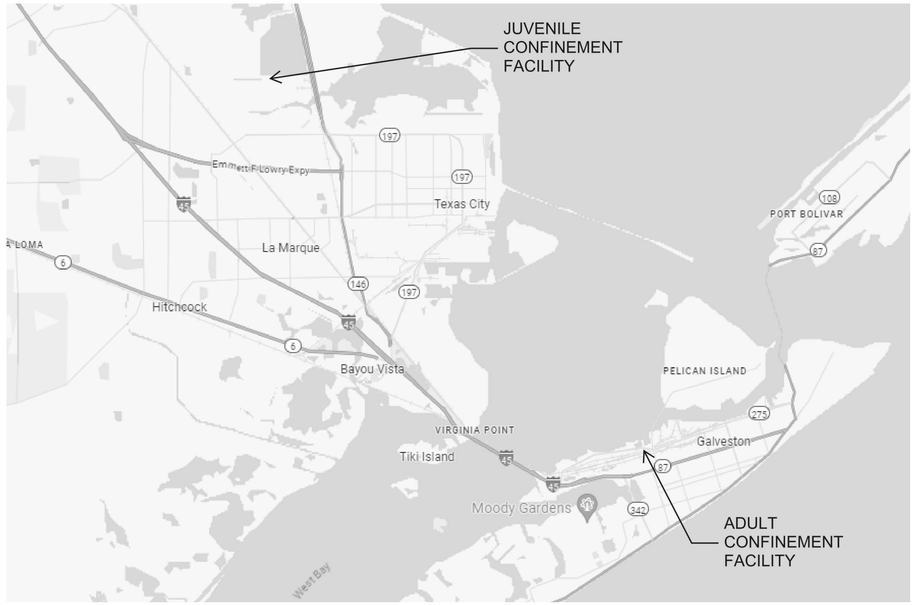
GALVESTON COUNTY / INDOOR AIR QUALITY IMPROVEMENTS CONFINEMENT FACILITIES



BID PACKAGE

CITY OF GALVESTON

04/12/2024

PROJECT NO.
R317334.01

SHEET INDEX

ADULT CONFINEMENT FACILITY:

JUVENILE CONFINEMENT FACILITY:

THE STATE OF TEXAS
COUNTY OF GALVESTON

HUITT ZOLLARS

4/11/2024 3:49:16 PM

GENERAL NOTES

NOTE	DESCRIPTION
A.	SHOULD DISCREPANCIES OCCUR WITHIN THE CONTRACT DOCUMENTS (DRAWINGS AND SPECIFICATIONS), THE MORE STRINGENT AND MORE COSTLY APPROACH MUST APPLY FOR BIDDING PURPOSES. THE CONTRACTOR IS TO NOTIFY THE OWNER'S REPRESENTATIVE OF DISCREPANCIES FOR CLARIFICATION. CLARIFICATIONS ISSUED AFTER THE CONTRACT IS AWARDED ARE TO BE INCORPORATED BY THE CONTRACTOR AT NO ADDITIONAL COSTS AND ARE TO BE REVIEWED BY THE OWNER'S REPRESENTATIVE TO DETERMINE IF A REDUCTION IN COST IS JUSTIFIED.
B.	THE CONTRACTOR MUST OBTAIN ALL PERMITS AND PAY ALL FEES AND CHARGES TO ALL LOCAL AND OTHER RELATED AGENCIES AS REQUIRED.
C.	PROVIDE ALL MATERIALS, LABOR, EQUIPMENT, AND SERVICES NECESSARY FOR A COMPLETE AND OPERABLE INSTALLATION AS SPECIFIED AND SHOWN ON THE DRAWINGS AND SPECIFICATIONS, FULLY TESTED, ADJUSTED AND READY FOR USE.
D.	THE DRAWINGS SHOW THE EXTENT OF THE WORK AND THE GENERAL ARRANGEMENT. THE DRAWINGS, HOWEVER, ARE DIAGRAMMATIC AND EXACT COORDINATED LAYOUT OF THE VARIOUS SYSTEMS IS THE RESPONSIBILITY OF THE CONTRACTOR.
E.	VERIFY ANY AND ALL INDICATED CONFIGURATIONS, DIMENSIONS AND ELEVATIONS BY FIELD MEASUREMENTS AND COORDINATED WITH ARCHITECTURAL DRAWINGS AND STRUCTURAL CONDITIONS.
F.	COORDINATE THE CUTTING AND PATCHING OF BUILDING COMPONENTS TO ACCOMMODATE THE INSTALLATION OF THE VARIOUS SYSTEM EQUIPMENT AND MATERIALS. STRUCTURAL MEMBERS MUST NOT BE CUT WITHOUT PRIOR APPROVAL OF STRUCTURAL ENGINEER.
G.	COORDINATE THE INSTALLATION OF THE VARIOUS SYSTEM MATERIALS AND EQUIPMENT ABOVE CEILINGS WITH SUSPENSION SYSTEM, LIGHT FIXTURES, AND OTHER INSTALLATIONS.
H.	ALL MATERIALS, EQUIPMENT AND APPARATUS INSTALLED ON THE PROJECT MUST BE NEW AND INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S PRINTED INSTRUCTIONS. THE MANUFACTURER, OR HIS AUTHORIZED REPRESENTATIVE, MUST CERTIFY IN WRITING TO THE OWNER AND THE OWNER'S REPRESENTATIVE, THAT THE INSTALLATION HAS BEEN MADE IN ACCORDANCE WITH SUCH PRINTED REQUIREMENTS.
I.	MANUFACTURER'S NAME AND MODEL NUMBERS INDICATED ON THE DRAWINGS ARE ONLY FOR REFERENCE CONVENIENCE. ENGINEER-APPROVED SUBSTITUTIONS ARE PERMITTED. THE CONTRACTOR, THROUGH THE MANUFACTURER, IS RESPONSIBLE TO CONFIRM THE CORRECTNESS OF ALL MODEL NUMBERS SO AS TO MEET THE SPECIFIC PROJECT REQUIREMENTS AND MINIMUM INDICATED PERFORMANCE.
J.	INSTALL EQUIPMENT, MATERIALS AND PIPING SYSTEMS TO PROVIDE REQUIRED ACCESS FOR SERVICING, MAINTENANCE, AND GENERAL INSPECTION PER MANUFACTURER'S INSTRUCTIONS AND LOCAL CODE REQUIREMENTS. COORDINATE THE FINAL LOCATION OF CONCEALED EQUIPMENT AND DEVICES REQUIRING ACCESS WITH FINAL LOCATION OF REQUIRED ACCESS PANELS AND DOORS. ALLOW AMPLE SPACE FOR REMOVAL OF ALL PARTS THAT REQUIRE REPLACEMENT OR SERVICING. PIPING SYSTEMS SHALL NOT BLOCK SERVICE ACCESS OF ANY NATURE, SUCH AS FILTER REMOVAL, EQUIPMENT ACCESS PANELS, CLEANING OF TUBES, AND SIMILAR ITEMS.
K.	COORDINATE THE EXACT LOCATION OF THIS WORK WITH THE WORK OF THE OTHER TRADES PRIOR TO FABRICATION OR INSTALLATION OF SAME. VERIFY ALL DIMENSIONS AND ELEVATIONS. PROVIDE ADDITIONAL OFFSETS AND SECTIONS OF MATERIAL AS MAY BE REQUIRED TO MEET THE APPLICABLE JOB CONDITION REQUIREMENTS.
L.	IT WILL BE THE RESPONSIBILITY OF EACH CONTRACTOR TO COORDINATE BETWEEN HIS EQUIPMENT SUPPLIERS AND ANY SUBCONTRACTOR AS TO WHICH DEVICES ARE SUPPLIED WITH EQUIPMENT, REQUIRED WIRING AND VOLTAGES AND OTHER COORDINATION ITEMS AS RELATED TO A PROPER AND OPERABLE INSTALLATION. ALL POWER WIRING AND CONTROL WIRING MUST COMPLY WITH DIVISION 26 REQUIREMENTS.
M.	DIMENSIONAL LOCATIONS INCLUDING ELEVATIONS INDICATED ON THE DRAWINGS ARE APPROXIMATE AND FOR REFERENCE ONLY. THE CONTRACTOR MUST COORDINATE WITH OTHER TRADES AND SERVICES TO AVOID INTERFERENCES ROUTING DUCTWORK AND PIPING.
N.	ALL MATERIALS IN ALL SUPPLY AND RETURN AIR PLENUMS MUST BE PLENUM RATED IN ACCORDANCE WITH THE INTERNATIONAL MECHANICAL CODE. MATERIALS WITHIN PLENUM MUST NOT EXCEED A FLAME SPREAD INDEX OF 25 AND A SMOKE-DEVELOPED INDEX OF 50. COORDINATE WITH OTHER TRADES TO PROVIDE PLENUM RATED MATERIALS.
O.	INSTALL ALL SPACE TEMPERATURE SENSORS AND THERMOSTATS 48 INCHES AFF UNLESS OTHERWISE NOTED.

AIRSIDE NOTES

NOTE	DESCRIPTION
A.	ALL DUCT DIMENSIONS INDICATED ON DRAWINGS ARE CLEAR INSIDE DIMENSIONS IN INCHES. IF DUCT LINER IS SPECIFIED, THE EXTERNAL SHEET METAL DIMENSIONS MUST BE INCREASED TO MAINTAIN THE INSIDE DUCT DIMENSIONS SHOWN ON THE PLANS.
B.	PROVIDE TURNING VANES IN ALL 90 DEGREE MITERED ELBOWS AND ALL BULLHEAD TEES EVEN IF TURNING VANES ARE NOT GRAPHICALLY SHOWN ON PLAN DRAWINGS.
C.	NEW DUCT TO SERVE AHU-01 SHALL BE CONSTRUCTED FROM STAINLESS STEEL.

CODE CRITERIA AND DESIGN CONDITIONS

APPLICABLE CODES	2018 INTERNATIONAL BUILDING CODE	
	2018 INTERNATIONAL ENERGY CONSERVATION CODE	
	2018 INTERNATIONAL MECHANICAL CODE	
	2018 INTERNATIONAL PLUMBING CODE	
	ASHRAE 62.1 - 2013 VENTILATION FOR ACCEPTABLE INDOOR AIR QUALITY	
	NFPA 90A - STANDARD FOR THE INSTALLATION OF AIR-CONDITIONING AND VENTILATING SYSTEMS	
AMBIENT DESIGN CONDITIONS	AMBIENT DESIGN CONDITIONS	
	91.3°F	COOLING DRY BULB DESIGN TEMPERATURE (0.4%)
	79.1°F	MEAN COINCIDENT COOLING WET BULB DESIGN TEMPERATURE (0.4%)
	36F	HEATING DESIGN TEMPERATURE (99.6%)
	105°F	AMBIENT AIR-COOLED HEAT REJECTION TEMPERATURE
	DEHUMIDIFICATION CONDITIONS FOR OUTDOOR AIR UNIT	
	79°F	COOLING WET BULB DESIGN TEMPERATURE (0.4%)
	83°F	MEAN COINCIDENT COOLING DRY BULB DESIGN TEMPERATURE (0.4%)
	50 FEET	ELEVATION
	2A	CLIMATE ZONE (IECC - 2018)
LOAD CRITERIA	0.063 BTU/(H-FT²-°F)	WALL U-VALUE (ASSEMBLY DESCRIPTION BELOW)
		FACE BRICK
		2" CONTINUOUS RIGID INSULATION (R-13 TOTAL)
		METAL STUD WALL 16" ON CENTER
	0.048 BTU/(H-FT²-°F)	ROOF U-VALUE (ASSEMBLY DESCRIPTION BELOW)
		R-20 CONTINUOUS RIGID INSULATION ABOVE ROOF DECK
	0.50 BTU/(H-FT²-°F)	WINDOW UNIT U-VALUE
	0.27	WINDOW UNIT SOLAR HEAT GAIN COEFFICIENT
	1.0 W/FT²	PLUG LOADS
	PER ELECTRICAL DRAWINGS	LIGHTING LOADS

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R317334.01 07/12/2024

THE STATE OF TEXAS
COUNTY OF GALVESTON

COUNTY OF GALVESTON

GALVESTON COUNTY INDOOR AIR QUALITY IMPROVEMENTS CONFINEMENT FACILITIES

COUNTY OF GALVESTON

ISSUES / REVISIONS LOG:

MARK	DATE	DESCRIPTION

PROJECT NO.:	R317334.01
DRAWN BY:	DGM
REVIEWED BY:	JK
APPROVED BY:	JK

SHEET TITLE:

MECHANICAL NOTES AND DESIGN DATA

SHEET NUMBER:

MA-001

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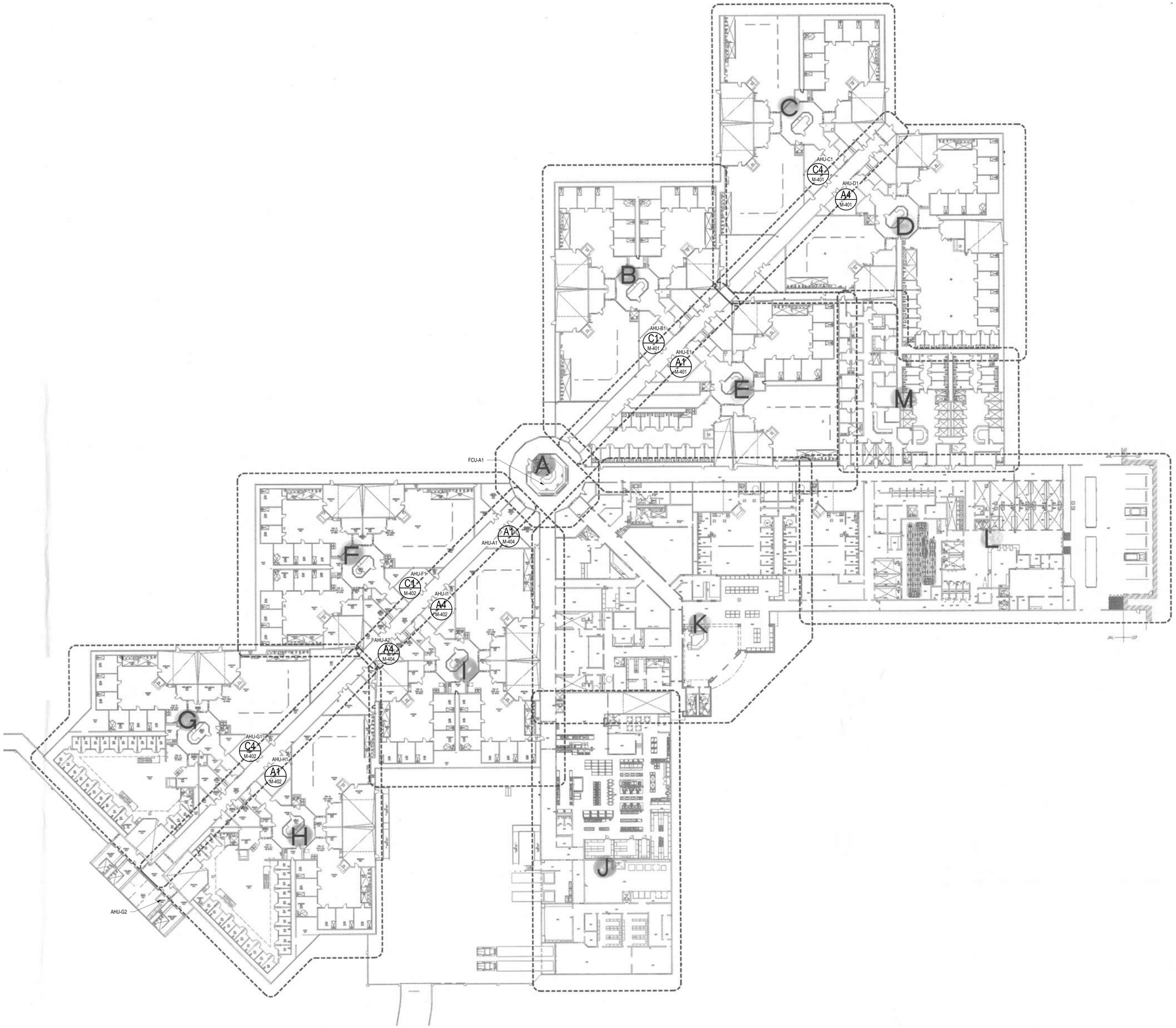

1 OVERALL 1ST FLOOR PLAN
NTS

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GALVESTON COUNTY INDOOR AIR QUALITY IMPROVEMENTS CONFINEMENT FACILITIES

COUNTY OF GALVESTON

ISSUES / REVISIONS LOG:

MARK	DATE	DESCRIPTION

PROJECT NO.:	R317334.01
DRAWN BY:	DGM
REVIEWED BY:	JK
APPROVED BY:	JK

SHEET TITLE:

OVERALL FIRST FLOOR PLAN

SHEET NUMBER:

