UNIVERSITY HOUSE

515 E Ford Ave, Pittsburg, KS 66762
Building Number :38500-0230

CONSTRUCTION DOCUMENTS
01- 28- 2022

Architect:
PGAV ARCHITECTS, INC.
1900 West 47th Place Suite 300
Westwood, Kansas 66205
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Lenexa, KS 66214

DRAWING INDEX

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CERTIFICATE NO. 2-0-1-0-1
KANSAS
ARCHITECT
Expires 12-31-2020

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SYMBOL LEGEND

- GRAPHIC SCALE (0, 10' - 0", 20' - 0", 30' - 0")
- SECTION CUTS (WALL SECTION)
- DOOR TAGS (###-X)
- PARTITION TAG (SEE WALLTYPE DETAILS ON SHEET A1.50 FOR DETAILS) (EQ.X / X.#)
- ROOM TAGS (Room name)
- DRAWING TITLE (NAME, NUMBER ON SHEET, SCALE)
- CALLOUTS (CONSTRUCTION IS SIMILAR TO REFERENCED DETAIL; DETAIL # ON SHEET; SHEET #)
- FLOOR LEVEL (LEVEL X 100'-0")
- NORTH ARROW (PLAN NORTH; TRUE NORTH)

VIEW TITLE
VIEW SCALE X#

GENERAL NOTES

1. GENERAL REQUIREMENTS:
A. THE INTENT OF THE DRAWINGS IS TO PROVIDE NECESSARY INFORMATION IN THE MOST APPROPRIATE GENERAL CATEGORY/ DRAWING SERIES AND SUBCATEGORY WITH MINIMAL REPETITION OR DUPLICATION. THE CONTRACTOR IS TO UTILIZE ALL GENERAL CATEGORIES AND SUBCATEGORIES OF THE DRAWINGS.
B. ALL WORK INDICATED IN THE DRAWINGS AND SPECIFICATIONS IS THE SOLE RESPONSIBILITY OF THE GENERAL CONTRACTOR UNLESS OTHERWISE NOTED.
C. OMISSIONS OR CONFLICTS, BETWEEN VARIOUS ELEMENTS OF THE DRAWINGS AND OR SPECIFICATIONS, SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ARCHITECT BY THE CONTRACTOR. THE OMISSION OR CONFLICT SHALL BE RESOLVED BY THE ARCHITECT BEFORE PROCEEDING WITH THE WORK OR RELATED WORK AFFECTED BY THE OMISSION OR CONFLICT.
D. CONTRACTOR SHALL PROVIDE AND MAINTAIN A "RECORD" CONSTRUCTION DOCUMENT SET AT THE SITE. THE OWNER AND THE ARCHITECT RESERVE THE RIGHT TO REVIEW THESE DOCUMENTS ON A WEEKLY BASIS.
E. MATERIALS INDICATED TO BE REMOVED SHALL BE PROPERLY DISPOSED OF OFF SITE IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL LAWS. OWNER HAS OPTION TO KEEP ANYTHING REMOVED FROM THE PROJECT, IN OWNER'S OWN STORAGE.

2. DIMENSIONS:
A. DIMENSIONS ARE SPECIFICALLY NOTED OR CAN BE DETERMINED FROM OTHER INFORMATION INDICATED IN THE DRAWINGS OR SPECIFICATIONS. THE CONTRACTOR SHALL PREPARE LAYOUT DRAWINGS AS SPECIFIED OR REQUIRED TO COORDINATE THE WORK. VERIFY ALL DIMENSIONS BEFORE PROCEEDING WITH THE WORK. NOTIFY THE ARCHITECT IMMEDIATELY OF ANY DISCREPANCIES OR OMISSIONS. DO NOT PROCEED WITH THE AFFECTED WORK UNTIL THE DISCREPANCY OR OMISSION HAS BEEN RESOLVED BY THE ARCHITECT.
B. DO NOT SCALE DRAWINGS. IF DRAWINGS ARE LESS THAN 30" X 42" THEN THE PRINT HAS BEEN REDUCED.
C. EACH FLOOR LEVEL REFERENCE ELEVATION IS TO TOP OF STRUCTURAL DECK U.O.N. ALL STRUCTURAL DEPRESSIONS, RAISED STRUCTURES OR SLOPED FLOORS ON A SPECIFIC LEVEL ARE ABOVE OR BELOW EACH FLOOR LEVEL ELEVATION AS NOTED.
D. THE FLOOR LEVEL REFERENCE POINTS ESTABLISH REFERENCE ELEVATIONS FOR VERTICAL ELEVATIONS OF FINISH FLOORS.
E. ALL INTERIOR ELEVATION HEIGHTS SHOWN ARE FROM TOP OF FLOOR LEVEL REFERENCE ELEVATION U.O.N.
F. CEILING HEIGHTS SHOWN ON REFLECTED CEILING PLANS ARE FROM THE FLOOR LEVEL REFERENCE ELEVATION
G. HORIZONTAL DIMENSIONING: THE OVERALL BUILDING DIMENSIONS ARE TIED TO THE ORTHOGONAL GRID SYSTEM INDICATED ON THE PLAN DRAWINGS.
H. PLAN DIMENSIONING: PLAN DIMENSIONS ARE FROM COLUMN GRID TO FINISH MATERIAL OR FROM MATERIAL TO MATERIAL AS NOTED. INTERIOR DIMENSIONS ARE TO FACE OF FINISH
I. DOOR / OPENINGS: WHERE DOOR JAMBS OCCUR NEXT TO A PERPENDICULAR WALL, JAMBS ARE LOCATED 4" (TO INSIDE FACE OF FRAME) FROM THE FACE OF ADJACENT WALL, UNLESS NOTED OTHERWISE.
J. EXTERIOR DIMENSIONS ARE FROM GRIDLINE TO FACE OF EXTERIOR MATERIAL OR FROM FACE OF EXTERIOR MATERIAL TO FACE OF EXTERIOR MATERIAL.
K. "TYPICAL" OR "TYP." AS USED IN THESE DOCUMENTS SHALL MEAN THAT THE CONDITION OR DIMENSION IS THE SAME OR REPRESENTATIVE FOR SIMILAR CONDITIONS THROUGHOUT.

3. PLAN DIMENSION INDICATION NOTES:
A. SEE GENERAL INFORMATION NOTES FOR METHODOLOGY FOR DIMENSIONING.
B. EXACT DIMENSIONS: SOME ADA REQUIREMENTS SPECIFY EXACT DIMENSIONS. COMPLY WITH EXACT DIMENSION WHERE NOTED. INDUSTRY AND OR SPECIFIED TOLERANCES MAY NOT APPLY.
C. MIN. CLEAR DIMENSIONS: MINIMUM CLEAR DIMENSIONS MAY BE NOTED WHERE THE ACTUAL DIMENSION MAY BE EQUAL TO OR GREATER THAN THE DIMENSION NOTED.
D. MINIMUM CLEAR DIMENSIONS MAY BE PROVIDED TO INDICATE THE MINIMUM ADA OR EQUIPMENT CLEARANCES THAT NEED TO BE COMPLIED WITH.
ADVISE ARCHITECT WHERE MINIMUM CLEAR DIMENSIONS CANNOT BE MET.

4. ARCHITECTURAL MATERIAL SYMBOL NOTES:
A. MATERIAL SYMBOLS INDICATED SHOW THE TYPICAL LARGE SCALE GRAPHIC REPRESENTATION OF VARIOUS MATERIALS.
B. OTHER GRAPHIC REPRESENTATION OF MATERIALS MAY HAVE BEEN USED THAT ARE NOT DEPICTED ON THIS DRAWING. REFER TO THE SPECIFIC DRAWING AND/ OR DETAIL FOR ADDITIONAL INFORMATION REGARDING MATERIAL REPRESENTATION AND IDENTIFICATION.

5. FLOOR PLAN PARTITION IDENTIFICATION NOTES:
A. TYPICAL PARTITIONS ARE AS NOTED PER THE PARTITION TYPE SYMBOL U.O.N.
B. TYPICAL PARTITIONS ARE AS INDICATED ON PLANS AND DETAILS.

7. FLOOR PLAN OBJECT SYMBOL NOTES:
A. NOT ALL PLUMBING, ELECTRICAL AND MECHANICAL ITEMS MAY BE SHOWN ON ARCHITECTURAL DRAWINGS. SEE PLUMBING, ELECTRICAL, AND MECHANICAL SHEETS FOR ADDITIONAL INFORMATION
B. CONCRETE EQUIPMENT PADS: SIZE AND SCOPE OF PADS SHOWN OR INDICATED IS APPROXIMATE. ACTUAL SIZE, LOCATION AND NUMBER ARE AS REQUIRED FOR EQUIPMENT TO BE INSTALLED. COORDINATE WITH MECHANICAL, ELECTRICAL AND PLUMBING EQUIPMENT PROVIDED. COORDINATE ALL REQUIRED CLEARANCES AROUND EQUIPMENT. NOTIFY ARCHITECT IF REQUIRED CLEARANCES AROUND EQUIPMENT CANNOT BE MAINTAINED.

8. FLOOR PLAN PANEL INDICATION NOTES:
A. EXAMINE PANELS AND CABINETS SPECIFIED OR INDICATED AND VERIFY THAT PANEL OR CABINET TO BE PROVIDED HAS SUFFICIENT SPACE WITHIN PARTITION PRIOR TO INSTALLATION OF PARTITION. ADVISE ARCHITECT WHERE INSUFFICIENT DEPTH OCCURS.

11. RCP INDICATION NOTES:
A. SEE FINISH PLANS AND MATERIAL LEGEND/ FINISH SCHEDULE FOR ADDITIONAL FINISH INFORMATION.

12. RCP PARTITION INDICATION NOTES:
A. PARTIAL HEIGHT & FULL HEIGHT NON-RATED PARTITIONS AND FULL HEIGHT RATED PARTITIONS ARE INDICATED ON PLANS & RCP'S. MECHANICAL/ELECTRICAL/PLUMBING/FIRE PROTECTION UTILITIES ARE TO BE COORDINATED WITH FULL AND PARTIAL HEIGHT PARTITIONS.

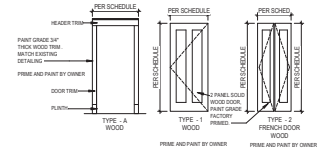
13. RCP ELECTRICAL PLAN SYMBOL NOTES:
A. LIGHT FIXTURES AND OTHER ELECTRICAL DEVICES ARE INDICATED FOR COORDINATION WITH ARCHITECTURAL WORK AND MECHANICAL/ PLUMBING/ FIRE PROTECTION WORK. ACTUAL FIXTURE AND DEVICE TYPES ARE INDICATED ON ELECTRICAL DOCUMENTS. COORDINATE ELECTRICAL ITEMS WITH LAYOUT AS SHOWN ON ARCHITECTURAL RCP'S.
B. NOT ALL ELECTRICAL DEVICES AND FIXTURES MAY BE SHOWN ON ARCHITECTURAL RCP'S. SEE ELECTRICAL DRAWINGS FOR ADDITIONAL INFORMATION. COORDINATE ANY CEILING FRAMING AND FINISH MATERIALS WITH ELECTRICAL WORK NOT SHOWN.

14. RCP MECHANICAL PLAN SYMBOL NOTES:
A. MECHANICAL REGISTERS AND DIFFUSERS ARE INDICATED FOR COORDINATION WITH ARCHITECTURAL AND ELECTRICAL/PLUMBING/FIRE PROTECTION WORK. ACTUAL REGISTER AND DIFFUSER TYPES MAY BE INDICATED ON MECHANICAL DOCUMENTS. COORDINATE MECHANICAL ITEMS WITH LAYOUT AS SHOWN ON ARCHITECTURAL RCP'S.
B. NOT ALL MECHANICAL REGISTERS AND DIFFUSERS MAY BE SHOWN ON ARCHITECTURAL RCP'S. SEE MECHANICAL DRAWINGS FOR ADDITIONAL INFORMATION. COORDINATE ANY CEILING FRAMING AND FINISH MATERIALS WITH MECHANICAL WORK NOT SHOWN.
C. CENTER SPRINKLER HEADS IN CENTER OF CEILING PANELS

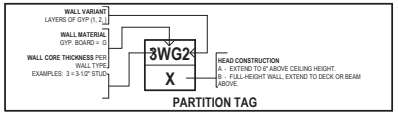
15. CONTROL JOINTS:
A CONTROL JOINTS SHALL BE CONTINUOUS FROM FLOOR TO TOP OF WALL U.O.N.
B. CEILING CONTROL JOINTS SHALL BE CONTINUOUS FROM WALL TO WALL

DOOR SCHEDULE

DOOR #	DOOR MATERIAL	DOOR TYPE	FRAME MATERIAL	FRAME TYPE	HEIGHT	DOOR WIDTH	COMMENTS
BASEMENT							
01	WD	1	WD	A	6'-8"	3' - 0"	PAINT GRADE. 2 PANEL DOORS. WITH LOCK HARDWARE. WITH 3 HINGES EACH DOOR.
02	WD	1	WD	A	6'-8"	2' - 6"	PAINT GRADE. 2 PANEL DOORS. WITH PRIVACY LATCH HARDWARE. WITH 3 HINGES EACH DOOR.
03	WD	2	WD	A	6'-8"	2' - 8"	PAINT GRADE. 2 PANEL FRENCH DOORS. WITH DUMMY PASSAGE HANDLES WITH 3 HINGES EACH DOOR. MAGNETIC CABINET LATCH AT TOP EACH DOOR
04	WD	1	WD	A	6'-8"	2' - 8"	PAINT GRADE. 2 PANEL DOORS. WITH PRIVACY LATCH HARDWARE. WITH 3 HINGES EACH DOOR.
05	WD	1	WD	A	6'-8"	2' - 8"	(FIELD VERIFY EXISTING FRAMED OPENING). PAINT GRADE. 2 PANEL DOORS. WITH PASSAGE HARDWARE. WITH 3 HINGES EACH DOOR.



DOOR HARDWARE - MATCH EXISTING. KEY TO OWNERS OPERATIONS
SCHLAGE AND BEST LOCKS. OILED BRONZE FINISH
LEVER HANDLE
DOOR STOP FOR EACH DOOR



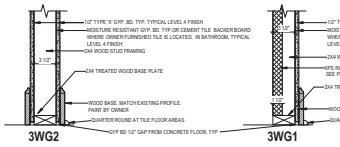
PARTITION TAG

GYPSUM BOARD

GYPSUM BOARD IS TYPICALLY 1/2" TYPE 'X', UNLESS NOTED OTHERWISE.

PROVIDE **MOISTURE-RESISTANT OR CEMENTITOUS BOARDS** WHERE REQUIRED IN GYPSUM BOARD AND WHERE NOTED IN THE DRAWINGS.

GENERAL PARTITION NOTES



'G' TYPE PARTITIONS

GYPSUM WALLBOARD - ASTM C 1396/C 1396M.

THICKNESS: 1/2 INCH (12.7 MM).
LONG EDGES: TAPERED.

MOISTURE- AND MOLD-RESISTANT GYPSUM BOARD: ASTM C 1396/C 1396M. WITH MOISTURE- AND MOLD-RESISTANT CORE AND PAPER SURFACES. INSTALL IN ALL BATHROOMS, EXCEPT WHERE CEMENTITOUS TILE BACKER UNITS ARE UTILIZED. (AS SHOWN ON DRAWINGS ,COORDINATE WITH TILE INSTALLER LOCATIONS)

CORE: 1/2 INCH (12.7 MM), REGULAR TYPE
LONG EDGES: TAPERED.
MOLD RESISTANCE: ASTM D 3273, SCORE OF 10.

SPECIALTY GYPSUM BOARD: -TILE BACKING PANELS

CEMENTITIOUS BACKER UNITS ANSI A118.9 AND ASTM C 1288 OR 1325, WITH MANUFACTURER'S STANDARD EDGES. INSTALL UNDER ALL WALL TILE IN LIEU OF DRYWALL.

THICKNESS: 1/2 INCH (12.7 MM).
MOLD RESISTANCE: ASTM D 3273, SCORE OF 10.

Air Sealing Specification

General Notes
1. Materials used shall meet or exceed applicable local, state and federal codes and regulations. All materials shall be installed in accordance with manufacturer's instructions.
2. All materials shall be resistant to corrosion, degradation from ultraviolet light, and be compatible with other elements and materials (e.g. will not react chemically, etc.) so as to enhance long life expectancy of installed measures.
3. Structural members and building components shall be free of decay and structurally sound before the weatherization measure is installed.
4. Weatherization materials, products and labor shall be warranted by the Installer against failure due to manufacturing and installation defects for a period of at least 1 year from the installation date. The Installer shall provide a written warranty, with the installation date, to the Owner.
5. Caulking shall be one of the following materials conforming to the federal specifications listed below or material demonstrating equivalent performance in resiliency and durability. The cartridge or tube containing the caulking material shall be labeled indicating conformance to the applicable federal specification:
a) Silicone Rubber TT-S-1543A
b) Polysulfide or Polyurethane (single component) TT-S-230C
c) Polysulfide or Polyurethane (multiple component) TT-S-227E
d) Acrylic Terpolymer (single component) TT-S-230C
e) Butyl Rubber TT-S-1657
f) Acrylic Latex ASTM C834

Air Sealing Requirements
1 All applicable items on AIR SEALING CHECKLIST shall be sealed.
2 Whole House Air Sealing includes a pre- and post blower door test, and a measurement of building tightness. Air leakage testing shall occur immediately prior to the installation of any air leakage control measures. Post-installation testing shall occur immediately following the installation of air leakage control measures.
3 Pre and post blower door tests will be done by a BPI certified building analyst approved by Owner/ Architect, or by a Certified energy auditor. Air Leakage Testing Protocol- It is acceptable to isolate the second floor private residence for Air Leakage Testing or provide whole house or private residence testing.
a) All windows and exterior doors shall be properly closed and latched, including pass-through wood-box doors and pet doors. All interior doors shall be left open.
b) Ventilation openings: All exhaust fan openings, vent openings, and intake-air vents with backdraft dampers (e.g., dryer vents and kitchen, bathroom, utility room, whole-house, range vents, etc.) shall NOT be sealed.
c) Exterior vent openings without backdraft dampers (e.g., some continuous ventilation systems) shall be temporarily sealed for the test. Heat recovery ventilator supply openings shall be sealed. Heat recovery ventilator exhaust openings should have backdraft dampers and shall not be sealed.
d) When measuring house leakage to determine overall leakage, supply and return registers shall be open.
e) Combustion appliances: All flue dampers, fireplace doors, and wood burning stove doors shall be closed, but NOT sealed. In conditions of gas logs in solid-fuel-burning fireplaces, the permanently blocked open dampers shall NOT be closed nor sealed.
f) Equipment Set-up: The blower door and digital manometer equipment shall be set-up using the manufacturer instructions for depressurization to 50 Pa.
g) Quantifying Air Leakage Reduction: Air leakage reduction is determined by the difference between pre-and post-measure CFM50.
h) Verification of Second Floor Leakage Reduction: In pre- and post- measurement, verify existing leakage points during pressurization with infrared devices. Submit pre and post infrared photography noting improvements -noting interior exterior temperature differential.
4 Perform air sealing in all accessible locations. Any item not sealable due to being within areas deemed not accessible shall be sealed by removing gypsum board as necessary to fill cavity with cellulose insulation or other acceptable means to seal inaccessible items. Any gypsum board removed shall be returned to finished primed condition. All locations are considered to be accessible except the following:
I. Locations not physically accessible due to building structure or mechanically fastened materials
II. Top plates located adjacent to eave line
III. Top plates covered by more than ten inches of loose-fill insulation or a combination of loose-fill and batt/blanket insulation totaling R-30 or more.
5 Air Sealing Checklist:

AIR SEALING CHECKLIST

	Item	Sealing requirements between conditioned and unconditioned space/exterior
Attic	Attic hatch/door	Weather-stripping permanently attached to create an effective air seal between the attic access frame and hatch/door
	Duct penetrations	Foam/caulk or other air-tight seal around perimeter of duct boots between the boot and the sub/floor
	Chases	Foam/caulk/rigid material sealed to attic floor/wall; use fire rated materials at chimneys and flues
	Recessed cans	Foam/caulk or other air-tight seal between fixture and ceiling or install air-tight drywall, sheet metal, or other non-combustible assembly; maintain 3" space between non-IC rated fixtures and insulation. Do not insulate above non-IC rated fixtures
	Bath fans	Foam/caulk or other air-tight seal around fixture perimeter
	Bath fans with heat source	Fire rated materials shall be used. Foam /caulk/ rigid sheet if opening larger than 1 inch
	Electrical penetrations	Foam/caulk or other air-tight seal around perimeter of electrical junction box
	Plumbing penetrations	Penetrations sealed
	Top plates	Accessible drywall to top plate connections, wood to wood seams, other wall penetrations sealed with foam/caulk
	Drop soffits	Rigid material covering attic floor opening and sealed with foam/caulk
	Knee wall doors	Weather-stripping permanently attached to create an effective air seal between the attic access frame and hatch/door. Install latch or handle if necessary
Walls Separating Conditioned Space From Exterior/Unconditioned Space	**Item**	**Sealing requirements between conditioned and unconditioned space/exterior**
	Plumbing penetrations	Foam /caulk/rigid moisture resistant material if opening larger than 1 inch
	Doors	Weather-stripping and door sweep/air-tight threshold permanently attached to create an effective air seal between interior and exterior/unconditioned space
	Other unintentional opening	Sealed with appropriate material if accessible
	Electrical boxes	Seal box to drywall
	Baseboards/ Crown Molding	Sealed with appropriate material as necessary
	Door & window trim	Sealed with appropriate material as necessary
	Window weather-stripping	Sealed with appropriate material as necessary

LOCATION MAP

PLAN NORTH
NORTH

#	DATE	DESCRIPTION

UNIVERSITY HOUSE

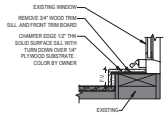
PITTSBURG STATE UNIVERSITY
PITTSBURG KANSAS
Building Number: 38500-0230

CONSTRUCTION DOCUMENTS

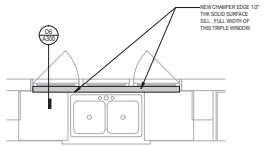
Original Size: 11 12" Drawing may have been reduced in size

COVER

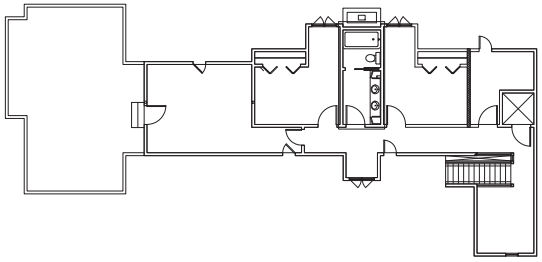
DATE: 01-28-2022
DRAWN: PGAV | CHECKED: PGAV
PGAV # S3458-00 | CLIENT # A-D14445
SHEET #
A000

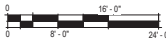


DETAIL D6
1 1/2" = 1'-0"

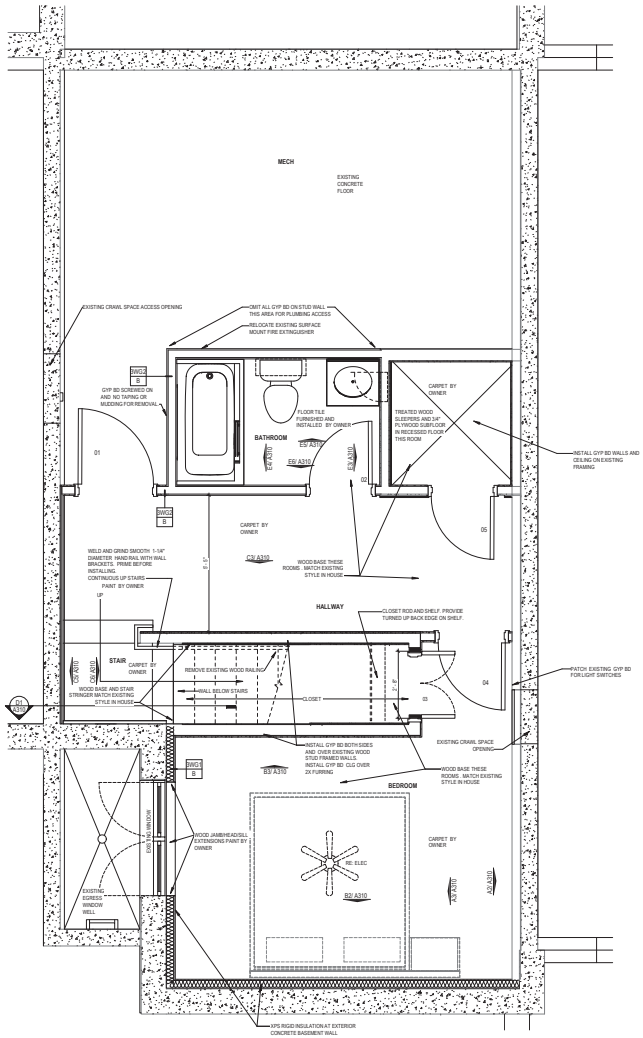


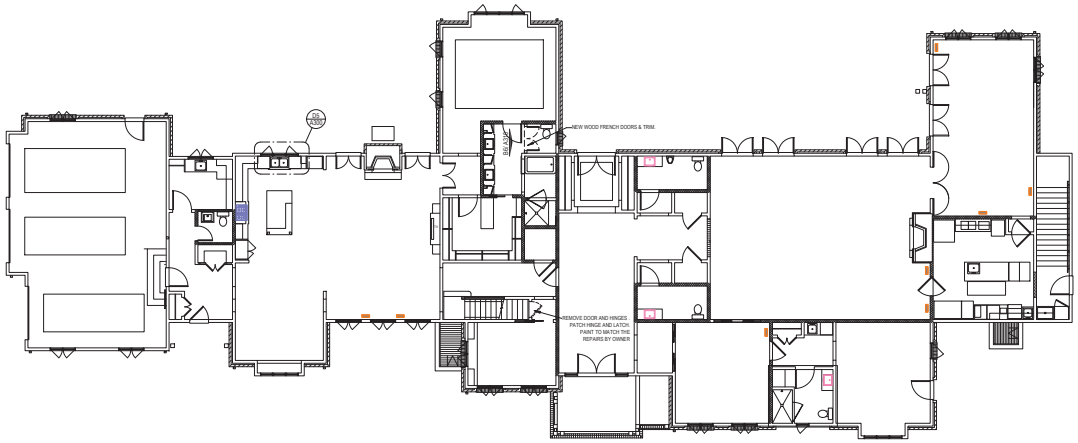
PLAN DETAIL D5
1/2" = 1'-0"

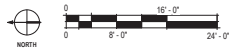




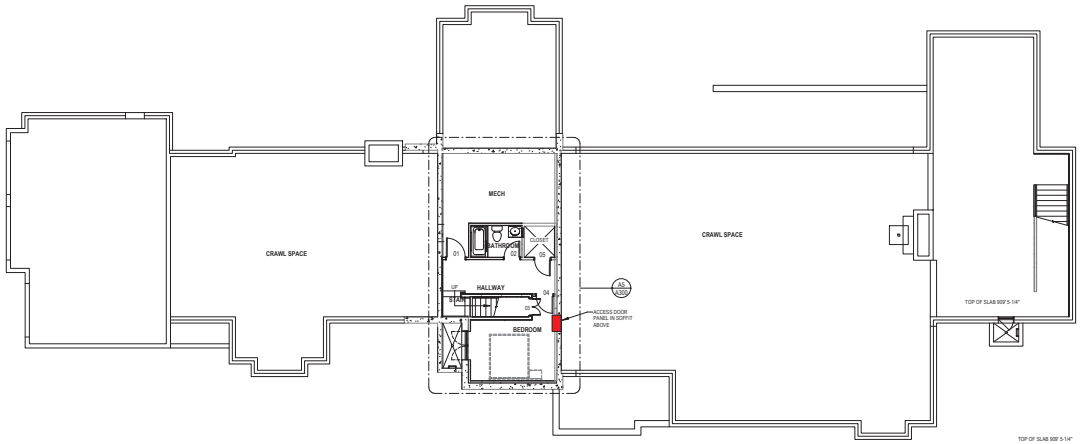
SECOND FLOOR PLAN D3
1/8" = 1'-0"







FIRST FLOOR PLAN C1
1/8" = 1'-0"



BASEMENT FLOOR PLAN A1
1/8" = 1'-0"

PLAN DETAIL A5
1/2" = 1'-0"

PGAV ARCHITECTS
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#	DATE	DESCRIPTION

UNIVERSITY HOUSE

PITTSBURG STATE UNIVERSITY
PITTSBURG KANSAS
Building Number: 3500-0230

CONSTRUCTION DOCUMENTS

Original Size: 11 1/2" Drawing may have been reduced.

FLOOR PLANS AND DETAILS

DATE: 01-28-2022	
DRAWN: DT	CHECKED: CD
PGAV #: S3458-00	CLIENT #: A-014445
SHEET #: **A300**	

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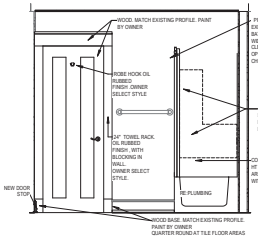
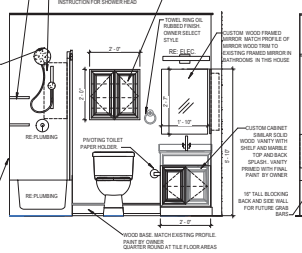
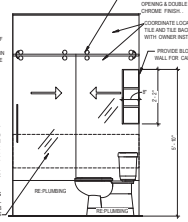


ELEVATION E6
1/2" = 1'-0"



ELEVATION E5
1/2" = 1'-0"



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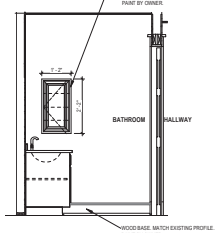


ELEVATION E3
1/2" = 1'-0"

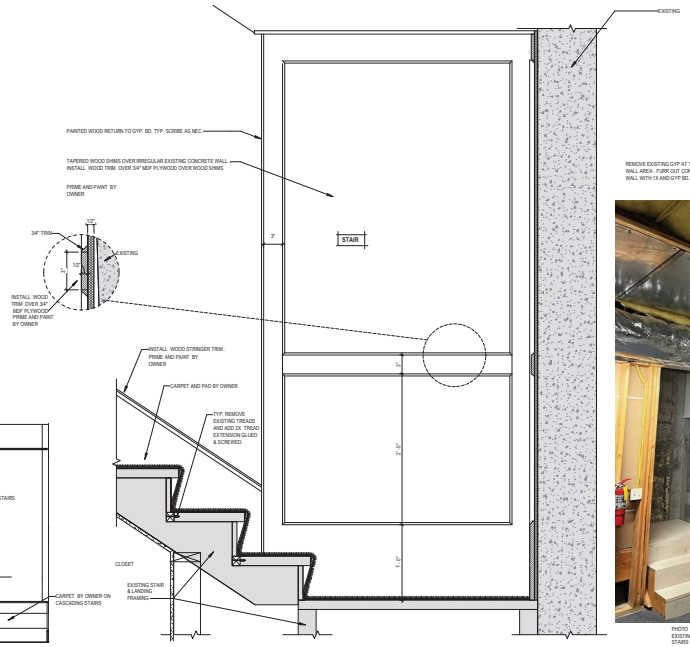
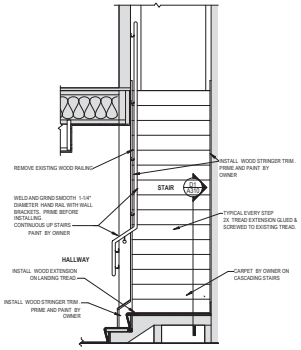
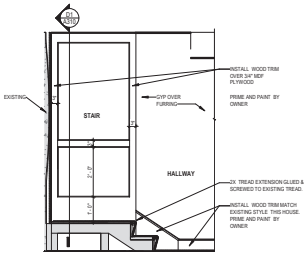


PHOTO IN BASEMENT OF EXISTING CONDITIONS AT STAIRS

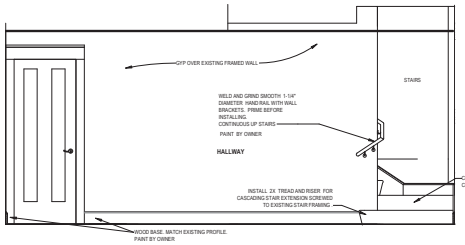
EXISTING STAIR D1
1 1/2" = 1'-0"



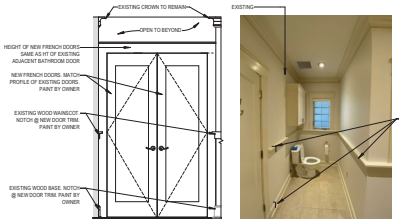
ELEVATION C6
1/2" = 1'-0"



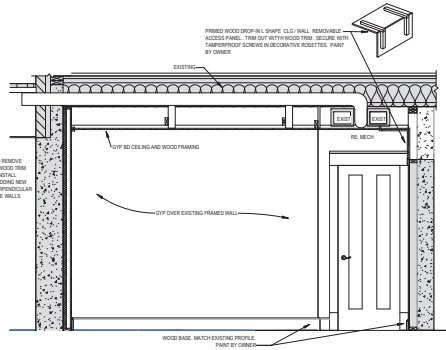
ELEVATION C5
1/2" = 1'-0"



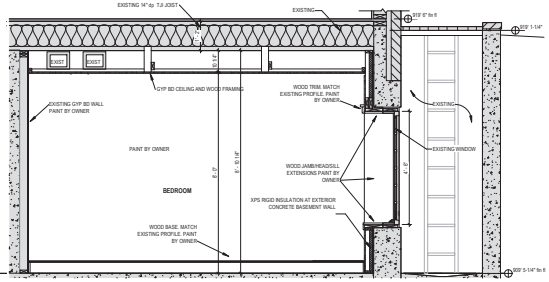
WEST HALLWAY C3
1/2" = 1'-0"



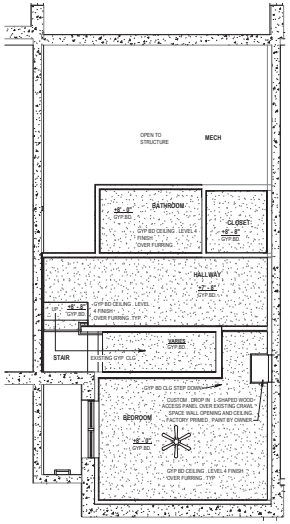
BATHROOM PARTITION B6
1/2" = 1'-0"



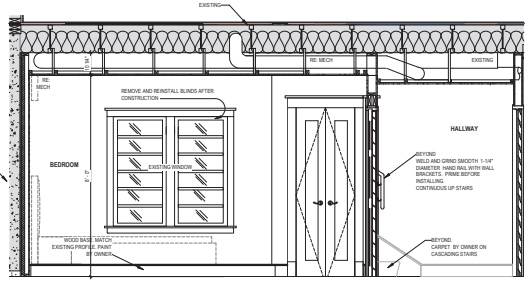
EAST BEDROOM B3
1/2" = 1'-0"



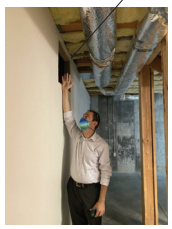
WEST BEDROOM B2
1/2" = 1'-0"

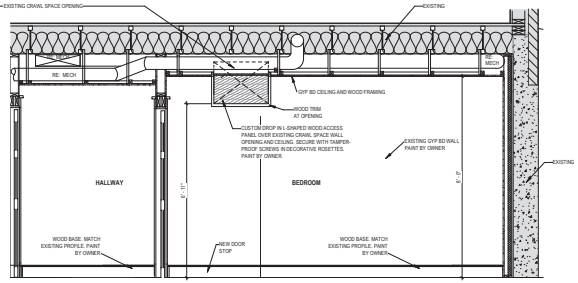


REFLECTED CEILING PLAN A1
1/4" = 1'-0"



NORTH BEDROOM / HALLWAY A3
1/2" = 1'-0"





SOUTH BEDROOM / HALLWAY A2
1/2" = 1'-0"

NORTH
0 8' - 0"
0 4' - 0" 12' - 0"

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#	DATE	DESCRIPTION

UNIVERSITY HOUSE

PITTSBURG STATE UNIVERSITY
PITTSBURG KANSAS
Building Number: 3800-0230

CONSTRUCTION DOCUMENTS

Original Size: 11 12" Drawing may have been reduced.

ELEVATIONS DETAILS & RCP

DATE: 01-28-2022	
DRAWN: DT	CHECKED: CD
PGAV # S3458-00	SSMT # A-014445

SHEET #
A310

FIRE PROTECTION GENERAL NOTES:

1. PRIOR TO SUBMITTING BID, VISIT THE JOB SITE AND BECOME FULLY ACQUAINTED WITH THE EXISTING CONDITIONS OF THE PROJECT. REVIEW THE GENERAL NOTES, SPECIFICATIONS AND OTHER DRAWINGS FOR ADDITIONAL REQUIREMENTS WHICH MAY NOT BE SPECIFICALLY CALLED OUT IN THIS PORTION OF THE CONSTRUCTION DOCUMENTS. NOTIFY ARCHITECT, ENGINEER AND/OR OWNER OF CONFLICTS OR DISCREPANCIES PRIOR TO SUBMISSION OF BID.
2. SYSTEM DESIGN, INSTALLATION AND MATERIALS SHALL BE IN ACCORDANCE WITH APPLICABLE NFPA STANDARDS. SYSTEM SHALL ALSO MEET ALL APPLICABLE BUILDING CODES, FIRE CODES AND THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION AND INSURANCE CARRIER. VERIFY REQUIREMENTS PRIOR TO BID SUBMITTAL.
3. INFORMATION ON CONTRACT DOCUMENTS IS GENERAL INFORMATION AND FOR BID PURPOSES ONLY. CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR THE FINAL SYSTEM DESIGN AND LAYOUT OF ALL COMPONENTS, COORDINATION WITH ALL OTHER TRADES, AND SYSTEM CALCULATIONS REQUIRED FOR APPROVAL BY THE AUTHORITY HAVING JURISDICTION, ENGINEER, AND OWNER'S INSURER.
4. THE CONTRACTOR SHALL FOLLOW THE ENGINEER OF RECORD'S SYSTEM DESIGN AND LAYOUT OF ALL COMPONENTS EXCEPT WHERE MODIFICATION TO THE DESIGN IS NECESSARY. MODIFICATIONS SHALL BE REFLECTED IN THE CONTRACTOR'S SHOP DRAWINGS AND CALCULATIONS.
5. DEVIATIONS FROM ENGINEER'S DESIGN WILL NOT BE CONSIDERED UNLESS A FORMALLY SUBMITTED RFI IS RECEIVED AND APPROVED.
6. THE CONTRACTOR SHALL PROVIDE ALL EQUIPMENT AND LABOR REQUIRED FOR A COMPLETE AND OPERATIONAL SYSTEM AS INDICATED IN THE DRAWINGS AND SPECIFICATIONS.
7. WHERE EXISTING SYSTEMS ARE PRESENT, CONTRACTOR SHALL MODIFY, RELOCATE AND/OR PROVIDE ADDITIONAL EQUIPMENT AS REQUIRED FOR SCOPE OF WORK AS REQUIRED FOR A COMPLETE AND OPERATIONAL SYSTEM, COORDINATE WITH WALLS, CEILINGS, LIGHTS, DIFFUSERS, STRUCTURE, OBSTRUCTIONS, ETC. IN AREAS AFFECTED BY SCOPE OF WORK. NEW EQUIPMENT SHALL BE COMPATIBLE WITH EXISTING SYSTEMS. CONTRACTOR SHALL REMOVE ALL ABANDONED EQUIPMENT. COORDINATE SYSTEM MODIFICATIONS TO MINIMIZE SYSTEM IMPAIRMENT, AND PROVIDE FIRE WATCH AND/OR INTERIM FIRE PROTECTION MEASURES WHERE REQUIRED BY THE AUTHORITY HAVING JURISDICTION, INSURANCE CARRIER OR OWNER.
8. PROVIDE ADDITIONAL MATERIALS AND LABOR REQUIRED DUE TO LACK OF COORDINATION OR TO MEET AUTHORITY HAVING JURISDICTION AND INSURANCE CARRIER REQUIREMENTS AT NO ADDITIONAL COST TO THE OWNER.
9. FORWARD COMPLETED CERTIFICATE OF COMPLETION AND CONTRACTOR MATERIAL TEST CERTIFICATES TO THE OWNER.
10. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.

