### GRAYLING HIGH SCHOOL HVAC UPGRADES

#### ALTERNATE #2

BID SET - 01.17.2025

#### **GENERAL NOTES**

#### OWNERSHIP AND USE OF DOCUMENTS:

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- · ALL DIMENSIONS AND EXISTING CONDITIONS SHALL BE CHECKED AND VERIFIED BY THE CONTRACTOR AT THE SITE
- HOLD INDICATED DIMENSIONS. DO NOT SCALE DRAWINGS. RESOLVE ANY DISCREPANCIES WITH THE ARCHITECT BEFORE BEGINNING
- IN THE CASE OF AN INCONSISTENCY BETWEEN THE DRAWINGS AND SPECIFICATIONS, OR WITHIN EITHER DOCUMENT NOT CLARIFIED BY ADDENDUM, THE BETTER QUALITY, MORE EXPENSIVE, OR GREATER QUANTITY OF WORK SHALL BE PROVIDED IN ACCORDANCE WITH THE
- · ALL CONSTRUCTION THAT IS ALREADY IN PLACE THAT IS TO REMAIN AS PART OF THE PROJECT SHALL BE PROTECTED FROM DAMAGE SHALL BE PROTECTED THROUGHOUT THE PERIOD OF CONSTRUCTION WORK. ANY DAMAGED CONSTRUCTION OR FEATURES SHALL BE REPLACED AT THE EXPENSE OF THE CONTRACTOR TO THE SATISFACTION OF THE OWNER WITH MATERIALS EQUIVALENT OR SUPERIOR
- IT SHALL BE THE RESPONSIBILITY OF EACH CONTRACTOR TO VERIFY ALL DIMENSIONS AND INSPECT CONDITIONS OF PRIOR WORK OF THE OTHER TRADES BEFORE STARTING WORK. PROCEEDING WITH THE WORK SHALL CONSTITUTE ACCEPTANCE OF PRIOR WORK.
- $\cdot$  ALL ELECTRICAL OUTLETS, DATA & TELEPHONE OUTLETS/JACKS, SWITCHES, PULL STATIONS, THERMOSTATS, EXIT LIGHTS, AND ALL
- · UNLESS OTHERWISE SHOWN, PLACING OF ACCESS DOORS IN GYPSUM CEILINGS SHALL NOT BE ACCEPTED. LOCATE AND INSTALL ALL WORK AS REQUIRED TO PRECLUDE THE NEED FOR ACCESS THROUGH THE CEILINGS. COORDINATION OF THIS REQUIREMENT SHALL BE
- PROVIDE BLOCKING IN PARTITIONS AS REQUIRED FOR ALL MILLWORK, CASEWORK, ACCESSORIES OR OTHER SIMILAR ITEMS ATTACHED TO WALLS. ALL WOOD BLOCKING TO BE FIRE-RETARDENT TREATED AS REQUIRED BY CODE, CONTINUOUS FROM STUD TO STUD.
- · ALL MATERIALS AND EQUIPMENT SHALL BE INSTALLED PER MANUFACTURE'S WRITTEN INSTRUCTIONS.
- SEALANT, CAULKING, AND FLASHING LOCATIONS SHOWN ON DRAWINGS ARE NOT INTENDED TO BE INCLUSIVE. FOLLOW MANUFACTURE'S INSTALLATION RECOMMENDATIONS AND STANDARD INDUSTRY AND BUILDING PRACTICE
- IN ALL CASES WHERE WORK DEPICTED IN THESE DRAWINGS REPRESENTS A COMPLETE SYSTEM COMPOSED OF SEPARATE PARTS, IT IS THE RESPONSIBILITY OF THE CM/GENERAL CONTRACTOR TO PROVIDE ALL OF THE PARTS, COMPONENTS, ACCESSORIES, HARDWARE, FASTENERS, ETC. REQUIRED FOR A COMPLETE AND FULLY FUNCTIONING ASSEMBLY WITHIN THE DEFINITIONS OF NORMAL INDUSTRY STANDARDS, WHETHER OR NOT THESE MISCELLANEOUS ITEMS ARE DIRECTLY SPECIFIED IN THE CONSTRUCTION DOCUMENTS.

#### **ABBREVIATIONS**

A.F.F.	ABOVE FINISHED FLOOR	GL.	GLASS
ABV.	ABOVE	GC	GENERAL CONTRACTOR
AC	AIR CONDITIONING	H.W.	HOT WATER
ADJ.	ADJUSTABLE	H.C.	HOLLOW CORE
ALUM.	ALUMINUM	НМ	HOLLOW METAL
ALT.	ALTERNATE	HB	HOSEBIB
ASPH.	ASPHALT	HDR.	HEADER
B.O.	BOTTOM OF	HDW	HARDWARE
BD.	BOARD	I.D.	INSIDE DIAMETER
BLDG.	BUILDING	INSUL.	INSULATION
BLKG.	BLOCKING	INT.	INTERIOR
BLW.	BELOW	J.H.	JOIST HANGER
BM.	BEAM	JB	JUNCTION BOX
BTW.	BETWEEN	JST.	JOIST
CMU	CONCRETE MASONRY	K.D.	KILN-DRIED
	UNIT	LAV.	LAVATORY
COL.	COLUMN	LT.	LIGHT
CONC.	CONCRETE	MAT	MATERIAL
CAB.	CABINET	MAX	MAXIMUM
CLO.	CLOSET	MFR.	MANUFACTURER
CLR.	CLEAR	MIN.	MINIMUM
CONT.	CONTINUOUS	MO	MASONRY OPENING
COORD.	COORDINATE	MIR.	MIRROR
CTR	CENTER	MTL.	METAL
DEMO	DEMOLITION	(N)	NEW
DIA.	DIAMETER	N.T.S.	NOT TO SCALE
DR.	DOOR	NIC	NOT IN CONTRACT
DN.	DOWN	0/	OVER
DIM.	DIMENSION	OC	ON CENTER
DTL.	DETAIL	OPNG.	OPENING
ELEV.	ELEVATINO	OPP.	OPPOSITE
EQ.	EQUAL	P.T.	PRESSURE TREATED
EQUIP.	EQUIPMENT	PL.	PLATE
EXIST.	EXISTING	PLAM.	PLASTIC LAMINATE
EXT.	EXTERIOR	PLYWD	PLYWOOD
F.G.	FINISHED GRADE	PNL.	PANEL
F.O.C.	FACE OF CONCRETE	PTD.	PAINTED
F.O.F.	FACE OF FINISH	RO	ROUGH OPENING
F.O.M.	FACE OF MASONRY	R.W.L.	RAINWATER LEADER
F.O.S.	FACE OF STUD	RESIL.	RESILIENT
FDN.	FOUNDATION	REQ'D	REQUIRED
FR.	FRAME	RM.	ROOM
FIN.	FINISH	RTG	RATING
FLR.	FLOOR	RAD./R.	RADIUS
FRPR.	FIREPROOFING	S.A.D.	SEE ARCHITECTURAL
FTG.	FOOTING		DWGS
GALV.	GALVANIZED		
CIMP			

#### **LOCATION MAP**



#### PROJECT INFORMATION

UPGRADES AND REPLACEMENT OF HVAC EQUIPMENT TO BE EQUIPPED WITH AIR CONDITIONING AT THE EXISTING GYMNASIUM. RELATED MINOR WORK **INCLUDES ROOFING WORK 8** 

**USE & OCCUPANCY CLASSIFICATION - CHAPTER 3** EDUCATION (E) - HIGH SCHOOL

FIRE SUPRESSION SYSTEM: FULLY SPRINKLERED, NFPA 13 SYSTEM CONSTRUCTION TYPE (PER NFPA 101 LIFE SAFETY CODE, 2012 EDITION)

**CONSTRUCTION TYPE (PER MBC)** 

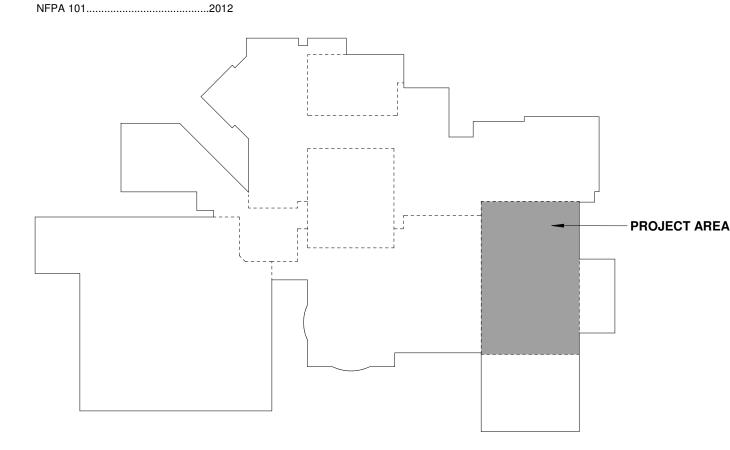
ALL NEW WORK SHALL MAINTAIN 1-HR RATING OF CORRIDOR WALLS AS **REQUIRED PER MBC 1020.1** 

TOTAL AREA OF GYMNASIUM (SEPARATED BY EX. 2 HOUR WALL): 14,606 SF (NO CHANGE)

TOTAL AREA OF ENTIRE BUILDING: 159,650 SF (INCLUDING SEPARATIONS) NO CHANGE TO EXISTING OCCUPANT LOAD - HVAC EQUIPMENT REPLACEMENT

THIS RENOVATION TO SN EXISTING SCHOOL BUILDING IS DESIGNED IN ACCORDANCE WITH THE FOLLOWING CODES THAT GOVERN STATE OF MICHIGAN PROJECTS:

MICHIGAN BUILDING CODE.....2015 MICHIGAN MECHANICAL CODE....2021 MICHIGAN PLUMBING CODE......2021 MICHIGAN ELECTRICAL CODE.....2023



#### **SHEET INDEX**

#### **REFERENCE**

TITLE SHEET

#### **ARCHITECTURAL**

OVERALL FLOOR PLAN

GYM MEZZANINE PLANS & DETAILS

#### **STRUCTURAL**

STRUCTURAL NOTES & SCHEDULES

OVERALL ROOF PLAN

FRAMING DETAILS LINTEL DETAILS

#### **MECHANICAL**

MECHANICAL STANDARDS AND DRAWING INDEX

HIGH SCHOOL HVAC PIPING DEMOLITION PLAN

HIGH SCHOOL MEZZANINE HVAC PIPING DEMOLITION PLAN

HIGH SCHOOL SHEET METAL DEMOLITION PLAN HIGH SCHOOL MEZZANINE SHEET METAL DEMOLITION PLAN

HIGH SCHOOL HVAC PIPING PLAN

M3.2 HIGH SCHOOL MEZZANINE HVAC PIPING PLAN

M4.1 HIGH SCHOOL SHEET METAL PLAN

HIGH SCHOOL MEZZANINE SHEET METAL PLAN

HIGH SCHOOL ROOF MECHANICAL PLAN

MECHANICAL DETAILS

MECHANICAL DETAILS

MECHANICAL DETAILS

MECHANICAL SCHEDULES

MECHANICAL SCHEDULES TEMPERATURE CONTROL STANDARDS AND GENERAL NOTES

TEMPERATURE CONTROLS

#### **ELECTRICAL**

ELECTRICAL STANDARDS AND DRAWING INDEX

E0.2 ELECTRICAL STANDARD SCHEDULES

E0.3 HIGH SCHOOL ELECTRICAL COMPOSITE PLAN

HIGH SCHOOL GYM MEZZANINE ELECTRICAL DEMOLITION PLAN

HIGH SCHOOL GYM MEZZANINE ELECTRICAL PLAN

E2.2 HIGH SCHOOL ROOF ELECTRICAL PLAN E5.2 HIGH SCHOOL ONE LINE DIAGRAM

**Wolgast Corporation** 4835 Towne Centre Road, Ste 203 Saginaw, MI 49604 ph: 989.790.9120 contact: Joe Powers

GYPSUM WALLBOARD

#### M/E/P

SELF-ADHERED SHEET

SEE CIVIL DRAWINGS SEE LANDSCAPE DWGS

SEE STRUCTURAL DWGS

**TONGUE AND GROOVE** 

**TOP OF CONCRETE** 

**UNLESS OTHERWISE** 

TOP OF STEEL

TOP OF PLATE

VERIFY IN FIELD

WHERE OCCURS

WATER CLOSET

WATER HEATER

STAINLESS STEEL

**SPECIFICATIONS** 

SOLID CORE

SIMILAR

STAIN

**SQUARE** 

SAFETY

TOP OF

**TYPICAL** 

NOTED

WITH

WINDOW

WOOD

S.S.

S.S.D.

SIM.

SPEC

STL.

STN.

SQ.

SFTY

T.O.

T.O.C.

T.O.S.

T.O.P

TYP.

W.O.

WDW.

WD.

Peter Basso Associates 5145 Livernois Rd. #100 Troy, MI 48098 ph: 248.879.5666 contact: Wayne Kerbelis

#### **STRUCTURAL**

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#### **OWNER**

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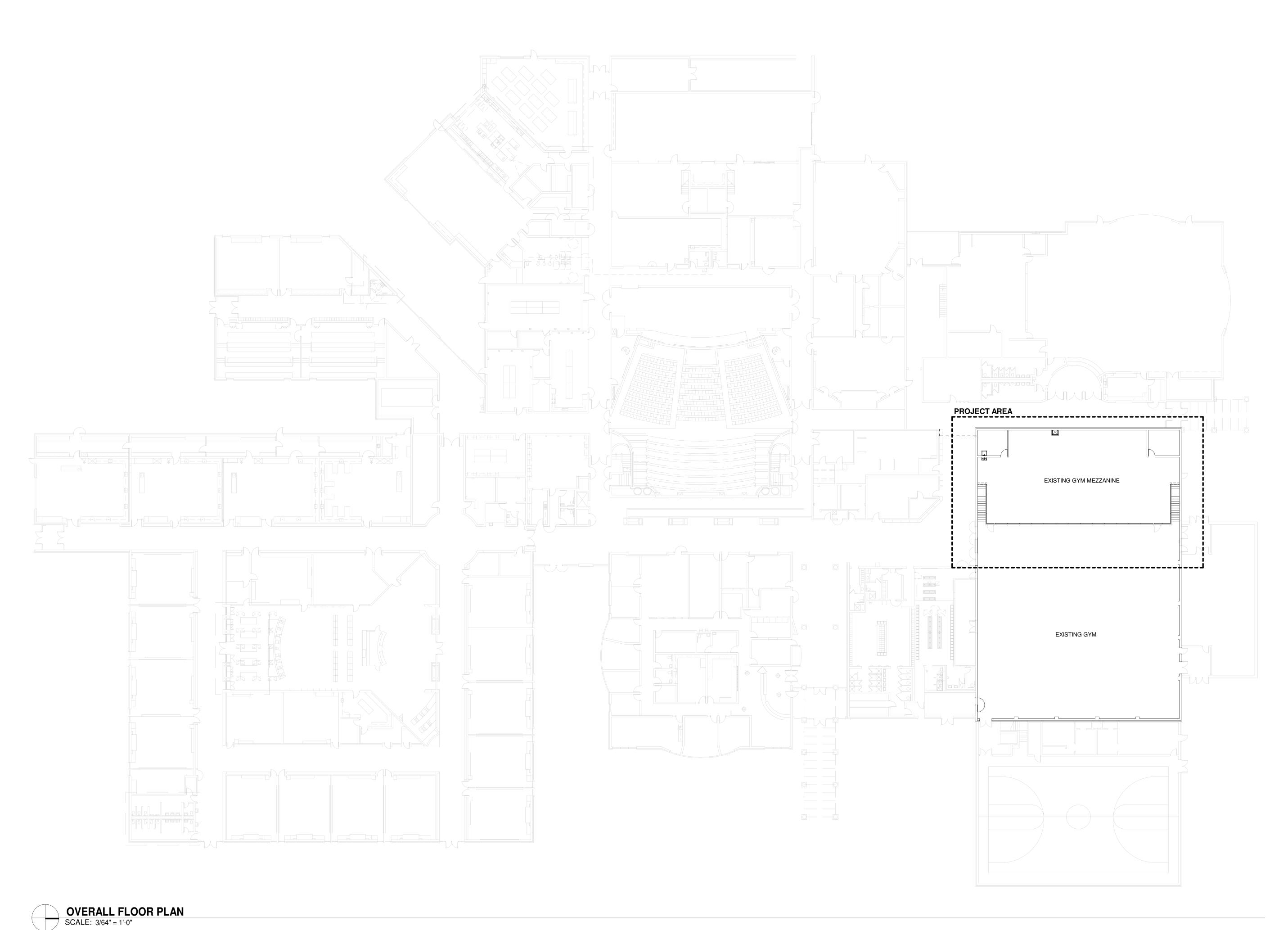
CORNERSTONE ARCHITECTS raverse City, MI 231.947.2177 p www.cornerstone-arch.com

Date Issued For 01/17/25 BID SET

22.516 HS

TITLE SHEET

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231.947.2177 p

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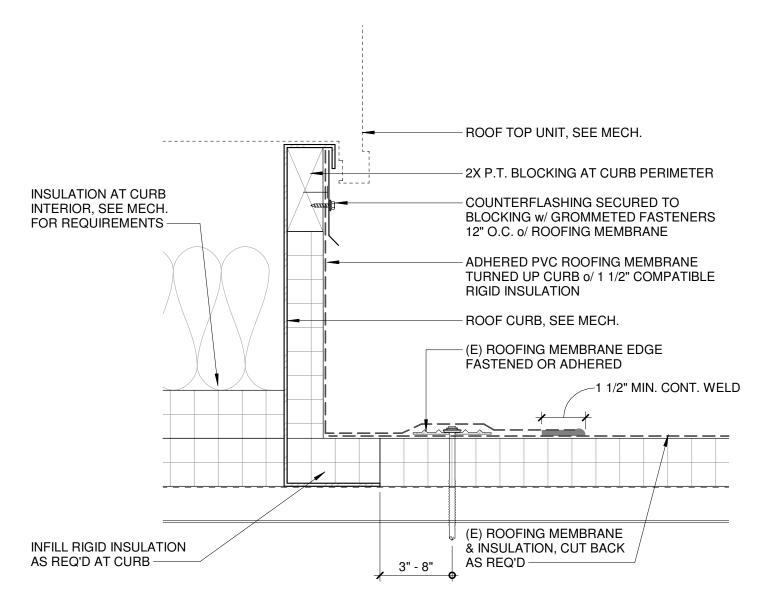
PROJECT NO:

22.516 HS

SHEET TITLE:

A100

OVERALL FLOOR PLAN



1 TYP. DETAIL AT (N) ROOF CURB
A101 SCALE: 3" = 1'-0"

#### - EXISTING ROOF BELOW-(E) LADDER TO REMAIN -. . . . . . . . . . . . . . . . — EXISTING ROOF BELOW— – EXISTING ROOF ––––– . . . . . . . . . . . . . ~ 6 6 6 6 6 6 1 . P P P P 1 — EXISTING ROOF BELOW—

#### GYM ROOF PLAN SCALE: 3/32" = 1'-0"



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UPGRADES

#### **GENERAL FLOOR PLAN NOTES**

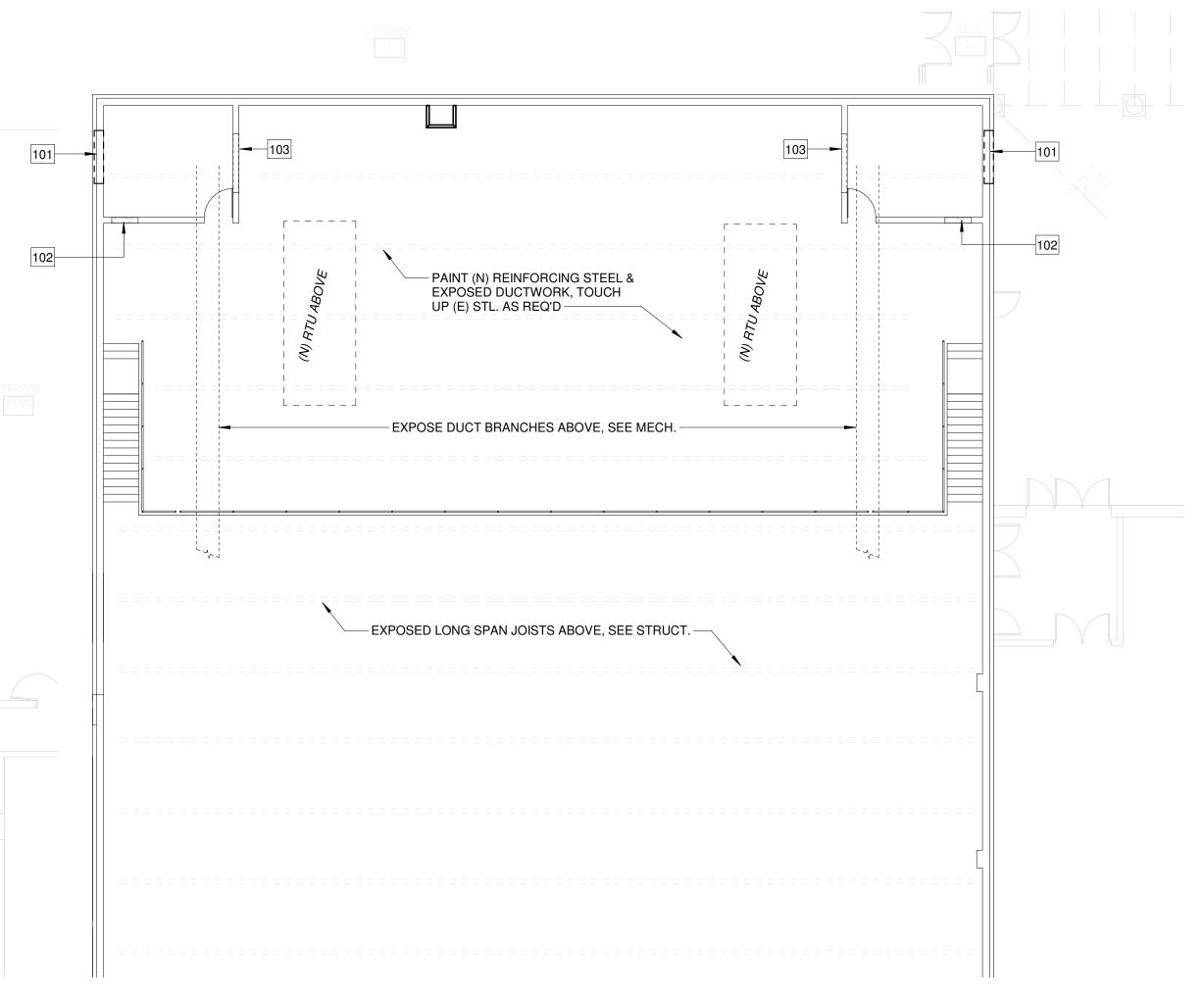
 REFER TO MECHANICAL & ELECTRICAL DRAWINGS FOR EQUIPMENT MOUNTING REQUIREMENTS

#### **GENERAL INTERIOR FINISH NOTES**

- PROVIDE INTERIOR WALL TOUCH-UP, PATCHING, & PAINTING AS REQ'D AT ALL NEW WORK LOCATIONS
- ALL FLOORING TO BE PROTECTED WHERE NEW WORK IS TO OCCUR. ANY INCEDENTAL DAMAGE TO EXISTING FLOORING DUE TO NEW CONTRUCTION WORK WITHOUT PROPER PRECAUTIONS/PROTECTION SHALL BE RESPONSIBILITY OF CONTRACTOR TO REPAIR AT NO ADDITIONAL COST.

#### **FLOOR PLAN KEYNOTE LEGEND**

- 101 ABANDON (E) LOUVER; CAP AT INTERIOR w/ INSULATED METAL PANEL, SEE MECH. DETAILS
- 102 REMOVE (E) GRILLE & INFILL OPENING TO MATCH (E) CONSTRUCTION
- 103 (N) OPENING AT (E) WALL FOR (N) RETURN GRILLE, SEE STRUCT. &



PIC:

PM:

DRAFTS:

PROJECT NO:

22.516 HS

SHEET TITLE:

GYM MEZZANINE
PLANS & DETAILS

Date Issued For

01/17/25 BID SET

A101

	STRUCTURAL SPECIAL INSPECTION SCHEDULE (2015 IBC - Chapter 17)													
row		00NT3	DEDIODIO	DEFEDENCE OTANDADD	NOTEO									
#	ITEM	CONT <sup>2</sup>	PERIODIC <sup>2</sup>	REFERENCE STANDARD	NOTES									
1	PRE-FABRICATED CONSTRUCTION (1704.2.5)				3&4									
2														
3	STRUCTURAL STEEL CONSTRUCTION (1705.2)				13									
7	Verify Structural Steel Materials		X	ASTM A 6/ASTM A 568										
8	Verify Weld Filler Materials		X	AISC 360 - A3.5										
10	Single-pass Fillet Welds ≤ 5/16". Anchor / Stud Welds. Stair / Railing Welds		X	AWS D1.1	6									

#### STRUCTURAL SPECIAL INSPECTION SCHEDULE NOTES:

- Items marked with an 'X' shall be inspected in accordance with chapter 17 of the building code by a certified special inspector from an established testing agency. For material sampling and testing requirements, refer to the project specifications and the specific general notes, sections. The testing agency shall send copies of all structural testing and inspection reports directly to the architect, engineer, contractor, and building official. Any items which fail to comply with the approved construction documents shall immediately be brought to the attention of the contractor for correction. If discrepancies are not corrected, they shall be brought to the attention of the building official, architect, and engineer prior to completion of that phase of the work. Special inspection testing requirements apply equally to all bidder designed components.
- Continuous special inspection means the full-time observation of work requiring special inspection by an approved special inspector who is present in the area where the work is being performed. Periodic special inspection means the part-time or intermittent observation of work requiring special inspection by an approved special inspector who is present in the area where the work has been or is being
- performed and at the completion of the work. (sect 1702)

  Special inspection is not required for work performed by an approved fabricator per section 1704.2.5.1.
- 4. Inspection for pre-fabricated construction shall be the same as if the material used in the construction took place on site. Continuous inspection will not be required during pre-fabrication if the approved
- agency certifies the construction and furnishes evidence of compliance.
- 5. Not used.6. All welds shall be visibly inspected.
- 7. All complete penetration welds shall be tested ultrasonically or by using another approved method.
- 8. Not used.
- 9. Not used.
- 10. Not used.11. Not used.
- 12. Not used.
  13. Special inspection for structural steel shall be per AISC 303, Section 8 or the project contract documents, whichever is more stringent.
- 14. Any construction or material that has failed inspection shall be subject to removal and replacement.
- 15. This table and notes represent code requirements for structural portions of the project and is not a complete representation of what may be required by chapter 17 of the building code. See chapter 17 and project specifications for additional requirements.

			1
ABBREV.	ITEM	ABBREV.	ITEM
λ/E	Architect/Engineer	INT	Interior
AB	Anchor Bolt/Column Anchor Rod	JB	Joist Bearing Elevation
ACIP	Augered Cast In Place	L	Lintel
AESS	Architecturally Exposed Structural Steel	L	Angle
AFF	Above Finished Floor	LAT	Lateral
ALT	Alternate	LD	Load
AP	Anchor Plate	LF	Linear Foot
ARCH	Architectural	LG	Long
BB	Bond Beam	LLH	Long Leg Horizontal
ВС	Bottom Chord	LLV	Long Leg Vertical
BCX	Bottom Chord Extension	LOC'N	Location
BFF	Below Finished Floor	LP	Low Point
BL	Brick Ledge	LT	Light
BM	Beam	LW	Long Way
BO	Bottom of	LWB	Laminated Wood Beam
BOS	Bottom of Steel	MAX	Maximum Maximum Control Joint
BP BBC	Bearing Plate	MCJ	Masonry Control Joint
BRG	Bearing	MECH	Mechanical
BT	Bent Contor	MIN	Minimum Near Side
C/C	Center-to-Center	NS	Near Side
CANT	Calumn Ress Plate	NTS	Not To Scale
CBP	Cold Formed Metal Framing	0/0	Out-to-Out
CFMF	Cold Formed Metal Framing	OC	On-Center
CFMT	Cold Formed Metal Truss	OD	Outside Diameter
CJ	Construction Joint	OF	Outside Face
CJ	Contraction Joint	OFD	Overflow Drain
CJ	Control Joint	ОН	Opposite Hand
CJP	Complete Joint Penetration Weld	P	Pier
CL	Centerline	PAF	Power Actuated Fastener
CLR	Clear	PC	Precast
CMU	Concrete Masonry Unit	PEMB	Pre-Engineered Metal Building
COL	Column	PERP	Perpendicular
CONC	Concrete	PL	Plate
CONN	Connection, Connect	PT	Pressure Treated
CONT	Continuous	R, RAD	Radius
COORD	Coordinate	RD	Roof Drain
DA	Deck Angle	RE:	Reference, Refer to
DB	Deck Bar	REINF	Reinforce
DBE	Deck Bearing Elevation	REM	Remainder
DIA, Ø	Diameter	REQ'D	Required
DP	Deck Plate	RMW	Reinforced Masonry Wall
DWG	Drawing(s)	RTU	Roof Top Unit
EA	Each	RXN	Reaction
EF	Each Face	SC	Slip Critical
EL	Elevation	SF	Step Footing
EQ	Equal	SIM	Similar
ES	Each Side	SIP	Structural Insulated Panel
EW	Each Way	SOG	Slab On Grade
EX	Existing	SPCS	Spaces
EXP	Expansion	SS	Stainless Steel
EXT	Exterior	SST	Simpson Strong Tie
FD	Floor Drain	STL	Steel
FDN	Foundation	SW	Short Way
FF	Finished Floor	T&B	Top and Bottom
FFE	Finished Floor Elevation	TC	Top Chord
FP	Foundation Pier	TCX	Top Chord Extension
FS	Far Side	TO	Top of
FTG, F	Footing	ТОВ	Top of Beam
FV	Field Verify	TOF	Top of Footing
GA	Gauge	TOL	Top of Ledge
GALV	Galvanized	TOM	Top of Masonry
GB	Grade Beam	TOS	Top of Steel
GS	Grout Solid	TOW	Top of Wall
GT	Girder Truss	TYP	Typical
HD	Hold Down Anchor	UNO	Unless Noted Otherwise
HORZ	Horizontal	VERT	Vertical
HP	High Point	w/	With
HS	Headed Stud	w/o	Without
HT	Height	WF	Wall Footing
	·		Working Point
ID	Inside Diameter	WP	WORKING POINT

#### GENERAL STRUCTURAL NOTES

- 1. All work shall be performed in accordance with the contract documents. In case of a conflict within the contract documents, the more stringent condition shall govern, unless directed otherwise by the engineer of record. Prior to implementation, any discrepancies shall be reported to the architect for clarification.
- 2. In the event that certain details of construction are not indicated or noted in the drawings, details for similar conditions that are indicated or noted shall be utilized, subject to the structural engineer's approval.
- 3. Openings and penetrations through structural elements, and items embedded in structural elements that are not indicated in the structural drawings shall be reviewed by the structural engineer prior to fabrication, erection and/or construction.
- Materials or equipment shall not be placed on unfinished floors or roofs in excess of 20 psf nor on finished floors in excess of the design live loads which are indicated in the structural drawings. Impact loading shall be avoided.
- 5. The structure has been designed for the in-service loads only. The methods, procedures and sequences of construction are the responsibility of the contractor. Contractor shall take all necessary precautions to maintain and ensure the integrity of the structure at all stages of construction. Contractor shall immediately notify the structural engineer of any condition which, in his opinion, might endanger the stability of the structure or cause distress in the
- 6. All existing conditions and all related dimensions indicated in the contract documents shall be field verified prior to fabrication, erection and/or construction. Any condition that differs from that indicated in the contract documents shall be submitted to the architect for review prior to fabrication. erection and/or construction.
- 7. The structure has been designed to meet or exceed serviceability requirements of section 1604.3 of the Michigan Building Code. All non-structural components & their connections that are anchored to the structure shall be designed to allow for the movement of the structure caused by wind, snow, live, thermal, shrinkage/creep and earthquake loads. Non-structural components include items such as non-load bearing walls, MEP components, bulkheads, etc.
- 8. Provide special inspection in accordance with chapter 17 of the Michigan Building Code and
- with project specifications.

