MICRO FOUNDRY EXPANSION
BUILDING 9001
CONTRACT NO. W912BV22R0015

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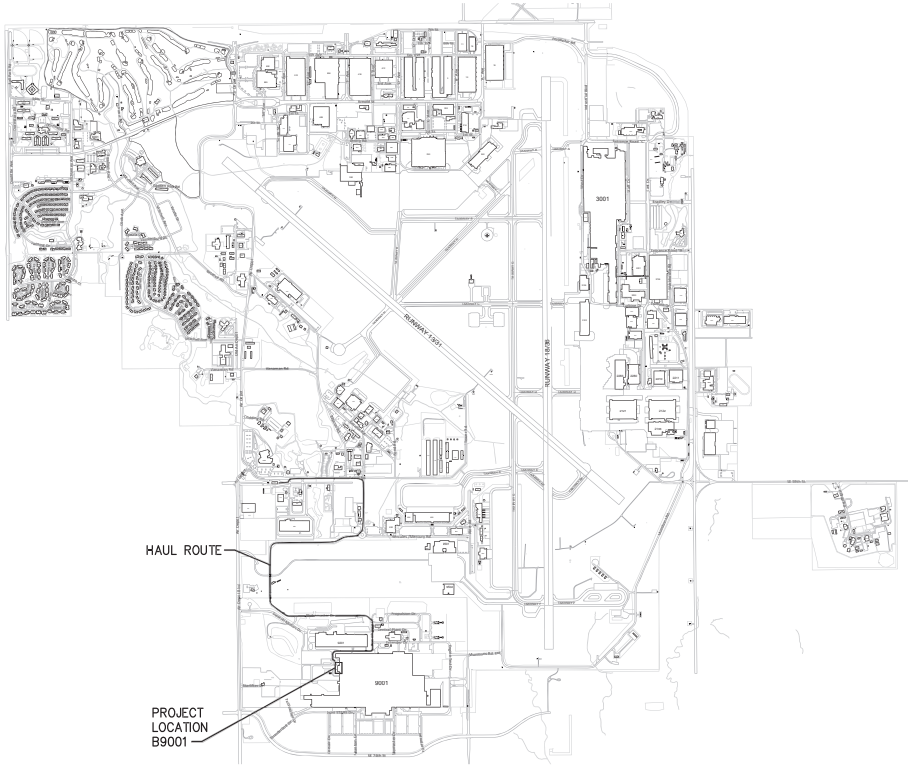

GENERAL NOTES:

1. BRAND NAMES: REFERENCE TO SPECIFIC BRAND NAMES OR COMPANIES IS FOR THE PURPOSE OF ESTABLISHING MINIMUM QUALITY STANDARDS, IDENTIFICATION AND GUIDANCE AND IS NOT INTENDED TO LIMIT SELECTION OF OTHER MANUFACTURERS THAT ARE EQUAL OR EXCEED THE SPECIFIED ITEMS IN TERMS OF PHYSICAL PROPERTIES, INCLUDING, COLOR RANGE, FINISH, DURABILITY, APPEARANCE, PERFORMANCE CHARACTERISTICS, AND OTHER FACTORS. OTHER PRODUCTS, MATERIALS, COLORS AND SYSTEMS, MAY BE SUBMITTED FOR EVALUATION AND APPROVAL/DISAPPROVAL BY THE CONTRACTING OFFICER.
2. THIS SET OF CONSTRUCTION DOCUMENTS SHALL BE CONSIDERED AS A WHOLE IN THAT THE GENERAL CONTRACTOR AND ALL THE SUB-CONTRACTORS ARE RESPONSIBLE FOR THE INFORMATION PRESENTED ON ALL SHEETS ON THE SET OF DRAWINGS AND ALL SECTIONS OF THE SPECIFICATIONS.
3. THE CONTRACTOR IS RESPONSIBLE FOR ERECTING ALL CONSTRUCTION FENCING AND BARRICADES AS REQUIRED TO PROTECT CONSTRUCTION MATERIAL AND TO PREVENT ANY UNAUTHORIZED PERSONNEL FROM ENTERING THE CONSTRUCTION SITE.
4. ANY DAMAGE TO THE EXISTING GROUNDS OR FACILITIES CAUSED BY CONSTRUCTION TRAFFIC OR ANY CONSTRUCTION OPERATION SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR TO MATCH OR EXCEED EXISTING CONDITIONS AT NO ADDITIONAL COST TO THE GOVERNMENT.
5. ALL WORK NOTED & LOCATED IN THESE DOCS SHALL BE UNDERSTOOD BY THE CONTRACTOR TO REQUIRE ALL NEW LABOR & MATERIALS UNLESS SPECIFICALLY NOTED TO BE "EXISTING" OR "BY OTHERS".

AS-BUILT DRAWING
15 FEBRUARY 2024
THIS DRAWING REFLECTS THE CHANGES MADE DURING CONSTRUCTION AS IDENTIFIED BY THE CONTRACTOR'S RECORD DRAWINGS.

US Army Corps of Engineers ®

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DRAWN BY: HAMPTON
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TINKER AFB, OKLAHOMA
MICRO FOUNDRY EXPANSION BUILDING 9001
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TITLE SHEET, AREA MAP
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SHEET ID
G001
SHEET 1 OF 8

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LEGEND OF SYMBOLS AND ABBREVIATIONS

REFERENCE ABBREVIATIONS

ABV	ABOVE
AFF	ABOVE FINISHED FLOOR
AHJ	AUTHORITY HAVING JURISDICTION
ARCH	ARCHITECTURAL
BHP	BRAKE HORSE POWER
BLDG	BUILDING
BLW	BELOW
BOD	BOTTOM OF DUCT
BOI	BOTTOM OF INSULATION
BOP	BOTTOM OF PIPE OR PIPE INSULATION
BTUH	BRITISH THERMAL UNITS PER HOUR
CFM	CUBIC FEET PER MINUTE
CLG	CEILING
CO	CLEANOUT
DIA OR ø	DIAMETER
DN	DOWN
DTL	DETAIL
(E)	EXISTING
EA	EXHAUST AIR
ELEV	ELEVATION
ELEC	ELECTRICAL
FT	FEET
FC	FLEXIBLE CONNECTION
FCO	FLOOR CLEANOUT
FLR	FLOOR
FPM	FEET PER MINUTE
FR	FROM
GCO	GRADE CLEANOUT
GPM	GALLONS PER MINUTE
HP	HORSEPOWER
HZ	HERTZ
MIN	MINIMUM
NC	NORMALLY CLOSED
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OA or O/A	OUTSIDE AIR
O.R.	ON ROOF
PH	PHASE
RA or R/A	RETURN AIR
RAO	RETURN AIR OPENING
REF or RE	REFERENCE
RLFA	RELIEF AIR
RPM	REVOLUTIONS PER MINUTE
RTU	ROOFTOP AIR CONDITIONING UNIT
SA or S/A	SUPPLY AIR
SP	STATIC PRESSURE
TDH	TOTAL DYNAMIC HEAD
TYP	TYPICAL
UG	UNDERGROUND
	VENT
WG	WATER GAUGE (INCHES)

EQUIPMENT DESIGNATIONS

AC	AIR COMPRESSOR
AHU	AIR HANDLING UNIT
AS	AIR SEPARATOR
AT	AIR TERMINAL UNIT
BP	BOILER PUMP
BR	BOILER
CH	CHILLER
CHWP	CHILLED WATER PUMP
DOAS	DEDICATED OUTSIDE AIR UNIT
DWC	DOMESTIC HOT WATER CIRCULATION PUMP
DWH	DOMESTIC WATER HEATER
EF	EXHAUST FAN
ET	EXPANSION TANK
EWH	ELECTRIC WATER HEATER
EXP	EXPANSION JOINT
FCU	FAN COIL UNIT
FD	FLOOR DRAIN
FDPR	FIRE DAMPER
HB	HOSE BIBB
HEX	HEAT EXCHANGER
HUM	HUMIDIFIER
HWP	HEATING WATER PUMP
L	LOUVER
MA	MIXED AIR
OAI	OUTSIDE AIR INTAKE
OBD	OPPOSED BLADE DAMPER
P	PLUMBING FIXTURE
PCHWP	PRIMARY CHILLED WATER PUMP
RD	ROOF DRAIN
RPBP	REDUCED PRESSURE BACKFLOW PREVENTER
RTU	ROOFTOP AIR CONDITIONING UNIT
SCHWP	SECONDARY CHILLED WATER PUMP
SCRP	STEAM CONDENSATE RETURN PUMP
SF	SUPPLY FAN
ST	STEAM TRAP
UH	UNIT HEATER
VAV	VARIABLE AIR VOLUME
VFD	VARIABLE FREQUENCY DRIVE
VTR	VENT THROUGH ROOF
WHA	WATER HAMMER ARRESTOR
WS	WATER SOFTENER

PIPING SERVICE DESIGNATIONS

CD	COIL CONDENSATE DRAIN
CHW	CHILLED WATER SUPPLY AND RETURN
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
DCW	DOMESTIC COLD WATER
DHW	DOMESTIC HOT WATER
DHWR	DOMESTIC HOT WATER RETURN
(E)	EXISTING (PREFIX FOR OTHER PIPING SERVICE DESIGNATIONS)
EC	ELECTRICAL CONDUIT
F	FIRE SPRINKLER PIPE
G	NATURAL GAS
HW	HEATING WATER SUPPLY AND RETURN
HWR	HEATING WATER RETURN
HWS	HEATING WATER SUPPLY
NPW	NON-POTABLE WATER
SCR	STEAM CONDENSATE RETURN
STM	STEAM
SS	SANITARY SEWER
V	VENT

HEATING, VENTILATION, AIR CONDITIONING

- 12x20 — RECTANGULAR DUCT SIZE IN INCHES, FIRST DIMENSION IS SIDE SHOWN
- DUCT TO BE DEMOLISHED
- 84ø — ROUND DUCT SIZE IN INCHES
- R — CHANGE OF ELEVATION RISE(R) OR DROP(D)
- 20x12 — DUCT SECTION, SUPPLY AIR FIRST DIMENSION IS SIDE LEADER POINTS TO
- 20x12 — DUCT SECTION, RETURN, EXHAUST, TRANSFER, RELIEF AND OUTSIDE AIR. FIRST DIMENSION IS SIDE LEADER POINTS TO
- DUCT SUPPLY AIR, DOWN
- DUCT RETURN, EXHAUST, TRANSFER, RELIEF, OR OUTSIDE AIR, DOWN
- BRANCH CONNECTIONS INTO RECTANGULAR MAIN
  - RECTANGULAR TO RECTANGULAR
  - ROUND TO RECTANGULAR
- TRANSITION – RECTANGULAR TO ROUND
- MD — DAMPER
  - MD OR BLANK – MANUAL OR VOLUME DAMPER
  - OBD – OBD DAMPER
  - BDD – BACKDRAFT DAMPER
  - RLD – RELIEF DAMPER
- M — MOTORIZED DAMPER
- FDPR — FIRE DAMPER AND SLEEVE, PROVIDE ACCESS DOOR
- AD — ACCESS DOOR, VERTICAL OR HORIZONTAL
- DIRECTION OF AIR FLOW
- Y X — AIR DISTRIBUTION DEVICE
  - X = CFM
  - Y = MARK AS SCHEDULED
- SUPPLY AIR, CEILING DIFFUSER
- RETURN OR EXHAUST AIR, CEILING GRILLE
- GRILLE OR REGISTER, SIDEWALL

PIPING AND FITTINGS

- FLOW, IN DIRECTION OF ARROW
- PIPE SLOPE, INCHES/FOOT OR PERCENT DOWN IN DIRECTION OF ARROW
- RISER DOWN, ELBOW
- RISER UP, ELBOW
- RISE OR DROP
- BRANCH CONNECTION OUT OF BOTTOM
- BRANCH CONNECTION OUT OF TOP
- BRANCH CONNECTION OUT OF SIDE
- SANITARY WYE
- ELBOW, 45°
- ELBOW, 90°
- CAP ON END OF PIPE
- CONCENTRIC REDUCER
- ECCENTRIC REDUCER
- UNION, SCREWED
- D — UNION, DIELECTRIC
- FLEXIBLE PIPE CONNECTOR
- FLANGED CONNECTION
- FIRE SPRINKLER HEAD

PIPING SPECIALTIES

- AUTOMATIC AIR VENT
- HOSE CONNECTION
- HB — HOSE BIBB
- FD RD — DRAIN, FLOOR OR ROOF
- SWING CHECK VALVE
- STRAINER, WYE TYPE
- STRAINER W/VALVE AND CAP
- RPBP — REDUCED PRESSURE BACKFLOW PREVENTER
- T — STEAM TRAP
- P — PRESSURE GAUGE
- EXPANSION JOINT
- X — EXPANSION ANCHOR

MISCELLANEOUS

- X — KEY NOTE
- DETAIL OR SECTION NUMBER 1 M-101 — No. OF DRAWING WHERE DETAIL OR SECTION IS DRAWN
- CONNECTION OF NEW TO EXISTING.
- LIMITS OF DEMOLITION.

VALVES AND ACTUATORS

- SHUT-OFF/ISOLATION VALVE
- GLOBE VALVE
- BUTTERFLY VALVE
- BALL VALVE
- PLUG VALVE, GAS COCK
- ANGLE VALVE
- THREE-WAY VALVE
- CALIBRATED BALANCING VALVE
- CALIBRATED BALANCING VALVE WITH FLOW MEASUREMENT TAPS
- PRESSURE REDUCING VALVE
- COMBINATION BALANCE AND SHUT-OFF VALVE
- AUTO FLOW CONTROL VALVE W/PRESSURE PORTS
- SAFETY RELIEF VALVE
- VALVE IN RISER
- R — GAS PRESSURE REGULATOR

CONTROLS

- H — HUMIDITY SENSOR
- T — THERMOSTAT
- SP — DUCT STATIC PRESSURE SENSOR
- SMOKE DETECTOR, DUCT MOUNTED

PACKAGED ROOFTOP UNIT SCHEDULE

MARK		RTU-18V-1
OUTSIDE AIR CFM		1,191
BASIS OF DESIGN MFG/ MODEL		TRANE YSJ300AA4SAM
FAN DATA	COOLING AIRFLOW (CFM)	8000
	HEATING AIRFLOW (CFM)	8000
	MINIMUM AIRFLOW (CFM)	3600
	EXTERNAL ESP (IN W.G.)	1.0
	BHP	2 @ 3.0 EA
ELECTRICAL	VOLTAGE/PHASE/HZ	460 / 3 / 60
	MINIMUM CIRCUIT AMP. (MCA)	59
	MAXIMUM OVERCURRENT PROTECTION (AMPERES) MOCP	80
COOLING COIL	MIXED AIR DB / WB (°F)	78.1 / 65.4
	TOTAL COOLING LOAD (MBH)	250
	SENSIBLE COOLING LOAD (MBH)	176
	LEAVING AIR DB / WB (F)	57.3 / 55.8
	MIN IEER (AT ARI CONDITIONS)	11.4
	MIN EER (AT ARI CONDITIONS)	9.8
HEATING (FURNANCE)	ENTERING AIR TEMPERATURE (F)	60.5
	LEAVING AIR TEMPERATURE (F)	90.5
	INPUT (MBH)	320
	OUTPUT (MBH)	259
OPERATING WEIGHT (LBS.)		2343
CURB WIDTH (IN) X HEIGHT (IN) X LENGTH (IN)		86 x 58 x 123
ACCESSORIES		1 THRU 11

REMARKS
1. PROVIDE UNITS WITH STRUCTURAL ROOF CURB.
2. PROVIDE WITH R410A REFRIGERANT DX COOLING.
3. PROVIDE WITH SUPPLY AIR SMOKE DETECTOR, RECONNECT TO EXISTING FIRE ALARM SYSTEM.
4. PROVIDE WITH STAINLESS STEEL BURNER .
5. PROVIDE COOLING COIL WITH STAINLESS STEEL DRAIN PAN.
6. PROVIDE WITH INTERGRAL DISCONNECT.
7. CAPACITY BASED ON 105 DEF F DESIGN CONDENSING TEMPERATURE.
8. PROVIDE WITH PREFILTER: 2" PLEATED – MERV 13 WITH CLOGGED FILTER SWITCH AND MAGNEHELIC GAUGE.
9. MANUFACTURER'S STANDARD SINGLE ZONE VARIABLE VOLUME CONTROL WITH VFD SUPPLY FAN AND DISCHARGE AIR TEMPERATURE CONTROL.
10. PROVIDE WITH CONDENSER HAIL GUARDS.