FIRE PROTECTION GENERAL DEMOLITION NOTES:

1. COORDINATE ALL DEMOLITION WITH WHAT IS SHOWN ON ARCHITECTURAL PLANS. NOTIFY ARCHITECT OF ANY DISCREPANCIES.
2. COORDINATE NEW WORK AND DEMOLITION WITH OTHER DISCIPLINES AND EXISTING CONDITIONS PRIOR TO CONSTRUCTION.
3. PRIOR TO SUBMITTING BID, VISIT THE JOB SITE AND BECOME FULLY ACQUAINTED WITH THE EXISTING CONDITIONS OF THE PROJECT. REVIEW GENERAL NOTES, SPECIFICATIONS AND OTHER DRAWINGS FOR ADDITIONAL REQUIREMENTS THAT MAY NOT BE SPECIFICALLY CALLED OUT IN THIS PORTION OF THE CONSTRUCTION DOCUMENTS. NOTIFY ARCHITECT, ENGINEER OR OWNER, AS DEFINED IN BID DOCUMENTS, OF CONFLICTS OR DISCREPANCIES PRIOR TO SUBMISSION OF BID. ADDITIONAL COMPENSATION WILL NOT BE PAID FOR LACK OF SUCH DETERMINATION, FAMILIARIZATION, AND/OR ALLOWANCE.
4. EXISTING CONDITIONS WERE TAKEN FROM ORIGINAL DRAWINGS AND SITE VISITS AND MAY NOT REFLECT EXACT "AS-BUILT" CONDITIONS. FIELD VERIFY EXISTING CONDITIONS PRIOR TO SUBMITTING FINAL BIDS. COORDINATE NEW WORK AND DEMOLITION WITH OTHER DISCIPLINES AND EXISTING CONDITIONS PRIOR TO CONSTRUCTION.
5. OWNER RETAINS RIGHTS OF SALVAGE FOR EQUIPMENT AND FIXTURES TO BE REMOVED. COORDINATE WITH THE OWNER THE EQUIPMENT AND FIXTURES TO BE SALVAGED AND THE LOCATION FOR STORAGE. AVOID DAMAGE TO EQUIPMENT DURING DEMOLITION WORK AND DURING TRANSPORT TO OWNER'S DESIGNATED STORAGE LOCATION. PROPERLY DISPOSE OF MATERIALS THAT ARE REMOVED AND ARE NOT REQUESTED TO BE SALVAGED BY THE OWNER.
6. REMOVE ITEMS SHOWN HEAVY LINED AND/OR CROSSHATCHED AND/OR NOTED TO BE REMOVED.
7. EQUIPMENT TO BE REMOVED SHALL BE KEPT FOR REINSTALLATION DURING THE CONSTRUCTION PHASE WHEN POSSIBLE AND/OR INDICATED ON THE DRAWINGS. AVOID DAMAGING EXISTING SURFACES AND EQUIPMENT TO REMAIN FOR NEW INSTALLATION. REPAIR ANY DAMAGE CAUSED DURING WORK AT NO EXTRA COST TO THE OWNER.
8. SEAL PENETRATIONS THROUGH FLOORS, WALLS, CEILINGS AND ROOFS WHERE COMPONENTS ARE REMOVED AND WHERE THE EXISTING PENETRATION IS NOT USED FOR THE NEW INSTALLATION. REPAIR DAMAGED SURFACES TO MATCH ADJACENT AREAS OR AS INDICATED ON THE ARCHITECTURAL DRAWINGS.
9. PERFORM ALL WORK ACCORDING TO THE PHASING SCHEDULE FOR THIS PROJECT. PROVIDE ALL TEMPORARY DESIGN AND/OR CONFIGURATIONS THAT MEET APPLICABLE CODE REQUIREMENTS AS NECESSARY TO CONFORM TO THE REQUIRED CONSTRUCTION PHASING OF THE PROJECT.
10. ONLY THE PORTIONS OF THE BUILDING AFFECTED BY THE SCOPE OF THE PROJECT HAVE BEEN SHOWN. INFORMATION SHOWN AS EXISTING TO REMAIN IS NOT BEING MODIFIED AS A PART OF THIS PROJECT.
11. ALL WORK SHALL BE PERFORMED SO AS TO NOT INTERRUPT SERVICE. THE CONTRACTOR SHALL PROPERLY NOTIFY THE BUILDING OWNER, LANDLORD, THE LEASER AND ADJACENT TENANTS AS APPLICABLE A MINIMUM OF 48 HOURS IN ADVANCE BEFORE PROCEEDING WITH THIS WORK.
12. REMOVE ALL UNUSED AND DEMOLISHED EQUIPMENT AND ASSOCIATED MATERIALS FROM SITE. ABANDONING UNUSED PORTIONS WILL NOT BE ACCEPTABLE.
13. SYSTEM(S) NOT ASSOCIATED WITH THE DEMOLITION SHALL BE LEFT IN SERVICE AS APPLICABLE.
14. INSPECT EXISTING EQUIPMENT TO REMAIN TO VERIFY THAT EQUIPMENT IS OPERATING PROPERLY. NOTIFY OWNER OF DAMAGED AND/OR MALFUNCTIONING COMPONENTS.
15. ALL SYSTEMS TO BE LEFT IN SERVICE PRIOR TO THE END OF EACH WORKDAY.

FIRE PROTECTION SYMBOLS

THIS IS A MASTER LEGEND AND NOT ALL SYMBOLS OR ABBREVIATIONS ARE USED.

ABBREVIATIONS

V2.02

AFF	ABOVE FINISHED FLOOR	NIC	NOT IN CONTRACT
AFG	ABOVE FINISHED GRADE	OC	ON CENTER
CD	CANDELA	PIV	POST INDICATOR VALVE
DI	DUCTILE IRON	PRV	PROVIDE FURNISH AND INSTALL PRESSURE REDUCING VALVE
ESFR	EARLY SUPPRESSION FAST RESPONSE	RD	RETURN DUCT
ETR	EXISTING TO REMAIN	REV	REVISION
FHC	FIRE HOSE CABINET	SD	SUPPLY DUCT
FP	FIRE PROTECTION	SF	SQUARE FEET
GC	CONTRACTOR	TYP	TYPICAL
GPM	GALLONS PER MINUTE	UNO	UNLESS NOTES OTHERWISE
JBU-4-BOX	JUNCTION BOX	V	VOLT(S)
MAX	MAXIMUM	W	WATTS
MIN	MINIMUM	WP	WEATHERPROOF
N/A	NOT APPLICABLE		

ANNOTATION

- 1 — FIRE PROTECTION PLAN NOTE CALLOUT
- CONNECTION POINT OF NEW WORK TO EXISTING
- 1 / P1 — DETAIL REFERENCE UPPER NUMBER INDICATES DETAIL NUMBER LOWER NUMBER INDICATES SHEET NUMBER
- 1 / P1 — SECTION CUT DESIGNATION
- DEDICATED EQUIPMENT ACCESS TILE
- ACCESS PANEL

FIRE ALARM

- FACP — FIRE ALARM CONTROL PANEL/UNIT
- FACP — RECESSED FIRE ALARM CONTROL PANEL/UNIT
- FAAP — FIRE ALARM ANNUNCIATOR PANEL
- FAAP — RECESSED FIRE ALARM ANNUNCIATOR PANEL
- AMP — AMPLIFIER PANEL
- RPS — REMOTE POWER SUPPLY
- RT — REMOTE TEST STATION WITH INDICATING LIGHT
- RL — REMOTE INDICATING LIGHT
- PS — PRESSURE SWITCH LOW/HIGH
- FS — WATERFLOW ALARM SWITCH
- VT — CONTROL VALVE TAMPER SWITCH
- DH — MAGNETIC DOOR HOLD OPEN DEVICE
- CM — CONTROL MODULE
- MM — MONITOR MODULE
- K — FIRE DEPARTMENT KEY BOX
- PULL STATION
- FIREFIGHTER'S PHONE JACK
- H — HEAT DETECTOR (E INDICATES ELEVATOR RECALL)
- S — SMOKE DETECTOR (E INDICATES ELEVATOR RECALL)
- S — SINGLE STATION SMOKE DETECTOR
- PROJECTED BEAM SMOKE DETECTOR
- S — DUCT MOUNTED SMOKE DETECTOR (SD=SUPPLY,RD=RETURN)
- CO — CARBON MONOXIDE DETECTOR
- AREA OF REFUGE 2-WAY COMMUNICATION SYSTEM
- F — AV — WALL MOUNTED AUDIBLE NOTIFICATION APPLIANCE #W INDICATES WATTAGE (VOICE EVACUATION SYSTEMS ONLY)
- W — WALL MOUNTED VISIBLE NOTIFICATION APPLIANCE ## INDICATES CANDELA
- W — AV — WALL MOUNTED AUDIBLE/VISIBLE NOTIFICATION APPLIANCE ## INDICATES CANDELA #W INDICATES WATTAGE (VOICE EVACUATION SYSTEMS ONLY)
- C — AV — CEILING MOUNTED AUDIBLE NOTIFICATION APPLIANCE #W INDICATES WATTAGE (VOICE EVACUATION SYSTEMS ONLY)
- C — W — CEILING MOUNTED VISIBLE NOTIFICATION APPLIANCE ## INDICATES CANDELA
- C — W — AV — CEILING MOUNTED AUDIBLE/VISIBLE NOTIFICATION APPLIANCE ## INDICATES CANDELA #W INDICATES WATTAGE (VOICE EVACUATION SYSTEMS ONLY)
- EOL — END OF LINE RESISTOR
- ABORT SWITCH
- BELL

CALL OUTS

- ENLARGED PLAN CALLOUT
- NOT IN SCOPE

LINETYPE LEGEND

THROUGHOUT THE DRAWINGS DIFFERENT LINETYPES ARE USED IN COMBINATION WITH THE SYMBOLS TO INDICATE THE STATUS OF ITEMS AS EXISTING, TO BE DEMOLISHED, TO BE INCLUDED AS PART OF NEW WORK AND/OR ITEMS WHICH ARE ANTICIPATED TO BE PROVIDED IN THE FUTURE. THE STATUS OF ITEMS USING THESE LINETYPES ARE RELATIVE TO THE VIEW IN WHICH THEY APPEAR. PHASING SHOWN IN DRAWINGS IS NOT INTENDED TO FULLY DESCRIBE ALL NECESSARY CONSTRUCTION PHASING, WHICH IS DETERMINED BY THE CONTRACTOR AS PART OF THEIR RESPONSIBILITIES. ANY SUCH PHASES DESCRIBED IN THE CONSTRUCTION DOCUMENTS ARE GENERAL AND ONLY INTENDED TO INDICATE A BROAD ORDER FOR THE SAKE OF DESCRIBING THE PROJECT. THE FOLLOWING LINETYPES MAY BE USED ON ANY DEVICE, EQUIPMENT, NOTE, LINE, SHAPE, ETC.

EXISTING	NEW
DEMOLISH	FUTURE

STANDARD MOUNTING HEIGHTS

AUDIBLE APPLIANCE (TOP OF APPLIANCE)	90"
FIRE ALARM ANNUNCIATOR PANEL (TOP OF DISPLAY)	60"
FIRE ALARM BELL (EXTERIOR) (CENTERLINE)	120"
FIRE ALARM CONTROL PANEL/UNIT (TOP OF DISPLAY)	60"
PULL STATION (TOP OF DEVICE)	48"
VISIBLE APPLIANCE (CENTERLINE)	84"

INSTALL DEVICES AT THE MOUNTING HEIGHTS SHOWN ABOVE UNO IN THE CONSTRUCTION DOCUMENTS. MOUNTING HEIGHTS LISTED ABOVE, OR ELSEWHERE IN THE CONSTRUCTION DOCUMENTS, ARE AFF OR AFG, UNO. ALL DEVICES SHALL BE INSTALLED IN COMPLIANCE WITH CURRENT ADA AND LOCAL REQUIREMENTS.

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01/20/2022

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WWW.HENDERSONENGINEERS.COM

21X00003
EXPIRES 12/31/2022

#	DATE	DESCRIPTION

UNIVERSITY HOUSE

PITTSBURG STATE UNIVERSITY
PITTSBURG KANSAS
Building Number: 38500-0230

CONSTRUCTION DOCUMENTS

Original Sheet: 1 1/2" Drawing may have been reduced.

FIRE ALARM GENERAL NOTES AND LEGEND

DATE: 01-28-2022	
DRAWN: Author	CHECKED: Checker
PGAV # 5345L00	CLIENT # C-114445

SHEET #: FA000

STEVE_DRYGEN

FIRE ALARM PLAN NOTES:

F1 HATCHED AREA NOT IN SCOPE OF WORK.

F2 NEW SMOKE DETECTOR TO BE PROVIDED AND INSTALLED IN ACCORDANCE WITH IBC - 2018 AND NFPA 72. THE NEW SMOKE DETECTORS ARE TO BE CONNECTED TO THE EXISTING FIRE/SECURITY SYSTEM. SMOKE DETECTORS IN SLEEPING AREAS SHALL BE PROVIDED WITH SOUNDER BASE TO COMPLY WITH NFPA 72 LOW FREQUENCY ALARM SIGNAL OUTPUT.

F3 DEMOLISH EXISTING FIRE ALARM AND SECURITY PANELS. PROVIDE NEW COMBINED FIRE ALARM SECURITY PANEL AND CONNECT PANEL TO FIBER CABLE TO PROVIDE REMOTE ANNUNCIATION. RECONNECT DEVICES THAT ARE EXISTING TO REMAIN.

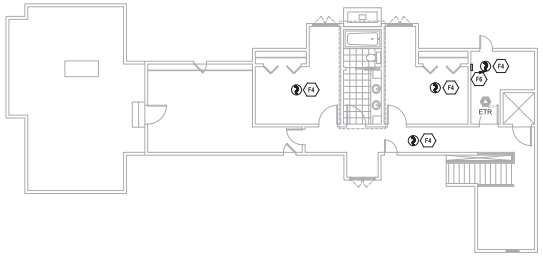
F4 EXISTING SMOKE DETECTOR TO BE DEMOLISHED. NEW SMOKE DETECTOR TO BE PROVIDED AND INSTALLED IN ACCORDANCE WITH IBC - 2018 AND NFPA 72. THE NEW SMOKE DETECTORS ARE TO BE CONNECTED TO THE EXISTING FIRE/SECURITY SYSTEM. THE SMOKE DETECTOR SHALL BE PROVIDED WITH SOUNDER BASE TO COMPLY WITH NFPA 72 LOW FREQUENCY ALARM SIGNAL OUTPUT.

F5 EXISTING NOTIFICATION APPLIANCES TO REMAIN. RECONNECT APPLIANCES TO NEW COMBINED FIRE ALARM SECURITY PANEL.

F6 DEMOLISH EXISTING FIRE ALARM AND SECURITY PANELS.

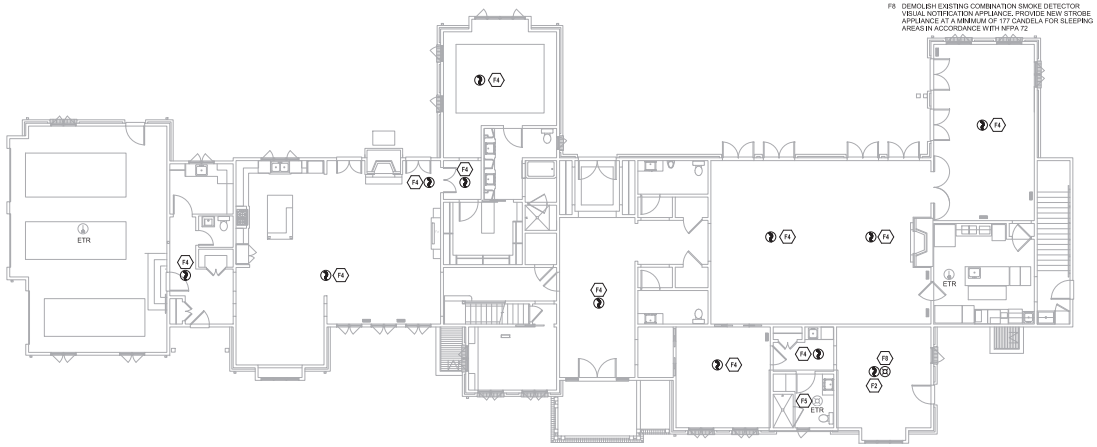
F7 VISUAL NOTIFICATION SHALL BE A MINIMUM OF 177 CANDELA FOR SLEEPING AREAS IN ACCORDANCE WITH NFPA 72

F8 DEMOLISH EXISTING COMBINATION SMOKE DETECTOR VISUAL NOTIFICATION APPLIANCE. PROVIDE NEW STROBE APPLIANCE AT A MINIMUM OF 177 CANDELA FOR SLEEPING AREAS IN ACCORDANCE WITH NFPA 72



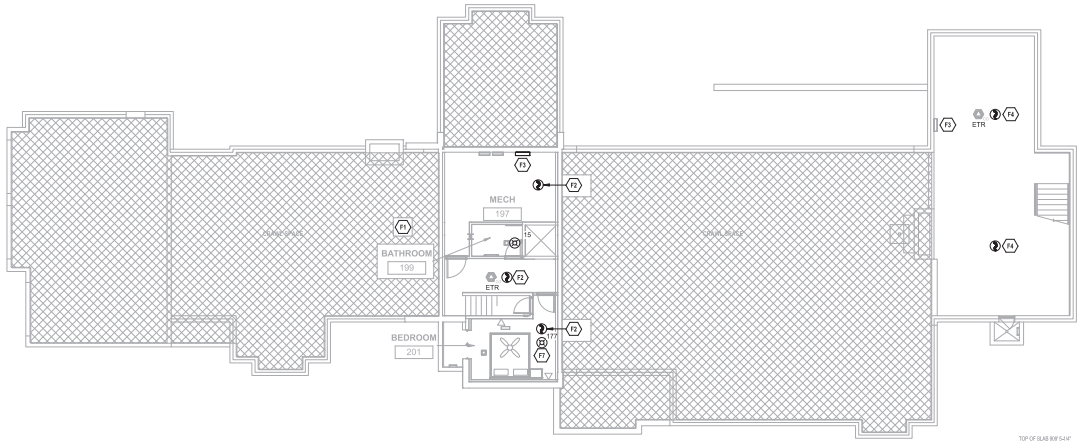
3 FIRE ALARM SECOND FLOOR RCP
1/8" = 1'-0"

0 4' 8' 12'
SCALE: 1/8"=1'-0"



2 FIRE ALARM FIRST FLOOR RCP - OVERALL
1/8" = 1'-0"

0 4' 8' 12'
SCALE: 1/8"=1'-0"



1 FIRE ALARM BASEMENT RCP
1/8" = 1'-0"

0 4' 8' 12'
SCALE: 1/8"=1'-0"

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21000000003
EXPIRES 12/31/2022

#	DATE	DESCRIPTION

UNIVERSITY HOUSE

PITTSBURG STATE UNIVERSITY
PITTSBURG KANSAS
Building Number: 38500-0230

CONSTRUCTION DOCUMENTS

Original Size: 1 1/2" Drawing may have been reduced.

FIRE ALARM PLAN

DATE: 01-28-2022	
DRAWN: Author	CHECKED: Checker
PROJ # S34054.00	CLIENT # A-014445

SHEET #
FA101

Author
STEVE_DRYGEN

Division 28: FIRE ALARM SYSTEM

1. GENERAL INSTRUCTIONS

A. GENERAL REQUIREMENTS

All requirements under Division 01 (General Requirements) and the general and supplementary conditions of these specifications apply to this section and division. Where the requirements of this section and division exceed those of Division 01 (General Requirements), this section and division take precedence. Become thoroughly familiar with all its contents as to requirements that affect this division, section, or both. Work required under this division includes all material, equipment, appliances, transportation, services, and labor required to complete the entire system as required by the drawings and specifications, or reasonably inferred to be necessary to facilitate the function of each system as implied by the design and the equipment specified.

The specifications and drawings for the project are complementary, and any portion of work described in one shall be provided as if described in both. In the event of discrepancies, notify the Engineer and request clarification prior to proceeding with the work involved.

Drawings are graphic representations of the work upon which the contract is based. They show the materials and their relationship to one another, including sizes, shapes, locations, and connections. They convey the scope of work, indicating the intended general arrangement of the systems without showing all of the exact details as to elevations, offsets, control lines, and other installation requirements. Use the drawings as a guide when laying out the work and to verify that materials and equipment will fit into the designated spaces, and which when installed per manufacturers' requirements, will ensure a complete, coordinated, satisfactory, and properly operating system.

Installation of devices shall be performed or supervised by a National Institute for Certification of Engineering Technologies (NICET) Level 2 or higher fire alarm technician. Submit copies of the certification for employees through shop drawing submittals.

B. DEFINITIONS

Division: References contained in this specification follow the numbering system defined in the Construction Specifications Institute (CSI) MasterFormat 2004 Edition. Specification Divisions 01 through 13 provided with this project may reference the CSI MasterFormat 1995 Edition. The corresponding division references between the 2004 Edition and 1995 Edition are as follows:

	2004 Edition	1995 Edition
1.	Division 21 – Fire Suppression	Division 15
2.	Division 22 – Plumbing	Division 15
3.	Division 23 – HVAC	Division 15
4.	Division 26 – Electrical	Division 16
5.	Division 27 – Communications	Division 16
6.	Division 28 – Electronic Safety and Security	Division 16

Furnish: "to supply and deliver to the project site, ready for unloading, unpacking, assembly, installation and similar operations."

Install: "to perform all operations at the project site including, but not limited to, the actual unloading, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, testing, commissioning, starting up and similar operations, complete, and ready for the intended use."

Provide: "to furnish and install, complete and ready for the intended use."

Furnished by Owner (or Owner-Furnished) or Furnished by Others: "an item furnished by the Owner or under other divisions or contracts, and installed under the requirements of this division, complete and ready for the intended use, including all items and services incidental to the work necessary for proper installation and operation. Include the installation under the warranty required by this division."

Engineer: Where referenced in this division, "Engineer" is the Engineer of Record and the Design Professional for the work under this division, and is a consultant to, and an authorized representative of the Architect, as defined in the General and/or Supplementary Conditions. When used in this division, Engineer means increased involvement by and obligations to the Engineer, in addition to involvement by and obligations to the Architect.

AHJ: The local code and/or inspection agency (Authority) Having Jurisdiction over the work.

NRTL: Nationally recognized testing laboratory, as defined and listed by OSHA in 29 CFR 1910.7 (e.g., UL, ETL, CSA), and acceptable to the AHJ over this project. Nationally recognized testing laboratories and standards listed are used only to represent the characteristics required and are not intended to restrict the use of other NRTLs that are acceptable to the AHJ and standards that meet the specified criteria.

The terms "approved equal", "equivalent", or "equal" are used synonymously and shall mean "accepted by or acceptable to the Engineer as equivalent to the item or manufacturer specified". The term "approved" shall mean labeled, listed, or both, by an NRTL, and acceptable to the AHJ over this project.

C. PREBID SITE VISIT

Prior to submitting bid, visit the site of the proposed work and become fully informed as to the conditions under which the work is to be done. Failure to comply with this requirement shall not be considered sufficient justification to request or obtain extra compensation over and above the contract price.

D. SCOPE OF WORK

The scope of work in this section includes fire alarm control panels, automatic smoke detectors, fire alarm notification appliances, auxiliary fire alarm equipment, and battery stand-by power.

E. CODES AND STANDARDS

Provide an integrated fire alarm system, which meets the current versions of NFPA 70, National Electrical Code; NFPA 72, National Fire Alarm Code; IBC - 2018; IFC - 2018; and all local building and fire codes. All fire alarm equipment shall be Underwriters Laboratory (UL) approved for the type and class of service performed.

F. SYSTEM DESCRIPTION

The fire alarm system shall be a non-coded manual and automatic fire alarm system with connections to a remote supervising station. The Fire Alarm Control panel shall be a combination Fire alarm and Security panel.

G. COORDINATION

Coordinate work with that of other trades so that the various components of the systems are installed at the proper time, will fit the available space, and will allow proper service access to those items requiring maintenance. Components installed without regard to the above shall be relocated at no additional cost to the Owner.

H. SUBMITTALS

Upon being awarded a contract, submit to the Architect for approval, six (6) copies of manufacturer's shop drawings for equipment to be furnished under this contract. Items requiring coordination between contractors, and sheet metal ductwork fabrication drawings. Before submitting shop drawings and material lists, verify that equipment submitted is mutually compatible and suitable for the intended use, and will fit the available space and allow ample room for maintenance. Highlight, mark, list or indicate the materials, performance criteria and accessories that are being proposed. Submit shop drawings as early as required to support the project schedule. Allow for two weeks Engineer review time plus mailing time plus a duplication of this time for resubmittal if required.

Submittals and shop drawings shall not contain the firm name, logo, seal, or signature of the Engineer. They shall not be copies of the work product of the Engineer. If the Contractor desires to use elements of such product, refer to paragraph "Electronic Drawing Files" for procedures to be used.

The checking and subsequent approval of such shop drawings by the Engineer shall not relieve the Contractor from responsibility for errors in dimensions, details, size of members, quantities, omissions of components or fittings; coordination of electrical requirements; or for coordinating items with actual building conditions. Proceed with the procurement and installation of equipment only after receiving approved shop drawings relative to each item.

Submit a detailed sequence of operation. Pre-printed, generic material will not be accepted and will be rejected. Highlight, mark, list or indicate the materials, performance criteria and accessories that are being proposed.

Submit drawings showing fire alarm floor plans and a full building riser diagram. Fire alarm floor plans and riser diagram shall show fire alarm control panel, all fire alarm initiating devices and notification appliances. Show typical wiring diagrams of control panels, and each device and wiring connections required. Show all interfaces to other systems, such as temperature control systems, and security systems.

Where required by the AHJ, Contractor is responsible for obtaining a professional engineer or NICET stamp and signature on their shop drawing submittal. The Engineer is not responsible and will not provide this.

Shop drawings shall be produced using Computer Aided Design. Hand drawn documents will not be reviewed or approved.

Shop drawing scale shall match the Engineer's drawings where possible. Scale shall not be less than 3/32" = 1'-0".

Submit a bill of material and manufacturers product data for all devices and equipment.

Refer to Division 01 for acceptance of electronic submittals for this project. For electronic submittals, Contractor shall submit the documents in accordance with the procedures specified in Division 01. Contractor shall notify the Architect and Engineer that the shop drawings have been posted. If electronic submittal procedures are not defined in Division 01, Contractor shall include the website, user name and password information needed to access the submittals. For submittals sent by e-mail, Contractor shall copy the designated representatives of the Architect and Engineer. Contractor shall allow the Engineer review time as specified above in the construction schedule. Contractor shall submit only the documents required to purchase the materials and/or equipment in the electronic submittal and shall clearly indicate the materials, performance criteria and accessories being proposed. General product catalog data not specifically noted to be part of the specified product will be rejected and returned without review.

I. ELECTRONIC DRAWINGS

In preparation of shop drawings or record drawings, Contractor may, at his option, obtain electronic drawing files in AutoCAD or DXF format on CD-ROM disk, DVD disk, flash drive, or direct download, as desired, from the Engineer for a fee of $200 for a drawing set up to 12 sheets and $15 per sheet for each additional sheet. Contact the Architect for written authorization and Engineer for the necessary release agreement form and to specify shipping method and drawing format. In addition to payment, written authorization from the Architect and release agreement from the Engineer must be received before electronic drawing files will be sent.

J. RECORD DRAWINGS (AS-BUILT DRAWINGS)

During progress of the work in this division, Contractor shall maintain an accurate record of all changes made during the installation of the system. Upon completion of the work, accurately transfer all record information to three identical sets of the approved shop drawings. Insert one set into each copy of the manual described below.

See Division 01 and General Conditions for additional information.

K. QUALIFICATIONS

The manufacturer shall be a company specializing in manufacturing the products specified in this section with minimum three years documented experience. The installer shall be a company specializing in installing the products specified in this section with minimum three years documented experience, be a bonded and licensed contractor and merchant of electronic automated fire alarm systems, and employ full-time factory-trained installers and technicians. The equipment manufacturer's service department shall be fully stocked in standard parts and components and engaged in the maintenance of fire alarm systems. On-the-premises service shall be available within 4 hours of notification, 7 days a week, 24 hours a day. Furnish service and maintenance of fire alarm system for one year from date of substantial completion.

L. WARRANTIES

Warrant each system and each element thereof against all defects due to faulty workmanship, design, or material for a period of 12 months from date of Substantial Completion, unless specific items are noted to carry a longer warranty in the construction documents or manufacturer's standard warranty exceeds 12 months. Remedy all defects, occurring within the warranty period(s), as stated in the General Conditions and Division 01.

All corrective software modifications made during warranty periods shall be updated on all user documentation and on user and manufacturer archived software disks.

Warranties shall include labor and material, including travel expenses. Make repairs or replacements without any additional costs to the Owner, and to the satisfaction of the Owner, Architect, and Engineer.

Perform the remedial work promptly, upon written notice from the Engineer or Owner.

At the time of Substantial Completion, deliver to the Owner all warranties, in writing and properly executed, including term limits for warranties extending beyond the one year period and any actions the Owner must take in order to maintain warranty status. Each warranty instrument shall be addressed to the Owner and state the commencement date and term.

2. MATERIALS AND INSTALLATION

A. MANUFACTURERS

All new equipment shall be compatible with the Pittsburg State University's fire alarm standards.

B. FIRE ALARM CONTROL PANEL

The Fire Alarm Control Panel shall be UL listed under Standard 864 (Control Units for Fire-Protective Signaling Systems). Modular construction with a flush mounted enclosure.

The system shall incorporate one-way emergency Alarm via specified horns. Continuous supervision shall be provided along with specific information as to the type of failure.

Power Supply: Provide two separate and reliable power supplies. The control panel shall receive 120 Vac power via a dedicated branch circuit of the building's electrical system. Each shall have adequate capacity for the system. The fire alarm contractor shall submit battery calculations for review and approval. The calculations shall indicate each device and the load required in stand-by and alarm mode. The secondary power system shall be a battery-operated emergency power supply and charger with capacity for operating system in standby mode for 24 hours followed by alarm mode for 5 minutes.

System Supervision: Automatically detects and reports open circuits, shorts, and grounds of wiring for initiating device, signaling line, and notification appliance circuits. Alarm, supervisory and trouble signals shall be monitored in accordance with NFPA 72.

Initiating Device Circuits: Provide circuitry, which meets the performance requirements during abnormal conditions, based upon the style and class of the circuitry selected. Initiating device circuits shall be Class B.

Notification Appliance Circuits: Provide circuitry, which meets the performance requirements during abnormal conditions, based upon the style and class of the circuitry selected. Notification appliance circuits shall be Class B.

Signaling Line Circuits: Provide circuitry, which meets the performance requirements during abnormal conditions, based upon the style and class of the circuitry selected. Signaling line circuitry shall be Class B.

Auxiliary Relays: Provide sufficient SPDT auxiliary relay contacts to provide accessory functions specified.

Provide trouble acknowledge, and alarm silence switch.

The control panel shall have dedicated alarm, supervisory and trouble LED s and dedicated alarm, supervisory and trouble acknowledge switches.

Lamp Test: Manual lamp test function causes each LED to function at fire alarm control panel.

C. SEQUENCE OF OPERATIONS

Trouble Sequence of Operation: System or circuit trouble places system in trouble mode, which causes the following system operations:

1. Visible and audible trouble alarm indicated at fire alarm control panel and remote annunciator panel (if provided).
2. Trouble signal transmitted to supervising station.
3. Manual acknowledge function at fire alarm control panel silences audible trouble alarm; visible alarm is displayed until initiating failure or circuit trouble is cleared.

Supervisory Sequence of Operation: The activation of any sprinkler valve tamper switch or duct-mounted smoke detector places system in supervisory mode, which causes the following system operations:

1. Visible and audible supervisory alarm indicated by address at fire alarm control panel and remote annunciator panel (if provided).
2. Supervisory signal transmitted to supervising station.
3. Duct-mounted smoke detectors shall shutdown their respective unit upon detection of smoke and remain down until manually reset.
4. Fan-powered terminal units that are less than 2,000 cfm and are not provided with duct detection shall shutdown when its respective air handling unit is shutdown.
5. Manual acknowledge function at fire alarm control panel and remote annunciator panel silences audible supervisory alarm; visible alarm is displayed until device is returned to its normal position/supervisory condition is cleared.

Alarm Sequence of Operation: Actuation of an alarm initiating device places system in alarm mode, which causes the following system operations:

1. Audible notification appliances shall sound until silenced by the alarm silence switch at the control panel.
2. All visible alarm notification appliances shall display a continuous synchronized pattern until reset by the Alarm Reset Switch.
3. Alarm signal transmitted to supervising station.
4. The alarm LED shall flash on the control panel and remote annunciator panel until the alarm has been acknowledged at the control panel/remote annunciator panel. Once acknowledged, this same LED shall latch on and the custom label for the address in alarm shall be displayed on the alphanumeric LCD readout. A subsequent alarm received from another address after acknowledged shall flash the alarm LED on the control panel showing the new alarm information.
7. A pulsing alarm tone shall occur within the control panel until acknowledged.

D. INITIATING DEVICES

Smoke Detector (Photoelectric type): Device shall have visible indication of detector actuation and self-restoring, plug-in. Photoelectric detectors shall have sensitivity between 0.5 and 3.5 percent/foot smoke obscuration.

Carbon Monoxide Detectors: Detector complying with UL 2075 and listed for connection to fire alarm system. Detector shall include alarm contacts and trouble contacts. Detector shall send trouble alarm when nearing end-of-life, power supply problems, or internal faults. Locate, mount, and wire according to manufacturer's written instructions. Testable by introducing test carbon monoxide into the sensing cell. Test button simulates an alarm condition.

E. NOTIFICATION APPLIANCES

Alarm Horn: Surface type fire alarm horn. Sound rating: 90 dB at 10 feet.

Visible Alarm Notification Appliances (Strobes): Strobes shall be xenon or equivalent, unfiltered or clear filtered white light, intensity as indicated on drawings, flash rate range from 1 to 3 Hz, a maximum pulse duration of 0.2 sec with a maximum duty cycle of 40 percent. Strobe shall meet all requirements of the Americans with Disabilities Act.

Audible/Visible Alarm Notification Appliances (Horn/Strobes): Combination units shall provide a common enclosure for the fire alarm audible and visible alarm appliances and be UL listed for its purpose. Minimum audible level and strobe intensity shall meet all requirements for separate appliances.

G. FIRE ALARM WIRE AND CABLE

Fire Alarm Power Branch Circuits: Building wire as specified in Division 26.

All new signaling Line, Initiating Device, and Notification Appliance Circuits: Power limited fire-protective signaling cable, solid copper conductor, 300 Volts insulation, suitable for temperature, conditions and location installed. Minimum wire size for initiating device circuits, control circuits and notification appliance circuits shall be determined by calculations and manufacturer's requirements or recommendations. Wire and cable shall be twisted and shielded if recommended by the system manufacturer. Initiating, notification, and control circuits shall be sized based on 20 percent additional power consuming devices. The conductors shall meet the requirements of NEC Article 760.

All new wiring provided on this project shall be UL listed for the intended use.

3. EXECUTION

A. GENERAL

Install, program, and test all new equipment identified in this contract and revise existing equipment as noted.

The installation supervisor shall be on the job site during the entire installation. The installation supervisor shall maintain marked up copies of the drawings at the job site showing as-built conditions. These drawings shall be updated daily and available for Owner review.

Provide all required conduit and all associated hardware and install (pull), connect, and test all cable for a complete fire alarm system. Install all wiring in accordance with the guidelines of these specifications and documents as well as the NFPA codes and standards listed in these specifications.

B. INSTALLATION

Install all new wiring in conduit. Minimum allowable conduit size shall be 3/4 inch. Size the conduit so that conduit fill does not exceed 75 percent of NFPA 70 maximum fill requirements. Cables in vertical runs shall not exceed 50 percent of NFPA 70 maximum fill requirements. Conduit installation shall be as required by the Contractor's layout and as described in these specifications. All conduit field routing shall be acceptable to the Owner. Routing not acceptable shall be rerouted and replaced without expense to the Owner.

Conceal all wire, cable, conduit, and raceways in walls, ceiling spaces, electrical shafts, or closets in finished areas except as specifically noted otherwise. Conduit and raceways may be exposed in unfinished areas or where specifically approved by the Owner.

Except as otherwise specified or indicated on the drawings, Install all conduit parallel or perpendicular to dominant surfaces with right angle turns made of symmetrical bends or fittings. Except where prevented by the location of other work, a single conduit or a conduit group shall be centered on structural members.

Locate conduit at least six inches from hot water or steam pipes and from other hot surfaces. Conduit shall not block access to any existing equipment or fixtures.

Label all conduits and junction boxes as specified in Division 26.

Terminate all wiring at devices or panels using terminal connectors for screw type terminals. All terminal connectors for conductors shall be pre-insulated ring type or pre-insulated spade type. Pre-insulated terminal connectors shall include a vinyl sleeve, color coded to indicate conductor size. Pre-insulated terminal connectors shall include a metallic support sleeve bonded to the vinyl insulating sleeve and designed to grip the conductor insulation.

