



# Manatee County Judicial Center

Bradenton, Florida

As Prepared By

## Boyd Brothers Service, Inc.

2460 Highlands Rd.  
Port Charlotte, Florida 33983

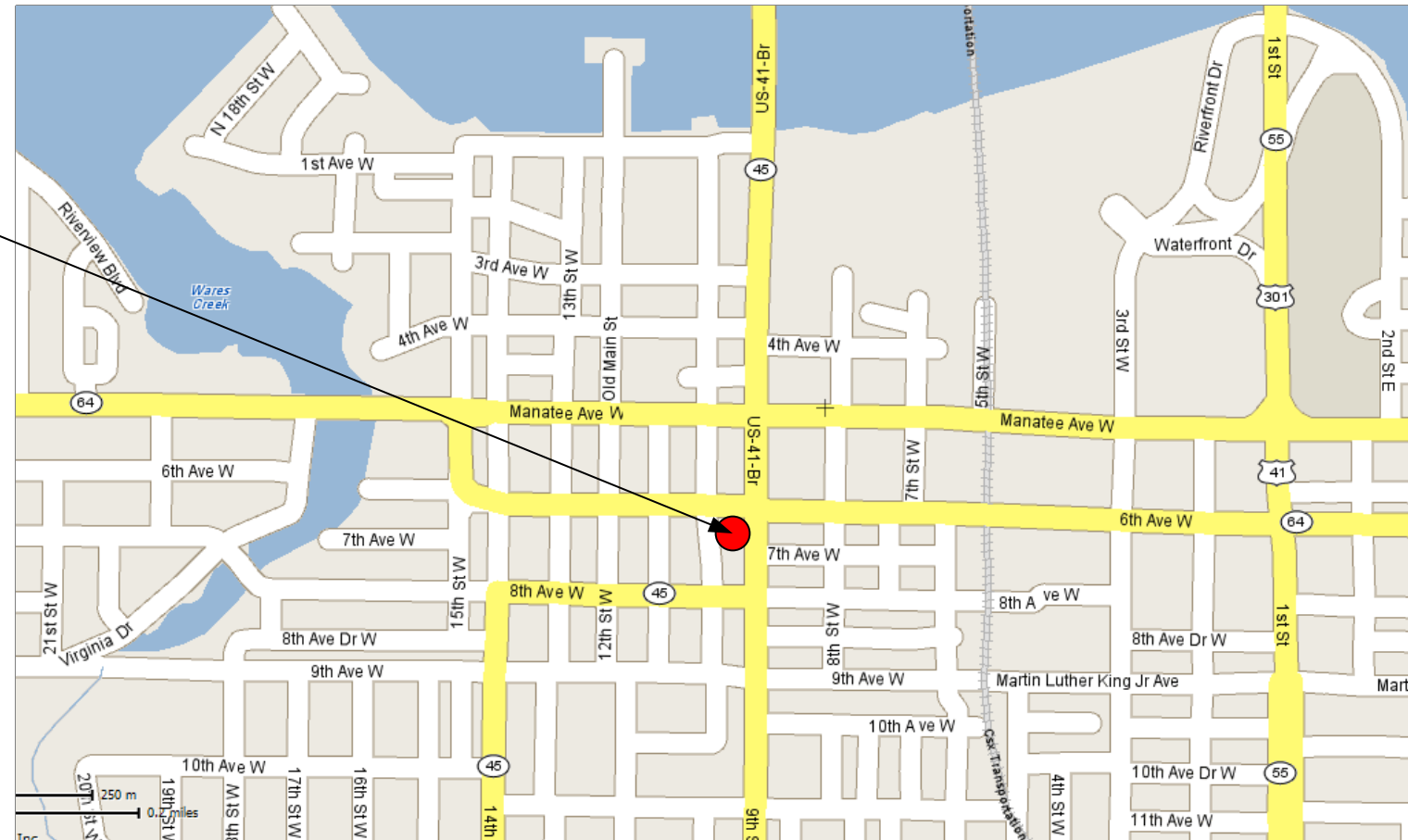
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**AUTOMATEDLOGIC**<sup>®</sup>  
CORPORATION

Manatee County  
Judicial Center

Job Site Location:



# BOYD BROTHERS SERVICE, INC.

2460 HIGHLANDS ROAD  
PORT CHARLOTTE, FLORIDA 33983  
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**Architect**  
Hellmuth, Obata & Kassabaum, Inc.

**Associate Architect**  
Fawley Bryant Architects, Inc.

**Civil Engineering**  
WilsonMiler, Inc.

**Structural Engineering**  
Walter P. Moore & Associates, Inc.  
Chris R. Walker, P.E. Inc.

**Mechanical / Electrical / Fire Protection Engineering**  
Tilden Lobnitz Cooper

**Landscape Architect**  
John Moody & Associates, Inc.

**Hazardous Material Abatement Design**  
Mactec Engineering & Consulting of Georgia, Inc.

## AUTOMATED LOGIC BUILDING AUTOMATION SYSTEM

REVISION DATA

No	Date	Description	By
1	08/01/06	SUBMITTAL	CLT

FILENAME: fb75026f-1862-452b-aeed-f4e5932e6a78.vsd

PROJECT

**Manatee County Judicial Center**  
Bradenton, Florida


GB  
Project Manager

CLT  
Project Engineer

1007-26894  
Job Number

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Section 15950			
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# Symbol Legend

RSBASIC Zone Temperature Sensor	DX Cooling Coil	Parallel Blade Damper with Actuator	High Static Pressure Switch	Exhaust Fan	Pump
RSPRO Zone Temperature Sensor	Electric Heating Coil	Manual Valve	Current Transducer	Water Cooled Chiller	Server Tower
Outdoor Air Temperature / Humidity Sensor	Gas Heating	2 - Way Valve with Actuator	Liquid Flow Sensor	Cooling Tower	Work Station
Zone Humidity Sensor	Hot Water Heating Coil	3 - Way Valve with Actuator	Air Flow Sensor	Heat Exchanger	Laptop Computer
Zone Temperature Sensor	Chilled Water Cooling Coil	Averaging Duct Temperature Sensor	Control Transformer	Air Cooled Chiller	Printer
Combination Zone Temperature/Humidity Sensor	Steam Coil	Immersion Temperature Sensor w/ Well	Power Supply	Hot Water Boiler	VAV Box
Logistat Plus Room Temperature Sensor	Humidifier	Duct Humidity Sensor	Alarm Horn	Steam Converter	PIU
Logistat Pro Room Temperature Sensor	Filter	FreezeStat	Alarm Light	Fan	Fan w/ Inlet Vane Control
Opposed Blade Damper with Actuator	Air Flow Station	Smoke Detector	Network Hub	Relay	
Differential Pressure Switch	Differential Pressure Sensor				

## Symbol Notes

- 120 VAC --- 120 VAC POWER TO PANELS AND CONDUIT BY DIV. 16. POWER SUPPLY DEDICATED PER PANEL.
- 120 VAC UPS --- 120 VAC UPS POWER AND CONDUIT TO FIELD MODULE PANELS (FMPs) BY CONTROLS INSTALLATION SUBCONTRACTOR. POWER SUPPLY DEDICATED PER PANEL.
- 120 VAC UPS --- 120 VAC UPS POWER AND CONDUIT TO FIELD MODULE PANELS (FMPs) BY DIV. 16. ONE DEDICATED UPS CIRCUIT PER FMP. THESE CIRCUITS ARE INTENDED FOR MISSION CRITICAL OPERATIONS.
- TERM 485 120 OHM TERMINATING RESISTOR
- PROT 485 NETWORK BOARD
- DIAG 485 NETWORK BOARD
- FIBER 485 FIBER OPTIC CONVERTER
- REP 485 NETWORK REPEATER
- ETHERNET CONNECTION JACK
- EQUIPMENT CONTROLLED / MONITORED BY ALC BUILDING AUTOMATION SYSTEM
- ALCS CONTROL PANEL (FMP)
- ZONE HUMIDITY SENSOR
- ZONE TEMPERATURE SENSOR
- COMBINATION ZONE TEMPERATURE/HUMIDITY SENSOR
- ZONE HYDROGEN SENSOR
- DIFFERENTIAL PRESSURE TRANSDUCER
- STATIC PRESSURE TRANSDUCER
- UNITARY CONTROLLER
- CABLE/WIRE TYPE MARKER
- INSTALLATION DETAILS REFERENCE (REFER TO THE INSTALLATION DETAILS PAGES FOR THE APPROPRIATE DETAIL)
- PAGE NOTE REFERENCE (THE NUMBER IN THE OVAL REFERS TO THE APPROPRIATE NOTE NUMBER IN THE NOTES TEXT BLOCK)
- TCP-# PANEL NOMENCLATURE

<b>Manatee County Judicial Center</b>			
Bradenton, Florida			
Section 15950			
Symbol Legend			
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# Abbreviation/Installation Notes

ARCNET - Network Comm 156K	E - Existing	PSI - Pounds Per Square Inch
A/C - Alternating Current	EA - Exhaust Air	PWR - Power
ACU - Air Conditioning Unit	EAD - Exhaust Air Damper	R - Relay
ADA - Americans with Disabilities Act	ECON - Economizer	RA - Return Air
AFF - Above Finished Floor	EDH - Electric Duct Heater	RAD - Return Air Damper
AHU - Air Handling Unit	EF - Exhaust Fan	RET - Return
AI - Analog Input	EPO - Emergency Power Off	REV - Revision
ALM - Alarm	EVAP - Evaporator	RF - Return Fan
AMP - Ampere	F - Fahrenheit	RH - Relative Humidity
AO - Analog Output	FBO - Furnished by Others	RM - Room
AUTO - Automatic	FCU - Fan Coil Unit	RTU - Rooftop Unit
AUX - Auxiliary	FM-200 - Chemical Fire Suppression	S - Shield
AWG - American Wire Gauge	FMP - Field Module Panel	S/S - Start / Stop
BAI - BACnet Analog Input	FO - Fuel Oil	SA - Supply Air
BAO - BACnet Analog Output	FOP - Fuel Oil Pump	SAT - Supply Air Temperature
BAS - Building Automation System	FS - Flow Switch	SCHWP - Secondary Chilled Water Pump
BBI - BACnet Binary Input	G or GND - Ground	SCHWR - Secondary Chilled Water Return
BBO - BACnet Binary Output	GEN - Generator	SCHWS - Secondary Chilled Water Supply
BFF - Below Finished Floor	GPM - Gallons Per Minute	SCWP - Secondary Condenser Water Pump
BH - Basin Heater	H - Hot (AC Voltage)	SD - Smoke Detector
BKUP - Backup	H2 - Hydrogen	SF - Supply Fan
BLR - Boiler	HD - Heating Deck	SP - Static Pressure
BOM - Bill Of Materials	HGB - Hot Gas Bypass	SPDT - Single Pole Double Throw
BTU - British Thermal Units	HOA - Hand/Off/Auto	SPST - Single Pole Single Throw
C - Celsius	HP - Heat Pump	SSP - Systems & Service Provider
CAV - Constant Air Volume	HRU - Heat Recovery Unit	ST - Status
CCW - Counter Clockwise	HTX - Heat Exchanger	STP - Setpoint
CD - Cooling Deck	HU - Humidifier	STS - Static Transfer Switch
CFM - Cubic Feet Per Minute	HW - Hot Water	SUP - Supply
CHIV - Chiller Isolation Valve	HWP - Hot Water Pump	SW - Switch
CHLR - Chiller	HWR - Hot Water Return	T/S - Twisted Shielded
CHW - Chilled Water	HWS - Hot Water Supply	TB - Terminal Block
CHWP - Chilled Water Pump	ID - Inside Diameter	TD - Time Delay
CHWR - Chilled Water Return	I/O - Input/Output	TEMP - Temperature
CHWS - Chilled Water Supply	IAQ - Indoor Air Quality	TP - Total Pressure
CHWV - Chilled Water Valve	IP - Internet Protocol	TPI - Third Party Interface
CM - Control Module	ISO - Isolation	TWR - Cooling Tower
COND - Condenser	L - Line Voltage	TX - Transformer
CRAC - Computer Room Air Conditioner	LL - Liquid Level	UH - Unit Heater
CRAH - Computer Room Air Handler	LS - LogiStat	UL - Underwriters Laboratories
CRU - Computer Room Unit	LVL - Level	UNET - U-Card Comm Network
CS - Current Switch	mA - Milliamp	UPS - Uninterrupted Power Supply
CT - Current Transducer	MAD - Mixed Air Damper	UST - Underground Storage Tank
CTM - Current Transmitter	MAT - Mixed Air Temperature	UV - Unit Ventilator
CTRL - Control	MAU - Makeup Air Unit	VA - Apparent Power (Voltage * Amperage)
CTX - Current Transformer	MAX - Maximum	VAC - AC Voltage
CU - Condensing Unit	MGR - Manager	VAV - Variable Air Volume
CUH - Cabinet Unit Heater	MIN - Minimum	VD - Volume Damper
CW - Clockwise	MISC - Miscellaneous	VDC - DC Voltage
CNDW - Condenser Water	N - Neutral	VESDA - Very Early Smoke Detecting Apparatus
CWBV - Condenser Water Bypass Valve	NC - Normally Closed	VFD - Variable Frequency Drive
CWIV - Condenser Water Isolation Valve	NEC - National Electric Code	VLV - Valve
CWP - Condenser Water Pump	NO - Normally Open	VP - Velocity Pressure
CWR - Condenser Water Return	NTS - Not To Scale	VVTU - Variable Volume Terminal Unit
CWS - Condenser Water Supply	OA - Outdoor Air	"WC - Inches of Water Column
D/C - Direct Current	OAD - Outdoor Air Damper	W - Watt
DA - Discharge Air	OAH - Outdoor Air Humidity	W/ - With
DAT - Discharge Air Temperature	OAT - Outdoor Air Temperature	WB - Wet Bulb
DD - Double Duct	OAT/H - Outdoor Air Temperature / Humidity	W/O - Without
DDC - Direct Digital Controls	OBD - Opposed Blade Damper	WSHP - Water Source Heat Pump
DEV - Device	OD - Outside Diameter	XFMR - Transformer
DH - Duct Heater	OPS - Oil Pressure Switch	ZD - Zone Damper
DI - Digital Input	PAC - Packaged Air Conditioning Unit	
DMPR - Damper	PBD - Parallel Blade Damper	
DO - Digital Output	PCHWP - Primary Chilled Water Pump	
DP - Differential Pressure	PCWP - Primary Condenser Water Pump	
DPDT - Double Pole Double Throw	PDU - Power Distribution Unit	
DPS - Differential Pressure Switch	PIU - Power Induction Unit	
DPST - Double Pole Single Throw	PMP - Pump	
DPT - Differential Pressure Transducer	PNL - Panel	
DSP - Duct Static Pressure	POS - Position	
DWG - Drawing	PPM - Parts Per Million	
DX - Direct Expansion	PS - Power Switch	

# Cable Identification/Wire Labels

## M & S-Line Point Notation



- BN - BACNET NETWORK NUMBER (OPTIONAL)
- DR - DEVICE ROUTER NUMBER (OPTIONAL)
- DA - DEVICE ADDRESS
- EN - EXPANDER NUMBER
- PL - POINT LOCATION
- OPC - OFF PAGE CONNECTOR

## U-Line Point Notation



- BN - BACNET NETWORK NUMBER
- DR - DEVICE ROUTER NUMBER
- DA - DEVICE ADDRESS
- FB - FUNCTION BLOCK NUMBER
- PL - POINT LOCATION
- OPC - OFF PAGE CONNECTOR

Monitoring and control points for remote equipment are identified by the Module Point representation shown above. The electrical contractor or installer must label both ends of each control or monitoring point cable using the following format: (BN-DR-DA-EN-PL) or (BN-DR-DA-FB-PL). Adherence to this identification system is mandatory and must be followed using an approved tagging system comparable to the Brady I.D. Pro Plus electronic labeling system or equivalent.

These tags are intended for the wiring for all Analog Inputs (AI's), Digital Inputs (DI's), Analog Outputs (AO's), and Digital Outputs (DO's) except VAV's and terminal equipment where the wire runs are short and the field termination point is seen, or is easily identified. Points using pneumatic tubing follow the same convention.

All communication cable, terminations "in" an "out" of a field module panel, terminal equipment or VAV's must be labeled with "from (equipment name)" and "to (equipment name)" locations. See Figure 1 below.

All ARC156 or UNet communication, serial interface, control, and monitoring wiring must be terminated at the locations designated and must be free of splices.

When stripping multi-conductor cables, use only strippers specifically designed for removal of outer sheath insulation so as not to damage the shielding or insulation of the conductors. Use Ideal Catalog #45-514 or #45-165 data cable strippers or equivalent.

When shielded cable is used, do not strip back sheath more than 1" in order to keep twisted pair from separating. Do not ground shield to the panel or chassis ground. The shield should only be connected to the 'Optional Shield' connection at a module. Ungrounded shields must be cut back and taped to prevent contact with metal surfaces (heat shrink is preferred). See figure 2 below.

Multi-conductor cabling other than specified or pre-approved by the electrical contractor is unacceptable.

Electrical installation shall be in accordance with the project specifications, national, state, and local electrical codes along with ALC standards as outlined in this and other documents.

LogiStat Plus and LogiStat Pro room temperature sensors shall be mounted 48 inches above the finished floor per the Americans with Disabilities Act.

All pneumatic tubing that exceeds ten feet in length must be rigid copper or poly tubing installed in conduit. All poly tubing in exposed areas must be installed in conduit. Use plenum rated poly tubing for runs made in hung ceilings. Short lengths of less than 16 inches are permitted to be exposed for connection to field devices.

All field module panels (FMPs) will have a dedicated 120vac circuit.

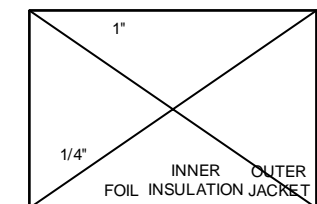
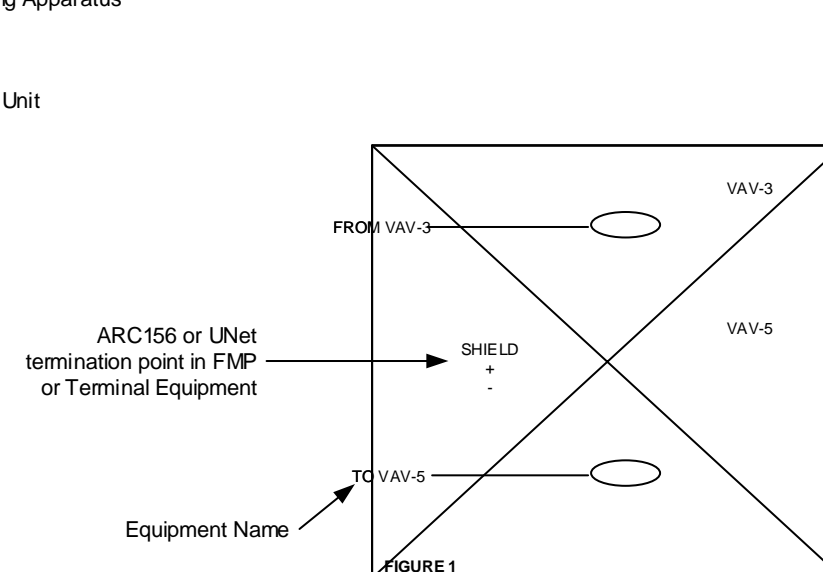


FIGURE 2

<b>Manatee County Judicial Center</b>			
Bradenton, Florida			
Section 15950			
Abbreviation/Installation Notes			
REV: 1	Submittal	8/14/2006	JOB NO: 29083
<b>BOYD BROTHERS SERVICE, INC.</b>			CHECK BY: CLT
			CORE NO: 1007
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# Summary Bill of Materials

Summary Bill of Materials				
DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
AA-16	VALVE ASSEMBLY, LARGE BRACKET WITH PW TRANSDUCER	VERIS IND.	AA-16	3 ea
AFS-1	AIR FLOW SWITCH,0.4 +/-0.06-12", MAN RESET	CLEVELAND	AFS-460	28 ea
AFS-4	AIR FLOW SWITCH,0.05 +/-0.02-12" ADJ.	CLEVELAND	AFS-262	8 ea
AVT-1	AIR VELOCITY TRANS,DUCT MOUNT,24VAC,8" PROBE,DISPLAY	E+E ELEKTRONIK	EE65-VB5-D02	28 ea
BT485	ARC156 TERMINATER DEVICE	AUTOMATED LOGIC	BT485	1 ea
CO2-3	SINGLE BEAM ABS CO2 SENSOR, 0-10 VDC, 24VAC	VERIS IND.	CDE	15 ea
CS-120	SPST STATUS RELAY W/INTEGRAL CURRENT SWITCH, NO	VERIS IND.	H120	8 ea
CS-4	CURRENT SWITCH .25-150A PLENUM NEMA1 HOUSING	FUNCTIONAL DEVICES	RIBXKF	9 ea
CS-9	ENC 50A CURRENT SENSOR W/LOOP POWERED 4-20MA OUTPUT	FUNCTIONAL DEVICES	RIBXK420-50	70 ea
CV-ACHW	CONTROL VALVE AND ACTUATOR	BELIMO	SEE VALVE SCHEDULE	14 ea
DACT-7	SR ACT 24VAC, 35IN-LB, 2-10VDC	BELIMO	LF24-SR ALC	42 ea
DACT-8	SR ACT 24VAC 60IN-LB ON-OFF	BELIMO	NF24 ALC	42 ea
DAS-24	DUCT 10K THERMISTOR AVERAGING 24 FT.	BAPI	ALC/10K-2-A-24	14 ea
DIAG 485	ARC156 DIAGNOSTIC DEVICE	AUTOMATED LOGIC	DIAG 485	1 ea
DSTP-7	PRESSURE,ADJ,0-5", 4-20MA,PROBE,LCD,FIELD MOUNT	BAPI	ZPS-20-SR05-ST-125-D-FMK	14 ea
DTS-4	DUCT 10K THERMISTOR PROBE 4 IN.	BAPI	BA/10K-2-D-4"	277 ea
DTS-8	DUCT 10K THERMISTOR PROBE 8 IN.	BAPI	ALC/10K-2-D-8"	28 ea
DTS-XB	DUCT 10K THERM DUCT CURVE 2 12" + 2% HUMIDITY	BAPI	ALC/10K-2-H220-D-EU	14 ea
E1015	10"H X 15"W ENCLOSURE	ALPS CONTROLS	ALPS004	8 ea
E3024_6	NEMA 1 30 X 24 X 6.62 ENCLOSURE	HOFFMAN	A-30N24ALP	15 ea
E3630_8	NEMA 1 36 X 30 X 8.6 ENCLOSURE	HOFFMAN	A-36N30BLP	1 ea
E3630_P	PANEL FOR 36 X 30 X 8.6 ENCLOSURE	HOFFMAN	A-36N30MP	1 ea
EZ3024	NEMA 1 30 X 24 PREFAB SUBPANEL	ALPS	SUB-S-3024-VG-X-X-050-050	14 ea
EZ3024_1	NEMA 1 30 X 24 PREFAB SUBPANEL	ALPS	SUB-S-3024-VG-X-X-050-000	1 ea
FM-1	IN LINE FLOW METER 4-20MA	ONICON	F1211	4 ea
FRZ-5	LOW TEMP DETECT THERMOSTAT, AUTO RESET, 35-45F	SIEMENS	134-1510	22 ea
FSTP-1	PRESSURE,ADJ,0-2.50", 4-20MA,PROBE,LCD,FIELD MOUNT	BAPI	ZPS-20-SR04-ST-125-D-FMK	14 ea
LGR1000	LGR1000	AUTOMATED LOGIC	LGR1000	1 ea
LSPLUS	LOGISTAT 10K ROOM SENSOR W/ SETP ADJ, TLO, COMM+	BAPI	LSPLUS	277 ea
M4106	M4106	AUTOMATED LOGIC	M4106	28 ea
MX0160	MX0160	AUTOMATED LOGIC	MX0160	1 ea
MX16160	MX16160	AUTOMATED LOGIC	MX16160	2 ea
MX880	MX880	AUTOMATED LOGIC	MX880	14 ea
OATH-1	OA TEMP/HUMIDITY SENSOR W/WEATHER PROOF ENC	BAPI	ALC/10K-2-H200-O-WP	1 ea
PC	PERSONAL COMPUTER OPERATOR WORKSTATION	DELL	TBD	1 ea
REL-1	RIB PILOT RELAY SPDT 10AMP	FUNCTIONAL DEVICES	RIBU1C	9 ea
REL-4	SPDT RELAY W/INDICATOR LIGHT 24 VAC	IDEC	RH1B-ULC-AC24V	2 ea
REL-S1	RELAY BASE FOR RH1B	IDEC	SH1B-05	2 ea
SW-1	POWER CONTROL CENTER, 10AMP, W RECEIPT	FUNCTIONAL DEVICES	PSPT2RB10	1 ea
TR-1	TRANSFORMER, 100VA, 120 TO 24 VAC, CIRCUIT BREAKER	FUNCTIONAL DEVICES	TR100VA001	2 ea
TR-5	TRANSFORMER, 50VA, 120 TO 24 VAC, CIRCUIT BREAKER	FUNCTIONAL DEVICES	TR50VA005	8 ea
U341v+	U341v+	AUTOMATED LOGIC	U341v+	269 ea
U551	U551	AUTOMATED LOGIC	U551	8 ea
UNI16	UNI/16 BACNET UNITARY NETWORK	AUTOMATED LOGIC	UNI16	3 ea
UNI32	UNI/32 BACNET UNITARY NETWORK	AUTOMATED LOGIC	UNI32	11 ea
V-CT1	COOLING TOWER OUTLET VALVE	BELIMO	SEE VALVE SCHEDULE	2 ea
V-CT2	COOLING TOWER BYPASS VALVE	BELIMO	SEE VALVE SCHEDULE	2 ea
VFC-CW	CONTROL VALVE AND ACTUATOR	BELIMO	SEE VALVE SCHEDULE	8 ea
VIB-1	VIBRATION TRANSMITTER 4-20MA	KELE & ASSOC.	140T-2	2 ea
W-4	TWO PART (WELDED) SS WELL 4"	BAPI	ALC/4IN.	11 ea
WC	WEBCTRL 3.0 SOFTWARE	AUTOMATED LOGIC	WC	1 ea
WPS-1	DIFF PRESSURE SWITCH 4-45 PSID	UNITED ELECTRIC	24-014	4 ea
WSTP-1	PRESSURE WET NEMA 40-50PSI	VERIS IND.	PWLX03S	3 ea
WTS-1	10K IMMERSION THERMISTOR, WEATHERPROOF ENC, 4"	BAPI	ALC/10K-2-I-4-WP	11 ea

Manatee County Judicial Center  
Bradenton, Florida

Section 15950

Summary Bill of Materials

REV: 1      Submittal      8/14/2006      JOB NO: 29083




CHECK BY: CLT

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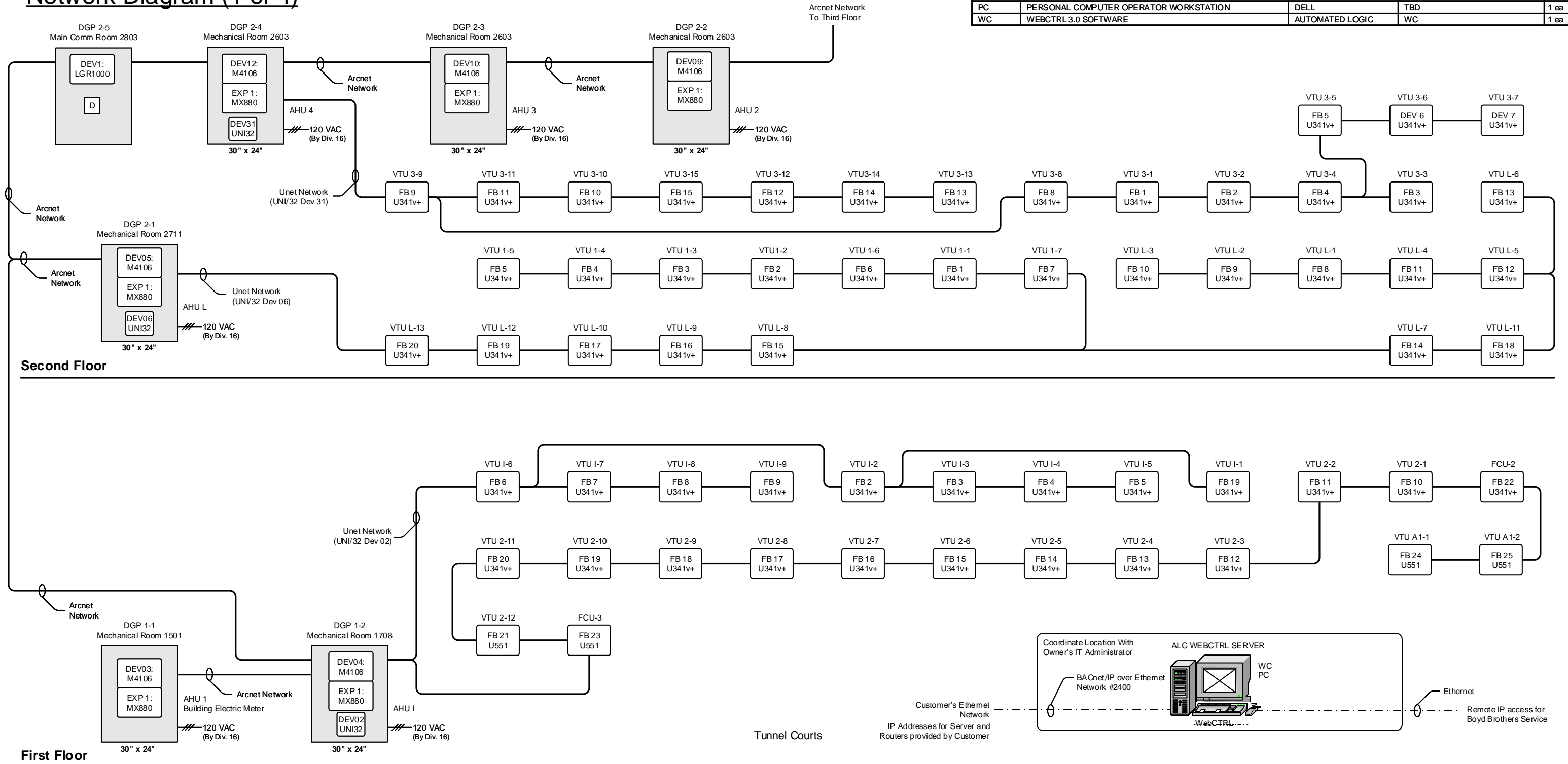
# Valve Schedule

From Project Specifications					Sizing Data		Valve Type and Actuator Specifications														Ordering																	
Specified Pressure Drop (psi)					5.0																																	
Valve Schedule																																						
Quantity	Location (Floor)	Valve Service	Valve Tag	Flow (GPM)	Calculated Cv Rating	Actual Pressure Drop (psi)	Line Size (in.)	Media Temp Max°F	Close-off Pressure (PSI)	Valve Size (in.)	Valve Cv	VALVE TYPE								ELECTRIC SOLUTION						2 WAY		3 WAY		Manufacturer	Valve #							
												ZONE	CCV	BALL - BRZ BODY / SS BALL	GLOBE / NV / NPT	GLOBE ANSI-125 FLNGD / STD TRIM	BUTTERFLY - SS	OTHER	OTHER	24 VAC	120 VAC	ON / OFF	PWM	TRI-STATE /	MODULATING	SPRING RETURN	N.O.	N.C.	OPEN			CLOSED	UNSPECIFIED	B TO AB OPEN	A TO AB OPEN	B TO AB OPEN	A TO AB OPEN	CONFIGURATION
A	B	C	D	E	F	G	H	I	J	K	L	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	
1	--	AHU-A CHW	AHU-A CHW	144.2	64.5	4.9	4	212	200	2	65	X								X				X	X												Belimo	B251
1	--	AHU-I CHW	AHU-I CHW	24.3	10.9	5.9	2	212	200	0.75	10	X								X				X	X												Belimo	B215
1	--	AHU-L CHW	AHU-L CHW	53.1	23.7	4.9	2.5	212	200	0.75	24	X								X				X	X												Belimo	B220
1	--	AHU-1 CHW	AHU-1 CHW	59.7	26.7	4.0	2.5	212	200	1	30	X								X				X	X												Belimo	B225
1	--	AHU-2 CHW	AHU-2 CHW	75.8	33.9	260.1	2.5	212	200	2	4.7	X								X				X	X												Belimo	B249
1	--	AHU-3 CHW	AHU-3 CHW	75.5	33.8	258.0	2.5	212	200	1.5	4.7	X								X				X	X												Belimo	B249
1	--	AHU-4 CHW	AHU-4 CHW	128	57.2	3.9	3	212	200	2	65	X								X				X	X												Belimo	B251
1	--	AHU-5 CHW	AHU-5 CHW	170.2	76.1	2.4	4	212	200	2.5	110	X								X				X	X												Belimo	B263
1	--	AHU-6 CHW	AHU-6 CHW	213.4	95.4	3.8	4	212	200	2.5	110	X								X				X	X												Belimo	B263
1	--	AHU-7 CHW	AHU-7 CHW	221.7	99.1	4.1	4	212	200	2.5	110	X								X				X	X												Belimo	B263
1	--	AHU-8 CHW	AHU-8 CHW	226.9	101.5	4.3	4	212	200	2.5	110	X								X				X	X												Belimo	B263
1	--	AHU-9 CHW	AHU-9 CHW	133.1	59.5	4.2	4	212	200	2	65	X								X				X	X												Belimo	B251
1	--	AHU-10 CHW	AHU-10 CHW	162	72.4	2.2	4	212	200	2.5	110	X								X				X	X												Belimo	B263
1	--	AHU-11 CHW	AHU-11 CHW	129.2	57.8	4.0	3	212	200	2	65	X								X				X	X												Belimo	B251
1	--	FCU-1 CHW	FCU-1 CHW	11.5	5.1	6.0	0.75	212	200	0.5	4.7	X								X				X	X												Belimo	B213
1	--	FCU-2 CHW	FCU-2 CHW	11.3	5.1	5.8	1	212	200	0.5	4.7	X								X				X	X												Belimo	B213
1	--	FCU-3 CHW	FCU-3 CHW	11.3	5.1	5.8	1	212	200	0.5	4.7	X								X				X	X												Belimo	B213
1	--	FCU-4 CHW	FCU-4 CHW	11.3	5.1	5.8	0.75	212	200	0.5	4.7	X								X				X	X												Belimo	B213
1	--	FCU-5 CHW	FCU-5 CHW	11.3	5.1	5.8	0.75	212	200	0.5	4.7	X								X				X	X												Belimo	B213
1	--	FCU-6 CHW	FCU-6 CHW	11.3	5.1	5.8	0.75	212	200	0.5	4.7	X								X				X	X												Belimo	B213
1	--	FCU-7 CHW	FCU-7 CHW	11.3	5.1	5.8	1	212	200	0.5	4.7	X								X				X	X												Belimo	B213
1	--	FCU-8 CHW	FCU-8 CHW	11.3	5.1	5.8	1	212	200	0.5	4.7	X								X				X	X												Belimo	B213
1	--	CT-A Bypass	CT-A Bypass	3000	1341.6	407424.2	12	212	200	1.5	4.7									X			X	X												Belimo	F6150HSU	
1	--	CT-A Outlet	CT-A Outlet	3000	1341.6	407424.2	10	212	200	1.5	4.7									X			X	X												Belimo	F6150HSU	
1	--	CT-B Bypass	CT-B Bypass	3000	1341.6	407424.2	12	212	200	0.75	4.7									X			X	X													Belimo	F6150HSU
1	--	CT-B Outlet	CT-B Outlet	3000	1341.6	14062500.0	10	212	200	0.5	0.8									X			X	X													Belimo	F6150HSU

<b>Manatee County Judicial Center</b> Bradenton, Florida			
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# Network Diagram (1 of 4)

Bill of Materials				
DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
PC	PERSONAL COMPUTER OPERATOR WORKSTATION	DELL	TBD	1 ea
WC	WEBCTRL 3.0 SOFTWARE	AUTOMATED LOGIC	WC	1 ea



- General Notes:
- Wire Types: All ARC156, Unet, Rnet, and zone sensor wiring shall be plenum rated cable.
  - ARC156 Wiring/Routing: Each segment must be wired in a 'daisy chain' fashion. Branching requires the use of a REP485. Segment 'ends' must be terminated with TERM485 terminating resistors. Each segment must have at least one (1) DIAG485 installed on the network to supply bias.
  - WebCTRL Server: Coordinate location of server/workstation with owner. Ethernet connections by others.
  - Device Wiring is a recommendation only. All devices should be wired based on equipment proximity and accessibility. All Wiring will follow ARC156 Wiring Specifications. TERM485, PROT485, DIAG485, AND REP485's should be used in accordance with ARC156 wiring guidelines.

Ethernet (LAN) Network Information			
Equipment	IP Address	Subnet Mask	Default Gateway
WebCTRL Server	.....	.....	.....
Router 1: LGR	.....	.....	.....

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Bradenton, Florida

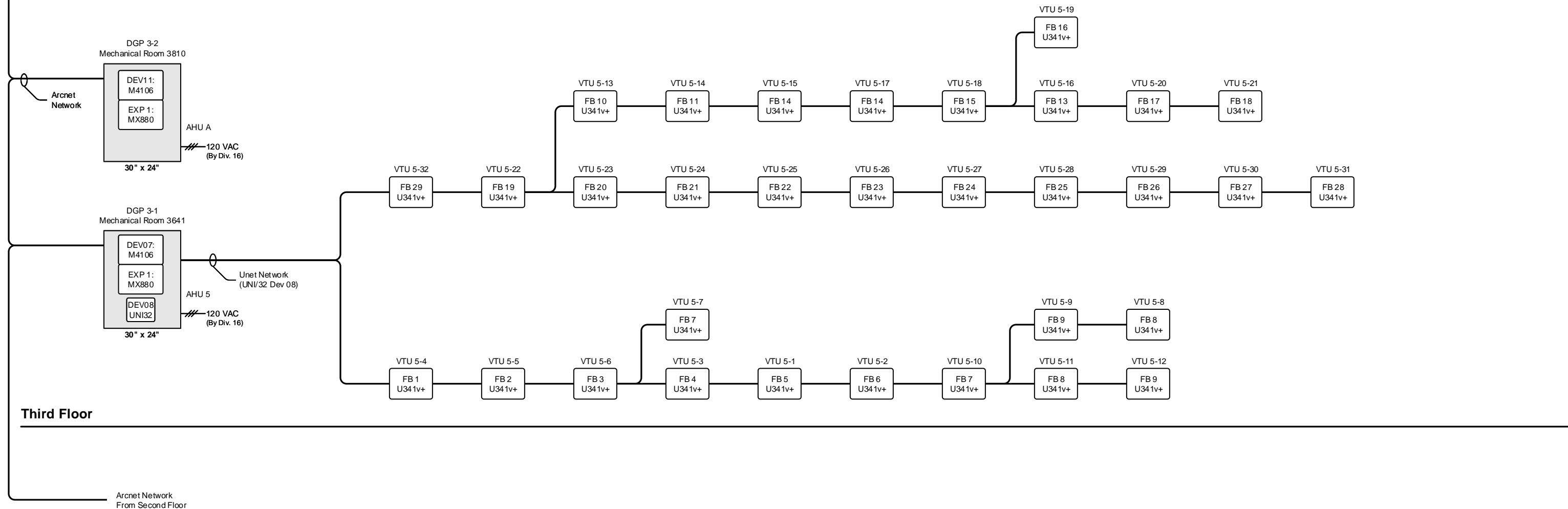
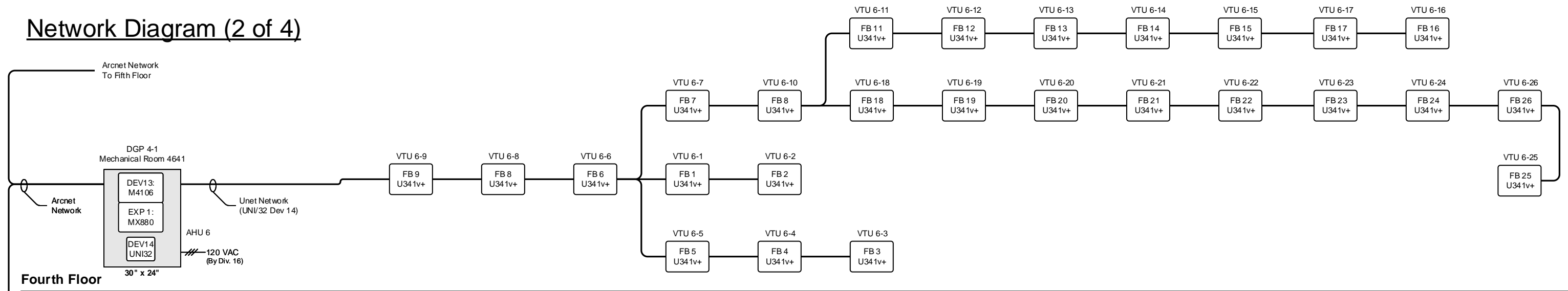
Section 15950

Network Diagram (1 of 4)

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# Network Diagram (2 of 4)



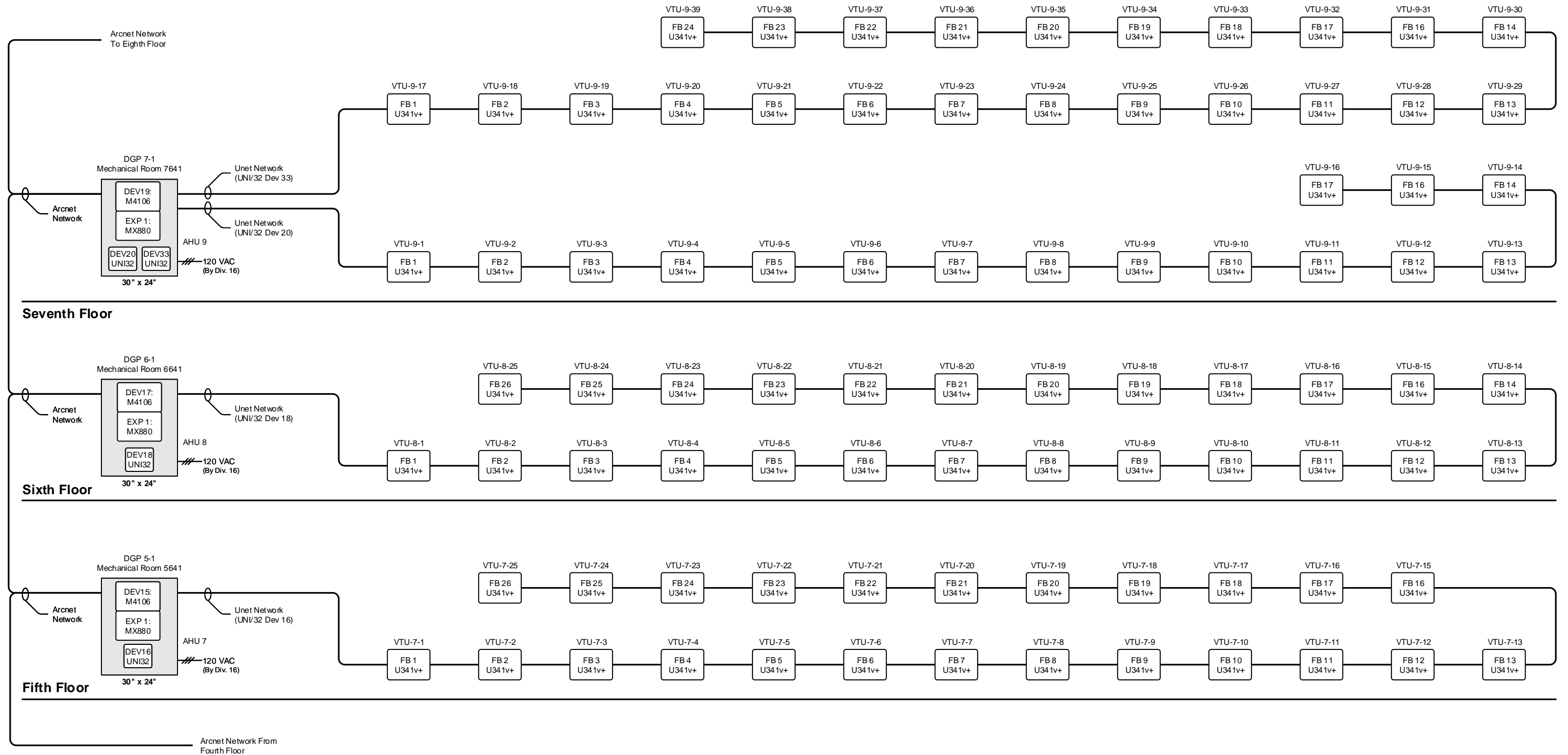
**General Notes:**

- Wire Types:**  
All ARC156, Unet, Rnet, and zone sensor wiring shall be plenum rated cable.
- ARC156 Wiring/Routing:**  
Each segment must be wired in a 'daisy chain' fashion. Branching requires the use of a REP485. Segment 'ends' must be terminated with TERM485 terminating resistors. Each segment must have at least one (1) DIAG485 installed on the network to supply bias.
- WebCTRL Server:**  
Coordinate location of server/workstation with owner. Ethernet connections by others.
- Device Wiring** is a recommendation only. All devices should be wired based on equipment proximity and accessibility. All Wiring will follow ARC156 Wiring Specifications. TERM485, PROT485, DIAG485, AND REP485's should be used in accordance with ARC156 wiring guidelines.

