STATE SYSTEM OF HIGHER EDUCATION
Commonwealth of Pennsylvania
Millersville University of Pennsylvania

Project No. MI-1155
BIEMESDERFER STADIUM SPEAKERS

1 S. GEORGE ST, Millersville, PA

Dr. Dan Greenstein, Chancellor
State System of Higher Education of Pennsylvania
Harrisburg, PA
CONTRACTS: MI-1155.G, GENERAL CONSTRUCTION
CONTRACTS: MI-1155.H, HVAC CONSTRUCTION
CONTRACTS: MI-1155.E, ELECTRICAL CONSTRUCTION

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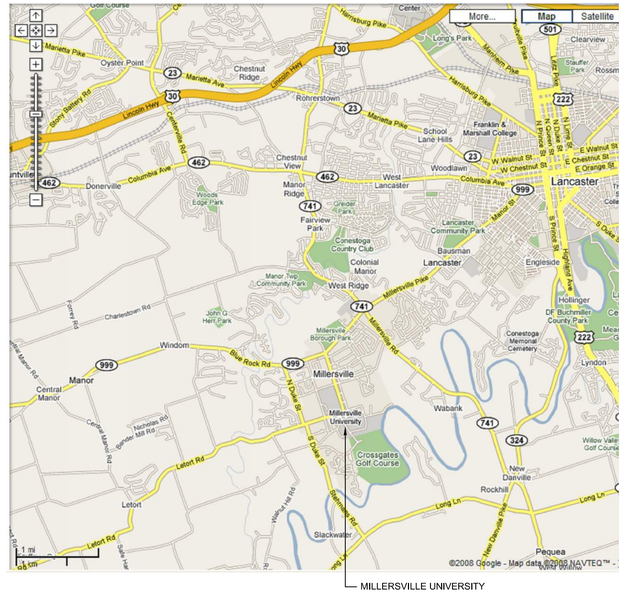
CAMPUS MAP

DRAWING LIST:

C-000	COVER SHEET
A1	SITE, FLOOR & ROOF PLAN, ELEVS, 2015 IBC EVALUATION
A2	SECTIONS, DETAILS
S-1	TOWER PLANS AND ELEVATIONS
S-2	TOWER DETAILS AND NOTES
H-000	NOTES, SYMBOLS, ABBREVIATIONS
H-101	FLOOR PLANS - HVAC, SCHEDULES, DETAILS & SEQUENCE OF OPERATIONS
H-201	SPECIFICATIONS
E-000	NOTES, SYMBOLS, ABBREV. & SPECS
E-100	SITE PLAN - ELECTRICAL & DETAILS
E-101	FLOOR PLANS - ELECTRICAL, SCHEDULES, ONE-LINE & DETAILS

LOCATION MAP



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COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER STEVEN G. HEIDLAGE No. PE-037371

NO. DATE ISSUE
REVISIONS

MI-1155 BIEMESDERFER STADIUM SPEAKERS
45 PUCILLO DR.
MILLERSVILLE, PA 17551
MILLERSVILLE BOROUGH
LANCASTER COUNTY, PA

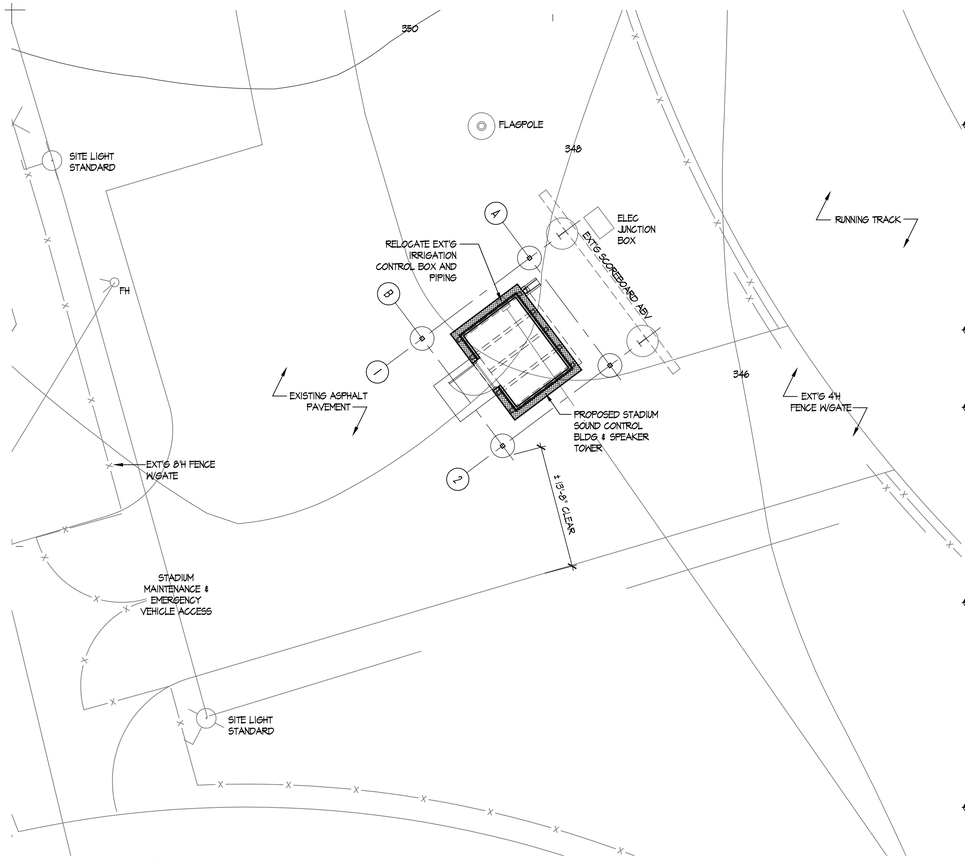
SHEET TITLE
COVER SHEET

MILLERSVILLE UNIVERSITY

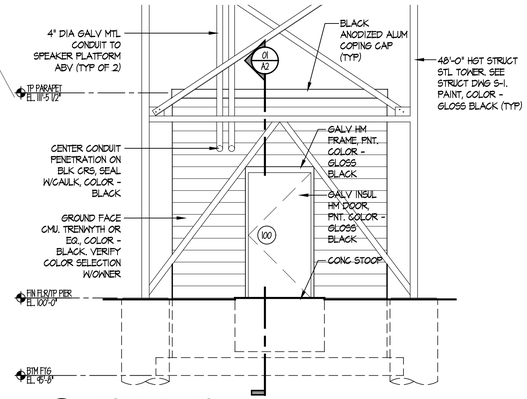
ISSUE DATE	DRAWN	DESIGNED	CHECKED
03/21/2019	JSS	JSS	SGH

SCALE: AS NOTED
SHEET NO.: C-000
PROJECT NO.: 180104

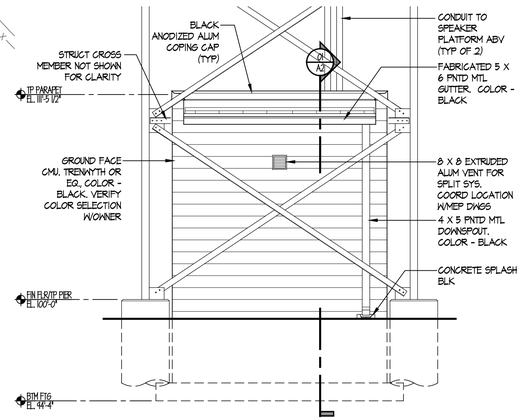
C-000 COVER SHEET.dwg Plotted: 3/22/2019 3:27 PM Revised: —
BLUEBEAM PDF plotted by: Jeremy Sacher



06 A1.0 **PARTIAL SITE PLAN**
SCALE: 1/8" = 1'-0"



03 A1.0 **WEST ELEVATION**
SCALE: 1/4" = 1'-0"



04 A1.0 **EAST ELEVATION**
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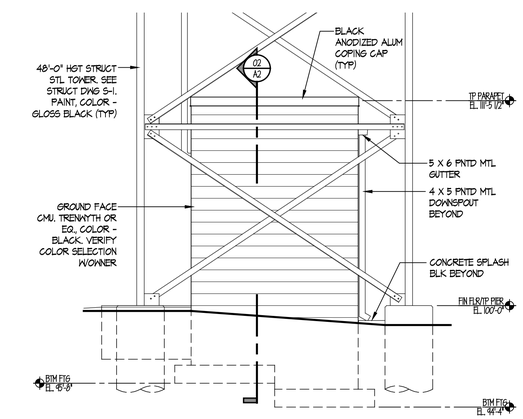
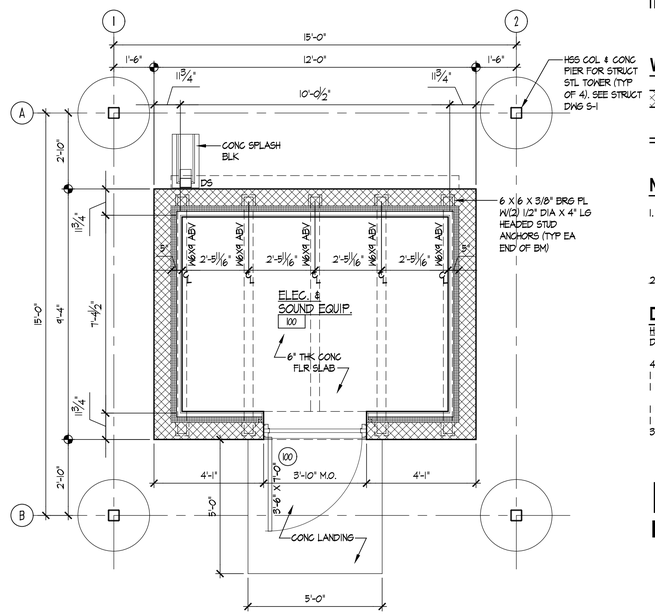
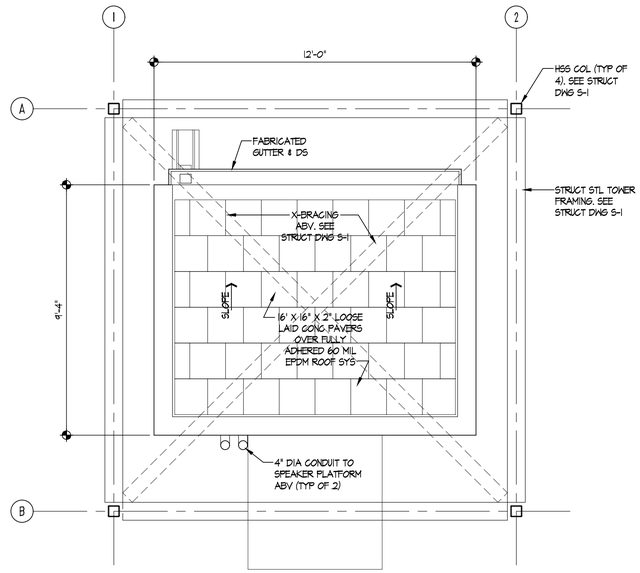


05 A1.0 **SOUTH ELEVATION (NORTH ELEV. SIM.)**
SCALE: 1/4" = 1'-0"



01 A1.0 **FLOOR PLAN**
SCALE: 3/8" = 1'-0"



02 A1.0 **ROOF PLAN**
SCALE: 3/8" = 1'-0"

INTERNATIONAL BUILDING CODE INFORMATION SUMMARY
Volume Date: IBC 2015

USE AND OCCUPANCY CLASSIFICATION: Chapter 3
1. Occupancy Group
   a. Utility and Miscellaneous Group U

GENERAL BUILDING HEIGHTS AND AREAS: Chapter 5.

	ALLOWABLE	ACTUAL
1. Allowable Building Height, Table 504.3	40 ft	11-6" ft
2. Allowable Number of Stories, Table 504.4	2 st	1 st
3. Allowable Building Area, Table 506.2	5,500 sf	112 sf

TYPES OF CONSTRUCTION: Chapter 6
1. Construction Classification: Type VB (5B)

FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS: Chapter 6, Table 601

1. Primary Structural Frame	
• Columns, girders, trusses, bracing members	N/A
2. Bearing Walls	
• Exterior	0 hr
3. Nonbearing walls and partitions	
• Exterior, Table 602	0 hr
4. Floor Construction and secondary members	
• Beams, joists, bracing members	N/A
5. Roof Construction and secondary members	
• Beams, joists, bracing members	0 hr

FIRE-RESISTANCE RATING / EXTERIOR WALLS / FIRE SEPARATION: Chapter 6, Table 602

1. Exterior Walls:	
• Fire separation 30' or more	0 hr

FIRE AND SMOKE PROTECTION FEATURES: Chapter 7

1. Thermal & Sound-Insulating Materials, Section 720	
• Concealed installation	Foil faced FSK type batt insulation over rigid extruded polystyrene insulation
• Exposed installation	N/A
• Loose-fill insulation	N/A
• Roof insulation	Polyisocyanurate
• Cellulose loose-fill insulation	N/A
• Insulation and covering on pipe and tubing	N/A

INTERIOR FINISHES: Chapter 8

1. Int. Wall & Clg. Fin. Req'mnts by Occ., Table 803.11	
Occupancy Group	Utility and Miscellaneous Group U
• Rooms and enclosed spaces	No restrictions

FIRE PROTECTION SYSTEMS: Chapter 9

1. Auto Sprinkler System (NFPA 13)	Not required
2. Portable Fire Extinguishers, Section 906	Not required

MEANS OF EGRESS: Chapter 10

1. Max. Flr. Area Allowance per Occupant, Table 1004.1.2	
• Occupant Load per Occupancy	
1. (Warehouse)	120 sf ÷ 500 sf/occupant = 1 occupant
2. Means of Egress Sizing, Section 1005	
• Other egress components	0.2"/occupant; 36" req'd, 42" provided
3. Areas of Refuge	N/A
4. Exit Access Travel Distance, Table 1017.2	
USE GROUP	**ALLOWABLE** **ACTUAL**
• Utility and Miscellaneous Group U	300' +/- 9'-0"

END OF INTERNATIONAL BUILDING CODE INFORMATION SUMMARY

APPLICABLE CODES SUMMARY

ARCHITECTURAL
- **2015 INTERNATIONAL BUILDING CODE**
- **2015 INTERNATIONAL FIRE CODE**
- **2015 INTERNATIONAL ENERGY CONSERVATION CODE**
- **2009 AMERICAN NATIONAL STANDARD ICC/ANSI A117.1 ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES**
- **2012 NFPA 101 LIFE SAFTEY CODE**

MECHANICAL
- **2015 INTERNATIONAL MECHANICAL CODE**
- **2015 INTERNATIONAL ENERGY CONSERVATION CODE**

ELECTRICAL
- **NFPA-70 2014 NATIONAL ELECTRIC CODE**
- **2015 INTERNATIONAL ENERGY CONSERVATION CODE**

SYMBOLS KEY

FFE — WALL MOUNTED FIRE EXTINGUISHER

NOTE: VERIFY REQUIRED FIRE EXTINGUISHER CODE COMPLIANCE WITH LOCAL FIRE MARSHALL OR CODE OFFICIAL

WALL TYPES

8" GROUND FACE CONCRETE MASONRY UNIT (SEE WALL AND BUILDING SECTION FOR ADDITIONAL INFORMATION)

1 5/8" METAL STUD PARTITION (SEE BUILDING AND WALL SECTION FOR ADDITIONAL INFORMATION)

NOTES

1. GENERAL CONTRACTOR WILL VERIFY AND BE RESPONSIBLE FOR ALL EXISTING SITE CONDITIONS AND THEIR PHYSICAL PROPERTIES, I.E. DIMENSIONS, ELEVATION, LOCATION, AND TOPOGRAPHY BEFORE EXECUTING 'THE WORK'.
2. GENERAL CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF OWNER SUPPLIED EQUIPMENT.