Mount end-of-line device in box with last device or separate box adjacent to last device in circuit for conventional hardwired Class B initiating and notification appliance circuits.

Securely fasten conduit to all boxes and cabinets. Threads on metallic conduit shall project through the wall of the box to allow the bushing to butt against the end of the conduit. The locknuts both inside and outside shall then be tightened sufficiently to bond the conduit securely to the box. Conduit shall enter cabinets from the bottom and sides only.

Install ceiling mounted initiating devices in areas with exposed structure tight to underside of floor/roof deck.

Do not install smoke detectors in a direct air flow nor closer than 3 feet (1 meter) from an air supply diffuser or return air opening.

Install ceiling mounted visible and audible/visible notification appliances in areas with exposed structure to bottom of floor/roof structure or at 30 ft AFF, whichever is lower.

Install ceiling mounted visible and audible/visible notification appliances in areas with finished ceilings flush with bottom of ceiling or at 30 ft AFF, whichever is lower.

Install wall mounted visible and audible/visible notification appliances with visible element (strobe) between 80 inches and 96 inches above finished floor unless noted otherwise on drawings.

Install wall mounted audible devices with the top of the device at least 90 inches above finished floor or 6 inches below the ceiling, whichever is lower, unless noted otherwise on drawings. If combination devices are installed, they shall be installed per the visible signal device requirements.

Make conduit and wiring connections to equipment provided by others.

Provide strobe synchronization as required per NFPA 72.

C. FIELD QUALITY CONTROL

Systems shall be checked and tested in accordance with the instructions provided by the manufacturer to ensure that the system functions as required and is free of grounds, opens, and shorts. Each device shall be tested. Smoke detectors shall be tested with products of combustion.

Upon completion of the system installation and before the date of final acceptance, a factory-trained technician shall perform all necessary tests and adjustments and shall file a Letter of Certification and a Certificate of Completion (NFPA 72) with the Owner indicating that the system functions and conforms to the specifications.

Test in accordance with NFPA 72 and local fire department requirements.

D. MANUFACTURER'S FIELD SERVICES

Include services of factory trained and certified technician to supervise installation, adjustments, final connections, and system testing as performed by the Contractor's factory-trained technicians.

The equipment supplier's factory trained technician shall train the Owner's personnel in the proper use and maintenance of the system. Training sessions shall be conducted as needed, not to exceed a total of 2 sessions, with each session lasting a maximum of 4 hours each.

E. ACCEPTANCE TESTING

Upon completion of the system installation, a factory-trained technician shall perform all necessary tests and adjustments in the presence of the Owner's designated personnel.

END OF SECTION 28

PGAV ARCHITECTS
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01/28/2022

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21000000003
EXPIRES 12/31/2022

#	DATE	DESCRIPTION

UNIVERSITY HOUSE

PITTSBURG STATE UNIVERSITY
PITTSBURG KANSAS
Building Number: 36500-0230

CONSTRUCTION DOCUMENTS

Original Size: 1 1/2" Drawing may have been reduced.

FIRE ALARM SPECIFICATIONS

DATE: 01-28-2022
DRAWN: Author
CHECKED: Checker
PGAV #: 53458-00
CLIENT #: (+)14445
SHEET #: FA200

Author
STEVE_DRYGEN

APPLICABLE ELECTRICAL CODES:
NOTE: PROJECT IS DESIGNED IN COMPLIANCE WITH THE FOLLOWING CODES. THIS IS NOT AN EXHAUSTIVE LIST. PROJECT SHALL COMPLY WITH ALL APPLICABLE CODES, STANDARDS AND LOCAL REQUIREMENTS. REFER TO THE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

ELECTRICAL CODE: 2020 NATIONAL ELECTRICAL CODE (NFPA 70)
BUILDING CODE: 2018 INTERNATIONAL BUILDING CODE
ENERGY CODE: 2018 INTERNATIONAL ENERGY CONSERVATION CODE

ELECTRICAL GENERAL NOTES (REMODELS/TENANT FINISH PROJECT):

1. EXISTING CONDITIONS WERE TAKEN FROM ORIGINAL DRAWINGS AND SITE VISITS AND MAY NOT REFLECT ACTUAL "AS-BUILT" CONDITIONS. VERIFY EXISTING CONDITIONS PRIOR TO SUBMITTING FINAL BID. COORDINATE NEW AND DEMOLITION WORK WITH ALL OTHER TRADES AND EXISTING CONDITIONS.

2. NOTIFY ARCHITECT, ENGINEER AND OWNER, AS APPLICABLE, IF ANY DANGEROUS CONDITIONS EXIST ON JOB SITE BEFORE ANY DEMOLITION OR REMODEL WORK BEGINS.

3. COORDINATE ANY NECESSARY POWER OUTAGES WITH THE LANDLORD AND OWNER AND MAKE EVERY ATTEMPT TO SCHEDULE DURING NON-BUSINESS OR OFF-BUSINESS HOURS TO MINIMIZE DISRUPTION TO BUSINESS OPERATIONS. REQUESTS FOR ELECTRICAL SHUTDOWNS OF THE LANDLORD'S EQUIPMENT SHALL BE BROUGHT IN WRITING TO THE ATTENTION OF THE LANDLORD AT LEAST 7 DAYS IN ADVANCE. SHUTDOWNS SHALL NOT BE PERFORMED WITHOUT WRITTEN APPROVAL FROM THE LANDLORD.

4. FOR AREAS AND EQUIPMENT WITHIN THE SCOPE OF THIS REMODEL: EXISTING ELECTRICAL EQUIPMENT AND CIRCUITRY MAY BE REUSED IF IN GOOD CONDITION AND NEW DESIGN REQUIREMENTS CAN BE MET, OTHERWISE REPLACE.

5. FOR AREAS AND EQUIPMENT WITHIN THE SCOPE OF THIS REMODEL: REPAIR OR REPLACE ANY EXISTING DAMAGED OR RECALLED ELECTRICAL EQUIPMENT, LIGHT FIXTURES, WIRING DEVICES AND RELATED CIRCUITRY AND RESTORE ALL ELECTRICAL SYSTEMS TO PROPER WORKING ORDER. THE FINAL ELECTRICAL INSTALLATION SHALL BE FREE FROM ELECTRICAL DEFECTS TO THE SATISFACTION OF THE AHJ, OWNER, ARCHITECT AND ENGINEER.

6. FOR AREAS AND EQUIPMENT WITHIN THE SCOPE OF THIS REMODEL: VERIFY CONDITION AND AGE OF EXISTING REUSED ELECTRICAL EQUIPMENT, LIGHT FIXTURES, CIRCUIT BREAKERS, FUSES, CONDUIT, SWITCHES AND RELATED WIRING. NOTIFY OWNER OF ANY ELECTRICAL EQUIPMENT, LIGHT FIXTURES AND WIRING AGED BEYOND ITS USEFUL LIFE AND REPLACE AS DIRECTED. THE MAXIMUM EXPECTED USEFUL LIFE SHALL NOT EXCEED THE FOLLOWING, (AS DATED FROM THE POINT OF MANUFACTURE); UNLESS APPROVED BY THE ENGINEER, MANUFACTURER AND OWNER: 20 YEARS FOR CIRCUIT BREAKERS, GENERATORS/UPS SYSTEMS AND LIGHT FIXTURES, 30 YEARS FOR TRANSFORMERS AND PANELBOARDS, 40 YEARS FOR SWITCHBOARDS AND OTHER ELECTRICAL EQUIPMENT.

7. FOR AREAS AND EQUIPMENT WITHIN THE SCOPE OF THIS REMODEL: ELECTRICAL EQUIPMENT SHALL BE LOCATED SO THAT THE CODE REQUIRED MINIMUM WORKING CLEARANCE AND DEDICATED ELECTRICAL SPACE ARE MAINTAINED. EXISTING EQUIPMENT NOT MEETING CURRENT CODE CLEARANCE REQUIREMENTS MAY REMAIN IF ALLOWED TO REMAIN BY THE AHJ, ENGINEER AND OWNER.

ELECTRICAL SUPPLEMENTAL SPECIFICATIONS:

1. PRIOR TO SUBMITTING BID, VISIT THE JOB SITE AND BECOME FULLY ACQUAINTED WITH THE EXISTING CONDITIONS, AS APPLICABLE. REVIEW THE LANDLORD CRITERIA, GENERAL NOTES, OTHER TRADE DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS THAT MAY NOT BE CALLED OUT IN THIS PORTION OF THE CONSTRUCTION DOCUMENTS. NOTIFY ARCHITECT AND ENGINEER OF ANY CONFLICTS OR DISCREPANCIES PRIOR TO SUBMITTING BID.

2. ALL WORK SHALL CONFORM TO ALL LOCAL CODES AND ORDINANCES AS WELL AS APPLICABLE INDUSTRY STANDARDS. ALL EQUIPMENT SHALL BEAR LABELS FOR THE USE INTENDED BY AN AHJ ACCEPTED NATIONALLY RECOGNIZED TESTING LABORATORY (NRTL), SUCH AS UL OR ETL. THE FINAL ELECTRICAL INSTALLATION OF THE FACILITY OCCUPIED BY OWNER SHALL BE FREE FROM ELECTRICAL DEFECTS TO THE SATISFACTION OF THE AHJ, OWNER, ARCHITECT AND ENGINEER.

3. COORDINATE FINAL LOCATION AND INSTALLATION REQUIREMENTS OF ALL LIGHT FIXTURES, ELECTRICAL EQUIPMENT AND ELECTRICAL DEVICES WITH ARCHITECTURAL DRAWINGS, EXISTING CONDITIONS AND OTHER TRADES PRIOR TO ROUGH-IN. PROVIDE ALL NECESSARY DEVICES, CORDS, PLUGS, DISCONNECTS AND FINAL CONNECTIONS TO ELECTRICAL EQUIPMENT FOR PROPER OPERATION IN ACCORDANCE WITH CODE, OWNER AND MANUFACTURER REQUIREMENTS.

4. ELECTRICAL DRAWINGS ARE DIAGRAMMATIC/SCHEMATIC IN NATURE AND REPRESENT THE GENERAL SCOPE OF WORK. IT IS NOT WITHIN THE SCOPE OF THE ELECTRICAL DRAWINGS TO SHOW ALL NECESSARY RACEWAY ROUTING, BENDS, OFFSETS, PULL BOXES AND OBSTRUCTIONS. CONTRACTOR SHALL COORDINATE THE FINAL LOCATION OF EQUIPMENT AND WIRING DEVICES WITH OTHER TRADES PRIOR TO INSTALLATION AND INSTALL ALL WORK TO CONFORM TO THE OWNER REQUIREMENTS.

5. ALL CONDUCTOR AND CONDUIT LENGTHS SHOWN IN THESE DESIGN DOCUMENTS ARE INTENDED SOLELY FOR USE IN THE DESIGN CALCULATIONS BY THE DESIGN PROFESSIONAL, UNLESS NOTED OTHERWISE. LENGTHS SHOWN SHALL NOT BE USED TO ASSIST IN THE BIDDING TAKEOFF PROCESS. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE MATERIAL QUANTITIES REQUIRED TO BID AND CONSTRUCT THE COMPLETE PROJECT.

6. PROVIDE PROPER FIRE PROOFING AND SEALANT FOR PENETRATIONS THROUGH FIRE RATED ASSEMBLIES. THE FIRE STOPPING METHOD, MATERIAL AND ITS APPLICATION SHALL BE NRTL LISTED, CODE COMPLIANT AND APPROVED BY AHJ.

7. ALL APPLICABLE SWITCHES, RECEPTACLES, OUTLETS, AND CONTROLS SHALL BE PLACED AT HEIGHTS THAT ARE IN ACCORDANCE WITH ADA ACCESSIBILITY GUIDELINES.

8. COORDINATE FLOOR MOUNTED BOX, RECEPTACLE, AND COVER PLATE TYPES WITH ARCHITECT AND OWNER PRIOR TO ORDER.

9. WIRING DEVICES ADJACENT TO EACH OTHER SHALL BE INSTALLED UNDER A SINGLE COVER PLATE, UNO.

10. WIRING DEVICES SHOWN BACK-TO-BACK ON A COMMON WALL SHALL BE OFFSET A MINIMUM OF 12" HORIZONTALLY TO REDUCE SOUND TRANSMISSION BETWEEN ROOMS, UNO.

11. ALL RECEPTACLES AND APPLIANCES SHALL BE GFCI PROTECTED IN LOCATIONS REQUIRED BY CODE. THIS INCLUDES BATHROOMS, KITCHENS/FOOD PREP AREAS, EXTERIOR LOCATIONS AND RECEPTACLES WITHIN 6 FEET OF A SINK. GFCI DEVICES SHALL BE READILY ACCESSIBLE AND SHALL NOT BE LOCATED BEHIND OBSTACLES, LABEL WIRING DEVICES PROTECTED BY AN UPSTREAM GFCI DEVICE.

12. PROVIDE TAMPER-RESISTANT (TR) TYPE RECEPTACLES AT ALL CODE REQUIRED LOCATIONS AND AT LOCATIONS WHERE RECEPTACLES ARE MOUNTED LESS THAN 5'-0" AFF AND ARE EASILY ACCESSIBLE BY CHILDREN, UNLESS NOTED OTHERWISE.

13. FLEXIBLE CONDUIT IS ONLY PERMITTED WHERE SPECIFICALLY ALLOWED IN THE CONSTRUCTION DOCUMENTS. WHERE CONCEALED FROM VIEW OR EXPOSED FINAL CONNECTIONS TO LIGHT FIXTURES AND EQUIPMENT IN LENGTHS OF 6'-0" OR LESS.

14. ALL EMPTY CONDUIT/RACEWAY SHALL BE INSTALLED WITH PULL STRINGS. TERMINATE CONDUIT STUB-UP WITH A NYLON BUSHING.

15. EXPOSED CONDUIT/RACEWAY SHALL BE PAINTED TO MATCH ADJACENT SURFACE, UNLESS NOTED OTHERWISE. COORDINATE REQUIREMENTS WITH ARCHITECT AND OWNER PRIOR TO INSTALLATION.

16. CONDUITS/RACEWAYS SHALL BE CONCEALED FROM VIEW WHEREVER PRACTICABLE, UNLESS NOTED OTHERWISE. ROUTE CONDUITS SERVING ROOFTOP EQUIPMENT CONCEALED INSIDE EQUIPMENT CURB AND MINIMIZE ROOF PENETRATIONS AND EXTERIOR CONDUIT RUNS WHERE PRACTICABLE. SUPPORT RACEWAY FROM STRUCTURE. NOT ROOF DECK. MAINTAIN 2" MIN SPACING FROM BOTTOM OF ROOF DECK TO PREVENT ROOFING SCREWS FROM PENETRATING RACEWAY. DO NOT ROUTE CONDUITS ACROSS SKYLIGHTS, ACCESS PANELS, HATCHED TILES, HVAC DIFFUSERS, OR EQUIPMENT WORKING CLEARANCE SPACE. ROUTE ALL EXPOSED NON-FLEXIBLE CONDUITS TIGHT TO STRUCTURE, PARALLEL TO BUILDING LINES AND IN STRUT OR CABLE/PIPE TRAY WHERE PRACTICABLE. INSTALL CONDUITS PLUMB LEVEL WHERE EXPOSED TO VIEW. COORDINATE RACEWAY ROUTING AND INSTALLATION WITH OTHER TRADES PRIOR TO ROUGH-IN.

17. MULTIWIRE BRANCH CIRCUITS ARE NOT ALLOWED, UNLESS NOTED OTHERWISE.

18. PROVIDE INSULATED EQUIPMENT GROUNDING CONDUCTOR FOR ALL CIRCUITS, UNLESS NOTED OTHERWISE.

ELECTRICAL SYMBOLS

THIS IS A MASTER LEGEND AND NOT ALL SYMBOLS OR ABBREVIATIONS ARE USED. V3.00

STANDARD MOUNTING HEIGHTS

AUDIBLE APPLIANCES (CENTERLINE)	84"
ALARMS	48"
ANNUNCIATOR PANELS (DISPLAY)	60"
CONTROLS (TOP OF DEVICE)	48"
EXIT SIGNS (WALL MOUNTED)	80"
FIRE ALARM ANNUNCIATOR PANEL (DISPLAY)	60"
FIRE ALARM BELL (EXTERIOR) (CENTERLINE)	120"
FIRE ALARM CONTROL PANEL/UNIT (DISPLAY)	60"
INTERCOM (AFEA ONLY)	36"
INTERCOMS (TOP OF DEVICE)	48"
PULL STATIONS (TOP OF DEVICE)	48"
PHOTOCELLS	144"
RECEPTACLES	16"
RECEPTACLES (EXTERIOR)	24"
RECEPTACLES (GARAGES)	24"
RECEPTACLES (POOLS)	27"
RECEPTACLES (ABOVE COUNTER)	+6" ABOVE BACKSPLASH/COUNTER, 40" MAX
RECEPTACLES IN EQUIPMENT ROOMS	44"
REMOTE INDICATING LIGHT (EQUIPMENT ROOMS)	48"
REMOTE INDICATING LIGHT (FINISHED AREAS)	CEILING
SAFETY SWITCHES (TOP OF DEVICE)	48"
STARTERS (TOP OF DEVICE)	48"
SWITCHES (TOP OF DEVICE)	44"
TELEPHONE, DATA OUTLETS	SAME AS ADJACENT DEVICE, UNO
TELEPHONE TERMINAL BOARD (BOTTOM)	6"
TELEVISION OUTLETS	REFER TO ARCH DRAWINGS
VISIBLE APPLIANCES (CENTERLINE)	84"

INSTALL OUTLET BOXES AT THE MOUNTING HEIGHTS SHOWN ABOVE UNO IN THE CONSTRUCTION DOCUMENTS. MOUNTING HEIGHTS LISTED ABOVE, OR ELSEWHERE IN THE CONSTRUCTION DOCUMENTS, ARE AFF OR AFG TO BOTTOM OF OUTLET BOX, UNO. ALL DEVICES SHALL BE INSTALLED IN COMPLIANCE WITH CURRENT ADA AND LOCAL REQUIREMENTS.

ABBREVIATIONS

AF	AMPERE FUSE SIZE	MCC	MOTOR CONTROL CENTER
AFC	ABOVE FINISHED CEILING	MFR	MANUFACTURER
AFF	ABOVE FINISHED FLOOR	MIN	MINIMUM
AFG	ABOVE FINISHED GRADE	MLO	MAIN LUGS ONLY
AHJ	AUTHORITY HAVING JURISDICTION	MLV	MAGNETIC LOW-VOLTAGE
		MOCP	MAXIMUM OVERCURRENT PROTECTION
AHU	AIR HANDLING UNIT		
AIC	AMPERE INTERRUPTING CAPACITY	MTD	MOUNTED
		N/A	NOT APPLICABLE
AS	AMPERE SWITCH SIZE	NF	NON-FUSED
AT	AMPERE TRIP SETTING	NL	NIGHT LIGHT (24HR ON)
ATS	AUTOMATIC TRANSFER SWITCH	NRTL	NATIONALLY RECOGNIZED TESTING LABORATORY (CSA, ETL, NSF, UL)
AV	AUDIO VISUAL		
BAS	BUILDING AUTOMATION SYSTEM	NTS	NOT TO SCALE
		OS	OCCUPANCY SENSOR
BKR	BREAKER	P	POLE
C	CONDUIT	PART	PARTIAL CIRCUIT
CAT	CATEGORY	PH/Ø	PHASE
CATV	CABLE TELEVISION SYSTEM	PNL	PANEL
CCTV	CLOSED CIRCUIT TELEVISION	PNLBD	PANELBOARD
CD	CANDELA	PROVIDE	FURNISH AND INSTALL
CKT	CIRCUIT	PT	POTENTIAL TRANSFORMER
CODE	APPLICABLE CODE ADOPTED BY JURISDICTION	QTY	QUANTITY
		R/REL	RELOCATE
CT	CURRENT TRANSFORMER	RCPT	RECEPTACLE
CTR	CENTER	RLA	RUNNING LOAD AMPS
CVD	CUMULATIVE VOLTAGE DROP	RTU	ROOFTOP UNIT
D/DEMO	DEMOLITION	SCCR	SHORT-CIRCUIT CURRENT RATING
DPDT	DOUBLE-POLE, DOUBLE-THROW		
DPST	DOUBLE-POLE, SINGLE-THROW	SD	SMOKE DUCT DETECTOR
		SF	SQUARE FEET
E/E/TR/EX	EXISTING TO REMAIN	SPDT	SINGLE-POLE, DOUBLE-THROW
EC	ELECTRICAL CONTRACTOR	SPST	SINGLE-POLE, SINGLE-THROW
EF	EXHAUST FAN		
EM	EMERGENCY	SSBJ	SUPPLY-SIDE BONDING JUMPER
EMS	ENERGY MANAGEMENT SYSTEM	ST	SHUNT TRIP
ELV	ELECTRONIC LOW-VOLTAGE	SWBD	SWITCHBOARD
EWC	ELECTRIC WATER COOLER	SWGR	SWITCHGEAR
FAAP	FIRE ALARM ANNUNCIATOR PANEL	TBB	TELECOMMUNICATIONS BONDING BACKBONE
FACP	FIRE ALARM CONTROL PANEL	TBD	TO BE DETERMINED
FCA	FAULT CURRENT AMPS AVAILABLE	TGB	TELECOMMUNICATIONS GROUND BUS BAR
FCU	FAN COIL UNIT	TL	TWISTLOCK
FF	FINISHED FLOOR	TMGB	TELECOMMUNICATIONS MAIN GROUND BUS BAR
FLA	FULL LOAD AMPS		
FLR	FLOOR	TX/XFMR	TRANSFORMER
GC	GENERAL CONTRACTOR	TYP	TYPICAL
GEC	GROUNDING ELECTRODE CONDUCTOR	U/F	UNDERFLOOR
		U/G	UNDERGROUND
GES	GROUNDING ELECTRODE SYSTEM	U/S	UNDERSLAB
		UH	UNIT HEATER
GFR	GROUND FAULT RELAY	UNO	UNLESS NOTED OTHERWISE
G	GROUND	UPS	UNINTERRUPTIBLE POWER SUPPLY
IG	ISOLATED GROUND		
ISC	SHORT CIRCUIT CURRENT	VD	VOLTAGE DROP
JB/J-BOX	JUNCTION BOX	VFD	VARIABLE FREQUENCY DRIVE
LF	LINEAR FEET		
LRA	LOCKED ROTOR AMPS	VS	VACANCY SENSOR
LTG/LTS	LIGHT/FIXTURE/LIGHTS	W	WIRE
MAU	MAKE-UP AIR UNIT	W/	WITH
MAX	MAXIMUM	WP	WEATHER PROOF
MCA	MINIMUM CIRCUIT AMPACITY	WR	WEATHER RESISTANT
MCB	MAIN CIRCUIT BREAKER	WT	WATERTIGHT
		XP	EXPLOSION PROOF

LINETYPE LEGEND

THROUGHOUT THE DRAWINGS DIFFERENT LINETYPES ARE USED IN COMBINATION WITH THE SYMBOLS TO INDICATE THE STATUS OF ITEMS AS EXISTING, TO BE DEMOLISHED, TO BE INCLUDED AS PART OF NEW WORK AND/OR ITEMS WHICH ARE ANTICIPATED TO BE PROVIDED IN THE FUTURE. THE STATUS OF ITEMS USING THESE LINETYPES ARE RELATIVE TO THE VIEW IN WHICH THEY APPEAR. PHASING SHOWN IN DRAWINGS IS NOT INTENDED TO FULLY DESCRIBE ALL NECESSARY CONSTRUCTION PHASING, WHICH IS DETERMINED BY THE CONTRACTOR AS PART OF THEIR RESPONSIBILITIES. ANY SUCH PHASES DESCRIBED IN THE CONSTRUCTION DOCUMENTS ARE GENERAL AND ONLY INTENDED TO INDICATE A BROAD ORDER FOR THE SAKE OF DESCRIBING THE PROJECT. THE FOLLOWING LINETYPES MAY BE USED ON ANY DEVICE, EQUIPMENT, NOTE, LINE, SHAPE, ETC.

EXISTING
DEMOLISH
NEW
FUTURE

ANNOTATION

- MECHANICAL OR FIRE PROTECTION PLAN NOTE CALLOUT
- PLUMBING PLAN NOTE CALLOUT
- ELECTRICAL OR FIRE ALARM PLAN NOTE CALLOUT
- TECHNOLOGY PLAN CALLOUT
- PLUMBING EQUIPMENT DESIGNATION. (CONTRACTOR FURNISHED AND INSTALLED). REFER TO PLUMBING FIXTURE OR EQUIPMENT SCHEDULES
- EQUIPMENT DESIGNATION (OWNER FURNISHED, CONTRACTOR INSTALLED)
- MECHANICAL EQUIPMENT DESIGNATION (CONTRACTOR FURNISHED AND INSTALLED UNLESS NOTED OTHERWISE)
- CONNECTION POINT OF NEW WORK TO EXISTING
- DETAIL REFERENCE UPPER NUMBER INDICATES DETAIL NUMBER LOWER NUMBER INDICATES SHEET NUMBER
- SECTION CUT DESIGNATION
- DEDICATED EQUIPMENT ACCESS TILE
- ACCESS PANEL

CIRCUITING & WIRING

- HOMERUN TO PANELBOARD. INFORMATION AT ARROWS ARE CIRCUIT NUMBERS AND PANELBOARD FOR TERMINATION. REFER TO PANELBOARD SCHEDULES FOR BRANCH CIRCUIT CONDUCTOR SIZES.
- INDICATES RELAY NUMBER
- CIRCUIT CONTINUATION OR PARTIAL CIRCUIT
- CONDUIT CONCEALED
- CONDUIT CONCEALED (EMERGENCY)
- CONDUIT IN UNDER FLOOR/GROUND CONSTRUCTION
- EXPOSED CONDUIT
- EXPOSED CONDUIT (EMERGENCY)
- FLEXIBLE CONDUIT
- LOW VOLTAGE CABLE (NOT ROUTED IN CONDUIT)
- CONDUIT TURNING DOWN
- CONDUIT TURNING UP
- CONNECTION POINT OR EQUIPMENT TERMINATION
- EQUIPMENT TERMINATION

CONDUCTOR TICK MARK LEGEND

WHERE TICK MARKS ARE SHOWN, THE FOLLOWING SHALL GOVERN:

- SWITCHED HOT (PHASE) CONDUCTORS (SHOWN TRAILING NEUTRAL)
- NEUTRAL (GROUNDED) CONDUCTOR
- UNSWITCHED HOT (PHASE) CONDUCTORS (SHOWN LEADING NEUTRAL)

NOTE: HASH MARKS INDICATE QUANTITY OF CONDUCTORS

- EQUIPMENT GROUNDING CONDUCTOR IN CONDUIT (GREEN INSULATION OR BARE)
- ISOLATED GROUNDING CONDUCTOR IN CONDUIT (GREEN INSULATION WITH YELLOW TRACER)

BRANCH CIRCUIT CONDUCTOR TABLE

WHERE TICK MARKS ARE NOT SHOWN, THE FOLLOWING SHALL GOVERN:

# OF POLES	HOT (PHASE)*	NEUTRAL (GROUNDED)**	GROUNDING***
1P	(1)	(1) UNO	(1)
2P	(2)	(1) UNO	(1)
3P	(3)	(1) UNO	(1)

* PROVIDE ADDITIONAL CONDUCTORS THROUGH ENTIRE CIRCUIT (SWITCHED, UNSWITCHED/EM, ETC.) AS INDICATED THROUGHOUT CONSTRUCTION DOCUMENTS AND AS REQUIRED FOR A COMPLETE AND WORKING SYSTEM.

** REFER TO SPECIFICATIONS FOR LIMITATIONS ON SHARING NEUTRAL (GROUNDED) CONDUCTORS, DO NOT CIRCUIT AS A MULT-WIRE BRANCH CIRCUIT, UNO.

*** PROVIDE ADDITIONAL ISOLATED GROUNDING CONDUCTORS WHERE INDICATED.

REFER TO SPECIFICATIONS, PLANS, NOTES, WIRING AND CONTROL DIAGRAMS FOR ADDITIONAL CIRCUITING REQUIREMENTS.

SIGNALING

- SIGNALING BELL
- SIGNALING BUZZER
- LV TRANSFORMER

LIGHTING

- LIGHT FIXTURE
- a = LOWER CASE LETTER IS SWITCH IDENTIFIER
- A = UPPER CASE LETTER INDICATES LIGHT FIXTURE TYPE
- = WALL MOUNT
- = ARROW INDICATED AIMING DIRECTION
- LIGHT FIXTURE CIRCUITED AS A NIGHT LIGHT (NL)
- EMERGENCY LIGHT FIXTURE WITH EMERGENCY LIGHTING BATTERY PACK OR CONNECTED TO EMERGENCY SOURCE
- NIGHT LIGHT/EMERGENCY LIGHT FIXTURE WITH EMERGENCY BATTERY PACK OR CONNECTED TO EMERGENCY SOURCE
- LIGHT FIXTURE WITH DUAL BALLASTS CIRCUITED SEPARATELY (SHADING IMPLIES EMERGENCY LIGHT FIXTURE)
- LIGHTING TRACK (# INDICATES RELAY NUMBER)
- MIRROR LIGHTS
- EXTERIOR PARKING LOT LIGHT FIXTURE
- EXTERIOR PEDESTRIAN POST TOP LIGHT FIXTURE
- EXTERIOR LIT BOLLARD LIGHT
- EXIT SIGN - CEILING / WALL MOUNTED, ARROWS AS INDICATED. FACE HATCHED
- EMERGENCY LIGHTING UNIT EQUIPMENT WITH BATTERY PACK - CEILING/WALL MOUNTED
- AFEA (AREA FOR EVACUATION ASSISTANCE) SIGN - CEILING/WALL MOUNTED, ARROWS AS INDICATED

REFER TO LIGHT FIXTURE SCHEDULE FOR MORE INFORMATION

POWER EQUIPMENT & DEVICES

- ELECTRICAL PANELBOARD (SURFACE OR FLUSH MOUNT)
- ELECTRICAL CABINET (SURFACE OR FLUSH MOUNT), TYPE AS NOTED
- PLYWOOD TERMINAL BOARD FOR TELEPHONE SYSTEM, UNO, SIZE AS NOTED
- SWITCHBOARD OR MOTOR CONTROL CENTER ON HOUSEKEEPING PAD
- ELECTRICAL DISTRIBUTION PANELBOARD
- TRANSFORMER
- DISCONNECT SWITCH • "2003/150/3R" DENOTES AMPERES/POLE/FUSE/NEMA ENCLOSURE RATING, NF= NON-FUSED, CB= CIRCUIT BREAKER (200/3/CB), NO VALUE (200/3/150) FOR NEMA ENCLOSURE MEANS STANDARD NEMA 1 RATING
- COMBINATION DISCONNECT (SAFETY) SWITCH AND MOTOR STARTER "30/2/15/1/3R" DENOTES AMPERES/POLE/FUSE/NEMA STARTER SIZE/NEMA ENCLOSURE RATING, NF= NON-FUSED, CB= CIRCUIT BREAKER (30/3/CB/1), NO VALUE (200/3/150/1) FOR NEMA ENCLOSURE MEANS STANDARD NEMA 1 ENCLOSURE RATING
- MAGNETIC MOTOR STARTER, NEMA SIZE AS NOTED, 3-POLE, UNO
- VARIABLE FREQUENCY DRIVE
- INDICATING LIGHT
- EMERGENCY POWER OFF BUTTON
- STOP-START PUSH BUTTON CONTROL STATION
- HAND-OFF-AUTO PUSH BUTTON CONTROL STATION
- MUSHROOM-TYPE PUSH BUTTON
- OVERHEAD PADDLE FAN

BOXES, LIGHTING CONTROL & WIRING DEVICES

SWITCH LETTER DESIGNATIONS AS FOLLOWS:
BLANK = SINGLE
2 = TWO POLE
3 = THREE-WAY
4 = FOUR-WAY
D = DIMMER
F = FAN SPEED CONTROL
FH = FRACTIONAL HORSEPOWER MANUAL CONTROLLER
IH = INTEGRAL HORSEPOWER MANUAL CONTROLLER
K = KEYED
LVM = LOW VOLTAGE / DIGITAL
M = MANUAL MOTOR STARTER DISCONNECT
OSM = OCCUPANCY SENSOR
P = SPST PILOT LIGHT
WP = WEATHER PROOF
# = REFER TO LIGHTING CONTROL DEVICE SCHEDULE

- AUTOMATIC LOAD CONTROL RELAY
- BRANCH CIRCUIT TRANSFER SWITCH
- CEILING / WALL MOUNTED OCCUPANCY SENSOR (# INDICATES TYPE PER SCHEDULE)
  - CORNER 90 DEGREE SENSING
  - ONE-DIRECTION SENSING, CEILING/WALL MOUNT
  - CEILING MOUNT, TWO DIRECTION SENSING
  - CEILING MOUNT, FOUR DIRECTION SENSING
- CONTACTOR (SIZE, COIL VOLTAGE AND NUMBER OF POLES AS INDICATED)
- TRACK-MOUNTED CURRENT LIMITER (# INDICATES AMPERAGE)
- DAYLIGHT SENSOR (# INDICATES TYPE PER SCHEDULE)
- LIGHTING CONTROLS PROCESSOR AND/OR EQUIPMENT
- POWER PACK (# INDICATES TYPE PER SCHEDULE)
- PHOTOELECTRIC SWITCH
- ROOM CONTROLLER (# INDICATES TYPE PER SCHEDULE)
- TIME SWITCH
- SIMPLEX RECEPTACLE • NEMA 5-20R, UNO
- DUPLEX RECEPTACLE • NEMA 5-20R, UNO
- DOUBLE DUPLEX RECEPTACLE • NEMA 5-20R, UNO
- SPECIAL RECEPTACLE • NEMA TYPE AS NOTED
- TWIST-LOCK TYPE RECEPTACLE
- BLANK FACE GFCI FEED THROUGH DEVICE
- GFCI TYPE RECEPTACLE*
- ISOLATED GROUND TYPE RECEPTACLE*
- EMERGENCY RECEPTACLE*
- RECEPTACLE INSTALLED ABOVE COUNTER OR BACKSPLASH*
- RECEPTACLE INSTALLED IN CEILING*
- RECEPTACLE INSTALLED IN FLOOR*
- RECEPTACLE INSTALLED VIA DROP CORD*
- RECEPTACLE LETTER DESIGNATIONS AS FOLLOWS:
  C = AUTOMATICALLY CONTROLLED
  CH = CLOCK HANGER TYPE
  G=RCPT PROTECTED BY GFCI CIRCUIT BREAKER OR UPSTREAM GFCI DEVICE
  H = HORIZONTALLY MOUNTED
  S = MANUALLY CONTROLLED
  SP / TVSS = SURGE PROTECTION
  TR = TAMPER RESISTANT
  TV = TELEVISION
  USB = USB/DUPLEX
  WP = WEATHER PROOF COVER
  WR = WEATHER RESISTANT
- MULTI-OUTLET ASSEMBLY
- TELEPHONE OUTLET
- DATA OUTLET
- MULTI-SERVICE OUTLET; TELEPHONE AND DATA
  - ABOVE COUNTER, TYP
  - WALL, TYP
  - FLOOR, TYP
- MULTI-SERVICE POWER POLE WITH TELEPHONE, DATA AND POWER OUTLETS A = TYPE, REFER TO PLANS, SCHEDULES AND SPECIFICATIONS
- MULTI-SERVICE FLOOR BOX WITH TELEPHONE, DATA AND POWER OUTLETS A = TYPE, REFER TO PLANS, SCHEDULES AND SPECIFICATIONS
- POKE THROUGH. A = TYPE, REFER TO PLANS, SCHEDULES AND SPECIFICATIONS
- THERMOSTAT
- CEILING/FLOOR MOUNT JUNCTION/OUTLET BOX
- WALL MOUNT JUNCTION/OUTLET BOX

* SYMBOL DEMONSTRATED WITH DUPLEX RECEPTACLE. WHEN USED IN COMBINATION WITH OTHER DEVICES MEANING IS SIMILAR FOR THOSE DEVICE TYPES.

REFER TO LIGHTING CONTROL DEVICE SCHEDULE FOR MORE INFORMATION.

ELECTRICAL ONE-LINE & RISER DIAGRAM

- SWITCH (RATING AS INDICATED)
- DRAWOUT CIRCUIT BREAKER (RATINGS AS INDICATED)
- FUSED SWITCH (RATING, POLES AND FUSE TYPE AS INDICATED)
- COMBINATION FUSED SWITCH/STARTER AND STARTER SIZE
- CIRCUIT BREAKER (RATINGS AS INDICATED)
- COMBINATION CIRCUIT BREAKER/STARTER AND STARTER SIZE
- PANELBOARD, SINGLE OR MULT-SECTION (REFER TO SCHEDULES)
- ISOLATED POWER PANELBOARD W/ INTEGRAL TRANSFORMER (REFER TO SCHEDULES)
- TRANSFORMER (TYPE AND RATINGS AS INDICATED)
- SHIELDED TRANSFORMER (TYPE AND RATINGS AS INDICATED)
- AUTOMATIC TRANSFER SWITCH (RATINGS AS INDICATED)
- AUTOMATIC TRANSFER SWITCH WITH BYPASS (RATINGS AS INDICATED)
- GENERATOR (RATINGS AS INDICATED)
- NON-SEPARATELY DERIVED SOURCE
- SEPARATELY DERIVED SOURCE
- SWITCHGEAR, SWITCHBOARD AND/OR DISTRIBUTION PANELBOARD (TYPE, RATING, DEVICES AND ACCESSORIES AS INDICATED)
- COMBINATION DIGITAL VOLT METER/AMMETER
- CIRCUIT IDENTIFICATION (REFER TO CIRCUIT SCHEDULE)
- GROUND FAULT RELAY
- PHASE FAILURE RELAY
- KIRK-KEY INTERLOCK (# INDICATES KEY PAIR)
- SHUNT TRIP
- AMMETER (RANGE AS SPECIFIED OR REQUIRED)
- VOLTMETER (RANGE AS SPECIFIED OR REQUIRED)
- UTILITY METER (AS REQUIRED BY UTILITY)
- AMMETER SWITCH
- VOLTMETER SWITCH
- WATT-HOUR METER. "D" DENOTES DEMAND REGISTER. "15" DENOTES MINUTES OF DEMAND INTERVAL
- CURRENT TRANSFORMER RATING AS SPECIFIED OR REQUIRED
- POTENTIAL TRANSFORMER RATING AS SPECIFIED OR REQUIRED
- SURGE-PROTECTIVE DEVICE
- GROUND CONNECTION
- GROUND CONNECTION WITH TEST WELL
- GROUND ROD
- LIGHTNING ARRESTER
- CAPACITOR
- CONTACT (OPEN OR CLOSED)
- HEATER
- MOTOR
- BLOCK LOAD KW OR KVA
- FAULT POINT REFERENCED IN SHORT CIRCUIT CURRENT AND VOLTAGE DROP SPREADSHEET

CALL OUTS

- ENLARGED PLAN CALLOUT
- NOT IN SCOPE

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CURTIS A. OLDS LICENSED 26555 KANSAS PROFESSIONAL ENGINEER
01/28/2022

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21000X003
EXPIRES 12/31/2022

#	DATE	DESCRIPTION

UNIVERSITY HOUSE

PITTSBURG STATE UNIVERSITY
PITTSBURG KANSAS
Building Number: 36500-0230

CONSTRUCTION DOCUMENTS

Original Size: 1 1/2" Drawing may have been reduced.

