Attachment K

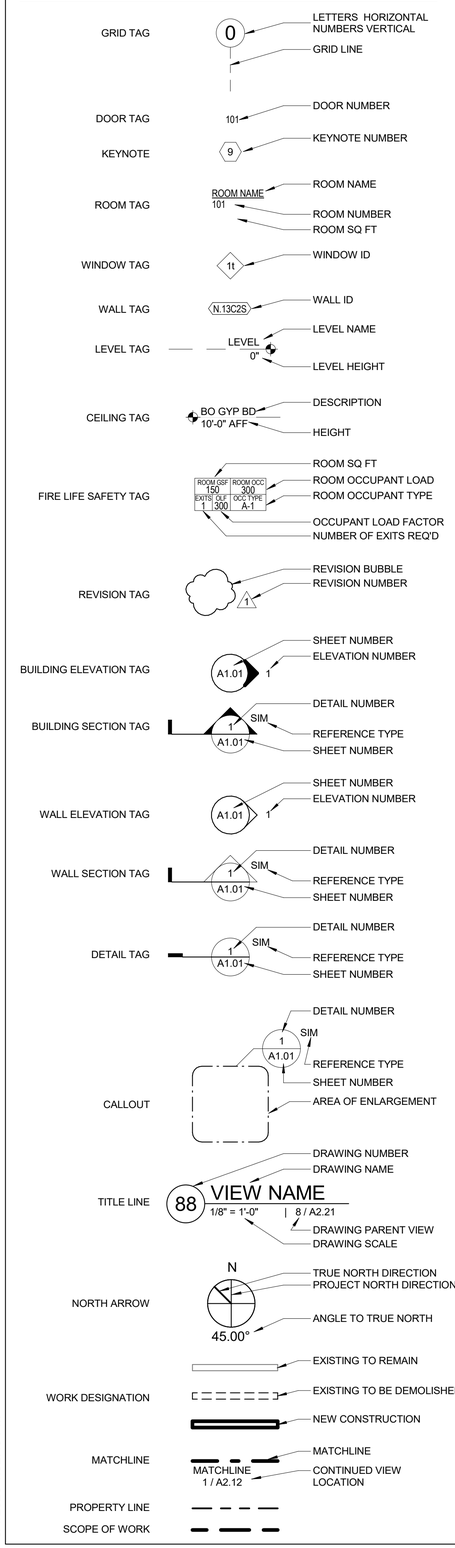
BSD RALEIGH PARK HVAC AND ELECTRICAL UPGRADE BEAVERTON SCHOOL DISTRICT

BID/PERMIT DOCUMENTS / MARCH 04, 2020
19-0012

YOST GRUBE HALL
ARCHITECTURE

707 SW Washington Street | Suite 1200 | Portland, OR 97205
t 503 221 0150 f 503 295 0840

SYMBOLS LEGEND



ABBREVIATIONS

&	AND
∟	ANGLE
@	AT
CL	CENTERLINE
Ø	DIAMETER
±	PLUS OR MINUS
°	DEGREE
#	POUND OR NUMBER
(E)	EXISTING
AB	ANCHOR BOLT
A/C	AIR CONDITIONING
ACST	ACOUSTICAL
ACM	ALUMINUM COMPOSITE MATERIAL PANELS
ACT	ACOUSTICAL CEILING TILE
ACW	ALUMINUM CURTAIN WALL
AD	AREA DRAIN
ADJ	ADJUSTABLE OR ADJACENT
AF	ACCESS FLOOR
AFF	ABOVE FINISHED FLOOR
AGGR	AGGREGATE
AHU	AIR HANDLING UNIT
ALUM	ALUMINUM
APPROX	APPROXIMATE
ARCH	ARCHITECTURAL
ASF	ALUMINUM STOREFRONT
ASPH	ASPHALT
AWP	ACOUSTICAL WALL PANEL
BCS	BABY CHANGING STATION
BD	BOARD
BLDG	BUILDING
BLKG	BLOCKING
BM	BEAM
BOT	BOTTOM
CAB	CABINET
CB	CATCH BASIN OR CHALKBOARD
CBB	CEMENT BACKER BOARD
CEM	CEMENT
CER	CERAMIC
CFCI	CONTRACTOR FURNISHED CONTRACTOR INSTALLED
CG	CORNER GUARD
CI	CAST IRON
CIP	CAST-IN-PLACE
CJ	CONSTRUCTION OR CONTROL JOINT
CLG	CEILING
CLO	CLOSET
CLR	CLEAR
CMP	COMPOSITE METAL PANEL
CMU	CONCRETE MASONRY UNIT
CNTR	COUNTER
CO	CLEANOUT
COL	COLUMN
CONC	CONCRETE
CONN	CONNECTION
CONSTR	CONSTRUCTION
CONT	CONTINUOUS
CORR	CORRIDOR
CPT	CARPET OR CARPET TILE
CSK	COUNTERSUNK
CT	CERAMIC TILE
CTR	CENTER
CV	CONDOM VENDOR
DBL	DOUBLE
DEPT	DEPARTMENT
DET	DETAIL
DF	DRINKING FOUNTAIN
DIA	DIAMETER
DIM	DIMENSION
DISP	DISPENSER
DIV	DIVISION OR DIVIDE
DN	DOWN
DR	DOOR
DS	DOWNSPOUT
DWG	DRAWING
DWR	DRAWER
EA	EACH
EF	EACH FACE
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC	ELECTRICAL
ELEV	ELEVATOR
EOS	EDGE OF SLAB
EP	ELECTRICAL PANEL
EQ	EQUAL
EQUIP	EQUIPMENT
ESCAL	ESCALATOR
EST	ESTIMATE
EWC	ELECTRIC WATER COOLER
EWH	ELECTRIC WATER HEATER
EXH	EXHAUST
EXIST	EXISTING
EXP	EXPOSED OR EXPANSION
EXT	EXTERIOR
FA	FIRE ALARM
FB	FLAT BAR
FD	FLOOR DRAIN
FDTN	FOUNDATION
FE	FIRE EXTINGUISHER
FEC	FIRE EXTINGUISHER CABINET
FHC	FIRE HOSE CABINET
FIN	FINISH
FIN FLR	FINISH FLOOR
FLR	FLOOR
FLOUR	FLUORESCENT
FMT	FORMED METAL TRIM
FOC	FACE OF CONCRETE OR CURB
FOF	FACE OF FINISH
FOS	FACE OF STUD
FP	FIREPROOF

ABBREVIATIONS

FT	FOOT OR FEET
FTG	FOOTING
FUS	FOLDING UTILITY SHELF
G	GROUND
GA	GAGE
GALV	GALVANIZED
GB	GRAB BAR
GL	GLASS
GL BLK	GLASS BLOCK
GLZ CMU	GLAZED CMU
GR	GRADE
GWB	GYPSUM WALL BOARD
GWB-AR	GYPSUM WALL BOARD - ABUSE RESISTANT
GWB-IR	GYPSUM WALL BOARD - IMPACT RESISTANT
GWB-WR	GYPSUM WALL BOARD - WATER RESISTANT
HB	HOSE BIBB
HC	HOLLOW CORE
HD	HAND DRYER
HDWD	HARDWOOD
HGT	HEIGHT
HM	HOLLOW METAL
HORIZ	HORIZONTAL
HR	HOUR
HVAC	HEATING, VENTILATION, AIR CONDITIONING
ID	INSIDE DIAMETER
INSUL	INSULATION
INT	INTERIOR
JS	JOINT SEALANT
JT	JOINT
LAB	LABORATORY
LAM	LAMINATE
LAV	LAVATORY
LINO	LINOLEUM
LKR	LOCKER
LS	INTERIOR LIGHT SHELF ASSEMBLY
LT	LIGHT
MATL	MATERIAL
MAX	MAXIMUM
MB	MARKER BOARD
MECH	MECHANICAL
MEMB	MEMBRANE
MFR	MANUFACTURER
MH	MANHOLE
MIN	MINIMUM
MIRR	MIRROR
MISC	MISCELLANEOUS
MO	MASONRY OPENING
MTD	MOUNTED
MTL	METAL
MU	MIRROR UNIT
MULL	MULLION
NIC	NOT IN CONTRACT
NO	NUMBER
NOM	NOMINAL
MTS	NOT TO SCALE
OA	OVERALL
OC	ON CENTER
OD	OUTSIDE DIAMETER
OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
OFD	OVER FLOW DRAIN
OFF	OFFICE
OFOI	OWNER FURNISHED OWNER INSTALLED
OPNG	OPENING
OPP	OPPOSITE
P-	PAINT COLOR
PBD	PARTICLEBOARD
PCC	PRECAST CONCRETE
PERF	PERFORATED
PL	PROPERTY LINE
PLAM	PLASTIC LAMINATE
PLAS	PLASTER
PLYWD	PLYWOOD
PNL	PANEL
PR	PAIR
PS	PROJECTION SCREEN
PT	POINT
PTD	PAPER TOWEL DISPENSER
PTN	PARTITION
QT	QUARRY TILE
R	RADIUS OR RISER
RA	RETURN AIR
RB	RESILIENT BASE
RB HK	ROBE HOOK
RD	ROOF DRAIN
REF	REFRIGERATOR - FREEZER
REINF	REINFORCED
REQD	REQUIRED
RESIL	RESILIENT
RM	ROOM
RO	ROUGH OPENING
RVS	REVERSED
RWL	RAIN WATER LEADER
SC	SOLID CORE
SCD	SEAT COVER DISPENSER
SCHED	SCHEDULE
SD	STORM DRAIN OR SOAP DISPENSER
SECT	SECTION
SHR	SHOWER
SHT	SHEET
SIM	SIMILAR
SKLT	SKYLIGHT
SNDU	SANITARY NAPKIN DISPOSAL UNIT
SNV	SANITARY NAPKIN VENDOR
SPEC	SPECIFICATION
SQ	SQUARE
SS	EXTERIOR SUNSCREEN ASSEMBLY
SST	STAINLESS STEEL
ST	STONE
STA	STATION

ABBREVIATIONS

STD	STANDARD
STL	STEEL
STOR	STORAGE
STRUCT	STRUCTURAL
SUSP	SUSPEND
SYMM	SYMMETRICAL
T	TREAD
T&G	TONGUE & GROOVE
TB	TACK BOARD
TEL	TELEPHONE
THX	THICKNESS
THRU	THROUGH
TO	TOP OF
TOC	TOP OF CURB
TOL	TOLERANCE
TOS	TOP OF STEEL
TOW	TOP OF WALL
TPD	TOILET PAPER DISPENSER
TPTN	TOILET PARTITION
TYP	TYPICAL
UNFIN	UNFINISHED
UOI	UNLESS OTHERWISE INDICATED
UR	URINAL
US	UTILITY SHELF
VERT	VERTICAL
VEST	VESTIBULE
VIF	VERIFY IN FIELD
W/	WITH
WC	WATER CLOSET or WOOD CEILING
WD	WOOD
WDF	WOOD FLOORING
WDP	WOOD VENEER FACED PANELING
WM	WIRE MESH
WR	WASTE RECEPTACLE
W/O	WITHOUT
WOM	WALK OFF MAT
WP	WATERPROOF
WS	WINDOW SHADE
WSCT	WAINSCOT
WWF	WELDED WIRE FABRIC

TEAM DIRECTORY

CLIENT

BEAVERTON SCHOOL DISTRICT

16550 SW Merlo Road
Portland, OR 97003 USA
Tel: 503-356-4318
Contact: Megan Finch

BUILDING / PLANNING AUTHORITY

DEPARTMENT OF LAND USE & TRANSPORTATION
PLANNING AND DEVELOPMENT SERVICES
155 N 1st Ave. Suite 350
Hillsboro, OR 97124 USA
Tel: 503-846-3470
Contact: Jeff Shelby

ARCHITECT

YOST GRUBE HALL ARCHITECTURE

707 SW Washington St, Suite 1200
Portland, OR. 97205 USA
Tel: 503-221-0150
Contact: Jesse Walt

STRUCTURAL ENGINEER

ABHT STRUCTURAL ENGINEERS

1640 NW Johnson Street
Portland, OR. 97209 USA
Tel: 503-243-6682
Contact: Clinton Ambrose

MECHANICAL ENGINEER

KCL ENGINEERING

2175 NW Raleigh Street, Suite 110
Portland, OR 97210 USA
Tel: 971-400-0416
Contact: Stormy Shanks

ELECTRICAL ENGINEER

KCL ENGINEERING

2175 NW Raleigh Street, Suite 110
Portland, OR 97210 USA
Tel: 503-679-5954
Contact: Adam Koble

CODE SUMMARY

GENERAL

JURISDICTIONAL AUTHORITY
WASHINGTON COUNTY

APPLICABLE CODES
2019 OREGON STRUCTURAL SPECIALTY CODE
2019 OREGON FIRE CODE
2019 OREGON MECHANICAL SPECIALTY CODE
2019 OREGON ELECTRICAL SPECIALTY CODE
2019 OREGON STRUCTURAL SPECIALTY CODE (2016 ASHRAE 90.1)
2017 OREGON PLUMBING SPECIALTY CODE

TYPE OF CONSTRUCTION

CONSTRUCTION CLASSIFICATION (SECTION 602)
TYPE V-B

BUILDING DESCRIPTION

RALEIGH PARK ELEMENTARY SCHOOL CONSISTS OF A SINGLE STORY WITH 45,166 SF AND THREE ADDITIONAL PORTABLE CLASSROOM BUILDINGS THAT ARE NOT PART OF THE SCOPE OF THIS PROJECT. THE SCHOOL OPENED IN 1958 IN AN EXISTING PRIVATE SCHOOL BUILDING AND WAS EXPANDED IN 1959, 1964, AND IN 1997. IN 2002, THE ORIGINAL WEST PORTION OF THE BUILDING WAS PARTIALLY RENOVATED. THIS PROJECT INCLUDES ALL ARCHITECTURAL, STRUCTURAL, AND ELECTRICAL RENOVATIONS REQUIRED TO UPGRADE THE HVAC SYSTEM THROUGHOUT THE BUILDING.

DEFERRED SUBMITTALS

1. SECTION 077200 "ROOF ACCESSORIES", ATTACHMENT OF ROOFTOP MECHANICAL UNIT TO SUPPORTING CURBS.
2. SEISMIC BRACING FOR PERMANENTLY INSTALLED HVAC EQUIPMENT.
3. PRODUCT DATA AND INSTALLATION INSRUCTIONS FOR HVAC SYSTEMS, COMPONENTS, AND EQUIPMENT.
4. HANGERS AND SUPPORT FOR ALL EQUIPMENT.
5. SEISMIC BRACING FOR PERMANENTLY INSTALLED ELECTRICAL EQUIPMENT.
6. FIRE ALARM SYSTEM MODIFICATIONS FOR HVAC EQUIPMENT SHUTDOWN.

DRAWING LIST

GENERAL

G0.00	COVER SHEET
G0.10	GENERAL ABBREVIATONS AND SHEET INDEX

GENERAL: 2

ARCHITECTURAL

A1.01	SITE PLAN
A2.10	FIRST FLOOR PLAN
A2.10D	FIRST FLOOR DEMOLITION PLAN
A2.20	ROOF PLAN
A3.01	CLASSROOM ENLARGED PLANS
A3.02	LIBRARY ENLARGED PLANS
A8.10	EXTERIOR DETAILS
A9.10	INTERIOR DETAILS

ARCHITECTURAL: 8

STRUCTURAL

S0.01	GENERAL STRUCTURAL NOTES AND DETAILS
S1.01	FIRST FLOOR PLAN
S2.01	SECTIONS AND DETAILS

STRUCTURAL: 3

MECHANICAL

M0.00	MECHANICAL SYMBOL LEGEND AND GENERAL NOTES
M2.00	UTILITY TUNNEL MECHANICAL PLAN
M2.10	FIRST FLOOR MECHANICAL PLAN
M2.10D	FIRST FLOOR MECHANICAL DEMOLITION PLAN
M2.11	FIRST FLOOR MECHANICAL CONTROLS PLAN
M2.20	ROOF MECHANICAL PLAN
M2.20D	ROOF MECHANICAL DEMOLITION PLAN
M2.21	ROOF MECHANICAL CONTROLS PLAN
M3.10	ENLARGED MECHANICAL PLANS
M4.00	MECHANICAL DETAILS
M5.00	MECHANICAL CONTROLS
M5.01	MECHANICAL CONTROLS
M5.02	MECHANICAL CONTROLS
M5.03	MECHANICAL CONTROLS
M6.00	MECHANICAL SCHEDULES
M6.01	MECHANICAL SCHEDULES
M6.02	MECHANICAL SCHEDULES

MECHANICAL: 17

ELECTRICAL

E0.01	ELECTRICAL GENERAL NOTES AND SYMBOLS
E1.01	ELECTRICAL SITE PLAN
E2.10	ELECTRICAL PLAN
E2.10D	ELECTRICAL DEMOLITION PLAN
E3.01	ELECTRICAL ONE-LINE DIAGRAM
E3.02	PANEL SCHEDULES
E3.03	PANEL SCHEDULES
E3.04	PANEL SCHEDULES
E4.01	ELECTRICAL SCHEDULES

ELECTRICAL: 9

ASBESTOS ABATEMENT

1	ASBESTOS ABATEMENT MATERIAL LOCATION MAP

ASBESTOS ABATEMENT: 1

GRAND TOTAL: 40

LOCATION MAP

SITE ADDRESS: 3670 SW 78TH AVE, PORTLAND, OR 97225

BID/PERMIT DOCUMENTS

REGISTERED ARCHITECT
THOMAS ROBBINS
Portland, OR
6448
STATE OF OREGON

YOST GRUBE HALL
ARCHITECTURE
707 SW Washington Street | Suite 1200 | Portland, OR 97205
t 503 221 0150 f 503 295 0840

Owner
BEAVERTON SCHOOL DISTRICT
CENTRAL ADMINISTRATION CENTER
16550 MERLO ROAD
BEAVERTON, OREGON 97003

Project
BSD RALEIGH PARK HVAC AND ELECTRICAL UPGRADE
RALEIGH PARK ELEMENTARY SCHOOL
3670 SW 78TH AVE
PORTLAND, OR 97225

MARK	DATE	DESCRIPTION

Sheet Title
GENERAL
ABBREVIATONS AND
SHEET INDEX

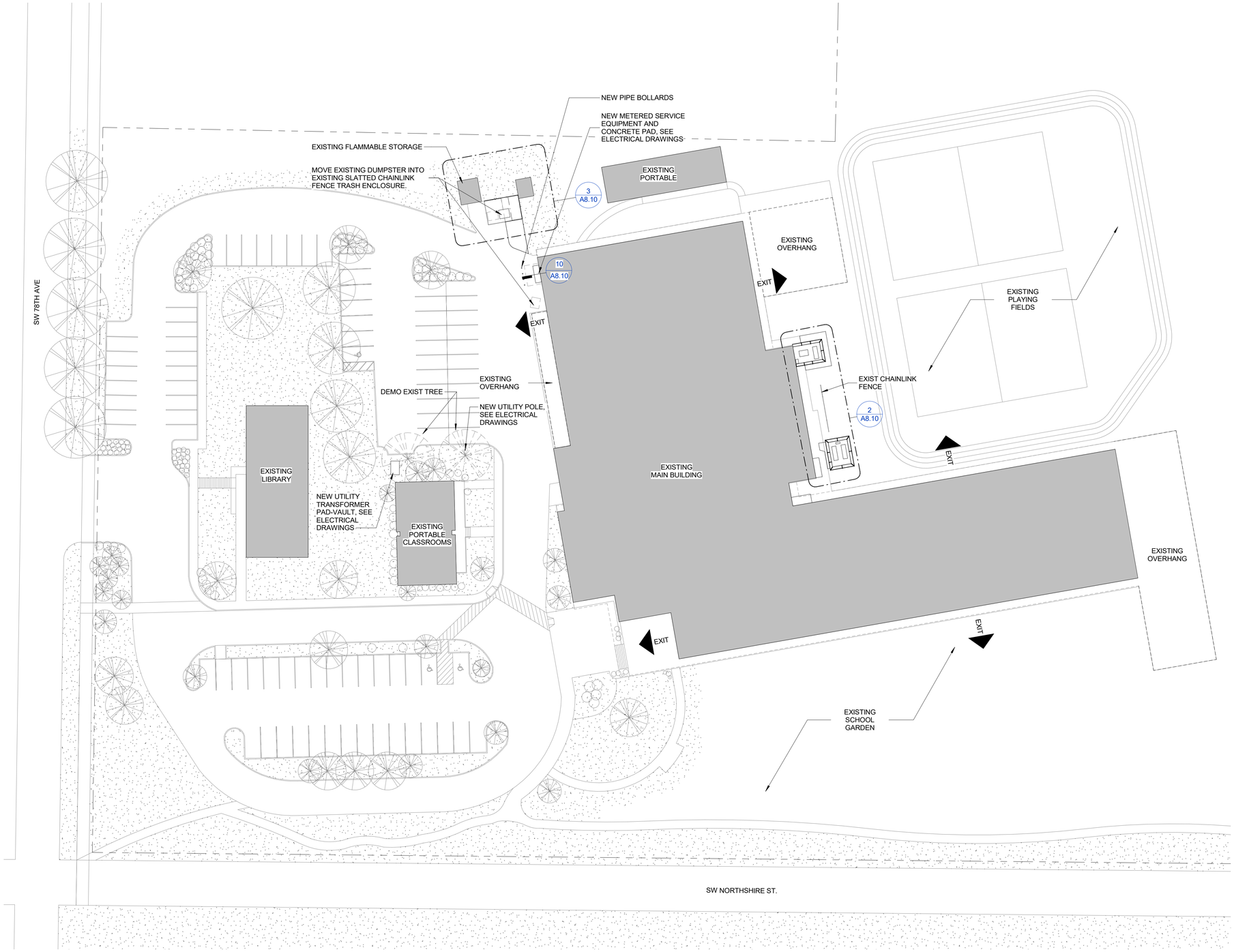
Drawing No.
G0.10

Scale 12" = 1'-0"

Date MARCH 04, 2020

Project No. 19-0012

3/4/2020 1:52:49 PM



1 SITE PLAN
1" = 30'-0"

GRAPHIC SCALE: 1" = 30'-0"
0' 15' 30' 60' 120'

GENERAL NOTES

1. ARCHITECTURAL ELEVATIONS ARE BASED ON MAIN FLOOR LEVEL 100'-0"
2. WHERE ENLARGED PLANS ARE PROVIDED, DETAILED DIMENSIONS AND OTHER INFORMATION WILL BE FOUND ON THE ENLARGED PLAN, U.O.I.
3. INTERIOR PARTITIONS ARE DIMENSIONED TO FACE OF FINISH UNLESS OTHERWISE INDICATED.
4. DIMENSIONS ARE TO FACE OF STRUCTURE OR TO GRIDLINES OR TO REFERENCED DIMENSION POINT (DIM PT).
5. CONTRACTOR TO COORDINATE AND VERIFY THAT THE TRANSITION OF MATERIALS PROVIDES FOR A CONTINUOUS WEATHER TIGHT ENVELOPE WHERE DIFFERENT TRADES ARE RESPONSIBLE FOR WEATHER TIGHT CONSTRUCTION OF THE EXTERIOR ENVELOPE.
6. REFER TO A8.10 FOR TYPICAL PENETRATION DETAILS.
7. REFER TO FIG. 1 ASBESTOS ABATEMENT MATERIAL LOCATION MAP. SEE THE FULL TRC ASBESTOS REPORT FOR ADDITIONAL INFORMATION

LEGEND

- EXIT — ENTRANCE / EXIT
- DESCRIPTION
- PROPERTY LINE
- FENCE
- EXISTING TREES
- DEMOLISHED TREES

BID/PERMIT DOCUMENTS

REGISTERED ARCHITECT
THOMAS ROBBINS
Portland, OR
6448
STATE OF OREGON

YOST GRUBE HALL
ARCHITECTURE
707 SW Washington Street | Suite 1200 | Portland, OR 97205
t 503 221 0150 f 503 295 0840

Owner
BEAVERTON SCHOOL DISTRICT
CENTRAL ADMINISTRATION CENTER
16550 MERLO ROAD
BEAVERTON, OREGON 97003

Project
BSD RALEIGH PARK HVAC AND ELECTRICAL UPGRADE
RALEIGH PARK ELEMENTARY SCHOOL
3670 SW 78TH AVE
PORTLAND, OR 97225

MARK	DATE	DESCRIPTION
1		

Sheet Title
SITE PLAN

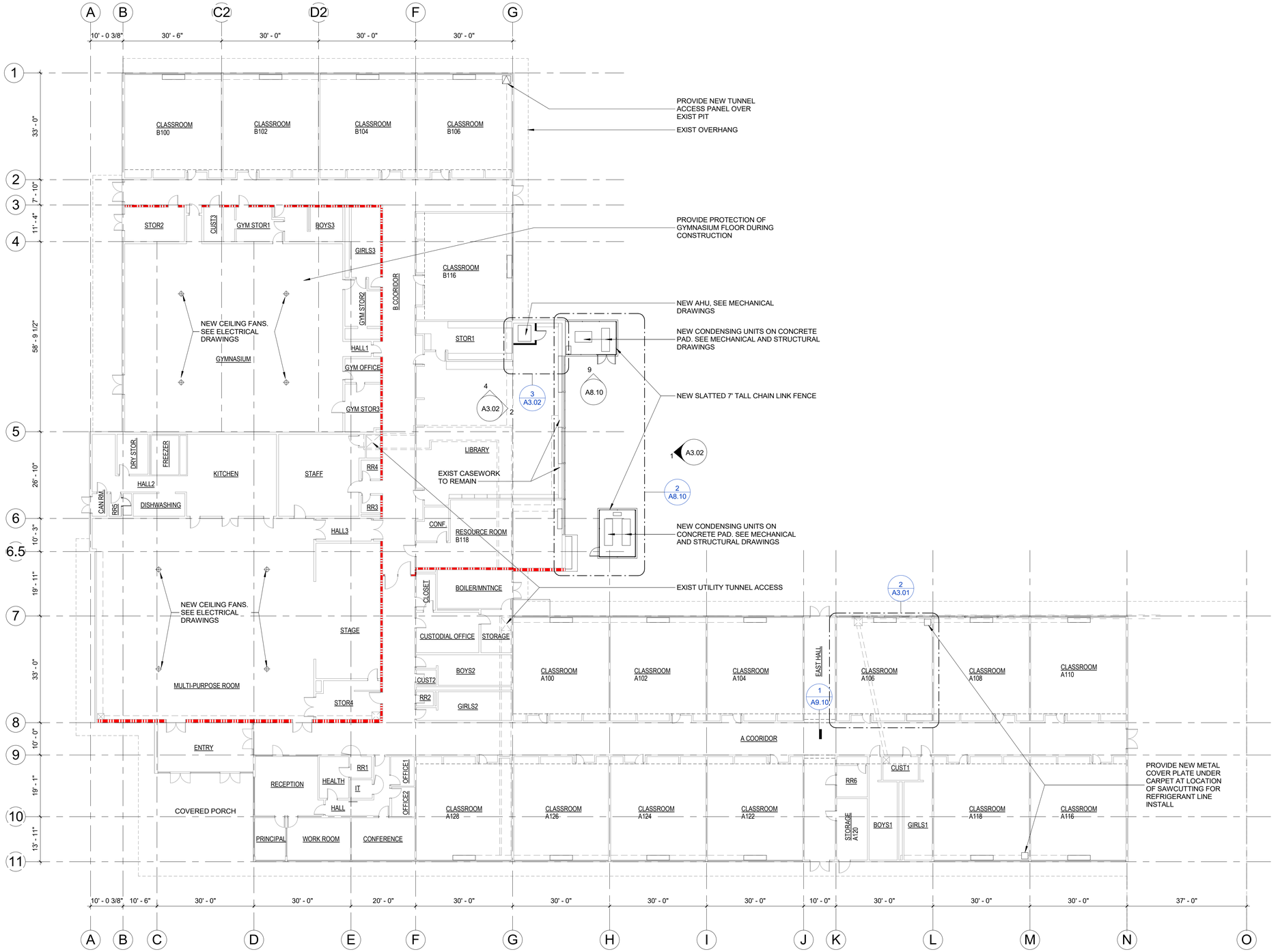
Drawing No.
A1.01

Scale As indicated

Date MARCH 04, 2020

Project No. 19-0012

3/4/2020 1:26:06 PM



1 OVERALL FIRST FLOOR PLAN
1/16" = 1'-0"

GRAPHIC SCALE: 1/16" = 1'-0"
0' 8' 16' 32' 64'

GENERAL NOTES

1. ARCHITECTURAL ELEVATIONS ARE BASED ON MAIN FLOOR LEVEL 100'-0"
2. WHERE ENLARGED PLANS ARE PROVIDED, DETAILED DIMENSIONS AND OTHER INFORMATION WILL BE FOUND ON THE ENLARGED PLAN, U.O.I.
3. INTERIOR PARTITIONS ARE DIMENSIONED TO FACE OF FINISH UNLESS OTHERWISE INDICATED.
4. DIMENSIONS ARE TO FACE OF STRUCTURE OR TO GRIDLINES OR TO REFERENCED DIMENSION POINT (DIM PT).
5. CONTRACTOR TO COORDINATE AND VERIFY THAT THE TRANSITION OF MATERIALS PROVIDES FOR A CONTINUOUS WEATHER TIGHT ENVELOPE WHERE DIFFERENT TRADES ARE RESPONSIBLE FOR WEATHER TIGHT CONSTRUCTION OF THE EXTERIOR ENVELOPE.
6. REFER TO A8.10 FOR TYPICAL PENETRATION DETAILS.
7. REFER TO FIG. 1 ASBESTOS ABATEMENT MATERIAL LOCATION MAP. SEE THE FULL TRC ASBESTOS REPORT FOR ADDITIONAL INFORMATION

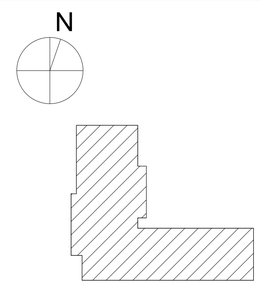
SHEET NOTES

1. ALL WOOD BLOCKING SHALL BE FIRE RETARDANT TREATED.
2. PAINT ALL GWB SURFACES THROUGHOUT SCOPE OF WORK. COLORS AND FINISHES ARE AS SPECIFIED ON FINISH SCHEDULE OR IN DRAWINGS.
3. PARTITION EXTENSTIONS AND INFILLS SHALL BE FLUSH WITH EXISTING ADJOINING PARTITIONS.
4. PROVIDE SHOP DRAWINGS OF ANY FINISHES, MATERIALS AND ASSEMBLIES PRIOR TO PROCUREMENT INCLUDING, BUT NOT LIMITED TO, MILLWORK, CARPET SEAMING, FABRIC WALL PANELS, WINDOW COVERINGS, ETC.
5. ALL MILLWORK SHALL CONFORM TO ARCHITECTURAL WOODWORKING INSTITUTE (AWI) PREMIUM GRADE. ALL LAMINATE CASEWORK TO CONFORM TO AWI CUSTOM GRADE.

LEGEND

- EXISTING WALL
- NEW WALL
- EXISTING 2 HOUR RATED WALL
- EXISTING UTILITY TUNNEL
- ROOF LINE OVERHEAD

KEY PLAN



BID/PERMIT DOCUMENTS

REGISTERED ARCHITECT
THOMAS ROBBINS
Portland, OR
6448
STATE OF OREGON

YOST GRUBE HALL
ARCHITECTURE
707 SW Washington Street | Suite 1200 | Portland, OR 97205
t 503 221 0150 f 503 295 0840

Owner
BEAVERTON SCHOOL DISTRICT
CENTRAL ADMINISTRATION CENTER
16550 MERLO ROAD
BEAVERTON, OREGON 97003

Project
BSD RALEIGH PARK HVAC AND ELECTRICAL UPGRADE
RALEIGH PARK ELEMENTARY SCHOOL
3670 SW 78TH AVE
PORTLAND, OR 97225

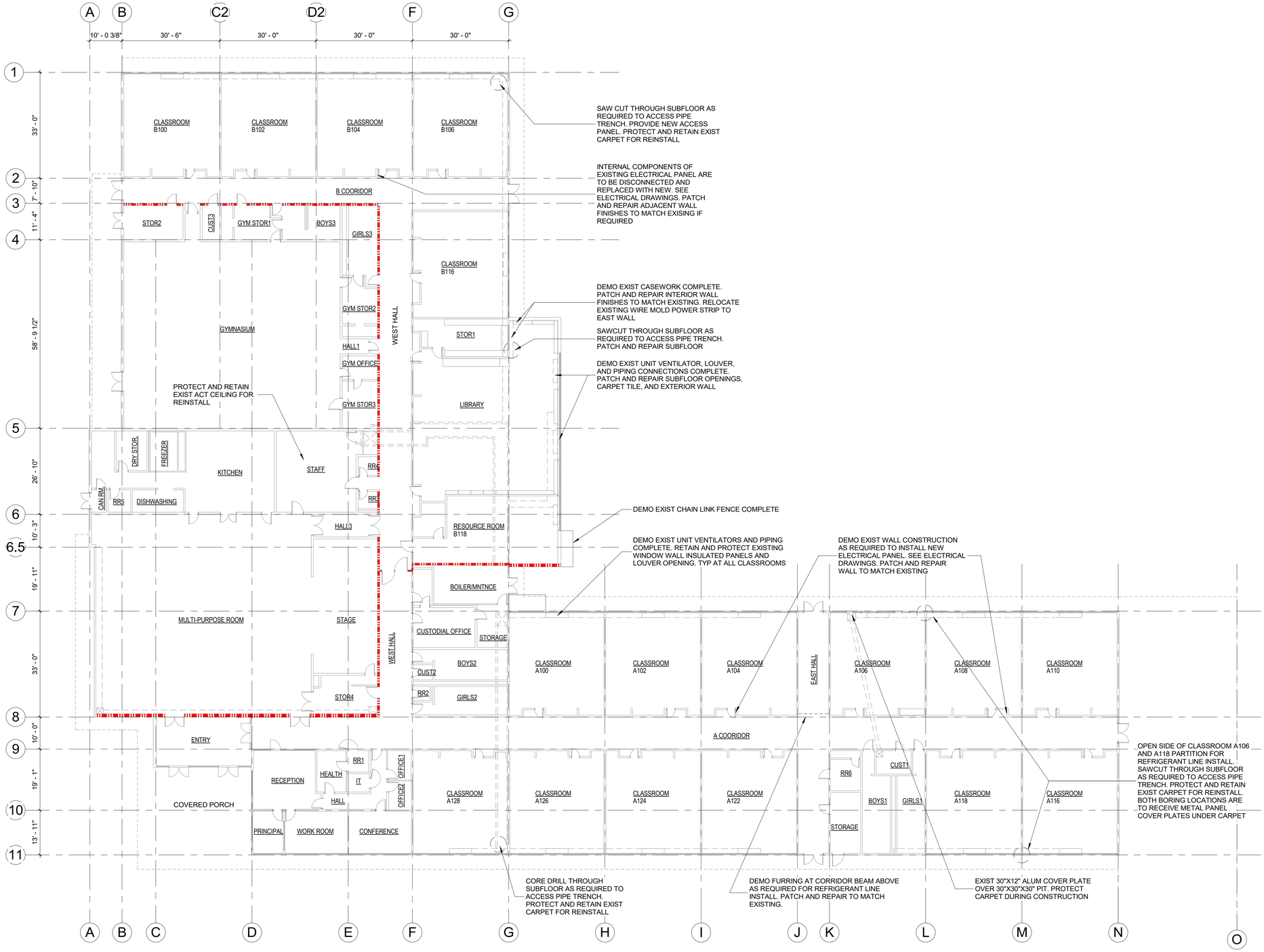
MARK DATE DESCRIPTION

Sheet Title
FIRST FLOOR PLAN

Drawing No.
A2.10

Scale As indicated
Date MARCH 04, 2020
Project No. 19-0012

3/4/2020 1:26:07 PM



1 FIRST FLOOR - DEMOLITION PLAN
1/16" = 1'-0"

GRAPHIC SCALE: 1/16" = 1'-0"
0' 8' 16' 32' 64'

GENERAL NOTES

1. ARCHITECTURAL ELEVATIONS ARE BASED ON MAIN FLOOR LEVEL 100'-0"
2. WHERE ENLARGED PLANS ARE PROVIDED, DETAILED DIMENSIONS AND OTHER INFORMATION WILL BE FOUND ON THE ENLARGED PLAN, U.O.I.
3. INTERIOR PARTITIONS ARE DIMENSIONED TO FACE OF FINISH UNLESS OTHERWISE INDICATED.
4. DIMENSIONS ARE TO FACE OF STRUCTURE OR TO GRIDLINES OR TO REFERENCED DIMENSION POINT (DIM PT).
5. CONTRACTOR TO COORDINATE AND VERIFY THAT THE TRANSITION OF MATERIALS PROVIDES FOR A CONTINUOUS WEATHER TIGHT ENVELOPE WHERE DIFFERENT TRADES ARE RESPONSIBLE FOR WEATHER TIGHT CONSTRUCTION OF THE EXTERIOR ENVELOPE.
6. REFER TO A8.10 FOR TYPICAL PENETRATION DETAILS.
7. REFER TO FIG. 1 ASBESTOS ABATEMENT MATERIAL LOCATION MAP. SEE THE FULL TRC ASBESTOS REPORT FOR ADDITIONAL INFORMATION

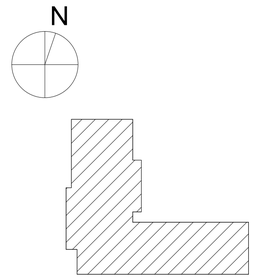
SHEET NOTES

1. PROVIDE A SMOOTH TRANSITION WHERE WORK ABUTS OR TERMINATES IN A FLUSH CONDITION WITH EXISTING WORK. WHERE EXISTING FINISHES MUST BE CUT OR REMOVED, METHODS WHICH TERMINATE SURFACES IN A STRAIGHT, NEAT LINE SHALL BE USED. TERMINATION OF AN EXISTING SURFACE SHALL BE MADE IN A LOCATION WHICH SERVES AS A NATURAL POINT OF DIVISION. REPAIRS OR PATCHES TO EXISTING WORK SHALL MATCH ADJACENT EXISTING CONDITION IN TEXTURE AND FINISH AND MAINTAIN THE EXISTING RATING.
2. REMOVE ALL POWER SIGNAL SWITCHING AND OTHER PERTINENT ITEMS FROM WALLS TO BE DEMOLISHED. ABANDONED WIRING SHALL BE REMOVED TO SOURCE.
3. DEMOLITION IS NOT NECESSARILY LIMITED TO WHAT IS SHOWN ON THE DEMOLITION PLAN. THE INTENT IS TO INDICATE THE GENERAL SCOPE OF DEMOLITION REQUIRED TO COMPLETE THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. GENERAL ITEMS FOR DEMOLITION ARE INDICATED ON DRAWINGS. ALL ITEMS NOT SPECIFICALLY SHOWN THAT ARE LOCATED IN AREAS OR WALLS INDICATED TO BE DEMOLISHED ARE TO BE REMOVED AND/OR RELOCATED AS REQUIRED.
4. **CONTRACTOR IS TO COORDINATE WITH THE OWNER ANY INTERRUPTIONS OF TELEPHONE AND COMMUNICATIONS, ELECTRICAL, MECHANICAL, PLUMBING OR FIRE PROTECTION SERVICES WHICH AFFECT THE OPERATION OF THE REMAINING PORTION OF THE FACILITY. ANY INTERRUPTIONS TO THESE SERVICES ARE TO BE SCHEDULED IN ADVANCE AND THE DURATION IS TO BE HELD TO THE ABSOLUTE MINIMUM.**
5. SALVAGE ALL CASEWORK FOR REUSE WHERE POSSIBLE IN NEW LAYOUT OR RETURN TO BUILDING MANAGEMENT/ OWNER FOR REUSE.
6. PARTITIONS, DOORS, FRAMES, RELITES AND ITEMS SHOWN DASHED ARE TO BE REMOVED OR RELOCATED AS NOTED.

LEGEND

- EXISTING WALL
- NEW WALL
- EXISTING 2 HOUR RATED WALL
- EXISTING UTILITY TUNNEL
- ROOF LINE OVERHEAD

KEY PLAN



BID/PERMIT DOCUMENTS

REGISTERED ARCHITECT
THOMAS ROBBINS
Portland, OR
6448
STATE OF OREGON

YOST GRUBE HALL
ARCHITECTURE
707 SW Washington Street | Suite 1200 | Portland, OR 97205
t 503 221 0150 f 503 295 0840

Owner
BEAVERTON SCHOOL DISTRICT
CENTRAL ADMINISTRATION CENTER
16550 MERLO ROAD
BEAVERTON, OREGON 97003

Project
BSD RALEIGH PARK HVAC AND ELECTRICAL UPGRADE
RALEIGH PARK ELEMENTARY SCHOOL
3670 SW 78TH AVE
PORTLAND, OR 97225

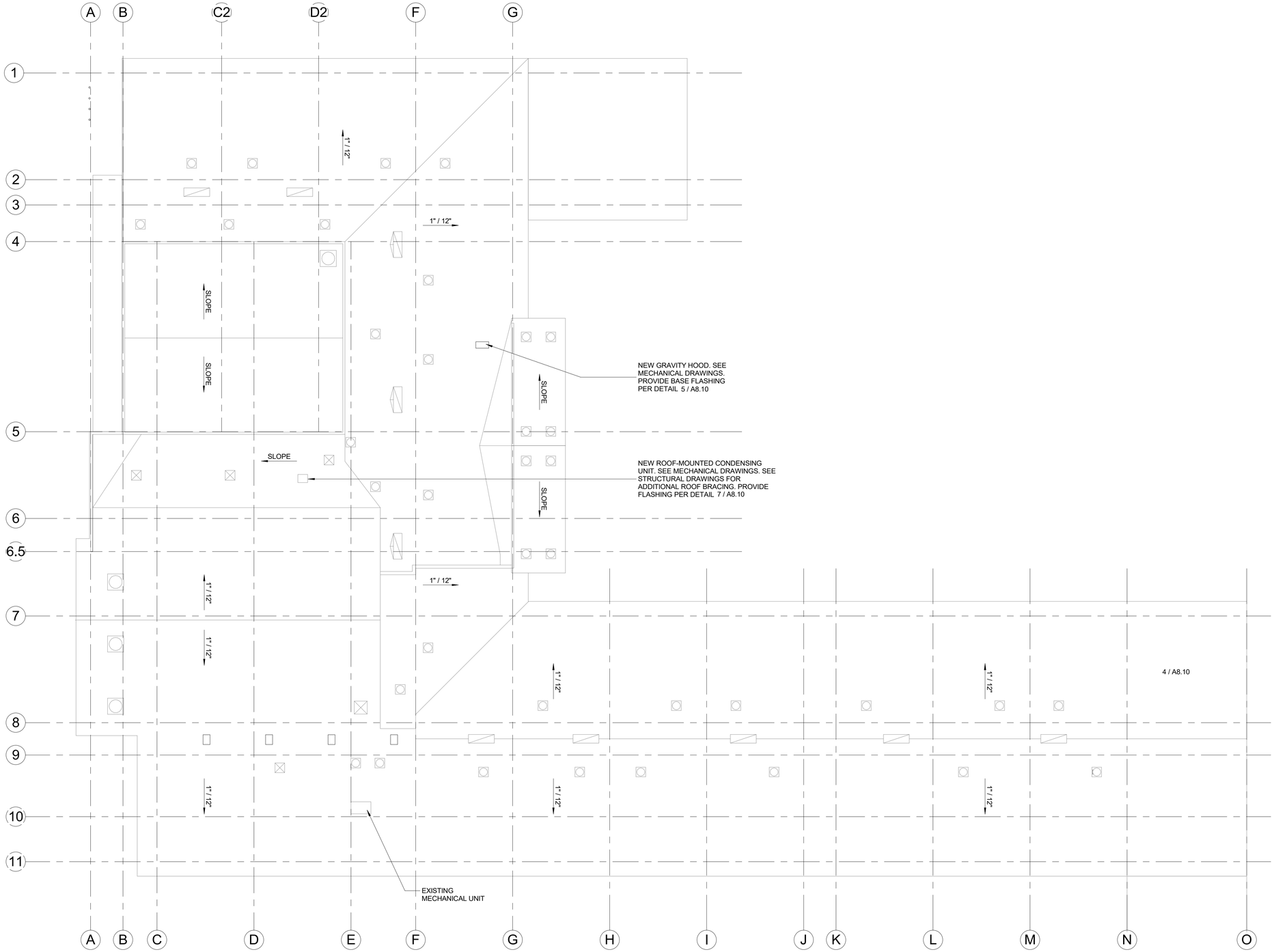
MARK	DATE	DESCRIPTION

Sheet Title
FIRST FLOOR DEMOLITION PLAN

Drawing No.
A2.10D

Scale As indicated
Date MARCH 04, 2020
Project No. 19-0012

3/4/2020 1:26:07 PM



1 ROOF PLAN
1/16" = 1'-0"

GRAPHIC SCALE: 1/16" = 1'-0"
0' 8' 16' 32' 64'

GENERAL NOTES

1. ARCHITECTURAL ELEVATIONS ARE BASED ON MAIN FLOOR LEVEL 100'-0"
2. WHERE ENLARGED PLANS ARE PROVIDED, DETAILED DIMENSIONS AND OTHER INFORMATION WILL BE FOUND ON THE ENLARGED PLAN, U.O.I.
3. INTERIOR PARTITIONS ARE DIMENSIONED TO FACE OF FINISH UNLESS OTHERWISE INDICATED.
4. DIMENSIONS ARE TO FACE OF STRUCTURE OR TO GRIDLINES OR TO REFERENCED DIMENSION POINT (DIM PT).
5. CONTRACTOR TO COORDINATE AND VERIFY THAT THE TRANSITION OF MATERIALS PROVIDES FOR A CONTINUOUS WEATHER TIGHT ENVELOPE WHERE DIFFERENT TRADES ARE RESPONSIBLE FOR WEATHER TIGHT CONSTRUCTION OF THE EXTERIOR ENVELOPE.
6. REFER TO A8.10 FOR TYPICAL PENETRATION DETAILS.
7. REFER TO FIG. 1 ASBESTOS ABATEMENT MATERIAL LOCATION MAP. SEE THE FULL TRC ASBESTOS REPORT FOR ADDITIONAL INFORMATION

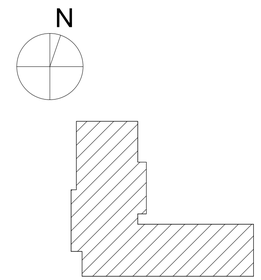
SHEET NOTES

1. PROVIDE POSITIVE DRAINAGE TO ROOF DRAINAGE. CONTRACTOR TO PROVIDE CRICKETS AS NECESSARY TO MAINTAIN THE MANUFACTURER'S WARRANTY
2. DRAWING INDICATES MAJOR ROOFTOP EQUIPMENT AND PENETRATIONS. CONTRACTOR TO PROVIDE AND COORDINATE FLASHING DETAILS TO MAINTAIN MANUFACTURERS' WARRANTIES FOR PENETRATIONS
3. PAINT ALL ROOFTOP EQUIPMENT, DUCTWORK, VENTS, PIPING AND APPURTENANCES. COLOR SELECTED BY ARCHITECT

LEGEND

- VALLEY / RIDGE / VALLEY — ROOF CRICKET
- RD — ROOF DRAIN
- 1/4" / 12" — ROOF SLOPE
- EXISTING ROOF VENT
- EXISTING ROOF FAN
- WS — SCUPPER
- WALKWAY PAD
- EXIST CURBED SKYLIGHT

KEY PLAN



BID/PERMIT DOCUMENTS

REGISTERED ARCHITECT
THOMAS ROBBINS
Portland, OR
6448
STATE OF OREGON

YOST GRUBE HALL
ARCHITECTURE
707 SW Washington Street | Suite 1200 | Portland, OR 97205
t 503 221 0150 f 503 295 0840

Owner
BEAVERTON SCHOOL DISTRICT
CENTRAL ADMINISTRATION CENTER
16550 MERLO ROAD
BEAVERTON, OREGON 97003

Project
BSD RALEIGH PARK HVAC AND ELECTRICAL UPGRADE
RALEIGH PARK ELEMENTARY SCHOOL
3670 SW 78TH AVE
PORTLAND, OR 97225

MARK DATE DESCRIPTION

Sheet Title
ROOF PLAN

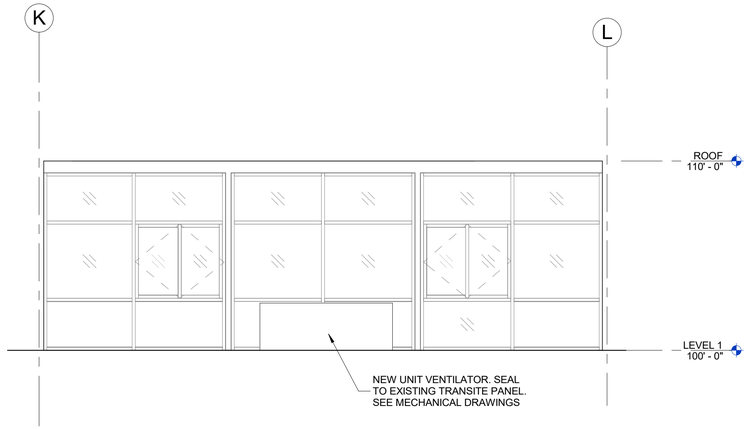
Drawing No.
A2.20

Scale As indicated

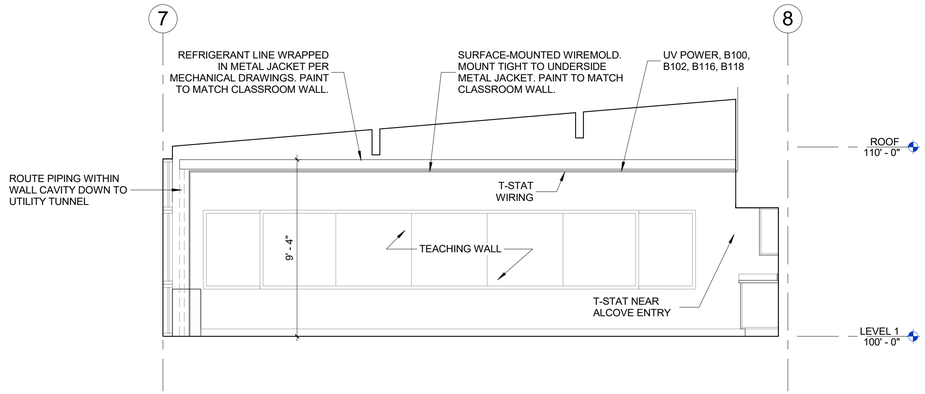
Date MARCH 04, 2020

Project No. 19-0012

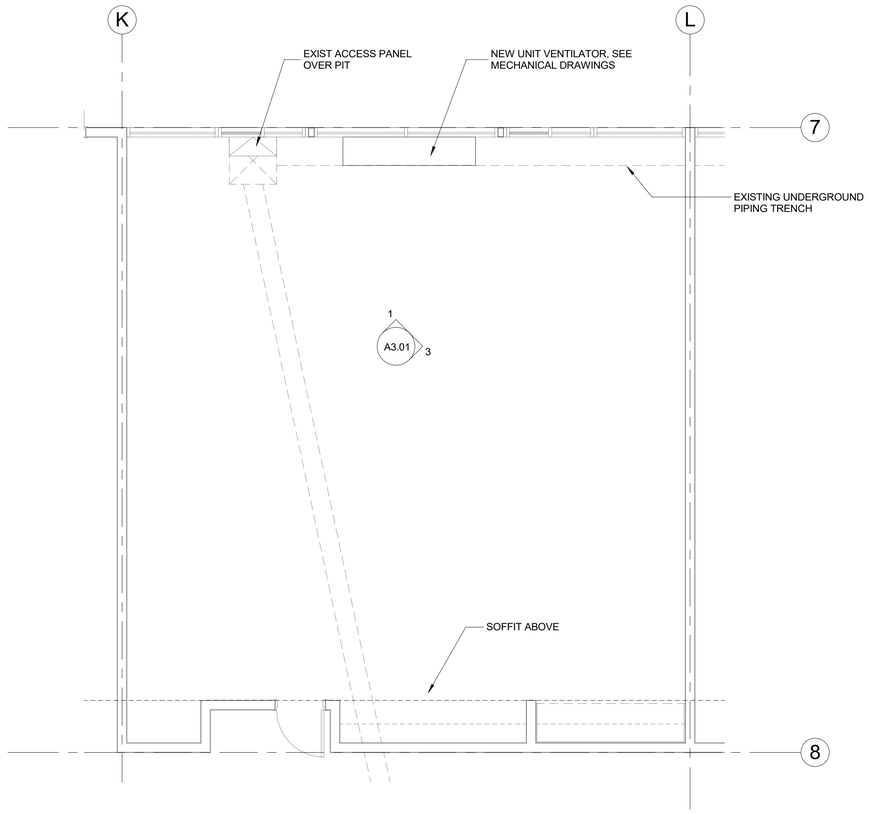
3/4/2020 1:26:08 PM



1 INT ELEVATION - TYP CLASSROM WINDOW WALL
1/4" = 1'-0"



3 INT ELEVATION - CLASSROOM A106 EAST, SIM @ CLASSROOM A118 EAST
1/4" = 1'-0"



2 ENLARGED PLAN - CLASSROOM A106
1/4" = 1'-0"

GENERAL NOTES

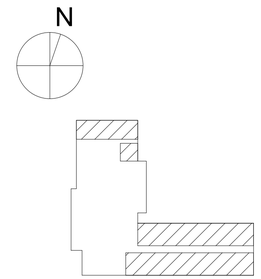
1. ARCHITECTURAL ELEVATIONS ARE BASED ON MAIN FLOOR LEVEL 100'-0"
2. WHERE ENLARGED PLANS ARE PROVIDED, DETAILED DIMENSIONS AND OTHER INFORMATION WILL BE FOUND ON THE ENLARGED PLAN, U.O.I.
3. INTERIOR PARTITIONS ARE DIMENSIONED TO FACE OF FINISH UNLESS OTHERWISE INDICATED.
4. DIMENSIONS ARE TO FACE OF STRUCTURE OR TO GRIDLINES OR TO REFERENCED DIMENSION POINT (DIM PT).
5. CONTRACTOR TO COORDINATE AND VERIFY THAT THE TRANSITION OF MATERIALS PROVIDES FOR A CONTINUOUS WEATHER TIGHT ENVELOPE WHERE DIFFERENT TRADES ARE RESPONSIBLE FOR WEATHER TIGHT CONSTRUCTION OF THE EXTERIOR ENVELOPE.
6. REFER TO A8.10 FOR TYPICAL PENETRATION DETAILS.
7. REFER TO FIG. 1 ASBESTOS ABATEMENT MATERIAL LOCATION MAP. SEE THE FULL TRC ASBESTOS REPORT FOR ADDITIONAL INFORMATION

SHEET NOTES

1. ALL WOOD BLOCKING SHALL BE FIRE RETARDANT TREATED.
2. PAINT ALL GWB SURFACES THROUGHOUT SCOPE OF WORK. COLORS AND FINISHES ARE AS SPECIFIED ON FINISH SCHEDULE OR IN DRAWINGS.
3. PARTITION EXTENSTIONS AND INFILLS SHALL BE FLUSH WITH EXISTING ADJOINING PARTITIONS.
4. PROVIDE SHOP DRAWINGS OF ANY FINISHES, MATERIALS AND ASSEMBLIES PRIOR TO PROCUREMENT INCLUDING, BUT NOT LIMITED TO, MILLWORK, CARPET SEAMING, FABRIC WALL PANELS, WINDOW COVERINGS, ETC.
5. ALL MILLWORK SHALL CONFORM TO ARCHITECTURAL WOODWORKING INSTITUTE (AWI) PREMIUM GRADE. ALL LAMINATE CASEWORK TO CONFORM TO AWI CUSTOM GRADE.