DOOR SCHEDULE

HARDWARE SET 1
DOOR # 100

4 EA. BUTT HINGES
1 EA. MORTISE STOREROOM OR SERVICE LOCKSET
1 EA. OVERHEAD SURFACE DOOR CLOSER W/100° DEAD STOP THUMB TURN HOLD OPEN ARM
1 EA. THERMALLY BROKEN ALUMINUM THRESHOLD
1 EA. WEATHER STRIPPING/HEAD, JAMB, SILL
3 EA. SILENCER

DOCUMENT FOR CONSTRUCTION

PROFESSIONAL SEAL

KAUTTER & KELLEY ARCHITECTS
5 Belmont Avenue
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Tel 610.372.9960
www.kautterkelley.com

UTILITY BUILDING FOR:
MILLERSVILLE UNIVERSITY
MI-1155 BIEMESDERFER STADIUM SPEAKERS
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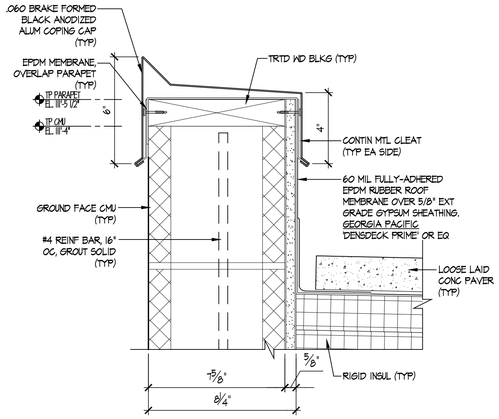
MILLERSVILLE, PA 17551

SITE, FLOOR, & ROOF PLAN, ELEVS., 2015 IBC EVALUATION

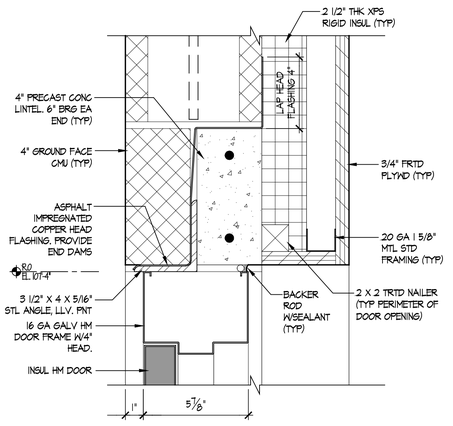
PROJ. NO.: MI-1155
DATE: 03.21.19
SCALE: AS NOTED

A1



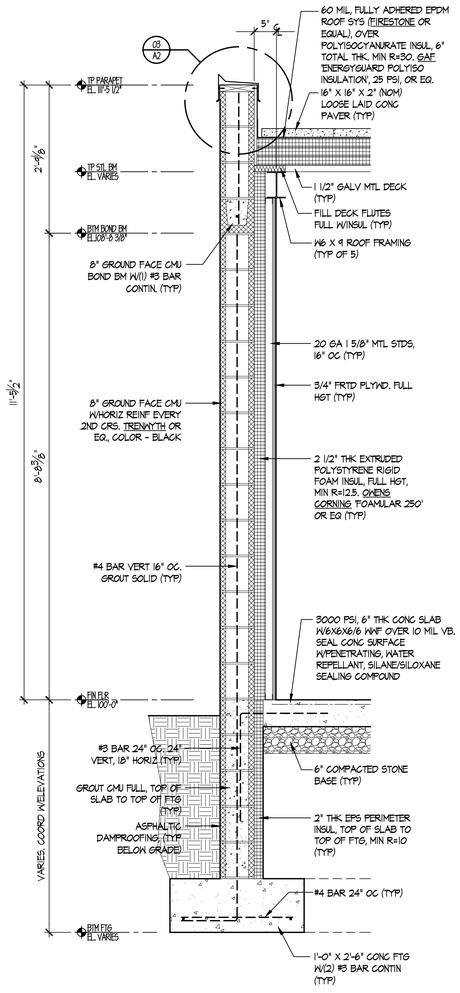
03/A2 DETAIL - PARAPET

SCALE: 3" = 1'-0"



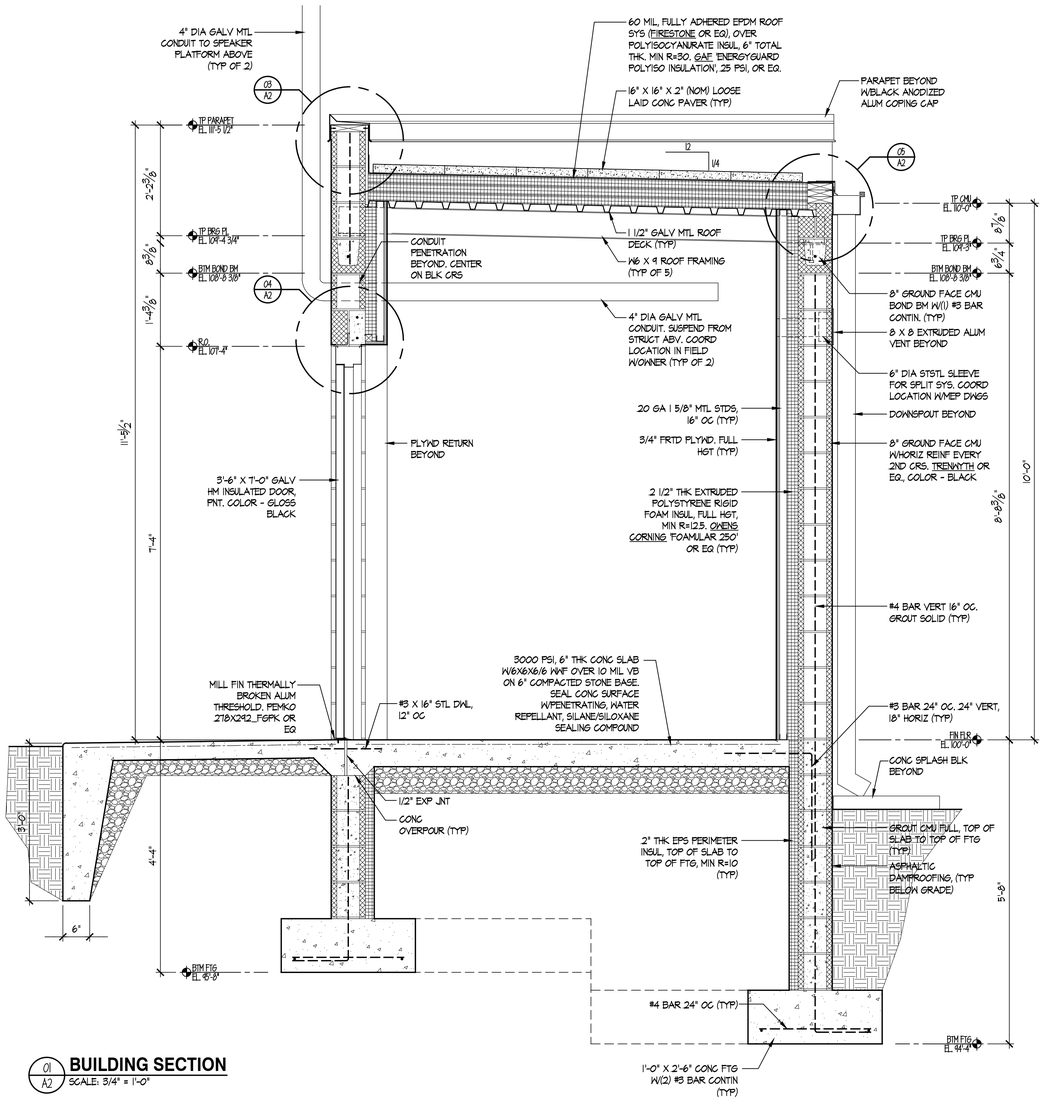
04/A2 HEAD DETAIL (JAMB SIM.)

SCALE: 3" = 1'-0"



02/A2 WALL SECTION

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



01/A2 BUILDING SECTION

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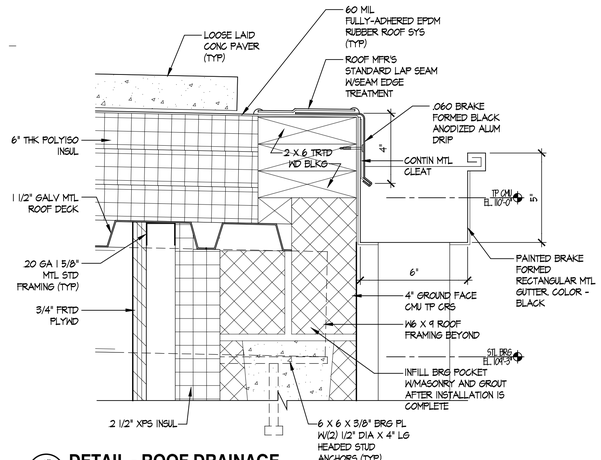

05/A2 DETAIL - ROOF DRAINAGE

SCALE: 3" = 1'-0"

DOCUMENT
FOR CONSTRUCTION

PROFESSIONAL SEAL

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UTILITY BUILDING FOR:
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45 PUCILLO DRIVE
MILLERSVILLE, PA 17551

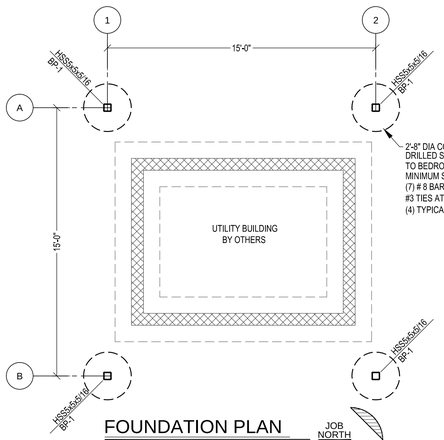
SECTIONS, DETAILS

PROJ. NO.: MI-1155

DATE: 03.21.19

SCALE: AS NOTED

A2



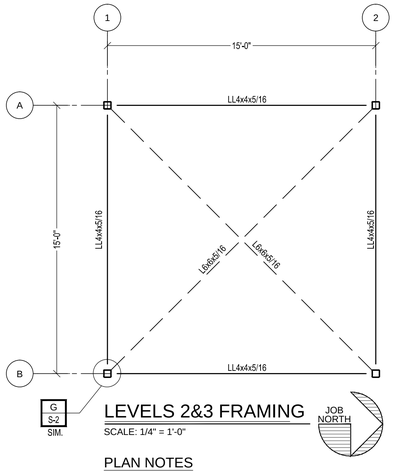
FOUNDATION PLAN

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

JOB NORTH

PLAN NOTES

1. SEE GENERAL STRUCTURAL NOTES ON SHEET S-1.
2. BP-X REFERS TO BASE PLATE SEE DETAILS ON S-1
3. REFER TO ECS SOILS REPORT DATED 11-06-2018 FOR DRILLED SHAFT PIER INFORMATION.



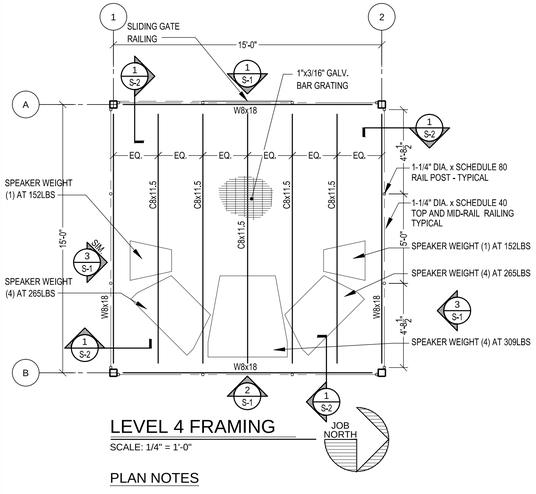
LEVELS 2&3 FRAMING

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

JOB NORTH

PLAN NOTES

1. SEE GENERAL STRUCTURAL NOTES ON SHEET S-2.
2. SEE ELEVATIONS THIS SHEET FOR T.O.S. ELEVATIONS



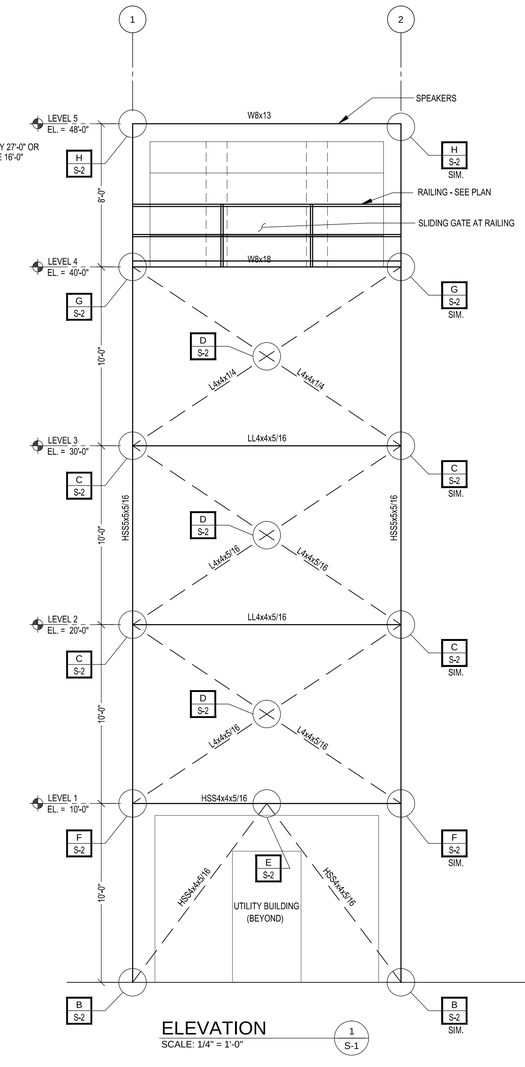
LEVEL 4 FRAMING

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

JOB NORTH

PLAN NOTES

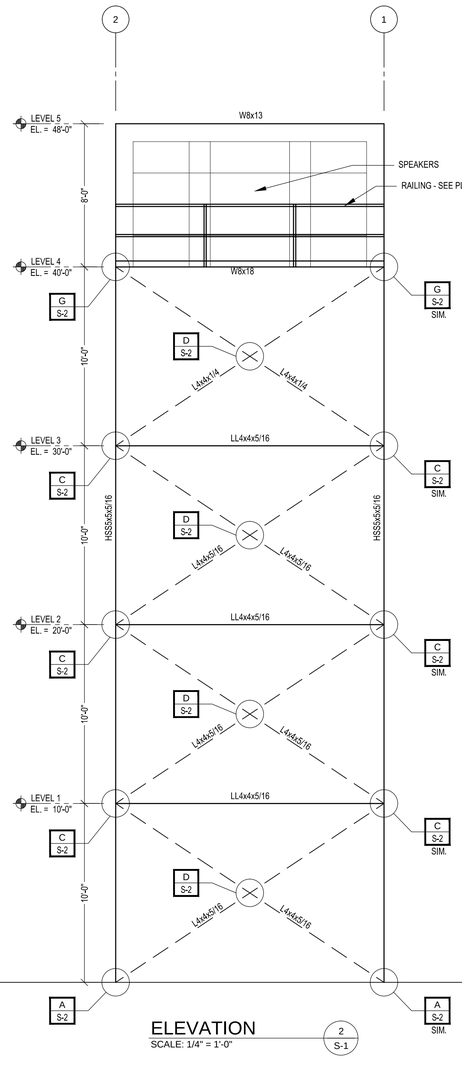
1. SEE GENERAL STRUCTURAL NOTES SHEET S-2.
2. SEE ELEVATIONS THIS SHEET FOR T.O.S. ELEVATIONS
3. TOTAL SPEAKER WEIGHT NOT TO EXCEED WEIGHT SHOW ABOVE



ELEVATION 1

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

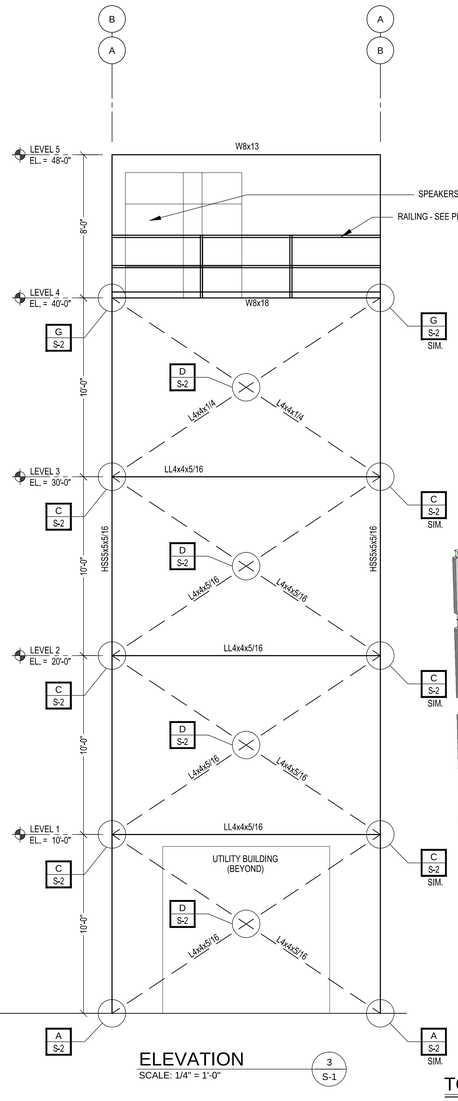
S-1



ELEVATION 2

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

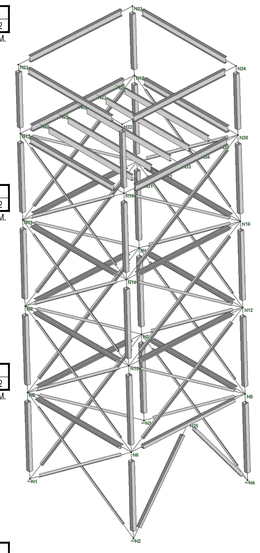
S-1



ELEVATION 3

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

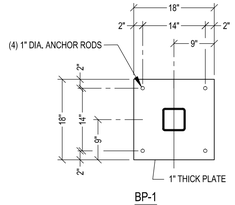
S-1



TOWER RENDERING

SCALE: NOT TO SCALE

BASE PLATES



BP-1

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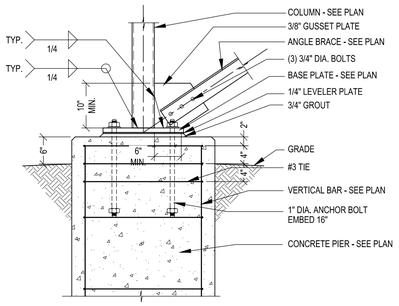
COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
DANIEL J. FICHTNER
ENGINEER
PE039260E
2019.03.22

REVISION	DATE	BY
0 ISSUED FOR PERMIT	03-21-2019	EHS

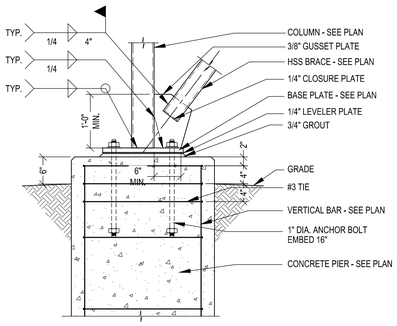
MILLERSVILLE UNIVERSITY
153 CREEK DRIVE
MILLERSVILLE, PA 17551

TOWER PLANS AND ELEVATIONS
MI-1155 BIEMESDERFER STADIUM SPEAKERS
MILLERSVILLE UNIVERSITY
45 PUCILLO DRIVE
MILLERSVILLE, PA 17551