ELECTRICAL GENERAL NOTES AND LEGEND

DATE: 01-28-2022	
DRAWN: Author	CHECKED: Checker
PROJ # 53456.00	CUSTOMER # 42-14445

SHEET # E000

CURTIS A. OLDS

LIGHT FIXTURE SCHEDULE

TYPE	MANUFACTURER / MODEL #	APPROVED ALTERNATES	LAMPING / LIGHT SOURCE	DRIVING TYPE	VOLTAGE	INPUT WATTS	INPUT VA	DESCRIPTION	NOTES
CF	HUNTER NEWSOME LOW PROFILE	MINKA AIRE, HAIKU, KICHLER	2-LED BULB 3000K 1600 LUMENS 15,000 HRS	NON-DIM	120	30	33	INTERIOR 52" CEILING FAN WITH INTERGAL LIGHT KIT.	
H1	LITHONIA LIGHTING FMDECL 10	EATON (COOPER), GE, HUBBELL, LSI INDUSTRIES, PHILIPS	LED 80CRI, 3000K 1100 LUMENS 50,000 HRS	NON-DIM	120	20	22	LOW PROFILE ROUND LED DÉCOR FLUSH MOUNTED FIXTURE, BRONZE.	
R1	LITHONIA LIGHTING WF6 LL LED 3TK30K35K 90CRI BN	EATON (COOPER), GE, HUBBELL, LSI INDUSTRIES, PHILIPS	LED 90 CRI, 3000K 830 LUMENS 50,000 HRS	NON-DIM	120	10	11	RECESSED LED DOWNLIGHT.	
W1	LITHONIA LIGHTING SWBLED/DLSOS-BN	EATON (COOPER), GE, HUBBELL, LSI INDUSTRIES, PHILIPS	LED 79 CRI, 2700K 720 LUMENS 50,000 HRS	NON-DIM	120	11.2	12.4	LED WALL SCONCE BACKPLATE WITH DECORATIVE WALL SCONCE DIFFUSER.	
W2	LITHONIA LIGHTING LTFSGL3 LED 27K 90 CRI BN	EATON (COOPER), GE, HUBBELL, LSI INDUSTRIES, PHILIPS	3-LED 90 CRI, 2700K 1260 LUMENS 40,000 HRS	NON-DIM	120	24	27	WALL MOUNTED FARMHOUSE STYLE TRACK LIGHTING KIT.	
W3	LITHONIA LIGHTING FMWCL 840	EATON (COOPER), GE, HUBBELL, LSI INDUSTRIES, PHILIPS	LED 85 CRI, 4000K 575 LUMENS 50,000 HRS	NON-DIM	120	10.4	11.5	WALL MOUNTED LED LIGHT	

ELECTRICAL PLAN NOTES:

E1 CONNECT NEW SWITCH TO EXISTING LIGHT FIXTURE IN THIS AREA.

E2 ROUTE SWITCH LEG TO EXHAUST FAN EF-1. REFER TO SHEET M101 FOR LOCATION.

E3 REFER TO SHEET E201 DETAIL 1 FOR CIRCUIT CONTINUATION.

E4 CONNECT TO EXISTING CIRCUIT SERVING BASEMENT.

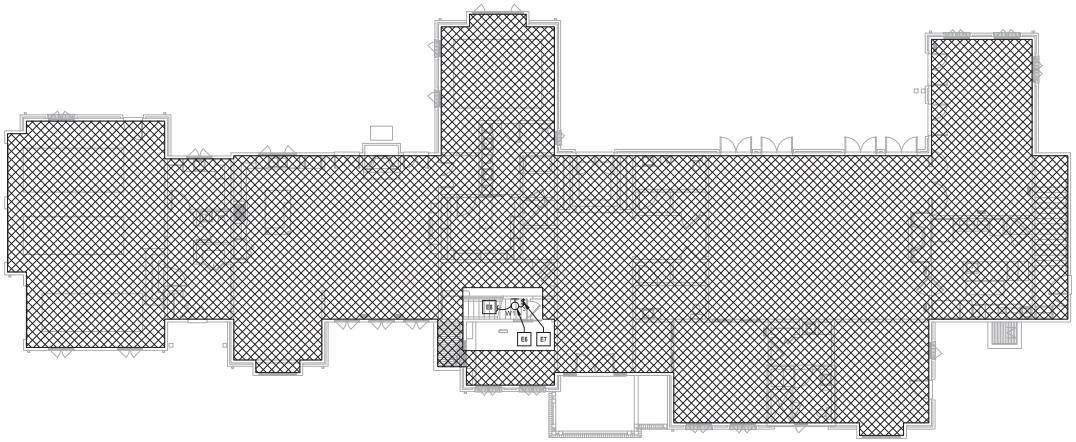
E5 REFER TO DETAIL 2 ON THIS SHEET FOR CIRCUIT CONTINUATION.

E6 REPLACE EXISTING LIGHT FIXTURE WITH NEW W1 FIXTURE.

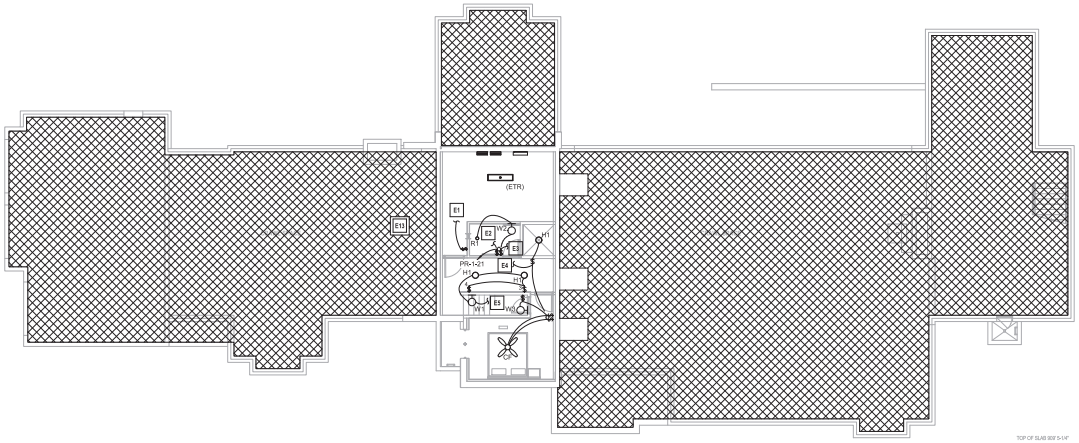
E7 REPLACE EXISTING LIGHT SWITCH WITH NEW 2 POLE FOR 3-WAY SWITCH.

E8 REFER TO DETAIL 1 ON THIS SHEET FOR CIRCUIT CONTINUATION.

E13 HATCHED AREA NOT IN SCOPE OF WORK.



2 LIGHTING FIRST FLOOR RCP
1/8" = 1'-0"



1 LIGHTING BASEMENT RCP
1/8" = 1'-0"

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21000005003
EXPIRES 12/31/2022

#	DATE	DESCRIPTION

UNIVERSITY HOUSE

PITTSBURG STATE UNIVERSITY
PITTSBURG KANSAS
Building Number: 38500-0230

CONSTRUCTION DOCUMENTS

Original Size: 1 1/2" Drawing may have been reduced.

LIGHTING BASEMENT RCP

DATE: 01-28-2022	
DRAWN: Author	CHECKED: Checker
PGAV # 53458-00	CLIENT # A-214445

SHEET #
E101

Author
CURTIS A. OLDS

ELECTRICAL PLAN NOTES:

E9 REFER TO SHEET E101 DETAIL 1 FOR CIRCUIT CONTINUATION.

E11 REMOVE EXISTING RECEPTACLE AND PREPARE CIRCUIT FOR REUSE. PROVIDE NEW JUNCTION BOX AND RECEPTACLE AND REUSE EXISTING CIRCUIT. REPLACE EXISTING CIRCUIT BREAKER IN PANELBOARD SERVICE THIS RECEPTACLE WITH A NEW AFCI/GFCI COMBINATION BREAKER.

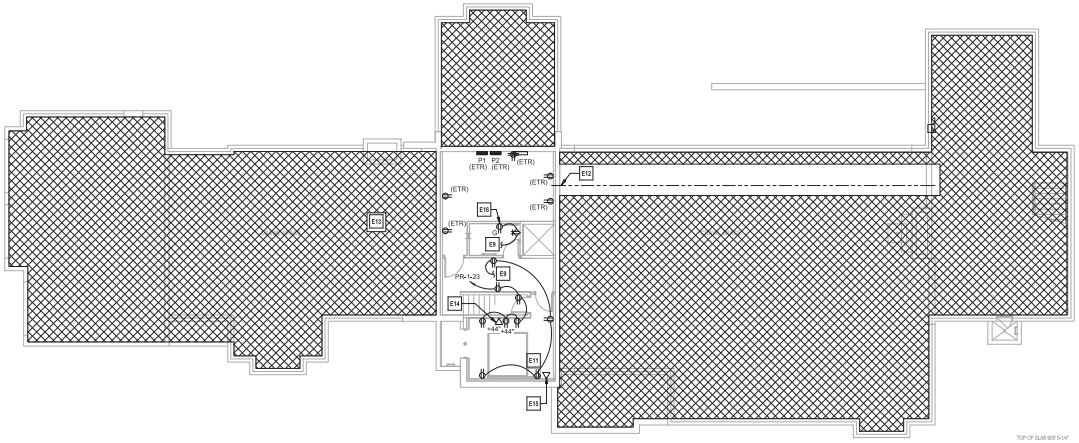
E12 PROVIDE 1 1/4" CONDUIT FOR FIRE ALARM AND SECURITY. PROVIDE WIRING FOR EACH ZONE BETWEEN EXISTING PANEL IN PRIVATE BASEMENT AND NEW FIRE ALARM AND SECURITY PANEL IN PUBLIC BASEMENT. MAINTAIN SAME NUMBER OF ZONES.

E13 HATCHED AREA NOT IN SCOPE OF WORK.

E14 ALL DATA TO CABLING TO BE PULLED BY PSU ITS. GC TO COORDINATE WITH PSU ITS PRIOR TO COVERUP.

E15 DATA DROP IS EXISTING TO REMAIN. EXTEND DROP AND REPLACE JUNCTION BOX TO ACCOMMODATE NEW STUD WALL.

E16 INSTALL RECEPTACLE MORE THAN 3' FROM THE TUB EDGE OF NIM. COORDINATE LOCATION WITH ARCHITECT PRIOR TO ROUGH.



1 POWER BASEMENT PLAN
1/8" = 1'-0"

PANELBOARD: PR-1 (ETR)

BUS AMPS: 400A
MAIN SIZE/TYPE: MLO
VOLTS/PHASE: 208Y/120V, 3PH, 4W
SECTION: 1

FED FROM: PR-2
AIC RATING: 10000; FULLY RATED
MOUNTING: SURFACE
SERVES: HOUSE
LOCATION: BASEMENT

LINE-SIDE LUGS: MECHANICAL
EQUIPMENT GROUND BUS

	CKT NO.	DESCRIPTION	VOLTAMPS/PHASE A	B	C	WIRE NO.	BKR AMP	P	P	BKR AMP	WIRE NO.	VOLTAMPS/PHASE A	B	C	DESCRIPTION	CKT NO.
	1	WASHER				EX	20	1	1	20	EX				DISHWASHER	2
	3	KITCHEN DINING LTG				EX	20	1	1	20	EX				LAUNDRY RM GFCI REC	4
	5	SPARE					20	1	1	20					SPARE	6
	7	SPRWLER				EX	20	1	1	20	EX				WST BD RM, CLST, BATH LTS	8
	9	UPSTAIRS & BEDRM REC				EX	20	1	1	20	EX				OUTSIDE REC GFCI	10
	11	MICROWAVE				EX	20	1	1	20	EX				W GARAGE DR OPENER	12
	13	SW KITCH GFCI				EX	20	1	1	20	EX				CENTER GARAGE DR OPENER	14
	15	OVEN				EX	20	2	1	20	EX				GARBAGE DISP	16
	17								1	20	EX				W RIT GFCI	18
	19	FIRE PLACE REC				EX	20	1	1	20	EX				DIMMING REC	20
R	21	(R L) BATH ROOM CIRCUIT		180		12	20	1	1	20	EX				1ST FLR OFF LTS	22
AF,GF,N	23	(R L) BASEMENT BEDROOM			900	12	20	1	1	20	EX				SE KIT GFCI REC	24
	25	GFCI 2ND FLR BATHRM				EX	20	1	1	20	EX				KIT ISLAND GFCI REC	26
	27	HUMIDIFIER				EX	20	1	1	15	EX				FLR RM REC	28
	29	EAST HOT WATER TANK			2,000	EX	40	2	2	60	EX			2,000	WEST HOT WATER TANK	30
	31		2,000						1			2,000				32
	33	EQUIPPED SPACE						1	1						EQUIPPED SPACE	34
	35	EQUIPPED SPACE						1	1						EQUIPPED SPACE	36
	37	EQUIPPED SPACE						1	1						EQUIPPED SPACE	38
	39	EQUIPPED SPACE						1	1						EQUIPPED SPACE	40
	41	EQUIPPED SPACE						1	1						EQUIPPED SPACE	42
		SUBTOTAL	2,000	180	2,900							2,000		2,000	SUBTOTAL	

TOTAL PHASE A - VA	4,900	LOAD		CONN. VA	DF	LOAD		CONN. VA	DF
AMPS	33	COOLING	(C)		1.00	REFRIG	(F)		1.00
TOTAL PHASE B - VA	180	HEATING	(H)		0	SIGNAGE	(S)		1.25
AMPS	2	LIGHTING	(L)		1.25	KITCHEN	(K)		1.00
TOTAL PHASE C - VA	4,900	RECEPTACLES	(R)	1,080	1.0-0.5	EXISTING	(E)		1.00
AMPS	41	MOTORS	(M)		1.00	LRG MOTOR			1.35
TOTAL PNLBD - VA	9,980	SURF HEAT	(U)	6,000	1.00	SNOW WND (W)			1.35
AMPS	25	MISC EQUIP	(Z)		1.00	LTG TRACK			1.00

TOTAL DEMAND	
	9,080 VA
	25 A

PANELBOARD NOTES
N - PROVIDE NEW CKT BRKR
GF - GFCI TYPE CIRCUIT BREAKER(5mA)
AF - ARC FAULT CKT INTERRUPTER
R - REUSE EXISTG CKT BRKR FOR NEW/REVISED LOAD

PANELBOARD: PR-2 (ETR)

BUS AMPS: 400A
MAIN SIZE/TYPE: MLO
VOLTS/PHASE: 208Y/120V, 3PH, 4W
SECTION: 1

FED FROM: UTILITY
AIC RATING: 10000; FULLY RATED
MOUNTING: SURFACE
SERVES: HOUSE
LOCATION: BASEMENT

LINE-SIDE LUGS: MECHANICAL
EQUIPMENT GROUND BUS
FEED THRU LUGS

CKT NO.	DESCRIPTION	VOLTAMPS/PHASE A	B	C	WIRE NO.	BKR AMP	P	P	BKR AMP	WIRE NO.	VOLTAMPS/PHASE A	B	C	DESCRIPTION	CKT NO.
1	MASTER BR				EX	20	1	1	20					SPARE	2
3	SPARE					20	1	1	20					SPARE	4
5	BASEMENT WATER CIRC PUMP				EX	20	1	1	20					SPARE	6
7	BASEMENT RECEPTACLE	1,673			EX	20	1	1	20					SPARE	8
9	DRYER		1,875		EX	30	2	1	20	EX				1ST FLR OFFICE RECEPTACLES	10
11				3,975				1	20	EX				ALL BATHROOMS EX FANS	12
13	KITCHEN COOKTOP	3,974			EX	30	2	1	20	EX				LTS READ RM2NF FLR/GARAGE	14
15								1	20					SPARE	16
17	PHONE BOARD				EX	20	1	1	20	EX				MASTER BEDROOM RECETACLES	18
19	BASEMENT LIGHTS				EX	20	1	1	20					SPARE	20
21	SPARE					20	1	1	20	EX				E GARAGE DOOR	22
23	A/C BASEMENT UNIT				EX	20	2	1	20	EX				LTS 2NF FLR/BR1,3/BATH	24
25								2	20	EX				MASTER BATH TUB	26
27	BASEMENT FURNACE				EX	50	2								28
29								1	20	EX				LTS	30
31	SPARE					60	2	1	20	EX				LTS LAUNDRY RM/BATH/HALL	32
33								1	20	EX				WATER HEATER CONTROLS	34
35	BASEMENT AIR HANDLER				EX	30	2	1	20	EX				GARAGE RECEPTACLES	36
37								1	20					SPARE	38
39	SPARE					40	2	1	20					SPARE	40
41								1	20					SPARE	42
	SUBTOTAL	5,650	1,875	3,975							4,000	180	4,900	SUBTOTAL	

TOTAL PHASE A - VA	9,650	LOAD		CONN. VA	DF	LOAD		CONN. VA	DF
AMPS	82	COOLING	(C)		1.00	REFRIG	(F)		1.00
TOTAL PHASE B - VA	2,055	HEATING	(H)		0	SIGNAGE	(S)		1.25
AMPS	17	LIGHTING	(L)		1.25	KITCHEN	(K)		1.00
TOTAL PHASE C - VA	8,875	RECEPTACLES	(R)	1,080	1.0-0.5	EXISTING	(E)		1.00
AMPS	74	MOTORS	(M)		1.00	LRG MOTOR			1.35
TOTAL PNLBD - VA	20,780	SURF HEAT	(U)	18,660	1.00	SNOW WND (W)			1.35
AMPS	58	MISC EQUIP	(Z)	3,750	1.00	LTG TRACK			1.00

TOTAL DEMAND	
	20,780 VA
	58 A

PANELBOARD NOTES

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01/28/2022

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EXPIRES 12/31/2022

#	DATE	DESCRIPTION

UNIVERSITY HOUSE

PITTSBURG STATE UNIVERSITY
PITTSBURG KANSAS
Building Number: 38500-0230

CONSTRUCTION DOCUMENTS

Original Size: 1 1/2" Drawing may have been reduced.

POWER BASEMENT PLAN

DATE: 01-28-2022
DRAWN: Author
CHECKED: Checker
PGAV # 5345E-00
CUSTV # 4-214445
SHEET #
E201

Division 26: GENERAL ELECTRICAL REQUIREMENTS

1 GENERAL INSTRUCTIONS

A. GENERAL REQUIREMENTS

All requirements under Division 01 and the general and supplementary conditions of these specifications apply to this section and division, Where the requirements of this section and division exceed those of Division 01, this section and division take precedence, Become thoroughly familiar with all its contents as to requirements that affect this division, section, or both, Work required under this division includes all material, equipment, appliances, transportation, services, and labor required to complete the entire system as required by the drawings and specifications, or reasonably inferred to be necessary to facilitate the function of each system as implied by the design and the equipment specified,

The specifications and drawings for the project are complementary, and any portion of work described in one shall be provided as if described in both, In the event of discrepancies, notify the Engineer and request clarification prior to proceeding with the Work involved.

Drawings are graphic representations of the work upon which the contract is based, They show the materials and their relationship to one another, including sizes, shapes, locations, and connections, They convey the scope of work, indicating the intended general arrangement of the systems without showing all of the exact details as to elevations, offsets, control lines, and other installation requirements, Use the drawings as a guide when laying out the work and to verify that materials and equipment will fit into the designated spaces, and which when installed per manufacturers' requirements, will ensure a complete, coordinated, satisfactory, and properly operating system.

B. DEFINITIONS

Division: References contained in this specification follow the numbering system defined in the Construction Specifications Institute (CSI) MasterFormat 2004 Edition, Specification Divisions 01 through 13 provided with this project may reference the CSI MasterFormat 1995 Edition, The corresponding division references between the 2004 Edition and 1995 Edition are as follows:

2004 Edition	1995 Edition
Division 21 – Fire Suppression	Division 15
Division 22 – Plumbing	Division 15
Division 23 – HVAC	Division 15
Division 26 – Electrical	Division 16
Division 27 – Communications	Division 16
Division 28 – Electronic Safety and Security	Division 16

Furnish: "to supply and deliver to the project site, ready for unloading, unpacking, assembling, installing, and similar operations."

Install: "to perform all operations at the project site including, but not limited to, the actual unloading, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, testing, commissioning, starting up and similar operations, complete, and ready for the intended use."

Provide: "to furnish and install."

Furnished by Owner (or Owner-Furnished) or Furnished by Others: "an item furnished by the Owner or under other divisions or contracts, and installed under the requirements of this division, complete, and ready for the intended use, including all items and services incidental to the work necessary for proper installation and operation, Include the installation under the warranty required by this division,

Engineer: Where referenced in this Division, "Engineer" is the Engineer of Record and the Design Professional for the work under this division, and is a consultant to, and an authorized representative of the Architect, as defined in the General and/or Supplementary Conditions, When used in this division, Engineer means increased involvement by and obligations to the Engineer, in addition to involvement by and obligations to the Architect.

AHJ : The local code and/or inspection agency (Authority) Having Jurisdiction over the Work,

NRTL : Nationally Recognized Testing Laboratory, as defined and listed by OSHA in 29 CFR 1910.7 (e.g., UL, ETL, CSA), and acceptable to the AHJ over this project, Nationally recognized testing laboratories and standards listed are used only to represent the characteristics required and are not intended to restrict the use of other NRTLs that are acceptable to the AHJ and standards that meet the specified criteria.

Homerun: That portion of an electrical circuit originating at a junction box, termination box, receptacle, or switch with termination at an electrical panelboard, Note: Where MC cable is utilized for receptacle and/or lighting branch circuiting loads, the originating point of the homerun shall be at the first load in the circuit or at a junction box located in an accessible ceiling space as close as possible to the first load.

Substitution: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor, Substitutions include Value Engineering proposals.

1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms,
2. Substitutions for convenience: changes proposed by contractor or owner that are not required in order to meet other project requirements but may offer advantage to contractor or owner.

When 'furnish', 'install', 'perform', or 'provide' is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Contractor, "provide" is implied.

The terms "approved equal", "equivalent", or "equal" are used synonymously and shall mean 'accepted by or acceptable to the Engineer as equivalent to the item or manufacturer specified'. The term "approved" shall mean labeled, listed, certified, or all three, by an NRTL, and acceptable to the AHJ over this project.

C. PRE-BID SITE VISIT

Prior to submitting bid, visit the site of the proposed work and become fully informed as to the conditions under which the work is to be done, Failure to comply with this requirement shall not be considered sufficient justification to request or obtain extra compensation over and above the contract price.

Existing conditions were taken from original drawings and/or site visits and may not reflect exact "as-built" conditions, Contractor shall verify existing conditions prior to submitting final bid, Coordinate new and demolition work with all other trades and existing conditions.

D. MATERIAL AND WORKMANSHIP

Provide new material, equipment, and apparatus under this contract unless otherwise stated herein, of best quality normally used for the purpose in good commercial practice, and free from defects, Model numbers listed in the specifications or shown on the drawings are not necessarily intended to designate the required trim, written descriptions of the trim govern model numbers.

Provide markings or a nameplate for all material and equipment identifying the manufacturer and providing sufficient reference to establish quality, size, and capacity, All workmanship shall be of the finest possible by experienced mechanics of the proper trade, In general, provide the following quality grade(s) for all materials and equipment.

Commercial specification grade

Provide all hoists, scaffolds, staging, runways, tools, machinery, and equipment required for the performance of the electrical work, Store and maintain material and equipment in clean condition, and protected from weather, moisture, and physical damage.

Furnish only material and equipment that are listed, labeled, certified, or all three, by an NRTL whenever any listing or labeling exists for the types of material and equipment specified.

At a minimum, general work practices for electrical construction shall be in accordance with NECA 1 (latest edition), "Standard Practices for Good Workmanship in Electrical Construction".

E. MANUFACTURERS

In other articles where lists of manufacturers are introduced, subject to compliance with requirements, provide products by one of the manufacturers specified.

Where a list is provided, manufacturers are listed alphabetically and not in accordance with any ranking or preference.

Where manufacturers are not listed, provide products subject to compliance with requirements from manufacturers that have been actively involved in manufacturing the specified product for no less than 5 years.

F. COORDINATION

Coordinate all work with other divisions and trades so that various components of the systems are installed at the proper time, fit the available space, and allow proper service access to those items requiring maintenance, Components which are installed without regard to the above shall be relocated at no additional cost to the Owner,

All roof penetrations, floor chasing and/or core drilling shall require the specific approval of the Landlord and Owner, All work in common areas, shafts or other Landlord owned spaces must be reviewed and approved by the Landlord and Owner prior to commencement of the work, Contractor shall minimize any disruption and disturbances to other tenants, All work within other tenant spaces must be coordinated with and approved by the Landlord and Owner.

Unless otherwise indicated, the General Contractor shall provide chases and openings in building construction required for installation of the systems specified herein, Contractor shall furnish the General Contractor with information where chases and openings are required, Contractor shall keep informed as to the work of other trades engaged in the construction of the project and shall execute work in a manner as to not interfere with or delay the work of other trades.

Figured dimensions shall be taken in preference to scale dimensions, Contractor shall take his own measurements at the building, as variations may occur, Contractor shall be held responsible for errors that could have been avoided by proper checking and inspection.

Provide materials with trim that will properly fit the types of ceiling, wall, or floor finishes actually installed, Model numbers listed in the specifications or shown on the drawings are not intended to designate the required trim,

Make all offsets required to clear equipment, beams, and other structural members, and to facilitate concealing raceways in the manner anticipated in the design, Provide materials with trim that will fit properly the types of ceiling, wall, or floor finishes actually installed.

Coordinate all work with Architectural phasing drawings to properly stage transitions of work to provide power to existing, new and temporary loads, Monitor loads on distribution system to ensure shifting of loads does not overload electrical equipment.

G. ORDINANCES AND CODES

Work performed under this contract shall, at a minimum, be in conformance with applicable national, state and local codes having jurisdiction, Equipment furnished and associated installation work performed under this contract shall be in strict compliance with current applicable codes adopted by the local AHJ, including any amendments and standards as set forth by the following:

1. National Fire Protection Association (NFPA)
2. Underwriters Laboratories (UL)
3. Occupational Safety and Health Administration (OSHA)
4. American National Standards Institute (ANSI)
5. American Society of Testing Materials (ASTM)
6. Rules and regulations of public utilities and municipal departments affected by connection of services,
7. Other national standards and codes where applicable.

Where the contract documents exceed the requirements of the referenced codes, standards, etc., the contract documents shall take precedence, Where conflicts between various codes, ordinances, rules, and regulations exist, comply with the most stringent.

Promptly bring all conflicts observed between codes, ordinances, rules, regulations, referenced standards, and these documents to the attention of the Architect and Engineer for final resolution, Contractor will be held responsible for any violation of the law.

Procure and pay for permits and licenses required for the accomplishment of the work herein described, Where required, obtain, pay for, and furnish certificates of inspection to Owner, Provide all safety lights, guards, and warning signs required for the performance of the work and for the safety of the public.

Electrical equipment shall be located so that the code required minimum working clearance and dedicated electrical space are maintained, Existing equipment not meeting current code required clearance requirements may remain if allowed by the AHJ, Engineer and Owner.

H. PROTECTION OF EQUIPMENT AND MATERIALS

Store and protect from damage equipment and materials delivered to job site, For materials and equipment susceptible to changing weather conditions, dampness, or temperature variations, store inside in conditioned spaces, For materials and equipment not susceptible to these conditions, cover with waterproof, tear-resistant, heavy tarp or polyethylene plastic as required to protect from plaster, dirt, paint, water, or physical damage, Equipment and material damaged by construction activities shall be rejected, and Contractor shall furnish new equipment and material of a like kind at his own expense.

Keep premises broom clean of foreign material created during work performed under this contract, Conduit, equipment, etc, shall have a neat and clean appearance at the termination of the work.

Protect adjacent materials indicated to remain, For work specific to this Division, Install and maintain dust and noise barriers to keep dirt, dust, and noise from being transmitted to adjacent areas, Remove protection and barriers after demolition operations are complete.

Plug or cap open ends of conduits while stored and installed during construction when not in use to prevent the entrance of debris into the systems.

I. SUBSTITUTIONS

Materials, products, equipment, and systems described in the Bidding Documents establish a standard of required function, dimension, appearance and quality to be met by the proposed substitution, The base bid shall include only the products from manufacturers specifically named in the drawings and specifications, To request a substitution, request the Substitution Request Form from the Architect or Engineer, Complete and send the Substitution Request Form for each material, product, equipment, or system that is proposed to be substituted, The burden of proof of the merit of the proposed substitution is upon the proposer,

Unless stated otherwise in writing to the Engineer by the Contractor, Contractor warrants to the Engineer, Architect, and Owner the following:

1. Proposed substitution has been fully investigated and determined to meet or exceed the specified Work in all respects unless stated otherwise in the substitution request.
2. Proposed substitution is consistent with the Contract Documents and will produce indicated results, including functional clearances, maintenance service, and sourcing of replacement parts.

Proposed substitution has received necessary approvals of authorities having jurisdiction.

Same warranty will be furnished for proposed substitution as for specified Work.

If accepted substitution fails to perform as required, Contractor shall replace substitute material or system with that originally specified and bear costs incurred thereby.

Coordination, installation and changes in the Work as necessary for accepted substitution will be complete in all respects.

No substitutions will be considered unless the Substitution Request Form is completed and attached with the appropriate substitution documentation, No substitution will be considered prior to receipt of bids unless written request for approval to bid has been received by the Engineer at least ten (10) calendar days prior to the date for receipt of bids.

If the proposed substitution is approved prior to receipt of bids, such approval will be stated in an addendum, Bidders shall not rely upon approvals made in any other way, Verbal approval will not be given, No substitutions will be considered after the contract is awarded unless specifically provided in the contract documents.

J. SUBMITTALS

Assemble and submit for review shop drawings, material lists, manufacturer product literature for equipment to be furnished, and items requiring coordination between contractors under this contract, Provide submittals in sufficient detail so as to demonstrate compliance with these Contract Documents and the design concept, Prior to transmitting submittals, verify that the equipment submitted is mutually compatible with and suitable for the intended use, will fit the available space, and maintains manufacturer recommended service clearances, If the size of equipment furnished makes necessary any change in location or configuration, submit a shop drawing showing the proposed layout.

Transmit submittals as early as required to support the project schedule, Allow two weeks for Engineer review time, plus to/from mailing time via the Architect, plus a duplication of this time for resubmittals, if required, Only resubmit those sections requested for resubmittal.

Submittals shall contain the project name, applicable specification section, submittal data, equipment identifications acronym as used on the drawings, and the Contractor's stamp, The stamp shall certify that the submittal has been checked by the Contractor, complies with the drawings and specifications, and is coordinated with other trades, Manufacturer product literature shall include shop drawings, product data, performance sheets, samples, and other submittals required by this division, Highlight, mark, list, or indicate the materials, performance criteria, and accessories that are being proposed, General product catalog data not specifically noted to be part of the specified product will be rejected and returned without review.

Submittals and shop drawings shall not contain firm name, logo, the seal, or signature of the Engineer, They shall not be copies of the work product of the Engineer, If the Contractor desires to use elements of such product, refer to paragraph "Electronic Drawing Files" for procedures to be used.

Separate submittals according to individual specification sections, Ineligible submittals will be rejected and returned without review, Catalog data shall be properly bound, identified, indexed and tabbed in a 3-ring binder, Each item or model number shall be clearly marked and accessories indicated, Label the catalog data with the equipment identification acronym or number as used on the drawings and include performance curves, capacities, sizes, weights, materials, finishes, wiring diagrams, electrical requirements and deviations from specified equipment or materials, Mark out inapplicable items, Shop drawings will be returned without review if the above mentioned requirements are not met.

Provide the quantity of submittals required by Division 01, If not indicated and hard-copy sets are provided, submit a minimum of six (6) copies, Refer to Division 01 for acceptance of electronic submittals for this project, For electronic submittals, Contractor shall submit the documents in accordance with the procedures specified in Division 01, Contractor shall notify the Architect and Engineer that the submittals have been posted, If electronic submittal procedures are not defined in Division 01, Contractor shall include the website, user name, and password information needed to access the submittals, For submittals sent by e-mail, Contractor shall copy the designated representatives of the Architect and Engineer, Contractor shall allow for the Engineer review time as specified above in the construction schedule, Contractor shall submit only the documents required to purchase the materials and/or equipment in the submittal.

The checking and subsequent acceptance of submittals by the Engineer and/or Architect shall not relieve the Contractor from responsibility for deviations from the drawings and specifications, errors in dimensions, details, sizes of equipment, or quantities, omissions of components or fittings, coordination of electrical requirements, and not coordinating items with actual building conditions and adjacent work, Contractor shall request and secure written acceptance from the Engineer and Architect prior to implementing any deviation.

K. ELECTRONIC DRAWING FILES

In preparation of shop drawings or record drawings, Contractor may, at his option, obtain electronic drawing files in AutoCAD or DXF format on CD-ROM disk, DVD disk, flash drive, or direct download, as desired, from the Engineer for a shipping and handling fee of $200 for a drawing set up to 12 sheets and $15 per sheet for each additional sheet, Contact the Architect for written authorization and Engineer for the necessary agreement form and to specify shipping method and drawing format, In addition to payment, the written authorization from the Architect and release agreement form from the Engineer must be received before electronic drawing files will be sent.

L. RECORD DRAWINGS (AS-BUILT DRAWINGS)

During progress of the work in this division, Contractor shall maintain an accurate record of all changes made during the installation of the systems, Upon completion of the work, accurately transfer all record information to three identical sets of the approved shop drawings, Insert one set into each copy of the manual described below.

See Division 01 and General Conditions for additional information.

M. OPERATION AND MAINTENANCE INSTRUCTIONS

During the course of construction, collect and compile a complete brochure of equipment furnished and installed on this project, Include operational and maintenance instructions, manufacturer's catalog sheets, wiring diagrams, parts lists, approved submittals and shop drawings, warranties, and descriptive literature as furnished by the equipment manufacturer, Include an inside cover sheet that lists the project name, date, Owner, Architect, Engineer, General Contractor, Sub-Contractor, and an index of contents.

Submit three copies of literature bound in approved binders with index and tabs separating equipment types to the Architect, for Engineer's review, at the termination of the work, Paper clips, staples, rubber bands, loose-leaf binding, and mailing envelopes are not considered approved binders, Final approval of systems installed under this contract shall be withheld until this equipment brochure is received and deemed complete by the Architect and Engineer, Instruct workmen to save required literature shipped with the equipment itself for inclusion in this brochure.

Include Record Drawings as described above.

Refer to Division 01 for acceptance of electronic manuals for this project, For electronic manuals, refer to paragraph "Submittals" for requirements.

N. WARRANTIES

Warrant each system and each element thereof against all defects due to faulty workmanship, design, or material for a period of 12 months from date of Substantial Completion, unless specific items are noted to carry a longer warranty in these construction documents or manufacturer's standard warranty exceeds 12 months, Remedy all defects occurring within the warranty period(s) as stated in the General Conditions and Division 01.

Warranties shall include labor and material, including travel expenses, Make repairs or replacements without any additional costs to the Owner, and to the satisfaction of the Owner, Architect, and Engineer.

Perform the remedial work promptly, upon written notice from the Engineer or Owner.

Also warrant the following additional items:

1. All raceways are free from obstructions, holes, crushing, or breaks of any nature.
2. All raceway seals are effective.
3. The entire electrical system is free from all short circuits and unwanted open circuits and grounds.

At the time of Substantial Completion, deliver to the Owner all warranties, in writing and properly executed, including term limits for warranties extending beyond the one year period and any actions the Owner must take in order to maintain warranty status, Each warranty instrument shall be addressed to the Owner and state the commencement date and term.

2 GENERAL MATERIALS AND INSTALLATION

A. BUILDING OPERATION

Comply with the schedule of operations as outlined in the architectural portions of this specification, Building shall be in operation during normal workday hours, Accomplish work requiring interruption of building operation at a time when the building is not in operation and only with written approval of building Owner and/or tenant, Coordinate interruption of building operation with the Owner and/or tenant a minimum of seven (7) days in advance of work.

B. EXISTING EQUIPMENT REUSE AND REMOVAL

Provide all demolition of existing electrical systems and new electrical system modifications required because of building remodeling, as noted on the Drawings, or necessary for proper operation and new construction, Remove all abandoned cables and wiring and conduit above accessible ceilings and ventilation shafts.

Notify Architect, Engineer and Owner immediately of any dangerous conditions that exist on the job site, as they are discovered, before demolition, during selective demolition or before remodel work begins.

Remove all existing wiring, light fixtures, exposed conduits, and other electrical installations not reused prior to substantial completion of the work.

Existing raceways may be reused if their points of terminations are suitable, if they are clean inside with no evidence of rust or burrs, if free from cracks, flattened sections, or sharp bends; and, if suitably located to avoid conflicts with other trades or installations, Carefully "fish" all existing conduits reused under this contract to remove all debris and obstructions, and swab until all moisture is removed.

Cut, patch, and repair where required for new electrical installations, and patch and repair all surface damage resulting from this work, Cut flush with the floor and plug all both ends raceways stubbed above the floor and not used at substantial completion of the work.

Relocate all existing electrical systems required to be in operation at substantial completion of the contract, if required, as a result of work included under this contract, even if not specifically indicated in the drawings or specifications.

Existing service entrance conductors and feeder conductors may be reused if all of the following conditions are met:

1. Conductor sizes meet or exceed the sizes specified on the drawings.
2. Conductor insulation is in good or better condition.
3. Conductor insulation is the correct type for the conditions.

C. COINCIDENTAL DAMAGE

Avoid damaging streets, sidewalks, drives, paving, walls, finishes, and other facilities, including equipment, light fixtures, and devices that are existing to remain, new or reused, Repair all damage caused in the course of this Work at no extra cost to the Owner, Repair or replace any existing damaged or recalled electrical equipment, light fixtures, wiring devices and related circuitry and restore all electrical systems to proper working order, Repair materials shall match existing construction, Repair work shall meet all requirements of the Owner, local authorities having jurisdiction, and meet the satisfaction of the Architect, Repair work shall be thoroughly first class and be free from any defects.