MA-101

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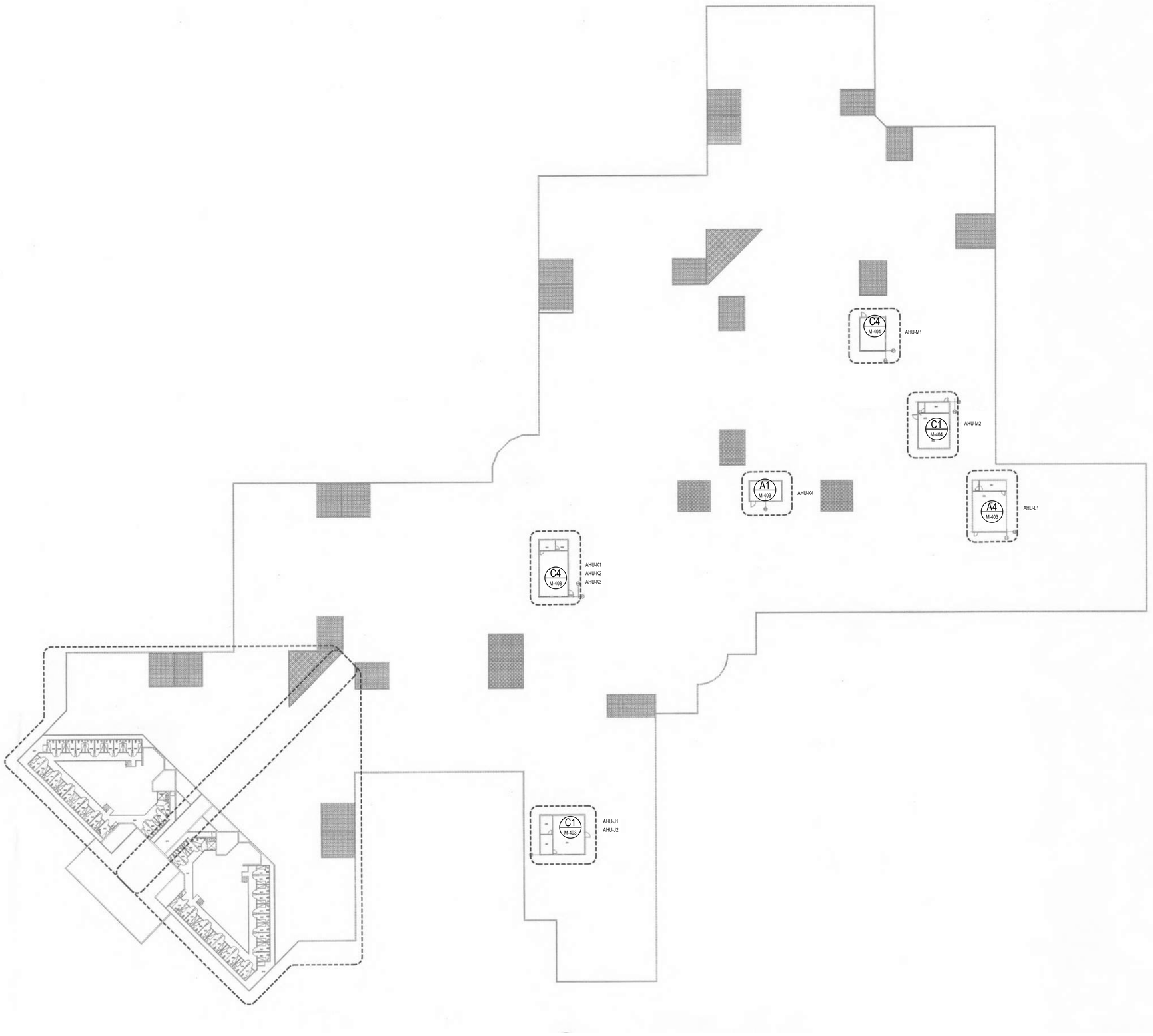

A1 OVERALL 2ND FLOOR / PENTHOUSE PLAN
NTS

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COUNTY OF GALVESTON

ISSUES / REVISIONS LOG:

MARK	DATE	DESCRIPTION

PROJECT NO.:	R317334.01
DRAWN BY:	Author
REVIEWED BY:	Checker
APPROVED BY:	Approver

SHEET TITLE:

OVERALL ROOF / PENTHOUSE PLAN

SHEET NUMBER:

MA-201

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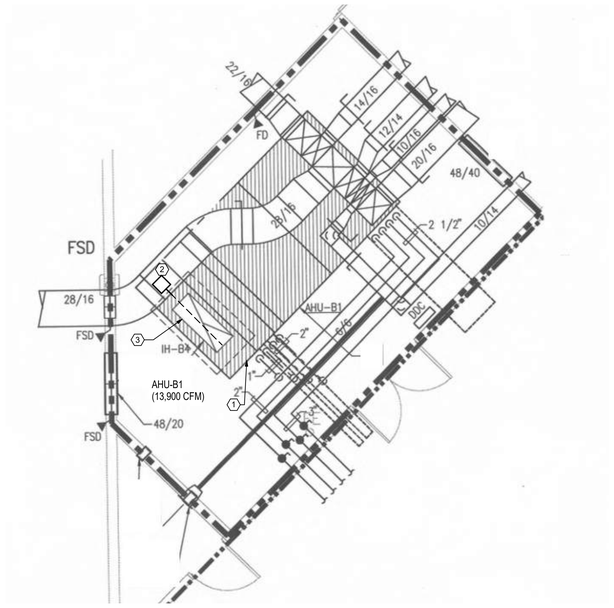
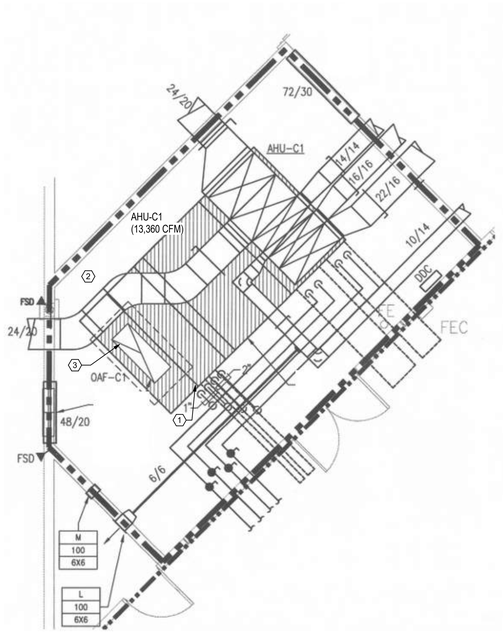
NOTES BY SYMBOL ⬡

APPLIES TO SHEET MA-401

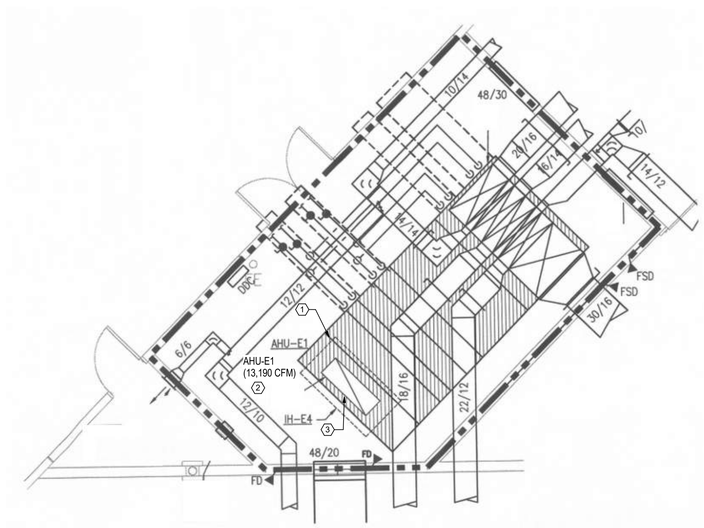
NOTE	DESCRIPTION
1	BID PACKAGE 3: FIELD MODIFY THE EXISTING AIR HANDLING UNIT'S FILTER SECTION WITHIN THE RETURN AIR PLENUM AND INSTALL NEW AIR PURIFICATION MODULE AS INDICATED ON THE AIR HANDLING UNIT SCHEDULE, DRAWING MA-601. MODIFICATIONS TO THE AHU INCLUDE REPLACEMENT OF THE RETURN AIR PLENUM CASING (PLENUM WALLS, FLOOR TOP), PANEL ACCESS DOOR INCLUDING VIEW WINDOW INTO THE PLENUM, FILTER TRACKS FOR EACH THE PRE-FILTER AND AIR PURIFICATION SYSTEM, DOOR SEALED AIR-TIGHT.
2	BID PACKAGE 5: PROVIDE NEW AIR QUALITY MONITORING AND VERIFICATION EQUIPMENT WITHIN OUTSIDE AIR DUCTWORK. PROVIDE NEW AIR QUALITY MEASUREMENT AND AIR FLOW EQUIPMENT (230923.14 - FLOW INSTRUMENTS).
3	BID PACKAGE 6: REMOVE AND REPLACE OUTSIDE AIR DUCTWORK FROM AHU TO AND INCLUDING INTAKE HOOD ON THE ROOF. PROVIDE NEW INSULATED DOUBLE WALL STAINLESS STEEL DUCTWORK, INTAKE HOOD, SECURITY BARS AND MOTORIZED DAMPER AT THE INTAKE HOOD. REFER TO AIR HANDLING UNIT SCHEDULE ON MA-601 FOR INTAKE HOOD REQUIREMENTS.



C1 ENLARGED MECHANICAL ROOM B404 (AHU-B1)
1/4" = 1'-0"



C4 ENLARGED MECHANICAL ROOM C404 (AHU-C1)
1/4" = 1'-0"



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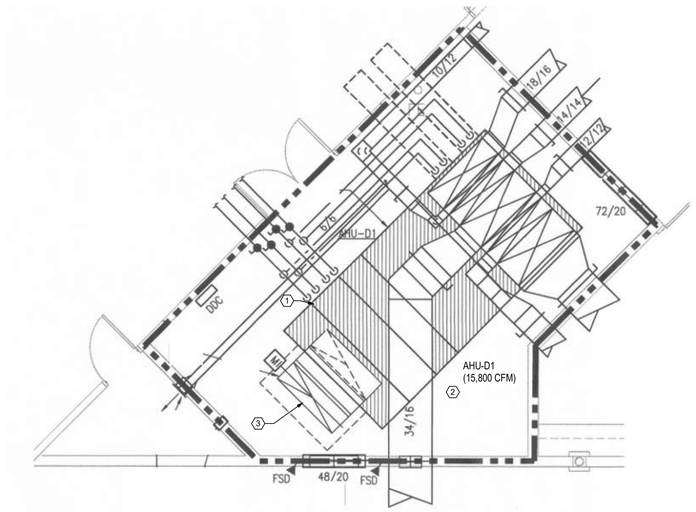
1/4" = 1'-0"



A4 ENLARGED MECHANICAL ROOM D404 (AHU-D1)
1/4" = 1'-0"

TRUE NORTH PLAN NORTH

0' 2' 4' 8'
SCALE 1/4" = 1'-0"

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COUNTY OF GALVESTON

COUNTY OF GALVESTON

GALVESTON COUNTY INDOOR AIR QUALITY IMPROVEMENTS CONFINEMENT FACILITIES

COUNTY OF GALVESTON

ISSUES / REVISIONS LOG:

MARK	DATE	DESCRIPTION

PROJECT NO.:	R317334.01
DRAWN BY:	Author
REVIEWED BY:	Checker
APPROVED BY:	Approver

SHEET TITLE:

ENLARGED PLANS (B404, C404, D404, E404)

SHEET NUMBER:

MA-401

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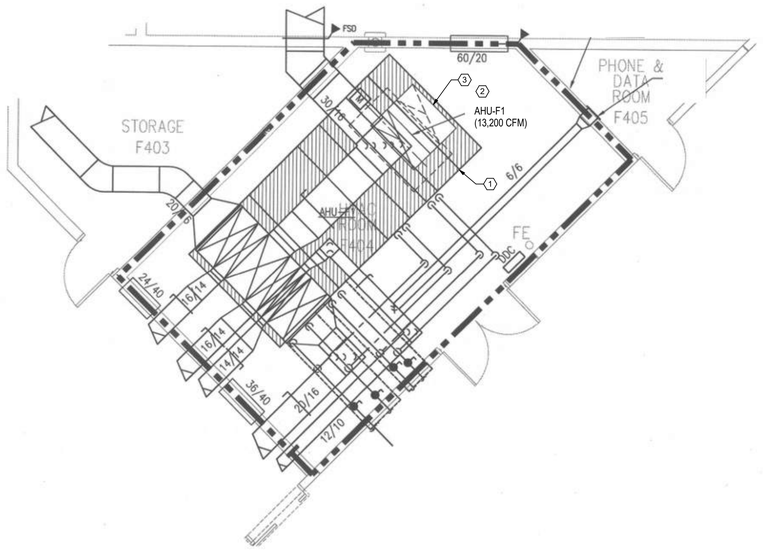
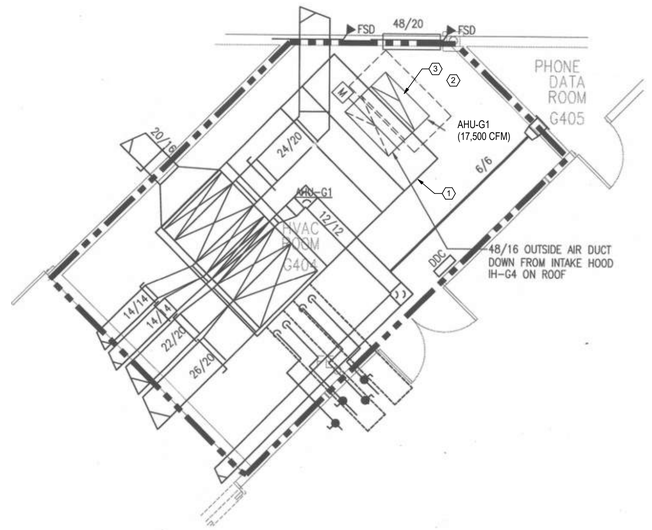
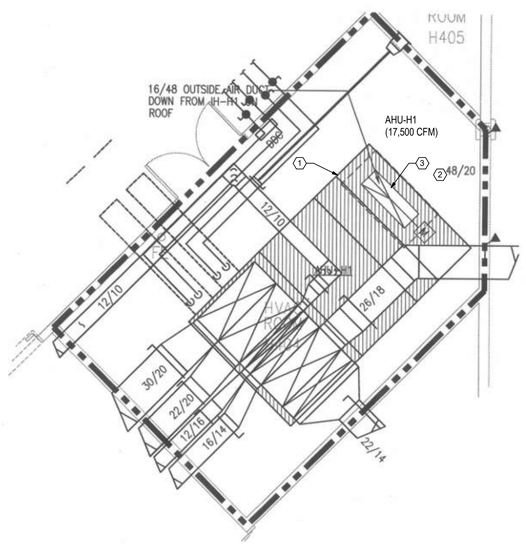


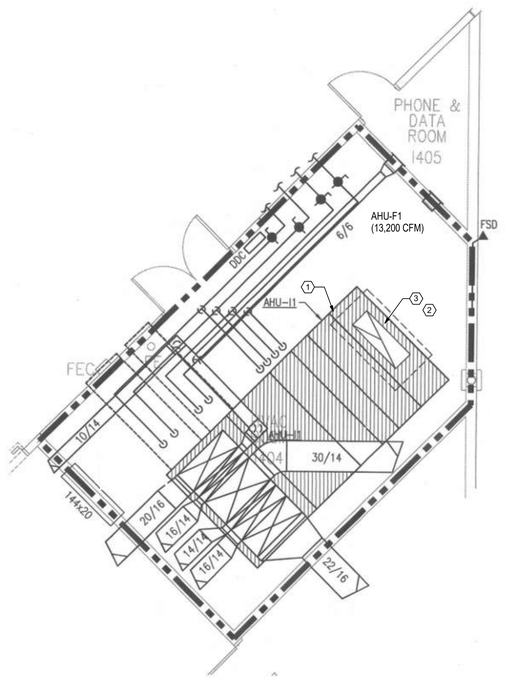
C1 ENLARGED MECHANICAL ROOM F404 (AHU-F1)
1/4" = 1'-0"



C4 ENLARGED MECHANICAL ROOM G404 (AHU-G1)
1/4" = 1'-0"



A1 ENLARGED MECHANICAL ROOM H404 (AHU-H1)
1/4" = 1'-0"



A4 ENLARGED MECHANICAL ROOM I404 (AHU-I1)
1/4" = 1'-0"

NOTES BY SYMBOL ⬡

APPLIES TO SHEET MA-402	
NOTE	DESCRIPTION
1	BID PACKAGE 3: FIELD MODIFY THE EXISTING AIR HANDLING UNIT'S FILTER SECTION WITHIN THE RETURN AIR PLENUM AND INSTALL NEW AIR PURIFICATION MODULE AS INDICATED ON THE AIR HANDLING UNIT SCHEDULE, DRAWING MA-601. MODIFICATIONS TO THE AHU INCLUDE REPLACEMENT OF THE RETURN AIR PLENUM CASING (PLENUM WALLS, FLOOR TOP), PANEL ACCESS DOOR INCLUDING VIEW WINDOW INTO THE PLENUM, FILTER TRACKS FOR EACH THE PRE-FILTER AND AIR PURIFICATION SYSTEM, DOOR SEALED AIR-TIGHT.
2	BID PACKAGE 5: PROVIDE NEW AIR QUALITY MONITORING AND VERIFICATION EQUIPMENT WITHIN OUTSIDE AIR DUCTWORK. PROVIDE NEW AIR QUALITY MEASUREMENT AND AIR FLOW EQUIPMENT (230923.14 - FLOW INSTRUMENTS).
3	BID PACKAGE 6: REMOVE AND REPLACE OUTSIDE AIR DUCTWORK FROM AHU TO AND INCLUDING INTAKE HOOD ON THE ROOF. PROVIDE NEW INSULATED DOUBLE WALL STAINLESS STEEL DUCTWORK, INTAKE HOOD, SECURITY BARS AND MOTORIZED DAMPER AT THE INTAKE HOOD. REFER TO AIR HANDLING UNIT SCHEDULE ON MA-601 FOR INTAKE HOOD REQUIREMENTS.