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Network Diagram (2 of 4)			
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# Network Diagram (3 of 4)



## General Notes:

1. Wire Types:  
All ARC156, Unet, Rnet, and zone sensor wiring shall be plenum rated cable.
2. ARC156 Wiring/Routing:  
Each segment must be wired in a 'daisy chain' fashion. Branching requires the use of a REP485.  
Segment 'ends' must be terminated with TERM485 terminating resistors.  
Each segment must have at least one (1) DIAG485 installed on the network to supply bias.
3. WebCTRL Server:  
Coordinate location of server/workstation with owner. Ethernet connections by others.
4. Device Wiring is a recommendation only. All devices should be wired based on equipment proximity and accessibility.  
All Wiring will follow ARC156 Wiring Specifications. TERM485, PROT485, DIAG485, AND REP485's should be used in accordance with ARC156 wiring guidelines.

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Network Diagram (3 of 4)

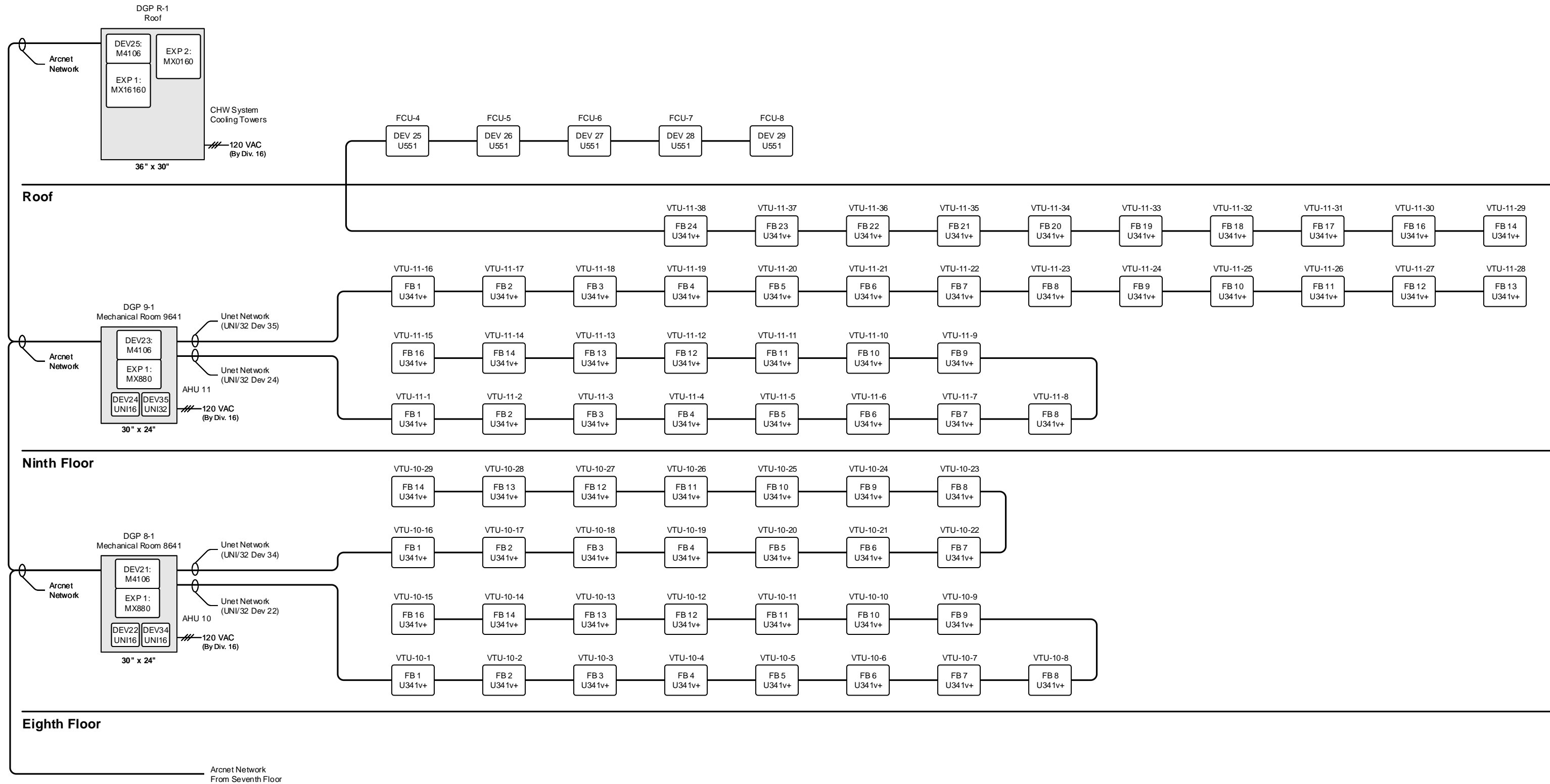
REV: 1	Submittal	8/14/2006	JOB NO: 29083
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CHECK BY: CLT

CORE NO: 1007

# Network Diagram (4 of 4)

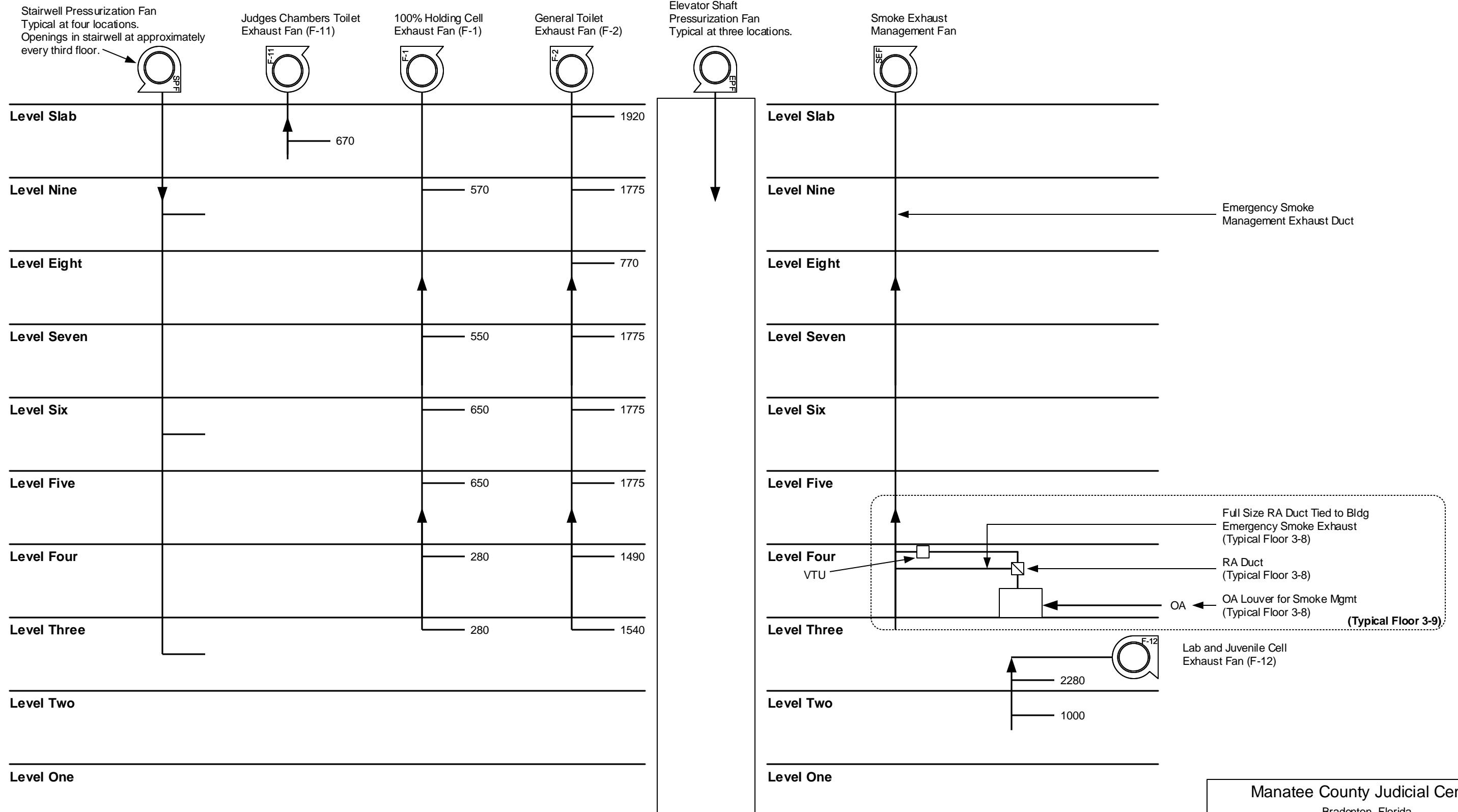


## General Notes:

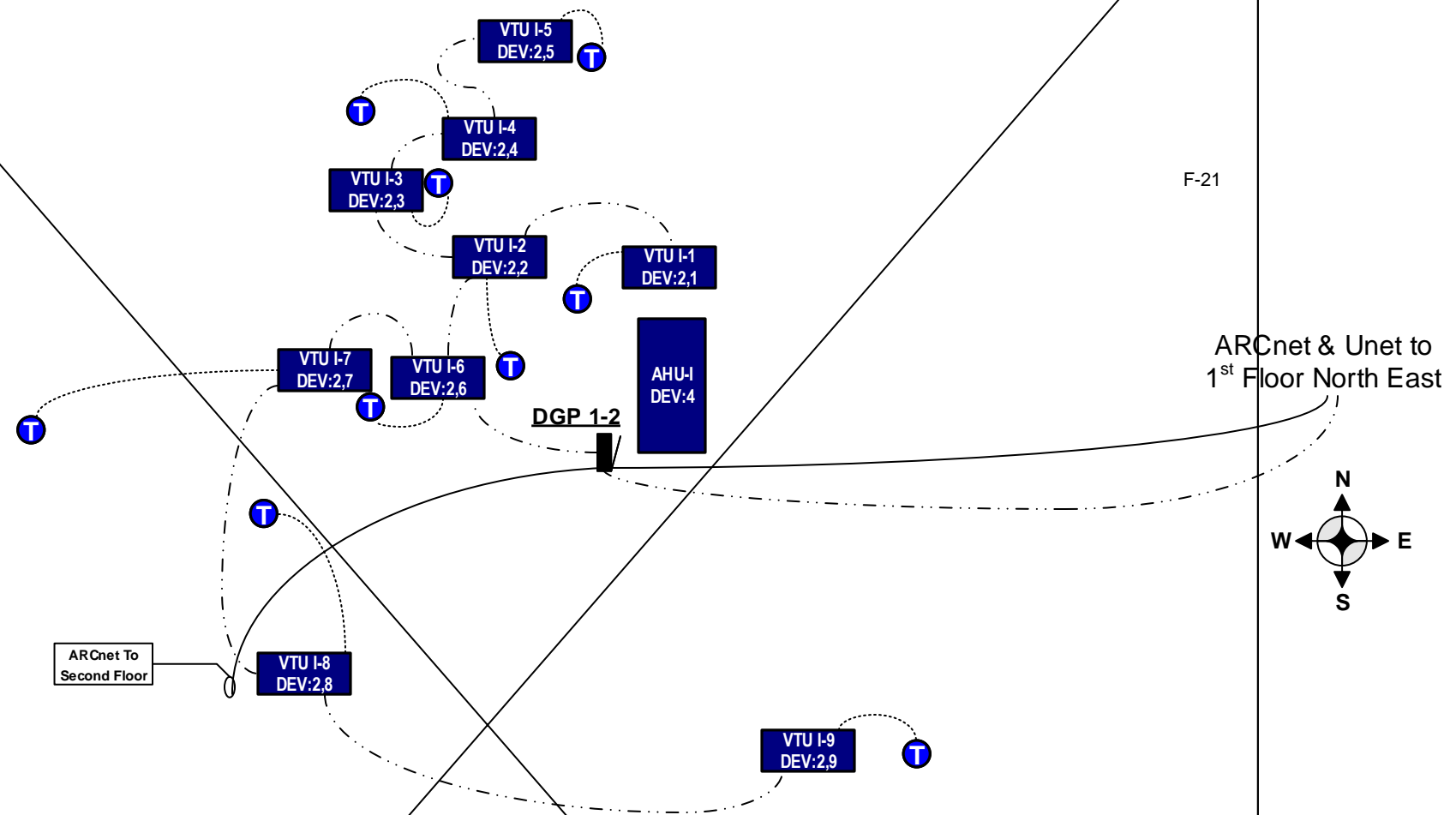
1. Wire Types:  
All ARC156, Unet, Rnet, and zone sensor wiring shall be plenum rated cable.
2. ARC156 Wiring/Routing:  
Each segment must be wired in a 'daisy chain' fashion. Branching requires the use of a REP485.  
Segment 'ends' must be terminated with TERM485 terminating resistors.  
Each segment must have at least one (1) DIAG485 installed on the network to supply bias.
3. WebCTRL Server:  
Coordinate location of server/workstation with owner. Ethernet connections by others.
4. Device Wiring is a recommendation only. All devices should be wired based on equipment proximity and accessibility.  
All Wiring will follow ARC156 Wiring Specifications. TERM485, PROT485, DIAG485, AND REP485's should be used in accordance with ARC156 wiring guidelines.

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Network Diagram (4 of 4)			
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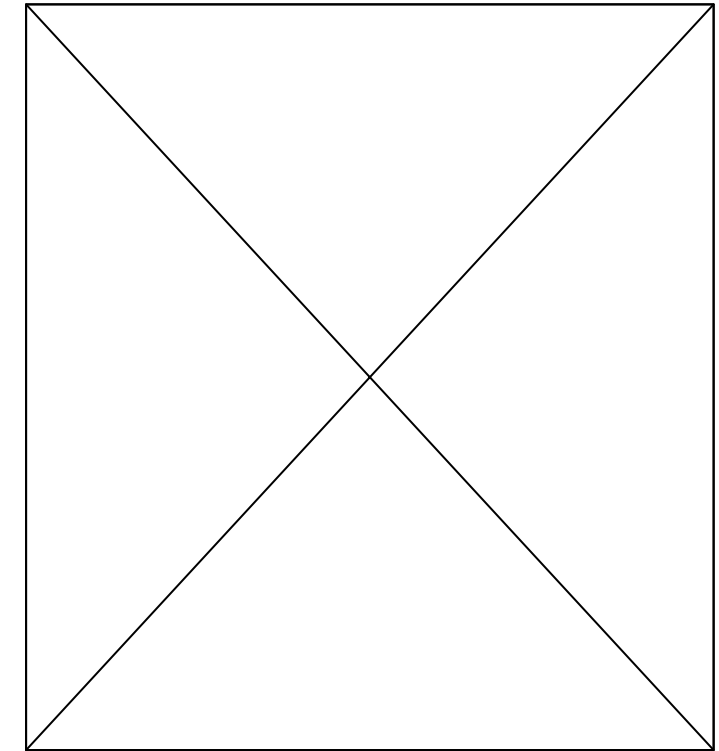
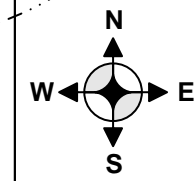
# Air Riser Diagram



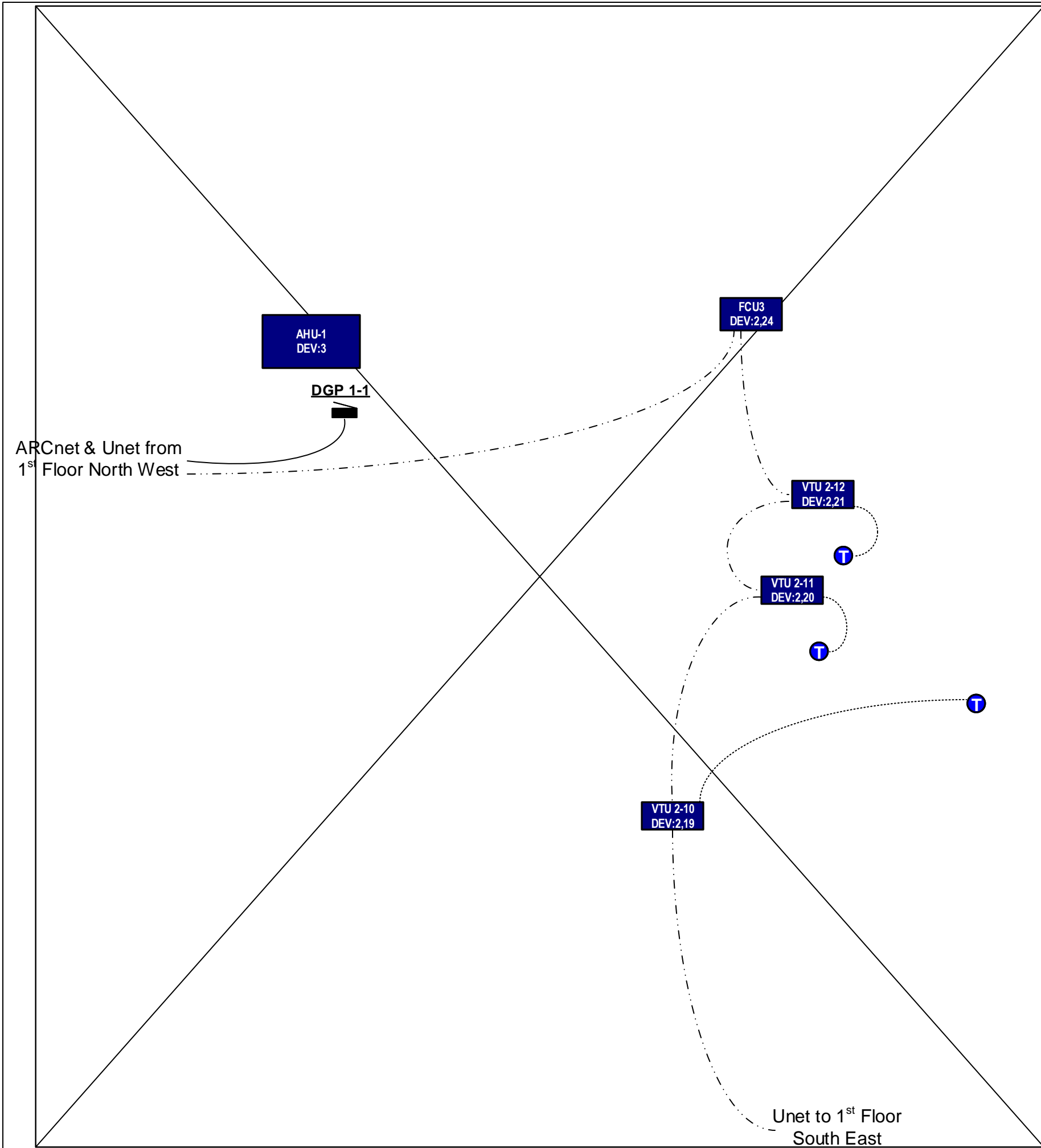
<b>Manatee County Judicial Center</b> Bradenton, Florida			
Section 15950 Air Riser Diagram			
REV: 1	Submittal	8/14/2006	JOB NO: 29083
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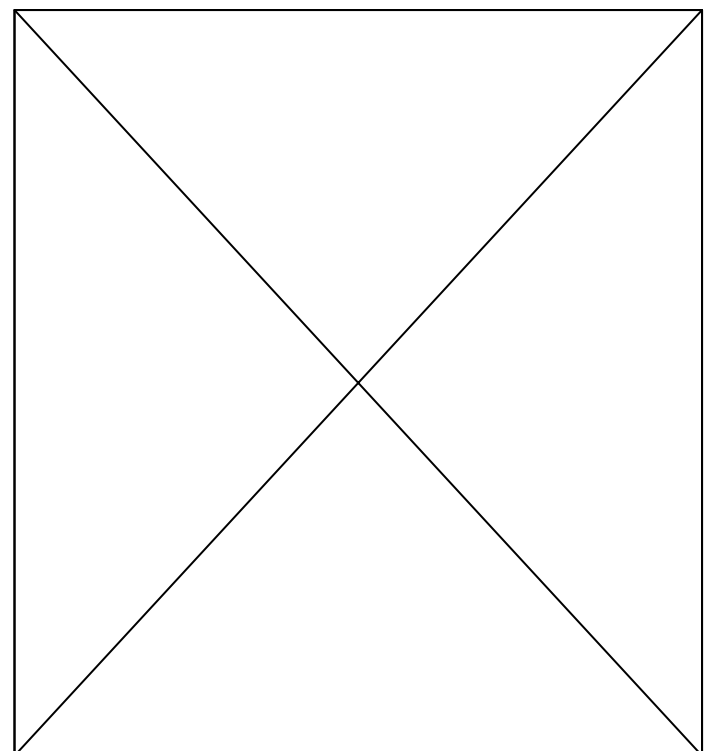
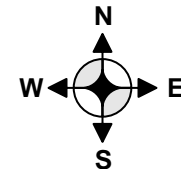
- DEV:XX** Control Module Address
- H** Wall-mount Humidity Sensor
- T** Wall-mount Temperature Sensor
- GF** Exhaust Fan
- SP** Duct Static Pressure Sensor
- DCP** DDC Control Panel
- ARC156 Communication Wiring
- - - - - Unet #22/2 Strnd Communication
- ..... #22/4 Solid Logistat
- - - - - #22/4 Strnd Control Wiring
- - - - - #18/2 Strnd 24VAC



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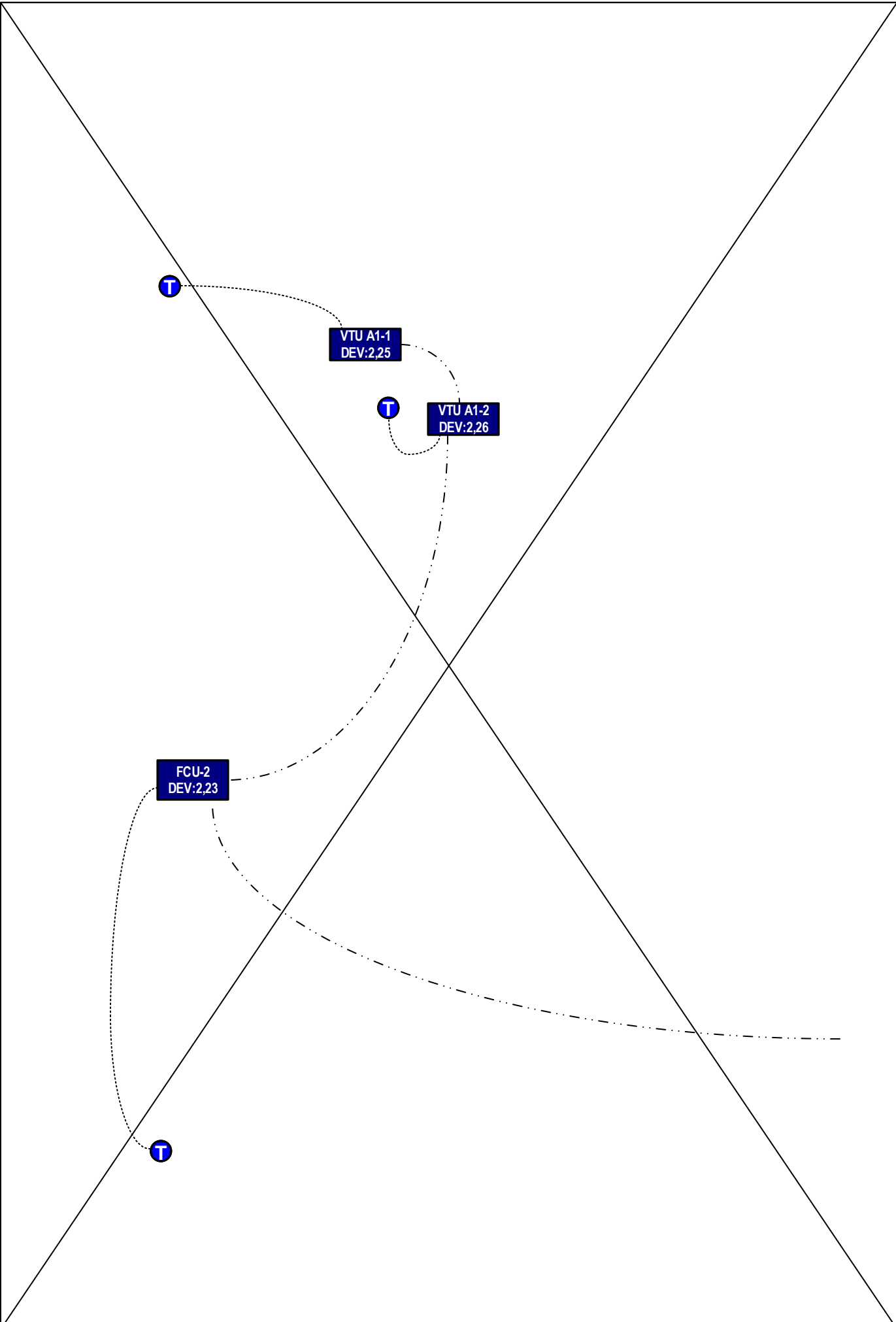


- DEV:X,XX Control Module Address
- H Wall-mount Humidity Sensor
- T Wall-mount Temperature Sensor
- ⊗ Exhaust Fan
- SP Duct Static Pressure Sensor
- DDC Control Panel
- ARC156 Communication Wiring
- ..... #22/4 Solid Logistat
- - - - #22/4 Strnd Control Wiring
- · - · - #18/2 Strnd 24VAC

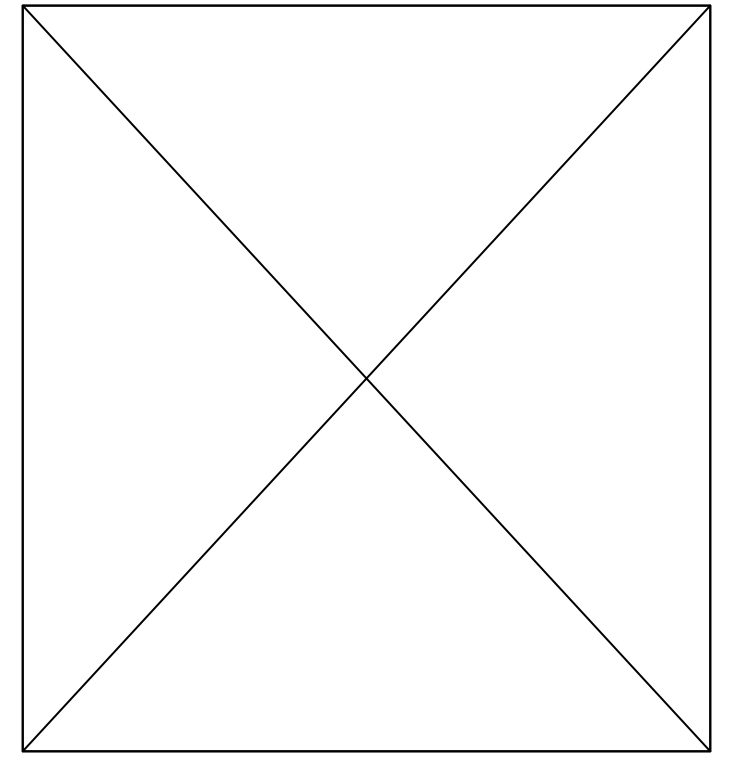
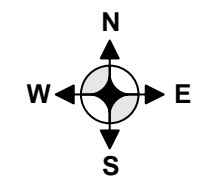


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Bradenton, Florida			
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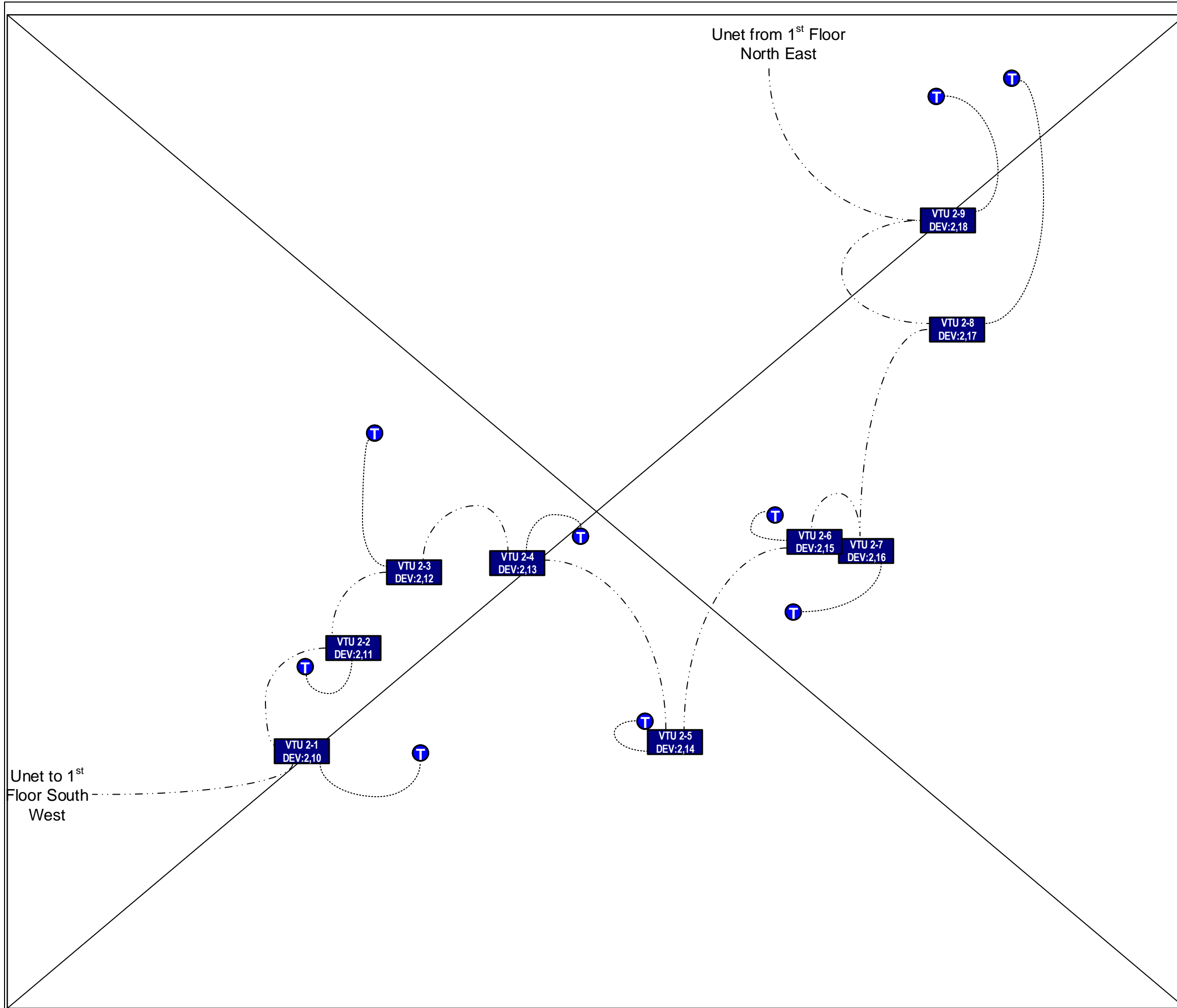
1st Floor So



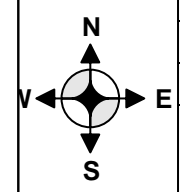
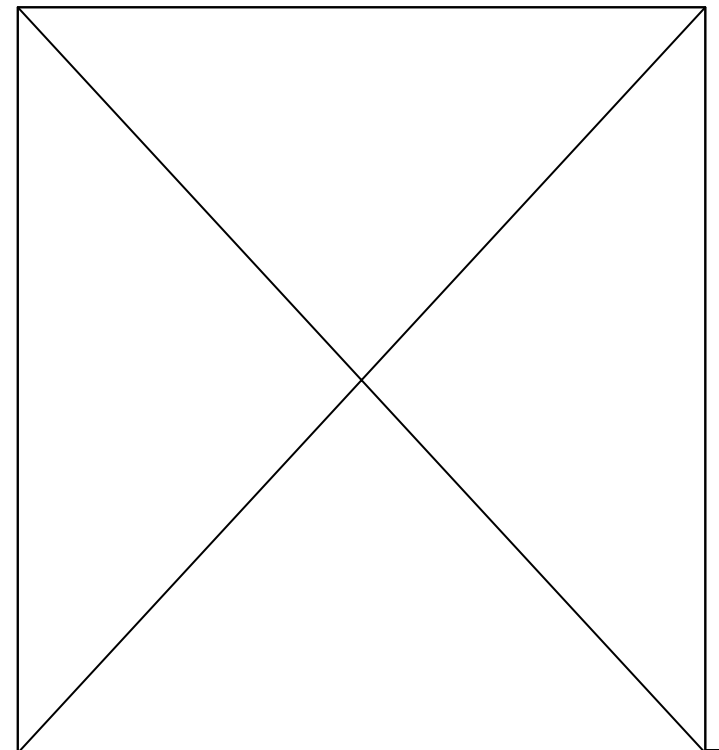
- DEV:X,XX Control Module Address
- H Wall-mount Humidity Sensor
- T Wall-mount Temperature Sensor
- X Exhaust Fan
- SP Duct Static Pressure Sensor
- / DDC Control Panel
- ARC156 Communication Wiring
- ..... #22/4 Solid Logistat
- - - - #22/4 Strnd Control Wiring
- · - · - #18/2 Strnd 24VAC



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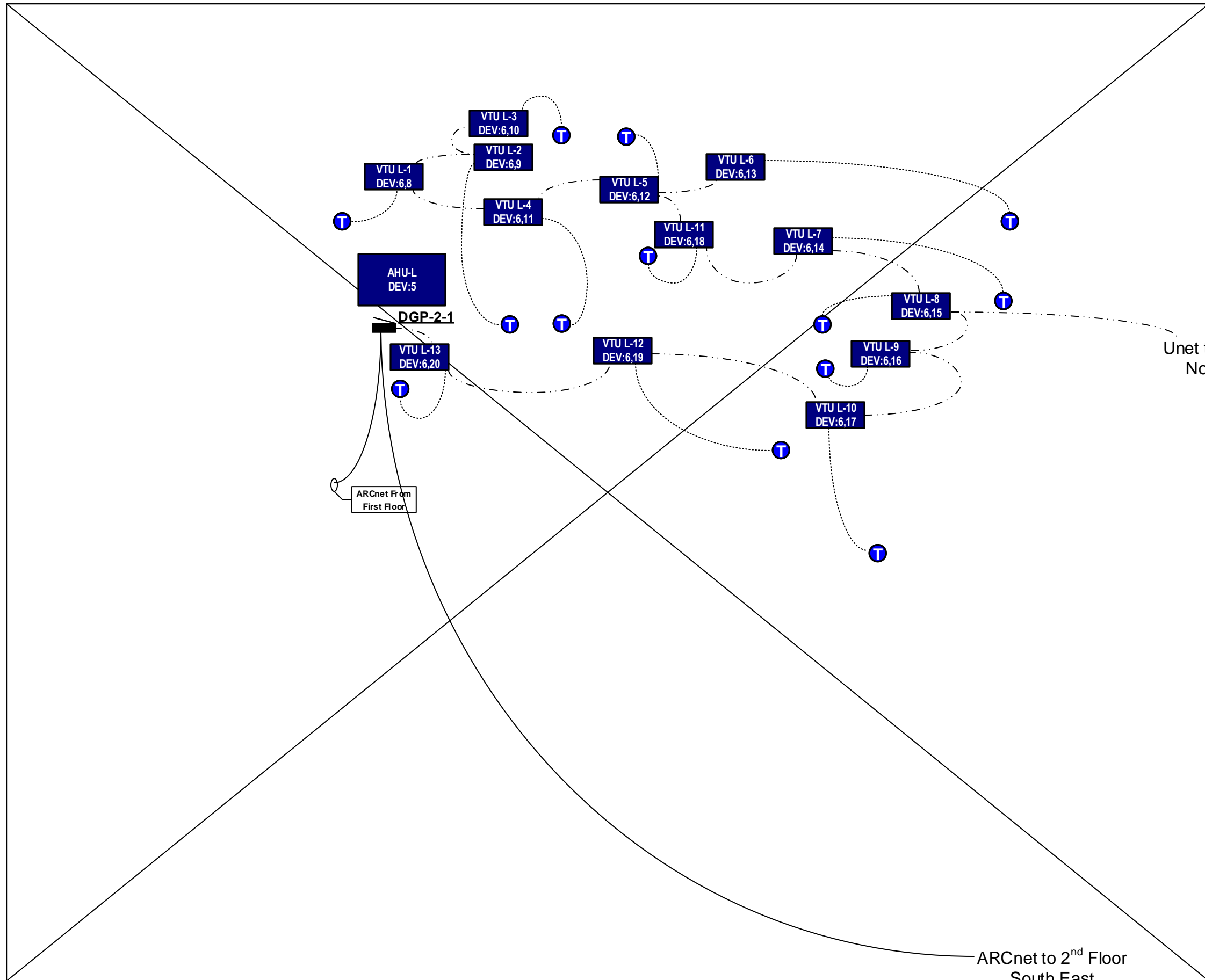


- DEV:XX Control Module Address
- H Wall-mount Humidity Sensor
- T Wall-mount Temperature Sensor
- ⊗ Exhaust Fan
- SP Duct Static Pressure Sensor
- DDC Control Panel
- ARC156 Communication Wiring
- - - #22/4 Solid Logistat
- - #22/4 Strnd Control Wiring
- · - #18/2 Strnd 24VAC



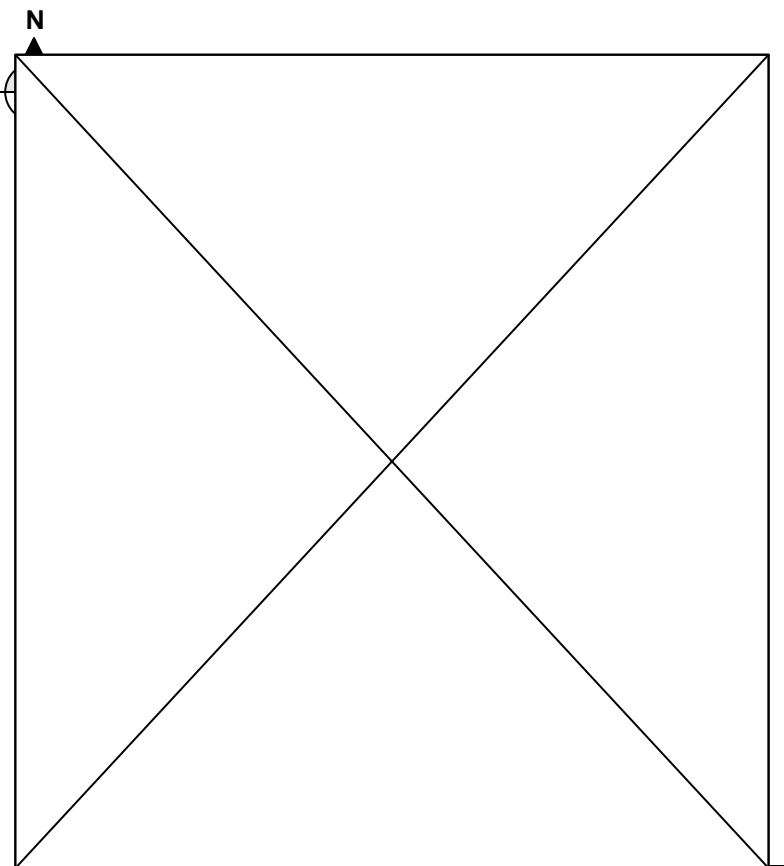
Manatee County Judicial Center			
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# 2nd Floor North West



- DEV:X,XX** Control Module Address
- H** Wall-mount Humidity Sensor
- T** Wall-mount Temperature Sensor
- GF** Exhaust Fan
- SP** Duct Static Pressure Sensor
- DCP** DDC Control Panel
- ARC156 Communication Wiring
- - - #22/4 Solid Logistat
- - - #22/4 Strnd Control Wiring
- · - · #18/2 Strnd 24VAC

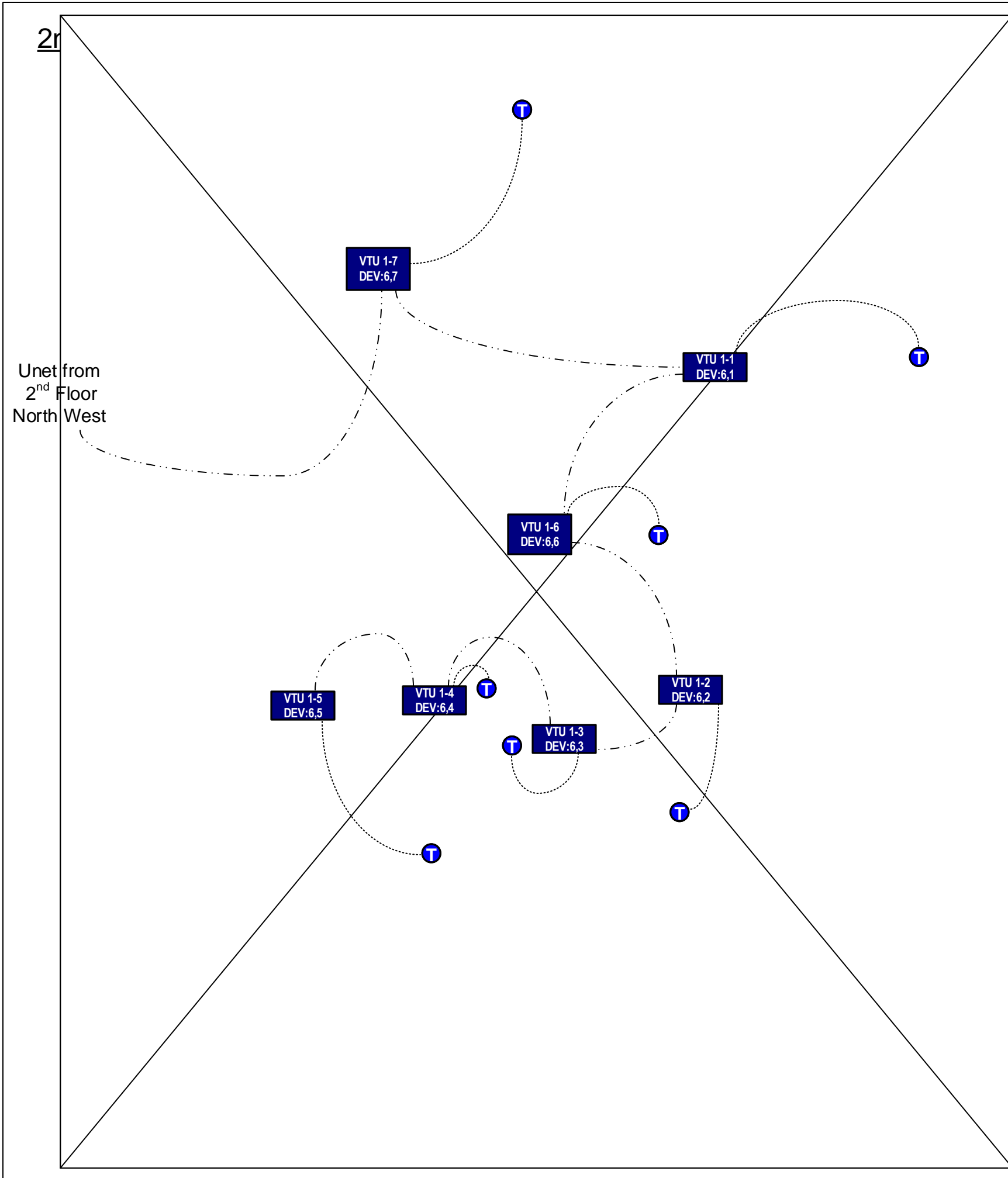
Unet to 2<sup>nd</sup> Floor North East



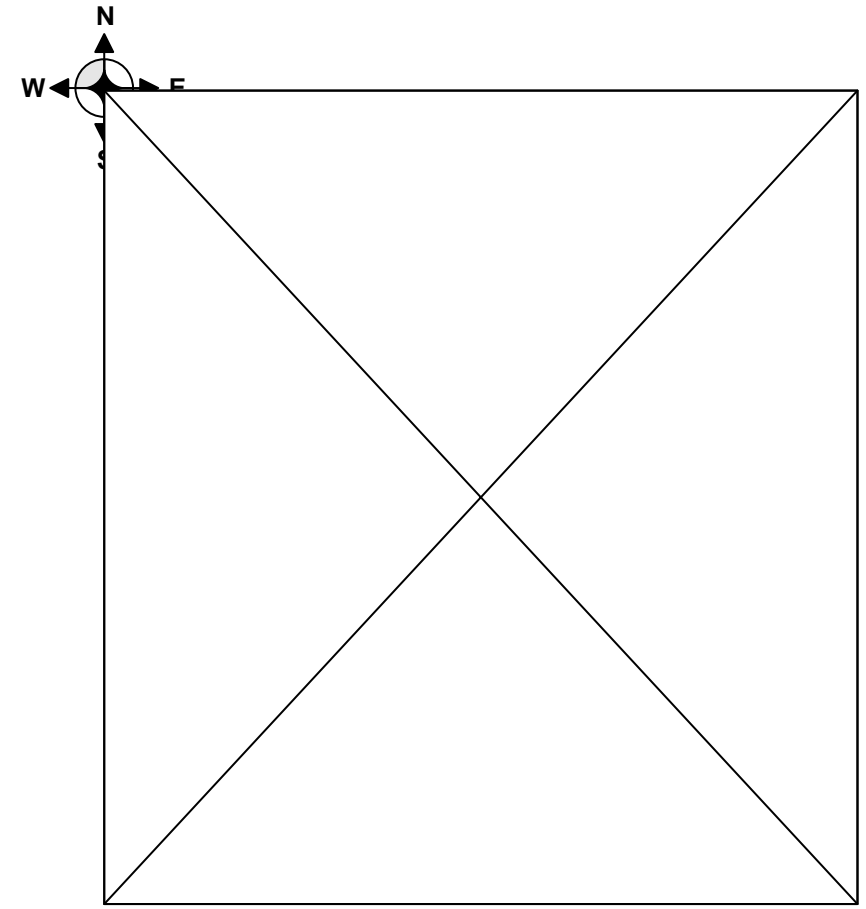
Manatee County Judicial Center			
Bradenton, Florida			
Section 15950			
2nd Floor North West			
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<b>BOYD BROTHERS SERVICE, INC.</b>			CHECK BY: CLT
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ARCnet to 2<sup>nd</sup> Floor South East