D. CUTTING AND PATCHING

Conform to the requirements in Division 01, Cut walls, floors, ceilings, and other portions of the facility as required to install work under this division, Obtain permission of the Architect prior to cutting, Do not cut or disturb structural members without prior approval from the Architect, Cut holes as small as possible, Patch walls, floors, and other portions of the facility as required by work under this division, Patching shall match the original material and construction including fire ratings, if applicable, Repair and refinish areas disturbed by work to the condition of adjoining surfaces in a manner satisfactory to the Architect.

E. ROUGH-IN

Coordinate without delay all roughing-in with other divisions, Conceal all conduit and raceways except in unfinished areas and where otherwise indicated on the drawings.

F. SUPPORT SYSTEMS

Steel Slotted Support Systems (Slotted Channel): Comply with MFMA-3, factory-fabricated components for field assembly; 12-gauge, 1-5/8-inch by 1-5/8-inch.

Finishes:

1. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-3.

Aluminum Slotted Support Systems (Slotted Channel): Comply with MFMA-3, Type 6063-T6, per ASTM B221; factory-fabricated components for field assembly; 12-gauge, 1-5/8-inch by 1-5/8-inch.

Manufacturers: Cooper B-Line, ERICO International, Hilti, Power-Strut, Thomas and Betts, or Unistrut.

Field Fabrication:

Where field cutting of standard lengths of channel are required, make cuts straight and perpendicular to manufactured surfaces.

For field-cut or damaged surfaces of coated channels, dress cut ends, damaged surfaces, or both, with an abrasive material (e.g., file, grinding stone, or similar) and cleanser to remove oils, rust, sharp edges, and shards.

For channel with a factory-applied coating, re-finish cut edges with a coating compatible with the factory finish and as recommended by the manufacturer (e.g., manufacturer's touch-up paint or zinc-rich cold-galvanizing compound, as applicable).

G. PENETRATIONS

Coordinate sleeve selection and application with selection and application of fire-stopping specified in Division 07 section "Through-Penetration Firestop Systems."

Roofs:

1. Coordinate all roof penetrations with Engineer, Owner, and as applicable, the roofing contractor providing a roof warranty.
2. Keep all raceway penetrations within mechanical equipment curbs wherever possible, Coordinate with Division 01.
3. Flash and counterflash all openings through roof, and/or provide pre-fabricated molded seals compatible with the roof construction installed, or as required by the Engineer, Owner, or roofing contractor, All roof penetrations shall be leaktight at the termination of the work and shall not void any new or existing roof warranties.

Walls and Floors:

1. Steel Pipe Sleeves for Raceways and Cables: ASTM A53/A53M, Type E, Grade B, Schedule 40, galvanized steel, plain ends, and drip rings.
2. Cast-in-in Pipe Sleeves for Raceways and Cables: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop, unless otherwise indicated.
3. Sleeves for Rectangular Openings: Galvanized sheet steel with minimum 0.052 inch thickness and of length to suit application.

H. FIRESTOPPING

Sealants and accessories shall have fire-resistance ratings indicated, as established by testing identical assemblies in accordance with UL 2079 or ASTM E 814, or other NRTL acceptable to AHJ.

Manufacturers: Hilti, RectorSeal, Specified Technologies Inc., United States Gypsum Company, or 3M corp.

Through and Membrane Penetration Firestopping Systems Product Schedule: Provide UL listing, location, wall or floor rating, and installation drawing for each penetration fire stop system.

Where project conditions require modification to qualified testing and inspecting agency's illustrations for a particular firestopping condition, submit illustration, with modifications marked, approved by penetration firestopping manufacturer's fire-protection engineer, as an engineering judgment or equivalent fire-resistance-rated assembly. Include qualifications data for testing agency.

I. EQUIPMENT FURNISHED BY OTHERS

Provide necessary equipment and accessories that are not provided by the equipment supplier or Owner to complete installation of equipment furnished by others in locations as indicated on the drawings, specified herein, or both, Equipment and accessories not provided by the equipment supplier may include, but not be limited to, flexible cords and plugs as required for proper operation of the complete system, in accordance with the manufacturers' instructions.

Contractor shall be responsible for correct rough-in dimensions, and verify them with Architect and/or equipment supplier prior to rough-in and service installations.

J. SYSTEM TESTING AND ADJUSTING

Adjust, align, and test all electrical equipment on this project provided under this division and all electrical equipment furnished by others for installation or wiring under this division for proper operation.

Test all systems and equipment according to the requirements in NETA ATS (latest edition) and all additional requirements specified in following sections.

Maintain the following on the project premises at all times: a true RMS reading voltmeter, a true RMS reading ammeter, and a megohmmeter insulation resistance tester, Provide test data readings as requested or as required by the Engineer.

K. EQUIPMENT IDENTIFICATION

Provide equipment identification nameplates on all switchboards, panelboards, electrical equipment enclosures, access doors, transformers, disconnect switches, enclosed circuit breakers, motor starters, feeder devices in switchboards, distribution panelboards, and motor control centers.

Nameplates:

1. Engraved, contrasting color, three-layer, laminated plastic, indicating the name of the equipment, load, or circuit as designated on the drawings and in the specifications

Attachment method shall be acceptable to the manufacturers of the equipment to which the nameplates are being applied.

Nameplate Color:

1. Black background with white letters for Normal Power;
2. Letter height: 3/8-inch minimum.

L. SYSTEM START UP

Perform the following prior to starting up the electrical systems:

1. Check all components and devices and lubricate items accordingly.
2. Tighten screws and bolts for connectors and terminals according to manufacturer's published torque-tightening values, If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.
3. After all systems have been inspected and adjusted, confirm all operating features required by the drawings and specifications and make final adjustments as necessary.

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01/28/2022

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EXPIRES 12/31/2022

#	DATE	DESCRIPTION

UNIVERSITY HOUSE

PITTSBURG STATE UNIVERSITY
PITTSBURG KANSAS
Building Number: 38500-0230

CONSTRUCTION DOCUMENTS

Original Size: 1 1/2" Drawing may have been reduced.

ELECTRICAL SPECIFICATIONS

DATE: 01-28-2022	
DRAWN: RAG	DESIGNED: RAG
PROJ #: 134584.00	IDENTIFY: (~)-14445

SHEET #:
E300

RAG

CURTIS A. OLDS

Division 26: BASIC ELECTRICAL MATERIALS AND METHODS

1 RACEWAYS

A. METALLIC CONDUIT AND TUBING

Electrical Metallic Tubing, Couplings, and Fittings (EMT): ANSI C80.3, UL 797. Only steel products allowed. Reduced wall EMT is not allowed.

Flexible Metal Conduit (FMC): Zinc-coated steel or aluminum, UL 1, Reduced-wall FMC is not allowed.

Intermediate Metal Conduit (IMC): Hot-dip Galvanized Rigid Steel Conduit, ANSI C80.6, UL 1242.

Liquidtight Flexible Metal Conduit (LFMC): Flexible steel conduit with PVC jacket, UL 360; fittings: NEMA FB 1.

Rigid Metal Conduit (RMC):

1. Hot-dip Galvanized Rigid Steel Conduit (GRS): ANSI C80.1, UL 6.

Plastic-Coated IMC, RMC, and Fittings: NEMA RN 1, NRTL listed. Coating thickness of 0.04 inches minimum.

IMC and RMC Fittings: NEMA FB 1; compatible with conduit type and material, NRTL listed.

Manufacturers: AFC Cable, Allflex, Anamet Electrical, Electri-Flex, Indalex, Manhattan/CDT/Cable-Flex, O-Z/Gedney, Republic Raceway, Tyco International, Western Tube and Conduit, or Wheatland Tube.

2 RACEWAY INSTALLATION

A. GENERAL RACEWAY INSTALLATION REQUIREMENTS

Install raceways parallel and perpendicular to building lines.

Install raceways to requirements of structure, to requirements of all other work on the project, and to clear all openings, depressions, pipes, ducts, reinforcing steel, and other immovable obstacles.

Install raceways set in forms for concrete structure in such a manner that installation will not affect the strength of the structure.

Except where approved in writing by the Engineer, install no raceway in a slab-on-grade. Locate raceway below granular fill below slabs-on-grade.

Install raceways continuous between connections to outlets, boxes, and cabinets with a minimum possible number of bends and not more than the equivalent of four 90-degree bends between connections. Use manufactured elbows for all 45- and 90-degree bends, unless approved by the Engineer in advance. Make other bends smooth, even and without flattening raceway or flaking galvanizing or enamel. Radii of bends shall be as long as possible and never shorter than the corresponding trade elbow.

Conceal raceways from view unless noted or approved otherwise.

Route raceways serving rooftop equipment inside equipment curb and minimize roof penetrations and exterior raceway runs. Support raceway from structure, do not support from the roof decking. Maintain 2' spacing between the raceway and roof deck to prevent roofing screws from penetrating raceway. Do not route raceways across skylights or other roof penetrations.

Route all exposed non-flexible raceways light to structure, parallel to building lines in strut or cable tray where practicable. Install raceways plumb/level where exposed to view.

Use long radius elbows for all underground installations, where necessary, or where otherwise indicated.

Securely fasten raceways in place with approved straps, hangers, and steel supports as required. Attach raceway supports to the building structure. Hang single raceways for feeders with malleable split ring hangers with rod and turnbuckle suspension from inserts spaced not over 10 feet apart in construction above. Clamp groups of horizontal feeder raceways to steel channels that are suspended from inserts spaced over 10 feet apart in construction above. Securely clamp vertical feeder raceways to structural steel members attached to structure. Install cable clamps for support of vertical feeders where required. Add raceway supports within 12 inches of all bends, on both sides of the bends. Do not support raceways from suspended ceiling components.

Ream raceway ends, thoroughly clean raceways before installation, and keep clean after installation. Plug or cover openings and boxes as required to keep raceways clean during construction and fish all raceways clear of obstructions before pulling conductor wires. Provide raceways of ample size for pulling of wire, not smaller than code requirements and not less than 1/2-inch in size, unless indicated otherwise on Drawings. Homeruns containing more than one branch circuit shall not be less than 3/4-inch in size.

Protect all raceway installations against damage during construction. Repair all raceways damaged or moved out of line after roughing-in to meet Engineer's approval without additional cost to the Owner.

Align and install true and plumb all raceway terminations at panelboards, switchboards, motor control equipment, and junction boxes.

Install approved expansion/deflection fittings where raceways pass through (if embedded) or across (if exposed) expansion joints, and when using RNC or RAC in exposed environments in accordance with NFPA 70 and expansion/contraction properties of RNC or RAC.

Install a pull wire in each empty raceway that is left for installation of conductors or cables under other divisions or contracts. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 24 inches of slack at each end of pull wire.

Terminate all conduit stub-ups with nylon bushings.

Make all joints and connections in a manner that will ensure mechanical strength and electrical continuity.

Coordinate raceway routing and installation with other trades prior to rough-in and installation.

B. ABOVE GROUND RACEWAY USE:

Install all circular raceways concealed above suspended ceilings or concealed in walls or floors wherever possible except where otherwise indicated. Provide GRS for all conduits exposed to weather or other hazardous conditions.

Unless noted otherwise, all other raceway may be EMT where approved by local code. Use compression type fittings for EMT, with all fittings NRTL listed for the environment in which they are used. Unless noted otherwise, use screw type fittings are not allowed.

C. EQUIPMENT CONNECTIONS

Use FMC for final connection to each motor, transformer, and any device that would otherwise transmit motion, vibration, or noise. Use LFMC where exposed to liquids, vapors, or sunlight, and to connect to kitchen and food service equipment. Provide all FMC and LFMC with an insulated bonding conductor.

Use only metal raceways for all power wiring from the output of variable frequency drives to their respective motors.

D. BUSHINGS AND LOCKNUTS

Rigidly terminate conduits entering sheet metal enclosures to the enclosure with a bushing and locknut on the inside and a locknut or an approved hub on the outside. Conduit shall enter the enclosure squarely.

Provide bushings and locknuts made of galvanized malleable iron with sharp, clean-cut threads.

Where EMT enters a box, provide approved EMT compression connectors.

Use insulated, grounding, or combination bushings wherever connection is subject to vibration and/or motion, or when required by NFPA 70.

Provide nylon bushings for all communications and low voltage wiring conduits and sleeves, unless noted otherwise.

3 CONDUCTORS AND CABLES

A. GENERAL CONDUCTOR AND CABLE REQUIREMENTS

Annealed (soft) copper complying with ICEA S-95-658/NEMA WC70 and UL standards 44 or 83 as applicable.

Conductor Insulation Types: 90-degree C-rated, Type THHN/THWN-2 or XHHW-2 complying with ICEA S-95-658/NEMA WC70.

Sizes of conductors and cables indicated or specified are in American Wire Gage (AWG - Brown and Sharpe).

All feeder and branch circuit conductors No. 8 AWG and larger: Stranded.

All conductors, No. 10 AWG and smaller: Solid copper.

All Branch Circuit Wiring: Not smaller than No. 12 AWG. If no conductor size is indicated on the Drawings for a branch circuit, provide conductors and conduit sized per NFPA 70 and based on the indicated branch circuit overcurrent protective device (OCPD) rating and number of poles. Where no circuit size (i.e., conductors and OCPD) is indicated on the drawings for a branch circuit, provide three No. 12 AWG conductors, in 3/4-inch raceway, and a 20A circuit breaker.

Control Wiring: Stranded copper conductors, 600V insulation, of the proper type, size, and number as required to accomplish specified function. Minimum size: No. 14 AWG, unless noted otherwise.

Flexible Cords and Cables: Stranded copper conductors for all, unless noted otherwise.

Special Purpose Conductors And Cables, Such As Low Voltage Control And Shielded Instrument Wiring: As recommended by the system equipment manufacturer unless indicated otherwise.

Copper Conductor Manufacturers: Advance Wire and Cable, AFC Cable, Alan Wire, Allflex, American Insulated Wire, Encore Wire, Northern Cables, Okonite, or Southwire.

Connections: Apply a zinc based anti-oxidizing compound to connections. Do not use terminals on wiring devices to feed through to the next device.

B. CONDUCTORS AND CABLES INSTALLATION

Install all wiring in approved raceway and enclosures, except where specified or indicated for low-voltage wiring, where specified or indicated for direct-buried cables, or where type MC cable is indicated or specified as acceptable.

Install all conductors and cables in raceways continuous without taps or splices. Splice or tap only in approved boxes and enclosures with approved solderless connectors, or crimp connectors and terminal blocks for control wiring, and keep to the minimum required. Insulate all splices, taps, and joints as required by codes.

All materials used to terminate, splice, or tap conductors: designed for, properly sized for, and NRTL listed for the specific application and conductors involved, and installed in strict accordance with the manufacturer's recommendations, using the manufacturer's recommended tools.

Where wiring is indicated as installed, but the connection is indicated "FUTURE" or "BY OTHER DIVISION, TRADES, OR CONTRACTS", leave a minimum 3-foot "Pigtail" at the box, tape the ends of the conductors, and cover the box.

In general, the direction of branch circuit "home run" routing is indicated on the drawings, complete with circuit numbers and panelboard designation. Continue all such "home run" wiring to the designated panelboard, as though "circuit runs" were indicated in their entirety.

Common or shared neutrals are not allowed unless shown on the drawings to be used or specifically noted to be allowed.

Where multi-wire branch circuits (i.e., shared neutral) are allowed, they shall be provided with a means that will simultaneously disconnect all ungrounded conductors at the point the branch circuit originates. Multi-pole breakers or 3 single-pole breakers with a handle tie are two examples.

When multiple home runs are combined into a single raceway such that the number of conductors exceeds four (conductor count is made up of any combination of phase and neutral conductors), the following restrictions apply, which are in addition to those in NFPA 70

Normal or Non-Essential circuits:

1. Maximum of 16 conductors in a single raceway. For up to eight conductors in a raceway, minimum raceway size: 3/4-inch. For greater than eight conductors, minimum raceway size: 1-inch. Do not install any other type of circuit in this raceway.
2. Minimum wire size for all conductors in this raceway: No. 10 AWG.
3. Only 15A and 20A branch circuit homeruns may be combined into one raceway.

GFCI circuits:

1. Do not use multi-conductor circuits, with a shared neutral, for any GFCI circuit breaker or receptacle circuit.

For branch circuits fed from GFCI circuit breakers, limit the one-way conductor length to 100 feet between the panelboard and the most remote receptacle or load on the GFCI circuit.

Properly identify all terminal blocks and wire terminals for control wiring with vinyl stick-on markers or equivalent. Provide Engineer with a list of proposed identifying numbers for review prior to installing markers.

Provide an equipment-grounding conductor or bonding jumper, as applicable, in all feeders and branch circuits, sized in accordance with NFPA 70 Tables 250.66 or 250.122, as applicable, unless indicated as larger on the drawings.

Wiring shall have insulation of the proper color to match color code system in the table below unless there is a color system currently in use by the facility, utility, or enforced by local amendments, in which case the colors are to match the requirements set forth by the AHJ, utility or facility management. In larger sizes where properly colored insulation is not available, use vinyl plastic electrical tape of the appropriate color around each conductor at all termination points, junctions, and pull boxes.

System Voltage:

240V and under, including 208Y/120, 120/240, 120/208, and 240D/120 systems:

1. Phase A: Black.
2. Phase B: Red.
3. Phase C: Blue.
4. Neutral: White.
5. Equipment Ground: Green.
6. Isolated Ground: Green with yellow stripe.

C. MC CABLE

Metal-clad cable (MC Cable): 600V, unjacketed; UL Standard 83, 1569, and 1685; NFPA 70 Article 330; aluminum or galvanized steel interlocked armor; THHN- or XHHW-insulated conductors; color code: ICEA Method 1, with green insulated grounding conductor. Listed for use in UL 1, 2, and 3 hour through-penetration firestop systems. MC Cable manufacturers: AFC Cable Systems, Encore Wire Corporation, Kaf-Tech, or Southwire.

D. APPLICATIONS OF MC CABLE

In lieu of flexible conduit and wiring from light fixtures located in accessible ceilings to junction boxes attached to building structure directly above the ceiling. Provide cable whips of sufficient lengths to allow for relocating each light fixture within a 5 foot radius of its installed location, but not exceeding 6 feet in unsupported lengths.

For vertical drops in stud walls.

E. PROHIBITED USE OF MC CABLE UNLESS NOTED ABOVE

Examples of those uses include, but are not limited to the following:

1. Homeruns to panelboards (refer to Section 26: Definitions).
2. Where exposed to view.
3. Where exposed to damage.
4. Hazardous locations.
5. Wet locations.
6. When restricted otherwise.
7. When specifically disallowed by the local AHJ.
8. When specifically disallowed by the landlord.
9. Circuits supplied by an emergency or standby power source.

F. MC CABLE INSTALLATION

Secure and support cable per NFPA 70 Article 330. Secure cable within 12 inches of every box or fitting. Securing and supporting intervals shall not exceed six feet. Maintain consistent spacing to avoid derating due to bundling per NFPA 70 Section 310.15. Utilize steel cable hangers, Arlington SMC series or equivalent, to support wherever possible so cables can be routed in a neat and workmanship like manner.

G. NM AND NMC (NONMETALLIC SHEATHED) CABLE

Nonmetallic sheathed cable (NM Cable): 600V, THHN- or XHHW-insulated conductors (2, 3 or 4 as indicated on drawings or as required); color code: ICEA Method 1, with green insulated or bare grounding conductor; color-coded PVC-jacket for quick identification of conductor size; UL standards 44 or 83 (as applicable), and 719. NFPA 70 Article 334, NM and NMC manufacturers: Encore Wire Corporation, Republic Wire, or Southwire.

H. APPLICATIONS OF NM AND NMC CABLE

Type NM and Type NMC cables shall be permitted to be used in the following, except as prohibited in section I below:

1. One- and two-family dwellings and their attached or detached garages, and their storage buildings.
2. Multi-family dwellings units permitted to be of Types II, IV, and V construction with in units only.
3. Types I and II construction where installed within raceways permitted to be installed in Types I and II construction.

I. PROHIBITED USE OF NM AND NMC CABLE UNLESS NOTED ABOVE

Examples of those uses include, but are not limited to the following:

1. In any dwelling or structure not specifically permitted in H - 1, 2, 3, and 5
2. Exposed within a dropped or suspended ceiling cavity in other than one- and two-family and multifamily dwellings
3. As service-entrance cable
4. In commercial garages having hazardous (classified) locations
5. In theaters and similar locations
6. In motion picture studios
7. In storage battery rooms
8. In hoistways or on elevators or escalators
9. Embedded in poured cement, concrete, or aggregate
10. In hazardous (classified) locations

J. NM AND NMC CABLE INSTALLATION

Secure and support cable per NFPA 70 Article 334. Secure cable within 12 inches of every box or fitting. Securing and supporting intervals shall not exceed 4.5 feet. Maintain consistent spacing to avoid derating due to bundling per NFPA 70 Section 310.15. Utilize staples, cable ties listed and identified for securement and support wherever possible so cables can be routed in a neat and workmanship like manner. Utilize straps, hangers, or similar fittings designed and installed so as not to damage cable.

4 JUNCTION BOXES, PULL BOXES, CABINETS, AND WIREWAYS

Provide junction boxes, pull boxes, cabinets, and wireways wherever necessary for proper installation of various electrical systems according to NFPA 70 and where indicated on the drawings. Size as required for the specific function or as required by NFPA 70, whichever is larger. Construction shall be of a NEMA design suitable for the environment installed.

Junction boxes installed behind wall cases and in or on other store fixtures, except where otherwise specified, shall be 4 inches square or larger with galvanized covers.

Horizontally mount junction boxes under center fixtures (and cases), handy boxes or 4-inch square boxes with tops of boxes not more than 3-1/2 inches above the floor. Size junction boxes to adequately contain all required conductors and splices.

5 OUTLET BOXES

All outlets including light fixture, switch, receptacle, and similar outlets: galvanized steel knockout boxes, suitable in design to the purpose they serve and the space they occupy. Size as required for the specific function or as required by NFPA 70, whichever is larger. Set all outlet boxes in walls, columns, floors, or ceilings so they are flush with the finished surface, accurately set, and rigidly secured in position. Provide plaster rings, extension rings and/or masonry rings as required for flush mounting. Provide approved cast outlet boxes with hubs and weatherproof covers in all areas subject to damp, wet, or harsh conditions.

Manufacturers: Appleton, Cooper, Erikson Electrical, Hoffman, Killark Electric, O-Z/Gedney, Raco, Robroy Industries, Scott Fetzer, Spring City Electrical, Thomas and Betts, Walker Systems, or Woodhead.

6 OUTLET LOCATIONS

Coordinate locations of outlet boxes. Outlets are only approximately located on the small scale drawings. Use great care in the actual location by consulting the various large scale detailed drawings used by other division trades, and by securing definite locations from the Architect.

7 MOUNTING HEIGHTS

Unless noted otherwise, install wiring devices vertically aligned at height indicated on construction drawings.

8 RECEPTACLES

Unless indicated otherwise, install vertically with the ground slot mounted at the top.

Where installed horizontally, install with the neutral slot mounted at the top.

Above counter: mount vertically aligned.

Mechanical and electrical equipment rooms and janitors closets: mount vertically aligned.

Garages: mount vertically aligned.

Weatherproof exterior receptacles: horizontally aligned.

GFCI receptacles: Same as general receptacles.

Isolated ground receptacles: Same as general receptacles.

SPD receptacles: Same as general receptacles.

Clock Receptacles: 84 inches above finished floor.

Concrete Block Walls: As long as ADA requirements are maintained, dimensions above may be adjusted slightly as required to compensate for variable joint dimensions such that bottom or top of boxes, as applicable, are at block joints.9 SWITCHES

General: All switches shall be mounted at the same height throughout the project unless noted otherwise.

Above Counters: Same as for receptacles.

Concrete Block Walls: As long as ADA requirements are maintained, dimensions above may be adjusted slightly as required to compensate for variable joint dimensions, such that bottom or top of boxes, as applicable, are at block joints.

Walls with Wainscoting: 6 inches minimum above wainscoting, but not exceeding 48 inches above finished floor.

10 TELEPHONE/DATA OUTLET BOXES

General: Match mounting height of adjacent wiring device listed above.

Wall-mounted Telephone (Public): One at 48 inches above finished floor and one at 36 inches above finished floor.

For other than wiring devices, refer to paragraphs, articles, sections, divisions, or drawings to obtain mounting heights for specific equipment or systems.

11 WIRING DEVICES

The catalog numbers listed for wiring devices are generally for 20A rated devices. Where 15A rated devices are indicated on the drawings or required for circuit rating limitations, provide wiring devices equivalent to those specified for 20A, but rated for 15A.

All receptacles located outdoors or in damp or wet locations: Listed as 'Weather Resistant', designated by a 'WR' on the faceplate.

Minor changes relative to the location of electrical equipment may be made to comply with structural and building requirements as determined in the course of construction. Provide all wiring devices of the same manufacturer and model on the project, to the maximum extent possible. Provide color of toggles and receptacles as requested by the Architect.

Wiring Devices: Unless noted otherwise, devices shall be commercial grade and rated for 20A. Wiring device manufacturers: Cooper, Hubbell, Legrand, or Leviton.

Provide Tamper Resistant (TR) devices where indicated on the plans. TR devices shall also be provided in locations required by local codes or as required by the AHJ.

12 SWITCH AND OUTLET COVER PLATES

Switch and Outlet Plates: Colored, smooth nylon; by the same manufacturer as the wiring devices, wherever possible. Verify desired materials and colors with Architect before installation. Switch plates in unfinished rooms and spaces: Stamped steel, cadmium plated. Install groups of switches under one ganged-plate, usually horizontally; or, where required by details, vertically. Set all cover plates plumb, parallel, and finished flush with the wall.

Provide type-written, adhesive backed label at each receptacle cover plate with the respective "PNLBD-CKT#" designation. Coordinate final labeling requirements with the Owner prior to installation. Where visible to the public, labels shall be adhered to the backside of the coverplate.

13 LIGHT FIXTURES, LAMPS AND BALLASTS

A. LIGHT FIXTURE LOCATIONS

Light fixtures shown on the drawings represent general arrangements only. Refer to architectural drawings for more exact locations. Coordinate location with all other trades before installation to avoid conflicts. Coordinate light fixture locations in mechanical rooms with final installed piping and ductwork layouts.

B. LIGHT FIXTURES

Provide light fixtures as scheduled on drawings, including all lamps, all necessary accessories, material and labor to securely hang, clean, and make light fixtures completely ready for use. Light fixture model numbers scheduled on the drawings show only the manufacturer, grade, and style of light fixtures required. Provide all hangers, supports, and miscellaneous hardware required to install light fixtures, proper trim to fit each ceiling condition actually encountered, and additional tie wires connected to structure to conform to seismic requirements where required by the applicable building code.

Packaging of light fixtures will not be allowed. Only those luminaires listed in the Light Fixture Schedule or approved in accordance with substitutions of these specifications will be accepted. Where the Light Fixture Schedule indicates an allowance for a specific light fixture, the price is a Contractor price. Include all additional costs for freight, lamps, and installation of light fixture and lamps.

Through-wiring of recessed light fixtures in suspended ceilings is not permitted. Connect each light fixture by a whip to a junction box. Provide cable whips of sufficient lengths to allow for relocating each light fixture within a 5-foot radius of its installed location, but not exceeding 6 feet in unsupported lengths.

Light fixtures near or in contact with insulation shall comply with code for such. Maintain minimum 3" working clearance between non-IC rated light fixture housings and insulation on all adjacent ductwork, piping, walls and ceilings.

C. LAMPS

Provide lamps and color temperatures as indicated on the drawings for all light fixtures; or, if not indicated, per the Architect and/or lighting designer. Lamps shall be by the same manufacturer for color consistency. Lamps shall be compatible with the specified light fixture. Fluorescent, metal halide, and incandescent lamp manufacturers: Eiko, G.E., Osram/Sylvania, Philips, Sorae, or Venture.

LED Lamps and Luminaires: Comply with ANSI C78.377 for white light LED color range; minimum CRI of 80 unless noted otherwise. LED binning specification tolerance to be within 3 macadam ellipses of rated values; all LEDs used for same fixture type throughout the project must originate from the same production bin; minimum average rated life of 20,000 hours for LED lamps and 50,000 hours for LED luminaires. Rohs compliant. LED lamp manufacturers: Bridgelux, Cree, Nichia, Osram, or Xicato.

D. BALLASTS

LED Drivers: Comply with NRTL requirements and ANSI C82.77; designed for type and quantity of lamps served; sound levels not exceeding Class A ambient noise levels; lamp current crest factor of 1.5 or less; 90-percent power factor or greater; line transient withstand ratings as defined in ANSI/IEEE C62.41, Category A.; total harmonic distortion less than 20 percent; shall tolerate sustained open circuit and short circuit output conditions without damage; shall not over-drive LEDs at a current or voltage above LED rated values; ROHS compliant; meets EN61000 requirements for input harmonics.

E. DIMMABLE LIGHT FIXTURES

For dimmable light fixtures provide both control and power wiring between light fixture and control device and between light fixtures. Quantity of low voltage and line voltage wiring and wire type shall be per manufacturer's recommendations. Coordinate light fixture and control device dimming types for compatibility.

14 MISCELLANEOUS ELECTRICAL

A. TELEPHONE SYSTEM PROVISIONS

Provide incoming telephone service raceways as indicated on drawings or as required by the serving telephone company. Provide 3/4-inch thick plywood board, fire-retardant-treated and stamped FRT, securely anchored to the wall, at the location and of the size as indicated on the drawings. Provide flush mounted telephone outlet boxes with 1 inch conduit stub-up with pull-string concealed to accessible ceiling space at locations as indicated on the drawings.

B. DATA SYSTEM PROVISIONS

Provide flush mounted data outlet boxes with 1 inch conduit stub-up with pull-string concealed to accessible ceiling space at locations as indicated on the drawings.

END OF SECTION 26

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01/28/2022

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#	DATE	DESCRIPTION

UNIVERSITY HOUSE

PITTSBURG STATE UNIVERSITY
PITTSBURG KANSAS
Building Number: 38500-0230

CONSTRUCTION DOCUMENTS

Original Size: 1 1/2" Drawing may have been reduced in size

ELECTRICAL SPECIFICATIONS

DATE: 01-28-2022	
DRAWN: RAG	CHECKED: RAG
PROJ #: 134090-00	CAD #: A-214445

SHEET #:
E301

MECHANICAL SYMBOLS

THIS IS A MASTER LEGEND AND NOT ALL SYMBOLS OR ABBREVIATIONS ARE USED. V2.07

STANDARD MOUNTING HEIGHT

THERMOSTATS (USER ADJUSTABLE)	48"
CONTROLS	48"

INSTALL DEVICES AT THE MOUNTING HEIGHTS SHOWN ABOVE UNO IN THE CONSTRUCTION DOCUMENTS. MOUNTING HEIGHTS LISTED ABOVE OR ELSEWHERE IN THE CONSTRUCTION DOCUMENTS ARE AFF OR AFG TO TOP OF THE DEVICE UNO. ALL DEVICES SHALL BE INSTALLED IN COMPLIANCE WITH CURRENT ADA AND LOCAL REQUIREMENTS.

ANNOTATION

- 1 — MECHANICAL PLAN NOTE CALLOUT
- CU 1 — MECHANICAL EQUIPMENT DESIGNATION (CONTRACTOR FURNISHED AND INSTALLED UNLESS NOTED OTHERWISE)
- CONNECTION POINT OF NEW WORK TO EXISTING
- 1 M1 — DETAIL REFERENCE. UPPER NUMBER INDICATES DETAIL NUMBER LOWER NUMBER INDICATES SHEET NUMBER
- 1 M1 — SECTION CUT DESIGNATION
- DEDICATED EQUIPMENT ACCESS TILE
- ACCESS PANEL

ABBREVIATIONS

A/C	AIR CONDITIONING	HWP	HEATING WATER PUMP
ACC	AIR COOLED CHILLER	IN WC	INCHES OF WATER COLUMN
ACCU	AIR COOLED CONDENSING UNIT	L	LOUVER
AFC	ABOVE FINISHED CEILING	LAT	LEAVING AIR TEMPERATURE
AFF	ABOVE FINISHED FLOOR	LDB	LEAVING DRY BULB
AFG	ABOVE FINISHED GRADE	LP	LOW PRESSURE
AHJ	AUTHORITY HAVING JURISDICTION	LWB	LEAVING WET BULB
AHU	AIR HANDLING UNIT	LWT	LEAVING WATER TEMPERATURE
AI	ANALOG INPUT	MAU	MAKE-UP AIR UNIT
AO	ANALOG OUTPUT	MAX	MAXIMUM
AP	ACCESS PANEL	MBH	1000 BTU PER HOUR
APD	AIR PRESSURE DROP	MD	MOTORIZED DAMPER
AWG	AMERICAN WIRE GAUGE	MFR	MANUFACTURER
B	BOILER	MIN	MINIMUM
BAS	BUILDING AUTOMATION SYSTEM	N/A	NOT APPLICABLE
BB	BACKBONE	N/C	NORMALLY CLOSED
BD	BACKDRAFT DAMPER	N/O	NORMALLY OPEN
BD	BLOWDOWN	NOM	NOMINAL
BFC	BELOW FINISHED CEILING	NC	NOISE CRITERIA
BFF	BELOW FINISHED FLOOR	NF	NON-FUSED
BFG	BELOW FINISHED GRADE	NIC	NOT IN CONTRACT
BFP	BOILER FEED PUMP	OA	OUTSIDE AIR
BHP	BRAKE HORSEPOWER	PICV	PRESSURE INDEP. CONTROL VALVE
BI	BINARY INPUT	PROV	PROVIDE FURNISH AND INSTALL
BO	BINARY OUTPUT	QTY	QUANTITY
BOD	BOTTOM OF DUCT	RA	RETURN AIR
BOS	BOTTOM OF STRUCTURE	RC	ROOM CRITERIA
BTU	BRITISH THERMAL UNIT	RD	RETURN DUCT
CFM	CUBIC FEET PER MINUTE	REA	RELIEF AIR
CH	CHILLER	RF	RETURN FAN
CLG	COOLING	RFR	REFRIGERANT
CP	CONDENSATE PUMP	RH	RELATIVE HUMIDITY
CPT	CONTROL POWER TRANSFORMER	RH	ROOF HOOD
CRAC	COMPUTER ROOM AIR CONDITIONING UNIT	RPM	REVOLUTIONS PER MINUTE
CRU	COMPUTER ROOM UNIT	RTU	ROOFTOP UNIT
CT	COOLING TOWER	SA	SUPPLY AIR
CV	CONTROL VALVE	SCP	STEAM CONDENSATE PUMP
CWP	CONDENSER WATER PUMP	SD	SMOKE DUCT DETECTOR
CU	CONDENSING UNIT	SD	SUPPLY DUCT
CHWP	CHILLED WATER PUMP	SF	SUPPLY FAN
DB	DECIBELS	SH	SENSIBLE HEAT CAPACITY
DBA	DECIBEL AVERAGE	SOW	SCOPE OF WORK
DDC	DIRECT DIGITAL CONTROL	SP	STATIC PRESSURE
DI	DIGITAL INPUT	ST	STEAM TRAP
DISC	DISCONNECT	STM	STEAM
DN	DOWN	TBD	TO BE DETERMINED
DS	DUCT SILENCER	T-C	TEMPERATURE CONTROLS CONTRACTOR
DX	DIRECT EXPANSION	TCP	TEMPERATURE CONTROL PANEL
(E)	EXISTING	TF	TRANSFER FAN
EA	EXHAUST AIR	TFA	TO FLOOR ABOVE
EAT	ENTERING AIR TEMPERATURE	TFB	TO FLOOR BELOW
ED	EXHAUST DUCT	TH	TOTAL HEAT CAPACITY
EDB	ENTERING DRY BULB	TSP	TOTAL STATIC PRESSURE
EF	EXHAUST FAN	TT	TEMPERATURE TRANSMITTAL
EFF	EFFICIENCY	TYP	TYPICAL
EMS	EMERGY MANAGEMENT SYSTEM	U/F	UNDERFLOOR
ESP	EXTERNAL STATIC PRESSURE	U/G	UNDERGROUND
ETR	EXISTING TO REMAIN	U/S	UNDERSLAB
EWB	ENTERING WET BULB	UH	UNIT HEATER
EWT	ENTERING WATER TEMPERATURE	UNO	UNLESS NOTED OTHERWISE
FCU	FAN COIL UNIT	VAV	VARIABLE AIR VOLUME
FFA	FROM FLOOR ABOVE	VEL	VELOCITY
FFB	FROM FLOOR BELOW	VFD	VARIABLE FREQUENCY DRIVE
FF	FINISHED FLOOR	VRF	VARIABLE REFRIGERANT FLOW
FPI	PINS PER INCH	VRV	VARIABLE REFRIGERANT VOLUME
FPM	FEET PER MINUTE	W/	WITH
GC	GENERAL CONTRACTOR	W/O	WITHOUT
GPM	GALLONS PER MINUTE	WB	WET BULB
HOA	HAND-OFF-AUTOMATIC	WC	WATER COLUMN
HP	HORSEPOWER	WPD	WATER PRESSURE DROP
HTG	HEATING	XP	EXPLOSION PROOF

HVAC DUCTWORK AND ACCESSORIES

- LINEAR SLOT DIFFUSER
- INSULATED FLEXIBLE DUCT (MAX. 5'-0" LONG)
- BRANCH DUCT WITH 45° RECTANGLE-ROUND BRANCH FITTING AND MANUAL VOLUME DAMPER
- ELBOW WITH TURNING VANES
- BRANCH DUCT WITH BELL-MOUTH FITTING & MANUAL VOLUME CONTROL DAMPER
- DUCT UP
- DUCT DOWN
- EA — EXHAUST AIR
- GEA — EXHAUST AIR - GREASE
- OA — OUTSIDE AIR
- REA — RELIEF AIR
- EA — RETURN AIR
- XEA — SPECIAL EXHAUST
- SA — SUPPLY AIR
- EQUIPMENT WITH FLEXIBLE DUCT CONNECTION
- 10" (NECK SIZE) CSD-1 (TYPE) 300 CFM (CFM OF SUPPLY DIFFUSER OR REGISTER)
- 24x24 (NECK SIZE) CEG-1 (TYPE) 800 CFM (CFM OF EXHAUST GRILLE)
- EQUIPMENT ACCESS TILE (IN ACT CEILINGS)
- ACCESS PANEL (IN GYPSUM)
- MANUAL VOLUME DAMPER
- SQUARE TO ROUND TRANSITION
- RD — DUCT MOUNTED SMOKE DETECTOR (SD=SUPPLY/RD=RETURN)
- XX" Ø — ROUND DUCT TAG INDICATING DIAMETER
- XX" x XX" — RECTANGULAR DUCT TAG INDICATING INTERNAL DUCT DIMENSIONS.
- XX' / XX" — FLAT OVAL DUCT TAG INDICATING INTERNAL DUCT DIMENSIONS
- R — RISER DESIGNATION
- FD — FIRE DAMPER
- FSD — FIRE SMOKE DAMPER
- SD — SMOKE DAMPER
- VD — VOLUME DAMPER
- MD — MOTORIZED DAMPER
- BD — BACKDRAFT DAMPER

ALL DUCT DIMENSIONS SHOWN ON DRAWINGS ARE INSIDE DIMENSIONS. REFER TO DUCTWORK SPECIFICATIONS FOR DUCTWORK INSULATION AND LINER INFORMATION.