TRUE NORTH PLAN NORTH

0' 2' 4' 8'
SCALE 1/4" =1'-0"

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COUNTY OF GALVESTON

COUNTY OF GALVESTON

GALVESTON COUNTY INDOOR AIR QUALITY IMPROVEMENTS CONFINEMENT FACILITIES

COUNTY OF GALVESTON

ISSUES / REVISIONS LOG:

MARK	DATE	DESCRIPTION

PROJECT NO.:	R317334.01
DRAWN BY:	DGM
REVIEWED BY:	JK
APPROVED BY:	JK

SHEET TITLE:

ENLARGED PLANS (F404, G404, H404, I404)

SHEET NUMBER:

MA-402

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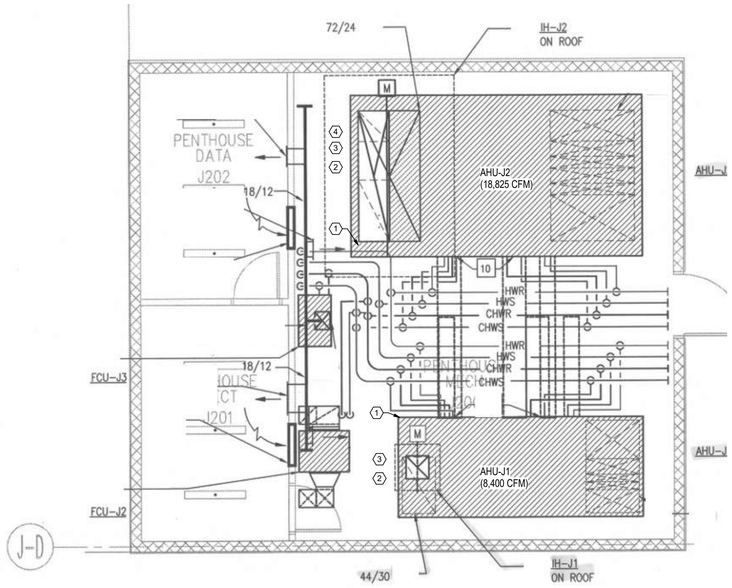
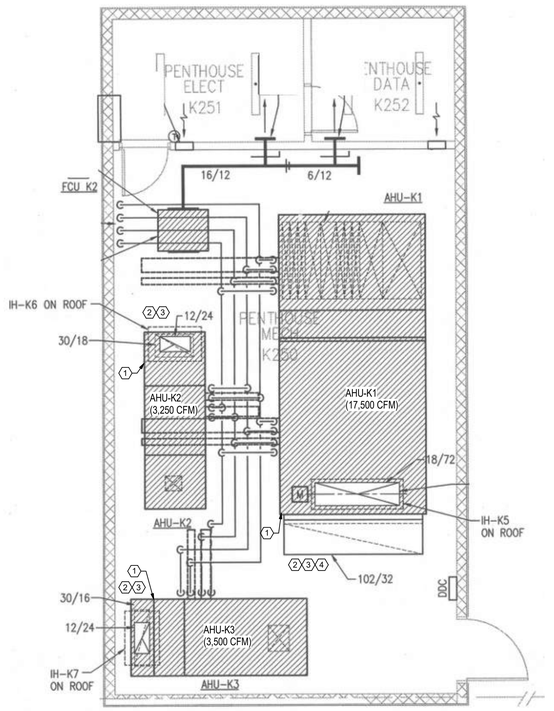
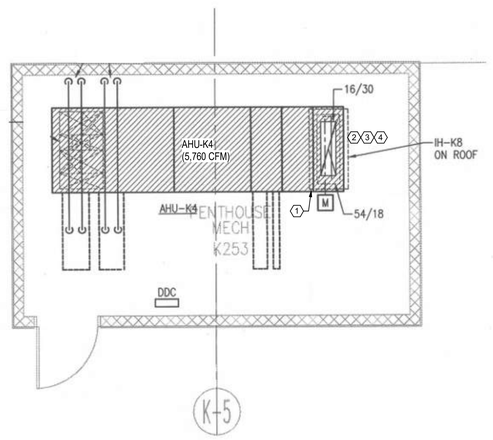


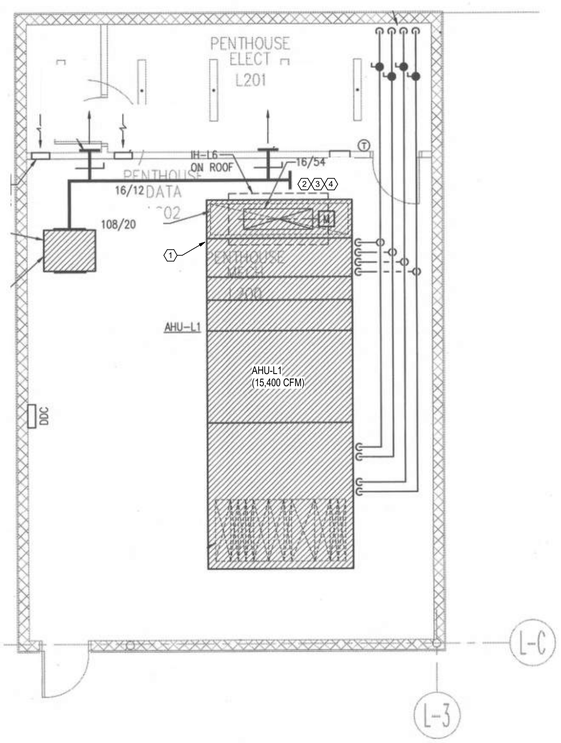
C1 ENLARGED MECHANICAL ROOM J200 (AHU-J1,AHU-J2)
1/4" = 1'-0"



C4 ENLARGED MECHANICAL ROOM K250 (AHU-K1, AHU-K2, AHU-K3)
1/4" = 1'-0"



A1 ENLARGED MECHANICAL ROOM K253 (AHU-K4)
1/4" = 1'-0"



A4 ENLARGED MECHANICAL ROOM L200 (AHU-L1)
1/4" = 1'-0"

NOTES BY SYMBOL ⬡

APPLIES TO SHEET M-403	
NOTE	DESCRIPTION
1	BID PACKAGE 3: FIELD MODIFY THE EXISTING AIR HANDLING UNIT'S FILTER SECTION WITHIN THE RETURN AIR PLENUM AND INSTALL NEW AIR PURIFICATION MODULE AS INDICATED ON THE AIR HANDLING UNIT SCHEDULE, DRAWING MA-601. MODIFICATIONS TO THE AHU INCLUDE REPLACEMENT OF THE RETURN AIR PLENUM CASING (PLENUM WALLS, FLOOR TOP), PANEL ACCESS DOOR INCLUDING VIEW WINDOW INTO THE PLENUM, FILTER TRACKS FOR EACH THE PRE-FILTER AND AIR PURIFICATION SYSTEM, DOOR SEALED AIR-TIGHT.
2	BID PACKAGE 5: PROVIDE NEW AIR QUALITY MONITORING AND VERIFICATION EQUIPMENT WITHIN OUTSIDE AIR DUCTWORK. PROVIDE NEW AIR QUALITY MEASUREMENT AND AIR FLOW EQUIPMENT (230923.14 - FLOW INSTRUMENTS).
3	BID PACKAGE 6: REMOVE AND REPLACE OUTSIDE AIR DUCTWORK FROM AHU TO AND INCLUDING INTAKE HOOD ON THE ROOF. PROVIDE NEW INSULATED DOUBLE WALL STAINLESS STEEL DUCTWORK, INTAKE HOOD, SECURITY BARS AND MOTORIZED DAMPER AT THE INTAKE HOOD. REFER TO AIR HANDLING UNIT SCHEDULE ON MA-601 FOR INTAKE HOOD REQUIREMENTS.
4	BID PACKAGE 4: REMOVE AHU CASING FOR EACH THE RETURN AND OUTSIDE AIR PLENUMS. FIELD MODIFICATIONS INCLUDE REPLACEMENT OF AHU WALL, CEILING AND FLOOR CASINGS FOR THE RETURN AIR PLENUM AND OUTSIDE AIR PLENUM THAT HAVE SIGNS OF CORROSION. CASING MODIFICATIONS INCLUDE FIELD FABRICATED NEW INTERIOR/EXTERIOR INSULATED WALL AND FLOOR PANELS, REPLACEMENT OF RETURN AND OUTSIDE AIR DAMPERS, REPLACEMENT OF FILTER RACKS AND CONNECTIONS TO EXISTING DUCTWORK. REFER TO SPECIFICATION 233119 - FIELD FABRICATED HVAC CASINGS.

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COUNTY OF GALVESTON

GALVESTON COUNTY INDOOR AIR QUALITY IMPROVEMENTS CONFINEMENT FACILITIES

COUNTY OF GALVESTON

ISSUES / REVISIONS LOG:

MARK	DATE	DESCRIPTION

PROJECT NO.:	R317334.01
DRAWN BY:	DGM
REVIEWED BY:	JK
APPROVED BY:	JK

SHEET TITLE:

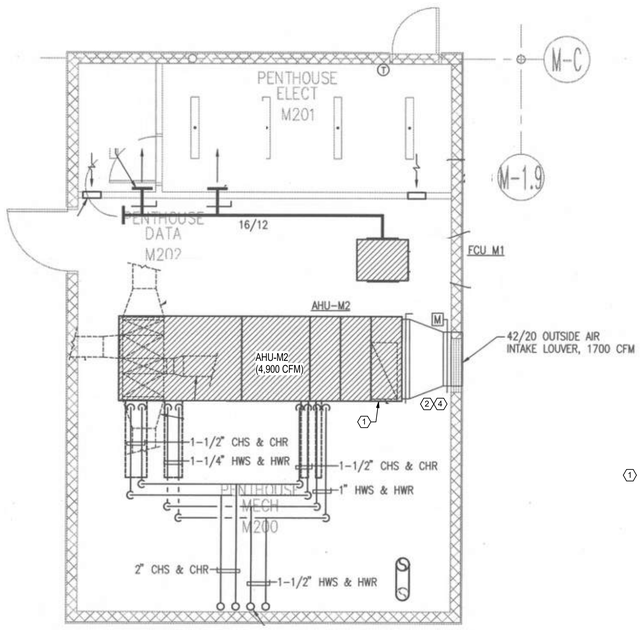
ENLARGED PLANS (J200, K250, K253, L200)

SHEET NUMBER:

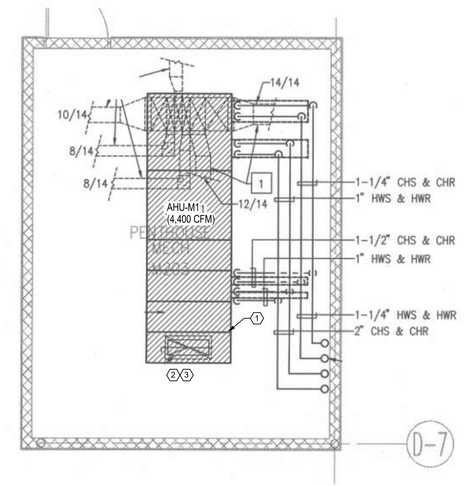
MA-403

TRUE NORTH PLAN NORTH

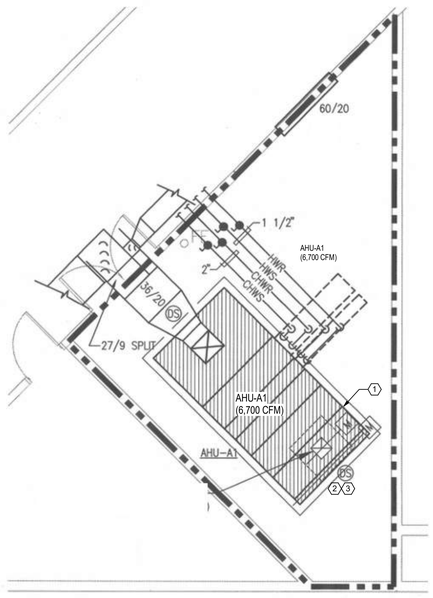
SCALE 1/4" =1'-0"



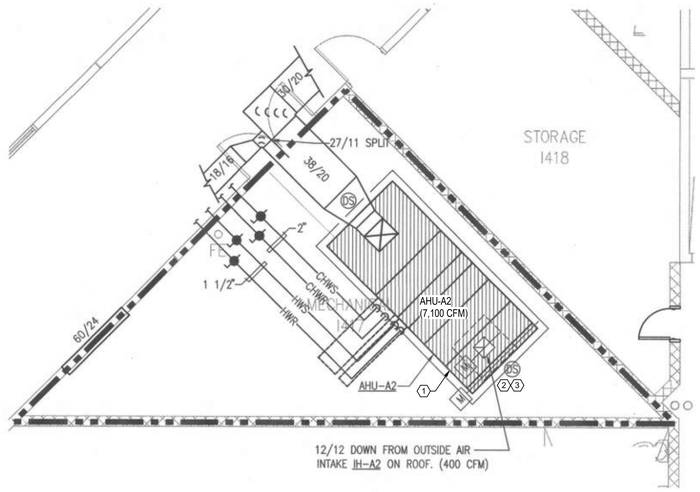
C1 ENLARGED MECHANICAL ROOM M200 (AHU-M2)
1/4" = 1'-0"



C4 ENLARGED MECHANICAL ROOM M203 (AHU-M1)
1/4" = 1'-0"



A1 ENLARGED MECHANICAL ROOM E418 (AHU-A1)
1/4" = 1'-0"



A4 ENLARGED MECHANICAL ROOM I417 (AHU-A2)
1/4" = 1'-0"

TRUE NORTH PLAN NORTH

0' 2' 4' 8'
SCALE 1/4" =1'-0"

NOTES BY SYMBOL ⬡

NOTE	APPLIES TO SHEET M-404 DESCRIPTION
1	BID PACKAGE 3: FIELD MODIFY THE EXISTING AIR HANDLING UNIT'S FILTER SECTION WITHIN THE RETURN AIR PLENUM AND INSTALL NEW AIR PURIFICATION MODULE AS INDICATED ON THE AIR HANDLING UNIT SCHEDULE, DRAWING MA-601. MODIFICATIONS TO THE AHU INCLUDE REPLACEMENT OF THE RETURN AIR PLENUM CASING (PLENUM WALLS, FLOOR TOP), PANEL ACCESS DOOR INCLUDING VIEW WINDOW INTO THE PLENUM, FILTER TRACKS FOR EACH THE PRE-FILTER AND AIR PURIFICATION SYSTEM, DOOR SEALED AIR-TIGHT.
2	BID PACKAGE 5: PROVIDE NEW AIR QUALITY MONITORING AND VERIFICATION EQUIPMENT WITHIN OUTSIDE AIR DUCTWORK. PROVIDE NEW AIR QUALITY MEASUREMENT AND AIR FLOW EQUIPMENT (230923.14 - FLOW INSTRUMENTS).
3	BID PACKAGE 6: REMOVE AND REPLACE OUTSIDE AIR DUCTWORK FROM AHU TO AND INCLUDING INTAKE HOOD ON THE ROOF. PROVIDE NEW INSULATED DOUBLE WALL STAINLESS STEEL DUCTWORK, INTAKE HOOD, SECURITY BARS AND MOTORIZED DAMPER AT THE INTAKE HOOD. REFER TO AIR HANDLING UNIT SCHEDULE ON MA-601 FOR INTAKE HOOD REQUIREMENTS.
4	BID PACKAGE 6: REMOVE AND REPLACE OUTSIDE AIR DUCTWORK FROM AHU TO EXISTING EXTERIOR WALL INTAKE LOUVER (LOUVER TO REMAIN). PROVIDE NEW INSULATED DOUBLE WALL STAINLESS STEEL DUCTWORK, EXTERIOR WALL LOUVER, SECURITY BARS AND MOTORIZED DAMPERS.

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THE STATE OF TEXAS
COUNTY OF GALVESTON

COUNTY OF GALVESTON

GALVESTON COUNTY INDOOR AIR QUALITY IMPROVEMENTS CONFINEMENT FACILITIES

COUNTY OF GALVESTON

ISSUES / REVISIONS LOG:

MARK	DATE	DESCRIPTION

PROJECT NO.:	R317334.01
DRAWN BY:	DGM
REVIEWED BY:	JK
APPROVED BY:	JK

SHEET TITLE:

ENLARGED PLANS (M200, M203, E, I417)

SHEET NUMBER:

MA-404

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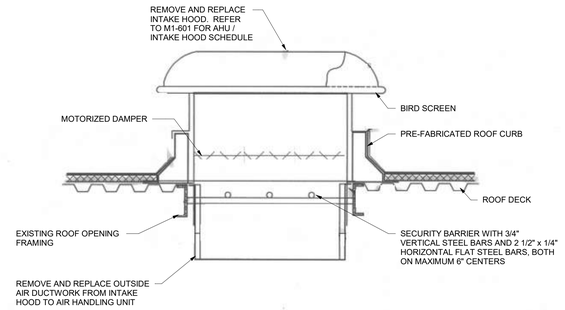
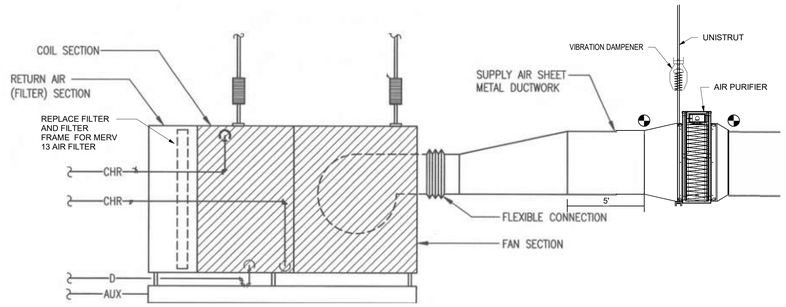
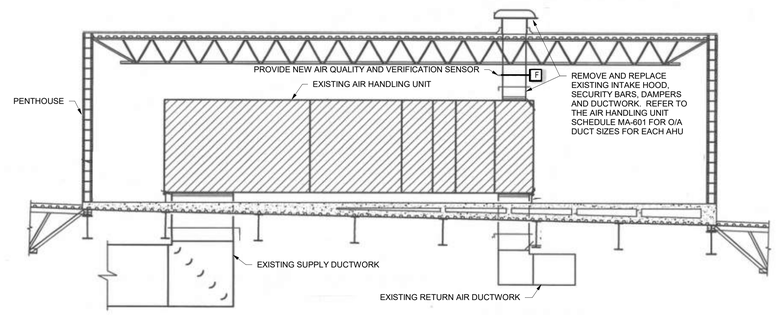


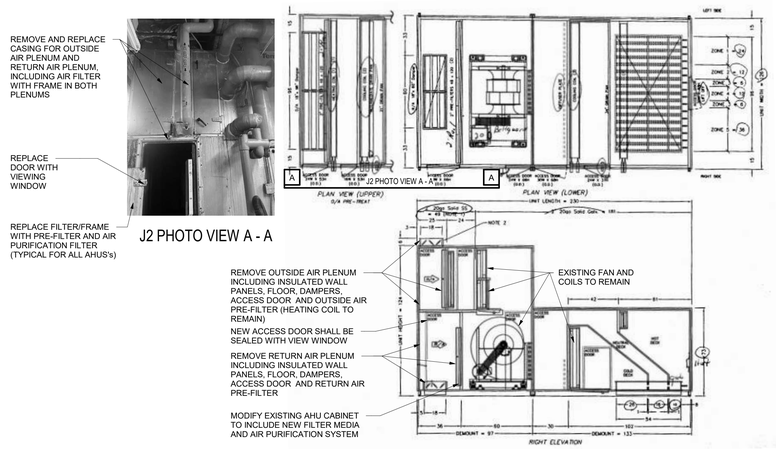
C2 INTAKE HOOD DETAIL
NTS



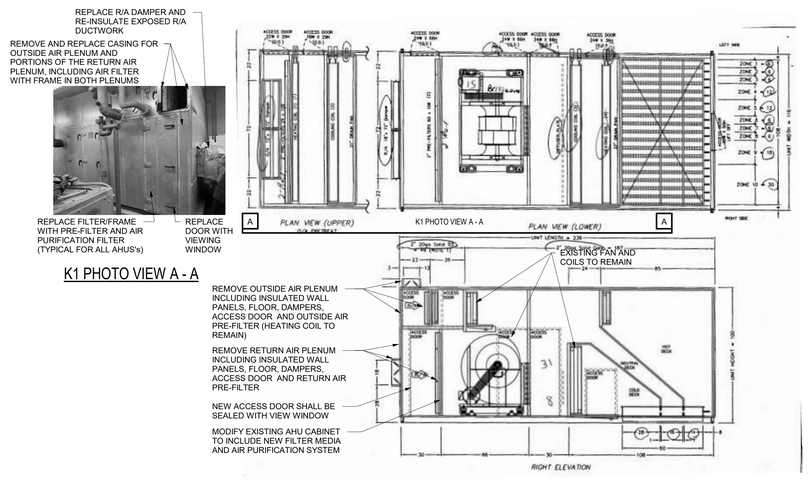
B2 FAN COIL UNIT DETAIL
NTS



A2 PENTHOUSE AIR HANDLING UNIT DETAIL
NTS



C4 AIR HANDLING UNIT REPAIRS, AHU-J2
NTS



A4 AIR HANDLING UNIT REPAIRS, AHU-K1
NTS

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GALVESTON COUNTY INDOOR AIR QUALITY IMPROVEMENTS CONFINEMENT FACILITIES