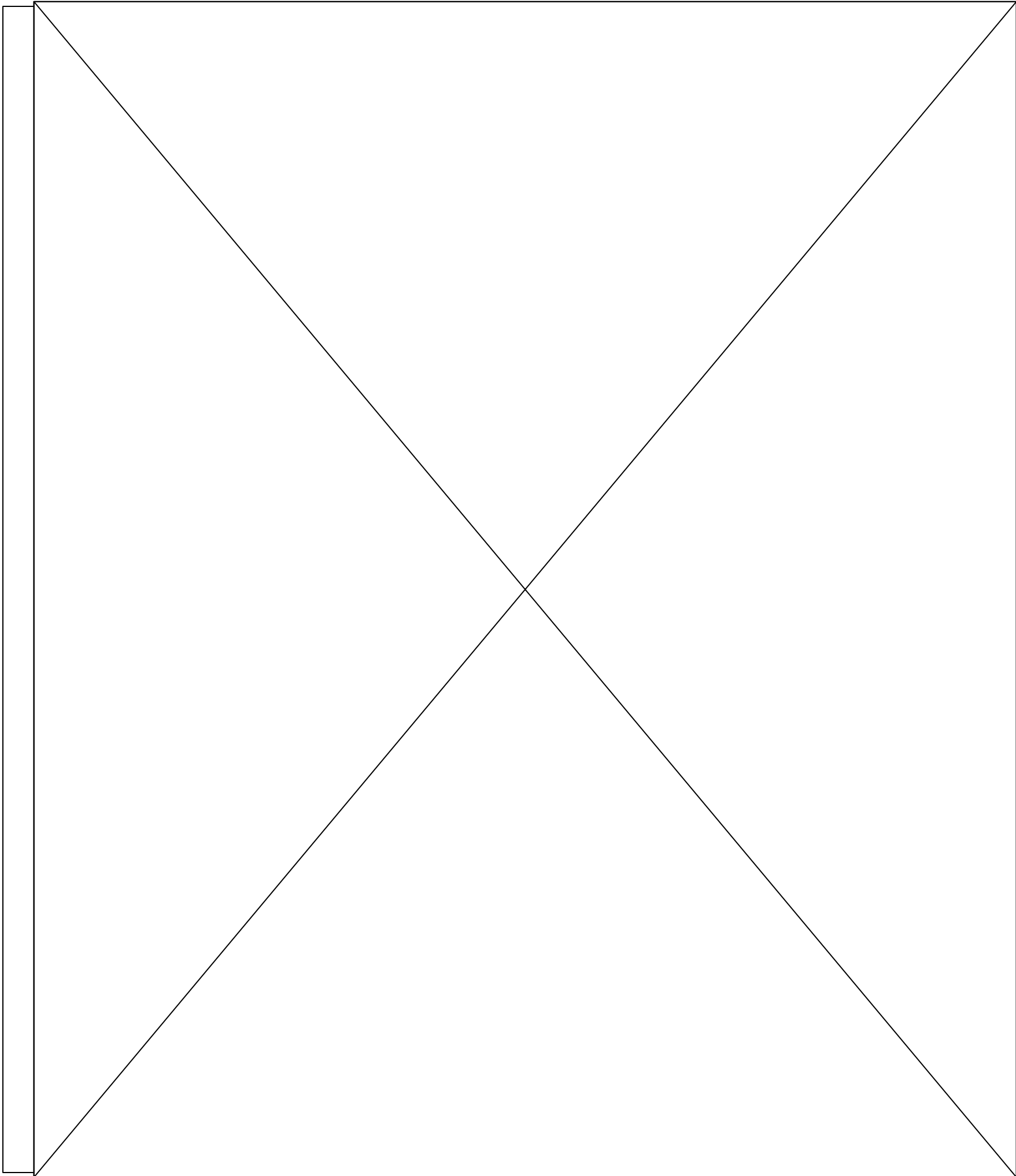




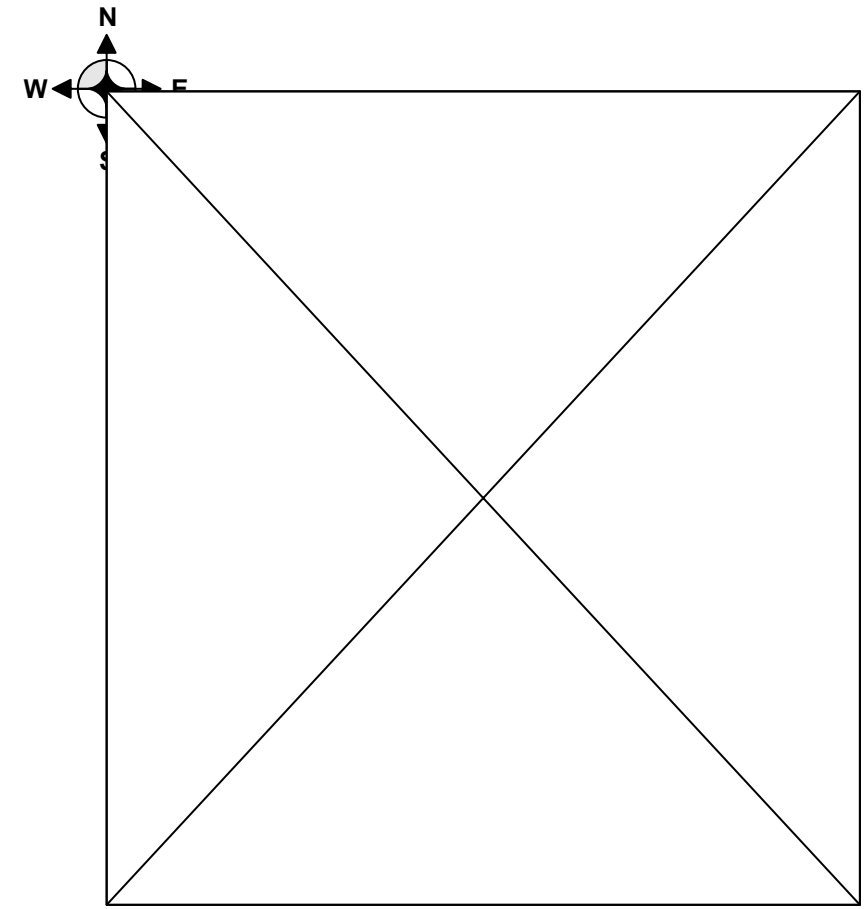
- DEV:X,XX Control Module Address
- Ⓜ Wall-mount Humidity Sensor
- Ⓣ Wall-mount Temperature Sensor
- ⊗ Exhaust Fan
- SP Duct Static Pressure Sensor
- DDC Control Panel
- ARC156 Communication Wiring
- ⋯⋯⋯ #22/4 Solid Logistat
- - - - #22/4 Strnd Control Wiring
- · - · #18/2 Strnd 24VAC



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- DEV:X,XX Control Module Address
- H Wall-mount Humidity Sensor
- T Wall-mount Temperature Sensor
- X Exhaust Fan
- SF Duct Static Pressure Sensor
- DDC Control Panel
- ARC156 Communication Wiring
- ..... #22/4 Solid Logistat
- - - - #22/4 Strnd Control Wiring
- · - · - #18/2 Strnd 24VAC

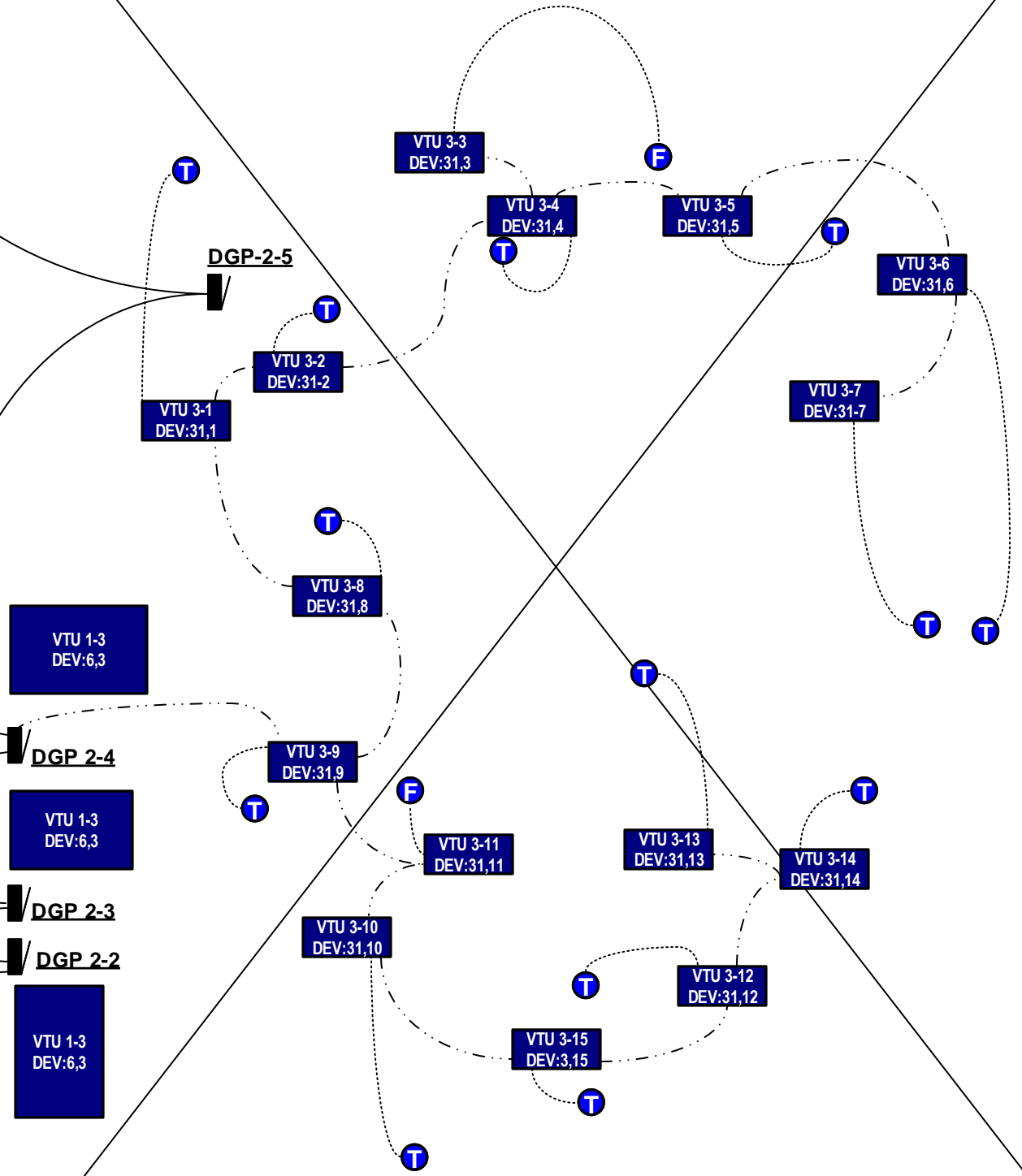


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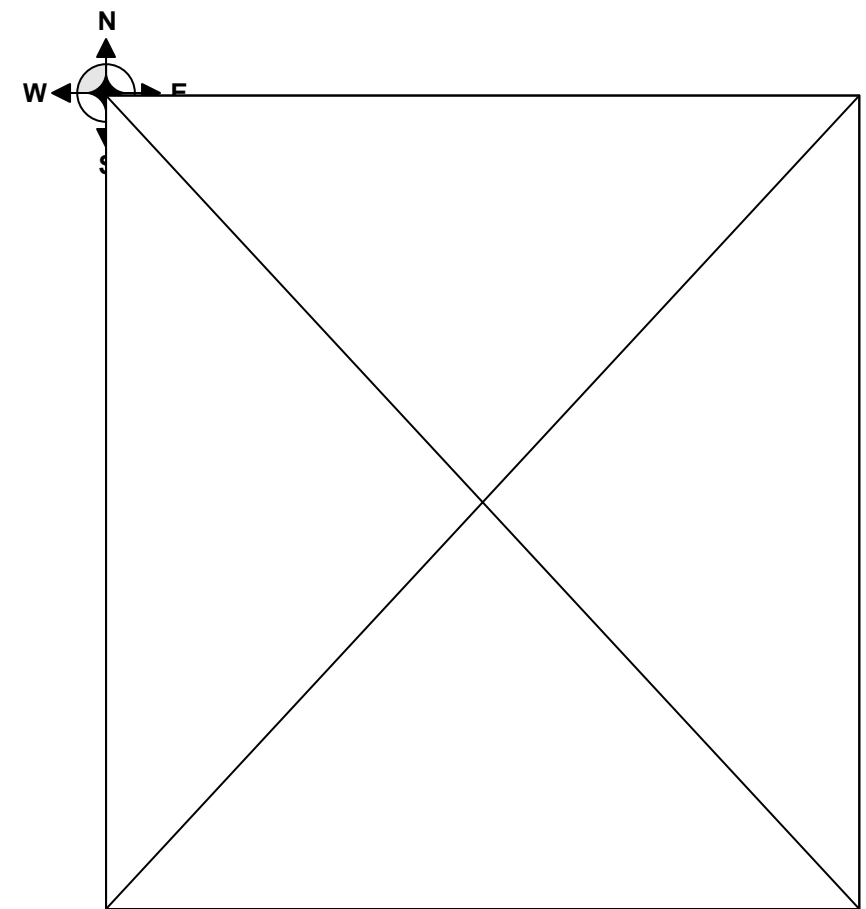
2nd Floor

ARCnet from 2<sup>nd</sup> Floor North West

ARCnet to 3<sup>rd</sup> Floor South East



- DEV:X,XX Control Module Address
- H Wall-mount Humidity Sensor
- T Wall-mount Temperature Sensor
- X Exhaust Fan
- SP Duct Static Pressure Sensor
- DDC Control Panel
- ARC156 Communication Wiring
- ..... #22/4 Solid Logistat
- #22/4 Strnd Control Wiring
- · - · - #18/2 Strnd 24VAC



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2nd Floor South East			
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# 3rd Floor North West

**DEV:XX** Control Module Address

**H** Wall-mount Humidity Sensor

**T** Wall-mount Temperature Sensor

**⊗** Exhaust Fan

**SP** Duct Static Pressure Sensor

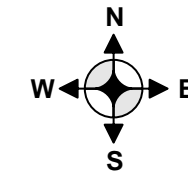
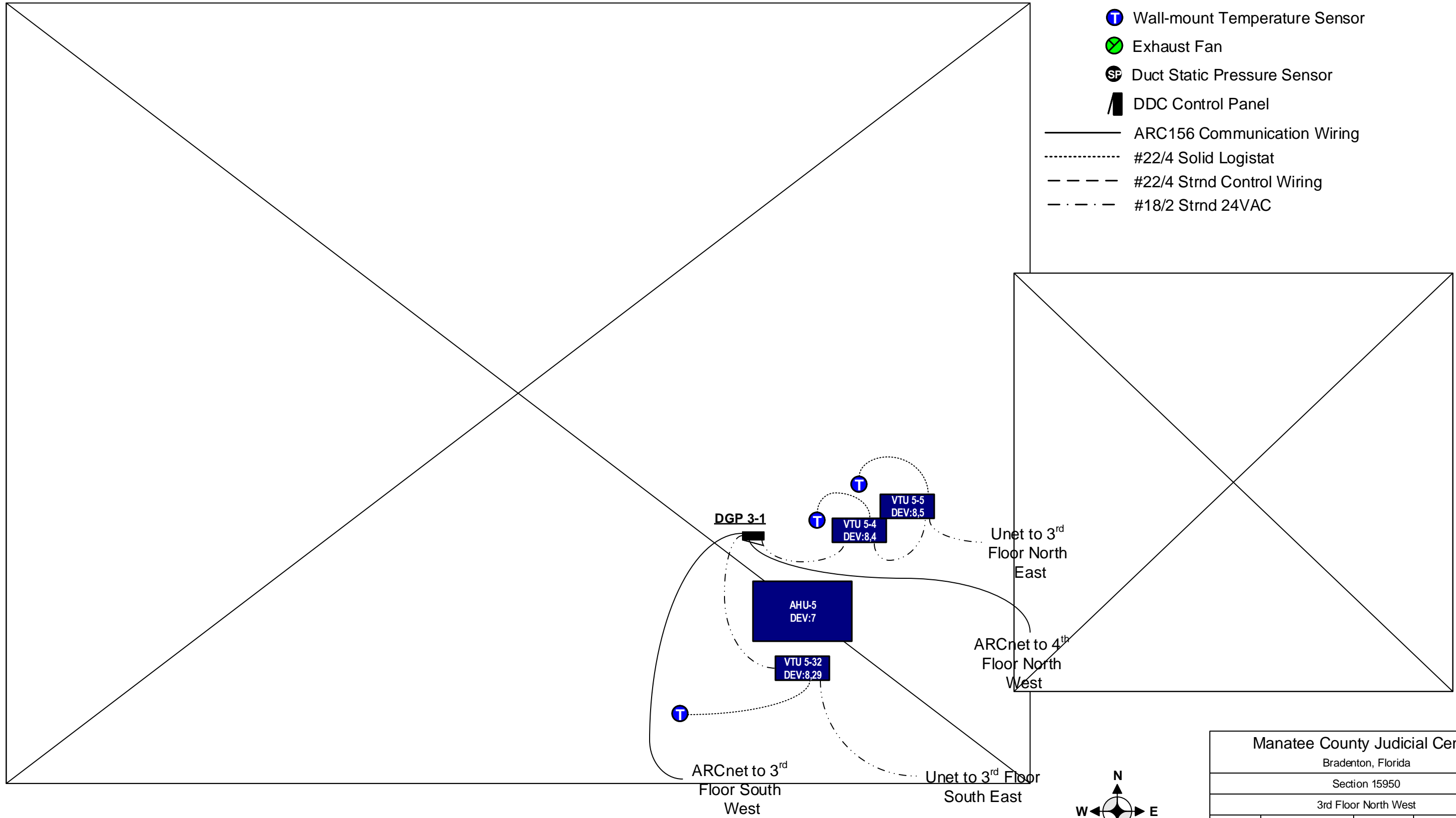
**▲** DDC Control Panel

— ARC156 Communication Wiring

⋯ #22/4 Solid Logistat

- - - #22/4 Strnd Control Wiring

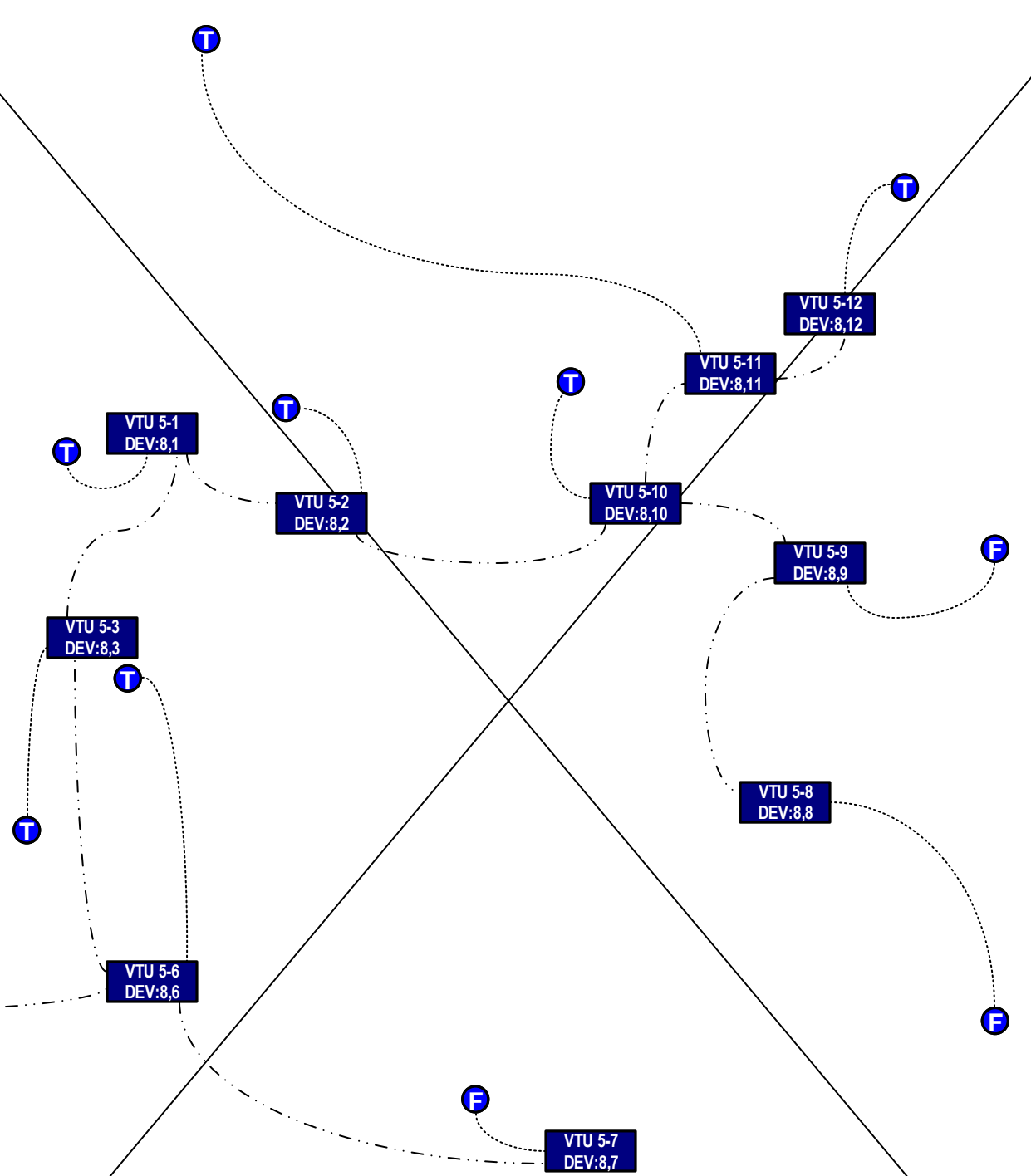
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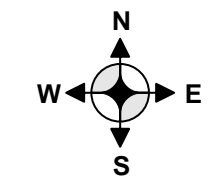
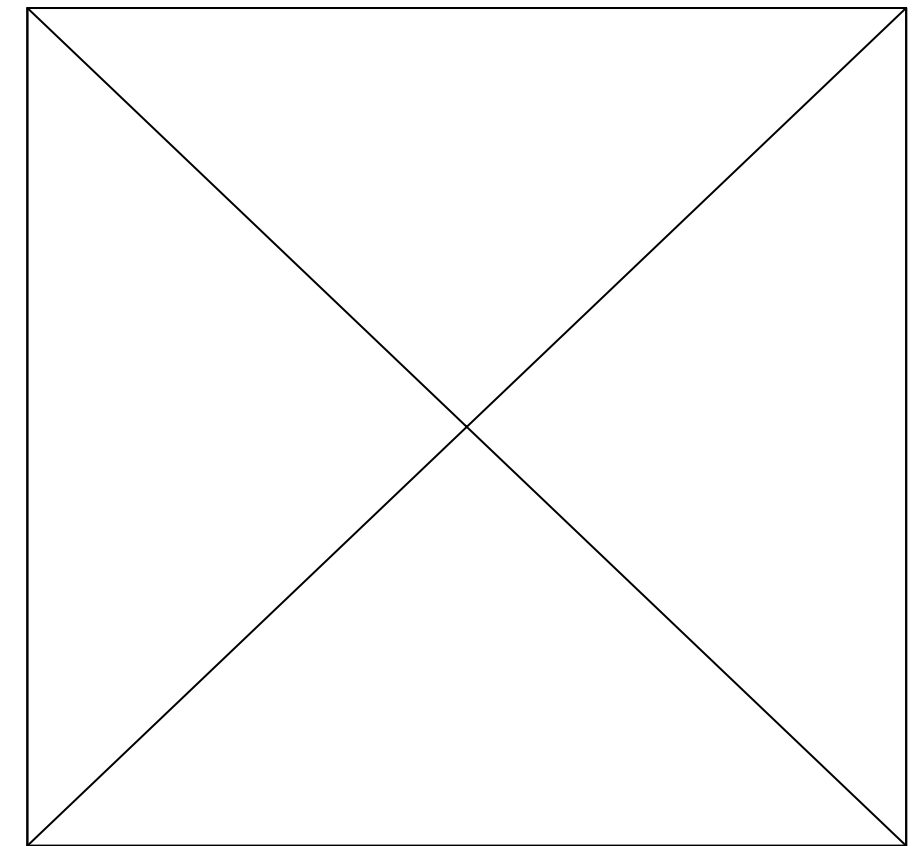
Manatee County Judicial Center Bradenton, Florida			
Section 15950			
3rd Floor North West			
REV: 1	Submittal	8/14/2006	JOB NO: 29083
			CHECK BY: CLT
			CORE NO: 1007
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3rd F

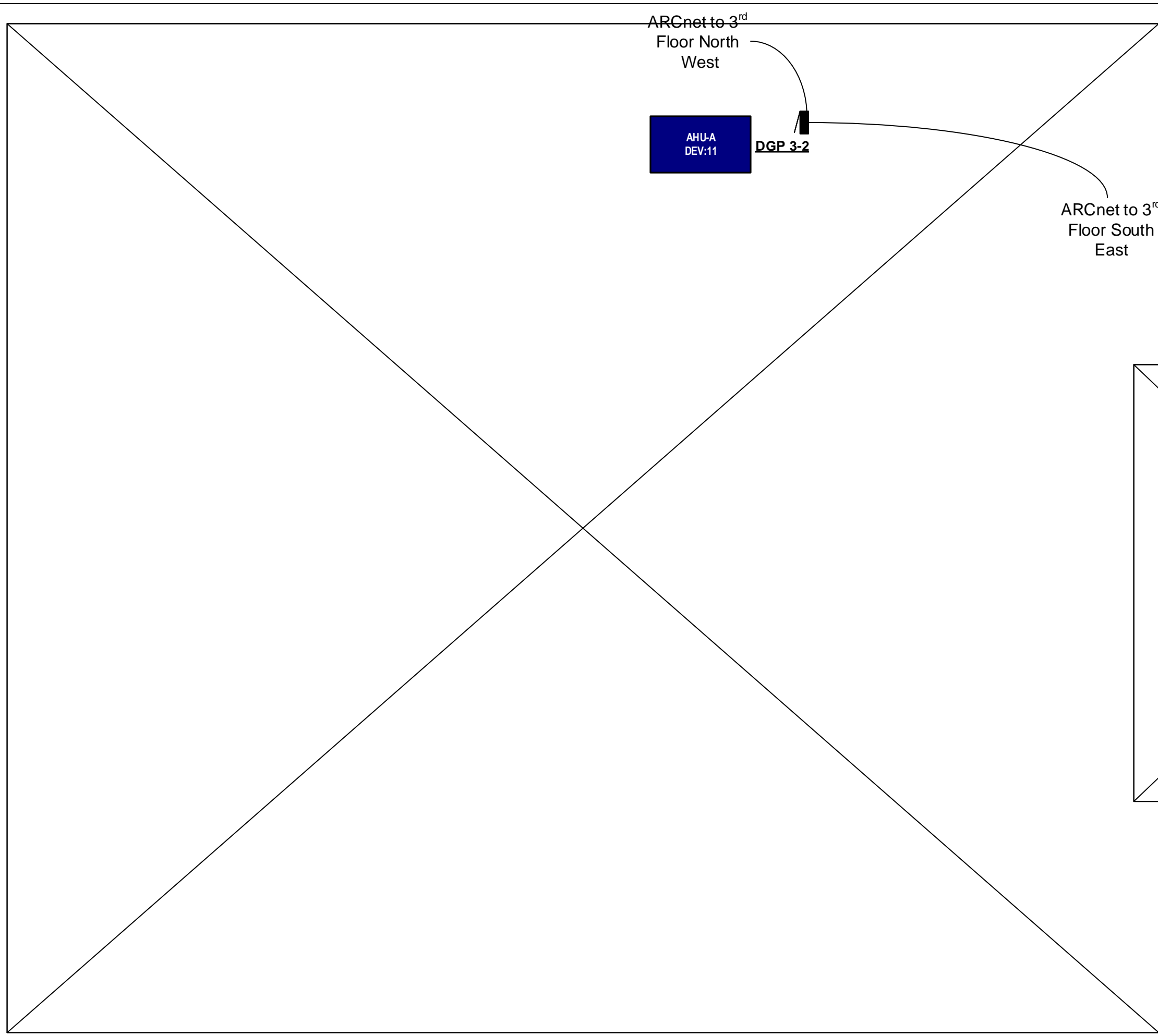
Unet to 3<sup>rd</sup>  
Floor North  
West



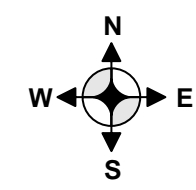
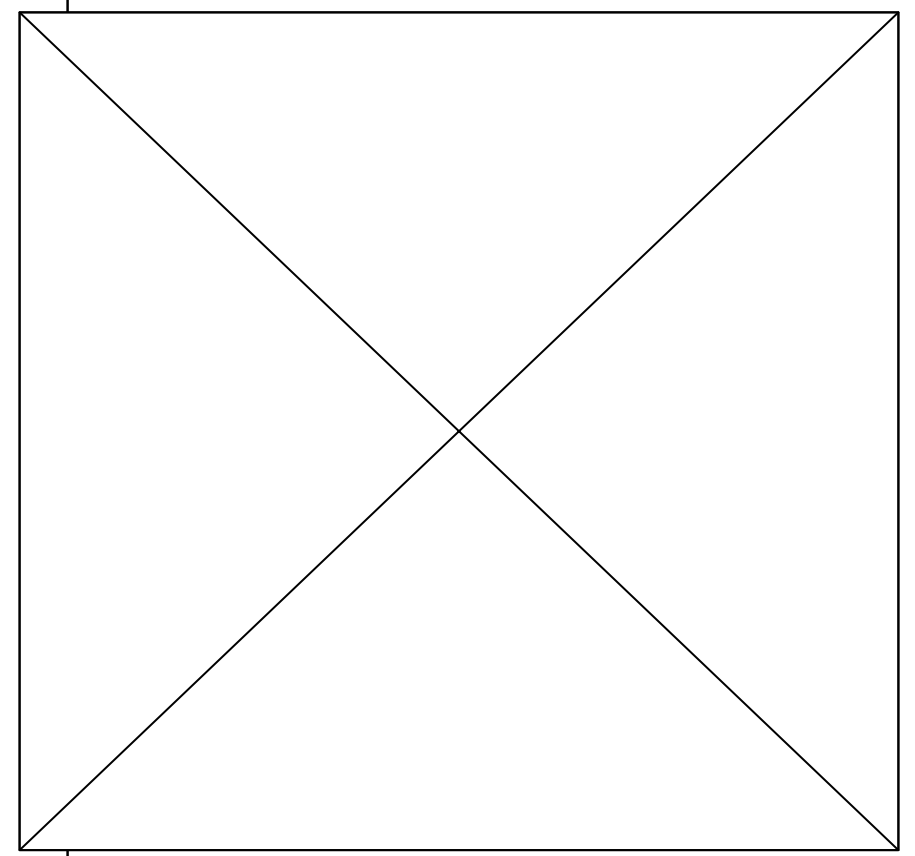
- DEV:X,XX Control Module Address
- H Wall-mount Humidity Sensor
- T Wall-mount Temperature Sensor
- ⊗ Exhaust Fan
- SP Duct Static Pressure Sensor
- DDC Control Panel
- ARC156 Communication Wiring
- ..... #22/4 Solid Logistat
- #22/4 Strnd Control Wiring
- · - · - #18/2 Strnd 24VAC



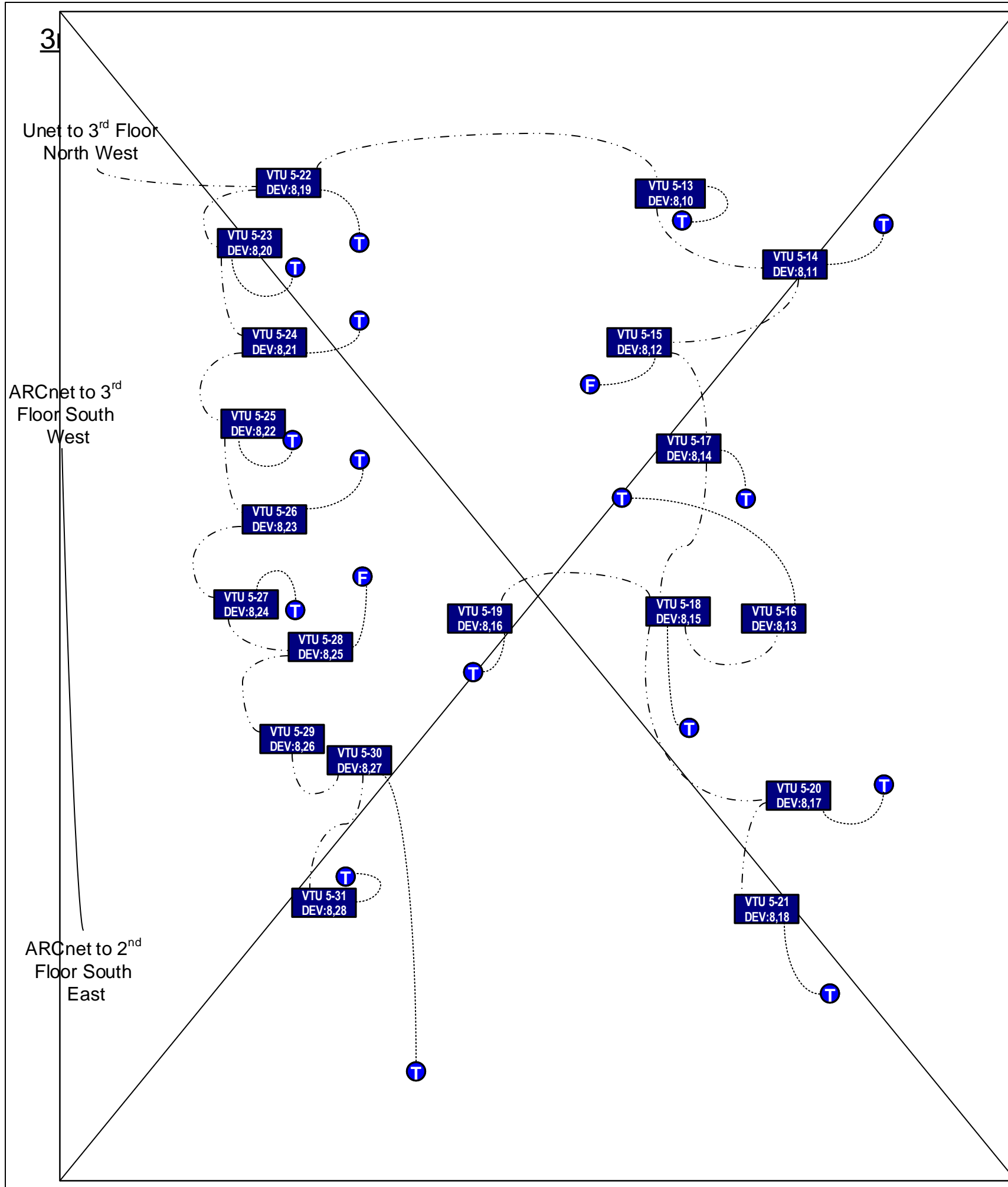
Manatee County Judicial Center			
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3rd Floor North East			
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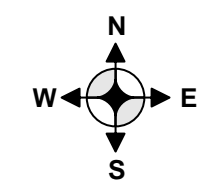
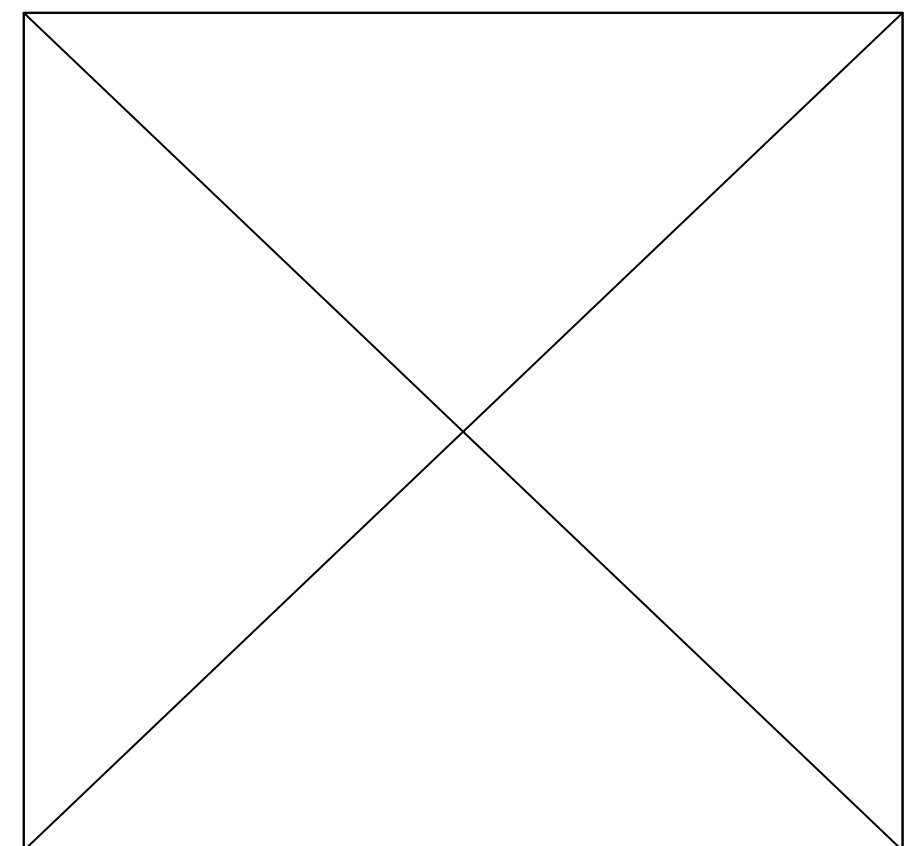
- DEV:X,XX Control Module Address
- H Wall-mount Humidity Sensor
- T Wall-mount Temperature Sensor
- X Exhaust Fan
- SP Duct Static Pressure Sensor
- DDC Control Panel
- ARC156 Communication Wiring
- #22/4 Solid Logistat
- #22/4 Strnd Control Wiring
- #18/2 Strnd 24VAC



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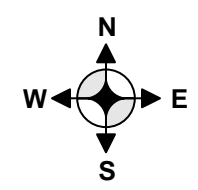
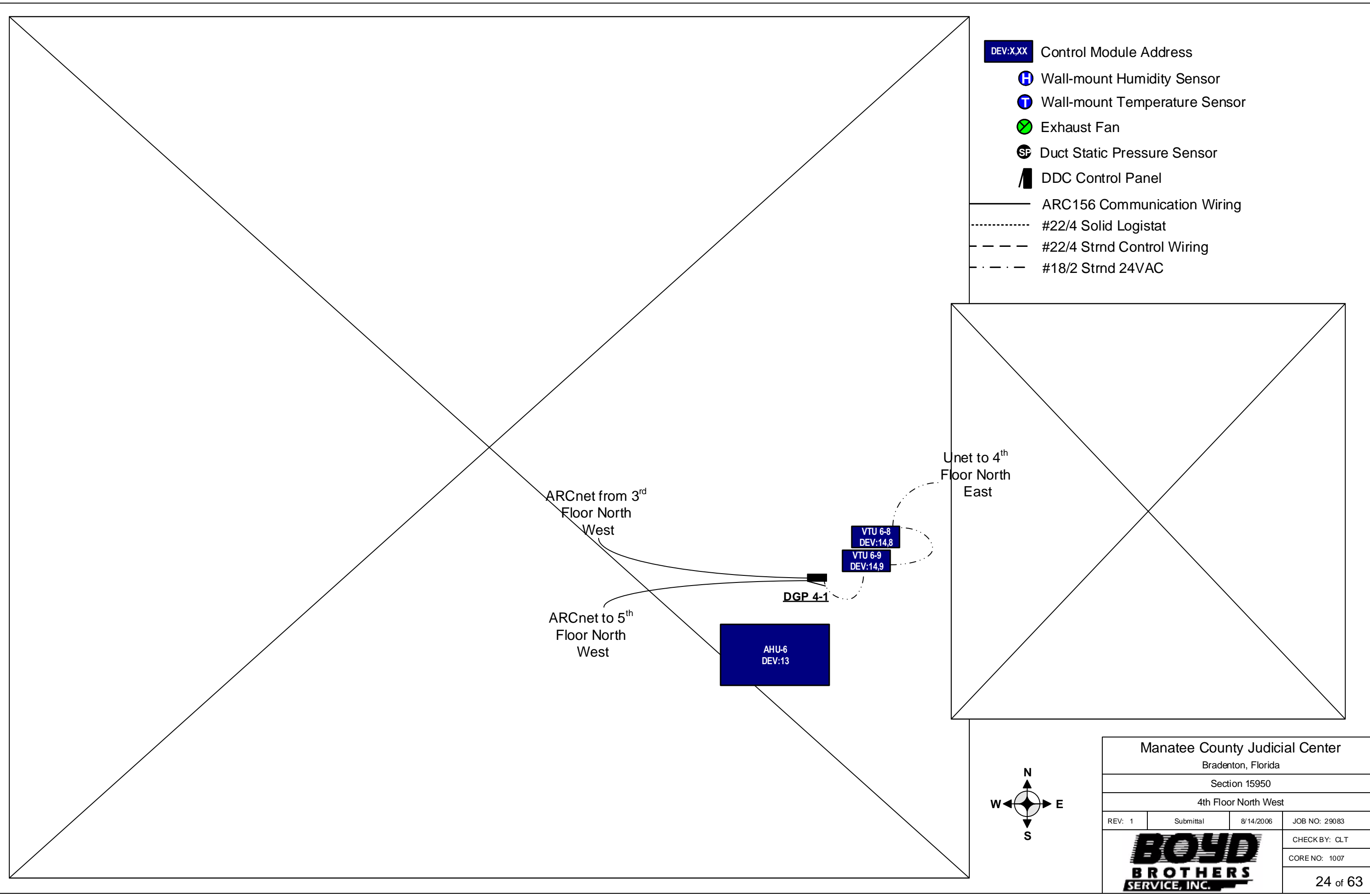


- DEV:X,XX Control Module Address
- H Wall-mount Humidity Sensor
- T Wall-mount Temperature Sensor
- Exhaust Fan
- SP Duct Static Pressure Sensor
- DDC Control Panel
- ARC156 Communication Wiring
- ..... #22/4 Solid Logistat
- - - - #22/4 Strnd Control Wiring
- · - · - #18/2 Strnd 24VAC



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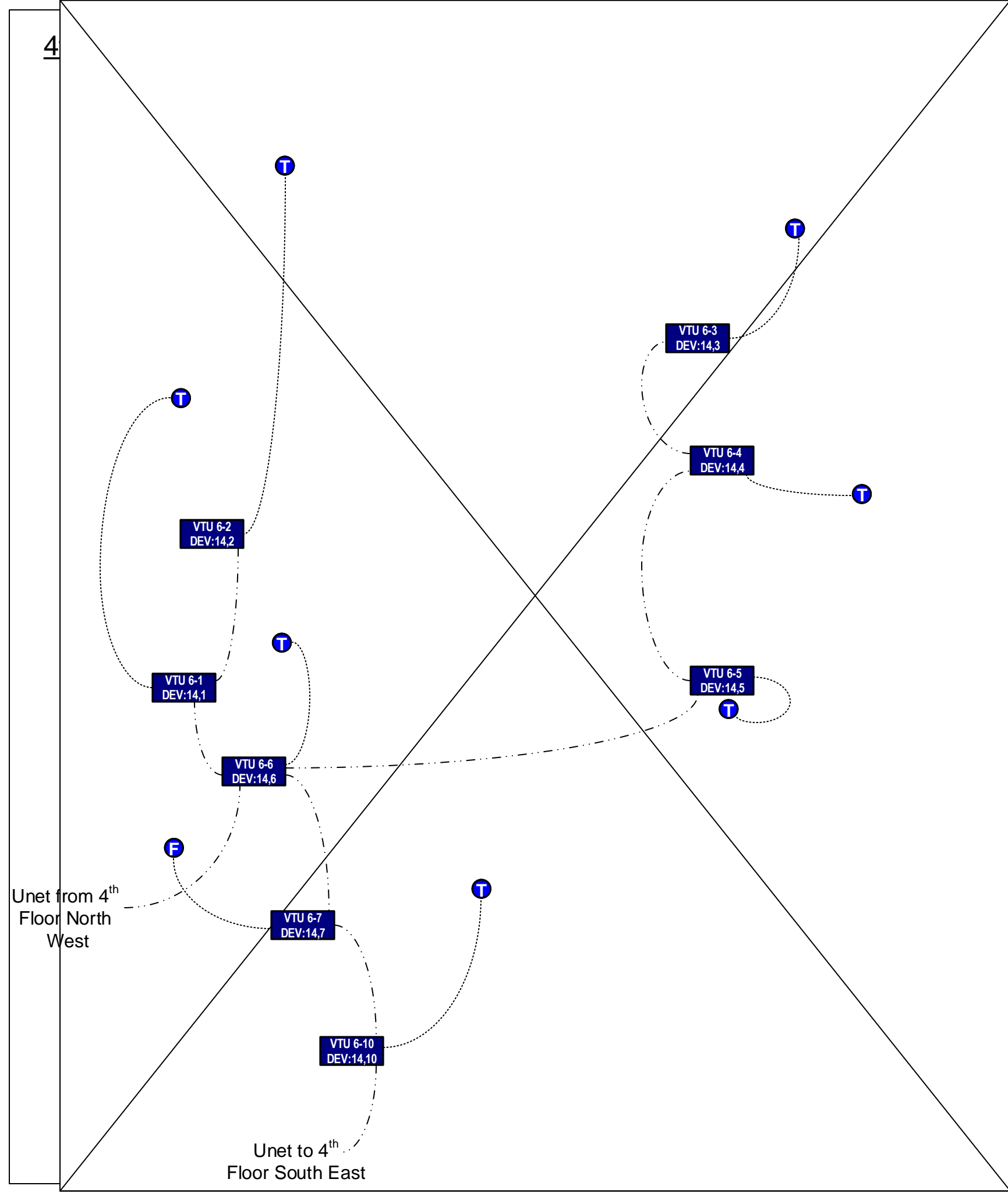
- DEV:X,XX Control Module Address
- H Wall-mount Humidity Sensor
- T Wall-mount Temperature Sensor
- X Exhaust Fan
- SP Duct Static Pressure Sensor
- / DDC Control Panel
- ARC156 Communication Wiring
- #22/4 Solid Logistat
- - - - #22/4 Strnd Control Wiring
- · - · #18/2 Strnd 24VAC



