COLUMBIA FALLS HIGH SCHOOL ROOF REPLACEMENT

COLUMBIA FALLS
MONTANA

GENERAL CONDITIONS

1. THE GENERAL CONTRACTOR IS TO GUARANTEE ALL WORK INCLUDING WORK DONE BY SUBCONTRACTORS FOR A PERIOD OF ONE (1) YEAR COMMENCING WITH THE SUBSTANTIAL COMPLETION OF THE CONTRACT.

2. ALL WORK IS TO BE PERFORMED IN ACCORDANCE WITH ALL GOVERNING CODES, ORDINANCES AND AUTHORITIES HAVING JURISDICTION. CONTRACTOR TO CONTACT LOCAL UTILITIES, IF NECESSARY, SUBMIT ALL APPLICABLE PERMIT DOCUMENTS, QUALIFICATIONS, ETC., AND BE RESPONSIBLE FOR ALL FEES ASSOCIATED WITH PERMITS, UTILITY EXTENSIONS, TAP-INS, ETC.

3. THE GENERAL CONTRACTOR IS TO HAVE A FULL TIME QUALIFIED SUPERVISOR ON THE SITE AT ALL TIMES WHILE WORK IS BEING PERFORMED.

4. ALL MATERIAL SPECIFIED IS TO BE NEW & INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND SPECIFICATIONS. GENERAL CONTRACTOR IS TO CONSTRUCT PROJECT IN ACCORDANCE WITH THE DOCUMENTS. ANY DEVIATION FROM THE INTENT OF THE DOCUMENTS, WITHOUT ARCHITECT OR ENGINEER'S APPROVAL, ARE AT THE CONTRACTOR'S OWN RISK AND MAY RESULT IN THE WORK BEING DONE OVER AT CONTRACTOR'S EXPENSE (MATERIALS AND LABOR).

GENERAL NOTES

1. CONTRACTOR TO REVIEW AND BECOME FAMILIAR WITH ALL EXISTING CONDITIONS PRIOR TO COMMENCING WORK. ANY CONDITIONS NOT INDICATED ON CONTRACT DOCUMENTS ARE TO BE REPORTED TO THE PROJECT MANAGER PRIOR TO BEGINNING WORK.

2. GENERAL CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND PAYING FOR ALL REQUIRED BUILDING PERMITS.

3. THE CONTRACTOR SHALL REMOVE ALL DEBRIS AS A RESULT OF THIS PROJECT. THE CONTRACTOR WILL REMOVE EXISTING EQUIPMENT, FIXTURES, ETC. IN THE SPACE PRIOR TO CONSTRUCTION AND RELOCATE PER OWNER.

4. THE CONTRACTOR SHALL SCHEDULE HIS WORK AND MATERIAL AND EQUIPMENT DELIVERIES SO AS NOT TO INTERFERE WITH THE DAILY OPERATIONS OF THE REMAINDER OF THE FACILITY.

5. THE CONTRACTOR SHALL PROTECT EXISTING FACILITIES, EQUIPMENT, FIXTURES, ETC. FROM DAMAGE DURING THE COURSE OF CONSTRUCTION.

6. ALL SURFACES AND/OR FINISHES DAMAGED AS A RESULT OF AND ADJACENT TO THE WORK SHALL BE REPAIRED AND FINISHED TO THEIR ORIGINAL CONDITION.

7. EACH SUBCONTRACTOR IS RESPONSIBLE TO COORDINATE AND SCHEDULE HIS WORK WITH THE GENERAL CONTRACTOR AND ALL OTHER SUBCONTRACTORS WHOSE WORK WILL BE AFFECTED.

8. USE DETAILS MARKED 'TYPICAL' (TYP) WHEREVER APPLICABLE.

9. ALL ITEMS REQUIRED BY THE DRAWINGS AND SPECIFICATIONS SHALL BE PERFORMED IN A WORKMANLIKE MANNER BY PERSONS SKILLED IN THEIR RESPECTIVE TRADE AND WHO NORMALLY PARTICIPATE IN THE WORK OF THAT TRADE.

10. WORDS WHICH HAVE WELL KNOWN TECHNICAL OR TRADE MEANINGS ARE USED IN THE DRAWINGS AND SPECIFICATIONS IN ACCORDANCE WITH SUCH RECOGNIZED MEANINGS.

11. WITHIN THE DRAWINGS AND RELATED SPECIFICATIONS THERE SHALL BE THE FOLLOWING PRECEDENCE:

A) ADDENDA OR MODIFICATIONS TO THE DRAWINGS AND SPECIFICATIONS TAKE PRECEDENCE OVER THE ORIGINAL, WHEN ISSUED BY THE ARCHITECT.

B) SPECIFICATIONS SHALL TAKE PRECEDENCE OVER DRAWINGS.

C) WITHIN THE DRAWINGS THE LARGER SCALE TAKES PRECEDENCE OVER THE SMALLER, FIGURED DIMENSIONS OVER SCALED AND NOTED MATERIALS OVER GRAPHIC INDICATIONS.

12. THE ARCHITECT OR ENGINEER SHALL BE IN THE FIRST INSTANCE THE SOLE INTERPRETER OF THE DRAWINGS AND SPECIFICATIONS WITH REGARD TO THEIR MEANING OR INTENT.

13. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES AND PROCEDURES.

14. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ASPECTS OF SAFETY DURING BUILDING CONSTRUCTION.

15. WHERE EXTERIOR LANDINGS ARE PRESENT, THE MAXIMUM CROSS SLOPE SHALL BE 2%

16. ALL PUBLIC ROUTES THROUGHOUT THE SITE SHALL NOT HAVE A CROSS SLOPE GREATER THAN 1:20

PROJECT INFORMATION:

OWNER / DEVELOPER

COLUMBIA FALLS SCHOOL DISTRICT
501 6TH AVENUE WEST
COLUMBIA FALLS, MT 59912
ATTN: DAVE WICK
EMAIL : d_wick@cfmtschools.net
TEL: (406) 253-8170

BUILDING DEPARTMENT

WHITEFISH BUILDING DEPARTMENT
510 RAILWAY ST.
WHITEFISH, MT 59937
TEL: 406 863-2410

DESIGN PROFESSIONALS

JACKOLA ENGINEERING & ARCHITECTURE, P.C.
2250 HWY. 93 SOUTH
PO BOX 1134
KALISPELL, MT 59903

PROJECT MANAGER: TYLER TONIUM, PE

ARCHITECT: VALERIE HARRIS, AIA

STRUCTURAL ENGINEER: KARL HENSHAW, PE

KALISPELL | BOZEMAN | VANCOUVER
406-755-3208 | 406-586-0707 | 360-852-8746
info@jackola.com jackola.com

LICENSED ARCHITECT
VALERIE ANNE HARRIS
24456
KALISPELL, MT
STATE OF MONTANA

BID SET

COLUMBIA FALLS HIGH SCHOOL ROOF REPLACEMENT
COLUMBIA FALLS, MONTANA

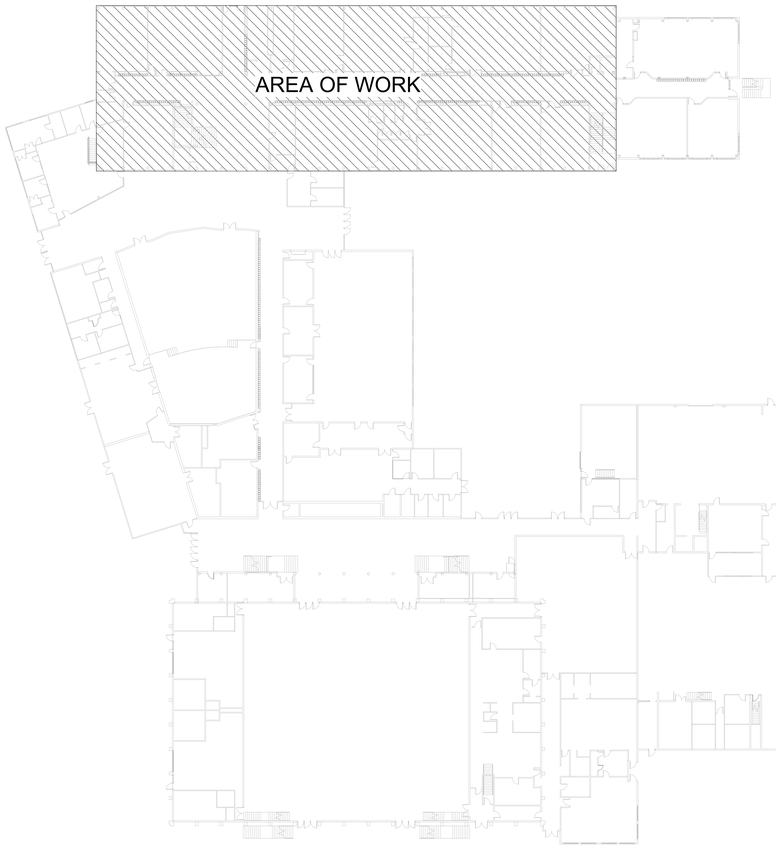
DRAWN: PLR CHECKED: KBH
DATE: 02/12/2024
REVISIONS:

TITLE SHEET

T0.00

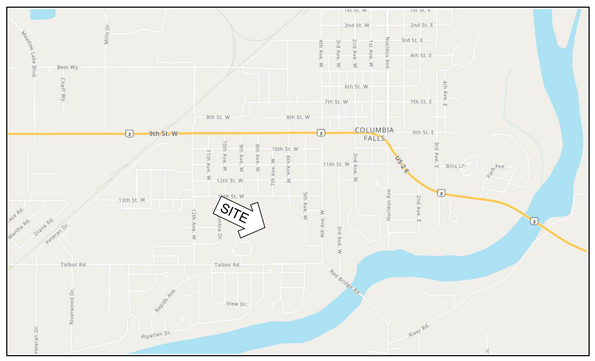
PROJECT # 220408

INDEX OF DRAWINGS

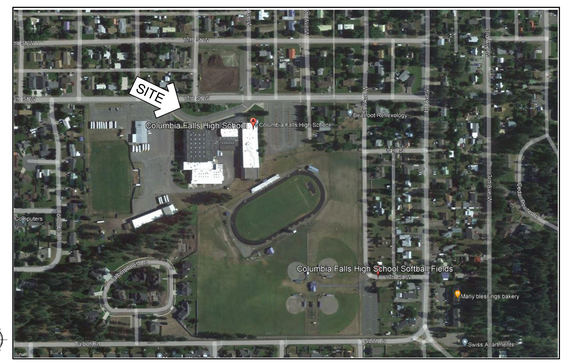


1 OVERALL BUILDING PLAN
1" = 30'-0"
0 15' 30' 60'

SITE VICINITY MAP



SITE LOCATION MAP



KALISPELL 406-755-3208 | BOZEMAN 406-586-0707 | VANCOUVER 360-852-8746
info@jackola.com jackola.com

LICENSED ARCHITECT
VALERIE ANNE HARRIS
2445
KALISPELL, MT
STATE OF MONTANA

BID SET

COLUMBIA FALLS HIGH SCHOOL ROOF REPLACEMENT

COLUMBIA FALLS, MONTANA

DRAWN: VAH CHECKED: VAH
DATE: 02/12/2024
REVISIONS:

GENERAL NOTES

T0.01

PROJECT #23068

ABBREVIATIONS

A

AFF	ABOVE FINISH FLOOR
ACT	ACOUSTICAL CEILING TILE
ADJ	ADJUSTABLE
AB	ANCHOR BOLT
ALUM	ALUMINUM
ALT	ALTERNATE
ANOD	ANODIZED
APPROX	APPROXIMATE
ARCH	ARCHITECT

B

BSMT	BASEMENT
BATH	BATHROOM
BM	BEAM
BRG	BEARING
BEDRM	BEDROOM
BET	BETWEEN
BLDG	BUILDING
BO	BOTTOM OF
BOT	BOTTOM
BN	BOUNDARY NAILING
BS	BOTH SIDES

C

CPT	CARPET
CLG	CEILING
CT	CERAMIC TILE
CLR	CLEAR
CLST	CLOSET
COL	COLUMN
CONC	CONCRETE
CONST	CONSTRUCTION
CONT	CONTINUOUS
CONTR	CONTRACT, CONTRACTOR
CORR	CORRIDOR
CJ	CONTROL JOINT
CMU	CONCRETE MASONRY UNIT

D

DEMO	DEMOLISH, DEMOLITION
DTL	DETAIL
DIA	DIAMETER
DIM	DIMENSION
DW	DISHWASHER
DIV	DIVISION
DL	DEAD LOAD
DR	DOOR
DN	DOWN
DS	DOWNSPOUT
DWG	DRAWING
DF	DRINKING FOUNTAIN
D	DRYER

E

EA	EACH
E	EAST
ELEC	ELECTRIC
ELEV	ELEVATION, ELEVATOR
EQ	EQUAL
EQUIP	EQUIPMENT
EXIST	EXISTING
EXP	EXPANSION
EJ	EXPANSION JOINT
EXT	EXTERIOR

F

FOB	FACE OF BRICK
FOC	FACE OF CONCRETE
FOM	FACE OF MASONRY
FOS	FACE OF STUDS
FIN	FINISH
FF	FINISH FLOOR
FEC	FIRE EXTINGUISHER/AND OR CABINET
FL	FLASHING
FLR	FLOOR
FD	FLOOR DRAIN
FT	FOOT, FEET
FTG	FOOTING
FND	FOUNDATION
FURN	FURNITURE
FUT	FUTURE
FBO	FURNISHED BY OTHERS
FRP	FIBER REINFORCED PANEL

G

GA	GAUGE
GALV	GALVANIZED
GEN	GENERAL
GL	GLASS
GWB	GYPSUM WALL BOARD
GYPC	GYPCRETE

H

HALL	HALLWAY
HDW	HARDWARE
HVAC	HEATING, VENTILATING, & AIR CONDITIONING
HT	HEIGHT
HM	HOLLOW METAL
HORIZ	HORIZONTAL
HWT	HOT WATER TANK
HR	HOUR

I

IBC	INTERNATIONAL BUILDING CODE
INCL	INCLUDE, INCLUDED (ING)
INFO	INFORMATION
ID	INSIDE DIAMETER
INSUL	INSULATE,INSULATION
INT	INTERIOR

J

JAN	JANITOR
JC	JANITOR'S CLOSET
JT	JOINT

K

KIT	KITCHEN
KO	KNOCK OUT

L

LBL	LABEL
LAM	LAMINATED
LNDRY	LAUNDRY
LAV	LAVATORY
LVL	LEVEL
LL	LIVE LOAD
LR	LIVING ROOM
LOC'N	LOCATION

M

MFR	MANUFACTURER
MAS	MASONRY
MO	MASONRY OPENING
MATL	MATERIAL
MAX	MAXIMUM
MECH	MECHANICAL, MECHANICAL ROOM
MTL	METAL
MIN	MINIMUM
MIRR	MIRROR
MISC	MISCELLANEOUS

N

NOM	NOMINAL
N	NORTH
NA	NOT APPLICABLE
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
NO	NUMBER

O

OC	ON CENTER
OFF	OFFICE
OPG	OPENING
OPP	OPPOSITE
OD	OUTSIDE DIAMETER
OF	OUTSIDE FACE
O/O	OUT TO OUT

P

PNT	PAINT, PAINTED
PNL	PANEL
PH	PHASE
PLAS	PLASTIC
P-LAM	PLASTIC LAMINATE
PL	PLATE
PLYWD	PLYWOOD
PVC	POLYVINYL CHLORIDE
PREFIN	PREFINISHED
PROP	PROPERTY

Q

QUAN	QUANTITY

R

RAD	RADIUS
RWL	RAIN WATER LEADER
REF	REFERENCE
REINF	REINFORCE, REINFORCEMENT
RCP	REFLECTED CEILING PLAN
REQ'D	REQUIRED
RFI	REQUEST FOR INFORMATION
REV	REVISION
R	RISER
RD	ROOF DRAIN
RM	ROOM
RO	ROUGH OPENING

S

SCHED	SCHEDULE
SEC	SECTION
SG	SAFETY GLASS
SHTG	SHEATHING
SIM	SIMILAR
SOG	SLAB ON GRADE
S	SOUTH
SPEC	SPECIFICATION
SQ	SQUARE
STD	STANDARD
STL	STEEL
STOR	STORAGE
STRUCT	STRUCTURAL
SF	SQUARE FEET
SUSP	SUSPENDED

T

TEL	TELEPHONE
TV	TELEVISION
TEMP	TEMPERED, TEMPORARY
T&G	TONGUE AND GROOVE
TOB	TOP OF BRICK
TOS	TOP OF SLAB
TOW	TOP OF WALL
TOM	TOP OF MASONRY
T	TREAD
TYP	TYPICAL

U

UAS	UPWARD ACTING SECTIONAL DOOR
UBC	UNIFORM BUILDING CODE
UNO	UNLESS NOTED OTHERWISE
UTIL	UTILITY

V

VR	VAPOR BARRIER
VNR	VENEER
VERT	VERTICAL
VG	VERTICAL GRAIN
VCT	VINYL COMPOSITION TILE

W

WSCT	WAINSCOT
WC	WATER CLOSET
WIN	WINDOW
WP	WATERPROOF (ING)
WRB	WEATHER RESISTANT BARRIER
WWF	WELDED WIRE FABRIC
WWM	WELDED WIRE MESH
WT	WEIGHT
W	WEST, WASHER
W/	WITH
W/D	WASHER / DRYER

SYMBOLS USED AS ABBREVIATIONS

&	AND
L	ANGLE
@	AT
CL	CENTERLINE
u	CHANNEL
ø	DIAMETER
PL	PLATE

SYMBOLS & MATERIALS

STRUCTURAL FILL
UNDISTURBED EARTH
DISTURBED EARTH
GRAVEL
POURED CONCRETE
CONCRETE BLOCK VENEER
BRICK VENEER
EIFS
ROUGH WOOD
BLOCKING
SECTION (XX / AX.X)
ELEVATION (XX / AX.X)
DETAIL (XX / AX.X)
ITEM IDENTIFICATION (XX / AX.X) SHEET WHERE ITEM IS CUT
NORTH ARROW

FINISHED WOOD
PLYWOOD
RIGID INSULATION
BATT INSULATION
SPRAYFOAM INSULATION
SAND, PLASTER, GROUT
METAL
STEEL
WINDOW TYPE (XX)
DOOR NUMBER (X)
ROOM NUMBER (XXX)
WALL TYPE (X.XX - S / X'-X")
REVISION NUMBER (A)
KEY NOTE (X)
DEMOLITION NOTE (X)
FINISH TAG (X)
ROOM FINISH KEY (WALL N, WALL W, WALL E, WALL S, CLG, SILL, FLR, BASE, NOTES, NOTES)

1-A1.02D

- 1 — DENOTES BUILDING NUMBER (OMIT ON SINGLE BUILDING PROJECTS)
- A — DENOTES SPECIFIC DISCIPLINE
- 1 — DENOTES SHEET TYPE
- 02 — DENOTES BUILDING LEVEL (0 IS BASEMENT / CRAWL SPACE, LEVEL 1 IS 1, ETC.)
- D — DENOTES DEMO PLANS (OMIT ON NON DEMO SHEETS)
- 1 — DENOTES SHEET COUNT

ARCHITECTURAL SHEET INDEX

GENERAL NOTES:
1. EXISTING STRUCTURE (FLOORS/ROOFS, COLUMNS) IS CONSIDERED 2 HOUR RATED.

