ADDITION AND RENOVATIONS OF GALENA ELEMENTARY SCHOOL

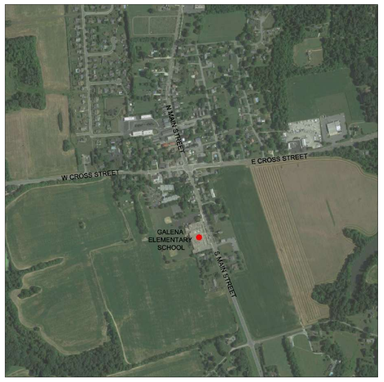
114 S MAIN STREET
GALENA, MD 21635
KENT COUNTY

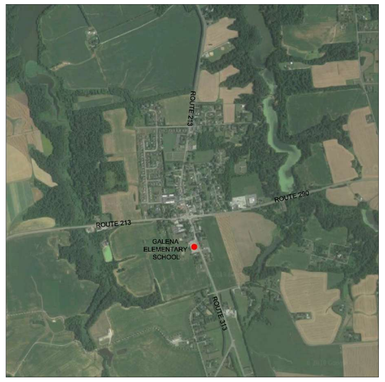
KENT COUNTY PUBLIC SCHOOLS
CRA PROJECT No. 3309
FEBRUARY 10, 2020

PSC NO. 14.002.20LP/21C.
KCPS FACILITY NO. 14.0106

ARCHITECTURAL REGISTRATION BOARD 8490 THOMAS C. CRABTREE STATE OF MARYLAND

PROFESSIONAL CERTIFICATION:
I CERTIFY THAT THESE DOCUMENTS WERE PREPARED BY OR APPROVED BY ME AND THAT I AM A DULY LICENSED ARCHITECT UNDER THE LAWS OF THE STATE OF MARYLAND.
LICENSE NO. 8490
EXPIRATION DATE: 3/4/2021





CRABTREE ROHRBAUGH & ASSOCIATES - ARCHITECTS
100 WEST ROAD, SUITE 402
TOWSON, MD 21204

STRUCTURAL ENGINEER
ADTEK ENGINEERS
150 S EAST ST, SUITE 201
FREDERICK, MD 21701

MEP ENGINEER
ALBAN ENGINEERING
303 INTERNATIONAL CIR #450,
COCKEYSVILLE, MD 21030

CIVIL ENGINEER
DMS & ASSOCIATES, LLC
207 E WATER STREET
CENTERVILLE, MD 21617

FOOD SERVICE
NYIKOS ASSOCIATES, INC
18219-A FLOWER HILL WAY,
GAITHERSBURG, MD 20879

HAZMAT
ECS MID-ATLANTIC, LLC
1340 CHARWOOD RD, SUITE B
HANOVER, MARYLAND 21076

APPLICABLE CODES:

Maryland Building Rehabilitation Code, COMAR 09.12.58
International Existing Building Code / 2018 – Chapter(s) 5, 6, 7, 8 & 11
Maryland Building Performance Standards, COMAR 09.12.51
International Building Code / 2018
National Electrical Code / 2017
International Fuel Gas Code / 2018
International Mechanical Code / 2018
2015 National Standard Plumbing Code / 2015
International Energy Conservation Code / 2018
International Green Construction Code / 2012
Maryland Fire Prevention Code, COMAR 29.06.01
NFPA 1 National Fire Code / 2018
NFPA 101 Life Safety Code / 2018
Maryland Accessibility Code, COMAR 05.02.02
2010 ADA Standards

STATE OF MARYLAND

DEPARTMENT OF GENERAL SERVICES
ELLINGTON E. CHURCHILL, JR., SECRETARY
301 WEST PRESTON STREET
BALTIMORE, MARYLAND 21201

KENT COUNTY PUBLIC SCHOOLS
DR. KAREN M. COUCH, SUPERINTENDENT
5608 BOUNDARY AVE
ROCK HALL, MD 21661

BOARD OF PUBLIC WORKS
LARRY HOGAN, GOVERNOR
PETER FRANCHOT, COMPTROLLER
NANCY K. KOPP, TREASURER

LEGEND

MATERIALS

- UNDISTURBED EARTH
- CONTROLLED FILL
- CONCRETE
- GRANULAR FILL
- CONC MASONRY UNIT
- FACE MASONRY UNITS
- WOOD BLOCKING
- RIGID INSULATION
- BATT INSULATION

ARCHITECTURAL DRAWING NO. DESIGNATIONS

- A1.1 — INDICATES FLOOR PLANS; INDICATES SHEET NUMBER
- A2.1 — INDICATES ELEVATIONS; INDICATES SHEET NUMBER
- A3.1 — INDICATES SECTIONS; INDICATES SHEET NUMBER
- A4.1 — INDICATES LARGE SCALE PLANS; INDICATES SHEET NUMBER
- A5.1 — INDICATES GENERAL DETAILS; INDICATES SHEET NUMBER
- A6.1 — INDICATES SCHEDULES AND FRAME ELEVATIONS; INDICATES SHEET NUMBER
- I4.1 — INDICATES INTERIOR LARGE SCALE LAYOUTS; INDICATES SHEET NUMBER
- I7.1 — INDICATES FLOOR PATTERN LAYOUTS; INDICATES SHEET NUMBER

SYMBOLS

SECTION
SECTION OR DETAIL NO.
SHEET NO.

BUILDING SECTION
SECTION INDICATOR
BUILDING SECTION SHEET NO.

DETAIL
DETAIL NO.
DETAIL SHEET NO.

INTERIOR ELEVATION
ELEVATION NO.
ELEVATION SHEET NO.

DOOR TAG
DOOR NUMBER

WINDOW TAG
WINDOW ELEVATION

WALL TYPE TAG
WALL IDENTIFICATION

MILLWORK SECTION
SECTION OR DETAIL NO.
DETAIL SHEET NO.

ROOM TAG
ROOM NAME
BLDG. & ROOM NO.

NORTH ARROW

ARCHITECTURAL ABBREVIATIONS

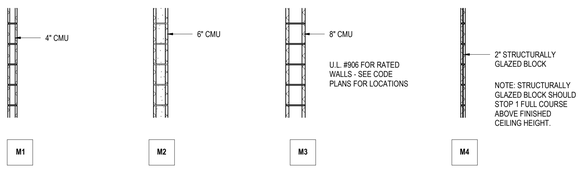
THIS ABBREVIATION LIST IS A STANDARD AND NOT ALL ABBREVIATIONS ARE NECESSARILY USED ON THIS PROJECT

ABV	ABOVE
AC	ACOUSTICAL
ACT	ACOUSTICAL CEILING TILE
AED	AUTOMATED EXTERNAL DEFIBRILLATOR
AFF	ABOVE FINISH FLOOR
ALUM	ALUMINUM
ALT	ALTERNATE
AP	ACCESS PANEL
ARCH	ARCHITECT(URAL)
BD	BOARD
BIT	BITUMINOUS
BLDG	BUILDING
BLK	BLOCK(ING)
BM	BENCH MARK
BOT	BOTTOM
BRG	BEARING
BSMT	BASEMENT
CLR	CLEAR
CL	CENTERLINE
CJ	CONTROL JOINT
CLG	CEILING
CMU	CONCRETE MASONRY UNIT
COL	COLUMN
CONC	CONCRETE
CONT	CONTINUOUS
CONST	CONSTRUCTION
CONTR	CONTRACTOR
COORD	COORDINATE
CT	CERAMIC TILE
DEMO	DEMOLITION
DET	DETAIL
DF	DRINKING FOUNTAIN
DIM	DIMENSION
DN	DOWN
DR	DOOR
DS	DOWNSPOUT
DWG	DRAWING
EA	EACH
EC	ELECTRICAL CONTRACTOR
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC	ELECTRICAL
ELEV	ELEVATOR
ENT	ENTRANCE
EQ	EQUAL
EQUIP	EQUIPMENT
EX	EXISTING
EXP	EXPOSED
EXT	EXTERIOR
EW	EACH WAY
FD	FLOOR DRAIN
FE	FIRE EXTINGUISHER (CABINET)
FFE	FINISHED FLOOR ELEVATION
FIN	FINISH(ED)
FL	FLOOR
FRP	FIBERGLASS REINFORCED PANEL
FRT	FIRE RETARDANT
FT	FOOT or FEET
GA	GAUGE
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GFCMU	GROUND FACE CONCRETE MASONRY UNIT
GL	GLASS
GCMU	GLAZED CONCRETE MASONRY UNIT
GWB	GYPSUM WALL BOARD
GWBAR	GYPSUM WALL BOARD ABUSE RESISTANT
GWBMR	GYPSUM WALL BOARD MOISTURE RESISTANT
GWBFR	GYPSUM WALL BOARD FIRE RATED
HC	HANDICAPPED
HDW	HARDWARE
HGT	HEIGHT
HP	HIGH POINT
HM	HOLLOW METAL
HORIZ	HORIZONTAL
HVAC	HEATING, VENTILATION & AIR CONDITIONING
ID	INSIDE DIAMETER
INFO	INFORMATION
INSUL	INSULATION
INT	INTERIOR
INV	INVERT
JST	JOIST
JT	JOINT
KIT	KITCHEN(ETTE)
LAM	LAMINATE
LAV	LAVATORY
LB	POUND
LF	LINEAL FEET
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LP	LOW POINT
MFR	MANUFACTURER
MAT	MATERIAL
MAX	MAXIMUM
MC	MECHANICAL CONTRACTOR
MECH	MECHANICAL
MEP	MECHANICAL, ELECTRICAL, PLUMBING
MIN	MINIMUM
MISC	MISCELLANEOUS
MO	MASONRY OPENING
MTD	MOUNTED or MOUNTING
NIC	NOT IN CONTRACT
NO	NUMBER
NOM	NOMINAL
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OPNG	OPENING
OPP	OPPOSITE
PTN	PARTITION
PC	PLUMBING CONTRACTOR
PL	PLATE
PLAM	PLASTIC LAMINATE
PLWD	PLYWOOD
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PTD	PAINTED
QT	QUARRY TILE
R	RISER or RADIUS
RD	ROOF DRAIN
REC	RECESSED
RECT	RECTANGLE
REINF	REINFORCED or REINFORCING
REQD	REQUIRED
RM	ROOM
RO	ROUGH OPENING
RWC	RAIN WATER CONDUCTOR
SCH	SCHEDULE
SECT	SECTION
SF	SQUARE FEET
SFCMU	SPLIT FACE CONCRETE MASONRY UNIT
SFRM	SPRAY-APPLIED FIRE RESISTIVE MATERIAL
SH	SHEATHING
SIM	SIMILAR
SJ	SCORE JOINT
SPECS	SPECIFICATIONS
SQ	SQUARE
SS	STAINLESS STEEL
STD	STANDARD
STR	STRUCTURAL
SYN	SYNTHETIC
T	TREAD
TG	TEMPERED GLASS
THK	THICK(NESS)
TOM	TOP OF MASONRY
TOP	TOP OF PLANK
TOS	TOP OF STEEL
TYP	TYPICAL
UL	UNDERWRITERS LABORATORIES
UNO	UNLESS NOTED OTHERWISE
VCT	VINYL COMPOSITION TILE
VERT	VERTICAL
VIF	VERIFY IN FIELD
WP	WATERPROOFING
W/	WITH
WD	WOOD
WG	WIRE GLASS

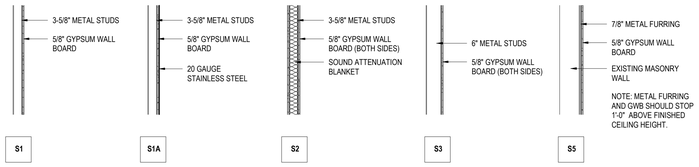
ABBREVIATION SYMBOLS

@	AT
℄	CENTER LINE
Ø	DIAMETER
+/-	PLUS OR MINUS

INTERIOR MASONRY WALL TYPES



INTERIOR STUD WALL TYPES



GYPSUM WALL BOARD LOCATION SCHEDULE

ABUSE RESISTANT GYPSUM BOARD	• ALL CLASSROOMS AND OFFICES • ALL LOCATIONS SCHEDULED TO RECEIVE GYPSUM WALL BOARD UNLESS NOTED OTHERWISE • EXPOSED LAYER AT MULTIPLE LAYERS OF GYPSUM WALL BOARD
GYPSUM WALL BOARD	• ALL APPLICATIONS ABOVE 8'-0" FINISH FLOOR • ALL MULTIPLE LAYER WALLS, EXCEPT THE EXPOSED LAYER
MOLD & MOISTURE RESISTANT GYPSUM BOARD	• PAINTED WALLS & CEILINGS IN TOILET ROOMS, LOCKER ROOMS & SHOWERS
CEMENTITIOUS BACKER UNIT	• AT WALLS SURROUNDING SHOWERS AND TUBS SCHEDULED TO RECEIVE CERAMIC TILE

GENERAL NOTES: WALL TYPES

1. ALL INTERIOR WALLS WHICH ARE NOT TAGGED OR OTHERWISE DETAILED SHALL BE TYPE M1.

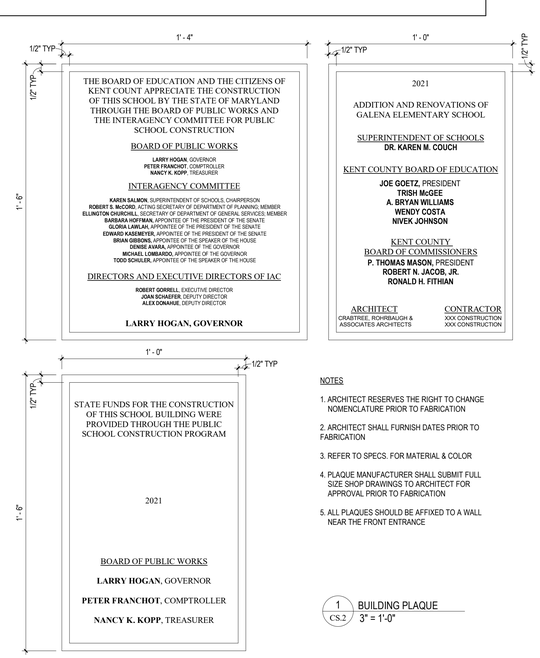
2. ALL WALLS SHALL EXTEND TO WITHIN 2" OF UNDERSIDE OF FLOOR, ROOF OR ROOF STRUCTURE. AT ALL NON-RATED WALLS, INSTALL COMPRESSIBLE FILLER IN JOINT BETWEEN TOP OF PARTITION AND UNDERSIDE OF STRUCTURE ABOVE. AT ALL FIRE-RATED WALLS, INSTALL FIRESTOPPING IN JOINT BETWEEN TOP OF PARTITION AND UNDERSIDE OF STRUCTURE ABOVE.

3. PROVIDE THROUGH-PENETRATION FIRE STOP SYSTEMS FOR ALL BUILDING UTILITIES PENETRATING FIRE-RESISTANCE RATED WALL ASSEMBLIES. RATED AT THE SAME FIRE-RESISTANCE RATING AS THE ASSEMBLIES IN WHICH IT IS PENETRATING. OPENINGS IN FIRE-RATED ASSEMBLIES SHALL BE LIMITED TO MINIMUM SIZES TO ACCOMMODATE PENETRATIONS TO ENSURE MAXIMUM INTEGRITY OF THE ASSEMBLIES FIRE-RATING.

4. AT STUD WALLS WITH GYPSUM WALL BOARD, PANELS TO EXTEND TO UNDERSIDE OF DECK ABOVE UNLESS NOTED OTHERWISE.

5. REFER TO CODE ANALYSIS DRAWINGS FOR LOCATION AND EXTENT OF FIRE-RESISTANCE-RATED ASSEMBLIES.

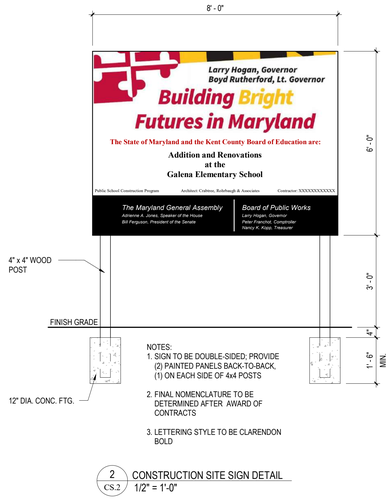
6. SEE SECTIONS, STRUCTURAL DRAWINGS AND ELEVATIONS FOR FURTHER DETAIL OF WALL CONSTRUCTION.



NOTES

1. ARCHITECT RESERVES THE RIGHT TO CHANGE NOMENCLATURE PRIOR TO FABRICATION
2. ARCHITECT SHALL FURNISH DATES PRIOR TO FABRICATION
3. REFER TO SPECS. FOR MATERIAL & COLOR
4. PLAQUE MANUFACTURER SHALL SUBMIT FULL SIZE SHOP DRAWINGS TO ARCHITECT FOR APPROVAL PRIOR TO FABRICATION
5. ALL PLAQUES SHOULD BE AFFIXED TO A WALL NEAR THE FRONT ENTRANCE

1 CS.2 BUILDING PLAQUE
3" = 1'-0"



2 CS.2 CONSTRUCTION SITE SIGN DETAIL
1/2" = 1'-0"

DRAWING LIST

Sheet Number	Sheet Name
0 - 0	Starting View
GENERAL	
CS.1	COVER SHEET
CS.2	GENERAL INFORMATION
CIVIL	
C1.0	OVERALL SITE PLAN
C1.1	EXISTING CONDITIONS AND DEMOLITION PLAN
C1.2	SITE, GRADING AND SEDIMENT & EROSION CONTROL PLAN
C2.0	MISCELLANEOUS DETAILS
ARCHITECTURAL CODE COMPLIANCE	
CC.1	CODE COMPLIANCE FIRST FLOOR PLAN
DEMOLITION	
D1.1	OVERALL FIRST FLOOR DEMOLITION PLAN
D1.2	PARTIAL DEMOLITION PLANS
D1.3	ROOF DEMOLITION PLAN
ARCHITECTURAL	
A1.1	OVERALL FIRST FLOOR PLAN
A1.2	PARTIAL FIRST FLOOR PLANS
A1.3	OVERALL ROOF PLAN
A1.4	PARTIAL REFLECTED CEILING PLANS
A2.1	OVERALL EXTERIOR ELEVATIONS
A3.1	BUILDING & WALL SECTIONS
A4.1	LARGE SCALE PLANS
A5.1	DETAILS
A5.2	DETAILS
A6.1	ROOM FINISH & SIGNAGE SCHEDULE
A6.2	DOOR SCHEDULE & HOLLOW METAL FRAME ELEVATION & DETAILS
A6.3	ALUMINUM WINDOW ELEVATIONS & DETAILS
INTERIORS	
I4.1	LARGE SCALE LAYOUTS MEDIA CENTER/OFFICES, LANGUAGE SUPPORT, & KITCHEN OFFICE
FOOD SERVICE	
K-101	KITCHEN EQUIPMENT PLAN
K-102	BUILDING CONDITIONS & VENTILATION PLAN
K-103	PLUMBING ROUGH-IN PLAN
K-104	ELECTRICAL ROUGH-IN PLAN
K-501	VENTILATION DETAILS
K-502	VENTILATION WIRING DIAGRAM
K-503	FIRE SYSTEM DETAILS
STRUCTURAL	
S0.1	STRUCTURAL NOTES
S0.2	STRUCTURAL SCHEDULES
S1.1	OVERALL FOUNDATION PLAN
S1.2	PARTIAL FOUNDATION PLAN - AREA A
S2.1	OVERALL ROOF FRAMING PLAN
S2.2	PARTIAL ROOF FRAMING PLAN - AREA A
S3.1	FOUNDATION DETAILS
S4.1	ROOF FRAMING DETAILS
S5.1	MASONRY WALL DETAILS

DRAWING LIST

Sheet Number	Sheet Name
MECHANICAL GENERAL	
M0.1	NOTES & LEGEND
MECHANICAL DEMOLITION	
MD2.1	PARTIAL FLOOR PLANS - BASE BID AND ALTERNATES - DEMOLITION
MD2.2	PARTIAL FLOOR PLANS – BASE BID RTU REPLACEMENTS - DEMOLITION
MD2.3	ROOF PLAN - DEMOLITION
MECHANICAL	
M2.1	PARTIAL FLOOR PLANS - BASE BID AND ALTERNATES
M2.2	PARTIAL FLOOR PLANS – BASE BID RTU REPLACEMENTS
M2.3	ROOF PLAN
M3.1	MECHANICAL SECTIONS
M7.1	AIR DISTRIBUTION DETAILS
M7.2	PIPING AND EQUIPMENT DETAILS
M7.3	EQUIPMENT SUPPORT AND ROOFTOP DETAILS
M8.1	TYPICAL SZVAV RTU WITH HEAT RECOVERY AND HW HEAT CONTROL DIAGRAM
M8.2	TYPICAL VAV RTU WITH HEAT RECOVERY AND HW HEAT CONTROL DIAGRAM
M8.3	TYPICAL VAV RTU WITH HEAT RECOVERY CONTROL DIAGRAM
M8.4	TYPICAL SZVAV RTU CONTROL DIAGRAM
M8.5	TYPICAL VAV RTU WITH HW HEAT CONTROL DIAGRAM
M9.1	SCHEDULES & EQUIPMENT NOTES
M9.2	VENTILATION RATES SCHEDULE
PLUMBING GENERAL	
P0.1	PLUMBING NOTES, & LEGEND
PLUMBING DEMOLITION	
PD2.1	FLOOR PLAN - DEMOLITION
PD2.2	ROOF PLAN - DEMOLITION
PLUMBING	
P2.1	PARTIAL FLOOR PLANS - KITCHEN/CAFETERIA
P2.2	PARTIAL FLOOR PLANS - ADD ALTERNATE
P2.3	ROOF PLAN
P6.1	RISER DIAGRAMS
P7.1	PIPING DETAILS
P7.2	EQUIPMENT AND ROOF DETAILS
P9.1	SCHEDULES, NOTES & RISERS
FIRE PROTECTION	
FP2.1	FIRE PROTECTION
FP7.1	FIRE PROTECTION DETAILS
ELECTRICAL GENERAL	
E0.1	ELECTRICAL LEGEND, ABBREVIATIONS, & CONVENTIONS
E0.2	LIGHT FIXTURE SCHEDULE
ELECTRICAL DEMOLITION	
ED1.1	DEMOLITION PLANS
ELECTRICAL	
E1.1	ELECTRICAL PLANS
E2.1	LIGHTING PLANS
E3.1	FIRE ALARM
E4.1	KITCHEN PART PLANS
E5.1	SCHEMATIC RISER DIAGRAMS
E6.1	ELECTRICAL DETAILS
E7.1	PANELBOARD SCHEDULES

ARCHITECTURAL REGISTRATION BOARD 8490 THOMAS C. CRABTREE STATE OF MARYLAND

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REVISIONS

	MM-DD-YR	NAME	DESCRIPTION OF CHANGES

CRABTREE ROHRBAUGH & ASSOCIATES - ARCHITECTS
100 WEST ROAD, SUITE 402
TOWSON MD 21204
410-528-0272
www.cra-architects.com
MECHANICSBURG, PENNSYLVANIA
CHARLOTTESVILLE, VIRGINIA
WHITE SULPHUR SPRINGS, WEST VIRGINIA

ADDITION AND RENOVATIONS OF GALENA ELEMENTARY SCHOOL
KENT COUNTY PUBLIC SCHOOLS
114 S MAIN STREET
GALENA, MD 21635

GENERAL INFORMATION

PLOT SCALE: As indicated
FILENAME:
DATE: FEBRUARY 10, 2020

PROJECT 3309

CS.2

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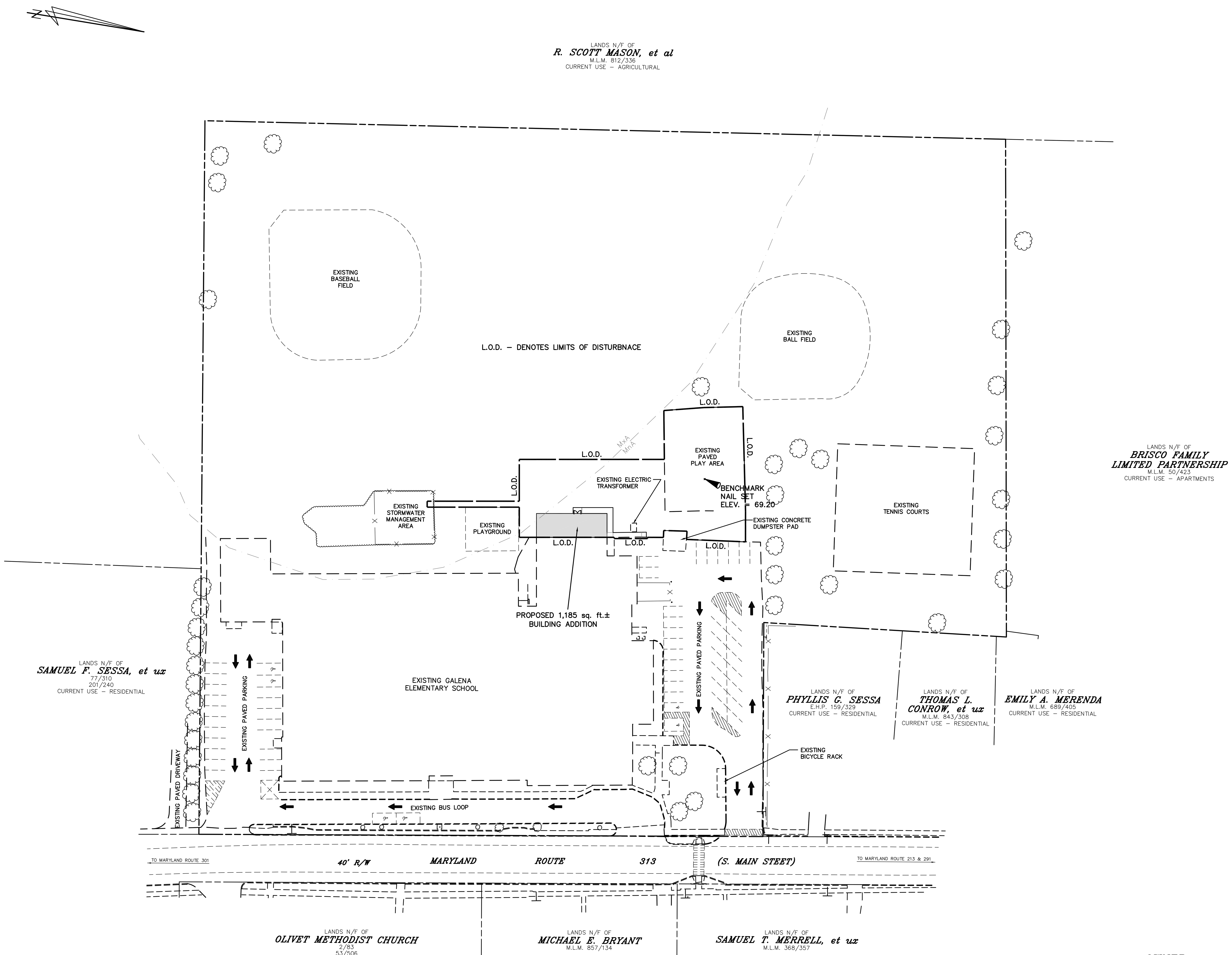
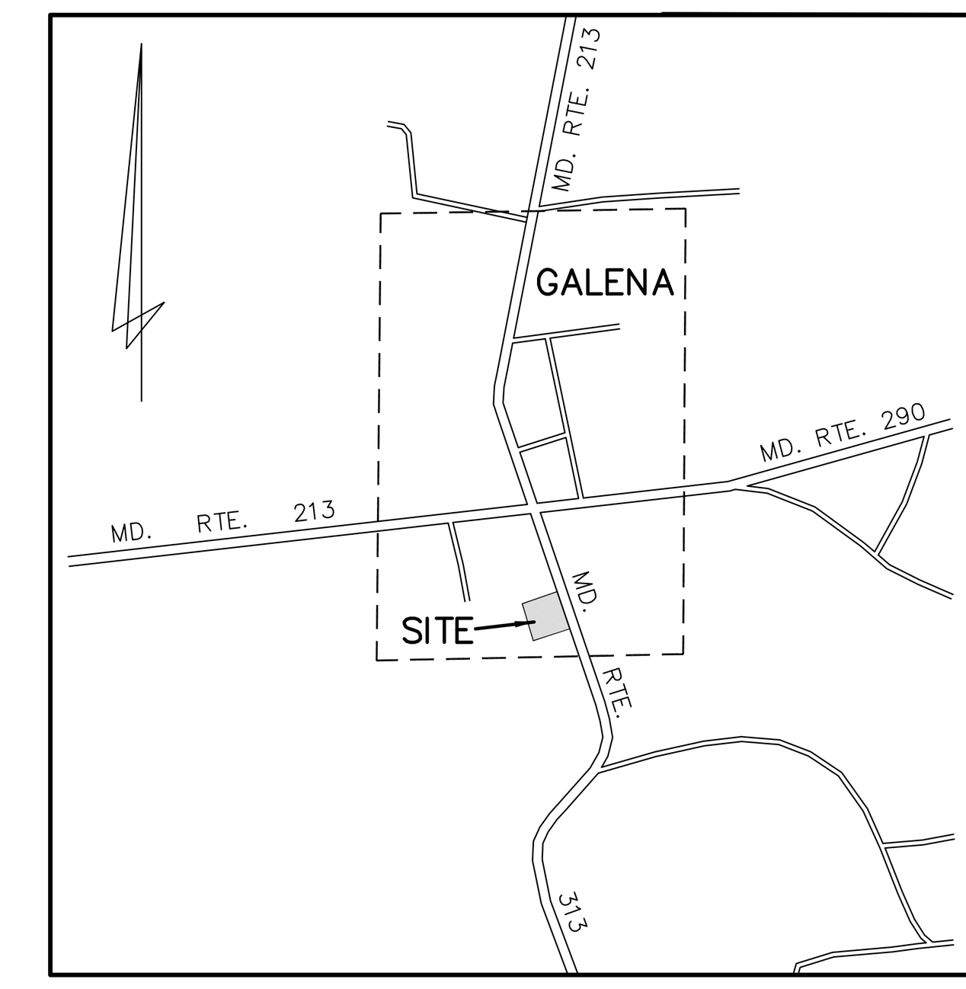




VICINITY MAP

SCALE 1" = 2000'

GENERAL NOTES

1. These drawings show information obtained from the best available records regarding pipes, conduits, telephone lines, and other structures and conditions which exist along the lines of the work both at and below the surface of the ground. The owner and engineer disclaim any responsibilities for the accuracy or completeness of said information being shown only for the convenience of the contractor, who must verify the information to his own satisfaction. If the contractor relies on said information, he does so at his own risk. The giving of the information on the contract drawings will not relieve the contractor of his obligations to support and protect all pipes, conduits, telephone lines, and other structures.

2. The contractor shall notify the following two (2) weeks prior to the start of construction and shall coordinate construction with the utility companies involved:

   Delmarva Power & Light Company --------- 1–800–375–7117
   Miss Utility ------------------------- 1–800–441–8355
   DMS & Associates, LLC ---------------- 1–443–262–9130
   Kent County Dept. Public Works ---------- 1–410–778–7439
   Kent Co. Sediment & Erosion Control Inspector – 1–410–778–7437

3. All construction shall be marked for traffic and pedestrian safety.

4. The Contractor shall provide all equipment, labor, and materials for any miscellaneous or test pit excavations required by the Engineer.

5. The owner is responsible for the acquisition of all easements, both permanent and temporary.

6. The Contractor assumes all responsibility for any deviations from these plans unless said deviation is approved by the Engineer. Contractor shall receive written permission from the Engineer if a deviation of the plans is necessary.

7. All disturbed areas shall be smoothly graded to provide positive drainage in the direction of flow arrows herein and stabilized with topsoil, seed, and mulch. If settlement occurs, topsoil, seeding, and mulching shall be repeated until settlement subsides (See Erosion and Sediment Control Specifications).

8. All trash, trees, and underbrush are to be cleared and removed off site to an approved dump site by the contractor.

9. Any excess excavated material shall be removed off site by the contractor or material shall be placed on site as directed by the Engineer and/or Owner.

10. Any existing survey monumentation that is disturbed during construction shall be replaced by a registered surveyor at the contractor's expense.

11. The Contractor shall conduct his work in easements so that there will be a minimum of disturbance of the properties crossed. Any disturbed areas shall be restored to its original condition.

12. All materials and methods of construction shall conform to the drawings, specifications, local building codes, and the standard specifications and details of the Kent County.

13. All drainage structures and swales shall remain functional during construction unless otherwise indicated on the plans.

14. All water valves, boxes and hydrants shall be set and adjusted to finish grade.

15. Wherever sewer or water mains or services run parallel to each other, a minimum horizontal separation of 10' shall be provided.

16. Minimum cover over the water main shall be 42".

17. All concrete used for utility work shall be in accordance with MD SHA Standards and Specifications for Mix No. 2.

18. All paving materials and methods shall be in accordance with the latest MD SHA Standards and Specifications and be supplied by a State Certified plant.

19. Trenches shall not remain open overnight. If it is necessary for trenches to remain open, steel plates capable of bearing traffic shall be used to completely cover the trench openings.

20. Erosion and Sediment Control will be strictly enforced by the Kent County Sediment Control Inspector.

21. All top of curb grades shown hereon are for undepressed conditions.

NOTES

1. EXISTING IMPROVEMENTS AND TOPOGRAPHY WITHIN THE PROJECT AREA SHOWN HEREON ARE THE RESULT OF A FIELD RUN SURVEY BY MICHAEL A. SCOTT, INC. IN AUGUST, 2019.

2. CURRENT USE – INSTITUTIONAL

3. CURRENT ZONING CLASSIFICATION IS RESIDENTIAL.

4. THE PROPERTY IS NOT LOCATED WITHIN THE CHESAPEAKE BAY CRITICAL AREA.

5. SITE IS NOT LOCATED WITHIN THE 100 YEAR FLOODPLAIN AS SCALED FROM FLOOD INSURANCE RATE MAPS COMMUNITY PANEL 24029C0185D. (ZONE "X"), DATED JUNE 9, 2014.

6. SOILS SHOWN ONSITE CONSIST OF "MATAPEAKE SILT LOAM" (MnA) AND (MxA) AS SCALED FROM http://websoilsurvey.nrcs.usda.gov.

REVIEWED FOR THE KENT SOIL AND WATER CONSERVATION DISTRICT AND MEET TECHNICAL REQUIREMENTS

APPROVED:

KENT SOIL AND WATER CONSERVATION DISTRICT ______ DATE ______

NOTE: KENT SOIL AND WATER CONSERVATION DISTRICT RESERVES THE RIGHT TO ADD, DELETE, MODIFY OR OTHERWISE ALTER THE EROSION CONTROL PROVISIONS OF THIS PLAN IN THE EVENT ADDITIONAL PROTECTION BECOMES NECESSARY.

DEVELOPERS CERTIFICATION

I (WE) CERTIFY THAT:

A. ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE IN ACCORDANCE WITH THIS SEDIMENT AND EROSION CONTROL PLAN AND/OR STORMWATER MANAGEMENT PLAN, AND FURTHER, AUTHORIZED THE RIGHT OF ENTRY FOR PERIODIC ONSITE EVALUATION BY THE KENT SOIL AND WATER CONSERVATION DISTRICT SEDIMENT CONTROL INSPECTOR OR MARYLAND DEPARTMENT OF THE ENVIRONMENT.

B. ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATION OF ATTENDANCE AT THE DEPARTMENT OF ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF EROSION AND SEDIMENT BEFORE BEGINNING THE PROJECT.

C. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR OR SUBCONTRACTOR TO NOTIFY THE ENGINEER OF ANY DEVIATION FROM THIS PLAN. ANY CHANGE MADE IN THIS PLAN WITHOUT WRITTEN AUTHORIZATION FROM THE ENGINEER WILL PLACE RESPONSIBILITY FOR SAID CHANGE ON THE CONTRACTOR OR SUBCONTRACTOR.

Karen M. Couch (signature)
SIGNATURE ______ DATE 11/15/19

5608 Boundary Avenue, Rock Hall, MD 21661
ADDRESS ______ ~~CARD No.~~

410 778 1595
PHONE No.

SITE STATISTICS

GROSS AREA (DEED)	=	8.37 ac.±
FLOOR AREA (EXISTING) (15.9%)	=	1.33 ac.±
FLOOR AREA (TO BE REMOVED)	=	0.00 ac.±
FLOOR AREA (PROPOSED)	=	0.027 ac.± (1,185 sq. ft.±)
FLOOR AREA (TOTAL) (16.2%)	=	1.357 ac.±
IMPERVIOUS AREA (EXISTING) (33.2%)	=	2.780 ac.±
IMPERVIOUS AREA (TO BE REMOVED)	=	0.005 ac.±
IMPERVIOUS AREA (PROPOSED)	=	0.038 ac.±
IMPERVIOUS AREA (TOTAL) (33.6%)	=	2.813 ac.±

PARKING CALCULATIONS

PARKING SPACES (EXISTING) = 56 SPACES (6 HANDICAP)

GRAPHIC SCALE

40 0 20 40 80

1 inch = 40 ft.

LEGEND

x 69.21	EXISTING SPOT ELEVATION
73x12	PROPOSED SPOT ELEVATION
69	EXISTING CONTOUR
71	PROPOSED CONTOUR
MxA / MnA	EXISTING SOIL LINE
X X	EXISTING FENCE
E E	EXISTING UNDERGROUND ELECTRIC LINE
	EXISTING UTILITY POLE
	EXISTING TREE
	EXISTING TRAFFIC FLOW
SF SF SF	SILT FENCE
L.O.D.	LIMITS OF DISTURBANCE

OWNER:
GALENA MIDDLE ELEMENTARY SCHOOL
114 S. MAIN STREET
GALENA, MARYLAND 21635
Ph: 1–410–810–2510

DEVELOPER:
KENT COUNTY PUBLIC SCHOOLS
5608 BOUNDARY AVENUE
ROCK HALL, MARYLAND 21661
Ph: 1–410–778–1595

ARCHITECT
CRABTREE, ROHRBAUGH & ASSOCIATES
200 WEST ROAD, SUITE 402
TOWSON, MARYLAND 21204
PHONE No. 1–410–528–0272

ENGINEER:
DMS & ASSOCIATES, LLC
c/o KEVIN SHEARON, P.E., LEED AP
P.O. BOX 80
CENTREVILLE, MARYLAND 21617
PHONE No. 1–443–262–9130

SURVEYOR
MICHAEL A. SCOTT, INC.
400 S. CANNON STREET
CHESTERTOWN, MARYLAND 21620
PHONE No. 1–410–778–2310

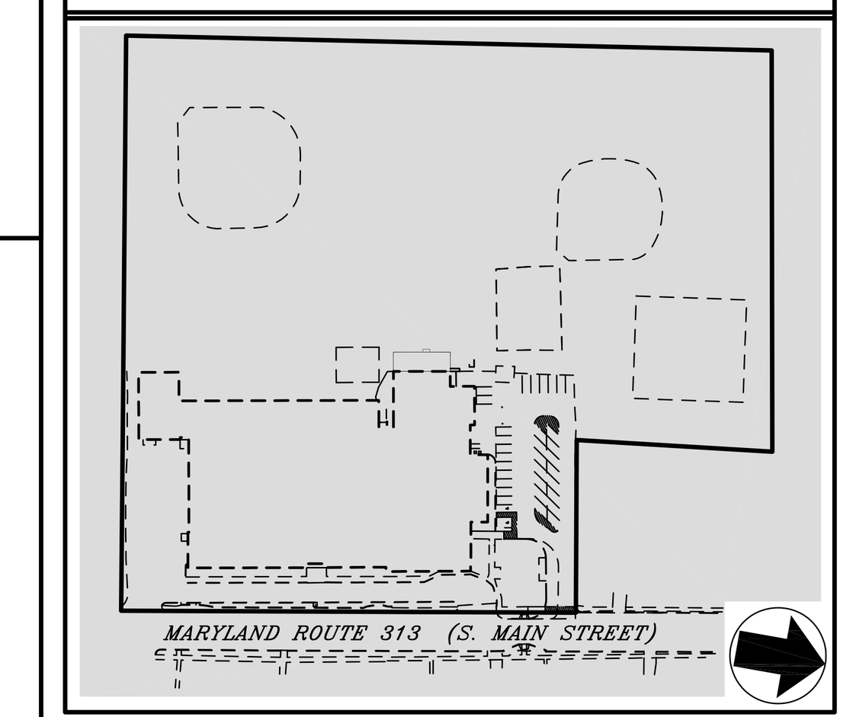
KENT SOIL AND WATER CONSERVATION DISTRICT ______ DATE

SEAL:
PROFESSIONAL CERTIFICATION:
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE No. 200499 EXPIRATION DATE: 9–2–2021

STATE OF MARYLAND – KEVIN JAMES SHEARON – No. 200499 – PROFESSIONAL ENGINEER

FEBRUARY 10, 2020
DATE SEAL

KEY PLAN



REVISIONS

01	MM-DD-YR	NAME	DESCRIPTION OF CHANGES

CRABTREE ROHRBAUGH & ASSOCIATES - ARCHITECTS
100 WEST ROAD, SUITE 402
TOWSON MD 21204
410-528-0272
MECHANICSBURG, PENNSYLVANIA
CHARLOTTESVILLE, VIRGINIA
WHITE SULPHUR SPRINGS, WEST VIRGINIA
www.cra-architects.com

ADDITION AND RENOVATIONS OF GALENA ELEMENTARY SCHOOL

KENT COUNTY PUBLIC SCHOOLS
114 S MAIN STREET
GALENA, MD 21635

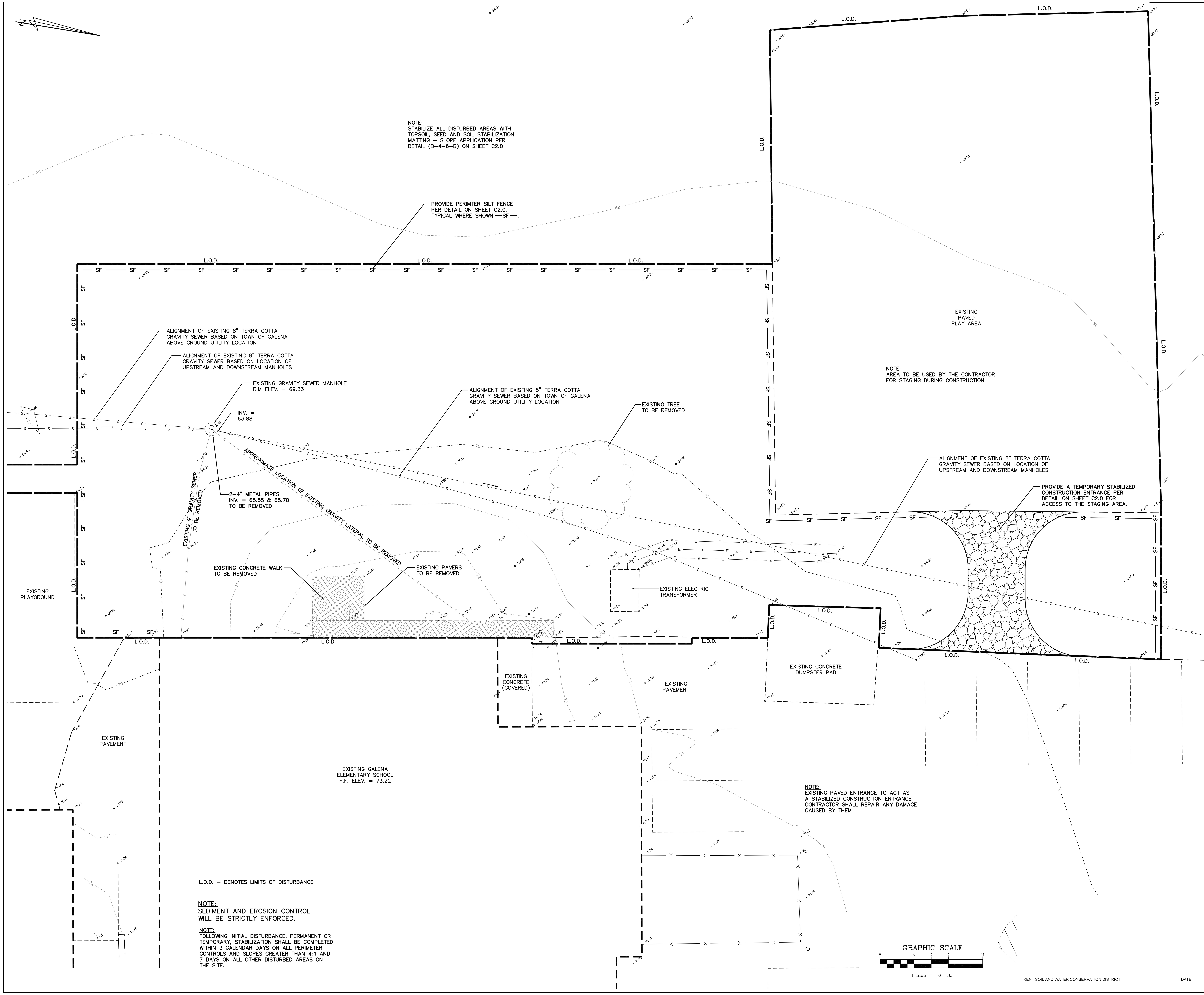
CR

DAVIS, MOORE, SHEARON & ASSOCIATES, LLC
ENGINEERING, DRAFTING/DESIGN, ENVIRONMENTAL SERVICES & SURVEYING
P.O. BOX 80
CENTREVILLE, MARYLAND 21617
PHONE : 1–443–262–9130
FAX : 1–443–262–9148

OVERALL SITE PLAN
PLOT SCALE: 1" = 40'
FILENAME:
DATE: FEBRUARY 10, 2020

PROJECT 3309

C1.0

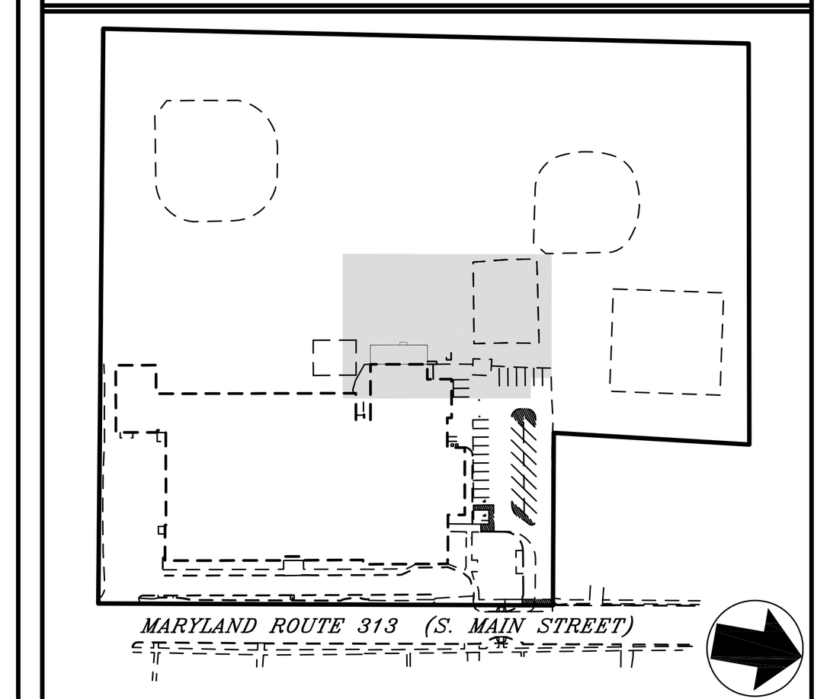


NOTE:
STABILIZE ALL DISTURBED AREAS WITH TOPSOIL, SEED AND SOIL STABILIZATION MATTING – SLOPE APPLICATION PER DETAIL (B-4-6-B) ON SHEET C2.0
PROVIDE PERIMTER SILT FENCE PER DETAIL ON SHEET C2.0. TYPICAL WHERE SHOWN —SF—.
L.O.D.
SF
EXISTING PAVED PLAY AREA
NOTE:
AREA TO BE USED BY THE CONTRACTOR FOR STAGING DURING CONSTRUCTION.
ALIGNMENT OF EXISTING 8" TERRA COTTA GRAVITY SEWER BASED ON TOWN OF GALENA ABOVE GROUND UTILITY LOCATION
ALIGNMENT OF EXISTING 8" TERRA COTTA GRAVITY SEWER BASED ON LOCATION OF UPSTREAM AND DOWNSTREAM MANHOLES
EXISTING GRAVITY SEWER MANHOLE RIM ELEV. = 69.33
INV. = 63.88
ALIGNMENT OF EXISTING 8" TERRA COTTA GRAVITY SEWER BASED ON TOWN OF GALENA ABOVE GROUND UTILITY LOCATION
EXISTING TREE TO BE REMOVED
APPROXIMATE LOCATION OF EXISTING GRAVITY LATERAL TO BE REMOVED
EXISTING 4" GRAVITY SEWER TO BE REMOVED
2-4" METAL PIPES INV. = 65.55 & 65.70 TO BE REMOVED
ALIGNMENT OF EXISTING 8" TERRA COTTA GRAVITY SEWER BASED ON LOCATION OF UPSTREAM AND DOWNSTREAM MANHOLES
PROVIDE A TEMPORARY STABILIZED CONSTRUCTION ENTRANCE PER DETAIL ON SHEET C2.0 FOR ACCESS TO THE STAGING AREA.
EXISTING PLAYGROUND
EXISTING CONCRETE WALK TO BE REMOVED
EXISTING PAVERS TO BE REMOVED
EXISTING ELECTRIC TRANSFORMER
EXISTING CONCRETE DUMPSTER PAD
EXISTING CONCRETE (COVERED)
EXISTING PAVEMENT
EXISTING PAVEMENT
EXISTING GALENA ELEMENTARY SCHOOL F.F. ELEV. = 73.22
NOTE:
EXISTING PAVED ENTRANCE TO ACT AS A STABILIZED CONSTRUCTION ENTRANCE CONTRACTOR SHALL REPAIR ANY DAMAGE CAUSED BY THEM
L.O.D. – DENOTES LIMITS OF DISTURBANCE
NOTE:
SEDIMENT AND EROSION CONTROL WILL BE STRICTLY ENFORCED.
NOTE:
FOLLOWING INITIAL DISTURBANCE, PERMANENT OR TEMPORARY, STABILIZATION SHALL BE COMPLETED WITHIN 3 CALENDAR DAYS ON ALL PERIMETER CONTROLS AND SLOPES GREATER THAN 4:1 AND 7 DAYS ON ALL OTHER DISTURBED AREAS ON THE SITE.
GRAPHIC SCALE
1 inch = 6 ft.
KENT SOIL AND WATER CONSERVATION DISTRICT
DATE

SEAL:
PROFESSIONAL CERTIFICATION:
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE No. 200499 EXPIRATION DATE: 9-2-2021

FEBRUARY 10, 2020
DATE SEAL

KEY PLAN



REVISIONS

01	MM-DD-YR	NAME	DESCRIPTION OF CHANGES

CRABTREE ROHRBAUGH & ASSOCIATES - ARCHITECTS
100 WEST ROAD, SUITE 402
TOWSON MD 21204
410-528-0272
MECHANICSBURG, PENNSYLVANIA
CHARLOTTESVILLE, VIRGINIA
WHITE SULPHUR SPRINGS, WEST VIRGINIA
www.cra-architects.com

ADDITION AND RENOVATIONS OF GALENA ELEMENTARY SCHOOL

KENT COUNTY PUBLIC SCHOOLS
114 S MAIN STREET
GALENA, MD 21635

DAVIS, MOORE, SHEARON & ASSOCIATES, LLC
ENGINEERING, DRAFTING/DESIGN, ENVIRONMENTAL SERVICES & SURVEYING
P.O. BOX 80
CENTREVILLE, MARYLAND 21617
PHONE : 1-443-262-9130
FAX : 1-443-262-9148

EXISTING CONDITIONS AND DEMOLITION PLAN

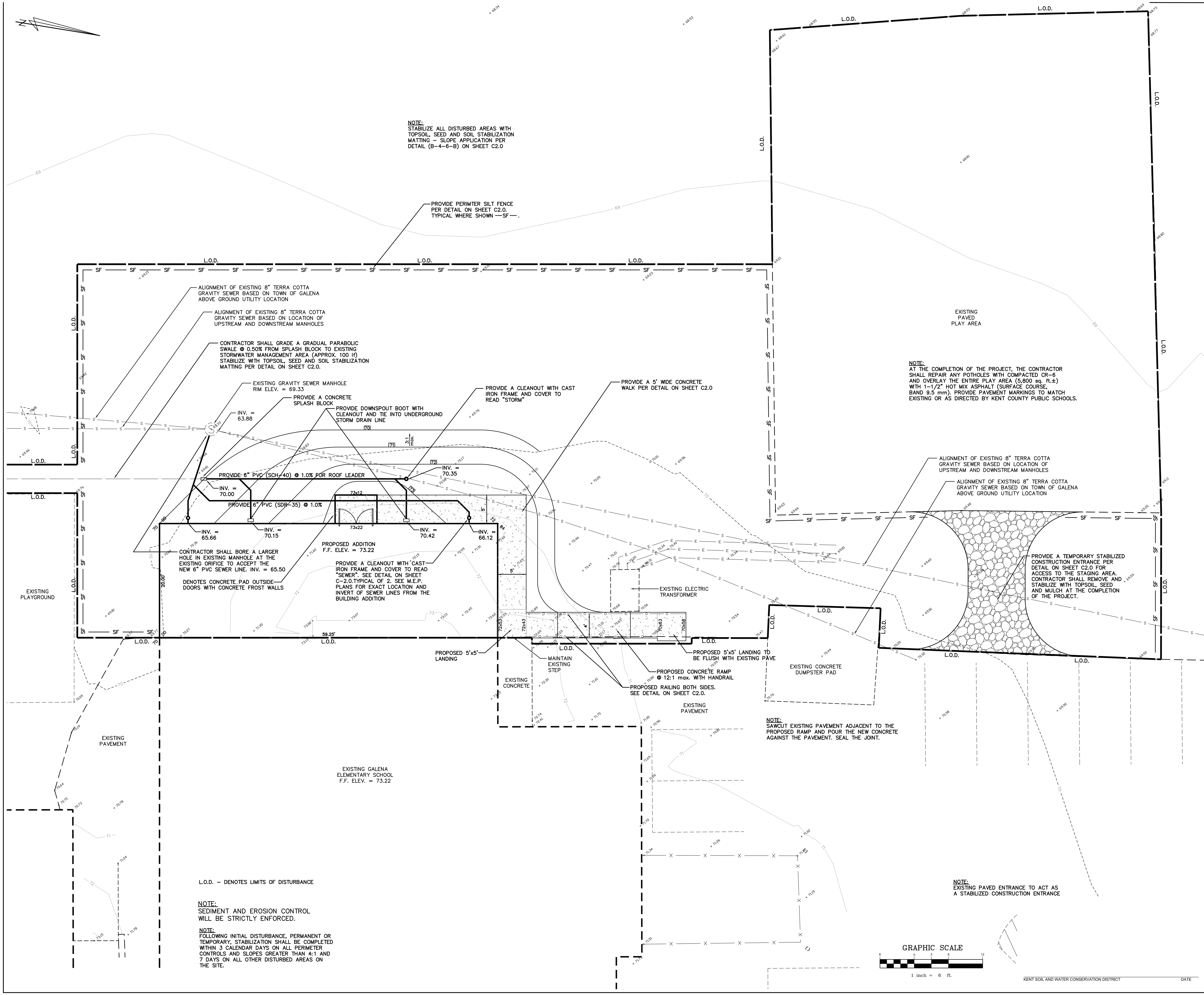
PLOT SCALE: 1" = 6'

FILENAME:

DATE: FEBRUARY 10, 2020

PROJECT
3309

C1.1


NOTE:
STABILIZE ALL DISTURBED AREAS WITH TOPSOIL, SEED AND SOIL STABILIZATION MATTING – SLOPE APPLICATION PER DETAIL (B-4-6-B) ON SHEET C2.0
PROVIDE PERIMTER SILT FENCE PER DETAIL ON SHEET C2.0. TYPICAL WHERE SHOWN —SF—.
L.O.D.
SF
ALIGNMENT OF EXISTING 8" TERRA COTTA GRAVITY SEWER BASED ON TOWN OF GALENA ABOVE GROUND UTILITY LOCATION
ALIGNMENT OF EXISTING 8" TERRA COTTA GRAVITY SEWER BASED ON LOCATION OF UPSTREAM AND DOWNSTREAM MANHOLES
CONTRACTOR SHALL GRADE A GRADUAL PARABOLIC SWALE @ 0.50% FROM SPLASH BLOCK TO EXISTING STORMWATER MANAGEMENT AREA (APPROX. 100 lf) STABILIZE WITH TOPSOIL, SEED AND SOIL STABILIZATION MATTING PER DETAIL ON SHEET C2.0.
EXISTING GRAVITY SEWER MANHOLE RIM ELEV. = 69.33
INV. = 63.88
PROVIDE A CONCRETE SPLASH BLOCK
PROVIDE DOWNSPOUT BOOT WITH CLEANOUT AND TIE INTO UNDERGROUND STORM DRAIN LINE
PROVIDE A CLEANOUT WITH CAST IRON FRAME AND COVER TO READ "STORM"
PROVIDE A 5' WIDE CONCRETE WALK PER DETAIL ON SHEET C2.0
EXISTING PAVED PLAY AREA
NOTE:
AT THE COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL REPAIR ANY POTHOLES WITH COMPACTED CR-6 AND OVERLAY THE ENTIRE PLAY AREA (5,800 sq. ft.±) WITH 1-1/2" HOT MIX ASPHALT (SURFACE COURSE, BAND 9.5 mm). PROVIDE PAVEMENT MARKINGS TO MATCH EXISTING OR AS DIRECTED BY KENT COUNTY PUBLIC SCHOOLS.
PROVIDE 6" PVC (SCH-40) @ 1.0% FOR ROOF LEADER
INV. = 70.35
INV. = 70.00
PROVIDE 6" PVC (SDR-35) @ 1.0%
INV. = 65.66
INV. = 70.15
INV. = 70.42
INV. = 66.12
ALIGNMENT OF EXISTING 8" TERRA COTTA GRAVITY SEWER BASED ON LOCATION OF UPSTREAM AND DOWNSTREAM MANHOLES
ALIGNMENT OF EXISTING 8" TERRA COTTA GRAVITY SEWER BASED ON TOWN OF GALENA ABOVE GROUND UTILITY LOCATION
CONTRACTOR SHALL BORE A LARGER HOLE IN EXISTING MANHOLE AT THE EXISTING ORIFICE TO ACCEPT THE NEW 6" PVC SEWER LINE. INV. = 65.50
PROPOSED ADDITION F.F. ELEV. = 73.22
PROVIDE A CLEANOUT WITH CAST IRON FRAME AND COVER TO READ "SEWER". SEE DETAIL ON SHEET C-2.0.TYPICAL OF 2. SEE M.E.P. PLANS FOR EXACT LOCATION AND INVERT OF SEWER LINES FROM THE BUILDING ADDITION
DENOTES CONCRETE PAD OUTSIDE DOORS WITH CONCRETE FROST WALLS
EXISTING PLAYGROUND
EXISTING ELECTRIC TRANSFORMER
PROVIDE A TEMPORARY STABILIZED CONSTRUCTION ENTRANCE PER DETAIL ON SHEET C2.0 FOR ACCESS TO THE STAGING AREA. CONTRACTOR SHALL REMOVE AND STABILIZE WITH TOPSOIL, SEED AND MULCH AT THE COMPLETION OF THE PROJECT.
59.25'
PROPOSED 5'x5' LANDING
MAINTAIN EXISTING STEP
PROPOSED 5'x5' LANDING TO BE FLUSH WITH EXISTING PAVE
PROPOSED CONCRETE RAMP @ 12:1 max. WITH HANDRAIL
PROPOSED RAILING BOTH SIDES. SEE DETAIL ON SHEET C2.0.
EXISTING CONCRETE
EXISTING PAVEMENT
EXISTING CONCRETE DUMPSTER PAD
NOTE:
SAWCUT EXISTING PAVEMENT ADJACENT TO THE PROPOSED RAMP AND POUR THE NEW CONCRETE AGAINST THE PAVEMENT. SEAL THE JOINT.
EXISTING PAVEMENT
EXISTING GALENA ELEMENTARY SCHOOL F.F. ELEV. = 73.22
L.O.D. – DENOTES LIMITS OF DISTURBANCE
NOTE:
SEDIMENT AND EROSION CONTROL WILL BE STRICTLY ENFORCED.
NOTE:
FOLLOWING INITIAL DISTURBANCE, PERMANENT OR TEMPORARY, STABILIZATION SHALL BE COMPLETED WITHIN 3 CALENDAR DAYS ON ALL PERIMETER CONTROLS AND SLOPES GREATER THAN 4:1 AND 7 DAYS ON ALL OTHER DISTURBED AREAS ON THE SITE.
NOTE:
EXISTING PAVED ENTRANCE TO ACT AS A STABILIZED CONSTRUCTION ENTRANCE
GRAPHIC SCALE
1 inch = 6 ft.
KENT SOIL AND WATER CONSERVATION DISTRICT
DATE

SEAL:
PROFESSIONAL CERTIFICATION:
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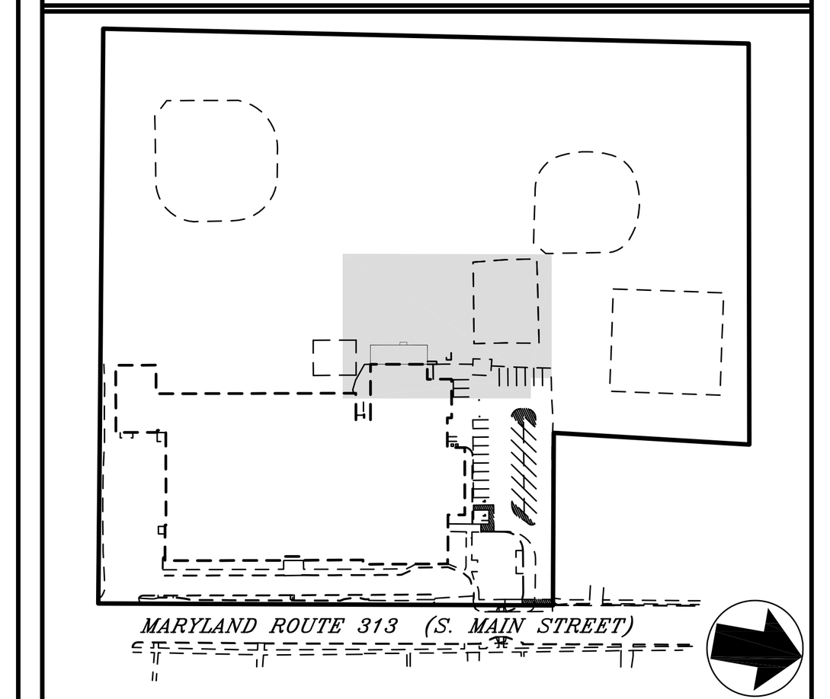
FEBRUARY 10, 2020

DATE SEAL

KEY PLAN



REVISIONS

01	MM-DD-YR	NAME	DESCRIPTION OF CHANGES

CRABTREE ROHRBAUGH & ASSOCIATES - ARCHITECTS
100 WEST ROAD, SUITE 402
TOWSON MD 21204
410-528-0272
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CHARLOTTESVILLE, VIRGINIA
WHITE SULPHUR SPRINGS, WEST VIRGINIA
www.cra-architects.com

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KENT COUNTY PUBLIC SCHOOLS
114 S MAIN STREET
GALENA, MD 21635

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ENGINEERING, DRAFTING/DESIGN, ENVIRONMENTAL SERVICES & SURVEYING
P.O. BOX 80
CENTREVILLE, MARYLAND 21617
PHONE : 1-443-262-9130
FAX : 1-443-262-9148

SITE, GRADING AND SEDIMENT & EROSION CONTROL PLAN

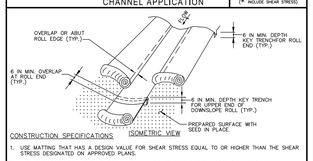
PLOT SCALE: 1" = 6'

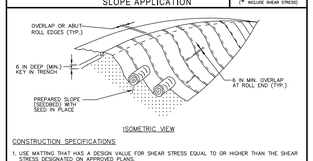
FILENAME:

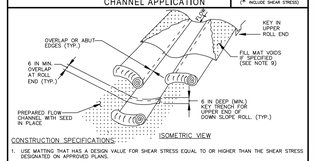
DATE: FEBRUARY 10, 2020

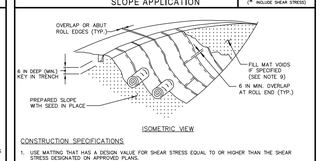
PROJECT
3309

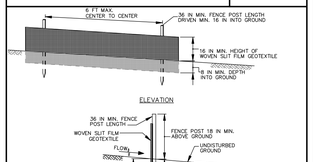
C1.2

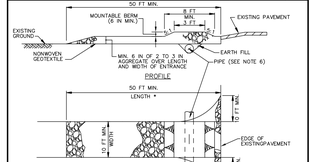


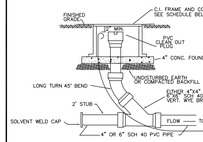


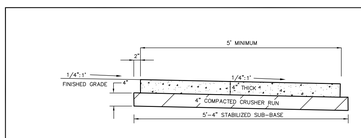


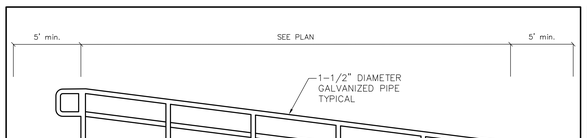


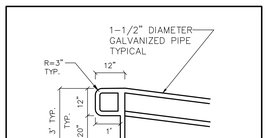












DETAIL B-4-6-A TEMPORARY SOIL STABILIZATION MATTING CHANNEL APPLICATION

STANDARD SYMBOL
TSSMC – * lb/ft²
(* INCLUDE SHEAR STRESS)

CONSTRUCTION SPECIFICATIONS

1. USE MATTING THAT HAS A DESIGN VALUE FOR SHEAR STRESS EQUAL TO OR HIGHER THAN THE SHEAR STRESS DESIGNATED ON APPROVED PLANS.
2. USE TEMPORARY SOIL STABILIZATION MATTING MADE OF DEGRADABLE (LASTS 6 MONTHS MINIMUM) NATURAL OR MAN–MADE FIBERS (MOSTLY ORGANIC). MAT MUST HAVE UNIFORM THICKNESS AND DISTRIBUTION OF FIBERS THROUGHOUT AND BE SMOLDER RESISTANT. CHEMICALS USED IN THE MAT MUST BE NON–LEACHING AND NON–TOXIC TO VEGETATION AND SEED GERMINATION AND NON–INJURIOUS TO THE SKIN. IF PRESENT, NETTING MUST BE EXTRUDED PLASTIC WITH A MAXIMUM MESH OPENING OF 2x2 INCHES AND SUFFICIENTLY BONDED OR SEWN ON 2 INCH CENTERS ALONG LONGITUDINAL AXIS OF THE MATERIAL TO PREVENT SEPARATION OF THE NET FROM THE PARENT MATERIAL.
3. SECURE MATTING USING STEEL STAPLES, WOOD STAKES, OR BIODEGRADABLE EQUIVALENT. STAPLES MUST BE "U" OR "T" SHAPED STEEL WIRE HAVING A MINIMUM GAUGE OF NO. 11 AND NO. 8 RESPECTIVELY. "U" SHAPED STAPLES MUST AVERAGE 1 TO 1½ INCHES WIDE AND BE A MINIMUM OF 6 INCHES LONG. "T" SHAPED STAPLES MUST HAVE A MINIMUM 8 INCH MAIN LEG, A MINIMUM 1 INCH SECONDARY LEG, AND A MINIMUM 4 INCH HEAD. WOOD STAKES MUST BE ROUGH–SAWN HARDWOOD, 12 TO 24 INCHES IN LENGTH, 1x3 INCH IN CROSS SECTION, AND WEDGE SHAPED AT THE BOTTOM.
4. PERFORM FINAL GRADING, TOPSOIL APPLICATION, SEEDBED PREPARATION, AND PERMANENT SEEDING IN ACCORDANCE WITH SPECIFICATIONS. PLACE MATTING WITHIN 48 HOURS OF COMPLETING SEEDING OPERATIONS UNLESS END OF WORKDAY STABILIZATION IS SPECIFIED ON THE APPROVED EROSION AND SEDIMENT CONTROL PLAN.
5. UNROLL MATTING IN DIRECTION OF WATER FLOW, CENTERING THE FIRST ROLL ON THE CHANNEL CENTERLINE. WORK FROM CENTER OF CHANNEL OUTWARD WHEN PLACING ROLLS. LAY MAT SMOOTHLY AND FIRMLY ON THE SEEDED SURFACE. AVOID STRETCHING THE MATTING.
6. KEY–IN UPSTREAM END OF EACH MAT ROLL BY DIGGING A 6 INCH (MINIMUM) TRENCH AT THE UPSTREAM END OF THE MATTING, PLACING THE ROLL END IN THE TRENCH, STAPLING THE MAT IN PLACE, REPLACING THE EXCAVATED MATERIAL, AND TAMPING TO SECURE THE MAT END.
7. OVERLAP OR ABUT THE ROLL EDGES PER MANUFACTURER RECOMMENDATIONS. OVERLAP ROLL ENDS BY 6 INCHES (MINIMUM), WITH THE UPSTREAM MAT OVERLAPPING ON TOP OF THE NEXT DOWNSTREAM MAT.
8. STAPLE/STAKE MAT IN A STAGGERED PATTERN ON 4 FOOT (MAXIMUM) CENTERS THROUGHOUT AND 2 FOOT (MAXIMUM) CENTERS ALONG SEAMS, JOINTS, AND ROLL ENDS.
9. ESTABLISH AND MAINTAIN VEGETATION SO THAT REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT ARE CONTINUOUSLY MET IN ACCORDANCE WITH SECTION B–4 VEGETATIVE STABILIZATION.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL B-4-6-B TEMPORARY SOIL STABILIZATION MATTING SLOPE APPLICATION

STANDARD SYMBOL
TSSMS – * lb/ft²
(* INCLUDE SHEAR STRESS)

CONSTRUCTION SPECIFICATIONS

1. USE MATTING THAT HAS A DESIGN VALUE FOR SHEAR STRESS EQUAL TO OR HIGHER THAN THE SHEAR STRESS DESIGNATED ON APPROVED PLANS.
2. USE TEMPORARY SOIL STABILIZATION MATTING MADE OF DEGRADABLE (LASTS 6 MONTHS MINIMUM) NATURAL OR MAN–MADE FIBERS (MOSTLY ORGANIC). MAT MUST HAVE UNIFORM THICKNESS AND DISTRIBUTION OF FIBERS THROUGHOUT AND BE SMOLDER RESISTANT. CHEMICALS USED IN THE MAT MUST BE NON–LEACHING AND NON–TOXIC TO VEGETATION AND SEED GERMINATION AND NON–INJURIOUS TO THE SKIN. IF PRESENT, NETTING MUST BE EXTRUDED PLASTIC WITH A MAXIMUM MESH OPENING OF 2x2 INCHES AND SUFFICIENTLY BONDED OR SEWN ON 2 INCH CENTERS ALONG LONGITUDINAL AXIS OF THE MATERIAL TO PREVENT SEPARATION OF THE NET FROM THE PARENT MATERIAL.
3. SECURE MATTING USING STEEL STAPLES, WOOD STAKES, OR BIODEGRADABLE EQUIVALENT. STAPLES MUST BE "U" OR "T" SHAPED STEEL WIRE HAVING A MINIMUM GAUGE OF NO. 11 AND NO. 8 RESPECTIVELY. "U" SHAPED STAPLES MUST AVERAGE 1 TO 1½ INCHES WIDE AND BE A MINIMUM OF 6 INCHES LONG. "T" SHAPED STAPLES MUST HAVE A MINIMUM 8 INCH MAIN LEG, A MINIMUM 1 INCH SECONDARY LEG, AND A MINIMUM 4 INCH HEAD. WOOD STAKES MUST BE ROUGH–SAWN HARDWOOD, 12 TO 24 INCHES IN LENGTH, 1x3 INCH IN CROSS SECTION, AND WEDGE SHAPED AT THE BOTTOM.
4. PERFORM FINAL GRADING, TOPSOIL APPLICATION, SEEDBED PREPARATION, AND PERMANENT SEEDING IN ACCORDANCE WITH SPECIFICATIONS. PLACE MATTING WITHIN 48 HOURS OF COMPLETING SEEDING OPERATIONS UNLESS END OF WORKDAY STABILIZATION IS SPECIFIED ON THE APPROVED EROSION & SEDIMENT CONTROL PLAN.
5. UNROLL MATTING DOWNSLOPE. LAY MAT SMOOTHLY AND FIRMLY UPON THE SEEDED SURFACE. AVOID STRETCHING THE MATTING.
6. OVERLAP OR ABUT ROLL EDGES PER MANUFACTURER RECOMMENDATIONS. OVERLAP ROLL ENDS BY 6 INCHES (MINIMUM), WITH THE UPSLOPE MAT OVERLAPPING ON TOP OF THE DOWNSLOPE MAT.
7. KEY IN THE UPSLOPE END OF MAT 6 INCHES (MINIMUM) BY DIGGING A TRENCH, PLACING THE MATTING ROLL END IN THE TRENCH, STAPLING THE MAT IN PLACE, REPLACING THE EXCAVATED MATERIAL, AND TAMPING TO SECURE THE MAT END IN THE KEY.
8. STAPLE/STAKE MAT IN A STAGGERED PATTERN ON 4 FOOT (MAXIMUM) CENTERS THROUGHOUT AND 2 FOOT (MAXIMUM) CENTERS ALONG SEAMS, JOINTS, AND ROLL ENDS.
9. ESTABLISH AND MAINTAIN VEGETATION SO THAT REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT ARE CONTINUOUSLY MET IN ACCORDANCE WITH SECTION B–4 VEGETATIVE STABILIZATION.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL B-4-6-C PERMANENT SOIL STABILIZATION MATTING CHANNEL APPLICATION

STANDARD SYMBOL
PSSMC – * lb/ft²
(* INCLUDE SHEAR STRESS)

CONSTRUCTION SPECIFICATIONS

1. USE MATTING THAT HAS A DESIGN VALUE FOR SHEAR STRESS EQUAL TO OR HIGHER THAN THE SHEAR STRESS DESIGNATED ON APPROVED PLANS.
2. USE PERMANENT SOIL STABILIZATION MATTING MADE OF OPEN WEAVE SYNTHETIC, NON–DEGRADABLE FIBERS OR ELEMENTS OF UNIFORM THICKNESS AND DISTRIBUTION THROUGHOUT. CHEMICALS USED IN THE MAT MUST BE NON–LEACHING AND NON–TOXIC TO VEGETATION AND SEED GERMINATION AND NON–INJURIOUS TO THE SKIN. IF PRESENT, NETTING MUST BE EXTRUDED PLASTIC WITH A MAXIMUM MESH OPENING OF 2x2 INCHES AND SUFFICIENTLY BONDED OR SEWN ON 2 INCH CENTERS ALONG LONGITUDINAL AXIS OF THE MATERIAL TO PREVENT SEPARATION OF THE NET FROM THE PARENT MATERIAL.
3. SECURE MATTING USING STEEL STAPLES OR WOOD STAKES. STAPLES MUST BE "U" OR "T" SHAPED STEEL WIRE HAVING A MINIMUM GAUGE OF NO. 11 AND NO. 8 RESPECTIVELY. "U" SHAPED STAPLES MUST AVERAGE 1 TO 1 ½ INCHES WIDE AND BE A MINIMUM OF 6 INCHES LONG. "T" SHAPED STAPLES MUST HAVE A MINIMUM 8 INCH MAIN LEG, A MINIMUM 1 INCH SECONDARY LEG, AND A MINIMUM 4 INCH HEAD. WOOD STAKES MUST BE ROUGH–SAWN HARDWOOD, 12 TO 24 INCHES IN LENGTH, 1x3 INCH IN CROSS SECTION, AND WEDGE SHAPE AT THE BOTTOM.
4. PERFORM FINAL GRADING, TOPSOIL APPLICATION, SEEDBED PREPARATION, AND PERMANENT SEEDING IN ACCORDANCE WITH SPECIFICATIONS. PLACE MATTING WITHIN 48 HOURS OF COMPLETING SEEDING OPERATIONS, UNLESS END OF WORKDAY STABILIZATION IS SPECIFIED ON THE APPROVED EROSION AND SEDIMENT CONTROL PLAN.
5. UNROLL MATTING IN DIRECTION OF WATER FLOW, CENTERING THE FIRST ROLL ON THE CHANNEL CENTER LINE. WORK FROM CENTER OF CHANNEL OUTWARD WHEN PLACING ROLLS. LAY MATTING SMOOTHLY AND FIRMLY UPON THE SEEDED SURFACE. AVOID STRETCHING THE MATTING.
6. OVERLAP OR ABUT EDGES OF MATTING ROLLS PER MANUFACTURER RECOMMENDATIONS. OVERLAP ROLL ENDS BY 6 INCHES (MINIMUM), WITH THE UPSTREAM MAT OVERLAPPING ON TOP OF THE NEXT DOWNSTREAM MAT.
7. KEY IN THE TOP OF SLOPE END OF MAT 6 INCHES (MINIMUM) BY DIGGING A TRENCH, PLACING THE MATTING ROLL END IN THE TRENCH, STAPLING THE MAT IN PLACE, REPLACING THE EXCAVATED MATERIAL, AND TAMPING TO SECURE THE MAT END IN THE KEY.
8. STAPLE/STAKE MAT IN A STAGGERED PATTERN ON 4 FOOT (MAXIMUM) CENTERS THROUGHOUT AND 2 FOOT (MAXIMUM) CENTERS ALONG SEAMS, JOINTS, AND ROLL ENDS.
9. IF SPECIFIED BY THE DESIGNER OR MANUFACTURER AND DEPENDING ON THE TYPE OF MAT BEING INSTALLED, ONCE THE MATTING IS KEYED AND STAPLED IN PLACE, FILL THE MAT VOIDS WITH TOP SOIL OR GRANULAR MATERIAL AND LIGHTLY COMPACT OR ROLL TO MAXIMIZE SOIL/MAT CONTACT WITHOUT CRUSHING MAT.
10. ESTABLISH AND MAINTAIN VEGETATION SO THAT REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT ARE CONTINUOUSLY MET IN ACCORDANCE WITH SECTION B–4 VEGETATIVE STABILIZATION.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL B-4-6-D PERMANENT SOIL STABILIZATION MATTING SLOPE APPLICATION

STANDARD SYMBOL
PSSMS – * lb/ft²
(* INCLUDE SHEAR STRESS)

CONSTRUCTION SPECIFICATIONS

1. USE MATTING THAT HAS A DESIGN VALUE FOR SHEAR STRESS EQUAL TO OR HIGHER THAN THE SHEAR STRESS DESIGNATED ON APPROVED PLANS.
2. USE PERMANENT SOIL STABILIZATION MATTING MADE OF OPEN WEAVE SYNTHETIC, NON–DEGRADABLE FIBERS OR ELEMENTS OF UNIFORM THICKNESS AND DISTRIBUTION THROUGHOUT. CHEMICALS USED IN THE MAT MUST BE NON–LEACHING AND NON–TOXIC TO VEGETATION AND SEED GERMINATION AND NON–INJURIOUS TO THE SKIN. IF PRESENT, NETTING MUST BE EXTRUDED PLASTIC WITH A MAXIMUM MESH OPENING OF 2x2 INCHES AND SUFFICIENTLY BONDED OR SEWN ON 2 INCH CENTERS ALONG LONGITUDINAL AXIS OF THE MATERIAL TO PREVENT SEPARATION OF THE NET FROM THE PARENT MATERIAL.
3. SECURE MATTING USING STEEL STAPLES OR WOOD STAKES. STAPLES MUST BE "U" OR "T" SHAPED STEEL WIRE HAVING A MINIMUM GAUGE OF NO. 11 AND NO. 8 RESPECTIVELY. "U" SHAPED STAPLES MUST AVERAGE 1 TO 1½ INCHES WIDE AND BE A MINIMUM OF 6 INCHES LONG. "T" SHAPED STAPLES MUST HAVE A MINIMUM 8 INCH MAIN LEG, A MINIMUM 1 INCH SECONDARY LEG, AND MINIMUM 4 INCH HEAD. WOOD STAKES MUST BE ROUGH–SAWN HARDWOOD, 12 TO 24 INCHES IN LENGTH, 1x3 INCH IN CROSS SECTION, AND WEDGE SHAPE AT THE BOTTOM.
4. PERFORM FINAL GRADING, TOPSOIL APPLICATION, SEEDBED PREPARATION, AND PERMANENT SEEDING IN ACCORDANCE WITH SPECIFICATIONS. PLACE MATTING WITHIN 48 HOURS OF COMPLETING SEEDING OPERATIONS, UNLESS END OF WORKDAY STABILIZATION IS SPECIFIED ON THE APPROVED EROSION AND SEDIMENT CONTROL PLAN.
5. UNROLL MATTING DOWN SLOPE. LAY MATTING SMOOTHLY AND FIRMLY UPON THE SEEDED SURFACE. AVOID STRETCHING THE MATTING.
6. OVERLAP OR ABUT EDGES OF MATTING ROLLS PER MANUFACTURER RECOMMENDATIONS. OVERLAP ROLL ENDS BY 6 INCHES (MINIMUM), WITH THE UPSLOPE MAT OVERLAPPING ON TOP OF THE DOWNSLOPE MAT.
7. KEY IN THE TOP OF SLOPE END OF MAT 6 INCHES (MINIMUM) BY DIGGING A TRENCH, PLACING THE MATTING ROLL END IN THE TRENCH, STAPLING THE MAT IN PLACE, REPLACING THE EXCAVATED MATERIAL, AND TAMPING TO SECURE THE MAT END IN THE KEY.
8. STAPLE/STAKE MAT IN A STAGGERED PATTERN ON 4 FOOT (MAXIMUM) CENTERS THROUGHOUT AND 2 FOOT (MAXIMUM) CENTERS ALONG SEAMS, JOINTS, AND ROLL ENDS.
9. IF SPECIFIED BY THE DESIGNER OR MANUFACTURER AND DEPENDING ON THE TYPE OF MAT BEING INSTALLED, ONCE THE MATTING IS KEYED AND STAPLED IN PLACE, FILL THE MAT VOIDS WITH TOP SOIL OR GRANULAR MATERIAL AND LIGHTLY COMPACT OR ROLL TO MAXIMIZE SOIL/MAT CONTACT WITHOUT CRUSHING MAT.
10. ESTABLISH AND MAINTAIN VEGETATION SO THAT REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT ARE CONTINUOUSLY MET IN ACCORDANCE WITH SECTION B–4 VEGETATIVE STABILIZATION.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-1 SILT FENCE

STANDARD SYMBOL
├——SF——┤

1 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-1 SILT FENCE

STANDARD SYMBOL
├——SF——┤

CONSTRUCTION SPECIFICATIONS

1. USE WOOD POSTS 1¾ X 1¾ ± 1⁄16 INCH (MINIMUM) SQUARE CUT OF SOUND QUALITY HARDWOOD. AS AN ALTERNATIVE TO WOODEN POST USE STANDARD "T" OR "U" SECTION STEEL POSTS WEIGHING NOT LESS THAN 1 POUND PER LINEAR FOOT.
2. USE 36 INCH MINIMUM POSTS DRIVEN 16 INCH MINIMUM INTO GROUND NO MORE THAN 6 FEET APART.
3. USE WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H–1 MATERIALS AND FASTEN GEOTEXTILE SECURELY TO UPSLOPE SIDE OF FENCE POSTS WITH WIRE TIES OR STAPLES AT TOP AND MID–SECTION.
4. PROVIDE MANUFACTURER CERTIFICATION TO THE AUTHORIZED REPRESENTATIVE OF THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT THE GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H–1 MATERIALS.
5. EMBED GEOTEXTILE A MINIMUM OF 8 INCHES VERTICALLY INTO THE GROUND. BACKFILL AND COMPACT THE SOIL ON BOTH SIDES OF FABRIC.
6. WHERE TWO SECTIONS OF GEOTEXTILE ADJOIN: OVERLAP, TWIST, AND STAPLE TO POST IN ACCORDANCE WITH THIS DETAIL.
7. EXTEND BOTH ENDS OF THE SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SILT FENCE.
8. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN SILT FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL FENCE.

2 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL B-1 STABILIZED CONSTRUCTION ENTRANCE

STANDARD SYMBOL
SCE

CONSTRUCTION SPECIFICATIONS

1. PLACE STABILIZED CONSTRUCTION ENTRANCE IN ACCORDANCE WITH THE APPROVED PLAN. VEHICLES MUST TRAVEL OVER THE ENTIRE LENGTH OF THE SCE. USE MINIMUM LENGTH OF 50 FEET (*30 FEET FOR SINGLE RESIDENCE LOT). USE MINIMUM WIDTH OF 10 FEET. FLARE SCE 10 FEET MINIMUM AT THE EXISTING ROAD TO PROVIDE A TURNING RADIUS.
2. PIPE ALL SURFACE WATER FLOWING TO OR DIVERTED TOWARD THE SCE UNDER THE ENTRANCE, MAINTAINING POSITIVE DRAINAGE. PROTECT PIPE INSTALLED THROUGH THE SCE WITH A MOUNTABLE BERM WITH 5:1 SLOPES AND A MINIMUM OF 12 INCHES OF STONE OVER THE PIPE. PROVIDE PIPE AS SPECIFIED ON APPROVED PLAN. WHEN THE SCE IS LOCATED AT A HIGH SPOT AND HAS NO DRAINAGE TO CONVEY, A PIPE IS NOT NECESSARY. A MOUNTABLE BERM IS REQUIRED WHEN SCE IS NOT LOCATED AT A HIGH SPOT.
3. PREPARE SUBGRADE AND PLACE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H–1 MATERIALS.
4. PLACE CRUSHED AGGREGATE (2 TO 3 INCHES IN SIZE) OR EQUIVALENT RECYCLED CONCRETE (WITHOUT REBAR) AT LEAST 6 INCHES DEEP OVER THE LENGTH AND WIDTH OF THE SCE.
5. MAINTAIN ENTRANCE IN A CONDITION THAT MINIMIZES TRACKING OF SEDIMENT. ADD STONE OR MAKE OTHER REPAIRS AS CONDITIONS DEMAND TO MAINTAIN CLEAN SURFACE, MOUNTABLE BERM, AND SPECIFIED DIMENSIONS. IMMEDIATELY REMOVE STONE AND/OR SEDIMENT SPILLED, DROPPED, OR TRACKED ONTO ADJACENT ROADWAY BY VACUUMING, SCRAPING, AND/OR SWEEPING. WASHING ROADWAY TO REMOVE MUD TRACKED ONTO PAVEMENT IS NOT ACCEPTABLE UNLESS WASH WATER IS DIRECTED TO AN APPROVED SEDIMENT CONTROL PRACTICE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

Right of Way and Traffic Bearing Areas

FRAME AND COVER REQUIRED	
PIPE SIZE	CASTING #
4"	BC UTILITIES A-1100-N
6"	BC UTILITIES B-1160
8"	BC UTILITIES B-1181

Notes:
1. Right of Way clean outs are also necessary at the edge of any easements.
2. Traffic Bearing Areas are defined as being in, or within 3 feet of, any paving, driveways, or any other area where vehicular traffic is likely.
3. Tracer wire to be uncoated copper.

	DATE	REVISION	
	SCALE NTS		Gravity Sewer Cleanouts
	DRAWN BY		
	APPROVED BY		
	FILE dt-gs-co		

NOTES:

1. CONCRETE SHALL BE SHA MIX NO. 2, 3,000 PSI – 28 DAY COMPRESSIVE STRENGTH.
2. STABILIZED SUB–BASE SHALL BE 4 INCHES MINIMUM COMPACTED BANK RUN GRAVEL (OR APPROVED EQUAL) PLACED AND COMPACTED ON APPROVED SUBGRADE TO 95% OF THE MODIFIED PROCTOR DENSITY FOR THE MATERIAL
3. ALL AREAS WITHIN THE RIGHT–OF–WAY AND EASEMENTS SHALL BE GRADED TO PROVIDE POSITIVE DRAINAGE TO ROADWAY DRAINAGE SYSTEMS AND STABILIZED WITH A MINIMUM OF 4 INCHES OF TOPSOIL, SEEDED AND MULCHED PER NRCS SPECIFICATIONS.
4. SIDEWALKS TO BE MAINTAINED BY PROPERTY OWNER.
5. ALL METHODS OF CONSTRUCTION SHALL BE IN COMPLIANCE WITH THE TOWN OF CHESTERTOWN STANDARDS. ALL MATERIAL SPECIFICATIONS SHALL COMPLY WITH THE 2001 EDITION OF THE MARYLAND STATE HIGHWAY ADMINISTRATION'S "STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS" MANUAL AND ANY ADDENDUM THERETO.

	SCALE: NO SCALE	
	REVISIONS:	**SIDEWALK**
		STANDARD NO. RD–104.01

RAMP AND HANDRAIL SECTION
NOT TO SCALE

RAMP AND HANDRAIL SECTION
NOT TO SCALE

GENERAL NOTES

1. NOTIFICATION OF MARYLAND DEPARTMENT OF ENVIRONMENT INSPECTOR AT 410–901–4020 AT LEAST FIVE (5) DAYS PRIOR TO THE START OF WORK.
2. PRIOR TO THE START OF WORK, THE CONTRACTOR IS TO OBTAIN MDE APPROVAL OF ANY PROPOSED CHANGES AND SEQUENCE OF CONSTRUCTION, SPECIFICALLY RELATING TO INSTALLATION, INSPECTION, MAINTENANCE AND R1 REMOVAL OF EROSION AND SEDIMENT CONTROL MEASURES.
3. SEDIMENT CONTROL MEASURES ARE NOT TO BE REMOVED UNTIL THE AREAS SERVED HAVE ESTABLISHED VEGETATIVE COVER OR WITH THE PERMISSION OF THE MDE SEDIMENT CONTROL INSPECTOR.
4. WHEN PUMPING SEDIMENT–LADEN WATER, THE DISCHARGE MUST BE DIRECTED TO APPROVED SEDIMENT TRAPPING MEASURES PRIOR TO RELEASE FROM THE SITE.
5. ALL TEMPORARY STOCKPILES ARE TO BE LOCATED WITHIN AREAS PROTECTED BY SEDIMENT CONTROL MEASURES AND ARE TO BE TEMPORARILY STABILIZED.
6. ALL SEDIMENT CONTROL DIKES, SWALES, BASINS AND FLOW LINES TO BASINS WILL BE TEMPORARILY SEEDED IMMEDIATELY UPON INSTALLATION TO REDUCE THE CONTRIBUTION TO SEDIMENT LOADING.
7. DISPOSAL OF EXCESS EARTH MATERIALS ON STATE OR FEDERAL PROPERTY REQUIRES MDE APPROVAL, OTHERWISE MATERIALS ARE TO BE DISPOSED OF AT A LOCATION APPROVED BY THE LOCAL AUTHORITY.
8. TEMPORARY SOIL EROSION CONTROL AND SEDIMENT CONTROL MEASURES ARE TO BE PROVIDED AS PER THE APPROVED PLAN PRIOR TO GRADING OPERATION. LOCATION ADJUSTMENTS ARE TO BE MADE IN THE FIELD AS NECESSARY. THE MINIMUM AREA PRACTICAL SHALL BE DISTURBED FOR THE MINIMUM POSSIBLE TIME.
9. IF GRADING IS COMPLETED OUT OF SEEDING SEASON, GRADED AREAS ARE TO BE TEMPORARILY STABILIZED BY MULCH AND MULCH ANCHORING. MULCH MATERIAL SHALL BE UN–WEATHERED, UN–CHOPPED SMALL GRAIN STRAW SPREAD AT THE RATE OF 1–1/2 TO 2 TONS PER ACRE. MULCH ANCHORING TO BE ACCOMPLISHED BY AN APPROVED METHOD, USE OF A MULCH ANCHORING TOOL IS RECOMMENDED WHERE POSSIBLE.
10. IMPLEMENTATION OF THE SEDIMENT CONTROL PLAN SHALL BE IN ACCORDANCE WITH THE "2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL" OF THE DEPARTMENT OF THE ENVIRONMENT.
11. THE CONTRACTOR IS RESPONSIBLE FOR IMPLEMENTATION AND MAINTENANCE OF THE APPROVED PLAN AND ALL OTHER MEASURES NECESSARY TO CONTROL, FILTER OR PREVENT SEDIMENT FROM LEAVING THE SITE.
12. IN CASES WHERE STORMWATER MANAGEMENT STRUCTURES ARE A PART OF SITE DEVELOPMENT, REMOVAL OF SEDIMENT CONTROL MAY NOT BE ACCOMPLISHED BEFORE THE CONTRIBUTING AREA TO THE STORMWATER MANAGEMENT STRUCTURE IS STABILIZED.
13. ON SITES WHERE INFILTRATION TECHNIQUES ARE UTILIZED FOR THE CONTROL OF STORMWATER, EXTREME CARE MUST BE TAKEN TO PREVENT ALL RUNOFF FROM ENTERING THE STRUCTURE DURING CONSTRUCTION.
14. SEDIMENT CONTROL FOR UTILITY CONSTRUCTION IN AREAS OUTSIDE OF DESIGNED CONTROL:
    A. EXCAVATED TRENCH MATERIAL SHALL BE PLACED ON THE HIGH SIDE OF THE TRENCH.
    B. IMMEDIATELY FOLLOWING PIPE INSTALLATION, THE TRENCH SHALL BE BACKFILLED, COMPACTED AND STABILIZED AT THE END OF EACH WORKING DAY.
    C. TEMPORARY SILT FENCE OR STRAW BALE DIKES SHALL BE PLACED IMMEDIATELY DOWNSTREAM OF ANY DISTURBED AREA INTENDED TO REMAIN DISTURBED LONGER THAN ON WORKING DAY.
15. ALL POINTS OF CONSTRUCTION INGRESS AND EGRESS SHALL BE PROTECTED TO PREVENT TRACKING OF MUD ONTO PUBLIC WAYS.
16. SITE INFORMATION:

TOTAL SITE AREA	8.37 ACRES
AREA DISTURBED	0.36 ACRES
TOTAL CUT	0,000 cu. yds
TOTAL FILL	100 cu yds

PHASE OF CONSTRUCTION

1. CONTACT THE KENT COUNTY SEDIMENT AND EROSION CONTROL INSPECTOR AT 410–778–7437 A MINIMUM OF 2 WEEKS PRIOR TO THE START OF CONSTRUCTION TO SCHEDULE A PRE–CONSTRUCTION MEETING PRIOR TO INITIATION OF ANY GRADING ACTIVITY.
2. INSTALL PERIMETER SILT FENCE AND TEMPORARY STABILIZED CONSTRUCTION ENTRANCE AT LOCATIONS SHOWN.
3. REMOVE THE CONCRETE WALK, PAD AND PAVERS AS SHOWN. STRIP THE TOPSOIL FROM THE LIMITS OF THE BUILDING ADDITION AND DISPOSED OF OFFSITE AT AN APPROVED OFFSITE LOCATION.
4. BEGIN BUILDING ADDITION CONSTRUCTION.
5. MAINTAIN PERIMETER CONTROLS.
6. INSTALL UNDERGROUND UTILITIES (STORM AND SANITARY SEWER).
7. GRADE SWALE TO EXISTING STORWMWATER MANAGEMENT AREA. STABILIZE WITH TOPSOIL, SEED, AND STABILIZATION MATTING.
8. REMOVE EXISTING STABILIZED CONSTRUCTION ENTRANCE AND STABILIZE AREA WITH TOPSOIL, SEED AND MULCH.
9. UPON APPROVAL FROM THE KENT COUNTY SEDIMENT CONTROL INSPECTOR, REMOVE ALL TEMPORARY SEDIMENT AND EROSION CONTROL DEVICES AND STABILIZE ALL DISTURBED AREAS PER PERMANENT STABILIZATION SPECIFICATIONS FOUND ON THIS SHEET.

TOTAL AREA TO BE DISTURBED = 0.36 ac.± (15,724 sq. ft.±)
TOTAL AREA TO BE SEEDED = 0.18 ac.± (7,988 sq. ft.±

INSPECTION CHECKLIST

THE CONTRACTOR SHALL NOTIFY THE KENT COUNTY SEDIMENT AND EROSION CONTROL INSPECTOR AT (778–7437) AT THE FOLLOWING POINTS:

1. THE REQUIRED PRECONSTRUCTION MEETING.
2. FOLLOWING INSTALLATION OF SEDIMENT CONTROL MEASURES.
3. PRIOR TO REMOVAL OR MODIFICATION OF ANY SEDIMENT CONTROL STRUCTURE.
4. PRIOR TO REMOVAL OF ALL SEDIMENT AND EROSION CONTROL DEVICES.
5. PRIOR TO FINAL ACCEPTANCE.

MAINTENANCE SCHEDULE

PREVENTATIVE MAINTENANCE SHALL BE ENSURED THROUGH INSPECTION OF ALL INFILTRATION SYSTEMS, RETENTION, OR DETENTION STRUCTURES BY THE KENT COUNTY INSPECTOR. THE INSPECTION SHALL OCCUR DURING THE FIRST YEAR OF OPERATION AND AT LEAST ONCE EVERY 2 YEARS THEREAFTER.

KENT SOIL AND WATER CONSERVATION DISTRICT ______ DATE

EROSION & SEDIMENT CONTROL STANDARDS AND SPECIFICATIONS FOR VEGETATIVE STABILIZATION

1.) Contractor shall install soil erosion and sediment control devices prior to any grading. Following initial disturbance or re–disturbance, permanent or temporary stabilization shall be completed within three (3) calendar days as to the surface of all perimeter controls, dikes, swales, ditches, perimeter slopes greater than three (3) horizontal to one (1) vertical (3:1) and seven days (7) as to all other disturbed or graded areas on the project site.

2.) All temporary erosion and sediment control devices are to be provided as indicated on this plan, with location adjustments to be made in the field as necessary, and to be maintained at the end of each working day until project completion. The minimum area practical shall be disturbed for the minimal amount of time possible.

3.) Clearing and grubbing shall include all trees, brush, debris, root mat and organic materials to be removed.

4.) Temporary seeding shall be accomplished between February 15th through April 30th, or August 15th through November 30th. During other times, temporary mulching shall be provided.

5.) Temporary seeding shall conform to the following applications: 436 lbs. per acre of 10–20–20; 4,000 lbs. per acre of ground limestone, to be incorporated into the soil by disking or other suitable means. Annual rye grass shall be applied at a rate of 50 lbs. per acre using suitable equipment. Mulching shall be accomplished immediately after seeding

Seed Mixture (For Hazard Zone 7a) (From Table B–1)					Fertilizer Rate (10–20–20)	Lime Rate
No.	Species	Appl. Rate (lbs./ac.)	Seeding Dates	Seeding Depths		
	ANNUAL RYE GRASS	50 lbs.	2/15–4/30 8/15–11/30	1/2"	436 lb/ac 10 lb/ 1000 sf	2 tons/ac 90 lb/ 1000 sf
	BARLEY OATS WHEAT CEREAL RYE	96 lbs. 72 lbs. 120 lbs. 112 lbs.	2/15–4/30, 8/15–11/30 2/15–4/30, 8/15–11/30 2/15–4/30, 8/15–11/30 2/15–4/30, 8/15–12/15	1" 1" 1" 1"		
	FOXTAIL MILLET PEARL MILLET	30 lbs. 20 lbs.	5/1–8/14 5/1–8/14	1/2"		

6.) Mulching shall be unchopped, unrotted, small grain straw applied at a rate of 2–2 1/2 tons per acre. Anchor mulch with a mulch anchoring tool on the contour. Wood cellulose fiber may be used for anchoring straw at 750 lbs. per acre mixed with water at a maximum of 50 lbs. of wood cellulose fiber per 100 gals of water, or with a synthetic liquid binder according to manufacture recommendations. Wood cellulose fiber used as mulch must be applied at a net dry weight of 1,500 lbs. per acre. Mix wood cellulose fiber with water to attain a mixture with a maximum of 50 lbs. of wood cellulose fiber per 100 gals. of water.

7.) Permanent seeding shall be accomplished between March 1st through May 15th, or August 15th through October 15th. Permanent seeding at other than specified times will be allowed only upon written approval. Permanent seeding shall conform to the following applications: Permanent seeding for sites having disturbed over five (5) acres shall use fertilizer rates recommended by a soil testing agency and the recommendations provided in the Permanent Seeding Summary Table. Permanent seeding for conditions other than listed above shall be performed at the rates and dates as provided in the Permanent Seeding Summary Table below. Fertilizer and lime amendments shall be incorporated into the top 3" – 5" of the soil be disking or other suitable means. Mulching shall be accomplished as discussed in Item #6 of these specifications.

Seed Mixture (For Hazard Zone 7a) (From Table B–3)					Fertilizer Rate (10–20–20)			Lime Rate
No.	Species	Appl. Rate (lbs./ac.)	Seeding Dates	Seeding Depths	N	P205	K20	
7	CREEPING RED FESCUE KENTUCKY BLUEGRASS	60 lbs 15 lbs.	3/1–5/15 8/15–10/15	1/4" to 1/2"	45 lb/ac 1 lb/ 1000 sf	90 lb/ac 2 lb/ 1000 sf	90 lb/ac 2 lb/ 1000 sf	2 tons/ac 90 lb/ 1000 sf
8	TALL FESCUE	100 lbs.	3/1–5/15 8/15–10/15	1/4" to 1/2"				
9	TALL FESCUE KENTUCKY BLUEGRASS PERENNIAL RYEGRASS	60 lbs 40 lbs. 20 lbs.	3/1–5/15 8/15–10/15	1/4" to 1/2"				

8.) Any spoil or borrow will be placed at a site approved by the Soil Conservation District.

9.) All areas remaining or intended to remain disturbed for longer than seven (7) days shall be stabilized in accordance with the USDA, Natural Resources Conservation Service Standards and Specifications for Soil Erosion and Sediment Control in developing areas for critical area stabilization.

10) It will be the responsibility of the Contractor or Subcontractor to notify the Engineer of any deviation from this plan. Any change made in this plan without written authorization from the Engineer will place responsibility of said change on the Contractor or the Subcontractor.

STORMWATER MANAGEMENT SUMMARY TABLE

REQUIREMENT	VOLUME REQ.	VOLUME PRO.	NOTES
ESDv	138 cubic ft.	114 cubic ft.*	ROOFTOP DISCONNECTION/ EXISTING BIORETENTION AREA
RECHARGE (Rev)	N/A	N/A	ESD TO THE MEP MET, THUS SITE IS CONSIDERED WOODS IN GOOD CONDITION
CHANNEL PROTECTION (Cpv)	N/A	N/A	ESD TO THE MEP MET, THUS SITE IS CONSIDERED WOODS IN GOOD CONDITION
EXTREME FLOOD (Qf)	N/A	N/A	ESD TO THE MEP MET, THUS SITE IS CONSIDERED WOODS IN GOOD CONDITION

* – ADDITIONAL TREATMENT VOLUME REALIZED BY DIVERTING RUNOFF INTO THE EXISTING BIORETENTION AREA.

SEAL:
PROFESSIONAL CERTIFICATION:
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE No. 200499 EXPIRATION DATE: 9–2–2021
KEVIN JAMES SHEARON No. 200499
FEBRUARY 10, 2020
DATE SEAL

KEY PLAN

REVISIONS

01	MM-DD-YR	NAME	DESCRIPTION OF CHANGES

CRABTREE ROHRBAUGH & ASSOCIATES - ARCHITECTS
100 WEST ROAD, SUITE 402
TOWSON MD 21204
410-528-0272
MECHANICSBURG, PENNSYLVANIA
CHARLOTTESVILLE, VIRGINIA
WHITE SULPHUR SPRINGS, WEST VIRGINIA
www.cra-architects.com

ADDITION AND RENOVATIONS OF GALENA ELEMENTARY SCHOOL
KENT COUNTY PUBLIC SCHOOLS
114 S MAIN STREET
GALENA, MD 21635

CR

DAVIS, MOORE, SHEARON & ASSOCIATES, LLC
ENGINEERING, DRAFTING/DESIGN, ENVIRONMENTAL SERVICES & SURVEYING
P.O. BOX 80
CENTREVILLE, MARYLAND 21617
PHONE : 1–443–262–9130
FAX : 1–443–262–9148

MISCELLANEOUS DETAILS

PLOT SCALE:
AS SHOWN

FILENAME:

DATE:
FEBRUARY 10, 2020

PROJECT
3309

C2.0

BUILDING ADDITION & RENOVATION:

BUILDING CONSTRUCTION CLASSIFICATION(S):
- IBC: TYPE II B
- NFPA: TYPE II (000)

OCCUPANCY CLASSIFICATION(S):
- IBC: GROUP E
- NFPA: NEW EDUCATIONAL OCCUPANCY

BUILDING AREA - EXISTING: 56,307 SQUARE FEET
ALLOWABLE BUILDING AREA – GROUP E / TYPE IIB CONSTRUCTION:
- IBC TABLE(S) 506.2: S1 = 58,000 SQUARE FEET
- FRONTAGE INCREASE: NOT NEEDED
- ALLOWABLE: 58,000 SQUARE FEET (WITHOUT FRONTAGE INCREASE)

PROPOSED BUILDING AREA: 57,362 SQUARE FEET
ALLOWABLE BUILDING HEIGHT – GROUP E / TYPE IIB CONSTRUCTION:
- TABLE(S) 504.3 & 504.4: S = 75 FEET AND 3 STORIES
- PROPOSED BUILDING HEIGHT: < 50 FEET AND 1 STORY

PROPOSED WORK AREAS:
- ADDITION: 1,183 SQUARE FEET
- ALTERATION LEVEL 1: 6,060 SQUARE FEET
- ALTERATION LEVEL 2: 8,273 SQUARE FEET

MAXIMUM ALLOWABLE FIRE AREA WITHOUT AUTOMATIC SPRINKLERS: 12,000 SQUARE FEET
PROPOSED FIRE AREA WITHOUT AUTOMATIC SPRINKLERS: 0 SQUARE FEET

OCCUPANT LOADS:	IBC TABLE 1004.5:	LSC TABLE 7.3.1.2:
CAFETERIA ADDITION:	79	79
MEDIA CENTER:	48	48
GUIDANCE OFFICE:	4	4
TITLE ONE OFFICE:	4	4
LANGUAGE SUPPORT:	42	42
SENSORY ROOM:	1	1
CALMING ROOM:	1	1
KITCHEN:	4	8
KITCHEN OFFICE:	1	1
TOTALS:	184	188

ACCESSIBLE ENTRANCE(S):	REQUIRED:	PROVIDED:
CAFETERIA ADDITION:	1	2
ALTERATIONS:	1	1

ACCESSIBLE MEANS OF EGRESS:	REQUIRED:	PROVIDED:
CAFETERIA ADDITION:	2	2
ALTERATIONS:	0	1

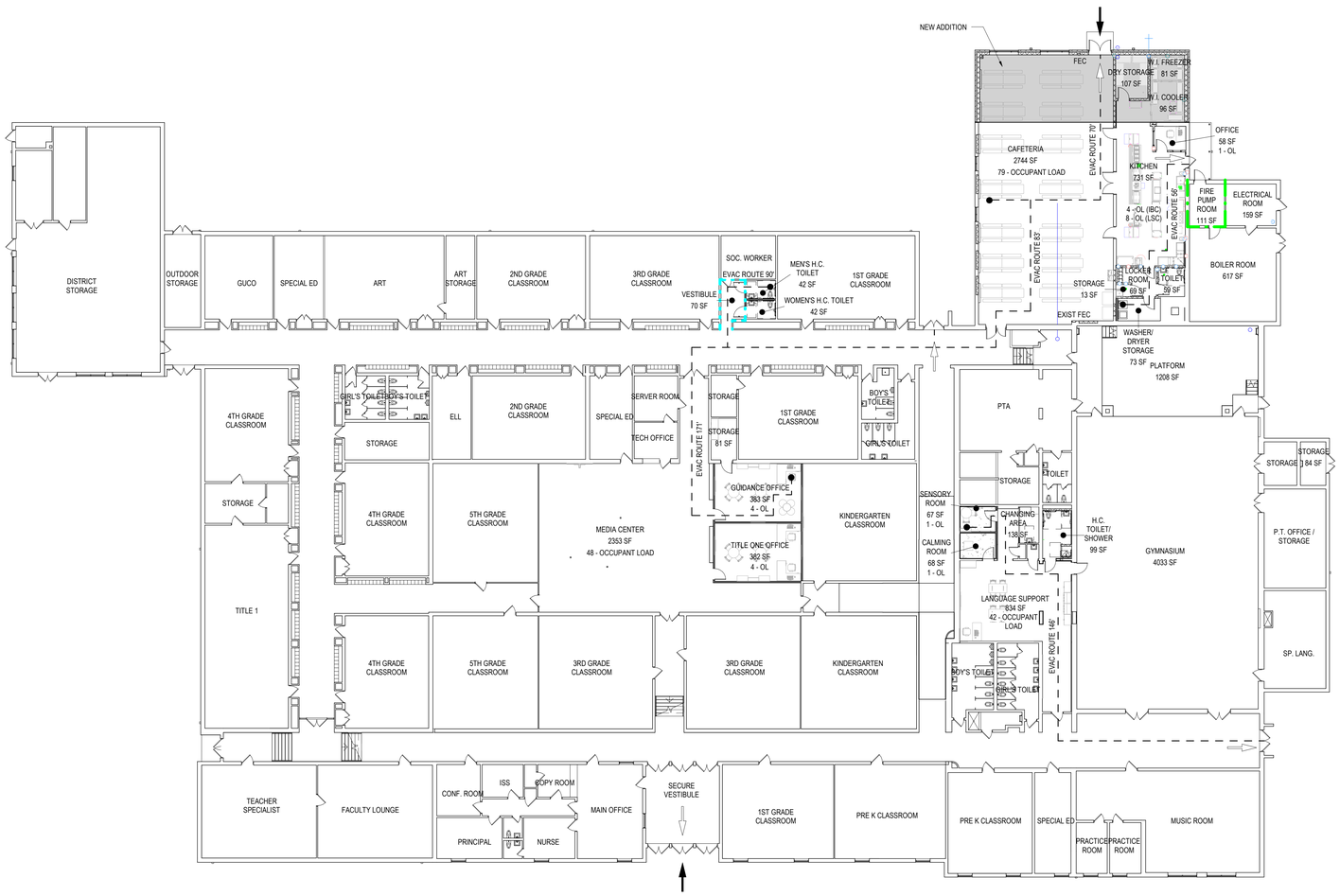
TYPICAL BUILDING CONSTRUCTION – TYPE II B / TYPE II (000):
- EXTERIOR WALLS: FIRE SEPARATION LESS THAN 10 FEET = 1-HOUR RATED; FIRE SEPARATION AT LEAST 10 FEET = 0-HOUR RATED
- FLOOR / CEILINGS: 0-HOUR RATED CONSTRUCTION
- ROOF / CEILING: 0-HOUR RATED CONSTRUCTION
- FIRE WALL: 2-HOUR RATED CONSTRUCTION

OTHER TYPICAL CONSTRUCTION:
- 1-HOUR RATED FIRE BARRIERS: FIRE PUMP ROOM
- 1-HOUR RATED FIRE PARTITIONS: N/A

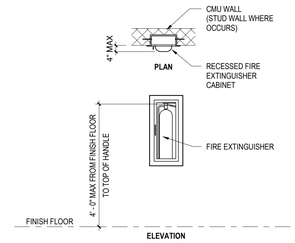
NFPA SMOKE BARRIERS:
- CORRIDORS
- BOILER ROOM
- CUSTODIAL ROOMS
- TOILET ROOMS OPEN TO CORRIDOR

FIRE PROTECTION SYSTEMS:
- AUTOMATIC SPRINKLERS: THROUGHOUT - PER NFPA-13
- STANDPIPE SYSTEM(S): N/A
- EMERGENCY VENTILATION: N/A
- FIRE ALARM SYSTEM: PER NFPA-72 – MANUAL ALARM
- FIRE EXTINGUISHERS: PER INTERNATIONAL FIRE CODE & NFPA-10

MAXIMUM TRAVEL DISTANCES TO EXTINGUISHERS (WHERE EXTINGUISHERS ARE NEEDED):
- CLASS 'A' HAZARDS: 75 FEET
- CLASS 'B' HAZARDS: 30 OR 50 FEET
- TYPE 'K': 30 FEET TO COOKING EQUIPMENT



1 CC.1 CODE COMPLIANCE PLAN
1/16" = 1'-0"



FEC
SEMI-RECESSED FIRE EXTINGUISHER WITH CABINET

FIRE EXTINGUISHER DETAILS
SCALE: 1/2" = 1'-0"

CODE COMPLIANCE LEGEND
- SMOKE PARTITIONS
- 1 HOUR RATED FIRE BARRIER
- 2 HOUR RATED FIRE BARRIER
- 2 HOUR RATED FIRE WALL
- ACCESSIBLE ENTRANCE
- ACCESSIBLE MEANS OF EGRESS
- HE — HORIZONTAL EXIT
- FIRE EXTINGUISHER LOCATIONS
- EVACUATION ROUTE
- RATED CEILING SYSTEM

ARCHITECTURAL REGISTRATION BOARD 8490 THOMAS C. CRABTREE STATE OF MARYLAND

PROFESSIONAL CERTIFICATION. I CERTIFY THAT THESE DOCUMENTS WERE PREPARED BY OR APPROVED BY ME AND THAT I AM A DULY LICENSED ARCHITECT UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 8490 EXPIRATION DATE: 3/4/2021

REVISIONS

#	MM-DD-YR	NAME	DESCRIPTION OF CHANGES

CRABTREE ROHRBAUGH & ASSOCIATES - ARCHITECTS
100 WEST ROAD, SUITE 402
TOWSON MD 21204
410-528-0272
www.cra-architects.com
MECHANICSBURG, PENNSYLVANIA
CHARLOTTESVILLE, VIRGINIA
WHITE SULPHUR SPRINGS, WEST VIRGINIA

ADDITION AND RENOVATIONS OF GALENA ELEMENTARY SCHOOL
KENT COUNTY PUBLIC SCHOOLS
114 S MAIN STREET
GALENA, MD 21635

CODE COMPLIANCE FIRST FLOOR PLAN

PLOT SCALE: As indicated
FILENAME:
DATE: FEBRUARY 10, 2020

PROJECT 3309

CC.1

GENERAL DEMOLITION NOTES:

D1. DASHED LINES INDICATE GENERAL EXISTING CONSTRUCTION TO BE REMOVED. GENERAL CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING ALL EXISTING CONDITIONS RELATING TO THE DEMOLITION REQUIRED FOR INSTALLATION OF NEW CONSTRUCTION SHOWN ELSEWHERE.

D2. SEE STRUCTURAL, MECHANICAL, ELECTRICAL, PLUMBING AND FOOD SERVICE DRAWINGS FOR OTHER DEMOLITION WORK REQUIRED. ANY DEMOLITION OF MECHANICAL, ELECTRICAL, OR PLUMBING EQUIPMENT SHOWN ON THESE DRAWINGS, IS FOR COORDINATION ONLY. COORDINATE ALL WORK BY OTHER CONTRACTORS INCLUDING CAPPING AND DISCONNECTING OF BUILDING SERVICES SUCH AS WATER, WASTE, ELECTRIC, DUCTWORK, ETC.

D3. BEFORE DEMOLITION AND THROUGHOUT CONSTRUCTION, GENERAL CONTRACTOR SHALL BE RESPONSIBLE TO REVIEW WITH OWNER'S REPRESENTATIVE ALL ITEMS BEING REMOVED BY THEIR TRADES. ALL ITEMS DESIGNATED DURING THIS REVIEW TO REMAIN OWNER'S PROPERTY, SHALL BE MAINTAINED IN GOOD CONDITION AND TURNED OVER TO OWNER. ALL ITEMS DESIGNATED TO BE REUSED AS PART OF NEW CONSTRUCTION SHALL BE MAINTAINED IN A REUSABLE CONDITION AND STORED ON SITE BY CONTRACTOR IN A CLEAN, DRY LOCATION UNTIL INSTALLATION. ALL REMAINING ITEMS AND MATERIALS DEEMED TO BE TRASH SHALL BE DISPOSED OF PROPERLY BY LAW, OFF SITE BY THE RESPONSIBLE CONTRACTOR.

D4. EXISTING CONDITIONS AS THEY APPEAR IN THESE CONTRACT DOCUMENTS MAY VARY WITH ACTUAL CONDITIONS BECAUSE OF WORK PERFORMED WITH OWNER'S STAFF AND BY OTHER CONTRACTORS (I.E. ASBESTOS ABATEMENT CONTRACTOR) PRIOR TO CONTRACT. PORTIONS OF DEMOLITION WORK MAY BE INCLUDED IN THE SCOPE OF WORK OF ANOTHER CONTRACT AND NOT PART OF THIS PROJECT. GENERAL CONTRACTOR SHALL VERIFY THE ACTUAL SCOPE OF DEMOLITION IN THEIR CONTRACT PRIOR TO SUBMITTING A BID.

D5. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF ALL EXISTING BUILDING DIMENSIONS AND CONDITIONS, INCLUDING FINISHES AND MATERIALS. SYSTEMS SHOWN AND DESIGNATED AS EXISTING ON CONTRACT DRAWINGS PRIOR TO STARTING DEMOLITION AND CONSTRUCTION. ANY DISCREPANCIES IN INFORMATION INDICATED ON CONTRACT DRAWINGS SHALL BE DIRECTED IN WRITING TO THE ATTENTION OF THE ARCHITECT PRIOR TO STARTING OF DEMOLITION AND CONSTRUCTION. VERIFICATION OF CLEARANCES REQUIRED FOR ALL NEW EQUIPMENT, PIPING, DUCTWORK AND RELATED COMPONENTS SHALL BE THE CONTRACTORS RESPONSIBILITY.

D6. DEMOLITION WORK SHOWN ON THE DEMOLITION CONTRACT DRAWINGS SHALL BE FOR THE BUILDING RECEIVING MAJOR DEMOLITION WORK AND DOES NOT REPRESENT THE DEMOLITION FOR THE PROJECT IN ITS ENTIRETY. REFER TO CONTRACT DRAWINGS FOR ADDITIONAL DEMOLITION WORK, IF, ANY, FOR EACH ROOM OR BUILDING COMPONENT.

D7. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF ALL DEMOLITION CONDITIONS RELATED TO ACCEPTED ALTERNATE BIDS. INCLUDING FINISHES AND MATERIALS, SYSTEMS SHOWN AND DESIGNATED AS EXISTING OR NEW ON THE CONTRACT DRAWINGS PRIOR TO STARTING OF DEMOLITION AND CONSTRUCTION. ANY DISCREPANCIES IN INFORMATION INDICATED ON CONTRACT DRAWINGS SHALL BE DIRECTED IN WRITING TO THE ATTENTION OF THE ARCHITECT PRIOR TO STARTING OF DEMOLITION AND CONSTRUCTION.

D8. OWNER RESERVES THE RIGHT TO SALVAGE AND REMOVE ANY EXISTING ITEMS BEFORE START OF DEMOLITION WORK.

D9. DEMOLITION DRAWINGS INDICATE EXISTING SLABS TO BE REMOVED IN THEIR ENTIRETY. REFER TO MECHANICAL, ELECTRICAL AND PLUMBING DRAWINGS FOR ANY SAWCUTTING AND PATCHING OF CONCRETE SLABS THAT NEEDS TO OCCUR AS PART OF THEIR WORK. IN ADDITON, REFER TO STRUCTURAL DRAWINGS FOR SAWCUTTING AND PATCHING THAT NEEDS TO OCCUR TO ACCOMODATE INSTALLATION OF NEW FOOTINGS, PIERS ETC.

D10. GENERAL CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY EXISTING LOAD BEARING WALLS AND PROVIDE TEMPORARY SHORING AND SUPPORT UNTILL NEW STRUCTURE CAN BE INSTALLED.

D11. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING ASBESTOS CONTAINING MATERIALS AND DISPOSING OF THEM OFF SITE IN ACCORDANCE WITH STATE LOCAL AND LAWS AND SPEC SECTION 024120 - ASBESTOS ABATEMENT.

D12. ASBESTOS ABATEMENT TO BE DONE PRIOR TO DEMOLITION. AT THE COMPLETION OF ASBESTOS ABATEMENT, AIR MONITORING TO BE PERFORMED IN ACCORDANCE WITH SPEC SECTION 024120-ASBESTOS ABATEMENT AND APPROVED PRIOR TO BEGINNING REMAINING DEMOLITION.

D13. WHERE EXTERIOR WALLS ARE SCHEDULED TO BE REMOVED, THEY ARE TO BE REMOVED DOWN TO TOPS OF EXISTING FOOTINGS. REMOVE EXISTING FOOTINGS WHERE THEY INTERFERE WITH NEW CONSTRUCTION.

GENERAL ALTERATION NOTES:

R1. GENERAL CONTRACTOR IS RESPONSIBLE FOR VERIFICATION AND RECORDING OF ALL EXISTING BUILDING DIMENSIONS AND CONDITIONS RELATED TO THE WORK, INCLUDING BUT NOT LIMITED TO FINISHES, MATERIALS AND SYSTEMS SHOWN AND DESIGNATED AS EXISTING IN CONTRACT DOCUMENTS. ANY DISCREPANCIES FROM INFORMATION INDICATED ON CONTRACT DOCUMENTS SHALL BE DIRECTED TO THE ATTENTION OF THE ARCHITECT. VERIFICATION OF CLEARANCES REQUIRED FOR ALL NEW EQUIPMENT, PIPING, DUCTWORK, AND RELATED COMPONENTS SHALL BE THE CONTRACTORS RESPONSIBILITY.

R2. GENERAL CONTRACTORS RESPONSIBILITY TO REVIEW WITH THE OWNERS REPRESENTATIVE, ALL ITEMS REQUIRING REMOVAL BEFORE THE START OF WORK. OWNER RESERVES THE RIGHT TO SALVAGE ANY ITEM. ALL REMAINING ITEMS SHALL BE DISPOSED OF OFF SITE.

R3. WHERE EXISTING WALL OPENINGS ARE INDICATED TO BE CLOSED, USE MATERIALS AND FINISHES TO MATCH ADJACENT EXISTING FINISHES. MASONRY SHALL BE TOOTHED INTO THE EXISTING COURSING TO ACHIEVE A UNIFORM JOINT PATTERN TO MATCH THE EXISTING.

R4. ALL NEW MASONRY WALLS AND INFILLS THAT ARE IN CONTINUANCE WITH EXISTING MASONRY WALLS SHALL BE TOOTHED INTO THE EXISTING COURSING TO ACHIEVE A UNIFORM JOINT PATTERN TO MATCH THE EXISTING, FIELD VERIFY WALL THICKNESS.

R5. IN ALL RENOVATED AREAS OF THE WORK, THE INTENT OF THESE CONTRACT DOCUMENTS IS TO PROVIDE A LEVEL OF QUALITY FOR ALL PATCHED SURFACES EQUAL TO THAT OF NEW SURFACES, INCLUDING BUT NOT LIMITED TO PLASTER, GYPSUM WALL BOARD AND MASONRY.

R6. ALL EXISTING MATERIALS AND FINISHES DISTURBED OR INTERRUPTED BY THE WORK SHALL BE REPLACED OR "FILLED IN" TO ACHIEVE UNIFORM COLOR, TEXTURE, PATTERN AND APPEARANCE TO MATCHING ADJACENT MATERIALS AND FINISHES. TRANSITION BETWEEN EXISTING TO EXISTING AND NEW TO EXISTING MATERIALS AND FINISHES SHALL BE ACHIEVED IN STRAIGHT HORIZONTAL AND OR VERTICAL LINES BETWEEN DIFFERENT AND OR NEW MATERIALS AND FINISHES.

R7. PATCH ALL HOLES IN FLOORS, WALLS AND CEILINGS; LEVEL WITH EXISTING ADJACENT SURFACES TO RECEIVE NEW FINISHES AND/OR CONSTRUCTION TO COMPLETE THE WORK. MATCH THE EXISTING ADJACENT MATERIALS, PATTERNS AND FINISHES.

R8. PATCH, REPAIR OR REPLACE ALL EXISTING FINISHES AND MATERIALS DISTURBED DURING CONSTRUCTION OR AS A RESULT OF DEMOLITION OR REMOVAL OF AN ITEM. ALL REPAIR OR REPLACEMENT SHALL MATCH ADJACENT EXISTING AND/OR NEW FINISHES, PATTERNS AND MATERIALS. SEE ROOM FINISH SCHEDULE FOR NEW FINISHES.

R9. PREPARE EXISTING REMAINING WORK SUBSTRATES TO RECEIVE NEW FINISHES AS INDICATED ON THE ROOM FINISH SCHEDULE. SUBSTRATE PREPARATION SHALL BE IN CONFORMANCE WITH THE INSTALLATION REQUIREMENTS OF EACH NEW FINISH.

R10. ALL WALLS SHOWN WITH MASONRY HATCHING WITHIN THE EXISTING BUILDING SHALL BE NEW AND TOOTHED INTO EXISTING MASONRY. MATCH EXISTING COURSING, JOINT PATTERN AND THICKNESS UNLESS NOTED OTHERWISE.

R11. MASONRY WALLS AND INFILLS THAT ARE IN CONTINUANCE WITH EXISTING MASONRY WALLS SHALL BE TOOTHED INTO THE EXISTING COURSING TO ACHIEVE A UNIFORM JOINT PATTERN TO MATCH THE EXISTING WORK. MATCH EXISTING WALL THICKNESS.

R12. AT THE DEMOLITION OF AN EXISTING ITEM, REMOVE ALL TRACES OF THE DEMOLISHED ITEMS COMPONENTS FROM THE SURFACE OF THE REMAINING FLOOR, WALLS AND CEILING. AT THE REMOVED FASTENERS IN ALL EXISTING MASONRY WALLS AND FLOORS. PATCH HOLE WITH GROUT LEVEL WITH EXISTING ADJACENT SURFACES IN ORDER TO RECEIVE NEW FINISHES.

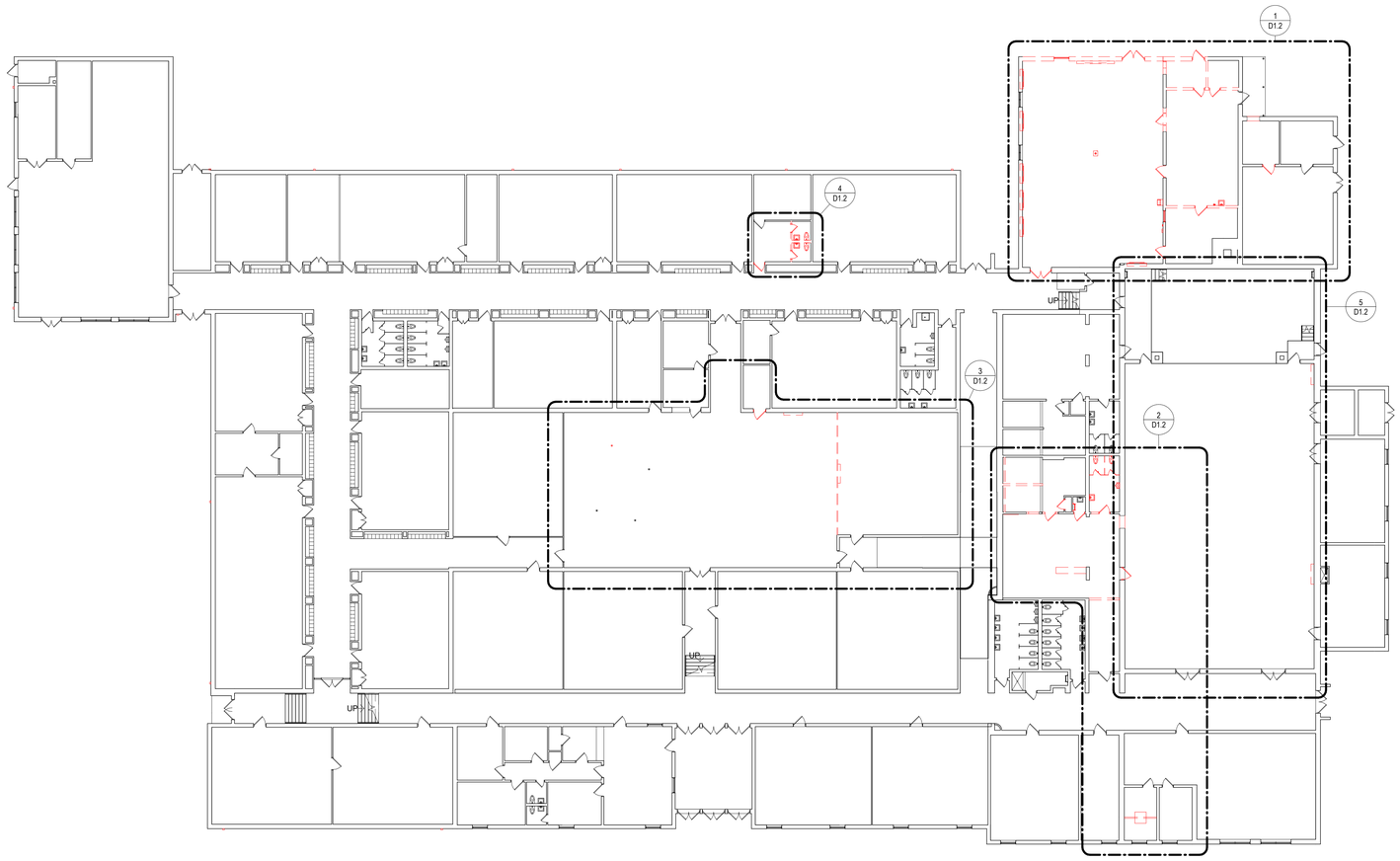
R13. AT EXISTING FLOORS: CUT IN PLACE CONSTRUCTION TO RECEIVE NEW WORK. REPLACE WITH MATERIALS TO MATCH EXISTING REMAINING MATERIALS, PATCH FLUSH TO ADJACENT EXISTING ELEVATIONS. APPLY CEMENTITIOUS UNDERLAYMENT TO PRODUCE A UNIFORM SURFACE IN ALL AREAS RECEIVING NEW FINISHES AS INDICATED ON THE ROOM FINISH SCHEDULE. PATCHED JOINTS SHALL NOT TELEGRAPH THRU THE NEW FINISH. SEE DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS AND OTHER FINISHES.

R14. AT EXISTING FLOORS: WHERE WALLS ARE SCHEDULED FOR DEMOLITION AND EXTEND TO BELOW THE CONTINUOUS CONCRETE FLOOR SLAB, THE WALL SHALL BE DEMOLISHED TO BELOW THE FLOOR THICKNESS. THE FLOOR SHALL BE PATCHED WITH CONCRETE AND GRANULAR FILL TO MATCH THE EXISTING THICKNESS, PROVIDE NEW VAPOR BARRIER TO THE PATCHED AREA. PATCH FLUSH TO ADJACENT EXISTING ELEVATIONS. APPLY CEMENTITIOUS UNDERLAYMENT TO PRODUCE A UNIFORM SURFACE IN ALL AREAS RECEIVING NEW FINISH AS INDICATED ON ROOM FINISH SCHEDULE. PATCHED JOINTS SHALL NOT TELEGRAPH THRU THE NEW FINISH.

R15. PAINT EXISTING METALS: AT EXISTING DOOR FRAMES TO REMAIN AND OTHER PAINTED METAL COMPONENTS INDICATED. REMOVE ALL DIRT, LOOSE PAINT AND RUST, SAND ENTIRE FRAME, PRIME AND PAINT. COLOR SELECTION BY ARCHITECT. WHERE THE EXISTING PAINT IS INCOMPATIBLE WITH NEW PAINT COATINGS, THE EXISTING PAINT SHALL BE COMPLETELY REMOVED.

R16. PAINT SURFACES: WHERE PATCHING OCCURS IN THE WORK OF AN EXISTING PAINTED SURFACE, THE PATCHED AREA SHALL BE SPACKLED, PRIMED AND INTERMEDIATE PAINT COATS APPLIED OVER THE PATCH. APPLY FINAL PAINT COAT OVER ENTIRE UNBROKEN SURFACE CONTAINING THE PATCH. THE UNBROKEN SURFACE SHALL BE FROM THE INTERSECTION OF THE WALL TO FLOOR TO THE INTERSECTION OF THE WALL TO CEILING AND FROM THE RIGHT SIDE WALL TO WALL INTERSECTION TO THE LEFT SIDE WALL TO WALL INTERSECTION. PROVIDE ADDITIONAL SPACKLING AND/OR PAINT COATS UNTIL THE PATCH AREAS BLEND INVISIBLY INTO THE ADJACENT EXISTING SURFACE. UNBROKEN CEILING SURFACES SHALL BE FROM CEILING TO WALL INTERSECTION AND OR NEW BULKHEAD CEILING ELEVATION CHANGE FOR THE ENTIRE PERIMETER OF THE CEILING AREA. APPLY PAINT COATS AS DESCRIBED FOR THE WALLS.

R17. AT EXISTING CERAMIC TILE: AT DEMOLISHED ITEMS AND DAMAGED AREAS, FILL ALL HOLES IN EXISTING CERAMIC WALL AND FLOOR TILE THAT ARE UP TO 1" WITH A COLOR EPOXY GROUT TO MATCH THE EXISTING CERAMIC TILE COLOR. REMOVE AND REPLACE EXISTING TILES AT HOLES THAT ARE OVER 1" AND AT ALL BROKEN AND MISSING WALL AND FLOOR TILES WITH A NEW TILE TO MATCH EXISTING COLOR AND SIZE.



1 D1.1 OVERALL FIRST FLOOR DEMOLITION PLAN
1/16" = 1'-0"

DEMOLITION LEGEND

TAG	DEMOLITION NOTE
0 - ROOF DEMOLITION & RENOVATION	
0A	REMOVE EXISTING CONCRETE CANOPY STRUCTURE IN ITS ENTIRETY. WHERE EXISTING WALL STRUCTURE IS TO REMAIN PATCH AND REPAIR SURFACES TO MATCH ADJACENT SURFACES.
0B	REMOVE EXISTING ROOF DRAIN BODY AND CAGE IN IT'S ENTIRETY. SEE PLUMBING DEMOLITION DRAWINGS FOR MORE INFORMATION. PREPARE EXISTING TO REMAIN FOR NEW WORK.
0C	REMOVE EXISTING ROOF HATCH AND CURB IN IT'S ENTIRETY DOWN TO BELOW EXISTING ROOF DECK. PATCH OPENING WITH NEW STEEL ROOF DECK. PREPARE EXISTING TO REMAIN TO RECEIVE NEW WORK.
0D	REMOVE EXISTING ROOF LADDER AND ALL RELATED COMPONENTS IN ITS ENTIRETY. PATCH AND PREPARE EXISTING TO REMAIN TO RECEIVE NEW WORK.
0E	REMOVE EXISTING ROOFING SYSTEM AND INSULATION IN IT'S ENTIRETY DOWN TO EXISTING ROOF DECK. PREPARE EXISTING TO REMAIN TO RECEIVE NEW WORK.
0F	REMOVE EXISTING DOWNSPOUT AND SPLASH BOX IN THEIR ENTIRETY. PATCH AND PREPARE EXISTING TO REMAIN TO RECEIVE NEW WORK.
0G	REMOVE EXISTING GUTTER IN IT'S ENTIRETY. PATCH AND PREPARE EXISTING TO REMAIN TO RECEIVE NEW WORK.
0H	REMOVE EXISTING METAL PANEL IN ITS ENTIRETY. PATCH AND PREPARE EXISTING TO REMAIN TO RECEIVE NEW WORK.
0J	REMOVE AND SALVAGE EXISTING METAL ROOF LADDER. CUT BOTTOM OF LADDER TO WORK WITH NEW ROOF THICKNESS. SAND, REFINISH AND REINSTALL IN SAME LOCATION. PATCH AND PREPARED EXISTING TO REMAIN SURFACE TO RECEIVE NEW WORK.
0K	REMOVE EXISTING CHIMNEY IN IT'S ENTIRETY DOWN TO BELOW EXISTING ROOF DECK. PATCH OPENING WITH NEW STEEL ROOF DECK.
0M	REMOVE EXISTING SCUPPER BOX AND THRU-WALL SCUPPER AND FLASHING IN IT'S ENTIRETY. PATCH AND PREPARE EXISTING TO REMAIN TO RECEIVE NEW WORK.
0N	REMOVE EXISTING ROOF DECK AND PREPARE FOR NEW ROOF HATCH. SEE ROOF PLAN FOR NEW WORK.
0P	REMOVE EXISTING CURB AND PLENUM ADAPTER CURB, WHERE OCCURS, IN IT'S ENTIRETY DOWN TO BELOW EXISTING ROOF DECK. PATCH OPENING WITH NEW STEEL ROOF DECK EXCEPT WHERE NEW RTU WILL OCCUR. REFER TO MECHANICAL DRAWINGS.
0Q	REMOVE EXISTING LADDER BRACKET IT IN'S ENTIRETY. PATCH AND PREPARE EXISTING TO REMAIN TO RECEIVE NEW WORK.
0R	REMOVE EXISTING ROOF MEMBRANE, INSULATION AND EXISTING ROOF DECK IN IT'S ENTIRETY. PREPARE OPENING FOR NEW RTU. REFER TO MECHANICAL DRAWINGS FOR WORK.
0S	REMOVE EXISTING THRU-WALL SCUPPER AND FLASHING IN IT'S ENTIRETY. PATCH AND PREPARE EXISTING TO REMAIN TO RECEIVE NEW WORK.
1 - WALL DEMOLITION & RENOVATION	
1A	REMOVE EXISTING MASONRY WALL AND ALL ASSOCIATED COMPONENTS IN THEIR ENTIRETY. WHERE WALL CONTINUES BELOW CONCRETE SLAB REMOVE WALL TO A MINIMUM OF 8" BELOW FINISH FLOOR. PATCH AND REPAIR ALL EXISTING SUBSTRATES AND ADJACENT SURFACES TO REMAIN TO MATCH EXISTING.
1B	REMOVE PORTION OF EXISTING MASONRY WALL AND ALL RELATED COMPONENTS, WHERE WALL CONTINUES BELOW CONCRETE SLAB, REMOVE WALL TO A MINIMUM OF 8" BELOW FINISH FLOOR. PATCH AND REPAIR ALL EXISTING SUBSTRATES AND ADJACENT SURFACE TO REMAIN TO MATCH EXISTING.
1C	REMOVE CERAMIC TILE WAINSCOT FINISH AND WALL BASE DOWN TO EXISTING SUBSTRATE. PREPARE SURFACE TO RECEIVE NEW SCHEDULED FINISH.
1D	REMOVE EXISTING VINYL / RUBBER BASE. PATCH AND REPAIR TO MATCH EXISTING. PREPARE SURFACE FOR NEW SCHEDULED FINISH.
1E	REMOVE EXISTING WALL PARTITION AND ALL ASSOCIATED COMPONENTS IN THEIR ENTIRETY. PATCH AND REPAIR ALL EXISTING SUBSTRATES AND ADJACENT SURFACES TO REMAIN TO MATCH EXISTING.
1F	SAW CUT AND REMOVE PORTION OF EXISTING MASONRY WALL AND ALL RELATED COMPONENTS IN OR TO RECEIVE NEW CONSTRUCTION. REFER TO GENERAL RENOVATION NOTES. SEE STRUCTURAL DRAWINGS FOR ADDITIONAL INFORMATION.
1G	REMOVE EXISTING MARBLE PLUMBING CHASE IN IT'S ENTIRETY.
2 - WINDOW DEMOLITION & RENOVATION	
2A	REMOVE EXISTING WINDOW IN ITS ENTIRETY INCLUDING ALL HARDWARE, TRIM, SEALANT AND RELATED COMPONENTS. PATCH AND REPAIR MASONRY OPENING, EXISTING SUBSTRATES AND ADJACENT SURFACES TO REMAIN TO MATCH EXISTING FINISHES AND PREPARE FOR NEW SCHEDULED WORK AS INDICATED.
2B	REMOVE EXISTING COILING WINDOW IN ITS ENTIRETY INCLUDING ALL HARDWARE, TRIM, SEALANT AND RELATED COMPONENTS. PATCH AND REPAIR MASONRY OPENING, EXISTING SUBSTRATES AND ADJACENT SURFACES TO REMAIN TO MATCH EXISTING FINISHES AND PREPARE FOR NEW SCHEDULED WORK AS INDICATED.
2C	REMOVE EXISTING WINDOW IN ITS ENTIRETY INCLUDING ALL HARDWARE, TRIM, SEALANT AND RELATED COMPONENTS.
3 - DOOR DEMOLITION & RENOVATION	
3A	REMOVE EXISTING DOOR, FRAME AND ALL RELATED COMPONENTS. PREP EXISTING MASONRY OPENING TO RECEIVE INFILL. REFER TO GENERAL RENOVATION NOTES FOR PROPER PATCH/INFILL REPAIR INFORMATION.
3B	REMOVE EXISTING DOOR, FRAME AND ALL RELATED COMPONENTS IN ORDER TO RECEIVE NEW CONSTRUCTION AND FINISHES AS INDICATED.
3C	REMOVE EXISTING DOOR. EXISTING FRAME TO REMAIN. PREP FRAME TO RECEIVE NEW DOOR.
3D	REMOVE EXISTING DOOR, FRAME AND ALL RELATED COMPONENTS IN ITS ENTIRETY.
3E	REMOVE EXISTING INTERAL DOOR, FRAME AND INFILL PANEL. EXISTING OUTER FRAME TO REMAIN. REPAIR EXISTING FRAME TO RECEIVE NEW FINISH.
4 - CEILING DEMOLITION & RENOVATION	
4A	REMOVE EXISTING ACT IN ITS ENTIRETY INCLUDING ALL FRAMING AND SUSPENSION COMPONENTS SO THAT STRUCTURAL SYSTEM IS COMPLETELY EXPOSED. PATCH AND REPAIR EXISTING SURFACES TO REMAIN TO MATCH EXISTING.
4B	REMOVE EXISTING PLASTER CEILING ITS ENTIRETY INCLUDING ALL FRAMING AND SUSPENSION COMPONENTS SO THAT STRUCTURAL SYSTEM IS COMPLETELY EXPOSED. PATCH AND REPAIR EXISTING ADJACENT SURFACES TO REMAIN TO MATCH EXISTING.
4C	REMOVE POTION OF EXISTING CEILING AS REQUIRED FOR INSTALLATION OF NEW WALL PARTITION.
5 - FLOOR DEMOLITION & RENOVATION	
5A	REMOVE EXISTING VCT FLOORING SYSTEM DOWN TO EXISTING SUBSTRATE. PATCH AND REPAIR SURFACE TO RECEIVE NEW SCHEDULED FINISH.
5B	REMOVE EXISTING CONCRETE SLAB TO BE FLUSH WITH FINISH FLOOR LINE. PATCH AND REPAIR SURFACE TO RECEIVE NEW SCHEDULED FINISH.
5C	REMOVE CERAMIC TILE FLOORING DOWN TO EXISTING SETTING BED. PREPARE EXISTING SURFACE FOR NEW SCHEDULED FINISH.
5D	REMOVE EXISTING CARPET FLOORING DOWN TO EXISTING SLAB. PREPARE EXISTING SURFACE FOR NEW SCHEDULED FINISH.
7 - EQUIPMENT DEMOLITION & RENOVATION	
7A	REMOVE AND RELOCATE EXISTING PROJECTOR, MOUNTING BRACKETS AND ALL RELATED COMPONENTS IN THEIR ENTIRETY.
7B	REMOVE EXISTING TOILET ROOM ACCESSORIES INCLUDING BUT NOT LIMITED TO DISPENSERS, MIRRORS, SHELVES, GRAB BARS AND ETC. PREPARE REMAINING SURFACE FOR NEW CONSTRUCTION & FINISHES AS SCHEDULED.
7C	REMOVE EXISTING TOILET PARTITIONS, ANCHORS, AND ALL RELATED COMPONENTS IN THEIR ENTIRETY. REFER TO RENOVATION NOTES FOR PROPER PATCH / REPAIR INFORMATION.
7D	REMOVE AND RELOCATE EXISTING PARMETHIAN BOARD AND ALL RELATED COMPONENTS.
7E	REMOVE EXISTING CHALKBAORDS AND ALL RELATED COMPONENTS. PATCH AND REPAIR EXISTING SURFACES TO REMAIN TO PREPARE FOR NEW SCHEDULED FINISHES.
7F	REMOVE EXISTING WINDOW LOUVER SYSTEM AND ALL COMPONENTS IN IT'S ENTIRETY. PATCH AND REPAIR EXISTING SURFACES TO MATCH ADJACENT SURFACES AND PREPARE FOR NEW CONSTRUCTION.
7G	REMOVE EXISTING POWER POLE IN ITS ENTIRETY. PATCH AND REPAIR EXISTING SURFACES TO REMAIN TO MATCH EXISTING.
7H	REMOVE AND SALVAGE EXISTING PROJECTOR SCREEN, MOUNTING BRACKETS AND ALL RELATED COMPONENTS IN THEIR ENTIRETY AND TURN OVER TO OWNER.
7J	REMOVE EXISTING INTERIOR METAL LOUVER SYSTEM IN IT'S ENTIRETY. PREPARE FOR NEW WORK.
8 - MISCELLANEOUS SPECIALTIES DEMOLITION & RENOVATION	
8A	REMOVE EXISTING WALL MOUNTED ROOF LADDER. PATCH AND REPAIR EXISTING TO RECEIVE NEW WORK.
8B	REMOVE EXISTING WOOD TRIM IN ITS ENTIRETY. PATCH AND REPAIR EXISTING SURFACES TO MATCH ADJACENT SURFACES AND PREPARE FOR NEW CONSTRUCTION.
8C	REMOVE AND RELOCATE EXISTING SWING. PATCH AND REPAIR ALL EXISTING SUBSTRATES AND ADJACENT SURFACES TO REMAIN TO MATCH EXISTING. SEE I4 DRAWING FOR NEW LOCATION.
9 - MEP	
9A	REMOVE EXISTING PLUMBING FIXTURES IN THEIR ENTIRETY, INCLUDING LAVATORIES, SINKS, TOILETS, URINALS, MOP BASINS, DRINKING FOUNTAINS/WATER COOLERS, FAUCETS, HOSE BIBBS & SIMILAR ITEMS, INCLUDING ASSOCIATED PIPING, CARRIERS/SUPPORTS, ETC. CAP WATER AND WASTE PIPING BEYOND WALL SURFACE TO ALLOW FOR NEW CONSTRUCTION / EQUIPMENT & FINISHES TO OCCUR, UNLESS NOTED OTHERWISE. REFER TO PLUMBING AND ELECTRICAL DRAWINGS FOR FULL EXTENT OF DEMOLITION.

ARCHITECTURAL REGISTRATION BOARD
8490
THOMAS C. CRABTREE
STATE OF MARYLAND

PROFESSIONAL CERTIFICATION.
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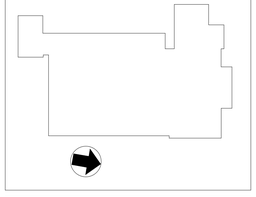
LICENSE NO. 8490
EXPIRATION DATE: 3/4/2021

KEY PLAN



REVISIONS

MM-DD-YR	NAME	DESCRIPTION OF CHANGES

CRABTREE ROHRBAUGH & ASSOCIATES - ARCHITECTS
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ADDITION AND RENOVATIONS OF GALENA ELEMENTARY SCHOOL
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114 S MAIN STREET
GALENA, MD 21635

CR

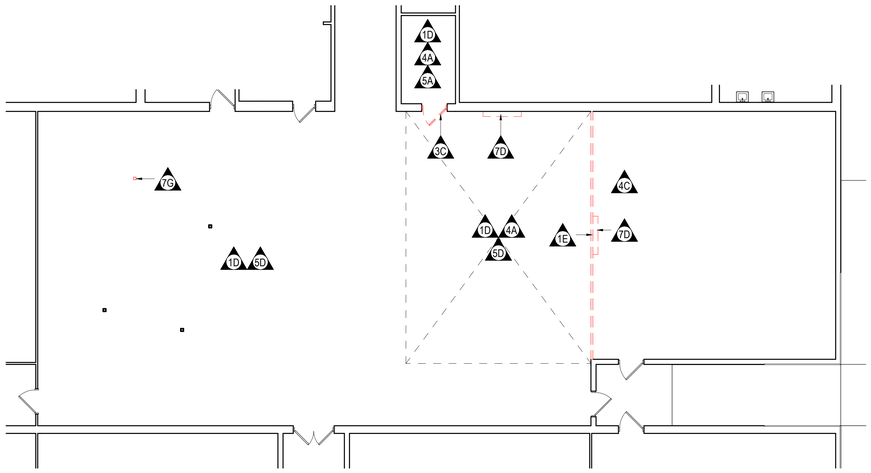
OVERALL FIRST FLOOR DEMOLITION PLAN

PLOT SCALE: 1/16" = 1'-0"
FILENAME:
DATE: FEBRUARY 10, 2020

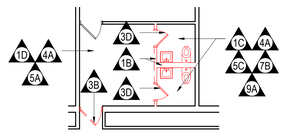
PROJECT 3309

D1.1

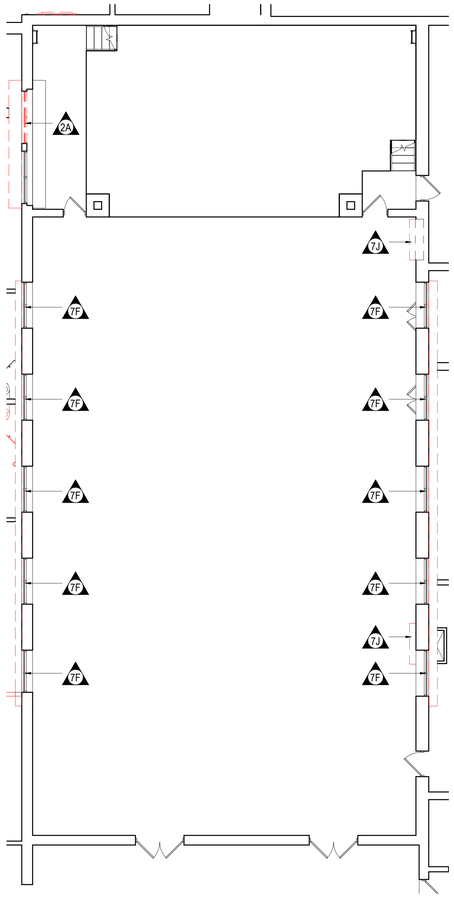
1 D1.2 PARTIAL FIRST FLOOR DEMOLITION PLAN - BASE BID
1/8" = 1'-0"



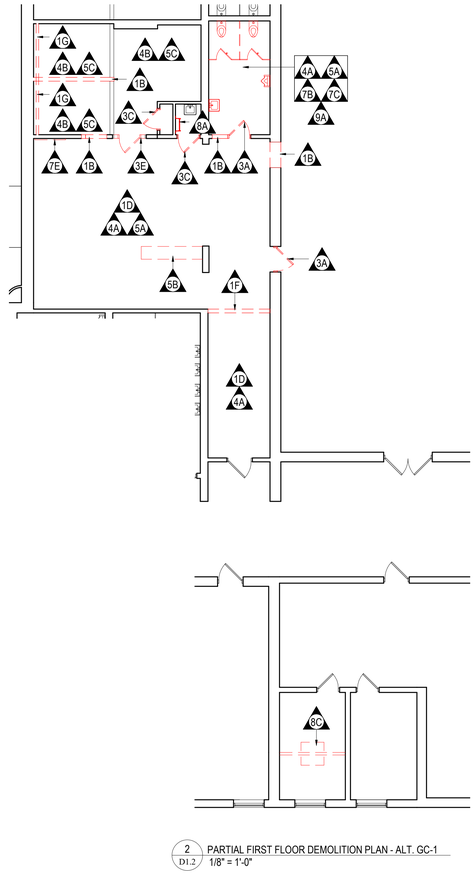
3 D1.2 PARTIAL FIRST FLOOR DEMOLITION PLAN - ALT. GC-2
1/8" = 1'-0"



4 D1.2 PARTIAL FIRST FLOOR DEMOLITION PLAN - ALT. GC-3
1/8" = 1'-0"



5 D1.2 PARTIAL FIRST FLOOR DEMOLITION PLAN - BASE BID
1/8" = 1'-0"



2 D1.2 PARTIAL FIRST FLOOR DEMOLITION PLAN - ALT. GC-1
1/8" = 1'-0"

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KEY PLAN

REVISIONS

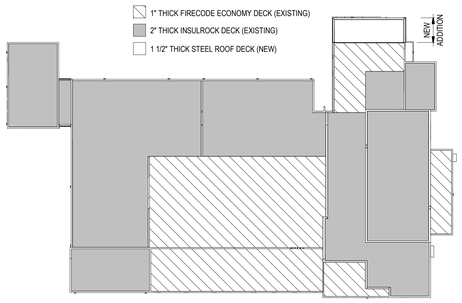
	MM-DD-YR	NAME	DESCRIPTION OF CHANGES

PARTIAL DEMOLITION PLANS

PLOT SCALE: 1/8" = 1'-0"
FILENAME:
DATE: FEBRUARY 10, 2020

PROJECT 3309

D1.2



EXISTING DECK KEY PLAN

EXISTING RTU

EXISTING ROOF HATCH TO REMAIN

1 D1.3 OVERALL ROOF DEMOLITION PLAN
3/32" = 1'-0"

GENERAL BUILT-UP ROOF DEMOLITION NOTES

D1. REFER TO DRAWING D1.1 FOR DEMOLITION NOTES / LEGEND.

D2. REMOVE EXISTING ROOFING SYSTEM INCLUDING ROOF INSULATION IN IT'S ENTIRETY, DOWN TO EXISTING ROOF DECK. CLEAN AND PREPARE EXISTING ROOF DECK FOR NEW ROOFING SYSTEM. INSPECT EXISTING ROOF DECK AND ALERT OWNER / ARCHITECT IN FIELD OF ANY ISSUES. REMOVAL / REPLACEMENT OF DEFECTIVE ROOF DECK TO BE DONE AS A CHANGE ORDER PER UNIT COST. SEE SPEC FOR ADDITIONAL INFORMATION. QUANTITY OF DEFECTIVE ROOF DECK WILL BE VERIFIED IN FIELD.