PIPING SYMBOLS

- DIRECTION OF FLOW
- CONTROL VALVE
- THREE-WAY CONTROL VALVE
- SHUTOFF VALVE
- CHECK VALVE
- BALANCING VALVE WITH PRESSURE PORTS
- TRIPLE DUTY VALVE WITH PRESSURE PORTS
- STRAINER
- STRAINER WITH BLOWDOWN VALVE
- RELIEF / SAFETY VALVE
- SOLENOID VALVE
- PRESSURE REDUCING VALVE
- GAS PRESSURE REGULATOR
- THERMOSTATIC MIXING VALVE
- PA — PIPE ANCHOR
- EXPANSION JOINT
- PIPE GUIDE
- PIPING SUPPORT
- F & T TRAP
- BUCKET TRAP
- THERMOSTATIC TRAP
- BACKFLOW PREVENTER
- PRESSURE GAUGE
- THERMOMETER
- PRESSURE AND TEMPERATURE TEST PLUG
- UNION
- FLANGE CONNECTION
- VACUUM RELIEF VALVE
- AV — AUTOMATIC AIR VENT
- MV — MANUAL AIR VENT
- PRESSURE / VACUUM SWITCH
- CLEANOUT
- CAP
- ELBOW UP
- ELBOW DOWN
- TEE UP
- TEE DOWN
- ELBOW UP WITH SHUT-OFF VALVE (SOV)
- ELBOW DOWN WITH SHUT-OFF VALVE (SOV)
- TEE UP WITH SHUT-OFF VALVE (SOV)
- TEE DOWN WITH SHUT-OFF VALVE (SOV)
- REDUCER
- RECIRCULATION PUMP
- P-TRAP
- GAS COCK
- TOP BEAM CLAMP
- TRAPEZE HANGER
- FLEXIBLE CONNECTION

CALL OUTS

- ENLARGED PLAN CALLOUT
- NOT IN SCOPE

PIPING LINETYPES

- EXISTING PIPING TO BE REMOVED OR RELOCATED
- EXISTING PIPING TO REMAIN
- CD — CONDENSATE DRAIN (CD)
- ACD — AUXILIARY CONDENSATE DRAIN (ACD)
- NPW — NON-POTABLE WATER (NPW)
- G — NATURAL GAS (G)
- G — NATURAL GAS ON ROOF (G)
- MPG — MEDIUM PRESSURE NATURAL GAS (MPG)
- MPG — MEDIUM PRESSURE NATURAL GAS ON ROOF (MGP)
- FOS — FUEL OIL SUPPLY (FOS)
- FOR — FUEL OIL RETURN (FOR)
- FOV — FUEL OIL VENT (FOV)
- LPG — LIQUEFIED PETROLEUM GAS (LPG)
- BFW — BOILER FEED WATER (BFW)
- HPS — HIGH PRESSURE STEAM SUPPLY (HPS)
- HPC — HIGH PRESSURE STEAM CONDENSATE (HPC)
- LPS — LOW PRESSURE STEAM SUPPLY (LPS)
- LPC — LOW PRESSURE STEAM CONDENSATE (LPC)
- CPD — CONDENSATE PUMP DISCHARGE (CPD)
- HWS — HEATING HOT WATER SUPPLY (HWS)
- HWR — HEATING HOT WATER RETURN (HWR)
- CHWS — CHILLED WATER SUPPLY (CHWS)
- CHWR — CHILLED WATER RETURN (CHWR)
- HCS — HOT / CHILLED WATER SUPPLY (HCS)
- HCR — HOT / CHILLED WATER SUPPLY (HCR)
- CWS — CONDENSER WATER SUPPLY (CWS)
- CWR — CONDENSER WATER RETURN (CWR)
- RL — REFRIGERANT LIQUID (RL)
- RD — REFRIGERANT DISCHARGE (HOT GAS) (RD)
- RS — REFRIGERANT SUCTION (RS)
- RDB — REFRIGERANT DISCHARGE BYPASS (RDB)
- RV — REFRIGERANT VENT (RV)

HVAC CONTROL DEVICES

- H — HUMIDISTAT
- T — THERMOSTAT
- CO — CARBON MONOXIDE SENSOR
- CO2 — CARBON DIOXIDE SENSOR
- DP — DIFFERENTIAL PRESSURE SENSOR
- FS — FLOW SWITCH
- HS — HUMIDITY SENSOR
- PS — PULL STATION
- RT — REMOTE TESTING STATION WITH INDICATING LIGHT
- SP — STATIC PRESSURE
- TS — TEMPERATURE SENSOR

LINETYPE LEGEND

THROUGHOUT THE DRAWINGS DIFFERENT LINETYPES ARE USED IN COMBINATION WITH THE SYMBOLS TO INDICATE THE STATUS OF ITEMS AS EXISTING, TO BE DEMOLISHED, TO BE INCLUDED AS PART OF NEW WORK AND/OR ITEMS WHICH ARE ANTICIPATED TO BE PROVIDED IN THE FUTURE. THE STATUS OF ITEMS USING THESE LINETYPES ARE RELATIVE TO THE VIEW IN WHICH THEY APPEAR. PHASING SHOWN IN DRAWINGS IS NOT INTENDED TO FULLY DESCRIBE ALL NECESSARY CONSTRUCTION PHASING, WHICH IS DETERMINED BY THE CONTRACTOR AS PART OF THEIR RESPONSIBILITIES. ANY SUCH PHASES DESCRIBED IN THE CONSTRUCTION DOCUMENTS ARE GENERAL AND ONLY INTENDED TO INDICATE A BROAD ORDER FOR THE SAKE OF DESCRIBING THE PROJECT. THE FOLLOWING LINETYPES MAY BE USED ON ANY DEVICE, EQUIPMENT, NOTE, LINE, SHAPE, ETC.

EXISTING		NEW	
DEMOLISH		FUTURE	

GENERAL NEW NOTES:

1. PRIOR TO SUBMITTING BID, VISIT THE JOB SITE AND BECOME FULLY ACQUAINTED WITH THE EXISTING CONDITIONS OF THE PROJECT. REVIEW THE GENERAL NOTES, SPECIFICATIONS AND OTHER DRAWINGS FOR ADDITIONAL REQUIREMENTS WHICH MAY NOT BE SPECIFICALLY CALLED OUT IN THIS PORTION OF THE CONSTRUCTION DOCUMENTS. NOTIFY ARCHITECT, ENGINEER AND/OR OWNER OF CONFLICTS OR DISCREPANCIES PRIOR TO SUBMISSION OF BID.
2. EXISTING CONDITIONS WERE TAKEN FROM ORIGINAL DRAWINGS AND SITE VISITS AND MAY NOT REFLECT EXACT "AS-BUILT" CONDITIONS. FIELD VERIFY EXISTING CONDITIONS PRIOR TO SUBMITTING FINAL BIDS. COORDINATE NEW WORK AND DEMOLITION WITH OTHER DISCIPLINES AND EXISTING CONDITIONS PRIOR TO CONSTRUCTION.
3. COORDINATE THE INSTALLATION OF THE MECHANICAL SYSTEMS WITH OTHER TRADES TO ENSURE A NEAT AND ORDERLY INSTALLATION. INSTALL DUCTWORK AND PIPING AS TIGHT TO STRUCTURE AS POSSIBLE. COORDINATE WITH OTHER TRADES TO AVOID CONFLICTS. COORDINATE INSTALLATION OF DUCTWORK AND PIPING TO AVOID CONFLICTS WITH ELECTRICAL PANELS, LIGHTING FIXTURES, ETC. ANY MODIFICATIONS REQUIRED DUE TO LACK OF COORDINATION WILL BE THE RESPONSIBILITY OF THE CONTRACTOR AT NO EXTRA COST TO THE OWNER.
4. WHERE SHUTDOWN OF EXISTING SYSTEMS IS REQUIRED DURING NEW WORK, COORDINATE SHUTDOWN TIME AND DURATION WITH THE OWNER TO MINIMIZE DOWNTIME. NOTIFY OWNER SEVEN (7) DAYS PRIOR TO INTERRUPTION OF SERVICE.
5. DURING INSTALLATION OF NEW WORK, AVOID DAMAGING EXISTING SURFACES AND EQUIPMENT TO REMAIN. REPAIR DAMAGE CAUSED DURING CONSTRUCTION AT NO EXTRA COST TO THE OWNER.
6. PROVIDE TEMPORARY BARRIERS TO CONTAIN DUST AND DEBRIS RESULTING FROM THE PERFORMANCE OF THE WORK TO THE AREA WHERE WORK IS BEING PERFORMED.
7. ALL MECHANICAL EQUIPMENT SHOWN ON THE MECHANICAL PLANS SHALL BE PROVIDED BY DIVISION 23 UNLESS OTHERWISE NOTED.
8. NEW MECHANICAL EQUIPMENT, DUCTWORK AND PIPING ARE SHOWN AT APPROXIMATE LOCATIONS. FIELD MEASURE FINAL DUCTWORK AND PIPING LOCATIONS PRIOR TO FABRICATION AND MAKE ADJUSTMENTS AS REQUIRED TO FIT THE DUCTWORK AND PIPING WITHIN THE AVAILABLE SPACE. VERIFY THAT FINAL EQUIPMENT LOCATIONS MEET MANUFACTURER'S RECOMMENDATIONS REGARDING SERVICE CLEARANCE AND PROPER AIRFLOW CLEARANCE AROUND EQUIPMENT.
9. REFER TO ARCHITECTURAL DRAWINGS FOR RELATED CONSTRUCTION DETAILS AS APPLICABLE TO THE HVAC SYSTEM. VERIFY CHASES AND PENETRATIONS SHOWN ON ARCHITECTURAL DRAWINGS THAT ARE INTENDED FOR DUCTWORK AND PIPING MEET REQUIREMENTS.
10. INDOOR AIR QUALITY MEASURES PROTECT INSIDE OF (INSTALLED AND DELIVERED) DUCTWORK AND HVAC UNITS FROM EXPOSURE TO DUST, DIRT, PAINT AND MOISTURE. REPLACE INSULATION THAT HAS BECOME WET AT ANY TIME DURING CONSTRUCTION. DRYING THE INSULATION IS NOT ACCEPTABLE. SEAL ANY TEARS OR JOINTS OF INTERNAL FIBERGLASS INSULATION. REMOVE DEBRIS FROM CEILING/RETURN AIR PLENUM INCLUDING DUST. AN INDEPENDENT, PROFESSIONAL DUCT CLEANING COMPANY SHALL VACUUM CLEAN ANY DUCTWORK CONNECTED TO HVAC UNITS THAT WERE OPERATED DURING THE CONSTRUCTION PERIOD AFTER NEW FILTERS ARE INSTALLED AND PRIOR TO TURNING SYSTEM OVER TO THE OWNER. THE INTERNAL SURFACES AND ASSOCIATED COILS OF ANY HVAC UNITS THAT WERE OPERATED SHALL ALSO BE CLEANED.
11. INSTALL DUCTWORK AND PIPING PARALLEL TO BUILDING COLUMN LINES UNLESS OTHERWISE SHOWN OR NOTED.
12. OVERHEAD HANGERS AND SUPPORTS FOR EQUIPMENT, DUCTWORK AND PIPING SHALL BE FASTENED TO BUILDING JOISTS OR BEAMS. DO NOT ATTACH HANGERS AND SUPPORTS TO THE ABOVE FLOOR SLAB OR ROOF EXCEPT WHERE CONCRETE INSERTS IN CONCRETE SLABS ARE ALLOWED BY THE SPECIFICATIONS.
13. COORDINATE LOCATION OF EQUIPMENT SUPPORTS WITH LOCATION OF EQUIPMENT ACCESS PANELS/DOORS TO ENABLE SERVICE OF EQUIPMENT AND/OR FILTER REPLACEMENT.
14. SEAL PENETRATIONS THROUGH THE BUILDING COMPONENTS IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS. FIREPROOF PENETRATIONS THROUGH FIRE RATED COMPONENTS IN ACCORDANCE WITH U.L. REQUIREMENTS.
15. COORDINATE THE EXACT MOUNTING SIZE AND FRAME TYPE OF DIFFUSERS, REGISTERS AND GRILLES WITH THE SUPPLIER TO MEET THE CEILING, WALL AND DUCT INSTALLATION REQUIREMENTS.
16. PAINT PORTIONS OF DUCTWORK AND INSULATION THAT ARE EXPOSED TO VIEW BY THE INSTALLATION OF DIFFUSERS, REGISTERS, AND GRILLES IN CEILINGS OR WALLS FLAT BLACK. PORTIONS INCLUDE BOTH THE INTERIOR OF UNLINED DUCTWORK AND THE EXTERIOR OF DUCTWORK AND INSULATION.
17. PROVIDE A MANUAL BALANCING DAMPER IN EACH DUCT TAKEOFF FROM SUPPLY AND EXHAUST AIR DUCTS.
18. PROVIDE A PREFABRICATED 45 DEGREE, HIGH EFFICIENCY, RECTANGULAR/ROUND BRANCH DUCT TAKEOFF FITTING FOR BRANCH DUCT CONNECTIONS AND TAKE-OFFS TO INDIVIDUAL DIFFUSERS, REGISTERS AND GRILLES. PROVIDE WITH INTEGRAL MANUAL BALANCING DAMPER AND LOCKING QUADRANT WHERE INDICATED ON PLANS.
19. BRANCH DUCTWORK TO AIR OUTLETS SHALL BE SAME SIZE AS OUTLET NECK SIZE UNLESS OTHERWISE NOTED.
20. REFER TO SPECIFICATIONS FOR DUCTWORK AND PIPING INSULATION REQUIREMENTS. DUCT SIZES ON MECHANICAL PLANS INDICATE CLEAR INSIDE AIRFLOW DIMENSIONS, INCREASE SHEET METAL SIZES ACCORDINGLY TO ACCOUNT FOR THICKNESS OF DUCT LINER.
21. PROVIDE A NEW SET OF AIR FILTERS IN UNITS PRIOR TO TESTING, ADJUSTING AND BALANCING AND BEFORE TURNING SYSTEM(S) OVER TO OWNER.
22. FIELD VERIFY THAT THE EXISTING EQUIPMENT INCLUDING ACCESSORIES BEING REUSED FOR THIS PROJECT IS NOT DAMAGED AND IS IN GOOD WORKING ORDER. REPORT ANY DEFICIENCIES TO THE OWNER OR ARCHITECT. SUBMIT TO THE OWNER AND ARCHITECT A WRITTEN REPORT DESCRIBING TESTS PERFORMED TO VERIFY OPERATION AND RESULTS OF THE TESTS.
23. CLEAN EXISTING EQUIPMENT AND EQUIPMENT COMPONENTS BEING REUSED FOR THIS PROJECT. PROVIDE NEW FILTERS FOR EXISTING AIR HANDLING EQUIPMENT PRIOR TO STARTUP OF EQUIPMENT. NEW FILTERS SHALL BE COMPATIBLE WITH THE EXISTING EQUIPMENT AND EQUAL IN PERFORMANCE TO THE EXISTING FILTERS AT NEW CONDITION UNLESS OTHERWISE NOTED. CLEAN STRAINERS IN PIPING SYSTEMS PRIOR TO STARTING PUMPS.
24. CLEAN THE EXTERIOR OF EXISTING COILS TO BE REUSED FOR THIS PROJECT. VACUUM BRUSH THE COIL IN THE DIRECTION OF THE FINS AND CLEAN THE COILS WITH COIL CLEANING FLUID. COMB ANY FINS BENT TO PROVIDE A STRAIGHT SURFACE FOR AIRFLOW.
25. LUBRICATE EXISTING EQUIPMENT BEING REUSED FOR THIS PROJECT IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS. OBTAIN INSTRUCTIONS FROM MANUFACTURER IF THEY ARE NOT AVAILABLE AT THE SITE.

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01/28/2022

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EXPIRES 12/31/2022

#	DATE	DESCRIPTION

UNIVERSITY HOUSE

PITTSBURG STATE UNIVERSITY
PITTSBURG KANSAS
Building Number: 36500-0230

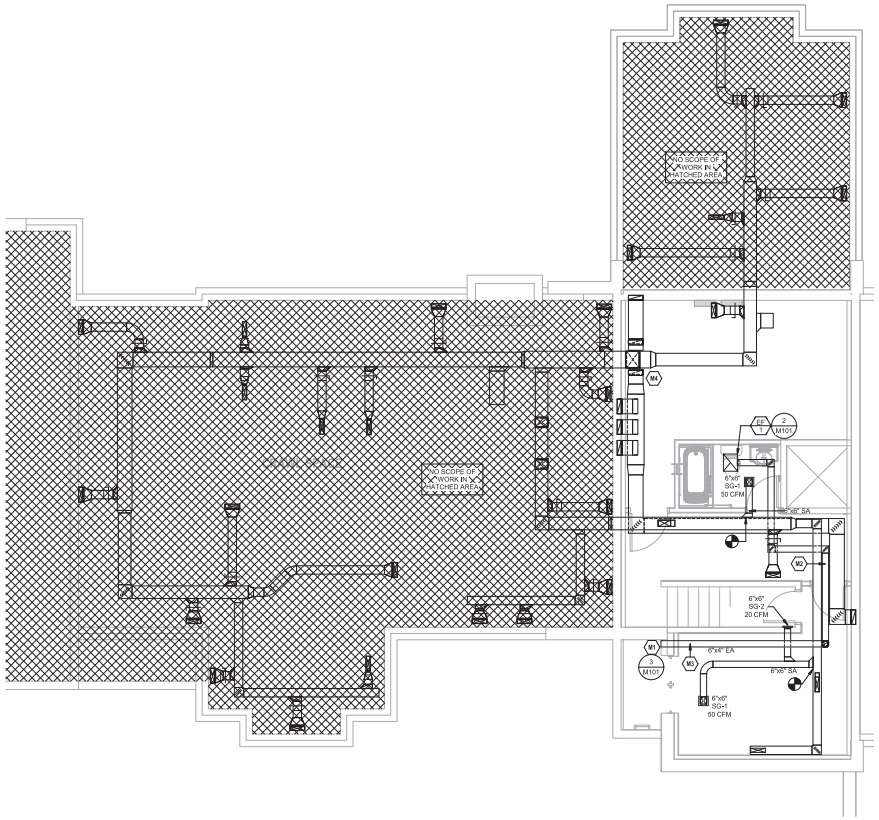
CONSTRUCTION DOCUMENTS

Original Size: 1 1/2" Drawing may have been reduced.

MECHANICAL GENERAL NOTES AND LEGEND

DATE: 01-28-2022	
DRAWN: SB	CHECKED: JP
PGAV # 53458-00	CLIENT # 04-14445
SHEET # M000	

CARL J. HOLDEN



1 HVAC BASEMENT PLAN
1/4" = 1'-0"

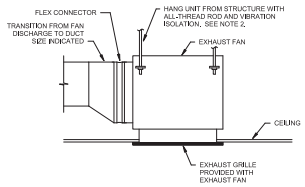
MECHANICAL PLAN NOTES:

M1 ROUTE EXHAUST DUCT THROUGH WINDOW WELL. ENSURE 3' CLEARANCE IS MET FROM OPERABLE WINDOW. TERMINATE WITH WEATHER HOOD. PROVIDE BACKDRAFT DAMPER AND INSECT SCREEN AT EXTERIOR WALL. INSULATE THE LAST 10'-0" OF DUCTING FROM EXTERIOR.

M2 ROUTE EXHAUST DUCT BETWEEN EXISTING DUCTS AND WITHIN JOIST SPACE AS NEEDED TO ROUTE DUCT AS SHOWN.

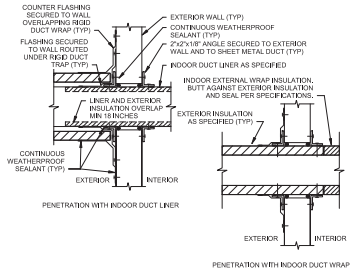
M3 ROUTE EXHAUST DUCT WITHIN JOIST SPACE.

M4 EXISTING DUCT SYSTEM TO REMAIN.



NOTES:
1. ARRANGEMENT SHOWN IS SCHEMATIC, ADJUST TO SUIT FIELD CONDITIONS AND MEET LOCAL CODE REQUIREMENTS.
2. FOR FANS 1 HP AND LESS, PROVIDE NEOPRENE RUBBER MOUNT HANGER (NR). FOR FANS LARGER THAN 1 HP, PROVIDE SPRING VIBRATION ISOLATION HANGER (SPNR).

2 CEILING MOUNTED FAN DETAIL
NTS



NOTES:
1. COORDINATE SIZE AND LOCATION OF DUCT WITH STRUCTURAL ENGINEER AND ARCHITECTURAL ELEVATIONS.

3 DUCT EXTERIOR WALL PENETRATION
NTS

FAN SCHEDULE

MARK	SERVICE DESCRIPTION	MANUFACTURER	MOUNTING	MODEL	CFM	ESP (IN)	NOM HP	FAN RPM	DRIVE (BELT/DIRECT)	ELECTRICAL V/PH	ELECTRICAL DISC TYPE	WEIGHT (LBS)	NOTES
EF 1	EXHAUST	GREENHECK	CEILING	SP-880-VG	50	0.25	0.01	808	DIRECT	115/1	NF	20	ALL

MODEL NUMBERS SHALL NOT BE CONSIDERED COMPLETE AND MATERIAL SHALL NOT BE ORDERED BY MANUFACTURER AND MODEL NUMBERS ONLY. REVIEW THE COMPLETE DESCRIPTION, NOTES AND SPECIFICATIONS TO DETERMINE THE EXACT MATERIAL AND ACCESSORIES TO BE ORDERED. THE MANUFACTURERS LISTED ARE THE BASIS FOR THE DESIGN.

NOTES:

A. DIVISION 26 CONTRACTOR TO PROVIDE LOCAL SWITH FOR ON/OFF CONTROL.
B. PROVIDE WITH NEOPRENE VIBRATION ISOLATION AND ALL-THREAD HANGING RODS.
C. PROVIDE FACTORY MOUNTED DISCONNECT SWITCH.
D. PROVIDE WITH EC MOTOR.
E. PROVIDE WITH INTEGRAL GRILLE.

GRILLE, REGISTER AND DIFFUSER SCHEDULE

MARK	MANUFACTURER	SERVICE	MODEL	MOUNTING LOCATION	FACE TYPE	FACE SIZE (IN)	MAX NC	MAX PRESS DROP (IN W.C.)	NOTES
SG-1	PRICE	SUPPLY	CVD	CEILING	LOUVERED	REFER TO PLANS	20	0.08	ALL
SG-2	PRICE	SUPPLY	640	WALL	LOUVERED	REFER TO PLANS	20	0.08	ALL

MODEL NUMBERS SHALL NOT BE CONSIDERED COMPLETE AND MATERIAL SHALL NOT BE ORDERED BY MANUFACTURER AND MODEL NUMBERS ONLY. REVIEW THE COMPLETE DESCRIPTION, NOTES AND SPECIFICATIONS TO DETERMINE THE EXACT MATERIAL AND ACCESSORIES TO BE ORDERED. THE MANUFACTURERS LISTED ARE THE BASIS FOR THE DESIGN.

NOTES:

A. AIR TERMINALS TO BE CONSTRUCTED OF ALUMINUM.
B. NECK SIZE SHOWN ON DRAWINGS. PROVIDE BRANCH DUCT TO MATCH NECK SIZE UNLESS OTHERWISE SHOWN ON DRAWINGS.
C. BAKED ENAMEL FINISH. WHITE TO MATCH CEILING/WALL COLOR.
D. FRONT BLADES PARALLEL TO SHORT DIMENSION.
E. FRAME TYPE TO MATCH CEILING/WALL CONSTRUCTION. COORDINATE WITH ARCHITECTURAL REFLECTED CEILING/WALL PLAN.
F. PROVIDE OPPOSED BLADE DAMPER ADJUSTABLE FROM FACE OF DEVICE.

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EXPIRES 12/31/2022

#	DATE	DESCRIPTION

UNIVERSITY HOUSE

PITTSBURG STATE UNIVERSITY
PITTSBURG KANSAS
Building Number: 38500-0230

CONSTRUCTION DOCUMENTS

Original Size: 1 1/2" Drawing may have been reduced.

HVAC BASEMENT PLAN

DATE: 01-28-2022
DRAWN: SB
CHECKED: JP
PGAV # 53458.00
CLIENT # A-014445
SHEET #
M101

CARL L HOLDEN

Division 23: HEATING, VENTILATING, AND AIR CONDITIONING

1. GENERAL INSTRUCTIONS

A. GENERAL REQUIREMENTS

All requirements under Division 01 and the general and supplementary conditions of these specifications apply to this section and division. Where the requirements of this section and division exceed those of Division 01, this section and division take precedence. Become thoroughly familiar with all its contents as to requirements that affect this division, section, or both. Work required under this division includes all material, equipment, appliances, transportation, services, and labor required to complete the entire system as required by the drawings and specifications, or reasonably inferred to be necessary to facilitate the function of each system as implied by the design and the equipment specified.

The specifications and drawings for the project are complementary, and any portion of work described in one shall be provided as if described in both. In the event of discrepancies, notify the Engineer and request clarification prior to proceeding with the work involved.

Drawings are graphic representations of the work upon which the contract is based. They show the materials and their relationship to one another, including sizes, shapes, locations, and connections. They convey the scope of work, indicating the intended general arrangement of the systems without showing all of the exact details as to elevations, offsets, control lines, and other installation requirements. Use the drawings as a guide when laying out the work and to verify that materials and equipment will fit into the designated spaces, and which when installed per manufacturers' requirements, will ensure a complete, coordinated, satisfactory, and properly operating system.

B. DEFINITIONS

Division: References contained in this specification follow the numbering system defined in the Construction Specifications Institute (CSI) MasterFormat 2004 Edition. Specification Divisions 01 through 13 provided with this project may reference the CSI MasterFormat 1995 Edition. The corresponding division references between the 2004 Edition and 1995 Edition are as follows:

2004 Edition		1995 Edition
1.	Division 21 – Fire Suppression	Division 15
2.	Division 22 – Plumbing	Division 15
3.	Division 23 – HVAC	Division 15
4.	Division 26 – Electrical	Division 16
5.	Division 27 – Communications	Division 16
6.	Division 28 – Electronic Safety and Security	Division 16

Furnish: "to supply and deliver to the project site, ready for unloading, unpacking, assembly, installation and similar operations."

Install: "to perform all operations at the project site including, but not limited to, the actual unloading, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, testing, commissioning, starting up and similar operations, complete, and ready for the intended use."

Provide: "to furnish and install."

Furnished by Owner (or Owner-Furnished) or Furnished by Others: "an item furnished by the Owner or under other divisions or contracts, and installed under the requirements of this division, complete and ready for intended use, including all items and services incidental to the work necessary for proper installation and operation. Include the installation under the warranty required by this division."

Engineer: Where referenced in this division, "Engineer" is the Engineer of Record and the Design Professional for the work under this division, and is a consultant to, and an authorized representative of the Architect, as defined in the General and/or Supplementary Conditions. When used in this division, Engineer means increased involvement by and obligations to the Engineer, in addition to involvement by and obligations to the Architect.

AHJ: The local code and/or inspection agency (Authority) Having Jurisdiction over the work.

NRTL: Nationally recognized testing laboratory, as defined and listed by OSHA in 29 CFR 1910.7 (e.g., UL, ETL, CSA), and acceptable to the AHJ over this project. Nationally recognized testing laboratories and standards listed are used only to represent the characteristics required and are not intended to restrict the use of other NRTLs that are acceptable to the AHJ and standards that meet the specified criteria.

Substitution: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor. Substitutions include Value Engineering proposals.
1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

The terms "approved equal", "equivalent", or "equal" are used synonymously and shall mean "accepted by or acceptable to the Engineer as equivalent to the item or manufacturer specified". The term "approved" shall mean labeled, listed, or both, by an NRTL, and acceptable to the AHJ over this project.

C. PREBID SITE VISIT

Prior to submitting bid, visit the site of the proposed work and become fully informed as to the conditions under which the work is to be done. Failure to comply with this requirement shall not be considered sufficient justification to request or obtain extra compensation over and above the contract price.

D. MATERIAL AND WORKMANSHIP

Provide new material, equipment, and apparatus under this contract unless otherwise stated herein, of best quality normally used for the purpose in good commercial practice, and free from defects. Install material and equipment in accordance with the manufacturer's installation instructions. Model numbers listed in the specifications or shown on the drawings are not necessarily intended to designate the required trim, written descriptions of the trim govern model numbers.

Work performed under this contract shall provide a neat and "workmanlike" appearance when completed, to the satisfaction of the Architect and Engineer. Workmanship shall be the finest possible by experienced mechanics. Installations shall comply with applicable codes and laws.

The complete installation shall function as designed and intended with respect to efficiency, capacity, noise level, etc. Abnormal noise caused by rattling equipment, piping, ducts, air devices, and squeaks in rotating components shall not be acceptable. Materials and equipment shall be of commercial specification grade in quality. Light duty and residential grade equipment shall not be accepted unless otherwise indicated.

Remove from the premises waste material present as a result of work, including cartons, crating, paper, stickers, and/or excavation material not used in backfilling, etc. Clean equipment installed under this contract to present a neat and clean installation at the termination of the work.

Repair or replace public and private property damaged as a result of work performed under this contract to the satisfaction of authorities and regulations having jurisdiction. Provide all safety lights, guards, and warning signs required for the performance of the work and for the safety of the public.

E. MANUFACTURERS

In other articles where lists of manufacturers are introduced, subject to compliance with requirements, provide products by one of the manufacturers specified.

Where a list is provided, manufacturers are listed alphabetically and not in accordance with any ranking or preference.

Where manufacturers are not listed, provide products subject to compliance with requirements from manufacturers that have been actively involved in manufacturing the specified product for no less than 5 years.

F. COORDINATION

Coordinate work with that of other trades so that the various components of the systems are installed at the proper time, will fit the available space, and will allow proper service access to those items requiring maintenance. Components which are installed without regard to the above shall be relocated at no additional cost to the Owner.

Contractor shall furnish the General Contractor with information where chases and openings are required. Contractor shall keep informed as to the work of other trades engaged in the construction of the project and shall execute work in a manner as to not interfere with or delay the work of other trades.

Figured dimensions shall be taken in preference to scale dimensions. Contractor shall take his own measurements at the building, as variations may occur. Contractor shall be held responsible for errors that could have been avoided by proper checking and inspection.

Provide materials with trim that will properly fit the types of ceiling, wall, or floor finishes actually installed. Model numbers listed in the specifications or shown on the drawings are not intended to designate the required trim.

G. ORDINANCES AND CODES

Work performed under this contract shall, at a minimum, be in conformance with applicable national, state and local codes having jurisdiction. Equipment furnished and associated installation work performed under this contract shall be in strict compliance with current applicable codes adopted by the local AHJ, including any amendments and standards as set forth by the following:
1. National Electrical Code (NEC)
2. National Fire Protection Association (NFPA)
3. Underwriters Laboratories (UL)
4. Occupational Safety and Health Administration (OSHA)
5. American Society of Mechanical Engineers (ASME)
6. American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE)
7. American National Standards Institute (ANSI)
8. American Society of Testing and Materials (ASTM)
9. Other national standards and codes where applicable.

Where the contract documents exceed the requirements of the referenced codes, standards, etc., the contract documents shall take precedence. Where conflicts between various codes, ordinances, rules, and regulations exist, comply with the most stringent.

Promptly bring all conflicts observed between codes, ordinances, rules, regulations, referenced standards, and these documents to the attention of the Architect and Engineer for final resolution. Contractor will be held responsible for any violation of the law.

Procure and pay for permits and licenses required for the accomplishment of the work herein described. Where required, obtain, pay for, and furnish certificates of inspection to Owner.

H. PROTECTION OF EQUIPMENT AND MATERIALS

Store and protect from damage equipment and materials delivered to job site. Replace insulation that has become wet at any time during construction. Drying the insulation is not acceptable. Seal any tears or joints of internal fiberglass insulation. Equipment and material damaged by construction activities shall be rejected and Contractor shall furnish new equipment and material of a like kind at his own expense.

Keep premises broom clean of foreign material created during work performed under this contract. Piping, equipment, etc. shall have a neat and clean appearance at the termination of the work.

Plug, seal, or cap open ends of ductwork and piping systems while stored and installed during construction when not in use to prevent the entrance of debris into the systems. Remove temporary protection prior to starting equipment and turning the system over to the owner.

I. SUBSTITUTIONS

Materials, products, equipment, and systems described in the Bidding Documents establish a standard of required function, dimension, appearance and quality to be met by the proposed substitution. The base bid shall include only the products from manufacturers specifically named in the drawings and specifications To request a substitution, request the Substitution Request Form from the Architect or Engineer. Complete and send the Substitution Request Form for each material, product, equipment, or system that is proposed to be substituted. The burden of proof of the merit of the proposed substitution is upon the proposer.

Unless stated otherwise in writing to the Engineer by the Contractor, Contractor warrants to the Engineer, Architect, and Owner the following:
1. Proposed substitution has been fully investigated and determined to meet or exceed the specified Work in all respects unless stated otherwise in the substitution request.
2. Proposed substitution is consistent with the Contract Documents and will produce indicated results, including functional clearances, maintenance service, and sourcing of replacement parts.
3. Proposed substitution has received necessary approvals of authorities having jurisdiction.
4. Same warranty will be furnished for proposed substitution as for specified Work.
5. If accepted substitution fails to perform as required, Contractor shall replace substitute material or system with that originally specified and bear costs incurred thereby.
6. Coordination, installation and changes in the Work as necessary for accepted substitution will be complete in all respects.

No substitutions will be considered unless the Substitution Request Form is completed and attached with the appropriate substitution documentation. No substitution will be considered prior to receipt of bids unless written request for approval to bid has been received by the Engineer at least ten (10) calendar days prior to the date for receipt of bids.

If the proposed substitution is approved prior to receipt of bids, such approval will be stated in an addendum. Bidders shall not rely upon approvals made in any other way. Verbal approval will not be given. No substitutions will be considered after the contract is awarded unless specifically provided in the contract documents.

J. SUBMITTALS

Assemble and submit for review shop drawings, material lists, manufacturer product literature for equipment to be furnished, and items requiring coordination between contractors under this contract. Provide submittals in sufficient detail so as to demonstrate compliance with these contract documents and the specifications To request a substitution, request the Substitution Request Form from the Architect or Engineer. Complete and send the Substitution Request Form for each material, product, equipment, or system that is proposed to be substituted. The burden of proof of the merit of the proposed substitution is upon the proposer.

Transmit submittals as early as required to support the project schedule. Allow for two weeks Engineer review time, plus to/from mailing time via the Architect, plus a duplication of this time for resubmittal, if required. Only resubmit those sections requested for resubmittal.

Submittals shall contain the project name, applicable specification section, submittal date, equipment identification acronym as used on the drawings, and the Contractor's stamp. The stamp shall certify that the submittal has been checked by the Contractor, complies with the drawings and specifications, and is coordinated with other trades. Manufacturer product literature shall include shop drawings, product data, performance sheets, samples and other submittals required by this division. Highlight, mark, list, or indicate the materials, performance criteria, and accessories that are being proposed. General product catalog data not specifically noted to be part of the specified product will be rejected and returned without review.

Submittals and shop drawings shall not contain the firm name, logo, seal, or signature of the Engineer. They shall not be copies of the work product of the Engineer. If the Contractor desires to use elements of such product, refer to paragraph "Electronic Drawing Files" for procedures to be used.

Separate submittals according to individual specification sections. Illegible submittals will be rejected and returned without review. Each item or model number shall be clearly marked and accessories indicated. Label the catalog data with the equipment identification acronym or number as used on the drawings and include performance curves, capacities, sizes, weights, materials, finishes, wiring diagrams, electrical requirements and deviations from specified equipment or materials. For equipment with motor starters or VFDs, include short circuit current ratings. Mark out inapplicable items. Shop drawings will be returned without review if the above mentioned requirements are not met.

Provide the quantity of submittals required by Division 01. If not indicated and hard-copy sets are provided, submit a minimum of six (6) copies. Refer to Division 01 for acceptance of electronic submittals for this project. For electronic submittals, Contractor shall submit the documents in accordance with the procedures specified in Division 01. Contractor shall notify the Engineer that the submittals have been posted. If electronic submittal procedures are not defined in Division 01, Contractor shall include the website, user name, and password information needed to access the submittals. For submittals sent by e-mail, Contractor shall copy the designated representatives of the Architect and Engineer. Contractor shall allow for the Engineer review time as specified above in the construction schedule. Contractor shall submit only the documents required to purchase the materials and/or equipment in the electronic submittal. The checking and subsequent acceptance of submittals by the Engineer shall not relieve the Contractor from responsibility for deviations from the drawings and specifications, errors in dimensions, details, size of members, or quantities, omissions of components or fittings; coordination of electrical requirements; and not coordinating items with actual building conditions and adjacent work. Proceed with the procurement and installation of equipment only after receiving approved shop drawings relative to each item.

K. ELECTRONIC DRAWING FILES

In preparation of shop drawings or record drawings, Contractor may, at his option, obtain electronic drawing files in AutoCAD or DXF format on CD-ROM disk, DVD disk, flash drive or direct download, as desired, from the Engineer for a shipping and handling fee of $200 for a drawing set up to 12 sheets and $15 per sheet for each additional sheet. Contact the Architect for written authorization and Engineer for the necessary release agreement form and to specify shipping method and drawing format. In addition to payment, the written authorization from the Architect and release agreement form from the Engineer must be received before electronic drawing files will be sent.

L. RECORD DRAWINGS (AS-BUILT DRAWINGS)

During progress of the work in this division, Contractor shall maintain an accurate record of all changes made during the installation of the system. Upon completion of the work, accurately transfer all record information to three identical sets of the approved shop drawings. Insert one set into each copy of the manual described below.

See Division 01 and General Conditions for additional information.

M. OPERATION AND MAINTENANCE INSTRUCTIONS

During the course of construction, collect and compile a complete brochure of equipment furnished and installed on this project. Include operational and maintenance instructions, manufacturer's catalog sheets, wiring diagrams, parts lists, approved submittals and shop drawings, warranties, and descriptive literature as furnished by the equipment manufacturer. Include an inside cover sheet that lists the project name, date, Owner, Architect, Engineer, General Contractor, Sub-Contractor, and an index of contents.