GRAPHIC SCALE: 1/4" = 1'-0"
0' 2' 4' 8' 16'

KEY PLAN



BID/PERMIT DOCUMENTS

REGISTERED ARCHITECT
THOMAS ROBBINS
Portland, OR
6448
STATE OF OREGON

YOST GRUBE HALL
ARCHITECTURE
707 SW Washington Street | Suite 1200 | Portland, OR 97205
t 503 221 0150 f 503 295 0840

Owner
BEAVERTON SCHOOL DISTRICT
CENTRAL ADMINISTRATION CENTER
16550 MERLO ROAD
BEAVERTON, OREGON 97003

Project
BSD RALEIGH PARK HVAC AND ELECTRICAL UPGRADE
RALEIGH PARK ELEMENTARY SCHOOL
3670 SW 78TH AVE
PORTLAND, OR 97225

MARK	DATE	DESCRIPTION

Sheet Title
CLASSROOM
ENLARGED PLANS

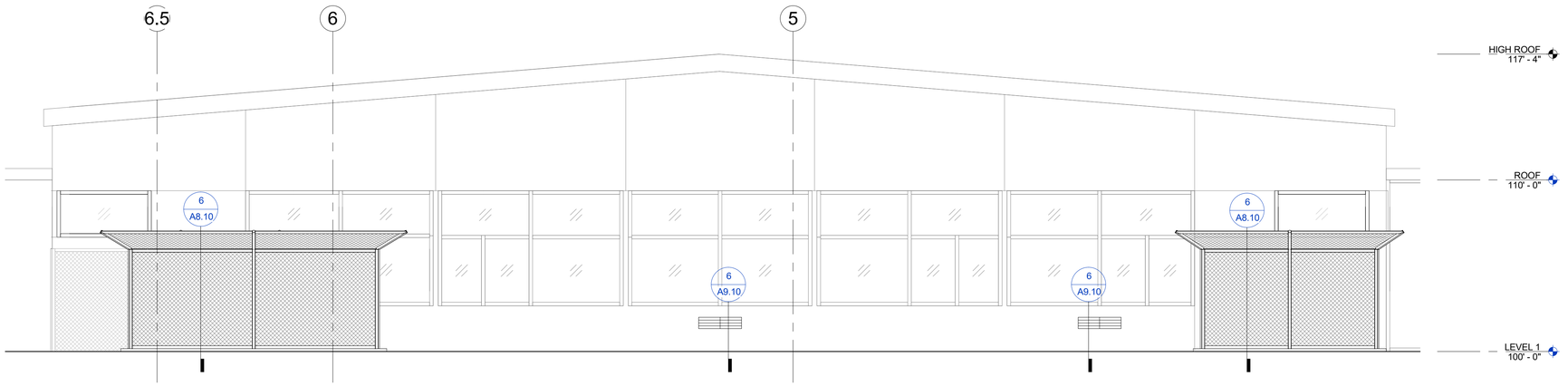
Drawing No.
A3.01

Scale 1/4" = 1'-0"

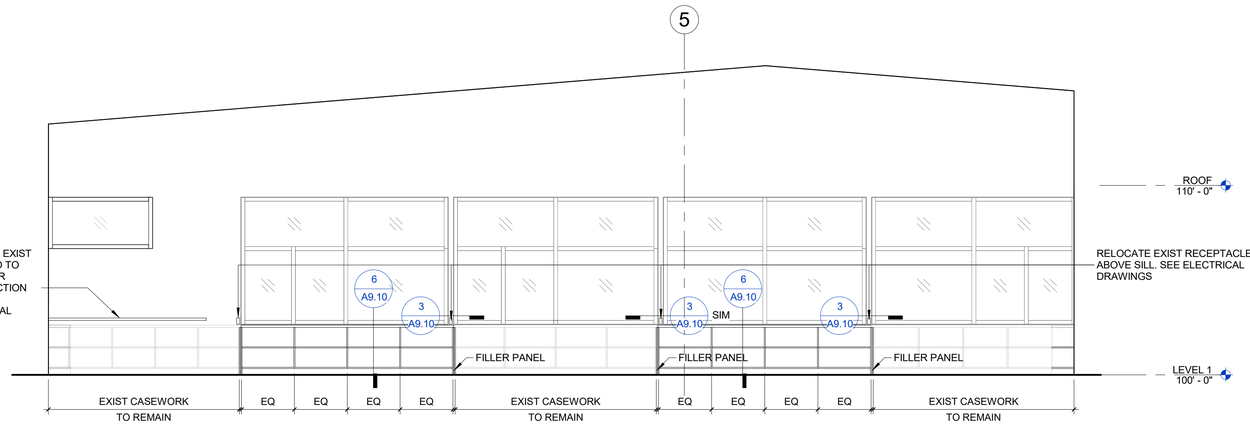
Date MARCH 04, 2020

Project No. 19-0012

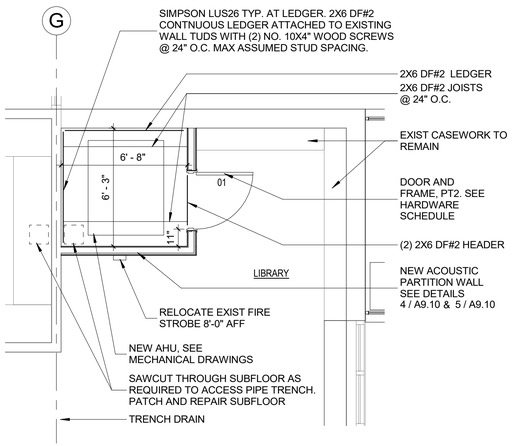
3/4/2020 1:26:08 PM



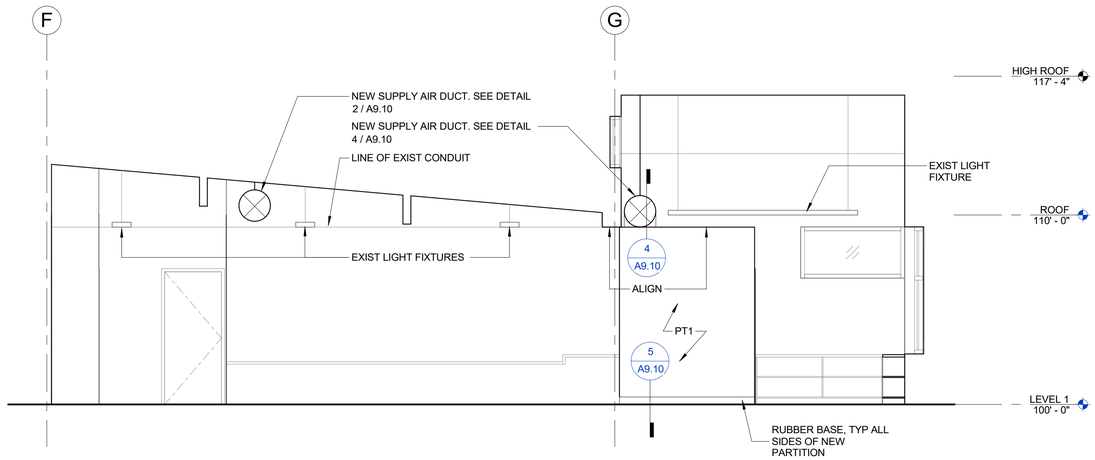
1 EXTERIOR ELEVATION - LIBRARY
1/4" = 1'-0"



2 INT ELEVATION - LIBRARY EAST
1/4" = 1'-0"



3 ENLARGED PLAN - LIBRARY / RESOURCE ROOM
1/4" = 1'-0"



4 INT ELEVATION - LIBRARY NORTH
1/4" = 1'-0"

GENERAL NOTES

1. ARCHITECTURAL ELEVATIONS ARE BASED ON MAIN FLOOR LEVEL 100'-0"
2. WHERE ENLARGED PLANS ARE PROVIDED, DETAILED DIMENSIONS AND OTHER INFORMATION WILL BE FOUND ON THE ENLARGED PLAN, U.O.I.
3. INTERIOR PARTITIONS ARE DIMENSIONED TO FACE OF FINISH UNLESS OTHERWISE INDICATED.
4. DIMENSIONS ARE TO FACE OF STRUCTURE OR TO GRIDLINES OR TO REFERENCED DIMENSION POINT (DIM PT).
5. CONTRACTOR TO COORDINATE AND VERIFY THAT THE TRANSITION OF MATERIALS PROVIDES FOR A CONTINUOUS WEATHER TIGHT ENVELOPE WHERE DIFFERENT TRADES ARE RESPONSIBLE FOR WEATHER TIGHT CONSTRUCTION OF THE EXTERIOR ENVELOPE.
6. REFER TO A8.10 FOR TYPICAL PENETRATION DETAILS.
7. REFER TO FIG. 1 ASBESTOS ABATEMENT MATERIAL LOCATION MAP. SEE THE FULL TRC ASBESTOS REPORT FOR ADDITIONAL INFORMATION

SHEET NOTES

1. ALL WOOD BLOCKING SHALL BE FIRE RETARDANT TREATED.
2. PAINT ALL GWB SURFACES THROUGHOUT SCOPE OF WORK. COLORS AND FINISHES ARE AS SPECIFIED ON FINISH SCHEDULE OR IN DRAWINGS.
3. PARTITION EXTENSTIONS AND INFILLS SHALL BE FLUSH WITH EXISTING ADJOINING PARTITIONS.
4. PROVIDE SHOP DRAWINGS OF ANY FINISHES, MATERIALS AND ASSEMBLIES PRIOR TO PROCUREMENT INCLUDING, BUT NOT LIMITED TO, MILLWORK, CARPET SEAMING, FABRIC WALL PANELS, WINDOW COVERINGS, ETC.
5. ALL MILLWORK SHALL CONFORM TO ARCHITECTURAL WOODWORKING INSTITUTE (AWI) PREMIUM GRADE. ALL LAMINATE CASEWORK TO CONFORM TO AWI CUSTOM GRADE.

HARDWARE SCHEDULE #01

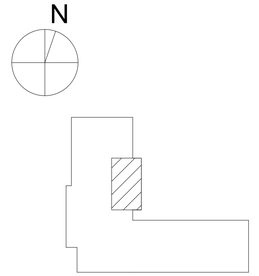
QTY	DESCRIPTION	CATALOG NUMBER	FINISH	MFR
4 EA	HINGE	5BB1HW 5 X 4.5 NRP	630	IVE
1 EA	STOREROOM LOCK	ND80TD RHO	626	SCH
2 EA	FSIC CORE	23-030	626	SCH
1 EA	SURFACE CLOSER	4011 TBWMS	689	LCN
1 EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1 EA	GASKETING	870AA-S	AA	ZER
SET	SEALS	S88D 20'	DKB	PEM
1 EA	DOOR BOTTOM	365AA	AA	ZER
1 EA	THRESHOLD	564A-223	A	ZER

*COORDINATE WITH SOUND DOOR SUPPLIER ON SEALS AND HINGES. MATCH SCHOOL KEYWAY

DOOR SCHEDULE

MARK	TO ROOM	DOOR WIDTH	DOOR HEIGHT	DOOR MATERIAL	DOOR FINISH	RATING	HARD WARE	FRAME MATERIAL	FRAME FINISH	COMMENTS
01	MECHANICAL ENCLOSURE	3' - 0"	7' - 0"	HM	PT2	NR	01	HM	PT2	

KEY PLAN



BID/PERMIT DOCUMENTS

REGISTERED ARCHITECT
THOMAS ROBBINS
Portland, OR
6448
STATE OF OREGON

YOST GRUBE HALL
ARCHITECTURE
707 SW Washington Street | Suite 1200 | Portland, OR 97205
t 503 221 0150 f 503 295 0840

Owner
BEAVERTON SCHOOL DISTRICT
CENTRAL ADMINISTRATION CENTER
16550 MERLO ROAD
BEAVERTON, OREGON 97003

Project
BSD RALEIGH PARK HVAC AND ELECTRICAL UPGRADE
RALEIGH PARK ELEMENTARY SCHOOL
3670 SW 78TH AVE
PORTLAND, OR 97225

MARK	DATE	DESCRIPTION

Sheet Title
LIBRARY ENLARGED PLANS

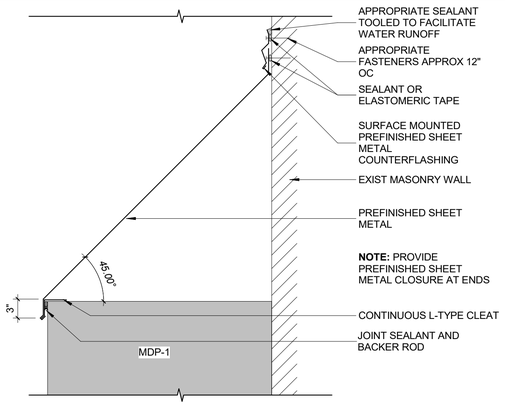
Drawing No.
A3.02

Scale 1/4" = 1'-0"

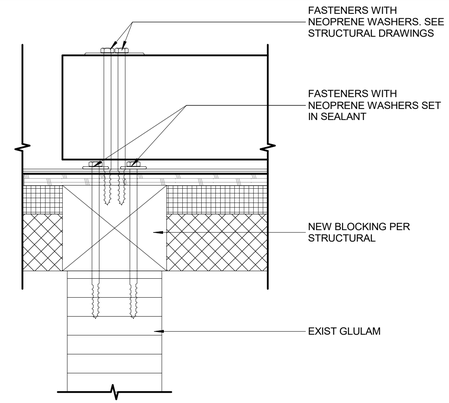
Date MARCH 04, 2020

Project No. 19-0012

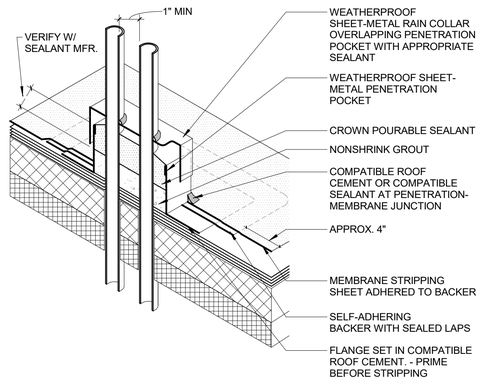
3/4/2020 1:26:09 PM



10 MDP-1 ANTI-CRIME MTL SHROUD
1" = 1'-0"



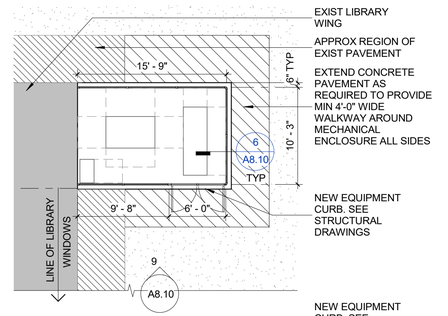
7 PT SLEEPER TO ROOF CONNECTION
3" = 1'-0"

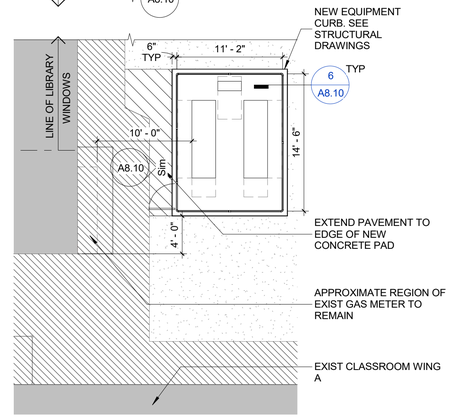


4 TYP PENETRATION @ BUILT-UP ROOF
NTS

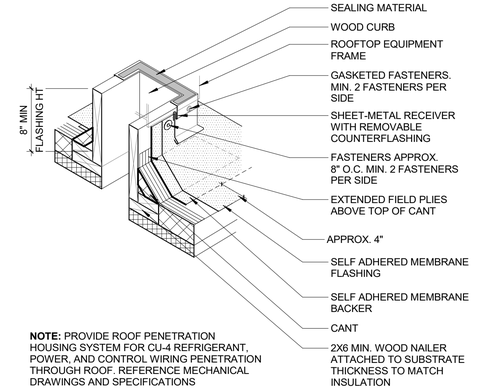
ENLARGED SITE PLAN LEGEND

- EXISTING PAVEMENT
- NEW PAVEMENT
- EXISTING ASPHALT
- NEW ASPHALT
- EXISTING GROUND COVER
- NEW CONCRETE PAD

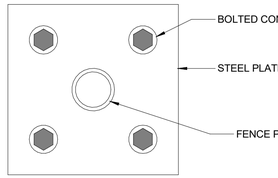




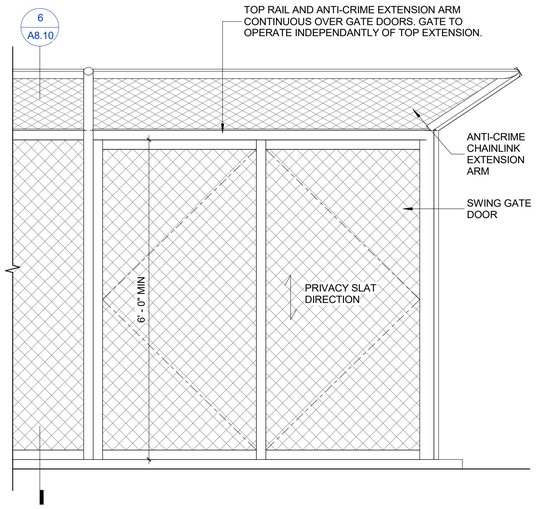
2 ENLARGED PLAN - MECHANICAL EQUIP ENCLOSURE
1/8" = 1'-0"



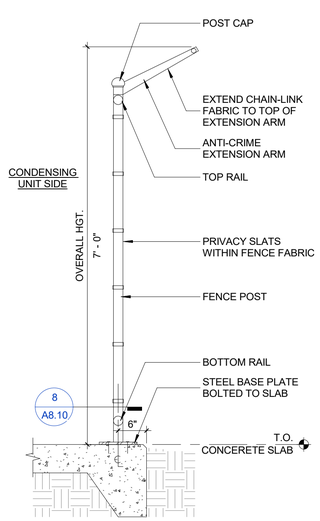
5 BASE FLASHING AT WOOD CURB
NTS



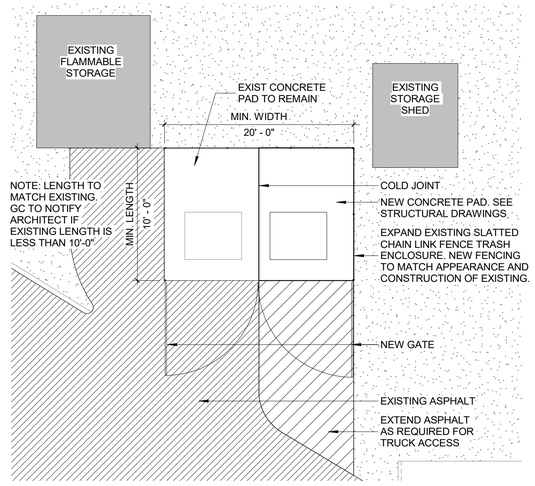
8 TYP. FENCE POST ANCHORAGE
3" = 1'-0"



9 ANTI-CRIME FENCE ELEVATION
3/4" = 1'-0"



6 ANTI-CRIME FENCE
3/4" = 1'-0"



3 ENLARGED PLAN - TRASH ENCLOSURE EXPANSION
1/8" = 1'-0"

BID/PERMIT DOCUMENTS

REGISTERED ARCHITECT
THOMAS ROBBINS
Portland, OR
6448
STATE OF OREGON

YOST GRUBE HALL
ARCHITECTURE
707 SW Washington Street | Suite 1200 | Portland, OR 97205
t 503 221 0150 f 503 295 0840

Owner
BEAVERTON SCHOOL DISTRICT
CENTRAL ADMINISTRATION CENTER
16550 MERLO ROAD
BEAVERTON, OREGON 97003

Project
BSD RALEIGH PARK HVAC AND ELECTRICAL UPGRADE
RALEIGH PARK ELEMENTARY SCHOOL
3670 SW 78TH AVE
PORTLAND, OR 97225

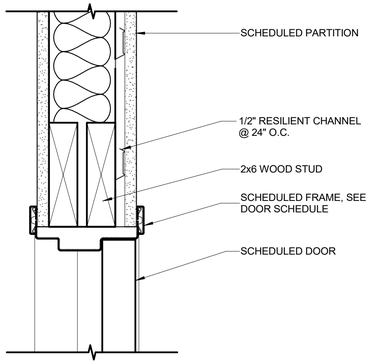
MARK	DATE	DESCRIPTION

Sheet Title
EXTERIOR DETAILS

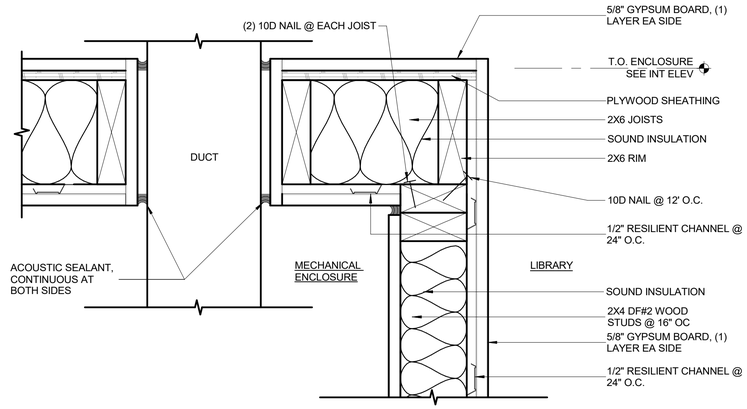
Drawing No.
A8.10

Scale As indicated
Date MARCH 04, 2020
Project No. 19-0012

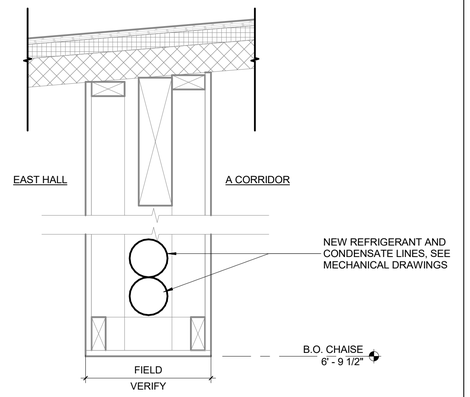
3/4/2020 1:26:09 PM



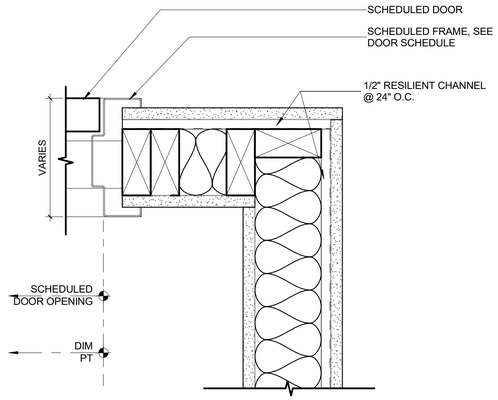
7 HM HEAD AT DOOR
3" = 1'-0"



4 HEAD CONDITION AT NEW PARTITION WALL STC 50
3" = 1'-0"

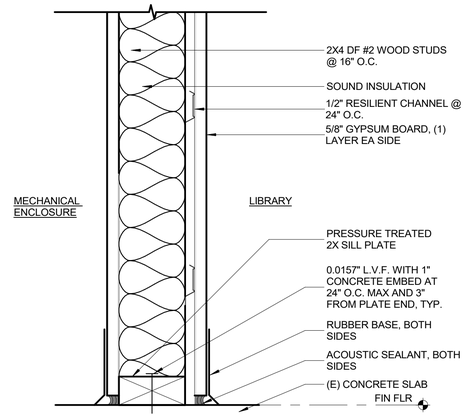


1 FURRING AT CORRIDOR CHASE
1 1/2" = 1'-0"

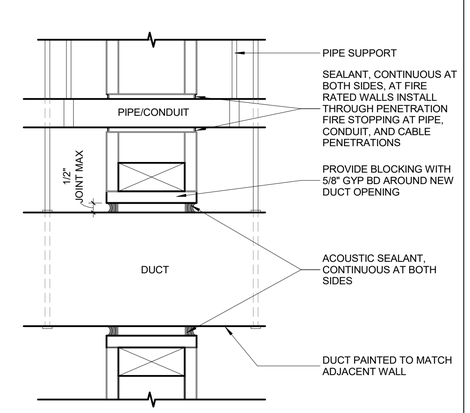


8 HM JAMB AT DOOR
3" = 1'-0"

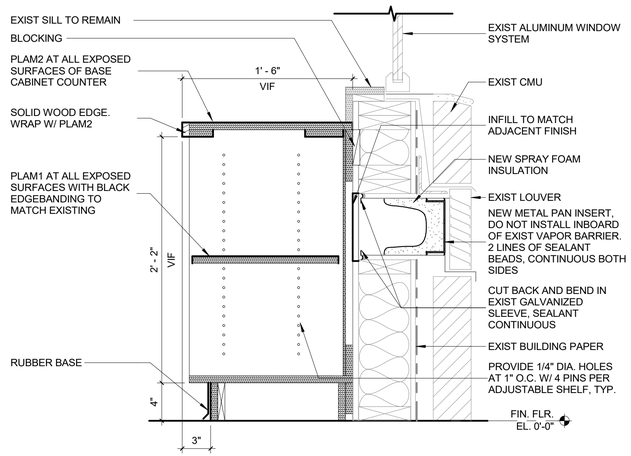
INTERIOR FINISH SCHEDULE		
MATERIAL	LOCATION	BASIS OF DESIGN
PT1	LIBRARY INTERIOR WALLS & EXPOSED DUCTWORK	NO. 8308 "WHISPERING SMOKE"
PT2	LIBRARY DOOR AND FRAME	NO. OW135 "DUBAI SAND"
PT3	CLASSROOM AND HALLWAY WALLS	NO. OW121 "LITTLE FLOWER"
RUBBER BASE	LIBRARY BASE CABINET TOE KICK AND INTERIOR WALLS	HEIGHT: 4", PROFILE: COVE, COLOR: BLACK
PLAM1	LIBRARY BASE CABINET PANELS AND SHELVES	WILSONART NO. D403-60 "WHITE SAND", MATTE. W/ BLACK EDGEBANDING
PLAM2	LIBRARY BASE CABINET COUNTER TOP	MATCH EXISTING



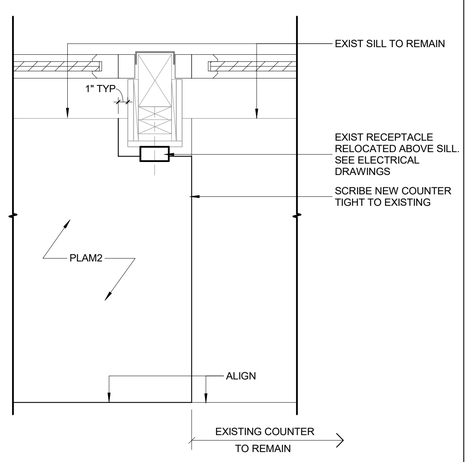
5 BASE CONDITION AT NEW PARTITION WALL STC 50
3" = 1'-0"



2 TYP PENETRATION AT EXIST PARTITION
3" = 1'-0"



6 BASE CABINET @ EXIST LOUVER
1 1/2" = 1'-0"



3 BASE CABINET - TOP @ EXIST COLUMN
1 1/2" = 1'-0"

BID/PERMIT DOCUMENTS

REGISTERED ARCHITECT
THOMAS ROBBINS
Portland, OR
6448
STATE OF OREGON

YOST GRUBE HALL
ARCHITECTURE
707 SW Washington Street | Suite 1200 | Portland, OR 97205
t 503 221 0150 f 503 295 0840

Owner
BEAVERTON SCHOOL DISTRICT
CENTRAL ADMINISTRATION CENTER
16550 MERLO ROAD
BEAVERTON, OREGON 97003

Project
BSD RALEIGH PARK HVAC AND ELECTRICAL UPGRADE
RALEIGH PARK ELEMENTARY SCHOOL
3670 SW 78TH AVE
PORTLAND, OR 97225

MARK	DATE	DESCRIPTION

Sheet Title
INTERIOR DETAILS

Drawing No.
A9.10

Scale As indicated

Date MARCH 04, 2020

Project No. 19-0012

3/4/2020 1:46:28 PM

GENERAL STRUCTURAL NOTES

GENERAL NOTES:

1. ALL CONSTRUCTION AND DESIGN SHALL CONFORM TO THE 2018 INTERNATIONAL BUILDING CODE AS AMENDED BY THE STATE OF OREGON, 2019 OREGON STRUCTURAL SPECIALTY CODE (OSSC)

2. THE STRUCTURAL DRAWINGS SHALL BE UTILIZED IN CONJUNCTION WITH OTHER DESIGN CONSULTANT'S DRAWINGS (ARCHITECTURAL, MECHANICAL, ETC.), IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE THE REQUIREMENTS OF THE DRAWINGS INTO THEIR SHOP DRAWINGS AND CONSTRUCTION.

3. THE GENERAL STRUCTURAL NOTES ARE INTENDED FOR USE IN CONJUNCTION WITH THE PROJECT SPECIFICATIONS. IN THE EVENT OF A CONFLICT BETWEEN THE TWO, THE GENERAL STRUCTURAL NOTES SHALL SUPERSEDE THE PROJECT SPECIFICATIONS. ANY DISCREPANCY SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT AND ENGINEER.

4. CONSTRUCTION SEQUENCE AND METHODS:

   A. THE STRUCTURAL DRAWINGS ARE INTENDED FOR THE STRUCTURE TO ACT AS A WHOLE ONCE CONSTRUCTION IS COMPLETE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE SAFETY AND STABILITY (I.E. TEMPORARY BRACING IF REQUIRED) DURING CONSTRUCTION AS A RESULT OF CONSTRUCTION METHODS AND SEQUENCES.

   B. THE CONTRACTOR SHALL TAKE INTO ACCOUNT COLD WEATHER CONSTRUCTION AND THE EFFECTS OF THERMAL MOVEMENT DURING THE CONSTRUCTION SCHEDULE.

5. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS. THE ARCHITECT AND/OR ENGINEER SHALL BE NOTIFIED OF ANY DISCREPANCY BETWEEN THE EXISTING CONDITIONS AND CONSTRUCTION DOCUMENTS.

6. SUBMITTALS:

   A. SEISMIC BRACING AND RESTRAINT TO THE STRUCTURE OF ANY MEP EQUIPMENT, MACHINERY, AND ASSOCIATED PIPING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. CONNECTIONS NOT IN COMPLIANCE WITH SMACNA (SHEET METAL AND AIR CONDITIONING CONTRACTOR'S NATIONAL ASSOCIATION) OR THE MEP DESIGN DRAWINGS, SHALL BEAR THE SEAL OF A REGISTERED ENGINEER IN THE STATE OF OREGON AND SHALL BE SUBMITTED ALONG WITH CALCULATIONS TO THE ARCHITECT FOR APPROVAL PRIOR TO FABRICATION.

   B. SUBMITTAL TABLE

SUBMITTAL TABLE			
ITEM	SUBMITTAL (1) (3)	DEFERRED SUBMITTAL (2) (3)	COMMENTS
CONCRETE MIX DESIGNS	X		
CONCRETE AND MASONRY REINFORCEMENT (INCLUDING MILL TEST REPORTS)	X		

SUBMITTAL TABLE NOTES:

(1) SHOP DRAWINGS SHALL BE SUBMITTED TO THE ARCHITECT PRIOR TO FABRICATION AND CONSTRUCTION OF STRUCTURAL ITEMS. IF THE SHOP DRAWINGS DIFFER FROM OR ADD TO THE DESIGN OF THE STRUCTURAL DRAWINGS, THEY SHALL BEAR THE SEAL AND SIGNATURE OF A STRUCTURAL ENGINEER REGISTERED IN THE STATE OF OREGON. ANY CHANGES TO THE STRUCTURAL DRAWINGS SHALL BE SUBMITTED TO THE ARCHITECT AND ARE SUBJECT TO REVIEW AND ACCEPTANCE OF THE STRUCTURAL ENGINEER.

(2) DESIGN DRAWINGS, SHOP DRAWINGS, AND CALCULATIONS FOR THE DESIGN AND FABRICATION OF ITEMS THAT ARE DESIGNED BY OTHERS SHALL BEAR THE SEAL AND SIGNATURE OF A STRUCTURAL ENGINEER REGISTERED IN THE STATE OF OREGON, AND SHALL BE SUBMITTED TO THE ARCHITECT PRIOR TO FABRICATION. CALCULATIONS AND BIDDER DESIGN DRAWINGS SHALL INCLUDE THE DESIGN, CONNECTION TO THE STRUCTURE, AND ACCOUNTING OF ANY LOCALIZED EFFECTS THE CONNECTIONS OR SYSTEMS MAY INDUCE ON THE STRUCTURE. DESIGN SHALL BE BASED ON THE REQUIREMENTS OF THE OSSC AND AS NOTED UNDER "DESIGN CRITERIA."

(3) THE USE OF REPRODUCTIONS OR PHOTO COPIES OF THE CONTRACT DRAWINGS SHALL NOT BE PERMITTED. WHEN CAD OR REVIT FILES ARE PROVIDED TO THE CONTRACTORS, IT IS THE RESPONSIBILITY OF THE DETAILERS TO REMOVE ALL INFORMATION NOT DIRECTLY RELEVANT TO THE CREATION OF THE PLACING DRAWINGS AS WELL AS ALL REFERENCES TO THE OUTSIDE SOURCE FILES..

7. DESIGN CRITERIA:

   A. CODE: 2018 INTERNATIONAL BUILDING CODE AS AMENDED BY THE STATE OF OREGON (2019 OSSC).

   B. LOADS AND DESIGN CRITERIA: THE FOLLOWING LIVE LOADS AND CRITERIA WERE USED IN ADDITION TO THE DEAD LOAD OF THE STRUCTURE.

   LIVE LOADS:

   ROOF..... 25 PSF

   SOIL CRITERIA: (PER ORIGINAL DESIGN CRITERIA)

   ALLOW. SOIL BEARING VALUES 2000 PSF
   RETAINING WALLS
   FRICTION COEFFICIENT..... 0.20

   LATERAL CRITERIA:

   WIND.....V$_{ult}$ = 105 MPH, EXPOSURE B
   SEISMIC..... Ip = 1.0 RISK CATEGORY III
   S_s = 0.892g S_1 = 0.404g
   SITE CLASS D (PER IBC 1613.2.3 DEFAULT)
   S_{ms} = 0.713g S_{m1} = 0.392g
   SEISMIC DESIGN CATEGORY D

CONCRETE AND REINFORCING STEEL:

1. CONCRETE CONSTRUCTION SHALL CONFORM TO ACI 318-14 AND THE 2018 INTERNATIONAL BUILDING CODE AS AMENDED BY THE STATE OF OREGON.

2. THE MINIMUM 28 DAY CONCRETE STRENGTHS SHALL BE AS FOLLOWS:

   f'c = 3000 PSI..... FOR ALL USES UNLESS NOTED OTHERWISE

3. CONCRETE MIX DESIGNS, ALONG WITH TEST DATA AS REQUIRED, SHALL BE SUBMITTED BY THE CONTRACTOR AN ADEQUATE AMOUNT OF TIME PRIOR TO CONCRETE POURS. ALL HORIZONTALLY EXPOSED SURFACES SHALL HAVE MIX DESIGNS SUBMITTED WITH AN AIR ENTRAINMENT ADMIXTURE INCLUDED.

4. A 20% MAXIMUM OF THE CEMENT CONTENT MAY BY SUBSTITUTED WITH FLYASH CONFORMING TO ASTM C618, TYPE F OR C. HIGHER PERCENTAGES OF FLYASH MAY BE UTILIZED WITH ACCEPTANCE AND APPROVAL BY THE STRUCTURAL ENGINEER. ANY CONCRETE MIX UTILIZING FLYASH SHALL BE VERIFIED WITH TEST DATA.

5. ADDITIONAL WATER SHALL NOT BE ADDED TO THE CONCRETE MIX AT THE JOBSITE. WATER REDUCING ADMIXTURES CONFORMING TO ASTM C494 MAY BE UTILIZED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

6. IF CONCRETE IS TO BE POURED AGAINST AN EXISTING CONCRETE SURFACE, THE EXISTING SURFACE SHALL BE CLEANED AND ROUGHENED TO A MIN. 1/4" AMPLITUDE.

7. SLEEVES, OPENINGS, CONDUITS, AND OTHER EMBEDDED ITEMS NOT SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE APPROVED BY THE STRUCTURAL ENGINEER BEFORE POURING. CONDUITS EMBEDDED IN SLABS SHALL NOT BE LARGER IN OUTSIDE DIAMETER THAN ONE THIRD THE THICKNESS OF THE SLAB AND SHALL NOT BE SPACED CLOSER THAN THREE DIAMETERS ON CENTER. PROVIDE 3/4" CHAMFERS ON ALL EXPOSED CONCRETE EDGES UNLESS NOTED OTHERWISE.

8. REINFORCING STEEL:

   A. REINFORCING STEEL SHALL BE DETAILED, FABRICATED, AND INSTALLED ACCORDING TO THE "MANUAL OF STANDARD PRACTICE OF REINFORCED CONCRETE CONSTRUCTION" BY THE CONCRETE REINFORCING STEEL INSTITUTE (CRSI).

   B. REINFORCING STEEL SHALL CONFORM TO ASTM A615, GRADE 60.

   C. ALL LAP SPLICES OF REINFORCEMENT SHALL BE 55 BAR DIAMETERS UNLESS NOTED OTHERWISE.

   G. UNLESS NOTED OTHERWISE, REINFORCING STEEL SHALL HAVE THE MINIMUM COVER OR PROTECTION FOR THE FOLLOWING USES AS NOTED BELOW:

   EXTERIIOR SLABS ON GRADE.....3"

   FOOTINGS..... 3"

9. ADDITIONAL CONCRETE ITEMS

   A. WEDGE ANCHORS OR EXPANSION BOLTS SHALL BE HILTI KB-TZ OR AN APPROVED EQUAL SUBMITTED WITH ICC REPORTS TO THE ENGINEER FOR REVIEW.

   B. EPOXY ANCHORS OR DOWELS SHALL BE INSTALLED WITH HILTI HIT-RE 500-V3 EPOXY IN CONCRETE. AN APPROVED EQUAL MAY BE SUBMITTED TO THE ENGINEER FOR APPROVAL.

10. POST-INSTALLED CONCRETE ANCHORS

    A. WHERE THE AUTHORITY HAVING JURISDICTION OVER THIS PROJECT REQUIRES ADHERENCE TO ACI 318-14 SECTION 17.8.2.2, MANUFACTURER'S FIELD REPRESENTATIVE SHALL PROVIDE INSTALLATION TRAINING FOR ALL PRODUCTS TO BE USED PRIOR TO THE COMMENCEMENT OF WORK. ONLY TRAINED INSTALLERS SHALL PERFORM POST INSTALLED ANCHOR INSTALLATION. A RECORD OF TRAINING SHALL BE KEPT ON SITE AND BE MADE AVAILABLE TO THE ENGINEER OF RECORD AS REQUIRED.

    ADHESIVE ANCHORS SHALL BE INSTALLED IN CONCRETE HAVING A MINIMUM AGE OF 21 DAYS AT THE TIME OF ANCHOR INSTALLATION IN ACCORDANCE WITH ACI 318-14 17.4.5.2.

    WHERE THE AUTHORITY HAVING JURISDICTION OVER THIS PROJECT REQUIRES ADHERENCE TO THE ACI 318-14, SECTION D.17.8.2.2 INSTALLATION OF ADHESIVE ANCHORS IN HORIZONTAL TO VERTICALLY OVERHEAD ORIENTATION SHALL BE DONE BY A CERTIFIED ADHESIVE ANCHOR INSTALL (AAI) AS CERTIFIED THROUGH ACI AND IN ACCORDANCE WITH ACI 318-2014 (SECTION 17.8.2.2). PROOF OF CURRENT CERTIFICATION SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO COMMENCEMENT OF INSTALLATION.

SAWN LUMBER:

1. ALL WOOD FRAMING MEMBERS INCLUDING BUT NOT LIMITED TO WALL STUDS AND JOISTS, ARE INTENDED TO ACT AS A SYSTEM AS DETAILED IN THE STRUCTURAL DRAWINGS AND ONCE CONSTRUCTION IS COMPLETE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE SAFETY AND STABILITY OF WOOD FRAMING SYSTEMS (I.E. TEMPORARY BRACING IF REQUIRED) DURING CONSTRUCTION AS A RESULT OF CONSTRUCTION METHODS AND SEQUENCES.

2. ALL SAWN LUMBER SHALL CONFORM TO THE WESTERN WOOD PRODUCTS ASSOCIATION OR THE WEST COAST LUMBER INSPECTION BUREAU GRADING RULES. LUMBER SHALL BE OF THE SPECIES AND GRADE SHOWN BELOW:

MEMBER	GRADE
2x AND 4x FRAMING	DOUGLAS FIR-LARCH NO. 2
5x AND GREATER BEAMS	DOUGLAS FIR-LARCH NO. 1

3. STORAGE OF ALL LUMBER AND TIMBER ON SITE SHALL BE KEPT OFF GROUND, UNDER COVER AND PROTECTED FROM DAMAGE.

4. ALL DIMENSIONAL LUMBER SHALL BE CERTIFIED BY THE SUPPLIER IN WRITING TO BE KILN DRIED.

5. ALL TIMBER SHALL BE CERTIFIED BY THE SUPPLIER IN WRITING TO BE LESS THAN 19% MOISTURE CONTENT.

6. ALL LUMBER IN CONTACT WITH THE GROUND, CONCRETE OR CMU SHALL BE PRESSURE TREATED. CONTRACTOR MAY SUBMIT FOR APPROVAL, A MOISTURE BARRIER IN-LIEU OF THE PRESSURE TREATED WOOD.

7. FASTENERS FOR PRESERVATIVE-TREATED AND FIRE-RETARDANT-TREATED WOOD SHALL BE OF HOT-DIPPED ZINC-COATED GALVANIZED STEEL, OR STAINLESS STEEL.

8. ALL PLATES AND LEDGERS SHALL BE FASTENED WITH A MINIMUM (3) ANCHORS PER PIECE.

9. ALL METAL HARDWARE AND FRAMING ACCESSORIES SHALL BE MANUFACTURED BY SIMPSON STRONG-TIE COMPANY, SUBSTITUTIONS SHALL NOT BE MADE. ALL ITEMS SHALL BE INSTALLED PER THE MANUFACTURERS INSTALLATION REQUIREMENTS. ALL NAIL HOLES SHALL BE FILLED WITH THE RECOMMENDED FASTENER UNLESS NOTED OTHERWISE ON THE DRAWINGS.