  Unless noted otherwise, all loads specified in these documents are nominal loads and are to be entered into the appropriate strength or allowable stress design load combinations with appropriate factors, as defined by ASCE 7, by the building component engineer in the design of their product. Gravity load shear beam reactions on plan for steel framing represent the
- combined service load effect from allowable stress design load combinations.

  10. Copies or reproductions of architectural or structural drawings and details will not be accepted as shop drawings. Submittals recieved as such will not be reviewed and will be rejected.

#### CONCRETE MASONRY NOTES

- Concrete masonry units shall conform to ASTM C90, below grade units shall be medium or normal weight.
   Mortar shall conform to ASTM C270, and shall be made with Type I portland cement/lime or
- mortar cement. Mortar shall be Type S.

  3. Grout shall conform to ASTM C476, with a minimum compressive strength of 2000 psi.

  4. Painforcing bare shall conform to ASTM A615. Grade 60, upless noted.
- 4. Reinforcing bars shall conform to ASTM A615, Grade 60, unless noted.
  5. Provide layout shop drawings indicating lap splices, rebar spacing, bond beams, grout lifts,
- 5. Provide layout snop drawings indicating lap splices, rebar spacing, bond beams, grout lifts, etc.
  6. Horizontal joint reinforcing (continuous wire reinforcing) shall be hot-dipped galvanized ladder
- type fabricated units with a single pair of 9 gage side rods and 9 gage cross rods at 16" oc fabricated from cold drawn steel wire complying with ASTM A82.
  Horizontal joint reinforcing shall be spaced at 16" oc in all masonry walls and shall be lapped
- 8. Horizontal joint reinforcing shall be spaced at 16" oc in all masonry walls and shall be lapped 8", unless noted otherwise on the drawings.
  No chases, risers, conduits or toothing of masonry shall occur in masonry walls within 18" of
- centerline of beam bearing.

  Vertical cells that will be grouted shall have a vertical alignment to maintain a continuous
- vertical cells that will be grouted shall have a vertical alignment to maintain a continuounobstructed cell area not less than 3" x 4".
  Consolidate grout lifts greater than 12" by mechanical means and reconsolidate by
- Consolidate grout lifts greater than 12" by mechanical means and reconsolidate by mechanical means after initial water loss and settlement. Lifts less than 12" may be consolidated by puddling or by mechanical means
- consolidated by puddling or by mechanical means.

  11. All bolts, anchors, etc. inserted into the walls shall be grouted solidly into position.

  12. Joist and beam bearing plates shall be centered on the member that they support, within a
- tolerance of 1" on either side of the member centerline.

  13. Provide "Dur-O-Stop" grout screens (or equal) to terminate grout pours over open cells below, such as at bond beams.
- 14. Coordinate bond beam locations with Architectural & Structural drawings.
   15. The masonry has been engineered, and shall be inspected in accordance with chapter 1 of TMS 402/ACI 530/ASCE 5 (Building Code Requirements for Masonry Structures). A minimum Level B Quality Assurance program is required. Periodic inspection shall be performed daily with a minimum of one inspection for every 1,500 square feet or portion
- thereof.

  16. Masonry has been designed and shall be built in conformance to TMS 402/ACI 530/ASCE 5
  (Building Code Requirements for Masonry Structures) and TMS 602/ACI 530.1/ASCE 6
- 17. Contractor shall design and provide all temporary bracing required for strength and stability of the masonry throughout construction. At a minimum, comply with OSHA and local requirements for temporary bracing of walls.

#### CONCRETE MASONRY SPEC NOTES

- Provide solid masonry or fill cores of block under all beam and lintel bearing points down to concrete wall or footing below.
- Bond beams are intended to be open-cell with "Dur-O-Stop" or equivalent grout stop below.
   Vertical reinforcing shall extend through or into bond beam. All bond beams shall be filled
   with grout. Refer to Architectural & Structural drawings for locations.

#### STEEL NOTES

Structural steel shall be finished as follows:

(Specifications for Masonry Structures).

- A. Non-fireproofed interior steel shall be shop painted with min. 1.5 mil dry film thickness of a rust inhibiting primer.
  B. Unless noted otherwise, exterior exposed steel, including veneer relief angles, shall be:
- Galvanized and prepared for paint
   Refer to lintel schedule for finish requirements of lintels.
- Erector is to provide temporary bracing sufficient to hold frame in position until all construction necessary for building stability is complete.
- Beam and lintel bearing on concrete and masonry wall shall be 8" unless otherwise shown.

  Provide beam bearing plates and wall anchors as required.
- Camber beams upward the designated amount indicated on the structural drawings. Beams without a specified camber shall be oriented such that any incidental camber is upward.
   All bolted moment, brace frame, and truss connections shall be done with slip critical bolts
- All bolted moment, brace frame, and truss connections shall be done with slip critical bolts including the gravity shear connection. Slip critical joints shall be prepared with a Class A faying surface, and oversized holes in slip critical joints may be used at the fabricator's option.
  Bolted connections not specified to be slip critical shall be tightened snug tight (all metal surfaces in contact).
- Refer to specs. and Arch. drawings for all fireproofing requirements and UL assembly Nos. Beams and columns do not necessarily conform to minimum size requirements of the UL assembly. Adjust thickness of fireproofing as required based on (W/D) ratio as outlined in the latest edition of the "Fire Resistance Directory" by Underwriters" Laboratories, Inc. All beams
- and assemblies shall be considered unrestrained.

  Where aluminum or steel will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer and applying sealant or tape, or by installing
- nonconductive spacers as recommended for this purpose.

  9. All gusset plates to be minimum 3/8" thick. Unless noted otherwise, all column and beam web stiffeners and gusset plates shall be 3/8" thick.

#### STEEL SPEC NOTES

- All steel shall be fabricated, detailed, and erected in accordance with AISC" Code of Standard Practice", ASTM A6 "Specification for General Requirements for Rolled Steel Plates, Shapes, Sheet Piling, and Bars for Structural Use", and Research Council on Structural Connections (RCSC) "Specifications for Structural Joints Using ASTM A325 or A490 Bolts."
   Inspect all steel in accordance with Michigan Building Code and AISC requirements. At a
- Inspect all steel in accordance with Michigan Building Code and AISC requirements. At a minimum visually inspect all fillet welds, non-destructively test all full penetration welds, inspect all bolted connections, etc.
   All welding shall be done in accordance with AWS D1.1 "Structural Welding Steel."
- 4. All metal deck shall be in accordance with SDI Standards and Specifications. Roof deck shall be cleaned, pretreated, and primed with manufacturer's baked-on, lead and chromate-free rust inhibitive primer. Deck supplier shall provide closures and edge stiffeners as required.
- Deck strengths shall be as follows:A. Roof Deck shall be minimum 33 ksi

#### STEEL NOTES

Unless otherwise shown on plans, provide lintels for masonry walls as follows:
 For 6" Walls

(1)L5x3-1/2x5/16, SPANS TO 8'-0"

(2)L3-1/2x2-1/2x5/16, spans to 6'-0"
For each 4" of wall thickness:
(1)L3-1/2x31/2x1/4, SPANS TO 4'-0"
(1)L4x3-1/2x5/16, SPANS TO 6'-0"

#### ENGINEERING DATA

#### Design stresses

Oteel	
W shapes	Fy = 50000 psi
Rectangular HSS shapes (A500 Gr. C)	Fy = 46000 psi
Round HSS & Pipe shapes (A500)	Fy = 42000 psi
All other shapes	Fy = 36000 psi
Welding electrode	E70XX
Masonry	
CMU	f'm = 2000 psi
Grout	f'c = 2250 psi
Reinforcing steel	Fy = 60000 psi

#### Structural design requirements

## Roof live load 20 psf Risk Category III Roof snow load Ground snow load (Pg) 50 psf Flat roof snow load (Pf) 39 psf + Drift Snow exposure (Ce) 1.0

Thermal factor (Ct) 1.0

Wind Load

Ultimate design wind speed (3 sec) 115 mph

Wind exposure category B

Snow load importance factor (I)

Wind exposure category
Internal pressure coeff (GCpi)
Components & cladding (varies)
Wall stud design pressure

Waries - per ASCE7

#### Earthquake Seismic importance factor, le Spectral response 1.25 Spectral response Ss = 0.051

St = 0.051 St = 0.032 SDs = 0.054 SD1 = 0.052 D

1.1

"Equivalent lateral force"

AISC 360 - ASD

ASCE 7

TMS 402/ACI 530/ASCE 5

Seismic design category

Basic seismic force resisting system:
Ordinary reinforced masonry shear walls
Design base shear

Seismic response coefficient Cs
Response Modification Factor R

A

0.034W

2

#### Specific Design Loads

Masonry

Environmental Loads

**EXISTING BUILDING NOTE:** 

THIS PROJECT IS AN ADDITION AND EXTENSION OF AN EXISTING

BEFORE FABRICATION AND CONSTRUCTION. ABUTTING

BUILDING. THE DRAWINGS REFLECT WHAT IS KNOWN ABOUT THE

CONSTRUCTION MUST MATCH UP. VERIFY ALL SUCH CONDITIONS, AND NOTIFY A/E IF ACTUAL CONDITIONS DIFFER FROM THE CONTRACT DOCUMENTS. AN ATTEMPT HAS BEEN MADE TO ANTICIPATE CONDITIONS IN THE EXISTING STRUCTURE.

EXISTING BUILDING, BUT EXISTING CONDITIONS MUST BE VERIFIED

Site class

Analysis Procedure

- Roof dead loads
  Roofing (Adhered)
  Insulation
  Metal deck
  Structure
  Ceiling
  M/E/P
  Fire protection
  Misc
- M/E/P
   3

   Fire protection
   3

   Misc
   2

   25 psf Total

   esign codes
   Michigan Building Code 2015

# CORNERSTONE

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ARCHITECTS

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Grandville, Michigan 49418
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# IGH SCHOOL DISTRICTION OF SAMES

GRAYLING HIGH SHADE

Date Issued For 01/17/2025 BID SET

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and are for uses authorized by the architect only.	
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T. NEMITZ

J. CARDINAL

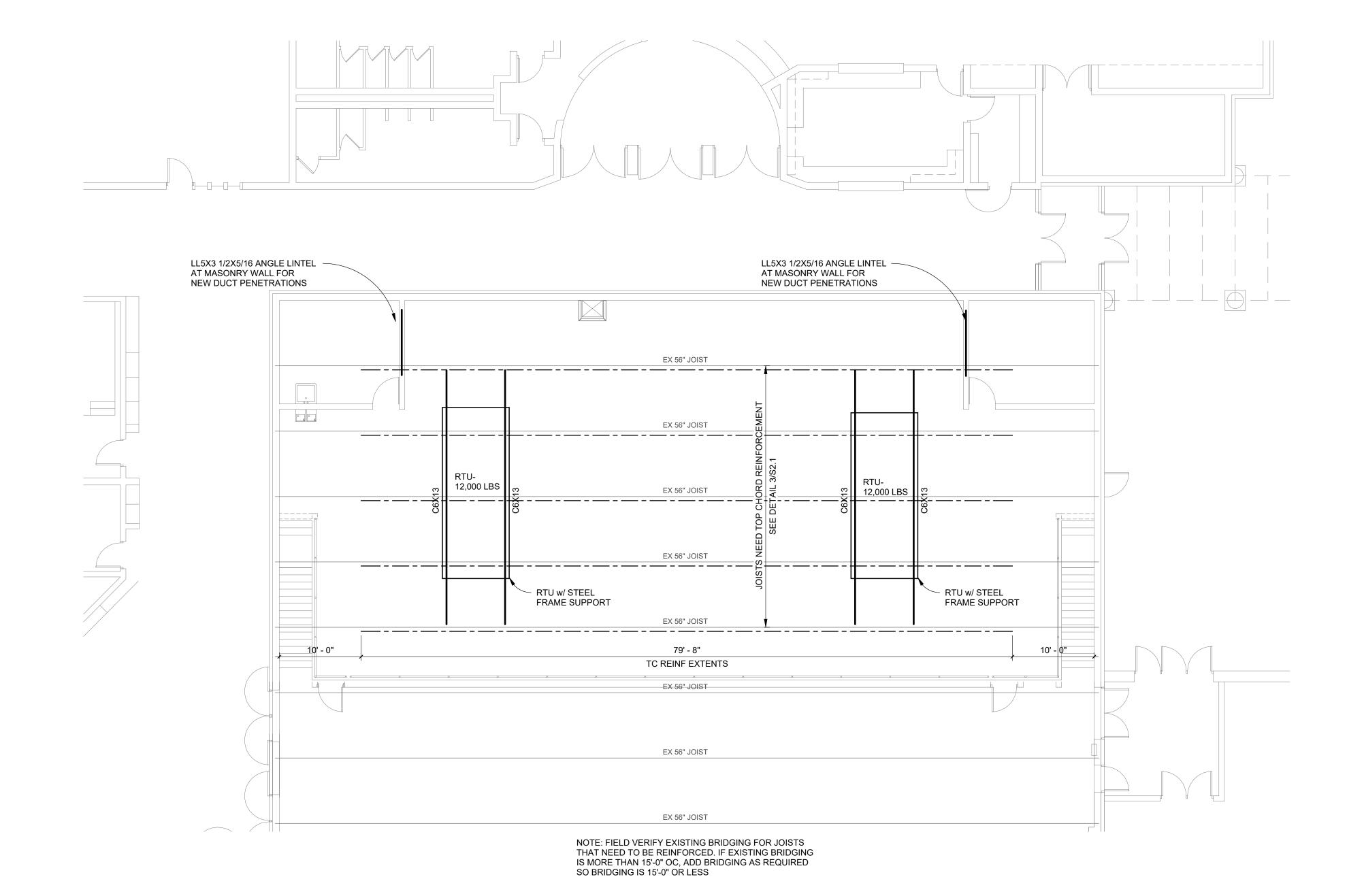
FTS: M. FOX

22.516 HS

ROJECT NO:

STRUCTURAL NOTES & SCHEDULES

S<sub>0.1</sub>



#### ROOF FRAMING PLAN NOTES

- Steel bar joists: A. Horizontal bridging shall be welded (1/8" fillet weld) to top and bottom chord at steel
- bar joist.

  2. Roof top mechanical equipment:
  A. Refer to Mechanical drawings for exact size, qty and location of mechanical equipment.
  - B. Mechanical equipment weight shall be as indicated on plan and/or in mechanical
  - equipment schedules. Any deviation or discrepancy in equipment weight, location or quantity shall be reported to the architect and structural engineer.
  - C. Provide support framing under all mechanical unit curbs and around all roof

ROOF FRAMING PLAN SCALE: 1/8" = 1'-0"

#### **EXISTING BUILDING NOTE:**

THIS PROJECT IS AN ADDITION AND EXTENSION OF AN EXISTING BUILDING. THE DRAWINGS REFLECT WHAT IS KNOWN ABOUT THE EXISTING BUILDING, BUT EXISTING CONDITIONS MUST BE VERIFIED BEFORE FABRICATION AND CONSTRUCTION. ABUTTING CONSTRUCTION MUST MATCH UP. VERIFY ALL SUCH CONDITIONS, AND NOTIFY A/E IF ACTUAL CONDITIONS DIFFER FROM THE CONTRACT DOCUMENTS. AN ATTEMPT HAS BEEN MADE TO ANTICIPATE CONDITIONS IN THE EXISTING STRUCTURE.

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HIGH SCHOOL

CRAWFORD AUSABLE

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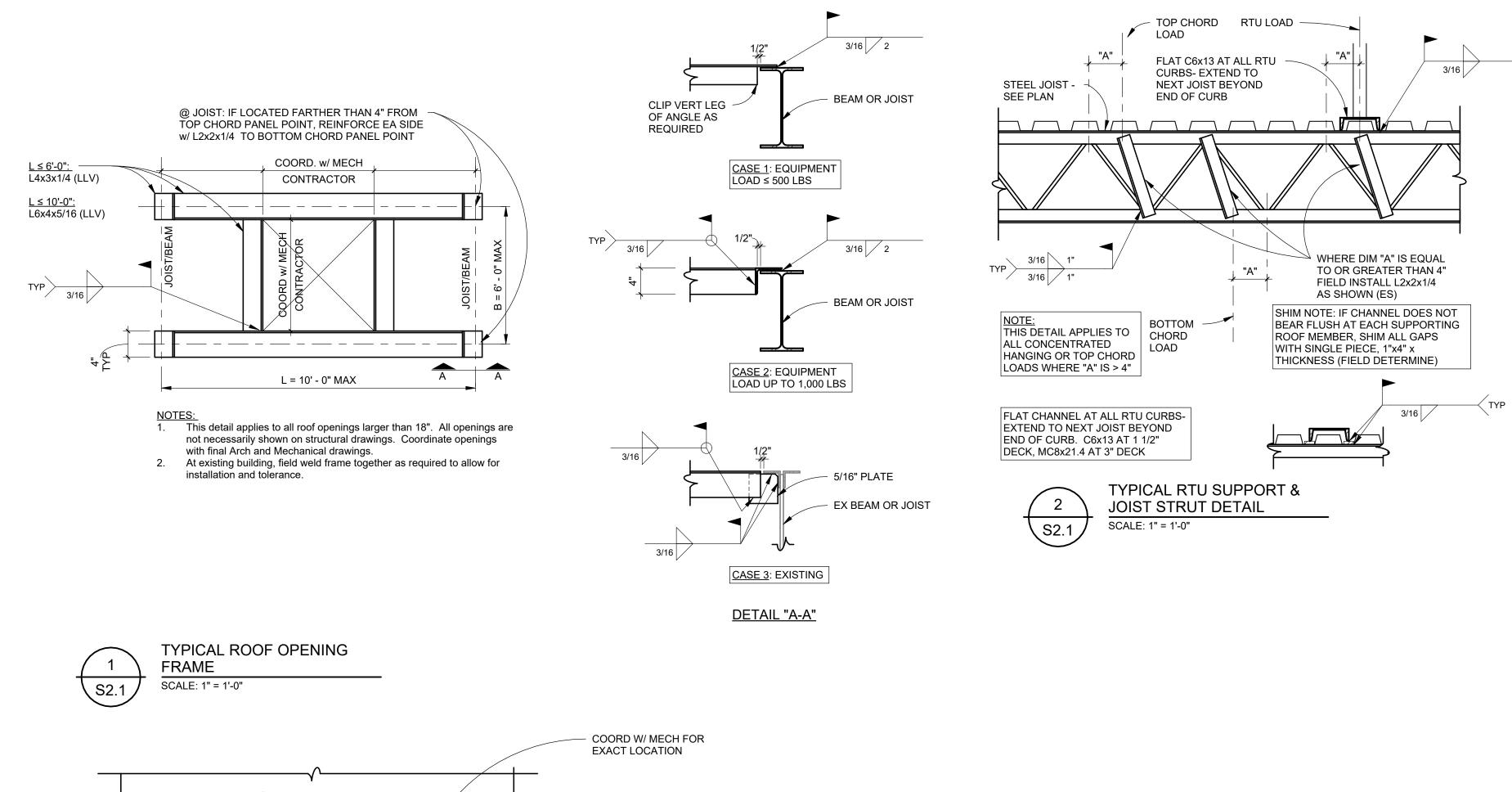
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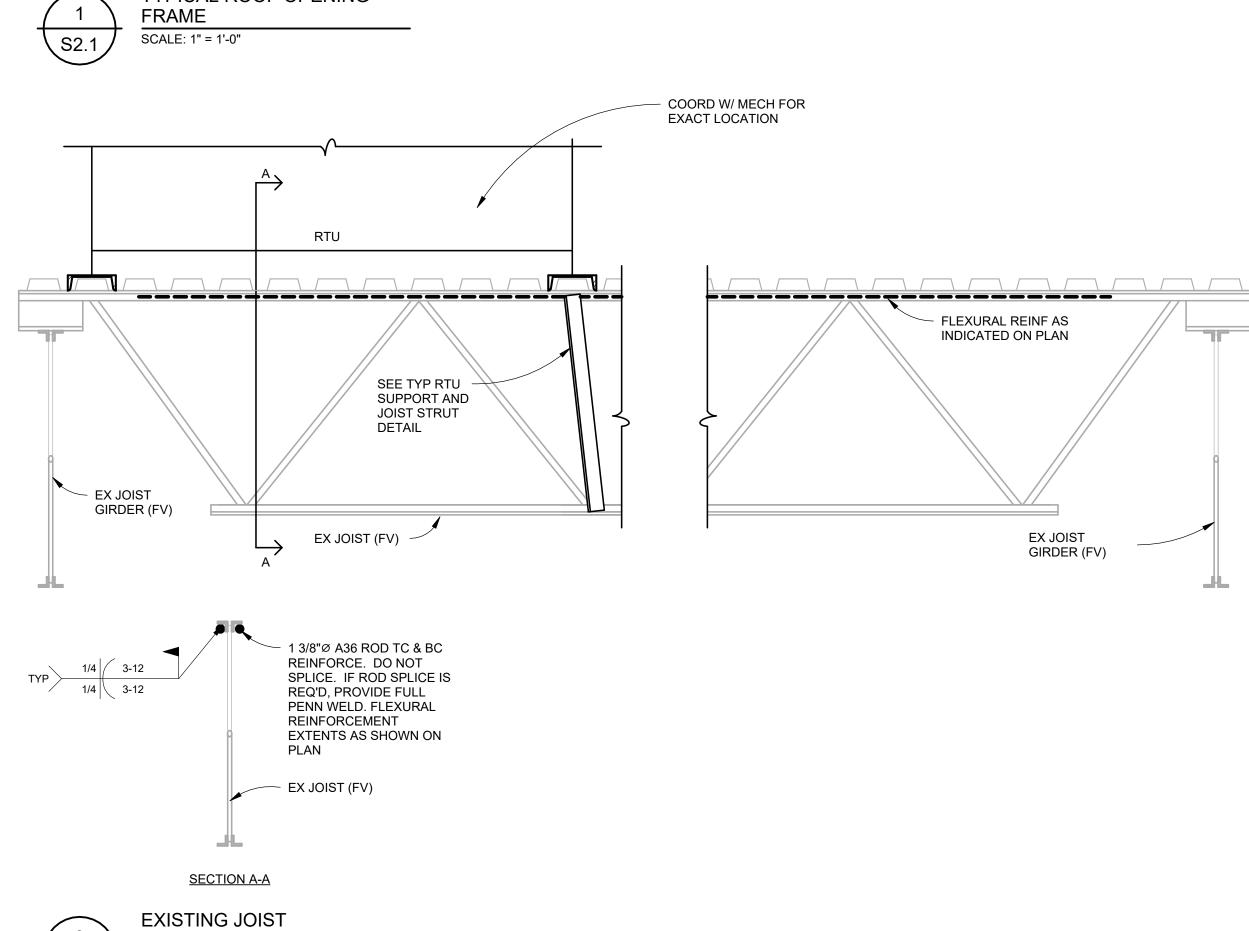
01/17/2025 BID SET

J. CARDINA

22.516 HS

**ROOF FRAMING** PLAN





REINFORCING

SCALE: 1" = 1'-0"





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## **70**0

CRAWFORD AUSABLE SCHOOL DISTRICT

GRAYLING HIGH SCHOOL

HVAC UPGRADES

S **G** 

Date	Issued For
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PIC:	T. NEMITZ
PM:	J. CARDINAL
DRAFTS:	M. FOX
PROJECT	
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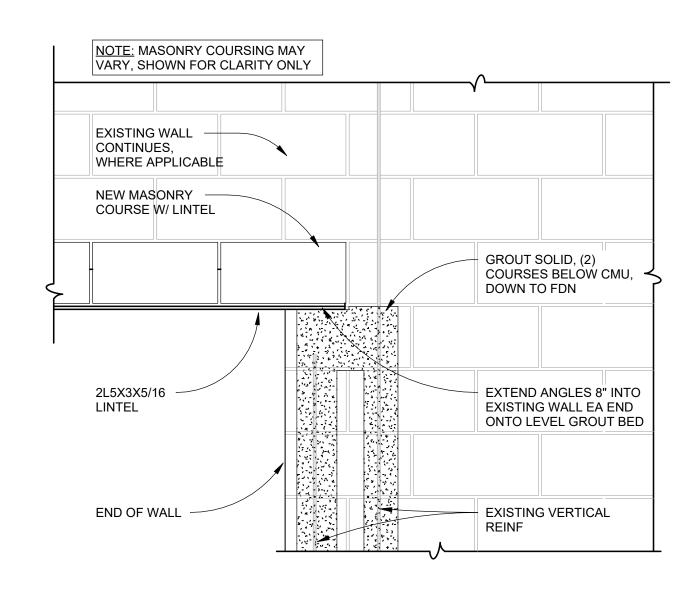
#### EXISTING BUILDING NOTE:

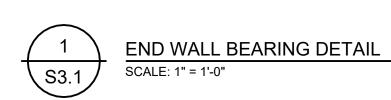
THIS PROJECT IS AN ADDITION AND EXTENSION OF AN EXISTING BUILDING. THE DRAWINGS REFLECT WHAT IS KNOWN ABOUT THE EXISTING BUILDING, BUT EXISTING CONDITIONS MUST BE VERIFIED BEFORE FABRICATION AND CONSTRUCTION. ABUTTING CONSTRUCTION MUST MATCH UP. VERIFY ALL SUCH CONDITIONS, AND NOTIFY A/E IF ACTUAL CONDITIONS DIFFER FROM THE CONTRACT DOCUMENTS. AN ATTEMPT HAS BEEN MADE TO ANTICIPATE CONDITIONS IN THE EXISTING STRUCTURE.