D3. REMOVE ALL EXISTING COPING AND / OR FASCIA SYSTEMS, ENTIRE PERIMETER IN IT'S ENTIRETY. REMOVE EXISTING WOOD BLOCKING.

D4. REMOVE ALL EXISTING GRAVEL STOPS, REGLETS AND TERMINATION BARS IN THEIR ENTIRETY.

D5. SEE MECHANICAL, ELECTRICAL AND PLUMBING DEMOLITION DRAWINGS FOR ADDITIONAL INFORMATION ON DEMOLITION OF EXISTING ROOF EQUIPMENT.

D6. WHERE EXISTING LIGHT FIXTURES AND CONDUIT ARE ATTACHED TO EXISTING PARAPETS REMOVE AND RE-INSTALL IN SAME LOCATIONS AFTER INSTALLATION OF NEW ROOFING SYSTEM AND COPINGS.

D7. REMOVE ALL THROUGHWALL SUPPERS AND OVERFLOW SCUPPERS IN THEIR ENTIRETY. PREP SURFACES TO RECEIVE NEW METAL SCUPPERS AND ROOFING SYSTEMS AND BASE FLASHINGS.

D8.REMOVE ALL METAL WALL PANELS AT PARAPETS AND PREP SURFACE TO RECEIVE NEW ROOFING SYSTEM AND BASE FLASHING.

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ROOF DEMOLITION PLAN

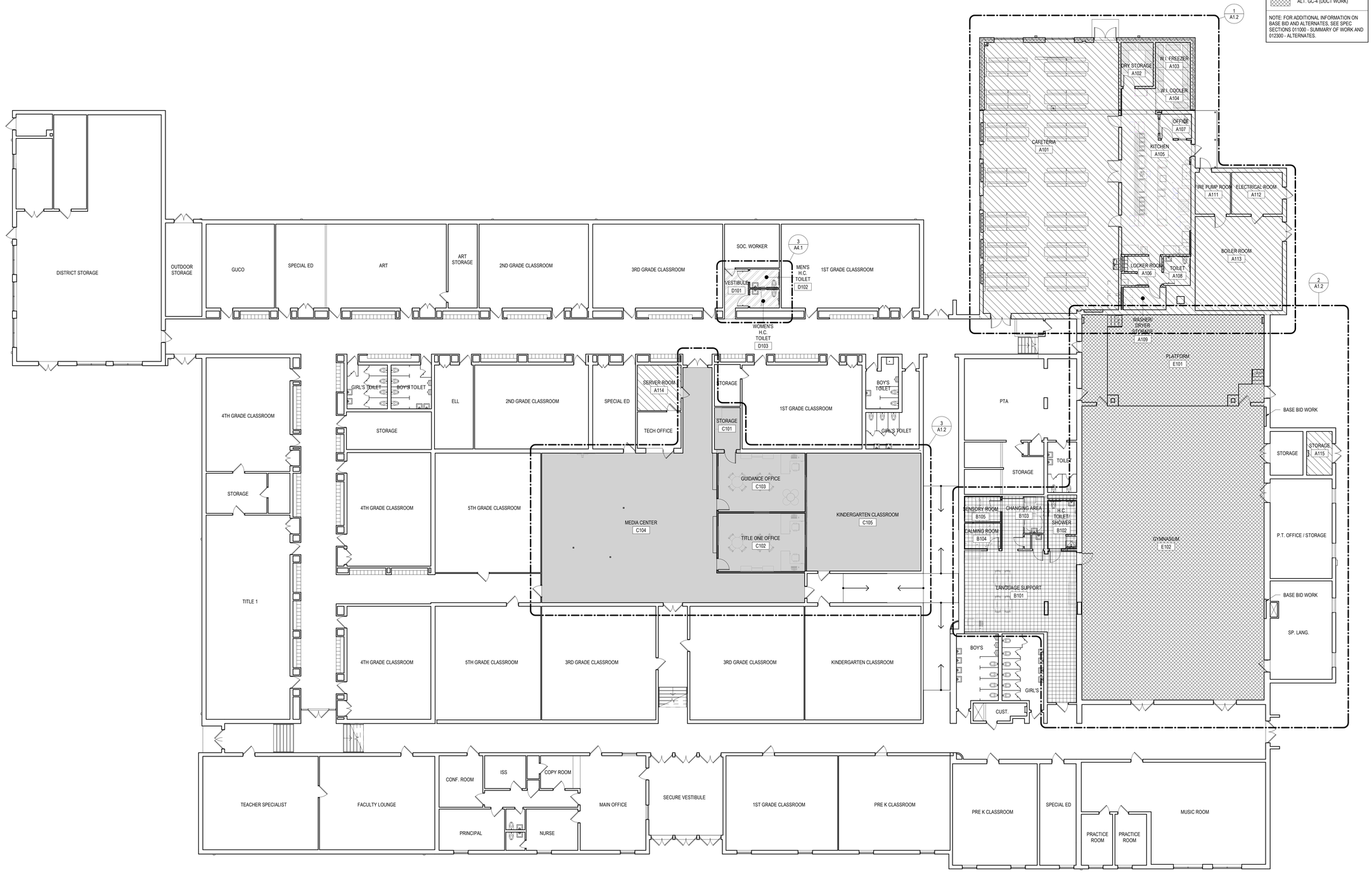
PLOT SCALE: As indicated

FILENAME:

DATE: FEBRUARY 10, 2020

PROJECT 3309

D1.3



1 A1.1 OVERALL FIRST FLOOR PLAN
3/32" = 1'-0"

BASE BID / ALT. BID LEGEND

- BASE BID (REPLACE ROOF, ROOF TOP MECHANICAL UNITS, NEW ELECTRIC SWITCHEGEAR, AIR CONDITION IN GYMNASIUM, CAFETERIA / KITCHEN ADDITION AND RENOVATIONS, NEW FIRE PUMP ROOM)
- ALT. GC-1
- ALT. GC-2
- ALT. GC-3
- ALT. GC-4 (DUCT WORK)

NOTE: FOR ADDITIONAL INFORMATION ON BASE BID AND ALTERNATES, SEE SPEC SECTIONS 011000 - SUMMARY OF WORK AND 012300 - ALTERNATES.

ARCHITECTURAL REGISTRATION BOARD 8490 THOMAS C. CRABTREE STATE OF MARYLAND

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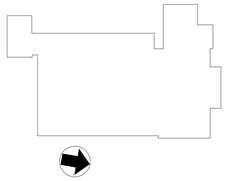

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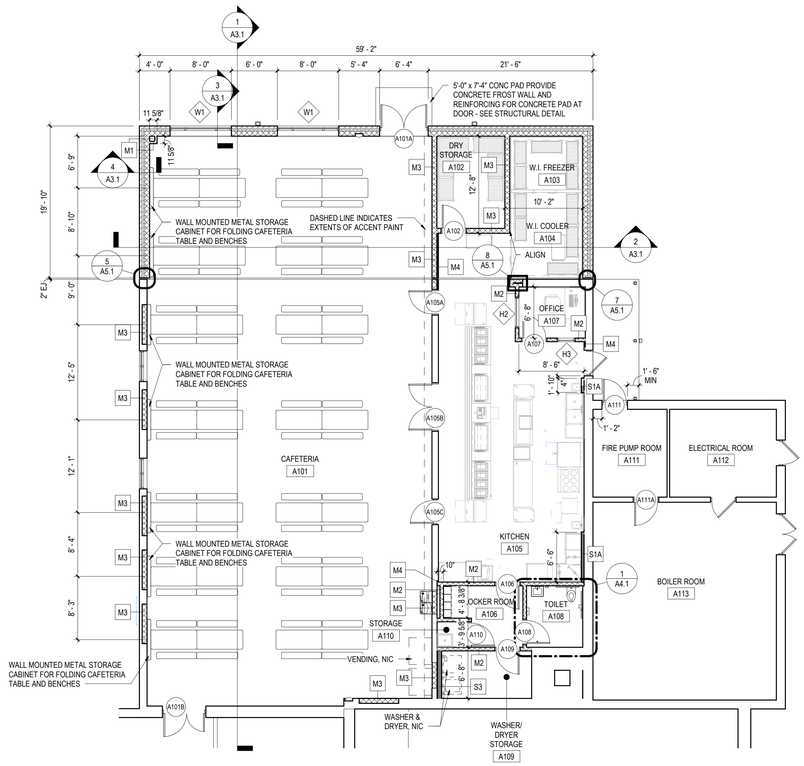
OVERALL FIRST FLOOR PLAN

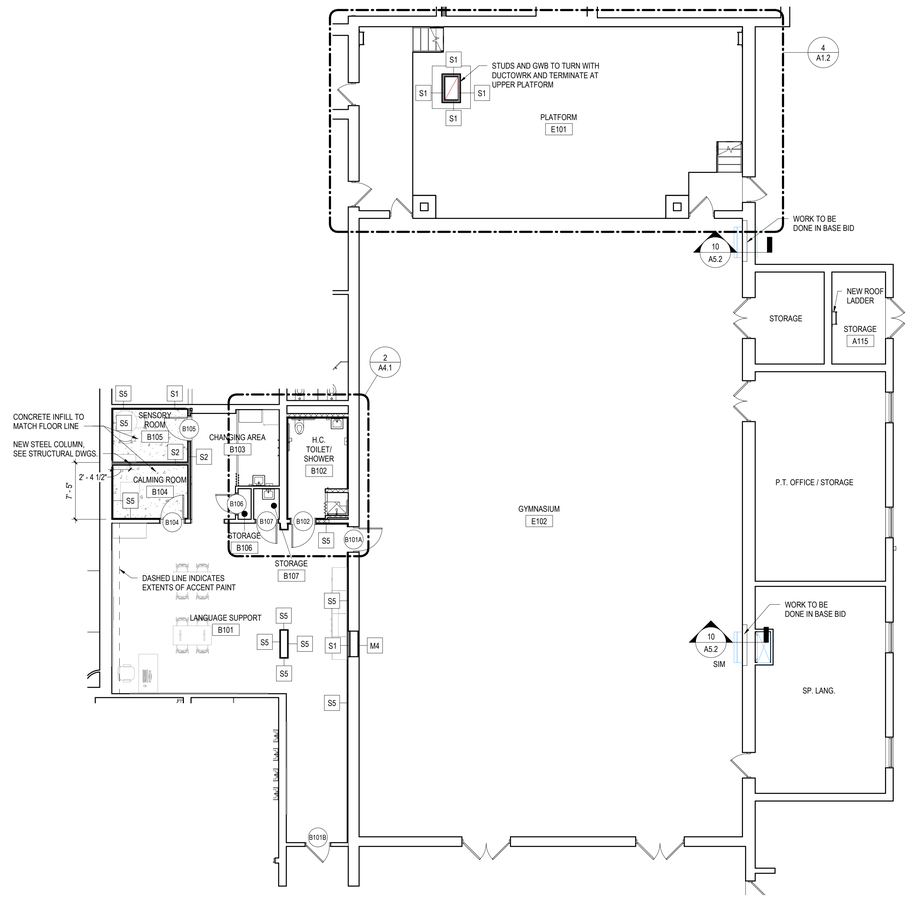
PLOT SCALE: As indicated
FILENAME:
DATE: FEBRUARY 10, 2020

PROJECT 3309

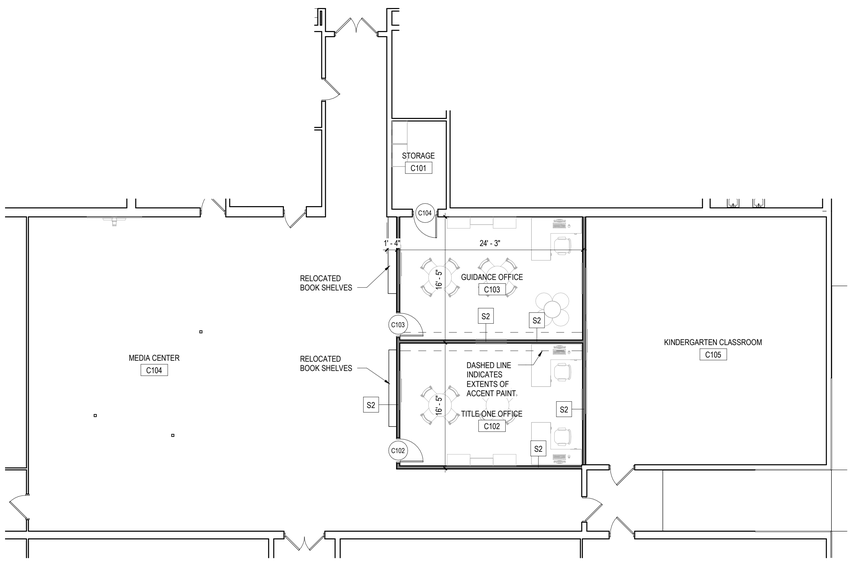
A1.1



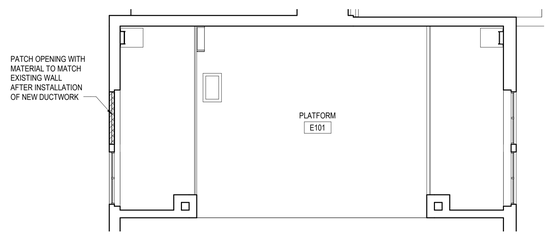
1 A1.2 PARTIAL FIRST FLOOR PLAN - BASE BID
1/8" = 1'-0"



2 A1.2 PARTIAL FIRST FLOOR PLAN - ALT. GC-1 / GC-4
1/8" = 1'-0"



3 A1.2 PARTIAL FIRST FLOOR PLAN - ALT. GC-2
1/8" = 1'-0"



4 A1.2 UPPER LEVEL PLAN
1/8" = 1'-0"

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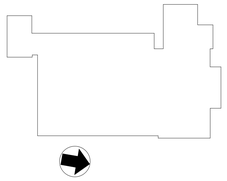

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KENT COUNTY PUBLIC SCHOOLS
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GALENA, MD 21635

PARTIAL FIRST FLOOR PLANS

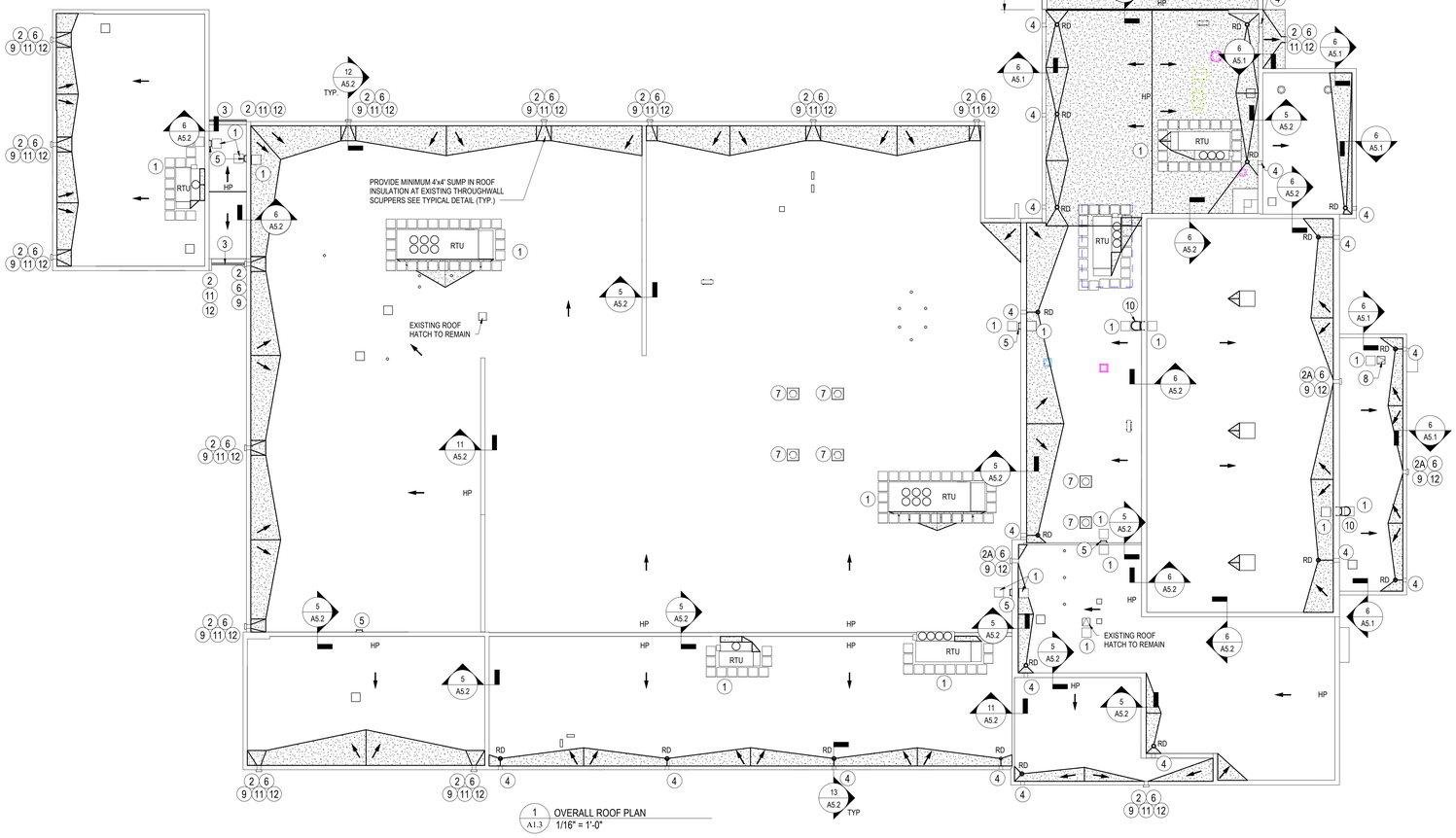
PLOT SCALE: 1/8" = 1'-0"

FILENAME:

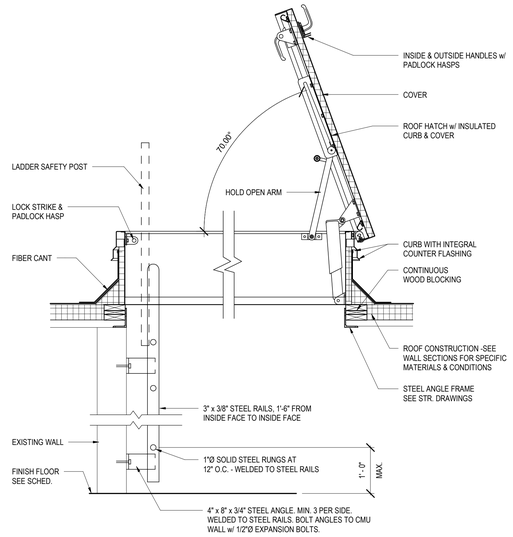
DATE: FEBRUARY 10, 2020

PROJECT 3309

A1.2

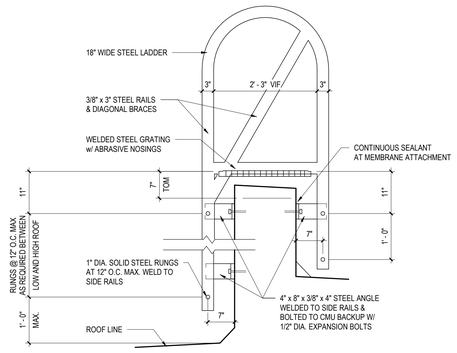


1 A1.3 OVERALL ROOF PLAN
1/16" = 1'-0"



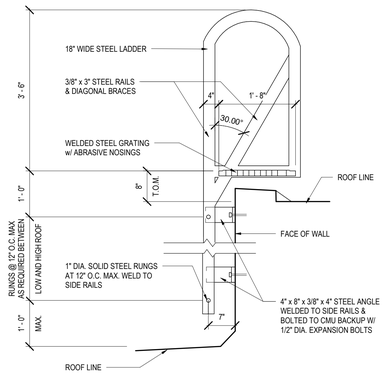
NOTES:
1. CONTRACTOR SHALL VERIFY HEIGHT FROM FLOOR LINE TO ROOF WHERE LADDER OCCURS TO DETERMINE QUANTITY OF RUNGS.
2. SEE WALL SECTIONS FOR SPECIFIC MATERIALS AND CONDITIONS.

ROOF HATCH DETAIL
SCALE: 3/4" = 1'-0"



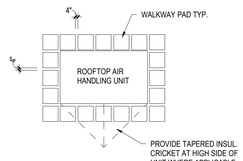
NOTES:
1. CONTRACTOR SHALL VERIFY HEIGHT FROM LOW ROOF TO HIGH ROOF WHERE LADDER OCCURS TO DETERMINE QUANTITY OF RUNGS.
2. ALL EXPOSED STEEL COMPONENTS TO BE GALVANIZED.

ROOF LADDER DETAIL
SCALE: 3/4" = 1'-0"



NOTES:
1. CONTRACTOR SHALL VERIFY HEIGHT FROM LOW ROOF TO HIGH ROOF WHERE LADDER OCCURS TO DETERMINE QUANTITY OF RUNGS.
2. ALL EXPOSED STEEL COMPONENTS TO BE GALVANIZED.

ROOF LADDER DETAIL
SCALE: 3/4" = 1'-0"



TYPICAL WALKWAY PAD LAYOUT
N.T.S.

LEGEND		ROOF PLAN NOTES:
(1)	WALKWAY PADS	1. COORDINATE ROOF MOUNTED EQUIPMENT AND PENETRATIONS WITH MEP DRAWINGS.
(2)	4"X6" METAL DOWNSPOUT	2. UTILIZE ROOF MANUFACTURER'S STANDARD DETAILS FOR ALL PENETRATIONS AND ROOF CURBS AND PROVIDE FLASHING, COPINGS, FASCIA'S, ETC. IN ORDER FOR THE ROOF MANUFACTURER TO PROVIDE A ROOF WARRANTY FOR THE PROJECT.
(2A)	4"X5" METAL DOWNSPOUT	3. CRICKETS AND SADDLES SHALL HAVE A MINIMUM OF TWO TIMES THE SLOPE OF THE PRIMARY TAPERED SYSTEM OR STRUCTURAL SLOPE.
(3)	METAL GUTTER	4. CURBS FOR ROOF MOUNTED MECHANICAL EQUIPMENT TO BE PROVIDED BY THE CONTRACTOR INSTALLING THE EQUIPMENT. FLASHINGS, ETC. FOR ROOF CURBS TO BE PROVIDED BY THE ROOFING CONTRACTOR.
(4)	OVERFLOW THRU-WALL SCUPPER	5. WHERE PROVIDING NEW METAL THROUGH WALL SCUPPERS AT EXISTING THROUGH WALL METAL SCUPPER OPENINGS, PROVIDE 4'-0" X 4'-0" SUMP IN BASE ROOF INSULATION AT EACH SCUPPER LOCATION IN ORDER FOR WATER TO DRAIN TO DOWNSPOUTS. SEE ROOF PLAN FOR LOCATIONS.
(5)	WALL LADDER WITH PLATFORM AND RETURN	6. ROOF DRAINS INDICATED ARE EXISTING LOCATIONS. REPLACE ALL ROOF DRAINS AND STRAINERS. PLUMBING CONTRACTOR WILL PROVIDE ROOF DRAINS FOR ROOFING CONTRACTOR TO INSTALL WITH ROOFING SYSTEM. PLUMBING CONTRACTOR TO PROVIDE PIPE EXTENSIONS IN ORDER TO RAISE ROOF DRAINS WITH NEW INSULATION THICKNESS. FINAL CONNECTIONS OF INTERNAL PIPING TO ROOF DRAINS TO BE DONE BY THE PLUMBING CONTRACTOR.
(6)	SCUPPER BOX	7. WHERE EXISTING STEEL ROOF LADDERS ARE TO REMAIN, REMOVE LADDER AND PATCH EXISTING HOLES WHERE ANCHORS OCCURRED. TAKE LADDERS TO SHOP AND SAND SMOOTH REMOVING ANY RUST, ETC. PROVIDE PRIMER AND FINISH PAINT COATS IN SHOP. BECAUSE OF THE ADDED ROOF INSULATION, THE LADDERS WILL NEED NEW HOLES AND EXPANSION ANCHORS. TOUCH-UP PAINT LADDERS AND ANCHORS IN FIELD USING PRIMER AND FINISH COATS.
(7)	TUBULAR DAYLIGHTING DEVICE	8. WHERE EXISTING ROOF HATCHES, EXHAUST HOODS, PIPING, CONDUITS, ETC. ARE TO REMAIN, REMOVE EXISTING INTEGRAL CURBS TO EQUIPMENT AND RE-SET ON EXTENDED CURBS. EXTENDED CURBS TO BE PROVIDED BY RESPECTIVE CONTRACTORS. ADDITIONAL DUCTWORK, PIPING, CONDUIT, ETC. TO ALSO BE PROVIDED BY RESPECTIVE CONTRACTORS. ROOFING CONTRACTOR TO PROVIDE FLASHINGS IN ACCORDANCE WITH ROOFING MANUFACTURER'S STANDARD DETAILS. G.C. TO COORDINATE ALL WORK AND IS RESPONSIBLE FOR ANY WORK NOT INCLUDED BY RESPECTIVE CONTRACTORS AS THEY ARE RESPONSIBLE FOR A COMPLETE JOB.
(8)	36" X 36" ROOF HATCH	9. IT IS ASSUMED THAT ALL EXISTING WOOD BLOCKING AND NAILERS WILL HAVE TO BE REPLACED. IF WHEN DEMOLISHING THE EXISTING ROOF IT IS DETERMINED THAT SOME OR ALL OF THE EXISTING WOOD BLOCKING AND NAILERS CAN BE REUSED, THE CONTRACTOR TO PROVIDE A CREDIT TO THE OWNER FOR NOT HAVING TO REPLACE THE WOOD BLOCKING AND NAILERS.
(9)	THRU-WALL SCUPPER	10. ALL CONDENSATE PIPING FROM ROOFTOP UNITS TO EXTEND TO EXISTING ROOF DRAIN AND THROUGHWALL SCUPPER LOCATIONS.
(10)	ROOF LADDER WITH PASS THROUGH AND CAGE	
(11)	CAST IRON DOUWNSPOUT SHOE	
(12)	PRECAST SPLASH BLOCK	
LP	LOW POINT	
HP	HIGH POINT	
OD	OVERFLOW DRAIN	
	FLOW DIRECTION	
	INDICATES BUILT-UP ROOF SYSTEM WITH RIGID INSULATION STRUCTURALLY SLOPED	
	INDICATES AREAS WITH TAPERED INSULATION	

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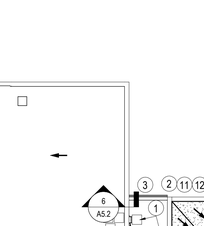

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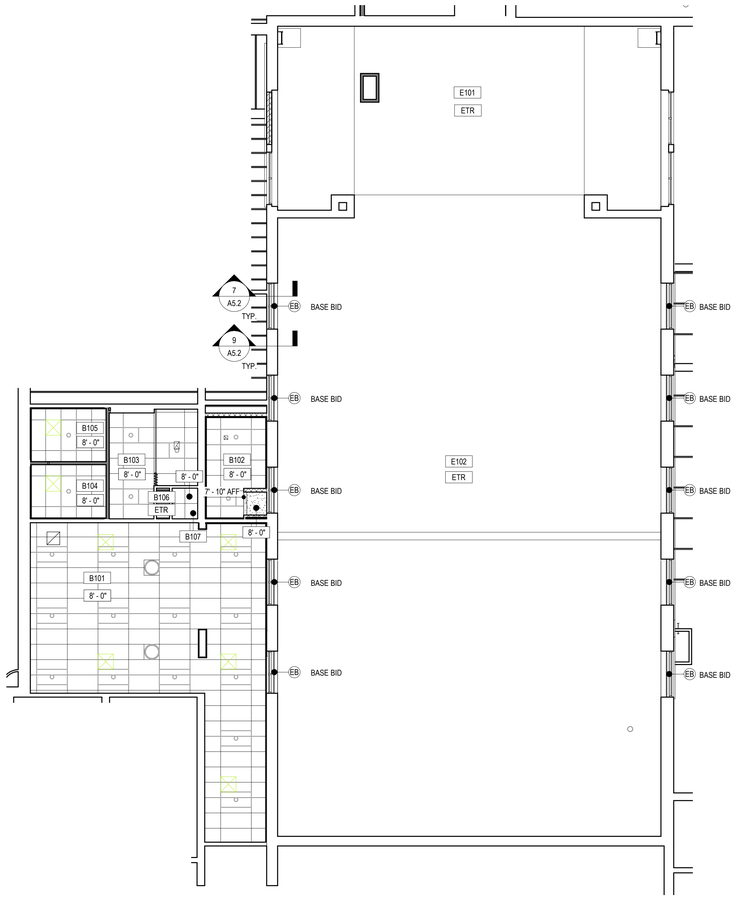
OVERALL ROOF PLAN

PLOT SCALE: As indicated
FILENAME:
DATE: FEBRUARY 10, 2020

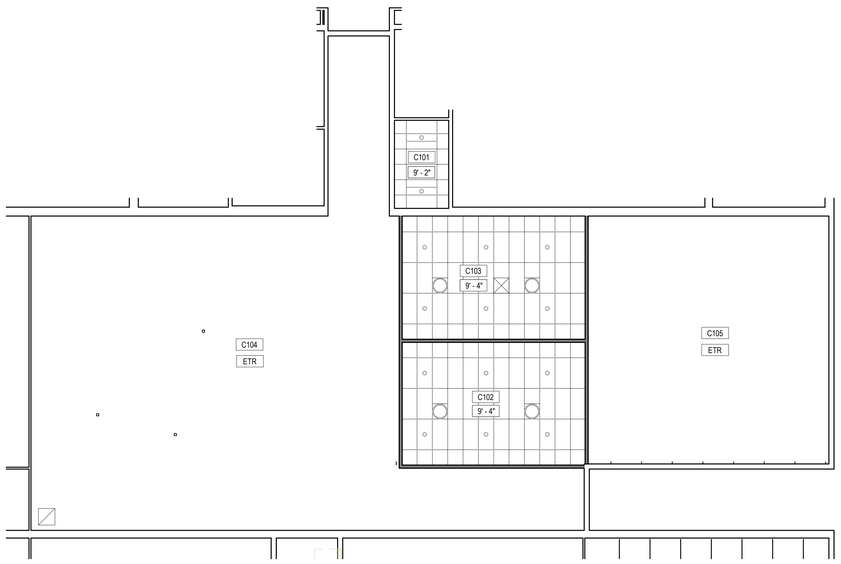
PROJECT 3309

A1.3

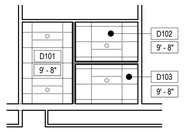
1 A1.4 PARTIAL FIRST FLOOR PLAN - BASE BID
1/8" = 1'-0"



2 A1.4 PARTIAL FIRST FLOOR PLAN - BASE BID / ALT. GC-1 / GC-4
1/8" = 1'-0"



3 A1.4 PARTIAL FIRST FLOOR PLAN - ALT. GC-2
1/8" = 1'-0"



4 A1.4 PARTIAL FIRST FLOOR PLAN - ALT. GC-3
1/8" = 1'-0"

REFLECTED CEILING PLAN GENERAL NOTES:

1. UNLESS NOTED OTHERWISE, GYPSUM BULKHEADS TO BE 3 5/8" METAL STUDS AT 16" O/C WITH 5/8" GWB EACH SIDE, EXTENDING MIN. 1" BELOW ADJACENT CEILING.

2. CEILING GRID SHALL BE COORDINATED WITH MEP EQUIPMENT AND DEVICES.

3. UNLESS NOTED OTHERWISE, ALL VISIBLE STRUCTURAL STEEL, ROOF/ FLOOR DECK, DUCTWORK, PIPING, CONDUIT, HANGER WIRES, ETC. AT EXPOSED LOCATIONS OR ABOVE CEILING CLOUDS SHALL BE PAINTED.

4. REFER TO ROOM FINISH SCHEDULE FOR CEILING TYPES.

5. ALL VISIBLE HANGER WIRES, STRUCTURE AND BRACING AT EXPOSED CEILING GRID OR CEILING CLOUD LOCATIONS SHALL BE INSTALLED PLUMB AND LEVEL.

6. FOR WINDOWS THAT REQUIRE TWO OR MORE ROLLER SHADES, EACH ROLLER SHADE SHALL TERMINATE AT THE CENTER OF THE WINDOW MULLION. REFER TO HOLLOW METAL AND ALUMINUM FRAME ELEVATIONS FOR FOR DIMENSIONS AND WINDOW MULLION DESIGN AND ROLLER SHADE BRAKES.

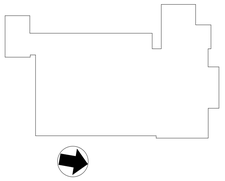
LEGEND

- 2' X 4' SUSPENDED CEILING SYSTEM
- 2' X 4' SECOND LOOK SUSPENDED CEILING SYSTEM
- 2' X 2' SUSPENDED CEILING SYSTEM
- GYPSUM WALLBOARD
- LINEAR METAL SOFFIT
- STEEL LINTEL - PAINTED
- 2' X 4' LIGHT FIXTURE
- 1' X 4' LIGHT FIXTURE
- 2' X 2' LIGHT FIXTURE
- SEE MEP DRAWINGS
- SEE MEP DRAWINGS
- RECESSED DOWN LIGHT
- PENDANT LIGHT FIXTURES
- TUBULAR DAYLIGHT DEVICE
- (M) ROLLER SHADE - MANUAL
- (MB) ROLLER SHADE - MANUAL BLACKOUT W/ DUAL ROLLER
- (E) ROLLER SHADE - MOTORIZED
- (EB) ROLLER SHADE - MOTORIZED BLACKOUT W/ DUAL ROLLER

ARCHITECTURAL REGISTRATION BOARD 8490 THOMAS C. CRABTREE STATE OF MARYLAND

PROFESSIONAL CERTIFICATION. I CERTIFY THAT THESE DOCUMENTS WERE PREPARED BY OR APPROVED BY ME AND THAT I AM A DULY LICENSED ARCHITECT UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 8490 EXPIRATION DATE: 3/4/2021

KEY PLAN



REVISIONS

#	MM-DD-YR	NAME	DESCRIPTION OF CHANGES

CRABTREE ROHRBAUGH & ASSOCIATES - ARCHITECTS
MECHANICSBURG, PENNSYLVANIA
CHARLOTTESVILLE, VIRGINIA
WHITE SULPHUR SPRINGS, WEST VIRGINIA
www.cra-architects.com
100 WEST ROAD, SUITE 402
TOWSON MD 21204
410-528-0272

ADDITION AND RENOVATIONS OF GALENA ELEMENTARY SCHOOL
KENT COUNTY PUBLIC SCHOOLS
114 S MAIN STREET
GALENA, MD 21635

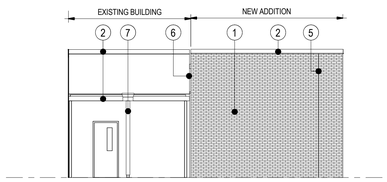
PARTIAL REFLECTED CEILING PLANS

PLOT SCALE: 1/8" = 1'-0"
FILENAME:
DATE: FEBRUARY 10, 2020

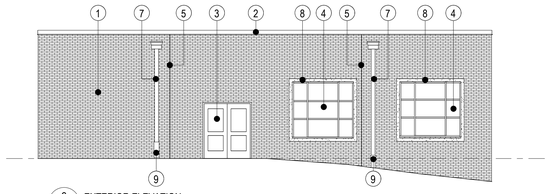
PROJECT 3309

A1.4

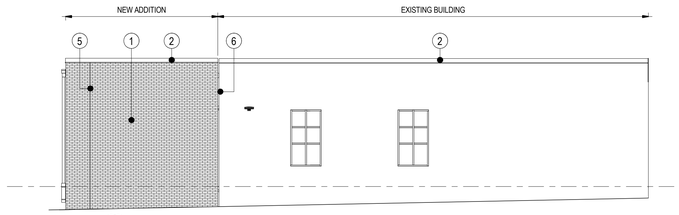
ELEVATION LEGEND	
TAG	ELEVATION NOTE
1	FACE BRICK TO MATCH EXISTING
2	METAL COPING
3	1" INSULATED GLASS IN ALUMINUM ENTRANCE DOORS IN THERMALLY BROKEN ALUMINUM FRAME
4	1" INSULATED GLASS IN THERMALLY BROKEN ALUMINUM STOREFRONT
5	CONTROL JOINT
6	1" EXPANSION JOINT
7	DOWNSPOUT AND SCUPPER BOX
8	ARCHITECTURAL PRECAST
9	CAST IRON DOWNSPOUT SHOE W/ POWDER COATING



1 A2.1 EXTERIOR ELEVATION
1/8" = 1'-0"



2 A2.1 EXTERIOR ELEVATION
1/8" = 1'-0"



3 A2.1 EXTERIOR ELEVATION
1/8" = 1'-0"

ARCHITECTURAL REGISTRATION BOARD
8490
THOMAS C. CRABTREE
STATE OF MARYLAND

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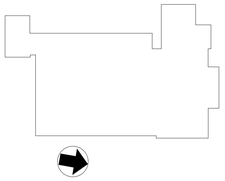

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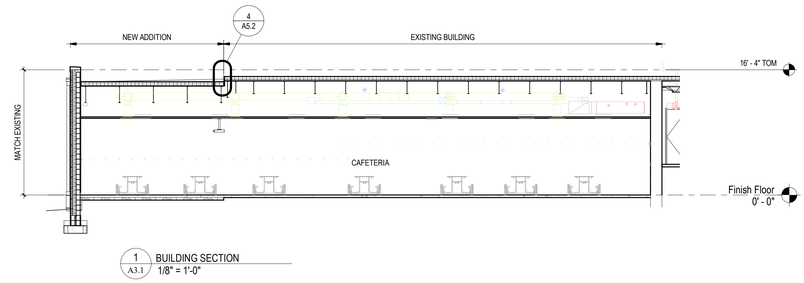
GALENA, MD 21635

OVERALL EXTERIOR ELEVATIONS

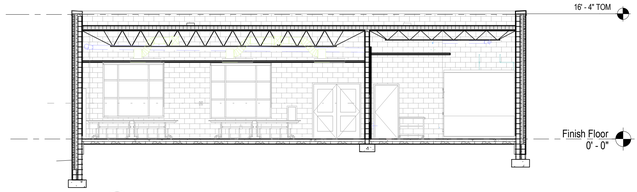
PLOT SCALE: 1/8" = 1'-0"
FILENAME:
DATE: FEBRUARY 10, 2020

PROJECT 3309

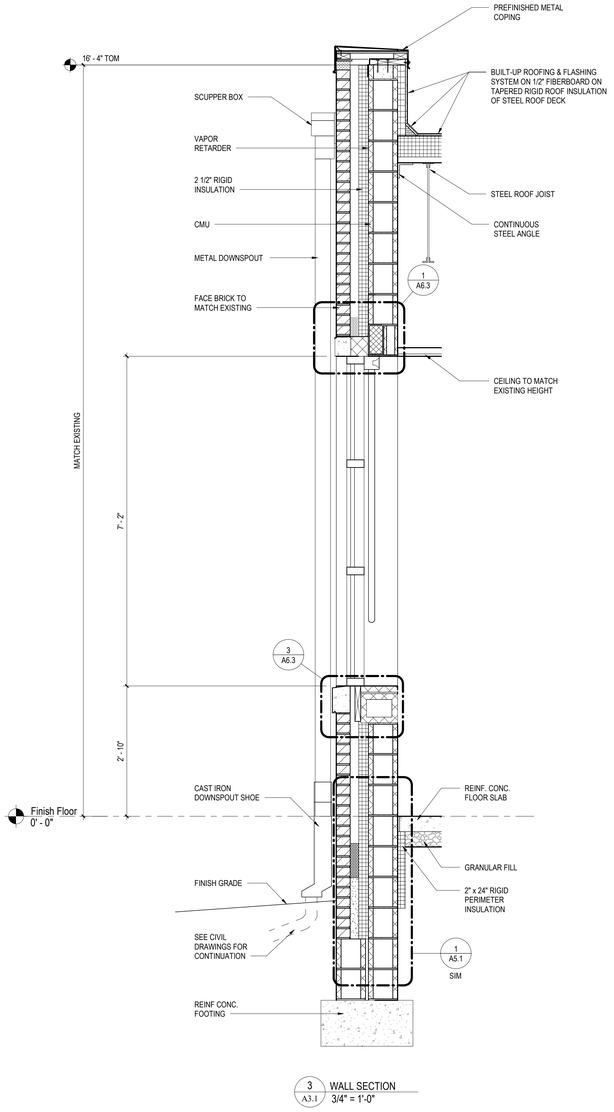
A2.1



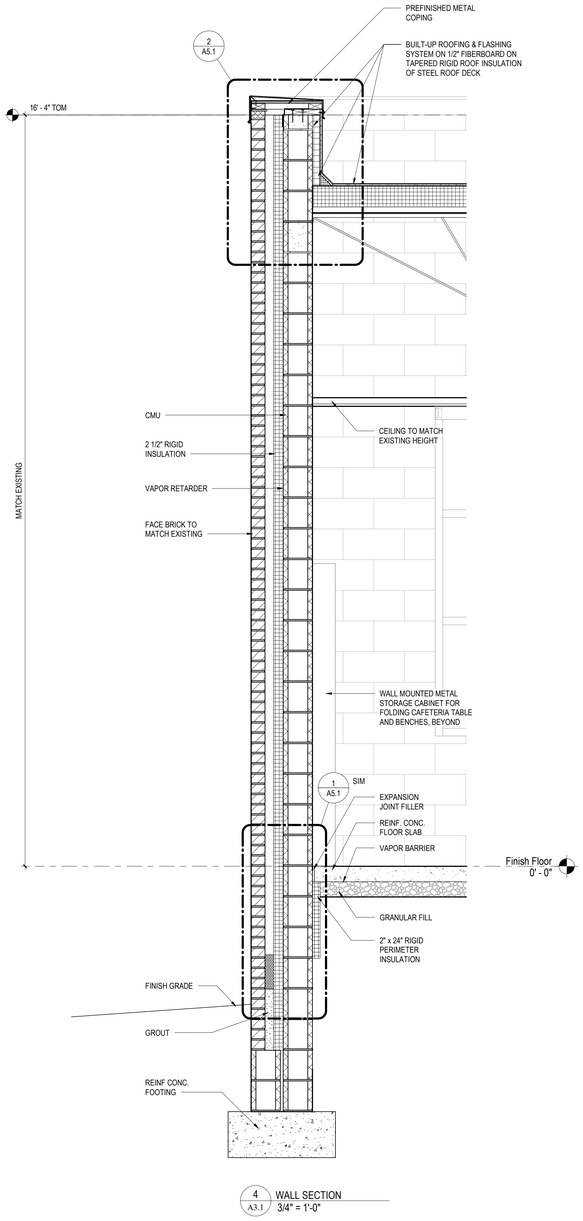
1 A3.1 BUILDING SECTION
1/8" = 1'-0"



2 A3.1 BUILDING SECTION
1/8" = 1'-0"



3 A3.1 WALL SECTION
3/4" = 1'-0"



4 A3.1 WALL SECTION
3/4" = 1'-0"

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BUILDING & WALL SECTIONS

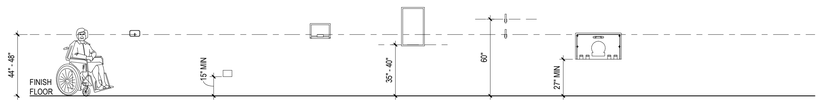
PLOT SCALE:
As indicated

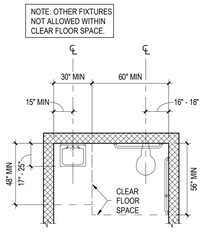
FILENAME:

DATE:
FEBRUARY 10, 2020

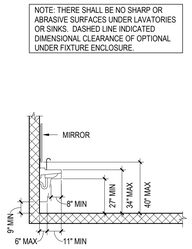
PROJECT
3309

A3.1

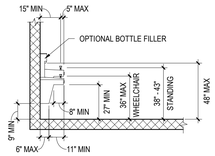




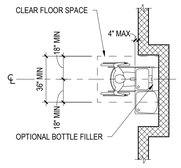
CLEAR FLOOR AT WALL HUNG WATER CLOSET AND LAVATORY



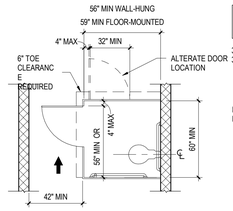
LAVATORY HEIGHT AND LEG CLEARANCE



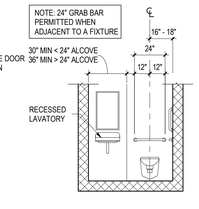
DRINKING FOUNTAIN HEIGHT AND LEG CLEARANCE



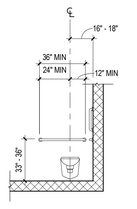
CLEAR FLOOR AT DRINKING FOUNTAIN



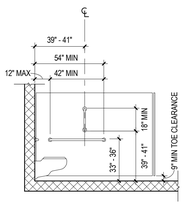
PLAN FOR WATER CLOSET



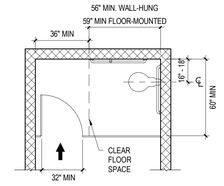
REAR WALL FOR WATER CLOSET ADJACENT TO RECESSED LAVATORY



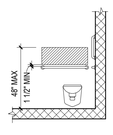
REAR WALL FOR WATER CLOSET



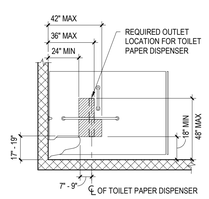
SIDE WALL FOR WATER CLOSET



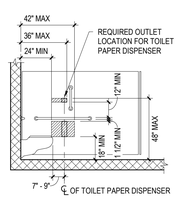
ALTERNATE PLAN FOR WATER CLOSET



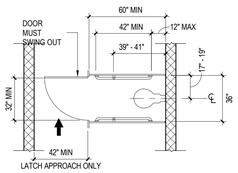
REAR WALL RECESSED DISPENSERS



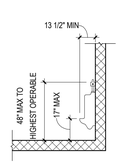
SIDE WALL RECESSED DISPENSERS



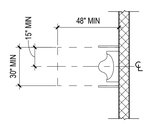
SIDE WALL PROTRUDING DISPENSERS



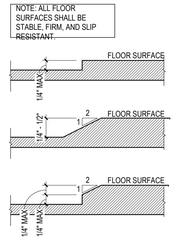
PLAN FOR AMBULATORY ACCESSIBLE TOILET COMPARTMENT



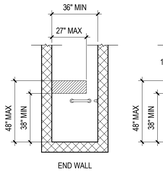
WALL HUNG URINAL CLEARANCES

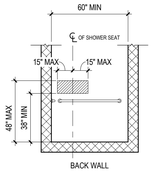


WALL HUNG URIAL CLEARANCES



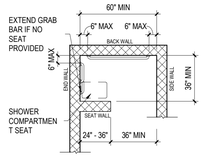
CHANGES IN FLOOR LEVEL



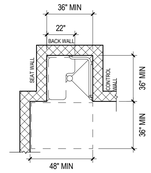


END WALL BACK WALL

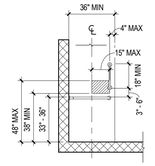
ALTERNATE ROLL-IN SHOWER SIDE & BACK WALL



PLAN FOR ALTERNATE ROLL-IN SHOWER



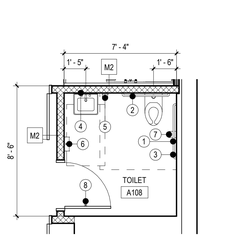
PLAN FOR TRANSFER-TYPE SHOWER



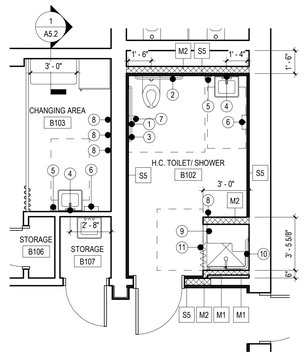
CONTROL WALL FOR TRANSFER-TYPE SHOWER

ACCESSIBILITY STANDARDS

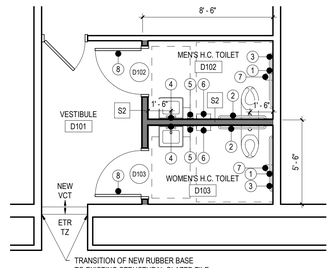
NOT TO SCALE



1 A4.1 LARGE SCALE TOILET PLAN - BASE BID
1/4" = 1'-0"



2 A4.1 LARGE SCALE TOILET PLAN - ALT. GC-1
1/4" = 1'-0"



3 A4.1 LARGE SCALE TOILET PLAN - ALT. GC-3
1/4" = 1'-0"

GENERAL NOTES:

1. ACCESSIBLE FIXTURES ARE INDICATED WITH THE REQUIRED CLEAR FLOOR SPACE CLEARANCES FOR ALL ACCESSIBLE ROUTES & MANEUVERING CLEARANCES.
2. PLUMBING FIXTURE ROUGH-IN DIMENSIONS & TOILET PARTITION LAYOUT DIMENSIONS ARE FROM THE WALL FINISH MATERIAL.
3. PROVIDE WOOD BLOCKING IN STUD WALLS FOR ALL TOILET ACCESSORIES.
4. TOILET PARTITION DIMENSIONS ARE TO THE PANEL CENTERLINE UNLESS NOTED OTHERWISE. MINIMUM CLEAR DIMENSIONS MUST BE PROVIDED WHERE NOTED.
5. COORDINATE ALL WALL FINISHES WITH THE ROOM FINISH SCHEDULE.
6. CONTRACTOR TO CONFIRM WITH THE OWNER'S REPRESENTATIVE THE LOCATION OF ALL SURFACE-MOUNTED TOILET ROOM ACCESSORIES PRIOR TO INSTALLATION.
7. URINAL PARTITIONS SHALL BEGIN AT A HEIGHT NO MORE THAN 12" FROM AND EXTEND NOT LESS THAN 60" ABOVE THE FINISHED FLOOR SURFACE. URINAL PARTITIONS SHALL EXTEND FROM THE WALL SURFACE AT EACH SIDE OF THE URINAL A MINIMUM OF 18".
8. ACCESSIBLE LOCKERS ARE INDICATED AS '♂' AT DOUBLE TIER LOCKERS, ONLY THE BOTTOM TIER IS REQUIRED TO BE ACCESSIBLE. FOR FOUR TIER LOCKERS, ONLY THE BOTTOM TWO TIERS ARE REQUIRED TO BE ACCESSIBLE.

TOILET ACCESSORY SCHEDULE

No.	DESCRIPTION	MOUNTING	MANUFACTURER	MODEL
1	18" GRAB BAR (VERTICAL)	39" MIN - 41" MAX AFF TO BOTTOM OF GRAB BAR	BOBRICK	B-5806 x 18
2	36" GRAB BAR (HORIZONTAL)	33" MIN - 36" MAX AFF TO TOP OF GRIPPING SURFACE	BOBRICK	B-5806 x 36
3	42" GRAB BAR (HORIZONTAL)	33" MIN - 36" MAX AFF TO TOP OF GRIPPING SURFACE	BOBRICK	B5806 x 42
4	MIRROR 18" x 30" w/ SS FRAME	40" AFF TO BOTTOM EDGE OF REFLECTING SURFACE	BOBRICK	B-165 (1830)
5	SURFACE MOUNTED SOAP DISPENSER	PUSH BUTTON @ 44" MAX AFF	BOBRICK	B-2111
6	SURFACE MOUNTED PAPER TOWEL DISPENSER	48" MAX TO OUTLET OF DISPENSER	OWNER PROVIDED, GC INSTALLED	--
7	SURFACE MOUNTED MULTI-ROLL TOILET TISSUE DISPENSER	TISSUE ACCESS @ 19" MIN AFF	OWNER PROVIDED, GC INSTALLED	--
8	SURFACE MTD. S.S. COAT HOOK	48" AFF TO TOP	BOBRICK	B-6827
9	FOLDING SHOWER SEAT w/ PADDED CUSHION	16" AFF TO TOP	BOBRICK	B-517, B-518
10	GRAB BAR FOR 36" x 36" SHOWER STALL	33" MIN - 36" MAX AFF TO TOP OF GRIPPING SURFACE	BOBRICK	B-6861
11	SS SHOWER ROD, VINYL SHOWER CURTAIN & SS SHOWER CURTAIN HOOKS	COORDINATE WITH SHOWER UNIT	-	-

ARCHITECTURAL REGISTRATION BOARD 8490 THOMAS C. CRABTREE STATE OF MARYLAND

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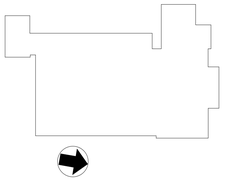

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LARGE SCALE PLANS

PLOT SCALE: 1/4" = 1'-0"
FILENAME:
DATE: FEBRUARY 10, 2020

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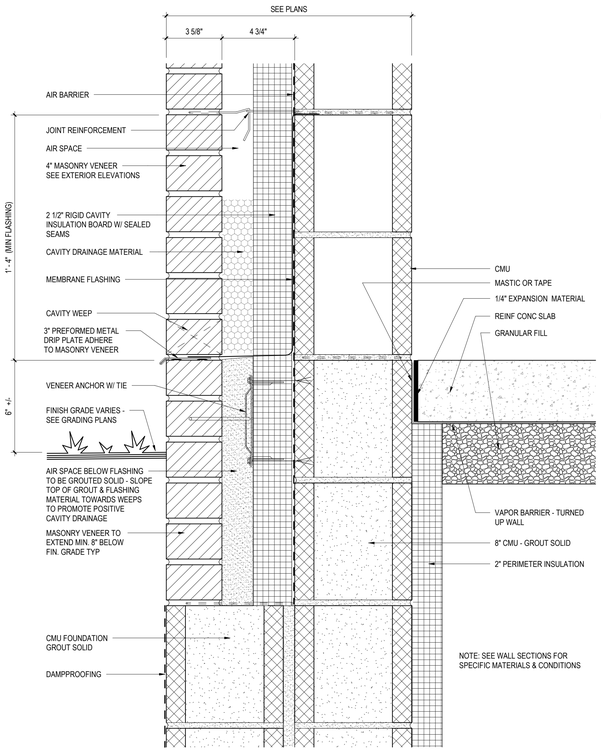
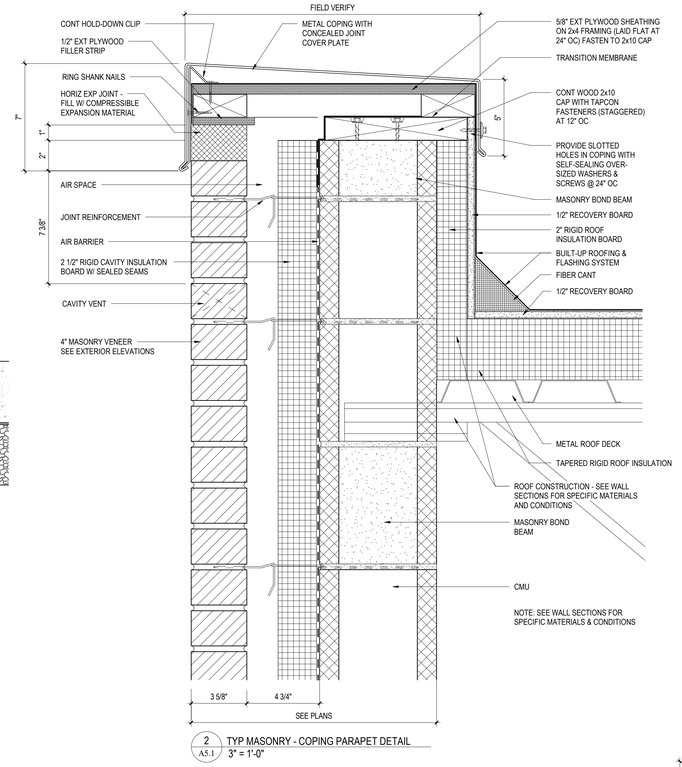
A4.1

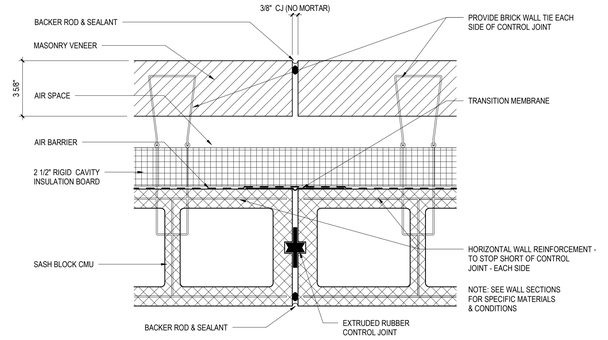


1 A5.1 TYPICAL BASE FLASHING DETAIL
3" = 1'-0"

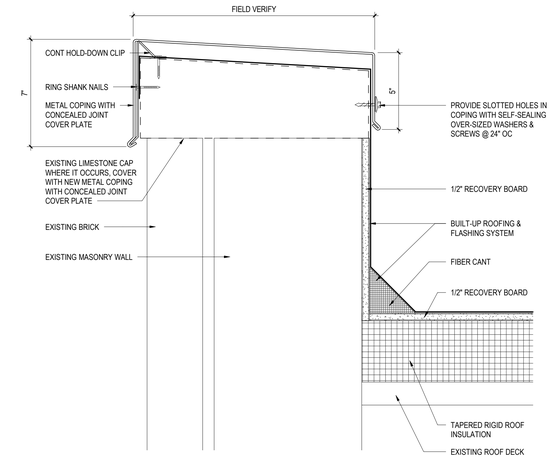


2 A5.1 TYP MASONRY - COPING PARAPET DETAIL
3" = 1'-0"

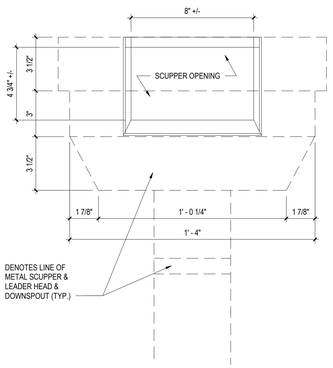
NOTE:
DETAILS WITHIN THIS DRAWING, TITLED AS "TYPICAL", INDICATE COMMON NON-SPECIFIC CONDITIONS OCCURRING THROUGHOUT BUILDING. THE LARGE SCALE ALLOWS A MORE COMPREHENSIVE LEVEL OF DETAIL TO BE SHOWN. SPECIFIC CONSTRUCTION CONDITIONS WILL VARY ACCORDING TO MATERIAL AND DIMENSIONS, MORE ACCURATELY SHOWN AS PART OF INDIVIDUAL SECTIONS AND DETAILS THROUGHOUT THE CONSTRUCTION DOCUMENTS.



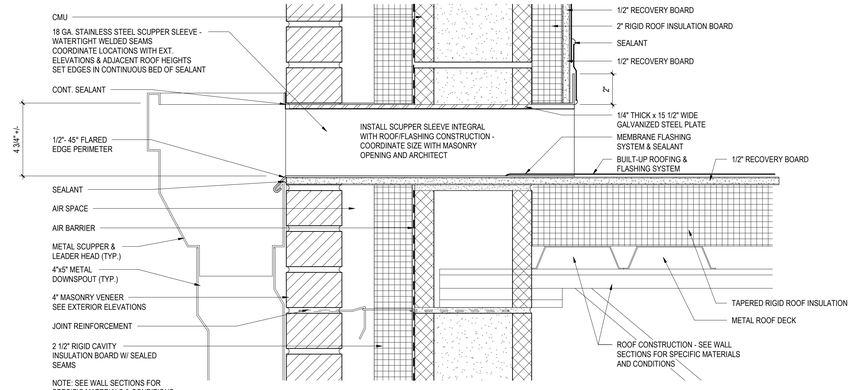
3 A5.1 TYP MASONRY - EXTERIOR WALL CONTROL JOINT DETAIL
3" = 1'-0"



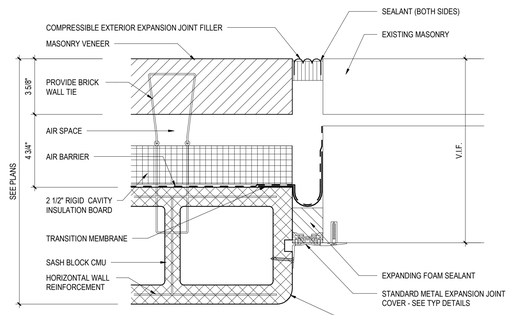
6 A5.1 EXISTING MASONRY - COPING PARAPET DETAIL
3" = 1'-0"



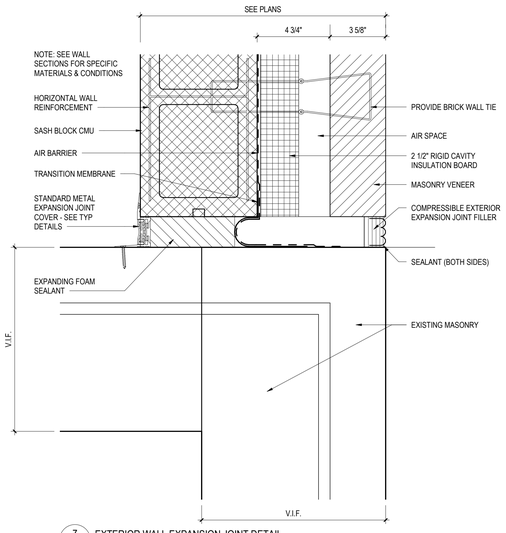
ELEVATION



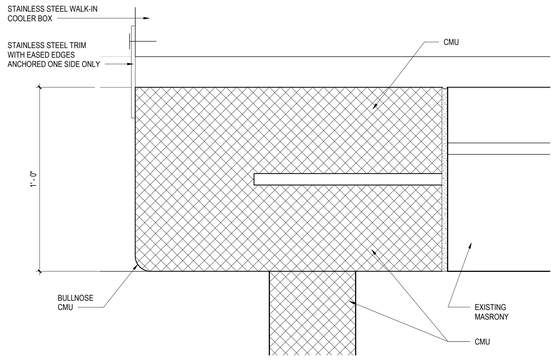
4 A5.1 TYP MASONRY - ROOF SCUPPER DETAIL
3" = 1'-0"



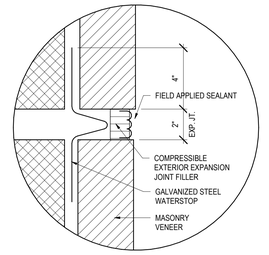
5 A5.1 EXTERIOR WALL EXPANSION JOINT DETAIL
3" = 1'-0"



7 A5.1 EXTERIOR WALL EXPANSION JOINT DETAIL
3" = 1'-0"

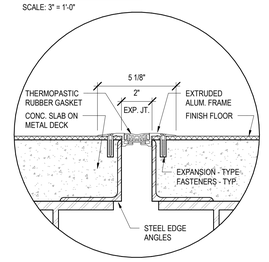


8 A5.1 MASONRY DETAIL
3" = 1'-0"



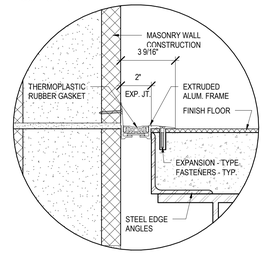
TYPICAL EXTERIOR WALL BUILDING EXPANSION JOINT DETAIL

SCALE: 3" = 1'-0"



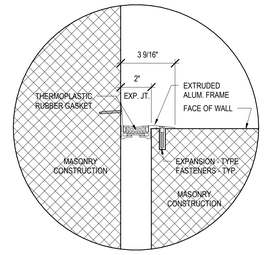
TYPICAL FLOOR-TO-FLOOR BUILDING EXPANSION JOINT DETAIL

SCALE: 3" = 1'-0"



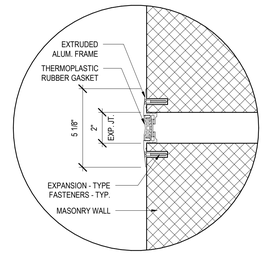
TYPICAL FLOOR-TO-WALL BUILDING EXPANSION JOINT DETAIL

SCALE: 3" = 1'-0"



TYPICAL INTERIOR WALL BUILDING EXPANSION JOINT CORNER DETAIL

SCALE: 3" = 1'-0"



TYPICAL INTERIOR WALL BUILDING EXPANSION JOINT DETAIL

SCALE: 3" = 1'-0"

ARCHITECTURAL REGISTRATION BOARD
8490
THOMAS C. CRABTREE
STATE OF MARYLAND

PROFESSIONAL CERTIFICATION.
I CERTIFY THAT THESE DOCUMENTS WERE PREPARED BY OR APPROVED BY ME AND THAT I AM A DULY LICENSED ARCHITECT UNDER THE LAWS OF THE STATE OF MARYLAND.
LICENSE NO. 8490
EXPIRATION DATE: 3/4/2021

REVISIONS

MM-DD-YR	NAME	DESCRIPTION OF CHANGES

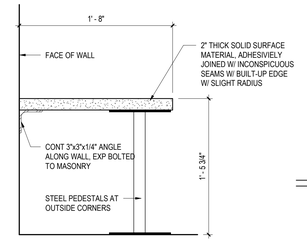
CRABTREE ROHRBAUGH & ASSOCIATES - ARCHITECTS
100 WEST ROAD, SUITE 402
TOWSON MD 21204
410-528-0272
www.cra-architects.com
MECHANICSBURG, PENNSYLVANIA
CHARLOTTESVILLE, VIRGINIA
WHITE SULPHUR SPRINGS, WEST VIRGINIA

ADDITION AND RENOVATIONS OF GALENA ELEMENTARY SCHOOL
KENT COUNTY PUBLIC SCHOOLS
114 S MAIN STREET
GALENA, MD 21635

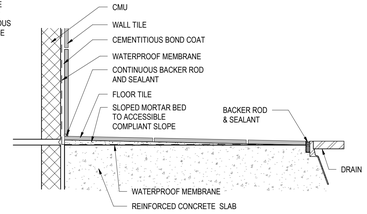
DETAILS
PLOT SCALE: 3" = 1'-0"
FILENAME:
DATE: FEBRUARY 10, 2020

PROJECT 3309

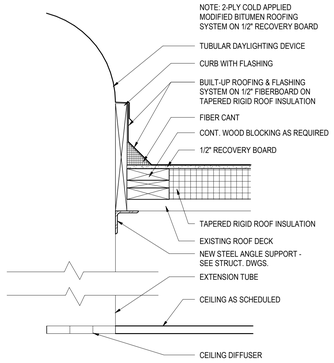
A5.1



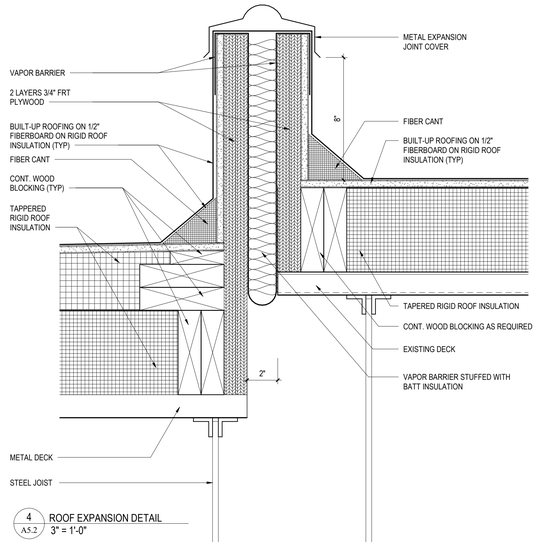
1 A5.2 HC BENCH DETAIL
1 1/2" = 1'-0"



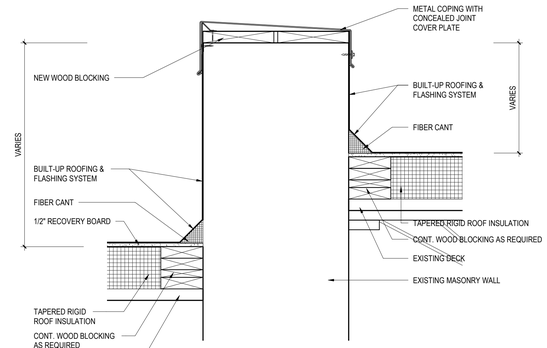
2 A5.2 SLOPED FLOOR DETAIL AT PRIVATE SHOWER
3" = 1'-0"



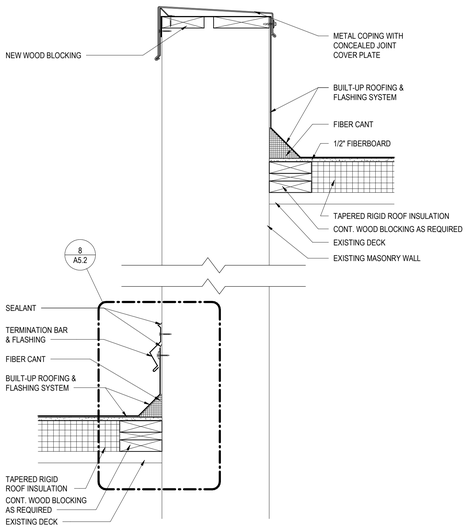
3 A5.2 TUBULAR DAYLIGHTING DEVICE DETAIL
1 1/2" = 1'-0"



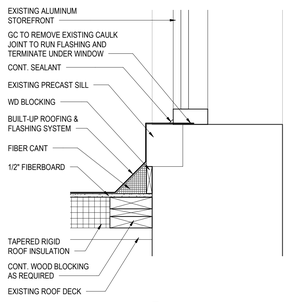
4 A5.2 ROOF EXPANSION DETAIL
3" = 1'-0"



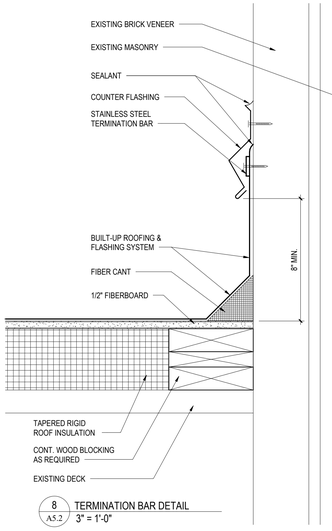
5 A5.2 ROOF DETAIL
1 1/2" = 1'-0"



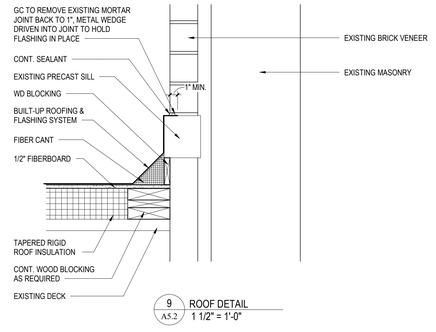
6 A5.2 ROOF DETAIL
1 1/2" = 1'-0"



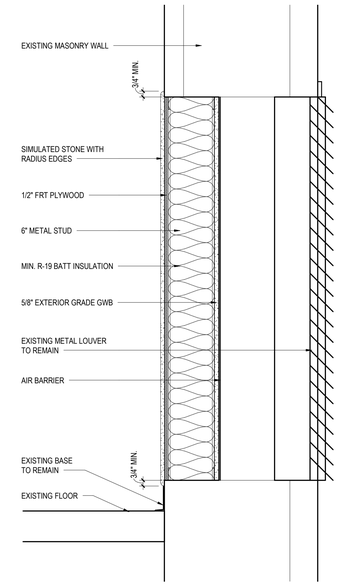
7 A5.2 ROOF DETAIL
1 1/2" = 1'-0"



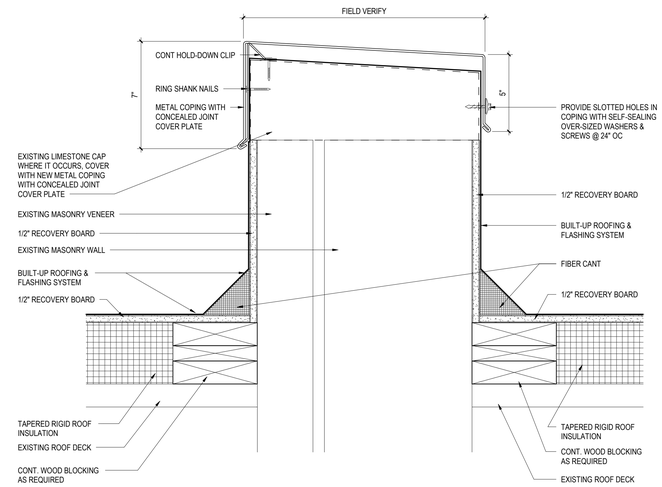
8 A5.2 TERMINATION BAR DETAIL
3" = 1'-0"



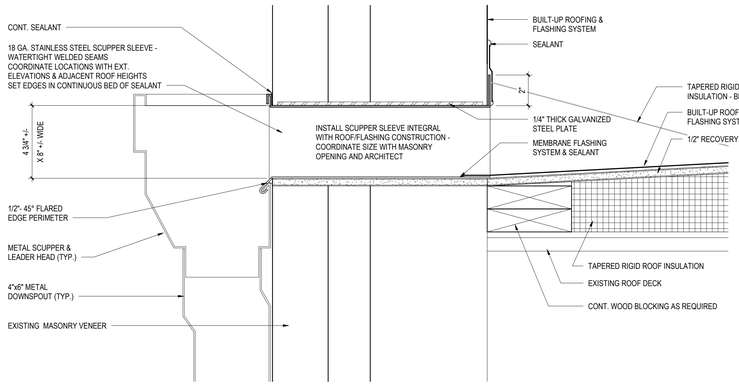
9 A5.2 ROOF DETAIL
1 1/2" = 1'-0"



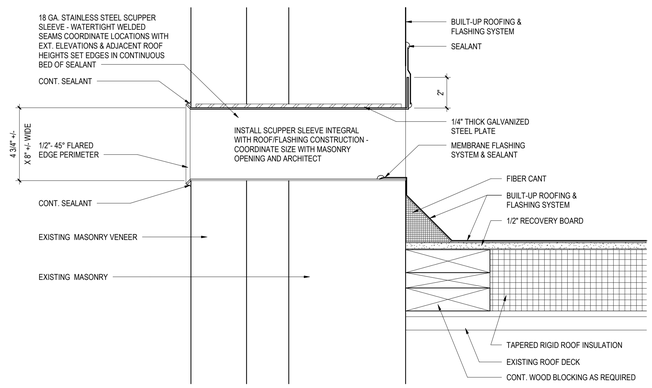
10 A5.2 EXISTING LOUVER INFILL DETAIL
1 1/2" = 1'-0"



11 A5.2 EXISTING MASONRY - COPING PARAPET DETAIL
3" = 1'-0"



12 A5.2 EXISTING MASONRY - ROOF SCUPPER DETAIL
3" = 1'-0"



13 A5.2 EXISTING MASONRY - ROOF SCUPPER DETAIL
3" = 1'-0"

CRABTREE ROHRBAUGH & ASSOCIATES - ARCHITECTS
100 WEST ROAD, SUITE 402
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ARCHITECTURAL REGISTRATION BOARD 8490 THOMAS C. CRABTREE STATE OF MARYLAND

PROFESSIONAL CERTIFICATION. I CERTIFY THAT THESE DOCUMENTS WERE PREPARED BY OR APPROVED BY ME AND THAT I AM A DULY LICENSED ARCHITECT UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 8490 EXPIRATION DATE: 3/4/2021

REVISIONS

MM-DD-YR	NAME	DESCRIPTION OF CHANGES

DETAILS

PLOT SCALE: As indicated
FILENAME:
DATE: 10/29/19

PROJECT 3309

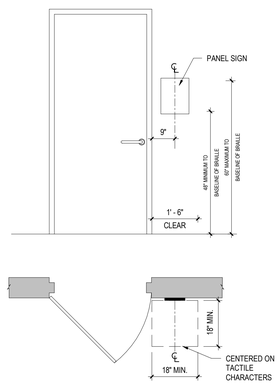
A5.2

ROOM FINISH SCHEDULE

NUMBER	NAME	COLOR SCHEME	FLOOR	BASE	WALLS			CEILING FINISH	REMARKS
					WALL FINISH	WAINSCOT FINISH	WAINSCOT HEIGHT		
A - BASE BID									
A101	CAFETERIA		RES1	RES1	EPX2/EPX3			ACT2	R53
A102	DRY STORAGE		RES1	RES1	EPX2			FRP	--
A103	W.I. FREEZER		--	--	--			--	R4, R28, R57, R81
A104	W.I. COOLER		--	--	--			--	R4, R28, R57, R81
A105	KITCHEN		RES1	RES1	ETR/EPX2/SGT			FRP	--
A106	LOCKER ROOM		RES1	RES1	EPX2/EPX3			FRP	--
A107	OFFICE		RES1	RES1	EPX2/EPX3			FRP	--
A108	TOILET		RES1	RES1	EPX2/EPX3			FRP	--
A109	WASHER/ DRYER STORAGE		RES1	RES1	EPX2/EPX3			FRP	--
A110	STORAGE		RES1	RES1	EPX2/EPX3			FRP	--
A111	FIRE PUMP ROOM		--	--	--			--	NO WORK
A112	ELECTRICAL ROOM		--	--	--			--	NO WORK
A113	BOILER ROOM		--	--	--			--	NO WORK
A114	SERVER ROOM		--	--	--			--	NO WORK
A115	STORAGE		--	--	--			--	NO WORK
B - ALT. GC-1									
B101	LANGUAGE SUPPORT		ETR TZ/VCT	RB	PNT			ACT1	R2, R53
B102	H.C. TOILET/ SHOWER		RES2	RES2	CT			ACT1/EPX	R3, R27, R55, R77, R79
B103	CHANGING AREA		RES2	RES2	ETR/PNT			ACT1	
B104	CALMING ROOM		CPT	RB	WP			ACT1	
B105	SENSORY ROOM		CPT	RB	PNT			ACT1	
B106	STORAGE		ETR	ETR	PNT			ETR	
B107	STORAGE		ETR	ETR	EPX3			ACT1	
C - ALT. GC-2									
C101	STORAGE		CPT	RB	PNT			ACT1	
C102	TITLE ONE OFFICE		CPT	RB	PNT			ACT1	R53
C103	GUIDANCE OFFICE		CPT	RB	PNT			ACT1	R53
C104	MEDIA CENTER		CPT	RB	ETR			ETR	--
C105	KINDERGARTEN CLASSROOM		ETR	ETR/RB	ETR/PNT			ETR	--
D - ALT. GC-3									
D101	VESTIBULE		VCT	RB/ETR SGT	PNT			ACT1	R2
D102	MEN'S H.C. TOILET		RES2	RES2	CT			ACT1	
D103	WOMEN'S H.C. TOILET		RES2	RES2	CT			ACT1	
E - ALT. GC-4									
E101	PLATFORM		ETR	ETR/RB	ETR/PNT			ETR	
E102	GYMNASIUM		ETR	ETR	ETR	ETR	ETR	ETR	R80

SIGNAGE SCHEDULE - UPDATED

ORIGINAL		SIGN TO READ		SIGN TYPE					DIRECTIONAL ARROW		
ROOM#	ARCHITECTURAL ROOM NAME	ROOM#	ROOM NAME	TYPE	ADA	FEMALE	MALE	TRANSGENDER	LEFT	RIGHT	QTY
A - BASE BID											
A101	CAFETERIA	TBD	EXIT/MAXIMUM OCCUPANCY	4B/4A							2
A102	DRY STORAGE	--	--	--							0
A103	W.I. FREEZER	--	--	--							0
A104	W.I. COOLER	--	--	--							0
A105	KITCHEN	--	--	--							0
A106	LOCKER ROOM	--	--	--							0
A107	OFFICE	--	--	--							0
A108	TOILET	TBD	RESTROOM	2A	•	•	•				1
A109	WASHER/ DRYER STORAGE	--	--	--							0
A110	STORAGE	--	--	--							0
A111	FIRE PUMP ROOM	--	--	--							0
A112	ELECTRICAL ROOM	--	--	--							0
A113	BOILER ROOM	--	--	--							0
A114	SERVER ROOM	--	--	--							0
A115	STORAGE	--	--	--							0
B - ALT. GC-1											
B101	LANGUAGE SUPPORT	--	--	--							0
B102	H.C. TOILET/ SHOWER	TBD	RESTROOM	2A	•	•	•				1
B103	CHANGING AREA	--	--	--							0
B104	CALMING ROOM	--	--	--							0
B105	SENSORY ROOM	--	--	--							0
B106	STORAGE	--	--	--							0
B107	STORAGE	--	--	--							0
C - ALT. GC-2											
C101	STORAGE	--	--	--							0
C102	TITLE ONE OFFICE	--	--	--							0
C103	GUIDANCE OFFICE	--	--	--							0
C104	MEDIA CENTER	TBD	MAXIMUM OCCUPANCY	4A							1
C105	KINDERGARTEN CLASSROOM	--	--	--							0
D - ALT. GC-3											
D101	VESTIBULE	--	--	--							0
D102	MEN'S H.C. TOILET	TBD	MEN RESTROOM	2A	•		•				1
D103	WOMEN'S H.C. TOILET	TBD	WOMEN RESTROOM	2A	•	•					1
E - ALT. GC-4											
E101	PLATFORM	--	--	--							0
E102	GYMNASIUM	--	--	--							0



1 / A6.1 PANEL SIGN - INSTALL DETAIL (TYP)
1/2" = 1'-0"

TYPE 2A | SIZE: 8"x10"
NOT TO SCALE

TYPE 4A | SIZE: 8"x10"
NOT TO SCALE

TYPE 4B | SIZE: 8"x10"
NOT TO SCALE

GENERAL NOTE IN REFERENCE TO A6.1 DRAWINGS

1. INSTALL SIGNS LEVEL, PLUMB, AND AT THE HEIGHT INDICATED, WITH SIGN SURFACES FREE FROM DISTORTION OR OTHER DEFECTS IN APPEARANCE.
2. TACTILE CHARACTERS SHALL BE 48 INCHES MINIMUM ABOVE THE FLOOR, MEASURED TO THE BASELINE OF THE LOWEST TACTILE CHARACTER AND 60 INCHES MAXIMUM ABOVE THE FLOOR, MEASURED TO THE BASELINE OF THE HIGHEST TACTILE CHARACTER.
3. WHERE A TACTILE SIGN IS PROVIDED AT A DOOR, THE SIGN SHALL BE ALONGSIDE THE DOOR AT THE LATCH SIDE. WHERE A TACTILE SIGN IS PROVIDED AT DOUBLE DOORS WITH ONE ACTIVE LEAF, THE SIGN SHALL BE LOCATED ON THE INACTIVE LEAF. WHERE A TACTILE SIGN IS PROVIDED AT DOUBLE DOORS WITH TWO ACTIVE LEAVES, THE SIGN SHALL BE TO THE RIGHT OF THE RIGHT HAND DOOR. WHERE THERE IS NO WALL SPACE ON THE LATCH SIDE OF A SINGLE DOOR, OR TO THE RIGHT SIDE OF DOUBLE DOORS. SIGNS SHALL BE ON THE NEAREST ADJACENT WALL.
4. SIGNS CONTAINING TACTILE CHARACTERS SHALL BE LOCATED SO THAT A CLEAR FLOOR AREA 18 INCHES MINIMUM BY 18 INCHES MINIMUM, CENTERED ON THE TACTILE CHARACTERS, IS PROVIDED BEYOND THE ARC OF ANY DOOR SWING BETWEEN THE CLOSED POSITION AND 45 DEGREE OPEN POSITION.
   a. **EXCEPTION:** SIGNS WITH TACTILE CHARACTERS SHALL BE PERMITTED ON THE PUSH SIDE OF DOORS WITH CLOSERS AND WITHOUT HOLD OPEN DEVICES.
5. GENERAL CONTRACTOR SHALL COORDINATE WITH ELECTRICAL CONTRACTOR REGARDING NUMBERING FOR ELECTRICAL PANELS.
6. IN ADDITION TO THE SIGNAGE SCHEDULE PLEASE PROVIDE THE FOLLOWNG SIGN TYPES:
   a. SIGN TYPE 4A: 48 MEDIA CENTER & 185 CAFETERIA
   b. SIGN TYPE 4B: @ DOOR A101A

ROOM FINISH SCHEDULE LEGEND

FLOOR FINISH

CPT	CARPET
TZ	TERRAZZO
QSV	QUARTZ SHEET VINYL
RES	RESINOUS FLOORING
VCT	VINYL COMPOSITION TILE

FLOOR REMARKS

R1: NOT USED.
R2: SEE PLANS FOR VARYING FLOOR MATERIALS.
R3: PROVIDE RESINOUS FLOORS AT SHOWER.
R4. PROVIDE QUARTZ SHEET VINYL FLOOR IN WALK-IN COOLER & FREEZER.
R5-R25: NOT USED.

BASE FINISH

QSV	QUARTZ SHEET VINYL
RES	RESINOUS
RB	RUBBER
SGT	STRUCTURAL GLAZED TILE

BASE REMARKS

R26: NOT USED.
R27: PROVIDE RESINOUS BASE AT SHOWER.
R28: PROVIDE QUARTZ SHEET VINYL BASE AT WALK-IN COOLER & FREEZER.
R29-R50: NOT USED.

WALL FINISH

CT	CERAMIC TILE
EPX	EPOXY PAINT
PNT	PAINT
SGT	STRUCTURAL GLAZED TILE
WP	WALL PADS
SS	SIMULATED STONE

WALL REMARKS

R51: NOT USED.
R52: NOT USED.
R53: PROVIDE ACCENT WALL.
R54: PROVIDE 16"H STRIPE ABOVE EXISTING SGT WAINSCOT.
R55: PROVIDE CERAMIC TILE WALLS AT SHOWER.
R56: NOT USED.
R57: WALK-IN COOLER & FREEZER SHALL BE PRE-FABRICATED UNITS.
R58: NOT USED.
R59-R75: NOT USED

CEILING FINISH

ACT	ACOUSTICAL CEILING TILE
EPX	EPOXY PAINT
FRP	FIBERGLASS REINFORCED PANELS

CEILING REMARKS

R76: NOT USED.
R77: SEE REFLECTED CEILING PLANS FOR VARYING CEILING MATERIALS AND HEIGHTS.
R78: NOT USED.
R79: PROVIDE EPOXY PAINT AT SHOWER (EPX1).
R80: PROVIDE THE FOLLOWING ACCENT COLORS FOR PAINTED STRUCTURE SYSTEM:
   a. DECK - ETR
   b. JOIST - ETR
   c. DUCTWORK - PNT
R81: WALK-IN COOLER & FREEZER SHALL BE PRE-FABRICATED UNITS.
R82-R100: NOT USED

GENERAL NOTES

1. REFER TO SPECIFICATIONS FOR DETAILED DESCRIPTION OF FINISH SYSTEM/TYPES.
2. REFER TO WALL TYPES FOR MASONRY, GYPSUM WALLBOARD, & STRUCTURAL GLAZED TILE LOCATIONS AND DETAILS.
3. GYPSUM WALLBOARD BULKHEADS AND SOFFITS SHALL BE PAINTED AS NOTED.
4. HOLLOW METAL DOOR AND FRAMES, INTERIOR AND EXTERIOR, SHALL BE PAINTED AS NOTED.
5. INTERIOR AND EXTERIOR FERROUS METAL SHALL BE PAINTED INCLUDING LINTELS, RAILINGS, GRILLES AND LOUVERS AS NOTED. (DOES NOT INCLUDE FACTORY OR PRE-FINISHED ITEMS)
6. T=TREAD, R=RISER, L=LANDING, S=STRINGER
7. SEE I7 DRAWINGS FOR MATERIAL TRANSITIONS & FLOOR PATTERN PLANS.
8. ETR = EXISTING TO REMAIN
9. EXIST = EXISTING

ARCHITECTURAL REGISTRATION BOARD 8490 THOMAS C. CRABTREE STATE OF MARYLAND

PROFESSIONAL CERTIFICATION. I CERTIFY THAT THESE DOCUMENTS WERE PREPARED BY OR APPROVED BY ME AND THAT I AM A DULY LICENSED ARCHITECT UNDER THE LAWS OF THE STATE OF MARYLAND.
LICENSE NO. 8490
EXPIRATION DATE: 3/4/2021

REVISIONS

	MM-DD-YR	NAME	DESCRIPTION OF CHANGES

CRABTREE ROHRBAUGH & ASSOCIATES - ARCHITECTS
100 WEST ROAD, SUITE 402
TOWSON MD 21204
410-528-0272
www.cra-architects.com
MECHANICSBURG, PENNSYLVANIA
CHARLOTTESVILLE, VIRGINIA
WHITE SULPHUR SPRINGS, WEST VIRGINIA

ADDITION AND RENOVATIONS OF GALENA ELEMENTARY SCHOOL
KENT COUNTY PUBLIC SCHOOLS
114 S MAIN STREET
GALENA, MD 21635

ROOM FINISH & SIGNAGE SCHEDULE

PLOT SCALE: 1/2" = 1'-0"
FILENAME:
DATE: FEBRUARY 10, 2020

PROJECT 3309

A6.1

DOOR SCHEDULE

OPENING NUMBER	DOOR & FRAME U.L. RATING	DOOR						FRAME				GLAZING TYPE	HARDWARE SET	SPECIAL DETAIL	REMARKS
		DOOR TYPE	DOOR MATERIAL	DIMENSIONS				FRAME TYPE	FRAME MATERIAL	DETAILS					
				WIDTH		HEIGHT	THICKNESS			HEAD	JAMB				
				LEAF 1	LEAF 2										
A - BASE BID															
A101A	--	FG2	FRP	3' - 0"	3' - 0"	7' - 2"	1 3/4"	W2	ALUM	4/A6.3	5/A6.3	IG	01	6/A6.3	C
A101B	--	N	WD	2' - 4"	3' - 0"	7' - 2"	1 3/4"	ETR	ETR	--	--	TG	11	--	C, F
A102	--	F	WD	3' - 0"		7' - 0"	1 3/4"	H1	HM	1/A6.2	6/A6.2	--	04	--	E, F, G
A105A	--	FG2	WD	3' - 0"		7' - 2"	1 3/4"	H1	HM	5/A6.2	10 & 11/A6.2	TG	09	--	D, E, F
A105B	--	F	WD	3' - 0"	3' - 0"	7' - 2"	1 3/4"	H1	HM	5/A6.2	10/A6.2	--	10	--	D, E, F
A105C	--	F	WD	3' - 0"		7' - 2"	1 3/4"	ETR	ETR	--	--	--	09	--	B, D, E, F
A106	--	F	WD	3' - 0"		7' - 2"	1 3/4"	H1	HM	4/A6.2	9/A6.2	--	04	--	E, F
A107	--	G	WD	3' - 0"		7' - 2"	1 3/4"	H1	HM	4/A6.2	9/A6.2	TG	05	--	
A108		F	WD	3' - 0"		7' - 2"	1 3/4"	H1	HM	4/A6.2	9/A6.2		07	--	
A109	--	F	WD	3' - 0"		7' - 2"	1 3/4"	H1	HM	4/A6.2	9/A6.2	--	08	--	E, F
A110	--	F	WD	3' - 0"		7' - 2"	1 3/4"	H1	HM	4/A6.2	9/A6.2	--	06	--	E, F
A111	--	F	FRP	3' - 0"		7' - 2"	1 3/4"	W2	ALUM	7/A6.3	8/A6.3	--	02	6/A6.3	
A111A	45 MIN	F	HM	3' - 0"		7' - 2"	1 3/4"	H1	HM	2/A6.2	7/A6.2	--	03	--	
B - ALT. GC-1															
B101A	--	F	WD	3' - 0"		7' - 2"	1 3/4"	H1	HM	17/A6.2	18/A6.2	--	14	--	
B101B	--	F	ETR	3' - 0"		7' - 2"	1 3/4"	ETR	ETR	--	--	--	14	--	A
B102	--	F	WD	3' - 0"		7' - 2"	1 3/4"	H1	HM	13/A6.2	14/A6.2	--	15	--	
B104	--	N	WD	3' - 0"		7' - 2"	1 3/4"	H1	HM	15/A6.2	16/A6.2	TG	16	--	
B105	--	N	WD	3' - 0"		7' - 2"	1 3/4"	H1	HM	3/A6.2	8/A6.2	TG	16	--	
B106	--	F	WD	2' - 6"		7' - 0"	1 3/4"	ETR	ETR	--	--	--	13	--	B, E, F
B107	--	F	WD	2' - 8"		7' - 2"	1 3/4"	ETR	ETR	--	--	--	13	--	B, E, F
C - ALT. GC-2															
C102	--	N	WD	3' - 0"		7' - 2"	1 3/4"	H1	HM	3/A6.2	8/A6.2	TG	12	--	
C103	--	N	WD	3' - 0"		7' - 2"	1 3/4"	H1	HM	3/A6.2	8/A6.2	TG	12	--	
C104	--	F	WD	3' - 0"		7' - 2"	1 3/4"	ETR	ETR	--	--	--	13	--	B, E, F
D - ALT. GC-3															
D102	--	F	WD	3' - 0"		7' - 2"	1 3/4"	HM	HM	3/A6.2	8/A6.2	--	17	--	
D103	--	F	WD	3' - 0"		7' - 2"	1 3/4"	HM	HM	3/A6.2	8/A6.2	--	17	--	

REMARKS

A. EXISTING DOOR AND FRAME TO REMAIN, REPLACE EXISTING HARDWARE.

B. EXISTING DOOR FRAME TO REMAIN, REPLACE EXISTING DOOR AND HARDWARE.

C. PROVIDE PANIC HARDWARE AND CLOSER.

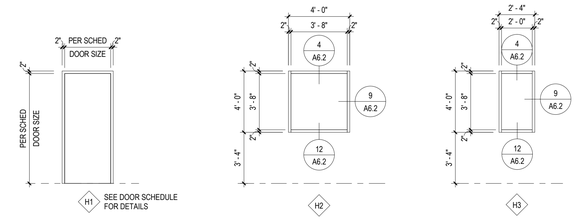
D. DOOR TO SWING 180 DEGREES.

E. PROVIDE DOOR CLOSER.

F. PROVIDE MANUAL HOLD OPEN.

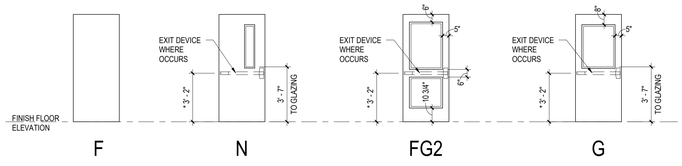
G. DOOR TO HAVE SEPARATE KEYING.

HOLLOW METAL ELEVATIONS

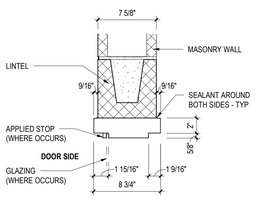


DOOR TYPES

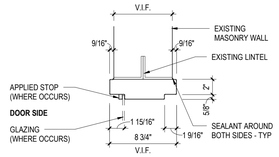
* - RECOMMENDED MOUNTING HEIGHT FROM FINISHED FLOOR TO CENTER LINE OF FIRE EXIT DEVICE
** - COORDINATE WITH DOOR MANUFACTURE REQUIREMENTS



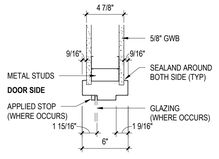
HOLLOW METAL FRAME DETAILS



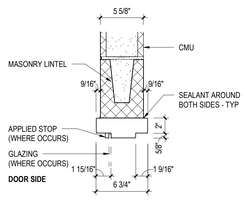
1 A6.2 HM INTERIOR HEAD - 8" CMU
1 1/2" = 1'-0"



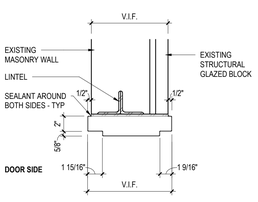
2 A6.2 HM EXTERIOR HEAD
1 1/2" = 1'-0"



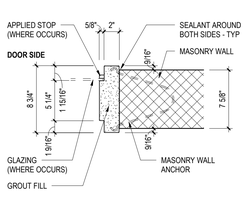
3 A6.2 HM INTERIOR HEAD - 3 5/8" STUD
1 1/2" = 1'-0"



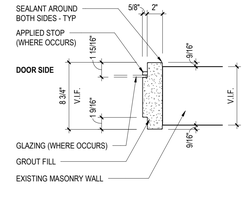
4 A6.2 HM INTERIOR HEAD - 6" CMU
1 1/2" = 1'-0"



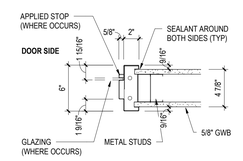
5 A6.2 HM INTERIOR HEAD - EXISTING CMU
1 1/2" = 1'-0"



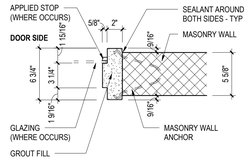
6 A6.2 HM INTERIOR JAMB - 8" CMU
1 1/2" = 1'-0"



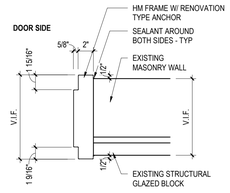
7 A6.2 HM EXTERIOR JAMB
1 1/2" = 1'-0"



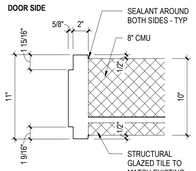
8 A6.2 HM INTERIOR JAMB - 3 5/8" STUD
1 1/2" = 1'-0"



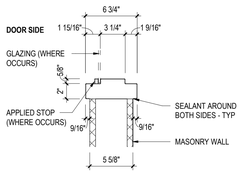
9 A6.2 HM INTERIOR JAMB - 6" CMU
1 1/2" = 1'-0"



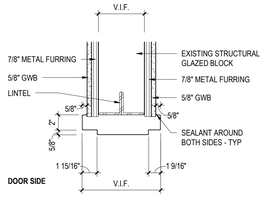
10 A6.2 HM INTERIOR JAMB - EXISTING CMU
1 1/2" = 1'-0"



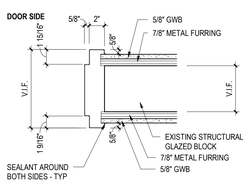
11 A6.2 HM INTERIOR JAMB - CMU
1 1/2" = 1'-0"



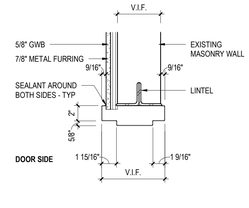
12 A6.2 HM INTERIOR SILL - 6" CMU
1 1/2" = 1'-0"



13 A6.2 HM INTERIOR HEAD - EXISTING CMU
1 1/2" = 1'-0"



14 A6.2 HM INTERIOR JAMB - EXISTING CMU
1 1/2" = 1'-0"



15 A6.2 HM INTERIOR HEAD - EXISTING CMU
1 1/2" = 1'-0"

16 A6.2 HM INTERIOR JAMB - EXISTING CMU
1 1/2" = 1'-0"

17 A6.2 HM INTERIOR HEAD - EXISTING CMU
1 1/2" = 1'-0"

18 A6.2 HM INTERIOR JAMB - EXISTING CMU
1 1/2" = 1'-0"

CRABTREE ROHRBAUGH & ASSOCIATES - ARCHITECTS
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ADDITION AND RENOVATIONS OF GALENA ELEMENTARY SCHOOL
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114 S MAIN STREET
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ARCHITECTURAL REGISTRATION BOARD 8490 THOMAS C. CRABTREE STATE OF MARYLAND

PROFESSIONAL CERTIFICATION. I CERTIFY THAT THESE DOCUMENTS WERE PREPARED BY OR APPROVED BY ME AND THAT I AM A DULY LICENSED ARCHITECT UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 8490 EXPIRATION DATE: 3/4/2021

REVISIONS

MM-DD-YR	NAME	DESCRIPTION OF CHANGES

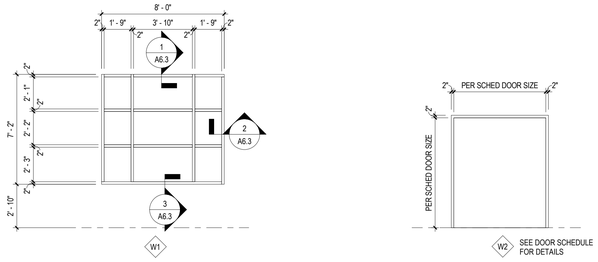
DOOR SCHEDULE & HOLLOW METAL FRAME ELEVATION & DETAILS

PLOT SCALE: As indicated
FILENAME:
DATE: FEBRUARY 10, 2020

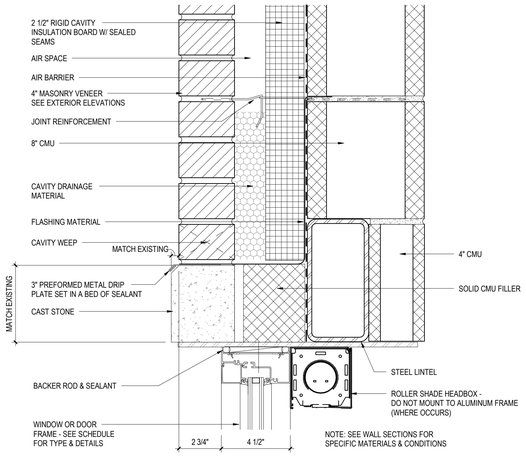
PROJECT 3309

A6.2

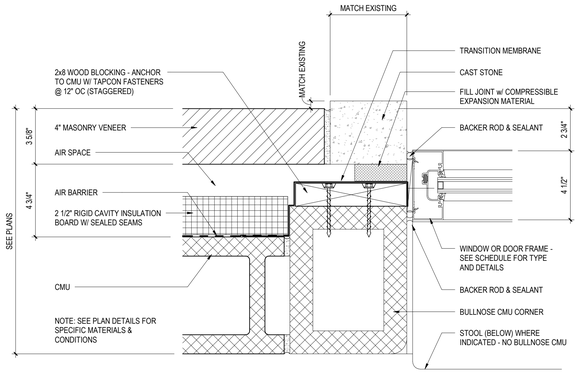
ALUMINUM STOREFRONT ELEVATIONS



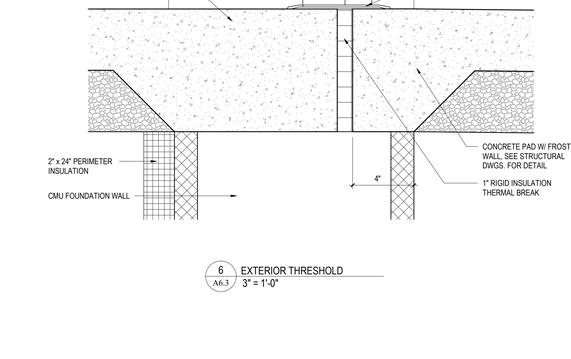
ALUMINUM STOREFRONT DETAILS



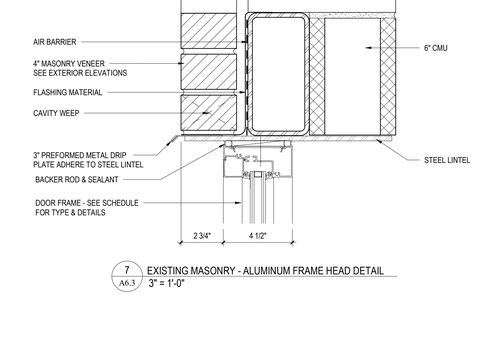
1 A6.3 TYP MASONRY - ALUMINUM FRAME HEAD DETAIL
3" = 1'-0"



2 A6.3 TYP MASONRY - ALUMINUM FRAME JAMB DETAIL
3" = 1'-0"



3 A6.3 TYP MASONRY - ALUMINUM FRAME SILL DETAIL
3" = 1'-0"

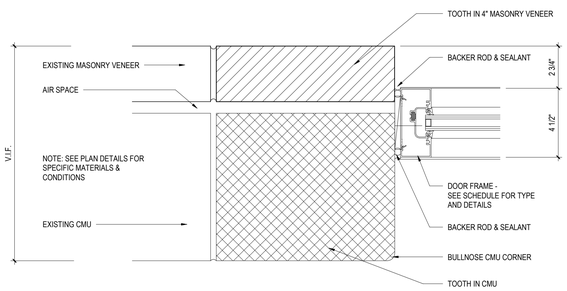


4 A6.3 TYP MASONRY - ALUMINUM FRAME HEAD DETAIL
3" = 1'-0"

5 A6.3 TYP MASONRY - ALUMINUM FRAME JAMB DETAIL
3" = 1'-0"

6 A6.3 EXTERIOR THRESHOLD
3" = 1'-0"

7 A6.3 EXISTING MASONRY - ALUMINUM FRAME HEAD DETAIL
3" = 1'-0"



8 A6.3 EXISTING MASONRY - ALUMINUM FRAME JAMB DETAIL
3" = 1'-0"

ARCHITECTURAL REGISTRATION BOARD
8490
THOMAS C. CRABTREE
STATE OF MARYLAND

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REVISIONS

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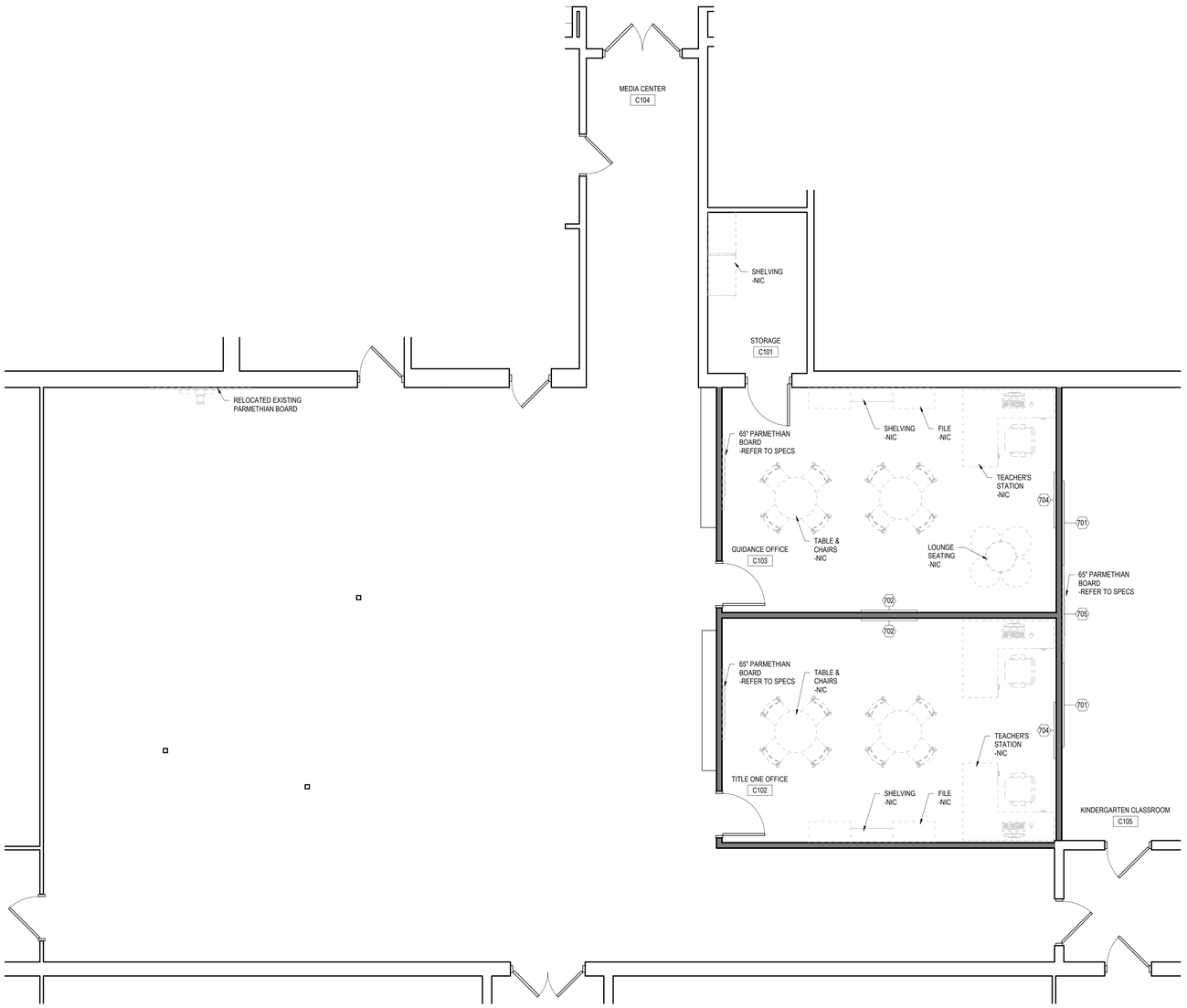
GALENA, MD 21635

ALUMINUM WINDOW ELEVATIONS & DETAILS

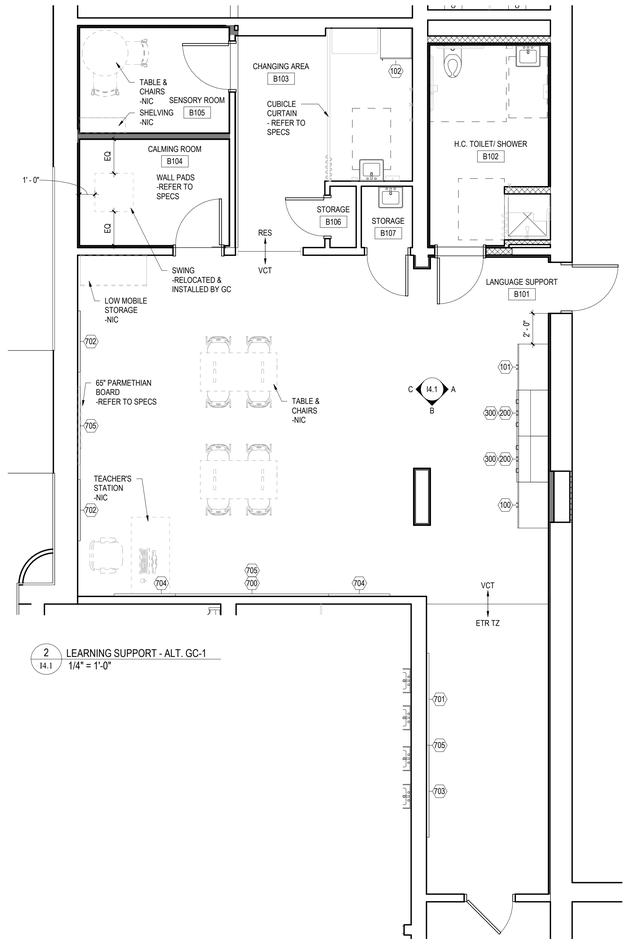
PLOT SCALE: As indicated
FILENAME:
DATE: FEBRUARY 10, 2020

PROJECT 3309

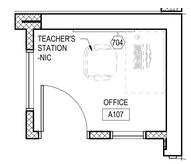
A6.3



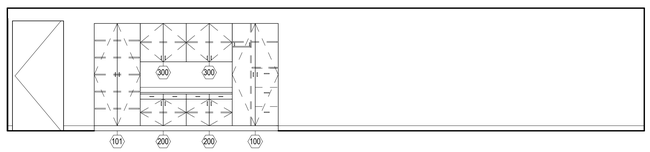
1 / I4.1 MEDIA CENTER & OFFICES - ALT. GC-2
1/4" = 1'-0"



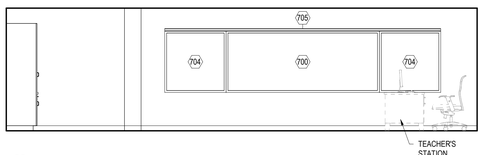
2 / I4.1 LEARNING SUPPORT - ALT. GC-1
1/4" = 1'-0"



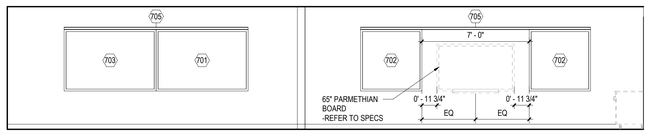
3 / I4.1 KITCHEN OFFICE - BASE BID
1/4" = 1'-0"



A / I4.1 INTERIOR ELEVATION A
1/4" = 1'-0"



B / I4.1 INTERIOR ELEVATION B
1/4" = 1'-0"



C / I4.1 INTERIOR ELEVATION C
1/4" = 1'-0"

GRADE PRE-K-5 MOUNTING HEIGHT SCHEDULE	
MARKER BOARD	2'-6" AFF TO BOTTOM EDGE
TACK BOARD	2'-6" AFF TO BOTTOM EDGE
BASE CABINETS	2'-6" AFF TO TOP OF CABINET
WALL CABINETS	7'-0" AFF TO TOP OF CABINET
PARMETHIAN BOARD	REFER TO SPECS AND GC TO FURNISH & INSTALL COORDINATE W/ OWNER IN THE FIELD

ADMINISTRATION MOUNTING HEIGHT SCHEDULE	
MARKER BOARD	3'-0" AFF TO BOTTOM EDGE
TACK BOARD	3'-0" AFF TO BOTTOM EDGE
PARMETHIAN BOARD	REFER TO SPECS AND GC TO FURNISH & INSTALL COORDINATE W/ OWNER IN THE FIELD
ADMINISTRATION MOUNTING HEIGHT SCHEDULE SHALL BE APPLIED TO ALL ROOMS IN THE GUIDANCE AND OFFICES.	

I4.1 - GENERAL CASEWORK AND EQUIPMENT SCHEDULE

NO	DESCRIPTION	MANUFACTURER	MODEL	DIMENSIONS
100	2-DOOR TEACHER'S WARDROBE - FIXED SHELF, ROD, PIN TRAY & MIRROR. MODIFIED TO INCLUDE LOCK, (3) FILE DRAWERS, & (2) ADJ. SHELVES	CASE SYSTEMS	T2780M	36"W x 24"D x 84"H
101	2-DOOR TALL STORAGE	CASE SYSTEMS	T0100	36"W x 24"D x 84"H
102	1-DOOR TALL STORAGE - RIGHT HINGED	CASE SYSTEMS	T0120	24"W x 24"D x 84"H
200	2-DOOR/2-DRAWER BASE CABINET	CASE SYSTEMS	B3100	36"W x 24"D x 30"H
300	2-DOOR WALL CABINET	CASE SYSTEMS	W0100	36"W x 14"D x 30"H
700	MARKERBOARD	SEE SPECIFICATIONS	SEE SPECIFICATIONS	10'-0"W x 4'-0"H
701	MARKERBOARD	SEE SPECIFICATIONS	SEE SPECIFICATIONS	6'-0"W x 4'-0"H
702	MARKERBOARD	SEE SPECIFICATIONS	SEE SPECIFICATIONS	4'-0"W x 4'-0"H
703	TACK BOARD	SEE SPECIFICATIONS	SEE SPECIFICATIONS	6'-0"W x 4'-0"H
704	TACK BOARD	SEE SPECIFICATIONS	SEE SPECIFICATIONS	4'-0"W x 4'-0"H
705	TACK STRIP	SEE SPECIFICATIONS	SEE SPECIFICATIONS	WIDTH TO FIT x 2"H

GENERAL NOTE IN REFERENCE TO I4.1
1. ALL CASEWORK SHALL RECEIVE LOCKS.

GENERAL NOTE IN REFERENCE TO ALL DRAWINGS
1. PROVIDE FLASH PATCHING FOR CONTINUOUS TRANSITION OF ADJOINING MATERIAL.

FLOOR TRANSITION SCHEDULE	
CPT TO TZ	JOHNSONITE NO. CE-XX-C
CPT TO VCT	JOHNSONITE NO. CTA-XX-K
VCT TO TZ	JOHNSONITE NO. CTA-XX-K
VCT TO RES	MARBLE
TZ TO RES	MARBLE
CPT TO RES	MARBLE
EXISTING AWD TO VCT	LOW MOUNT THRESHOLD: ALUMINUM
SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION.	

GENERAL NOTES TO APPLY TO ALL I4 DRAWINGS

1. MOUNTING HEIGHT SCHEDULE IS APPLICABLE TO MOST ROOMS. IN INSTANCE WHERE NOTE/DETAILS ON DRAWINGS DO NOT COINCIDE WITH THE SCHEDULE. THE DRAWINGS TAKE PRECEDENCE.
2. ALL BASE CABINETS SHALL RECEIVE A CONTINUOUS 1-1/4" THICK LAMINATE COUNTERTOP WITH A 4"H BACKSPLASH UNLESS NOTED OTHERWISE. THE DEPTH OF THE COUNTERTOP SHALL EXTEND 3/4" PAST THE DEPTH OF THE BASE CABINET.
3. COUNTERTOPS THAT RETURN INTO A WALL(S) SHALL RECEIVE BACKSPLASH THAT WRAPS CORNER ALONG WALL(S).
4. PROVIDE CHAMFERED EDGE CORNER FOR ALL COUNTERTOPS ADJACENT TO ALL TALL STORAGE UNITS.
5. WHERE COLUMNS, WINDOWS OR OTHER BUILDING COMPONENTS CONFLICT WITH CASEWORK DIMENSIONAL REQUIREMENTS. FIELD VERIFY DIMENSIONS AND PROVIDE CUSTOM UNIT TO ALLOW PROPER FITTING.
6. ALL EXPOSED ENDS OF CASEWORK SHALL RECEIVE FINISHED END PANELS.
7. LAMINATE COLOR FOR INTERIOR OF OPEN CABINETS SHALL MATCH EXTERIOR LAMINATE COLOR.
8. ALL VISUAL DISPLAY AREAS (MARKER BOARDS AND/OR TACK BOARDS) 10'-0"W OR LONGER SHALL RECEIVE 2"H MAP RAIL THAT SPANS FROM VERTICAL EDGE TO VERTICAL EDGE.
9. PROVIDE WOOD BLOCKING IN METAL STUD WALLS, PER MANUFACTURER'S RECOMMENDATIONS, TO RECEIVE THE TELEVISION WALL BRACKET.
10. IN ROOMS RECEIVING RESILIENT BASE, ADHERE TO ALL WALLS, BASE CABINET TOE KICKS, AND EXPOSED END PANELS. REFER TO SPECIFICATIONS FOR LOCATION OF 4" AND 6" BASE.
11. SEE REFLECTED CEILING PLANS FOR LOCATION OF WINDOW TREATMENTS.
12. TELEPHONE UNITS AND SYSTEMS ARE NOT IN CONTRACT.
13. COORDINATE ALL LARGE SCALE PLANS WITH MECHANICAL, ELECTRICAL AND PLUMBING DRAWINGS.
14. NIC = NOT IN CONTRACT
15. WHEN DESCRIPTION AND MODEL NUMBER IN CASEWORK AND EQUIPMENT SCHEDULE CONFLICT, THE DESCRIPTION TAKES PRECEDENCE.

ARCHITECTURAL REGISTRATION BOARD
8490
THOMAS C. CRABTREE
STATE OF MARYLAND

PROFESSIONAL CERTIFICATION.
I CERTIFY THAT THESE DOCUMENTS WERE PREPARED BY OR APPROVED BY ME AND THAT I AM A DULY LICENSED ARCHITECT UNDER THE LAWS OF THE STATE OF MARYLAND.
LICENSE NO. 8490
EXPIRATION DATE: 3/4/2021

REVISIONS

MM-DD-YR	NAME	DESCRIPTION OF CHANGES

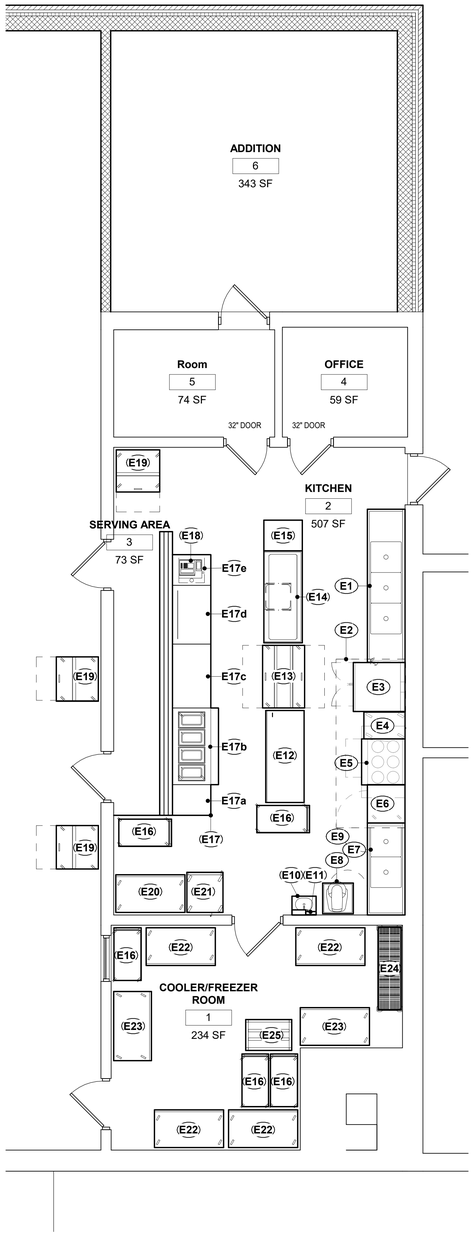
CRABTREE ROHRBAUGH & ASSOCIATES - ARCHITECTS
401 EAST WINDING HILL ROAD
MECHANICSBURG PA 17055
717-458-0272
www.cra-architects.com
TOWSON, MARYLAND
CHARLOTTESVILLE, VIRGINIA
WHITE SULPHUR SPRINGS, WEST VIRGINIA

ADDITION AND RENOVATIONS OF GALENA ELEMENTARY SCHOOL
KENT COUNTY PUBLIC SCHOOLS
114 S MAIN STREET
GALENA, MD 21635

LARGE SCALE LAYOUTS MEDIA CENTER/OFFICES, LANGUAGE SUPPORT, & KITCHEN OFFICE
PLOT SCALE: 1/4" = 1'-0"
FILENAME:
DATE: FEBRUARY 10, 2020

PROJECT 3309

I4.1



KITCHEN EQUIPMENT PLAN

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

EQUIPMENT SCHEDULE

ITEM	QTY.	DESCRIPTION	REMARKS
E1	1	POT WASHING SINK	
E2	1	VENTILATOR	
E3	1	CONVECTION OVEN	
E4	1	REACH-IN HEATED CABINET, MOBILE	
E5	1	RANGE W/ OVEN BASE	
E6	1	REACH-IN HEATED CABINET, MOBILE	
E7	1	PREP SINK	
E8	1	20-QT MIXER	
E9	1	MIXER STAND, MOBILE	
E10	1	HAND SINK	
E11	1	SOAP & TOWEL DISPENSER	
E12	1	BAKER'S TABLE	W/ UTILITY TREE
E13	1	MILK COOLER, MOBILE	
E14	1	WORKTABLE	
E15	1	WORKTABLE	
E16	5	UTILITY CART, MOBILE	
E17	1	SERVING COUNTER	
E17a	1	SOLID TOP COUNTER	
E17b	1	HOT FOOD COUNTER	
E17c	1	SOLID TOP COUNTER	
E17d	1	WORKTABLE	
E17e	1	CASHIER'S STAND	
E18	1	CASH REGISTER	
E19	3	MILK COOLER, MOBILE	
E20	1	REACH-IN REFRIGERATOR, MOBILE	
E21	1	REACH-IN HEATED CABINET, MOBILE	
E22	4	REACH-IN FREEZER, MOBILE	
E23	2	REACH-IN REFRIGERATOR, MOBILE	
E24	1	SHELVING	
E25	1	DUNNAGE RACK	

(N.I.C.) - NOT IN CONTRACT.

(N.I.K.E.C.) - NOT IN KITCHEN EQUIPMENT CONTRACT.

THE USE OF SEALANTS IN FOOD SERVICE EQUIPMENT

1. ALL SEALANTS MUST BE LISTED AS APPROVED BY THE NATIONAL SANITATION FOUNDATION (NSF) UNDER 51.
2. SEALANTS SHALL BE USED ONLY ON STRUCTURALLY SOUND JOINTS AND SEAMS.
3. SEALANTS MAY BE USED TO FILL SPACES AND OPENINGS SUCH AS, BUT NOT LIMITED TO, BLIND RIVET HEADS AND SLOT AND PHILLIPS HEAD SCREWS.
4. OPENINGS AROUND SERVICE AND UTILITY LINES SHOULD BE CLOSED INSOFAR AS PRACTICAL BY:
   A. COLLARS AND GROMMETS.
   B. FLEXIBLE FORM GASKETS.

   SEALANTS MAY BE USED TO SEAL SERVICE AND UTILITY LINES TO WALL AND ADJACENT PIECES OF EQUIPMENT WHERE THE SPACING IS. CLOSED TO LESS THAN 1/8 OF INCH.
5. SEALANTS MAY NOT BE UTILIZED IN FOOD AND SPLASH CONTACT SURFACES, TO FILL OPEN SPACES, OR VOIDS WHICH RESULT DUE TO IMPROPER DESIGN OR FABRICATION. ANY OPENING IN EXCESS OF 1/8 INCH SHALL BE CONSIDERED EXCESSIVE AND MUST BE CLOSED USING PROPER FIELD JOINTS.

GENERAL HEALTH DEPARTMENT NOTATIONS

1. ALL PIPING, CONDUIT, BX CABLE AND SIMILAR CONSTRUCTION WILL BE EITHER LOCATED INSIDE A WALL OR INSTALLED WITH A MINIMUM 3/4" SPACE FROM THE WALL OR SEALED TO THE WALL.
2. ALL DOORS TO THE OUTSIDE WILL BE SELF-CLOSING AND RODENT-PROOF.
3. A MINIMUM OF FIFTY (50) FOOT-CANDLES OF SHIELDED LIGHT WILL BE PROVIDED AT ALL WORK SURFACES, STORAGE AREAS, FOOD PREPARATION AREAS, UTENSIL WASHING AREAS, TOILET ROOMS, LOCKER ROOMS AND IN THE GARBAGE AND RUBBISH STORAGE AREAS.
4. ALL RESTROOM DOORS WILL BE SELF-CLOSING.
5. ALL RESTROOMS WILL BE EQUIPPED WITH MECHANICAL EXHAUST VENTILATION SIZED AT A MINIMUM RATE OF TWO (2) CUBIC FEET PER MINUTE PER SQUARE FOOT OF FLOOR AREA AND EXHAUSTING DIRECTLY TO THE OUTSIDE.
6. ALL FLOOR MOUNTED EQUIPMENT WILL BE PLACED ON NATIONAL SANITATION FOUNDATION (NSF) APPROVED SIX (6) INCH LEGS, OR THE EQUIVALENT, AND PROPERLY SPACED FROM ADJACENT EQUIPMENT OR WALLS, OR PLACED ON NSF APPROVED CASTERS, OR THE EQUIVALENT, OR PROPERLY SEALED TO ALL ADJACENT SURFACES.
7. ALL COUNTER MOUNTED FOODSERVICE EQUIPMENT WEIGHING IN EXCESS OF EIGHTY (80) POUNDS WILL BE MOUNTED ON NSF APPROVED FOUR (4) INCH HIGH LEGS.
8. ALL EXPOSED RAW WOOD WILL BE SEALED.
9. ALL ANNULAR OPENINGS IN CONSTRUCTION WILL BE SEALED TO WITHIN 1/32TH OF AN INCH.
10. ALL AISLES WILL BE A MINIMUM OF THIRTY-SIX (36) INCHES WIDE PER NATIONAL FIRE PROTECTION ASSOCIATION 101.
11. THE OUTSIDE STORAGE OF REFUSE WILL BE IN RODENT-PROOF CONTAINERS LOCATED ON A PAVED SURFACE.
12. ALL SINK INSTALLATIONS WILL BE EQUIPPED WITH HOT AND COLD RUNNING WATER THROUGH A MIXING VALVE OR COMBINATION FAUCET.
13. ALL PAINTING WILL BE WITH LEAD-FREE, NON-METALLIC ENAMEL PAINT OR A HIGH QUALITY VARNISH.
14. WASTE WATER FROM ALL APPLICABLE FOODSERVICE EQUIPMENT WILL BE INDIVIDUALLY PLUMBED TO AN OPEN SITE DRAIN WITH A MINIMUM ONE INCH AIR GAP.

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18219-A Flower Hill Way ■ Gaithersburg, MD 20879
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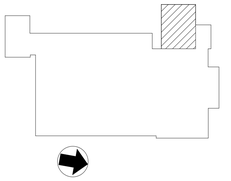
ARCHITECTURAL REGISTRATION BOARD 8490 THOMAS C. CRABTREE STATE OF MARYLAND

PROFESSIONAL CERTIFICATION. I CERTIFY THAT THESE DOCUMENTS WERE PREPARED BY OR APPROVED BY ME AND THAT I AM A DULY LICENSED ARCHITECT UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 8490 EXPIRATION DATE: 3/4/2021

KEY PLAN



REVISIONS

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114 S MAIN STREET
GALENA, MD 21635

CR

EXISTING KITCHEN EQUIPMENT PLAN

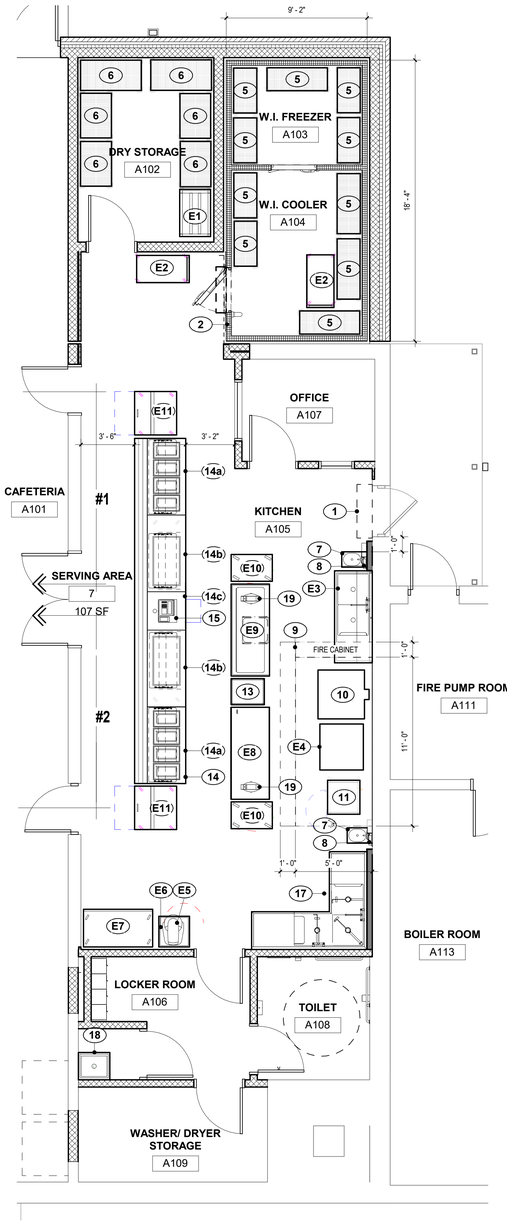
PLOT SCALE: 1/4" = 1'-0"

FILENAME:

DATE: FEBRUARY 10, 2020

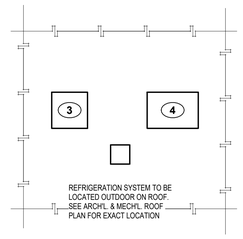
PROJECT 3309

K-100



KITCHEN EQUIPMENT PLAN

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



EQUIPMENT SCHEDULE

ITEM	QTY.	DESCRIPTION	REMARKS
1	1	FLY FAN	
2	1	WALK-IN COOLER/FREEZER	W/ AIR CURTAINS
3	1	COOLER REFRIGERATION SYSTEM	LOCATED OUTDOORS ON ROOF
4	1	FREEZER REFRIGERATION SYSTEM	LOCATED OUTDOORS ON ROOF
5	10	SHELVING, MOBILE	
6	6	SHELVING, MOBILE	
7	2	HAND SINK	12"WIDE WITH ENDSPLASHES
8	2	SOAP & TOWEL DISPENSER	
9	1	VENTILATOR	W/ FIRE PROTECTION SYSTEM
10	1	CONVECTION OVEN	DOUBLE STACKED
11	1	STEAMER	DOUBLE COMPARTMENT
12	1	SPARE NUMBER	
13	1	PAN RACK	
14	1	SERVING COUNTER	
14a	2	HOT FOOD COUNTER	W/ FILL FAUCET
14b	2	FROST TOP COUNTER	
14c	1	CASHIER'S STAND	
15	1	CASH REGISTER	(N.I.C.) - FURNISHED BY OWNER
16	1	SPARE NUMBER	
17	1	POT WASHING SINK	
18	1	MOP SINK & RACK	
19	2	RETRACTABLE CORD REEL	
E1	1	DUNNAGE RACK	
E2	2	UTILITY CART, MOBILE	
E3	1	PREP SINK	
E4	1	RANGE W/ OVEN BASE	
E5	1	MIXER, 20 QUART	
E6	1	MIXER STAND, MOBILE	
E7	1	REACH-IN REFRIGERATOR	
E8	1	BAKER'S TABLE	W/ UTILITY RACK
E9	1	WORKTABLE	
E10	2	HEATED CABINET, MOBILE	
E11	2	MILK COOLER, MOBILE	

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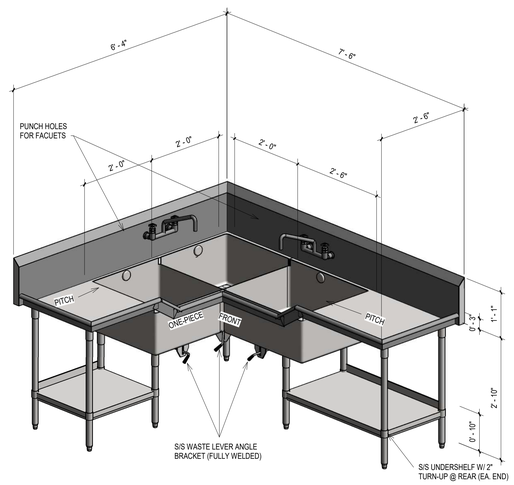

POT WASHING SINK (17)

SCALE: 3/4"=1'-0"

VIEW AT SERVING LINE - A

VIEW AT SERVING LINE - B

VIEW AT SERVING LINE & WALK-IN BOX

VIEW AT SERVING LINE - C

VIEW AT COOKING, VEG. PREP & PREP AREA

VIEW AT COOKING AREA & DISHWASHING

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18219-A Flower Hill Way ■ Gaithersburg, MD 20879
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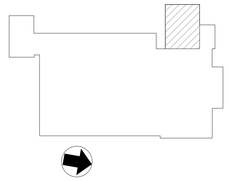

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KITCHEN EQUIPMENT PLAN

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

FILENAME:

DATE: FEBRUARY 10, 2020

PROJECT 3309

K-101

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VENTILATION SCHEDULE

NO.	SIZE	C.F.M. EXHAUST	C.F.M. SUPPLY	W.G.S.P.@ COLLAR	TOTAL C.F.M.	CONN. HGT. A.F.F.	DESCRIPTION
1	16" DIA.	2475		-0.872"	2475	9' - 6"	
2	12" x 28"		663 (3)	0.167"	1989	9' - 6"	W/ BUILT-IN BALANCING DAMPER

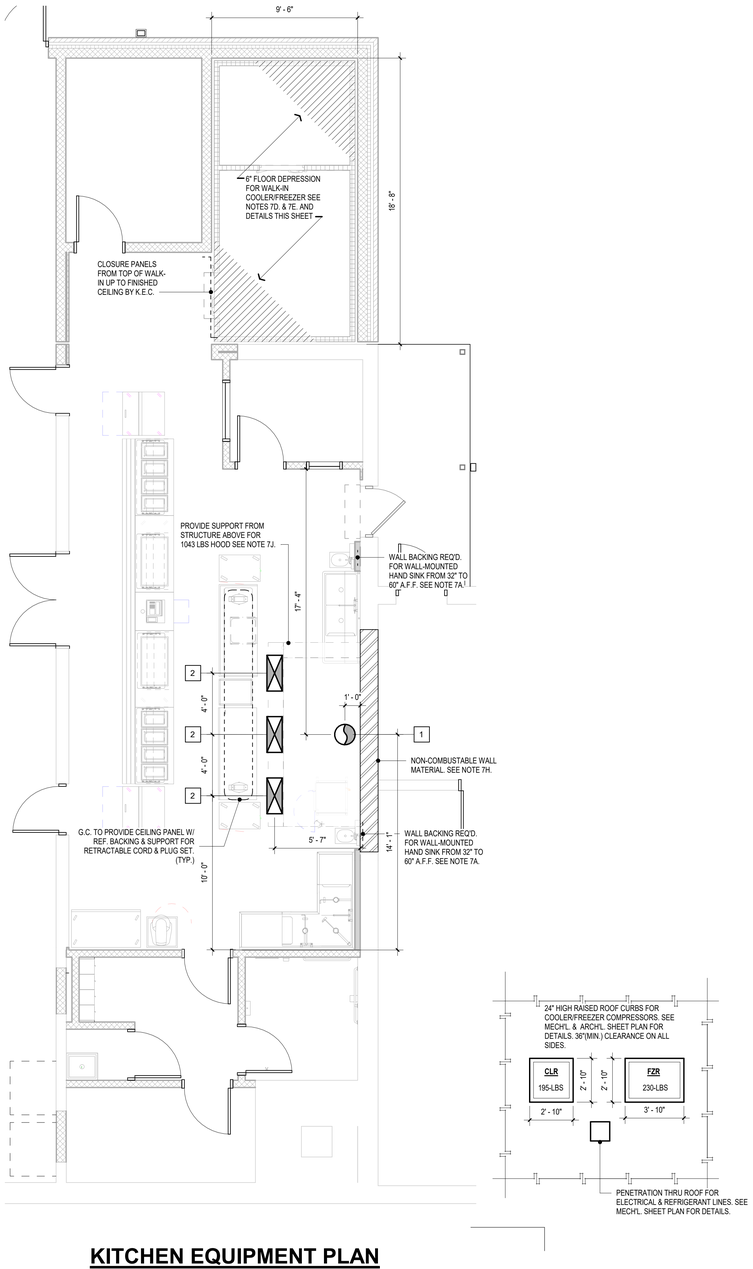
* PROVIDE TEMPERED SUPPLY AIR DURING WINTER MONTHS: 55° to 60°F.
SEE SHEET K-501, K-502 & K-503 FOR FURTHER VENTILATOR DETAILS.

BUILDING CONDITIONS & VENTILATION NOTE:

- FLOOR DEPRESSION
- NON-COMBUSTIBLE WALL MATERIAL
- FINISHED WALL OPENING
- WALL BACKING
- EXHAUST DUCT/GRILL
- SUPPLY DUCT/GRILL
- # VENTILATION ROUGH-IN PLAN DESIGNATION

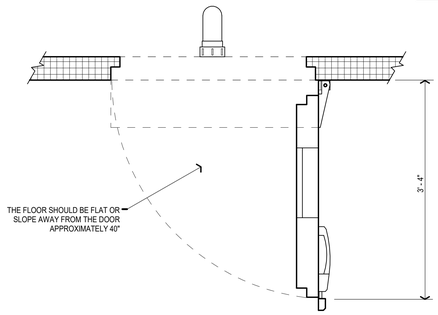
BUILDING CONDITIONS & VENTILATION NOTE:

1. ALL WORK INDICATED ON THIS PLAN AND IN THESE NOTES SHALL BE BY OTHER THAN. THE KITCHEN EQUIPMENT CONTRACTOR, UNLESS NOTED BY "K.E.C.".
2. WALLS, FLOORS AND CEILINGS IN KITCHEN, PREP, SERVICE, AND DISHWASHING AREAS, OR ANY OTHER LOCATION WHERE FOOD OR BEVERAGES ARE PREPARED, SHALL BE SMOOTH, EASILY- CLEANABLE, NON-ABSORBANT, AND DURABLE. WALLS AND CEILINGS SHALL BE LIGHT COLORED.
3. PARTITION WALLS BETWEEN KITCHEN AREAS AND PUBLIC AREAS SHALL BE CONTRUCTED FOR MAXIMUM SOUND CONTROL.
4. MINIMUM VENTILATION REQUIREMENTS:
   A. KITCHEN, SERVICE, PREP AND DISHWASHING AREAS: 4 TO 6 AIR CHANGES PER HOUR.
   B. STOREROOMS: 2 TO 3 AIR CHANGES PER HOUR.
   C. OFFICES: 4 AIR CHANGES PER HOUR. (RECOMMEND AIR CONDITIONING).
   D. REFRIGERATION CONDENSING UNITS: 750 C.F.M. PER H.P., SUPPLY AND EXHAUST.
   E. OTHER AREAS: AS REQUIRED BY CODES OR AS NOTED.
   F. VERIFY VENTILATION REQUIREMENTS SHOWN ARE IN COMPLIANCE WITH LOCAL CODES.
5. FINAL DUCT CONNECTIONS SHALL BE BY MECHANICAL CONTRACTOR, OR EQUIVALENT, UNLESS NOTED.
6. FLOOR LOADING CAPACITY SHALL BE A MINIMUM OF 100 LBS. PER SQUARE FOOT OR AS REQUIRED BY LOCAL CODES.
7. GENERAL CONTRACTOR (G.C.) OR EQUIVALENT SHALL:
   A. PROVIDE IN-WALL REINFORCING OR BACKING, AS REQUIRED, FOR WALL-MOUNTED EQUIPMENT; COORDINATE WITH K.E.C.
   B. SLOPE FLOOR TO FLOOR SINKS, FLOOR DRAINS, OR FLOOR TROUGHS.
   C. PROVIDE DOOR/WALL OPENINGS AND/OR PASSAGES TO ASSURE ACCESS FOR ALL KITCHEN EQUIPMENT. COORDINATE OPENING REQUIREMENTS WITH K.E.C.
   D. PROVIDE WALK-IN COOLER/FREEZER DEPRESSIONS, SMOOTH AND TRANSIT-LEVEL, WHERE DEPRESSIONS ARE REQUIRED. DEPTH AS NOTED.
   E. FILL EXCESS DEPRESSIONS AROUND WALK-IN COOLER/FREEZER WITH GROUT, FINISH FLOOR MATERIAL, AND COVED BASE, AFTER COOLER/FREEZER IS INSTALLED BY
   F. PROVIDE SOLID MASONRY CURBS WITH TROWEL-SMOOTH AND LEVEL FINISH.
   G. PROVIDE FIRE-RATED MATERIALS AND/OR INSULATION AS REQUIRED FOR EXHAUST DUCTS, VENT STACKS, ROOF/WALL PENETRATIONS, ETC. PER LOCAL CODES.
   H. PROVIDE FIRE-RATED PARTITIONS WHERE NOTED AROUND COOKING/HEAT PRODUCING EQUIPMENT PER LOCAL CODES.
   I. PROVIDE COVED-BASE MOLDING OR COVED INTEGRAL FLOOR MATERIALS AS REQUIRED AT ALL VERTICAL SURFACES OF KITCHEN FLOORS.
   J. PROVIDE 1/2" DIAMETER (MINIMUM) HANGER RODS FROM STRUCTURE ABOVE CEILING AS REQUIRED FOR VENTILATORS AND CEILING-MOUNTED EQUIPMENT, WHERE NOTED.



KITCHEN EQUIPMENT PLAN
SCALE: 1/4"=1'-0"

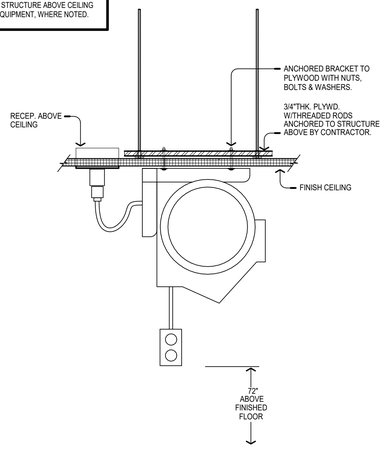
NOTE: SEE ARCH'L. & MECH'L. SHEET PLAN FOR ROOF CURB DETAIL & PIPE PENETRATION ENCLOSURE DETAIL.



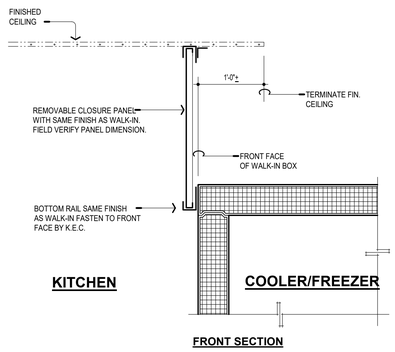
NOTE:
WHEN QUARRY TILES ARE USED, THE FINISHED FLOOR CANNOT BE HIGHER THAN THE THRESHOLD IN FRONT OF THE WALK-IN DOOR. IF THE FLOOR IS HIGHER THAN THE DOOR, THE DOOR WILL DRAG ON THE FLOOR AND NOT CLOSE. THE DOOR SWEEP WILL ALSO BE DAMAGED.

NOTE:
KEEP THE WALK IN DOORS OPEN WHEN INSTALLING THICKSET, TILE AND GROUT. THE OFF GASSES WILL DAMAGE THE FITTINGS AND WALL FINISH IN THE WALK-IN.

WALK-IN COOLER/FREEZER DOOR CLEARANCE
SCALE: NTS.

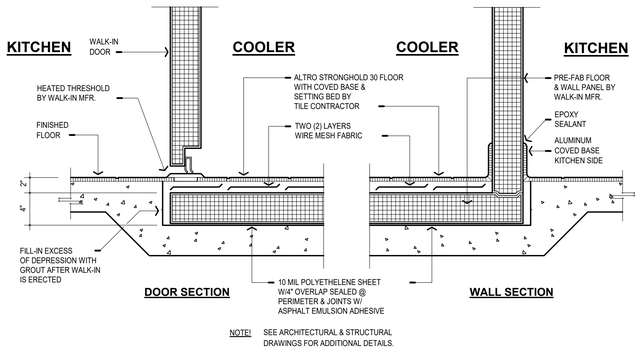


CORD REEL CEILING SUPPORT DETAIL
SCALE: NTS.



FRONT SECTION

WALK - IN CLOSURE PANEL DETAIL
SCALE: NTS.

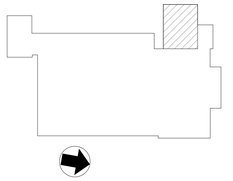


DOOR SECTION WALL SECTION

NOTE! SEE ARCHITECTURAL & STRUCTURAL DRAWINGS FOR ADDITIONAL DETAILS.

WALK-IN FLOOR DETAIL
SCALE: NTS.

KEY PLAN



REVISIONS

#	MM-DD-YR	NAME	DESCRIPTION OF CHANGES

CRABTREE ROHRBAUGH & ASSOCIATES - ARCHITECTS
100 WEST ROAD, SUITE 402
TOWSON MD 21204
410-528-0272
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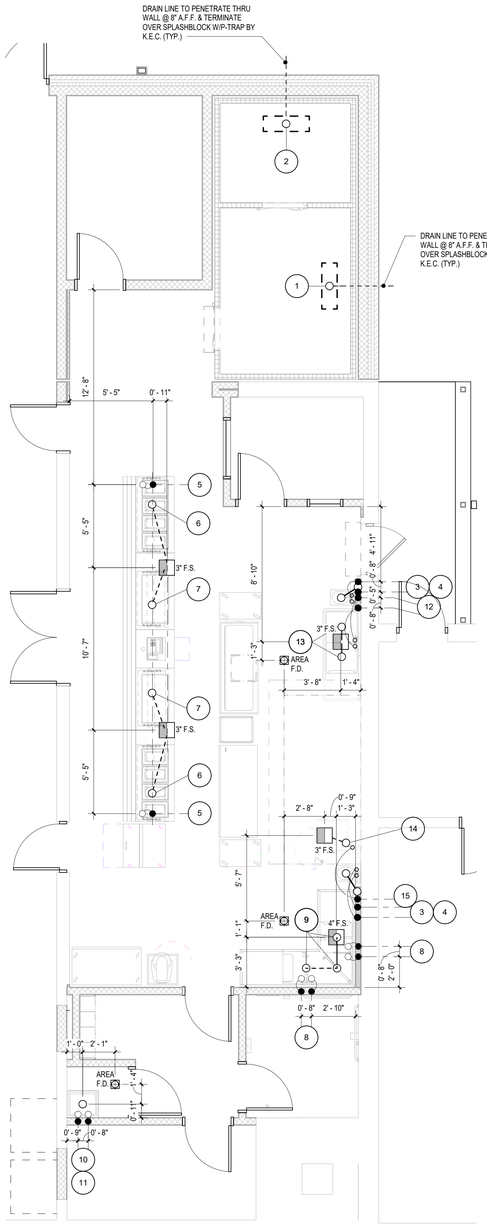
ADDITION AND RENOVATIONS OF GALENA ELEMENTARY SCHOOL
KENT COUNTY PUBLIC SCHOOLS
114 S MAIN STREET
GALENA, MD 21635

BUILDING CONDITIONS & VENTILATION PLAN

PLOT SCALE: 1/4" = 1'-0"
FILENAME:
DATE: FEBRUARY 10, 2020

PROJECT 3309

K-102



KITCHEN EQUIPMENT PLAN

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

PLUMBING SCHEDULE

R.I. #	WATER HW	WATER CW	WASTE DIR	WASTE IND	GAS SIZE	GAS MBH	R.I. HGT. A.F.F.	GPH @ 140°F	CONN. SIZE	CONN. HEIG HT	DESCRIPTION	EQ. #
1				3/4"					3/4"	84"	COOLER EVAPORATOR COIL DRAIN	3
2				3/4"					3/4"	84"	FREEZER EVAPORATOR COIL DRAIN	4
3	1/2"	1/2"					26"		1/2"	40"	HAND SINK FAUCET	7
4			1 1/2"				24"		1 1/2"	28"	HAND SINK DRAIN	7
5	1/2"						STUB		1/2"	34"	FILL FAUCET	14a
6				3/4"					3/4"	6"	HOT FOOD COUNTER DRAIN	14a
7				3/4"					3/4"	6"	FROST TOP COUNTER DRAIN	14b
8	3/4"	3/4"					15"		3/4"	40"	POT WASHING SINK FAUCET	17
9				2"					2"	22"	POT WASHING SINK DRAIN (3)	17
10	1/2"	1/2"					36"		1/2"	36"	MOP SINK FAUCET	18
11			4"				STUB		4"	3"	MOP SINK DRAIN	18
12	1/2"	1/2"							1/2"	40"	PREP SINK FAUCET	E3
13				1 1/2"					1 1/2"	22"	PREP SINK DRAIN (2)	E3
14				3/4" (2)			12"/46"		3/4"	46"	CONVECTION STEAMER DRAIN (2)	11
15		3/4"					36"		3/4"	36"	CONVECTION STEAMER INLET (2)	11

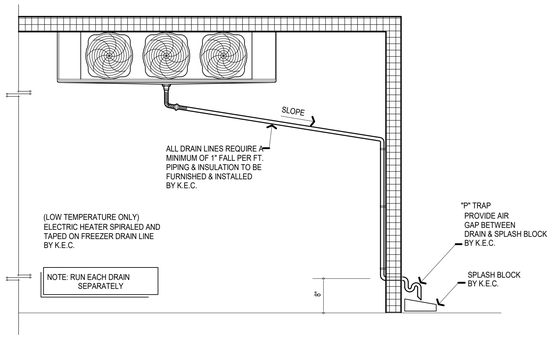
NOTE: PLUMBING CONTRACTOR TO FIELD VERIFY THE EXACT UTILITY LOAD REQUIREMENTS OF THE EXISTING EQUIPMENT TO BE RE-USED.