JACKOLA ENGINEERING & ARCHITECTURE PLLC
SINCE 1969
Engineering, Architecture, Surveying, Land Use Planning
KALISPELL 406-755-3208 | BOZEMAN 406-586-0707 | VANCOUVER 360-852-8746
info@jackola.com jackola.com

LICENSED ARCHITECT
VALERIE ANNE HARRIS
24456
KALISPELL, MT
STATE OF MONTANA

BID SET

COLUMBIA FALLS HIGH SCHOOL ROOF REPLACEMENT

COLUMBIA FALLS, MONTANA

DRAWN: VAH CHECKED: VAH

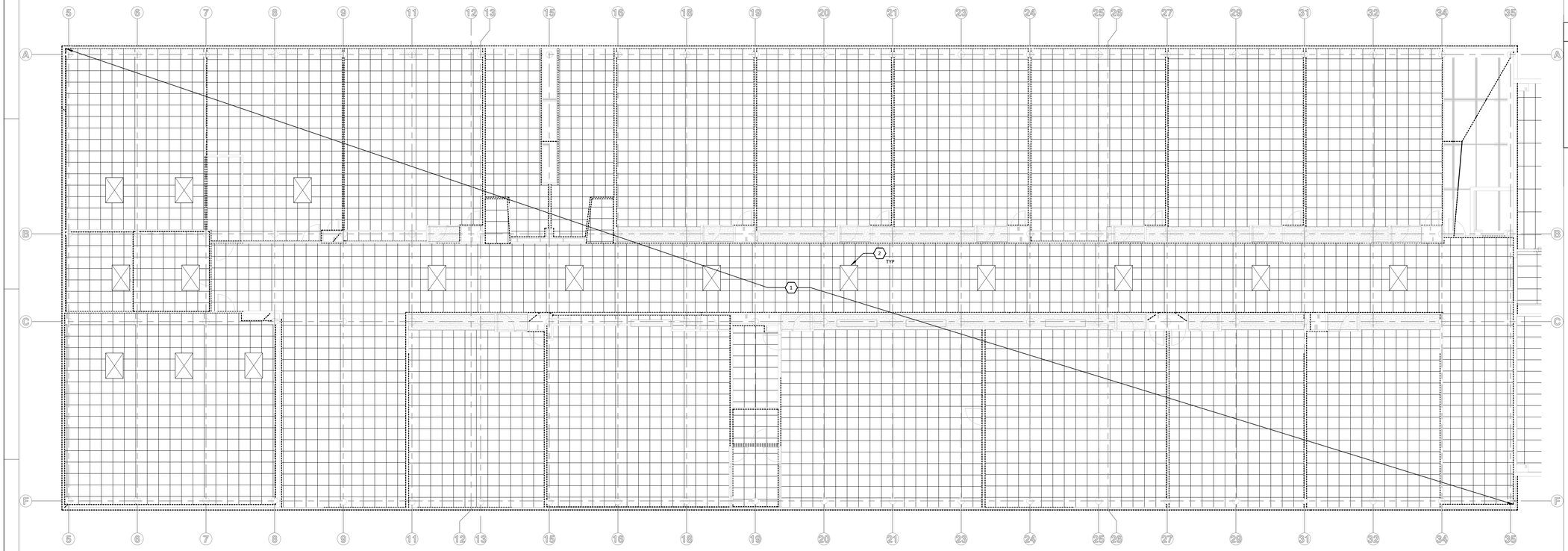
DATE: 02/12/2024

REVISIONS:

ARCHITECTURAL NOTES

A0.00

PROJECT # 220408



1 DEMOLITION REFLECTED CEILING PLAN

1/8" = 1'-0"

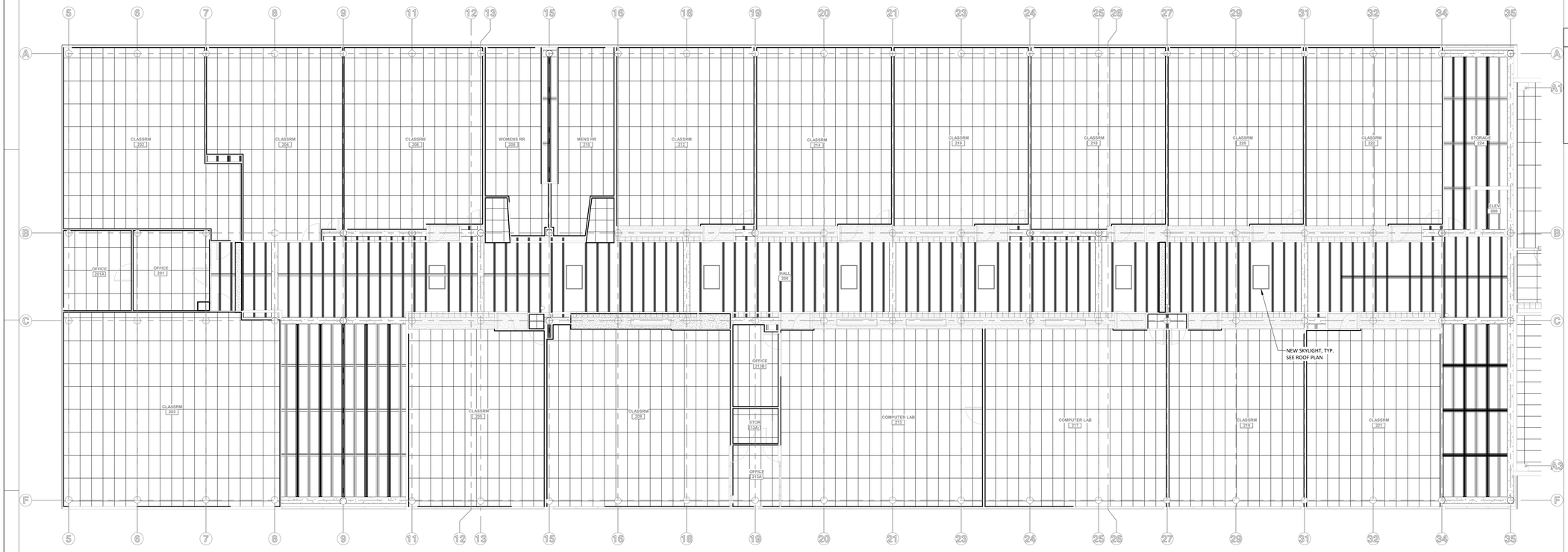
0 4' 8' 16'

DEMO RCP KEYNOTES

1	DEMO EXISTING CEILING, ACCESSORIES AND SUPPORTS
2	DEMO EXISTING SKYLIGHT, ACCESSORIES AND SUPPORTS

DEMO CEILING PLAN LEGEND

- DEMOLISHED 1'X1' PLASTER CEILING TILE
- EXISTING GWB GYPSUM WALL BOARD
- OPEN TO STRUCTURE



2 REFLECTED CEILING PLAN

1/8" = 1'-0"

0 4' 8' 16'

CEILING PLAN LEGEND

- NEW ACOUSTIC CEILING GRID & TILE MATCH HEIGHT OF EXISTING CEILING
- EXISTING GWB GYPSUM WALL BOARD
- OPEN TO STRUCTURE, PAINT (COLOR SELECTED BY OWNER)

PROJECT #:23068

JACKOLA SINCE 1969 P.C.
Engineering, Architecture, Surveying, Land Use Planning
KALISPELL 406-755-3208 | BOZEMAN 406-586-0707 | VANCOUVER 360-852-8746
info@jackola.com jackola.com

LICENSED ARCHITECT
VALERIE ANNE HARRIS
24456
KALISPELL, MT
STATE OF MONTANA

BID SET

COLUMBIA FALLS HIGH SCHOOL ROOF REPLACEMENT

COLUMBIA FALLS, MONTANA

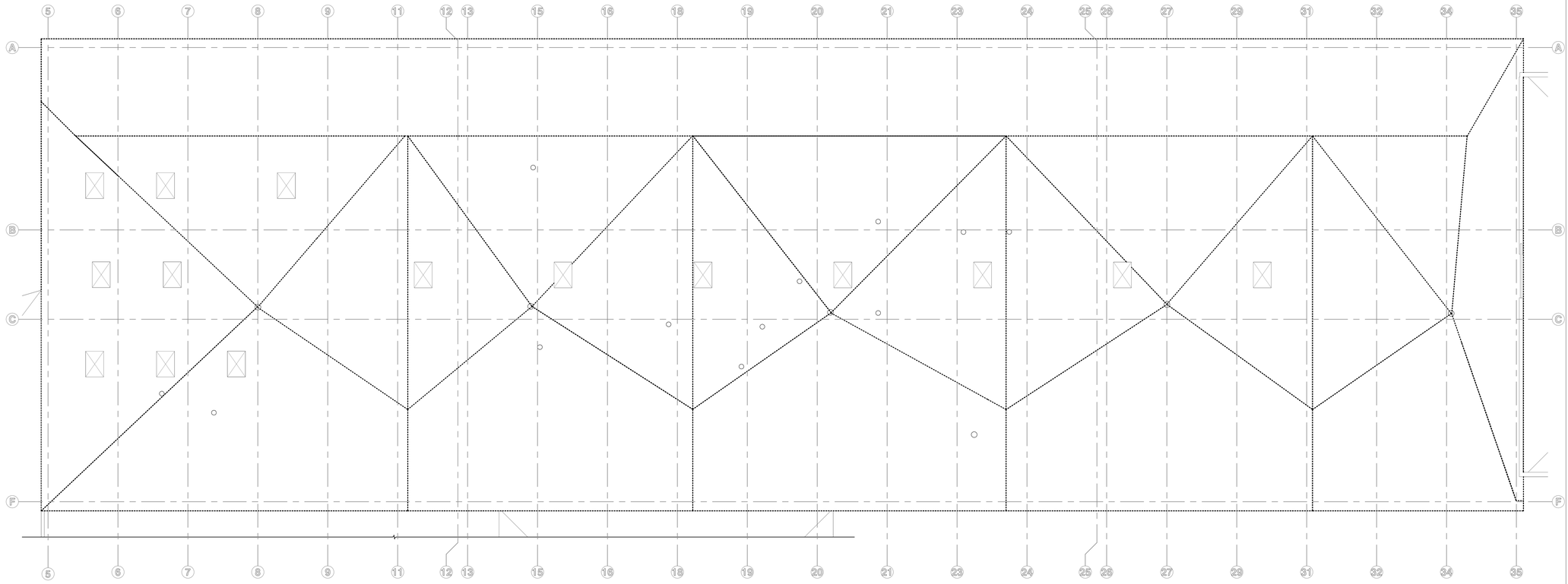
DRAWN: VAH CHECKED: VAH

DATE: 02/12/2024

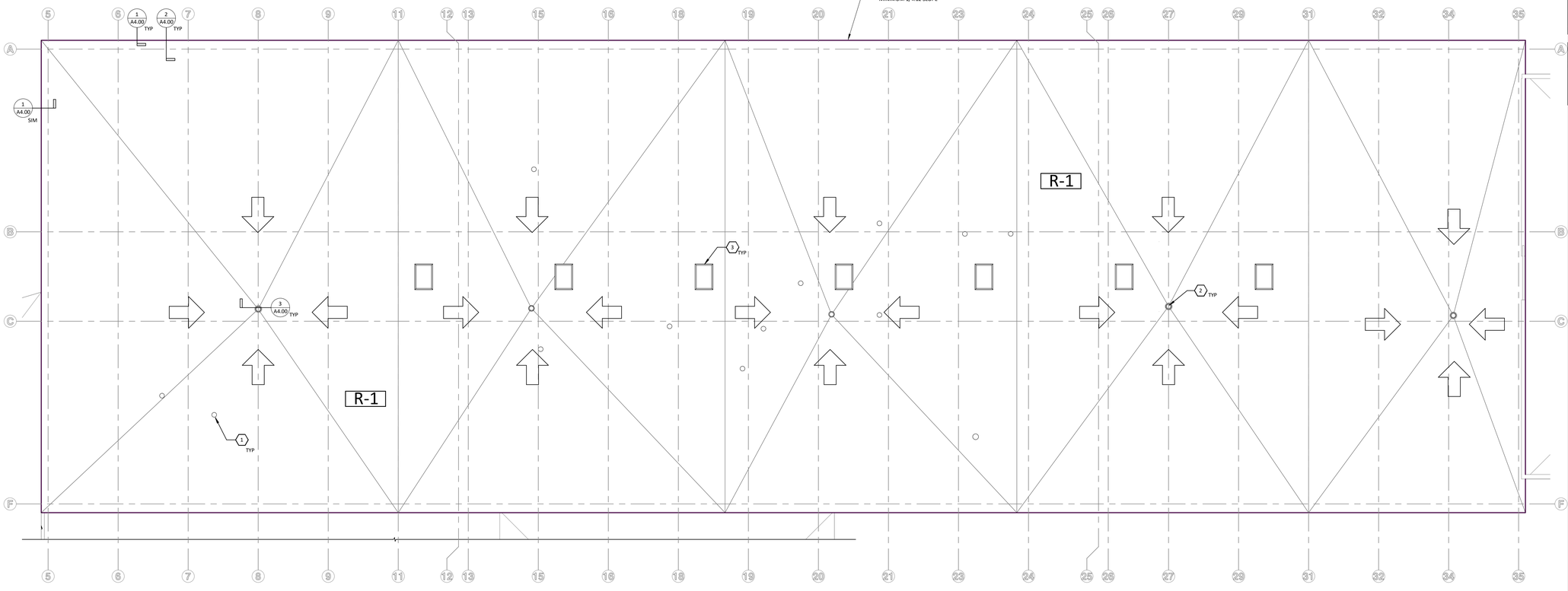
REVISIONS:

REFLECTED CEILING PLANS

A2.00



1 DEMOLITION ROOF PLAN
1/8" = 1'-0"
0 4' 8' 16'



2 ROOF PLAN
1/8" = 1'-0"
0 8' 16' 24'

ROOF PLAN KEYNOTES

1	ROOF PENETRATION FOR MECHANICAL EQUIPMENT, COORDINATE WITH HVAC CONTRACTOR
2	NEW ROOF DRAIN, CONNECT TO EXISTING INTERNAL DRAINAGE SYSTEM
3	NEW SKYLIGHT

ROOF TYPE NOTES

R-1
-20 YR ROOF MEMBRANE
-1/4" DECK BOARD
-R-30 MIN INSULATION
-6 MIL V.B.
-5HTG PER STRUCT
-FRAMING PER STRUCT

JACKOLA ENGINEERING & ARCHITECTURE, P.C.
SINCE 1969
Engineering, Architecture, Surveying, Land Use Planning
KALISPELL 406-755-3256 | BOZEMAN 406-586-0707 | VANCOUVER 360-852-8746
info@jackola.com jackola.com

LICENSED ARCHITECT
VALERIE ANNE HARRIS
24456
KALISPELL, MT
STATE OF MONTANA

BID SET

COLUMBIA FALLS HIGH SCHOOL ROOF REPLACEMENT

COLUMBIA FALLS, MONTANA

DRAWN: VAH CHECKED: VAH

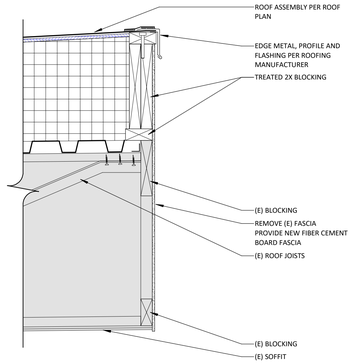
DATE: 02/12/2024

REVISIONS:

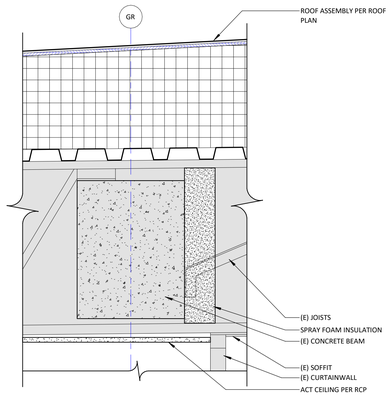
ROOF PLANS

A3.00

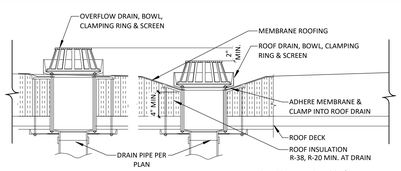
PROJECT #:23068



1 ROOF EDGE DETAIL
1 1/2" = 1'-0"

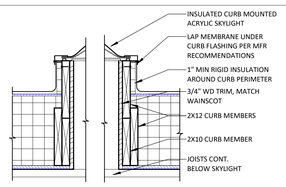


2 ROOF DETAIL @ CURTAINWALL
1 1/2" = 1'-0"

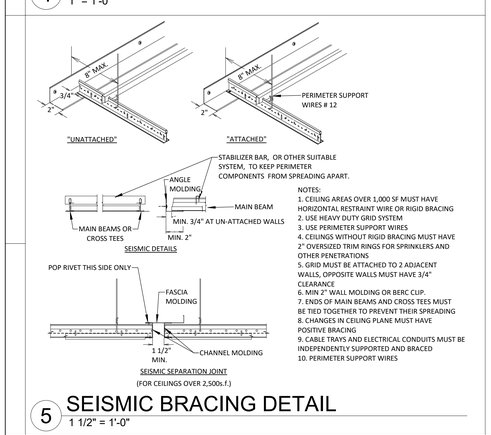


NOTE: COMBINATION ROOF & OVERFLOW DRAIN "ZURN" OR EQUAL

3 MEMBRANE ROOF DRAIN
1" = 1'-0"

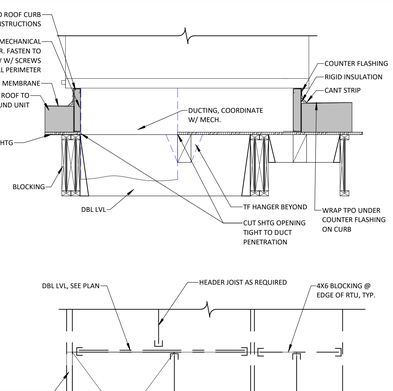


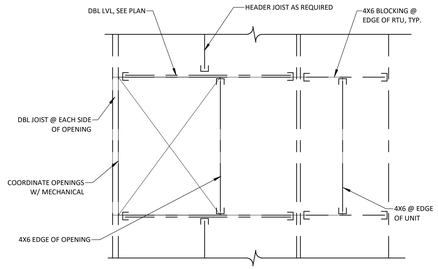
4 SKYLIGHT DETAIL
1" = 1'-0"



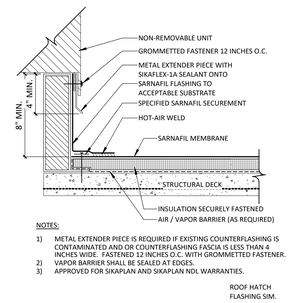
NOTES:
1. CEILING AREAS OVER 1,000 SF MUST HAVE HORIZONTAL RESTRAINT WIRE OR RIGID BRACING
2. USE HEAVY DUTY GRID SYSTEM
3. USE PERIMETER SUPPORT WIRES
4. CEILINGS WITHOUT RIGID BRACING MUST HAVE 2" OVERSIZED TRIM RINGS FOR SPRINKLERS AND OTHER PENETRATIONS
5. GRID MUST BE ATTACHED TO 2 ADJACENT WALLS, OPPOSITE WALLS MUST HAVE 3/4" CLEARANCE
6. MIN 2" WALL MOLDING OR BERC CLIP .
7. ENDS OF MAIN BEAMS AND CROSS TEES MUST BE TIED TOGETHER TO PREVENT THEIR SPREADING
8. CHANGES IN CEILING PLANE MUST HAVE POSITIVE BRACING
9. CABLE TRAYS AND ELECTRICAL CONDUITS MUST BE INDEPENDENTLY SUPPORTED AND BRACED
10. PERIMETER SUPPORT WIRES

5 SEISMIC BRACING DETAIL
1 1/2" = 1'-0"





6 RTU MOUNTING DETAIL
3/4" = 1'-0"



NOTES:
1) METAL EXTENDER PIECE IS REQUIRED IF EXISTING COUNTERFLASHING IS CONTAMINATED AND OR COUNTERFLASHING FASCIA IS LESS THAN 4 INCHES WIDE . FASTENED 12 INCHES O.C. WITH GROMMETTED FASTENER.
2) VAPOR BARRIER SHALL BE SEALED AT EDGES.
3) APPROVED FOR SIKAPLAN AND SIKAPLAN NDL WARRANTIES.

ROOF HATCH FLASHING SIM.