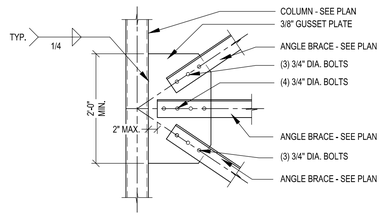
DRAWN BY:	EHS
CHECKED BY:	KAS
DATE:	03-21-2019
SCALE:	SEE PLAN
JOB NO.:	181706
SHEET:	S-1
	FOR PERMIT



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



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



DETAIL C
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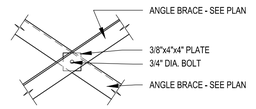
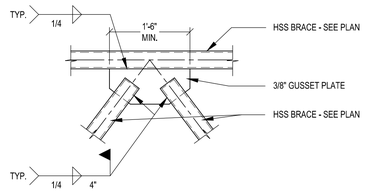


DETAIL D
SCALE: 3/4" = 1'-0"



DETAIL E
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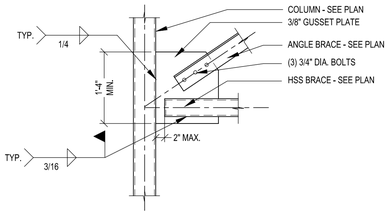
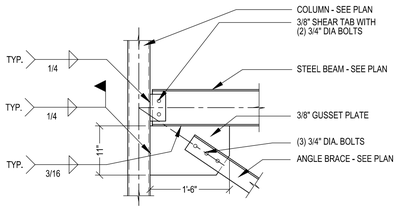
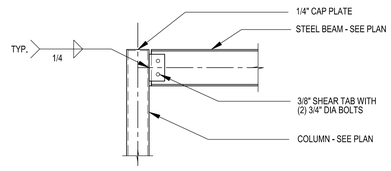


DETAIL F
SCALE: 3/4" = 1'-0"



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



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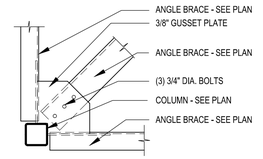

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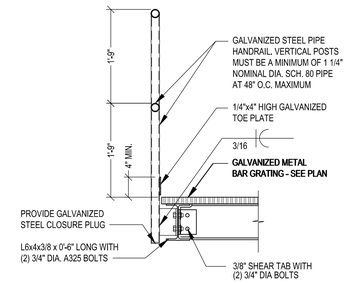

SECTION 1
SCALE: 3/4" = 1'-0"

GENERAL STRUCTURAL NOTES

A. BUILDING CODES AND STANDARDS

1. THE FOLLOWING CODES AND STANDARDS, INCLUDING ALL SPECIFICATIONS REFERENCED WITHIN, SHALL APPLY TO THE DESIGN, CONSTRUCTION AND QUALITY CONTROL OF ALL WORK PERFORMED ON THE PROJECT.
   a. "INTERNATIONAL BUILDING CODE - 2015" INTERNATIONAL CODE COUNCIL, INC.
   b. "MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES", (ANSI/ASCE 7) AMERICAN SOCIETY OF CIVIL ENGINEERS.
2. ADDITIONAL DESIGN STANDARDS FOR MATERIALS SHALL BE FOUND IN THE APPROPRIATE SECTIONS THAT FOLLOW. SEE THOSE SECTIONS FOR THE APPLICABLE CODES.

B. DESIGN LOADS (2015 IBC)

1.. GRAVITY - LIVE LOADS

a.	LIVE LOAD	20 PSF
b.	SNOW LOAD (PLUS DRIFTING WHERE APPLICABLE)	
	1) GROUND SNOW LOAD (Pg)	30 PSF
	2) SNOW EXPOSURE FACTOR (Ce)	1.0
	3) SNOW LOAD IMPORTANCE FACTOR (Is)	1.0
	4) THERMAL FACTOR (Ct)	1.0

2. LATERAL LOADS - WIND

a.	ULTIMATE DESIGN WIND SPEED (3 SECOND GUST)	115 MPH
b.	NOMINAL WIND SPEED	89 MPH
c.	RISK FACTOR	1.0
d.	MAIN WIND-FORCE RESISTING SYSTEM	EXPOSURE B
e.	INTERNAL PRESSURE COEFFICIENT	±0.18

3. LATERAL LOADS - SEISMIC

a.	SEISMIC IMPORTANCE FACTOR (Ie)	1.0
b.	RISK CATEGORY	II
c.	SPECTRAL RESPONSE ACCELERATION FOR SHORT PERIOD (Ss)	0.179
d.	SPECTRAL RESPONSE ACCELERATION FOR 1-SECOND PERIOD (S1)	0.058
e.	SPECTRAL RESPONSE COEFFICIENT (SDS)	0.191
f.	SPECTRAL RESPONSE COEFFICIENT (SD1)	0.093
g.	SITE CLASS	D
h.	SEISMIC DESIGN CATEGORY	B
i.	BASIC SEISMIC FORCE RESISTING SYSTEM(S)	STRUCTURAL STEEL NOT SPECIFICALLY DESIGNED FOR SEISMIC
j.	RESPONSE MODIFICATION FACTOR(S) (R)	3
k.	SEISMIC RESPONSE COEFFICIENT(S) (Cs)	0.064
l.	ANALYSIS PROCEDURE	EQUIVALENT LATERAL FORCE PROCEDURE

C. FOUNDATION

1. DESIGN DATA
   a. FOUNDATIONS HAVE BEEN DESIGNED IN ACCORDANCE WITH THE GEOTECHNICAL REPORT PREPARED BY ECS MID-ATLANTIC, LLC DATED 11-16-2018 REPORT NO.18:4632
2. GENERAL
   a. SEE THE PROJECT SPECIFICATIONS AND GEOTECHNICAL ENGINEERING REPORT FOR EXCAVATION AND SUBGRADE PREPARATION REQUIREMENTS, INCLUDING COMPACTION PROCEDURES. REQUIREMENTS CONTAINED IN THE GEOTECHNICAL ENGINEERING REPORT ARE PART OF THIS WORK.
   b. THE CONTRACTOR SHALL VERIFY ALL EXISTING FIELD CONDITIONS THAT MAY AFFECT THE INSTALLATION OF THE FOUNDATION SYSTEM AS SHOWN PRIOR TO STARTING WORK.
   c. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND PROTECTING ALL EXISTING UTILITIES. EXISTING STRUCTURES, ETC., WHETHER INDICATED OR NOT, WHICH MAY BE AFFECTED BY THE CONSTRUCTION PROCESS. SHOULD ANY DAMAGE TO SUCH UTILITIES OCCUR, THE CONTRACTOR SHALL BE REQUIRED TO REPAIR SUCH DAMAGE AT HIS OWN EXPENSE AND TO THE SATISFACTION OF THE OWNER.

E. CAST-IN-PLACE CONCRETE

1. ALL CONCRETE WORK SHALL CONFORM TO ALL PROVISIONS OF THE FOLLOWING PUBLICATIONS:
   a. "SPECIFICATIONS FOR STRUCTURAL CONCRETE", ACI 301.
   b. "BUILDING CODE REQUIREMENTS FOR CONCRETE", ACI 318.
2. MATERIALS
   a. CONCRETE SHALL HAVE THE FOLLOWING MINIMUM PROPERTIES:

APPLICATION	f'c AT 28 DAYS	DRY UNIT WEIGHT PCF	MAX. W/CM RATIO	SLUMP (IN) (+/- 1")
FOOTINGS & PIERS	3,000	145		4"

   (*SLUMP: CONCRETE CONTAINING HRWR ADMIXTURE SHALL HAVE A MAXIMUM SLUMP OF 7" AFTER ADDITION OF HRWR TO A VERIFIED WATER SLUMP OF 2" TO 3" MAXIMUM)

   b. CEMENT ASTM C150, TYPE I OR II
   c. CEMENT SUBSTITUTES ASTM C595, ASTM C989, ASTM C618 (CLASS C OR F) MAXIMUM PERCENT OF TOTAL IN ACCORDANCE WITH ACI 318

D. CAST-IN-PLACE CONCRETE CONT.

   d. COARSE AGGREGATES COARSE AGGREGATE SIZE SHALL BE 2" MAX. / 1 1/2" TOP SIZE FOR SLAB ON GROUND AND 1 1/2" MAX. / 1" TOP SIZE FOR ALL OTHER WORK. ASTM C33 (NORMAL WEIGHT)
   e. AIR: ALL CONCRETE EXPOSED TO WEATHER, EXCEPT CONCRETE TO RECEIVE A STEEL TROWEL FINISH, SHALL BE AIR-ENTRAINED 6% ± 1 1/2% BY VOLUME. ENTRAINING ADMIXTURES TO COMPLY WITH ASTM C260.
   f. REINFORCEMENT: DEFORMED REINFORCING BARS ASTM A615, GRADE 60
   g. SUBMIT CONCRETE DESIGN MIXES INCLUDING TEST RESULTS IN ACCORDANCE WITH ACI 318 TO VERIFY STRENGTH FOR ALL CLASSES OF CONCRETE TO THE STRUCTURAL ENGINEER FOR REVIEW PRIOR TO PLACING ANY CONCRETE.
   h. SUBMIT REINFORCING PLACEMENT SHOP DRAWINGS TO THE ENGINEER FOR REVIEW PRIOR TO PROCEEDING WITH THE WORK.
3. GENERAL
   a. REINFORCING STEEL CLEAR COVER SHALL BE AS FOLLOWS UNLESS NOTED OTHERWISE ON THE DRAWINGS: CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH: 3"
   b. UNLESS DETAILED OTHERWISE, SPLICES SHALL BE MADE BY CONTACT TENSION LAP SPLICES. MINIMUM LAP TO BE 44 BAR DIAMETERS FOR #6 BARS AND SMALLER, 70 BAR DIAMETERS FOR #7 AND #8 BARS, OR 24 INCHES WHICHEVER IS GREATER, SEE DRAWINGS FOR LAP SPLICE REQUIREMENTS FOR #9 BARS AND LARGER. LAP BARS CONTINUOUS AROUND CORNERS. DOWEL INTERSECTING WALLS INTO CROSS WALLS.
4. INSPECTION AND TESTING
   a. THE OWNER WILL ENGAGE A TESTING AND INSPECTION AGENCY TO PROVIDE SERVICES AS INDICATED BELOW AND SUBMIT REPORTS TO THE ARCHITECT AND STRUCTURAL ENGINEER.
   b. CAST-IN-PLACE CONCRETE
      1) THE AGENCY SHALL INSPECT THE FORMWORK AND REINFORCING STEEL PLACEMENT FOR COMPLIANCE WITH THE CONTRACT DOCUMENTS AND SHOP DRAWINGS. THE AGENCY SHALL MONITOR ALL STRUCTURAL CONCRETE PLACEMENT FOR CONFORMANCE WITH APPLICABLE ACI REQUIREMENTS.
      2) SAMPLE FRESH CONCRETE IN ACCORDANCE WITH ASTM C172. MOLD TEST CYLINDERS IN ACCORDANCE WITH ASTM C31. RECORD AIR AND CONCRETE TEMPERATURES, AIR CONTENT AND SLUMP.
      3) A MINIMUM OF FIVE TEST CYLINDERS SHALL BE CAST FOR EACH DAY'S POUR OR EACH 50 CUBIC YARDS, WHICHEVER RESULTS IN MORE TEST CYLINDERS.

E. STRUCTURAL STEEL

1. DESIGN STANDARDS
   a. "STEEL CONSTRUCTION MANUAL", THIRTEENTH EDITION, AISC (INCLUDING "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS", AISC 360, "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS", RCSC, "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES", AISC.)
   b. "DETAILING FOR STEEL CONSTRUCTION", AISC.
   c. "STRUCTURAL WELDING CODE - STEEL", AWS D1.1.
2. MATERIALS

a.	W-SHAPES AND WT's	ASTM A992, Fy = 50 KSI
b.	CHANNELS, ANGLES AND PLATES	ASTM A36, Fy = 36 KSI
c.	STRUCTURAL TUBING (HSS)	ASTM A500, GRADE B, Fy = 46 KSI
d	HIGH STRENGTH BOLTS	ASTM A325-N (UNLESS NOTED ON DRAWINGS)
e.	WASHERS AND NUTS	ASTM F436 AND ASTM A563
f.	ANCHOR RODS	ASTM F1554, GRADE 36 (UNLESS NOTED ON DRAWINGS)
g.	WELDING ELECTRODES	AWS A5.1 OR A5.5, E70XX
h	EXPANSION BOLTS	HILTI KWIK BOLT 3, DEWALT/POWERS POWER-STUD+SD1 OR APPROVED EQUAL SUBMIT ICC-ES REPORT(S) FOR ANY PROPOSED EQUAL
i.	NON-SHRINK GROUT UNDER PLATES	MINIMUM COMPRESSIVE STRENGTH = 5,000 PSI

3. GENERAL
   a. THE CONTRACTOR SHALL DESIGN AND INSTALL ALL NECESSARY TEMPORARY SUPPORTS, GUYING AND OTHER BRACING TO PROVIDE LATERAL STABILITY OF THE STRUCTURE UNTIL ALL PERMANENT STRUCTURAL ELEMENTS, INCLUDING SHEAR WALLS AND BRACING ARE ATTACHED AND CAPABLE OF SUPPORTING LOADS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ERECTION PROCEDURES.
   b. ALL SHOP AND FIELD CONNECTIONS SHALL BE MADE WITH HIGH STRENGTH BOLTS OR WELDS. ALL HIGH STRENGTH BOLTS AND NUTS SHALL BE CLEARLY MARKED AS REQUIRED BY AISC SPECIFICATIONS. CONNECTIONS MADE WITH UNMARKED BOLTS AND NUTS WILL BE REJECTED.
   c. ALL ANCHOR ROD EMBEDDED ENDS SHALL BE HEADED OR DOUBLE-NUTTED. HOOK BOLTS ARE NOT ALLOWED UNLESS APPROVED BY THE ENGINEER. ANCHOR RODS SHALL BE FURNISHED WITH A36 PLATE WASHERS ON TOP OF THE BASE PLATE. MINIMUM WASHER SIZE AND THICKNESS SHALL BE AS SHOWN IN TABLE 14-2 OF THE AISC MANUAL.
   d. ALL STEEL AT AND BELOW FINISHED GRADE OR SLAB ON GRADE ELEVATION SHALL RECEIVE (2) COATS OF BITUMINOUS PAINT COMPLYING WITH ASTM D1187 OR BE ENCASED IN CONCRETE WHICH PROVIDES A MINIMUM 3" OF COVER.
   e ALL STEEL TO BE HOT DIP GALVANIZE STRUCTURAL AND MISCELLANEOUS STEEL ACCORDING TO ASTM A123 AFTER FABRICATION, FILL VENT AND DRAIN HOLES THAT WILL BE EXPOSED IN THE FINISHED WORK, UNLESS INDICATED TO REMAIN AS WEEP HOLES, BY PLUGGING WITH ZINC SOLDER AND FILING SMOOTH. AFTER ERECTION, CLEAN FIELD WELDS, BOLTED CONNECTIONS AND ABRADED AREAS AND REPAIR GALVANIZING TO COMPLY WITH ASTM A780.
4. INSPECTION AND TESTING
   a. THE OWNER WILL ENGAGE A TESTING AND INSPECTION AGENCY TO PROVIDE SERVICES AS INDICATED BELOW AND SUBMIT REPORTS TO THE ARCHITECT AND ENGINEER.
   b. STRUCTURAL STEEL:
      1) VISUALLY INSPECT ALL FILLET WELDS, BOLTED CONNECTIONS.
      2) 10% OF ALL FIELD FILLET WELDS IN PRIMARY CONNECTIONS AND MULTI-PASS WELDS SHALL BE TESTED BY THE MAGNETIC PARTICLE METHOD.
      3) TEST ANY WELD WHICH VISUAL EXAMINATION INDICATES AN UNUSUAL CONDITION AND/OR POOR QUALITY.
      4) WELDING INSPECTION AND TESTING PROCEDURES SHALL BE IN ACCORDANCE WITH THE AWS CODE.