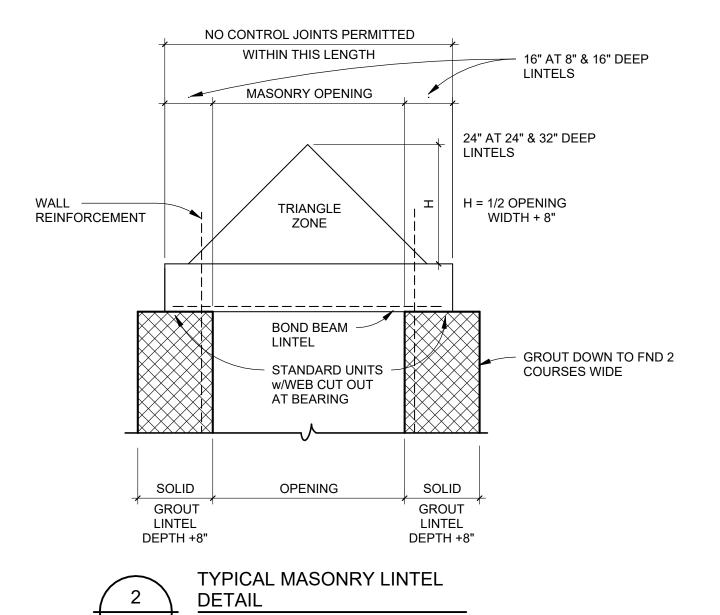
FRAMING DETAILS

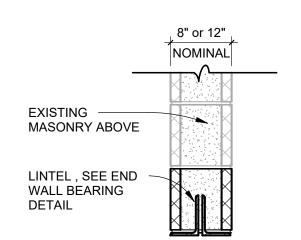
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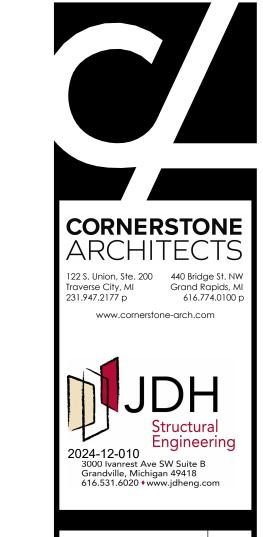




#### **EXTERIOR**

SCALE: 1" = 1'-0"





CRAWFORD AUSABLE SCHOOL DISTRICT

GRAYLING HIGH SCHOOL

HVAC UPGRADES

Date Issued For 01/17/2025 BID SET T. NEMIT J. CARDINA

S3.1

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LINTEL DETAILS

HUMIDISTAT OR HUMIDITY SENSOR

(AS DEFINED ON TC DRAWINGS)

THERMOSTAT OR TEMPERATURE SENSOR

(AS DEFINED ON TC DRAWNGS)

MECHANICAL ABBREVIATION LIST MECHANICAL SYMBOL LIST PIPING SYMBOLS **ABBREVIATION** DESCRIPTION **DESCRIPTION ABBREVIATION DESCRIPTION ABBREVIATION** COMPRESSED AIR FLOOR DRAIN PACKAGED AIR CONDITIONING UNIT PACU <u>SYMBOL</u> **DESCRIPTION** COMPRESSED AIR (SPECIFIC PSIG) FUNNEL FLOOR DRAIN PARALLEL BLADE DAMPER PBD AIR VENT - AUTOMATIC AUTOMATIC AIR VENT FIRE HYDRANT PUMPED CONDENSATE AIR COOLED CONDENSER FIRE HOSE CABINET PROCESS COOLING WATER AIR VENT - MANUAL <u>TU-101</u> PCWR PROCESS COOLING WATER RETURN ACCU AIR COOLED CONDENSING UNIT FIRE HOSE RACK BACKFLOW PREVENTER PCWS PROCESS COOLING WATER SUPPLY ACCESS DOOR FIRE HOSE VALVE FULL LOAD AMPS PRESSURE DROP (FEET OF WATER) ——— CATCH BASIN AIR EXTRACTOR PERIMETER HEAT ABOVE FINISHED FLOOR FLOW METER PERIMETER HEAT RETURN CIRCULATING PUMP FLOW MEASURING STATION AIR HANDLING UNIT PERIMETER HEAT SUPPLY CLEAN OUT - IN FLOOR \_\_\_\_ow\_\_ ALTERNATE FLAT ON BOTTOM FLAT ON TOP PARTS PER MILLION AMPERE ——I<sup>co</sup> CLEAN OUT - FLANGE AIR PRESSURE DROP FEET PER MINUTE PRESSURE PRESSURE REDUCING VALVE DIRECTION OF FLOW FIRE PUMP PRV  $\longrightarrow$ FAN POWERED (AIR) TERMINAL UNIT ASHRAE AMERICAN SOCIETY OF HEATING, REFRIGERATION PUMPED SANITARY DIRECTION OF PITCH - DOWN AND AIR-CONDITIONING ENGINEERS PST PUMPED STORM FLOOR SINK FOOD SERVICE EQUIPMENT CONTRACTOR AUTOMATIC SPRINKLER RISER POUNDS PER SQUARE INCH FINNED TUBE RADIATION POUNDS PER SQUARE INCH - ABSOLUTE AIR TRANSFER DUCT FIRE PROTECTION - SIAMESE CONNECTION - FREE STANDING FINNED TUBE RADIATION PSIG POUNDS PER SQUARE INCH - GAUGE AUX ACID VENT FACE VELOCITY PURIFIED WATER FIRE PROTECTION - SIAMESE CONNECTION - WALL MOUNTED ACID VENT THROUGH ROOF PURIFIED WATER RETURN NATURAL GAS PURIFIED WATER SUPPLY FIRE PROTECTION - SPRINKLER HEAD, CONCEALED FIRE PROTECTION - SPRINKLER HEAD, PENDANT BUILDING AUTOMATION SYSTEM RELOCATED GALLON GRAVITY RELIEF HOOD RETURN GRILLE OR REGISTER BLOWER COIL UNIT FIRE PROTECTION - SPRINKLER HEAD, UPRIGHT <del>----</del>0----GALLONS PER HOUR RETURN AIR FIRE PROTECTION - SPRINKLER HEAD, SIDEWALL BELOW FINISHED FLOOR GALLONS PER MINUTE RETURN AIR TEMPERATURE BACKELOW PREVENTER GREASE SANITARY WASTE RAIN CONDUCTOR <del>-----</del> FLOOR DRAIN BRAKE HORSEPOWER RADIANT CEILING PANEL HYDROGEN ROOF DRAIN FLOOR DRAIN - ELEVATION BOTTOM OF DUCT BOTTOM OF PIPE HOSE BIBB REQUIRED FLOOR DRAIN - FUNNEL ROOF EXHAUST FAN BRITISH THERMAL UNIT HEATING COIL BRITISH THERMAL UNIT PER HOUR HOT DECK RETURN FAN FLOOR DRAIN — FUNNEL, ELEVATION HIGH EFFICIENCY PARTICULATE ARRESTANCE BEVERAGE CONDUIT RELATIVE HUMIDITY FLOW MEASURING DEVICE (FOR TEST AND BALANCING) REFRIGERANT LIQUID BACKWATER VALVE HIGH LIMIT HAND/OFF/AUTO RLFA relief air FLOW SWITCH REVOLUTIONS PER MINUTE RPM RPDA <del>Рм</del> CAPACITY HORSEPOWER REDUCED PRESSURE BACKFLOW PREVENTION DETECTION ASSY RPZA HIGH PRESSURE DOMESTIC COLD WATER CONSTANT AIR VOLUME HPCW REDUCED PRESSURE BACKFLOW PREVENTION ZONE ASSY HOSE BIBB HIGH PRESSURE DOMESTIC HOT WATER CATCH BASIN REFRIGERANT SUCTION COOLING COIL HIGH PRESSURE DOMESTIC HOT WATER RETURN ROOFTOP UNIT MANHOLE COLD DECK HEAT PUMP LOOP OPEN SITE DRAIN HEAT PUMP LOOP RETURN **----**SUPPLY AIR DIFFUSER OR GRILLE CONDENSATE DRAIN CONTRACTOR FURNISHED. CONTRACTOR INSTALLED HEAT PUMP LOOP SUPPLY SOUND ATTENUATOR  $\longrightarrow$ PIPE - ANCHOR CUBIC FEET PER HOUR SUPPLY AIR PIPE - CAP OR PLUG SANITARY WASTE CUBIC FEET PER MINUTE HEATING HEATING VENTILATING SUPPLY AIR TEMPERATURE PIPE - ELBOW DOWN CHILLED WATER HEATING, VENTILATING, AIR CONDITIONING SECTION SCCR SHORT CIRCUIT CURRENT RATING CHILLED WATER RETURN HOT WATER HEATING PIPE - ELBOW UP HOT WATER HEATING RETURN CHILLED WATER SUPPLY SUPPLY FAN PIPE - EXPANSION JOINT OR COMPENSATOR HOT WATER HEATING SUPPLY CONDENSATE DOMESTIC HOT WATER PIPE - FLANGE —— CONDENSATE (SPECIFIC PSIG) DOMESTIC HOT WATER (SPECIFIC TEMP 'F) SNOW MELT RETURN PIPE - HOSE AND BRAID FLEXIBLE CONNECTION DOMESTIC HOT WATER RETURN SNOW MELT SUPPLY CARBON DIOXIDE STATIC PRESSURE HEAT EXCHANGER PIPE - RUBBER FLEXIBLE CONNECTION CONTINUATION OR CONTINUED SPECIFICATION CONTRACTOR SPRINKLER PIPE - GUIDE INDOOR AIR QUALITY CONVECTOR SQUARE FOOT/SQUARE FEET PIPE - TEE DOWN COEFFICIENT OF PERFORMANCE INSIDE DIAMETER START/STOP INVERT ELEVATION CIRCUI ATING PUMP SERVICE SINK CONDENSATE RETURN UNIT INTAKE HOOD STORM CLINICAL SERVICE SINK STANDARD COOLING TOWER INFRARED HEATER STACK CABINET UNIT HEATER PRESSURE AND TEMPERATURE TEST PLUG INDIRECT WASTE STEAM DOMESTIC COLD WATER STEAM (SPECIFIC PSIG) DOMESTIC COLD WATER - FILTERED JANITOR'S CLOSET PRESSURE GAUGE AND COCK SUMMER/WINTER CONDENSER WATER RETURN JOCKEY PUMP REDUCER - CONCENTRIC CONDENSER WATER SUPPL' TRANSFER GRILLE THOUSAND AMP REDUCER - ECCENTRIC DRIP AND TRAP TEMPERATURE CONTROL KILOWATT ROOF/OVERFLOW DRAIN <del>----</del> DISCHARGE AIR KILOWATT-HOUR TEMPERING COIL DISCHARGE AIR TEMPERATURE TEMPERATURE CONTROL PANEL STEAM TRAP - FLOAT AND THERMOSTATIO LEAVING AIR TEMPERATURE DIRECT DIGITAL CONTROL STEAM TRAP - BUCKET LABORATORY TEMPERATURE LAVATORY TEMPORARY STRAINER DRAINAGE FIXTURE UNITS TERMINAL HEATING LEAVING DRY BULB TOTAL HEAT ABSORBED DIAMETER STRAINER WITH VALVE AND BLOW-OFF DAMPER TERMINAL HEATING RETURN LOW LIMIT LOW PRESSURE CONDENSATE DAY/NIGHT TOTAL HEAT REJECTED THERMOMETER LOW PRESSURE STEAM TERMINAL HEATING SUPPLY DOWNSPOUT NOZZLE LOCKED ROTOR AMPS TRAP ——эо LEAVING WATER TEMPERATURE TEPID WATER DRAIN TILE --- VALVE - ANGLE DRAIN TILE CONNECTION TOTAL STATIC PRESSURE DOMESTIC WATER HEATER MIXED AIR (AIR) TERMINAL UNIT ——Ю́—— VALVE − BALL MIXED AIR TEMPERATURE TURNING VANES MAKE-UP AIR UNIT TEMPERED WATER MAXIMUM VALVE - BALANCE (i.e. BALANCE VALVE TO 0.5 GPM) EXHAUST GRILLE OR REGISTER THOUSAND BRITISH THERMAL UNITS PER HOUR VALVE - COMBINATION BALANCE & FLOW MEASURING (i.e. BALANCE VALVE TO 0.5 GPM) UNIT HEATER MEDICAL COMPRESSED AIR EXHAUST AIR MINIMUM CIRCUIT AMPACITY UNDERWRITER'S LABORATORY ENTERING AIR TEMPERATURE MOTOR CONTROL CENTER UNLESS OTHERWISE NOTED → VALVE - CHECK EXPANSION COMPENSATOR MECHANICAL ELECTRONICALLY COMMUTATED MOTOR MEZZANINE UNIT VENTILATOR → VALVE - SPRING CHECK ELECTRIC CABINET UNIT HEATER MANUFACTURER VALVE - GAS (MANUAL ENTERING DRY BULB MANHOLE ENERGY EFFICIENCY RATIO 1/1000th INCH VALVE - GLOBE EMERGENCY EYE WASH / SHOWER VACUUM EMERGENCY EYE WASH MISCELLANEOUS VARIABLE AIR VOLUME MILLION BRITISH THERMAL UNITS PER HOUR VACUUM BREAKER FXHAUST FAN VALVE - NEEDLE VOLUME DAMPER (MANUALLY ADJUSTABLE) MAXIMUM OVERCURRENT PROTECTION ELECTRIC HEATING COIL MOTOR STARTER VARIABLE FREQUENCY CONTROLLER EXPANSION JOINT MOUNTED VENT THROUGH ROOF ——IVH—— VALVE − PLUG FI EVATION MOTOR ELECTRICAL MANUAL AIR VENT VENTURI TERMINAL UNIT **ENERGY MANAGEMENT SYSTEM** VERTICAL UNIT VENTILATOR → VALVE – PRESSURE REGULATING MEDICAL VACUUM ENERGY RECOVERY LOOP → VALVE - PRESSURE REDUCING ENERGY RECOVERY LOOP RETURN NITROGEN WASTE AND VENT ENERGY RECOVERY LOOP SUPPLY NITROUS OXIDE ENERGY RECOVERY UNIT WASTE ANESTHETIC GAS DISPOSAL VALVE – PRESSURE RELIEF NOISE CRITERIA FMFRGENCY SHOWER NORMALLY CLOSED WFT BULB NORMALLY CLOSED TIMED CLOSED EXTERNAL STATIC PRESSURE WATER CLOSET VALVE - PRESSURE & TEMPERATURE RELIEF ELECTRIC UNIT HEATER NORMALLY CLOSED TIMED OPEN WATER COLUMN NATIONAL FIRE PROTECTION ASSOCIATION VENT THROUGH ROOF ENTERING WET BULB WATER GAUGE ELECTRIC WATER COOLER NORMALLY OPEN TIMED CLOSED WALL HYDRAN WALL HYDRANT WASHING MACHINE SUPPLY AND DRAIN BOX ENTERING WATER TEMPERATURE NORMALLY OPEN TIMED OPEN NOT IN CONTRACT WATER PRESSURE DROP WATER METER NORMALLY OPEN FIRE PROTECTION GAS METER DEGREES FAHRENHEIT NON POTABLE COLD WATER TRANSFORMER FACE AND BYPASS **DOUBLE LINE PIPING SYMBOLS** FLOAT AND THERMOSTATIC ZONE VALVE BOX FACE AREA OUTSIDE AIR **DESCRIPTION** <u>SYMBOL</u> FAN COIL UNIT OUTSIDE AIR TEMPERATURE FLANGE OUTLET BOX OPPOSED BLADE DAMPER FLEX CONNECTION ON CENTER/CENTER TO CENTER OUTSIDE DIÂMETER STRAINER - BASKET OPEN ENDED DUCT OWNER FURNISHED, CONTRACTOR INSTALLED STRAINER - Y TYPE OWNER FURNISHED, OWNER INSTALLED OVERFLOW RAIN CONDUCTOR VALVE - 2 WAY CONTROL OVERFLOW ROOF DRAIN OUTSIDE SCREW AND YOKE VALVE - 3 WAY CONTROL OUTLET VELOCITY OPERATOR WORKSTATION TEMPERATURE CONTROL - PARTIAL SYMBOLS LIST VALVE - BUTTERFLY VALVE - CHECK <u>DESCRIPTION</u> <u>DESCRIPTION</u> CARBON DIOXIDE SENSOR OCCUPANCY SENSOR VALVE - DETECTOR CHECK PRESSURE TRANSMITTER CARBON MONOXIDE SENSOR STATIC PRESSURE SENSOR OR PROBE DIFFERENTIAL PRESSURE TRANSMITTER VALVE - OS&Y HORIZONTAL STEM FLOW METER VALVE - 2 WAY CONTROL VALVE VALVE - OS&Y VERTICAL STEM GUARD FOR STAT OR SENSOR VALVE - 3 WAY CONTROL VALVE

MECHANICAL DRAWING INDEX SHEET TITLE

**DUCTWORK SYMBOLS** 

DESCRIPTION

AIR TERMINAL UNIT

AIR TERMINAL UNIT WITH HEATING COIL

VENTURI AIR TERMINAL UNIT WITH HEATING COIL

DAMPER - HORIZONTAL FIRE (EXISTING, NEW)

DAMPER - VERTICAL FIRE (EXISTING, NEW)

DAMPER - VOLUME (MANUALLY ADJUSTABLE)

DIFFUSER - SQUARE OR RECTANGULAR

DUCT CROSS SECTION - SUPPLY

DUCT CROSS SECTION - RETURN

DUCT CROSS SECTION - EXHAUST

DUCT TAKE-OFF - ROUND CONICAL

DUCT TAKE-OFF - RECTANGULAR WITH SHOE TAP

ELBOW - RECTANGULAR / ROUND SMOOTH RADIUS

VARIABLE FREQUENCY CONTROLLER SERVING EQUIPMENT XX-#

ELBOW - RECTANGULAR WITH TURNING VANES

DUCT - FLEXIBLE CONNECTION

ELBOW DOWN - RECTANGULAR

ELBOW DOWN — ROUND

ELBOW UP - ROUND

FAN – AXIAL

HEATING COIL

=

 $\rightarrow$ 

<u>SYMBOL</u>

ELBOW UP - RECTANGULAR

FAN - CENTRIFUGAL (ELEVATION)

INCLINED DROP IN DIRECTION OF AIRFLOW

INCLINED RISE IN DIRECTION OF AIRFLOW

INTAKE OR RELIEF HOOD

REGISTER - RETURN OR EXHAUST

REGISTER - RETURN WITH BOOT

REGISTER - TRANSFER GRILLE

TRANSITION - CONCENTRIC

TRANSITION - ECCENTRIC

UNIT HEATER - HORIZONTAL THROW

DUCT TAKE-OFF - ROUND CONICAL

DUCT TAKE-OFF - RECTANGULAR WITH SHOE TAP

ELBOW - RECTANGULAR WITH TURNING VANES

ELBOW - RECTANGULAR SMOOTH RADIUS

INCLINED DROP IN DIRECTION OF AIRFLOW

INCLINED RISE IN DIRECTION OF AIRFLOW

ELBOW DOWN - RECTANGULAR

ELBOW DOWN — ROUND

ELBOW UP - ROUND

HEATING COIL

ELBOW UP - RECTANGULAR

TRANSITION - CONCENTRIC

TRANSITION - ECCENTRIC

ELBOW - RECTANGULAR SHORT RADIUS WITH SPLITTER VANES

UNIT HEATER - VERTICAL THROW

ROOF EXHAUST FAN

DOUBLE LINE DUCTWORK SYMBOLS

**DESCRIPTION** 

ELBOW - ROUND

DUCT — FLEXIBLE DUCT

DAMPER - SMOKE (EXISTING, NEW)

DAMPER - BACK DRAFT

DAMPER - MOTORIZED

DIFFUSER - BLANK OFF

DIFFUSER - LINEAR SLOT

DAMPER - HORIZONTAL FIRE / SMOKE (EXISTING, NEW)

DAMPER - VERTICAL FIRE / SMOKE (EXISTING, NEW)

VENTURI AIR TERMINAL UNIT

<u>SYMBOL</u>

SHEET NO. MO.1 MECHANICAL STANDARDS AND DRAWING INDEX MD3.1 HIGH SCHOOL GYM HVAC PIPING DEMOLITION PLAN MD3.2 HIGH SCHOOL GYM MEZZANINE HVAC PIPING DEMOLITION PLAN MD4.1 HIGH SCHOOL GYM SHEET METAL DEMOLITION PLAN MD4.2 HIGH SCHOOL GYM MEZZANINE SHEET METAL DEMOLITION PLAN M3.1 HIGH SCHOOL GYM HVAC PIPING PLAN M3.2 HIGH SCHOOL GYM MEZZANINE HVAC PIPING PLAN M4.1 HIGH SCHOOL GYM SHEET METAL PLAN M4.2 HIGH SCHOOL GYM MEZZANINE SHEET METAL PLAN HIGH SCHOOL ROOF MECHANICAL PLAN M6.1 MECHANICAL DETAILS M6.2 MECHANICAL DETAILS

TEMPERATURE CONTROL STANDARDS AND GENERAL NOTES

MECHANICAL DETAILS

MECHANICAL SCHEDULES

MECHANICAL SCHEDULES

TEMPERATURE CONTROLS

M6.3

M7.1

M7.2

M8.1

M8.2

350-4

640-2

STANDARD METHODS OF NOTATION

SUPPLY DIFFUSER WITH SCHEDULE TAG "1", 10" DIAMETER NECK SIZE 350 CFM TYPICAL FOR 4 RETURN REGISTER WITH SCHEDULE TAG "1", 22"x 22" NECK SIZE 640 CFM TYPICAL FOR 2 EXHAUST REGISTER E DESIGNATION SIMILAR. AIR TERMINAL UNIT WITH HEATING COIL NO. 101 WITH SERVICE CLEARANCE SHOWN VENTURI AIR TERMINAL WITH HEATING COIL NO. 101 WITH SERVICE CLEARANCE SHOWN PLUMBING FIXTURE UNIT IDENTIFICATION TAG WATER CLOSET TYPE "1"

PIPE DIAMETER NOTATION ALL SIZES IN INCHES 22x10 18x14ø -OVAL DUCT -RECTANGULAR DUCT

CONSTRUCTION KEY NOTE (NUMBER) OR DEMOLITION KEY NOTE (LETTER)

EQUIPMENT DESIGNATION, (i.e. EXHAUST FAN NUMBER 1)

PIPING RISER DESIGNATION (i.e. HOT WATER RISER NUMBER 1)

- NEW SYSTEM COMPONENT EXISTING SYSTEM COMPONENT TO REMAIN - POINT OF NEW CONNECTION SYMBOL SHEET WHERE SECTION IS DRAWN - AREA OF ENLARGEMENT

PLAN NUMBER SHEET WHERE ENLARGED PLAN IS DRAWN 

SECTION OR ENLARGED PLAN M5.1 SCALE: 1/8" - 1' - 0"

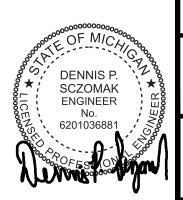
- SHEET WHERE SECTION IS CUT OR

ENLARGED PLAN IS REFERENCED

HEAVY LINE WEIGHT INDICATES NEW WORK LIGHT LINE WEIGHT INDICATES EXISTING EQUIPMENT OR REFERENCED INFORMATION GRAY LINE INDICATES BACKGROUND INFORMATION DASHED LINES INDICATE PIPING \_\_\_\_\_ ROUTED BELOW SLAB OR GRADE

HATCH MARKS INDICATE EQUIPMENT OR MATERIALS TO BE DISCONNECTED AND REMOVED.

NOTE: SOME SYMBOLS AND ABBREVIATIONS SHOWN MAY NOT APPLY TO THIS PROJECT.



CORNERSTONE ARCHITECTS 22 S. Union, Ste. 200 440 Bridge St. NW raverse City, MI 231.947.2177 p Grand Rapids, M 616.774.0100 g

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DATE ISSUED FOR 11/20/24 DD 12/02/24 COORDINATION 12/06/24 50% CD

01/17/25 |BID SET

Peter Basso Associates 5145 Livernois, Suite 100 Troy, Michigan 48098-3276 Tel: 248-879-5666

www.PeterBassoAssociates.com PBA Project No.: 2024.0338 WEK WEK DRAFTS: FMW

PROJECT NO: 22.516 HS

**MECHANICAL** STANDARDS AND DRAWING INDEX

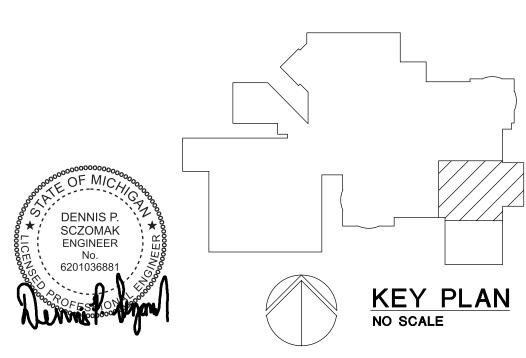
HIGH SCHOOL GYM HVAC PIPING DEMOLITION PLAN
SCALE: 1/8" - 1' - 0"

#### MECHANICAL DEMOLITION GENERAL NOTES:

- ANY INTERRUPTION OF EXISTING SERVICES AND/OR EQUIPMENT SHALL BE PERFORMED AT A TIME APPROVED IN ADVANCE BY THE OWNER'S REPRESENTATIVE.
- 2. THESE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL EXTENT OF THE WORK. ACTUAL ROUTING AND SIZES OF EXISTING PIPING AND DUCTWORK MIGHT DIFFER TO A LIMITED EXTENT FROM WHAT IS SHOWN. MAJOR DISCREPANCIES BETWEEN THE DRAWINGS AND ACTUAL EXISTING CONDITIONS SHALL BE REPORTED TO THE ENGINEER.
- 3. THE EXACT EXTENT OF DEMOLITION SHALL BE AS REQUIRED BY THE NEW WORK.
- 4. ALL MECHANICAL ITEMS TO BE REMOVED SHALL BE REMOVED COMPLETE, INCLUDING ALL RELATED ITEMS SUCH AS HANGERS, SUPPORTS, CONTROLS, ETC. CAP ALL OPEN ENDED PIPES AND DUCTWORK.

#### **DEMOLITION KEY NOTES:**

- A. DISCONNECT AND REMOVE EXISTING 1 1/2 IN HWHS AND HWHR PIPING BACK TO EXISTING 2 IN PIPING AND CAP.
- B. DISCONNECT AND REMOVE EXISTING PUMP, GATE VALVES, THREE WAY MIXING VALVE, DRAIN VALVES AND ASSOCIATED PIPING.
- C. DISCONNECT AND REMOVE EXISTING H&V UNIT AND ASSOCIATED HWHS, HWHR, AND CONTROLS.
- D. REMOVE EXISTING TEMPERATURE CONTROLS





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PBA Project No.: 2024.0338

PIC: WEK

PM: WEK

DRAFTS: EMW

PROJECT NO: 22.516 HS

SHEET TITLE:
HIGH SCHOOL GYM
HVAC PIPING
DEMOLITION PLAN

MD3.1

HIGH SCHOOL GYM MEZZANINE HVAC PIPING DEMOLITION PLAN SCALE: 1/8' - 1' - 0'

#### MECHANICAL DEMOLITION GENERAL NOTES:

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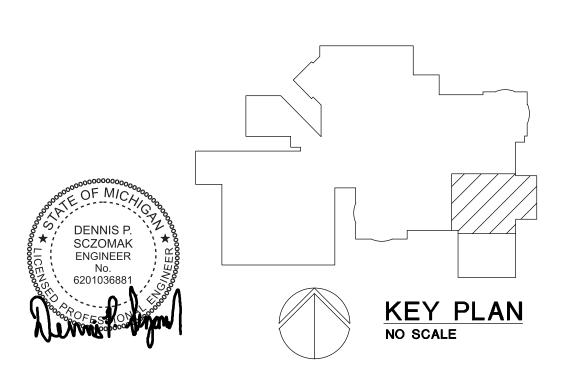
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PROJECT NO:

PROJECT NO: 22.516 HS

SHEET TITLE:
HIGH SCHOOL GYM
MEZZANINE HVAC PIPING
DEMOLITION PLAN

MD3.2





HIGH SCHOOL GYM SHEET METAL DEMOLITION PLAN
SCALE: 1/8' - 1' - 0"

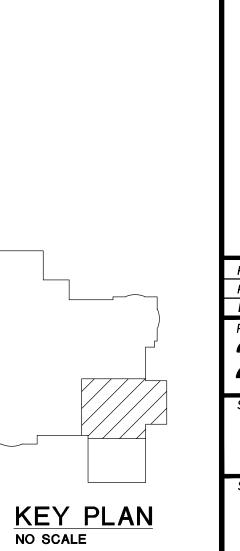
#### MECHANICAL DEMOLITION GENERAL NOTES:

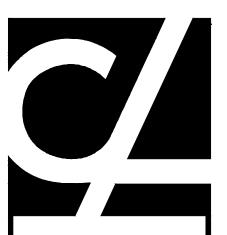
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#### **#** DEMOLITION KEY NOTES:

DENNIS P. SCZOMAK ENGINEER

- A. DISCONNECT AND REMOVE DUCT TO EXISTING OUTSIDE AIR LOUVER COMPLETE. INSULATE LOUVER AS SEEN IN DETAIL ON SHEET 6.1.
- B. DISCONNECT AND REMOVE EXISTING H&V UNIT AND ASSOCIATED DUCT WORK AND CAP AT LOCATION INDICATED ON DRAWINGS.
- C. DISCONNECT AND REMOVE RETURN LOUVER AND ASSOCIATED DUCT WORK.
- D. REMOVE EXISTING RELIEF VENT AND CAP. INSULATE AS SEEN ON DETAILS ON SHEET 6.1.