COUNTY OF GALVESTON

ISSUES / REVISIONS LOG:

MARK	DATE	DESCRIPTION

PROJECT NO.:	R317334.01
DRAWN BY:	Author
REVIEWED BY:	Checker
APPROVED BY:	Approver

SHEET TITLE:

MECHANICAL SECTIONS AND DETAILS

SHEET NUMBER:

MA-501

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EXISTING AIR HANDLING UNIT DATA, INTAKE HOOD AND AIR PURIFIER SCHEDULE

GENERAL		EXISTING AIR HANDLING UNIT DATA										INTAKE HOOD EQUIPMENT				AIR PURIFICATION EQUIPMENT						
UNIT TAG	AREA SERVED / AHU LOCATION	UNIT TYPE	EXISTING AHU EXTERNAL STATIC PRESSURE (IN. W.G.)	EXISTING S/A AIR FLOW (CFM)	EXISTING R/A AIRFLOW (CFM)	EXISTING R/A PRE-FILTER (FACE AREA(SQFT) / FACE VELOCITY (FPM))	EXISTING R/A PRE-FILTER SIZE (IN. x IN.)	EXISTING O/A AIRFLOW (CFM)	EXISTING O/A DUCT SIZE (INSIDE CLEAR IN. / IN.)	EXISTING O/A PRE-FILTER (FACE AREA(SQFT) / FACE VELOCITY (FPM))	EXISTING O/A PRE-FILTER SIZE (IN. x IN.)	OUTSIDE AIR INTAKE HOOD UNIT TAG	FACE VELOCITY (FPM)	FREE AREA (SF)	OUTSIDE AIR INTAKE HOOD THROAT SIZE (IN. x IN.)	UNIT TAG	SIZE (IN.)	MANUFACTURER AND MODEL	POWER		FILTER	NOTES
																			VOLTS/ HZ	AMPS		
AHU-A1 (E)	CORRIDORS BETWEEN AREA B AND AREA E / MECHANICAL E418	SINGLE ZONE DRAW THRU	1.70	6,700	6,300	FIELD VERIFY	FIELD VERIFY	400	12/12	FIELD VERIFY	FIELD VERIFY	***IH-A1***	133	3	12 x 12	***AP-A1***	FIELD VERIFY	GENESIS AIR PCP	120 / 60	NOTE 4	MERV 13	1,2,3,4
AHU-A2 (E)	CORRIDORS BETWEEN AREA F AND AREA I / MECHANICAL I417	SINGLE ZONE DRAW THRU	1.70	7,100	6,700	FIELD VERIFY	FIELD VERIFY	400	12/12	FIELD VERIFY	FIELD VERIFY	***IH-A2***	133	3	12 x 12	***AP-A2***	FIELD VERIFY	GENESIS AIR PCP	120 / 60	NOTE 4	MERV 13	1,2,3,4
AHU-B1 (E)	BUILDING AREA B / MECHANICAL B404	3-DECK MULTIZONE	1.70	13,900	10,700	FIELD VERIFY	FIELD VERIFY	3,200	48/18	FIELD VERIFY	FIELD VERIFY	***IH-B4***	468	6.83	18 x 48	***AP-B1***	FIELD VERIFY	GENESIS AIR PCP	120 / 60	NOTE 4	MERV 13	1,2,3,4
AHU-C1 (E)	BUILDING AREA C / MECHANICAL C404	3-DECK MULTIZONE	1.70	13360	10,060	FIELD VERIFY	FIELD VERIFY	3,300	48/18	FIELD VERIFY	FIELD VERIFY	***IH-C4***	468	6.83	18 x 48	***AP-C1***	FIELD VERIFY	GENESIS AIR PCP	120 / 60	NOTE 4	MERV 13	1,2,3,4
AHU-D1 (E)	BUILDING AREA D / MECHANICAL D404	3-DECK MULTIZONE	1.70	15,800	12,300	FIELD VERIFY	FIELD VERIFY	3,500	60/18	FIELD VERIFY	FIELD VERIFY	***IH-D4***	312	11.22	18 x 60	***AP-D1***	FIELD VERIFY	GENESIS AIR PCP	120 / 60	NOTE 4	MERV 13	1,2,3,4
AHU-E1 (E)	BUILDING AREA E / MECHANICAL E404	3-DECK MULTIZONE	1.75	13,190	10,090	FIELD VERIFY	FIELD VERIFY	3,100	48/18	FIELD VERIFY	FIELD VERIFY	***IH-E4***	307	10.08	18 x 48	***AP-E1***	FIELD VERIFY	GENESIS AIR PCP	120 / 60	NOTE 4	MERV 13	1,2,3,4
AHU-F1 (E)	BUILDING AREA F / MECHANICAL F404	3-DECK MULTIZONE	1.75	13,200	10,000	FIELD VERIFY	FIELD VERIFY	3,200	48/18	FIELD VERIFY	FIELD VERIFY	***IH-F4***	468	6.83	18 x 48	***AP-F1***	FIELD VERIFY	GENESIS AIR PCP	120 / 60	NOTE 4	MERV 13	1,2,3,4
AHU-G1 (E)	BUILDING AREA G / MECHANICAL G404	3-DECK MULTIZONE	1.70	17,500	14,300	FIELD VERIFY	FIELD VERIFY	3,200	48/18	FIELD VERIFY	FIELD VERIFY	***IH-G4***	468	6.83	18 x 48	***AP-G1***	FIELD VERIFY	GENESIS AIR PCP	120 / 60	NOTE 4	MERV 13	1,2,3,4
AHU-G2 (E)	BUILDING AREA G501, G503, G504 / MECHANICAL G501	SINGLE ZONE DRAW THRU	1.60	2,500	1,960	FIELD VERIFY	FIELD VERIFY	540	12/12	FIELD VERIFY	FIELD VERIFY	***IH-G6***	180	3	12 x 12	***AP-G2***	FIELD VERIFY	GENESIS AIR PCP	120 / 60	NOTE 4	MERV 13	1,2,3,4
AHU-H1 (E)	BUILDING AREA H / MECHANICAL H404	3-DECK MULTIZONE	1.70	17,700	14,500	FIELD VERIFY	FIELD VERIFY	3,200	48/16	FIELD VERIFY	FIELD VERIFY	***IH-H4***	468	6.83	18 x 48	***AP-H1***	FIELD VERIFY	GENESIS AIR PCP	120 / 60	NOTE 4	MERV 13	1,2,3,4
AHU-I1 (E)	BUILDING AREA I / MECHANICAL I404	3-DECK MULTIZONE	1.70	13,200	10,000	FIELD VERIFY	FIELD VERIFY	3,200	48/18	FIELD VERIFY	FIELD VERIFY	***IH-I4***	468	6.83	18 x 48	***AP-I1***	FIELD VERIFY	GENESIS AIR PCP	120 / 60	NOTE 4	MERV 13	1,2,3,4
AHU-J1 (E)	BUILDING AREA J / PENTHOUSE MECH. J200	3-DECK MULTIZONE	1.35	8,400	7,450	24.0 / 310	TWO @ 48 / 72	950	72/24	4.0 / 237	12 / 48	***IH-J1***	317	3	10 x 18	***AP-J1***	FIELD VERIFY	GENESIS AIR PCP	120 / 60	NOTE 4	MERV 13	1,2,3,4
AHU-J2 (E)	BUILDING AREA J / PENTHOUSE MECH. J200	3-DECK MULTIZONE	1.75	18,825	8,725	40.0 / 198	TWO @ 48 / 120	10,100	72/24	40.0 / 272	48 / 120	***IH-J2***	158	63.83	46 x 102	***AP-J2***	FIELD VERIFY	GENESIS AIR PCP	120 / 60	NOTE 4	MERV 13	1,2,3,4
AHU-K1 (E)	BUILDING AREA K / PENTHOUSE MECH. K250	3-DECK MULTIZONE	1.70	17,500	12,750	44.0 / 289	TWO @ 60 / 106	4,750	72/18	18.0 / 263	24 / 106	***IH-K5***	310	15.33	18 x 72	***AP-K1***	FIELD VERIFY	GENESIS AIR PCP	120 / 60	NOTE 4	MERV 13	1,2,3,4
AHU-K2 (E)	BUILDING AREA K / PENTHOUSE MECH. K250	SINGLE ZONE DRAW THRU	1.70	3,250	2,150	FIELD VERIFY	FIELD VERIFY	1,100	24/12	FIELD VERIFY	FIELD VERIFY	***IH-K6***	275	4	12 x 24	***AP-K2***	FIELD VERIFY	GENESIS AIR PCP	120 / 60	NOTE 4	MERV 13	1,2,3,4
AHU-K3 (E)	BUILDING AREA K / PENTHOUSE MECH. K250	SINGLE ZONE DRAW THRU	1.70	3,500	2,350	FIELD VERIFY	FIELD VERIFY	1,150	24/12	FIELD VERIFY	FIELD VERIFY	***IH-K7***	288	4	12 x 24	***AP-K3***	FIELD VERIFY	GENESIS AIR PCP	120 / 60	NOTE 4	MERV 13	1,2,3,4
AHU-K4 (E)	BUILDING AREA K / PENTHOUSE MECH. K253	3-DECK MULTIZONE	1.60	5,760	4,160	17.8 / 233	TWO @ 40 / 64	1,600	30/16	6.7 / 238	16 / 60	***IH-K8***	297	5.39	16 x 30	***AP-K4***	FIELD VERIFY	GENESIS AIR PCP	120 / 60	NOTE 4	MERV 13	1,2,3,4
AHU-L1 (E)	BUILDING AREA L / PENTHOUSE MECH. L202	3-DECK MULTIZONE	1.70	15,400	12,320	44.4 / 277	TWO @ 53 / 100	3,080	12/12	11.1 / 277	12 / 72	***IH-L5***	451	6.83	12 x 48	***AP-L1***	FIELD VERIFY	GENESIS AIR PCP	120 / 60	NOTE 4	MERV 13	1,2,3,4
AHU-M1 (E)	BUILDING AREA M / PENTHOUSE MECH. M200	3-DECK MULTIZONE	1.60	4,400	3,050	13.3 / 228	TWO @ 29 / 60	1,350	12/12	6.7 / 201	16 / 60	***IH-M4***	253	5.33	12 x 36	***AP-M1***	FIELD VERIFY	GENESIS AIR PCP	120 / 60	NOTE 4	MERV 13	1,2,3,4
AHU-M2 (E)	BUILDING AREA M / PENTHOUSE MECH. M203	3-DECK MULTIZONE	1.80	4,900	3,200	13.3 / 240	TWO @ 29 / 60	1,700	12/12	6.7 / 253	16 / 60	N/A	N/A	N/A	N/A	***AP-M2***	FIELD VERIFY	GENESIS AIR PCP	120 / 60	NOTE 4	MERV 13	1,2,3,4
FCU-A1 (E)	BUILDING AREA A OFFICER CENTRALIZED CONTROL ROOM	SINGLE ZONE	0.50	1,200	1,100	N/A	N/A	100	N/A	N/A	N/A	N/A	N/A	N/A	N/A	***AP-CA1***	FIELD VERIFY	GENESIS AIR CU	120 / 60	NOTE 4	MERV 13	5

NOTES:

1. CONTRACTOR MUST FIELD VERIFY SIZES OF EACH AIR HANDLING UNIT INCLUDING SIZE OF FILTER RACK WITHIN EACH EXISTING AIRHANDLING UNIT AND PROVIDE MERV FILTER/AIR PURIFIER SELECTIONS.
2. MAX FACE VELOCITY ACROSS FILTER MEDIA MUST NOT BE GREATER THAN 500 FEET/MINUTE
3. AIR PURIFIERS MUST BE PCP = PHOTOCATALYTIC PANELS SELECTED FROM FIELD MEASUREMENTS.
4. VERIFY ELECTRICAL REQUIREMENTS BASED ON AIR PURIFING EQUIPMENT SELECTED FOR EACH AIR HANDLING UNIT
5. PROVIDE IN-LINE AIR PURIFICATION SYSTEM IN SUPPLY AIR DUCTWORK. REFER TO SPECIFICATION 234202 - INDOOR AIR PURIFIERS

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GALVESTON COUNTY INDOOR AIR QUALITY IMPROVEMENTS CONFINEMENT FACILITIES

COUNTY OF GALVESTON

ISSUES / REVISIONS LOG:

MARK	DATE	DESCRIPTION

PROJECT NO.:	R317334.01
DRAWN BY:	DGM
REVIEWED BY:	JK
APPROVED BY:	JK

SHEET TITLE:

HVAC SCHEDULES

SHEET NUMBER:

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CV AHU SEQUENCE OF OPERATIONS

AHU-01

AHU'S ARE MULTIZONE, MULTI-DECK AIR-HANDLING UNIT WITH PRE-HEATING AND COOLING COILS CONDITIONING OUTSIDE AIR; A CONSTANT SPEED SUPPLY FAN; A COOLING COIL SERVING A 'COLD DECK, A HEATING COIL SERVING THE AHU 'HOT DECK' AND A NEUTRAL TEMPERATURE DECK.

WHENEVER THE SUPPLY FAN IS DE-ENERGIZED, AS SENSED BY THE STATUS SWITCH, THE OUTSIDE AND EXHAUST AIR DAMPERS SHALL BE CLOSED AND THE RETURN AIR DAMPER SHALL BE OPEN, THE HEATING AND COOLING VALVES SHALL BE CLOSED OR POSITIONED AS DESCRIBED BELOW.

A. OCCUPIED MODE:

1. THE SUPPLY FAN SHALL BE ENERGIZED.

2. THERE SHALL BE SEPARATE HEATING AND COOLING SPACE TEMPERATURE SETPOINTS WITH A 5°F DEADBAND BETWEEN THE HEATING AND COOLING.

3. THE HEATING COIL VALVE AND COOLING COIL VALVE SHALL MODULATE IN SEQUENCE TO MAINTAIN SUPPLY AIR TEMPERATURE SETPOINT. THERE SHALL BE A DEADBAND BETWEEN HEATING AND COOLING.

4. MINIMUM OUTSIDE AIR: THE MINIMUM OA FLOW RATE IS 50%. WHEN SUPPLY FAN IS ENERGIZED, MODULATE OA AND RA DAMPERS TO BRING IN 50% OA.

5. ECONOMIZER MODE: MODULATE OA DAMPER TO 100% OPEN. RETURN AIR DAMPER IS CLOSED WHEN OUTSIDE AIR IS ABOVE 55°F (ADJUSTABLE) AND OUTSIDE ENTHALPY IS BELOW 28 BTU/LB.

6. SUPPLY AIR TEMPERATURE SETPOINT SHALL BE RESET BASED ON SPACE TEMPERATURE ACCORDING TO THE FOLLOWING RESET SCHEDULE:

SUPPLY AIR TEMPERATURE SETPOINT	SPACE TEMPERATURE
55°F	SETPOINT +2°F
85°F	SETPOINT -2°F

ALL PARAMETERS SHALL BE INDEPENDENTLY ADJUSTABLE.

7. THE SOFTWARE SHALL PREVENT:
A. THE HEATING SETPOINT FROM EXCEEDING THE COOLING SETPOINT MINUS 5°F (I.E. THE MINIMUM DEADBAND SHALL BE 5°F);
B. THE UNOCCUPIED HEATING SETPOINT FROM EXCEEDING THE OCCUPIED HEATING SETPOINT; AND THE UNOCCUPIED COOLING SETPOINT FROM BEING LESS THAN THE OCCUPIED COOLING SETPOINT.

8. HUMIDITY CONTROL: HUMIDITY SENSOR SHALL BE PLACED AFTER THE CHILLED WATER COIL TO MEASURE THE HUMIDITY OF THE SUPPLY AIR. GLOBAL HUMIDISTAT SHALL BE PLACED IN THE ROOM THE UNIT IS INSTALLED IN TO MEASURE HUMIDITY OF THE SPACE. IF RELATIVE HUMIDITY IS DETECTED TO BE ABOVE 65%, HEATING COILS SHALL ENGAGE TO REDUCE THE HUMIDITY IN THE SUPPLY AIR TO BELOW 65%. SYSTEM TO REFERENCE GLOBAL HUMIDISTAT TO MONITOR SUPPLY AIR HUMIDITY.

9. DURING PERIODS WITH OUTDOOR AIR HUMIDITY LEVELS ARE ABOVE 50% (MEASURED BY OUTDOOR HUMIDITY SENSOR), THE OUTSIDE AIR COOLING COIL LEAVING AIR TEMPERATURE SHALL AUTOMATICALLY REDUCE THE OUTSIDE AIR TEMPERATURE LEAVING THE PRE-COOLING COIL REDUCING THE LEAVING WET-BULB AIR TEMPERATURE THAT MIXES WITH THE RETURN AIR FROM THE AHU RETURN AIR SYSTEM.

B. SAFETY SHUTDOWNS

1. DUCT SMOKE DETECTION, SPACE SMOKE DETECTION, AND LOW TEMPERATURE LIMIT TRIPS SHALL DE-ENERGIZE THE SUPPLY FAN AND CLOSE THE OUTSIDE AIR DAMPERS. MANUAL RESET OF THE TRIPPED DEVICE SHALL BE REQUIRED TO RESTART THE SYSTEM.