PROVIDENCE
ENGINEERING CORP
10 Eisenhower Boulevard
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Certificate Number: 3869

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
DANIEL J. FICHTNER
ENGINEER
PE33260E
2019-03-22

REVISION	DATE	BY
0 ISSUED FOR PERMIT	03-21-2019	EHS

MILLERSVILLE UNIVERSITY
153 CREEK DRIVE
MILLERSVILLE, PA 17551

TOWER DETAILSAND NOTES
MI-1155 BIEMESDERFER STADIUM SPEAKERS
MILLERSVILLE UNIVERSITY
45 PUCILLO DRIVE
MILLERSVILLE, PA 17551

DRAWN BY: EHS
CHECKED BY: KAS
DATE: 03-21-2019
SCALE: SEE PLAN
JOB NO.: 181706
SHEET: S-2
FOR PERMITD

MECHANICAL LEGEND

SYMBOL	ABBREV	DESCRIPTION
CT	CT	COOLING TOWER WATER SUPPLY
CTR	CTR	COOLING TOWER WATER RETURN
C	C	CONDENSER WATER SUPPLY
CR	CR	CONDENSER WATER RETURN
		FLOW METER FITTING
		REDUCED PRESSURE ZONE BACKFLOW PREVENTER
TP	TP	TRAP PRIMER
		RELIEF VALVE
MAV	MAV	MANUAL AIR VALVE
AAV	AAV	AUTOMATIC AIR VALVE
		STRAINER W/VALVE
		UNION
SA	SA	SHOCK ABSORBER
FS		FLOW SWITCH
T		THERMOMETER
		THERMOMETER WELL
PG		PRESSURE GAUGE W/ SYPHON & NEEDLE VALVE
		PRESSURE GAUGE W/NEEDLE VALVE
	PG	PRESSURE GAUGE TAPPING
		PIPE GUIDE
		ANCHOR
TCV	TCV	TEMPERATURE CONTROL VALVE (2-WAY)
TCV	TCV	TEMPERATURE CONTROL VALVE (3-WAY)
		STEAM TRAP ASSEMBLY (THERMODYNAMIC)
		DRIP POINT
		BUCKET TRAP
F&T	F&T	FLOAT AND THERMOSTATIC TRAP
		FLEXIBLE PIPE CONNECTION
		OS&Y VALVE W/ TAMPER SWITCH
		SHUTOFF VALVE
		CHECK VALVE
BWV	BWV	BACK WATER VALVE
PRV	PRV	PRESSURE REDUCING VALVE
		PIPE TURNING UP
		PIPE TURNING DOWN
		TEE TURNING UP
		TEE TURNING DOWN
T		THERMOSTAT
		SUPPLY DUCT TURNED UP
		SUPPLY DUCT TURNED DOWN
		RETURN OR OUTSIDE AIR DUCT TURNED UP
		RETURN OR OUTSIDE AIR DUCT TURNED DOWN
		EXHAUST AIR DUCT TURNED UP
		EXHAUST AIR DUCT TURNED DOWN
		FLEXIBLE DUCT CONNECTION
DD	DD	DUCT SMOKE DETECTOR
MVD	MVD	MANUAL VOLUME DAMPER
MOD	MOD	MOTOR OPERATED DAMPER
SD	SD	SMOKE DAMPER
FD	FD	FIRE DAMPER
BDD	BDD	BACKDRAFT DAMPER
	OBD	OPPOSED BLADE DAMPER
R		INCLINED DUCT RISE
D		INCLINED DUCT DOWN
		MATCH LINE
1 / 1		SECTION DESIGNATION
1 / 1		DETAIL DESIGNATION
N		PLAN NORTH

MECHANICAL ABBREVIATIONS

ABBREV	DESCRIPTION
AFF	ABOVE FINISHED FLOOR
BTU	BRITISH THERMAL UNIT
CB	CATCH BASIN
CD	CONDENSATE DRAIN
CFH	CUBIC FEET HOUR
CFM	CUBIC FEET MINUTE
DIA	DIAMETER
DIFF	DIFFUSER
DB	DRY BULB
EAT	ENTERING AIR TEMPERATURE
ESP	EXTERNAL STATIC PRESSURE
EXH	EXHAUST
(FLOOR PLAN -M-1)	FOR CONTINUATION SEE FLOOR PLAN ON DRAWING M-1
GR	GRILLE
GPM	GALLONS PER MINUTE
KW	KILOWATTS
LAT	LEAVING AIR TEMPERATURE
MBH	THOUSAND BTU/HR
OA	OUTSIDE AIR
PD	PRESSURE DROP
RA	RETURN AIR
REG	REGISTER
RX	REMOVE EXISTING
SA	SUPPLY AIR
TSP	TOTAL STATIC PRESSURE
V-PH	VOLT-PHASE
VTR	VENT THROUGH ROOF

GENERAL NOTES
(APPLY TO WORK PROVIDED UNDER DIV. 20):

1. GENERAL: FURNISH LABOR, EQUIPMENT AND MATERIALS NECESSARY FOR THE INSTALLATION OF THE COMPLETE MECHANICAL SYSTEMS AS SPECIFIED HEREIN AND INDICATED IN THE CONTRACT DOCUMENTS. OUTLINE DESCRIPTION AND DIAGRAMMATIC REPRESENTATION OF SYSTEM OPERATION AND EQUIPMENT DOES NOT LIMIT CONTRACTOR LIABILITY FOR FURNISHING AND INSTALLING COMPLETE AND OPERABLE SYSTEMS.
2. APPLICABLE CODES: THE INSTALLATION SHALL COMPLY WITH THE LATEST EDITION OF THE CODE OF THE LOCAL AUTHORITY HAVING JURISDICTION.
3. NOTE DEFINITIONS: "DRAWING NOTES" APPLY TO THE ENTIRE DRAWING ON WHICH THEY APPEAR, WHERE RELEVANT. "SPECIFIC NOTES" APPLY ONLY WHERE INDICATED WITH THE "SPECIFIC NOTE" SYMBOL. REFER TO LEGEND.
4. DUCTWORK TO BE SHEET METAL UNLESS NOTED OTHERWISE.
5. PROVIDE REQUIRED CLEARANCE FOR MAINTENANCE IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS OR AS REQUIRED BY CODE FOR MECHANICAL EQUIPMENT.
6. SCHEDULING: COORDINATE WITH THE OWNER FOR SCHEDULING OF WORK.
7. WORK SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER.
8. KEEP THE WORK SITE AND SURROUNDING AREA FREE FROM ACCUMULATION OF WASTE MATERIALS OR RUBBISH GENERATED BY WORK FROM THIS CONTRACT. PROPERLY AND LEGALLY DISPOSE OF MATERIALS.
9. SAFETY: JOB SITE SAFETY SHALL BE IN STRICT ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REQUIREMENTS.
10. VISIT THE SITE AND CAREFULLY EXAMINE EXISTING CONDITIONS THAT MAY AFFECT THE BID.
11. DO NOT DISCONTINUE ANY MECHANICAL SYSTEM SERVICE WITHOUT FIRST OBTAINING WRITTEN APPROVAL FROM THE USER AGENCY. THE MECHANICAL SYSTEM OUTAGES SHALL BE KEPT TO A MINIMUM.
12. WHEN MOUNTING MECHANICAL WORK IN AREAS SUBJECT TO PEDESTRIAN TRAFFIC, MAINTAIN REQUIRED HEADROOM CLEARANCES.
13. MECHANICAL MATERIALS AND EQUIPMENT SHALL BE INSTALLED AS TO MAINTAIN THEIR RESPECTIVE UL RATING AND SHALL CONFORM TO FACTORY MUTUAL STANDARDS AS APPLICABLE.
14. EQUIPMENT LOCATIONS: REFER TO THE ELECTRICAL DRAWINGS FOR EXACT ELECTRICAL EQUIPMENT LOCATIONS. LOCATIONS OF MECHANICAL EQUIPMENT, DUCTWORK, AND PIPING ARE SHOWN DIAGRAMMATICALLY. DETERMINE EXACT LOCATIONS IN THE FIELD.
15. SEALING FITTINGS AND APPROVED SEALING COMPOUND SHALL BE INSTALLED IN ACCORDANCE WITH THE APPLICABLE CODE. SEAL AROUND PENETRATIONS OF FIRE-RATED WALLS WITH AN APPROVED SEALANT.
16. LOCATIONS OF DUCTWORK, AIR DEVICES, TEMPERATURE CONTROLS, AND EQUIPMENT SHALL BE COORDINATED WITH THE ARCHITECTURAL LAYOUTS, EQUIPMENT CUTS AND PLUMBING/ELECTRICAL/STRUCTURAL PLANS. NO WORK SHALL BE INSTALLED UNTIL THE LOCATIONS HAVE BEEN VERIFIED. BRING ANY DISCREPANCY TO THE ARCHITECTS ATTENTION PRIOR TO MANUFACTURING OF DUCTWORK OR INSTALLATION.
17. NORTH ARROWS ON THESE DRAWINGS INDICATE PLAN NORTH ONLY.
18. DUCT JOINTS SHALL BE SEALED USING 3M MODEL 540 DUCT SEALER. EXCESS SEALER SHALL BE REMOVED FROM DUCTWORK AND JOINTS. PAINT SEALED JOINTS TO MATCH FINISH OF DUCTWORK.

MECHANICAL DRAWING LIST

CENTURY ENGINEERING
CONSULTING ENGINEERS - PLANNERS
10710 Gilroy Road
Hunt Valley, MD 21031
Phone: (443) 589-2400 Fax: (443) 589-2401
www.centuryeng.com

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COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
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NO. DATE ISSUE
REVISIONS

MI-1155 BIEMESDERFER STADIUM SPEAKERS

45 PUCILLO DR.
MILLERSVILLE, PA 17551
MILLERSVILLE BOROUGH LANCASTER COUNTY, PA

SHEET TITLE

NOTES, SYMBOLS, ABBREVIATIONS

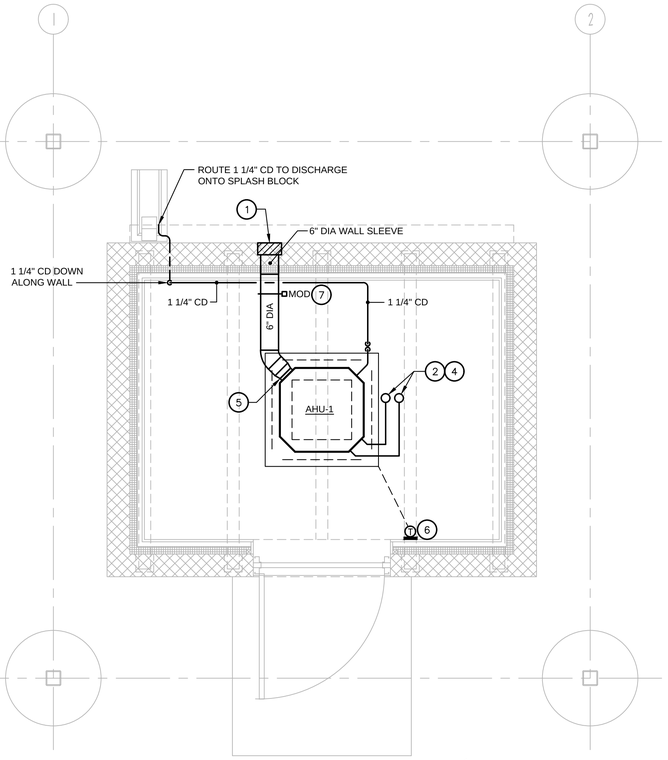
MILLERSVILLE UNIVERSITY

ISSUE DATE		03.21.2019
DRAWN	DESIGNED	CHECKED
KAB	KAB	JAB

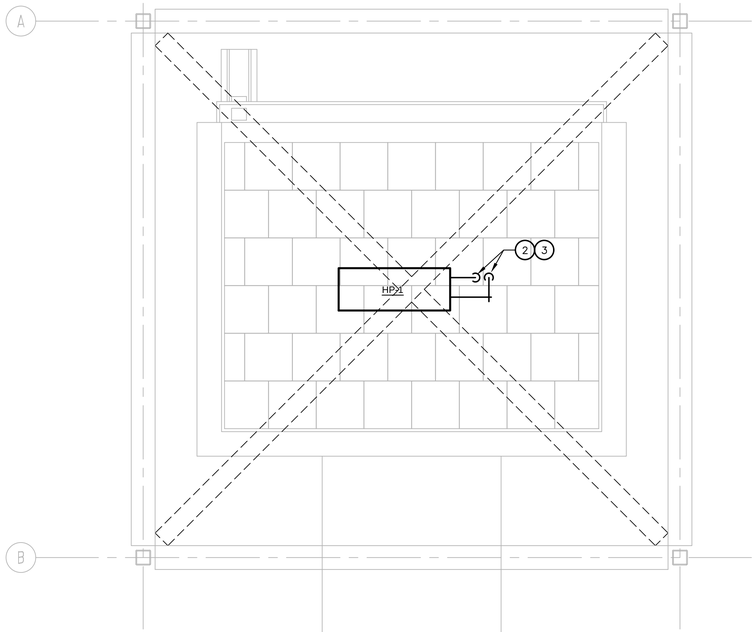
SCALE: AS NOTED

PROJECT NO.: 180104

SHEET NO.: H-000



1 H-101 FLOOR PLAN - HVAC
SCALE: 1/2" = 1'-0"



2 H-101 ROOF PLAN - HVAC
SCALE: 1/2" = 1'-0"

SEQUENCE OF OPERATIONS

DUCTLESS SPLIT SYSTEM HEAT PUMP WITH OUTSIDE AIR CONTROL -

1. OCCUPIED/UNOCCUPIED CONTROL SHALL BE CONTROLLED BY A PROGRAMMABLE THERMOSTAT.
2. WHEN IN UNOCCUPIED MODE, THE UNITS SUPPLY FAN SHALL BE DE-ENERGIZED AND THE OUTSIDE AIR DAMPER SHALL BE CLOSED.
3. WHEN IN UNOCCUPIED MODE, ON A RISE IN SPACE TEMPERATURE, AS SENSED BY A SPACE THERMOSTAT, ABOVE THE UNOCCUPIED MODE SET POINT (ADJUSTABLE), THE UNITS SUPPLY FAN AND COOLING CYCLE SHALL BE ENERGIZED. THE OUTSIDE AIR DAMPER SHALL REMAIN CLOSED.
4. WHEN IN UNOCCUPIED MODE, ON A DROP IN SPACE TEMPERATURE, AS SENSED BY A SPACE THERMOSTAT, BELOW THE UNOCCUPIED MODE SET POINT (ADJUSTABLE), THE UNITS SUPPLY FAN AND HEATING CYCLE SHALL BE ENERGIZED. THE OUTSIDE AIR DAMPER SHALL REMAIN CLOSED.
5. WHEN IN MORNING WARM UP/COOL DOWN MODE, THE UNITS SUPPLY FAN AND HEATING OR COOLING CYCLE SHALL BE ENERGIZED. THE OUTSIDE AIR DAMPER SHALL REMAIN CLOSED. CHANGE OVER TO OCCUPIED MODE SHALL BE CONTROLLED VIA THE TIMECLOCK SCHEDULE.
6. WHEN IN OCCUPIED MODE, THE SUPPLY FAN SHALL RUN CONTINUOUSLY AND THE OUTSIDE AIR DAMPER SHALL BE OPEN.
7. WHEN IN OCCUPIED MODE, ON A RISE IN SPACE TEMPERATURE, AS SENSED BY A SPACE THERMOSTAT, ABOVE THE OCCUPIED MODE SET POINT (ADJUSTABLE), THE UNITS COOLING CYCLE SHALL BE ENERGIZED.
8. WHEN IN OCCUPIED MODE, ON A DROP IN SPACE TEMPERATURE, AS SENSED BY A SPACE TEMPEARTURE SENSOR, BELOW THE OCCUPIED MODE SET POINT (ADJUSTABLE), THE UNITS HEATING CYCLE SHALL BE ENERGIZED.
9. UPON SENSING IMPROPER CONDITIONS, THE SECONDARY WATER LEVEL SWITCH SHALL DE-ENERGIZE THE UNIT AND GENERATE AN ALARM CONDITION.

SPECIFIC NOTES:

1. 8"x8" EXTRUDED ALUMINUM OUTSIDE AIR INTAKE LOUVER PROVIDED BY ANOTHER DIVISION.
2. REFRIGERANT PIPING. SIZE AND QUANTITY AS DIRECTED BY UNIT MANUFACTURER.
3. REFRIGERANT PIPING DOWN THROUGH ROOF TO AUH-1. PROVIDE PATE PIPING PORTAL. SEAL PIPE PENETRATION WEATHERTIGHT. FLASH PORTAL TO MATCH ROOFING MATERIAL. FLASHING SHALL NOT VOID ROOF WARRANTY.
4. REFRIGERANT PIPING UP THROUGH ROOF TO HP-1. SUSPEND REFRIGERANT PIPING FROM STRUCTURE THOUGH VIBRATION ISOLATION HANGERS / ANCHORS.
5. TRANSITION OUTSIDE AIR DUCTWORK TO UNIT OPENING.
6. THERMOSTAT TO BE MOUNTED ON RIGID INSULATION BOARD.
7. INTERLOCK MOD WITH AHU-1.

SSHP - AIR HANDLING UNIT SCHEDULE

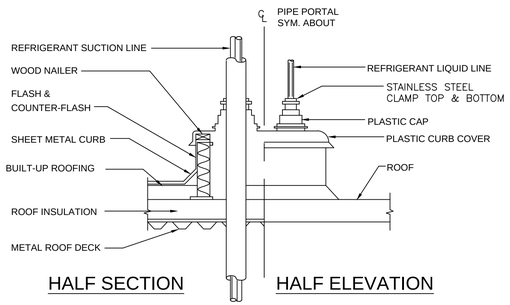
DESIG.	SERVING	SUPPLY AIR CFM	OUTSIDE AIR CFM	FAN MOTOR WATTS	SENSIBLE CAPACITY	TOTAL COOLING CAPACITY	HEATING CAPACITY 17°F	MCA	MOCP	VOLATGE	PHASE	MANUFACTURER	MODEL NUMBER
AHU-1	UTILITY BUILDING	810	40	120	. Btu/h	36,000 Btu/h	38,000 Btu/h	2 A	15 A	208	1	MITSUBISHI ELECTRIC	PLA-A36

NOTES:
1. UNIT SHALL BE SUSPENDED FROM STRUCTURE THROUGH VIBRATION ISOLATION HARDWARE.

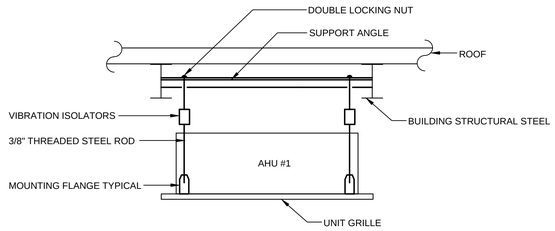
HEAT PUMP SCHEDULE

DESIG.	SERVING	AMBIENT TEMPERATURE SUMMER °F	AMBIENT TEMPERATURE WINTER °F	MCA	MOCP	VOLATGE	PHASE	SEER	MANUFACTURER	MODEL NUMBER
HP-1	AHU-1	95	10	28 A	40 A	208	1	17	MITSUBISHI ELECTRIC	PUZ-HA36

NOTES:
1. SIZE AND QUANTITY OF REFRIGERANT PIPING AS DIRECTED BY UNIT MANUFACTURER'S RECOMMENDATIONS.
2. PROVIDE MANUFACTURER'S ROOF MOUNTING CURB TO MATCH ROOF PITCH.