Include Record Drawings as described above.

Refer to Division 01 for acceptance of electronic manuals for this project. For electronic manuals, refer to paragraph "Submittals" for requirements.

N. SPARE PARTS

Furnish to Owner, with receipt, the following spare parts for the equipment furnished for this project:
1. Furnish three operating keys for each type of air outlet and inlet that require them.

O. TRAINING

At a time mutually agreed upon between the Owner and Contractor, provide the services of a factory trained and authorized representative to train Owner's designated personnel on the operation and maintenance of the equipment provided for this project.

Provide training to include, but not be limited to, an overview of the system and/or equipment as it relates to the facility as a whole, operation and maintenance procedures and schedules related to startup and shutdown, troubleshooting, servicing, preventive maintenance and appropriate operator intervention; and review of data included in the operation and maintenance manuals.

Schedule training with Owner with at least 7 days advance notice.

P. WARRANTIES

Warrant each system and each element thereof against all defects due to faulty workmanship, design, or material for a period of 12 months from date of Substantial Completion, unless specific items are noted to carry a longer warranty in the construction documents or manufacturer's standard warranty exceeds 12 months. Remedy all defects, occurring within the warranty period(s), as stated in the General Conditions and Division 01.

Warranties shall include labor and material, including travel expenses. Make repairs or replacements without any additional costs to the Owner, and to the satisfaction of the Owner Architect, and Engineer.

At the time of Substantial Completion, deliver to the Owner all warranties, in writing and properly executed, including term limits for warranties extending beyond the one year period and any actions the Owner must take in order to maintain warranty status. Each warranty instrument shall be addressed to the Owner and state the commencement date and term.

2. GENERAL MATERIALS AND INSTALLATION

A. BUILDING OPERATION

Comply with the schedule of operations as outlined in the architectural portions of this specification. Accomplish work requiring interruption of building operation at a time when the building is not in operation and only with written approval of building Owner and/or tenant. Coordinate interruption of building operation with the Owner and/or tenant a minimum of seven (7) days in advance of work.

B. EXISTING EQUIPMENT REUSE AND REMOVAL

Remove all unused equipment, ductwork, piping, and associated supports. Cap ductwork and piping at mains and seal airtight and watertight.

Provide items of HVAC systems modification required because of building remodeling, as noted on the drawings or necessary for proper operation. Match existing materials and construction techniques when modifying existing systems unless specified otherwise. Coordinate additional requirements with General Contractor and Architect.

Clean and rebalance existing ductwork, diffusers, registers, and grilles intended for reuse as required or as indicated on drawings.

Clean and refurbish existing HVAC equipment intended for reuse as required for proper operation.

C. COINCIDENTAL DAMAGE

Repair streets, sidewalks, drives, paving, walls, finishes, and other facilities damaged in the course of the work. Repair materials shall match existing construction. Repair work shall meet all requirements of the Owner, local authorities having jurisdiction, and meet the satisfaction of the Architect.

D. CUTTING AND PATCHING

Conform to the requirements in Division 01. Cut walls, floors, ceilings, and other portions of the facility as required to install work under this division. Obtain permission from the Architect prior to cutting. Do not cut or disturb structural members without prior approval from the Architect. Engineer Penetrations shall be made as small as possible while maintaining required clearances between the building element penetrated and the system component. Patch around openings to match the adjacent construction including fire ratings, if applicable. Repair and refinish areas disturbed by work to the condition of adjoining surfaces in a manner satisfactory to the Architect.

E. ROUGH-IN

Coordinate without delay all roughing-in with other divisions. Conceal piping, conduit, and rough-in except in unfinished areas and where otherwise shown.

F. PENETRATIONS

Seal elevated floor, exterior wall and roof penetrations watertight and weathertight with non-shrink, non-hardening commercial sealant. Pack with mineral wool and seal both ends with minimum of 1/2 inch of sealant.

G. MOTORS AND STARTERS

Provide motors and starting equipment where not furnished with the equipment package. Motors shall have copper windings. Class B insulation, and standard squirrel cage with starting torque characteristics suitable for the equipment served. Motors for air handling equipment shall be selected for quiet operation. Motors shall be manufactured by Century, General Electric, Louis Allis, Westinghouse, or approved equal.

Unless noted otherwise, motor starters shall be furnished by the Division 23 Contractor for installation and connection by the Division 26 Contractor. Starters shall be Allen-Bradley, Clark, Furnas, Square D, or approved equal.

H. EQUIPMENT FURNISHED BY OTHERS

Provide necessary equipment and accessories that are not provided by the equipment supplier or Owner to complete installation of equipment furnished by others in locations as indicated on the drawings, specified herein, or both. Equipment and accessories not provided by the equipment supplier may include, but not be limited to vents, and caps to outdoors, etc. as required for proper operation of the complete system in accordance with the manufacturer's instructions.

Contractor shall be responsible for correct rough-in dimensions and shall verify them with Architect and/or equipment supplier prior to service installations.

I. SYSTEM TESTING, ADJUSTING, AND BALANCING

Upon completion of each phase of the installation, test each system in conformance with local code requirements and as noted below. Furnish labor and equipment required to test each system installed under this contract. Assume all costs involved in making the tests and repairing and/or replacing any damages resulting therefrom.

Final system testing, balancing and adjustments (TAB) shall be performed by a Contractor certified by the National Environmental Balancing Bureau (NEBB), Associated Air Balance Council (AABC), or Testing, Adjusting and Balancing Bureau (TABB). TAB shall be performed in accordance with the most current edition of the certified agencies procedural standard for testing, adjusting and balancing and shall comply with the strictest interpretation of that standard for execution and reporting of all TAB work.

Test, adjust, and balance equipment and systems included in the scope of work. Prepare testing and balancing report log using forms equivalent with the standard forms available from the TAB certification standard being followed. Adjust equipment to deliver specified flow amounts on the drawings. For air systems, include airflow supply quantities, entering and leaving temperatures, and pressures at design flow. Include fan and unit test readings, motor voltage and amp draws, etc., and submit six copies of the final compilation of data to the Architect for evaluation and approval before final inspection of the project.

Balance air systems to within plus or minus 10 percent for terminal devices and branch lines and plus or minus 5 percent for main ducts and air handling equipment of the amount of air shown on the drawings. TAB Contractor shall record space temperatures and make adjustments in airflow to each diffuser to obtain uniform temperature (no greater than +- 3 F) in spaces. Document temperatures and adjustments in tab report. TAB report shall include a 'report summary/remarks' section in accordance with the procedural standard that provides both system set up and a summary of deficiencies as defined by the procedural standard..

TAB Contractor shall be responsible to calibrate, set, and adjust automatic temperature control sensors, actuators and control devices. Check proper sequencing of interlock systems, and operation of safety controls, adjust thermostats, and control setpoints, limits and time based adjustment to operate in accordance with the performance requirements of the Construction Documents.

J. AIR FILTERS

Temporary filters used to protect openings in ductwork and inside equipment when permanent HVAC equipment is used during the construction period shall be pleated, throwaway type filters, minimum MERV 6.

3. DUCT INSULATION, DUCTWORK, ACCESSORIES, FLUES AND FANS

Cover concealed, rigid ductwork with ASTM C553, Type II flexible fiberglass insulation. Installed insulation shall be 1-1/2 inch thick, 3/4 pound density, minimum R-4.2 duct wrap. Certainteed or equivalent Johns Manville, Owens-Corning, or Knauf with heavy-duty foil-scrim-kraft facing, and with joints taped with 3 inch wide foil tape as follows:

1. Round and rectangular supply and return air ductwork.
2. Round and rectangular exhaust air ductwork within 10 feet of exterior discharge.

A. DUCTWORK

Provide galvanized steel ductwork and housings as shown on drawings. Construct ductwork including fittings and transitions in conformance with current SMACNA standards relative to gauge, bracing, joints, etc. Minimum thickness of duct shall be 26-gauge sheet metal. Reinforce housings and ductwork over 30 inches with 1-1/4 inch angles not less than 6-4" on centers, and closer if required for sufficient rigidity to prevent vibration. Support horizontal runs of duct from strap iron hangers on centers not to exceed 8'-0". Do not support ceiling grid, conduits, pipes, equipment, etc. from ductwork. Coordinate routing of ductwork with other contractors such that piping, electrical conduit, and associated supports are not routed through the ductwork.

Construct non-VAV supply ducts to meet SMACNA positive pressure of 2 inches w.g. Construct Return, Outdoor and Exhaust ductwork upstream of fans to meet SMACNA negative pressure of 1 inch w.g. Construct exhaust ductwork downstream of fans to meet SMACNA positive pressure of 1 inch w.g.

Seal ductwork with heavy liquid sealant, Hardcast Iron-pro 601, Design Polymer DP 1010, United Mcgill duct sealer or approved equal, applied according to sealant manufacturer's instructions. Seal all longitudinal and transverse ductwork joints airtight to meet SMACNA Seal Class A. Tapes and mastics shall be listed and labeled in accordance with UL 181A.

Provide radius elbows, turns, and offsets with a minimum centerline radius of 1-1/2 times the duct width. Where space does not permit full radius elbows, provide short radius elbows with a minimum of two continuous splitter vanes. Vanes shall be the entire length of the bend. Provide mitered elbows where space does not permit radius elbows, where shown on the drawings, or at the option of the contractor with the engineer's approval. Mitered elbows less than 45 degrees shall not require turning vanes. Mitered elbows 45 degrees and greater shall have single thickness turning vanes of same gauge as ductwork, rigidly fastened with guide strips in ductwork. Vanes for mitered elbows shall be provided in all supply and exhaust ductwork and in return and outside air ductwork that has an air velocity exceeding 1000 fpm. The use of square throat, radius heel elbows is prohibited. Remove and replace all installed elbows of this type with an approved elbow at no additional cost to the owner.

Connect ducts to vibrating equipment and when transitioning between two different metals; duct materials (e.g., aluminum to galvanized steel) by means of flexible connectors. Flexible connectors shall be neoprene coated glass cloth canvas connections. Duro-Dyne, Elgen, Ventfabric or equal. Flexible connectors shall have a flame spread of 25 or less and smoke developed rating not higher than 50. Make airtight joints and install with minimum 1-1/2 inches slack.

Provide balancing dampers, manufactured by Cesco, Greenheck, Louvers & Dampers, Nailor Industries, Pottorff, Ruskin, Tamco, or approved equal, where shown on drawings and wherever necessary for complete control of air flow. Splitter dampers shall be controlled by locking quadrants; provide Young Regulator or Ventlok end bearings for the damper rod. Rectangular volume dampers shall be opposed blade interlocking type. Round volume dampers shall be single-blade type consisting of circular blade mounted to a shaft. Provide 45 degree rectangular/round side takeoff fitting with model BO3 damper with locking quadrant and insulation build out for round ductwork branch takeoffs to individual air devices. Omit damper at takeoff fitting when damper is located downstream of takeoff.

Round ductwork shall be FlakiGroup Semco, United, Hercules Industries or equal, sheetmetal, with smooth interior surface, with low pressure (duct pressure class up to and including 2 inches w.g.) Round ductwork gauges per the following table (reference SMACNA HVAC duct construction standards for gauges when pressures exceed 2 inches w.g.):

Size	Duct Gauge	Fitting Gauge
14" & under	26	24
15" thru 26"	24	22

Low pressure (duct pressure class up to and including 2 inches w.g.) Fittings 24 inches in diameter and less shall be prefabricated, spot-welded and internally sealed.

If permanent HVAC equipment is used during the construction period, provide temporary filters at all openings in the ductwork and inside equipment to protect the system from dust, dirt, paint, and moisture. Replace and maintain filters when needed, but not less than every month. On the day of Substantial Completion, clean the unit and ductwork and provide a new set of filters in the unit. Refer to section "Air Filters" for filter requirements.

B. AIR DEVICES

Provide air devices as scheduled on drawings, manufactured by Carnes, Krueger, Metalaire, Nailor Industries, Price, Titus, Tuttle & Bailey, or Hart & Cooley. Select air devices to limit room noise level to no higher than NC-30 unless otherwise shown. Provide devices with a soft plastic gasket to make an airtight seal against the mounting surface. Coordinate final location, frame, and mounting type of air devices with Architectural reflected ceiling plans.

Submit complete shop drawings including information on noise level, pressure drop, throw, CFM for each air device, styles, borders, etc. Clearly marked with specified equipment number.

Provide supply registers with horizontal 35 or 45 degree angle vision-proof bars. Provide concealed fasteners for wall mounted registers and grilles. Provide opposed blade dampers for supply air registers.

Provide ceiling mounted air devices of surface mounted type as required to be compatible with ceiling construction. Provide ceiling diffusers and grilles with white enamel finish unless noted otherwise. Provide opposed blade dampers for ceiling mounted air devices.

C. EXHAUST AIR SYSTEMS

Provide ceiling mounted exhaust fan as scheduled on the drawings. ACME, Carnes, Cook, Greenheck, Pennbarry, or Twin City Fans complete with isolated blower unit and ceiling grille. Provide disconnect switch, backdraft damper, discharge duct,exhaust vent cap at exterior termination, and neoprene vibration isolators with all-thread hanging rods.

D. EXHAUST FAN CONTROL (EF-1)

Provide local switch for on/off control of fan and fan speed controller for balancing.

END OF SECTION 23

PGAV ARCHITECTS
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01/28/2022

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21000003
EXPIRES 12/31/2022

#	DATE	DESCRIPTION

UNIVERSITY HOUSE

PITTSBURG STATE UNIVERSITY
PITTSBURG KANSAS
Building Number: 38500-0230

CONSTRUCTION DOCUMENTS

Original Size: 1' x 1' Drawing may have been reduced.

MECHANICAL SPECIFICATIONS

DATE: 01-28-2022	
DRAWN: SB	CHECKED: JP
PGAV # 5345A20	CLIENT # 4-74445

SHEET #
M200

CARL L. HOLDEN

GENERAL DEMOLITION NOTES:

1. PRIOR TO SUBMITTING BID, VISIT THE JOB SITE AND BECOME FULLY ACQUAINTED WITH THE EXISTING CONDITIONS OF THE PROJECT. REVIEW THE GENERAL NOTES, SPECIFICATIONS AND OTHER DRAWINGS FOR ADDITIONAL REQUIREMENTS WHICH MAY NOT BE SPECIFICALLY CALLED OUT IN THIS PORTION OF THE CONSTRUCTION DOCUMENTS. NOTIFY ARCHITECT, ENGINEER AND/OR OWNER OF CONFLICTS OR DISCREPANCIES PRIOR TO SUBMISSION OF BID.
2. EXISTING CONDITIONS WERE TAKEN FROM ORIGINAL DRAWINGS AND SITE VISITS AND MAY NOT REFLECT EXACT "AS-BUILT" CONDITIONS. FIELD VERIFY EXISTING CONDITIONS PRIOR TO SUBMITTING FINAL BIDS. COORDINATE NEW WORK AND DEMOLITION WITH OTHER DISCIPLINES AND EXISTING CONDITIONS PRIOR TO CONSTRUCTION.
3. OWNER RETAINS RIGHTS OF SALVAGE FOR EQUIPMENT AND FIXTURES TO BE REMOVED. COORDINATE WITH THE OWNER THE EQUIPMENT AND FIXTURES TO BE SALVAGED AND THE LOCATION FOR STORAGE. AVOID DAMAGE TO EQUIPMENT, FIXTURES AND DEVICES DURING DEMOLITION WORK AND DURING TRANSPORT TO OWNER'S DESIGNATED STORAGE LOCATION.
4. REMOVE ITEMS SHOWN HEAVY LINED AND/OR CROSSHATCHED AND/OR NOTED TO BE REMOVED.
5. AVOID DAMAGING EXISTING SURFACES AND EQUIPMENT TO REMAIN FOR NEW INSTALLATION. REPAIR ANY DAMAGE CAUSED DURING WORK AT NO EXTRA COST TO THE OWNER.
6. REMOVE PIPE HANGERS, PIPE SUPPORTS AND EQUIPMENT SUPPORTS WHERE PIPING OR EQUIPMENT IS REMOVED AND THE EXISTING HANGERS AND SUPPORTS ARE NOT USED FOR THE NEW INSTALLATION.
7. VERIFY THAT EXISTING EQUIPMENT TO REMAIN IS OPERATING PROPERLY. NOTIFY THE ARCHITECT, ENGINEER AND/OR OWNER OF ANY DAMAGED AND/OR MALFUNCTIONING COMPONENTS.
8. WHERE SHUTDOWN OF EXISTING ACTIVE PIPING SYSTEMS IS REQUIRED DURING DEMOLITION PHASE OF WORK IN PREPARATION FOR NEW TIE-IN PHASE OF WORK, COORDINATE WITH THE OWNER AND MINIMIZE DOWNTIME. VERIFY EXISTING SYSTEMS, EQUIPMENT, AND COMPONENTS WILL BE PROVIDED WITH BACKUP SERVICE WHERE REQUIRED. NOTIFY OWNER A MINIMUM OF SEVEN (7) DAYS PRIOR TO INTERRUPTION OF SERVICE.

GENERAL NOTES:

1. PROVIDE A CONSTRUCTION RECORD SET OF "AS-BUILT" DOCUMENTS TO THE ARCHITECT REFLECTING ANY VARIANCES OF INSTALLED PIPING LOCATIONS OR EQUIPMENT CONTRARY TO THE CONSTRUCTION DOCUMENTS. REFER TO SPECIFICATIONS.
2. DRAWINGS ARE DIAGRAMMATIC ONLY AND REPRESENT THE GENERAL SCOPE OF THE WORK. REVIEW THE GENERAL NOTES, SPECIFICATIONS AND PLANS FOR ADDITIONAL REQUIREMENTS THAT MAY NOT BE SPECIFICALLY CALLED OUT IN THIS PORTION OF THE CONSTRUCTION DOCUMENTS. NOTIFY THE ARCHITECT OF ANY CONFLICTS OR DISCREPANCIES PRIOR TO SUBMISSION OF BID.
3. DRAWINGS ARE DIAGRAMMATIC ONLY AND REPRESENT THE GENERAL SCOPE OF THE WORK. PRIOR TO SUBMITTING BID, VISIT THE JOB SITE TO OBSERVE THE EXISTING CONDITIONS OF THE PROJECT. REVIEW THE GENERAL NOTES, SPECIFICATIONS AND PLANS FOR ADDITIONAL REQUIREMENTS THAT MAY NOT BE SPECIFICALLY CALLED OUT IN THIS PORTION OF THE CONSTRUCTION DOCUMENTS. NOTIFY ARCHITECT OF ANY CONFLICTS OR DISCREPANCIES PRIOR TO SUBMISSION OF BID.
4. PROVIDE TO THE ARCHITECT A COPY OF INSPECTION REPORTS AND APPROVAL CERTIFICATES FROM LOCAL AND STATE INSPECTIONS. REFER TO SPECIFICATIONS.
5. INSTALLATION SHALL COMPLY WITH LEGALLY CONSTITUTED CODES AND THE REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION AND ALSO MEET ALL REQUIREMENTS OF THE LANDLORD. OBTAIN A COPY OF THE LANDLORD'S REQUIREMENTS AND REVIEW PRIOR TO SUBMITTING BID.
6. PLANS AND SPECIFICATIONS GOVERN WHERE THEY EXCEED CODE REQUIREMENTS.
7. REFER TO ARCHITECTURAL PLANS FOR EXACT LOCATION AND MOUNTING HEIGHTS OF PLUMBING FIXTURES.
8. DO NOT SCALE FLOOR PLANS FOR EXACT HORIZONTAL LOCATION OF PIPE ROUTING.
9. INSTALL CONCEALED PIPING TIGHT TO THE STRUCTURE AND AS HIGH AS POSSIBLE.
10. VALVES SHALL BE LINE SIZE UNLESS OTHERWISE NOTED.
11. INSTALL EXPOSED PIPING, WHERE NECESSARY, IN FINISHED AREAS TIGHT TO THE STRUCTURE, WALL OR CEILING AND AS HIGH AS POSSIBLE. INSTALL PIPING PARALLEL AND / OR PERPENDICULAR TO WALLS.
12. INSTALL VALVES AND APPURTENANCES A MAXIMUM OF 24" ABOVE CEILING IN ACCESSIBLE LOCATION WITHIN 24" OF ACCESS DOORS OR ACCESSIBLE CEILING TILES. PROVIDE PIPE AND FITTINGS TO INSTALL VALVES AND APPURTENANCES AT REQUIRED HEIGHT AND WITHIN 24" OF ACCESS DOORS OR ACCESSIBLE CEILING TILES.
13. INSTALL NO PLASTIC PIPE OF ANY KIND ABOVE SLAB INSIDE OR UNDER THE BUILDING. INSTALL NO PLASTIC PIPE IN THE CEILING RETURN AIR PLENUM.
14. COORDINATE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
15. COORDINATE PIPING INSTALLATION WITH STRUCTURAL GRADE BEAMS, FOOTINGS, COLUMN PIERS, ETC. SLEEVE PIPING THROUGH GRADE BEAMS, FOOTING, ETC. WHERE REQUIRED AND AS NOTED ON PLANS. COORDINATE SLEEVE INSTALLATIONS WITH THE ARCHITECT, STRUCTURAL ENGINEER, STRUCTURAL CONTRACTOR AND GENERAL CONTRACTOR BEFORE CONCRETE IS INSTALLED.
16. CLEAN FAUCET AERATORS AND PIPE STRAINERS PRIOR TO TURNING BUILDING OVER TO THE OWNER.
17. COORDINATE PIPE ROUTING AWAY FROM ELECTRICAL PANELS. DO NOT INSTALL PIPING OVER ELECTRICAL PANELS.
18. PROVIDE TRANSITION ADAPTER COUPLINGS FOR CONNECTION OF PVC DWV TO CAST IRON SANITARY, WASTE AND VENT PIPE AT SLAB ON GRADE. SEE DIVISION 22 SPECIFICATION FOR MORE INFORMATION.
19. PROVIDE TRANSITION ADAPTER COUPLINGS FOR CONNECTION OF PVC DWV TO CAST IRON SANITARY, WASTE AND VENT PIPE AT SLAB ON GRADE. SEE DIVISION 22 SPECIFICATION SECTION "SANITARY DRAINAGE AND VENT PIPING AND SPECIALTIES" FOR MORE INFORMATION.
20. WATER HAMMER ARRESTORS SHALL BE SIZE "A" UNLESS NOTED OTHERWISE.

PLUMBING SYMBOLS

THIS IS A MASTER LEGEND AND NOT ALL SYMBOLS OR ABBREVIATIONS ARE USED. V2.02

STANDARD MOUNTING HEIGHTS

CLINIC SERVICE SINKS (RIM)	30"
HOSE BIBB (CENTERLINE)	36"
ICE MAKER OUTLET BOX (CENTER OF BOX)	24"
JANITOR'S SINK FAUCET FITTINGS (CENTERLINE)	42"
LAVATORY OR SINK	
STANDARD HEIGHT (RIM)	31"
ADA ACCESSIBLE (RIM)	34"
CHILD HEIGHT (RIM)	24"
NON FREEZE WALL HYDRANT (AFG TO CENTERLINE)	18"
SHOWER HEAD	
MEN (CENTERLINE)	78"
WOMEN (CENTERLINE)	72"
SHOWER VALVE	
STANDARD HEIGHT - MEN (CENTERLINE)	48"
STANDARD HEIGHT - WOMEN (CENTERLINE)	43"
ADA ACCESSIBLE (CENTERLINE)	38" TO 48"
SURGEON'S SCRUB-UP SINK (FRONT RIM)	35"
TUB VALVE	
STANDARD HEIGHT (CENTERLINE)	32"
ADA ACCESSIBLE CENTER BETWEEN GRAB BAR AND TUB RIM	
URINAL	
STANDARD HEIGHT (RIM)	24"
ADA ACCESSIBLE (RIM)	17"
CHILD HEIGHT (RIM)	14"
WASHING MACHINE OUTLET BOX (RIM)	42"
WATER CLOSET	
STANDARD HEIGHT (RIM)	15"
ADA ACCESSIBLE (TOP OF SEAT)	17" TO 19"
CHILD HEIGHT (RIM)	10"
WATER COOLER OR DRINKING FOUNTAIN	
STANDARD HEIGHT (SPOUT)	41"
ADA ACCESSIBLE (SPOUT)	36"
CHILD HEIGHT (SPOUT)	30"

INSTALL PLUMBING FIXTURES AT THE MOUNTING HEIGHTS SHOWN ABOVE UNO IN THE ARCHITECTURAL DRAWINGS OR ELSEWHERE IN THE CONSTRUCTION DOCUMENTS, FINAL APPROVAL OF LOCATIONS BY ARCHITECT. MOUNTING HEIGHTS LISTED ABOVE, OR ELSEWHERE IN THE CONSTRUCTION DOCUMENTS, ARE AFF. UNO, ALL DEVICES SHALL BE INSTALLED IN COMPLIANCE WITH CURRENT ADA AND LOCAL REQUIREMENTS.

ANNOTATION

- 1 — PLUMBING PLAN NOTE CALLOUT
- 1 — PLUMBING EQUIPMENT DESIGNATION, (CONTRACTOR FURNISHED AND INSTALLED); REFER TO PLUMBING FIXTURE OR EQUIPMENT SCHEDULES
- 1 — EQUIPMENT DESIGNATION (OWNER FURNISHED, CONTRACTOR INSTALLED)
- CU 1 — MECHANICAL EQUIPMENT DESIGNATION (CONTRACTOR FURNISHED AND INSTALLED UNLESS NOTED OTHERWISE)
- CONNECTION POINT OF NEW WORK TO EXISTING
- 1 P1 — DETAIL REFERENCE UPPER NUMBER INDICATES DETAIL NUMBER LOWER NUMBER INDICATES SHEET NUMBER
- 1 P1 — SECTION CUT DESIGNATION
- DEDICATED EQUIPMENT ACCESS TILE
- ACCESS PANEL

ABBREVIATIONS

ADA	AMERICANS WITH DISABILITIES ACT	MIN	MINIMUM
AFF	ABOVE FINISHED FLOOR	N/C	NORMALLY CLOSED
AFG	ABOVE FINISHED GRADE	N/O	NORMALLY OPEN
AHU	AIR HANDLING UNIT	NIC	NOT IN CONTRACT
AP	ACCESS PANEL	ORD	OVERFLOW ROOF DRAIN
BAS	BUILDING AUTOMATION SYSTEM	PDI	PLUMBING DRAINAGE INSTITUTE
BFF	BELOW FINISHED FLOOR	PHØ	PHASE
BFG	BELOW FINISHED GRADE	PRV	PRESSURE REDUCING VALVE
BOP	BOTTOM OF PIPE	PVC	POLYVINYL CHLORIDE
BOS	BOTTOM OF STRUCTURE	RCP	REINFORCED CONCRETE PIPE
BTU	BRITISH THERMAL UNIT	RD	ROOF DRAIN
CP	CONDENSATE PUMP	RPM	REVOLUTIONS PER MINUTE
CPVC	CHLORINATED POLYVINYL CHLORIDE	RTU	ROOFTOP UNIT
CU	COPPER	SF	SQUARE FEET
DI	DUCTILE IRON	SP	SUMP
DN	DOWN	SS	STAINLESS STEEL
DFU	DRAINAGE FIXTURE UNIT		SANITARY SEWER, SOIL
DS	DOWNSPOUT		STACK
(E)	EXISTING	TDH	TOTAL DYNAMIC HEAD
EMS	ENERGY MANAGEMENT SYSTEM	TFA	TO FLOOR ABOVE
ETR	EXISTING TO REMAIN	TFB	TO FLOOR BELOW
EWC	ELECTRIC WATER COOLER	TYP	TYPICAL
FD	FLOOR DRAIN	UL	UNDERWRITERS LABORATORIES, INC.
FFA	FROM FLOOR ABOVE	UNO	UNLESS NOTED OTHERWISE
FFB	FROM FLOOR BELOW	UPS	UNINTERRUPTIBLE POWER SUPPLY
FF	FINISHED FLOOR	VCP	VITRIFIED CLAY PIPE
FL	FLOW LINE	VFD	VARIABLE FREQUENCY DRIVE
FLA	FULL LOAD AMPS	VS	VENT STACK
FLR	FLOOR	VTR	VENT THROUGH ROOF
GPM	GALLONS PER MINUTE	W/	WITH
HD	HEAD, HUB DRAIN	W/O	WITHOUT
HZ	HERTZ	WC	WATER COLUMN
IE	INVERT ELEVATION	WS	WASTE STACK
IN WC	INCHES OF WATER COLUMN	WSFU	WATER SUPPLY FIXTURE UNIT
JB	JUNCTION BOX	WVS	WASTE VENT STACK
J-BOX	JUNCTION BOX		
KW	KILOWATT		
MAU	MAKE-UP AIR UNIT		
MAX	MAXIMUM		
MBH	1000 BTU PER HOUR		
MH	MANHOLE		

PIPING SYMBOLS

- OXYGEN OUTLET
- NITROUS OXIDE OUTLET
- MEDICAL AIR OUTLET
- NITROGEN OUTLET
- MEDICAL VACUUM INLET
- FLOOR SINK (FS), SIZE & TYPE
- FLOOR DRAIN (FD), SIZE & TYPE
- ROOF DRAIN (RD), SIZE & TYPE
- BALL VALVE
- CONTROL VALVE
- SHUTOFF VALVE
- CHECK VALVE
- BALANCING VALVE WITH PRESSURE PORTS
- WATER METER
- STRAINER
- STRAINER WITH BLOWOFF
- RELIEF/SAFETY VALVE
- SOLENOID VALVE
- PRESSURE REDUCING VALVE
- GAS PRESSURE REGULATOR
- THERMOSTATIC MIXING VALVE
- PA — PIPE ANCHOR
- EXPANSION JOINT
- BACKFLOW PREVENTER
- PRESSURE GAUGE
- THERMOMETER
- UNION
- FLANGE CONNECTION
- HOSE BIBB (HB)
- NON-FREEZING WALL HYDRANT (NW)
- MANUAL / AUTOMATIC AIR VENT OR VACUUM RELIEF VALVE
- PRESSURE / VACUUM SWITCH
- CLEANOUT
- CAP
- WALL CLEANOUT (WCO)
- FLOOR CLEANOUT (FCO)
- EXTERIOR CLEANOUT (ECO)
- ELBOW UP
- ELBOW DOWN
- TEE UP
- TEE DOWN
- ELBOW UP WITH SHUT-OFF VALVE (SOV)
- ELBOW DOWN WITH SHUT-OFF VALVE (SOV)
- TEE UP WITH SHUT-OFF VALVE (SOV)
- TEE DOWN WITH SHUT OFF VALVE (SOV)
- "A" — WATER HAMMER ARRESTER (WHA) WITH PDI SIZES, (A, B, C, D, & E)
- RECIRCULATION PUMP
- P-TRAP
- GAS COCK
- TRAP PRIMER
- TRAP PRIMER WITH DISTRIBUTION UNIT

PIPING LINETYPES

CW	DOMESTIC COLD WATER (CW)
SCW	SOFTENED COLD WATER (SCW)
HW	DOMESTIC HOT WATER (HW)
HWR	DOMESTIC HOT WATER RECIRC. (HWR)
140°	DOMESTIC HOT WATER (140°)
T	TRAP PRIMER LINE (T)
S	SOIL PIPING - ABOVE FLOOR (S)
S	SOIL PIPING - BELOW FLOOR (S)
W	WASTE PIPING - ABOVE FLOOR (W)
W	WASTE PIPING - BELOW FLOOR (W)
GW	GREASE WASTE - ABOVE FLOOR (GW)
GW	GREASE WASTE - BELOW FLOOR (GW)
CGWV	COMBINATION GREASE WASTE AND VENT (CGWV)
CWV	COMBINATION WASTE AND VENT (CWV)
ST	STORM DRAIN - ABOVE FLOOR (ST)
ST	STORM DRAIN - BELOW FLOOR (ST)
OST	OVERFLOW STORM DRAIN - ABOVE FLOOR (OST)
VBG	VENT BELOW GRADE (VBG)
VBF	VENT BELOW FLOOR (VBF)
ID	INDIRECT DRAIN (ID)
CDH	CONDENSATE DRAIN - HIGH EFFICIENCY RTU (CDH)
CD	CONDENSATE DRAIN (CD)
ACD	AUXILIARY CONDENSATE DRAIN (ACD)
SPD	SUMP OR SEWAGE PUMP DISCHARGE (SPD)
G	NATURAL GAS (G)
G	NATURAL GAS ON ROOF (G)
MPG	MEDIUM PRESSURE NATURAL GAS (MPG)
MPG	MEDIUM PRESSURE NATURAL GAS ON ROOF (MPG)
NPW	NON-POTABLE WATER (NPW)
LPG	LIQUEFIED PETROLEUM GAS (LPG)
WS	WATER SERVICE (WS)
DFP	FIRE PROTECTION SPRINKLER DRY (DFP)
FP	FIRE PROTECTION SPRINKLER WET (FP)
DSP	FIRE PROTECTION STANDPIPE DRY (DSP)
WSP	FIRE PROTECTION STANDPIPE WET (WSP)
PD	CONDENSATE PUMP DISCHARGE (PD)
V	VENT PIPING (V)
AW	ACID WASTE - ABOVE FLOOR (AW)
AW	ACID WASTE - BELOW FLOOR (AW)
AV	ACID VENT (AV)
GWS	GRAY WATER (GWS)
CA	COMPRESSED AIR (CA)
MA	MEDICAL AIR (MA)
MV	MEDICAL VACUUM (VE)
HE	HELIUM (HE)
IA	INSTRUMENT AIR (IA)
IV	INSTRUMENT VACUUM (IV)
N2	NITROGEN (N2)
N2O	NITROUS OXIDE (N2O)
O2	OXYGEN (O2)
EV	EVAC/WAGD (EV)
CO2	CARBON DIOXIDE (CO2)
AI	MEDICAL AIR INTAKE (AI)
VE	MEDICAL VACUUM EXHAUST (VE)
DA	DENTAL AIR (DA)
DV	DENTAL VACUUM (DV)
FW1	FILTERED WATER (FW1)
FW2	FILTERED WATER W/ SCALE INHIBITOR (FW2)
RO	REVERSE OSMOSIS (RO)
ROR	REVERSE OSMOSIS REMINERALIZATION (ROR)

LINETYPE LEGEND

THROUGHOUT THE DRAWINGS DIFFERENT LINETYPES ARE USED IN COMBINATION WITH THE SYMBOLS TO INDICATE THE STATUS OF ITEMS AS EXISTING, TO BE DEMOLISHED, TO BE INCLUDED AS PART OF NEW WORK AND/OR ITEMS WHICH ARE ANTICIPATED TO BE PROVIDED IN THE FUTURE. THE STATUS OF ITEMS USING THESE LINETYPES ARE RELATIVE TO THE VIEW IN WHICH THEY APPEAR. PHASING SHOWN IN DRAWINGS IS NOT INTENDED TO FULLY DESCRIBE ALL NECESSARY CONSTRUCTION PHASING, WHICH IS DETERMINED BY THE CONTRACTOR AS PART OF THEIR RESPONSIBILITIES. ANY SUCH PHASES DESCRIBED IN THE CONSTRUCTION DOCUMENTS ARE GENERAL AND ONLY INTENDED TO INDICATE A BROAD ORDER FOR THE SAKE OF DESCRIBING THE PROJECT. THE FOLLOWING LINETYPES MAY BE USED ON ANY DEVICE, EQUIPMENT, NOTE, LINE, SHAPE, ETC.

EXISTING	NEW
DEMOLISH	FUTURE

CALL OUTS

- ENLARGED PLAN CALLOUT
- NOT IN SCOPE

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01/28/2022

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P100000003
EXPIRES 12/31/2022

#	DATE	DESCRIPTION

UNIVERSITY HOUSE

PITTSBURG STATE UNIVERSITY
PITTSBURG KANSAS
Building Number: 38500-0230

CONSTRUCTION DOCUMENTS

Original Size: 1 1/2" Drawing may have been reduced.

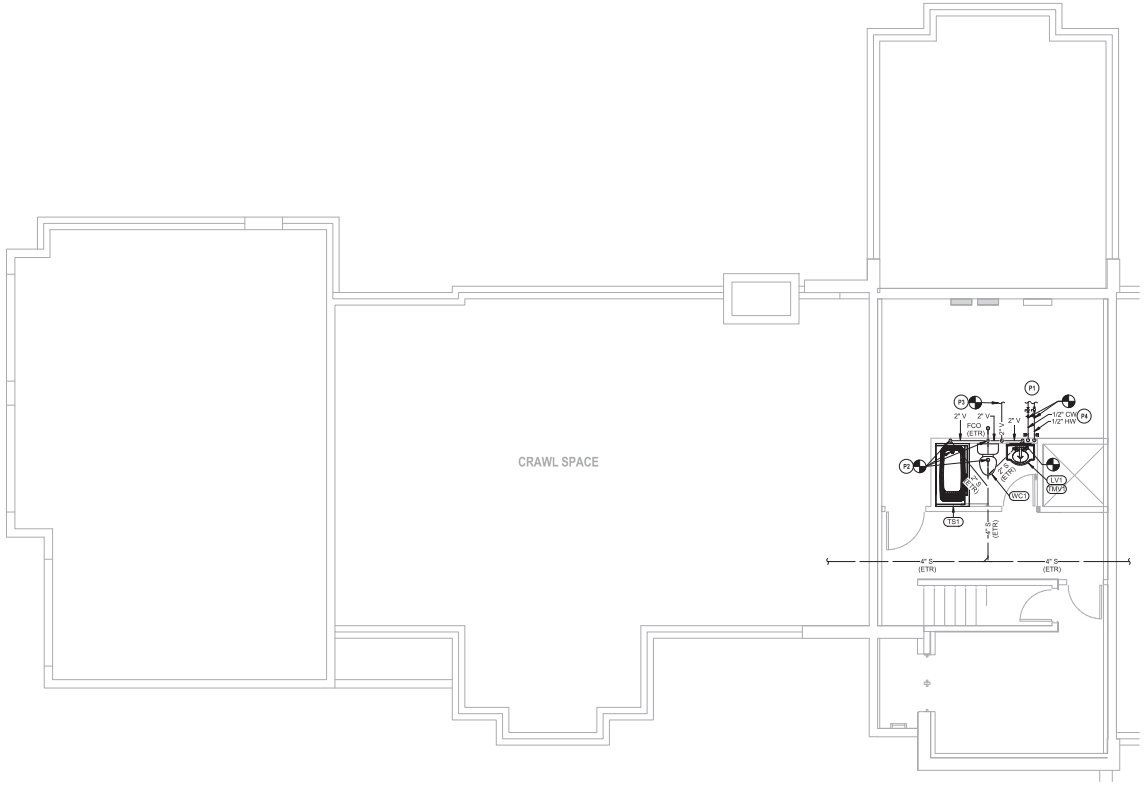
PLUMBING GENERAL NOTES AND LEGEND

DATE: 01-28-2022	
DRAWN: VAP	DESIGN: MEM
PROJ #: 5345E-00	CLIENT #: A-214445

SHEET #: P000

VAP

CARL L. HOLDEN



1 PLUMBING BASEMENT PLAN
1/4" = 1'-0"

PLUMBING PLAN NOTES:

P1 DO NOT INSTALL PLUMBING PIPING OVER ELECTRICAL PANELS OR EQUIPMENT.