2. WHEN THE OA TEMPERATURE IS BELOW THE OUTSIDE AIR LOW TEMPERATURE PROTECTION SETPOINT 35°F (ADJUSTABLE) AND THE AIR HANDLER HAS SHUT DOWN IN ALARM, THE HEATING AND COOLING VALVES SHALL CYCLE AS DESCRIBED PREVIOUSLY IN THE UNOCCUPIED OFF COIL PROTECTION MODE.

3. WHENEVER THE RETURN AIR PLENUM, AIR FILTER REPLACEMENT CASSING DOOR IS OPENED, THE AIR HANDLING UNIT SHALL SHUT-DOWN INCLUDING SHUT DOWN OF THE AIR PURIFICATION SYSTEM.

CV AHU INPUT/OUTPUT POINTS SCHEDULE

UNIT TAG		POINT DESCRIPTION	ANALOG INPUT	ANALOG OUTPUT	BINARY INPUT	BINARY OUTPUT	CALCULATED VALUE	NOTES
AHU-01	1	OUTSIDE AIR DAMPER POSITION	●					
	2	OUTSIDE AIR DAMPER COMMAND				●		
	3	RETURN AIR DAMPER POSITION	●					
	4	RETURN AIR DAMPER COMMAND				●		
	5	OUTSIDE AIR MEASUREMENT SENSOR	●	●				
	6	MIXED AIR TEMPERATURE	●					
	7	HEATING COIL VALVE COMMAND		●				
	8	HEATING COIL VALVE POSITION	●					
	9	HEATING WATER RETURN TEMPERATURE	●					
	10	HEATING WATER SUPPLY TEMPERATURE	●					
	11	COOLING COIL VALVE COMMAND		●				
	12	COOLING COIL VALVE POSITION	●					
	13	CHILLED WATER RETURN TEMPERATURE	●		●			HARDWIRE SHUTDOWN
	14	CHILLED WATER SUPPLY TEMPERATURE	●					AIRFLOW PROOF
	15	FREEZESTAT	●		●			
	16	SUPPLY FAN STATUS				●		
	17	SUPPLY FAN SPEED FEEDBACK	●					
	18	SUPPLY FAN START/STOP				●		
	19	SUPPLY FAN COMMAND		●				
	20	SUPPLY FAN VFD FAULT			●			
	21	SUPPLY FAN PRESSURE	●					
	22	SUPPLY AIR TEMPERATURE	●					HARDWIRE SHUTDOWN
	23	SUPPLY AIR TEMPERATURE SETPOINT		●				
	24	SUPPLY AIR SMOKE ALARM			●			
	25	SUPPLY AIR HIGH STATIC LIMIT			●			
	26	HUMIDISTAT	●					

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MARK	DATE	DESCRIPTION

PROJECT NO.:	R317334.01
DRAWN BY:	Author
REVIEWED BY:	Checker
APPROVED BY:	Approver

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CONTROL DIAGRAMS

SHEET NUMBER:

MA-701

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GENERAL NOTES

NOTE	DESCRIPTION
A.	SHOULD DISCREPANCIES OCCUR WITHIN THE CONTRACT DOCUMENTS (DRAWINGS AND SPECIFICATIONS), THE MORE STRINGENT AND MORE COSTLY APPROACH MUST APPLY FOR BIDDING PURPOSES. THE CONTRACTOR IS TO NOTIFY THE OWNER'S REPRESENTATIVE OF DISCREPANCIES FOR CLARIFICATION. CLARIFICATIONS ISSUED AFTER THE CONTRACT IS AWARDED ARE TO BE INCORPORATED BY THE CONTRACTOR AT NO ADDITIONAL COSTS AND ARE TO BE REVIEWED BY THE OWNER'S REPRESENTATIVE TO DETERMINE IF A REDUCTION IN COST IS JUSTIFIED.
B.	THE CONTRACTOR MUST OBTAIN ALL PERMITS AND PAY ALL FEES AND CHARGES TO ALL LOCAL AND OTHER RELATED AGENCIES AS REQUIRED.
C.	PROVIDE ALL MATERIALS, LABOR, EQUIPMENT, AND SERVICES NECESSARY FOR A COMPLETE AND OPERABLE INSTALLATION AS SPECIFIED AND SHOWN ON THE DRAWINGS AND SPECIFICATIONS, FULLY TESTED, ADJUSTED AND READY FOR USE.
D.	THE DRAWINGS SHOW THE EXTENT OF THE WORK AND THE GENERAL ARRANGEMENT. THE DRAWINGS, HOWEVER, ARE DIAGRAMMATIC AND EXACT COORDINATED LAYOUT OF THE VARIOUS SYSTEMS IS THE RESPONSIBILITY OF THE CONTRACTOR.
E.	VERIFY ANY AND ALL INDICATED CONFIGURATIONS, DIMENSIONS AND ELEVATIONS BY FIELD MEASUREMENTS AND COORDINATED WITH ARCHITECTURAL DRAWINGS AND STRUCTURAL CONDITIONS.
F.	COORDINATE THE CUTTING AND PATCHING OF BUILDING COMPONENTS TO ACCOMMODATE THE INSTALLATION OF THE VARIOUS SYSTEM EQUIPMENT AND MATERIALS. STRUCTURAL MEMBERS MUST NOT BE CUT WITHOUT PRIOR APPROVAL OF STRUCTURAL ENGINEER.
G.	COORDINATE THE INSTALLATION OF THE VARIOUS SYSTEM MATERIALS AND EQUIPMENT ABOVE CEILINGS WITH SUSPENSION SYSTEM, LIGHT FIXTURES, AND OTHER INSTALLATIONS.
H.	ALL MATERIALS, EQUIPMENT AND APPARATUS INSTALLED ON THE PROJECT MUST BE NEW AND INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S PRINTED INSTRUCTIONS. THE MANUFACTURER, OR HIS AUTHORIZED REPRESENTATIVE, MUST CERTIFY IN WRITING TO THE OWNER AND THE OWNER'S REPRESENTATIVE, THAT THE INSTALLATION HAS BEEN MADE IN ACCORDANCE WITH SUCH PRINTED REQUIREMENTS.
I.	MANUFACTURER'S NAME AND MODEL NUMBERS INDICATED ON THE DRAWINGS ARE ONLY FOR REFERENCE CONVENIENCE. ENGINEER-APPROVED SUBSTITUTIONS ARE PERMITTED. THE CONTRACTOR, THROUGH THE MANUFACTURER, IS RESPONSIBLE TO CONFIRM THE CORRECTNESS OF ALL MODEL NUMBERS SO AS TO MEET THE SPECIFIC PROJECT REQUIREMENTS AND MINIMUM INDICATED PERFORMANCE.
J.	INSTALL EQUIPMENT, MATERIALS AND PIPING SYSTEMS TO PROVIDE REQUIRED ACCESS FOR SERVICING, MAINTENANCE, AND GENERAL INSPECTION PER MANUFACTURER'S INSTRUCTIONS AND LOCAL CODE REQUIREMENTS. COORDINATE THE FINAL LOCATION OF CONCEALED EQUIPMENT AND DEVICES REQUIRING ACCESS WITH FINAL LOCATION OF REQUIRED ACCESS PANELS AND DOORS. ALLOW AMPLE SPACE FOR REMOVAL OF ALL PARTS THAT REQUIRE REPLACEMENT OR SERVICING. PIPING SYSTEMS SHALL NOT BLOCK SERVICE ACCESS OF ANY NATURE, SUCH AS FILTER REMOVAL, EQUIPMENT ACCESS PANELS, CLEANING OF TUBES, AND SIMILAR ITEMS.
K.	COORDINATE THE EXACT LOCATION OF THIS WORK WITH THE WORK OF THE OTHER TRADES PRIOR TO FABRICATION OR INSTALLATION OF SAME. VERIFY ALL DIMENSIONS AND ELEVATIONS. PROVIDE ADDITIONAL OFFSETS AND SECTIONS OF MATERIAL AS MAY BE REQUIRED TO MEET THE APPLICABLE JOB CONDITION REQUIREMENTS.
L.	IT WILL BE THE RESPONSIBILITY OF EACH CONTRACTOR TO COORDINATE BETWEEN HIS EQUIPMENT SUPPLIERS AND ANY SUBCONTRACTOR AS TO WHICH DEVICES ARE SUPPLIED WITH EQUIPMENT, REQUIRED WIRING AND VOLTAGES AND OTHER COORDINATION ITEMS AS RELATED TO A PROPER AND OPERABLE INSTALLATION. ALL POWER WIRING AND CONTROL WIRING MUST COMPLY WITH DIVISION 26 REQUIREMENTS.
M.	DIMENSIONAL LOCATIONS INCLUDING ELEVATIONS INDICATED ON THE DRAWINGS ARE APPROXIMATE AND FOR REFERENCE ONLY. THE CONTRACTOR MUST COORDINATE WITH OTHER TRADES AND SERVICES TO AVOID INTERFERENCES ROUTING DUCTWORK AND PIPING.
N.	ALL MATERIALS IN ALL SUPPLY AND RETURN AIR PLENUMS MUST BE PLENUM RATED IN ACCORDANCE WITH THE INTERNATIONAL MECHANICAL CODE. MATERIALS WITHIN PLENUM MUST NOT EXCEED A FLAME SPREAD INDEX OF 25 AND A SMOKE-DEVELOPED INDEX OF 50. COORDINATE WITH OTHER TRADES TO PROVIDE PLENUM RATED MATERIALS.
O.	INSTALL ALL SPACE TEMPERATURE SENSORS AND THERMOSTATS 48 INCHES AFF UNLESS OTHERWISE NOTED.

AIRSIDE NOTES

NOTE	DESCRIPTION
A.	ALL DUCT DIMENSIONS INDICATED ON DRAWINGS ARE CLEAR INSIDE DIMENSIONS IN INCHES. IF DUCT LINER IS SPECIFIED, THE EXTERNAL SHEET METAL DIMENSIONS MUST BE INCREASED TO MAINTAIN THE INSIDE DUCT DIMENSIONS SHOWN ON THE PLANS.
B.	PROVIDE TURNING VANES IN ALL 90 DEGREE MITERED ELBOWS AND ALL BULLHEAD TEES EVEN IF TURNING VANES ARE NOT GRAPHICALLY SHOWN ON PLAN DRAWINGS.
C.	OUTSIDE AIR DUCT SERVING AHU-01 SHALL BE CONSTRUCTED FROM STAINLESS STEEL.

CODE CRITERIA AND DESIGN CONDITIONS

APPLICABLE CODES	2018 INTERNATIONAL BUILDING CODE	
	2018 INTERNATIONAL ENERGY CONSERVATION CODE	
	2018 INTERNATIONAL MECHANICAL CODE	
	2018 INTERNATIONAL PLUMBING CODE	
	ASHRAE 62.1 - 2013 VENTILATION FOR ACCEPTABLE INDOOR AIR QUALITY	
	NFPA 90A - STANDARD FOR THE INSTALLATION OF AIR-CONDITIONING AND VENTILATING SYSTEMS	
AMBIENT DESIGN CONDITIONS	AMBIENT DESIGN CONDITIONS	
	91.3°F	COOLING DRY BULB DESIGN TEMPERATURE (0.4%)
	79.1°F	MEAN COINCIDENT COOLING WET BULB DESIGN TEMPERATURE (0.4%)
	36F	HEATING DESIGN TEMPERATURE (99.6%)
	105°F	AMBIENT AIR-COOLED HEAT REJECTION TEMPERATURE
	DEHUMIDIFICATION CONDITIONS FOR OUTDOOR AIR UNIT	
	79°F	COOLING WET BULB DESIGN TEMPERATURE (0.4%)
	83°F	MEAN COINCIDENT COOLING DRY BULB DESIGN TEMPERATURE (0.4%)
	50 FEET	ELEVATION
	2A	CLIMATE ZONE (IECC - 2018)
LOAD CRITERIA	0.063 BTU/(H-FT²-°F)	WALL U-VALUE (ASSEMBLY DESCRIPTION BELOW)
		FACE BRICK
		2" CONTINUOUS RIGID INSULATION (R-13 TOTAL)
		METAL STUD WALL 16" ON CENTER
	0.048 BTU/(H-FT²-°F)	ROOF U-VALUE (ASSEMBLY DESCRIPTION BELOW)
		R-20 CONTINUOUS RIGID INSULATION ABOVE ROOF DECK
	0.50 BTU/(H-FT²-°F)	WINDOW UNIT U-VALUE
	0.27	WINDOW UNIT SOLAR HEAT GAIN COEFFICIENT
	1.0 W/FT²	PLUG LOADS
	PER ELECTRICAL DRAWINGS	LIGHTING LOADS

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04/12/2024

THE STATE OF TEXAS
COUNTY OF GALVESTON

CITY OF GALVESTON

GALVESTON COUNTY / INDOOR AIR QUALITY IMPROVEMENTS CONFINEMENT FACILITIES

CITY OF GALVESTON

ISSUES / REVISIONS LOG:

MARK	DATE	DESCRIPTION

PROJECT NO.:	R317334.01
DRAWN BY:	C.TORRES
REVIEWED BY:	J.KLUBER
APPROVED BY:	J.KLUBER

SHEET TITLE:

HVAC GENERAL NOTES AND DESIGN DATA

SHEET NUMBER:

MJ-001

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4/11/2024 3:03:50 PM

HVAC ABBREVIATIONS

A	
AF	AIRFOIL
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
AI	ANALOG INPUT
AO	ANALOG OUTPUT
AP	AIR PURIFIER
B	
B	BOILER
BAS	BUILDING AUTOMATION SYSTEM
BCU	BLOWER COIL UNIT
BI	BACKWARD INCLINED (FANS)
BI	BINARY INPUT (CONTROLS)
BO	BINARY OUTPUT
BOP	BOTTOM OF PIPE
BTUH	BRITISH THERMAL UNITS PER HOUR
C	
C	COMMON
CD	CONDENSATE DRAIN
CFM	CUBIC FEET PER MINUTE
CL	CENTER LINE
CHWP	CHILLED WATER PUMP
CHR	CHILLED WATER RETURN
CHS	CHILLED WATER SUPPLY
COP	COEFFICIENT OF PERFORMANCE
CRAC	COMPUTER ROOM AIR-CONDITIONER
CT	COOLING TOWER
CU	CONDENSING UNIT
CV	CONSTANT VOLUME
CWP	CONDENSER WATER PUMP
CWR	CONDENSER WATER RETURN
CWS	CONDENSER WATER SUPPLY
D	
DB	DRY BULB
dB	DECIBELS
DDC	DIRECT DIGITAL CONTROLS
DWH	DOMESTIC WATER HEATER
DWG	DRAWING
DX	DIRECT EXPANSION
E	
(E)	EXISTING
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
ECM	ELECTRONICALLY COMMUTATED MOTOR
EER	ENERGY EFFICIENCY RATIO
EF	EXHAUST FAN
EMCS	ENERGY MANAGEMENT CONTROL SYSTEM
ESP	EXTERNAL STATIC PRESSURE
ET	EXPANSION TANK
EUH	ELECTRIC UNIT HEATER

F	
°F	DEGREES FAHRENHEIT
FC	FORWARD CURVED
FCU	FAN COIL UNIT
FD	FIRE DAMPER
FD	FLOOR DRAIN
FLA	FULL LOAD AMPS
FPS	FEET PER SECOND
G	
GPM	GALLONS PER MINUTE
H	
HP	HORSEPOWER
HVAC	HEATING, VENTILATION, AND AIR CONDITIONING
HWP	HEATING WATER PUMP
HWR	HEATING WATER RETURN
HWS	HEATING WATER SUPPLY
HZ	HERTZ
I	
ID	INSIDE DIAMETER
IEER	INTEGRATED ENERGY EFFICIENCY RATIO
IN	INCHES
IN H20	INCHES OF WATER (PRESSURE)
IN WC	INCHES WATER COLUMN (PRESSURE)
IN WG	INCHES WATER GAUGE (PRESSURE)
IPLV	INTEGRATED PART-LOAD VALUE
K	
kBTU/H	ONE THOUSAND BRITISH THERMAL UNITS PER HOUR
kW	KILOWATTS
L	
LAT	LEAVING AIR TEMPERATURE
LEED	LEADERSHIP IN ENERGY AND ENVIRONMENTAL DESIGN
M	
MAU	MAKEUP AIR UNIT
MAX	MAXIMUM
MBH	ONE THOUSAND BRITISH THERMAL UNITS PER HOUR
MCA	MINIMUM CIRCUIT AMPS
MECH	MECHANICAL
MERV	MINIMUM EFFICIENCY REPORTING VALUE
MIN	MINIMUM
MOCP	MAXIMUM OVER CURRENT PROTECTION
MZ	MULTIZONE

N	
N/A	NOT APPLICABLE
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
No.	NUMBER (QUANTITY)
NPSHR	NET POSITIVE SUCTION HEAD REQUIRED
NTS	NOT TO SCALE
O	
OA	OUTSIDE AIR
OBD	OPPOSED BLADE VOLUME DAMPER
OD	OUTSIDE DIAMETER
ODP	OPEN DRIP PROOF MOTOR
P	
P	PRESSURE
PH	PHASE (ELECTRICAL)
PSC	PERMANENT SPLIT-CAPACITOR MOTOR
PSI	POUNDS PER SQUARE INCH (GAUGE)
R	
RA	RETURN AIR
REF	REFERENCE
REV	REVISION
RG	REFRIGERANT GAS
RH	RADIANT HEATER
RH	RELATIVE HUMIDITY
RL	REFRIGERANT LIQUID
RPM	REVOLUTIONS PER MINUTE
RTU	ROOFTOP UNIT
S	
SA	SUPPLY AIR
SEER	SEASONAL ENERGY EFFICIENCY RATIO
T	
TEFC	TOTALLY-ENCLOSED FAN-COOLED MOTOR
TOD	TOP OF DUCT
TSP	TOTAL STATIC PRESSURE
TU	TERMINAL UNIT
TYP	TYPICAL
U	
UH	UNIT HEATER
V	
VAV	VARIABLE AIR VOLUME
VFD	VARIABLE FREQUENCY DRIVE
VRF	VARIABLE REFRIGERANT FLOW
W	
WB	WET BULB
X	
XP	EXPLOSION-PROOF MOTOR

NOTE:

NOT ALL OF THE ABBREVIATIONS ON THIS SHEET ARE NECESSARILY USED IN THIS PROJECT.