7 NON - REMOVABLE CURB FLASHING
NTS

JACKOLA ENGINEERING & ARCHITECTURE, P.C.
SINCE 1969
Engineering, Architecture, Surveying, Land Use Planning
KALISPELL 406-755-3258 | BOZEMAN 406-586-0707 | VANCOUVER 360-852-8746
info@jackola.com jackola.com

LICENSED ARCHITECT
VALERIE ANNE HARRIS
24456
KALISPELL, MT
STATE OF MONTANA

BID SET

COLUMBIA FALLS HIGH SCHOOL ROOF REPLACEMENT

COLUMBIA FALLS, MONTANA

DRAWN: VAH CHECKED: VAH

DATE: 02/12/2024

REVISIONS:

DETAILS

A4.00

PROJECT # 220606

ABBREVIATIONS

A

AFF	ABOVE FINISH FLOOR
ACT	ACOUSTICAL CEILING TILE
ADJ	ADJUSTABLE
AB	ANCHOR BOLT
ALUM	ALUMINUM
ALT	ALTERNATE
ANOD	ANODIZED
APPROX	APPROXIMATE
ARCH	ARCHITECT
AVG	AVERAGE

B

BSMT	BASEMENT
BM	BEAM
BRG	BEARING
BET	BETWEEN
BLDG	BUILDING
BLKG	BLOCKING
BO	BOTTOM OF
BOT	BOTTOM
BN	BOUNDARY NAILING
BS	BOTH SIDES

C

CIP	CAST-IN-PLACE
CLG	CEILING
CLR	CLEAR
CLT	CROSS LAMINATED TIMBER
COL	COLUMN
CONC	CONCRETE
CONN	CONNECTION
CONST	CONSTRUCTION
CONT	CONTINUOUS
CONTR	CONTRACT, CONTRACTOR
CORR	CORRIDOR
CJ	CONTROL JOINT
CMU	CONCRETE MASONRY UNIT

D

DBL	DOUBLE
DBL TP	DOUBLE TOP PLATE
DEG	DEGREE
DEMO	DEMOLISH, DEMOLITION
DTL	DETAIL
DIA	DIAMETER
DIM	DIMENSION
DIST	DISTANCE
DF/L	DOUGLAS/FIR LARCH
DIV	DIVISION
DL	DEAD LOAD
DR	DOOR
DN	DOWN
DS	DOWNSPOUT
DWG	DRAWING

E

EA	EACH
E	EAST
EIFS	EXTERIOR INSULATION FINISHING SYSTEMS
ELEC	ELECTRIC
EN	EDGE/END NAIL
ELEV	ELEVATION, ELEVATOR
EMBED	EMBEDMENT
EOS	EDGE OF SLAB
EOR	ENGINEER OF RECORD
EQ	EQUAL
EQUIP	EQUIPMENT
EW	EACH WAY
EXIST	EXISTING
EXP	EXPANSION
EXC	EXCAVATION
EJ	EXPANSION JOINT
EXT	EXTERIOR

F

FOB	FACE OF BRICK
FOC	FACE OF CONCRETE
FOM	FACE OF MASONRY
FOS	FACE OF STUDS
FIN	FINISH
FF	FINISH FLOOR
FL	FLASHING
FLR	FLOOR
FN	FIELD NAILING
FD	FLOOR DRAIN
FT	FOOT, FEET
FTG	FOOTING
FND	FOUNDATION
FUT	FUTURE
FBO	FURNISHED BY OTHERS
FRP	FIBER REINFORCED PANEL
FS	FAR SIDE

G

GA	GAUGE
GALV	GALVANIZED
GEN	GENERAL
GL	GLASS
G/L	GLULAM BEAM/COLUMN
GWB	GYPSUM WALL BOARD
GYPC	GYPCRETE

H

HALL	HALLWAY
HDR	HEADER
HDW	HARDWARE
HVAC	HEATING, VENTILATING, & AIR CONDITIONING
HT	HEIGHT
HM	HOLLOW METAL
HORIZ	HORIZONTAL
HR	HOUR
HSS	HOLLOW STRUCTURAL SECTION

I

IBC	INTERNATIONAL BUILDING CODE
ICC	INTERNATIONAL CODE COUNCIL
INCL	INCLUDE, INCLUDED (ING)
INFO	INFORMATION
ID	INSIDE DIAMETER
INSUL	INSULATE,INSULATION
INT	INTERIOR

J

JST	JOIST(S)
JT	JOINT

K

KO	KNOCK OUT

L

LB	POUND(S)
LBL	LABEL
LAM	LAMINATED
LAV	LAVATORY
LVL	LAMINATED VENEER LUMBER
LL	LIVE LOAD
LT	LIGHT
LOC'N	LOCATION
LSL	LAMINATED STRAND LUMBER
LWC	LIGHT WEIGHT CONCRETE

M

MEP	MECHANICAL, ELECTRICAL, AND PLUMBING DOCUMENTS
MFR	MANUFACTURER
MAS	MASONRY
MO	MASONRY OPENING
MTL	METAL
MATL	MATERIAL
MAX	MAXIMUM
MECH	MECHANICAL, MECHANICAL ROOM
MIN	MINIMUM
MISC	MISCELLANEOUS

N

NOM	NOMINAL
N	NORTH
NA	NOT APPLICABLE
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
NO	NUMBER
NS	NEAR SIDE
NWC	NORMAL WEIGHT CONCRETE

O

OC	ON CENTER
OFF	OFFICE
OPG	OPENING
OPP	OPPOSITE
OD	OUTSIDE DIAMETER
OF	OUTSIDE FACE
O/O	OUT TO OUT
OSB	ORIENTED STRAND BOARD

P

PERP	PERPENDICULAR
PNT	PAINT, PAINTED
PNL	PANEL
PH	PHASE
PLAS	PLASTIC
PL	PLATE
PLF	POUNDS PER LINEAR FOOT
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PSL	PARALLEL STRAND LUMBER
PLYWD	PLYWOOD
PVC	POLYVINYL CHLORIDE
PREFIN	PREFINISHED
PROP	PROPERTY
PT	PRESSURE TREATED

Q

QUAN	QUANTITY

R

RAD	RADIUS
REB	REBAR
REF	REFERENCE
REINF	REINFORCE, REINFORCEMENT
RCP	REFLECTED CEILING PLAN
REQ'D	REQUIRED
RFI	REQUEST FOR INFORMATION
REV	REVISION
R	RISER
RD	ROOF DRAIN
RM	ROOM
RO	ROUGH OPENING

S

SCHED	SCHEDULE
SEC	SECTION
SHTG	SHEATHING
SIM	SIMILAR
SOG	SLAB ON GRADE
S	SOUTH
(S)	SIMPSON
SPEC	SPECIFICATION
SQ	SQUARE
STAG	STAGGERED
STD	STANDARD
STL	STEEL
STOR	STORAGE
STRUCT	STRUCTURAL
SF	SQUARE FEET
SUSP	SUSPENDED
SQ	SQUARE
SYMM	SYMMETRY, SYMMETRICAL

T

TEL	TELEPHONE
TEMP	TEMPERED, TEMPORARY
T&B	TOP AND BOTTOM
T&G	TONGUE AND GROOVE
THK	THICK
THRU	THROUGH
T.O.	TOP OF
TOB	TOP OF BRICK
TOC	TOP OF CONCRETE
TOS	TOP OF SLAB
TOW	TOP OF WALL
TOM	TOP OF MASONRY
T	TREAD
TYP	TYPICAL

U

UBC	UNIFORM BUILDING CODE
UNO	UNLESS NOTED OTHERWISE
UTIL	UTILITY

V

VB	VAPOR BARRIER
VNR	VENEER
VERT	VERTICAL
VCT	VINYL COMPOSITION TILE
VIF	VERIFY IN FIELD

W

WF	WIDE FLANGE
WD	WOOD
WIN	WINDOW
WP	WATERPROOF (ING)
WRB	WEATHER RESISTANT BARRIER
WWF	WELDED WIRE FABRIC
WWM	WELDED WIRE MESH
WT	WEIGHT
W	WEST, WASHER
W/	WITH
W/O	WITHOUT

SYMBOLS & MATERIALS

STRUCTURAL FILL
UNDISTURBED EARTH
DISTURBED EARTH
GRAVEL
POURED CONCRETE
CONCRETE BLOCK VENEER
BRICK VENEER
EIFS
ROUGH WOOD
BLOCKING
FINISHED WOOD
PLYWOOD
RIGID INSULATION
BATT INSULATION
SPRAYFOAM INSULATION
SAND, PLASTER, GROUT
METAL
STEEL
GYPCRETE
FLOOR SHEATHING

XX / SX.X — SECTION
XX / SX.X — ELEVATION
XX / SX.X — DETAIL
XX / SX.X — ITEM IDENTIFICATION, SHEET WHERE FOUND
NORTH ARROW

HOLD DOWN
HANGER
A — REVISION NUMBER
3 — KEY NOTE
3 — DEMOLITION NOTE

SYMBOLS USED AS ABBREVIATIONS

&	AND
L	ANGLE
2L	DOUBLE ANGLE
@	AT
CL	CENTERLINE
u	CHANNEL
Ø	DIAMETER
PL	PLATE
#	NUMBER

S1.02D

- S — DENOTES SPECIFIC DISCIPLINE
- 1 — DENOTES SHEET TYPE
- 02 — DENOTES SHEET COUNT
- D — DENOTES BUILDING LEVEL (0 IS BASEMENT/ CRAWL SPACE, LEVEL 1 IS 1, ETC.)
- DENOTES DEMO PLANS (OMIT ON NON DEMO SHEETS)

STRUCTURAL SHEET INDEX

JACKOLA ENGINEERING & ARCHITECTURE PLLC
SINCE 1969
Engineering, Architecture, Surveying, Land Use Planning
KALISPELL 406-755-3208 | BOZEMAN 406-586-0707 | VANCOUVER 360-852-8746
info@jackola.com jackola.com

NOT FOR CONSTRUCTION

COLUMBIA FALLS HIGH SCHOOL ROOF REPLACEMENT

COLUMBIA FALLS, MONTANA

DRAWN: AMH CHECKED: KBH

DATE: 02/12/2024

REVISIONS:

STRUCTURAL NOTES

S0.00

PROJECT # 220508

1 STRUCTURAL DESIGN INFORMATION

STRUCTURAL DESIGN

PROJECT SCOPE

A. DESIGN OF THE REPAIR OF A SECTION OF ROOF FOR AN EXISTING HIGH SCHOOL. THE EXISTING ROOF MEMBRANE, INSULATION, ANY SHEATHING AND LIGHTWEIGHT TOPPING SLAB IS TO BE REMOVED. THE EXISTING METAL DECK IS TO BE REPLACED WITH THE SPECIFIED DECK. NEW STEEL OPEN WEB JOISTS ARE TO BE ADDED BETWEEN EXISTING JOISTS. THE NEW JOISTS ARE DESIGNED TO SUPPORT THE ENTIRE ROOF LOADS.
B. PORTIONS OF THE EXISTING DECK WERE TEMPORARILY SUPPORTED IN THE FALL OF 2023 AS SHOWN ON S2.01D. ALL THE SHORING IS TO BE REMOVED.

CODE REVIEW

A. THE SCOPE OF WORK OF THE PROJECT IS DEFINED AS A STRUCTURAL REPAIR PER IEBC 2021 SECTION 202 GENERAL DEFINITIONS
   1. (A) REPAIR. THE RECONSTRUCTION, REPLACEMENT OR RENEWAL OF ANY PART OF AN EXISTING BUILDING FOR THE PURPOSE OF ITS MAINTENANCE OR TO CORRECT DAMAGE.
B. THE CURRENT CONDITION OF THE EXISTING ROOF IS CLASSIFIED AS SUBSTANTIAL STRUCTURAL DAMAGE PER IEBC 2021 SECTION 202 GENERAL DEFINITIONS
   1. (BS) SUBSTANTIAL STRUCTURAL DAMAGE, CONDITION 3: THE CAPACITY OF ANY STRUCTURAL COMPONENT CARRYING SNOW LOAD, OR ANY GROUP OF SUCH COMPONENTS, THAT SUPPORTS MORE THAN 20 PERCENT OF THE ROOF AREA OF SIMILAR CONSTRUCTION HAS BEEN REDUCED MORE THAN 20 PERCENT FROM ITS PREDAMAGE CONDITION, AND THE REMAINING CAPACITY WITH RESPECT TO DEAD, LIVE, AND SNOW LOADS IS LESS THAN 75 PERCENT OF THAT REQUIRED BY THE INTERNATIONAL BUILDING CODE FOR NEW BUILDINGS OF SIMILAR STRUCTURE, PURPOSE AND LOCATION.
C. IEBC 2021 SECTION 405.2.3 SUBSTANTIAL STRUCTURAL DAMAGE TO VERTICAL ELEMENTS OF THE LATERAL FORCE-RESISTING SYSTEM - **DOES NOT APPLY**
   1. A BUILDING THAT HAS SUSTAINED SUBSTANTIAL STRUCTURAL DAMAGE TO THE VERTICAL ELEMENTS OF ITS LATERAL FORCE-RESISTING SYSTEM SHALL BE EVALUATED IN ACCORDANCE WITH SECTION 405.2.3.1 AND EITHER REPAIRED IN ACCORDANCE WITH SECTION 405.2.3.2 OR REPAIRED AND RETROFITTED IN ACCORDANCE WITH SECTION 405.2.3.3 DEPENDING ON THE RESULTS OF THE EVALUATION.
D. IEBC 2021 SECTION 405.2.4 SUBSTANTIAL STRUCTURAL DAMAGE TO GRAVITY LOAD-CARRYING COMPONENTS - **APPLIES**
   1. GRAVITY LOAD-CARRYING COMPONENTS THAT HAVE SUSTAINED SUBSTANTIAL DAMAGE SHALL BE REHABILITATED TO COMPLY WITH THE APPICABLE PROVISIONS FOR DEAD, LIVE AND SNOW LOADS IN THE INTERNATIONAL BUILDING CODE. UNDAMAGED GRAVITY LOAD-CARRYING COMPONENTS THAT RECEIVE DEAD, LIVE OR SNOW LOADS FROM REHABILITATED COMPONENTS SHALL ALSO BE REHABILITATED IF REQUIRED TO COMPLY WITH THE DESIGN LOADS OF THE REHABILITATION DESIGN.
E. IEBC 2021 SECTION 405.2.4.1 LATERAL FORCE-RESISTING ELEMENTS - **DOES NOT APPLY**
   1. REGARDLESS OF THE LEVEL OF DAMAGE TO VERTICAL ELEMENTS OF THE LATERAL FORCE-RESISTING SYSTEM, IF SUBSTANTIAL STRUCTURAL DAMAGE TO GRAVITY LOAD-CARRYING COMPONENTS WAS CAUSED PRIMARILY BY WIND OR SEISMIC EFFECTS, THEN THE BUILDING SHALL BE EVALUATED IN ACCORDANCE WITH SECTION 405.2.3.1 AND IF NONCOMPLIANT, RETROFITTED IN ACCORDANCE WITH SECTION 405.2.3.3.

GENERAL PROJECT NOTES

A. THE METAL ROOF DECK FOR THE A-WING OF THE COLUMBIA FALLS HIGH SCHOOL WAS FOUND TO HAVE CORROSION DURING THE INSTALLATION OF THE HVAC UPGRADES.
B. THE CONTRACTOR SHALL CONSULT WITH THE EOR DURING THE PROJECT AND FOR ANY CONDITIONS ENCOUNTERED WHICH ARE NOT SHOWN ON THE DRAWINGS.
C. THE EXISTING CEILING AND ITS SUPPORT STRUCTURE SHALL BE REMOVED IN THE AREA OF THE SHORING AND SHOULD NOT BE REPLACED UNTIL AFTER THE EXISTING ROOF DECK IS REPLACED.
D. CONTRACTOR IS RESPONSIBLE FOR ANY ELECTRICAL MODIFICATION DUE TO THE CEILING REMOVAL.
E. CORROSION AND DECK CONDITION SHALL BE MONITORED UNTIL THE DECK IS REPLACED.
F. EXISTING STRUCTURE AS SHOWN IS BASED ON THE ORIGINAL DESIGN DRAWINGS FOR THE BUILDING BY WEED & FEHLBERG ARCHITECTS DATED 1957. THERE WAS NO STRUCTURAL DESIGN LOADING INFORMATION PROVIDED ON THE DRAWINGS.
G. SHOP DRAWINGS OF THE ORIGINAL STEEL OPEN WEB JOISTS WERE NOT AVAILABLE.
H. IT IS ENVISIONED THAT PLASTIC SHEATHING WILL BE INSTALLED AS A TEMPORARY CEILING FOR ENVIROMENTAL SAFETY AND CLEANLINESS. 10 MIL MIN WITH TAPED SEAMS. A SAMPLE OF THE SHEATHING AND THE TAPE SHOULD BE PROVIDED TO THE OWNER FOR APPROVAL.

GOVERNING CODES AND GENERAL NOTES

A. INTERNATIONAL BUILDING CODE (IBC) 2021
B. INTERNATIONAL EXISTING BUILDING CODE (IEBC) 2021
C. AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE)- MINIMUM DESIGN LOADS FOR BUILDINGS & OTHER STRUCTURES- ASCE 7-16 WITH SUPPLEMENT 1
D. AMERICAN CONCRETE INSTITUTE (ACI) - BUILDING CODE & COMMENTARY ACI 318-19
E. THE MASONRY SOCIETY (TMS) - BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES TMS 402-16
F. AMERICAN INSTITUTE STEEL OF CONSTRUCTION (AISC) - STEEL CONSTRUCTION MANUAL FOURTEENTH EDITION AISC 360-16

DESIGN LOADS

A. RISK CATEGORY - III
B. GRAVITY LOADS
   1. ROOF LOADS
      a. ROOF DEAD LOAD - 20 PSF
      b. ROOF LIVE LOADS - 20 PSF
   2. SNOW LOADS
      a. GROUND SNOW LOAD, P_g - 71 PSF
      b. FLAT-ROOF SNOW LOAD, P_f - 55 PSF
      c. SNOW EXPOSURE FACTOR, C_e - 1.0
      d. SNOW LOAD IMPORTANCE FACTOR, I_s - 1.1
      e. THERMAL FACTOR, C_t - 1.0
      f. SLOPE FACTOR, C_s - 1.0
      g. SEE DRIFTS AND UNBALANCED SNOW LOADS ON SHEET S2.01
C. LATERAL LOADS
   1. WIND LOADS
      a. BASIC WIND SPEED (3-SECOND GUST) - 110 MPH
      b. WIND EXPOSURE - B
      c. INTERNAL PRESSURE COEFFICIENT - +/-0.18
   2. SEISMIC LOADS
      a. SEISMIC IMPORTANCE FACTOR, I_e - 1.25
      b. MAPPED SPECTRAL RESPONSE ACCELERATIONS, S_s / S_1 - 0.696/0.213
      c. SPECTRAL RESPONSE COEFFICIENT, S_{DS} / S_{D1} - 0.577/0.213
      d. SITE CLASS - D
      e. SEISMIC DESIGN CATEGORY - D
      f. BASIC SEISMIC FORCE RESISTING SYSTEM - EXISTING BUILDING CONCRETE FRAME

2 STEEL JOIST AND GIRDER NOTES

STEEL JOISTS AND GIRDERS

A. STEEL JOIST AND GIRDERS SHALL BE DESIGNED, FABRICATED, AND ERECTED IN ACCORDANCE WITH STEEL JOIST INSTITUTE STANDARD SPECIFICATIONS AND OSHA REGULATIONS, LATEST ADDITION.
B. PROVIDE ONE SHOP COAT OF PRIMER.
C. ALL JOISTS AND GIRDERS SHALL HAVE CALCULATIONS PREPARED BY AN ENGINEER LICENSED IN THE STATE OF THIS PROJECT. THESE CALCULATIONS ALONG WITH SHOP DRAWINGS SHALL BE SUBMITTED FOR APPROVAL BY THE ENGINEER AND AHJ PRIOR TO FABRICATION OF THE JOISTS AND GIRDERS.
D. JOISTS SHALL BE DESIGNED TO SUPPORT THE SUPERIMPOSED DEAD AND LIVE LOADS INDICATED IN STRUCTURAL DESIGN INFORMATION AND ON DRAWINGS.
E. JOIST BRIDGING, INCLUDING ALL CONNECTIONS, SHALL BE DESIGNED AND SUPPLIED BY JOIST SUPPLIER IN ACCORDANCE WITH CURRENT STEEL JOIST INSTITUTE RECCOMENDATIONS AND OSHA REGULATIONS. USE "X" BRIDGING AT DISCONTINUOUS ENDS OF BRIDGING. LOCATE BRIDGING TO AVOID MECHANICAL OPENINGS. SEE NOTE J.
F. ALL JOISTS SHALL BE DESIGNED FOR A SINGLE CONCENTRATED LOAD OF 300 LBS ALONG THE TOP CHORD AND 100 LBS ALONG THE BOTTOM CHORD APPLIED BETWEEN PANEL POINTS.
G. JOIST DIAGONAL MEMBERS LOCATED IN THE MIDDLE QUARTER OF THE SPAN SHALL BE DESIGNED FOR A MINIMUM SHEAR, IN COMPRESSION, OF 15% OF THE END REACTION. THIS MINIMUM DESIGN LOAD SHALL BE TO ACCOUNT FOR THE POSSIBILITY OF SHEAR REVERSAL DUE TO UNBALANCED LOADING.
H. JOIST SEATS SHALL HAVE THE CAPACITY TO RESIST A LATERAL LOAD APPLIED TO THE TOP CHORD, PERPENDICULAR TO THE SPAN. PROVIDE A MINIMUM ROLLOVER FORCE OF 2,000 LBS FOR SEATS UP TO 3 1/2" DEEP AND 1,200 LBS FOR SEATS OVER 3 1/2" DEEP.
I. ALL SUPPORTED MECHANICAL UNITS AND OTHER SUSPENDED EQUIPMENT AND PIPING SHALL BE DIRECTLY SUPPORTED FROM JOIST PANEL POINTS UNLESS ADDITIONAL REINFORCEMENT IS PROVIDED.
J. BRIDGING AND OTHER FRAMING PERPENDICULAR TO THE NEW AND EXISTING JOISTS SHALL BE DESIGNED TO AVOID CONFLICTS WITH THE EXISTING JOISTS.

3 STRUCTURAL STEEL NOTES

STRUCTURAL STEEL

A. DETAIL, FABRICATE AND ERECT STRUCTURAL STEEL IN ACCORDANCE WITH THE AISC SPECIFICATIONS AND CODES, LATEST EDITION
B. PROVIDE MATERIAL CONFORMING TO THE FOLLOWING REQUIREMENTS FOR ALL STRUCTURAL STEEL:
   1. SHAPES AND PLATES (EXCEPT WIDE FLANGE) AND PLATES: ASTM A36, Fy=36KSI
   2. WIDE FLANGE SHAPES: ASTM A992, Fy=50 KSI MIN. (65 KSI MAX.)
   3. STRUCTURAL TUBING: ASTM A500, GRADE B, Fy=46 KSI
   4. ANCHOR BOLTS: ASTM F1554 GR 36/ OR ASTM A36 THREADED ROD - UNLESS NOTED OTHERWISE
   5. THREADED ROD: ASTM A36
   6. WELDING ELECTRODE: E70XX
C. FABRICATOR SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO FABRICATION.
D. MEMBERS SHALL BE FABRICATED PER AISC WITH 'STANDARD' HOLES 1/16" LARGER THAN BOLT DIAMETER UNLESS SPECIFICALLY DETAILED OR APPROVED OTHERWISE. HOLES FOR ANCHOR BOLTS MAY BE 5/16" MAX. LARGER THEN BOLT UNLESS NOTED OTHERWISE. (PROVIDE WASHERS AT ALL ANCHOR BOLTS.)
E. SHOP WELDING SHALL BE DONE IN A CERTIFIED FABRICATOR'S SHOP APPROVED BY THE BUILDING OFFICIAL (IBC 1704.2) OR SHALL BE PERFORMED UNDER SPECIAL INSPECTION WITH SUCH INSPECTION AT THE FABRICATOR'S EXPENSE. SUBMIT EVIDENCE OF CERTIFICATION PRIOR TO COMMENCING FABRICATION.
F. STEEL TO STEEL CONNECTIONS - A325 BOLTS SHALL BE INSTALLED 'SNUG-TIGHT' PER RCSC 'SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS' AND COMMENTARY WITH PERIODIC INSPECTION PER SECTION 1704.3.3. STEEL TO WOOD CONNECTIONS - ASTM A307 BOLTS TO BE USED.
G. MAXIMUM FILLET WELDS SIZE SHALL BE 1/16" LESS THAN MATERIAL THICKNESS IF THICKNESS IS 1/4" OR LARGER, 3/16" SHALL BE USED ON MATERIAL 3/16" THICK.
H. FABRICATOR TO HAND CLEAN THE STEEL OF LOOSE RUST, LOOSE MILL SCALE, DIRT, AND OTHER FOREIGN MATTER PRIOR TO PAINTING BY MEANS OF WIRE BRUSHING, OR OTHER MEANS TO MEET REQUIREMENTS OF SSDC-SP2.
I. ALL STEEL SHALL BE SHOP PRIMED PRIOR TO SHIPMENT TO SITE. CONNECTIONS SHALL BE FIELD PRIMED AFTER WELDING AND/OR BOLTING. UNLESS OTHERWISE NOTED, PAINT IS TO BE APPLIED BY BRUSH, SPRAY, ROLLER COATING, FLOW COATING, OR DIPPING WITH STANDARD PRIMER.
J. CONTRACTORS RESPONSIBILITY TO PROVIDE TOUCH-UP OF ABRASIONS CAUSED BY FIELD HANDLING.
K. NO CUTTING, DRILLING, OR OTHER ALTERATION OF STEEL FRAMEWORK IS PERMITTED EITHER TO ACCOMMODATE OTHER TRADES OR TO REPAIR MISALIGNMENTS. CONTACT ENGINEERS FOR ANY FIELD REVISIONS OR REPAIRS.