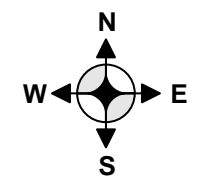
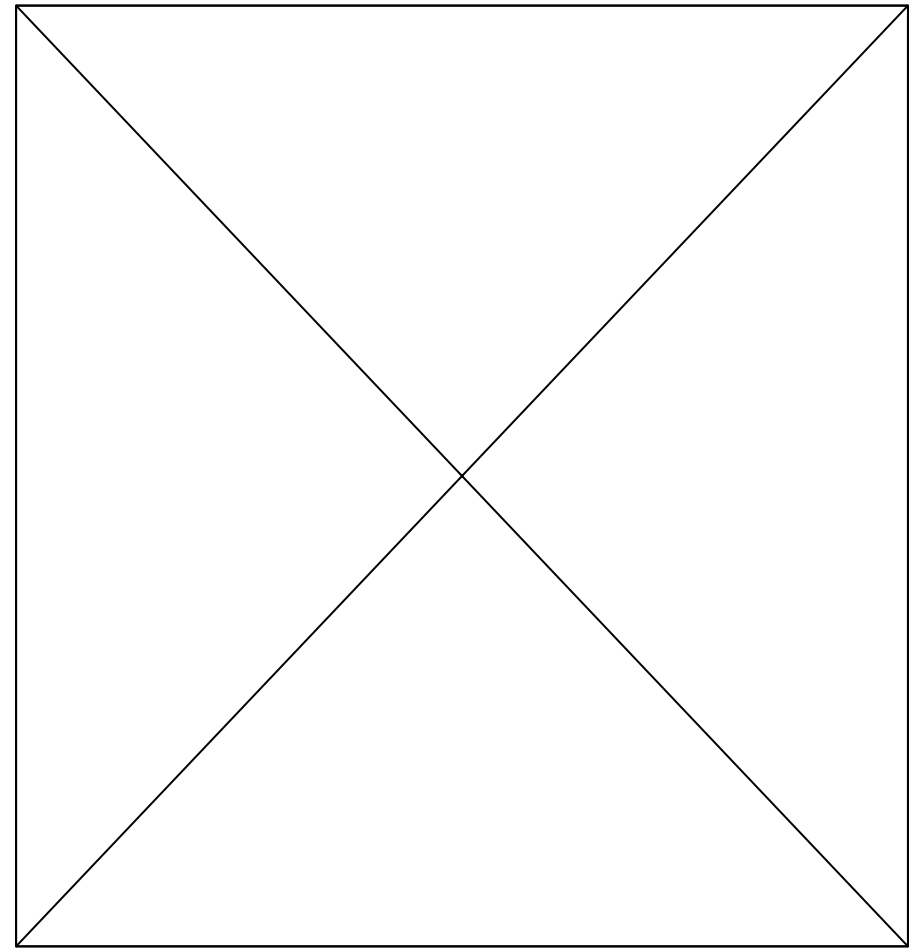
Manatee County Judicial Center Bradenton, Florida			
Section 15950			
4th Floor North West			
REV: 1	Submittal	8/14/2006	JOB NO: 29083
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4



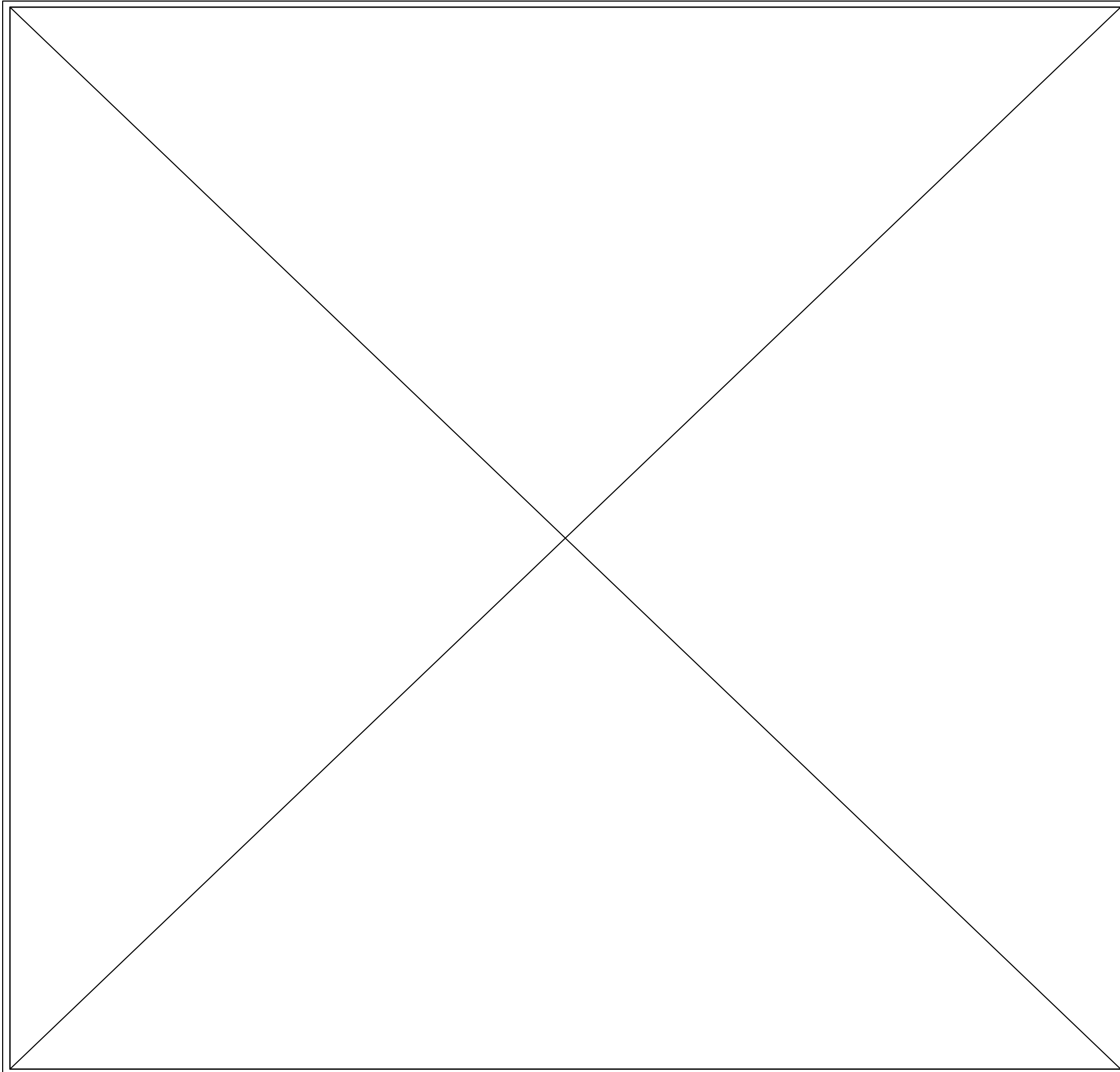
- DEV:XXX** Control Module Address
- H** Wall-mount Humidity Sensor
- T** Wall-mount Temperature Sensor
- F** Exhaust Fan
- SP** Duct Static Pressure Sensor
- DDC Control Panel**
- ARC156 Communication Wiring
- ..... #22/4 Solid Logistat
- - - - #22/4 Strnd Control Wiring
- · - · - #18/2 Strnd 24VAC



Unet from 4<sup>th</sup> Floor North West


Unet to 4<sup>th</sup> Floor South East

Manatee County Judicial Center Bradenton, Florida			
Section 15950			
4th Floor North East			
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<b>BOYD BROTHERS SERVICE, INC.</b>			CHECK BY: CLT
			CORE NO: 1007
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DEV:X,XX

Control Module Address

 Wall-mount Humidity Sensor


 Wall-mount Temperature Sensor

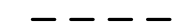
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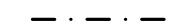
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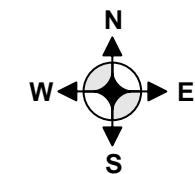
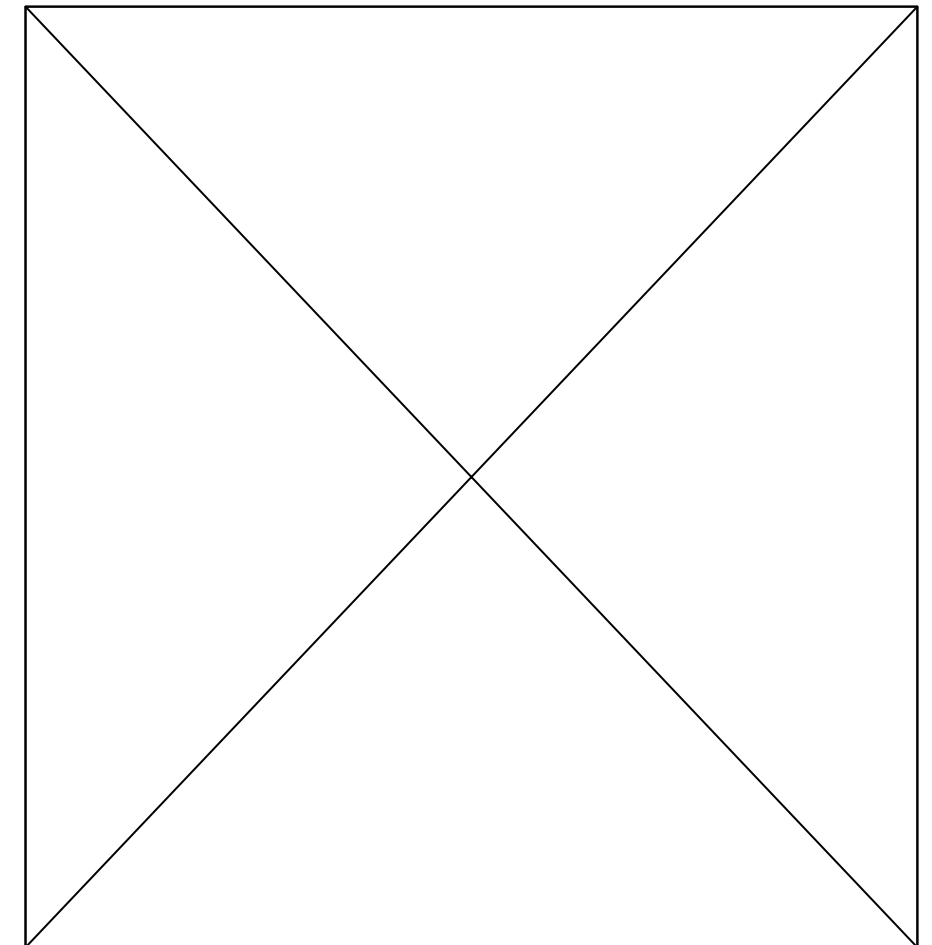
 DDC Control Panel

 ARC156 Communication Wiring

 #22/4 Solid Logistat

 #22/4 Strnd Control Wiring

 #18/2 Strnd 24VAC



Manatee County Judicial Center

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4th Floor South West

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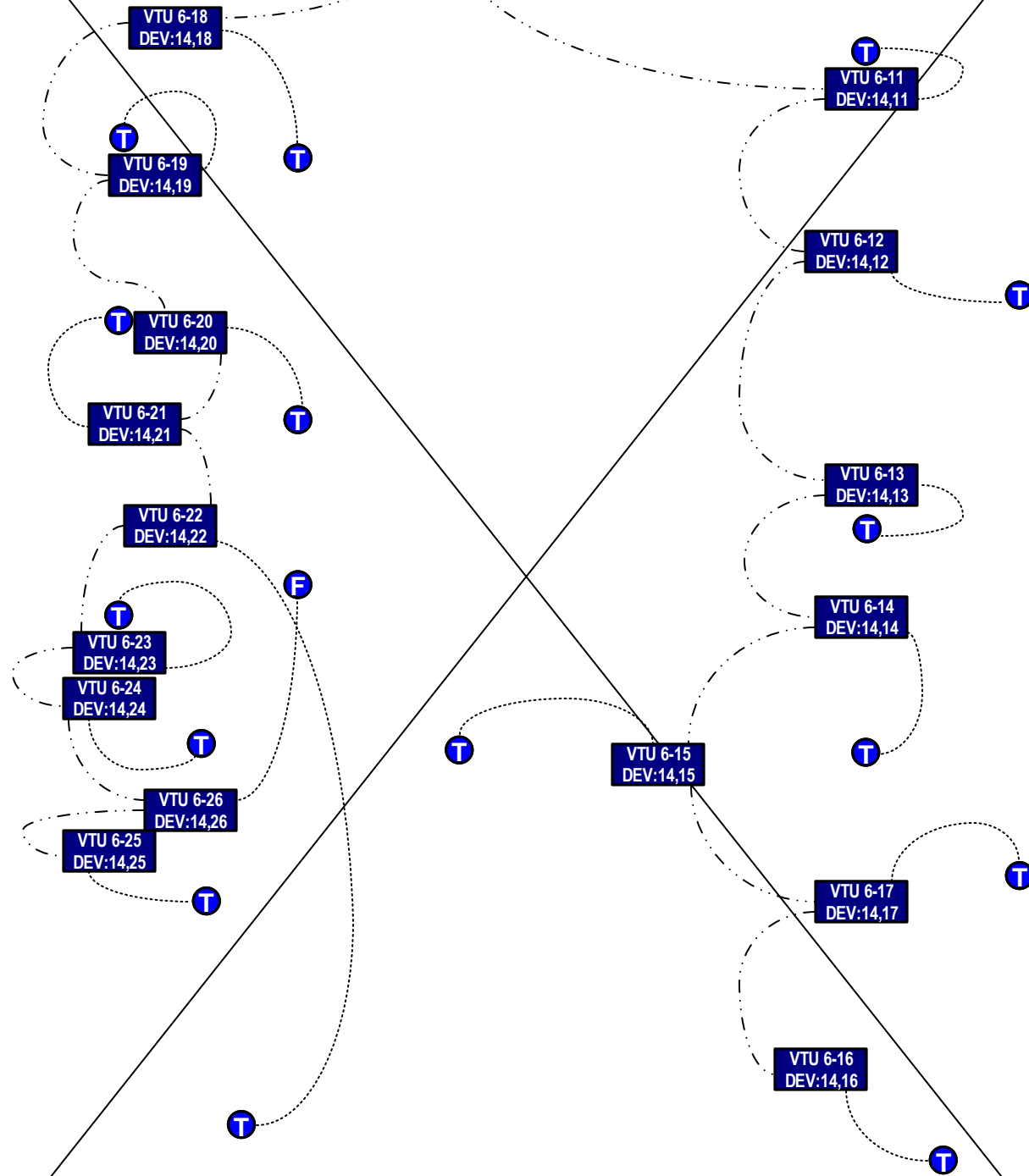


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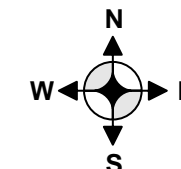
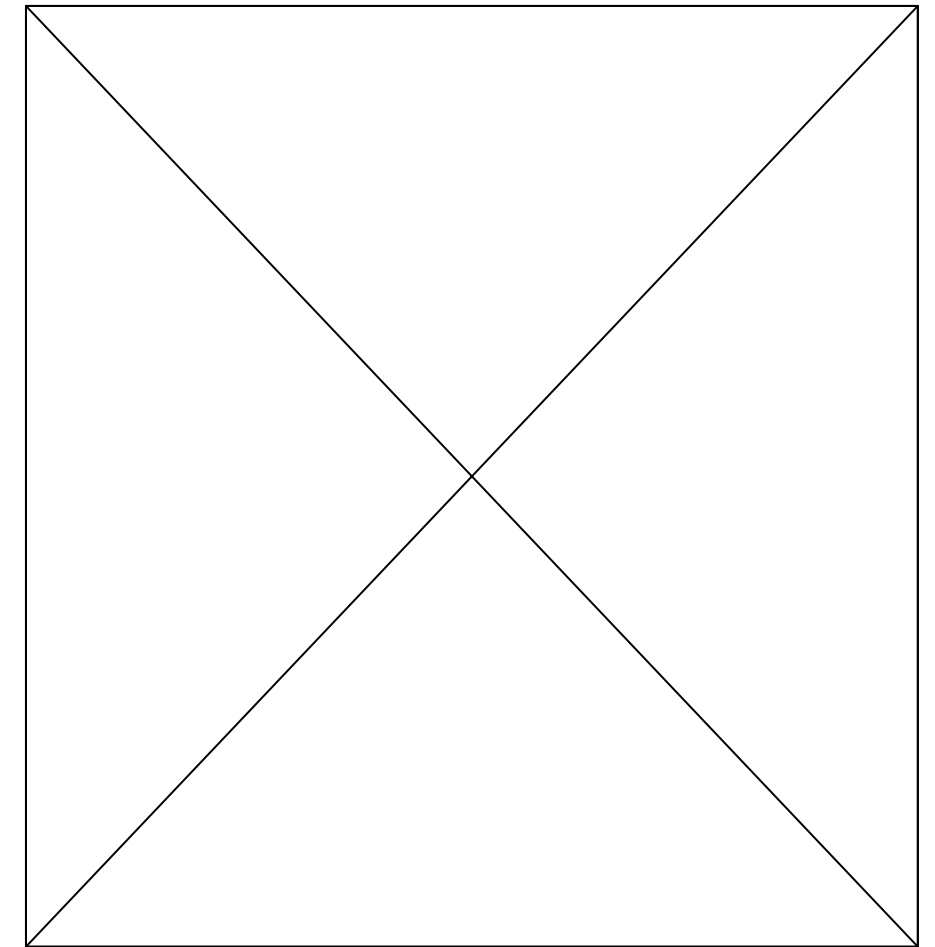
CORE NO: 1007

14

Unet from 4<sup>th</sup> Floor  
North East

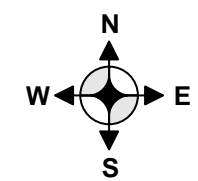
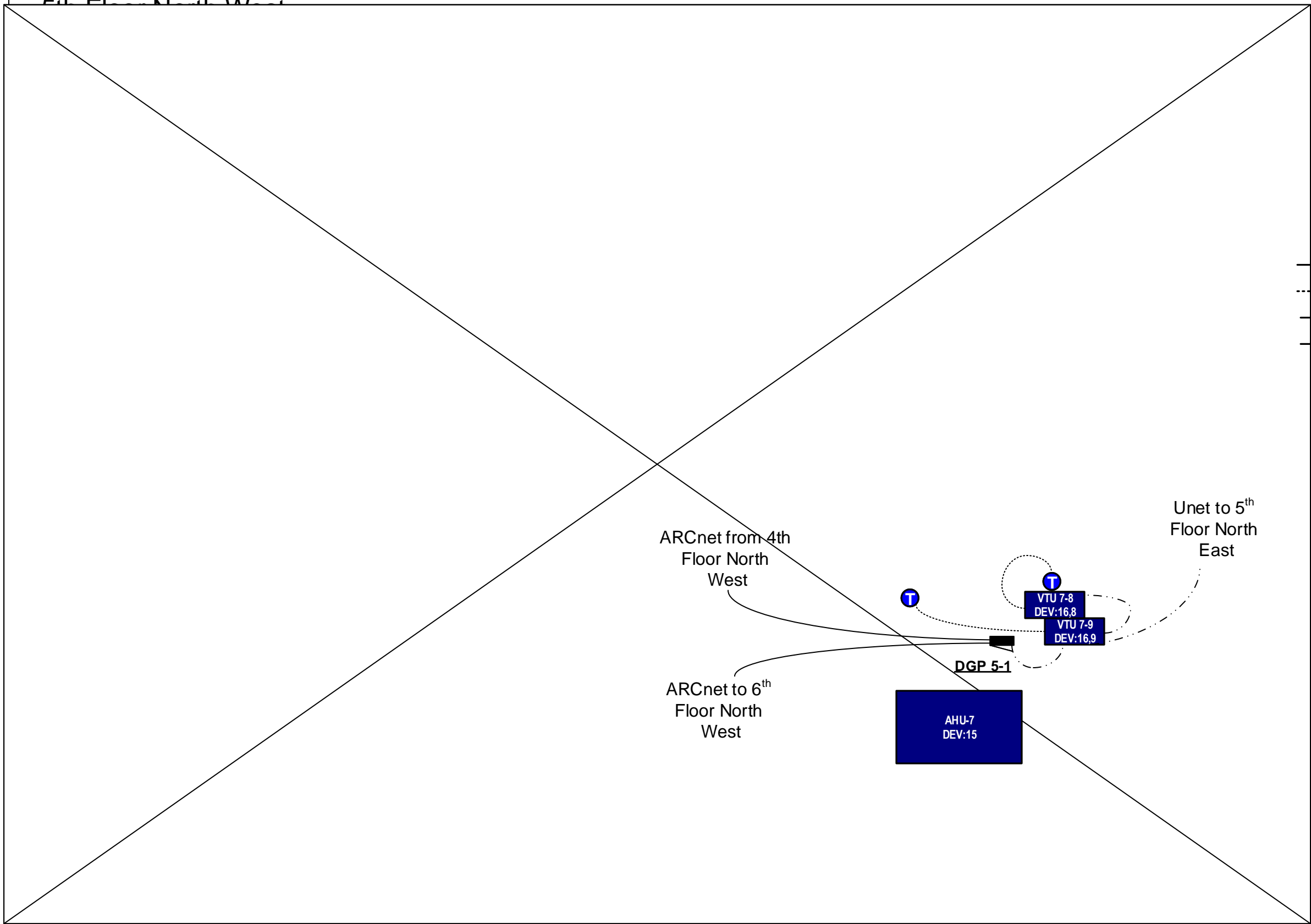


- DEV:X,XX Control Module Address
- H Wall-mount Humidity Sensor
- T Wall-mount Temperature Sensor
- F Exhaust Fan
- SP Duct Static Pressure Sensor
- ▮ DDC Control Panel
- ARC156 Communication Wiring
- ..... #22/4 Solid Logistat
- - - - #22/4 Strnd Control Wiring
- · - · #18/2 Strnd 24VAC



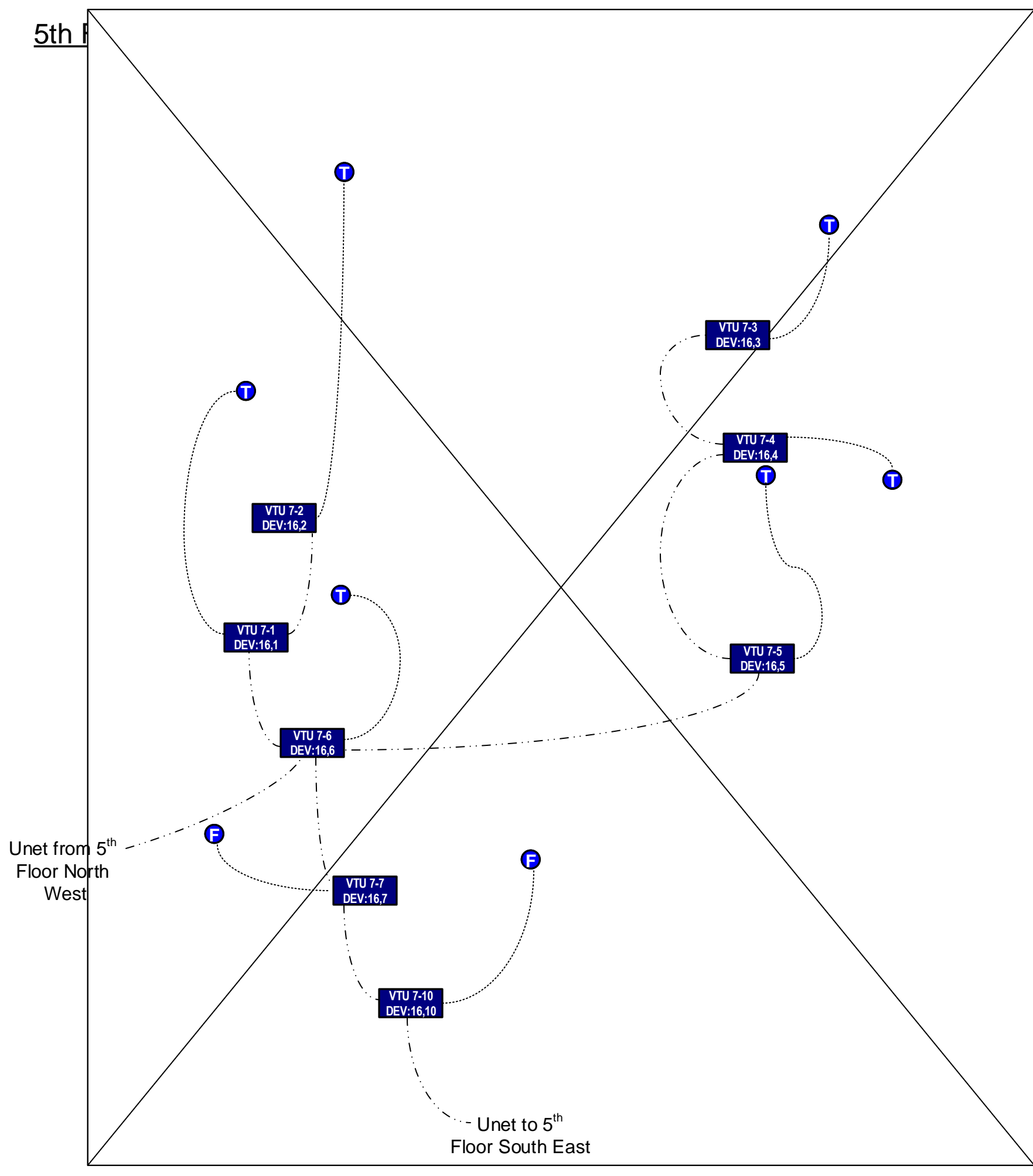
Manatee County Judicial Center Bradenton, Florida			
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4th Floor South East			
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- DEV:X,XX Control Module Address
  - H Wall-mount Humidity Sensor
  - T Wall-mount Temperature Sensor
  - X Exhaust Fan
  - SP Duct Static Pressure Sensor
  - DDC Control Panel
- 
- ARC156 Communication Wiring
  - #22/4 Solid Logistat
  - #22/4 Strnd Control Wiring
  - #18/2 Strnd 24VAC



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Bradenton, Florida			
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5th Floor North West			
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5th F



DEV:X,XX Control Module Address

H Wall-mount Humidity Sensor

T Wall-mount Temperature Sensor

F Exhaust Fan

SP Duct Static Pressure Sensor

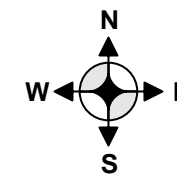
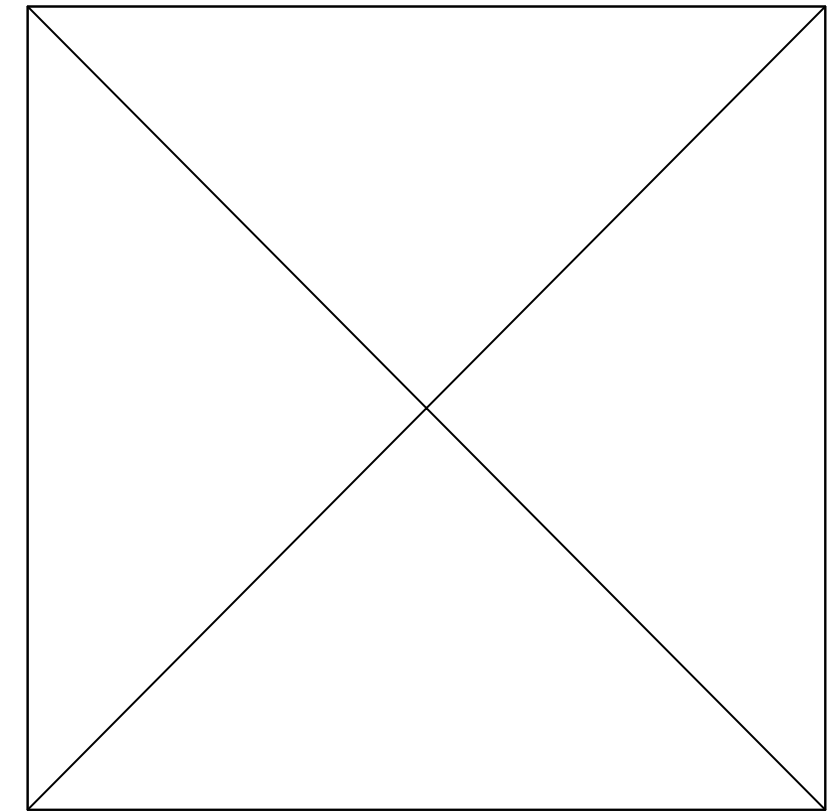
DDC Control Panel

— ARC156 Communication Wiring

..... #22/4 Solid Logistat

- - - - #22/4 Strnd Control Wiring

- · - · - #18/2 Strnd 24VAC



Manatee County Judicial Center

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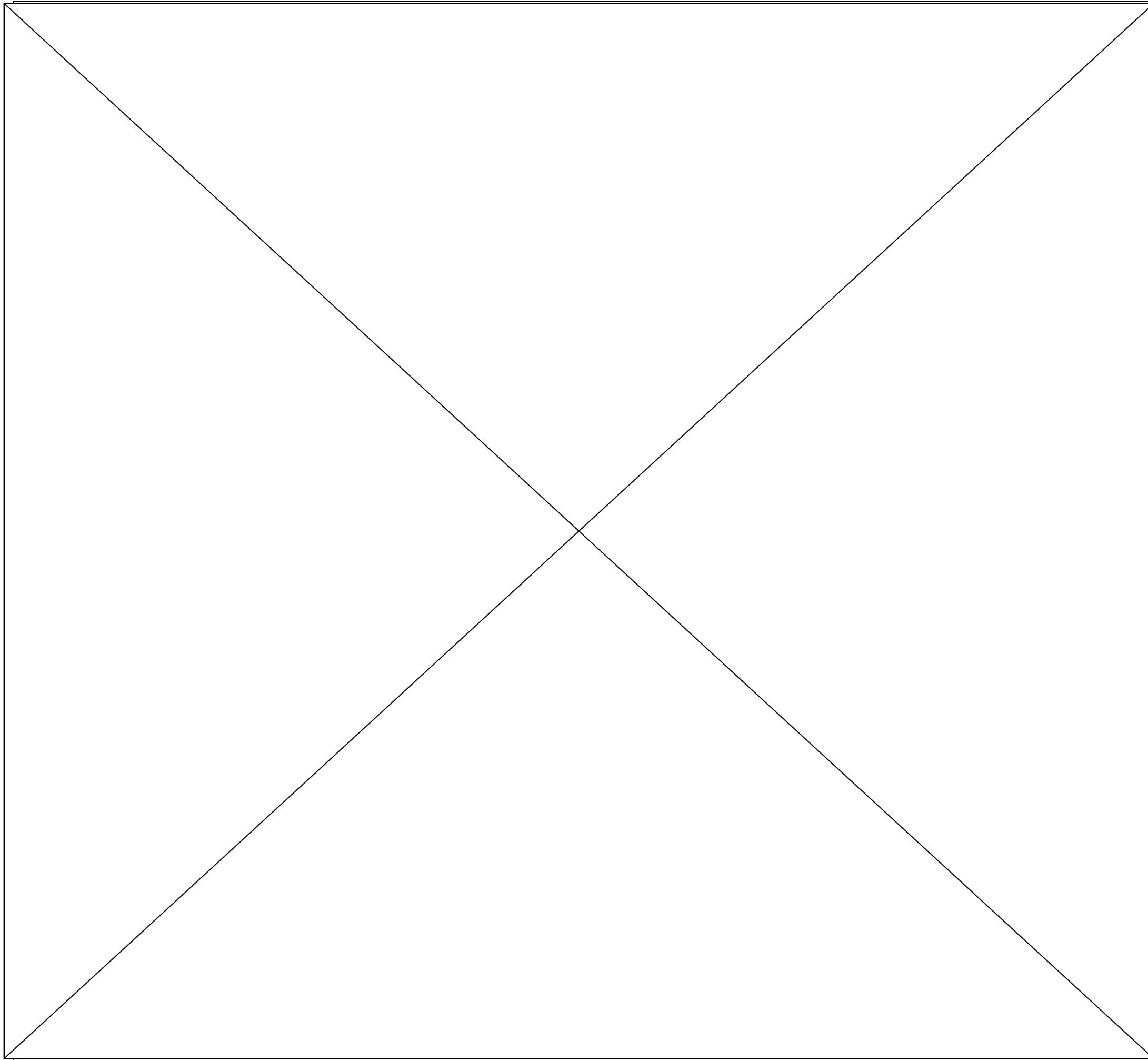
5th Floor North East

REV: 1	Submittal	8/14/2006	JOB NO: 29083
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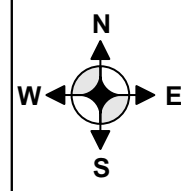
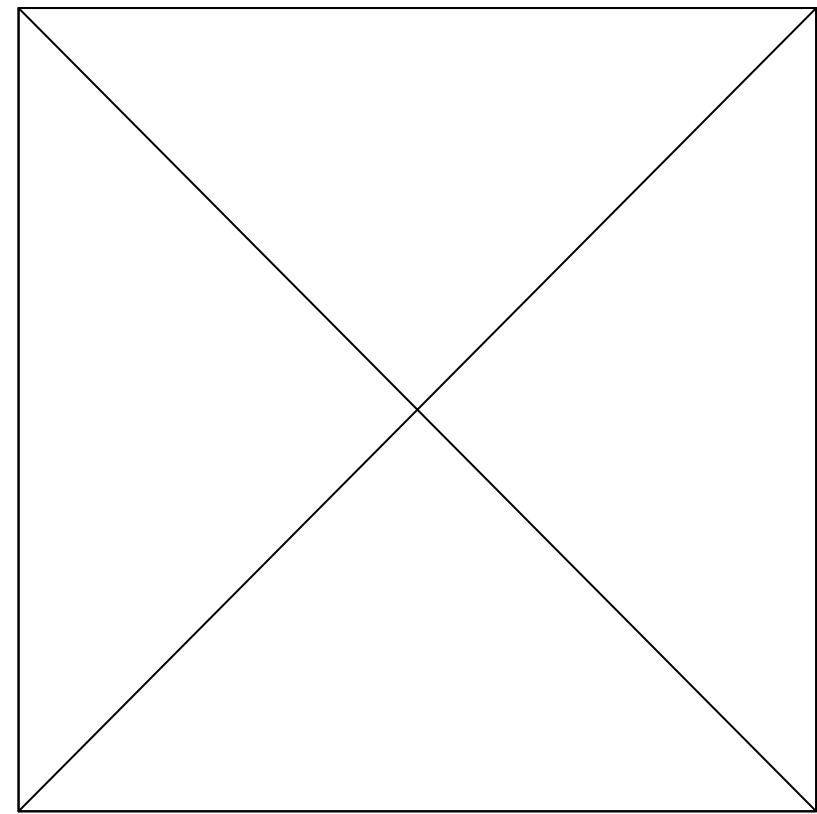


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CORE NO: 1007

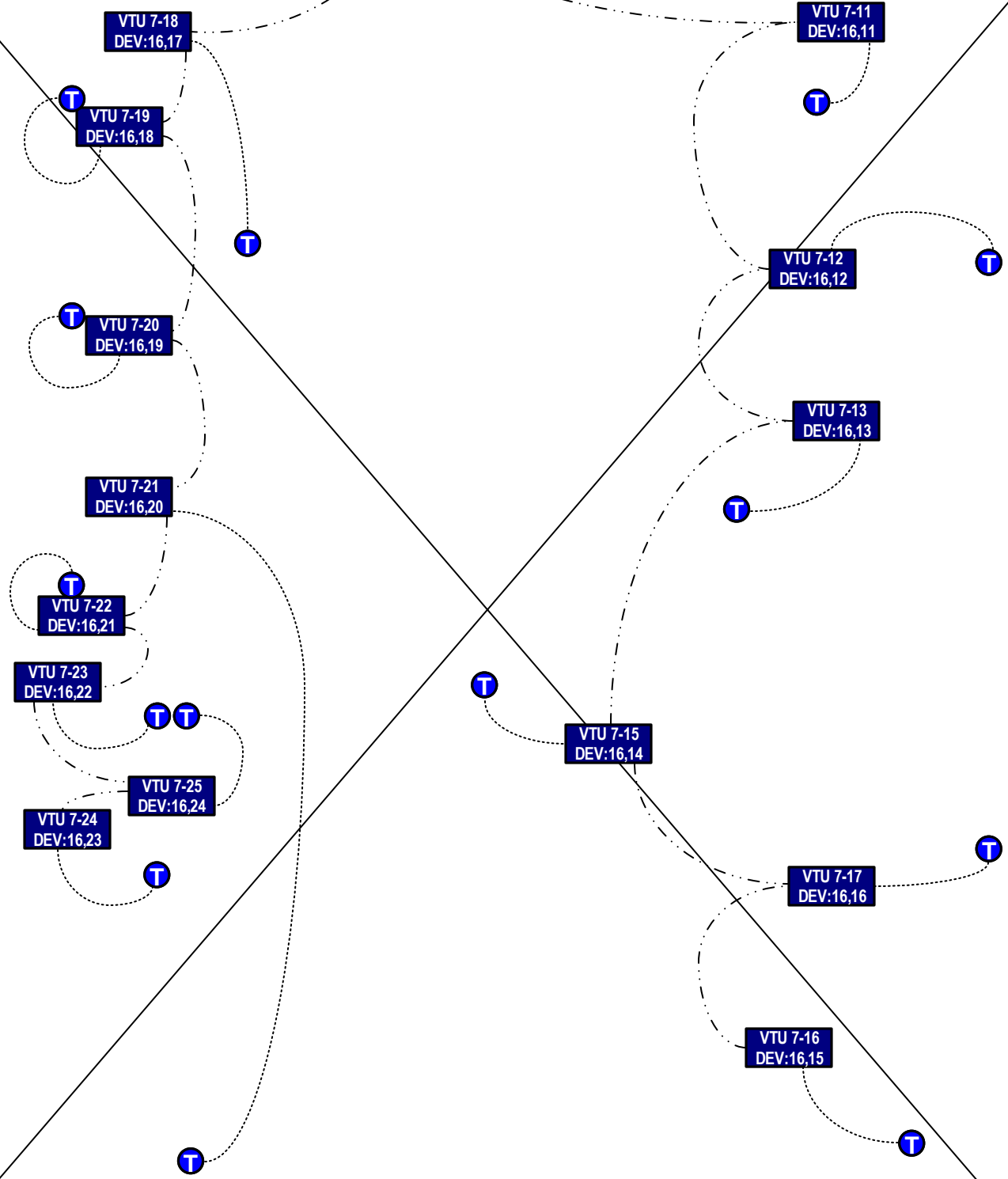


- DEV:X,XX Control Module Address
- H Wall-mount Humidity Sensor
- T Wall-mount Temperature Sensor
- X Exhaust Fan
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- / DDC Control Panel
- ARC156 Communication Wiring
- ..... #22/4 Solid Logistat
- - - - #22/4 Strnd Control Wiring
- · - · - #18/2 Strnd 24VAC

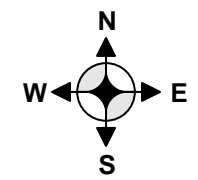
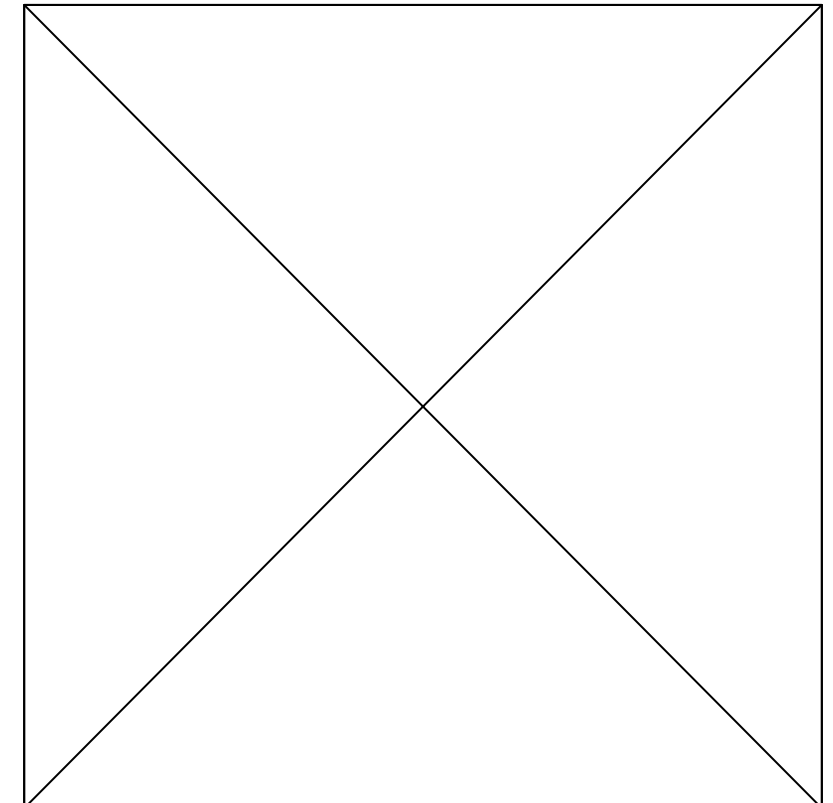


<b>Manatee County Judicial Center</b> Bradenton, Florida			
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5th Floor South West			
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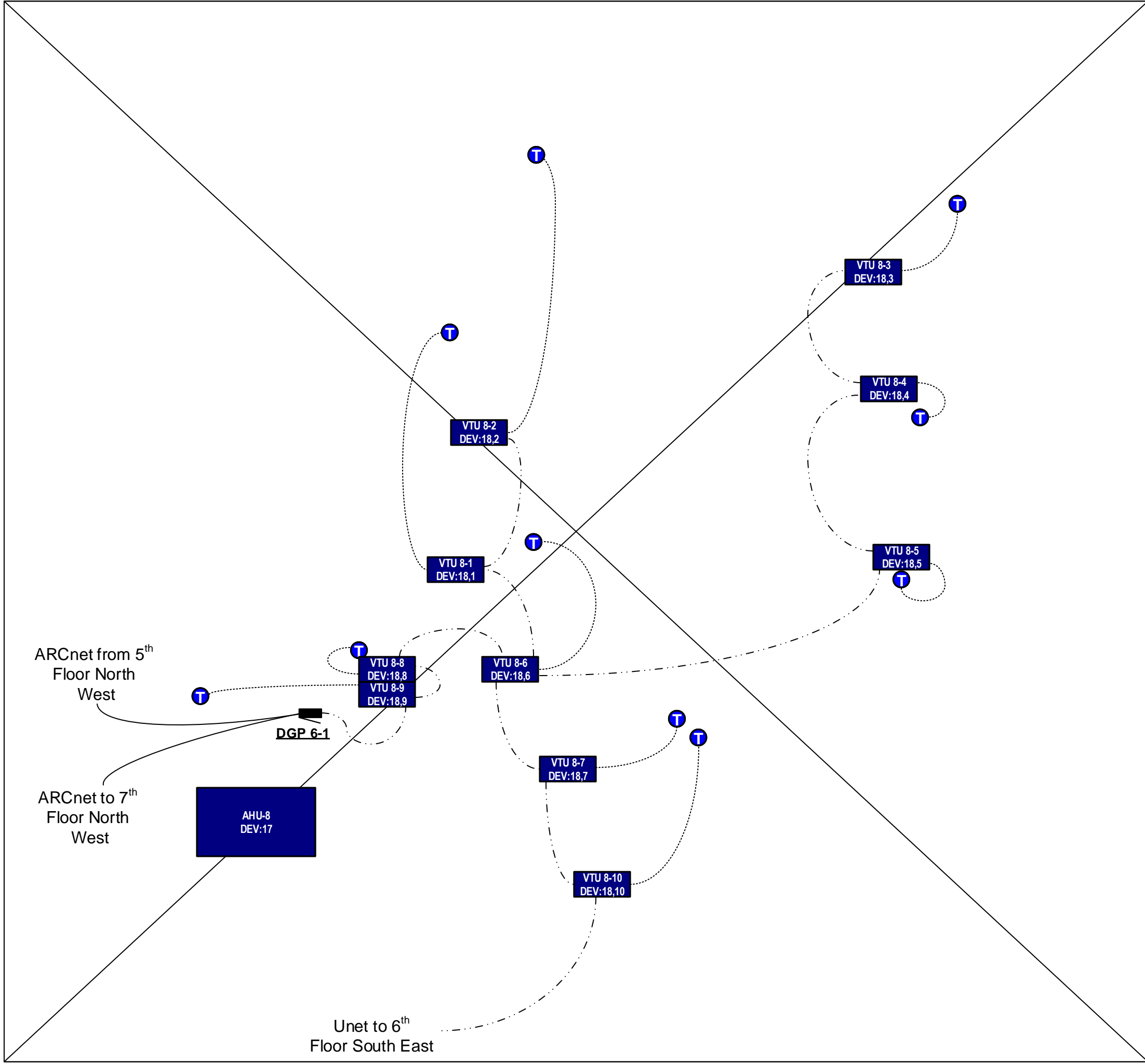
Unet from 5<sup>th</sup> Floor  
North East