PIPE PORTAL DETAIL
NO SCALE



AIR HANDLING UNIT SUPPORT DETAIL
NO SCALE

GRAPHIC SCALE
one-half inch = one foot
0 2 4

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NO. DATE ISSUE REVISIONS

MI-1155 BIEMESDERFER STADIUM SPEAKERS

45 PUCILLO DR.
MILLERSVILLE, PA 17551
MILLERSVILLE BOROUGH LANCASTER COUNTY, PA

SHEET TITLE
FLOOR PLANS - HVAC, SCHEDULES, DETAILS & SEQUENCE OF OPERATIONS

MILLERSVILLE UNIVERSITY

ISSUE DATE 03.21.2019
DRAWN KAB
DESIGNED KAB
CHECKED JAB
SCALE AS NOTED
SHEET NO. H-101
PROJECT NO. 180104

SECTION 200000

GENERAL MECHANICAL REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for work under Division 20.

B. Coordinate the work of this Section with the requirements of the Project.

1.2 DEFINITIONS

A. Following are definitions of terms and expressions used in the Mechanical Sections in addition to definitions found in the Contract Conditions:

1. "Piping" includes pipe, fittings, valves, hangers, and other accessories that comprise a system.
2. "Ductwork" includes ducts, fittings, housings, dampers, hangers, and other accessories, which comprise a system.

1.3 QUALITY ASSURANCE

A. Regulatory Requirements

1. Work shall conform to the requirements of the codes, laws and ordinances of the State of Pennsylvania, National Fire Protection Association, American Society of Mechanical Engineers and other authorities having jurisdiction.
2. Comply with applicable codes, laws, standard practices.
3. Comply with the standards of good practice as outlined in the ASHRAE Guide, the Sheet Metal and Air Conditioning Contractor's Association's "Duct Manual", and the Apprentice Training Manual of the Steam Fitters Union.
4. The requirements of the authorities having jurisdiction shall take precedence over the Drawings and Specifications and changes required by the authorities shall be made after review by the Architect.

1.4 SUBMITTALS

A. Shop drawings are required for the following:

1. Heating and Air Conditioning
   a. Heating and Air Conditioning Equipment

B. Review of shop drawings does not relieve the Contractor of responsibility for complying with the contract documents.

1.5 PROTECTION

A. Protect material and equipment from damage.

B. Cap or plug openings in equipment, piping and ductwork with proper caps and plugs.

C. Building materials should be stored in a weather-tight, clean area prior to unpacking for installation.

D. Accumulation of water during construction should be avoided and any porous construction materials such as insulation should be protected from moisture.

1.6 WARRANTY

A. During the warranty period, make the proper adjustments of systems, equipment and devices installed and perform work necessary to ensure the efficient and proper operation of the systems, equipment and devices.

B. Certain items of equipment shall be warranted for a longer time than the general warranty period. Provide for service or replacement required in connection with the warranty of these items.

C. The warranty period shall not begin until the project has reached substantial completion. Any warranty limits from the manufacturer related to delivery of equipment or unit startup shall be between the contractor and the manufacturer only and shall not impact the warranty between the owner and the contractor.

PART 2 - PRODUCTS

2.1 PRODUCTS TO BE USED

A. Items are specified by designations such as trade name, manufacturer's name, catalog number and indicate the capacity and quality of the products or materials to be used on this project.

B. Only products indicated on Contract Documents by name and model number have been coordinated with other trades. Coordinate items of other manufacturer with other trades.

2.2 MATERIALS AND WORKMANSHIP

A. Items shown and not specifically called for, or items specified and not specifically indicated or detailed on the Drawings, or items neither specified nor shown, but which are reasonably incidental to and commonly required to make a complete job, shall be provided.

2.3 FOUNDATIONS AND EQUIPMENT SUPPORTS

A. Provide foundations, supports, curbs and bases for equipment, as indicated or necessary for satisfactory installation and operation of equipment. Furnish and set anchor bolts.

2.4 HANGERS AND PIPE SUPPORTS

A. Provide pipe hangers and supports to maintain required slope and alignment for equipment and piping. Pipe hangers shall be as manufactured by Carpenter & Patterson, Fee & Mason, Modern Hanger or Grinnell.

B. Pipes may not be supported from other pipes. Trapeze hangers may be used for parallel runs of pipe with same slope.

C. Provide sway bracing at sufficient intervals to prevent lateral motion of horizontal or vertical piping and ductwork as required by the jurisdiction to meet the appropriate regional requirements.

D. For pipe and tubing, both horizontal and vertical, and regardless of the spacing of other supports, provide supports at or near changes in direction. Hangers shall be spaced at not over 6 feet apart for ¾ inch pipe, not over 8 feet apart for 3/4 and 1-inch pipe and not over 10 feet for larger sizes.

E. For steel bar joist construction, hanger rods shall be supported from the top chord of the joists or from panel points of the lower chord of the joists. Where piping runs parallel to joists or where hangers are required at other than joist locations, provide steel angles welded to joists to support hangers so that weight is supported from the top chord of the joists.

F. Hangers for pipe shall be similar to Carpenter & Paterson "Clevis" figure 100. Hangers for insulated lines with vapor barrier and carrying fluids with temperatures below 70 degrees shall be large enough to permit continuous insulation. Hangers on vapor barrier insulated piping shall be provided with rigid protector saddles with rigid core of insulation to thickness of adjacent insulation. Saddles shall be 16 gauge galvanized steel and shall cover one half of the circumference of the pipe covering. Saddle shall be secured to insulation with adhesive.

G. Expansion bolts or wood plugs will not be permitted in slag block walls. Equipment hung on such walls shall be supported by through bolts or approved anchor bolts set into masonry as the wall is laid up.

2.5 VIBRATION ISOLATION

A. Provide vibration isolators manufactured by a firm specializing in this type of work for equipment and piping that is capable of transmitting noise and vibration to the building structures.

B. Isolators shall be designed to suit vibration frequency to be absorbed. Provide isolator units of area distribution to obtain proper resiliency under machinery load and impact. Where unequal distribution of weight occurs, design isolators for uniform deflection under imposed load.

C. Examine the contract drawings for sizes, horsepowers, rotational speeds, equipment location, length of span between columns and beams and construction type to determine the isolator selection type and deflection required for each piece of mechanical equipment. Conform to the requirements of the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) Handbook, "HVAC Applications", Chapter 48, "Sound and Vibration Control"

D. Isolators of the same type shall be the product of the same manufacturer, Mason, Vibration Eliminator or Korfund.

E. Mountings shall be of the types indicated below:

1. Type C: Equipment with operating weight different from the installed weight and equipment exposed to the wind such as cooling towers shall be mounted on spring mountings as described in Type B, but a housing shall be used that included vertical limit stops to prevent spring extension when weight is removed. The housing shall serve as blocking during erection and cooling tower mounts shall be located between the supporting steel and roof or the grillage and dunnage as shown on the drawings. The installed and operating heights shall be the same. A minimum clearance of ½" shall be maintained around restraining bolts and between the housing and the spring so as not to interfere with the spring action. Limit stops shall be out of contact furring normal operations. Mounting used out of the doors shall be hot dipped galvanized. Mountings shall be SLR as manufactured by Mason Industries, Inc.

F. Hangers shall be of the types indicated below:

1. Type E: Vibration hangers shall contain a steel spring and 0.3" deflection neoprene element in series. The neoprene element shall be molded with a rod isolation bushing that passes through the hanger box. Spring diameters and hanger box lower hole sizes shall be large enough to permit the hanger rod to swing thru a 30-degree arc before contacting the hole and short- circuiting the spring. Springs shall have a minimum additional travel to solid equal to 50% of the rated deflection. Submittals shall include a scale drawing of the hanger showing the 30-degree capability. Hanger shall be type 30N as manufactured by Mason Industries, Inc.

G. Pipe anchors shall be of types indicated below:

1. Type N: Provide an all directional acoustical pipe anchor, consisting of a telescopic arrangement of two sizes of steel tubing separated by a minimum 1 inch thickness of heavy duty neoprene and duct or neoprene isolation materials. Vertical restraints shall be provided by similar material arranged to prevent vertical travel in either direction. Allowable loads on the isolation material and shall not exceed 500 psi and the design shall be balanced for equal resistance in any direction. Deflection shall be a minimum of 1". All directional anchors shall be type ADA as manufactured by Mason Industries, Inc.

H. Pipe connectors shall be of types indicated below:

1. Type K: Flexible wire reinforced butyl or neoprene hose with integral elastomer and duct flanges and iron back-up rings, control cables with isolating bushings and washers and flange brackets to limit expansion. Length: 6 times diameter up to 36" maximum 150 psi working pressure at 250 degrees F, suction service working pressure 200 psi at 100 degrees F. Mason Industries, Inc. Type MTBF.
2. Type L: Flexible bellows type bronze hose with bronze braid, sweat connections. Length: 8 times diameter, 10" minimum. Suitable for freon refrigerant service. Compressor discharge servicing working pressure 200 psi at 100 degrees F. Mason Industries, Inc. Type BSS.

I. The first three pipe hangers in the main lines near isolated mechanical equipment shall be supported with hangers as described in Type F. Horizontal runs in other locations in mechanical rooms and equipment rooms shall be isolated by hangers as described in Type E. Floor supported piping shall rest on isolators as describes in Type C. Heat exchangers shall be considered part of the piping run. Type F hangers or the first three type C mounts as noted above will have the same static deflection as specified for the mounting under the connected equipment. If piping is connected to equipment located in basements and hangs from ceiling under occupied spaces, the first three hangers shall have 1" deflection for pipe sizes up to and including 3", 2" deflection for pipe sizes up to and including 6", and 3" deflection thereafter. Other hangers are mounts shall have a minimum steel spring deflection of 1". Hangers shall be located as close to the overhead supports as practical.

J. Provide vibration isolation as required above and as indicted in the following schedule:

EQUIPMENT	LOCATION	ISOLATION TYPE	DEFL. (IN)
Roof Mounted Condensing/Heat Pump Units		C	1.0"
Indoor Air Handling Units		E – Suspended	1.0"

2.6 ELECTRICAL WORK

A. Motors and heating elements for equipment specified under the mechanical Sections of the Specifications shall be provided with the equipment.

B. Disconnect switches, and work pertaining to equipment power connections are specified under Division 26 unless specified with the equipment of this Division of the Specifications. Electrical devices provided under this Division shall meet requirements for similar equipment specified under Division 26.

C. Coordinate control device voltages.

D. Mechanical equipment with a factory wired control panel shall be wired in accordance with the National Electrical Code. Additionally, components within the panel shall bear the UL label.

E. Equipment shall be UL listed as a system or be tested by an independent electrical testing agency acceptable to the Authority having jurisdiction.

F. Do not install equipment, ductwork or piping in the dedicated spaces above switchgear, panels and transformers as identified in the National Electrical Code.

2.7 IDENTIFICATION

A. Equipment shall be identified with engraved plastic laminate or anodized aluminum nameplates with pressure sensitive backing. Plates shall also be provided with drilled holes and fastened to equipment with moly_rivets. Letters shall be at least 3/8 inch high and larger in proportion to the size of the piece of equipment. Identification shall be the same as noted on schedules on the Drawings. Labels shall be provided for the following equipment.

1. Air Handling Units
2. Condensing Units

B. Labels shall identify the piping system. Labels shall be located where pipes enters and leaves a space and at 30 foot centers on normal runs. Duct systems shall be similarly identified by noting the system and direction of flow.

PART 3 - EXECUTION

3.1 MANNER OF INSTALLATION

A. Piping and ductwork shall be installed to preserve access to valves, dampers and equipment. Valves, dampers and equipment which require frequent service, adjustment or control and which cannot be located in a readily accessible and safe place, shall be provided with extension devices and remote operators, as necessary and as accepted for use by the Architect.

B. Piping and ductwork shall be run to follow the lines of the building and to allow the maximum headroom consistent with proper pitch. Piping subject to thermal expansion shall be arranged to permit movement without damage to the piping, ductwork and equipment.

C. The Drawings are generally indicative of the work to be installed, but they do not show all offsets, fittings and similar details required, which shall be provided to meet the job conditions. In areas where work is installed in close proximity to work of other trades or within trades covered by this Division of the Specifications, prepare larger scale drawings consisting of plans and sections to show how work is to be installed in relation to work of other trades.

D. Equipment and systems shall be installed in accordance with the requirements and recommendations of the associated manufacturer.

END OF SECTION

SECTION 230000

HEATING & AIR CONDITIONING

PART 1 - GENERAL

1.1 NOTE

A. The requirements of Section 200000 apply to work performed under this Section.

1.2 SCOPE

A. The Work under this Section of the Specification shall include the furnishing of labor, equipment and materials for the installation of heating, air conditioning and ventilating systems as specified, shown on the Drawings or implied to provide continuous and satisfactory service.

PART 2 - PRODUCTS

2.1 DUCTLESS SPLIT SYSTEM HEAT PUMP - CEILING CASSETTE

A. The Air Conditioner system shall be a split system with Variable Speed Inverter Compressor technology. The system shall consist of a horizontal discharge, single phase outdoor unit, a branch selector box, a matched capacity indoor section that shall be equipped with a wireless wall mounted remote controller. All systems shall be Energy Star Qualified and listed.

B. Outdoor Unit - Horizontal Air Discharge

1. The outdoor unit shall be capable of Hyper Heating performance delivering 100% rated heating capacity down to +5° F and 75% rated heating capacity at -13° F outdoor ambient temperature. Further, the outdoor unit shall be capable of cooling operating at 0°F (-18°C) ambient temperature without additional low ambient controls and optional wind baffle.
2. The outdoor unit shall be completely factory assembled, piped, and wired. Each unit must be test run at the factory.
3. The casing shall be constructed from galvanized steel plate, finished with an electrostatically applied, thermally fused acrylic or polyester powder coating for corrosion protection. Mounting feet shall be provided and shall be welded to the base of the cabinet and be of sufficient size to afford reliable equipment mount and stability. Easy access shall be afforded to all serviceable parts by means of removable panel sections. The fan grill shall be of ABS plastic.
4. The compressor shall be a high performance, hermetic, inverter driven, variable speed, dual rotary type. The compressor motor shall be direct current (DC) type equipped with a factory supplied and installed inverter drive package.
5. The outdoor unit shall have an accumulator and high pressure safety switch. The compressor shall be mounted to avoid the transmission of vibration.
6. The outdoor unit coil shall be of nonferrous construction with lanced or corrugated plate fins on copper tubing. The coil shall be protected with an integral guard.
7. Refrigerant flow from the condenser shall be controlled by means of an electronic linear expansion valve (LEV) metering device. The LEV shall be controlled by a microprocessor controlled step motor.
8. All refrigerant lines between outdoor and indoor units shall be of annealed, refrigeration grade copper tubing, ARC Type, meeting ASTM B280 requirements, individually insulated in twin-tube, flexible, closed-cell, CFC-free (ozone depletion potential of zero), elastomeric material for the insulation of refrigerant pipes and tubes with thermal conductivity equal to or better than 0.27 BTU-inch/hour per Sq Ft / °F, a water vapor transmission equal to or better than 0.08 Perm-inch and superior fire ratings such that insulation will not contribute significantly to fire and up to 1" thick insulation shall have a Flame-Spread Index of less than 25 and a Smoke-development Index of less than 50 as tested by ASTM E 84 and CAN / ULC S-102. All refrigerant connections between outdoor and indoor units shall be flare type. The outdoor unit shall have manifold connections providing a separate set of flared fittings for each indoor unit.
9. The unit shall be furnished with a horizontal discharge direct drive, high performance propeller type fan. The condenser fan motor shall be a variable speed, direct current (DC) motor and shall have permanently lubricated bearings.
10. Fan speed shall be switch automatically according to the number of operating indoor units and the compressor operating frequency.
11. The fan motor shall be mounted with vibration isolation for quiet operation.
12. The fan shall be provided with a raised guard to prevent contact with moving parts.
13. The outdoor unit shall be equipped with Pulse Amplitude Modulation (PAM) compressor inverter drive control for maximum efficiency with minimum power consumption. The outdoor unit shall be controlled by the microprocessors located in the indoor unit and in the outdoor unit communicating system status, operation, and instructions digitally over A-Control - a system directing that the indoor unit be powered directly from the outdoor unit using a 3-wire, 14 ga. AWG connection plus ground.
14. The unit electrical power shall be 208/230 volts, 1-phase, 60 hertz.