10. HOLES FOR BOLTS SHALL BE DRILLED WITH A BIT OF THE SAME NOMINAL DIAMETER AS THE BOLT + 1/16". LEAD HOLES FOR LAG SCREWS SHALL BE BORED PER NDS 11.1.3

DRAWING INDEX

SAWN LUMBER CONTINUED:

11. ALL BOLTS, CARRIAGE BOLTS, LAG SCREWS, EXPANSION BOLTS AND EPOXY BOLTS SHALL BE INSTALLED WITH STANDARD CUT WASHERS UNDER THE BOLT HEADS AND NUTS THAT BEAR DIRECTLY ON THE WOOD. ALL NUTS SHALL BE TIGHTENED AT THE TIME OF INSTALLATION AND RE-TIGHTENED IF NECESSARY, DUE TO WOOD SHRINKAGE, PRIOR TO CLOSE-IN OR AT THE COMPLETION OF THE PROJECT. BOLTS AND LAG SCREWS SHALL CONFORM TO ANSI/ASME STANDARD B18.2.1-1996.

12. WOOD SYMBOLS:

CONTINUOUS

BLOCKING

13. ALL NAILS FOR STRUCTURAL WORK SHALL BE COMMON WIRE NAILS UNLESS NOTED OR DETAILED OTHERWISE. HOLES SHALL BE PRE-DRILLED WHERE NECESSARY TO PREVENT SPLITTING. NAILING NOT SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE PER THE NAILING SCHEDULE BELOW:

NAIL TYPE	SHANK DIAMETER - INCHES	MINIMUM PENETRATION - INCHES
6d	0.113	1.13
8d	0.131	1.31
10d	0.148	1.48
12d	0.148	1.48
16d	0.162	1.63
20d	0.192	1.92

NAILING SCHEDULE

A.	JOIST SITTING ON SILL OR GIRDER.....	(3) 8d TOENAILS, EA. SIDE
B.	BRIDGING TO JOIST.....	(2) 8d TOENAILS, EA. SIDE, EA. END
C.	TOP PLATE TO STUD.....	(2) 16d END NAILS
D.	STUD TO SILL PLATE.....	(2) 16d END NAILS OR (4) 8d TOE NAILS
E.	DOUBLE STUDS.....	16d AT 24" o.c.
F.	DOUBLE TOP PLATES - BETWEEN SPLICE NAILING.....	16d AT 16" o.c. FACE NAILS
G.	DOUBLE TOP PLATES - EACH SIDE OF SPLICED PLATE.....	(8) 16d
H.	BLOCKING TO TOP PLATE.....	(3) 8d TOE NAILS EACH SIDE
I.	RIM JOIST TO TOP PLATE OR SILL PLATE.....	8d TOENAILS AT 6" o.c.
J.	CONTINUOUS (2) AND (3) PIECE HEADERS.....	16d AT 16" o.c. ALONG EACH EDGE
K.	CEILING JOIST LAPS OVER PARTITIONS.....	(3) 16d FACE NAILS, MINIMUM
L.	RAFTER TO TOP PLATE OR SILL PLATE.....	(3) 8d TOENAILS EACH SIDE
M.	BUILT-UP CORNER STUDS.....	16d AT 24" o.c.
N.	TONGUE AND GROOVE DECKING.....	(2) 16d AT EACH BEARING
P.	CROSS BRIDGING.....	(2) 10d EACH END

NAILING SCHEDULE NOTES:
1. ALL OTHER NAILING REQUIREMENTS NOT SHOWN ON DRAWINGS OR IN SCHEDULE ABOVE SHALL BE IN ACCORDANCE WITH 2019 IBC TABLE 2304.10.1.

2. POWER DRIVEN OR PNUEMATIC NAILS OTHER THAN COMMON NAILS MAY BE USED IF DATA IS SUBMITTED TO THE ARCHITECT/ENGINEER FOR APPROVAL PRIOR TO USE.

3. MINIMUM NAIL LENGTHS SHALL BE SUFFICIENT TO ACHIEVE MINIMUM PENETRATION INTO MAIN MEMBER AS NOTED IN SCHEDULE ABOVE.

BID/PERMIT DOCUMENTS

STRUCTURAL REGISTERED PROFESSIONAL ENGINEER 19,495PE OREGON NOV. 18, 1997 CLINTON J. AMBROSE
EXPIRES 12-31-21

YOST GRUBE HALL ARCHITECTURE
707 SW Washington Street | Suite 1200 | Portland, OR 97205
t 503 221 0150 f 503 295 0840

Owner
BEAVERTON SCHOOL DISTRICT
CENTRAL ADMINISTRATION CENTER
16550 MERLO ROAD
BEAVERTON, OREGON 97003

Project
BSD RALEIGH PARK HVAC AND ELECTRICAL UPGRADE
RALEIGH PARK ELEMENTARY SCHOOL
3670 SW 78TH AVE
PORTLAND, OR 97225

MARK	DATE	DESCRIPTION

Sheet Title
FIRST FLOOR PLAN

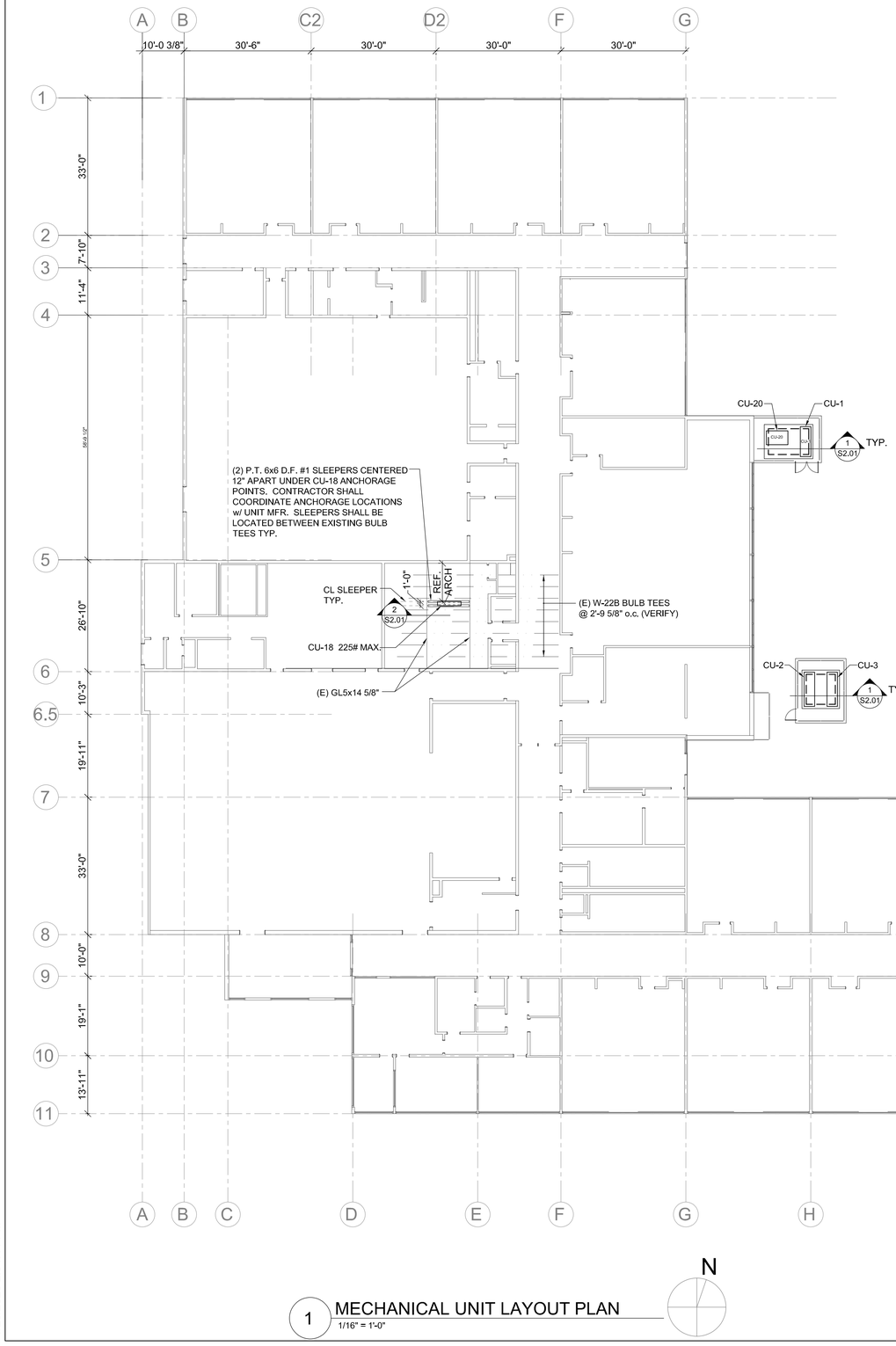
Drawing No.
S0.01

Scale NONE

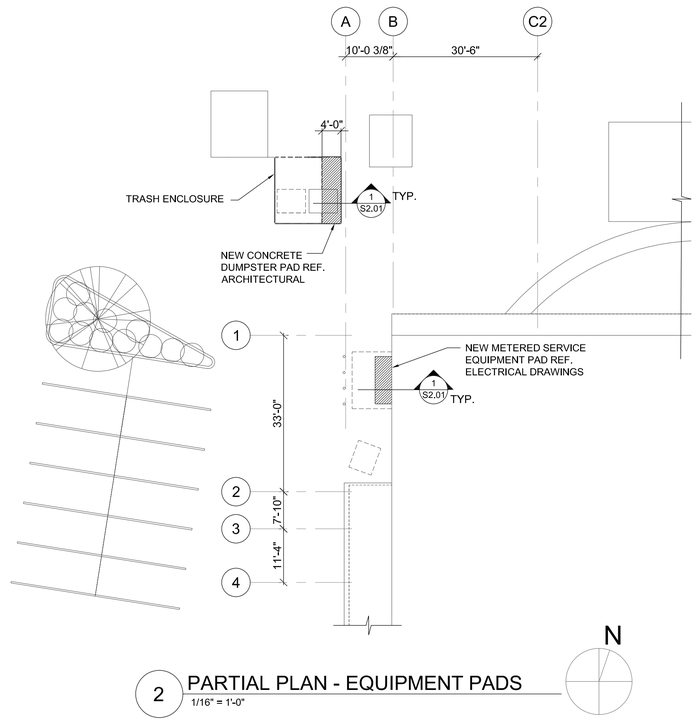
Date MARCH 04, 2020

Project No. 116619

1/20/2020 2:54:44 PM

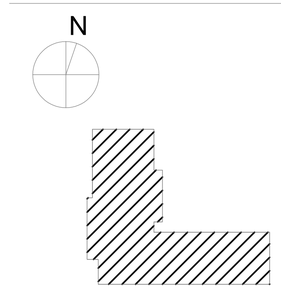


1 MECHANICAL UNIT LAYOUT PLAN
1/16" = 1'-0"



2 PARTIAL PLAN - EQUIPMENT PADS
1/16" = 1'-0"

KEY PLAN



BID/PERMIT DOCUMENTS

STRUCTURAL
REGISTERED PROFESSIONAL ENGINEER
19.495PE
OREGON
NOV 18, 1987
CLINTON J. AMBROSE
EXPIRES 12-31-21

YOST GRUBE HALL
ARCHITECTURE
707 SW Washington Street | Suite 1200 | Portland, OR 97205
t 503 221 0150 f 503 295 0840

Owner
BEAVERTON SCHOOL DISTRICT
CENTRAL ADMINISTRATION CENTER
16550 MERLO ROAD
BEAVERTON, OREGON 97003

Project
BSD RALEIGH PARK HVAC AND ELECTRICAL UPGRADE
RALEIGH PARK ELEMENTARY SCHOOL
3670 SW 78TH AVE
PORTLAND, OR 97225

MARK	DATE	DESCRIPTION

Sheet Title
FIRST FLOOR PLAN

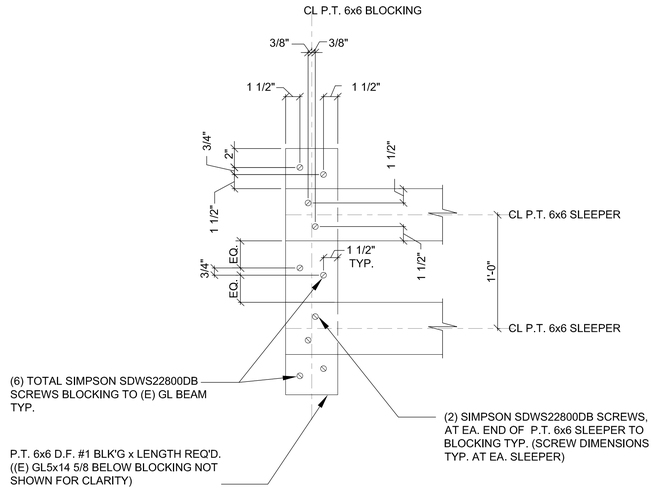
Drawing No.
S1.01

Scale 1/16"=1'-0"

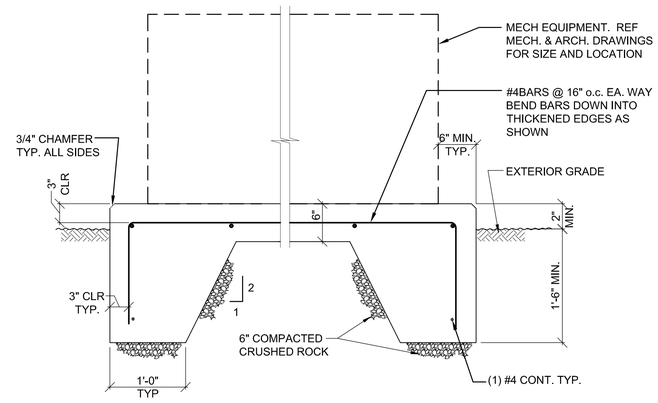
Date MARCH 04, 2020

Project No. 16619

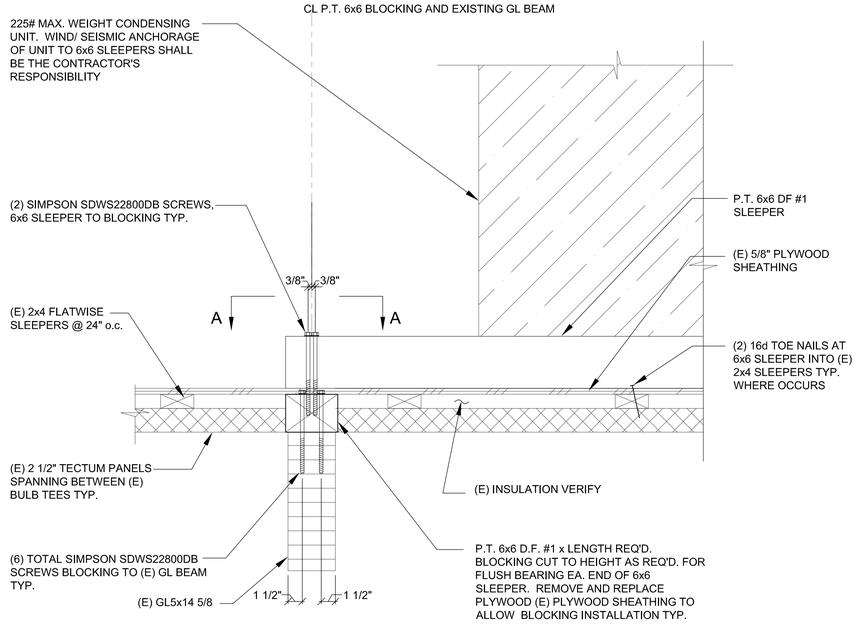
1/20/2020 2:54:44 PM



SECTION A-A



1 SECTION AT TYP. EXTERIOR EQUIPMENT PAD
1"=1'-0"



2 PT SLEEPER TO ROOF CONNECTION AT CONDENSING UNIT
1 1/2"=1'-0"

BID/PERMIT DOCUMENTS

1/20/2020 2:54:44 PM

STRUCTURAL REGISTERED PROFESSIONAL ENGINEER 19,495PE OREGON NOV. 18, 1982 CLINTON J. AMBROSE
EXPIRES 12-31-21

YOST GRUBE HALL ARCHITECTURE
707 SW Washington Street | Suite 1200 | Portland, OR 97205
t 503 221 0150 f 503 295 0840

Owner
BEAVERTON SCHOOL DISTRICT
CENTRAL ADMINISTRATION CENTER
16550 MERLO ROAD
BEAVERTON, OREGON 97003

Project
BSD RALEIGH PARK HVAC AND ELECTRICAL UPGRADE
RALEIGH PARK ELEMENTARY SCHOOL
3670 SW 78TH AVE
PORTLAND, OR 97225

MARK	DATE	DESCRIPTION

Sheet Title
SECTIONS AND DETAILS

Drawing No.
S2.01

Scale AS NOTED

Date MARCH 04, 2020

Project No. 116619

MECHANICAL - GENERAL NOTES

1. COORDINATE LOCATION/INSTALLATION OF MECHANICAL AND ELECTRICAL WORK WITH ALL OTHER TRADES. NO ASPECT OF A SYSTEM INSTALLATION OR ITS ROUGH-IN SHALL COMMENCE UNTIL PROPER AND TIMELY COORDINATION WITH ALL TRADES ASSOCIATED WITH THE INSTALLATION. ITEMS TO BE COORDINATED SHALL INCLUDE BUT NOT BE LIMITED TO: BUILDING STRUCTURE, SHEET METAL, ALL PIPING SYSTEMS, LIGHT FIXTURES, CONDUITS, CABLE TRAYS, ETC. REFER TO ALL GENERAL, MECHANICAL, AND ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR THIS PROJECT. ANY REWORK OF INSTALLED EQUIPMENT WILL BE AT CONTRACTORS EXPENSE.
2. INCORPORATE INTO INSTALLATION MECHANICAL SPECIFICATIONS, DRAWINGS, STATE AND LOCAL CODES, AND OTHER APPLICABLE REQUIREMENTS.
3. **WARNING - CALL BEFORE YOU DIG: LAW REQUIRES ANYONE DOING ANY EXCAVATION, FENCING, PLANTING OR DRILLING TO CALL IN ADVANCE. HAND DIG WITHIN 18 INCHES OF ANY LOCATE MARK OR FLAG.**
4. ON COMPLETION OF THE INSTALLATION, MECHANICAL CONTRACTOR SHALL COOPERATE WITH THE OWNER TO PROVIDE ANY NECESSARY ADJUSTING AND BALANCING TO OBTAIN PROPER OPERATION OF ALL EQUIPMENT AND SYSTEMS. CONTRACTOR SHALL PROVIDE ALL FACILITIES AND EQUIPMENT, AND MAKE ALL TESTS, REQUIRED FOR ADJUSTMENTS AND BALANCING TO ESTABLISH THE PROPER PERFORMANCE OF ANY PIECE OF EQUIPMENT.
5. REFER TO ARCHITECTURAL SPECIFICATIONS FOR FIRESTOPPING AND TO ARCHITECTURAL CODE PLAN FOR FIRE RATED WALLS AND FLOORS. EACH TRADE IS RESPONSIBLE TO FIRESTOP PENETRATIONS THROUGH RATED ASSEMBLIES.
6. EACH TRADE IS RESPONSIBLE TO MAKE PENETRATIONS WHERE REQUIRED IN EXISTING WALLS, FLOORS, AND CEILINGS. PENETRATIONS SHALL BE NEAT. ANY OVERCUT SHALL BE CONCEALED OR CAULKED.
7. ALL EXPOSED WALL PENETRATIONS SHALL BE COVERED BY ESCUTCHEONS OR SHEET METAL AS APPROPRIATE.
8. ALL CONCEALED AND EXPOSED PIPING AND DUCT WALL PENETRATIONS SHALL BE CAULKED TO PREVENT NOISE TRANSFER BETWEEN SPACES.
9. CONTRACTOR SHALL BE RESPONSIBLE TO CREATE NECESSARY OPENINGS TO THE BUILDING TO REMOVE EXISTING ITEMS AND TO BRING IN NEW EQUIPMENT. ALL OPENINGS CREATED SHALL BE PATCHED AND FINISHED WITH MATERIALS TO MATCH EXISTING CONDITIONS.

HVAC - NOTES

1. CONTRACTOR TO COORDINATE INSTALLATION WITH ALL OTHER TRADES AS DESCRIBED IN MECHANICAL GENERAL NOTE #1.
2. MECHANICAL CONTRACTOR TO PROVIDE A COMPLETE HVAC SYSTEM, INCLUDING SUPPLY, RETURN, EXHAUST, AND VENTILATION DUCTWORK, MECHANICAL EQUIPMENT, SUPPORTS, HANGERS, DIFFUSERS, GRILLES, REGISTERS, AND ALL APPURTENANCES. INSTALL ALL EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS. INSTALL SYSTEM TO MEET ALL CITY AND STATE CODES AND REQUIREMENTS.
3. DRAWING PLANS, SCHEMATICS, AND DIAGRAMS INDICATE GENERAL LOCATION AND ARRANGEMENT OF DUCT SYSTEM. INDICATED DUCT LOCATIONS, CONFIGURATIONS, AND ARRANGEMENTS WERE USED TO SIZE DUCTS AND CALCULATE FRICTION LOSS FOR AIR-HANDLING EQUIPMENT SIZING AND FOR OTHER DESIGN CONSIDERATIONS. INSTALL DUCT SYSTEMS AS INDICATED UNLESS DEVIATIONS TO LAYOUT ARE APPROVED ON SHOP DRAWINGS AND COORDINATION DRAWINGS.
4. ALL DUCT DIMENSIONS LISTED ARE INTERIOR FREE AREA DUCT DIMENSIONS AND DO NOT INCLUDE INSULATION REQUIREMENTS.
5. CONTRACTOR TO SEAL ALL WALL DUCT PENETRATIONS. PROVIDE FIRE CAULKING ASSEMBLIES FOR PENETRATIONS OF RATED WALLS. REFER TO ARCHITECTURAL DRAWINGS FOR WALL RATINGS. DUCT INSULATION TO CONTINUE THRU WALL PENETRATIONS UNBROKEN, EXCEPT WHERE FIRE OR FIRE/SMOKE DAMPERS ARE INSTALLED. SEAL AROUND DUCT INSULATION AT WALL PENETRATIONS.

MECHANICAL – DEMOLITION NOTES

1. MECHANICAL DEMOLITION DRAWINGS SHOWING EXISTING CONDITIONS HAVE BEEN PREPARED BASED ON FIELD OBSERVATION AND ORIGINAL DRAWINGS. ADDITIONAL COMPONENTS MAY EXIST, WHICH MAY NOT BE SHOWN, AND SUCH ITEMS SHALL BE DEALT WITH IN A MANNER SIMILAR TO THOSE ITEMS WHICH DO SHOW. CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH EXISTING CONDITIONS.
2. BE FAMILIAR WITH EXISTING MECHANICAL SYSTEMS WHICH WILL BE AFFECTED BY THE DEMOLITION WORK. OBTAIN PERMISSION FROM OWNER'S REPRESENTATIVE TO SHUT OFF SERVICES OR SYSTEMS WHICH MAY AFFECT OTHER AREAS BEYOND THE LIMITS OF THE IMMEDIATE DEMOLITION AREA.
3. PIPING, HANGERS, DUCTWORK, GRILLES, REGISTERS, DIFFUSERS, ETC., SHOWN ON PLANS SHALL BE REMOVED UNLESS NOTED OTHERWISE. REMOVAL SHALL BE DONE IN A TIMELY MANNER IN ACCORDANCE WITH THE GENERAL DEMOLITION WORK. COORDINATE WITH THE OWNER AND OTHER CONTRACTORS.
4. EQUIPMENT AND/OR MATERIALS SCHEDULED FOR ABANDONMENT AND REMOVAL ARE TO BECOME CONTRACTOR'S SALVAGE AND SHALL BE HAULED AWAY FROM THE SITE PROMPTLY. EXCEPTION SHALL BE THE EQUIPMENT LISTED FOR DISTRICT SALVAGE.
5. REMOVE ALL ABANDONED PIPING AND DUCTWORK. REFER TO ARCH PLANS FOR CEILINGS TO BE REMOVED.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH REPAIR OR REPLACEMENT OF TELECOMMUNICATIONS FACILITIES OR EQUIPMENT FOUND TO BE DAMAGED OR NON-FUNCTIONAL AFTER SUBSTANTIAL COMPLETION.

H.V.A.C. / DUCTWORK SYMBOLS

RECT. RND.	SUPPLY (SA), OUTSIDE (OA), VENTILATION (VA) AIR DUCT (UP/DOWN/SECTION)
	RETURN (RA) AIR DUCT (UP/DOWN/SECTION)
	EXHAUST (EA) AIR DUCT (UP/DOWN/SECTION)
10x6 SA	RECTANGULAR DUCT (WIDTH/HEIGHT/SYSTEM)
10 Ø SA	ROUND DUCT (DIAMETER/SYSTEM)
10/6 Ø SA	FLAT OVAL DUCT (WIDTH/HEIGHT/SYSTEM)
	SUPPLY DIFFUSER
	SUPPLY REGISTER OR GRILLE
	RETURN REGISTER OR GRILLE
	EXHAUST REGISTER OR GRILLE
AD	DUCT ACCESS DOOR
	DUCT END CAP
	TURNING VANES
	FLEXIBLE DUCTWORK
R	ELEVATION CHANGE (RISE OR DROP)
	HIGH EFF. TAKE OFF FITTING w/ VOLUME DAMPER
BD	BACKDRAFT DAMPER
	OPPOSED BLADE DAMPER
	PARALLEL BLADE DAMPER
	VOLUME CONTROL DAMPER
FD	FIRE DAMPER
SD	SMOKE DAMPER
FSD	FIRE/SMOKE DAMPER
M	MOTORIZED ACTUATOR
T	THERMOSTAT
C	CARBON DIOXIDE SENSOR
	SIDE WALL DIFFUSER
	ROUND DIFFUSER
	EXTERIOR LOUVER
X - #	FIXTURE IDENTIFICATION TAG
#x#/CFM	NECK SIZE / CFM

MECHANICAL ABBREVIATIONS

ABSOR	ABSORPTION
ACU	AIR CONDITIONING UNIT
AD	ACCESS DOOR OR AREA DRAIN
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHU	AIR HANDLING UNIT
AV	AIR VENT
BOT	BOTTOM
BTU	BRITISH THERMAL UNIT
BTUH	BTU PER HOUR
BV	BALL VALVE
CA	COMPRESSED AIR
CB	CATCH BASIN
CENT	CENTRIFUGAL
CFM	CUBIC FEET PER MINUTE
CI	CAST IRON
CL	CENTER LINE
COND	CONDENSATE
CO	CLEAN OUT
CONC	CONCRETE
CONTR	CONTRACTOR
CP	CONDENSATE PUMP/CIRC. PUMP
CU	COPPER
CUH	CABINET UNIT HEATER
CWP	CIRCULATING WATER PUMP
DDC	DIRECT DIGITAL CONTROLS
DN	DOWN
DR	DRAIN
DS	DOWNSPOUT
EA	EXHAUST AIR
EAT	EXHAUST AIR TEMPERATURE
EC	ELECTRICAL CONTRACTOR
EDBT	ENTERING DRY BULB TEMPERATURE
EEW	EMERGENCY EYE WASH
EF	EXHAUST FAN
EJ	EXPANSION JOINT
EQUIP	EQUIPMENT
ESE	EMERGENCY SHOWER / EYEWASH
EST	EXTERNAL STATIC PRESSURE
EWBT	ENTERING WET BULB TEMPERATURE
EWC	ELECTRIC WATER COOLER
EWT	ENTERING WATER TEMPERATURE
EX	EXISTING
EXH	EXHAUST
EXP	EXPANSION
FAI	FRESH AIR INTAKE
FCU	FAN COIL UNIT
FD	FLOOR DRAIN
FDC	FIRE DEPARTMENT CONNECTION
FLEX	FLEXIBLE
FLR	FLOOR
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FS	FLOOR SINK
FT	FINTUBE
FTG	FOOTING
GA	GAGE
GAL	GALLON
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GW	GREASE WASTE
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
HR	HOUR
HTG	HEATING
HB	HOSE BIBB
ISP	INTERNAL STATIC PRESSURE
JR	JANITOR RECEPTOR
LAV	LAVATORY
LDBT	LEAVING DRY BULB TEMPERATURE
LWT	LEAVING WATER TEMPERATURE
LWBT	LEAVING WET BULB TEMPERATURE
MB	MOP BASIN
MBH	1000 BTUH
MC	MECHANICAL CONTRACTOR
MECH	MECHANICAL
MH	MANHOLE
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OD	OVERFLOW ROOF DRAIN
PSI	POUNDS PER SQUARE INCH
PRV	POWER ROOF VENTILATOR
PRV	PRESSURE REDUCING VALVE
PV	PRESSURE VENT
PVC	POLYVINYL CHLORIDE
RA	RETURN AIR
RD	ROOF DRAIN
RH	RELATIVE HUMIDITY
RTU	ROOF TOP UNIT
RV	RELIEF VALVE
RVT	ROOF VENT TERMINATION
SK	SINK
SA	SUPPLY AIR
SH	SHOWER
SO	STORM OVERFLOW
ST	STORM
TCC	TEMPERATURE CONTROL CONTRACTOR
TYP	TYPICAL
UH	UNIT HEATER
UR	URINAL
UV	UNIT VENTILATOR
VA	VENTILATION AIR
VTR	VENT THROUGH ROOF
WB	WALL BOX – CONDENSATE
WC	WATER CLOSET
WH	WATER HEATER

MECHANICAL PIPING SYMBOLS

HWR	HEATING WATER RETURN
HWRR	HEATING WATER REVERSE RETURN
HWS	HEATING WATER SUPPLY
PC	PUMPED CONDENSATE
CD	COIL CONDENSATE DRAIN
RL	REFRIGERANT LIQUID
RS	REFRIGERANT SUCTION
	PIPE ANCHOR
	ALIGNMENT GUIDE
	FLEX CONNECTOR
	EXPANSION - LOOP
	THERMOMETER
	EXPANSION - JOINT
	INLINE PUMP

MISCELLANEOUS

XXX / X	EQUIPMENT IDENTIFICATION TAG
1 / A101 SIM	DETAIL REFERENCE / SHEET REFERENCE
1 / A101 SIM	SECTION CUT REFERENCE / SHEET REFERENCE
	NEW CONNECTION POINT
	POINT OF DISCONNECT
?	KEYNOTES
	EXISTING = HALFTONE LINEWORK
	NEW = DARK LINEWORK
	DEMO = DASHED DARK LINEWORK

REGISTERED PROFESSIONAL ENGINEER
94129
OREGON
NOV. 13, 2018
STORMY L. SHANKS
EXPIRES: 6/30/2020

YOST GRUBE HALL ARCHITECTURE
707 SW Washington Street | Suite 1200 | Portland, OR 97205
t 503 221 0150 f 503 295 0840

Owner
BEAVERTON SCHOOL DISTRICT
CENTRAL ADMINISTRATION CENTER
16550 MERLO ROAD
BEAVERTON, OREGON 97003

Project
BSD RALEIGH PARK HVAC AND ELECTRICAL UPGRADE
RALEIGH PARK ELEMENTARY SCHOOL
3670 SW 78TH AVE
PORTLAND, OR 97225

MARK DATE DESCRIPTION

Sheet Title
MECHANICAL SYMBOL LEGEND & GENERAL NOTES

Drawing No.
M0.00

Scale As indicated

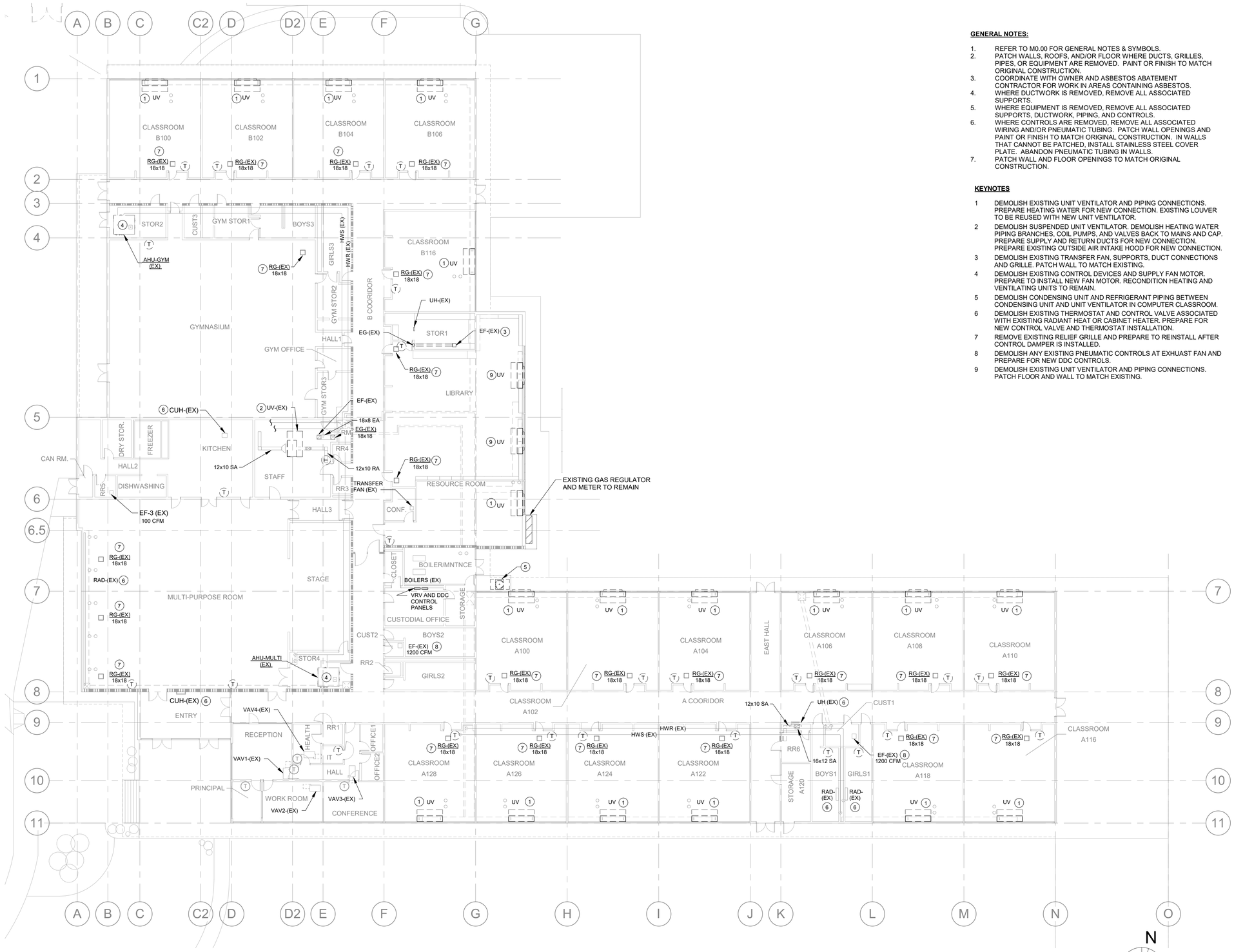
Date MARCH 04, 2020

Project No. 19-0012

KCL ENGINEERING

BID/PERMIT DOCUMENTS

3/3/2020 3:12:51 PM



1 FIRST FLOOR MECHANICAL DEMOLITION PLAN
1/16" = 1'-0"

GENERAL NOTES:

1. REFER TO M0.00 FOR GENERAL NOTES & SYMBOLS.
2. PATCH WALLS, ROOFS, AND/OR FLOOR WHERE DUCTS, GRILLES, PIPES, OR EQUIPMENT ARE REMOVED. PAINT OR FINISH TO MATCH ORIGINAL CONSTRUCTION.
3. COORDINATE WITH OWNER AND ASBESTOS ABATEMENT CONTRACTOR FOR WORK IN AREAS CONTAINING ASBESTOS.
4. WHERE DUCTWORK IS REMOVED, REMOVE ALL ASSOCIATED SUPPORTS.
5. WHERE EQUIPMENT IS REMOVED, REMOVE ALL ASSOCIATED SUPPORTS, DUCTWORK, PIPING, AND CONTROLS.
6. WHERE CONTROLS ARE REMOVED, REMOVE ALL ASSOCIATED WIRING AND/OR PNEUMATIC TUBING. PATCH WALL OPENINGS AND PAINT OR FINISH TO MATCH ORIGINAL CONSTRUCTION. IN WALLS THAT CANNOT BE PATCHED, INSTALL STAINLESS STEEL COVER PLATE. ABANDON PNEUMATIC TUBING IN WALLS.
7. PATCH WALL AND FLOOR OPENINGS TO MATCH ORIGINAL CONSTRUCTION.

KEYNOTES

1 DEMOLISH EXISTING UNIT VENTILATOR AND PIPING CONNECTIONS. PREPARE HEATING WATER FOR NEW CONNECTION. EXISTING LOUVER TO BE REUSED WITH NEW UNIT VENTILATOR.

2 DEMOLISH SUSPENDED UNIT VENTILATOR. DEMOLISH HEATING WATER PIPING BRANCHES, COIL PUMPS, AND VALVES BACK TO MAINS AND CAP. PREPARE SUPPLY AND RETURN DUCTS FOR NEW CONNECTION. PREPARE EXISTING OUTSIDE AIR INTAKE HOOD FOR NEW CONNECTION.

3 DEMOLISH EXISTING TRANSFER FAN, SUPPORTS, DUCT CONNECTIONS AND GRILLE. PATCH WALL TO MATCH EXISTING.

4 DEMOLISH EXISTING CONTROL DEVICES AND SUPPLY FAN MOTOR. PREPARE TO INSTALL NEW FAN MOTOR. RECONDITION HEATING AND VENTILATING UNITS TO REMAIN.

5 DEMOLISH CONDENSING UNIT AND REFRIGERANT PIPING BETWEEN CONDENSING UNIT AND UNIT VENTILATOR IN COMPUTER CLASSROOM.

6 DEMOLISH EXISTING THERMOSTAT AND CONTROL VALVE ASSOCIATED WITH EXISTING RADIANT HEAT OR CABINET HEATER. PREPARE FOR NEW CONTROL VALVE AND THERMOSTAT INSTALLATION.

7 REMOVE EXISTING RELIEF GRILLE AND PREPARE TO REINSTALL AFTER CONTROL DAMPER IS INSTALLED.

8 DEMOLISH ANY EXISTING PNEUMATIC CONTROLS AT EXHUAST FAN AND PREPARE FOR NEW DDC CONTROLS.

9 DEMOLISH EXISTING UNIT VENTILATOR AND PIPING CONNECTIONS. PATCH FLOOR AND WALL TO MATCH EXISTING.

BID/PERMIT DOCUMENTS

3/3/2020 3:12:59 PM

REGISTERED PROFESSIONAL ENGINEER
94129
OREGON
NOV. 13, 2018
STORMY L. SHANKS
EXPIRES: 6/30/2020

YOST GRUBE HALL ARCHITECTURE
707 SW Washington Street | Suite 1200 | Portland, OR 97205
t 503 221 0150 f 503 295 0840

Owner
BEAVERTON SCHOOL DISTRICT
CENTRAL ADMINISTRATION CENTER
16550 MERLO ROAD
BEAVERTON, OREGON 97003

Project
BSD RALEIGH PARK HVAC AND ELECTRICAL UPGRADE
RALEIGH PARK ELEMENTARY SCHOOL
3670 SW 78TH AVE
PORTLAND, OR 97225

MARK	DATE	DESCRIPTION

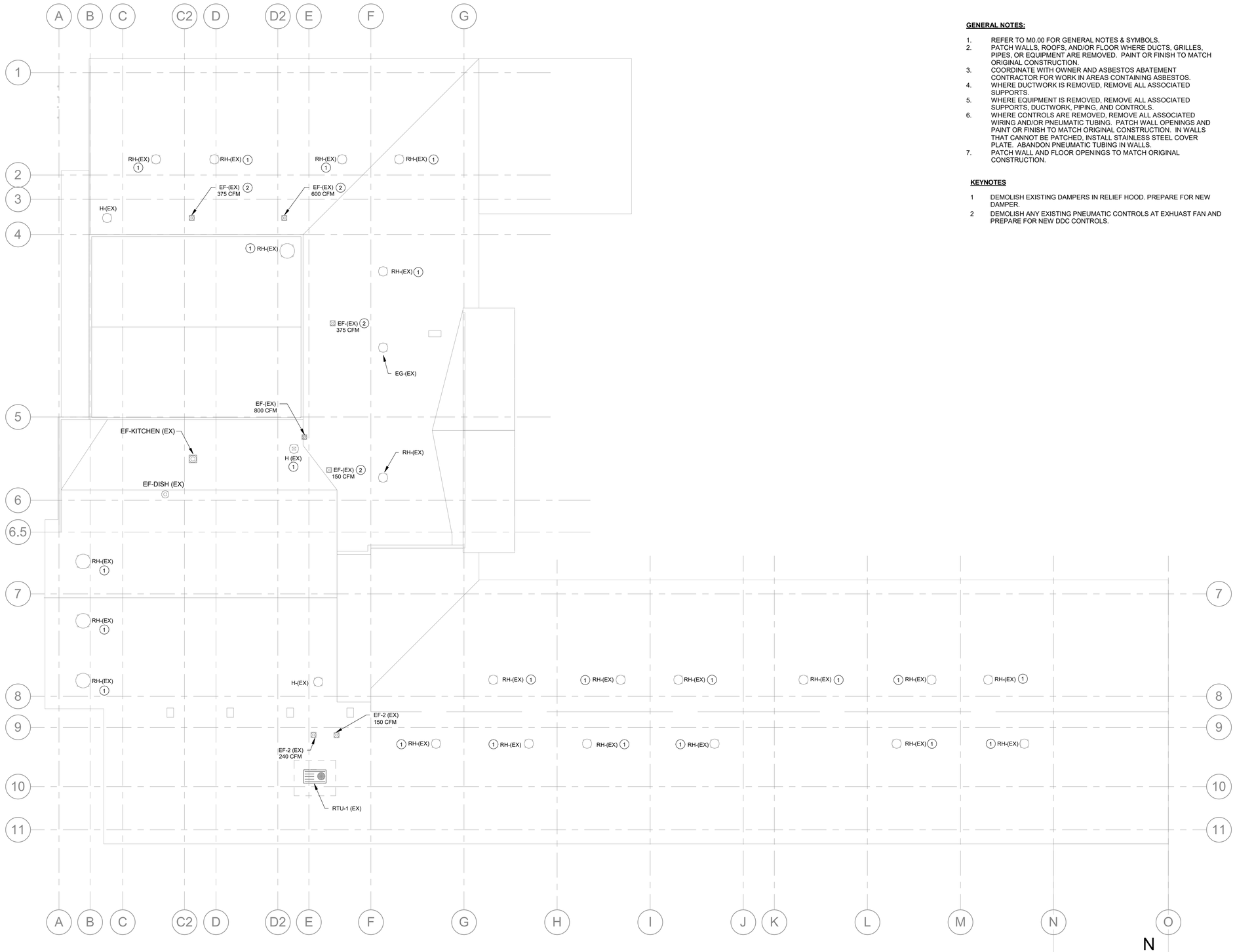
Sheet Title
FIRST FLOOR MECHANICAL DEMOLITION PLAN

Drawing No.
M2.10D

Scale 1/16" = 1'-0"

Date MARCH 04, 2020

Project No. 19-0012



1 ROOF MECHANICAL DEMOLITION PLAN
1/16" = 1'-0"

GENERAL NOTES:

1. REFER TO M0.00 FOR GENERAL NOTES & SYMBOLS.
2. PATCH WALLS, ROOFS, AND/OR FLOOR WHERE DUCTS, GRILLES, PIPES, OR EQUIPMENT ARE REMOVED. PAINT OR FINISH TO MATCH ORIGINAL CONSTRUCTION.
3. COORDINATE WITH OWNER AND ASBESTOS ABATEMENT CONTRACTOR FOR WORK IN AREAS CONTAINING ASBESTOS.
4. WHERE DUCTWORK IS REMOVED, REMOVE ALL ASSOCIATED SUPPORTS.
5. WHERE EQUIPMENT IS REMOVED, REMOVE ALL ASSOCIATED SUPPORTS, DUCTWORK, PIPING, AND CONTROLS.
6. WHERE CONTROLS ARE REMOVED, REMOVE ALL ASSOCIATED WIRING AND/OR PNEUMATIC TUBING. PATCH WALL OPENINGS AND PAINT OR FINISH TO MATCH ORIGINAL CONSTRUCTION. IN WALLS THAT CANNOT BE PATCHED, INSTALL STAINLESS STEEL COVER PLATE. ABANDON PNEUMATIC TUBING IN WALLS.
7. PATCH WALL AND FLOOR OPENINGS TO MATCH ORIGINAL CONSTRUCTION.

KEYNOTES

1 DEMOLISH EXISTING DAMPERS IN RELIEF HOOD. PREPARE FOR NEW DAMPER.

2 DEMOLISH ANY EXISTING PNEUMATIC CONTROLS AT EXHUAST FAN AND PREPARE FOR NEW DDC CONTROLS.

BID/PERMIT DOCUMENTS

3/3/2020 3:13:03 PM

REGISTERED PROFESSIONAL ENGINEER
94129
OREGON
NOV. 13, 2018
STORMY L. SHANKS
EXPIRES: 6/30/2020

YOST GRUBE HALL
ARCHITECTURE
707 SW Washington Street | Suite 1200 | Portland, OR 97205
t 503 221 0150 f 503 295 0840

Owner
BEAVERTON
SCHOOL DISTRICT
CENTRAL ADMINISTRATION CENTER
16550 MERLO ROAD
BEAVERTON, OREGON 97003

Project
BSD RALEIGH PARK HVAC
AND ELECTRICAL UPGRADE
RALEIGH PARK ELEMENTARY SCHOOL
3670 SW 78TH AVE
PORTLAND, OR 97225

MARK	DATE	DESCRIPTION

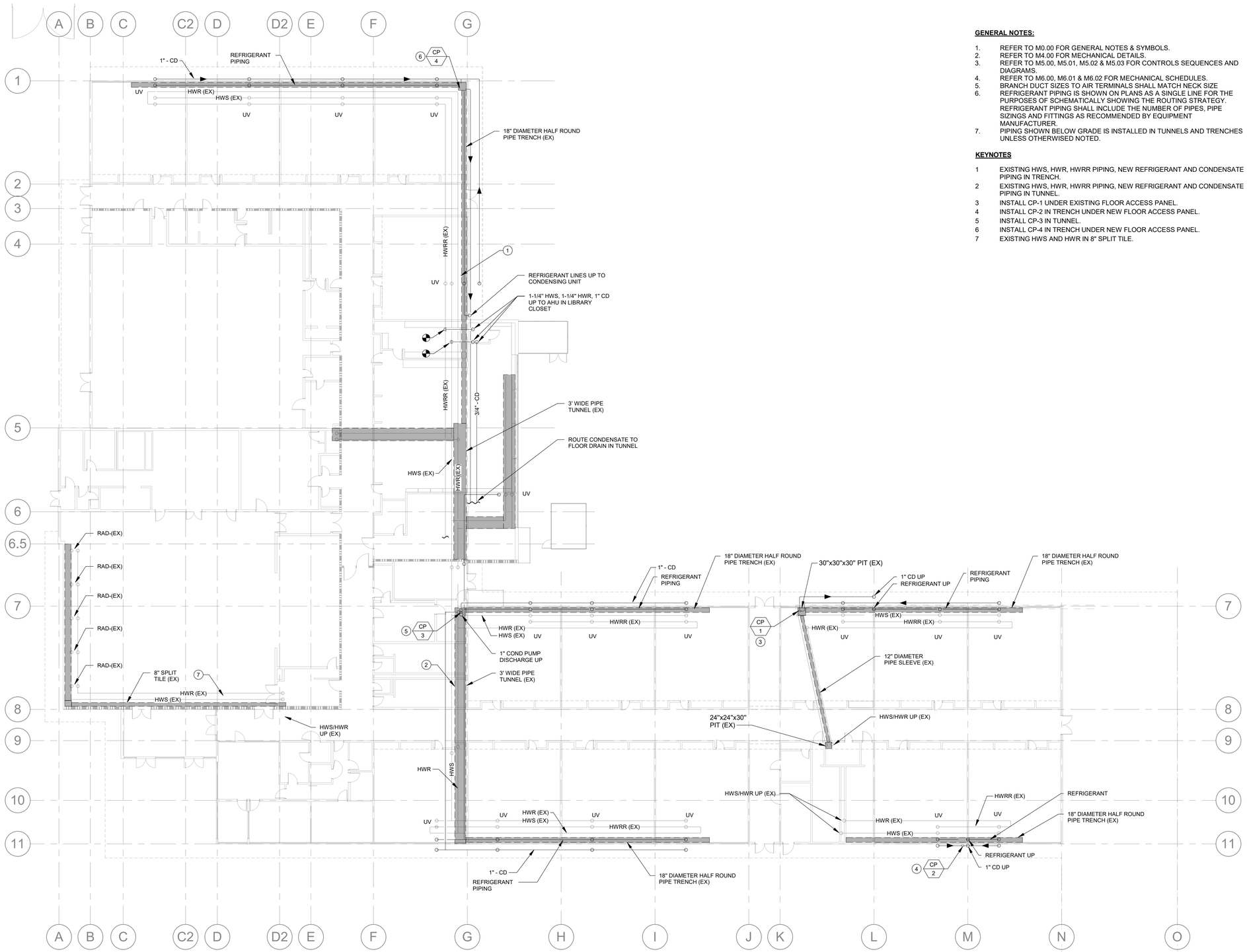
Sheet Title
ROOF MECHANICAL
DEMOLITION PLAN

Drawing No.
M2.20D

Scale 1/16" = 1'-0"

Date MARCH 04, 2020

Project No. 19-0012



1 UTILITY TUNNEL MECHANICAL PLAN
1/16" = 1'-0"

GENERAL NOTES:

1. REFER TO M0.00 FOR GENERAL NOTES & SYMBOLS.
2. REFER TO M4.00 FOR MECHANICAL DETAILS.
3. REFER TO M5.00, M5.01, M5.02 & M5.03 FOR CONTROLS SEQUENCES AND DIAGRAMS.
4. REFER TO M6.00, M6.01 & M6.02 FOR MECHANICAL SCHEDULES.
5. BRANCH DUCT SIZES TO AIR TERMINALS SHALL MATCH NECK SIZE
6. REFRIGERANT PIPING IS SHOWN ON PLANS AS A SINGLE LINE FOR THE PURPOSES OF SCHEMATICALLY SHOWING THE ROUTING STRATEGY. REFRIGERANT PIPING SHALL INCLUDE THE NUMBER OF PIPES, PIPE SIZINGS AND FITTINGS AS RECOMMENDED BY EQUIPMENT MANUFACTURER.
7. PIPING SHOWN BELOW GRADE IS INSTALLED IN TUNNELS AND TRENCHES UNLESS OTHERWISED NOTED.