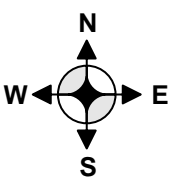
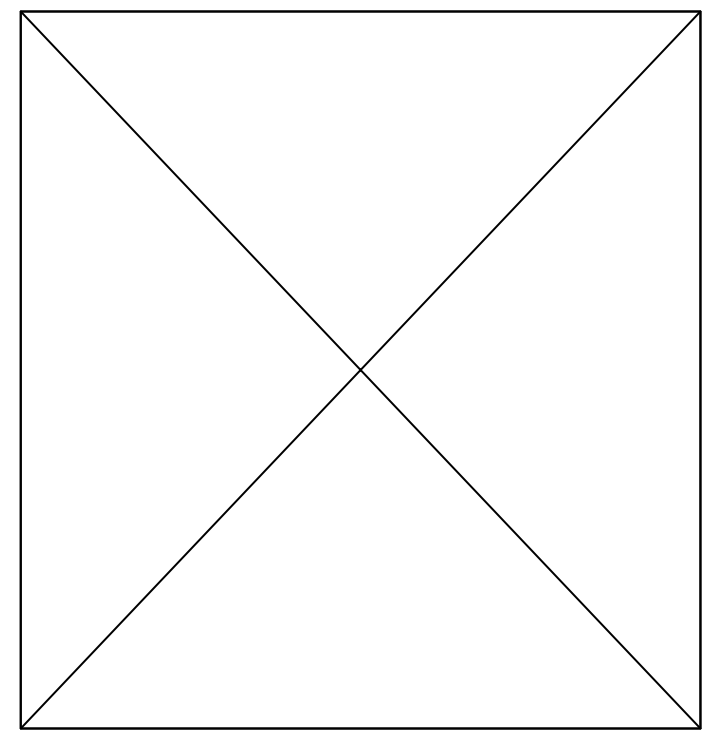
- DEV:X,XX Control Module Address
- H Wall-mount Humidity Sensor
- T Wall-mount Temperature Sensor
- X Exhaust Fan
- SP Duct Static Pressure Sensor
- / DDC Control Panel
- ARC156 Communication Wiring
- ..... #22/4 Solid Logistat
- #22/4 Strnd Control Wiring
- · - · - #18/2 Strnd 24VAC



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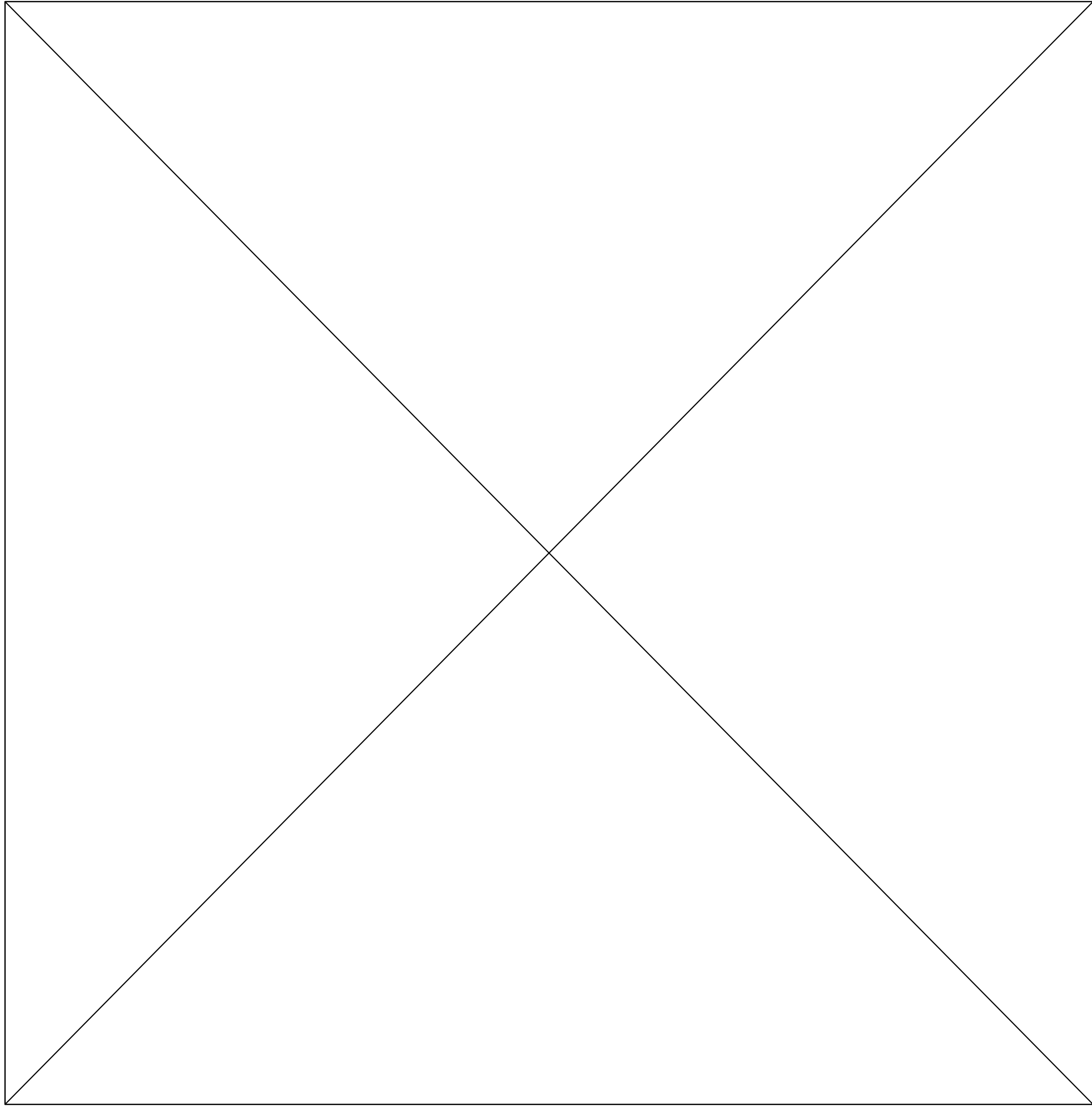


- DEV:X,XX Control Module Address
- H Wall-mount Humidity Sensor
- T Wall-mount Temperature Sensor
- X Exhaust Fan
- SP Duct Static Pressure Sensor
- DDC Control Panel
- ARC156 Communication Wiring
- ..... #22/4 Solid Logistat
- - - - #22/4 Strnd Control Wiring
- · - · - #18/2 Strnd 24VAC

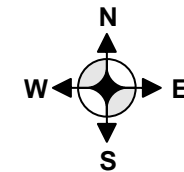
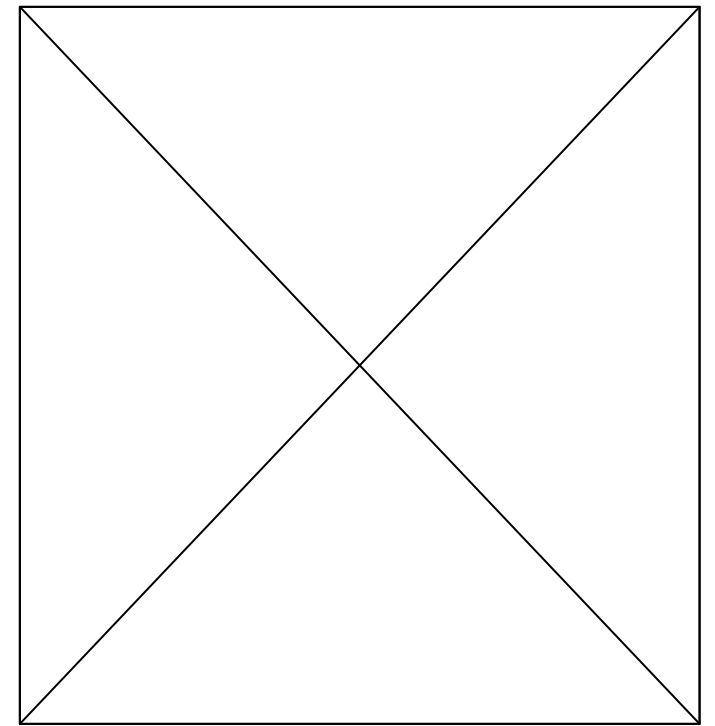


Manatee County Judicial Center Bradenton, Florida			
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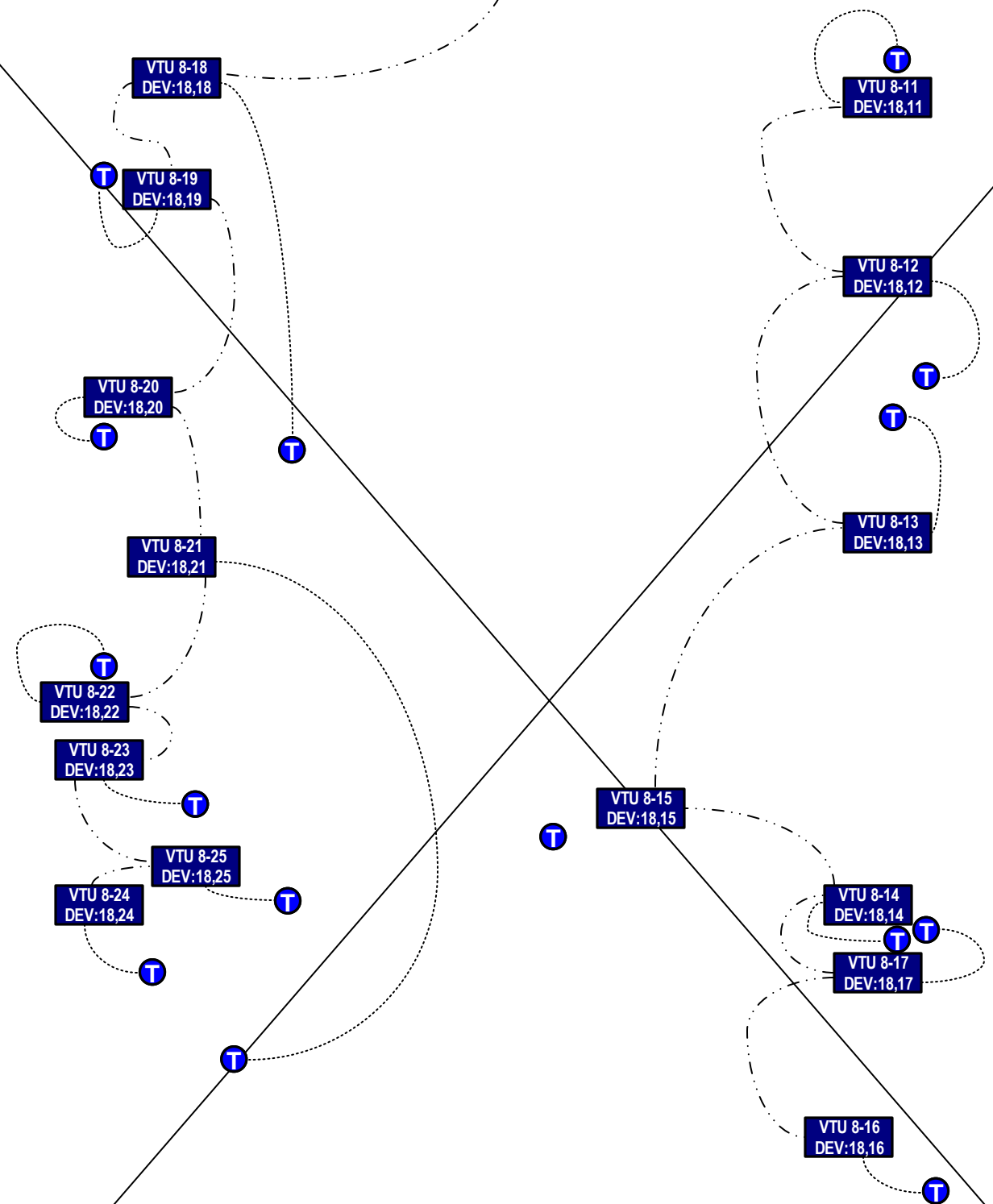


- DEV:X,XX Control Module Address
- H Wall-mount Humidity Sensor
- T Wall-mount Temperature Sensor
- X Exhaust Fan
- SP Duct Static Pressure Sensor
- DDC Control Panel
- ARC156 Communication Wiring
- ..... #22/4 Solid Logistat
- - - - #22/4 Strnd Control Wiring
- · - · - #18/2 Strnd 24VAC

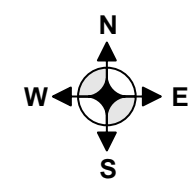
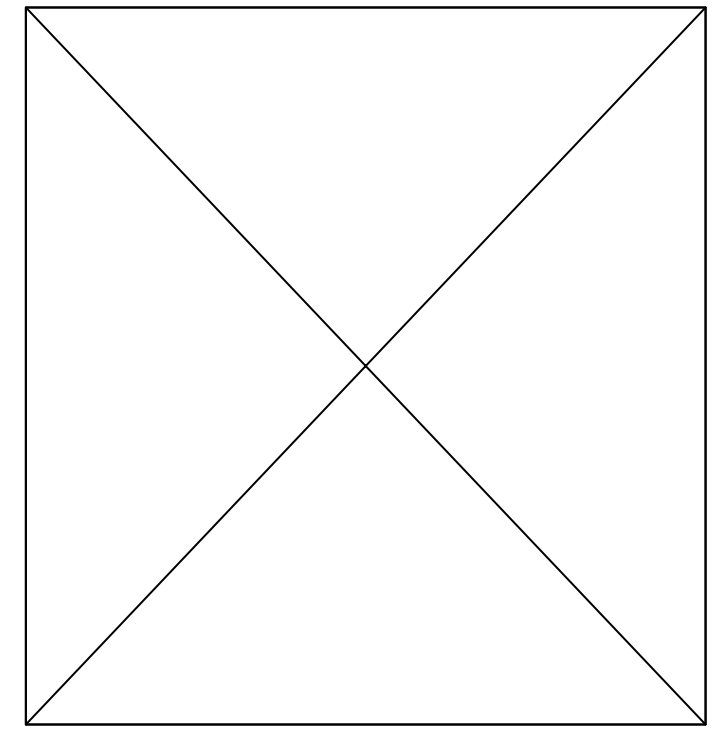


<b>Manatee County Judicial Center</b> Bradenton, Florida			
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6th Floor South West			
REV: 1	Submittal	8/14/2006	JOB NO: 29083
			CHECK BY: CLT
			CORE NO: 1007
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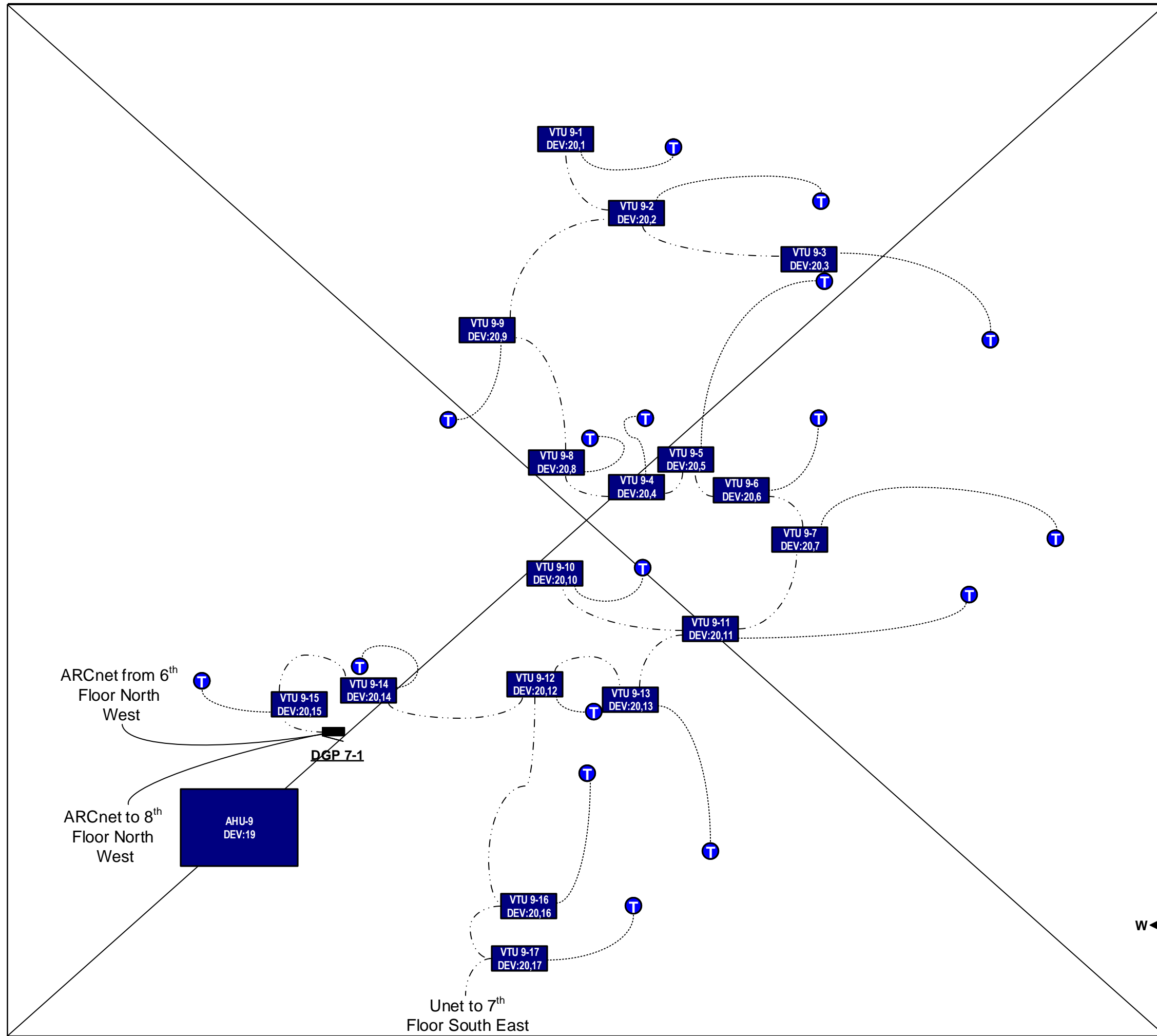
Unet from 6<sup>th</sup> Floor  
North East



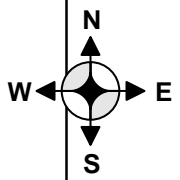
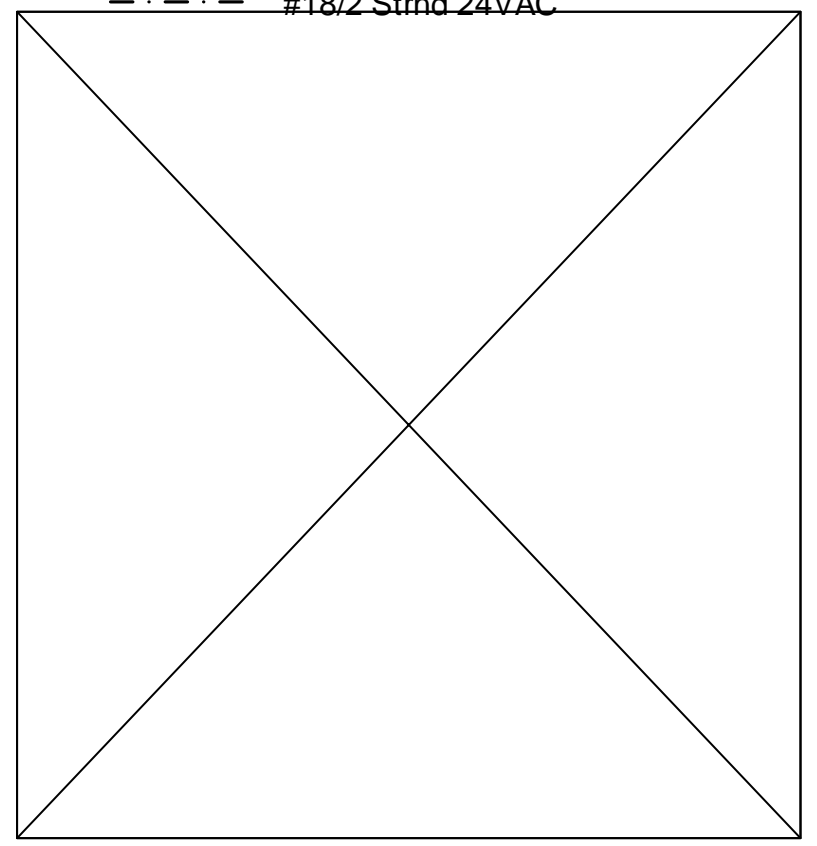
- DEV:X,XX Control Module Address
- H Wall-mount Humidity Sensor
- T Wall-mount Temperature Sensor
- F Exhaust Fan
- SP Duct Static Pressure Sensor
- DDC Control Panel
- ARC156 Communication Wiring
- ..... #22/4 Solid Logistat
- - - - #22/4 Strnd Control Wiring
- · - · - #18/2 Strnd 24VAC



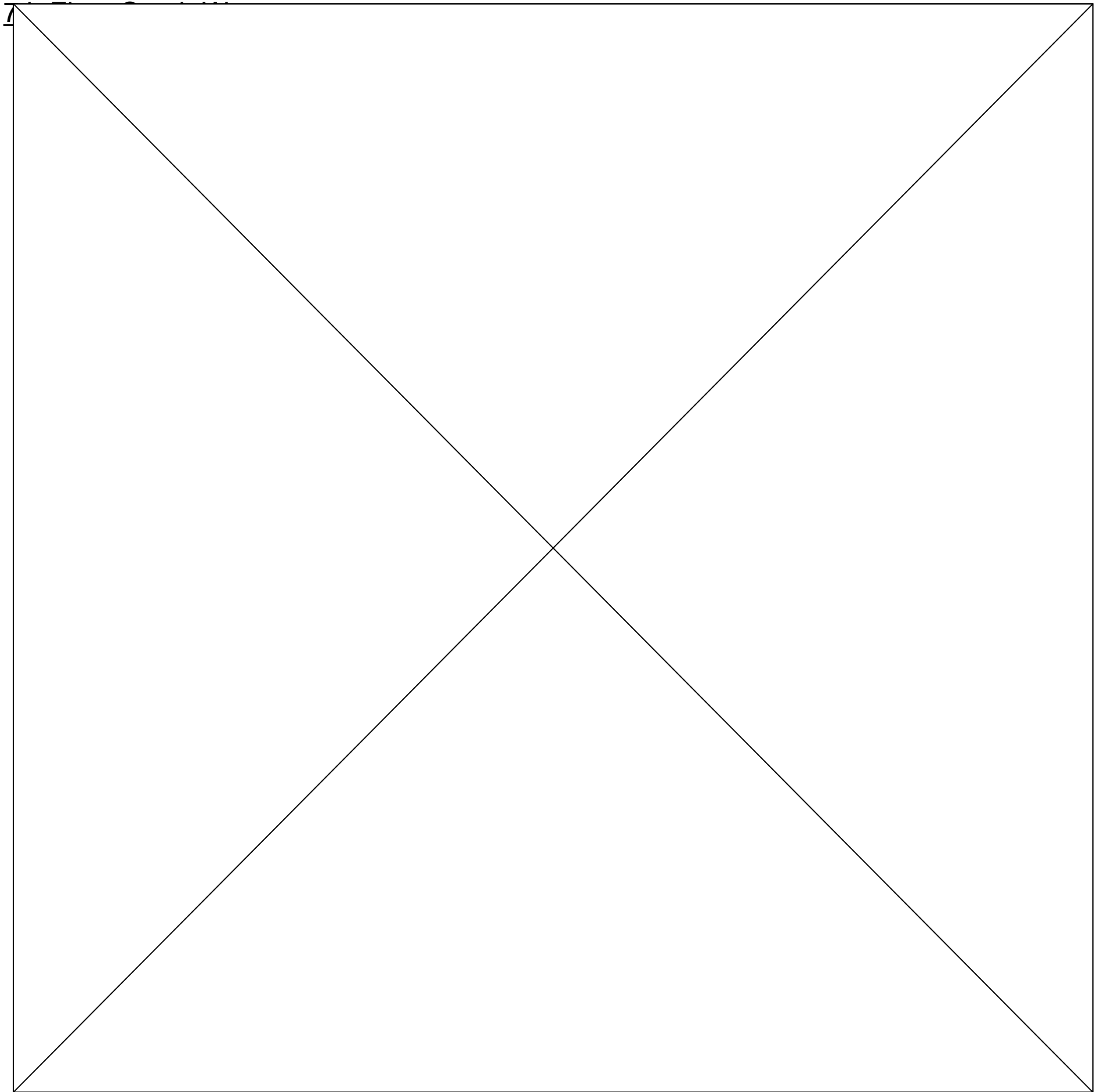
<b>Manatee County Judicial Center</b> Bradenton, Florida			
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6th Floor South East			
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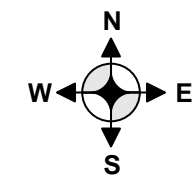
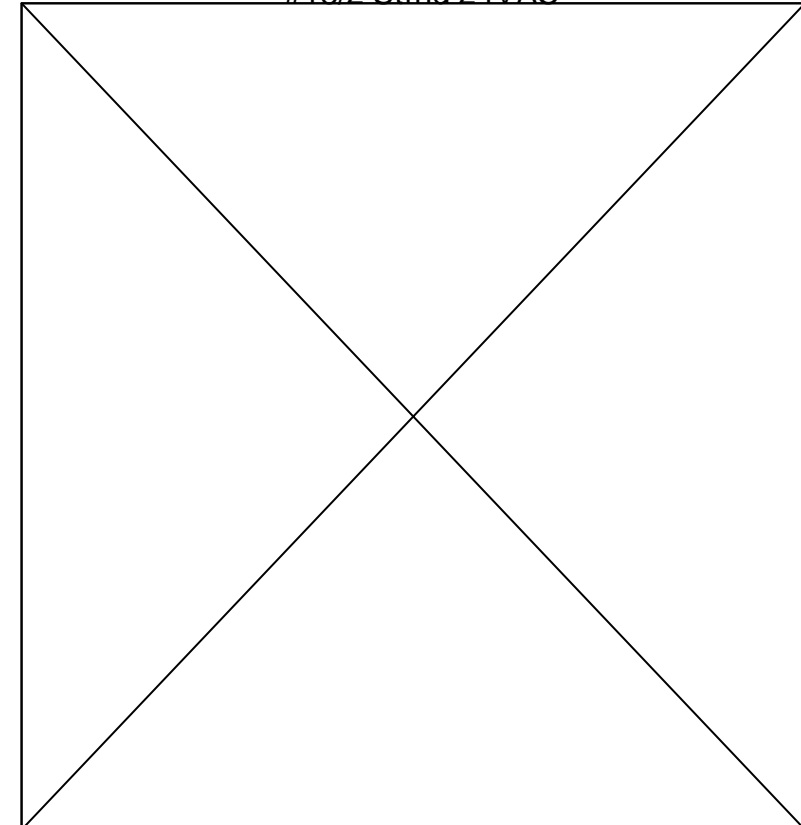
- DEV:X,XX Control Module Address
- H Wall-mount Humidity Sensor
- T Wall-mount Temperature Sensor
- ✔ Exhaust Fan
- SP Duct Static Pressure Sensor
- / DDC Control Panel
- ARC156 Communication Wiring
- ..... #22/4 Solid Logistat
- #22/4 Strnd Control Wiring
- . - . - #18/2 Strnd 24VAC



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7th Floor North			
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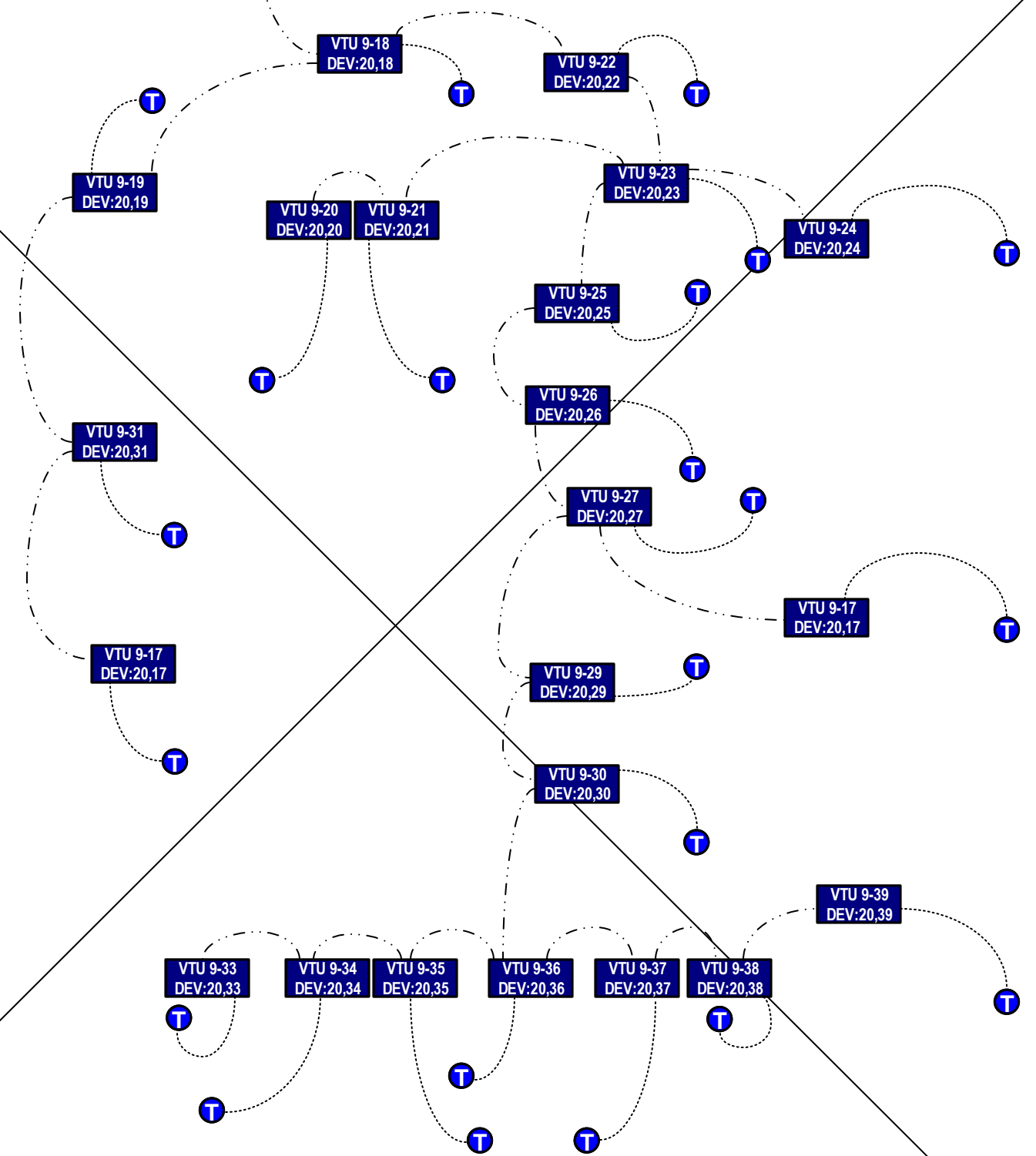


- DEV:X,XX Control Module Address
- H Wall-mount Humidity Sensor
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- SP Duct Static Pressure Sensor
- / DDC Control Panel
- ARC156 Communication Wiring
- ..... #22/4 Solid Logistat
- - - - #22/4 Strnd Control Wiring
- . - . - #18/2 Strnd 24VAC

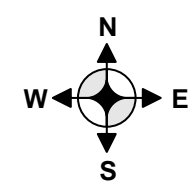
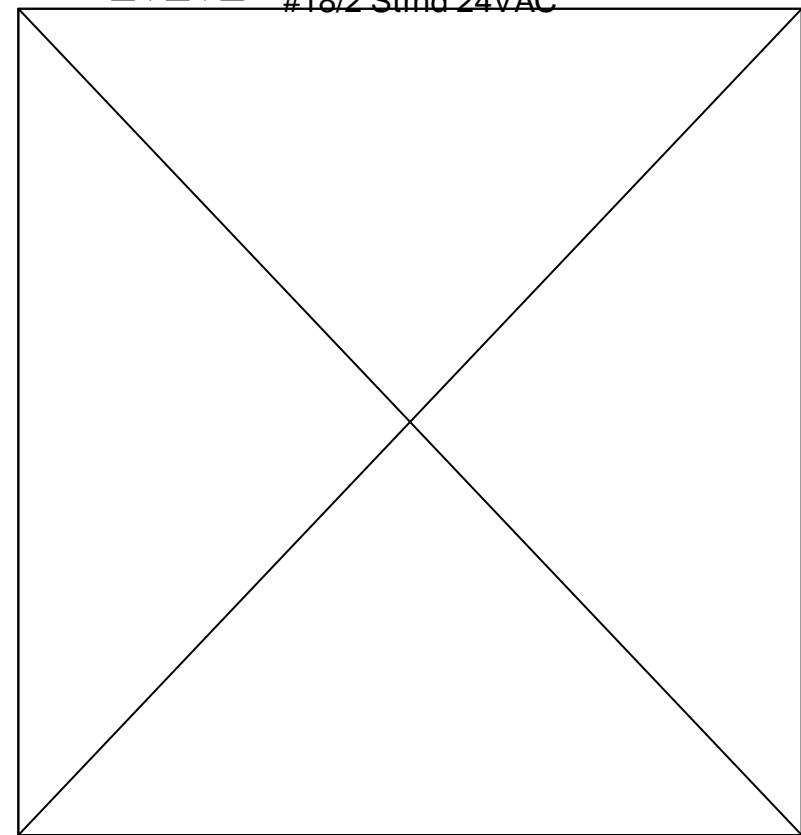


<b>Manatee County Judicial Center</b> Bradenton, Florida			
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7th Floor South West			
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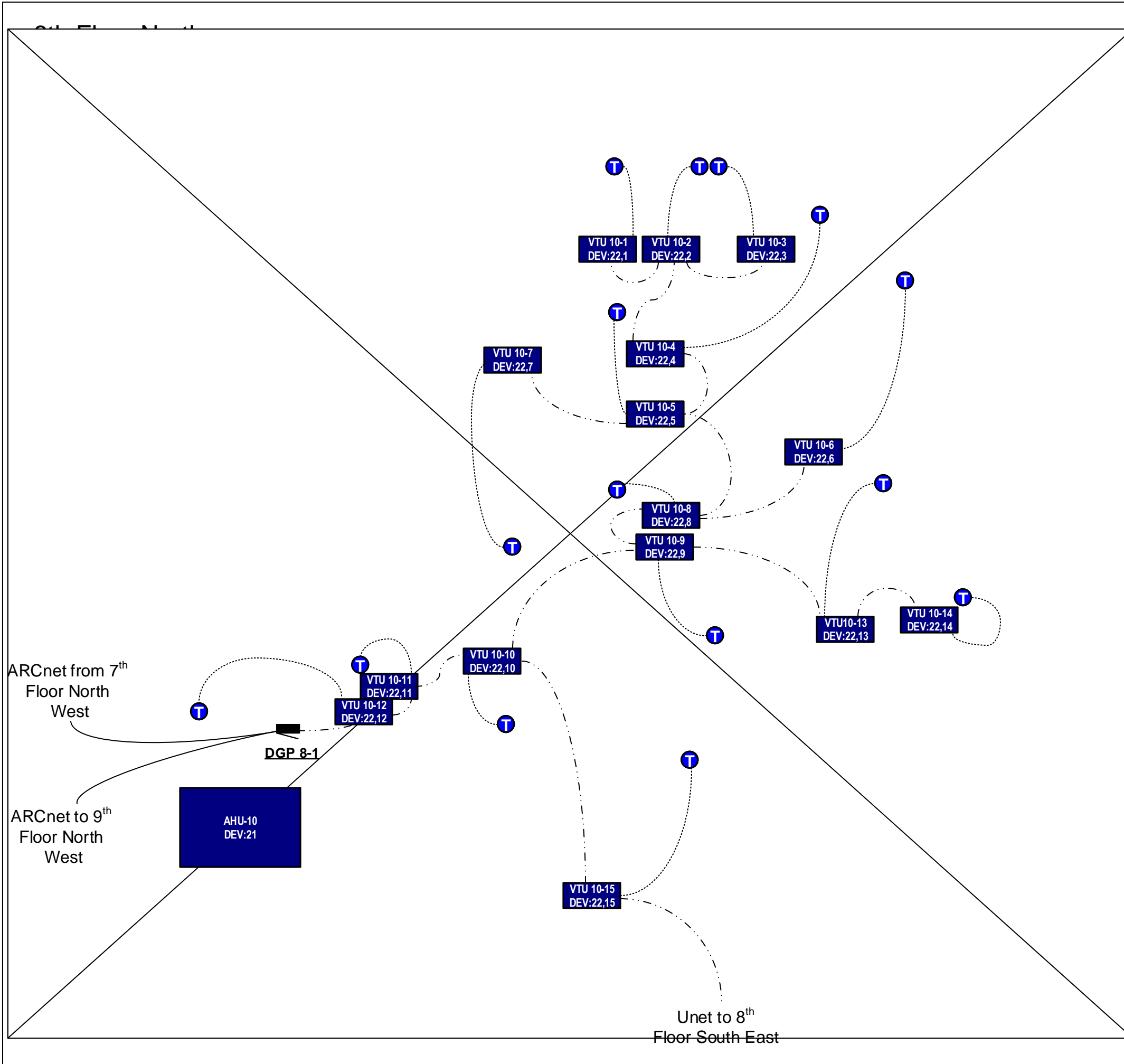
Unet from 7<sup>th</sup> Floor  
North



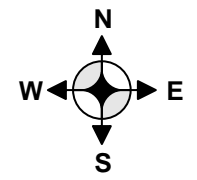
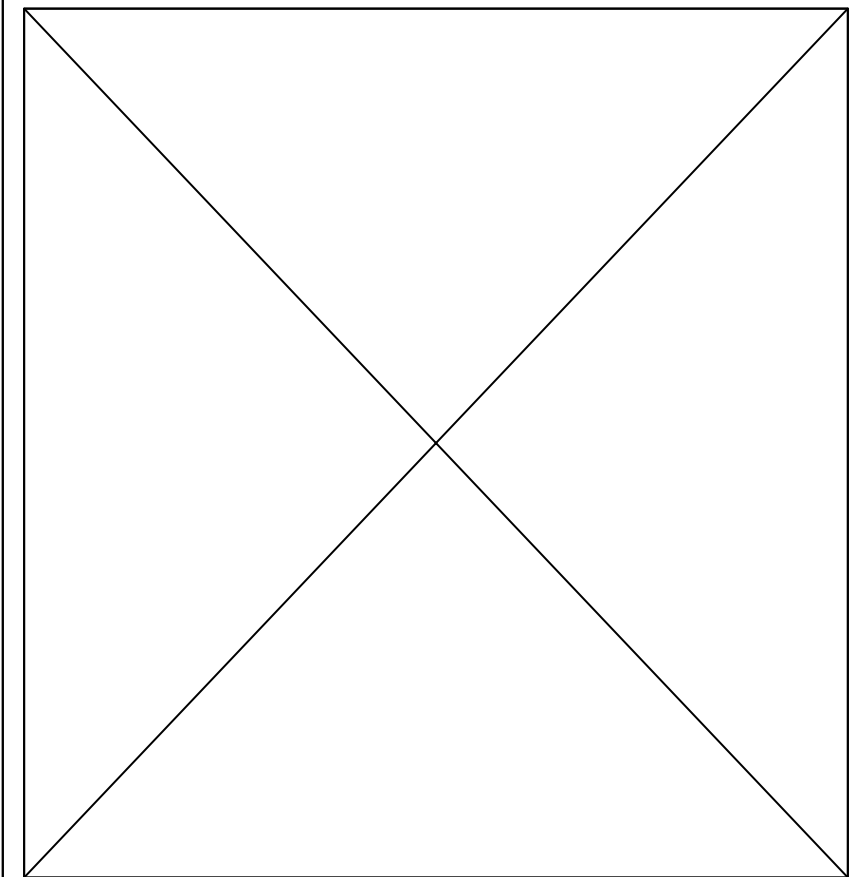
- DEV:XX Control Module Address
- H Wall-mount Humidity Sensor
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- DDC Control Panel
- ARC156 Communication Wiring
- ..... #22/4 Solid Logistat
- - - - #22/4 Strnd Control Wiring
- · - · #18/2 Strnd 24VAC



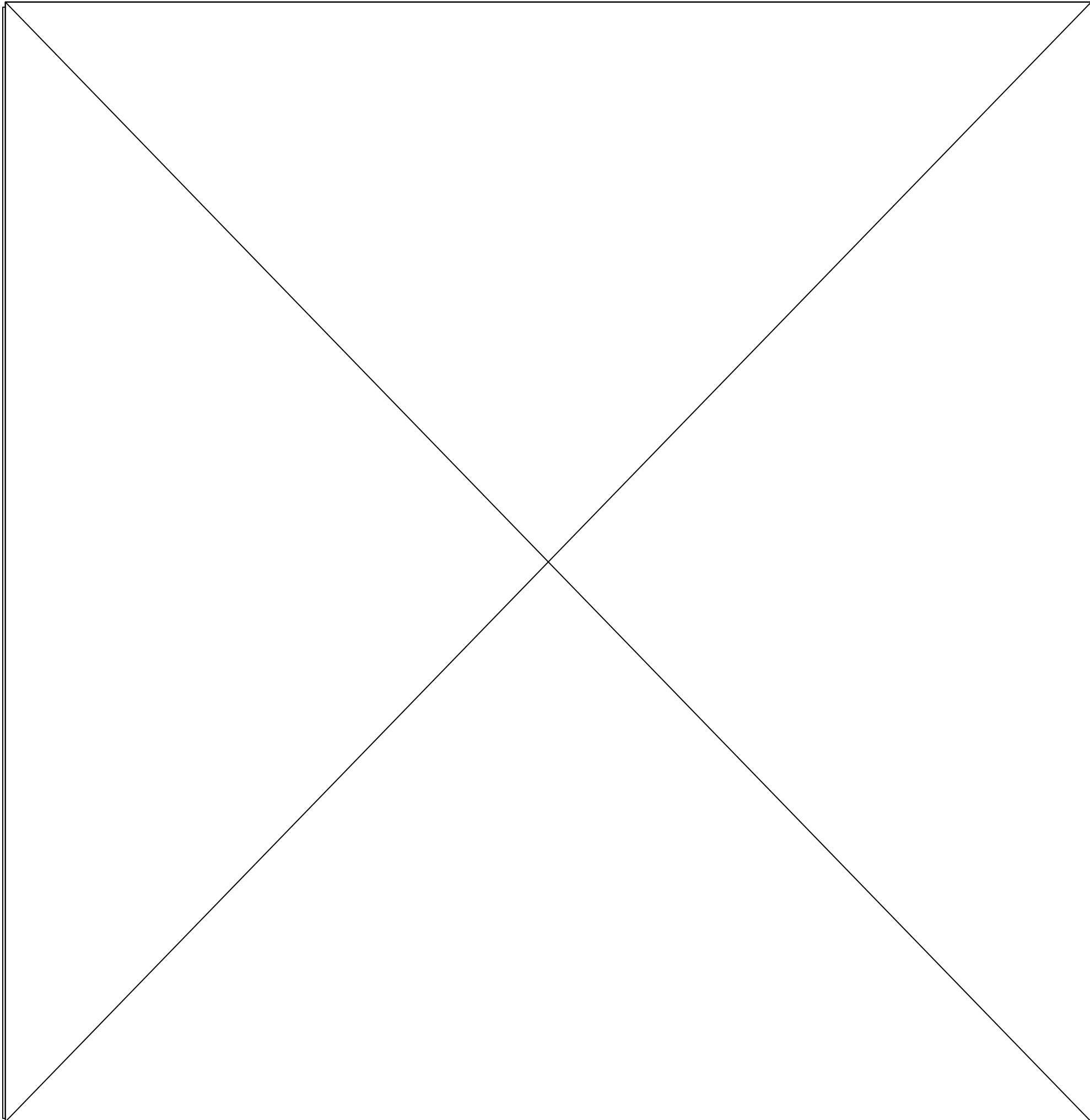
Manatee County Judicial Center Bradenton, Florida			
Section 15950			
7th Floor South East			
REV: 1	Submittal	8/14/2006	JOB NO: 29083
			CHECK BY: CLT
			CORE NO: 1007
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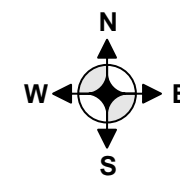
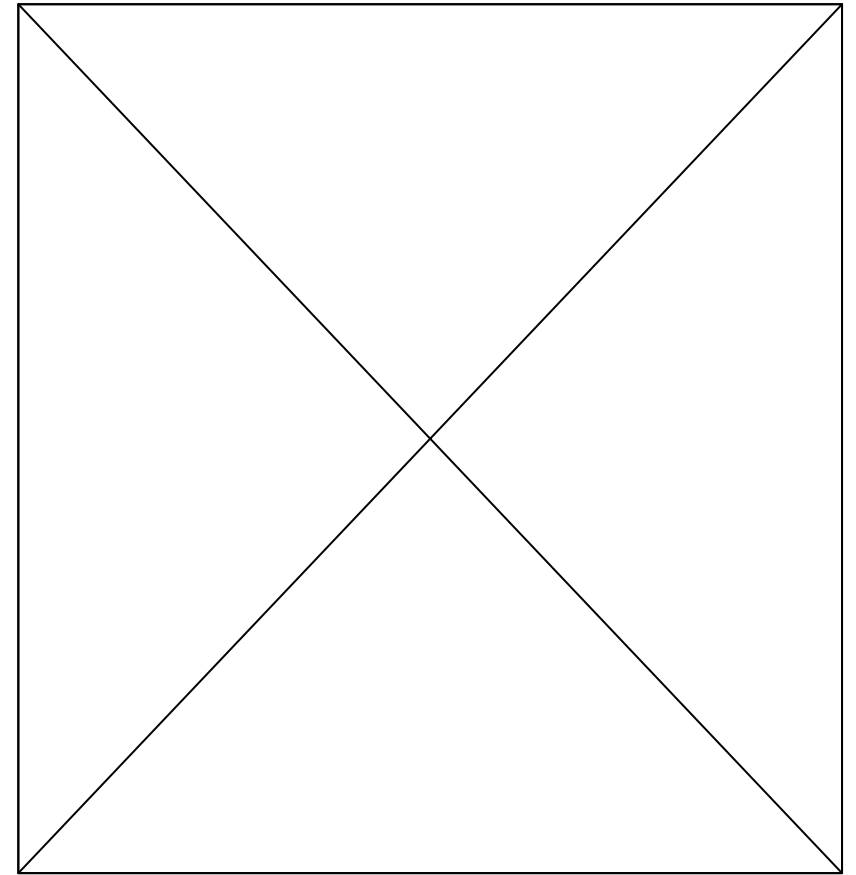
- DEV:XXX Control Module Address
- H Wall-mount Humidity Sensor
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- ⊗ Exhaust Fan
- SP Duct Static Pressure Sensor
- DDC Control Panel
- ARC156 Communication Wiring
- ..... #22/4 Solid Logstat
- - - - #22/4 Strnd Control Wiring
- · - · - #18/2 Strnd 24VAC