4 STATEMENT OF SPECIAL INSPECTIONS

STATEMENT OF SPECIAL INSPECTIONS & STRUCTURAL OBSERVATIONS

A. SPECIAL INSPECTIONS SHALL BE COMPLETED BY AN APPROVED INDEPENDENT AGENCY EMPLOYED BY THE OWNER. THE STRUCTURAL OBSERVATIONS SHALL BE COMPLETED BY THE ENGINEER OF RECORD (EOR) OR A REGISTERED DESIGN PROFESSIONAL AS OUTLINED BELOW.
B. THE CONTRACTOR SHALL PROVIDE ACCESS TO THE SITE & MANLIFTS &/OR SAFETY EQUIPMENT REQUIRED FOR ACCESS TO THE PARTICULAR INSPECTION LOCATION. THE CONTRACTOR SHALL PROVIDE SUFFICIENT NOTICE IN ADVANCE FOR THE INSPECTIONS AND OBSERVATIONS TO BE COMPLETED.
C. SPECIAL INSPECTIONS SHALL BE COMPLETED TO SECTION 1705 OF THE 2018 INTERNATIONAL BUILDING CODE.
D. SPECIAL INSPECTORS SHALL SUBMIT A STATEMENT OF THEIR ACCREDITATION TO THE ARCHITECT AND THE BUILDING OFFICIAL.
E. THE APPROVED SPECIAL INSPECTORS AND STRUCTURAL OBSERVERS SHALL COMPLETE A STATEMENT OF SPECIAL INSPECTORS FOR THEIR SCOPE OF WORK.
F. PRIOR TO COMMENCEMENT OF THE CONSTRUCTION A MEETING WITH THE BUILDING OFFICIAL, OWNER, ARCHITECT, EOR, CONTRACTOR AND SPECIAL INSPECTOR AGENCY(IES) SHALL BE COMPLETED TO REVIEW THE SCOPE AND THE STATEMENT(S) OF SPECIAL INSPECTIONS.
G. SPECIAL INSPECTOR DUTIES
   1. OBSERVE AND OR TEST THE WORK FOR COMPLIANCE WITH THE APPROVED CONSTRUCTION DOCUMENTS.
   2. NOTIFY THE CONTRACTOR OF ALL DISCREPANCIES AND NOTED IN THE INSPECTION REPORTS
   3. INSPECTION AND OBSERVATION REPORTS SHALL BE COMPLETED & SUBMITTED TO THE BUILDING OFFICIAL, ARCHITECT ENGINEER AND CONTRACTOR. INSPECTION AGENCY SHALL SUBMIT A REPORT THAT ALL WORK REQUIRING SPECIAL INSPECTIONS WAS INSPECTED AND IS IN CONFORMANCE WITH THE CONSTRUCTION DOCUMENTS AND ALL DISCREPANCIES NOTED IN THE INSPECTION REPORTS HAVE BEEN CORRECTED.
H. SPECIAL INSPECTIONS OF POST INSTALLED ANCHORS SHALL MEET THE REQUIREMENT OF THE APPROVED ICC-ES REPORT FOR THE PRODUCT

TABLE 5 - REQUIRED STEEL CONSTRUCTION INSPECTIONS

	ITEM		NOTES	
1	FABRICATOR QUALITY CONTROL		FABRICATOR QUALITY CONTROL SHALL BE COMPLETED BASED ON THE MINIMUM REQUIREMENT OF THE MBMA. FABRICATED STEEL SHALL BE INSPECTED TO VERIFY COMPLIANCE WITH THE DETAILS ON THE SHOP DRAWINGS	
2	INSPECTIONS DURING CONSTRUCTION		ERECTORS QUALITY CONTROL	QUALITY ASSURANCE
	A	FIELD WELDING PER AWS 1.1		
	B	PRIOR TO BOLTING		
	1	MANUFACTURERS CERTIFICATIONS AVAILABLE FOR FASTENERS MATERIALS	OBSERVE	PERFORM
	2	FASTENERS MARKED PER ASTM REQUIREMENTS	OBSERVE	OBSERVE
	3	CORRECT MATERIAL FOR BOLTING & FASTENING	OBSERVE	OBSERVE
	4	CORRECT BOLTING PROCEDURE SELECTED	OBSERVE	OBSERVE
	5	CONNECTING ELEMENTS INCLUDING APPROPRIATE FRAYING SURFACE CONDITION AND HOLE CONDITION MEETS REQUIREMENTS	OBSERVE	OBSERVE
	6	PREINSTALLATION VERIFICATION TESTING BY INSTALLATION PERSONNEL OBSERVED AND DOCUMENTED	PERFORM	OBSERVE
	7	CORRECT STORAGE OF FASTENER MATERIAL	OBSERVE	OBSERVE
	B	DURING BOLTING		
	1	FASTENERS ASSEMBLIES OF SUITABLE CONDITION PLACED IN ALL HOLES AND WASHER INSTALLED	OBSERVE	PERFORM
	2	JOINTS BROUGHT TO SNUG TIGHT CONDITION PRIOR TO PRETENSIONED IF REQUIRED	OBSERVE	OBSERVE
	3	FASTENER COMPONENT NOT TURNED BY WRENCH TO PREVENT ROTATING	OBSERVE	OBSERVE
	4	FASTENER PRETENSIONED PER THE RCSC SPECIFICATIONS	OBSERVE	OBSERVE
	C	AFTER BOLTING		
	1	DOCUMENT ACCEPTANCE OR REJECTION OF BOLTED CONNECTIONS	OBSERVE	OBSERVE
	D	PLACEMENT OF ANCHOR RODS AND OTHER EMBEDDED ITEMS	OBSERVE	OBSERVE
	E	INSPECTION OF FABRICATED ITEMS PRIOR TO INSTALLATION	OBSERVE	OBSERVE
	F	INSPECTION OF STEEL FRAME & BRACES, STIFFENER AND JOISTS OF THE COMPLETED PROJECT	PERFORM	OBSERVE

ON THIS PROJECT THE QUALITY ASSURANCE SHALL BE COMPLETED BY THE SPECIAL INSPECTORS.
PERFORM MEANS THESE ITEMS NEED TO BE COMPLETED.
OBSERVE MEANS THESE ITEMS NEED TO BE PERFORMED ON A RANDOM BASIS.

5 METAL DECK NOTES

METAL DECK

A. REFERENCE STANDARDS (CURRENT EDITION)
   1. SDI "SPECIFICATIONS AND COMMENTARY FOR STEEL DECK" AND "SPECIFICATIONS AND COMMENTARY FOR COMPOSITE STEEL DECK".
   2. SDI "CODE OF RECOMMENDED STANDARD PRACTICE".
   3. AISI "SPECIFICATIONS FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS".
   4. AWS D1.3 "STRUCTURAL WELDING CODE-SHEET STEEL".
B. DECK STRUCTURAL PROPERTIES
   1. ROOF DECK
      a. YIELD STRENGTH = 50 KSI MIN
      b. I_{pos} = 0.0.179 IN^4/FT MIN
      c. I_p = 0.192 IN^4/FT MIN
      d. S_{eff} = 0.176 IN^3/FT MIN
      e. S_{pos} = 0.188 IN^3/FT MIN
C. ALL DECK TO BE GALVANIZED IN ACCORDANCE WITH ASTM A653 COATING CLASS G60. REPAIR DAMAGED COATING.
D. WHERE POSSIBLE, LAYOUT METAL DECK TO SPAN AT LEAST THREE SPANS CONTINUOUSLY. TERMINATE ENDS OVER SUPPORTS EXCEPT AT OPENINGS OR BUILDING EDGES WHERE METAL DECKS MAY BE CANTILEVERED AS SHOWN IN THE STRUCTURAL DRAWINGS.
E. PROVIDE 2 INCH MINIMUM BEARING AT ALL SUPPORTS. END LAPS OF METAL DECK SHALL ONLY OCCUR OVER SUPPORTS AND BE A MINIMUM OF 2 INCHES. DECK SHALL BE LAID OUT SUCH THAT A LOW FLUTE FALLS ON EACH PARALLEL SUPPORT.
F. SECURE FLOOR METAL DECK TO THE STEEL FRAMEWORK AND TOGETHER AS SHOWN ON THE STRUCTURAL DRAWINGS.
G. ALTERNATIVES TO TYPES OF DECK AND FASTENING MAY BE USED WITH THE APPROVAL OF THE EOR. DECK PROPERTIES SHALL BE EQUAL TO OR GREATER THAN THOSE SHOWN ABOVE. ANY DECK OR METHOD OF FASTENING SHALL HAVE AN EVALUATION REPORT APPROVING THE DECK FOR THE APPLICATION.

6 DEFFERED SUBMITTALS

SUBMITTALS

SUBMITTALS SHALL BE SUBMITTED TO THE ENGINEER OF RECORD (EOR) AND FORWARDED TO THE BUILDING OFFICIAL FOR REVIEW PRIOR TO FABRICATION IN ACCORDANCE WITH IBC107.3.4.1. ALLOW 7-14 DAYS FOR REVIEW BY THE EOR.

A. SUBMIT SPECIFICATIONS FOR:
   a. METAL DECK
B. SUBMIT SHOP DRAWINGS AND CALCULATIONS, STAMPED BY A REGISTERED PROFESSIONAL ENGINEER LICENSED IN THE STATE OF MONTANA, FOR:
   1. OPEN WEB STEEL JOISTS
   2. BIDDER-DESIGN STRUCTURAL ITEMS

PROJECT # 23068

SINCE 1969 P.C. JACKOLA
Engineering, Architecture, Surveying, Land Use Planning
KALISPELL 406-755-3208 | BOZEMAN 406-586-0707 | VANCOUVER 360-852-8746
info@jackola.com jackola.com

NOT FOR CONSTRUCTION

COLUMBIA FALLS HIGH SCHOOL ROOF REPLACEMENT

COLUMBIA FALLS, MONTANA

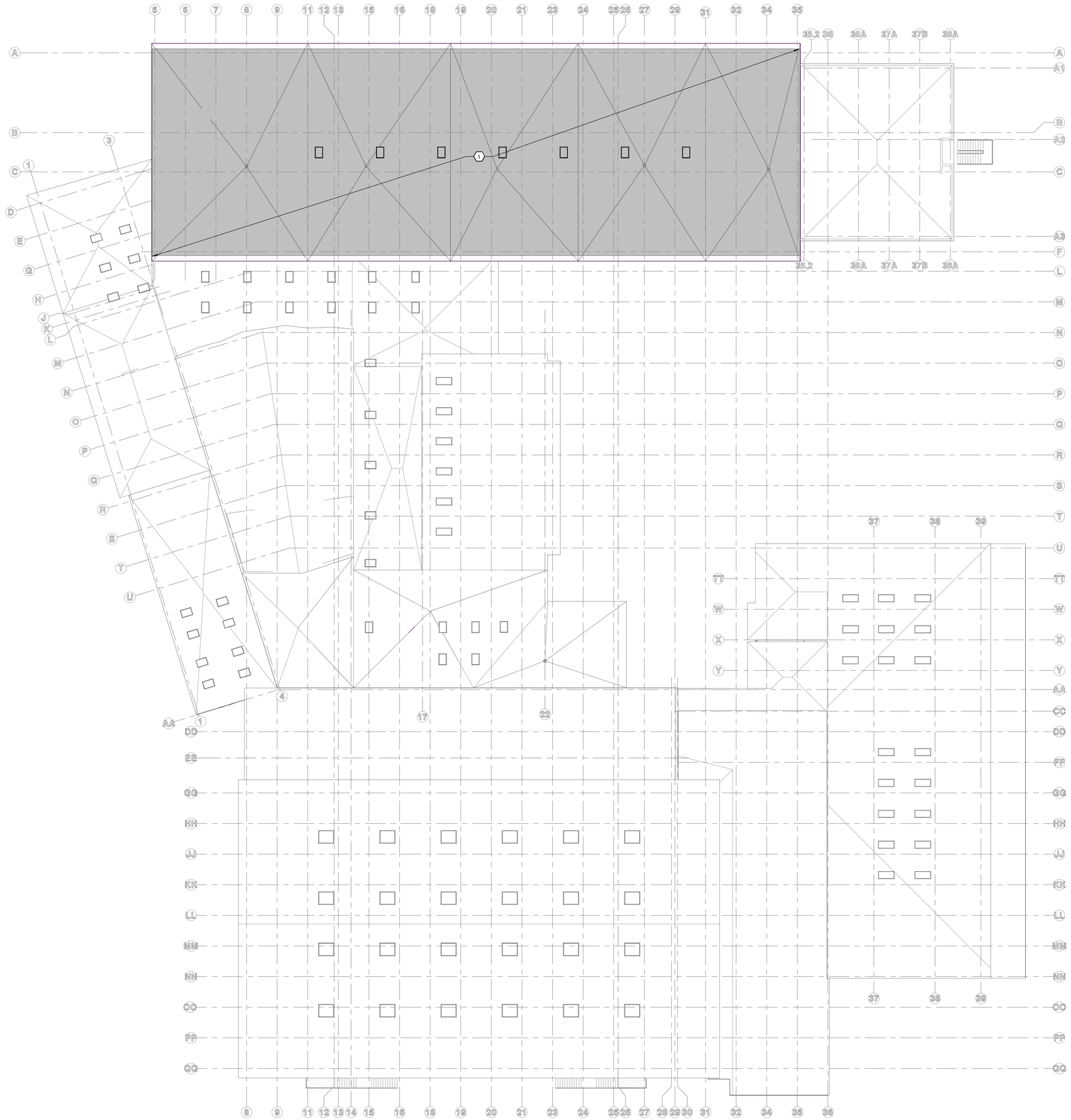
DRAWN: AMH CHECKED: KBH

DATE: 02/12/2024

REVISIONS:

STRUCTURAL NOTES

S0.01



1 STRUCTURAL ROOF PLAN OVERALL

1/16" = 1'-0"

0 8' 16' 32'

ROOF PLAN OVERALL KEYNOTES

1 AREA OF WORK (EAST SECTION / AREA A)

JACKOLA SINCE 1969 P.C.
Engineering, Architecture, Surveying, Land Use Planning

KALISPELL 406-755-3208 | BOZEMAN 406-586-0707 | VANCOUVER 360-852-8746

info@jackola.com jackola.com

NOT FOR CONSTRUCTION

COLUMBIA FALLS HIGH SCHOOL ROOF REPLACEMENT

COLUMBIA FALLS, MONTANA

DRAWN: AMH CHECKED: KBH

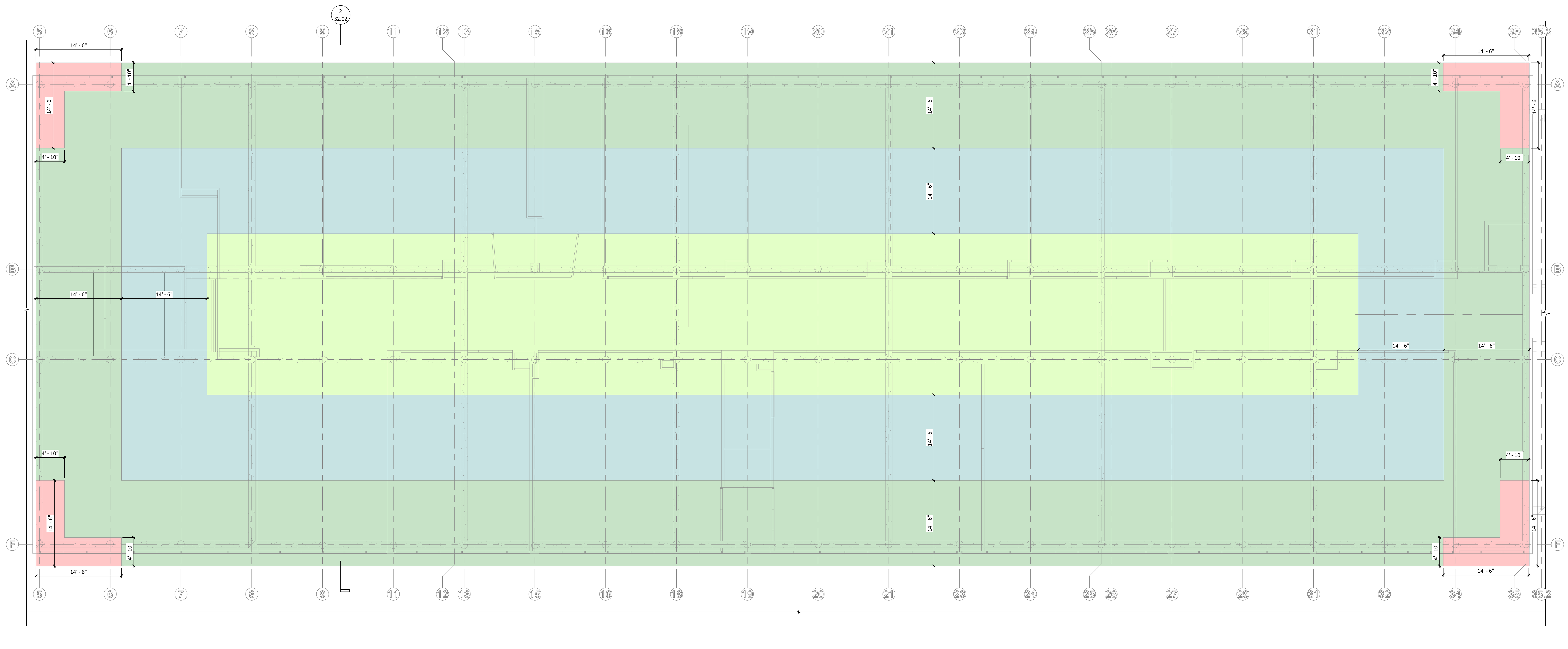
DATE: 02/12/2024

REVISIONS:

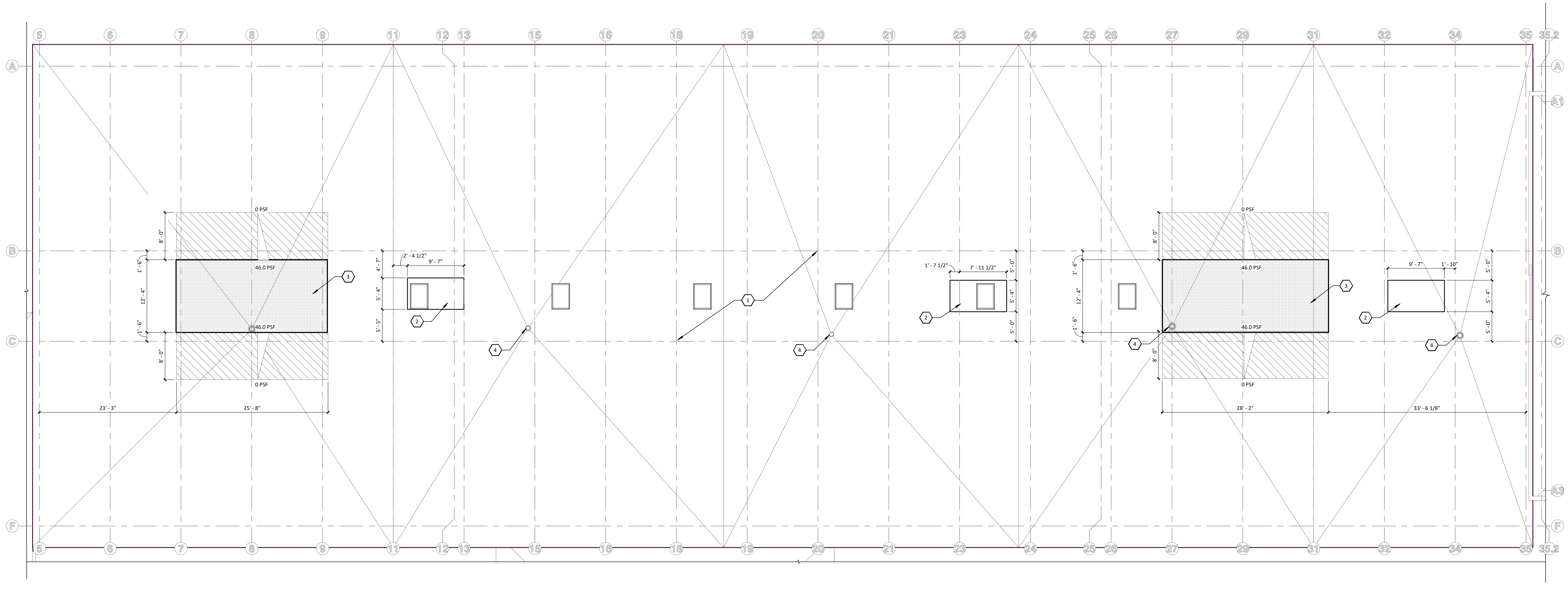
STRUCTURAL ROOF PLAN - OVERALL

S2.00

PROJECT # 22CA08



1 ROOF WIND LOADING PLAN EAST
1/8" = 1'-0"
0 4' 8' 16'



2 ROOF GRAVITY LOADING PLAN EAST
1/8" = 1'-0"
0 4' 8' 16'

PROJECT #:220408

WIND LOADING PLAN LEGEND

COLORED REGION	WIND REGION	UNFACTORED LOAD (PSF)	
		DOWNWARD	UPWARD
(blue)	WIND REGION 1	9.1	35.0
(light green)	WIND REGION 1'	9.1	25.7
(green)	WIND REGION 2	9.1	46.5
(red)	WIND REGION 3	9.1	55.3

GENERAL LOADING PLAN NOTES:
A. NEW JOISTS TO BE DESIGNED FOR FULL ROOF LOADING, I.E. EXISTING JOISTS TO BE IGNORED.