KEYNOTES

1 EXISTING HWS, HWR, HWRR PIPING, NEW REFRIGERANT AND CONDENSATE PIPING IN TRENCH.
2 EXISTING HWS, HWR, HWRR PIPING, NEW REFRIGERANT AND CONDENSATE PIPING IN TUNNEL.
3 INSTALL CP-1 UNDER EXISTING FLOOR ACCESS PANEL.
4 INSTALL CP-2 IN TRENCH UNDER NEW FLOOR ACCESS PANEL.
5 INSTALL CP-3 IN TUNNEL.
6 INSTALL CP-4 IN TRENCH UNDER NEW FLOOR ACCESS PANEL.
7 EXISTING HWS AND HWR IN 8" SPLIT TILE.

BID/PERMIT DOCUMENTS

3/3/2020 3:12:53 PM

REGISTERED PROFESSIONAL ENGINEER
94129
OREGON
NOV. 13, 2018
STORMY L. SHANKS
EXPIRES: 6/30/2020

YOST GRUBE HALL
ARCHITECTURE
707 SW Washington Street | Suite 1200 | Portland, OR 97205
t 503 221 0150 f 503 295 0840

Owner
BEAVERTON SCHOOL DISTRICT
CENTRAL ADMINISTRATION CENTER
16550 MERLO ROAD
BEAVERTON, OREGON 97003

Project
BSD RALEIGH PARK HVAC AND ELECTRICAL UPGRADE
RALEIGH PARK ELEMENTARY SCHOOL
3670 SW 78TH AVE
PORTLAND, OR 97225

MARK	DATE	DESCRIPTION

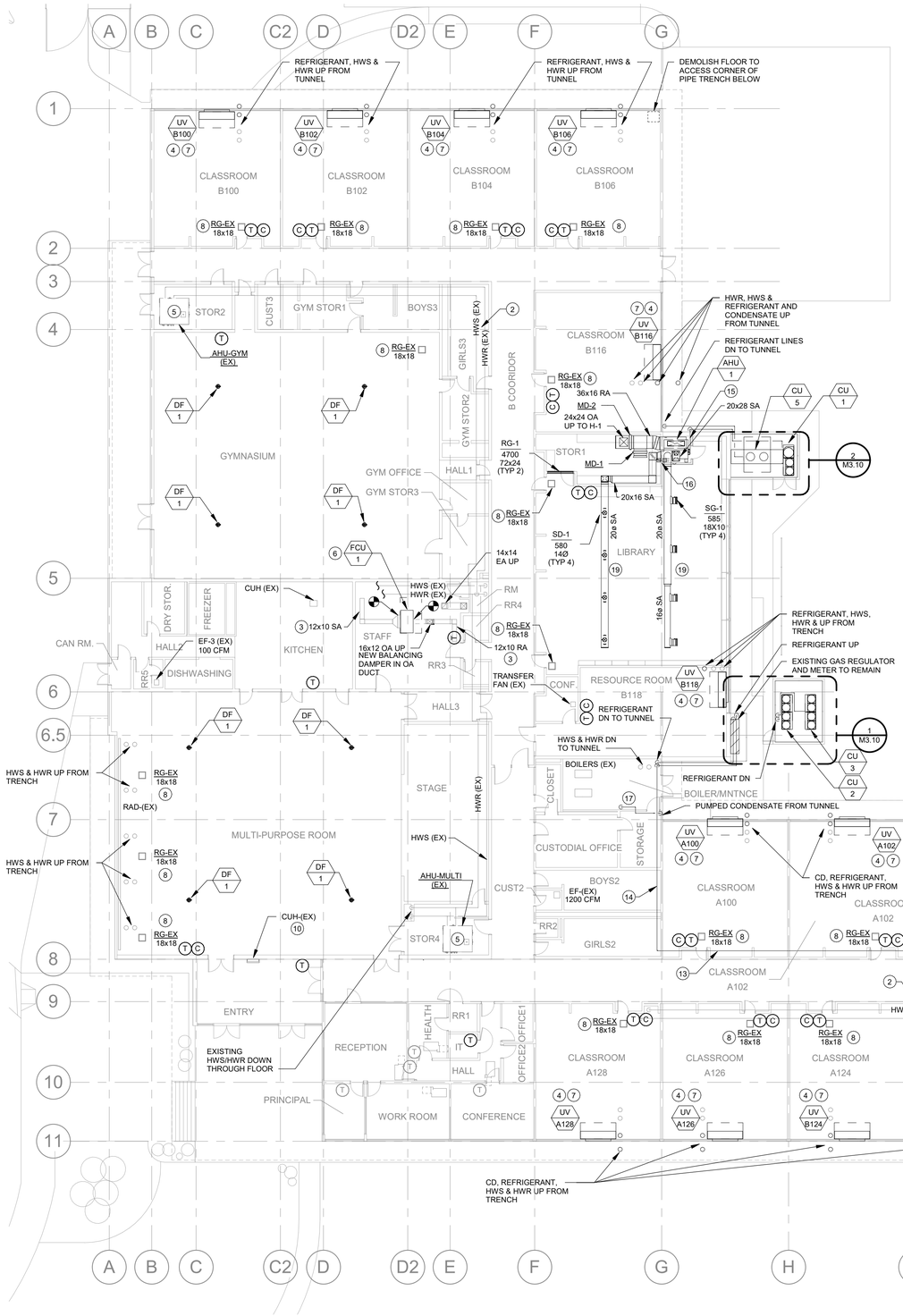
Sheet Title
UTILITY TUNNEL MECHANICAL PLAN

Drawing No.
M2.00

Scale 1/16" = 1'-0"

Date MARCH 04, 2020

Project No. 19-0012



1 FIRST FLOOR MECHANICAL PLAN
1/16" = 1'-0"

GENERAL NOTES:

1. REFER TO M0.00 FOR GENERAL NOTES & SYMBOLS.
2. REFER TO M4.00 FOR MECHANICAL DETAILS.
3. REFER TO M5.00, M5.01, M5.02 & M5.03 FOR CONTROLS SEQUENCES AND DIAGRAMS.
4. REFER TO M6.00, M6.01 & M6.02 FOR MECHANICAL SCHEDULES.
5. BRANCH DUCT SIZES TO AIR TERMINALS SHALL MATCH NECK SIZE
6. ROUTE AND SIZE REFRIGERANT PIPING PER MANUFACTURER RECOMMENDATIONS.
7. REFER TO 2/M4.00 FOR STANDARD DUCT CONSTRUCTION DETAILS.

KEYNOTES

1 EXISTING SA DUCTWORK WITH TWO 30x8 SUPPLY GRILLES ABOVE EXISTING RA DUCTWORK WITH TWO 30x8 RETURN GRILLES.
2 EXISTING HWS, HWR, AND HWRR PIPING IN FURRED SPACE ABOVE DOORS.
3 EXISTING SA AND RA DUCTWORK ABOVE CEILING.
4 CONNECT NEW UNIT VENTILATOR TO EXISTING HEATING WATER SUPPLY AND RETURN IN TRENCH BELOW. REUSE EXISTING OUTSIDE AIR LOUVER. CONNECT REFRIGERANT PIPING IN TRENCH BELOW TO NEW UNIT VENTILATOR. REFER TO DETAIL 3/M4.00. PROVIDE NEW THERMOSTAT AND DDC CONTROLS.
5 PROVIDE NEW SUPPLY FAN MOTOR AND VARIABLE FREQUENCY DRIVE FOR EXISTING HEATING AND VENTILATING UNIT. EC TO PROVIDE NEW VFD.
6 NEW FAN COIL UNIT ABOVE CEILING. RECONNECT TO EXISTING OUTSIDE AIR INTAKE HOOD. PROVIDE NEW DDC CONTROLS AND THERMOSTAT. ROUTE REFRIGERANT PIPING BETWEEN CU-4 ON ROOF AND FCU-1. ROUTE CONDENSATE TO TAILPIECE OF SINK. PROVIDE NEW TAILPIECE WITH CONDENSATE CONNECTION.
7 EXISTING VENTILATION LOUVER TO BE REUSED WITH NEW UNIT VENTILATORS.
8 EXISTING RELIEF GRILLE TO BE REMOVED AND REINSTALLED FOR INSTALLATION OF NEW RELIEF DAMPER.
9 ROUTE CONDENSATE TO MOP BASIN OR FLOOR DRAIN IN JANITOR ROOM.
10 EXISTING CABINET UNIT HEATER TO REMAIN. DEMOLISH EXISTING CONTROL VALVE AND THERMOSTAT. PREPARE TO INSTALL NEW CONTROL VALVE AND THERMOSTAT.
11 INSTALL REFRIGERANT PIPING EXPOSED ON WALL JUST BELOW BOTTOM OF GLULAM BEAMS. PROVIDE PAINTABLE METAL JACKET ON ALL EXPOSED REFRIGERANT PIPING IN CLASSROOM.
12 OPEN WALL TO INSTALL REFRIGERANT AND CONDENSATE PIPING IN WALL. CORE DRILL INTO PIPE TRENCH BELOW, ROUTE REFRIGERANT PIPING IN PIPING TRENCH TO UNIT VENTILATORS.
13 INSTALL NEW REFRIGERANT PIPING IN FURRED OUT SOFFIT AREA. DEMO SOFFIT GYP BOARD ON HALLWAY SIDE AS NECESSARY TO INSTALL AND SUPPORT NEW REFRIGERANT PIPING.
14 INSTALL NEW REFRIGERANT PIPING ABOVE BATHROOM CEILING.
15 ROUTE REFRIGERANT PIPING ALONG EXTERIOR WALL. COVER EXPOSED PIPING WITH SHEET METAL PIPE ENCLOSURE WITH SLOPED TOP. PROVIDE WALL SEAL PENETRATION SYSTEM FOR REFRIGERANT AND CONTROL WIRE PENETRATION THROUGH WALL. CONTINUE INSULATION THROUGH WALL SEAL PENETRATION SYSTEM.
16 SAW CUT FLOOR AS NECESSARY IN STOR1 AND AHU CLOSET TO GAIN ACCESS TO PIPE TRENCH. ROUTE 1-1/4" HWS, 1-1/4" HWR, AND 1" CD THROUGH SIDE OF PIPE TRENCH INTO AHU CLOSET. SEAL PIPE TRENCH PENETRATIONS WATER TIGHT. BACKFILL AND PATCH FLOOR.
17 ROUTE CONDENSATE TO MOP BASIN IN BOILER ROOM.
18 ROUTE PIPING AS HIGH AS POSSIBLE ACROSS HALLWAY. PAINT PIPING AND HANGERS TO MATCH CEILING OR STRUCTURE TO WHICH IT IS ATTACHED.
19 DOUBLE WALL DUCT WITH PAINTGRIP FINISH. PAINTING BY GENERAL CONTRACTOR.

BID/PERMIT DOCUMENTS

REGISTERED PROFESSIONAL ENGINEER
94129
OREGON
NOV. 13, 2018
STORMY L. SHANKS
EXPIRES: 6/30/2020

YOST GRUBE HALL ARCHITECTURE
707 SW Washington Street | Suite 1200 | Portland, OR 97205
t 503 221 0150 f 503 295 0840

Owner
BEAVERTON SCHOOL DISTRICT
CENTRAL ADMINISTRATION CENTER
16550 MERLO ROAD
BEAVERTON, OREGON 97003

Project
BSD RALEIGH PARK HVAC AND ELECTRICAL UPGRADE
RALEIGH PARK ELEMENTARY SCHOOL
3670 SW 78TH AVE
PORTLAND, OR 97225

MARK	DATE	DESCRIPTION

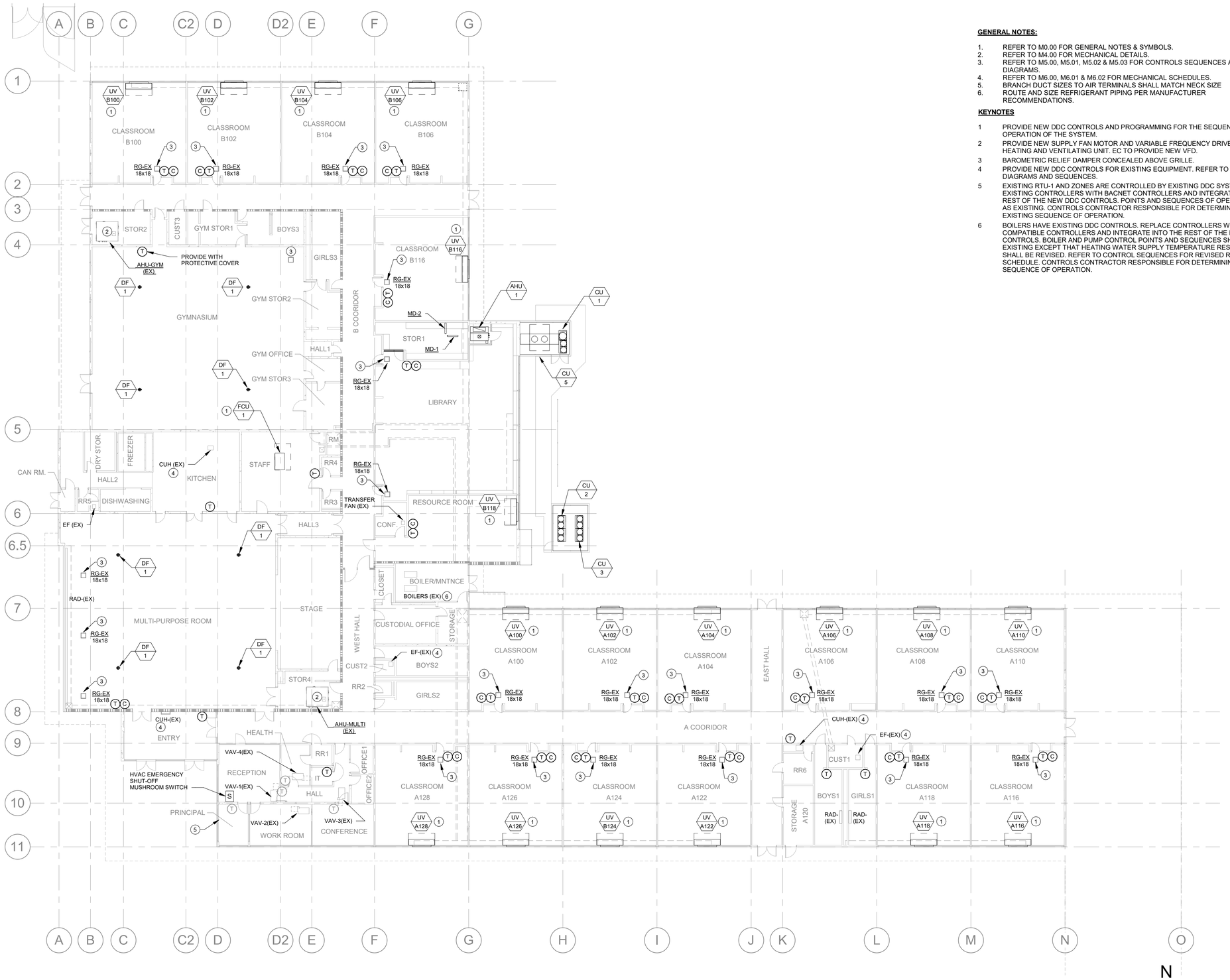
FOR REFERENCE ONLY

Sheet Title
FIRST FLOOR MECHANICAL PLAN

Drawing No.
M2.10

Scale 1/16" = 1'-0"
Date MARCH 04, 2020
Project No. 19-0012

3/3/2020 3:12:56 PM



1 FIRST FLOOR MECHANICAL CONTROLS PLAN
1/16" = 1'-0"

GENERAL NOTES:

1. REFER TO M0.00 FOR GENERAL NOTES & SYMBOLS.
2. REFER TO M4.00 FOR MECHANICAL DETAILS.
3. REFER TO M5.00, M5.01, M5.02 & M5.03 FOR CONTROLS SEQUENCES AND DIAGRAMS.
4. REFER TO M6.00, M6.01 & M6.02 FOR MECHANICAL SCHEDULES.
5. BRANCH DUCT SIZES TO AIR TERMINALS SHALL MATCH NECK SIZE
6. ROUTE AND SIZE REFRIGERANT PIPING PER MANUFACTURER RECOMMENDATIONS.

KEYNOTES

1 PROVIDE NEW DDC CONTROLS AND PROGRAMMING FOR THE SEQUENCES OF OPERATION OF THE SYSTEM.

2 PROVIDE NEW SUPPLY FAN MOTOR AND VARIABLE FREQUENCY DRIVE FOR EXISTING HEATING AND VENTILATING UNIT. EC TO PROVIDE NEW VFD.

3 BAROMETRIC RELIEF DAMPER CONCEALED ABOVE GRILLE.

4 PROVIDE NEW DDC CONTROLS FOR EXISTING EQUIPMENT. REFER TO CONTROL DIAGRAMS AND SEQUENCES.

5 EXISTING RTU-1 AND ZONES ARE CONTROLLED BY EXISTING DDC SYSTEM. REPLACE EXISTING CONTROLLERS WITH BACNET CONTROLLERS AND INTEGRATE INTO THE REST OF THE NEW DDC CONTROLS. POINTS AND SEQUENCES OF OPERATION REMAIN AS EXISTING. CONTROLS CONTRACTOR RESPONSIBLE FOR DETERMINING THE EXISTING SEQUENCE OF OPERATION.

6 BOILERS HAVE EXISTING DDC CONTROLS. REPLACE CONTROLLERS WITH BACNET COMPATIBLE CONTROLLERS AND INTEGRATE INTO THE REST OF THE NEW DDC CONTROLS. BOILER AND PUMP CONTROL POINTS AND SEQUENCES SHALL REMAIN AS EXISTING EXCEPT THAT HEATING WATER SUPPLY TEMPERATURE RESET SCHEDULE SHALL BE REVISED. REFER TO CONTROL SEQUENCES FOR REVISED RESET SCHEDULE. CONTROLS CONTRACTOR RESPONSIBLE FOR DETERMINING EXISTING SEQUENCE OF OPERATION.

REGISTERED PROFESSIONAL ENGINEER
94129
OREGON
NOV. 13, 2018
STORMY L. SHANKS
EXPIRES: 6/30/2020

YOST GRUBE HALL ARCHITECTURE
707 SW Washington Street | Suite 1200 | Portland, OR 97205
t 503 221 0150 f 503 295 0840

Owner
BEAVERTON SCHOOL DISTRICT
CENTRAL ADMINISTRATION CENTER
16550 MERLO ROAD
BEAVERTON, OREGON 97003

Project
BSD RALEIGH PARK HVAC AND ELECTRICAL UPGRADE
RALEIGH PARK ELEMENTARY SCHOOL
3670 SW 78TH AVE
PORTLAND, OR 97225

MARK	DATE	DESCRIPTION

Sheet Title
FIRST FLOOR MECHANICAL CONTROLS PLAN

Drawing No.
M2.11

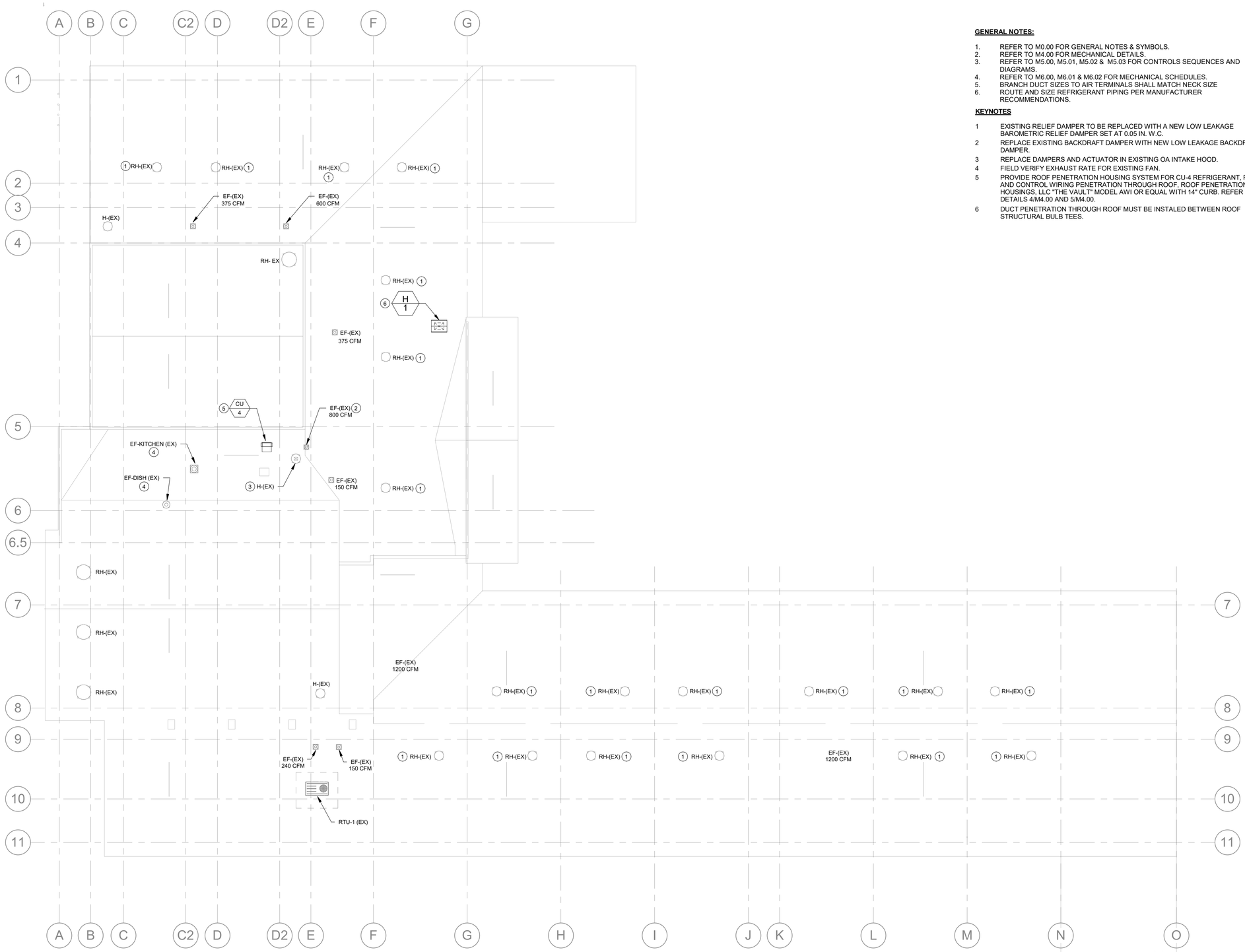
Scale 1/16" = 1'-0"

Date MARCH 04, 2020

Project No. 19-0012

BID/PERMIT DOCUMENTS

3/3/2020 3:13:00 PM



1 ROOF MECHANICAL PLAN
1/16" = 1'-0"

GENERAL NOTES:

1. REFER TO M0.00 FOR GENERAL NOTES & SYMBOLS.
2. REFER TO M4.00 FOR MECHANICAL DETAILS.
3. REFER TO M5.00, M5.01, M5.02 & M5.03 FOR CONTROLS SEQUENCES AND DIAGRAMS.
4. REFER TO M6.00, M6.01 & M6.02 FOR MECHANICAL SCHEDULES.
5. BRANCH DUCT SIZES TO AIR TERMINALS SHALL MATCH NECK SIZE
6. ROUTE AND SIZE REFRIGERANT PIPING PER MANUFACTURER RECOMMENDATIONS.

KEYNOTES

1 EXISTING RELIEF DAMPER TO BE REPLACED WITH A NEW LOW LEAKAGE BAROMETRIC RELIEF DAMPER SET AT 0.05 IN. W.C.

2 REPLACE EXISTING BACKDRAFT DAMPER WITH NEW LOW LEAKAGE BACKDRAFT DAMPER.

3 REPLACE DAMPERS AND ACTUATOR IN EXISTING OA INTAKE HOOD.

4 FIELD VERIFY EXHAUST RATE FOR EXISTING FAN.

5 PROVIDE ROOF PENETRATION HOUSING SYSTEM FOR CU-4 REFRIGERANT, POWER, AND CONTROL WIRING PENETRATION THROUGH ROOF, ROOF PENETRATION HOUSINGS, LLC "THE VAULT" MODEL AWI OR EQUAL WITH 14" CURB. REFER TO DETAILS 4/M4.00 AND 5/M4.00.

6 DUCT PENETRATION THROUGH ROOF MUST BE INSTALED BETWEEN ROOF STRUCTURAL BULB TEES.

BID/PERMIT DOCUMENTS

REGISTERED PROFESSIONAL ENGINEER
94129
OREGON
NOV. 13, 2018
STORMY L. SHANKS
EXPIRES: 6/30/2020

YOST GRUBE HALL
ARCHITECTURE
707 SW Washington Street | Suite 1200 | Portland, OR 97205
t 503 221 0150 f 503 295 0840

Owner
BEAVERTON
SCHOOL DISTRICT
CENTRAL ADMINISTRATION CENTER
16550 MERLO ROAD
BEAVERTON, OREGON 97003

Project
BSD RALEIGH PARK HVAC
AND ELECTRICAL UPGRADE
RALEIGH PARK ELEMENTARY SCHOOL
3670 SW 78TH AVE
PORTLAND, OR 97225

MARK	DATE	DESCRIPTION

Sheet Title
ROOF MECHANICAL PLAN

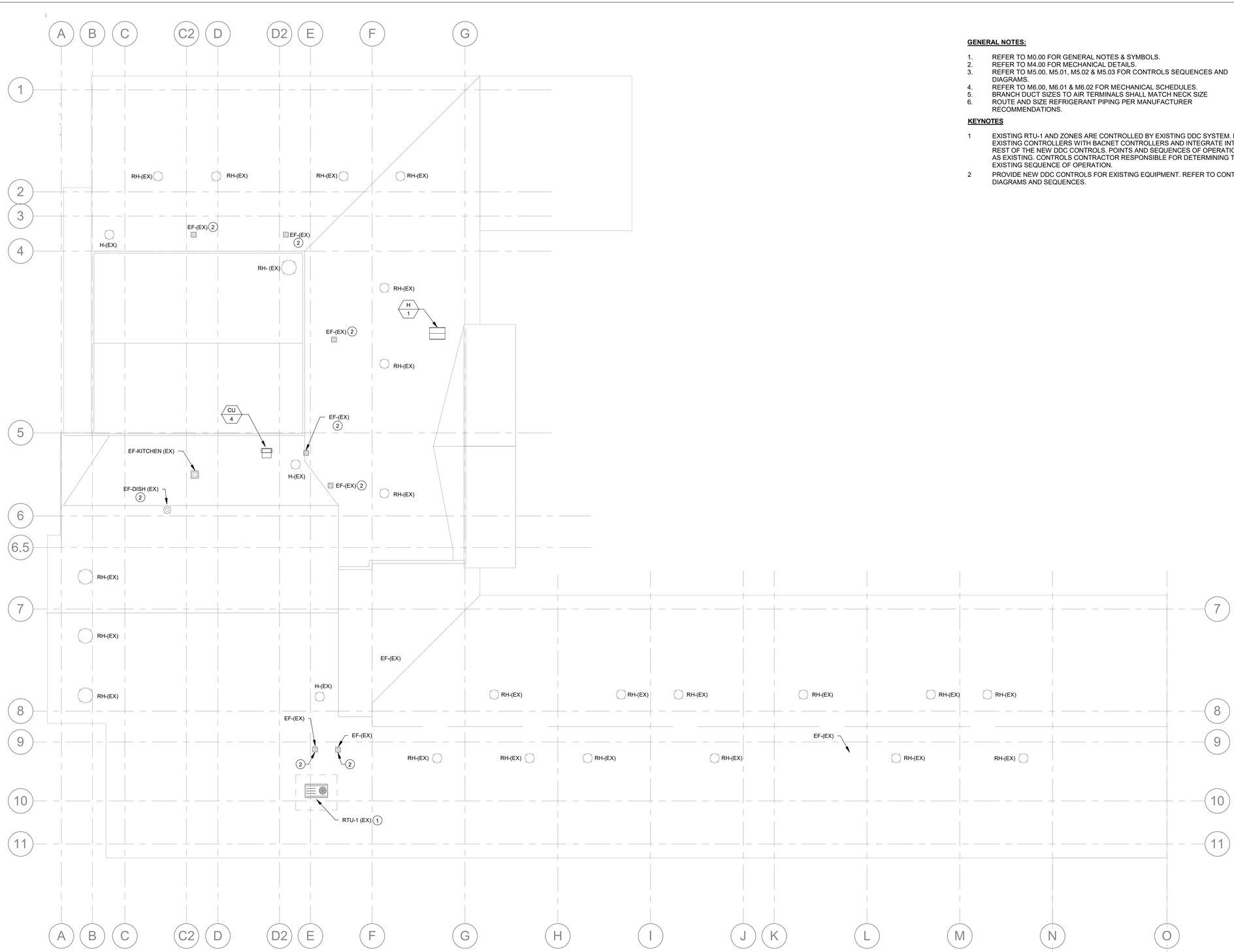
Drawing No.
M2.20

Scale 1/16" = 1'-0"

Date MARCH 04, 2020

Project No. 19-0012

3/3/2020 3:13:02 PM



1 ROOF MECHANICAL CONTROLS PLAN
1/16" = 1'-0"

GENERAL NOTES:

1. REFER TO M0.00 FOR GENERAL NOTES & SYMBOLS.
2. REFER TO M4.00 FOR MECHANICAL DETAILS.
3. REFER TO M5.00, M5.01, M5.02 & M5.03 FOR CONTROLS SEQUENCES AND DIAGRAMS.
4. REFER TO M6.00, M6.01 & M6.02 FOR MECHANICAL SCHEDULES.
5. BRANCH DUCT SIZES TO AIR TERMINALS SHALL MATCH NECK SIZE
6. ROUTE AND SIZE REFRIGERANT PIPING PER MANUFACTURER RECOMMENDATIONS.

KEYNOTES

1 EXISTING RTU-1 AND ZONES ARE CONTROLLED BY EXISTING DDC SYSTEM. REPLACE EXISTING CONTROLLERS WITH BACNET CONTROLLERS AND INTEGRATE INTO THE REST OF THE NEW DDC CONTROLS. POINTS AND SEQUENCES OF OPERATION REMAIN AS EXISTING. CONTROLS CONTRACTOR RESPONSIBLE FOR DETERMINING THE EXISTING SEQUENCE OF OPERATION.

2 PROVIDE NEW DDC CONTROLS FOR EXISTING EQUIPMENT. REFER TO CONTROL DIAGRAMS AND SEQUENCES.

BID/PERMIT DOCUMENTS

REGISTERED PROFESSIONAL ENGINEER
94129
OREGON
NOV. 13, 2018
STORMY L. SHANKS
EXPIRES: 6/30/2020

YOST GRUBE HALL ARCHITECTURE
707 SW Washington Street | Suite 1200 | Portland, OR 97205
t 503 221 0150 f 503 295 0840

Owner
BEAVERTON SCHOOL DISTRICT
CENTRAL ADMINISTRATION CENTER
16550 MERLO ROAD
BEAVERTON, OREGON 97003

Project
BSD RALEIGH PARK HVAC AND ELECTRICAL UPGRADE
RALEIGH PARK ELEMENTARY SCHOOL
3670 SW 78TH AVE
PORTLAND, OR 97225

MARK	DATE	DESCRIPTION

Sheet Title
ROOF MECHANICAL CONTROLS PLAN

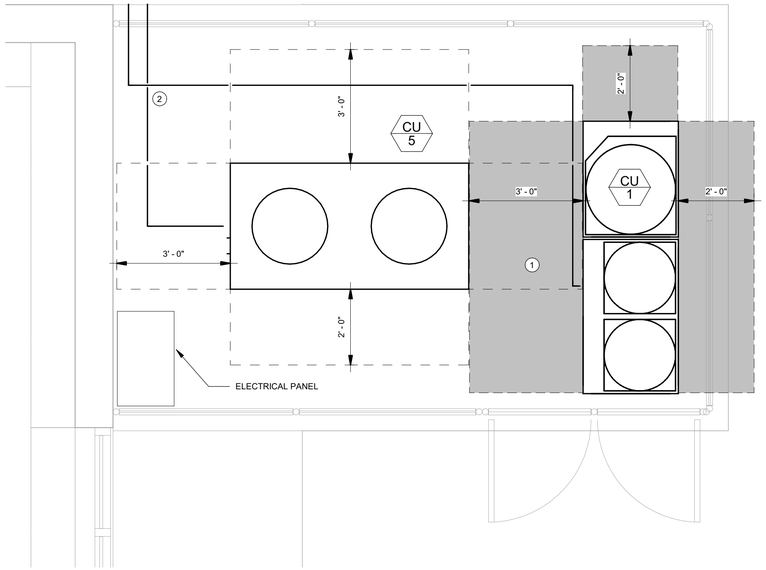
Drawing No.
M2.21

Scale 1/16" = 1'-0"

Date MARCH 04, 2020

Project No. 19-0012

3/3/2020 3:13:04 PM



2 CONDENSING UNITS 1 AND 5 ENLARGED PLAN
1/2" = 1'-0"

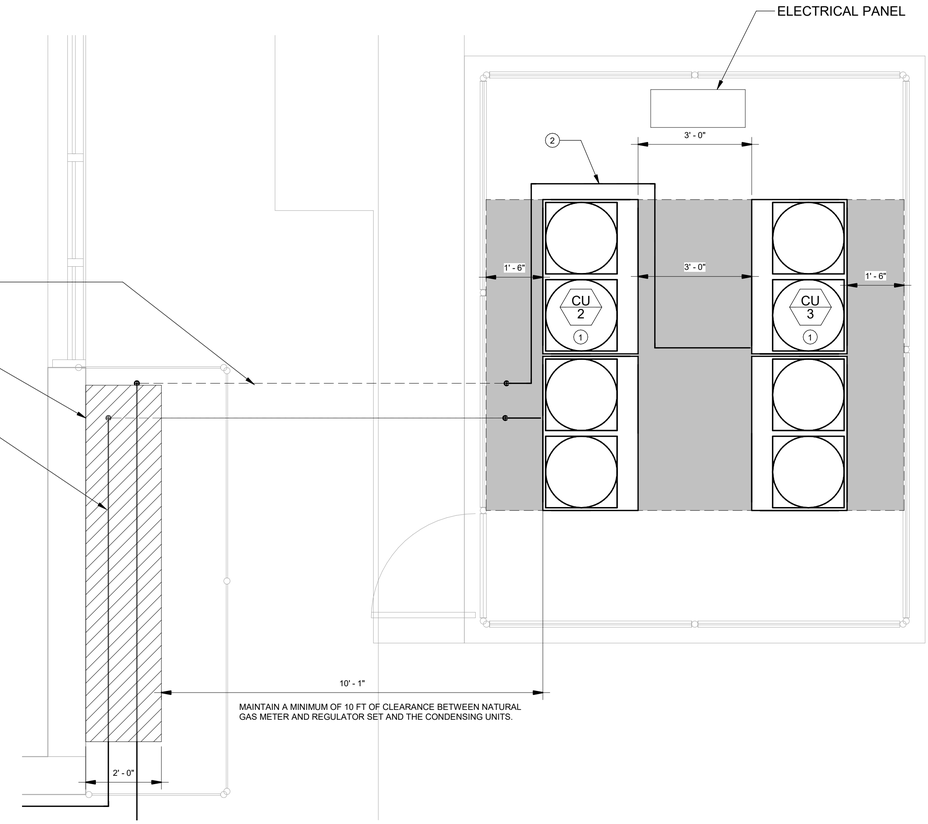
KEYNOTES

1 MAINTAIN 3 FEET OF CLEARANCE IN FRONT OF ELECTRICAL CONNECTIONS FOR CONDENSING UNITS.
2 SUPPORT REFRIGERANT PIPING ALONG THE SLAB WITH NON-PENETRATING ROOFTOP SUPPORTS. REFER TO 23 05 29.

ROUTE REFRIGERANT PIPING 2 FT BELOW GRADE. REFER TO PIPING SCHEDULE AND PIPE INSULATION SPECIFICATIONS FOR DIRECT BURY INSULATION AND JACKET REQUIREMENTS. TRENCH AND BACKFILL ACCORDING TO INSULATION MANUFACTURER'S REQUIREMENTS.

EXISTING GAS REGULATOR AND METER

ROUTE REFRIGERANT PIPING ALONG WALL JUST ABOVE GAS METER AND REGULATOR SET



1 CONDENSING UNITS 2 AND 3 ENLARGED PLAN
1/2" = 1'-0"

BID/PERMIT DOCUMENTS

3/3/2020 3:13:05 PM

REGISTERED PROFESSIONAL ENGINEER
94129
OREGON
NOV. 13, 2018
STORMY L. SHANKS
EXPIRES: 6/30/2020

YOST GRUBE HALL
ARCHITECTURE
707 SW Washington Street | Suite 1200 | Portland, OR 97205
t 503 221 0150 f 503 295 0840

Owner
BEAVERTON SCHOOL DISTRICT
CENTRAL ADMINISTRATION CENTER
16550 MERLO ROAD
BEAVERTON, OREGON 97003

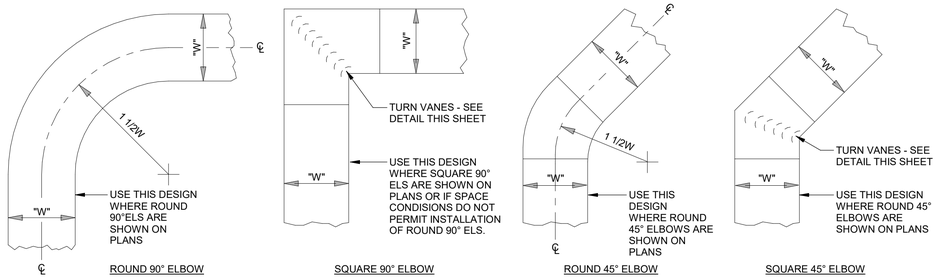
Project
BSD RALEIGH PARK HVAC AND ELECTRICAL UPGRADE
RALEIGH PARK ELEMENTARY SCHOOL
3670 SW 78TH AVE
PORTLAND, OR 97225

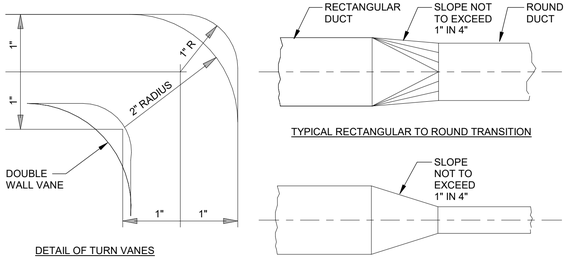
MARK	DATE	DESCRIPTION

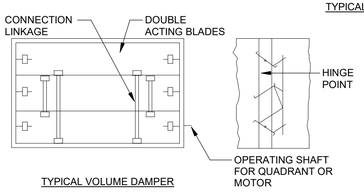
Sheet Title
ENLARGED MECHANICAL PLANS

Drawing No.
M3.10

Scale 1/2" = 1'-0"
Date MARCH 04, 2020
Project No. 19-0012

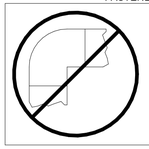






INSTALLATION NOTES:

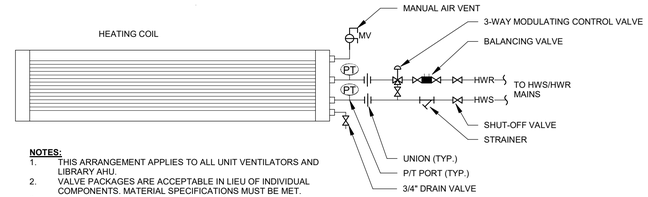
1. ALL DUCTS SHALL BE CONSTRUCTED AND ERECTED IN A NEAT AND WORKMANLIKE MANNER.
2. DUCTS SHALL BE CONSTRUCTED OF THE WEIGHTS, GAGES AND MATERIAL AS SPECIFIED.
3. THE DIMENSION SHOWN FOR ALL DUCTS SHOWN IN PLAN GIVE THE WIDTH FIRST AND THEN THE HEIGHT.
4. DUCT RISERS SHOULD BE SUPPORTED BY ANGLES AT EVERY FLOOR.
5. AIR TURN SHALL BE INSTALLED IN ALL ABRUPT ELBOWS TO PREVENT TURBULENCE.
6. DUCTS SHALL BE SECURELY ATTACHED TO THE BUILDING CONSTRUCTION IN AN APPROVED MANNER.
7. DIVERGING TRANSITION PIECES SHALL BE MADE AS GRADUAL AS POSSIBLE.
8. INSTALL FIRE DAMPERS IN ACCORDANCE TO ALL APPLICABLE REQUIREMENTS INCLUDING UL 555.
9. ACCESS PANELS SHOULD BE PLACED BEFORE AND/OR AFTER EQUIPMENT INSTALLED IN THE DUCT.
10. DUCT AREA SHOULD NOT BE DECREASED MORE THAN 10 PERCENT WHEN OBSTRUCTIONS CANNOT BE AVOIDED, AND THEN A STREAMLINED FITTING SHOULD BE USED.
11. FLEXIBLE FABRIC CONNECTIONS (OR EQUAL) SHOULD BE USED ON BOTH INLETS AND OUTLETS OF ALL FANS AND AIR HANDLING UNITS.
12. JOINTS AND SEAMS OF SUPPLY DUCTS SHALL BE FASTENED SECURELY AND MADE AIR TIGHT.



RADIUS ELBOW WITH SQUARE THROAT NOT ALLOWED

USAGE OF THIS TYPE OF ELBOW WILL RESULT IN REMOVAL AND REPLACEMENT WITH RADIUS ELBOW OR VANED MITERED ELBOW AT CONTRACTOR'S EXPENSE.

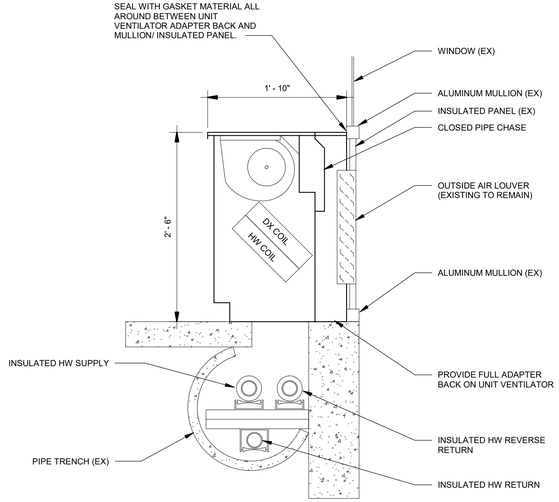
2 LOW VELOCITY DUCT LAYOUT DETAILS
NOT TO SCALE



NOTES:

1. THIS ARRANGEMENT APPLIES TO ALL UNIT VENTILATORS AND LIBRARY AHU.
2. VALVE PACKAGES ARE ACCEPTABLE IN LIEU OF INDIVIDUAL COMPONENTS. MATERIAL SPECIFICATIONS MUST BE MET AT UNIT VENTILATORS, INSTALL VALVES INSIDE EQUIPMENT CABINETS.

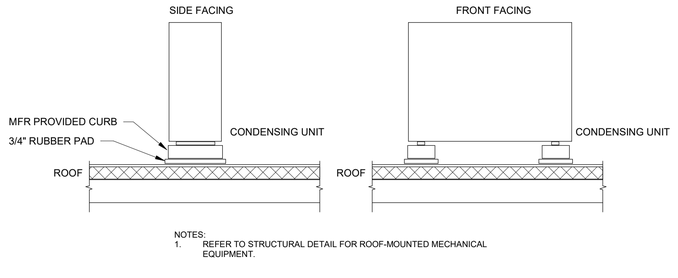
1 HOT WATER COIL PIPING
NOT TO SCALE



NOTES:

1. FIELD VERIFY HEIGHT OF EXISTING MULLIONS THAT UNIT VENTILATORS ARE SEALED TO. ENSURE NEW UNIT VENTILATOR HEIGHT WILL MEET THE MULLION. PROVIDE ACCESSORY BASE AS NECESSARY. SHOW DIMENSIONS OF UNIT VENTILATORS AND ALL ACCESSORIES AND MULLIONS IN SHOP DRAWINGS.
2. FIELD VERIFY EACH UNIT VENTILATOR'S RIGHT HAND/LEFT HAND PIPING CONFIGURATION. INDICATED ON SUBMITTAL PIPING CONFIGURATION FOR EACH UNIT VENTILATOR.
3. PROVIDE SUFFICIENT CABINET AREA TO INSTALL ALL CONTROLS COMPONENTS (DAIKIN AHU INTEGRATION KIT, TX VALVE, NAVIGATOR CONTROLLER), ALL PIPING AND VALVES, AND ELECTRICAL CONNECTIONS.

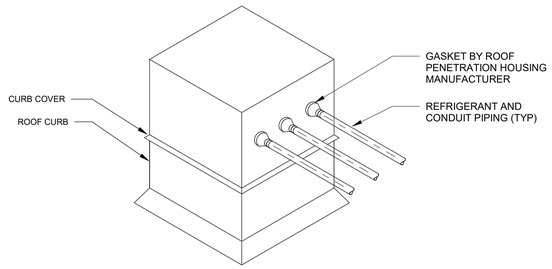
3 UNIT VENTILATOR DETAIL
NOT TO SCALE



NOTES:

1. REFER TO STRUCTURAL DETAIL FOR ROOF-MOUNTED MECHANICAL EQUIPMENT.

5 CONDENSING UNIT ON ROOF
NOT TO SCALE



NOTES:

1. MANUFACTURED ROOF PENETRATION HOUSING SYSTEM, "THE VAULT" OR SIMILAR.
2. CONTINUE INSULATION THROUGH PENETRATION HOUSING.
3. PROVIDE INSULATED ROOF CURB AND PENETRATION HOUSING.
4. REFER TO ARCHITECTURAL DRAWINGS FOR ROOFING DETAILS.

4 MANUFACTURED ROOF PIPE PENTRATION HOUSING
NOT TO SCALE

BID/PERMIT DOCUMENTS

3/3/2020 3:13:06 PM

REGISTERED PROFESSIONAL ENGINEER
94129
OREGON
NOV. 13, 2018
STORMY L. SHANKS
EXPIRES: 6/30/2020

YOST GRUBE HALL ARCHITECTURE
707 SW Washington Street | Suite 1200 | Portland, OR 97205
t 503 221 0150 f 503 295 0840

Owner
BEAVERTON SCHOOL DISTRICT
CENTRAL ADMINISTRATION CENTER
16550 MERLO ROAD
BEAVERTON, OREGON 97003

Project
BSD RALEIGH PARK HVAC AND ELECTRICAL UPGRADE
RALEIGH PARK ELEMENTARY SCHOOL
3670 SW 78TH AVE
PORTLAND, OR 97225

MARK	DATE	DESCRIPTION

Sheet Title
MECHANICAL DETAILS

Drawing No.
M4.00

Scale As indicated

Date MARCH 04, 2020

Project No. 19-0012

GENERAL CONTROL NOTES:

TEMPERATURE CONTROL CONTRACTOR (TCC) TO PROVIDE A COMPLETE CONTROL SYSTEM, INCLUDING SENSORS, RELAYS, WIRING, CONDUIT, CONTROLLERS, AND OTHER COMPONENTS. INSTALL ALL EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS. TCC TO INSTALL ALL MFR PROVIDED CONTROLS COMPONENTS FURNISHED LOOSE FROM FACTORY.

DIAGRAMS ARE SCHEMATIC. PROVIDE ADDITIONAL POINTS WHERE REQUIRED TO MEET SEQUENCE OF CONTROL. REFER TO DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL DETAIL.

UNLESS STATED OTHER, ELECTRICAL CONTRACTOR IS TO PROVIDE ALL LINE VOLTAGE POWER AND CONDUIT FOR CONTROL SYSTEM AND ALL CODE REQUIRED HARD WIRED POINTS FOR INTERACTION WITH FIRE ALARM SHUTDOWN. COORDINATE WITH EC ON REQUIRED POWER REQUIREMENTS AND LOCATIONS.

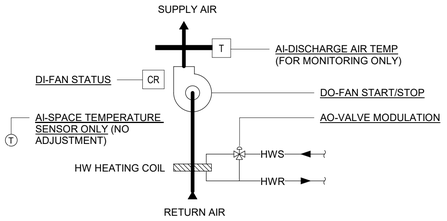
VRF SYSTEM CONTROLS PROVIDED BY VRF MANUFACTURER AND INSTALLED BY TCC. ALL WIRING PROVIDED AND INSTALLED BY TCC.