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8th Floor North			
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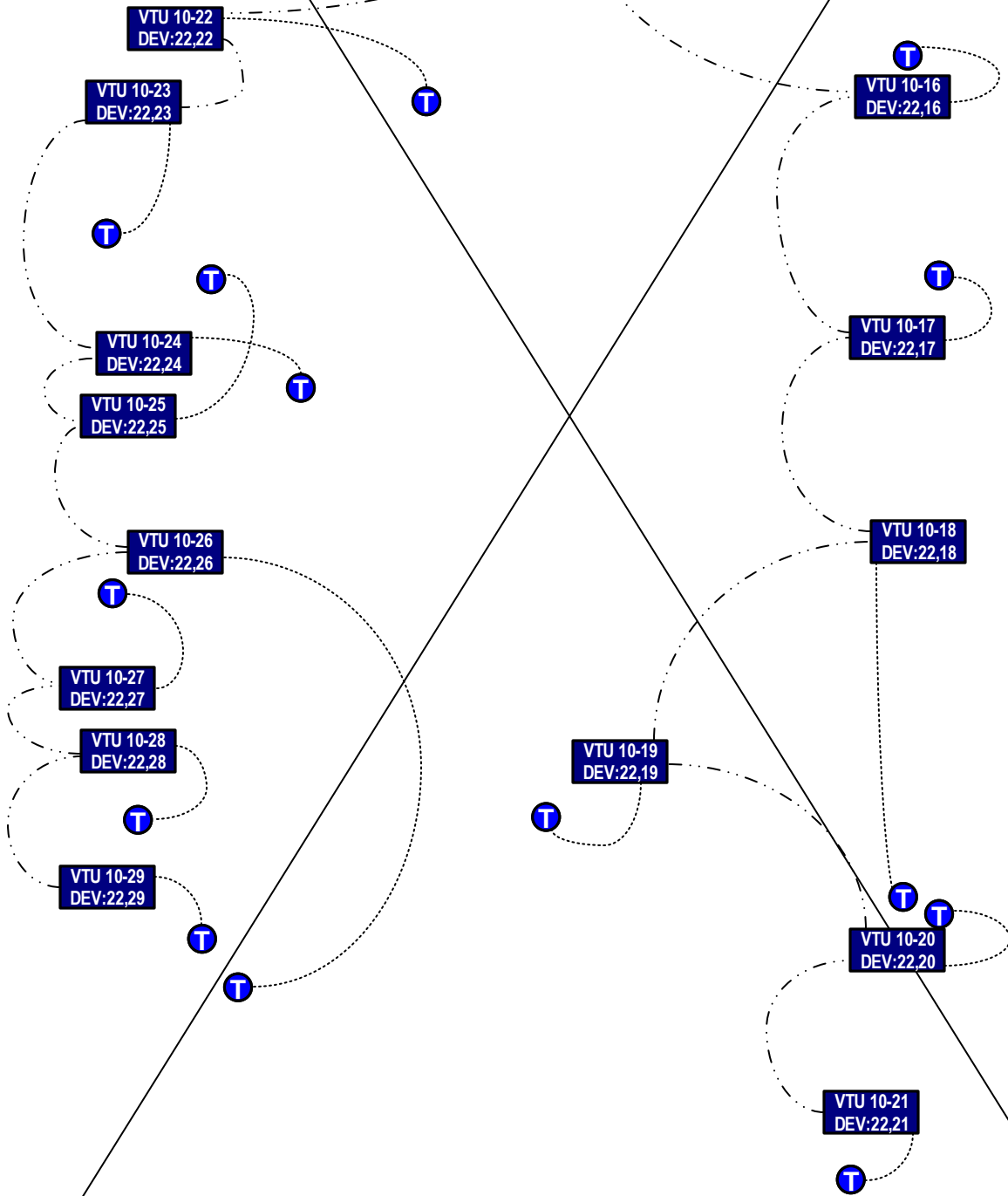


- DEV:X,XX Control Module Address
- H Wall-mount Humidity Sensor
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- DDC Control Panel
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- - - - #22/4 Strnd Control Wiring
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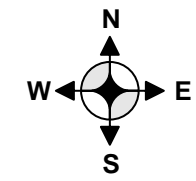
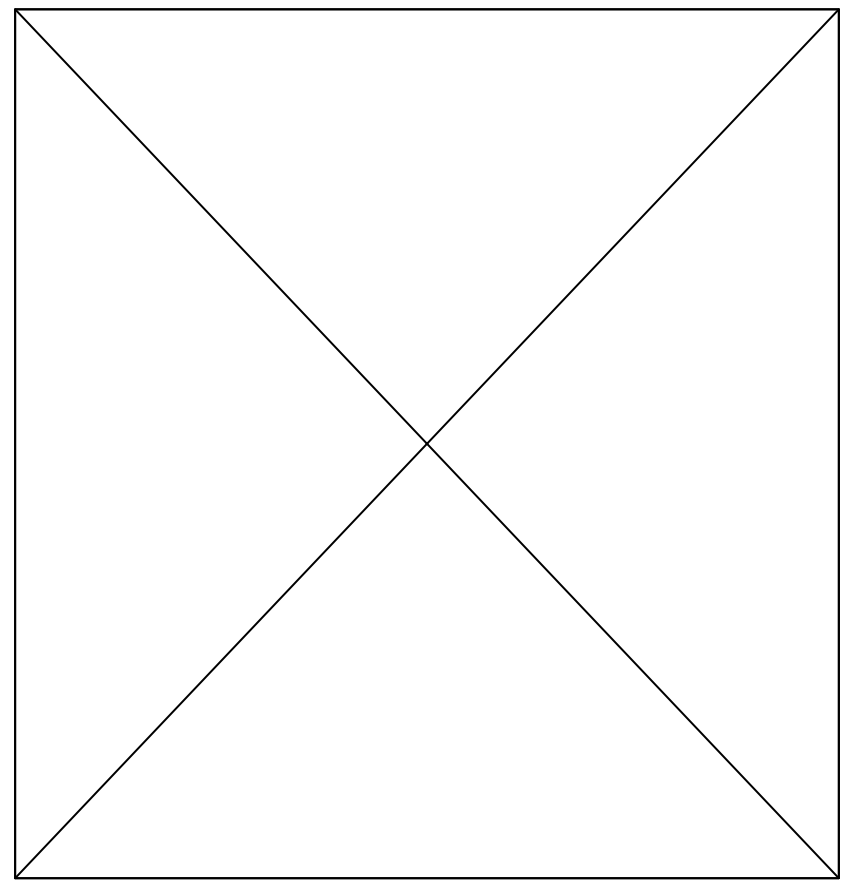


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			CORE NO: 1007
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Unet from 8<sup>th</sup> Floor North

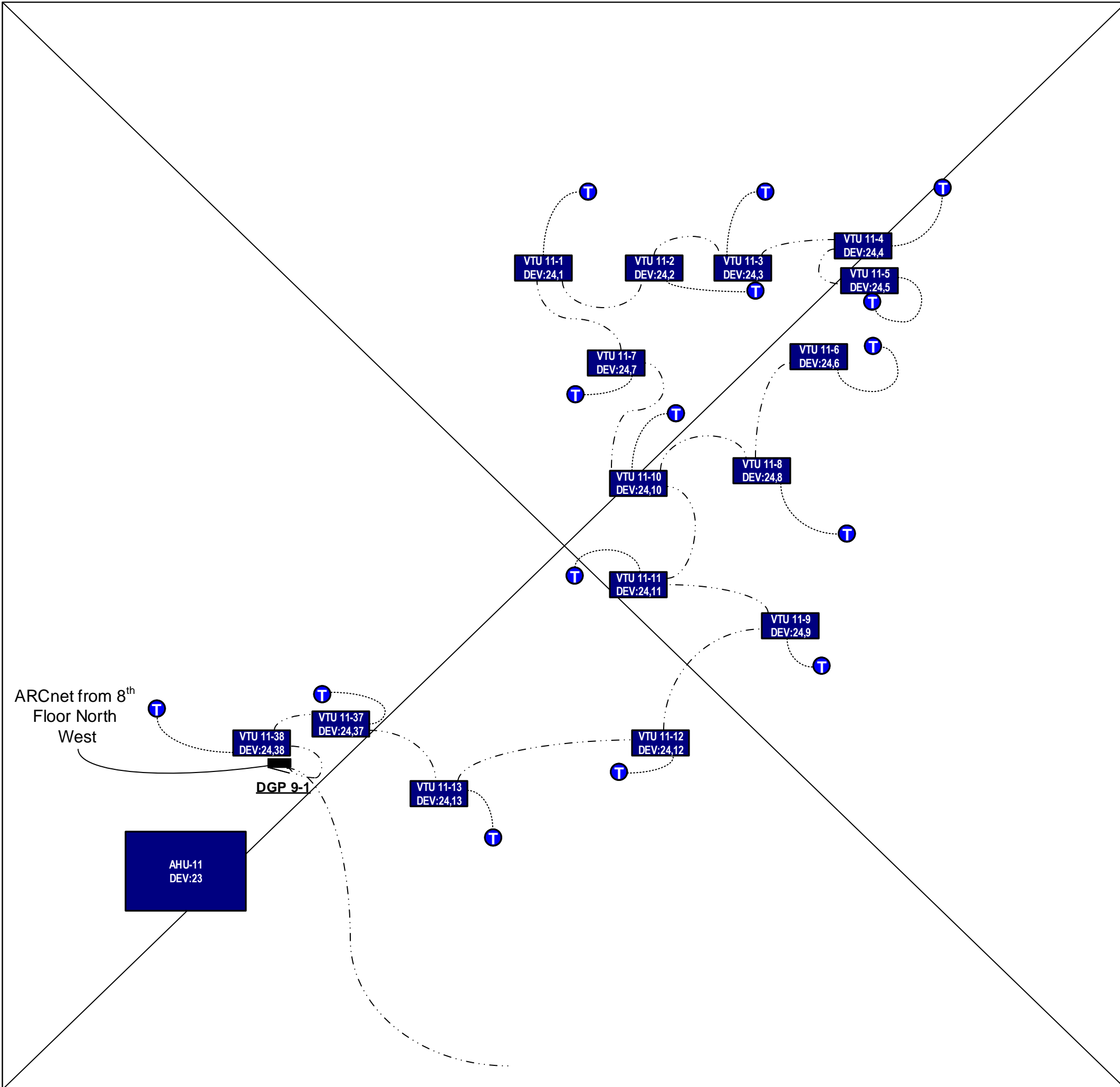


- DEV:X,XX Control Module Address
- H Wall-mount Humidity Sensor
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- / DDC Control Panel
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- - - - #22/4 Strnd Control Wiring
- · - · #18/2 Strnd 24VAC

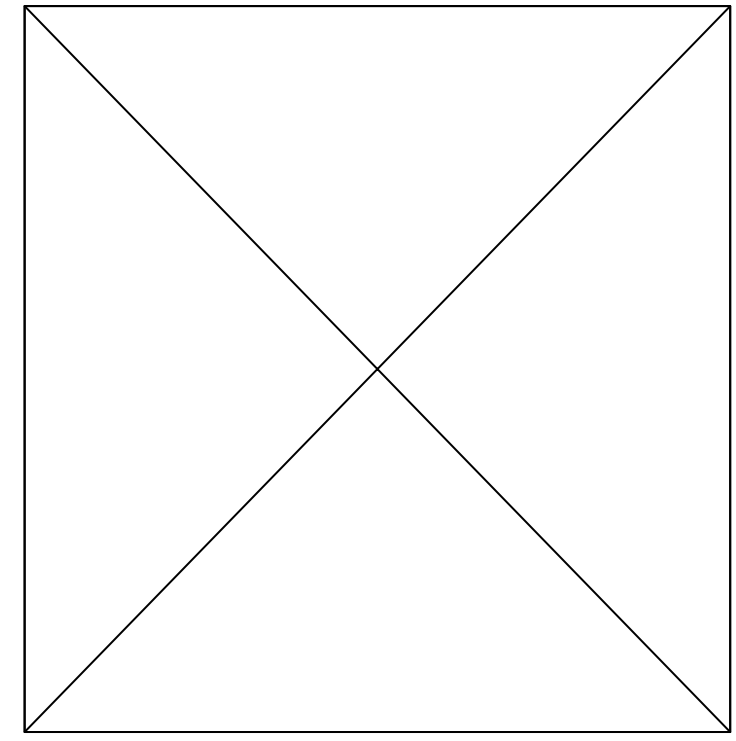


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Bradenton, Florida			
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8th Floor South East			
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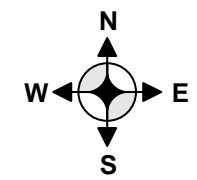




- DEV:X,XX Control Module Address
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- ▮ DDC Control Panel
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- ..... #22/4 Solid Logistat
- #22/4 Strnd Control Wiring
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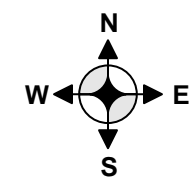
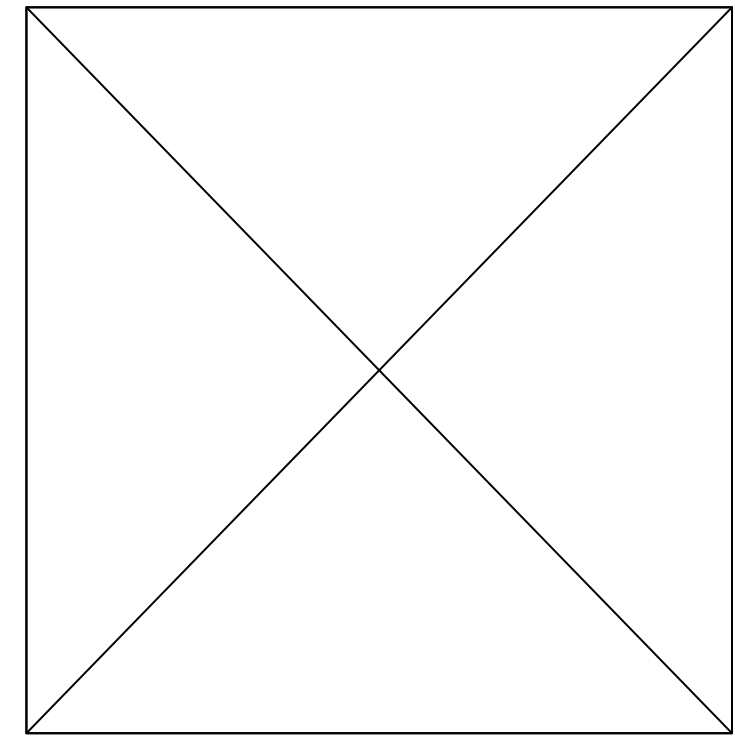


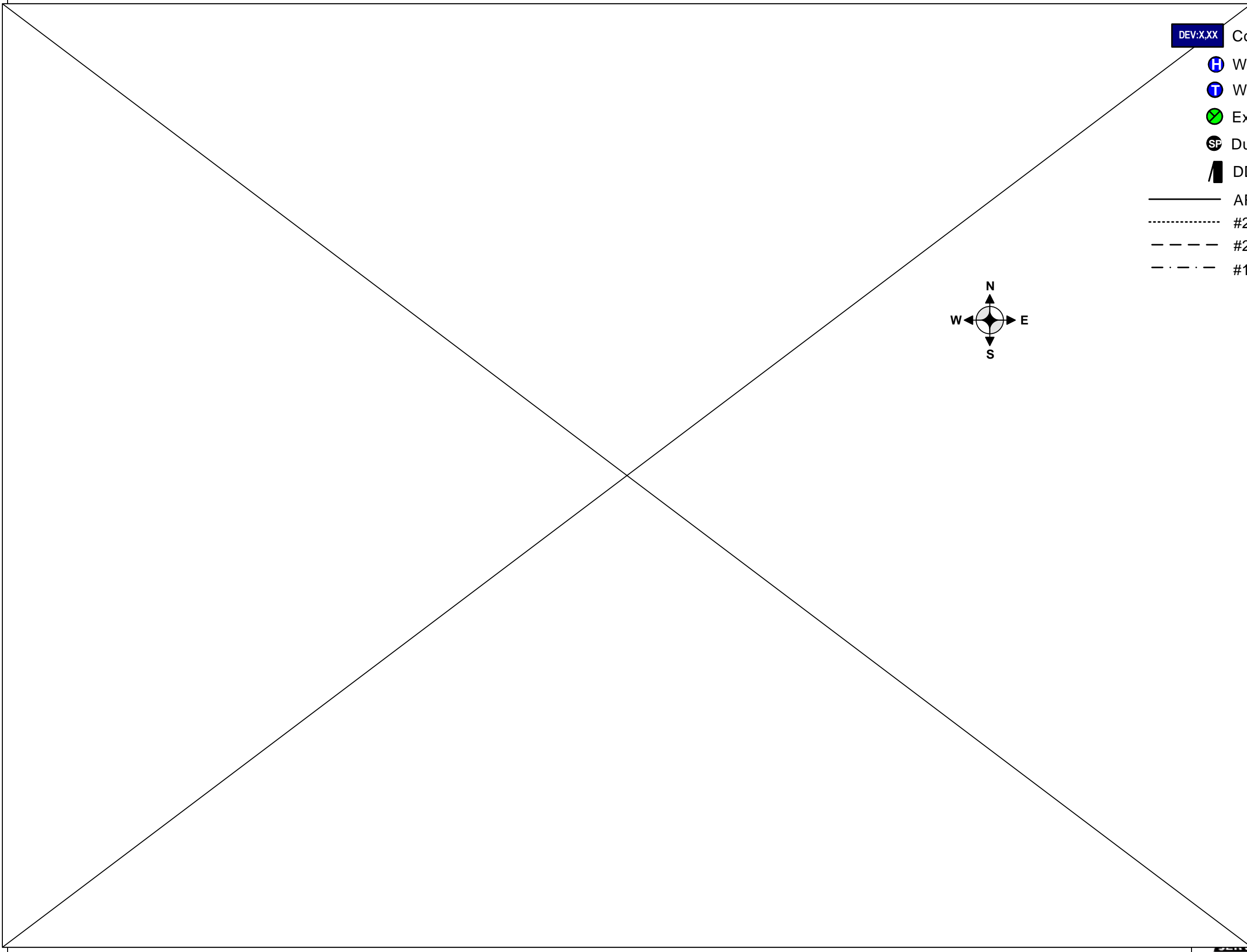
ARCnet from 8<sup>th</sup>  
Floor North  
West








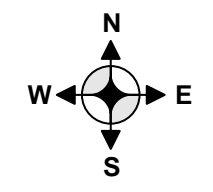
Manatee County Judicial Center			
Bradenton, Florida			
Section 15950			
9th Floor North			
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			CORE NO: 1007
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- DEV:X,XX Control Module Address
- H Wall-mount Humidity Sensor
- T Wall-mount Temperature Sensor
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- SP Duct Static Pressure Sensor
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- DEV:XX Control Module Address
-  Wall-mount Humidity Sensor
-  Wall-mount Temperature Sensor
-  Exhaust Fan
-  Duct Static Pressure Sensor
-  DDC Control Panel
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- - - - #22/4 Strnd Control Wiring
- · - · #18/2 Strnd 24VAC

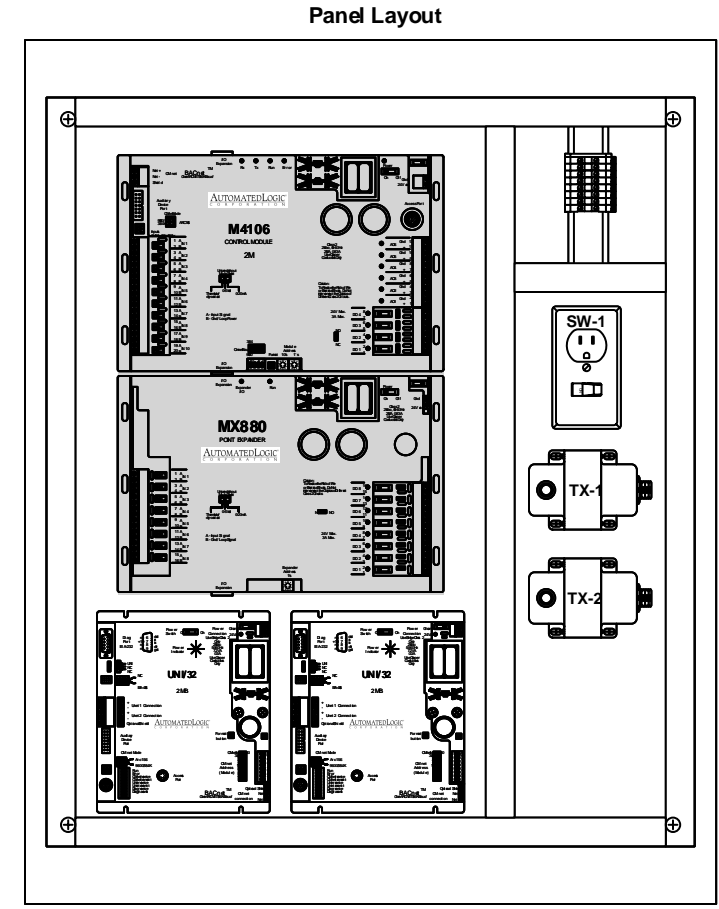
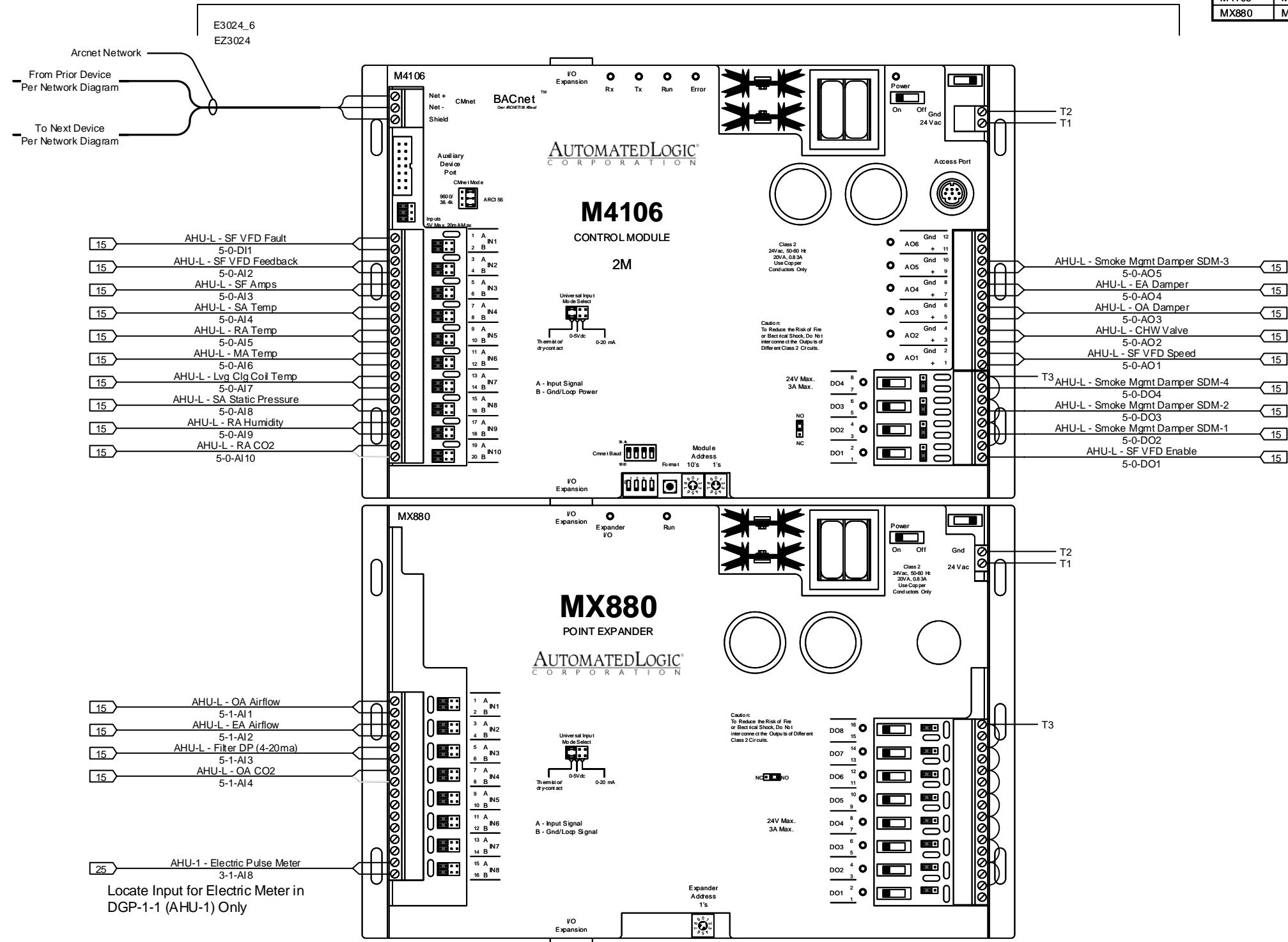


Manatee County Judicial Center Bradenton, Florida		
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# VAV AHU Panel Layout (1 of 2)

Typical of (14) Variable Air Volume Air Handling Unit Panels, AHU-L Shown (DGP-2-1)

Bill of Materials				
DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
E3024_6	NEMA 1 30 X 24 X 6.62 ENCLOSURE	HOFFMAN	A-30N24ALP	14 ea
EZ3024	NEMA 1 30 X 24 PREFAB SUBPANEL	ALP'S	SUB-S-3024-VG-X-X-050-050	14 ea
M4106	M4106	AUTOMATED LOGIC	M4106	14 ea
MX880	MX880	AUTOMATED LOGIC	MX880	14 ea



Panel continued on next page

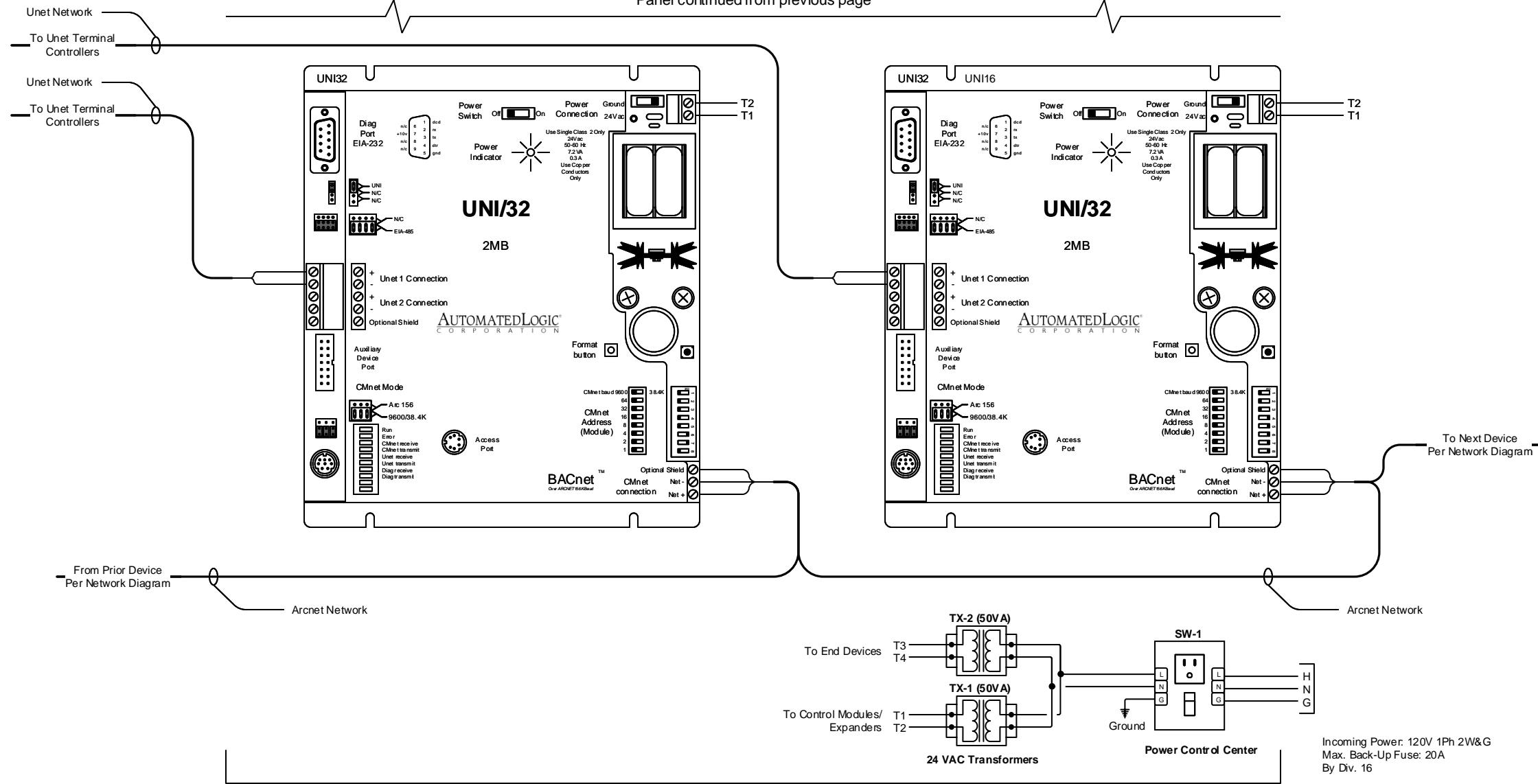
- General Notes:
1. Refer to cable specification chart for wire types.
  2. Refer to ALC Technical Documentation for specifications on Modules and wiring.

Manatee County Judicial Center Bradenton, Florida			
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VAV AHU Panel Layout (1 of 2)			
REV: 1	Submittal	8/14/2006	JOB NO: 29083
			CHECK BY: CLT
			CORE NO: 1007
			44 of 63

# VAV AHU Panel Layout (2 of 2)

Typical of (14) Variable Air Volume Air Handling Unit Panels, AHU-L Shown (DGP-2-1)

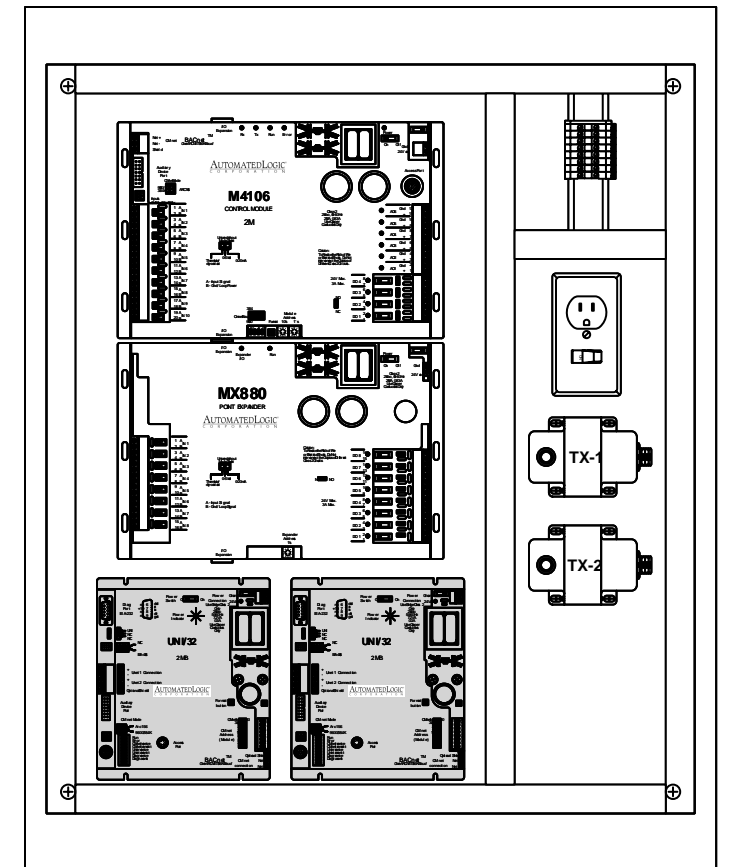
Panel continued from previous page



## Bill of Materials

DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
UNI16	UNI/16 BACNET UNITARY NETWORK	AUTOMATED LOGIC	UNI16	3 ea
UNI32	UNI/32 BACNET UNITARY NETWORK	AUTOMATED LOGIC	UNI32	10 ea

## Panel Layout



DGP 3-2 Mechanical Room 3810	DGP 4-1 Mechanical Room 4641	DGP 5-1 Mechanical Room 5641	DGP 6-1 Mechanical Room 6641	DGP 7-1 Mechanical Room 7641	DGP 8-1 Mechanical Room 8641	DGP 9-1 Mechanical Room 9641
DEV11: M4106	DEV13: M4106	DEV15: M4106	DEV17: M4106	DEV19: M4106	DEV21: M4106	DEV23: M4106
EXP 1: MX880	EXP 1: MX880	EXP 1: MX880	EXP 1: MX880	EXP 1: MX880	EXP 1: MX880	EXP 1: MX880
	DEV14 UNI32	DEV16 UNI32	DEV18 UNI32	DEV20 UNI32	DEV22 UNI16	DEV24 UNI16
				DEV23 UNI32	DEV25 UNI16	DEV27 UNI32
DGP 1-1 Mechanical Room 1501	DGP 1-2 Mechanical Room 1708	DGP 2-1 Mechanical Room 2711	DGP 2-2 Mechanical Room 2603	DGP 2-3 Mechanical Room 2603	DGP 2-4 Mechanical Room 2603	DGP 3-1 Mechanical Room 3641
DEV03: M4106	DEV04: M4106	DEV05: M4106	DEV09: M4106	DEV10: M4106	DEV12: M4106	DEV07: M4106
EXP 1: MX880	EXP 1: MX880	EXP 1: MX880	EXP 1: MX880	EXP 1: MX880	EXP 1: MX880	EXP 1: MX880
		DEV06 UNI32				DEV08 UNI32
		DEV31 UNI32				DEV32 UNI32

AHU Device/Panel Schedule				
Equipment	Service	Panel	Device Address	UNI Addresses
AHU-A	Jail - Floors 1,2,3	DGP-3-2	11	N/A
AHU-I	1st Floor Sheriffs	DGP-1-2	4	N/A
AHU-L	2nd Floor Sheriffs	DGP-2-1	5	UNI/32 (DEV 06) UNI/32 (DEV 31)
AHU-1	Court - 2nd Floor	DGP-1-1	3	N/A
AHU-2	Court - Floors 1,2	DGP-2-2	9	N/A
AHU-3	Court - Floors 1,2	DGP-2-3	10	N/A
AHU-4	2nd Floor Lobby	DGP-2-4	12	N/A
AHU-5	Court - 3rd Floor	DGP-3-1	7	UNI/32 (DEV 08) UNI/32 (DEV 32)
AHU-6	Court - 4th Floor	DGP-4-1	13	UNI/32 (DEV 14)
AHU-7	Court - 5th Floor	DGP-5-1	15	UNI/32 (DEV 16)
AHU-8	Court - 6th Floor	DGP-6-1	17	UNI/32 (DEV 18)
AHU-9	Court - 7th Floor	DGP-7-1	19	UNI/32 (DEV 20) UNI/32 (DEV 33)
AHU-10	Court - 8th Floor	DGP-8-1	21	UNI/16 (DEV 22) UNI/16 (DEV 34)
AHU-11	Court - 9th Floor	DGP-9-1	23	UNI/16 (DEV 24) UNI/32 (DEV 35)

- General Notes:
1. Refer to cable specification chart for wire types.
  2. Refer to ALC Technical Documentation for specifications on Modules and wiring.

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VAV AHU Panel Layout (2 of 2)

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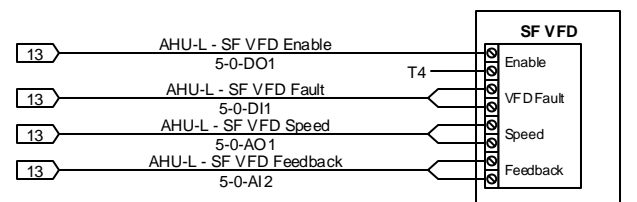
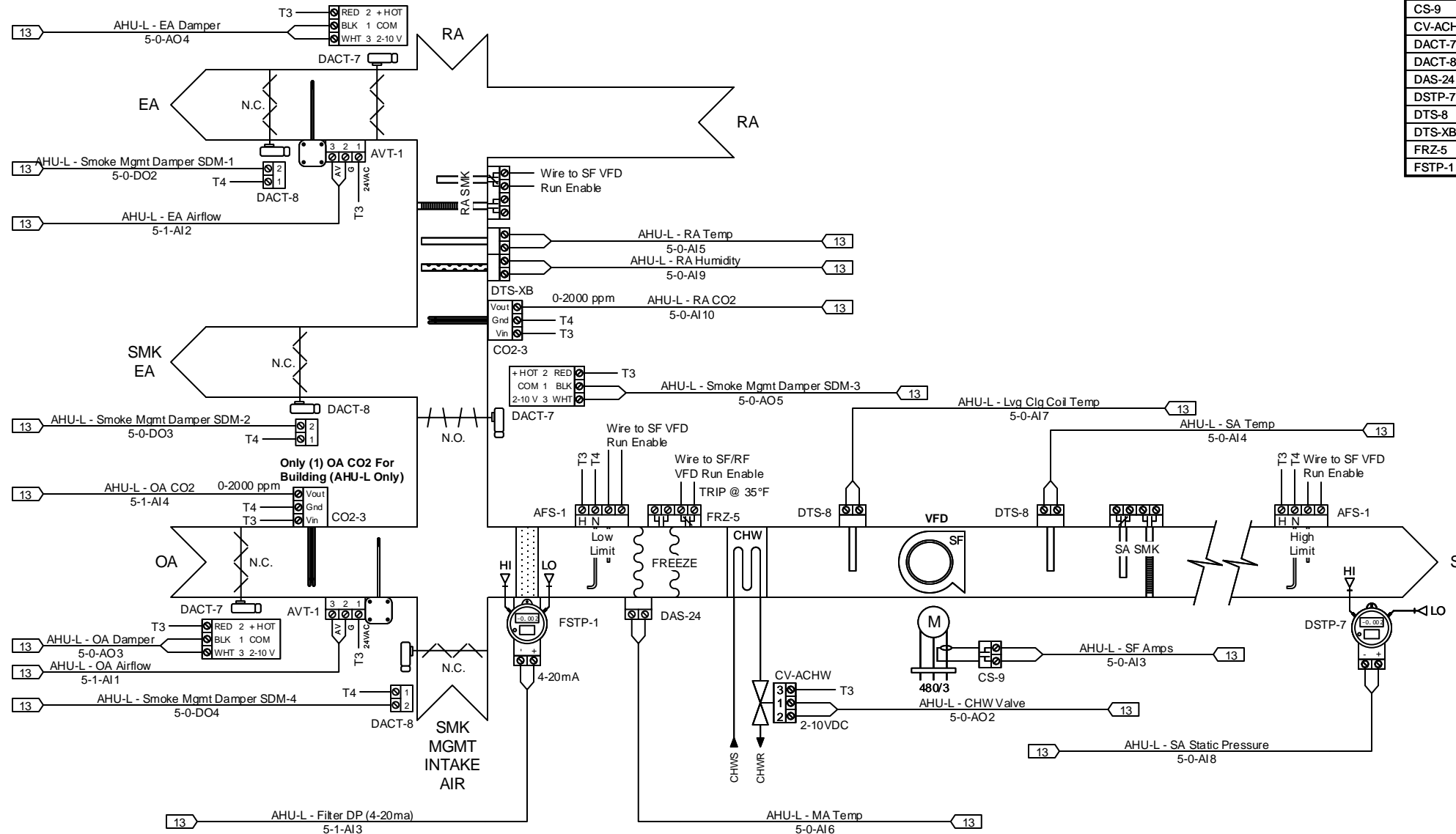


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CORE NO: 1007

# VAV AHU Schematic

Typical of (14) Variable Air Volume Air Handling Units, AHU-L Shown



Field Verify VFD Terminations with Manufacturer's Specifications  
**Supply Fan VFD Wiring Detail**

- General Notes:**
1. All communications wiring to be Magnum Cable Corporation A3ARC156, 22/2 single twisted pair unless indicated otherwise.
  2. Panel wiring to be 18 AWG on binary outputs and 22 AWG on all binary inputs.
  3. All control wiring in mechanical room to be in conduit.
  4. All of the wiring to be plenum rated.
  5. Refer to ALC Technical Documentation for specifications on Modules and wiring.
  6. Refer to Network Diagram for details.
  7. Relays as required due to different operating voltages, power sources, or loads.
  8. Duct Area = HH"xWWW" = XX sq.in./144 = YY sq.ft. Field Verify Duct Area for CFM Calculation

## Bill of Materials

DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
AFS-1	AIR FLOW SWITCH, 0.4 +/-0.06-12", MAN RESET	CLEVELAND	AFS-460	28 ea
AVT-1	AIR VELOCITY TRANS, DUCT MOUNT, 24VAC, 8" PROBE, DISPLAY	E+E ELEKTRONIK	EE65-VB5-D02	28 ea
CO2-3	SINGLE BEAM ABS CO2 SENSOR, 0-10 VDC, 24VAC	VERIS IND.	CDE	15 ea
CS-9	ENC 50A CURRENT SENSOR W/LOOP POWERED 4-20MA OUTPUT	FUNCTIONAL DEVICES	RIBXK420-50	14 ea
CV-ACHW	CONTROL VALVE AND ACTUATOR	BELIMO	SEE VALVE SCHEDULE	14 ea
DACT-7	SR ACT 24VAC, 35IN-LB, 2-10VDC	BELIMO	LF24-SR ALC	42 ea
DACT-8	SR ACT 24VAC 60IN-LB ON-OFF	BELIMO	NF24 ALC	42 ea
DAS-24	DUCT 10K THERMISTOR AVERAGING 24 FT.	BAPI	ALC/10K-2-A-24	14 ea
DSTP-7	PRESSURE, ADJ, 0-5", 4-20MA, PROBE, LCD, FIELD MOUNT	BAPI	ZPS-20-SR05-ST-125-D-FMK	14 ea
DTS-8	DUCT 10K THERMISTOR PROBE 8 IN.	BAPI	ALC/10K-2-D-8"	28 ea
DTS-XB	DUCT 10K THERM DUCT CURVE 2 12" + 2% HUMIDITY	BAPI	ALC/10K-2-H220-D-EU	14 ea
FRZ-5	LOW TEMP DETECT THERMOSTAT, AUTO RESET, 35-45F	SIEMENS	134-1510	14 ea
FSTP-1	PRESSURE, ADJ, 0-2.50", 4-20MA, PROBE, LCD, FIELD MOUNT	BAPI	ZPS-20-SR04-ST-125-D-FMK	14 ea

## Sequence of Operation

### Variable Air Volume AHU (Serving Terminal Units)

**General:** Each unit is a variable volume fan system, with a VFD controlled supply fan, and chilled water cooling coil.

**Air handling unit fan** shall be automatically enabled by the BCS start/stop relay when in "AUTO" position at the fan VFD or manually when in "HAND". When scheduled "ON" via the BCS, the variable frequency drive (VFD) unit shall be energized and the supply fan shall run continuously. Upon proof of fan operation (via the air differential pressure switch), the controls shall be enabled.

**Operation:** Provide an adjustable PID loop which will modulate the fan VFD to maintain a duct static setpoint. Enable this loop only after startup of this unit to insure that the VFD starts in an unloaded condition, and slowly ramps up to required speed. Should the data loop be lost or the sensor fail, the BCS shall drive the VFD to provide 50 percent of the scheduled air flow. Upon proof of supply fan operation, the BCS will assume control of the fan speed and the chilled water valve.

