER TO BE REUSED.

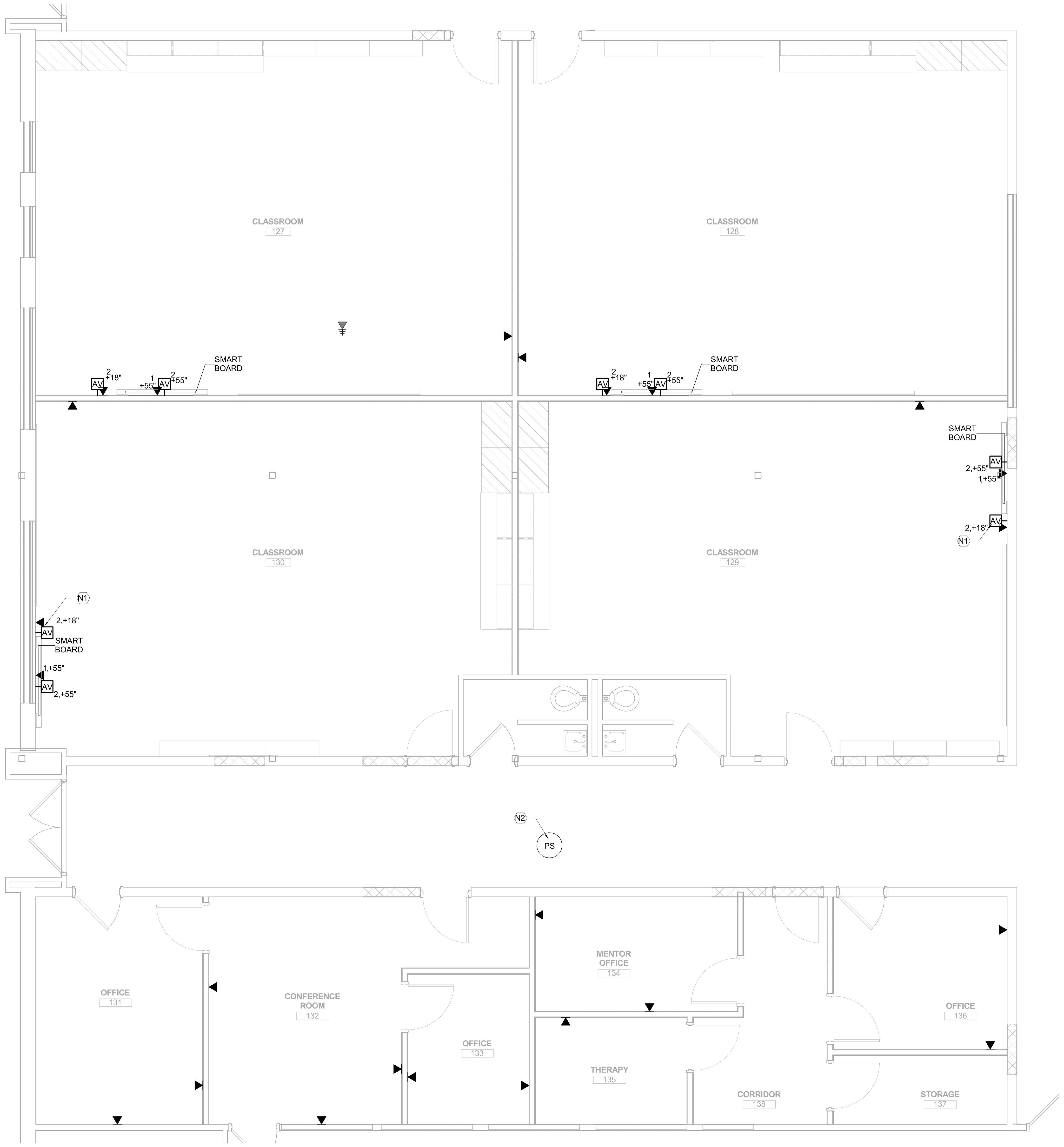
5. ALL DATA CABLING IS EXISTING TO REMAIN. IN CLASSROOMS OR WALLS TO BE DEMOLISHED, PULL UP EXISTING CABLING TO BE REUSED IN NEW LOCATION/CONFIGURAITON.