CONTROL DIAGRAM ABREVIATIONS

NC	NORMALLY CLOSED
NO	NORMALLY OPEN
AI	ANALOG INPUT
AO	ANALOG OUTPUT
DI	DIGITAL INPUT
DO	DIGITAL OUTPUT
ADJ	ADJUSTABLE
VFD	VARIABLE FREQUENCY DRIVE

DI - FIRE ALARM SYSTEM
AI - OUTDOOR AIR TEMPERATURE
AI - OUTDOOR AIR CO2 (AMBIENT CONDITION)
AI - OUTDOOR AIR RELATIVE HUMIDITY
AI - OUTDOOR AIR CALCULATED ENTHALPY

2 GLOBAL DDC POINTS
1/8" = 1'-0"



EXISTING HW CABINET HEATER (TYPICAL)

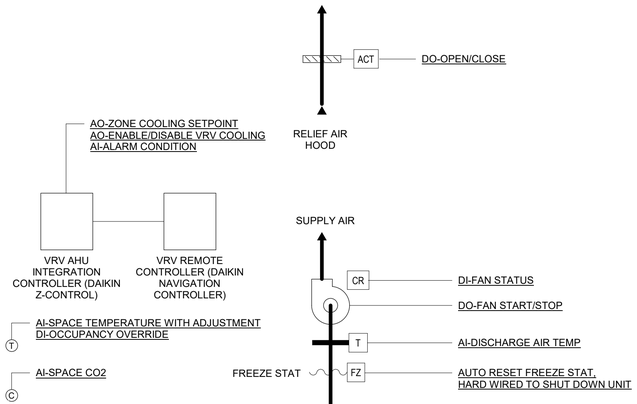
SEQUENCE OF OPERATION

FAN AND TEMPERATURE CONTROL
A. WHEN THE SPACE TEMPERATURE FALLS BELOW THE SETPOINT IN THE SCHEDULE, THE FAN IS ENERGIZED AND THE CONTROL VALVE MODULATES TO MAINTAIN THE SETPOINT. CABINET HEATERS SHALL HAVE TEMPERATURE SETPOINT AND SETBACK SCHEDULES THAT ARE ADJUSTABLE.
B. WHEN THE SPACE TEMPERATURE IS AT OR ABOVE THE SCHEDULED HEATING SETPOINT, THE FAN IS DEENERGIZED AND THE HEATING CONTROL VALVE IS CLOSED.

ALARMS AND INTERLOCKS
A. THE FOLLOWING SHALL INDICATE AN ALARM STATUS AT THE DDC:
1. SPACE TEMPERATURE FALLS BELOW 50 DEG (ADJ.) FOR MORE THAN 15 MINUTES (ADJ.)
2. CURRENT RELAY INDICATES FAN FAILED TO START UPON ENABLE COMMAND

TRENDS
A. HISTORICALLY TREND ALL POINTS EVERY 15 MIN (ADJ.) OVER A 90 DAY PERIOD (ADJ.)

3 CABINET UNIT HEATER CONTROLS
NOT TO SCALE



NEW UNIT VENTILATOR WITH VRV DX COOLING

SEQUENCE OF OPERATION

OCCUPIED MODE:
A. FAN CONTROL
1. THE SUPPLY FAN SHALL BE ENABLED TO RUN CONTINUOUSLY AT CONSTANT VOLUME WHEN THE ZONE IS SCHEDULED TO BE IN OCCUPIED MODE.
B. RELIEF AIR DAMPER CONTROL
1. THE RELIEF AIR DAMPER(S) IN THE RELIEF AIR ROOF HOODS ARE OPEN CONTINUOUSLY DURING OCCUPIED MODE AND WHEN ECONOMIZER MODE IS ENABLED.
C. TEMPERATURE CONTROL
1. WHEN THE ZONE TEMPERATURE IS BELOW THE OCCUPIED HEATING TEMPERATURE SETPOINT, THE VRV COOLING IS DISABLED, THE 3-WAY CONTROL VALVE IS MODULATED OPEN TO MAINTAIN THE ZONE TEMPERATURE SETPOINT UP TO A MAXIMUM SUPPLY AIR TEMPERATURE OF 90 DEG (ADJ.).
2. WHEN THE ZONE TEMPERATURE IS ABOVE THE OCCUPIED COOLING TEMPERATURE SETPOINT:
a. THE VRV COOLING REMAINS DISABLED IN THE ZONE, AND THE ECONOMIZER CONTROL IS ENABLED.
b. UPON A FURTHER RISE IN TEMPERATURE AFTER THE OUTSIDE AIR DAMPER IS FULLY OPEN AND THE FAN IS RUNNING AT HIGH SPEED,
• THE DDC SYSTEM SENDS A SIGNAL TO THE VRV AHU INTEGRATION TO ENABLE COOLING
• THE DDC SYSTEM SENDS WRITES THE CURRENT ZONE COOLING TEMPERATURE SETPOINT TO THE VRV AHU INTEGRATION CONTROLLER
• THE VRV AHU INTEGRATION CONTROLLER AND VRV CENTRAL CONTROLS ENABLE VRV CONDENSING UNITS AND DX COOLING. VRV CONTROLS VARY THE FLOW OF REFRIGERANT IN THE DX COOLING COIL TO MAINTAIN THE COOLING SETPOINT IN THE SPACE AND THE SUPPLY AIR TEMPERATURE NO LOWER THAN 55 DEG (ADJ).
3. WHEN THE ZONE TEMPERATURE IS IN THE DEADBAND, VRV COOLING SHALL BE DISABLED AND THE HEATING CONTROL VALVE SHALL BE CLOSED.
D. MINIMUM OUTSIDE AIR CONTROL
1. WHEN IN THE OCCUPIED MODE, OUTDOOR AIR DAMPER SHALL MODULATE BETWEEN THE HIGH MIN POSITION AND LOW MIN POSITION TO PROVIDE REQUIRED VENTILATION AIR BASED ON THE CO2 SENSOR INPUT. TAB CONTRACTOR TO DETERMINE HIGH MIN AND LOW MIN DAMPER POSITION BASED ON THE VENTILATION SCHEDULE.
2. IF THE ZONE CO2 LEVEL IS THE SAME AS THE OUTSIDE AMBIENT CO2 READING, THE OUTSIDE AIR DAMPER SHALL BE AT THE LOW MINIMUM POSITION. UPON A RISE IN ZONE CO2 LEVEL, THE OUTSIDE AIR DAMPER SHALL MODULATE OPEN TO THE HIGH MIN SETTING TO MAINTAIN THE ZONE CO2 SETPOINT IN THE VENTILATION SCHEDULE (ADJ.). THE RETURN AIR DAMPER MODULATES CLOSED IN SEQUENCE WITH THE OUTSIDE AIR DAMPER MODULATING OPEN.
E. ECONOMIZER CONTROL
1. WHEN THE OUTSIDE AIR DRY BULB TEMPERATURE IS LOWER THAN THE SCHEDULED SPACE TEMPERATURE SETPOINT, ECONOMIZER COOLING IS ENABLED.
2. WHEN THERE IS A CALL FOR COOLING IN THE ZONE AND THE ECONOMIZER SEQUENCE IS ENABLED, THE OUTSIDE AIR DAMPER MODULATES OPEN AND THE RETURN AIR DAMPER MODULATES CLOSED TO MAINTAIN THE OCCUPIED ZONE TEMPERATURE SETPOINT. THE OUTSIDE AIR DAMPER DOES NOT CLOSE MORE THAN THE CURRENTLY CALCULATED MINIMUM POSITION BASED ON CO2 LEVEL.

UNOCCUPIED MODE:
A. FAN CONTROL
1. DURING UNOCCUPIED MODE, THE FAN SHALL BE ENABLED INTERMITTENTLY WHEN THERE IS A CALL FOR HEATING OR COOLING.
B. ZONE TEMPERATURE CONTROL
1. WHEN THE ZONE TEMPERATURE IS BELOW THE UNOCCUPIED SETBACK TEMPERATURE, THE FAN IS ENABLED AND THE 3-WAY CONTROL VALVE IS MODULATED OPEN AFTER THE FAN PROVES ON TO MAINTAIN THE UNOCCUPIED ZONE SETBACK TEMPERATURE.
2. WHEN THE ZONE TEMPERATURE IS ABOVE THE UNOCCUPIED COOLING SETBACK TEMPERATURE,
a. THE FAN IS ENABLED AND THE ECONOMIZER CONTROL IS ENABLED.
b. UPON A FURTHER RISE IN THE ZONE TEMPERATURE
• THE DDC SENDS A SIGNAL TO THE VRV AHU INTEGRATION TO ENABLE DX COOLING
• THE DDC WRITES THE COOLING SETBACK TEMPERATURE TO THE VRV AHU INTEGRATION CONTROLS.
• THE VRV AHU INTEGRATION CONTROLLER AND VRV CENTRAL CONTROLS ENABLE VRV CONDENSING UNITS AND DX COOLING. VRV CONTROLS VARY THE FLOW OF REFRIGERANT IN THE DX COOLING COIL TO MAINTAIN THE COOLING SETPOINT IN THE SPACE AND THE SUPPLY AIR TEMPERATURE NO LOWER THAN 55 DEG (ADJ.).
C. MINIMUM OUTSIDE AIR CONTROL
1. THE OUTSIDE AIR DAMPER IS CLOSED, THE RELIEF AIR HOOD DAMPER IS CLOSED, AND THE RETURN AIR DAMPER IS 100% OPEN.
D. ECONOMIZER CONTROL
1. WHEN THERE IS A CALL FOR COOLING IN THE ZONE AND THE ECONOMIZER SEQUENCE IS ENABLED, THE RELIEF AIR DAMPER OPENS, THE OUTSIDE AIR DAMPER MODULATES BETWEEN CLOSED AND OPEN, AND THE RETURN AIR DAMPER MODULATES BETWEEN OPEN AND CLOSED TO MAINTAIN THE UNOCCUPIED COOLING SETBACK TEMPERATURE SETPOINT.

OCCUPANCY OVERRIDE MODE:
A. WHEN THE SYSTEM IS IN UNOCCUPIED MODE AND THE OCCUPANCY OVERRIDE BUTTON IS PRESSED, THE SYSTEM SHALL RUN IN OCCUPIED MODE FOR 1 HOUR (ADJ.).

OPTIMUM START:
A. DDC SYSTEM SHALL CALCULATE OPTIMUM START TIME BASED ON OUTDOOR AIR DRY BULB TEMPERATURE AND ZONE TEMPERATURE.
B. MORNING WARM-UP
1. THE FAN IS ENABLED, AND AFTER IT IS PROVEN ON, HEATING CONTROL VALVE SHALL MODULATE OPEN TO BRING THE ZONE TEMPERATURE UP TO THE OCCUPIED ZONE TEMPERATURE SETPOINT.
2. THE OUTSIDE AIR DAMPER SHALL BE CLOSED AND RETURN AIR DAMPER 100% OPEN DURING MORNING WARM-UP.

FREEZE PROTECTION SAFETIES:
A. IF THE MIXED AIR TEMPERATURE FALLS BELOW 55 DEG (ADJ.) WHILE THE FAN IS OFF, MODULATE THE HEATING WATER VALVE OPEN TO MAINTAIN THE MIXED AIR TEMPERATURE AT 55 DEG. (ADJ.) FAN OFF SETPOINT.
B. IF AT ANY TIME THE COIL FREEZE STAT SENSES A TEMPERATURE BELOW ITS SETPOINT OF 38 DEG (ADJ.):
1. THE OUTDOOR AIR DAMPER SHALL CLOSE.
2. THE FAN SHALL BE DISABLED.
3. THE HEATING WATER VALVE SHALL OPEN TO 100%.
4. WHEN THE FREEZE STAT TEMPERATURE RISES AND THE CONTACTS OPEN, THE UNIT SHALL RETURN TO NORMAL OPERATION.

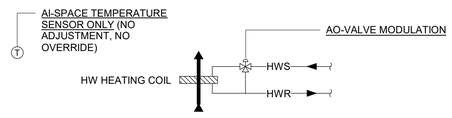
ALARMS AND INTERLOCK SAFETIES:

A. THE FOLLOWING SHALL SHUT DOWN THE UNIT VENTILATOR AND INDICATE AN ALARM CONDITION:
1. FIRE ALARM CONDITION SIGNAL SENT FROM FIRE ALARM PANEL. (AUTO RESET)
2. SHOULD ANY 1' SECTION OF THE AUTO RESET LOW LIMIT TEMP SENSOR DOWN STREAM OF THE COILS SENSE AIR TEMP < 38°F (ADJ.)
B. THE FOLLOWING SHALL INDICATED AN ALARM CONDITION:
1. MIXED AIR TEMPERATURE BELOW 38 DEG (ADJ.) FOR MORE THAN 10 MIN.
2. FAN FAILS TO START UPON ENABLE COMMAND.
3. ANY SPACE TEMPERATURE FALLS BELOW 50 DEG (ADJ.) FOR MORE THAN 10 MINUTES.

TRENDS

A. HISTORICALLY TREND ALL POINTS EVERY 15 MIN (ADJ.) OVER A 90 DAY PERIOD (ADJ.)

1 UNIT VENTILATOR CONTROLS
NOT TO SCALE



EXISTING RESTROOM RADIANT HEATER (TYPICAL)

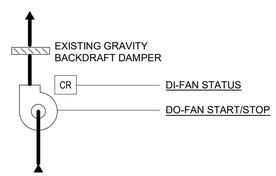
SEQUENCE OF OPERATION

TEMPERATURE CONTROL
A. WHEN THE SPACE TEMPERATURE FALLS BELOW THE SCHEDULED HEATING SETPOINT, THE CONTROL VALVE MODULATES TO MAINTAIN THE SETPOINT.
B. WHEN THE SPACE TEMPERATURE IS AT OR ABOVE THE SCHEDULED HEATING SETPOINT, THE HEATING CONTROL VALVE IS CLOSED.

ALARMS AND INTERLOCKS
A. THE FOLLOWING SHALL INDICATE AN ALARM STATUS AT THE DDC:
1. SPACE TEMPERATURE FALLS BELOW 50 DEG (ADJ.) FOR MORE THAN 15 MINUTES (ADJ.)

TRENDS
A. HISTORICALLY TREND ALL POINTS EVERY 15 MIN (ADJ.) OVER A 90 DAY PERIOD (ADJ.)

6 RADIANT HEATING CONTROLS
NOT TO SCALE



EXISTING EXHAUST FAN SERVING RESTROOM (TYPICAL)

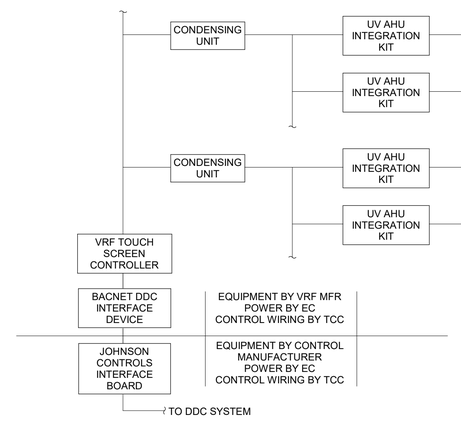
SEQUENCE OF OPERATION

FAN CONTROL
A. EXHAUST FAN SHALL BE ENABLED TO RUN CONTINUOUSLY DURING OCCUPIED TIMES IN THE BUILDING OCCUPANCY SCHEDULE.

ALARMS AND INTERLOCKS
A. THE FOLLOWING SHALL INDICATE AN ALARM STATUS AT THE DDC:
1. CURRENT RELAY INDICATES FAN FAILED TO START UPON ENABLE COMMAND

TRENDS
A. HISTORICALLY TREND ALL POINTS EVERY 15 MIN (ADJ.) OVER A 90 DAY PERIOD (ADJ.)

5 EXHAUST FAN CONTROLS
NOT TO SCALE



NOTES:
1. REFER TO UNIT VENTILATOR CONTROL DIAGRAM AND SEQUENCE FOR DDC INTEGRATION WITH UV AHU INTEGRATION KIT.

VRV SYSTEM / DDC MONITOR/CONTROL ITEMS:

THE FOLLOWING POINTS FROM THE VRV SYSTEM SHALL BE MONITORED BY THE DDC SYSTEM AND DISPLAYED ON THE DDC USER INTERFACE GRAPHICS:

• OUTDOOR UNIT COMPRESSOR STATUS

THE DDC SYSTEM SHALL INCLUDE THE FOLLOWING POINTS FOR OPERATION, CONFIGURATION, AND MONITORING:

• REMOTE CONTROLLER PERMIT/PROHIBIT

4 VARIABLE REFRIGERANT VOLUME CONTROLS INTEGRATION
1/8" = 1'-0"

BID/PERMIT DOCUMENTS

3/3/2020 3:13:06 PM

REGISTERED PROFESSIONAL ENGINEER
94129
OREGON
NOV. 13, 2018
STORMY L. SHANKS
EXPIRES: 6/30/2020

YOST GRUBE HALL ARCHITECTURE
707 SW Washington Street | Suite 1200 | Portland, OR 97205
t 503 221 0150 f 503 295 0840

Owner
BEAVERTON SCHOOL DISTRICT
CENTRAL ADMINISTRATION CENTER
16550 MERLO ROAD
BEAVERTON, OREGON 97003

Project
BSD RALEIGH PARK HVAC AND ELECTRICAL UPGRADE
RALEIGH PARK ELEMENTARY SCHOOL
3670 SW 78TH AVE
PORTLAND, OR 97225

MARK	DATE	DESCRIPTION

Sheet Title
MECHANICAL CONTROLS

Drawing No.
M5.00

Scale NOT TO SCALE

Date MARCH 04, 2020

Project No. 19-0012

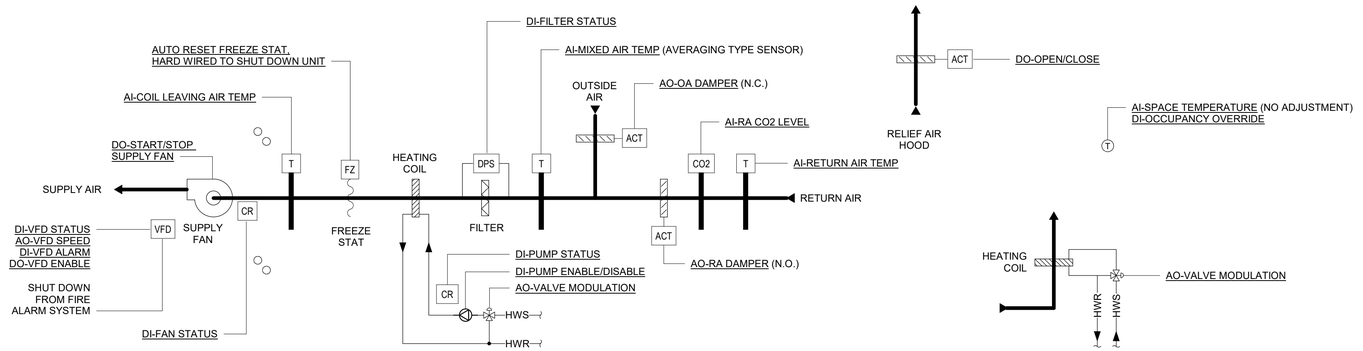
REMOTE/GLOBAL POINTS

CO2	AI - OUTDOOR AIR CO2 (AMBIENT CONDITION) LOCATE SENSOR OUTSIDE ABOVE ROOM
TS	AI-OUTDOOR AIR TEMPERATURE
FA	DI-FIRE ALARM

CONTROL DEVICES AND ACTUATORS INDICATED ARE PROVIDED BY TCC AND ARE TO BE FIELD INSTALLED ON EXISTING HEATING AND VENTILATING UNIT, CONTROL VALVES, AND PUMPS.

OUTDOOR AIR DAMPER SHALL BE SPRING ACTUATED CLOSED ON LOSS OF POWER/SIGNAL.

HEAT CONTROL VALVE SHALL BE SPRING ACTUATED OPEN ON LOSS OF POWER/SIGNAL.



EXISTING MULTIPURPOSE HEATING AND VENTILATING AHU

EXISTING MULTIPURPOSE PERIMETER RADIANT HEATING

SEQUENCE OF OPERATION

OCCUPIED MODE:
A. FAN CONTROL
 1. THE SUPPLY FAN IS ENABLED TO RUN CONTINUOUSLY WHEN THE ZONE IS SCHEDULED TO BE IN OCCUPIED MODE. THE SUPPLY FAN SPEED SHALL MODULATE TO MAINTAIN THE ZONE TEMPERATURE SETPOINT. THE SUPPLY FAN SHALL RUN AT A MINIMUM SPEED ACCORDING TO THE MINIMUM CFM IN THE AHU SCHEDULE.
B. RELIEF AIR DAMPER(S) CONTROL
 1. RELIEF AIR DAMPERS IN THE RELIEF AIR ROOF HOODS ARE OPEN CONTINUOUSLY DURING OCCUPIED MODE.
C. ZONE TEMPERATURE CONTROL
 1. WHEN THE ZONE TEMPERATURE IS BELOW THE HEATING SETPOINT, THE AIR HANDLING UNIT 3-WAY CONTROL VALVE IS MODULATED OPEN TO MAINTAIN THE ZONE TEMPERATURE SETPOINT UP TO A MAXIMUM SUPPLY AIR TEMPERATURE OF 90 DEG (ADJ.).
 2. UPON A FURTHER DROP IN TEMPERATURE, THE FAN SPEED INCREASES TO MAXIMUM WHILE MAINTAINING A SUPPLY AIR TEMPERATURE OF 90 DEG (ADJ.) TO MAINTAIN THE ZONE TEMPERATURE SETPOINT.
 3. UPON A FURTHER DROP IN ZONE TEMPERATURE, THE PERMIMETER RADIANT HEATING CONTROL VALVE SHALL MODULATE OPEN TO MAINTAIN THE THE ZONE TEMPERATURE SETPOINT.
 4. WHEN THE ZONE TEMPERATURE IS ABOVE THE COOLING SETPOINT, THE ECONOMIZER CONTROL IS ENABLED.
 5. SUPPLY AIR SHALL NOT DROP BELOW 55 DEG (ADJ.).
D. MINIMUM OUTSIDE AIR CONTROL
 1. THE OUTDOOR AIR DAMPER MODULATES BETWEEN THE HIGH MIN POSITION AND LOW MIN POSITION TO MAINTAIN THE CO2 LEVEL SETPOINT. TAB CONTRACTOR TO DETERMINE HIGH MIN AND LOW MIN DAMPER POSITION BASED ON THE AIRFLOWS IN THE AHU SCHEDULE.
 2. WHEN THE RETURN AIR CO2 LEVEL IS THE SAME AS THE OUTSIDE AMBIENT CO2 READING, THE OUTSIDE AIR DAMPER IS AT THE LOW MINIMUM POSITION. WHEN THE RETURN AIR CO2 LEVEL IS AT THE CO2 SETPOINT, THE OUTSIDE AIR DAMPER IS AT THE HIGH MINIMUM POSITION. THE OUTSIDE AIR DAMPER MODULATES BETWEEN THE LOW MINIMUM AND HIGH MINIMUM IN PROPORTION WHEN THE RETURN AIR CO2 LEVEL IS BETWEEN THE AMBIENT CO2 LEVEL AND THE CO2 SETPOINT. THE RETURN AIR DAMPER MODULATES IN SEQUENCE WITH THE OUTSIDE AIR DAMPER MODULATING OPEN.
E. ECONOMIZER CONTROL
 1. WHEN THE OUTSIDE AIR DRY BULB TEMPERATURE IS LOWER THAN THE RETURN AIR DRY BULB TEMPERATURE, ECONOMIZER COOLING SHALL BE ENABLED.
 2. WHEN THERE IS A CALL FOR COOLING IN THE ZONE AND THE ECONOMIZER SEQUENCE IS ENABLED, THE OUTSIDE AIR DAMPER MODULATES OPEN AND THE RETURN AIR DAMPER MODULATES CLOSED TO MAINTAIN THE OCCUPIED ZONE TEMPERATURE SETPOINT.
 3. IF THE ZONE TEMPERATURE CONTINUES TO RISE AFTER THE OUTSIDE AIR DAMPER IS FULLY OPEN, THE FAN SPEED MODULATES UP TO ITS MAXIMUM TO MAINTAIN THE ZONE TEMPERATURE SETPOINT.
 4. SUPPLY AIR TEMPERATURE SHALL NOT DROP BELOW 55 DEG (ADJ.).

UNOCCUPIED MODE:
A. FAN CONTROL
 1. DURING UNOCCUPIED MODE, THE FAN SHALL BE ENABLED INTERMITTENTLY WHEN THERE IS A CALL FOR HEATING OR COOLING. THE SUPPLY FAN SPEED SHALL MODULATE TO MAINTAIN THE ZONE TEMPERATURE SETPOINT. THE SUPPLY FAN SHALL RUN AT A MINIMUM SPEED ACCORDING TO THE MINIMUM CFM IN THE AHU SCHEDULE.
B. ZONE TEMPERATURE CONTROL
 1. ON A CALL FOR HEATING, THE FAN IS ENABLED AND THE 3-WAY CONTROL VALVE IS MODULATED OPEN AFTER THE FAN PROVES ON TO MAINTAIN THE UNOCCUPIED ZONE SETBACK TEMPERATURE.
 2. ON A CALL FOR COOLING, THE ECONOMIZER CONTROL ENABLED.
C. MINIMUM OUTSIDE AIR CONTROL
 1. THE OUTSIDE AIR DAMPER SHALL BE CLOSED, THE RELIEF AIR DAMPER SHALL BE CLOSED, AND THE RETURN AIR DAMPER SHALL BE 100% OPEN.
D. ECONOMIZER CONTROL
 1. WHEN THERE IS A CALL FOR COOLING IN THE ZONE AND THE ECONOMIZER SEQUENCE IS ENABLED, THE RELIEF AIR DAMPER SHALL OPEN, THE OUTSIDE AIR DAMPER SHALL MODULATE OPEN AND THE RETURN AIR DAMPER SHALL MODULATE CLOSED TO MAINTAIN THE UNOCCUPIED ZONE SETBACK TEMPERATURE SETPOINT.

OCCUPANCY OVERRIDE MODE:
A. WHEN THE SYSTEM IS IN UNOCCUPIED MODE AND THE OCCUPANCY OVERRIDE BUTTON IS PRESSED, THE SYSTEM RUNS IN OCCUPIED MODE FOR ONE HOUR (ADJ.)

OPTIMUM START:
A. DDC SYSTEM SHALL CALCULATE OPTIMUM START TIME BASED ON OUTDOOR AIR DRY BULB TEMPERATURE AND ZONE TEMPERATURE.
B. MORNING WARM-UP
 1. THE FAN IS ENABLED, AND AFTER IT IS PROVEN ON, THE AIR HANDLING UNIT HEATING CONTROL MODULATES OPEN UNTIL THE SUPPLY TEMPERATURE REACHES 90 DEG (ADJ.) AND THE PERIMETER RADIANT CONTROL VALVE IS OPENED UNTIL THE ZONE TEMPERATURE REACHES THE OCCUPIED ZONE TEMPERATURE SETPOINT.
 2. THE OUTSIDE AIR DAMPER SHALL BE CLOSED AND RETURN AIR DAMPER 100% OPEN DURING MORNING WARM-UP.

HEATING COIL PUMP:
A. WHEN THE OUTSIDE AIR TEMPERATURE IS BELOW 40 DEG (ADJ.), THE HEATING COIL PUMP SHALL BE ENABLED, AND THE HEATING VALVE SHALL BE OPEN TO 5% (ADJ.).

FREEZE PROTECTION SAFETIES:
A. IF THE MIXED AIR TEMPERATURE FALLS BELOW 55 DEG (ADJ.) WHILE THE FAN IS OFF, MODULATE THE HEATING WATER VALVE OPEN TO MAINTAIN THE MIXED AIR TEMPERATURE AT 55 DEG. (ADJ.) FAN OFF SETPOINT.
B. IF AT ANY TIME THE COIL FREEZE STAT SENSES A TEMPERATURE BELOW ITS SETPOINT OF 38 DEG (ADJ.);
 1. THE OUTDOOR AIR DAMPER SHALL CLOSE.
 2. THE FAN SHALL BE DISABLED.
 3. THE HEATING WATER VALVE SHALL OPEN TO 100%.
 4. THE COIL PUMP SHALL BE ENABLED IF IT IS NOT ALREADY.
 5. WHEN THE FREEZE STAT TEMPERATURE RISES AND THE CONTACTS OPEN, THE UNIT SHALL RETURN TO NORMAL OPERATION.

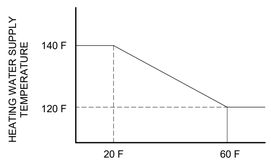
ALARMS AND INTERLOCK SAFETIES:
A. THE FOLLOWING SHALL SHUT DOWN THE AIR HANDLING UNIT AND SHALL INDICATE AN ALARM CONDITION:
 1. FIRE ALARM CONDITION SIGNAL SENT FROM FIRE ALARM PANEL. (AUTO RESET)
 2. SHOULD ANY 1' SECTION OF THE AUTO RESET LOW LIMIT TEMP SENSOR DOWN STREAM OF THE COILS SENSE AIR TEMP < 38°F (ADJ.)

ALARMS
A. THE FOLLOWING SHALL INDICATED AN ALARM CONDITION:
 1. DIRTY FILTER ALARM
 2. MIXED AIR TEMPERATURE BELOW 38 DEG (ADJ.) FOR MORE THAN 10 MIN (ADJ).
 3. FAN FAILS TO START UPON ENABLE COMMAND.
 4. PUMP FAILS TO START UPON ENABLE COMMAND.
 5. ANY SPACE TEMPERATURE FALLS BELOW 50 DEG (ADJ.) FOR MORE THAN 10 MINUTES (ADJ).
 6. VFD ALARM
 7. RETURN AIR CO2 LEVEL IS ABOVE SETPOINT FOR MORE THAN 10 MINUTES (ADJ.)

TRENDS
A. HISTORICALLY TREND ALL POINTS EVERY 15 MIN (ADJ.) OVER A 90 DAY PERIOD (ADJ.)

NOTES
1. THE HEATING COIL IN THIS EXISTING UNIT WAS SELECTED FOR AN ENTERING WATER TEMPERATURE OF 190 DEG F. AS PART OF THIS PROJECT, THE BOILER SUPPLY WATER TEMPERATURE WILL BE REDUCED TO 140 DEG F WITH A RESET SCHEDULE. DURING WINTER OPERATION, FACILITIES MAY NEED TO TEMPORARILY OVERRIDE THE BOILER SUPPLY WATER TEMPERATURE IF THIS ZONE IS NOT MAINTAINING THE HEATING SETPOINT.

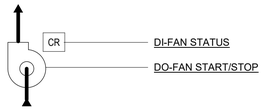
1 MULTIPURPOSE ROOM AHU CONTROLS
NOT TO SCALE



SEQUENCE OF OPERATION

BOILER SUPPLY TEMPERATURE RESET SCHEDULE
A. REVISE THE EXISTING BOILER HEATING WATER SUPPLY TEMPERATURE RESET SCHEDULE:
 1. WHEN THE OUTDOOR AIR TEMPERATURE IS 60 DEG (ADJ.) OR HIGHER, HEATING WATER SUPPLY TEMPERATURE IS 120 DEG (ADJ.)
 2. WHEN THE OUTDOOR AIR TEMPERATURE IS 20 DEG (ADJ.) OR LOWER, HEATING WATER SUPPLY TEMPERATURE IS 140 DEG (ADJ.)
 3. HEATING WATER SUPPLY TEMPERATURE RESETS LINEARLY BETWEEN THE LOW AND HIGH RESET VALUES WHEN THE OUTSIDE AIR TEMPERATURE IS IN BETWEEN

4 UPDATED BOILER RESET SCHEDULE
NOT TO SCALE



EXISTING TRANSFER FAN SERVING CONF. ROOM

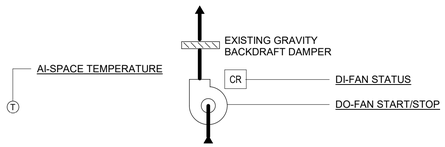
SEQUENCE OF OPERATION

FAN CONTROL
A. FAN IS ENABLED WHEN UNIT VENTILATOR UV-B118 IS RUNNING IN OCCUPIED MODE.

ALARMS AND INTERLOCKS
A. THE FOLLOWING SHALL INDICATE AN ALARM STATUS AT THE DDC:
 1. CURRENT RELAY INDICATES FAN FAILED TO START UPON ENABLE COMMAND.

TRENDS
A. HISTORICALLY TREND ALL POINTS EVERY 15 MIN (ADJ.) OVER A 90 DAY PERIOD (ADJ.)

3 CONF TRANSFER FAN CONTROLS
NOT TO SCALE



EXISTING EXHAUST FAN SERVING MDF ROOM

SEQUENCE OF OPERATION

TEMPERATURE CONTROL
A. WHEN THE SPACE TEMPERATURE IS ABOVE THE SETPOINT OF 75 DEG (ADJ.), THE FAN IS ENABLED.

ALARMS AND INTERLOCKS
A. THE FOLLOWING SHALL INDICATE AN ALARM STATUS AT THE DDC:
 1. CURRENT RELAY INDICATES FAN FAILED TO START UPON ENABLE COMMAND.
 2. SPACE TEMPERATURE IS ABOVE 80 DEG. (ADJ.) FOR LONGER THAN 10 MIN. (ADJ.)

TRENDS
A. HISTORICALLY TREND ALL POINTS EVERY 15 MIN (ADJ.) OVER A 90 DAY PERIOD (ADJ.)

2 MDF ROOM EXHAUST FAN CONTROLS
NOT TO SCALE

BID/PERMIT DOCUMENTS

3/3/2020 3:13:07 PM

REGISTERED PROFESSIONAL ENGINEER
94129
OREGON
NOV. 13, 2019
STORMY L. SHANKS
EXPIRES: 6/30/2020

YOST GRUBE HALL ARCHITECTURE
707 SW Washington Street | Suite 1200 | Portland, OR 97205
t 503 221 0150 f 503 295 0840

Owner
BEAVERTON SCHOOL DISTRICT
CENTRAL ADMINISTRATION CENTER
16550 MERLO ROAD
BEAVERTON, OREGON 97003

Project
BSD RALEIGH PARK HVAC AND ELECTRICAL UPGRADE
RALEIGH PARK ELEMENTARY SCHOOL
3670 SW 78TH AVE
PORTLAND, OR 97225

MARK	DATE	DESCRIPTION

Sheet Title
MECHANICAL CONTROLS

Drawing No.
M5.01

Scale NOT TO SCALE

Date MARCH 04, 2020

Project No. 19-0012

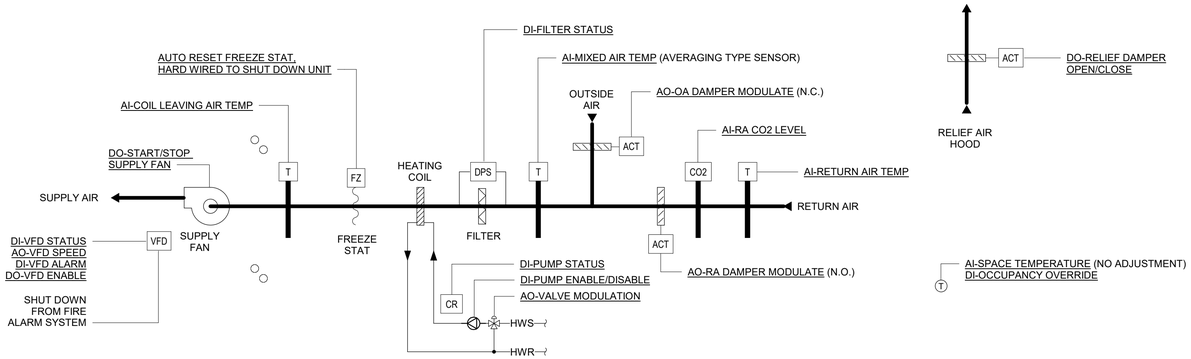
REMOTE/GLOBAL POINTS

CO2	AI - OUTDOOR AIR CO2 (AMBIENT CONDITION) LOCATE SENSOR OUTSIDE ABOVE ROOM
TS	AI-OUTDOOR AIR TEMPERATURE
FA	DI-FIRE ALARM

CONTROL DEVICES AND ACTUATORS INDICATED ARE PROVIDED BY TCC AND ARE TO BE FIELD INSTALLED ON EXISTING HEATING AND VENTILATING UNIT, CONTROL VALVES, AND PUMPS.

OUTDOOR AIR DAMPER SHALL BE SPRING ACTUATED CLOSED ON LOSS OF POWER/SIGNAL.

HEAT CONTROL VALVE SHALL BE SPRING ACTUATED OPEN ON LOSS OF POWER/SIGNAL.



EXISTING GYM HEATING AND VENTILATING AHU

SEQUENCE OF OPERATION

OCCUPIED MODE:
A. FAN CONTROL
 1. THE SUPPLY FAN IS ENABLED TO RUN CONTINUOUSLY WHEN THE ZONE IS SCHEDULED TO BE IN OCCUPIED MODE. THE SUPPLY FAN SPEED SHALL MODULATE TO MAINTAIN THE ZONE TEMPERATURE SETPOINT. THE SUPPLY FAN SHALL RUN AT A MINIMUM SPEED ACCORDING TO THE MINIMUM CFM IN THE AHU SCHEDULE.THE SUPPLY FAN SHALL BE ENABLED TO RUN CONTINUOUSLY WHEN THE ZONE IS SCHEDULED TO BE IN OCCUPIED MODE.
B. RELIEF AIR DAMPER CONTROL
 1. RELIEF AIR DAMPERS IN THE RELIEF AIR ROOF HOODS ARE OPEN CONTINUOUSLY DURING OCCUPIED MODE.
C. TEMPERATURE CONTROL
 1. WHEN THE ZONE TEMPERATURE IS BELOW THE HEATING SETPOINT, THE AIR HANDLING UNIT 3-WAY CONTROL VALVE IS MODULATED OPEN TO MAINTAIN THE ZONE TEMPERATURE SETPOINT UP TO A MAXIMUM SUPPLY AIR TEMPERATURE OF 90 DEG (ADJ.).
 2. UPON A FURTHER DROP IN TEMPERATURE, THE FAN SPEED INCREASES TO MAXIMUM WHILE MAINTAINING A SUPPLY AIR TEMPERATURE OF 90 DEG (ADJ.) TO MAINTAIN THE ZONE TEMPERATURE SETPOINT.
 3. WHEN THE ZONE TEMPERATURE IS ABOVE THE COOLING SETPOINT, THE ECONOMIZER SEQUENCE IS ENABLED.
 4. SUPPLY AIR SHALL NOT DROP BELOW 55 DEG (ADJ.).
D. MINIMUM OUTSIDE AIR CONTROL
 1. THE OUTDOOR AIR DAMPER MODULATES BETWEEN THE HIGH MIN POSITION AND LOW MIN POSITION TO MAINTAIN THE CO2 LEVEL SETPOINT. TAB CONTRACTOR TO DETERMINE HIGH MIN AND LOW MIN DAMPER POSITION BASED ON THE AIRFLOWS IN THE AHU SCHEDULE.
 2. WHEN THE RETURN AIR CO2 LEVEL IS THE SAME AS THE OUTSIDE AMBIENT CO2 READING, THE OUTSIDE AIR DAMPER IS AT THE LOW MINIMUM POSITION. WHEN THE RETURN AIR CO2 LEVEL IS AT THE CO2 SETPOINT, THE OUTSIDE AIR DAMPER IS AT THE HIGH MINIMUM POSITION. THE OUTSIDE AIR DAMPER MODULATES BETWEEN THE LOW MINIMUM AND HIGH MINIMUM IN PROPORTION WHEN THE RETURN AIR CO2 LEVEL IS BETWEEN THE AMBIENT CO2 LEVEL AND THE CO2 SETPOINT. THE RETURN AIR DAMPER MODULATES IN SEQUENCE WITH THE OUTSIDE AIR DAMPER MODULATING OPEN.
E. ECONOMIZER CONTROL
 1. WHEN THE OUTSIDE AIR DRY BULB TEMPERATURE IS LOWER THAN THE RETURN AIR DRY BULB TEMPERATURE, ECONOMIZER COOLING SHALL BE ENABLED.
 2. WHEN THERE IS A CALL FOR COOLING IN THE ZONE AND THE ECONOMIZER SEQUENCE IS ENABLED, THE OUTSIDE AIR DAMPER MODULATES OPEN AND THE RETURN AIR DAMPER MODULATES CLOSED TO MAINTAIN THE OCCUPIED ZONE TEMPERATURE SETPOINT.
 3. IF THE ZONE TEMPERATURE CONTINUES TO RISE AFTER THE OUTSIDE AIR DAMPER IS FULLY OPEN, THE FAN SPEED MODULATES UP TO ITS MAXIMUM TO MAINTAIN THE ZONE TEMPERATURE SETPOINT.
 4. SUPPLY AIR TEMPERATURE SHALL NOT DROP BELOW 55 DEG (ADJ.).

UNOCCUPIED MODE:
A. FAN CONTROL
 1. DURING UNOCCUPIED MODE, THE FAN SHALL BE ENABLED INTERMITTENTLY WHEN THERE IS A CALL FOR HEATING OR COOLING.
B. ZONE TEMPERATURE CONTROL
 1. ON A CALL FOR HEATING, THE FAN IS ENABLED AND THE 3-WAY CONTROL VALVE IS MODULATED OPEN AFTER THE FAN PROVES ON TO MAINTAIN THE UNOCCUPIED ZONE SETBACK TEMPERATURE.
 2. ON A CALL FOR COOLING, THE ECONOMIZER SEQUENCE IS ENABLED.
C. MINIMUM OUTSIDE AIR CONTROL
 1. THE OUTSIDE AIR DAMPER IS CLOSED, THE RELIEF AIR HOOD DAMPER IS CLOSED, AND THE RETURN AIR DAMPER IS 100% OPEN.
D. ECONOMIZER CONTROL
 1. WHEN THERE IS A CALL FOR COOLING IN THE ZONE AND THE ECONOMIZER SEQUENCE IS ENABLED, THE RELIEF AIR DAMPER OPENS, THE OUTSIDE AIR DAMPER MODULATES OPEN AND THE RETURN AIR DAMPER MODULATES CLOSED TO MAINTAIN THE UNOCCUPIED ZONE SETBACK TEMPERATURE SETPOINT.

OCCUPANCY OVERRIDE MODE:
A. WHEN THE SYSTEM IS IN UNOCCUPIED MODE AND THE OCCUPANCY OVERRIDE BUTTON IS PRESSED, THE SYSTEM RUNS IN OCCUPIED MODE FOR ONE HOUR (ADJ.)

OPTIMUM START:
A. DDC SYSTEM SHALL CALCULATE OPTIMUM START TIME BASED ON OUTDOOR AIR DRY BULB TEMPERATURE AND ZONE TEMPERATURE.
B. MORNING WARM-UP
 1. THE FAN IS ENABLED, AND AFTER IT IS PROVEN ON, HEATING CONTROL VALVE SHALL MODULATE OPEN TO BRING THE ZONE TEMPERATURE UP TO THE OCCUPIED ZONE TEMPERATURE SETPOINT.
 2. THE OUTSIDE AIR DAMPER SHALL BE CLOSED AND RETURN AIR DAMPER 100% OPEN DURING MORNING WARM-UP.

HEATING COIL PUMP:
A. WHEN THE OUTSIDE AIR TEMPERATURE IS BELOW 40 DEG (ADJ.), THE HEATING COIL PUMP SHALL BE ENABLED AND THE HEATING VALVE SHALL BE OPEN TO 5% (ADJ.).

FREEZE PROTECTION SAFETIES:
A. IF THE MIXED AIR TEMPERATURE FALLS BELOW 55 DEG (ADJ.) WHILE THE FAN IS OFF, MODULATE THE HEATING WATER VALVE OPEN TO MAINTAIN THE MIXED AIR TEMPERATURE AT 55 DEG. (ADJ.) FAN OFF SETPOINT.
B. IF AT ANY TIME THE COIL FREEZE STAT SENSES A TEMPERATURE BELOW ITS SETPOINT OF 38 DEG (ADJ.):
 1. THE OUTDOOR AIR DAMPER SHALL CLOSE.
 2. THE FAN SHALL BE DISABLED.
 3. THE HEATING WATER VALVE SHALL OPEN TO 100%.
 4. THE COIL PUMP SHALL BE ENABLED IF IT IS NOT ALREADY.
 5. WHEN THE FREEZE STAT TEMPERATURE RISES AND THE CONTACTS OPEN, THE UNIT SHALL RETURN TO NORMAL OPERATION.

ALARMS AND INTERLOCK SAFETIES:

A. THE FOLLOWING SHALL SHUT DOWN THE AIR HANDLING UNIT AND SHALL INDICATE AN ALARM CONDITION:
 1. FIRE ALARM CONDITION SIGNAL SENT FROM FIRE ALARM PANEL. (AUTO RESET)
 2. SHOULD ANY 1' SECTION OF THE AUTO RESET LOW LIMIT TEMP SENSOR DOWN STREAM OF THE COILS SENSE AIR TEMP < 38°F (ADJ.)

ALARMS

A. THE FOLLOWING SHALL INDICATED AN ALARM CONDITION:
 1. DIRTY FILTER ALARM
 2. MIXED AIR TEMPERATURE BELOW 38 DEG (ADJ.) FOR MORE THAN 10 MIN (ADJ).
 3. VFD INDICATES FAN FAILS TO START UPON ENABLE COMMAND.
 4. PUMP FAILS TO START UPON ENABLE COMMAND.
 5. ANY SPACE TEMPERATURE FALLS BELOW 50 DEG (ADJ.) FOR MORE THAN 10 MINUTES (ADJ).
 6. VFD ALARM
 7. RETURN AIR CO2 LEVEL IS ABOVE SETPOINT FOR MORE THAN 10 MINUTES (ADJ.)

TRENDS

A. HISTORICALLY TREND ALL POINTS EVERY 15 MIN (ADJ.) OVER A 90 DAY PERIOD (ADJ.)

NOTES
1. THE HEATING COIL IN THIS EXISTING UNIT WAS SELECTED FOR AN ENTERING WATER TEMPERATURE OF 190 DEG F. AS PART OF THIS PROJECT, THE BOILER SUPPLY WATER TEMPERATURE WILL BE REDUCED TO 140 DEG F WITH A RESET SCHEDULE. DURING WINTER OPERATION, FACILITIES MAY NEED TO TEMPORARILY OVERRIDE THE BOILER SUPPLY WATER TEMPERATURE IF THIS ZONE IS NOT MAINTAINING THE HEATING SETPOINT.

1 GYM AHU CONTROLS
NOT TO SCALE

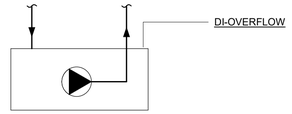
EMERGENCY HVAC SHUT-DOWN SWITCH IN ADMINISTRATIVE OFFICE

SEQUENCE OF OPERATION

EMERGENCY SHUT-DOWN
A. WHEN THE EMERGENCY HVAC SHUT-DOWN PUSHBUTTON SWITCH PRESSED:
 a. ALL MECHANICAL EQUIPMENT CONTROLLED BY THE BUILDING AUTOMATION SYSTEM SHALL SHUT DOWN.
 b. AN ALARM SHALL BE GENERATED.
 c. SYSTEM RESTART REQUIRES A MANUAL RESET AT THE DDC INTERFACE.

TRENDS
A. HISTORICALLY TREND ALL POINTS EVERY 15 MIN (ADJ.) OVER A 90 DAY PERIOD (ADJ.)

4 EMERGENCY HVAC SHUT-DOWN CONTROLS
NOT TO SCALE

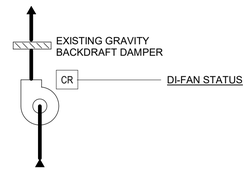


CONDENSATE PUMP WITH OVERFLOW SWITCH

SEQUENCE OF OPERATION

ALARMS AND INTERLOCKS
A. THE FOLLOWING SHALL INDICATE AN ALARM STATUS AT THE DDC:
 1. CONDENSATE PUMP OVERFLOW SENSOR INDICATES AN OVERFLOW CONDITION.

3 CONDENSATE PUMP OVERFLOW MONITORING
NOT TO SCALE



EXISTING EXHAUST FANS SERVING KITCHEN HOOD AND DISHWASHER HOOD

SEQUENCE OF OPERATION

FAN CONTROL
A. FANS ARE CONTROLLED BY LOCAL CONTROLS. DDC MONITORS FAN STATUS ONLY

TRENDS
A. HISTORICALLY TREND ALL POINTS EVERY 15 MIN (ADJ.) OVER A 90 DAY PERIOD (ADJ.)