**Operating Sequence:** Monitor the fan discharge air temperature sensor for control of the cooling coil. Through a separately adjustable PID algorithm, modulate the chilled water coil valve to maintain the discharge air temperature as scheduled. As the temperature drops below setpoint the chilled water valve shall close. Should the supply fan sensor fail, drive the cooling valve to the full cooling position.

**Outside Air Sequence:** For AHU's with one or more CO2 sensors in spaces served by them, the outside air setpoint shall be continuously adjusted in occupied mode to maintain a maximum CO2 concentration no greater than 500 ppm (adjustable) above the ambient outside air CO2 level. The minimum cfm shall be as scheduled during occupied mode and shall be equal to the exhaust air taken from that zone plus 300 cfm (adjustable). The normal outside air damper shall be modulated to maintain the outside air setpoint as sensed by the airflow monitoring station in the outside air duct

**General Exhaust Air Sequence:** The general exhaust air setpoint shall be continuously adjusted in occupied mode to maintain a maximum pressurization per zone of 1000 cfm (adjustable by individual zones). The general exhaust air setpoint shall be calculated as follows: Current outside airflow - fixed exhaust flow rate -1000 (adjustable) - general exhaust air setpoint. The general exhaust air damper shall be modulated to maintain the general exhaust air setpoint as sensed by the airflow monitoring station in the general exhaust air duct.

**Setbacks:** The air handling units shall include night setback and morning warm-up sequences.

**Alarms** will be generated by the DDC system for Fan Failure, Fan in Hand, Fan Runtime, SA Temp High, SA Temp Low, MA Temp High, MA Temp Low, RA Temp High, RA Temp Low, Duct Static High, Duct Static Low, Dirty Filter.

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VAV AHU Schematic

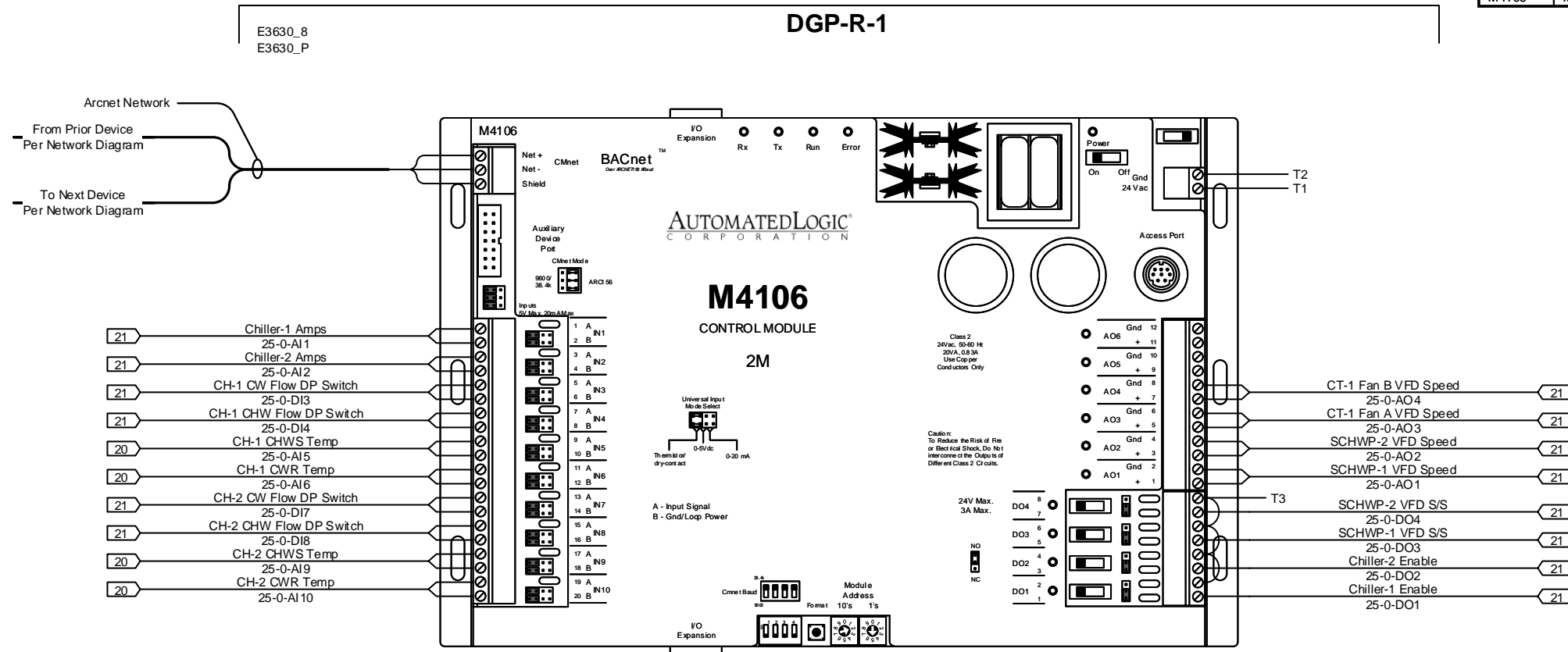
REV: 1      Submittal      8/14/2006      JOB NO: 29083



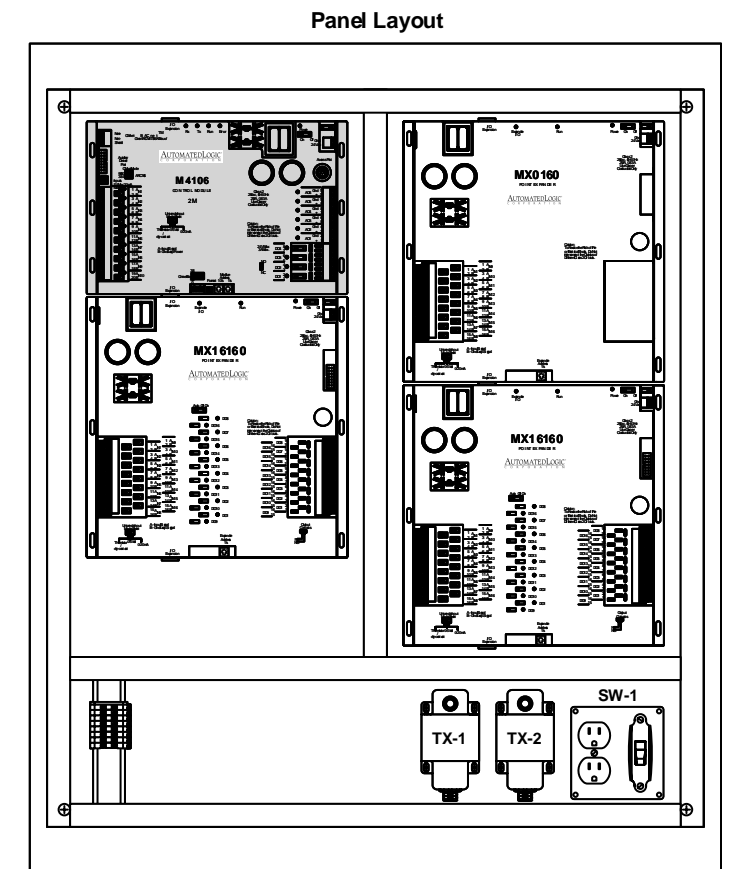
CHECK BY: CLT  
CORE NO: 1007

# CHW System Panel Layout (1 of 4)

Bill of Materials				
DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
E3630_8	NEMA 1 36 X 30 X 8.6 ENCLOSURE	HOFFMAN	A-36N30BLP	1 ea
E3630_P	PANEL FOR 36 X 30 X 8.6 ENCLOSURE	HOFFMAN	A-36N30MP	1 ea
M4106	M4106	AUTOMATED LOGIC	M4106	14 ea



Panel continued on next page



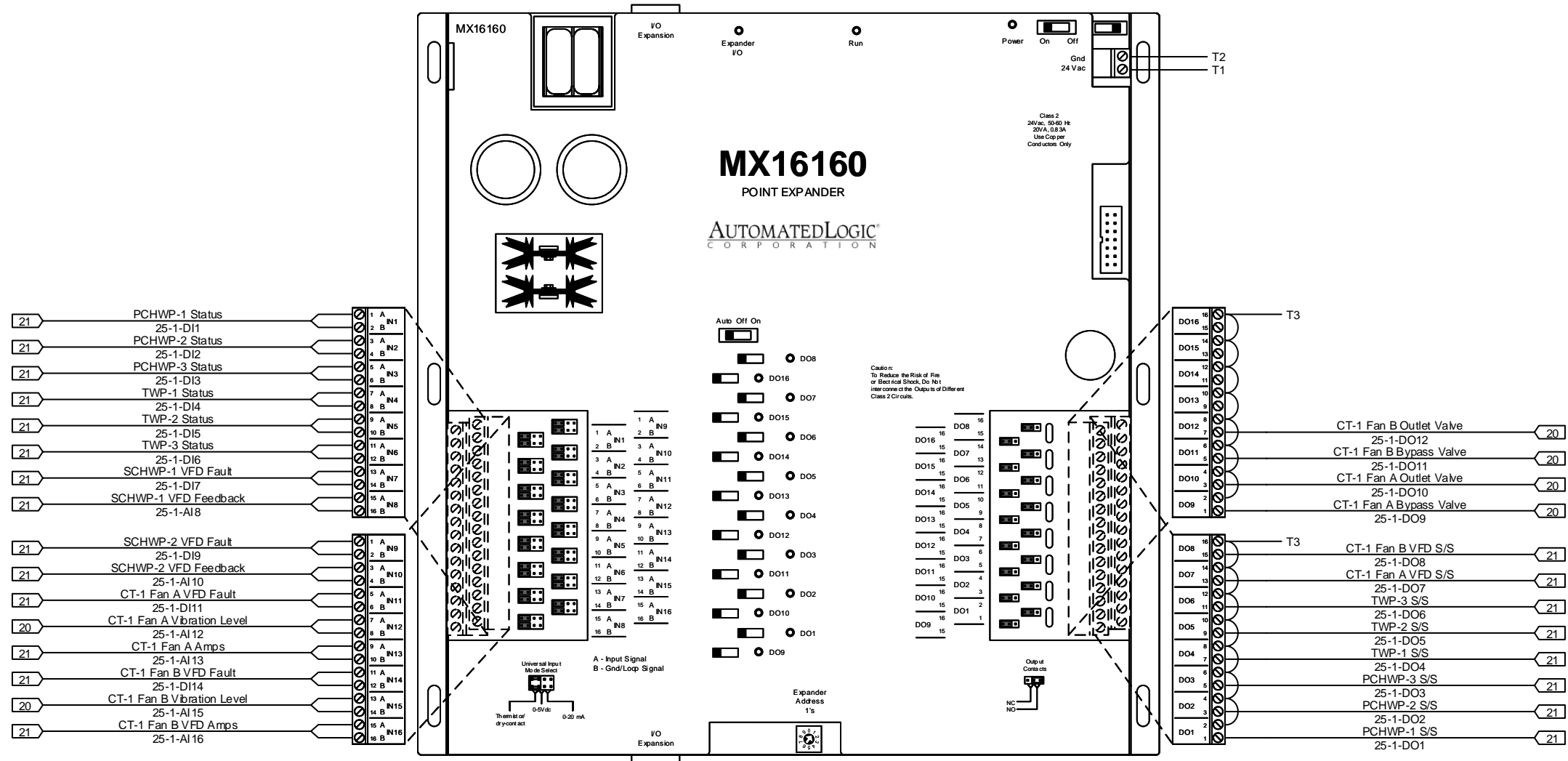
- General Notes:
1. Refer to cable specification chart for wire types.
  2. Refer to ALC Technical Documentation for specifications on Modules and wiring.

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CHW System Panel Layout (1 of 4)			
REV: 1	Submittal	8/14/2006	JOB NO: 29083
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			CORE NO: 1007
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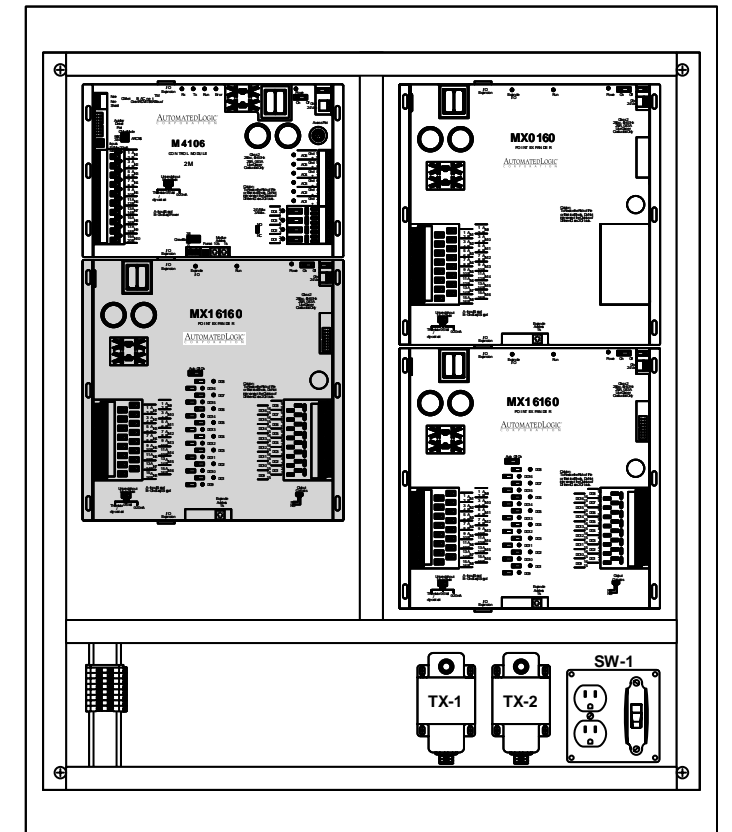
# CHW System Panel Layout (2 of 4)

Bill of Materials				
DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
MX16160	MX16160	AUTOMATED LOGIC	MX16160	1 ea

Panel continued from previous page



Panel Layout



Panel continued on next page

- General Notes:
1. Refer to cable specification chart for wire types.
  2. Refer to ALC Technical Documentation for specifications on Modules and wiring.

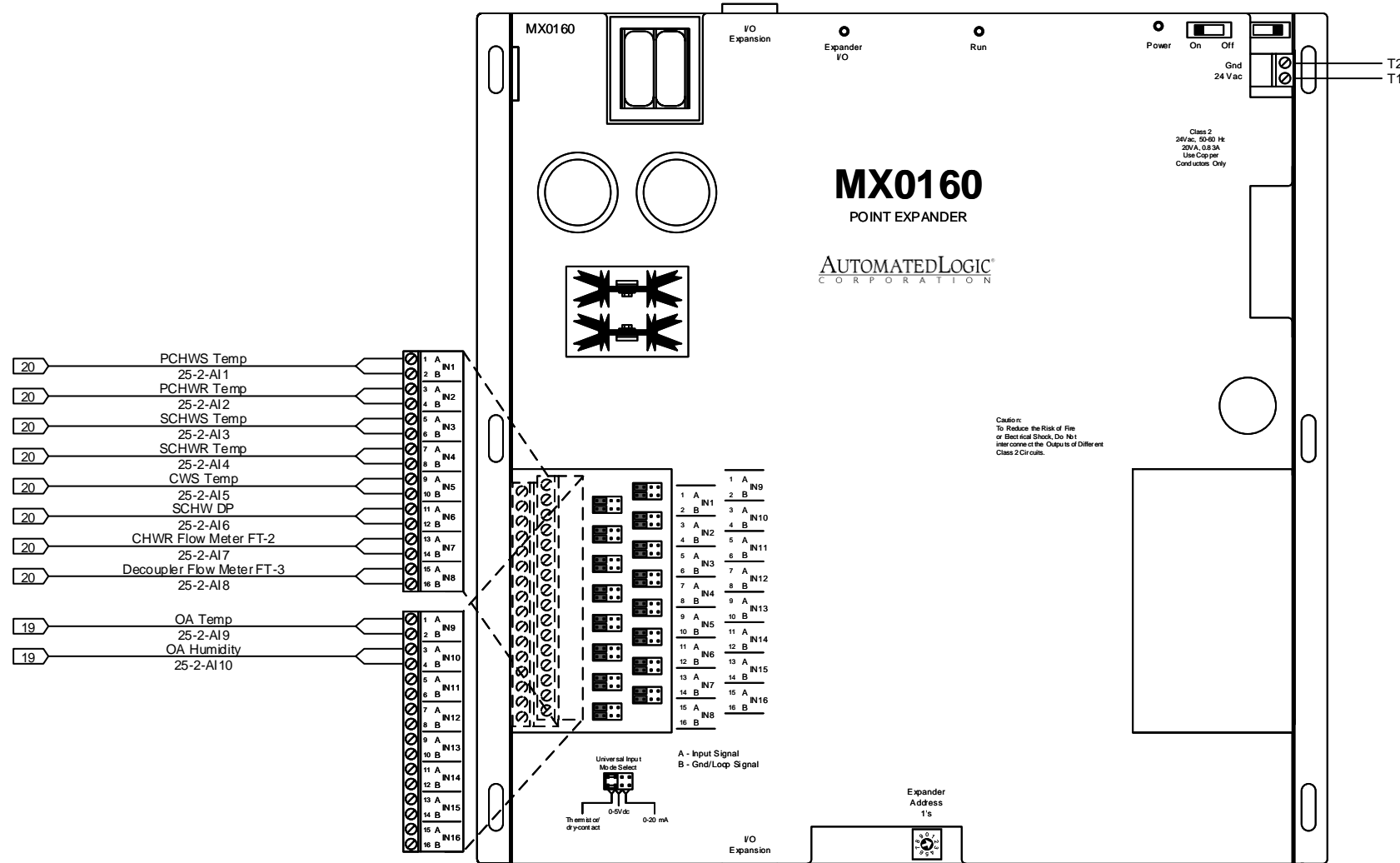
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CHW System Panel Layout (2 of 4)			
REV: 1	Submittal	8/14/2006	JOB NO: 29083
			CHECK BY: CLT
			CORE NO: 1007
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# CHW System Panel Layout (3 of 4)

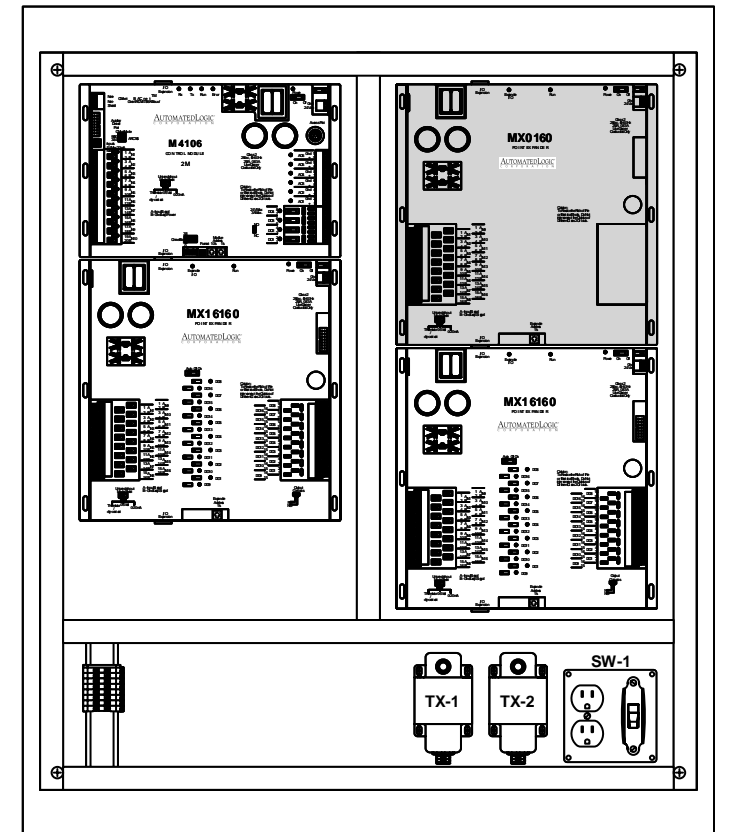
Bill of Materials				
DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
MX0160	MX0160	AUTOMATED LOGIC	MX0160	1 ea

Panel continued from previous page



Panel continued on next page

Panel Layout



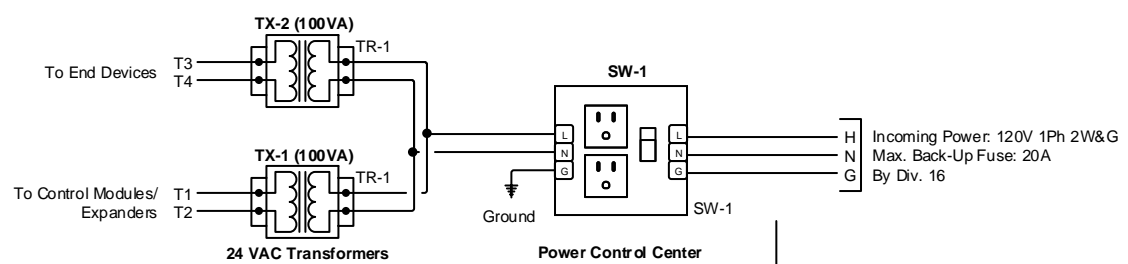
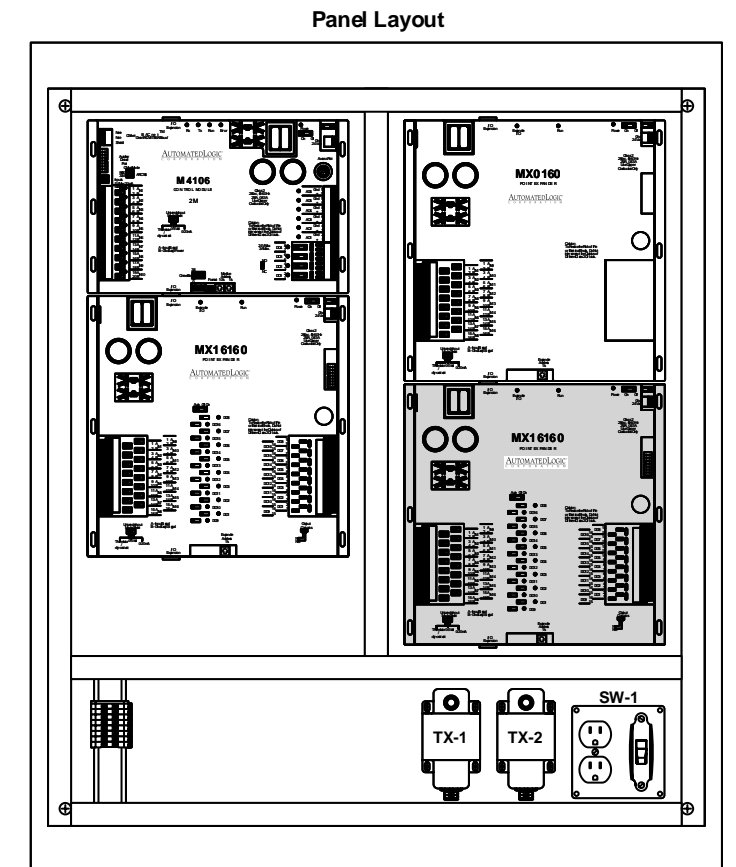
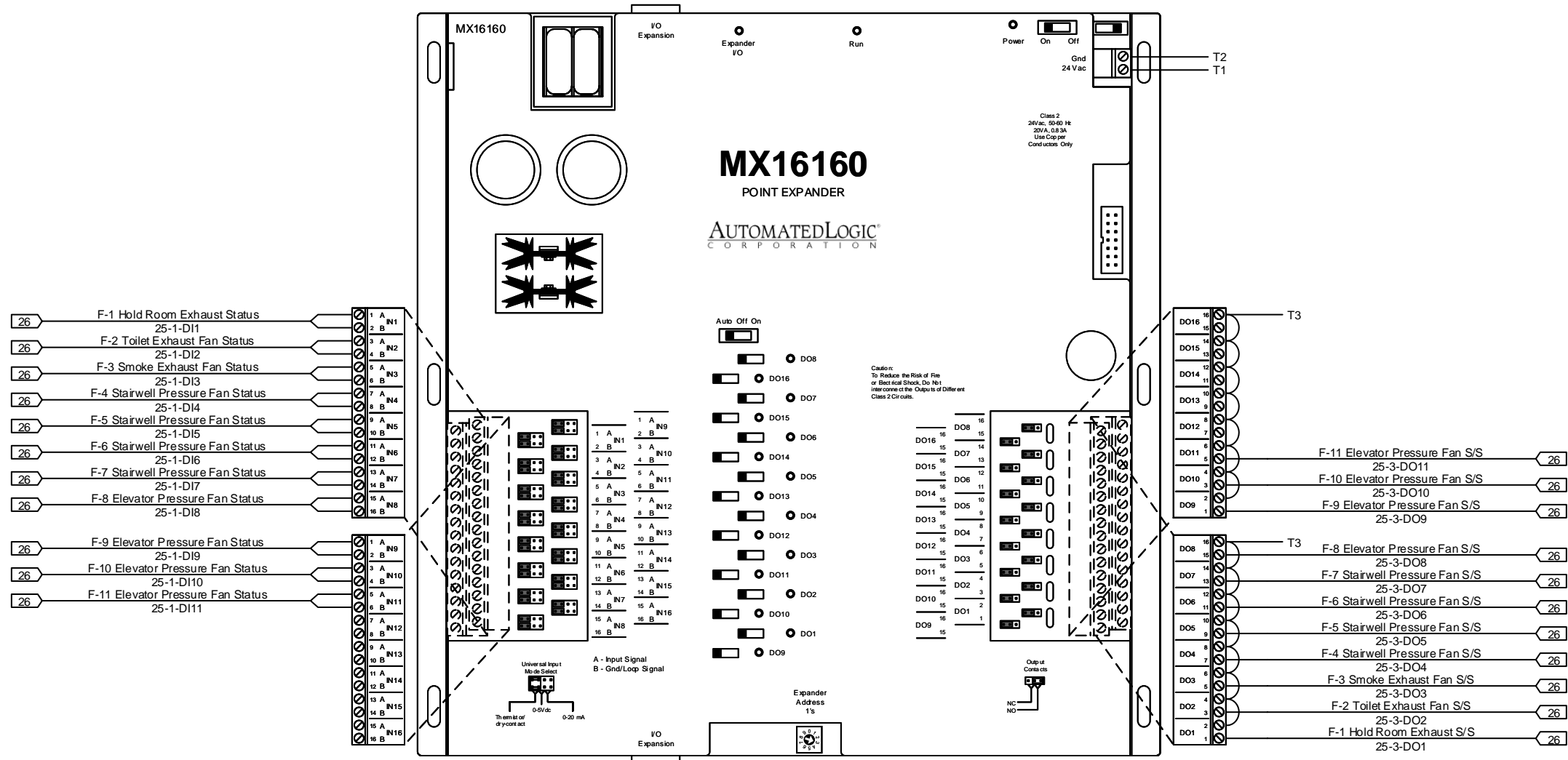
- General Notes:
1. Refer to cable specification chart for wire types.
  2. Refer to ALC Technical Documentation for specifications on Modules and wiring.

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CHW System Panel Layout (3 of 4)			
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# CHW System Panel Layout (4 of 4)

Panel continued from previous page

Bill of Materials				
DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
MX16160	MX16160	AUTOMATED LOGIC	MX16160	1 ea
SW-1	POWER CONTROL CENTER, 10AMP, W RECEPT	FUNCTIONAL DEVICES	PSPT2RB10	1 ea
TR-1	TRANSFORMER, 100VA, 120 TO 24 VAC, CIRCUIT BREAKER	FUNCTIONAL DEVICES	TR100VA001	2 ea



- General Notes:
1. Refer to cable specification chart for wire types.
  2. Refer to ALC Technical Documentation for specifications on Modules and wiring.

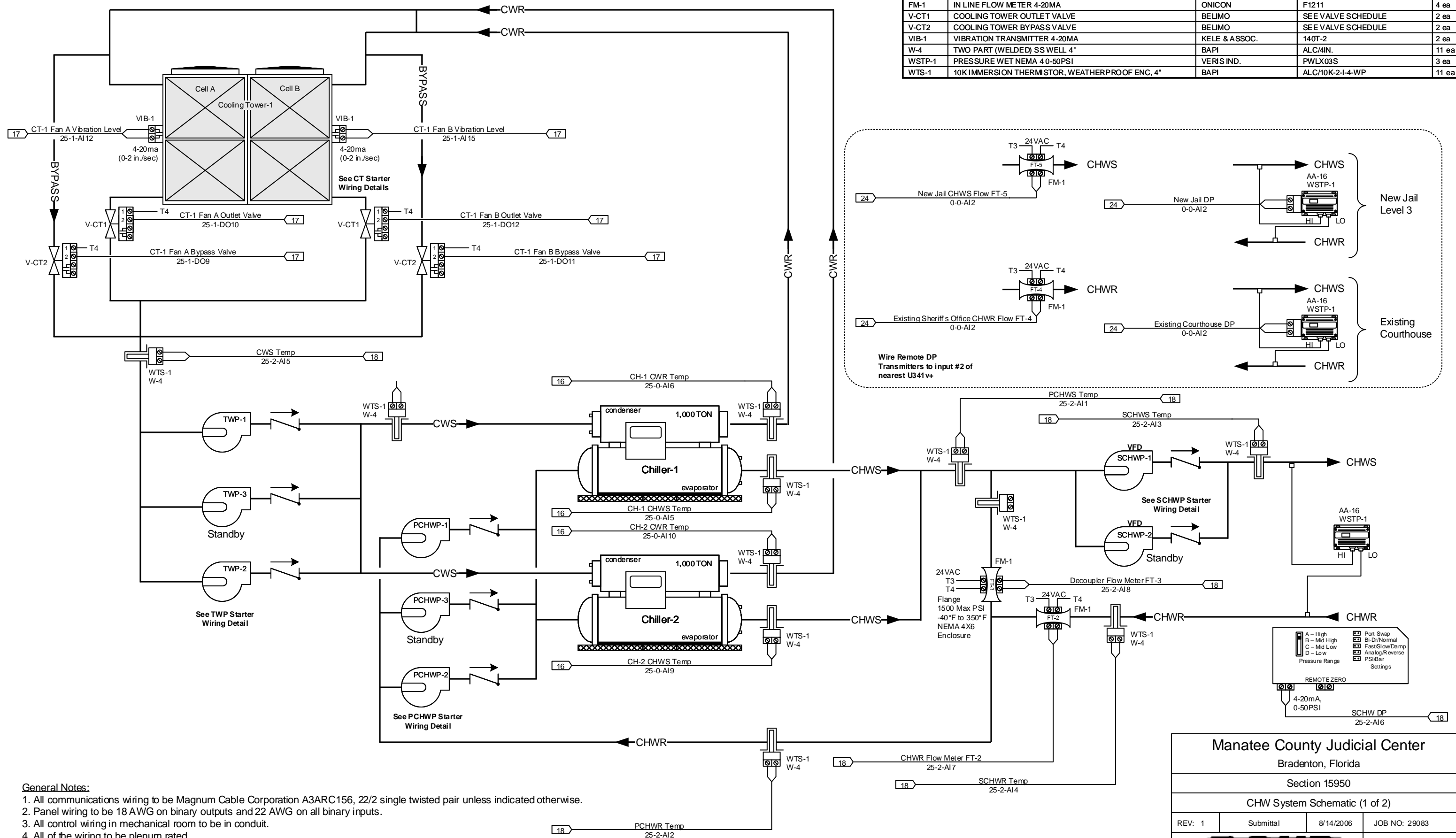
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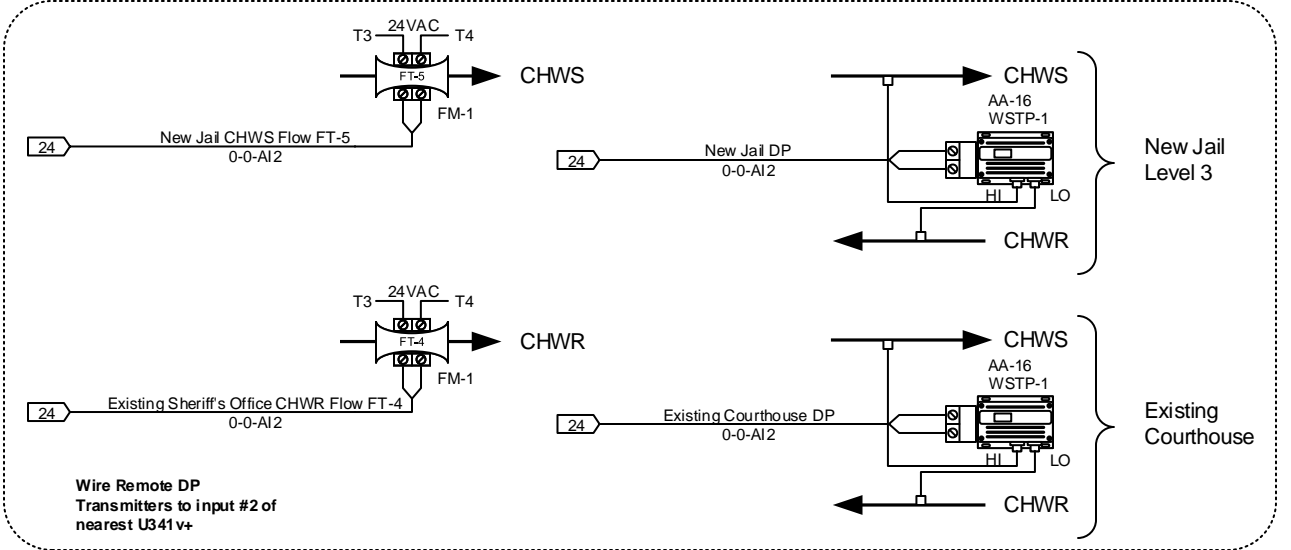
CHW System Panel Layout (4 of 4)

REV: 1	Submittal	8/14/2006	JOB NO: 29083
<b>BOYD BROTHERS SERVICE, INC.</b>			CHECK BY: CLT
			CORE NO: 1007
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# CHW System Schematic (1 of 2)



Bill of Materials				
DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
AA-16	VALVE ASSEMBLY, LARGE BRACKET WITH PW TRANSDUCER	VERIS IND.	AA-16	3 ea
FM-1	IN LINE FLOW METER 4-20MA	ONICON	F1211	4 ea
V-CT1	COOLING TOWER OUTLET VALVE	BELIMO	SEE VALVE SCHEDULE	2 ea
V-CT2	COOLING TOWER BYPASS VALVE	BELIMO	SEE VALVE SCHEDULE	2 ea
VIB-1	VIBRATION TRANSMITTER 4-20MA	KELE & ASSOC.	140T-2	2 ea
W-4	TWO PART (WELDED) SS WELL 4"	BAPI	ALC/4IN.	11 ea
WSTP-1	PRESSURE WET NEMA 4.0-50PSI	VERIS IND.	PWLX03S	3 ea
WTS-1	10K IMMERSION THERMISTOR, WEATHERPROOF ENC, 4"	BAPI	ALC/10K-2-1-4-WP	11 ea



- General Notes:**
1. All communications wiring to be Magnum Cable Corporation A3ARC156, 22/2 single twisted pair unless indicated otherwise.
  2. Panel wiring to be 18 AWG on binary outputs and 22 AWG on all binary inputs.
  3. All control wiring in mechanical room to be in conduit.
  4. All of the wiring to be plenum rated.
  5. Refer to ALC Technical Documentation for specifications on Modules and wiring.
  6. Refer to Network Diagram for details.
  7. Relays as required due to different operating voltages, power sources, or loads.

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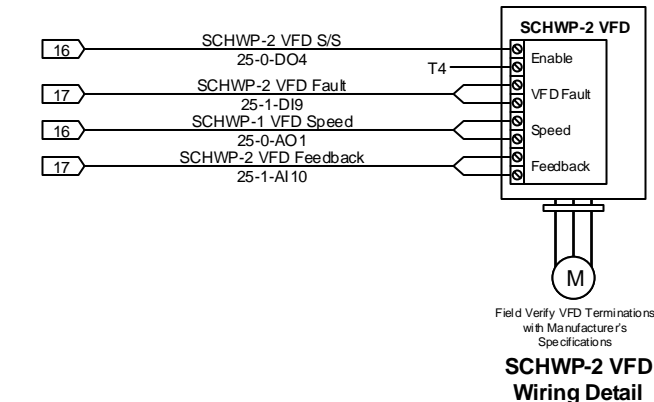
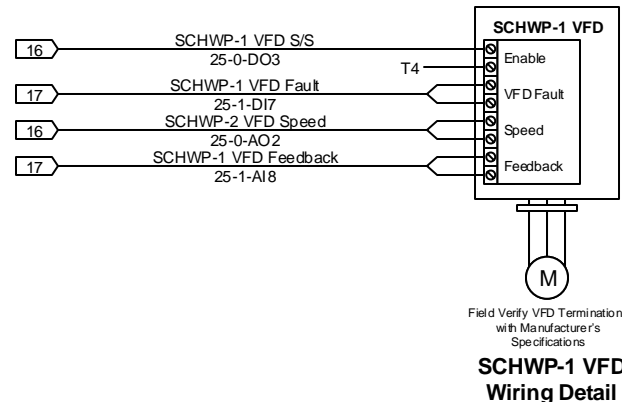
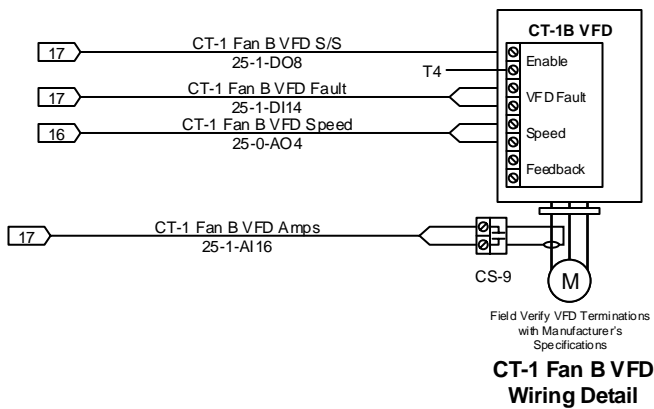
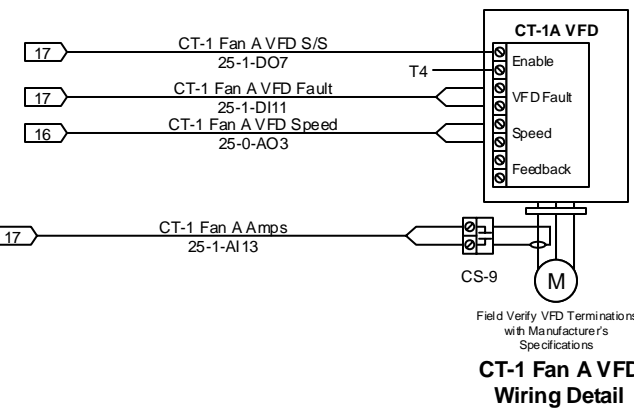
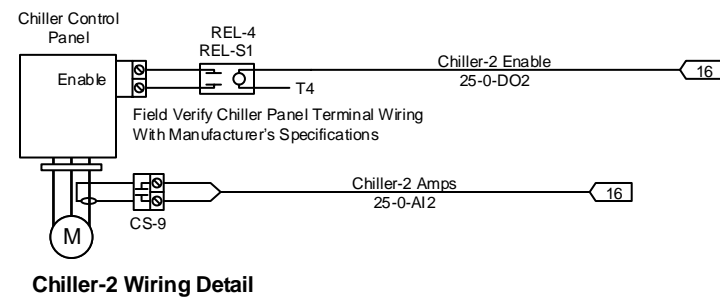
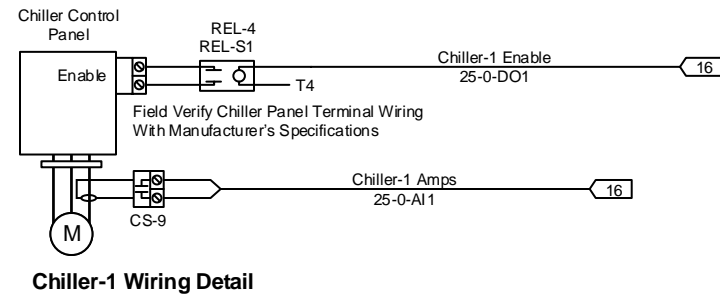
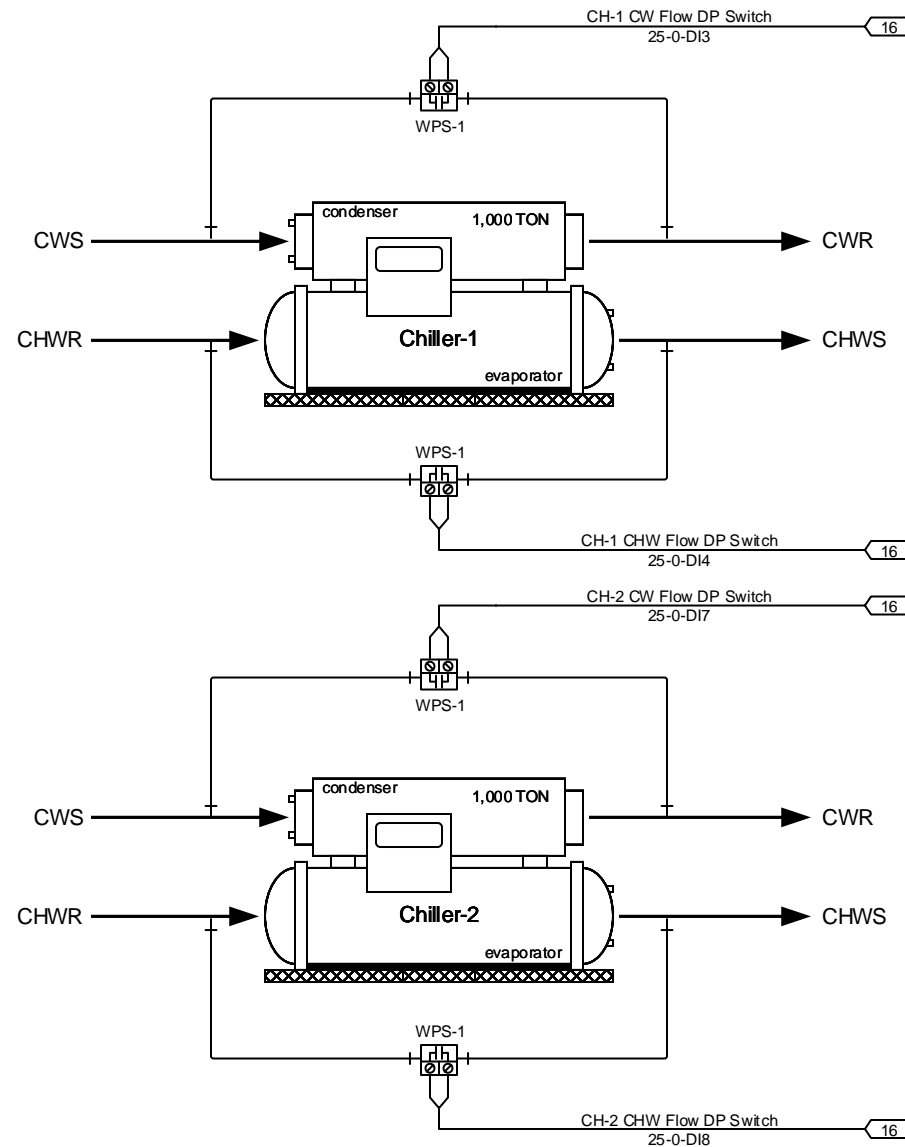
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CHW System Schematic (1 of 2)

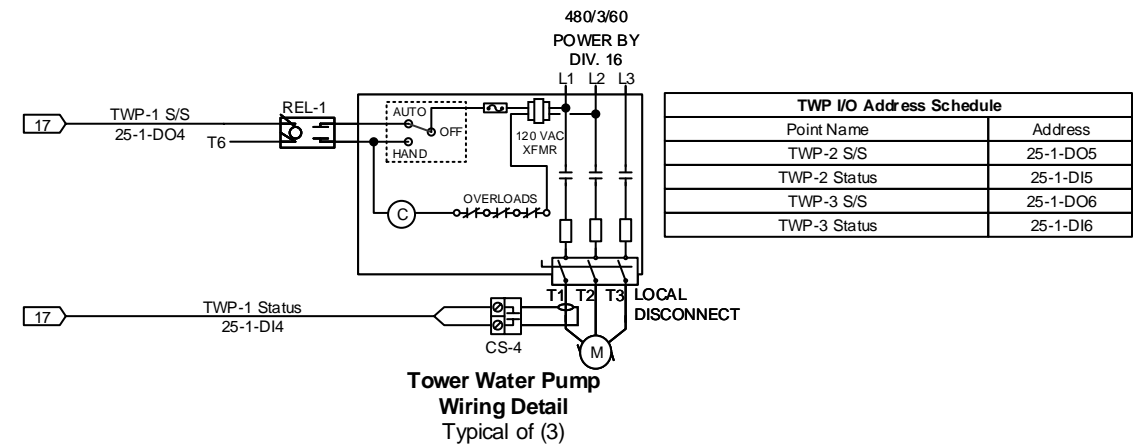
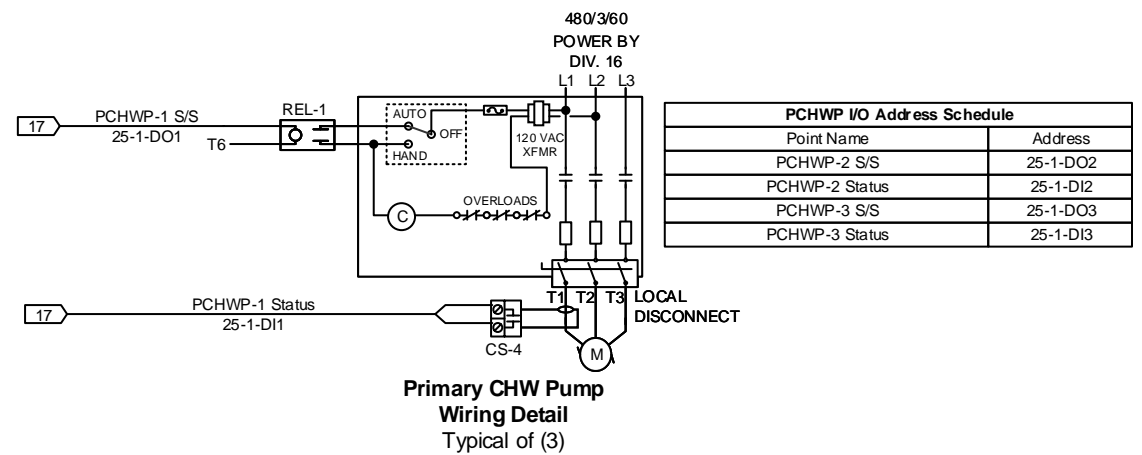
REV: 1	Submittal	8/14/2006	JOB NO: 29083
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	CHECK BY: CLT
	CORE NO: 1007

# CHW System Schematic (2 of 2)



Bill of Materials				
DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
CS-4	CURRENT SWITCH .25-150A PLENUM NEMA1 HOUSING	FUNCTIONAL DEVICES	RIBXKF	6 ea
CS-9	ENC 50A CURRENT SENSOR W/LOOP POWERED 4-20MA OUTPUT	FUNCTIONAL DEVICES	RIBXK420-50	56 ea
REL-1	RIB PILOT RELAY SPDT 10AMP	FUNCTIONAL DEVICES	RIBU1C	6 ea
REL-4	SPDT RELAY W/INDICATOR LIGHT 24 VAC	IDEC	RH1B-U LC-AC24V	2 ea
REL-S1	RELAY BASE FOR RH1B	IDEC	SH1B-05	2 ea
WPS-1	DIFF PRESSURE SWITCH 4-45 PSID	UNITED ELECTRIC	24-014	4 ea



- General Notes:**
- All communications wiring to be Magnum Cable Corporation A3ARC156, 22/2 single twisted pair unless indicated otherwise.
  - Panel wiring to be 18 AWG on binary outputs and 22 AWG on all binary inputs.
  - All control wiring in mechanical room to be in conduit.
  - All of the wiring to be plenum rated.
  - Refer to ALC Technical Documentation for specifications on Modules and wiring.
  - Refer to Network Diagram for details.
  - Relays as required due to different operating voltages, power sources, or loads.