AIR DEVICE SCHEDULE

MARK	MAX. CFM	DESCRIPTION	MOUNTING TYPE	DIFFUSER SIZE (INCHES)	NECK SIZE (INCHES)	FUNCTION	THROW Ø100FPM (FT)	PRESSURE DROP (IN H20)	MAX NC LEVEL	MATERIAL CONSTRUCTION	COLOR	BASIS FOR DESIGN (MFGR/MODEL)	NOTES
A1	100	LOUVER FACE CEILING DIFFUSER	LAY-IN	24x24	6	SUPPLY	4	0.06	11	ALUMINUM	WHITE	KRUEGER / 51450	1, 3,4
A2	200	LOUVER FACE CEILING DIFFUSER	LAY-IN	24x24	8	SUPPLY	4	0.05	12	ALUMINUM	WHITE	KRUEGER / 51450	1, 3,4
B1	427	DRUM DIFFUSER	DUCT-MOUNTED	24 X 6	25.125 X 6.625	SUPPLY	27	0.1	14	STEEL	SILVER	KRUEGER / DPL	2
C1	200	FIXED BAR RETURN AIR GRILLE	LAY-IN	22 X 10	20 X 8	TRANSFER	–	0.01	–	STEEL	WHITE	KRUEGER / S80	1

REMARKS:
1. THROW DATA SHALL BE FOR A TERMINAL VELOCITY OF 100 FPM.
2. LEVEL FOR SELECTION dB RE 10 –12W INCLUDES 10dB ROOM ABSORPTION IN MAX, NC LEVEL.
3. THROW, STATIC PRESSURE & NC LEVELS ARE BASED ON MAXIMUM CFM.
4. COORDINATE TYPES OF MOUNTING FRAMES ON AIR DEVICES WITH EXISTING CEILINGS.

NOTES:
1. FURNISH WITH LAY-IN FRAME WHEN MOUNTED IN SHEETROCK CEILING.
2. DIFFUSER SHALL BE PROVIDED WITH OPPOSED BLADE MANUAL BALANCING DAMPER AND TAP BOX TO REMOVE DIFFUSER AND DAMPER COMPLETELY OUT OF AIRSTREAM..
3. BALANCING DAMPERS SHALL BE INSTALLED IN THE BRANCH DUCT FOR EACH DIFFUSER, REFER TO PLANS AND DETAILS.
4. PROVIDE MOLDED INSULATION BLANKET. INSULATION SHALL BE R-6,FOIL BACKED. PROVIDE 1-INCH GAP AROUND NECK TO INSTALL INSULATED FLEX DUCT.

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15 FEBRUARY 2024
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US Army Corps of Engineers ®

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US ARMY CORPS OF ENGINEERS
TULSA DISTRICT
2488 E 81ST STREET
TULSA OK 74137

CAPEFOX MOUNTAIN POINT
ZRHD An LDG Company

TINKER AFB, OKLAHOMA
MICRO FOUNDRY EXPANSION BUILDING 9001
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MECHANICAL LEGEND OF SYMBOLS & ABBREVIATIONS, SCHEDULES

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M001
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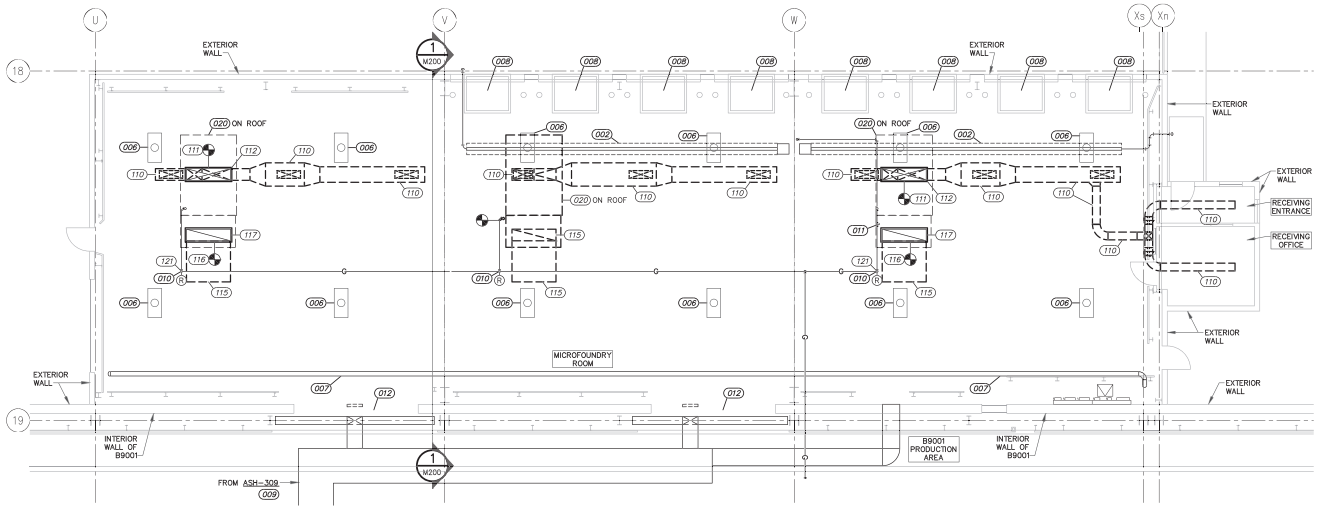
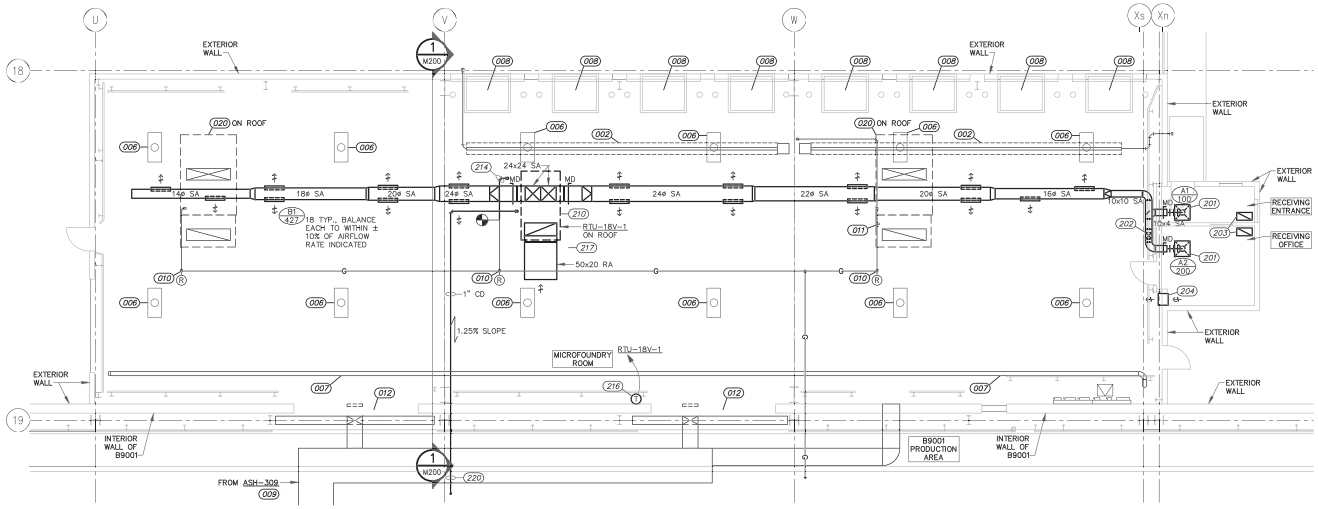


1 M100 MICRO FOUNDRY DEMOLITION FLOOR PLAN

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

NORTH



2 M100 MICRO FOUNDRY FLOOR PLAN

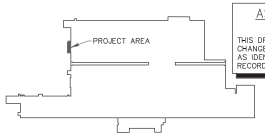
SCALE: 1/8"=1'-0"

NORTH

NOTE: NONE OF THE WALLS SHOWN ON THIS PLAN ARE FIRE OR SMOKE RATED.

KEYED NOTES THIS SHEET

- 002 ABANDONED IR TUBE HEATER TO REMAIN.
- 006 EXISTING HIGH BAY LED LIGHT FIXTURE TO REMAIN.
- 007 EXISTING 6" FIRE LINE TO REMAIN.
- 008 EXISTING DOCK LEVELERS TO REMAIN UNDER THIS CONTRACT.
- 009 EXISTING DUCTWORK TO REMAIN.
- 010 EXISTING GAS REGULATOR AND SHUT OFF VALVE.
- 011 EXISTING GAS TAP WITH SHUT OFF VALVE FOR IR HEATERS.
- 012 EXISTING OVERHEAD DOOR OPENING FROM B9001 PRODUCTION AREA TO MICROFOUNDRY.
- 020 EXISTING RTU TO BE ABANDONED IN PLACE. CLOSE GAS VALVE.
- 110 REMOVE SUPPLY AIR DUCTWORK AND AIR DEVICES.
- 111 REMOVE SUPPLY AIR TO FIRST FLANGE BELOW ROOF DECK.
- 112 INSTALL BLANK OFF COVER ON EXISTING ABANDONED SUPPLY AIR DUCTWORK.
- 115 REMOVE RETURN AIR DUCTWORK.
- 116 REMOVE RETURN AIR TO FIRST FLANGE BELOW ROOF DECK.
- 117 INSTALL BLANK OFF COVER ON EXISTING ABANDONED RETURN AIR DUCTWORK.
- 121 CLOSE GAS VALVE AT REGULATOR.
- 201 INSTALL NEW DUCTWORK ABOVE EXISTING CEILING. INSTALL DIFFUSER IN EXISTING CEILING GRID.
- 202 DROP DUCTWORK TO RECEIVING OFFICE CEILING HEIGHT.
- 203 INSTALL 22x12 INCH GRILLE IN CEILING.
- 204 6"X12" TRANSFER DUCT THROUGH WALL
- 210 PROVIDE NEW RTU WITH STRUCTURAL CURB, DUCTWORK, CONDENSATE PIPING AND CONTROLS. ALL CONTROL WIRING EXTERNAL TO THE RTU SHALL BE IN ELECTRICAL METALLIC TUBING USING COMPRESSION TYPE FITTINGS.
- 214 REROUTE 3/4" GAS LINE AS REQUIRED TO SERVE NEW RTU ABOVE.
- 216 ROUTE THERMOSTAT CABLE FROM THERMOSTAT TO RTU IN ELECTRICAL METALLIC TUBING USING COMPRESSION FITTINGS.
- 217 DUCT MOUNTED SMOKE DETECTOR, REFERENCE FIRE ALARM DRAWINGS.
- 220 NEW 1" INSULATED CONDENSATE TRAP AND DRAIN LINE WITH ROOF FLASHING. ROUTE INSULATED LINE TO EXISTING 4" SS AT COLUMN V22. PROVIDE SELF REGULATING HEAT TRACING ON EXTERIOR CONDENSATE DRAIN PIPING. USE ELECTRICAL SERVICE FROM UNIT AHU OUTLET FOR HEAT TAPE POWER.



KEYPLAN

AS-BUILT DRAWING
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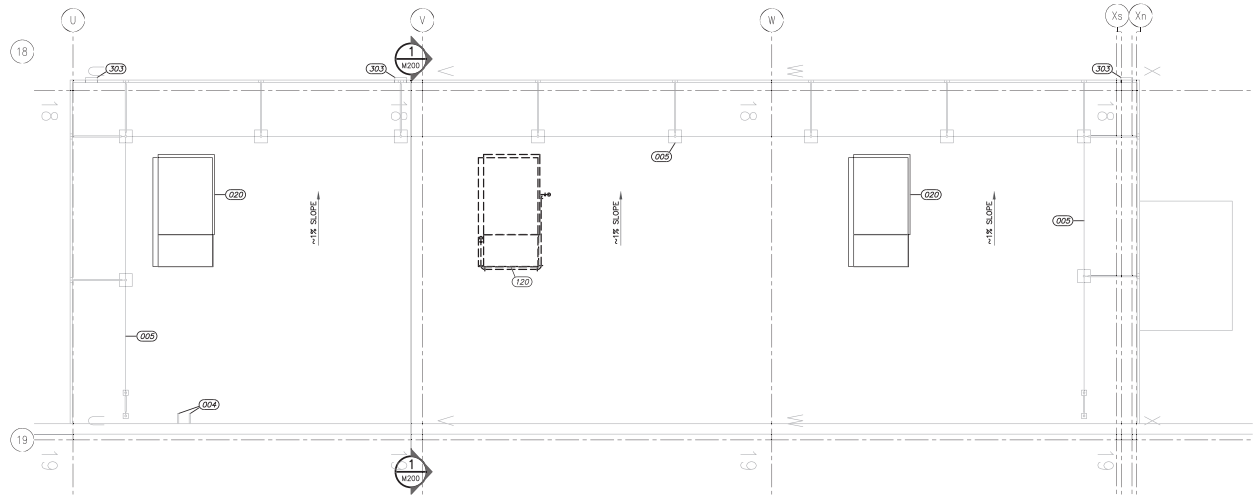
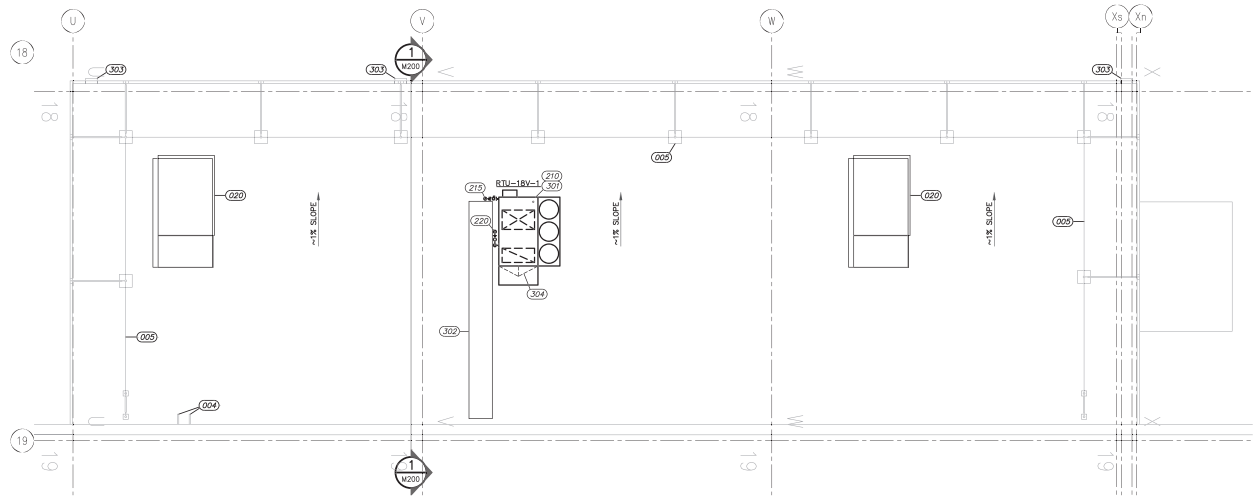


1 M110 MICRO FOUNDRY DEMOLITION ROOF PLAN

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

NORTH



2 M110 MICRO FOUNDRY ROOF PLAN

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

NORTH

KEYED NOTES THIS SHEET

004 EXISTING LADDER SUPPORTS TO REMAIN.

005 EXISTING BALLASTED CABLE GUARDRAIL TO REMAIN.

020 EXISTING RTU TO BE ABANDONED IN PLACE. CLOSE GAS VALVE.

120 REMOVE EXISTING RTU AND CURB TO DECK, PATCH UNUSED OPENINGS AND CUT NEW OPENINGS AS REQUIRED. REMOVE GAS LINE TO ROOF DECK. REPAIR ROOFING AROUND NEW CURB.