6. DISCONNECT AND REMOVE ANY UNUSED COAX CABLING AND FACEPLATES.

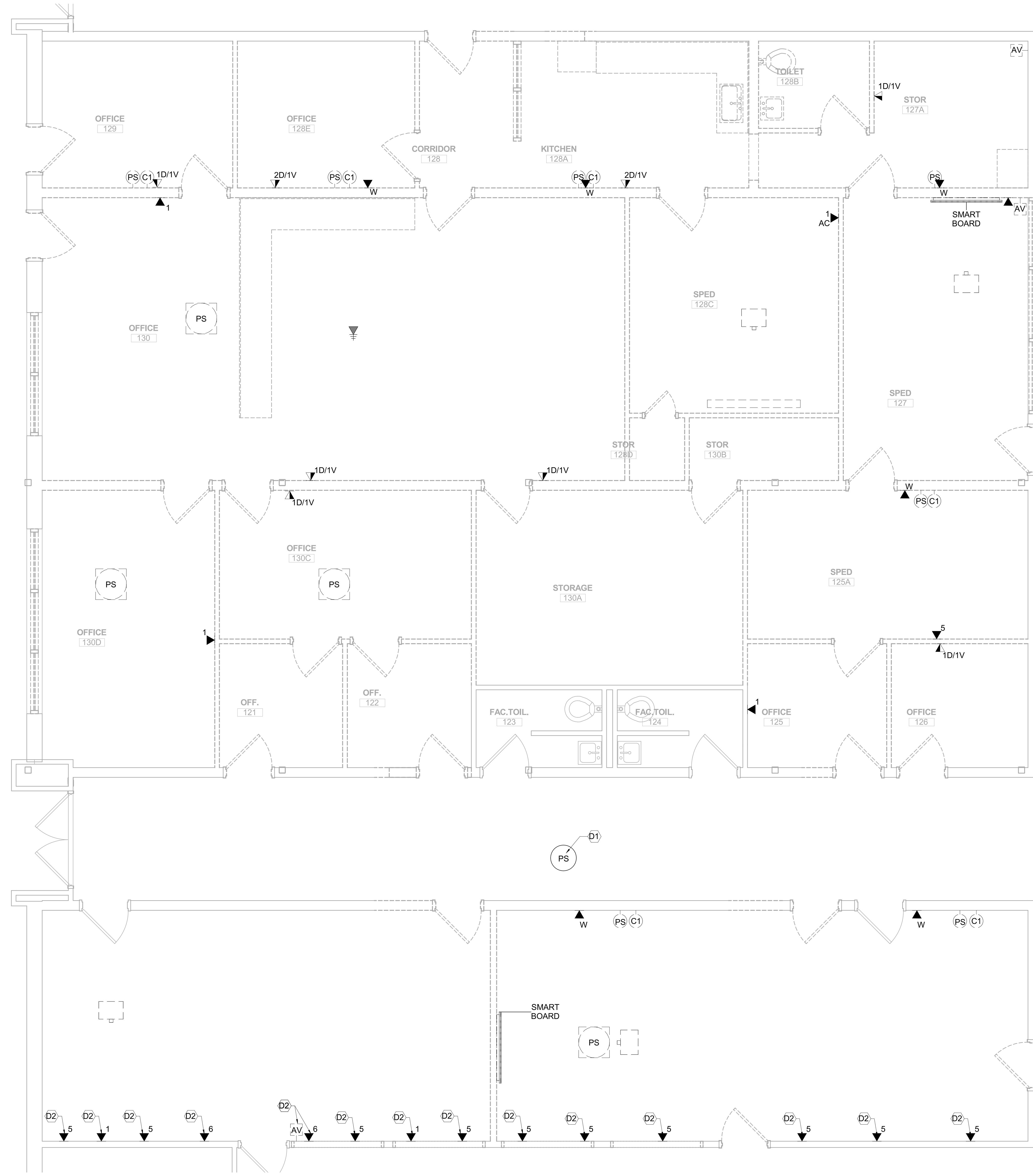
ALTERNATE #1 DEMOLITION KEYED NOTES:

D1 EXISTING TO REMAIN.