HVAC SYMBOLS

GENERAL SYMBOLS

- NEW OR RELOCATED MECHANICAL EQUIPMENT
- EXISTING MECHANICAL EQUIPMENT TO REMAIN
- EXISTING MECHANICAL EQUIPMENT TO BE REMOVED
- POINT OF NEW CONNECTION
- NOTE BY SYMBOL (DEMOLITION)
- NOTE BY SYMBOL (NEW WORK)
- 3/4" UNDERCUT DOOR
- ISOMETRIC VIEW
- EQUIPMENT TAGS
  - EQUIPMENT NUMBER ON FLOOR
  - FLOOR NUMBER (IF APPLICABLE)
- TERMINAL UNIT TAGS
  - VAV BOX NUMBER SEQUENCE
  - AHU NUMBER ASSOCIATED WITH VAV
  - FLOOR NUMBER SERVED BY VAV BOX
- NORTH ARROW

CONTROLS SYMBOLS

- TEMPERATURE SENSOR (DDC) (FIGURE NOTES UNIT SERVED)
- THERMOSTAT (FIGURE NOTES UNIT SERVED)
- SMOKE DETECTOR
- CARBON DIOXIDE SENSOR
- DUCT AIRFLOW STATION
- PRESSURE SENSOR
- HUMIDITY SENSOR OR HUMIDISTAT
- CARBON MONOXIDE SENSOR
- NITROGEN DIOXIDE SENSOR
- DIFFERENTIAL PRESSURE SENSOR
- MOTORIZED ACTUATOR
- OPPOSED-BLADE CONTROL DAMPER
- PARALLEL-BLADE CONTROL DAMPER
- TWO-WAY CONTROL VALVE
- THREE-WAY CONTROL VALVE

ELECTRIC SYMBOLS

- 30 AMP, 3 PHASE, NONFUSED, NEMA 1, DISCONNECT SWITCH
- 20 AMP SINGLE POLE MOTOR RATED SWITCH

AIRSIDE SYMBOLS

- SUPPLY AIR DUCT RISER
- RETURN AIR DUCT RISER
- EXHAUST AIR DUCT RISER
- NEW OR RELOCATED CEILING-MOUNTED SUPPLY AIR DIFFUSER
- NEW OR RELOCATED CEILING-MOUNTED RETURN AIR GRILLE
- NEW OR RELOCATED CEILING-MOUNTED EXHAUST AIR GRILLE
- EXISTING CEILING-MOUNTED SUPPLY AIR DIFFUSER TO REMAIN
- EXISTING CEILING-MOUNTED SUPPLY AIR DIFFUSER TO BE REMOVED
- EXISTING CEILING-MOUNTED RETURN AIR GRILLE TO REMAIN
- EXISTING CEILING-MOUNTED RETURN AIR GRILLE TO BE REMOVED
- EXISTING CEILING-MOUNTED EXHAUST AIR GRILLE TO REMAIN
- EXISTING CEILING-MOUNTED EXHAUST AIR GRILLE TO BE REMOVED
- NEW OR RELOCATED DUCTWORK
- EXISTING DUCTWORK TO REMAIN
- EXISTING DUCTWORK TO BE REMOVED
- RECTANGULAR DUCT - FIRST FIGURE IS SIDE SHOWN IN INCHES
- ROUND DUCT (FIGURE=SIZE IN INCHES)
- OVAL DUCT (FIGURE=SIZE IN INCHES)
- ACOUSTICALLY LINED DUCT. FIGURES ARE INSIDE CLEAR DIMENSIONS IN INCHES. INCREASE SHEET METAL SIZE
- ELBOW WITH TURNING VANES
- RADIUS ELBOW
- MANUAL VOLUME DAMPER (WITH LOCKING QUADRANT)
- FIRE DAMPER
- COMBINATION FIRE/SMOKE DAMPER
- CEILING RADIATION DAMPER
- CEILING SLOT DIFFUSER
- FLEXIBLE DUCT
- DUCT BALANCING DAMPER TAG
  - CFM = BALANCED AIRFLOW
  - XX = SYSTEM TYPE
    - SA = SUPPLY AIR
    - OA = OUTSIDE AIR
    - RA = RETURN AIR
    - EA = EXHAUST AIR
- DIFFUSER / REGISTER / GRILLE TAG
  - XX = DIFFUSER TYPE
  - CFM = BALANCED AIRFLOW
  - Y / Z = NECK SIZE IF DIFFERENT THAN DUCT RUNOUT
- DIFFUSER / REGISTER / GRILLE TAG
  - XX = DIFFUSER TYPE
  - OPEN PLENUM RETURN
  - Y / Z = NECK SIZE

PIPING SYMBOLS

- NEW OR RELOCATED PIPING
- EXISTING PIPING TO REMAIN
- EXISTING PIPING TO BE REMOVED
- ELBOW DOWN
- ELBOW UP
- PIPE CAP CLEANOUT
- DIRECTION OF FLOW
- DIRECTION OF PIPE PITCH (DOWN)
- CHILLED WATER SUPPLY
- CHILLED WATER RETURN
- HEATING WATER SUPPLY
- HEATING WATER RETURN
- CONDENSATE DRAIN PIPING
- CONDENSER WATER SUPPLY
- CONDENSER WATER RETURN
- VALVE (GENERAL)
- CHECK VALVE
- BALL VALVE
- BUTTERFLY VALVE
- VALVE IN RISER
- BALANCING VALVE
- UNION OR FLANGE
- WYE-STRAINER (PROVIDE SHUTOFF VALVE AND HOSE CONNECTION)
- GAS PRESSURE REGULATOR
- SAFETY RELIEF VALVE
- WATER PRESSURE REDUCING VALVE
- PIPE ANCHOR POINT
- PIPE GUIDE
- REFRIGERANT PIPING (LIQUID/GAS)
- HEAT TRACED PIPE
- UNDERGROUND PIPE (MAY ALSO INCLUDE SYSTEM TYPE LABEL)
- EXISTING UNDERGROUND PIPE (MAY ALSO INCLUDE SYSTEM TYPE LABEL)

NOTE:

NOT ALL OF THE SYMBOLS ON THIS SHEET ARE NECESSARILY USED IN THIS PROJECT.

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04/12/2024

THE STATE OF TEXAS
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CITY OF GALVESTON

GALVESTON COUNTY / INDOOR AIR QUALITY IMPROVEMENTS CONFINEMENT FACILITIES

CITY OF GALVESTON

ISSUES / REVISIONS LOG:

MARK	DATE	DESCRIPTION

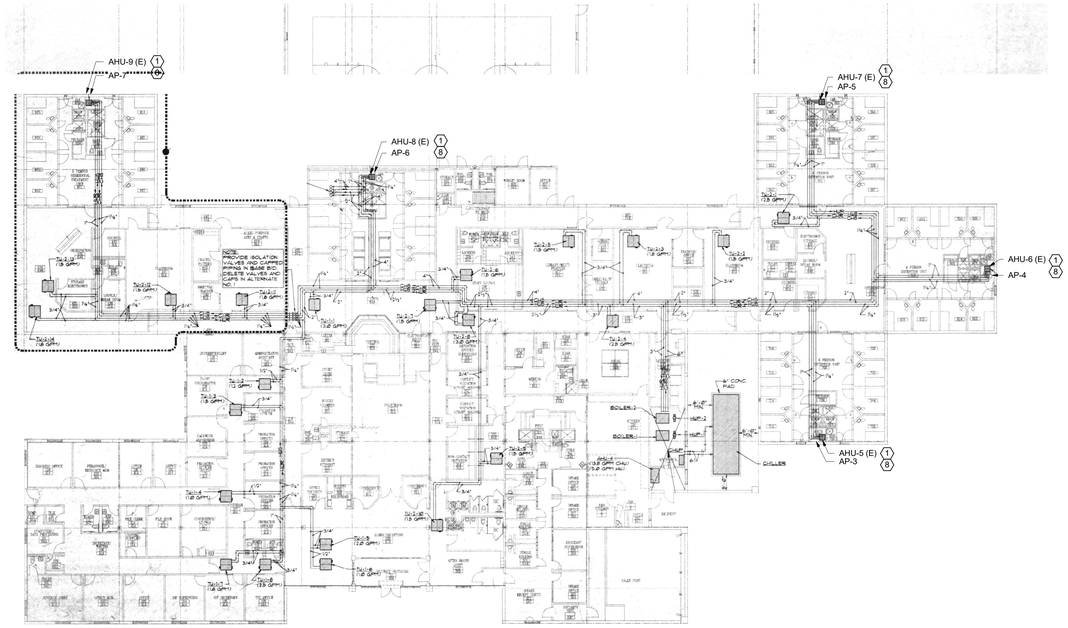
PROJECT NO.:	R317334.01
DRAWN BY:	C.TORRES
REVIEWED BY:	J.KLUBER
APPROVED BY:	J.KLUBER

SHEET TITLE:

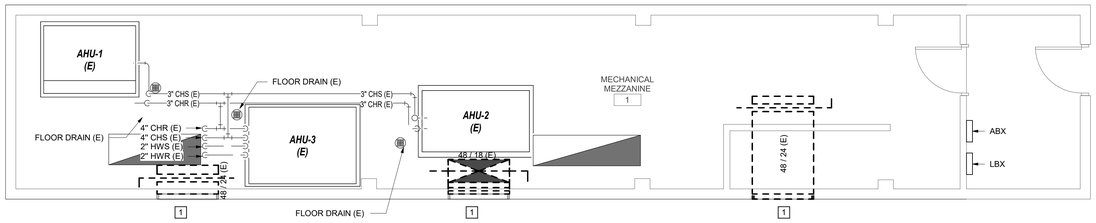
HVAC ABBREVIATIONS AND SYMBOLS

SHEET NUMBER:

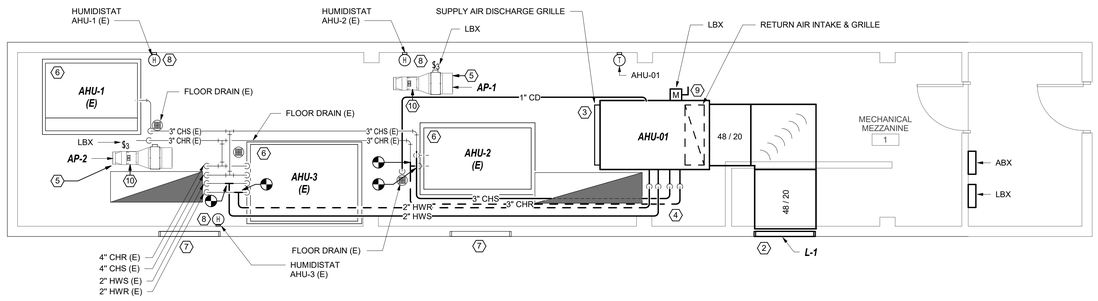
MJ-002



C1 FIRST FLOOR MECHANICAL PLAN (EXISTING)
NTS



B1 MECHANICAL MEZZANINE FLOOR PLAN (DEMO)
1/4" = 1'-0"



A1 MECHANICAL MEZZANINE FLOOR PLAN (NEW CONSTRUCTION)
1/4" = 1'-0"

N

0' 2' 4' 8'
SCALE 1/4" =1'-0"

DEMO NOTES BY SYMBOL

NOTE	DESCRIPTION
1	REMOVE EXISTING 48/24" OUTSIDE AIR DUCT AND ASSOCIATED MOTORIZED DAMPERS. UNDER BID PACKAGE 2.

CONSTRUCTION NOTES BY SYMBOL

NOTE	DESCRIPTION
1	INSTALL AIR PURIFIER UNIT TO SERVE EXISTING AHU. UNIT TO BE INSTALLED DOWNSTREAM OF EXISTING AHU. BID WORK UNDER BID PACKAGE 1.
2	NEW 48/24" OUTSIDE AIR WALL LOUVER TO REPLACE EXISTING WALL LOUVER. NEW LOUVER TO BE CORROSION RESISTANT. BID WORK UNDER BID PACKAGE 2.
3	INSTALL NEW AHU IN MECHANICAL MEZZANINE ROOM. NEW UNIT TO BE SUSPENDED FROM CEILING. EXISTING SUPPLY AIR DUCT TO CONNECT INTO NEW UNIT. UNIT INSTALLATION NOT TO INTERFERE WITH EXISTING MECHANICAL EQUIPMENT AND ASSOCIATED DUCTS AND PIPES. UNIT SHALL HAVE RETURN GRILLE INSTALLED UNDERNEATH UNIT.BID WORK UNDER BID PACKAGE 2.
4	CONNECT NEW AHU TO EXISTING HOT AND CHILLED WATER PIPE. REFER TO DETAIL B4 ON SHEET MJ-501 FOR HOT AND CHILLED WATER CONNECTION. BID WORK UNDER BID PACKAGE 2.
5	INSTALL AIR PURIFIER UNIT IN MECHANICAL MEZZANINE ROOM. UNIT TO BE SUSPENDED FROM CEILING IN MECHANICAL MEZZANINE ROOM, REFER TO DETAIL A3/MJ503 . UNIT NOT TO BE INSTALLED INTO EXISTING DUCTWORK. BID WORK UNDER BID PACKAGE 1.
6	MODIFY EXISTING AHU IN MECHANICAL MEZZANINE FOR HUMIDITY CONTROL. REFER TO SHEET MJ702 FOR CONTROLS MODIFICATIONS. BID WORK UNDER BID PACKAGE 2.
7	BLANK OFF EXISTING WALL LOUVER AND INSULATE. BID WORK UNDER BID PACKAGE 2.
8	INSTALL HUMIDISTAT 48 INCHES AFF IN MECHANICAL ROOM. BID WORK UNDER BID PACKAGE 1.
9	PROVIDE 30A, 3P, NONFUSED, NEMA 1 DISCONNECT SWITCH AT AHU-01 AND EXTEND 3#12,#12G, 3/4"C TO EXISTING PANEL "LBX". PROVIDE NEW 20A/3P CIRCUIT BREAKER IN EXISTING SPACE IN PANEL. EXTEND CIRCUIT FROM SWITCH TO AHU IN FLEXIBLE METALLIC CONDUIT.
10	PROVIDE 20A SINGLE POLE MOTOR RATED SWITCH AT AIR PURIFIER AND EXTEND 2#12,#12G,3/4"C TO EXISTING PANEL "LBX". PROVIDE NEW 20A/1P CIRCUIT BREAKER IN EXISTING SPACE IN PANEL. EXTEND CIRCUIT FROM SWITCH TO AIR PURIFIER IN FLEXIBLE METALLIC CONDUIT.

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PROJECT NO.:	R317334.01
DRAWN BY:	C.TORRES
REVIEWED BY:	J.KLUBER
APPROVED BY:	J.KLUBER

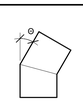
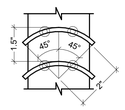
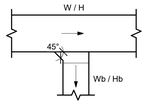
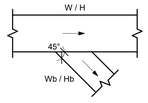
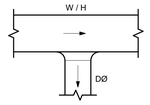
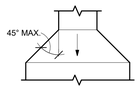
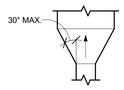
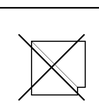
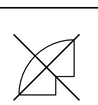
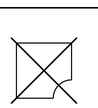
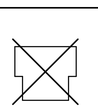
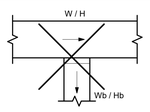
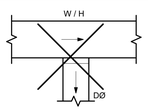
SHEET TITLE:

HVAC PLAN

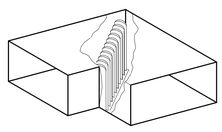
SHEET NUMBER:

MJ-101

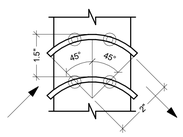
RECTANGULAR

ELBOWS				
	• IF θ IS EQUAL TO OR LESS THAN 30°, THEN TURNING VANES MAY BE OMITTED. • IF θ IS GREATER THAN 30°, THEN TURNING VANES MUST BE INSTALLED	• USE RADIUS ELBOWS DOWNSTREAM OF VAV TERMINALS AND FAN COIL UNITS AND OTHER LOW VELOCITY DUCTS. • r/W = 1.0 FOR VELOCITIES LESS THAN 2,000 FPM. • r/W = 1.5 FOR VELOCITIES 2,000 FPM AND GREATER IF SPACE PERMITS, OTHERWISE USE MITERED ELBOW WITH TURNING VANES.	• USE MITERED ELBOWS WITH TURNING VANES UPSTREAM OF VAV TERMINALS AND ELSEWHERE INDICATED ON PLANS WHERE RADIUS ELBOWS DO NOT FIT. • TURNING VANES PER ADJACENT DETAIL AND SMACNA DUCT CONSTRUCTION STANDARDS. PROVIDE TURNING VANES IN ALL MITERED ELBOWS WITH A TURNING ANGLE GREATER THAN 30°, EVEN IF NOT GRAPHICALLY INDICATED ON PLANS.	SINGLE THICKNESS TURNING VANE CONFIGURATION ASHRAE DUCT FITTING NO. CR3-9
TEES AND TAPS				
	• BULLHEAD TEES MUST USE TURNING VANES PER IDENTICAL CONFIGURATION NOTED ABOVE.	• LOW-LOSS TAP • HEIGHT OF MAIN DUCT (H) MUST AT LEAST TWO INCHES TALLER THAN BRANCH HEIGHT (Hb).	• ANGLED TAP • HEIGHT OF MAIN DUCT (H) MUST AT LEAST TWO INCHES TALLER THAN BRANCH HEIGHT (Hb).	• ROUND BELLMOUTH / CONICAL TAP • HEIGHT OF MAIN DUCT (H) MUST AT LEAST FOUR INCHES TALLER THAN ROUND BRANCH DIAMETER (DØ).
TRANSITIONS				
	• DUCT TRANSITIONS • ECCENTRIC TRANSITIONS MUST USE A 15° TRANSITION ANGLE IF SPACE PERMITS. IF SPACE DOES NOT PERMIT THEN USE NEXT LARGER SIZE TRANSITION IN 15° INCREMENTS.	• DUCT TRANSITION TO AHU SUCTION • MAXIMUM 45° TRANSITION ANGLE IF SPACE PERMITS. IF SPACE DOES NOT PERMIT THEN USE NEXT LARGER SIZE TRANSITION IN 15° INCREMENTS.	• DUCT TRANSITION FROM AHU SUPPLY • MAXIMUM 30° TRANSITION ANGLE IF SPACE PERMITS. IF SPACE DOES NOT PERMIT THEN USE NEXT LARGER SIZE TRANSITION IN 15° INCREMENTS.	
PROHIBITED FITTINGS				
	• MITERED ELBOWS WITHOUT TURNING VANES	• RADIUS ELBOWS THAT REDUCE FLOW AREAS	• RADIUS ELBOWS THAT DO NOT MAINTAIN TURNING GEOMETRY	• TEES WITHOUT TURNING VANES
PROHIBITED FITTINGS				
	• RECTANGULAR DUCT BRANCH WITH STRAIGHT TAP (WITHOUT ANGLED TRANSITION)	• ROUND DUCT BRANCH WITH STRAIGHT TAP (WITHOUT SMOOTH TRANSITION)		