GRAVITY PLAN LEGEND

DENOTES 125 PSF LIVE LOAD

DENOTES ADDITIONAL SNOW LOAD

SNOW LOAD DRIFT — DRIFT LOAD PER PLAN — BASE SNOW LOAD PER S0.01

GENERAL LOADING PLAN NOTES:
A. NEW JOISTS TO BE DESIGNED FOR FULL ROOF LOADING, I.E. EXISTING JOISTS TO BE IGNORED.

ROOF GRAVITY LOADING PLAN...

1 APPLY ENTIRE ROOF SNOW LOAD PER 1/S0.01 TO NEW JOISTS PER NEW JOIST SPACING, I.E. IGNORE EXISTING JOISTS
2 4000 LB MECHANICAL UNIT
3 FUTURE PENTHOUSE, USE 125 PSF LIVE LOAD FOR AREA
4 ROOF DRAIN

SINCE 1969 JACKOLA P.C.
Engineering, Architecture, Surveying, Land Use Planning
KALISPELL 406-755-3208 | BOZEMAN 406-586-0707 | VANCOUVER 360-852-8746
info@jackola.com jackola.com

NOT FOR CONSTRUCTION

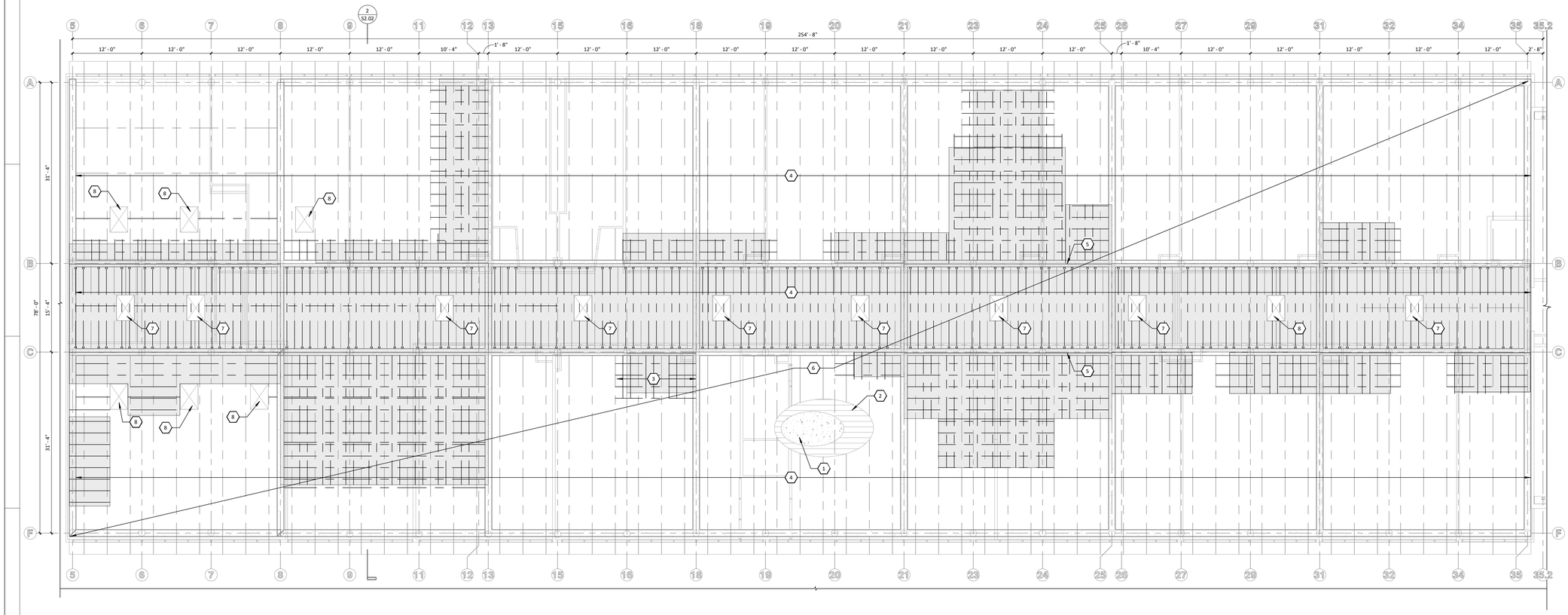
COLUMBIA FALLS HIGH SCHOOL ROOF REPLACEMENT

COLUMBIA FALLS, MONTANA

DRAWN: AMH CHECKED: KBH
DATE: 02/12/2024
REVISIONS:

STRUCTURAL ROOF LOADING PLANS EAST

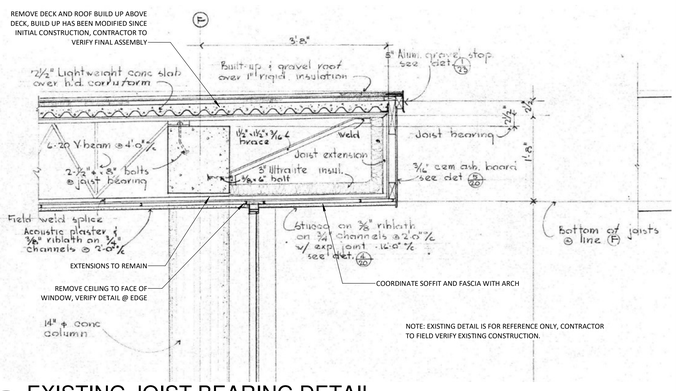
S2.01



1 DEMO STRUCTURAL ROOF PLAN EAST

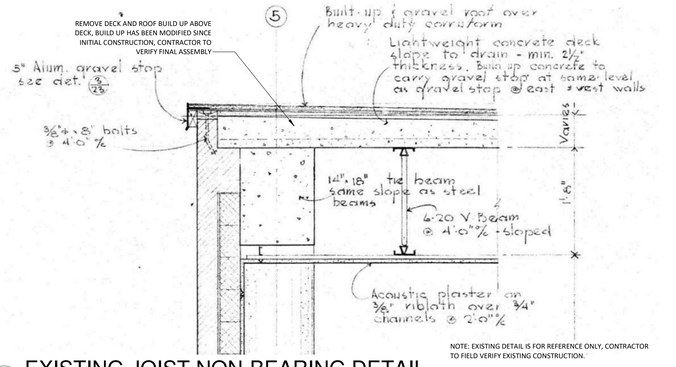
1/8" = 1'-0"

0 4' 8' 16'



2 EXISTING JOIST BEARING DETAIL

NTS



3 EXISTING JOIST NON-BEARING DETAIL

NTS

IMAGE 1
WOOD I-JOIST SHORING FRAMED IN CORRIDOR

IMAGE 2
WOOD 2X AND PLYWOOD SHORING IN CLASSROOMS

4 EXISTING SHORING IMAGES

DEMO FRAMING LEGEND

	EXISTING JOIST
	EXISTING CONCRETE BEAM
	HANGER
	KNOWN LOCATIONS OF SHORING TO BE DEMOED (FIELD VERIFY EXTENTS)

GENERAL DEMO PLAN NOTES:

A. CONTRACTOR TO FIELD VERIFY EXISTING CONDITIONS, CONTACT AOR AND/OR EOR IF DISCREPENCIES EXIST.
B. CONTRACTOR TO BE RESPONSIBLE FOR MINIMIZING DEBRIS FALLING INTO INTERIOR OF BUILDING.
C. CONTRACTOR TO VISUALLY EVALUATE CONDITIONS OF THE EXISTING STRUCTURAL MEMBERS TO THE FULLEST EXTENT POSSIBLE AND CONTACT EOR WITH ANY CONCERNS.

DEMO STR ROOF PLAN KEYNOTES

1 DEMO EXISTING LIGHT-WEIGHT CONCRETE TOPPING TO FULL EXTENT
2 DEMO EXISTING STEEL DECK TO FULL EXTENTS, TAKE CARE NOT TO DAMAGE REMAINING STRUCTURAL MEMBERS
3 DEMO EXISTING WOOD SHORING, CONTRACTOR TO SALVAGE TO FULL EXTENT POSSIBLE, TYPICAL AT INDICATED HATCH
4 EXISTING STEEL V-JOISTS @ 4'-0" O.C. TO REMAIN, CONTRACTOR TO INVESTIGATE CONDITION OF JOISTS, CONTACT EOR W/ CONCERNS
5 EXISTING CONCRETE BEAMS TYP TO REMAIN, CONTRACTOR TO INVESTIGATE CONDITION OF BEAMS, CONTACT EOR W/ CONCERNS
6 EXISTING MECHANICAL AND ELECTRICAL ITEMS TO BE REMOVED AND REPLACED AS REQUIRED FOR ROOF REPAIR, CONTRACTOR TO COORDINATE
7 (E) SKYLIGHT, REMOVE AND REPLACE
8 DEMO (E) SKYLIGHT, FIELD VERIFY LOCATIONS AND QUANTITY

JACKOLA ENGINEERING & ARCHITECTURE PLLC
SINCE 1969 P.C.
Engineering, Architecture, Surveying, Land Use Planning
KALISPELL 406-755-3208 | BOZEMAN 406-586-0707 | VANCOUVER 360-852-8746
info@jackola.com jackola.com

COLUMBIA FALLS HIGH SCHOOL ROOF REPLACEMENT

COLUMBIA FALLS, MONTANA

DRAWN: AMH CHECKED: KBH

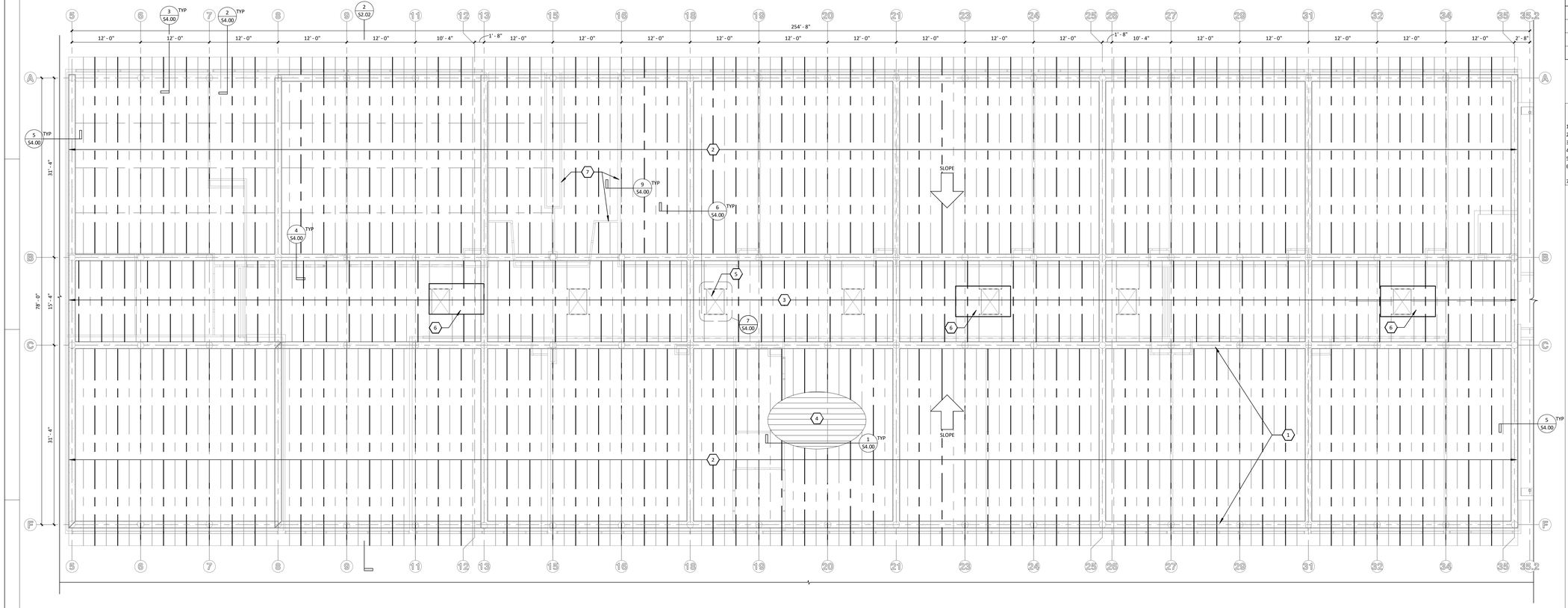
DATE: 02/12/2024

REVISIONS:

STRUCTURAL ROOF DEMO PLAN EAST

S2.01D

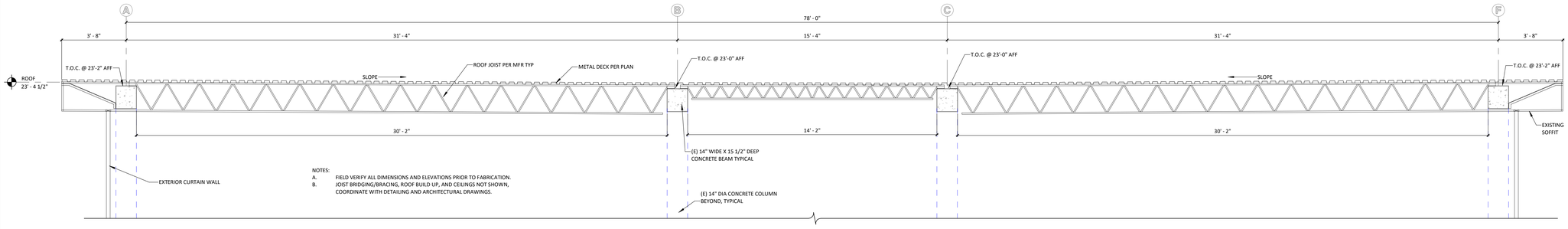
PROJECT # 20XXX



1 ROOF FRAMING PLAN EAST

1/8" = 1'-0"

0 4' 8' 16'



NOTES:
A. FIELD VERIFY ALL DIMENSIONS AND ELEVATIONS PRIOR TO FABRICATION.
B. JOIST BRIDGING/BRACING, ROOF BUILD UP, AND CEILINGS NOT SHOWN, COORDINATE WITH DETAILING AND ARCHITECTURAL DRAWINGS.

2 TRANSVERSE STRUCTURAL SECTION

3/8" = 1'-0"

0 2' 4' 6'

PROJECT # 23068

FRAMING LEGEND

	EXISTING JOIST
	NEW JOIST
	BLOCKING
	EXISTING CONCRETE BEAM

GENERAL LOADING PLAN NOTES:

A. NEW JOISTS TO BE DESIGNED FOR FULL ROOF LOADING, I.E. EXISTING JOISTS TO BE IGNORED.

ROOF FRAMING KEYNOTES

1 SEE DEMO PLAN FOR EXISTING STRUCTURE INFO
2 20K4 OPEN-WEB STEEL JOISTS @ 4'-0" O.C., BTW (E) JOISTS
3 10K1 OPEN-WEB STEEL JOISTS @ 4'-0" O.C., BTW (E) JOISTS
4 1 1/2" PLB-36 22 GAUGE STEEL ROOF DECK
5 OMIT JOISTS AT REMAINING SKYLIGHT LOCATIONS TYP
6 ROOF TOP UNIT, PROVIDE GIRDERS AS REQUIRED FOR LOADING, SEE ROOF LOADING PLANS
7 NON-STRUCTURAL INTERIOR WALL TYP

SINCE 1969 P.C. JACKOLA Engineering, Architecture, Surveying, Land Use Planning

KALISPELL 406-755-3208 | BOZEMAN 406-586-0707 | VANCOUVER 360-852-8746

info@jackola.com jackola.com

NOT FOR CONSTRUCTION

COLUMBIA FALLS HIGH SCHOOL ROOF REPLACEMENT

COLUMBIA FALLS, MONTANA

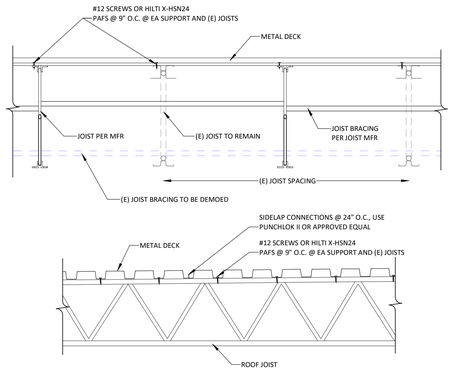
DRAWN: AMH CHECKED: KBH

DATE: 02/12/2024

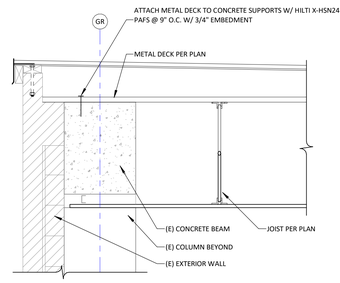
REVISIONS:

STRUCTURAL ROOF FRAMING PLAN

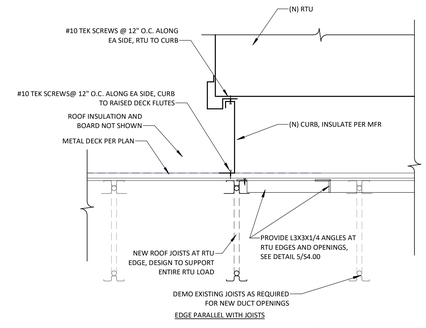
S2.02



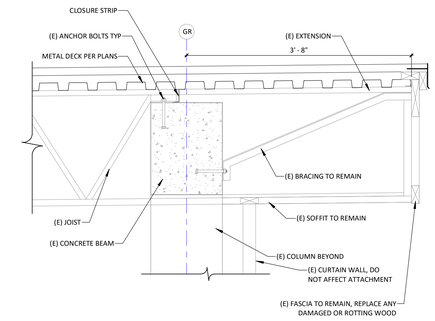
1 TYP METAL DECK TO JOIST CONN
1" = 1'-0"



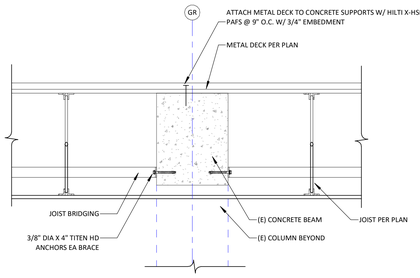
5 METAL DECK TO END WALL
1" = 1'-0"



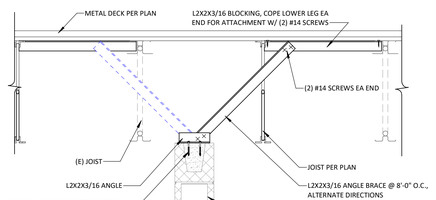
8 RTU ATTACHMENT TO METAL DECK
1" = 1'-0"



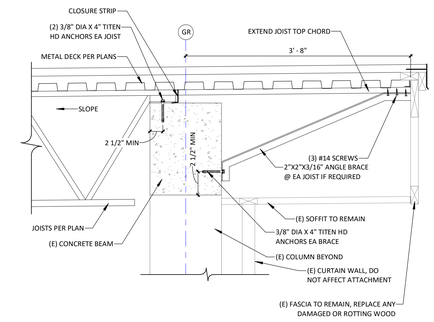
2 (E) CLASSROOM JOIST BEARING
1" = 1'-0"



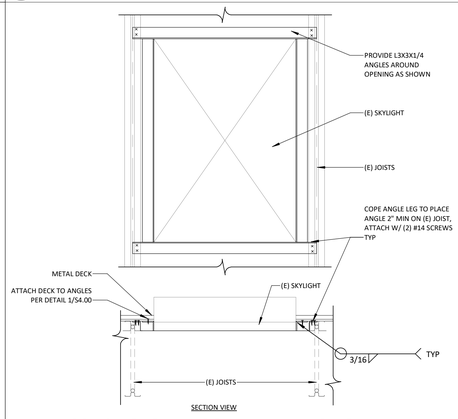
6 NON-BEARING CONCRETE BEAM DETAIL
1" = 1'-0"