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PM: WEK

DRAFTS: EMW

PROJECT NO:

22.516 HS

SHEET TITLE:
HIGH SCHOOL GYM
SHEET METAL
DEMOLITION PLAN

MD4.1

HIGH SCHOOL GYM MEZZANINE SHEET METAL DEMOLITION PLAN SCALE: 1/8" - 1' - 0"

#### MECHANICAL DEMOLITION **GENERAL NOTES:**

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- B. DISCONNECT AND REMOVE EXISTING H&V UNIT AND ASSOCIATED DUCT WORK AND CAP AT LOCATION INDICATED ON DRAWINGS.
- C. DISCONNECT AND REMOVE RETURN LOUVER AND ASSOCIATED DUCT WORK.
- D. REMOVE EXISTING RELIEF VENT AND CAP. INSULATE AS SEEN ON DETAILS ON SHEET



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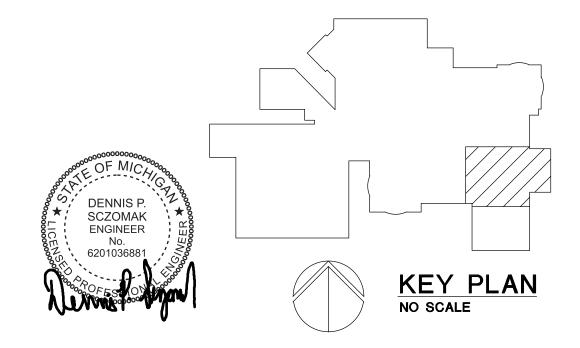
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DRAFTS:

PROJECT NO: 22.516 HS

HIGH SCHOOL GYM MEZZANINE SHEET METAI DEMOLITION PLAN

SHEET NO: MD4.2



HIGH SCHOOL GYM HVAC PIPING PLAN
SCALE: 1/8" - 1" - 0"

#### **HVAC PIPING GENERAL NOTES:**

- 1. THESE DRAWINGS ARE DIAGRAMMATIC, AND REPRESENT THE GENERAL INTENT AND ARRANGEMENT OF SYSTEMS. THEY ARE NOT TO BE CONSIDERED FABRICATION/COORDINATION/SHOP DRAWINGS. COORDINATION WITH OTHER TRADES IS REQUIRED. PROVIDE THE ADDITIONAL FITTINGS AND OFFSETS THAT WILL BE REQUIRED TO COMPLETE EACH SYSTEM AND TO AVOID INTERFERENCES WITH ALL OTHER SYSTEMS INCLUDING THE STRUCTURE, SHEET METAL, OTHER PIPING SYSTEMS, ELECTRICAL CONDUITS, BUS DUCTS, CABLE TRAY, LIGHT FIXTURES, ETC. AND/OR OTHER SPACE CONSTRAINTS.
- 2. INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.
- 3. PIPING AND DUCTWORK SHALL NOT BE INSTALLED ABOVE ELECTRICAL TRANSFORMERS, SWITCHBOARDS, PANELBOARDS OR MOTOR CONTROL CENTERS.
- 4. COORDINATE AND PROVIDE ACCESS DOORS WITHIN INACCESSIBLE CEILING, SHAFT, AND CHASE AREAS FOR ALL COMPONENTS WHICH REQUIRE SERVICE ACCESS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.
- 5. PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL
- 6. SUBMIT PROPOSED METHODS OF ANCHORING AND GUIDING PIPING SYSTEMS TO STRUCTURAL ENGINEER FOR APPROVAL.
- 7. COORDINATE LOCATION OF DUCT-MOUNTED HYDRONIC DEVICES WITH SHEET METAL
- 8. BRANCH PIPING SERVING TERMINAL UNIT HEATING COILS OR RADIANT CEILING PANELS SHALL BE 3/4" UNLESS OTHERWISE NOTED, BRANCH PIPING SERVING MORE THAN ONE TERMINAL UNIT HEATING COIL SHALL BE 1" UNLESS OTHERWISE NOTED. BRANCH PIPING SERVING HOT WATER UNIT HEATERS AND CABINET UNIT HEATERS SHALL BE 1" UNLESS OTHERWISE NOTED.
- 9. REFER TO TEMPERATURE CONTROLS STANDARD MOUNTING HEIGHTS DETAIL FOR ELEVATIONS OF WALL MOUNTED TEMPERATURE CONTROL DEVICES.

#### **#** CONSTRUCTION KEY NOTES:

- 1. THERMOSTAT SERVING ERU-1 AND ERU-2.
- 2. ROUTE HWHS AND HWHR TO HEATING COIL. SEE HOT WATER HEATING COIL DETAIL ON M6.3
- 3. LOCATE NEW PUMPS AT A MAXIMUM OF 8' ABOVE FINISHED FLOOR TO ALLOW FOR
- 4. RELOCATE EXISTING FIRE PROTECTION LINES AND SPRINKLERS AS NEEDED FOR
- 5. SUPPORT HVAC PIPING TO THE EXISTING JOIST.



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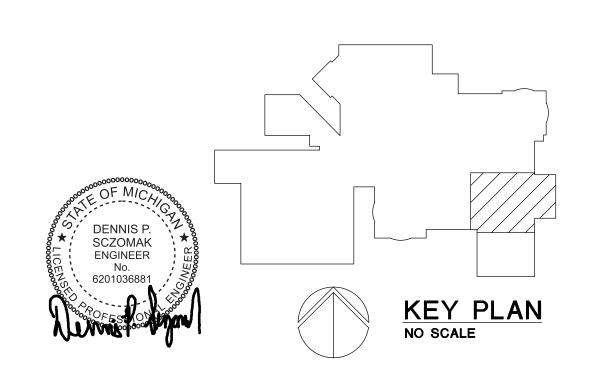


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HIGH SCHOOL GYM HVAC PIPING PLAN

SHEET NO: M3.1



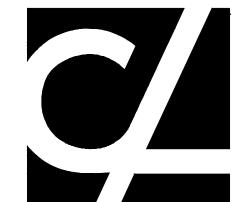
HIGH SCHOOL GYM MEZZANINE HVAC PIPING PLAN
SCALE: 1/8" - 1" - 0"

#### **HVAC PIPING GENERAL NOTES:**

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- 4. COORDINATE AND PROVIDE ACCESS DOORS WITHIN INACCESSIBLE CEILING, SHAFT, AND CHASE AREAS FOR ALL COMPONENTS WHICH REQUIRE SERVICE ACCESS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.
- 5. PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.
- 6. SUBMIT PROPOSED METHODS OF ANCHORING AND GUIDING PIPING SYSTEMS TO STRUCTURAL ENGINEER FOR APPROVAL.
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- 3. LOCATE NEW PUMPS AT A MAXIMUM OF 8' ABOVE FINISHED FLOOR TO ALLOW FOR
- 4. RELOCATE EXISTING FIRE PROTECTION LINES AND SPRINKLERS AS NEEDED FOR RENOVATION.
- 5. SUPPORT HVAC PIPING TO THE EXISTING JOIST.



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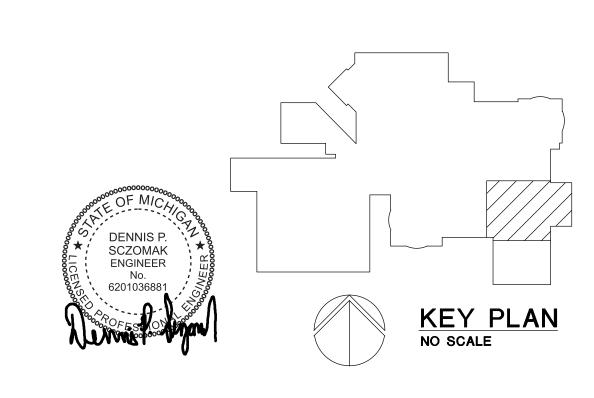
CONSULTING ENGINEERS
5145 Livernois, Suite 100
Troy, Michigan 48098-3276 Tel: 248-879-5666 www.PeterBassoAssociates.com PBA Project No.: 2024.0338

DRAFTS:

PROJECT NO: 22.516 HS

HIGH SCHOOL GYM MEZZANINE HVAC PIPING PLAN

M3.2





#### SHEET METAL GENERAL NOTES:

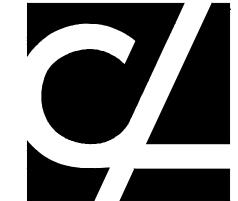
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- 7. REFER TO TEMPERATURE CONTROLS STANDARD MOUNTING HEIGHTS DETAIL FOR ELEVATIONS OF WALL MOUNTED TEMPERATURE CONTROL DEVICES.

#### **EXAMPLE 2** CONSTRUCTION KEY NOTES:

- 1. PROVIDE CONDENSATE DRAIN PIPING TO THE NEAREST ROOF DRAIN AND PROVIDE
- 2. RELOCATE EXISTING FIRE PROTECTION LINES AND SPRINKLERS AS NEED FOR
- 3. ROUTE NEW SUPPLY DUCTWORK THROUGH JOIST, REWORK EXISTING CROSS BRIDGES TO ACCOMMODATE NEW DUCTWORK. PAINT NEW SUPPLY DUCTWORK TO MATCH EXISTING DUCT WORK.
- 4. ROUTE NEW RETURN DUCTWORK UNDER JOIST. PAINT NEW RETURN DUCT WORK TO MATCH EXISTING DUCT WORK.
- 5. INSULATE OUTSIDE AIR LOUVER AS SEEN ON SHEET M6.1.

DENNIS P. SCZOMAK ENGINEER

- 6. RE-BALANCE ALL AIR DIFFUSERS TO CFM INDICATED ON DRAWINGS.
- 7. CAP EXISTING RELIEF VENT ON ROOF AFTER REMOVAL ON ROOF. SEE DETAIL ON
- 8. STACK 48X20 RETURN GRILLES ON TOP OF EACH OTHER. TOTAL OF 5 48X20 RETURN GRILLES. ENSURE RETURN DUCT DOES NOT BLOCK EXISTING DOOR WHEN SWUNG OPEN.



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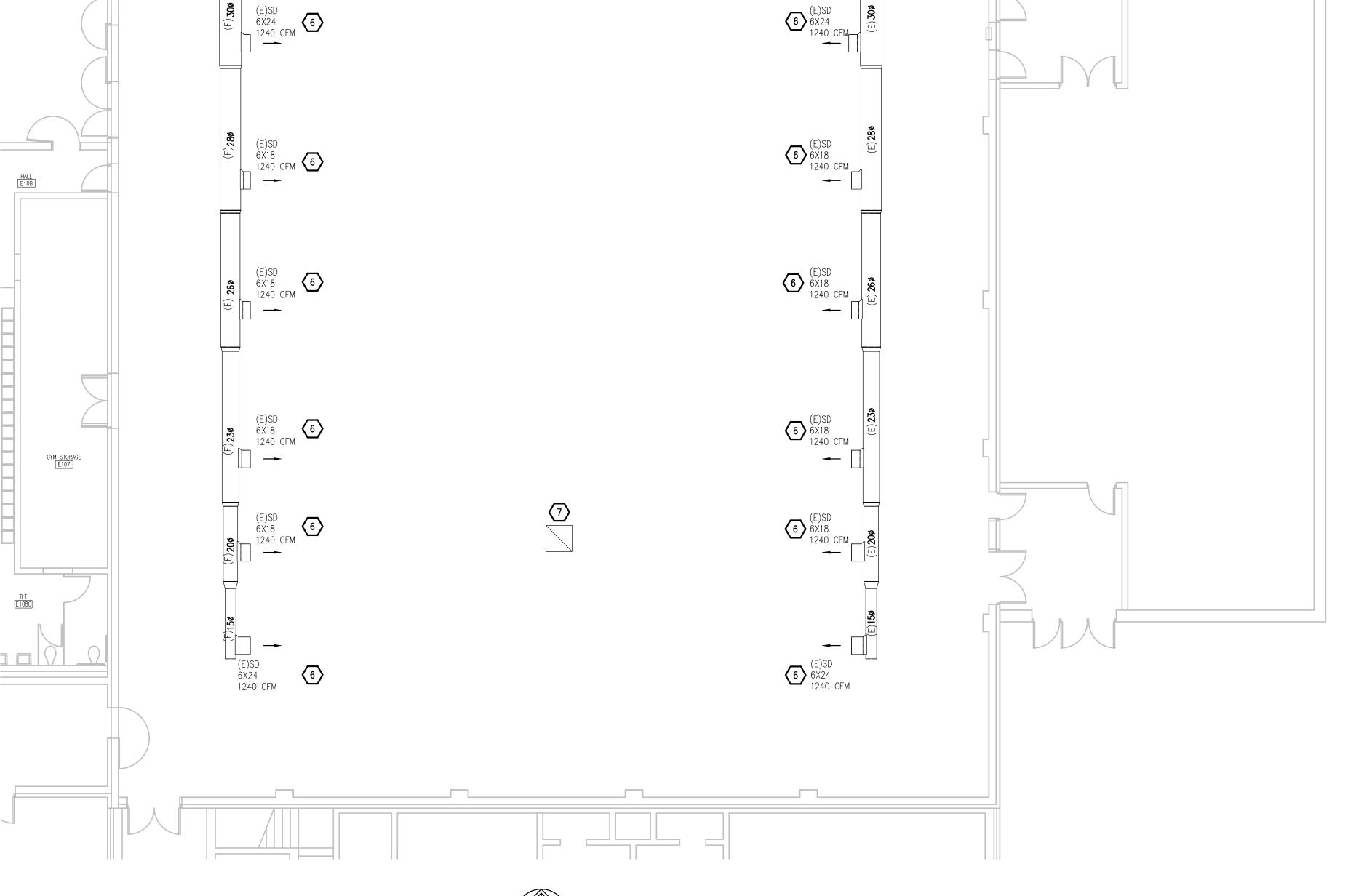
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22.516 HS

HIGH SCHOOL GYM SHEET METAL PLAN

SHEET NO: M4.1

KEY PLAN NO SCALE





HIGH SCHOOL GYM MEZZANINE SHEET METAL PLAN
SCALE: 1/8\* - 1' - 0\*

#### SHEET METAL GENERAL NOTES:

- 1. THESE DRAWINGS ARE DIAGRAMMATIC, AND REPRESENT THE GENERAL INTENT AND ARRANGEMENT OF SYSTEMS. THEY ARE NOT TO BE CONSIDERED FABRICATION/COORDINATION/SHOP DRAWINGS. COORDINATION WITH OTHER TRADES IS REQUIRED. PROVIDE THE ADDITIONAL FITTINGS AND OFFSETS THAT WILL BE REQUIRED TO COMPLETE EACH SYSTEM AND TO AVOID INTERFERENCES WITH ALL OTHER SYSTEMS INCLUDING THE STRUCTURE, PIPING SYSTEMS, ELECTRICAL CONDUITS, BUS DUCTS, CABLE TRAY, LIGHT FIXTURES, ETC. AND/OR OTHER SPACE CONSTRAINTS.
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- 7. REFER TO TEMPERATURE CONTROLS STANDARD MOUNTING HEIGHTS DETAIL FOR ELEVATIONS OF WALL MOUNTED TEMPERATURE CONTROL DEVICES.

#### **#** CONSTRUCTION KEY NOTES:

- 1. PROVIDE CONDENSATE DRAIN PIPING TO THE NEAREST ROOF DRAIN AND PROVIDE HEAT TRACE.
- 2. RELOCATE EXISTING FIRE PROTECTION LINES AND SPRINKLERS AS NEED FOR RENOVATION.
- 3. ROUTE NEW SUPPLY DUCTWORK THROUGH JOIST, REWORK EXISTING CROSS BRIDGES TO ACCOMMODATE NEW DUCTWORK. PAINT NEW SUPPLY DUCTWORK TO MATCH EXISTING DUCT WORK.
- 4. ROUTE NEW RETURN DUCTWORK UNDER JOIST. PAINT NEW RETURN DUCT WORK TO MATCH EXISTING DUCT WORK.
- 5. INSULATE OUTSIDE AIR LOUVER AS SEEN ON SHEET M6.1.
- 6. RE-BALANCE ALL AIR DIFFUSERS TO CFM INDICATED ON DRAWINGS.
- 7. CAP EXISTING RELIEF VENT ON ROOF AFTER REMOVAL ON ROOF. SEE DETAIL ON SHEET M6.1.
- 8. STACK 48X20 RETURN GRILLES ON TOP OF EACH OTHER. TOTAL OF 5 48X20 RETURN GRILLES. ENSURE RETURN DUCT DOES NOT BLOCK EXISTING DOOR WHEN SWUNG OPEN.



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PM: .

DRAFTS: .

PROJECT NO:

PROJECT NO: 22.516 HS

SHEET TITLE:
HIGH SCHOOL GYM
MEZZANINE SHEET
METAL PLAN

M4.2

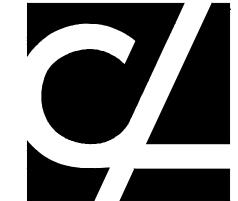
HIGH SCHOOL ROOF MECHANICAL PLAN
SCALE: 1/8" - 1' - 0"

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#### **EXECUTION KEY NOTES:**

- PROVIDE CONDENSATE DRAIN PIPING TO THE NEAREST ROOF DRAIN AND PROVIDE HEAT TRACE.
- 2. RELOCATE EXISTING FIRE PROTECTION LINES AND SPRINKLERS AS NEED FOR RENOVATION.
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Creamford Musicable Solvool Distorice

3H SCHOO

HVAC UPGRA

ISSUED FOR

DATE ISSUED FOR

11/20/24 DD

12/02/24 COORDINATION

12/06/24 50% CD

01/17/25 BID SET



5145 Livernois, Suite 100 Troy, Michigan 48098-3276 Tel: 248-879-5666 www.PeterBassoAssociates.com PBA Project No.: 2024.0338

PIC: WEK

PM: WEK

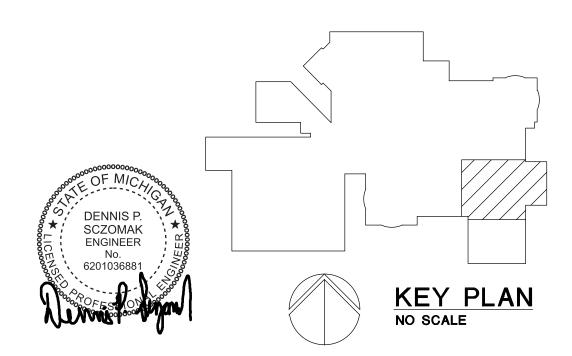
DRAFTS: EMW

PROJECT NO:

22.516 HS

SHEET TITLE:
HIGH SCHOOL ROOF
MECHANICAL PLAN

SHEET NO:
M5.1



FIRE RATED AND NON-FIRE RATED POURED CONCRETE OR BLOCK WALL PIPE PENETRATION DETAIL NO SCALE

MATERIAL AND CAULK WITH NON-HARDENING SEALANT.

IN EXPOSED AREAS ONLY: PROVIDE FINISHED ESCUTCHEON PLATE FLUSH AGAINST WALL. (SIZE TO COMPLETELY COVER ÒPENING).— - CALCIUM SILICATE INSULATION INSERT WHERE INSULATED PIPE PENETRATES WALL - 360° SPLIT SHEET METAL SHIELD PIPE PENETRATION DETAIL SIMILAR FOR UNINSULATED PIPING - SCHEDULE 40 BLACK STEEL PIPE SLEEVE. METAL STUD AND SEAL OPENING AROUND SLEEVE AND DRYWALL PARTITION WALL-DRYWALL PARTITION AIRTIGHT

FIRE RATED AND NON-FIRE RATED METAL STUD AND DRYWALL PARTITION WALL PIPE PENETRATION DETAIL

DETAIL INDICATES THE INSTALLATION REQUIREMENTS FOR A FIRE RATED ASSEMBLY.

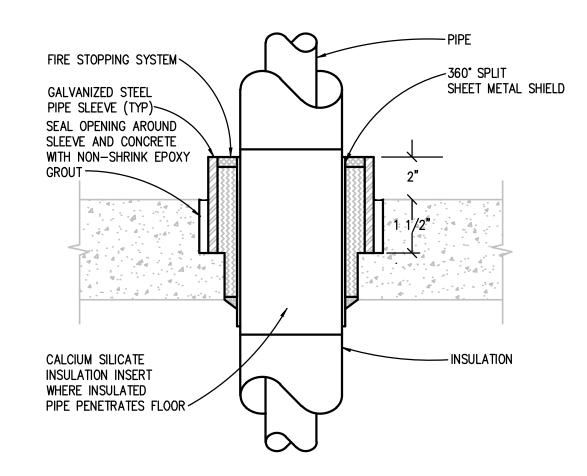
FOR A NON-FIRE RATED ASSEMBLY PACK SLEEVED OPENING WITH INSULATION

MATERIAL AND CAULK WITH NON-HARDENING SEALANT.

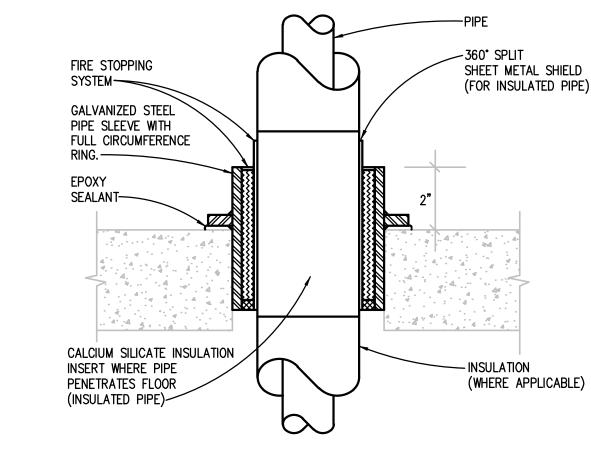
IN EXPOSED AREAS ONLY: PROVIDE FINISHED ESCUTCHEON PLATE FLUSH AGAINST WALL. (SIZE TO COMPLETELY COVER OPENING).— SEAL ALL AROUND OPENING WITH NON-HARDENING SEALANT - 360° SPLIT SHEET METAL SHIELD WHERE INSULATED PIPES PENETRATE WALL PIPE PENETRATION DETAIL SIMILAR FOR UNINSULATED PIPING METAL STUD AND DRYWALL PARTITION WALL-

THIS DETAIL <u>DOES NOT</u> APPLY TO HEATING PIPING 2" AND LARGER. FOR HEATING PIPING 2" AND LARGER REFER TO "FIRE RATED AND NON-FIRE RATED METAL STUD AND DRYWALL PARTITION WALL PIPE PENETRATION DETAIL"

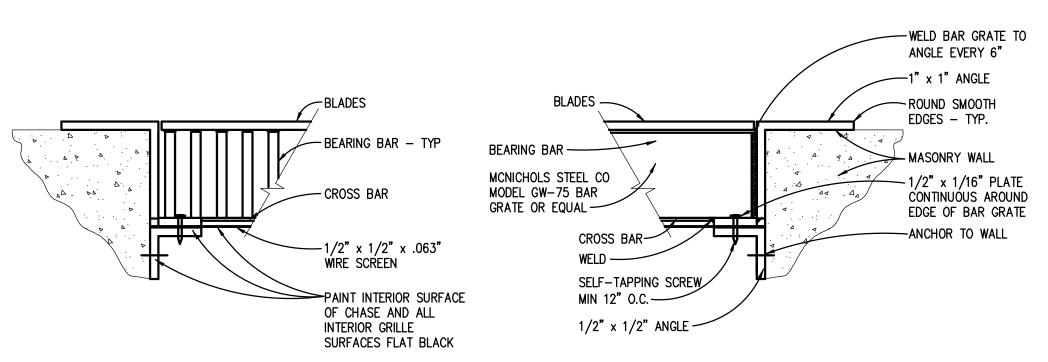
NON-FIRE RATED METAL STUD AND DRYWALL PARTITION WALL PIPE PENETRATION DETAIL NO SCALE



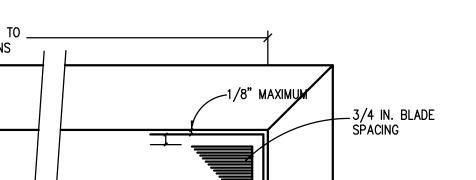
**EXISTING FLOOR PIPE PENETRATION DETAIL** 



**EXISTING FLOOR PIPE PENETRATION DETAIL** 

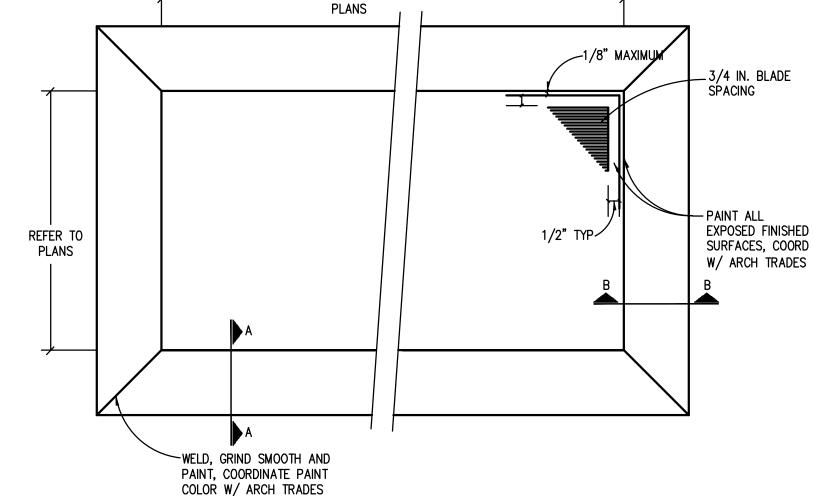






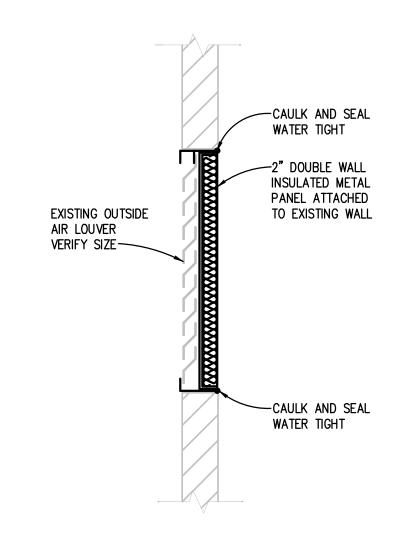
SECTION "A-A"

NO SCALE

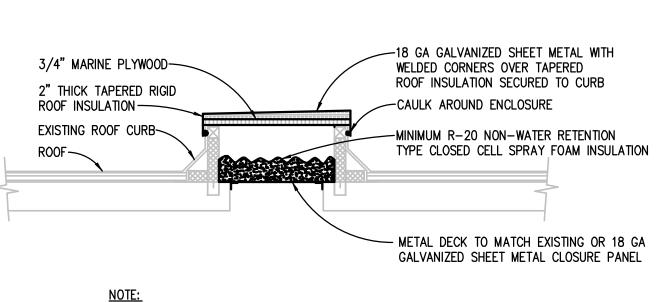


NOTES:
GRIND AND DEBURR ALL SURFACES PRIOR TO APPLYING FINISH.

**HEAVY DUTY RETURN AIR GRILLE DETAIL** 



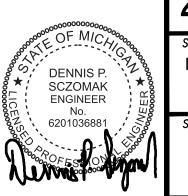
**EXISTING EXTERIOR LOUVER** AND/OR GRILLE CLOSURE DETAIL NO SCALE



NOTE:

1. FASTEN TOP CLOSURE, WITH SCREWS THROUGH SIDE. 2. NOT TO BE USED FOR CURBS GREATER THAN 24" IN ANY DIMENSION

SMALL ROOF CURB CAP DETAIL NO SCALE



CORNERSTONE ARCHITECTS 122 S. Union, Ste. 200 440 Bridge St. NW Traverse City, MI Grand Rapids, MI 231,947.2177 p 616.774.0100 p www.cornerstone-arch.com

Crawford MuSable School Dist

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DATE ISSUED FOR 11/20/24 DD 12/02/24 COORDINATION 12/06/24 50% CD 01/17/25 BID SET

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WEK DRAFTS: EMW PROJECT NO:

22.516 HS

MECHANICAL DETAILS

M6.1

			Ti	RAP DIN	MENSIO	N TABL	.E			
	S.P. AT DRAIN	DIMENSION "A"	DIMENSION "D"	DIMENSION "C"		DIMENIOLONI "E"		DIMENSION '	'F" (INCHES)	
TYPE OF SYSTEM	PAN (IN.)	(INCHES)	DIMENSION "B" (INCHES)	(INCHES)	DIMENSION "D" (INCHES)	DIMENSION "E" (INCHES)		DRAIN PIPE S	SIZE (INCHES)	
0,0,2,	(NOTE A)	MIN.	(11101120)	(TRAP SEAL)	(	(	1 1/2	2	2 1/2, 3	4
	−5.1 TO −6	5.0	5.0	2	6	2	13.0	14.0	15.0	16.0
DRAW THROUGH	-4.1 TO -5 4.5		4.5	2	5	2	12.0	13.0	14.0	15.0
	-3.1 TO -4	4.0	4.0	2	4	2	11.0	12.0	13.0	14.0
	-2.1 TO -3	3.5	3.5 3.5		3	2	10.0	11.0	12.0	13.0
	UP TO −2	3.0	3.0	2	2	2	9.0	10.0	11.0	12.0
	UP TO +2	4.0	2.0	2	2	4	9.0	10.0	11.0	12.0
ЭОСН	+2.1 TO +3	5.0	2.0	2	3	5	10.0	11.0	12.0	13.0
BLOW THROUGH	+3.1 TO +4	6.0	2.0	2	4	6	11.0	12.0	13.0	14.0
BLOW	+4.1 TO +5	7.0	2.0	2	5	7	12.0	13.0	14.0	15.0
_	+5.1 TO +6	8.0	2.0	2	6	8	13.0	14.0	15.0	16.0

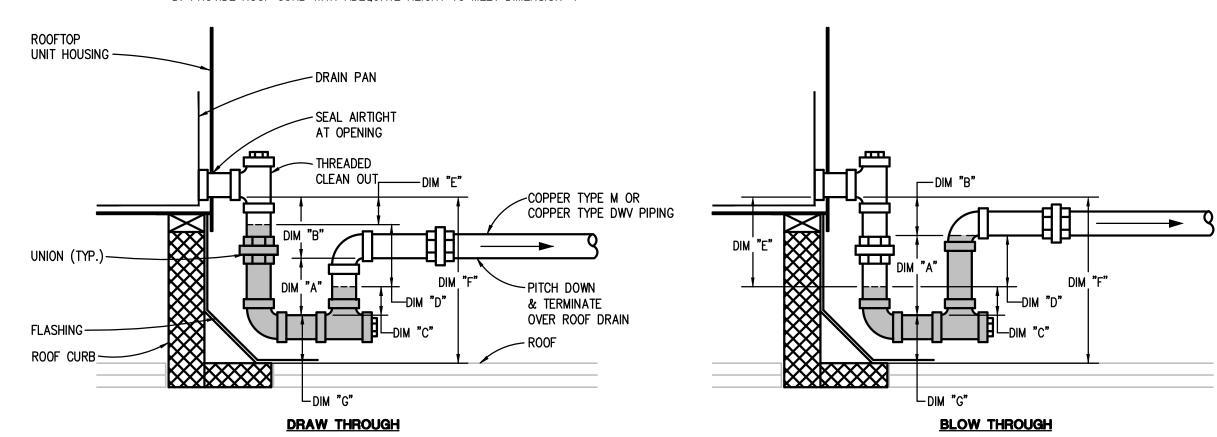
NOTES: A. REFER TO ROOFTOP AIR HANDLING UNIT (COMMERCIAL, UNITARY, MODULAR) SCHEDULE

FOR (-) OR (+) STATIC PRESSURE AT DRAIN PAN. B. CONDÈNSATE DRAIN PAN TRAP PIPING SERVING ENERGY RECOVERY UNIT HEAT EXCHANGER AND

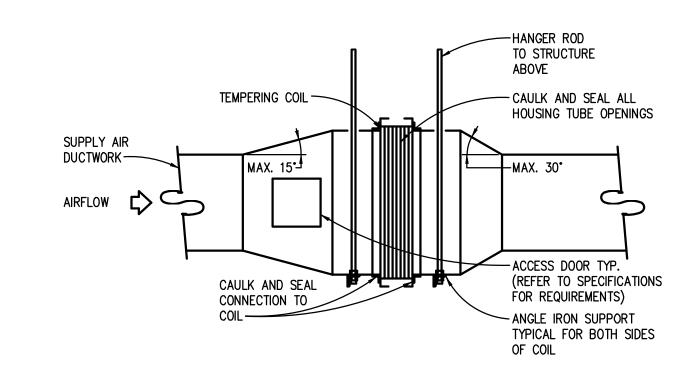
HUMIDIFIER SECTIONS, WHERE LOCATED OUTDOORS, SHALL BE INSULATED AND HEAT TRACED. C. DIMENSION "G" IS MIN: 3" FOR UP TO 1 1/2" DRAIN PIPE 4" FOR 2" DRAIN PIPE

5" FOR 2 1/2" OR 3" DRAIN PIPE

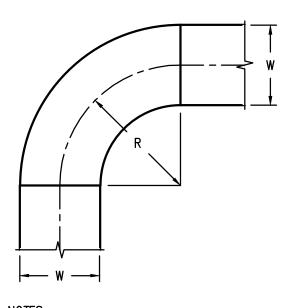
6" FOR 4" DRAIN PIPE D. PROVIDE ROOF CURB WITH ADEQUATE HEIGHT TO MEET DIMENSION "F"



ENERGY RECOVERY UNIT CONDENSATE DRAIN PAN TRAP DETAIL



DUCT MOUNTED TEMPERING COIL INSTALLATION DETAIL
NO SCALE

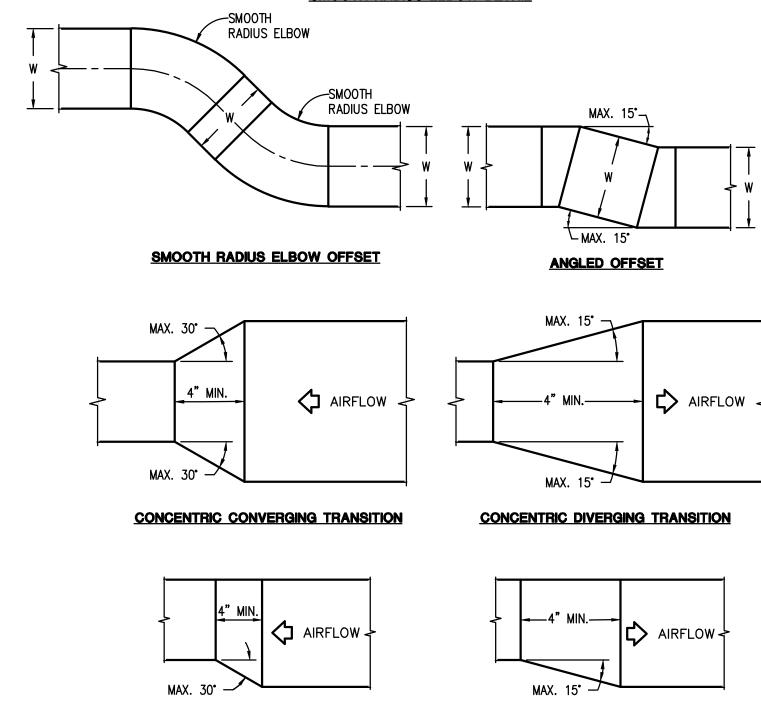


1. R/W = 1.0 FOR VELOCITIES  $\leq 2,000$  FPM UNLESS OTHERWISE INDICATED, R/W = 1.5FOR VELOCITIES > 2,000 FPM UNLESS

- OTHERWISE INDICATED.