B1 DUCT FITTING STANDARDS
NOT TO SCALE

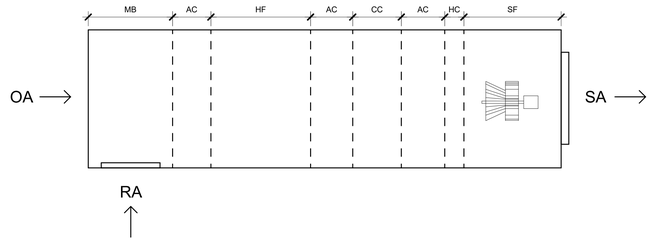


RECTANGULAR OR OVAL DUCT ELBOW



TURNING VANE GEOMETRY
ASHRAE DUCT FITTING NO. CR3-9

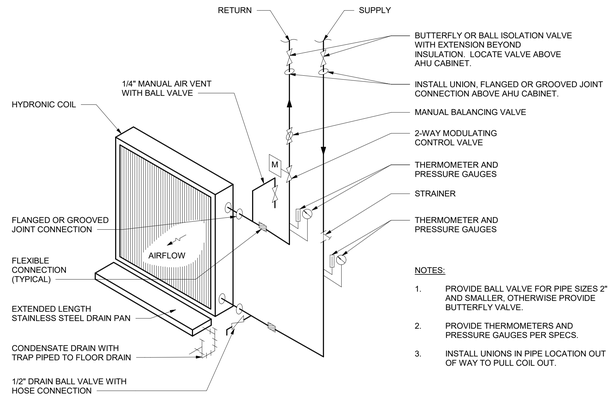
A1 TURNING VANE - SINGLE THICKNESS
NOT TO SCALE



AHU-01 FRONT VIEW

	VARIABLE	DESCRIPTION	AHU-01		NOTES
UNIT DIMS (IN.)	L	CABINET LENGTH	TBD		TOTAL CABINET LENGTH
	W	CABINET WIDTH	TBD		TOTAL CABINET WIDTH
	H	CABINET HEIGHT	TBD		TOTAL CABINET HEIGHT; DOES NOT INCLUDE BASE RAIL
SECTION DIMENSIONS (IN.)	MB	MIXING BOX	TBD		PROVIDE LOW-LEAKAGE DAMPER. PROVIDE ACCESS DOOR. PROVIDE LED MARINE LIGHT.
	HF	FILTER SECTION	TBD		PROVIDE ACCESS DOOR. MERV 13 FILTER.
	HC	HOT WATER COIL SECTION	TBD		HEATING COIL
	AC	ACCESS SECTION	TBD		PROVIDE ACCESS DOOR. PROVIDE LED MARINE LIGHT.
	CC	CHILLED WATER COIL SECTION	TBD		PROVIDE ACCESS DOOR AND EXTENDED DRAIN PAN. PROVIDE LED MARINE LIGHT.
	SF	SUPPLY FAN SECTION	TBD		PROVIDE ACCESS DOOR. PROVIDE LED MARINE LIGHT. PROVIDE VIEW WINDOW.

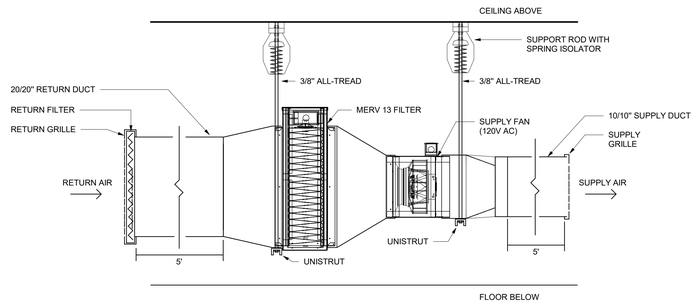
C4 AIR-HANDLING UNIT DIAGRAMS
NOT TO SCALE



NOTES:

1. PROVIDE BALL VALVE FOR PIPE SIZES 2" AND SMALLER, OTHERWISE PROVIDE BUTTERFLY VALVE.
2. PROVIDE THERMOMETERS AND PRESSURE GAUGES PER SPECS.
3. INSTALL UNIONS IN PIPE LOCATION OUT OF WAY TO PULL COIL OUT.

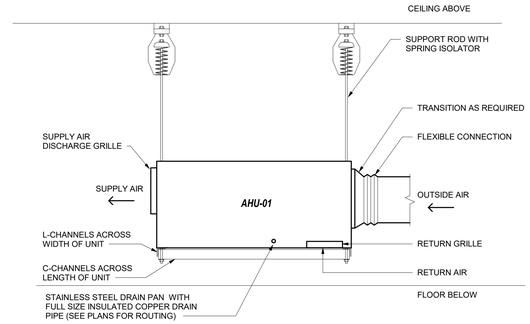
B4 AIR-HANDLING UNIT (AHU-01) HOT WATER AND CHILL WATER COIL CONNECTION
NOT TO SCALE



NOTE:

1. INSTALL SUPPLY GRILLE AT LEAST 10 FEET AWAY FROM RETURN/FILTER GRILLE.

A3 AIR PURIFIER DETAIL
NOT TO SCALE



NOTE:
PROVIDE PRIMARY DRAIN PAN CONDENSATE SWITCH THAT DE-ENERGIZES THE UNIT WHEN WATER DOES NOT DRAIN FROM CONDENSATE PAN.

A5 AHU-01 SUSPENDED MOUNTING DETAIL
NOT TO SCALE

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04/12/2024

THE STATE OF TEXAS COUNTY OF GALVESTON

CITY OF GALVESTON

GALVESTON COUNTY / INDOOR AIR QUALITY IMPROVEMENTS CONFINEMENT FACILITIES

CITY OF GALVESTON

ISSUES / REVISIONS LOG:

MARK	DATE	DESCRIPTION

PROJECT NO.:	R317334.01
DRAWN BY:	C.TORRES
REVIEWED BY:	J.KLUBER
APPROVED BY:	J.KLUBER

SHEET TITLE:

MECHANICAL DETAILS

SHEET NUMBER:

MJ-501

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AIR-HANDLING UNIT SCHEDULE

GENERAL	UNIT TAG	***AHU-01***
	SYSTEM TYPE	CV
	MANUFACTURER	TBD
	MODEL NUMBER	TBD
	AREA SERVED	GALVESTON JUVENILE JUSTICE CENTER
	UNIT WEIGHT - LBS	TBD
SUPPLY FAN	AIRFLOW (CFM)	4,000
	OUTSIDE AIRFLOW (CFM)	2,000
	EXTERNAL STATIC PRESSURE (IN WG)	0.5
	TOTAL STATIC PRESSURE (IN WG)	6.3
	BRAKE POWER (HP)	1.64
	MOTOR POWER (HP)	2
	MOTOR SPEED (RPM)	1,150
	MOTOR ENCLOSURE	ODP
	VOLTAGE / PHASE	208 / 3
	DRIVE TYPE	DIRECT
	FAN SPEED (RPM)	773
PRE-FILTER	TYPE (EFFICIENCY)	ANGLED FILTER (MERV 8)
	CLEAN PRESSURE DROP (IN WG)	0.20
	DIRTY PRESSURE DROP (IN WG)	1.00
CHILLED WATER COIL	AIRFLOW (CFM)	4,000
	TOTAL CAPACITY (BTU/H)	133,704
	SENSIBLE CAPACITY (BTU/H)	98,253
	ENTERING AIR TEMPERATURE DB / WB (°F)	84 / 72
	LEAVING AIR TEMPERATURE DB / WB (°F)	55 / 54
	MAX FACE VELOCITY (FPM)	500
	AIR PRESSURE DROP (IN WG)	0.5
	ROWS	6
	WATER FLOW RATE (GPM)	46
	WATER PRESSURE DROP (FT WATER)	13
	TUBE WATER VELOCITY (FPS)	4
	ENTERING WATER TEMPERATURE (°F)	42
	LEAVING WATER TEMPERATURE (°F)	58
HEATING WATER COIL	AIRFLOW (CFM)	4,000
	TOTAL CAPACITY (BTU/H)	32,400
	ENTERING AIR TEMPERATURE - DB (°F)	52
	LEAVING AIR TEMPERATURE - DB (°F)	72
	MAX FACE VELOCITY (FPM)	500
	AIR PRESSURE DROP (IN WG)	0.11
	ROWS / FINS PER INCH	2 / 12
	WATER FLOW RATE (GPM)	32.4
	WATER PRESSURE DROP (FT WATER)	10
	TUBE WATER VELOCITY (FPS)	4
	ENTERING WATER TEMPERATURE (°F)	180
	LEAVING WATER TEMPERATURE (°F)	160
NOTES		1,2,3,4,5,6,7,8,9,10,11

NOTES:

1. RATE MOTOR AND TOTAL STATIC PRESSURE FOR DIRTY FILTER CONDITION.
2. PROVIDE WITH FACTORY-WIRED SINGLE POINT OF POWER ELECTRICAL CONNECTION.
3. PROVIDE PREMIUM EFFICIENCY, INVERTER-DUTY RATED FAN MOTORS AND MOTOR SHAFT GROUNDING RING.
4. PROVIDE VFD IN NEMA 12 ENCLOSURE WITH INTEGRAL DISCONNECT.
5. PROVIDE STAINLESS STEEL DRAIN PANS.
6. UNIT CONSTRUCTION SHALL BE 2 INCH DOUBLE-WALL.
7. UNIT PANEL INSULATION SHALL BE A MINIMUM R-15.
8. UNIT SHALL HAVE LATCHED ACCESS DOORS IN SECTIONS REQUIRING SERVICE. SCREW PANELS ARE NOT ACCEPTABLE.
9. PROVIDE LOW-LEAKAGE, MODULATING OUTDOOR AIR DAMPER.
10. REFER TO DETAIL C4/M-501 FOR UNIT DIMENSIONS AND SECTION REQUIREMENTS.
11. HEATING AND CHILLED WATER COILS SHALL HAVE PHENOLIC COATING.

LOUVER SCHEDULE

GENERAL												OPTIONS AND ACCESSORIES								NOTES
UNIT TAG	SYSTEM SERVED	MANUFACTURER AND MODEL	LOUVER TYPE	AIRFLOW (CFM)	WIDTH (INCHES)	HEIGHT (INCHES)	DEPTH (INCHES)	LOUVER FREE AREA (FT²)	MAXIMUM AIR VELOCITY (FPM)	AIR PRESSURE DROP (IN WG)	AIRFLOW DIRECTION	BACKDRAFT DAMPER	MOTORIZED DAMPER	SPECIAL SHAPE	INSECT SCREEN	CHANNEL FRAME	FLANGED FRAME	DECORATIVE COATING	PROTECTIVE COATING	
L-1	MECHANICAL MEZZANINE	GREENHECK EAD-635	WIND-DRIVEN RAIN	4,000	48	24	6	3.95	750	0.07	INTAKE		●			●		●		1,2,3

NOTES:

1. BLADE AND FRAMES SHALL BE CONSTRUCTED OF HEAVY GAUGE ALUMINUM, 0.081-INCH WALL THICKNESS.
2. PROVIDE 3/4-INCH MESH ALUMINUM BIRDSCREEN ON INSIDE FACE OF LOUVER.
3. LOUVER SHALL WITHSTAND A MINIMUM 25 POUND PER SQUARE FOOT WIND LOAD.

GENERAL NOTES:

A. NEW LOUVER SHALL BE CORROSION RESISTANT.

AIR PURIFIER SCHEDULE

GENERAL				FAN					NOTES
UNIT TAG	AREA SERVED	MANUFACTURER AND MODEL	SIZE (IN.)	AIRFLOW (CFM)	STATIC PRESSURE (IN WG)	MOTOR		FILTER	
						VOLTS/ HZ	FLA		
AP-1	MECHANICAL MEZZANINE	GENESIS AIR DT-FP	21" X 41" 18"	830	0.1	120 / 1	4.7	MERV 13	1,2,3,4,5
AP-2	MECHANICAL MEZZANINE	GENESIS AIR DT-FP	21" X 41" 18"	830	0.1	120 / 1	4.7	MERV 13	1,2,3,4,5
AP-3	AHU-5 (E)	GENESIS AIR CU-S	-	1,600	0.1	120 / 1	1.6	-	1,2,3,4,5
AP-4	AHU-6 (E)	GENESIS AIR CU-S	-	1,600	0.1	120 / 1	1.6	-	1,2,3,4,5
AP-5	AHU-7 (E)	GENESIS AIR CU-S	-	1,600	0.1	120 / 1	1.6	-	1,2,3,4,5
AP-6	AHU-8 (E)	GENESIS AIR CU-S	-	1,600	0.1	120 / 1	1.6	-	1,2,3,4,5
AP-7	AHU-9 (E)	GENESIS AIR CU-S	-	1,600	0.1	120 / 1	1.6	-	1,2,3,4,5

NOTES:

1. MAX FACE VELOCITY = 500 FEET/MINUTE.
2. PROVIDE MOTOR WITH THERMAL OVERLOAD PROTECTION.
3. PROVIDE MOTOR STARTER.
4. UL/cUL 705 LISTED.
5. TITANIUM DIOXIDE COATED MEDIA..

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MARK	DATE	DESCRIPTION

PROJECT NO.:	R317334.01
DRAWN BY:	C.TORRES
REVIEWED BY:	J.KLUBER
APPROVED BY:	J.KLUBER

SHEET TITLE:

HVAC SCHEDULES

SHEET NUMBER:

MJ-601

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CONTROL SYSTEM GENERAL NOTES

NOTE	DESCRIPTION
A.	DDC STANDS FOR DIRECT DIGITAL CONTROL AND IS USED UNIVERSALLY TO INDICATE A COMMUNICATING NETWORK.
B.	BAS AND BMS STAND FOR BUILDING AUTOMATION SYSTEM AND BUILDING MANAGEMENT SYSTEM. THESE TERMS MAY BE USED INTERCHANGEABLY AND REFER TO THE CONTROL SYSTEM AT THE BUILDING LEVEL.
C.	EMCS AND UMCS STAND FOR ENERGY MANAGEMENT AND CONTROL SYSTEM AND UTILITY MANAGEMENT AND CONTROL SYSTEM. THESE TERMS MAY BE USED INTERCHANGEABLY AND REFER TO A NETWORKED CONTROL SYSTEM THAT MAY BE REMOTE FROM THE BUILDING. WHERE AN EMCS EXISTS, ALL CONTROL POINTS AND INTEROPERABILITY OF THE SYSTEM MUST BE INTEGRATED WITH THE EMCS SYSTEM. IT IS THE RESPONSIBILITY OF THE CONTROLS CONTRACTOR TO COORDINATE WITH OWNER'S EMCS SYSTEM TO PROVIDE FULL INTEGRATION OF NEW ELEMENTS INTO THE EXISTING EMCS SYSTEM.
D.	ALL COMMUNICATIONS MUST BE BACnet OPEN PROTOCOL. ALL EQUIPMENT, CONTROL DEVICES, AND METERS MUST BE ORDERED WITH BACnet COMMUNICATION OPTIONS TO THE MAXIMUM EXTENT POSSIBLE. IN INSTANCES WHERE A DEVICE IS NOT AVAILABLE WITH BACnet PROTOCOL, THEN PROVIDE GATEWAY DEVICES THAT COMMUNICATE BETWEEN THE DEVICE AND THE BACnet NETWORK.
E.	SOME EQUIPMENT MAY HAVE PROPRIETARY CONTROL ALGORITHMS THAT CONTROL THE FUNCTION OF THE UNIT, HOWEVER, THE MANUFACTURER OF THE EQUIPMENT MUST PROVIDE A BACnet CONTROLLER WITH THE EQUIPMENT. THE EQUIPMENT MUST BE PROVIDED WITH TWO-WAY COMMUNICATION TO THE BAS (AND EMCS IF APPLICABLE) FOR I/O POINTS, ALARMS, SCHEDULING, AND REMOTE SETPOINT CHANGES.
F.	BTL STANDS FOR BACnet TESTING LABORATORIES. ALL DDC SYSTEM COMPONENTS MUST BE BTL LISTED TO THE MAXIMUM EXTENT POSSIBLE.
G.	APPLICATION PROGRAMS, CONFIGURATION SETTINGS AND COMMUNICATION INFORMATION MUST BE STORED IN A MANNER SUCH THAT THEY PERSIST THROUGH LOSS OF POWER. APPLICATION PROGRAMS MUST PERSIST REGARDLESS OF THE LENGTH OF TIME POWER IS LOST.
H.	ALL EQUIPMENT AND DDC CONTROLLERS MUST BE CAPABLE OF FULL OPERATION AS A COMPLETELY INDEPENDENT UNIT AND AS A PART OF A DDC SYSTEM WIDE DISTRIBUTED NETWORK.
I.	ALL DEVICES MUST RETAIN NORMAL PROGRAMMING, OPERATING SEQUENCES, AND SCHEDULES IF COMMUNICATIONS FROM THE FRONT-END SYSTEM IS LOST.
J.	ALL CONTROL SETPOINTS LISTED IN CONTROL SEQUENCES MUST BE ABLE TO BE REMOTELY VIEWED AND ADJUSTED FROM THE BUILDING AUTOMATION SYSTEM WORKSTATION (AND EMCS WORKSTATION IF APPLICABLE).
K.	CONTROL AND MONITORING POINTS AVAILABLE THROUGH EQUIPMENT MANUFACTURER'S CONTROLLER (INCLUDING, BUT NOT LIMITED TO CHILLERS, BOILERS, PACKAGED DX EQUIPMENT, COMPUTER ROOM UNITS, ETC. ,) MUST BE FULLY INTEGRATED WITH THE DDC CONTROL SYSTEM. EQUIPMENT SETPOINTS MUST BE ABLE TO BE REMOTELY VIEWED AND ADJUSTED FROM THE BUILDING AUTOMATION SYSTEM WORKSTATION (AND EMCS WORKSTATION IF APPLICABLE).
L.	THE CONTROLS CONTRACTOR AND COMMISSIONING AGENT MUST INCLUDE 5 DAYS EACH DURING THE FIRST YEAR AFTER BUILDING IS OCCUPIED TO OPTIMIZE VAV AND CONTROL VALVE POLLING CONTROL SEQUENCE, SETPOINTS, TIMING INTERVALS AND PRESSURE RESET INCREMENTS.
M.	ALL CONTROL DEVICES MUST BE PROVIDED BY THE CONTROLS CONTRACTOR. ONCE A CONTROL SYSTEM MANUFACTURER IS SELECTED, PROVIDE ALL CONTROL DEVICES FROM THAT MANUFACTURER'S INVENTORY OF PRODUCTS TO THE MAXIMUM EXTENT POSSIBLE.
N.	PROVIDE HAND-OFF-AUTO (HOA) SWITCHES FOR ALL HVAC EQUIPMENT THAT INCLUDES A CONTROL SEQUENCE. HOA SWITCH MAY BE A PHYSICAL SWITCH OR INTEGRATED ELECTRONICALLY THROUGH EQUIPMENT CONTROLLER OR VFD. PROVIDE ALARMS TO THE BAS IF EQUIPMENT IS IN "HAND" MODE OR "OFF" MODE. 1. HAND MODE – EQUIPMENT OPERATES AT FULL SPEED WITHOUT CONTROL SYSTEM INPUT. EQUIPMENT MUST BE INSTALLED TO SHUTDOWN ON SAFETIES WHILE IN HAND MODE. 2. OFF – EQUIPMENT IS TURNED OFF 3. AUTO – EQUIPMENT OPERATES ACCORDING TO CONTROL SEQUENCE
O.	FOR THE PURPOSES OF THESE CONTROL DRAWINGS USE THE FOLLOWING DEFINITIONS 1. N.C. – NORMALLY CLOSED. WHEN ACTUATOR LOSES POWER THE DEVICE IS CLOSED. 2. N.O. – NORMALLY OPEN. WHEN ACTUATOR LOSES POWER THE DEVICE IS OPENED.
P.	CHILLED WATER VALVES, SYSTEM BYPASS VALVES, AND THE CONDENSER WATER TEMPERATURE CONTROL VALVE MUST BE SELECTED WITH A MINIMUM AUTHORITY OF 0.5 AT DESIGN CONDITIONS.