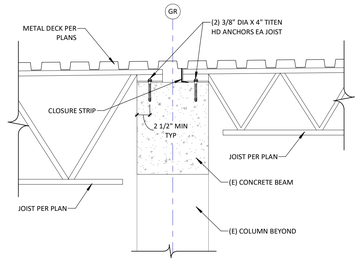
9 NON-BEARING WALL ATTACHMENTS
1" = 1'-0"



3 NEW CLASSROOM JOIST BEARING
1" = 1'-0"



7 EXISTING SKYLIGHT FRAMING
3/4" = 1'-0"



4 CORRIDOR JOIST FRAMING
1" = 1'-0"

JACKOLA
SINCE 1969 P.C.
Engineering, Architecture, Surveying, Land Use Planning
KALISPELL 406-755-3208 | BOZEMAN 406-586-0707 | VANCOUVER 360-852-8746
info@jackola.com jackola.com

NOT FOR CONSTRUCTION

COLUMBIA FALLS HIGH SCHOOL ROOF REPLACEMENT

COLUMBIA FALLS, MONTANA

DRAWN: AMH CHECKED: KBH

DATE: 02/12/2024

REVISIONS:

STRUCTURAL DETAILS

S4.00

PROJECT # 23X08

GENERAL ELECTRICAL NOTES AND SPECIFICATIONS

GENERAL NOTES:
1. ALL WORK SHALL CONFORM TO ALL APPLICABLE REQUIREMENTS OF FEDERAL AND STATE CODES, REGULATIONS, LAWS AND ORDINANCES, LOCAL LAWS AND REGULATIONS, LOCAL JURISDICTIONS, AND THE AUTHORITY HAVING JURISDICTION (AHJ).
2. ALL ELECTRICAL WORK UNDER THE REQUIREMENTS OF THESE SPECIFICATIONS SHALL MEET THE REQUIREMENTS OF THE CURRENT STATE ADOPTED EDITIONS OF THE NATIONAL ELECTRICAL CODE (NEC) AND SHALL ALSO BE IN COMPLIANCE WITH ALL APPLICABLE STATE AND/OR LOCAL LAWS AND ORDINANCES.
3. THE CONTRACTOR SHALL COOPERATE WITH AND ASSIST THE OWNER IN SECURING FROM THE AHJ ANY "SPECIAL PERMISSION" OR INTERPRETATION NEEDED TO COMPLETE THE WORK.
4. ALL DRAWINGS AND DETAILS PROVIDED ARE GENERAL IN NATURE AND MAY NOT REPRESENT ALL CONDITIONS AND DIMENSIONS FOR THE ACTUAL WORK. ELECTRICAL CONTRACTOR (EC) SHALL REVIEW ALL DOCUMENTS PROVIDED AND/OR REFERENCED. EC SHALL VISIT THE SITE TO VERIFY ALL EXISTING CONDITIONS INCLUDING: ACCESS TO WORK, VERIFICATION OF MEASUREMENTS, VERIFICATION OF QUANTITIES AND LOCATIONS LISTED HEREIN, POWER REQUIREMENTS, STAGING, DISPOSAL AND MATERIAL STORAGE. IF DRAWING OR SPECIFICATIONS ARE NOT AVAILABLE FOR A PARTICULAR CONDITION, OR A NEW CONDITION IS EXPOSED DURING THE PROJECT, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO REQUEST INFORMATION OR ADJUSTMENT OF SCOPE FROM OWNER'S REPRESENTATIVE BEFORE PROCEEDING WITH SUCH WORK.

COORDINATION:
1. ALL WORK SHALL BE COORDINATED WITH THE WORK OF OTHER TRADES. EC TO COORDINATE ALL ELECTRICAL MATERIAL, EQUIPMENT, FIXTURES, AND DEVICE LOCATIONS WITH ALL RELATED ARCHITECTURAL, MECHANICAL, STRUCTURAL, AND OTHER TRADE DRAWINGS TO AVOID AND PREVENT IMPROPER INSTALLATIONS OR WASTEFUL PRACTICES.
2. ALL WORK SHALL BE CLOSELY COORDINATED WITH THE ACTIVITIES OF OTHERS AROUND THE WORK SITE.
3. OWNER, GENERAL CONTRACTOR, AND ELECTRICAL CONTRACTOR SHALL COORDINATE AND VERIFY ALL OTHER ELECTRICAL WORK REQUIRED WHETHER OR NOT SPECIFIED ON THE DRAWINGS. OTHER WORK INCLUDES BUT IS NOT LIMITED TO: AUDIO SYSTEMS, LIFE SAFETY SYSTEMS, FIRE/SECURITY ALARMS, MECHANICAL SYSTEMS, TELEPHONE/DATA CABLES, SITE/SEWERAGE WORK, UTILITY/TRENCHING, AND EMERGENCY/STANDBY POWER SYSTEMS.

ELECTRICAL DRAWINGS:
1. UNLESS OTHERWISE NOTED, ELECTRICAL WORK IS DRAWN WITH BOLD LINES.
2. FURNITURE INDICATED ON PLANS IS FOR REFERENCE ONLY.
3. THE CONTRACTOR SHALL KEEP A RECORD OF CHANGES MADE AND THE RECORD SHALL BE TURNED OVER TO THE OWNER AT THE COMPLETION OF PROJECT FOR THE OWNERS RECORDS. PROVIDE THE OWNER WITH ONE COMPLETE SET OF ELECTRICAL "AS-BUILT" DRAWINGS AT THE COMPLETION OF THE JOB.

WORKMANSHIP:
1. WORKMANSHIP SHALL BE FIRST QUALITY AND IN ACCORDANCE WITH THE BEST PRACTICE OF THE TRADE. ONLY WORKMEN SKILLED IN THE TASKS ASSIGNED TO THEM SHALL BE EMPLOYED.
2. ALL ELECTRICAL WORK IS TO BE PERFORMED, INSTALLED, TESTED, INSPECTED, AND APPROVED BY QUALIFIED, LEGALLY LICENSED AND BONDED ELECTRICAL CONTRACTORS PER THE LAWS OF THE STATE.
3. CONTRACTOR SHALL CARRY OUT ALL WORK IN COMPLIANCE WITH APPLICABLE LOCAL AND STATE LAWS LOCAL BUILDING CODES, MANUFACTURE SPECIFICATIONS, STANDARDS OF CARE AND THE SPECIFICATIONS SET FORTH WITHIN THESE DOCUMENTS AND FULLY COMPLY WITH ALL OSHA REQUIREMENTS.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR OF ANY DAMAGE CAUSED BY THE CONTRACTOR OR ITS EMPLOYEES TO THE SOLE SATISFACTION OF OWNER.

WORK SAFETY:
1. ALL WORK PERFORMED BY CONTRACTOR SHALL MEET SAFETY REQUIREMENTS BY OSHA AND/OR THE STATE AND AHJ.
2. ELECTRICAL WORK REQUIRED ON OR NEAR EXPOSED LIVE PARTS, OR TO ANY HAZARDOUS EQUIPMENT SHALL ONLY BE PERFORMED BY OSHA CERTIFIED EMPLOYEE FOR THE WORK BEING PERFORMED.

DELIVERY, STORAGE, AND HANDLING:
1. RECEIVE, INSPECT, HANDLE, AND STORE ALL ELECTRICAL EQUIPMENT, FIXTURES, AND MATERIALS IN ACCORDANCE WITH MANUFACTURE'S INSTRUCTIONS.

MATERIAL :
1. ALL ELECTRICAL EQUIPMENT, FIXTURES, MATERIALS, METHODS, AND WORK MUST BE IN ACCORDANCE AND IN COMPLIANCE WITH THE MOST RECENT APPROVED EDITION OF ADAAG, ANSI, IEEE, NEC, NEMA, NFPA, OSHA, IBC, TIA, CODES AND STANDARDS, OR OTHER AS REQUIRED BY THE AHJ.
2. ALL ELECTRICAL EQUIPMENT, FIXTURES, MATERIAL, AND DEVICES SHALL BE NEW AND ORIGINAL EQUIPMENT MANUFACTURED (UNLESS OTHERWISE NOTED), AND BE LISTED WITH THE UNDERWRITERS LABORATORIES INC., OR EQUAL.
3. ALL ELECTRICAL EQUIPMENT, FIXTURES, MATERIAL, AND DEVICES SHALL BE COMPATIBLE, EACH WITH ONE ANOTHER AND WITH EXISTING WORK AND WITH EXISTING BUILDING (IF APPLICABLE) STANDARDS.

COMMERCIAL SPACES:
a. ELECTRICAL DEVICES SHALL BE 20A COMMERCIAL GRADE. COLOR AND STYLE SHALL BE CHOSEN BY THE ARCHITECT AND/OR OWNER SHALL VERIFY COLOR & STYLE PRIOR TO ORDERING/INSTALLING.
b. BREAKERS FOR PANELBOARD SHALL BE BOLT-ON TYPE IN COMMERCIAL SPACES.

DWELLING UNITS:
a. ELECTRICAL DEVICES SHALL BE 20A COMMERCIAL GRADE. OWNER SHALL VERIFY DEVICE COLOR & STYLE PRIOR TO ORDERING/INSTALLING.
b. BREAKERS FOR LOAD CENTER TO BE PLUG IN TYPE.

CONTRACTOR RESPONSIBILITIES:
1. CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF ALL ELECTRICAL WORK AND TO PROVIDE COMPLETE AND WORKING SYSTEMS COMPLYING WITH THE CONTRACT DOCUMENTS. ALL PROPOSED DEVIATIONS FROM CONTRACT DOCUMENTS SHALL BE SUBMITTED AND APPROVED BEFORE EXECUTION OF THE AFFECTED WORK.
2. CONTRACTOR SHALL APPLY AND PAY FOR ALL REQUIRED PERMITS, FEES, LICENSES AND INSPECTIONS FOR ALL ELECTRICAL WORK.
3. CONTRACTOR IS RESPONSIBLE FOR ANY DELAYS DUE TO THE EQUIPMENT THAT THEY PROVIDE.
4. CONTRACTOR SHALL PROVIDE ALL MATERIALS, TOOLS, EQUIPMENT, LABOR AND SERVICES NECESSARY TO FURNISH AND INSTALL COMPLETE WORKING ELECTRICAL SYSTEMS.
5. UNLESS OTHERWISE INDICATED, MANUFACTURERS SPECIFIED IN THE DRAWINGS AND SPECIFICATIONS ARE BASIS OF DESIGN. APPROVED EQUAL PRODUCTS ARE ALSO ALLOWED IF:
   a. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AND SUBMITTALS FOR ENGINEER AND ARCHITECTURAL REVIEW PRIOR TO CONSTRUCTION.
   b. AT A MINIMUM PROVIDE SUBMITTALS FOR ENGINEER AND ARCHITECTURAL REVIEW FOR LIGHTING, POWER DISTRIBUTION EQUIPMENT, AND ELECTRICAL DEVICES.
6. CONTRACTOR IS RESPONSIBLE TO VERIFY ALL ELECTRICAL MATERIAL RATINGS. PRIOR TO INSTALLATION, CONFIRM BREAKER, FUSE, CONDUIT AND CONDUCTOR SIZES ARE CONSISTENT WITH CIRCUIT VOLTAGES AND MANUFACTURES' RECOMMENDATIONS AND NAMEPLATE DATA FOR EQUIPMENT AND THE AHJ REQUIREMENTS.

CLEANING:
1. COMPLETE FINAL CLEANING FOR ALL ELECTRICAL PARTS. REMOVE CONDUCTIVE AND HARMFUL DELETERIOUS MATERIALS AND REMOVE DIRT AND DEBRIS, PLASTER, AND OTHER FOREIGN MATERIALS FROM ENCLOSURES.
2. CLEAN FINISHES, TOUCH UP PAINT, AND OTHERWISE REPAIR AND RESTORE MARRED EXPOSED FINISHES TO ELIMINATE VISUAL DEFECTS. MATCH ORIGINAL FACTORY FINISH.

CLOSEOUT:
1. COMPLETE STARTUP AND TESTING OF SYSTEMS AND EQUIPMENT.
2. ALL SYSTEMS, AT PROJECT COMPLETION AND BEFORE FINAL ACCEPTANCE, SHALL BE DEMONSTRATED TO HAVE A COMPLETE AND WORKING FUNCTIONAL OPERATION.
3. ALL BROCHURES, OPERATING AND MAINTENANCE DATA AND MANUALS, CATALOGS, SHOP DRAWINGS, ETC, RELATED TO ELECTRICAL WORK SHALL BE TURNED OVER TO THE OWNER AT JOB COMPLETION BY EC. ADDITIONALLY, ALL PRODUCT WARRANTY REGISTRATION CARDS, APPLICATIONS, AND CERTIFICATES SHALL BE COMPLETED, FILLED OUT, AND TURNED OVER TO OWNER. ALL SPARE, SURPLUS, AND RELATED ADJUSTMENT PARTS, TOOLS OR DEVICES ARE TO BE TURNED OVER TO OWNER.
4. ALL COMPLETED ELECTRICAL JOB(S) SHALL BE GUARANTEED BY THE EC. AT COMPLETION OF WORK, PROVIDE WRITTEN WARRANTY. THE EC WARRANTIES SHALL INCLUDE:
   A. WORK WILL BE PERFORMED IN A WORKMANLIKE MANNER
   B. FINISHED WORK IS FREE FROM DEFECTS AND IS IN ACCORDANCE WITH STANDARDS
   C. A MINIMUM WARRANTY DURRATION OF ONE YEAR (1) AFTER THE DATE OF ACCEPTANCE BY OWNER.
   D. ANY WORKMANSHIP PERFORMED BY THE EC FOUND TO BE DEFECTIVE OR FAULTY DURING THAT PERIOD OF TIME SHALL BE CORRECTED AT ONCE, UPON WRITTEN NOTIFICATION AND AT THE SOLE EXPENSE OF THE EC

ELECTRICAL WORK:
1. ALL ELECTRICAL EQUIPMENT, FIXTURES, MATERIAL, AND DEVICES MUST BE INSTALLED PER THE MANUFACTURERS INSTRUCTIONS AND MUST NOT INTERFERE, REMOVE, OR ALTER ITS LISTING, FUNCTION, WARRANTY, OR SAFETY AGREEMENTS.
2. THE ELECTRICAL WORK INCLUDES BUT IS NOT SPECIFICALLY LIMITED TO ITEMS INDICATED ON DRAWINGS AND SPECIFICATIONS. PERFORM ALL OPERATIONS NECESSARY OR INCIDENTAL TO PROPER EXECUTION AND COMPLETION OF ALL "ELECTRICAL WORK" WHETHER SPECIFICALLY MENTIONED OR NOT.
3. CIRCUIT PATH WIRING IS NOT SHOWN EXCEPT FOR SWITCHING INTENT OF FIXTURES AND CONTROL OF DEVICES.
4. CONTRACTOR SHALL MAINTAIN ALL CEILING, FLOOR, AND WALL WIRE AND SMOKE PROTECTION RATINGS. SEAL AROUND CABLES PASSING THROUGH FIRE-RATED ELEMENTS. SEAL ALL CONDUIT, CONDUCTOR, AND BOX PENETRATIONS THROUGH OR IN ALL FIRE RATED ASSEMBLIES.
   a. COORDINATE SEALANTS MATERIAL AND COLOR WITH ARCHITECT.

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES:
1. WIRE COUNTS FOR CIRCUIT CONDUCTORS ARE NOT SHOWN CIRCUIT NUMBERS SHOWN ON DRAWING CORRESPOND TO PANELBOARD BREAKERS (SEE PANEL SCHEDULE).
2. BRANCH CIRCUITS SHALL BE SIZED ACCORDING TO THE CIRCUIT BREAKER SIZE AND RATING, UNLESS INDICATED OTHERWISE ON THE EQUIPMENT SCHEDULE.
3. PROVIDE AND INSTALL PROPER SIZE AND NUMBER OF CONDUCTORS REQUIRED BY THE NEC TO ACHIEVE CIRCUIT AND SWITCHING CONNECTIONS SHOWN.
4. ALLOW FOR 3% MAXIMUM VOLTAGE DROP ON ALL CONDUCTORS. UPSIZE WIRES IF NECESSARY. COORDINATE SIZES OF RACEWAYS, BOXES, AND EQUIPMENT ENCLOSURES INSTALLED UNDER OTHER SECTIONS WITH THE ACTUAL CONDUCTORS TO BE INSTALLED.
5. MINIMUM CONDUCTOR SIZE:
   A. BRANCH CIRCUITS: 12 AWG.
   B. CONTROL CIRCUITS: 14 AWG.
6. CONDUCTOR MATERIAL:
   A. ALL CONDUCTOR SHALL BE TYPE THHN, THHN/THWN, OR THHN/THWN-2 UNLESS NOTED OTHERWISE.
   B. PROVIDE COPPER CONDUCTORS FOR ALL CIRCUITS UNLESS NOTED OTHERWISE. CONDUCTOR SIZES INDICATED ARE BASED ON COPPER.
   C. MC CABLE IS NOT PERMITTED FOR HOME RUNS OR PANEL FEEDS, BUT MAY BE USED ELSEWHERE.

GROUNDING AND BONDING FOR ELECTRICAL SYSTEM:
1. GROUNDING AND BONDING WORK SHALL COMPLY WITH REQUIREMENTS OF NEC, LOCAL UTILITY, TELEPHONE COMPANY REQUIREMENTS, AND AHJ.
   a. UNLESS SPECIFICALLY INDICATED TO BE EXCLUDED, PROVIDE ALL REQUIRED COMPONENTS, CONDUCTORS, CONNECTORS, CONDUIT, BOXES, FITTING, SUPPORTS, ACCESSORIES, ETC. AS NECESSARY FOR COMPLETE GROUNDING AND BONDING SYSTEM.
   b. PROVIDE PRODUCTS LISTED, CLASSIFIED, AND LABELED AS SUITABLE FOR THE PURPOSE INTENDED, AND LABELED AS COMPLYING WITH UL 467 WHERE APPLICABLE.
   c. WHERE CONDUCTOR SIZE IS NOT INDICATED, SIZE TO COMPLY WITH NEC BUT NOT LESS THAN APPLICABLE MINIMUM SIZE REQUIREMENTS SPECIFIED OR THAT REQUIRED BY THE AHJ.
   d. PROVIDE GROUNDING ELECTRODE SYSTEM. CONCRETE-ENCASED GROUNDING ELECTRODE (UFER GROUND) AT EACH ELECTRICAL SERVICE ENTRANCE. COMPLY WITH UL 467 FOR GROUNDING AND BONDING MATERIALS AND EQUIPMENT. REFER TO ELECTRICAL SINGLE DIAGRAM DETAIL.
   e. PROVIDE A COPPER EQUIPMENT GROUNDING CONDUCTOR IN ALL RACEWAYS.

CONDUIT FOR ELECTRICAL SYSTEM:
1. HOMERUNS SHALL CONSIST OF 3/4" EMT AND #12 COPPER MINIMUM. PANEL FEEDS SHALL BE EMT CONDUIT.
2. CONCEAL ALL CONDUIT AND WIRING IN WALLS AND CEILING SPACES. MECHANICAL/ELECTRICAL ROOMS AND AREAS WITH UNFINISHED SURFACES MAY HAVE EXPOSED CONDUIT.

IDENTIFICATION FOR ELECTRICAL SYSTEM:
1. COMPLY WITH REQUIREMENTS OF NEC.
2. VERIFY FINAL DESIGNATIONS FOR EQUIPMENT, SYSTEMS, AND COMPONENTS TO BE IDENTIFIED PRIOR TO FABRICATION OF IDENTIFICATION PRODUCTS.
3. DO NOT CONCEAL ITEMS TO BE IDENTIFIED, IN LOCATIONS SUCH AS ABOVE SUSPENDED CEILINGS, UNTIL IDENTIFICATION PRODUCTS HAVE BEEN INSTALLED.
4. DO NOT INSTALL IDENTIFICATION PRODUCTS UNTIL FINAL SURFACE FINISHES AND PAINTING ARE COMPLETE.
5. PANELBOARD IDENTIFICATION MUST BE TWO-LAYER OR THREE LAYER LAMINATED ACRYLIC OR ELECTRICALLY NON-CONDUCTIVE PHENOLIC WITH BEVELED EDGES, MINIMUM THICKNESS OF 1/16 INCH; MECHANICALLY ENGRAVED TEXT.

LIGHTING CONTROL DEVICES:
1. PROVIDE PRODUCTS LISTED, CLASSIFIED, AND LABELED AS SUITABLE FOR THE PURPOSE INTENDED.
2. UNLESS SPECIFICALLY INDICATED TO BE EXCLUDED, PROVIDE ALL REQUIRED CONDUIT, WIRING, CONNECTORS, HARDWARE, COMPONENTS, ACCESSORIES, ETC. AS REQUIRED FOR A COMPLETE OPERATING SYSTEM.
3. UNLESS OTHERWISE INDICATED, CONNECT LIGHTING CONTROL DEVICE GROUNDING TERMINAL OR CONDUCTOR TO BRANCH CIRCUIT EQUIPMENT GROUNDING CONDUCTOR AND TO OUTLET BOX WITH BONDING JUMPER.
4. ADJUST OCCUPANCY SENSOR SETTING TO MINIMIZE UNDESIRED ACTIVATIONS WHILE OPTIMIZING ENERGY SAVING, AND TO ACHIEVE DESIRED FUNCTION AS INDICATED OR AS DIRECTED BY ARCHITECT.