210 PROVIDE NEW RTU WITH STRUCTURAL CURB, DUCTWORK, CONDENSATE PIPING AND CONTROLS. ALL CONTROL WIRING EXTERNAL TO THE RTU SHALL BE IN ELECTRICAL METALLIC TUBING USING COMPRESSION TYPE FITTINGS.

215 NEW 3/4" GAS LINE WITH ROOF FLASHING. PROVIDE PLUG VALVE AND DIRT LEG OUTSIDE UNIT. REFERENCE DETAIL 4/M200.

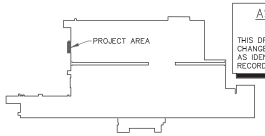
220 NEW 1" INSULATED CONDENSATE TRAP AND DRAIN LINE WITH ROOF FLASHING. ROUTE INSULATED LINE TO EXISTING 4" SS AT COLUMN V22. PROVIDE SELF REGULATING HEAT TRACING ON EXTERIOR CONDENSATE DRAIN PIPING. USE ELECTRICAL SERVICE FROM UNIT AHU OUTLET FOR HEAT TAPE POWER.

301 FLASH ROOFING INTO NEW ROOF CURB.

302 NEW WALKWAY PADS.

303 EXISTING ROOF SCUPPER.

304 INSTALL NEW CRICKET TO PREVENT PONDING ON EAST SIDE OF NEW RTU.



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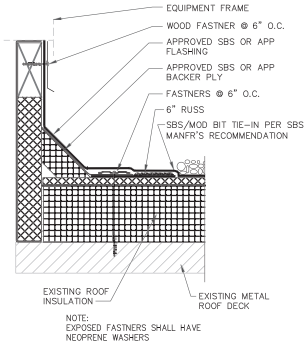
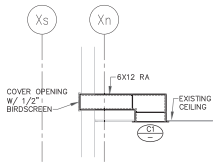
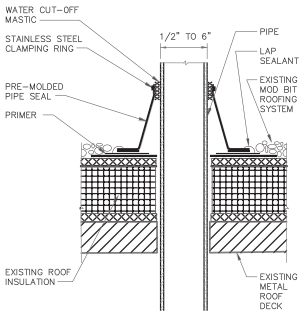


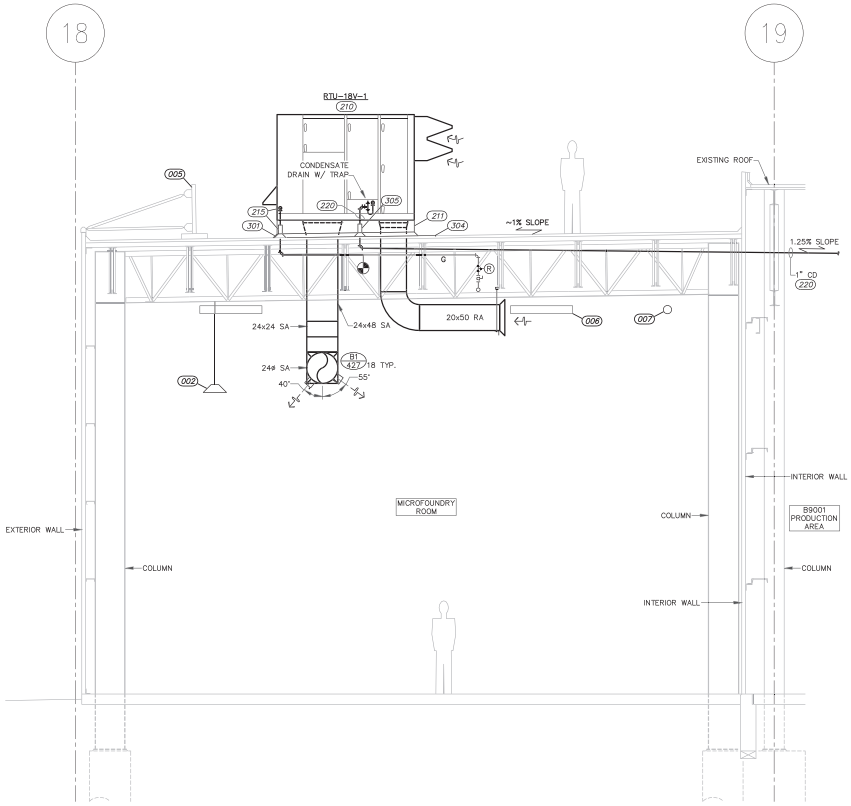
2 DETAIL – EQUIPMENT CURB
M200 SCALE: 3"=1'-0" 0 3" 6" 9" 12"



3 DETAIL – TRANSFER DUCT
M200 SCALE: 1/2"=1'-0" 0 3" 6" 9" 12"



4 DETAIL – PIPE PENETRATION
M200 SCALE: 3"=1'-0" 0 3" 6" 9" 12"



1 MICRO FOUNDRY SECTION
M200 SCALE: 1/4"=1'-0" 4' 2' 0 4' 8'

KEYED NOTES THIS SHEET

002 ABANDONED IR TUBE HEATER TO REMAIN.

005 EXISTING BALLASTED CABLE GUARDRAIL TO REMAIN.

006 EXISTING HIGH BAY LED LIGHT FIXTURE TO REMAIN.

007 EXISTING 6" FIRE LINE TO REMAIN.

210 PROVIDE NEW RTU WITH STRUCTURAL CURB, DUCTWORK, CONDENSATE PIPING AND CONTROLS. ALL CONTROL WIRING EXTERNAL TO THE RTU SHALL BE IN ELECTRICAL METALLIC TUBING USING COMPRESSION TYPE FITTINGS.

211 NEW STRUCTURAL CURB AND FLASHING. REFERENCE DETAIL 2/M200.

215 NEW 3/4" GAS LINE WITH ROOF FLASHING. PROVIDE PLUG VALVE AND DIRT LEG OUTSIDE UNIT. REFERENCE DETAIL 4/M200.

220 NEW 1" INSULATED CONDENSATE TRAP AND DRAIN LINE WITH ROOF FLASHING. ROUTE INSULATED LINE TO EXISTING 4" SS AT COLUMN V22. PROVIDE SELF REGULATING HEAT TRACING ON EXTERIOR CONDENSATE DRAIN PIPING. USE ELECTRICAL SERVICE FROM UNIT AHU OUTLET FOR HEAT TAPE POWER.

301 FLASH ROOFING INTO NEW ROOF CURB.

304 INSTALL NEW CRICKET TO PREVENT PONDING ON EAST SIDE OF NEW RTU.

305 PIPE PENETRATION OF ROOF. REFERENCE DETAIL 4/M200.

AS-BUILT DRAWING
15 FEBRUARY 2024
THIS DRAWING REFLECTS THE CHANGES MADE DURING CONSTRUCTION AS IDENTIFIED BY THE CONTRACTOR'S RECORD DRAWINGS.

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

ISSUE DATE: 15 MARCH 2023
CONTRACT NO.: W912BV22C0015
TASK ORDER NO.:
DESIGNED BY: R. CARTER
DRAWN BY: L. HAMPTON
CHECKED BY: R. CARTER
SUBMITTED BY: R. CARTER
SIZE: ANSI D

US ARMY CORPS OF ENGINEERS
TULSA DISTRICT
2488 E 81ST STREET
TULSA OK 74137

CAPEFOX MOUNTAIN POINT
ZRHD An LDG Company

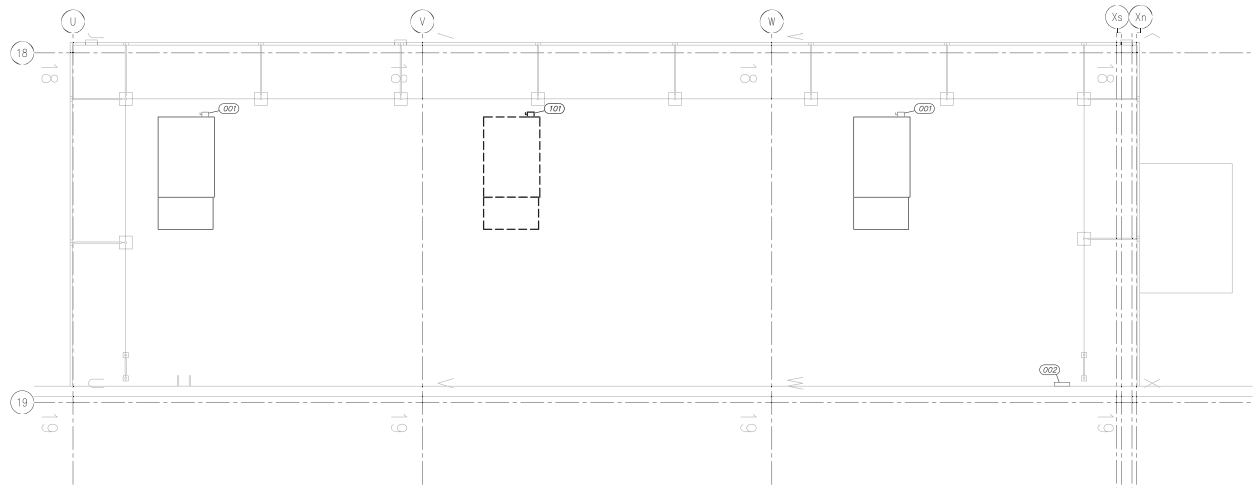
TINKER AFB, OKLAHOMA
MICRO FOUNDRY EXPANSION BUILDING 9001
CONTRACT NO.: W912BV22C0015

MICRO FOUNDRY SECTION

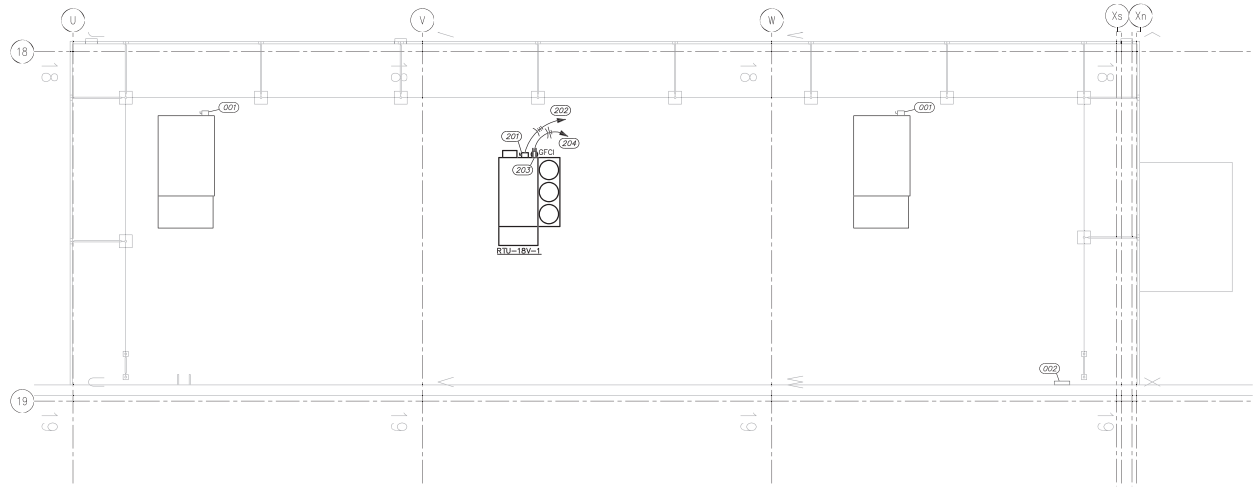
SHEET ID
M200

SHEET 5 OF 8

P:_ZRHD-Legacy\ZRHD_Projects\22CF001 Construction\Acad\FINAL AS-BUILTS 2-15-2024\M200.dwg February 15, 2024 – 12:35pm
ZRHD INC. CERTIFICATE OF AUTHORIZATION: CA 1373 EXPIRATION DATE: 30 JUNE 2023



1 E110 MICROFOUNDRY DEMOLITION ROOF PLAN
SCALE: 1/8"=1'-0"
NORTH

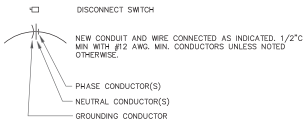


2 E110 MICROFOUNDRY ELECTRICAL ROOF PLAN
SCALE: 1/8"=1'-0"
NORTH

GENERAL NOTES

1. ALL WORK SHOWN ON THIS SHEET SHALL BE PERFORMED IN ACCORDANCE WITH NFPA 70-2020, NATIONAL ELECTRICAL CODE.
2. EXISTING EQUIPMENT AND CIRCUITS SHOWN ARE BASED ON RECORD DOCUMENTS AND LIMITED FIELD OBSERVATIONS. ACTUAL CONFIGURATION MAY VARY. VERIFY EXISTING CONDITIONS PRIOR TO BEGINNING WORK.
3. LAYOUTS SHOWN ON THIS SHEET ARE DIAGRAMMATIC AND DO NOT NECESSARILY DEPICT EXACT CONFIGURATIONS. EQUIPMENT AND DEVICE LOCATIONS SHALL BE AS NEAR AS PRACTICABLE TO LOCATIONS SHOWN EXCEPT WHERE SPECIFIED, NOTED, OR INDICATED OTHERWISE.
4. MAINTAIN AND/OR RESTORE ELECTRICAL SERVICE TO ANY EQUIPMENT, DEVICES, OR CIRCUITS THAT ARE TO REMAIN IF SUCH ITEMS ARE AFFECTED BY THIS WORK.
5. REVISE RECORD DOCUMENTATION TO REFLECT EQUIPMENT AND CIRCUITS AS INSTALLED AND/OR MODIFIED.
6. COORDINATE ALL WORK WITH ONGOING ACTIVITIES IN OCCUPIED FACILITY. SCHEDULE AND ARRANGE WORK SO AS TO MINIMIZE IMPACT ON PRODUCTION AND MISSION.

SYMBOL LEGEND



KEYED NOTES THIS SHEET

(001) EXISTING ELECTRICAL CONNECTION FOR ABANDONED IN PLACE RTU TO REMAIN, INSTALL LOCK-OUT/TAG-OUT DEVICE.

(002) EXISTING 120/208V PANEL IN SPACE BELOW TO REMAIN, USE SPARE 1P20A BREAKER FOR NEW ROOFTOP UNIT GFCI RECEPTACLE AND HEAT TAPE.

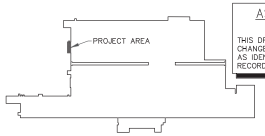
(101) DEMOLISH EXISTING ELECTRICAL CONNECTION FOR RTU, RETAIN EXISTING CONDUIT AND WIRING FOR NEW CONSTRUCTION IF PRACTICABLE, REMOVE BACK TO SOURCE IF NOT REUSABLE. REMOVE EXISTING 60A BREAKER AT SOURCE IN PANEL.

(201) NEW 3P100A INTEGRAL, NON-FUSED DISCONNECT SWITCH, FACTORY INSTALLED.

(202) TO EXISTING PANEL SERVING REPLACED RTU, 1" C - 3 #4, #8 GND. IN SOURCE PANEL, REPLACE EXISTING 3P60A BREAKER WITH NEW 3P70A BREAKER FOR SERVICE TO NEW RTU.

(203) NEW 120V DUPLEX RECEPTACLE FOR HEAT TAPE (40W) AND RTU MAINTENANCE. RECEPTACLE COVER SHALL BE LISTED AND LABELED AS "EXTRA DUTY" PER NFPA 70.

(204) TO SPARE 1P20A BREAKER IN EXISTING 120/208V PANEL IN SPACE BELOW. FIELD VERIFY EXACT LOCATION AND REQUIREMENTS BEFORE ROUGH-IN.



KEYPLAN

AS-BUILT DRAWING
15 FEBRUARY 2024

THIS DRAWING REFLECTS THE CHANGES MADE DURING CONSTRUCTION AS IDENTIFIED BY THE CONTRACTOR'S RECORD DRAWINGS.