2 KITCHEN EXHAUST FAN CONTROLS
NOT TO SCALE

BID/PERMIT DOCUMENTS

3/3/2020 3:13:08 PM

REGISTERED PROFESSIONAL ENGINEER
94129
OREGON
NOV. 13, 2018
STORMY L. SHANKS
EXPIRES: 6/30/2020

YOST GRUBE HALL ARCHITECTURE
707 SW Washington Street | Suite 1200 | Portland, OR 97205
t 503 221 0150 f 503 295 0840

Owner
BEAVERTON SCHOOL DISTRICT
CENTRAL ADMINISTRATION CENTER
16550 MERLO ROAD
BEAVERTON, OREGON 97003

Project
BSD RALEIGH PARK HVAC AND ELECTRICAL UPGRADE
RALEIGH PARK ELEMENTARY SCHOOL
3670 SW 78TH AVE
PORTLAND, OR 97225

MARK	DATE	DESCRIPTION

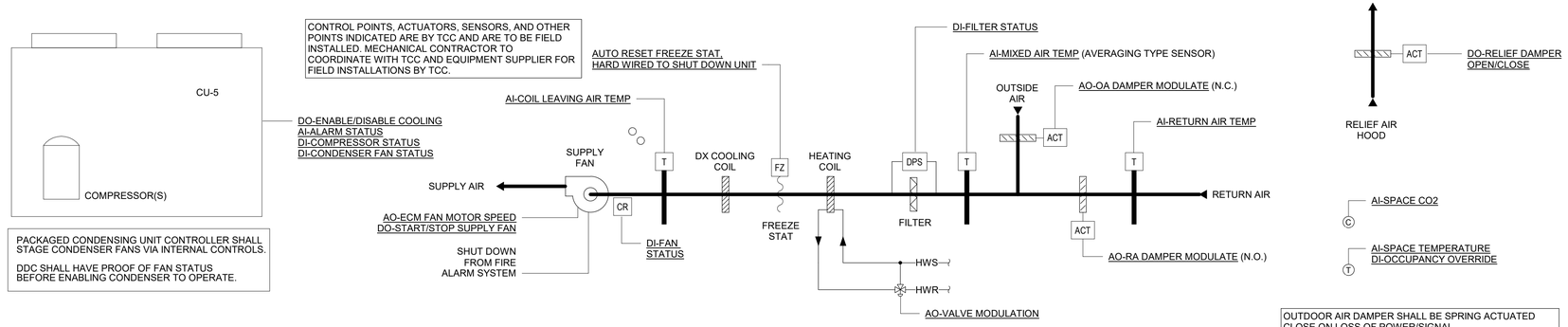
Sheet Title
MECHANICAL CONTROLS

Drawing No.
M5.02

Scale NOT TO SCALE

Date MARCH 04, 2020

Project No. 19-0012



PACKAGED CONDENSING UNIT CONTROLLER SHALL STAGE CONDENSER FANS VIA INTERNAL CONTROLS.

DDC SHALL HAVE PROOF OF FAN STATUS BEFORE ENABLING CONDENSER TO OPERATE.

OUTDOOR AIR DAMPER SHALL BE SPRING ACTUATED CLOSE ON LOSS OF POWER/SIGNAL.
HEAT CONTROL VALVE SHALL BE SPRING ACTUATED OPEN ON LOSS OF POWER/SIGNAL.

SINGLE ZONE VAV AHU WITH DX COOLING AND HW HEATING

SEQUENCE OF OPERATION

OCCUPIED MODE:
A. FAN CONTROL
 1. THE SUPPLY FAN SHALL BE ENABLED TO RUN CONTINUOUSLY WHEN THE ZONE IS SCHEDULED TO BE IN OCCUPIED MODE. THE SUPPLY FAN SPEED SHALL MODULATE TO MAINTAIN THE ZONE TEMPERATURE SETPOINT. THE SUPPLY FAN SHALL RUN AT A MINIMUM SPEED ACCORDING TO THE MINIMUM CFM IN THE AHU SCHEDULE. THE SUPPLY FAN RUNS AT NO LESS THAN 30% WHEN DX CONDENSING IS ENABLED.
B. RELIEF AIR DAMPER CONTROL
 1. THE RELIEF AIR DAMPER(S) IN THE RELIEF AIR ROOF HOODS ARE OPEN CONTINUOUSLY DURING OCCUPIED MODE AND WHEN ECONOMIZER MODE IS ENABLED.
C. DISCHARGE AIR TEMPERATURE CONTROL
 1. WHEN THE ZONE TEMPERATURE IS BELOW THE OCCUPIED HEATING SETPOINT TEMPERATURE,
  a. WITH THE FAN AT ITS MINIMUM SPEED, THE 3-WAY CONTROL VALVE IS MODULATED OPEN UNTIL THE DISCHARGE AIR TEMPERATURE REACHES 90 DEG (ADJ.).
  b. UPON A FURTHER DROP IN ZONE TEMPERATURE, THE FAN SPEED SHALL MODULATE AND THE 3-WAY CONTROL VALVE SHALL MODULATE TO MAINTAIN THE 90 DEG (ADJ.) DISCHARGE AIR TEMPERATURE.
 2. WHEN THE ZONE TEMPERATURE IS ABOVE THE OCCUPIED COOLING SETPOINT TEMPERATURE,
  a. THE DX CONDENSING UNIT REMAINS DISABLED, AND THE ECONOMIZER CONTROL IS ENABLED.
  b. UPON A FURTHER RISE IN ZONE TEMPERATURE AFTER THE OUTSIDE AIR DAMPER IS FULLY OPEN AND THE FAN IS AT MAXIMUM SPEED,
   • THE DDC ENABLES THE DX COOLING.
   • THE DX COOLING CONTROLS STAGE COMPRESSORS TO PROVIDE A DISCHARGE AIR TEMPERATURE OF 55 DEG (ADJ.)
   • THE FAN MODULATES TO MAINTAIN THE ZONE OCCUPIED COOLING SETPOINT.
 3. WHEN THE ZONE TEMPERATURE IS IN THE DEADBAND, DX COOLING IS DISABLED, FAN SPEED IS AT MINIMUM, AND THE THREE-WAY VALVE IS CLOSED.
D. MINIMUM OUTSIDE AIR CONTROL
 1. WHEN IN THE OCCUPIED MODE, OUTDOOR AIR DAMPER SHALL MODULATE BETWEEN THE HIGH MIN POSITION AND LOW MIN POSITION TO PROVIDE REQUIRED VENTILATION AIR BASED ON THE CO2 SENSOR INPUT. TAB CONTRACTOR TO DETERMINE HIGH MIN AND LOW MIN DAMPER POSITION BASED ON THE VENTILATION SCHEDULE.
 2. IF THE SPACE CO2 LEVEL IS THE SAME AS THE OUTSIDE AMBIENT CO2 READING, THE OUTSIDE AIR DAMPER SHALL BE AT THE LOW MINIMUM POSITION. UPON A RISE IN RETURN AIR CO2 LEVEL, THE OUTSIDE AIR DAMPER SHALL MODULATE OPEN TO THE HIGH MIN SETTING TO MAINTAIN THE ZONE CO2 SETPOINT. THE RETURN AIR DAMPER SHALL MODULATE CLOSED IN SEQUENCE WITH THE OUTSIDE AIR DAMPER MODULATING OPEN.
E. ECONOMIZER CONTROL
 1. WHEN THE OUTSIDE AIR DRY BULB TEMPERATURE IS LOWER THAN THE RETURN AIR DRY BULB TEMPERATURE, ECONOMIZER COOLING IS ENABLED.
 2. WHEN THERE IS A CALL FOR COOLING IN THE ZONE AND THE ECONOMIZER SEQUENCE IS ENABLED, THE OUTSIDE AIR DAMPER MODULATES OPEN AND THE RETURN AIR DAMPER MODULATES CLOSED TO MAINTAIN THE OCCUPIED ZONE TEMPERATURE SETPOINT. THE OUTSIDE AIR DAMPER DOES NOT CLOSE MORE THAN THE CURRENTLY CALCULATED MINIMUM POSITION.

UNOCCUPIED MODE:
A. FAN CONTROL
 1. DURING UNOCCUPIED MODE, THE FAN SHALL BE ENABLED INTERMITTENTLY WHEN THERE IS A CALL FOR HEATING OR COOLING.
B. ZONE TEMPERATURE CONTROL
 1. ON A CALL FOR HEATING, THE FAN IS ENABLED AND THE 3-WAY CONTROL VALVE IS MODULATED OPEN AFTER THE FAN PROVES ON TO MAINTAIN THE UNOCCUPIED ZONE SETBACK TEMPERATURE.
 2. ON A CALL FOR COOLING, THE ECONOMIZER CONTROL ENABLED.
C. MINIMUM OUTSIDE AIR CONTROL
 1. THE OUTSIDE AIR DAMPER IS CLOSED, THE RELIEF AIR HOOD DAMPER IS CLOSED, AND THE RETURN AIR DAMPER IS 100% OPEN.
D. ECONOMIZER CONTROL
 1. WHEN THERE IS A CALL FOR COOLING IN THE ZONE AND THE ECONOMIZER SEQUENCE IS ENABLED, THE RELIEF AIR DAMPER OPENS, THE OUTSIDE AIR DAMPER MODULATES OPEN AND THE RETURN AIR DAMPER MODULATES CLOSED TO MAINTAIN THE UNOCCUPIED ZONE SETBACK TEMPERATURE SETPOINT.
 2. UPON A FURTHER RISE IN ZONE TEMPERATURE AFTER THE OUTSIDE AIR DAMPER IS FULLY OPEN AND THE FAN IS AT MAXIMUM SPEED,
  a. THE DDC ENABLES THE DX COOLING.
  b. THE DX COOLING CONTROLS STAGE COMPRESSORS TO PROVIDE A DISCHARGE AIR TEMPERATURE OF 55 DEG (ADJ.)
  c. THE FAN MODULATES TO MAINTAIN THE ZONE OCCUPIED COOLING SETPOINT.

OCCUPANCY OVERRIDE MODE:
A. WHEN THE SYSTEM IS IN UNOCCUPIED MODE AND THE OCCUPANCY OVERRIDE BUTTON IS PRESSED, THE SYSTEM RUNS IN OCCUPIED MODE FOR ONE HOUR (ADJ.)

OPTIMUM START:
A. DDC SYSTEM SHALL CALCULATE OPTIMUM START TIME BASED ON OUTDOOR AIR DRY BULB TEMPERATURE AND ZONE TEMPERATURE.
B. MORNING WARM-UP
 1. THE FAN IS ENABLED, AND AFTER IT IS PROVEN ON, HEATING CONTROL VALVE SHALL MODULATE OPEN TO BRING THE ZONE TEMPERATURE UP TO THE OCCUPIED ZONE TEMPERATURE SETPOINT.
 2. THE OUTSIDE AIR DAMPER SHALL BE CLOSED AND RETURN AIR DAMPER 100% OPEN DURING MORNING WARM-UP.

FREEZE PROTECTION SAFETIES:
A. IF THE MIXED AIR TEMPERATURE FALLS BELOW 55 DEG (ADJ.) WHILE THE FAN IS OFF, MODULATE THE HEATING WATER VALVE OPEN TO MAINTAIN THE MIXED AIR TEMPERATURE AT 55 DEG. (ADJ.) FAN OFF SETPOINT.
B. IF AT ANY TIME THE COIL FREEZE STAT SENSES A TEMPERATURE BELOW ITS SETPOINT OF 38 DEG (ADJ.):
 1. THE OUTDOOR AIR DAMPER SHALL CLOSE.
 2. THE FAN SHALL BE DISABLED.
 3. THE HEATING WATER VALVE SHALL OPEN TO 100%.
 4. WHEN THE FREEZE STAT TEMPERATURE RISES AND THE CONTACTS OPEN, THE UNIT SHALL RETURN TO NORMAL OPERATION.

ECONOMIZER FAULT DETECTION AND DIAGNOSTICS
A. PROVIDE ECONOMIZER STATUS AT THE GRAPHICAL INTERFACE:
 1. FREE COOLING AVAILABLE
 2. ECONOMIZER ENABLED
 3. COMPRESSOR ENABLED
 4. HEATING ENABLED
 5. MIXED-AIR LOW-LIMIT CYCLE ACTIVE

ALARMS AND INTERLOCK SAFETIES:

A. THE FOLLOWING SHALL SHUT DOWN THE AIR HANDLING UNIT AND SHALL INDICATE AN ALARM CONDITION:
 1. FIRE ALARM CONDITION SIGNAL SENT FROM FIRE ALARM PANEL. (AUTO RESET)
 2. SHOULD ANY 1 FT SECTION OF THE AUTO RESET LOW LIMIT TEMP SENSOR DOWN STREAM OF THE COILS SENSE AIR TEMP < 38°F (ADJ.)

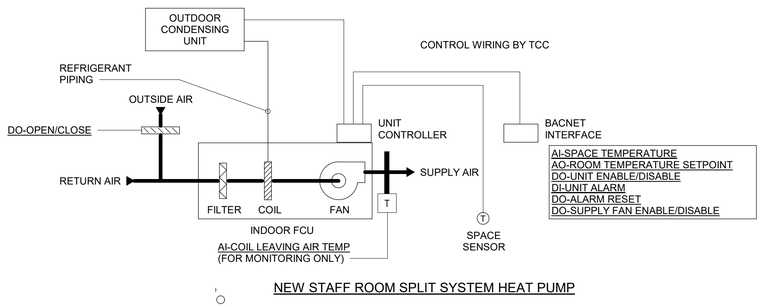
ALARMS

A. THE FOLLOWING SHALL INDICATED AN ALARM CONDITION:
 1. DIRTY FILTER ALARM
 2. MIXED AIR TEMPERATURE BELOW 38 DEG (ADJ.) FOR MORE THAN 10 MIN.
 3. FAN FAILS TO START UPON ENABLE COMMAND.
 4. ANY SPACE TEMPERATURE FALLS BELOW 50 DEG (ADJ.) FOR MORE THAN 10 MINUTES.
 5. VFD ALARM.
 6. SPACE CO2 LEVEL IS ABOVE SETPOINT FOR MORE THAN 10 MINUTES (ADJ.)

TRENDS

A. HISTORICALLY TREND ALL POINTS EVERY 15 MIN (ADJ.) OVER A 90 DAY PERIOD (ADJ.)

1 LIBRARY AHU CONTROLS
NOT TO SCALE



NEW STAFF ROOM SPLIT SYSTEM HEAT PUMP

SEQUENCE OF OPERATION

OCCUPIED CONTROL:
A. WHEN THE ZONE IS SCHEDULED TO BE OCCUPIED:
 1. THE OUTSIDE AIR DAMPER OPENS.
 2. THE FAN RUNS CONTINUOUSLY AT CONSTANT VOLUME.
 3. THE SPLIT SYSTEM MANUFACTURER'S CONTROLS ENABLE HEATING AND COOLING AT THE HEAT PUMP CONDENSING UNIT TO MAINTAIN THE SCHEDULED TEMPERATURE SETPOINT IN THE SPACE.

UNOCCUPIED CONTROL:
A. WHEN THE ZONE IS SCHEDULED TO BE UNOCCUPIED:
 1. THE OUTSIDE AIR DAMPER CLOSES.
 2. THE FAN RUNS INTERMITTENTLY ON A CALL FOR COOLING OR HEATING.
 3. THE SPLIT SYSTEM MANUFACTURER'S CONTROLS ENABLE HEATING AND COOLING AT THE HEAT PUMP CONDENSING UNIT TO MAINTAIN THE SCHEDULED TEMPERATURE SETPOINT IN THE ZONE.

ALARMS AND INTERLOCKS
A. THE FOLLOWING SHALL INDICATE AN ALARM STATUS AT THE DDC:
 1. SPACE TEMPERATURE FALLS BELOW 50 DEG (ADJ.) FOR MORE THAN 15 MINUTES (ADJ.)
 2. AN ALARM STATUS FROM THE SPLIT SYSTEM CONTROLS.

TRENDS
A. HISTORICALLY TREND ALL POINTS EVERY 15 MIN (ADJ.) OVER A 90 DAY PERIOD (ADJ.)

2 SPLIT SYSTEM CONTROLS
1/8" = 1'-0"

BID/PERMIT DOCUMENTS

REGISTERED PROFESSIONAL ENGINEER
94129
OREGON
NOV. 13, 2018
STORMY L. SHANKS
EXPIRES: 6/30/2020

YOST GRUBE HALL ARCHITECTURE
707 SW Washington Street | Suite 1200 | Portland, OR 97205
t 503 221 0150 f 503 295 0840

Owner
BEAVERTON SCHOOL DISTRICT
CENTRAL ADMINISTRATION CENTER
16550 MERLO ROAD
BEAVERTON, OREGON 97003

Project
BSD RALEIGH PARK HVAC AND ELECTRICAL UPGRADE
RALEIGH PARK ELEMENTARY SCHOOL
3670 SW 78TH AVE
PORTLAND, OR 97225

MARK DATE DESCRIPTION

Sheet Title
MECHANICAL CONTROLS

Drawing No.
M5.03

Scale 1/8" = 1'-0"

Date MARCH 04, 2020

Project No. 19-0012

3/3/2020 5:38:57 PM

CONDENSATE PUMP SCHEDULE

REFERENCE	CP-1	CP-2	CP-3	CP-4
MANUFACTURER	FRANKLIN ELECTRIC	FRANKLIN ELECTRIC	FRANKLIN ELECTRIC	FRANKLIN ELECTRIC
MODEL #	LITTLE GIANT VCMX-20ULS	LITTLE GIANT VCMX-20ULS	LITTLE GIANT VCMX-20ULS	LITTLE GIANT VCMX-20ULS
SERVES	UNIT VENTILATORS	UNIT VENTILATORS	UNIT VENTILATORS	UNIT VENTILATORS
TANK CAPACITY (GAL.)	0.5	0.5	0.5	0.5
FLOW (GPH)	10	10	10	10
HEAD (FT OF WATER)	20	20	20	20
MOTOR HP	1/30	1/30	1/30	1/30
VOLTAGE/PHASE	120/1	120/1	120/1	120/1
FLA	1.50	1.50	1.50	1.50
NOTES	1	1	1	1

NOTES:
1. PROVIDE WITH OVERFLOW DETECTION.

DESIGN CONDITIONS

TEMPERATURE	COOLING OUTSIDE AIR	COOLING SET POINT	HEATING OUTSIDE AIR	HEATING SETPOINT
DRY BULB (F)	92	75	17	70
WET BULB (F)	66.2	-	-	-
NOTES	2	2	2	2

1. ASHRAE 1% DESIGN CONDITIONS
2. PER BSD TECHNICAL STANDARD DIVISION

GRILLES REGISTERS AND DIFFUSERS SCHEDULE

REFERENCE	MATERIAL	MARGIN (IN)	INLET (IN)	FACE (IN)	DAMPER	MFR	MODEL	NOTES
SG-1 (DUCT SUPPLY GRILLE)	ALUMINUM	1 1/4"	SEE DWG	INLET +2"	YES	TITUS	300R	-
SD-1 (ROUND SUPPLY DIFFUSER)	ALUMINUM	1 1/4"	SEE DWG	INLET +2"	YES	TITUS	TMRA-AA	2,3
RG-1 (SIDEWALL RETURN GRILLE)	ALUMINUM	1 1/4"	SEE DWG	INLET +2"	NO	TITUS	25RL	1,2

NOTES:
1. PROVIDE WITH WHITE FINISH.
2. AEROBLADE RETURN GRILLE, HORIZONTAL BLADES, 30 DEGREE DEFLECTION ANGLED UP.
3. FRONT BLADES VERTICAL.

CONDENSING UNIT SCHEDULES

REFERENCE	CU-1	CU-2	CU-3	CU-4	CU-5
MANUFACTURER	DAIKIN	DAIKIN	DAIKIN	DAIKIN	DAIKIN
MODEL #	RXYQ192	RXYQ336	RXYQ216	RX09	RCS10G
SERVES	UV-B100 - UV-B116	UV-B118, UV-A100 - UV-A106, UV-A122 - UV-A128	UV-A108 - UV -118	FCU-1	AHU-1
SYSTEM NOMINAL TONS	16	28	18	0.75	10
MODULE WEIGHT (LBS)	436.5+526.9	694.5+694.5	525+527	60	557
MODULE DIMENSIONS (W x H x D)	85.6x66.7x30.2	97.8x66.7x30.2	97.8x66.7x30.2	27x22x11	73.9x44.8x38.4
NUMBER OF COMPRESSORS	2	2	2	1	1
SYSTEM COOLING CAP. (MBH)	198.3	346.3	218.7	9	112.2
SYSTEM HEATING CAP. (MBH)	160.6	240.8	180.5	10.9	-
SYSTEM COOLING EFFICIENCY	11.6 EER	9.5 EER	10.9 EER	11.1 EER	13.1 EER
SYSTEM COP	3.29	3.2	3.5	4.1	-
VOLTAGE - PHASE	208/3	208/3	208/3	208/1	208/3
MCA	27.6+36.3	55.1+55.1	36.3+36.3	9	48
MOCP	35+45	60+60	45+45	15	80
NOTES	1, 2, 3	1, 2, 3	1, 2, 3	-	-

NOTES:
1. PROVIDE WITH PIPING TWINNING KIT.
2. INDIVIDUAL POWER CONNECTIONS FOR EACH MODULE IN TWINNED UNITS.
3. HEATING CAPACITY IS SHOWN FOR REFERENCE ONLY. UNITS WILL BE USED FOR COOLING ONLY.

UNIT VENTILATOR SCHEDULE

REFERENCE	UV-B100	UV-B102	UV-B104	UV-B106	UV-B116	UV-A100	UV-A102	UV-A104	UV-A106	UV-A108	UV-A110	UV-A116	UV-A118	UV-A122	UV-A124	UV-A126	UV-A128	UV-B118
MANUFACTURER	DAIKIN	DAIKIN	DAIKIN	DAIKIN	DAIKIN	DAIKIN	DAIKIN	DAIKIN	DAIKIN	DAIKIN	DAIKIN	DAIKIN	DAIKIN	DAIKIN	DAIKIN	DAIKIN	DAIKIN	DAIKIN
MODEL	UAVV9H13	UAVV9H13	UAVV9H13	UAVV9H13	UAVV9H15	UAVV9H13	UAVV9H13	UAVV9H13	UAVV9H13	UAVV9H13	UAVV9H13	UAVV9H15	UAVV9H15	UAVV9H15	UAVV9H15	UAVV9H15	UAVV9H15	UAVV9H13
SERVICE	CLASSROOM B100	CLASSROOM B102	CLASSROOM B104	CLASSROOM B106	CLASSROOM B116	CLASSROOM A100	CLASSROOM A102	CLASSROOM A104	CLASSROOM A106	CLASSROOM A108	CLASSROOM A110	CLASSROOM A116	CLASSROOM A118	CLASSROOM A122	CLASSROOM A124	CLASSROOM A126	CLASSROOM A128	RESOURCE ROOM B118
GENERAL DATA																		
DIMENSIONS (LxDxH)	86x22x30	86x22x30	86x22x30	86x22x30	98x22x30	86x22x30	86x22x30	86x22x30	86x22x30	86x22x30	86x22x30	98x22x30	98x22x30	98x22x30	98x22x30	98x22x30	98x22x30	86x22x30
WEIGHT (LBS)	525	525	525	525	600	525	525	525	525	525	525	600	600	600	600	600	600	525
LOW MINIMUM OUTDOOR AIR (CFM)	115	115	115	115	120	115	115	115	115	115	115	115	115	115	115	115	115	100
HIGH MINIMUM OUTDOOR AIR (CFM)	355	355	355	355	360	350	350	350	350	350	350	345	350	350	350	350	350	300
SUPPLY FAN																		
ESP (IN. W.C.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MOTOR HP	1/3	1/3	1/3	1/3	1/4	1/3	1/3	1/3	1/3	1/3	1/3	1/4	1/4	1/4	1/4	1/4	1/4	1/3
MOTOR TYPE	ECM	ECM	ECM	ECM	ECM	ECM	ECM	ECM	ECM	ECM	ECM	ECM	ECM	ECM	ECM	ECM	ECM	ECM
DX COOLING COIL																		
COOLING EAT (DB) °F	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0
COOLING EAT (WB) °F	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0
COOLING LAT (DB) °F	54.8	55.2	55.2	55.2	54.3	55.2	55.2	55.2	55.2	55.2	55.2	54.3	54.3	54.3	54.3	54.3	54.3	55.6
NET TOTAL CAPACITY (MBH)	43.4	43.4	43.4	43.4	53.7	43.4	43.4	43.4	43.4	43.4	43.4	53.7	53.7	53.7	53.7	53.7	53.7	43.4
NET SENSIBLE CAPACITY (MBH)	32.6	32.6	32.6	32.6	40.3	32.6	32.6	32.6	32.6	32.6	32.6	40.3	40.3	40.3	40.3	40.3	40.3	32.6
HOT WATER HEATING																		
EAT (DB) °F	55.0	55.0	55.0	55.0	57.0	55.0	55.0	55.0	55.0	55.0	55.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0
LAT (DB) °F	110.6	101.8	101.8	101.8	111.2	101.8	101.8	101.8	101.8	101.8	101.8	111.2	111.2	111.2	111.2	111.2	111.2	89.5
OUTPUT (MBH)	70.0	60.0	60.0	60.0	70.0	60.0	60.0	60.0	60.0	60.0	60.0	70.0	70.0	70.0	70.0	70.0	70.0	45.0
EWT °F	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0
LWT °F	119.5	119.5	119.5	119.5	118.8	119.5	119.5	119.5	119.5	119.5	119.5	118.8	118.8	118.8	118.8	118.8	118.8	120.7
GPM	7.0	6.0	6.0	6.0	8.0	6.0	6.0	6.0	6.0	6.0	6.0	8.0	8.0	8.0	8.0	8.0	8.0	4.5
PRESSURE DROP FT. HEAD	3.89	5.17	5.17	5.17	10.47	5.17	5.17	5.17	5.17	5.17	5.17	10.47	10.47	10.47	10.47	10.47	10.47	3.27
ELECTRICAL DATA																		
VOLTAGE/PH	115/1	115/1	115/1	115/1	115/1	115/1	115/1	115/1	115/1	115/1	115/1	115/1	115/1	115/1	115/1	115/1	115/1	115/1
MCA	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
MOP	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NOTES	1, 2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6

NOTES:
1. PROVIDE FACTORY MOUNTED AND WIRED DISCONNECT SWITCH.
2. PROVIDE 1" THICK, MERV 8 FILTERS, INCLUDING ONE SPARE FILTER SET.
3. PROVIDE HOT WATER VALVE PACKAGE INCLUDING SHUT OFF VALVES, STRAINER, DRAIN WITH HOSE BIB, AND THREE WAY MODULATING CONTROL VALVE. PROVIDE AUTOMATIC RESET FREEZE PROTECTION BULB AND CAPILLARY SENSOR.
4. REFER TO THE DESIGN CONDITIONS SCHEDULES FOR OUTDOOR DESIGN CONDITIONS AND SETPOINTS. REFER TO CONTROLS DRAWINGS FOR CONTROLS DEVICES AND SEQUENCES OF OPERATION.
5. PROVIDE WITH DAIKIN VRV AIR HANDLING UNIT INTEGRATION KIT, TX VALVE, AND NAVIGATOR LOCAL CONTROL INSTALLED INSIDE THE CABINET.
6. PROVIDE WITH 6-INCH EXTENDED END PANELS ON BOTH ENDS TO ALLOW SUFFICIENT SPACE FOR PIPING AND CONTROLS INSTALLATION INSIDE CABINET.

BID/PERMIT DOCUMENTS

3/3/2020 3:13:10 PM

REGISTERED PROFESSIONAL ENGINEER
94129
OREGON
NOV. 13, 2018
STORMY L. SHANKS
EXPIRES: 6/30/2020

YOST GRUBE HALL ARCHITECTURE
707 SW Washington Street | Suite 1200 | Portland, OR 97205
t 503 221 0150 f 503 295 0840

Owner
BEAVERTON SCHOOL DISTRICT
CENTRAL ADMINISTRATION CENTER
16550 MERLO ROAD
BEAVERTON, OREGON 97003

Project
BSD RALEIGH PARK HVAC AND ELECTRICAL UPGRADE
RALEIGH PARK ELEMENTARY SCHOOL
3670 SW 78TH AVE
PORTLAND, OR 97225

MARK DATE DESCRIPTION

Sheet Title
MECHANICAL SCHEDULES

Drawing No.
M6.00

Scale

Date MARCH 04, 2020

Project No. 19-0012

VIBRATION ISOLATION SCHEDULE

REFERENCE	FCU-1	AHU-1
EQUIPMENT SUPPORT	SUSPENDED FROM STRUCTURE ABOVE	FLOOR MOUNTED
TYPE	3 - SPRING HANGER (SEISMIC)	3 - SPRING FLOOR ISOLATOR
DEFLECTION	0.75"	0.75"
NOTES	-	-
PIPING CONNECTIONS	-	-
MATERIAL	-	-
NOTES	-	-
DUCT CONNECTIONS	FLEXIBLE CONNECTORS	FLEXIBLE CONNECTORS
NOTES	1	1

NOTES:
1. PROVIDE VENTFABRICS OR EQUIVALENT FLEXIBLE CONNECTORS, 3 1/2" WIDE FABRIC STRIP WITH TWO STRIPS OF 2 3/4" WIDE GALVANIZED STEEL SHEETS. FABRIC SHALL BE FLAME-RETARDANT OR NONCOMBUSTIBLE.

DESTRATIFICATION FAN SCHEDULE

REFERENCE	DF-1
MANUFACTURER	AIR PEAR
MODEL #	A-25-EC
TYPE	DESTRATIFICATION
SERVES	GYM / MULTIPURPOSE
CFM	620
FAN RPM	1,700
SOUND LEVEL (Db(A))	51
MOTOR WATTS	30
AMPS	0.4
VOLTAGE - PHASE	120 / 1
NOTES	1

NOTES:
1. FAN CONTROLLED BY TIMED WALL SWITCH BY ELECTRICAL CONTRACTOR.

EXISTING AIR HANDLING UNIT SCHEDULE

REFERENCE	AHU-GYM (EX)	AHU-MULTI (EX)
MANUFACTURER	--	--
MODEL #	--	--
SERVICE	GYM	MULTIPURPOSE
LOCATION	STOR2	STOR4
CONFIGURATION	HORIZONTAL	HORIZONTAL
OPERATION	SINGLE ZONE VAV	SINGLE ZONE VAV
GENERAL DATA		
LOW MIN OUTDOOR AIR (CFM)	1,100	910 (NOTE 4)
HIGH MIN OUTDOOR AIR (CFM)	1,205	4,700
RELIEF PATH	GRAVITY ROOF HOOD	GRAVITY ROOF HOOD
SUPPLY FAN		
MAX CFM	6,000	8,000
MIN CFM	2,000	2,400
ESP (IN. W.C.)	1.0	1.0
DRIVE / TYPE	BELT	BELT
SPEED CONTROL METHOD	VFD	VFD
MOTOR HP	3	5
VOLTAGE/PH	208/3	208/3
HOT WATER HEATING COIL		
EAT (DB) °F	55	40
LAT (DB/WB) °F	95	85
OUTPUT (MBH)	259	389
EWT °F	140	140
LWT °F	--	--
GPM	9.0	17.0
NOTES	1,2,3	1,2,3

NOTES:
1. REPLACE FAN MOTOR. NEW VFD BY ELECTRICAL CONTRACTOR.
2. UNIT IS CURRENTLY OPERATED AS CONSTANT VOLUME, SINGLE ZONE, HEATING AND VENTILATING. NEW OPERATION WILL BE SINGLE ZONE, VARIABLE VOLUME, HEATING AND VENTILATING WITH ECONOMIZER COOLING. REFER TO CONTROL DIAGRAMS AND SEQUENCES.
3. HEATING COIL ORIGINALLY DESIGNED FOR 190 DEG EWT, 40 DEG DELTA T. BOILERS WILL NOW OPERATE AT 140 DEG F SUPPLY TEMP.
4. LOW MIN CFM IS BASED ON VENTILATION AREA RATE. FIELD VERIFY EXHAUST FLOW RATES IN KITCHEN, RR5, AND STAFF SPACES. ADJUST LOW MIN OUTSIDE AIR INTAKE AT CAFETERIA UNIT IF NECESSARY TO ENSURE THAT IT IS HIGHER THAN THE SUM OF EXHAUST IN THOSE ADJACENT SPACES.

AIR HANDLING UNIT SCHEDULE

REFERENCE	AHU-1
MANUFACTURER	ENVIRO-TEC
MODEL #	VDD40
SERVICE	LIBRARY / STORAGE 1
LOCATION	LIBRARY
CONFIGURATION	VERTICAL
MAINTENANCE ACCESS	ONE SIDE
OPERATION	SINGLE ZONE VAV WITH CO2 SENSOR
GENERAL DATA	
WEIGHT (LBS)	807
DIMENSIONS (LxWxH)	54x68x59
LOW MIN OUTDOOR AIR (CFM)	260
HIGH MIN OUTDOOR AIR (CFM)	710
RELIEF PATH	ROOF MOUNTED GRAVITY HOOD
SUPPLY FAN	
CFM	4,700
DRIVE / TYPE	DIRECT DRIVE ECM
SPEED CONTROL METHOD	0-10 V MODULATING
ESP (IN. W.C.)	1.0
BHP	1.4
MOTOR HP	1 1/2
MCA	9.9
MOCP	15
VOLTAGE/PH	208/3
DX COOLING	
REMOTE CONDENSING UNIT	CU-5
EAT (DB/WB) °F	81.4 / 64
COIL LAT °F	54
TOTAL CAPACITY (MBH)	121.5
SENSIBLE CAPACITY (MBH)	114.9
HOT WATER HEATING COIL	
EAT (DB) °F	53.0
OUTPUT (MBH)	94
EWT °F	140
LWT °F	120.0
GPM	11.3
PRESSURE DROP FT. HEAD	12.45
NOTES	1, 2, 3

NOTES:
1. PROVIDE WITH FILTER BANK AT RETURN INLET, 2" MERV 8 FILTERS. FILTERS SHALL BE SELECTED AT MEAN PRESSURE DROP.
2. SUPPLY FAN SHALL BE FACTORY WIRED TO EXTERNAL JUNCTION BOX. TCC SHALL PROVIDE VFD. EC SHALL PROVIDE POWER WIRING TO VFD, AND FROM VFD TO JUNCTION BOX.
3. PROVIDE NON-FUSED DISCONNECT.

DUCTWORK AND INSULATION SCHEDULE

SYSTEM	LOCATION	MATERIAL (NOTE 1)	PRESSURE CLASS, IN W.C. (NOTE 1)	SEAL CLASS (NOTE 3)	LEAKAGE CLASS (NOTE 3)	INSULATION THICKNESS AND TYPE (NOTE 2)					NOTES
						INSULATION THICKNESS (INCHES)	INTERIOR LINER	FLEXIBLE WRAP	DOUBLE-WALL INSULATED	RIGID BOARD	
VENTILATION INTAKE - RECTANGULAR	CONDITIONED EXPOSED	G60 GALVANIZED STEEL	-1	A	12	1				X	4
RETURN - RECTANGULAR	CONDITIONED SPACE	G60 GALVANIZED STEEL	-1	B	12	1	X				4
RETURN - ROUND	CONDITIONED SPACE	G60 GALVANIZED STEEL	-1	B	6	1	X				4
SUPPLY - LOW PRESSURE RECTANGULAR	CONDITIONED EXPOSED	G60 GALVANIZED STEEL	+1	B	12	1	X				4
SUPPLY - LOW PRESSURE ROUND	CONDITIONED EXPOSED	G60 GALVANIZED STEEL	+1	B	6	--					4

NOTES:
1. DUCT WORK MATERIAL AND CONSTRUCTION SHALL MEET SMACNA DUCT CONSTRUCTION STANDARDS, AND BE MINIMUM 26 GAUGE UNLESS NOTED OTHERWISE. REFER TO SPECIFICATIONS FOR FURTHER REQUIREMENTS.
2. REFER TO SPECIFICATIONS FOR FURTHER INSULATION AND LINER MATERIAL REQUIREMENTS. ASHRAE 90.1-2016 MINIMUM R-VALUE.
3. SEAL AND LEAKAGE CLASS BASED ON SMACNA HVAC DUCT CONSTRUCTION STANDARDS.
4. PROVIDE EXPOSED DUCTWORK IN LIBRARY WITH PAINT GRIP FINISH.

MOTORIZED DAMPER SCHEDULE

REFERENCE	MD-1	MD-2
MANUFACTURER	GREENHECK	GREENHECK
SERVES	AHU-1 RA DAMPER	AHU-1 OA DAMPER
DIMENSIONS (WxH)	36x16	36x16
PARALLEL/OPPOSED	OPPOSED	OPPOSED
INSULATED	NO	YES
CFM	3950	4700
ACTUATION	MOTOR	MOTOR
ACTUATOR VOLTAGE	CONTROL VOLTAGE	CONTROL VOLTAGE
FAIL POSITION	OPEN	CLOSED

FAN COIL UNIT SCHEDULE

REFERENCE	FCU-1
SERVES	STAFF ROOM
MANUFACTURER	DAIKIN
MODEL #	FDMQ09RV
TYPE	CEILING CONCEALED
WEIGHT	64.0
CFM	340
NOMINAL TONS	0.75
COOLING CAPACITY (MBH)	9
SENSIBLE CAPACITY (MBH)	7.61
HEATING CAPACITY (MBH)	10.9
VOLTAGE - PH	208/1
MCA	9
MOP	15
NOTES	1

NOTES:
1. DUCTED UNITS HAVE CONDENSATE LIFT CAPABILITIES.

GRAVITY HOOD SCHEDULE

REFERENCE	H-1
MANUFACTURER	GREENHECK
MODEL #	FGI
SERVES	AHU-1
THROAT (LxW)	36x26
THROAT VELOCITY (FPM)	723
HOOD DIMENSIONS (WxLxH)	47x60x19
SERVES	LIBRARY
CFM	4,700
ESP (IN. W.C.)	0.07
BACKDRAFT (MOTOR/GRAVITY/NONE)	MOTOR
NOTES	1

NOTES:
1. PROVIDE WITH ROOF CURB AND ALUMINUM BIRD SCREEN. REFER TO SPECIFICATIONS FOR CURB TYPE.

BID/PERMIT DOCUMENTS

3/3/2020 3:13:10 PM

REGISTERED PROFESSIONAL ENGINEER
94129
OREGON
NOV. 13, 2018
STORMY L. SHANKS
EXPIRES: 6/30/2020

YOST GRUBE HALL ARCHITECTURE
707 SW Washington Street | Suite 1200 | Portland, OR 97205
t 503 221 0150 f 503 295 0840

Owner
BEAVERTON SCHOOL DISTRICT
CENTRAL ADMINISTRATION CENTER
16550 MERLO ROAD
BEAVERTON, OREGON 97003

Project
BSD RALEIGH PARK HVAC AND ELECTRICAL UPGRADE
RALEIGH PARK ELEMENTARY SCHOOL
3670 SW 78TH AVE
PORTLAND, OR 97225

MARK DATE DESCRIPTION

Sheet Title
MECHANICAL SCHEDULES

Drawing No.
M6.01

Scale

Date MARCH 04, 2020

Project No. 19-0012

HVAC PIPING AND INSULATION SCHEDULE

SYSTEM	PIPE SIZE (INCHES)	PIPE MATERIAL (NOTE 1)	JOINT TYPE (NOTE 1)	SHUT-OFF VALVE TYPE (NOTE 4)	INSULATION TYPE (NOTE 2,3)	INSULATION THICKNESS (INCHES)	INSULATION CONDUCTIVITY (BTU·IN/H·FT2·°F)	JACKET (NOTE 5)	NOTES
COIL CONDENSATE DRAIN	3/4 - 1 1/4	TYPE L COPPER	SOLDER OR PRESS	BRONZE BALL, SS TRIM	--				
HEATING WATER PIPING	3/4 - 1 1/2	TYPE L COPPER	SOLDER OR PRESS	BRONZE BALL, SS TRIM	MINERAL FIBER	1 1/2	0.25 - 0.29		
HEATING WATER PIPING	1 1/2 - 2	TYPE L COPPER	SOLDER OR PRESS	BRONZE BALL, SS TRIM	MINERAL FIBER	2	0.25 - 0.29		
HEATING WATER PIPING	2 1/2 - 10	SCHED. 40 STEEL	FLANGED OR WELDED	DUCTILE IRON,BUTTERFLY	MINERAL FIBER	2	0.25 - 0.29		
REFRIGERANT LIQUID - BURIED	3/8 - 3/4	B280 ANNEALED COPPER	BRAZED	--	CELLULAR GLASS	1	0.29	BITUMINOUS	6
REFRIGERANT LIQUID	3/8 - 3/4	B280 ANNEALED COPPER	BRAZED	--	ELASTOMERIC	1/2	0.20 - 0.26	ALUMINUM	6
REFRIGERANT GAS - BURIED	3/8 - 1-1/8	B280 ANNEALED COPPER	BRAZED	--	CELLULAR GLASS	1	0.29	BITUMINOUS	6
REFRIGERANT GAS	3/8 - 1-1/8	B280 ANNEALED COPPER	BRAZED	--	ELASTOMERIC	1/2	0.20 - 0.26	ALUMINUM	6
REFRIGERANT GAS	1-3/8 - 1-5/8	B280 ACR B HARD COPPER	BRAZED	--	CELLULAR GLASS	1	0.29	BITUMINOUS	6
REFRIGERANT GAS	1-3/8 - 1-5/8	B280 ACR B HARD COPPER	BRAZED	--	ELASTOMERIC	1/2	0.20 - 0.26	ALUMINUM	6

NOTES:
1. REFER TO SPECIFICATIONS FOR FURTHER PIPE MATERIAL, JOINT AND INSTALLATION REQUIREMENTS. PUSH TO CONNECT / PUSH ON TYPE CONNECTIONS ARE NOT ALLOWED.
2. REFER TO SPECIFICATIONS FOR FURTHER INSULATION REQUIREMENTS. INSULATION R-VALUE SHALL MEET ASHRAE 90.1-2016 REQUIREMENTS.
3. INSULATION APPLIED TO PIPING LOCATED IN RETURN AIR PLENUMS SHALL MEET ASTM E84 25/50 FLAME AND SMOKE SPREAD RATING, AND COMPLY WITH NFPA STANDARD 90A.
4. REFER TO SPECIFICATIONS FOR FURTHER VALVE REQUIREMENTS.
5. EXPOSED PIPING INSIDE THE BUILDING AND ALL OUTDOOR PIPING TO HAVE EMBOSSED ALUMINUM JACKET READY FOR FIELD PAINT.
6. REFRIGERANT PIPING FITTINGS AND JOINTS IN VRV SYSTEM SHALL BE MANUFACTURER'S SPECIFIC FITTINGS.

VENTILATION SCHEDULE

ROOM NUMBER/NAME	ZONE FLOOR AREA (SF)	OCCUPANCY CLASSIFICATION	PEOPLE OUTDOR AIRFLOW RATE [Rp] (CFM/PERSON)	AREA OUTDOOR AIRFLOW RATE [Ra] (CFM/FT2)	DEFAULT OCCUPANT DENSITY (#/1000 FT2)	ZONE POPULATION [Pz] (# OF PEOPLE)	DESIGN ZONE POPULATION [Pz]	PEOPLE OUTDOOR AIRFLOW RATE [Rp] (CFM)	AREA OUTDOOR AIRFLOW RATE [Ra] (CFM)	BREATHING ZONE AIRFLOW RATE [Vbz] (CFM)	DISTRIBUTION EFFECTIVENESS [Ez]	ZONE OUTDOOR AIRFLOW RATE [Voz]	EXHAUST AIRFLOW RATE (CFM)
MULTI-PURPOSE	5,045	CAFETERIA	7.5	0.18	100	505	505	3,788	908	4,696	1	4,696	--
GYMNASIUM	4,011	GYM	--	0.3	--	0	200	-	1,203	1,203	1	1,203	--
RESOURCE ROOM B118	812	CLASSROOMS (AGE 5-8)	10	0.12	25	20	20	203	97	300	1	300	--
STAFF A133	635	OFFICE SPACES	5	0.06	5	3	3	17	41	58	0.8	72	--
LIBRARY A141	2,135	LIBRARIES	5	0.12	10	21	90	450	256	706	0.8	883	--
CLASSROOM A100	940	CLASSROOMS (AGE 5-8)	10	0.12	25	24	24	235	113	348	1	348	--
CLASSROOM A102	940	CLASSROOMS (AGE 5-8)	10	0.12	25	24	24	235	113	348	1	348	--
CLASSROOM A104	940	CLASSROOMS (AGE 5-8)	10	0.12	25	24	24	235	113	348	1	348	--
CLASSROOM A106	940	CLASSROOMS (AGE 5-8)	10	0.12	25	24	24	235	113	348	1	348	--
CLASSROOM A108	940	CLASSROOMS (AGE 5-8)	10	0.12	25	24	24	235	113	348	1	348	--
CLASSROOM A110	940	CLASSROOMS (AGE 5-8)	10	0.12	25	24	24	235	113	348	1	348	--
CLASSROOM A116	925	CLASSROOMS (AGE 5-8)	10	0.12	25	23	23	231	111	342	1	342	--
CLASSROOM A118	925	CLASSROOMS (AGE 5-8)	10	0.12	25	23	23	231	111	342	1	342	--
CLASSROOM A122	959	CLASSROOMS (AGE 5-8)	10	0.12	25	24	24	240	115	355	1	355	--
CLASSROOM A124	959	CLASSROOMS (AGE 5-8)	10	0.12	25	24	24	240	115	355	1	355	--
CLASSROOM A126	959	CLASSROOMS (AGE 5-8)	10	0.12	25	24	24	240	115	355	1	355	--
CLASSROOM A128	959	CLASSROOMS (AGE 5-8)	10	0.12	25	24	24	240	115	355	1	355	--
CLASSROOM B100	959	CLASSROOMS (AGE 5-8)	10	0.12	25	24	24	240	115	355	1	355	--
CLASSROOM B102	959	CLASSROOMS (AGE 5-8)	10	0.12	25	24	24	240	115	355	1	355	--
CLASSROOM B104	959	CLASSROOMS (AGE 5-8)	10	0.12	25	24	24	240	115	355	1	355	--
CLASSROOM B106	959	CLASSROOMS (AGE 5-8)	10	0.12	25	24	24	240	115	355	1	355	--
CLASSROOM B116	967	CLASSROOMS (AGE 5-8)	10	0.12	25	24	24	242	116	358	1	358	--

BID/PERMIT DOCUMENTS

REGISTERED PROFESSIONAL ENGINEER
94129
OREGON
NOV. 13, 2018
STORMY L. SHANKS
EXPIRES: 6/30/2020

YOST GRUBE HALL ARCHITECTURE
707 SW Washington Street | Suite 1200 | Portland, OR 97205
t 503 221 0150 f 503 295 0840

Owner
BEAVERTON SCHOOL DISTRICT
CENTRAL ADMINISTRATION CENTER
16550 MERLO ROAD
BEAVERTON, OREGON 97003

Project
BSD RALEIGH PARK HVAC AND ELECTRICAL UPGRADE
RALEIGH PARK ELEMENTARY SCHOOL
3670 SW 78TH AVE
PORTLAND, OR 97225

MARK DATE DESCRIPTION

Sheet Title
MECHANICAL SCHEDULES

Drawing No.
M6.02

Scale

Date MARCH 04, 2020

Project No. 19-0012

3/3/2020 3:13:11 PM

BUILDING EQUIPMENT COORDINATION NOTES - ELECTRICAL

A. REFER TO HVAC, PLUMBING, AND FIRE PROTECTION EQUIPMENT CONNECTION SCHEDULE FOR COORDINATION DETAILS BETWEEN MECHANICAL AND ELECTRICAL SYSTEMS.
B. THE ELECTRICAL SYSTEMS SHALL BE PROVIDED AND INSTALLED UNDER THIS CONTRACT TO MEET THE REQUIREMENTS OF THE SPECIFIED MECHANICAL SYSTEMS. THE ENTIRE PROJECT DOCUMENTS AND MANUALS SHALL BE REFERENCED AS A COMPLETE PROJECT. ELECTRICAL CONTRACTOR SHALL REFER TO ALL SCHEDULES, DETAILS, AND NOTES AND PROVIDE ELECTRICAL EQUIPMENT, WIRING, AND INSTALLATION REQUIRED UNDER THIS PROJECT.
C. PROVIDE ELECTRICAL CONNECTIONS AND ACCESSORIES INCLUDING STARTERS, DISCONNECTS, CONTROL WIRING, ETC. AS REQUIRED FOR THE BUILDING MECHANICAL EQUIPMENT. INFORMATION HEREIN AND ON THE DRAWINGS IS FOR GENERAL DESCRIPTION AND ESTIMATING PURPOSES ONLY. VERIFY VOLTAGE, AMPERAGE, PHASE, INRUSH, ETC. FOR EACH ITEM OF EQUIPMENT BEFORE PROCEEDING WITH WIRING FOR IT. WIRING DETAILS SHALL BE IN ACCORDANCE WITH INSTRUCTIONS TO BE FURNISHED BY THE SUPPLIERS OF THE EQUIPMENT AS NECESSARY TO PROVIDE PROPER OPERATION OF THE EQUIPMENT.
D. REVIEW MECHANICAL EQUIPMENT SHOP DRAWINGS INCLUDED WITHIN THIS PROJECT FOR COMPLIANCE AND COORDINATION WITH ELECTRICAL SYSTEMS. MODIFY ELECTRICAL CONNECTION, EQUIPMENT, WIRING, AND BREAKER REQUIREMENTS AS NECESSARY TO COORDINATE WITH SHOP DRAWINGS. NOTIFY ENGINEER FOR CLARIFICATION OF CHANGES.
E. NO ELECTRICAL DISTRIBUTION EQUIPMENT SHALL BE RELEASED UNTIL ALL MECHANICAL EQUIPMENT REQUIRING ELECTRICAL INFRASTRUCUTRE HAS BEEN SUBMITTED AND APPROVED. ADJUSTMENTS TO BREAKER SIZES AND SIMILAR CHANGES MUST BE MADE TO ELECTRICAL EQUIPMENT PRIOR TO RELEASE, FABRICATION, AND SHIPPING OF ELECTRICAL EQUIPMENT. COORDINATE SCHEDULING OF SHOP DRAWINGS WITH ALL TRADES SUCH AS NOT TO CAUSE ANY DELAYS TO PROJECT.
F. PROVIDE DISCONNECTS RATED FOR EQUIPMENT AS REQUIRED AND AS INDICATED WITHIN MECHANICAL EQUIPMENT CONNECTION SCHEDULE. MOUNTING OF DISCONNECTS SHOULD BE COORDINATED TO ALLOW FOR REMOVAL OF MECHANICAL EQUIPMENT WITHOUT NEEDING TO REMOVE THE DISCONNECT AND MINIMIZE WIRING WORK REQUIRED.
G. ALL MECHANICAL EQUIPMENT DISCONNECTS SHALL BE HEAVY DUTY TYPE AND RATED FOR THE ENVIRONMENT THEY SERVE. INTERIOR DISCONNECTS SHALL BE MINIMUM OF NEMA 1. EXTERIOR DISCONNECTS SHALL BE RATED A MINIMM OF 3R OR AS INDICATED.
H. VERIFY LOCATION OF ALL MECHANICAL EQUIPMENT WITH MECHANICAL DRAWINGS AND MECHANICAL CONTRACTOR. ADJUST ELECTRICAL INSTALLATION AS REQUIRED.