  2. ALL CHANGES IN DIRECTION SHALL BE SMOOTH RADIUS ELBOW UNLESS OTHERWISE
- 3. THIS DETAIL APPLIES TO CHANGES IN DIRECTION FOR ALL ANGLES.

#### SMOOTH RADIUS ELBOW DETAIL



DUCT TRANSITION AND OFFSET DETAILS
NO SCALE

**ECCENTRIC CONVERGING TRANSITION** 

**ECCENTRIC DIVERGING TRANSITION** 



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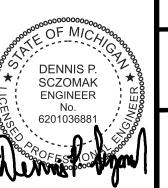
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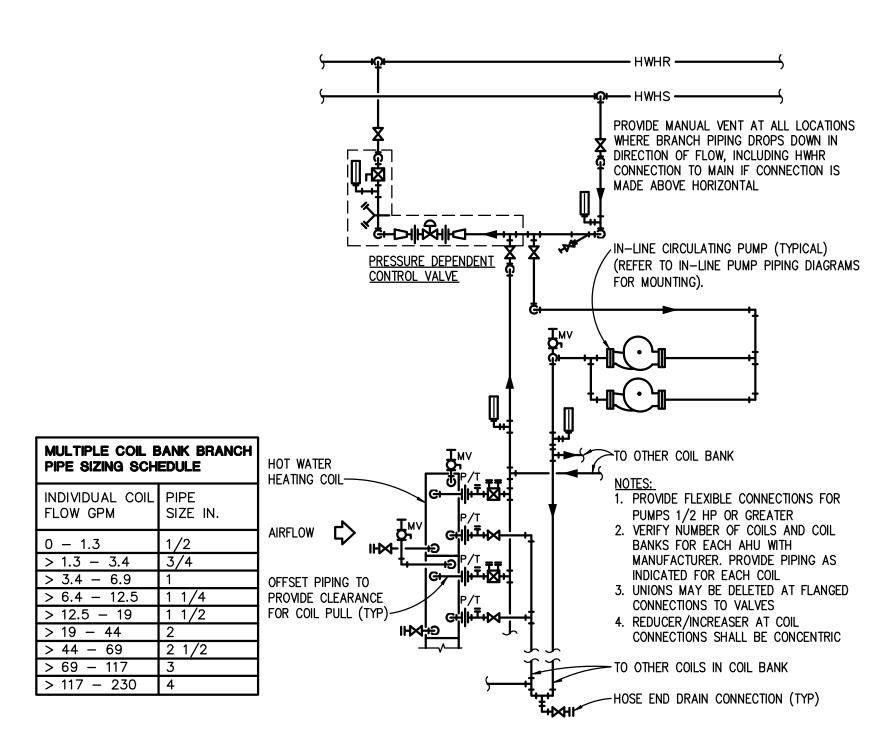
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PROJECT NO: 22.516 HS

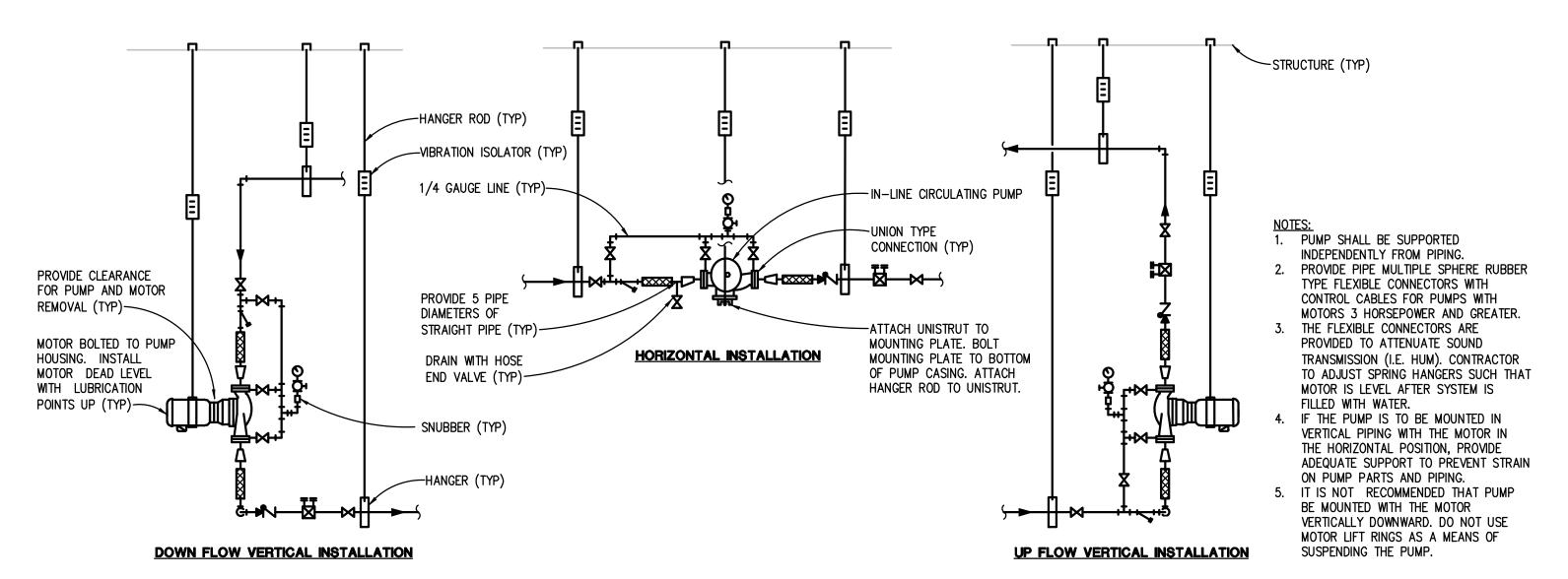
MECHANICAL DETAILS

M6.2

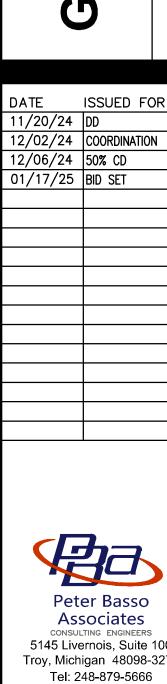




AHU HOT WATER HEATING COIL PIPING DIAGRAM
NO SCALE



IN-LINE CLOSE COUPLED (BELL AND GOSSETT SERIES 90) TYPE CIRCULATING PUMP PIPING DIAGRAM NO SCALE







SCHOOL

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EMW PROJECT NO: 22.516 HS

MECHANICAL DETAILS

DENNIS P.

SCZOMAK **ENGINEER** 

ABOVE	3R(	OUI	ND	Н١	/A(	CF	PIPI	NG	&	V	<b>4</b> L\	/E	AP	PL	IC/	<b>ATI</b>	ON	S	CHI	EDULE
			N	IATERIA	\L			CONNECTION							ISC	OLATIOI	N VAL\	ÆS.		
PIPE SIZE (INCHES)	SOFT COPPER TYPE K	HARD COPPER TYPE L	HARD COPPER TYPE M	CARBON STEEL (SCHED. 40)	CARBON STEEL (SCHED. 80)	CARBON STEEL (STD.)	COPPER TYPE DWV	SOLDERED	BRAZED	WELDED	THREADED	FLANGED	GROOVED	Pressure seal	MECHANICALLY FORMED TEE	BALL	GENERAL SERVICE BUTTERFLY	HI-PERF BUTTERFLY	GATE	KEYED NOTES
HEATING HOT W	ATER	SUPF	LY &	RET	URN -	MIN.	WOR	KING	PRES	S. & '	TEMP.	· 125	PSIG	AT 2	00 DE	EG F				
UP TO 2				Х							Х					Х				
UP TO 2		Х						Х	Х							Х				
2-1/2 TO 4				Х						Х		Х					Х			Α
2-1/2 TO 4		Х							Х								Х			А
6 TO 8				Х						Х		Х					Х			А
6 TO 8		Х							Х								Х			Α
10				Х						Х		Х					Х			Α
12						Х				Х		Х					Х			Α
14 AND LARGER						Х				Х		Х					Х			Α

#### GENERAL NOTES

- 1. 'X' INDICATES ACCEPTABLE SELECTION. IF MORE THAN ONE SELECTION IS INDICATED FOR A PIPING SYSTEM, CONTRACTOR MAY SELECT FROM THOSE 2. DISSIMILAR-METAL PIPING JOINTS: CONSTRUCT JOINTS USING DIELECTRIC FITTINGS COMPATIBLE WITH BOTH PIPING MATERIALS. IF A BRONZE VALVE
- CONNECTS THE DISSIMILAR METALS NO FURTHER DIELECTRIC ISOLATION IS REQUIRED.
  - a. NPS 2 AND SMALLER: USE BRASS COUPLING, NIPPLE, OR UNION.
- b. NPS 2-1/2 AND LARGER: USE DIELECTRIC FLANGE KITS.
- 3. USE UNIONS OR FLANGES AT VALVE AND EQUIPMENT CONNECTIONS. 4. HVAC EQUIPMENT DRAINS, VENTS, SAFETY VALVE PIPING, BLOWDOWN PIPING AND THE LIKE SHALL BE SAME PIPING MATERIAL AS ASSOCIATED PIPING
- 5. GROOVED END VALVES MAY BE USED WITH GROOVED PIPING.

#### KEYED NOTES

A. GROOVED AND FLANGED FITTINGS, JOINTS, AND COUPLINGS, IF INDICATED AS AN ACCEPTABLE SELECTION, MAY BE USED IN ACCESSIBLE LOCATIONS FOR THIS PIPING SYSTEM ONLY. ACCESSIBLE LOCATIONS ARE DEFINED AS EXPOSED CONSTRUCTION OR ABOVE LAY-IN CEILINGS. B. BALL VALVE WITH 250 PSIG STEAM TRIM.

C. BALL VALVE WITH 150 PSIG STEAM TRIM.

ABOVEGROUND HVAC PIPE	& AC				RY	INS	SUI	_A	ΓΙΟ	N A	AP	PLI	CA	TION
	IN	ISULAT		ATERIAL INCHES		HICKNE	SS	FIEL	D-APF	PLIED .	JACKET	MATE	RIAL	
	FLEXIBLE ELASTOMERIC	FIBERGLASS	MINERAL WOOL	POLYISOCYANURATE	PHENOLIC	CELLULAR GLASS	CALCIUM SILICATE	ALUMINUM	STAINLESS STEEL	PVC	SELF—ADHESIVE (FOR OUTDOOR APPLICATIONS)	PVDC (INDOOR)	PVDC (OUTDOOR)	KEYED NOTES
INDOOR PIPE SYSTEM AND SIZE (INCHES)														
HEATING HOT WATER SUPPLY & RETURN 200 DEG F AND LOWER														
NPS 1-1/4 AND SMALLER		1.5						Х		Х				Α
NPS 1-1/2 AND LARGER		2						Х		Х				Α
REFRIGERANT SUCTION & HOT GAS (RIGID COPPER)														
NPS 6 AND SMALLER	1	1		1	1	1		Х		Х				
NPS 8 AND LARGER	1.5	1.5		1.5	1.5	1.5		Х		Х				
REFRIGERANT SUCTION & HOT GAS (SOFT COPPER)	1							Х		Х				

UNLESS OTHERWISE INDICATED OR SCHEDULED, THE FOLLOWING DO NOT REQUIRE INSULATION:

DIRECT BURIED COOLING SYSTEM PIPING PIPING THAT CONVEYS FLUIDS HAVING DESIGN OPERATING TEMPERATURE RANGE BETWEEN 60 DEG F. AND 105 DEG F., INCLUSIVE.

#### **GENERAL NOTES**

- 1. 'X' OR THICKNESS IN INCHES INDICATES ACCEPTABLE SELECTION. IF MORE THAN ONE SELECTION IS INDICATED, CONTRACTOR MAY SELECT FROM THOSE INDICATED SELECTIONS.
- 2. INSULATE PIPING WITHIN AIR HANDLING EQUIPMENT THE SAME AS INDOOR PIPING. PROVIDE ALUMINUM OR STAINLESS STEEL JACKET.
- 3. FOR PIPING NPS 1-1/4 AND SMALLER WITHIN PARTITIONS IN CONDITIONED SPACES INSULATION MAY BE REDUCED BY ONE-INCH THICKNESS, BUT NOT TO LESS THAN ONE-INCH
- 4. FOR PIPING NPS 1 AND SMALLER, INSULATION IS NOT REQUIRED FOR STRAINERS, CONTROL VALVES, AND BALANCING VALVES.

#### KEYED NOTES

- A. PROVIDE FIELD APPLIED JACKET FOR PIPING EXPOSED IN EQUIPMENT ROOMS, STORAGE ROOMS, JANITORS CLOSETS, RECEIVING ROOMS, TEST AREAS, CIRCULATION
- AREAS AND SUCH AREAS SUBJECT TO DAMAGE WITHIN 10 FEET (3 METERS) OF FINISHED FLOOR. B. PROVIDE MANUFACTURER'S RECOMMENDED PROTECTIVE COATING FOR FLEXIBLE ELASTOMERIC THERMAL INSULATION.
- C. STEAM AND CONDENSATE PIPING JACKET SHALL BE STUCCO EMBOSSED.
- D. PIPING WITHIN ENERGY RECOVERY UNITS SHALL BE TYPE 304 STAINLESS STEEL, SMOOTH; 0.010 INCH THICK. SEAMS AND JOINTS CAULKED WITH CHEMICALLY RESISTANT SEALER.

DUCT SYSTEM INSULATION A	APP	LIC	AT	101	<b>V</b> S	SCH	HEC	DUL	.E	
	IN	ISULAT		ATERIAI INCHES		HICKNE	SS	API	ELD PLIED	
						BLANKET			CKET ERIAL	
	FIBERGLASS BLANKET 0.75 LB/CU FT	FIBERGLASS BLANKET 1.0 LB/CU FT	FIBERGLASS BOARD 2.25 LB/CU FT	FIBERGLASS BOARD 6.0 LB/CU FT	FLEXIBLE ELASTOMERIC	ASTM E2336 2-HOUR FIRE RATED BLAN	2—HOUR FIRE RATED BLANKET	ALUMINUM	SELF-ADHESIVE (FOR OUTDOOR APPLICATIONS)	KEYED NOTES
DUCT SYSTEMS LOCATED INDOORS	_				_					
SUPPLY AIR, EXCEPT AS NOTED BELOW		1.5								A, E
OUTSIDE AIR AND MIXED AIR, EXCEPT AS NOTED BELOW		1.5								
OUTSIDE AIR INTAKE, RELIEF AIR AND EXHAUST AIR PLENUMS ADJACENT TO EXTERIOR LOUVERS			1.5							

PLENUMS, DUCTS, AND DUCT ACCESSORIES NOT REQUIRING INSULATION:

FIBROUS-GLASS DUCTS

DOUBLE-WALL METAL DUCTS WITH INSULATION OF SUFFICIENT THICKNESS TO COMPLY WITH ENERGY CODE AND ASHRAE/IESNA 90.1 - 2013

METAL DUCTS WITH DUCT LINER OF SUFFICIENT THICKNESS TO COMPLY WITH ENERGY CODE AND ASHRAE/IESNA 90.1 - 2013 FABRIC SUPPLY DUCTS

FACTORY-INSULATED FLEXIBLE DUCTS FACTORY-INSULATED PLENUMS AND CASINGS

FLEXIBLE CONNECTORS

VIBRATION-CONTROL DEVICES

FACTORY-INSULATED ACCESS PANELS AND DOORS

#### GENERAL NOTES

- 1. 'X' OR THICKNESS IN INCHES INDICATE ACCEPTABLE SELECTION. IF MORE THAN ONE SELECTION IS INDICATED FOR A DUCT SYSTEM, CONTRACTOR MAY SELECT FROM THOSE INDICATED SELECTIONS.
- 2. REFER TO METAL DUCT SECTION OF SPECIFICATIONS FOR DUCT LINING AND DOUBLE-WALL INSULATED DUCT. 3. REFER TO HVAC CASINGS SECTION OF SPECIFICATIONS FOR DOUBLE—WALL INSULATED PLENUMS.

#### KEYED NOTES

- A. INCLUDE INSULATION AROUND DUCT MOUNTED COILS AND AIR TERMINAL UNIT COILS.
- B. NUMBER OF LAYERS AND TOTAL INSULATION THICKNESS AS RECOMMENDED BY SELECTED MANUFACTURER.
- C. DOES NOT APPLY TO PREFABRICATED, ZERO-CLEARANCE GREASE DUCT. D. PROVIDE MANUFACTURER'S RECOMMENDED PROTECTIVE COATING FOR FLEXIBLE ELASTOMERIC THERMAL DUCT INSULATION.
- E. EXPOSED SUPPLY DUCTWORK LOCATED IN A CONDITIONED SPACE SERVED BY THE SAME AIR HANDLING SYSTEM IS NOT REQUIRED TO BE INSULATED.

DUC	T S	SYS	TE	M .	AP	PLI	CA	TIC	NC	SC	HE	EDI	JLE					
						DI	UCT M	ATERIA	L									
AIR SYSTEMS	G90 GALV. SHEET METAL	DOUBLE—WALL LINED G90 GALV. SHEET METAL (SOLID INNER WALL)	DOUBLE—WALL LINED G90 GALV. SHEET METAL (PERF. INNER WALL)	G90 GALV. SHEET METAL WITH 1-INCH LINING	GALVANNEALED SHEET METAL	ALUMINUM	TYPE 304 STAINLESS STEEL	TYPE 316 STAINLESS STEEL	PVC COATED GALV. SHEET METAL (4X1)	PVC COATED GALV. SHEET METAL (1X4)	PVC COATED GALV. SHEET METAL (4X4)	16 GA. CARBON STEEL	ZERO-CLEARANCE PREFABRICATED RANGE HOOD EXHAUST DUCT	FABRIC	DESIGN PRESSURE CLASS (INCHES WG)	SEAL CLASS	MAX. ALLOWABLE LEAKAGE RATE (PERCENT)	KEYED NOTES
SUPPLY AIR WITHOUT TERMINAL UNITS	Х														+2	A	5	
RETURN AIR WITHOUT TERMINAL UNITS	Х														-2	Α	5	

#### 1. 'X' INDICATES ACCEPTABLE SELECTION. IF MORE THAN ONE SELECTION IS INDICATED FOR A DUCT SYSTEM, CONTRACTOR MAY SELECT FROM THOSE INDICATED SELECTIONS. 2. 4 X 1 PVC-COATED GALVANIZED STEEL: FACTORY-APPLIED PVC COATINGS SHALL BE 4 MILS (0.10 MM) THICK ON EXTERIOR SHEET METAL SURFACES OF DUCTS AND

- FITTINGS EXPOSED TO CORROSIVE CONDITIONS AND MINIMUM 1 MIL (0.025 MM) THICK ON INTERIOR SURFACES. 3. 1 X 4 (4 X 1 REVERSE COATED) PVC-COATED GALVANIZED STEEL: FACTORY-APPLIED PVC COATINGS SHALL BE 4 MILS (0.10 MM) THICK ON INTERIOR SHEET METAL
- SURFACES OF DUCTS AND FITTINGS EXPOSED TO CORROSIVE CONDITIONS AND MINIMUM 1 MIL (0.025 MM) THICK ON EXTERIOR SURFACES.
- 4. 4 X 4 PVC-COATED GALVANIZED STEEL: FACTORY-APPLIED PVC COATINGS SHALL BE 4 MILS (0.10 MM) THICK ON SHEET METAL SURFACES OF DUCTS AND FITTINGS EXPOSED TO CORROSIVE CONDITIONS AND 4 MILS (0.10 MM) THICK ON OPPOSITE SURFACES.

#### <u>KEYED NOTES</u>

GENERAL NOTES

- A. SCREWS, DAMPERS, OR PROJECTIONS OF ANY TYPE ON INTERIOR OF DUCT SURFACE ARE PROHIBITED.
- B. DUCT SHALL BE LINED WITHIN 25 FEET UPSTREAM OF FANS.
- C. ALL WELDED CONSTRUCTION.

#### SCHEDULES GENERAL NOTES:

TYPICAL FOR ALL SCHEDULE SHEETS:

- 1. REFER TO ELECTRICAL STANDARD SCHEDULES, ONE LINE DIAGRAM AND PANEL SCHEDULES FOR ADDITIONAL ELECTRICAL INFORMATION
- 2. PROVIDE THE FOLLOWING FACTORY-WIRED ELECTRICAL OPTIONS/ACCESSORIES WHERE INDICATED IN SCHEDULE:
- A NON-FUSED DISCONNECT SWITCH
- B UNIT SHALL BE SINGLE POINT ELECTRICAL CONNECTION WITH FACTORY INSTALLED DISCONNECTING MEANS AND ALL REQUIRED STARTERS AND
- CONTROLS
- C SERVICE RECEPTACLE
- D FUSED DISCONNECT SWITCH E - COMBINATION STARTER
- F UNIT SHALL HAVE (2) SINGLE POINT CONNECTIONS WITH FACTORY INSTALLED DISCONNECTING MEANS AND ALL REQUIRED STARTERS AND CONTROLS. (1) CONNECTION SHALL BE FOR CONDENSING SECTION AND (1) CONNECTION SHALL BE FOR THE REMAINDER OF THE UNIT.
- 3. FOR MODULATION/CONTROL TYPE COLUMN, "VFC" INDICATES VARIABLE FREQUENCY CONTROLLERS, "AUTO" INDICATES AUTOMATIC OPERATION (CONTROLLED BY TEMPERATURE CONTROLS OR SELF CONTAINED CONTROLS), "MANUAL" INDICATES HAND OPERATION.
- 4. IF VARIABLE FREQUENCY CONTROLLERS ARE INDICATED TO BE PROVIDED AND ARE NOT INSTALLED INTEGRAL TO THE UNIT, VARIABLE FREQUENCY CONTROLLERS SHALL BE SUPPLIED BY THE MECHANICAL CONTRACTOR (UNLESS OTHERWISE NOTED) AND INSTALLED BY THE ELECTRICAL CONTRACTOR INCLUDING THE LINE SIDE AND LOAD SIDE WIRING TO THE MOTOR AND INCLUDING MISCELLANEOUS STEEL REQUIRED FOR THE SUPPORT AND MOUNTING OF THE VFC. REFER TO FLOOR PLANS FOR LOCATION.
- 5. WHERE EQUIPMENT IS INDICATED TO HAVE A SINGLE POINT ELECTRICAL CONNECTION, THAT EQUIPMENT SHALL COME COMPLETE WITH FACTORY INSTALLED STARTERS, MOTOR OVERLOAD PROTECTION, CONTACTORS, FUSING AND ALL NECESSARY INTERNAL WIRING AND CONTROLS. PROVIDE A FACTORY MOUNTED UNIT DISCONNECTING MEANS WHERE THE ELECTRICAL CONTRACTOR SHALL MAKE SINGLE POINT CONNECTION. INSTALL PACKAGED EQUIPMENT SUCH THAT THE ELECTRICAL CONNECTION AND CONTROLS ARE ACCESSIBLE AND HAVE CLEARANCES MEETING THE NATIONAL ELECTRICAL CODE.
- 6. WHERE PACKAGED EQUIPMENT IS PROVIDED, NAMEPLATE MUST INDICATE MAXIMUM OVERCURRENT PROTECTION BY HACR RATED CIRCUIT BREAKERS OR FUSES. IF FUSE PROTECTION ONLY IS INDICATED, PROVIDE A FUSIBLE DISCONNECT AND FUSES WITH THE UNIT.
- WHERE EQUIPMENT IS DESIGNATED BY MANUFACTURER AND MODEL NUMBER, THIS IS THE BASIS OF DESIGN. IF THE CONTRACTOR ELECTS TO PROVIDE EQUIPMENT BY OTHER SPECIFIED MANUFACTURERS OR PROPOSED ALTERNATE EQUIPMENT BY THE BASIS OF DESIGN MANUFACTURER, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY REVISIONS TO ELECTRICAL REQUIREMENTS, STRUCTURAL LOADING, OR ARCHITECTURAL APPURTENANCES AND SHALL INCLUDE THE COST OF SUCH REVISIONS IN HIS BID.
- WHERE EQUIPMENT IS SCHEDULED TO INCLUDE A SERVICE RECEPTACLE, PROVIDE A FACTORY MOUNTED SERVICE RECEPTACLE WITH APPROPRIATE FUSES AND TRANSFORMERS CONNECTED ON THE LINE SIDE OF THE UNIT DISCONNECT. PROVIDE A NAMEPLATE ON THE DISCONNECT SWITCH INDICATING THE PRESENCE OF LIVE POWER TO THE SERVICE RECEPTACLE WHEN THE UNIT DISCONNECT IS IN THE OFF
- 9. SIZE ALL EQUIPMENT FEEDERS BASED ON THE LISTED MOP (MAXIMUM OVERCURRENT PROTECTION). REFER TO THE FEEDER AND BRANCH CIRCUIT SIZING SCHEDULE ON THE ELECTRICAL STANDARD SCHEDULES SHEET.