PLUMBING SYMBOLS

ABBREVIATION	SYMBOL	DESCRIPTION
H/CW		HOT/COLD WATER ROUGH-IN AND CONNECTION
W		WASTE ROUGH-IN AND CONNECTION
IW		INDIRECT WASTE
F.S.		FLOOR SINK W/HALF GRATE (W/MIN. CONN. SIZE)
F.D.		FLOOR (AREA) DRAIN
O.S.D.		OPEN SITE DRAIN (STORM WATER)
D.F.A.		DOWN FROM ABOVE
R.I. #	#	ROUGH-IN NUMBER (SEE PLUMBING SCHEDULE)

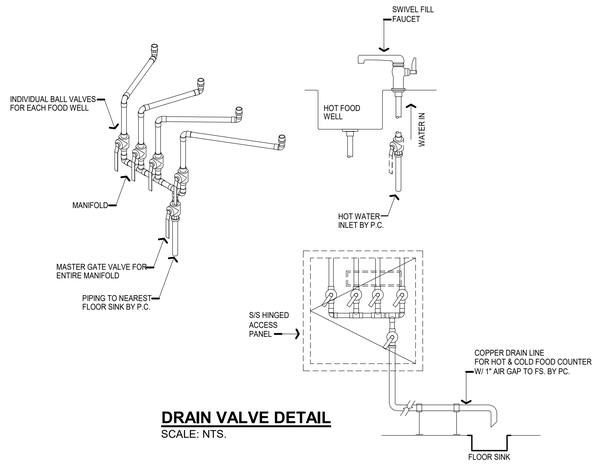
PLUMBING KITCHEN GENERAL NOTES:

1. ALL OUTLETS AND CONNECTIONS SHOWN RELATE TO FOODSERVICE FIXTURES AND EQUIPMENT ONLY. SEE ARCHITECTURAL/ENGINEERING PLANS FOR ADDITIONAL PLUMBING REQUIREMENTS.
2. THIS PLUMBING PLAN IS INTENDED TO SHOW ROUGH-IN LOCATIONS AND HEIGHTS, CONNECTION SIZES, POSITIONS, HEIGHTS AND LOAD REQUIREMENTS. DIMENSIONS SHOWN ARE FROM FINISHED FLOORS AND FINISHED WALLS. VERIFY WALL PARTITION LOCATIONS WITH ARCHITECTURAL DRAWINGS.
3. FINAL CONNECTIONS TO ALL EQUIPMENT SHALL BE BY PLUMBING CONTRACTOR INCLUDING REQUIRED MATERIALS SUCH AS, STOPS, MIXING VALVES, FILTERS, TRAPS, CHECK VALVES, PIPING, TUBING, ETC. TO ASSURE PROPER OPERATION ACCORDING TO MANUFACTURER'S RECOMMENDATIONS AND LOCAL CODES.
4. PLUMBING CONTRACTOR (P.C.), OR EQUIVALENT, SHALL FURNISH AND INSTALL THE FOLLOWING:
   A. ALL WATER, WASTE, AND GAS SERVICE TO POINT OF ROUGH-IN AS SHOWN ON PLAN. ROUGH-IN OUTLETS TO STUB 4" OUT OF WALLS AT HEIGHT INDICATED FROM FINISHED FLOOR TO CENTERLINE OF OUTLET. FLOOR ROUGH-INS TO STUB UP 2" ABOVE FINISHED FLOOR OR CURBS. ALL FLOOR OPENINGS/PENETRATIONS ARE TO BE SEALED WATERTIGHT.
   B. PRESSURE REDUCING AND/OR REGULATING VALVES FOR DISHWASHERS, BOOSTER HEATERS, OR AS OTHERWISE NOTED IN ALL FOODSERVICE AREAS.
   C. ALL FLOOR SINKS, COMPLETE WITH TOP GRATES INDICATED, AND REMOVABLE SEDIMENT BUCKETS SET FLUSH WITH FINISH FLOOR, UNLESS NOTED.
   D. ALL WASTE LINES, DIRECT OR INDIRECT, EXCEPT AS NOTED. MINIMUM DIAMETER OF LINE SHALL BE AS INDICATED ON PLAN REGARDLESS OF CONNECTION SIZE, AND SHALL BE PITCHED DOWNWARD. MAINTAIN DRAIN LINES AS HIGH AS POSSIBLE ABOVE FLOOR FOR SANITATION AND AND CLEANING. ALL WASTE LINES SHALL HAVE ADEQUATE CLEAN-OUT PROVISIONS.
   E. INDIRECT WASTE LINES FOR WALK-IN COOLER/FREEZER BLOWER COILS SHALL BE PITCHED 1" PER FOOT OF HORIZONTAL RUN, AND TERMINATE WITH A P-TRAP OVER FLOOR SINK OR APPROVED RECEPTER WITH VACUUM BREAK AS REQUIED BY LOCAL CODE.
   F. ALL REQUIRED GREASE TRAPS, OUTSIDE THE BUILDING WHERE POSSIBLE; OTHERWISE BELOW OR SET FLUSH WITH FINISHED FLOOR.
   G. INSTALL FIRE CONTROL GAS SHUT-OFF VALVES AS SUPPLIED BY FIRE PROTECTION SYSTEM SUBCONTRACTOR PER LOCAL CODES. (IF GAS COOKING EQUIPMENT IS SPECIFIED.)
   H. VACUUM BREAKERS, AS REQUIRED, EXCEPT FOR DISHWASHERS AND DISPOSERS, AS SUPPLIED BY KITCHEN EQUIPMENT CONTRACTOR.
   I. ALL WASTE LINE FOR HOT & COLD FOOD COUNTER SHALL BE OF COPPER PIPE TO DISCHARGE INDIRECTLY TO THE NEAREST FLOOR SINK WITH 1" AIR GAP.
5. PLUMBING CONTRACTOR (P.C.), OR EQUIVALENT, SHALL INTERCONNECT DISHMACHINE WITH BOOSTER HEATER, AND WATER-TYPE VENTILATORS WITH CONTROL PANELS AS PER MANUFACTURER'S INSTRUCTIONS, WHEN APPLICABLE AND NOTED.
6. ALL VENT PIPES SHALL BE CONCEALED IN WALLS OR COLUMN CHASES. USE LOOP VENTS FOR ISLAND FIXTURES.
7. ALL EXPOSED PIPING AND FITTINGS IN KITCHEN AREAS SHALL BE CHROME-PLATED OR STAINLESS STEEL.
8. ALL LINES ROUTED THROUGH EQUIPMENT SHALL NOT INTERFERE WITH INTENDED USE OF, OR SERVICING OF EQUIPMENT.



EVAPORATOR COIL DRAIN DETAIL

SCALE: NTS.



DRAIN VALVE DETAIL

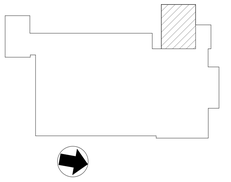
SCALE: NTS.

NYIKOS ASSOCIATES, INC.
Foodservice Facilities Design/Consulting
18219-A Flower Hill Way ■ Gaithersburg, MD 20879
Tel-(240)683-9530 ■ Fax-(240)683-9532

ARCHITECTURAL REGISTRATION BOARD 8490 THOMAS C. CRABTREE STATE OF MARYLAND

PROFESSIONAL CERTIFICATION. I CERTIFY THAT THESE DOCUMENTS WERE PREPARED BY OR APPROVED BY ME AND THAT I AM A DULY LICENSED ARCHITECT UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 8490 EXPIRATION DATE: 3/4/2021

KEY PLAN



REVISIONS

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GALENA, MD 21635

PLUMBING ROUGH-IN PLAN

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

FILENAME:

DATE: FEBRUARY 10, 2020

PROJECT 3309

K-103

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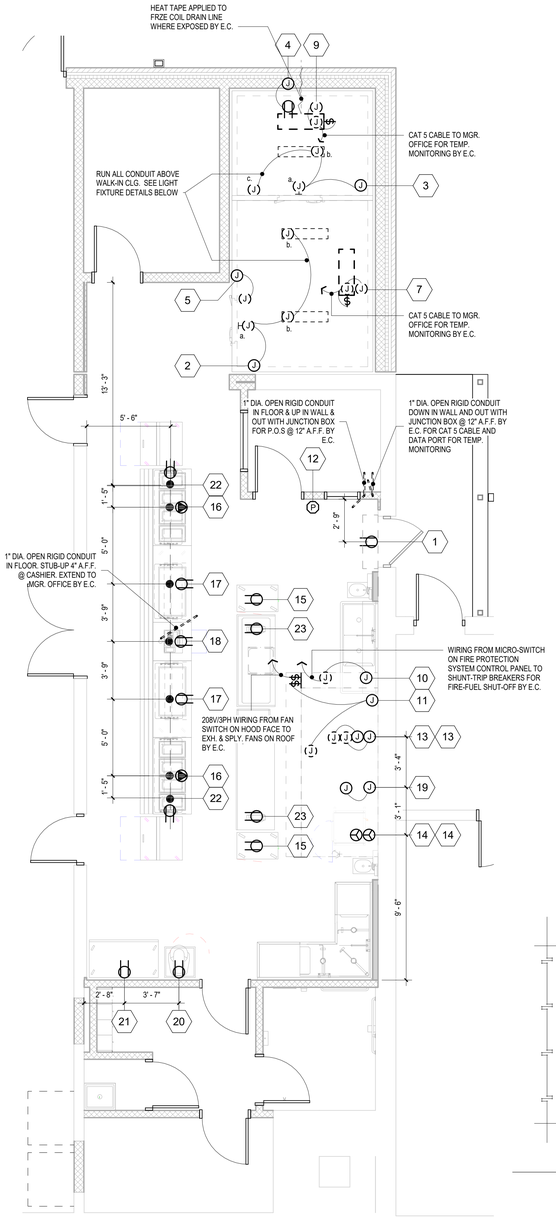
Foodservice Facilities Design/Consulting
18219-A Flower Hill Way ■ Gaithersburg, MD 20879
Tel-(240)683-9530 ■ Fax-(240)683-9532



KITCHEN EQUIPMENT PLAN
SCALE: 1/4"=1'-0"

ELECTRICAL SCHEDULE

	R.I.#	HP	KW	AMP	VOLTS	PH	R.I. HGT. A.F.F.	DESCRIPTION	E.Q. NO.	E.C. TO PROVIDE CORD & PLUG	E.C. TO PROVIDE RECEP.	E.C. TO PROVIDE DISC.	E.C. TO PROVIDE J.B.
	1	1/2"			120	1	50"	FLY FAN RECEP.	1		O		
	2						114"	BRANCH TO:					O
	2a		1.5 KW		120	1		DOOR LIGHT, HEATER, ALARM	2				
	2b		32W(2)		120	1		L.E.D. LIGHT FIXTURE (2)	2				
	3						114"	BRANCH TO:					O
	3a		1.5 KW		120	1		DOOR LIGHT, HEATER, ALARM	2				
	3b		32W		120	1		L.E.D. LIGHT FIXTURE	2				
	3c		.100		120	1		HEATED RELIEF PORT	2				
	4		.150		120	1		DRAIN LINE HEAT TAPE RECEP.	2		O		O
	5			1.50	120	1	114"	AIR SCREEN RECEP.	2		O		O
(1)	6			4.1	208	3	STUB	COOLER COMPRESSOR RACK	3				O
	7			1.6	120	1	114"	COOLER BLOWER COIL	3				O
(1)	8			8.8	208	3	STUB	FREEZER COMPRESSOR RACK	4				O
	9			9.8	208	1	114"	FREEZER BLOWER COIL	4				O
	10			20.0(Cir.)	120	1	108"	FIRE PROTECTION SYSTEM	9				O
(2)	11		350W		120	1	114"	VENTILATOR LIGHT CONTROLLER	9				O
(3)	12						48"	HEXAGON J-BOX, FIRE PULL	9				O
	13			31.0(2)	208	3	24"/36"	CONVECTION OVEN	10				O
	14			28.0(2)	208	3	24"/36"	CONVECTION STEAMER	11				
(4)	15		1.0		120	1	@CLG.	HEATED CABINET RECEP.	E10		O		
	16			32.0	120/208	1	STUB	HOT FOOD COUNTER RECEP.	14a		O		
	17			7.0	120	1	STUB	FROST TOP COUNTER RECEP.	14b		O		
	18			15.0	120	1	STUB	CASH REGISTER RECEP.	15		O		
	19		17.0		208	3	24"	RANGE	E4				O
	20			9.0	120	1	36"	MIXER RECEP.	E5		O		
	21			5.80	120	1	88"	REACH-IN REFRIGERATOR RECEP.	E7		O		
	22			5.50	120	1	STUB	MILK COOLER RECEP.	E11		O		
	23			20.0	120	1	@CLG.	RETRACTABLE CORD REEL RECEP.	19		O		

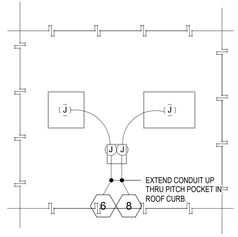
(1) SEE SHEET ??? FOR EXACT LOCATION. ITEM FURNISHED W/MAIN-FUSED DISCONNECT SWITCH.
(2) EXTEND CONDUIT DOWN FROM JUNCTION BOX MOUNTED ABOVE FINISH CEILING TO CONTROL PANEL BY E.C. SEE SHEET K-501, K-502 & K-503 FOR FURTHER VENTILATOR DETAILS.
(3) EXTEND 1/2" DIA. OPEN RIGID CONDUIT FROM TOP OF PULL BOX UP IN WALL TO 6" ABOVE FINISH CLG. BY E.C.
(4) ELECTRICAL CONTRACTOR TO PROVIDE TWIST-LOCK PLUG & MATCHING RECEPTACLE. SEE DETAIL THIS SHEET.
NOTE: ITEM # E4 RANGE W/ OVEN BASE, #E5 MIXER, #E7 REACH-IN REFRIGERATOR, #E10 HEATED CABINET, #E11 MILK COOLER. ELECTRICAL CONTRACTOR TO FIELD VERIFY EXACT UTILITY LOAD REQUIREMENTS OF THE EXISTING EQUIPMENT TO BE RE-USED.

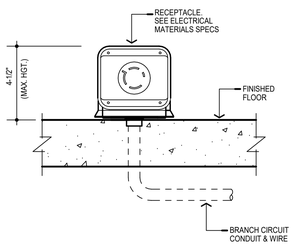
ELECTRICAL SYMBOLS

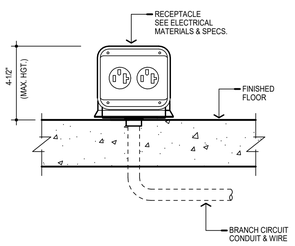
SYMBOL	DESCRIPTION
J	JUNCTION BOX W/FINAL CONN. TO EQUIPMENT
(J)	JUNCTION BOX (INSTALLED IN EQUIPMENT BY K.E.C. OR MFR.)
	DUPLEX CONVENIENCE OUTLET
	POWER OUTLET, 1 PHASE
S	SWITCH
P	OCTAGON J-BOX, FIRE PULL
LED	L.E.D. LIGHT FIXTURE
D.F.A.	DOWN FROM ABOVE
#	ROUGH-IN NUMBER (SEE ELECTRICAL SCHEDULE)

KITCHEN ELECTRICAL GENERAL NOTES:

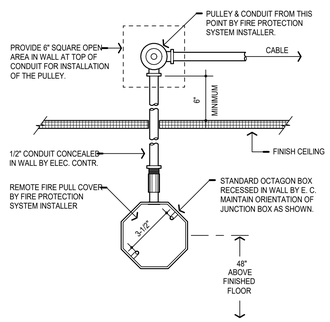
1. ELECTRICAL SYSTEM IS DESIGNED FOR 120/208 VOLT, 3-PH; 480 VOLT, 3-PH, 4-WIRE, 60 HERTZ.
2. ALL OUTLETS AND CONNECTIONS SHOWN RELATE TO FOODSERVICE FIXTURES AND EQUIPMENT ONLY. SEE ARCHITECTURAL/ENGINEERING PLANS FOR ADDITIONAL ELECTRICAL REQUIREMENTS.
3. THIS ELECTRICAL PLAN IS INTENDED TO SHOW ROUGH-IN OUTLET TYPES, HEIGHTS AND LOCATIONS, AND CONNECTION POSITIONS AND LOAD REQUIREMENTS. ALL DIMENSIONS SHOWN ARE FROM FINISHED WALLS AND FINISHED FLOORS. VERIFY FINISH WALL PARTITION LOCATIONS WITH ARCHITECTURAL DRAWINGS.
4. ALL ELECTRICAL WORK FOR FABRICATED FOODSERVICE EQUIPMENT SHALL BE COMPLETELY WIRED BY THE FABRICATION CONTRACTOR TO A COMMON JUNCTION BOX, PULL BOX, OR CONTROL PANEL ON THE EQUIPMENT IN AN ACCESSIBLE POSITION. FINAL CONNECTIONS TO EQUIPMENT JUNCTION BOX OR PULL BOX, AND ALL ELECTRICAL WORK FROM MAIN PANEL BOARDS SHALL BE BY THE ELECTRICAL CONTRACTOR.
5. FINAL CONNECTIONS TO ALL FOODSERVICE EQUIPMENT SHALL BE PERFORMED BY THE ELECTRICAL CONTRACTOR, INCLUDING MATERIALS.
6. PIPING, CONDUIT, AND SIMILAR CONSTRUCTION, LOCATED OUTSIDE A WALL, MUST BE INSTALLED SO THAT THERE IS A MINIMUM OF 3/4 INCH SPACE BETWEEN IT AND THE WALL.
7. ELECTRICAL CONTRACTOR (E.C.), OR EQUIVALENT, SHALL FURNISH AND INSTALL THE FOLLOWING:
   A. ALL JUNCTION BOXES, ELECTRICAL OUTLETS, COVER PLATES, SWITCHES, ETC. NOT BUILT INTO FIXTURES OR EQUIPMENT. ALL OUTLETS, JUNCTION BOXES, COVER PLATES, ETC. IN DISHROOMS OR AS INDICATED ON SCHEDULE SHALL BE MOISTURE-PROOF.
   B. ALL PLUGS AND CORDS AS NOTED ON SCHEDULE. ALL CORDS SHALL BE N.E.M.A. RATED AND U.L. APPROVED FOR MANUFACTURED AND FABRICATED EQUIPMENT.
   C. SHUNT-TRIP CIRCUIT BREAKERS OR DISCONNECTS FOR FIRE CONTROL SYSTEM SHUT-OFF OF FOODSERVICE EQUIPMENT BENEATH HOODS/VENTILATORS AS REQUIRED BY N.F.P.A.-96, LATEST EDITION, AND LOCAL CODES.
   D. DISCONNECTS OR OTHER DEVICES AS REQUIRED BY CODES.
8. WHEN APPLICABLE, ELECTRICAL CONTRACTOR SHALL PROVIDE CONDUIT AND WIRING, INSTALL ELECTRICAL COMPONENTS (PROVIDED BY K.E.C.), AND INTERWIRE BETWEEN THE FOLLOWING:
   A. REMOTE REFRIGERATION SYSTEMS TO EVAPORATOR COILS.
   B. WALK-IN COOLER/FREEZER LIGHTS (RUN CONDUIT ABOVE COMPARTMENT CEILING).
   C. REMOTE WALK-IN COOLER/FREEZER ALARM SYSTEMS (WHEN USED).
   D. CONTROL PANELS TO VENTILATORS AND EXHAUST/SUPPLY FANS PER MANUFACTURER'S INSTRUCTIONS.
   E. KITCHEN EXHAUST HOODS/VENTILATORS TO FIRE CONTROL SYSTEM, BUILDING ANNOUNCIATOR AND SHUT-OFF.



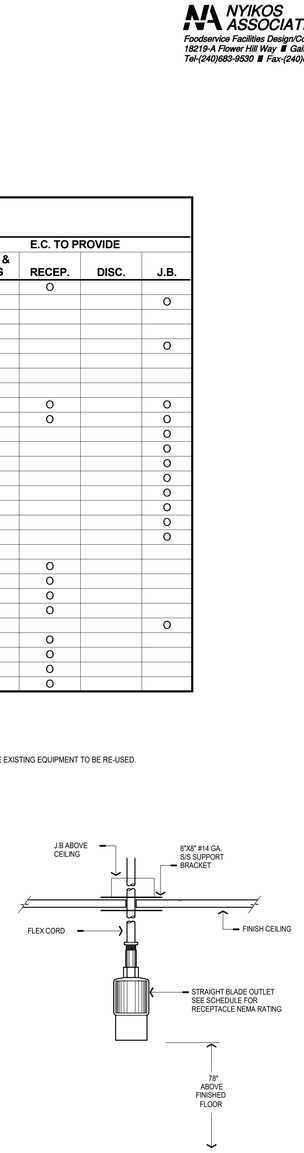




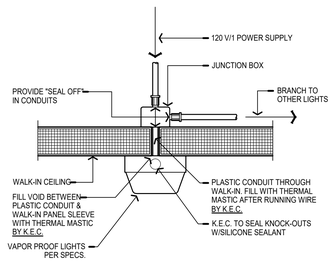
FLOOR RECEPTACLE DETAIL
SCALE: NTS.



REMOTE FIRE PROTECTION PULL STATION DETAIL
SCALE: NTS.



SUSPENDED RECEPTACLE DETAIL
SCALE: NTS.



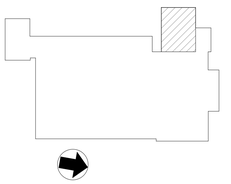
1. ALL CONDUIT TO BE RUN ON EXTERIOR CEILING OF WALK-IN.
2. ALL PENETRATIONS THRU WALK-IN ARE TO BE SEALED WITH THERMAL MASTIC BY K.E.C.
3. LIGHT FIXTURES TO BE SHIPPED LOOSE & INSTALLED BY K.E.C. FINAL CONNECTION BY ELECTRICIAN.
4. NO METAL CONDUIT INSIDE WALK-IN BOX.
5. ALL CONDUIT KNOCK OUTS IN LIGHT FIXTURE TO BE SEALED W/SILICONE SEALANT BY K.E.C.

WALK-IN LIGHT INSTALLATION DETAIL
SCALE: NTS.

ARCHITECTURAL REGISTRATION BOARD 8490 THOMAS C. CRABTREE STATE OF MARYLAND

PROFESSIONAL CERTIFICATION. I CERTIFY THAT THESE DOCUMENTS WERE PREPARED BY OR APPROVED BY ME AND THAT I AM A DULY LICENSED ARCHITECT UNDER THE LAWS OF THE STATE OF MARYLAND.
LICENSE NO. 8490
EXPIRATION DATE: 3/4/2021

KEY PLAN



REVISIONS

	MM-DD-YR	NAME	DESCRIPTION OF CHANGES

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MECHANICSBURG, PENNSYLVANIA
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ELECTRICAL ROUGH-IN PLAN
PLOT SCALE: 1/4" = 1'-0"
FILENAME:
DATE: FEBRUARY 10, 2020

PROJECT 3309

K-104

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Tel-(240)683-9530 ■ Fax-(240)683-9532

HOOD INFORMATION - Job#4133360

HOOD NO.	TAG	MODEL	LENGTH	MAX. COOKING TEMP.	APPLIANCE DUTY	DESIGN CFM/ft	TOTAL EXH. CFM	EXHAUST PLENUM RISER(S) WIDTH	LENG.	HEIGHT	DIA.	CFM	VEL.	S.P.	TOTAL SUPPLY CFM	HOOD CONSTRUCTION	HOOD CONFIG. END TO END	ROW
1	8	6030 ND-2-PSP-F	11' 0"	600 Deg.	Heavy	225	2475			4"	16"	2475	1773	-0.872"	1989	304 SS 100%	ALONE	ALONE

HOOD INFORMATION

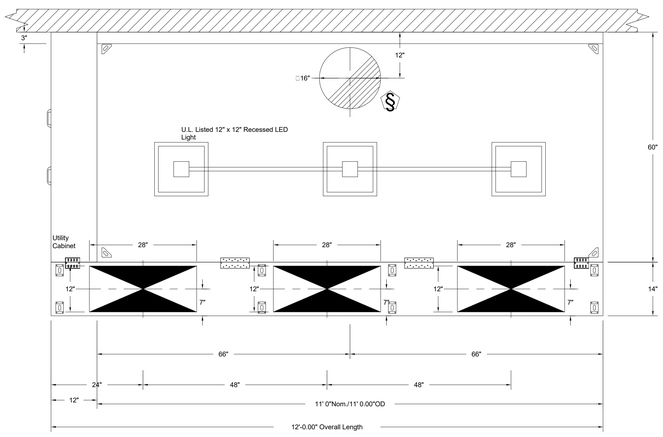
HOOD NO.	TAG	FILTER(S) TYPE	QTY.	HEIGHT	LENGTH	EFFICIENCY @ 7 MICRONS	LIGHT(S) QTY.	TYPE	WIRE GUARD	UTILITY CABINET(S) LOCATION	SIZE	FIRE SYSTEM TYPE	FIRE SYSTEM SIZE	ELECTRICAL MODEL #	SWITCHES QUANTITY	FIRE SYSTEM PIPING	HOOD HANGING WGHT
1	8	Captrate Solo Filter	8	20"	16"	85% See Filter Spec.	3	12" x 12" LED	NO	Left	12"x60"x30"	Ansul R102	3.0	DCV-1111	1 Light 1 Fan	YES	847 LBS

HOOD OPTIONS

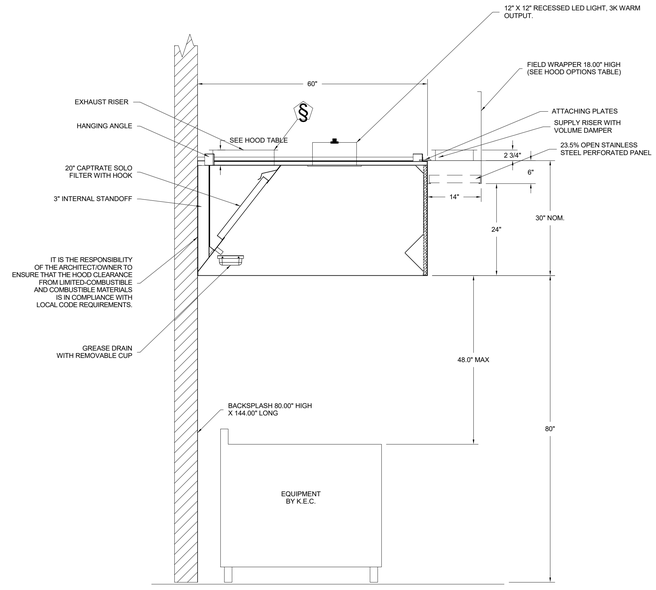
HOOD NO.	TAG	OPTION
1	8	FIELD WRAPPER 18.00" High Front, Left, Right
		BACKSPLASH 80.00" High X 144.00" Long 304 SS Vertical
		STRUCTURAL FRONT PANEL
		SENSOR-CV

PERFORATED SUPPLY PLENUM(S)

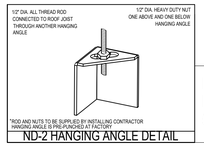
HOOD NO.	TAG	POS.	LENGTH	WIDTH	HEIGHT	TYPE	RISER(S) WIDTH	LENG.	DIA.	CFM	S.P.
1	8	Front	144"	14"	6"	MUA	12"	28"		663	0.167"
						MUA	12"	28"		663	0.167"
						MUA	12"	28"		663	0.167"



PLAN VIEW - Hood #1 (8)
11' 0.00" LONG 6030ND-2-PSP-F



SECTION VIEW - MODEL 6030ND-2-PSP-F
HOOD - #1 (8)



ND-2 HANGING ANGLE DETAIL

LED BULBS BY K.E.C.
BULBS MUST BE RATED FOR 5000K COLOR TEMPERATURE

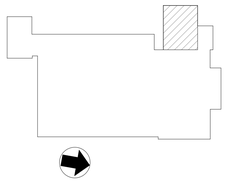
CAPTIVE-AIRE HOOD ARE BUILT IN COMPLIANCE WITH:
ETL LISTED #3054804-001
ETL SANITATION LISTED
NFPA #96

FOR QUESTIONS CONTACT CAPTIVEAIRE
2221 KANSAS AVE, SILVER SPRING, MD 20910
PHONE: (301) 357-8929
REG32@CAPTIVEAIRE.COM

ARCHITECTURAL REGISTRATION BOARD 8490 THOMAS C. CRABTREE STATE OF MARYLAND

PROFESSIONAL CERTIFICATION.
I CERTIFY THAT THESE DOCUMENTS WERE PREPARED BY OR APPROVED BY ME AND THAT I AM A DULY LICENSED ARCHITECT UNDER THE LAWS OF THE STATE OF MARYLAND.
LICENSE NO. 8490
EXPIRATION DATE: 3/4/2021

KEY PLAN



REVISIONS

MM-DD-YR	NAME	DESCRIPTION OF CHANGES

CRABTREE ROHRBAUGH & ASSOCIATES - ARCHITECTS
100 WEST ROAD, SUITE 402
TOWSON MD 21204
410-528-0272
www.cra-architects.com
MECHANICSBURG, PENNSYLVANIA
CHARLOTTESVILLE, VIRGINIA
WHITE SULPHUR SPRINGS, WEST VIRGINIA

ADDITION AND RENOVATIONS OF GALENA ELEMENTARY SCHOOL
KENT COUNTY PUBLIC SCHOOLS
114 S MAIN STREET
GALENA, MD 21635

VENTILATION DETAILS

PLOT SCALE: 3/4" = 1'-0"
FILENAME:
DATE: FEBRUARY 10, 2020

PROJECT 3309

K-501

NYIKOS ASSOCIATES, INC.
Foodservice Facilities Design/Consulting
18219-A Flower Hill Way ■ Gaithersburg, MD 20879
Tel-(240)683-9530 ■ Fax-(240)683-9532

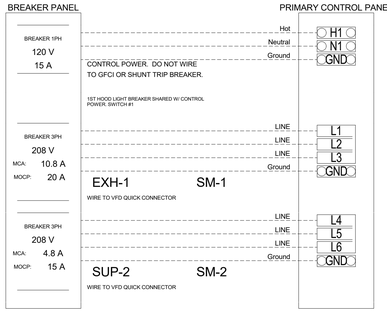
JOB NO	MODEL NUMBER	DRAWN BY	SCHEMATIC TYPE
4133360	DCV-1111		INSTALL
	JOB NAME: Galena ES - Galena, MD_R2	DATE: 12/23/2019	DWG NO: ECP #1-1

DESCRIPTION OF OPERATION:

Demand Control Ventilation, w/ control for 1 Exhaust Fan, 1 Supply Fan, Exhaust on in Fire, Lights out in Fire, Fans modulate based on duct temperature. INVERTER DUTY 3 PHASE MOTOR REQUIRED FOR USE WITH VFD. Room temperature sensor shipped loose for field installation.Verify distance between VFD and Motor; additional cost could apply if distance exceeds 50 feet.

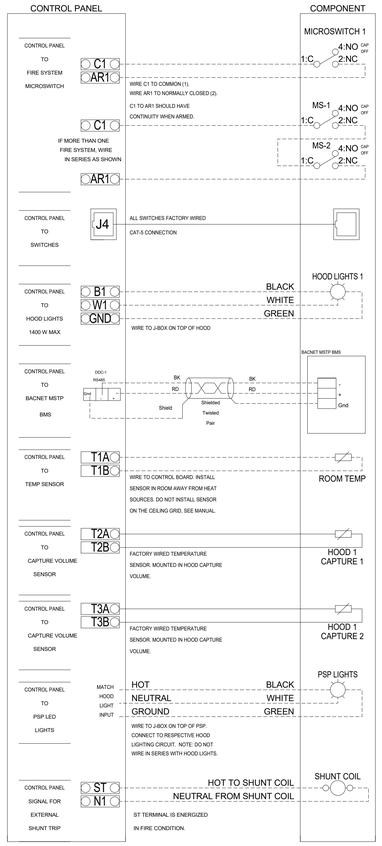
BREAKER PANEL TO PRIMARY CONTROL PANEL

Responsibility: Electrician
BREAKER SIZE SHOWN IS THE MAXIMUM ALLOWED



CONTROL PANEL TO ACCESSORY ITEMS

Responsibility: Electrician

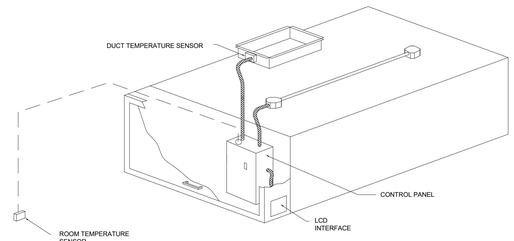


CONTROL PANEL TO FANS

Responsibility: Electrician

ELECTRICAL PACKAGE - Job#4133360

NO.	TAG	PACKAGE #	LOCATION	SWITCHES		OPTION	FANS CONTROLLED				
				LOCATION	QUANTITY		TYPE	Φ	H.P.	VOLT	FLA
1		DCV-1111	Utility Cabinet Left	03 - Utility Cabinet Left	1 Light	Smart Controls DCV	Exhaust	3	3.000	208	8.6
				Hood # 1	1 Fan		Supply	3	1.000	208	3.8



TYPICAL HOOD CONTROL PANEL INSTALLATION

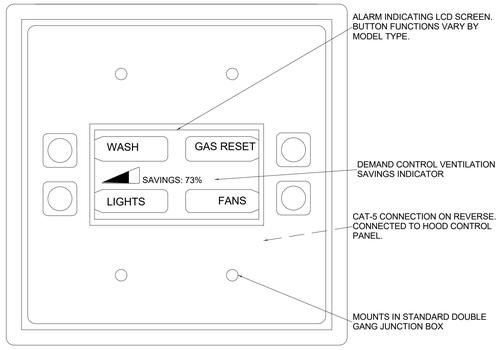
SEQUENCE OF OPERATION - HOOD CONTROLS

ELECTRICAL PACKAGE: FP SERIES

ALL POWER, LIGHTING, MICROSWITCH AND TEMPERATURE PROBE CONNECTIONS AND INTERLOCKS TO BE COMPLETED BY ELECTRICAL CONTRACTOR PER SCHEMATICS PROVIDED WITH EQUIPMENT.

TWO METHODS TO ACTIVATE EXHAUST SYSTEM:
1. ENGAGE FAN SWITCH IN THE "ON" POSITION TO ENERGIZE CONTACTOR(S) AND START THE EXHAUST FAN(S). SUPPLY FAN(S), IF PRESENT, WILL BE ACTIVATED BY FACTORY PRE-WIRED INTERLOCK.
2. TURN ON COOKING APPLIANCES. EXHAUST FAN(S) [AND SUPPLY FAN(S), IF PRESENT] WILL AUTOMATICALLY ENERGIZE WHEN DUCT TEMPERATURE EXCEEDS SET-POINT (FACTORY PRE-SET = 85°F). AUTOMATIC ACTIVATION COMPLIES WITH IMC 507.2.1.1 "OPERATION." FAN(S) WILL DISENGAGE WHEN DUCT TEMPERATURE FALLS BELOW SET-POINT.

FIRE CONDITION
IN THE EVENT OF A FIRE, A SIGNAL IS SENT ACROSS THE NORMALLY OPEN DRY CONTACT OF THE FIRE SUPPRESSION SYSTEM MICROSWITCH (INTERLOCKED WITH HOOD CONTROL PANEL BY ELECTRICIAN). EXHAUST FAN(S) TO REMAIN RUNNING, SUPPLY FAN(S) TO DE-ENERGIZE, LIGHTING CIRCUIT(S) TO DE-ENERGIZE. MICROSWITCH MUST BE RESET PRIOR TO RESUMPTION OF NORMAL OPERATION.



ROOM TEMPERATURE SENSOR

The Room Temperature sensor is a 10K Ohm Thermistor. The sensor provides constant room temperature to the controller. It should be installed on a wall somewhere in the space but not directly under the hood or close to an appliance so that the reading is not affected by heat.

Typically a system will have one room temperature sensor. However, systems configured with 2 fan zones have the option to be ordered with 2 room temperature sensors, one for each zone. They should be mounted in the space accordingly.

ARCHITECTURAL REGISTRATION BOARD 8490 THOMAS C. CRABTREE STATE OF MARYLAND

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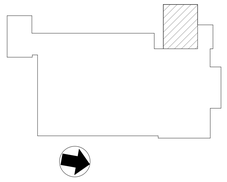

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ADDITION AND RENOVATIONS OF GALENA ELEMENTARY SCHOOL
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114 S MAIN STREET
GALENA, MD 21635

VENTILATION WIRING DIAGRAM

PLOT SCALE: 3/4" = 1'-0"
FILENAME:
DATE: FEBRUARY 10, 2020

PROJECT 3309

K-502

NYIKOS ASSOCIATES, INC.
Foodservice Facilities Design/Consulting
18219-A Flower Hill Way ■ Gaithersburg, MD 20879
Tel-(240)683-9530 ■ Fax-(240)683-9532

SPECIFICATIONS

THE RESTAURANT FIRE SUPPRESSION SYSTEM SHALL BE THE PRE-ENGINEERED TYPE WITH A FIXED NOZZLE AGENT DISTRIBUTION NETWORK. IT SHALL BE LISTED WITH UNDERWRITERS LABORATORIES, INC. (UL)

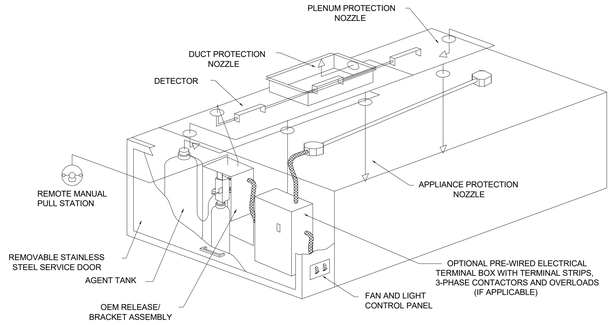
THE SYSTEM SHALL BE CAPABLE OF AUTOMATIC DETECTION AND ACTUATION WITH LOCAL OR REMOTE MANUAL ACTUATION. ACCESSORIES SHALL BE AVAILABLE FOR MECHANICAL OR ELECTRICAL GAS LINE SHUT-OFF APPLICATIONS.

THE EXTINGUISHING AGENT SHALL BE A POTASSIUM CARBONATE, POTASSIUM ACETATE-BASED FORMULATION DESIGNED FOR FLAME KNOCKDOWN AND SECUREMENT OF GREASE RELATED FIRES. IT SHALL BE AVAILABLE IN PLASTIC CONTAINERS WITH INSTRUCTIONS FOR LIQUID AGENT HANDLING AND USAGE.

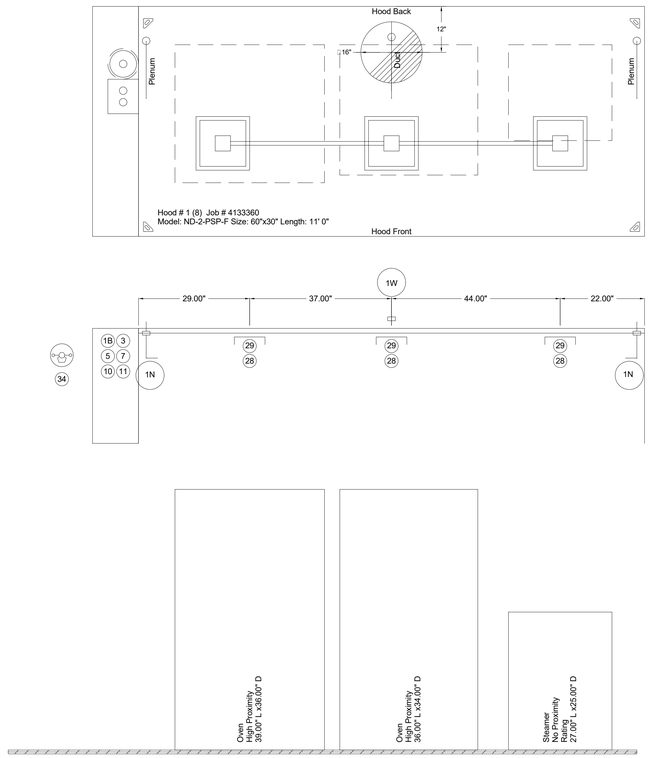
THE REGULATED RELEASE MECHANISM SHALL BE COMPATIBLE WITH A FUSIBLE LINK DETECTION SYSTEM. THE FUSIBLE LINK SHALL BE SELECTED AND INSTALLED ACCORDING TO THE OPERATING TEMPERATURE IN THE VENTILATING SYSTEM. THE FUSIBLE LINK SHALL BE SUPPORTED BY A DETECTOR BRACKET/ LINKAGE ASSEMBLY.

Fire System Information - Job#4133360

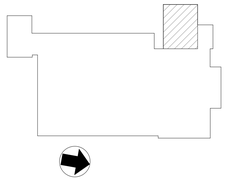
FIRE SYSTEM NO.	Tag	TYPE	SIZE	INSTALLATION	
				SYSTEM	LOCATION ON HOOD
1		Ansul R102	3.0	Fire Cabinet Left	Left



TYPICAL ANSUL R-102 SYSTEM LAYOUT



KEY PLAN



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GALENA, MD 21635

FIRE SYSTEM DETAILS

PLOT SCALE: 3/4" = 1'-0"
FILENAME:
DATE: FEBRUARY 10, 2020

PROJECT 3309

K-503

STRUCTURAL NOTES

BUILDING CODE: 2018 INTERNATIONAL BUILDING CODE AND ASCE 7-16

ANY REFERENCES TO VARIOUS TRADE CODES THROUGHOUT THESE NOTES ARE TO THE YEAR OF THE CODE CITED IN THE ABOVE REFERENCE BUILDING CODE.

DESIGN LIVE LOADS

ROOF STRUCTURAL ELEMENTS SHALL BE DESIGNED FOR THE MORE CRITICAL OF THE FOLLOWING LOAD CASES

CASE 1	30 PSF MINIMUM (NOT REDUCIBLE)
CASE 2	SNOW LOAD BASED ON 25 PSF GROUND SNOW LOAD WITH APPLICABLE DRIFT AND SLIDING LOADS

ROOF SNOW LOAD DESIGN DATA:
FLAT ROOF SNOW LOAD (Pf) – 19.3 PSF
SNOW EXPOSURE FACTOR (Ce) – 1.0
SNOW LOAD IMPORTANCE FACTOR (I) - 1.1
THERMAL FACTOR (Ct) – 1.0

FLOORS: THE FLOOR AREAS HAVE BEEN DESIGNED FOR THE FOLLOWING MINIMUM LIVE LOADS.

SLAB ON GRADE	150 PSF
EQUIPMENT SUPPORTS	DESIGNED FOR ACTUAL LOADS INDICATED ON THE DRAWINGS

DESIGN DEAD LOADS

ROOF 30 PSF (TOTAL INCLUDING SELF WEIGHT)

LATERAL LOADS

WIND LOAD ANALYSIS

RISK CATEGORY	III
ULTIMATE WIND SPEED (Vult)	120 MPH
NOMINAL WIND SPEED (Vasd)	93 MPH
WIND EXPOSURE	C
INTERNAL PRESSURE COEFFICIENT	+/- 0.18

NET WIND UPLIFT ON ROOF WITH RESPECT TO METAL DECK AND STEEL FRAMING TO BE PER THE LOADS IN THE COMPONENTS AND CLADDING WIND CHART ON SHEET S0.2.

SEISMIC LOAD ANALYSIS

RISK CATEGORY	III
SEISMIC IMPORTANCE FACTOR(Ie)	1.25
MCE SPECTRAL RESPONSE ACCELERATION PARAMETER - SHORT (Ss)	0.147
MCE SPECTRAL RESPONSE ACCELERATION PARAMETER - 1 second (S1)	0.043
SITE CLASS	D
SOIL SITE COEFFICIENT (FA / FV)	1.6 / 2.4
DESIGN EQ SPECTRAL RESPONSE ACCEL. PARAMETER - SHORT (Sds)	0.157
DESIGN EQ SPECTRAL RESPONSE ACCEL. PARAMETER - 1 second (Sd1)	0.069
SEISMIC DESIGN CATEGORY	B

LATERAL ANALYSIS OF RENOVATION SHOWS THAT LATERAL MEMBER DEMAND-TO-CAPACITY RATIOS ARE INCREASED BY LESS THAN 10 PERCENT AFTER ALTERATIONS; NO REMEDIATION OF THE LATERAL SYSTEM IS REQUIRED PER IEBC SECTION 403.4 EXCEPTION.

GENERAL NOTES

REFER TO THE ARCHITECTURAL, ELECTRICAL, MECHANICAL AND PLUMBING DRAWINGS FOR ADDITIONAL SLEEVES, ANCHORS, VENT OPENINGS, ETC. NOT SHOWN ON THE STRUCTURAL PLANS.

ALL MATERIALS SHALL BE IN CONFORMANCE WITH THE LATEST EDITION OF THE ASTM SPECIFICATIONS NOTED IN THE STRUCTURAL NOTES AND PROJECT SPECIFICATIONS BASED ON THE FINAL DATE NOTED ON THE CONSTRUCTION DOCUMENTS.

THIS PROJECT HAS BEEN DESIGNED FOR THE WEIGHTS OF THE MATERIALS INDICATED ON THE DRAWINGS AND FOR THE LIVE LOADS INDICATED IN THE DESIGN DATA ABOVE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE ADDITIONAL SHORING AND BRACING FOR THE STRUCTURE IF ACTUAL CONSTRUCTION LOADS EXCEED THE DESIGN LOADS.

ALL DIMENSIONS AND NOTES SHALL SUPERSEDE ALL SCALE REFERENCES ON THE DRAWINGS.

ALL WORK SPECIFIED HEREIN SHALL BE INSPECTED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, THE BUILDING CODE AND ALL LOCAL ORDINANCES. THE CONTRACTOR SHALL HIRE AN EXPERIENCED, QUALIFIED SPECIAL INSPECTOR TO PERFORM ALL THE REQUIRED INSPECTION WORK. ADTEK ENGINEERS WILL NOT PERFORM THE CONTINUOUS DAILY SPECIAL INSPECTIONS DURING CONSTRUCTION. ADTEK ENGINEERS MAY VISIT THE SITE TO ASCERTAIN GENERAL CONFORMANCE TO THE CONTRACT DOCUMENTS AND SUCH VISITS ARE NOT TO BE CONSTRUED AS MEETING THE DAILY SPECIAL INSPECTION REQUIREMENTS UNLESS THE ENGINEER SPECIFICALLY SO STATES IN WRITING.

NEW RTU CONNECTION TO THE CURBS AND THE CURB CONNECTIONS TO THE NEW SUPPORT FRAMING BELOW THE ROOF SHALL BE IN ACCORDANCE WITH THE RTU MANUFACTURER'S RECOMMENDATIONS.

IT IS THE INTENT OF THESE DRAWINGS FOR ALL DISCIPLINES AND SPECIFICATIONS TO PRODUCE A COMPLETE PROJECT. IN ALL CASES THE DRAWINGS AND SPECIFICATIONS MUST BE REVIEWED, PRICED, ESTIMATED, AND CONSTRUCTED IN THEIR ENTIRETY. THE DRAWINGS ARE COMPLEMENTARY TO ONE ANOTHER AND THE SPECIFICATIONS. ANYTHING SHOWN OR IMPLIED ON ANY ONE DRAWING MUST BE PROVIDED, INSTALLED AND CONNECTED AS THOUGH IT WAS SHOWN ON ALL DRAWINGS AND INCLUDED IN THE ORIGINAL PRICING. NO REQUEST FOR ADDITIONAL COST OR CHANGE ORDER WILL BE ACCEPTED BY THE OWNER FROM ANY CONTRACTOR, SUPPLIER, OR INSTALLER THAT RESULTS FROM A FAILURE TO THOROUGHLY REVIEW ALL DRAWINGS AND SPECIFICATIONS, COORDINATE WITH OTHER TRADES, OR THOROUGHLY INSPECT THE SITE TO DETERMINE ALL EXISTING CONDITIONS.

IF AN ASSUMED OR ACTUAL CONFLICT IS DISCOVERED IN THE CONTRACT DOCUMENTS, THE MORE EXPENSIVE OR HIGHER QUALITY OPTION (AS DETERMINED BY THE ARCHITECT/ENGINEER) SHALL BE ASSUMED TO APPLY UNLESS DIRECTED OTHERWISE BY THE ARCHITECT/ENGINEER.

THE CONTRACTOR IS REQUIRED TO VISIT THE SITE, FAMILIARIZE THEMSELVES WITH THE LOCAL CONDITIONS UNDER WHICH THE WORK IS TO BE PERFORMED AND AS ARE NECESSARY FOR CONSTRUCTION, AND CORRELATE THEIR OBSERVATIONS WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS. IT IS ASSUMED THAT THE CONTRACTOR HAS OBTAINED, BEFORE AWARD OF THE CONTRACT, CLARIFICATION OF ALL QUESTIONS AS TO THE INTENT OF THE CONTRACT DOCUMENTS AND OF ASSUMED OR ACTUAL CONFLICT BETWEEN TWO OR MORE ITEMS IN CONTRACT DOCUMENTS. SHOULD THE CONTRACTOR FAIL TO OBTAIN SUCH CLARIFICATION, THE ARCHITECT/ENGINEER SHALL DIRECT WORK TO PROCEED BY THE METHOD INDICATED, SPECIFIED OR REQUIRED BY CONTRACT DOCUMENTS WHICH WILL PRODUCE THE BEST RESULTS, AS JUDGED BY THE ARCHITECT/ENGINEER. SUCH DIRECTION BY THE ARCHITECT/ENGINEER SHALL NOT ENTITLE THE CONTRACTOR TO ANY CLAIM FOR EXTRA COST.

CONTRACTOR RESPONSIBILITIES

THE FOLLOWING LIST IS NOT INTENDED TO BE ALL INCLUSIVE, BUT MERELY TO PLACE EMPHASIS ON PARTICULAR ITEMS OF JOB SCHEDULING AND SAFETY.

1. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS TO THE PROJECT ARCHITECT AND STRUCTURAL ENGINEER FOR REVIEW, ALLOWING A MINIMUM OF TWO WEEKS FOR REVIEW BY THE PROJECT ARCHITECT AND STRUCTURAL ENGINEER.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REDESIGN OF THE STRUCTURAL SUPPORTS OF EQUIPMENT WHEN THE OPERATING WEIGHT OF THE EQUIPMENT PROVIDED (INCLUDING CURBS AND ACCESSORIES) EXCEEDS THE MAXIMUM DESIGN WEIGHTS NOTED ON THE STRUCTURAL DRAWINGS. SUBMIT STRUCTURAL CALCULATIONS AND DETAILS FOR THE REVISED EQUIPMENT SUPPORT TO THE PROJECT ARCHITECT FOR REVIEW. THE SUBMITTAL SHALL BE STAMPED AND SIGNED BY A PROFESSIONAL ENGINEER REGISTERED IN THE PROJECT JURISDICTION.
3. IF ACTUAL FIELD CONDITIONS VARY FROM WHAT IS SHOWN OR ASSUMED IN THE CONTRACT DOCUMENTS, THE CONTACTOR IS REQUIRED TO PROMPTLY NOTIFY THE ARCHITECT/ENGINEER AND RECEIVE DIRECTION PRIOR TO PROCEEDING WITH THE WORK AFFECTED BY THE ACTUAL FIELD CONDITION.
4. THE CONTRACTOR SHALL NOTIFY THE PROJECT SPECIAL INSPECTOR IN ADVANCE OF WORK REQUIRING INSPECTIONS OR ON-SITE PERSONNEL. COORDINATE ADVANCE NOTIFICATION REQUIREMENTS WITH THE SPECIAL INSPECTOR.
5. IF THE CONTRACTOR ANTICIPATES A PROBLEM THAT WILL REQUIRE ASSISTANCE FROM THE PROJECT STRUCTURAL ENGINEER, THE CONTRACTOR SHALL MAKE EVERY EFFORT TO PROVIDE THE ENGINEER WITH MINIMUM 24 HOURS NOTICE.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT ALL CONSTRUCTION IS ACCORDING TO THE SIGNED AND SEALED CONSTRUCTION DOCUMENTS AND THE REVIEWED SHOP DRAWINGS.
7. THE CONTRACTOR SHALL ENGAGE A PROFESSIONAL ENGINEER REGISTERED IN THE PROJECT JURISDICTION TO DESIGN AND DETAIL THE SUBMITTAL ITEMS NOTED IN THE DEFERRED SUBMITTALS BELOW.
8. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING BETWEEN THE STRUCTURAL AND ARCHITECTURAL DRAWINGS. IT IS NOT INTENDED THAT THE STRUCTURAL DRAWINGS BE USED INDEPENDENTLY OF THE ARCHITECTURAL DRAWINGS. ANY DISCREPANCIES, INCLUDING DIMENSIONS, SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT AND ENGINEER BEFORE PROCEEDING WITH THE WORK.
9. THE CONTRACTOR IS RESPONSIBLE FOR METHODS TO ENSURE CONSTRUCTION SAFETY AT THE SITE THROUGHOUT THE COURSE OF THE PROJECT CONSTRUCTION. SEE O.S.H.A. & M.O.S.H. REGULATIONS FOR CONSTRUCTION.
10. UPON STRUCTURAL COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR HAVING THE SPECIAL INSPECTOR SUBMIT A LETTER OF CERTIFICATION INDICATING THAT THE STRUCTURE IS IN COMPLIANCE WITH THE PLANS, SPECIFICATIONS, CONCRETE TEST REPORTS AND CODE REQUIREMENTS. THIS LETTER MUST BE REVIEWED BY THE ARCHITECT AND ENGINEER OF RECORD BEFORE SUBMITTAL.

SUBMITTALS NOTES

1. SUBMIT THE SHOP DRAWINGS NOTED BELOW TO THE PROJECT ARCHITECT AND STRUCTURAL ENGINEER FOR REVIEW.
2. DEFERRED SUBMITTALS (DRAWINGS AND CALCULATIONS) NOTED BELOW SHALL BE SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE PROJECT JURISDICTION. THE ENGINEER MUST HAVE A MINIMUM OF THREE YEARS EXPERIENCE IN THE DESIGN OF THE TYPE OF STRUCTURAL COMPONENT REQUIRED FOR THE SUBMITTAL. THE ENGINEER SHALL PERFORM PERIODIC FIELD OBSERVATIONS AND ISSUE A FINAL CERTIFICATION FOR THE FINAL CONSTRUCTION OF THE STRUCTURE INCLUDED IN THEIR SUBMITTAL.
3. REPRODUCTION OF ANY PORTION OF THE STRUCTURAL CONSTRUCTION DOCUMENTS FOR USE AS SHOP DRAWINGS IS PROHIBITED.
4. IF REQUIRED BY THE AUTHORITY HAVING JURISDICTION, PROVIDE THE REVIEWED THE SHOP DRAWINGS OF THE DEFERRED SUBMITTALS FOR THEIR REVIEW.

SUBMITTALS
A. CONCRETE MIX DESIGN BY EITHER TRIAL BATCH OR FIELD EXPERIENCE METHODS. (EACH SUBMITTED MIX MUST IDENTIFY ITS INTENDED USE)
B. CONCRETE REINFORCING
C. MASONRY REINFORCING
D. STRUCTURAL STEEL
E. STEEL JOISTS
F. METAL DECK (INCLUDING SECTION PROPERTIES OF DECK)
G. MISCELLANEOUS METALS FRAMING SUPPORTS
H. CMU PARTITION SUPPORT

DEFERRED SUBMITTALS
A. SHORING AND BRACING FOR BUILDING ELEMENTS WITH CALCULATIONS
B. BRACING OF MASONRY WALLS OVER 8'-0" PER OSHA (DRAWINGS AND CALCULATIONS) CALCULATIONS TO INCLUDE VERIFICATION OF CONCRETE SLAB ON GRADE TO SUPPORT SHORING LOADS, WHERE APPLICABLE.
C. STEEL LADDERS WITH CALCULATIONS

SPECIAL INSPECTIONS

SPECIAL INSPECTIONS ARE REQUIRED DURING CONSTRUCTION IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND CHAPTER 17 OF THE INTERNATIONAL BUILDING CODE. THE TERM SPECIAL INSPECTOR REFERS TO THE SPECIAL INSPECTING ENGINEER OF RECORD HIRED BY THE OWNER IN COMPLIANCE WITH THE INTERNATIONAL BUILDING CODE. INSPECTIONS OF FOUNDATION SUBGRADES MUST BE CONDUCTED BY A LICENSED GEOTECHNICAL ENGINEER, REFERRED TO HEREIN AS THE GEOTECHNICAL INSPECTOR. SPECIAL INSPECTIONS SHALL BE PERFORMED FOR, BUT NOT LIMITED TO, THE FOLLOWING STRUCTURAL ITEMS:

1. FOUNDATION SUBGRADES AND FILL PLACEMENT
2. CONCRETE REINFORCING
3. CONCRETE MIX AND PLACEMENT
4. MASONRY REINFORCING
5. MASONRY GROUT
6. STRUCTURAL STEEL ERECTION
7. STEEL JOISTS
8. METAL DECKING
9. POST-INSTALLED ANCHORS

FOUNDATION

ASSUMED LATERAL WALL LOADS (EQUIVALENT FLUID PRESSURE)

63 PSF PER FOOT OF DEPTH

ASSUMED SOIL BEARING VALUE

2,000 POUNDS PER SQUARE FOOT FOR COLUMN AND WALL FOOTINGS.

SUBSURFACE INVESTIGATION

SUBSURFACE INVESTIGATION AND REPORT BY JOHN D. HYNES & ASSOCIATES, INC.
JASON A. LINDSEY, PE AND JOHN D. HYNES, PE TELEPHONE NO: 410-546-6462
REPORT NO: JDH-10/19/303 GEOTECHNICAL REPORT DATED: SEPTEMBER 30, 2019 &
LETTER DATED NOVEMBER 20, 2019.

ALL FOUNDATION WORK AND SOIL COMPACTION SHALL BE IN STRICT ACCORDANCE WITH THE GEOTECHNICAL REPORT FOR THE PROJECT.

ALL SPREAD FOOTINGS SHALL EXTEND MINIMUM 1'-0" INTO UNDISTURBED SOIL OR SHALL BEAR ON COMPACTED STRUCTURAL FILL. PLACE THE FILL REQUIRED TO BRING THE SUBGRADE TO THE PROPER ELEVATION PRIOR TO INSTALLING THE FOUNDATION.

THE BOTTOM OF ALL EXTERIOR FOOTINGS SHALL BE A MINIMUM OF 2'- 0" BELOW THE FINISHED EXTERIOR GRADE UNLESS NOTED OTHERWISE.

THE ELEVATION AT THE TOP OF FOOTINGS SHALL NOT BE HIGHER THAN INDICATED ON THE FOUNDATION PLAN, NOTES AND SECTIONS. THE FOOTING ELEVATIONS SHOWN ON THE DRAWINGS ARE FOR ESTIMATION PURPOSES ONLY. LOWER THE FOOTING ELEVATIONS, IF REQUIRED, TO ACHIEVE THE REQUIRED DESIGN BEARING CAPACITY OR FOR COORDINATION WITH UTILITIES.

THE FINAL SOIL BEARING CAPACITY AND FOUNDATION SUBGRADES SHALL BE INSPECTED AND APPROVED BY THE GEOTECHNICAL INSPECTOR PRIOR TO THE CONCRETE FOOTING INSTALLATION. THE CONTRACTOR SHOULD TAKE NOTE OF ANY WATER CONDITIONS AT THE SITE. FOUNDATION SUBGRADES SHALL REMAIN DRY DURING CONSTRUCTION.

BACKFILL OF BELOW GRADE FOUNDATION WALLS

THE CONTRACTOR SHALL NOT OVERLOAD THE WALL WITH HEAVY EQUIPMENT DURING PLACEMENT OF BACKFILL ADJACENT TO THE WALL. ONLY LIGHTWEIGHT (A MAXIMUM OF THREE TON TOTAL WEIGHT) EQUIPMENT SHALL BE PERMITTED WITHIN THE CRITICAL ZONE DEFINED AS BEGINNING AT THE BASE OF THE WALL AND WIDENING UPWARD FROM THE BASE AT A 1:1 SLOPE.

STRUCTURAL COMPACTED FILL

STRUCTURAL COMPACTED FILL FOR FOUNDATIONS AND SLAB ON GRADE SHALL BE APPROVED BY THE PROJECT GEOTECHNICAL ENGINEER AND COMPACTED PER THE GEOTECHNICAL REPORT.

EXISTING CONDITIONS

ALL EXISTING CONDITIONS SHALL BE CHECKED AND VERIFIED IN THE FIELD BEFORE EXCAVATION, DEMOLITION, OR CONSTRUCTION IS BEGUN. EXISTING UTILITIES SHALL BE LOCATED AND PROTECTED AS REQUIRED BY THE EXCAVATION, DEMOLITION, OR CONSTRUCTION. FIELD MEASUREMENTS SHALL BE MADE OF ADJOINING CONSTRUCTION RELATIVE TO THE PROPER INSTALLATION OF NEW WORK. ALL DISCREPANCIES SHALL BE REPORTED TO THE PROJECT ARCHITECT AND STRUCTURAL ENGINEER PRIOR TO PROCEEDING WITH THE WORK IN THE AREA OF THE DISCREPANCY.

FIELD VERIFY ALL RELEVANT EXISTING DIMENSIONS, ELEVATIONS, AND MEMBER SIZES.

SHORING OF BUILDING STRUCTURAL MEMBERS

SHORING OF STRUCTURAL ELEMENTS SHALL BE PROVIDED AS REQUIRED TO PROTECT EXISTING CONSTRUCTION. THE SHORING DESIGN SHALL BE AS REQUIRED BY THE CONSTRUCTION. SUBMIT SHOP DRAWINGS SHOWING ACTUAL SEQUENCE AND DETAILS OF THE SHORING PROCEDURE, AS WELL AS CALCULATIONS INDICATING THAT THE EXISTING BUILDING LOADS AND CONSTRUCTION LOADS HAVE BEEN ACCOMMODATED IN THE SHORING DESIGN. SEE THE "CONTRACTOR RESPONSIBILITIES" AND "SUBMITTAL" NOTES ABOVE FOR ADDITIONAL REQUIREMENTS.

THE CONTRACTOR SHALL VERIFY THE CONDITION OF THE EXISTING STRUCTURE IN THE AREA OF THE PROPOSED SHORING. THE CONTRACTOR IS RESPONSIBLE FOR THE COST OF THE DESIGN AND REPAIR OF EXISTING STRUCTURES AND/OR FINISHES DAMAGED DURING SHORING OPERATIONS.

STRUCTURAL CONCRETE

REINFORCING STEEL SHALL CONFORM TO ASTM A615, GRADE 60. ALL WELDED WIRE REINFORCING SHALL CONFORM TO ASTM A1064. DETAILING SHALL BE IN ACCORDANCE WITH ACI MANUAL 315 AND STANDARD 318.

CONCRETE SHALL BE NORMAL WEIGHT. CONCRETE MIX DESIGN TABLE ON THIS SHEET INDICATES DESIGN COMPRESSIVE STRENGTH AT 28 DAYS, WATER/CEMENT RATIOS, AND ENTRAINED AIR CONTENT REQUIRED.

MAXIMUM AGGREGATE SIZE FOR CONCRETE SHALL BE IN ACCORDANCE WITH THE MAXIMUM AGGREGATE SIZES IN ACI 318 AND AS FOLLOWS:

FOOTINGS	1-1/2"
CONCRETE SLABS ON GRADE	3/4"

ALL EXTERIOR CONCRETE AND CONCRETE EXPOSED TO WEATHER SHALL BE AIR-ENTRAINED.

CONCRETE SLUMP: 3" +/- 1"
8" AFTER ADDITION OF HRWR AT THE SITE

THE USE OF ADDITIVES SHALL NOT BE PERMITTED UNLESS SPECIFICALLY APPROVED BY THE STRUCTURAL ENGINEER OR NOTED IN THE PROJECT SPECIFICATIONS. THE USE OF ADDITIVES CONTAINING CALCIUM CHLORIDE SHALL NOT BE PERMITTED.

PROVIDE A HIGH RANGE WATER REDUCER (HRWR OR SUPERPLASTICIZER) FOR PUMPED CONCRETE AND AS REQUIRED FOR WORKABILITY.

ALL REINFORCING STEEL MARKED "CONTINUOUS" SHALL BE LAPPED AS REQUIRED WITH CLASS B TENSION SPLICES PER ACI 315. PROVIDE CLASS B TENSION SPLICES AT WALL CORNERS AND INTERSECTIONS WITH STANDARD 90 DEGREE BENT CORNER BARS, INCLUDING CORNERS OF WALL FOOTINGS AND BOND BEAMS. LAP WELDED WIRE MESH ONE FULL MESH AT SIDE AND END LAPS. PROVIDE CORNER LAP BARS AT ALL LONGITUDINAL FOOTING REINFORCING AS WELL AS AT ALL HORIZONTAL WALL REINFORCING.

ALL TENSION SPLICES IN THE REINFORCING STEEL, UNLESS NOTED OTHERWISE, SHALL HAVE A MINIMUM LAP DISTANCE AS SHOWN IN THE TENSION LAP SPLICE CHART IN THE GENERAL NOTES.

PROVIDE CONCRETE PROTECTION FOR REINFORCING AS FOLLOWS (UNLESS NOTED OTHERWISE):

FOOTINGS:	3"
INTERIOR SLABS:	3/4"

ALL CONCRETE WORK, REINFORCING PLACEMENT FORMWORK AND SHORING SHALL BE INSPECTED UNDER THE SUPERVISION OF THE SPECIAL INSPECTOR. CONCRETE QUALITY CONTROL, INSPECTION AND TESTING SHALL BE IN STRICT ACCORDANCE WITH THE PROJECT SPECIFICATIONS, ACI 301 AND THE LOCAL BUILDING CODE REQUIREMENTS.

CONSTRUCTION PRACTICES:

WET STICKING OF DOWELS INTO THE FOOTING WILL NOT BE ACCEPTED. DOWELS SHOULD BE PROPERLY PLACED AND TIED TO LONGITUDINAL FOOTING REINFORCING IN ACCORDANCE WITH CRSI.

THE SPECIAL INSPECTOR SHALL PERFORM A MINIMUM OF ONE CONCRETE TEST FOR EACH 50 CUBIC YARDS OF CONCRETE POURED AT THE PROJECT WITH AT LEAST ONE TEST FOR EACH DAY THAT CONCRETE IS POURED. EACH CONCRETE TEST SHALL INCLUDE A SLUMP TEST AND FIVE LABORATORY CURED TEST CYLINDERS FOR COMPRESSIVE STRENGTH TESTS. TEST TWO CYLINDERS AT 7 DAYS AFTER THE CONCRETE POUR AND TWO AT 28 DAYS WITH ONE RESERVE CYLINDER. THE SPECIAL INSPECTOR SHALL SUBMIT WRITTEN TEST REPORTS TO THE PROJECT ARCHITECT AND STRUCTURAL ENGINEER. THE ARCHITECT AND STRUCTURAL ENGINEER SHALL BE NOTIFIED OF ALL TESTS THAT DO NOT MEET THE PROJECT SPECIFICATIONS WITHIN 24 HOURS.

SLAB ON GRADE

PROVIDE A MINIMUM THICKNESS REINFORCED CONCRETE SLAB AS NOTED ON THE PLANS ON A CONTINUOUS VAPOR RETARDER/BARRIER OVER DRAINAGE COURSE. THE WELDED WIRE REINFORCING SHALL BE PLACED AT 2" BELOW THE TOP SURFACE OF THE SLAB. THE DRAINAGE COURSE SHALL BE PER THE EARTHWORK SPECS OR ASTM C33, SIZE 57.

ALL CONDUITS/PIPES MUST BE PLACED BELOW THE CONCRETE. CONDUIT SHALL NOT TO BE RUN IN THE CONCRETE SLAB.

STRUCTURAL MASONRY

ALL MASONRY CONSTRUCTION SHALL BE IN ACCORDANCE WITH FOLLOWING STANDARDS:

BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES - ACI 530/ASCE 5
SPECIFICATIONS FOR MASONRY STRUCTURES ACI 530.1/ASCE 6
SPECIFICATIONS FOR DESIGN AND CONSTRUCTION OF LOAD BEARING CONCRETE MASONRY PUBLISHED BY NATIONAL CONCRETE MASONRY ASSOCIATION.

THE MINIMUM NET AREA COMPRESSIVE STRENGTH OF MASONRY (F'm) SHALL BE 1500 PSI PER ACI 530.

THE MINIMUM NET AREA COMPRESSIVE STRENGTH OF CONCRETE MASONRY UNITS SHALL BE 1900 PSI PER ACI 530.

HOLLOW AND SOLID LOAD BEARING CONCRETE MASONRY UNITS SHALL CONFORM TO ASTM C90 AND ASTM C145.

MORTAR SHALL CONFORM TO THE REQUIREMENTS OF THE ASTM TENTATIVE SPECIFICATIONS FOR MORTAR FOR UNIT MASONRY, ASTM C270, TYPE S MORTAR.

HOLLOW UNITS SHALL BE LAID WITH FULL MORTAR COVERAGE ON HORIZONTAL AND VERTICAL FACE SHELLS. SOLID UNITS SHALL BE LAID WITH FULL HEAD AND BED JOINTS. FIELD TESTED MORTAR IS REQUIRED TO ACHIEVE SPECIFIED DESIGN STRENGTHS.

MASONRY GROUT SHALL HAVE A 28 DAY COMPRESSIVE STRENGTH OF 2500 PSI, COMPLYING WITH ASTM C476.

REINFORCING STEEL SHALL CONFORM TO ASTM A615, GRADE 60. ALL VERTICAL MASONRY REINFORCING SHALL BE INSTALLED IN FULLY GROUTED CELLS AS SHOWN ON THE DRAWINGS. PROVIDE BAR SPLICES PER THE CMU BAR SPLICE CHART IN THE GENERAL NOTES.

FOR HORIZONTAL JOINT REINFORCING TYPE, SIZE AND SPACING SEE TYPICAL MASONRY DETAIL SHEETS.

CONTROL JOINTS SHALL BE SPACED WITHIN 4'-0" MAXIMUM OF THE VENEER JOINTS SHOWN ON THE ARCHITECTURAL DRAWINGS AND AT A MAXIMUM SPACING OF 25' - 0" ON CENTER. JOINTS MUST BE 24" FROM WALL OPENINGS TYPICAL.

DISCONTINUE JOINT REINFORCING AT CONTROL JOINTS.

PROVIDE TIES FOR MASONRY VENEER WALLS AS DETAILED ON ARCHITECTURAL DRAWINGS. SHEET METAL TIES FOR VENEER ARE NOT ACCEPTABLE. WIRE TIES MUST BE USED.

ALL MASONRY WALLS SHALL BE TEMPORARILY BRACED IN AN APPROVED MANNER DURING CONSTRUCTION UNTIL MORTAR HAS ATTAINED THE DESIGN STRENGTH, AND UNTIL ROOF MEMBERS HAVE BEEN PLACED AND ANCHORED THERETO. SUBMIT BRACING DRAWINGS IN ACCORDANCE WITH OSHA REQUIREMENTS; DRAWINGS AND CALCULATIONS ARE TO BE STAMPED AND SIGNED BY A PROFESSIONAL ENGINEER IN ACCORDANCE WITH SUBMITTALS NOTES.

CONSTRUCTION PRACTICES:

1. WET STICKING OF VERTICAL REINFORCING INTO GROUTED CELLS FOR LAPS IS UNACCEPTABLE. LAP AND TIE BARS PER ACI.
2. ALL BELOW GRADE WALLS ARE TO BE GROUTED SOLID.
3. GROUT TOP COURSE SOLID AT ALL TRANSITIONS IN WALL CONSTRUCTION FROM LARGER SIZE BLOCK TO SMALLER SIZE BLOCK. PROVIDE GROUT SCREEN AS REQUIRED.
4. USE VIBRATORS TO CONSOLIDATE GROUT IN MASONRY WALLS. RODDING WILL NOT BE PERMITTED.

MASONRY WALL LINTELS

PROVIDE LINTELS FOR ALL OPENINGS IN LOAD-BEARING MASONRY WALLS AS SHOWN ON THE STRUCTURAL DRAWINGS ON THE TYPICAL MASONRY DETAIL SHEETS.

ALL OPENINGS EXCEEDING 1'-0" IN WIDTH IN NON-LOAD-BEARING MASONRY PARTITIONS MUST HAVE A LINTEL. NON-BEARING MASONRY PARTITIONS ARE NOT INDICATED ON THE STRUCTURAL DRAWINGS. REFER TO THE ARCHITECTURAL DRAWINGS FOR OPENING SIZE, OPENING LOCATION, AND LINTEL TYPE. REFER TO THE CMU LINTEL SCHEDULE IN THE DETAILS FOR LINTEL SIZE AND REINFORCING.

MECHANICAL OPENINGS HAVE NOT BEEN SHOWN ON THE STRUCTURAL DRAWINGS. PROVIDE LINTELS FOR ALL MECHANICAL OPENINGS PER THE LINTEL SCHEDULE. DUCT OPENINGS THROUGH BEARING WALLS ARE TO BE LOCATED BETWEEN THE BEAMS/JOISTS, PROVIDING 1'-0" MINIMUM CLEAR FROM EDGE OF MASONRY OPENING TO STEEL BEARING. DUCTS ARE NOT TO BE LOCATED DIRECTLY UNDER STEEL BEARING.

NOTES:

1. PROVIDE HORIZONTAL JOINT REINFORCING AT 8" O.C. FOR TWO COURSES ABOVE ALL LINTELS. EXTEND THE JOINT REINFORCING 12" BEYOND THE LINTELS AT EACH END OF THE LINTELS.
2. PROVIDE BEARING AT EACH END OF MASONRY LINTELS AS SHOWN IN THE DETAIL.

STRUCTURAL STEEL

ALL STEEL SHALL BE IN ACCORDANCE WITH THE SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS, AISC 360-10, BY THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC).

ALL STEEL W SHAPES SHALL BE ASTM A992, GRADE 50. ALL ANGLES, CHANNELS, BENT PLATES, FLAT STOCK AND OTHER MISC. METAL SHAPES SHALL BE ASTM A36 UNLESS NOTED OTHERWISE. ALL CONNECTIONS SHALL BE WELDED OR BOLTED.

STRUCTURAL STEEL PIPE SHALL CONFORM TO ASTM A501 OR ASTM A53, TYPE E OR S.

HOLLOW STRUCTURAL SECTIONS (HSS) SHALL CONFORM TO ASTM A500, GRADE C.

ANCHOR BOLTS SHALL CONFORM TO ASTM F1554, GRADE 36

SHOP AND FIELD FASTENERS SHALL BE ASTM A325 HIGH STRENGTH BOLTS IN BEARING TYPE CONNECTIONS, UNLESS NOTED OTHERWISE.

HOLES SHALL NOT BE CUT THROUGH BEAMS AND COLUMNS UNLESS INDICATED OR APPROVED BY THE STRUCTURAL ENGINEER.

WELDING SHALL BE DONE ONLY BY AWS CERTIFIED WELDERS. WELD IN ACCORDANCE WITH THE AWS "STANDARD CODE" FOR ARC AND GAS WELDING IN BUILDING CONSTRUCTION. USE E70XX ELECTRODES.

SEE THE "CONTRACTOR RESPONSIBILITES" AND "SUBMITTAL" NOTES FOR ADDITIONAL STEEL SHOP DRAWING REQUIREMENTS.

STEEL JOISTS

OPEN WEB STEEL JOISTS SHALL BE DESIGNED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE SPECIFICATIONS OF THE STEEL JOIST INSTITUTE. ALL JOISTS SHALL BE ANCHORED TO STEEL BEAMS AND BEARING PLATES WITH A MINIMUM 1/8" FILLET WELD 2" LONG ON EACH SIDE OF THE JOIST.

ROOF JOISTS TO BE DESIGNED FOR A NET UPLIFT LOAD AS CALCULATED FROM THE COMPONENTS AND CLADDING CHARTS.

HORIZONTAL OR DIAGONAL BRIDGING SHALL BE USED IN COMPLIANCE WITH REQUIREMENTS OF THE STEEL JOIST INSTITUTE. BRIDGING ANGLE SIZES SHALL BE AS RECOMMENDED BY SJI, FOR THE SPACINGS INDICATED. THE CONTRACTOR SHALL COORDINATE BRIDGING LOCATIONS WITH MECHANICAL DUCTWORK AND MECHANICAL UNIT LOCATIONS. ANCHOR BRIDGING TO MASONRY WALLS AS SHOWN ON THE DRAWINGS AND PER THE STEEL JOIST MANUFACTURER. COORDINATE BRIDGING ATTACHMENT WITH INSTALLATION OF DECK SUPPORT ANGLES.

STRUCTURAL DRAWINGS ARE NOT INTENDED TO STAND ALONE, BUT WORK IN CONJUCTION WITH THE ARCHITECTURAL DRAWINGS. JOIST MANUFACTURER TO COORDINATE WITH BOTH THE ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR DIMENSIONS, DETAILING, EDGE OF JOIST LOCATIONS, TOP CHORD EXTENSIONS, ETC. JOIST LOCATIONS ARE TO BE COORDINATED BY THE G.C. WITH DUCTWORK, CURTAIN WALL LOCATIONS, EXHAUST FANS AND OTHER ROOF PENETRATIONS, ROOF TOP UNITS, ETC. ADJUST JOIST LOCATIONS AS REQUIRED WITHIN THE MAXIMUM SPACING LIMITS PROVIDED. JOISTS ARE NOT TO BEAR ACROSS WALL CONTROL JOINTS. ADJUST JOIST LOCATIONS AS REQUIRED SO AS NOT TO STRADDLE THE JOINT WITH THE JOIST BEARING PLATE. THE CENTERLINE OF JOIST IS TO BE A MINIMUM OF 6" FROM THE CENTERLINE OF THE CONTROL JOINT. PROVIDE ADDITIONAL JOISTS AS REQUIRED TO COORDINATE WITH OTHER TRADES WHILE MAINTAINING MAXIMUM SPACINGS NOTED ON PLANS.

INDIVIDUAL PIPE HANGERS FOR PIPING SUPPORT ARE PERMITTED ON NEW OR EXISTING JOISTS AS FOLLOWS:

1. NO MORE THAN 450 POUNDS TO BE SUPPORTED ON ANY INDIVIDUAL JOIST. MULTIPLE HANGERS MAY BE LOCATED ON ONE JOIST AS LONG AS THE COMBINED SUPPORTED WEIGHT OF THOSE HANGERS DOES NOT EXCEED 450 POUNDS.
2. ADDITIONAL JOIST REINFORCING IS TO BE USED IF HANGER LOCATION IS FURTHER THAN 3" FROM THE JOIST PANEL POINT AND POINT LOAD EXCEEDS 100 POUNDS

STEEL ROOF DECK

THE ROOF DECK SHALL BE IN ACCORDANCE WITH SPECIFICATIONS AND CODE OF RECOMMENDED STANDARD PRACTICE OF THE STEEL DECK INSTITUTE. SUBMIT SHOP DRAWINGS INDICATING THE ROOF DECK SECTION PROPERTIES MEET OR EXCEED THE FOLLOWING MINIMUM SPECIFICATIONS:

1-1/2" DEEP, 22 GAGE, Sx = 0.183 IN**3/FT.
Ix = 0.162 IN**4/FT., YIELD STRENGTH = 33,000 PSI, TYPE B.

THE STEEL ROOF DECK SHALL BE GALVANIZED.

REFER TO THE ARCHITECTURAL, MECHANICAL, PLUMBING, AND ELECTRICAL DRAWINGS FOR SIZES AND LOCATIONS OF ALL ROOF OPENINGS.

CONNECT THE STEEL ROOF DECK TO THE SUPPORTS WITH MINIMUM 5/8" DIAMETER PUDDLE WELDS AT 12" O.C. AT THE INTERIOR AND 6" O.C. AT THE PERIMETER. SIDELAPS SHALL BE FASTENED WITH #10 SELF DRILLING SCREWS AT MID SPAN BETWEEN SUPPORTS.

STRUCTURAL DRAWINGS ARE NOT INTENDED TO STAND ALONE, BUT WORK IN CONJUCTION WITH THE ARCHITECTURAL DRAWINGS. DECK MANUFACTURER TO COORDINATE WITH BOTH THE ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR DIMENSIONS, DETAILING, EDGE OF DECK LOCATIONS, ETC.

NO PIPING, CONDUIT, LIGHT FIXTURES, OR MECHANICAL DUCTWORK IS TO BE SUPPORTED FROM THE METAL ROOF DECK.

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 47042 Expiration Date: 07/13/21

ROSE A. RODRIGUEZ
47042
2/5/2020
Rose Rodriguez

REVISIONS

01	MM-DD-YR	NAME	DESCRIPTION OF CHANGES

CRABTREE ROHRBAUGH & ASSOCIATES - ARCHITECTS
100 WEST ROAD, SUITE 402
TOWSON MD 21204
410-528-0272
MECHANICSBURG, PENNSYLVANIA
CHARLOTTESVILLE, VIRGINIA
WHITE SULPHUR SPRINGS, WEST VIRGINIA
www.cra-architects.com

ADDITION AND RENOVATIONS OF GALENA ELEMENTARY SCHOOL
KENT COUNTY PUBLIC SCHOOLS
114 S MAIN STREET
GALENA, MD 21635

CR

ADTEK
ADTEK ENGINEERS, INC.
150 South East Street
Suite 201
Frederick, Maryland 21701
301-662-4408
Fax: 301-662-7484

ADTEK PROJECT #: 1913.0001

STRUCTURAL NOTES

PLOT SCALE:

FILENAME:

DATE: FEBRUARY 10, 2020

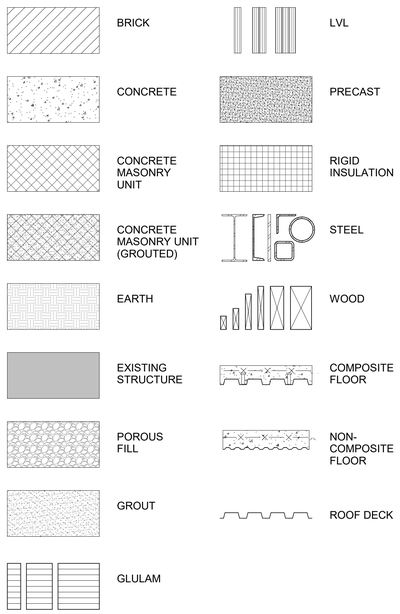
PROJECT
3309

S0.1

STRUCTURAL ABBREVIATIONS

&	AND
@	AT
°	DEGREE
Ø	DIAMETER
=	EQUAL
#	NUMBER/POUNDS
±	PLUS OR MINUS
A	
AB	ANCHOR BOLT
ARCH.	ARCHITECT, ARCHITECTURAL
ACI	AMERICAN CONCRETE INSTITUTE
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION
ASCE	AMERICAN SOCIETY OF CIVIL ENGINEERS
AISI	AMERICAN IRON AND STEEL INSTITUTE
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
AWS	AMERICAN WELDING SOCIETY
B	
BCX	BOTTOM CHORD EXTENSION
BEW	BOTTOM EACH WAY
B.F.	BRACED FRAME
BM	BEAM
BOTT	BOTTOM
B.O.	BOTTOM OF
B PL, BP	BEARING PLATE / BASE PLATE
BRG	BEARING
BTWN	BETWEEN
C	
CJ	CONTROL JOINT / CONSTRUCTION JOINT
CL	CENTERLINE
CFS	COLD FORMED STEEL
CIP	CAST IN PLACE
CLR	CLEAR
COL	COLUMN
CONC	CONCRETE
CONN	CONNECTION
CONSTR	CONSTRUCTION
CONT	CONTINUOUS
CRSI	CONCRETE REINFORCING STEEL INSTITUTE
CVR	COVER
D	
DEFL	DEFLECTION
DIA	DIAMETER
DN	DOWN
DWG, DWGs	DRAWING / DRAWINGS
E	
EA	EACH
EE	EACH END
EF	EACH FACE
EJ	EXPANSION JOINT
ELEC	ELECTRICAL
ELEV, EL	ELEVATION
EMBED	EMBEDMENT / EMBEDDED
ENGR	ENGINEER
EOD	EDGE OF DECK
EOJ	EDGE OF JOIST
EOS	EDGE OF SLAB
EQ	EQUAL
ETC	ETCETERA
EW	EACH WAY
EX, EXIST, (E)	EXISTING
EXP	EXPANSION
EXT	EXTERIOR
F	
FAB	FABRICATOR
FDN, FOUND	FOUNDATION
FFE	FINISHED FLOOR ELEVATION
FIN	FINISHED
FLR	FLOOR
FOW	FACE OF WALL
FT	FEET / FOOT
FTG	FOOTING
G	
GA	GAGE
GALV	GALVANIZED
H	
HORIZ	HORIZONTAL
HSS	HOLLOW STRUCTURAL SECTION
H.J.R.	HORIZONTAL JOINT REINFORCEMENT
I	
IF	INSIDE FACE
IN	INCH
INT.	INTERIOR
J	
J.B.E.	JOIST BEARING ELEVATION
JST	JOIST
JT	JOINT
K	
k, K	KIP
L	
LB	POUND
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LT	LIGHT
M	
MAX	MAXIMUM
MC	MOMENT CONNECTION
MECH	MECHANICAL
MFR	MANUFACTURER
MIN	MINIMUM
MO	MASONRY OPENING
MTL	METAL
N	
(N)	NEW
NO.	NUMBER
NCMA	NATIONAL CONCRETE AND MASONRY ASSOCIATION
O	
O.C.	ON CENTER
OF	OUTSIDE FACE
OH	OPPOSITE HAND
OPP	OPPOSITE
OSHA	OCCUPATIONAL SAFETY HEALTH ADMINISTRATION
P	
PAF	POWDER ACTUATED FASTENER
PL	PLATE
PLUMB	PLUMBING
PLWD	PLYWOOD
P/C	PRECAST
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
R	
REINF	REINFORCED / REINFORCING
REQ'D	REQUIRED
RO	ROUGH OPENING
RTU	ROOF TOP UNIT
S	
SCHED, SCH'D	SCHEDULE
SIM	SIMILAR
SJI	STEEL JOIST INSTITUTE
S.O.G., SOG	SLAB ON GRADE
STD	STANDARD
STL	STEEL
SW	SHEAR WALL
T	
TCX	TOP CHORD EXTENSION
T.O.	TOP OF
T.O.STL	TOP OF STEEL
T.O.S.	TOP OF SLAB ELEVATION
T.O.W.	TOP OF WALL
TYP	TYPICAL
U	
U.N.O.	UNLESS NOTED OTHERWISE
V	
VERT	VERTICAL
V.I.F.	VERIFY IN FIELD
W	
W/	WITH
W/IN	WITHIN
W/OUT	WITHOUT
WMC	WIND MOMENT CONNECTION
WT	WEIGHT
WWR	WELDED WIRE REINFORCING
X	
x, X	BY

SYMBOL LEGEND



CONCRETE MIX DESIGN TABLE

MEMBER	LOCATION	f'c	W/C	EXPOSURE CATEGORY				ENTRAINED AIR CONTENT	
				F	S	P	C	3/4" AGGREGATE	1" AGGREGATE
FOOTINGS	INTERIOR	3000 PSI	0.55	F0	S0	P0	C0	N/A	N/A
	EXTERIOR	4500 PSI	0.45	F2	S0	P0	C1	6 +/-1.5%	6 +/- 1.5%
SLABS-ON-GRADE AND INFILL SLABS	INTERIOR	4000 PSI	0.48	F0	S0	P0	C0	N/A	N/A

NOTES:
1. PROVIDE CONCRETE MIXES IN ACCORDANCE WITH ACI 301 FOR THE EXPOSURE CATEGORIES IDENTIFIED IN THE ABOVE TABLE.
2. "EXTERIOR" MEMBERS ARE THOSE FULLY OR PARTIALLY OUTSIDE A CONDITIONED BUILDING ENVELOPE AND FULLY OR PARTIALLY ABOVE THE FROST DEPTH. ALL OTHER MEMBERS SHALL BE CONSIDERED "INTERIOR".
3. MAXIMUM WATER-CEMENT (W/C) RATIOS INDICATED IN THE TABLE SHALL INCLUDE WATER FROM ADMIXTURES IN W/C CALCULATIONS.
4. DO NOT AIR-ENTRAIN NORMAL WEIGHT CONCRETE DESIGNATED TO RECEIVE STEEL TROWEL FINISH.

CONCRETE TENSION LAP SPLICE LENGTH SCHEDULE

BAR SIZE	f'c=3,000 PSI				f'c=3,500 PSI				f'c=4,000 PSI				f'c=4,500 PSI			
	TOP BARS		OTHER BARS		TOP BARS		OTHER BARS		TOP BARS		OTHER BARS		TOP BARS		OTHER BARS	
	CASE 1	CASE 2	CASE 1	CASE 2	CASE 1	CASE 2	CASE 1	CASE 2	CASE 1	CASE 2	CASE 1	CASE 2	CASE 1	CASE 2	CASE 1	CASE 2
#3	1'-5"	1'-11"	1'-4"	1'-6"	1'-4"	1'-10"	1'-4"	1'-5"	1'-4"	1'-8"	1'-4"	1'-4"	1'-4"	1'-7"	1'-4"	1'-4"
#4	1'-11"	3'-2"	1'-6"	2'-5"	1'-9"	2'-11"	1'-4"	2'-3"	1'-8"	2'-9"	1'-4"	2'-1"	1'-7"	2'-7"	1'-4"	2'-0"
#5	2'-4"	4'-6"	1'-10"	3'-6'	2'-2"	4'-2"	1'-8"	3'-3"	2'-1"	3'-11"	1'-7"	3'-0"	1'-11"	3'-8"	1'-6"	2'-10"
#6	2'-10"	6'-0"	2'-2"	4'-7"	2'-7"	5'-7"	2'-0"	4'-3"	2'-5"	5'-2"	1'-11"	4'-0"	2'-4"	4'-11"	1'-9"	3'-9"
#7	4'-7"	9'-6"	3'-7"	7'-4"	4'-3"	8'-9"	3'-4"	6'-9"	4'-0"	8'-3"	3'-1"	6'-4"	3'-9"	7'-9"	2'-11"	6'-0"
#8	5'-10"	11'-7"	4'-6"	8'-11"	5'-5"	10'-9"	4'-2"	8'-3"	5'-1"	10'-1"	3'-11"	7'-9"	4'-9"	9'-6"	3'-8"	7'-4"
#9	7'-2"	13'-1"	5'-6"	10'-1"	6'-8"	12'-2"	5'-1"	9'-4"	6'-3"	11'-4"	4'-10"	8'-9"	5'-10"	10'-8"	4'-6"	8'-3"
#10	8'-9"	14'-9"	6'-9"	11'-4"	8'-2"	13'-8"	6'-3"	10'-6"	7'-7"	12'-9"	5'-10"	9'-10"	7'-2"	12'-0"	5'-6"	9'-3"
#11	10'-6"	16'-4"	8'-1"	12'-7"	9'-8"	15'-2"	7'-6"	11'-8"	9'-1"	14'-2"	7'-0"	10'-9"	8'-7"	13'-4"	6'-7"	10'-3"

NOTES:
1. LAP SPLICE INFORMATION APPLIES TO BEAM, COLUMN, SLAB AND WALL REINFORCING BARS.
2. TOP BARS ARE HORIZONTAL BARS WITH MORE THAN 12 INCHES OF CONCRETE CAST BELOW THE BARS.
3. CASE 1&2, DEPENDS ON THE CONCRETE COVER, AND CLEAR SPACING OF BARS AS DEFINED BELOW:
   CASE 1 : COVER AT LEAST 1 1/2" AND CLEAR SPACING AT LEAST 3".
   CASE 2 : ALL OTHER CASES.
4. FOR LIGHTWEIGHT AGGREGATE, MULTIPLY ABOVE VALUES BY 1.3.
5. THIS SCHEDULE APPLIES TO 60ksi REINFORCING BARS. FOR 75ksi REINFORCING BARS, MULTIPLY ABOVE VALUES BY 1.25.
7. FOR BAR DEVELOPMENT LENGTHS, DIVIDE ABOVE VALUE BY 1.3.

CMU WALL LAP SPLICE SCHEDULE

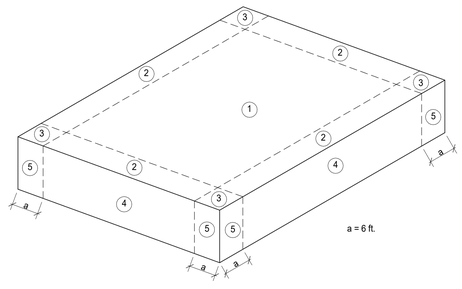
LONGITUDINAL BAR SIZE	MINIMUM LAP SPLICE LENGTH, in. FOR:			
	6-in. CMU	8-in. CMU	10-in. CMU	12-in. CMU
NO. 3	12	12	12	12
NO. 4	20	15	12	12
NO. 5	32	23	18	15
NO. 6	-	43	34	28
NO. 7	-	60	46	38
NO. 8	-	72	71	57
NO. 9	-	-	82	74

NOTES:
1. VALUES ARE BASED ON GRADE 60 REINFORCEMENT.

WIND COMPONENT & CLADDING LOAD SCHEDULE

	POSITIVE PRESSURE		NEGATIVE PRESSURE				
AREA (SQ. FT.)	ZONE 4 (PSF)	ZONE 5 (PSF)	ZONE 1 (PSF)	ZONE 2 (PSF)	ZONE 3 (PSF)	ZONE 4 (PSF)	ZONE 5 (PSF)
10	+23.7	+23.7	-25.9	-43.5	-65.4	-25.7	-31.6
100	+17.8	+17.8	-23.7	-28.1	-28.1	-19.8	-19.8

NOTES:
1. POSITIVE AND NEGATIVE SIGNS ON VALUES IN SCHEDULE INDICATE PRESSURES ACTING TOWARD AND AWAY FROM THE SURFACE, RESPECTIVELY.
2. ZONES 1, 2, AND 3 ARE FOR ROOFS. ZONES 4 AND 5 ARE FOR WALLS. SEE THE WIND PRESSURE ZONE DIAGRAM IDENTIFYING THE EXTENTS OF THE WIND PRESSURE ZONES.



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5/5/2020

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CRABTREE ROHRBAUGH & ASSOCIATES - ARCHITECTS
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TOWSON MD 21204
410-528-0272
www.cra-architects.com
MECHANICSBURG, PENNSYLVANIA
CHARLOTTESVILLE, VIRGINIA
WHITE SULPHUR SPRINGS, WEST VIRGINIA

ADTEK ENGINEERS, INC.
150 South East Street
Suite 201
Frederick, Maryland 21701
301-662-4408
Fax: 301-662-7484

ADTEK PROJECT #: 1913.0001

ADDITION AND RENOVATIONS OF GALENA ELEMENTARY SCHOOL
KENT COUNTY PUBLIC SCHOOLS
114 S MAIN STREET
GALENA, MD 21635

STRUCTURAL SCHEDULES

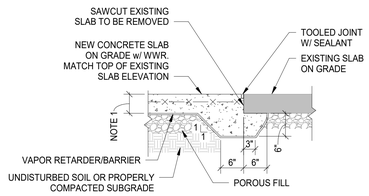
PLOT SCALE: As indicated

FILENAME:

DATE: FEBRUARY 10, 2020

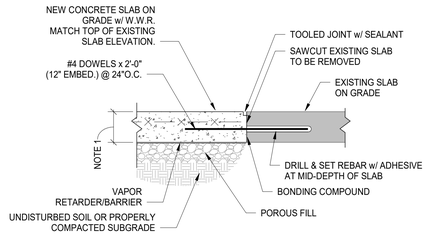
PROJECT 3309

S0.2



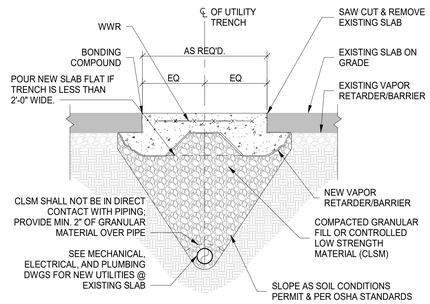
NOTES:
1. MATCH EXISTING SLAB THICKNESS UNLESS NOTED OTHERWISE ON PLAN.

2 / S1.1 NEW SOG INTERFACE AT EXISTING SOG
SCALE: NTS



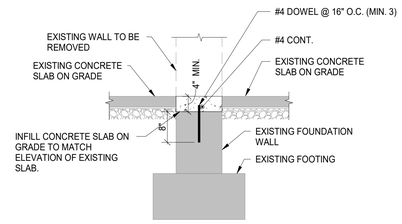
NOTES:
1. MATCH EXISTING SLAB THICKNESS UNLESS NOTED OTHERWISE ON PLAN.
2. ALTERNATE 2 / S1.1 DETAIL.

3 / S1.1 NEW SLAB DOWELED TO EXISTING SLAB ON GRADE
SCALE: NTS



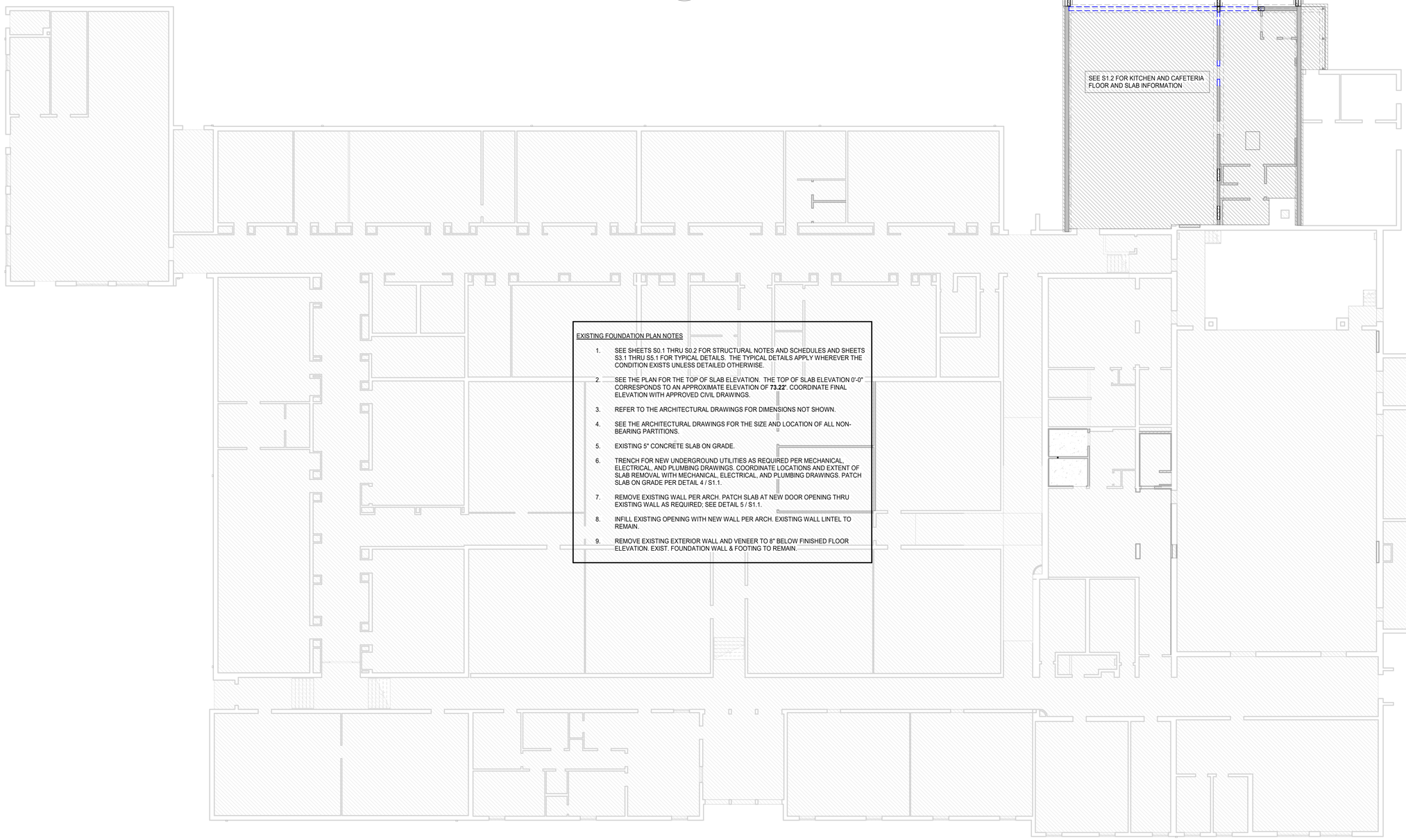
NOTES:
1. SEE 2 / S1.1 FOR INFORMATION NOT SHOWN.
2. SLAB THICKNESS TO MATCH EXISTING SLAB THICKNESS
3. WELDED WIRE REINFORCING TO BE 6x6-W2.1xW2.1

4 / S1.1 UTILITY AT EXISTING SLAB ON GRADE
SCALE: NTS



NOTES:
1. SEE ARCHITECTURAL DRAWINGS FOR NEW DOOR LOCATIONS.
2. DRILL AND ANCHOR WITH ADHESIVE IF EXISTING WALL IS GROUTED, OTHERWISE GROUT AND SET REBAR.

5 / S1.1 EXIST. SLAB ON GRADE PATCH @ NEW INT. DOOR
SCALE: NTS



EXISTING FOUNDATION PLAN NOTES

1. SEE SHEETS S0.1 THRU S0.2 FOR STRUCTURAL NOTES AND SCHEDULES AND SHEETS S3.1 THRU S5.1 FOR TYPICAL DETAILS. THE TYPICAL DETAILS APPLY WHEREVER THE CONDITION EXISTS UNLESS DETAILED OTHERWISE.
2. SEE THE PLAN FOR THE TOP OF SLAB ELEVATION. THE TOP OF SLAB ELEVATION 0'-0" CORRESPONDS TO AN APPROXIMATE ELEVATION OF **73.22'**. COORDINATE FINAL ELEVATION WITH APPROVED CIVIL DRAWINGS.
3. REFER TO THE ARCHITECTURAL DRAWINGS FOR DIMENSIONS NOT SHOWN.
4. SEE THE ARCHITECTURAL DRAWINGS FOR THE SIZE AND LOCATION OF ALL NON-BEARING PARTITIONS.
5. EXISTING 5" CONCRETE SLAB ON GRADE.
6. TRENCH FOR NEW UNDERGROUND UTILITIES AS REQUIRED PER MECHANICAL, ELECTRICAL, AND PLUMBING DRAWINGS. COORDINATE LOCATIONS AND EXTENT OF SLAB REMOVAL WITH MECHANICAL, ELECTRICAL, AND PLUMBING DRAWINGS. PATCH SLAB ON GRADE PER DETAIL 4 / S1.1.
7. REMOVE EXISTING WALL PER ARCH. PATCH SLAB AT NEW DOOR OPENING THRU EXISTING WALL AS REQUIRED; SEE DETAIL 5 / S1.1.
8. INFILL EXISTING OPENING WITH NEW WALL PER ARCH. EXISTING WALL LINTEL TO REMAIN.
9. REMOVE EXISTING EXTERIOR WALL AND VENEER TO 8" BELOW FINISHED FLOOR ELEVATION. EXIST. FOUNDATION WALL & FOOTING TO REMAIN.

1 / S1.1 OVERALL FOUNDATION PLAN
SCALE: 3/32" = 1'-0"

0 8' 16' 32'
SCALE: 3/32" = 1'-0"

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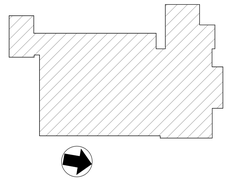
5/5/2020

KEY PLAN



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100 WEST ROAD, SUITE 402
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301-662-4408
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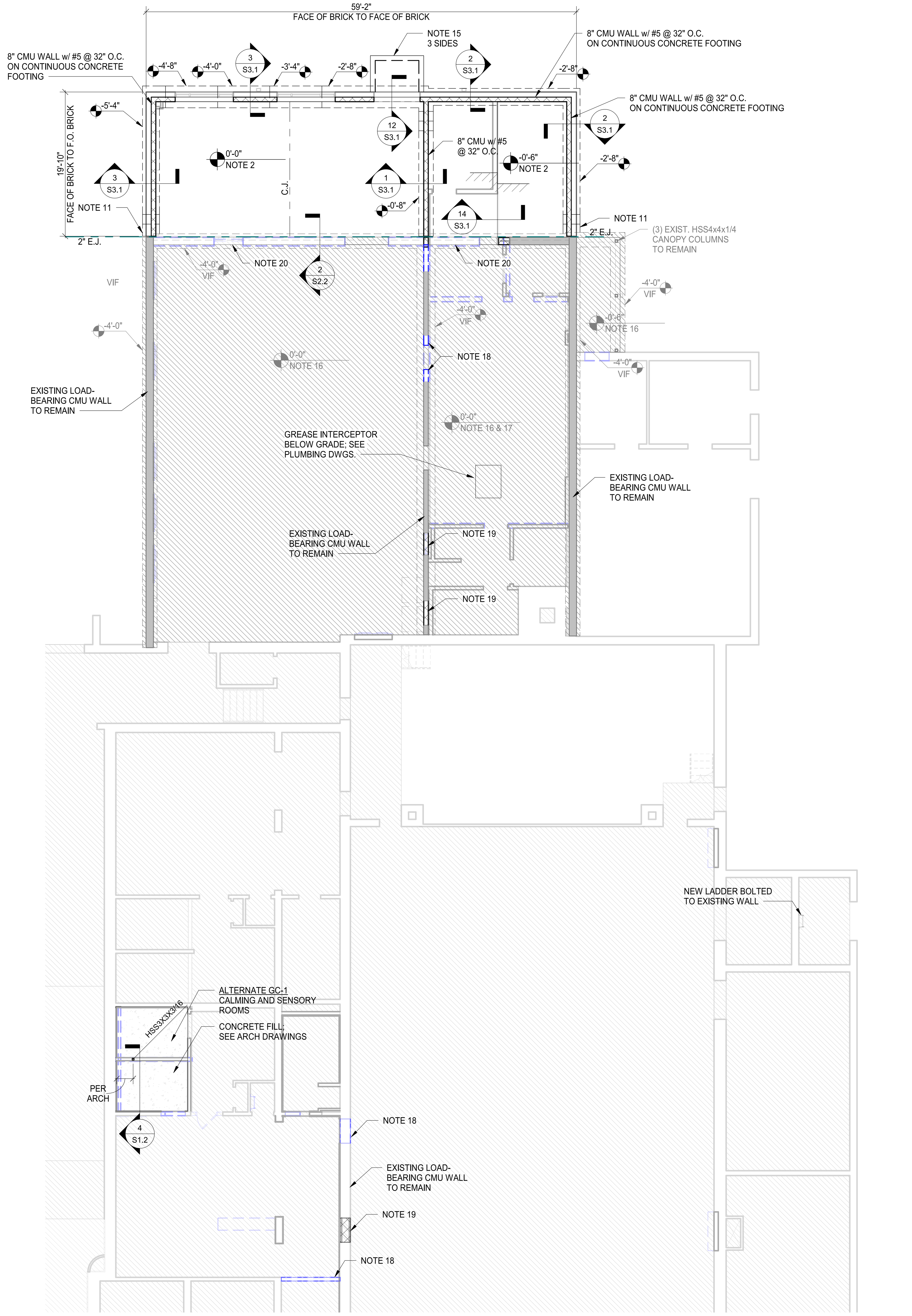
ADTEK PROJECT #: 1913.0001

OVERALL FOUNDATION PLAN

PLOT SCALE: As indicated
FILENAME:
DATE: FEBRUARY 10, 2020

PROJECT 3309

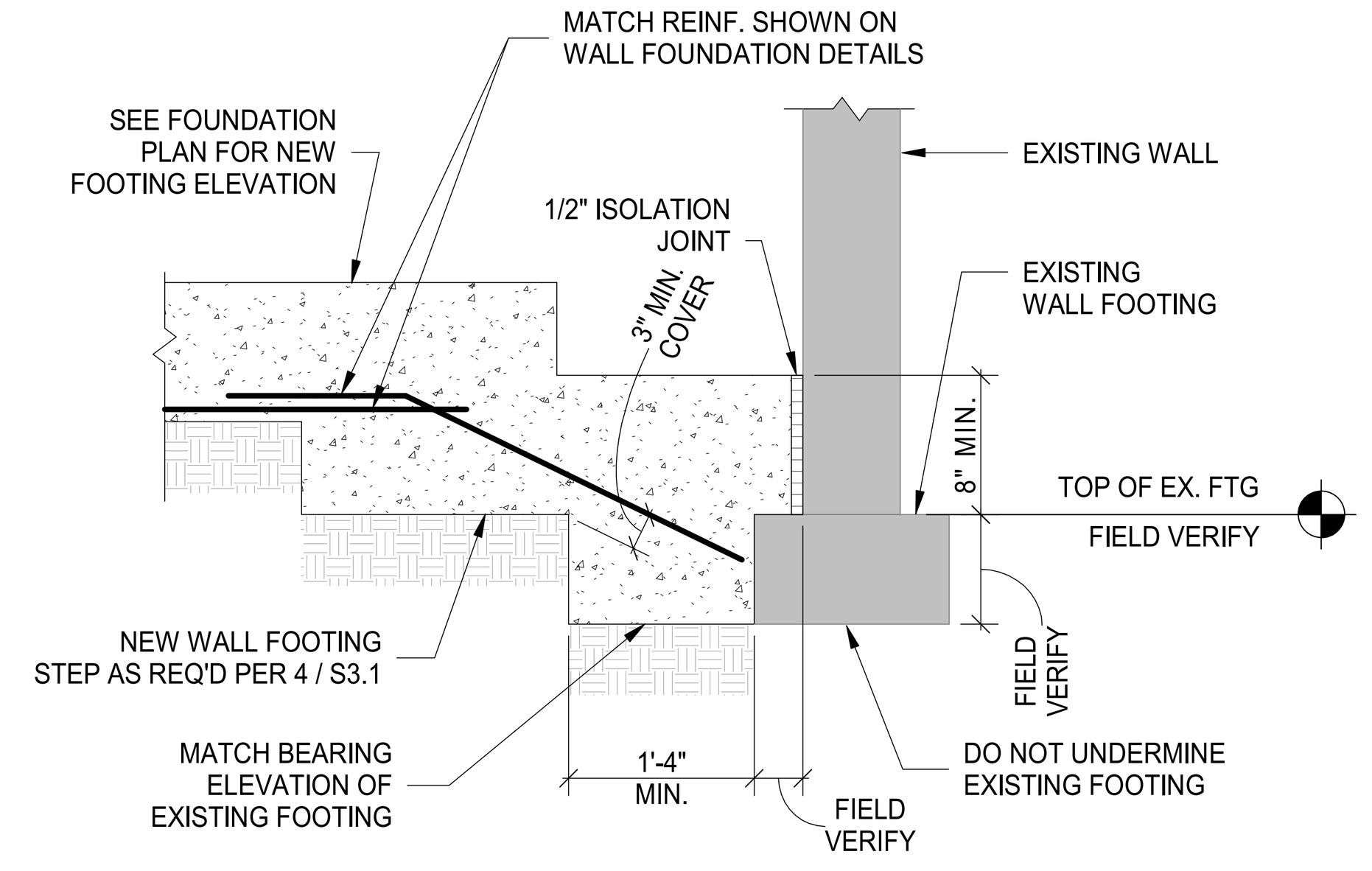
S1.1



1 S1.2 PARTIAL FOUNDATION PLAN - AREA A

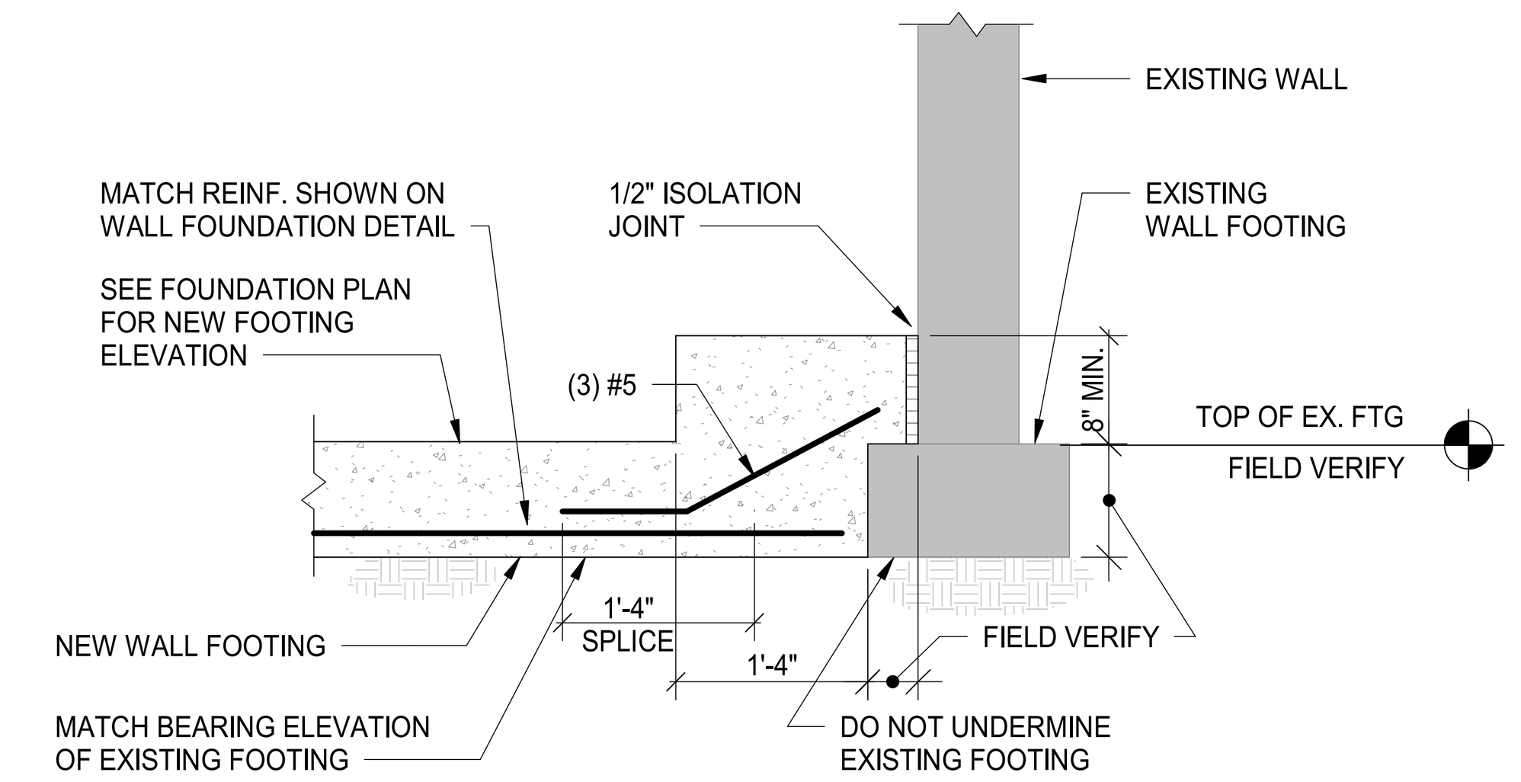
SCALE: 1/8" = 1'-0"

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



2 S1.2 NEW WALL FOOTING STEP DOWN TO EXISTING FOUNDATION

SCALE: NTS

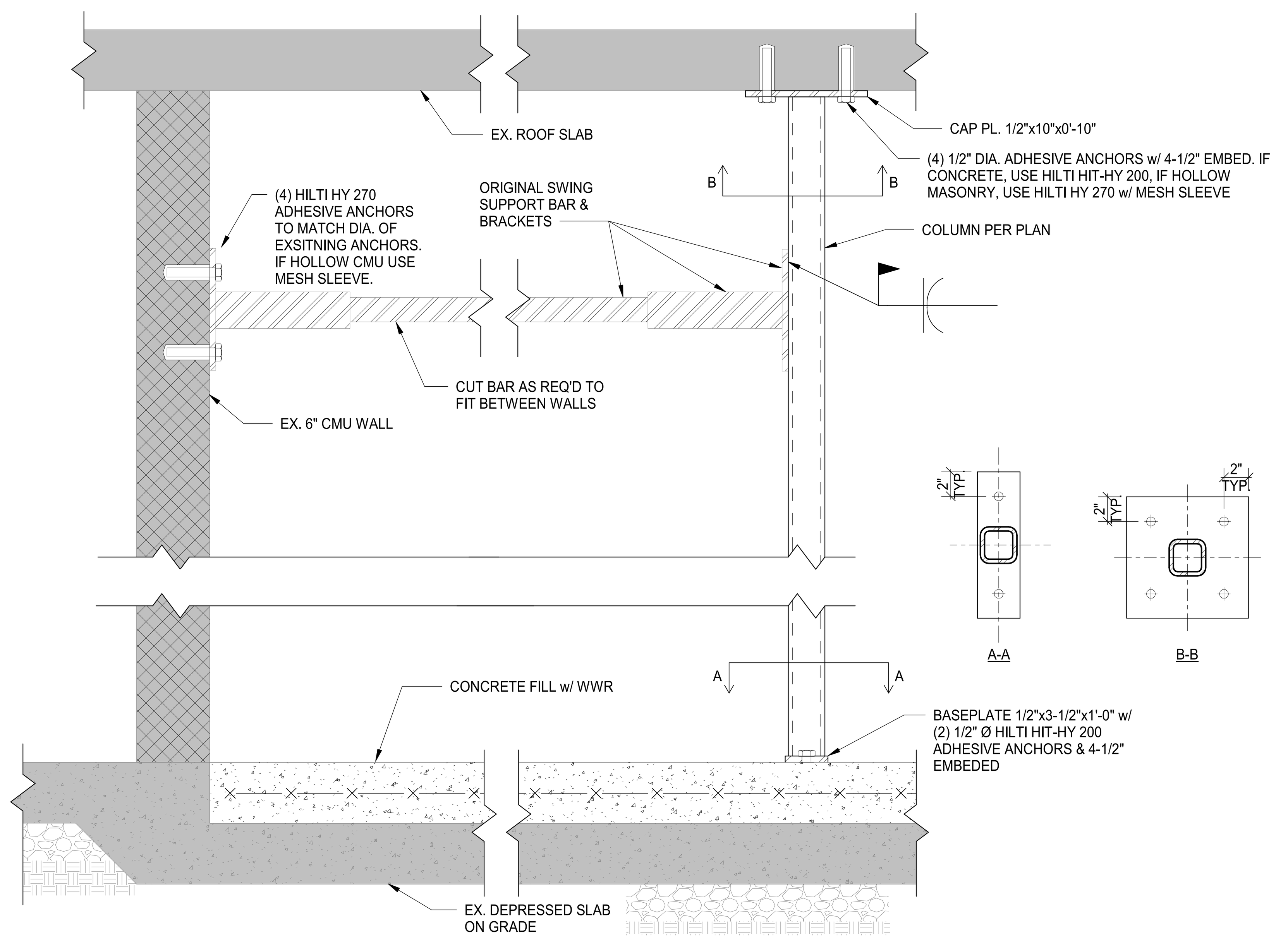


3 S1.2 NEW WALL FOOTING AT EXISTING FOUNDATION

SCALE: NTS

FOUNDATION PLAN NOTES

1. SEE SHEETS S0.1 THRU S0.2 FOR STRUCTURAL NOTES AND SCHEDULES AND SHEETS S3.1 THRU S5.1 FOR TYPICAL DETAILS. THE TYPICAL DETAILS APPLY WHEREVER THE CONDITION EXISTS UNLESS DETAILED OTHERWISE.
2. PROVIDE A 5" CONCRETE SLAB ON GRADE WITH 6X6 W2.0XW2.0 WWR ON CONTINUOUS VAPOR RETARDER OVER 6" OF DRAINAGE FILL. SEE THE PLAN FOR THE TOP OF SLAB ELEVATION. THE TOP OF SLAB ELEVATION 0'-0" CORRESPONDS TO AN APPROXIMATE ELEVATION OF **73.22'**. COORDINATE FINAL ELEVATION WITH APPROVED CIVIL DRAWINGS.
3. C.J. INDICATES A CONTROL JOINT IN THE GRADE SLAB. SEE DETAILS 9 & 10 ON S3.1.
4. SEE THE PLAN FOR TOP OF WALL FOOTING ELEVATIONS. THE TOP OF FOOTING ELEVATIONS ARE REFERENCED FROM ELEVATION 0'-0". FOOTING ELEVATIONS ARE FOR BIDDING PURPOSES ONLY AND MAY HAVE TO BE ADJUSTED BASED ON FIELD CONDITIONS ENCOUNTERED DURING EXCAVATION.
5. TOP OF INTERIOR FOOTINGS SHALL BE 8" BELOW FINISHED FLOOR ELEVATION UNLESS NOTED OTHERWISE.
6. BOTTOM OF EXTERIOR FOOTINGS SHALL BE A MINIMUM OF 2'-0" BELOW FINISHED EXTERIOR GRADE. COORDINATE ELEVATIONS WITH THE APPROVED SITE PLAN. USE TOP OF FOOTING VALUE SHOWN OR 2'-0" TO BOTTOM OF FOOTING FROM EXTERIOR GRADE, WHICHEVER IS DEEPER.
7. SEE THE TYPICAL WALL FOOTING AT UTILITIES DETAILS 6-8 ON SHEET S3.1. STEP ALL WALL FOOTINGS AS INDICATED OR REQUIRED BELOW UNDERGROUND UTILITIES. THE CONTRACTOR SHALL VERIFY THE INVERT ELEVATIONS OF ALL UTILITIES WITH THE TOP OF FOOTING ELEVATIONS SHOWN. COORDINATE ALL UTILITY LOCATIONS WITH SITE, PLUMBING, ELECTRICAL, AND MECHANICAL DRAWINGS. THE SYMBOL - - - - - - - - - - - INDICATES A UTILITY CROSSING A FOUNDATION ON THE PLAN. UTILITIES ARE SHOWN AS AN EFFORT TO AID IN THE COORDINATION OF TRADES; IT IS NOT INTENDED TO BE A COMPLETE REPRESENTATION OF ALL UTILITIES. G.C. TO COORDINATE FOOTING STEPS WITH UTILITY CONTRACTOR AND CONCRETE CONTRACTOR PRIOR TO FOOTING POUR.
8. REFER TO THE ARCHITECTURAL DRAWINGS FOR DIMENSIONS NOT SHOWN.
9. SEE THE ARCHITECTURAL DRAWINGS FOR THE SIZE AND LOCATION OF ALL NON-BEARING PARTITIONS.
10. CONTRACTOR TO COORDINATE FINAL SLAB ELEVATION WITH ARCHITECTURAL FLOOR AND KITCHEN FINISH REQUIREMENTS. SEE DETAIL 9/3.2 FOR DEPRESSION REQUIREMENTS. SLOPE SLAB TO FLOOR DRAINS. SEE ARCH. DRAWINGS FOR DRAIN LOCATIONS.
11. STEP FOOTING AS REQUIRED TO MATCH BEARING ELEVATION OF EXISTING ADJACENT FOOTING. SEE DETAIL 2 & 3 / S1.2.
12. ALL CMU WALLS SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE REINFORCED PER THE PLAN. PROVIDE DOWELS TO FOOTING TO MATCH. REBAR SHALL BE CENTERED IN CELL U.N.O. GROUT REINFORCED CELLS SOLID.
13. PROVIDE JAMB REINFORCING PER 2/S5.1 AT ALL MASONRY OPENINGS. JAMB REINFORCING TO BE FULL HEIGHT OF WALL WITH MATCHING DOWELS TO FOOTING.
14. SMP INDICATES A SOLID MASONRY PIER. SEE DETAIL 9/S5.1.
15. CONCRETE PAD WITH TURN DOWN PER 11/S3.1. COORDINATE DIMENSIONS WITH ARCH., AND CIVIL DRAWINGS.
16. EXISTING 5" CONCRETE SLAB ON GRADE.
17. TRENCH FOR NEW UNDERGROUND UTILITIES AS REQUIRED PER MECHANICAL, ELECTRICAL, AND PLUMBING DRAWINGS. COORDINATE LOCATIONS AND EXTENT OF SLAB REMOVAL WITH MECHANICAL, ELECTRICAL, AND PLUMBING DRAWINGS. PATCH SLAB ON GRADE PER DETAIL 4 / S1.1.
18. REMOVE EXISTING WALL PER ARCH. PROVIDE NEW LINTEL PER 3/S5.1 AS REQUIRED. PROVIDE TEMPORARY SHORING AS REQUIRED. PATCH SLAB AT NEW DOOR OPENING THRU EXISTING WALL AS REQUIRED; SEE DETAIL 5 / S1.1.
19. INFILL EXISTING OPENING WITH NEW WALL PER ARCH. EXISTING WALL LINTEL TO REMAIN.
20. REMOVE EXISTING EXTERIOR WALL AND VENEER TO 8" BELOW FINISHED FLOOR ELEVATION. EXIST. FOUNDATION WALL & FOOTING TO REMAIN.

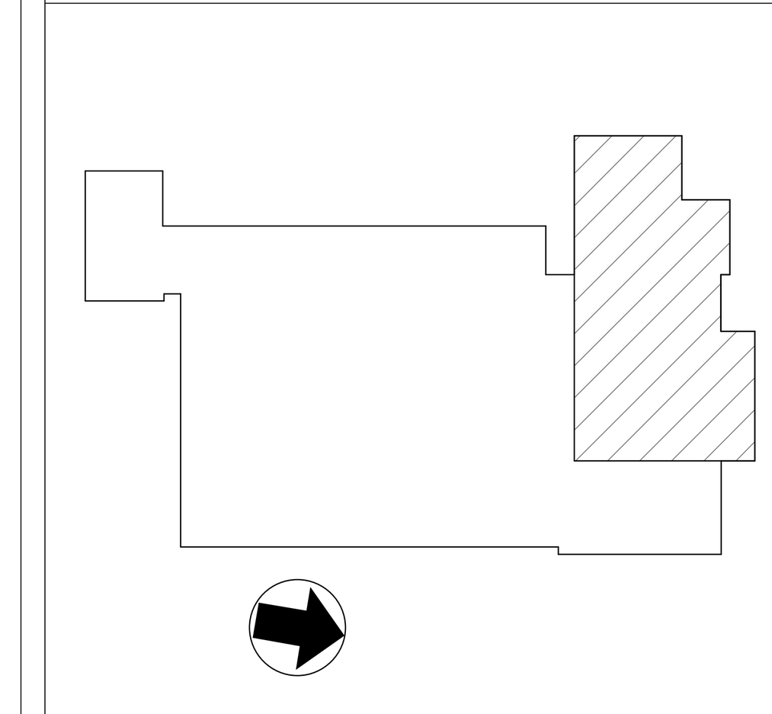


4 S1.2 SWING SUPPORT FRAMING

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

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

KEY PLAN



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PARTIAL FOUNDATION PLAN - AREA A

PROJECT 3309

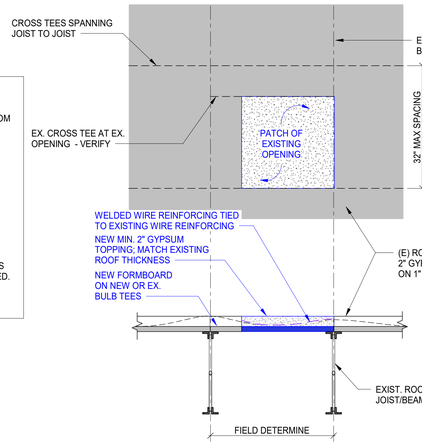
PLOT SCALE: As indicated

FILENAME:

DATE: FEBRUARY 10, 2020

S1.2

PLAN OF ROOF INFILL



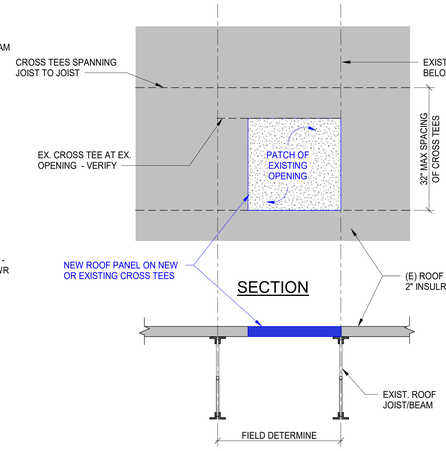
SECTION

NOTES:

1. DETERMINE LOCATION AND EXTENT OF AREAS OF ROOF DECK OPENINGS TO BE INFILLED. VISUALLY AND PHYSICALLY CHECK FROM ABOVE AND BELOW FOR DAMAGE AROUND OPENING:
   A. CHECK FOR WATER STAINS AND CHECK CURRENT MOISTURE LEVELS.
   B. CHECK FOR SAGGING FORMBOARD.
   C. LOCATE BROKEN FORMBOARDS.
   D. LOCATE EXCESSIVELY CRACKED GYPSUM TOPPING.
2. IN THE AREAS OF THE OPENING BEING INFILLED, REMOVE THE ROOFING AND GYPSUM.
3. REMOVE WIRE MESH LEAVING AT LEAST 3" FOR LAP.
4. REPLACE COMPLETE FORMBOARDS WITH NEW BOARDS;
   A. OPTION 1 - SHEET ROCK - MIN. 6 lbs. DENSITY (SPRAY AS REQUIRED FOR PROTECTION).
   B. OPTION 2 - 1" THICK FIBERGLASS FORM BOARD.
5. PROVIDE NEW GALVANIZED CROSS TEES AT END OF FORMBOARDS. WHERE EXISTING CROSS TEES ARE MISSING, DAMAGED OR RUSTED.
6. INSTALL NEW WIRE MESH TIED TO EXISTING MESH.
7. POUR GYPSUM TOPPING ON JOINTS THEN POUR MIN. 2" THICK GYPSUM ON THE FORMBOARD.

2 / S2.1 GYPSUM AND BOARD ROOF OPENING INFILL
SCALE: NTS

PLAN OF ROOF INFILL

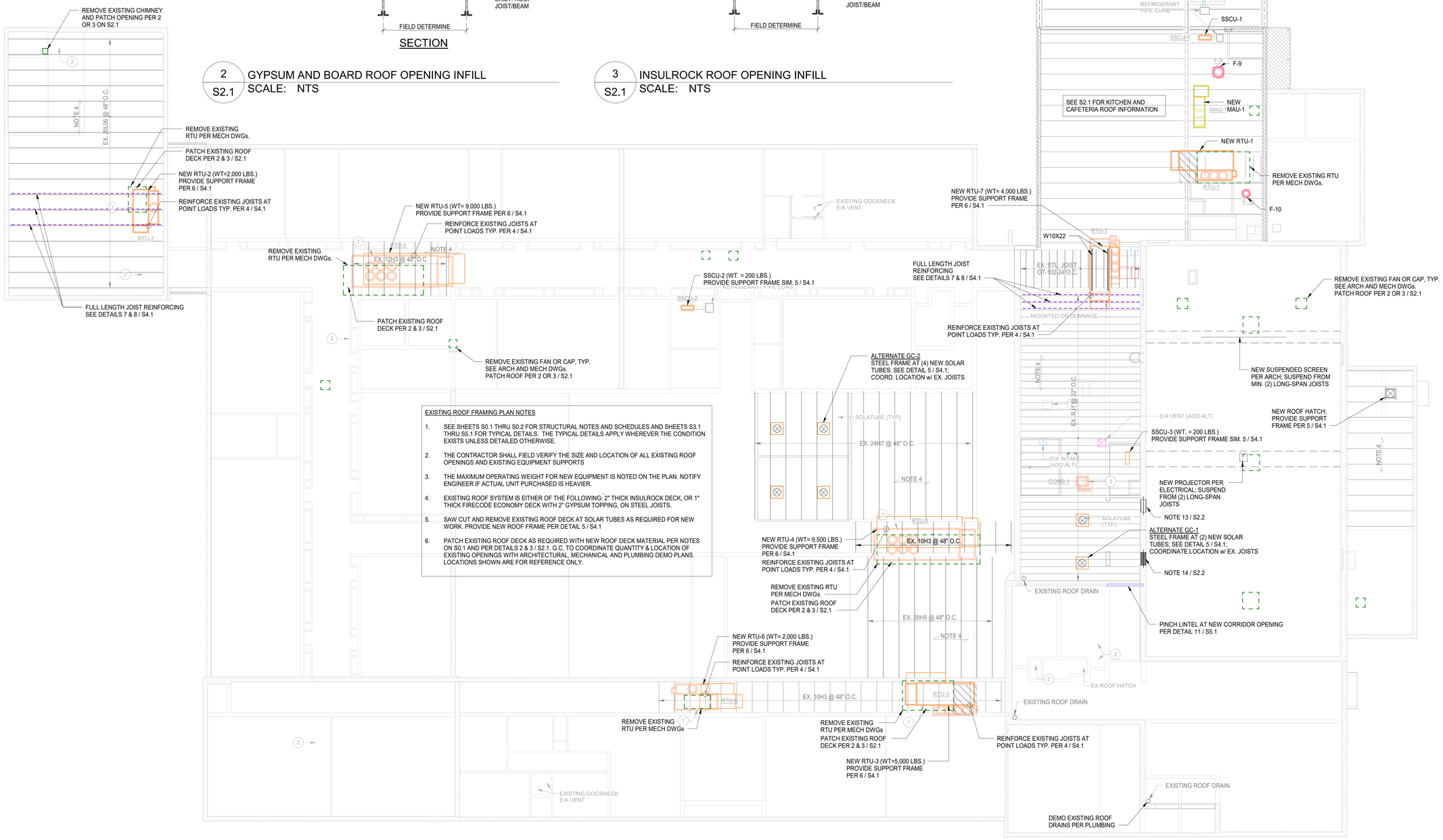


SECTION

NOTES:

1. DETERMINE LOCATION AND EXTENT OF AREAS OF INSULROCK ROOF DECK OPENINGS TO BE INFILLED. VISUALLY AND PHYSICALLY CHECK FROM ABOVE AND BELOW FOR DAMAGE AROUND OPENING:
   A. CHECK FOR WATER STAINS AND FOR CURRENT MOISTURE ISSUES.
   B. LOCATE BROKEN ROOF PANELS, SOFT PANELS OR EXCESSIVELY CRACKED PANELS.
2. IN THE AREA OF THE OPENING BEING INFILLED, REMOVE THE ROOFING.
3. REPLACE DAMAGED PANEL WITH NEW PANEL;
   A. OPTION 1 - INSULROCK ROOF PANEL SPANNING CROSS TEE TO CROSS TEE.
   B. OPTION 2 - 1 1/2" ROOF DECK SPANNING JOIST TO JOIST SCREWED TO THE TOP OF STEEL JOIST/BEAM; ADD SUFFICIENT THICKNESS PLYWOOD TO MATCH EXISTING ROOF THICKNESS.
4. PROVIDE NEW GALVANIZED CROSS TEES AT END OF FORMBOARDS WHERE EXISTING CROSS TEES ARE MISSING, DAMAGED OR RUSTED.
5. SEAL EDGES OF PANEL FROM ABOVE WITH BARRIER TAPE OR MASTIC.

3 / S2.1 INSULROCK ROOF OPENING INFILL
SCALE: NTS



EXISTING ROOF FRAMING PLAN NOTES

1. SEE SHEETS S0.1 THRU S0.2 FOR STRUCTURAL NOTES AND SCHEDULES AND SHEETS S3.1 THRU S5.1 FOR TYPICAL DETAILS. THE TYPICAL DETAILS APPLY WHEREVER THE CONDITION EXISTS UNLESS DETAILED OTHERWISE.
2. THE CONTRACTOR SHALL FIELD VERIFY THE SIZE AND LOCATION OF ALL EXISTING ROOF OPENINGS AND EXISTING EQUIPMENT SUPPORTS
3. THE MAXIMUM OPERATING WEIGHT FOR NEW EQUIPMENT IS NOTED ON THE PLAN. NOTIFY ENGINEER IF ACTUAL UNIT PURCHASED IS HEAVIER.
4. EXISTING ROOF SYSTEM IS EITHER OF THE FOLLOWING: 2" THICK INSULROCK DECK, OR 1" THICK FIRECODE ECONOMY DECK WITH 2" GYPSUM TOPPING, ON STEEL JOISTS.
5. SAW CUT AND REMOVE EXISTING ROOF DECK AT SOLAR TUBES AS REQUIRED FOR NEW WORK. PROVIDE NEW ROOF FRAME PER DETAIL 5 / S4.1
6. PATCH EXISTING ROOF DECK AS REQUIRED WITH NEW ROOF DECK MATERIAL PER NOTES ON S0.1 AND PER DETAILS 2 & 3 / S2.1. G.C. TO COORDINATE QUANTITY & LOCATION OF EXISTING OPENINGS WITH ARCHITECTURAL, MECHANICAL AND PLUMBING DEMO PLANS. LOCATIONS SHOWN ARE FOR REFERENCE ONLY.

1 / S2.1 OVERALL ROOF FRAMING PLAN
SCALE: 3/32" = 1'-0"

0 8' 16' 32'
SCALE: 3/32" = 1'-0"

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KEY PLAN

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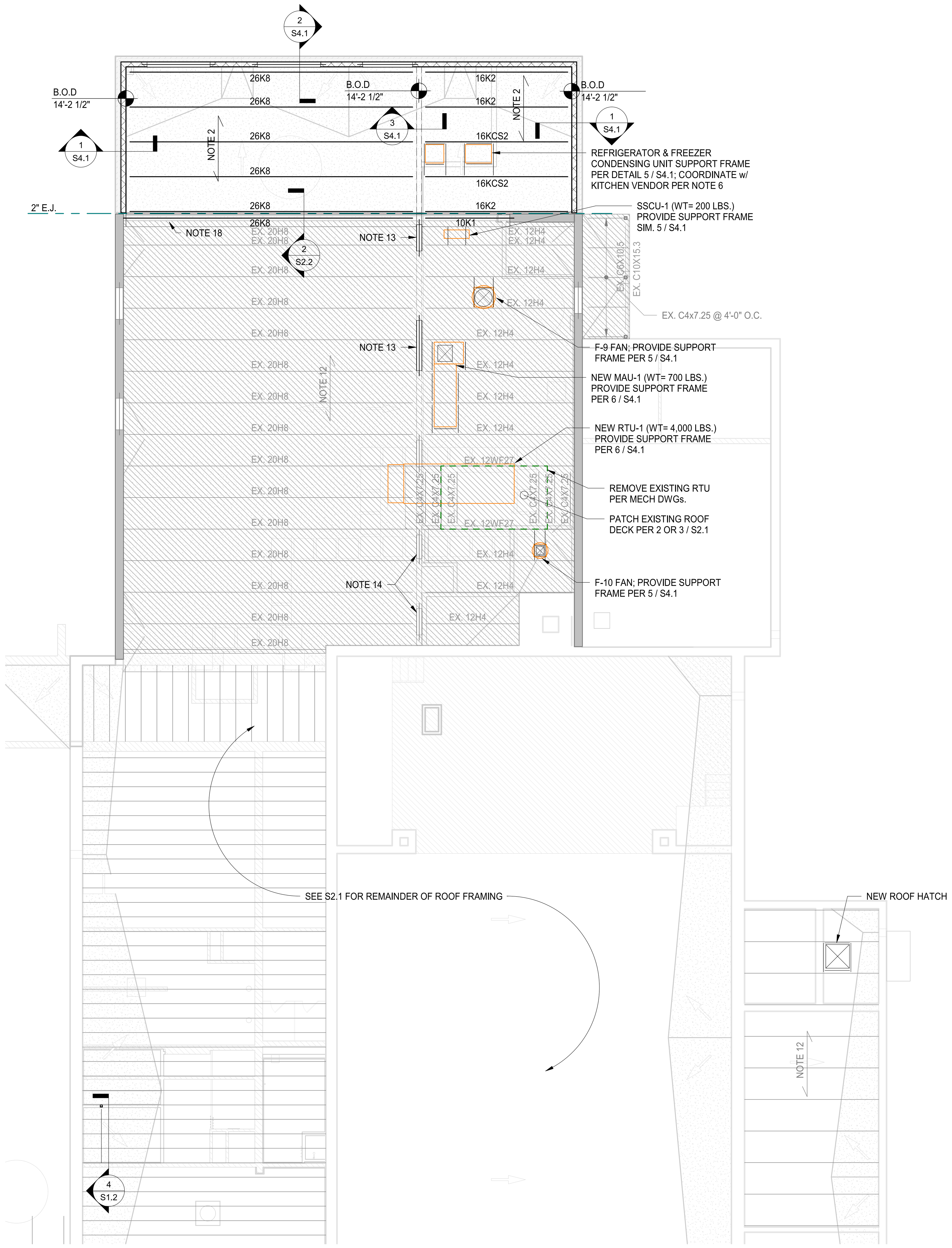
ADTEK
ADTEK ENGINEERS, INC.
150 South East Street
Suite 201
Frederick, Maryland 21701
301-662-4408
Fax: 301-662-7484
ADTEK PROJECT #: 1913.0001

OVERALL ROOF FRAMING PLAN

PLOT SCALE: As indicated
FILENAME:
DATE: FEBRUARY 10, 2020

PROJECT 3309

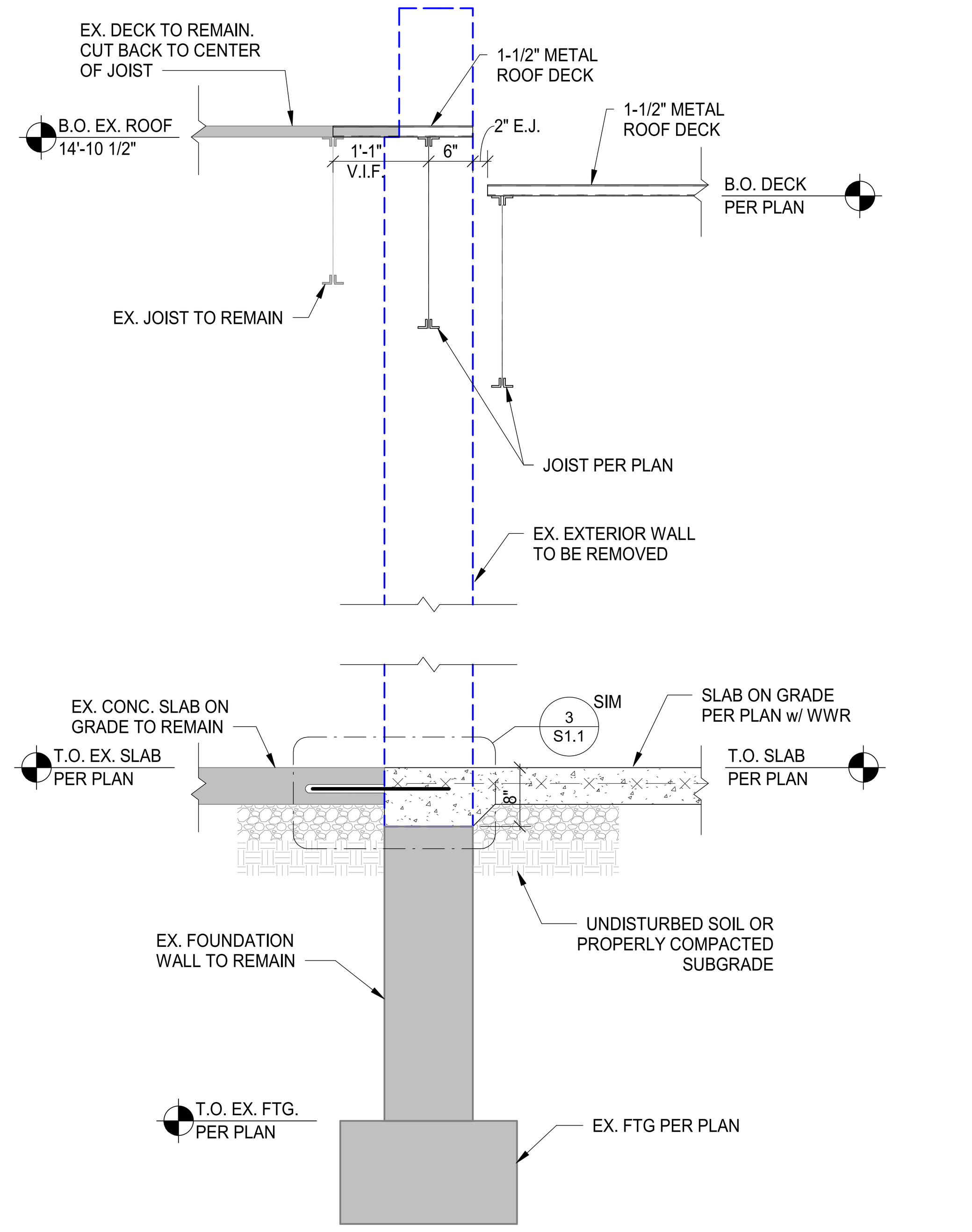
S2.1



1 / S2.2 PARTIAL ROOF FRAMING PLAN - AREA A

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

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



2 / S2.2 INTERFACE OF NEW AND EXIST. BUILDING

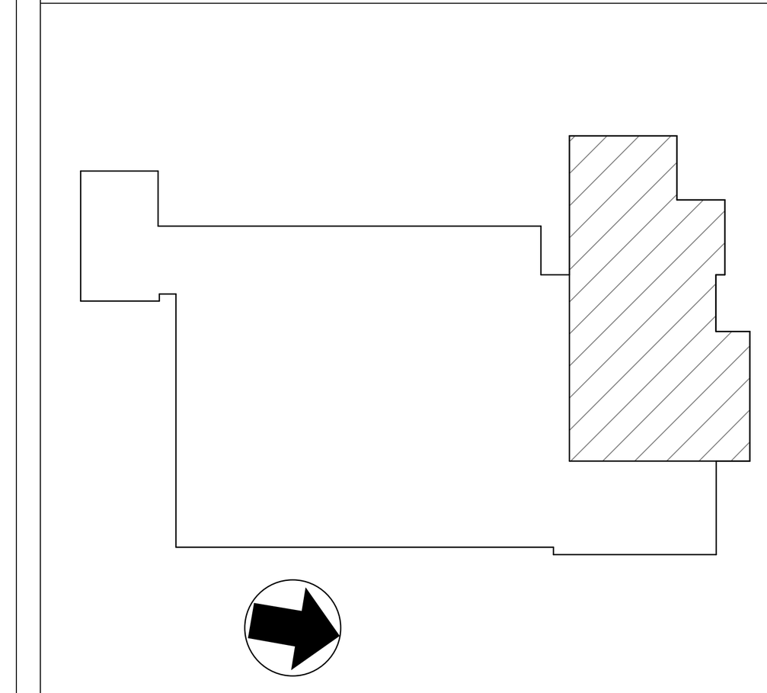
SCALE: 3/4" = 1'-0"

SCALE: 3/4" = 1'-0"

ROOF FRAMING PLAN NOTES

1. SEE SHEETS S0.1 THRU S0.2 FOR STRUCTURAL NOTES AND SCHEDULES AND SHEETS S3.1 THRU S5.1 FOR TYPICAL DETAILS. THE TYPICAL DETAILS APPLY WHEREVER THE CONDITION EXISTS UNLESS DETAILED OTHERWISE.
2. THE NEW ROOF SYSTEM SHALL BE 1½" STEEL ROOF DECK, THREE SPANS CONTINUOUS. SEE STRUCTURAL NOTES SHEETS FOR DECK PROPERTIES.
3. ALL CMU WALLS SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE REINFORCED PER THE FOUNDATION PLANS; REBAR SHALL BE CENTERED IN CELL U.N.O. GROUT REINFORCED CELLS SOLID.
4. BOTTOM OF DECK ELEVATIONS ARE NOTED ON THE PLANS THUS: B.O.D.=+0'-0" REFERENCED FROM ELEVATION 0'-0". ASSUME 2 ½" K-SERIES SEATS. CONTRACTOR COORDINATE REQUIRED BEARING PL. ELEVATION WITH JOIST SEATS PROVIDED ON SHOP DRAWINGS TO MAINTAIN BOTTOM OF DECK ELEVATIONS.
5. SLOPE ROOF TO DRAIN, TYP. SEE ARCH. DRAWINGS FOR SLOPES.
6. THE CONTRACTOR SHALL COORDINATE THE SIZE AND LOCATION OF ALL ROOF OPENINGS AND EQUIPMENT SUPPORTS WITH THE ARCHITECTURAL, MECHANICAL, ELECTRICAL, PLUMBING AND KITCHEN DRAWINGS AND SUB-CONTRACTORS. SEE DETAIL 5 / S4.1. PROVIDE ADDITIONAL JOISTS AS REQUIRED AT OPENINGS OR MECH., ELEC., PLUMBING EQUIPMENT. THE MAXIMUM OPERATING WEIGHT FOR EQUIPMENT SHALL BE AS NOTED ON THE PLAN.
7. SEE S5.1 FOR THE LINTEL SCHEDULE FOR ALL LINTELS IN MASONRY WALLS UNLESS NOTED OTHERWISE. SEE THE ARCHITECTURAL, MECHANICAL, PLUMBING AND ELECTRICAL DRAWINGS FOR THE SIZE, LOCATION, AND FIRE RATING OF ALL MASONRY OPENINGS.
8. REFER TO THE ARCHITECTURAL DRAWINGS FOR DIMENSIONS AND ELEVATIONS NOT SHOWN. CONTRACTOR SHALL COORDINATE BETWEEN THE STRUCTURAL AND ARCHITECTURAL DRAWINGS.
9. PROVIDE JAMB REINFORCING PER 2 / S5.1 AT ALL MASONRY OPENINGS. JAMB REINFORCING TO BE FULL HEIGHT OF WALL WITH MATCHING DOWELS TO SLAB OR STRUCTURE, AS REQUIRED.
10. SMP INDICATES A SOLID MASONRY PIER. SEE DETAIL 9 / S5.1.
11. ALL INTERIOR WALLS ON THIS PLAN ARE BELOW THE ROOF FRAMING, U.N.O.
12. EXISTING ROOF SYSTEM IS EITHER OF THE FOLLOWING: 2" THICK INSULROCK DECK, OR 1" THICK FIRECODE ECONOMY DECK WITH 2" GYPSUM TOPPING, ON STEEL JOISTS.
13. REMOVE EXISTING WALL PER ARCH. PROVIDE NEW LINTEL PER SCHEDULE ON S5.1 AS REQUIRED. PROVIDE TEMPORARY SHORING AS REQUIRED.
14. INFILL EXISTING OPENING WITH NEW WALL PER ARCH. THE EXISTING MASONRY LINTEL IS TO REMAIN.
15. SAW CUT AND REMOVE EXISTING ROOF DECK AT SOLAR TUBES AS REQUIRED FOR NEW WORK. PROVIDE NEW ROOF FRAME PER DETAIL 5 / S4.1
16. PATCH EXISTING ROOF DECK AS REQUIRED WITH NEW ROOF DECK MATERIAL PER NOTES ON S0.1 AND PER DETAILS 2 & 3 / S2.1. G.C. TO COORDINATE QUANTITY & LOCATION OF EXISTING OPENINGS WITH ARCHITECTURAL, MECHANICAL AND PLUMBING DEMO PLANS. LOCATIONS SHOWN ARE FOR REFERENCE ONLY.
17. CONTRACTOR COORDINATE MECHANICAL, ELECTRICAL, AND PLUMBING WALL PENETRATIONS WITH JOIST LAYOUT AS NOTED IN THE MISCELLANEOUS LINTELS SECTION IN STRUCTURAL NOTES.
18. REMOVE EXIST. EXTERIOR WALL & VENEER TO 8" BELOW FINISHED FLOOR ELEVATION. EXIST. ROOF JOISTS TO REMAIN

KEY PLAN



REVISIONS

MM-DD-YR	NAME	DESCRIPTION OF CHANGES

CRABTREE ROHRBAUGH & ASSOCIATES - ARCHITECTS
www.cra-architects.com
100 WEST ROAD, SUITE 402
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PARTIAL ROOF FRAMING PLAN - AREA A

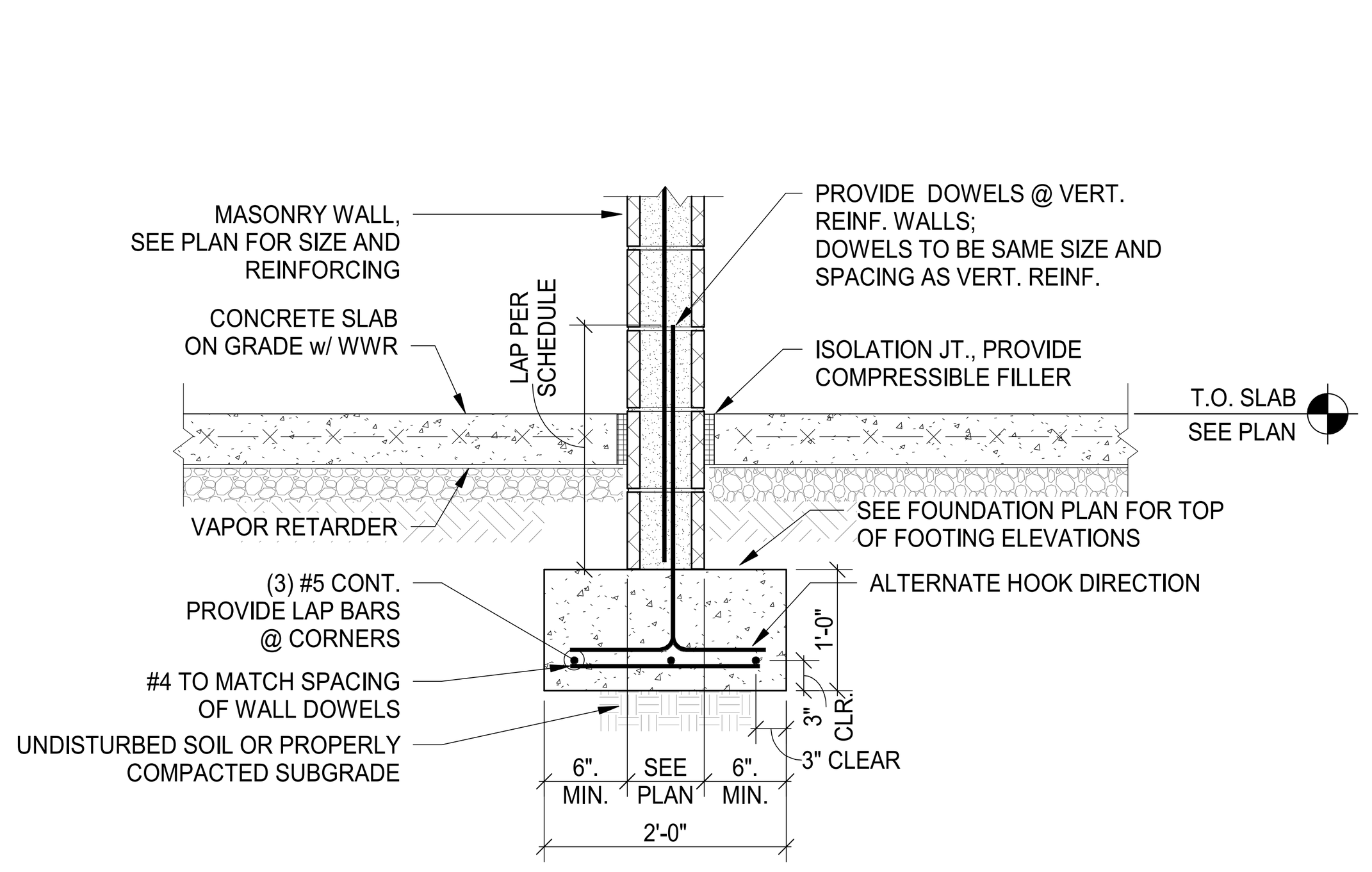
PLOT SCALE: As indicated

FILENAME:

DATE: FEBRUARY 10, 2020

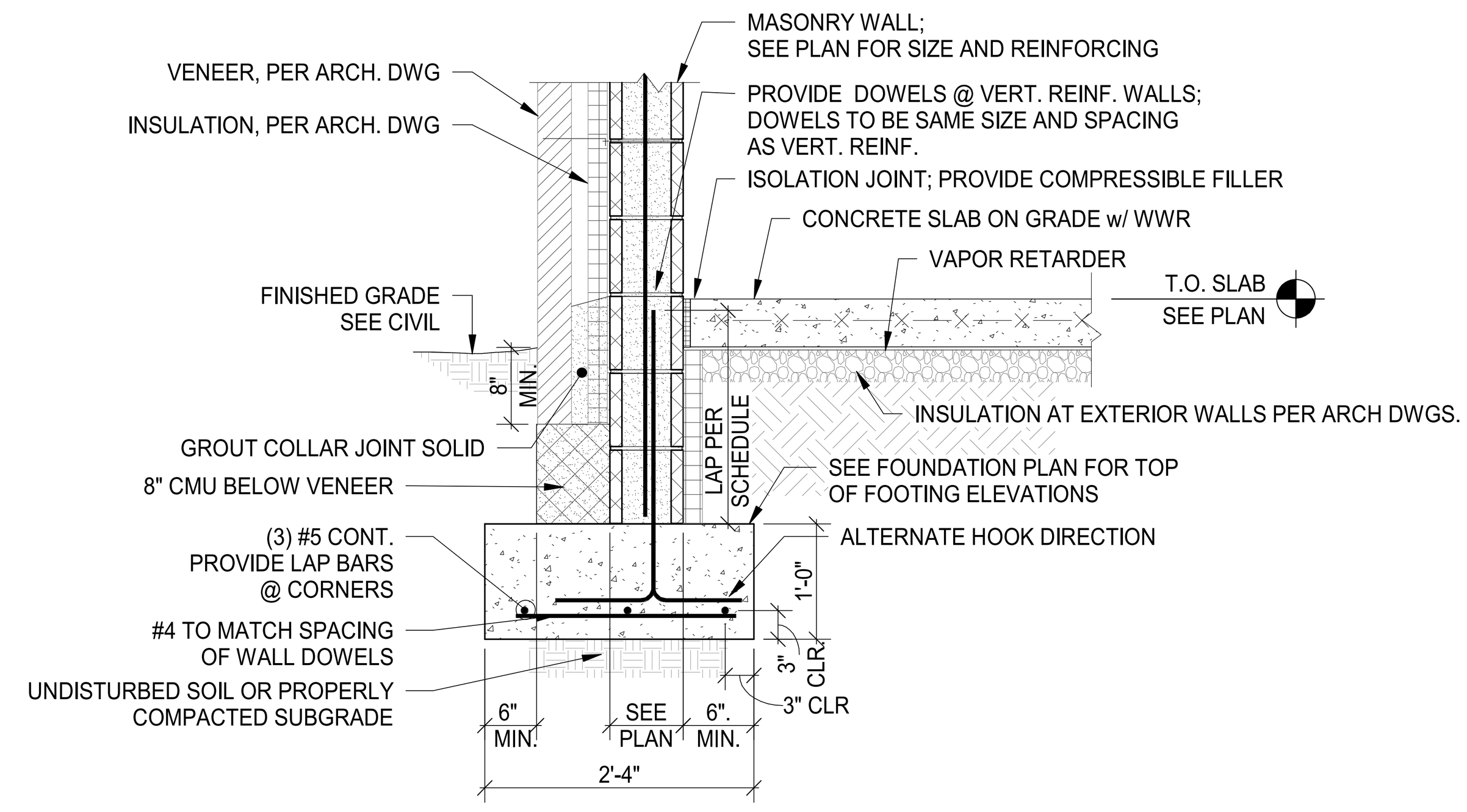
PROJECT 3309

S2.2



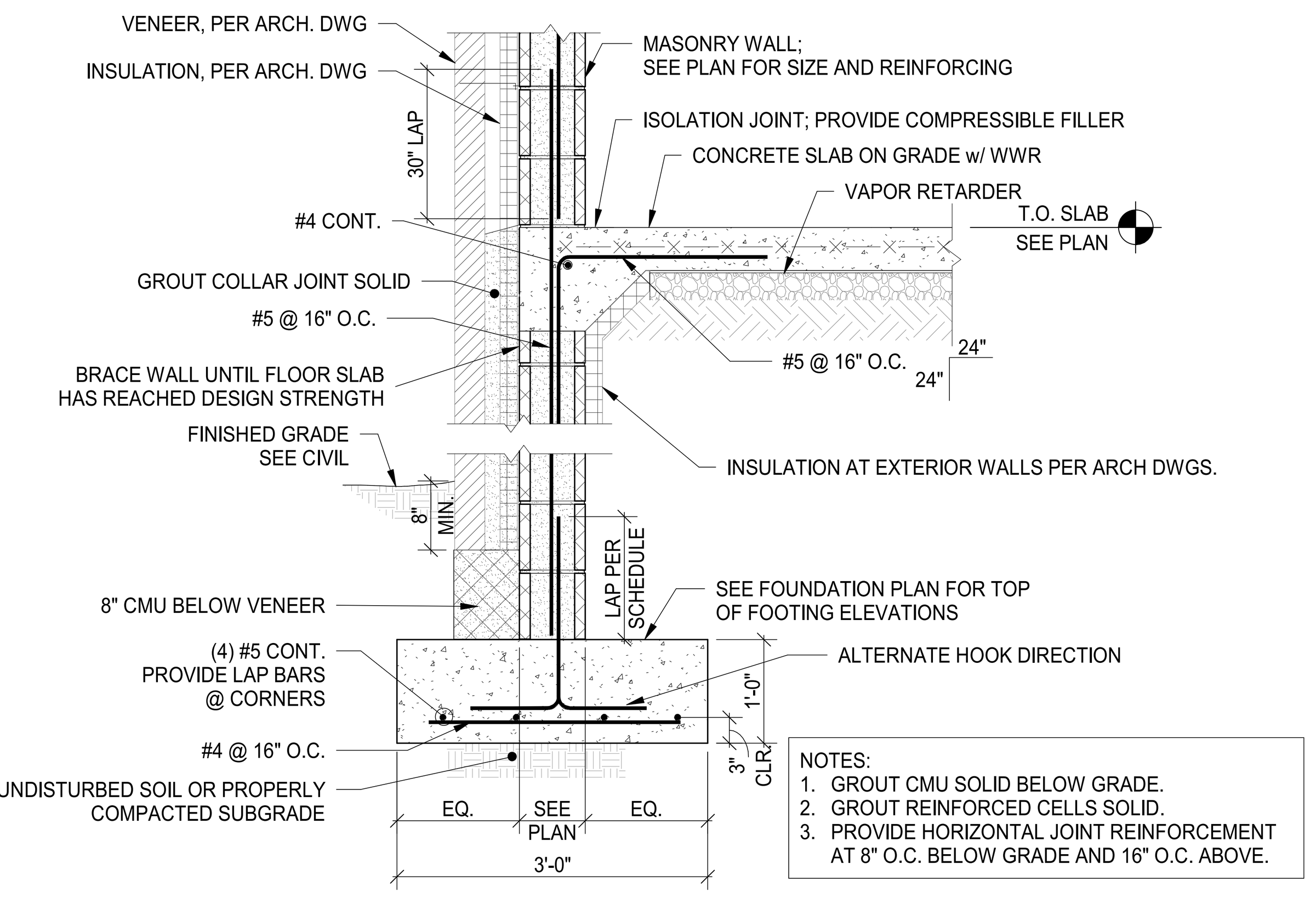
NOTES:
1. GROUT CMU SOLID BELOW GRADE.
2. GROUT REINFORCED CELLS SOLID.
3. PROVIDE HORIZONTAL JOINT REINFORCEMENT AT 8" O.C. BELOW GRADE AND 16" O.C. ABOVE.