INTERIOR LIGHTING:
1. COORDINATE THE INSTALLATION OF LUMINARIES WITH MOUNTING SURFACES INSTALLED UNDER OTHER SECTIONS OR BY OTHERS. COORDINATE THE WORK WITH PLACEMENT OF SUPPORTS, ANCHORS, ETC. REQUIRED FOR MOUNTING. COORDINATE COMPATIBILITY OF LUMINARIES AND ASSOCIATED TRIMS WITH MOUNTING SURFACES AT INSTALLED LOCATIONS.
2. COORDINATE THE PLACEMENT OF LUMINARIES WITH STRUCTURAL MEMBERS, DUCTWORK, PIPING, EQUIPMENT DIFFUSERS, FIRE SUPPRESSION SYSTEM COMPONENTS, AND OTHER POTENTIAL CONFLICTS INSTALLED BY OTHERS.
3. COORDINATE THE PLACEMENT OF EXIT SIGNS WITH FURNITURE, EQUIPMENT, SIGNAGE OR OTHER POTENTIAL VISIBILITY OBSTRUCTIONS INSTALLED BY OTHERS.
4. NOTIFY ARCHITECT OF ANY CONFLICTS OR DEVIATIONS FROM CONTRACT DOCUMENTS TO OBTAIN DIRECTION PRIOR TO PROCEEDING WITH WORK.

EXTERIOR LIGHTING:
1. COORDINATE PLACEMENT OF POLES AND ASSOCIATED FOUNDATIONS WITH UTILITIES, CURBS, SIDEWALKS, TREES, WALLS, FENCES, STRIPING, ETC. INSTALLED BY OTHERS. COORDINATE ELEVATION TO OBTAIN SPECIFIED FOUNDATION HEIGHT.
2. NOTIFY ARCHITECT OF ANY CONFLICTS OR DEVIATIONS FROM CONTRACT DOCUMENTS TO OBTAIN DIRECTION PRIOR TO PROCEEDING WITH WORK.

26 06 00 SCHEDULES FOR ELECTRICAL:
1. PANEL SCHEDULES SHALL BE TYPEWRITTEN DIRECTORY OF CIRCUITS AND PLACED IN LOCATION PROVIDED BY PANELBOARD MANUFACTURER.

26 27 00 WIRING DEVICES:
1. LOCATION AND MOUNTING HEIGHTS OF RECEPTACLES AND SWITCHES AS INDICATED ON ARCHITECTURAL ELEVATIONS. EXACT LOCATION SHALL BE COORDINATED WITH THE ARCHITECT.
2. COLOR AND MATERIALS OF RECEPTACLES AND SWITCHES SHALL BE COORDINATED WITH ARCHITECT AND OWNER.
3. PROVIDE AND INSTALL GFCI AND ARC FAULT PROTECTION REQUIRED BY THE NEC AND AHJ.
4. PROVIDE AND INSTALL TAMPER-RESISTANT(TR) RECEPTACLES REQUIRED BY THE NEC AND AHJ.
5. PROVIDE AND INSTALL WEATHER-RESISTANT RECEPTACLES AND COVERS REQUIRED BY THE NEC AND AHJ.
6. INSTALL WIRING DEVICES IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
7. DO NOT SHARE NEUTRAL CONDUCTOR ON BRANCH CIRCUITS UTILIZING WALL DIMMERS.

26 28 00 ENCLOSED SWITCHES:
1. FOR FUSED SAFETY DISCONNECT SWITCHES FOR MECHANICAL DEVICES, PROVIDE AND INSTALL CLASS RK1 TIME-DELAY FUSES UNLESS SPECIFIED BY EQUIPMENT MANUFACTURER. PROVIDE FUSES OF THE SAME TYPE, RATING AND MANUFACTURER WITHIN THE SAME SWITCH.
2. PROVIDE AND INSTALL DISCONNECTING MEANS AT ALL LOCATIONS REQUIRED BY THE NEC AND AHJ.

27 00 00 COMMUNICATIONS:
1. TYPICAL END USER (CORD CONNECTED) ELECTRICAL EQUIPMENT, SUCH AS BUT NOT LIMITED TO; TELEPHONES, COMPUTER, OFFICE EQUIPMENT, TOOLING, OTHER CORD CONNECTED EQUIPMENT, ETC. SHALL BE PROVIDED BY OTHERS. GENERAL CONTRACTOR SHALL PROVIDE COORDINATION WITH OUTSIDE VENDORS/INSTALLERS REGARDING DELIVERIES, COMMISSIONING, AND TRAINING AS DIRECTED BY OWNER.
2. PROVIDE PROPER GROUNDING AND BONDING PER EQUIPMENT INSTALLATION INSTRUCTIONS.
3. COMPLY WITH INSPECTION AND TESTING REQUIREMENTS OF SPECIFIED INSTALLATION STANDARDS.
4. AFTER ALL WORK IS COMPLETE, INCLUDING INSTALLATION OF TELECOMMUNICATIONS OUTLETS, AND TELEPHONE DIAL TONE SERVICE IS ACTIVE, TEST EACH VOICE JACK FOR DIAL TONE.

28 00 00 FIRE DETECTION AND ALARM:
1. GENERAL CONTRACTOR SHALL PROVIDE COORDINATION WITH OUTSIDE VENDORS/INSTALLERS REGARDING FIRE DETECTION AND ALARM SYSTEM. GENERAL CONTRACTOR SHALL PROVIDE CLOSEOUT AND MAINTENANCE INSTRUCTION PLANS PER EQUIPMENT MANUFACTURER'S RECOMMENDATIONS AND INSTRUCTIONS.
2. INSTALLATION OF FIRE DETECTION AND ALARM SYSTEM SHALL BE DESIGNED BY CERTIFIED OR REGISTERED FIRE PROTECTION ENGINEER, EMPLOYED BY FIRE ALARM CONTROL PANEL MANUFACTURER, CONTRACTOR, OR INSTALLER WITH EXPERIENCE DESIGNING FIRE ALARM SYSTEMS IN THE JURISDICTIONAL AREA OF THE AHJ.
3. INSTALL IN ACCORDANCE WITH APPLICABLE CODES, NEC, NFPA 72, AND CONTRACT DOCUMENTS.
4. CONCEAL ALL WIRING, CONDUIT, BOXES, AND SUPPORTS WHERE INSTALLED IN FINISHED AREA.
5. OBTAIN OWNER'S APPROVAL OF LOCATIONS OF DEVICES BEFORE INSTALLATION.
6. INSTALL INSTRUCTION CARDS AND LABELS AS REQUIRED.

ELECTRICAL ABBREVIATIONS LIST

1P	1 POLE (2P, 3P, 4P, ETC.)
A	AMPERE
AC	ABOVE COUNTER OR AIR CONDITIONER
ACLG	ABOVE CEILING
ADO	AUTOMATIC DOOR OPENER
AF	AMP FRAME
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AFI	ARC FAULT CIRCUIT INTERRUPTER
AHU	AIR HANDLING UNIT
AL	ALUMINUM
ALT	ALTERNATE
AMP	AMPERE
AMPL	AMPLIFIER
ANNUN	ANNUNCIATOR
APPROX	APPROXIMATELY
AQ-STAT	AQUASTAT
ARCH	ARCHITECT, ARCHITECTURAL
AS	AMP SWITCH
AT	AMP TRIP
ATS	AUTOMATIC TRANSFER SWITCH
AUTO	AUTOMATIC
AUX	AUXILIARY
AV	AUDIO VISUAL
AWG	AMERICAN WIRE GAUGE
BATT	BATTERY
BD	BOARD
BLDG	BUILDING
BMS	BUILDING MANAGEMENT SYSTEM
C	CONDUIT
CAB	CABINET
CAT	CATALOG
CATV	CABLE TELEVISION
CB	CIRCUIT BREAKER
CCTV	CLOSED CIRCUIT TELEVISION
CKT	CIRCUIT
CLG	CEILING
COMB	COMBINATION
CMPR	COMPRESSOR
CONN	CONNECTION
CONST	CONSTRUCTION
CONT	CONTINUATION OR CONTINUOUS
CONTR	CONTRACTOR
CONV	CONVECTOR
CP	CIRCULATING PUMP
CRT	CATHODE-RAY TUBE
CT	CURRENT TRANSFORMER
CTR	CENTER
CU	COPPER
DCP PUMP	DOMESTIC WATER CIRCULATING
DEPT	DEPARTMENT
DET	DETAIL
DIA	DIAMETER
DISC	DISCONNECT
DIST	DISTRIBUTION
DN	DOWN
DS	SAFETY DISCONNECT SWITCH
DT	DOUBLE THROW
DWG	DRAWING
(E)	EXISTING
EC	ELECTRICAL CONTRACTOR

ELEC	ELECTRIC, ELECTRICAL
ELEV	ELEVATOR
EM	EMERGENCY
EMS	ENERGY MANAGEMENT SYSTEM
EMT	ELECTRICAL METALLIC TUBING
EP	ELECTRIC PNEUMATIC
EQUIP	EQUIPMENT
EWC	ELECTRIC WATER COOLER
EXIST	EXISTING
EXH	EXHAUST
EXP	EXPLOSION PROOF
FA	FIRE ALARM
FABP	FIRE ALARM BOOSTER POWER SUPPLY PANEL
FACP	FIRE ALARM CONTROL PANEL
FCU	FAN COIL UNIT
FIXT	FIXTURE
FLR	FLOOR
FLUOR	FLUORESCENT
FU	FUSE
FUDS	FUSED SAFETY DISCONNECT SWITCH
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GEN	GENERATOR
GFI	GROUND FAULT CIRCUIT INTERRUPTER
GFP	GROUND FAULT PROTECTOR
GND	GROUND
GRS	GALVANIZED RIGID STEEL (CONDUIT)
GYP BD	GYPSUM BOARD
HOA	HANDS-OFF-AUTOMATIC SWITCH
HORIZ	HORIZONTAL
HP	HORSEPOWER
HPF	HIGH POWER FACTOR
HT	HEIGHT
HTG	HEATING
HTR	HEATER
HV	HIGH VOLTAGE
HVAC	HEATING, VENTILATING AND AIR CONDITIONING
HWP	HYDRONIC WATER PUMP
IC	INTERRUPTING CAPACITY
IG	ISOLATED GROUND
IMC	INTERMEDIATE METAL CONDUIT
INCAND	INCANDESCENT
IR	INFRARED
I/W	INTERLOCK WITH
J-BOX	JUNCTION BOX
KV	KILOVOLT
KVA	KILOVOLT-AMPERE
KVAR	KILOVOLT-AMPERE REACTIVE
KW	KILOWATT
KWH	KILOWATT HOUR
LOC	LOCATE OR LOCATION
L, LTG	LIGHTS, LIGHTING
LTNG	LIGHTNING
LV	LOW VOLTAGE
M, MTR	MOTOR, MOTORIZED
MAX	MAXIMUM
MAG.S	MAGNETIC STARTER
M/C	MOMENTARY CONTACT
MC	MECHANICAL CONTRACTOR
MCB	MAIN CIRCUIT BREAKER

MCC	MOTOR CONTROL CENTER
MDC	MAIN DISTRIBUTION CENTER
MDP	MAIN DISTRIBUTION PANEL
MFR	MANUFACTURER
MFS	MAIN FUSED DISCONNECT SWITCH
MH	MANHOLE
MIC	MICROPHONE
MIN	MINIMUM
MISC	MISCELLANEOUS
MLO	MAIN LUGS ONLY
MMS	MANUAL MOTOR STARTER
MOA	MULTIOUTLET ASSEMBLY
MSP	MOTOR STARTER PANELBOARD
MSBD	MAIN SWITCHBOARD
MT	MOUNT
MT.C	EMPTY CONDUIT
MTS	MANUAL TRANSFER SWITCH
(N)	NEW
N.C.	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION
NFDS	NON-FUSED SAFETY DISCONNECT SWITCH
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
N.O.	NORMALLY OPEN
NPF	NORMAL POWER FACTOR
NTS	NOT TO SCALE
OH	OVERHEAD
OL	OVERLOADS
PA	PUBLIC ADDRESS
PB	PULL BOX OR PUSHBUTTON
PE	PNEUMATIC ELECTRIC
PED	PEDESTAL
PF	POWER FACTOR
PH	PHASE
PNL	PANEL
PP	POWER POLE
PR	PAIR
PRI	PRIMARY
PROJ	PROJECTION
PRV	POWER ROOF VENTILATOR
PT	POTENTIAL TRANSFORMER
PVC	POLYVINYL CHLORIDE (CONDUIT)
PWR	POWER
QUAN	QUANTITY
(R)	RELOCATED
R, RCPT	RECEPTACLE
REQD	REQUIRED
RM	ROOM
RSC	RIGID STEEL CONDUIT
RTU	ROOF TOP UNIT
SC	SURFACE CONDUIT
SEC	SECONDARY
SHT	SHEET
SIM	SIMILAR
S/N	SOLID NEUTRAL
SPEC	SPECIFICATION
SPKR	SPEAKER
SP	SPARE
SR	SURFACE RACEWAY
SS	STAINLESS STEEL

S/S	STOP/START PUSHBUTTONS
STA	STATION
STD	STANDARD
SURF	SURFACE MOUNTED
SW	SWITCH
SWBD	SWITCHBOARD
SYM	SYMMETRICAL
SYS	SYSTEM
TEL	TELEPHONE
TEL/DATA	TELEPHONE/DATA
TERM	TERMINAL
TL	TWIST LOCK
TR	TAMPER RESISTANT
T-STAT	THERMOSTAT
TTC	TELEPHONE TERMINAL CABINET
TV	TELEVISION
TVTC	TELEVISION TERMINAL CABINET
TYP	TYPICAL
UC	UNDER COUNTER
UE	UNDERGROUND ELECTRICAL
UG	UNDERGROUND
UH	UNIT HEATER
UT	UNDERGROUND TELEPHONE
UTIL	UTILITY
UV	UNIT VENTILATOR OR ULTRAVIOLET
V	VOLT
VA	VOLT-AMPERES
VDT	VIDEO DISPLAY TERMINAL
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VOL	VOLUME
W	WATT
W/	WITH
WG	WIRE GUARD
WH	WATER HEATER
W/O	WITHOUT
WP	WEATHERPROOF
XFMR	TRANSFORMER
XFR	TRANSFER
∠	ANGLE
@	AT
▲	DELTA
'	FEET
"	INCHES
#	NUMBER
Ø	PHASE
C	CENTER LINE
P	PLATE

SPECIFIC CODE NOTES

FIRE PROTECTION & SOUND REQUIREMENTS

A. PENETRATIONS IN WALLS REQUIRING PROTECTED OPENINGS MUST BE FIRESTOPPED WITH AN APPROVED MATERIAL. REFER TO ARCHITECTURAL DRAWINGS FOR LOCATIONS OF FIRE/SOUND RATED WALLS AND CEILINGS.
B. LIGHT FIXTURES AND OTHER APPARATUS SUPPORTED BY THE ACOUSTICAL CEILING GRID MUST MEET THE REQUIREMENTS OF NEC SECTION 410.36, MEANS OF SUPPORT.
   1. CONDUITS MAY PENETRATE WALLS OR PARTITIONS, PROVIDED THEY ARE FIRE-STOPPED.
   2. OPENINGS FOR STEEL ELECTRICAL BOXES NOT EXCEEDING 16 SQUARE INCHES ARE PERMITTED PROVIDED OPENINGS DO NOT AGGREGATE MORE THAN 100 SQUARE INCHES FOR ANY 100 SQUARE FEET OF WALL OR PARTITION.
   3. OUTLET BOXES ON OPPOSITE SIDES OF WALLS OR PARTITIONS MUST BE SEPARATED BY A HORIZONTAL DISTANCE OF 24 INCHES WHERE POSSIBLE WITHOUT ADDING HAVING TO ADD RECEPTACLES. WHERE 24" SPACING IS NOT POSSIBLE, USE MAXIMUM SEPARATION AND AVOID USING THE STUD BAY IF POSSIBLE.
   4. PROVIDE PUTTY PADS AROUND BOXES IN FIRE RATED WALLS AND ACOUSTICAL ASSEMBLIES. PUTTY PACKS SHALL BE INSTALLED SO THAT GYPSUM BOARD SEALS AIR GAP.
C. RECESSED LIGHTING FIXTURES INSTALLED IN FIRE RATED CEILING ASSEMBLIES SHALL BE FIRE RATED FIXTURES BEARING THE UL FIRE RATED LABEL. FIXTURES SHALL BE INSTALLED IN ACCORDANCE WITH THE UL FIRE RESISTANCE DIRECTORY, AND SHALL INCLUDE A FIRE RATED ENCLOSURE INSTALLED OVER THE FIXTURE THAT MEETS THE REQUIREMENTS OF THE UL FIRE RESISTANCE DIRECTORY.

1-E1.02D

- 1 — DENOTES BUILDING NUMBER (OMIT ON SINGLE BUILDING PROJECTS)
- E — DENOTES SPECIFIC DISCIPLINE
- 1 — DENOTES SHEET TYPE
- 0 — DENOTES BUILDING LEVEL (0 IS BASEMENT/CRAWLSPACE LEVEL 1 IS 1 ETC.)
- 2 — DENOTES SHEET COUNT
- D — DENOTES DEMO PLANS (OMIT ON NON DEMO SHEETS)

* NOTE *
THE SYMBOLS AND ABBREVIATIONS SHOWN ON THIS SHEET MAY OR MAY NOT BE USED IN THIS SET OF DRAWINGS.

ELECTRICAL SYMBOL NOTES

Symbol label	Description
D	THE CONTROL DEVICE DESIGNATION IS INDICATED BY A LOWER CASE LETTER. EXAMPLE: SINGLE POLE SWITCH "d" TO CONTROL LIGHTING FIXTURES INDICATED BY "D".
1,3,5	SPECIAL CONNECTIONS. THE EQUIPMENT IS INDICATED BY A NUMBER IN A CIRCLE. SEE THE MOTOR AND EQUIPMENT SCHEDULE FOR THE LOAD DESCRIPTION AND TYPE OF CONNECTION. THE CIRCUIT DESIGNATION IS INDICATED BY NUMBER(S) ADJACENT TO THE SYMBOL. EXAMPLE: EQUIPMENT NO. 1; 3 PHASE CONNECTION TO CIRCUITS 1, 3, 5.
LPN-1,3,5	HOME RUN TO BRANCH CIRCUIT PANELBOARD. THE PANELBOARD DESIGNATION IS SHOWN WITH THE HOME RUN ARROW AIMING AT THE ID. CIRCUIT BREAKER SIZES (AMPS/NUMBER OF POLES) ARE SHOWN IN THE PANELBOARD SCHEDULE WITH THE CORRESPONDING PANELBOARD AND CIRCUIT DESIGNATION. EXAMPLE: HOME RUN TO PANELBOARD LPN; CIRCUITS 1, 3, 5.
30AF/2P/3R 15A FU	DISCONNECT NOTATION. EXAMPLE: 30 AMP FRAME DISCONNECT, 2 POLE, NEMA 3R, 15 AMP FUSE
T1	TRANSFORMERS. THE TRANSFORMER TYPE IS INDICATED BY A NUMBER FOLLOWING THE UPPER CASE LETTER "T". SEE THE TRANSFORMER SCHEDULE OR THE SINGLE LINE DIAGRAM FOR THE TRANSFORMER DESCRIPTION AND REQUIREMENTS. EXAMPLE: TRANSFORMER TYPE "T1".
LPN-102	PANEL BOARDS. PANELBOARD DOORS MAY BE SHOWN TO INDICATE OPENING SIDE OF RECESSED PANEL BOARDS.
1	KEYNOTE. SEE THE SPECIAL NOTES ON THAT SHEET FOR THE NOTE NUMBER INDICATED IN THE HEXAGON.
(ISO)	CONDUIT/WIRES SHOWN WITH SLASH MARKS. SLASH MARK INDICATORS ARE: SHORT STRAIGHT = PHASE CONDUCTOR; LONG STRAIGHT = NEUTRAL; GROUND = DOT; ISOLATED GROUND = DOT WITH T
$ P1-11,13	CIRCUIT ID. NOTATION IS FOUND NEXT TO A SWITCH, WIRE, LIGHT, RCPT OR EQMT. INDICATES PANEL NAME AND CIRCUIT NUMBER(S). EXAMPLE: PANEL P1, CIRCUIT NUMBERS 11 & 13.