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGNED BY: M. WEBSTER
DRAWN BY: M. RICHARDS
REVIEWED BY: M. WEBSTER
SUBMITTED BY: R. CARTER
SIZE: ANSI D
ISSUE DATE: 15 FEBRUARY 2023
CONTRACT NO.: W912BV22C0015
TASK ORDER NO.:

US ARMY CORPS OF ENGINEERS
TULSA DISTRICT
2488 E 81ST STREET
TULSA OK 74137

CAPEFOX MOUNTAIN POINT
ZRHD An LDG Company

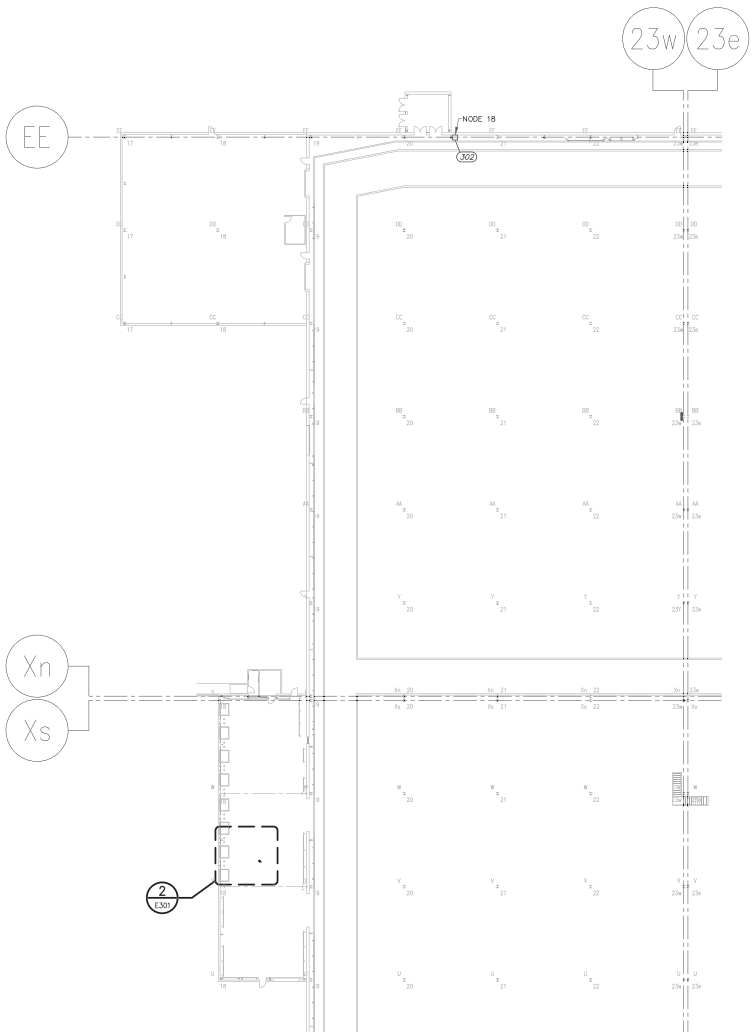
TINKER AFB, OKLAHOMA
MICRO FOUNDRY EXPANSION BUILDING 9001
CONTRACT NO.: W912BV22C0015

MICROFOUNDRY
ELECTRICAL ROOF PLANS

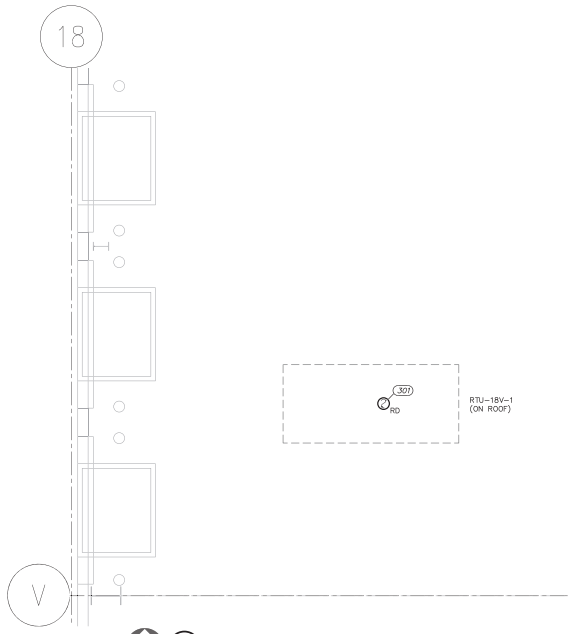
SHEET ID
E110
SHEET 6 OF 8

ZRHD INC. CERTIFICATE OF AUTHORIZATION: CA 1373
EXPIRATION DATE: 30 JUNE 2023

P:_ZRHD-Legacy\ZRHD_Projects\22CF001 Construction\Acad\FINAL AS-BUILTS 2-15-2024\E110.dwg
February 15, 2024 - 12:35pm



1 E301 FIRE ALARM PLAN – FIRST FLOOR
SCALE: 1"=30'-0"
30' 20' 10' 0 30' 60'



2 E301 ENLARGED FIRE ALARM PLAN – RTU-18V-1
SCALE: 1/4"=1'-0"
4' 2' 0 4' 8'

GENERAL NOTES

1. ALL FIRE ALARM WORK SHALL BE PERFORMED IN ACCORDANCE WITH NFPA 72-2019, NFPA 70-2020, UFC 3-600-01, AND TAFB BASE STANDARDS.
2. LAYOUTS SHOWN ON THIS SHEET ARE DIAGRAMMATIC AND DO NOT NECESSARILY DEPICT EXACT CONFIGURATIONS OR EXACT EXISTING CONDITIONS. LOCATE EQUIPMENT AND DEVICES AS NEAR AS PRACTICABLE TO LOCATIONS SHOWN UNLESS SPECIFIED, NOTED, OR INDICATED OTHERWISE.
3. MAINTAIN AND/OR RESTORE POWER AND CONNECTIVITY TO ANY EQUIPMENT, DEVICES, AND/OR CIRCUITS THAT ARE TO REMAIN IF SUCH ITEMS ARE AFFECTED BY THIS WORK.
4. ALL NEW FIRE AND/OR CO DETECTION CIRCUITS SHALL BE CLASS B.
5. ALL NEW FIRE AND/OR CO DETECTION CIRCUITS SHALL BE INSTALLED IN RED COLORED CONDUIT SYSTEM IN FULL CONFORMANCE WITH TAFB STANDARDS AND REQUIREMENTS.
6. ALL NEW FIRE AND/OR CO DETECTION CIRCUITS SHALL BE RUN SPLICE FREE.
7. ALL NEW SLC SHALL BE 16 AWG MINIMUM, UL LISTED TYPE FPLR OR FPLP AS APPLICABLE.
8. ALL NEW NAC SHALL BE 14 AWG MINIMUM, UL LISTED TYPE FPLR OR FPLP AS APPLICABLE.
9. CONTRACTOR SHALL CONFIRM EXISTING SLC AND NAC HAVE CAPACITY FOR NEW DEVICES. IF EXISTING PANEL OR POWER SUPPLIES DO NOT HAVE ADEQUATE CAPACITY TO SUPPORT THE NEW WORK, NOTIFY THE ENGINEER AND CONTRACTING OFFICER IMMEDIATELY.
10. CONTRACTOR SHALL SUBMIT PRODUCT DATA AND SHOP DRAWINGS REFLECTED THE SCOPE OF THIS PROJECT FOR APPROVAL PRIOR TO ORDERING MATERIALS. SHOP DRAWINGS SHALL INDICATE SALIENT FEATURES OF EXISTING SYSTEM INSOFAR AS NECESSARY TO DOCUMENT ADDITION OF COMPONENTS TO THE SYSTEM AND AS NECESSARY TO DOCUMENT NEW CONNECTIONS TO BE MADE TO THE EXISTING SYSTEM. COMPLETE AS-BUILTS OF EXISTING SYSTEM ARE NOT REQUIRED.
11. CONTRACTOR SHALL PERFORM FUNCTIONAL TEST OF THE EXISTING FIRE ALARM SYSTEM PRIOR TO BEGINNING WORK. FUNCTIONAL TEST SHALL INCLUDE TEST OF ALL INITIATING DEVICES IN PROJECT AREA. ANY AND ALL EXISTING DEFICIENCIES SHALL BE DOCUMENTED IN WRITING BEFORE BEGINNING WORK. GOVERNMENT RESERVES THE RIGHT TO WITNESS THE EXISTING SYSTEM TESTING AND RESERVES THE RIGHT TO DELAY FIRE ALARM WORK FOR 14 CALENDAR DAYS TO MAKE REPAIRS AND/OR CORRECTIONS TO THE EXISTING SYSTEM BEFORE WORK UNDER THIS PROJECT BEGINS.
12. CONTRACTOR SHALL INSTALL AND TEST ALL EQUIPMENT, DEVICES, AND CIRCUITS INDICATED HEREIN IN ACCORDANCE WITH NFPA 72, UFC 3-600-01, AND THE MANUFACTURER'S INSTRUCTIONS.
13. CONTRACTOR SHALL PERFORM REACCEPTANCE TESTING IN ACCORDANCE WITH NFPA 72 SECTION 14.4.2 ON MODIFIED FIRE ALARM AFTER WORK IS COMPLETE. GOVERNMENT RESERVES THE RIGHT TO WITNESS THIS TESTING. ALL TESTING SHALL BE PERFORMED AND DOCUMENTED IN ACCORDANCE WITH REQUIREMENTS OF NFPA 72 AND UFC 3-600-01.

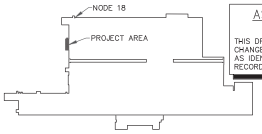
SYMBOL LEGEND

RD — DUCT-TYPE SMOKE DETECTOR.

KEYED NOTES THIS SHEET

307 DUCT-TYPE SMOKE DETECTOR IN RTU SUPPLY AIR DUCT. PROVIDE 2-WIRE TYPE DETECTOR, DERIVE DETECTOR POWER FROM RTU OR FROM 120V CONVENIENCE OUTLET POWER. PROVIDE INTERFACE MODULES, WIRING, CONDUIT, DEVICES AND HARDWARE AS NECESSARY TO CONNECT TO EXISTING REACT LAB NODE 18 AT COLUMN EE/20.

302 PROVIDE 16-GUAGE UNSHIELDED TWISTED PAIR (UTP) AND (2) 12-GUAGE WIRES FOR 24V POWER. COORDINATE EXACT LOCATION AND REQUIREMENTS IN FIELD WITH SUPPPLIER BEFORE ROUGH-IN.



KEYPLAN

AS-BUILT DRAWING
15 FEBRUARY 2024
THIS DRAWING REFLECTS THE CHANGES MADE DURING CONSTRUCTION AS IDENTIFIED BY THE CONTRACTOR'S RECORD DRAWINGS.

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

ISSUE DATE: 15 FEBRUARY 2023
CONTRACT NO.: W912BV22C0015
TASK ORDER NO.:
DESIGNED BY: MDR
DRAWN BY: MDR
CHECKED BY: CYRIL
SUBMITTED BY: R. CARTER
SIZE: ANSI D

US ARMY CORPS OF ENGINEERS
TULSA DISTRICT
2488 E. 81ST STREET
TULSA OK 74137

CAPEFOX MOUNTAIN POINT
ZRHD An LDG Company

TINKER AFB, OKLAHOMA
MICRO FOUNDRY EXPANSION BUILDING 9001
CONTRACT NO.: W912BV22C0015

MICROFOUNDRY
FIRE ALARM PLAN
FIRST FLOOR

SHEET ID
E301

SHEET 7 OF 8

ZRHD INC. CERTIFICATE OF AUTHORIZATION: CA 1373
EXPIRATION DATE: 30 JUNE 2023

P:_ZRHD-Legacy\ZRHD_Projects\22CF001 Construction\Acad\FINAL AS-BUILTS 2-15-2024\E301.dwg
February 15, 2024 – 12:36pm

1. GENERAL INFORMATION

A. GOVERNING BUILDING CODE: 2018 INTERNATIONAL BUILDING CODE (IBC–2018).

B. BUILDING RISK CATEGORY: THE BUILDING RISK CATEGORY ACCORDING TO IBC–2018 TABLE 1604.5 AND ASCE 7–16 TABLE 1.5–1 IS CATEGORY II.

2. DESIGN LOADS

A. DEAD LOAD: SELF WEIGHT OF MATERIALS, UNLESS NOTED OTHERWISE

B. ROOF DEAD LOAD (PER AS–BUILT DRAWINGS FOR THE 2000 ADDITION):
1) ROOFING & INSULATION..... .....7.0 PSF
2) METAL ROOF DECK.....3.0 PSF
3) MECHANICAL, ELECTRICAL & MISC.....10.0 PSF
4) TOTAL.....20.0 PSF

C. UNIFORM ROOF LIVE LOAD:
1) ROOF LIVE LOAD.....20 PSF

3. MATERIAL DESIGN VALUES

A. STRUCTURAL STEEL (MINIMUM YIELD STRENGTH)
1) STEEL ANGLES (ASTM A36) FY = 36 KSI

4. STEEL CONSTRUCTION NOTES

A. GOVERNING STANDARDS: ALL STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED, AND ERECTED IN ACCORDANCE WITH THE FOLLOWING STANDARDS AND AS SUPPLEMENTED BY THESE GENERAL NOTES AND THE PROJECT DRAWINGS AND SPECIFICATIONS.
1) ANSI/AISC 360–16 "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS".
2) AISC 303–16 "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES".
3) ANSI/AWS "D1.1–STRUCTURAL WELDING CODE – STEEL", 2015 EDITION.
4) RCSC–2014 "SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH–STRENGTH BOLTS".

B. STRUCTURAL BOLTS:

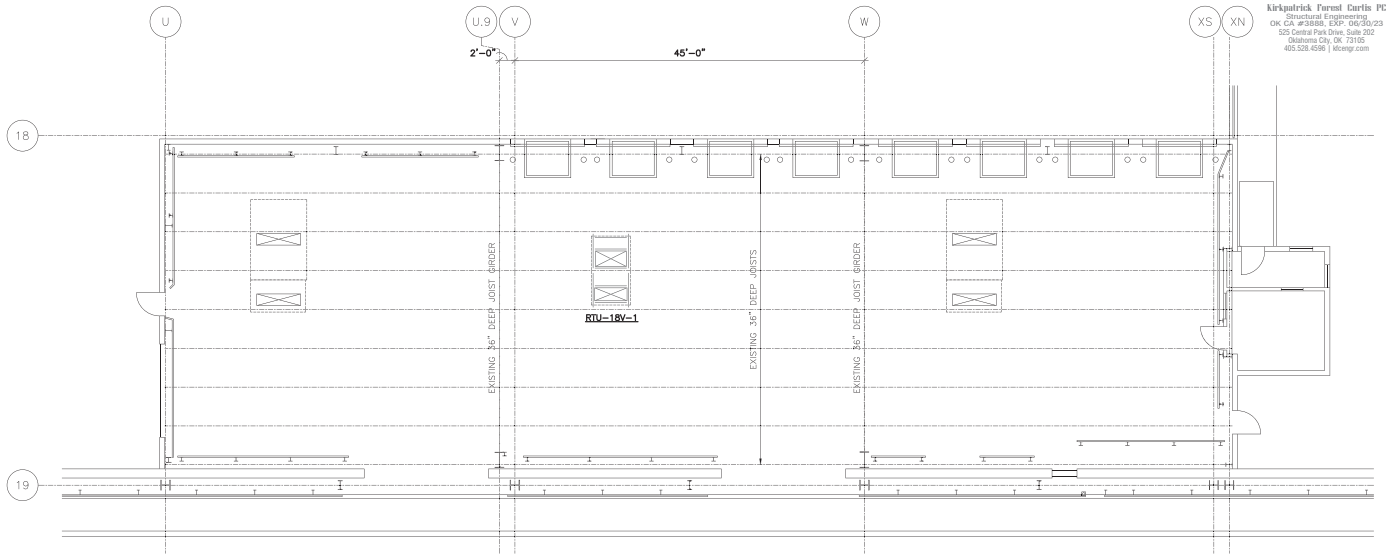
1) ALL BOLTS SHALL BE 3/4 IN. DIAMETER ASTM A325 WITH SUITABLE WASHERS AND NUTS UNLESS OTHERWISE SHOWN IN THE CONSTRUCTION DOCUMENTS OR APPROVED IN WRITING BY THE OWNER'S REPRESENTATIVE.