1 / S3.1 INTERIOR CMU WALL FOOTING
SCALE: NTS



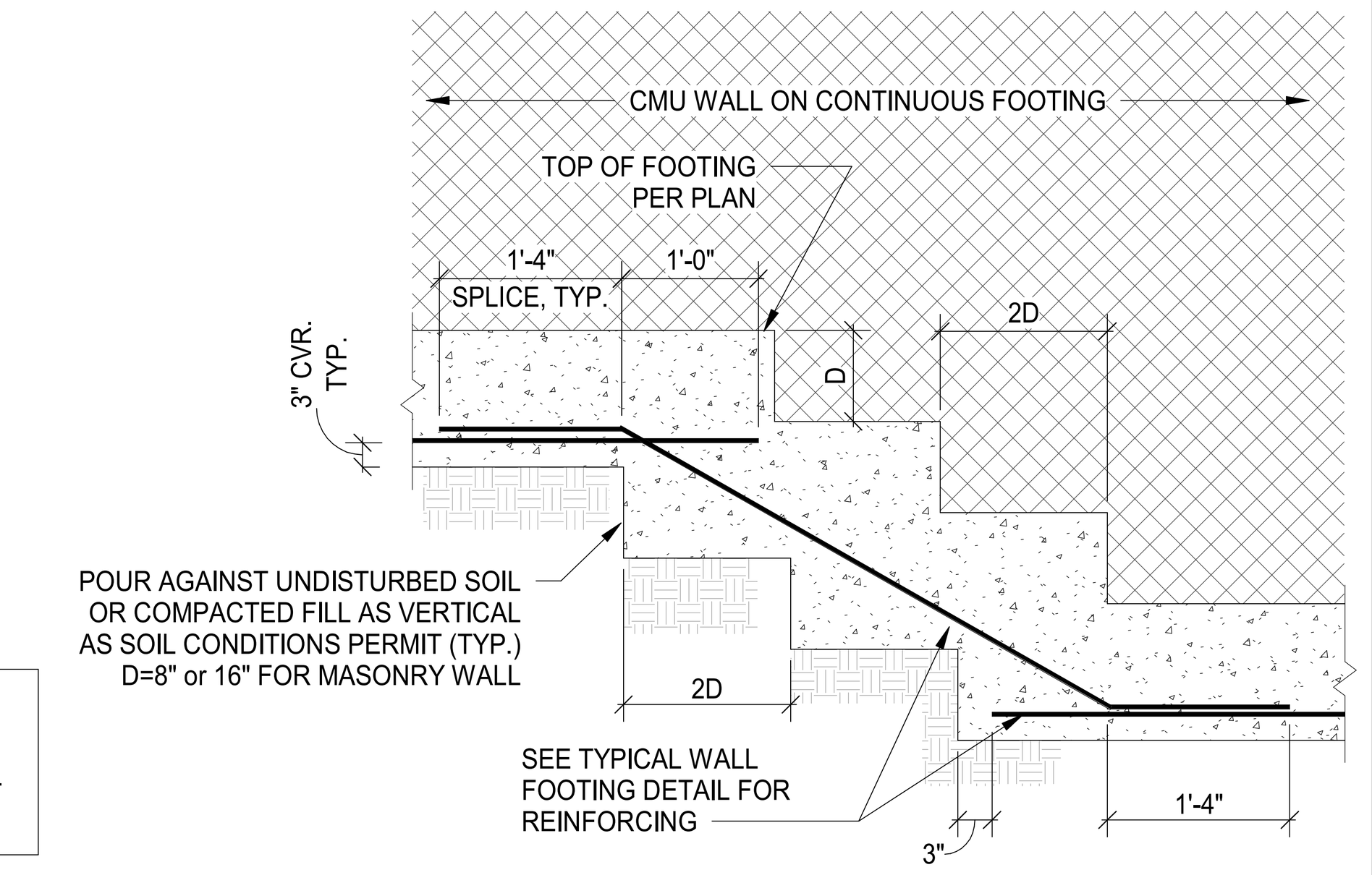
NOTES:
1. GROUT CMU SOLID BELOW GRADE.
2. GROUT REINFORCED CELLS SOLID.
3. PROVIDE HORIZONTAL JOINT REINFORCEMENT AT 8" O.C. BELOW GRADE AND 16" O.C. ABOVE.

2 / S3.1 EXTERIOR CMU WALL SECTION WITH BRICK VENEER
SCALE: NTS

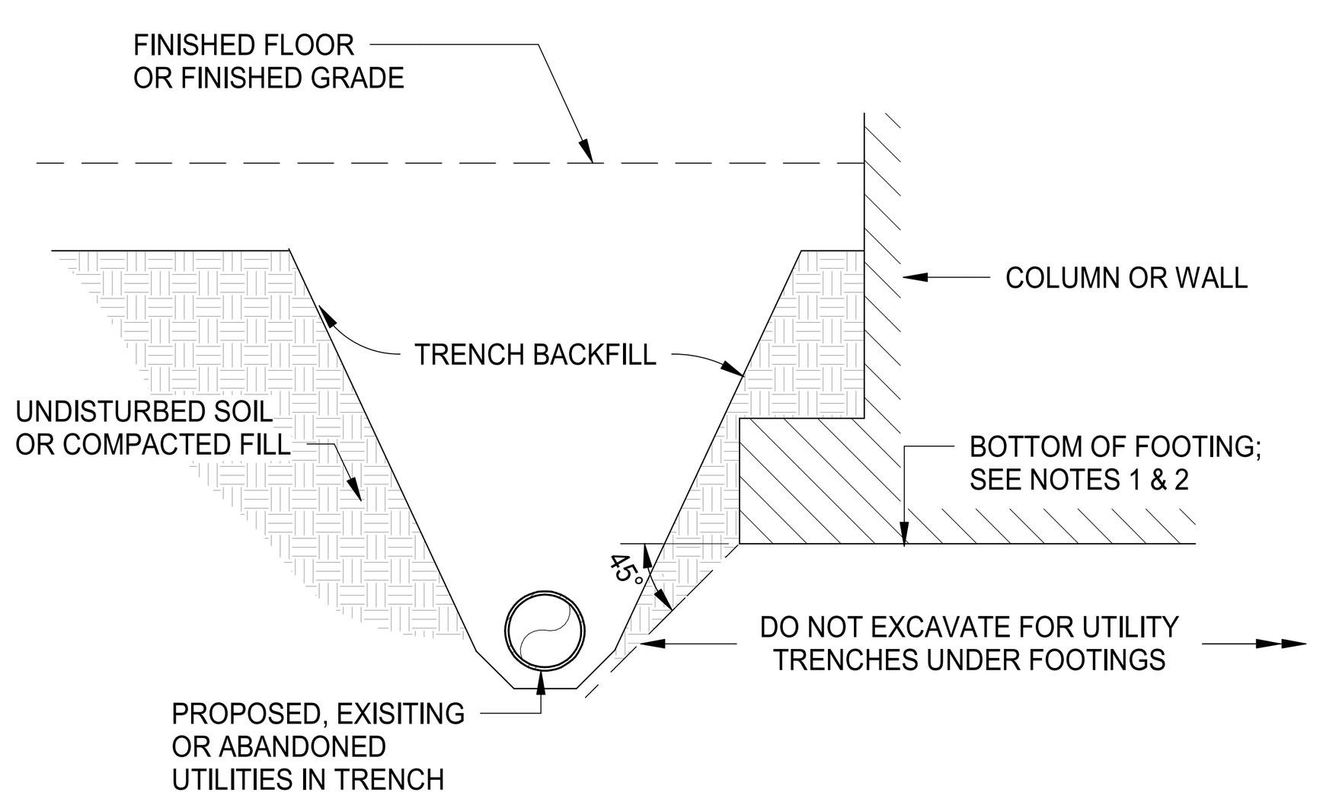


NOTES:
1. GROUT CMU SOLID BELOW GRADE.
2. GROUT REINFORCED CELLS SOLID.
3. PROVIDE HORIZONTAL JOINT REINFORCEMENT AT 8" O.C. BELOW GRADE AND 16" O.C. ABOVE.

3 / S3.1 EXTERIOR CMU RETAINING WALL SECTION WITH BRICK VENEER
SCALE: NTS

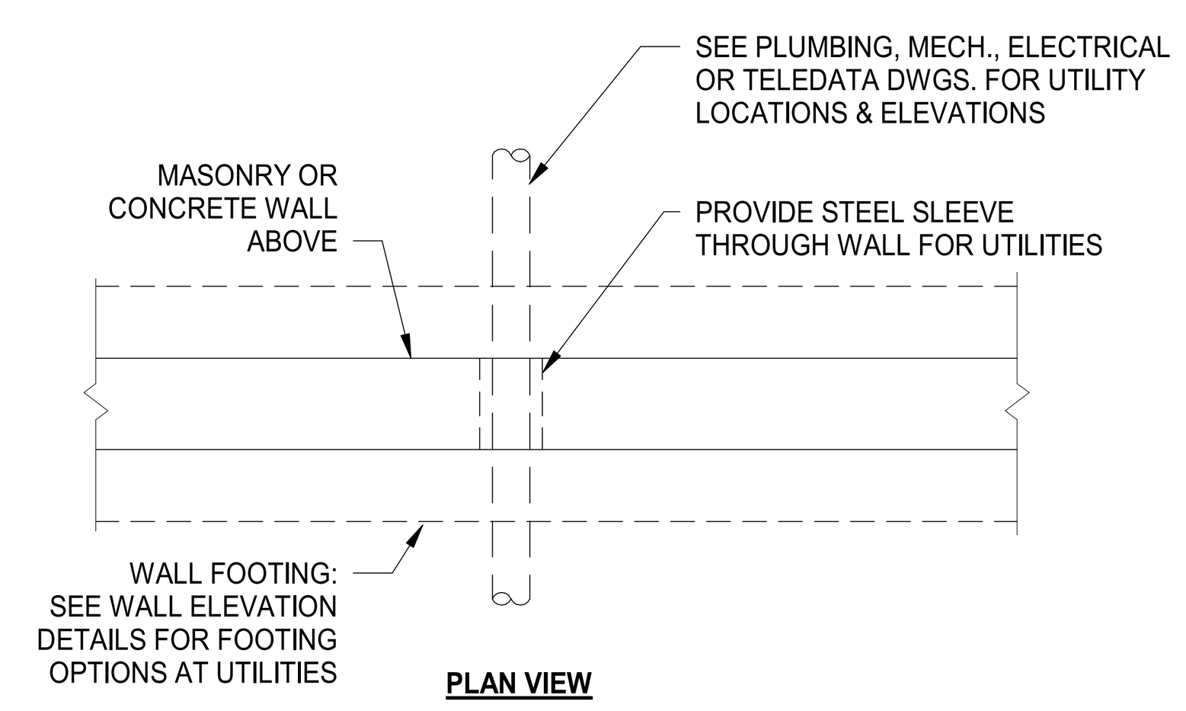


4 / S3.1 STEPPED FOOTING AT CMU WALL
SCALE: NTS

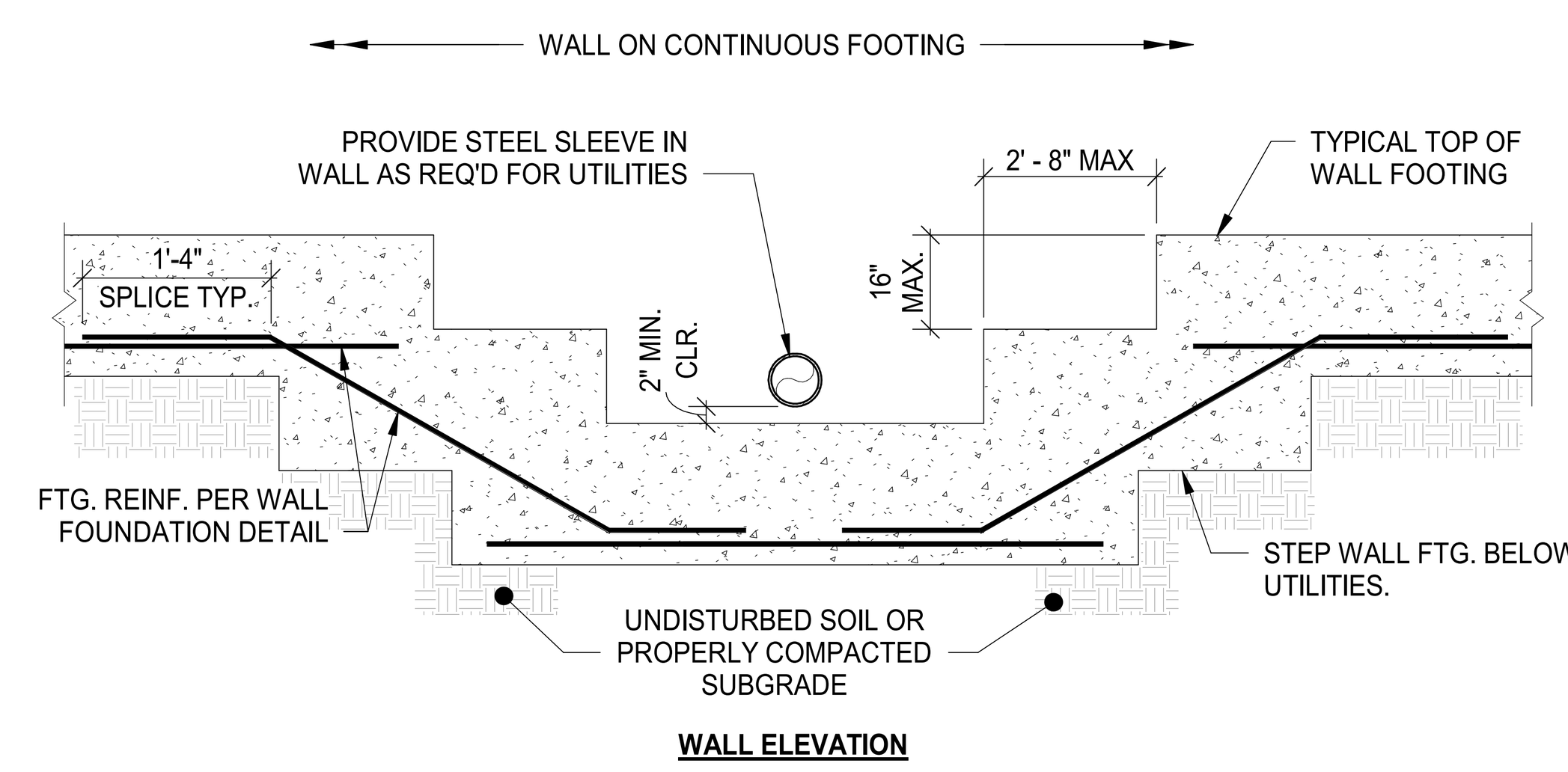


NOTES:
1. SEE FOUNDATION PLAN OR COLUMN/FOOTING SCHEDULE FOR FOOTING SIZE & ELEVATION.
2. LOWER NEW FOOTING AS REQUIRED TO AVOID CRUSHING PROPOSED, EXISTING OR ABANDONED UTILITIES.

5 / S3.1 PIPE TRENCH EXCAVATION NEAR FOUNDATIONS
SCALE: NTS

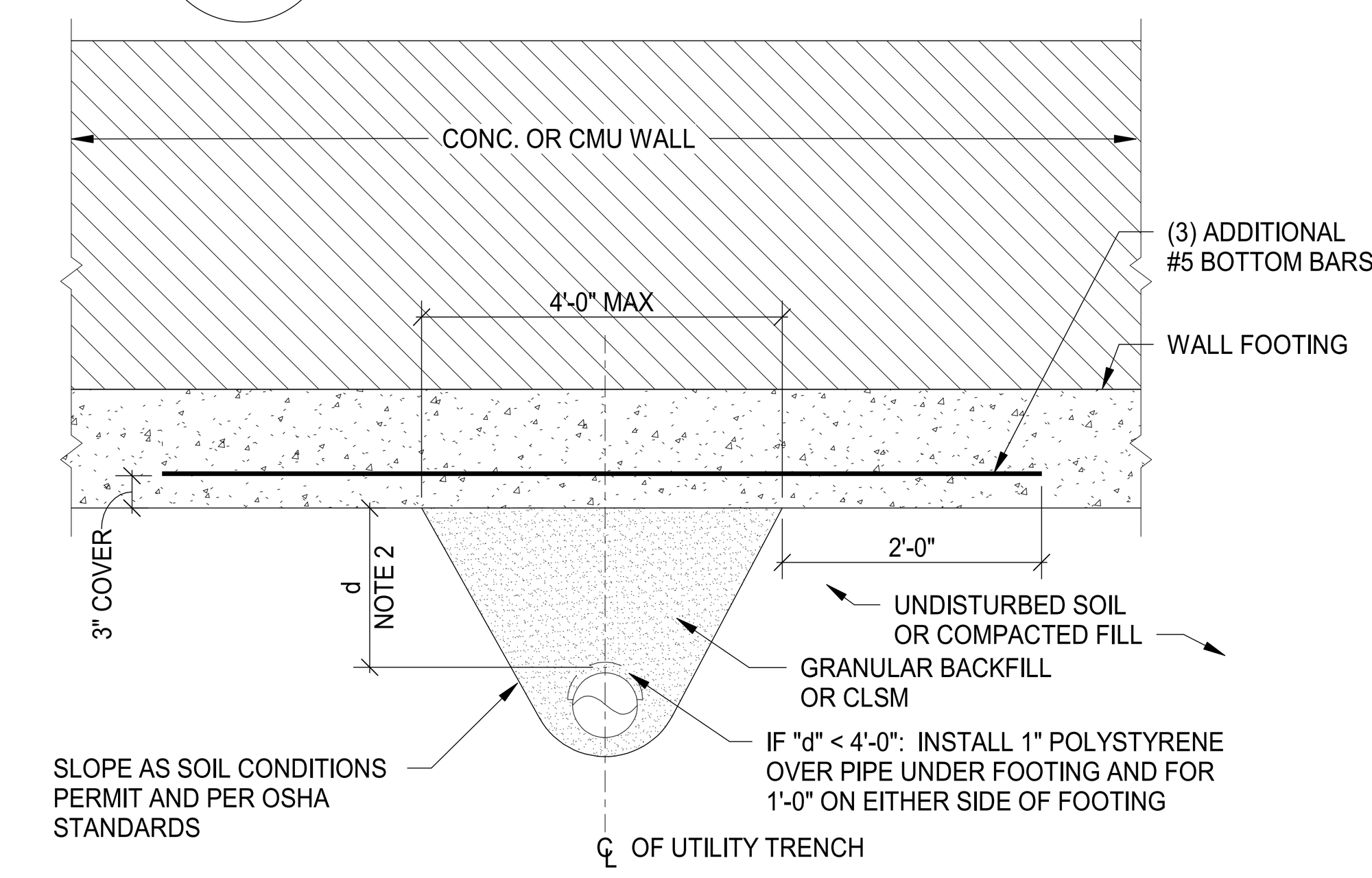


6 / S3.1 WALL FOOTING AT UTILITY
SCALE: NTS



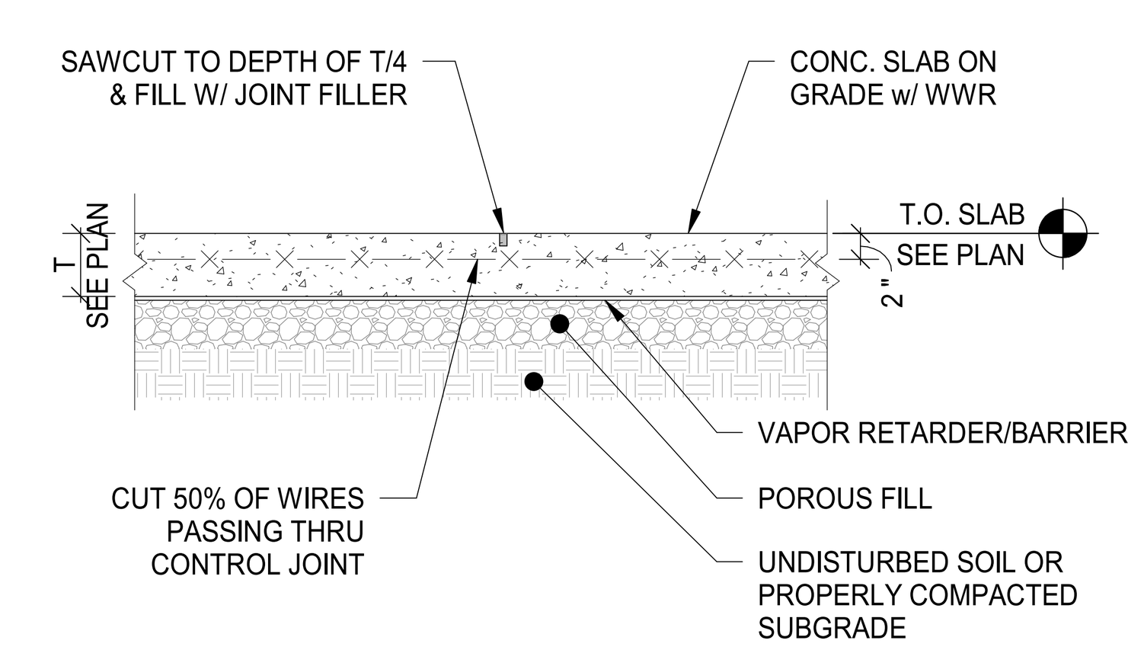
NOTES:
1. SEE PLUMBING, ELECTRICAL, MECHANICAL AND TELEDATA DWGs FOR UTILITY LOCATIONS AND ELEVATIONS.
2. REFER TO STEPPED WALL FOOTING DETAIL FOR ADDITIONAL INFORMATION

7 / S3.1 WALL FOOTING STEPPED AT UTILITY
SCALE: NTS



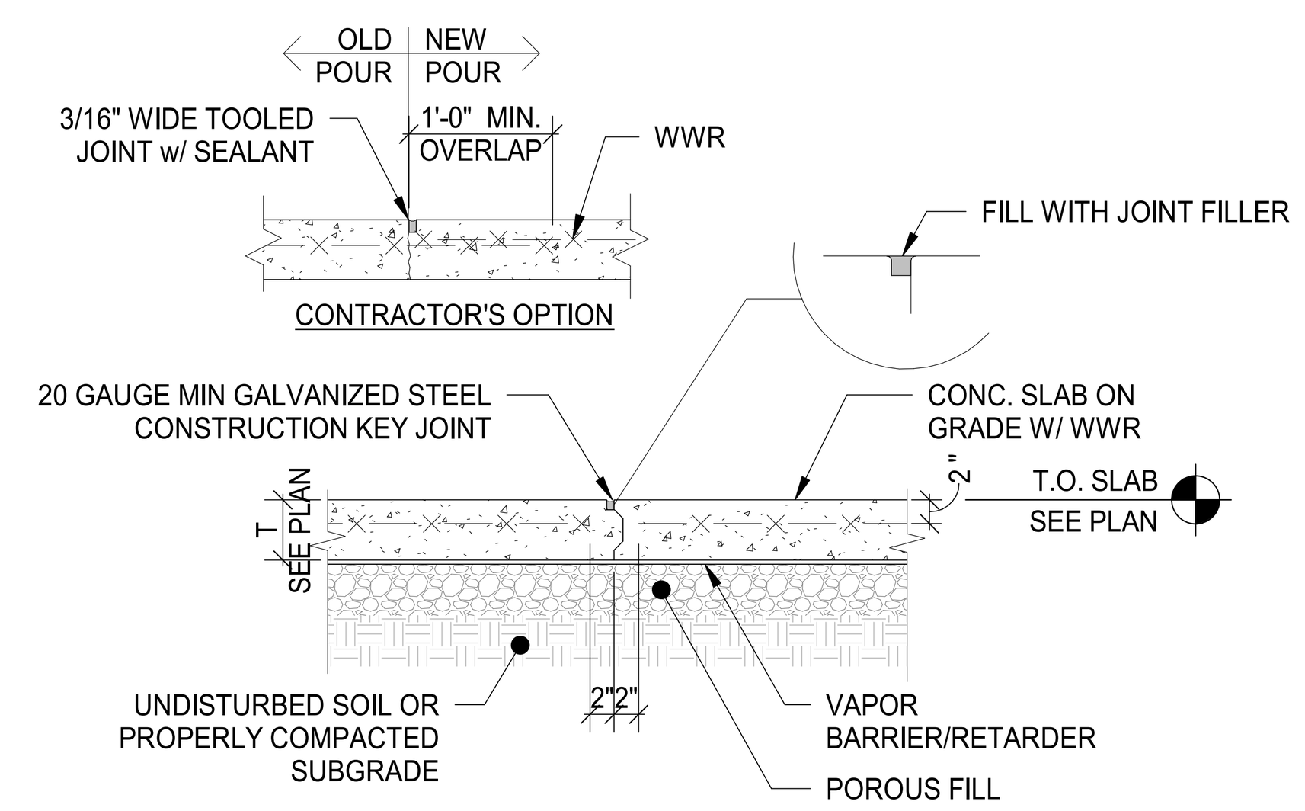
NOTES:
1. SEE MECHANICAL, ELECTRICAL, PLUMBING, AND TELEDATA DWGS FOR UTILITY INFORMATION.
2. MINIMUM DEPTH "d" TO USE THIS DETAIL = 3 x PIPE DIA.
3. DIG TRENCH FOR UNDERGROUND PIPING INSTALLATION A MINIMUM OF 4'-0" FROM END OF FOOTING.
4. AFTER UTILITY INSTALLATION, BACKFILL TRENCH w/ SELF-COMPACTING GRANULAR FILL. IF "d" IS LESS THAN 4'-0", BACKFILL WITH CONTROLLED LOW STRENGTH MATERIAL AND USE OVERSIZE PIPE SLEEVE.
5. DO NOT DAMAGE WALL FOOTING DURING INSTALLATION OF UTILITIES & DURING FILL INSTALLATION.
6. CONTRACTOR ALTERNATE TO 7 / S3.1

8 / S3.1 DEEP UTILITY UNDER WALL FOOTING
SCALE: NTS



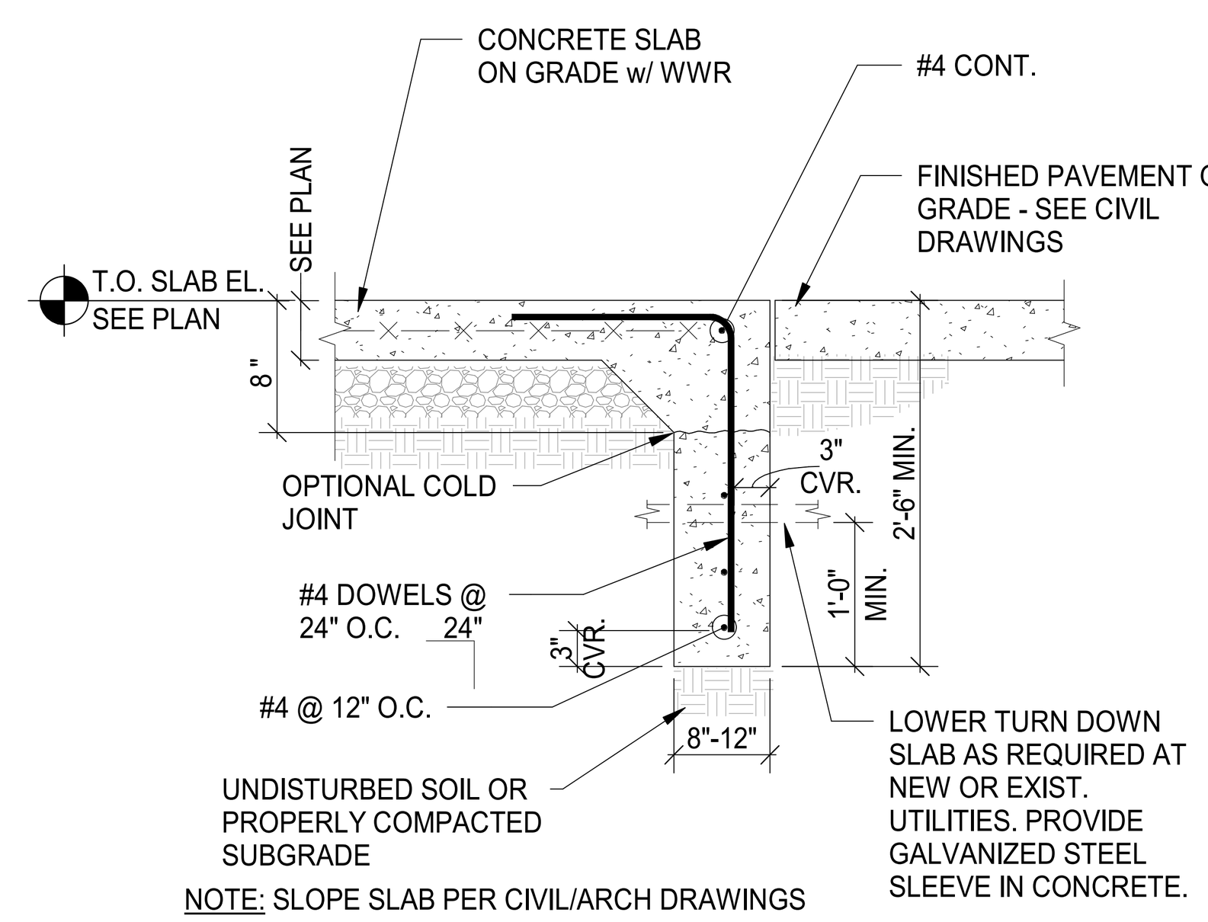
NOTE:
1. CONTRACTOR'S OPTION: ZIPCAP CONTROL JOINT FORMER IN LIEU OF SAWCUT.
2. COORDINATE JOINT SEALANT WITH ARCH. DRAWINGS AND SPECS.
3. DO NOT PLACE CJ PARALLEL TO WALL WITHIN 1'-0" FROM FACE OF INTERIOR MASONRY PARTITIONS.

9 / S3.1 SLAB ON GRADE CONTROL JOINT
SCALE: NTS

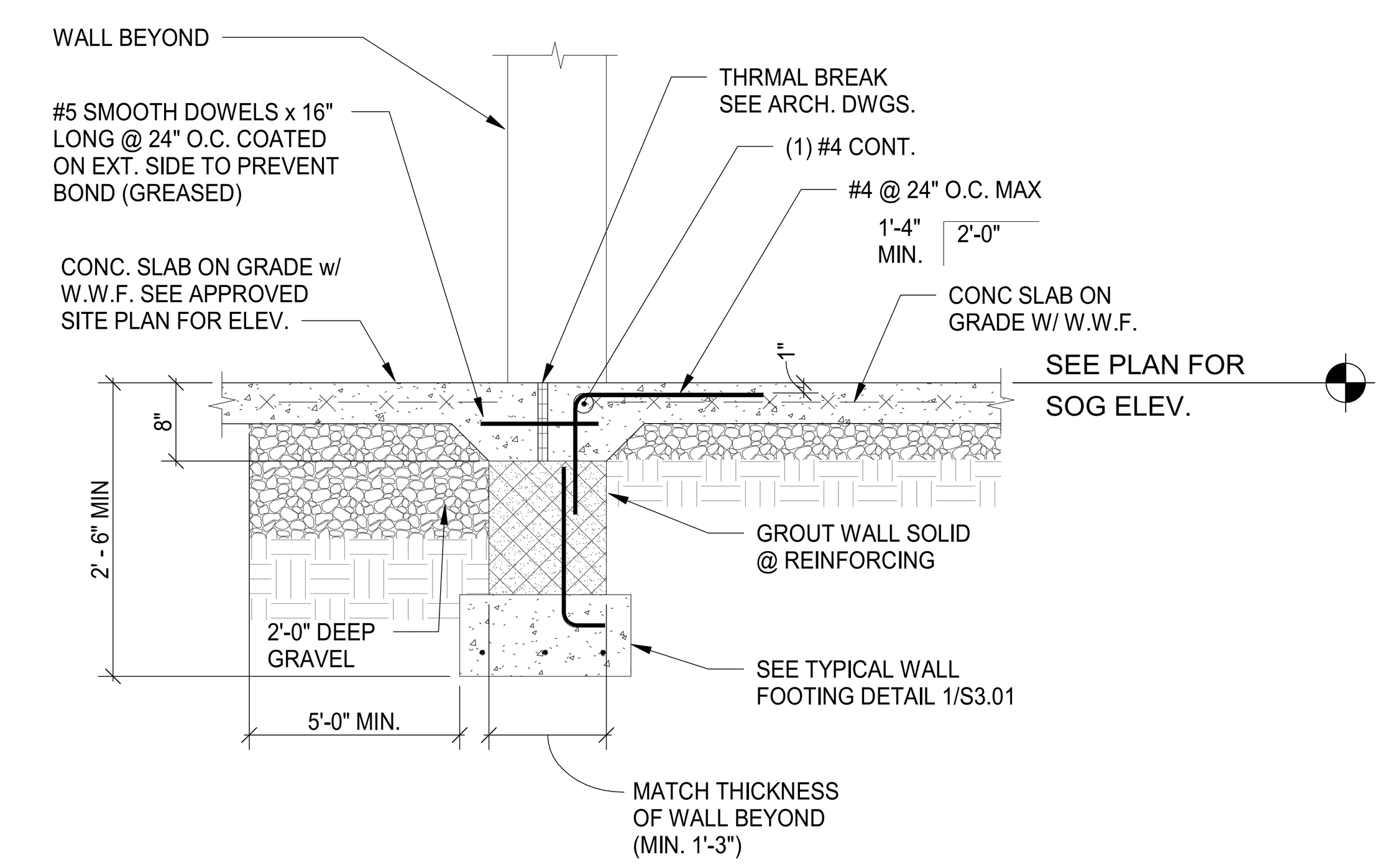


NOTE:
1. CONSTRUCTION JOINT MAY REPLACE CONTROL JOINTS (CJs); SEE PLAN FOR LOCATIONS OF CJs.
2. COORDINATE JOINT SEALANT WITH ARCH DWGS. AND SPECS.
3. DO NOT PLACE CJ PARALLEL TO WALL WITHIN 1'-0" FROM FACE OF INTERIOR MASONRY PARTITIONS.

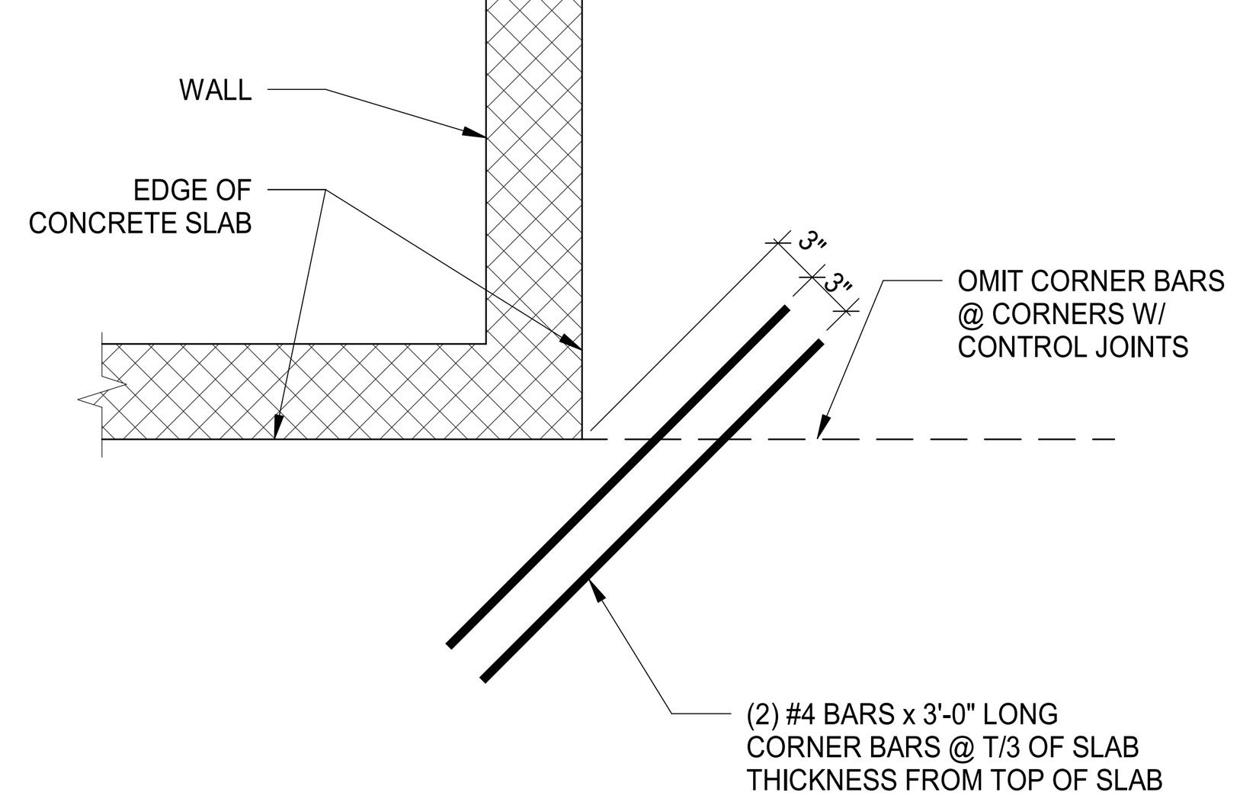
10 / S3.1 SLAB ON GRADE CONSTRUCTION JOINT
SCALE: NTS



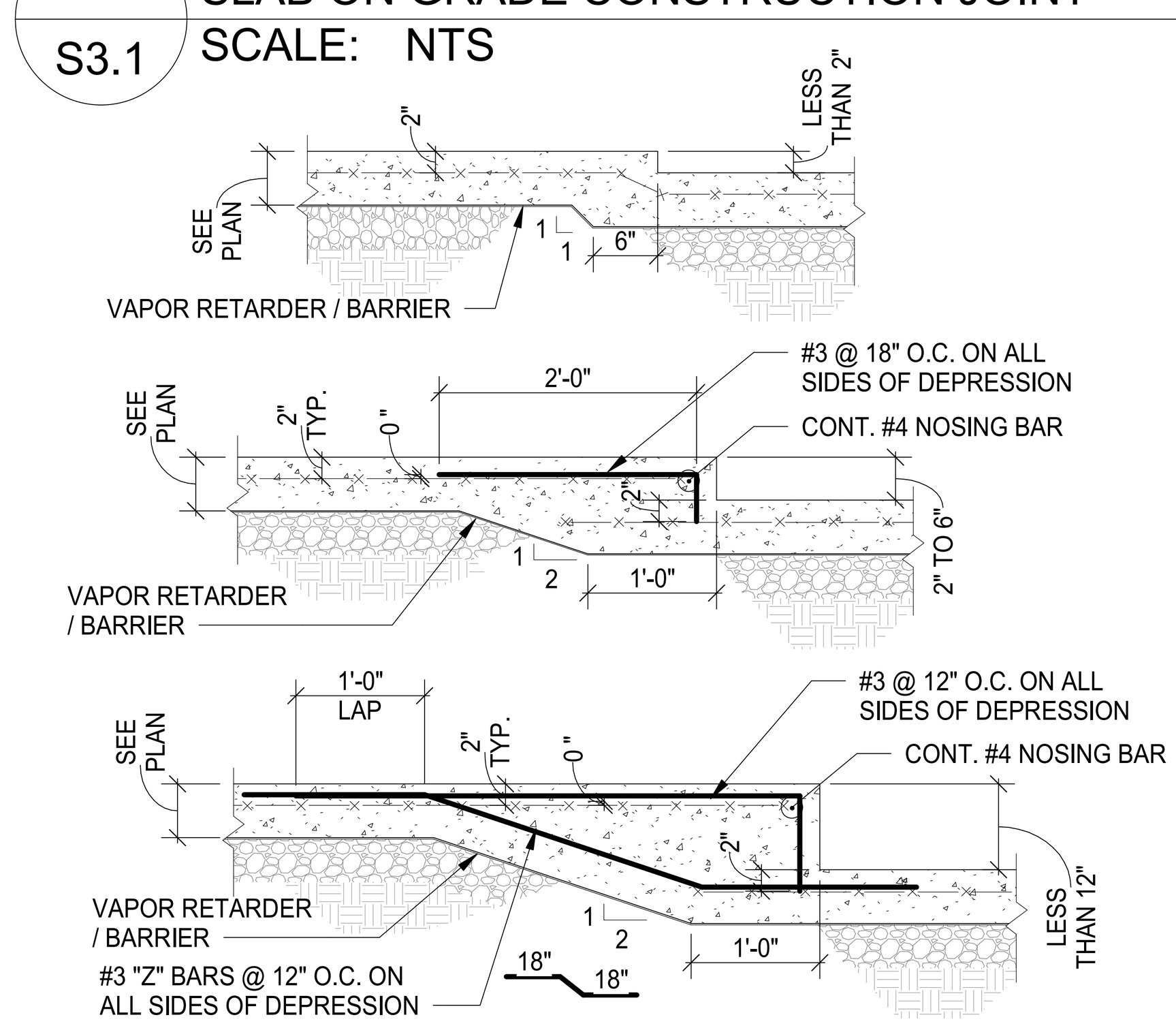
11 / S3.1 TURNED DOWN SLAB
SCALE: NTS



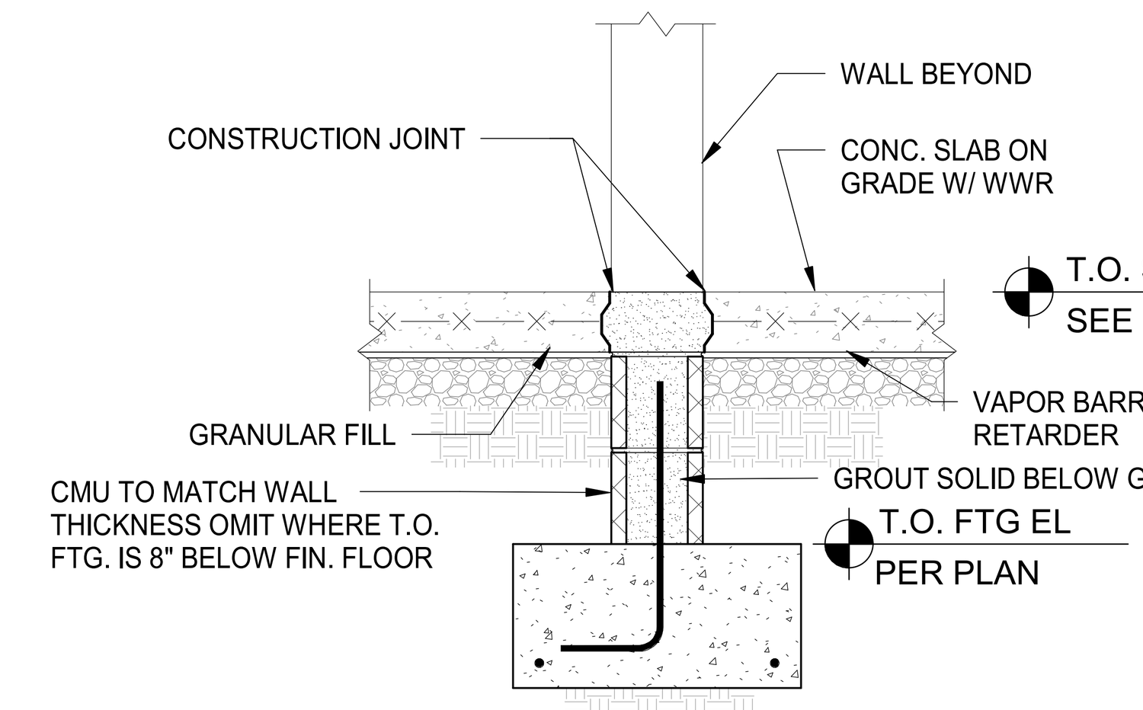
12 / S3.1 SLAB AT EXTERIOR DOORWAY
SCALE: NTS



13 / S3.1 SLAB REINF. AT RE-ENTRANT CORNER
SCALE: NTS



14 / S3.1 DEPRESSED SLAB ON GRADE
SCALE: NTS



15 / S3.1 SLAB ON GRADE AT DOOR
SCALE: NTS

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.

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FOUNDATION DETAILS

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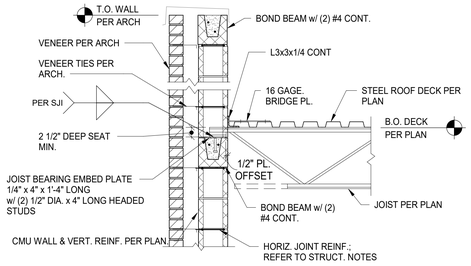
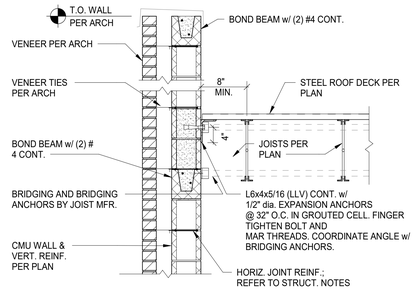
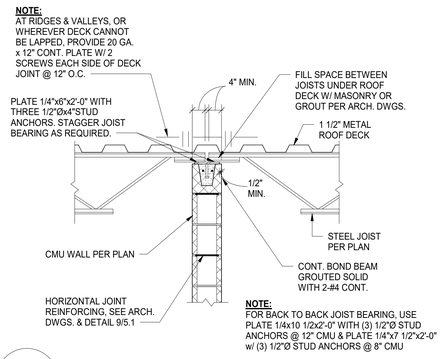


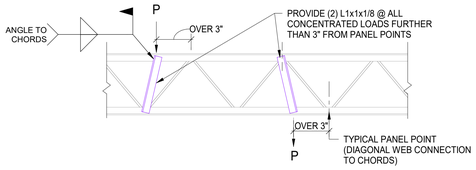
1 S4.1 ROOF JOIST BEARING AT AN EXTERIOR CMU WALL
SCALE: NTS



2 S4.1 ROOF DECK SUPPORT AT EXTERIOR CMU WALL PARALLEL TO JOISTS
SCALE: NTS



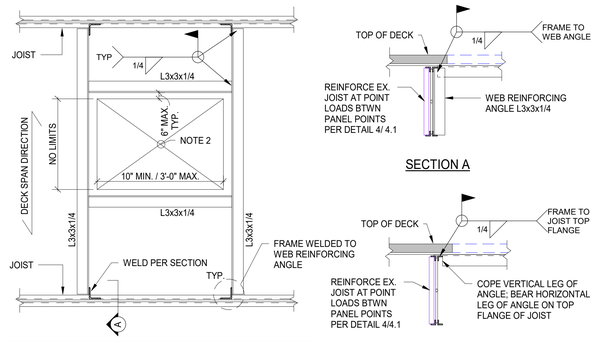
3 S4.1 JOIST BEARING ON MASONRY WALL
SCALE: NTS



P = LOADS OVER 100 lbs. MORE THAN 3" FROM A PANEL POINT
THIS DETAIL IS APPLICABLE TO ALL CONCENTRATED LOADS THAT ARE ATTACHED TO JOISTS, WHETHER INDICATED ON STRUCTURAL DWGs OR NOT. EXAMPLES OF THESE LOADS ARE:
1. ROOF TOP UNITS.
2. HANGING PLUMBING, MECH. STEEL PIPES, SPRINKLER PIPING
3. KITCHEN HOODS

SEE MECHANICAL, ELECTRICAL, PLUMBING, FIRE SAFETY, ARCHITECTURAL AND KITCHEN DRAWINGS FOR LOCATIONS

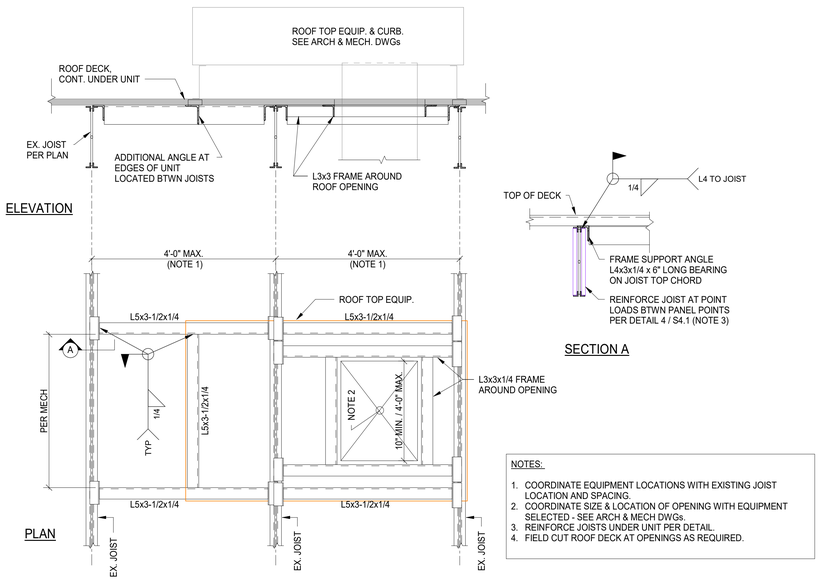
4 S4.1 JOIST REINF. AT LOADS BETWEEN PANEL POINTS
SCALE: NTS



NOTES:
1. FIELD CUT EXISTING DECKING AS REQUIRED. [PROVIDE STANDARD LIGHT GAGE DECK ACCESSORY POUR STOP AT EDGES OF OPENING AS REQUIRED.]
2. COORDINATE SIZE & LOCATION OF OPENING WITH EQUIPMENT SELECTED - SEE ARCH & MECH DWGs.
3. PROVIDE WOOD BLOCKING AS NECESSARY FOR EQUIPMENT SUPPORT AT LOW DECK FLUTES.

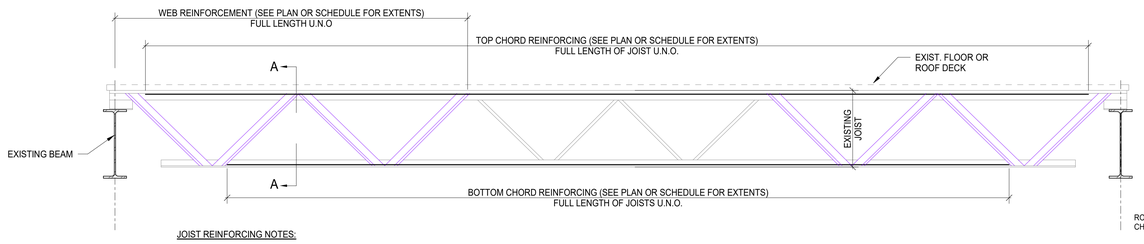
SECTION A (CONTRACTOR'S OPTION)

5 S4.1 ANGLE SUPPORT FRAME AT NEW OR EXISTING ROOF DECK
SCALE: NTS



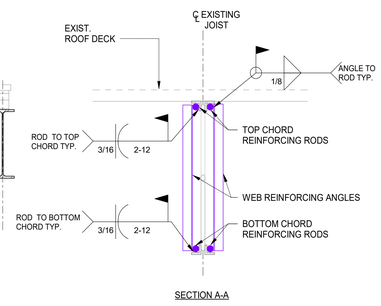
NOTES:
1. COORDINATE EQUIPMENT LOCATIONS WITH EXISTING JOIST LOCATION AND SPACING.
2. COORDINATE SIZE & LOCATION OF OPENING WITH EQUIPMENT SELECTED - SEE ARCH & MECH DWGs.
3. REINFORCE JOISTS UNDER UNIT PER DETAIL.
4. FIELD CUT ROOF DECK AT OPENINGS AS REQUIRED.

6 S4.1 ROOF TOP UNIT SUPPORT FRAME AT EXISTING ROOF JOISTS
SCALE: NTS

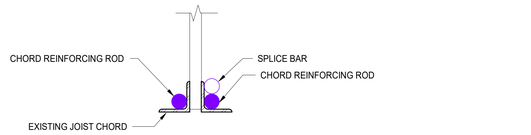


JOIST REINFORCING NOTES:

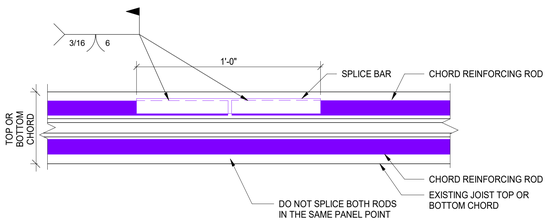
1. SEE PLAN FOR LOCATION OF JOISTS REQUIRING REINFORCEMENT.
2. SEE PLAN OR SCHEDULE FOR LENGTH OF REINFORCEMENT REQUIRED ALONG EACH JOIST.
3. TOP AND BOTTOM CHORD REINFORCMENT IS A CONTINUOUS **5/8" DIA. ROD**, SPLICED AS REQUIRED.
4. WEB REINFORCEMENT IS ANGLE MEMBERS **L1-1/4 x 1-1/4 x 3/16** EACH SIDE OF WEB MEMBERS U.N.O.
5. ALL REINFORCEMENT IS FULL LENGTH U.N.O.
6. RODS SHALL BE 55 ksi MATERIAL AND WELDABLE.
7. ANGLES SHALL BE 50 ksi MATERIAL.



7 S4.1 EXISTING JOIST REINFORCEMENT - ELEVATION VIEW
SCALE: NTS



SECTION OF CHORD REINFORCING SPLICE



PLAN VIEW OF CHORD REINFORCING SPLICE

SPLICE NOTES:
1. SPLICE BAR DIAMETER TO MATCH DIAMETER OF CHORD REINFORCING ROD.
2. LOCATE SPLICE MID PANELPOINT.
3. STAGGER SPLICES ON EITHER SIDE OF THE BOTTOM CHORD AND LOCATE BETWEEN DIFFERENT PANEL POINTS.

8 S4.1 EXISTING JOIST REINFORCEMENT - CHORD SPLICE
SCALE: NTS

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 42562 Expiration Date: 07/13/21

STATE OF MARYLAND
ROSS A. RODRIGUEZ
42562
PROFESSIONAL ENGINEER
2/5/2020

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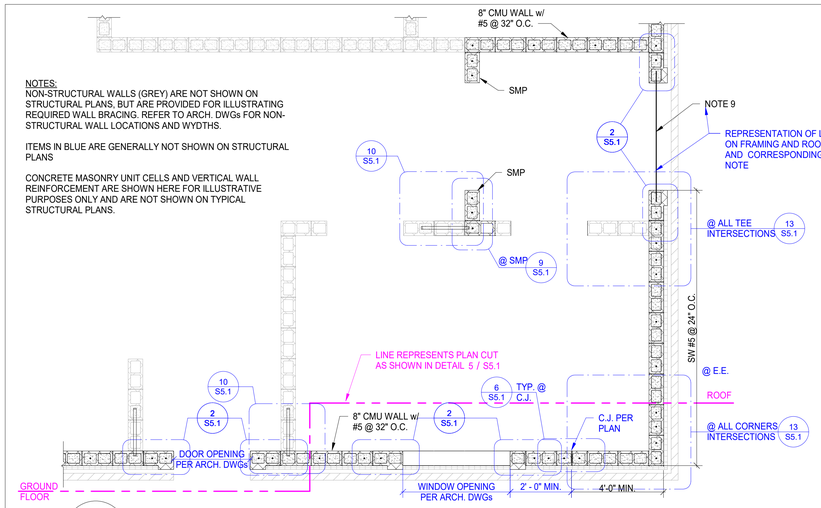
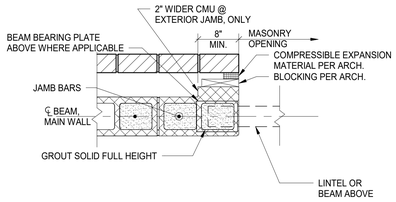


NOTES:
NON-STRUCTURAL WALLS (GREY) ARE NOT SHOWN ON STRUCTURAL PLANS, BUT ARE PROVIDED FOR ILLUSTRATING REQUIRED WALL BRACING. REFER TO ARCH. DWGs FOR NON-STRUCTURAL WALL LOCATIONS AND WYDTHS.

ITEMS IN BLUE ARE GENERALLY NOT SHOWN ON STRUCTURAL PLANS

CONCRETE MASONRY UNIT CELLS AND VERTICAL WALL REINFORCEMENT ARE SHOWN HERE FOR ILLUSTRATIVE PURPOSES ONLY AND ARE NOT SHOWN ON TYPICAL STRUCTURAL PLANS.

1 S5.1 PLAN VIEW - GENERAL MASONRY WALL
SCALE: NTS



1. AT REINFORCED EXTERIOR WALLS:
PROVIDE 2 JAMB BARS AT EACH OPENING JAMB, SIZE TO MATCH WALL REINFORCING, WITH TWO JAMB DOWELS INTO FOOTING, DOWELS TO BE SAME SIZE AS JAMB REINF.

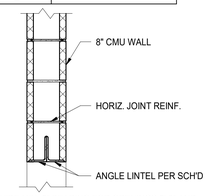
2. AT REINFORCED INTERIOR WALLS SHOWN ON STRUCTURAL DRAWINGS:
PROVIDE 2 JAMB BARS AT EACH OPENING JAMB, SIZE TO MATCH WALL REINFORCING, WITH 2 JAMB DOWELS INTO FOOTING, DOWELS TO BE SAME SIZE AS JAMB REINF.

3. AT NON-REINFORCED INTERIOR WALLS SHOWN ON STRUCTURAL DRAWINGS:
PROVIDE (1) #4 VERTICAL FULL HEIGHT W/ (1) #4 DOWEL TO FOOTING.

4. AT INTERIOR WALLS NOT SHOWN ON STRUCTURAL DRAWINGS:
GROUT BEARING SOLID WITH NO REINFORCING.

2 S5.1 WALL JAMB DETAIL
SCALE: NTS

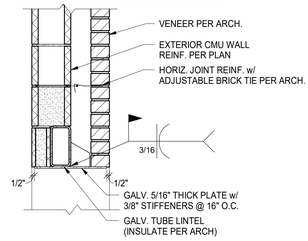
ANGLE LOOSE LINTEL SCHEDULE	
WALL OPENING	ANGLE (EVERY 4" OF CMU)
Lo ≤ 4'-0"	L3-1/2x3-1/2x1/4
4'-0" < Lo ≤ 5'-0"	L4x3-1/2x1/4 (LLV)
5'-0" < Lo ≤ 6'-0"	L5x3-1/2x5/16 (LLV)
6'-0" < Lo ≤ 7'-0"	L6x3-1/2x5/16 (LLV)
7'-0" < Lo ≤ 8'-0"	L6x3-1/2x3/8 (LLV)
8'-0" < Lo ≤ 9'-4"	L7x4x3/8 (LLV)



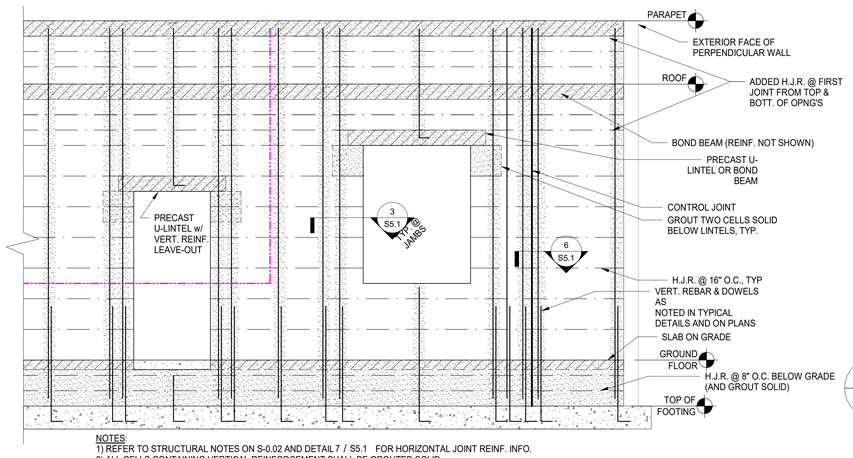
NOTE: PROVIDE MIN. 5" BEARING FOR OPENINGS 5'-0" AND UNDER, AND MIN. 8" BEARING FOR OPENINGS OVER 5'-0".

3 S5.1 INTERIOR LOOSE ANGLE LINTEL SCHEDULE
SCALE: NTS

STEEL TUBE LINTEL SCHEDULE	
WALL OPENING	TUBE
Lo ≤ 5'-0"	HSS4x4x3/8
5'-1" < Lo ≤ 7'-0"	HSS6x4x3/8
7'-1" < Lo ≤ 10'-0"	HSS10x6x1/2

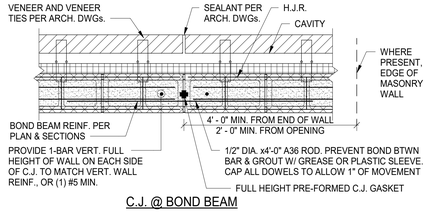


4 S5.1 EXTERIOR CAVITY WALL LINTEL SCHEDULE
SCALE: NTS

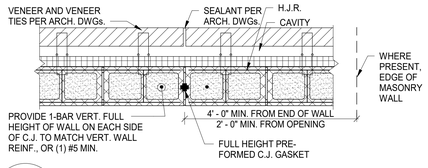


NOTES:
1) REFER TO STRUCTURAL NOTES ON S-0.02 AND DETAIL 7 / S5.1 FOR HORIZONTAL JOINT REINF. INFO.
2) ALL CELLS CONTAINING VERTICAL REINFORCEMENT SHALL BE GROUTED SOLID.

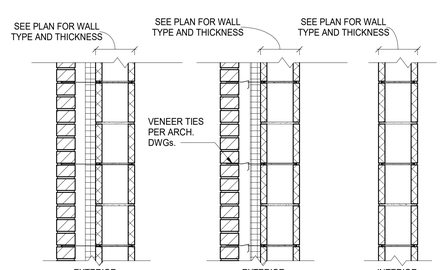
5 S5.1 REINFORCED MASONRY WALL ELEVATION
SCALE: NTS



C.J. @ BOND BEAM

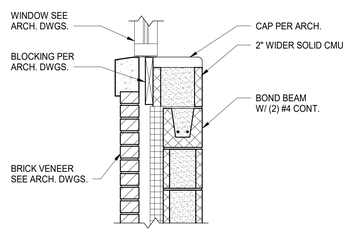


6 S5.1 WALL CONTROL JOINT W/ VENEER
SCALE: NTS

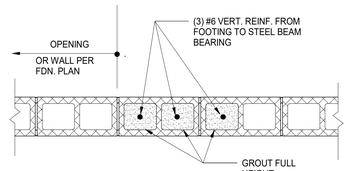


1) BUILDING WALLS - STANDARD TRUSS TYPE H.J.R. EVERY 2ND BLOCK COURSE.
2) PARAPET WALL - HEAVY DUTY TRUSS TYPE H.J.R. EVERY COURSE.
3) BELOW GRADE WALLS - HEAVY DUTY TRUSS TYPE H.J.R. EVERY COURSE
4) PRE-FABRICATED CORNER & TEE SECTION SHALL BE USED WHERE APPLICABLE. SEE 2/S5.02

7 S5.1 HORIZ. JOINT REINF. (H.J.R.) DETAIL
SCALE: NTS

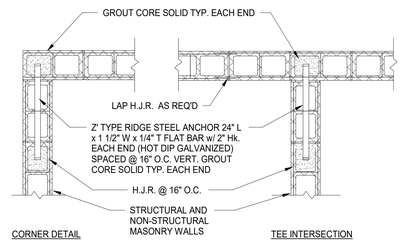


8 S5.1 WINDOW SILL DETAIL
SCALE: NTS

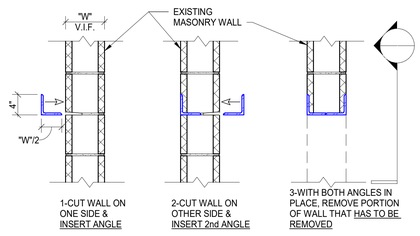


9 S5.1 SOLID MASONRY PIER (SMP) DETAIL (IF REQUIRED)
SCALE: NTS

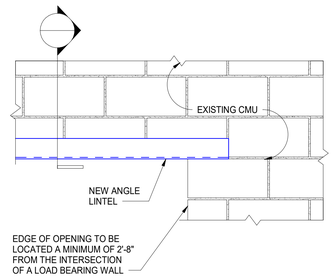
NOTES:
- MASONRY VERTICAL REBAR NOT SHOWN.
- REFER TO PLANS AND SECTIONS FOR MASONRY VERTICAL REBAR.



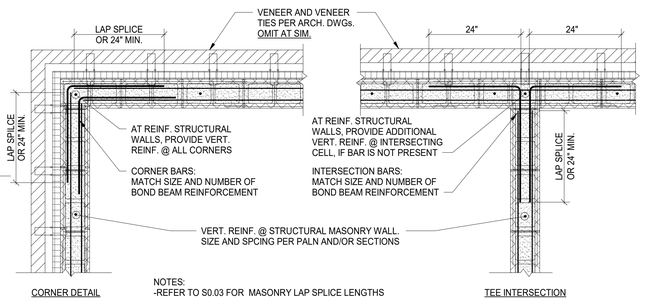
10 S5.1 CORNER/TEE INTERSECTING WALL REINFORCING
SCALE: NTS



11 S5.1 "PINCH" LINTEL SECTION
SCALE: 1" = 1'-0"

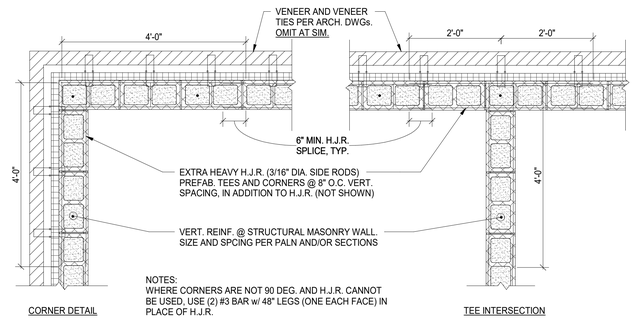


11B S5.1 "PINCH" LINTEL ELEVATION
SCALE: NTS



NOTES:
-REFER TO S0.03 FOR MASONRY LAP SPLICE LENGTHS

12 S5.1 BOND BEAM CORNER / TEE INTERSECTION
SCALE: NTS



NOTES:
WHERE CORNERS ARE NOT 90 DEG. AND H.J.R. CANNOT BE USED, USE (2) #3 BAR w/ 48" LEGS (ONE EACH FACE) IN PLACE OF H.J.R.

13 S5.1 CORNER TEE INTERSECTION HJR REINFORCING
SCALE: NTS

STATE OF MARYLAND
ROSS A. ROHRBAUGH
42562
REGISTERED PROFESSIONAL ENGINEER
2/5/2020

REVISIONS

	MM-DD-YR	NAME	DESCRIPTION OF CHANGES

CRABTREE ROHRBAUGH & ASSOCIATES - ARCHITECTS
100 WEST ROAD, SUITE 402
TOWSON MD 21204
410-528-0272
www.cra-architects.com
MECHANICSBURG, PENNSYLVANIA
CHARLOTTESVILLE, VIRGINIA
WHITE SULPHUR SPRINGS, WEST VIRGINIA

ADDITION AND RENOVATIONS OF GALENA ELEMENTARY SCHOOL
KENT COUNTY PUBLIC SCHOOLS
114 S MAIN STREET
GALENA, MD 21635

ADTEK
ADTEK ENGINEERS, INC.
150 South East Street
Suite 201
Frederick, Maryland 21701
301-662-4408
Fax: 301-662-7484
ADTEK PROJECT #: 1913.0001

MASONRY WALL DETAILS

PLOT SCALE: As indicated
FILENAME:
DATE: FEBRUARY 10, 2020

PROJECT 3309

S5.1

GENERAL NOTES: (MECHANICAL)

GENERAL NOTES AND CONDITIONS:

A. COORDINATE NEW WORK BETWEEN ALL DISCIPLINES.

B. ALL WORK SHALL BE DONE IN ACCORDANCE WITH ALL APPLICABLE CODES, ORDINANCES, REGULATIONS, AND REQUIREMENTS OF ALL AGENCIES HAVING JURISDICTION OVER THE PROJECT.

C. THE INTENT OF THESE DRAWINGS IS FOR THE CONTRACTOR TO PROVIDE ALL LABOR, MATERIAL, FINISHES, EQUIPMENT, INSTALLATION, AND SERVICES NECESSARY FOR AND INCIDENTAL WITH THE WORK, TO PROVIDE THE OWNER WITH A COMPLETE PROJECT INCLUSIVE OF ALL SYSTEMS.

D. PRIOR TO INITIATING ANY PORTION OF THE WORK, THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND COORDINATE ALL PORTIONS OF THE CONTRACT DOCUMENTS RELATING TO THAT PORTION OF THE WORK AND AFFECTING ADJOINING PORTIONS. IF DISCREPANCIES EXIST, THEY SHALL BE REPORTED TO THE CONSTRUCTION MANAGER FOR CLARIFICATION AND/OR RESOLUTION BEFORE COMMENCING SUCH WORK.

E. BY SUBMITTING A BID PROPOSAL THE CONTRACTOR CERTIFIES THAT THEY HAVE VISITED THE SITE AND UNDERSTAND THE COMPLETE SCOPE OF WORK, WHICH IS INCLUDED IN THE PROPOSAL.

F. DEFINITIONS: "PROVIDE" MEANS "FURNISH AND INSTALL". "VERIFY" MEANS "VERIFY IN THE FIELD AND COORDINATE DIMENSIONS AND DISCREPANCIES".

G. THESE NOTES AND OTHER NOTES ON THE DRAWINGS ARE DIRECTIONS FOR THE CONTRACTOR'S PERFORMANCE, UNLESS NOTED OTHERWISE (U.N.O.). FOR EXAMPLE, THE VERB "INSTALL" MEANS "CONTRACTOR SHALL INSTALL", "RELOCATE" MEANS "CONTRACTOR SHALL RELOCATE", ETC.

H. UNLESS NOTED OTHERWISE, NUMBERED DIMENSIONS SHOWN ON DRAWINGS TAKE PRECEDENCE OVER SCALED DRAWINGS. DETAIL DRAWINGS TAKE PRECEDENCE OVER GENERAL DRAWINGS. IF CONFLICTS EXIST ON THE DRAWINGS, THEN THE MORE STRINGENT REQUIREMENT SHALL APPLY. FINAL INTERPRETATION SHALL BE MADE BY THE ENGINEER.

I. SAMPLES AND SHOP DRAWINGS MUST BE SUBMITTED BY THE CONTRACTOR TO THE CONSTRUCTION MANAGER FOR REVIEW AND PROCESSING BEFORE THE PURCHASE OR FABRICATION OF ANY MATERIALS.

J. DURING THE WORK, ANY CONDITION DISCOVERED THAT CAUSES CONFLICT WITH THE INTENDED DESIGN MUST BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ENGINEER.

K. CONTRACTOR SHALL STAGE WORK IN SUCH A WAY AT TO ENSURE SAFE EMERGENCY EGRESS AT ALL TIMES.

L. EXCEPT FOR PREFINISHED SURFACES, ALL ITEMS DISTURBED OR DAMAGED BY WORK SHALL BE REFINISHED TO MATCH SURROUNDING AREA OR FINISHED AS INDICATED.

M. ALL HOLED AND PENETRATIONS IN WALLS AND CEILING SURFACES SHALL BE PATCHED AND FIRE STOPPED.

N. ANY ALTERATION TO THE STRUCTURE (I.E. CORE DRILLING CONCRETE, ETC.) SHALL BE COORDINATED.

O. UNLESS OTHERWISE INDICATED, ALL PIPING, CONDUIT, DUCTWORK, AND SIMILAR SERVICES SHALL BE CONCEALED.

P. GENERAL NOTES, THOSE FOUND ON THIS SHEET, APPLY TO ALL DRAWINGS RELATED TO THIS PROJECT.

Q. DRAWING NOTES SPECIFICALLY REFER TO ITEMS NOTED WITH NUMBER OR LETTER DESIGNATIONS ON THE RESPECTIVE DRAWING WHERE THE DESIGNATIONS ARE SHOWN.

GENERAL CONSTRUCTION NOTES:

A. LEAVE SPACE CLEAN ON COMPLETION, INCLUDING THE CLEANING OF GLASS, DOORS, FRAMES, FLOORS, GRILLES, LIGHT LENSES, ETC.

B. REFER TO STRUCTURAL DRAWINGS FOR TYPICAL PENETRATION/OPENING/INFILL DETAILS.

C. ALL AIR HANDLING EQUIPMENT WITH A FLOW RATE OF 2,000 CFM OR GREATER SHALL BE PROVIDED WITH SUPPLY AND RETURN AIR SMOKE DETECTORS. COORDINATE DEVICES AND INSTALLATION WITH THE FIRE ALARM SYSTEM.

D. THE CONTRACTOR IS REQUIRED TO VISIT THE SITE, FAMILIARIZE THEMSELVES WITH THE LOCAL CONDITIONS UNDER WHICH THE WORK IS TO BE PERFORMED AND AS ARE NECESSARY FOR CONSTRUCTION, AND CORRELATE THEIR OBSERVATIONS WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS. IT IS ASSUMED THAT THE CONTRACTOR HAS OBTAINED, BEFORE AWARD OF THE CONTRACT, CLARIFICATION OF ALL QUESTIONS AS TO THE INTENT OF THE CONTRACT DOCUMENTS AND OF ASSUMED OR ACTUAL CONFLICT BETWEEN TWO OR MORE ITEMS IN CONTRACT DOCUMENTS. SHOULD THE CONTRACTOR FAIL TO OBTAIN SUCH CLARIFICATION, THE ARCHITECT/ENGINEER SHALL DIRECT WORK TO PROCEED BY THE METHOD INDICATED, SPECIFIED OR REQUIRED BY CONTRACT DOCUMENTS WHICH WILL PRODUCE THE BEST RESULTS, AS JUDGED BY THE ARCHITECT/ENGINEER. SUCH DIRECTION BY THE ARCHITECT/ENGINEER SHALL NOT ENTITLE THE CONTRACTOR TO ANY CLAIM FOR EXTRA COST.

E. IF ACTUAL FIELD CONDITIONS VARY FROM WHAT IS SHOWN OR ASSUMED IN THE CONTRACT DOCUMENTS, THE CONTACTOR IS REQUIRED TO PROMPTLY NOTIFY THE ARCHITECT/ENGINEER AND RECEIVE DIRECTION PRIOR TO PROCEEDING WITH THE WORK AFFECTED BY THE ACTUAL FIELD CONDITION.

MECHANICAL LEGEND

SYMBOL	ABBREV.	DEFINITION
	SA	SUPPLY AIR DUCT UP, DOWN
	RA	RETURN AIR DUCT UP, DOWN
	EA	EXHAUST AIR DUCT UP, DOWN
	OA	OUTSIDE AIR DUCT UP, DOWN
		RECT. TO ROUND TRANSITION
		FLEXIBLE CONNECTION (DUCTWORK)
		FLEXIBLE DUCT
	VD	MANUAL VOLUME DAMPER
	FD	FIRE DAMPER
	MOD	MOTOR OPERATED DAMPER
	SD	SMOKE DAMPER
	CD	COMBINATION FIRE/SMOKE DAMPER
	AMS	AIR MONITORING STATION
	SA	SOUND ATTENUATOR
DD	DD	DUCT SMOKE DETECTOR
		ELBOW W/ TURNING VANES
		RADIUS ELBOW
	FPTU	FAN POWERED VAV BOX W/ HEAT COIL
	SL	ACOUSTICAL SOUND LINING
		DUCT TRANSITION
R		CHANGE IN ELEVATION RISE(R),DROP(D)
		POWER ROOF VENTILATOR
		GATE VALVE
		GLOBE VALVE
		BALL VALVE
		MULTI-PURPOSE VALVE
		CHECK VALVE
		BUTTERFLY VALVE
		3-WAY MODULATING VALVE (ATC)
		2-WAY MODULATING VALVE (ATC)
	PRV	PRESSURE REDUCING VALVE
		NEEDLE VALVE
		PRESSURE RELIEF OR SAFETY VALVE
	HED	HOSE END DRAIN VALVE
		STRAINER W/HOSE END DRAIN VALVE & CAP
		AUTOMATIC AIR VENT
		FLOW METER FITTING
		COMBINATION SHUT-OFF/BALANCING VALVE
		UNION
		FLANGE
		CONCENTRIC REDUCER
		ECCENTRIC REDUCER
		FLEXIBLE CONNECTION (PIPING)
		MANUAL AIR VENT
		THERMOMETER
		PRESSURE GAUGE W/NEEDLE VALVE
T(N)		TEMPERATURE SENSOR (NIGHT SETBACK)
T	T'STAT	THERMOSTAT
FS		FAN SWITCH
		STATIC PRESSURE GAUGE
DP	DP	DIFFERENTIAL PRESSURE CONTROLLER
DPT	DPT	DIFFERENTIAL PRESSURE TRANSMITTER
	AFC	AUTOMATIC FLOW CONTROL VALVE
FS	FS	FLOW SWITCH
SP		STATIC PRESSURE CONTROLLER
		PIPE ALIGNMENT GUIDE
		PIPE ANCHOR
		EXPANSION LOOP
		UNIT HEATER
x%		PITCH OF PIPE, % SLOPE
		PIPE-TURN DOWN
		PIPE-TURN UP
S		SOLENOID VALVE
E		END CAP
		BLIND FLANGE
		DIRECTION OF FLOW

SYMBOL	ABBREV.	DEFINITION
ø	DIA.	DIAMETER
	FOT	FLAT ON TOP
	FOB	FLAT ON BOTTOM
	AFPF	AIRFOIL PLENUM FAN
	DL	DOOR LOUVER
	AP	ACCESS PANEL
HPS	HPS	HIGH PRESSURE STEAM
LPS	LPS	LOW PRESSURE STEAM
SC	SC	STEAM CONDENSATE
HS(P)	HS(P)	HEATING SUPPLY (PRIMARY)
HR(P)	HR(P)	HEATING RETURN (PRIMARY)
HS(S)	HS(S)	HEATING SUPPLY (SECONDARY)
HR(S)	HR(S)	HEATING RETURN (SECONDARY)
HS	HS	HEATING SUPPLY
HR	HR	HEATING RETURN
CS	CS	CONDENSER WATER SUPPLY
CR	CR	CONDENSER WATER RETURN
HPWS	HPWS	HEAT PUMP WATER SUPPLY
HPWR	HPWR	HEAT PUMP WATER RETURN
CW	CW	COLD WATER
COND	CD/COND	CONDENSATE DRAIN LINE
	F&T	FLOAT AND THERMOSTATIC TRAP
	BTU	BRITISH THERMAL UNIT
	MBH	BTU PER HOUR (THOUSAND)
	SENS.	SENSIBLE
	WG	WATER GAUGE
	VEL	VELOCITY
	FPM	FEET PER MINUTE
	LF	LINEAR FOOT
	KW	KILOWATT
	MIN	MINIMUM
	MAX	MAXIMUM
	NC	NOISE CRITERIA
	DB	DECIBEL
	EMS	ENERGY MANAGEMENT SYSTEM
	SAF	SUPPLY AIR FAN
	OAF	OUTSIDE AIR FAN
	RAF	RETURN AIR FAN
	EAF	EXHAUST AIR FAN
	LBS	POUNDS
	TEMP	TEMPERATURE
	EXH	EXHAUST
	OC	ON CENTER
	TONS	TONS OF REFRIGERATION
	SQ	SQUARE
	OAT	OUTSIDE AIR TEMPERATURE
	STD	STANDARD
	ΔT	TEMPERATURE DIFFERENCE
	%	PERCENT
	EFF.	EFFICIENCY
	ELECT. CHAR.	ELECTRICAL CHARACTERISTICS
	CAP	CAPACITY
	SB	STAND-BY
	FT. H_2O	FEET WATER GAUGE
	IN. H_2O	INCHES WATER GAUGE
	ATC	AUTOMATIC TEMPERATURE CONTROL
	EX	EXISTING
	RX	REMOVE EXISTING
		CONNECT TO EXISTING
		DEMOLITION ENDS HERE
	VSD	VARIABLE SPEED DRIVE
	°F	DEGREES FAHRENHEIT
	CFM	CUBIC FEET PER MINUTE
	GPM	GALLONS PER MINUTE
	EAT	ENTERING AIR TEMPERATURE
	LAT	LEAVING AIR TEMPERATURE
	EWT	ENTERING WATER TEMPERATURE
	LWT	LEAVING WATER TEMPERATURE
	DB	DRY BULB
	WB	WET BULB
	PD	PRESSURE DROP
	WPD	WATER PRESSURE DROP
	APD	AIR PRESSURE DROP
	SP	STATIC PRESSURE
	ESP	EXTERNAL STATIC PRESSURE
	PSI	POUNDS PER SQUARE INCH
	HP	HORSEPOWER
	BHP	BRAKE HORSEPOWER
	RPM	REVOLUTIONS PER MINUTE
	FPM	FEET PER MINUTE
	V	VOLTS
	Hz	HERTZ
	DIFF	DIFFUSER
	REG	REGISTER
	AFF	ABOVE FINISHED FLOOR
	W/	WITH
∅	FO	FLAT OVAL
	SS	STAINLESS STEEL
	HT.	HEIGHT
	REQ'D	REQUIRED
	DWG	DRAWING
	No.	NUMBER
	VAV	VARIABLE AIR VOLUME
	EF	EXHAUST FAN
	FZ	FREEZE STAT
	SD	SMOKE DAMPER
	SPC	STATIC PRESSURE CONTROLLER
	AHU	AIR HANDLING UNIT
	OAT	OUTSIDE AIR TEMPERATURE
	SWT	SUPPLY WATER TEMPERATURE
	NO	NORMALLY OPEN
	NC	NORMALLY CLOSED
	C	CLOSED

NOTE: NOT ALL SYMBOLS AND ABBREVIATIONS MAY BE USED

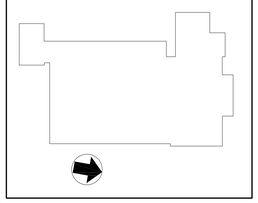
LINETYPE LEGEND

SYMBOL	DEFINITION
	DEMOLITION
	EXISTING TO REMAIN
	NEW WORK
	BROKEN AND DASHED WORK BELOW

STATE OF MARYLAND — [illegible] — No. 39921 — PROFESSIONAL ENGINEER

PROFESSIONAL CERTIFICATION:
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 39921, EXPIRATION DATE 01/19/2021

KEY PLAN



REVISIONS

◇	MM-DD-YR	NAME	DESCRIPTION OF CHANGES

CRABTREE ROHRBAUGH & ASSOCIATES - ARCHITECTS
100 WEST ROAD, SUITE 402
TOWSON MD 21204
410-528-0272
www.cra-architects.com
MECHANICSBURG, PENNSYLVANIA
CHARLOTTESVILLE, VIRGINIA
WHITE SULPHUR SPRINGS, WEST VIRGINIA

ADDITION AND RENOVATIONS OF GALENA ELEMENTARY SCHOOL

114 S MAIN STREET
GALENA, MD 21635

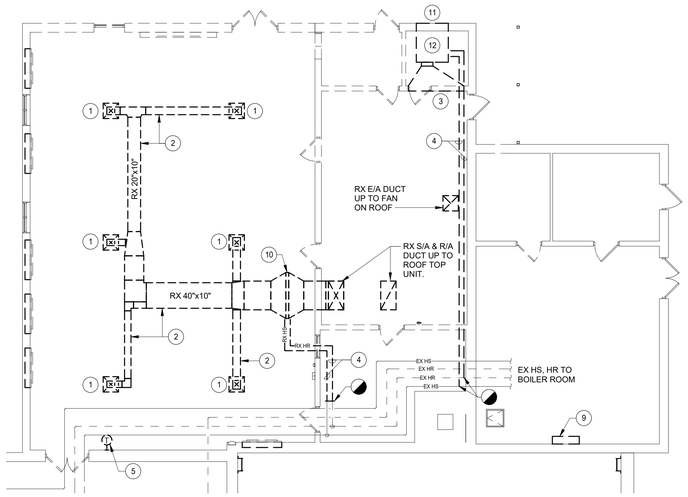
CR

NOTES & LEGEND

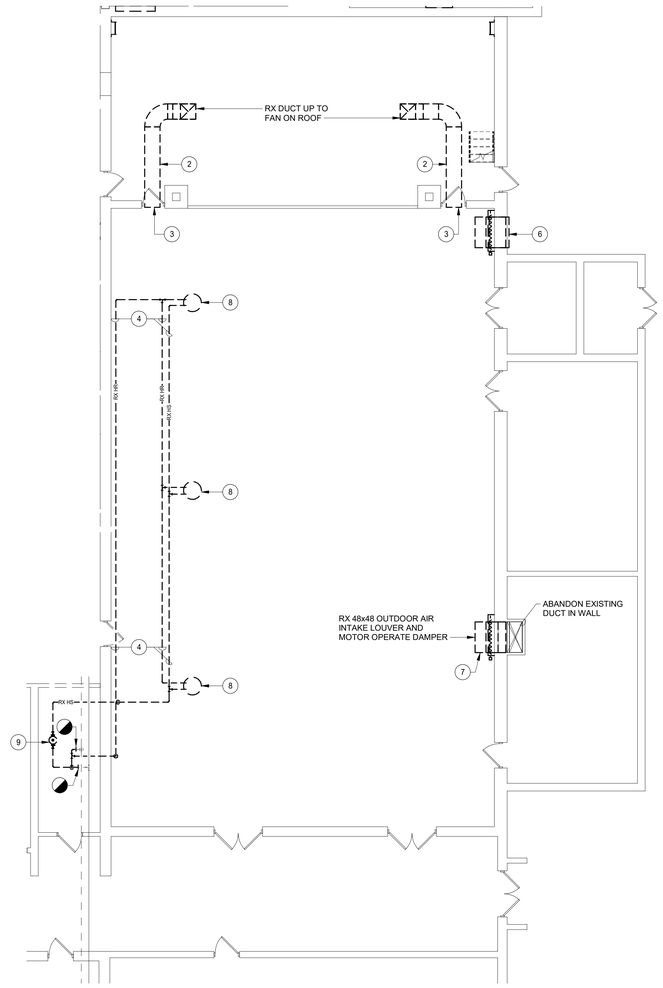
PLOT SCALE: NONE
FILENAME:
DATE: FEBRUARY 10, 2020

PROJECT 3309

M0.1



PARTIAL FLOOR PLAN - CAFETERIA/KITCHEN - DEMOLITION - BASE BID
1/8" = 1'-0"



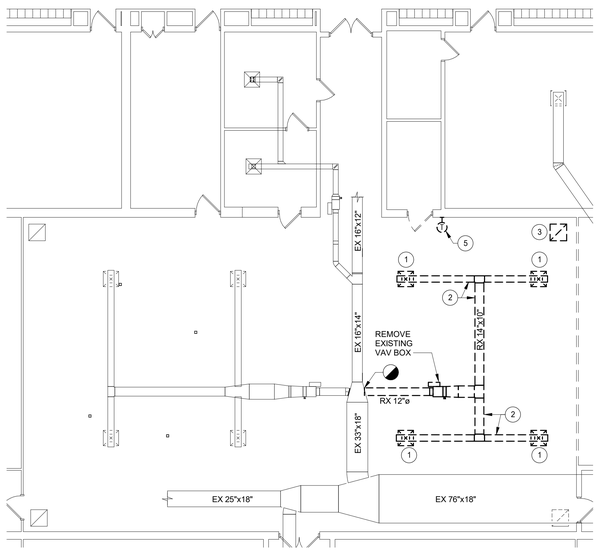
PARTIAL FLOOR PLAN - GYM - DEMOLITION - BASE BID
1/8" = 1'-0"

GENERAL NOTES:

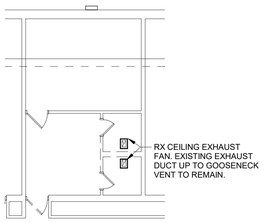
1. PATCH ALL HOLES, PENETRATIONS, ETC. TO MATCH EXISTING MATERIALS (WALLS, FLOORS, ROOF ETC), FINISHES ETC. AND PAINT TO MATCH EXISTING FINISHES. ALL ROOFING WORK SHALL BE PERFORMED BY A CERTIFIED ROOFING CONTRACTOR TO MAINTAIN THE EXISTING WARRANTY IN THE AREAS OF WORK.

DRAWING NOTES:

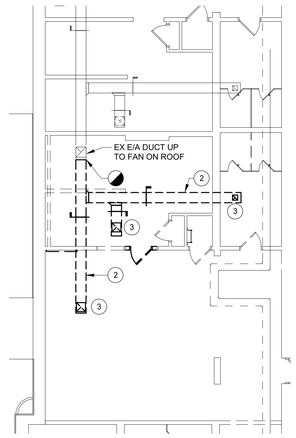
1. REMOVE EXISTING SUPPLY AIR DIFFUSER AND ALL ASSOCIATED DUCTWORK, INSULATION, HANGERS, SUPPORTS, ETC. IN IT'S ENTIRETY.
2. REMOVE EXISTING DUCTWORK, INSULATION, HANGERS, SUPPORTS, AIR DEVICES, ETC IN IT'S ENTIRETY.
3. REMOVE EXISTING GRILLE AND ALL ASSOCIATED DUCTWORK, INSULATION, HANGERS, SUPPORTS, ETC. IN IT'S ENTIRETY.
4. REMOVE EXISTING HEATING WATER PIPING AND ALL ASSOCIATED INSULATION, HANGERS, SUPPORTS, VALVES ETC. IN IT'S ENTIRETY.
5. REMOVE EXISTING THERMOSTAT AND ALL ASSOCIATED CONTROLS ETC. IN IT'S ENTIRETY.
6. REMOVE EXISTING 48x48 DUCT, MOTOR OPERATED DAMPER AND OUTDOOR AIR INTAKE LOUVER. EXISTING PENETRATION TO BE INFILLED TO MATCH EXISTING WALL. REFER TO ARCHITECTURAL DRAWINGS FOR ADDITIONAL INFORMATION.
7. REMOVE EXISTING 48x48 DUCT AND MOTOR OPERATED DAMPER INTO EXISTING WALL. EXISTING PENETRATION TO BE INFILLED AND PATCHED TO MATCH EXISTING WALL. EXISTING DUCT IN WALL AND UP IN CHASE TO BE ABANDONED IN PLACE. REFER TO ARCHITECTURAL DRAWINGS FOR ADDITIONAL INFORMATION.
8. REMOVE EXISTING UNIT HEATER AND ALL ASSOCIATED PIPING, VALVES, CONTROLS INSULATION, HANGERS, SUPPORTS ETC. IN IT'S ENTIRETY.
9. REMOVE EXISTING INLINE HEATING WATER PUMPS AND ALL ASSOCIATED PIPING, INSULATION, CONTROLS, VALVES ETC IN IT'S ENTIRETY.
10. REMOVE EXISTING DUCT MOUNTED HEATING WATER COIL AND ALL ASSOCIATED PIPING, VALVES, CONTROLS INSULATION, HANGERS, SUPPORTS ETC. IN IT'S ENTIRETY.
11. REMOVE EXISTING OUTDOOR AIR LOUVER IN IT'S ENTIRETY.
12. REMOVE EXISTING MAKE-UP AIR UNIT AND ALL ASSOCIATED PIPING, VALVES, CONTROLS INSULATION, HANGERS, SUPPORTS ETC. IN IT'S ENTIRETY.
13. REMOVE EXISTING HEAD END CONTROLLER. REFER TO DRAWING M2.1 FOR ADDITIONAL INFORMATION.



PARTIAL FLOOR PLAN - MEDIA CENTER - DEMOLITION - ALT. GC-2
1/8" = 1'-0"



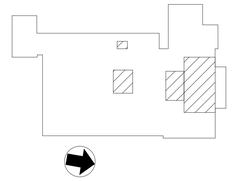
PARTIAL FLOOR PLAN - TOILET ROOM - DEMOLITION - ALT. GC-3
1/8" = 1'-0"



PARTIAL FLOOR PLAN - LANGUAGE SUPPORT - DEMOLITION - ALT. GC-1
1/8" = 1'-0"

SCALE: 1/8" = 1'-0"
8 0 8 16

KEY PLAN



REVISIONS

MM-DD-YR	NAME	DESCRIPTION OF CHANGES

CRABTREE ROHRBAUGH & ASSOCIATES - ARCHITECTS
100 WEST ROAD, SUITE 402
TOWSON MD 21204
410-528-0272
www.cra-architects.com
MECHANICSBURG, PENNSYLVANIA
CHARLOTTESVILLE, VIRGINIA
WHITE SULPHUR SPRINGS, WEST VIRGINIA

ADDITION AND RENOVATIONS OF GALENA ELEMENTARY SCHOOL
KENT COUNTY PUBLIC SCHOOLS
114 S MAIN STREET
GALENA, MD 21635

PARTIAL FLOOR PLANS - BASE BID AND ALTERNATES - DEMOLITION

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

FILENAME:

DATE: FEBRUARY 10, 2020

PROJECT 3309

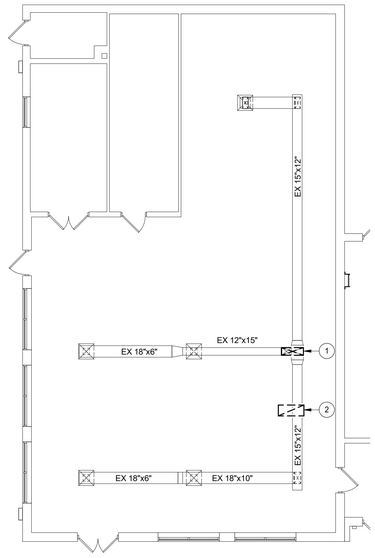
MD2.1

GENERAL NOTES:

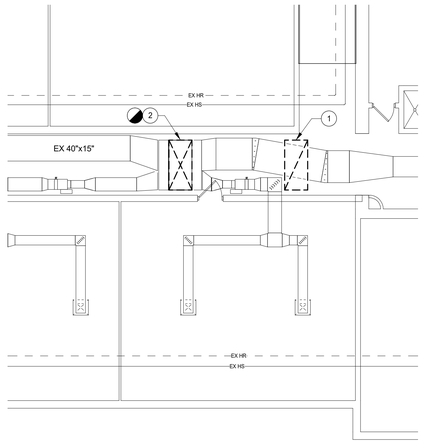
1. PATCH ALL HOLES, PENETRATIONS, ETC. TO MATCH EXISTING MATERIALS (WALLS, FLOORS, ROOF ETC), FINISHES ETC. AND PAINT TO MATCH EXISTING FINISHES.
2. IF ACTUAL FIELD CONDITIONS VARY FROM WHAT IS SHOWN OR ASSUMED IN THE CONTRACT DOCUMENTS, THE CONTACTOR IS REQUIRED TO PROMPTLY NOTIFY THE ARCHITECT/ENGINEER AND RECEIVE DIRECTION PRIOR TO PROCEEDING WITH THE WORK AFFECTED BY THE ACTUAL FIELD CONDITION.

DRAWING NOTES:

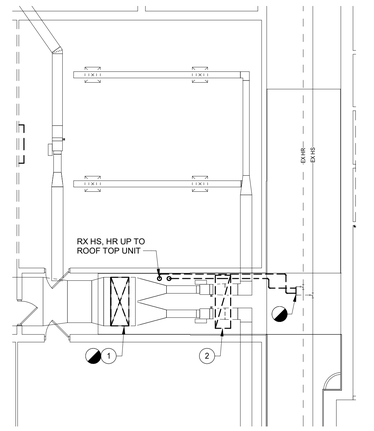
1. RX S/A DUCT UP TO RTU ON ROOF.
2. RX OPEN END PLENUM R/A DUCT UP TO RTU ON ROOF.
3. REMOVE EXISTING DUCT MOUNTED HEATING WATER COIL AND ALL ASSOCIATED PIPING, VALVES, CONTROLS INSULATION, HANGERS, SUPPORTS ETC. IN IT'S ENTIRETY.



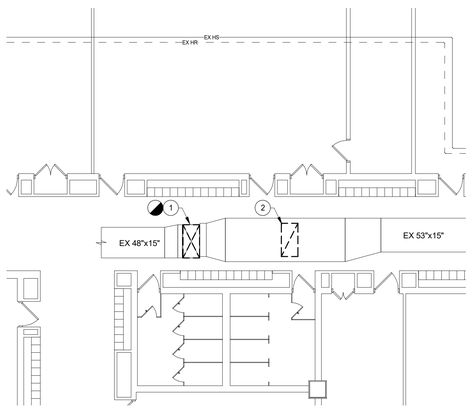
PARTIAL FLOOR PLAN - DEMOLITION - RTU-2
1/8" = 1'-0"



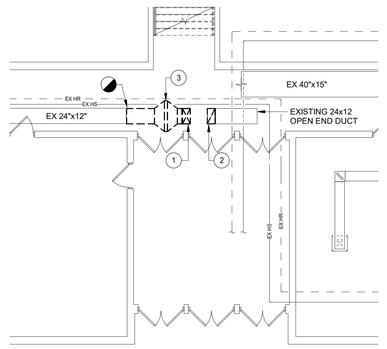
PARTIAL FLOOR PLAN - DEMOLITION - RTU-3
1/8" = 1'-0"



PARTIAL FLOOR PLAN - DEMOLITION - RTU-4
1/8" = 1'-0"



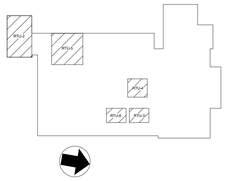
PARTIAL FLOOR PLAN - DEMOLITION - RTU-5
1/8" = 1'-0"



PARTIAL FLOOR PLAN - DEMOLITION - RTU-6
1/8" = 1'-0"

SCALE: 1/8" = 1'-0"
8 0 8 16

KEY PLAN



REVISIONS

MM-DD-YR	NAME	DESCRIPTION OF CHANGES

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100 WEST ROAD, SUITE 402
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114 S MAIN STREET
GALENA, MD 21635

PARTIAL FLOOR PLANS – BASE BID RTU REPLACEMENTS - DEMOLITION

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

FILENAME:

DATE: FEBRUARY 10, 2020

PROJECT 3309

MD2.2

GENERAL NOTES:

1. PATCH ALL HOLES, PENETRATIONS, ETC. TO MATCH EXISTING MATERIALS (WALLS, FLOORS, ROOF ETC), FINISHES ETC. AND PAINT TO MATCH EXISTING FINISHES. ALL ROOFING WORK SHALL BE PERFORMED BY A CERTIFIED ROOFING CONTRACTOR TO MAINTAIN THE EXISTING WARRANTY IN THE AREAS OF WORK.

DRAWING NOTES:

(1) REMOVE EXISTING ROOF TOP UNIT, CONTROLS, PIPING ETC, CURB & ADAPTER CURB IN IT'S ENTIRETY. REFRIGERANT SHALL BE CAREFULLY EVACUATED, STORED, AND DISPOSED OF IN ACCORDANCE WITH EPA CLEAN AIR ACT AND THE AUTHORITIES HAVING JURISDICTION.

(2) REMOVE EXISTING CAPPED ROOF CURB IN IT'S ENTIRETY.

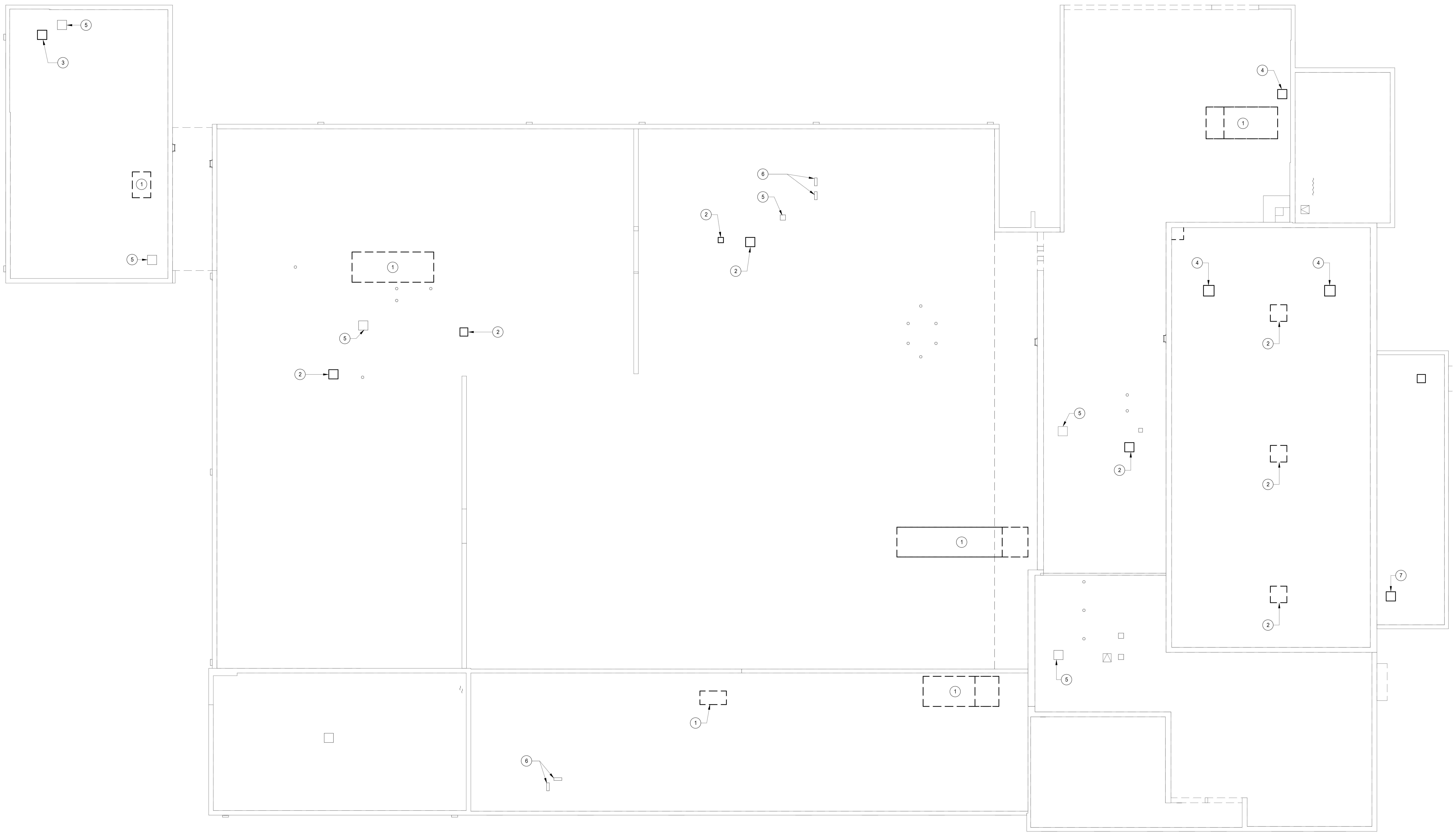
(3) REMOVE EXISTING CAPPED CHIMNEY IN IT'S ENTIRETY.

(4) REMOVE EXISTING EXHAUST FAN, CURB, CONTROLS, DUCTWORK ETC. IN IT'S ENTIRETY.

(5) EXISTING EXHAUST FAN TO REMAIN.

(6) EXISTING GOOSENECK EXHAUST VENT THROUGH ROOF.

(7) REMOVE EXISTING EXHAUST VENT ON ROOF, CURB ETC IN IT'S ENTIRETY.

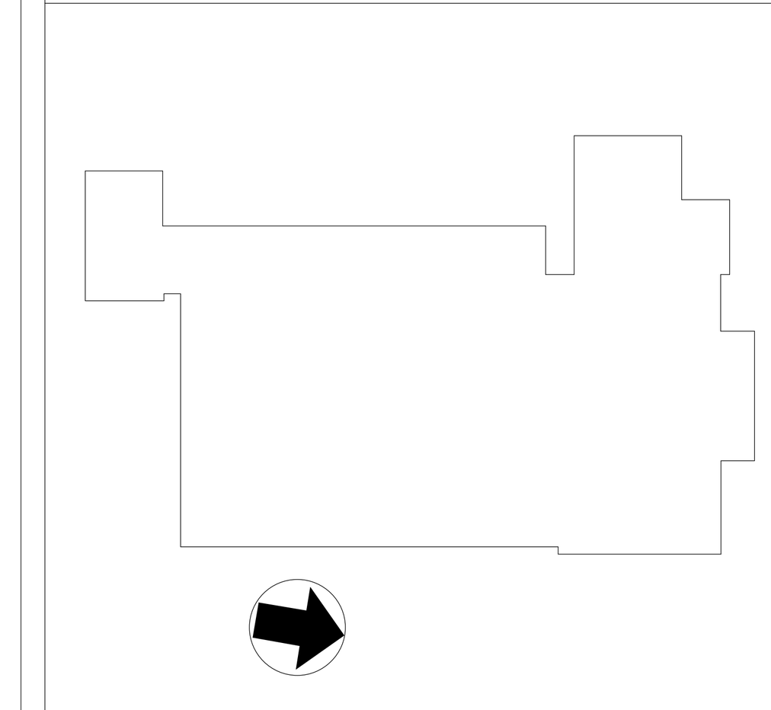


ROOF PLAN - DEMOLITION
3/32" = 1'-0"

SCALE: 3/32" = 1'-0"
8 0 8 16 32

PROFESSIONAL CERTIFICATION: I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO: 39921, EXPIRATION DATE 01/19/2021

KEY PLAN



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www.cra-architects.com
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KENT COUNTY PUBLIC SCHOOLS
114 S MAIN STREET
GALENA, MD 21635

CR

ROOF PLAN - DEMOLITION

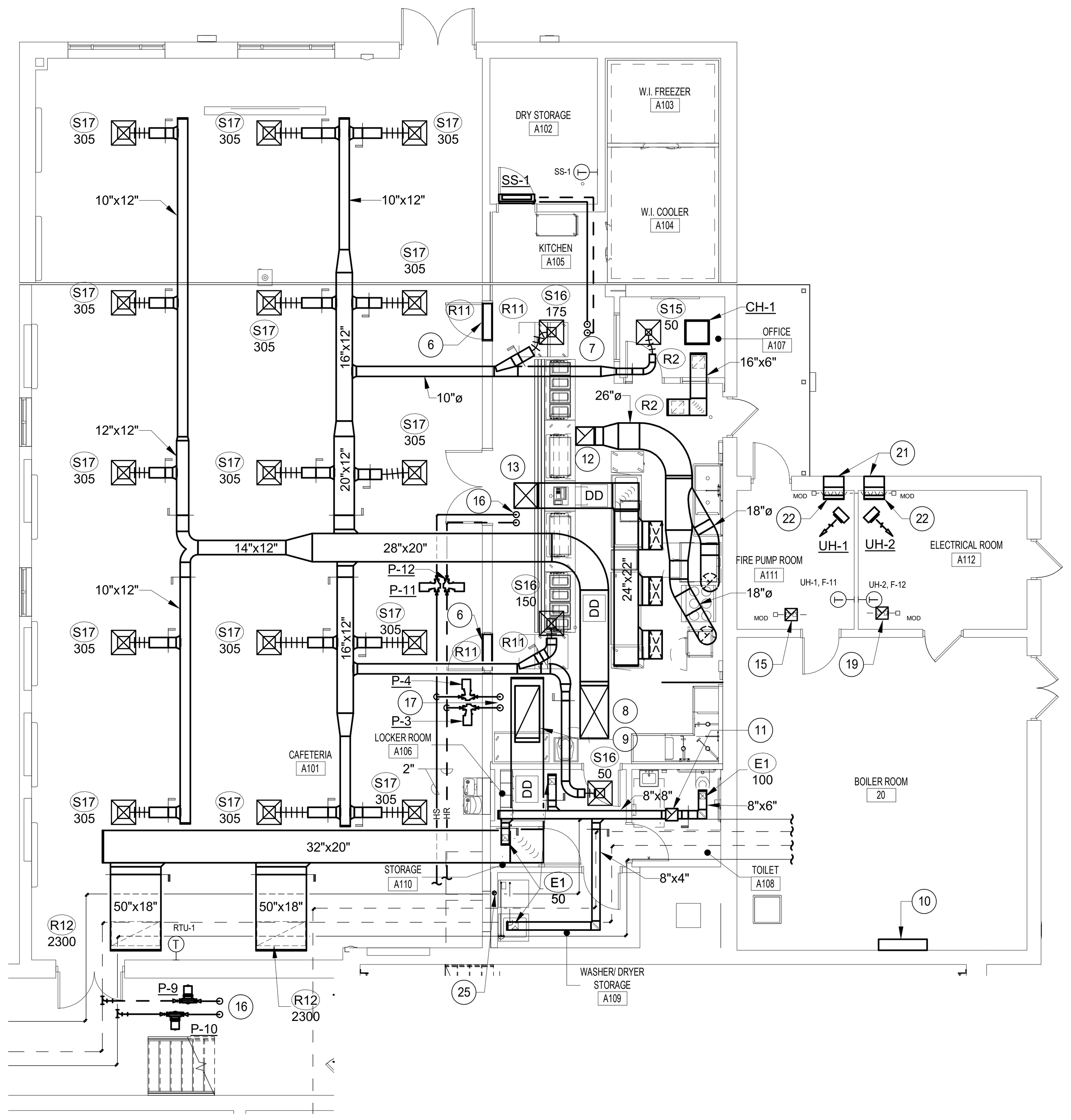
PLOT SCALE: 3/32" = 1'-0"

FILENAME:

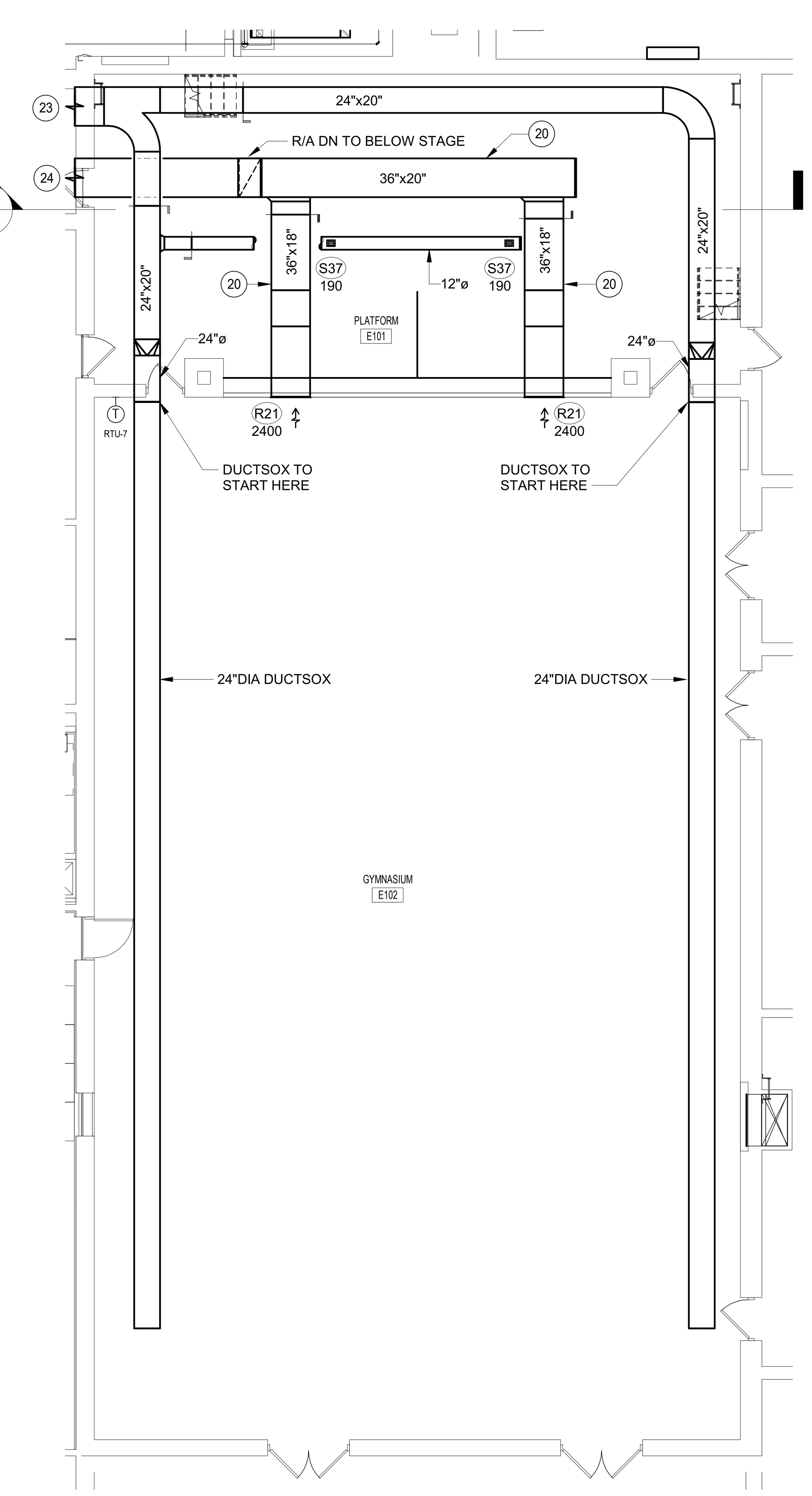
DATE: FEBRUARY 10, 2020

PROJECT
3309

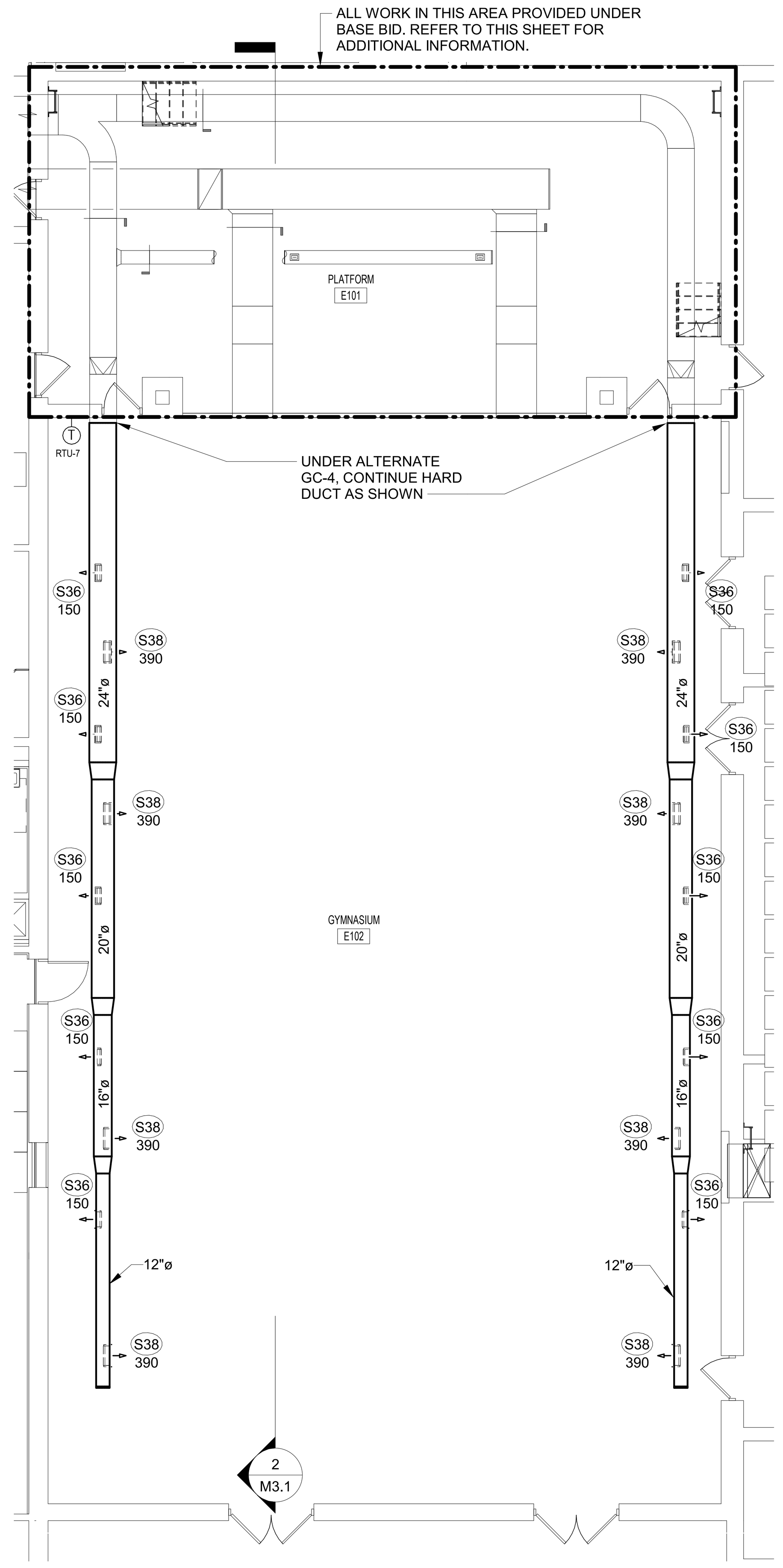
MD2.3



PARTIAL FLOOR PLAN - KITCHEN/CAFETERIA - BASE BID
1/8" = 1'-0"



PARTIAL FLOOR PLAN - GYM - BASE BID
1/8" = 1'-0"



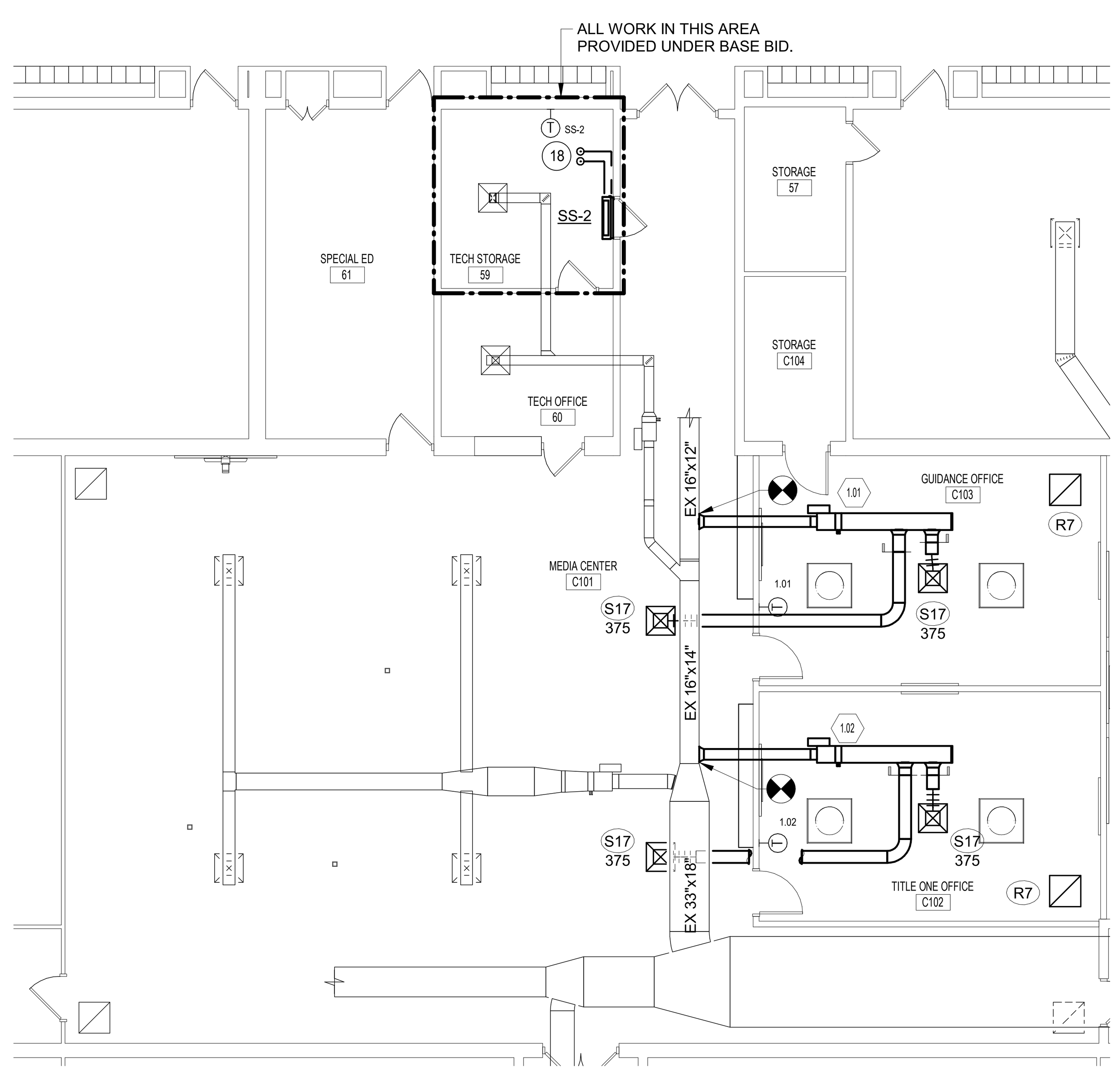
PARTIAL FLOOR PLAN - GYM - ALT. GC-4
1/8" = 1'-0"

GENERAL NOTES:

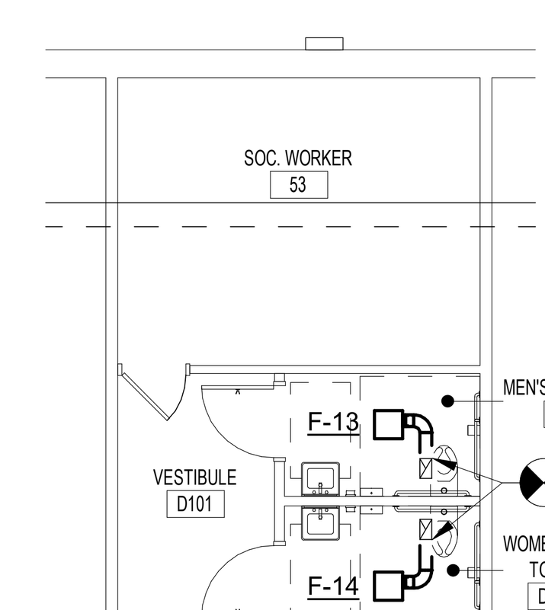
1. PATCH ALL HOLES, PENETRATIONS, ETC. TO MATCH EXISTING MATERIALS (WALLS, FLOORS, ROOF ETC), FINISHES ETC. AND PAINT TO MATCH EXISTING FINISHES.
2. IF ACTUAL FIELD CONDITIONS VARY FROM WHAT IS SHOWN OR ASSUMED IN THE CONTRACT DOCUMENTS, THE CONTACTOR IS REQUIRED TO PROMPTLY NOTIFY THE ARCHITECT/ENGINEER AND RECEIVE DIRECTION PRIOR TO PROCEEDING WITH THE WORK AFFECTED BY THE ACTUAL FIELD CONDITION.

DRAWING NOTES:

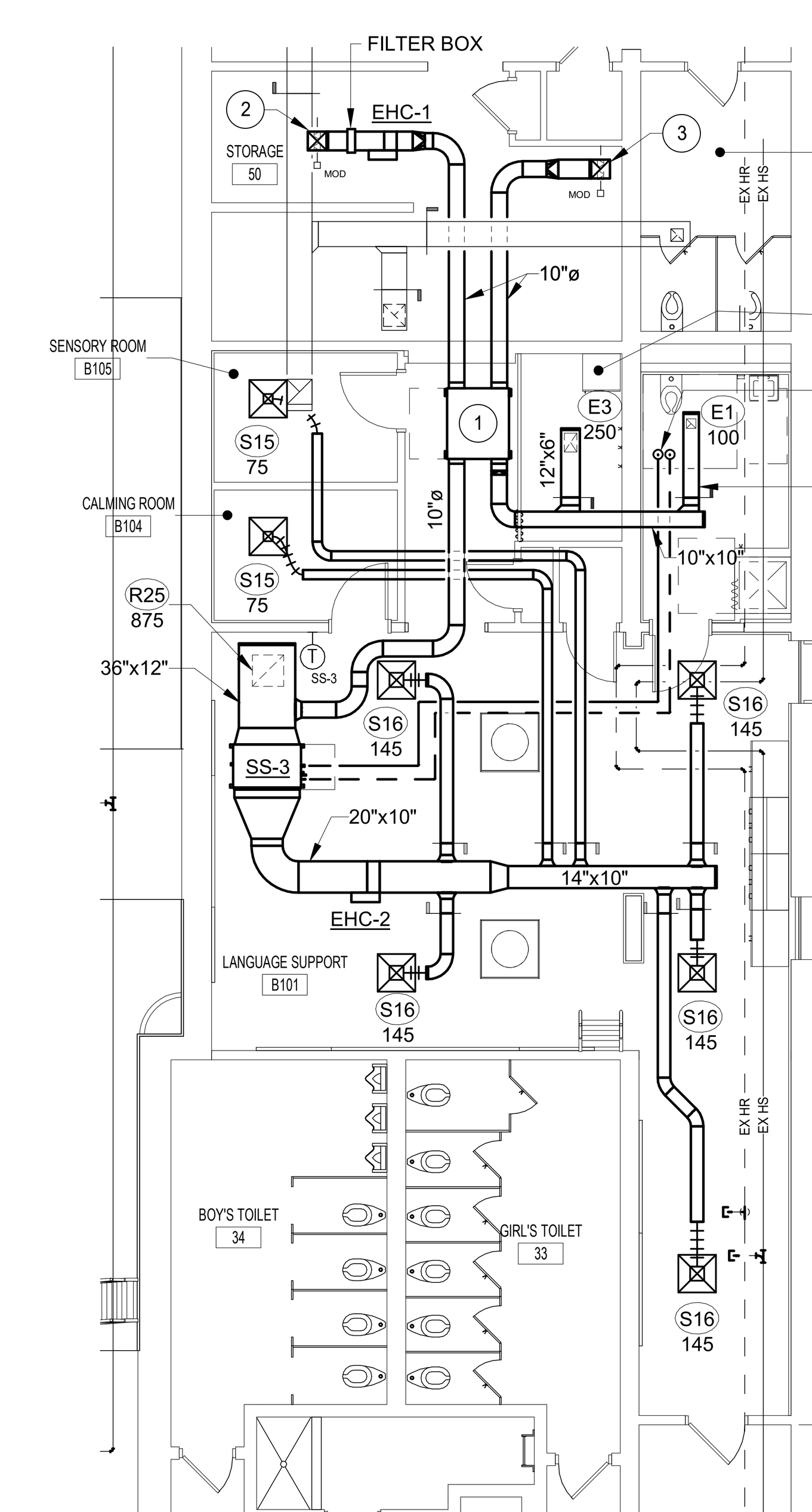
1. ENERGY RECOVERY UNIT, ER-1
   LOSSNAY CROSS-FLOW ENERGY RECOVERY CORE
   CAPACITY: 470 CFM
   ELEC CHAR: 208/1/60
   BASED ON MITSUBISHI LOSSNAY MODEL LGH-F470RX5-E1.
2. 12x12 O/A DUCT UP TO GRAVITY INTAKE VENT ON ROOF. REFER TO DRAWING M2.3 FOR CONTINUATION.
3. 12x12 E/A DUCT UP TO GRAVITY RELIEF VENT ON ROOF. REFER TO DRAWING M2.3 FOR CONTINUATION.
4. RS, RL PIPING UP TO SSCU-3 ON ROOF. REFER TO DRAWING M2.3 FOR CONTINUATION.
5. EXISTING 10x6 E/A DUCT UP TO EXISTING GOOSENECK VENT ON ROOF. REFER TO DRAWING M2.3 FOR CONTINUATION.
6. 36x12 TRANSFER AIR DUCT ABOVE DOOR.
7. RS, RL PIPING UP TO SSCU-1 ON ROOF. REFER TO DRAWING M2.3 FOR CONTINUATION.
8. 52x28 S/A DUCT UP TO RTU-1 ON ROOF. REFER TO DRAWING M2.3 FOR CONTINUATION.
9. 52x24 R/A DUCT UP TO RTU-1 ON ROOF. REFER TO DRAWING M2.3 FOR CONTINUATION.
10. REPLACE EXISTING HEAD END CONTROLLER. PROVIDE ALL PROGRAMMING AND REQUIRED COMPONENTS TO MAINTAIN ALL EXISTING CONTROL FUNCTIONALITY, POINTS, ETC. AND ACCOMMODATE ALL CONTROLS ASSOCIATED WITH THE SCOPE OF THIS PROJECT.
11. 12x12 E/A DUCT UP TO F-10 ON ROOF. REFER TO DRAWING M2.3 FOR CONTINUATION
12. 18x18 E/A DUCT UP TO F-9 ON ROOF. REFER TO DRAWING M2.3 FOR CONTINUATION
13. 24x22 S/A DUCT UP TO MAU-1 ON ROOF. REFER TO DRAWING M2.3 FOR CONTINUATION
14. 2" HS, HL UP TO RTU-1 ON ROOF. REFER TO DRAWING M2.3 FOR CONTINUATION.
15. 12x12 O.E.D WITH ½"x½" MESH BIRDSCREEN. E/A DUCT UP TO F-11 ON ROOF. REFER TO DRAWING M2.3 FOR CONTINUATION
16. 2" HS, HL UP TO RTU-7 ON ROOF. REFER TO DRAWING M2.3 FOR CONTINUATION.
17. 1¼" HS, HL UP TO MAU-1 ON ROOF. REFER TO DRAWING M2.3 FOR CONTINUATION.
18. RS, RL PIPING UP TO SSCU-3 ON ROOF. REFER TO DRAWING M2.3 FOR CONTINUATION.
19. 12x12 O.E.D WITH ½"x½" MESH BIRDSCREEN. E/A DUCT UP TO F-12 ON ROOF. REFER TO DRAWING M2.3 FOR CONTINUATION
20. RETURN AIR DUCTWORK BELOW STAGE.
21. 20x12 OUTDOOR AIR INTAKE LOUVER.
22. 20X12 O/A O.E.D WITH ½"x½" MESH BIRDSCREEN.
23. 36x20 S/A DUCT THROUGH WALL TO RTU-7. REFER TO DRAWING M2.3 FOR CONTINUATION.
24. 36x20 R/A DUCT THROUGH WALL TO RTU-7. REFER TO DRAWING M2.3 FOR CONTINUATION.
25. 4"∅ ALUMINUM DRYER VENT DN TO UNIT AND UP TO VENT TERMINAL ON ROOF. REFER TO DRAWING M2.3 FOR CONTINUATION.



PARTIAL FLOOR PLAN - MEDIA CENTER - ALT. GC-2
1/8" = 1'-0"



PARTIAL FLOOR PLAN - ADA TOILET ROOMS - ALT. GC-3
1/8" = 1'-0"

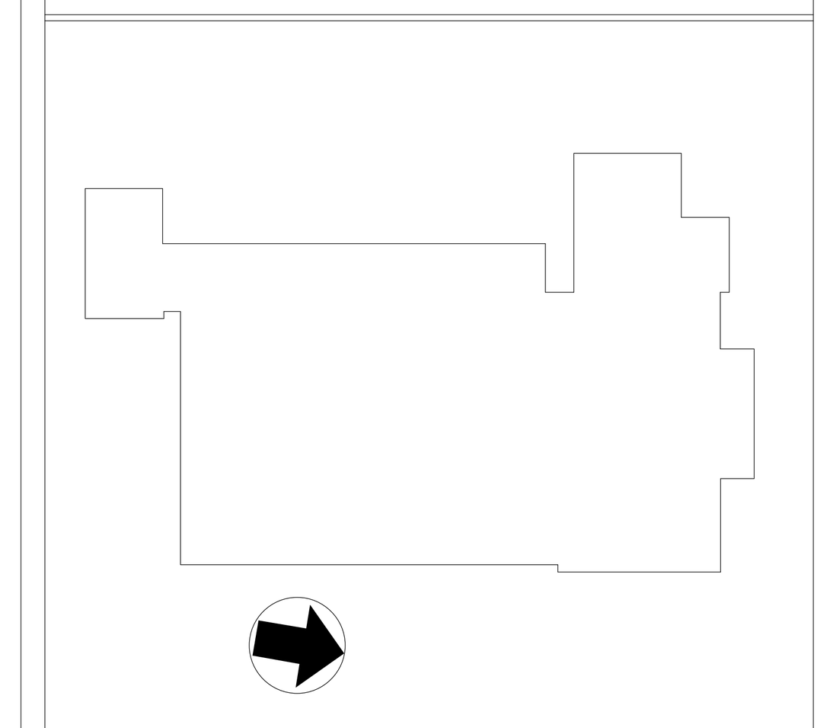


PARTIAL FLOOR PLAN - LANGUAGE SUPPORT - ALT. GC-1
1/8" = 1'-0"

SCALE: 1/8" = 1'-0"
8 0 8 16

PROFESSIONAL CERTIFICATION: I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO: 39921, EXPIRATION DATE 01/19/2021

KEY PLAN



REVISIONS

MM-DD-YR	NAME	DESCRIPTION OF CHANGES

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ADDITION AND RENOVATIONS OF GALENA ELEMENTARY SCHOOL
KENT COUNTY PUBLIC SCHOOLS
114 S MAIN STREET
GALENA, MD 21635

CR

PARTIAL FLOOR PLANS - BASE BID AND ALTERNATES

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

FILENAME:

DATE: FEBRUARY 10, 2020

PROJECT
3309

M2.1

GENERAL NOTES:

1. PATCH ALL HOLES, PENETRATIONS, ETC. TO MATCH EXISTING MATERIALS (WALLS, FLOORS, ROOF ETC), FINISHES ETC. AND PAINT TO MATCH EXISTING FINISHES.
2. IF ACTUAL FIELD CONDITIONS VARY FROM WHAT IS SHOWN OR ASSUMED IN THE CONTRACT DOCUMENTS, THE CONTACTOR IS REQUIRED TO PROMPTLY NOTIFY THE ARCHITECT/ENGINEER AND RECEIVE DIRECTION PRIOR TO PROCEEDING WITH THE WORK AFFECTED BY THE ACTUAL FIELD CONDITION.

DRAWING NOTES:

(1) 2½" HS, HL UP TO RTU-4 ON ROOF. REFER TO DRAWING M2.3 FOR CONTINUATION.

(2) 1" HS, HL UP TO RTU-6 ON ROOF. REFER TO DRAWING M2.3 FOR CONTINUATION.

(3) ROOFTOP UNIT CURB OUTLINE.

(4) 40x18 PLENUM R/A DUCT UP THROUGH ROOF TO PLENUM CURB OF RTU-2. REFER TO MECHANICAL DETAILS FOR ADDITIONAL INFORMATION.

(5) 34x12 S/A DUCT DN TO EXISTING 34x12 S/A DUCT. CONNECT TO EXISTING DUCT. 34x12 S/A DUCT UP AND TRANSITION TO 28x22 DUCT IN VERTICAL (FULL SIZE CONNECTION OF UNIT) UP TO RTU-2.

(6) 40x17 R/A DUCT CONNECTION TO RTU-2 LOCATED IN PLENUM CURB (FULL SIZE CONNECTION OF UNIT AND SHOWN FOR REFERENCE). REFER TO MECHANICAL DETAILS FOR ADDITIONAL INFORMATION.

(7) 59x26 PLENUM R/A DUCT UP THROUGH ROOF TO PLENUM CURB OF RTU-3. REFER TO MECHANICAL DETAILS FOR ADDITIONAL INFORMATION.

(8) 78x36 S/A DUCT DN TO EXISTING 78x36 S/A DUCT. CONNECT TO EXISTING DUCT. 78x36 S/A DUCT UP AND TRANSITION TO 59x26 DUCT IN VERTICAL (FULL SIZE CONNECTION OF UNIT) UP TO RTU-3.

(9) 59x26 R/A DUCT CONNECTION TO RTU-3 LOCATED IN PLENUM CURB (FULL SIZE CONNECTION OF UNIT AND SHOWN FOR REFERENCE). REFER TO MECHANICAL DETAILS FOR ADDITIONAL INFORMATION.

(10) 82x24 PLENUM R/A DUCT UP THROUGH ROOF TO PLENUM CURB OF RTU-4. REFER TO MECHANICAL DETAILS FOR ADDITIONAL INFORMATION.

(11) 76x28 S/A DUCT DN TO EXISTING 76x28 S/A DUCT. CONNECT TO EXISTING DUCT. 76x28 S/A DUCT UP AND TRANSITION TO 81x42 DUCT IN VERTICAL (FULL SIZE CONNECTION OF UNIT) UP TO RTU-4.

(12) 83x24 R/A DUCT CONNECTION TO RTU-4 LOCATED IN PLENUM CURB (FULL SIZE CONNECTION OF UNIT AND SHOWN FOR REFERENCE). REFER TO MECHANICAL DETAILS FOR ADDITIONAL INFORMATION.

(13) 82x24 PLENUM R/A DUCT UP THROUGH ROOF TO PLENUM CURB OF RTU-5. REFER TO MECHANICAL DETAILS FOR ADDITIONAL INFORMATION.

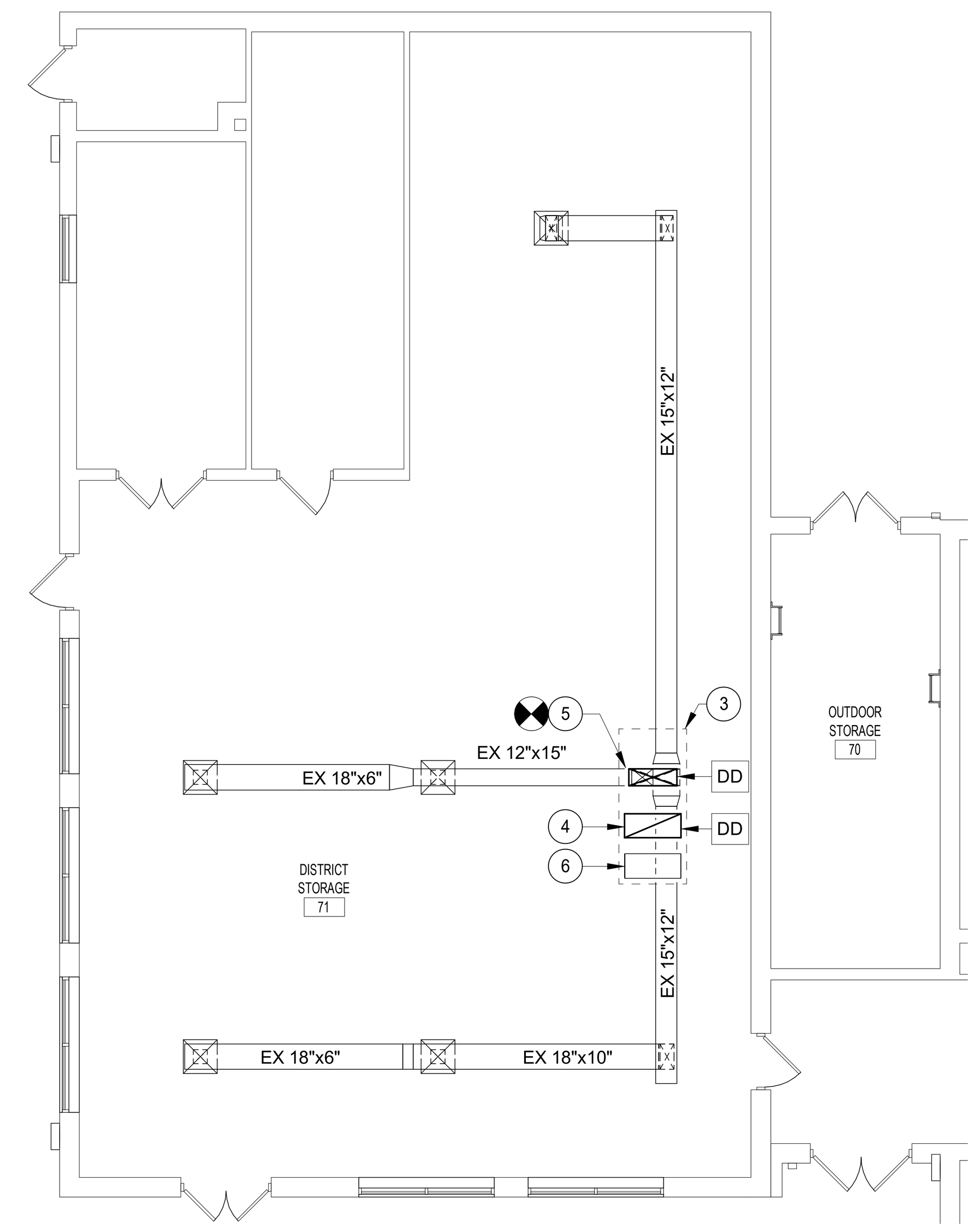
(14) 52x26 S/A DUCT DN TO EXISTING 52x26 S/A DUCT. CONNECT TO EXISTING DUCT. 52x26 S/A DUCT UP AND TRANSITION TO 81x42 DUCT IN VERTICAL (FULL SIZE CONNECTION OF UNIT) UP TO RTU-5.

(15) 83x24 R/A DUCT CONNECTION TO RTU-5 LOCATED IN PLENUM CURB (FULL SIZE CONNECTION OF UNIT AND SHOWN FOR REFERENCE). REFER TO MECHANICAL DETAILS FOR ADDITIONAL INFORMATION.

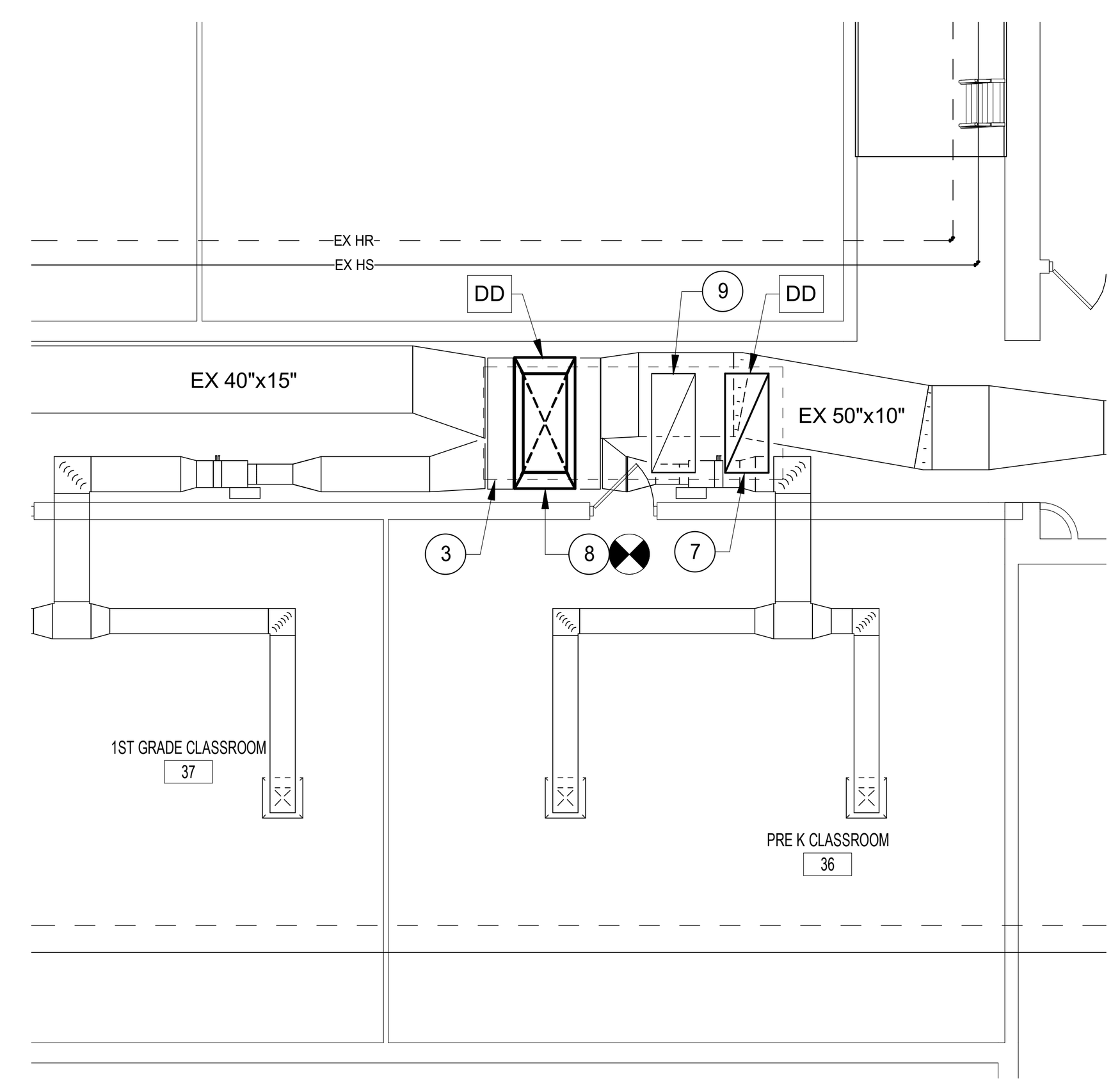
(16) 24x12 PLENUM R/A DUCT DN. CONNECT TO EXISTING 24x12 R/A PLENUM DUCT. 24x12 PLENUM R/A DUCT UP THROUGH ROOF TO PLENUM CURB OF RTU-6. REFER TO MECHANICAL DETAILS FOR ADDITIONAL INFORMATION.

(17) 28x22 S/A DUCT UP TO RTU-6 (FULL SIZE CONNECTION OF UNIT).

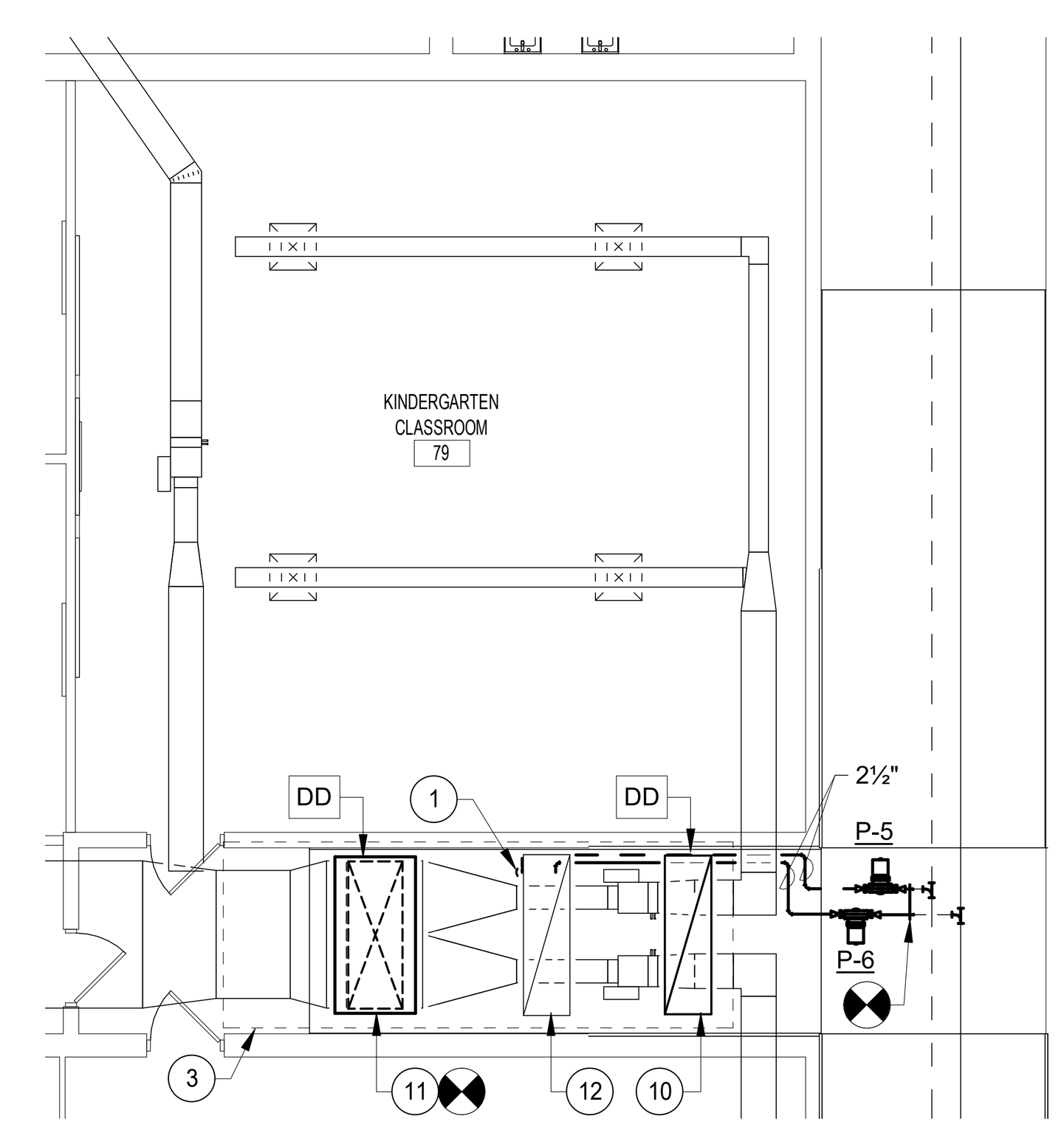
(18) 40x17 R/A DUCT CONNECTION TO RTU-6 LOCATED IN PLENUM CURB (FULL SIZE CONNECTION OF UNIT AND SHOWN FOR REFERENCE). REFER TO MECHANICAL DETAILS FOR ADDITIONAL INFORMATION.