CODE COMPLIANCE

BUILDING ELECTRICAL SYSTEMS ARE DESIGNED IN ACCORDANCE WITH THE FOLLOWING CODES:

- 2021 IBC (INTERNATIONAL BUILDING CODE)
- 2021 IEBC (INTERNATIONAL EXISTING BUILDING CODE)
- 2017 ICC A117.1 - ACCESSIBLITY
- 2020 NFPA 70 (NATIONAL ELECTRICAL CODE)
- 2021 IECC (INTERNATIONAL ENERGY CONSERVATION CODE)
- NFPA 72 CURRENT EDITION

ELECTRICAL MOUNTING HEIGHTS

HEIGHTS ARE TO CENTER OF BOX UNLESS OTHERWISE NOTED

RECEPTACLE	18"
SWITCH	46"
THERMOSTAT	58"
DATA/TEL	18"
PANELBOARD	72" TOP OF ENCLOSURE
FA PULL STATION	46"
FA HORN STROBE	12" BELOW CEILING, IF CEILING IS 80"-96" AFF
FA HORN HORN	86" OR 6" BELOW CEILING
TV/AV/INTERCOM	86"
EXIT SIGN	12" ABOVE DOOR TO CENTER OF FIXTURE, UNLESS CEILING MOUNTED

ELECTRICAL SHEET INDEX

JACKOLA · SINCE 1969 · P.C. · Engineering, Architecture, Surveying, Land Use Planning
KALISPELL 406-755-3208 | BOZEMAN 406-586-0707 | VANCOUVER 360-852-8746
info@jackola.com jackola.com

MONTANA · DANIEL LEE TINTZMAN · No. 15453PE · LICENSED · PROFESSIONAL ENGINEER · 02/21/24

REVIEW SET

COLUMBIA FALLS HIGH SCHOOL ROOF REPLACEMENT

COLUMBIA FALLS,MT 59912

DRAWN: DLT CHECKED: DLT
DATE: 02/21/2024

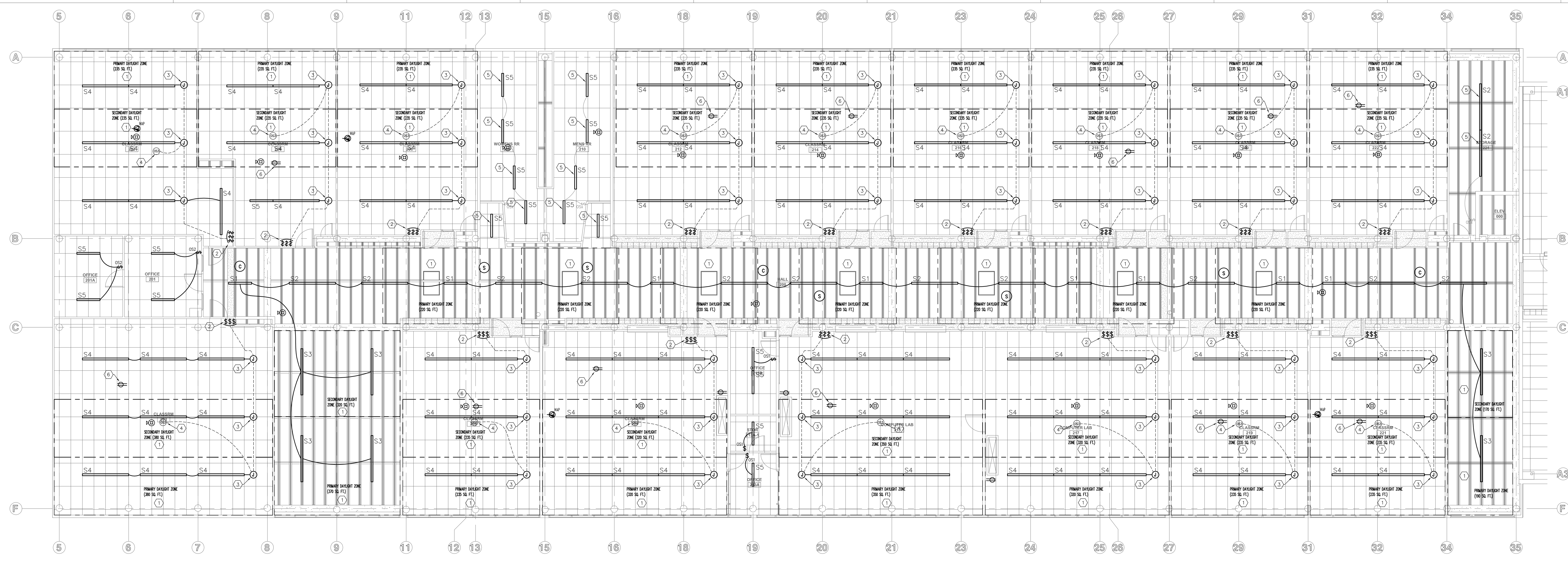
REVISIONS:

ELECTRICAL TITLE SHEET

ELECTRICAL CONSULTANT
K.B. Engineering, Inc.
P.O. Box 8694 Ph: 406.212.1624
Kalispell, MT 59904 Fax: 406.257.0107
KBengineers@centurytel.net

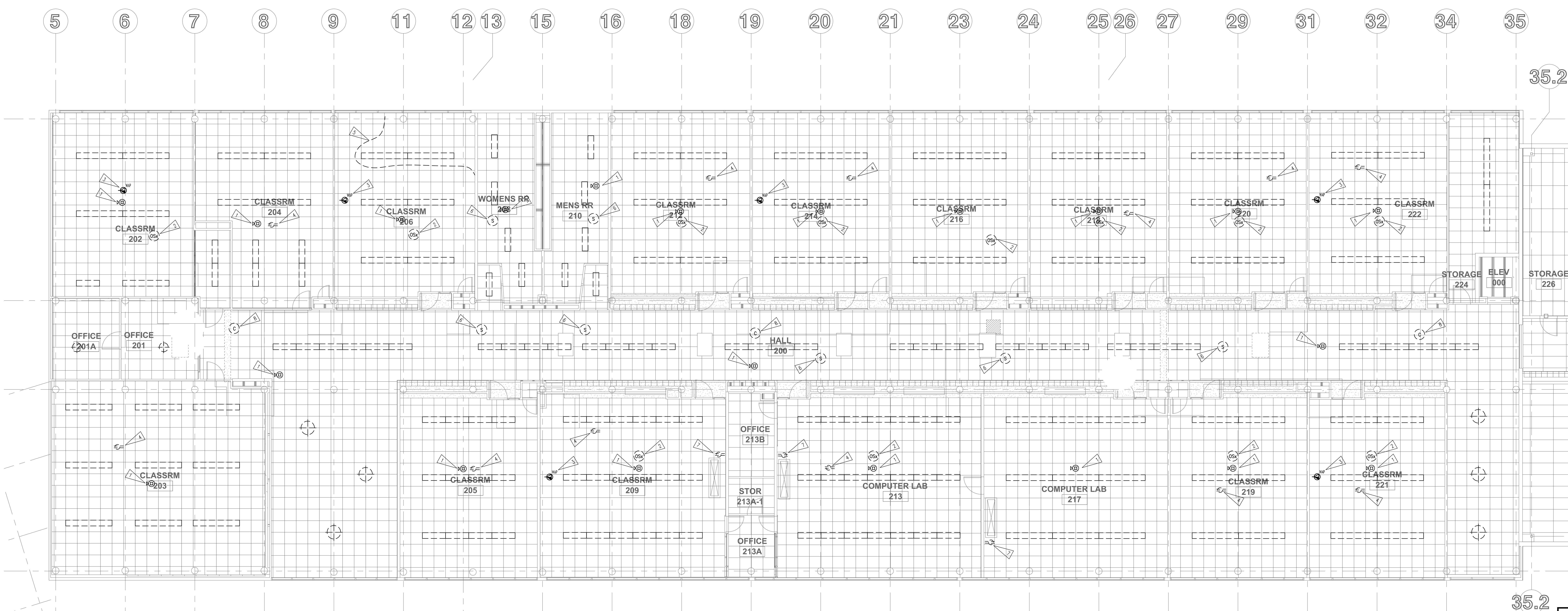
E0.00

PROJECT #:Project Number



1 UPPER LEVEL LIGHTING PLAN - EAST - NEW WORK

1/8" = 1'-0"



2 UPPER LEVEL LIGHTING PLAN - EAST - DEMO

1/8" = 1'-0"

GENERAL NOTES:

1. SHOULD THE CONTRACTOR EXCEED THE ROUTING INDICATED ON THE DRAWING, THE CONDUCTOR AND CONDUIT SHALL BE INCREASED TO ALLOW FOR A 3% (MAX) VOLTAGE DROP, AND THE CONTRACTOR MUST NOTIFY THE ENGINEER IN WRITING PRIOR TO ANY DEVIATION.
2. ALL HOMERUNS SHALL BE IN 3/4" EMT CONDUIT MIN. CONCEALED BRANCH CIRCUITS WITH 3 WIRES OR LESS MAY BE MC CABLE.
3. ALL CONDUCTORS TO BE THHN/THWN COPPER, UNLESS NOTED OTHERWISE. ALUMINUM BRANCH CIRCUIT AND FEEDER CONDUCTORS MAY BE USED ON CIRCUITS 200A AND LARGER.
4. ALL HOMERUNS OVER 75 FEET SHALL BE UPSIZED AS NECESSARY TO KEEP THE BRANCH CIRCUIT VOLTAGE DROP BELOW 3%.
5. CONTRACTOR SHALL FIRE SEAL ALL BOXES AND CONDUIT PENETRATIONS THROUGH FIRE RATED WALLS TO MAINTAIN FIRE RATING WHERE APPLICABLE. SEE ARCHITECTURAL DRAWINGS FOR FIRE RATINGS.
6. CONCEAL ALL RACEWAYS AND/OR CONDUIT. EXPOSED RACEWAYS AND/OR CONDUIT ARE ONLY ALLOWED IN UNFINISHED CEILINGS, MECHANICAL, OR ELECTRICAL ROOMS.

DEVICE NOTES:

1. CONSULT AND REFERENCE ARCHITECTURAL FOR CEILING HEIGHTS, FINISHES, AND ALL DEVICE AND COVER PLATE COLORS.
2. ALL LAY-IN FIXTURES SHALL BE INDEPENDENTLY SUPPORTED WITH 12GA WIRE, PER IBC, DIRECTLY TO STRUCTURE FROM OPPOSITE CORNERS.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR CORE DRILLING STRUCTURE AND STUDS FOR CONDUITS AND RACEWAYS. PENETRATIONS THROUGH STRUCTURAL MEMBERS SHALL NOT BE MADE WITHIN THE TOP OR BOTTOM 15% OF MEMBER. PENETRATIONS LARGER THAN 2"Ø SHALL BE APPROVED BY STRUCTURAL ENGINEER PRIOR TO WORK. PROTECT WIRES WITHIN 1.25" OF STUD EDGE WITH STEEL PLATE, RACO OR EQUAL.
4. ALL FACE PLATES ARE TO BE LEVEL, PLUMB, AND ALIGNED WITH OTHER FACE PLATES, HORIZONTALLY AND VERTICALLY, WHERE OCCURS. PROVIDE UNIFORM COMMON INSTALLATION THROUGHOUT.

KEY NOTES:

1. PROVIDE CONTINUOUS DIMMING DAYLIGHT SENSING CONTROLS FOR THE SKYLIGHT AND SIDELIGHT DAYLIGHT ZONES TO AUTOMATICALLY REDUCE THE POWER OF THE GENERAL LIGHTING IN RESPONSE TO THE AVAILABLE DAYLIGHT. ALL LIGHT FIXTURES WITHIN THE ZONE SHALL DIM SIMULTANEOUSLY TO MAINTAIN UNIFORM ILLUMINATION IN THE ZONE. THE PRIMARY ZONE SHALL DIM SEPARATELY FROM THE SECONDARY ZONE. CONFIGURE ALL DAYLIGHT RESPONSIVE CONTROLS TO COMPLETELY SHUT OFF ALL CONTROLLED LIGHTS IN THE ZONE. NO SWITCHING IS ALLOWED TO OVERRIDE THE DIMMING OF THESE ZONES.
2. PROVIDE ADDITIONAL SWITCHING TO ACHIEVE (3) INDIVIDUAL ROWS OF LIGHTING CONTROL (CRESTRON ZUMLINK-KP-R-W, OR EQUAL).
3. J-BOX LOAD CONTROLLER FOR DIMMING OF 0-10V LED DRIVERS (CRESTRON ZUMLINK-JBOX-16A-LV, OR EQUAL).
4. DUAL TECHNOLOGY PRESENCE DETECTOR WITH DAYLIGHT SENSING (CRESTRON ZUMLINK-DT-QUATTRO-DLS, OR EQUAL).
5. ONE-FOR-ONE FIXTURE REPLACEMENT. UTILIZE EXISTING BRANCH CIRCUIT & SWITCHING.
6. MOUNT CEILING RECEPTACLE FLUSH WITH THE NEW ACT CEILING TILES. UTILIZE EXISTING BRANCH CIRCUIT WITH NEW MC CABLE. REFER TO DEMO NOTE 4.

GENERAL DEMOLITION NOTES:

1. DURING CONSTRUCTION, THE CONTRACTOR SHALL PROVIDE ANY NECESSARY TEMPORARY CONNECTIONS TO MAINTAIN SERVICES TO THE OCCUPIED PARTS OF THE BUILDING UNTIL THE NEW SERVICE AND POWER DISTRIBUTION SYSTEM CAN BE INSTALLED. CORRDINATE WITH ARCHITECT/OWNER.
2. REMOVE ALL WIRE BACK TO ITS SOURCE WHEREVER EXISTING CIRCUITS ARE ABANDONED OR DEMOLISHED. REMOVE ABANDONED RACEWAY AND BOXES UNLESS CONCEALED IN CONCRETE OR MASONRY CONSTRUCTION. REMOVE EXISTING LIGHT FIXTURES, SWITCHES, RECEPTACLES, AND POWER FEEDS TO EXISTING MECHANICAL EQUIPMENT SCHEDULED FOR REMOVAL.
3. REMOVE ALL ABANDONED ELECTRICAL EQUIPMENT AND RETURN TO OWNER AS DIRECTED. ALL ABANDONED EQUIPMENT REMAINS THE PROPERTY OF THE OWNER. ITEMS WHICH THE OWNER DOES NOT CHOOSE TO RETAIN SHALL BE REMOVED BY THE CONTRACTOR FROM THE BUILDING AND DISPOSED OF IN AN APPROVED AND LEGAL MANNER.
4. REINSTALL EXISTING ELECTRICAL INSTALLATIONS DISTURBED. CERTAIN EXISTING ELECTRICAL INSTALLATIONS MAY BE LOCATED IN WALLS, CEILINGS, OR FLOORS THAT ARE TO BE REMOVED AND ARE ESSENTIAL FOR THE OPERATION OF OTHER REMAINING INSTALLATIONS. WHERE THIS CONDITION OCCURS, PROVIDE A NEW EXTENSION OF THE ORIGINAL CIRCUITS, RACEWAYS, EQUIPMENT, AND OUTLETS TO RETAIN SERVICE CONTINUITY. INSTALLATIONS SHALL BE CONCEALED IN FINISHED AREAS, WHERE POSSIBLE.
5. SALVAGE ALL LIGHTING FIXTURES, LAMPS, BALLASTS, AND ASSOCIATED HARDWARE TO THE OWNER. ITEMS THAT THE OWNER DOES NOT WISH TO KEEP SHALL BE DISPOSED OF IN A PROPER AND LEGAL MANNER.
6. EPA REGULATIONS REQUIRE CONTROLLED DISPOSAL OF FLUORESCENT LIGHTING BALLAST CONTAINING PCBS WHEN REMOVED FROM SERVICE. THE BALLAST INVOLVED WERE GENERALLY MANUFACTURED BETWEEN 1950 AND 1979. CONTRACTOR'S DISPOSAL OF PCB CONTAINING BALLAST SHALL COMPLY WITH EPA REQUIREMENTS.
7. SEE ARCHITECTURAL PLANS FOR RELATED DEMOLITION REQUIREMENTS.
8. NOT ALL EXISTING DEVICES ARE SHOWN ON THESE PLANS. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING ALL DEMOLITION WORK WITH THE GENERAL CONTRACTOR, THE ARCHITECT, AND THE REST OF THE CONSTRUCTION DOCUMENTS PRIOR TO INITIATING ANY WORK.

LEGEND:

EXISTING ELECTRICAL DEVICE TO REMAIN (SHADED)

ELECTRICAL DEVICE TO BE DEMOLISHED (BOLD/DASHED)

DEMO KEY NOTES: X

1. REMOVE CEILING MOUNTED FIRE ALARM HORN/STROBE AND REINSTALL AFTER NEW CEILING IS IN PLACE.
2. REMOVE CEILING MOUNTED OCCUPANCY SENSOR. A COMBO OCCUPANCY/DAYLIGHT SENSOR SHALL BE INSTALLED IN ITS PLACE.
3. REMOVE CEILING MOUNTED WIRELESS ACCESS POINT AND REINSTALL AFTER NEW CEILING IS IN PLACE.
4. REMOVE CEILING MOUNTED RECEPTACLE AND REINSTALL NEW RECEPTACLE AFTER NEW CEILING IS IN PLACE. DEMO ALL SURFACE RACEWAY. MOUNT RECEPTACLE FLUSH WITH THE NEW ACT CEILING TILES. UTILIZE EXISTING BRANCH CIRCUIT WITH NEW MC CABLE.
5. REMOVE AND REROUTE TV MONITOR CABLING. PROVIDE RACEWAY ABOVE THE CEILING.
6. REMOVE SPEAKER AND REINSTALL AFTER NEW CEILING IS IN PLACE.
7. HVAC UNIT TO REMAIN. REMOVE CEILING MOUNTED RECEPTACLE AND REINSTALL NEW FLUSH MOUNTED RECEPTACLE AFTER NEW CEILING IS IN PLACE.
8. REMOVE CEILING MOUNTED CAMERA AND REINSTALL AFTER CEILING WORK COMPLETE.

ELECTRICAL CONSULTANT
K.B. Engineering, Inc.
P.O. Box 8694 Ph: 406.212.1624
Kalispell, MT 59904 Fax: 406.257.0107
KBengineers@centurytel.net

JACKOLA P.C. SINCE 1969
Engineering, Architecture, Surveying, Land Use Planning
KALISPELL 406-755-3208 | BOZEMAN 406-586-0707 | VANCOUVER 360-852-8746
info@jackola.com jackola.com

MONTANA DANIEL LEE TINTZMAN NO. 15453PE LICENSED PROFESSIONAL ENGINEER 02/21/24

REVIEW SET

COLUMBIA FALLS HIGH SCHOOL ROOF REPLACEMENT

COLUMBIA FALLS, MT 59912

DRAWN: DLT CHECKED: DLT

DATE: 02/21/2024

REVISIONS:

UPPER LEVEL LIGHTING PLAN EAST WING

E1.22

OCCUPANCY SENSOR SCHEDULE

TAG	MANUFACTURER	PART NUMBER
OS1	WATT STOPPER PW-100	PIR LINE VOLTAGE WALL SWITCH WITH 900 SF COVERAGE. SET OFF DELAY TO 30 MINUTES AND SENSITIVITY TO MAX.
OS2	WATT STOPPER PW-200	WALL MOUNT DUAL RELAY OCCUPANCY SENSOR WITH 1000 SF COVERAGE. CONNECT TO LINE VOLTAGE. SET OFF DELAY TO 30 MINUTES AND SENSITIVITY TO MAX.
OS3	CRESTRON ZUMLINK DT-QUATTRO-DLS	CEILING MOUNT DUAL TECHNOLGY OCCUPANCY SENSOR WITH DAYLIGHT SENSING. CONNECT TO LOAD CONTROLLER. SET OFF DELAY TO 30 MINUTES AND SENSITIVITY TO MAX.

LIGHTING FIXTURE SCHEDULE

TYPE	DESCRIPTION	LAMPS PER FIXTURE	WATTS PER LAMP	LAMP SIZE	VOLTS	MAX WATTS	MOUNTING	MFG & P/N	NOTES
S1	4' Surface Arch Slimline Linear LED	1	42	6,000 Lumen LED 3500k	120	42	Surface	HEWilliams: LLM-4-L15-835-S-SQ-AWNSBL DSR-UNV	Provide daylight control; Black finish
S2	8' Surface Arch Slimline Linear LED	1	83	12,000 Lumen LED 3500k	120	83	Surface	HEWilliams: LLM-8-L15-835-S-SQ-AWNSBL DSR-UNV	Provide daylight control; Black finish
S3	8' Surface Arch Slimline Linear LED	1	110	16,000 Lumen LED 3500k	120	110	Surface	HEWilliams: LLM-8-L20-835-S-SQ-AWNSBL DSR-UNV	Provide daylight control; Black finish
S4	8' Surface Arch Edge-Lit Linear LED	1	54	1,000 Lm/ft LED 3500k	120	54	Surface	Xico: ESO275-S-8-MWH-E2-OFL-SUN/35-DBW65-100-UNV-FD01-RLDB-T1-S24WH	Provide daylight control; White finish, T-BAR mount;
S5	4' Surface Arch Edge-Lit Linear LED	1	27	1,000 Lm/ft LED 3500k	120	27	Surface	Xico: ESO275-S-4-MWH-E2-OFL-SUN/35-DBW65-100-UNV-FDND-NN-T1-S24WH	White finish, T-BAR mount;
GT1	2x4 Recessed Grid Troffer	1	37	4,900 Lumen LED 4000k	120	37	Recessed	HEWilliams: PT-24-L49-840-RA-DIM-UNV	

NOTES: ALL FIXTURES SHALL BE OF THE LED TYPE.

ELECTRICAL CONSULTANT

K.B. Engineering, Inc.
P.O. Box 8694 Ph: 406.212.1624
Kalispell, MT 59904 Fax: 406.257.0107
KBengineers@centurytel.net

JACKOLA P.C.
SINCE 1969
Engineering, Architecture, Surveying, Land Use Planning
KALISPELL 406-755-3208 | BOZEMAN 406-586-0707 | VANCOUVER 360-852-8746
info@jackola.com jackola.com

MONTANA
DANIEL LEE TINTZMAN
NO. 15453PE
LICENSED
PROFESSIONAL ENGINEER
02/21/24

REVIEW SET

COLUMBIA FALLS HIGH SCHOOL ROOF REPLACEMENT

COLUMBIA FALLS,MT 59912

DRAWN: DLT CHECKED: DLT

DATE: 02/21/2024

REVISIONS:

ELECTRICAL SCHEDULES

E8.00

PROJECT #Project Number