D2 EXISTING OUTLET IS LOCATED IN SURFACE MOUNT RACEWAY.



2 CLASSROOMS 127, 128, 129 & 130 NEW TECHNOLOGY PLAN
1/4" = 1'-0"



1 CLASSROOMS 127, 128, 129 & 130 TECHNOLOGY DEMO PLAN
1/4" = 1'-0"

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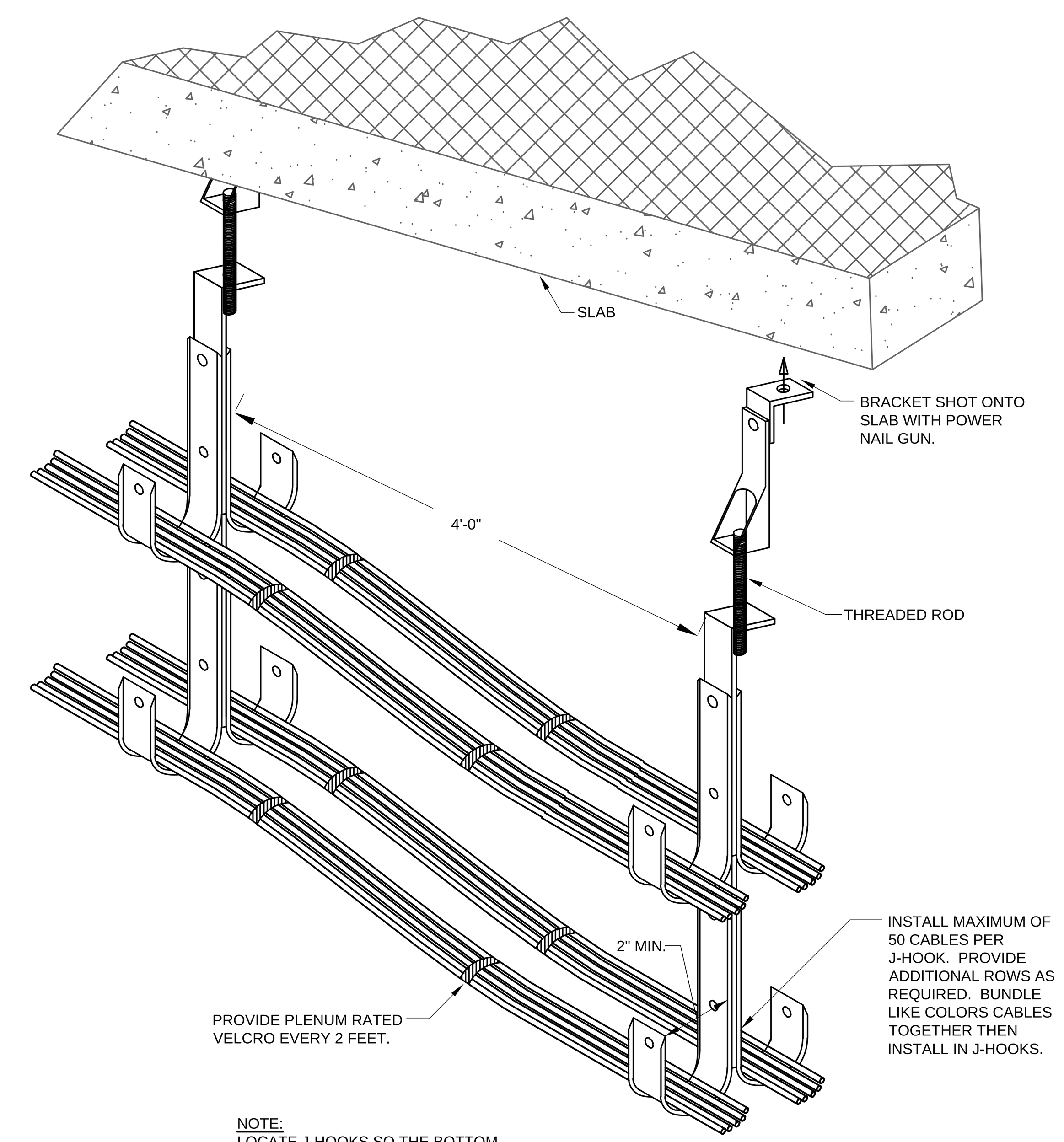
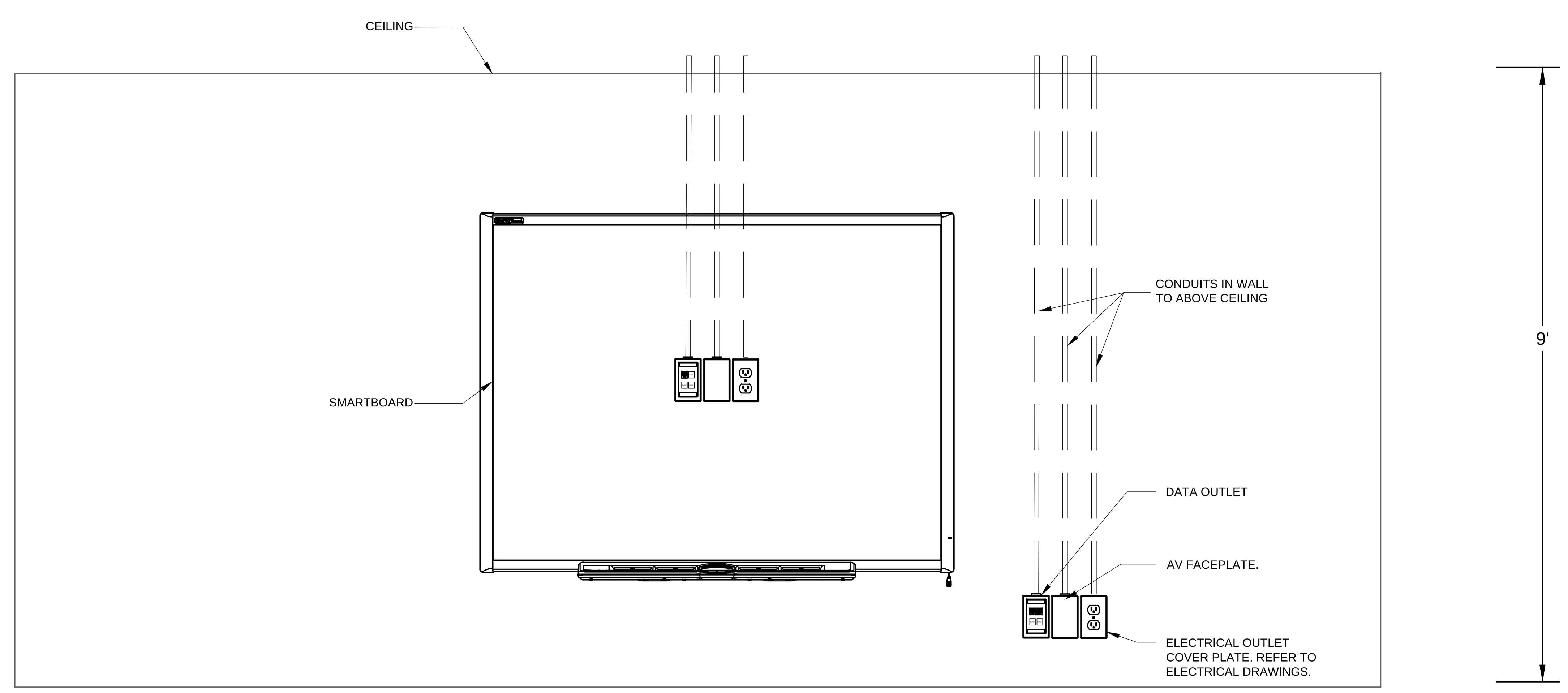
ALTERNATE #1 - ENLARGED CLASSROOM TECHNOLOGY PLANS