DEMOLITION AND RENOVATION NOTES - ELECTRICAL

A. THE ELECTRICAL DEMOLITION DRAWING SHOWING EXISTING CONDITIONS HAS BEEN PREPARED BASED ON FIELD OBSERVATION AND ORIGINAL DRAWINGS. ADDITIONAL COMPONENTS MAY EXIST WHICH DO NOT SHOW, AND SUCH ITEMS SHALL BE DEALT WITH IN A MANNER SIMILAR TO THOSE ITEMS WHICH DO SHOW.
B. CONTRACTOR SHALL THOROUGHLY FAMILIARIZE HIMSELF WITH EXISTING ELECTRICAL SYSTEM WHICH WILL BE AFFECTED BY THE DEMOLITION WORK. CONTRACTOR SHALL OBTAIN PERMISSION FROM OWNER'S REPRESENTATIVE TO SHUT OFF SERVICES OR SYSTEMS WHICH MAY AFFECT OTHER AREAS BEYOND THE LIMITS OF THE DEMOLITION AREA. SUCH PERMISSION WILL BE GRANTED ONLY AFTER OWNER'S REPRESENTATIVE IS INFORMED OF THE REASON FOR AND DURATION OF THE SHUTDOWN AND IS SATISFIED THAT THE SHUTDOWN CAN BE MADE WITH AS LITTLE INCONVENIENCE TO OTHER AREAS AS POSSIBLE.
C. PROVIDE PLANT, LABOR, AND MATERIALS TO REMOVE ELECTRICAL FACILITIES AND CLEAR THE AREA TO RECEIVE THE NEW WORK TO BE PROVIDED UNDER THIS CONTRACT.
D. CONDUITS, BOXES, ETC., SHALL BE REMOVED AS REQUIRED BY WALL AND CEILING DEMOLITION AND ADJACENT REMOVALS. ALL EXISTING WIRING SHALL BE REMOVED FOR DEMOED DEVICES.
E. ALL BRANCH CIRCUITS TO BE DISCONNECTED SHALL BE IDENTIFIED AS TO LOCATION OR ITEM SERVED BEFORE DISCONNECTING.
F. ALL BUILDING SYSTEMS (EXISTING AND/OR NEW) THAT ARE NOT AFFECTED BY THE SCOPE OF THE PROJECT ARE TO BE KEPT OPERATIONAL IN ALL OCCUPIED AREAS OF THE BUILDING THROUGH THE DURATION OF THE PROJECT. COORDINATE ANY REQUIRED OUTAGES WITH THE OWNER IN ADVANCE OF SHUT DOWN.
G. DO NOT CUT EXISTING TELECOMMUNICATION WIRING, CABLES OR CONDUIT AS EXISTING SYSTEMS SHALL REMAIN OPERATIONAL DURING ALL PHASES OF CONSTRUCTION. CONTRACTOR WHO CUTS IN-SERVICE CABLES SHALL BE RESPONSIBLE FOR ANY AND ALL DOWNTIME AND COSTS TO REPAIR.
H. PROVIDE CUTTING AND PATCHING OF EXISTING CONSTRUCTION AS REQUIRED FOR THE PROPER COMPLETION OF THE DEMOLITION WORK AND THE INSTALLATION OF THE NEW WORK.
I. EQUIPMENT AND DEVICES SHOWN AS EXISTING OR AS REMOVE/RELOCATE SHALL BE PROTECTED AND HANDLED WITH APPROPRIATE CARE SO AS TO MAINTAIN FULL FUNCTIONAL AND AESTHETIC INTEGRITY OF THE DEVICE.
J. REMOVED EQUIPMENT AND SYSTEMS SHALL REMAIN THE PROPERTY OF THE OWNER UNLESS OTHERWISE NOTED. ALL MATERIALS NOT SALVAGED BY THE OWNER SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR FOR PROPER DISPOSAL.

SITE NOTES - ELECTRICAL

A. CONTRACTOR SHALL REPAIR ALL AFFECTED SURFACES AND RESTORE TO EXISTING CONDITIONS AT COMPLETION OF PROJECT.
B. WARNING - CALL 48 HOURS BEFORE YOU DIG: - IOWA LAW REQUIRES ANYONE DOING ANY EXCAVATION, FENCING, PLANTING OR DRILLING TO CALL 48 HOURS IN ADVANCE. HAND DIG WITHIN 18 INCHES OF ANY LOCATE MARK OR FLAG. IOWA ONE-CALL 1-800-292-8989.
C. CONDUIT ROUTES AND LOCATIONS ON ELECTRICAL SITE PLAN ARE SCHEMATIC. REFER TO COMPLETE PROJECT DOCUMENTS FOR COORDINATION OF SITE UTILITIES AND DIMENSIONAL LOCATIONS. MAINTAIN PROPER SEPARATION OF DRY AND WET UTILITIES. CALL UNDERGROUND LOCATING SERVICES 48 HOURS IN ADVANCE AND PRIOR TO WORK.
D. ELECTRICAL SITE UTILITIES AND INFRASTRUCTURE ARE SHOWN SCHEMATIC. UTILITY INFRASTRUCTURE AND MATERIALS INCLUDING CONDUITS, PADS, CONNECTIONS, METERING EQUIPMENT, PULL BOXES, AND OTHER REQUIRED SERVICE PROVISIONS SHALL BE INSTALLED BY THE CONTRACTOR PER UTILITY COMPANY REQUIREMENTS. CONTRACTOR SHALL CONTACT THE UTILITY COMPANY REPRESENTATIVE TO OBTAIN UTILITY DESIGN DRAWINGS AND TO SCHEDULE MILESTONE INSPECTIONS.
CONTACT: JIM KRUEGER (PGE) (503)672-5464 james.krueger@pgn.com
E. SYSTEM OUTAGES: CONTRACTOR SHALL CLOSELY COORDINATE ELECTRICAL SYSTEM OUTAGES WITH THE DISTRICT PRIOR TO WORK ASSOCIATED WITH ELECTRIC UTILITY AND ELECTRICAL DISTRIBUTION, AND THE RELATED SYSTEM OUTAGES AND CUT-OVER TO NEW SERVICES. PROVIDE MINIMUM 7 DAYS ADVANCE NOTICE TO THE DISTRICT IN ORDER TO COORDINATE PROPER SHUTDOWN OF SYSTEMS AND FOR SCHEDULING FIRE AND SECURITY WATCH WHILE THE BUILDING IS OUT OF SERVICE.

UNDERGROUND UTILITY SAFETY

CALL (811) - OREGON UTILITY NOTIFICATION CENTER, TO DETERMINE LOCATIONS OF UNDERGROUND UTILITIES BEFORE YOU DIG.

UNDERGROUND FACILITIES, STRUCTURES, AND UTILITIES HAVE BEEN SHOWN BASED UPON INFORMATION OBTAINED FROM FIELD LOCATIONS BY UTILITY COMPANIES, AVAILABLE SURVEYS AND RECORDS. THEIR LOCATIONS MUST BE CONSIDERED APPROXIMATE ONLY. HAND DIG WITHIN 18 INCHES OF LOCATE MARKS OR FLAGS. IT IS ALSO POSSIBLE THAT THERE MAY BE OTHER UNDERGROUND FACILITIES, STRUCTURES, AND UTILITIES IN EXISTENCE THAT ARE NOT SHOWN. IT IS THE RESPONSIBILITY OF EACH INDIVIDUAL PARTY REFERENCING THIS PLAN TO DETERMINE THE EXACT LOCATION AND TYPE OF UNDERGROUND FACILITIES ON THE SITE. HAND EXCAVATE AT CRITICAL POINTS AS NECESSARY TO VERIFY LOCATIONS, SIZES, ELEVATIONS, FLOW LINES, ETC. IF A PROBLEM OR INTERFERENCE EXISTS, NOTIFY ARCHITECT/ENGINEER BEFORE PROCEEDING.

INSTALLATION NOTES - ELECTRICAL

A. CONTRACTOR SHALL FAMILIARIZE THEMSELVES WITH EXISTING CONDITIONS PRIOR TO BID.
B. ALL 120V-1 PHASE CIRCUITS EXCEEDING 100 FEET TO CENTER OF LOAD SHALL HAVE CONDUCTORS INCREASED TO ACCOUNT FOR VOLTAGE DROP.
C. RACEWAYS AND BOXES ARE SHOWN DIAGRAMMATICALLY ONLY AND INDICATE THE GENERAL AND APPROXIMATE LOCATION. THE LAYOUT DOES NOT NECESSARILY SHOW THE TOTAL NUMBER OF RACEWAYS OR BOXES FOR THE CIRCUITS REQUIRED, NOR ARE THE LOCATIONS OF INDICATED RUNS INTENDED TO SHOW THE ACTUAL ROUTING OF THE RACEWAYS.
D. ALL EQUIPMENT, DEVICES, ETC. ARE SHOWN IN PREFERRED LOCATION. E.C. RESPONSIBLE FOR MODIFYING CONDUIT, HANGERS, CIRCUITING, ETC. TO PROVIDE A COMPLETE AND OPERATIONAL SYSTEM.
E. ALL RECEPTACLE CIRCUITS SHALL HAVE DEDICATED NEUTRALS PER CODE.
F. PROVIDE AN EQUIPMENT GROUNDING CONDUCTOR, GREEN INSULATED GROUND CONDUCTOR IN EACH CONDUIT AND RACEWAY. THE CONDUIT SYSTEM SHALL NOT BE USED AS THE ONLY EQUIPMENT GROUNDING METHOD.
G. BALANCE THE LOAD ON PANELS AS EVENLY AS POSSIBLE DURING INSTALLATION. CIRCUIT NUMBERING SHOWN ON PLANS MAY BE ADJUSTED.
H. PROVIDE FINAL TYPED PERMANENT PANEL DIRECTORY AT PROJECT COMPLETION.
I. CONTRACTOR SHALL BE RESPONSIBLE FOR OPENINGS IN ALL WALLS CREATED BY THEIR WORK. PENETRATIONS SHALL BE SEALED IN ACCORDANCE WITH THE RATINGS OF THE AFFECTED WALL, WITH A UL LISTED DETAIL SUITED FOR THE RATED PENETRATION AND MATERIALS INSTALLED. REFER TO ARCHITECTURAL CODE PLAN FOR RATED WALLS.

DEVICE INSTALLATION AND MATERIALS - ELECTRICAL

A. CONDUCTORS SHALL BE COPPER, TYPE THHN/THWN, OR XHHW-2 UNLESS OTHERWISE NOTED.
B. CONDUCTORS SHALL BE INSTALLED IN CONDUIT:
   a. TYPE EMT - AT INTERIOR AND EXTERIOR LOCATIONS WHERE EXPOSED. STEEL COMPRESSION TYPE FITTINGS.
   b. TYPE GRC - AT EXTERIOR LOCATIONS WHERE EXPOSED UP TO 8FT HEIGHT. THREADED FITTINGS WRENCH TIGHTENED.
   c. TYPE PVC - SCH 40, WHERE INSTALLED UNDERGROUND.
C. CONDUIT ATTACHMENT SHALL BE ON METAL STRUT ATTACHED TO THE BUILDING STRUCTURE, EXCEPT AT ROOF WHERE RUBBER SLEEPERS WITH METAL STRUT SHALL BE USED.
D. PANELBOARDS (PANELS) SHALL BE COMMERCIAL GRADE PRODUCT WITH BOLT-ON TYPE CIRCUIT BREAKERS. PROVIDE EACH CIRCUIT BREAKER WITH PAD-LOCKABLE "LOCKED OFF" DEVICE.
E. CIRCUIT BREAKERS FEEDING MECHANICAL EQUIPMENT SHALL BE HACR TYPE, WITH TRIP RATING CONFIRMED WITH APPROVED EQUIPMENT MANUFACTURER.
F. MECHANICAL EQUIPMENT CONNECTIONS SHALL BE PROVIDED WITH SAFETY DISCONNECT SWITCH AT THE POINT OF CONNECTION.
G. ENCLOSURES FOR PANELS, EQUIPMENT AND NEMA BOXES SHALL BE RATED PROPERLY FOR THE ENVIRONMENT IN WHICH THEY ARE INSTALLED.
H. PROVIDE "MYERS" WEATHERPROOF CONDUIT HUBS AT CONDUIT ENTERING ENCLOSURE KNOCKOUTS AT EXTERIOR LOCATIONS.
I. ELECTRICAL DEVICES SHALL BE GRAY UNLESS OTHERWISE NOTED.
J. EXTERIOR RECEPTACLES SHALL BE GFCI WEATHERPROOF TYPE, WITH METALLIC WHILE-IN-USE WEATHERPROOF COVER, MOUNTED AT 24" AFF UNLESS OTHERWISE NOTED.
K. GFCI RECEPTACLES SHALL BE PROVIDED AT ALL LOCATIONS AS REQUIRED BY THE NEC.

GROUNDING AND BONDING SYMBOLS

- GROUND BAR
- TMGB — TELECOMMUNICATIONS MAIN GROUND BAR
- TGB — TELECOMMUNICATIONS GROUND BAR
- SEE RISER DIAGRAM AND SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS

GENERAL SYMBOLS

- CONDUIT SLEEVE
- CONDUIT UP, REFER TO TAG ON DRAWING FOR SIZE
- CONDUIT DOWN, REFER TO TAG ON DRAWING FOR SIZE
- CIRCUIT HOMERUN, CONCEALED CONDUIT OR CABLE
- CIRCUIT HOMERUN, UNDER FLOOR CONDUIT OR CABLE
- (#) KEYNOTE
- AHU 1 — EQUIPMENT TAG. REFER TO EQUIPMENT CONNECTION SCHEDULE
- 1 A101 SIM — DETAIL DRAWING REFERENCE TAG, SIM-SIMILAR, TYP-TYPICAL, OPP-OPPOSITE
- A101 Ref 1 — ELEVATION DRAWING REFERENCE TAG

ELECTRICAL ABBREVIATIONS

A	DEVICE MOUNTED +8" ABOVE COUNTER TOP (VERIFY LOCATION)	NIC	NOT IN CONTRACT
AFF	ABOVE FINISHED FLOOR	NM	NONMETALLIC
ATS	AUTOMATIC TRANSFER SWITCH	NTS	NOT TO SCALE
C	CEILING	OC	ON CENTER
CB	CIRCUIT BREAKER	OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
CT	CURRENT TRANSFORMER	OFOI	OWNER FURNISHED, OWNER INSTALLED
E	EXISTING ITEM TO REMAIN	R	EXISTING ITEM TO BE REMOVED
EC	ELECTRICAL CONTRACTOR	RR	EXISTING ITEM TO BE REMOVED AND RELOCATED
EM	EMERGENCY LIGHT FIXTURE	RN	EXISTING ITEM TO BE REMOVED AND REPLACED WITH NEW
ER	NEW LOCATION OF EXISTING ITEM	SCCR	SHORT CIRCUIT CURRENT RATING
F	ROUGH IN FOR FUTURE DEVICE	T	TAMPER PROOF DEVICE
FAAP	FIRE ALARM ANNUNCIATOR PANEL	TCC	TEMPERATURE CONTROL CONTRACTOR
FACP	FIRE ALARM CONTROL PANEL	TV	TELEVISION
FSD	FIRE SMOKE DAMPER	TYP	TYPICAL
G	GROUND FAULT CIRCUIT INTERRUPTER	UPS	UNINTERRUPTIBLE POWER SUPPLY
GND	GROUND	V	VOLTS
KVA	KILO-VOLT-AMPERES	VA	VOLT-AMPERES
KW	KILOWATTS	WG	WIREGUARD COVER
MC	MECHANICAL CONTRACTOR	WP	WEATHERPROOF DEVICE
MCB	MAIN CIRCUIT BREAKER	WR	WEATHER RESISTANT DEVICE
MDP	MAIN DISTRIBUTION PANEL	+24"	INDICATES MOUNTING HEIGHT CENTER LINE OF DEVICE TO FINISHED FLOOR
MLO	MAIN LUGS ONLY		
N	NEW DEVICE IN EXISTING LOCATION		

POWER SYMBOLS

- SINGLE RECEPTACLE, WALL MOUNT +18", OR AS NOTED
- DUPLEX RECEPTACLE, CEILING MOUNT
- DUPLEX RECEPTACLE, TAMPER-RESISTANT, WALL MOUNT +18", OR AS NOTED
- SR — DUPLEX RECEPTACLE, SURFACE RACEWAY, WALL MOUNT +18", OR AS NOTED
- G — DUPLEX GFCI RECEPTACLE, TAMPER-RESISTANT, WALL MOUNT +18", OR AS NOTED
- EWC — DUPLEX RECEPTACLE, MOUNTED WITHIN WATER COOLER HOUSING, VERIFY HEIGHT. CONNECT TO GFCI, CIRCUIT BREAKER OR REMOTE WALL DEVICE.
- W — DUPLEX GFCI RECEPTACLE WITH WEATHER-PROOF IN-USE COVER, TAMPER-RESISTANT, WALL MOUNT +24", OR AS NOTED
- QUADRAPLEX RECEPTACLE, TAMPER-RESISTANT, WALL MOUNT +18", OR AS NOTED
- QUADRAPLEX RECEPTACLE, TAMPER-RESISTANT, WALL MOUNT +18", OR AS NOTED
- SPECIAL RECEPTACLE, WALL MOUNT +18", OR AS NOTED, REFER TO ELECTRICAL EQUIPMENT CONNECTION SCHEDULE FOR RECEPTACLE TYPE
- SPECIAL RECEPTACLE, CEILING MOUNT, REFER TO ELECTRICAL EQUIPMENT CONNECTION SCHEDULE FOR RECEPTACLE TYPE
- EQUIPMENT CONNECTION, REFER TO ELECTRICAL EQUIPMENT CONNECTION SCHEDULE FOR CONNECTION TYPE
- EQUIPMENT CONNECTION, WALL MOUNT +18", OR AS NOTED, REFER TO ELECTRICAL EQUIPMENT CONNECTION SCHEDULE FOR CONNECTION TYPE
- J — JUNCTION BOX, WITH PULL STRING, WALL MOUNT, REFER TO PLAN OR DETAIL FOR MOUNTING HEIGHT
- GROUND BAR
- T — UTILITY TRANSFORMER
- M — UTILITY METER
- SPD — SURGE PROTECTIVE DEVICE
- SAFETY DISCONNECT SWITCH
- PLUG STRIP, SURFACE MOUNTED. ELEVATION AS NOTED.
- PANELBOARD - SURFACE MOUNTED
- PANELBOARD - RECESSED IN WALL
- VARIABLE FREQUENCY DRIVE

NOTE: NOT ALL SYMBOLS APPLY TO THIS PROJECT

KCL ENGINEERING

BID/PERMIT SET

REGISTERED PROFESSIONAL ENGINEER 94252 OREGON ADAM R. KOBLE
EXPIRES: 6/30/2021

YOST GRUBE HALL ARCHITECTURE
707 SW Washington Street | Suite 1200 | Portland, OR 97205
t 503 221 0150 f 503 295 0840

Owner
BEAVERTON SCHOOL DISTRICT
CENTRAL ADMINISTRATION CENTER
16550 MERLO ROAD
BEAVERTON, OREGON 97003

Project
BSD RALEIGH PARK HVAC AND ELECTRICAL UPGRADE
RALEIGH PARK ELEMENTARY SCHOOL
3670 SW 78TH AVE
PORTLAND, OR 97225

MARK	DATE	DESCRIPTION

Sheet Title
ELECTRICAL GENERAL NOTES AND SYMBOLS

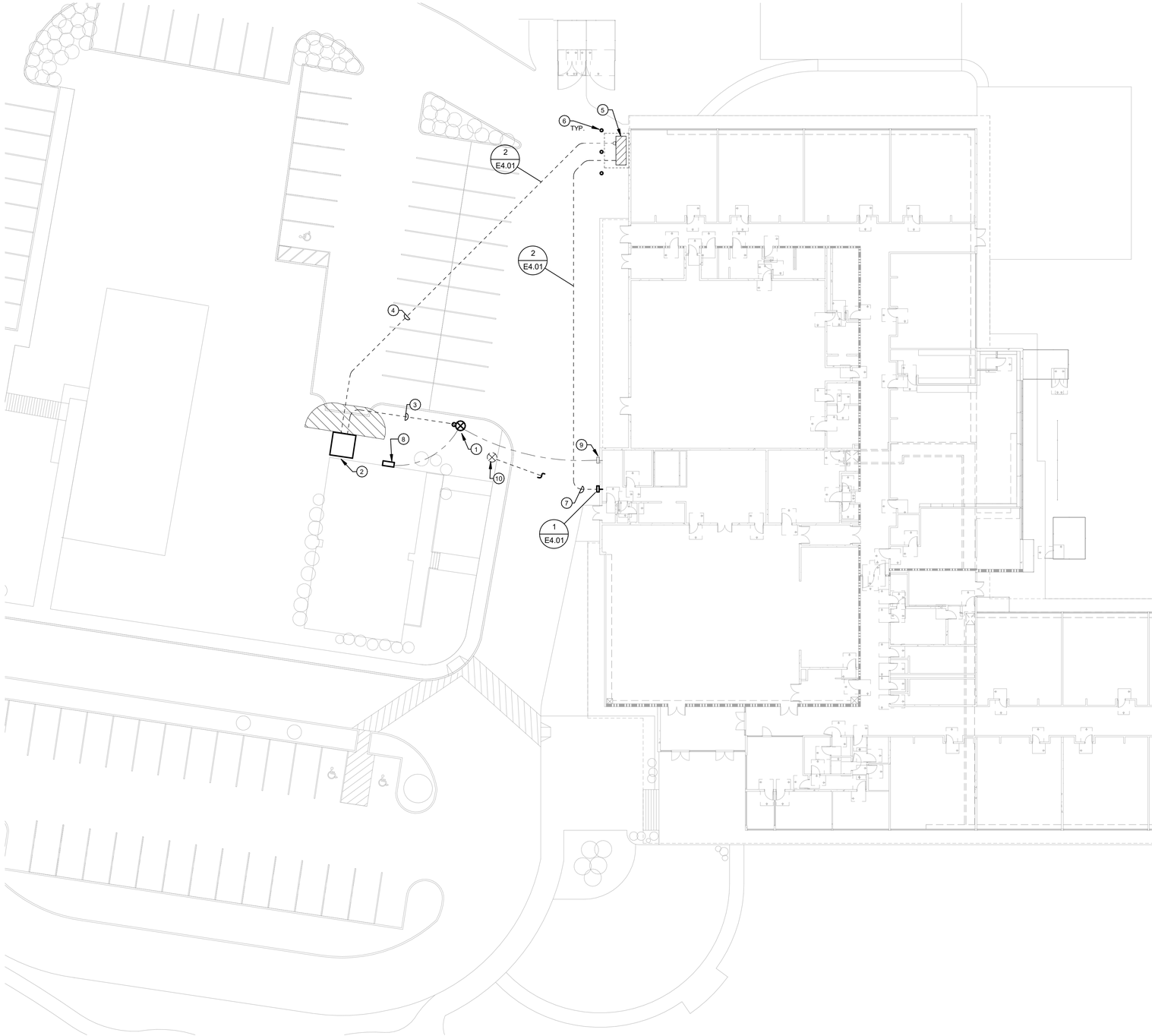
Drawing No.
E0.01

Scale As indicated

Date MARCH 04, 2020

Project No. 19-0012

3/3/2020 4:43:41 PM



1 ELECTRICAL SITE PLAN
1" = 20'-0"

N

KEYNOTES (#)

1 UTILITY JOINT POLE, IN NEW LOCATION BY PGE. COORDINATE DISCONNECTION AND RECONNECTION OF EXISTING OVERHEAD SERVICE DROPS WITH PGE REPRESENTATIVE PRIOR TO WORK. PROVIDE TREE REMOVAL TO ALLOW POLE INSTALLATION AT NEW LOCATION, VERIFY WITH ARCHITECT PRIOR TO WORK.

2 UTILITY TRANSFORMER 8'X8' CONCRETE PAD, PER PGE REQUIREMENTS. OBTAIN DESIGN DRAWINGS AND DETAILS FROM PGE. HATCHED AREA SHOWN SHALL REMAIN FLAT AND CLEAR OF OBSTRUCTIONS. PROVIDE SHRUB REMOVAL TO ALLOW PAD-VAULT INSTALLATION.

3 PRIMARY UTILITY CONDUIT. CONDUCTORS BY PGE. REFER TO ONE-LINE DIAGRAM.

4 SECONDARY UTILITY CONDUIT. CONDUCTORS BY PGE. REFER TO ONE-LINE DIAGRAM.

5 STUB-UP AT NEW METERED SERVICE EQUIPMENT "2MDP". VERIFY CONDUIT ENTRY LOCATION WITH SHOP DRAWINGS. REFER TO ONE-LINE DIAGRAM.

6 PROTECTIVE PIPE BOLLARD PER PGE REQUIREMENTS.

7 GROUNDING AND FEEDER CONDUITS FROM NEW SERVICE TO BUILDING. STUB-UP AT BUILDING EXTERIOR INTO NEMA 3R PULL CAN. CORE DRILL AND PENETRATE LOW AS PRACTICAL INTO FORMER MDP WIREWAY ENCLOSURE LOCATED AT THE INTERIOR SPACE. REFER TO ONE-LINE DIAGRAM.

8 COORDINATE REFEED OF OVERHEAD ELECTRICAL SERVICE AT PORTABLE WITH PGE.

9 COORDINATE REFEED OF OVERHEAD TELECOM SERVICE WITH PGE AND SERVICE PROVIDERS.

10 EXISTING JOINT POLE LOCATION, TO BE REMOVED AND RELOCATED BY UTILITY COMPANY. COORDINATE WITH UTILITY REPRESENTATIVE.

BID/PERMIT SET

REGISTERED PROFESSIONAL ENGINEER
94252
OREGON
ADAM R. KOBLE
EXPIRES: 6/30/2021

YOST GRUBE HALL
ARCHITECTURE
707 SW Washington Street | Suite 1200 | Portland, OR 97205
t 503 221 0150 f 503 295 0840

Owner
BEAVERTON SCHOOL DISTRICT
CENTRAL ADMINISTRATION CENTER
16550 MERLO ROAD
BEAVERTON, OREGON 97003

Project
BSD RALEIGH PARK HVAC AND ELECTRICAL UPGRADE
RALEIGH PARK ELEMENTARY SCHOOL
3670 SW 78TH AVE
PORTLAND, OR 97225

MARK	DATE	DESCRIPTION

Sheet Title
ELECTRICAL SITE PLAN

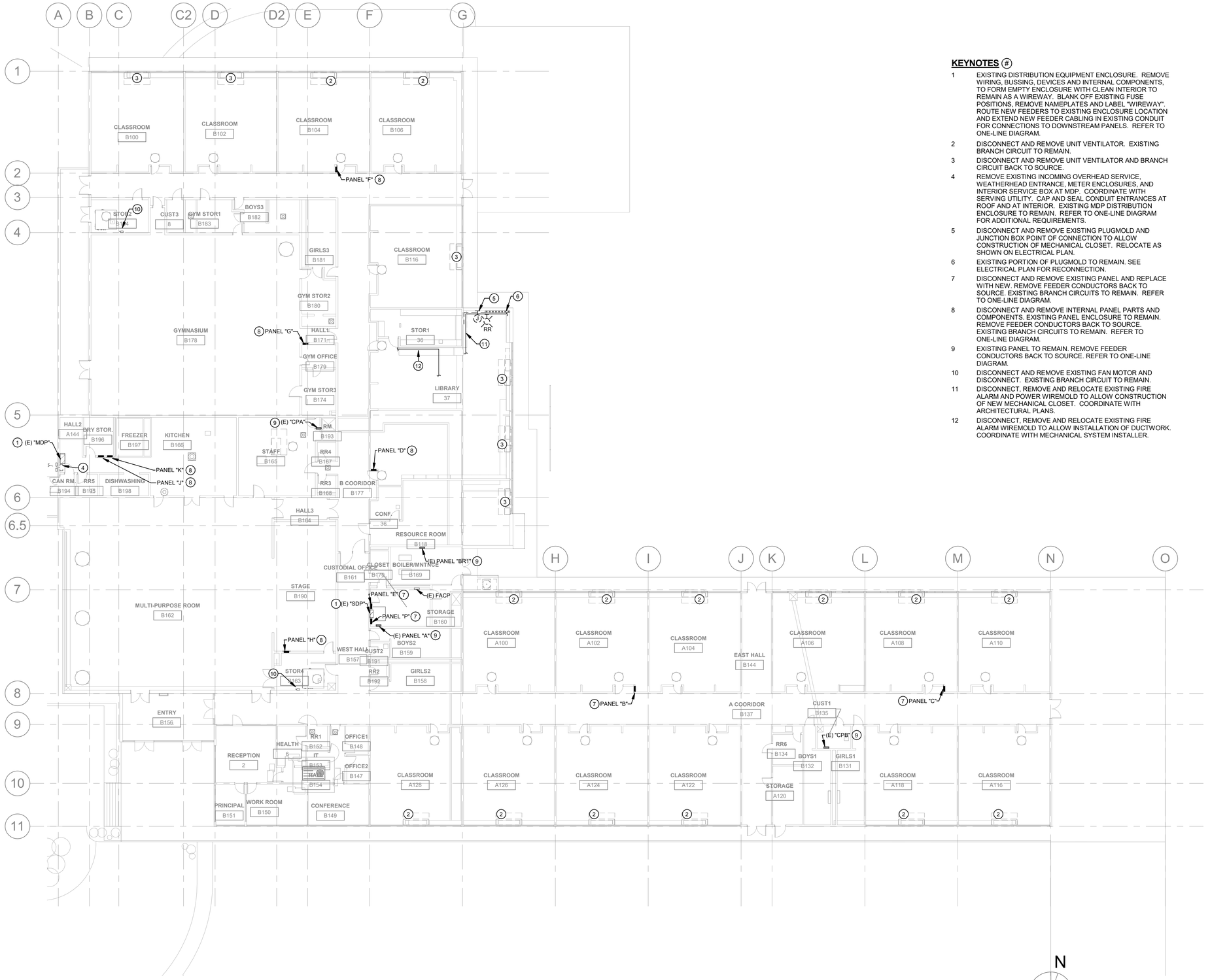
Drawing No.
E1.01

Scale 1" = 20'-0"

Date MARCH 04, 2020

Project No. 19-0012

3/3/2020 4:43:41 PM



1 ELECTRICAL DEMOLITION PLAN
1/16" = 1'-0"

KEYNOTES (#)

1 EXISTING DISTRIBUTION EQUIPMENT ENCLOSURE. REMOVE WIRING, BUSSING, DEVICES AND INTERNAL COMPONENTS, TO FORM EMPTY ENCLOSURE WITH CLEAN INTERIOR TO REMAIN AS A WIREWAY. BLANK OFF EXISTING FUSE POSITIONS, REMOVE NAMEPLATES AND LABEL "WIREWAY". ROUTE NEW FEEDERS TO EXISTING ENCLOSURE LOCATION AND EXTEND NEW FEEDER CABLING IN EXISTING CONDUIT FOR CONNECTIONS TO DOWNSTREAM PANELS. REFER TO ONE-LINE DIAGRAM.

2 DISCONNECT AND REMOVE UNIT VENTILATOR. EXISTING BRANCH CIRCUIT TO REMAIN.

3 DISCONNECT AND REMOVE UNIT VENTILATOR AND BRANCH CIRCUIT BACK TO SOURCE.

4 REMOVE EXISTING INCOMING OVERHEAD SERVICE, WEATHERHEAD ENTRANCE, METER ENCLOSURES, AND INTERIOR SERVICE BOX AT MDP. COORDINATE WITH SERVING UTILITY. CAP AND SEAL CONDUIT ENTRANCES AT ROOF AND AT INTERIOR. EXISTING MDP DISTRIBUTION ENCLOSURE TO REMAIN. REFER TO ONE-LINE DIAGRAM FOR ADDITIONAL REQUIREMENTS.

5 DISCONNECT AND REMOVE EXISTING PLUGMOLD AND JUNCTION BOX POINT OF CONNECTION TO ALLOW CONSTRUCTION OF MECHANICAL CLOSET. RELOCATE AS SHOWN ON ELECTRICAL PLAN.

6 EXISTING PORTION OF PLUGMOLD TO REMAIN. SEE ELECTRICAL PLAN FOR RECONNECTION.

7 DISCONNECT AND REMOVE EXISTING PANEL AND REPLACE WITH NEW. REMOVE FEEDER CONDUCTORS BACK TO SOURCE. EXISTING BRANCH CIRCUITS TO REMAIN. REFER TO ONE-LINE DIAGRAM.

8 DISCONNECT AND REMOVE INTERNAL PANEL PARTS AND COMPONENTS. EXISTING PANEL ENCLOSURE TO REMAIN. REMOVE FEEDER CONDUCTORS BACK TO SOURCE. EXISTING BRANCH CIRCUITS TO REMAIN. REFER TO ONE-LINE DIAGRAM.

9 EXISTING PANEL TO REMAIN. REMOVE FEEDER CONDUCTORS BACK TO SOURCE. REFER TO ONE-LINE DIAGRAM.

10 DISCONNECT AND REMOVE EXISTING FAN MOTOR AND DISCONNECT. EXISTING BRANCH CIRCUIT TO REMAIN.

11 DISCONNECT, REMOVE AND RELOCATE EXISTING FIRE ALARM AND POWER WIREMOLD TO ALLOW CONSTRUCTION OF NEW MECHANICAL CLOSET. COORDINATE WITH ARCHITECTURAL PLANS.

12 DISCONNECT, REMOVE AND RELOCATE EXISTING FIRE ALARM WIREMOLD TO ALLOW INSTALLATION OF DUCTWORK. COORDINATE WITH MECHANICAL SYSTEM INSTALLER.

BID/PERMIT SET

REGISTERED PROFESSIONAL ENGINEER
94252
OREGON
ADAM R. KOBLE
EXPIRES: 6/30/2021

YOST GRUBE HALL
ARCHITECTURE
707 SW Washington Street | Suite 1200 | Portland, OR 97205
t 503 221 0150 f 503 295 0840

Owner
BEAVERTON SCHOOL DISTRICT
CENTRAL ADMINISTRATION CENTER
16550 MERLO ROAD
BEAVERTON, OREGON 97003

Project
BSD RALEIGH PARK HVAC AND ELECTRICAL UPGRADE
RALEIGH PARK ELEMENTARY SCHOOL
3670 SW 78TH AVE
PORTLAND, OR 97225

MARK	DATE	DESCRIPTION

Sheet Title
ELECTRICAL DEMOLITION PLAN

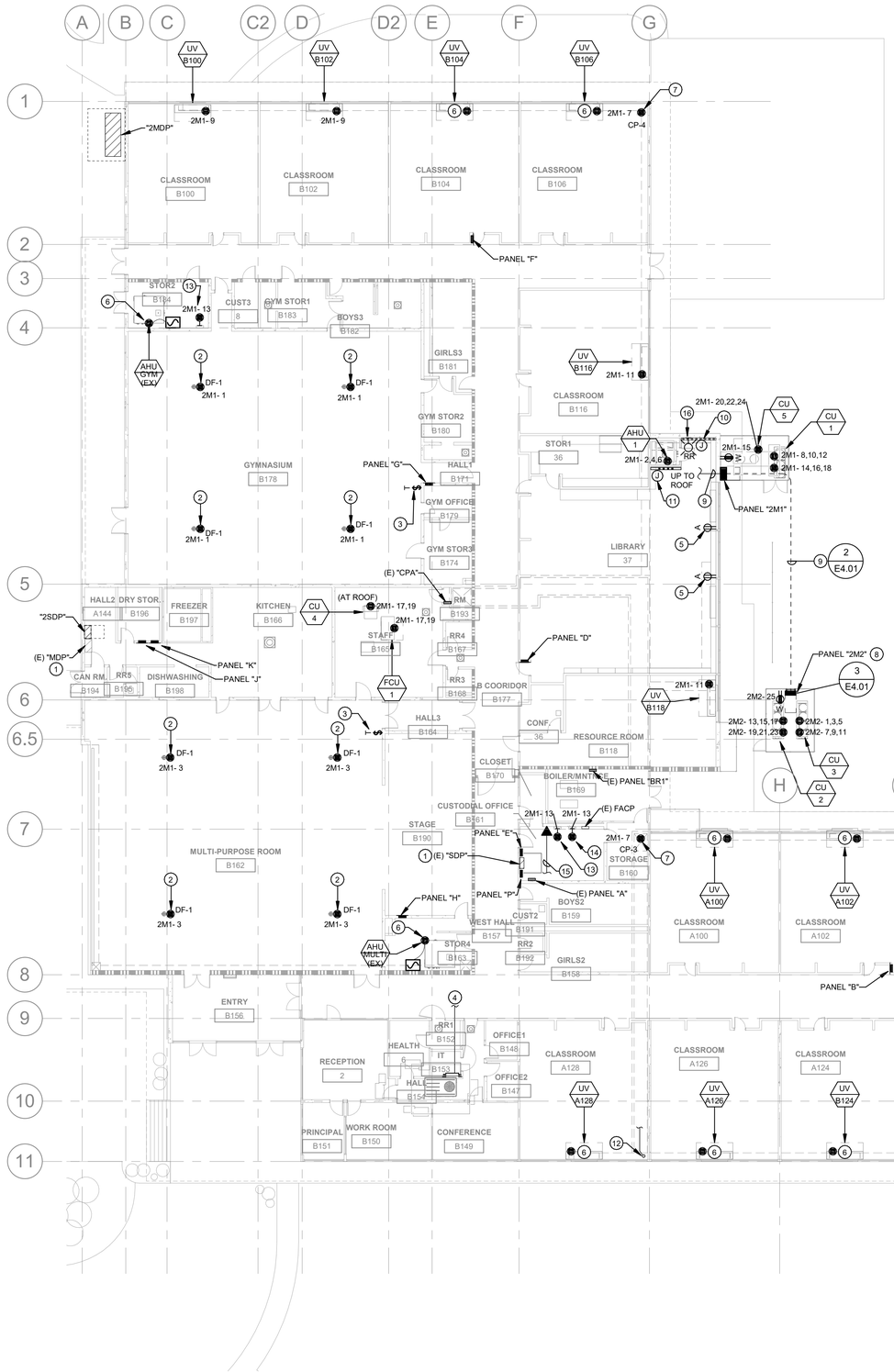
Drawing No.
E2.10D

Scale 1/16" = 1'-0"

Date MARCH 04, 2020

Project No. 19-0012

3/3/2020 4:43:45 PM



1 ELECTRICAL PLAN
1/16" = 1'-0"

POWER GENERAL NOTES

A. REFER TO ONE-LINE DIAGRAM FOR ADDITIONAL REQUIREMENTS RELATED TO ELECTRICAL EQUIPMENT.

B. PANELS SHOWN ON THIS SHEET ARE TO BE DISCONNECTED, INTERNAL PARTS REMOVED AND REPLACED, OR REPLACED COMPLETELY, UNLESS OTHERWISE NOTED. REFER TO ONE-LINE DIAGRAM FOR ADDITIONAL REQUIREMENTS.

C. COORDINATE ELECTRICAL WORK WITH ALL OTHER TRADES. NO ASPECT OF A SYSTEM INSTALLATION OR ITS ROUGH-IN SHALL COMMENCE UNTIL PROPER AND TIMELY COORDINATION WITH ALL TRADES ASSOCIATED WITH THE INSTALLATION HAS TRANSPIRED. ITEMS TO BE COORDINATED SHALL INCLUDE BUT NOT BE LIMITED TO: BUILDING STRUCTURE, SHEET METAL, PIPING SYSTEMS, CONDUITS, EQUIPEMENT, ETC. REFER TO ALL TRADE CONTRACT DOCUMENTS FOR THIS PROJECT.

D. COORDINATE ELECTRICAL REQUIREMENTS FOR MECHANICAL UNITS WITH M.C. AND FINAL MECHANICAL SHOP DRAWINGS. INSTALLATION SHALL BE COORDINATED WITH APPROVED EQUIPMENT PRIOR TO ROUGH-IN.

E. PROVIDE THE REQUIRED PENETRATIONS WHILE ROUTING CABLING THROUGH THE BUILDING. COORDINATE FIRE RATED WALL PENETRATIONS. PROVIDE CONDUIT SLEEVES AND FIRE STOPPING SUITED FOR THE RATING AND MATERIALS INSTALLED. REFER TO ARCHITECTURAL REQUIREMENTS AND ASBESTOS REPORT SPECIFICATION DOCUMENTS FOR ADDITIONAL REQUIREMENTS.

F. REFER TO ELECTRICAL AND MECHANICAL SCHEDULES FOR ADDITIONAL REQUIREMENTS.

G. SURFACE MOUNTED CONDUIT SHALL BE ALLOWED IN THE GYM AND MULTIPURPOSE ROOM, IN UTILITY ROOMS, OR CONCEALED IN ACCESSIBLE CEILING SPACE OR CHASES. OTHERWISE CONDUIT SHALL BE ROUTED ON ROOF. WIRING AT INTERIOR FINISHED SPACES (SUCH AS CLASSROOMS AND LIBRARY) SHALL BE IN WIREMOLD UNLESS OTHERWISE NOTED. VERIFY SURFACE MOUNTED CONDUIT AND RACEWAY ROUTING WITH ARCHITECT FOR ALL INTERIOR LOCATIONS PRIOR TO INSTALLATION.

H. PLUGMOLD: PROVIDE NEW FITTINGS, BOX EXTENDERS, AND CONNECTORS TO MATCH EXISTING PLUGMOLD PRODUCT.

KEYNOTES (#)

1 EXISTING DISTRIBUTION EQUIPMENT ENCLOSURE. REMOVE WIRING, BUSSING, DEVICES AND INTERNAL COMPONENTS, TO FORM EMPTY ENCLOSURE WITH CLEAN INTERIOR TO REMAIN AS A WIREWAY. BLANK OFF EXISTING FUSE POSITIONS, REMOVE NAMEPLATES AND LABEL "WIREWAY". ROUTE NEW FEEDERS TO EXISTING ENCLOSURE LOCATION AND EXTEND NEW FEEDER CABLING IN EXISTING CONDUIT FOR CONNECTIONS TO DOWNSTREAM PANELS. REFER TO ONE-LINE DIAGRAM.

2 CONNECT TO DESTRATIFICATION FAN AT CEILING. REFER TO MECHANICAL PLANS AND SCHEDULES FOR ADDITIONAL REQUIREMENTS.

3 DIGITAL TIMER CONTROLS FOR FANS, INTERMATIC #FF6H OR APPROVED EQUAL. PROVIDE CLEAR LEXAN COVER, KEY-LOCKED. LABEL "FAN CONTROL".

4 #2 COPPER INSULATED GROUNDING CONDUCTOR FROM TELECOM MAIN GROUND BAR TO NEW ELECTRICAL SERVICE. REFER TO ONE-LINE DIAGRAM FOR ADDITIONAL REQUIREMENTS.

5 RELOCATE EXISTING RECEPTACLE AND SURFACE MOUNTED RACEWAY ABOVE CASEWORK. MOUNT 6IN ABOVE NEW CASEWORK.

6 CONNECT MECHANICAL UNIT TO EXISTING BRANCH CIRCUIT.

7 CONNECT TO CONDENSATE PUMP. SEE MECHANICAL PLANS AND SCHEDULES FOR ADDITIONAL REQUIREMENTS.

8 MOUNT ON METAL POST UNISTRUT RACK. MAINTAIN CLEAR WORKING SPACE AT PANEL AND MECHANICAL EQUIPMENT.

9 ELECTRICAL FEEDER. SEE ONE-LINE DIAGRAM FOR ADDITIONAL REQUIREMENTS.

10 NEW LOCATION OF POWER CONNECTION TO EXISTING PLUGMOLD. RECONNECT PLUGMOLD TO EXISTING BRANCH CIRCUIT.

11 NEW LOCATION OF EXISTING PLUGMOLD. VERIFY EXACT LOCATION WITH OWNER PRIOR TO INSTALLATION. PROVIDE NEW CONNECTION TO EXISTING BRANCH CIRCUIT.

12 PROVIDE GROUNDING SYSTEM BOND TO COLD WATER PIPE ENTRANCE IN TUNNEL. SEE ONE-LINE DIAGRAM FOR ADDITIONAL REQUIREMENTS.

13 CONNECT TO DDC PANEL. COORDINATE WITH CONTROLS SYSTEM INSTALLER AND SHOP DRAWINGS FOR FINAL CONNECTIONS AND LOCATIONS.

14 CONNECT TO VRF PANEL. COORDINATE WITH CONTROLS SYSTEM INSTALLER AND SHOP DRAWINGS FOR FINAL CONNECTIONS AND LOCATIONS.

15 PROVIDE DATA OUTLET ROUGH-IN AND 3/4" CONDUIT HOMERUN TO MDF ROOM. REFER TO CONTROLS SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

16 RELOCATED FIRE ALARM DEVICE, SURFACE MOUNTED WITH WIREMOLD. MOUNT ON WALL NEAR WINDOW.

BID/PERMIT SET

REGISTERED PROFESSIONAL ENGINEER
94252
OREGON
ADAM R. KOBLE
EXPIRES: 6/30/2021

YOST GRUBE HALL
ARCHITECTURE
707 SW Washington Street | Suite 1200 | Portland, OR 97205
t 503 221 0150 f 503 295 0840

Owner
BEAVERTON SCHOOL DISTRICT
CENTRAL ADMINISTRATION CENTER
16550 MERLO ROAD
BEAVERTON, OREGON 97003

Project
BSD RALEIGH PARK HVAC AND ELECTRICAL UPGRADE
RALEIGH PARK ELEMENTARY SCHOOL
3670 SW 78TH AVE
PORTLAND, OR 97225

MARK	DATE	DESCRIPTION

Sheet Title
ELECTRICAL PLAN

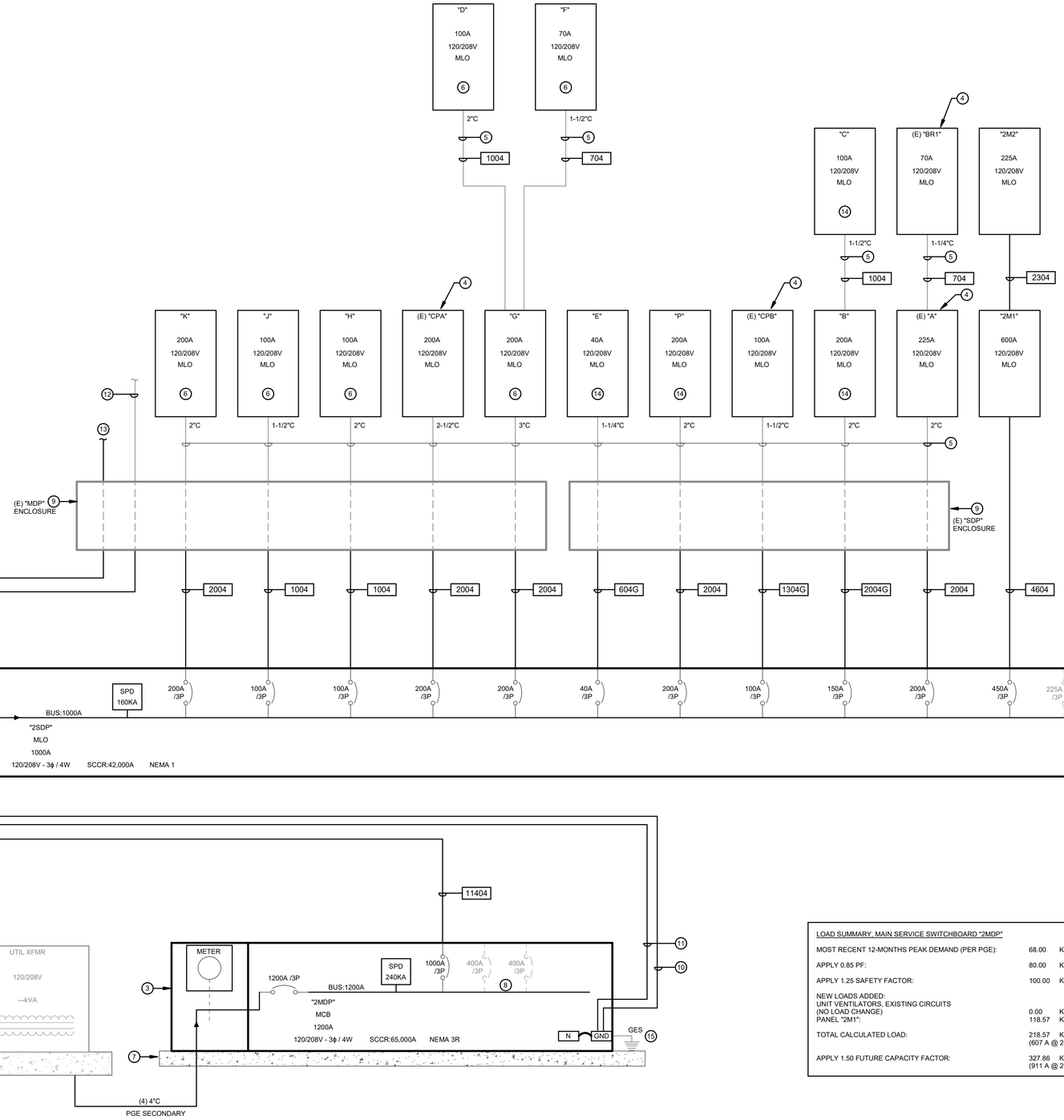
Drawing No.
E2.10

Scale As indicated

Date MARCH 04, 2020

Project No. 19-0012

3/3/2020 4:43:43 PM



1 ONE-LINE DIAGRAM
NOT TO SCALE

ELECTRICAL RISER DIAGRAM NOTES

A. DIAGRAM INDICATES OVERALL LAYOUT OF ELECTRICAL DISTRIBUTION SYSTEM. REFER TO FLOOR PLANS FOR EQUIPMENT LOCATIONS.

B. WIRING SHALL BE COPPER UNLESS INDICATED OTHERWISE.

C. NEUTRAL CONDUCTOR SIZE SHALL MATCH THE PHASE CONDUCTORS UNLESS OTHERWISE NOTED.

D. ALL WIRING SHALL BE IN CONDUIT UNLESS OTHERWISE NOTED. REFER TO SPECIFICATIONS FOR CONDUIT APPLICATION REQUIREMENTS.

E. EXISTING PANELS SHALL HAVE EXISTING FEEDER CONDUCTORS REMOVED TO SOURCE. EXISTING BRANCH CIRCUIT CONDUCTORS SHALL REMAIN. MARK EXISTING BRANCH CIRCUIT CONDUCTORS, PULL BACK AND RETERMINATE AT NEW PANEL OR NEW PANEL INTERIOR. PROVIDE ALL PANELS WITH NEW FEEDER AS SCHEDULED.