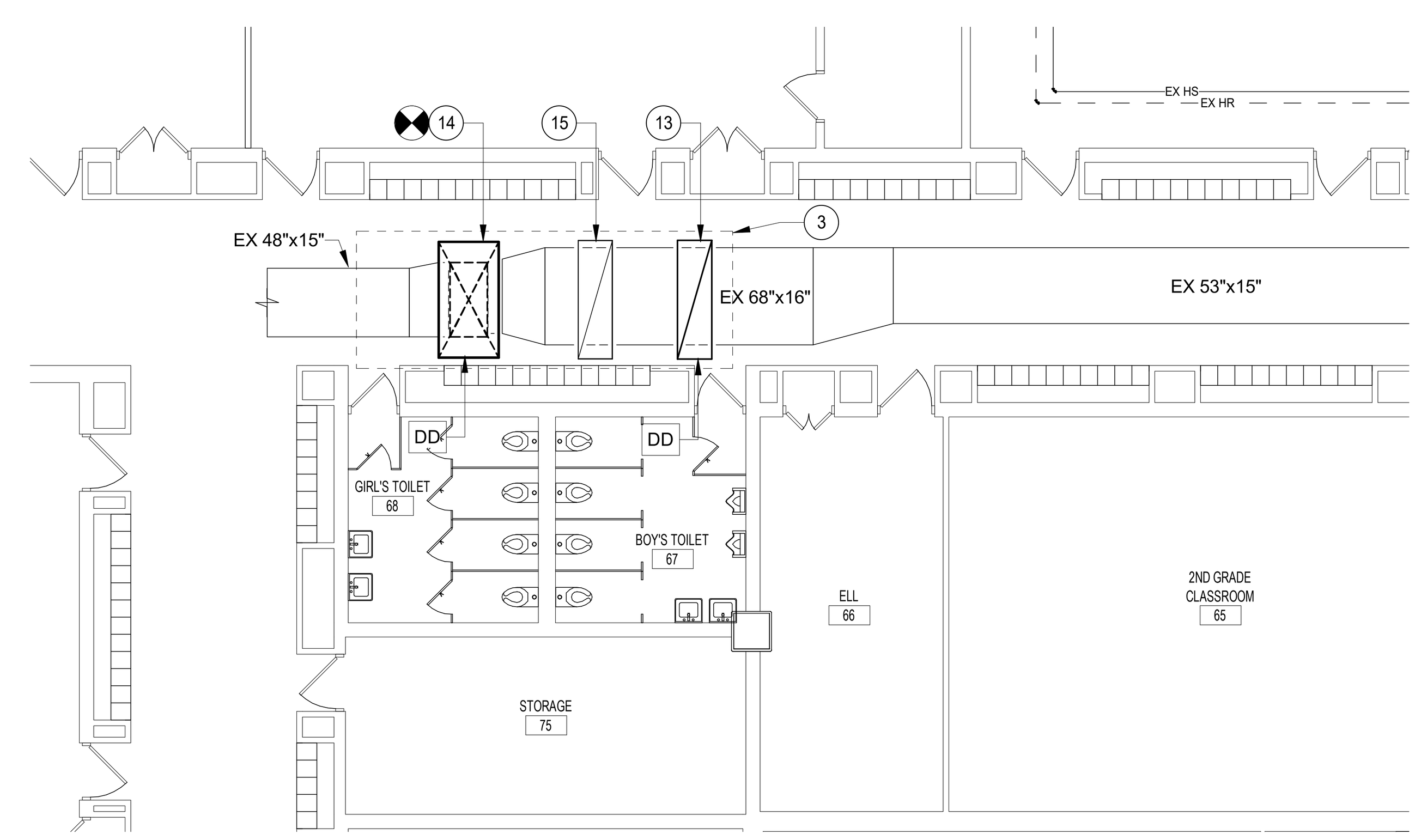
PARTIAL FLOOR PLAN - RTU-2
1/8" = 1'-0"



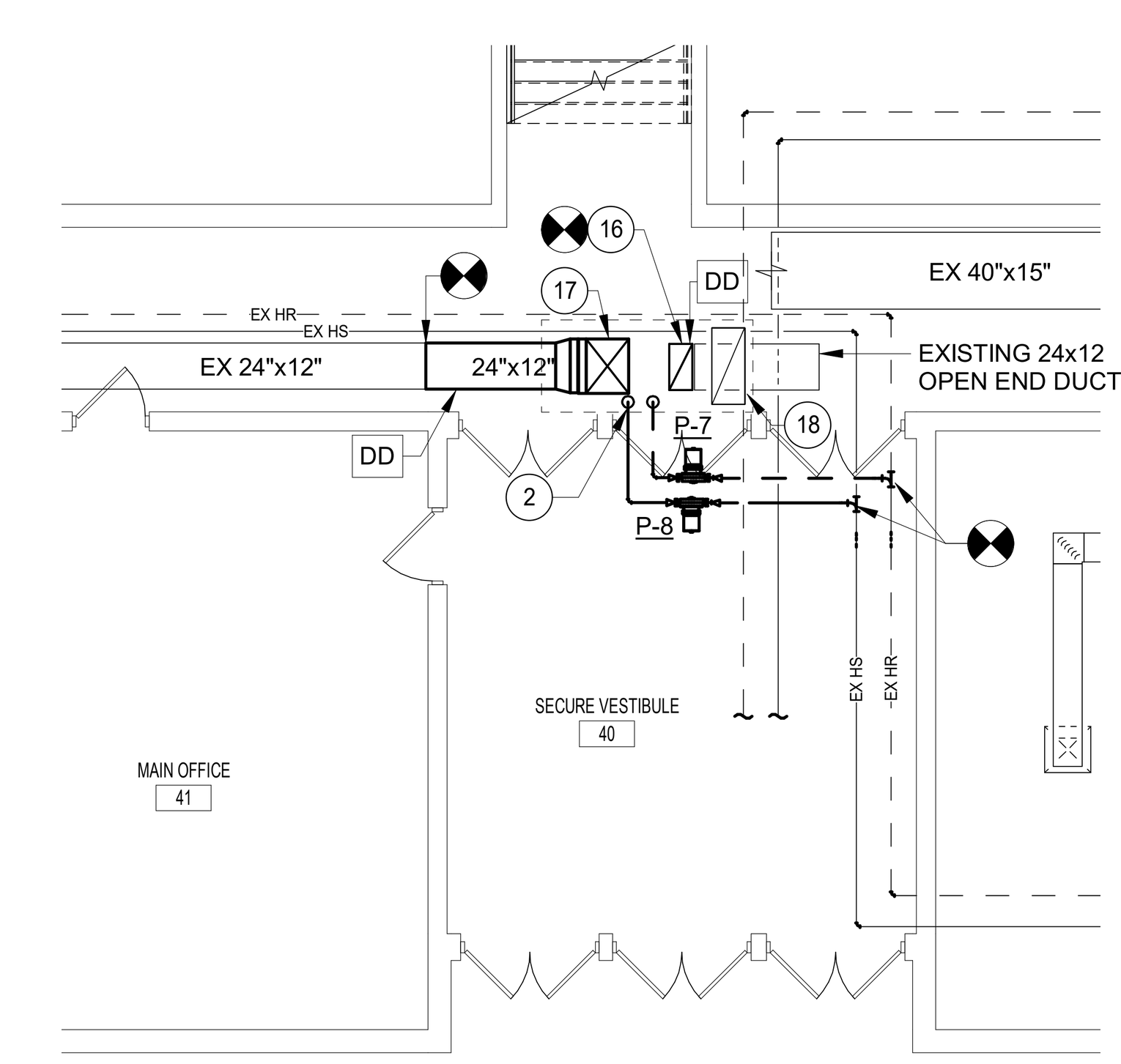
PARTIAL FLOOR PLAN - RTU-3
1/8" = 1'-0"



PARTIAL FLOOR PLAN - RTU-4
1/8" = 1'-0"



PARTIAL FLOOR PLAN - RTU-5
1/8" = 1'-0"



PARTIAL FLOOR PLAN - RTU-6
1/8" = 1'-0"

SCALE: 1/8" = 1'-0"
8 0 8 16

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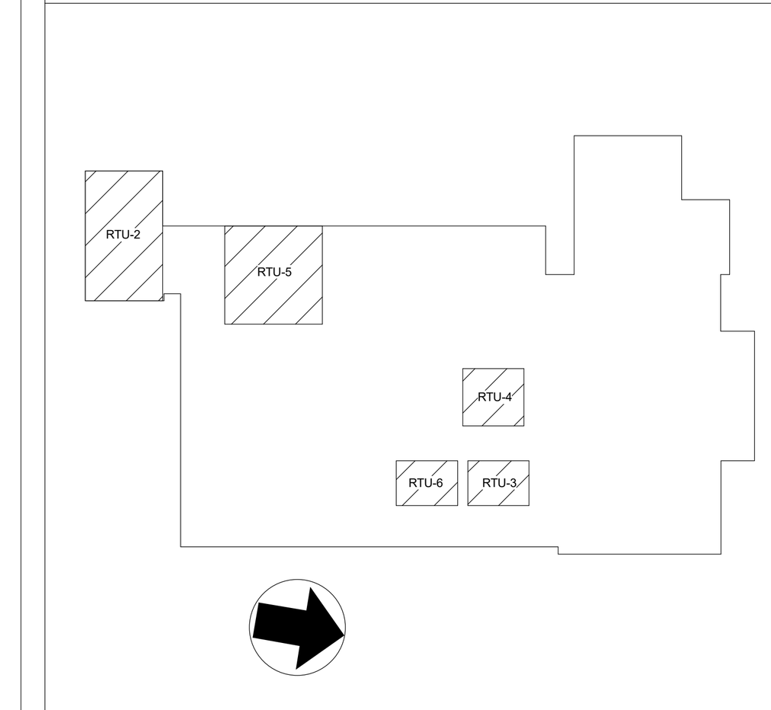
KEY PLAN



REVISIONS

01	MM-DD-YR	NAME	DESCRIPTION OF CHANGES

CRABTREE ROHRBAUGH & ASSOCIATES - ARCHITECTS
100 WEST ROAD, SUITE 402
TOWSON MD 21204
410-528-0272
MECHANICSBURG, PENNSYLVANIA
CHARLOTTESVILLE, VIRGINIA
WHITE SULPHUR SPRINGS, WEST VIRGINIA
www.cra-architects.com

ADDITION AND RENOVATIONS OF GALENA ELEMENTARY SCHOOL
KENT COUNTY PUBLIC SCHOOLS
114 S MAIN STREET
GALENA, MD 21635

PARTIAL FLOOR PLANS – BASE BID RTU REPLACEMENTS

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

FILENAME:

DATE: FEBRUARY 10, 2020

PROJECT
3309

M2.2

GENERAL NOTES:

1. PATCH ALL HOLES, PENETRATIONS, ETC. TO MATCH EXISTING MATERIALS (WALLS, FLOORS, ROOF ETC), FINISHES ETC. AND PAINT TO MATCH EXISTING FINISHES.
2. IF ACTUAL FIELD CONDITIONS VARY FROM WHAT IS SHOWN OR ASSUMED IN THE CONTRACT DOCUMENTS, THE CONTACTOR IS REQUIRED TO PROMPTLY NOTIFY THE ARCHITECT/ENGINEER AND RECEIVE DIRECTION PRIOR TO PROCEEDING WITH THE WORK AFFECTED BY THE ACTUAL FIELD CONDITION.

DRAWING NOTES:

(1) ROOF TOP UNIT TO BE INSTALLED ON PLENUM CURB. PLENUM CURB SHALL BE SIZED TO COVER OVER EXISTING ROOF DUCT PENETRATION. CONNECT NEW SUPPLY AIR DUCT TO EXISTING SUPPLY AIR DUCT PENETRATION. EXTEND EXISTING R/A DUCT CONNECTION INTO CURB COMPLETELY SEAL PLENUM CURB.

(2) GRAVITY INTAKE VENT
350 CFM @ 400 FPM THROAT VELOCITY
BASED ON GREENHECK MODEL WIH

(3) GRAVITY RELIEF VENT
350 CFM @ 400 FPM THROAT VELOCITY
BASED ON GREENHECK MODEL WRH

(4) 36x20 S/A DUCT THROUGH WALL. REFER TO DRAWING M2.1 FOR CONTINUATION.

(5) 36x20 R/A DUCT THROUGH WALL. REFER TO DRAWING M2.1 FOR CONTINUATION.

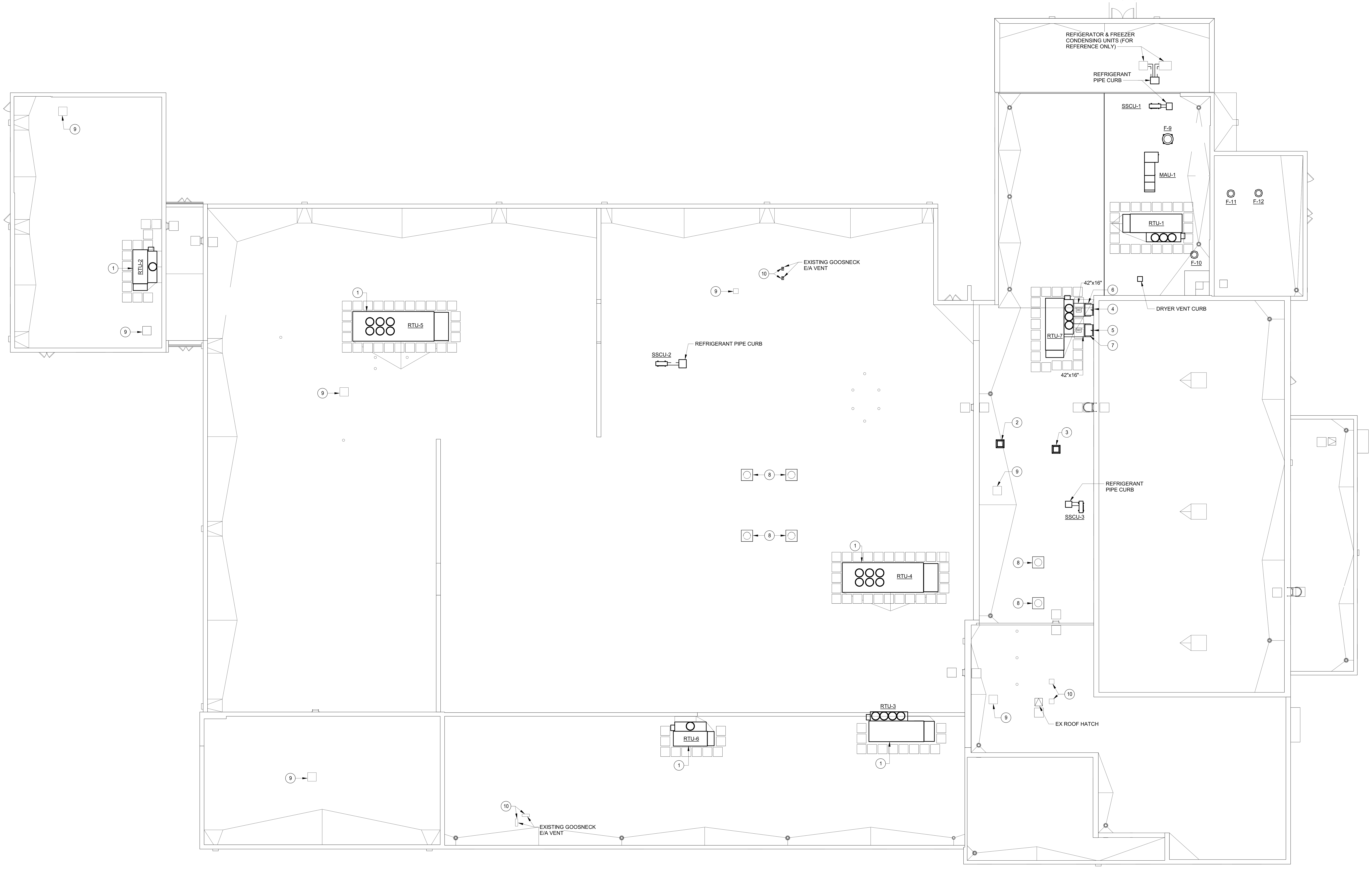
(6) 42x16 S/A DUCT UP TRANSITION TO 36x20 DUCT IN VERTICAL.

(7) 42x16 R/A DUCT UP TRANSITION TO 36x20 DUCT IN VERTICAL.

(8) SOLATUBE. REFER TO ARCHITECTURAL DRAWINGS FOR ADDITIONAL INFORMATION.

(9) EXTEND EXISTING CURB UP TO ACCOMMODATE ROOFING AND ADDITIONAL ROOF INSULATION AND RE-INSTALL EXISTING FAN. CURB SHALL BE 18" ABOVE FINISHED ROOF. EXTEND CONTROL WIRING, POWER, DUCTWORK ETC. TO RE-INSTALL FAN AT EXTENDED CURB HEIGHT.

(10) EXTEND EXISTING CURB UP TO ACCOMMODATE ROOFING AND ADDITIONAL ROOF INSULATION AND RE-INSTALL EXISTING VENT TERMINAL.



ROOF PLAN
3/32" = 1'-0"

SCALE: 3/32" = 1'-0"
8 0 8 16 32

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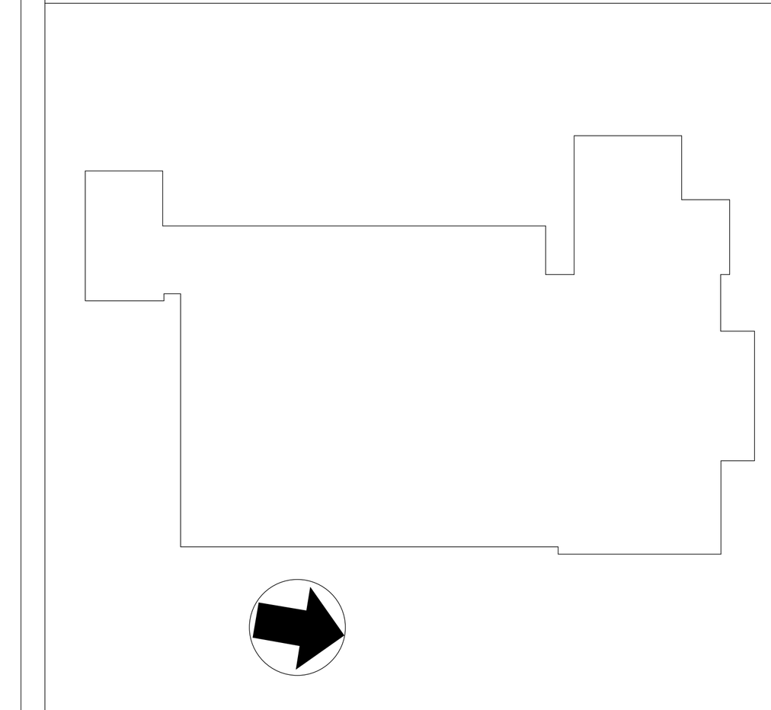
KEY PLAN



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GALENA, MD 21635

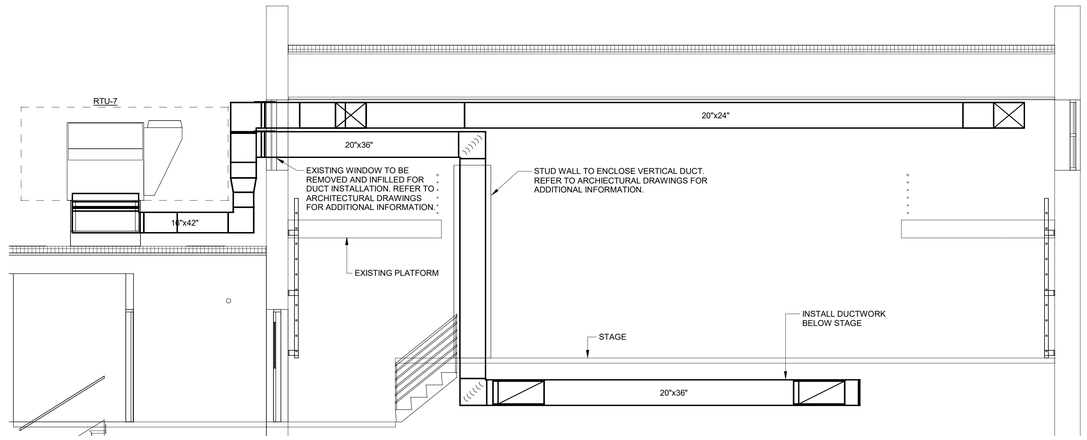
CR

ROOF PLAN

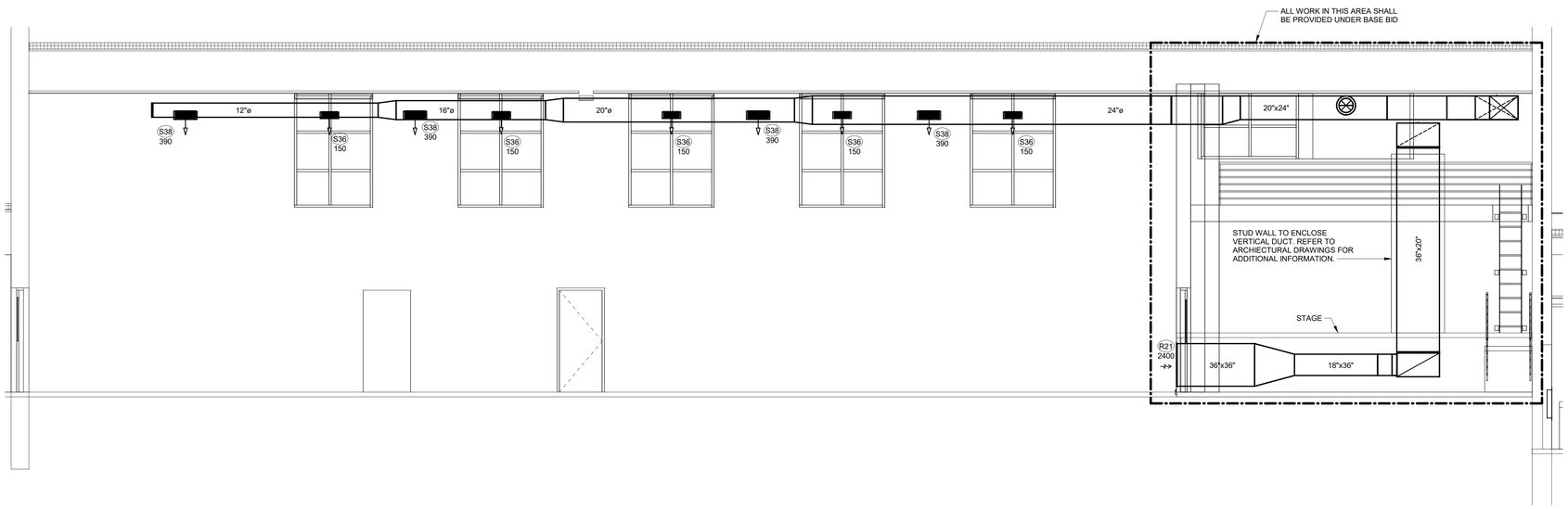
PLOT SCALE: 3/32" = 1'-0"
FILENAME:
DATE: FEBRUARY 10, 2020

PROJECT
3309

M2.3



GYMNASIUM SECTION
1/4" = 1'-0"



GYMNASIUM SECTION - ALT. GC-4
1/4" = 1'-0"

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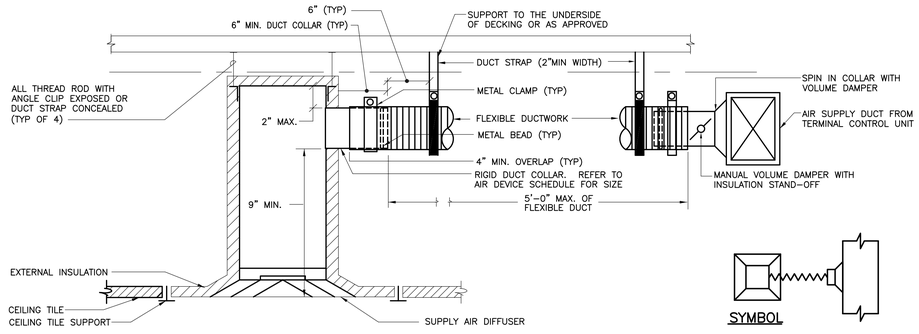
ADDITION AND RENOVATIONS OF GALENA ELEMENTARY SCHOOL
KENT COUNTY PUBLIC SCHOOLS
114 S MAIN STREET
GALENA, MD 21635

MECHANICAL SECTIONS

PLOT SCALE: 1/4" = 1'-0"
FILENAME:
DATE: FEBRUARY 10, 2020

PROJECT 3309

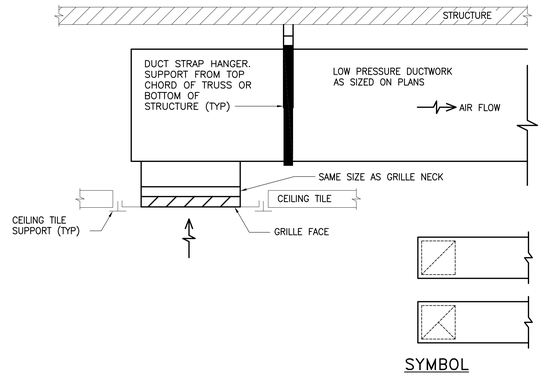
M3.1



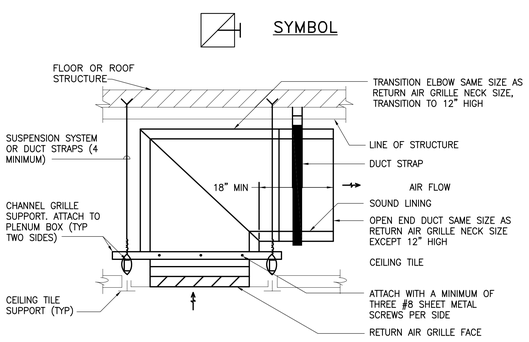
NOTES: 1. STEEL STRAP CLAMP MUST BE POSITIONED BEHIND A BEAD ON THE COLLAR.

CONCEALED CEILING AREA DETAIL

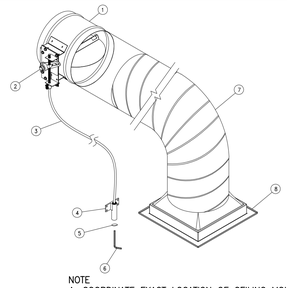
1 TYPICAL SUPPLY AIR DEVICE INSTALLATION DETAIL — SCALE: NONE



2 TYPICAL CEILING RETURN AND EXHAUST AIR DEVICE DETAIL — SCALE: NONE



3 TYPICAL CEILING PLENUM RETURN AIR DEVICE DETAIL — SCALE: NONE



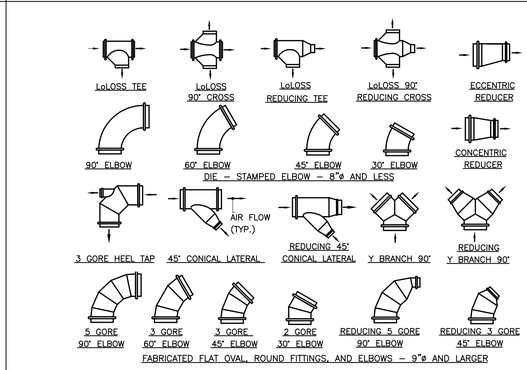
1. REMOTE CABLE OPERATED BALANCING DAMPER.
2. CABLE CONTROLLED LOCKING QUADRANT
3. CONTROL CABLE
4. MOUNTING BRACKET– INSTALL WITH OPEN END FLUSH TO FINISHED CEILING LINE
5. FINISH CAP
6. ALLEN HEX WRENCH
7. DUCT
8. CEILING DIFFUSER OR GRILLE

NOTE
A. COORDINATE EXACT LOCATION OF CEILING MOUNTED CONCEALED REGULATOR WITH ARCHITECT PRIOR TO INSTALLATION.

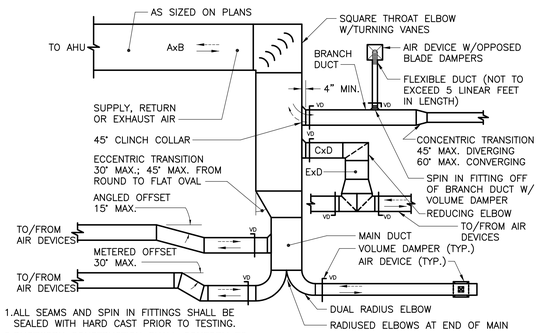
B. DETAIL IS TYPICAL FOR BOTH ROUND AND SQUARE REMOTE MANUAL VOLUME DAMPERS.

C. PROVIDE IN LIEU OF CEILING ACCESS DOOR WHERE MANUAL VOLUME DAMPERS ARE INSTALLED ABOVE HARD/INACCESSABLE CEILING SYSTEMS.

4 TYPICAL REMOTE MANUAL VOLUME DAMPER DETAIL — SCALE: NONE

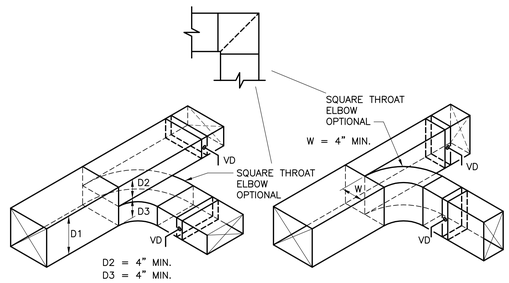


5 TYPICAL DUCT FITTINGS DETAIL — SCALE: NONE

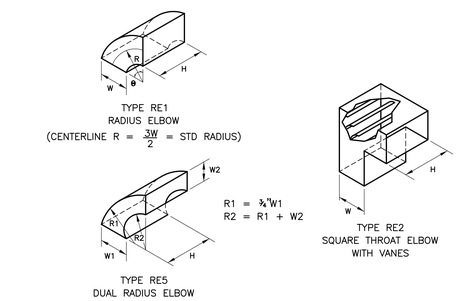


1.ALL SEAMS AND SPIN IN FITTINGS SHALL BE SEALED WITH HARD CAST PRIOR TO TESTING.
2.DUCTWORK CONSTRUCTION SHALL CONFORM TO THE MOST RECENT SMACNA STANDARD HVAC DUCT CONSTRUCTION STANDARDS
3.PROVIDE MANUAL VOLUME DAMPERS FOR EACH BRANCH AND RUNNOUT IN LOW PRESSURE SYSTEMS

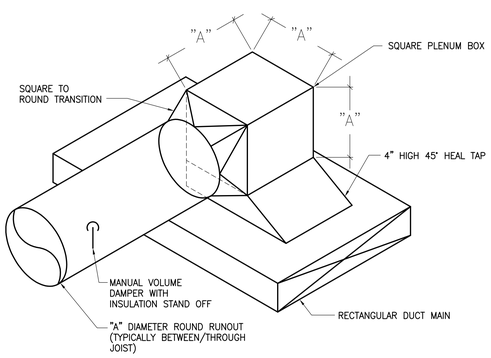
6 TYPICAL SUPPLY,EXHUAST, OR RETURN DUCT OFFSET AND TRANSITION DETAIL — SCALE: NONE



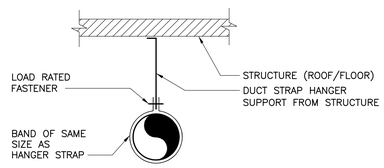
7 PARALLEL FLOW BRANCHES DETAIL — SCALE: NONE



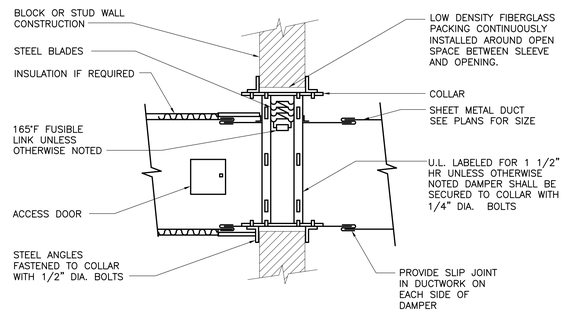
8 TYPICAL RECTANGULAR DUCT CONSTRUCTION DETAIL — SCALE: NONE



9 TYPICAL SUPPLY/RETURN AIR RUNNOUT DETAIL — SCALE: NONE



10 EXPOSED DUCT HANGER DETAIL — SCALE: NONE



NOTE: INSTALLATION SHALL COMPLY WITH U.L. AND MANUFACTURER'S LISTING REQUIREMENTS

11 TYPICAL VERTICAL FIRE DAMPER DETAIL — SCALE: NONE

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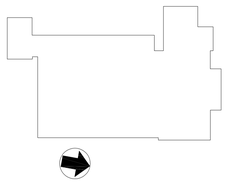
KEY PLAN



REVISIONS

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100 WEST ROAD, SUITE 402
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ADDITION AND RENOVATIONS OF GALENA ELEMENTARY SCHOOL

114 S MAIN STREET
GALENA, MD 21635

AIR DISTRIBUTION DETAILS

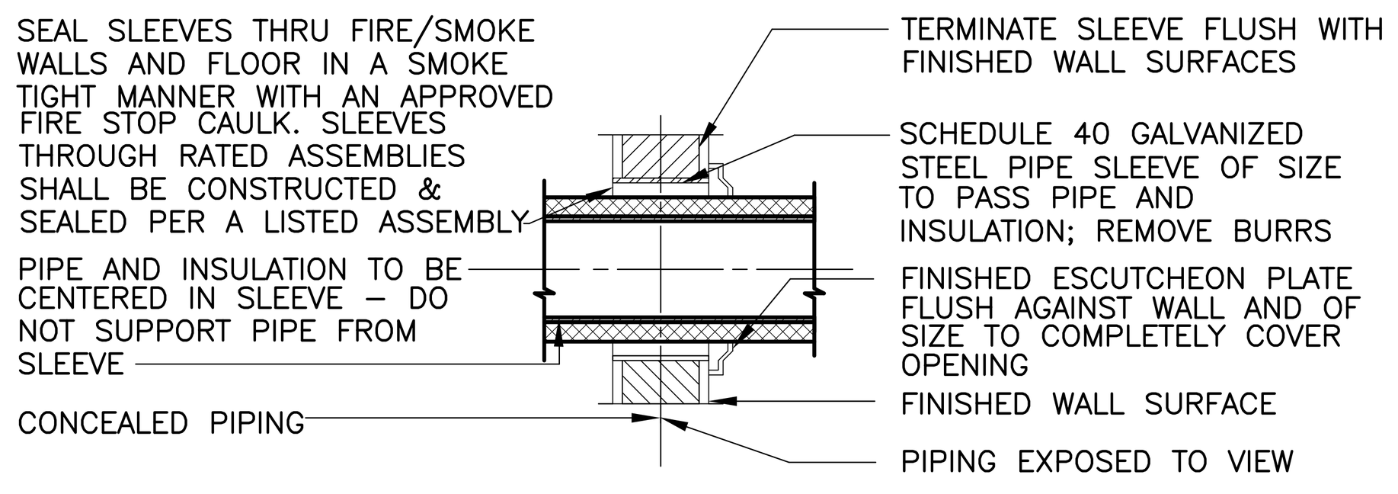
PLOT SCALE: NONE

FILENAME:

DATE: FEBRUARY 10, 2020

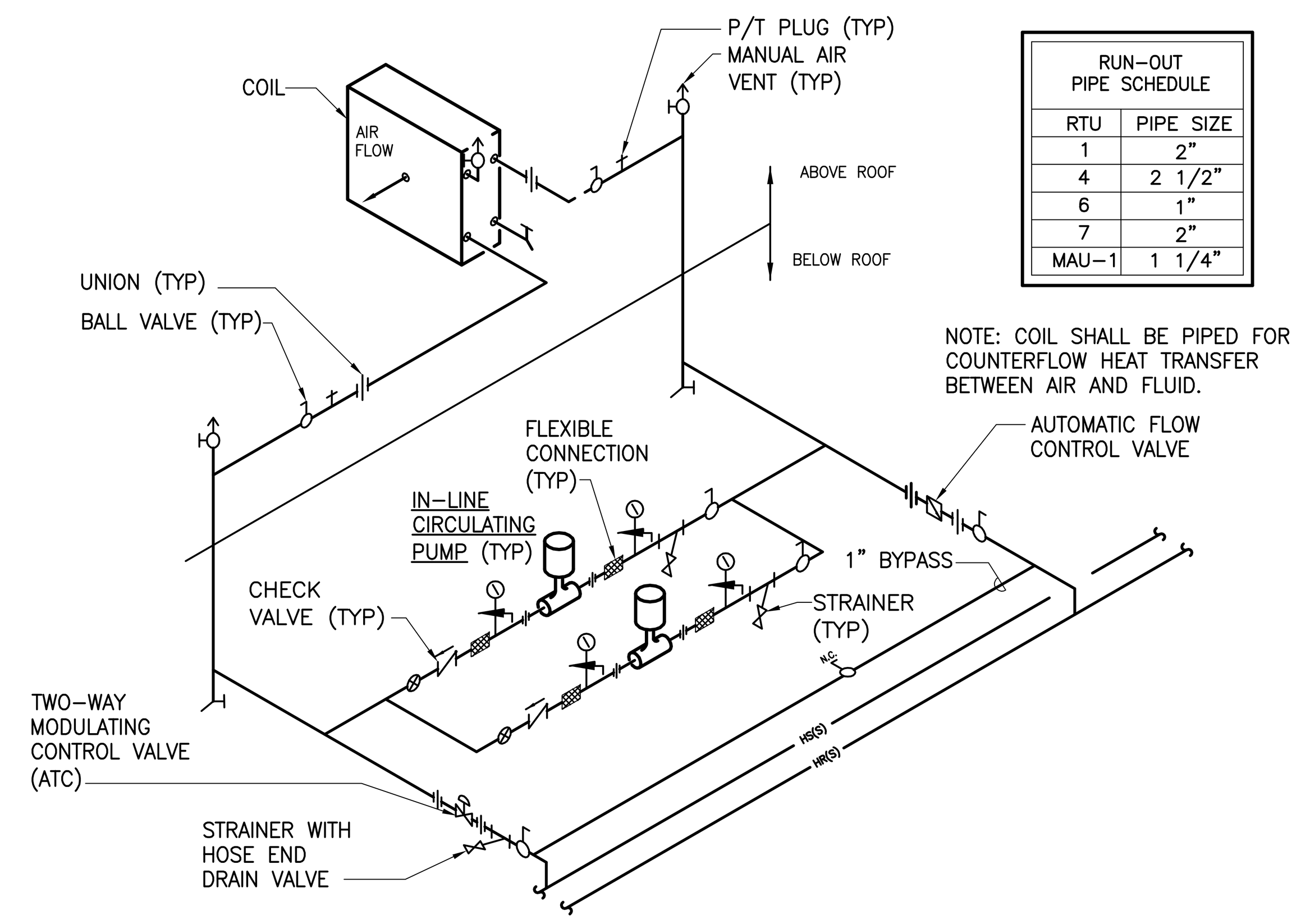
PROJECT 3309

M7.1



NOTE: FOR INTERIOR FRAME PARTITIONS–PIPE SLEEVES MAY BE FABRICATED FROM GALVANIZED SHEET METAL; ROUND TUBE CLOSED WITH SNAPLOCK JOINT, WELDED SPIRAL SEAMS, OR WELDED LONGITUDINAL JOINT. FABRICATE FROM THE FOLLOWING GAUGES: 3" AND SMALLER, 20 GAUGE; 4" TO 6", 16 GAUGE; OVER 6", 14 GAUGE.

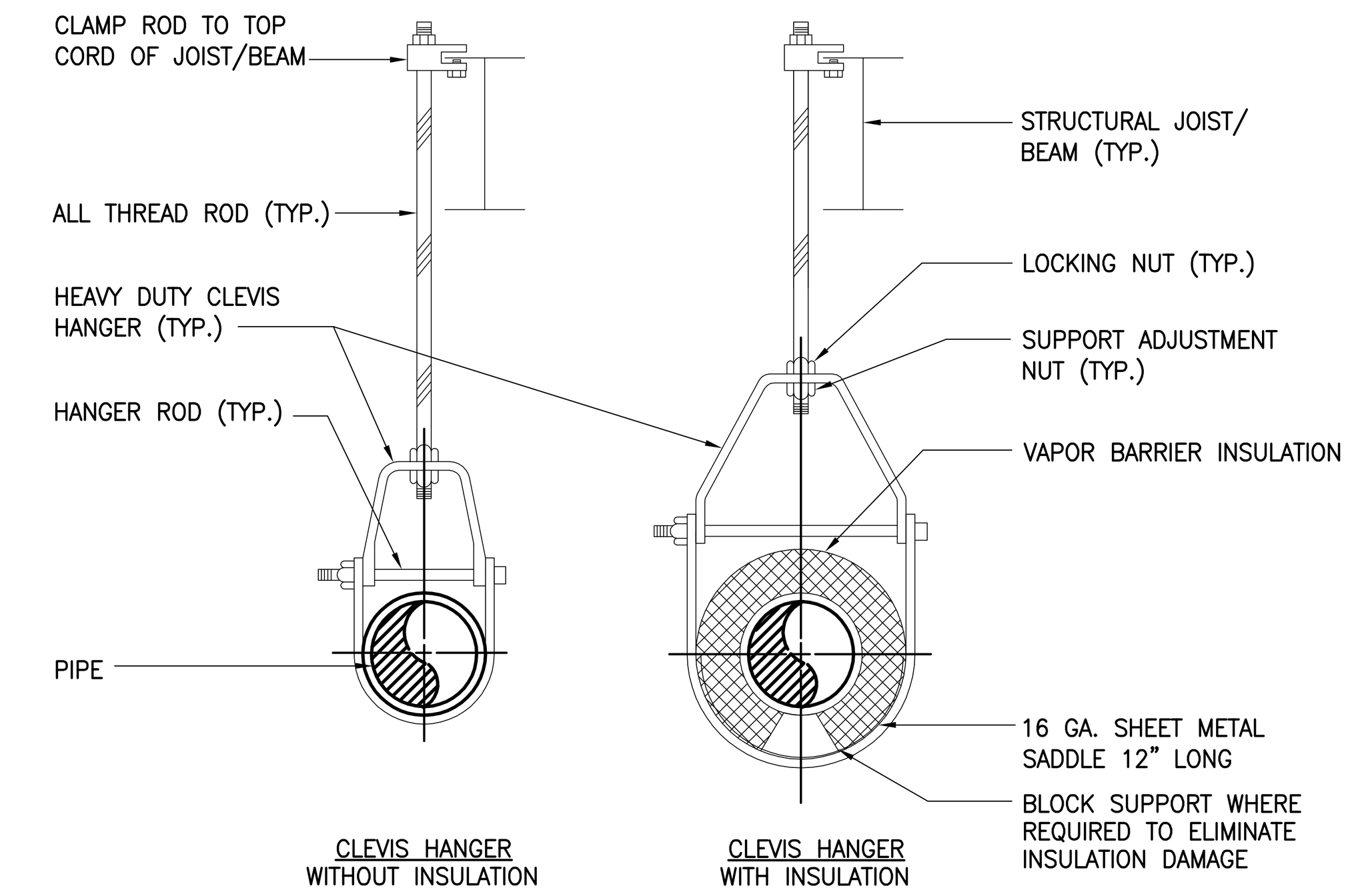
(12) TYPICAL PIPE SLEEVE THRU INTERNAL WALL DETAIL — SCALE: NONE



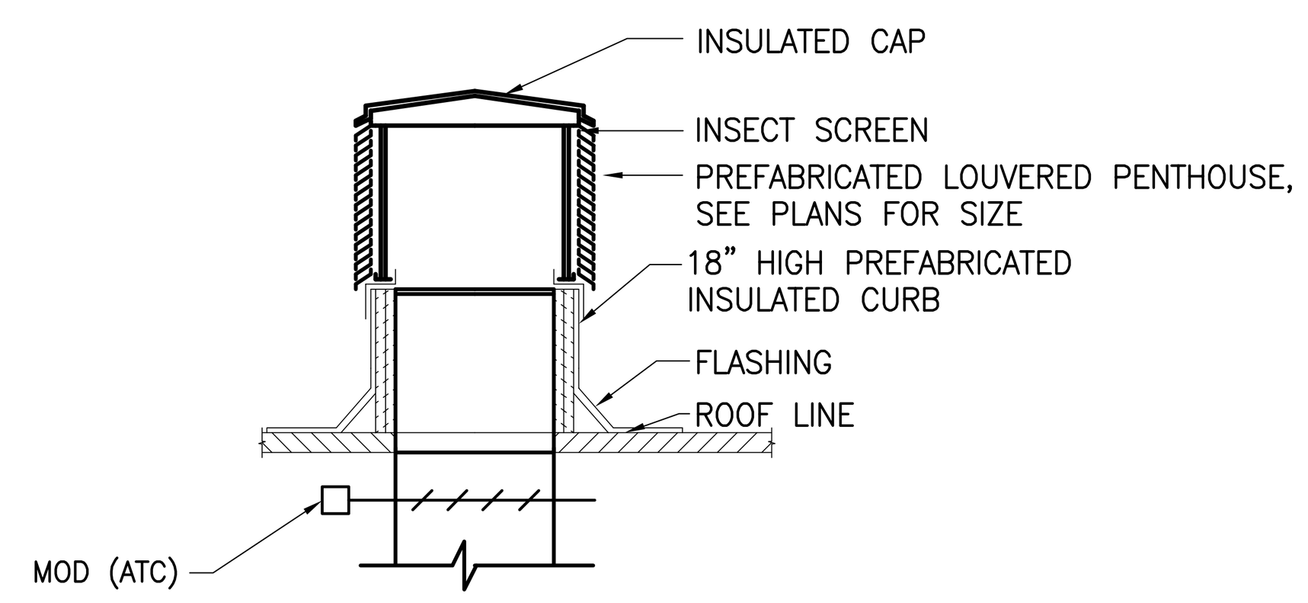
RUN-OUT PIPE SCHEDULE	
RTU	PIPE SIZE
1	2"
4	2 1/2"
6	1"
7	2"
MAU-1	1 1/4"

NOTE: COIL SHALL BE PIPED FOR COUNTERFLOW HEAT TRANSFER BETWEEN AIR AND FLUID.

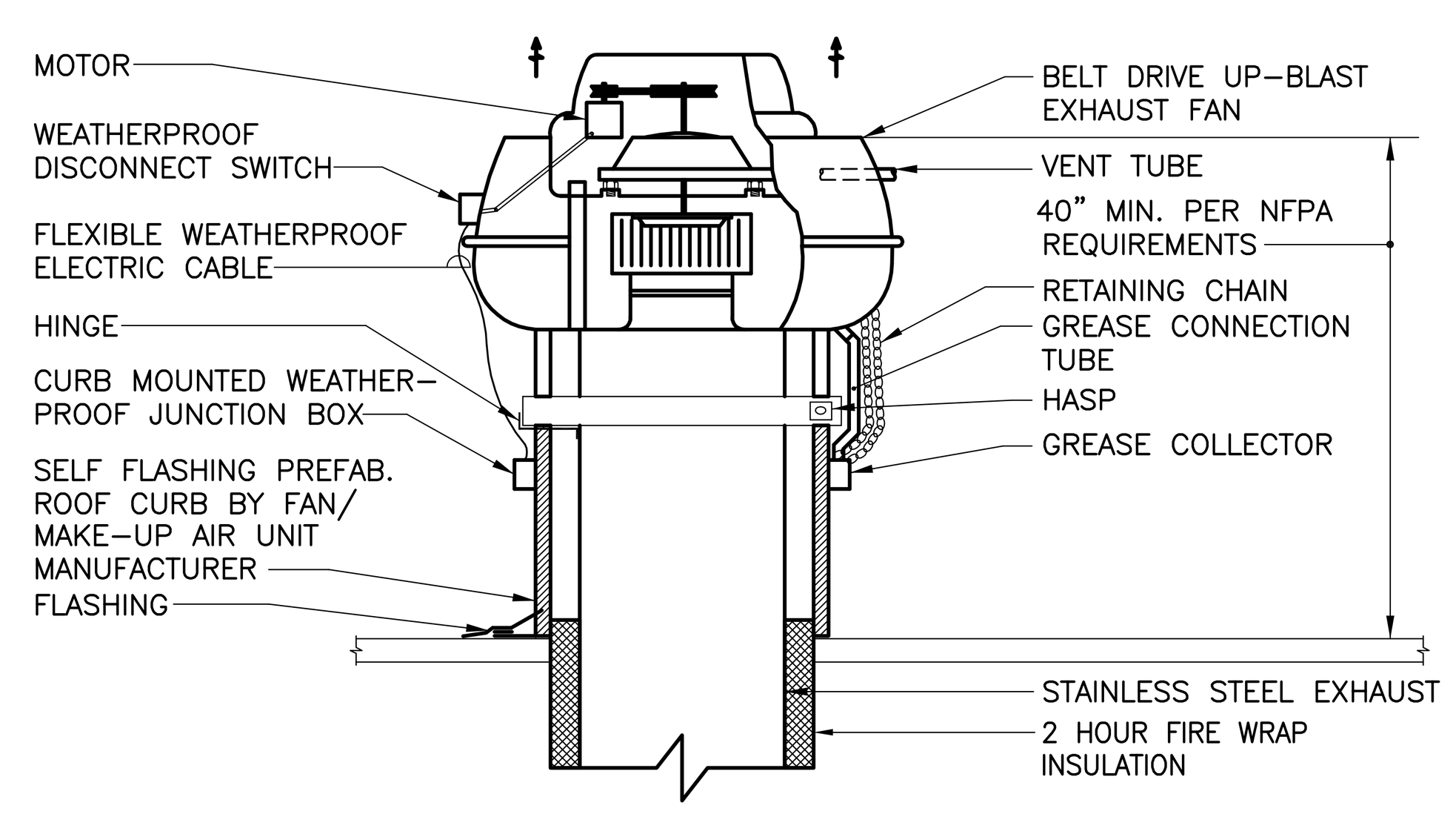
(13) TYPICAL ROOF MOUNTED AHU HEAT COIL PIPING DETAIL WITH 2-WAY CONTROL VALVE — SCALE: NONE



(14) TYPICAL PIPE SUPPORT DETAIL — SCALE: NONE

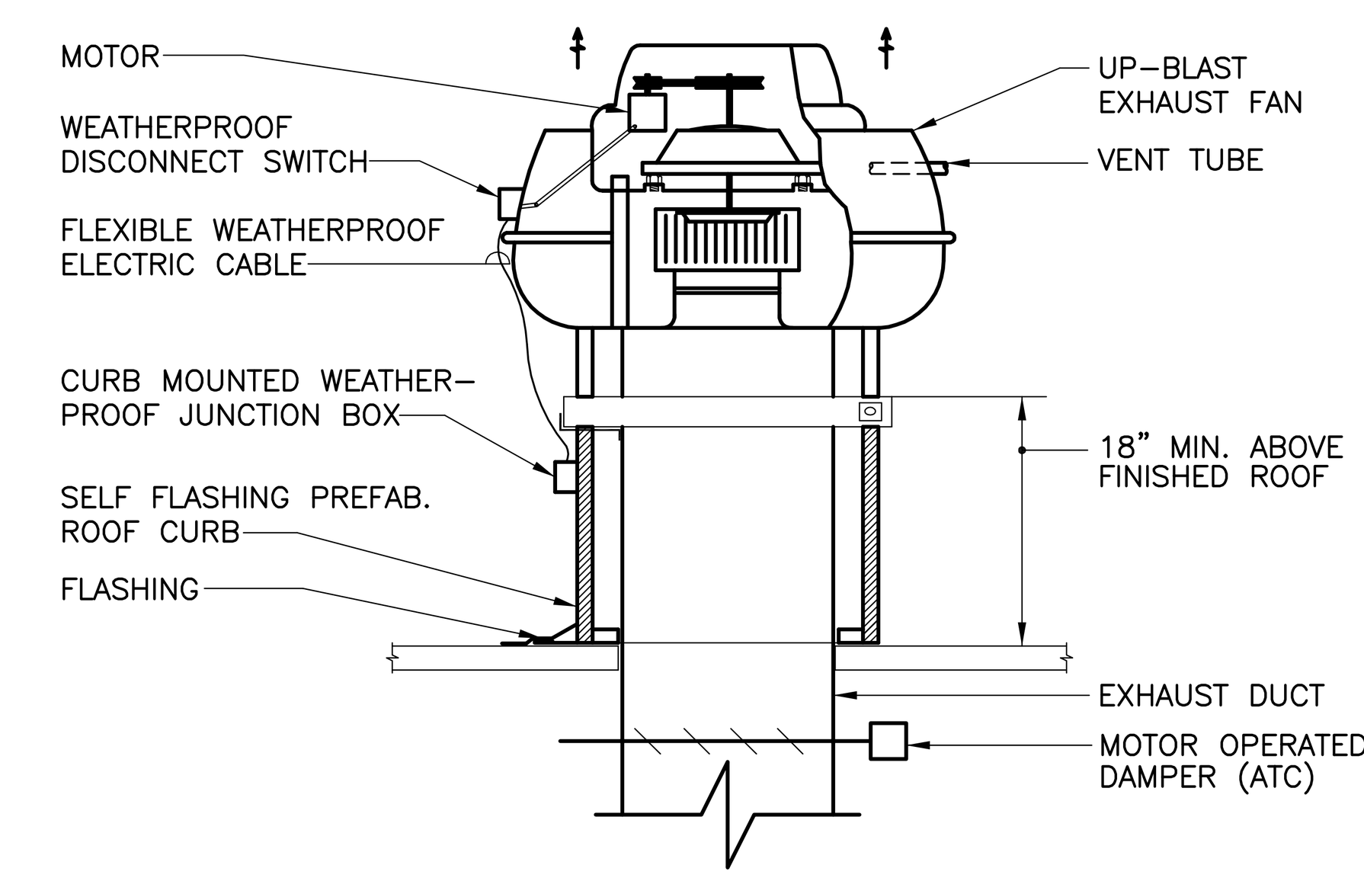


(15) TYPICAL RELIEF/INTAKE DETAIL — SCALE: NONE



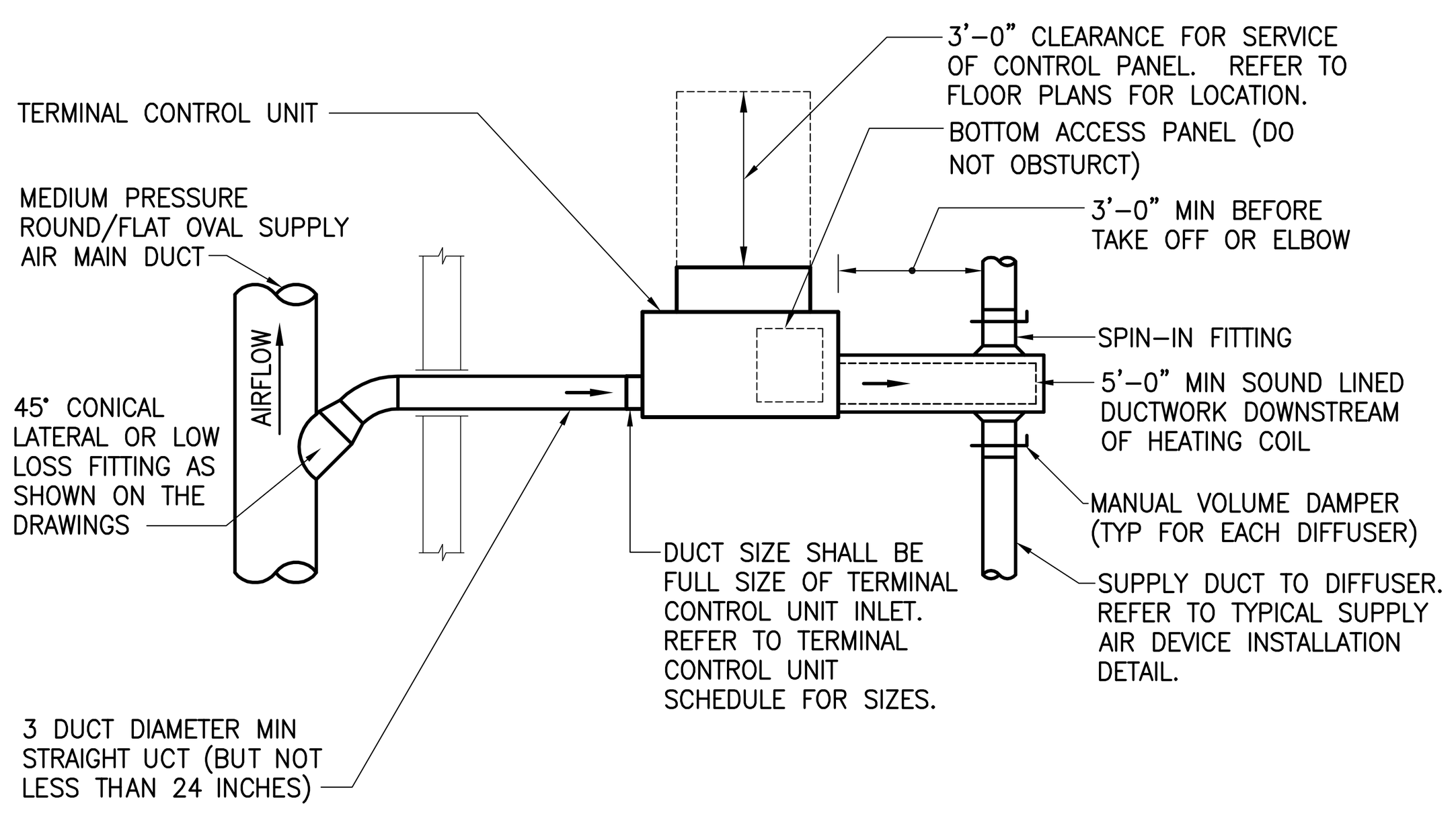
NOTES:
1. INSTALLATION SHALL COMPLY WITH NFPA 96 REQUIREMENTS.
2. COORDINATE FLASHING REQUIREMENTS WITH ARCHITECT.
3. DETAIL TYPICAL OF BELT AND DIRECT DRIVE TYPE

(16) KITCHEN EXHAUST HOOD FAN DETAIL — SCALE: NONE



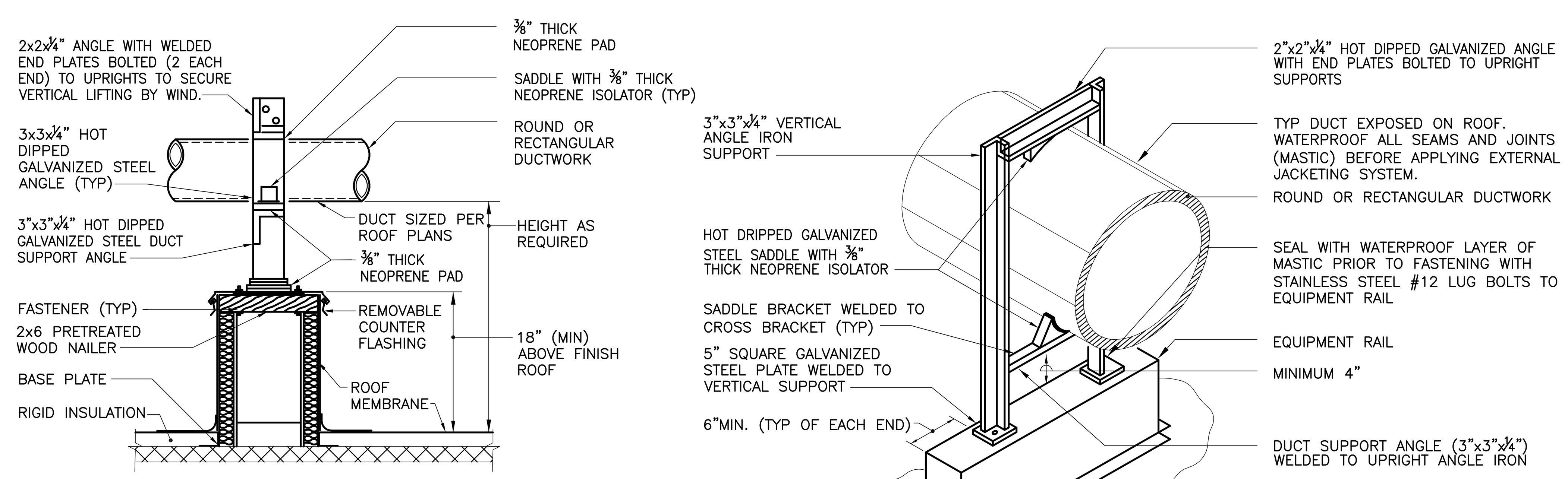
NOTES:
1. COORDINATE FLASHING REQUIREMENTS WITH ARCHITECT.
2. COORDINATE ROOF OPENING SIZE AND LOCATION WITH STRUCTURE ENGINEER.

(17) TYPICAL UP BLAST FAN DETAIL — SCALE: NONE



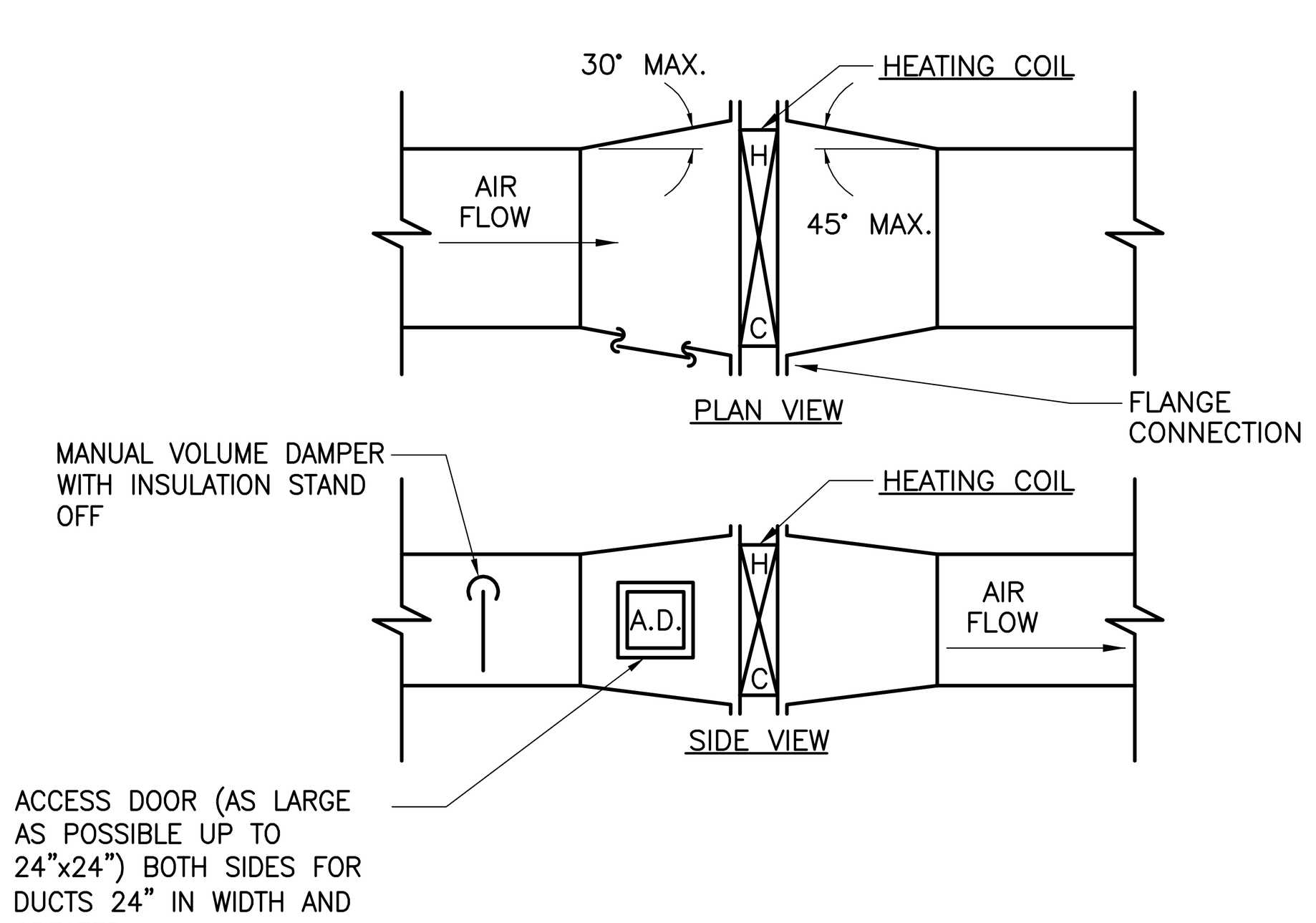
NOTE: IN LIEU OF 45° CONICAL LATERAL, A 45° LO LOSS FITTING WHERE SHOWN ON THE DRAWINGS, SHALL BE PROVIDED.

(18) TYPICAL STANDARD TERMINAL CONTROL UNIT DETAIL — SCALE: NONE

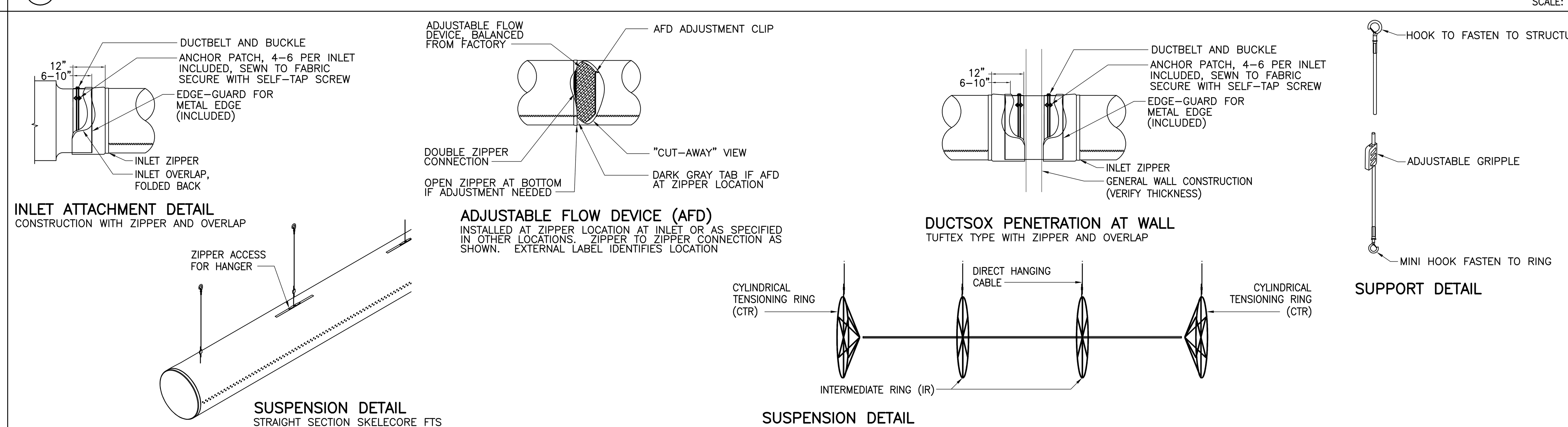


NOTES:
1. ALL STRUCTURAL STEEL SUPPORTS SHALL BE HOT DIPPED GALVANIZED.
2. ALL FLASHING AND COUNTER FLASHING SHALL BE HEAVY GAUGE ALUMINUM.
3. ALL SCREWS SHALL BE STAINLESS STEEL.

(19) TYPICAL EXTERIOR DUCT SUPPORT DETAIL — SCALE: NONE



(20) TYPICAL DUCT MOUNTED HEATING COIL DETAIL — SCALE: NONE



(21) TYPICAL FABRIC DUCT DETAILS — SCALE: NONE

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KEY PLAN

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ADDITION AND RENOVATIONS OF GALENA ELEMENTARY SCHOOL
114 S MAIN STREET
GALENA, MD 21635

PIPING AND EQUIPMENT DETAILS

PLOT SCALE: NONE

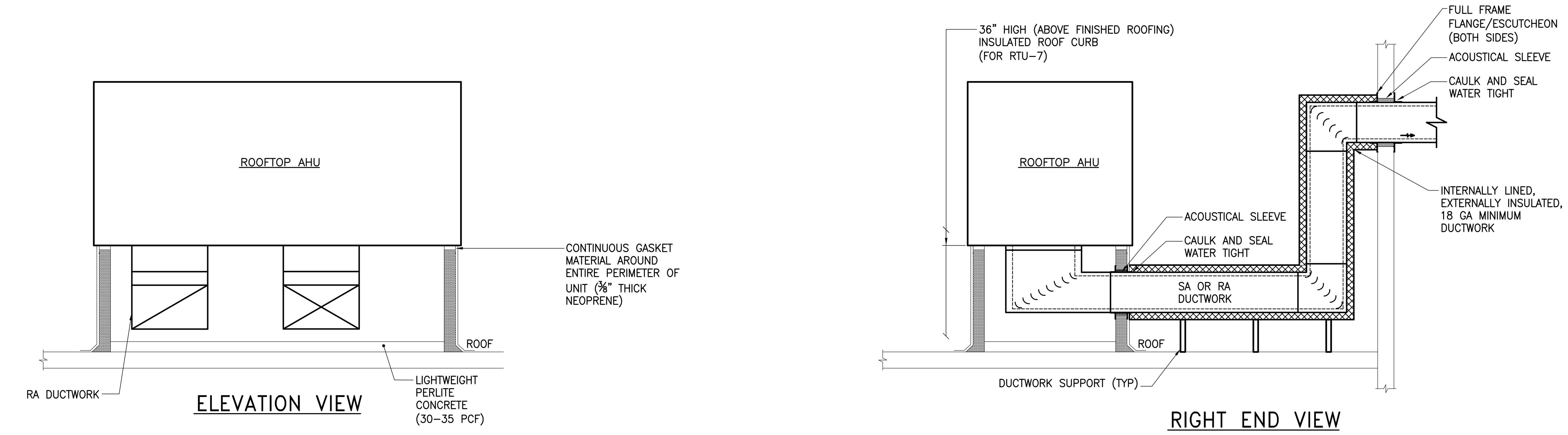
FILENAME:

DATE: FEBRUARY 10, 2020

PROJECT 3309

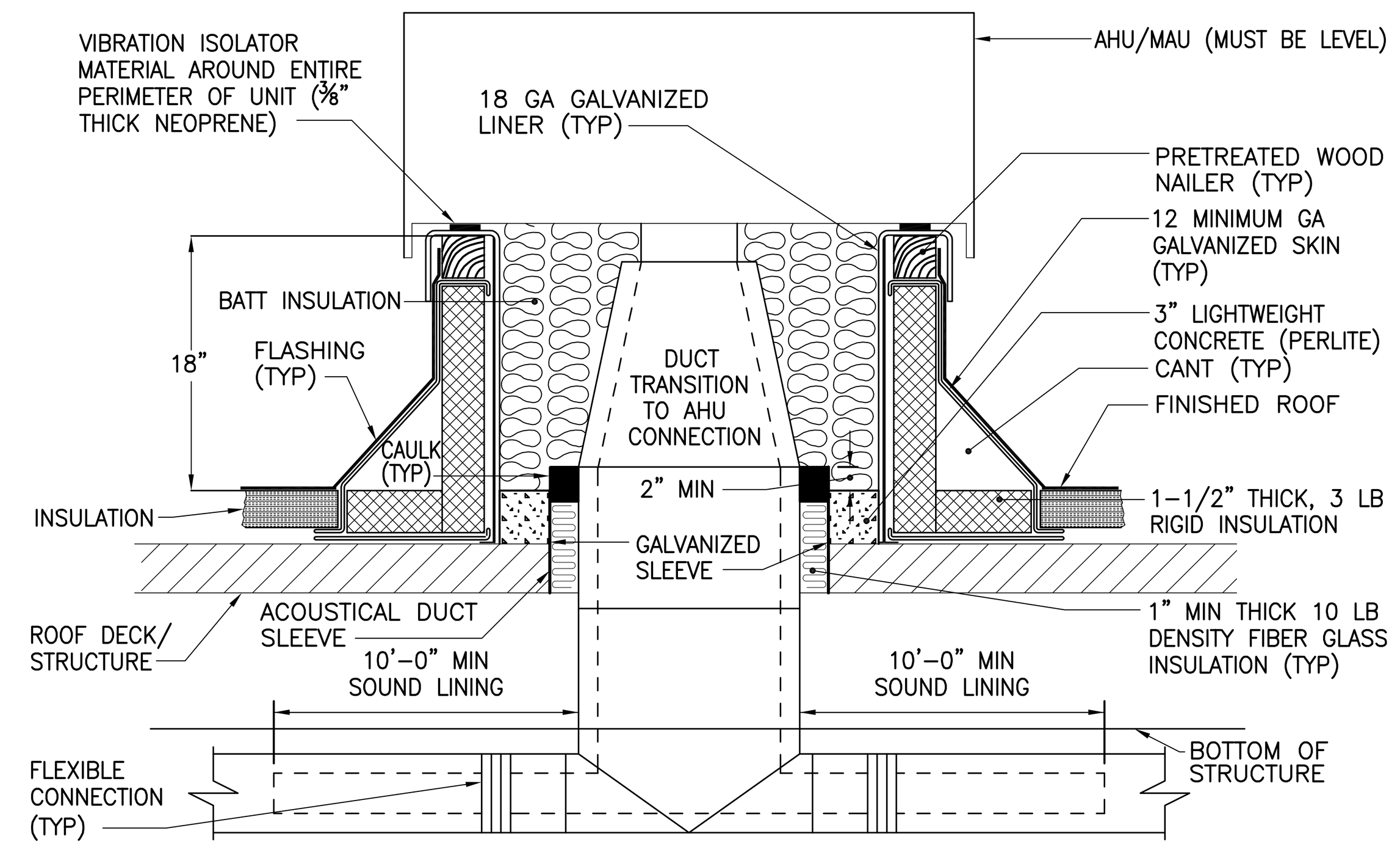
M7.2

22 NOT USED SCALE: NONE



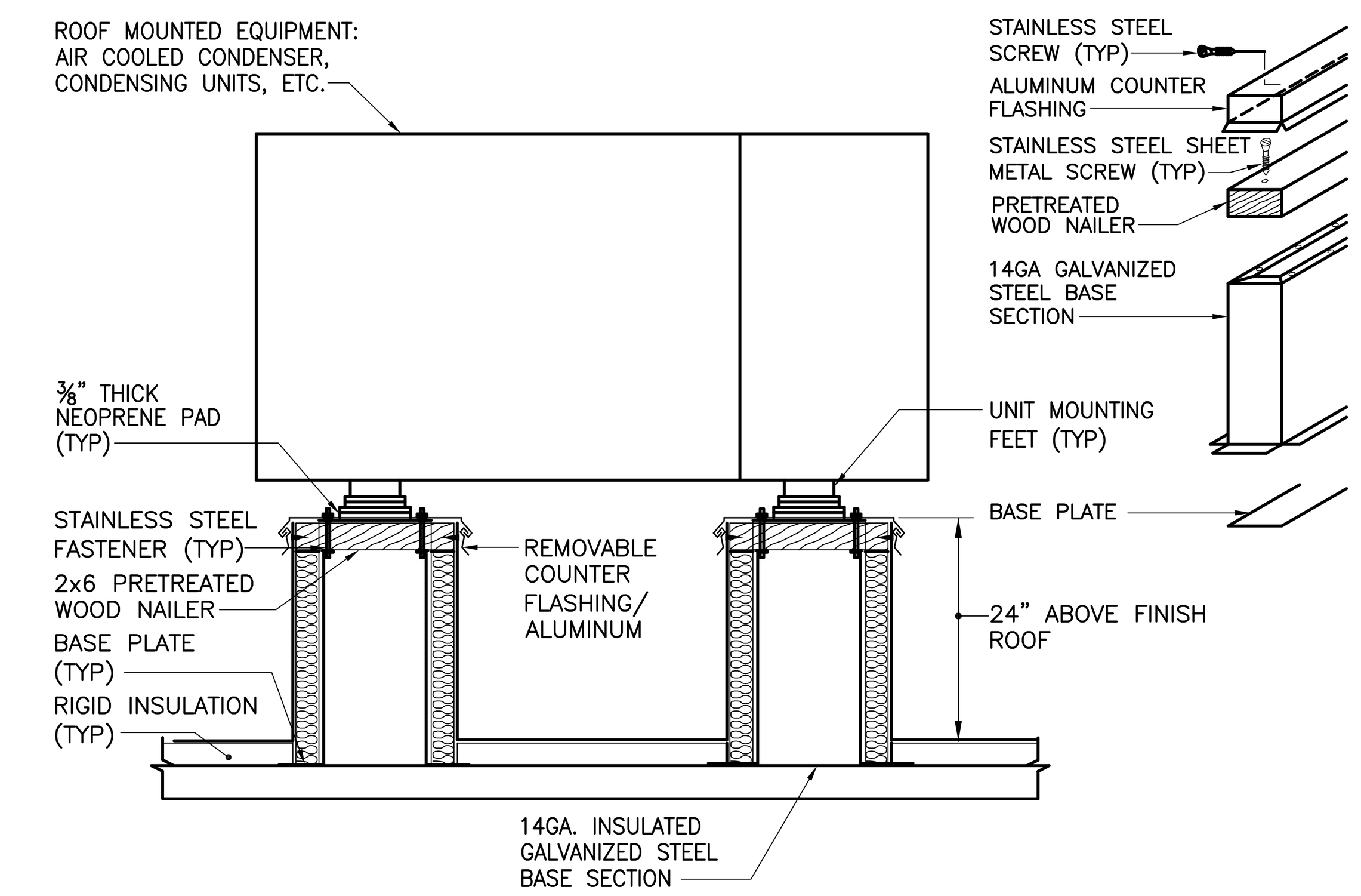
23 ROOFTOP UNIT No. 7 DUCTWORK INSTALLATION DETAIL SCALE: NONE

24 NOT USED SCALE: NONE



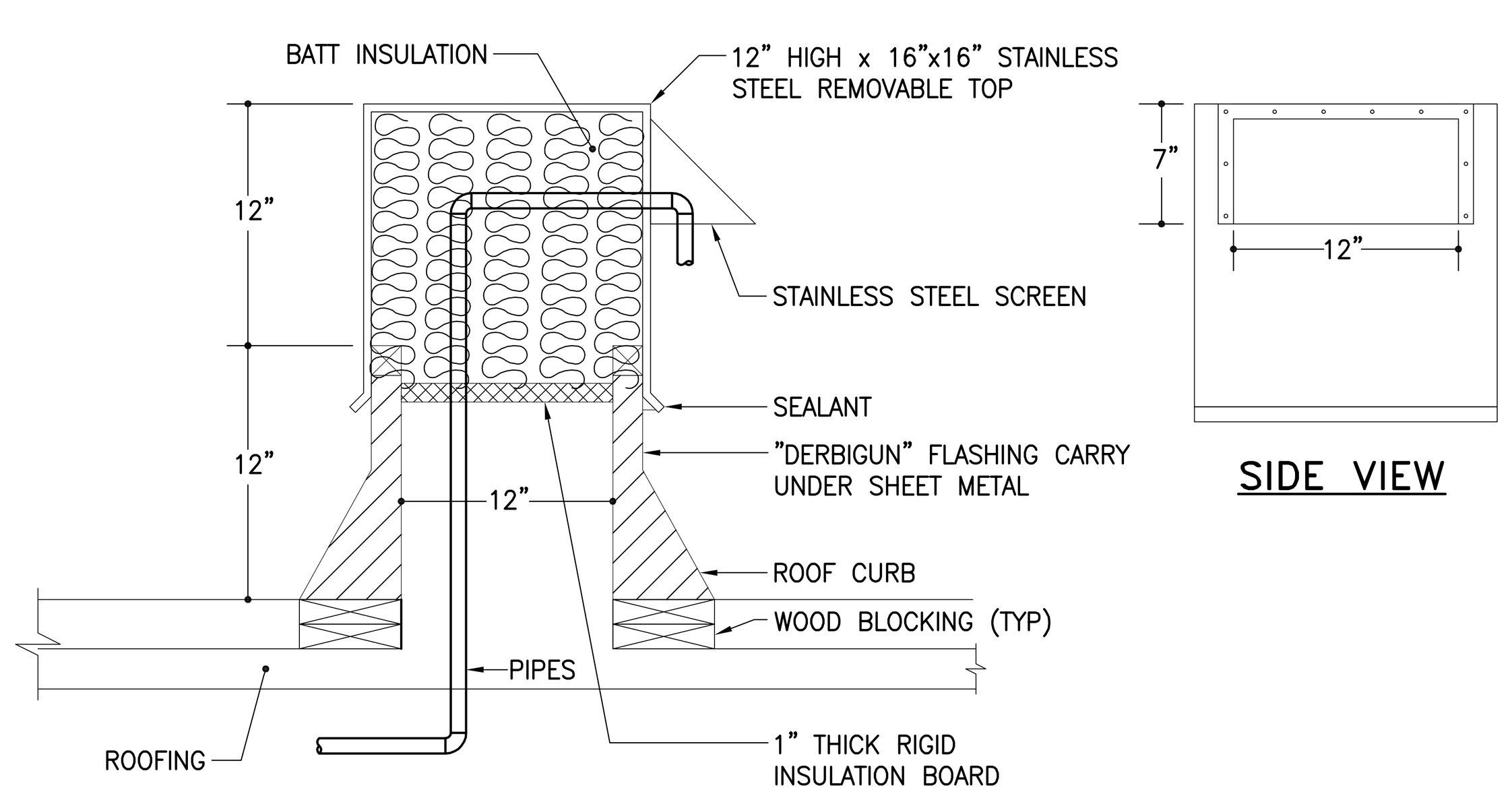
NOTE: 1. DETAIL TYPICAL FOR SUPPLY AND RETURN DUCT CONNECTIONS FOR ALL UNITS ROOF DECK SLOPE AND ROOF CURB SHALL BE SLOPED ACCORDINGLY TO MAINTAIN TOP OF CURB A MINIMUM OF 18" ABOVE THE HIGHEST POINT OF THE ROOF AND BE LEVEL

25 TYPICAL ROOFTOP AIR HANDLING UNIT INSULATED CURB FOR INSULATED ROOF DECK DETAIL SCALE: NONE



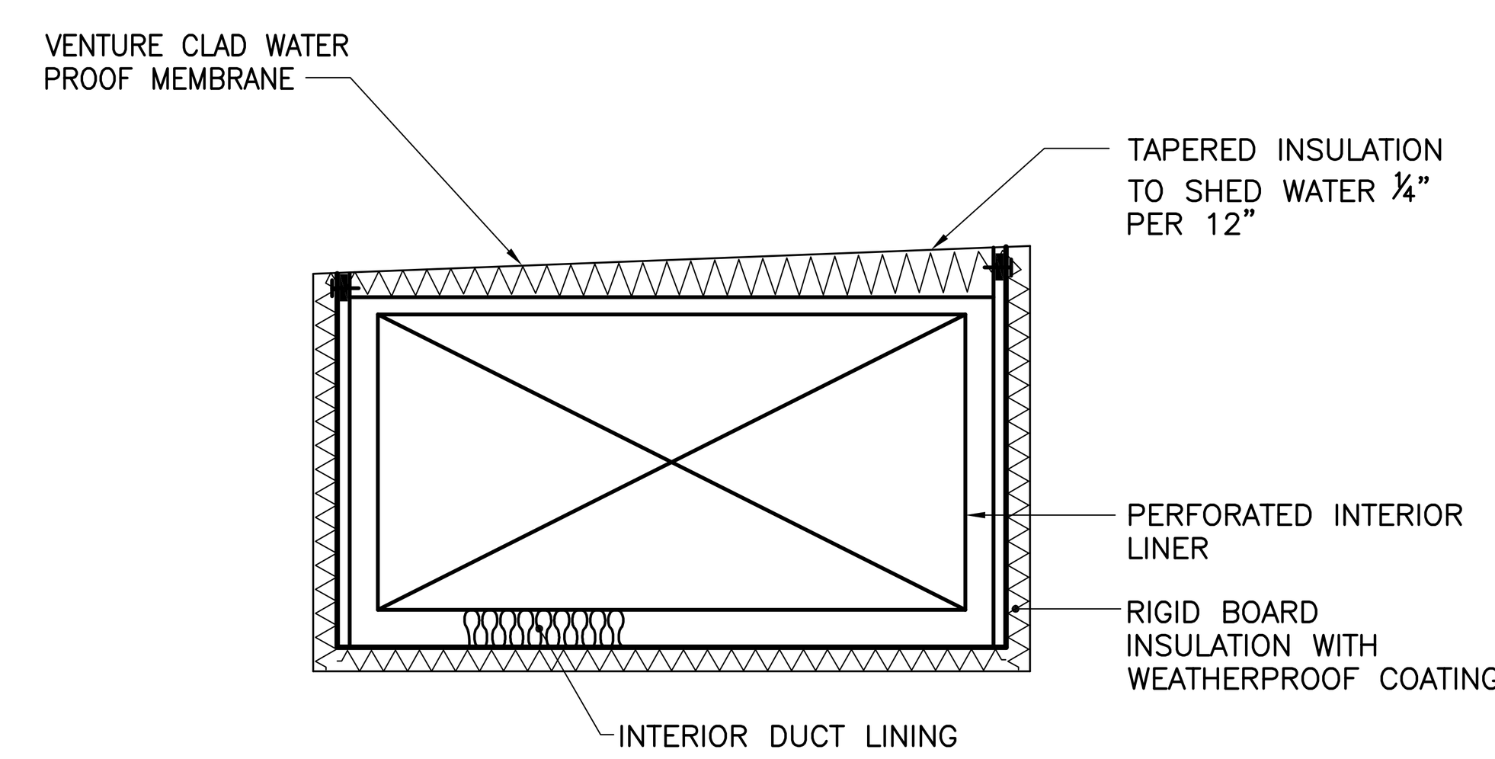
26 TYPICAL EQUIPMENT ROOF CURB DETAIL SCALE: NONE

27 NOT USED SCALE: NONE



NOTE:
STAINLESS STEEL TOP TO BE FABRICATED TO BE 1½" LARGER IN WIDTH AND DEPTH THAN THE CURB FOR FLASHING

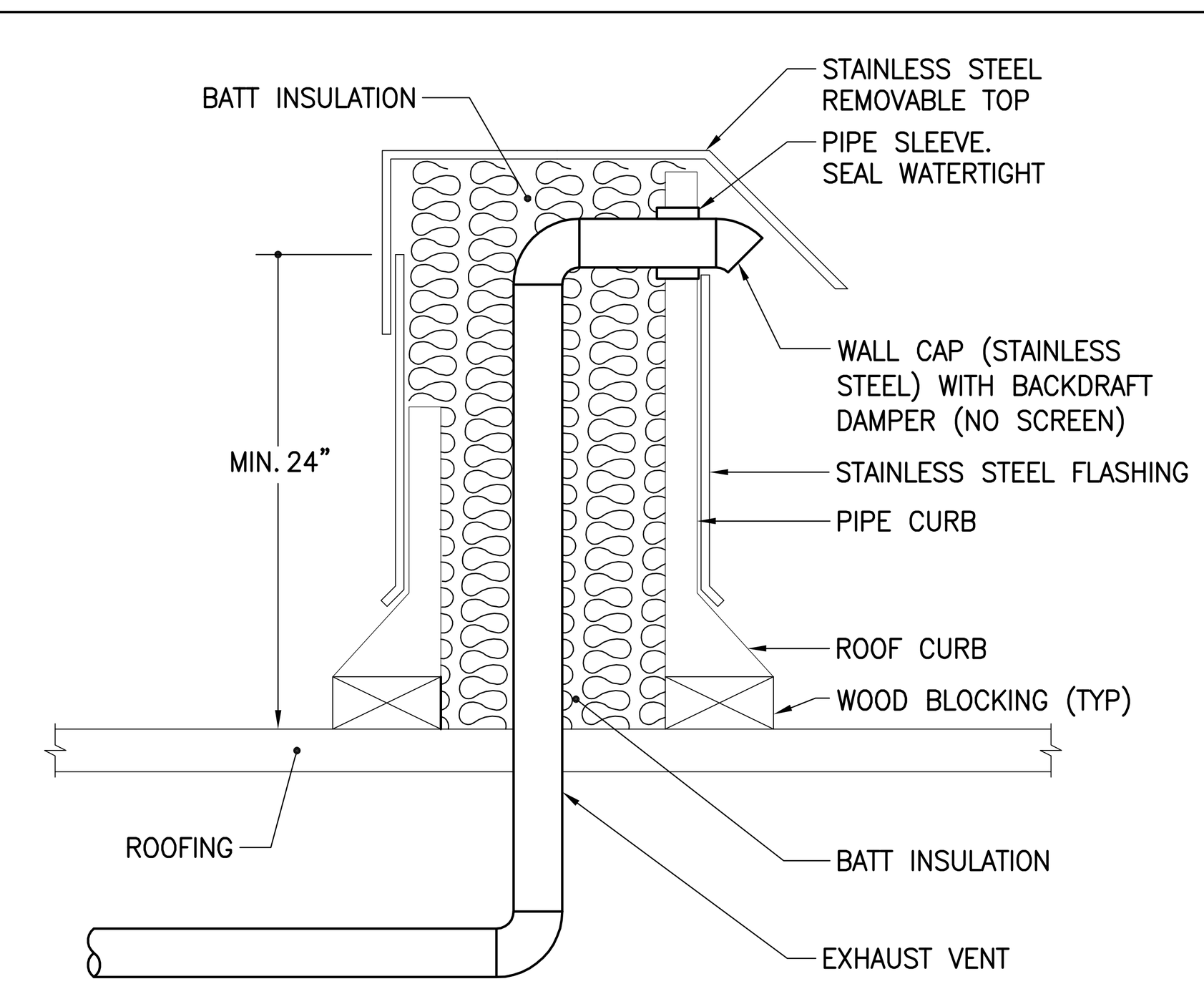
28 TYPICAL PIPE CURB DETAIL SCALE: NONE



NOTE:
1) REFER TO EXTERIOR DUCTWORK SUPPORT DETAIL FOR ADDITIONAL INFORMATION.
2) ALL EXTERIOR DUCTWORK SHALL BE CONSTRUCTED OF 18GA MINIMUM GALVANIZED SHEETMETAL.
3) DETAIL APPLIES TO RECTANGULAR OR ROUND DUCTWORK.

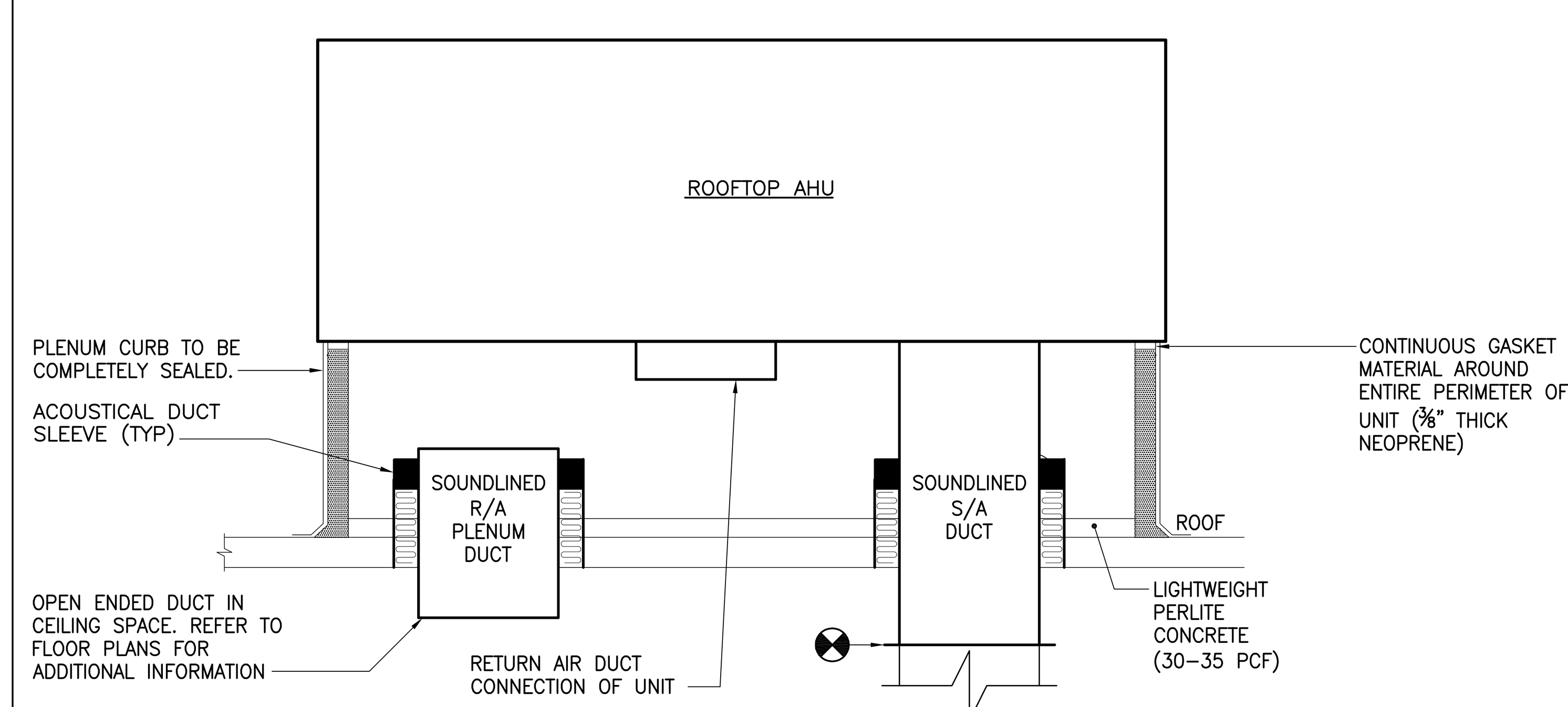
29 TYPICAL EXTERIOR DUCTWORK INSULATION DETAIL SCALE: NONE

30 NOT USED SCALE: NONE



NOTE: PROVIDE FOR DRYER EXHAUST

31 TYPICAL VENT PENETRATION ROOF CURB DETAIL SCALE: NONE



32 TYPICAL ROOFTOP UNIT PLENUM CURB INSTALLATION DETAIL SCALE: NONE

STATE OF MARYLAND PROFESSIONAL ENGINEER No. 39921

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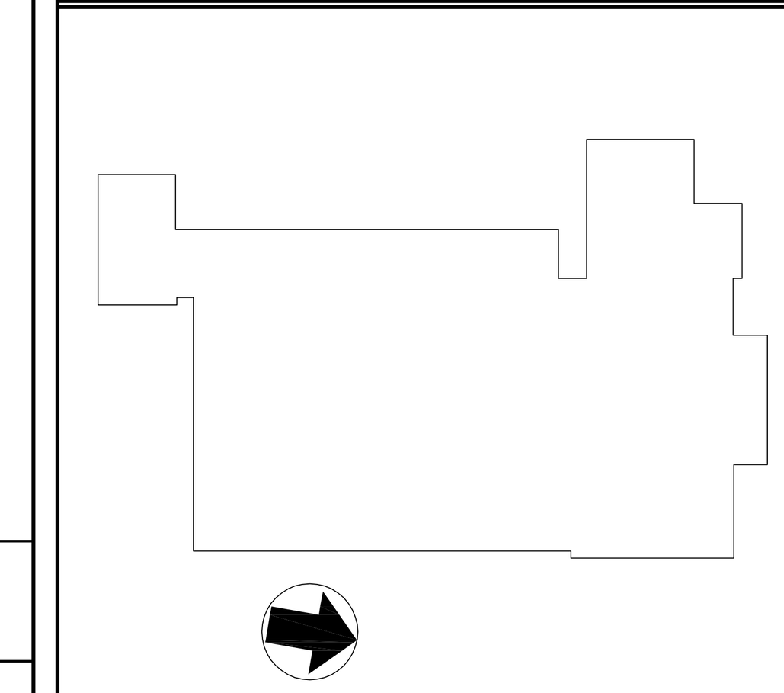
KEY PLAN



REVISIONS

MM-DD-YR	NAME	DESCRIPTION OF CHANGES

CRABTREE ROHRBAUGH & ASSOCIATES - ARCHITECTS
www.cra-architects.com
MECHANICSBURG, PENNSYLVANIA
CHARLOTTESVILLE, VIRGINIA
WHITE SULPHUR SPRINGS, WEST VIRGINIA
100 WEST ROAD, SUITE 402
TOWSON MD 21204
410-528-0272

ADDITION AND RENOVATIONS OF GALENA ELEMENTARY SCHOOL
114 S MAIN STREET
GALENA, MD 21635

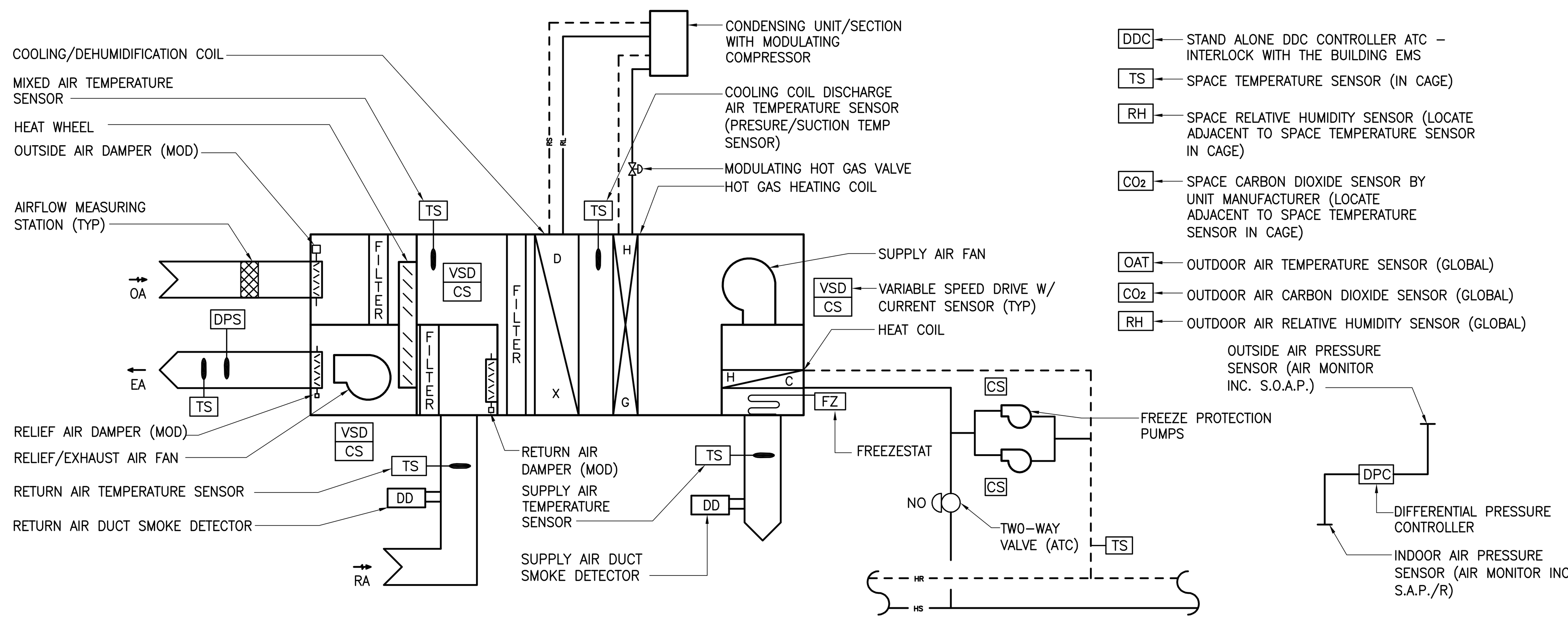
CR

EQUIPMENT SUPPORT AND ROOFTOP DETAILS

PLOT SCALE: NONE
FILENAME:
DATE: FEBRUARY 10, 2020

PROJECT 3309

M7.3



TYPICAL SINGLE ZONE VARIABLE AIR VOLUME ROOFTOP UNIT W/ HEAT RECOVERY AND HW HEAT CONTROL DIAGRAM

SCALE: NONE

INPUT/OUTPUT SUMMARY FOR SINGLE ZONE VAV UNIT

BUILDING SYSTEM:
RTU-1: CAFETERIA
RTU-7: GYM

INPUTS

DESCRIPTION	ANALOG									BINARY					
	ROOM TEMPERATURE	DUCT TEMPERATURE	DEWPOINT TEMPERATURE	O.A. TEMPERATURE (GLOBAL)	CURRENT SENSOR/STATUS	STATIC PRESSURE	CO_2	RELATIVE HUMIDITY	AIRFLOW	FLOW SWITCH	SWITCH CLOSURE	STATIC PRESSURE	LOW TEMPERATURE CUTOUT	END SWITCH	DIFFERENTIAL PRESSURE SWITCH
AHU															
RETURN AIR		●					●	●							
DUCT DETECTORS (TYP)															
SPACE	●						●	●							
SUPPLY AIR		●													
SUPPLY AND RELIEF FANS					●										
OUTSIDE AIR (GLOBAL)				●			●	●							
INDOOR STATIC PRESSURE						●									
RELIEF AIR		●	●						●						
OUTDOOR AIR									●						
OUTSIDE AIR DAMPER															
RELIEF AIR DAMPER															
RETURN AIR DAMPER															
HEAT WHEEL															

OUTPUTS

DESCRIPTION	ANALOG						BINARY						3-POINT FLOATING					
	MODULATING ACTUATOR	E/P TRANSDUCER	VARIABLE SPEED				CONTROL RELAY	SOLENOID	START/STOP	2-POSITION DAMPER MOD.			ACTUATOR	MERCURY RELAY	FEED/BLEED SAV			
AHU									●									
RETURN AIR																		
DUCT DETECTORS (TYP)																		
SPACE	●																	
SUPPLY AIR																		
SUPPLY AND RELIEF FANS			●															
OUTSIDE AIR (GLOBAL)																		
INDOOR STATIC PRESSURE																		
RELIEF AIR																		
OUTDOOR AIR																		
OUTSIDE AIR DAMPER	●																	
RELIEF AIR DAMPER	●																	
RETURN AIR DAMPER	●																	
HEAT WHEEL																		

ALARMS / FEATURES

DESCRIPTION	ALARMS						FEATURES														
	HIGH LIMIT	LOW LIMIT	RUN TIME	MAINTENANCE MESSAGE	SMOKE/FIRE	LIQUID DETECTION	SCHEDULED START/STOP	TEMPERATURE SETBACK/SETUP	OPTIMIZED START (ADAPT.)	DEMAND LIMITING	DUTY CYCLE	VENTILATION DELAY	ECONOMIZER CYCLE	H.W. RESET W/ O.A. TEMP.	VAV CONTROL	REMOTE READ/RESET	TENANT OVERRIDE	COLOR GRAPHICS	POINT LOCKOUT	TREND LOG	WARM UP/PULL DOWN
AHU				●			●		●						●			●			●
RETURN AIR																					
DUCT DETECTORS (TYP)					●																
SPACE																					
SUPPLY AIR		●														●				●	
SUPPLY AND RELIEF FANS				●																	
OUTSIDE AIR (GLOBAL)																					
INDOOR STATIC PRESSURE																●				●	
RELIEF AIR																					
OUTDOOR AIR																					
OUTSIDE AIR DAMPER																					
RELIEF AIR DAMPER																					
RETURN AIR DAMPER																					
HEAT WHEEL				●																	

TYPICAL SINGLE ZONE VARIABLE AIR VOLUME ROOFTOP UNIT W/ HEAT RECOVERY AND HW HEAT I/O POINTS LIST

1. GENERAL:

A. THE AIR HANDLING SYSTEM SHALL BE PROVIDED WITH FACTORY MOUNTED CONTROL SYSTEM. THE DIRECT DIGITAL CONTROL SYSTEM SHALL BE INTERFACED WITH THE BUILDING ENERGY MANAGEMENT SYSTEM (EMS). THE ATC CONTRACTOR SHALL INTERFACE WITH THE FACTORY MOUNTED DIRECT DIGITAL CONTROLLER AND ALL SENSORS, DEVICES AND CONTROLS NEEDED TO INTERFACE WITH THE AHU CONTROLLER. THE AIR HANDLING SYSTEM SHALL BE STARTED AND STOPPED THROUGH A MANUAL SYSTEM ON-OFF-AUTOMATIC (H-O-A) SWITCH. WHEN INDEXED TO "ON", THE SYSTEM SHALL BE ENERGIZED AND OPERATE UNDER ITS CONTROL SEQUENCE. WHEN INDEXED TO "OFF" THE SYSTEM SHALL DE-ENERGIZE. WHEN INDEXED TO THE "AUTOMATIC" POSITION THE SYSTEM SHALL BE STARTED AND STOPPED BY A SIGNAL FROM THE EMS THROUGH ITS BUILT IN CONTROLLER.

B. SUPPLY FAN SHALL BE LOCALLY OR REMOTELY STARTED AND STOPPED THROUGH THE MANUAL SYSTEM SWITCH OR BY A SIGNAL FROM THE EMS.

C. RELIEF FAN AND HEAT WHEEL SHALL BE INTERLOCKED TO OPERATE WHEN THE SUPPLY FAN OPERATES AND TO BE OFF WHEN THE SUPPLY FAN IS OFF.

D. WHEN THE UNIT SUPPLY FAN IS OFF, THE OUTSIDE AIR DAMPER SHALL CLOSE AND RETURN AIR DAMPER SHALL OPEN; HEATING WATER COIL VALVE SHALL BE OPEN, AND CONDENSING UNIT SHALL BE DE-ENERGIZED; THE HEAT WHEEL SHALL BE DE-ENERGIZED; AND THE RELIEF AIR FAN SHALL BE OFF.

E. SUPPLY FAN, RELIEF FAN, CONDENSING UNIT AND HEAT WHEEL AND RELIEF FAN SHALL DE-ENERGIZE WHENEVER THE SUPPLY AIR TEMPERATURE DROPS BELOW THE LIMIT OF THE DISCHARGE AIR TEMPERATURE SET POINT OF 36°F (ADJUSTABLE THROUGH SOFTWARE) OR WHEN THE DUCT SMOKE DETECTORS SENSES PRODUCTS OF COMBUSTION OR WHEN THE HIGH DUCT STATIC PRESSURE SENSOR REACHES ITS SETPOINT (5" W.C. ADJUSTABLE).

F. WHEN THE AIR HANDLING UNIT IS OFF, THE HEAT WHEEL SHALL BE DE-ENERGIZED. WHENEVER THE AIR HANDLING SYSTEM IS ON AND IN THE OCCUPIED MODE, THE HEAT WHEEL AND THE ASSOCIATED RELIEF AIR FAN SHALL BE ENERGIZED AND OPERATE THROUGH ITS CONTROL SEQUENCE.

G. ALL SAFETIES AND ASSOCIATED CONTROLS SHALL REMAIN ACTIVE WHETHER THE SYSTEM IS LOCALLY OR REMOTELY CONTROLLED AND/OR MANUALLY OVERRIDDEN.

H. PROVIDE A REMOTE EMERGENCY SHUTDOWN SWITCH FOR SYSTEM SHUTDOWN. REMOTE SWITCH SHALL BE INSTALLED AT A LOCATION APPROVED BY THE FIRE INSPECTOR. SHUT-DOWN SHALL OCCUR FROM A SIGNAL THROUGH THE EMS.

I. THE UNIT SHALL OPERATE WITH ITS BUILT-IN CONTROL SEQUENCE WHEN COMMUNICATION IS LOST TO THE EMS. COORDINATE ALL CONTROLLER SETPOINTS WITH THE UNIT MANUFACTURER.

2. OCCUPIED CYCLE

A. GENERAL:

1. WHEN THE UNIT SUPPLY FAN IS ENERGIZED TO RUN, IT SHALL GO THROUGH A WARM-UP/PULL DOWN CYCLE. WHEN THE SYSTEM COMPLETES ITS WARM-UP/PULL-DOWN MODE OF OPERATION AND THE SYSTEM SWITCHES TO THE OCCUPIED MODE OF OPERATION, THE OUTSIDE AIR DAMPER SHALL OPEN TO ITS MINIMUM POSITION AND THE RETURN AIR DAMPER SHALL MODULATE TO ITS CORRESPONDING POSITION. THE RELIEF AIR FAN AND HEAT WHEEL SHALL ENERGIZE.

2. THE SPACE TEMPERATURE IS CONTROLLED BY A SINGLE, SPACE MOUNTED TEMPERATURE SENSOR WITH SET POINT ADJUSTMENT.

3. WHEN THE SYSTEM IS PLACED IN OCCUPIED MODE, THE RELIEF FAN IS COMMANDED ON WHEN SUPPLY FAN RUN STATUS IS CONFIRMED AND THE OUTSIDE AIR DAMPER IS OPEN TO ITS MINIMUM SETPOINT OR THE HEAT WHEEL HAS BEEN COMMANDED TO OPERATE.

B. WARM-UP/PULL DOWN:

THE UNIT CONTROL SHALL BE ARRANGED FOR A WINTER MORNING WARM-UP HEATING CYCLE AND SUMMER PULL DOWN COOLING CYCLE. DURING WARM-UP CYCLE THE OUTSIDE AIR DAMPER AND RELIEF AIR DAMPER SHALL REMAIN CLOSED, THE RETURN AIR DAMPER OPEN, AND THE AIR HANDLING UNIT HEATING COIL VALVE SHALL BE OPEN UNTIL THE SPACE TEMPERATURE RISES TO 70°F (ADJUSTABLE). SIMILARLY FOR PULL DOWN CYCLE, THE CONDENSING UNIT SHALL BE STAGED UNTIL THE SPACE TEMPERATURE DROPS TO 75°F (ADJUSTABLE). AT THAT POINT, THE OUTSIDE AIR DAMPER AND RELIEF AIR DAMPER SHALL OPEN, THE RETURN AIR DAMPER SHALL MODULATE TO ITS MINIMUM POSITION, THE RELIEF AIR FAN AND HEAT RECOVERY WHEEL SHALL ENERGIZE AS PREVIOUSLY DESCRIBED, AND THE HEATING AND COOLING CONTROL SHALL BE PLACED UNDER THE CONTROL OF THE SPACE AIR TEMPERATURE SENSOR.

C. COOLING

1. COOLING IS ENABLED WHEN THE SPACE AIR TEMPERATURE IS ABOVE THE COOLING SET POINT OF 76°F (ADJUSTABLE AND RESETTABLE THROUGH SOFTWARE) AND OUTSIDE AIR TEMPERATURE IS ABOVE THE COOLING LOCKOUT SET POINT OF 55°F (ADJ). THE UNIT SHALL SEQUENCE THE COOLING STAGES AS REQUIRED TO MAINTAIN THE SPACE TEMPERATURE SET POINT OF 76°F (ADJUSTABLE AND RESETTABLE THROUGH SOFTWARE), MODULATING THE COMPRESSOR FROM 15% TO 100% (OR THROUGH HOT GAS BYPASS). A STAGING DELAY ON AND DELAY OFF SHALL PREVENT EACH STAGE OF MECHANICAL COOLING FROM ENABLING AND DISABLING AT THE SAME TIME. IF THERE ARE MULTIPLE STAGES OF MECHANICAL COOLING AVAILABLE (I.E. MULTIPLE COMPRESSORS) EACH STAGE SHALL SEQUENTIALLY ENABLE BASED ON A TIME DELAY OF 180 SECONDS (ADJ) AND DISABLE BASED ON A MINIMUM DELAY OFF OF 180 SECONDS (ADJ). PROVIDE A 15 MINUTE (ADJ) ANTI-SHORT CYCLE TIME DELAY BETWEEN COMPRESSOR CYCLES.

D. REFRIGERATION LOW LIMIT CONTROL:

1. IF THE EVAPORATIVE LEAVING COIL FACE TEMPERATURE FALLS BELOW THE A LOW LIMIT SETPOINT OF 40°F (ADJUSTABLE), THE MECHANICAL COOLING WILL REVERT FROM TEMPERATURE CONTROL TO SEQUENTIALLY DISABLE STAGES OF MECHANICAL COOLING TO MAINTAIN THE LOW LIMIT TEMPERATURE SET POINT.

2. IF THE EVAPORATIVE LEAVING COIL FACE TEMPERATURE FALLS BELOW 34°F (ADJUSTABLE), MECHANICAL COOLING WILL BE DISABLED. MECHANICAL COOLING WILL BE COMMANDED TO RUN UNTIL THE EVAPORATIVE LEAVING COIL FACE TEMPERATURE RISES ABOVE 55°F (ADJUSTABLE) AND THE COMPRESSOR MINIMUM OFF TIME HAS BEEN ACHIEVED.

E. DEHUMIDIFICATION CONTROL:

1. DEHUMIDIFICATION IS ENABLED WHEN THE SUPPLY FAN IS OPERATING, SPACE TEMPERATURE IS AT OR ABOVE COOLING SET POINT AND THE OUTSIDE AIR TEMPERATURE IS ABOVE THE COMPRESSOR LOCKOUT POINT. SPACE RELATIVE HUMIDITY REACHES ITS SETPOINT 60%RH SPACE (ADJUSTABLE THROUGH SOFTWARE). DEHUMIDIFICATION MODE SHALL BE DISABLED IF EITHER THE SPACE RELATIVE HUMIDITY FALLS 5% (ADJUSTABLE) BELOW THE SPACE DEHUMIDIFICATION SETPOINT OR THE SPACE TEMPERATURE FALLS 5°F (ADJUSTABLE) BELOW THE OCCUPIED SPACE COOLING SETPOINT TEMPERATURE.

2. WHEN THE UNIT IS IN DEHUMIDIFICATION MODE, THE COOLING SHALL REVERT FROM MAINTAINING SPACE TEMPERATURE COOLING SET POINT TO MAINTAINING A CONSTANT LEAVING COIL FACE TEMPERATURE AS DETERMINED BY A REFRIGERATION SUCTION PRESSURE SENSOR LOCATED ON THE FIRST STAGE OF COOLING.

3. MODULATING HOT GAS REHEAT CONTROL-IF THE SUPPLY AIR TEMPERATURE FALLS BELOW ITS SETPOINT TEMPERATURE OF 74°F (ADJUSTABLE THROUGH SOFTWARE) DURING DEHUMIDIFICATION MODE AND THE FIRST STAGE OF MECHANICAL COOLING IS COMMANDED TO RUN, THE REFRIGERATION MODULATING GAS HEAT WILL BEGIN TO MODULATE OPEN UNTIL THE SUPPLY AIR TEMPERATURE SET POINT (74°F ADJUSTABLE THROUGH SOFTWARE) IS SATISFIED.

F. ECONOMIZER CONTROL:

1. THE UNIT SHALL BE PROVIDED WITH AN ENTHALPY ECONOMIZER CYCLE. THE ECONOMIZER CONTROL SHALL MODULATE THE OUTSIDE AIR AND RETURN AIR DAMPER TO MAINTAIN SPACE TEMPERATURE WHENEVER OUTSIDE AIR ENTHALPY IS LESS THAN RETURN AIR ENTHALPY. THE ECONOMIZER CYCLE SHALL BE LOCKED OUT WHEN THE UNIT IS OPERATING IN THE DEHUMIDIFICATION SEQUENCE OF OPERATION, OR IF MECHANICAL COOLING IS COMMANDED TO OPERATE.

2. AN ECONOMIZER LOW LIMIT WILL PREVENT THE MIXED AIR TEMPERATURE FROM FALLING BELOW THE ECONOMIZER LOW LIMIT SET POINT OF 45°F (ADJUSTABLE THROUGH SOFTWARE). IF THE MIXED AIR TEMPERATURE FALLS BELOW THE ECONOMIZER LOW LIMIT SET POINT AND MECHANICAL COOLING IS DISABLED, THE ECONOMIZER WILL MODULATE THE OUTSIDE AIR DAMPERS TO MAINTAIN THE ECONOMIZER LOW LIMIT SET POINT. DURING THIS MODE OF OPERATION, THE ECONOMIZER HAS THE ABILITY TO MODULATE THE OUTSIDE AIR DAMPER BELOW THE ECONOMIZER MINIMUM POSITION TO MAINTAIN THE ECONOMIZER LOW LIMIT TEMPERATURE SET POINT.

G. HEATING:

1. SPACE TEMPERATURE SENSOR SHALL MODULATE THE HEATING COIL CONTROL VALVE TO MAINTAIN 70°F (ADJUSTABLE THROUGH SOFTWARE) SPACE TEMPERATURE.

2. WHEN THE MIXED AIR TEMPERATURE IS BELOW 38°F (ADJUSTABLE THROUGH SOFTWARE) THE LEAD FREEZE PROTECTION PUMP SHALL BE ENERGIZED TO RUN CONTINUOUSLY WHETHER THE SUPPLY FAN IS ON OR OFF. WHEN THE MIXED AIR TEMPERATURE IS ABOVE 40°F (ADJUSTABLE THROUGH SOFTWARE), THE HEATING COIL PUMP SHALL BE DE-ENERGIZED. EACH SET OF HEATING COIL PUMPS SHALL BE PROVIDED WITH LEAD/LAG CONTROL SUCH THAT THE LEAD PUMP RUNS CONTINUOUSLY AS SPECIFIED ABOVE. IN THE EVENT OF A LEAD PUMP FAILURE (AS SENSED BY CURRENT SENSOR), THE LAG PUMP SHALL AUTOMATICALLY START AFTER A 15 SECOND TIME DELAY. PROVIDE THROUGH SOFTWARE TO AUTOMATICALLY ALTERNATE LEAD/LAG CONTROL OF HEATING COIL PUMPS BASED ON PUMP RUN TIME. OR THROUGH TIME OF DAY SCHEDULING (I.E. DAILY, WEEKLY, BI-WEEKLY ETC).

H. HEAT RECOVERY:

1. THE ROTARY AIR-TO-AIR HEAT RECOVERY WHEEL SHALL OPERATE WHEN OUTSIDE AIR IS REQUIRED. THE HEAT WHEEL CONTROLS SHALL INCLUDE FROST CONTROL, CLEANING CYCLE, AND ROTATIONAL DETECTOR. THE HEAT WHEEL SHALL RUN AT FULL SPEED EXCEPT AT OUTSIDE AIR TEMPERATURES OF 50°F-65°F (ADJ-ECONOMIZER OPERATION) AND WHEN FROST OF THE WHEEL MAY OCCUR AS DETERMINED BY RELIEF AIR DEW POINT SENSOR. THE ENERGY WHEEL VARIABLE SPEED DRIVE SHALL MODULATE WHEEL SPEED TO PREVENT FROSTING.

2. THE HEAT WHEEL ACTS AS THE FIRST STAGE OF HEATING OR COOLING, WHEN THE UNIT IS PLACED IN OCCUPIED MODE, THE SUPPLY FAN RUN STATUS IS CONFIRMED AND THERE IS A CALL FOR MECHANICAL HEATING OF COOLING, THE HEAT WHEEL IS COMMANDED TO RUN. IF THE UNIT IS IN ECONOMIZER MODE OR THERE IS NOT A CALL FOR EITHER MECHANICAL HEATING OR COOLING THE HEAT WHEEL IS COMMANDED OFF. IF THE RELIEF AIR DEWPOINT TEMPERATURE FALLS BELOW ITS TEMPERATURE SETPOINT AND RELIEF FAN RUN STATUS IS CONFIRMED, THE HEAT WHEEL WILL OPERATE IN DEFROST MODE. DURING THIS MODE OF OPERATION, THE HEAT WHEEL WILL CYCLE ON FOR 30 MINUTES (ADJUSTABLE) AND THEN CYCLE OFF FOR 2 MINUTES (ADJUSTABLE) TO PREVENT ANY ICE BUILDUP. WHEN THE UNIT IS IN DEFROST MODE, THE OUTSIDE AIR DAMPER AND RETURN AIR DAMPER WILL MODULATE TO MAINTAIN A HEAT WHEEL SUPPLY AIR TEMPERATURE SETPOINT OF 45%F (ADJUSTABLE)

I. OUTSIDE AIR:

1. THE MINIMUM OUTSIDE AIR FLOW RATE SHALL BE 20% OF THE SCHEDULED MINIMUM OUTSIDE AIR FLOW RATE. THE SPACE CARBON DIOXIDE SENSOR SHALL MODULATE OUTSIDE AIR DAMPER OPEN TO THE SCHEDULED MINIMUM OUTSIDE AIR FLOW RATE AS REQUIRED TO MAINTAIN A SPACE CO2 LEVEL THAT IS THE LESSER OF THE FOLLOWING:
   a. A 700 PPM (ADJUSTABLE) DIFFERENCE BETWEEN THE OUTSIDE AIR CO2 LEVEL AND THE SPACE CO2 LEVEL.
   b. A SPACE CO2 LEVEL A SPACE CO2 LEVEL OF 1500 PPM (ADJUSTABLE).

2. OUTSIDE AIR FLOW MEASURING STATION (ATTACHED TO RTU HOOD) SHALL MEASURE OUTSIDE AIR FLOW RATE TO MAINTAIN MINIMUM SETPOINTS.

J. FAN SPEED CONTROL:

1. SUPPLY AIR FAN SHALL BE CONTROLLED TO MAINTAIN SPACE TEMPERATURE THROUGH ITS BUILT CONTROLS. THE SUPPLY FAN SHALL MODULATE BETWEEN 50% (ADJUSTABLE THROUGH SOFTWARE) TO 100% OF THE SCHEDULED AIR FLOW RATE.

2. THE RELIEF AIR FAN SHALL VARY ITS FAN SPEED TO MAINTAIN A SLIGHTLY POSITIVE BUILDING PRESSURE THROUGH DIFFERENTIAL PRESSURE CONTROLLER.

3. UNOCCUPIED CYCLE

A. GENERAL:

1. THE CONDENSING UNIT SHALL DE-ENERGIZE AND AFTER A FIVE MINUTE TIME DELAY THE SUPPLY FAN, ASSOCIATED RELIEF FAN, AND HEAT RECOVERY WHEEL SHALL BE DE-ENERGIZED, OUTSIDE AIR DAMPER AND RELIEF AIR DAMPER SHALL BE CLOSED, THE HEATING WATER COIL CONTROL VALVE SHALL BE CLOSED AND RETURN AIR DAMPER SHALL BE OPEN. SPACE TEMPERATURE SENSOR SHALL BE RESET TO 55°F (ADJUSTABLE) IN THE HEATING MODE.

B. HEATING:

1. HEATING SETBACK TEMPERATURE SHALL BE MAINTAINED BY CYCLING THE SUPPLY FAN AS RECIRCULATING UNIT HEATER. WHEN THE SPACE TEMPERATURE FALLS BELOW THE UNOCCUPIED SETPOINT OF 55°F (ADJUSTABLE), THE SUPPLY FAN SHALL START AND FULL HEATING SHALL BE ENABLED. HEATING IS DISABLED WHEN SPACE TEMPERATURE REACHES 2°F ABOVE SPACE TEMPERATURE SETPOINT. THE SUPPLY FAN SHALL DE-ENERGIZE AFTER THE TIME DELAY TIMES OUT.

C. MECHANICAL COOLING:

1. MECHANICAL COOLING IS DISABLED. IF THE UNIT IS MONITORING SPACE TEMPERATURE AND THE SPACE TEMPERATURE RISES ABOVE THE UNOCCUPIED COOLING TEMPERATURE SETPOINT OF 85°F (ADJUSTABLE THROUGH SOFTWARE), THE UNIT COOLING NIGHT CYCLE MODE IS ENABLED. ONCE THE SUPPLY FAN RUN STATUS IS CONFIRMED, THE UNIT OPERATES WITH THE ECONOMIZER DISABLED AND SEQUENTIALLY ENABLES 100% MECHANICAL COOLING CAPACITY. ONCE THE SPACE TEMPERATURE FALLS 2°F (ADJUSTABLE THROUGH SOFTWARE) BELOW THE SPACE UNOCCUPIED COOLING TEMPERATURE SETPOINT, THE COOLING NIGHT CYCLE MODE IS DISABLE. THE SUPPLY FAN IS DISABLED AFTER 120 SECONDS TIME DELAY TO ALLOW FOR MECHANICAL UNLOADING. THE UNOCCUPIED COOLING SEQUENCE OF OPERATION SHALL BE ENABLED/DISABLED BY A MANUAL SOFTWARE SELECTOR SWITCH THROUGH THE EMS.

4. KITCHEN HOOD SYSTEM CONTROL (RTU-1 ONLY)

A. COORDINATE THE CONTROLS OF ALL KITCHEN HOOD EXHAUST FAN(S), AND MAKE-UP AIR HANDLING UNIT WITH THE KITCHEN CONTRACTOR AND THE ELECTRICAL CONTRACTOR FOR A FULLY TURN-KEY SYSTEM THAT COMPLIES WITH ALL NFPA REQUIREMENTS.

B. EACH KITCHEN HOOD SHALL HAVE A SYSTEM ON-OFF SWITCH WITH PILOT LIGHT MOUNTED ON THE HOOD. THE SWITCH SHALL ONLY BE ACTIVE WHEN THE AIR HANDLING SYSTEM IS IN THE OCCUPIED MODE OF OPERATION.

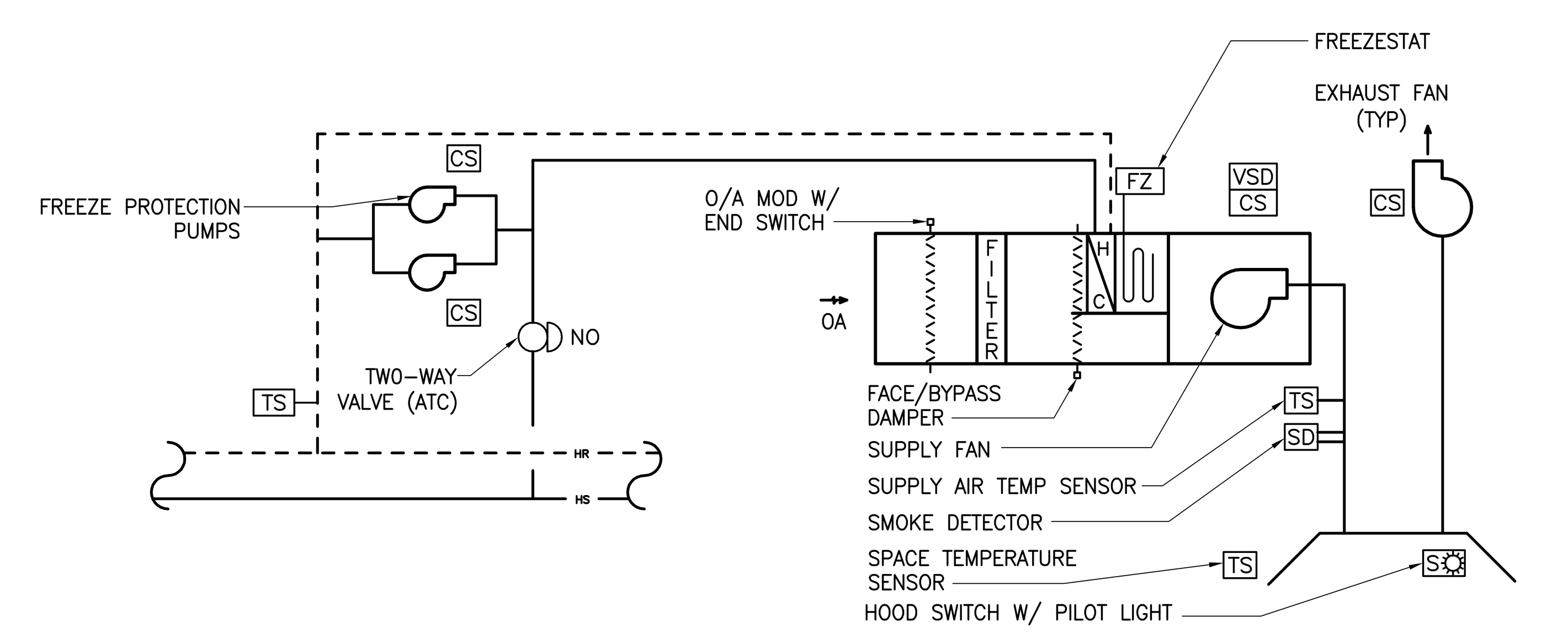
C. WHEN THE KITCHEN HOOD SWITCH IS INDEXED TO THE OFF POSITION, THE MAKE-UP AIR HANDLING UNIT IS OFF, ITS ASSOCIATED OUTSIDE AIR DAMPER IS CLOSED AND THE ASSOCIATED HOOD EXHAUST FAN IS OFF.

D. WHEN THE KITCHEN HOOD SYSTEM IS INDEXED TO ON THE EXHAUST FAN SHALL ENERGIZE, THE DEDICATED MAKE-UP AIR HANDLING UNIT OUTSIDE AIR DAMPER SHALL OPEN AND THROUGH DAMPER END SWITCH ENERGIZE ITS SUPPLY AIR FAN. THE VOLUMETRIC DIFFERENCE BETWEEN THE AHU OUTDOOR AIR AND RELIEF AIR SHALL INCREASED BY MEASURING THE SPACE-TO-OUTDOOR PRESSURE AND MAINTAINING A SLIGHT POSITIVE SPACE PRESSURE. WHEN THE KITCHEN HOOD SYSTEM IS ENERGIZED AND THE SUPPLY AIR TEMPERATURE FROM THE MAKE-UP AIR HANDLING UNIT IS LESS THEN 60°F (ADJUSTABLE THROUGH SOFTWARE), THE MAKE-UP AIR HANDLING UNIT HEATING COIL VALVE SHALL BE FULLY OPEN AND THE FACE/BYPASS DAMPER SHALL MODULATE TO MAINTAIN 60°F (ADJUSTABLE THROUGH SOFTWARE) SUPPLY AIR TEMPERATURE. SUPPLY AIR TEMPERATURE SHALL BE RE-SETTABLE THROUGH SPACE TEMPERATURE SENSOR EACH KITCHEN HOOD SYSTEM SHALL BE INDEPENDENTLY CONTROLLED.

E. THE MAKE-UP AIR HANDLING UNIT SHALL BE PROVIDED WITH A SUPPLY AIR SMOKE DETECTOR WHICH SHALL DEENERGIZE THE UNIT WHEN PRODUCTS OF COMBUSTION ARE SENSED. EACH KITCHEN HOOD SYSTEM SHALL BE INDEPENDENTLY CONTROLLED. THE DISCHARGE AIR TEMPERATURE SENSOR SHALL SEND AN ALARM TO THE EMS WHENEVER ITS LOW LIMIT TEMPERATURE SETPOINT (40°F – ADJUSTABLE THROUGH SOFTWARE) HAS BEEN REACHED.

F. THE MAKE-UP AIR HANDLING UNIT SHALL BE PROVIDED WITH FREEZE PROTECTION PUMPS. WHEN THE OUTDOOR AIR TEMPERATURE IS BELOW 38°F (ADJUSTABLE THROUGH SOFTWARE) THE LEAD FREEZE PROTECTION PUMP SHALL BE ENERGIZED TO RUN CONTINUOUSLY WHETHER THE SUPPLY FAN IS ON OR OFF. WHEN THE OUTDOOR AIR TEMPERATURE IS ABOVE 40°F (ADJUSTABLE THROUGH SOFTWARE), THE HEATING COIL PUMP SHALL BE DE-ENERGIZED. EACH SET OF HEATING COIL PUMPS SHALL BE PROVIDED WITH LEAD/LAG CONTROL SUCH THAT THE LEAD PUMP RUNS CONTINUOUSLY AS SPECIFIED ABOVE. IN THE EVENT OF A LEAD PUMP FAILURE (AS SENSED BY CURRENT SENSOR), THE LAG PUMP SHALL AUTOMATICALLY START AFTER A 15 SECOND TIME DELAY. PROVIDE THROUGH SOFTWARE TO AUTOMATICALLY ALTERNATE LEAD/LAG CONTROL OF HEATING COIL PUMPS BASED ON PUMP RUN TIME. OR THROUGH TIME OF DAY SCHEDULING (I.E. DAILY, WEEKLY, BI-WEEKLY ETC).

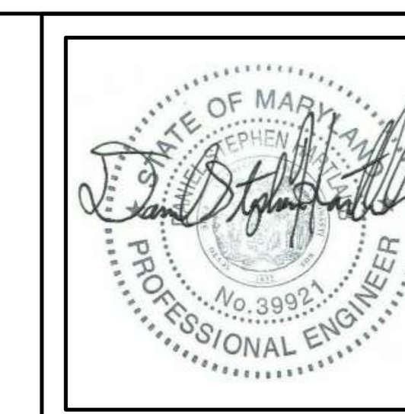
TYPICAL SINGLE ZONE VARIABLE AIR VOLUME ROOFTOP UNIT W/ HEAT RECOVERY AND HW HEAT SEQUENCE OF OPERATION – DDC (ELECTRIC/ELECTRONIC ACTUATION)



KITCHEN HOOD INTERLOCK SCHEDULE	
MAU-1	F-9

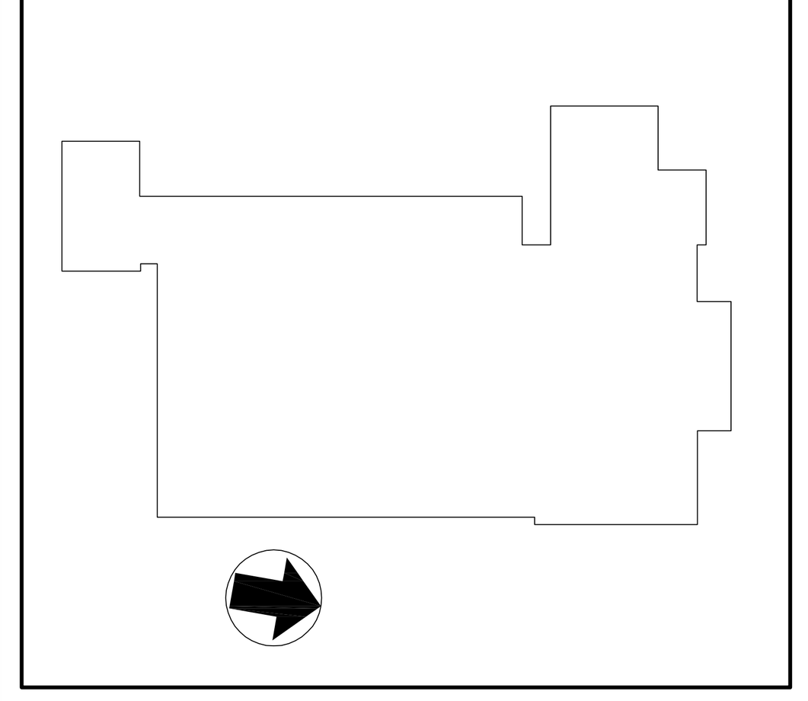
MAKE-UP AIR SYSTEM CONTROL DIAGRAM

SCALE: NONE



PROFESSIONAL CERTIFICATION: I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO: 39921, EXPIRATION DATE 01/19/2021

KEY PLAN



REVISIONS

01	MM-DD-YR	NAME	DESCRIPTION OF CHANGES

CRABTREE ROHRBAUGH & ASSOCIATES - ARCHITECTS
www.cra-architects.com
MECHANICSBURG, PENNSYLVANIA
CHARLOTTESVILLE, VIRGINIA
WHITE SULPHUR SPRINGS, WEST VIRGINIA
100 WEST ROAD, SUITE 402
TOWSON MD 21204
410-528-0272

ADDITION AND RENOVATIONS OF GALENA ELEMENTARY SCHOOL

114 S MAIN STREET
GALENA, MD 21635

TYPICAL SZVAV RTU WITH HEAT RECOVERY AND HW HEAT CONTROL DIAGRAM

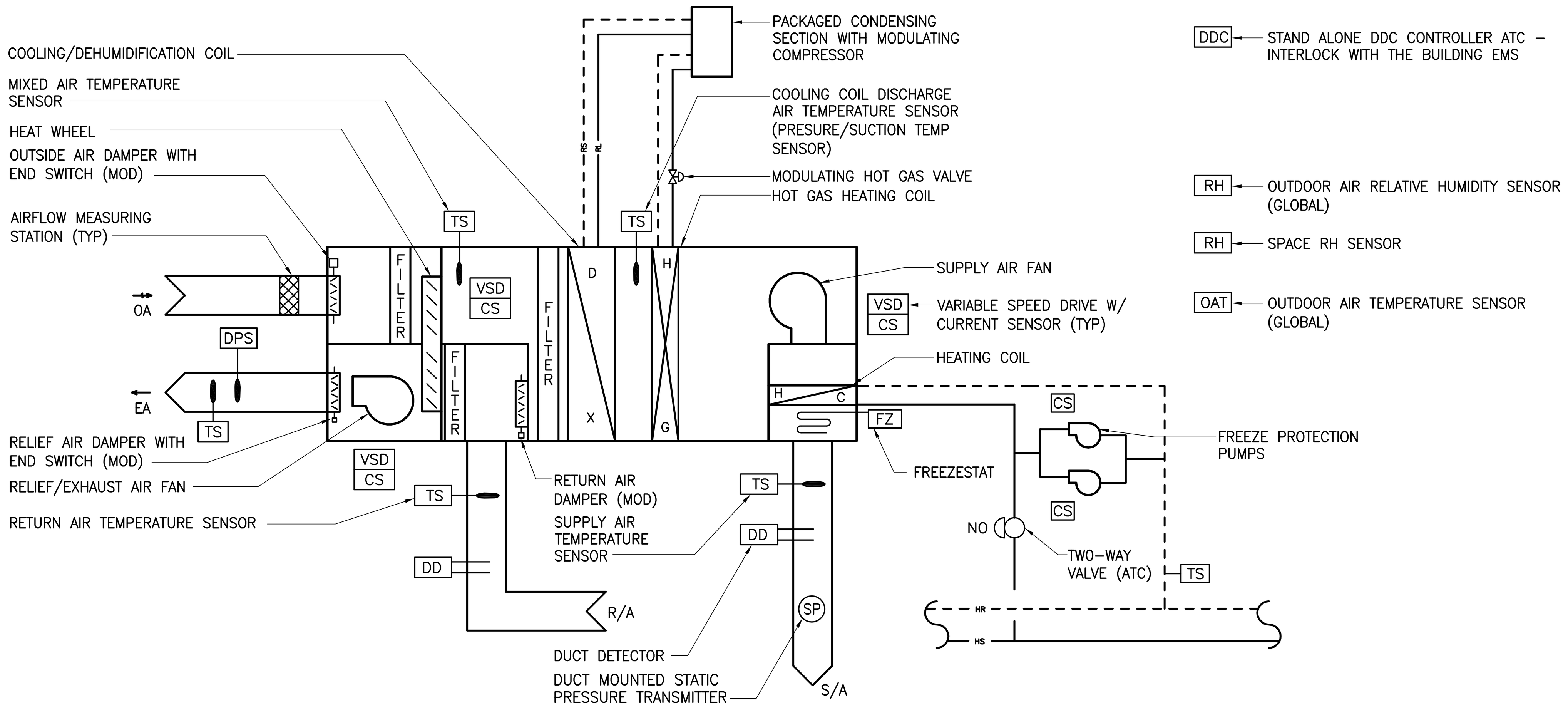
PLOT SCALE: NONE

FILENAME:

DATE: FEBRUARY 10, 2020

PROJECT 3309

M8.1



TYPICAL PACKAGED VARIABLE AIR VOLUME ROOFTOP UNIT W/ HEAT RECOVERY AND HW HEAT CONTROL DIAGRAM

SCALE: NONE

INPUT/OUTPUT SUMMARY FOR PACKAGED ROOFTOP UNIT

BUILDING SYSTEM:
RTU-4: CLASSROOMS

INPUTS

DESCRIPTION	ANALOG: ROOM TEMPERATURE	DUCT TEMPERATURE	DEWPOINT TEMPERATURE	O.A. TEMPERATURE (GLOBAL)	CURRENT SENSOR/STATUS	STATIC PRESSURE	CO_2	RELATIVE HUMIDITY	POSITION INDICATION	BINARY: FLOW SWITCH	SWITCH CLOSURE	STATIC PRESSURE	LOW TEMPERATURE CUTOUT	END SWITCH	DIFFERENTIAL PRESSURE SWITCH
AHU															
RETURN AIR		●						●							
DUCT DETECTORS (TYP)															
SUPPLY AIR		●													
SUPPLY AND RELIEF FANS					●										
OUTSIDE AIR (GLOBAL)				●				●							
RELIEF AIR		●	●												
SUPPLY AIR STATIC															
DAMPERS (TYP)														●	
SPACE TEMPERATURE	●														
HEAT WHEEL															
SPACE RH								●							
HW COIL										●					

OUTPUTS

DESCRIPTION	ANALOG: MODULATING ACTUATOR	E/P TRANSDUCER	VARIABLE SPEED				BINARY: CONTROL RELAY	SOLENOID	START/STOP	2-POSITION DAMPER MOD.			3-POINT FLOATING: ACTUATOR	MERCURY RELAY	FEED/BLEED SAV			
AHU									●									
RETURN AIR																		
DUCT DETECTORS (TYP)																		
SUPPLY AIR																		
SUPPLY AND RELIEF FANS			●															
OUTSIDE AIR (GLOBAL)																		
RELIEF AIR																		
SUPPLY AIR STATIC																		
DAMPERS (TYP)										●								
SPACE TEMPERATURE																		
HEAT WHEEL																		
SPACE RH																		
HW COIL	●																	

ALARMS / FEATURES

DESCRIPTION	ALARMS: HIGH LIMIT	LOW LIMIT	RUN TIME	MAINTENANCE MESSAGE	SMOKE/FIRE	LIQUID DETECTION	FEATURES: SCHEDULED START/STOP	TEMPERATURE SETBACK/SETUP	OPTIMIZED START (ADAPT.)	DEMAND LIMITING	DUTY CYCLE	VENTILATION DELAY	ECONOMIZER CYCLE	H.W. RESET W/ O.A. TEMP.	VAV CONTROL	REMOTE READ/RESET	TENANT OVERRIDE	COLOR GRAPHICS	POINT LOCKOUT	TREND LOG	WARM UP/PULL DOWN
AHU			●	●		●	●	●	●		●							●			●
RETURN AIR																				●	
DUCT DETECTORS (TYP)					●																
SUPPLY AIR																●				●	
SUPPLY AND RELIEF FANS				●																	
OUTSIDE AIR (GLOBAL)																					
RELIEF AIR																					
SUPPLY AIR STATIC	●																				
DAMPERS (TYP)																					
SPACE TEMPERATURE																●				●	
HEAT WHEEL				●																●	
SPACE RH	●															●				●	
HW COIL				●																	

TYPICAL PACKAGED VARIABLE AIR VOLUME ROOFTOP UNIT W/ HEAT RECOVERY AND HW HEAT I/O POINTS LIST

1. GENERAL:

A. THE AIR HANDLING SYSTEM SHALL BE PROVIDED WITH FACTORY MOUNTED CONTROL SYSTEM. THE DIRECT DIGITAL CONTROL SYSTEM SHALL BE INTERFACED WITH THE BUILDING ENERGY MANAGEMENT SYSTEM (EMS). THE ATC CONTRACTOR SHALL INTERFACE WITH THE FACTORY MOUNTED DIRECT DIGITAL CONTROLLER AND ALL SENSORS, DEVICES AND CONTROLS NEEDED TO INTERFACE WITH THE AHU CONTROLLER. THE AIR HANDLING SYSTEM SHALL BE STARTED AND STOPPED THROUGH A MANUAL SYSTEM ON-OFF-AUTOMATIC (H-O-A) SWITCH. WHEN INDEXED TO "ON", THE SYSTEM SHALL BE ENERGIZED AND OPERATE UNDER ITS CONTROL SEQUENCE. WHEN INDEXED TO "OFF" THE SYSTEM SHALL DE-ENERGIZE. WHEN INDEXED TO THE "AUTOMATIC" POSITION THE SYSTEM SHALL BE STARTED AND STOPPED BY A SIGNAL FROM THE EMS THROUGH ITS BUILT IN CONTROLLER.

B. RELIEF FAN SHALL BE INTERLOCKED TO OPERATE WHEN THE SUPPLY FAN OPERATES AND TO BE OFF WHEN THE SUPPLY FAN IS OFF.

C. WHEN THE UNIT SUPPLY FAN IS OFF, THE OUTSIDE AIR DAMPER AND RELIEF AIR DAMPER SHALL CLOSE AND RETURN AIR DAMPER SHALL OPEN; THE HEATING COIL VALVE SHALL FULLY OPEN AND CONDENSING UNIT SHALL BE DE-ENERGIZED; AND THE RELIEF AIR FAN SHALL BE OFF.

D. SUPPLY FAN, RELIEF FAN AND CONDENSING UNIT SHALL DE-ENERGIZE WHENEVER THE SUPPLY AIR TEMPERATURE DROPS BELOW THE LIMIT OF THE DISCHARGE AIR TEMPERATURE SET POINT OF 38°F (ADJ) OR WHEN THE DUCT SMOKE DETECTORS SENSES PRODUCTS OF COMBUSTION.

E. ALL SAFETIES AND ASSOCIATED CONTROLS SHALL REMAIN ACTIVE WHETHER THE SYSTEM IS LOCALLY OR REMOTELY CONTROLLED AND/OR MANUALLY OVERRIDDEN.

F. PROVIDE A REMOTE EMERGENCY SHUTDOWN SWITCH FOR SYSTEM SHUTDOWN. REMOTE SWITCH SHALL BE INSTALLED AT A LOCATION AS REQUIRED BY OWNER AND ADJ.

G. COORDINATE ALL CONTROL REQUIREMENTS WITH THE EXISTING VARIABLE AIR VOLUME TERMINAL CONTROL UNITS.

2. OCCUPIED CYCLE:

A. GENERAL:

WHEN THE UNIT SUPPLY FAN IS ENERGIZED TO RUN, IT SHALL GO THROUGH A WARM-UP/PULL DOWN CYCLE. WHEN THE SYSTEM COMPLETES ITS WARM-UP/PULL-DOWN MODE OF OPERATION AND THE SYSTEM SWITCHES TO THE OCCUPIED MODE OF OPERATION, THE OUTSIDE AIR DAMPER SHALL OPEN TO ITS MINIMUM POSITION AND THE RETURN AIR DAMPER SHALL MODULATE TO ITS CORRESPONDING POSITION AND THE RELIEF AIR FAN SHALL ENERGIZE

B. WARM-UP/PULL DOWN:

THE UNIT CONTROL SHALL BE ARRANGED FOR A WINTER MORNING WARM-UP HEATING CYCLE AND SUMMER PULL DOWN COOLING CYCLE. DURING WARM-UP CYCLE THE OUTSIDE AIR DAMPER AND RELIEF AIR DAMPER SHALL REMAIN CLOSED, THE RETURN AIR DAMPER OPEN, AND THE AIR HANDLING UNIT HEATING COIL VALVE SHALL BE OPEN UNTIL THE SPACE TEMPERATURE RISES TO 70°F (ADJUSTABLE). SIMILARLY FOR PULL DOWN CYCLE, THE CONDENSING UNIT SHALL BE STAGED UNTIL THE SPACE TEMPERATURE DROPS TO 75°F (ADJUSTABLE). AT THAT POINT, THE OUTSIDE AIR DAMPER AND RELIEF AIR DAMPER SHALL OPEN, THE RETURN AIR DAMPER SHALL MODULATE TO ITS MINIMUM POSITION, THE RELIEF AIR FAN AND HEAT RECOVERY WHEEL SHALL ENERGIZE AS PREVIOUSLY DESCRIBED, AND THE HEATING AND COOLING CONTROL SHALL BE PLACED UNDER THE CONTROL OF THE SPACE AIR TEMPERATURE SENSOR.

C. COOLING

COOLING IS ENABLED WHEN THE SUPPLY AIR TEMPERATURE IS ABOVE THE COOLING SET POINT OF 56°F (ADJUSTABLE AND RESETTABLE THROUGH SOFTWARE) AND OUTSIDE AIR TEMPERATURE IS ABOVE THE COOLING LOCKOUT SET POINT OF 55°F (ADJ). THE UNIT SHALL SEQUENCE THE COOLING STAGES AS REQUIRED TO MAINTAIN THE SUPPLY AIR TEMPERATURE SET POINT OF 58°F (ADJUSTABLE AND RESETTABLE THROUGH SOFTWARE), MODULATING THE COMPRESSOR FROM 15% TO 100% (OR THROUGH HOT GAS BYPASS). A STAGING DELAY ON AND DELAY OFF SHALL PREVENT EACH STAGE OF MECHANICAL COOLING FROM ENABLING AND DISABLING AT THE SAME TIME. IF THERE ARE MULTIPLE STAGES OF MECHANICAL COOLING AVAILABLE (I.E. MULTIPLE COMPRESSORS) EACH STAGE SHALL SEQUENTIALLY ENABLE BASED ON A TIME DELAY OF 180 SECONDS (ADJ) AND DISABLE BASED ON A MINIMUM DELAY OFF OF 180 SECONDS (ADJ). PROVIDE A 15 MINUTE (ADJ) ANTI-SHORT CYCLE TIME DELAY BETWEEN COMPRESSOR CYCLES.

D. REFRIGERATION LOW LIMIT CONTROL:

1. IF THE EVAPORATIVE LEAVING COIL FACE TEMPERATURE FALLS BELOW THE A LOW LIMIT SETPOINT OF 40°F (ADJUSTABLE), THE MECHANICAL COOLING WILL REVERT FROM TEMPERATURE CONTROL TO SEQUENTIALLY DISABLE STAGES OF MECHANICAL COOLING TO MAINTAIN THE LOW LIMIT TEMPERATURE SET POINT.

2. IF THE EVAPORATIVE LEAVING COIL FACE TEMPERATURE FALLS BELOW 34°F (ADJUSTABLE), MECHANICAL COOLING WILL BE DISABLED. MECHANICAL COOLING WILL BE COMMANDED TO RUN UNTIL THE EVAPORATIVE LEAVING COIL FACE TEMPERATURE RISES ABOVE 55°F (ADJUSTABLE) AND THE COMPRESSOR MINIMUM OFF TIME HAS BEEN ACHIEVED.

E. DEHUMIDIFICATION CONTROL:

1. DEHUMIDIFICATION IS ENABLED WHEN THE SUPPLY FAN IS OPERATING, SPACE TEMPERATURE IS AT OR ABOVE COOLING SET POINT AND THE OUTSIDE AIR TEMPERATURE IS ABOVE THE COMPRESSOR LOCKOUT POINT. SPACE RELATIVE HUMIDITY REACHES ITS SETPOINT 60%RH SPACE (ADJUSTABLE THROUGH SOFTWARE). DEHUMIDIFICATION MODE SHALL BE DISABLED IF EITHER THE SPACE RELATIVE HUMIDITY FALLS 5% (ADJUSTABLE) BELOW THE SPACE DEHUMIDIFICATION SETPOINT OR THE SPACE TEMPERATURE FALLS 5°F (ADJUSTABLE) BELOW THE OCCUPIED SPACE COOLING SETPOINT TEMPERATURE.

2. WHEN THE UNIT IS IN DEHUMIDIFICATION MODE, THE COOLING SHALL REVERT FROM MAINTAINING SUPPLY AIR TEMPERATURE COOLING SET POINT TO MAINTAINING A CONSTANT LEAVING COIL FACE TEMPERATURE AS DETERMINED BY A REFRIGERATION SUCTION PRESSURE SENSOR LOCATED ON THE FIRST STAGE OF COOLING.

3. MODULATING HOT GAS REHEAT CONTROL-IF THE SUPPLY AIR TEMPERATURE FALLS BELOW ITS SETPOINT TEMPERATURE OF 70°F (ADJUSTABLE THROUGH SOFTWARE) DURING DEHUMIDIFICATION MODE AND THE FIRST STAGE OF MECHANICAL COOLING IS COMMANDED TO RUN, THE REFRIGERATION MODULATING GAS HEAT WILL BEGIN TO MODULATE OPEN UNTIL THE SUPPLY AIR TEMPERATURE SET POINT (74°F ADJUSTABLE THROUGH SOFTWARE) IS SATISFIED.

F. ECONOMIZER CONTROL:

1. THE UNIT SHALL BE PROVIDED WITH AN ENTHALPY ECONOMIZER CYCLE. THE ECONOMIZER CONTROL SHALL MODULATE THE OUTSIDE AIR AND RETURN AIR DAMPER TO MAINTAIN SPACE TEMPERATURE WHENEVER OUTSIDE AIR ENTHALPY IS LESS THAN RETURN AIR ENTHALPY. THE ECONOMIZER CYCLE SHALL BE LOCKED OUT WHEN THE UNIT IS OPERATING IN THE DEHUMIDIFICATION SEQUENCE OF OPERATION, OR IF MECHANICAL COOLING IS COMMANDED TO OPERATE.

2. AN ECONOMIZER LOW LIMIT WILL PREVENT THE MIXED AIR TEMPERATURE FROM FALLING BELOW THE ECONOMIZER LOW LIMIT SET POINT OF 45°F (ADJUSTABLE THROUGH SOFTWARE). IF THE MIXED AIR TEMPERATURE FALLS BELOW THE ECONOMIZER LOW LIMIT SET POINT AND MECHANICAL COOLING IS DISABLED, THE ECONOMIZER WILL MODULATE THE OUTSIDE AIR DAMPERS TO MAINTAIN THE ECONOMIZER LOW LIMIT SET POINT. DURING THIS MODE OF OPERATION, THE ECONOMIZER HAS THE ABILITY TO MODULATE THE OUTSIDE AIR DAMPER BELOW THE ECONOMIZER MINIMUM POSITION TO MAINTAIN THE ECONOMIZER LOW LIMIT TEMPERATURE SET POINT.