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DATE ISSUED FOR 11/20/24 DD 12/02/24 COORDINATION

12/06/24 50% CD 01/17/25 |BID SET

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WEK

PROJECT NO:

**MECHANICAL** SCHEDULES



<b>ENERGY</b>	RECOVERY	UNIT	SCHEDULE

			SOVETTI STATE SOFTEDOLE				
EXHAUST FAN	HEAT EXCHANGER (SUMMER)	HEAT EXCHANGER (WINTER)	COOLING COIL - DX COOLING	HOT GAS REHEAT OUTSIDE AIR FILTERS	RETURN FILTERS ELECTRICAL	CURB	UNIT SA/RA EA/OA MODEL WEIGHT CONFIG. CONFIG. NO.
CFM ESP" TSP" TYPE	SUPPLY SIDE EXHAUST SIDE  E.A.T. L.A.T. A.P.D. E.A.T. L.A.T. A.P.D. IN. WG. (%)	SUPPLY SIDE EXHAUST SIDE  IC. E.A.T. L.A.T. A.P.D. E.A.T. L.A.T. A.P.D. IN. WG. (%)	MBH MBH ARE SQ. VEL FT. F.P.	X. E.D.B. L.D.B. EFF. AREA SP" CE F F F % SQ. TOTAL I.M	EFF. AREA SP" VOLTS PHASE FLA MOP SCCR OPTIO ACCE ORII	TYPE  STANDARD VIBRATION ISOLATION SPRING CURB	CURB (LBS.)
9 5 10,000 0.75 1.585 VFC 2.85 TOTAL 2 ®	9 3 91 78 0.75 75 87 0.75 -	-10     54     0.75     72     7.3     0.75     -	234 282 77 54 R-454 33 29T	70 (8) MERV 8 3.34 0.336	(8) MERV 8 3.34 - 460 3 67.9 90	N Y 24	11468 DOWN / DOWN END VXE-312-74 CURB CURB
5 10,000 0.75 1.585 VFC 2.85 TOTAL 2 @	9 3 91 78 0.75 75 87 0.75 -	-10     54     0.75     72     7.3     0.75     -	234 282 77 54 R-454 33 29°	70 (8) MERV 8 3.34 0.336	(8) MERV 8 3.34 - 460 3 67.9 90	N Y 24	11468 DOWN/ DOWN END VXE-312-74 THRU ROOF C-25I-0-G:
0	CFM ESP" TSP" CONTROL TYPE BHP H	MOTOR   SUPPLY SIDE   EXHAUST SIDE   EXHAUST SIDE   EFF   MOTOR   SUPPLY SIDE   EXHAUST SIDE   EFF   MOTOR   SUPPLY SIDE   EXHAUST SIDE   EFF   MOTOR   MOTOR   SUPPLY SIDE   EXHAUST SIDE   EFF   MOTOR   MOTOR   MOTOR   SUPPLY SIDE   EXHAUST SIDE   EXHAUST SIDE   EFF   MOTOR   MOTOR	FXHAUST FAN	CFM   ESP"   TSP"   CONTROL TYPE   BHP   HP   F   TOTAL   E.A.T.   A.P.D.   E.A.T.   L.A.T.   A.P.D.   E.A.T.   L.A.T.   A.P.D.   E.F.F.C.   (%)   F   TOTAL   E.D.B.   TOTAL   E.D.B.   E.D.B	Fig.   Fig.	EXHAUST FAN	Fig.   Fig.

2. MODEL NUMBERS ARE VALENT UNLESS OTHERWISE NOTED.

3. MINIMUM OUTSIDE AIRFLOW MAX-MIN CFM IS THE REQUIRED MINIMUM OUTSIDE AIRFLOW RATE WITH MAXIMUM OCCUPANT LOAD. MINIMUM OUTSIDE AIRFLOW MIN-MIN CFM IS THE REQUIRED MINIMUM OUTSIDE AIRFLOW RATE WITH ZERO OCCUPANT LOAD.

4. FLUID TYPE: W = WATER, PGXX = PROPYLENE GLYCOL SOLUTION XX PERCENTAGE OF GLYCOL, EGXX = ETHYLENE GLYCOL SOLUTION XX PERCENTAGE OF GLYCOL.

						НОТ	WAT	ER HEA	ATING C	COIL S	SCHEE	DULE					
UNIT	SYSTEM	MAXIMUM	MAXIMUM	CAPACITY			AIR		MINIMUM			WATER			CONTROL VALVE	MODEL	KEYED NOTES
IDENTIFICATION	SERVED	NUMBER ROWS	FIN DENSITY FINS/INCH	MBH	AIRFLOW CFM	E.D.B. *F	L.D.B. *F	MAXIMUM A.P.D. IN. W.G.	FACE AREA SQ. FT.	FLOW GPM	FLUID TYPE	E.W.T. °F	L.W.T. °F	MAXIMUM W.P.D. FT. HEAD	W.P.D. FT. HD.	NUMBER	
HC-1	HS GYM	3	11	460	10,000	48	90	0.25	22.5	23.0	W	130	90	5.5	5	5WQ1103B	
HC-2	HS GYM	3	11	460	10,000	48	90	0.25	22.5	23.0	W	130	90	5.5	5	5WQ1103B	

GENERAL NOTES: 1. MODEL NUMBERS ARE TRANE UNLESS OTHERWISE NOTED.

2. COIL SELECTION BASED ON .00025 FOULING FACTOR.

3. FLUID TYPE: W = WATER, PGXX = PROPYLENE GLYCOL SOLUTION XX PERCENTAGE OF GLYCOL, EGXX = ETHYLENE GLYCOL SOLUTION XX PERCENTAGE OF GLYCOL.

								Pl	JMP SC	HEDULE										
UNIT IDENTIFICATION	SYSTEM SERVED	LOCATION	TYPE	COUPLING TYPE	WATERFLOW GPM	FLUID TYPE	SYSTEM OPERATING		OVERLOAD GPM	MINIMUM EFFICIENCY %		MOTOR		MODULATION/ CONTROL TYPE		ELE	ECTRICAL		MODEL NUMBER	KEYED NOTES
							TEMP. 'F FOR PUMP SELECTION				ВНР	HP	RPM		VOLTS	PHASE	SCCR KA (NOTE 4)	OPTIONS/ ACCESSORIES		
CP-1A	HC-1	HS GYM	INLINE	CLOSE	23	WATER	60	15	NON-OVERLOA DING	61	0.154	1/3	1800	AUTO	120	1	10		E90-1.25AAB	PRIMARY
CP-1B	HC-1	HS GYM	INLINE	CLOSE	23	WATER	60	15	NON-OVERLOA DING	61	0.154	1/3	1800	AUTO	120	1	10		E90-1.25AAB	BACKUP
CP-2A	HC-2	HS GYM	INLINE	CLOSE	23	WATER	60	15	NON-OVERLOA DING	61	0.154	1/3	1800	AUTO	120	1	10		E90-1.25AAB	PRIMARY
CP-2B	HC-2	HS GYM	INLINE	CLOSE	23	WATER	60	15	NON-OVERLOA DING	61	0.154	1/3	1800	AUTO	120	1	10		E90-1.25AAB	BACKUP

GENERAL NOTES:

1. REFER TO SCHEDULES GENERAL NOTES.

2. MODEL NUMBER ARE BELL & GOSSETT UNLESS OTHERWISE NOTED.

3. FLUID TYPE: W = WATER, PGXX = PROPYLENE GLYCOL SOLUTION <math>XX PERCENTAGE OF GLYCOL, EGXX = ETHYLENE GLYCOL SOLUTION XX PERCENTAGE OF GLYCOL.

4. CONTROLLER (E.G. VARIABLE FREQUENCY CONTROLLER, MOTOR STARTER) FOR SPECIFIED EQUIPMENT SHALL BE MANUFACTURED AND MARKED PER NEC WITH A MINIMUM SHORT CIRCUIT CURRENT RATING AS INDICATED.

		GRILLI	E, REGI	STER, AN	ID DIFFUS	SER SCHE	EDULE		
UNIT IDENTIFICATION	TYPE	FACE SIZE	NECK SIZE	FRAME TYPE	ACCESSORY	CONSTRUCTION	FINISH	MODEL NUMBER	KEYED NOTES
R-1	GRILLE	48x20	SEE PLANS	F		STEEL	CUSTOM COLOR	95	

GENERAL NOTES:

1. MODEL NUMBERS ARE PRICE UNLESS OTHERWISE NOTED.

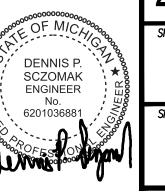
HORIZONTAL PIPING		ANI				)R1	ΓΑ	PP	LIC	CATION
		IANGEF				E	SHI	ELD T	YPE	
	E 1 CLEVIS HANGER	TYPE 10 SWIVEL RING BAND HANGER	E 41 DOUBLE ROD PIPE ROLLER	E 43 SINGLE ROD ROLLER HANGER	TYPE 44 PIPE ROLLER & STAND	E 46 ADJUSTABLE PIPE ROLL STAND	E 39 PROTECTION SADDLE	E 40 INSULATION PROTECTION SHIELD	THERMAL—HANGER SHIELD	
METAL PIPE TYPE & SIZE	MSS TYPE	MSS TYPI	MSS TYPE	MSS TYPE	MSS TYPI	MSS TYPE	MSS TYPE	MSS TYPE	THERMAL	KEYED NOTES
UNINSULATED SINGLE PIPE										KETED NOTES
UP TO 2 INCH	Х	Х								
2-1/2 INCH TO 4 INCH	Х	Х								
6 INCH TO 8 INCH	Х									
10 INCH	Х									
12 INCH			Х							
14 INCH AND LARGER			Х							
INSULATED SINGLE COLD PIPES										
UP TO 2 INCH	X	Χ						X	Х	A
2-1/2 INCH TO 4 INCH	Х								Х	
6 INCH TO 8 INCH	Х								Х	
10 INCH	Х								Х	
12 INCH	Х								Х	
14 INCH AND LARGER	Х								Х	
INSULATED SINGLE HOT PIPES										1
UP TO 2 INCH	Х	Х					Х	Х	Х	A, C
2-1/2 INCH TO 4 INCH			Х	Х	Х	Х	Х		Х	B, C
6 INCH TO 8 INCH			Х	Х	Х	Х	Х		Х	B, C
10 INCH			Х	Х	Х	Х	Х		Х	B, C
12 INCH			Х		Х	Х	Х		Х	B, C
14 INCH AND LARGER GENERAL NOTES			Χ				Χ		Х	B, C

#### **GENERAL NOTES**

- 1. "X" INDICATES APPROVED HANGER OR SUPPORT ELEMENTS. IF MORE THAN ONE HANGER OR SUPPORT ELEMENT IS INDICATED, SELECTION FROM APPROVED ELEMENTS IS CONTRACTOR'S OPTION. 2. REFER TO HANGER AND SUPPORT SECTION FOR APPROVED MANUFACTURERS.
- 3. HANGERS AND SUPPORTS USED FOR FIRE PROTECTION SERVICES SHALL BE UL LISTED OR FMG APPROVED. 4. HANGER ELEMENTS IN CONTACT WITH BARE COPPER PIPE SHALL BE COPPER PLATED, PLASTIC COATED, FELT
- LINED, OR USE MANUFACTURED COPPER TUBE ISOLATORS.
- 5. REFER TO INDIVIDUAL PIPING SPECIFICATION SECTIONS FOR HANGER SPACING. 6. MULTIPLE PARALLEL COLD PIPES MAY BE TRAPEZE SUPPORTED FROM BELOW USING U-BOLTS OR STRUT CLAMPS
- AND THERMAL HANGER SHIELDS. REFER TO KEYED NOTE A. 7. MULTIPLE PARALLEL COLD PIPES MAY BE TRAPEZE SUPPORTED FROM ABOVE USING STANDARD HANGER ELEMENTS INDICATED FOR SINGLE COLD PIPES.
- 8. MULTIPLE PARALLEL HOT PIPES MAY BE TRAPEZE SUPPORTED FROM BELOW USING ROLLER ELEMENTS AND THERMAL HANGER SHIELD OR INSULATION PROTECTION SADDLE. REFER TO KEYED NOTES B AND C.
- 9. MULTIPLE PARALLEL HOT PIPES MAY BE TRAPEZE SUPPORTED FROM ABOVE USING STANDARD ROLLER HANGERS
- INDICATED AND THERMAL HANGER SHIELD OR INSULATION PROTECTION SADDLE. REFER TO KEY NOTES B AND C. 10. REFER TO INDIVIDUAL PIPING SPECIFICATION SECTIONS FOR ADDITIONAL SYSTEM SPECIFIC HANGER APPLICATIONS.

#### <u>KEYED NOTES</u>

A. USE THERMAL HANGER SHIELD ON TRAPEZE SUPPORTED INSULATED PIPE TO PREVENT CRUSHING OF INSULATION. B. USE THERMAL HANGER SHIELD DESIGNED FOR USE ON ROLLER SUPPORTS FOR INSULATED HOT PIPE . C. USE TYPE 39 PROTECTION SADDLES IF INSULATION WITHOUT VAPOR BARRIER IS INDICATED. FILL INTERIOR VOIDS WITH INSULATION MATCHING ADJOINING INSULATION.



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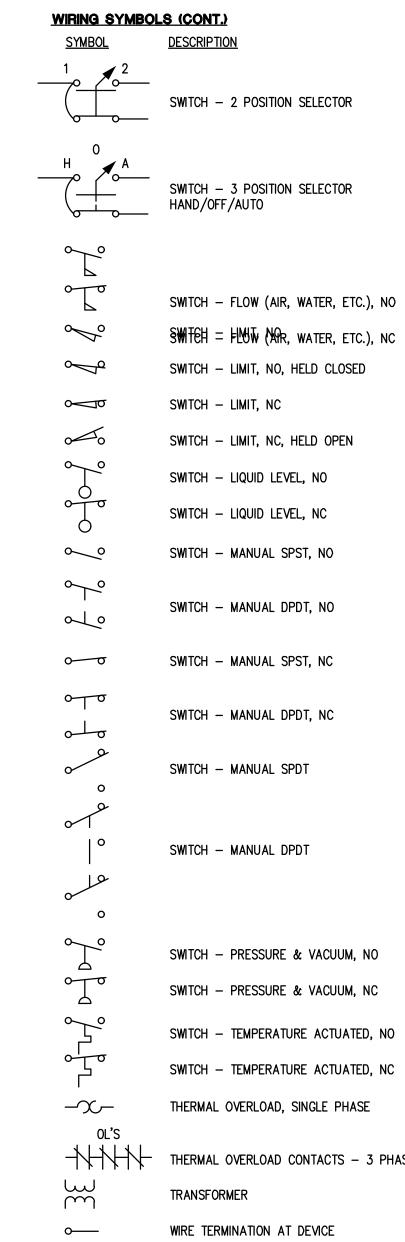
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WEK WEK DRAFTS: EMW PROJECT NO:

> MECHANICAL SCHEDULES

#### TEMPERATURE CONTROL - SYMBOLS LIST

HEMATIC SYI YMBOL	MBOLS  DESCRIPTION	SCHEMATIC SY SYMBOL	YMBOLS (CONT.)  DESCRIPTION
FC FC	AIR FLOW CONTROLLER	DD	SMOKE DETECTOR — DUCT MOUNTED
	AQUASTAT, STRAP ON BULB	SD	SMOKE DETECTOR - SPACE MOUNTED
02	CARBON DIOXIDE SENSOR — WALL MOUNTED	s/s	START/STOP RELAY
02	CARBON DIOXIDE SENSOR — DUCT MOUNTED	SPT	STATIC PRESSURE TRANSMITTER
co	CARBON MONOXIDE SENSOR — WALL MOUNTED	SP	STATIC PRESSURE SENSOR OR PROBE
	CARBON MONOXIDE SENSOR — DUCT MOUNTED	sw	SWTCH
 cs	CURRENT SWITCH		TEMPERATURE SENSOR — RIGID ELEMENT IN WELL
 рт	CURRENT TRANSMITTER		TEMPERATURE SENSOR — STRAP ON BULB
			TEMPERATURE SENSOR - DUCT MOUNTED AVG ELEMENT
	DAMPER - INLET VANES		TEMPERATURE SENSOR — DUCT MOUNTED RIGID ELEMEN
	DAMPER - OPPOSED BLADE	(T)	THERMOSTAT OR TEMPERATURE SENSOR
$\overline{}$	DAMPER — PARALLEL BLADE		(AS DEFINED ON TC DRAWINGS)
<u>M</u>	DAMPER MOTOR	(T) <sub>N</sub>	THERMOSTAT FOR NIGHT SETBACK
	DAMPER MOTOR W/ POSITIVE POSITIONER	XF	TRANSFORMER
PT	DIFFERENTIAL PRESSURE TRANSMITTER	R	VALVE - 2 WAY CONTROL VALVE
PS	DIFFERENTIAL PRESSURE SWITCH	**	VALVE - 3 WAY CONTROL VALVE
 :P	ELECTRIC-PNEUMATIC RELAY	M	
PT	ELECTRIC TO PNEUMATIC TRANSDUCER	X	VALVE - 2 WAY CONTROL W/ POSITIONER
<u></u>	FIRE ALARM SYSTEM, ADDRESSABLE CONTROL MODULE	M	
<u></u>	FIRE ALARM SYSTEM, ADDRESSABLE INTERFACE MODULE	×	VALVE - 3 WAY CONTROL W/ POSITIONER
 vs	FLOW MEASURING STATION	VFC	VARIABLE FREQUENCY CONTROLLER
<u></u>	FLOW METER	vs	VELOCITY SENSOR
	FLOW SWITCH	VIB	VIBRATION SWITCH
	FREEZESTAT	V	VOLTAGE SENSOR
$\overline{\mathcal{I}}$	GAUGE - FLOW		
	GAUGE - PRESSURE		
	GAUGE — TEMPERATURE	<u>WIRING SYMBO</u> <u>SYMBOL</u>	<u>DESCRIPTION</u>
フ コ	GUARD FOR STAT OR SENSOR		AUDIBLE DEVICE (AS DEFINED ON TC DRAWINGS)
	HUMIDIFIER	—(M/S)—	COIL - MOTOR STARTER CONTACTOR
<u>)</u> _	HUMIDISTAT OR HUMIDITY SENSOR	—(R)—	COIL — RELAY
	(AS DEFINED ON TC DRAWINGS) HUMIDITY SENSOR, DUCT MOUNTED	—(TDR)—	COIL — TIME DELAY RELAY
	LEVEL SWITCH OR TRANSMITTER	_(VFC)_	COIL — VARIABLE FREQUENCY CONTROLLER CONTACTOR
<u> </u>	LIMIT SWITCH		COIL — EP OR SOLENOID VALVE
	LINE - ELECTRIC	• ⊢•	CONTACT - INSTANT OPERATING, NO
	LINE - PNEUMATIC	•\ <del> </del> •	CONTACT - INSTANT OPERATING, NC
)	MAIN CONTROL AIR SUPPLY	, ,	CONTACT - TIMED AFTER COIL IS ENERGIZED, NOTC
<u> </u>	MOTOR STARTER		
s s	OCCUPANCY SENSOR		CONTACT TIMED AFTER COIL IS ENERGIZED, NCTO
5			CONTACT TIMED AFTER COIL IS DE-ENERGIZED, NOTO
R	PILOT LIGHT OR BEACON R — RED LENS		CONTACT — TIMED AFTER COIL IS DE—ENERGIZED, NCTO
	A — AMBER LENS B — BLUE LENS	<u>+</u>	GROUND
<del>-</del>	G — GREEN LENS	9	MOTOR, SINGLE PHASE
<u>E</u>	PNEUMATIC-ELECTRIC SWITCH	R	PILOT LIGHT OR BEACON R — RED LENS
s]	PRESSURE SWITCH	$\sim$	A — AMBER LENS
<u>T</u> ]	PRESSURE TRANSMITTER		B — BLUE LENS G — GREEN LENS
<u> </u>	RELAY, ELECTRIC	R	DILOT LIGHT WITH DUCK TO TTOT
N	SELECTOR SWITCH, (N=NUMBER OF POSITIONS)		∠ PILOT LIGHT, WITH PUSH-TO-TEST
	SIGNAL - DDC/BAS, ANALOG INPUT	<del>-</del>	DUOU DUTTON MANAGEMENT
9	SIGNAL - DDC/BAS, ANALOG OUTPUT	0 0	PUSH BUTTON - MOMENTARY CONTACT, NO
	SIGNAL - DDC/BAS, DIGITAL INPUT	مله	PUSH BUTTON - MOMENTARY CONTACT, NC
9	SIGNAL - DDC/BAS, DIGITAL OUTPUT	ملہ	
<u>al</u>	SIGNAL - PACKAGED EQUIPMENT, ANALOG INPUT	0 0	PUSH BUTTON - MOMENTARY CONTACT, NO & NC
<u>/o/</u>	SIGNAL - PACKAGED EQUIPMENT, ANALOG OUTPUT	$\overline{}$	PUSH BUTTON — MOMENTARY, NO (MUSHROOM HEAD)
Λ		U U	, SS., SOTION MOMENTANT, NO (MUSHINOUM HEAD)
OI/	SIGNAL - PACKAGED EQUIPMENT, DIGITAL INPUT		



# THERMAL OVERLOAD CONTACTS - 3 PHASE

WIRE TO WIRE TERMINATION

SINGLE POLE SINGLE THROW

SINGLE POLE DOUBLE THROW

WIRING NOT CONNECTED

**DESCRIPTION** 

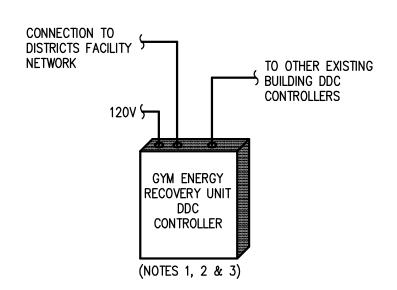
#### **WIRING TERMS**

<u>ABBREVIATION</u>

SPDT

DDCT	DOUBLE BOLE CINOLE TUROW
DPST	DOUBLE POLE SINGLE THROW
DPDT	DOUBLE POLE DOUBLE THROW
NO	NORMALLY OPEN
NC	NORMALLY CLOSED
NOTO	NORMALLY OPEN TIMED OPEN
NOTC	NORMALLY OPEN TIMED CLOSED
NCTO	NORMALLY CLOSED TIMED OPEN
NCTC	NORMALLY CLOSED TIMED CLOSED
DNEI MATIC C	ONTROL SYMBOLS (ADDITIONAL)
THEOMIA TO C	ONTHOL OTHIDOLO (ADDITIONAL)
<u>SYMBOL</u>	<u>DESCRIPTION</u>
LA	LOAD ANALYZER
LR	LOW PRESSURE SELECTOR RELAY
	MANUAL GRADUAL POSITION SWITCH
PS	PNEUMATIC SWITCH
RR	RATIO RELAY
RC	RECEIVER CONTROLLER
$\otimes$	SWITCHED CONTROL AIR SUPPLY

NOTE: SOME SYMBOLS & ABBREVIATIONS SHOWN MAY NOT APPLY TO THIS PROJECT.



#### DDC SYSTEM ARCHITECTURE

- 1. REFER TO TEMPERATURE CONTROL SCHEMATICS FOR THE REQUIRED POINTS ASSOCIATED
- 2. TC CONTRACTOR SHALL PROVIDE SYSTEM NETWORK CONTROL GRAPHICS FOR ALL NEW WORK. REFER TO SPECIFICATIONS FOR REQUIREMENTS.
- 3. TC CONTRACTOR SHALL PROVIDE REQUIRED POWER SUPPLIES FROM DEDICATED AND/OR SPARE CIRCUITS IDENTIFIED ON ELECTRICAL PANEL SCHEDULES. COORDINATE WITH ELEC CONTRACTOR. REFER TO ELECTRICAL DWGS FOR PANEL SCHEDULES AND PANEL LOCATIONS.

#### TEMPERATURE CONTROL GENERAL NOTES

1. THESE GENERAL SHALL BE APPLICABLE FOR ALL TC DRAWINGS.

2. "PROVIDE" IS DEFINED AS "FURNISH AND INSTALL".

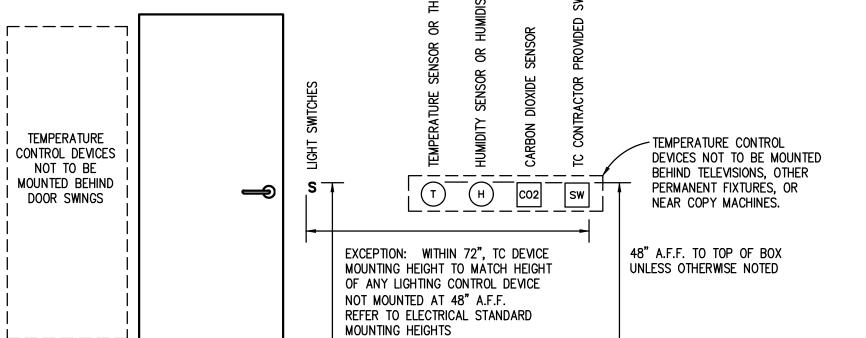
- 3. TC CONTRACTOR SHALL BE RESPONSIBLE TO COMPLY WITH
- ALL APPLICABLE CODES AND STANDARDS. 4. THE PORTIONS OF CONTROL DIAGRAMS AND WIRING DIAGRAMS DRAWN IN HEAVY LINE WEIGHT INDICATE NETWORK. THE
- PORTIONS DRAWNS IN LIGHT LINE WEIGHT INDICATE EXISTING. 5. ALL CONTROL SCHEMATICS AND WIRING DIAGRAMS ARE FOR
- THE CLARIFICATION OF EQUIPMENT INTERLOCKING FUNCTIONS AND THE INTERFACE OF VARIOUS CONTRACTORS'S WORK AND SHALL NOT BE MISTAKEN AS SHOP DRAWINGS FOR ACTUAL INSTALLATION.
- 6. TC CONTRACTOR SHALL PROVIDE DDC CONTROLLERS AS REQUIRED TO MEET INTENT OF DESIGN DOCUMENTS. REFER TO THE PLANS FOR THE DDC FUNCTIONS THAT APPLY TO EACH MECHANICAL SYSTEM.
- INSTALLED WIRING AND SHALL BE LABELED PER SPECIFICATIONS. 8. ALL WIRING AND SYSTEM CONTROL VOLTAGES SHALL BE IN

7. ALL TC PROVIDED COMPONENTS, AND ALL TC CONTRACTOR

- ACCORDANCE WITH THE EQUIPMENT MANUFACTURER'S RECOMMENDATION AND THE ELECTRICAL SPECIFICATIONS.
- 9. DESIGNATES DEVICE TO BE MOUNTED IN T.C. PANEL.
- 10. DUCT SMOKE DETECTORS SHALL BE FURNISHED, INSTALLED AND WIRED TO THE FIRE ALARM SYSTEM BY THE ELECTRICAL TC CONTRACTOR SHALL PROVIDE DUCT SMOKE DETECTOR WIRING INTERLOCK TO MOTOR STARTERS OR VSD'S.

- 11. ALL DDC AND CONTROL INTERLOCK WIRING SHALL BE BY TC CONTRACTOR UNLESS OTHERWISE NOTED. TC CONTRACTOR SHALL COORDINATE WITH VSD AND MOTOR STARTER SUPPLIERS TO DETERMINE EXACT WIRING REQUIREMENTS AND TERMINATION POINTS.
- 12. ALL DDC AND CONTROL INTERLOCK WIRING BETWEEN COMPONENTS SHALL BE INSTALLED WITHOUT INTERMEDIATE STOPS. WIRE SPLICING AT INTERMEDIATE TERMINAL STRIPS IS NOT ACCEPTABLE.
- 13. ALL ELECTRICAL WIRING AND RACEWAY SYSTEMS SHALL COMPLY WITH ELECTRICAL SPECIFICATION REQUIREMENTS. TWO SEPERATE ELECTRICAL RACEWAY SYSTEMS SHALL BE PROVIDED: ONE FOR A.C. WIRING AND THE OTHER FOR D.C.
- 14. TC CONTRACTOR SHALL BE RESPONSIBLE FOR ALL POWER SUPPLIES REQUIRED FOR TC SYSTEM UNLESS OTHERWISE NOTED. REFER TO ELECTRICAL PANEL SCHEDULES FOR SPARE CIRCUITS OR CIRCUITS DEDICATED TO TEMPERATURE CONTROLS. COORDINATE CIRCUIT USE WITH ELECTRICAL CONTRACTOR.
- 15. TC CONTRACTOR SHALL VERIFY EXACT LOCATION OF ALL FIELD MOUNTED COMPONENTS.
- 16. THERMOSTATS AND SPACE TEMPERATURE SENSORS SHALL BE MOUNTED 4'-0" ABOVE FINISHED FLOOR UNLESS NOTED OTHERWISE.
- 17. TC CONTRACTOR SHALL PROVIDE AUXILIARY PANELS FOR REQUIRED PANEL MOUNTED EQUIPMENT SUCH AS RELAYS, TRANSDUCERS, CONTROL TRANSFORMERS, ETC. AUXILIARY PANELS SHALL BE LOCATED NEXT TO ASSOCIATED DDC PANEL.
- 18. REMOTELY MOUNTED FIELD DEVICES SUCH AS RELAYS. CONTROL TRANSFORMERS, ETC., SHALL BE HOUSE IN AN ENCLOSURE PROVIDED BY THE TC CONTRACTOR.