F. REPLACEMENT PANELS WITH NEW ENCLOSURE: ADJUST CONDUIT ENTRIES TO MATCH NEW PANEL ENCLOSURE DIMENSION. FOR FLUSH PANELS, REMOVE, PATCH AND PAINT GYP WALL FINISH PER ARCHITECTURAL REQUIREMENTS.

G. NEW AND EXISTING ELECTRICAL EQUIPMENT SHALL BE PROVIDED WITH NEW ENGRAVED PLASTIC LAMINATE LABEL PER DISTRICT STANDARDS. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

(#) ONE-LINE KEY NOTES:

1. TO UTILITY POLE, POINT OF CONNECTION PER PGE REQUIREMENTS.
2. TRANSFORMER CONCRETE PAD PER PGE REQUIREMENTS.
3. UTILITY APPROVED TERMINATIONS AND METERING PROVISIONS.
4. EXISTING PANEL TO REMAIN.
5. NEW CONDUCTORS IN EXISTING CONDUIT.
6. PROVIDE NEW PANELBOARD INTERNAL PARTS IN EXISTING FLUSH MOUNT ENCLOSURE. PROVIDE NEW FLUSH MOUNT HARDWARE, DEAD-FRONT AND LOCKABLE PANEL DOOR.
7. EQUIPMENT PAD PER STRUCTURAL REQUIREMENTS. SEE DETAIL 1 SHEET S2.01.
8. VERTICAL BUS PROVISIONS FOR FUTURE CIRCUIT BREAKERS, MINIMUM SIZE SHOWN.
9. REMOVE ALL WIRING, BUSSING, OVERCURRENT PROTECTION AND COMPONENTS FROM EXISTING DISTRIBUTION ENCLOSURE INTERIOR. ENCLOSURE TO REMAIN AS WIREWAY. ROUTE NEW CONDUCTORS CONTINUOUS, UNSPLICED THROUGH EXISTING ENCLOSURE. INTERCEPT EXISTING CONDUITS AND ROUTE NEW FEEDER CONDUCTORS TO PANELS. SALVAGE INTERIOR PARTS AND COMPONENTS TO OWNER.
10. #2 COPPER, GREEN INSULATED TELECOM BONDING CONDUCTOR, 3/4" CONDUIT.
11. #3/0 COPPER GROUND, 1" CONDUIT. GROUNDING ELECTRODE SYSTEM TRUNK.
12. ROUTE TELECOM BONDING CONDUCTOR IN THROUGH EXISTING MDP WIREWAY AND EXISTING 3/4" CONDUIT, AND CONNECT TO EXISTING MDF GROUND BUS AT MDF ROOM.
13. BARE COPPER CONDUCTOR TO BOILER ROOM. BOND TO WATER AND GAS PIPING ENTERING BUILDING.
14. REMOVE AND REPLACE EXISTING PANEL AND ENCLOSURE.
15. PROVIDE BOND TO ALL AVAILABLE GROUNDING ELECTRODES TO FORM A GROUNDING ELECTRODE SYSTEM PER NEC ART. 250.

LOAD SUMMARY, MAIN SERVICE SWITCHBOARD "2MDP"

MOST RECENT 12-MONTHS PEAK DEMAND (PER PGE):	68.00	KW
APPLY 0.85 PF:	80.00	KVA
APPLY 1.25 SAFETY FACTOR:	100.00	KVA
NEW LOADS ADDED:		
UNIT VENTILATORS, EXISTING CIRCUITS (NO LOAD CHANGE)	0.00	KVA
PANEL "2M1":	118.57	KVA
TOTAL CALCULATED LOAD:	218.57 (607 A @ 208V/3PH)	KVA
APPLY 1.50 FUTURE CAPACITY FACTOR:	327.86 (911 A @ 208V/3PH)	KVA

BID/PERMIT SET

REGISTERED PROFESSIONAL ENGINEER
94252
OREGON
ADAM R. KOBLE
EXPIRES: 6/30/2021

YOST GRUBE HALL ARCHITECTURE
707 SW Washington Street | Suite 1200 | Portland, OR 97205
t 503 221 0150 f 503 295 0840

Owner
BEAVERTON SCHOOL DISTRICT
CENTRAL ADMINISTRATION CENTER
16550 MERLO ROAD
BEAVERTON, OREGON 97003

Project
BSD RALEIGH PARK HVAC AND ELECTRICAL UPGRADE
RALEIGH PARK ELEMENTARY SCHOOL
3670 SW 78TH AVE
PORTLAND, OR 97225

MARK DATE DESCRIPTION

Sheet Title
ELECTRICAL
ONE-LINE DIAGRAM

Drawing No.
E3.01

Scale As indicated

Date MARCH 04, 2020

Project No. 19-0012

3/3/2020 4:43:45 PM

BRANCH PANEL: "B"

LOCATION: A COORIDOR B137 | **VOLTAGE:** 120/208 Wye | **SCCR RATING:** 10KAIC
SUPPLY FROM: | **PHASES:** 3 | **MAINS TYPE:** MLO
MOUNTING: RECESSED | **WIRES:** 4 | **MAINS RATING:** 225 A
ENCLOSURE: TYPE 1 | **MCB RATING:**

NOTES:

CIRCUIT DESCRIPTION	P	AMP	CKT NO	A		B		C		CKT NO	AMP	P	CIRCUIT DESCRIPTION
EXISTING LOAD	1	-- 20 A	1	0	0					2	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	3			0	0			4	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	5					0	0	6	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	7	0	0					8	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	9			0	0			10	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	11					0	0	12	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	13	0	0					14	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	15			0	0			16	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	17					0	0	18	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	19	0	0					20	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	21			0	0			22	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	23					0	0	24	20 A --	1	EXISTING LOAD
			25	0	0					26	-- --	--	SPACE
(E) PANEL "C"	3	-- 100 A	27			0	0			28	-- --	--	SPACE
			29					0	0	30	-- --	--	SPACE
				0 VA		0 VA		0 VA					
				0 A		0 A		0 A					

LEGEND:

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED...	PANEL TOTALS	
				TOTAL CONN. LOAD:	0 VA
				TOTAL EST. DEMAND:	0 VA
				TOTAL CONN.:	0 A
				TOTAL EST. DEMAND:	0 A

NOTES:
1. EXISTING LOADS SHOWN. NO LOAD CHANGE ON PANEL. SEE LOAD SUMMARY FOR COMPLETE LOAD CALCULATION.

BRANCH PANEL: "C"

LOCATION: A COORIDOR B137 | **VOLTAGE:** 120/208 Wye | **SCCR RATING:** 10KAIC
SUPPLY FROM: | **PHASES:** 3 | **MAINS TYPE:** MLO
MOUNTING: RECESSED | **WIRES:** 4 | **MAINS RATING:** 100 A
ENCLOSURE: TYPE 1 | **MCB RATING:**

NOTES:

CIRCUIT DESCRIPTION	P	AMP	CKT NO	A		B		C		CKT NO	AMP	P	CIRCUIT DESCRIPTION
EXISTING LOAD	1	-- 20 A	1	0	0					2	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	3			0	0			4	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	5					0	0	6	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	7	0	0					8	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	9			0	0			10	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	11					0	0	12	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	13	0	0					14	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	15			0	0			16	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	17					0	0	18	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	19	0	0					20	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	21			0	0			22	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	23					0	0	24	20 A --	1	EXISTING LOAD
SPACE	--	-- --	25	0	0					26	-- --	--	SPACE
SPACE	--	-- --	27			0	0			28	-- --	--	SPACE
SPACE	--	-- --	29					0	0	30	-- --	--	SPACE
				0 VA		0 VA		0 VA					
				0 A		0 A		0 A					

LEGEND:

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED...	PANEL TOTALS	
				TOTAL CONN. LOAD:	0 VA
				TOTAL EST. DEMAND:	0 VA
				TOTAL CONN.:	0 A
				TOTAL EST. DEMAND:	0 A

NOTES:
1. EXISTING LOADS SHOWN. NO LOAD CHANGE ON PANEL. SEE LOAD SUMMARY FOR COMPLETE LOAD CALCULATION.

BRANCH PANEL: "D"

LOCATION: B COORIDOR B177 | **VOLTAGE:** 120/208 Wye | **SCCR RATING:** 10KAIC
SUPPLY FROM: | **PHASES:** 3 | **MAINS TYPE:** MLO
MOUNTING: RECESSED | **WIRES:** 4 | **MAINS RATING:** 100 A
ENCLOSURE: TYPE 1 | **MCB RATING:**

NOTES:
REPLACEMENT PANEL INTERIOR IN EXISTING ENCLOSURE. REFER TO SPECIFICATIONS AND ONE-LINE DIAGRAM FOR ADDITIONAL REQUIREMENTS.

CIRCUIT DESCRIPTION	P	AMP	CKT NO	A		B		C		CKT NO	AMP	P	CIRCUIT DESCRIPTION
EXISTING LOAD	1	-- 20 A	1	0	0					2	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	3			0	0			4	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	5					0	0	6	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	7	0	0					8	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	9			0	0			10	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	11					0	0	12	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	13	0	0					14	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	15			0	0			16	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	17					0	0	18	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	19	0	0					20	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	21			0	0			22	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	23					0	0	24	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	25	0	0					26	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	27			0	0			28	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	29					0	0	30	20 A --	1	EXISTING LOAD
SPARE	2	-- 30 A	31	0	0					32	-- --	--	SPACE
			33			0	0			34	-- --	--	SPACE
SPACE	--	-- --	35					0	0	36	-- --	--	SPACE
SPACE	--	-- --	37	0	0					38	-- --	--	SPACE
SPACE	--	-- --	39			0	0			40	-- --	--	SPACE
SPACE	--	-- --	41					0	0	42	-- --	--	SPACE
				0 VA		0 VA		0 VA					
				0 A		0 A		0 A					

LEGEND:

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED...	PANEL TOTALS	
				TOTAL CONN. LOAD:	0 VA
				TOTAL EST. DEMAND:	0 VA
				TOTAL CONN.:	0 A
				TOTAL EST. DEMAND:	0 A

NOTES:
1. EXISTING LOADS SHOWN. NO LOAD CHANGE ON PANEL. SEE LOAD SUMMARY FOR COMPLETE LOAD CALCULATION.

BRANCH PANEL: "E"

LOCATION: CUSTODIAL OFFICE B161 | **VOLTAGE:** 120/208 Wye | **SCCR RATING:** 10KAIC
SUPPLY FROM: | **PHASES:** 3 | **MAINS TYPE:** MLO
MOUNTING: SURFACE | **WIRES:** 4 | **MAINS RATING:** 100 A
ENCLOSURE: TYPE 1 | **MCB RATING:**

NOTES:

CIRCUIT DESCRIPTION	P	AMP	CKT NO	A		B		C		CKT NO	AMP	P	CIRCUIT DESCRIPTION
SPARE	1	-- 20 A	1	0	0					2	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	3			0	0			4	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	5					0	0	6	20 A --	1	EXISTING LOAD
SPARE	1	-- 20 A	7	0	0					8	20 A --	1	SPARE
SPARE	1	-- 20 A	9			0	0			10	20 A --	1	SPARE
SPARE	1	-- 20 A	11					0	0	12	20 A --	1	SPARE
EXISTING LOAD	1	-- 20 A	13	0	0					14	20 A --	1	EXISTING LOAD
SPACE	--	-- --	15			0	0			16	-- --	--	SPACE
SPACE	--	-- --	17					0	0	18	-- --	--	SPACE
SPACE	--	-- --	19	0	0					20	-- --	--	SPACE
SPACE	--	-- --	21			0	0			22	-- --	--	SPACE
SPACE	--	-- --	23					0	0	24	-- --	--	SPACE
SPACE	--	-- --	25	0	0					26	-- --	--	SPACE
SPACE	--	-- --	27			0	0			28	-- --	--	SPACE
SPACE	--	-- --	29					0	0	30	-- --	--	SPACE
				0 VA		0 VA		0 VA					
				0 A		0 A		0 A					

LEGEND:

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED...	PANEL TOTALS	
				TOTAL CONN. LOAD:	0 VA
				TOTAL EST. DEMAND:	0 VA
				TOTAL CONN.:	0 A
				TOTAL EST. DEMAND:	0 A

NOTES:
1. EXISTING LOADS SHOWN. NO LOAD CHANGE ON PANEL. SEE LOAD SUMMARY FOR COMPLETE LOAD CALCULATION.

BID/PERMIT SET

3/3/2020 4:43:45 PM

REGISTERED PROFESSIONAL ENGINEER
94252
OREGON
ADAM R. KOBLE
EXPIRES: 6/30/2021

YOST GRUBE HALL ARCHITECTURE
707 SW Washington Street | Suite 1200 | Portland, OR 97205
t 503 221 0150 f 503 295 0840

Owner
BEAVERTON SCHOOL DISTRICT
CENTRAL ADMINISTRATION CENTER
16550 MERLO ROAD
BEAVERTON, OREGON 97003

Project
BSD RALEIGH PARK HVAC AND ELECTRICAL UPGRADE
RALEIGH PARK ELEMENTARY SCHOOL
3670 SW 78TH AVE
PORTLAND, OR 97225

MARK DATE DESCRIPTION

Sheet Title
PANEL SCHEDULES

Drawing No.
E3.02

Scale

Date MARCH 04, 2020

Project No. 19-0012

BRANCH PANEL: "F"

LOCATION: B COORIDOR B177 **VOLTAGE:** 120/208 Wye **SCCR RATING:** 10KAIC
SUPPLY FROM: **PHASES:** 3 **MAINS TYPE:** MLO
MOUNTING: RECESSED **WIRES:** 4 **MAINS RATING:** 100 A
ENCLOSURE: TYPE 1 **MCB RATING:**

NOTES:
REPLACEMENT PANEL INTERIOR IN EXISTING ENCLOSURE. REFER TO SPECIFICATIONS AND ONE-LINE DIAGRAM FOR ADDITIONAL REQUIREMENTS.

CIRCUIT DESCRIPTION	P	AMP	CKT NO	A		B		C		CKT NO	AMP	P	CIRCUIT DESCRIPTION
EXISTING LOAD	1	-- 20 A	1	0	0					2	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	3			0	0			4	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	5					0	0	6	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	7	0	0					8	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	9			0	0			10	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	11					0	0	12	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	13	0	0					14	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	15			0	0			16	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	17					0	0	18	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	19	0	0					20	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	21			0	0			22	20 A --	1	EXISTING LOAD
EXISTING LOADSPARE	1	-- 20 A	23					0	0	24	20 A --	1	EXISTING LOAD
EXISTING LOAD	3	-- 20 A	25	0	0					26	-- --	--	SPACE
			27			0	0			28	-- --	--	SPACE
			29					0	0	30	-- --	--	SPACE
				0 VA		0 VA		0 VA					
				0 A		0 A		0 A					

LEGEND:

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED...	PANEL TOTALS	
				TOTAL CONN. LOAD:	0 VA
				TOTAL EST. DEMAND:	0 VA
				TOTAL CONN.:	0 A
				TOTAL EST. DEMAND:	0 A

NOTES:
1. EXISTING LOADS SHOWN. NO LOAD CHANGE ON PANEL. SEE LOAD SUMMARY FOR COMPLETE LOAD CALCULATION.

BRANCH PANEL: "G"

LOCATION: HALL1 B171 **VOLTAGE:** 120/208 Wye **SCCR RATING:** 10KAIC
SUPPLY FROM: **PHASES:** 3 **MAINS TYPE:** MLO
MOUNTING: RECESSED **WIRES:** 4 **MAINS RATING:** 225 A
ENCLOSURE: TYPE 1 **MCB RATING:**

NOTES:
REPLACEMENT PANEL INTERIOR IN EXISTING ENCLOSURE. REFER TO SPECIFICATIONS AND ONE-LINE DIAGRAM FOR ADDITIONAL REQUIREMENTS.

CIRCUIT DESCRIPTION	P	AMP	CKT NO	A		B		C		CKT NO	AMP	P	CIRCUIT DESCRIPTION
EXISTING LOAD	1	-- 20 A	1	0	0					2	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	3			0	0			4	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	5					0	0	6	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	7	0	0					8	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	9			0	0			10	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	11					0	0	12	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	13	0	0					14	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	15			0	0			16	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	17					0	0	18	20 A --	1	EXISTING LOAD
			19	0	0					20	-- --	--	SPACE
(E) PANEL "F"	3	-- 70 A	21			0	0			22	-- --	--	SPACE
			23					0	0	24	-- --	--	SPACE
			25	0	0					26	-- --	--	SPACE
(E) PANEL "D"	3	-- 90 A	27			0	0			28	-- --	--	SPACE
			29					0	0	30	-- --	--	SPACE
SPACE	--	-- --	31	0	0					32	-- --	--	SPACE
SPACE	--	-- --	33			0	0			34	-- --	--	SPACE
SPACE	--	-- --	35					0	0	36	-- --	--	SPACE
SPACE	--	-- --	37	0	0					38	-- --	--	SPACE
SPACE	--	-- --	39			0	0			40	-- --	--	SPACE
SPACE	--	-- --	41					0	0	42	-- --	--	SPACE
				0 VA		0 VA		0 VA					
				0 A		0 A		0 A					

LEGEND:

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED...	PANEL TOTALS	
				TOTAL CONN. LOAD:	0 VA
				TOTAL EST. DEMAND:	0 VA
				TOTAL CONN.:	0 A
				TOTAL EST. DEMAND:	0 A

NOTES:
1. EXISTING LOADS SHOWN. NO LOAD CHANGE ON PANEL. SEE LOAD SUMMARY FOR COMPLETE LOAD CALCULATION.

BRANCH PANEL: "H"

LOCATION: STAGE B190 **VOLTAGE:** 120/208 Wye **SCCR RATING:** 10KAIC
SUPPLY FROM: **PHASES:** 3 **MAINS TYPE:** MLO
MOUNTING: RECESSED **WIRES:** 4 **MAINS RATING:** 100 A
ENCLOSURE: TYPE 1 **MCB RATING:**

NOTES:
REPLACEMENT PANEL INTERIOR IN EXISTING ENCLOSURE. REFER TO SPECIFICATIONS AND ONE-LINE DIAGRAM FOR ADDITIONAL REQUIREMENTS.

CIRCUIT DESCRIPTION	P	AMP	CKT NO	A		B		C		CKT NO	AMP	P	CIRCUIT DESCRIPTION
EXISTING LOAD	1	-- 20 A	1	0	0					2	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	3			0	0			4	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	5					0	0	6	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	7	0	0					8	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	9			0	0			10	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	11					0	0	12	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	13	0	0					14	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	15			0	0			16	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	17					0	0	18	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	19	0	0					20	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	21			0	0			22	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	23					0	0	24	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	25	0	0					26	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	27			0	0			28	20 A --	1	EXISTING LOAD
			29					0	0	30	-- --	--	SPACE
SPARE	3	-- 50 A	31	0	0					32	-- --	--	SPACE
			33			0	0			34	-- --	--	SPACE
SPACE	--	-- --	35					0	0	36	-- --	--	SPACE
SPACE	--	-- --	37	0	0					38	-- --	--	SPACE
SPACE	--	-- --	39			0	0			40	-- --	--	SPACE
SPACE	--	-- --	41					0	0	42	-- --	--	SPACE
				0 VA		0 VA		0 VA					
				0 A		0 A		0 A					

LEGEND:

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED...	PANEL TOTALS	
				TOTAL CONN. LOAD:	0 VA
				TOTAL EST. DEMAND:	0 VA
				TOTAL CONN.:	0 A
				TOTAL EST. DEMAND:	0 A

NOTES:
1. EXISTING LOADS SHOWN. NO LOAD CHANGE ON PANEL. SEE LOAD SUMMARY FOR COMPLETE LOAD CALCULATION.

BRANCH PANEL: "J"

LOCATION: HALL2 A144 **VOLTAGE:** 120/208 Wye **SCCR RATING:** 18KAIC
SUPPLY FROM: **PHASES:** 3 **MAINS TYPE:** MLO
MOUNTING: RECESSED **WIRES:** 4 **MAINS RATING:** 100 A
ENCLOSURE: TYPE 1 **MCB RATING:**

NOTES:
REPLACEMENT PANEL INTERIOR IN EXISTING ENCLOSURE. REFER TO SPECIFICATIONS AND ONE-LINE DIAGRAM FOR ADDITIONAL REQUIREMENTS.

CIRCUIT DESCRIPTION	P	AMP	CKT NO	A		B		C		CKT NO	AMP	P	CIRCUIT DESCRIPTION
EXISTING LOAD	1	-- 20 A	1	0	0					2			
EXISTING LOAD	1	-- 20 A	3			0	0			4	20 A --	3	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	5					0	0	6			
			7	0	0					8			
EXISTING LOAD	3	-- 20 A	9			0	0			10	50 A --	3	EXISTING LOAD
			11					0	0	12			
SPARE	1	-- 20 A	13	0	0					14			
SPARE	1	-- 20 A	15			0	0			16	40 A --	3	EXISTING LOAD
SPARE	1	-- 20 A	17					0	0	18			
				0 VA		0 VA		0 VA					
				0 A		0 A		0 A					

LEGEND:

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED...	PANEL TOTALS	
				TOTAL CONN. LOAD:	0 VA
				TOTAL EST. DEMAND:	0 VA
				TOTAL CONN.:	0 A
				TOTAL EST. DEMAND:	0 A

NOTES:
1. EXISTING LOADS SHOWN. NO LOAD CHANGE ON PANEL. SEE LOAD SUMMARY FOR COMPLETE LOAD CALCULATION.

BID/PERMIT SET

REGISTERED PROFESSIONAL ENGINEER
94252
OREGON
ADAM R. KOBLE
EXPIRES: 6/30/2021

YOST GRUBE HALL ARCHITECTURE
707 SW Washington Street | Suite 1200 | Portland, OR 97205
t 503 221 0150 f 503 295 0840

Owner
BEAVERTON SCHOOL DISTRICT
CENTRAL ADMINISTRATION CENTER
16550 MERLO ROAD
BEAVERTON, OREGON 97003

Project
BSD RALEIGH PARK HVAC AND ELECTRICAL UPGRADE
RALEIGH PARK ELEMENTARY SCHOOL
3670 SW 78TH AVE
PORTLAND, OR 97225

MARK DATE DESCRIPTION

Sheet Title
PANEL SCHEDULES

Drawing No.
E3.03

Scale

Date MARCH 04, 2020

Project No. 19-0012

3/3/2020 4:43:46 PM

BRANCH PANEL: "K"

LOCATION: HALL2 A144
SUPPLY FROM:
MOUNTING: RECESSED
ENCLOSURE: TYPE 1

VOLTAGE: 120/208 Wye
PHASES: 3
WIRES: 4

SCCR RATING: 22KAIC
MAINS TYPE: MLO
MAINS RATING: 225 A
MCB RATING:

NOTES:
REPLACEMENT PANEL INTERIOR IN EXISTING ENCLOSURE. REFER TO SPECIFICATIONS AND ONE-LINE DIAGRAM FOR ADDITIONAL REQUIREMENTS.

CIRCUIT DESCRIPTION	P	AMP	CKT NO	A		B		C		CKT NO	AMP	P	CIRCUIT DESCRIPTION
EXISTING LOAD	2	-- 30 A	1	0	0					2	20 A --	1	EXISTING LOAD
			3			0	0			4	20 A --	1	EXISTING LOAD
SPARE	3	-- 40 A	5					0	0	6	20 A --	1	EXISTING LOAD
			7	0	0					8	20 A --	1	EXISTING LOAD
			9			0	0			10	20 A --	1	EXISTING LOAD
SPARE	3	-- 30 A	11					0	0	12	20 A --	1	EXISTING LOAD
			13	0	0					14	20 A --	2	EXISTING LOAD
			15			0	0			16			
EXISTING LOAD	1	-- 20 A	17					0	0	18	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	19	0	0					20	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	21			0	0			22	20 A --	1	EXISTING LOAD
EXISTING LOAD	3	-- 40 A	23					0	0	24	20 A --	1	EXISTING LOAD
			25	0	0					26	15 A --	2	EXISTING LOAD
			27			0	0			28			
EXISTING LOAD	2	-- 20 A	29					0	0	30	15 A --	2	EXISTING LOAD
			31	0	0					32			
EXISTING LOAD	2	-- 15 A	33			0	0			34	20 A --	2	EXISTING LOAD
			35					0	0	36			
EXISTING LOAD	3	-- 20 A	37	0	0					38	20 A --	1	EXISTING LOAD
			39			0	0			40	20 A --	1	EXISTING LOAD
			41					0	0	42	20 A --	1	EXISTING LOAD
				0 VA		0 VA		0 VA					
				0 A		0 A		0 A					

LEGEND:

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED...	PANEL TOTALS	
				TOTAL CONN. LOAD:	0 VA
				TOTAL EST. DEMAND:	0 VA
				TOTAL CONN.:	0 A
				TOTAL EST. DEMAND:	0 A

NOTES:
1. EXISTING LOADS SHOWN. NO LOAD CHANGE ON PANEL. SEE LOAD SUMMARY FOR COMPLETE LOAD CALCULATION.

BRANCH PANEL: "P"

LOCATION: CUSTODIAL OFFICE B161
SUPPLY FROM:
MOUNTING: SURFACE
ENCLOSURE: TYPE 1

VOLTAGE: 120/208 Wye
PHASES: 3
WIRES: 4

SCCR RATING: 10KAIC
MAINS TYPE: MLO
MAINS RATING: 225 A
MCB RATING:

NOTES:

CIRCUIT DESCRIPTION	P	AMP	CKT NO	A		B		C		CKT NO	AMP	P	CIRCUIT DESCRIPTION
EXISTING LOAD	3	-- 20 A	1	0	0					2			
			3			0	0			4	30 A --	3	EXISTING LOAD
			5					0	0	6			
EXISTING LOAD	3	-- 20 A	7	0	0					8	20 A --	1	EXISTING LOAD
			9			0	0			10	30 A --	2	EXISTING LOAD
			11					0	0	12			
EXISTING LOAD	1	-- 20 A	13	0	0					14	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	15			0	0			16	20 A --	1	EXISTING LOAD
EXISTING LOAD	1	-- 20 A	17					0	0	18	20 A --	1	EXISTING LOAD
EXISTING LOAD	3	-- 90 A	19	0	0					20	-- --	--	SPACE
			21			0	0			22	-- --	--	SPACE
			23					0	0	24	-- --	--	SPACE
SPACE	--	-- --	25	0	0					26	-- --	--	SPACE
SPACE	--	-- --	27			0	0			28	-- --	--	SPACE
SPACE	--	-- --	29					0	0	30	-- --	--	SPACE
				0 VA		0 VA		0 VA					
				0 A		0 A		0 A					

LEGEND:

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED...	PANEL TOTALS	
				TOTAL CONN. LOAD:	0 VA
				TOTAL EST. DEMAND:	0 VA
				TOTAL CONN.:	0 A
				TOTAL EST. DEMAND:	0 A

NOTES:
1. EXISTING LOADS SHOWN. NO LOAD CHANGE ON PANEL. SEE LOAD SUMMARY FOR COMPLETE LOAD CALCULATION.

BRANCH PANEL: 2M1

LOCATION:
SUPPLY FROM:
MOUNTING: SURFACE
ENCLOSURE: TYPE 3R

VOLTAGE: 120/208 Wye
PHASES: 3
WIRES: 4

SCCR RATING: 14KAIC
MAINS TYPE: MLO
MAINS RATING: 600 A
MCB RATING:

NOTES:

CIRCUIT DESCRIPTION	P	AMP	CKT NO	A		B		C		CKT NO	AMP	P	CIRCUIT DESCRIPTION
GYM DESTRATIFICATION FANS	1	20 A	1	192	1309					2			
MPR DESTRATIFICATION FANS	1	20 A	3			192	1309			4	20 A	3	AHU-1
CP-1 & 2	1	20 A	5					480	1309	6			
CP-3 & 4	1	20 A	7	480	4359					8			
UV-B100 & B102	1	20 A	9			1512	4359			10	45 A	3	CU-1 (MODULE 1)
UV-B116 & B118	1	20 A	11					1512	4359	12			
DDC/VRF PANELS	1	20 A	13	0	3314					14			
REC - NORTH YARD	1	20 A	15			180	3314			16	35 A	3	CU-1 (MODULE 2)
CU-4/FCU-1	2	20 A	17					1872	3314	18			
			19	1872	5764					20			
SPARE	1	-- 20 A	21			0	5764			22	80 A	3	CU-5
SPARE	1	-- 20 A	23					0	5764	24			
SPARE	1	-- 20 A	25	0	0					26	-- --	--	SPACE
SPARE	1	-- 20 A	27			0	0			28	-- --	--	SPACE
SPACE	--	-- --	29					0	0	30	-- --	--	SPACE
SPACE	--	-- --	31	0	0					32	-- --	--	SPACE
SPACE	--	-- --	33			0	0			34	-- --	--	SPACE
SPACE	--	-- --	35					0	0	36	-- --	--	SPACE
SPACE	--	-- --	37	0	22132					38			
SPACE	--	-- --	39			0	21952			40	225 A	3	SUB PANEL "2M2"
SPACE	--	-- --	41					0	21952	42			
				39423 VA		38583 VA		40563 VA					
				330 A		322 A		339 A					

LEGEND:

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED...	PANEL TOTALS	
POWER	118209 VA	100.00%	118209 VA		
RECEPTACLE	360 VA	100.00%	360 VA	**TOTAL CONN. LOAD:**	118569 VA
				TOTAL EST. DEMAND:	118569 VA
				TOTAL CONN.:	329 A
				TOTAL EST. DEMAND:	329 A

NOTES:

BRANCH PANEL: 2M2

LOCATION:
SUPPLY FROM: 2M1
MOUNTING: SURFACE
ENCLOSURE: TYPE 3R

VOLTAGE: 120/208 Wye
PHASES: 3
WIRES: 4

SCCR RATING: 10KAIC
MAINS TYPE: MLO
MAINS RATING: 225 A
MCB RATING:

NOTES:

CIRCUIT DESCRIPTION	P	AMP	CKT NO	A		B		C		CKT NO	AMP	P	CIRCUIT DESCRIPTION
CU-2 (MODULE 1)	3	60 A	1	6617	0					2	-- --	--	SPACE
			3			6617	0			4	-- --	--	SPACE
			5					6617	0	6	-- --	--	SPACE
CU-2 (MODULE 2)	3	60 A	7	6617	0					8	-- --	--	SPACE
			9			6617	0			10	-- --	--	SPACE
			11					6617	0	12	-- --	--	SPACE
CU-3 (MODULE 1)	3	45 A	13	4359	0					14	-- --	--	SPACE
			15			4359	0			16	-- --	--	SPACE
			17					4359	0	18	-- --	--	SPACE
CU-3 MODULE (2)	3	45 A	19	4359	0					20	-- --	--	SPACE
			21			4359	0			22	-- --	--	SPACE
			23					4359	0	24	-- --	--	SPACE
REC - SOUTH YARD	1	20 A	25	180	0					26	-- --	--	SPACE
SPARE	1	-- 20 A	27			0	0			28	-- --	--	SPACE
SPARE	1	-- 20 A	29					0	0	30	-- --	--	SPACE
				22132 VA		21952 VA		21952 VA					
				184 A		183 A		183 A					

LEGEND:

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED...	PANEL TOTALS	
POWER	65857 VA	100.00%	65857 VA		
RECEPTACLE	180 VA	100.00%	180 VA	**TOTAL CONN. LOAD:**	66037 VA
				TOTAL EST. DEMAND:	66037 VA
				TOTAL CONN.:	183 A
				TOTAL EST. DEMAND:	183 A

NOTES:

BID/PERMIT SET

3/3/2020 4:43:47 PM

REGISTERED PROFESSIONAL ENGINEER
ADAM R. KOBLE
94252
OREGON
EXPIRES: 6/30/2021

YOST GRUBE HALL ARCHITECTURE
707 SW Washington Street | Suite 1200 | Portland, OR 97205
t 503 221 0150 f 503 295 0840

Owner
BEAVERTON SCHOOL DISTRICT
CENTRAL ADMINISTRATION CENTER
16550 MERLO ROAD
BEAVERTON, OREGON 97003

Project
BSD RALEIGH PARK HVAC AND ELECTRICAL UPGRADE
RALEIGH PARK ELEMENTARY SCHOOL
3670 SW 78TH AVE
PORTLAND, OR 97225

MARK	DATE	DESCRIPTION

Sheet Title
PANEL SCHEDULES

Drawing No.
E3.04

Scale

Date MARCH 04, 2020

Project No. 19-0012

COPPER FEEDER SCHEDULE

TAG	PHASE/NEUTRAL	GROUND	CONDUIT	TAG	PHASE/NEUTRAL	GROUND	CONDUIT
303	(3) #10 THWN	#10 THWN	3/4"	2553	(3) #250 KCMIL THWN	#4 THWN	3"
304	(4) #10 THWN	#10 THWN	3/4"	2554	(4) #250 KCMIL THWN	#4 THWN	3"
403	(3) #8 THWN	#10 THWN	3/4"	2853	(3) #300 KCMIL THWN	#4 THWN	3"
404	(4) #8 THWN	#10 THWN	1"	2854	(4) #300 KCMIL THWN	#4 THWN	3"
603	(3) #6 THWN	#10 THWN	1"	3103	(3) #350 KCMIL THWN	#4 THWN	3"
604	(4) #6 THWN	#10 THWN	1"	3104	(4) #350 KCMIL THWN	#4 THWN	3"
604G	(4) #6 THWN	#8 THWN	1"	3353	(3) #400 KCMIL THWN	#3 THWN	3"
703	(3) #4 THWN	#8 THWN	1-1/4"	3354	(4) #400 KCMIL THWN	#3 THWN	3"
704	(4) #4 THWN	#8 THWN	1-1/4"	3803	(3) #500 KCMIL THWN	#3 THWN	4"
803	(3) #3 THWN	#8 THWN	1-1/4"	3804	(4) #500 KCMIL THWN	#3 THWN	4"
804	(4) #3 THWN	#8 THWN	1-1/4"	4203	(3) #600 KCMIL THWN	#2 THWN	4"
903	(3) #2 THWN	#8 THWN	1-1/4"	4204	(4) #600 KCMIL THWN	#2 THWN	4"
904	(4) #2 THWN	#8 THWN	1-1/2"	4603	(6) #4/0 THWN	#2 THWN, EACH	(2) 2"
1003	(3) #1 THWN	#8 THWN	1-1/2"	4604	(8) #4/0 THWN	#2 THWN, EACH	(2) 2-1/2"
1004	(4) #1 THWN	#8 THWN	1-1/2"	5103	(6) #250 KCMIL THWN	#2 THWN, EACH	3-1/2"
1303	(3) #1 THWN	#6 THWN	1-1/2"	5104	(8) #250 KCMIL THWN	#2 THWN, EACH	3-1/2"
1304	(4) #1 THWN	#6 THWN	1-1/2"	6203	(6) #350 KCMIL THWN	#1 THWN, EACH	(2) 3"
1304G	(4) #1 THWN	#4 THWN	1-1/2"	6204	(8) #350 KCMIL THWN	#1 THWN, EACH	(2) 4"
1503	(3) #1/0 THWN	#6 THWN	2"	7603	(6) #500 KCMIL THWN	#1/0 THWN, EACH	(2) 4"
1504	(4) #1/0 THWN	#6 THWN	2"	7604	(8) #500 KCMIL THWN	#1/0 THWN, EACH	(2) 4"
1753	(3) #2/0 THWN	#6 THWN	2"	8553	(9) #300 KCMIL THWN	#2/0 THWN, EACH	(3) 4"
1754	(4) #2/0 THWN	#6 THWN	2"	8554	(12) #300 KCMIL THWN	#2/0 THWN, EACH	(3) 4"
2003	(3) #3/0 THWN	#6 THWN	2"	10053	(9) #400 KCMIL THWN	#2/0 THWN, EACH	(3) 4"
2004	(4) #3/0 THWN	#6 THWN	2"	10054	(12) #400 KCMIL THWN	#2/0 THWN, EACH	(3) 4"
2004G	(4) #3/0 THWN	#4 THWN	2"	11404	(12) #500 KCMIL THWN	#3/0 THWN, EACH	(3) 4"
2303	(3) #4/0 THWN	#4 THWN	2-1/2"	12404	(16) #350 KCMIL THWN	#3/0 THWN, EACH	(4) 3"
2304	(4) #4/0 THWN	#4 THWN	2-1/2"				
2305	(4) #4/0 THWN	#4 THWN, + #4 ISO GND	2-1/2"				

EQUIPMENT CONNECTION SCHEDULE

ABBREVIATIONS:

1	NEMA 1 ENCLOSURE	INT	INTEGRAL WITH EQUIPMENT FROM...
3R	NEMA 3R ENCLOSURE	MMS	MANUAL MOTOR STARTER WITH FUSES
4	NEMA 4 ENCLOSURE	NFD	NON-FUSED DISCONNECT SWITCH
4X	NEMA 4X ENCLOSURE	RD	RETURN AIR DUCT DETECTOR
BO	PROVIDED BY OTHERS	RSR	RUN STATUS RELAY , NORMALLY OPEN
CB	CIRCUIT BREAKER IN PANEL	SD	SUPPLY AIR DUCT DETECTOR
CSD	COMBINATION STARTER/DISCONNECT	SSP	START/STOP PUSHBUTTON WITH PILOT
CP	CORD AND PLUG PROVIDED WITH UNIT	SS	START/STOP PUSHBUTTON
ECB	ENCLOSED CIRCUIT BREAKER	ST	SHUNT TRIP
FAR	FIRE ALARM SHUTDOWN RELAY	TOR	TIME DELAY OFF RELAY
FDS	FUSED DISCONNECT SWITCH	TS	TOGGLE SWITCH WITH PLUG FUSE
GF	GROUND FAULT CIRCUIT INTERRUPTION	VFD	VARIABLE FREQUENCY DRIVE
HOA	HAND-OFF-AUTO		

TAG	ELECTRICAL CHARACTERISTICS					DISCONNECT				CONTROLS		REMARKS
	VOLTAGE	PHASE	MOTOR HP	KW	MCA	TYPE	SIZE (AMPS)	NEMA RATING	FUSE SIZE (AMPS)	STARTER	DESCRIPTION	
AHU-1	208 V	3	(2)1-1/2		10.9	INT	-	-	-	-	-	PROVIDE INTERCONNECTION WITH EXISTING FIRE ALARM SYSTEM FOR FAN UNIT SHUTDOWN.
AHU-GYM(EX)	208 V	3	3		-	INT	-	1	-	VFD	HOA	EXISTING UNIT MOTOR REPLACEMENT. PROVIDE NEW VFD CONTROLS WITH INTEGRAL DISCONNECT SWITCH.
AHU-MULTI(EX)	208 V	3	5		-	INT	-	1	-	VFD	HOA	EXISTING UNIT MOTOR REPLACEMENT. PROVIDE NEW VFD CONTROLS WITH INTEGRAL DISCONNECT SWITCH.
CP-1	120 V	1			1.7	CP	20	-	-	-	-	PROVIDE 20A RECEPTACLE AT PUMP LOCATION.
CP-2	120 V	1			1.7	CP	20	-	-	-	-	PROVIDE 20A RECEPTACLE AT PUMP LOCATION.
CP-3	120 V	1			1.7	CP	20	-	-	-	-	PROVIDE 20A RECEPTACLE AT PUMP LOCATION.
CP-4	120 V	1			1.7	CP	20	-	-	-	-	PROVIDE 20A RECEPTACLE AT PUMP LOCATION.
CU-1	208 V	3			27.6 + 36.3	CB	-	-	-	-	-	REFER TO PANEL SCHEDULE.
CU-2	208 V	3			55.1 + 55.1	CB	-	-	-	-	-	REFER TO PANEL SCHEDULE.
CU-3	208 V	3			36.3 + 36.3	CB	-	-	-	-	-	REFER TO PANEL SCHEDULE.
CU-4	208 V	1			9	FDS	30	3R	15	-	-	
CU-5	208 V	3			48	CB	-	-	-	-	-	REFER TO PANEL SCHEDULE.
FCU-1	208 V	1			9	INT	-	-	-	-	-	POWERED BY OUTDOOR UNIT CU-4. PROVIDE WIRING CONNECTIONS PER APPROVED MANUFACTURER REQUIREMENTS.
UV-A100	120 V	1			6.3	INT	-	-	-	-	-	
UV-A102	120 V	1			6.3	INT	-	-	-	-	-	
UV-A104	120 V	1			6.3	INT	-	-	-	-	-	
UV-A106	120 V	1			6.3	INT	-	-	-	-	-	
UV-A108	120 V	1			6.3	INT	-	-	-	-	-	
UV-A110	120 V	1			6.3	INT	-	-	-	-	-	
UV-A116	120 V	1			6.3	INT	-	-	-	-	-	
UV-A118	120 V	1			6.3	INT	-	-	-	-	-	
UV-A122	120 V	1			6.3	INT	-	-	-	-	-	
UV-A126	120 V	1			6.3	INT	-	-	-	-	-	
UV-A128	120 V	1			6.3	INT	-	-	-	-	-	
UV-B100	120 V	1			6.3	INT	-	-	-	-	-	
UV-B102	120 V	1			6.3	INT	-	-	-	-	-	
UV-B104	120 V	1			6.3	INT	-	-	-	-	-	
UV-B106	120 V	1			6.3	INT	-	-	-	-	-	
UV-B116	120 V	1			6.3	INT	-	-	-	-	-	
UV-B118	120 V	1			6.3	INT	-	-	-	-	-	
UV-B142	120 V	1			6.3	INT	-	-	-	-	-	

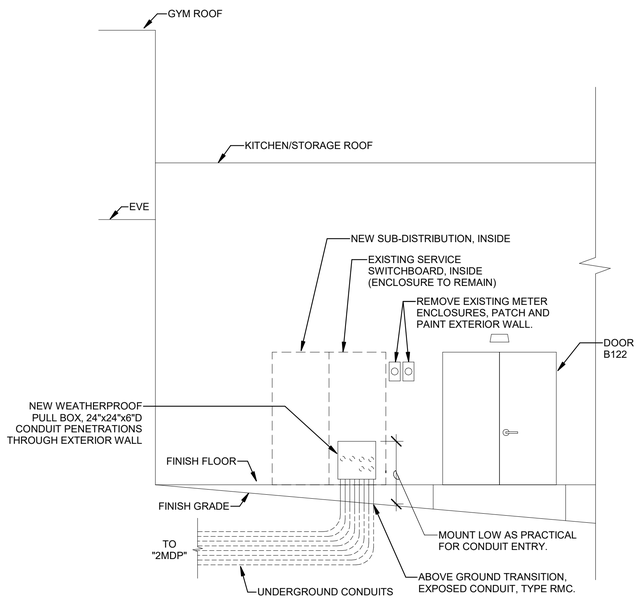
NOTES:

A. PROVIDE OVERCURRENT PROTECTION CIRCUIT BREAKER AND/OR FUSE AMP RATINGS PER EQUIPMENT NAMEPLATE.

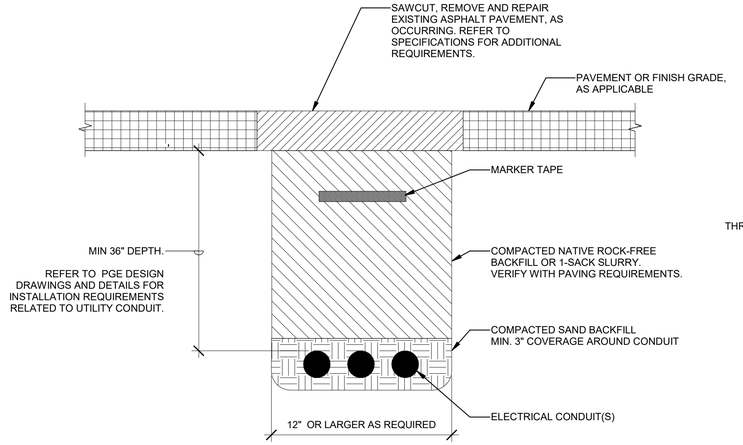
B. COORDINATE WITH MECHANICAL SYSTEM INSTALLER AND CONFIRM CONNECTION LOCATIONS OF APPROVED EQUIPMENT PRIOR TO ROUGH-IN.

C. VERIFY CONNECTION REQUIREMENTS WITH APPROVED EQUIPMENT AND PROVIDE WIRING, CONNECTIONS, AND ROUGH-IN PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.

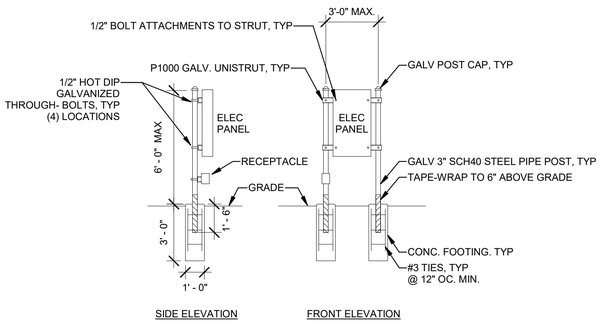
D. FIRE ALARM SYSTEM INTERFACE, WHERE REQUIRED, SHALL BE PROVIDED BY THE CONTRACTOR AS A DESIGN-BUILD SERVICE. PROVIDE DESIGN OF NEW DEVICES ON EXISTING SYSTEM, DRAWINGS, CALCULATIONS, AND SUBMITTAL FOR APPROVAL.



1 WEST EXTERIOR ELEVATION, KITCHEN/GARBAGE
NOT TO SCALE



2 CONDUIT TRENCH DETAIL
NOT TO SCALE



3 PANEL STRUT RACK
NOT TO SCALE

BID/PERMIT SET

3/3/2020 4:43:48 PM

REGISTERED PROFESSIONAL ENGINEER
94252
OREGON
ADAM R. KOBLE
EXPIRES: 6/30/2021

YOST GRUBE HALL ARCHITECTURE
707 SW Washington Street | Suite 1200 | Portland, OR 97205
t 503 221 0150 f 503 295 0840

Owner
BEAVERTON SCHOOL DISTRICT
CENTRAL ADMINISTRATION CENTER
16550 MERLO ROAD
BEAVERTON, OREGON 97003

Project
BSD RALEIGH PARK HVAC AND ELECTRICAL UPGRADE
RALEIGH PARK ELEMENTARY SCHOOL
3670 SW 78TH AVE
PORTLAND, OR 97225

MARK	DATE	DESCRIPTION

Sheet Title
ELECTRICAL SCHEDULES & DETAILS

Drawing No.
E4.01

Scale As indicated

Date MARCH 04, 2020

Project No. 19-0012

LEGEND

REMNANT ASBESTOS-CONTAINING FLOOR TILE AND MASTIC UNDER UNIVENTS AND ASSOCIATED PIPE INSULATION

ASBESTOS-CONTAINING FLOOR TILE AND MASTIC UNDER CARPET

NOTES:

- GYPSUM BOARD AND JOINT COMPOUND IN WALL/CEILING SYSTEM LOCATED THROUGHOUT, CONTAIN <1.0% CHRYSOLTILE AND ARE CONSIDERED AN OSHA REGULATED MATERIAL

-ASBESTOS-CONTAINING HARD FITTINGS LOCATED THROUGHOUT

-ASBESTOS-CONTAINING FIRE DOORS LOCATED THROUGHOUT

-ASBESTOS-CONTAINING FLOOR TILE AND MASTIC UNDER CARPET IN VARIOUS LOCATIONS

FIGURE NUMBER 1

ASBESTOS ABATEMENT MATERIAL LOCATION MAP

Raleigh Park Elementary School
3670 SW 78th Avenue
Beaverton, OR 97225

4105 SE International Way
Suite 505
Milwaukie, OR 97222
C: 503-407-0734
F: 503-762-6882

TRC

DATE	February 2020
PROJECT NO.	377064
DRAWN BY	SC
CHECKED BY	MC
CHECKED BY	RL