C. Fan Coil Unit

1. The ceiling-cassette indoor unit shall be factory assembled, wired and run tested. Contained within the unit shall be all factory wiring, piping, control circuit board and fan motor. The unit shall have a self-diagnostic function, 3-minute time delay mechanism, an auto restart function, an emergency operation function, a test run switch, and the ability to adjust airflow patterns for different ceiling heights. Indoor unit and refrigerant pipes shall be charged with dehydrated air before shipment from the factory. The unit shall be suitable for use in plenums in accordance with UL1995 ed 4.
2. The cabinet panel shall have provisions for a field installed filtered outside air intake. Branch ducting shall be allowed from cabinet.
3. Four-way grille shall be fixed to bottom of cabinet allowing two, three or four-way blow. The grille vane angles shall be individually adjustable from a wired remote controller to customize the airflow pattern for the conditioned space.
4. The indoor fan shall be an assembly with a statically and dynamically balanced turbo fan direct driven by a single motor with permanently lubricated bearings. The indoor unit shall include an AUTO fan setting capable of maximizing energy efficiency by adjusting the fan speed based on the difference between controller set-point and space temperature. The indoor fan shall be capable of five (5) speed settings, Low, Mid1, Mid2, High and Auto. The indoor unit shall have an adjustable air outlet system offering 4-way airflow, 3-way airflow, or 2-way airflow. The indoor unit fan logic must include multiple setting that can be changed to provide optimum airflow based on ceiling height and number of outlets used. The indoor unit vanes shall have 5 fixed positions and a swing feature that shall be capable of automatically swinging the vanes up and down for uniform air distribution. The vanes shall have an Auto-Wave selectable option in the heating mode that shall randomly cycle the vanes up and down to evenly heat the space. Grille shall include a factory-installed '3D i-see' sensor, to work in conjunction with indoor unit control sequence to prevent unnecessary cooling or heating in unoccupied areas of the zone without decreasing comfort levels. Sensor must detect occupancy (not simply motion) and location of occupants by measuring size & temperature of objects within a 39' detecting diameter (based on 8.8ft mounting height) with 1,856 or more measuring points.
5. Return air shall be filtered by means of an easily removable, long life, washable filter.
6. The indoor coil shall be of nonferrous construction with smooth plate fins on copper tubing. The tubing shall have inner grooves for high efficiency heat exchange. All tube joints shall be brazed with phos-copper or silver alloy. The coils shall be pressure tested at the factory. The unit shall be provided with an integral condensate lift mechanism that will be able to raise drain water 33 inches above the condensate pan
7. The electrical power of the unit shall be 208 volts or 230 volts, 1 phase, 60 hertz. The system shall be capable of satisfactory operation within voltage limits of 198 volts to 253 volts. The power to the indoor unit shall be supplied from the outdoor unit. A three (3) conductor AWG-14/16 wire with ground shall provide power feed and bi-directional control transmission between the outdoor and indoor units

D. Ductless split air conditioning units shall be Mitsubishi, Daikin Carrier, or LG.

2.2 DUCTWORK

A. Provide ductwork and plenums of the sizes shown on the Drawings and the materials, gauges and construction as listed below.

B. Ductwork shall not be fabricated or installed until clearances and dimensions have been verified in the field. Discrepancies between the duct sizes and configurations shown on the Contract Documents and those required to meet field conditions shall be brought to the attention of the Architect for his direction. Ductwork fabricated or installed prior to field verification that the ductwork will fit is done at the Contractor's risk and expense.

C. For details of duct construction not specified below refer to the latest editions of the Sheet Metal and Air Conditioning Contractors National Association (SMACNA) Manuals. Duct systems shall be defined as follows with the applicable manual.

1. All systems "HVAC Duct Construction Standards" metal and flexible.

D. Ductwork shall be galvanized steel except as specified hereinafter of sizes indicated with sheets shaped and constructed as noted in the SMACNA Manual.

E. Duct connections to air handling units and elsewhere as required to compensate for expansion and contraction and noise reduction shall be made with UL approved glass fabric such as Ventglas as manufactured by Vent Fabrics, Inc.

F. On low pressure systems duct details shall be as follows:

1. Hangers Figure 4_4
2. Volume dampers Figures 2_14 and 2_15

G. Provide manual volume dampers as shown on the Drawing and additionally as required to properly balance the air distribution systems as directed by the independent Test and Balance Agency.

PART 3 - EXECUTION

3.1 CONDENSATE PIPING

A. Drain piping from air conditioning unit condensate pans above the ground shall be schedule 40 polyvinyl chloride sewer pipe.

3.2 INSULATION

A. After the systems have been installed and tested, insulation as specified below shall be applied. Materials shall be Underwriters Laboratory, Inc., approved and shall be applied as recommended by the manufacturer's written instructions. Materials used shall be the products of Owens Corning, Manville, Knauff Corporation, Armstrong, Certainteed, Miracle Adhesive, Moneco or Benjamin Foster and shall be similar to those products that meet the specifications below.

B. Ductwork

1. Outside air duct shall be covered with minimum 2 inch thickness of 3/4 PCF density, a minimum R-Value of 6.0 for attic/concealed spaces and R 8.0 for exterior use flexible fiberglass duct covering with reinforced foil and kraft paper vapor barrier FRK jacket. Insulation shall be applied to duct over 100 percent coverage of duct adhesive such as Benjamin Foster 85_20. Edges shall be butted together with a vapor barrier lap of 2 inch minimum. Seal joint and punctures with Benjamin Foster 30-35. Where ducts are over 24 inches in width, weld pins and caps shall be used to secure insulation to underside of duct. Secure laps with adhesive and flared staples on 4 inch center.

C. Piping

1. Refrigeration suction piping and condensate drain piping above the ground shall be covered with 3/4 inch thickness of 6 PCF polyethylene foamed closed cell elastomeric pipe covering conforming to Mil Spec 15280, Armstrong Armaflex. Fittings shall be neatly mitered or continuous with piping. Covering on exterior of building shall be finished with 2 coats of Armaflex or other latex base finish to blend with adjacent finishes.
2. On exposed insulated piping exposed to outdoor elements, provide. 016 aluminum insulation jackets.
3. At pipe hangers for piping carrying fluids with temperatures below 70 degrees, provide rigid core of insulation to support the pipe. Rigid insulation shall be the same thickness as the adjacent insulation and shall have the same flame spread and smoke developed ratings.

END OF SECTION

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SHEET TITLE

SPECIFICATIONS

MILLERSVILLE UNIVERSITY

ISSUE DATE		03/21/2019
DRAWN	DESIGNED	CHECKED
KAB	KAB	JAB

SCALE: AS NOTED
SHEET NO.: H-201
PROJECT NO.: 180104

H-201 SPECIFICATIONS.dwg Plotted: 3/22/2019 1:51 PM Revised: — DWG TO PDF/PCS plotted by Kurt Bieber

ELECTRICAL LEGEND

NOTE:

1. MOUNTING HEIGHTS SHALL BE TO THE CENTER OF THE DEVICE ABOVE FINISHED FLOOR UNLESS OTHERWISE NOTED. MOUNTING HEIGHT ON PLAN SUPERCEDES THAT INDICATED IN LEGEND.

▭	STRIP LIGHT FIXTURE, SURFACE CEILING MOUNTED
⊖	LIGHTING FIXTURE, WALL MOUNTED
$	SINGLE POLE SWITCH, MOUNT AT 46" A.F.F. U.N.O.
▬	PANELBOARD, AS NOTED, MOUNT AT 6'-6" A.F.F. TO TOP
▭	EQUIPMENT CABINET, AS NOTED, MOUNT AT 6'-6" A.F.F. TO TOP
⏚	125V.–20A. DUPLEX RECEPTACLE, NEMA CONFIGURATION 5–20R, MOUNT AT 18" A.F.F. UNLESS NOTED OTHERWISE
⏚GFI	RECEPTACLE, MOUNT AS ABOVE, GROUND FAULT CIRCUIT INTERRUPTER TYPE
⏚WP	RECEPTACLE, MOUNT AS ABOVE, WITH WEATHERPROOF WHILE–IN–USE COVER
□	FUSED OR NON-FUSED DISCONNECT SWITCH, SIZE AS NOTED

BRANCH CIRCUIT WIRE SIZING

(20 AMPERE SINGLE PHASE CIRCUITS) (1)

LENGTH OF RUN	CIRCUIT WIRE SIZE (2)
120 VOLT SYSTEM	
0' - 100'	#12
100' - 150'	#10
150' - 250'	#8
208 OR 240 VOLT SYSTEM	
0' - 175'	#12
175' - 250'	#10
250' - 400'	#8
277 VOLT SYSTEM	
0' - 200'	#12
200' - 300'	#10
300' - 500'	#8

NOTES

(1) WIRING FOR BRANCH CIRCUITS PROTECTED BY 15 OR 20 AMPERE OVERCURRENT PROTECTIVE DEVICES SHALL BE SIZED IN ACCORDANCE WITH THE ABOVE TABLE. WIRING FOR OTHER BRANCH CIRCUITS SHALL BE SIZED AS SHOWN ON DRAWINGS. EQUIPMENT GROUNDING CONDUCTOR SHALL BE SIZED THE SAME AS THE HOMERUN/CIRCUIT CONDUCTOR.

(2) CIRCUIT LENGTH SHALL BE FROM THE SOURCE TO THE FARTHEST OUTLET, DEVICE OR FIXTURE.

ELECTRICAL SPECIFICATIONS

1. SCOPE

1.1. THE CONTRACTOR TO FURNISH AND INSTALL ALL LABOR, MATERIALS, EQUIPMENT AND FIXTURES AND PERFORM ALL OPERATIONS REQUIRED FOR THE COMPLETE INSTALLATION OF ALL ELECTRICAL WORK AND RELATED SYSTEMS AS SHOWN ON THE DRAWINGS, SPECIFIED HEREIN, OR AS MAY BE REASONABLY REQUIRED.

1.2. IN ADDITION, THE CONTRACTOR TO VERIFY THE ELECTRICAL REQUIREMENTS, AND TO MAKE ALL CONNECTIONS REQUIRED TO EQUIPMENT BEING FURNISHED UNDER THIS CONTRACT, AS WELL AS TO EQUIPMENT FURNISHED BY OTHERS FOR INSTALLATION UNDER THIS CONTRACT.

2. CODES AND INSPECTIONS

2.1. APPLICABLE CODES: THE INSTALLATION SHALL COMPLY WITH LABOR & INDUSTRY (L&I) AND WITH THE LATEST EDITION OF THE CODE OF THE LOCAL AUTHORITY HAVING JURISDICTION.
- 2.1.1. PENNSYLVANIA UNIFORM CONSTRUCTION CODE.
- 2.1.2. 2015 INTERNATIONAL BUILDING CODE.
- 2.1.3. 2015 INTERNATIONAL EXISTING BUILDING CODE.
- 2.1.4. 2015 INTERNATIONAL FIRE CODE.
- 2.1.5. 2015 INTERNATIONAL ENERGY CONSERVATION CODE.
- 2.1.6. 2014 NATIONAL ELECTRIC CODE.
- 2.1.7. 2009 ICC/ANSI STANDARDS.
- 2.1.8. NATIONAL FIRE PROTECTION ASSOCIATION STANDARDS.
- 2.1.9. ALL APPLICABLE STATE, COUNTY, AND LOCAL CODES.

3. COORDINATION AND SUPERVISION

3.1. OUTLET AND EQUIPMENT LOCATIONS ARE DIAGRAMMATIC IN NATURE, AND ARE SUBJECT TO MINOR MODIFICATIONS AS REQUIRED BY FIELD CONDITIONS OR AS DIRECTED BY THE OWNER.

3.2. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE THE WORK AND EQUIPMENT SPECIFIED HEREIN WITH THE WORK TO BE PERFORMED AND EQUIPMENT TO BE FURNISHED BY OTHERS TO ASSURE A COMPLETE AND SATISFACTORY INSTALLATION MEETING WITH THE APPROVAL OF THE OWNER.

4. MATERIAL AND EQUIPMENT

4.1. ALL MATERIALS AND EQUIPMENT INSTALLED AS PART OF THE PERMANENT INSTALLATION TO BE NEW, UNLESS OTHERWISE NOTED, AND TO BE APPROVED BY UL FOR INSTALLATION IN EACH PARTICULAR CASE WHERE STANDARDS HAVE BEEN ESTABLISHED. WHERE APPLICABLE, THE ITEM TO BEAR THE APPROVAL LABEL OF UNDERWRITERS LABORATORIES.

5. SHOP DRAWINGS

5.1. THE CONTRACTOR TO SUBMIT, IN A TIMELY MANNER, SHOP DRAWINGS OF AT LEAST THE FOLLOWING ITEMS AND SYSTEMS TO THE ENGINEER FOR APPROVAL:
- 5.1.1. LIGHT FIXTURES
- 5.1.2. LIGHTNING PROTECTION
- 5.1.3. PANELBOARD AND CIRCUIT BREAKERS
- 5.1.4. SAFETY SWITCHES
- 5.1.5. TRANSFORMERS
- 5.1.6. WIRING DEVICES
- 5.1.7. WIRING

6. EXISTING CONDITIONS

6.1. THE CONTRACTOR IS TO VISIT THE SITE, DETERMINE ALL CONDITIONS AND CIRCUMSTANCES UNDER WHICH THE WORK MUST BE DONE OR OTHER CIRCUMSTANCES WHICH WILL AFFECT THE WORK.

7. CUTTING AND PATCHING

7.1. CUTTING: PROVIDE CUTTING, CHANNELING, CHASING AND DRILLING OF FLOORS, WALLS,PARTITIONS, CEILINGS AND OTHER SURFACES NECESSARY FOR INSTALLATION OF ELECTRICAL WORK. ALL CUTTING SHALL BE PERFORMED BY SKILLED MECHANICS OF THE TRADES INVOLVED.

8. CLOSING OF OPENINGS

8.1. FIRESTOPPING: ALL PENETRATIONS TO BE SEALED WITH AN APPROVED FIRE STOPPING MATERIAL TO MAINTAIN APPLICABLE FIRE RATING OR WALL/CEILING/FLOOR BEING PENETRATED.

9. GROUNDING AND BONDING

9.1. THE ENTIRE INSTALLATION SHALL BE THOROUGHLY AND EFFECTIVELY GROUNDED AND BONDED IN ACCORDANCE WITH ALL REQUIREMENTS OF THE NATIONAL ELECTRIC CODE.

10. LIGHTNING PROTECTION SYSTEM

10.1. ENGAGE THE SERVICES OF A LIGHTNING PROTECTION COMPANY TO FURNISH AND INSTALL A COMPLETE LIGHTNING PROTECTION SYSTEM. LIGHTNING PROTECTION COMPONENTS INDICATED ON DRAWING E101 CONVEYS GENERAL INTENT ONLY.

11. CONDUIT

11.1. EXCEPT AS SPECIFIED HEREINAFTER, ALL WIRING INSTALLED UNDER THIS CONTRACT TO BE RUN IN CONDUIT. CONDUIT TO BE AS FOLLOWS:

11.1.1. INDOORS: USE THE FOLLOWING WIRING METHODS:
- 11.1.1.A. EXPOSED: EMT WITH STEEL COMPRESSION FITTINGS.
- 11.1.1.B. CONCEALED: EMT WITH STEEL COMPRESSION FITTINGS.
- 11.1.1.C. CONNECTIONS TO VIBRATING EQUIPMENT: FLEXIBLE METAL CONDUIT.

11.1.2. OUTDOORS: USE THE FOLLOWING WIRING METHODS:
- 11.1.2.A. EXPOSED: RIGID STEEL CONDUIT (INCLUDING TRANSITION THRU THE ROOF).
- 11.1.2.B. CONNECTIONS TO VIBRATING EQUIPMENT: LIQUID TIGHT FLEXIBLE METAL CONDUIT.
- 11.1.2.C. UNDERGROUND: PVC SCH. 40 EXCEPT WITHIN 5'-0" OF BUILDING FOUNDATION WALL, TRANSITION TO RIGID STEEL.

11.2. WHERE CONDUIT IS SPECIFIED TO BE USED ABOVE, IT SHALL BE SIZED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE, EXCEPT THAT THE MINIMUM CONDUIT SIZE TO BE 3/4".

11.3. ALL CONDUIT TO BE RUN PARALLEL AND PERPENDICULAR TO STRUCTURAL MEMBERS.

12. WIRING

12.1. ALL CONDUCTORS TO BE SOFT DRAWN COPPER. MINIMUM WIRE SIZE TO BE NUMBER 12 AWG. INSULATION TO BE TYPE THHN OR THWN, RATED 600V, 90 DEG C DRY, 75 DEG C WET. MANUFACTURERS TO BE SOUTHWIRE, ENCORE WIRE OR GENERAL CABLE.

13. WIRING DEVICES

13.1. WIRING DEVICES USED ON THIS PROJECT SHALL BE 'SPECIFICATION GRADE' AS MANUFACTURED BY HUBBELL, LEVITON OR PASS & SEYMOUR. COORDINATE DEVICE COLOR WITH OWNER. PROVIDE COVER PLATES (GALVANIZED STEEL: INTERIOR MECHANICAL ROOMS, DIECAST ALUMINUM WHILE IN USE: EXTERIOR LOCATIONS).

14. LIGHTING FIXTURES

14.1. FURNISH AND INSTALL A COMPLETE UL LISTED LIGHTING FIXTURE FOR EACH LOCATION SHOWN ON THE DRAWINGS.

14.2. EACH LIGHTING FIXTURE SHALL BE FURNISHED COMPLETE WITH ALL ACCESSORIES, HANGERS, TRIMS, LAMPS, BALLASTS, ETC., AS RECOMMENDED BY THE MANUFACTURER OR AS REQUIRED FOR A COMPLETE AND SATISFACTORY INSTALLATION.

14.3. ALL PLASTIC EMPLOYED IN LIGHTING FIXTURES SHALL BE 100 % VIRGIN ACRYLIC.

14.4. PERMANENT LIGHTING FIXTURES SHALL NOT BE USED FOR TEMPORARY LIGHTING DURING CONSTRUCTION.

14.5. ALL LIGHTING FIXTURES SHALL BE ADEQUATELY SUPPORTED FROM THE BUILDING STRUCTURE AND SHALL NOT RELY ON THE CEILING FOR SUPPORT. PROVIDE 2#10 GAUGE WIRES IN OPPOSITE CONERS OF FIXTURE AND TIE TO STRUCTURE.