P2 CONNECT NEW PLUMBING FIXTURE TO EXISTING PLUMBING WASTE AND VENT STUB-INS. FIELD VERIFY EXACT LOCATIONS AND SIZE PRIOR TO SUBMITTING BID.

P3 CONNECT NEW VENT PIPING INTO THE EXISTING VENT STUB. FIELD VERIFY EXACT LOCATION AND SIZE PRIOR TO SUBMITTING BID.

P4 CONNECT NEW DOMESTIC HOT AND COLD WATER PIPING TO EXISTING 1/2" WATER STUB OUTS. FIELD VERIFY EXACT LOCATION AND SIZE OF STUB OUTS PRIOR TO SUBMITTING BID. ROUTE IN NEW WALL TO SERVE NEW PLUMBING FIXTURES. REFER TO PLUMBING FIXTURE CONNECTION SCHEDULE FOR ADDITIONAL INFORMATION.

PLUMBING FIXTURE SCHEDULE:
FIXTURES IN THIS SCHEDULE OR THEIR APPROVED EQUIVALENT ARE PROVIDED BY THE PLUMBING CONTRACTOR. SUBMIT SHOP DRAWINGS ON EACH OF THESE ITEMS. REFER TO SPECIFICATIONS FOR FURTHER INFORMATION AND INSTALLATION REQUIREMENTS. VERIFY ROUGH-IN REQUIREMENTS WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS AND INSTALL PER MANUFACTURER'S RECOMMENDATIONS. REFER TO THE ARCHITECTURAL DRAWINGS FOR THE PLUMBING FIXTURE MOUNTING HEIGHTS.

LAVATORIES
LV1 CASEWORK AND BOWL PROVIDED BY OTHERS.
FAUCET: DELTA 3551-PT 'DRYDEN' 4" SPOUT AND 1.5 GPM SOFTFLOW AERATOR WITH POP-UP DRAIN. COLOR NICKLE. 1-1/4" X 1-1/2" PVC P-TRAP CHROME PLATED RISERS WITH OVAL HANDLE ANGLE STOPS.

SHOWERS
TS1 TUB / SHOWER COMBINATION: KOHLER K-1121-LA LEFT/RIGHT DRAIN DESIGNATION. WHITE ONE PIECE ACTYLIC BATH. 72" X 36" X 15-3/4" AND KOHLER® 7272-BN CLEARFLO SLOTTED OVERFLOW BATHDRAIN. DELTA T14451-PT (DRYDEN' SHOWER/TUB UNIT PRESSURE BALANCING MIXING VALVE WITH DELTA R1000-IP MULTICHOICE UNIVERSAL TUB AND SHOWER VALVEBODY ROUGH-IN. LEVER HANDLE. INTEGRAL VOLUME CONTROL/STOPS. TUB SPOUT. SHOWER HEAD (2.2 GPM) WITH ARM AND FLANGE. HANDHELD SHOWER. LEVER DIVERTER WITH VOLUME CONTROL. VERIFY DRAIN SIDE PRIOR TO ORDERING.

WATER CLOSETS
WC-1 FLOOR-MOUNTED WATER CLOSET: AMERICAN STANDARD # 215CA.004 'CADET PRO' TANK TYPE WHITE VITREOUS CHINA FIXTURE WITH ELONGATED BOWL. 1.6 GALLON PER FLUSH. AND SIPHON FLUSH ACTION WITH 3" OVERSIZED FLAPPER VALVE. MaP SCORE OF 1,000g AND CLOSE-COUPLED TANK WITH LEFT HAND METAL TRIP LEVER. TRIM: CHURCH # 9000SSCT WHITE OPEN-FRONT CONTOURED. SOLID PLASTIC. HEAVY DUTY. SEAT LESS COVER WITH SELF-SUSTAINING CHECK HINGES AND STAINLESS STEEL BOLTS. McGUIRE # LF2199CC LEAD FREE BRASS ANGLE STOP VALVE WITH RISER AND CHROME-PLATED ESCUTCHEON.

WATER HAMMER ARRESTER
WHA WATER HAMMER ARRESTER: PRECISION PLUMBING PRODUCTS. HARD DRAWN COPPER BODY WITH WROUGHT COPPER FITTINGS. PISTON TYPE WITH LUBRICATED EPDM "O" RING SEALS. MEETING ASSE 1010 OR PDI WH-201. PROVIDE PDI SIZES "A" THROUGH "F" AS SHOWN ON PLANS. PROVIDE SIZE "A" UNLESS SHOWN OTHERWISE ON THE PLANS. SIZE "AA" WATERHAMMER ARRESTORS ARE NOT ALLOWED.

PLUMBING FIXTURE CONNECTION SCHEDULE

FIXTURE	COLD WATER	HOT WATER	WASTE	VENT
WATER CLOSET (TANK)	1/2"	--	4"	2"
LAVATORY HAND SINK	1/2"	1/2"	2"	1-1/2"
BATHTUB	1/2"	1/2"	2"	1-1/2"

NOTES:
1 PIPE SIZES SHOWN ARE MINIMUM, AND ARE FOR INDIVIDUAL SERVICE PIPE SIZES

PLUMBING PIPE MATERIAL SCHEDULE

PIPING SYSTEM	ABBREVIATION	PIPING MATERIAL
SANITARY DRAINAGE & VENT (ABOVE GRADE)	S, W OR V	HUBLESS CAST IRON
SANITARY DRAINAGE & VENT (BELOW GRADE)	S, W OR V	SERVICE WEIGHT CAST IRON (PVC DWV OPTIONAL)
POTABLE WATER (ABOVE GRADE)	CW, HW OR HWR	TYPE L HARD DRAWN COPPER
REFER TO SPECIFICATIONS FOR FITTINGS, INSTALLATION REQUIREMENTS AND FURTHER INFORMATION		

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01/28/2022

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EXPIRES 12/31/2022

#	DATE	DESCRIPTION

UNIVERSITY HOUSE

PITTSBURG STATE UNIVERSITY
PITTSBURG KANSAS
Building Number: 38500-0230

CONSTRUCTION DOCUMENTS

Original Size: 1 1/2" Drawing may have been reduced.

PLUMBING BASEMENT PLAN

DATE: 01-28-2022
DRAWN: Author
DESIGN: MEM
PGAV #: SM38-00
CLIENT #: A-214445
SHEET #: P101

Author
CARL L. HOLDEN

Division 22. PLUMBING

1. GENERAL INSTRUCTIONS

A. GENERAL REQUIREMENTS

All requirements under Division 01 and the general and supplementary conditions of these specifications apply to this section and division. Where the requirements of this section and division exceed those of Division 01, this section and division take precedence. Become thoroughly familiar with all its contents as to requirements that affect this division, section, or both. Work required under this division includes all material, equipment, appliances, transportation, services and labor required to complete the entire system as required by the drawings and specifications, or reasonably inferred to be necessary to facilitate the function of each system as implied by the design and equipment specified.

The specifications and drawings for the Project are complementary, and any portion of work described in one shall be provided as if described in both. In the event of discrepancies, notify the Engineer and request clarification prior to proceeding with the work involved.

Drawings are graphic representations of the work upon which the contract is based. They show the materials and their relationship to one another, including sizes, shapes, locations, and connections. They convey the scope of work, indicating the intended general arrangement of the systems without showing all of the exact details as to elevations, offsets, connections, and other installation requirements. Use the drawings as a guide when laying out the work and to verify that materials and equipment will fit into the designated spaces, and which when installed per manufacturers' requirements, will ensure a complete, coordinated, satisfactory, and properly operating system.

B. DEFINITIONS

Division: References contained in this specification follow the numbering system defined in the Construction Specifications Institute (CSI) MasterFormat 2004 Edition. Specification Divisions 01 through 13 provided with this project may reference the CSI MasterFormat 1995 Edition. The corresponding division references between the 2004 Edition and 1995 Edition are as follows:

	2004 Edition	1995 Edition
1.	Division 21 - Fire Suppression	Division 15
2.	Division 22 - Plumbing	Division 15
3.	Division 23 - HVAC	Division 15
4.	Division 26 - Electrical	Division 16
5.	Division 27 - Communications	Division 16
6.	Division 28 - Electronic Safety and Security	Division 16

Furnish: "to supply and deliver to the project site, ready for unloading, unpacking, assembly, installation and similar operations."

Install: "to perform all operations at the project site including, but not limited to, the actual unloading, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, testing, commissioning, starting up and similar operations, complete, and ready for the intended use."

Provide: "to furnish and install, complete and ready for the intended use."

Furnished by Owner (or Owner-Furnished) or Furnished by Others: "an item furnished by the Owner or under other divisions or contracts, and installed under the requirements of this division, complete, and ready for the intended use, including all items and services incidental to the work necessary for proper installation and operation. Include the installation under the warranty required by this division."

Engineer: Where referenced in this division, "Engineer" is the Engineer of Record and the Design Professional for the work under this division, and is a consultant to, and an authorized representative of the Architect, as defined in the General and/or Supplementary Conditions. When used in this division, Engineer means increased involvement by and obligations to the Engineer, in addition to involvement by and obligations to the Architect.

AHJ: The local code and/or inspection agency (Authority) Having Jurisdiction over the work.

NRTL: Nationally recognized testing laboratory, as defined and listed by OSHA in 29 CFR 1910.7 (e.g., UL, ETL, CSA), and acceptable to the AHJ over this project. Nationally recognized testing laboratories and standards listed are used only to represent the characteristics required and are intended to meet the intent of the use of other NRTLs that are acceptable to the AHJ and standards that meet the specified criteria.

Substitution: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor. Substitutions include Value Engineering proposals.

A. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.

B. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

The terms "approved equal", "equivalent", or "equal" are used synonymously and shall mean "accepted by or acceptable to the Engineer as equivalent to the item or manufacturer specified". The term "approved" shall mean labeled, listed, or both, by an NRTL, and acceptable to the AHJ over this project.

The term lead free refers to the wetted surface of pipe, fittings and fixtures in potable water systems that have a weighted average lead content of less than or equal to 0.25% per safe drinking water act as amended January 4, 2011 Section 1417.

C. PREBID SITE VISIT

Prior to submitting bid, visit the site of the proposed work and become fully informed as to the conditions under which the work is to be done. Failure to comply with this requirement shall not be considered sufficient justification to request or obtain extra compensation over and above the contract price.

D. MATERIAL AND WORKMANSHIP

Provide new material, equipment, and apparatus under this contract unless otherwise stated herein, of best quality normally used for the purpose in good commercial practice, and free from defects. Install material and equipment in accordance with the manufacturer's installation instructions. Model numbers listed in specifications or shown on the drawings are not necessarily intended to designate the required trim, written descriptions of the trim govern model numbers.

Pipe, pipe fittings, pipe specialties and valves shall be manufactured in plants located in the United States or certified to meet the specified ASTM and ANSI standards.

Work performed under this contract shall provide a neat and "workmanlike" appearance when completed, to the satisfaction of the Architect and Engineer. Workmanship shall be the finest possible by experienced mechanics. Installations shall comply with applicable codes and laws.

The complete installation shall function as designed and intended with respect to efficiency, capacity, noise level, etc. Abnormal noise caused by rattling equipment, piping and equipment in rotating components shall not be acceptable. Materials and equipment shall be of commercial specification grade in quality. Light duty and residential grade equipment shall not be accepted unless otherwise indicated.

Remove from the premises waste material present as a result of his work, including cartons, crating, paper, stickers, and/or excavation material not used in backfilling, etc. Clean equipment installed under this contract to present a neat and clean installation at the termination of the work.

Repair or replace public and private property damaged as a result of work performed under this contract to the satisfaction of authorities and regulations having jurisdiction. Provide all safety lights, guards, and warning signs required for the performance of the work and for the safety of the public.

E. MANUFACTURERS

In other articles where lists of manufacturers are introduced, subject to compliance with requirements, provide products by one of the manufacturers specified.

Where a list is provided, manufacturers are listed alphabetically and not in accordance with any ranking or preference.

Where manufacturers are not listed, provide products subject to compliance with requirements from manufacturers that have been actively involved in manufacturing the specified product for no less than 5 years.

F. COORDINATION

Coordinate work with that of other trades so that the various components of the systems are installed at the proper time, will fit the available space, and will allow proper service access to those items requiring maintenance. Components which are installed without regard to the above shall be relocated at no additional cost to the Owner.

Unless otherwise indicated, General Contractor shall provide chases and openings in building construction required for installation of the systems specified herein. Contractor shall furnish the General Contractor with information where chases and openings are required. Contractor shall keep informed as to the work of other trades engaged in the construction of the project and shall execute his work in such a manner as not to interfere with or delay the work of other trades.

Figured dimensions shall be taken in preference to scaled dimensions. Contractor shall take his own measurements at the building, as variations may occur. Contractor shall be held responsible for errors which could have been avoided by proper checking and verification.

Provide materials with trim that will properly fit the types of ceiling, wall, or floor finishes actually installed. Model numbers listed in the specifications or shown on the drawings are not intended to designate the required trim.

G. ORDINANCES AND CODES

Work performed under this contract shall, at a minimum, be in conformance with applicable national, state and local codes having jurisdiction. Equipment furnished and associated installation work performed under this contract shall be in strict compliance with current applicable codes adopted by the local AHJ, including any amendments and standards as set forth by the following:

1. National Fire Protection Association (NFPA)
2. Underwriters Laboratories (UL)
3. Occupational Safety and Health Administration (OSHA)
4. American Society of Mechanical Engineers (ASME)
5. American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE)
6. American National Standards Institute (ANSI)
7. American Society of Testing Materials (ASTM)
8. Other national standards and codes where applicable.

Where the contract documents exceed the requirements of the referenced codes, standards, etc., the contract documents shall take precedence. Where conflicts between various codes, ordinances, rules, and regulations exist, comply with the most stringent.

Promptly bring all conflicts observed between codes, ordinances, rules, regulations, referenced standards, and these documents to the attention of the Architect and Engineer for final resolution. Contractor will be held responsible for any violation of the law.

Procure and pay for permits and licenses required for the accomplishment of the work herein described. Where required, obtain, pay for, and furnish certificates of inspection to Owner.

H. PROTECTION OF EQUIPMENT AND MATERIAL

Store and protect from damage equipment and material after delivery to job site. For materials and equipment susceptible to changing weather conditions, dampness, or temperature variations, store inside in conditioned spaces. For materials and equipment not susceptible to these conditions, cover with waterproof, non-resistant, heavy tarp or polyethylene sheeting as required to protect from plaster, dirt, paint, water, or physical damage. Equipment and material damaged by construction activities shall be rejected and Contractor shall furnish new equipment and material of like kind at his own expense.

Keep premises broom clean of foreign material created during work performed under this contract. Piping, equipment, etc. shall have a neat and clean appearance at the termination of the work.

Plug or cap open ends of piping systems while stored and installed during construction when not in use to prevent the entrance of debris into the systems.

Keep the manufacturer-provided protective coverings on floor drains, floor sinks and trench drains during construction. Remove coverings at the termination of the work and polish exposed surfaces.

I. SUBSTITUTIONS

Materials, products, equipment, and systems described in the Bidding Documents establish a standard of required function, dimension, appearance and quality to be met by the proposed substitution. The base bid shall include only the products from manufacturers specifically named in the drawings and specifications. To request a substitution, request the Substitution Request Form from the Architect or Engineer. Complete and send the Substitution Request Form for each material, product, equipment, or system that is proposed to be substituted. The burden of proof of the merit of the proposed substitution is upon the proposer.

Unless stated otherwise in writing to the Engineer by the Contractor, Contractor warrants to the Engineer, Architect, and Owner the following:

1. Proposed substitution has been fully investigated and determined to meet or exceed the specified Work in all respects unless stated otherwise in the substitution request.
2. Proposed substitution is consistent with the Contract Documents and will produce indicated results, including functional clearances, maintenance service, and sourcing of replacement parts.
3. Proposed substitution has received necessary approvals of authorities having jurisdiction.
4. Same warranty will be furnished for proposed substitution as for specified Work.
5. If accepted substitution fails to perform as required, Contractor shall replace substitute material or system with that originally specified and bear costs incurred thereby.
6. Coordination, installation and changes in the Work as necessary for accepted substitution will be complete in all respects.

No substitutions will be considered unless the Substitution Request Form is completed and attached with the appropriate substitution documentation. No substitution will be considered prior to receipt of bids unless written request for approval to bid has been received by the Engineer at least ten (10) calendar days prior to the date for receipt of bids.

If the proposed substitution is approved prior to receipt of bids, such approval will be stated in an addendum. Bidders shall not rely upon approvals made in any other way. Verbal approval will not be given. No substitutions will be considered after the contract is awarded unless specifically provided in the contract documents.

J. SUBMITTALS

Assemble and submit for review shop drawings, material lists, manufacturer product literature for equipment to be furnished, and items requiring coordination between contractors under this contract. Provide submittals in sufficient detail so as to demonstrate compliance with these Contract Documents and the design concept. Prior to transmitting submittal, verify that the equipment submitted is mutually compatible and suitable for the intended use, will fit the available space, and maintain manufacturer recommended service clearances. If the size of equipment furnished makes necessary any change in location or configuration, submit a shop drawing showing the proposed layout.

Transmit submittals as early as required to support the project schedule. Allow for two weeks Engineer review time, plus forty-eight mailing time via the Architect, plus a duplication of this time for resubmittal, if required. Only resubmit those sections requested for resubmittal.

Submittals shall contain the project name, applicable specification section, submittal date, equipment identification acronym as used on the drawings, and the Contractor's stamp. The stamp shall certify that the submittal has been checked by the Contractor, complies with the drawings and specifications, and is coordinated with other trades. Manufacturer product literature shall include shop drawings, product data, performance sheets, samples and other submittals required by this division. Highlight, mark, list, or indicate the materials, performance criteria, and accessories that are being proposed. General product catalog data not specifically noted to be part of the specified product will be rejected and returned without review.

Submittals and shop drawings shall contain the firm name, logo, and / or signature of the Engineer. They shall not be copies of the work product of the Engineer. If the Contractor desires to use elements of such product, refer to paragraph "Electronic Drawing Files" for procedures to be used.

Generate submittals according to individual specification sections. Begin submittals with an index of all submittals. Catalog data shall be properly bound, identified, indexed and tabbed in a 3-ring binder. Each item or model number shall be clearly marked and accessories indicated. Label the catalog data with the equipment identification acronym or number as used on the drawings and include performance curves, capacities, sizes, weights, materials, finishes, wiring diagrams, electrical requirements and deviations from specified equipment or materials. For equipment with motor starters or VFDs, include short circuit current ratings. Mark out inapplicable items. Shop drawings will be returned without review if the above mentioned requirements are not met.

Provide the quantity of submittals required by Division 01. If not indicated and hard-copy sets are provided, submit a minimum of six (6) copies. Refer to Division 01 for acceptance of electronic submittals for this project. For electronic submittals, Contractor shall submit the documents in accordance with the procedures specified in Division 01. Contractor shall notify the Architect and Engineer that the submittals have been posted. If electronic submittal procedures are not defined in Division 01, Contractor shall indicate the website, user name, and password information needed to access the submittals. For submittals sent by e-mail, Contractor shall copy the designated representatives of the Architect and Engineer. Contractor shall allow for the Engineer review time as specified above in the construction schedule. Contractor shall submit only the documents required to purchase the materials and/or equipment in the electronic submittal.

The checking and subsequent acceptance of submittals by the Engineer and/or Architect shall not relieve the Contractor from responsibility for deviations from the drawings and specifications, errors in dimensions, details, size of members, or quantities, omissions of components or fittings, coordination of electrical requirements and not coordinating items with actual building conditions and adjacent work. Proceed with the procurement and installation of equipment only after receiving approved shop drawings relative to each item.

K. ELECTRONIC DRAWINGS

In preparation of shop drawings or record drawings, Contractor may, at his option, obtain electronic drawing files in AutoCAD or DXF format on CD-ROM disc, DVD disc, flash drive, or direct download, as desired, from the Engineer for a shipping and handling fee of $200 for a drawing set up to 12 sheets and $15 per sheet for each additional sheet. Contact the Architect for written authorization and Engineer for the necessary release agreement form and to specify shipping method and drawing format. In addition to payment, written authorization from the Architect and release agreement form from the Engineer must be received before electronic drawing files will be sent.

L. RECORD DRAWINGS (AS-BUILT DRAWINGS)

During progress of the work in this division, Contractor shall maintain an accurate record of all changes made during the installation of the system. Upon completion of the work, accurately transfer all record information to these identical sets of the approved shop drawings. Insert one set into each copy of the manual described below.

See Division 01 and General Conditions for additional information.

M. OPERATION AND MAINTENANCE INSTRUCTIONS

During the course of construction, collect and compile a complete brochure of equipment furnished and installed on this project. Include operational and maintenance instructions, manufacturer's catalog sheets, wiring diagrams, parts lists, approved submittals and shop drawings, warranties, and descriptive literature as furnished by the equipment manufacturer. Include an inside cover sheet that lists the project name, date, Owner, Architect, Engineer, General Contractor, Sub-Contractor, and an index of contents.

Submit three copies of literature bound in approved binders with index and tabs separating equipment types to the Architect, for Engineer's review, at the termination of the work. Paper clips, staples, rubber bands, loose-leaf binding, and mailing envelopes are not considered approved binders. Final approval of systems installed under this contract shall be withheld until this equipment brochure is received and deemed complete by the Architect and Engineer. Instruct workmen to save required literature shipped with the equipment itself for inclusion in this brochure.

Include record drawings as described above.

Refer to Division 01 for acceptance of electronic manuals for this project. For electronic manuals, refer to paragraph "Submittals" for requirements.

N. SPARE PARTS

Furnish to Owner, with receipt, the spare parts for faucet washers and O-rings, flushometer repair kits, and water closet tank repair kits for the fixtures furnished for this project.

O. TRAINING

At a time mutually agreed upon between the Owner and Contractor, provide the services of a factory trained and authorized representative to train Owner's designated personnel on the operation and maintenance of the equipment provided for this project.

Provide training to include, but not be limited to, an overview of the system and/or equipment as it relates to the facility as a whole; operation and maintenance procedures and schedules; related to startup and shutdown, troubleshooting, servicing, preventive maintenance and appropriate operator intervention; and review of data included in the operation and maintenance manuals.

Submit a certification letter to the Architect stating that the Owner's designated representative has been trained as specified herein. Letter shall include date, time, attendees and subject of training. The Contractor and the Owner's representative shall sign the certification letter indicating agreement that the training has been provided.

Schedule training with Owner with at least 7 days advance notice.

P. WARRANTIES

Warrant each system and each element thereof against all defects due to faulty workmanship, design, or material for a period of 12 months from date of Substantial Completion, unless specific items are noted to carry a longer warranty in the construction documents or manufacturer's standard warranty exceeds 12 months. Remedy all defects, occurring within the warranty period(s), as stated in the General Conditions and Division 01.

Warranty shall include a guarantee of free circulation of liquids throughout the system as intended without leaks, excessive noise, or water hammer.

Warranties shall include labor and material, including travel expenses. Make repairs or replacements without any additional costs to the Owner, and to the satisfaction of the Owner, Architect, and Engineer.

Perform the remedial work promptly, upon written notice from the Engineer or Owner.

At the time of Substantial Completion, deliver to the Owner all warranties, in writing and properly executed, including term limits for warranties extending beyond the one year period and any actions the Owner must take in order to maintain warranty status. Each warranty instrument shall be addressed to the Owner and state the commencement date and term.

2. GENERAL MATERIALS AND INSTALLATION

A. BUILDING OPERATION

Comply with the schedule of operations as outlined in the architectural portions of this specification. Building shall be in operation at all times during normal worktime hours. Accomplish work requiring interruption of building operation at a time when the building is not in operation and only with written approval of building Owner and/or tenant. Coordinate interruption of building operation with the Owner and/or tenant a minimum of seven (7) days in advance of work.

B. EXISTING EQUIPMENT REUSE AND REMOVAL

Provide items of plumbing systems modification required because of building remodeling, as noted on the drawings, or necessary for proper operation. Match existing materials and construction techniques when modifying existing systems. Coordinate requirements with general contractor and architect.

Seal existing floor drains to be abandoned or not in use at completion of work gas-tight with plug. Clean P-trap of debris. Provide blank grate. Cover drains with floor material matching adjacent areas in finished portions of the building.

New floor drains shall be connected to the existing sanitary drainage system as shown on the drawings or as required. Saw-cut existing concrete floor as required to install new underfloor lines, and patch to match existing surroundings. Refer to architectural specifications for finish floor patching requirements.

Existing plumbing fixtures where indicated on the drawings to be reused shall be cleaned, repaired, provided with new washers, etc. As required to put them into good operating condition.

Patch holes weather-tight in existing roofs caused by removal of plumbing items such as piping.

Make connection of new pipe to similar existing waste, water and gas pipe using standard fittings and joining practices.

C. COINCIDENTAL DAMAGE

Repair walls, finishes, and other facilities damaged in the course of the work. Repair materials shall match existing construction. Repair work shall meet all requirements of the Owner, local authorities having jurisdiction, and meet the satisfaction of the Architect. Conform to requirements of Division 02 of this specification.

D. CUTTING AND PATCHING

Conform to the requirements in Division 01, Cut walls, floors, ceilings, and other portions of the facility as required to install work under this division. Obtain permission from the Architect prior to cutting. Do not disturb structural members without prior approval from the Architect. Cut holes as small as possible. Patch walls, floors, and other portions of the facility as required by work under this division. Patching shall match original material and construction including fire ratings, if applicable. Repair and refinish areas disturbed by work to the condition of adjoining surfaces in a manner satisfactory to the Architect.

E. ROUGH-IN

Coordinate without delay all roughing-in with other divisions. Conceal piping, conduit, and rough-in except in unfinished areas and where otherwise shown.

F. SUPPORT SYSTEMS

Structural steel used for pipe supports, equipment supports, etc., shall be new and clean, and shall conform to ASTM designation A-36.

Support plumbing equipment and piping from the building structure. Do not support plumbing equipment and piping from ceilings, other mechanical or electrical equipment, and other non-structural elements.

G. ACCESS DOORS

Provide access doors for all concealed equipment where indicated or as required, except where above lower ceilings. Access doors shall be adequately sized for the devices served with a minimum size of 18 inches x 18 inches. Access doors must be of the proper construction for type of construction in which it is installed. Obtain Architect's approval of type, size, location, and color before ordering. Provide factory-fabricated and assembled units, complete with attachment devices and fasteners ready for installation, concealed hinges, flush screwdriver-operated cam lock, and anchor straps. Provide access doors manufactured by Milcor, Titus, Zurn, or equal.

H. SYSTEM TESTING AND ADJUSTING

Upon completion of each phase of the installation, test each system in conformance with local code requirements and as noted below. Furnish labor and equipment required to test each system installed under this contract. Assume all costs involved in making the tests and repairing and/or replacing any damages resulting therefrom.

Notify the Architect and the AHJ, three (3) working days prior to making plumbing system tests. Leave concealed work uncovered until the required tests have been completed, but if necessary due to construction procedures, tests on portions of the work may be made, and when satisfactory, the work may be concealed. Test piping before insulation is installed, and before backfill. Pipes, joints, flanges, valve stems, etc., shall be leak-tight. Repair or replace system defects with new materials. Caulking of defective joints, cracks or holes will not be permitted. Repeat tests after defects have been eliminated. Make tests in the presence of the administrative authority and/or the Owner's authorized representative.

Upon completion of the systems installation, and prior to acceptance by the Architect and Engineer, make general operating tests to demonstrate that equipment and systems in proper working order, and are functioning in conformance with the intent of the drawings and specifications. As a part of these tests, open every water outlet to ensure complete system flushing, remove and clean faucet aerators, clean strainers, light pilot lights, and operate every piece of equipment furnished under this contract to demonstrate proper functioning.

Test the domestic water system by filling it with water and then isolating the system from its source. Keep the system closed for a period of twenty-four hours with no fixture being used. The pressure differential for this test period shall not exceed 10 psig. Test water piping to a 125 PSI hydrostatic pressure.

Test the drainage and vent system by plugging openings with test plugs, except those at the top of the stacks. Fill the system with water; test results will be satisfactory if the water level remains stationary for not less than one (1) hour. Subject the drainage and vent system to a pressure of at least ten (10) feet of water. If leaks develop, repair them and repeat the test.

I. VIBRATION ISOLATION

Provide vibration isolation equipment and materials by a single manufacturer. If type and deflection for specific equipment is not specified within the contract documents, references ASHRAE Handbook "HVAC Applications" or provide per manufacturer's recommendations. Approved manufacturers are Amber Booth, Kinetics Noise Control, Mason Industries, Inc., Vibration Eliminator Co., Inc., and Vibration Mounting and Controls, provided their systems are in compliance with the specified design and performance requirements.

General Requirements: Select vibration isolators by the weight distribution to produce uniform deflection. Vibration isolators shall have either known or reflected heights or calibration markings so that, after adjustment, the static deflection can be verified, thus determining that the load is within the operating range of the isolator. Isolators shall operate in the linear portion of their load versus deflection curves. Spring isolators shall have 50 percent excess capacity without becoming coil bound. Coat vibration isolators with factory-applied paint. Coat vibration isolators exposed to weather and other corrosive environments with factory-applied corrosion resistance protection. Install and adjust vibration isolators in accordance with manufacturers written instructions.

Pipe Connections. Provide flexible connectors for piping system connections on equipment side of shutoff valves for vacuum pumps and air compressors. Provide piping connectors shall be braided hose type as recommended by the manufacturer for the application.

Isolator Types

1. Provide type DDNM (Double Deflection Neoprene Mounts) for piping suspended from the structure within 50 feet of rotating equipment, consisting of double deflecting, molded neoprene isolators and be laterally stabilized with all metal surfaces covered with neoprene. Top and bottom surfaces shall be ribbed and both holes shall be provided in the base. The mounts shall have leveling bolts rigidly secured to the equipment. The isolator shall be manufactured with bridge bearing quality neoprene, and selected for a maximum durometer of 50 and designed for 15 percent strain. DDNM mounts shall be selected for a static deflection of 3/8 inch unless otherwise specified. Provide Mason Industries Type ND or as equal.

2. Provide type DDRN (Double Deflection Neoprene Hangers) for piping supported on the floor within 50 feet of rotating equipment, consisting of a molded neoprene isolating element in a steel hanger box. A neoprene sleeve must be provided where the lower hanger rod passes through the steel hanger box, such that the hanger rod cannot contact the steel hanger. The diameter of the upper hole in the hanger box shall be at least 3/4 inch larger than the diameter of the hanger rod and permit the hanger rod to swing through a 30 degree arc. When installed, the hanger box shall be allowed to rotate through a full 360 degrees without encountering any obstructions. The isolator shall be manufactured with bridge bearing quality neoprene, and selected for a maximum durometer of 50 and designed for 15 percent strain. Unless otherwise specified, the static deflection of DDNM hangers shall be 0.3 inches. Provide Mason Industries Type HD or as equal.

PLUMBING PIPING

PIPING MATERIALS

PEX tubing for recirculated hot water and hot water return mains: SDR 9 PEX water tube meeting ASTM F877 and marked with "3/380", with a pressure rating of 160psi at 73°F and bear or red color coded, manufactured utilizing the PEX "B" or "C" methods by Viega "Pureflow" or wolfin "WaterPEX".

PEX tubing insert fittings: meeting ASTM F2159 with internal diameter identical to PEX tubing sizes and manufactured from 20% glass-filled polysulfone meeting ASTM D6394 with reinforcing cylindrical expansion rings of same manufacturer of PEX tubing.

PIPING JOINTS

Stub Out Elb: Square "O" strap ASTM B88 type "T" fine size copper tube with tidelgrove bend and fine size PEX hose barb elbow.

Manifolds: Brass copper manifold with 3/4" or 1" body with 1/2" copper sweat outlets and two piece full port bronze ball valves with 1/2" PEX hose barb outlets.

PIPING INSTALLATION

PEX Tube: Plastic coated adjustable steel deck hangers, MSS SP-69 type 1 for individual horizontal runs of PEX piping. provide sheet steel bracket of 20 gauge copper with nominal copper tube tubes of inches of 12" or 1" on 4' centers. Provide plan mounted brackets of 20 gauge copper or plastic with clamps for securing copper water tube and stainless steel nose clamp for securing bracket to vertical waste and vent pipe in wall. Brackets for installation in return air plenums shall meet ASTM E84. Provide copper tube stubs at each fixture roughed. Install tubing in a manner to prevent stress from thermal expansion with 12" wide offsets in straight runs over 20' or with loops with diameters not less than 8 tube diameters. Install tubing plans over all bolt penetrations of studs. Install tube tubing for cold water and hot tubing for hot or hot water recirculation. Install tubing marked "0.180" for recirculated hot water and hot water return mains. Install PEX tubing at a minimum of 12" away from recessed light fixtures. provide pipe clamps and insulators designed specifically for use with PEX tubing manufactured by Hubbard or Sioux Chief.

PEX tube: Install hangers for horizontal runs every 32" and vertical runs every 6'. Support water tubing within 12" of each elbow, tee or stub out. Secure stub outs of roughed for individual fixtures with sheet stud brackets attached to the stud studs. Drops to rough-in may be supported with mounting brackets attached to the fixture waste & vent pipe or adjacent plumbing fixture.

VALVES, STRAINERS, HOSE BIBBS, AND UNIONS

Plumbing system valves shall be designed for 125 psi steam working pressure and 200 psi cold water pressure. Install valves on the hot and cold water lines at the water heater connections and other items of equipment, at branches from mains serving groups of fixtures, and at other places indicated or required by the installation to allow ease of future maintenance. Submit certification that valves, fittings and specialties comply with NSF 61 Annex G and / or NSF 372. Except for the following: Hose bibbs, hydrants, backflow preventers including irrigation or mechanical make-up systems, emergency mixing valves and trap primers. Provide valves 2" and smaller below with factory sweat X CPVC CTS tube adapters or fold provide valves with sweat X CPVC CTS tube adapters sweat X press to connect adapter with press to connect X CPVC CTS adapters.

5. PLUMBING FIXTURES AND EQUIPMENT

A. PLUMBING FIXTURES

Furnish and install commercial grade plumbing fixtures, see the drawings for quantities and descriptions. Provide china fixtures as scheduled by American Standard or approved equal by Gerber, Kohler, PROFLO, Bryan Vulcan Co., TotoAmi or Zurn. Provide stainless steel sinks as scheduled by Elkay or equal by Franke or Just. Provide electric water coolers as scheduled by Elkay or approved equal by Acorn / Aqua, Halsey Taylor or Haws. Provide mop sinks as scheduled by Stern-Williams or equal by Acorn Engineering Co., Fiat or Florestone. Provide emergency equipment as scheduled by Bradley or equal by Chicago, Encon, Guardian, Haws or Speakman. Provide fixtures of same manufacturer where possible.

Fixtures shown on the drawings or specified herein shall be furnished and installed, set firm and true, connected to required piping services, thoroughly cleaned, left clean and ready for use. Exposed fittings and piping at the fixtures shall be chrome-plated, and water supply piping shall be valved at each fixture.

Vitreous china fixtures shall be of the best grade vitreous ware, without pit holes or blemishes, and the surfaces shall be generally true. The engineer reserves the right to reject any pieces which, in his opinion, are faulty. Fixtures set against walls shall have ground backs and shall be caulked with silicone sealant of a matching color.

B. PLUMBING FIXTURE TRIM

Submit certification that faucets and trim comply with NSF 61 Annex G and / or NSF 372. Except for the following: Faucets not used for drinking water or cooking, shower valves and heads or flush valves.

Fixture trim shall have the manufacturer's name stamped clearly and visibly on each item.

Provide faucets as scheduled on drawings by Chicago, Delta-Commercial, Speakman, T&S Brass or Zurn.

Provide single lever handle faucets as scheduled on drawings by Chicago, Delta-Commercial, Kohler or Symmons.

Provide electronic faucets as scheduled on the drawings by Sloan or equal by Zurn.

Provide shower valves as scheduled on the drawings by Acorn, Bradley, Leader, Leonard Valve, Powers, Speakman or Symmons.

Fixture P-traps shall be 17 gauge brass body with cleanout, 17 gauge seamless tubular wall bend with cast brass slip nut, shallow steel flange, all chrome plated by McGuire, Brass Craft, Dearborn Brass, EBC, Prolo, Watts Brass and Tubular or Zurn.

Lavatory, sink, and water closet supplies shall be solid brass angle or straight type with full brass stem, wheel handle, or loose key types as noted on drawings, shallow steel flange, 3/8 inch copper riser flange, all chrome plated. Wall connection as required by McGuire, Brass Craft, EBC, Prolo or Zurn.

Lavatory drains shall be grid type chrome plated 17 gauge brass open grid with 1-1/4 inch x 6 inch long seamless brass tailpiece and brass tailpiece with heavy rubber basin washer and finer friction washer, by McGuire, Brass Craft, Dearborn Brass, EBC, Franke, Prolo, Watts Brass and Tubular or Zurn.

Sink drains shall be basket type with chrome plated forged brass basket strainer and strainer body with 1-1/2 inch x 4 inch long seamless brass tailpiece and cast brass tee and coupling nuts by McGuire, Brass Craft, Dearborn Brass, EBC, Prolo or Zurn.

Provide handicap insulation kits for lavatories and sinks on exposed water and waste pipes and fittings, including offset drain and continuous waste covers where required by Brocar, McGuire, Plumberex "Pro-2000", Prolo, Trap-Wrap or Tru-Bro.

6. ALTERNATES

A. DESCRIPTION

Refer to the architectural portion of the specification for list of alternates. Applicable sections of the base specifications shall apply to all work required by the alternate unless otherwise specified. Determine whether or not and how each alternate affects work. Include labor, materials, equipment, and transportation services necessary for and incidental to the completion of work under each particular alternate. Furnish separate bid for each alternate applicable to work, stating the amount to be added or deducted from the base bid

END OF SECTION 22

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01/28/2022

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EXPIRES 12/31/2022

#	DATE	DESCRIPTION

UNIVERSITY HOUSE

PITTSBURG STATE UNIVERSITY
PITTSBURG KANSAS
Building Number: 38500-0230

CONSTRUCTION DOCUMENTS

Original Sheet: 1 1/2" Drawing may have been reduced.

PLUMBING SPECIFICATIONS

DATE: 01-28-2022	
DRAWN: VAP	CHECKED: MEM
PROJ # 154854.00	IDENTIFY: (~)-14445
SHEET # P200	

VAP

CARL J. HOLDER