G. HEATING:

SUPPLY AIR TEMPERATURE SENSOR SHALL MODULATE HOT WATER HEATING COIL VALVE TO MAINTAIN THE SUPPLY AIR TEMPERATURE SETPOINT OF 53°F (ADJUSTABLE AND RESETTABLE THROUGH SOFTWARE.)

WHEN THE MIXED AIR TEMPERATURE IS BELOW 38°F (ADJUSTABLE THROUGH SOFTWARE) THE LEAD FREEZE PROTECTION PUMP SHALL BE ENERGIZED TO RUN CONTINUOUSLY WHETHER THE SUPPLY FAN IS ON OR OFF. WHEN THE MIXED AIR TEMPERATURE IS ABOVE 40°F (ADJUSTABLE THROUGH SOFTWARE), THE HEATING COIL PUMP SHALL BE DE-ENERGIZED. EACH SET OF HEATING COIL PUMPS SHALL BE PROVIDED WITH LEAD/LAG CONTROL SUCH THAT THE LEAD PUMP RUNS CONTINUOUSLY AS SPECIFIED ABOVE. IN THE EVENT OF A LEAD PUMP FAILURE (AS SENSED BY CURRENT SENSOR), THE LAG PUMP SHALL AUTOMATICALLY START AFTER A 15 SECOND TIME DELAY. PROVIDE THROUGH SOFTWARE TO AUTOMATICALLY ALTERNATE LEAD/LAG CONTROL OF HEATING COIL PUMPS BASED ON PUMP RUN TIME. OR THROUGH TIME OF DAY SCHEDULING (I.E. DAILY, WEEKLY, BI-WEEKLY ETC).

H. HEAT RECOVERY:

1. THE ROTARY AIR-TO-AIR HEAT RECOVERY WHEEL SHALL OPERATE WHEN OUTSIDE AIR IS REQUIRED. THE HEAT WHEEL CONTROLS SHALL INCLUDE FROST CONTROL, CLEANING CYCLE, AND ROTATIONAL DETECTOR.

2. THE HEAT WHEEL ACTS AS THE FIRST STAGE OF HEATING OR COOLING, WHEN THE UNIT IS PLACED IN OCCUPIED MODE, THE SUPPLY FAN RUN STATUS IS CONFIRMED AND THERE IS A CALL FOR MECHANICAL HEATING OF COOLING, THE HEAT WHEEL IS COMMANDED TO RUN. IF THE RELIEF AIR DEWPOINT TEMPERATURE FALLS BELOW ITS TEMPERATURE SETPOINT AND RELIEF FAN RUN STATUS IS CONFIRMED, THE HEAT WHEEL WILL OPERATE IN DEFROST MODE. DURING THIS MODE OF OPERATION, THE HEAT WHEEL WILL CYCLE ON FOR 30 MINUTES (ADJUSTABLE) AND THEN CYCLE OFF FOR 2 MINUTES (ADJUSTABLE) TO PREVENT ANY ICE BUILDUP. COORDINATE FROST CONTROL REQUIREMENTS WITH THE WHEEL MANUFACTURER.

3. THE ENTERING AND LEAVING AIR TEMPERATURES OF SUPPLY AND RELIEF AIR STREAMS SHALL BE MONITORED BY THE EMS. DURING INTERMEDIATE WEATHER CONDITIONS WHEN OUTSIDE AIR TEMPERATURES ARE BETWEEN 60°F (ADJUSTABLE THROUGH SOFTWARE) AND 80°F (ADJUSTABLE THROUGH SOFTWARE) THE WHEEL SHALL ROTATE AT MINIMUM SPEED (¼ RPM) TO MINIMIZE RECOVERY EFFECTIVENESS (I.E. ECONOMIZER MODE). WHENEVER THE OUTDOOR AIR TEMPERATURE IS WARMER THAN THE RETURN AIR TEMPERATURE THE HEAT WHEEL SHALL BE IN THE COOLING MODE AND OPERATE AT 100% SPEED. WHEN THE OUTSIDE IS LESS THAN 60°F THE WHEEL SPEED SHALL VARY TO MAINTAIN THE SUPPLY AIR TEMPERATURE SETPOINT.

I. OUTSIDE AIR:

THE SCHEDULED MINIMUM OUTSIDE AIR FLOW RATE SHALL BE MAINTAINED BY MODULATING THE OUTDOOR AIR DAMPER AND VERIFIED BY THE AIR FLOW MEASURING STATION.

J. FAN SPEED CONTROL:

1. SUPPLY AIR FAN SHALL BE CONTROLLED TO MAINTAIN SUPPLY AIR STATIC PRESSURE.

2. THE RELIEF AIR FAN SHALL VARY ITS FAN SPEED TO MAINTAIN A SLIGHTLY POSITIVE BUILDING PRESSURE THROUGH A DIFFERENTIAL PRESSURE CONTROLLER.

3. UNOCCUPIED CYCLE:

A. GENERAL:

THE CONDENSING UNIT SHALL DE-ENERGIZE AND AFTER A FIVE MINUTE TIME DELAY, THE SUPPLY FAN AND ASSOCIATED RELIEF FAN SHALL BE DE-ENERGIZED, OUTSIDE AIR DAMPER AND RELIEF AIR DAMPER SHALL BE CLOSED, THE HEATING COIL VALVE SHALL BE OPEN AND RETURN AIR DAMPER SHALL BE OPEN. SPACE TEMPERATURE SENSORS SHALL BE RESET TO 55°F (ADJUSTABLE) IN THE HEATING MODE.

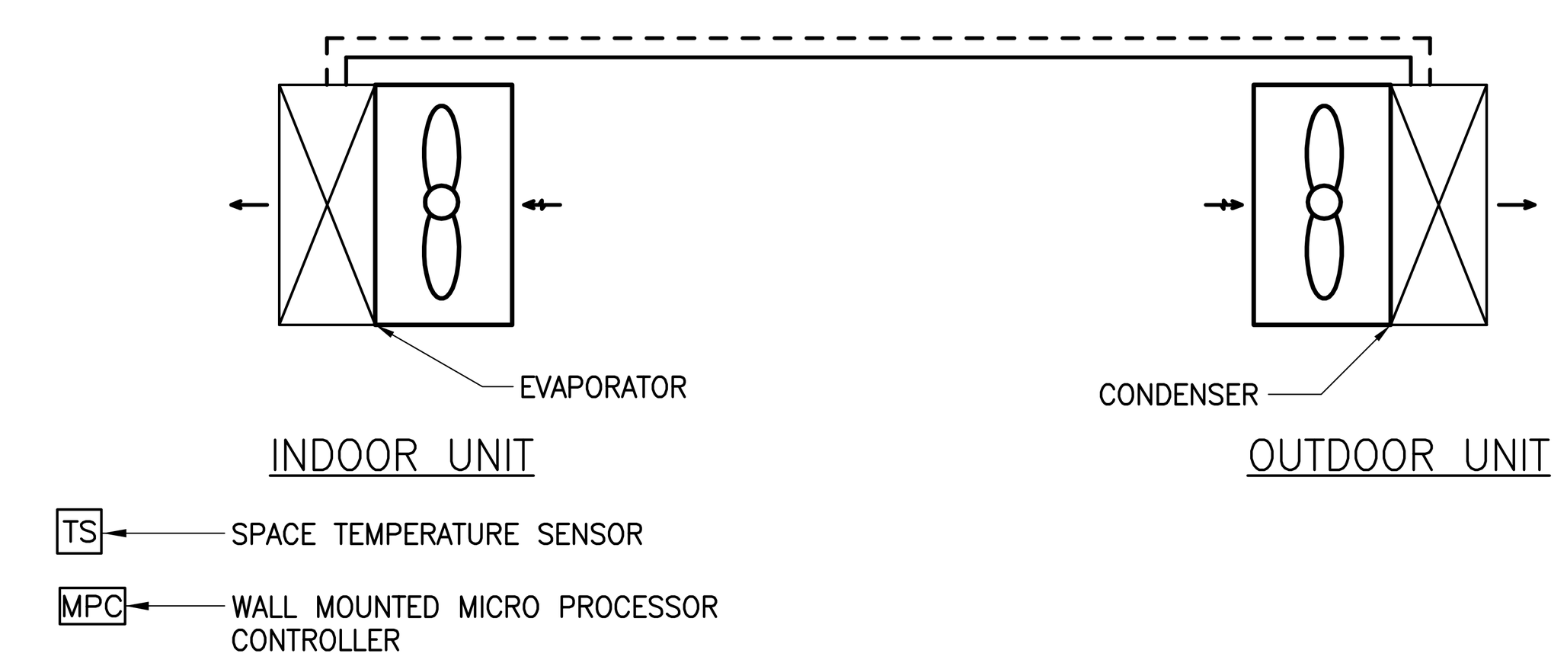
B. HEATING:

HEATING SETBACK TEMPERATURE SHALL BE MAINTAINED BY CYCLING THE SUPPLY FAN AS RECIRCULATING UNIT HEATER WHEN ANY SPACE TEMPERATURE FALLS BELOW THE UNOCCUPIED SETPOINT OF 55°F (ADJUSTABLE), THE SUPPLY FAN SHALL START AND FULL HEATING SHALL BE ENABLED. HEATING IS DISABLED WHEN SPACE TEMPERATURE REACHES 2°F ABOVE SPACE TEMPERATURE SETPOINT. THE SUPPLY FAN SHALL DE-ENERGIZE AFTER THE TIME DELAY TIMES OUT.

C. MECHANICAL COOLING:

THE UNOCCUPIED COOLING SEQUENCE OF OPERATION SHALL BE ENABLED/DISABLED BY A MANUAL SOFTWARE SELECTOR SWITCH THROUGH THE EMS. IF THE UNIT, WHEN ENABLED, IS MONITORING SPACE TEMPERATURE AND THE SPACE TEMPERATURE RISES ABOVE THE UNOCCUPIED COOLING TEMPERATURE SETPOINT OF 85°F (ADJUSTABLE), THE UNIT COOLING NIGHT CYCLE MODE IS ENALBED. ONCE THE SUPPLY FAN RUN STATUS IS CONFIRMED, THE UNIT OPERATES WITH THE ECONOMIZER DISABLED AND SEQUENTIALLY ENABLES 100% MECHANICAL COOLING CAPACITY. ONCE THE SPACE TEMPERATURE FALLS 2°F (ADJUSTABLE THROUGH SOFTWARE) BELOW THE SPACE UNOCCUPIED COOLING TEMPERATURE SETPOINT, THE COOLING NIGHT CYCLE MODE IS DISABLE. THE SUPPLY FAN IS DISABLED AFTER 120 SECONDS TIME DELAY TO ALLOW FOR MECHANICAL UNLOADING.

TYPICAL PACKAGED VARIABLE AIR VOLUME ROOFTOP UNIT W/ HEAT RECOVERY AND HW HEAT SEQUENCE OF OPERATION – DDC (ELECTRIC/ELECTRONIC ACTUATION)



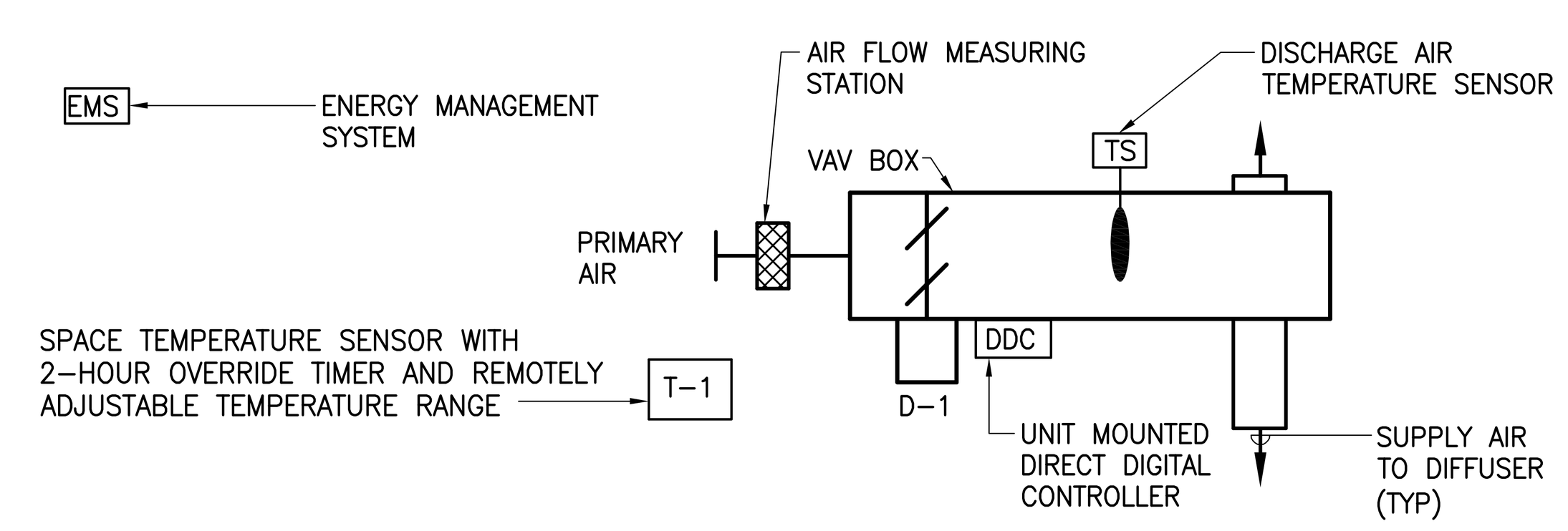
SEQUENCE OF OPERATION

1. FOR COOLING ONLY UNITS THE MICRO PROCESSOR CONTROLLER SHALL SEQUENCE INDOOR A/C UNIT TO MAINTAIN 70°F (ADJUSTABLE).

2. FOR COOLING ONLY UNITS THE SPACE TEMPERATURE SENSOR SHALL MONITOR SPACE TEMPERATURE AND SEND AN ALARM TO THE EMS WHEN A HIGH TEMPERATURE SETPOINT LIMIT (80°F – ADJUSTABLE THROUGH SOFTWARE) IS REACHED.

3. FOR HEAT PUMP UNITS THE MICRO PROCESSOR CONTROLLER SHALL SEQUENCE INDOOR HEAT PUMP UNIT TO MAINTAIN 70°F IN HEATING MODE (ADJUSTABLE) AND 76°F IN COOLING MODE (ADJUSTABLE).

TYPICAL DUCTLESS SPLIT A/C / HEAT PUMP UNIT CONTROL DIAGRAM



SEQUENCE OF OPERATION
(DDC ELECTRIC/ELECTRONIC ACTUATION)

1. VAV TERMINAL UNIT CONTROL:

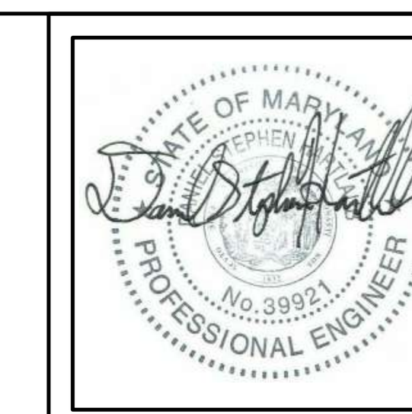
A. THE TERMINAL UNIT SHALL BE DIRECTLY INTERLOCKED WITH THE CENTRAL SYSTEM.

B. AS THE ROOM TEMPERATURE DECREASES BELOW THE SPACE TEMPERATURE SET-POINT AND THE DISCHARGE AIR TEMPERATURE IS GREATER THAN THE SPACE TEMPERATURE, SPACE TEMPERATURE SENSOR T-1 SHALL MODULATE TERMINAL BOX PRIMARY AIR DAMPER FROM MINIMUM TO MAXIMUM FLOW AS REQUIRED TO MAINTAIN THE SPACE TEMPERATURE SET-POINT. IF THE DISCHARGE AIR TEMPERATURE IS LESS THAN THE SPACE TEMPERATURE, THE TERMINAL BOX PRIMARY AIR DAMPER SHALL REMAIN AT ITS MINIMUM FLOW RATE POSITION.

C. AS THE ROOM TEMPERATURE INCREASES ABOVE THE SPACE TEMPERATURE SET-POINT, AND THE DISCHARGE AIR TEMPERATURE IS LESS THAN THE SPACE TEMPERATURE, SPACE TEMPERATURE SENSOR T-1 SHALL MODULATE TERMINAL BOX PRIMARY AIR DAMPER FROM MINIMUM TO MAXIMUM FLOW AS REQUIRED TO MAINTAIN THE SPACE TEMPERATURE SET-POINT. IF THE DISCHARGE AIR TEMPERATURE IS GREATER THAN THE SPACE TEMPERATURE, THE TERMINAL BOX PRIMARY AIR DAMPER SHALL REMAIN AT ITS MINIMUM FLOW RATE POSITION.

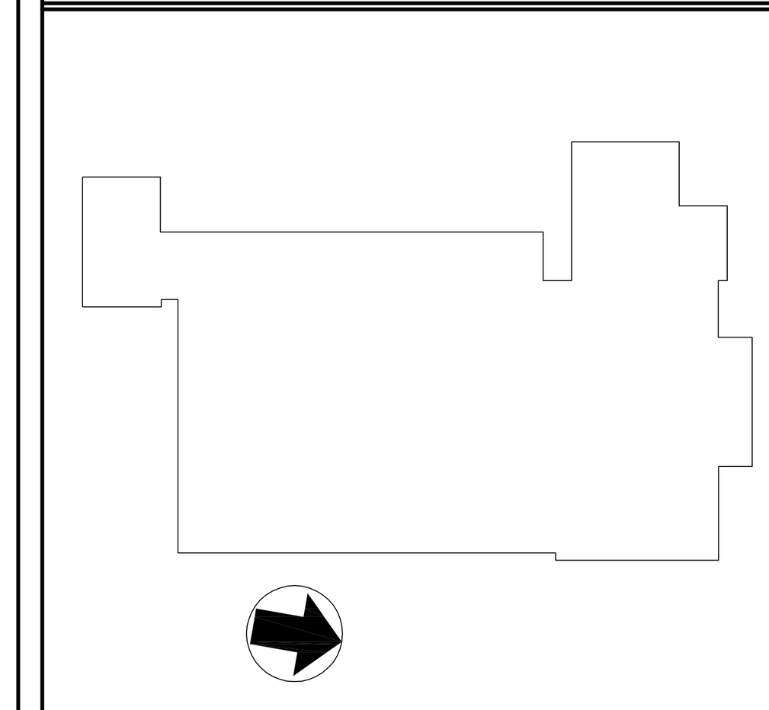
TYPICAL VAV TERMINAL CONTROL UNIT CONTROL DIAGRAM

SCALE: NONE



PROFESSIONAL CERTIFICATION: I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 39921, EXPIRATION DATE 01/19/2021

KEY PLAN



REVISIONS

#	MM-DD-YR	NAME	DESCRIPTION OF CHANGES

CRABTREE ROHRBAUGH & ASSOCIATES - ARCHITECTS
www.cra-architects.com
100 WEST ROAD, SUITE 402
TOWSON MD 21204
410-528-0272
MECHANICSBURG, PENNSYLVANIA
CHARLOTTESVILLE, VIRGINIA
WHITE SULPHUR SPRINGS, WEST VIRGINIA

ADDITION AND RENOVATIONS OF GALENA ELEMENTARY SCHOOL
114 S MAIN STREET
GALENA, MD 21635

TYPICAL VAV RTU WITH HEAT RECOVERY AND HW HEAT CONTROL DIAGRAM

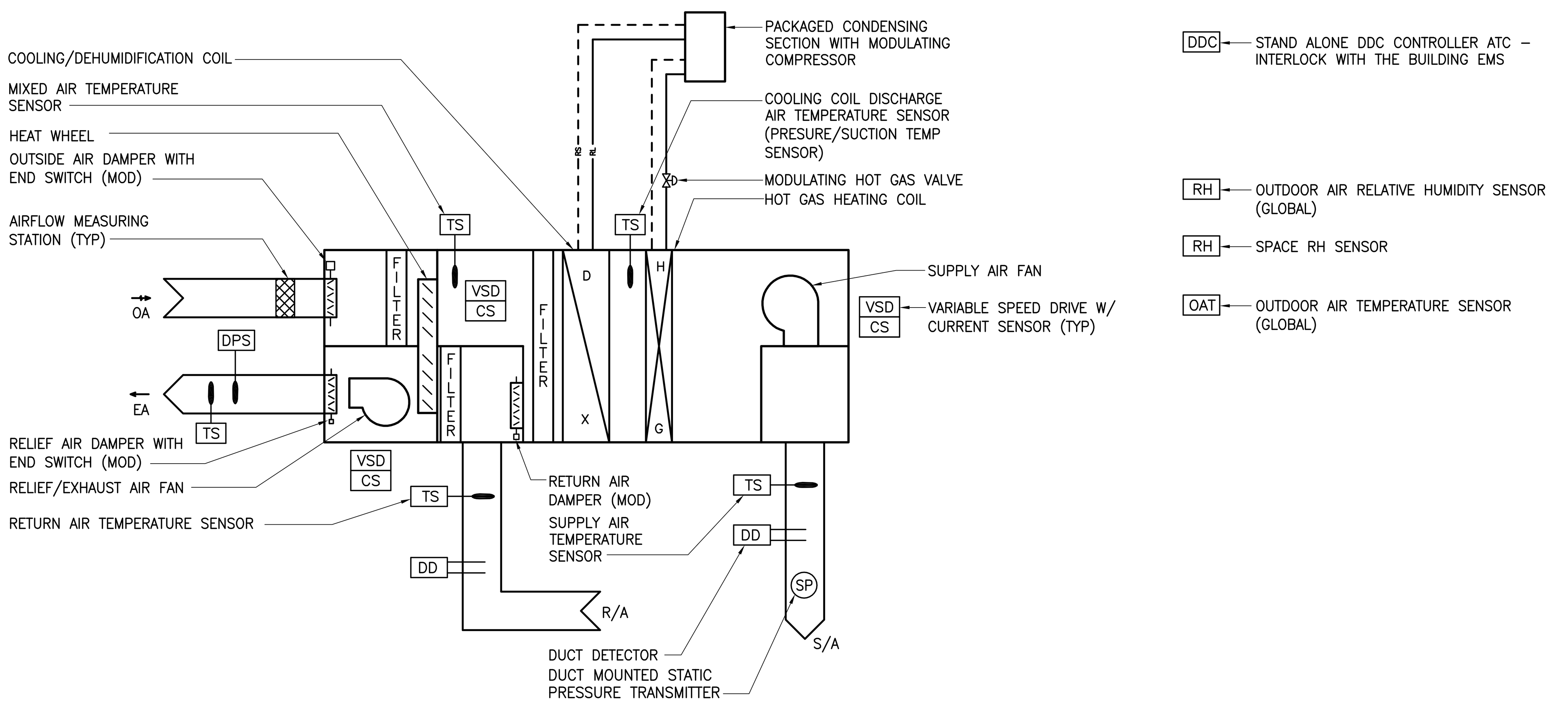
PLOT SCALE: NONE

FILENAME:

DATE: FEBRUARY 10, 2020

PROJECT
3309

M8.2



TYPICAL PACKAGED VARIABLE AIR VOLUME ROOFTOP UNIT W/ HEAT RECOVERY CONTROL DIAGRAM

SCALE: NONE

INPUT/OUTPUT SUMMARY FOR PACKAGED ROOFTOP UNIT

BUILDING SYSTEM:
RTU-3: CLASSROOMS
RTU-5: CLASSROOMS

INPUTS

DESCRIPTION	ANALOG: ROOM TEMPERATURE	ANALOG: DUCT TEMPERATURE	ANALOG: DEWPOINT TEMPERATURE	ANALOG: O.A. TEMPERATURE (GLOBAL)	ANALOG: CURRENT SENSOR/STATUS	ANALOG: STATIC PRESSURE	ANALOG: CO_2	ANALOG: RELATIVE HUMIDITY	ANALOG: POSITION INDICATION	BINARY: FLOW SWITCH	BINARY: SWITCH CLOSURE	BINARY: STATIC PRESSURE	BINARY: LOW TEMPERATURE CUTOUT	BINARY: END SWITCH	BINARY: DIFFERENTIAL PRESSURE SWITCH
AHU															
RETURN AIR		●						●							
DUCT DETECTORS (TYP)															
SUPPLY AIR		●													
SUPPLY AND RELIEF FANS					●										
OUTSIDE AIR (GLOBAL)				●				●							
RELIEF AIR		●	●												
SUPPLY AIR STATIC															
DAMPERS (TYP)														●	
SPACE TEMPERATURE	●														
HEAT WHEEL															
SPACE RH								●							

OUTPUTS

DESCRIPTION	ANALOG: MODULATING ACTUATOR	ANALOG: E/P TRANSDUCER	ANALOG: VARIABLE SPEED	ANALOG:	ANALOG:	ANALOG:	BINARY: CONTROL RELAY	BINARY: SOLENOID	BINARY: START/STOP	BINARY: 2-POSITION DAMPER MOD.	BINARY:	BINARY:	3-POINT FLOATING: ACTUATOR	3-POINT FLOATING: MERCURY RELAY	3-POINT FLOATING: FEED/BLEED SAV	3-POINT FLOATING:	3-POINT FLOATING:	3-POINT FLOATING:
AHU									●									
RETURN AIR																		
DUCT DETECTORS (TYP)																		
SUPPLY AIR																		
SUPPLY AND RELIEF FANS			●															
OUTSIDE AIR (GLOBAL)																		
RELIEF AIR																		
SUPPLY AIR STATIC																		
DAMPERS (TYP)										●								
SPACE TEMPERATURE																		
HEAT WHEEL																		
SPACE RH																		

ALARMS / FEATURES

DESCRIPTION	ALARMS: HIGH LIMIT	ALARMS: LOW LIMIT	ALARMS: RUN TIME	ALARMS: MAINTENANCE MESSAGE	ALARMS: SMOKE/FIRE	ALARMS: LIQUID DETECTION	FEATURES: SCHEDULED START/STOP	FEATURES: TEMPERATURE SETBACK/SETUP	FEATURES: OPTIMIZED START (ADAPT.)	FEATURES: DEMAND LIMITING	FEATURES: DUTY CYCLE	FEATURES: VENTILATION DELAY	FEATURES: ECONOMIZER CYCLE	FEATURES: H.W. RESET W/ O.A. TEMP.	FEATURES: VAV CONTROL	FEATURES: REMOTE READ/RESET	FEATURES: TENANT OVERRIDE	FEATURES: COLOR GRAPHICS	FEATURES: POINT LOCKOUT	FEATURES: TREND LOG	FEATURES: WARM UP/PULL DOWN
AHU			●	●		●	●	●	●		●							●			●
RETURN AIR																				●	
DUCT DETECTORS (TYP)					●																
SUPPLY AIR																●				●	
SUPPLY AND RELIEF FANS				●																	
OUTSIDE AIR (GLOBAL)																					
RELIEF AIR																					
SUPPLY AIR STATIC	●																				
DAMPERS (TYP)																					
SPACE TEMPERATURE																●				●	
HEAT WHEEL				●																●	
SPACE RH	●															●				●	

TYPICAL PACKAGED VARIABLE AIR VOLUME ROOFTOP UNIT W/ HEAT RECOVERY I/O POINTS LIST

1. **GENERAL:**

A. THE AIR HANDLING SYSTEM SHALL BE PROVIDED WITH FACTORY MOUNTED CONTROL SYSTEM. THE DIRECT DIGITAL CONTROL SYSTEM SHALL BE INTERFACED WITH THE BUILDING ENERGY MANAGEMENT SYSTEM (EMS). THE ATC CONTRACTOR SHALL INTERFACE WITH THE FACTORY MOUNTED DIRECT DIGITAL CONTROLLER AND ALL SENSORS, DEVICES AND CONTROLS NEEDED TO INTERFACE WITH THE AHU CONTROLLER. THE AIR HANDLING SYSTEM SHALL BE STARTED AND STOPPED THROUGH A MANUAL SYSTEM ON-OFF-AUTOMATIC (H-O-A) SWITCH. WHEN INDEXED TO "ON", THE SYSTEM SHALL BE ENERGIZED AND OPERATE UNDER ITS CONTROL SEQUENCE. WHEN INDEXED TO "OFF" THE SYSTEM SHALL DE-ENERGIZE. WHEN INDEXED TO THE "AUTOMATIC" POSITION THE SYSTEM SHALL BE STARTED AND STOPPED BY A SIGNAL FROM THE EMS THROUGH ITS BUILT IN CONTROLLER.

B. SUPPLY FAN SHALL BE LOCALLY OR REMOTELY STARTED AND STOPPED THROUGH THE MANUAL SYSTEM SWITCH OR BY A SIGNAL FROM THE EMS.

C. RELIEF FAN AND HEAT WHEEL SHALL BE INTERLOCKED TO OPERATE WHEN THE SUPPLY FAN OPERATES AND TO BE OFF WHEN THE SUPPLY FAN IS OFF.

D. WHEN THE UNIT SUPPLY FAN IS OFF, THE OUTSIDE AIR DAMPER SHALL CLOSE; CONDENSING UNIT SHALL BE DE-ENERGIZED; THE HEAT WHEEL SHALL BE DE-ENERGIZED; AND THE RELIEF AIR FAN SHALL BE OFF.

E. SUPPLY FAN, RELIEF FAN, CONDENSING UNIT AND HEAT WHEEL AND RELIEF FAN SHALL DE-ENERGIZE WHENEVER THE SUPPLY AIR TEMPERATURE DROPS BELOW THE LIMIT OF THE DISCHARGE AIR TEMPERATURE SET POINT OF 36°F (ADJUSTABLE THROUGH SOFTWARE) OR WHEN THE DUCT SMOKE DETECTORS SENSES PRODUCTS OF COMBUSTION OR WHEN THE HIGH DUCT STATIC PRESSURE SENSOR REACHES ITS SETPOINT (5" W.C. ADJUSTABLE).

F. WHEN THE AIR HANDLING UNIT IS OFF, THE HEAT WHEEL SHALL BE DE-ENERGIZED. WHENEVER THE AIR HANDLING SYSTEM IS ON AND IN THE OCCUPIED MODE, THE HEAT WHEEL AND THE ASSOCIATED RELIEF AIR FAN SHALL BE ENERGIZED AND OPERATE THROUGH ITS CONTROL SEQUENCE.

G. ALL SAFETIES AND ASSOCIATED CONTROLS SHALL REMAIN ACTIVE WHETHER THE SYSTEM IS LOCALLY OR REMOTELY CONTROLLED AND/OR MANUALLY OVERRIDDEN.

H. PROVIDE A REMOTE EMERGENCY SHUTDOWN SWITCH FOR SYSTEM SHUTDOWN. REMOTE SWITCH SHALL BE INSTALLED AT A LOCATION APPROVED BY THE FIRE INSPECTOR. SHUT-DOWN SHALL OCCUR FROM A SIGNAL THROUGH THE EMS.

I. THE UNIT SHALL OPERATE WITH ITS BUILD-IN CONTROL SEQUENCE WHEN COMMUNICATION IS LOST TO THE EMS. COORDINATE ALL CONTROLLER SETPOINTS WITH THE UNIT MANUFACTURER.

J. COORDINATE ALL CONTROL REQUIREMENTS WITH THE EXISTING VARIABLE AIR VOLUME TERMINAL CONTROL UNITS.

2. OCCUPIED CYCLE:

A. GENERAL:

1. WHEN THE SYSTEM IS PLACED IN OCCUPIED MODE, THE OUTSIDE AIR DAMPER AND RELIEF AIR DAMPER SHALL OPEN, THE RETURN AIR DAMPER SHALL CLOSE, AND THE SUPPLY FAN SHALL ENERGIZE WHEN THE OUTSIDE AIR DAMPER END SWITCH PROVES DAMPER IS IN OPEN POSITION. THE RELIEF FAN IS COMMANDED ON WHEN SUPPLY FAN RUN STATUS IS CONFIRMED AND THE RELIEF AIR DAMPER IS PROVED TO BE OPEN BY RELIEF AIR DAMPER END SWITCH.

B. WARM-UP/PULL DOWN:

1. THE UNIT CONTROL SHALL BE ARRANGED FOR A WINTER MORNING WARM-UP HEATING CYCLE AND SUMMER PULL DOWN COOLING CYCLE. DURING WARM-UP CYCLE THE OUTSIDE AIR DAMPER AND RELIEF AIR DAMPER SHALL REMAIN CLOSED, AND THE RETURN AIR DAMPER OPEN UNTIL THE SPACE TEMPERATURE RISES TO 70°F (ADJUSTABLE). SIMILARLY FOR PULL DOWN CYCLE, THE CONDENSING UNIT SHALL BE STAGED UNTIL THE SPACE TEMPERATURE DROPS TO 75°F (ADJUSTABLE). AT THAT POINT, THE OUTSIDE AIR DAMPER AND RELIEF AIR DAMPER SHALL OPEN, THE RETURN AIR DAMPER SHALL CLOSE, THE RELIEF AIR FAN AND HEAT RECOVERY WHEEL SHALL ENERGIZE AS PREVIOUSLY DESCRIBED, AND THE HEATING AND COOLING CONTROL SHALL BE PLACED UNDER THE CONTROL OF THE SPACE AIR TEMPERATURE SENSOR.

C. COOLING

1. COOLING IS ENABLED WHEN THE SUPPLY AIR TEMPERATURE IS ABOVE THE COOLING SET POINT OF 56°F (ADJUSTABLE AND RESETTABLE THROUGH SOFTWARE) AND OUTSIDE AIR TEMPERATURE IS ABOVE THE COOLING LOCKOUT SET POINT OF 55°F (ADJ). THE UNIT SHALL SEQUENCE THE COOLING STAGES AS REQUIRED TO MAINTAIN THE SUPPLY AIR TEMPERATURE SET POINT OF 58°F (ADJUSTABLE AND RESETTABLE THROUGH SOFTWARE), MODULATING THE COMPRESSOR FROM 15% TO 100% (OR THROUGH HOT GAS BYPASS). A STAGING DELAY ON AND DELAY OFF SHALL PREVENT EACH STAGE OF MECHANICAL COOLING FROM ENABLING AND DISABLING AT THE SAME TIME. IF THERE ARE MULTIPLE STAGES OF MECHANICAL COOLING AVAILABLE (I.E. MULTIPLE COMPRESSORS) EACH STAGE SHALL SEQUENTIALLY ENABLE BASED ON A TIME DELAY OF 180 SECONDS (ADJ) AND DISABLE BASED ON A MINIMUM DELAY OFF OF 180 SECONDS (ADJ). PROVIDE A 15 MINUTE (ADJ) ANTI-SHORT CYCLE TIME DELAY BETWEEN COMPRESSOR CYCLES.

E. HEATING:

1. HEATING IS CONTROLLED BY EXISTING TERMINAL CONTROL UNITS.

D. REFRIGERATION LOW LIMIT CONTROL:

1. IF THE EVAPORATIVE LEAVING COIL FACE TEMPERATURE FALLS BELOW THE A LOW LIMIT SETPOINT OF 40°F (ADJUSTABLE), THE MECHANICAL COOLING WILL REVERT FROM TEMPERATURE CONTROL TO SEQUENTIALLY DISABLE STAGES OF MECHANICAL COOLING TO MAINTAIN THE LOW LIMIT TEMPERATURE SET POINT.

2. IF THE EVAPORATIVE LEAVING COIL FACE TEMPERATURE FALLS BELOW 34°F (ADJUSTABLE), MECHANICAL COOLING WILL BE DISABLED. MECHANICAL COOLING WILL BE COMMANDED TO RUN UNTIL THE EVAPORATIVE LEAVING COIL FACE TEMPERATURE RISES ABOVE 55°F (ADJUSTABLE) AND THE COMPRESSOR MINIMUM OFF TIME HAS BEEN ACHIEVED.

E. DEHUMIDIFICATION CONTROL:

1. DEHUMIDIFICATION IS ENABLED WHEN THE SUPPLY FAN IS OPERATING, SPACE TEMPERATURE IS AT OR ABOVE COOLING SET POINT AND THE OUTSIDE AIR TEMPERATURE IS ABOVE THE COMPRESSOR LOCKOUT POINT. SPACE RELATIVE HUMIDITY REACHES ITS SETPOINT 60%RH SPACE (ADJUSTABLE THROUGH SOFTWARE). DEHUMIDIFICATION MODE SHALL BE DISABLED IF EITHER THE SPACE RELATIVE HUMIDITY FALLS 5% (ADJUSTABLE) BELOW THE SPACE DEHUMIDIFICATION SETPOINT OR THE SPACE TEMPERATURE FALLS 5°F (ADJUSTABLE) BELOW THE OCCUPIED SPACE COOLING SETPOINT TEMPERATURE.

2. WHEN THE UNIT IS IN DEHUMIDIFICATION MODE, THE COOLING SHALL REVERT FROM MAINTAINING SUPPLY AIR TEMPERATURE COOLING SET POINT TO MAINTAINING A CONSTANT LEAVING COIL FACE TEMPERATURE AS DETERMINED BY A REFRIGERATION SUCTION PRESSURE SENSOR LOCATED ON THE FIRST STAGE OF COOLING.

3. MODULATING HOT GAS REHEAT CONTROL-IF THE SUPPLY AIR TEMPERATURE FALLS BELOW ITS SETPOINT TEMPERATURE OF 70°F (ADJUSTABLE THROUGH SOFTWARE) DURING DEHUMIDIFICATION MODE AND THE FIRST STAGE OF MECHANICAL COOLING IS COMMANDED TO RUN, THE REFRIGERATION MODULATING GAS HEAT WILL BEGIN TO MODULATE OPEN UNTIL THE SUPPLY AIR TEMPERATURE SET POINT (74°F ADJUSTABLE THROUGH SOFTWARE) IS SATISFIED.

F. ECONOMIZER CONTROL:

1. THE UNIT SHALL BE PROVIDED WITH AN ENTHALPY ECONOMIZER CYCLE. THE ECONOMIZER CONTROL SHALL MODULATE THE OUTSIDE AIR AND RETURN AIR DAMPER TO MAINTAIN SPACE TEMPERATURE WHENEVER OUTSIDE AIR ENTHALPY IS LESS THAN RETURN AIR ENTHALPY. THE ECONOMIZER CYCLE SHALL BE LOCKED OUT WHEN THE UNIT IS OPERATING IN THE DEHUMIDIFICATION SEQUENCE OF OPERATION, OR IF MECHANICAL COOLING IS COMMANDED TO OPERATE.

2. AN ECONOMIZER LOW LIMIT WILL PREVENT THE MIXED AIR TEMPERATURE FROM FALLING BELOW THE ECONOMIZER LOW LIMIT SET POINT OF 45°F (ADJUSTABLE THROUGH SOFTWARE). IF THE MIXED AIR TEMPERATURE FALLS BELOW THE ECONOMIZER LOW LIMIT SET POINT AND MECHANICAL COOLING IS DISABLED, THE ECONOMIZER WILL MODULATE THE OUTSIDE AIR DAMPERS TO MAINTAIN THE ECONOMIZER LOW LIMIT SET POINT. DURING THIS MODE OF OPERATION, THE ECONOMIZER HAS THE ABILITY TO MODULATE THE OUTSIDE AIR DAMPER BELOW THE ECONOMIZER MINIMUM POSITION TO MAINTAIN THE ECONOMIZER LOW LIMIT TEMPERATURE SET POINT.

G. HEAT RECOVERY:

1. THE ROTARY AIR-TO-AIR HEAT RECOVERY WHEEL SHALL OPERATE WHEN OUTSIDE AIR IS REQUIRED. THE HEAT WHEEL CONTROLS SHALL INCLUDE FROST CONTROL, CLEANING CYCLE, AND ROTATIONAL DETECTOR.

2. THE HEAT WHEEL ACTS AS THE FIRST STAGE OF HEATING OR COOLING, WHEN THE UNIT IS PLACED IN OCCUPIED MODE, THE SUPPLY FAN RUN STATUS IS CONFIRMED AND THERE IS A CALL FOR MECHANICAL HEATING OF COOLING, THE HEAT WHEEL IS COMMANDED TO RUN. IF THE RELIEF AIR DEWPOINT TEMPERATURE FALLS BELOW ITS TEMPERATURE SETPOINT AND RELIEF FAN RUN STATUS IS CONFIRMED, THE HEAT WHEEL WILL OPERATE IN DEFROST MODE. DURING THIS MODE OF OPERATION, THE HEAT WHEEL WILL CYCLE ON FOR 30 MINUTES (ADJUSTABLE) AND THEN CYCLE OFF FOR 2 MINUTES (ADJUSTABLE) TO PREVENT ANY ICE BUILDUP. COORDINATE FROST CONTROL REQUIREMENTS WITH THE WHEEL MANUFACTURER.

3. THE ENTERING AND LEAVING AIR TEMPERATURES OF SUPPLY AND RELIEF AIR STREAMS SHALL BE MONITORED BY THE EMS. DURING INTERMEDIATE WEATHER CONDITIONS WHEN OUTSIDE AIR TEMPERATURES ARE BETWEEN 60°F (ADJUSTABLE THROUGH SOFTWARE) AND 80°F (ADJUSTABLE THROUGH SOFTWARE) THE WHEEL SHALL ROTATE AT MINIMUM SPEED (¼ RPM) TO MINIMIZE RECOVERY EFFECTIVENESS (I.E. ECONOMIZER MODE). WHENEVER THE OUTDOOR AIR TEMPERATURE IS WARMER THAN THE RETURN AIR TEMPERATURE THE HEAT WHEEL SHALL BE IN THE COOLING MODE AND OPERATE AT 100% SPEED. WHEN THE OUTSIDE IS LESS THAN 60°F THE WHEEL SPEED SHALL VARY TO MAINTAIN THE SUPPLY AIR TEMPERATURE SETPOINT.

H. OUTSIDE AIR:

1. THE SCHEDULED MINIMUM OUTSIDE AIR FLOW RATE SHALL BE MAINTAINED BY MODULATING THE OUTDOOR AIR DAMPER AND VERIFIED BY THE AIR FLOW MEASURING STATION.

I. FAN SPEED CONTROL:

1. SUPPLY AIR FAN SHALL BE CONTROLLED TO MAINTAIN SUPPLY AIR STATIC PRESSURE.

2. THE RELIEF AIR FAN SHALL VARY ITS FAN SPEED TO MAINTAIN A SLIGHTLY POSITIVE BUILDING PRESSURE THROUGH A DIFFERENTIAL PRESSURE CONTROLLER.

3. **UNOCCUPIED CYCLE:**

D. GENERAL:

1. THE CONDENSING UNIT SHALL DE-ENERGIZE AND AFTER A FIVE MINUTE TIME DELAY THE SUPPLY FAN, ASSOCIATED RELIEF FAN, AND HEAT RECOVERY WHEEL SHALL BE DE-ENERGIZED, OUTSIDE AIR DAMPER AND RELIEF AIR DAMPER SHALL BE CLOSED, THE HEATING WATER COIL CONTROL VALVE SHALL BE CLOSED AND RETURN AIR DAMPER SHALL BE OPEN. SPACE TEMPERATURE SENSOR SHALL BE RESET TO 55°F (ADJUSTABLE) IN THE HEATING MODE.

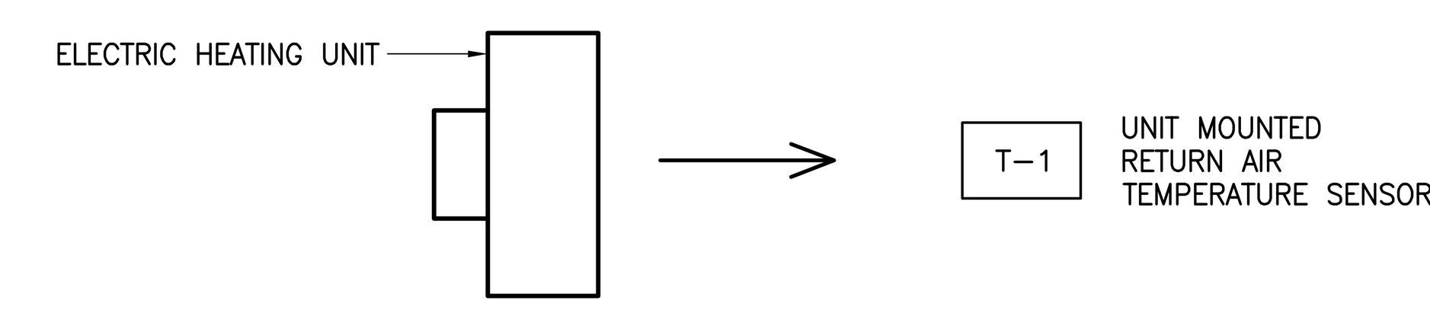
E. HEATING:

1. HEATING IS CONTROLLED BY EXISTING VARIABLE AIR VOLUME TERMINAL CONTROL UNITS.

C. MECHANICAL COOLING:

1. MECHANICAL COOLING IS DISABLED. IF THE UNIT IS MONITORING SPACE TEMPERATURE AND THE SPACE TEMPERATURE RISES ABOVE THE UNOCCUPIED COOLING TEMPERATURE SETPOINT OF 85°F (ADJUSTABLE THROUGH SOFTWARE), THE UNIT COOLING NIGHT CYCLE MODE IS ENABLED. ONCE THE SUPPLY FAN RUN STATUS IS CONFIRMED, THE UNIT OPERATES WITH THE ECONOMIZER DISABLED AND SEQUENTIALLY ENABLES 100% MECHANICAL COOLING CAPACITY. ONCE THE SPACE TEMPERATURE FALLS 2°F (ADJUSTABLE THROUGH SOFTWARE) BELOW THE SPACE UNOCCUPIED COOLING TEMPERATURE SETPOINT, THE COOLING NIGHT CYCLE MODE IS DISABLE. THE SUPPLY FAN IS DISABLED AFTER 120 SECONDS TIME DELAY TO ALLOW FOR MECHANICAL UNLOADING. THE UNOCCUPIED COOLING SEQUENCE OF OPERATION SHALL BE ENABLED/DISABLED BY A MANUAL SOFTWARE SELECTOR SWITCH THROUGH THE EMS.

TYPICAL PACKAGED VARIABLE AIR VOLUME ROOFTOP UNIT W/ HEAT RECOVERY SEQUENCE OF OPERATION – DDC (ELECTRIC/ELECTRONIC ACTUATION)



NOTE: ELECTRIC HEATING UNIT REFERS TO ANY ELECTRIC UNIT HEATER, ELECTRIC CABINET UNIT HEATER, ELECTRIC CEILING HEATER, ETC.

SEQUENCE OF OPERATION

A. GENERAL:

1. THE ELECTRIC HEATING UNITS SHALL BE PROVIDED WITH FACTORY PACKAGED CONTROLS.

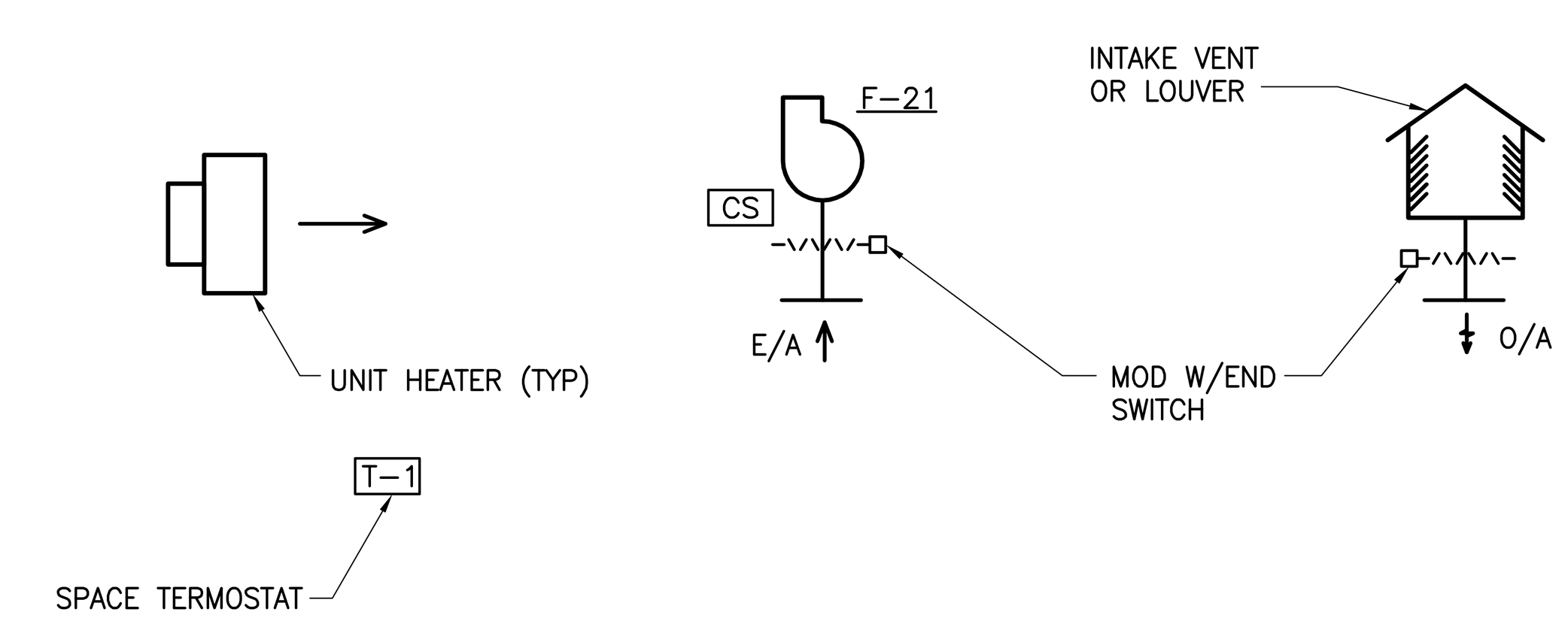
2. THE ATC SUBCONTRACTOR SHALL INSTALL FACTORY FURNISHED CONTROLS, INTERLOCK WIRING, THERMOSTATS, AND CONTROL WIRING FOR A COMPLETE AND OPERATIONAL SYSTEM.

B. SYSTEM OPERATION:

1. ON A FALL IN ROOM TEMPERATURE TO 70°F (ADJUSTABLE), THE RETURN AIR TEMPERATURE SENSOR, T-1, SHALL ENERGIZE THE ELECTRIC HEATING UNIT FANS AND HEATING ELEMENTS IN SEQUENCE TO MAINTAIN A SPACE TEMPERATURE OF 70°F (ADJUSTABLE). THE REVERSE SEQUENCE SHALL OCCUR UPON RISE IN SPACE TEMPERATURE ABOVE SET POINT.

2. FOR MECHANICAL/ELECTRICAL ROOMS AND SIMILAR NON-FINISHED SPACES SET SHALL BE 50°F (ADJUSTABLE).

TYPICAL ELECTRIC HEATING UNIT CONTROL DIAGRAM

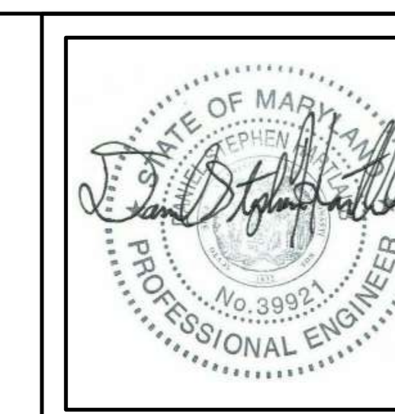


SEQUENCE OF OPERATION

1. ROOM THERMOSTAT, T-1, SHALL ON A RISE IN TEMPERATURE TO 90°F (ADJUSTABLE) OPEN OUTSIDE AIR DAMPER AND EXHAUST AIR DAMPER. WHEN DAMPERS ARE PROVEN OPEN BY THEIR END SWITCHES, THE ASSOCIATED OUTSIDE AIR AND EXHAUST AIR FANS SHALL ENERGIZE. ON A FALL IN TEMPERATURE TO 80°F (ADJUSTABLE), THE OUTSIDE AIR FAN AND EXHAUST AIR FAN SHALL BE DE-ENERGIZED AND OUTSIDE AIR DAMPER AND EXHAUST AIR DAMPER SHALL CLOSE.

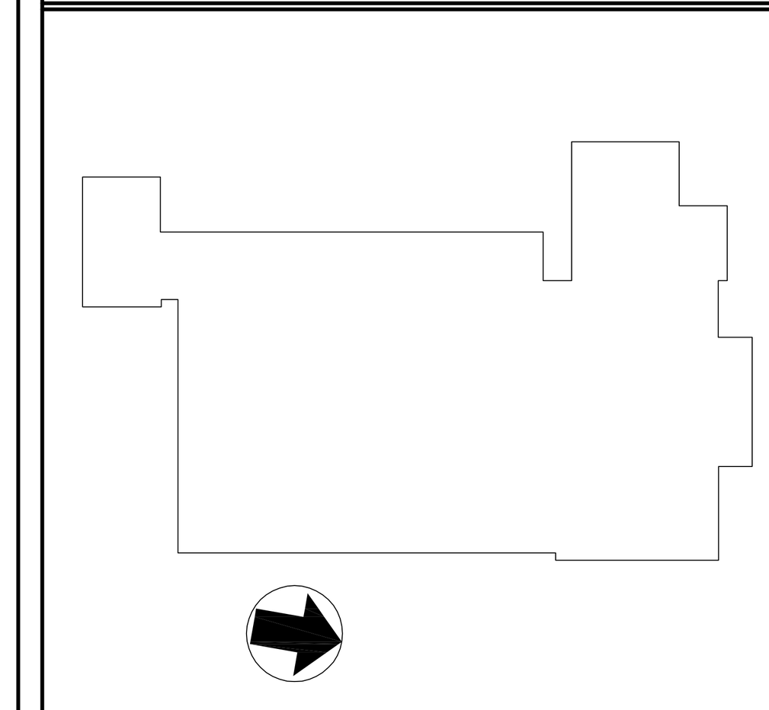
2. ON A FALL IN ROOM TEMPERATURE TO 60°F (ADJUSTABLE), ROOM THERMOSTAT T-1 (OR A SEPARATE THERMOSTAT) SHALL ENERGIZE THE UNIT HEATER. REFER TO UNIT HEATER SEQUENCE OF OPERATION. ON A RISE IN TEMPERATURE TO 65°F (ADJUSTABLE), THE UNIT HEATER FAN SHALL BE DE-ENERGIZED.

STORAGE ROOM VENTILATION CONTROL DIAGRAM (DDC)



PROFESSIONAL CERTIFICATION: I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO: 39921, EXPIRATION DATE 01/19/2021

KEY PLAN



REVISIONS

#	MM-DD-YR	NAME	DESCRIPTION OF CHANGES

CRABTREE ROHRBAUGH & ASSOCIATES - ARCHITECTS
100 WEST ROAD, SUITE 402
TOWSON MD 21204
410-528-0272
MECHANICSBURG, PENNSYLVANIA
CHARLOTTESVILLE, VIRGINIA
WHITE SULPHUR SPRINGS, WEST VIRGINIA
www.cra-architects.com

ADDITION AND RENOVATIONS OF GALENA ELEMENTARY SCHOOL

114 S MAIN STREET
GALENA, MD 21635

TYPICAL VAV RTU WITH HEAT RECOVERY CONTROL DIAGRAM

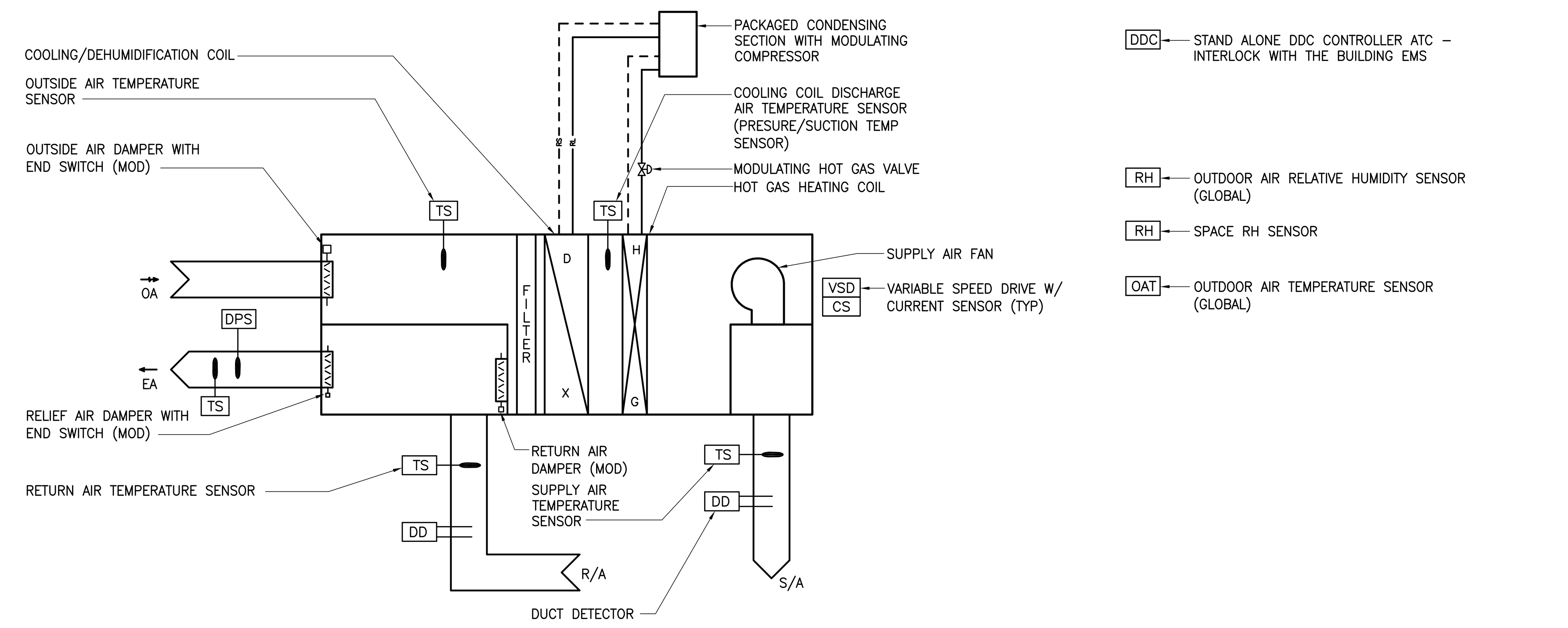
PLOT SCALE: NONE

FILENAME:

DATE: FEBRUARY 10, 2020

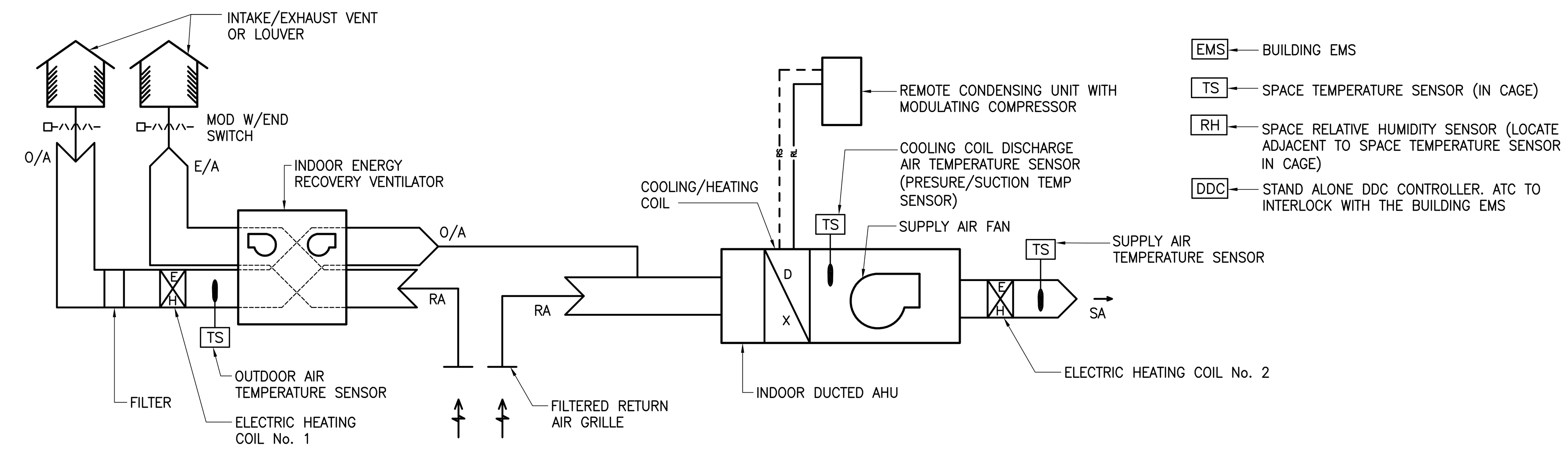
PROJECT
3309

M8.3



TYPICAL PACKAGED SINGLE ZONE VARIABLE AIR VOLUME ROOFTOP UNIT CONTROL DIAGRAM

SCALE: NONE



SPLIT AIR HANDLING UNIT WITH ENERGY RECOVERY CONTROL DIAGRAM – ALT. GC-1 (DDC-ELECTRIC/ELECTRONIC ACTUATION)

1. **GENERAL:**

A. THE AIR HANDLING SYSTEM SHALL BE PROVIDED WITH FACTORY MOUNTED CONTROL SYSTEM. THE DIRECT DIGITAL CONTROL SYSTEM SHALL BE INTERFACED WITH THE BUILDING ENERGY MANAGEMENT SYSTEM (EMS). THE ATC CONTRACTOR SHALL INTERFACE WITH THE FACTORY MOUNTED DIRECT DIGITAL CONTROLLER AND ALL SENSORS, DEVICES AND CONTROLS NEEDED TO INTERFACE WITH THE AHU CONTROLLER. THE AIR HANDLING SYSTEM SHALL BE STARTED AND STOPPED THROUGH A MANUAL SYSTEM ON-OFF-AUTOMATIC (H-O-A) SWITCH. WHEN INDEXED TO "ON", THE SYSTEM SHALL BE ENERGIZED AND OPERATE UNDER ITS CONTROL SEQUENCE. WHEN INDEXED TO "OFF" THE SYSTEM SHALL DE-ENERGIZE. WHEN INDEXED TO THE "AUTOMATIC" POSITION THE SYSTEM SHALL BE STARTED AND STOPPED BY A SIGNAL FROM THE EMS THROUGH ITS BUILT IN CONTROLLER.

B. SUPPLY FAN SHALL BE LOCALLY OR REMOTELY STARTED AND STOPPED THROUGH THE MANUAL SYSTEM SWITCH OR BY A SIGNAL FROM THE EMS.

C. WHEN THE UNIT SUPPLY FAN IS OFF, THE OUTSIDE AIR DAMPER SHALL CLOSE; AND CONDENSING UNIT SHALL BE DE-ENERGIZED.

D. SUPPLY FAN, AND CONDENSING UNIT DE-ENERGIZE WHENEVER THE SUPPLY AIR TEMPERATURE DROPS BELOW THE LIMIT OF THE DISCHARGE AIR TEMPERATURE SET POINT OF 36°F (ADJUSTABLE THROUGH SOFTWARE) OR WHEN THE DUCT SMOKE DETECTORS SENSES PRODUCTS OF COMBUSTION OR WHEN THE HIGH DUCT STATIC PRESSURE SENSOR REACHES ITS SETPOINT (5" W.C. ADJUSTABLE).

E. ALL SAFETIES AND ASSOCIATED CONTROLS SHALL REMAIN ACTIVE WHETHER THE SYSTEM IS LOCALLY OR REMOTELY CONTROLLED AND/OR MANUALLY OVERRIDDEN.

F. PROVIDE A REMOTE EMERGENCY SHUTDOWN SWITCH FOR SYSTEM SHUTDOWN. REMOTE SWITCH SHALL BE INSTALLED AT A LOCATION APPROVED BY THE FIRE INSPECTOR. SHUT-DOWN SHALL OCCUR FROM A SIGNAL THROUGH THE EMS.

G. THE UNIT SHALL OPERATE WITH ITS BUILD-IN CONTROL SEQUENCE WHEN COMMUNICATION IS LOST TO THE EMS. COORDINATE ALL CONTROLLER SETPOINTS WITH THE UNIT MANUFACTURER.

2. OCCUPIED CYCLE:

A. GENERAL:

1. WHEN THE SYSTEM IS PLACED IN OCCUPIED MODE, THE OUTSIDE AIR DAMPER AND RELIEF AIR DAMPER SHALL OPEN, THE RETURN AIR DAMPER SHALL CLOSE, AND THE SUPPLY FAN SHALL ENERGIZE WHEN THE OUTSIDE AIR DAMPER END SWITCH PROVES DAMPER IS IN OPEN POSITION.

B. PULL DOWN:

1. THE UNIT CONTROL SHALL BE ARRANGED FOR A SUMMER PULL DOWN COOLING CYCLE. DURING PULL DOWN CYCLE THE OUTSIDE AIR DAMPER AND RELIEF AIR DAMPER SHALL REMAIN CLOSED, THE RETURN AIR DAMPER OPEN, AND THE CONDENSING UNIT SHALL BE STAGED UNTIL THE SPACE TEMPERATURE DROPS TO 75°F (ADJUSTABLE). AT THAT POINT, THE OUTSIDE AIR DAMPER AND RELIEF AIR DAMPER SHALL OPEN, THE RETURN AIR DAMPER SHALL CLOSE, AND THE HEATING AND COOLING CONTROL SHALL BE PLACED UNDER THE CONTROL OF THE SPACE AIR TEMPERATURE SENSOR.

C. COOLING

1. COOLING IS ENABLED WHEN THE SPACE AIR TEMPERATURE IS ABOVE THE COOLING SET POINT OF 76°F (ADJUSTABLE AND RESETTABLE THROUGH SOFTWARE) AND OUTSIDE AIR TEMPERATURE IS ABOVE THE COOLING LOCKOUT SET POINT OF 55°F (ADJ). THE UNIT SHALL SEQUENCE THE COOLING STAGES AS REQUIRED TO MAINTAIN THE SPACE TEMPERATURE SET POINT OF 76°F (ADJUSTABLE AND RESETTABLE THROUGH SOFTWARE), MODULATING THE COMPRESSOR FROM 15% TO 100% (OR THROUGH HOT GAS BYPASS). A STAGING DELAY ON AND DELAY OFF SHALL PREVENT EACH STAGE OF MECHANICAL COOLING FROM ENABLING AND DISABLING AT THE SAME TIME. IF THERE ARE MULTIPLE STAGES OF MECHANICAL COOLING AVAILABLE (I.E. MULTIPLE COMPRESSORS) EACH STAGE SHALL SEQUENTIALLY ENABLE BASED ON A TIME DELAY OF 180 SECONDS (ADJ) AND DISABLE BASED ON A MINIMUM DELAY OFF OF 180 SECONDS (ADJ). PROVIDE A 15 MINUTE (ADJ) ANTI-SHORT CYCLE TIME DELAY BETWEEN COMPRESSOR CYCLES.

2. MODULATING HOT GAS REHEAT CONTROL – HOT GAS REHEAT SHALL MODULATE TO MAINTAIN DISCHARGE AIR TEMPERATURE OF 75°F (ADJUSTABLE THROUGH SOFTWARE).

D. REFRIGERATION LOW LIMIT CONTROL:

1. IF THE EVAPORATIVE LEAVING COIL FACE TEMPERATURE FALLS BELOW THE A LOW LIMIT SETPOINT OF 40°F (ADJUSTABLE), THE MECHANICAL COOLING WILL REVERT FROM TEMPERATURE CONTROL TO SEQUENTIALLY DISABLE STAGES OF MECHANICAL COOLING TO MAINTAIN THE LOW LIMIT TEMPERATURE SET POINT.

2. IF THE EVAPORATIVE LEAVING COIL FACE TEMPERATURE FALLS BELOW 34°F (ADJUSTABLE), MECHANICAL COOLING WILL BE DISABLED. MECHANICAL COOLING WILL BE COMMANDED TO RUN UNTIL THE EVAPORATIVE LEAVING COIL FACE TEMPERATURE RISES ABOVE 55°F (ADJUSTABLE) AND THE COMPRESSOR MINIMUM OFF TIME HAS BEEN ACHIEVED.

D. HEATING:

1. HEATING IS CONTROLLED BY EXISTING TERMINAL HEATING UNITS.

F. FAN SPEED CONTROL:
SUPPLY FAN UTILIZES DIRECT DRIVE FAN AND SHALL BE PROVIDED WITH A VARIABLE FREQUENCY DRIVE. THE VFD SHALL BE USED FOR BALANCING PURPOSES. THE FAN SPEED SHALL BE FIXED.

3. **UNOCCUPIED CYCLE:**

A. GENERAL:

1. THE CONDENSING UNIT SHALL DE-ENERGIZE AND AFTER A FIVE MINUTE TIME DELAY THE SUPPLY FAN, OUTSIDE AIR DAMPER AND RELIEF AIR DAMPER SHALL BE CLOSED, AND RETURN AIR DAMPER SHALL BE OPEN. SPACE TEMPERATURE SENSOR SHALL BE RESET TO 55°F (ADJUSTABLE) IN THE HEATING MODE.

B. HEATING:

1. HEATING IS CONTROLLED BY EXISTING TERMINAL HEATING UNITS.

C. MECHANICAL COOLING:

1. MECHANICAL COOLING IS DISABLED. IF THE UNIT IS MONITORING SPACE TEMPERATURE AND THE SPACE TEMPERATURE RISES ABOVE THE UNOCCUPIED COOLING TEMPERATURE SETPOINT OF 85°F (ADJUSTABLE THROUGH SOFTWARE), THE UNIT COOLING NIGHT CYCLE MODE IS ENABLED. ONCE THE SUPPLY FAN RUN STATUS IS CONFIRMED, THE UNIT OPERATES WITH THE ECONOMIZER DISABLED AND SEQUENTIALLY ENABLES 100% MECHANICAL COOLING CAPACITY. ONCE THE SPACE TEMPERATURE FALLS 2°F (ADJUSTABLE THROUGH SOFTWARE) BELOW THE SPACE UNOCCUPIED COOLING TEMPERATURE SETPOINT, THE COOLING NIGHT CYCLE MODE IS DISABLE. THE SUPPLY FAN IS DISABLED AFTER 120 SECONDS TIME DELAY TO ALLOW FOR MECHANICAL UNLOADING. THE UNOCCUPIED COOLING SEQUENCE OF OPERATION SHALL BE ENABLED/DISABLED BY A MANUAL SOFTWARE SELECTOR SWITCH THROUGH THE EMS.

TYPICAL PACKAGED SINGLE ZONE VARIABLE AIR VOLUME ROOFTOP UNIT SEQUENCE OF OPERATION – DDC (ELECTRIC/ELECTRONIC ACTUATION)

1. **GENERAL:**

A. THE AIR HANDLING SYSTEM SHALL BE PROVIDED WITH FACTORY MOUNTED CONTROL SYSTEM. THE DIRECT DIGITAL CONTROL SYSTEM SHALL BE INTERFACED WITH THE BUILDING ENERGY MANAGEMENT SYSTEM (EMS). THE ATC CONTRACTOR SHALL INTERFACE WITH THE FACTORY MOUNTED DIRECT DIGITAL CONTROLLER AND ALL SENSORS, DEVICES AND CONTROLS NEEDED TO INTERFACE WITH THE AHU CONTROLLER. THE AIR HANDLING SYSTEM SHALL BE STARTED AND STOPPED THROUGH A MANUAL SYSTEM ON-OFF-AUTOMATIC (H-O-A) SWITCH. WHEN INDEXED TO "ON", THE SYSTEM SHALL BE ENERGIZED AND OPERATE UNDER ITS CONTROL SEQUENCE. WHEN INDEXED TO "OFF" THE SYSTEM SHALL DE-ENERGIZE. WHEN INDEXED TO THE "AUTOMATIC" POSITION THE SYSTEM SHALL BE STARTED AND STOPPED BY A SIGNAL FROM THE EMS THROUGH ITS BUILT IN CONTROLLER.

B. SUPPLY FAN SHALL BE LOCALLY OR REMOTELY STARTED AND STOPPED THROUGH THE MANUAL SYSTEM SWITCH OR BY A SIGNAL FROM THE EMS.

C. WHEN THE UNIT SUPPLY FAN IS OFF, THE ENERGY RECOVERY UNIT SHALL BE OFF, THE OUTSIDE AIR DAMPER AND RELIEF AIR DAMPER SHALL CLOSE; THE HEATING COILS SHALL BE DE-ENERGIZED, AND CONDENSING UNIT SHALL BE DE-ENERGIZED.

D. SUPPLY FAN AND CONDENSING UNIT SHALL DE-ENERGIZE WHENEVER THE SUPPLY AIR TEMPERATURE DROPS BELOW THE LIMIT OF THE DISCHARGE AIR TEMPERATURE SET POINT OF 40°F (ADJUSTABLE THROUGH SOFTWARE)

E. ALL SAFETIES AND ASSOCIATED CONTROLS SHALL REMAIN ACTIVE WHETHER THE SYSTEM IS LOCALLY OR REMOTELY CONTROLLED AND/OR MANUALLY OVERRIDDEN.

F. PROVIDE A REMOTE EMERGENCY SHUTDOWN SWITCH FOR SYSTEM SHUTDOWN. REMOTE SWITCH SHALL BE INSTALLED AT A LOCATION APPROVED BY THE FIRE INSPECTOR. SHUT-DOWN SHALL OCCUR FROM A SIGNAL THROUGH THE EMS.

G. THE UNIT SHALL OPERATE WITH ITS BUILD-IN CONTROL SEQUENCE WHEN COMMUNICATION IS LOST TO THE EMS. COORDINATE ALL CONTROLLER SETPOINTS WITH THE UNIT MANUFACTURER.

H. THE ENERGY RECOVERY UNIT SHALL ONLY BE ENERGIZED WHEN THE ASSOCIATED AIR HANDLING UNIT IS IN AN OCCUPIED MODE OF OPERATION AND THE SUPPLY AIR FAN IS ENERGIZED.

2. **OCCUPIED CYCLE**

A. GENERAL:

WHEN THE SYSTEM IS PLACED IN OCCUPIED MODE, THE OUTSIDE AIR DAMPER SHALL OPEN, THE RELIEF AIR DAMPER SHALL OPEN, THE AHU SUPPLY FAN SHALL ENERGIZE. THE ENERGY RECOVERY UNIT SHALL BE ENERGIZED WITH THE AHU. HEATING COIL IN THE OUTDOOR AIR DUCT TO THE ENERGY RECOVERY UNIT SHALL BE ENERGIZED IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS FOR FREEZE PROTECTION.

B. COOLING:

1. COOLING IS ENABLED WHEN THE COOLING COIL DISCHARGE AIR TEMPERATURE IS ABOVE THE COOLING SET POINT OF 55°F (ADJUSTABLE AND RESETTABLE THROUGH SOFTWARE) AND OUTSIDE AIR TEMPERATURE IS ABOVE THE COOLING LOCKOUT SET POINT OF 55°F (ADJ). THE UNIT SHALL SEQUENCE THE COOLING STAGES AS REQUIRED TO MAINTAIN THE SPACE TEMPERATURE SET POINT OF 75°F (ADJUSTABLE AND RESETTABLE THROUGH SOFTWARE), MODULATING THE COMPRESSOR FROM 15% TO 100% (OR THROUGH HOT GAS BYPASS). A STAGING DELAY ON AND DELAY OFF SHALL PREVENT EACH STAGE OF MECHANICAL COOLING FROM ENABLING AND DISABLING AT THE SAME TIME. IF THERE ARE MULTIPLE STAGES OF MECHANICAL COOLING AVAILABLE (I.E. MULTIPLE COMPRESSORS) EACH STAGE SHALL SEQUENTIALLY ENABLE BASED ON A TIME DELAY OF 180 SECONDS (ADJ) AND DISABLE BASED ON A MINIMUM DELAY OFF OF 180 SECONDS (ADJ). PROVIDE A 15 MINUTE (ADJ) ANTI-SHORT CYCLE TIME DELAY BETWEEN COMPRESSOR CYCLES.

C. REFRIGERATION LOW LIMIT CONTROL:

1. IF THE EVAPORATIVE LEAVING COIL FACE TEMPERATURE FALLS BELOW THE A LOW LIMIT SETPOINT OF 40°F (ADJUSTABLE), THE MECHANICAL COOLING WILL REVERT FROM TEMPERATURE CONTROL TO SEQUENTIALLY DISABLE STAGES OF MECHANICAL COOLING TO MAINTAIN THE LOW LIMIT TEMPERATURE SET POINT.

2. IF THE EVAPORATIVE LEAVING COIL FACE TEMPERATURE FALLS BELOW 34°F (ADJUSTABLE), MECHANICAL COOLING WILL BE DISABLED. MECHANICAL COOLING WILL BE COMMANDED TO RUN UNTIL THE EVAPORATIVE LEAVING COIL FACE TEMPERATURE RISES ABOVE 55°F (ADJUSTABLE) AND THE COMPRESSOR MINIMUM OFF TIME HAS BEEN ACHIEVED.

D. DEHUMIDIFICATION CONTROL:

1. DEHUMIDIFICATION IS ENABLED WHEN THE SUPPLY FAN IS OPERATING, SPACE TEMPERATURE IS AT OR ABOVE COOLING SET POINT AND THE OUTSIDE AIR TEMPERATURE IS ABOVE THE COMPRESSOR LOCKOUT POINT. SPACE RELATIVE HUMIDITY REACHES ITS SETPOINT 60%RH SPACE (ADJUSTABLE THROUGH SOFTWARE). DEHUMIDIFICATION MODE SHALL BE DISABLED IF EITHER THE SPACE RELATIVE HUMIDITY FALLS 5% (ADJUSTABLE) BELOW THE SPACE DEHUMIDIFICATION SETPOINT OR THE SPACE TEMPERATURE FALLS 5°F (ADJUSTABLE) BELOW THE OCCUPIED SPACE COOLING SETPOINT TEMPERATURE.

2. WHEN THE UNIT IS IN DEHUMIDIFICATION MODE, THE COOLING SHALL REVERT FROM MAINTAINING SPACE TEMPERATURE COOLING SET POINT TO MAINTAINING A CONSTANT LEAVING COIL FACE TEMPERATURE AS DETERMINED BY A REFRIGERATION SUCTION PRESSURE SENSOR LOCATED ON THE FIRST STAGE OF COOLING.

3. THE SUPPLY AIR ELECTRIC HEATING COIL SHALL MODULATE TO MAINTAIN THE SPACE COOLING TEMPERATURE SET POINT.

E. HEATING:

1. THE DX HEAT PUMP SHALL BE THE FIRST STAGE OF HEATING. THE HEAT PUMP SHALL ENERGIZE AND MODULATE AS REQUIRED TO MAINTAIN THE SPACE TEMPERATURE SET POINT OF 70°F (ADJUSTABLE AND RESETTABLE THROUGH SOFTWARE).

2. IF THE HEAT PUMP IS NOT ABLE TO MAINTAIN THE REQUIRED DISCHARGE AIR TEMPERATURE, THE SUPPLY AIR ELECTRIC HEATING COIL (ECH-2) SHALL BE UTILIZED. THE SUPPLY AIR TEMPERATURE SENSOR SHALL MODULATE HEATING COIL (SCR CONTROL) TO MAINTAIN THE SPACE TEMPERATURE SET POINT OF 70°F (ADJUSTABLE AND RESETTABLE THROUGH SOFTWARE).

3. **UNOCCUPIED CYCLE**

A. GENERAL:

THE CONDENSING UNIT SHALL DE-ENERGIZE AND AFTER A FIVE MINUTE TIME DELAY THE SUPPLY FAN SHALL BE DE-ENERGIZED, THE HEATING COIL SHALL BE DE-ENERGIZED 30 SECONDS BEFORE THE FAN IS DE-ENERGIZED, AND THE OUTSIDE AIR DAMPER SHALL BE CLOSED AFTER FANS HAVE BEEN DE-ENERGIZED FOR 30 SECONDS (ADJUSTABLE THROUGH SOFTWARE). SPACE TEMPERATURE SENSOR SHALL BE RESET TO 55°F (ADJUSTABLE) IN THE HEATING MODE AND 85°F (ADJUSTABLE) IN THE COOLING MODE.

THE ENERGY RECOVERY VENTILATOR SHALL BE DE-ENERGIZED IN AN UN-OCCUPIED MODE OF OPERATION.

B. HEATING:

HEATING SETBACK TEMPERATURE SHALL BE MAINTAINED BY CYCLING THE FAN COIL UNITS AND ASSOCIATED CONDENSING UNIT WHEN ANY SPACE TEMPERATURE FALLS BELOW THE UNOCCUPIED SETPOINT OF 55°F (ADJUSTABLE).

C. MECHANICAL COOLING:

COOLING SETBACK TEMPERATURE SHALL BE MAINTAINED BY CYCLING THE FAN COIL UNITS AND ASSOCIATED CONDENSING UNIT WHEN THE SPACE TEMPERATURE RISES ABOVE THE UNOCCUPIED COOLING TEMPERATURE SETPOINT OF 85°F (ADJUSTABLE THROUGH SOFTWARE).

SPLIT DOAS UNIT SEQUENCE OF OPERATION – DDC – ALT. GC-1 (ELECTRIC/ELECTRONIC ACTUATION)

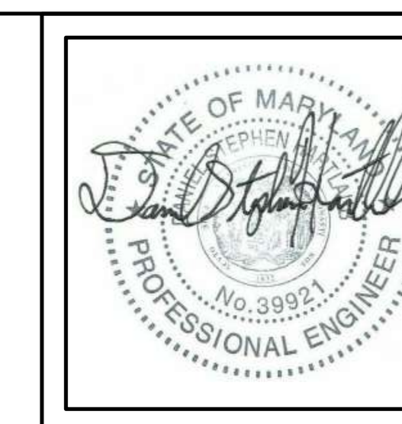
INPUT/OUTPUT SUMMARY FOR PACKAGED ROOFTOP UNIT

BUILDING SYSTEM: RTU-2: STORAGE	INPUTS															OUTPUTS																		ALARMS						FEATURES														
	ANALOG									BINARY						ANALOG						BINARY						3-POINT FLOATING																										
DESCRIPTION	ROOM TEMPERATURE	DUCT TEMPERATURE	DEWPOINT TEMPERATURE	O.A. TEMPERATURE (GLOBAL)	CURRENT SENSOR/STATUS	STATIC PRESSURE	CO_2	RELATIVE HUMIDITY	POSITION INDICATION	FLOW SWITCH	SWITCH CLOSURE	STATIC PRESSURE	LOW TEMPERATURE CUTOUT	END SWITCH	DIFFERENTIAL PRESSURE SWITCH	MODULATING ACTUATOR	E/P TRANSDUCER	VARIABLE SPEED				CONTROL RELAY	SOLENOID	START/STOP	2-POSITION DAMPER MOD.			ACTUATOR	MERCURY RELAY	FEED/BLEED SAV				HIGH LIMIT	LOW LIMIT	RUN TIME	MAINTENANCE MESSAGE	SMOKE/FIRE	LIQUID DETECTION	SCHEDULED START/STOP	TEMPERATURE SETBACK/SETUP	OPTIMIZED START (ADAPT.)	DEMAND LIMITING	DUTY CYCLE	VENTILATION DELAY	ECONOMIZER CYCLE	H.W. RESET W/ O.A. TEMP.	VAV CONTROL	REMOTE READ/RESET	TENANT OVERRIDE	COLOR GRAPHICS	POINT LOCKOUT	TREND LOG	WARM UP/PULL DOWN
AHU																								●												●	●		●	●	●	●		●							●			●
RETURN AIR		●						●																																													●	
DUCT DETECTORS (TYP)																																						●																
SUPPLY AIR		●																																															●				●	
SUPPLY FAN					●													●																			●																	
OUTSIDE AIR (GLOBAL)				●				●																																														
RELIEF AIR		●	●																																																			
SUPPLY AIR STATIC																																	●																					
DAMPERS (TYP)														●											●																													
SPACE TEMPERATURE	●																																																●				●	
SPACE RH								●																									●																●				●	

INPUT/OUTPUT SUMMARY FOR SPLIT DOAS UNIT

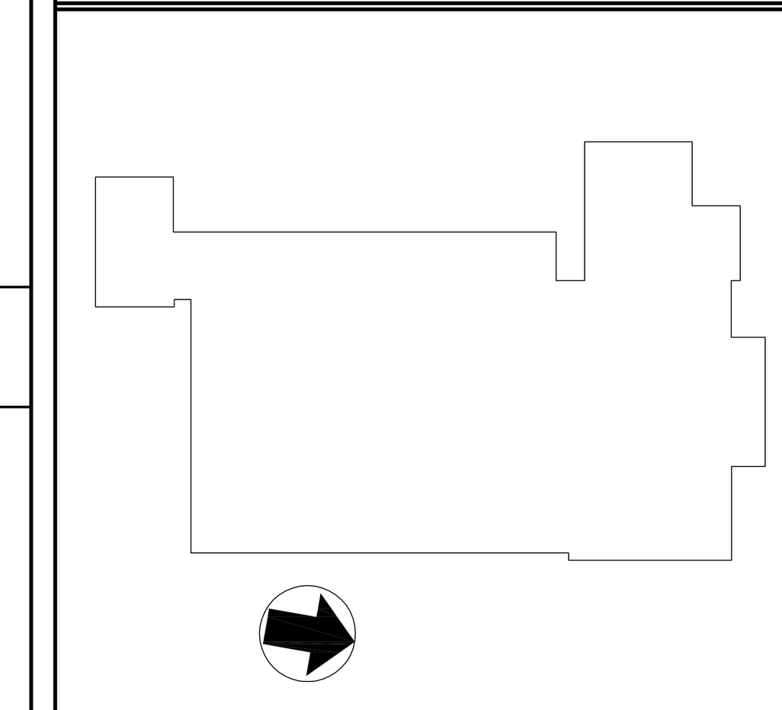
BUILDING SYSTEM: SS-3 (ALT. GC-1)	INPUTS															OUTPUTS																		ALARMS						FEATURES														
	ANALOG									BINARY						ANALOG						BINARY						3-POINT FLOATING																										
DESCRIPTION	ROOM TEMPERATURE	DUCT TEMPERATURE	DEWPOINT TEMPERATURE	O.A. TEMPERATURE (GLOBAL)	CURRENT SENSOR/STATUS	STATIC PRESSURE	CO_2	RELATIVE HUMIDITY	POSITION INDICATION	FLOW SWITCH	SWITCH CLOSURE	STATIC PRESSURE	LOW TEMPERATURE CUTOUT	END SWITCH	DIFFERENTIAL PRESSURE SWITCH	MODULATING CONTROL	E/P TRANSDUCER	VARIABLE SPEED				CONTROL RELAY	SOLENOID	START/STOP	2-POSITION DAMPER MOD.			ACTUATOR	MERCURY RELAY	FEED/BLEED SAV				HIGH LIMIT	LOW LIMIT	RUN TIME	MAINTENANCE MESSAGE	SMOKE/FIRE	LIQUID DETECTION	SCHEDULED START/STOP	TEMPERATURE SETBACK/SETUP	OPTIMIZED START (ADAPT.)	DEMAND LIMITING	DUTY CYCLE	VENTILATION DELAY	ECONOMIZER CYCLE	H.W. RESET W/ O.A. TEMP.	VAV CONTROL	REMOTE READ/RESET	TENANT OVERRIDE	COLOR GRAPHICS	POINT LOCKOUT	TREND LOG	WARM UP/PULL DOWN
AHU																								●																●		●									●			●
SPACE	●							●																																													●	
SUPPLY AIR		●																																															●				●	
SUPPLY FAN					●													●																			●																	
OUTSIDE AIR (GLOBAL)				●				●																																														
HEATING COIL		●								●						●																																					●	
COOLING COIL		●											●			●																			●																			
FREEZE STAT																																																						
OUTSIDE AIR DAMPER														●																																								
EXHAUST AIR FAN					●													●																			●																	
EXHAUST AIR DAMPER														●																																								
ENERGY RECOVERY UNIT		●			●																			●																●											●			

TYPICAL PACKAGED SINGLE ZONE VARIABLE AIR VOLUME ROOFTOP UNIT I/O POINTS LIST



PROFESSIONAL CERTIFICATION: I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO: 39921, EXPIRATION DATE 01/19/2021

KEY PLAN



REVISIONS

01	MM-DD-YR	NAME	DESCRIPTION OF CHANGES

CRABTREE ROHRBAUGH & ASSOCIATES - ARCHITECTS
www.cra-architects.com
100 WEST ROAD, SUITE 402
TOWSON MD 21204
410-528-0272
MECHANICSBURG, PENNSYLVANIA
CHARLOTTESVILLE, VIRGINIA
WHITE SULPHUR SPRINGS, WEST VIRGINIA

ADDITION AND RENOVATIONS OF GALENA ELEMENTARY SCHOOL

114 S MAIN STREET
GALENA, MD 21635

TYPICAL SZVAV RTU CONTROL DIAGRAM

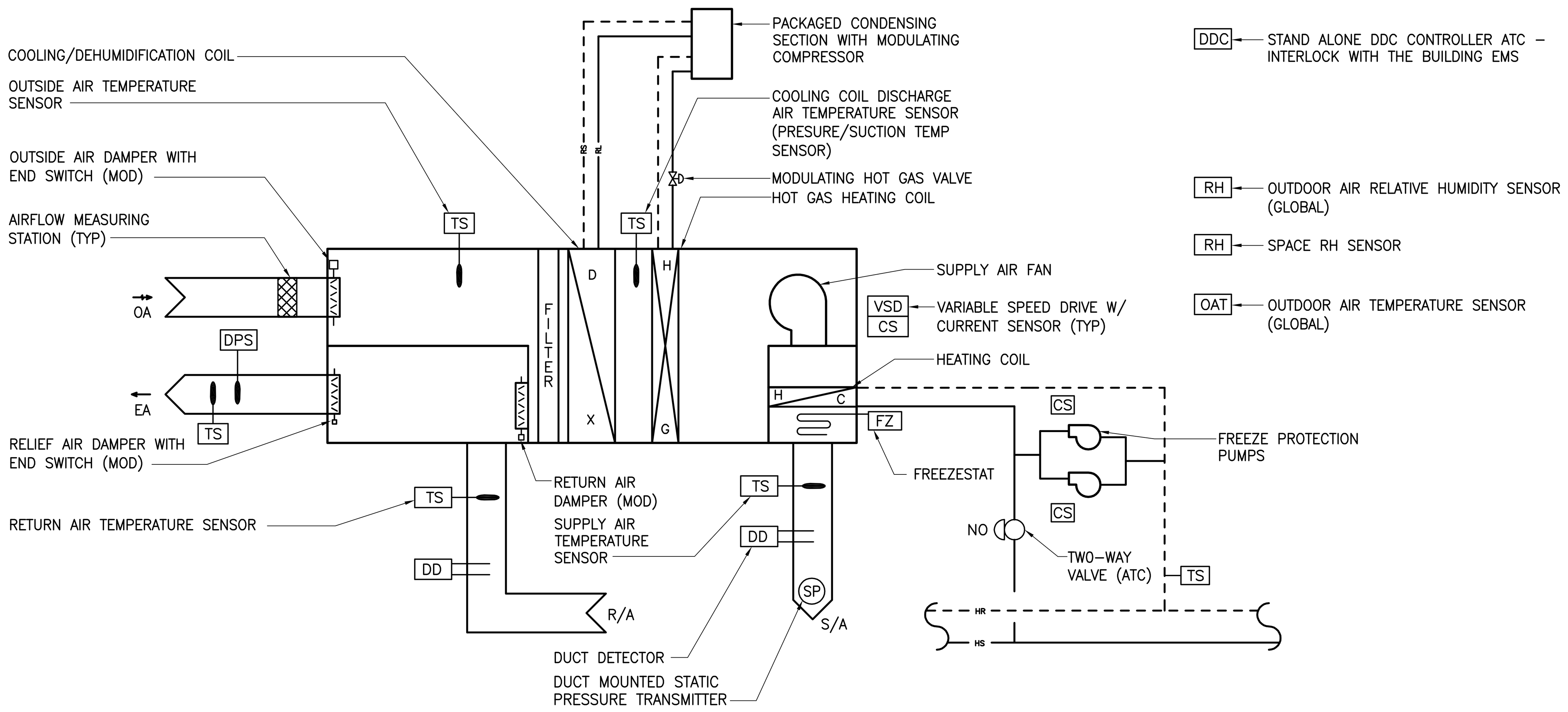
PLOT SCALE: NONE

FILENAME:

DATE: FEBRUARY 10, 2020

PROJECT 3309

M8.4



TYPICAL PACKAGED VARIABLE AIR VOLUME ROOFTOP UNIT W/ HW HEAT CONTROL DIAGRAM

SCALE: NONE

INPUT/OUTPUT SUMMARY FOR PACKAGED ROOFTOP UNIT

BUILDING SYSTEM:
RTU-6: ADMIN

DESCRIPTION	INPUTS – ANALOG									INPUTS – BINARY					
	ROOM TEMPERATURE	DUCT TEMPERATURE	DEWPOINT TEMPERATURE	O.A. TEMPERATURE (GLOBAL)	CURRENT SENSOR/STATUS	STATIC PRESSURE	CO_2	RELATIVE HUMIDITY	POSITION INDICATION	FLOW SWITCH	SWITCH CLOSURE	STATIC PRESSURE	LOW TEMPERATURE CUTOUT	END SWITCH	DIFFERENTIAL PRESSURE SWITCH
AHU															
RETURN AIR		●						●							
DUCT DETECTORS (TYP)															
SUPPLY AIR		●													
SUPPLY AND RELIEF FANS					●										
OUTSIDE AIR (GLOBAL)				●				●							
RELIEF AIR		●	●												
SUPPLY AIR STATIC															
DAMPERS (TYP)														●	
SPACE TEMPERATURE	●														
SPACE RH								●							
HW COIL										●					

DESCRIPTION	OUTPUTS – ANALOG						OUTPUTS – BINARY						OUTPUTS – 3-POINT FLOATING					
	MODULATING ACTUATOR	E/P TRANSDUCER	VARIABLE SPEED				CONTROL RELAY	SOLENOID	START/STOP	2-POSITION DAMPER MOD.			ACTUATOR	MERCURY RELAY	FEED/BLEED SAV			
AHU									●									
RETURN AIR																		
DUCT DETECTORS (TYP)																		
SUPPLY AIR																		
SUPPLY AND RELIEF FANS			●															
OUTSIDE AIR (GLOBAL)																		
RELIEF AIR																		
SUPPLY AIR STATIC																		
DAMPERS (TYP)										●								
SPACE TEMPERATURE																		
SPACE RH																		
HW COIL	●																	

DESCRIPTION	ALARMS						FEATURES														
	HIGH LIMIT	LOW LIMIT	RUN TIME	MAINTENANCE MESSAGE	SMOKE/FIRE	LIQUID DETECTION	SCHEDULED START/STOP	TEMPERATURE SETBACK/SETUP	OPTIMIZED START (ADAPT.)	DEMAND LIMITING	DUTY CYCLE	VENTILATION DELAY	ECONOMIZER CYCLE	H.W. RESET W/ O.A. TEMP.	VAV CONTROL	REMOTE READ/RESET	TENANT OVERRIDE	COLOR GRAPHICS	POINT LOCKOUT	TREND LOG	WARM UP/PULL DOWN
AHU			●	●		●	●	●	●		●							●			●
RETURN AIR																				●	
DUCT DETECTORS (TYP)					●																
SUPPLY AIR																●				●	
SUPPLY AND RELIEF FANS				●																	
OUTSIDE AIR (GLOBAL)																					
RELIEF AIR																					
SUPPLY AIR STATIC	●																				
DAMPERS (TYP)																					
SPACE TEMPERATURE																●				●	
SPACE RH	●															●				●	
HW COIL				●																	

TYPICAL PACKAGED VARIABLE AIR VOLUME ROOFTOP UNIT W/ HW HEAT I/O POINTS LIST

1. **GENERAL:**

A. THE AIR HANDLING SYSTEM SHALL BE PROVIDED WITH FACTORY MOUNTED CONTROL SYSTEM. THE DIRECT DIGITAL CONTROL SYSTEM SHALL BE INTERFACED WITH THE BUILDING ENERGY MANAGEMENT SYSTEM (EMS). THE ATC CONTRACTOR SHALL INTERFACE WITH THE FACTORY MOUNTED DIRECT DIGITAL CONTROLLER AND ALL SENSORS, DEVICES AND CONTROLS NEEDED TO INTERFACE WITH THE AHU CONTROLLER. THE AIR HANDLING SYSTEM SHALL BE STARTED AND STOPPED THROUGH A MANUAL SYSTEM ON-OFF-AUTOMATIC (H-O-A) SWITCH. WHEN INDEXED TO "ON", THE SYSTEM SHALL BE ENERGIZED AND OPERATE UNDER ITS CONTROL SEQUENCE. WHEN INDEXED TO "OFF" THE SYSTEM SHALL DE-ENERGIZE. WHEN INDEXED TO THE "AUTOMATIC" POSITION THE SYSTEM SHALL BE STARTED AND STOPPED BY A SIGNAL FROM THE EMS THROUGH ITS BUILT IN CONTROLLER.

B. SUPPLY FAN SHALL BE LOCALLY OR REMOTELY STARTED AND STOPPED THROUGH THE MANUAL SYSTEM SWITCH OR BY A SIGNAL FROM THE EMS.

C. RELIEF FAN AND HEAT WHEEL SHALL BE INTERLOCKED TO OPERATE WHEN THE SUPPLY FAN OPERATES AND TO BE OFF WHEN THE SUPPLY FAN IS OFF.

D. WHEN THE UNIT SUPPLY FAN IS OFF, THE OUTSIDE AIR DAMPER SHALL CLOSE; CONDENSING UNIT SHALL BE DE-ENERGIZED; THE HEAT WHEEL SHALL BE DE-ENERGIZED; AND THE RELIEF AIR FAN SHALL BE OFF.

E. SUPPLY FAN, RELIEF FAN, CONDENSING UNIT AND HEAT WHEEL AND RELIEF FAN SHALL DE-ENERGIZE WHENEVER THE SUPPLY AIR TEMPERATURE DROPS BELOW THE LIMIT OF THE DISCHARGE AIR TEMPERATURE SET POINT OF 36°F (ADJUSTABLE THROUGH SOFTWARE) OR WHEN THE DUCT SMOKE DETECTORS SENSES PRODUCTS OF COMBUSTION OR WHEN THE HIGH DUCT STATIC PRESSURE SENSOR REACHES ITS SETPOINT (5" W.C. ADJUSTABLE).

F. WHEN THE AIR HANDLING UNIT IS OFF, THE HEAT WHEEL SHALL BE DE-ENERGIZED. WHENEVER THE AIR HANDLING SYSTEM IS ON AND IN THE OCCUPIED MODE, THE HEAT WHEEL AND THE ASSOCIATED RELIEF AIR FAN SHALL BE ENERGIZED AND OPERATE THROUGH ITS CONTROL SEQUENCE.

G. ALL SAFETIES AND ASSOCIATED CONTROLS SHALL REMAIN ACTIVE WHETHER THE SYSTEM IS LOCALLY OR REMOTELY CONTROLLED AND/OR MANUALLY OVERRIDDEN.

H. PROVIDE A REMOTE EMERGENCY SHUTDOWN SWITCH FOR SYSTEM SHUTDOWN. REMOTE SWITCH SHALL BE INSTALLED AT A LOCATION APPROVED BY THE FIRE INSPECTOR. SHUT-DOWN SHALL OCCUR FROM A SIGNAL THROUGH THE EMS.

I. THE UNIT SHALL OPERATE WITH ITS BUILD-IN CONTROL SEQUENCE WHEN COMMUNICATION IS LOST TO THE EMS. COORDINATE ALL CONTROLLER SETPOINTS WITH THE UNIT MANUFACTURER.

J. COORDINATE ALL CONTROL REQUIREMENTS WITH THE EXISTING VARIABLE AIR VOLUME TERMINAL CONTROL UNITS.

2. OCCUPIED CYCLE:

A. GENERAL:

1. WHEN THE SYSTEM IS PLACED IN OCCUPIED MODE, THE OUTSIDE AIR DAMPER AND RELIEF AIR DAMPER SHALL OPEN, THE RETURN AIR DAMPER SHALL CLOSE, AND THE SUPPLY FAN SHALL ENERGIZE WHEN THE OUTSIDE AIR DAMPER END SWITCH PROVES DAMPER IS IN OPEN POSITION. THE RELIEF FAN IS COMMANDED ON WHEN SUPPLY FAN RUN STATUS IS CONFIRMED AND THE RELIEF AIR DAMPER IS PROVED TO BE OPEN BY RELIEF AIR DAMPER END SWITCH.

B. WARM-UP/PULL DOWN:

1. THE UNIT CONTROL SHALL BE ARRANGED FOR A WINTER MORNING WARM-UP HEATING CYCLE AND SUMMER PULL DOWN COOLING CYCLE. DURING WARM-UP CYCLE THE OUTSIDE AIR DAMPER AND RELIEF AIR DAMPER SHALL REMAIN CLOSED, AND THE RETURN AIR DAMPER OPEN UNTIL THE SPACE TEMPERATURE RISES TO 70°F (ADJUSTABLE). SIMILARLY FOR PULL DOWN CYCLE, THE CONDENSING UNIT SHALL BE STAGED UNTIL THE SPACE TEMPERATURE DROPS TO 75°F (ADJUSTABLE). AT THAT POINT, THE OUTSIDE AIR DAMPER AND RELIEF AIR DAMPER SHALL OPEN, THE RETURN AIR DAMPER SHALL CLOSE, THE RELIEF AIR FAN AND HEAT RECOVERY WHEEL SHALL ENERGIZE AS PREVIOUSLY DESCRIBED, AND THE HEATING AND COOLING CONTROL SHALL BE PLACED UNDER THE CONTROL OF THE SPACE AIR TEMPERATURE SENSOR.

C. COOLING

1. COOLING IS ENABLED WHEN THE SUPPLY AIR TEMPERATURE IS ABOVE THE COOLING SET POINT OF 56°F (ADJUSTABLE AND RESETTABLE THROUGH SOFTWARE) AND OUTSIDE AIR TEMPERATURE IS ABOVE THE COOLING LOCKOUT SET POINT OF 55°F (ADJ). THE UNIT SHALL SEQUENCE THE COOLING STAGES AS REQUIRED TO MAINTAIN THE SUPPLY AIR TEMPERATURE SET POINT OF 58°F (ADJUSTABLE AND RESETTABLE THROUGH SOFTWARE), MODULATING THE COMPRESSOR FROM 15% TO 100% (OR THROUGH HOT GAS BYPASS). A STAGING DELAY ON AND DELAY OFF SHALL PREVENT EACH STAGE OF MECHANICAL COOLING FROM ENABLING AND DISABLING AT THE SAME TIME. IF THERE ARE MULTIPLE STAGES OF MECHANICAL COOLING AVAILABLE (I.E. MULTIPLE COMPRESSORS) EACH STAGE SHALL SEQUENTIALLY ENABLE BASED ON A TIME DELAY OF 180 SECONDS (ADJ) AND DISABLE BASED ON A MINIMUM DELAY OFF OF 180 SECONDS (ADJ). PROVIDE A 15 MINUTE (ADJ) ANTI-SHORT CYCLE TIME DELAY BETWEEN COMPRESSOR CYCLES.

E. HEATING:

1. SUPPLY AIR TEMPERATURE SENSOR SHALL MODULATE HOT WATER HEATING COIL VALVE TO MAINTAIN THE SUPPLY AIR TEMPERATURE SETPOINT OF 53°F (ADJUSTABLE AND RESETTABLE THROUGH SOFTWARE.)

2. WHEN THE MIXED AIR TEMPERATURE IS BELOW 38°F (ADJUSTABLE THROUGH SOFTWARE) THE LEAD FREEZE PROTECTION PUMP SHALL BE ENERGIZED TO RUN CONTINUOUSLY WHETHER THE SUPPLY FAN IS ON OR OFF. WHEN THE MIXED AIR TEMPERATURE IS ABOVE 40°F (ADJUSTABLE THROUGH SOFTWARE), THE HEATING COIL PUMP SHALL BE DE-ENERGIZED. EACH SET OF HEATING COIL PUMPS SHALL BE PROVIDED WITH LEAD/LAG CONTROL SUCH THAT THE LEAD PUMP RUNS CONTINUOUSLY AS SPECIFIED ABOVE. IN THE EVENT OF A LEAD PUMP FAILURE (AS SENSED BY CURRENT SENSOR), THE LAG PUMP SHALL AUTOMATICALLY START AFTER A 15 SECOND TIME DELAY. PROVIDE THROUGH SOFTWARE TO AUTOMATICALLY ALTERNATE LEAD/LAG CONTROL OF HEATING COIL PUMPS BASED ON PUMP RUN TIME. OR THROUGH TIME OF DAY SCHEDULING (I.E. DAILY, WEEKLY, BI-WEEKLY ETC).

D. REFRIGERATION LOW LIMIT CONTROL:

1. IF THE EVAPORATIVE LEAVING COIL FACE TEMPERATURE FALLS BELOW THE A LOW LIMIT SETPOINT OF 40°F (ADJUSTABLE), THE MECHANICAL COOLING WILL REVERT FROM TEMPERATURE CONTROL TO SEQUENTIALLY DISABLE STAGES OF MECHANICAL COOLING TO MAINTAIN THE LOW LIMIT TEMPERATURE SET POINT.

2. IF THE EVAPORATIVE LEAVING COIL FACE TEMPERATURE FALLS BELOW 34°F (ADJUSTABLE), MECHANICAL COOLING WILL BE DISABLED. MECHANICAL COOLING WILL BE COMMANDED TO RUN UNTIL THE EVAPORATIVE LEAVING COIL FACE TEMPERATURE RISES ABOVE 55°F (ADJUSTABLE) AND THE COMPRESSOR MINIMUM OFF TIME HAS BEEN ACHIEVED.

E. DEHUMIDIFICATION CONTROL:

1. DEHUMIDIFICATION IS ENABLED WHEN THE SUPPLY FAN IS OPERATING, SPACE TEMPERATURE IS AT OR ABOVE COOLING SET POINT AND THE OUTSIDE AIR TEMPERATURE IS ABOVE THE COMPRESSOR LOCKOUT POINT. SPACE RELATIVE HUMIDITY REACHES ITS SETPOINT 60%RH SPACE (ADJUSTABLE THROUGH SOFTWARE). DEHUMIDIFICATION MODE SHALL BE DISABLED IF EITHER THE SPACE RELATIVE HUMIDITY FALLS 5% (ADJUSTABLE) BELOW THE SPACE DEHUMIDIFICATION SETPOINT OR THE SPACE TEMPERATURE FALLS 5°F (ADJUSTABLE) BELOW THE OCCUPIED SPACE COOLING SETPOINT TEMPERATURE.

2. WHEN THE UNIT IS IN DEHUMIDIFICATION MODE, THE COOLING SHALL REVERT FROM MAINTAINING SUPPLY AIR TEMPERATURE COOLING SET POINT TO MAINTAINING A CONSTANT LEAVING COIL FACE TEMPERATURE AS DETERMINED BY A REFRIGERATION SUCTION PRESSURE SENSOR LOCATED ON THE FIRST STAGE OF COOLING.

3. MODULATING HOT GAS REHEAT CONTROL-IF THE SUPPLY AIR TEMPERATURE FALLS BELOW ITS SETPOINT TEMPERATURE OF 70°F (ADJUSTABLE THROUGH SOFTWARE) DURING DEHUMIDIFICATION MODE AND THE FIRST STAGE OF MECHANICAL COOLING IS COMMANDED TO RUN, THE REFRIGERATION MODULATING GAS HEAT WILL BEGIN TO MODULATE OPEN UNTIL THE SUPPLY AIR TEMPERATURE SET POINT (74°F ADJUSTABLE THROUGH SOFTWARE) IS SATISFIED.

F. ECONOMIZER CONTROL:

1. THE UNIT SHALL BE PROVIDED WITH AN ENTHALPY ECONOMIZER CYCLE. THE ECONOMIZER CONTROL SHALL MODULATE THE OUTSIDE AIR AND RETURN AIR DAMPER TO MAINTAIN SPACE TEMPERATURE WHENEVER OUTSIDE AIR ENTHALPY IS LESS THAN RETURN AIR ENTHALPY. THE ECONOMIZER CYCLE SHALL BE LOCKED OUT WHEN THE UNIT IS OPERATING IN THE DEHUMIDIFICATION SEQUENCE OF OPERATION, OR IF MECHANICAL COOLING IS COMMANDED TO OPERATE.

2. AN ECONOMIZER LOW LIMIT WILL PREVENT THE MIXED AIR TEMPERATURE FROM FALLING BELOW THE ECONOMIZER LOW LIMIT SET POINT OF 45°F (ADJUSTABLE THROUGH SOFTWARE). IF THE MIXED AIR TEMPERATURE FALLS BELOW THE ECONOMIZER LOW LIMIT SET POINT AND MECHANICAL COOLING IS DISABLED, THE ECONOMIZER WILL MODULATE THE OUTSIDE AIR DAMPERS TO MAINTAIN THE ECONOMIZER LOW LIMIT SET POINT. DURING THIS MODE OF OPERATION, THE ECONOMIZER HAS THE ABILITY TO MODULATE THE OUTSIDE AIR DAMPER BELOW THE ECONOMIZER MINIMUM POSITION TO MAINTAIN THE ECONOMIZER LOW LIMIT TEMPERATURE SET POINT.

G. HEAT RECOVERY:

1. THE ROTARY AIR-TO-AIR HEAT RECOVERY WHEEL SHALL OPERATE WHEN OUTSIDE AIR IS REQUIRED. THE HEAT WHEEL CONTROLS SHALL INCLUDE FROST CONTROL, CLEANING CYCLE, AND ROTATIONAL DETECTOR.

2. THE HEAT WHEEL ACTS AS THE FIRST STAGE OF HEATING OR COOLING, WHEN THE UNIT IS PLACED IN OCCUPIED MODE, THE SUPPLY FAN RUN STATUS IS CONFIRMED AND THERE IS A CALL FOR MECHANICAL HEATING OF COOLING, THE HEAT WHEEL IS COMMANDED TO RUN. IF THE RELIEF AIR DEWPOINT TEMPERATURE FALLS BELOW ITS TEMPERATURE SETPOINT AND RELIEF FAN RUN STATUS IS CONFIRMED, THE HEAT WHEEL WILL OPERATE IN DEFROST MODE. DURING THIS MODE OF OPERATION, THE HEAT WHEEL WILL CYCLE ON FOR 30 MINUTES (ADJUSTABLE) AND THEN CYCLE OFF FOR 2 MINUTES (ADJUSTABLE) TO PREVENT ANY ICE BUILDUP. COORDINATE FROST CONTROL REQUIREMENTS WITH THE WHEEL MANUFACTURER.

3. THE ENTERING AND LEAVING AIR TEMPERATURES OF SUPPLY AND RELIEF AIR STREAMS SHALL BE MONITORED BY THE EMS. DURING INTERMEDIATE WEATHER CONDITIONS WHEN OUTSIDE AIR TEMPERATURES ARE BETWEEN 60°F (ADJUSTABLE THROUGH SOFTWARE) AND 80°F (ADJUSTABLE THROUGH SOFTWARE) THE WHEEL SHALL ROTATE AT MINIMUM SPEED (1/4 RPM) TO MINIMIZE RECOVERY EFFECTIVENESS (I.E. ECONOMIZER MODE). WHENEVER THE OUTDOOR AIR TEMPERATURE IS WARMER THAN THE RETURN AIR TEMPERATURE THE HEAT WHEEL SHALL BE IN THE COOLING MODE AND OPERATE AT 100% SPEED. WHEN THE OUTSIDE IS LESS THAN 60°F THE WHEEL SPEED SHALL VARY TO MAINTAIN THE SUPPLY AIR TEMPERATURE SETPOINT.

H. OUTSIDE AIR:

1. THE SCHEDULED MINIMUM OUTSIDE AIR FLOW RATE SHALL BE MAINTAINED BY MODULATING THE OUTDOOR AIR DAMPER AND VERIFIED BY THE AIR FLOW MEASURING STATION.

I. FAN SPEED CONTROL:

1. SUPPLY AIR FAN SHALL BE CONTROLLED TO MAINTAIN SUPPLY AIR STATIC PRESSURE.

2. THE RELIEF AIR FAN SHALL VARY ITS FAN SPEED TO MAINTAIN A SLIGHTLY POSITIVE BUILDING PRESSURE THROUGH A DIFFERENTIAL PRESSURE CONTROLLER.

3. **UNOCCUPIED CYCLE:**

D. GENERAL:

1. THE CONDENSING UNIT SHALL DE-ENERGIZE AND AFTER A FIVE MINUTE TIME DELAY THE SUPPLY FAN, ASSOCIATED RELIEF FAN, AND HEAT RECOVERY WHEEL SHALL BE DE-ENERGIZED, OUTSIDE AIR DAMPER AND RELIEF AIR DAMPER SHALL BE CLOSED, THE HEATING WATER COIL CONTROL VALVE SHALL BE CLOSED AND RETURN AIR DAMPER SHALL BE OPEN. SPACE TEMPERATURE SENSOR SHALL BE RESET TO 55°F (ADJUSTABLE) IN THE HEATING MODE.

E. HEATING:

1. HEATING SETBACK TEMPERATURE SHALL BE MAINTAINED BY CYCLING THE SUPPLY FAN AS RECIRCULATING UNIT HEATER WHEN ANY SPACE TEMPERATURE FALLS BELOW THE UNOCCUPIED SETPOINT OF 55°F (ADJUSTABLE), THE SUPPLY FAN SHALL START AND FULL HEATING SHALL BE ENABLED. HEATING IS DISABLED WHEN SPACE TEMPERATURE REACHES 2°F ABOVE SPACE TEMPERATURE SETPOINT. THE SUPPLY FAN SHALL DE-ENERGIZE AFTER THE TIME DELAY TIMES OUT.

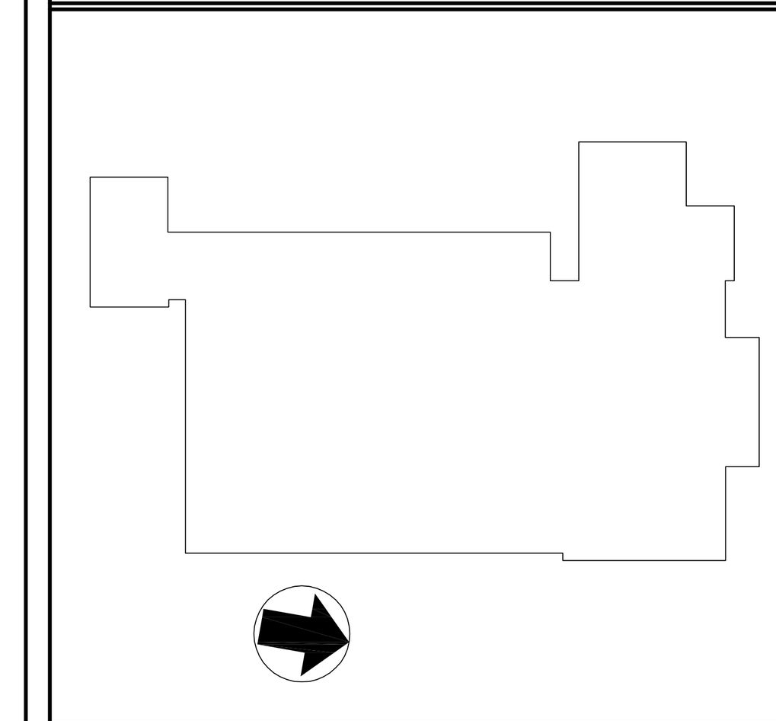
C. MECHANICAL COOLING:

1. MECHANICAL COOLING IS DISABLED. IF THE UNIT IS MONITORING SPACE TEMPERATURE AND THE SPACE TEMPERATURE RISES ABOVE THE UNOCCUPIED COOLING TEMPERATURE SETPOINT OF 85°F (ADJUSTABLE THROUGH SOFTWARE), THE UNIT COOLING NIGHT CYCLE MODE IS ENABLED. ONCE THE SUPPLY FAN RUN STATUS IS CONFIRMED, THE UNIT OPERATES WITH THE ECONOMIZER DISABLED AND SEQUENTIALLY ENABLES 100% MECHANICAL COOLING CAPACITY. ONCE THE SPACE TEMPERATURE FALLS 2°F (ADJUSTABLE THROUGH SOFTWARE) BELOW THE SPACE UNOCCUPIED COOLING TEMPERATURE SETPOINT, THE COOLING NIGHT CYCLE MODE IS DISABLE. THE SUPPLY FAN IS DISABLED AFTER 120 SECONDS TIME DELAY TO ALLOW FOR MECHANICAL UNLOADING. THE UNOCCUPIED COOLING SEQUENCE OF OPERATION SHALL BE ENABLED/DISABLED BY A MANUAL SOFTWARE SELECTOR SWITCH THROUGH THE EMS.

TYPICAL PACKAGED VARIABLE AIR VOLUME ROOFTOP UNIT W/ HW HEAT SEQUENCE OF OPERATION – DDC (ELECTRIC/ELECTRONIC ACTUATION)

PROFESSIONAL CERTIFICATION:
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO: 39921, EXPIRATION DATE 01/19/2021

KEY PLAN



REVISIONS

01	MM-DD-YR	NAME	DESCRIPTION OF CHANGES

CRABTREE ROHRBAUGH & ASSOCIATES - ARCHITECTS
100 WEST ROAD, SUITE 402
TOWSON MD 21204
410-528-0272
MECHANICSBURG, PENNSYLVANIA
CHARLOTTESVILLE, VIRGINIA
WHITE SULPHUR SPRINGS, WEST VIRGINIA
www.cra-architects.com

ADDITION AND RENOVATIONS OF GALENA ELEMENTARY SCHOOL

114 S MAIN STREET
GALENA, MD 21635

TYPICAL VAV RTU WITH HW HEAT CONTROL DIAGRAM

PLOT SCALE: NONE

FILENAME:

DATE: FEBRUARY 10, 2020

PROJECT
3309

M8.5

ROOFTOP UNIT SCHEDULE

RTU N°	SERVICE	LOCATION	SUPPLY FAN: FAN HP	SUPPLY FAN: FAN QTY	SUPPLY FAN: FAN TYPE	SUPPLY FAN: MAX ESP	SUPPLY FAN: RPM MAX	SUPPLY FAN: STD. AIR CFM MIN	SUPPLY FAN: STD. AIR CFM MAX	RETURN/RELIEF FAN: FAN HP	RETURN/RELIEF FAN: FAN QTY	RETURN/RELIEF FAN: FAN TYPE	RETURN/RELIEF FAN: MAX ESP	RETURN/RELIEF FAN: RPM MAX	RETURN/RELIEF FAN: STD. AIR CFM MIN	RETURN/RELIEF FAN: STD. AIR CFM MAX
1	CAFETERIA	ROOF	7.5	1	AFPF	1.5	2080	3500	5000	1	2	AFPF	1.0	2880	3500	5000
2	STORAGE	ROOF	3	1	AFPF	0.8	2560	400	3200							
3	CLASSROOMS	ROOF	10	1	AFPF	1.5	2080	3400	8700	2	1	AFPF	1.0	2560	3400	8700
4	CLASSROOMS	ROOF	10	2	AFPF	1.5	2080	7000	13100	2	3	AFPF	1.0	2880	7000	13100
5	CLASSROOMS	ROOF	7.5	2	AFPF	1.5	2080	4000	11600	1	2	AFPF	1.0	2880	4000	11600
6	ADMIN	ROOF	1.5	1	AFPF	1.3	2560	500	1800	–	–	–	–	–	–	–
7	GYMNASIUM (ADD/ALT)	ROOF	7.5	1	AFPF	1.5	2080	5000	5000	3	2	AFPF	1.0	2560	5000	5000

RTU N°	COOLING: EAT DB (°F)	COOLING: EAT WB (°F)	COOLING: LAT DB (°F)	COOLING: LAT WB (°F)	COOLING: MAX FACE VEL	COOLING: MAX A.P.D (IN	COOLING: SENS. CAP. (MBH)	COOLING: TOTAL CAP. (MBH)	HGRH: EAT DB (°F)	HGRH: LAT DB (°F)	HGRH: MAX FACE VEL (FPM)	HGRH: MAX A.P.D (IN	HGRH: TOTAL CAP. (MBH)
1	89	73	55	54	500	0.750	134.0	179.1	55	70	500	0.700	96.1
2	78	65	57	56	500	0.750	71.9	85.2	57	70	500	0.700	44.2
3	83	69	54	53	500	0.750	224.5	277.5	54	70	500	0.750	154.2
4	85	71	56	55	500	0.750	317.7	393.5	56	70	500	0.750	198.2
5	82	68	54	52	500	0.750	296.0	378.5	54	70	500	0.750	197.3
6	81	67	53	52	500	0.750	54.6	81.5	53	70	500	0.750	39.0
7	95	78	57	56	500	0.750	129.7	186.3	57	70	500	0.750	92.7

RTU N°	HEATING COIL: EAT DB (°F)	HEATING COIL: LAT DB (°F)	HEATING COIL: EWT (°F)	HEATING COIL: LWT (°F)	HEATING COIL: GPM	HEATING COIL: MAX FACE VEL (FPM)	HEATING COIL: MAX A.P.D (IN H20)	HEATING COIL: MAX W.P.D (FT H20)	HEATING COIL: TOTAL CAP. (MBH)	OUTSIDE AIR: MIN CFM	OUTSIDE AIR: MAX CFM	OUTSIDE AIR: %	ELECTRICAL: V/ø/Hz	ELECTRICAL: MCA	ELECTRICAL: MOCP	WEIGHT (lbs)	EMER. POWER	SYSTEM TYPE	BASED ON
1	27	95	180	160	38	500	0.750	10	372.6	3500	5000	70	208/3/60	87.0	110	4,000	NO	SZVAV	VALENT VPRE
2										400	3200	13	208/3/60	33.6	45	2,000	NO	SZCV	VALENT VPR
3	–	–	–	–	–	–	–	–	–	3400	8700	39	208/3/60	129.2	150	5,000	NO	VAV	VALENT VPRE
4	35	95	180	160	85	500	0.750	10	848.9	7000	13100	53	208/3/60	209.0	250	9,500	NO	VAV	VALENT VPRE
5	–	–	–	–	–	–	–	–	–	4000	11600	34	208/3/60	186.9	225	9,000	NO	VAV	VALENT VPRE
6	54	95	180	150	7	500	0.750	5	102.0	500	1800	28	208/3/60	29.6	40	2,000	NO	VAV	VALENT VPR
7	10	95	180	150	31	500	0.750	10	459.0	5000	5000	100	208/3/60	97.8	110	4,000	NO	SZCV	VALENT VPRE

NOTES:
1. VAV = VARIABLE AIR VOLUME / CV = CONSTANT VOLUME.
2. ESP = EXTERNAL STATIC PRESSURE BASED ON PRESSURE REQUIRED AT AHU DUCT CONNECTION.
3. FC FORWARD CURVED, BIAF BACKWARD INCLINED AIR FOIL (DOUBLE WIDTH, DOUBLE INLET).
4. AFPF AIRFOIL PLENUM FAN (SINGLE WIDTH, SINGLE INLET).
5. ALL FANS SHALL BE DIRECT DRIVE TYPE WITH VARIABLE SPEED DRIVE
6. PREFILTERS SHALL BE 2" THICK MERV 8 FARR 30/30 OR AS APPROVED EQUAL.
7. FINAL FILTERS SHALL BE 4" THICK MERV 13 FARR OPTI-PAC OR AS APPROVED EQUAL.
8. FOR TOTAL STATIC PRESSURE CALCULATIONS USE MEDIAN (CLEAN/DIRTY) FITLER AIR PRESSURE DROPS.
9. NG NATURAL GAS, HGRH HOT GAS REHEAT
10. ALL NATURAL GAS BURNERS SHALL HAVE A MINIMUM OF 12:1 TURNDOWN
11. ALL ROOF TOP UNITS ARE TO HAVE KEYED OR TAMPER PROOF LATCHES
12. ALL ROOF TOP UNITS SHALL HAVE FULL PIANO HINGES ON ALL ACCESS DOORS
13. ALL ROOF TOP UNITS CURBS AND PLENUM CHAMBERS ARE TO BE FULLY INSULATED
14. ALL ROOF TOP UNIT CONDENSATE DRAINS SHALL BE PVC
15. DESIGN COOLING EAT CONDITIONS: 95°F DB/78°F WB
16. DESIGN HEATING EAT CONDITIONS: 10°F DB/9°F WB

HEAT RECOVERY DEVICE SCHEDULE

SERVICES RTU №	MAX A.P.D (IN W.C)	MAX FACE VELOCITY (FPM)	SUMMER SUPPLY: DEVICE CFM (ENTERING)	SUMMER SUPPLY: EAT DB (°F)	SUMMER SUPPLY: EAT WB (°F)	SUMMER SUPPLY: LAT DB (°F)	SUMMER SUPPLY: LAT WB (°F)	SUMMER EXHAUST: DEVICE CFM (ENTERING)	SUMMER EXHAUST: EAT DB (°F)	SUMMER EXHAUST: EAT WB (°F)	SUMMER EXHAUST: LAT DB (°F)	SUMMER EXHAUST: LAT WB (°F)	WINTER SUPPLY: DEVICE CFM (ENTERING)	WINTER SUPPLY: EAT DB (°F)	WINTER SUPPLY: EAT WB (°F)	WINTER SUPPLY: LAT DB (°F)	WINTER SUPPLY: LAT WB (°F)	WINTER EXHAUST: DEVICE CFM (ENTERING)	WINTER EXHAUST: EAT DB (°F)	WINTER EXHAUST: EAT WB (°F)	WINTER EXHAUST: LAT DB (°F)	WINTER EXHAUST: LAT WB (°F)	REMARKS
1	1.00	500	3500	95	78	80.5	67.9	3500	75	62	86.0	73.0	3500	10	9	54.8	45.5	3500	72	58	35.0	31.0	
3	1.00	500	3400	95	78	81.5	69.0	3400	75	62	86.0	73.0	3400	10	9	51.7	43.2	3400	72	58	35.0	31.0	
4	1.00	500	7000	95	78	81.3	68.7	7000	75	62	86.0	73.0	7000	10	9	52.5	43.8	7000	72	58	35.0	31.0	
5	1.00	500	4000	95	78	80.9	68.2	4000	75	62	86.0	73.0	4000	10	9	53.8	44.8	4000	72	58	35.0	31.0	
7	1.00	500	5000	95	78	80.5	67.9	5000	75	62	86.0	73.0	5000	10	9	54.8	45.5	5000	72	58	35.0	31.0	

NOTES:
1. DEVICE ENTERING CFM INDICATED IS UPSTREAM OF HEAT RECOVERY DEVICE AND EXCLUDES PURGE VOLUME.
2. PROVIDE VARIALBE SPEED DRIVES FOR ALL ENTHALPY HEAT RECOVERY DEVICES.

ELECTRIC UNIT HEATER SCHEDULE

UNIT UH-X	AREA SERVED	SUPPLY FAN: CFM	SUPPLY FAN: RPM	ELECTRIC COIL: V/ø/Hz	ELECTRIC COIL: TOTAL CAP. (MBH)	ELECTRIC COIL: TOTAL CAP. (KW)	ELECTRIC COIL: AMPS	EMERGENCY POWER	TYPE	BASED ON (MARKEL)
1	A111 – FIRE PUMP ROOM	400	1050	208/3/60	17.1	5	14	NO	HORIZONTAL DISCHARGE	5100 SERIES
2	A112 – ELECTRICAL ROOM	400	1050	208/3/60	17.1	5	14	NO	HORIZONTAL DISCHARGE	5100 SERIES

NOTES: 1. PROVIDE CUSTOM COLOR AS SELECTED BY ARCHITECT
2. ALL UNITS SHALL BE PROVIDED WITH A DPST DISCONNECT SWITCH.

SPLIT SYSTEM SCHEDULE

INDOOR N° (SS-X)	OUTDOOR N° (SSCU-X)	SERVICE	LOCATION: EVAPORATOR	LOCATION: CONDENSER	MAX CFM	MAX ESP	REFRIGERANT TYPE	COOLING CAPACITY (BTUs)	HEATING CAPACITY (BTUs)	MAX CAPACITY FULL LOAD (TONS)	INDOOR CONDITIONS EAT DB (°F)	INDOOR CONDITIONS EAT WB (°F)	OUTDOOR EAT DB (°F)	INDOOR UNIT V/ø/Hz	INDOOR UNIT MCA	INDOOR UNIT MOCP	OUTDOOR UNIT V/ø/Hz	OUTDOOR UNIT MCA	OUTDOOR UNIT MOCP	EMERGENCY POWER	INDOOR UNIT SIZE (L X W X H)	WEIGHT INDOOR UNIT	WEIGHT OUTDOOR UNIT	BASED ON MITSUBISHI EVAPORATOR	BASED ON MITSUBISHI CONDENSER
1	1	A102 – DRY STORAGE	A102	ROOF	400	0.0	410	12000	7600	1	80	67	95	208/1/60	1.4	15	208/1/60	14	15	NO	32"X19"X12"	22	73	MSZ-JP12WA-U1	MUZ-JP12WA-U1
2	2	59 – TECH STORAGE	59	ROOF	320	0.0	410	18000	–	1.5	80	67	95	208/1/60	1	15	208/1/60	11	28	NO	36"X19"X12"	29	99	PKA-A18HA7	PUY-A18NKA7
3	3	B101 LANGUAGE SUPPORT (ALT GC 1)	B101	ROOF	320	0.0	410	27000	30000	2.5	80	67	95	208/1/60	2.73	15	208/1/60	17	30	NO	42"X29"X9"	75	135	PEAD-A30AA7	SUZ-KA30NA2

NOTES:
1. BASED ON MITSUBISHI INVERTER DRIVEN COMPRESSOR R410A REFRIGERANT AND DEHUMIDIFICATION MODE OR EQUAL
2. LOW AMBIENT CONTROL (COOLING TO 0°F OUTDOOR AIR TEMPERATURE) AND WIND BAFFLE.
3. SPLIT SYSTEMS LOCATED IN IDF/MDF SPACES SHALL HAVE TEMPERATURE SENSOR WITH HI-TEMP ALARM FURNISHED BY THE ATC CONTRACTOR.
4. OUTDOOR UNITS SHALL BE PROVIDED WITH HAIL GUARDS
5. ALL SPLIT SYSTEMS SHALL BE PROVIDED WITH MAXIBLUE ADVANCED BLUE DIAMOND MINI CONDENSATE PUMP W/ RESEVOIR & SENSOR (INTEGRAL TO UNIT).

PUMP SCHEDULE

No. P–	SERVICE	GPM	FT OF HEAD	HP	RPM	SIZE (SxDxl)	ELECT. CHAR. V/ø/Hz	REMARKS	BASED ON
3	PREHEAT COIL RTU-1	38	15	1/4	VARIABLE	1½ x 1½	115/1/60	IN-LINE CIRCULATOR	TACO MODEL VR3452
4	PREHEAT COIL RTU-1 (STANDBY)	38	15	1/4	VARIABLE	1½ x 1½	115/1/60	IN-LINE CIRCULATOR	TACO MODEL VR3452
5	PREHEAT COIL RTU-4	85	15	1/4	VARIABLE	1½ x 1½	115/1/60	IN-LINE CIRCULATOR	TACO MODEL VR3452
6	PREHEAT COIL RTU-4 (STANDBY)	85	15	1/4	VARIABLE	1½ x 1½	115/1/60	IN-LINE CIRCULATOR	TACO MODEL VR3452
7	PREHEAT COIL RTU-6	7	15	1/4	VARIABLE	1½ x 1½	115/1/60	IN-LINE CIRCULATOR	TACO MODEL VR3452
8	PREHEAT COIL RTU-6 (STANDBY)	7	15	1/4	VARIABLE	1½ x 1½	115/1/60	IN-LINE CIRCULATOR	TACO MODEL VR3452
9	PREHEAT COIL RTU-7	31	15	1/4	VARIABLE	1½ x 1½	115/1/60	IN-LINE CIRCULATOR	TACO MODEL VR3452
10	PREHEAT COIL RTU-7 (STANDBY)	31	15	1/4	VARIABLE	1½ x 1½	115/1/60	IN-LINE CIRCULATOR	TACO MODEL VR3452
11	PREHEAT COIL MAU-1	13	15	1/4	VARIABLE	1½ x 1½	115/1/60	IN-LINE CIRCULATOR	TACO MODEL VR3452
12	PREHEAT COIL MAU-1 (STANDBY)	13	15	1/4	VARIABLE	1½ x 1½	115/1/60	IN-LINE CIRCULATOR	TACO MODEL VR3452

NOTES: 1. LOCATE PUMPS IN CEILING SPACE BELOW ASSOCIATED ROOF TOP UNIT

FAN SCHEDULE

UNIT F-X	AREA SERVED	INTERLOCK	LOCATION	CFM	ESP (IN H2O)	FRPM	DRIVE TYPE	MOTOR HP	MOTOR TYPE	ELECTRICAL V/ø/Hz	ELECTRICAL EMERGENCY POWER	TYPE	BASED ON (GREENHECK)
9	A105 – KITCHEN	MAU-1	ROOF	3038	2.00	1571	DIRECT	2	ECM	208/3/60	NO	UPBLAST CENTRIFUGAL	USGF-180HP-20
10	A106 – LOCKER ROOM108 – TOILET, A-109 WASHER/DRYER STORAGE	SW W/ TD	ROOF	250	0.50	1574	DIRECT	1/10	ECM	115/1/60	NO	UPBLAST CENTRIFUGAL	CUE-080-VG
11	A111 FIRE PUMP ROOM	TSTAT	ROOF	250	0.50	1574	DIRECT	1/10	ECM	115/1/60	NO	UPBLAST CENTRIFUGAL	CUE 080 VG
12	A112 – ELECTRICAL ROOM	TSTAT	ROOF	250	0.50	1574	DIRECT	1/10	ECM	115/1/60	NO	UPBLAST CENTRIFUGAL	CUE-080-VG
13	D102 – MENS HC TOILET	SW W/ TD	D102	100	0.62	900	DIRECT	48W	ODP	115/1/60	NO	CEILING EXHAUST	SP-A200
14	D103 WOMENS HC TOILET	SW W/ TD	D103	100	0.62	900	DIRECT	48W	ODP	115/1/60	NO	CEILING EXHAUST	SP A200

NOTES: 1. TSTAT=THERMOSTAT; HSTAT=HUMIDISTAT; SW=SWITCH; SP=STATIC PRESSURE, TD=WITH 15 MINUTE TIME DELAY
2. PROVIDE FACTORY MOUNTED DISCONNECT SWITCH FOR ALL EXHAUST FANS, COORDINATING REQUIREMENTS AND INTERLOCKS WITH ELECTRICAL
3. REFER TO CONTROL DIAGRAMS FOR SPECIFIC SEQUENCES OF OPERATION AND INTERLOCK ARRANGEMENTS
4. KITCHEN HOOD EXHAUST FANS SHALL COMPLY WITH NFPA 96 REQUIREMENTS
5. PROVIDE VARIABLE SPEED DRIVES FOR KITCHEN HOOD EXHAUST FANS

ELECTRIC CEILING HEATER SCHEDULE

UNIT CH-XX	AREA SERVED	SUPPLY FAN: CFM	SUPPLY FAN: RPM	ELECTRIC COIL: V/ø/Hz	ELECTRIC COIL: TOTAL CAP. (MBH)	ELECTRIC COIL: TOTAL CAP. (KW)	ELECTRIC COIL: AMPS	EMER POWER	CONFIGURATION: INLET	CONFIGURATION: DISCHARGE	CONFIGURATION: FLOW	TYPE	BASED ON (MARKEL)
1	A107 – OFFICE	175	600	120/1/60	5.1	1.5	12.5	NO	BOTTOM	BOTTOM	DOWN	CEILING MOUNTED	3380 SERIES

NOTES: 1. PROVIDE CUSTOM COLOR AS SELECTED BY ARCHITECT
2. ALL UNITS SHALL BE PROVIDED WITH A DPST DISCONNECT SWITCH.

VARIABLE AIR VOLUME TERMINAL CONTROL UNIT

UNIT	INTERLOCK	SERVICE	INLET SIZE	OUTLET SIZE (HxW)	PRIMARY AIR (CFM) MIN CLG	PRIMARY AIR (CFM) MAX CLG	PRIMARY AIR (CFM) MIN HTG	PRIMARY AIR (CFM) MAX HTG	MAX APD (in. H2O)	BASED ON TITUS
1.01	AHU-1	C102 – TITLE ONE OFFICE	9	14x13	425	750	425	750	0.2	DESV-09
1.02	AHU-1	C103 – GUIDANCE	9	14x13	425	750	425	750	0.2	DESV-09

DUCT MOUNTED ELECTRIC HEATING COIL SCHEDULE

No. EHC-x	INTERLOCK	SERVICE	CFM	EAT (°F)	LAT (°F)	TOTAL CAP (MBH)	TOTAL CAP (kW)	Amps	V/ø/Hz	MAX APD (in. H2O)	MAX FACE VELOCITY (fpm)	COIL SIZE WxH	BASED ON GREENHECK
EHC-1	TSTAT	O/A INTAKE – LANGUAGE SUPPORT B101	350	10	40	11.3	3.5	9.7	208/3/60	0.20	700	12 x 12	IDHC
EHC-2	TSTAT	VRF SUPPLY RE-HEAT – LANGUAGE SUPPORT B101	875	55	74	18.0	5.5	15.3	208/3/60	0.20	700	20 x 10	IDHC

MECHANICAL EQUIPMENT NOTES

1. KITCHEN MAKEUP AIR UNIT, MAU-1

GENERAL:
SERVES KITCHEN HOODS NO.1
100% OUTSIDE AIR
HOT WATER HEATING
2" THROWAWAY FILTERS,
OUTDOOR/CURB MOUNTED
MOTORIZED INTAKE DAMPER
ELECTRICAL CONTROL CENTER
MAX WEIGHT: 700 LBS.

SUPPLY AIR FAN:
BOTTOM DISCHARGE
2430 CFM @ 1.5" ESP, 1874 RPM
2 HP MOTOR, MCA=9.8A, MOP=15A
PREMIUM EFFICIENCY MOTOR
208V/3ø/60HZ

HOT WATER COIL:
2430 CFM
10°F EAT, 82°F LAT
180°F EWT, 150°F LWT
13 GPM, 1 FT H2O MAX WPD
189.4 MBH

ARRANGEMENT:
GREENHECK MODEL MSX-P115-H12-MF
OR AS APPROVED EQUAL

AIR DEVICE SCHEDULE

No. (Sx)	CFM MAX	NECK SIZE	COLLAR ø SIZE	MAX NC	TYPE (SEE SPEC.)
SUPPLY AIR DEVICE					
S1	200	9x9	8"ø	18	TITUS TDV
S2	325	12x12	10"ø	18	TITUS TDV
S3	485	15x15	12"ø	18	TITUS TDV
S4	700	18x18	14"ø	18	TITUS TDV
S5	100	6x6	6"ø	18	TITUS TDCA
S6	170	9x9	8"ø	18	TITUS TDCA
S7	325	12x12	10"ø	18	TITUS TDCA
S8	485	15x15	12"ø	18	TITUS TDCA
S9	700	18x18	14"ø	18	TITUS TDCA
S10	100	6x6	–	18	TITUS TDCA
S11	170	9x9	–	18	TITUS TDCA
S12	325	12x12	–	18	TITUS TDCA
S13	485	15x15	–	18	TITUS TDCA
S14	700	18x18	–	18	TITUS TDCA
S15	125	6x6	6"ø	18	TITUS TDC
S16	230	9x9	8"ø	18	TITUS TDC
S17	400	12x12	10"ø	18	TITUS TDC
S18	600	15x15	12"ø	18	TITUS TDC
S19	800	18x18	14"ø	18	TITUS TDC
S20	1000	21x21	16"ø	18	TITUS TDC
S21	125	6x6	–	18	TITUS TDC
S22	230	9x9	–	18	TITUS TDC
S23	400	12x12	–	18	TITUS TDC
S24	600	15x15	–	18	TITUS TDC
S25	800	18x18	–	18	TITUS TDC
S26	1000	21x21	–	18	TITUS TDC
S27	200	12x12/8"ø	–	18	TITUS TDC
S28	50	12x12/6"ø	–	18	TITUS TDC
S29	270	10"ø	–	18	TITUS XC-310
S30	390	12"ø	–	18	TITUS XC-310
S31	500	14"ø	–	25	TITUS XC-310
S32	800	18"ø	–	25	TITUS XC-310
S33	1000	20"ø	–	25	TITUS XC-310
S34	2000	30"ø	–	25	TITUS XC-310
S35	2800	36"ø	–	25	TITUS XC-310
S36	180	10x6	–	20	TITUS S300FS
S37	250	14x6	–	20	TITUS S300FS
S38	450	18x8	–	20	TITUS S300FS
RETURN AIR DEVICE					
R1	100	6x6	–	18	TITUS 350RL
R2	300	10x10	–	18	TITUS 350RL
R3	450	12x12	–	18	TITUS 350RL
R4	800	16x16	–	18	TITUS 350RL
R5	1000	18x18	–	18	TITUS 350RL
R6	1300	20x20	–	18	TITUS 350RL
R7	1660	22x22	–	18	TITUS 350RL
R8	3300	46x22	–	18	TITUS 350RL
R9	650	18x12	–	18	TITUS 350RL
R10	1000	30x12	–	18	TITUS 350RL
R11	1250	36x12	–	18	TITUS 350RL
R12	3300	46x22	–	18	TITUS 350RL
R13	900	22x10	–	18	TITUS 50F
R14	1900	22x22	–	18	TITUS 50F
R15	4000	46x22	–	18	TITUS 50F
R16	1600	20x20	–	18	TITUS 50FF
R17	3400	42x20	–	18	TITUS 50FF
R18	700	24x12	–	18	TITUS 33RS
R19	1200	24x24	–	18	TITUS 33RS
R20	1700	36x24	–	18	TITUS 33RS
R21	2600	36x36	–	18	TITUS 33RS
R22	3100	42x36	–	18	TITUS 33RS
R23	3500	48x36	–	18	TITUS 33RS
R24	3600	42x42	–	18	TITUS 33RS
R25	1300	20x20	–	18	TITUS 350RLF
EXHAUST AIR DEVICE					
E1	100	6x6	–	18	TITUS 350RL
E2	150	8x6	–	18	TITUS 350RL
E3	300	12x8	–	18	TITUS 350RL
E4	325	10x10	–	18	TITUS 350RL
E5	450	12x12	–	18	TITUS 350RL
E6	750	18x12	–	18	TITUS 350RL
E7	800	16x16	–	18	TITUS 350RL
E8	900	24x12	–	18	TITUS 350RL
E9	1050	18x18	–	18	TITUS 350RL

NOTES:
1. ALL SUPPLY AIR DIFFUSERS SHALL BE 4-WAY BLOW UNLESS OTHERWISE SHOWN ON THE DRAWINGS.
2. ALL SUPPLY AIR REGISTERS SHALL BE DOUBLE DEFLECTION WITH FRONT BLADES PARALLEL TO THE SHORT DIMENSION (VERTICAL).
3. PROVIDE 24x24 OR 48x24 MODULE FOR ALL LAY-IN SUPPLY, RETURN AND EXHAUST AIR DEVICES. TRIM MODULE AS NECESSARY TO FIT INTO GRID IF LESS THAN 24x24 OR 48x24 IS AVAILABLE.
4. EGGCRATE REGISTERS SHALL HAVE ½"x½"x1" DEEP ALUMINUM CORES.
5. EXHAUST REGISTERS CONNECTED TO STAINLESS STEEL DUCTWORK SHALL BE CONSTRUCTED OF STAINLESS STEEL.
6. FOR SUPPLY AIR DEVICES CONNECTED TO THE BOTTOM OF BRANCH DUCTS (ie SERVING MORE THAN ONE AIR DEVICE) PROVIDE DAMPER WITH GRID, TITUS AG-65 OR EQUAL.
7. NOT ALL AIR DEVICES SCHEDULED MAY BE USED.
8. COLLAR SIZE REFERS TO RUNNOUT CONNECTION TO SOUND LINED PLENUM BOX FABRICATED BY THE SHEET METAL CONTRACTOR CONNECTING TO THE DIFFUSER NECK. REFER TO DETAILS FOR ADDITIONAL INFORMATION.
9. PROVIDE AIR EXTRACTOR FOR ALL SIDEWALL SUPPLY REGISTERS.
10. PROVIDE ALUMINUM CONSTRUCTION FOR ALL AIR DEVICES LOCATED IN LOCKER ROOMS, KITCHEN, ROOMS WITH SHOWERS AND ALL SCIENCE LABS.
11. ALL TDCA TYPE DIFFUSERS SHALL BE PROVIDED WITH ADJUSTABLE VANES, ACCESSIBLE FROM THE DIFFUSER FACE, WITH THE DISCHARGE PATTERN SET TO THE VERTICAL POSITION.

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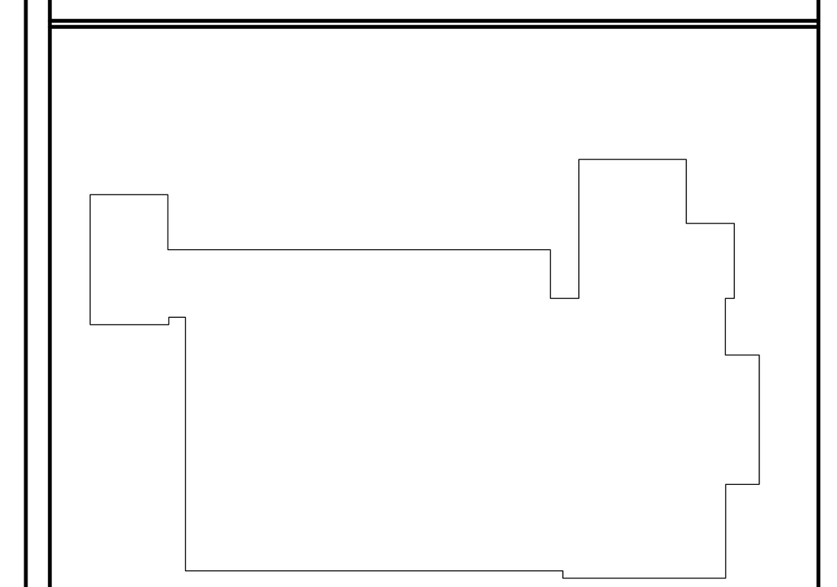
KEY PLAN



REVISIONS

01	MM-DD-YR	NAME	DESCRIPTION OF CHANGES

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www.cra-architects.com
100 WEST ROAD, SUITE 402
TOWSON MD 21204
410-528-0272
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ADDITION AND RENOVATIONS OF GALENA ELEMENTARY SCHOOL
114 S MAIN STREET
GALENA, MD 21635

SCHEDULES & EQUIPMENT NOTES
PLOT SCALE: NONE
FILENAME:
DATE: FEBRUARY 10, 2020

PROJECT 3309

M9.1

VENTILATION RATES SCHEDULE

RTU-X	SERVICE	Az (ft^2)	Ra (CFM/ft^2)	AzRa (CFM)	PEOPLE Pz (#)	Rp (CFM/pp)	PzRp (CFM)	BREATHING ZONE (Vbz) (AzRa+PzRp)	DIST EFF (Ez)	1 O/A Rqd (Vbz/Ez)	2 EX S/A (Vpz)	3 S/A DESIGN (Vpz)	4 O/A TO SPACE
						RTU-1 (70% O/A)							
1	A101 CAFETERIA	2745	0.18	494	275	7.5	2063	2557	0.8	3196	–	4575	3203
1	A105 KITCHEN	734	0.12	88	6	7.5	45	133	0.8	166	–	325	228
1	A106 LOCKER	73	0	0	1	0	0	0	0.8	0	–	50	35
1	A107 OFFICE	58	0.06	3	1	5	5	8	0.8	11	–	50	35
									Total	3373	5000		3500
						RTU-2 (12.5% O/A)							
2	EX 71 – DISTRICT STORAGE	2170	0	0	0	0	0	0	0.8	0	3200	–	400
									Total	0	3200		400
						RTU-3 (39% O/A)							
3	EX 47 – TEACHER SPEC	812	0.12	97	21	10	210	307	0.8	384	1400	–	547
3	EX 46 – FAC LOUNGE	812	0.12	97	21	10	210	307	0.8	384	1400	–	547
3	EX 37 – 1ST GRADE	800	0.12	96	20	10	200	296	0.8	370	1300	–	508
3	EX 36 – PRE-K	800	0.12	96	20	10	200	296	0.8	370	1300	–	508
3	EX 32 – PRE-K	670	0.12	80	17	10	170	250	0.8	313	1000	–	391
3	EX 31 – SP ED	280	0.12	34	5	10	50	84	0.8	105	300	–	117
3	EX 28 – MUSIC	1150	0.06	69	41	10	410	479	0.8	599	1600	–	625
3	EX 29 – PRACTICE RM	125	0.06	8	2	10	20	28	0.8	34	200		78
3	EX 30 – PRACTICE RM	125	0.06	8	2	10	20	28	0.8	34	200		78
									Total	2594	8700		3400
						RTU-4 (53% O/A)							
4	EX 80 – KINDERGARTEN	1000	0.12	120	25	10	250	370	0.8	463	1000	–	534
4	EX 81 – 3RD GRADE	975	0.12	117	25	10	250	367	0.8	459	1000	–	534
4	EX 82 – 3RD GRADE	975	0.12	117	25	10	250	367	0.8	459	1000	–	534
4	EX 83 – 5TH GRADE	905	0.12	109	23	10	230	339	0.8	423	900	–	481
4	EX 84 – 4TH GRADE	715	0.12	86	18	10	180	266	0.8	332	700	–	374
4	EX 76 – 4TH GRADE	715	0.12	86	18	10	180	266	0.8	332	700	–	374
4	EX 77 – 5TH GRADE	960	0.12	115	25	10	250	365	0.8	457	1420	–	759
4	EX 66 – ELL	250	0.06	15	3	5	15	30	0.8	38	250	–	134
4	EX 65 – 2ND GRADE	720	0.12	86	19	10	190	276	0.8	346	700	–	374
4	EX 61 – SP ED	275	0.12	33	8	10	80	113	0.8	141	350	–	187
4	EX 59 – TECH STORAGE	150	0	0	0	0	0	0	0.8	0	150	–	80
4	EX 60 – TECH OFFICE	120	0.06	7	1	5	5	12	0.8	15	150	–	80
4	EX 54 – 1ST GRADE	760	0.12	91	19	10	190	281	0.8	352	750	–	401
4	EX 79 – KINDERGARTEN	1020	0.12	122	26	10	260	382	0.8	478	1000	–	534
4	EX C101 – MEDIA CENTER	2355	0.12	283	60	10	600	883	0.8	1103	2280	–	1218
4	C102 – TITLE 1 OFFICE	385	0.06	23	3	5	15	38	0.8	48	–	375	200
4	C103 – GUIDANCE OFFICE	385	0.06	23	3	5	15	38	0.8	48	–	375	200
									Total	5492	13100		7000
						RTU-5 (34% O/A)							
5	EX 52 – 1ST GRADE	872	0.12	105	22	10	220	325	0.8	406	1700	–	586
5	EX D101 – VEST	70	0.06	4	1	0	0	4	0.8	5	150	–	52
5	EX 53 – SOC WORKER	181	0.06	11	2	5	10	21	0.8	26	350	–	121
5	EX 58 – 3RD GRADE	820	0.12	98	21	10	210	308	0.8	386	1550	–	534
5	EX 62 – 2ND GRADE	690	0.12	83	18	10	180	263	0.8	329	1300	–	448
5	EX 64 – ART	760	0.18	137	19	10	190	327	0.8	409	1400	–	483
5	EX 85 – SP ED	315	0.12	38	8	10	80	118	0.8	147	600	–	207
5	EX 69 – GUCO	435	0.12	52	11	10	110	162	0.8	203	800	–	276
5	EX 72 – 4TH GRADE	720	0.12	86	18	10	180	266	0.8	333	1300	–	448
5	EX 73 – STORAGE	185	0	0	0	0	0	0	0.8	0	150	–	52
5	EX 74 – TITLE 1	1290	0.12	155	33	10	330	485	0.8	606	2300	–	793
									Total	2849	11600		4000
						RTU-6 (28% O/A)							
6	EX 41 – MAIN OFFICE	470	0.06	28	14	5	70	98	0.8	123	500	–	139
6	EX 42 – HEALTH	165	0.18	30	3	10	30	60	0.8	75	350	–	97
6	EX 43 – ISS	105	0.06	6	2	5	10	16	0.8	20	200	–	56
6	EX 44 – PRINCIPAL	205	0.06	12	4	5	20	32	0.8	40	250	–	69
6	EX 45 – CONF RM	170	0.06	10	10	5	50	60	0.8	75	300	–	83
6	EX 48 – COPY RM	100	0.12	12	2	5	10	22	0.8	28	200	–	56
									Total	361	1800		500
						RTU-7 (100% O/A)							
7	E101 – PLATFORM	875	0.06	53	25	10	250	303	0.8	378	–	380	380
7	E102 – GYM	4034	0.06	242	305	7.5	2288	2530	0.8	3162	–	4620	4620
									Total	3540	5000		5000

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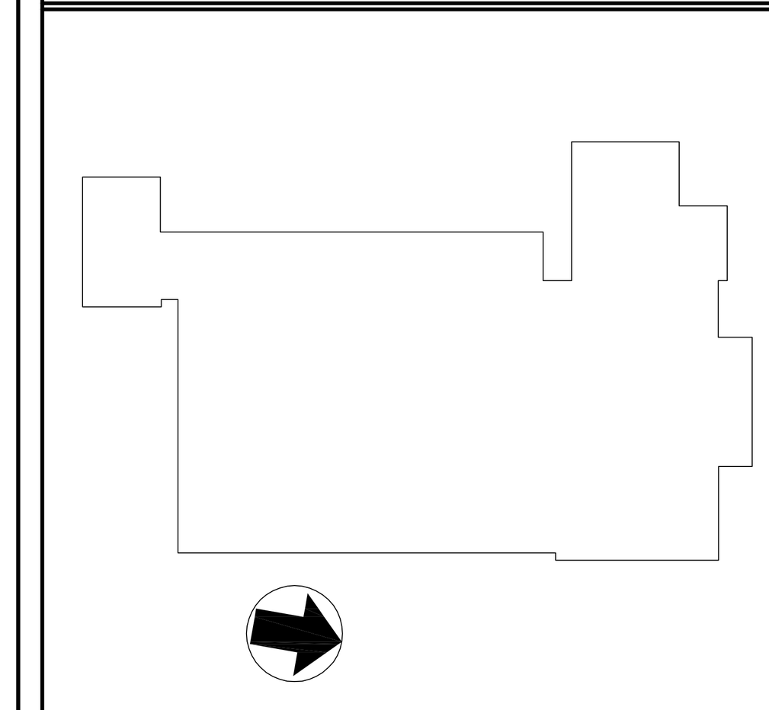

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VENTILATION RATES SCHEDULE

PLOT SCALE: NONE

FILENAME:

DATE: FEBRUARY 10, 2020

PROJECT
3309

M9.2

GENERAL NOTES: (PLUMBING)

A. COORDINATE NEW WORK BETWEEN ALL DISCIPLINES.

B. REFER TO SECTIONS ON ARCHITECTURAL AND MECHANICAL DRAWINGS FOR PIPE ROUTING THROUGH THE FACILITY.

C. CONDENSATE FROM HVAC EQUIPMENT COILS SHALL BE PIPED TO THE STORM DRAIN SYSTEM PIPING.

D. COORDINATE PLUMBING PIPING ENCLOSURES WITH ARCHITECTURAL DRAWINGS PRIOR TO SETTING PIPING BELOW SLABS.

E. COORDINATE FLOOR DRAIN AND OPEN HUB DRAIN LOCATIONS WITH MECHANICAL EQUIPMENT PLACEMENT PRIOR TO SETTING FLOOR DRAINS. DRAINS SHALL BE LOCATED AS CLOSE TO EQUIPMENT DRAIN POINTS AS POSSIBLE.