2) ALL BOLTS SHALL BE TIGHTENED TO THE SNUG–TIGHTENED JOINT REQUIREMENTS OF RCSC–10 EXCEPT AT SLIP–CRITICAL JOINTS OR WHERE NOTED OTHERWISE IN CONSTRUCTION DOCUMENTS OR IN FABRICATOR'S CONNECTION DESIGN.

C. STEEL FABRICATION & FINISH:

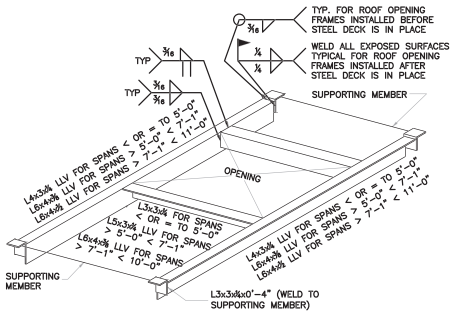
1) ALL SHOP AND FIELD WELDS SHALL BE MADE IN ACCORDANCE WITH THE ANSI/AWS "D1.1–STRUCTURAL WELDING CODE – STEEL", 2015 EDITION. ALL WELDING SHALL USE LOW HYDROGEN PROCESSES.

2) SHOP PRIMER
A) INTERIOR STEEL SHALL BE SHOP PRIMED WITH THE FABRICATORS STANDARD SHOP PRIMER.
B) SHOP PRIMER SHALL NOT BE APPLIED TO THE FOLLOWING AREAS:
I) SURFACES TO BE FIELD WELDED.

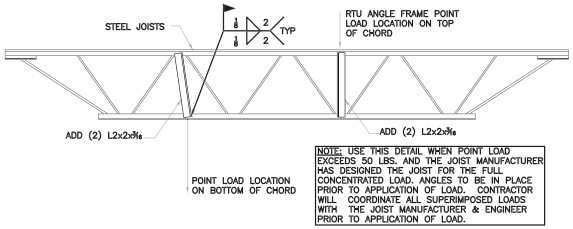


NORTH

1 S100 ROOF FRAMING PLAN
SCALE: 1/8"=1'-0"

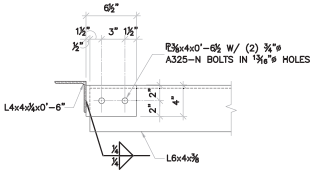


2 S100 TYP. ROOF OPENING FRAME AND MECHANICAL UNIT SUPPORT
SCALE: NONE



NOTE: USE THIS DETAIL WHEN POINT LOAD EXCEEDS 50 LBS. AND THE JOIST MANUFACTURER HAS DESIGNED THE JOIST FOR THE FULL CONCENTRATED LOAD. ANGLES TO BE IN PLACE PRIOR TO APPLICATION OF LOAD. CONTRACTOR WILL COORDINATE ALL SUPERIMPOSED LOADS WITH THE JOIST MANUFACTURER & ENGINEER PRIOR TO APPLICATION OF LOAD.

3 S100 BRACING DETAIL FOR STEEL JOISTS W/ POINT LOADS
SCALE: NONE



4 S100 FIELD - BOLT OPTION AT RTU FRAMES
SCALE: 1 1/2"=1'-0"

AS–BUILT DRAWING
15 FEBRUARY 2024
THIS DRAWING REFLECTS THE CHANGES MADE DURING CONSTRUCTION AS IDENTIFIED BY THE CONTRACTOR'S RECORD DRAWINGS.

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Kirkpatrick Forest Curtis PC
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Oklahoma City, OK 73105
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US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

ISSUE DATE: 15 FEBRUARY 2023
CONTRACT NO.: W912BV22C0015
TASK ORDER NO.:

DESIGNED BY: M. KIRKPATRICK
DRAWN BY: B. CAMPBELL
REVIEWED BY: R. FOREST
SUBMITTED BY: R. CARTER
SIZE: ANSI D

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TULSA DISTRICT
2488 E. 81ST STREET
TULSA, OK. 74137

CAPEFOX MOUNTAIN POINT
ZRHD An LDG Company

TINKER AFB, OKLAHOMA
MICRO FOUNDRY EXPANSION BUILDING 9001
CONTRACT NO.: W912BV22C0015

MICRO FOUNDRY
PLANS AND SECTIONS

SHEET ID
S100
SHEET 8 OF 8

ISSUED FOR CONSTRUCTION

TAFB B9001 MICRO FOUNDRY EXPANSION
W912BV22R0015
FIRE ALARM SYSTEM

DRAWING INDEX

Sheet List Table

Sheet Number	Sheet Title
General Information (FA-000 Series)	
FA-001	COVER SHEET
Floorplans (FA-100 Series)	
FA-101	DEVICE PLACEMENT PLAN
Riser Diagrams (FA-200 Series)	
FA-201	RISER DIAGRAM
Calculations (FA-600 Series)	
FA-601	CALCULATIONS, SCHEDULES AND WIRING TYPICALS

GENERAL NOTES

1. THESE DRAWINGS DEPICT GENERAL LOCATIONS OF LIFE SAFETY EQUIPMENT & FIELD DEVICES. EXACT ROUTING OF CONDUITS IS TO BE DETERMINED IN THE FIELD BY THE INSTALLING CONTRACTOR TO SUIT CONDITIONS. ALL CHANGES SHALL BE CLEARLY INDICATED ON THE RECORD DRAWINGS.
2. SHOULD ANY CONDITIONS EXIST THAT DIFFER FROM WHAT IS INDICATED ON THESE DRAWINGS WHICH CAUSE MAJOR DEVIATIONS IN THE WORK SHOWN, THE CONTRACTOR SHALL CONTACT JOHNSON CONTROLS IN A TIMELY MANNER SO AS NOT TO IMPAIR THE CONSTRUCTION SCHEDULE.
3. CONTRACTOR IS RESPONSIBLE FOR MAKING AND OBTAINING APPROVAL FOR ALL NECESSARY ADJUSTMENTS IN CIRCUITING AS REQUIRED TO ACCOMMODATE THE RELOCATION OF EQUIPMENT AND/OR DEVICES WHICH ARE AFFECTED BY ANY AUTHORIZED CHANGE. ALL CHANGES SHALL BE CLEARLY INDICATED ON THE RECORD DRAWINGS.
4. A STAMPED SET OF APPROVED FIRE ALARM DRAWINGS SHALL BE AT THE JOB SITE AND SHALL BE USED FOR INSTALLATION.
5. THE POWER CIRCUIT TO THE FACP AND TO THE FIRE ALARM POWER SUPPLIES SHALL BE ON A DEDICATED 120V, 20A BRANCH CIRCUIT BREAKER, AND SHALL HAVE A RED MARKING. LOOK-ON PROVISION AND SHALL BE IDENTIFIED AS "FIRE ALARM CIRCUIT CONTROL." THE LOCATION OF THE CIRCUIT DISCONNECT MEANS (CIRCUIT BREAKER) SHALL BE PERMANENTLY IDENTIFIED AT THE FIRE ALARM CONTROL UNIT.
6. UPDATE THE AS-BUILT DRAWING SET DAILY WITH JOB PROGRESS. RETURN THE AS-BUILT DRAWING SET TO JOHNSON CONTROLS NO LATER THAN 7 DAYS AFTER FINAL TEST.
7. THE CONTRACTOR WILL MAINTAIN ALL AREAS OF THE BUILDING IN A NEAT AND WORKMANLIKE MANNER.
8. DO NOT APPLY POWER EXCEPT IN THE PRESENCE OF A FACTORY TRAINED JOHNSON CONTROLS TECHNICAL REPRESENTATIVE.
9. ANY SMOKE DETECTOR HEAD INSTALLED BEFORE THE BUILDING IS CLEANED AND ACCEPTED SHALL BE COVERED TO PROTECT FROM DUST. ANY FALSE ALARMS DUE TO DIRT CONTAMINATED HEADS SHALL BE THE RESPONSIBILITY OF THE FIRE ALARM INSTALLER.
10. THE FIRE ALARM INSTALLER WILL MAINTAIN THE FIRE RESISTANCE INTEGRITY OF ALL WALL, CEILING, AND ROOF ASSEMBLIES ANY TIME THAT WORK IS NOT ACTIVELY BEING PERFORMED.
11. INSTALLATION OF DEVICES SHALL BE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. POWER LIMITED AND NON-POWER LIMITED FIELD WIRING MUST BE INSTALLED WITHIN THE FACP ENCLOSURE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND APPLICABLE ELECTRICAL CODES. REFER TO APPLICABLE CODES & STANDARDS' FOR SPECIFIC CODE REFERENCES.
12. ALL WIRING SHALL BE INSTALLED ACCORDING TO APPLICABLE ELECTRICAL CODES.
13. FIRE ALARM CIRCUITS SHALL BE IDENTIFIED IN ACCORDANCE WITH APPLICABLE ELECTRICAL CODES. MARK ALL FIRE ALARM WIRES IN ACCORDANCE WITH APPLICABLE ELECTRICAL CODE SECTIONS FOR POWER LIMITED AND NON-POWER LIMITED WIRE.
14. FIRE ALARM CABLE INSTALLED IN DUCTS, PLENUM, AND OTHER SPACES USED FOR ENVIRONMENTAL AIR SHALL BE TYPE FPLP.
15. FIRE ALARM CABLE INSTALLED IN THE VERTICAL RUNS AND PENETRATING MORE THAN ONE FLOOR OR CABLES INSTALLED IN VERTICAL RUNS IN SHAFTS SHALL BE TYPE FPLR.
16. FIRE ALARM CABLE INSTALLED IN UNDERGROUND CONDUIT OR OTHER WET LOCATIONS SHALL BE UL LISTED FOR WET LOCATIONS.
17. FIRE ALARM CIRCUITS EXTENDING BEYOND ONE BUILDING AND RUN OUTDOORS SHALL BE INSTALLED IN ACCORDANCE APPLICABLE ELECTRICAL CODES, WHERE APPLICABLE.
18. ALL WIRING, INCLUDING SHIELDS MUST BE DRY AND FREE OF SHORTS AND GROUNDS.
19. ALL SHIELDED WIRE MUST HAVE SHIELD CONTINUITY AT FULL LENGTH OF THE WIRE.
20. ONLY SYSTEM WIRING CAN BE RUN IN THE SAME CONDUIT.
21. 120VAC IS NOT PERMITTED IN THE SAME CONDUIT WITH LOW VOLTAGE WIRING.
22. MAINTAIN MAXIMUM CONDUIT FILL RATIO AS PER APPLICABLE ELECTRICAL CODES REQUIREMENTS.
23. EXISTING CONDUITS MAY BE USED BY THE INSTALLATION CONTRACTOR AS DEEMED NECESSARY; HOWEVER, ANY EXISTING CONDUIT WILL BE USED ONLY IF CONDUITS MEET CURRENT STANDARDS AND CODES. JOHNSON CONTROLS MAKES NO STATEMENTS WRITTEN OR VERBAL AS TO THE CONDITION OF EXISTING CONDUITS.

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LEGENDS

FIRE ALARM SYMBOL LEGEND

QTY	SYMBOL	DESCRIPTION	BRAND	MODEL	BACKBOX	WIRE TYPE
INITIATING DEVICES						
1		ADDRESSABLE DUCT SMOKE DETECTOR	SIMPLEX	4098-9755	MOUNTS TO DUCTWORK	M
		SAMPLING TUBE: 37"	SIMPLEX	4098-9858		
MODULES AND RELAYS						
1		RELAY IAM	SIMPLEX	4090-9002	4" SQ. 2-1/8"D	M
		TRIM PLATE FOR SURFACE MOUNTING	SIMPLEX	4090-9802		R
MISCELLANEOUS DEVICES						
1		REMOTE TEST STATION	SIMPLEX	2098-9808	SINGLE GANG 2"D	K
		JUNCTION BOX	BY OTHERS	BY OTHERS		

FIRE ALARM WIRE LEGEND

	CIRCUIT DESCRIPTION	CONSTRUCTION	GAUGE	CIRCUIT PROPERTIES	ACCEPTABLE CABLE TYPES: FPLR	FPLP	THWN	THWN OUTDOOR*	CI
K	REMOTE TEST SWITCHLED	(2) 2 COND. SOLID	14 AWG		X	X			
M	IDNET	UTP SOLID	16 AWG	0.60µF MAX TOTAL LINE CAPACITANCE	X	X			
P	POWER	2 COND. SOLID	14 AWG		X	X	X	X	
R	RELAY	2 COND. SOLID	14 AWG		X	X	X	X	

CONDUIT SIZE	MAX CONDUCTOR AREA	CONDUIT SIZE	MAX CONDUCTOR AREA
1/2"	0.122 SQ. INCH*	1-1/4"	0.598 SQ.INCH*
3/4"	0.213 SQ.INCH*	1-1/2"	0.814 SQ.INCH*
1"	0.346 SQ.INCH*	2"	1.342 SQ.INCH*

* 40% CONDUIT FILL PER N.E.C.

UTP = UNSHIELDED TWISTED PAIR

ITEMS SUCH AS CAPACITANCE BETWEEN CONDUCTORS AND WIRE GAUGE CAN BE CRUCIAL TO THE CIRCUIT DESIGN OF THIS SYSTEM INSTALLATION. THE INSTALLING CONTRACTOR IS RESPONSIBLE FOR SELECTING AND INSTALLING CABLE MANUFACTURER AND MODEL THAT MEETS OR EXCEEDS THE ABOVE REQUIREMENTS. RECOMMENDED CABLE MANUFACTURERS AND MODEL NUMBERS ARE AVAILABLE UPON REQUEST.

APPLICABLE CODES & STANDARDS

JURISDICTIONS WITHIN THE STATE MAY HAVE AMENDMENTS TO THE STATE ADOPTED CODE. CHECK WITH THE LOCAL JURISDICTION AUTHORITY FOR MORE DETAILS.

National Electric Code (NFPA 70), 2017 Edition

National Fire Alarm and Signaling Code (NFPA 72), 2019 Edition

Standard for Installation of Air Conditioning and Ventilating Systems (NFPA 90A), 2018 Edition

UFC 3-600-01: Fire Protection Engineering for Facilities, With Change 6, 6 May 2021

UFC 4-021-01: Design and O&M: Mass Notification Systems, 1 January 2010

Engineering Construction Bulletin (ECB) 2018-17: New Requirements for Visual Notification for Mass Notification Systems, 14 May 2020

OCCUPANCY TYPE(S):
B BUSINESS GROUP

BUILDING IS FULLY SPRINKLERED

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SCOPE OF WORK

MODIFY EXISTING FIRE ALARM SYSTEM: PROVIDE NEW DUCT DETECTOR, SHUT DOWN RELAY AND REMOTE TEST STATION FOR RTU-18V-1 AND CONNECT TO EXISTING NODE 18 TPR1 IN SAND MOLD PRINTER LAB AS SHOWN ON DRAWINGS.

ALL NEW WIRING TO BE CLASS B.

THE EXISTING FIRE ALARM SYSTEM SHALL NOT BE DISCONNECTED OR TAKEN OUT OF SERVICE WITHOUT WRITTEN PERMISSION FROM THE OWNER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE WITH THE OWNER THE TIMING OF ANY EXISTING FIRE ALARM SYSTEM DEMOLITION WORK CONNECTIONS, OR TESTING.