- 19. CONTROL TRANSFORMERS WHEN REQUIRED SHALL BE SIZED FOR 150% OF ACTUAL LOAD.
- 20. FREEZE-STATS SHALL BE MOUNTED ON UPSTREAM FACE OF COOLING COILS.
- 21. CURRENT SWITCHES USED FOR OPERATIONAL STATUS SHALL HAVE CURRENT THRESHOLD SETPOINT ADJUSTED TO INDICATE BELT OR DRIVE FAILURE.
- 22. ALL CONTROL VALVES, CONTROL DAMPERS AND ASSOCIATED CONTROL ACTUATORS IDENTIFIED ON TC DRAWINGS SHALL BE FURNISHED BY TC CONTRACTOR UNLESS OTHERWISE NOTED. DAMPER SIZE AND LOCATIONS ARE INDICATED ON MECHANICAL FLOOR PLAN DRAWINGS.
- 23. ALL CONTROL VALVES AND DAMPERS FURNISHED BY THE TC CONTRACTOR SHALL BE INSTALLED BY THE MECHANICAL CONTRACTOR. ALL PIPE PENETRATIONS AND BASIC FITTINGS REQUIRED FOR SENSOR INSTALLATIONS SHALL BE PROVIDED BY MECHANICAL CONTRACTOR.
- 24. DAMPER ACTUATORS SHALL BE INSTALLED BY TC
- 25. ALL INSTRUMENTATION TUBING REQUIRED FOR DPS, DPT AND SPT COMPONENT INSTALLATIONS SHALL BE PROVIDED BY TC CONTRACTOR.
- 26. TC CONTRACTOR SHALL FIELD MOUNT ALL REQUIRED PACKAGED CONTROL COMPONENTS FURNISHED BY EQUIPMENT SUPPLIERS WHERE INDICATED. ALL REQUIRED 24V PACKAGED CONTROL FIELD WIRING AND 120V FAN INTERLOCK WIRING SHALL BE PROVIDED BY TC CONTRACTOR UNLESS NOTED OTHERWISE. TC CONTRACTOR SHALL COORDINATE SPECIFIC SYSTEM WIRING REQUIREMENTS WITH PACKAGED EQUIPMENT



#### TC DEVICE STANDARD MOUNTING HEIGHTS DETAIL

FOLLOWING POINT DATA AS AVAILABLE: VARIABLE FREQUENCY CONTROLLER

 ON/OFF ACTIVE COMMAND STATUS ON/OFF RUN STATUS

BACnet-MS/TP OPEN PROTOCOL INTERFACE TO BAS COMMUNICATING BUT NOT LIMITED TO THE

- COMMON ALARM STATUS
- REMOTE VFC (ALARM) RESET
- CURRENT SPEED COMMAND (0-100%) CURRENT OPERATING FREQUENCY (Hz)
- RUNTIME HOURS RUNTIME HOURS RESET
- MOTOR VOLTAGE
- MOTOR TORQUE POWER (KW)

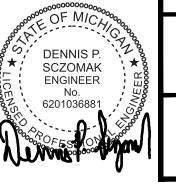
MOTOR AMPS

- ACCUMULATED KWH ACCUMULATED KWH RESET
- DC LINK VOLTAGE
- MOTOR THERMAL (0-100%) INVERTER THERMAL (0-100%)
- HEAT SINK TEMPERATURE

#### VFC BACnet INTERFACE & MONITORING REQUIREMENTS

TYPICAL FOR NEW FAN & PUMP VFCs

TC CONTRACTOR SHALL COORDINATE BACnet-MS/TP OPEN PROTOCOL WIRE TERMINATION REQUIREMENTS AND POINT INTEGRATION CAPABILITIES WITH VFC SUPPLIER/MANUFACTURER AND PROVIDE APPROPRIATE BAS COMPONENTS FOR COMMUNICATION INTERFACE TO BAS.



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DATE ISSUED FOR 11/20/24 DD 12/02/24 COORDINATION 12/06/24 50% CD

01/17/25 BID SET

Peter Basso Associates 5145 Livernois, Suite 100 Troy, Michigan 48098-3276 Tel: 248-879-5666

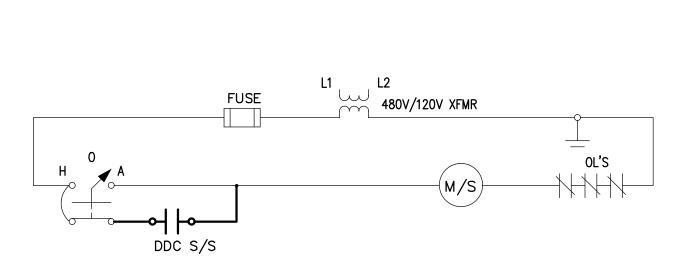
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DRAFTS: EMW PROJECT NO: 22.516 HS

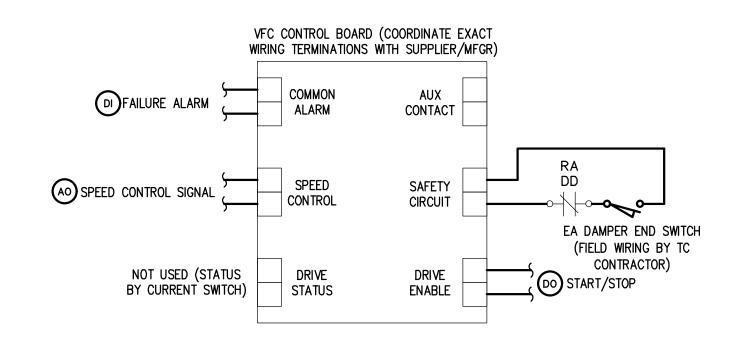
TEMPERATURE

CONTROL STANDARDS AND GENERAL NOTES

- FROM CONTROL MODULE TO VFC SAFETY CIRCUIT.
- 3. COORDINATE EXACT CONTROL, WIRING, AND INTERFACE REQUIREMENTS WITH EQUIPMENT SUPPLIER. REQUIREMENTS MAY VARY DEPENDING ON MANUFACTURER.



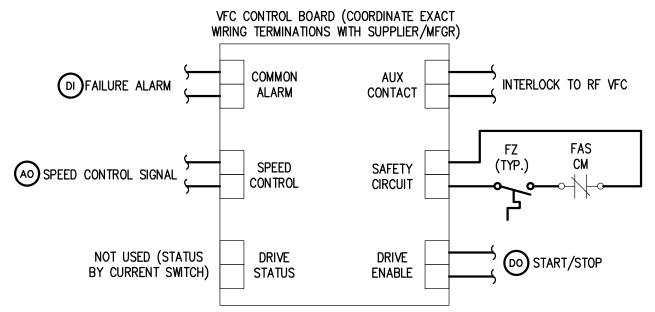
TYPICAL COIL CIRC PUMP CP- M/S WIRING



#### TYPICAL ERU RF VFC WIRING

TYPICAL FOR ERU-1 SERVING GYMNASIUM

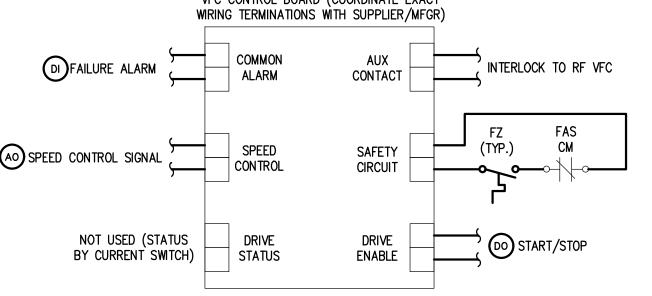
1. WRING DETAIL IDENTIFIES INTENT AND DOES NOT INDICATE ACTUAL WIRING REQUIREMENTS. CONSULT WITH VFC SUPPLIER FOR THE ACTUAL WIRING REQUIREMENTS.



#### TYPICAL ERU SF VFC WIRING

TYPICAL FOR ERU-1 SERVING GYMNASIUM

1. WIRING DETAIL IDENTIFIES INTENT AND DOES NOT INDICATE ACTUAL WIRING REQUIREMENTS. CONSULT WITH VFC SUPPLIER FOR THE ACTUAL WIRING REQUIREMENTS.



NOTE:



SEQUENCE OF OPERATION

NOTE: ALL SETPOINTS DESCRIBED IN SEQUENCE SHALL BE ADJUSTABLE BY SYSTEM OPERATORS (CREATE REQUIRED VIRTUAL POINTS). APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS.

- SUPPLY FAN SHALL HAVE START/STOP CAPABILITY FROM THE DDC SYSTEM. ERU SHALL OPERATE BASED ON TIME SCHEDULED OCCUPIED MODE (COMPENSATED BY OPTIMUM START PROGRAM) AND UNOCCUPIED CYCLE MODE.
- 2. DURING OCCUPIED MODE, EXHAUST FAN SHALL RUN CONTINUOUSLY. EXHAUST FAN SHALL REMAIN OFF FOR UNOCCUPIED CYCLING AND WARM-UP MODES OF OPERATION
- 3. SUPPLY AND EXHAUST FAN'S SHALL BE EQUIPPED WITH ECM MOTORS AND CONTROLLED BY TC CONTRACTOR TO MAINTAIN PROPER CONSTANT VOLUME AIR FLOW AND BALANCING. TC CONTRACTOR SHALL COORDINATE WITH TAB CONTRACTOR FOR PROPER ECM MOTOR SPEED CONTROL.
- 4. WHEN THE CONTROL CIRCUIT OF THE EXHAUST FAN IS ENERGIZED TO START, IT'S RESPECTIVE ISOLATION AIR DAMPER SHALL FULLY OPEN FIRST. AFTER THE DAMPER IS FULLY OPEN, THE ISOLATION AIR DAMPER LIMIT SWITCH SHALL COMPLETE THE CONTROL CIRCUITS TO START THE EXHAUST FAN.
- 5. FOR HEATING OCCUPIED MODE, ERU SHALL BE CONTROLLED TO MAINTAIN SPACE TEMP SETPOINT OF 70°F.
- 6. FOR COOLING OCCUPIED MODE, ERU SHALL BE CONTROLLED TO MAINTAIN SPACE
- 7. FOR HEATING UNOCCUPIED MODE, ERU SHALL CYCLE ON & OFF TO MAINTAIN A SETBACK SPACE TEMP SETPOINT OF 62°F.
- 8. FOR COOLING UNOCCUPIED MODE, ERU SHALL CYCLE ON & OFF TO MAINTAIN A SETUP SPACE TEMP SETPOINT OF 85°F.
- 9. SUPPLY FAN AND EXHAUST FAN STATUS SHALL BE MONITORED BY DDC SYSTEM THRU RESPECTIVE CURRENT SWITCHES. ABNORMAL STATUS CONDITION FOR SF OR EF SHALL ACTIVATE ALARM.
- 10. WHEN ERU IS ACTIVATED DURING OCCUPIED MODE; OUTSIDE & RETURN AIR (MIXED AIR) DAMPERS AND ENERGY RECOVERY WHEEL SHALL BE ALLOWED TO MODULATE AS DESCRIBED. WHEN ERU IS DEACTIVATED OR OPERATING IN UNOCCUPIED CYCLE MODE OR MORNING WARM-UP MODE, DAMPERS SHALL REMAIN IN NORMAL POSITIONS (FULL CLOSED TO OA) AND ENERGY RECOVERY WHEEL AND EXHAUST FAN SHALL REMAIN
- 11. DURING THE OCCUPIED PERIOD, THE OUTSIDE AIR FLOW MEASURING DEVICE THROUGH DDC SHALL MODULATE THE OUTSIDE AIR DAMPER (D-1) AND RECIRCULATION DAMPER (D-2) TO MAINTAIN A MINIMUM OUTSIDE AIR FLOW VOLUME FROM IT MIN/MIN POSITION TO MIN/MAX OA POSITION (REFER TO ERU EQUIPMENT SCHEDULE FOR MIN/MIN AND MIN/MAX AIR FLOW SETPOINTS.
- 12. VFC COMMON FAILURE ALARM FOR SF SHALL BE MONITORED BY DDC THRU AVAILABLE CONTACTS AT FAN VFC.
- WHEN SPACE TEMP IS BELOW HEATING SETPOINT, DDC SHALL KEEP MIXED AIR DAMPERS AT MINIMUM OA POSITION, KEEP ENERGY RECOVERY WHEEL RUNNING AT FULL SPEED, AND MODULATE THE ZONE HOT WATER HEATING COIL CONTROL VALVE TO ACHIEVE SETPOINT. IN HEATING MODE, DISCHARGE AIR TEMP LOW LIMIT SETPOINT OF 60°F SHALL PROVIDE OVERRIDE CONTROL.
- 14. HWH CIRC PUMPS ASSOCIATED WITH HEATING COIL SHALL HAVE START/STOP CAPABILITY FROM THE THE COIL PUMP SHALL BE ACTIVATED BY DDC TO OPERATE CONTINUOUSLY WHEN OA TEMP IS LESS THAN 55'F WHEN RTU IS ACTIVATED OR WHEN OA TEMP IS LESS THAN 35°F REGARDLESS OF RTU ACTIVATION. THE OTHER COIL CIRCULATING PUMP WILL SERVE AS STANDBY. BAS SHALL ALTERNATE PUMP OPERATION ON A WEEKLY BASIS. BAS SHALL MONITOR OPERATING STATUS OF EACH PUMP. UPON PUMP FAILURE, BAS SHALL ACTIVATE FAILURE ALARM AND AUTOMATICALLY START THE STANDBY PUMP.
- 15. DURING MORNING WARM-UP OR UNOCCUPIED MODE HEATING CYCLE, DAT SETPOINT SHALL BE 95'F UNTIL BUILDING OCCUPANCY TIME OR WHEN SPACE TEMPERATURE
- 16. WHEN SPACE TEMP IS ABOVE COOLING SETPOINT AND OUTDOOR AIR TEMPERATURE IS GREATER THAN 70°F. DDC SHALL KEEP MIXED AIR DAMPERS AT MINIMUM OA POSITION, KEEP ENERGY RECOVERY WHEEL AT FULL SPEED, AND STAGE DX COOLING TO MAINTAIN SPACE TEMP SETPOINT. IN COOLING MODE, DISCHARGE AIR TEMP LOW LIMIT SETPOINT OF 45°F SHALL PROVIDE OVERRIDE CONTROL.
- 17. WHEN SPACE TEMP IS ABOVE COOLING SETPOINT AND OUTDOOR AIR TEMPERATURE IS LESS THAN 70°F, DDC SHALL MODULATE MIXED AIR DAMPERS ABOVE MINIMUM OA POSITION AND DECREASE WHEEL SPEED TO MAINTAIN SPACE TEMP SETPOINT. IN COOLING MODE, DISCHARGE AIR TEMP LOW LIMIT SETPOINT OF 45°F SHALL PROVIDE OVERRIDE CONTROL.
- 18. WHENEVER THE RETURN AIR HUMIDITY RISES ABOVE 60 PERCENT RELATIVE HUMIDITY (ADJUSTABLE), THE DX COOLING COILS DISCHARGE TEMPERATURE SETPOINT SHALL BE 50 DEGREES FAHRENHEIT AND THE HOT GAS REHEAT SHALL BE ENABLED AND MODULATED TO MAINTAIN DISCHARGE AND SPACE TEMPERATURE SETPOINTS.
- 19. DURING THE OCCUPIED MODE, THE RETURN AIR CARBON DIOXIDE (CO2) SENSOR THROUGH THE DDC SHALL OVERRIDE THE MIXED AIR DAMPER CONTROL TO MODULATE THE OUTSIDE AIR DAMPER TOWARDS OPEN AND RETURN AIR DAMPER TOWARDS CLOSE TO PREVENT THE CO2 LEVEL IN THE SPACE FROM RISING ABOVE 1,000 PARTS PER MILLION (PPM). WHEN OUTSIDE AIR TEMPERATURE IS 40 DEGREES F. OR BELOW AND THE CARBON DIOXIDE (CO2) DEMAND CONTROL IS ACTIVE, THE OUTSIDE AIR DAMPER DAMPER SHALL BE LIMITED TO A MIN/MAX AIRFLOW (REFER TO THE ERU EQUIPMENT SCHEDULE FOR MIN/MIN AND MIN/MAX OUTSIDE AIR FLOW SETPOINTS) AS MEASURED BY THE OUTSIDE AIR FLOW MEASURING DEVICE THROUGH
- 20. ENERGY RECOVERY WHEEL DEFROST CYCLE SHALL BE ACTIVATED WHEN THE WHEEL EXHAUST DISCHARGE AIR TEMPERATURE DROPS BELOW 35° F (ADJUSTABLE). DDC SHALL REDUCE ENERGY RECOVERY WHEEL SPEED TO KEEP EXHAUST AIR
- TEMPERATURE FROM FALLING BELOW 35°F. 21. DISCHARGE AIR TEMPERATURE LOW-LIMIT ALARM SHALL ACTIVATE REMOTE WARNING AT DDC SYSTEM FRONT-END WHEN TEMPERATURE IS 35°F OR BELOW. DISCHARGE AIR TEMPERATURE LOW-LIMIT CUTOUT THRU DDC SHALL DEACTIVATE ERU AND ACTIVATE REMOTE ALARM WHEN DISCHARGE AIR TEMP FALLS BELOW 30°F. LOW-LIMIT CUTOUT SHALL BE MANUALLY RESET THRU DDC.
- 22. DUCT SMOKE DETECTOR(S) SHALL DEACTIVATE SF AND EF WHEN PRODUCTS OF COMBUSTION ARE DETECTED.
- 23. SUPPLY AND EXHAUST FILTER STATUS SHALL BE MONITORED BY DDC SYSTEM THRU DIFFERENTIAL PRESSURE SWITCHES. FILTER STATUS ALARMS SHALL BE MONITORED
- 24. WHEN ERU IS DEACTIVATED, DX COOLING, AND ENERGY RECOVERY WHEEL SHALL REMAIN OFF.



REFER TO SHEET M801 FOR T.C. (TEMPERATURE CONTROL) GENERAL NOTES.



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DRAFTS: EMW PROJECT NO: 22.516 HS

TEMPERATURE

CONTROLS

SHEET NO: M8.2

SIGNS ARE TO

FIXTURE, U.O.N.

BOTTOM OF

6'-6" A.F.F. TO TOP

48" A.F.F. TO TOP OF

ENCLOSURE, U.O.N.

18" A.F.F. TO

6" A.F.F. HORIZONTALLY TO TOP OF BOX, U.O.N.

CENTER OF BOX,

OF ENCLOSURE, U.O.N.

COORDINATE

MOUNTING

ARCHITECT

HEIGHTS WITH

#### **ELECTRICAL DRAWING INDEX**

SHEET NO.	SHEET TITLE
E0.1	ELECTRICAL STANDARDS AND DRAWING INDEX
E0.2	ELECTRICAL STANDARD SCHEDULES
E0.3	HIGH SCHOOL ELECTRICAL COMPOSITE PLAN
ED1.1	HIGH SCHOOL GYM MEZZANINE ELECTRICAL DEMOLITION PLAN
E2.1	HIGH SCHOOL GYM MEZZANINE ELECTRICAL PLAN
E2.2	HIGH SCHOOL ROOF ELECTRICAL PLAN
E5.1	HIGH SCHOOL ONE LINE DIAGRAM

#### ELECTRICAL ABBREVIATION LIST

FIRE ALARM

FL00R

GROUND

HERTZ

FULL LOAD AMPS

FRONT OF HOUSE

HAND-OFF-AUTO

ISOLATED GROUND

HORSEPOWER

HIGH VOLTAGE

FOOD SERVICE EQUIPMENT CONTRACTOR

GROUND FAULT CIRCUIT INTERRUPTER

GROUND FAULT PROTECTION

FLA

FLR

FOH

FU

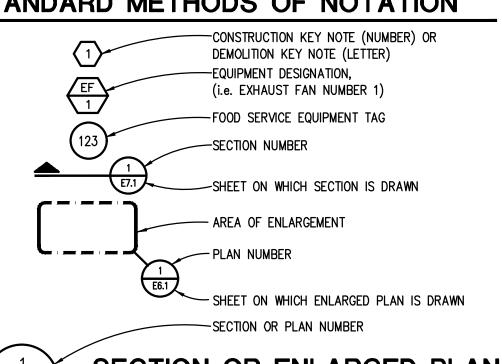
GFP

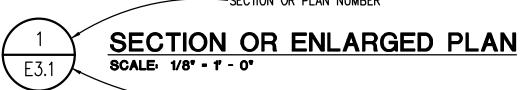
G/GRD/E

**FSEC** 

ABBREVIATION	<u>DESCRIPTION</u>	ABBREVIATION	<u>DESCRIPTION</u>	ABBREVIATION	<u>DESCRIPTION</u>
Α	AMPERES	JB	JUNCTION BOX	P	POLE
AER	ARC ENERGY REDUCTION	<b>U</b> D	SONO HON BOX	PB	PUSHBUTTON STATION
AF	AMPERES FRAME (BREAKER RATING)	KA	THOUSAND AMP	PH	PHASE
AFCI	ARC FAULT CIRCUIT INTERRUPTER	KV	KILOVOLT	PT	POTENTIAL TRANSFORMER
A.F.F.	ABOVE FINISH FLOOR	KVA	KILOVOLT - AMPERES	PDP	POWER DISTRIBUTION PANEL
AIC	AMPS INTERRUPTING CAPACITY	KW	KILOWATT	RECEPT.	RECEPTACLE
AL	AUDIENCE LEFT	KWH	KILOWATT - HOURS	RDP	RECEPTACLE DISTRIBUTION PANEL
ALCR	AUTOMATIC LOAD CONTROL RELAY	LA	LIGHTNING ARRESTOR	RP	RECEPTACLE PANEL
AR	AUDIENCE RIGHT	LP LP	LIGHTINING ARRESTOR LIGHTING PANEL	RSC	RIGID STEEL CONDUIT
AT	AMPERES TRIP (BREAKER SETTING)	LDP	LIGHTING FANEL LIGHTING DISTRIBUTION PANEL		
ATS	AUTOMATIC TRANSFER SWITCH			SCCR	SHORT CIRCUIT CURRENT RATING
AUX	AUXILIARY	MAX	MAXIMUM	SCHED	SCHEDULE
BCELTS	BRANCH CIRCUIT EMERGENCY	MCA	MINIMUM CIRCUIT AMPACITY	SPD ST	SURGE PROTECTION DEVICE
5022.0	LIGHTING TRANSFER SWITCH	MCB	MAIN CIRCUIT BREAKER	SW	SHUNT TRIP SWITCH
BKR	BREAKER	MCC	MOTOR CONTROL CENTER	SWBD	SWITCH SWITCHBOARD
BPS	BOLTED PRESSURE SWITCH	MDP	MAIN DISTRIBUTION PANEL	SWGR	SWITCHGEAR
С	CONDUIT	MECH	MECHANICAL		
CB	CIRCUIT BREAKER	MIN MISC.	MINIMUM MISCELLANEOUS	TB	TERMINAL BOX
CFCI	CONTRACTOR FURNISHED,	MLO	MAIN LUGS ONLY	TELECOM	TELECOMMUNICATIONS
· · ·	CONTRACTOR INSTALLED	MOP	MAXIMUM OVERCURRENT PROTECTION	TR	TAMPER RESISTANT
CKT	CIRCUIT	MTD	MOUNTED		TELEPHONE TERMINAL BACKBOARD
CT	CURRENT TRANSFORMER	MTG	MOUNTING	TYP	TYPICAL
DEMO	DEMOLITION	MTR	MOTOR	U.O.N.	UNLESS OTHERWISE NOTED
DIM	DIMENSION			US	UPSTAGE
DISC	DISCONNECT	N	NEUTRAL	٧	VOLTS
DP	DISTRIBUTION PANEL	NC	NORMALLY CLOSED		
DS	DOWNSTAGE	NEC NF	NATIONAL ELECTRICAL CODE	W	WIRE OR WATTS
DWG	DRAWING	NIC	NON-FUSIBLE NOT IN CONTRACT	WAP WG	WIRELESS ACCESS POINT WIRE GUARD
EBU	EMERGENCY BATTERY UNIT	NL NL	NIGHT LIGHT	WP	WEATHERPROOF
EC	ELECTRICAL CONTRACTOR	NO NO	NORMALLY OPEN	WR	WEATHER RESISTANT
ECM	ELECTRONICALLY COMMUTATED MOTOR	NTS	NOT TO SCALE		
ELEC	ELECTRICAL COMMOTATED MOTOR			XFMR	TRANSFORMER
EM/ EMERG	EMERGENCY	OC	ON CENTER	XP	EXPLOSION PROOF
EMT	ELECTRICAL METALLIC TUBING	OFCI	OWNER FURNISHED,	(E)	EXISTING
EO	ELECTRICALLY OPERATED		CONTRACTOR INSTALLED	(R)	RELOCATED
EPO	EMERGENCY POWER OFF	OFOI	OWNER FURNISHED,	(11)	NELOGATED
EWC	ELECTRIC WATER COOLER		OWNER INSTALLED		
EXIST	EXISTING		ANDADD METHOR		

#### STANDARD METHODS OF NOTATION





- SHEET ON WHICH SECTION IS CUT (ENLARGED PARTIAL PLAN SIMILAR)

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MYRON

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HEAVY LINE WEIGHT INDICATES NEW WORK LIGHT LINE WEIGHT INDICATES EXISTING EQUIPMENT OR REFERENCED INFORMATION GRAY LINE INDICATES BACKGROUND INFORMATION THIN GRAY LINE INDICATES CEILING GRID

DASHED LINES INDICATE CONDUIT ROUTED IN OR BELOW SLAB OR GRADE

TO BE DISCONNECTED AND REMOVED.

CIRCUIT HOMERUN

DUCT BANK - CONCRETE ENCASED / DIRECT BURIED IN USE SPARE

HATCH MARKS INDICATE EQUIPMENT OR MATERIALS

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PBA Project No.: 2024.0338 WEK WEK DRAFTS: NCJ

PROJECT NO: 22.516 HS

ELECTRICAL STANDARDS AND DRAWING INDEX

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RACEWAY / CONDUCTOR / C SCHEDULE			<b>=</b> .	AF	P		C#	\ T	IO	N
	WIRE	COPPER, TYPE THHN/THWN-2	COPPER, TYPE XHHW-2	RACEWAY	ELECTRICAL METALLIC TUBING (EMT)	INTERMEDIATE METAL CONDUIT (IMC)	RIGID STEEL CONDUIT (RSC)	LIQUID TIGHT FLEXIBLE METAL CONDUIT (LFMC)	CABLE TRAY	CABLE / CORD
BRANCH CIRCUITS - EXTERIOR	<b>-</b>   			J 1		1	ļ			] 1
ROOFTOPS (WHEN APPROVED BY ENGINEER)  BRANCH CIRCUITS - INTERIOR			X	]		X	<u> </u>			
CONCEALED, ACCESSIBLE CEILINGS		Х		1	Х	Ιx				]
EXPOSED, BELOW 10' AFF AND SUBJECT TO DAMAGE		X			<u> </u>	T X	X			
EXPOSED, BELOW 10' AFF AND NOT SUBJECT TO DAMAGE		X		1	X	X	<del>                                     </del>			
EXPOSED, ABOVE 10' AFF UNFINISHED SPACES		X		1	X	X				
EXPOSED, FINISHED SPACES		X		1						
CLASS 1 CONTROL CIRCUITS		X		1	X	X	X			
CLASS 2 CONTROL CIRCUITS		X		1	X	X	X		Х	1
CLASS 3 CONTROL CIRCUITS		X			X	X	X		Х	1
CONNECTIONS TO TRANSFORMERS, MOTORS AND VIBRATING EQUIPMENT			X					Х		1

- 1. TRANSITION FROM PVC/HDPE AND PROVIDE RIGID STEEL OR RTRC SWEEPS WHERE CONDUITS PENETRATE WALLS, CONCRETE
- SLABS, CONCRETE BASES, AND ASPHALT. 2. REFER TO SPECIFICATIONS FOR RESTRICTIONS ON MC/AC CABLE INSTALLATION.
- 3. EMT SHALL NOT BE USED ON THE EXTERIOR OF A BUILDING OR IN AREAS SUBJECT TO DAMAGE BELOW 10' AFF. 4. INSTALL SURFACE RACEWAYS ONLY WHERE INDICATED ON DRAWINGS.

	COPPER CONDUCTORS													
OVERCURRENT DEVICE RATING (AMPERES)		SIZE R KCMIL)	CONDUIT SIZE											
	PHASE & NEUTRAL	GROUND	SINGLE PHASE 2 WIRE+G (1PH, 1N, 1G, 2PH, 1G)	SINGLE PHASE 3 WIRE+G (2PH, 1N, 1G)	THREE PHASE 3 WIRE+G (3PH, 1G)	THREE PHASE & NEUTRAL 4 WIRE+G (3PH, 1N, 1Q)								
15-20	12	12	3/4"	3/4"	3/4"	3/4"								
25-30	10	10	3/4"	3/4"	3/4"	3/4"								
35-40	8	10	3/4"	3/4"	3/4"	3/4"								
45-50	8 (6)	10	3/4"	3/4"	3/4"	3/4"	1							
60	6 (4)	10	3/4" (1")	3/4" (1")	3/4" (1")	1" (1 1/4")	1							
70	4	8	1"	1 1/4"	1 1/4"	1 1/4"								
80	4 (3)	8	1"	1 1/4"	1 1/4"	1 1/4"	1							
90–100	3 (2)	8	1 1/4"	1 1/4"	1 1/4"	1 1/4"	1							
110	2 (1)	6	_	1 1/4"	1 1/4"	1 1/4" (1 1/2")	1							
125	1 (1/0)	6	-	1 1/4" (1 1/2")	1 1/4" (1 1/2")	1 1/2"	1							
150	1/0	6	-	1 1/2"	1 1/2"	1 1/2"								
175	2/0	6	-	2"	2"	2"								
200	3/0	6	-	2"	2"	2 1/2"								
225	4/0	4	-	2"	2"	2 1/2"								
250	250	4	-	2 1/2"	2 1/2"	2 1/2"								
300	350	4	-	2 1/2"	2 1/2"	3"								
350	500	3	-	3"	3"	3"								
400	500	3	_	3"	3"	3"								

- 1. CONTRACTOR TO SIZE FEEDERS AND BRANCH CIRCUITS BASED ON THIS SCHEDULE AND OVER CURRENT DEVICE SIZE, UNLESS NOTED OTHERWISE. 2. CONTRACTOR MAY COMBINE 20A CIRCUITS AS NOTED IN SPECIFICATION.
- 3. CONDUCTORS ARE BASED ON THHN/THWN-2 UP TO AND INCLUDING #4/0. LARGER THAN #4/0 ARE BASED ON TYPE XHHW. 4. CONDUIT SIZES ARE VALID FOR EMT OR RSC. CONDUIT SIZES SHALL BE ADJUSTED AS REQUIRED FOR OTHER TYPES OF CONDUIT.
- 5. SIZE OF DISCONNECT SWITCH LOCATED AT EQUIPMENT SHALL BE SIZED BASED UPON OVERCURRENT PROTECTION OF THAT DEVICE. 6. OBTAIN APPROVAL FROM ENGINEER PRIOR TO INSTALLING DIFFERENT SIZE/QUANTITY OF CONDUCTORS TO OBTAIN AN EQUIVALENT AMPACITY.