F. FIELD VERIFY PIPING MATERIALS AND SIZES PRIOR TO CONNECTION THERETO.

G. PROVIDE SHUTOFF VALVES IN DOMESTIC WATER SYSTEM BRANCH LINES SERVING TWO OR MORE FIXTURES.

H. INSTALL PIPING TO ALLOW ACCESS TO VALVES.

J. WHERE HOT AND COLD WATER PIPING DROPS INTO PIPE CHASE, THE SIZE SHOWN FOR THE PIPE DROPS SHALL BE USED TO THE LAST FIXTURE.

K. ITEMS SUCH AS ACCESS DOORS, RISE AND DROPS IN PIPING, ETC., ARE INDICATED ON THE DRAWINGS FOR CLARITY OR A SPECIFIC LOCATION REQUIREMENT AND SHALL NOT BE INTERPRETED AS THE EXTENT OF THE REQUIREMENTS FOR THESE ITEMS. THE CONTRACTOR IS RESPONSIBLE FOR THESE ITEMS AS REQUIRED ELSEWHERE IN THE CONTRACT DOCUMENTS.

L. ALL PLUMBING FIXTURES SHALL HAVE A MINIMUM AIR GAP FROM THE LOWEST END OF A POTABLE WATER OUTLET TO THE FLOOD RIM OR LINE OF THE FIXTURE INTO WHICH IT DISCHARGES. THE AIR GAP SHALL BE A MINIMUM OF TWICE THE EFFECTIVE OPENING OF A POTABLE WATER OUTLET UNLESS THE OUTLET IS A DISTANCE LESS THAN 3 TIMES THE EFFECTIVE OPENING AWAY FROM A WALL OR SIMILAR VERTICAL SURFACE IN WHICH CASE THE MINIMUM REQUIRED AIR GAP SHALL BE 3 TIMES THE EFFECTIVE OPENING OF THE OUTLET.

M. FIXTURES SUBJECT TO INTERMITTENT OR CONTINUOUS PRESSURE BACK-SIPHONAGE SHALL BE PROVIDED WITH A BACKFLOW PREVENTION DEVICE.

N. FIXTURES WHICH DISCHARGE INDIRECTLY INTO A FLOOR DRAIN OR FLOOR SINK SHALL DISCHARGE WITH AN AIR GAP EQUAL TO TWICE THE DIAMETER OF THE FIXTURE DISCHARGE PIPE.

O. COORDINATE SETTING OF KITCHEN FLOOR SINKS AND FLOOR DRAINS WITH LOCAL PLUMBING INSPECTOR.

P. ALL PIPING NOT INDICATED IN CHASES SHALL BE LOCATED ABOVE CEILING AS HIGH AS POSSIBLE. COORDINATE ROUTING OF PIPING WITH OTHER DISCIPLINES.

Q. REFER TO ALL ARCHITECTURAL DRAWINGS FOR RATED WALL ASSEMBLY LOCATIONS.

R. ALL COMPONENTS OF THE DOMESTIC WATER SYSTEMS SHALL BE NSF-61 CERTIFIED.

S. INSTALL DIELECTRIC FITTINGS IN ABOVEGROUND AND BELOWGROUND PIPING AT CONNECTIONS OF DISSIMILAR METAL PIPING AND TUBING. DIELECTRIC UNIONS AND COUPLINGS ARE PROHIBITED.

T. FLOOR DRAINS INSTALLED IN TILE FLOORS SHALL HAVE SQUARE STRAINERS

KITCHEN NOTES: (PLUMBING)

1. ALL OUTLETS AND CONNECTIONS SHOWN RELATE TO FOOD SERVICE FIXTURES AND EQUIPMENT ONLY. SEE ARCHITECTURAL/ENGINEERING PLANS FOR ADDITIONAL PLUMBING REQUIREMENTS.
2. THIS PLUMBING PLAN IS INTENDED TO SHOW ROUGH-IN LOCATIONS AND HEIGHTS, CONNECTION SIZES, POSITIONS, HEIGHTS AND LOAD REQUIREMENTS. DIMENSIONS SHOWN ARE FROM FINISHED FLOORS AND FINISHED WALLS. VERIFY WALL PARTITION LOCATIONS WITH ARCHITECTURAL DRAWINGS.
3. FINAL CONNECTIONS TO ALL EQUIPMENT SHALL BE BY PLUMBING CONTRACTOR INCLUDING REQUIRED MATERIALS SUCH AS, STOPS, VALVES, FILTERS, TRAPS, CHECK VALVES, PIPING, TUBING, ETC. TO ASSURE PROPER OPERATION ACCORDING TO MANUFACTURER'S RECOMMENDATIONS AND LOCAL CODES.
4. PLUMBING CONTRACTOR (P.C.), OR EQUIVALENT, SHALL FURNISH AND INSTALL THE FOLLOWING:
   A. ALL WATER AND WASTE SERVICE TO POINT OF ROUGH-IN AS SHOWN ON PLAN. ROUGH-IN OUTLETS TO STUB 4" OUT OF WALLS AT HEIGHT INDICATED FROM FINISHED FLOOR TO CENTERLINE OF OUTLET. FLOOR ROUGH-INS TO STUB UP 2" ABOVE FINISHED FLOOR OR CURBS. ALL FLOOR OPENINGS/PENETRATIONS ARE TO BE SEALED WATERTIGHT.

   B. ALL WASTE LINES, DIRECT OR INDIRECT, EXCEPT AS NOTED. MINIMUM DIAMETER OF LINE SHALL BE AS INDICATED ON PLAN REGARDLESS OF CONNECTION SIZE, AND SHALL BE PITCHED DOWNWARD. MAINTAIN DRAIN LINES AS HIGH AS POSSIBLE ABOVE FLOOR FOR SANITATION AND AND CLEANING. ALL WASTE LINES SHALL HAVE ADEQUATE CLEAN-OUT PROVISIONS.

   C. PRESSURE REDUCING AND/OR REGULATING VALVES FOR DISHWASHERS, BOOSTER HEATERS, OR AS OTHERWISE NOTED IN ALL FOOD SERVICE AREAS.

   D. ALL FLOOR SINKS, COMPLETE WITH TOP GRATES INDICATED, AND REMOVABLE SEDIMENT BUCKETS SET FLUSH WITH FINISH FLOOR, UNLESS NOTED.

   E. INDIRECT WASTE LINES FOR WALK-IN COOLER/FREEZER BLOWER COILS SHALL BE PITCHED 3/4" PER FOOT OF HORIZONTAL RUN, AND TERMINATE WITH A P-TRAP OVER FLOOR SINK OR APPROVED RECEPTOR WITH VACUUM BREAK AS REQUIRED BY LOCAL CODE.

   F. INSTALL FIRE CONTROL GAS SHUT-OFF VALVES AS SUPPLIED BY FIRE PROTECTION SYSTEM SUBCONTRACTOR PER LOCAL CODES. (IF GAS COOKING EQUIPMENT IS SPECIFIED.)

   G. VACUUM BREAKERS, AS REQUIRED, EXCEPT FOR DISHWASHERS AND DISPOSERS, AS SUPPLIED BY KITCHEN EQUIPMENT CONTRACTOR.
5. ALL VENT PIPES SHALL BE CONCEALED IN WALLS OR COLUMN CHASES. USE LOOP VENTS FOR ISLAND FIXTURES.
6. ALL EXPOSED PIPING AND FITTINGS IN KITCHEN AREAS SHALL BE CHROME-PLATED OR STAINLESS STEEL.
7. ALL LINES ROUTED THROUGH EQUIPMENT SHALL NOT INTERFERE WITH INTENDED USE OF, OR SERVICING OF EQUIPMENT.
8. PLUMBING CONTRACTOR (P.C.), OR EQUIVALENT, SHALL INTERCONNECT DISHWASHING MACHINE WITH BOOSTER HEATER, AND WATER-TYPE VENTILATORS WITH CONTROL PANELS AS PER MANUFACTURER'S INSTRUCTIONS, WHEN APPLICABLE AND NOTED.
9. REFER TO KITCHEN EQUIPMENT DRAWINGS FOR ADDITIONAL INFORMATION, REQUIREMENTS AND NOTES.

L E G E N D

SYMBOLS

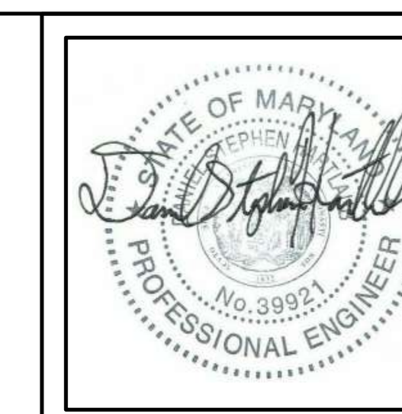
SYMBOL	DEFINITION
	COLD WATER
	TEMPERED WATER (110°)
	TEMPERED WATER RETURN (110°)
	140° DOMESTIC HOT WATER
	140° DOMESTIC HOT WATER RETURN
T	TEMPERED WATER
F	FIRE LINE
SP	SPRINKLER LINE
	SANITARY
	VENT
	STORM WATER
PD	PUMPED DISCHARGE
CD	CONDENSATE DRAIN
	FOUNDATION DRAIN
AW	ACID RESISTANT WASTE
AV	ACID RESISTANT VENT
G	COMPRESSED AIR
	BALL VALVE
	PIPING BELOW GRADE OR SLAB
	BUTTERFLY VALVE
	UNION
	GATE VALVE
	GLOBE VALVE
	BALANCING VALVE
	PLUG VALVE
	REDUCED PRESS. BACKFLOW PREVENTER
	PRESSURE REDUCING VALVE
	CHECK VALVE
	DOUBLE DETECTOR CHECK VALVE
	BACKWATER VALVE
	FLOOR CLEANOUT
	WALL CLEANOUT
	PIPE UP
	PIPE UP & DOWN
	PIPE DOWN
	SIGHT GLASS
	FLOAT VALVE
	FLOOR DRAIN
	FLOOR DRAIN WITH TRAP PRIMER
	FLOOR SINK
(#)	ROOF DRAIN (W/ SQ.FT INDICATED)
	TRAP (ELEVATION)
	VENT THROUGH ROOF (ELEVATION)
	VENT THROUGH ROOF (PLAN)
	MIXING VALVE
	METER (FLUID OR GAS)
"	INCHES
'	FEET
	HOSE BIBB (PLAN)
	NON-FREEZE WALL HYDRANT
	HOSE BIBB (ELEV.)
	HOSE END DRAIN
TS	OUTSIDE STEM & YOKE VALVE
TS	NON-RISING STEM & YOKE
FS	FLOW SWITCH
TS	TAMPER SWITCH
PS	PRESSURE SWITCH
	FIRE DEPT HOSE CONNECTION
FS	FLOOR CONTROL VALVE ASSEMBLY
	'Y' STRAINER
	WATER HAMMER ARRESTOR
	ACCESS PANEL
	POINT OF CONN. TO SITE UTILITIES
	SQUARE FOOTAGE
	DUPLEX GAS OUTLET
	ECCENTRIC REDUCER
	CONCENTRIC REDUCER
	FLEXIBLE CONNECTION
	CAPPED PIPE
	BLIND FLANGE
	MANUAL AIR VENT
	AUTOMATIC AIR VENT
	BLOW DOWN VALVE (W/HOSE END)
	PRESSURE/TEMP. RELIEF VALVE
ΔP	PRESSURE DIFFERENCE
ΔT	TEMPERATURE DIFFERENCE
	CENTER LINE
	THERMOMETER
	PRESSURE GAUGE W/ NEEDLE VALVE
Ø	DIAMETER (OR ELECTRICAL PHASE)
	BACK WATER VALVE W/ ACCESS COVER
	SOLENOID VALVE
%	SLOPE OF PIPE (WITH % OF SLOPE SHOWN)
	DIRECTION OF FLOW
	FUNNEL CONNECTION @ FLOOR DRAIN
(S-A-1)	SANITARY/WATER RISER DESIGNATION
	EXISTING TO REMAIN
	REMOVE EXISTING
	DEMOLITION ENDS HERE
	CONNECT TO EXISTING HERE

NOTE: NOT ALL SYMBOLS MAY BE USED.

ABBREVIATIONS

ABBREV.	DEFINITION
140°	140° DOMESTIC HOT WATER
140°R	140° DOMESTIC HOT WATER RETURN
AAV	AUTOMATIC AIR VENT
ABV	ABOVE
AD	AREA DRAIN
AFF	ABOVE FINISHED FLOOR
ANC	ANCHOR
AP	ACCESS PANEL
APPROX	APPROXIMATE
AQ	AQUASTAT
AV	ACID VENT
AW	ACID WASTE
BDV	BLOW DOWN VALVE
BF	BLIND FLANGE
BFP	BACKFLOW PREVENTER
BHP	BRAKE HORSEPOWER
BOP	BOTTOM OF PIPE
BOTT	BOTTOM
BTU	BRITISH THERMAL UNIT
BTUH	BRITISH THERMAL UNIT PER HOUR
BWV	BACK WATER VALVE W/ ACCESS COVER
CAP	CAPACITY
CD, COND	CONDENSATE DRAIN
CI	CAST IRON
CLG	CEILING
CO	CLEANOUT
CONN	CONNECT
CONC	CONCRETE
CU FT	CUBIC FEET
CW	COLD WATER
CX	CONNECT TO EXISTING
DDC	DOUBLE DETECTOR CHECK VALVE
DFU	DRAINAGE FIXTURE UNITS
DIA	DIAMETER
DISH	DISCHARGE
DN	PIPE DOWN
DS	DOWN SPOUT W/BOOT
DST	DEEP SEAL TRAP
DWG	DRAWING
ELEC	ELECTRIC
ELEV	ELEVATION
EWT	ENTERING WATER TEMPERATURE
EX	EXISTING
F	FIRE LINE
FC	FUNNEL CONNECTION @ FD
FCO	FLOOR CLEANOUT
FCVA	FLOOR CONTROL VALVE ASSEMBLY
FD	FLOOR DRAIN
FDV	FIRE DEPT. HOSE CONNECTION
FS	FLOW SWITCH
FT	FEET
FT.HD	FEET OF HEAD
G	GAS
GA	GAUGE
GALV	GALVANIZED
GPM	GALLONS PER MINUTE
HB	HOSE BIBB
HED	HOSE END DRAIN
HOR	HORIZONTAL
HP	HORSEPOWER
HT	HEAT TRAP
HW	HOT WATER (140°F)
HWR	HOT WATER RETURN (140°F)
HYD	HYDRAULIC
IN	INCHES
I.E.	INVERT ELEVATION
IW	INDIRECT WASTE
LOC	LIMIT OF CONTRACT
MAV	MANUAL AIR VENT
NFGH	NON-FREEZE GROUND HYDRANT
NFWH	NON-FREEZE WALL HYDRANT
NRS	NON-RISING STEM & YOKE
OHD	OPEN HUB DRAIN
O,S,&Y	OUTSIDE STEM & YOKE VALVE
P	PRESSURE
PCOND	PUMPED CONDENSATE
PD	PUMPED DISCHARGE
PH	PIPE HANGER
PRV	PRESSURE REDUCING VALVE
PS	PRESSURE SWITCH
PSAN	PUMPED SANITARY
PSC	PUMPED STEAM CONDENSATE
RD	ROOF DRAIN
RL	RAIN LEADER
SAN, S	SANITARY
SC	STEAM CONDENSATE
SCH	SCHEDULE
SP	SPRINKLER LINE
STD	STANDARD
SW	STORM WATER
T	TEMPERATURE
TD	TRENCH DRAIN
TS	TAMPER SWITCH
TW	TEMPERED WATER
TWR	TEMPERED WATER RETURN
UP	PIPE UP
UP&DN	PIPE UP & DN
V	VENT
VB	VACUUM BREAKER
VTR	VENT THROUGH ROOF
WCO	WALL CLEANOUT
WHA	WATER HAMMER ARRESTOR
WSFU	WATER SUPPLY FIXTURE UNITS
TD	TRENCH DRAIN

NOTE:
NOT ALL ABBREVIATIONS MAY BE USED.



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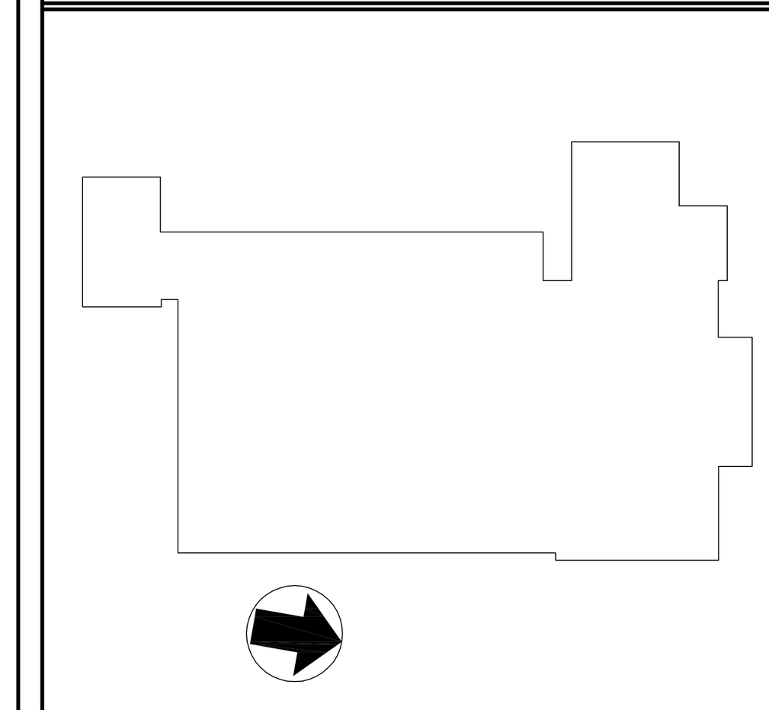

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CR

PLUMBING NOTES, & LEGEND

PLOT SCALE: NO SCALE
FILENAME:
DATE: FEBRUARY 10, 2020

PROJECT
3309

P0.1

GENERAL NOTES:

1. PATCH ALL HOLES, PENETRATIONS, ETC. TO MATCH EXISTING MATERIALS (WALLS, FLOORS, ROOF ETC), FINISHES ETC. AND PAINT TO MATCH EXISTING FINISHES. ALL ROOFING WORK SHALL BE PERFORMED BY A CERTIFIED ROOFING CONTRACTOR TO MAINTAIN THE EXISTING WARRANTY IN THE AREAS OF WORK.

DRAWING NOTES:

(1) REMOVE EXISTING PLUMBING FIXTURE(S), AND ASSOCIATED SANITARY, VENT AND DOMESTIC WATER PIPING IN IT'S ENTIRETY.

(2) REMOVE EXISTING DOMESTIC WATER PIPING BACK TO EXISTING BOILER ROOM.

(3) UNDER ADD ALTERNATE, REMOVE EXISTING PLUMBING FIXTURES, PIPING, VALVES ETC IN IT'S ENTIRETY.

(4) RX 6" UG SAN AS INDICATED.

(5) RX UG CW AS INDICATED

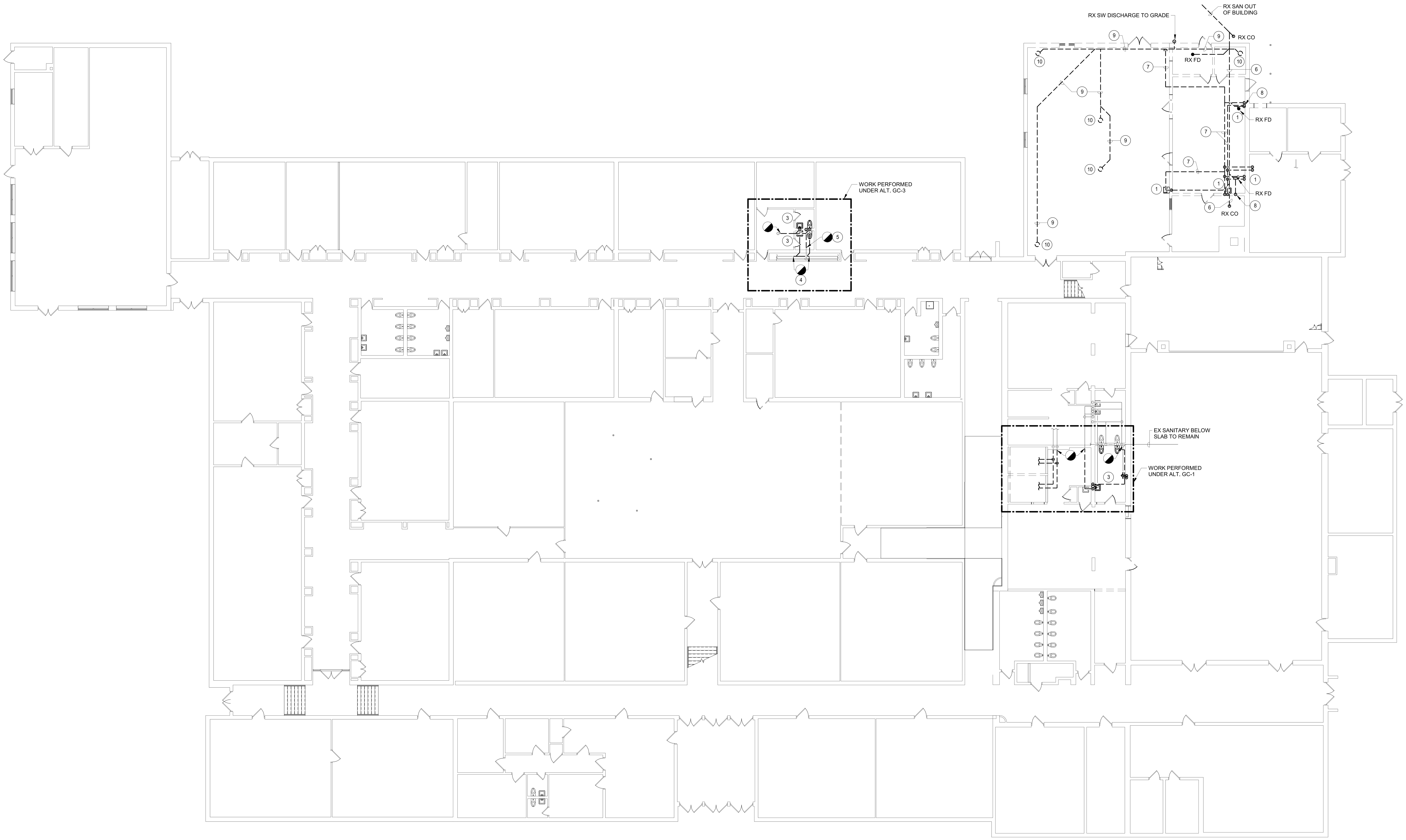
(6) RX 4" UG SAN AS INDICATED.

(7) RX DOMESTIC WATER PIPING, INSULATION, HANGERS ETC IN IT'S ENTIRETY.

(8) RX VENT THROUGH ROOF.\

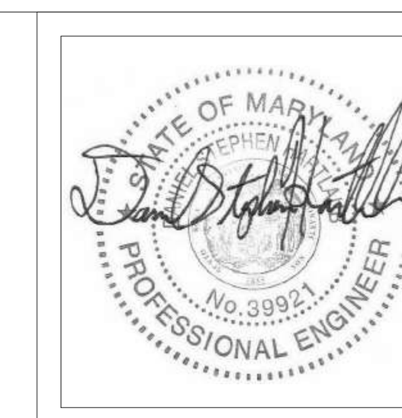
(9) RX STORM WATER PIPING AND ALL ASSOCIATED INSULATION, SUPPORTS, HANGERS ETC. IN IT'S ENTIRETY.

(10) RX STORM WATER PIPING UP TO RD.



FIRST FLOOR - DEMOLITION
3/32" = 1'-0"

SCALE: 3/32" = 1'-0"
8 0 8 16 32



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REVISIONS

MM-DD-YR	NAME	DESCRIPTION OF CHANGES

CRABTREE ROHRBAUGH & ASSOCIATES - ARCHITECTS
100 WEST ROAD, SUITE 402
TOWSON MD 21204
410-528-0272
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KENT COUNTY PUBLIC SCHOOLS
114 S MAIN STREET
GALENA, MD 21635

CR

FLOOR PLAN - DEMOLITION
PLOT SCALE: 3/32" = 1'-0"
FILENAME:
DATE: FEBRUARY 10, 2020

PROJECT
3309

PD2.1

GENERAL NOTES:

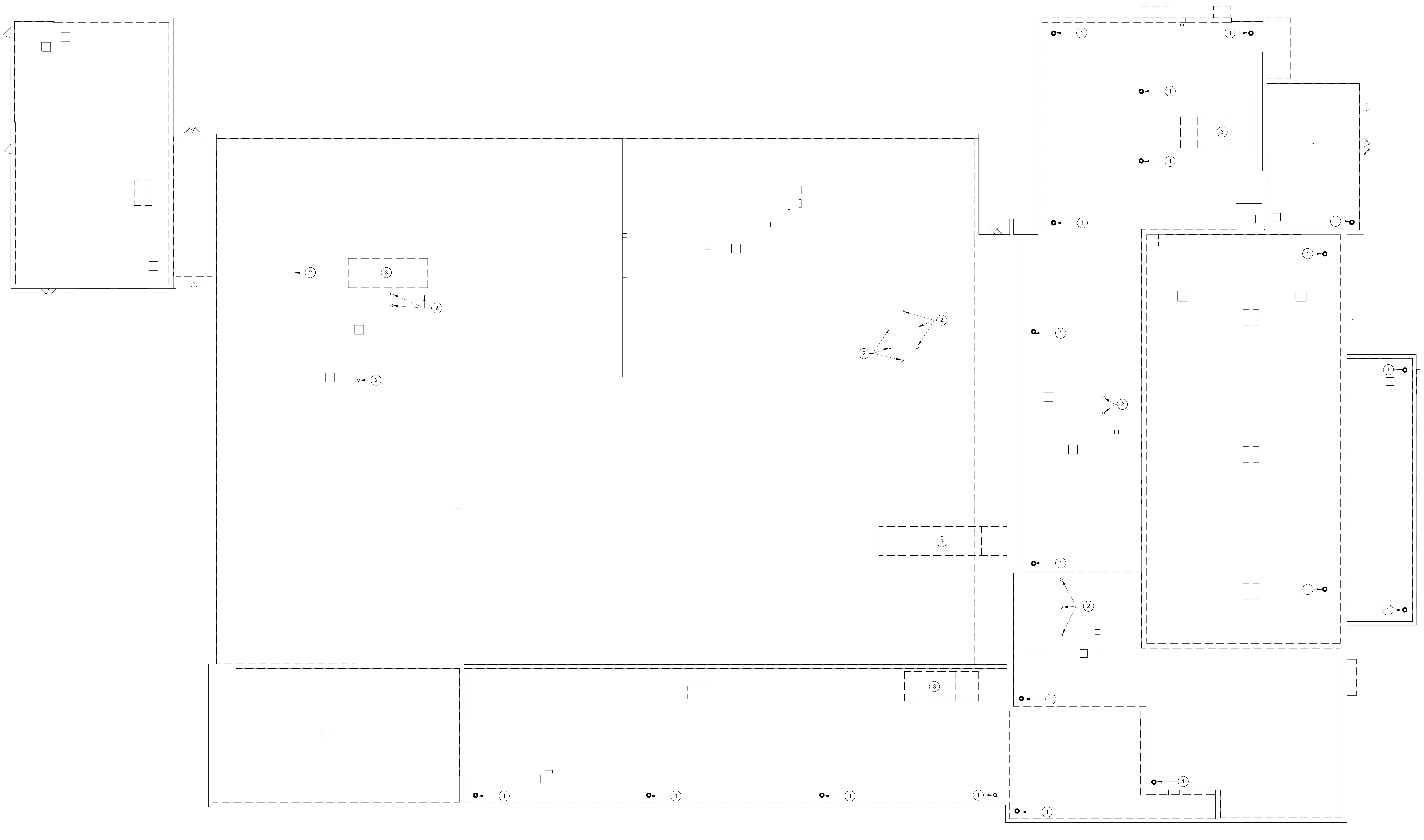
1. PATCH ALL HOLES, PENETRATIONS, ETC. TO MATCH EXISTING MATERIALS (WALLS, FLOORS, ROOF ETC), FINISHES ETC. AND PAINT TO MATCH EXISTING FINISHES. ALL ROOFING WORK SHALL BE PERFORMED BY A CERTIFIED ROOFING CONTRACTOR TO MAINTAIN THE EXISTING WARRANTY IN THE AREAS OF WORK.
2. DURING ROOF REPLACEMENT ALL EXISTING TO REMAIN VENTS AND DRAINS SHALL REMAIN ACTIVE THROUGH CONSTRUCTION.

DRAWING NOTES:

(1) REMOVE EXISTING ROOF DRAIN IN IT'S ENTIRETY.

(2) EXISTING TO REMAIN PLUMBING VENT.

(3) DEMOLISH EXISTING CONDENSATE DRAIN CONNECTED TO MECHANICAL UNITS TO BE DEMOLISHED.



ROOF PLAN - DEMOLITION
3/32" = 1'-0"

SCALE: 3/32" = 1'-0"
8 0 8 16 32

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ROOF PLAN - DEMOLITION

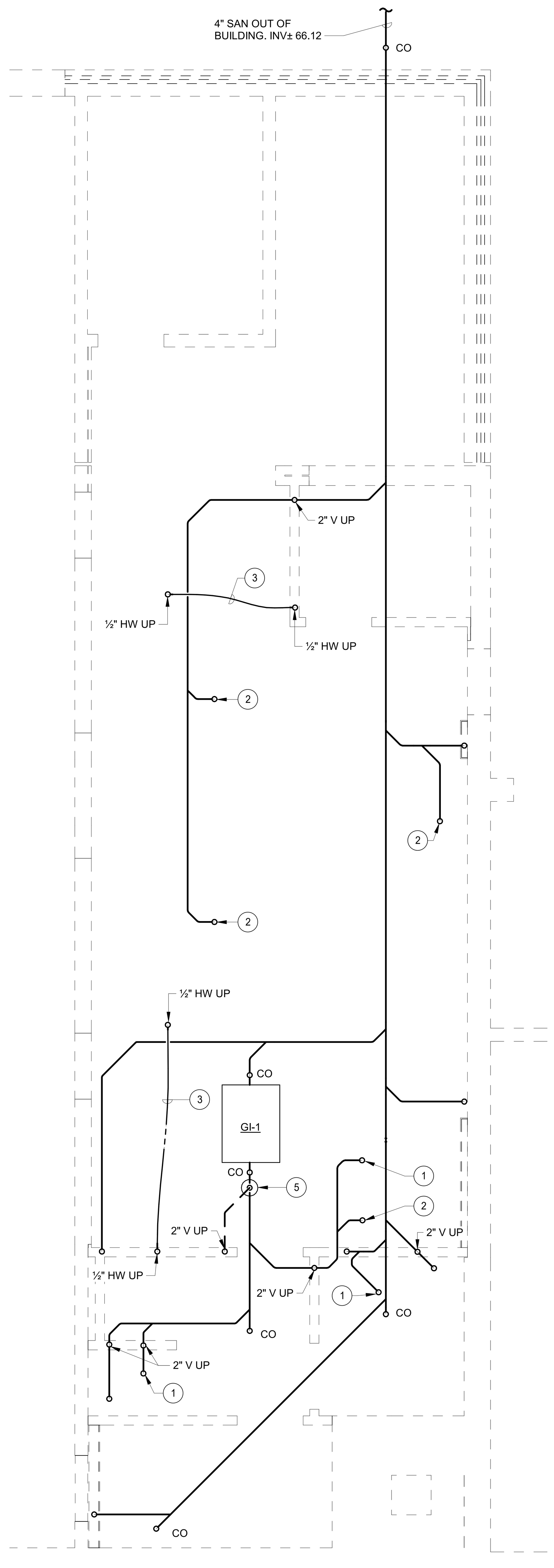
PLOT SCALE: 3/32" = 1'-0"

FILENAME:

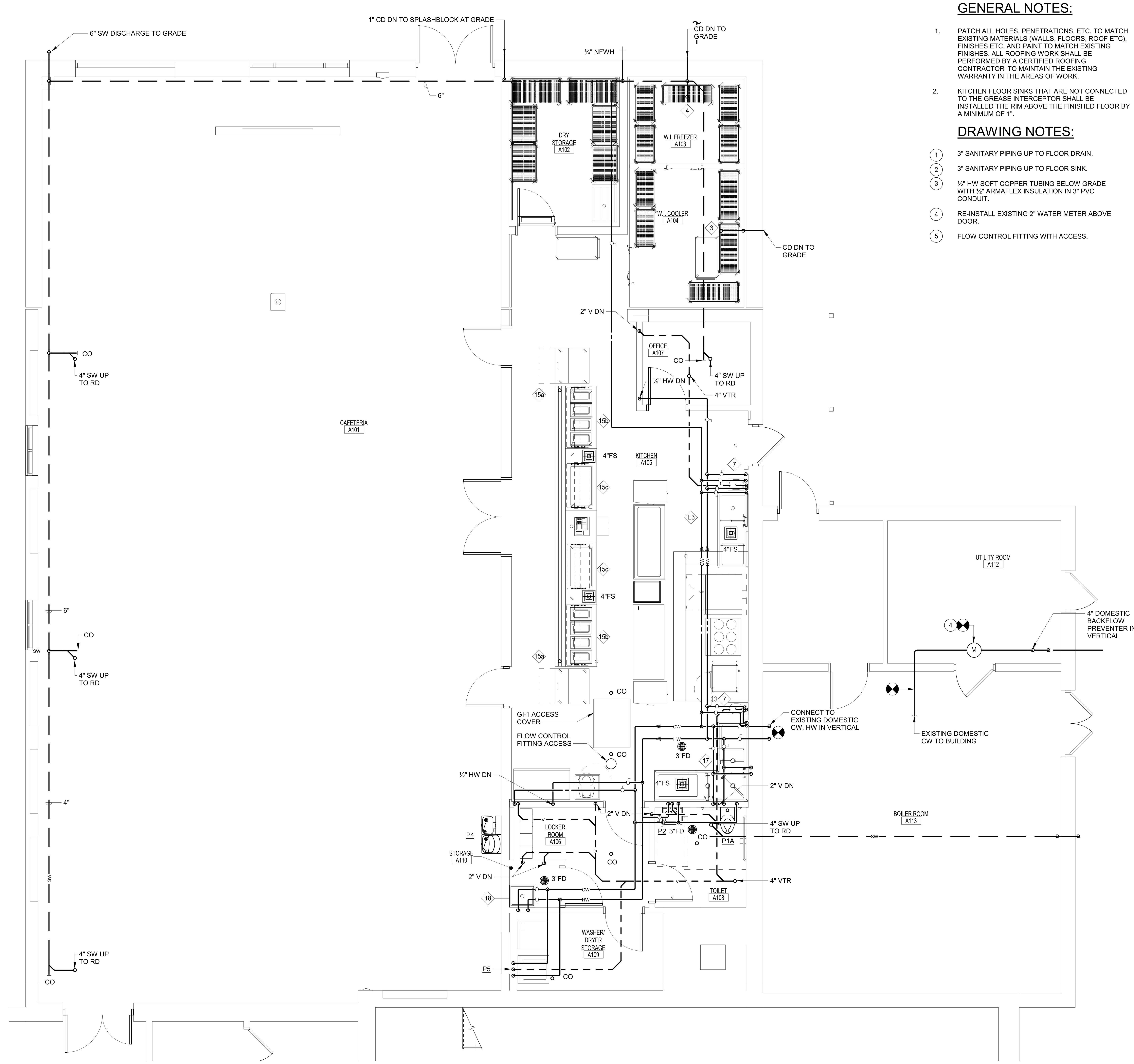
DATE: FEBRUARY 10, 2020

PROJECT
3309

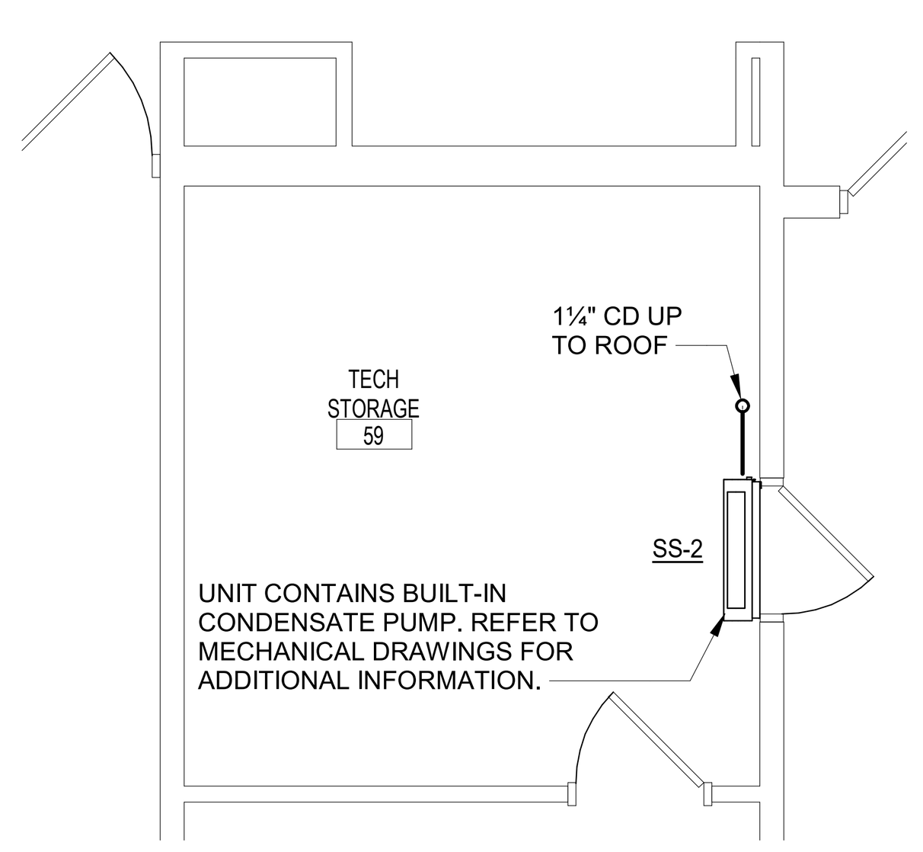
PD2.2



PARTIAL FOUNDATION PLAN - KITCHEN/CAFETERIA - BASE BID
1/4" = 1'-0"



PARTIAL FLOOR PLAN - KITCHEN/CAFETERIA - BASE BID
1/4" = 1'-0"



PARTIAL FLOOR PLAN - TECH STORAGE - BASE BID
1/4" = 1'-0"

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

GENERAL NOTES:

1. PATCH ALL HOLES, PENETRATIONS, ETC. TO MATCH EXISTING MATERIALS (WALLS, FLOORS, ROOF ETC), FINISHES ETC. AND PAINT TO MATCH EXISTING FINISHES. ALL ROOFING WORK SHALL BE PERFORMED BY A CERTIFIED ROOFING CONTRACTOR TO MAINTAIN THE EXISTING WARRANTY IN THE AREAS OF WORK.
2. KITCHEN FLOOR SINKS THAT ARE NOT CONNECTED TO THE GREASE INTERCEPTOR SHALL BE INSTALLED THE RIM ABOVE THE FINISHED FLOOR BY A MINIMUM OF 1".

DRAWING NOTES:

1. 3" SANITARY PIPING UP TO FLOOR DRAIN.
2. 3" SANITARY PIPING UP TO FLOOR SINK.
3. ½" HW SOFT COPPER TUBING BELOW GRADE WITH ½" ARMAFLEX INSULATION IN 3" PVC CONDUIT.
4. RE-INSTALL EXISTING 2" WATER METER ABOVE DOOR.
5. FLOW CONTROL FITTING WITH ACCESS.

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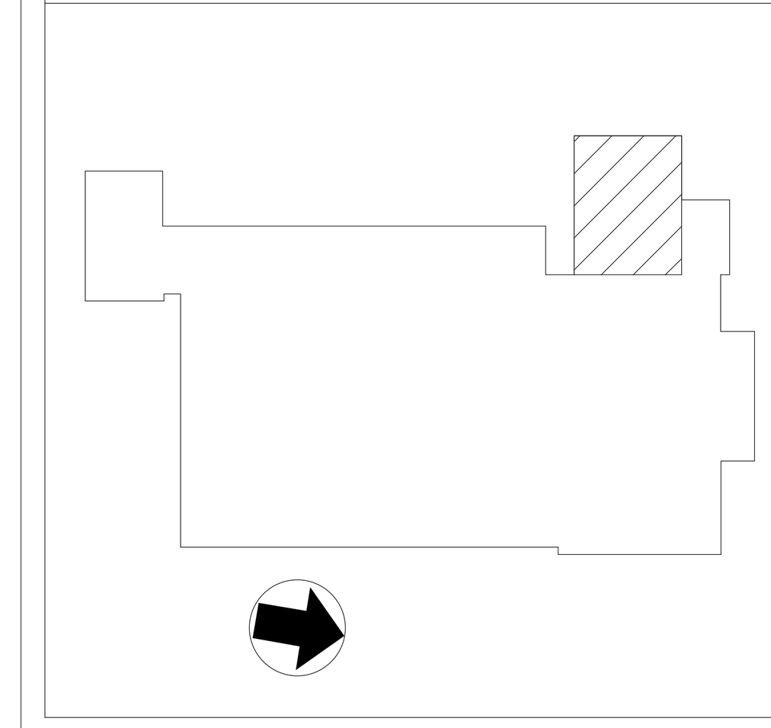
KEY PLAN



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PARTIAL FLOOR PLANS - KITCHEN/CAFETERIA

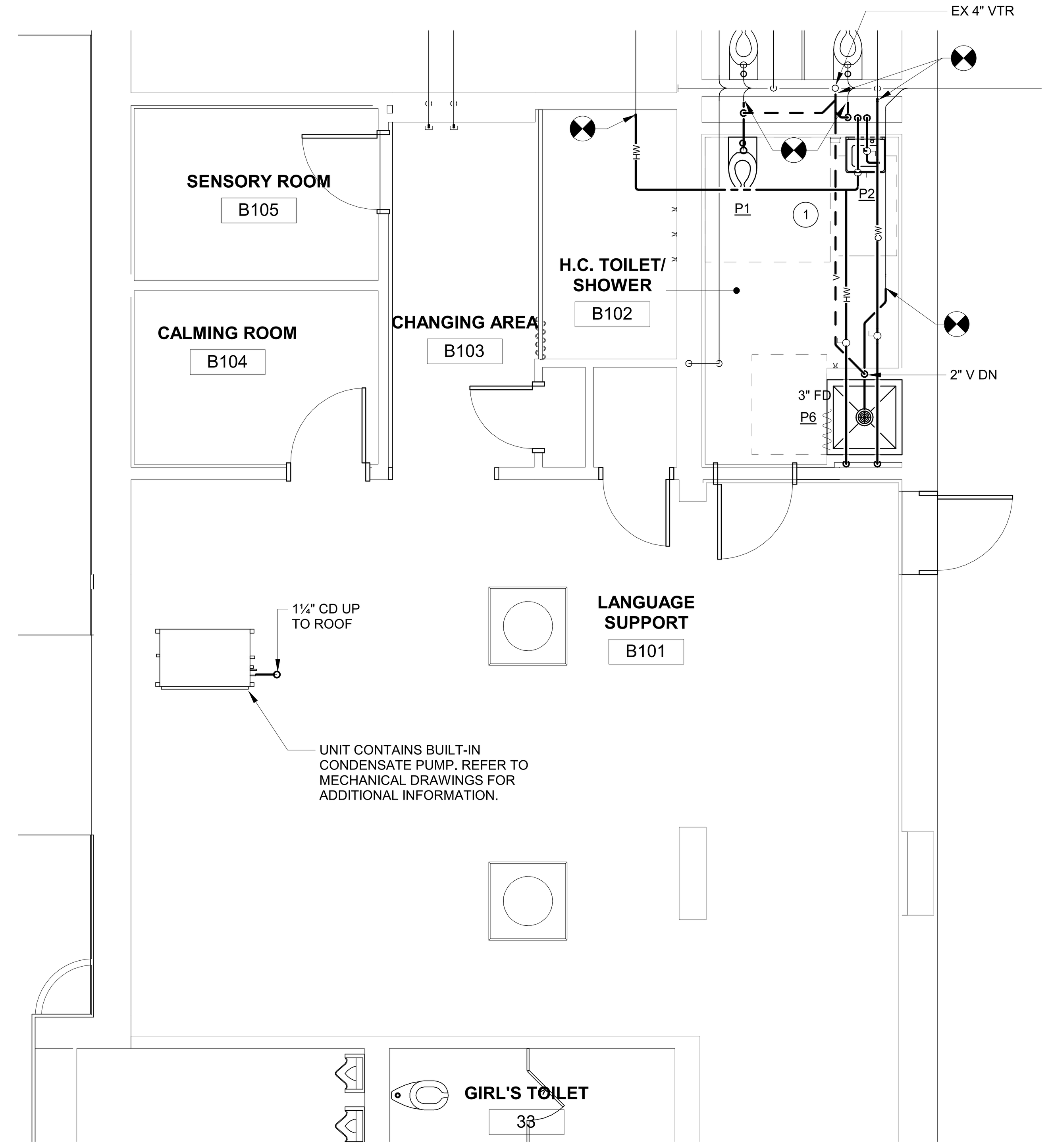
PLOT SCALE: 1/4" = 1'-0"

FILENAME:

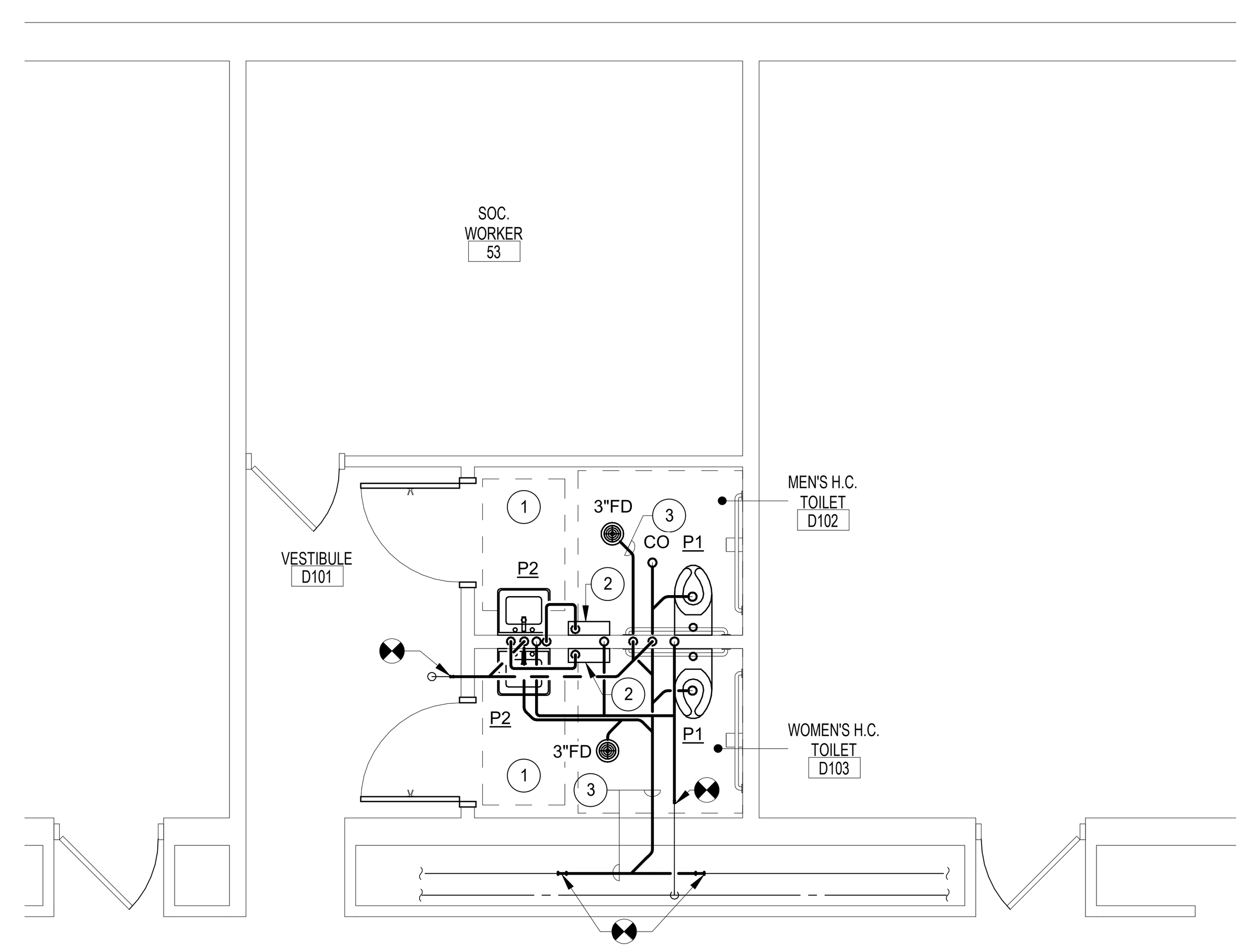
DATE: FEBRUARY 10, 2020

PROJECT
3309

P2.1



PARTIAL FLOOR PLAN - LANGUAGE SUPPORT - ALT. GC-1
1/4" = 1'-0"



PARTIAL FLOOR PLAN - ADA TOILETS - ALT. GC-3
1/4" = 1'-0"

GENERAL NOTES:

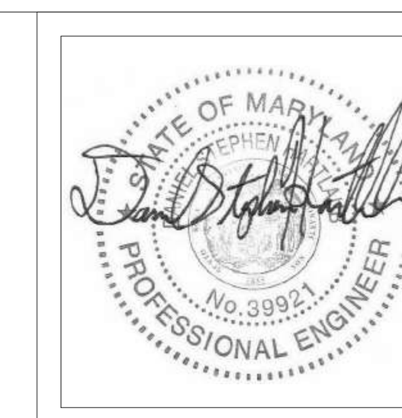
1. PATCH ALL HOLES, PENETRATIONS, ETC. TO MATCH EXISTING MATERIALS (WALLS, FLOORS, ROOF ETC), FINISHES ETC. AND PAINT TO MATCH EXISTING FINISHES. ALL ROOFING WORK SHALL BE PERFORMED BY A CERTIFIED ROOFING CONTRACTOR TO MAINTAIN THE EXISTING WARRANTY IN THE AREAS OF WORK.

DRAWING NOTES:

(1) EXTEND EXISTING SANITARY/VENT AND DOMESTIC WATER PIPING TO FIXTURES IN THIS AREA.

(2) ELECTRIC TANKLESS WATER HEATER LOCATED ABOVE CEILING. 3KW INPUT BASED ON HUBBELL MODEL R003-2S.

(3) SANITARY PIPING BELOW SLAB.



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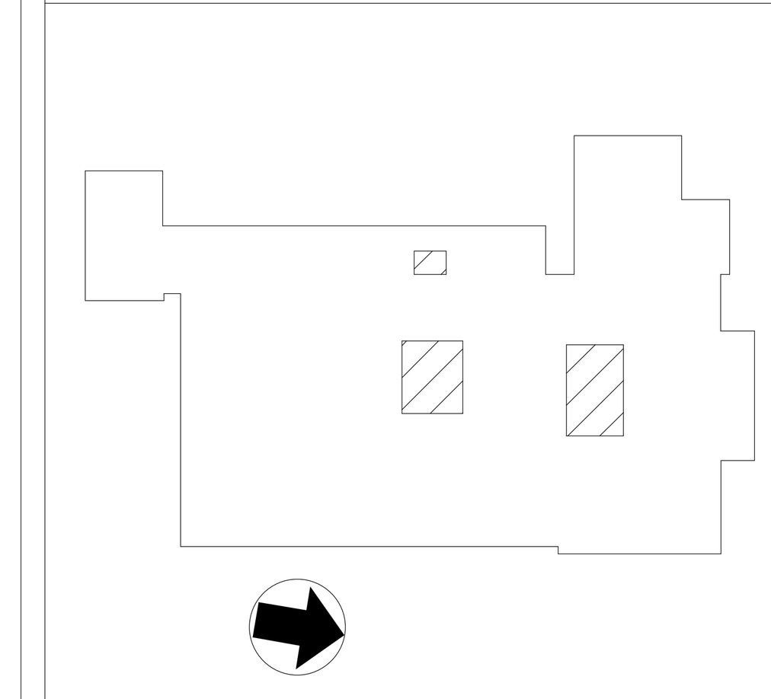
KEY PLAN



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PARTIAL FLOOR PLANS - ADD ALTERNATE

PLOT SCALE: 1/4" = 1'-0"
FILENAME:
DATE: FEBRUARY 10, 2020

PROJECT
3309

P2.2

SCALE: 1/4" = 1'-0"
4 0 4 8

GENERAL NOTES:

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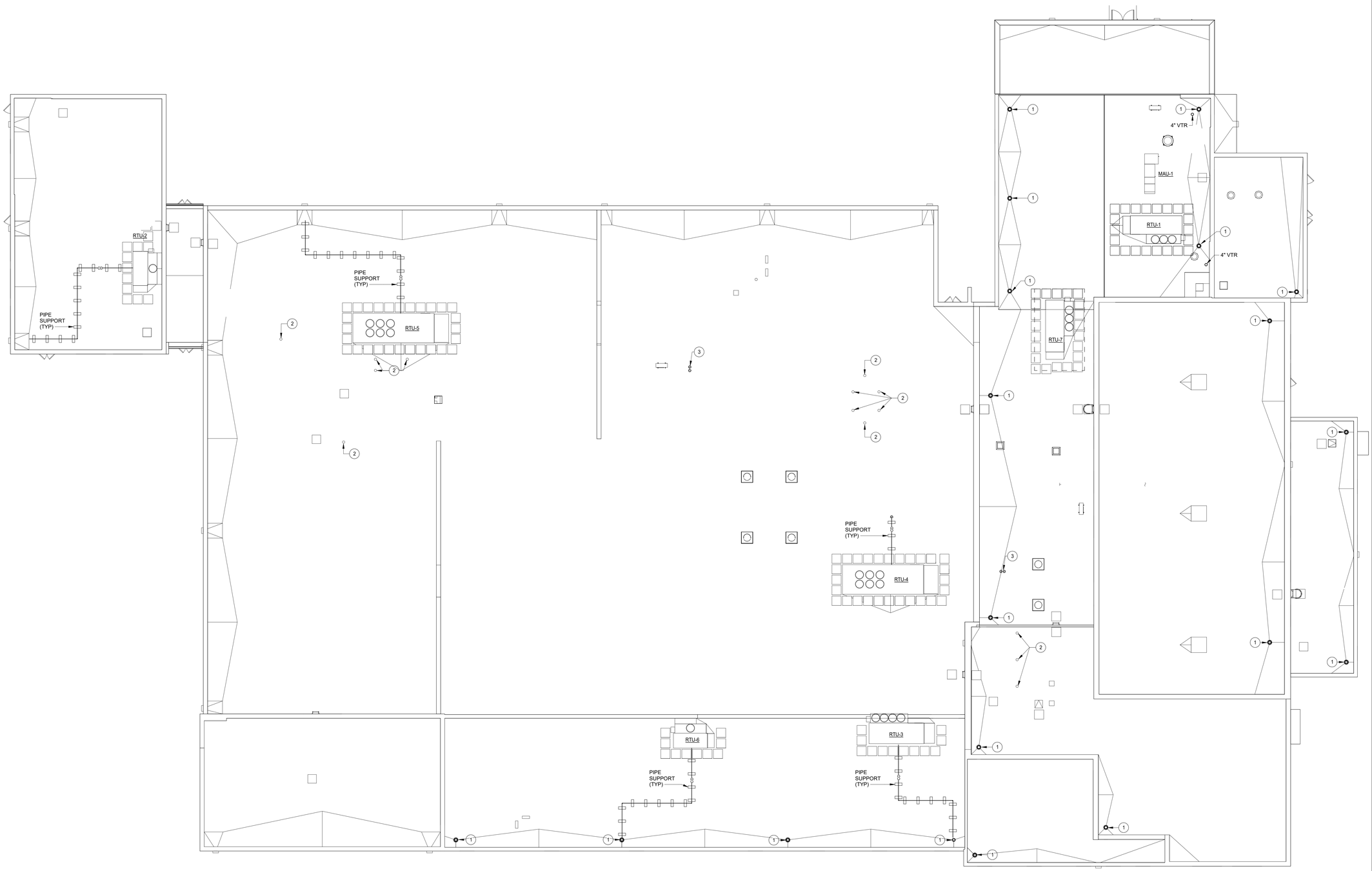
DRAWING NOTES:

(1) REPLACE ROOF DRAIN AND EXTEND PIPING TO ACCOUNT FOR NEW ROOF INSTALLATION.

(2) EXTEND EXISTING VENT THROUGH ROOF PIPING TO A MINIMUM OF 12" ABOVE FINISHED ROOF (TYP OF ALL)

(3) 1¼" GOOSENECK CD DISCHARGE TO ROOF. TERMINATE 18" ABOVE FINISHED ROOF. PROVIDE INSECT SCREEN OVER OPENING.



ROOF PLAN
3/32" = 1'-0"

SCALE: 3/32" = 1'-0"
8 0 8 16 32

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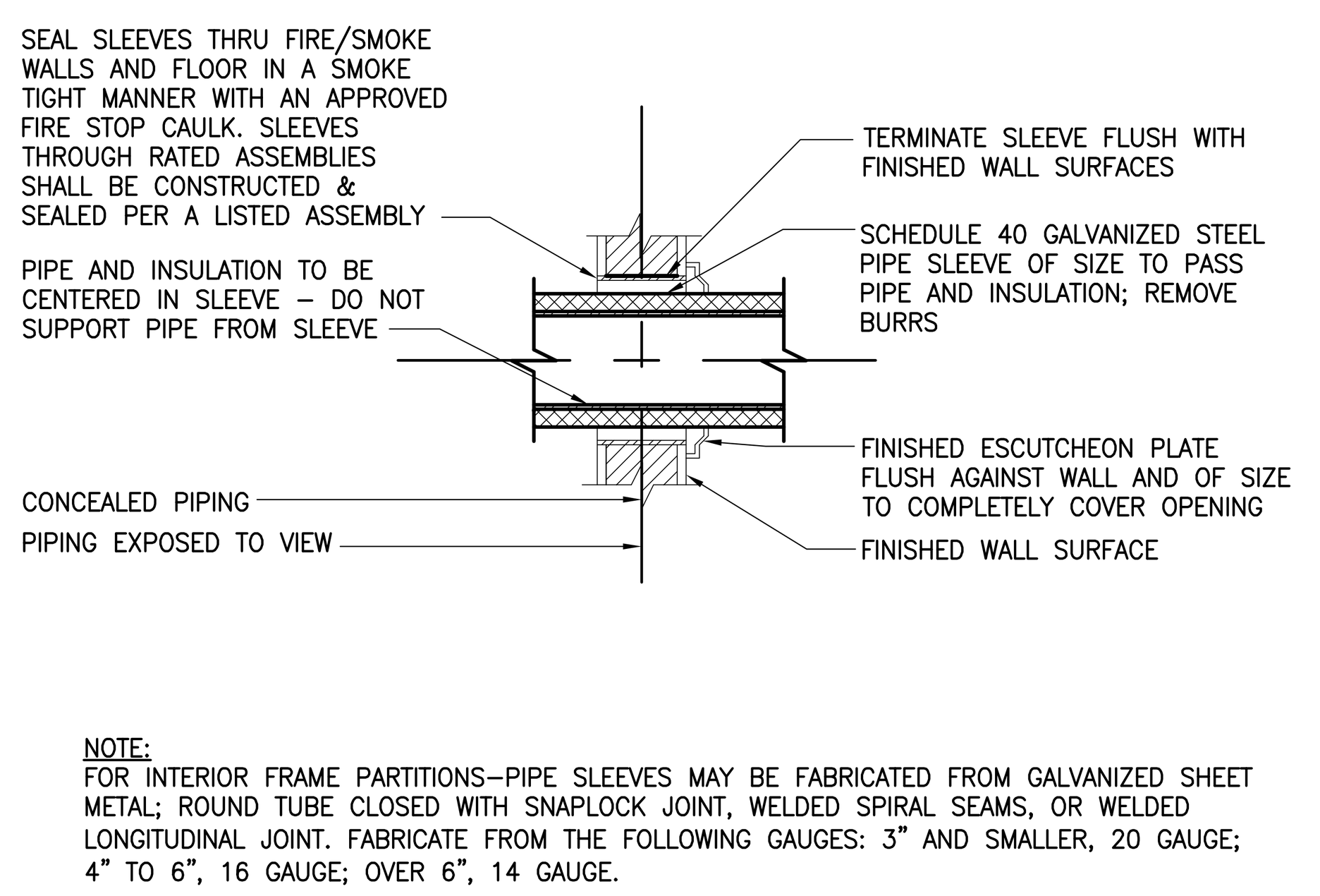
ROOF PLAN
PLOT SCALE: 3/32" = 1'-0"
FILENAME:
DATE: FEBRUARY 10, 2020

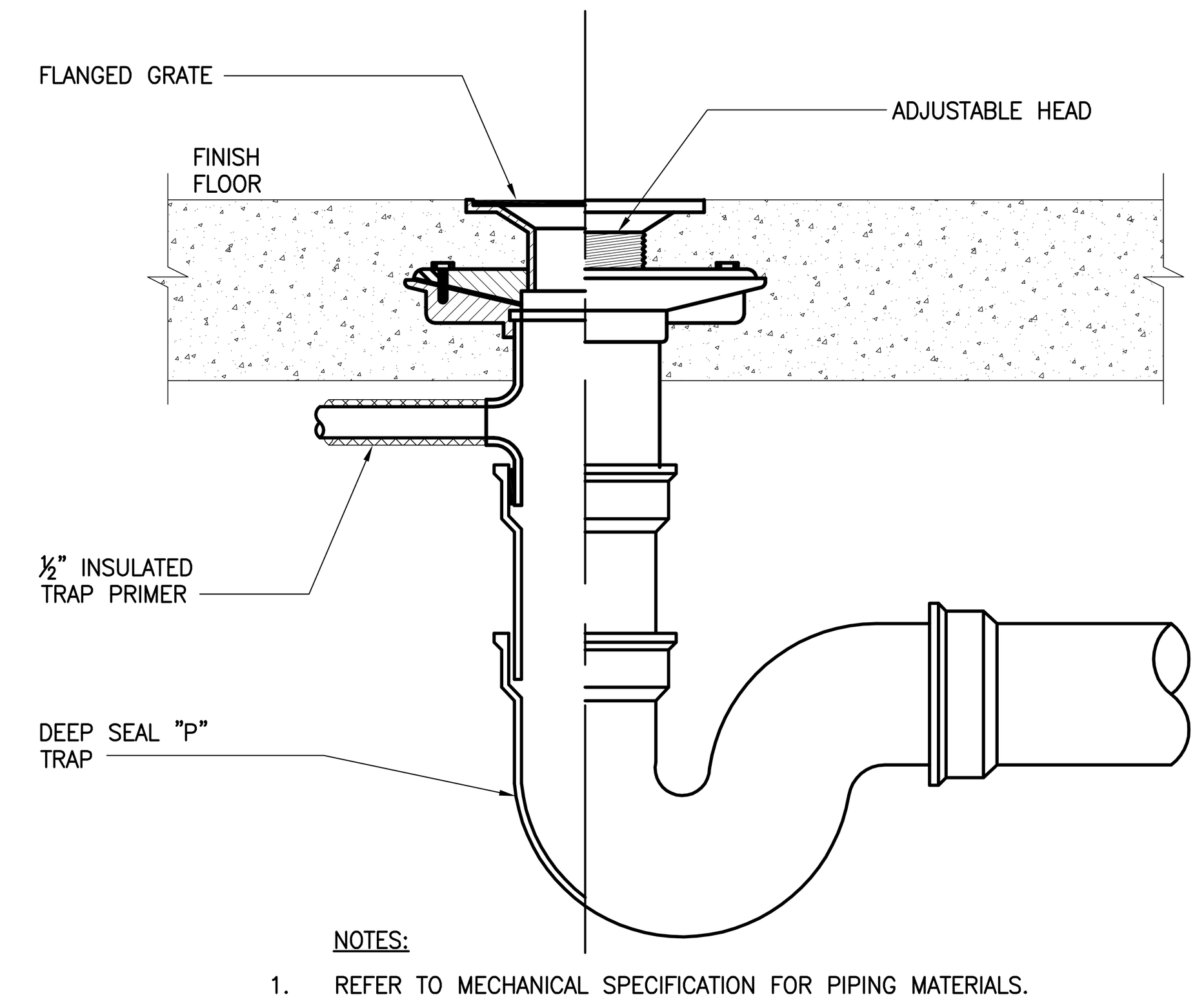
PROJECT 3309

P2.3



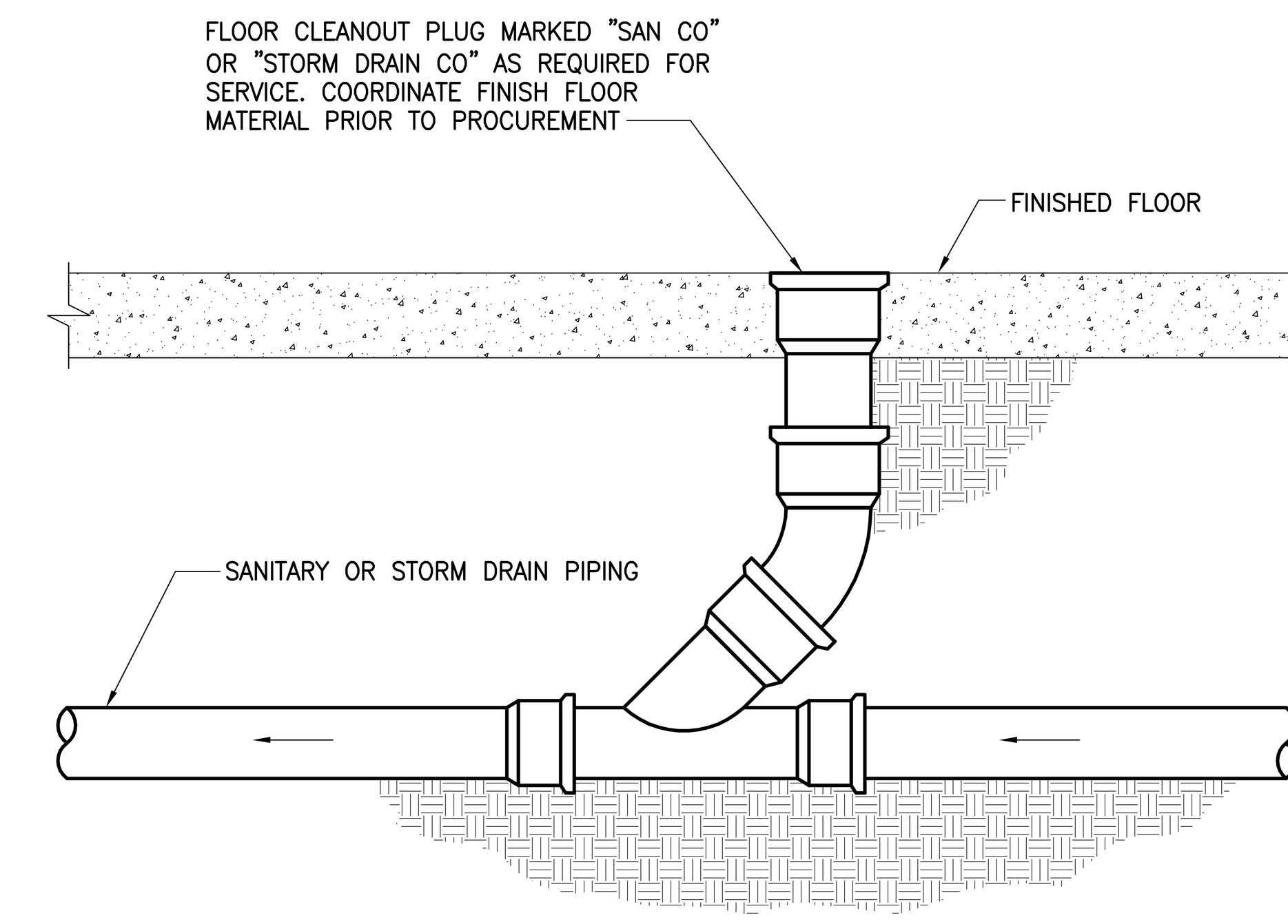
1 TYPICAL PIPE SLEEVE THRU INTERNAL WALL DETAIL

SCALE: NONE



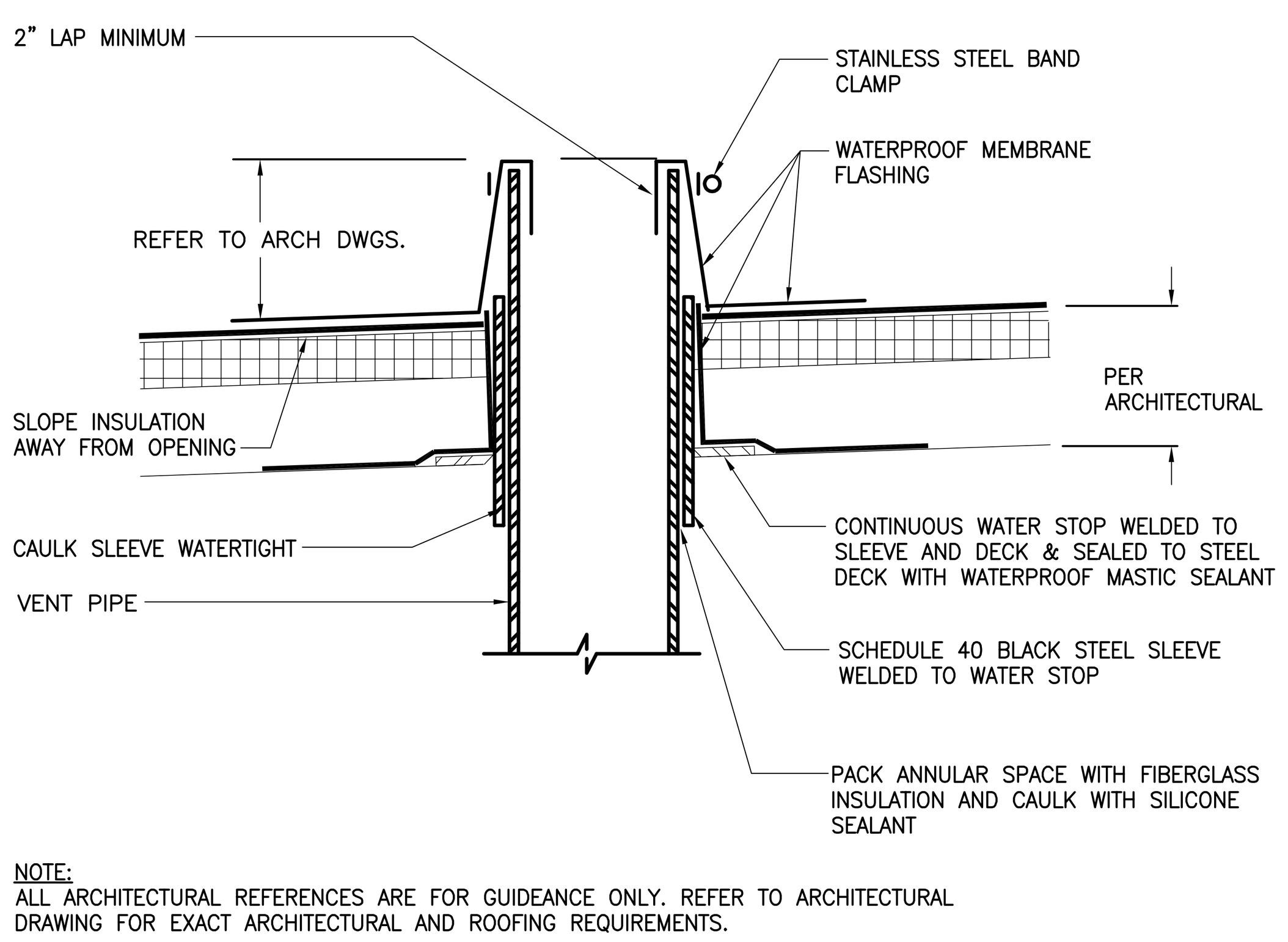
2 TYPICAL FLOOR DRAIN DETAIL

SCALE: NONE



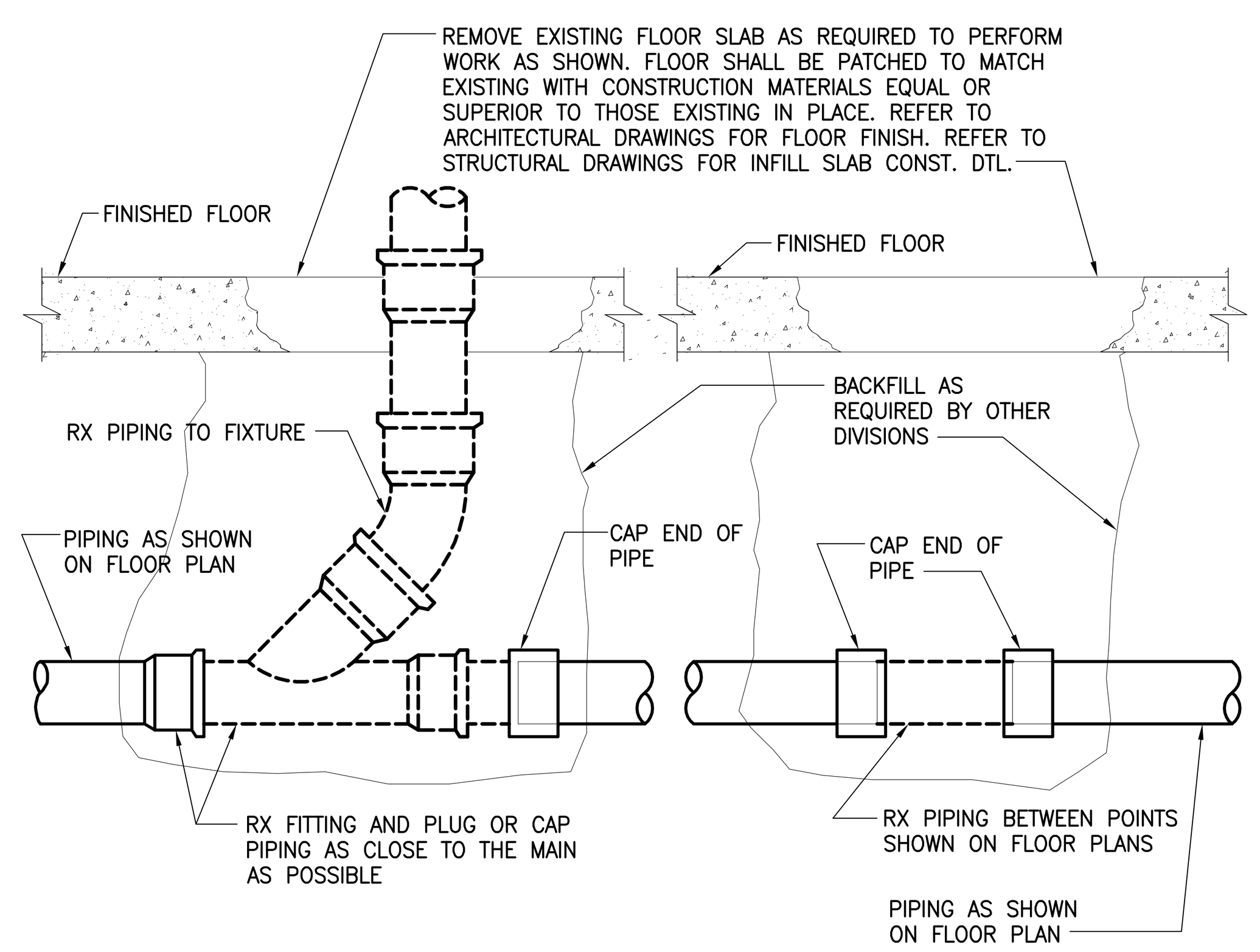
3 TYPICAL FLOOR CLEANOUT

SCALE: NONE



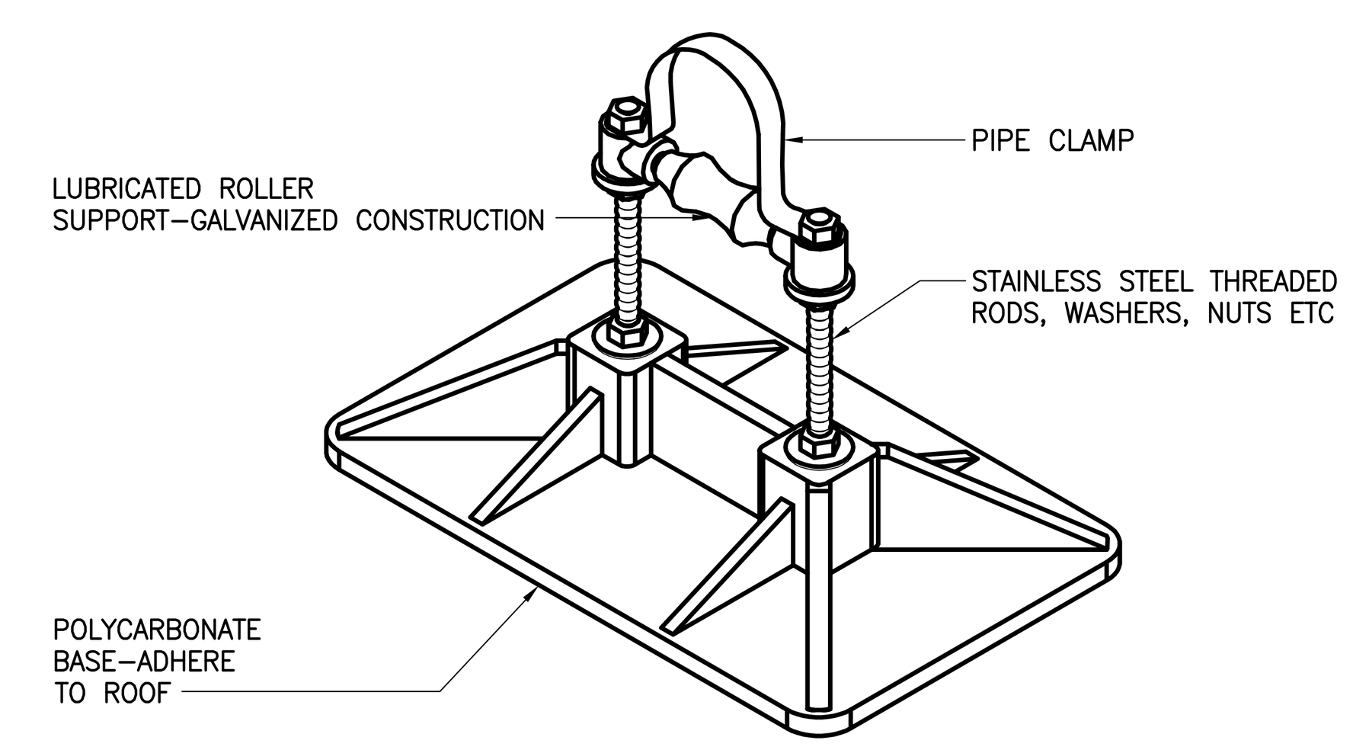
4 TYPICAL VENT PIPE THRU ROOF DETAIL

SCALE: NONE



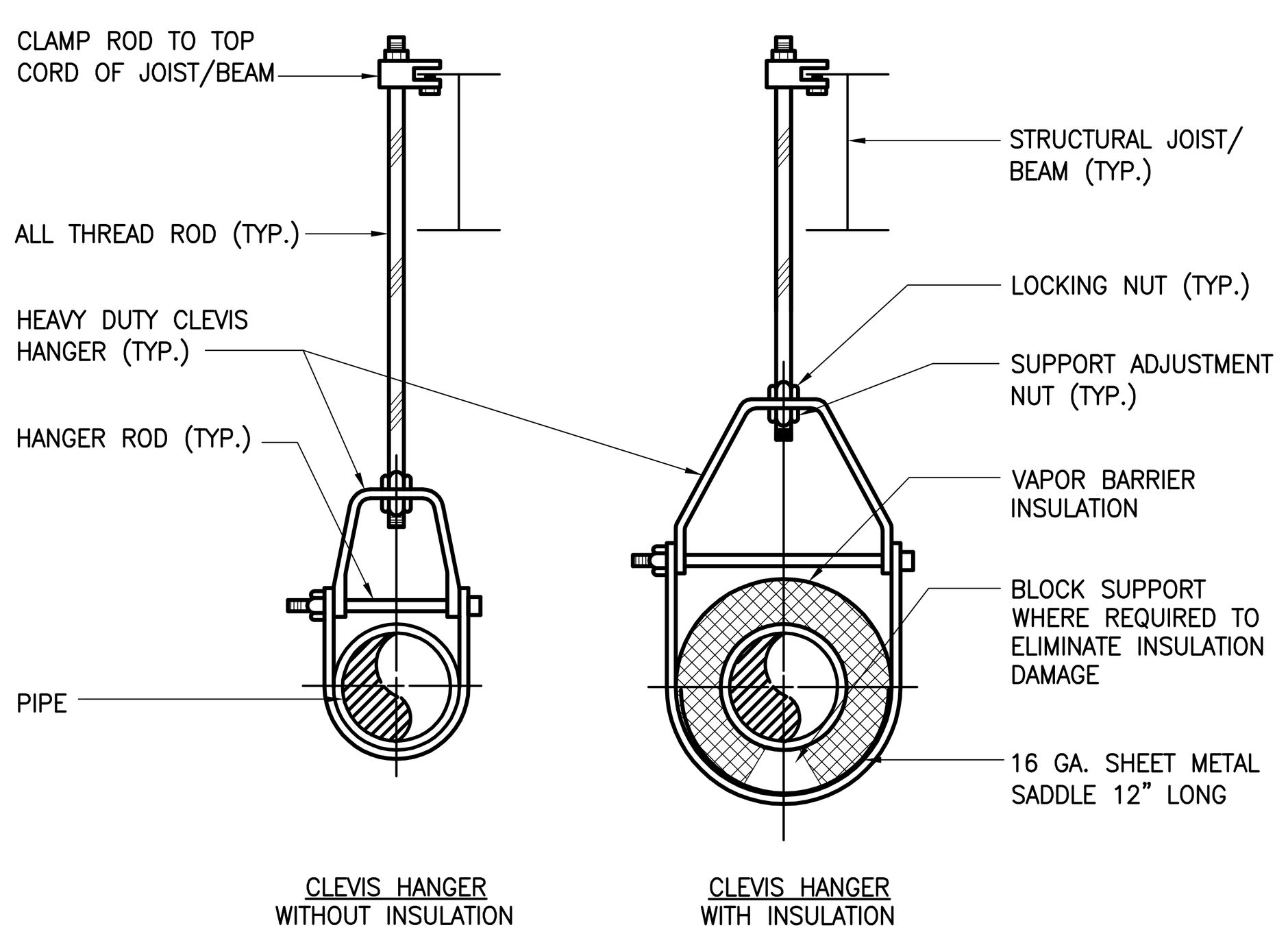
5 TYPICAL UNDERSLAB PIPING DEMOLITION AND ABANDONMENT DETAIL

SCALE: NONE



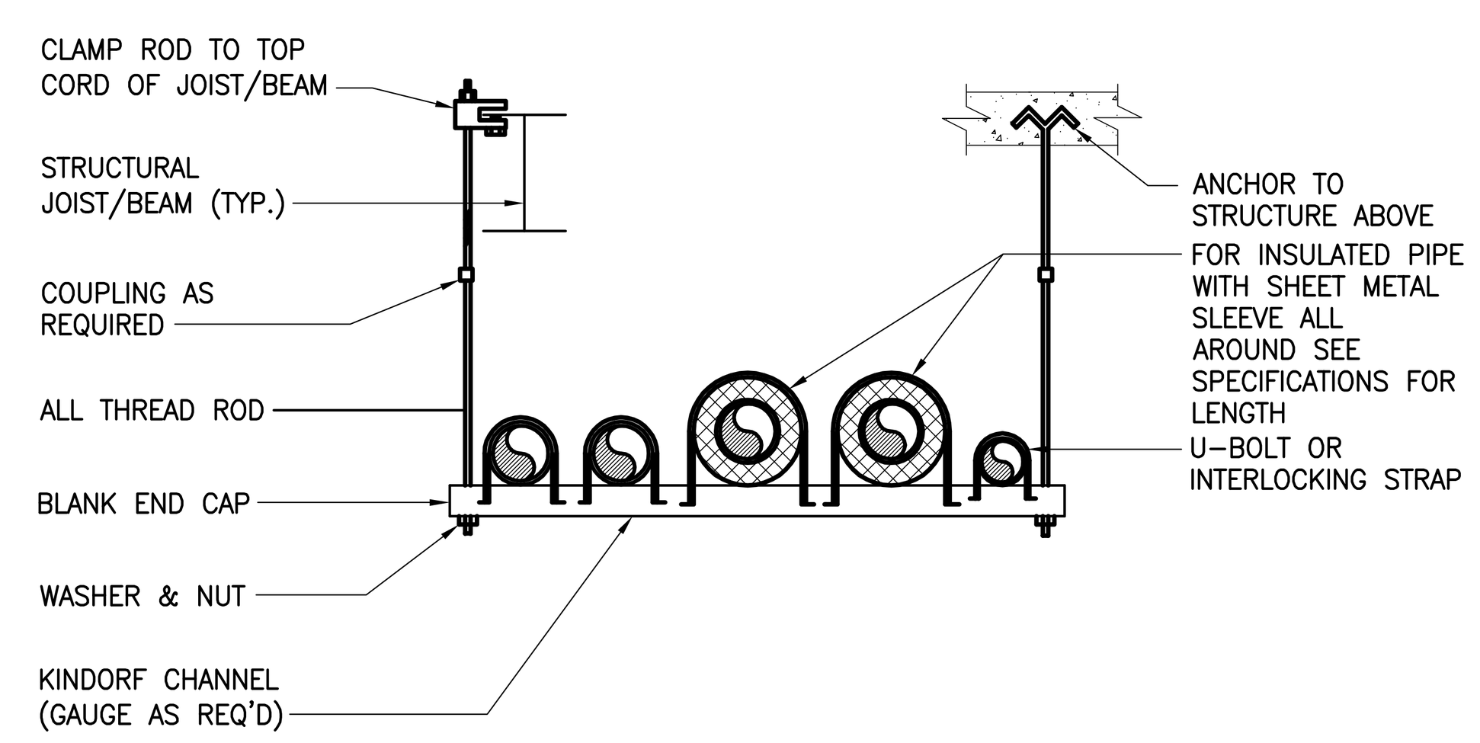
6 TYPICAL PIPING ON ROOF SUPPORT DETAIL

SCALE: NONE



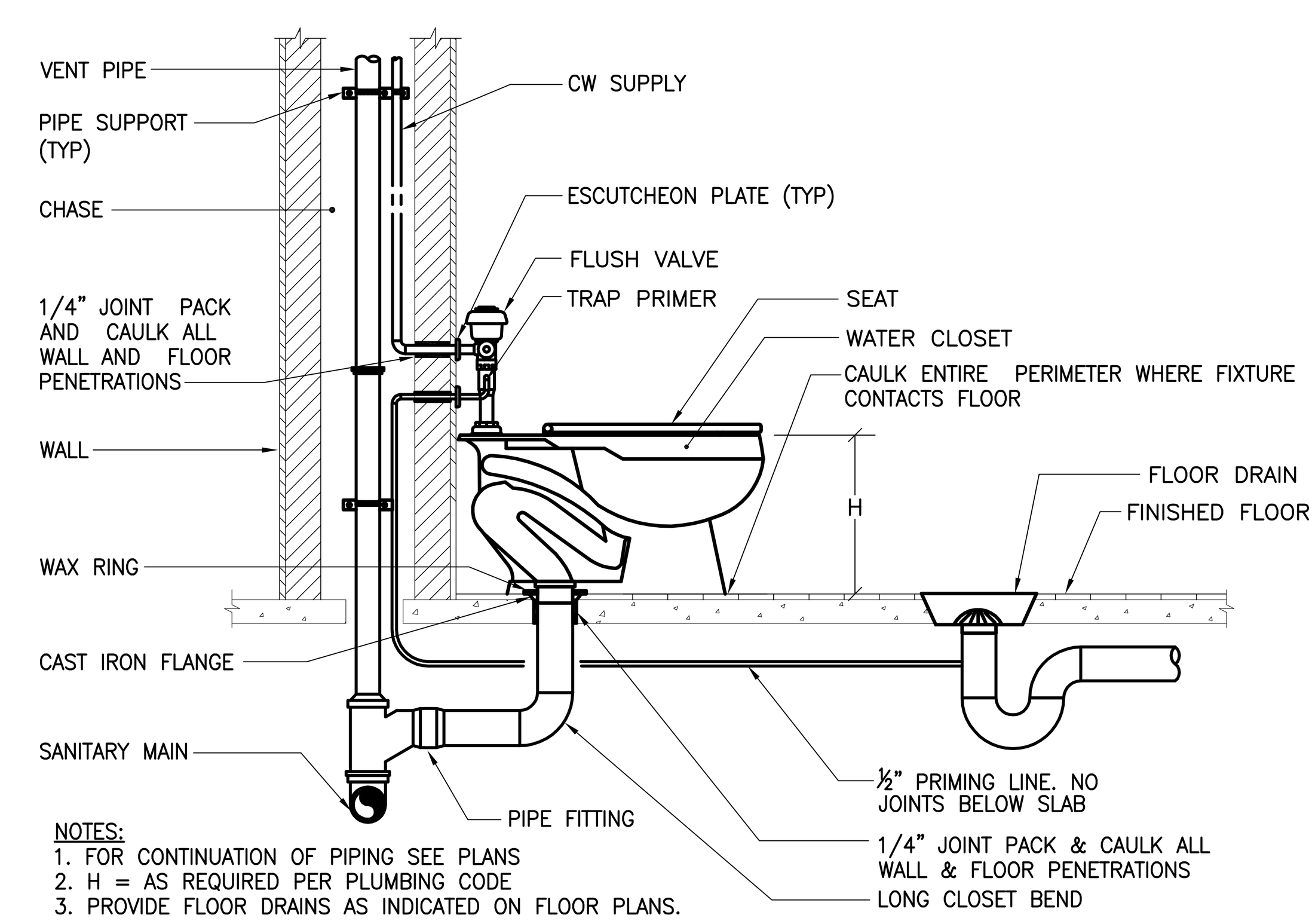
7 TYPICAL PIPE SUPPORT DETAIL

SCALE: NONE



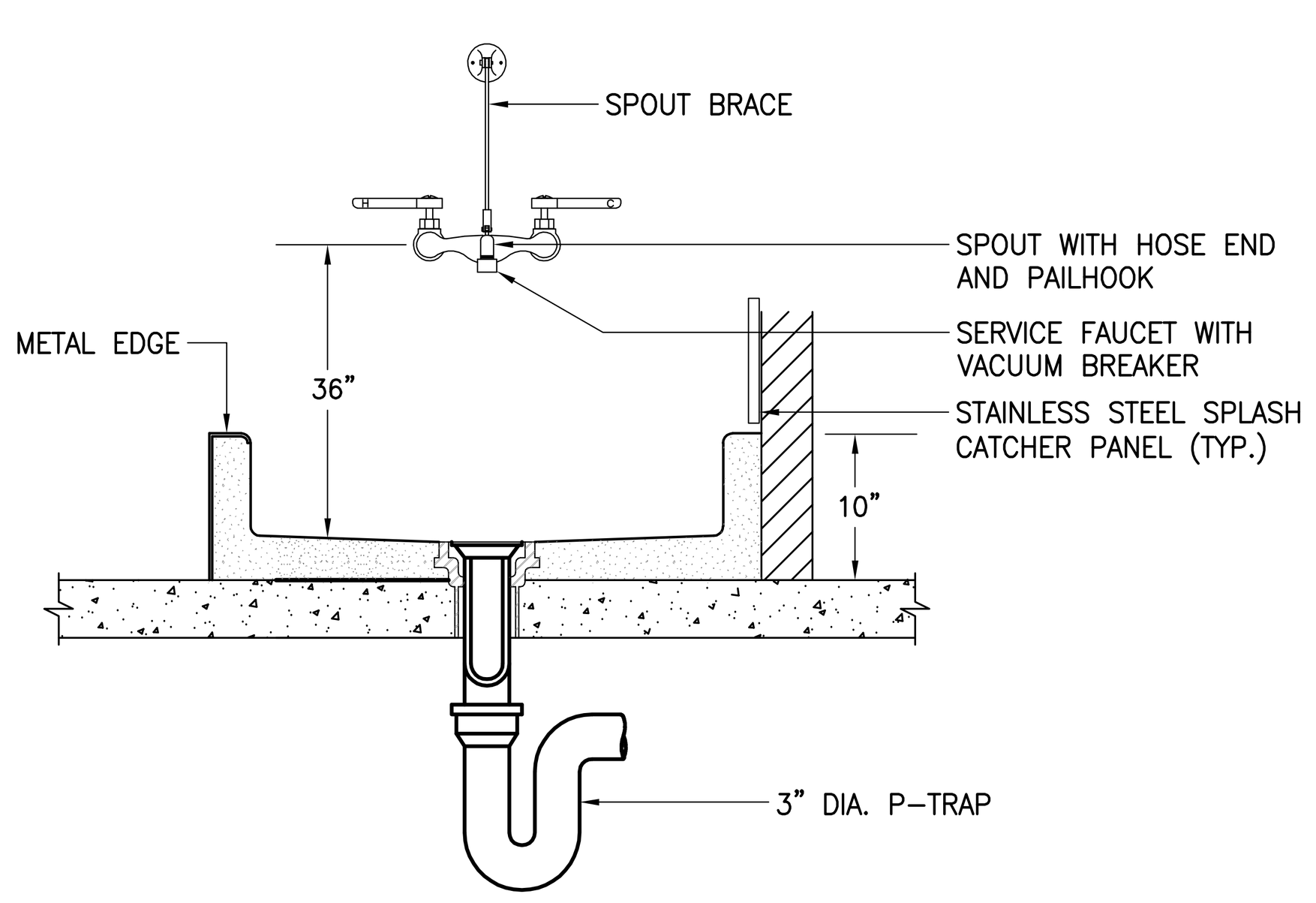
8 TYPICAL TRAPEZE PIPE SUPPORT DETAIL

SCALE: NONE



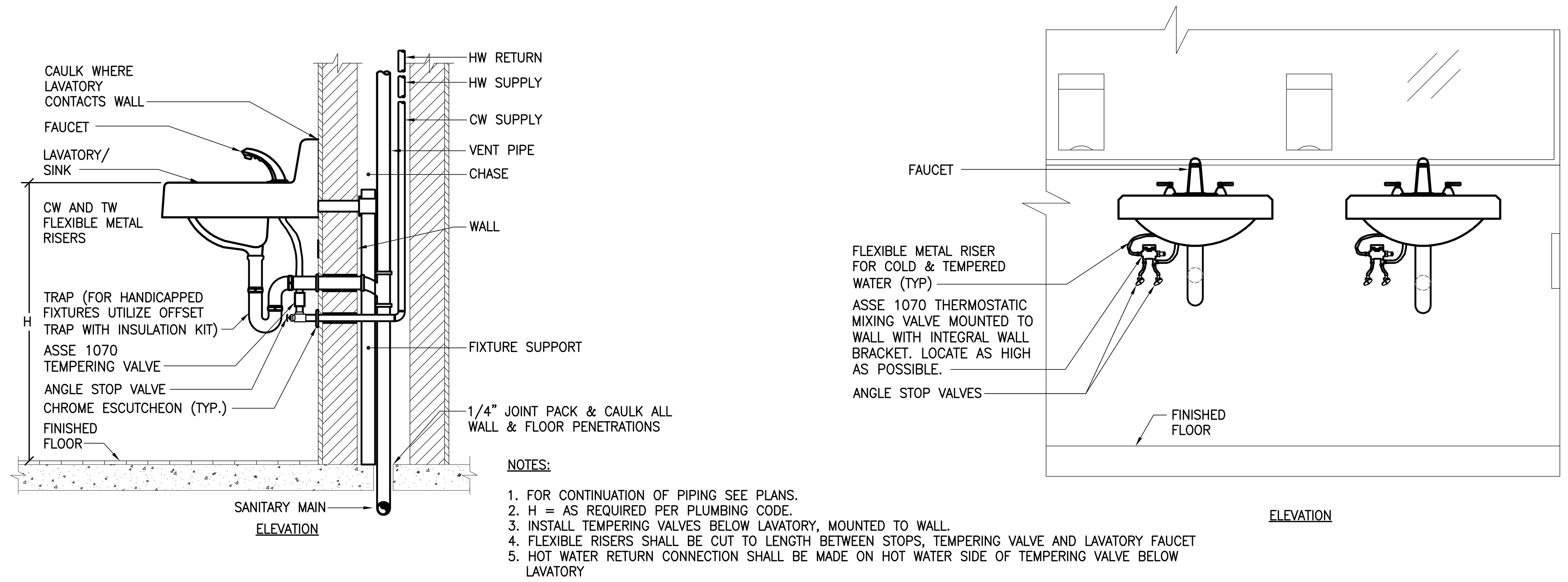
9 FLOOR MOUNTED WATER CLOSET (MANUAL FLUSH VALVE) AND TRAP PRIMING DETAIL

SCALE: NONE



10 TYPICAL FLOOR MOUNTED MOP SINK DETAIL

SCALE: NONE



11 TYPICAL WALL MOUNTED LAVATORY DETAIL

SCALE: NONE

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KEY PLAN

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ADDITION AND RENOVATIONS OF GALENA ELEMENTARY SCHOOL

114 S MAIN STREET
GALENA, MD 21635

PIPING, SUPPORT, & FIXTURE DETAILS

PLOT SCALE: NO SCALE

FILENAME:

DATE: FEBRUARY 10, 2020

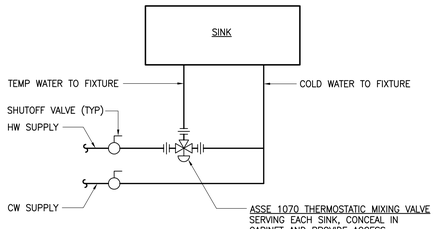
PROJECT 3309

P7.1

(12) NOT USED

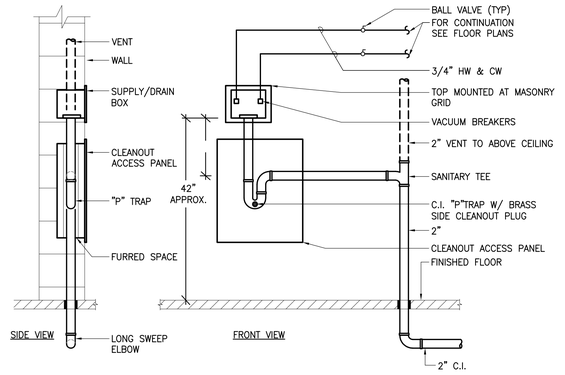
SCALE: NONE

(13) TYPICAL SINK ASSE 1070 MIXING VALVE INSTALLATION DETAIL



SCALE: NONE

(14) TYPICAL CLOTHES WASHER CONNECTOR BOX PIPING DETAIL

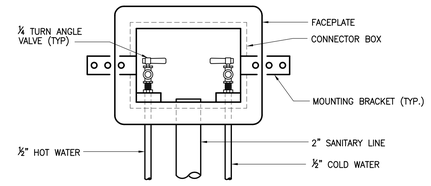


SCALE: NONE

(15) NOT USED

SCALE: NONE

(16) TYPICAL CLOTHES WASHER CONNECTOR BOX DETAIL

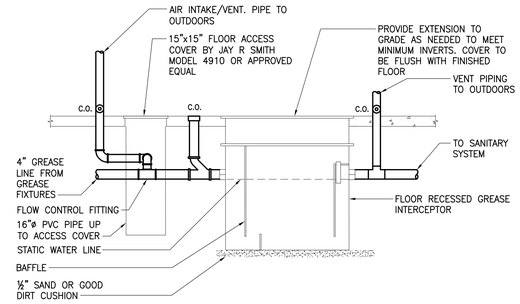


NOTES:
CONTRACTOR SHALL PROVIDE AN UP FEED OR DOWN FEED WASHING MACHINE BOX AS INDICATED ON DRAWINGS.

PROVIDE VACUUM BREAKERS ON WATER CONNECTIONS

SCALE: NONE

(17) TYPICAL INTERIOR GREASE INTERCEPTOR DETAIL



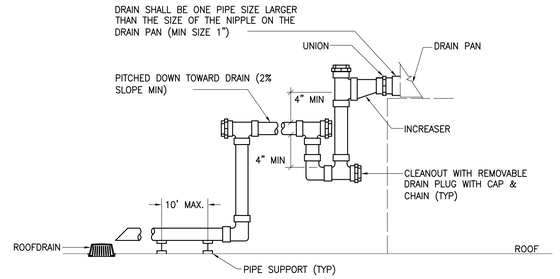
NOTES:
1. PROVIDE EXTENSION AS NEEDED TO MEET INLET & OUTLET INVERTS
2. GREASE INTERCEPTORS SHALL CONFORM TO PDI-G101 AND ASME A112.14.3

SCALE: NONE

(18) NOT USED

SCALE: NONE

(19) TYPICAL AHU CONDENSATE DRAIN TRAP DETAIL



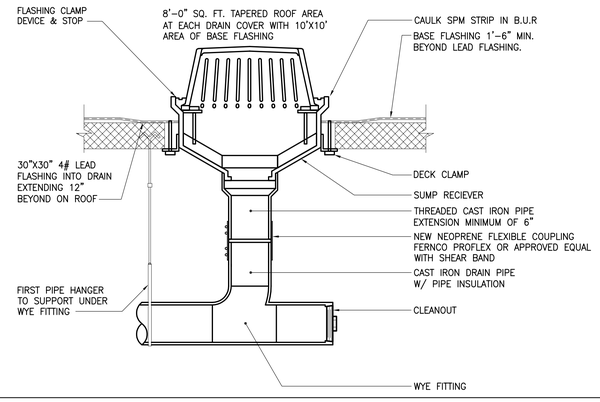
NOTES:
1. COORDINATE DISTANCE OFFSETS WITH EQUIPMENT PRESSURE DIFFERENTIALS.
2. COORDINATE ARRANGEMENT TO ALLOW ACCESS TO ALL CLEANOUTS.

SCALE: NONE

(20) NOT USED

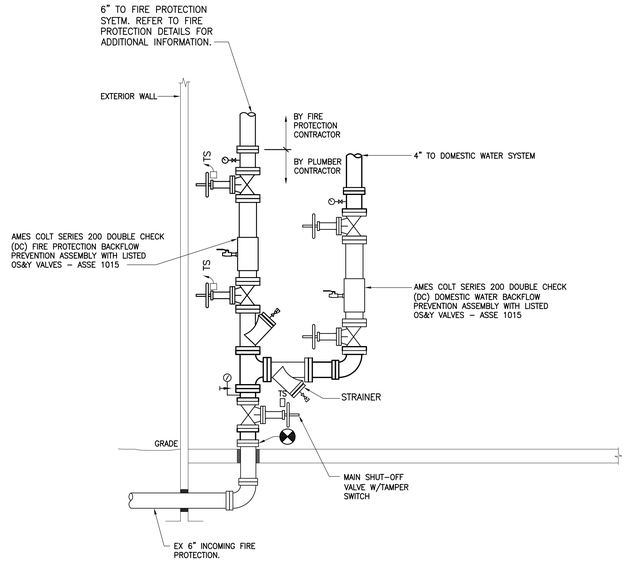
SCALE: NONE

(21) TYPICAL ROOF DRAIN DETAIL



SCALE: NONE

(22) INCOMING COMBINED WATER SERVICE DETAIL



SCALE: NONE

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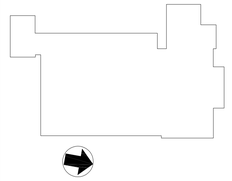
KEY PLAN



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GALENA, MD 21635

MISCELLANEOUS PLUMBING DETAILS

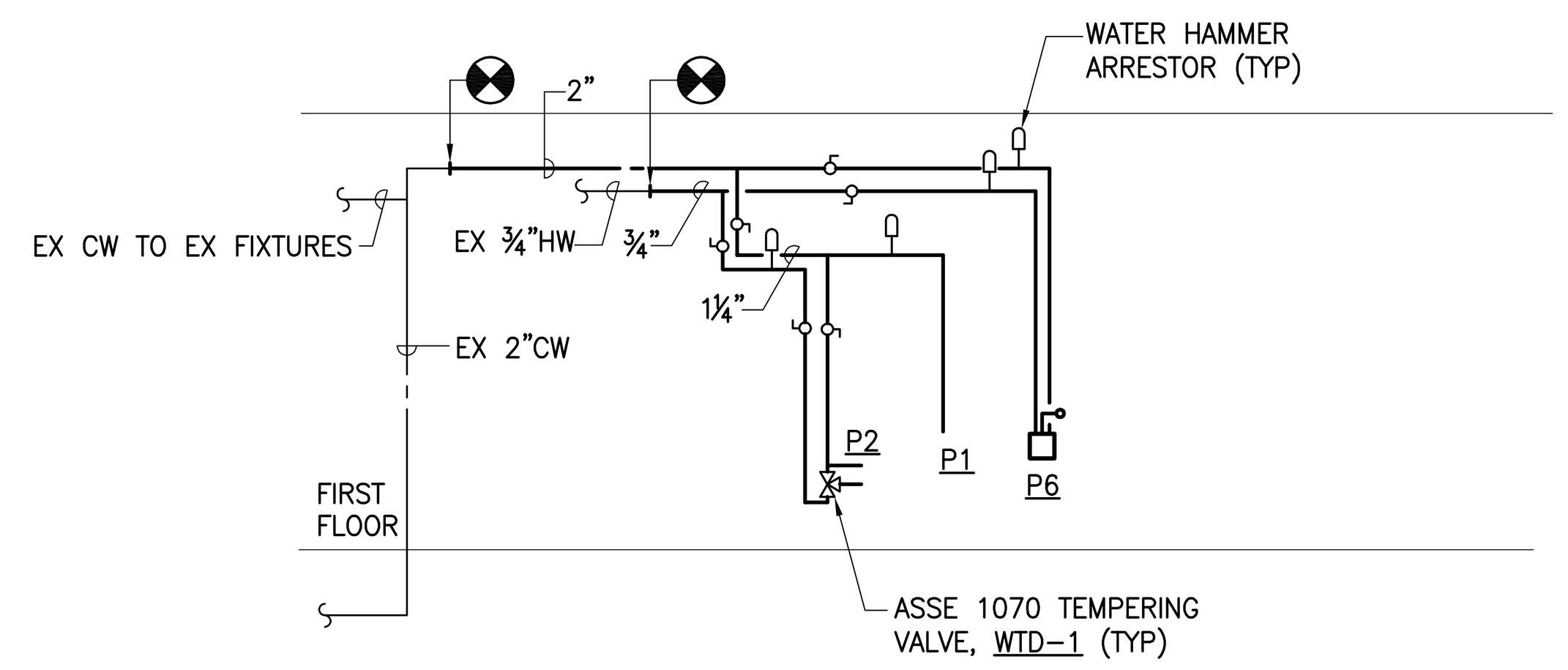
PLOT SCALE: NO SCALE

FILENAME:

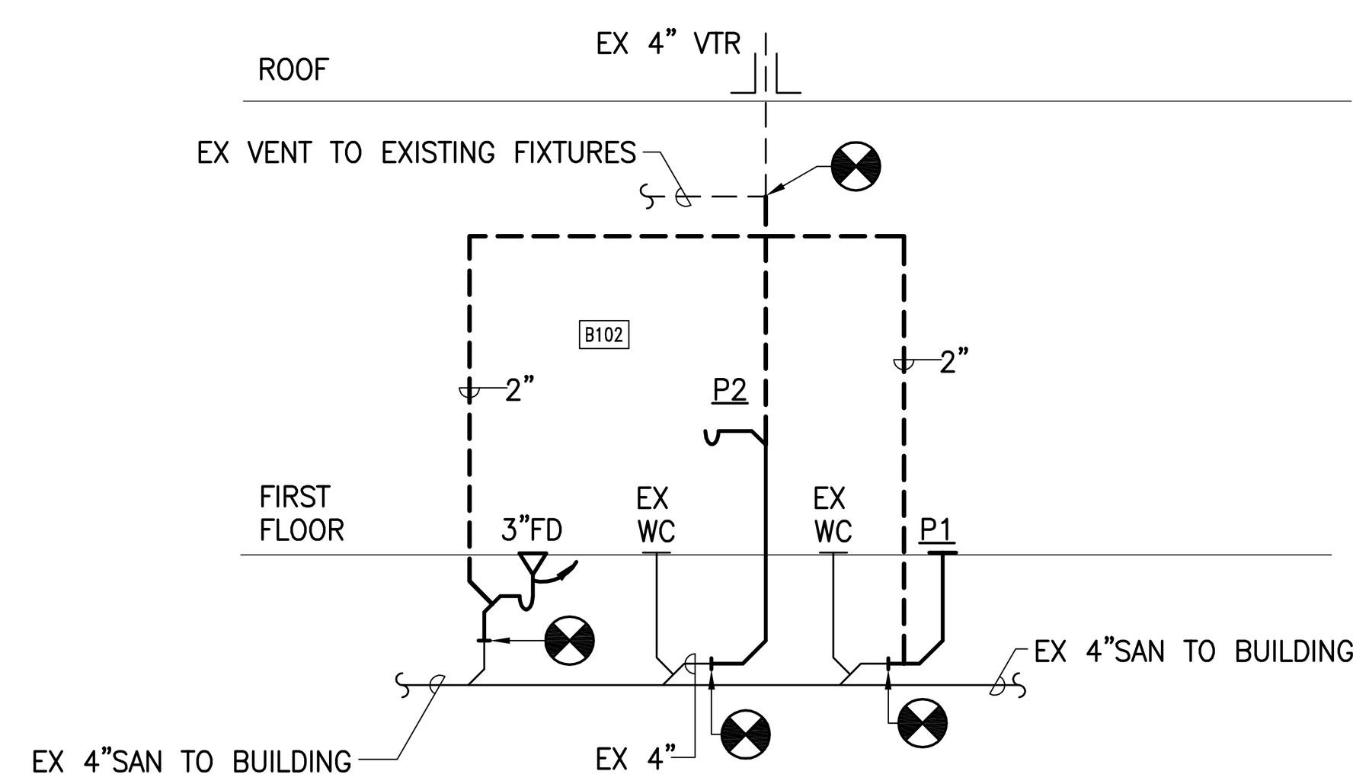
DATE: FEBRUARY 10, 2020

PROJECT 3309

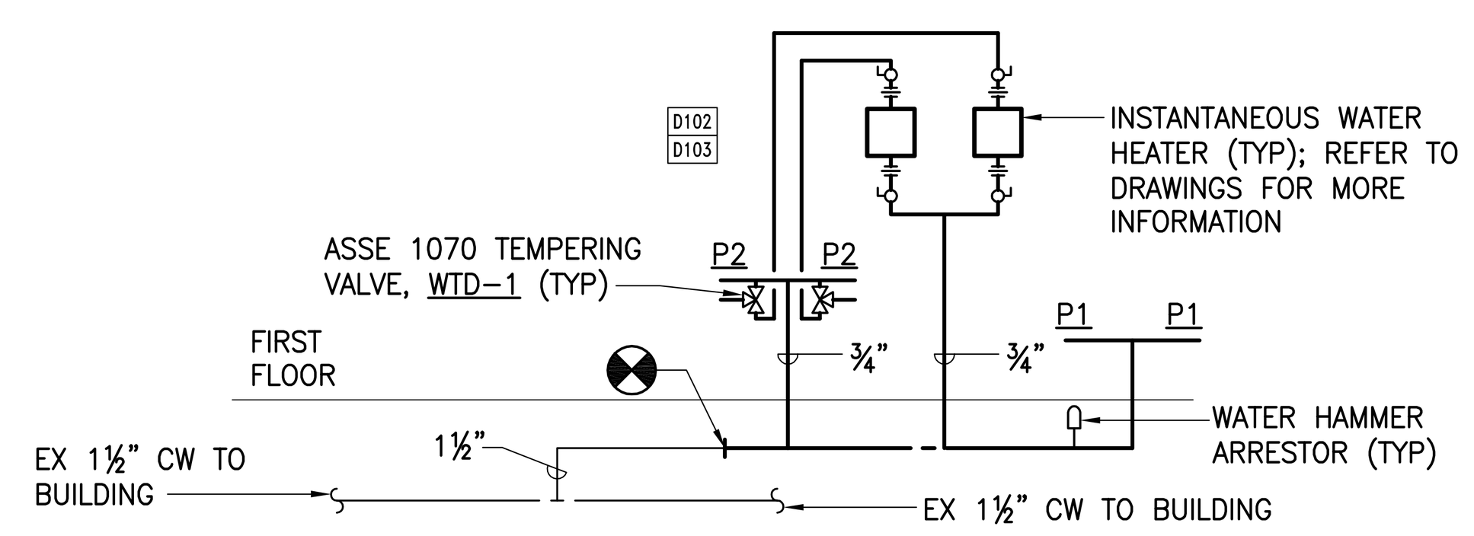
P7.2



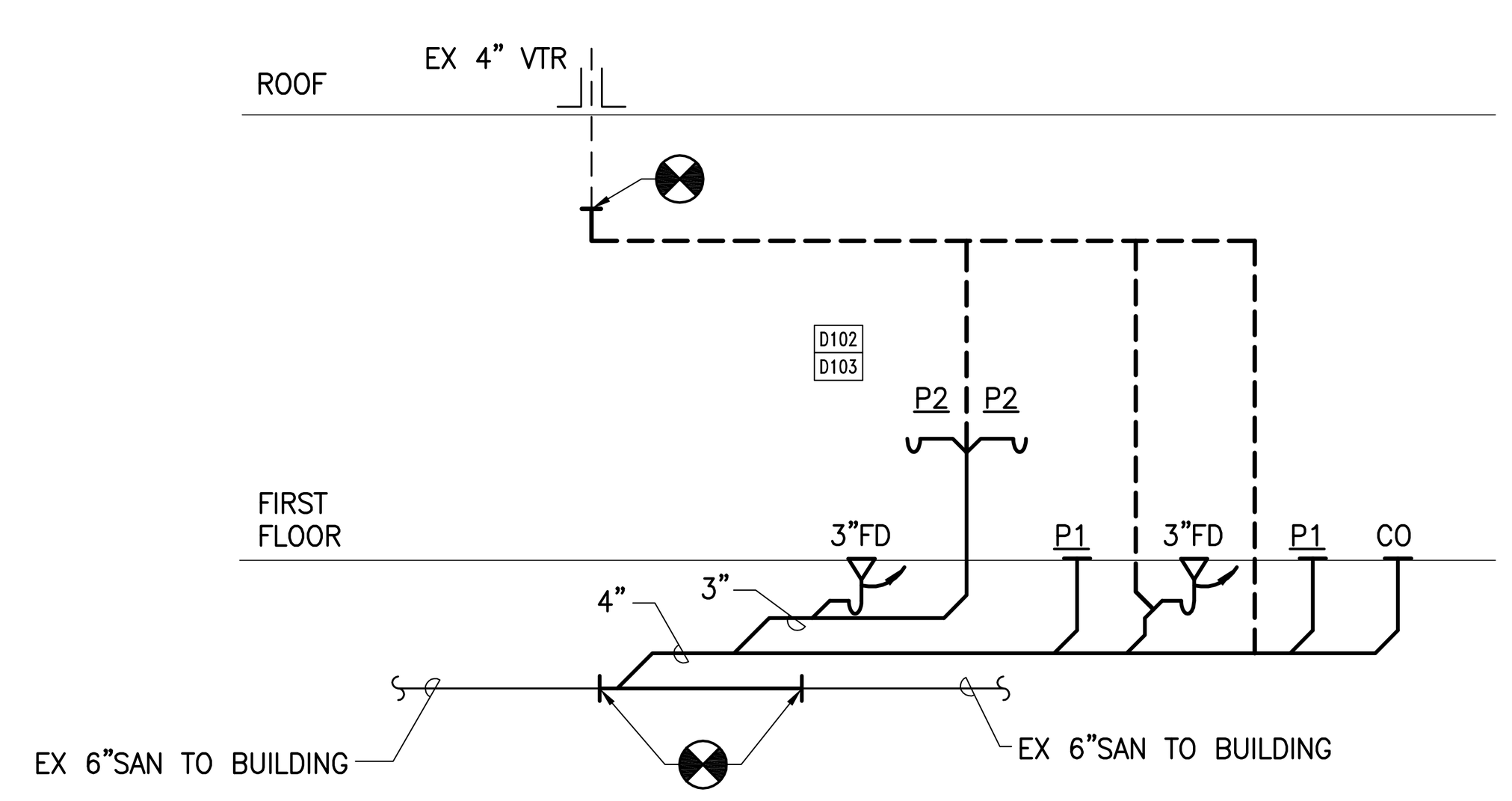
DOMESTIC WATER RISER DIAGRAM – LANGUAGE SUPPORT – GC-1
SCALE: NOT TO SCALE



SANITARY/VENT RISER DIAGRAM – LANGUAGE SUPPORT – GC-1
SCALE: NOT TO SCALE



DOMESTIC WATER RISER DIAGRAM – ADA TOILETS – GC-3
SCALE: NOT TO SCALE



SANITARY/VENT RISER DIAGRAM – ADA TOILETS – GC-3
SCALE: NOT TO SCALE

PLUMBING FIXTURE SCHEDULE

DESIG.	FIXTURE	ROUGH–IN CONNECTION				FIXTURE UNIT VALUES			GPM FLOW RATE	WATER TEMPERING DEVICE (WTD)	REMARKS
		C.W.	H.W.	SAN.	VENT	C.W.	H.W.	SAN.			
P1	WATER CLOSET	1"	---	4"	2"	10	---	4	1.6/1.1 GPF	---	STUDENT ADA/STANDARD; FLOOR MOUNTED, BOTTOM OUTLET
P1A	WATER CLOSET	1"	---	4"	2"	10	---	4	1.6/1.1 GPF	---	ADULT ADA ACCESSIBLE; FLOOR MOUNTED, BOTTOM OUTLET
P2	LAVATORY (W/H)	1/2"	1/2"	1½"	1½"	1.5	1.5	1	0.5	WTD–1	ADA ACCESSIBLE
P3	MOP SINK	3/4"	3/4"	3"	1½"	2.25	2.25	2	4.0	WTD–1	
P4	ELECTRIC WATER COOLER	1/2"		1½"	1½"	.25	---	.5	---		ADA ACCESSIBLE, SIDE–BY–SIDE W/ BOTTLE FILLER
P5	CLOTHES WASHER BOX	1/2"	1/2"	2"	1½"	1	1	2	---	---	
P6	SHOWER STALL	1/2"	1/2"	2"	1½"	1	1	2	1.5	WTD–1	ADA ACCESSIBLE

NOTES:

1) W/H = WALL HUNG
2) LOCATE ROUGH IN FOR HANDICAPPED TOILETS SO THAT FLUSH VALVE HANDLE IS IN THE WIDE SIDE OF THE STALL
3) SLAB ON GRADE FIXTURE DRAINS SHALL BE 2" MINIMUM.
4) PROVIDE DISHWASHER DRAIN CONNECTION AND WATER CONNECTION WHERE DISHWASHERS ARE LOCATED ADJACENT TO SINKS.

PLUMBING EQUIPMENT NOTES

1. WATER TEMPERING DEVICES

WATER TEMPERING DEVICE #1 (WTD–1)
LAVATORIES & SINKS
PROVIDE FOR ALL FIXTURES FOR WHICH HOT WATER IS PROVIDED
TEMPER WATER TO 110°F
ASSE 1070 RATED, NSF–61 CERTIFIED
CHICAGO MODEL 131–ABNF OR AS APPROVED EQUAL

GREASE INTERCEPTOR SCHEDULE

NO.	SERVICE	LOCATION	FLOW RATE (GPM)	CAPACITY	INLET OUTLET SIZE	DIMENSION (L x W x H)	REMARKS (BASED ON)
				GREASE (LBS)			
GI–1	KITCHEN GREASE FIXTURES	KITCHEN	100	200	4"	47"x35"x37*"	JOSAM 60110H–EXT

NOTES:
1. PROVIDE EXTENSION AS NEEDED TO MEET INLET & OUTLET INVERTS
2. GREASE INTERCEPTORS SHALL CONFORM TO PDI–G101 AND ASME A112.14.3

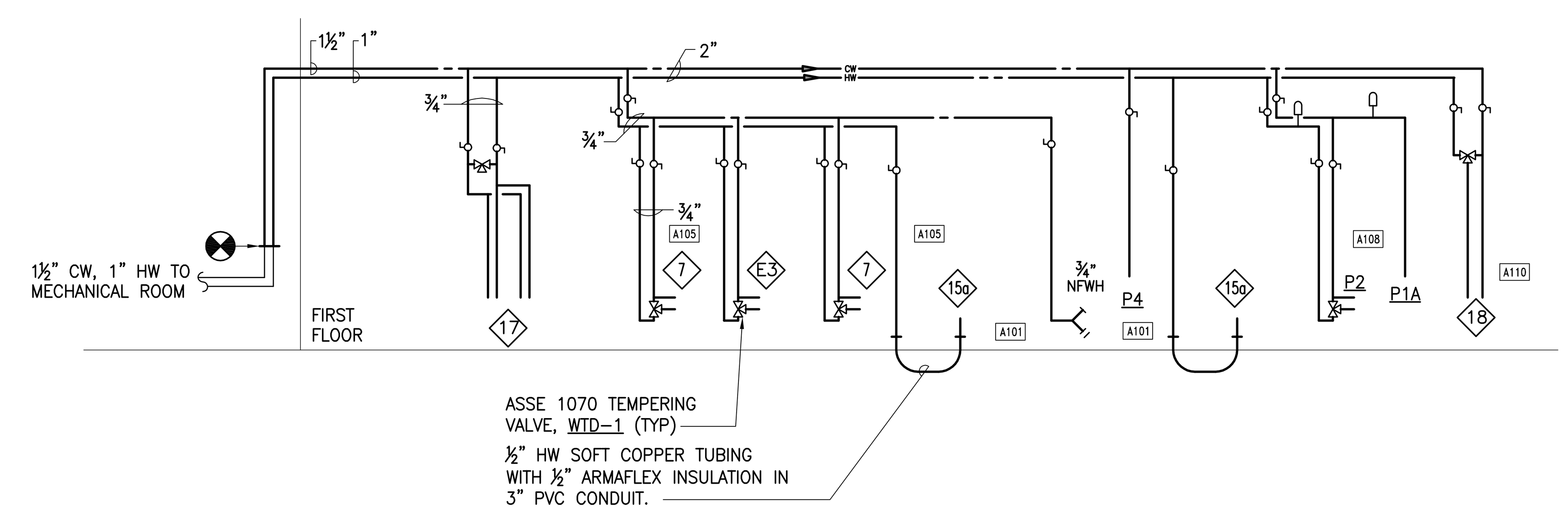
KITCHEN EQUIPMENT PLUMBING SCHEDULE

DESIG.	EQUIPMENT	ROUGH–IN CONNECTION							REMARKS
		C.W.	H.W.	W	IW	GAS	STM.	COND.	
3	COOLER EVAPORATOR COIL DRAIN	–	–	–	–	–	–	3/4"	EXTEND TO GRADE
4	FREEZER EVAPORATOR COIL DRAIN	–	–	–	–	–	–	3/4"	EXTEND TO GRADE
7	HAND SINK	1/2"	1/2"	1 1/2"	–	–	–	–	
15a	FILL FAUCET	–	1/2"	–	–	–	–	–	EXTEND TO FLOOR SINK
15b	HOT FOOD COUNTER DRAIN	–	–	–	3/4"	–	–	–	EXTEND TO FLOOR SINK
15c	FROST TOP COUNTER DRAIN	–	–	–	3/4"	–	–	–	EXTEND TO FLOOR SINK
17	POT SINK	(2)3/4"	(2)3/4"	–	(3) 1½"	–	–	–	EXTEND TO FLOOR SINK
18	MOP SINK	1/2"	1/2"	3"	–	–	–	–	
E3	PREP SINK	1/2"	1/2"	–	(2) 1½"	–	–	–	EXTEND TO FLOOR SINK

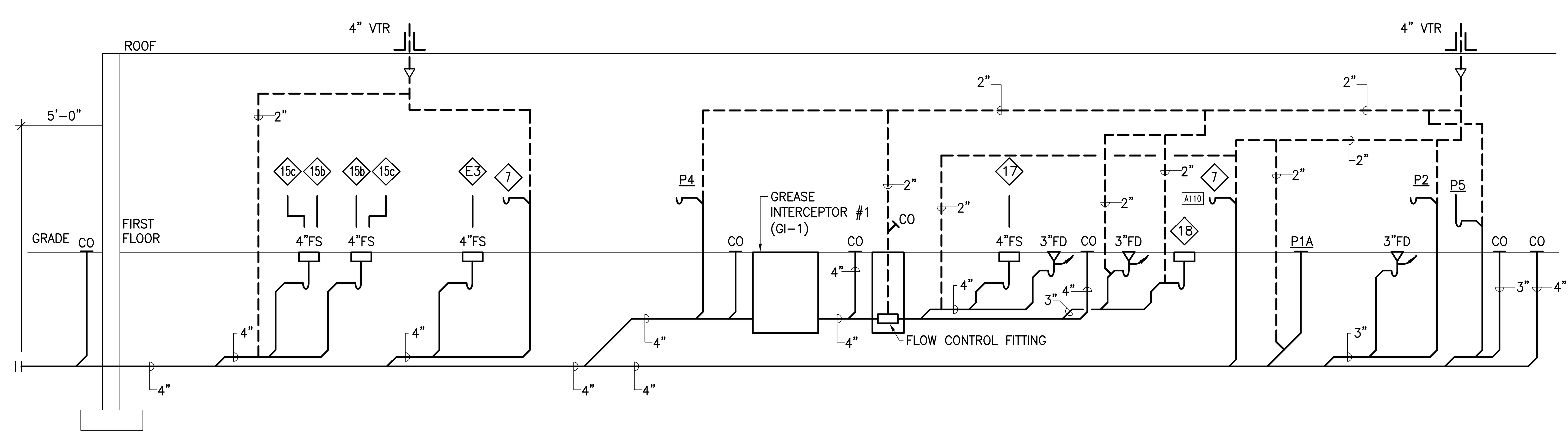
NOTES:

THE PLUMBING CONTRACTOR SHALL REFER TO THE FOOD SERVICE DRAWINGS FOR EXACT LOCATIONS OF ALL EQUIPMENT AND PROVIDE THE REQUIRED CONNECTIONS.

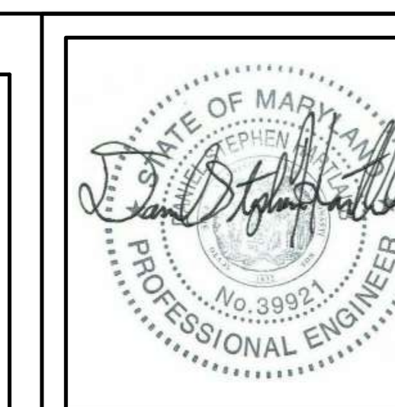
✳ IN–LINE WATER FILTER FURNISHED BY KITCHEN EQUIPMENT CONTRACTOR, INSTALLED BY PLUMBING CONTRACTOR.



DOMESTIC WATER RISER DIAGRAM – KITCHEN
SCALE: NOT TO SCALE

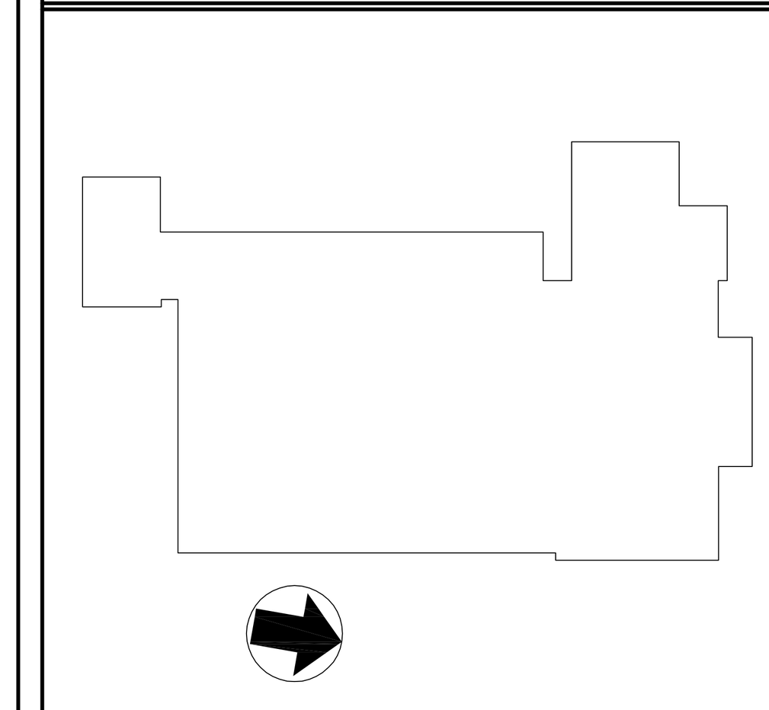


SANITARY/VENT RISER DIAGRAM – KITCHEN
SCALE: NOT TO SCALE



PROFESSIONAL CERTIFICATION: I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO: 39921, EXPIRATION DATE 01/19/2021

KEY PLAN



REVISIONS

#	MM-DD-YR	NAME	DESCRIPTION OF CHANGES

CRABTREE ROHRBAUGH & ASSOCIATES - ARCHITECTS
www.cra-architects.com
MECHANICSBURG, PENNSYLVANIA
CHARLOTTESVILLE, VIRGINIA
WHITE SULPHUR SPRINGS, WEST VIRGINIA
100 WEST ROAD, SUITE 402
TOWSON MD 21204
410-528-0272

ADDITION AND RENOVATIONS OF GALENA ELEMENTARY SCHOOL

114 S MAIN STREET
GALENA, MD 21635

SCHEDULES, NOTES & RISERS

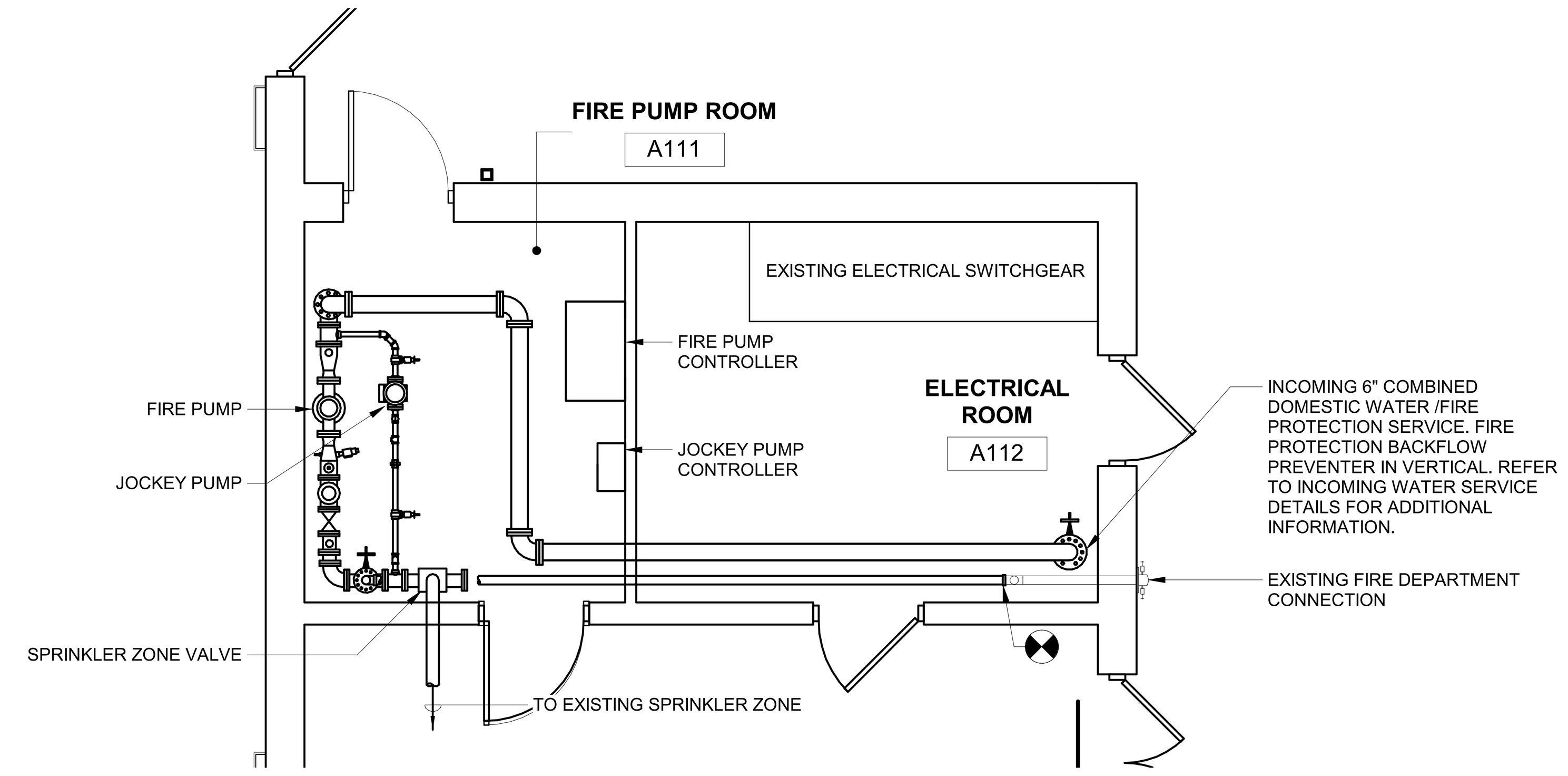
PLOT SCALE: NO SCALE

FILENAME:

DATE: FEBRUARY 10, 2020

PROJECT
3309

P9.1



1 FP2.1 FIRE PUMP ROOM - PART PLAN
1/4" = 1'-0"

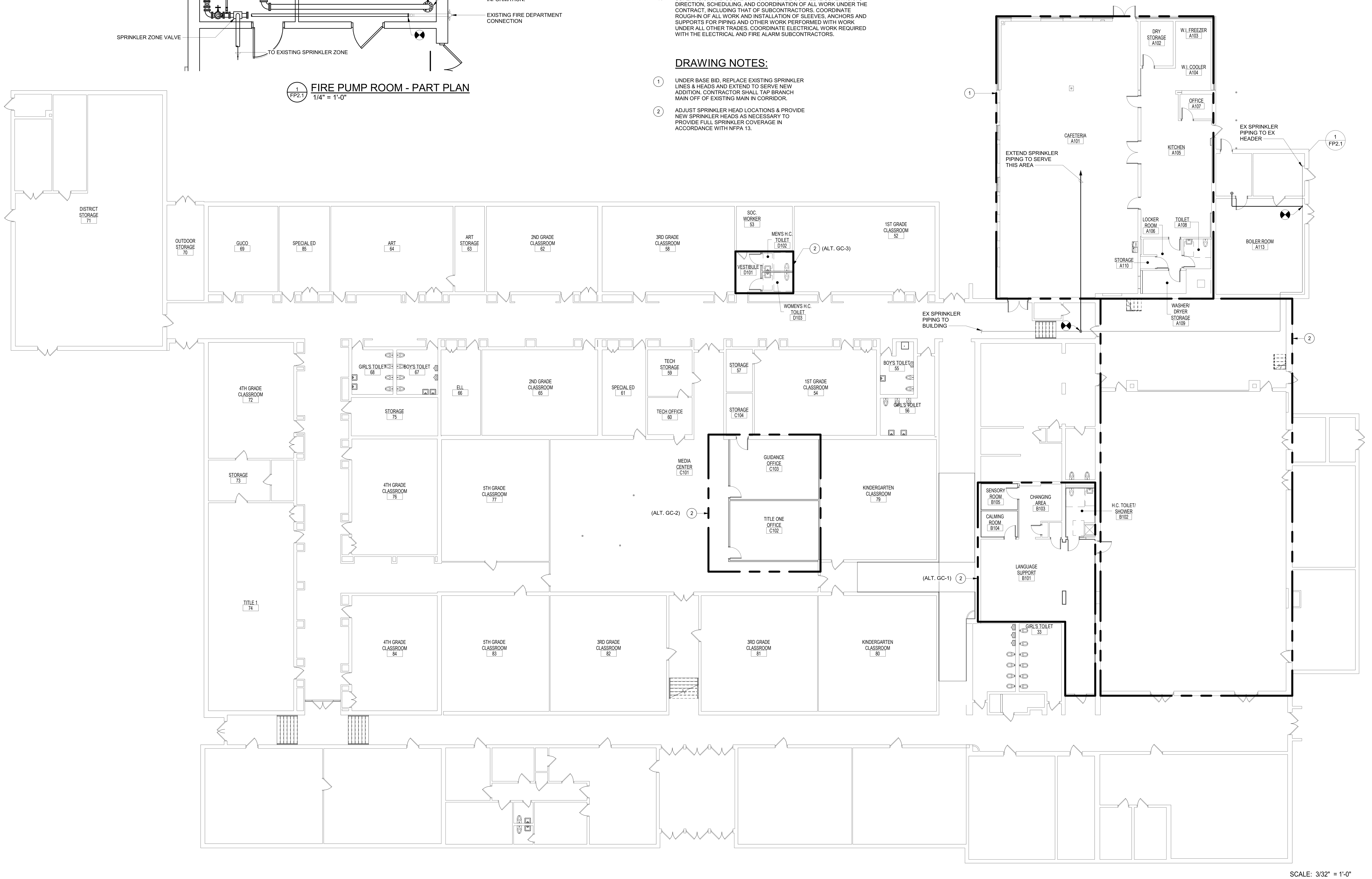
GENERAL NOTES:

1. THE ENTIRE BUILDING SHALL BE PROTECTED BY A FIRE SPRINKLER SYSTEM, DESIGNED AND INSTALLED IN ACCORDANCE WITH NFPA 13 REQUIREMENTS. THE SPRINKLER SYSTEM SHALL ALSO COMPLY WITH NFPA 25, NFPA 101, NFPA 1 AND THE LOCAL AUTHORITY HAVING JURISDICTION.
2. THE FIRE PROTECTION CONTRACTOR SHALL REMOVE AND REINSTALL EXISTING CEILING SYSTEMS, LIGHTS, CEILING MOUNTED DEVICES AS REQUIRED FOR THE INSTALLATION OF THE FIRE PROTECTION SYSTEM ABOVE EXISTING CEILINGS. ALL PIPING SHALL BE CONCEALED EXCEPT IN AREAS WITH EXPOSED STRUCTURE/NO CEILINGS.
3. THE CONTRACTOR SHALL PROVIDE ACCESS PANELS AND DOORS FOR ALL CONCEALED EQUIPMENT, VALVES, STRAINERS, CONTROLS, CONTROL DEVICES, CLEANOUTS, TRAPS AND OTHER DEVICES REQUIRING MAINTENANCE, SERVICE, ADJUSTMENT, BALANCING OR MANUAL OPERATION. FOR AREAS WITH HARD CEILINGS THAT ARE NOT BEING REPLACED, THE CONTRACTOR SHALL INSTALL ACCESS DOORS TO ACCOMMODATE INSTALLATION OF THE SPRINKLER SYSTEM ABOVE THE EXISTING HARD CEILING.
4. PROVIDE LABELING, IDENTIFICATIONS AND PIPE MARKERS ON EQUIPMENT, PIPING AND SYSTEM COMPONENTS IN ACCORDANCE WITH NFPA 13 REQUIREMENTS.
5. ALL EXPOSED PIPING SHALL BE PAINTED.
6. PIPE HANGERS SHALL BE 10'-0" MAXIMUM ON CENTER DISTANCE. BAR JOIST HANGERS SHALL BE ATTACHED TO THE TOP CHORD AT THE PANEL POINT.
7. SUPERVISION AND COORDINATION: PROVIDE COMPLETE SUPERVISION, DIRECTION, SCHEDULING, AND COORDINATION OF ALL WORK UNDER THE CONTRACT, INCLUDING THAT OF SUBCONTRACTORS. COORDINATE ROUGH-IN OF ALL WORK AND INSTALLATION OF SLEEVES, ANCHORS AND SUPPORTS FOR PIPING AND OTHER WORK PERFORMED WITH WORK UNDER ALL OTHER TRADES. COORDINATE ELECTRICAL WORK REQUIRED WITH THE ELECTRICAL AND FIRE ALARM SUBCONTRACTORS.
8. CUTTING AND PATCHING: ACCOMPLISH ALL CUTTING AND PATCHING NECESSARY FOR THE INSTALLATION OF ALL WORK UNDER DIVISION 21. DAMAGE RESULTING FROM THIS WORK TO OTHER WORK ALREADY IN PLACE, SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE. WHERE CUTTING IS REQUIRED, SAW-CUT OR CORE DRILL ONLY, AND PERFORM WORK IN NEAT AND WORKMANLIKE MANNER. USE MECHANICS SKILLED IN THE PARTICULAR TRADES REQUIRED. DO NO CUT STRUCTURAL MEMBERS WITHOUT APPROVAL.
9. ACCESSIBILITY: ALL EQUIPMENT SHALL BE INSTALLED IN SUCH A WAY THAT ALL COMPONENTS REQUIRING ACCESS (SUCH AS VALVES, FLOW SWITCHES, TAMPER SWITCHES, SITE GLASSES, DISCONNECT SWITCHES, CIRCUIT BREAKERS, STARTERS, AND ACCESSORIES) ARE SO LOCATED AND INSTALLED THAT THEY MAY BE SERVICED, RESET, REPLACED, RECALIBRATED, ETC. BY SERVICE TECHNICIANS IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. IF ANY EQUIPMENT OR COMPONENTS ARE LOCATED IN SUCH A POSITION THAT THIS CONTRACTOR CANNOT COMPLY WITH THE ABOVE, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IN WRITING BEFORE EQUIPMENT IS INSTALLED.
10. PROVIDE ESCUTCHEONS FOR PENETRATIONS OF WALLS, CEILINGS, AND FLOORS FOR EXPOSED PIPING.
11. INSTALL SLEEVES FOR PIPES PASSING THROUGH CONCRETE AND MASONRY WALLS, GYPSUM-BOARD PARTITIONS, AND CONCRETE FLOOR AND ROOF SLABS.
12. MAINTAIN INDICATED FIRE RATING OF WALLS, PARTITIONS, CEILINGS, AND FLOORS AT PIPE PENETRATIONS. SEAL PIPE PENETRATIONS WITH FIRESTOP MATERIALS.
13. COORDINATE LAYOUT AND INSTALLATION OF FIRE PROTECTION SYSTEM WITH ALL OTHER BUILDINGS' STRUCTURAL, MECHANICAL AND ELECTRICAL WORK. LOCATE SPRINKLER HEADS IN THE CENTER OF CEILING TILES AND SYMMETRICALLY WITH RESPECT TO THE CEILING TILES, LIGHTING FIXTURES, REGISTERS, GRILLES, DIFFUSERS, ETC. PROVIDE PIPING OFFSETS AS REQUIRED TO MAINTAIN SYMMETRY. SPRINKLER PIPE VELOCITY SHALL NOT EXCEED EIGHTEEN (18) FEET PER SECOND (FPS). THE SYSTEM DESIGN SHALL LIMIT MAXIMUM DEMAND FLOW RATES AT 25% GREATER THAN THE DESIGN REQUIREMENT ESTABLISHED BY THE NFPA. LOCATED ALL PIPING ABOVE CEILINGS. REMOVE AND REINSTALL CEILING SYSTEMS TO ACCOMMODATE THE INSTALLATION. REFER TO ARCHITECTURAL DRAWINGS FOR REPLACEMENT OF HARD CEILINGS TO ACCOMMODATE SPRINKLER INSTALLATION. PROVIDE CEILING ACCESS PANELS AS NECESSARY FOR PIPING INSTALLATION ABOVE HARD CEILINGS WHICH ARE EXISTING TO REMAIN. THE ENTIRE BUILDING SHALL BE PROTECTED BY A WET PIPE SRINKLER SYSTEM INCLUDING MECHANICAL AND ELECTRICAL EQUIPMENT SPACES. CONTRACTOR IS CAUTIONED THAT SPRINKLER MAINS MUST BE LOCATED TO PREVENT CONFLICTS WITH OTHER WORK AND IN ANY CASE, SPRINKLER CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION OF HIS WORK WITH WORK OF OTHER TRADES AND EXISTING SYSTEMS. AIR TERMINAL DEVICES, UNITS, AND EQUIPMENT SHALL BE INDICATED ON THE COORDINATED LAYOUT/SHOP DRAWING. FOR EXPOSED AREAS, CONCEAL PIPING AND UTILIZE SIDEWALL HEADS WHEREVER POSSIBLE, INCLUDING IN CONJUNCTION WITH PENDANT HEADS WHERE REQUIRED. FOR EXPOSED PIPING GET APPROVAL FROM THE ARCHITECT AND ENGINEER OF PROPOSED LOCATION AND ROUTING PRIOR TO FABRICATION AND INSTALLATION OF THE SYSTEMS.

DRAWING NOTES:

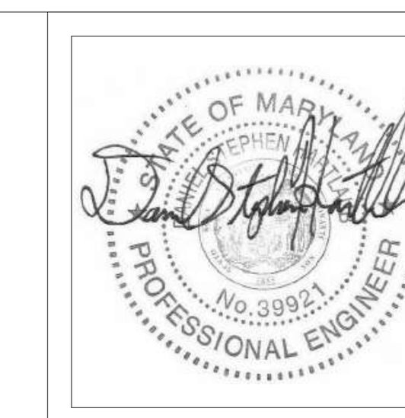
(1) UNDER BASE BID, REPLACE EXISTING SPRINKLER LINES & HEADS AND EXTEND TO SERVE NEW ADDITION. CONTRACTOR SHALL TAP BRANCH MAIN OFF OF EXISTING MAIN IN CORRIDOR.

(2) ADJUST SPRINKLER HEAD LOCATIONS & PROVIDE NEW SPRINKLER HEADS AS NECESSARY TO PROVIDE FULL SPRINKLER COVERAGE IN ACCORDANCE WITH NFPA 13.



FLOOR PLAN - FIRE PROTECTION
3/32" = 1'-0"

SCALE: 3/32" = 1'-0"
8 0 8 16 32



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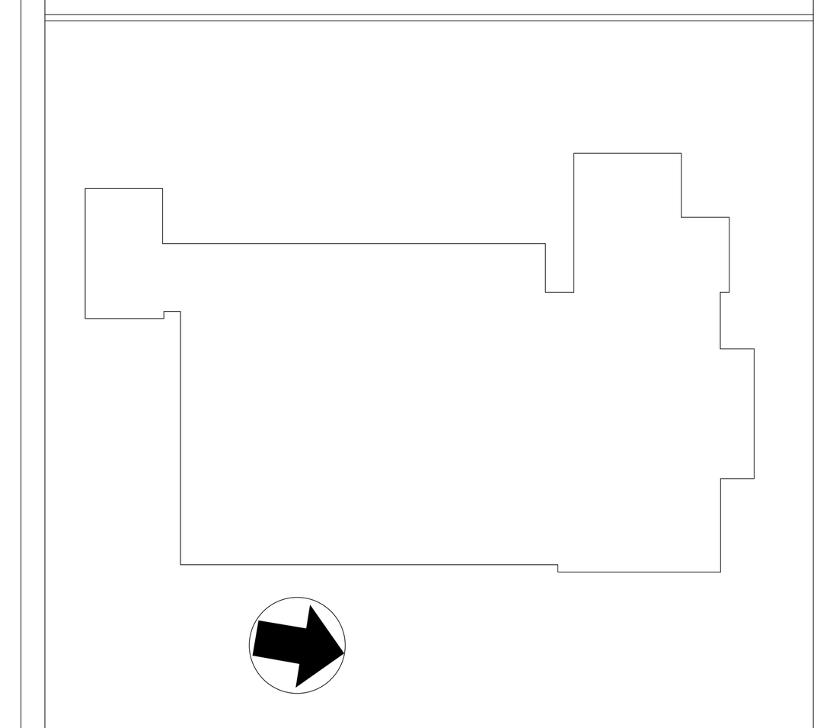
KEY PLAN



REVISIONS

MM-DD-YR	NAME	DESCRIPTION OF CHANGES

CRABTREE ROHRBAUGH & ASSOCIATES - ARCHITECTS
www.cra-architects.com
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CHARLOTTESVILLE, VIRGINIA
WHITE SULPHUR SPRINGS, WEST VIRGINIA
100 WEST ROAD, SUITE 402
TOWSON MD 21204
410-528-0272

ADDITION AND RENOVATIONS OF GALENA ELEMENTARY SCHOOL
KENT COUNTY PUBLIC SCHOOLS
114 S MAIN STREET
GALENA, MD 21635

CR

FLOOR PLAN - FIRE PROTECTION

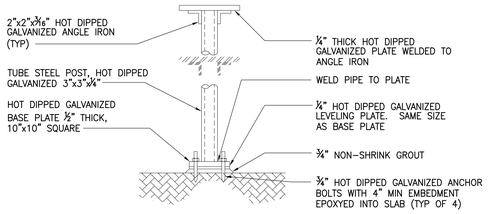
PLOT SCALE: As indicated

FILENAME:

DATE: FEBRUARY 10, 2020

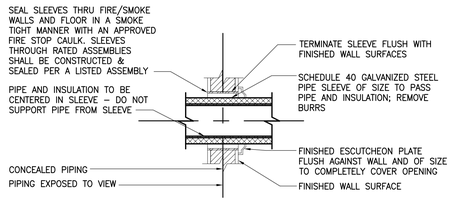
PROJECT
3309

FP2.1



1 TYPICAL PIPE SUPPORT DETAIL

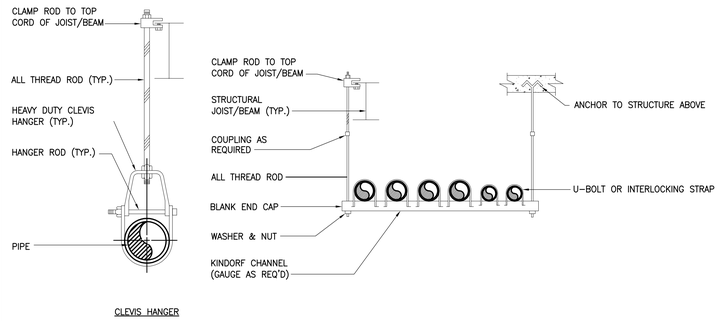
SCALE: NONE



NOTE:
FOR INTERIOR FRAME PARTITIONS–PIPE SLEEVES MAY BE FABRICATED FROM GALVANIZED SHEET METAL; ROUND TUBE CLOSED WITH SNAPLOCK JOINT, WELDED SPIRAL SEAMS, OR WELDED LONGITUDINAL JOINT. FABRICATE FROM THE FOLLOWING GAUGES: 3" AND SMALLER, 20 GAUGE; 4" TO 6", 16 GAUGE; OVER 6", 14 GAUGE.