CONTROL DIAGRAM SYMBOLS

GENERAL ELEMENTS		WALL-MOUNTED SENSORS	
	FAN SF = SUPPLY FAN RF = RETURN FAN EF = EXHAUST FAN	CO2	CARBON DIOXIDE SENSOR
	PUMP	CO	CARBON MONOXIDE SENSOR
M	MOTOR	H	HUMIDITY SENSOR
CT	CURRENT TRANSFORMER		
ECM	ELECTRONICALLY COMMUTATED MOTOR CONTROLLER	NO2	NITROGEN DIOXIDE SENSOR
VFD	VARIABLE FREQUENCY DRIVE	P	PRESSURE SENSOR
	HEAT TRANSFER COIL CHW = CHILLED WATER DX = REFRIGERANT COIL HW = HEATING WATER	T	TEMPERATURE SENSOR OR THERMOSTAT
M	OPPOSED-BLADE MOTOR-OPERATED CONTROL DAMPER		
M	PARALLEL-BLADE MOTOR-OPERATED CONTROL DAMPER		
B	GRAVITY BACKDRAFT DAMPER		
S	SMOKE DETECTOR		
T	TEMPERATURE SENSOR (AIR)		
T	FREEZESTAT (AIR - AVERAGING)		
P	OUTSIDE AIR MEASUREMENT SENSOR		
	AIR FILTER		
H L	PRESSURE SENSOR (AIR)		
	HUMIDIFIER		
M	TWO-WAY MOTOR-OPERATED VALVE		
M	THREE-WAY MOTOR-OPERATED VALVE		
T	TEMPERATURE SENSOR (LIQUID)		
	CRITICAL SPACE AIRFLOW VALVE		

NOTE:

NOT ALL OF THE SYMBOLS ON THIS SHEET ARE NECESSARILY USED IN THIS PROJECT.

CV AHU SEQUENCE OF OPERATIONS

AHU-01

AHU-01 IS A 50% OA AIR-HANDLING UNIT WITH HEATING AND COOLING COILS WITH A SUPPLY FAN DRIVEN WITH A VARIABLE FREQUENCY DRIVE. HEATING COILS ARE DOWNSTREAM THE COOLING COILS TO MODULATE AIR HUMIDITY IN THE SPACE.

WHENEVER THE SUPPLY FAN IS DE-ENERGIZED, AS SENSED BY THE STATUS SWITCH, THE OUTSIDE AND EXHAUST AIR DAMPERS SHALL BE CLOSED AND THE RETURN AIR DAMPER SHALL BE OPEN, THE HEATING AND COOLING VALVES SHALL BE CLOSED OR POSITIONED AS DESCRIBED BELOW.

A. OCCUPIED MODE:

1. THE SUPPLY FAN SHALL BE ENERGIZED.
2. THERE SHALL BE SEPARATE HEATING AND COOLING SPACE TEMPERATURE SETPOINTS WITH A 5°F DEADBAND BETWEEN THE HEATING AND COOLING.
3. THE HEATING COIL VALVE AND COOLING COIL VALVE SHALL MODULATE IN SEQUENCE TO MAINTAIN SUPPLY AIR TEMPERATURE SETPOINT. THERE SHALL BE A DEADBAND BETWEEN HEATING AND COOLING.
4. MINIMUM OUTSIDE AIR: THE MINIMUM OA FLOW RATE IS 50%. WHEN SUPPLY FAN IS ENERGIZED, MODULATE OA AND RA DAMPERS TO BRING IN 50% OA.
5. ECONOMIZER MODE: MODULATE OA DAMPER TO 100% OPEN. RETURN AIR DAMPER IS CLOSED WHEN OUTSIDE AIR IS ABOVE 55°F (ADJUSTABLE) AND OUTSIDE ENTHALPY IS BELOW 28 BTU/LB.
6. SUPPLY AIR TEMPERATURE SETPOINT SHALL BE RESET BASED ON SPACE TEMPERATURE ACCORDING TO THE FOLLOWING RESET SCHEDULE:

SUPPLY AIR TEMPERATURE SETPOINT	SPACE TEMPERATURE
55°F	SETPOINT +2°F
85°F	SETPOINT -2°F

ALL PARAMETERS SHALL BE INDEPENDENTLY ADJUSTABLE.

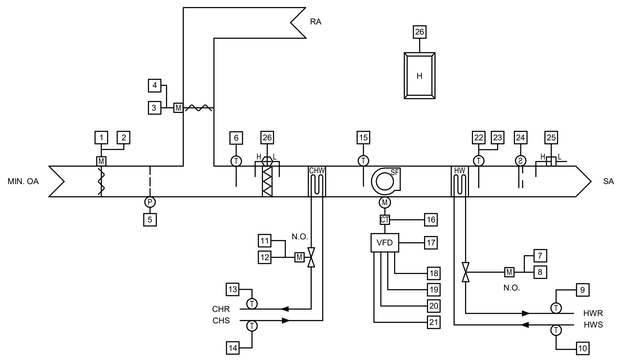
7. THE SOFTWARE SHALL PREVENT:
   A. THE HEATING SETPOINT FROM EXCEEDING THE COOLING SETPOINT MINUS 5°F (I.E. THE MINIMUM DEADBAND SHALL BE 5°F);
   B. THE UNOCCUPIED HEATING SETPOINT FROM EXCEEDING THE OCCUPIED HEATING SETPOINT; AND THE UNOCCUPIED COOLING SETPOINT FROM BEING LESS THAN THE OCCUPIED COOLING SETPOINT.
8. HUMIDITY CONTROL: HUMIDITY SENSOR SHALL BE PLACED AFTER THE CHILLED WATER COIL TO MEASURE THE HUMIDITY OF THE SUPPLY AIR. GLOBAL HUMIDISTAT SHALL BE PLACED IN THE ROOM THE UNIT IS INSTALLED IN TO MEASURE HUMIDITY OF THE SPACE. IF RELATIVE HUMIDITY IS DETECTED TO BE ABOVE 65%, HEATING COILS SHALL ENGAGE TO REDUCE THE HUMIDITY IN THE SUPPLY AIR TO BELOW 65%. SYSTEM TO REFERENCE GLOBAL HUMIDISTAT TO MONITOR SUPPLY AIR HUMIDITY.

B. SAFETY SHUTDOWNS

1. DUCT SMOKE DETECTION, SPACE SMOKE DETECTION, AND LOW TEMPERATURE LIMIT TRIPS SHALL DE-ENERGIZE THE SUPPLY FAN AND CLOSE THE OUTSIDE AIR DAMPERS. MANUAL RESET OF THE TRIPPED DEVICE SHALL BE REQUIRED TO RESTART THE SYSTEM.
2. WHEN THE OA TEMPERATURE IS BELOW THE OUTSIDE AIR LOW TEMPERATURE PROTECTION SETPOINT 35°F (ADJUSTABLE) AND THE AIR HANDLER HAS SHUT DOWN IN ALARM, THE HEATING AND COOLING VALVES SHALL CYCLE AS DESCRIBED PREVIOUSLY IN THE UNOCCUPIED OFF COIL PROTECTION MODE.

CV AHU INPUT/OUTPUT POINTS SCHEDULE

UNIT TAG		POINT DESCRIPTION	ANALOG INPUT	ANALOG OUTPUT	BINARY INPUT	BINARY OUTPUT	CALCULATED VALUE	NOTES
AHU-01	1	OUTSIDE AIR DAMPER POSITION	●					
	2	OUTSIDE AIR DAMPER COMMAND				●		
	3	RETURN AIR DAMPER POSITION	●					
	4	RETURN AIR DAMPER COMMAND				●		
	5	OUTSIDE AIR MEASUREMENT SENSOR	●	●				
	6	MIXED AIR TEMPERATURE	●					
	7	HEATING COIL VALVE COMMAND		●				
	8	HEATING COIL VALVE POSITION	●					
	9	HEATING WATER RETURN TEMPERATURE	●					
	10	HEATING WATER SUPPLY TEMPERATURE	●					
	11	COOLING COIL VALVE COMMAND		●				
	12	COOLING COIL VALVE POSITION	●					
	13	CHILLED WATER RETURN TEMPERATURE	●		●			HARDWIRE SHUTDOWN
	14	CHILLED WATER SUPPLY TEMPERATURE	●					AIRFLOW PROOF
	15	FREEZESTAT	●		●			
	16	SUPPLY FAN STATUS				●		
	17	SUPPLY FAN SPEED FEEDBACK	●					
	18	SUPPLY FAN START/STOP				●		
	19	SUPPLY FAN COMMAND		●				
	20	SUPPLY FAN VFD FAULT			●			
	21	SUPPLY FAN PRESSURE	●					
	22	SUPPLY AIR TEMPERATURE	●					HARDWIRE SHUTDOWN
	23	SUPPLY AIR TEMPERATURE SETPOINT		●				
	24	SUPPLY AIR SMOKE ALARM			●			
	25	SUPPLY AIR HIGH STATIC LIMIT			●			
	26	HUMIDISTAT	●					



OCCUPANY SCHEDULE

PARAMETER	SETPOINT TIME RANGE
OCCUPIED	24 HOURS

GENERAL NOTES:

A. ALL SETPOINT TIME RANGES MUST BE ADJUSTABLE.
B. ALL SPACE TEMPERATURE SENSORS MUST INCLUDE OCCUPANT OVERRIDE BUTTONS WHICH SWITCH THE RESPECTIVE UNIT FROM UNOCCUPIED MODE TO OCCUPIED MODE.

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04/12/2024

THE STATE OF TEXAS
COUNTY OF GALVESTON

CITY OF GALVESTON

GALVESTON COUNTY / INDOOR AIR QUALITY IMPROVEMENTS CONFINEMENT FACILITIES

CITY OF GALVESTON

ISSUES / REVISIONS LOG:

MARK	DATE	DESCRIPTION

PROJECT NO.:	R317334.01
DRAWN BY:	C.TORRES
REVIEWED BY:	J.KLUBER
APPROVED BY:	J.KLUBER

SHEET TITLE:

CONTROL DIAGRAMS

SHEET NUMBER:

MJ-701

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CV AHU SEQUENCE OF OPERATIONS (E)

AHU-1 (E), AHU-2 (E), AHU-3 (E)

COORDINATION OF EXISTING AIR HANDLING UNIT SEQUENCES: ENSURE THAT COOLING AND HEATING COIL CONTROLS HAVE COMMON INPUTS AND DO NOT OVERLAP IN FUNCTION. SEQUENCE OF OPERATIONS TO MATCH EXISTING CONTROL CONFIGURATIONS WITH THE ADDITION OF HUMIDITY CONTROL.

A. OCCUPIED MODE:

1. THE SUPPLY FAN SHALL BE ENERGIZED.

2. THERE SHALL BE SEPARATE HEATING AND COOLING SPACE TEMPERATURE SETPOINTS WITH A 5°F DEADBAND BETWEEN THE HEATING AND COOLING.

3. THE HEATING COIL VALVE AND COOLING COIL VALVE SHALL MODULATE IN SEQUENCE TO MAINTAIN SUPPLY AIR TEMPERATURE SETPOINT. THERE SHALL BE A DEADBAND BETWEEN HEATING AND COOLING.

4. MINIMUM OUTSIDE AIR: THE MINIMUM OA FLOW RATE IS ESTABLISHED BY THE REQUIRED OUTDOOR AIR FLOW WITH NO OCCUPANTS (V_{ot}) AND THE REQUIRED OUTDOOR AIR FLOW AT DESIGN OCCUPANCY (V_{ot}). THE DAMPER POSITIONS CORRESPONDING TO THESE TWO AIRFLOW RATES SHALL BE SET IN CONJUNCTION WITH THE BALANCE CONTRACTOR. THE OA DAMPER SHALL MODULATE BETWEEN THE NO OCCUPANTS POSITION AND THE DESIGN OCCUPANCY POSITION AS THE SPACE CO_2 CONCENTRATION VARIES FROM 400 PPM (AMBIENT) TO 1,500 PPM (ADJUSTABLE).

5. SUPPLY AIR TEMPERATURE SETPOINT SHALL BE RESET BASED ON SPACE TEMPERATURE ACCORDING TO THE FOLLOWING RESET SCHEDULE:

SUPPLY AIR TEMPERATURE SETPOINT	SPACE TEMPERATURE SETPOINT
55°F	SETPOINT +2°F
85°F	SETPOINT -2°F

ALL PARAMETERS SHALL BE INDEPENDENTLY ADJUSTABLE.

6. THE SOFTWARE SHALL PREVENT:
   A. THE HEATING SETPOINT FROM EXCEEDING THE COOLING SETPOINT MINUS 5°F (I.E. THE MINIMUM DEADBAND SHALL BE 5°F);
   B. THE UNOCCUPIED HEATING SETPOINT FROM EXCEEDING THE OCCUPIED HEATING SETPOINT; AND THE UNOCCUPIED COOLING SETPOINT FROM BEING LESS THAN THE OCCUPIED COOLING SETPOINT.

7. HUMIDITY CONTROL: GLOBAL HUMIDISTAT SENSOR SHALL BE PLACED IN THE ROOM THE UNITS ARE INSTALLED IN TO MEASURE HUMIDITY OF THE SPACE. IF RELATIVE HUMIDITY IS DETECTED TO BE ABOVE 65%, HEATING COILS SHALL ENGAGE TO REDUCE THE HUMIDITY IN THE SUPPLY AIR TO BELOW 65%.

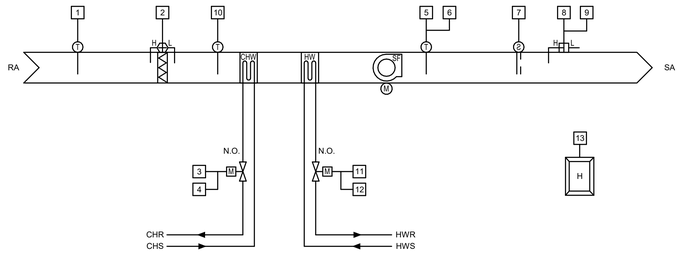
B. SAFETY SHUTDOWNS

1. DUCT SMOKE DETECTION, SPACE SMOKE DETECTION, AND LOW TEMPERATURE LIMIT TRIPS SHALL DE-ENERGIZE THE SUPPLY FAN AND CLOSE THE OUTSIDE AIR DAMPERS. MANUAL RESET OF THE TRIPPED DEVICE SHALL BE REQUIRED TO RESTART THE SYSTEM.

2. WHEN THE OA TEMPERATURE IS BELOW THE OUTSIDE AIR LOW TEMPERATURE PROTECTION SETPOINT 35°F (ADJUSTABLE) AND THE AIR HANDLER HAS SHUT DOWN IN ALARM, THE HEATING AND COOLING VALVES SHALL CYCLE AS DESCRIBED PREVIOUSLY IN THE UNOCCUPIED OFF COIL PROTECTION MODE.

CV AHU INPUT/OUTPUT POINTS SCHEDULE (E)

UNIT TAG		POINT DESCRIPTION	ANALOG INPUT	ANALOG OUTPUT	BINARY INPUT	BINARY OUTPUT	CALCULATED VALUE	NOTES
AHU-1 (E), AHU-2 (E), AHU-3 (E)	1	RETURN AIR TEMPERATURE	●					EXISTING
	2	FILTER PRESSURE SENSOR - SUPPLY AIR	●					PRE-FILTER, EXISTING
	3	COOLING COIL VALVE COMMAND		●				EXISTING
	4	COOLING COIL VALVE POSITION	●					EXISTING
	5	SUPPLY AIR TEMPERATURE	●					EXISTING
	6	SUPPLY AIR TEMPERATURE SETPOINT		●				EXISTING
	7	SUPPLY AIR SMOKE DETECTOR						EXISTING
	8	SUPPLY FAN PRESSURE	●					EXISTING
	9	SUPPLY AIR HIGH STATIC LIMIT			●			HARDWIRE SHUTDOWN, EXISTING
	10	FREEZESTAT	●		●			EXISTING
	11	HEATING COIL VALVE COMMAND	●					EXISTING
	12	HEATING COIL VALVE POSITION		●				EXISTING
	13	HUMIDISTAT	●					NEW



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SHEET TITLE:

CONTROL DIAGRAMS

SHEET NUMBER:

MJ-702

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