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ABBREVIATIONS LEGEND

AC = ABOVE CEILING
AFF = ABOVE FINISHED FLOOR
AHJ = AUTHORITY HAVING JURISDICTION
ALM = ALARM
ANN = ANNUNCIATOR
BMS = BUILDING MANAGEMENT SYSTEM
C = CEILING MOUNTED
CD = CANDELA RATING
DET = DETECTOR
DGP = DATA GATHERING PANEL
E = EXISTING TO REMAIN
EOL = END OF LINE
EPO = EMERGENCY POWER OFF
ER = ELEVATOR RECALL
FAA = FIRE ALARM ANNUNCIATOR
FACP = FIRE ALARM CONTROL PANEL
FATC = FIRE ALARM TERMINAL CABINET
FBO = FURNISHED BY OTHERS
FCC = FIRE COMMAND CENTER
FSD = FIRE SMOKE DAMPER
FTR = FIRE ALARM TRANSPONDER
H = HIGH HUMIDITY
HT = HEIGHT
HVAC = HEATING VENTILATION & AIR CONDITIONING
IMS = INFORMATION MANAGEMENT SYSTEM
MAX = MAXIMUM
MIN = MINIMUM
N/A = NOT APPLICABLE
NAC = NOTIFICATION APPLIANCE CIRCUIT
NDU = NETWORK DISPLAY UNIT
NEC = NATIONAL ELECTRIC CODE
NFPA = NATIONAL FIRE PROTECTION ASSOCIATION
NIC = NOT IN CONTRACT
NPU = NETWORK PROCESSING UNIT
NTS = NOT TO SCALE
PAP = PRE-ACTION PANEL
RC = EXISTING TO REMOVE AND COVER
RD = EXISTING DEVICE TO BE RELOCATED
RL = RELOCATED DEVICE
RR = REMOVE EXISTING & REPLACE WITH NEW
SCC = STATUS COMMAND CENTER
SLC = SIGNALING LINE CIRCUIT
SMK = SMOKE
SUPV = SUPERVISORY
TAC = TRUEALERT ADDRESSABLE CONTROLLER
TOS = TOP OF SHAFT
TRBL = TROUBLE
TS = TAMPER SWITCH
TYP = TYPICAL
UON = UNLESS OTHERWISE NOTED
VCC = VOICE COMMAND CENTER
VT = VALVE TAMPER
W = WATTAGE
W/ = WITH
W/O = WITHOUT
WF = WATERFLOW
WG = WIRE GUARD
WP = WEATHERPROOF
XP = EXPLOSION PROOF

DEVICE TAG LEGEND

1:T2:A2-1 E1:1

PANEL DESIGNATOR
- FA = FACP (NON-NETWORK)
- # = NODE NUMBER
- T# = TRANSPONDER NUMBER
- # T# = NODE TRANSPONDER NUMBER
- NE = NAC EXTENDER NUMBER

CIRCUIT DESIGNATOR
- A# = IDNAC* CIRCUIT NUMBER
- D# = DOOR HOLDER CIRCUIT NUMBER
- F# = FIRE PHONE CIRCUIT
- H# = AUDIBLE (HORN) CIRCUIT NUMBER
- M# = IDNET LOOP NUMBER
- P# = POWER CIRCUIT NUMBER
- S# = SPEAKER CIRCUIT NUMBER
- V# = VISUAL CIRCUIT NUMBER
- Z# = ZONE NUMBER

DEVICE NUMBER
BRANCH / ISOLATED LOOP DESIGNATOR:
- (LE) = IDNET ISOLATED LOOP NUMBER
- (#) = IDNAC BRANCH NUMBER
- (E#:#) = EPR# NUMBER:BRANCH NUMBER

1. IDNAC = ADDRESSABLE NOTIFICATION CIRCUIT
2. EPR = ENHANCED POWER REPEATER

SYSTEM SEQUENCE OF OPERATIONS

	ACTIVATE SPEAKERS, STROBES, AND TEST SIGNS	NODE 18 - ACTIVATE ALL SPEAKERS, STROBES, AND TEST SIGNS	NODE 18 PRINTER - ACTIVATE ALL SPEAKERS, STROBES, AND TEST SIGNS	DISPLAY "EVACUATE" ON ACTIVATED TEST SIGNS	DISPLAY STATUS AT NODE AND SEND TO NETWORK	TRANSMIT ALARM SIGNAL TO SUPERVISING STATION	TRANSMIT WATERFLOW/ALARM SIGNAL TO SUPERVISING STATION	DEACTIVATE VOICE INPUT THROUGHOUT ACTIVATED SPEAKERS	TELLAVER COMMUNICATIONS PRE-RECORDED MESSAGE ACTIVATES ON ACTIVATED TEST SIGNS	DISPLAY "WARNING/REMOTE" ON ACTIVATED TEST SIGNS	DEACTIVATE FIRE EVACUATION PRE-RECORDED MESSAGE	DEACTIVATE "EVACUATE" FROM TEST SIGNS	REVERT TO FIRE EVACUATION MESSAGE	DEACTIVATE "WARNING/REMOTE" FROM TEST SIGNS	TRANSMIT SUPERVISORY SIGNAL TO SUPERVISING STATION	SHUT DOWN ASSOCIATED AIR HANDLING UNIT	TRANSMIT TROUBLE SIGNAL TO SUPERVISING STATION	AUTOMATICALLY TRANSFER TO SECONDARY POWER
INPUTS																		
ALARM																		
MANUAL PULL STATION	X	X	X	X	X	X	X											
SPRINKLER WATERFLOW	X	X	X	X	X	X		X										
MASS NOTIFICATION (UFC 4-021-01)																		
NODE 18 EMERGENCY MICROPHONE KEYED	X	X			X				X		X				X			
NODE 18 PRE-RECORDED MESSAGE BUTTON	X	X			X					X	X				X			
CCD3 LOC PRE-RECORDED MESSAGE BUTTON	X	X			X					X	X				X			
CCD3 LOC MICROPHONE KEYED	X	X			X				X		X				X			
B9001 HEAD-END PRE-RECORDED MESSAGE BUTTON	X	X	X		X					X	X				X			
B9001 HEAD-END MICROPHONE KEYED	X	X	X		X				X		X				X			
ANY MASS NOTIFICATION INPUT WHILE FIRE MESSAGE ACTIVE					X					X	X	X			X			
FIRE MESSAGE OVERIDDEN BY MASS FOR 10 MINUTES				X	X								X	X				
SUPERVISORY																		
SMOKE DETECTOR - DUCT TYPE					X										X	X		
SPRINKLER - TAMPER SWITCH					X										X			
TROUBLE																		
LOSS OF PRIMARY POWER					X												X	X
LOSS OF SECONDARY POWER					X												X	
CIRCUIT FAULT					X												X	

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TAFB B9001 MICRO FOUNDRY EXPANSION
W912BV22R0015
TINKER AIR FORCE BASE B9001
OKLAHOMA CITY, OK

Revisions since last issue

REVISION	DATE	CAD OPR	DESCRIPTION

DRAWN BY:	KLC
CHECKED BY:	BDB
ISSUE DATE:	6/19/23
JOB #	
PROJECT #	442-60243444

JOHNSON CONTROLS © 2023

SYSTEM: FIRE ALARM SYSTEM

SHEET: COVER SHEET

FA-001

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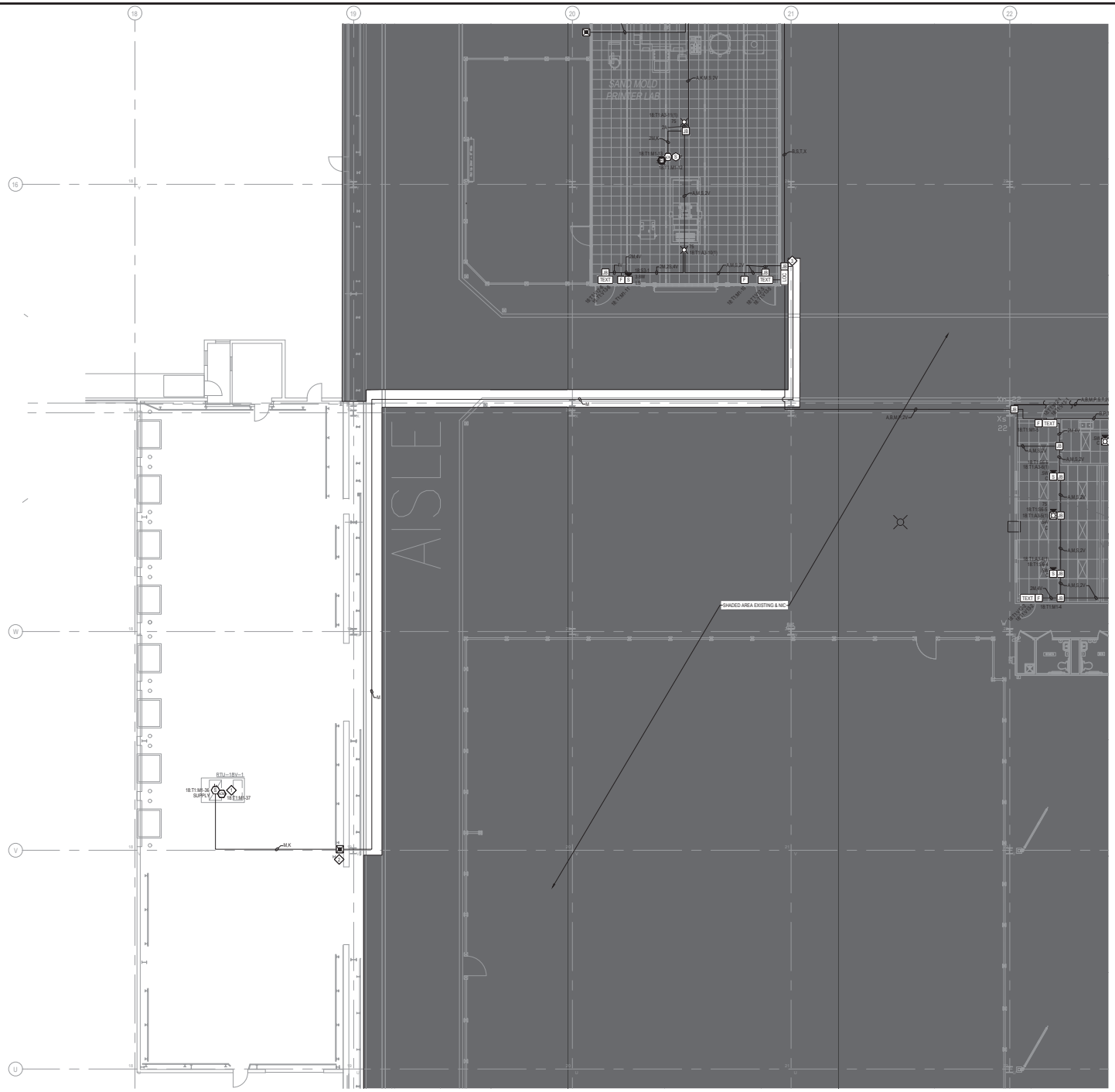
30" x 42" - Arch E Size



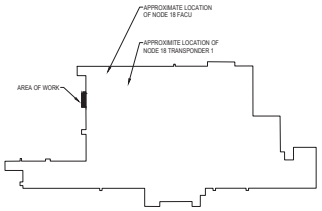
DEVICE PLACEMENT PLAN
SCALE:1/8" = 1'-0"

GENERAL NOTES:

1. THE DEVICE ADDRESSES INDICATED ON THESE DRAWINGS ARE AN ALPHANUMERIC DESCRIPTION OF WHICH CIRCUIT THE DEVICE IS LOCATED ON. DEVICES MAY BE ASSIGNED A DIFFERENT NUMBER WITHIN THE PANEL PROGRAM. CONSULT WITH A JOHNSON CONTROLS TECHNICIAN BEFORE APPLYING A PHYSICAL LABEL TO ANY DEVICES.

KEYNOTES.

1. INSTALL DUCT DETECTOR RELAY WITHIN 3'-0" OF CONTROLLING EQUIPMENT. VERIFY LOCATION IN FIELD AND INCLUDE ON RECORD DRAWINGS.
2. INSTALL REMOTE TEST STATION IN ACCESSIBLE AREA AND CONFIRM LOCATION WITH OWNER. VERIFY LOCATION OF REMOTE TEST STATION IN FIELD AND INCLUDE ON RECORD DRAWINGS.
3. CONNECT MICRO FOUNDRY DUCT DETECTOR AND RELAY TO NODE 18 TRANSPONDER 1 THROUGH Y21 SAND MOLD PRINTER LAB. ENETGAVIOC TO EITHER RUN TO MICRO FOUNDRY AND BACK OR CONNECT TO LAST END OF LINE IDNETGAVIOC DEVICE AT Y21 SAND MOLD PRINTER LAB. USE OF SPLICES, T-TAPS, WIRE NUTS, CRIMPED CONNECTORS IS PROHIBITED. JCI FIRE ALARM TECHNICIAN TO VERIFY LOCATION OF CONNECTION IN FIELD.



KEYPLAN
SCALE:N.T.S.

SCALE:1/8" = 1'-0" IN FEET
0 4 8 16

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TAFB B9001 MICRO FOUNDRY EXPANSION
W912BV22R0015

TINKER AIR FORCE BASE B9001
OKLAHOMA CITY, OK

REV. NO.	DATE	CAD	CHK	DESCRIPTION

Revisions shown with ▲ symbol

DRAWN BY:	KLC
CHECKED BY:	BDB
ISSUE DATE:	6/19/23
JOB #	
PROJECT #	442.650243444

JOHNSON CONTROLS © 2023

SYSTEM: FIRE ALARM SYSTEM

SHEET: DEVICE PLACEMENT PLAN

FA-101

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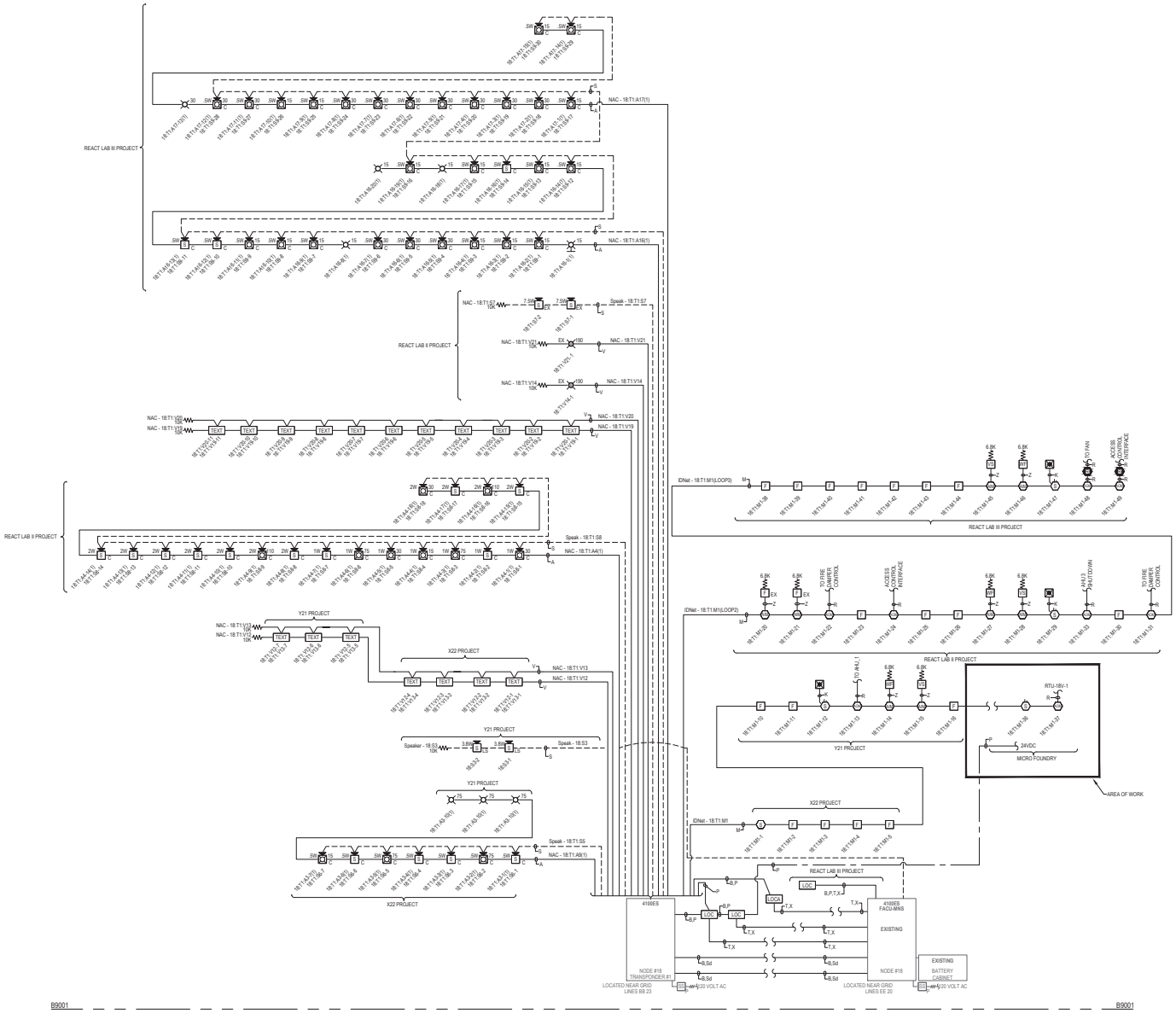
30"X 42" - Arch E1 Size

RISER NOTES:

1. RISER IS A DIAGRAMMATICAL REPRESENTATION OF THE SYSTEM ARCHITECTURE IN BUILDING CROSS SECTION. IT IS NOT INTENDED TO REPRESENT ACTUAL WIRE RUNS, PANEL CONFIGURATIONS OR PENETRATIONS. REFER TO FLOOR PLANS AND PANEL DETAILS FOR CIRCUIT ROUTING AND CONFIGURATION INFORMATION.
2. ALL WIRING SHALL COMPLY WITH APPLICABLE ELECTRICAL CODES. REFER TO APPLICABLE CODES & STANDARDS ON SHEET FA-001 FOR SPECIFIC CODE REFERENCES.