2 TYPICAL PIPE SLEEVE THRU INTERIOR WALL DETAIL

SCALE: NONE



3 TYPICAL PIPE HANGER DETAILS

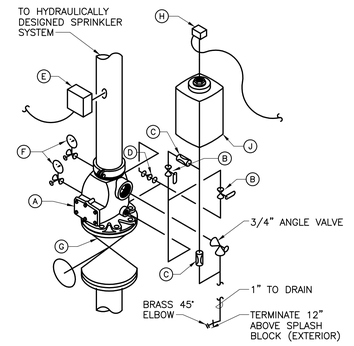
SCALE: NONE

4 NOT USED

SCALE: NONE

5 NOT USED

SCALE: NONE



DETAIL LEGEND:

- (A) VERTICAL ALARM CHECK VALVE SIZED IN ACCORDANCE WITH HYDRAULIC CALCULATIONS FOR FLOWS OF ZONE COVERAGE
- (B) ALARM TEST AND SHUT OFF VALVES (LOCKING HANDLE)
- (C) RESTRICTION OFFICE
- (D) SWING CHECK VALVE
- (E) PADDLE TYPE FLOW SWITCH
- (F) PRESSURE GAUGE WITH NEEDLE VALVE & SNUBBER
- (G) OS&Y GATE VALVE WITH TAMPER SWITCH
- (H) ELECTRIC PRESSURE SWITCH WIRED TO ANNUNCIATOR SYSTEM (ALARM CONDITION)
- (J) RETARDING CHAMBER WITH 60 SECOND DELAY

DETAIL NOTES:

1. INSTALL DEVICES PER MANUFACTURERS STANDARD RECOMMENDATIONS AND IN ACCORDANCE WITH APPLICABLE NFPA STANDARDS.
2. COORDINATE WITH ELECTRICAL
3. PROVIDE FOR EACH ZONE (MAX 52,000 SQ FT COVERAGE)
4. HORIZONTAL UNITS SIMILAR

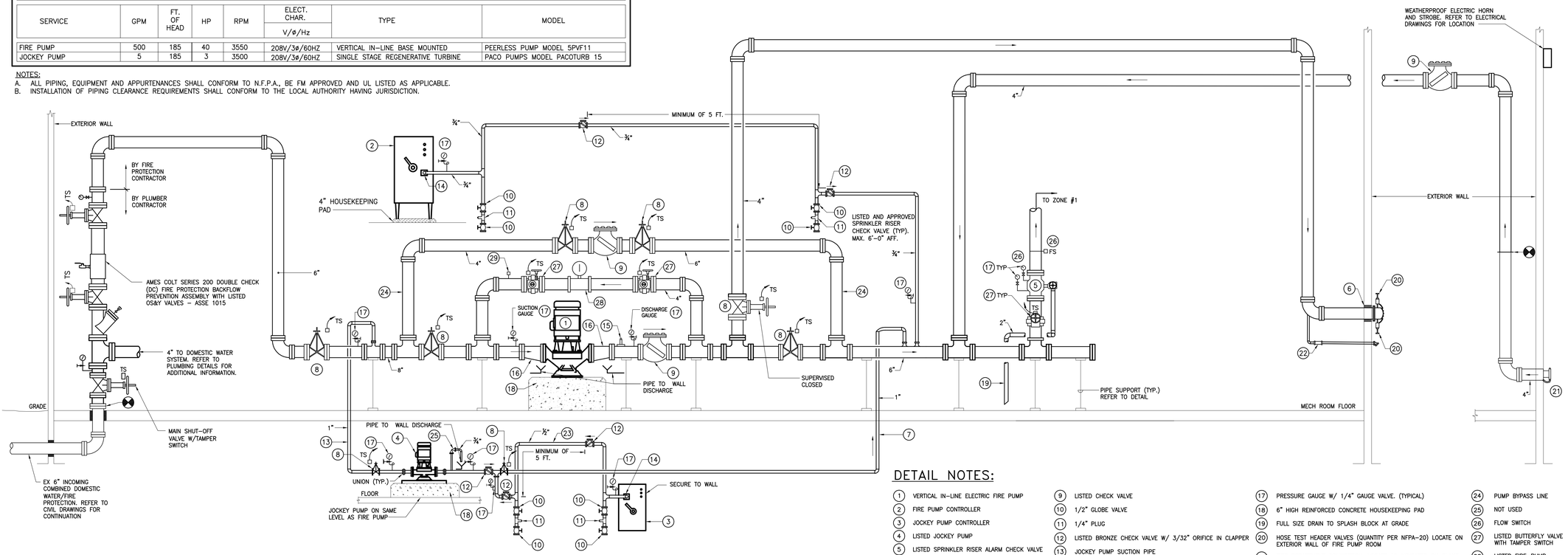
6 SPRINKLER RISER CHECK VALVE ASSEMBLY DETAIL

SCALE: NONE

PUMP SCHEDULE

SERVICE	GPM	FT. OF HEAD	HP	RPM	ELECT. CHAR. V/ø/Hz	TYPE	MODEL
FIRE PUMP	500	185	40	3550	208V/3ø/60HZ	VERTICAL IN-LINE BASE MOUNTED	PEERLESS PUMP MODEL 5PVF11
JOCKEY PUMP	5	185	3	3500	208V/3ø/60HZ	SINGLE STAGE REGENERATIVE TURBINE	PACO PUMPS MODEL PACOTURB 15

NOTES:
A. ALL PIPING, EQUIPMENT AND APPURTENANCES SHALL CONFORM TO N.F.P.A., BE FM APPROVED AND UL LISTED AS APPLICABLE.
B. INSTALLATION OF PIPING CLEARANCE REQUIREMENTS SHALL CONFORM TO THE LOCAL AUTHORITY HAVING JURISDICTION.



DETAIL NOTES:

1. VERTICAL IN-LINE ELECTRIC FIRE PUMP
2. FIRE PUMP CONTROLLER
3. JOCKEY PUMP CONTROLLER
4. LISTED JOCKEY PUMP
5. LISTED SPRINKLER RISER ALARM CHECK VALVE
6. WATERTIGHT PIPE SLEEVE
7. JOCKEY PUMP DISCHARGE
8. LISTED OS&Y GATE VALVE W/ TAMPER SWITCH
9. LISTED CHECK VALVE
10. 1/2" GLOBE VALVE
11. 1/4" PLUG
12. LISTED BRONZE CHECK VALVE W/ 3/32" ORIFICE IN CLAPPER
13. JOCKEY PUMP SUCTION PIPE
14. PRESSURE SWITCH
15. 3/4" AUTOMATIC RELIEF VALVE. PIPE TO THE OUTDOORS
16. ECCENTRIC TAPERED REDUCER
17. PRESSURE GAUGE W/ 1/4" GAUGE VALVE. (TYPICAL)
18. 6" HIGH REINFORCED CONCRETE HOUSEKEEPING PAD
19. FULL SIZE DRAIN TO SPLASH BLOCK AT GRADE
20. HOSE TEST HEADER VALVES (QUANTITY PER NFPA-20) LOCATE ON EXTERIOR WALL OF FIRE PUMP ROOM
21. FIRE DEPARTMENT CONNECTION. LOCATE AS INDICATED ON PLANS
22. BALL DRIP
23. JOCKEY PUMP PRESSURE SENSING LINE
24. PUMP BYPASS LINE
25. NOT USED
26. FLOW SWITCH
27. LISTED BUTTERFLY VALVE WITH TAMPER SWITCH
28. LISTED FIRE-PUMP FLOWMETER
29. AUTOMATIC AIR VENT

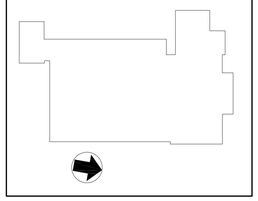
7 FIRE SERVICE SYSTEM PIPING DETAIL

SCALE: NONE

PROFESSIONAL CERTIFICATION:
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 39321, EXPIRATION DATE 01/15/2021

STATE OF MARYLAND — No. 39321 — PROFESSIONAL ENGINEER

KEY PLAN



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ADDITION AND RENOVATIONS OF GALENA ELEMENTARY SCHOOL

114 S MAIN STREET
GALENA, MD 21635

FIRE PROTECTION DETAILS

PLOT SCALE: NONE
FILENAME:
DATE: FEBRUARY 10, 2020

PROJECT 3309

FP7.1

GENERAL NOTES:

1. THE ELECTRICAL CONTRACTOR SHALL FAMILIARIZE HIMSELF WITH THE DRAWINGS OF ALL OTHER TRADES ON THE PROJECT. ELECTRICAL OR SYSTEMS CONNECTIONS INDICATED ON ARCHITECTURAL, MECHANICAL, CIVIL, STRUCTURAL, KITCHEN AND ALL OTHER DRAWINGS WHICH ARE PART OF THIS PROJECT, SHALL BE CONSIDERED A PART OF THIS CONTRACT AND SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR AT NO EXTRA COST TO THE OWNER.

2. THE ELECTRICAL DRAWINGS ARE DIAGRAMMATIC IN NATURE AND AS SUCH SHALL NOT BE SCALED. REFER TO THE ARCHITECTURAL DRAWINGS FOR EXACT LOCATIONS OF DEVICES AND EQUIPMENT AND DIMENSIONAL INFORMATION PRIOR TO ROUGH-IN. COORDINATE LOCATIONS OF MECHANICAL EQUIPMENT WITH MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN OF SERVICE EQUIPMENT AND WIRING.

3. COORDINATE MOUNTING HEIGHTS OF ALL DEVICES WITH ARCHITECTURAL PLANS, SECTIONS, ELEVATIONS AND CASEWORK DRAWINGS.

4. COORDINATE WALLS THAT ARE TO REMAIN AND NEW WALLS WITH ARCHITECTURAL PLANS.

5. WIRING AND CONDUIT SIZES INDICATED IN PANEL SCHEDULES ARE MINIMUM ONLY. CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING EXACT WIRING AND CONDUIT SIZES. CONTRACTOR SHALL PROVIDE SPLICE BLOCKS AND REDUCING PINS AS REQUIRED TO TERMINATE WIRING AND MAKE FINAL CONNECTIONS.

6. ELECTRICAL BOXES IN FIRE RATED PARTITIONS SHALL NOT EXCEED 16 SQUARE INCHES IN AREA (IF 4"x4"), SHALL BE MADE OF STEEL, AND SHALL BE SUCH THAT THE CUMULATIVE AREA OF BOX "CUTOUTS" IN THE FIREWALL DOES NOT EXCEED 100 SQUARE INCHES PER 100 SQUARE FEET OF WALL AREA. ELECTRICAL BOXES ON OPPOSITE SIDES OF THE SAME FIREWALL SHALL BE SEPARATED BY A HORIZONTAL AND VERTICAL DISTANCE OF NOT LESS THAN 24 INCHES. THE ELECTRICAL CONTRACTOR SHALL MAKE MINOR ADJUSTMENTS, AS NECESSARY, TO ELECTRICAL BOX LOCATIONS TO ENSURE COMPLIANCE WITH THIS REQUIREMENT SINCE BOX LOCATIONS ARE TYPICALLY NOT DIMENSIONED ON THE DRAWINGS. CONSULT ARCHITECT IF CLARIFICATION IS REQUIRED.

7. ALL CONDUIT SHALL BE CONCEALED IN WALLS, FLOORS, ABOVE CEILING OR THROUGH MILLWORK. AT TIMES CONDUIT ROUTING IS SHOWN FOR CLARITY AND IN NO WAY PROVIDES THE CONTRACTOR ABILITY TO NOT PROVIDE CONCEALED CONDUIT AT ANY POINT OTHER POINT NOT SHOWN IN THE BUILDING. REFER TO SPECIFICATIONS FOR CONDUIT AND WIRING REQUIREMENTS BASED ON APPLICATION.

8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE EXACT ROUTING OF WIRING AND CONDUITS AND SHALL BE RESPONSIBLE FOR SIZING ALL BRANCH CIRCUIT WIRING TO LIMIT VOLTAGE DROP TO 3%. CONTRACTOR SHALL SIZE CONDUIT TO ACCOMMODATE WIRING PER NEC. 20 AMPERE CIRCUITS SHALL BE SIZED AS FOLLOWS:

20 AMPERE CIRCUITS				
120 VOLT		277 VOLT		MINIMUM CONDUIT SIZE
WIRING LENGTH	WIRING SIZE	WIRING LENGTH	WIRING SIZE	
0' - 60'	#12	0 ' - 130'	#12	3/4"
60' - 100'	#10	130' - 210'	#10	3/4"
100' - 150'	#8	210' - 340'	#8	3/4"
150' - 240'	#6	340' - 540'	#6	3/4"
OVER 240'	#4	OVER 540'	#4	1"

NOTE:
BRANCH CIRCUITS IN PANELBOARDS WITH 200% RATED NEUTRAL BUS AND ALL DIMMED LIGHTING CIRCUITS & ECM MOTORS SHALL HAVE DEDICATED NEUTRAL CONDUCTORS.

DEMOLITION NOTES:

1. DEMOLITION DRAWING IS DIAGRAMMATIC IN NATURE; NO ATTEMPT HAS BEEN MADE TO SHOW ALL EXISTING ELECTRICAL WORK IN AREAS INDICATED TO BE RENOVATED. ALL EXISTING ELECTRICAL WORK IS TO BE REMOVED UNLESS OTHERWISE NOTED. WHEN AN ITEM IS INDICATED TO BE REMOVED, REMOVE ALL ASSOCIATED ELECTRICAL WORK BACK TO POINT OF SOURCE.

2. WHERE WORK PASSES THROUGH THE RENOVATION AREA TO SERVE OTHER PORTIONS OF THE BUILDING, OR WORK IN THE RENOVATION AREA INDICATED TO REMAIN, IT SHALL BE SUITABLY RELOCATED AND THE SYSTEMS RESTORED TO NORMAL. COORDINATE ANY OUTAGES WITH OWNER 7 DAYS IN ADVANCE.

3. WORK INDICATED TO REMAIN SHALL BE SUITABLY PROTECTED AGAINST DAMAGE.

4. DISPOSE OF ALL PCB CONTAINING FLUORESCENT AND HID BALLASTS IN ACCORDANCE WITH EPA, DOT, STATE AND LOCAL REGULATIONS. IF THE PCP CONTENT IS NOT STATED ON THE BALLAST LABEL, THE BALLAST LABEL SHALL BE HANDLED AS A PCB BALLAST. DISPOSE OF ALL FLUORESCENT, INCANDESCENT AND HID LAMPS IN ACCORDANCE WITH EPA, DOT, STATE AND LOCAL REGULATIONS.

5. ALL PA PHONES AND PA HEAD EQUIPMENT SHALL BE TURNED OVER TO OWNER.

6. COORDINATE ALL DEMOLITION AND CONSTRUCTION ACTIVITIES WITH THE OWNER TO MINIMIZE DISRUPTION OF THE NORMAL DAILY FUNCTIONING OF THE OWNERS OCCUPIED AREAS.

7. REFER TO ARCHITECTURAL FLOOR PLANS FOR EXISTING WALLS. ALL NEW DEVICES LOCATED ON EXISTING WALLS SHALL BE FISHED TO BE INSTALLED CONCEALED AND FLUSH TO THE WALL; IF FISHING CANNOT OCCUR, PROVIDE APPROPRIATE SERIES WIREMOLD TO SURFACE MOUNTED DEVICES.

8. ALL REMOVED DEVICE WALL PENETRATIONS SHALL BE PATCHED AND PAINTED TO MATCH EXISTING WALL COLOR OR WALL COLOR PER ARCHITECT'S DIRECTION.

ELECTRICAL LEGEND:

(MOUNTING HEIGHTS ARE TO CENTERLINE OF DEVICE U.O.N.)

FIRE ALARM

- F — FIRE ALARM PULL STATION. MOUNT AT 48" A.F.F.
- SD — SMOKE DETECTOR.
- SD E — FIRE ALARM SMOKE DETECTOR - CEILING OR WALL MOUNTED. SUBSCRIPT 'E' INDICATES ELEVATOR RECALL FUNCTION.
- DD — DUCT TYPE SMOKE DETECTOR. PROVIDE EACH DUCT DETECTOR WITH REMOTE TEST SWITCH. REFER TO DETAIL FOR ADDITIONAL INFORMATION.
- TS — SPRINKLER SYSTEM VALVE TAMPER SWITCH.
- FS — SPRINKLER SYSTEM FLOW SWITCH.
- HD — HEAT DETECTOR.
- HD E — FIRE ALARM HEAT DETECTORS. CEILING OR WALL MOUNTED. SUBSCRIPT 'E' INDICATES ELEVATOR RECALL FUNCTION.
- CM — CONTROL MODULE.
- RT — REMOTE TEST SWITCH.
- FACP — FIRE ALARM CONTROL PANEL. MOUNT PER AHJ's RECOMMENDATIONS.
- FAAP — FIRE ALARM ANNUNCIATOR PANEL. MOUNT PER AHJ's RECOMMENDATIONS.
- 15cd F — COMBINATION FIRE ALARM SPEAKER/STROBE LIGHTING. CANDELA RATING AS INDICATED. WALL MOUNT AT 6'-8" A.F.F. TO BOTTOM OR 6" BELOW CEILING, WHICHEVER IS LOWER U.O.N.
- 15cd F — CEILING MOUNTED FIRE ALARM SPEAKER/STROBE LIGHT. CANDELA RATING AS INDICATED.
- 15cd F — CEILING MOUNTED FIRE ALARM SPEAKER.
- 15cd F — FIRE ALARM STROBE LIGHT. CANDELA RATING AS INDICATED. WALL MOUNT AT 6'-8" A.F.F. TO BOTTOM OR 6" BELOW CEILING, WHICHEVER IS LOWER U.O.N.
- 15cd F — FIRE ALARM STROBE LIGHT. CEILING MOUNTED. CANDELA RATING AS INDICATED.
- H — FIRE ALARM MAGNETIC DOOR HOLDER.
- MM — MONITOR MODULE.
- CO — CARBON MONOXIDE DETECTOR.
- SMD — COMBINATION SMOKE/FIRE DAMPER. PROVIDE MONITOR MODULE FOR SMOKE DETECTOR FURNISHED WITH UNIT AND 120/24V TRANSFORMER WITH PRIMARY AND SECONDARY FUSING FOR POWER CONNECTION TO DAMPER AS REQUIRED.

CONDUIT

- HOMERUN TO PANELBOARD; REFER TO PANEL SCHEDULES FOR MINIMUM WIRE AND CONDUIT SIZES.
- BRANCH CIRCUIT CONDUIT AND WIRING CONCEALED IN CEILING OR WALL SPACE, OR SURFACE MOUNTED WHERE NO CEILING OR WALL SPACE EXISTS. REFER TO PANEL SCHEDULES FOR MINIMUM WIRE AND CONDUIT SIZES.
- BRANCH CIRCUIT CONDUIT AND WIRING IN SLAB, UNDER FLOOR OR UNDERGROUND. REFER TO PANEL SCHEDULES FOR MINIMUM WIRE AND CONDUIT SIZES.

LIGHTING

- A — LIGHT FIXTURE. TYPE AS SPECIFIED. REFER TO LIGHT FIXTURE SCHEDULE.
- A — WALL MOUNTED LIGHT FIXTURE - TYPE AS SPECIFIED. REFER TO LIGHT FIXTURE SCHEDULE.
- INDICATES LIGHT FIXTURE ON EMERGENCY CIRCUIT.
- EXIT SIGNAGE - CEILING MOUNTED, WALL MOUNTED 6" ABOVE DOOR. SHADING INDICATES ILLUMINATED FACE. DIRECTIONAL ARROWS AS INDICATED.

SWITCHES

(MOUNTING HEIGHTS TO TOP OF DEVICE)

- $ — LINE VOLTAGE TOGGLE SWITCH. MOUNT AT 48" A.F.F. U.O.N.
- $ — LOW VOLTAGE SWITCH. "#" INDICATES NUMBER OF BUTTONS. MOUNT AT 48" A.F.F. U.O.N. PROVIDE BACK BOX WITH 3/4" EMPTY CONDUIT WITH PULL STRING TO ACCESSIBLE CEILING TERMINATED IN BUSHED END. PROVIDE ROOM CONTROLLER, WATTSTOPPER LMRC-210 SERIES AND MOUNT ABOVE ACCESIBLE CEILING. EXACT BUTTON QUANTITY AND FUNCTION TO BE DETERMINED BY ARCHITECT.
- OS — OCCUPANCY SENSOR, LOW VOLTAGE WITH POWER PACK, DUAL TECHNOLOGY, CEILING MOUNTED. EATON OAC-DT SERIES OR APPROVED EQUALS. FAIL TO ON TYPE.
- OS H — OCCUPANCY SENSOR, LOW VOLTAGE WITH POWER PACK, ULTRASONIC LONG VIEW SENSOR, CEILING MOUNTED. EATON OAC-DT-2000R SERIES OR APPROVED EQUALS. FAIL TO ON TYPE.
- VS W — DUAL TECHNOLOGY, SINGLE LEVEL WALL (AIR-GAP) SWITCH SENSOR WITH MANUAL ON, AUTO OFF SETTING, ILLUMINATED ICON PUSHBUTTON. MOUNT AT 48" A.F.F. U.O.N. EATON ONW-D SERIES. NEUTRAL REQUIRED. TIME DELAY PER OWNERSHIP. FAIL TO ON TYPE.
- VS — VACANCY SENSOR, LOW VOLTAGE WITH POWER PACK, DUAL TECHNOLOGY, CEILING MOUNTED. EATON VAC-DT SERIES OR APPROVED EQUALS. FAIL TO ON TYPE.
- OS WC — OCCUPANCY SENSOR, LOW VOLTAGE WITH POWER PACK, DUAL TECHNOLOGY, WALL MOUNTED AT 10'-0" A.F.F. U.O.N.. EATON OAWC-DT SERIES OR APPROVED EQUALS. FAIL TO ON TYPE.
- VS WC — VACANCY SENSOR, LOW VOLTAGE WITH POWER PACK, DUAL TECHNOLOGY, WALL MOUNTED AT 10'-0" A.F.F. U.O.N.. EATON OAWC-DT SERIES OR APPROVED EQUALS. FAIL TO ON TYPE.
- $ DMX — STAND ALONE DMX CONTROLLER WITH INDIVIDUAL COLOR SELECTION WHEEL, RAISE/LOWER FUNCTIONS AND PRESET SCENES. NICOLAUDIE-SUNLITE STICK-DE3 SERIES OR APPROVED EQUALS. PROVIDE ALL REQUIRED APPURTENANCES FOR A COMPLETE SYSTEM. SYSTEM PROGRAMING AND ON SITE TRAINING WITH OWNERSHIP REQUIRED.

MISCELLANEOUS

- 1 — REFERENCE TO DRAWING NOTE.
- #/E#.# — DETAIL REFERENCE: DETAIL NUMBER/DRAWING NUMBER
- ITEMS SHOWN DASHED/HEAVY ARE TO BE REMOVED.
- ITEMS SHOWN SOLID/LIGHT ARE EXISTING TO REMAIN.
- #/A# — ELEVATION VIEW REFERENCE.

OUTLETS

- Y-1 — DUPLEX RECEPTACLE; 2P, 3W, 20A, 125V, NEMA 5-20R; MOUNT AT 18"A.F.F. U.O.N. SUBSCRIPT DENOTES INDICATES BRANCH CIRCUIT CONNECTION. REFER TO SPECIFICATIONS AND THIS DRAWING FOR WIRE AND CONDUIT REQUIREMENTS.
- DOUBLE DUPLEX RECEPTACLE; 2P, 3W, 20A, 125V, NEMA 5-20R; MOUNT AT 18" A.F.F. U.O.N. SUBSCRIPTS: USB - PROVIDE USB IN FACEPLATE
- DUPLEX RECEPTACLE; 2P, 3W, 20A, 125V, NEMA 5-20R; MOUNT IN LINE WITH THE TOP OF MASONRY UNIT 16" A.F.F. U.O.N.
- DUPLEX RECEPTACLE; 2P, 3W, 20A, 125V, NEMA 5-20R; GROUND FAULT INTERRUPTER MOUNT AT 18" A.F.F. U.O.N.
- SPECIAL RECEPTACLE; TYPE AS NOTED; MOUNT AT 18" A.F.F. U.O.N.
- SLASH INDICATES DEVICE TO BE MOUNTED AT 42" A.F.F. OR 6" ABOVE COUNTER U.O.N.
- DUPLEX RECEPTACLE; 2P, 3W, 20A, 125V, NEMA 5-20R; WEATHERPROOF AND WEATHER RESISTANT, GROUND FAULT INTERRUPTER; MOUNT AT 18" A.F.F. U.O.N.
- DOUBLE DUPLEX RECEPTACLE; 2P, 3W, 20A, 125V, NEMA 5-20R; RECESSED IN FLOOR.

POWER

- PANELBOARD; RECESSED, SURFACE MOUNTED. MOUNT AT 5'-6" A.F.F. TO TOP OF PANEL.
- SW — SINGLE POLE MANUAL MOTOR STARTING SWITCH WITH HOA SWITCH; MOUNT AT 48" A.F.F. IN NEMA 1 ENCLOSURE U.O.N.
- MOTOR; TYPE AS NOTED.
- SAFETY DISCONNECT SWITCH - FUSED, NON-FUSED. MOUNT AT 48" A.F.F. U.O.N. FUSED AS NOTED. REFER TO SPECIFICATION FOR NEMA RATING.
- ENCLOSED CIRCUIT BREAKER. MOUNT AT 5'-6" A.F.F. TO TOP U.O.N. FUSE SIZE AS NOTED. REFER TO SPECIFICATIONS FOR NEMA RATING.
- JUNCTION BOX - CEILING MOUNTED, WALL MOUNTED. TYPE AS NOTED.
- CR — CORD REEL.
- EPO PUSHBUTTON. MOUNT AT 48" A.F.F. U.O.N. (TO TOP OF DEVICE).
- T — TRANSFORMER.
- SPD — SURGE PROTECTION DEVICE.
- GDS — GENERATOR DOCKING STATION.
- COMBINATION TYPE MOTOR STARTER - FVNR WITH CONTROL TRANSFORMER, RED AND GREEN INDICATING LIGHTS, H.O.A. SELECTOR SWITCH AND CIRCUIT BREAKER DISCONNECT SWITCH. MOUNT AT 5'-6" A.F.F. TO TOP U.O.N. FUSED AS NOTED, REFER TO SPECIFICATION FOR NEMA RATING.
- M — ELECTRICAL METER.
- UNIT HEATER.
- WIREMOLD. TYPE AS NOTED.

TELECOMMUNICATIONS

- A — ADMIN. DATA DROP. REFER TO DETAILS FOR CONFIGURATION. MOUNT AT 18" A.F.F. U.O.N.
- SB — SMARTBOARD DROP. REFER TO DETAILS FOR CONFIGURATION. MOUNT PER MANUFACTURER RECOMMENDATIONS.

SOUND

- SPEAKER - CEILING MOUNTED, WALL MOUNTED AT 7'-6" A.F.F. U.O.N. 'H' HORN TYPE. 'WP' WEATHERPROOF OUTDOOR SPEAKER. 'VP' VAPOR PROOF. SHALL BE CAPABLE WITH EXISTING BOGEN HEAD END MCP 35A.
- PA CALL SWITCH - WALL MOUNTED AT 48" A.F.F. TO TOP OF DEVICE. SINGLE GANG BACK BOX WITH 3/4" CONDUIT AND PULL STRING TERMINATED IN BUSHED ENDS TO ACCESSIBLE CEILING. SHALL BE CAPABLE WITH EXISTING BOGEN HEAD END MCP 35A.

SECURITY

- # — SURVEILLANCE CAMERA. FOR REFERENCE ONLY
- #

ABBREVIATIONS:

A	AMPERE, AMPERES
A.F.F.	ABOVE FINISHED FLOOR
A.F.G.	ABOVE FINISHED GRADE
AHU	AIR HANDLING UNIT
AIC	AMPERE INTERRUPTING CAPACITY
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
B.O.D.	BASIS OF DESIGN
BLC	BUILDING LIGHTING CONTROL PANEL
CATV	CABLE TELEVISION
CCTV	CLOSED CIRCUIT TELEVISION
C	CONDUIT
CB	CIRCUIT BREAKER
DWG	DRAWING
ECB	ENCLOSED CIRCUIT BREAKER
EF	EXHAUST FAN
EPO	EMERGENCY POWER OFF
ETR	EXISTING TO REMAIN
EWC	ELECTRIC WATER COOLER
EX	EXISTING
FAAP	FIRE ALARM ANNUNCIATOR PANEL
FACP	FIRE ALARM CONTROL PANEL
FLA	FULL LOAD AMPERES
FSS	FUSED SAFETY SWITCH
G	GROUND
GFEP	GROUND FAULT EQUIPMENT PROTECTION
GFI	GROUND FAULT INTERRUPTING
HOA	HAND-OFF-AUTOMATIC
HP	HORSEPOWER
HWG	HOT WATER HEATER GENERATOR
IDF	INTERMEDIATE DISTRIBUTION FRAME
IMC	INTERMEDIATE METAL CONDUIT
KCMIL	THOUSAND CIRCULAR MILS
KVA	KILOVOLT-AMPERES
KW	KILOWATT
LFS	LIGHT FIXTURE SCHEDULE
LOS	LIGHTING OVERRIDE SWITCH
LRA	LOCKED ROTOR AMPERES
LMS	LUMENS
MCA	MINIMUM CIRCUIT AMPERES
MCB	MAIN CIRCUIT BREAKER
MDF	MAIN DISTRIBUTION FRAME
MLO	MAIN LUGS ONLY
MPOP	MAIN POINT OF PRESENCE
MSB	MAIN SWITCHBOARD
MTD	MOUNTED
MH	MOUNTING HEIGHT/MANHOLE
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURER's ASSOCIATION
N.L.P.	NETWORKED LIGHTING CONTROL PANEL
NFSS	NON-FUSED SAFETY SWITCH
NO	NUMBER
OS	OCCUPANCY SENSOR
OC	ON CENTERS
P	POLE, POLES
Ø	PHASE
PNL	PANEL
PVC	POLYVINYL CHLORIDE
RAF	RETURN AIR FAN
RGS	RIGID GALVANIZED STEEL
RX	REMOVE EXISTING
SSBJ	SUPPLY SIDE BONDING JUMPER
TYP	TYPICAL
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
UH	UNIT HEATER
VS	VACANCY SENSOR
V	VOLT, VOLTS
VR	VANDAL RESISTANT
WP	WEATHERPROOF
W	WATTS, WIRE, WIRES
XFMR	TRANSFORMER
TTB	TELEPHONE TERMINAL BOARD
UTP	UNSHIELDED TWISTED PAIR
U.O.N.	UNLESS OTHERWISE NOTED

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 39921, EXPIRATION DATE 01/19/2021

REVISIONS

	MM-DD-YR	NAME	DESCRIPTION OF CHANGES

CRABTREE ROHRBAUGH & ASSOCIATES - ARCHITECTS
100 WEST ROAD, SUITE 402
TOWSON MD 21204
410-528-0272
www.cra-architects.com
MECHANICSBURG, PENNSYLVANIA
CHARLOTTESVILLE, VIRGINIA
WHITE SULPHUR SPRINGS, WEST VIRGINIA

ADDITION AND RENOVATIONS OF GALENA ELEMENTARY SCHOOL
KENT COUNTY PUBLIC SCHOOLS
114 S MAIN STREET
GALENA, MD 21635

CR

ELECTRICAL LEGEND, ABBREVIATIONS, & CONVENTIONS

PLOT SCALE:

FILENAME:

DATE: February 10, 2020

PROJECT 3309

E0.1

LIGHTING FIXTURE SCHEDULE

TYPE	DESCRIPTION	MANUFACTURER	MODEL	VOLTS	MAX. ALLOCATED WATTAGE	LAMPS	MOUNTING	REMARKS
F	2'w x 4'l x 2"d (INCLUDING DRIVER) FLAT PANEL STYLE LED LUMINAIRE WITH NARROW ALUM. BEZEL, SEAMLESS CORNERS, 80+ CRI MIN., WHITE FROSTED LENS, 2 TO 1 MAX/MIN RATIO FOR SURFACE UNIFORMITY AND INTEGRAL 0-10V DIMMING DRIVER	METALUX [ORACLE LIGHTING] [SNOWBALL LIGHTING]	24FP4740C SERIES [24 FPL1 SERIES] [G2ETP SERIES]	277 V	42.0 W	LED, 4000k, 4658lms	CEILING, RECESSED	
F1	1'w x 4'l x 2"d (INCLUDING DRIVER) FLAT PANEL STYLE LED LUMINAIRE WITH NARROW ALUM. BEZEL, SEAMLESS CORNERS, 80+ CRI MIN., WHITE FROSTED LENS, 2 TO 1 MAX/MIN RATIO FOR SURFACE UNIFORMITY AND INTEGRAL 0-10V DIMMING DRIVER	METALUX [ORACLE LIGHTING] [REVOLUTION LIGHTING]	14FP4240C SERIES [14 FPL1 SERIES] [G2ETP SERIES]	277 V	40.0 W	LED, 4000k, 4389lms	CEILING, RECESSED	
F2	2'w x 2'l x 2"d (INCLUDING DRIVER) FLAT PANEL STYLE LED LUMINAIRE WITH NARROW ALUM. BEZEL, SEAMLESS CORNERS, 80+ CRI MIN., WHITE FROSTED LENS, 2 TO 1 MAX/MIN RATIO FOR SURFACE UNIFORMITY AND INTEGRAL 0-10V DIMMING DRIVER	METALUX [ORACLE LIGHTING] [REVOLUTION LIGHTING]	22FP4240C SERIES [22 FPL1 SERIES] [G2ETP SERIES]	277 V	40.0 W	LED, 4000k, 4567lms	CEILING, RECESSED	
FH	2'w x 4'l x 2"d (INCLUDING DRIVER) FLAT PANEL STYLE LED LUMINAIRE WITH NARROW ALUM. BEZEL, SEAMLESS CORNERS, 80+ CRI MIN., WHITE FROSTED LENS, 2 TO 1 MAX/MIN RATIO FOR SURFACE UNIFORMITY AND INTEGRAL 0-10V DIMMING DRIVER	METALUX [ORACLE LIGHTING] [SNOWBALL LIGHTING]	24FP6440C SERIES [24 FPL1 SERIES] [G2ETP SERIES]	277 V	42.0 W	LED, 4000k, 6838lms	CEILING, RECESSED	
G	2'w x 4'l x 3.5"d VOLUMETRIC STYLE LED LUMINAIRE WITH DMX DRIVER/CONTROL INPUT, FULL RANGE COLOR CHANGING (+3000k WHITE), STEEL CONSTRUCTION, FROSTED ACRYLIC DIFFUSE LENSES AND DAMP LOCATION RATED.	CORONET LIGHTING [PINNACLE LIGHTING] [OR APPROVED EQUALS]	TDJA 2x4 RGBW L TG3.UNV.DMX.W.x.x SERIES [LUCEN SERIES]	277 V	90.0 W	LED, RGBW	CEILING, RECESSED	

GENERAL NOTES:

1. PROVIDE ALL 0-10V DIMMING DRIVERS PREWIRED WITH ISOLATE LEADS. WHEN A DIMMING DRIVER IS PROVIDED BUT ONLY CALLED FOR STATIC OPERATION, CAP 0-10V LEADS AND LEAVE IN PLACE. ENSURE LUMINAIRE STILL OPERATES AT 100% OUTPUT.
2. COORDINATE LIGHTING FIXTURES INDICATED ON DRAWINGS WITH ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATIONS. VERIFY CEILING CONSTRUCTION IN ALL AREAS WITH ARCHITECTURAL DRAWINGS AND PROVIDE ALL MOUNTING FRAMES/HARDWARE AS REQUIRED FOR A COMPLETE INSTALLATION SUITABLE FOR THE CEILING TYPE.
3. IN SPRINKLERED AREAS, MAINTAIN ADEQUATE SPACING BETWEEN FIXTURES AND SPRINKLER HEADS PER COUNTY FIRE MARSHAL REQUIREMENTS.
4. ALL LOW VOLTAGE, CLASS 2 WIRING FROM A REMOTE POWER SUPPLY TO LUMINAIRE SHALL BE IN CONDUIT.
5. ALL DIMMING DRIVERS OR DIMMING BALLASTS SHALL BE COORDINATED WITH DIMMER/DIMMING SYSTEM TO ENSURE FLICKER FREE DIMMING DOWN TO 10% UNLESS SPECIFIED TO LOWER PERCENTAGE IN LIGHT FIXTURE SCHEDULE.
6. WHERE RECESSED LIENAR RUNS ARE SHOWN WITH NORMAL AND EMERGENCY POWER, HOUSING AND LENSING SHALL BE CONTINUOUS. PROVIDE SEPERATE EMERGENCY WIRING TO INDICATED LENGTH OF RUN ON EMERGENCY CIRCUIT.
7. COORDINATE ALL EXIT SIGN MOUNTING POINTS WITH ARCHITECTURAL DRAWINGS, MILLWORK DRAWINGS AND ALL OTHER TRADES PRIOR TO ROUGH-IN. SUBMIT PROPOSED CONDUIT ROUTING AND MOUNTING STYLE TO ARCHITECT FOR ALL EXIT SIGNAGE BEING MOUNTED TO WINDOW MULLIONS PRIOR TO ROUGH-IN.
8. PROVIDE ALL DRIVERS AS UNIVERSAL VOLTAGE.
9. PROVIDE INDEPENDANT DIMMING DRIVERS FOR PORTIONS OF LUMINAIRES IN LOCALIZED CORRIDOR DAYLIGHT ZONES.
10. MODEL NUMBERS ARE FOR REFERENCE ONLY. SUBMIT SHOP DRAWINGS BASED ON ENTIRE SCHEDULE AND DRAWING INFORMATION.

LFX NOTES:

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 39921, EXPIRATION DATE 01/19/2021

REVISIONS

	MM-DD-YR	NAME	DESCRIPTION OF CHANGES

CRABTREE ROHRBAUGH & ASSOCIATES - ARCHITECTS
www.cra-architects.com
MECHANICSBURG, PENNSYLVANIA
CHARLOTTESVILLE, VIRGINIA
WHITE SULPHUR SPRINGS, WEST VIRGINIA
100 WEST ROAD, SUITE 402
TOWSON MD 21204
410-528-0272

ADDITION AND RENOVATIONS OF GALENA ELEMENTARY SCHOOL
KENT COUNTY PUBLIC SCHOOLS
114 S MAIN STREET
GALENA, MD 21635

CR

LIGHT FIXTURE SCHEDULE

PLOT SCALE:

FILENAME:

DATE: February 10, 2020

PROJECT 3309

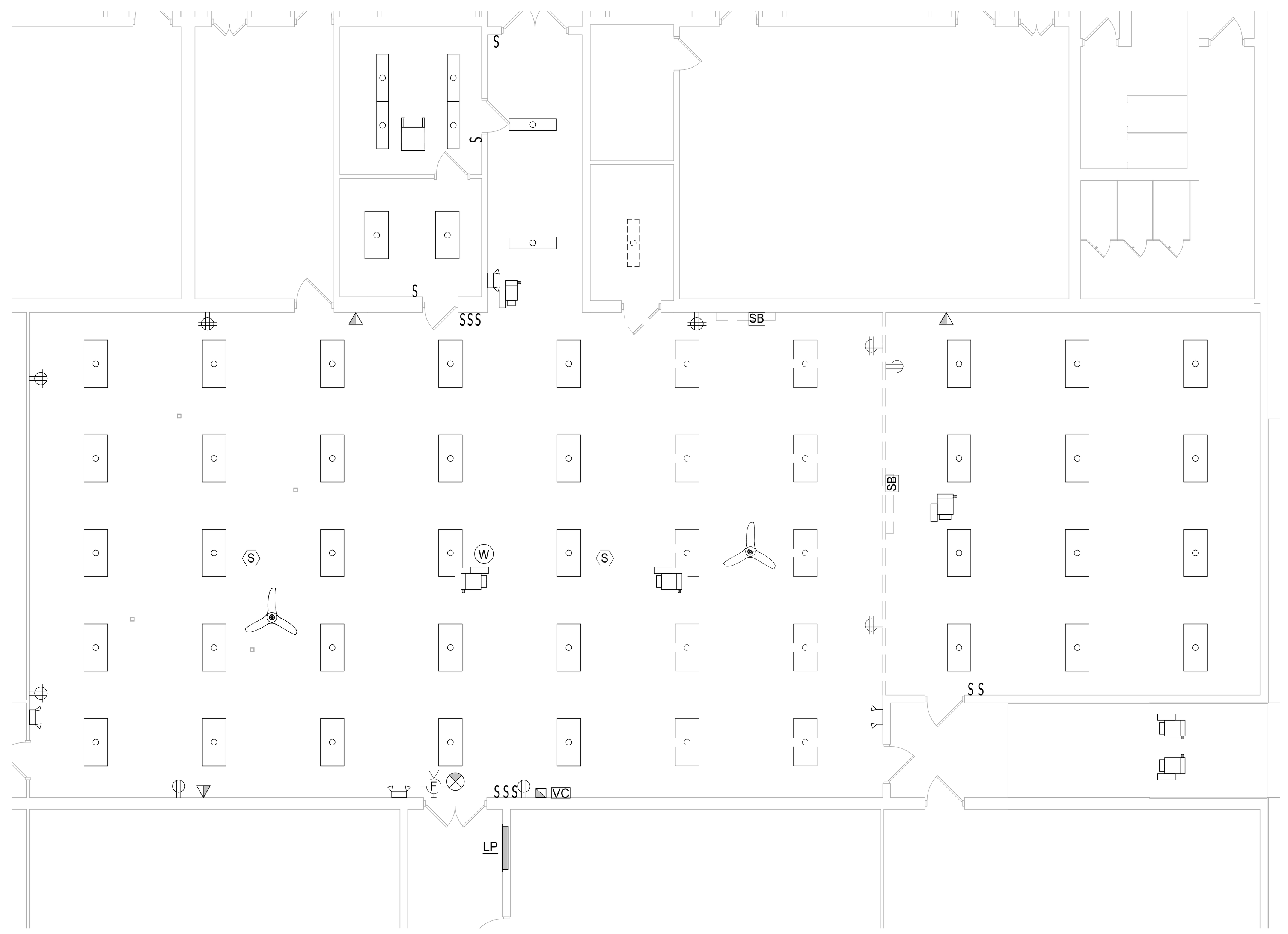
E0.2

GENERAL NOTES:

1. MAINTAIN EXISTING LIGHTING CIRCUIT FOR DEMOLISHED FIXTURES. CIRCUIT SHALL BE REUSED FOR NEW LIGHTING FIXTURES.

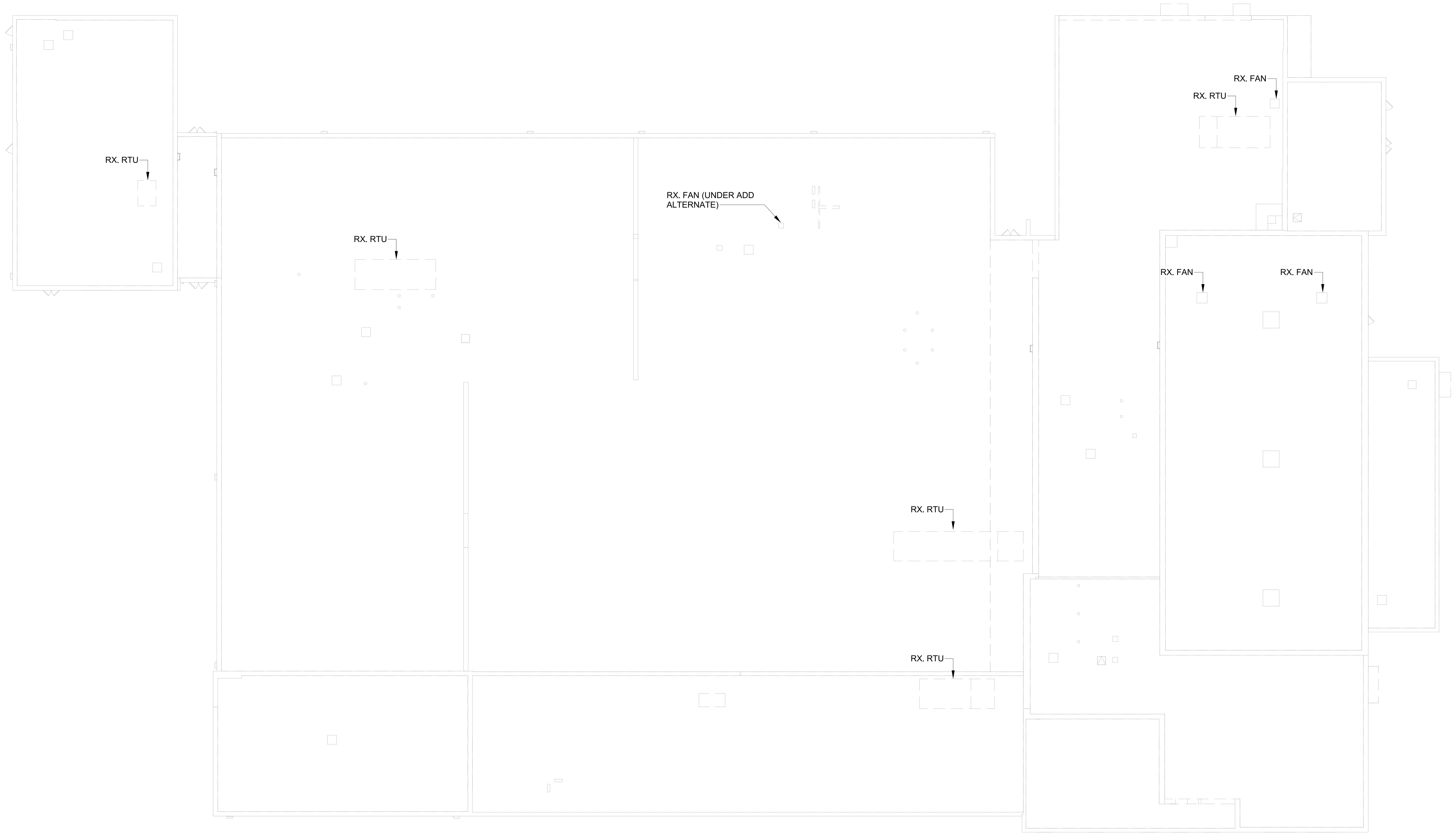
DRAWING NOTES:

(1) DEMOLISH WALL MOUNTED LIGHTING FIXTURE. MAINTAIN CIRCUIT FOR FUTURE CONNECTION OF NEW LIGHTING FIXTURE AND RECEPTACLE IN NEW BATHROOMS. EXTEND WIRING AS REQUIRED, (2) #12 + #12GW - 3/4"C.

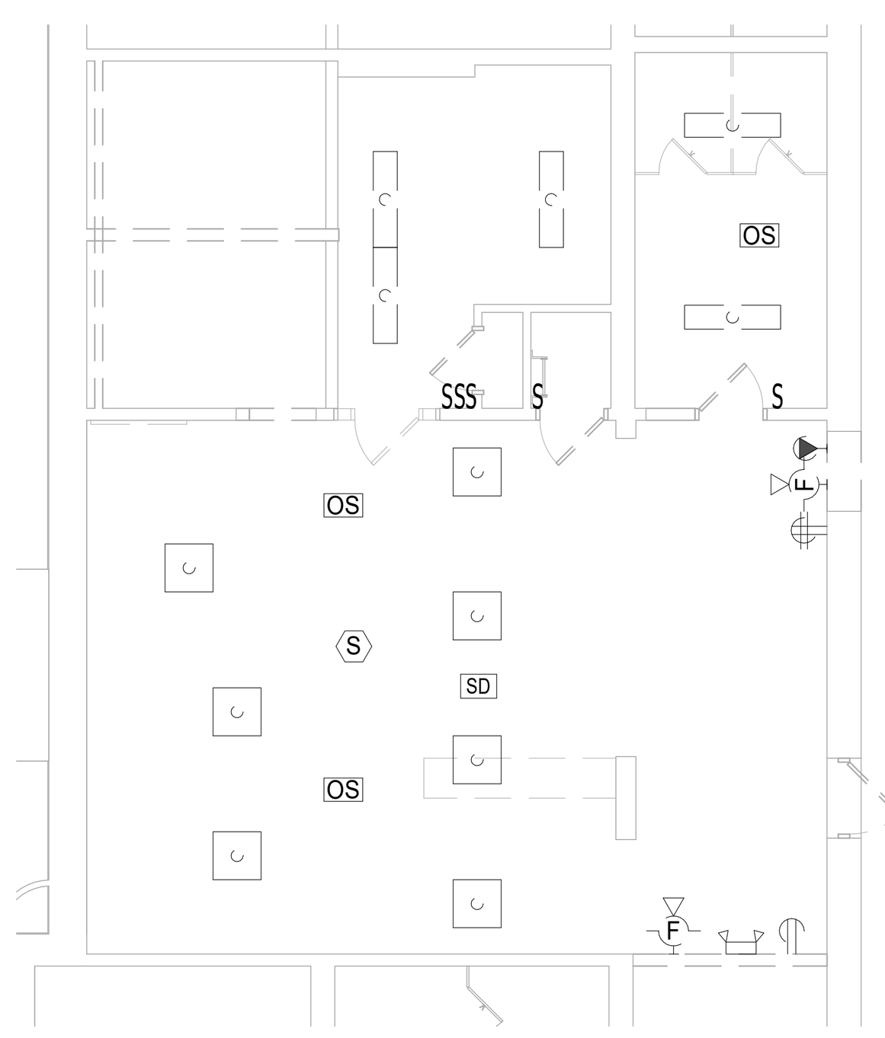


PARTIAL FIRST FLOOR DEMOLITION PLAN - ALT. GC-2
1/8" = 1'-0"

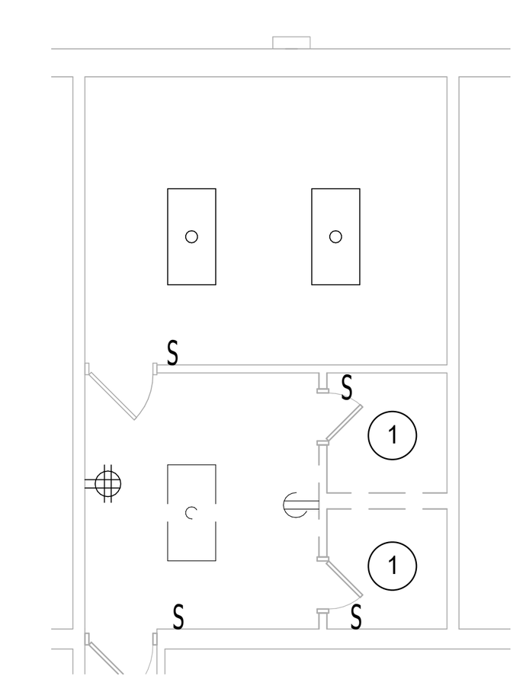
PARTIAL FIRST FLOOR DEMOLITION PLAN - BASE BID
1/8" = 1'-0"



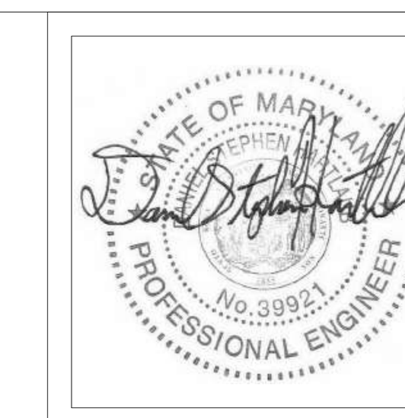
ROOF PLAN - DEMOLITION
1/16" = 1'-0"



PARTIAL FIRST FLOOR DEMOLITION PLAN - ALT. GC-1
1/8" = 1'-0"



PARTIAL FIRST FLOOR DEMOLITION PLAN - ALT. GC-3
1/8" = 1'-0"



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REVISIONS

MM-DD-YR	NAME	DESCRIPTION OF CHANGES

CRABTREE ROHRBAUGH & ASSOCIATES - ARCHITECTS
100 WEST ROAD, SUITE 402
TOWSON MD 21204
410-528-0272
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CHARLOTTESVILLE, VIRGINIA
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ADDITION AND RENOVATIONS OF GALENA ELEMENTARY SCHOOL
KENT COUNTY PUBLIC SCHOOLS
114 S MAIN STREET
GALENA, MD 21635

CR

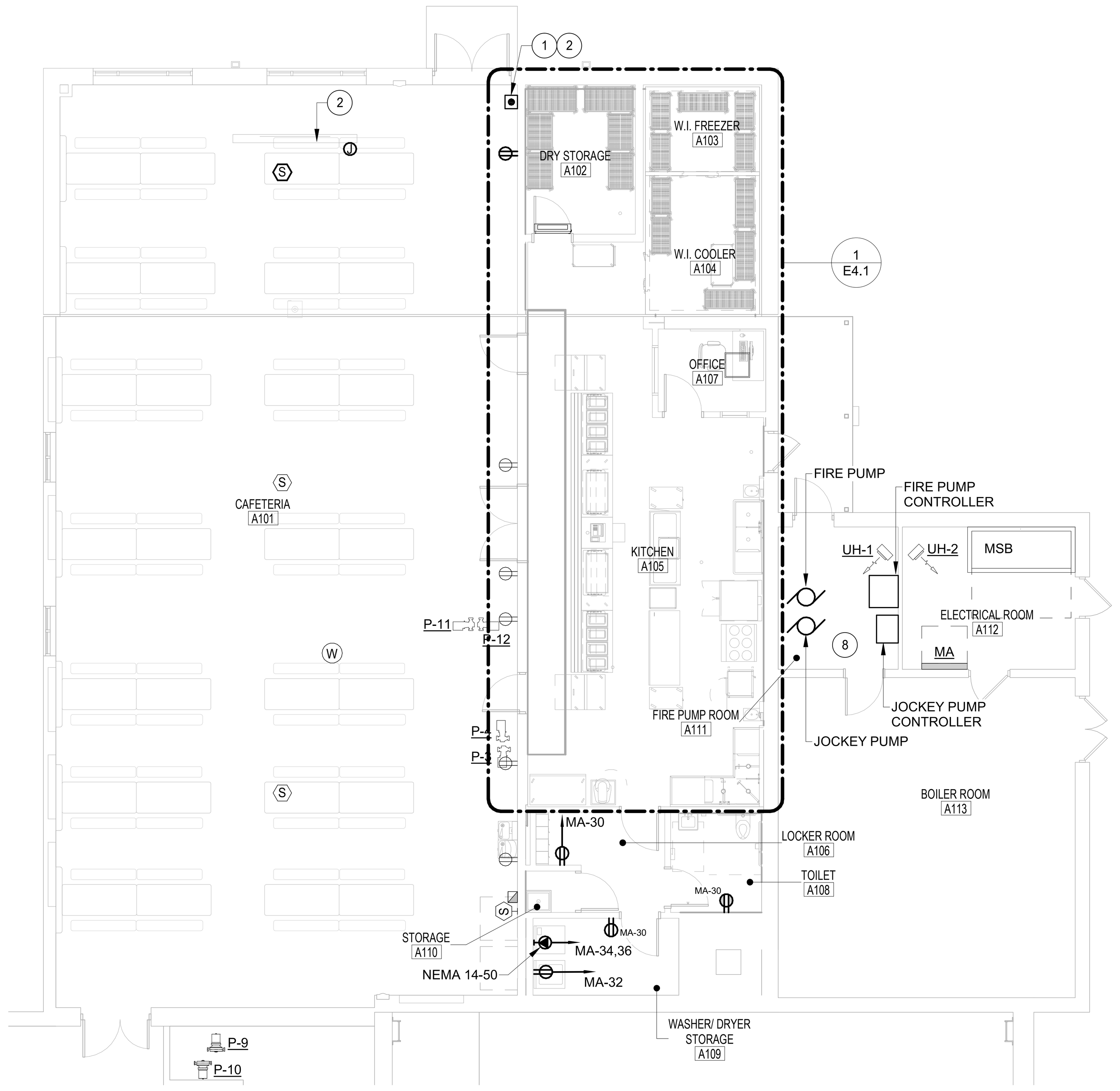
DEMOLITION PLANS

PLOT SCALE: As indicated
FILENAME:
DATE: February 10, 2020

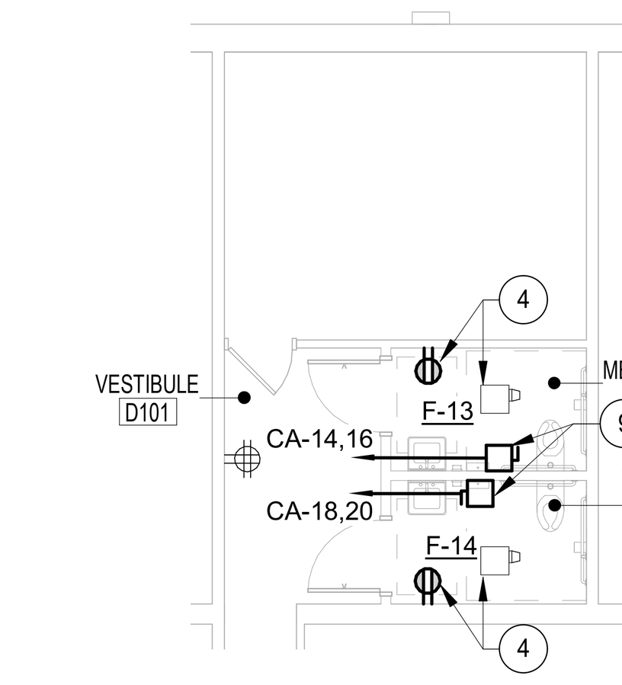
PROJECT
3309

ED1.1

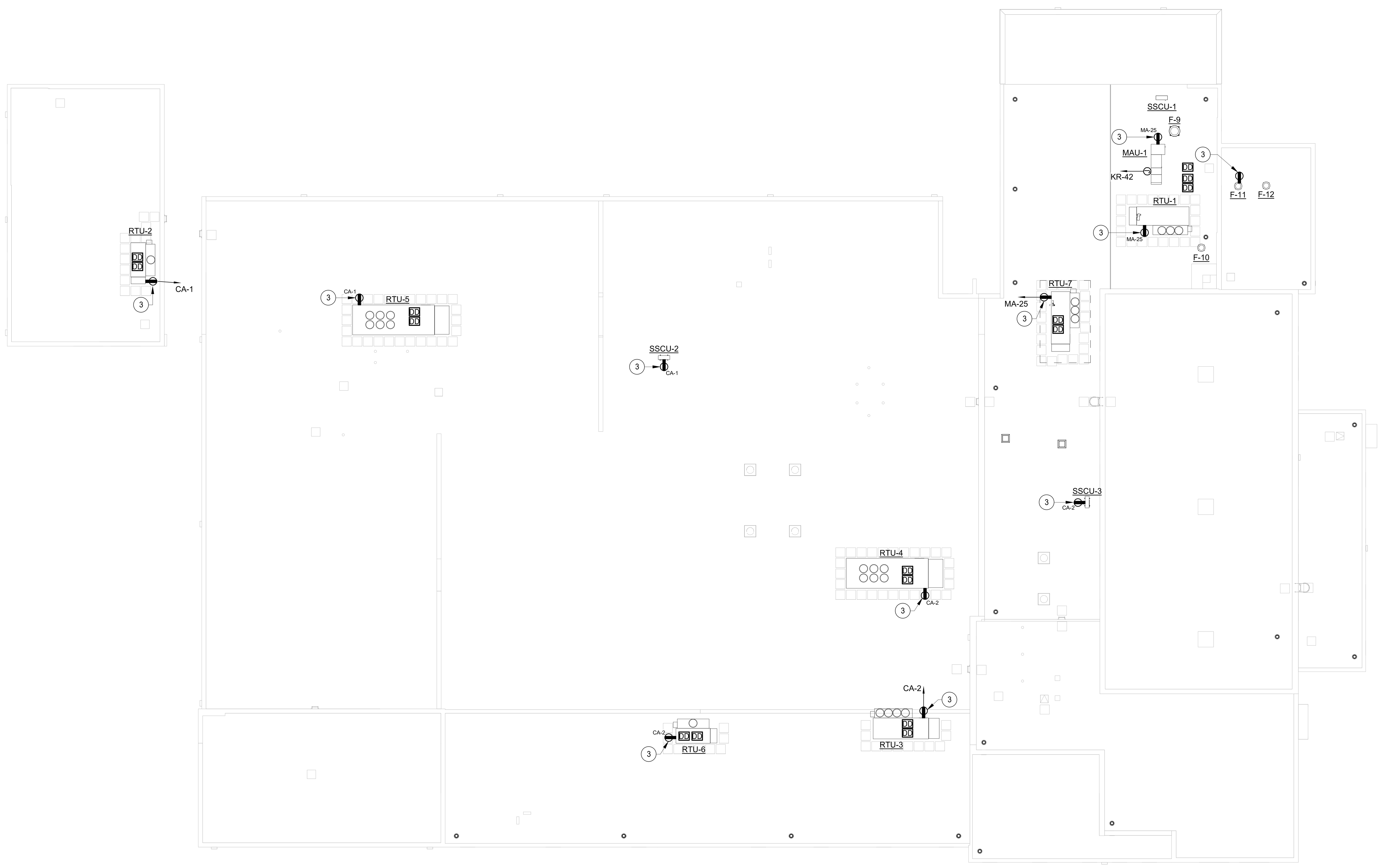
PARTIAL FIRST FLOOR PLAN - ALT. GC-2
1/8" = 1'-0"



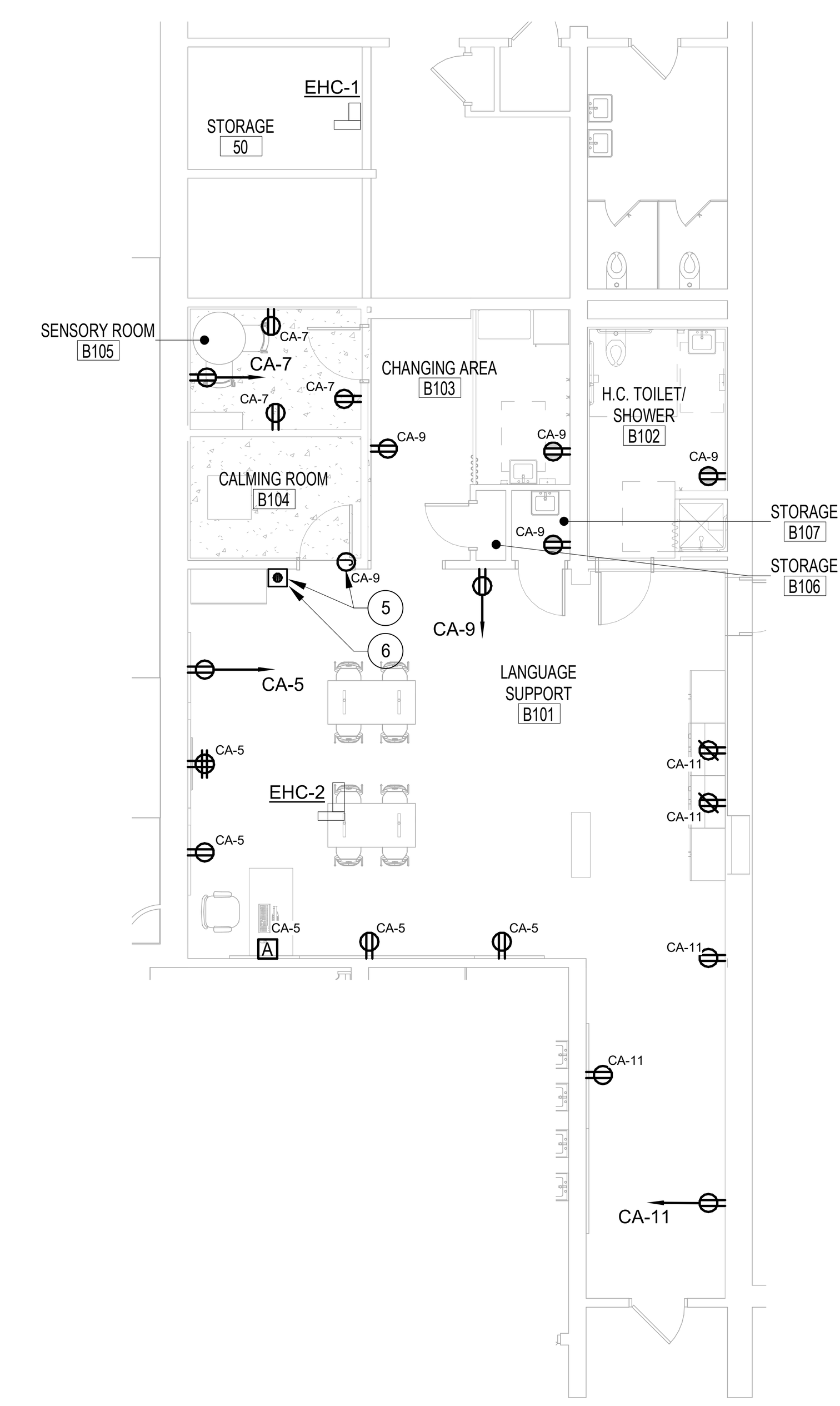
PARTIAL FIRST FLOOR PLAN - BASE BID
1/8" = 1'-0"



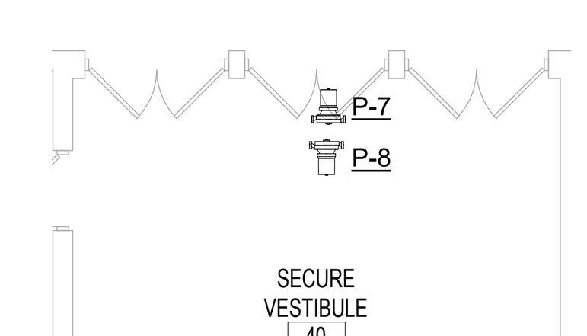
PARTIAL FIRST FLOOR PLAN - ALT. GC-3
1/8" = 1'-0"



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



PARTIAL FIRST FLOOR PLAN - ALT. GC-1 - ELECTRICAL
1/8" = 1'-0"



PARTIAL FIRST FLOOR PLAN - BASE BID (VESTIBULE)
1/8" = 1'-0"

SCALE: 1/8" = 1'-0"
8 0 8 16

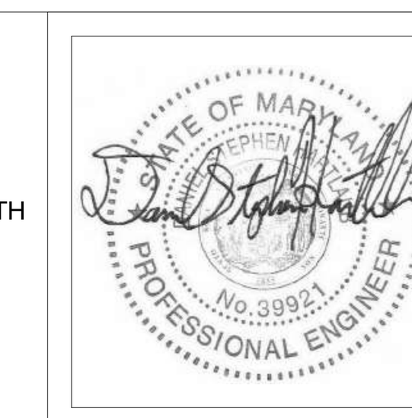
SCALE: 1/16" = 1'-0"
16 8 0 16 32

GENERAL NOTES:

1. PUMPS ARE LOCATED ABOVE ACCESSIBLE CEILING BELOW ASSOCIATED RTUs.
2. DUCT DETECTORS INDICATED ARE LOCATED IN CEILING SPACE BELOW. COORDINATE EXACT LOCATION WITH MECHANICAL CONTRACTOR. PROVIDE WITH REMOTE TEST STATION IN CEILING GRID BELOW DUCT DETECTOR.
3. REFER TO DRAWING E7.1 FOR ADDITIONAL MECHANICAL EQUIPMENT CONNECTION INFORMATION.

DRAWING NOTES:

1. COORDINATE LOCATION OF UP/DOWN ROCKER SWITCH WITH OWNER PRIOR TO INSTALLATION.
2. PROVIDE ALL INTERCONNECTIONS BETWEEN PROJECTOR SCREEN AND CONTROLLER, IN CONDUIT, AS REQUIRED BY MANUFACTURER.
3. REFER TO ELECTRICAL DETAILS FOR CONDUIT PENETRATIONS AND MOUNTING OF OUTLETS ON ROOF.
4. MAKE CONNECTION TO EXISTING CIRCUIT MAINTAINED DURING DEMOLITION.
5. MOUNT TO SUIT ELECTRIFIED DOOR POWER SUPPLY AND MAKE ALL INTERCONNECTIONS TO ASSOCIATED PUSHBUTTON.
6. PUSHBUTTON TO ACTIVATE DOOR LOCK. DOOR SHALL ONLY LOCK WHILE BUTTON IS HELD. TIE INTO FIRE ALARM SYSTEM FOR FAILSAFE TO UNLOCK.
7. PROVIDE CONNECTION TO TWO SOLATUBES LOCATED IN CEILING. COORDINATE LOCATION OF DIMMER SWITCH FURNISHED BY OTHERS WITH OWNER PRIOR TO INSTALLATION. CONNECT TO PANELBOARD CA (CKT CA-12) REFER TO PANELBOARD SCHEDULE FOR ADDITIONAL INFORMATION.
8. LOCATE 15 TAMPER SWITCHES, AND 3 FLOW SWITCHES IN FIRE PUMP ROOM A111. VERIFY QUANTITY WITH INSTALLING CONTRACTOR PRIOR TO PURCHASING.
9. PROVIDE 2P-30A-NF/SS IN NEMA 1 ENCLOSURE. MOUNT ABOVE ACCESSIBLE CEILING AND CONNECT TO EQUIPMENT BEING SERVED.



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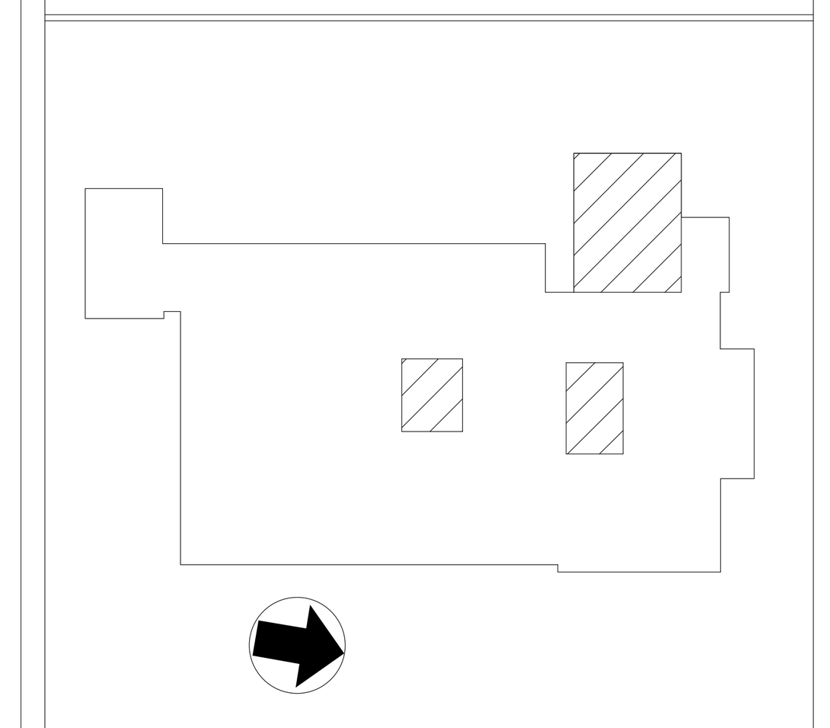
KEY PLAN



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ELECTRICAL PLANS

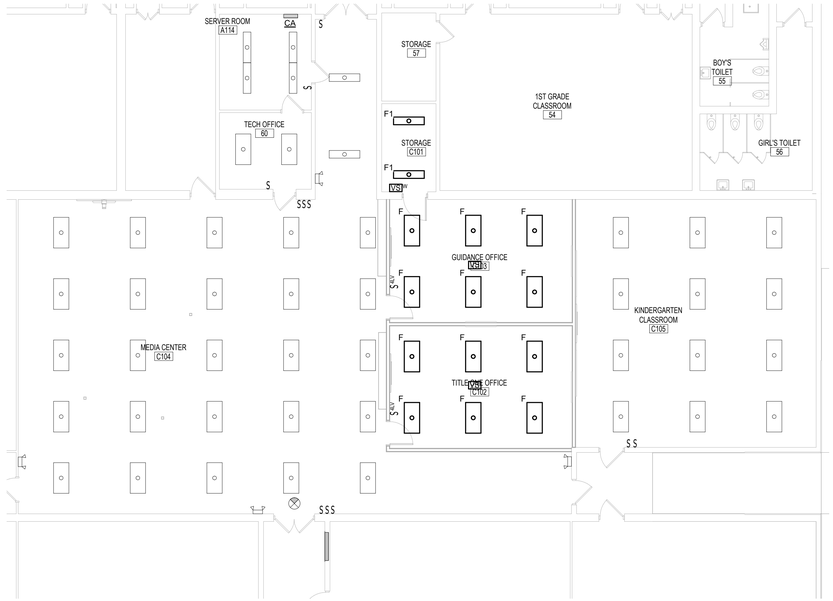
PLOT SCALE: As indicated
FILENAME:
DATE: February 10, 2020

PROJECT
3309

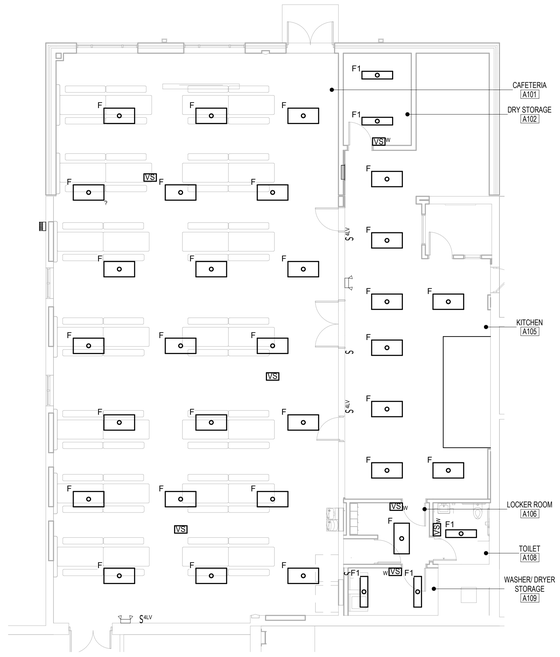
E1.1

GENERAL NOTES:

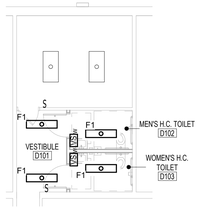
1. CONNECT LIGHTING FIXTURES TO EXISTING CIRCUIT, MAINTAINED DURING DEMOLITION.



PARTIAL FIRST FLOOR LIGHTING PLAN - ALT. GC-2
1/8" = 1'-0"



PARTIAL FIRST FLOOR LIGHTING PLAN - BASE BID
1/8" = 1'-0"



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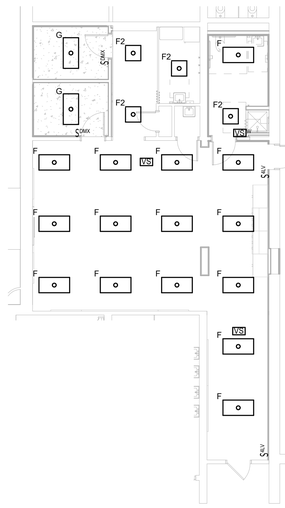
1/8" = 1'-0"



PARTIAL FIRST FLOOR PLAN - ALT. GC-1 - LIGHTING
1/8" = 1'-0"

SCALE: 1/8" = 1'-0"
8 0 8 16

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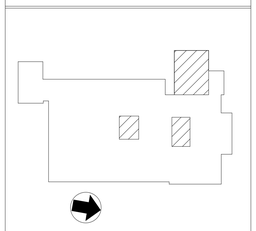
KEY PLAN



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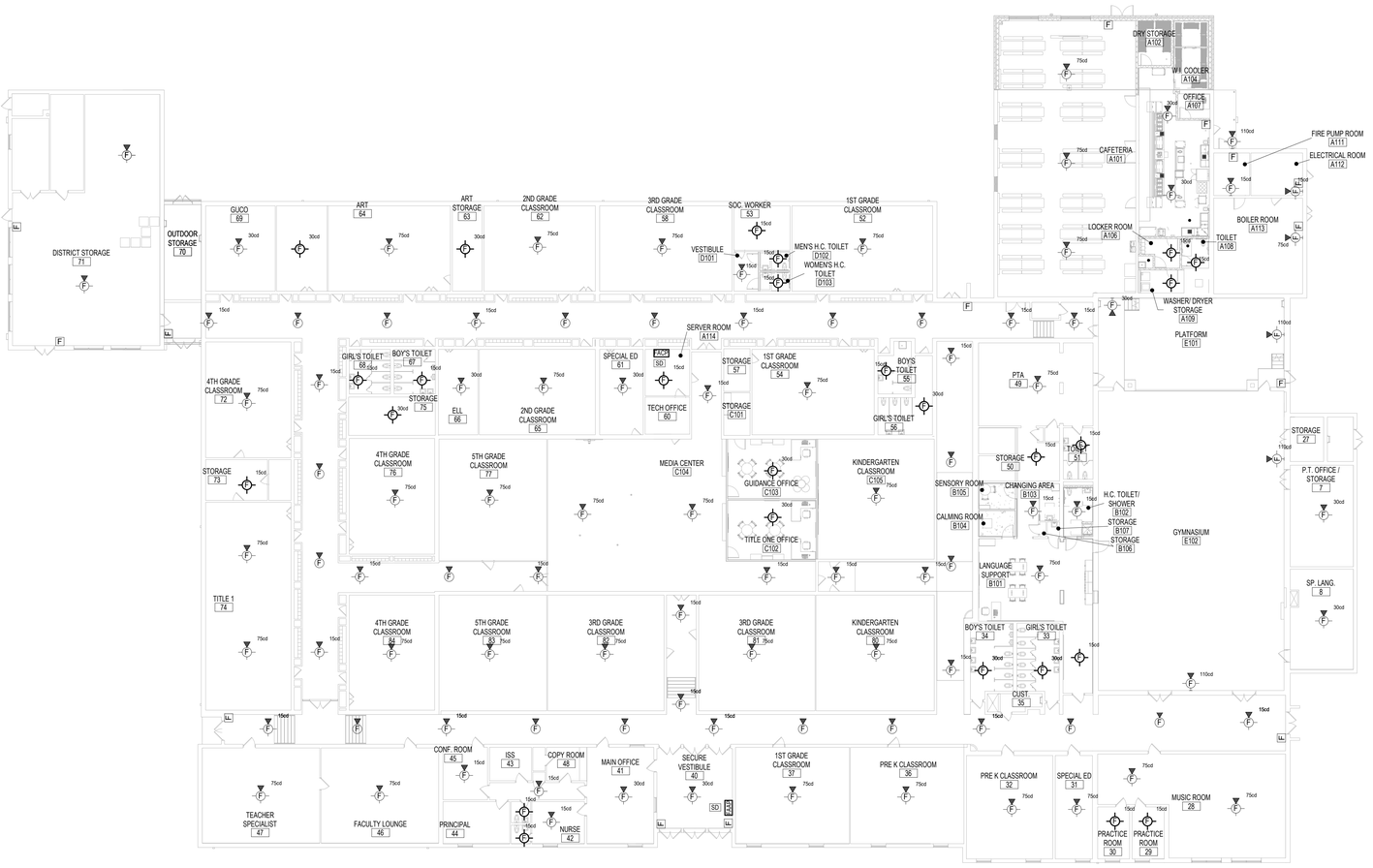
LIGHTING PLANS

PLOT SCALE: 1/8" = 1'-0"
FILENAME:
DATE: February 10, 2020

PROJECT
3309

E2.1



FIRST FLOOR - FIRE ALARM

1/16" = 1'-0"

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

16 8 0 16 32

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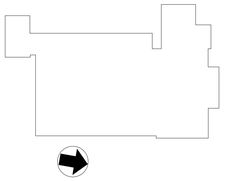
KEY PLAN



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GALENA, MD 21635

FIRE ALARM

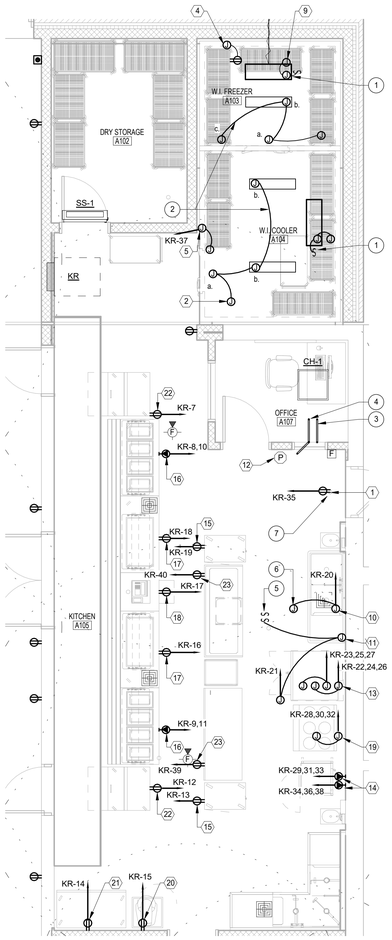
PLOT SCALE: 1/16" = 1'-0"

FILENAME:

DATE: 02/05/20

PROJECT 3309

E3.1



PART PLAN - KITCHEN
1/4" = 1'-0"

KITCHEN EQUIPMENT CONNECTION SCHEDULE NOTES:

1. ALL OUTLETS AND CONNECTIONS SHOWN RELATE TO FOOD SERVICE AND FIXTURES ONLY. SEE KITCHEN FOODSERVICE AND ENGINEERING PLANS FOR ADDITIONAL ELECTRICAL REQUIREMENTS.
2. ELECTRICAL SYSTEM IS DESIGNED FOR 480/277,3PH,4W & 208/120V,3PH,4W.
3. THIS PLAN SHOW INTENDED ROUGH-IN OUTLET TYPES, LOCATIONS AND HEIGHTS, AS WELL AS CONNECTION POSITIONS AND LOAD REQUIREMNETS. DIMENSIONS SHOWN ARE FROM FINISHED FLOOR/WALLS. VERIFY FINISH WALL PARTITION LOCATIONS WITH ARCHITECUTRAL DRAWINGS.
4. ALL ELECTRICAL WORK FOR FABRICATED FOODSERVICE EQUIPMENT SHALL BE COMPLETELY WIRED BY THE FABRICATION CONTRACTOR TO A COMMON JUNCTION BOX, PULL BOX OR CONTROL PANEL ON THE EQUIPMENT IN AN ACCESSIBLE POSITION. FINAL CONNECTIONS TO EQUIPMENT PULL BOX/JUNCTION BOX AND ALL ELECTRICAL WORK FROM PANELOBARDS SHALL BE BY ELECTRICAL CONTRACTOR.
5. ELECTRICAL CONTRACTOR SHALL PERFORM FINAL CONNECTIONS TO ALL FOODSERVICE EQUIPMENT.
6. ALL CONDUIT, PIPING AND/OR SIMILAR CONSTRUCTION, LOCATED OUTSIDE WALL, MUST BE INSTALLED SUCH THAT SPACE BETWEEN WALL AND CONDUIT IS MINIMUM 3/4".
7. ELECTRICAL CONTRACTOR OR EQUIVALENT, SHALL FURNISH AND INSTALL THE FOLLOWING:
   - A. ALL PLUGS AND CORDS AS NOTED ON SCHEDULE. ALL CORDS SHALL BE NEMA RATED AND UL APPROVED FOR MANUFACTURED AND FABRICATED EQUIPMENT.
   - B. ALL ELECTRICAL OUTLETS, SWITCHES, COVERPLATES, JUNCTION BOXES, ETC. NOT BUILT INTO FIXTURES OR EQUIPMENT. ALL OUTLET, JUNCTION BOXES, ETC. IN DISHROOMS SHALL BE MOISTURE-PROOF.
   - C. DISCONNECTS OR OTHER DEVICES AS REQUIRED BY CODE.
   - D. SHUNT-TRIP CIRCUIT BREAKERS OR DISCONNECTS FOR FIRE CONTROL SYSTEM SHUT-OFF OF FOODSERVICE EQUIPMENT BENEATH HOODS/VENTILATORS AS REQUIRED BY LOCAL CODES AND NFPA 96 (LATEST EDITION).
8. WHERE REQUIRED THE ELECTRICAL CONTRACTOR SHALL PROVIDE WIRING AND CONDUIT, INSTALL ELECTRICAL COMPONENTS PROVIDED BY KEC, AND INTERWIRE BETWEEN THE FOLLOWING:
   - A. WALK-IN COOLER/FREEZER LIGHT (CONDUIT SHALL BE RAN ABOVE COMPARTMENT CEILING)
   - B. REMOTE REFRIGERATION SYSTEMS TO EVAPORATOR COILS.
   - C. KITCHEN EXHAUST HOODS/VENTIALTORS AND EXHAST SUPPLY FANS PER MANUFACTURER'S INSTRUCTIONS.
9. REVIEW AND PROVIDE/INSTALL ALL ADDITIONAL REQUIRED CONDUIT, WIRING, DISCONNECTS, ETC. INDICATED ON FOODSERVICE PLANS FOR ANY TYPE OF EQUIPMENT FOR ANY TYPE OF EQUIPMENT DESIGNED FOR THIS PROJECT NOT INDICATED IN THIS DRAWING.
10. ALL RECEPTACLES SHALL BE GFCI TYPE UNLESS OTHERWISE NOTED.

ELECTRICAL SCHEDULE

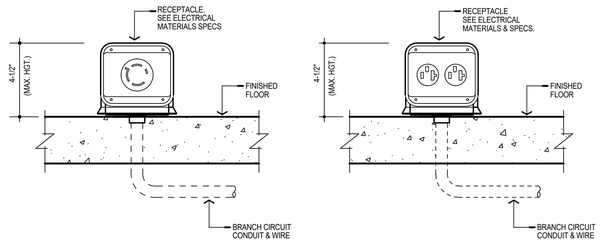
	R.I.#	HP	KW	AMP	VOLTS	PH	R.I. HGT. A.F.F.	DESCRIPTION	E.Q. NO.	E.C. TO PROVIDE: CORD & PLUG	RECEP.	DISC.	J.B.
	1	1/2			120	1	50"	FLY FAN RECEP.	1		O		
	2						114"	BRANCH TO:					O
	2a		1.5 KW		120	1		DOOR LIGHT, HEATER, ALARM	2				
	2b		32W(2)		120	1		L.E.D. LIGHT FIXTURE (2)	2				
	3						114"	BRANCH TO:					O
	3a		1.5 KW		120	1		DOOR LIGHT, HEATER, ALARM	2				
	3b		32W		120	1		L.E.D. LIGHT FIXTURE	2				
	3c		.100		120	1		HEATED RELIEF PORT	2				
	4		.150		120	1		DRAIN LINE HEAT TAPE RECEP.	2		O		O
	5			1.50	120	1	50"	AIR SCREEN RECEP.	2		O		O
	6			4.1	208	3	STUB	COOLER COMPRESSOR RACK	3				O
(1)	7			1.6	120	1	114"	COOLER BLOWER COIL	3				O
	8			8.8	208	3	STUB	FREEZER COMPRESSOR RACK	4				O
(1)	9			9.8	208	1	114"	FREEZER BLOWER COIL	4				O
	10			20.0(Cir.)	120	1	108"	FIRE PROTECTION SYSTEM	9				O
	11		350W	13.3	120	1	114"	VENTILATOR LIGHT CONTROLLER	9				O
(2)	12						48"	HEXAGON J-BOX, FIRE PULL	9				O
(3)	13		11.0(2)		208	3	24"/36"	CONVECTION OVEN	10				O
	14			8.0(2)	208	3	24"/36"	CONVECTION STEAMER	11				
	15		1.0		120	1	@CLG.	HEATED CABINET RECEP.	E10		O		
	16			22.0	208/120	1	STUB	HOT FOOD COUNTER RECEP.	14a		O		
	17			7.0	120	1	STUB	FROST TOP COUNTER RECEP.	14b		O		
	18			15.0	120	1	STUB	CASH REGISTER RECEP.	15		O		
	19		17.0		208	3	24"	RANGE	E4				O
	20		1.0		120	1	36"	MIXER RECEP.	E5		O		
	21		1.0		120	1	50"	REACH-IN REFRIGERATOR RECEP.	E7		O		
	22			4.6	120	1	48"	MILK COOLER RECEP.	E11		O		
	23			20.0	120	1	@CLG.	RETRACTABLE CORD REEL RECEP.	19		O		

(1) SEE SHEET ??? FOR EXACT LOCATION. ITEM FURNISHED W/MAIN-FUSED DISCONNECT SWITCH.
(2) EXTEND CONDUIT DOWN FROM JUNCTION BOX MOUNTED ABOVE FINISH CEILING TO CONTROL PANEL BY E.C. SEE SHEET K-502 & K-503 FOR FURTHER VENTILATOR DETAILS.
(3) EXTEND 1/2" DIA. OPEN RIGID CONDUIT FROM TOP OF PULL BOX UP IN WALL TO 6" ABOVE FINISH CLG. BY E.C.

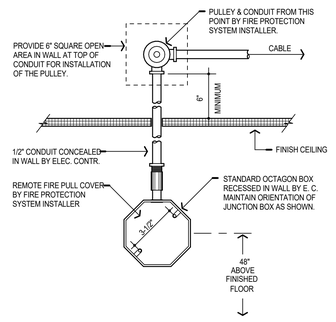
NOTE: ITEM # E4 RANGE W/ OVEN BASE. ELECTRICAL CONTRACTOR TO FIELD VERIFY UTILITY LOAD REQUIREMENTS.

DRAWING NOTES:

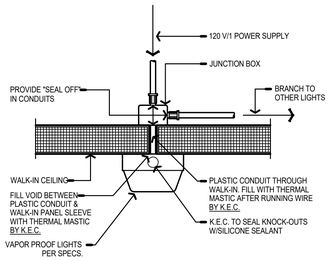
1. CAT 5 CABLE TO MGR. OFFICE FOR TEMP. MONITORING BY E.C.
2. RUN ALL CONDUIT ABOVE WALK-IN CLG. SEE LIGHT FIXTURE DETAIL BELOW.
3. 1" DIAMETER OPEN RIGID CONDUIT DOWN IN WALL AND OUT @ 12" AFF BY E.C. CAT 5 CABLE FOR TEMP. MONITORING.
4. 1" DIAMETER OPEN RIGID CONDUIT IN FLOOR AND UP IN WALL AND OT @ 12" AFF BY E.C.
5. 208V/3PH WIRING FROM FAN SWITCH ON HOOD TO EXHAUST AND SUPPLY FANS ON ROOF BY E.C.
6. WIRING FROM MICRO-SWITCH ON FIRE PROTECTION SYSTEM CONTROL PANEL TO SHUNT-TRIP BREAKERS FOR FIRE-FUEL SHUT-OFF BY E.C.
7. MAKE CONNECTION AT AIR CURTAIN. MOUNT CONTROLLER FURNISHED WITH UNIT AT WALL (COORDINATE EXACT LOCATION WITH KCPS PRIOR TO INSTALLATION). PROVIDE ALL INTERWIRING AND CONDUIT AS REQUIRED.



FLOOR RECEPTACLE DETAIL
SCALE: NTS.

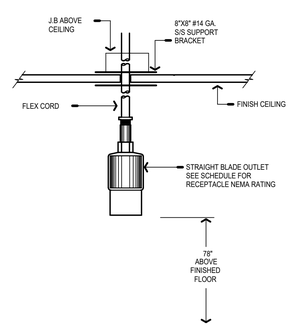


REMOTE FIRE PROTECTION PULL STATION DETAIL
SCALE: NTS.



1. ALL CONDUIT TO BE RUN ON EXTERIOR CEILING OF WALK-IN.
2. ALL PENETRATIONS THRU WALK-IN ARE TO BE SEALED WITH THERMAL MASTIC BY K.E.C.
3. LIGHT FIXTURES TO BE SHIPPED LOOSE & INSTALLED BY K.E.C. FINAL CONNECTION BY ELECTRICIAN.
4. NO METAL CONDUIT INSIDE WALK-IN BOX.
5. ALL CONDUIT KNOCK OUTS IN LIGHT FIXTURE TO BE SEALED W/SILICONE SEALANT BY K.E.C.

WALK-IN LIGHT INSTALLATION DETAIL
SCALE: NTS.



SUSPENDED RECEPTACLE DETAIL
SCALE: NTS.

SCALE: 1/4" = 1'-0"
4 0 4 8

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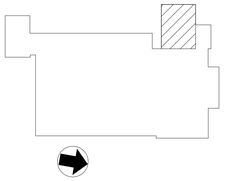
KEY PLAN



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KITCHEN PART PLANS

PLOT SCALE: 1/4" = 1'-0"
FILENAME:
DATE: February 10, 2020

PROJECT 3309

E4.1

COLOR CODE FOR CAT5E & CAT6 WIRE:

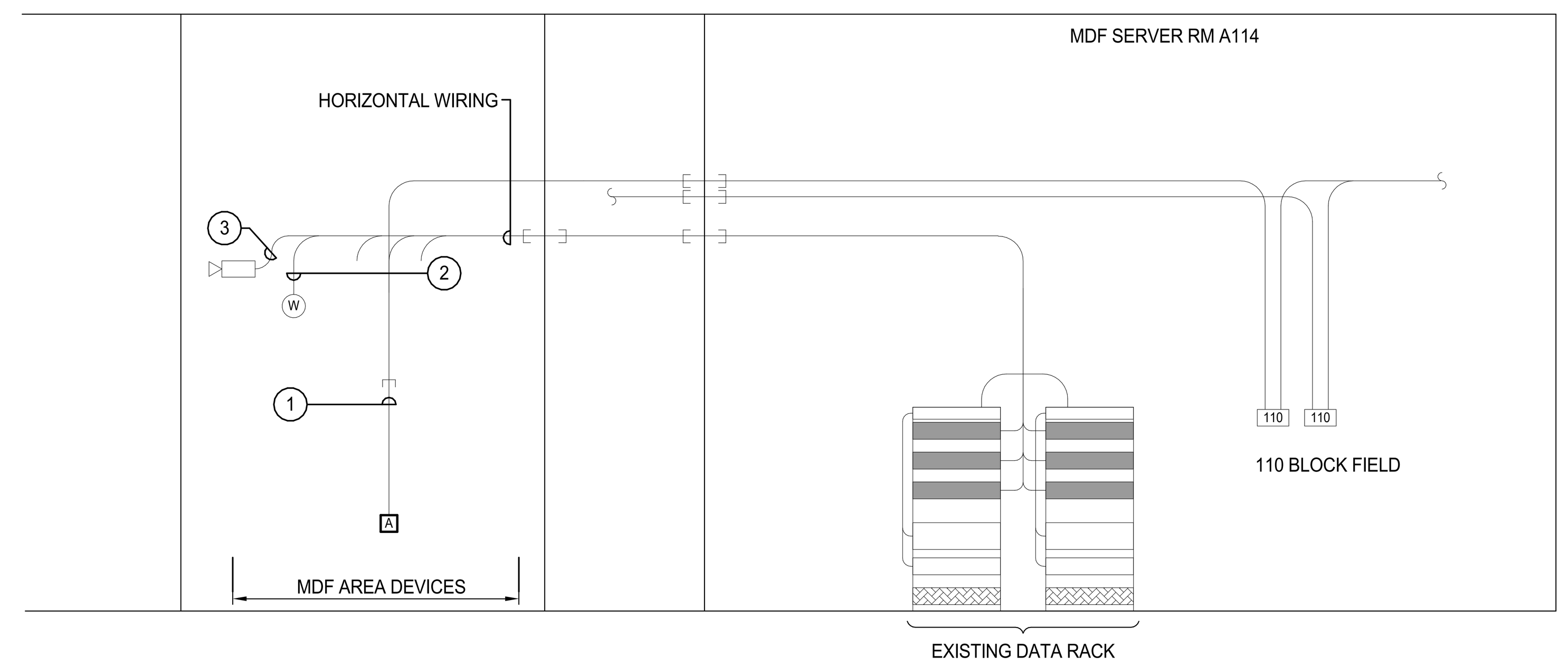
- DATA - BLUE CABLE - BLUE JACKS
- WAP - CAMERAS (BLUE CABLE & RJ-45)
- PA - YELLOW CABLE - YELLOW JACKS
- VOICE - WHITE CABLE - WHITE JACKS

GENERAL NOTES:

1. REFER TO DETAILS FOR ADDITIONAL INFORMATION ON DATA OUTLET CONFIGURATIONS.
2. TERMINATE WAP DROPS ON DEDICATED PATCH PANEL(S).
3. TERMINATE SECURITY CAMERA ON DEDICATED PATCH PANEL(S).
4. REFER TO FLOOR PLANS FOR LOCATIONS AND DEVICE COUNTS.
5. ALL EXTERIOR DEVICES SHALL BE PROVIDED WITH SURGE PROTECTION AT WALL PENETRATION.
6. REFER TO DETAIL 6 (TECHNOLOGY TEACHING WALL ELEVATION AND RISER) ON SHEET E6.03 FOR MORE INFORMATION.

DRAWING NOTES:

1. (3) 4PR CAT6 CABLES FOR DATA FROM OUTLET TO IDF/MDF IN 1-1/4"C TO CEILING SPACE ABOVE.
2. (1) CAT6 CABLE WITH 10' SERVICE LOOPS.
3. (1) 4PR CAT6 CABLE FOR SECURITY CAMERA FROM OUTLET TO IDF/MDF FOR CEILING MOUNTED CAMERAS. FOR WALL MOUNTED CAMERAS IN 1"C TO CEILING SPACE ABOVE. PROVIDE WITH 20'
4. SLACK FOR FIELD ADJUSTMENT AND TERMINATE WITH MALE END.

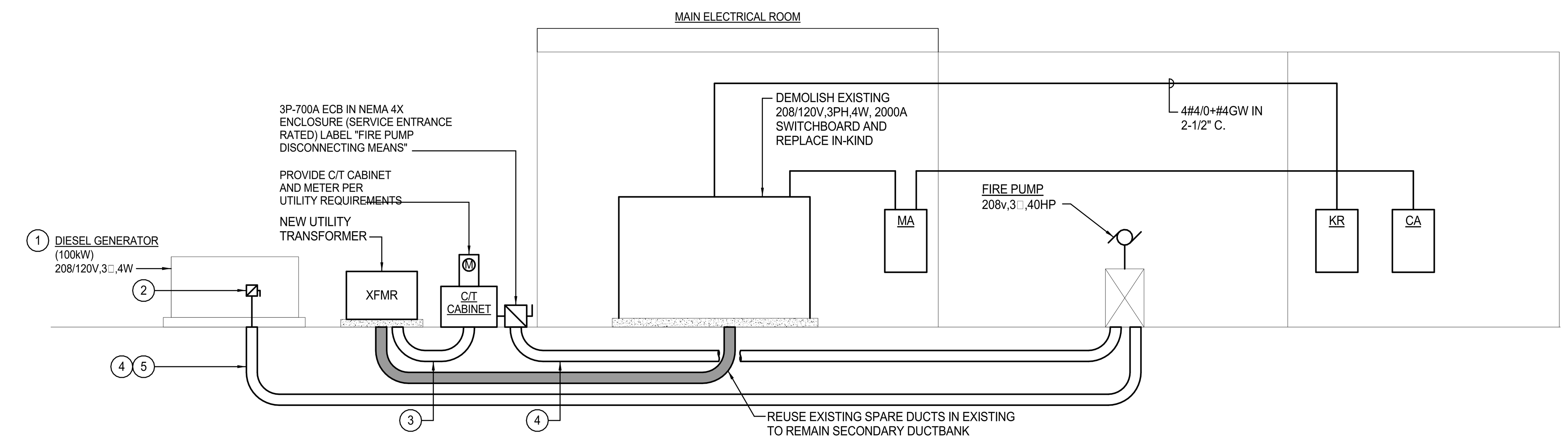


SCHEMATIC COMMUNICATIONS SYSTEM RISER DIAGRAM

SCALE: NONE

DRAWING NOTES:

1. KOHLER ALTERNATOR 4R12X.
2. 3P-175A-LSI TYPE CIRCUIT BREAKER.
3. (4) #1/0 + #6GW
4. (3) #1/0 + #6GW - 1"C
5. GENERATOR DUCTBANK



SCHEMATIC POWER RISER DIAGRAM

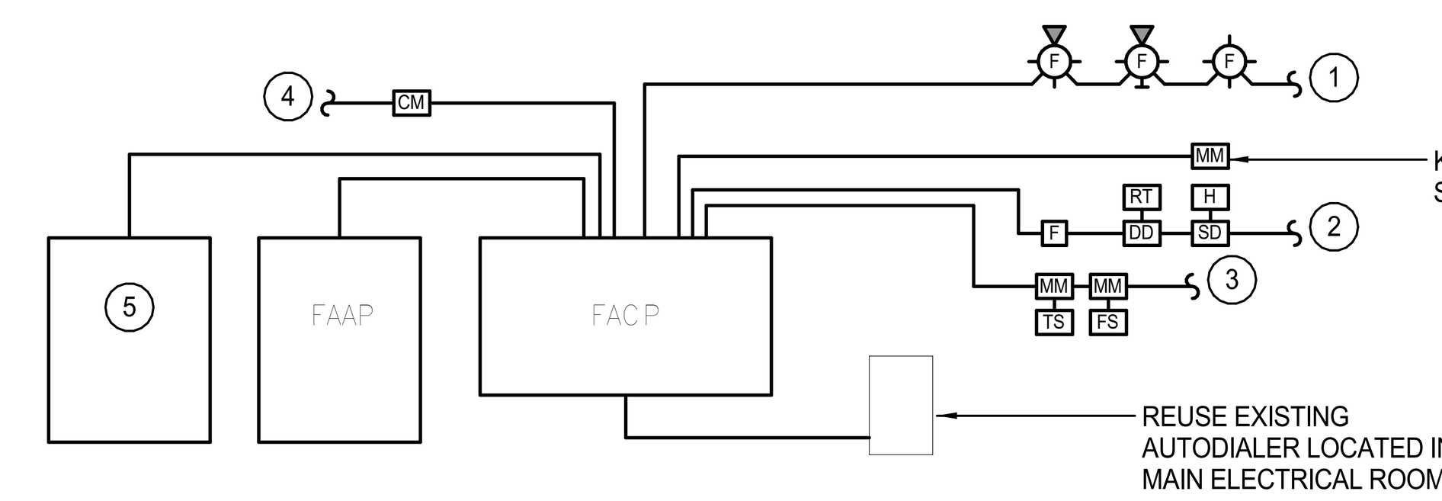
SCALE:NONE

GENERAL NOTES: (FIRE ALARM RISER)

1. REFER TO FLOOR PLAN SFOR EXACT QUANTITY AND LOCATION OF DEVICES.
2. PROVIDE ALL WIRING IN CONDUIT, SIZED AS RECOMMENDED BY SYSTEM MANUFACUTRER.

DRAWING NOTES: (FIRE ALARM RISER)

1. TO OTHER NOTIFICATION DEVICES IN THIS ZONE.
2. TO OTHER INITIATING DEVICES IN THIS ZONE.
3. TO ADDITIONAL SPRINKLER SYSTEM DEVICES IN THIS ZONE.
4. TO ADDITIONAL CONTROL MODULES (INCLUDING DOOR RELEASE IN THIS ZONE.
5. PROVIDE REMOTE GENERATOR ANNUNCIATOR PANEL COORDINATE LOCATION WITH OWNER. PANEL SHALL PROVIDE ALL CODE REQUIRED STATUS MONITORING, ALARMS FROM GENERATOR TO FIRE ALARM SYSTEM. INCLUDING GENERATOR TROUBLE, GENERATOR RUNNING, SUPERVISORY ALARMS AND GENERATOR IN AUTOMATIC MODE.



SCHEMATIC FIRE ALARM RISER DIAGRAM

SCALE: NONE

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 39921, EXPIRATION DATE 01/19/2021

REVISIONS

MM-DD-YR	NAME	DESCRIPTION OF CHANGES

CRABTREE ROHRBAUGH & ASSOCIATES - ARCHITECTS

100 WEST ROAD, SUITE 402
TOWSON MD 21204
410-528-0272

MECHANICSBURG, PENNSYLVANIA
CHARLOTTESVILLE, VIRGINIA
WHITE SULPHUR SPRINGS, WEST VIRGINIA

www.cra-architects.com

ADDITION AND RENOVATIONS OF GALENA ELEMENTARY SCHOOL
KENT COUNTY PUBLIC SCHOOLS
114 S MAIN STREET
GALENA, MD 21635

SCHEMATIC RISER DIAGRAMS

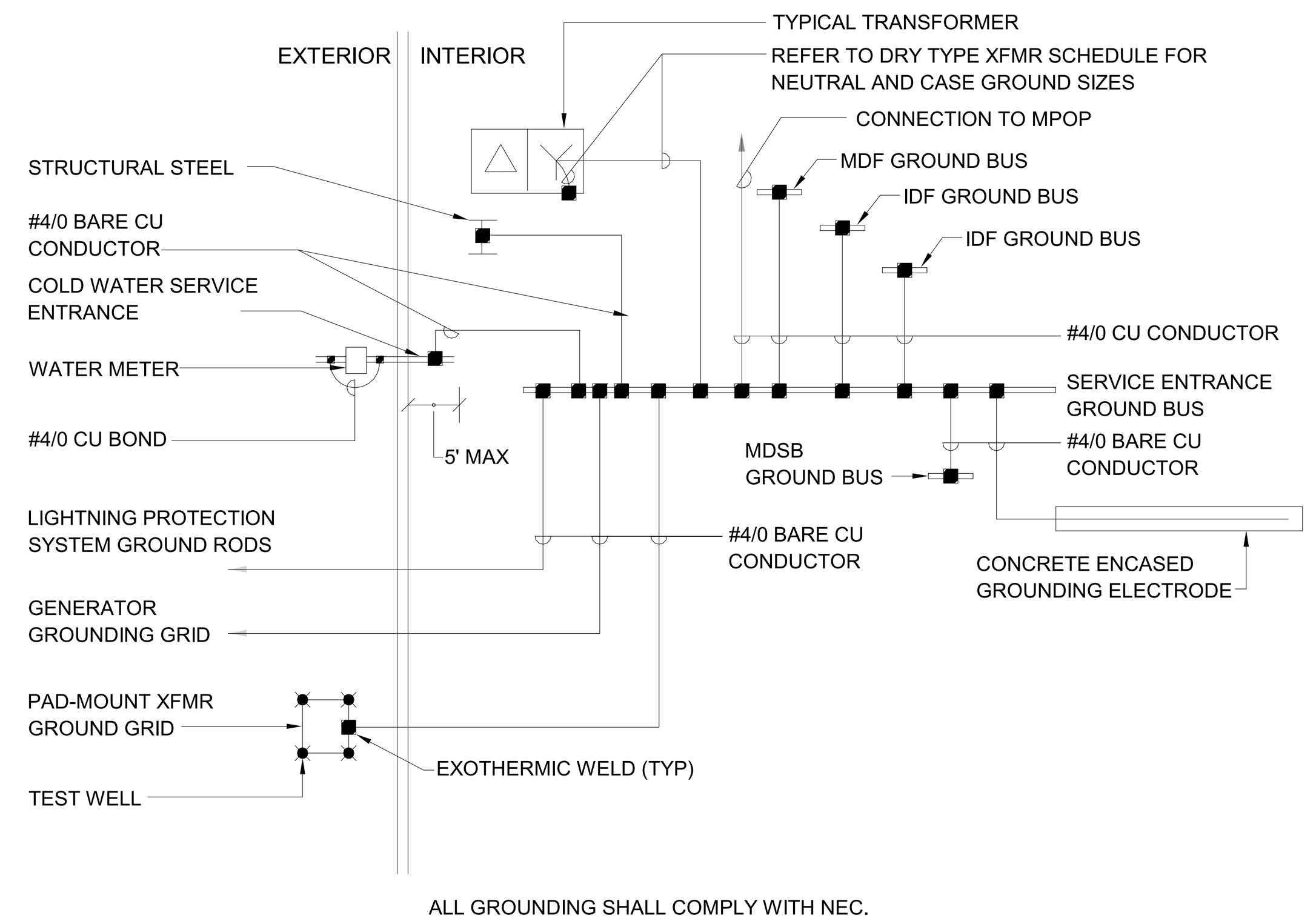
PLOT SCALE: 1/8" = 1'-0"

FILENAME:

DATE: February 10, 2020

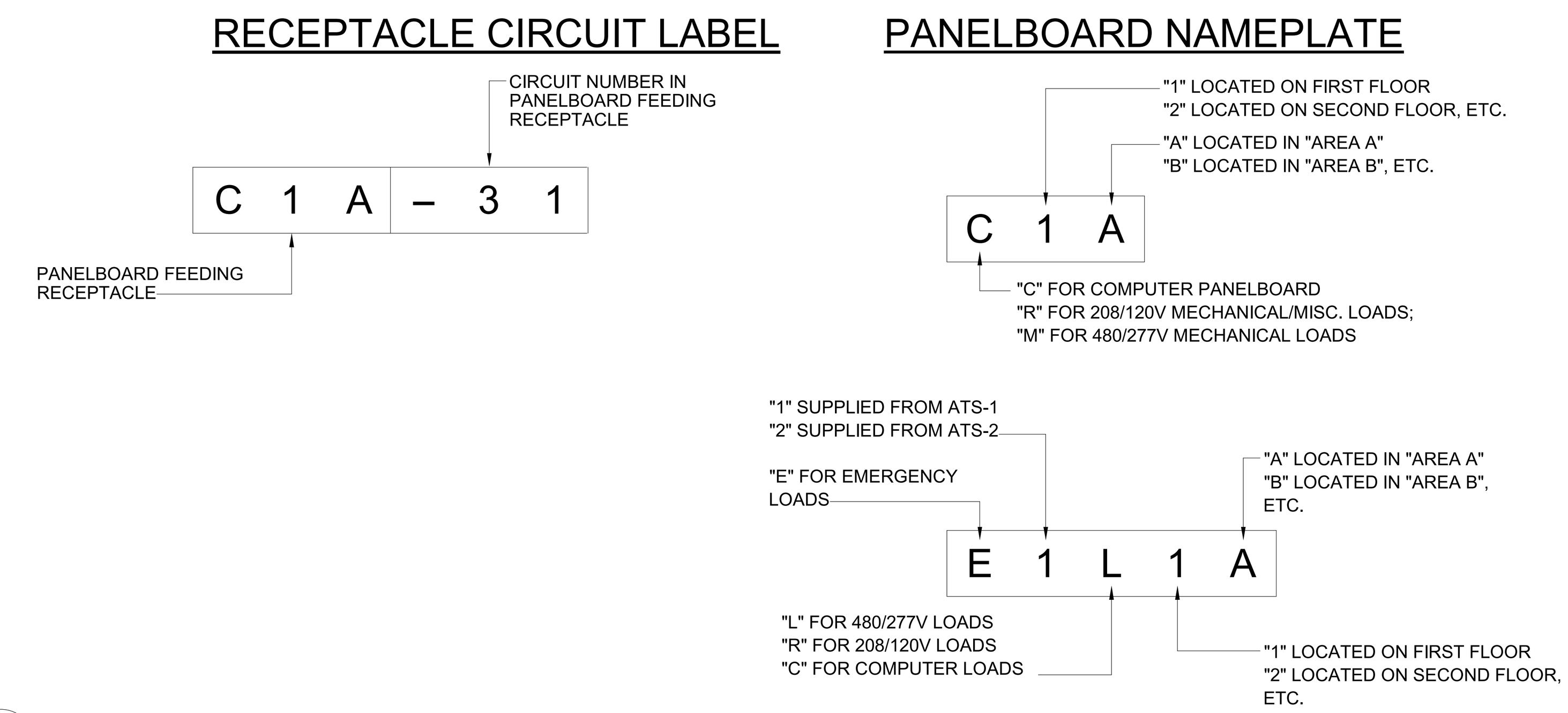
PROJECT
3309

E5.1

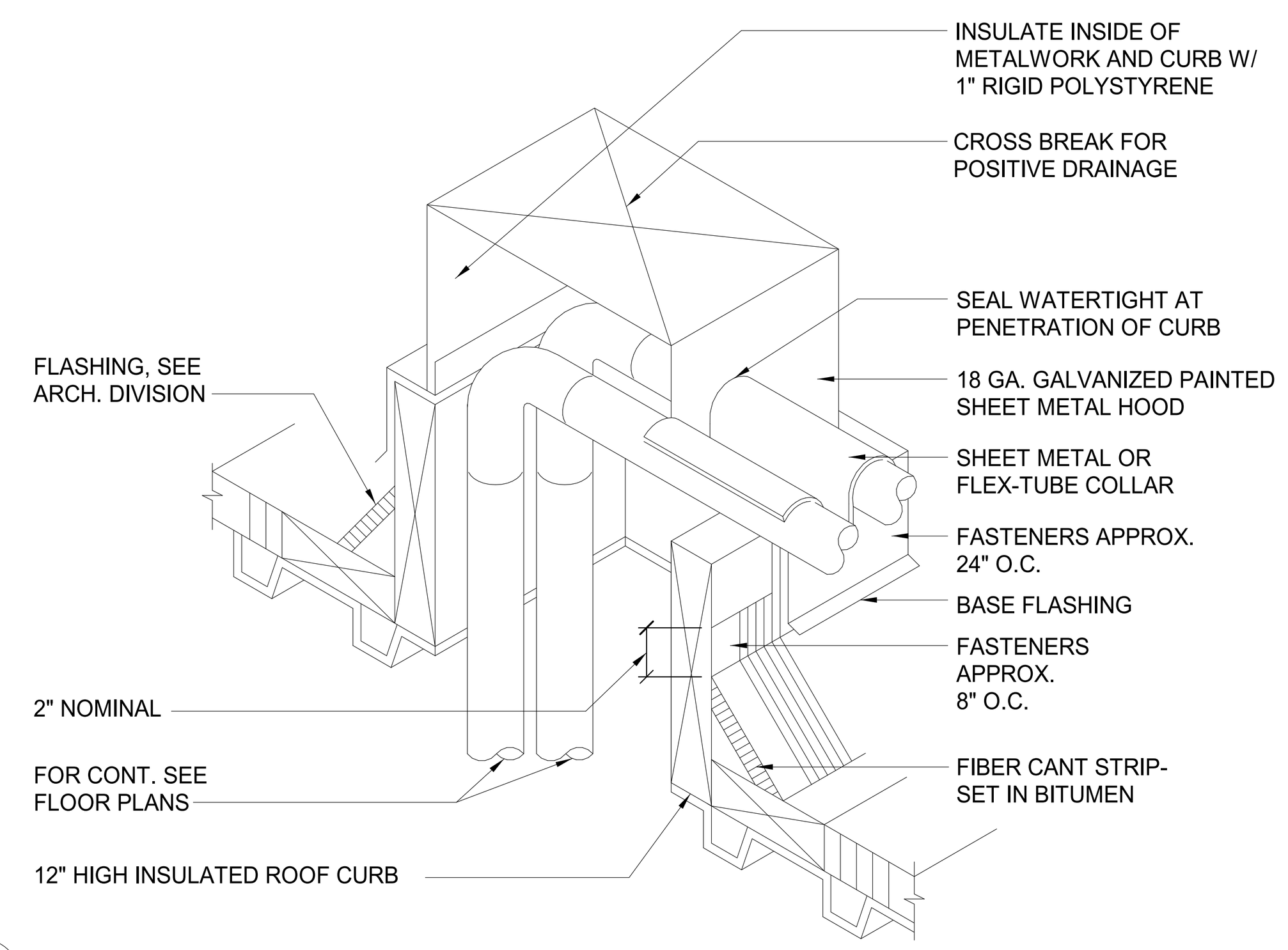


ALL GROUNDING SHALL COMPLY WITH NEC.

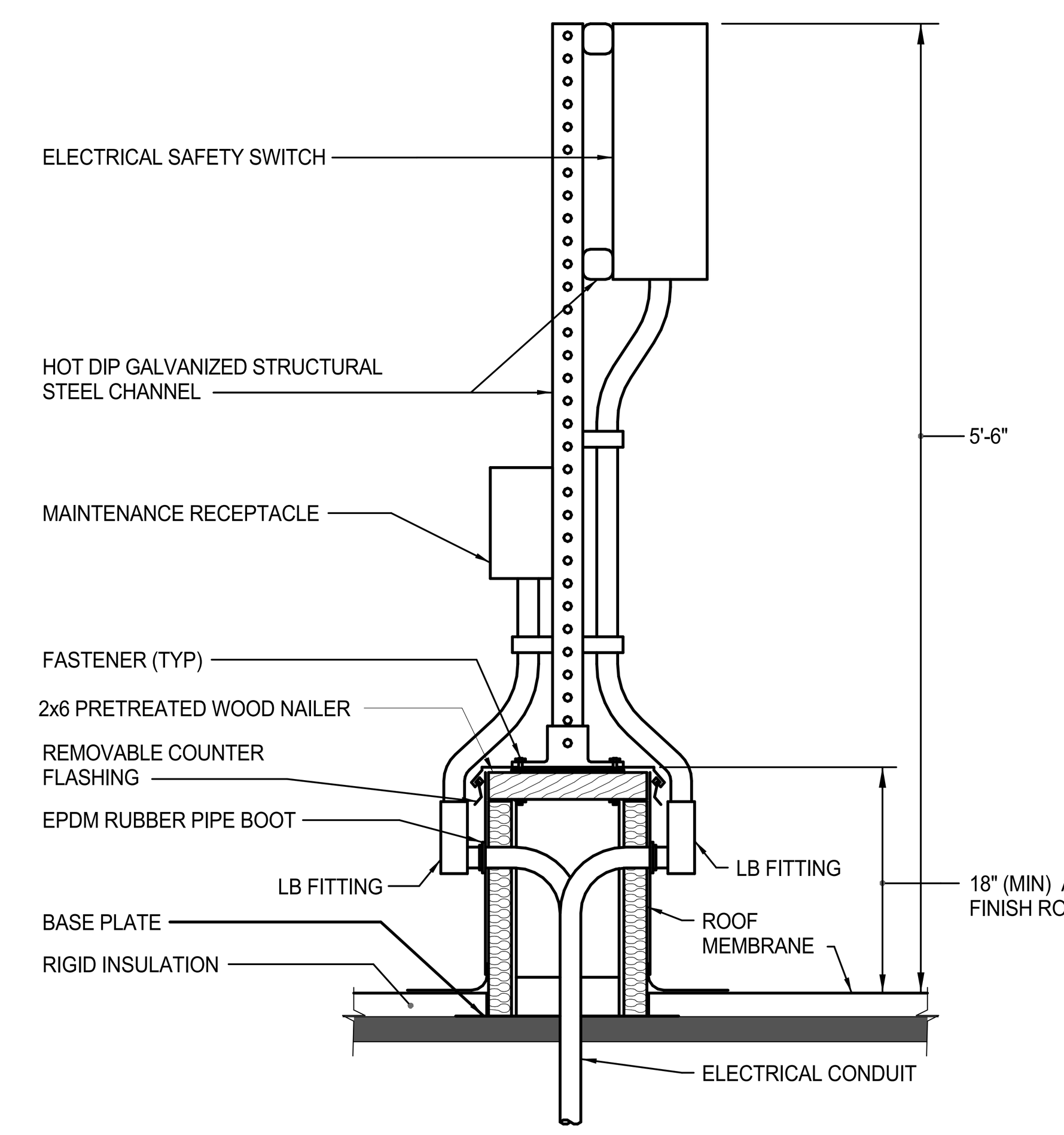
2 E6.1 PARTIAL GROUNDING SINGLE LINE SCHEMATIC DIAGRAM
NO SCALE



1 E6.1 OUTLET LABELING PANELBOARD NAMEPLATE IDENTIFICATION SCHEME
NO SCALE

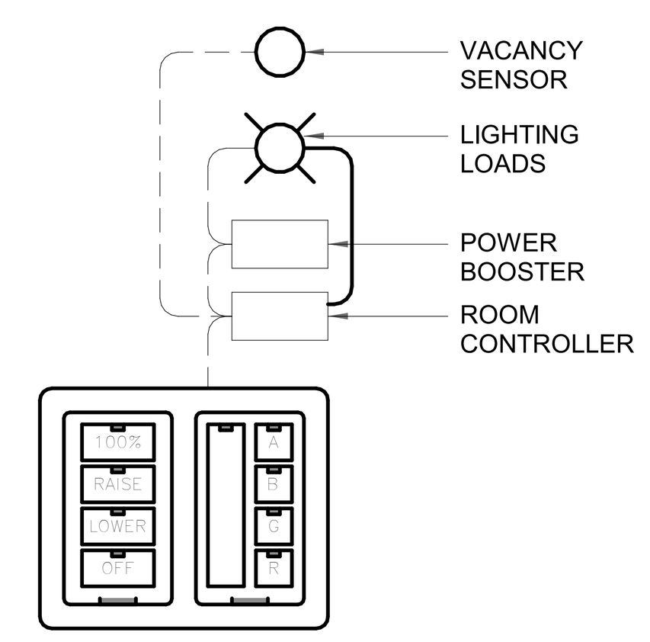


4 E6.1 CONDUIT PENETRATION THROUGH ROOF
NO SCALE



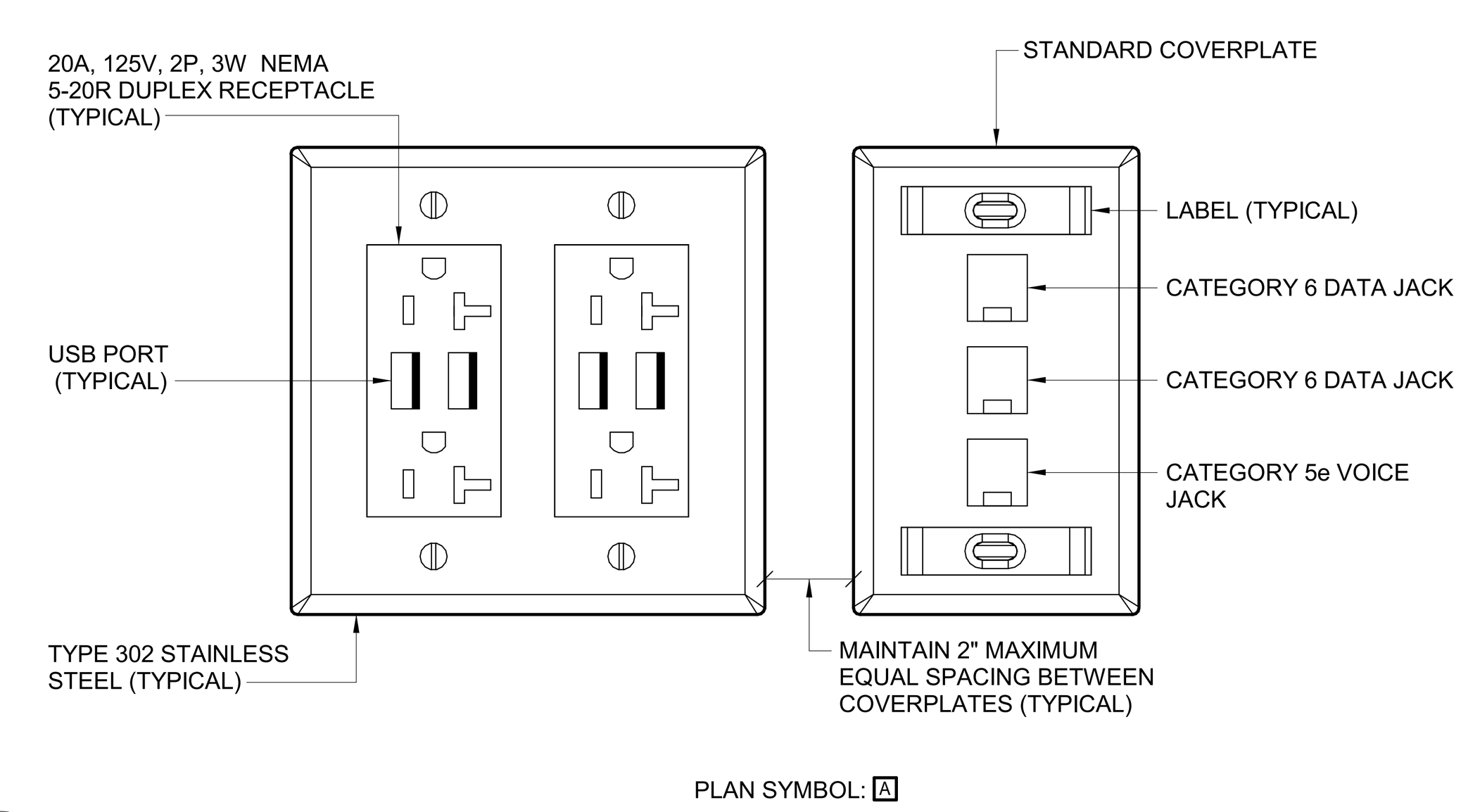
NOTES:
1. ALL STRUCTURAL STEEL SUPPORTS SHALL BE HOT DIPPED GALVANIZED.
2. ALL FLASHING AND COUNTER FLASHING SHALL BE HEAVY GAUGE ALUMINUM.
3. ALL SCREWS SHALL BE STAINLESS STEEL.
4. PROVIDE 14 GAUGE EQUIPMENT MOUNTING SUPPORT BY THYBAR CORPORATION OR APPROVED EQUAL.

3 E6.1 ROOFTOP EQUIPMENT DISCONNECT AND OUTLET
NO SCALE

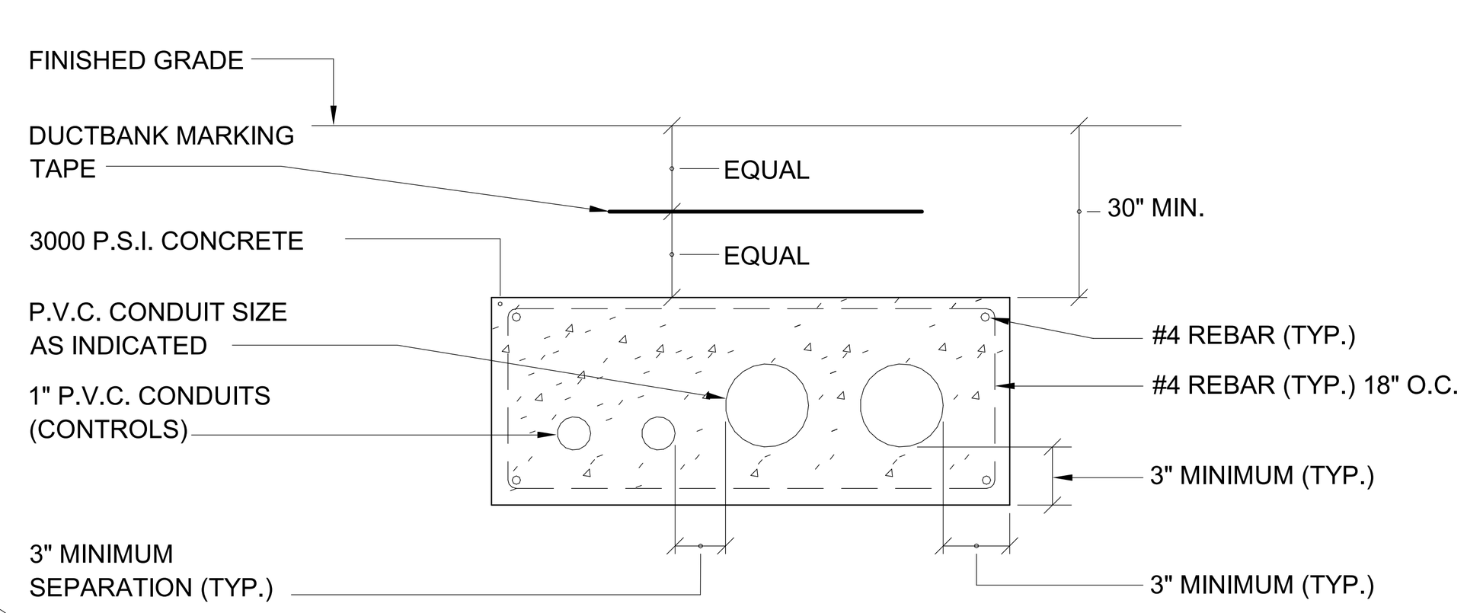


NOTES:
1. MOUNT BOTH CONTROL STATIONS IN ONE DOUBLE GANG BOX.
2. BASIS OF DESIGN FOR COLOR CHANGING STATION SHALL BE BY LEGRAND, DLM COLOR CONTROL PRESET SWITCH (MLSW-105-CCT SERIES) WITH FOUR PRESET BUTTONS AND ONE SCROLL/ROTATION BUTTON ALLOWING FOR INDIVIDUAL SELECTION OF COLOR DESIRED. IN ADDITION, PROVIDE ONE 4 BUTTON STATION FOR CONTROL OF LIGHTING LEVELS.
3. ROOM CONTROLLER SHALL BE MOUNTED IN CORRIDOR NEAR ENTRY DOOR OF SENSORY ROOM ABOVE CEILING, IN ACCESSIBLE CEILING SPACE. IDENTIFICATION PLATE WILL BE PLACED ON THE CEILING OR OVER THE DOOR TO IDENTIFY THE LOCATION OF ROOM CONTROLLER IN ROOM (VERIFY PLATE TYPE AND LOCATION WITH ARCHITECT AND OWNER REPRESENTATIVE PRIOR TO INSTALLATION).
4. ALL BUTTON LABELING AND PROGRAMMING SHALL BE VERIFIED WITH OWNERSHIP AT SHOP DRAWING LEVEL. SUBMIT BUTTON LABELING FORMS TO ARCHITECT.

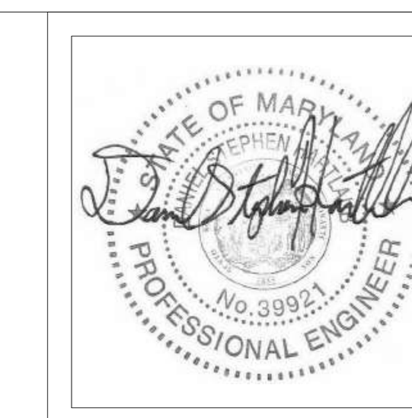
6 E6.1 WIRING DIAGRAM - COLOR TUNING CONTROLS
NO SCALE



5 E6.1 ADMINISTRATION DROP
NO SCALE



7 E6.1 GENERATOR DUCTBANK
NO SCALE



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ADDITION AND RENOVATIONS OF GALENA ELEMENTARY SCHOOL
KENT COUNTY PUBLIC SCHOOLS
114 S MAIN STREET
GALENA, MD 21635

CR

ELECTRICAL DETAILS

PLOT SCALE: 12" = 1'-0"

FILENAME:

DATE: February 10, 2020

PROJECT 3309

E6.1

Branch Panel: KR

LOCATION: CAFETERIA A101
SUPPLY FROM: MSB
MOUNTING: Recessed

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

A.I.C. RATING: 10 kAIC
MAINS RATING: 400 A
MCB RATING: 300 A
NEUTRAL RATING: 100%

Notes:

CKT	CIRCUIT	WIRE SIZE	P	CB	A		B		C		CB	P	WIRE SIZE	CIRCUIT	CKT
KR-1	MAU-1	(3) #12 + #12GW - 3/4"C	3	15 A	1.2 kVA	0.9 kVA					15 A	3	(3) #12 + #12GW - 3/4"C	F-9	KR-2
KR-3	--	--	--	--			1.2 kVA	0.9 kVA			--	--	--	--	KR-4
KR-5	--	--	--	--					1.2 kVA	0.9 kVA	--	--	--	--	KR-6
KR-7	REC (22) - KITCHEN A105	(2) #12 + #12GW - 3/4"C	1	20 A	0.5 kVA	3.3 kVA					40 A	2	(2) #8 + #10GW - 3/4"C	REC (16) - KITCHEN A105	KR-8
KR-9	REC (16) - KITCHEN A105	(2) #8 + #10GW - 3/4"C	2	40 A			3.3 kVA	3.3 kVA			--	--	--	--	KR-10
KR-11	--	--	--	--					3.3 kVA	0.5 kVA	20 A	1	(2) #12 + #12GW - 3/4"C	REC (22) - KITCHEN A105	KR-12
KR-13	REC (15) - KITCHEN A105	(2) #12 + #12GW - 3/4"C	1	20 A	0.2 kVA	1.0 kVA					20 A	1	(2) #12 + #12GW - 3/4"C	REC (21) - KITCHEN A105	KR-14
KR-15	REC (20) - KITCHEN A105	(2) #12 + #12GW - 3/4"C	1	20 A			1.0 kVA	1.0 kVA			20 A	1	(2) #12 + #12GW - 3/4"C	REC (17) - KITCHEN A105	KR-16
KR-17	REC (18) - KITCHEN A105	(2) #12 + #12GW - 3/4"C	1	20 A					1.0 kVA	1.0 kVA	20 A	1	(2) #12 + #12GW - 3/4"C	REC (17) - KITCHEN A105	KR-18
KR-19	REC (15) - KITCHEN A105	(2) #12 + #12GW - 3/4"C	1	20 A	1.0 kVA	1.8 kVA					20 A	1	(2) #12 + #12GW - 3/4"C	FIRE PROTECTION SYSTEM (10) -...	KR-20
KR-21	VENT. LIGHT CONTROLLER (11) -...	(2) #12 + #12GW - 3/4"C	1	20 A			1.6 kVA	3.7 kVA			40 A	3	(3) #8 + #10GW - 3/4"C	CONVECTION OVEN (13) - KITHCE...	KR-22
KR-23	CONVECTION OVEN (13) - KITHCE...	(3) #8 + #10GW - 3/4"C	3	40 A					3.7 kVA	3.7 kVA	--	--	--	--	KR-24
KR-25	--	--	--	--	3.7 kVA	3.7 kVA					--	--	--	--	KR-26
KR-27	--	--	--	--			3.7 kVA	5.7 kVA			60 A	3	(3) #6 + #10GW - 3/4"C	RANGE (19) - KITCHEN A105	KR-28
KR-29	CONVECTION STEAMER (14) -...	(3) #10 + #10GW - 3/4"C	3	30 A					1.5 kVA	5.7 kVA	--	--	--	--	KR-30
KR-31	--	--	--	--	1.5 kVA	5.7 kVA					--	--	--	--	KR-32
KR-33	--	--	--	--			1.5 kVA	1.5 kVA			30 A	3	(3) #10 + #10GW - 3/4"C	CONVECTION STEAMER (14) -...	KR-34
KR-35	REC -	(2) #12 + #12GW - 3/4"C	1	20 A					1.0 kVA	1.5 kVA	--	--	--	--	KR-36
KR-37	AIR SCREEN (5)	(2) #12 + #12GW - 3/4"C	1	20 A	0.2 kVA	1.5 kVA					--	--	--	--	KR-38
KR-39	REC (23)	(2) #12 + #12GW - 3/4"C	1	20 A			0.2 kVA	1.0 kVA			20 A	1	(2) #12 + #12GW - 3/4"C	REC (23)	KR-40
KR-41	Spare	--	1	20 A					0.0 kVA	0.2 kVA	20 A	1	(2) #12 + #12GW - 3/4"C	MAU CONTROL PANEL	KR-42
KR-43	Spare	--	1	20 A	0.0 kVA										KR-44
KR-45	Spare	--	1	20 A			0.0 kVA								KR-46
KR-47	Spare	--	1	20 A					0.0 kVA						KR-48
KR-49	Spare	--	1	20 A	0.0 kVA										KR-50
KR-51	Spare	--	1	20 A			0.0 kVA								KR-52
KR-53	Spare	--	1	20 A					0.0 kVA						KR-54
		Total Connected Load:	80.8...		26.1 kVA		29.5 kVA		25.1 kVA						

Legend:

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANELBOARD TOTALS	
EQUIPMENT -	42.8 kVA	100.00%	42.8 kVA	**Total Conn. Load:**	80.8 kVA
REC -	31.8 kVA	65.74%	20.9 kVA	**Total Est. Demand:**	69.9 kVA
MECHANICAL -	6.2 kVA	100.00%	6.2 kVA	**Total Conn.:**	224 A
LTG. -	0.0 kVA	0.00%	0.0 kVA	**Total Est. Demand.:**	194 A

Main Switchboard: EX. MSB

Location: UTILITY ROOM 19
Supply From:
Mounting: FREE-STANDING
Enclosure: Type 2

Volts: 480/277 Wye
Phases: 3
Wires: 4

A.I.C. Rating: 65 kAIC
Mains Rating: 2000 A
MCB Rating: 2000 A

Notes:

CKT	CIRCUIT	P	FRAME	CB	WIRE SIZE	LOAD	REMARKS
1	EX. RTU-4	3	--	500 A	--	0.0 kVA	
2	EX. PANELBOARD L1	3	--	225 A	--	0.0 kVA	
3	EX. OLD BUILDING	3	--	225 A	--	0.0 kVA	
4	EX. HVAC-3	3	--	350 A	--	0.0 kVA	
5	EX. RTU-3	3	--	300 A	--	0.0 kVA	
6	EX. HVAC-1	3	--	250 A	--	0.0 kVA	
7	EX. RTU-5	3	--	400 A	--	0.0 kVA	
8	EX. RTU-1	3	--	200 A	--	0.0 kVA	
9	EX. PANELBOARD K	3	--	225 A	--	0.0 kVA	
10	EX. BOILER ROOM PANELBOARD	3	--	100 A	--	0.0 kVA	
11	EX. "SPARE"	3	--	30 A	--	0.0 kVA	
12	EX. PUMPS 4 & 5	3	--	70 A	--	0.0 kVA	
13	EX. RTU-7	3	--	100 A	--	0.0 kVA	
14	EX. PANELBOARD E	3	--	100 A	--	0.0 kVA	
15							
					Total Connected Load:	0.0 kVA	

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
EQUIPMENT -	0.0 kVA	0.00%	0.0 kVA		
REC -	0.0 kVA	0.00%	0.0 kVA	**Total Conn. Load:**	0.0 kVA
MECHANICAL -	0.0 kVA	0.00%	0.0 kVA	**Total Est. Demand:**	0.0 kVA
LTG. -	0.0 kVA	0.00%	0.0 kVA	**Total Conn.:**	0 A
				Total Est. Demand:	0 A

Notes:

Main Switchboard: MSB

Location: UTILITY ROOM 19
Supply From:
Mounting: FREE-STANDING
Enclosure: Type 2

Volts: 120/208 Wye
Phases: 3
Wires: 4

A.I.C. Rating: 65 kAIC
Mains Rating: 2500 A
MCB Rating: 2500 A (100% RATED)

Notes:

CKT	CIRCUIT	P	FRAME	CB	WIRE SIZE	LOAD	REMARKS
MSB-1	RTU-1	3	250 A	110 A	(3) #2 + #6GW - 1-1/4"C	31.3 kVA	
MSB-2	RTU-3	3	250 A	150 A	(3) #1 + #6GW - 1-1/2"C	46.5 kVA	
MSB-3	RTU-4	3	250 A	250 A	(3) #4/0 + #4GW - 2"C	75.4 kVA	
MSB-4	RTU-5	3	250 A	225 A	(3) #3/0 + #4GW - 2"C	67.3 kVA	
MSB-5	RTU-7	3	250 A	110 A	(3) #1 + #6GW - 1-1/2"C	35.2 kVA	
MSB-6	PANELBOARD KR	3	400 A	300 A	(4) 350KCMIL + #4GW - 2-1/2"C	80.8 kVA	
MSB-7	PANELBOARD MA	3	400 A	300 A	(4) 350KCMIL + #4GW - 2-1/2"C	84.1 kVA	
MSB-8	EX. PANELBOARD L1	3	--	225 A	--	0.0 kVA	
MSB-9	EX. OLD BUILDING PANELBOARD	3	--	225 A	--	0.0 kVA	
MSB-10							
MSB-11	EX. BOILER ROOM PANELBOARD	3	--	100 A	--	0.0 kVA	
MSB-12	EX. PUMP 4 & 5	3	--	70 A	--	0.0 kVA	
MSB-13	EX. PANELBOARD E	3	--	100 A	--	0.0 kVA	
MSB-14							
MSB-15							
					Total Connected Load:	420.8 kVA	

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
EQUIPMENT -	43.2 kVA	100.00%	43.2 kVA		
REC -	46.1 kVA	60.86%	28.0 kVA	**Total Conn. Load:**	420.8 kVA
MECHANICAL -	322.8 kVA	100.00%	322.8 kVA	**Total Est. Demand:**	402.7 kVA
LTG. -	0.0 kVA	0.00%	0.0 kVA	**Total Conn.:**	1168 A
				Total Est. Demand:	1118 A

Notes:

MECHANICAL EQUIPMENT CONNECTION SCHEDULE (PUMPs)

EQUIPMENT DESIG.	ELECTRICAL CHARACTERISTICS				CIRCUIT DESIG.	MECS NOTES
	VOLTAGE	*ϕ*	*AMPS*	*kVA*		
JP-1	208 V	3	10.6 A	3.8 kVA	MA-38,40,42	7
P-3	120 V	1	5.8 A	0.7 kVA	MA-4	6
P-4 (SB)	120 V	1	0.0 A	0.0 kVA	MA-4	6
P-5	120 V	1	5.8 A	0.7 kVA	MA-3	6
P-6 (SB)	120 V	1	0.0 A	0.0 kVA	MA-3	6
P-7	120 V	1	5.8 A	0.7 kVA	MA-28	6
P-8 (SB)	120 V	1	0.0 A	0.0 kVA	MA-28	6
P-9	120 V	1	5.8 A	0.7 kVA	MA-2	6
P-10 (SB)	120 V	1	0.0 A	0.0 kVA	MA-2	6
P-11	120 V	1	5.8 A	0.7 kVA	MA-1	6
P-12 (SB)	120 V	1	0.0 A	0.0 kVA	MA-1	6

MECHANICAL EQUIPMENT CONNECTION SCHEDULE (ELEC CEILING HEATER)

EQUIPMENT DESIG.	ELECTRICAL CHARACTERISTICS				CIRCUIT DESIG.	MECS NOTES
	VOLTAGE	*ϕ*	*AMPS*	*kVA*		
CH-1	120 V	1	12.5 A	1.5 kVA	MA-29	5

MECHANICAL EQUIPMENT CONNECTION SCHEDULE (MAKE UP AIR)

EQUIPMENT DESIG.	ELECTRICAL CHARACTERISTICS				CIRCUIT DESIG.	MECS NOTES
	VOLTAGE	*ϕ*	*AMPS*	*kVA*		
MAU-1	208 V	3	9.8 A	3.5 kVA	KR-1,3,5	2

MECHANICAL EQUIPMENT CONNECTION SCHEDULE (RTUs)

EQUIPMENT DESIG.	ELECTRICAL CHARACTERISTICS				CIRCUIT DESIG.	MECS NOTES
	VOLTAGE	*ϕ*	*AMPS*	*kVA*		
RTU-1	208 V	3	87.0 A	31.3 kVA	MSB-1	3
RTU-2	208 V	3	33.6 A	12.1 kVA	MA-16,18,20	1
RTU-3	208 V	3	129.2 A	46.5 kVA	MSB-2	3
RTU-4	208 V	3	209.3 A	75.4 kVA	MSB-3	4
RTU-5	208 V	3	186.9 A	67.3 kVA	MSB-4	4
RTU-6	208 V	3	29.6 A	10.7 kVA	MA-19,21,23	1
RTU-7	208 V	3	97.8 A	35.2 kVA	MSB-5	3

MECHANICAL EQUIPMENT CONNECTION SCHEDULE (EHCs)

EQUIPMENT DESIG.	ELECTRICAL CHARACTERISTICS				CIRCUIT DESIG.	MECS NOTES
	VOLTAGE	*ϕ*	*AMPS*	*kVA*		
EHC-1	208 V	3	9.7 A	3.5 kVA	MA-31,33,35	9
EHC-2	208 V	3	15.3 A	5.5 kVA	MA-37,39,41	9

Branch Panel: MA

LOCATION: ELECTRICAL ROOM A112
SUPPLY FROM: MSB
MOUNTING: Surface

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

A.I.C. RATING: 22 kAIC
MAINS RATING: 400 A
MCB RATING: 300 A
NEUTRAL RATING: 100%

Notes:

CKT	CIRCUIT	WIRE SIZE	P	CB	A		B		C		CB	P	WIRE SIZE	CIRCUIT	CKT
MA-1	P-11 & P-12 (SB)	(2) #12 + #12GW - 3/4"C	1	20 A	0.7 kVA	0.7 kVA					20 A	1	(2) #12 + #12GW - 3/4"C	P-9 & P-10 (SB)	MA-2
MA-3	P-5 & P-6 (SB)	(2) #12 + #12GW - 3/4"C	1	20 A			0.7 kVA	0.7 kVA			20 A	1	(2) #12 + #12GW - 3/4"C	P-1 & P-2 (SB)	MA-4
MA-5	SSCU-1	(2) #12 + #12GW - 3/4"C	2	20 A					1.2 kVA	1.8 kVA	30 A	2	(2) #10 + #10GW - 3/4"C	SSCU-3	MA-6
MA-7	--	--	--	--	1.2 kVA	1.8 kVA					--	--	--	--	MA-8
MA-9	SSCU-2	(2) #10 + #10GW - 3/4"C	2	30 A			1.6 kVA	1.7 kVA			20 A	3	(3) #12 + #12GW - 3/4"C	UH-1	MA-10
MA-11	--	--	--	--					1.6 kVA	1.7 kVA	--	--	--	--	MA-12
MA-13	UH-2	(3) #12 + #12GW - 3/4"C	3	20 A	1.7 kVA	1.7 kVA					--	--	--	--	MA-14
MA-15	--	--	--	--			1.7 kVA	4.0 kVA			45 A	3	(3) #8 + #10GW - 3/4"C	RTU-2	MA-16
MA-17	--	--	--	--					1.7 kVA	4.0 kVA	--	--	--	--	MA-18
MA-19	RTU-6	(3) #10 + #10GW - 3/4"C	3	40 A	3.6 kVA	4.0 kVA					--	--	--	--	MA-20
MA-21	--	--	--	--			3.6 kVA	6.7 kVA			60 A	3	(4) #4 + #10GW - 1-1/4"C	PANELBOARD CA	MA-22
MA-23	--	--	--	--					3.6 kVA	5.9 kVA	--	--	--	--	MA-24
MA-25	REC - ROOFTOP	(2) #12 + #12GW - 3/4"C	1	20 A	0.8 kVA	5.7 kVA					--	--	--	--	MA-26
MA-27	F-10, 11, 12	(2) #12 + #12GW - 3/4"C	1	15 A			0.9 kVA	0.7 kVA			20 A	1	(2) #12 + #12GW - 3/4"C	P-7 & P-8 (SB) - SECURE...	MA-28
MA-29	CH-1	(2) #12 + #12GW - 3/4"C	1	20 A					1.5 kVA	0.6 kVA	20 A	1	(2) #12 + #12GW - 3/4"C	REC -	MA-30
MA-31	EHC-1	(2) #12 + #12GW - 3/4"C	3	20 A	1.2 kVA	1.2 kVA					20 A	1	(2) #12 + #12GW - 3/4"C	WASHER - A109	MA-32
MA-33	--	--	--	--			1.2 kVA	1.3 kVA			50 A	2	(3) #6 + #10GW - 3/4"C	DRYER - A109	MA-34
MA-35	--	--	--	--					1.2 kVA	1.3 kVA	--	--	--	--	MA-36
MA-37	EHC-2		3	20 A	1.8 kVA	1.3 kVA					20 A	3	(3) #12 + #12GW - 3/4"C	JOCKEY PUMP	MA-38
MA-39	--	--	--	--			1.8 kVA	1.3 kVA			--	--	--	--	MA-40
MA-41	--	--	--	--					1.8 kVA	1.3 kVA	--	--	--	--	MA-42
MA-43	Spare	--	1	20 A	0.0 kVA	0.0 kVA					20 A	1	--	Spare	MA-44
MA-45	Spare	--	1	20 A			0.0 kVA	0.0 kVA			20 A	1	--	Spare	MA-46
MA-47															MA-48
MA-49															MA-50
MA-51															MA-52
MA-53															MA-54
		Total Connected Load:	84.1...		27.4 kVA		27.7 kVA		29.1 kVA						

Legend:

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANELBOARD TOTALS	
EQUIPMENT -	0.4 kVA	100.00%	0.4 kVA	**Total Conn. Load:**	84.1 kVA
REC -	14.3 kVA	84.97%	12.2 kVA	**Total Est. Demand:**	82.0 kVA
MECHANICAL -	60.7 kVA	100.00%	60.7 kVA	**Total Conn.:**	233 A
LTG. -	0.0 kVA	0.00%	0.0 kVA	**Total Est. Demand.:**	228 A

Branch Panel: CA

LOCATION: SERVER ROOM A114
SUPPLY FROM: MA
MOUNTING: Surface

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

A.I.C. RATING: 10 kAIC
MAINS RATING: 100 A
MCB RATING: 60 A
NEUTRAL RATING: 100%

Notes:

CKT	CIRCUIT	WIRE SIZE	P	CB	A		B		C		CB	P	WIRE SIZE	CIRCUIT	CKT
CA-1	REC - ROOFTOP	(2) #12 + #12GW - 3/4"C	1	20 A	0.6 kVA	0.8 kVA					20 A	1	(2) #12 + #12GW - 3/4"C	REC - ROOFTOP	CA-2
CA-3	FACP - SERVER ROOM A114	(2) #12 + #12GW - 3/4"C	1	20 A			1.0 kVA	1.6 kVA			20 A	1	(2) #12 + #12GW - 3/4"C	REC - C102	CA-4
CA-5	REC - LANGUAGE SUPPORT B101	(2) #12 + #12GW - 3/4"C	1	20 A					1.6 kVA	1.8 kVA	20 A	1			CA-6
CA-7	REC - SENSORY ROOM B105	(2) #12 + #12GW - 3/4"C	1	20 A	0.8 kVA	1.2 kVA					20 A	1			CA-8
CA-9	REC - Room B102, B103, B101, B107	(2) #12 + #12GW - 3/4"C	1	20 A			1.2 kVA	1.0 kVA			20 A	1	(2) #12 + #12GW - 3/4"C	FACP - SERVER ROOM A114	CA-10
CA-11	REC - LANGUAGE SUPPORT B101	(2) #12 + #12GW - 3/4"C	1	20 A					1.0 kVA	0.2 kVA	20 A	1	(2) #12 + #12GW - 3/4"C	SOLATUBES	CA-12
CA-13	FACP - SERVER ROOM A114	(2) #12 + #12GW - 3/4"C	1	20 A	1.0 kVA	1.1 kVA					15 A	2	(2) #12 + #12GW - 3/4"C	ELEC. TANKLESS WTR HTR - D102	CA-14
CA-15	Spare	--	1	20 A			0.0 kVA	1.1 kVA			--	--	--	--	CA-16
CA-17	Spare	--	1	20 A					0.0 kVA	1.1 kVA	15 A	2	(2) #12 + #12GW - 3/4"C	ELEC. TANKLESS WTR HTR - D103	CA-18
CA-19	Spare	--	1	20 A	0.0 kVA	1.1 kVA					--	--	--	--	CA-20
CA-21	Spare	--	1	20 A			0.0 kVA								CA-22
CA-23	Spare	--	1	20 A					0.0 kVA						CA-24
CA-25	Spare	--	1	20 A	0.0 kVA										CA-26
CA-27	Spare	--	1	20 A			0.0 kVA								CA-28
CA-29	Spare	--	1	20 A					0.0 kVA						CA-30
		Total Connected Load:	18.3...		6.7 kVA		5.9 kVA		5.7 kVA						

Legend:

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANELBOARD TOTALS	
EQUIPMENT -	0.4 kVA	100.00%	0.4 kVA	**Total Conn. Load:**	18.3 kVA
REC -	9.2 kVA	100.00%	9.2 kVA	**Total Est. Demand:**	18.3 kVA
MECHANICAL -	0.0 kVA	0.00%	0.0 kVA	**Total Conn.:**	51 A
LTG. -	0.0 kVA	0.00%	0.0 kVA	**Total Est. Demand.:**	51 A

MECS NOTES:

1. PROVIDE 3P-60A-NF/SS IN NEMA 4X (STAINLESS STEEL) ENCLOSURE. MOUNT AT UNIT AND MAKE ALL CONNECTIONS.
2. PROVIDE 3P-30A-NF/SS IN NEMA 4X (STAINLESS STEEL) ENCLOSURE. MOUNT AT UNIT AND MAKE ALL CONNECTIONS.
3. PROVIDE 3P-200A-NF/SS IN NEMA 4X (STAINLESS STEEL) ENCLOSURE. MOUNT AT UNIT AND MAKE ALL CONNECTIONS.
4. PROVIDE 3P-400A-NF/SS IN NEMA 4X (STAINLESS STEEL) ENCLOSURE. MOUNT AT UNIT AND MAKE ALL CONNECTIONS.
5. MAKE CONNECTION TO INTEGRAL DISCONNECT FURNISHED WITH THE UNIT.
6. PROVIDE FRACTIONAL MANUAL MOTOR STARTER WITH RED PILOT LIGHT.
7. CONNECTION TO CONTROLLER FURNISHED BY OTHERS.
8. PROVIDE 2P-30A-NF/SS IN NEMA 4X STAINLESS STEEL ENCLOSURE AND MOUNT AT OUTDOOR UNIT. PROVIDE 2P-30A-NF/SS IN NEMA 1 ENCLOSURE TO ASSOCIATED INDOOR UNIT, MOUNT AT UNIT AND MAKE ALL INTERCONNECTIONS.
9. PROVIDE 3P-30A-NF/SS IN NEMA 1 ENCLOSURE. MOUNT AT UNIT AND MAKE ALL CONNECTIONS.

MECHANICAL EQUIPMENT CONNECTION SCHEDULE (FANs)

EQUIPMENT DESIG.	ELECTRICAL CHARACTERISTICS				CIRCUIT DESIG.	MECS NOTES
	VOLTAGE	*ϕ*	*AMPS*	*kVA*		
F-9	208 V	3	7.5 A	2.7 kVA	KR-2,4,6	5
F-10	120 V	1	2.5 A	0.3 kVA	MA-27	5
F-11	120 V	1	2.5 A	0.3 kVA	MA-27	5
F-12	120 V	1	2.5 A	0.3 kVA	MA-27	5

MECHANICAL EQUIPMENT CONNECTION SCHEDULE (UHs)

EQUIPMENT DESIG.	ELECTRICAL CHARACTERISTICS				CIRCUIT DESIG.	MECS NOTES
	VOLTAGE	*ϕ*	*AMPS*	*kVA*		
UH-1	208 V	3	14.0 A	5.0 kVA	MA-10,12,14	5
UH-2	208 V	3	14.0 A	5.0 kVA	MA-13,15,17	5

MECHANICAL EQUIPMENT CONNECTION SCHEDULE (SPLIT SYSTEMSs)

EQUIPMENT DESIG.	ELECTRICAL CHARACTERISTICS				CIRCUIT DESIG.	MECS NOTES
	VOLTAGE	*ϕ*	*AMPS*	*kVA*		
SSCU-1	208 V	1	12.0 A	2.5 kVA	MA-5,7	8
SSCU-2	208 V	1	15.0 A	3.1 kVA	MA-9,11	8
SSCU-3	208 V	1	17.0 A	3.5 kVA	MA-6,8	8

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 39921, EXPIRATION DATE 01/19/2021

REVISIONS

	MM-DD-YR	NAME	DESCRIPTION OF CHANGES

CRABTREE ROHRBAUGH & ASSOCIATES - ARCHITECTS
100 WEST ROAD, SUITE 402
TOWSON MD 21204
410-528-0272
www.cra-architects.com
MECHANICSBURG, PENNSYLVANIA
CHARLOTTESVILLE, VIRGINIA
WHITE SULPHUR SPRINGS, WEST VIRGINIA

ADDITION AND RENOVATIONS OF GALENA ELEMENTARY SCHOOL
KENT COUNTY PUBLIC SCHOOLS
114 S MAIN STREET
GALENA, MD 21635

PANELBOARD SCHEDULES

PLOT SCALE:

FILENAME:

DATE: February 10, 2020

PROJECT 3309

E7.1