14.6. LIGHTING FIXTURES SHALL BE AS INDICATED IN THE LIGHTING FIXTURE SCHEDULE ON THE DRAWINGS.

15. PANELBOARDS

15.1. PANELBOARDS SHALL BE SCHNEIDER ELECTRIC SQUARE D. PANEL TYPE AND RATING AS INDICATED IN PANEL SCHEDULES.

15.2. BUSS SHALL BE COPPER. (PHASE NEUTRAL AND GROUND)

15.3. CIRCUIT BREAKERS SHALL BE BOLT-ON TYPE.

15.4. CIRCUIT BREAKERS FOR EXISTING PANELBOARD SHALL BE THE SAME TYPE AND INTERRUPTIBLE RATING AS EXISTING.

16. SAFETY SWITCHES

16.1. SAFETY SWITCHES TO BE HEAVY DUTY TYPE, FUSED OR NON-FUSED AS INDICATED, IN NEMA 1 ENCLOSURE FOR INDOOR LOCATIONS, OR IN NEMA 3R ENCLOSURE FOR EXTERIOR LOCATIONS AND FOR NORMALLY WET OR DAMP INTERIOR LOCATIONS.

16.2. SAFETY SWITCHES TO BE SQUARE D.

17. DRY-TYPE TRANSFORMERS

17.1. NEMA TP-1, ENERGY EFFICIENT DRY-TYPE TRANSFORMERS SHALL BE PROVIDED WITH VENTILATED ENCLOSURES, COPPER WINDINGS, 220 DEGREE C. INSULATION, MINIMUM (2) 2.5% TAPS ABOVE AND (2) 2.5% TAPS BELOW NORMAL FULL CAPACITY. TRANSFORMERS SHALL BE SQUARE D CLASS 7400.

17.2. WHERE INDICATED ON DRAWINGS, PROVIDE TRANSFORMERS WITH K-FACTOR RATING, ELECTROSTATIC SHIELD, ETC. TO SUIT THE SPECIFIC APPLICATION.

18. ENCLOSURES AND BOXES

18.1. OUTLET AND DEVICE BOXES SHALL BE GALVANIZED STEEL AND OF SUFFICIENT SIZE TO ACCOMMODATE ALL WIRING AND DEVICES TO BE INSTALLED.

18.2. EQUIPMENT AND PANELBOARD CABINETS, LARGE PULL BOXES AND SIMILAR CABINETS SHALL BE GALVANIZED OR STAINLESS STEEL, AS INDICATED, OF GAUGE REQUIRED BY THE NATIONAL ELECTRICAL CODE.

19. IDENTIFICATIONS

19.1. FURNISH AND INSTALL ENGRAVED PHENOLIC NAMEPLATES ON ALL PANELBOARDS, CONTACTORS, AND SAFETY SWITCHES TO INDICATE VOLTAGE AND WHERE FED FROM.

19.2. LABEL RECEPTACLES TO INDICATE WHERE FED FROM.

20. OUTAGES

20.1. ALL OUTAGES OF ELECTRICAL EQUIPMENT AFFECTED BY THIS WORK TO BE SCHEDULED WITH THE OWNER IN WRITING FIVE DAYS IN ADVANCE OF THE PLANNED OUTAGE. SCHEDULED OUTAGES MAY BE CANCELED BY THE OWNER AT ANY TIME.

21. AS-BUILTS AND OPERATION AND MAINTENANCE MANUALS

21.1. THE CONTRACTOR TO TURN OVER TO THE OWNER AT THE FINAL INSPECTION ONE BROCHURE CONTAINING A CLEAN SET OF MARKED-UP "AS BUILT" DRAWINGS, AS WELL AS A COMPLETE SET OF WIRING DIAGRAMS FOR EACH SYSTEM AND/OR EQUIPMENT ITEM.

22. PROJECT CLOSEOUT

22.1. AT THE COMPLETION OF THE PROJECT, THE CONTRACTOR TO GATHER IN ONE PLACE AND AT ONE TIME ALL LOOSE EQUIPMENT, KEYS, OPERATION MANUALS, AS-BUILT DRAWINGS, ETC.

23. TESTS

23.1. UPON COMPLETION OF THE WORK AND AT SUCH TIME AS THE OWNER MAY DIRECT, THE CONTRACTOR TO CONDUCT AN OPERATING TEST FOR APPROVAL. ALL SYSTEMS TO BE DEMONSTRATED TO BE IN ACCORDANCE WITH THE DRAWINGS AND SPECIFICATIONS, DEFECTS REVEALED TO BE CORRECTED PROMPTLY AND THE TEST RE-CONDUCTED AS THE OWNER MAY DIRECT.

24. GUARANTEE

24.1. THE CONTRACTOR TO GUARANTEE THE ENTIRE INSTALLATION FREE FROM ANY MECHANICAL OR ELECTRICAL DEFECTS FOR ONE YEAR.

GENERAL NOTES - ELECTRICAL WORK

1. DRAWINGS SHALL NOT BE SCALED.
2. WHEREVER POSSIBLE, THE CONTRACTOR SHALL OBTAIN ACTUAL ROUGH-IN DRAWINGS FOR THE ACTUAL ITEM OF EQUIPMENT TO BE INSTALLED PRIOR TO ROUGH-IN.
3. IT IS THE INTENT OF THESE DRAWINGS THAT ALL NEW ELECTRICAL WORK TO BE INSTALLED IN FINISHED AREAS, BE INSTALLED CONCEALED WITHIN NEW OR EXISTING WALLS, FLOORS OR CEILINGS. DEVICES ON WALLS WITHIN DATA CENTER MAY BE INSTALLED EXPOSED ON SURFACE OF WALL. ANY AND ALL CUTTING AND PATCHING OF SURFACES SHALL BE PROVIDED BY THE CONTRACTOR.
4. WHERE CIRCUIT AND HOMERUN LINES ARE NOT SHOWN, PROVIDE MINIMUM 2#12+1#12 GROUND IN 3/4" CONDUIT.
5. PROVIDE TYPED CIRCUIT DIRECTORIES FOR ALL PANELBOARDS TO INDICATE TYPE OF LOAD SERVED AND AREA SERVED (E.G. RECEPTACLES-OFFICE 201). UPDATE EXISTING CIRCUIT DIRECTORIES WITH TYPED VERSION FOR ALL PANELBOARDS TO INDICATE TYPE OF LOAD SERVED AND AREA SERVED (E.G. RECEPTACLES-OFFICE 201).
6. UNLESS NOTED OTHERWISE, EVERY CONDUIT CONTAINING 120V OR GREATER WIRING SHALL CONTAIN A SEPARATE INSULATED GROUND WIRE RATED FOR 600V.
7. PROVIDE SEPARATE UNSHARED NEUTRAL CONDUCTOR(S) FOR ALL BRANCH CIRCUITS UTILIZING A NEUTRAL (I.E. 120V, 277V, ETC). PROVIDE SEPARATE UNSHARED NEUTRAL CONDUCTOR(S) FOR ALL FEEDERS REQUIRING A NEUTRAL (I.E. 1 PHASE - 3 WIRE, 3 PHASE - 4 WIRE FEEDERS). SHARING OF NEUTRAL CONDUCTORS BETWEEN ANY CIRCUIT (BRANCH OR FEEDER) IS NOT PERMITTED. MULTIWIRE BRANCH CIRCUITS ARE NOT PERMITTED.
8. PROVIDE STRUCTURAL STEEL FRAME SUPPORTS AS REQUIRED FOR DISCONNECT SWITCHES, MOTOR STARTERS, ETC., (IF DISCONNECT SWITCHES OR STARTERS ARE LOCATED ON EQUIPMENT HOUSINGS, COORDINATE LOCATIONS WITH EQUIPMENT SUPPLIER TO ENSURE SWITCHES/STARTERS ARE NOT INSTALLED ON EQUIPMENT ACCESS PANELS). MAINTAIN PROPER NATIONAL ELECTRICAL CODE CLEARANCES. IN ADDITION, MAINTAIN PROPER MECHANICAL WORKING CLEARANCES FOR SERVICING OF EQUIPMENT.
9. ELECTRICAL PENETRATIONS FOR BOXES, DEVICES, EQUIPMENT, WIRING AND RACEWAYS IN FIRE-RESISTANCE-RATED CONSTRUCTION SHALL COMPLY WITH ALL REQUIREMENTS OF THE INTERNATIONAL BUILDING CODE, "PENETRATIONS" SECTION. PROVIDE FIRE SEALANT FOR PENETRATIONS THROUGH FIRE RATED FLOORS AND WALLS TO MAINTAIN THE APPLICABLE FIRE RATING.
10. UNLESS INDICATED OTHERWISE, PROVIDE ALL FINAL CONNECTIONS TO EQUIPMENT (I.E. FROM LOAD SIDE OF LOCAL DISCONNECT/MOTOR CONTROLLER TO EQUIPMENT TERMINAL(S)). FINAL CONNECTIONS TO EQUIPMENT SHALL CONSIST OF THE SAME SIZE PHASE CONDUCTORS, NEUTRAL CONDUCTORS (AS APPLICABLE), GROUND CONDUCTORS, CONTROL CONDUCTORS (AS APPLICABLE), AND CONDUIT SIZES AS INDICATED TO LINE SIDE OF DISCONNECT/MOTOR CONTROLLER.

ELECTRICAL ABBREVIATIONS (NOT ALL USED)

A	AMPERE(S)	MLO	MAIN LUGS ONLY
ADA	AMERICAN DISABILITY ACT	NC	NORMALLY CLOSED
AFF	ABOVE FINISHED FLOOR	NEC	NATIONAL ELECTRICAL CODE
AIC	AMPERES INTERRUPTING CAPACITY	NFSS	NON-FUSED SAFETY SWITCH
ATS	AUTOMATIC TRANSFER SWITCH	NIC	NOT IN CONTRACT
AWG	AMERICAN WIRE GAUGE	NL	NIGHTLIGHT
BFC	BELOW FINISHED CEILING	NO	NORMALLY OPEN
C	CONDUIT	NTS	NOT TO SCALE
CATV	CABLE TELEVISION	OC	ON CENTER
CB	CIRCUIT BREAKER	OH	OVERHEAD
CKT	CIRCUIT	Ø	PHASE
CLG	CEILING	P	POLE
CONT	CONTINUATION	PF	POWER FACTOR
CT	CURRENT TRANSFORMER	PNL	PANELBOARD
Δ	DELTA CONNECTED	PRI	PRIMARY
DS	DISCONNECT SWITCH	PT	POTENTIAL TRANSFORMER
DT	DOUBLE THROW	RLA	RUNNING LOAD AMPERES
DWG	DRAWING	RMS	ROOT MEAN SQUARE
DPDT	DOUBLE POLE, DOUBLE THROW	RX	REMOVE EXISTING
DPST	DOUBLE POLE, SINGLE THROW	SEC	SECONDARY
EB	EXISTING BOX	S/N	SOLID NEUTRAL
EC	EMPTY CONDUIT	SPDT	SINGLE POLE, DOUBLE THROW
ER	EXISTING RELOCATED OR REINSTALLED	SPST	SINGLE POLE, SINGLE THROW
EX	EXISTING	SMR	SURFACE MOUNTED RACEWAY
FAA	FIRE ALARM ANNUNCIATOR	SS	SURGE SUPPRESSOR
FACP	FIRE ALARM CONTROL PANEL	ST	SINGLE THROW
FLA	FULL LOAD AMPERES	SW	SWITCH
FSS	FUSED SAFETY SWITCH	SYM	SYMMETRICAL
GFI	GROUND FAULT CIRCUIT INTERRUPTER	TELE	TELEPHONE
G/GRD	GROUND	TOH	TOP OF HOOD
HID	HIGH INTENSITY DISCHARGE	TTB	TELEPHONE TERMINAL BOARD
HOA	HAND-OFF-AUTOMATIC	TYP	TYPICAL
HP	HORSEPOWER	UG	UNDERGROUND
HPS	HIGH PRESSURE SODIUM	UNO	UNLESS NOTED OTHERWISE
HV	HIGH VOLTAGE	V	VOLTS
HZ	HERTZ	VA	VOLT-AMPERE
IG	ISOLATED GROUND	W	WIRE, WATTS
Isc	SHORT CIRCUIT INTERRUPTING CAPACITY (RMS SYMMETRICAL AMPERES)	WAP	WIRELESS ACCESS POINT
		WP	WEATHERPROOF
JB	JUNCTION BOX	Y	WYE CONNECTED
Kcmil	THOUSAND CIRCULAR MILLS	XFMR	TRANSFORMER
KV	KILOVOLTS	XP	EXPLOSION-PROOF
KVA	KILO-VOLT-AMPERES	1P	SINGLE POLE
KW	KILOWATTS	2P	DOUBLE POLE
LTG	LIGHTING	3P	THREE POLE
LV	LOW VOLTAGE	4P	FOUR POLE
LVC	LOW VOLTAGE CONTROL		
MCB	MAIN CIRCUIT BREAKER		
MCC	MOTOR CONTROL CENTER		
MCP	MOTOR CIRCUIT PROTECTOR		
MH	MOUNTING HEIGHT		
MISC	MISCELLANEOUS		

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MI-1155 BIEMESDERFER STADIUM SPEAKERS

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LANCASTER COUNTY, PA
MILLERSVILLE BOROUGH

SHEET TITLE

NOTES, SYMBOLS, ABBREV. & SPECS

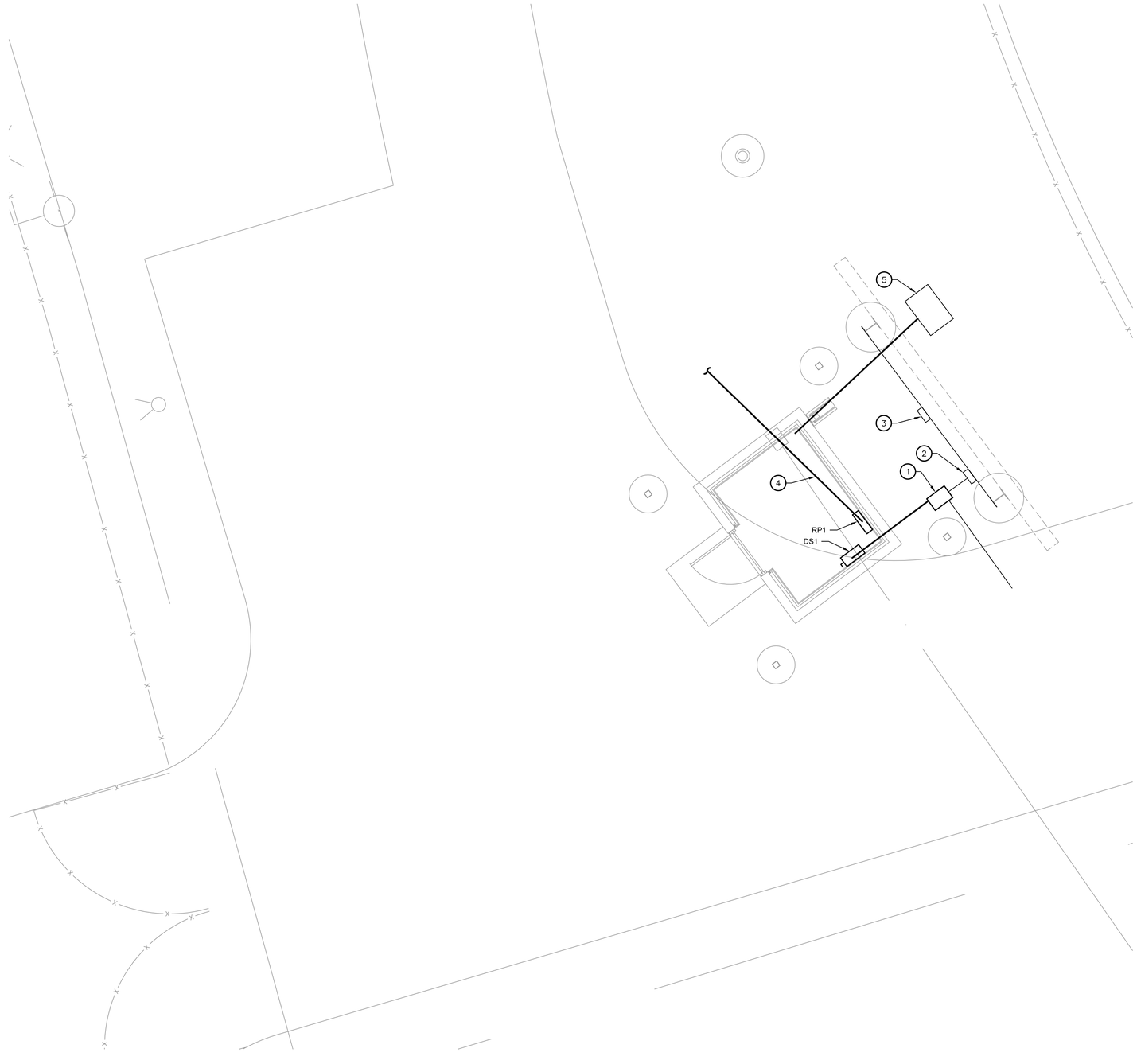
MILLERSVILLE UNIVERSITY

ISSUE DATE	03/21/2019	
DRAWN	DESIGNED	CHECKED
JSS	JSS	SGH

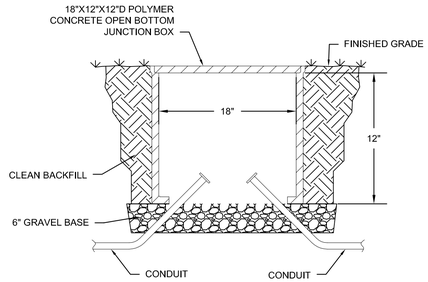
SCALE: AS NOTED
SHEET NO.: E-000
PROJECT NO.: 180104

REFERENCED NOTES:

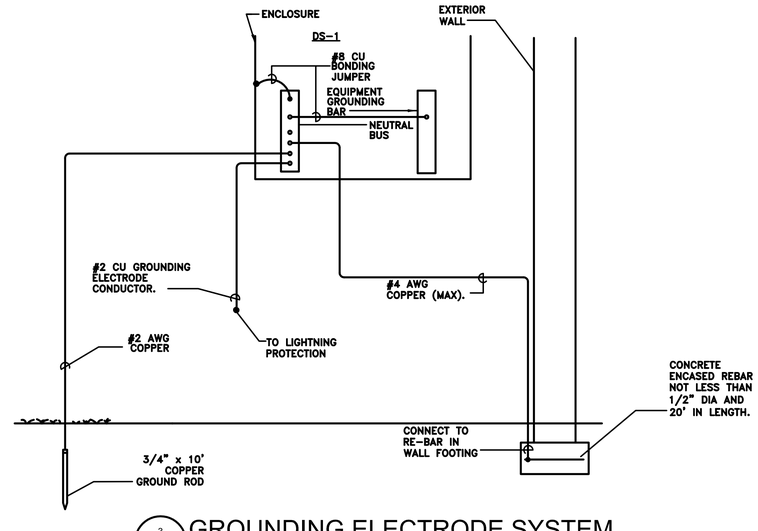
1. REMOVE EXISTING TRANSFORMER AND PAD. PROVIDE QUAZITE 18"X12"X12" HANDHOLE WITH TIER 15 COVER LABELED 'ELECTRIC'. MODIFY EXISTING CONDUIT AS NECESSARY TO REUSE FROM MAIN BUILDING. PROVIDE NEW FEEDER FROM HANDHOLE TO SPEAKER BUILDING AS INDICATED. SEE ONE-LINE DIAGRAM ON E-101 FOR SIZING DETAILS.
2. REMOVE CONTENTS OF PANEL ENCLOSURE. ENCLOSURE TO BE CONVERTED TO JUNCTION BOX. EXTEND BRANCH CIRCUITS TO NEW PANEL RP1. WIRE SIZE TO MATCH EXISTING. PROVIDE QUANTITY OF 1" CONDUITS REQUIRED.
3. EXISTING FIBER ENCLOSURE TO REMAIN.
4. PROVIDE (4) 1" SPARE CONDUITS WITH NYLON PULL STRING FROM PANEL RP1 STUBBED AND CAPPED 6" BEYOND THE EDGE OF BUILDING.
5. EXISTING HANDHOLE. PROVIDE (2)2" CONDUITS WITH PULL STRING FROM HANDHOLE TO SPEAKER BUILDING INTERIOR. STUB CONUITS 6" AFF IN CORNER BEHIND EQUIPMENT RACKS. CONDUITS TO BE 24" BFG.



1 / E-100 SITE PLAN
SCALE: 1/4" = 1'-0"



2 / E-100 HANDHOLE DETAIL
SCALE: NOT TO SCALE



3 / E-100 GROUNDING ELECTRODE SYSTEM
SCALE: NOT TO SCALE

GRAPHIC SCALE
one-quarter inch = one foot
0 1 2 4 8 12

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SHEET TITLE
SITE PLAN - ELECTRICAL & DETAILS

MILLERSVILLE UNIVERSITY

ISSUE DATE		03/21/2019
DRAWN	DESIGNED	CHECKED
JSS	JSS	SGH
SCALE		SHEET NO.
AS NOTED		E-100
PROJECT NO.		
180104		

E-100 SITE PLAN - ELECTRICAL & DETAILS.dwg Plotted: 3/22/2019 3:17 PM Revised: — by JSS
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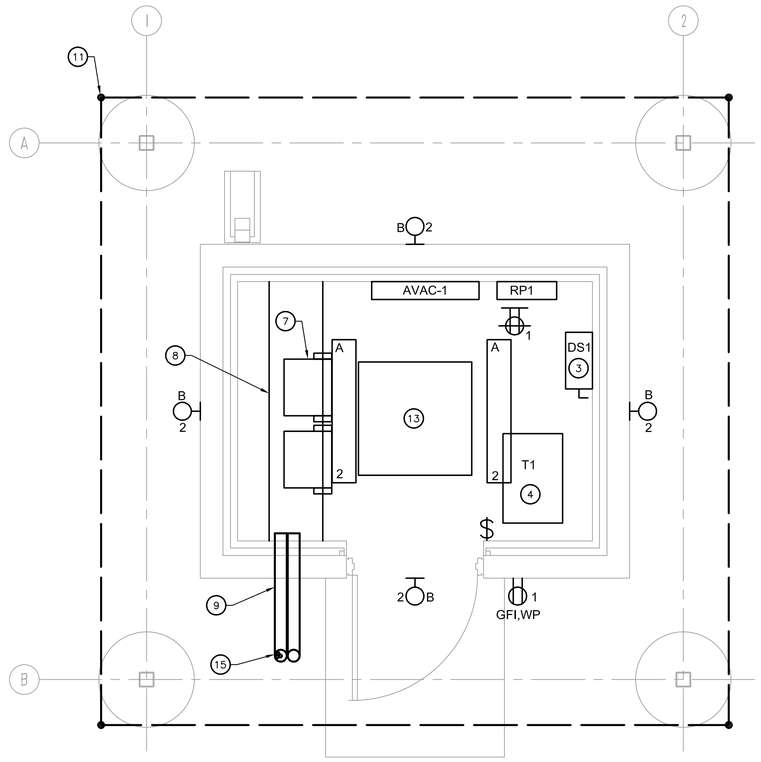
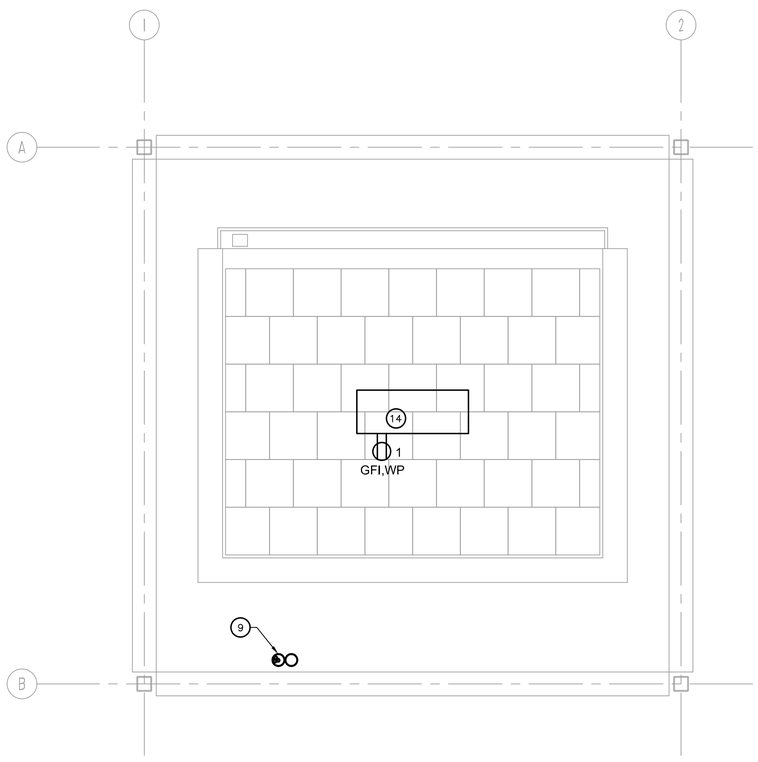


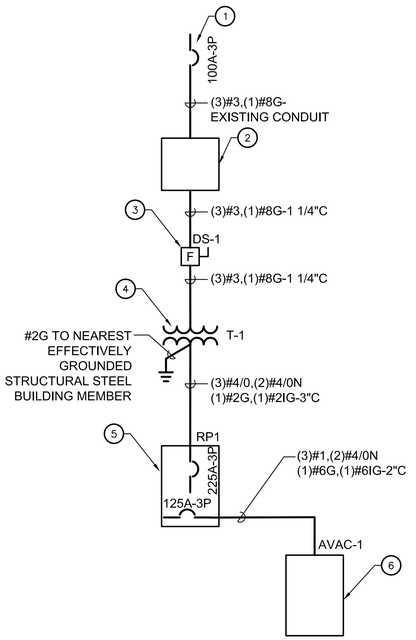
1 E-101 FLOOR PLAN
SCALE: 1/2" = 1'-0"



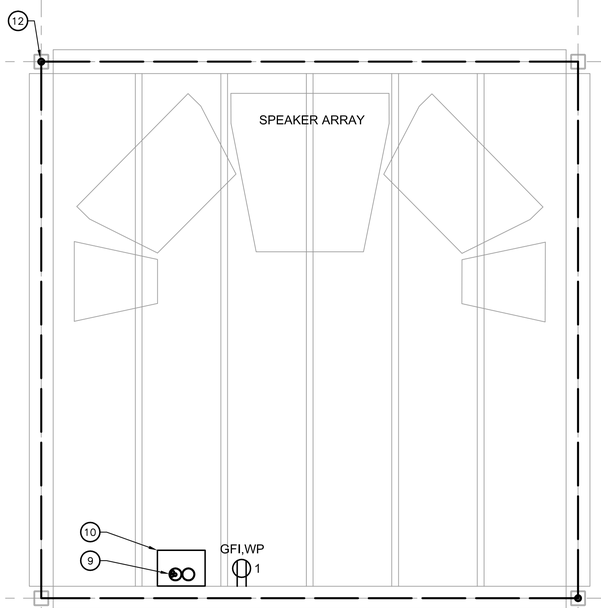
2 E-101 ROOF PLAN
SCALE: 1/2" = 1'-0"

REFERENCED NOTES:

1. PROVIDE 100A-3P BREAKER IN EXISTING PANELBOARD HPC (LOCATED IN STADIUM MAIN ELECTRICAL ROOM). BREAKER TYPE AND AIC RATING TO MATCH EXISTING.
2. NEW JUNCTION BOX, SEE NOTES ON E-100 FOR DETAILS.
3. PROVIDE 600V, 100A RATED, 3P NEMA TYPE 1 FUSED DISCONNECT SWITCH. WALL MOUNT IN AREA SHOWN ON PLAN. PROVIDE 100A RK1 FUSES.
4. PROVIDE 75KVA K-4 RATED XFMR, 480-3PH-3W PRIMARY, 208Y/120V-3P-4W SECONDARY. FLOOR MOUNT IN AREA SHOWN ON PLAN.
5. PROVIDE POWER PANEL RP1, SEE PANEL SCHEDULE ON THIS SHEET FOR DETAILS.
6. SPEAKER SYSTEM POWER PANEL FURNISHED BY OTHERS, INSTALLED AS PART OF THIS CONTRACT.
7. SPEAKER SYSTEM EQUIPMENT RACKS PROVIDED BY OTHERS.
8. PROVIDE 18"X4" WIRE BASKET TRAY.
9. PROVIDE (2)4" CONDUITS FROM BUILDING INTERIOR THROUGH SIDE WALL. SWEEP CONDUITS UP TO BE ATTACHED TO INSIDE OF TOWER STRUCTURE AND ROUTE UP TO EQUIPMENT CABINET ON SPEAKER PLATFORM. STUB CONDUITS 6" INTO BUILDING ABOVE WIRE BASKET TRAY. PROVIDE (3)1" INNERDUCTS IN (1) OF THE CONDUITS. PROVIDE PLASTIC BUSHINGS ON THE ENDS OF ALL 4" CONDUITS.
10. PROVIDE 24"H X 16"W X 12"D NEMA 3R STAINLESS STEEL ENCLOSURE WITH PADLOCKABLE HINGED GASKETED COVER. IN ADDITION TO THE (2) 4" CONDUITS ENTERING THE ENCLOSURE, PROVIDE (2)2" CONDUIT STUBS OUT OF THE BOTTOM OF THE ENCLOSURE 6" AND CAP. MOUNT ENCLOSURE TO RAILING 24" ABOVE PLATFORM TO BOTTOM.
11. PROVIDE 10'X3/4" COPPER GROUND ROD AT EACH CORNER OF STRUCTURE WITH COPPER GROUNDING RING. ALL GROUND CONNECTIONS SHALL BE APPROVED EXOTHERMAL WELD CONNECTIONS. PROVIDE (2) COPPER DOWN CONDUCTORS IN 1" PVC SCHEDULE 40 CONDUIT ON OPPOSING CORNERS, INSIDE STRUCTURE PERIMETER, UP TO HIGHEST STRUCTURAL MEMBERS ABOVE SPEAKER PLATFORM LEVEL. PROVIDE (2) COPPER BONDING JUMPERS ON OPPOSING CORNERS OF TOWER STRUCTURE. ALL COPPER CONDUCTORS FOR LIGHTNING PROTECTION TO BE SIZED PER NFPA 780 REQUIREMENTS.
12. PROVIDE (2) 1/2"X18" SOLID COPPER AIR TERMINALS WITH BLUNT TIP MOUNTED ON OPPOSITE CORNERS OF HIGHEST STRUCTURAL MEMBERS WITH COPPER CABLE CONDUCTORS AROUND THE PERIMETER OF THE HIGHEST STRUCTURAL FRAME. ALL COPPER CONDUCTORS FOR LIGHTNING PROTECTION TO BE SIZED PER NFPA 780 REQUIREMENTS.
13. HVAC SPLIT SYSTEM INDOOR UNIT. PROVIDE 3P NEMA 1 30A FUSIBLE DISCONNECT SWITCH WITH FUSES SIZED PER MANUFACTURER'S RECOMMENDATIONS. PROVIDE (3)#12, (1)#12G - 3/4" C FROM INDOOR UNIT TO OUTDOOR UNIT.
14. HVAC SPLIT SYSTEM OUTDOOR UNIT. PROVIDE 3P NEMA 3R 60A FUSIBLE DISCONNECT SWITCH WITH FUSES SIZED PER MANUFACTURER'S RECOMMENDATIONS. PROVIDE (3)#8, (1)#10G - 1" C FROM PANEL RP1 TO OUTDOOR UNIT.
15. PROVIDE 16" SWEEP RADIUS 90° ELBOW.



4 E-101 ONE-LINE DIAGRAM
SCALE: NONE



3 E-101 SPEAKER PLATFORM PLAN
SCALE: 1/2" = 1'-0"

PANEL NAME REVISED **RP1**	TYPE: SQUARE D NF CIRCUIT BREAKER MOUNTING SPACE: 42 MAIN BUS RATING: 225 AMPS 225A MCB	LOCATION: SPEAKER TOWER BLDG. VOLTAGE: 208Y/120V, 3-PH, 4-W, 200% NEUTRAL PANEL MOUNTING: SURFACE PANEL ENCLOSURE (NEMA): 1 PANEL MIN. A. I. C. RATING: 14,000

CIR. No.	DESCRIPTION	CIR. BKR.	LOAD - VA AØ	LOAD - VA BØ	LOAD - VA CØ	LOAD - VA AØ	LOAD - VA BØ	LOAD - VA CØ	CIR. BKR.	DESCRIPTION	CIR. No.
1	GENERAL RECEPTALCES	20/1	720			2369			40/3	HVAC UNIT	2
3	LIGHTING	20/1		150			2369		-	"	4
5	SPARE	20/1						2369	-	"	6
7	EXISTING LOAD	20/1							20/1	EXISTING LOAD	8
9	EXISTING LOAD	20/1							20/1	EXISTING LOAD	10
11	EXISTING LOAD	20/1							20/1	EXISTING LOAD	12
13	EXISTING LOAD	20/1							50/2	EXISTING LOAD	14
15	EXISTING LOAD	20/2							-	"	16
17	"	-							20/1		18
19		20/1							20/1		20
21		20/1							20/1		22
23		20/1							20/1		24
25		20/1							20/1		26
27		20/1							20/1		28
29		20/1							20/1		30
31		20/1							20/1		32
33		20/1							20/1		34
35		20/1							20/1		36
37		20/1				10900			125/3	AVAC-1	38
39		20/1					5960		-	"	40
41		20/1						10280	-	"	42
			720	150		13269	8329	12649			

CONNECTED LOAD:

AØ	13.99 KVA	50.50A
BØ	8.48 KVA	30.61A
CØ	12.65 KVA	45.66A
3Ø	35.12 KVA	42.29A

X ISOLATED NEUTRAL BUS
X EQUIPMENT GROUND BUS
X ISOLATED GROUND WIRE
NOTE: GROUNDING AND BONDING IN COMPLIANCE WITH THE NEC.

LIGHTING FIXTURE SCHEDULE

TYPE	DESCRIPTION	LAMPS VOLTS	LAMPS NO.	LAMPS TYPE	MAX W.	MOUNTING	MANU. / MODEL No. (OR APPROVED EQUAL)	REMARKS
A	LED ENCLOSED & GASKETED FIBERGLASS 6"X4' FIXTURE, 4450 LUMEN, 3500K, 80 CRI	120		LED	38.5	SURFACE	COLUMBIA LIGHTING LXEM435MW-RFA	
B	LED WALLPACK 2310 LUMENS, 4000K, 70 CRI	120		LED	21	SURFACE/WALL @8' AFG	HUBBELL LIGHTING SG1-20-4K-PCU	PROVIDE WITH INTEGRAL PHOTOCELL

GRAPHIC SCALE
one-half inch = one foot
0 2 4

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MILLERSVILLE BOROUGH LANCASTER COUNTY, PA

SHEET TITLE
FLOOR PLANS - ELECTRICAL, SCHEDULES, ONE-LINE & DETAILS

MILLERSVILLE UNIVERSITY

ISSUE DATE	03/21/2019
DRAWN	JSS
DESIGNED	JSS
CHECKED	SGH
SCALE	AS NOTED
SHEET NO.	E-101
PROJECT NO.	180104

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