NODE 18 TRANSPONDER 1 RISER DIAGRAM

SCALE: N.T.S.

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TAFB B9001 MICRO FOUNDRY EXPANSION
W912BV22R0015

TINKER AIR FORCE BASE B9001
OKLAHOMA CITY, OK

REV.	DATE	CAD	CHK	DESCRIPTION

DRAWN BY:	KLC
CHECKED BY:	BDB
ISSUE DATE:	6/19/23
JOB #	
PROJECT #	442-650243444

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SYSTEM: FIRE ALARM SYSTEM

SHEET: RISER DIAGRAM

FA-201

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NODE 18 TPR1 - POST BB-23E 4100ss XPDR						
Module	Qty	Description	Standby Current	Total Standby	Alarm Current	Total Alarm
Panel Equipment						
4100-9003	1	BASIC TRANSPONDER *	0.0870	0.0870	0.0870	0.0870
4100-9022	1	DIGITAL AUDIO RISER MODULE	0.0700	0.0700	0.0700	0.0700
4100-5311	1	ENHANCED POWER SUPPLY, 3 CHANNELS, IDNet, 120V	0.2200	0.2200	0.4600	0.4600
4100-5101	2	EXPANSION PWR SUPPLY (XPS) - 120VAC 50HZ	0.0900	0.1800	0.2000	0.1000
4100-1338	1	DIGITAL 100W AMP,8VAC,120VAC,70V	0.8800	0.8800	3.8000	3.8000
4100-5481	1	E3 Power Supply Only	0.0680	0.0680	0.0770	0.0770
4100-5401	1	IDNet Card	0.1040	0.1040	0.2300	0.2300
4603-9803	3	REMOTE MICROPHONE ON 2 GANG PL	0.0200	0.0600	0.0250	0.0750
4190-1391	1	REMOTE UNIT INTERFACE	0.0800	0.0800	0.0850	0.0850
		Panel Totals		0.8490		5.0140
IDNet Addressable Devices (SLC)						
4098-9001	8	ENET SUPERVISED IAM *	Constant current draw of .8mA standby and 1mA alarm per address used. Devices requiring additional current are accounted for in the section labeled "Miscellaneous Peripheral Devices Requiring Additional System Power".			
4098-9002	7	ENET RELAY IAM *				
4098-9714	1	TRUSLAN PHOTO SMOKE SENSOR *				
4098-9755	3	TRUSLAN DUCT SMOKE SENSOR W/O RELAY OUTPUT *				
4098-9758	1	TRUSLAN DUCT SMOKE SENSOR W/ RELAY OUTPUT *				
4098-9792	1	TRUSLAN IR SENSOR BASE *				
4099-9906	16	ADDRESSABLE DOUBLE ACTION MANUAL STATION, PUSH *				
Miscellaneous Peripheral Devices That Require (Additional) System Power						
4098-9845	1	NAC/SPEAKER RELAY PAM 6W	0.0000	0.0000	0.0100	0.0100
4098-9758	1	TRUSLAN DUCT SMOKE SENSOR W/ RELAY OUTPUT	0.0030	0.0030	0.0100	0.0100
2098-9806	3	REMOTE TEST STATION W/ LED AND KEY SWITCH	0.0000	0.0000	0.0000	0.0000
TM9100	2	LOCAL OPERATING CONSOLE	0.0760	0.1520	0.0900	0.1800
TM9100	2	LOCAL OPERATING CONSOLE W/ ANNUNCIATOR	0.1430	0.2860	0.2300	0.4700
Notification Appliances		**Setting:**				
2W-B120W	2	EXPLOSION PROOF STROBE CEIL MS MOUNT	0.0000	0.0000	1.2000	2.4000
LEM2-M	18	EMERGENCY MESSAGE DISPLAY	0.0000	0.0000	0.0700	1.2600
IDNac Notification Appliances		**Setting:**				
4906F-APPLC	17	ANTI SPEAKER ONLY APPLIANCE CEIL MOUNT	0.0008	0.0136	0.0090	0.1530
4906FS-APPLC	2	CA ADDRESSABLE HFV APPLIANCE ONLY, CEIL MT	110	0.0016	0.1824	0.3660
4906FT-APPLC	15	CA ADDRESSABLE HFV APPLIANCE ONLY, CEIL MT	15	0.0008	0.0120	0.0900
4906FV-APPLC	15	CA ADDRESSABLE HFV APPLIANCE ONLY, CEIL MT	30	0.0008	0.0120	0.0900
4906FP-APPLC	4	CA ADDRESSABLE HFV APPLIANCE ONLY, CEIL MT	75	0.0008	0.0032	0.1450
4906FP-APPLW	2	CA ADDRESSABLE HIGH FLSH APPLIANCE ONLY, WALL MT	15	0.0008	0.0024	0.0470
4904V-APPLC	3	STROBE APPLIANCE ONLY, CEILING MOUNT	15	0.0008	0.0024	0.0353
4904V-APPLC	1	STROBE APPLIANCE ONLY, CEILING MOUNT	30	0.0008	0.0008	0.0353
4904V-APPLC	1	STROBE APPLIANCE ONLY, CEILING MOUNT	75	0.0008	0.0008	0.0353
4904V-APPLW	1	CO APPLIANCE ONLY WALL MT	15	0.0008	0.0008	0.0470
		Total IDNac Device Current:		0.0512		4.1530
		IDNac Current Boost for 24vdc Regulated Output **				2.3047
		Peripheral Totals		0.4450		10.8870
		Address Totals 38 Addresses		0.0266		0.0380
		System Totals * Standby	1.3306	Alarm	15.9390	

* Device Address current draw included below (See Additional Current Draws)

2. Backup Amplifier assumes Main Amplifier alarm current on failure.

		Standby Current	Standby Total	Alarm Current	Alarm Total
Battery Set #1 (Cabinet/Charger #1)					
Select ALL Power Supplies on this battery set:					
ESPS-1			0.5634		2.7540
Amp-1			0.0850		3.8000
XPS-2			0.1700		1.7000
Sub Total			0.8954		8.3340
Additional Current Draws:					
IDNac Current Boost for 24vdc Regulated Output **					1.0918
RUI Connected Peripheral Devices	0	x 0.0035	= 0.0000	x 0.0035	= 0.0000
MAPNET/IDNet Device Address Communication Current	38	x 0.000800	= 0.0304	x 0.001000	= 0.0380
Sub Total			0.7242		9.4638
Spare addressable point capacity 0%	0	x 0.0008	= 0.0000	x 0.001	= 0.0000
Total			0.7242		9.4638
Standby Time = 48 Hrs		x 0.7242	= 34.7616	Standby Ah	
Alarm Time = 15 Min.		0.25 x 9.4638	= 2.3659	Alarm Ah	
			37.1245		
Additional Spare Battery Capacity = 0%			x 0.0000		
			37.1245		
Battery Discharge Factor = 20%			x 1.2435		
Minimum Battery Required 2081-9204 SMH (2x)			46.3400		
Battery Supplied 2081-9204 SMH (2x)					

* System Totals represent total system current requirements. Those currents may be distributed between multiple battery sets or power supplies as shown above.

** IDNac Current Boost formula: ((26.5 * IDNac Alarm Current) / .92) / 20.4 = Adjusted Current
DC-DC Converter Output = 26.5vdc. Terminal Output in 24vdc due to 0.5vdc internal loss.
Converter Worst Case efficiency is 92%. 26.4vdc represents battery output in 85% depleted state

		Standby Current	Standby Total	Alarm Current	Alarm Total
Battery Set #2 (Cabinet/Charger #2)					
Select ALL Power Supplies on this battery set:					
ESPS-1			0.4518		2.9470
XPS-1			0.1930		2.2800
Sub Total			0.6448		5.2270
Additional Current Draws:					
IDNac Current Boost for 24vdc Regulated Output **			0.0000		1.2202
MAPNET/IDNet Device Address Communication Current	0	x 0.000800	= 0.0000	x 0.001000	= 0.0000
Sub Total			0.6448		6.4472
Spare addressable point capacity 0%	0	x 0.0008	= 0.0000	x 0.001	= 0.0000
Total			0.6448		6.4472
Standby Time = 48 Hrs		x 0.6448	= 30.9504	Standby Ah	
Alarm Time = 15 Min.		0.25 x 6.4472	= 1.6118	Alarm Ah	
			32.5762		
Additional Spare Battery Capacity = 0%			x 0.0000		
			32.5762		
Battery Discharge Factor = 20%			x 0.1446		
Minimum Battery Required 2081-9204 SMH (2x)			38.9881		
Battery Supplied 2081-9204 SMH (2x)					

NODE 18 TPR1 BATTERY CALCULATION - FIRE

SCALE:N.T.S.

NODE 18 TPR1 - POST BB-23E 4100ss XPDR						
Module	Qty	Description	Standby Current	Total Standby	Alarm Current	Total Alarm
Panel Equipment						
4100-9003	1	BASIC TRANSPONDER *	0.0870	0.0870	0.0870	0.0870
4100-9022	1	DIGITAL AUDIO RISER MODULE	0.0700	0.0700	0.0700	0.0700
4100-5311	1	ENHANCED POWER SUPPLY, 3 CHANNELS, IDNet, 120V	0.2200	0.2200	0.4600	0.4600
4100-5101	2	EXPANSION PWR SUPPLY (XPS) - 120VAC 50HZ	0.0900	0.1800	0.2000	0.1000
4100-1338	1	DIGITAL 100W AMP,8VAC,120VAC,70V	0.8800	0.8800	3.8000	3.8000
4100-5481	1	E3 Power Supply Only	0.0680	0.0680	0.0770	0.0770
4100-5401	1	IDNet Card	0.1040	0.1040	0.2300	0.2300
4603-9803	3	REMOTE MICROPHONE ON 2 GANG PL	0.0200	0.0600	0.0250	0.0750
4190-1391	1	REMOTE UNIT INTERFACE	0.0800	0.0800	0.0850	0.0850
		Panel Totals		0.8490		5.0140
IDNet Addressable Devices (SLC)						
4098-9001	8	ENET SUPERVISED IAM *	Constant current draw of .8mA standby and 1mA alarm per address used. Devices requiring additional current are accounted for in the section labeled "Miscellaneous Peripheral Devices Requiring Additional System Power".			
4098-9002	7	ENET RELAY IAM *				
4098-9714	1	TRUSLAN PHOTO SMOKE SENSOR *				
4098-9755	3	TRUSLAN DUCT SMOKE SENSOR W/O RELAY OUTPUT *				
4098-9758	1	TRUSLAN DUCT SMOKE SENSOR W/ RELAY OUTPUT *				
4098-9792	1	TRUSLAN IR SENSOR BASE *				
4099-9906	16	ADDRESSABLE DOUBLE ACTION MANUAL STATION, PUSH *				
Miscellaneous Peripheral Devices That Require (Additional) System Power						
4098-9845	1	NAC/SPEAKER RELAY PAM 6W	0.0000	0.0000	0.0100	0.0100
4098-9758	1	TRUSLAN DUCT SMOKE SENSOR W/ RELAY OUTPUT	0.0030	0.0030	0.0100	0.0100
2098-9806	3	REMOTE TEST STATION W/ LED AND KEY SWITCH	0.0000	0.0000	0.0000	0.0000
TM9100	2	LOCAL OPERATING CONSOLE	0.0760	0.1520	0.0900	0.1800
TM9100	2	LOCAL OPERATING CONSOLE W/ ANNUNCIATOR	0.1430	0.2860	0.2300	0.4700
Notification Appliances		**Setting:**				
2W-B120W	2	EXPLOSION PROOF STROBE CEIL MS MOUNT	0.0000	0.0000	1.2000	2.4000
LEM2-M	18	EMERGENCY MESSAGE DISPLAY	0.0000	0.0000	0.0700	1.2600
IDNac Notification Appliances		**Setting:**				
4906F-APPLC	17	ANTI SPEAKER ONLY APPLIANCE CEIL MOUNT	0.0008	0.0136	0.0090	0.1530
4906FS-APPLC	2	CA ADDRESSABLE HFV APPLIANCE ONLY, CEIL MT	110	0.0016	0.1824	0.3660
4906FT-APPLC	15	CA ADDRESSABLE HFV APPLIANCE ONLY, CEIL MT	15	0.0008	0.0120	0.0900
4906FV-APPLC	15	CA ADDRESSABLE HFV APPLIANCE ONLY, CEIL MT	30	0.0008	0.0120	0.0900
4906FP-APPLC	4	CA ADDRESSABLE HFV APPLIANCE ONLY, CEIL MT	75	0.0008	0.0032	0.1450
4906FP-APPLW	2	CA ADDRESSABLE HIGH FLSH APPLIANCE ONLY, WALL MT	15	0.0008	0.0024	0.0470
4904V-APPLC	3	STROBE APPLIANCE ONLY, CEILING MOUNT	15	0.0008	0.0024	0.0353
4904V-APPLC	1	STROBE APPLIANCE ONLY, CEILING MOUNT	30	0.0008	0.0008	0.0353
4904V-APPLC	1	STROBE APPLIANCE ONLY, CEILING MOUNT	75	0.0008	0.0008	0.0353
4904V-APPLW	1	CO APPLIANCE ONLY WALL MT	15	0.0008	0.0008	0.0470
		Total IDNac Device Current:		0.0512		4.1530
		IDNac Current Boost for 24vdc Regulated Output **				2.3877
		Peripheral Totals		0.4450		10.8240
		Address Totals 38 Addresses		0.0266		0.0380
		System Totals * Standby	1.3306	Alarm	15.9560	

* Device Address current draw included below (See Additional Current Draws)

2. Backup Amplifier assumes Main Amplifier alarm current on failure.

		Standby Current	Standby Total	Alarm Current	Alarm Total
Battery Set #1 (Cabinet/Charger #1)					
Select ALL Power Supplies on this battery set:					
ESPS-1			0.5634		2.7540
Amp-1			0.0850		3.8000
XPS-2			0.1700		1.7000
Sub Total			0.8954		8.3340
Additional Current Draws:					
IDNac Current Boost for 24vdc Regulated Output **					1.0918
RUI Connected Peripheral Devices	0	x 0.0035	= 0.0000	x 0.0035	= 0.0000
MAPNET/IDNet Device Address Communication Current	38	x 0.000800	= 0.0304	x 0.001000	= 0.0380
Sub Total			0.7258		9.4638
Spare addressable point capacity 0%	0	x 0.0008	= 0.0000	x 0.001	= 0.0000
Total			0.7258		9.4638
Standby Time = 8 Hrs		x 0.7258	= 0.0000	Standby Ah	
Alarm Time = 60 Min.		1 x 9.4638	= 9.4638	Alarm Ah	
			9.4638		
Additional Spare Battery Capacity = 0%			x 0.0000		
			9.4638		
Battery Discharge Factor = 20%			x 1.8928		
Minimum Battery Required 2081-9208 12 MH (2x)			11.3445		
Battery Supplied 2081-9275 1100MH (2x)					

* System Totals represent total system current requirements. Those currents may be distributed between multiple battery sets or power supplies as shown above.