T-411A
SHEET OF

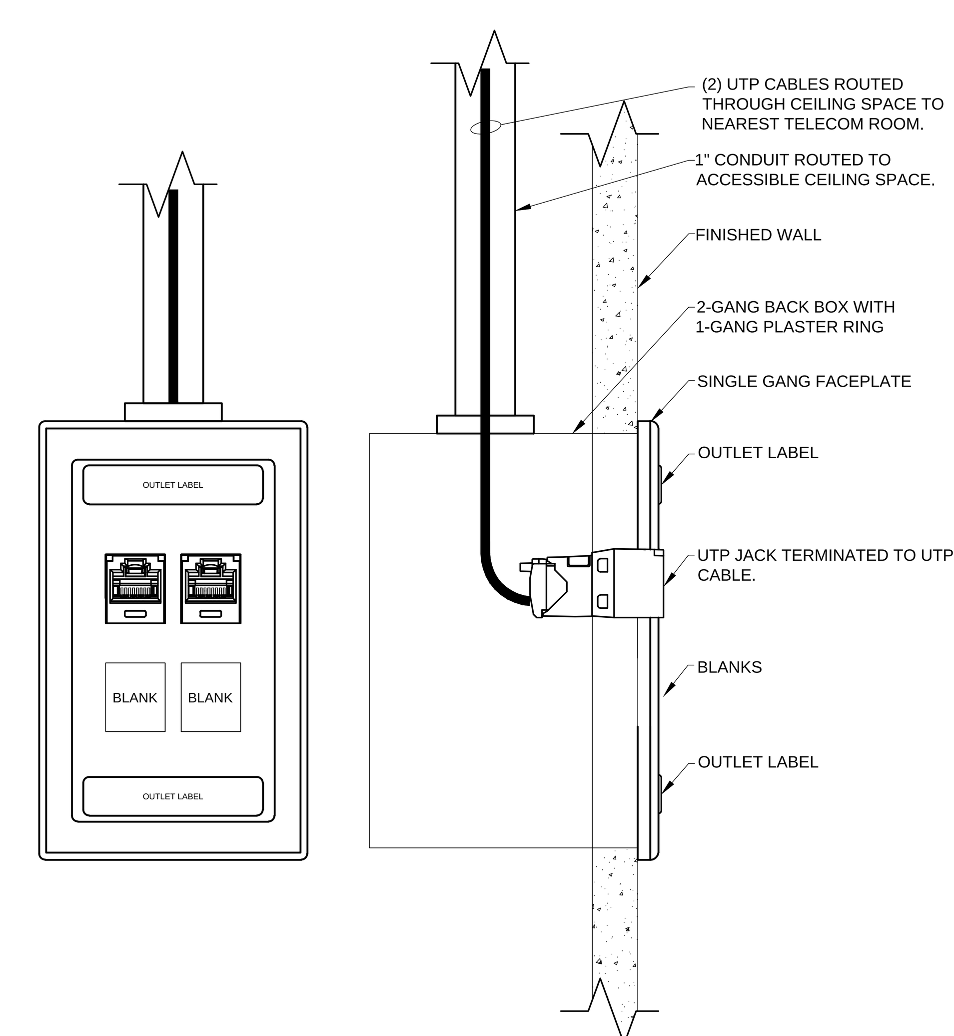


NOTE:
LOCATE J-HOOKS SO THE BOTTOM IS 8" ABOVE CEILING TILES.

2 J-HOOK ASSEMBLY
NTS
SYMBOL:



3 NEW CLASSROOM ALTERNATE #1 ELEVATION - SMARTBOARD
NTS
SYMBOL: SMARTBOARD



1 DATA OUTLET - TYPICAL
NTS
SYMBOL: ◄

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TECHNOLOGY SYSTEM DETAILS

T-810
SHEET OF