1. CONDUCTORS ARE BASED ON 90°C, 600V INSULATED WIRE APPLIED AT 75°C FOR TERMINATION RATED 60/75°C OR 75°C. FOR TERMINATION RATED AT 60°C, USE CONDUCTORS AND CONDUIT SIZES INDICATED IN PARENTHESES.

В	BRANCH CIRCUIT VOLTAGE DROP WIRING SCHEDULE FOR SINGLE PHASE CIRCUITS											
BRANCH CKT	WIRE SIZE (AWG)	MAXIMUM BRANCH CIRCUIT LENGTH (IN FEET)										
RATING (A)	(AWG/	120V	208V	240V	277V	480V						
20A	12	83	143	165	191	331						
	10	128	222	256	295	511						
	8	201	348	402	464	804						
	6	313	542	625	721	1250						
30A	10	85	148	170	197	341						
	8	134	232	268	309	536						
	6	208	361	417	481	833						
	4	313	542	625	721	1250						

- GENERAL NOTES:

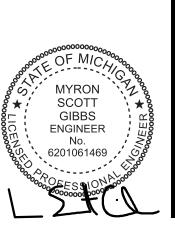
  1. THE ABOVE TABLE VALUES ARE BASED ON COPPER CONDUCTORS, IN STEEL CONDUIT, WITH A LOAD POWER FACTOR OF 0.85 PER NEC CHAPTER 9, TABLE 9.
- 2. PROVIDE BRANCH CIRCUIT CONDUCTORS AS INDICATED IN THE TABLE ABOVE FOR ALL LIGHTING AND RECEPTACLE BRANCH CIRCUITS. WHERE BRANCH CIRCUITS SERVE DEDICATED EQUIPMENT, THE CONTRACTOR MAY PERFORM VOLTAGE DROP CALCULATIONS BASED ON ACTUAL EQUIPMENT CONNECTED LOAD AND PROVIDE CONDUCTORS APPROPRIATELY SIZED TO LIMIT VOLTAGE DROP TO A MAXIMUM OF 3%.
- 3. CONDUCTOR SIZES ARE BASED ON MAXIMUM OF 9 CURRENT CARRYING CONDUCTORS IN A SINGLE CONDUIT.
  4. LIMITS FOR CONDUCTOR LENGTHS SHOWN ARE BASED ON A MAXIMUM BRANCH CIRCUIT LOADING OF 64% OF THE BRANCH BREAKER RATING AND A MAXIMUM OF 3 PERCENT VOLTAGE DROP TO COMPLY WITH ASHRAE 90.1 AND THE NEC. FOR CIRCUITS LOADED GREATER THAN 64% OF BRANCH BREAKER RATING, THE CONTRACTOR SHALL PROVIDE CONDUCTORS APPROPRIATELY SIZED TO LIMIT VOLTAGE DROP TO 3%.

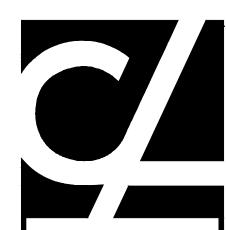
MOTOR CIRCUIT SIZING SCHEDULE (120V, SINGLE PHASE)										
MOTOR HP	CIRCUIT BREAKER	MANUAL MOTOR STARTER SIZE	COMBINATION STARTER SIZE	MOTOR DISCONNECT (NOTE 3)						
1/6	15A	1 HP	0	20A						
1/4	15A	1 HP	0	20A						
1/3	15A	1 HP	0	20A						
1/2	20A	1 HP	0	20A						

GENERAL NOTES:

1. BASED ON MOTOR FULL LOAD AMPERES AS PROVIDED BY THE NEC 2. BASED ON MOTOR RUNNING OVERLOAD PROTECTIONS PROVIDED BY THERMAL OVERLOAD RELAYS. 3. WHERE THE STARTER IS LOCATED REMOTE FROM THE MOTOR, PROVIDE DISCONNECT LOCATED AT THE MOTOR, SIZE AS INDICATED.

NOTE: SOME SYMBOLS AND ABBREVIATIONS SHOWN MAY NOT APPLY TO THIS PROJECT.





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	50% CD
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consulting engineers 5145 Livernois, Suite 100 Troy, Michigan 48098-3276 Tel: 248-879-5666 www.PeterBassoAssociates.com

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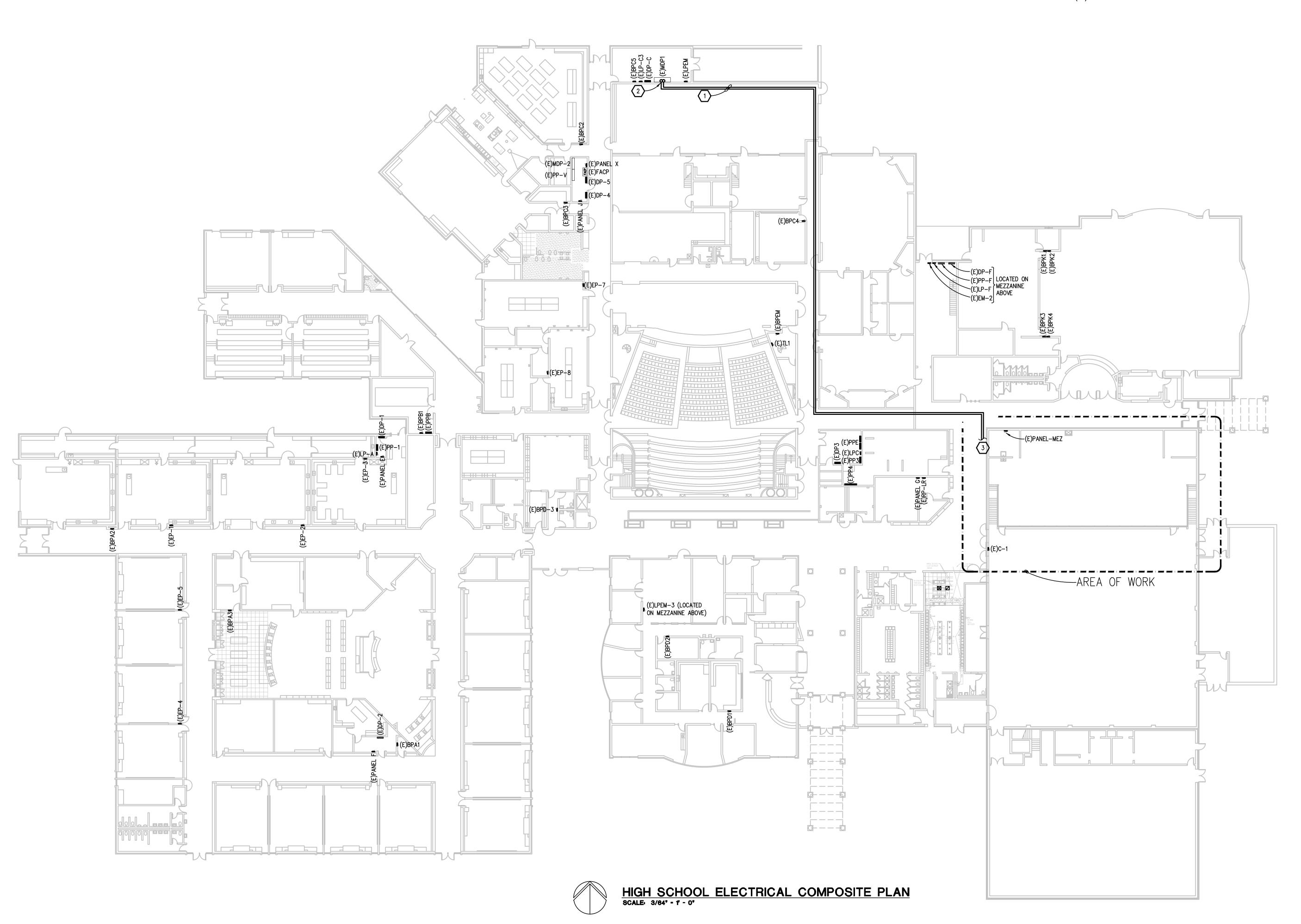
PROJECT NO: 22.516 HS

ELECTRICAL STANDARD

SCHEDULES

#### **\*** CONSTRUCTION KEY NOTES:

- 1. INSTALL (1)1 1/2"C WITH 4#1/0 CU AND 1#6G CU.
- 2. ROUTE FEEDER FOR ERU-1 AND ERU-2 INTO CEILING SPACE OF MAIN ELECTRICAL ROOM (10').
- 3. ROUTE FEEDER FOR ERU-1 AND ERU-2 TO ROOF. (25').









SABLE SCHOOL DISTRICT
HIGH SCHOOL
AC UPGRADES

GRAYLING

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PBA Project No.: 2024.0338

PIC: WEK

PM: WEK

DRAFTS: NCJ

PROJECT NO:

22.516 HS

SHEET TITLE:

HIGH SCHOOL

ELECTRICAL

COMPOSITE PLAN

E0.3





HIGH SCHOOL GYM MEZZANINE ELECTRICAL DEMOLITION PLAN
SCALE: 1/8" - 1' - 0"

#### **ELECTRICAL DEMOLITION GENERAL NOTES:**

- 1. VISIT THE SITE PRIOR TO SUBMISSION OF BID TO EXAMINE THE EXISTING CONDITIONS AND THE EXTENT OF DEMOLITION WORK.
- 2. EXAMINE THE DRAWINGS OF OTHER TRADES AND BE FAMILIAR WITH THE DEMOLITION REQUIRED BY OTHER TRADES. PERFORM ALL INCIDENTAL ELECTRICAL DEMOLITION AND/OR RELOCATION REQUIRED TO FACILITATE THE DEMOLITION WORK OF OTHER TRADES, WHETHER OR NOT SPECIFICALLY INDICATED.
- 3. REMOVE EQUIPMENT OR MATERIALS AS INDICATED ON PLAN WITH CROSS HATCHING. DEMOLITION SHALL INCLUDE, BUT NOT BE LIMITED TO, THOSE COMPONENTS SHOWN.
- 4. COORDINATE WITH NEW WORK PLANS AND ONE LINE DIAGRAMS FOR EXTENT OF DEMOLITION WORK.
- 5. PROVIDE PROPER SUPPORT FOR EXISTING TO REMAIN CONDUITS AND BOXES WHERE EXISTING SUPPORT IS TO BE REMOVED. RE-ROUTE BRANCH CIRCUIT CONDUITS AND RELOCATE JUNCTION BOXES AS REQUIRED TO FACILITATE INSTALLATION OF NEW EQUIPMENT AND SYSTEMS IN CEILING SPACES.
- 6. REMOVE ALL CONDUIT AND WIRE BACK TO THE SOURCE OR NEAREST UPSTREAM DEVICE REMAINING IN SERVICE.
- 7. MAINTAIN ELECTRICAL SERVICE TO ALL LIGHTING FIXTURES, DEVICES AND EQUIPMENT THAT ARE TO REMAIN. EXTEND CONDUIT AND WIRE AS REQUIRED WHERE DEMOLITION WORK AFFECTS ELECTRICAL SERVICE TO DOWNSTREAM LOADS THAT ARE TO REMAIN.
- 8. DISPOSE OF ALL MATERIALS OFF SITE AND INCLUDE ALL COSTS FOR DISPOSAL IN BID. ALL MATERIALS SHALL BE DISPOSED OF IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS, INCLUDING TCLP TESTING, PROPER DISPOSAL AND/OR RECYCLING OF FLUORESCENT LAMPS.
- 9. PROVIDE BLANK COVER PLATES WHERE SWITCHES AND DEVICES ARE REMOVED BUT EXISTING WALLS REMAIN INTACT.
- 10. RING OUT AND TAG ALL CIRCUITS AFFECTED BY THIS ALTERATION AT BOTH ENDS. MARK ALL UNUSED CIRCUIT BREAKERS "SPARE".
- 11. PROVIDE UPDATED TYPED-IN DIRECTORIES FOR ALL PANELS AFFECTED BY THIS ALTERATION.

#### **#** DEMOLITION KEY NOTES:

- A. DISCONNECT MECHANICAL EQUIPMENT AND MAKE ELECTRICALLY SAFE. MECHANICAL EQUIPMENT TO BE REMOVED BY OTHERS. REMOVE DISCONNECTS AND CONTROLS COMPLETE. REMOVE CONDUCTORS AND CONDUIT BACK TO SOURCE.
- B. REMOVE BRANCH CIRCUITS BACK TO NEAREST ACCESSIBLE SOURCE AND MAKE ELECTRICALLY SAFE, AS REQUIRED, TO FACILITATE MECHANICAL INSTALLATION. EXTEND BRANCH CIRCUITS IN NEW WORK.



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Tel: 248-879-5666 www.PeterBassoAssociates.com PBA Project No.: 2024.0338

WEK DRAFTS: PROJECT NO:

HIGH SCHOOL GYM

MEZZANINE ELECTRICA **DEMOLITION PLAN** 

MYRON SCOTT GIBBS ENGINEER No. 6201061469 KEY PLAN NO SCALE



HIGH SCHOOL GYM MEZZANINE ELECTRICAL PLAN
SCALE: 1/8" - 1' - 0"

- ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.
- 5. REFER TO MECHANICAL SCHEDULE SHEETS FOR ELECTRICAL REQUIREMENTS FOR MECHANICAL EQUIPMENT. PROVIDE ALL CONNECTIONS, STARTERS, DISCONNECTS, ETC. AS REQUIRED BY SCHEDULES AND WHERE NOTED ELSEWHERE. VERIFY REQUIREMENTS OF ALL MECHANICAL EQUIPMENT WITH SHOP DRAWINGS SUBMITTALS. NOTIFY ENGINEER OF ANY CONFLICTS BETWEEN EQUIPMENT SUBMITTALS AND ELECTRICAL DRAWINGS. WHERE CIRCUIT SIZES ARE SHOWN ON THE ELECTRICAL DRAWINGS THAT DIFFER FROM WHAT IS INDICATED ON THE MECHANICAL SCHEDULES, PROVIDE THE CIRCUIT OF HIGHER AMPACITY.
- 6. REFER TO TEMPERATURE CONTROLS SHEETS FOR REQUIRED FIRE ALARM CONTROL MODULES, DUCT SMOKE DETECTORS, AND MOTOR CONTROLLERS. PROVIDE ALL ACCESSORIES INDICATED.
- 7. ALL FIRE ALARM DEVICES SHALL BE COMPATIBLE WITH EXISTING SIMPLEX FIRE ALARM SYSTEM. PROVIDE NECESSARY COMPONENTS, MODULES, ETC. AS REQUIRED FOR A FULLY FUNCTIONAL SYSTEM. RE—TEST AND CERTIFY EXISTING FIRE ALARM SYSTEM AT COMPLETION OF PROJECT.

#### **#** CONSTRUCTION KEY NOTES:

- 1. PROVIDE COMBINATION STARTER WITHIN 6'-0" OF MECHANICAL EQUIPMENT.
- 2. PROVIDE CIRCUIT FOR HEAT TRACE SYSTEM. HEAT TRACE AND ASSOCIATED COMPONENTS TO BE PROVIDED BY MECHANICAL CONTRACTOR. COORDINATE EXACT REQUIREMENTS WITH HEAT TRACE MANUFACTURER AND INSTALLER. COORDINATE EXACT LOCATIONS WITH MECHANICAL DRAWINGS AND TRADES.



- THESE DRAWINGS REPRESENT THE GENERAL EXTENT AND ARRANGEMENT OF SYSTEMS. COORDINATE EXACT EQUIPMENT LOCATIONS, ELEVATIONS, AND FINAL CONNECTION REQUIREMENTS. PROVIDE EACH SYSTEM COMPLETE, INCLUDING ALL NECESSARY COMPONENTS, FITTINGS AND OFFSETS.
- 2. INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND
- 3. PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL
- 4. MOTOR CIRCUIT PROTECTION SHALL BE SIZED IN ACCORDANCE WITH MOTOR CIRCUIT SIZING SCHEDULES SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.

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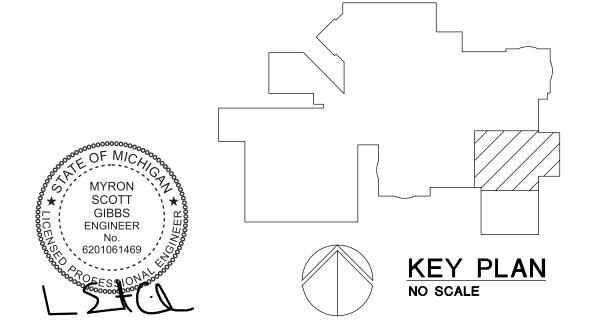


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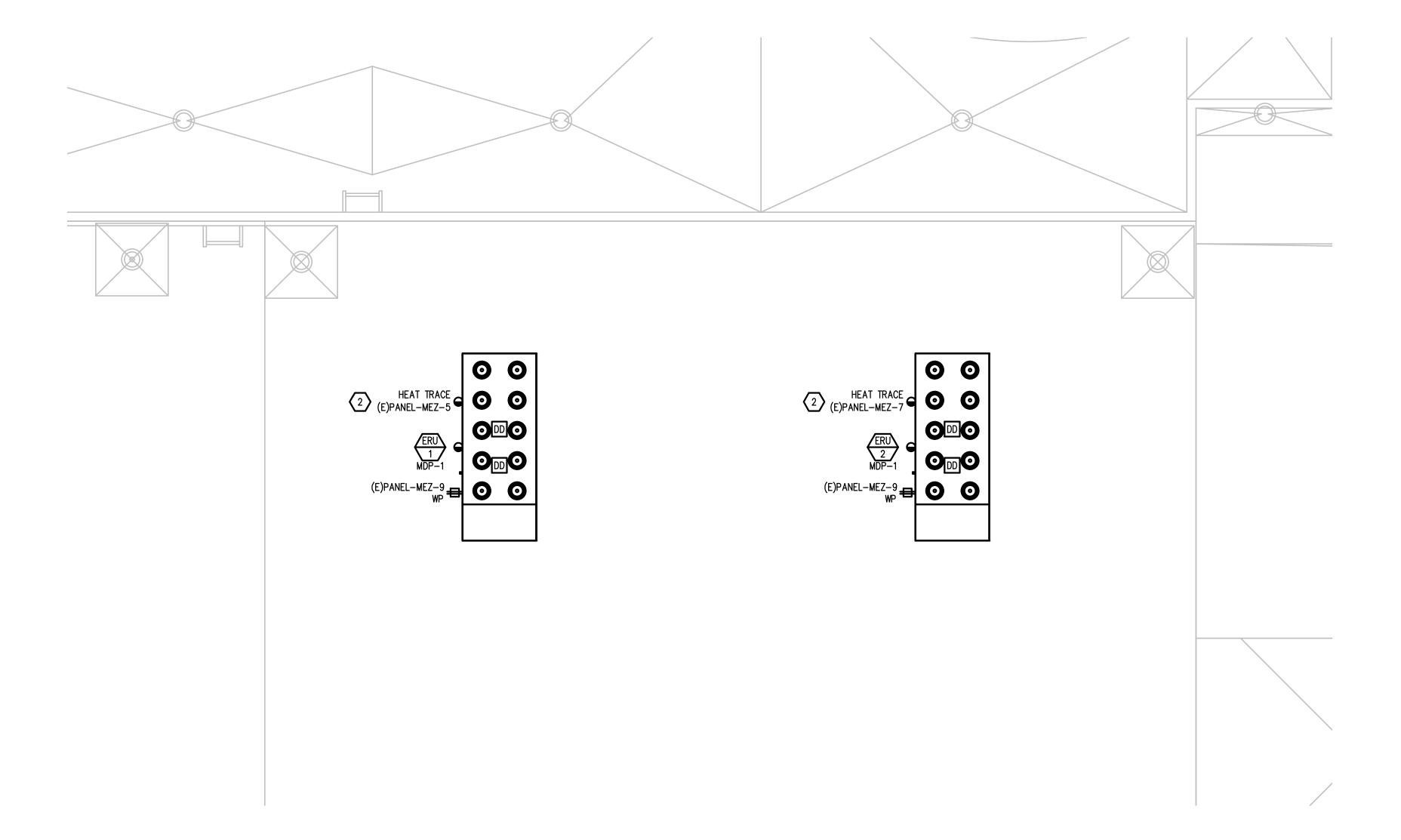
DRAFTS: PROJECT NO: 22.516 HS

HIGH SCHOOL GYM MEZZANINE ELECTRICA PLAN

SHEET NO: E2.1



THE FOLLOWING DIMENSION EQUALS
ONE INCH WHEN PRINTED TO SCALE.





#### **ELECTRICAL GENERAL NOTES:**

- THESE DRAWINGS REPRESENT THE GENERAL EXTENT AND ARRANGEMENT OF SYSTEMS. COORDINATE EXACT EQUIPMENT LOCATIONS, ELEVATIONS, AND FINAL CONNECTION REQUIREMENTS. PROVIDE EACH SYSTEM COMPLETE, INCLUDING ALL NECESSARY COMPONENTS, FITTINGS AND OFFSETS.
- 2. INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.
- 3. PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL
- 4. MOTOR CIRCUIT PROTECTION SHALL BE SIZED IN ACCORDANCE WITH MOTOR CIRCUIT SIZING SCHEDULES SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.
- 5. REFER TO MECHANICAL SCHEDULE SHEETS FOR ELECTRICAL REQUIREMENTS FOR MECHANICAL EQUIPMENT. PROVIDE ALL CONNECTIONS, STARTERS, DISCONNECTS, ETC. AS REQUIRED BY SCHEDULES AND WHERE NOTED ELSEWHERE. VERIFY REQUIREMENTS OF ALL MECHANICAL EQUIPMENT WITH SHOP DRAWINGS SUBMITTALS. NOTIFY ENGINEER OF ANY CONFLICTS BETWEEN EQUIPMENT SUBMITTALS AND ELECTRICAL DRAWINGS. WHERE CIRCUIT SIZES ARE SHOWN ON THE ELECTRICAL DRAWINGS THAT DIFFER FROM WHAT IS INDICATED ON THE MECHANICAL SCHEDULES, PROVIDE THE CIRCUIT OF HIGHER AMPACITY.
- 6. REFER TO TEMPERATURE CONTROLS SHEETS FOR REQUIRED FIRE ALARM CONTROL MODULES, DUCT SMOKE DETECTORS, AND MOTOR CONTROLLERS. PROVIDE ALL ACCESSORIES INDICATED.
- 7. ALL FIRE ALARM DEVICES SHALL BE COMPATIBLE WITH EXISTING SIMPLEX FIRE ALARM SYSTEM. PROVIDE NECESSARY COMPONENTS, MODULES, ETC. AS REQUIRED FOR A FULLY FUNCTIONAL SYSTEM. RE—TEST AND CERTIFY EXISTING FIRE ALARM SYSTEM AT COMPLETION OF PROJECT.

#### **#** CONSTRUCTION KEY NOTES:

- 1. PROVIDE COMBINATION STARTER WITHIN 6'-0" OF MECHANICAL EQUIPMENT.
- 2. PROVIDE CIRCUIT FOR HEAT TRACE SYSTEM. HEAT TRACE AND ASSOCIATED COMPONENTS TO BE PROVIDED BY MECHANICAL CONTRACTOR. COORDINATE EXACT REQUIREMENTS WITH HEAT TRACE MANUFACTURER AND INSTALLER. COORDINATE EXACT LOCATIONS WITH MECHANICAL DRAWINGS AND TRADES.



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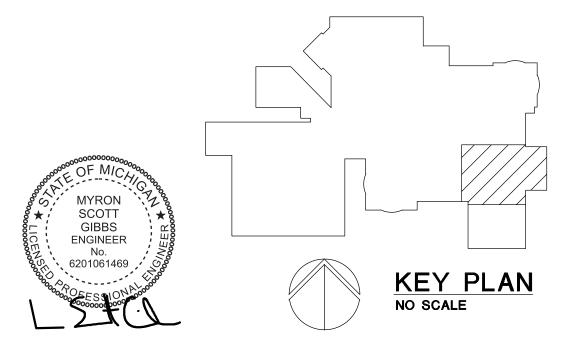
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WEK DRAFTS:

PROJECT NO: 22.516 HS

HIGH SCHOOL ROOF ELECTRICAL PLAN

E2.2



	SHORT-CIRCUIT CALCULATIONS													
FAULT POINT	PANEL/ TRANSFORMER	SOURCE FAULT POINT	SOURCE Isc	CONDUIT TYPE	CONDUCTOR MATERIAL			E (V)	L (FT)	XFMR kVA	XFMR %Z	f	М	Isc
1	UTILITY XFMR							480						52,298
2	MDP-1	1	52,298	NM	CU	10 SETS OF 600 KCML	28033	480				0.034	0.97	50,595
3	ERU-1	2	50,595	М	CU	1 SET OF 1/0	8925	480	460.0			9.409	0.10	4,860
4	ERU-2	2	50,595	М	CU	1 SET OF 1/0	8925	480	520.0			10.637	0.09	4,348
	lsc = lsc x M M = 1/(1+f)	CONI f =	FOLLOWING DUCTOR OR 1.732 x L C x n x E	BUS x Isc	lsc =	NS ARE BASED ON THE "PO UTILITY XFMR: <u>kVA x 100,000</u> E x 1.732 x %Z	f =		Ep x 1.7			<u>Ep x M</u> Es	x lp(sc	Ĺ
		L = LEN	IGTH (ft) O			TANT FROM TABLE, n = NU T CIRCUIT (A), E = VOLTAG						ter Bass	o Assoc	iates, Inc.

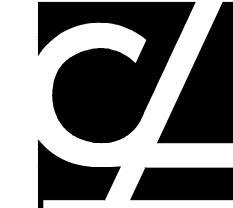
				PAN	IELE	3OA	RD	(E)P	ANE	EL-N	ΛEΖ					
#	LOAD TYPE	DESCRIPTION		CB TYPE	СВ	VA	ØA	ØC	VA	СВ	CB TYPE	DESCRIPTION	I		LOAD TYPE	
1		CDADE		EXIST	70		1176		1176	20	EXIST (	E)BALCONY	BLEACHERS		МН	T
3		SPARE		EXIST	30			1176	1176	20	EXIST (	E)BALCONY	BLEACHERS		М	T
5	С	HEAT TRACE ERU-1		GFEP	20	110	1286		1176	20	EXIST (	E)BALCONY	BLEACHERS		М	T
7	С	HEAT TRACE ERU-2		GFEP	20	110		1286	1176	20	EXIST (	E)BALCONY	BLEACHERS		М	Ι
9	R	RECEPT. ROOFTOP		EXIST	20	360	1536		1176	20		· /	BLEACHERS		М	Ι
11	М	(E)AHU FILTER MOTOR		EXIST	20	864		1728	864	20			KE DAMPER		М	I
13	М	CP-1A		NEW	15	864	1728		864	15	NEW (				М	
15	М	CP-2A		NEW	15	864		1728	864	15	NEW (	CP-2B			M	
	VOLTAI BUS A MAIN T MINIMU MOUNT	MPACITY: 125A TYPE: MLO IM A.I.C.: 10,000	CONTINUELECTRI NON-CO KITCHEN RECEPT RECEPT LIGHTING MOTORS	I CIRCUIT JOUS LOAI C HEAT (I DNTINUOUS I LOAD (K ACLE BASI ACLE DEM G LOAD (L NAL TRAC I, HIGHEST I, REMAINII	D (C): E) S LOAD D): E LOAD AND LOA L): K LIGHTI T LOAD (	(NC): (R): AD (R): NG LOAI MH):	360	Ē		220 220 360 1470 9888		EEDER AND DCPD SIZING 25% 000% 000% 000% 000% 000% 000% 000%		NOTES: PANEL IS SQUARE D G1 SERIES  PANEL IS FED FROM 70A BREAKER		
-		GYM MEZZANINE  O24 by Peter Basso Associates, Inc	NOTE: DI	MAND AND	SIZING IN	FORMATION			AL(KVA): (AMPS):	11.94	•	 (AMPS):	58			- -

#### **DIAGRAM GENERAL NOTES:**

- 1. THESE DRAWINGS REPRESENT THE GENERAL EXTENT AND ARRANGEMENT OF SYSTEMS. COORDINATE EXACT EQUIPMENT LOCATIONS, ELEVATIONS, AND FINAL CONNECTION REQUIREMENTS. PROVIDE EACH SYSTEM COMPLETE, INCLUDING ALL NECESSARY COMPONENTS, FITTINGS AND OFFSETS.
- 2. FEEDER AND BRANCH CIRCUIT CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH THE "FEEDER AND BRANCH CIRCUIT SIZING SCHEDULE-GENERAL PURPOSE" ON THE "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS SPECIFICALLY NOTED OTHERWISE.
- MOTOR CIRCUIT PROTECTION SHALL BE SIZED IN ACCORDANCE WITH THE MOTOR CIRCUIT SIZING SCHEDULES ON THE "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS SPECIFICALLY NOTED OTHERWISE.

#### **EXAMPLE 2** CONSTRUCTION KEY NOTES:

NEW CIRCUIT BREAKER IN EXISTING SPACE. (E)MDP-1 IS SQUARE D QED SWITCHBOARD.



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HIGH SCHOOL ONE LINE DIAGRAM