** IDNac Current Boost formula: ((26.5 * IDNac Alarm Current) / .92) / 20.4 = Adjusted Current
DC-DC Converter Output = 26.5vdc. Terminal Output in 24vdc due to 0.5vdc internal loss.
Converter Worst Case efficiency is 92%. 26.4vdc represents battery output in 85% depleted state

		Standby Current	Standby Total	Alarm Current	Alarm Total
Battery Set #2 (Cabinet/Charger #2)					
Select ALL Power Supplies on this battery set:					
ESPS-1			0.4518		2.9470
XPS-1			0.1930		2.2800
Sub Total			0.6448		5.2270
Additional Current Draws:					
IDNac Current Boost for 24vdc Regulated Output **			0.0000		1.2202
MAPNET/IDNet Device Address Communication Current	0	x 0.000800	= 0.0000	x 0.001000	= 0.0000
Sub Total			0.6448		6.5329
Spare addressable point capacity 0%	0	x 0.0008	= 0.0000	x 0.001	= 0.0000
Total			0.6448		6.5329
Standby Time = 8 Hrs		x 0.6448	= 0.0000	Standby Ah	
Alarm Time = 60 Min.		1 x 6.5329	= 6.5329	Alarm Ah	
			6.5329		
Additional Spare Battery Capacity = 0%			x 0.0000		
			6.5329		
Battery Discharge Factor = 20%			x 1.3066		
Minimum Battery Required 2081-9274 18AH (2x)			7.8395		
Battery Supplied 2081-9275 18AH (2x)					

NODE 18 TPR1 BATTERY CALCULATION - MNS

SCALE:N.T.S.

IDNET CHANNEL 10 TS IM1			ADDRESSES IN USE: 38 (15.2%) SPARE ADDRESSES: 212 (84.8%)		SWITCH SETTINGS						
Address	Device Type	Point Type	Location Description		1	2	3	4	5	6	7	8
10 T1-M1-1		DISABLE	SPARE TPR	10 M1-1		1						ON
10 T1-M1-2	ADDRESS	PULL	CAT SNEAK ROOM	10 M1-2		1						ON
10 T1-M1-3	ADDRESS	PULL	CAT BREAK ROOM	10 M1-3		1						ON
10 T1-M1-4	ADDRESS	PULL	CAT BREAK ROOM	10 M1-4		1						ON
10 T1-M1-5	ADDRESS	PULL	CAT BREAK ROOM	10 M1-5		1						ON
10 T1-M1-6						1						
10 T1-M1-7						1						
10 T1-M1-8						1						
10 T1-M1-9						1						
10 T1-M1-10	ADDRESS	PULL	CAT SAND MOLD PRINTER LAB	10 M1-10		1						ON
10 T1-M1-11	ADDRESS	PULL	CAT SAND MOLD PRINTER LAB	10 M1-11		1						ON
10 T1-M1-12	ADDRESS	PULL	CAT SAND MOLD PRINTER LAB ROOF	10 M1-12		1						ON
10 T1-M1-13	SMAI	WATER	CAT SAND MOLD PRINTER LAB ROOF	10 M1-13		1						ON
10 T1-M1-14	SMAI	WATER	CAT SAND MOLD PRINTER LAB	10 M1-14		1						ON
10 T1-M1-15	SMAI	WATER	CAT SAND MOLD PRINTER LAB	10 M1-15		1						ON
10 T1-M1-16	ADDRESS	PULL	CAT SAND MOLD PRINTER LAB	10 M1-16		1						ON
10 T1-M1-17						1						
10 T1-M1-18						1						
10 T1-M1-19						1						
10 T1-M1-20	SMAI	PULL	CAT LAB 6 TITANIUM LAB	10 M1-20		1						ON
10 T1-M1-21	SMAI	PULL	CAT LAB 5 ALUMINUM LAB	10 M1-21		1						ON
10 T1-M1-22	RELAY	PULL	CAT LAB 4 STEEL LAB	10 M1-22		1						ON
10 T1-M1-23	ADDRESS	PULL	CAT LAB 4 ADMIN	10 M1-23		1						ON
10 T1-M1-24						1						
10 T1-M1-25	ADDRESS	PULL	CAT LAB 4 ADMIN	10 M1-25		1						ON
10 T1-M1-26	ADDRESS	PULL	CAT LAB 4 STEEL LAB	10 M1-26		1						ON
10 T1-M1-27	SMAI	WATER	CAT LAB 4	10 M1-27		1						ON
10 T1-M1-28	SMAI	RED	CAT LAB 4	10 M1-28		1						ON
10 T1-M1-29	ADDRESS	DISCT	CAT LAB 4 STEEL LAB	10 M1-29		1						ON
10 T1-M1-30	ADDRESS	PULL	CAT LAB 4 STEEL LAB	10 M1-30		1						ON
10 T1-M1-31	RAM	RELAY	CAT LAB 4 ADMIN	10 M1-31		1						ON
10 T1-M1-32	RAM	RELAY	CAT LAB 4 STEEL LAB	10 M1-32		1						ON
10 T1-M1-33						1						
10 T1-M1-34						1						
10 T1-M1-35						1						
10 T1-M1-36	PHOTO	LSDUCT	STG-4100-1 SUPPLY	10 M1-36		1						ON
10 T1-M1-37	RAM	AVCO	STG-4100-1	10 M1-37		1						ON
10 T1-M1-38						1						
10 T1-M1-39						1						
10 T1-M1-40	ADDRESS	PULL	GALLWAY 2	10 M1-40		1						ON
10 T1-M1-41	ADDRESS	PULL	GALLWAY 2	10 M1-41		1						ON
10 T1-M1-42	ADDRESS	PULL	GALLWAY 2	10 M1-42		1						ON
10 T1-M1-43	ADDRESS	PULL	GALLWAY 2	10 M1-43		1						ON
10 T1-M1-44	ADDRESS	PULL	CONTROLLER 2 ON CEIL. ABOVE CAB. FIR	10 M1-44		1						ON
10 T1-M1-45	SMAI	RED	WATER WORKS	10 M1-45		1						ON
10 T1-M1-46	SMAI	WATER	WATER WORKS	10 M1-46		1						ON
10 T1-M1-47	RAM	LSDUCT	WATER WORKS	10 M1-47		1						ON
10 T1-M1-48	RAM	RELAY	CAT DETECTOR RELAY	10 M1-48		1						ON
10 T1-M1-49	RAM	RELAY	AVCO CONTROL INTERFACE	10 M1-49		1						ON
10 T1-M1-50	ADDRESS	PULL	CAT TECHNICAL INN 1	10 M1-50		1						ON
10 T1-M1-51	ADDRESS	PULL	AMPUTON TESTING 100	10 M1-51		1						ON
10 T1-M1-52						1						
10 T1-M1-53						1						
10 T1-M1-54						1						
10 T1-M1-55						1						
10 T1-M1-56						1						
10 T1-M1-57						1						
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10 T1-M1-64						1						
10 T1-M1-65						1						
10 T1-M1-66						1						
10 T1-M1-67						1						
10 T1-M1-68						1						
10 T1-M1-69						1						
10 T1-M1-70						1						
TM9						1						
10 T1-M1-200						1						ON

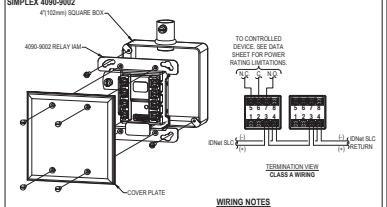
NOTE: THE LABELS SHOWN ABOVE WILL BE USED FOR PROGRAMMING PURPOSES.
THE LABELS ARE BASED UPON INFORMATION SHOWN ON THE ARCHITECTURAL DRAWINGS.
ANY CHANGES TO THESE LABELS MUST BE NOTED ON THE SUBMITTAL REVIEW, PRIOR TO PROGRAMMING.
POINTS SHOWN IN ITALIC TEXT REFER TO EXISTING DEVICES.

NODE 18 TPR1 IDNET SCHEDULE

SCALE:N.T.S.

ADDRESSABLE RELAY MODULE

SIMPLEX 4090-9002



MOUNTING OPTION "A"

WIRING NOTES

1. MAINTAIN CORRECT POLARITY ON TERMINAL CONNECTIONS.
2. ALWAYS CUT CONDUCTORS AND SECURE UNDER TERMINALS. NEVER LOOP WIRES UNDER TERMINALS.
3. ANY WIRE SPLICES TO BE MADE BY LISTED AND AHJ APPROVED METHODS.

MOUNTING OPTIONS

OPTION	DESCRIPTION	NOTE
A	4" (102mm) SQUARE BOX, 2-1/8" MINIMUM DEPTH WITH DOUBLE GANG COVER PLATE	BY OTHERS
B	4" (102mm) SQUARE BOX, 2-1/8" MINIMUM DEPTH WITH SIMPLEX 4090-9801 TRIM PLATE FOR SEMI-FLUSH MOUNTED BOX	BOX BY OTHERS, PLATES ORDERED SEPARATELY
C	4" (102mm) SQUARE BOX, 2-1/8" MINIMUM DEPTH WITH SIMPLEX 4090-9802 TRIM PLATE FOR SURFACE MOUNTED BOX	BOX BY OTHERS, PLATES ORDERED SEPARATELY

1. FOR ADDITIONAL MOUNTING OPTIONS, DOWNLOAD DATA SHEET 4090-0002 FROM HTTP://WWW.SIMPLEX-FIRE.COM

DUCT SMOKE DETECTOR INSTALLATION GUIDE

PRE-INSTALLATION ROUTINES

DUCT DETECTORS/SENSORS SHOULD BE INSTALLED IN A LOCATION OF RELATIVELY NON-TURBULENT AIR FLOW AND WITHIN THE INTENDED OPERATING VELOCITY RANGE OF 300-4000 FEET-PER-MINUTE (91 TO 1220 MMIN.)

MEASUREMENTS OF AIR FLOW AND EXAMINATION OF ENGINEERING SPECIFICATIONS THAT DEFINE EXPECTED DUCT AIR VELOCITIES UNDER ALL CONDITIONS IS RECOMMENDED. THIS IS DONE TO DETERMINE IF A LOCATION IS SUITABLE FOR DUCT DETECTOR/SENSOR OPERATION. AN ALNOR INSTRUMENT CO. (CHICAGO) MODEL 6000P VELOMETER OR EQUIVALENT (NOT SUPPLIED) MAY BE USED TO CHECK THE DUCT AIR VELOCITY.

INSTALLATION GUIDELINES

1. LOCATE DUCT HOUSINGS SO THAT DAMPERS DO NOT RESTRICT AIR FLOW AT THE DETECTOR/SENSOR LOCATION. SEE FIGURE 1.
2. LOCATE AIR DUCT DETECTORS/SENSORS ON THE RETURN OR SUPPLY DUCT OF THE EQUIPMENT'S AIR HANDLING SYSTEM. HOWEVER, DETECTORS/SENSORS SHOULD NOT BE INSTALLED IN THE RETURN AIR DAMPER BRANCH. SEE FIGURE 1.
3. LOCATE AIR DUCT DETECTORS/SENSORS ON BRANCH LINES IF CLOSE IDENTIFICATION OF THE ALARM SOURCE IS REQUIRED.
4. LOCATE AIR DUCT DETECTORS/SENSORS ON THE DOWNSTREAM SIDE OF FILTERS TO SENSE FIRE IN FILTERS. HOWEVER, SHOULD THE FILTERS BLOCK SUFFICIENT AIR FLOW MAY NOT BE AVAILABLE FOR PROPER AIR DUCT DETECTOR/SENSOR OPERATION. SEE FIGURE 1.
5. WHENEVER POSSIBLE, LOCATE AIR DUCT DETECTORS/SENSORS WHERE THEY CAN BE CONVENIENTLY OBSERVED AND READILY SERVICED.
6. LOCATE THE AIR DUCT DETECTORS/SENSORS IN RETURN AIR DUCTS AHEAD OF MIXING AREAS.
7. DO NOT LOCATE AIR DUCT DETECTORS/SENSORS NEXT TO OUTSIDE AIR INLETS UNLESS YOU WANT TO MONITOR SMOKE ENTRY TO THE HANDLING SYSTEM FROM AN ADJACENT AREA.
8. LOCATE AIR DUCT DETECTORS/SENSORS UPSTREAM OF AIR HUMIDIFIERS AND COOLING COILS.
9. DO NOT INSTALL THE DUCT DETECTOR HOUSING ON DUCT TUBES IN LOCATIONS THAT EXCEED THE LISTED TEMPERATURE RATINGS FOR THE DEVICE.
10. DO NOT MOUNT THE DUCT HOUSING ON BOTTOM OF DUCT.

DUCT DETECTOR/SENSOR INSTALLATION

1. TAPE THE TEMPLATE (SUPPLIED) ON THE DUCT SURFACE. DO NOT POSITION THE TEMPLATE WITH EDGES ANGLED WITH RESPECT TO AIR FLOW DIRECTION. SEE FIGURE 2.
2. DRILL TWO 1 1/4 INCH (31.75 MM) HOLES (MARKED "A") AS LOCATED BY THE TEMPLATE. REMOVE TEMPLATE AFTER HOLES HAVE BEEN DRILLED.
3. IF THE DUCT IS MORE THAN 3 FEET (0.9 M) WIDE, THEN PUNCH A 1-INCH (25.4 MM) HOLE IN THE DUCT WALL DIRECTLY OPPOSITE THE UPSTREAM 1-1/4 INCH (31.75 MM) HOLE. SEE FIGURE 3. THIS HOLE IS USED TO SUPPORT THE INLET TUBE.
4. INLET TUBES SHOULD BE SELECTED AND CUT TO LENGTH AS SPECIFIED IN TABLE 1. AFTER TRIMMING THE INLET TUBE OPPOSITE THE SLOT, TAP RUBBER PLUG (SUPPLIED) INTO THE TRIMMED END. SEE FIGURE 3.

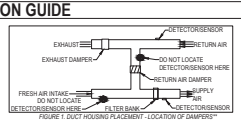


FIGURE 1. DUCT HOUSING PLACEMENT - LOCATION OF DAMPERS**

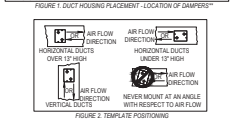


FIGURE 2. TEMPLATE POSITIONING

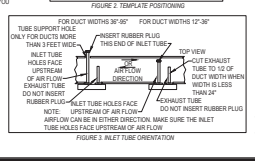
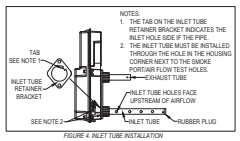


FIGURE 3. INLET TUBE ORIENTATION



NOTES:
1. THE TAB ON THE INLET TUBE RETAINER BRACKET INDICATES THE INLET HOLE SIDE IF THE PIPE.
2. THE INLET TUBE MUST BE INSTALLED THROUGH THE HOLE IN THE HOUSING CORNER NEXT TO THE SMOKE PORT/AIR FLOW TEST HOLES.

FIGURE 4. INLET TUBE INSTALLATION

INLET TUBE SELECTION

| OVERALL DUCT WIDTH | TUBE REQUIRED | TUB