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CHW System Schematic (2 of 2)

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**BOYD BROTHERS SERVICE, INC.**

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# CHW System Sequence

## Sequence of Operation

CHW System/Cooling Tower/Pumps

### General

- A. Individual pump status will be indicated at the BCS system through the current switch.
- B. Individual Chiller status and monitoring will be indicated at the BCS system through the chiller manufacturers protocol communication output.

### Water Chillers

- A. Chiller Interface: The chiller manufacturer will provide an output, in the form of an RS-232 connector at each chiller control panel. As a minimum, the output will provide to the BCS system all monitoring, alarm and control points that are available on the specified chillers. The BCS will provide all "reverse protocol engineering" necessary to monitor, display, and control all the digital data available from the protocol supplied by the building chiller manufacturer as well as the PCA chiller manufacturer.
- B. Data and Information: The BCS will make available trending and point history features for all information received from the data port Adjustable High and Low, and fault alarm threshold parameters will be made available for inputting into the BCS system.
- C. Proof of Chiller Operation: After the local chiller panel is enabled, the BCS will monitor the chiller running load amps for proof of operation.
- D. Building Water Chiller System consists of 2 dual-compressor water cooled centrifugal type chillers piped in parallel, with constant speed primary pumps, variable speed secondary pumps and constant temperature chilled water supply. The sequence will be as follows:

### Secondary System Operation:

The secondary chilled water system will be started upon request from the BCS based on time-of-day schedule, a manual request or on a request from any piece of equipment requiring chilled water within the secondary loop. Upon this request the lead secondary pump (SWP-1 and SWP-2) will start. The pump VFD will always start in an unloaded condition, and slowly ramp to its required operating speed. The lead pump speed will be controlled via a PID algorithm to maintain an adjustable minimum differential pressure set point at the end of the lowest of the two loops. Once the secondary pump proves flow via a delta pressure switch, the chillers and the primary pumps system will be released to sequence.

### Primary Pump Operation:

Upon request from the operator or BCS, the "lead" primary chilled water pump PWP-1 or PWP-2 will be initialized. The BCS will notify when the lead chilled water pump should be alternated based on an operator selected timed basis. Should the "lead" chilled water pump fail on start-up or during normal operation, the BCS will automatically start the "lag" chilled water pump and "lag" chiller and generate an alarm message at the central operator workstation.

### Condenser Water Operation:

After chilled water flow is established through the "lead" chiller via the differential pressure switch, the respective automatic butterfly control valve located in the cooling tower cell basin return will be opened, and the associated cooling tower water pump (TWP-1 or TWP-2) will be initialized. When the tower water flow is established through the condenser via the differential pressure switch, the "lead" chiller will be started. Refer to paragraph entitled "COOLING TOWER OPERATION" in this section of these specifications.

### Supply Water Temperature Control:

The chilled water supply temperature for each chiller will be controlled by the factory-supplied microprocessor based chiller control panel to maintain the scheduled chilled water supply temperature. This temperature will be adjustable at the BCS workstation.


### Building Cooling Water System Control

Operation: All AHU's will have two-way normally open modulating chilled water control valves. The building chilled water system will be controlled as follows:

1. System Flow Control: The speed of the secondary chilled water pumps will be controlled by the BCS system through the VFD to maintain a 10 psig (adjustable) differential pressure between the CWS and CWR at the worst case of too differential pressure transmitters at the end of the loops in the Building. On a decrease in the lowest differential pressure, the BCS will increase the speed of the secondary chilled water pump.
2. Lead/Lag Pump Control: The secondary pumps are each sized for the full cooling load of the building and will be split in runtime via Lead/Lag control.
3. Energizing the Second Chiller When the chilled water system tonnage increases to 800 Tons (adjustable) for more than twenty minutes (adjustable), the BCS will start the lag chiller. The "lag" system will be initialized as described for the "lead" chiller sequence.
4. Single Chiller Operation: On a decrease in chilled water load below 700 Tons (adjustable), the "lag" chilled water pump, chiller, and tower water pump will be stopped as follows:
  - a. The chiller will be de-energized through the BCS system
  - b. The cooling tower basin control valve will be dosed
  - c. The primary chilled water pump will be stopped,
  - d. The tower water pump will be de-energized.

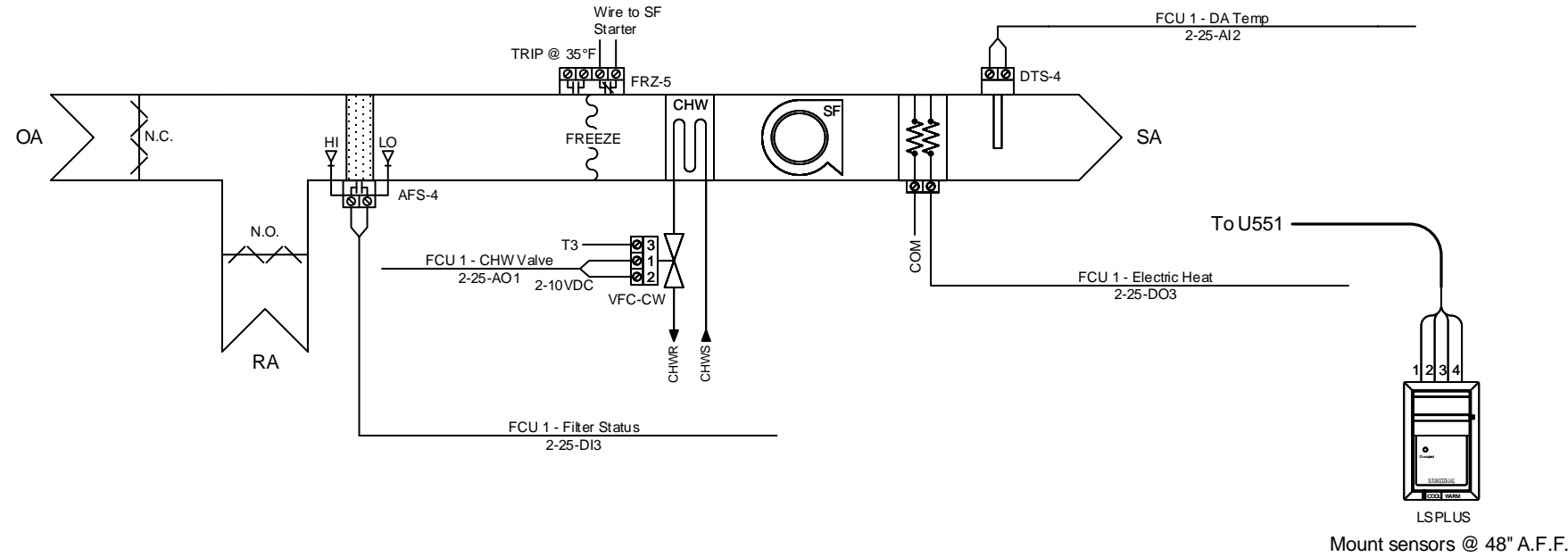
### Cooling Tower Operation

- A. General: Cooling towers with variable speed fans provide condenser water cooling for both the building chillers. The cooling towers are dedicated to independent chillers except in the case of an equipment failure. In an equipment failure the facility staff can operate a chiller and the "other" tower or pump via manually controlled bypass valves. Should the lead" chiller's cooling tower fan isolation valves, fan motor or condenser water pump fail on start-up or during normal operation, the BCS will automatically switch the operation to the "lag" chiller along with its tower fan isolation valves and pumps and generate an alarm message at the central monitoring station.
- B. Maximum Temperature Operation: Whenever any of the building tower water pumps are energized, the respective cooling tower fan control PID loop will be enabled. The tower fans speed will be modulated to maintain a maximum leaving water temperature of 75 degrees F. (adjustable) as sensed by tower water supply temperature sensors. Provide minimum fan speeds for each fan as determined by the manufacturer. Fans will be indexed to full off prior to operation of the bypass valve.
- C. Monitoring Fan Operation: Fan operation will be monitored via analog output current sensing transmitters around the fan power leads. Monitor vibration through vibration sensors
- D. Monitoring Interface: Interface with tower manufacturer control output for monitoring of oil level and vibration.
- E. Low Temperature Operation (Bypass): If the tower water supply drops more than 10 degrees (adjustable) below the temperature setpoint or less than 60 degrees Fahrenheit, and the cooling tower fans are off, the condenser water bypass valve will open to increase the condenser water supply temperature to 60 degrees F (adjustable).

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CHW System Sequence			
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# Typical Fan Coil Unit Schematic

Typical of (8) Fan Coil Units, FCU 1 Shown



## Bill of Materials

DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
AFS-4	AIR FLOW SWITCH, 0.05 +/- 0.02-12" ADJ.	CLEVELAND	AFS-262	8 ea
CS-120	SPST STATUS RELAY W/INTEGRAL CURRENT SWITCH, NO	VERIS IND.	H120	8 ea
DTS-4	DUCT 10K THERMISTOR PROBE 4 IN.	BAPI	BA/10K-2-D-4"	8 ea
E1015	10"H X 15"W ENCLOSURE	ALPS CONTROLS	ALPS004	8 ea
FRZ-5	LOW TEMP DETECT THERMOSTAT, AUTO RESET, 35-45F	SIEMENS	134-1510	8 ea
LSPLUS	LOGISTAT 10K ROOM SENSOR W/SETP ADJ, TLO, COMM+	BAPI	LSPLUS	8 ea
TR-5	TRANSFORMER, 50VA, 120 TO 24 VAC, CIRCUIT BREAKER	FUNCTIONAL DEVICES	TR50VA005	8 ea
U551	U551	AUTOMATED LOGIC	U551	8 ea
VFC-CW	CONTROL VALVE AND ACTUATOR	BELIMO	SEE VALVE SCHEDULE	8 ea

### Sequence of Operations

Fan Coil Unit

**Occupied Mode:** In the occupied mode, as determined by time of day scheduling, the supply fan shall run continuously. When the room temperature is above the control range of the room sensor, CHW Valve will modulate to maintain zone temperature cooling setpoint. Electric Heat will cycle to maintain zone temperature heating setpoint. If freeze stat is tripped in the event of a low-limit alarm, the supply fan will stop, the CHW Valve will open 50% (adj.) and the Electric Heat will be enabled.

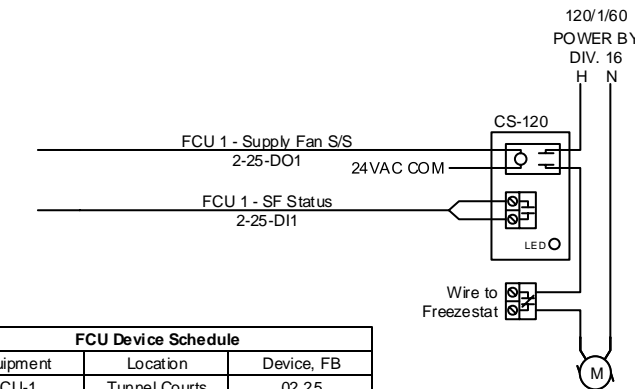
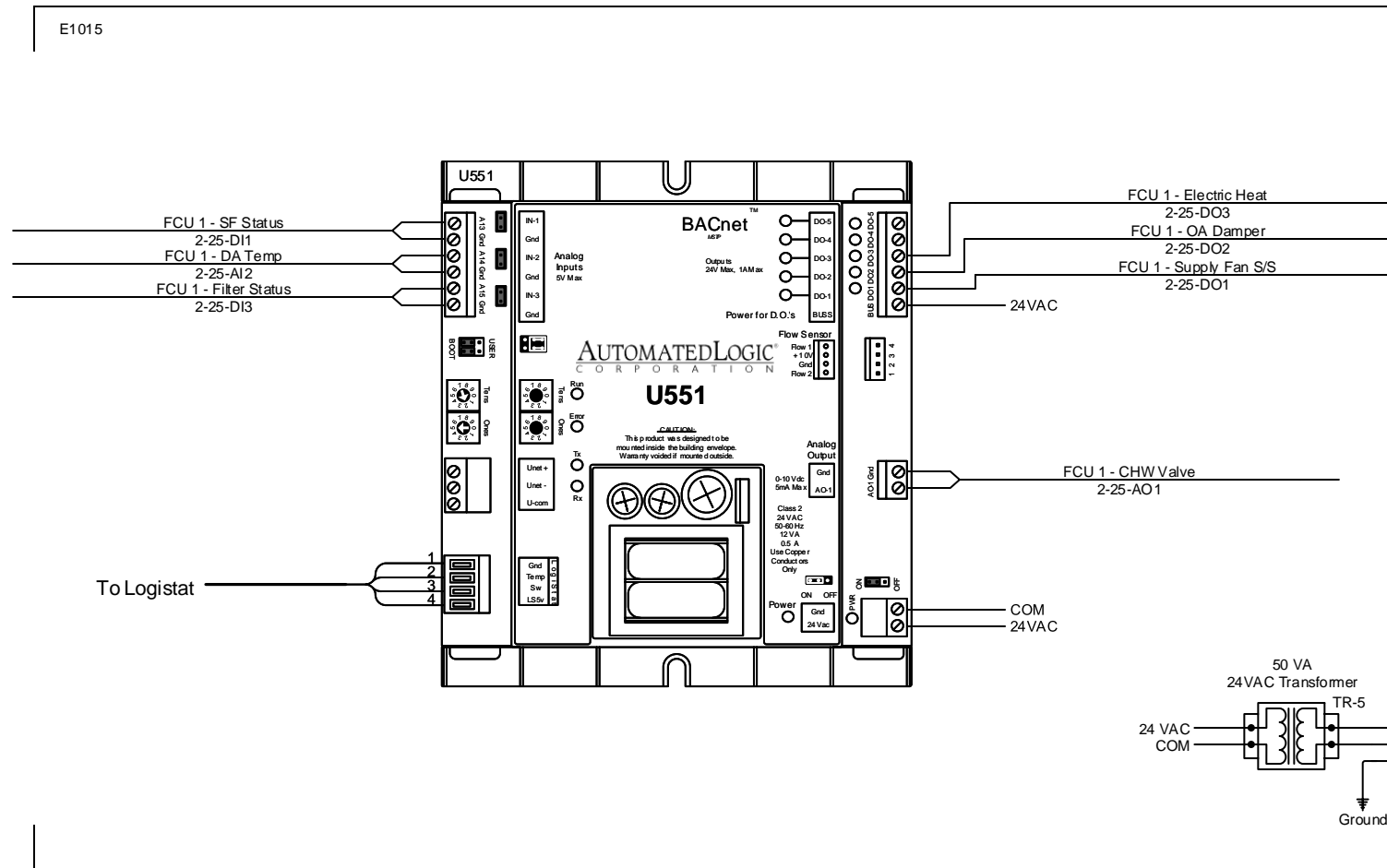
**Un-Occupied Mode:** Similar to the occupied mode of operation. The supply fan will cycle as required to maintain the night cooling setpoints. The override button located at the room sensor may be used to bring the unit back to the occupied mode.

### Zone Temperature Setpoints:

Mode	Clg	Htg
Occupied	74°F	70°F
UnOccupied	80°F	65°F

Setpoint Adjust of 3°F.

Alarms will be provided for high and low zone and discharge temperature sensor readings. Alarms will be provided on supply fan failure.



FCU Device Schedule		
Equipment	Location	Device, FB
FCU-1	Tunnel Courts	02,25
FCU-2	First Floor	02,23
FCU-3	First Floor	02,24
FCU-4	Roof	35,25
FCU-5	Roof	35,26
FCU-6	Roof	35,27
FCU-7	Roof	35,28
FCU-8	Roof	35,29

Supply Fan Starter Wiring Detail  
Typical of (8)  
FCU 1 Shown

### General Notes:

- All communications wiring to be Magnum Cable Corporation A3ARC156, 22/2 single twisted pair unless indicated otherwise.
- Panel wiring to be 18 AWG on binary outputs and 22 AWG on all binary inputs.
- All control wiring in mechanical room to be in conduit.
- All of the wiring to be plenum rated.
- Refer to ALC Technical Documentation for specifications on Modules and wiring.
- Refer to Network Diagram for details.
- Relays as required due to different operating voltages, power sources, or loads.

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Typical Fan Coil Unit Schematic

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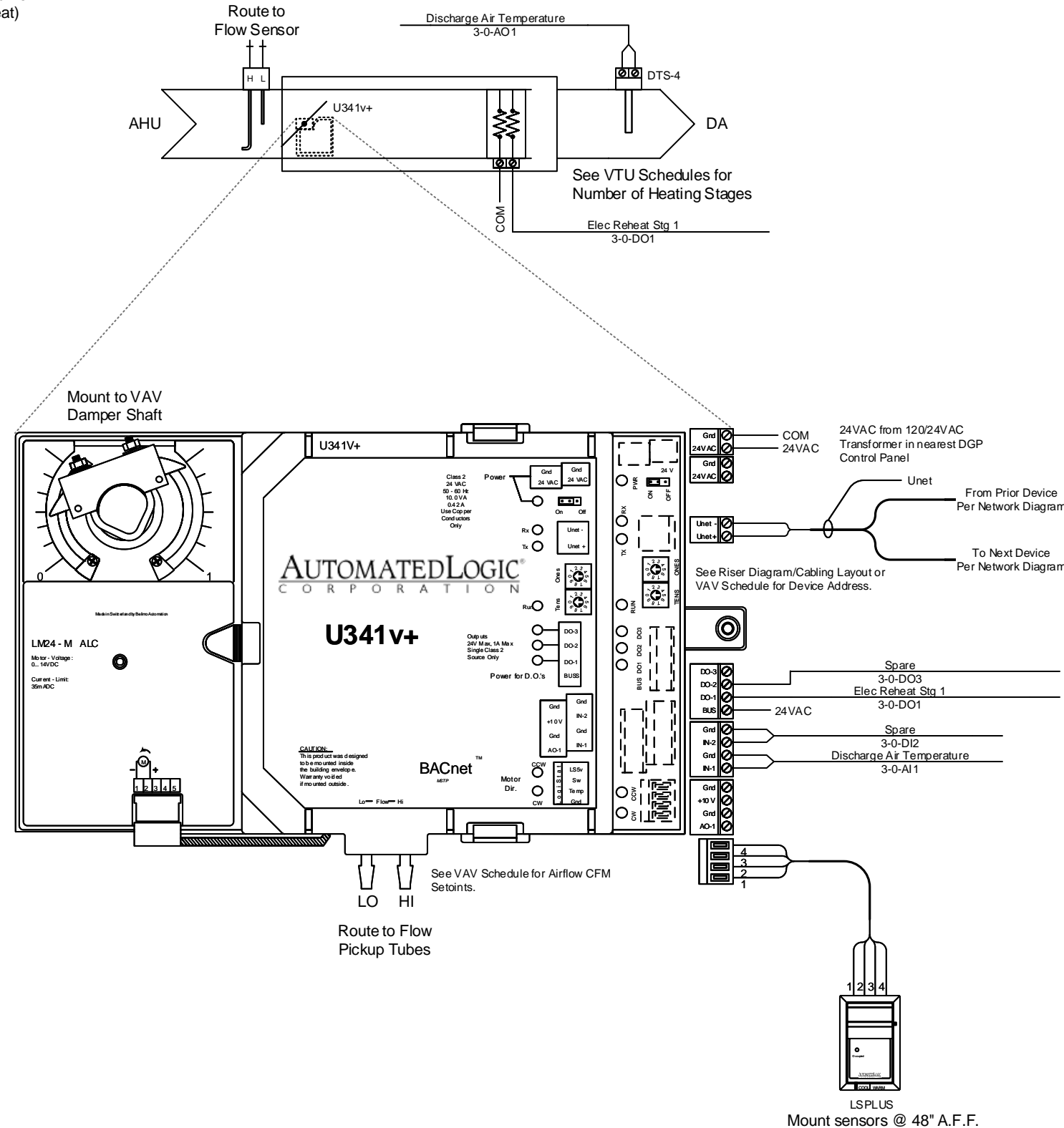


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# Typical VTU Schematic

Typical of (269) Variable Air Volume Boxes (with/without electric reheat)



Bill of Materials				
DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
DTS-4	DUCT 10K THERMISTOR PROBE 4 IN.	BAPI	BA/10K-2-D-4"	269 ea
LSPLUS	LOGISTAT 10K ROOM SENSOR W/ SETP ADJ, TLO, COMM+	BAPI	LSPLUS	269 ea
U341v+	U341v+	AUTOMATED LOGIC	U341v+	269 ea

## Sequence of Operations

Typical VAV with Electric Reheat

**Unoccupied** - When the building is indexed for unoccupied operation, the integral damper actuator shall drive to the unoccupied setpoint.

**Night Set-Back** - The terminal controller shall send a request to the associated air handler to run and modulate the hot water valve to prevent the space temperature from falling below 55°F.

**Night Set-Up** - The terminal controller shall send a request to the associated air handler to run and open the primary air damper to its maximum setpoint to prevent the space temperature from exceeding 90°F. The primary air damper shall remain fully open until the space temperature reaches 85°F, at which time the associated air handler shall be stopped and the primary damper shall drive to the unoccupied position.

**Warm-Up** - The terminal controller shall modulate the primary damper to the heating setpoint and modulate the hot water valve to reheat the supply to bring the space temperature up to the heating design temperature setpoint.

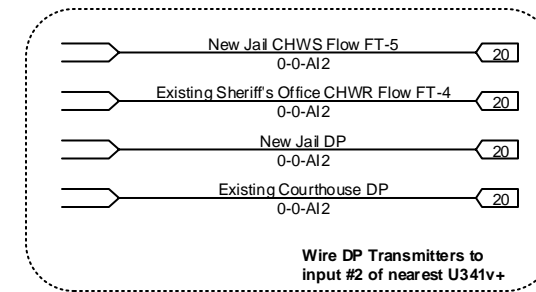
**Cool-Down** - The terminal controller shall modulate the primary damper open to deliver maximum air setpoint until the space temperature setpoint is achieved there after the primary air damper shall modulate to maintain space setpoints. On a drop in space temperature, below the cooling setpoint of 74°F, the primary air damper shall modulated to the minimum CFM setpoint.

**Occupied** - The AHU fans shall start if the building has been on warm-up or continue to run if the building has been on cool-down. The units shall control at the heating setpoint of 70°F. The the primary air damper shall modulate to maintain the cooling setpoint and stage the electric heat as required to maintain the space temperature. On a rise in temperature the electric heat will be off. On a continued rise in space temperature, and after the space has reached the cooling setpoint of 74°F, the primary air damper shall modulated open. The controls shall be arranged for pressure independent operation, i.e., the damper position shall be set by the flow sensor, and the space temperature will reset the flow sensor so that primary air flow will be constant at any setpoint, regardless of changes of the primary duct pressure.

**Unoccupied Override** - The unit temperature sensor shall have an override switch in the housing which can be manually activated to provide one hour (owner adj.) of occupied terminal operation during the unoccupied period. The setpoint adjustment shall allow the occupant to shift one degree (owner adj.) + or - from the space setpoints.

**Unoccupied Override** - The unit temperature sensor shall have an override switch in the housing which can be manually activated to provide one hour of occupied terminal operation during the unoccupied period.

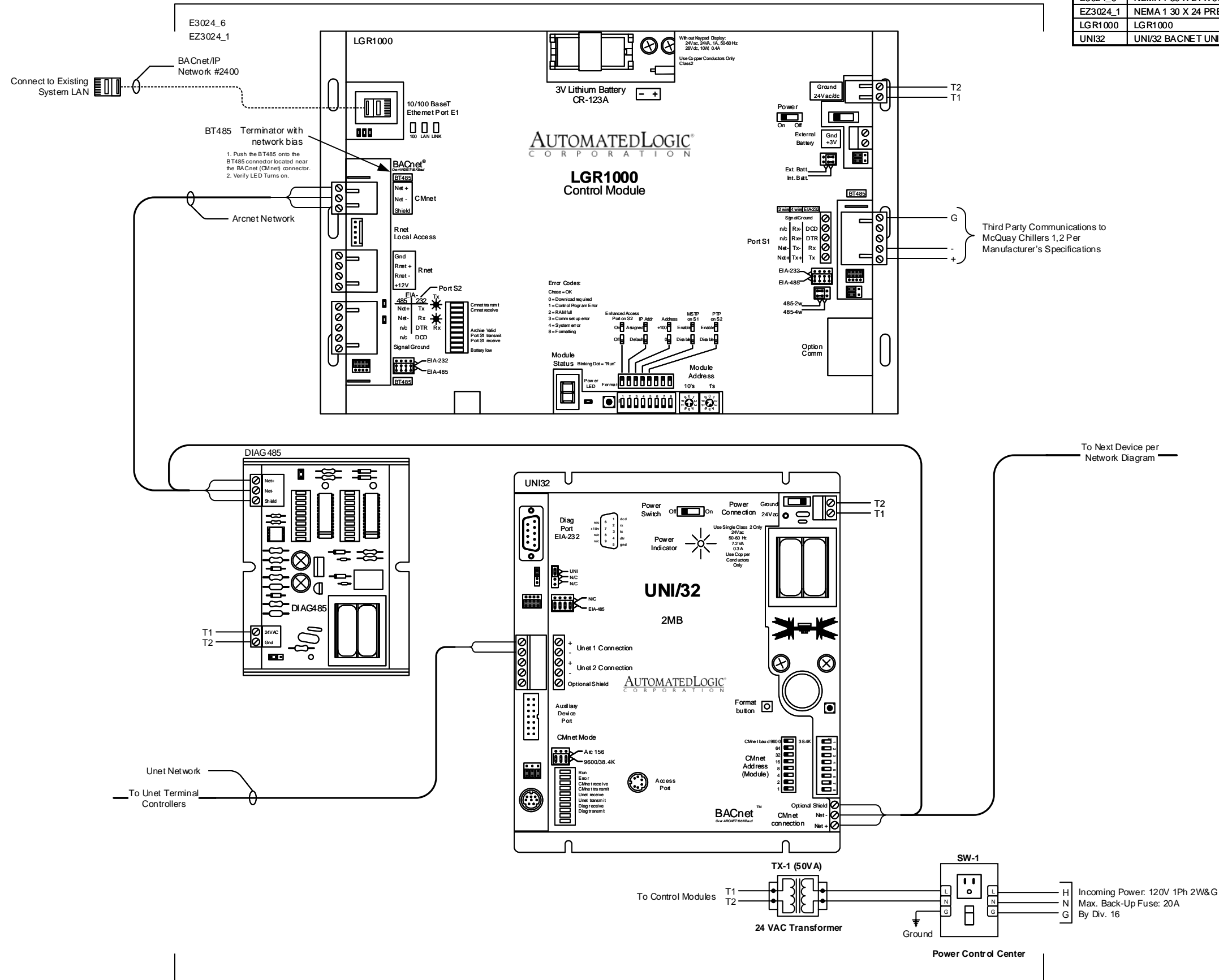
Note - All setpoints are user defined and adjustable.



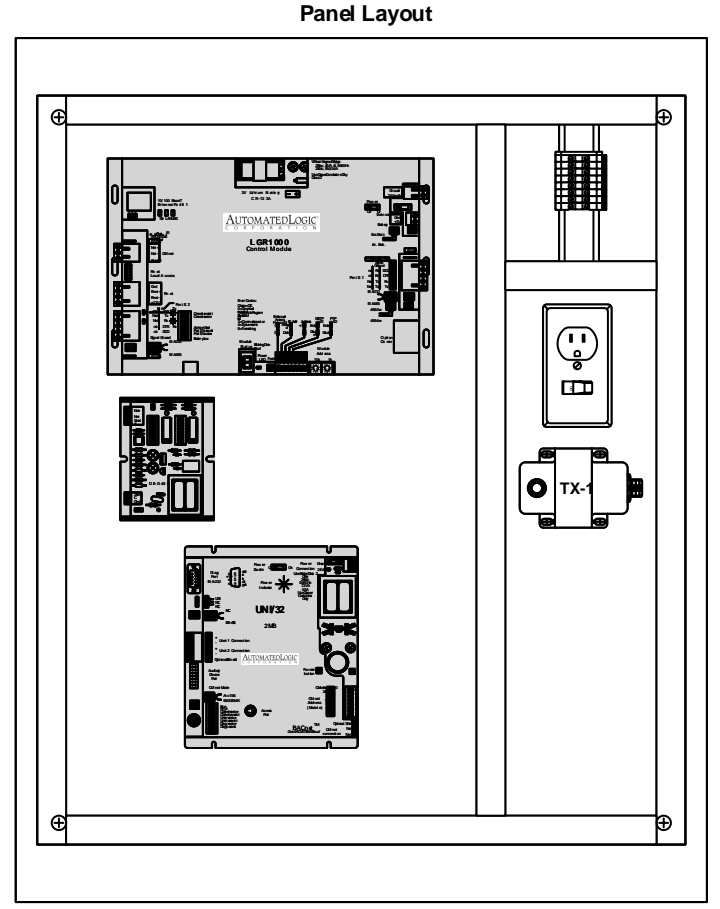
- General Notes:
1. Refer to ALC Technical Documentation for specifications on Modules and wiring.
  2. Refer to Network Diagram for details.
  3. Relays as required due to different operating voltages, power sources, or loads.
  4. Refer to Cable Specifications Chart for cable verification.
  5. Arcnet communication cable shall be plenum rated 22AWG, low capacitance (12.5pF/ft), single shielded twisted pair. Bridle ring and bundle above ceiling.
  6. Input device cabling will be plenum rated 22AWG single twisted pair. 7. 24 VAC power (14AWG) pulled from controls enclosure, see equipment and cabling drawing for power source location.
  8. Install insulated foambucks on all space sensors.
  9. Rough-in conduit from sensor wall box to above ceiling, bridle ring and bundle above ceiling.

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Typical VTU Schematic			
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# DGP-1-3 Panel Layout



Bill of Materials				
DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
BT485	ARC156 TERMINATOR DEVICE	AUTOMATED LOGIC	BT485	1 ea
DIAG 485	ARC156 DIAGNOSTIC DEVICE	AUTOMATED LOGIC	DIAG 485	1 ea
E3024_6	NEMA 1 30 X 24 X 6.62 ENCLOSURE	HOFFMAN	A-30N24ALP	1 ea
EZ3024_1	NEMA 1 30 X 24 PREFAB SUBPANEL	ALP'S	SUB-S-3024-VG-X-X-050-000	1 ea
LGR1000	LGR1000	AUTOMATED LOGIC	LGR1000	1 ea
UNI32	UNI/32 BACNET UNITARY NETWORK	AUTOMATED LOGIC	UNI32	1 ea



**General Notes:**

- Refer to cable specification chart for wire types.
- Refer to ALC Technical Documentation for specifications on Modules and wiring.

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DGP-1-3 Panel Layout

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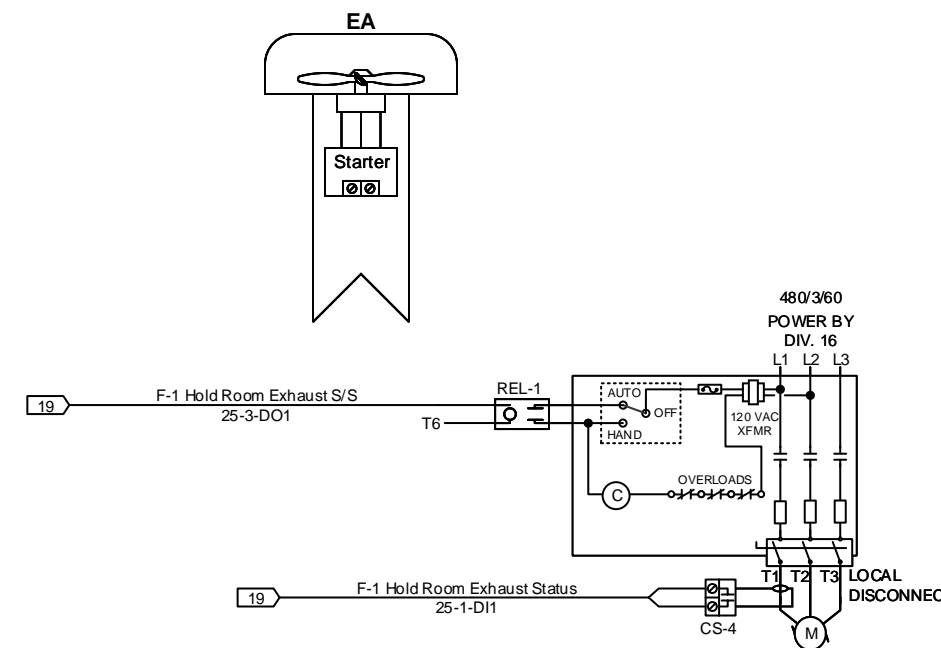
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# Fan Schematics

Bill of Materials				
DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
CS-4	CURRENT SWITCH .25-150A PLENUM NEMA1 HOUSING	FUNCTIONAL DEVICES	RIBXKF	3 ea
REL-1	RIB PILOT RELAY SPDT 10AMP	FUNCTIONAL DEVICES	RIBU1C	3 ea

FAN SCHEDULE						
Fan Tag	Location	Fan Service	CFM	Volts/Phs	Address	
					S/S	Status
F-1	Roof	Hold Room Exhaust	3,630	460/3	25-3-DO1	25-3-DI1
F-2	Roof	Toilet Exhaust	12,820	460/3	25-3-DO2	25-3-DI2
F-3		Smoke Exhaust	32,000	460/3	25-3-DO3	25-3-DI3
F-4	Roof	Stairwell Pressure	16,000	460/3	25-3-DO4	25-3-DI4
F-5	Roof	Stairwell Pressure	16,000	460/3	25-3-DO5	25-3-DI5
F-6	Roof	Stairwell Pressure	16,000	460/3	25-3-DO6	25-3-DI6
F-7	Roof	Stairwell Pressure	16,000	460/3	25-3-DO7	25-3-DI7
F-8	Roof	Elevator Pressure	10,000	460/3	25-3-DO8	25-3-DI8
F-9	Roof	Elevator Pressure	10,000	460/3	25-3-DO9	25-3-DI9
F-10	Roof	Elevator Pressure	10,000	460/3	25-3-DO10	25-3-DI10
F-11	Roof	Toilet Exhaust	670	X	25-3-DO11	25-3-DI11
F-12	Floor 3 - 2603	Toilet Exhaust/General	3,280	460/3	TBD	TBD
F-13	Floor 1 - Room 1300	Emer Gen Ventilation	1,600	480/3	TBD	TBD
F-14	Floor 1 - Room 1625	Dumpster	1,200	460/3	TBD	TBD
F-15	Floor 1 - Room 1302	Fuel Tank	1,200	460/3	TBD	TBD
F-16	Roof MEF	Refrigerant Exhaust	6,000	460/3	TBD	TBD
F-17	Floor 6	Toilet Exhaust	1,750	460/3	TBD	TBD
F-18	Floor 1 - Vault	Ventilation	12,500	460/3	TBD	TBD
F-19	Floor 1 - Vault	Ventilation	12,500	460/3	TBD	TBD
F-20	Floor 1 - Vault	Ventilation	12,500	460/3	TBD	TBD
F-21	Floor 1 - Vault	Ventilation	12,500	460/3	TBD	TBD
F-22	Floor 1 - Sallyport	Ventilation	12,500	460/3	TBD	TBD
F-23	Floor 1 - Sallyport	Ventilation	12,500	460/3	TBD	TBD
F-24	Floor 1 - Sallyport	Ventilation	12,500	460/3	TBD	TBD
F-25	Floor 1 - Sallyport	Ventilation	12,500	460/3	TBD	TBD
F-26	Floor 1 - Sallyport	Ventilation	12,500	460/3	TBD	TBD
F-27	Floor 1 - Sallyport	Ventilation	12,500	460/3	TBD	TBD
F-28	Floor 1 - Sallyport	Ventilation	12,500	460/3	TBD	TBD
F-29	Floor 1 - Sallyport	Ventilation	12,500	460/3	TBD	TBD
F-30	Floor 1 - Sallyport	Ventilation	12,500	460/3	TBD	TBD
F-31	Floor 1 - Sallyport	Ventilation	12,500	460/3	TBD	TBD
F-32	Floor 1 - Sallyport	Ventilation	12,500	460/3	TBD	TBD
F-33	Floor 1 - Sallyport	Ventilation	12,500	460/3	TBD	TBD
F-34	Floor 1 - Sallyport	Ventilation	12,500	460/3	TBD	TBD
F-35	Floor 1 - Parking	Ventilation	12,500	460/3	TBD	TBD
F-36	Floor 1 - Parking	Ventilation	12,500	460/3	TBD	TBD
F-37	Floor 1 - Parking	Ventilation	12,500	460/3	TBD	TBD
F-38	Floor 1 - Parking	Ventilation	12,500	460/3	TBD	TBD
F-39	Floor 1 - Toilet 1804/1805	Toilet Exhaust	100	120/1	TBD	TBD
F-40	Floor 1	Gas Boiler Room	26,060	480/3	TBD	TBD
F-41	Floor 2 - Area C Utility	OA/Ventilation	2,500	480/3	TBD	TBD
EF-2J	Floor 3 - Kitchen Hood Exhaust	Kitchen Exhaust	5,700	480/3	TBD	TBD
EF-3J	Floor 2	Toilet Exhaust	800	120/1	TBD	TBD



**Typical Fan Starter Wiring Detail**  
Typical of (11)

### Sequence of Operation Fans

- A. General: All fans will be connected to the building control system for on/off control and status, unless otherwise noted on documents. Fans will be operated based upon time of day schedules and will be interlocked with their respective AHU's during occupied modes unless otherwise indicated.
- B. Smoke Exhaust Fan Operation: The smoke exhaust fan on the roof includes a VFD and static pressure sensor in the exhaust air stream. During normal mode, the fan VFD will be modulated to maintain static pressure setpoint. When in smoke management operation, the fan will be driven to the full speed position.
- C. Garage/Sallyport Ventilation Fans: These fans will be energized based upon time of day schedule.
- D. Refrigerant Exhaust Fan: Upon indication of refrigerant leakage in the central plant, the refrigerant exhaust fan will be energized and the outside air intake damper will be opened. The refrigerant leakage sensor will provide an alarm in the control system.
- E. Generator Room and Dumpster Room Exhaust Fans: These fans will run continuously.

#### General Notes:

1. All communications wiring to be Magnum Cable Corporation A3ARC156, 22/2 single twisted pair unless indicated otherwise.
2. Panel wiring to be 18 AWG on binary outputs and 22 AWG on all binary inputs.
3. All control wiring in mechanical room to be in conduit.
4. All of the wiring to be plenum rated.
5. Refer to ALC Technical Documentation for specifications on Modules and wiring.
6. Refer to Network Diagram for details.
7. Relays as required due to different operating voltages, power sources, or loads.


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Fan Schematics			
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# Smoke Zone Schedule

## BCS SMOKE ZONE SCHEDULE

Zone	AHU # Serving	Level Served	Area Served	SMOKE ZONE ACTIVATION																													
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1	AHU-I	1st Floor	EXISTING SHERIFF'S OFFICE	E	P					P																							
2	AHU-4	1st Floor	COURTHOUSE LOBBY	P	E	P				P			P																				
	AHU-A	1st Floor	EXISTING JAIL FACILITY	P	E	P				P			P																				
3	FCU	1st Floor	EXISTING JAIL FACILITY		P	E																											
4	--	1st Floor	SALLY PORT	P	P	P				P	P	P																					
5	--	1st Floor	GARAGE							P			P	P																			
6	AHU-2	1st Floor	COURTHOUSE							E				P																			
7	AHU-J	2nd Floor	EXISTING SHERIFF'S OFFICE	P	P						E			P	P																		
8	AHU-A	2nd Floor	EXISTING JAIL FACILITY		P							E		P																			
9	AHU-1	2nd Floor	COURTHOUSE								P		E	P				P															
10	AHU-3	2nd Floor	COURTHOUSE		P					P	P	P		E	P		P																
11	AHU-L	3rd Floor	EXISTING SHERIFF'S OFFICE								P				E	P	P																
12	AHU-A	3rd Floor	EXISTING JAIL FACILITY												E	P		P															
13	AHU-5	3rd Floor	COURTHOUSE									P	P	P	P	E							P										
14	AHU-M	4th Floor	EXISTING SHERIFF'S OFFICE													P	P	E		P		P											
	AHU-O																																
15	AHU-C	4th Floor	EXISTING JAIL FACILITY													P	P		E		P	P											
16	AHU-N	5th Floor	EXISTING SHERIFF'S OFFICE														P		E		P	P											
17	AHU-D	5th Floor	EXISTING JAIL FACILITY															P		E	P		P										
	AHU-E																																
18	AHU-6	4th Floor	COURTHOUSE														P			P	P	E			P								
19	FCU	Penthouse	EXISTING SHERIFF'S OFFICE																P				E										
20	AHU-F	6th Floor	EXISTING JAIL FACILITY															P						E	P								
	AHU-G																																
	AHU-H																																
21	AHU-7	5th Floor	COURTHOUSE																			P		P	E		P						
22	AHU-F	7th Floor	EXISTING JAIL FACILITY																			P			P	E		P					
	AHU-G																																
	AHU-H																																
23	--	8th Floor	EXISTING JAIL FACILITY																						P	E							
24	AHU-8	6th Floor	COURTHOUSE																							P	E	P					
25	--	Penthouse	EXISTING JAIL FACILITY																														
26	--	Penthouse	EXISTING JAIL FACILITY																														
27	AHU-9	7th Floor	COURTHOUSE																									P	E	P			
28	AHU-10	8th Floor	COURTHOUSE																										P	E	P		
29	AHU-11	9th Floor	COURTHOUSE																											P	E		
30	FCU-4-5	Mechanical Penthouse	COURTHOUSE																												E		

P = Pressurize Zone  
E = Exhaust in this Zone  
Blank = Normal BCS Operation  
in this Zone


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Smoke Zone Schedule			
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# Smoke Management Sequence

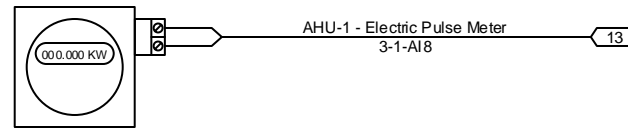
## **Sequence of Operation**

### *Smoke Management System*

- A. General: The smoke management system will be integrated with the fire alarm and fire protection system zone indicators. Each air handling unit typically serves one exclusive zone of the smoke management system. As required by code, end switches and other feedback devices will be provided on life safety controls.
- B. The control system manufacturer will design, furnish and install the fireman's smoke management interface and control panel to be placed in room 1705 (level 1). Inputs to this control panel will override the sequences listed below. Panel installation and interface to fire alarm system will be fully coordinated and approved by the AHJ prior to fabrication or installation. All points and feedback devices will be integrated to this interface panel for fire department review and override.
- C. Stair pressurization and elevator shaft pressurization fans will be energized upon fire alarm indication in the building.
- D. Pressurization and Exhaust Approach: The control system will be fully UUL listed for smoke management system operation and will include all devices, wiring, communications and interfaces required to perform these sequences. Typically, the zones immediately adjacent to the zone in alarm (alarm signal provided by the fire alarm system) will be indexed to pressurization mode. See zone diagrams and matrix in contract documents for further information.
- E. Pressurization Mode: When commanded into pressurization mode, the individual AHU's normal sequence will be overridden by the following sequence:
- a. All terminal units served by the AHU will be indexed to full cooling cfm and all heat de-energized.
  - b. The smoke management damper in the smoke management outside air intake will be indexed fully open,
  - c. The modulating damper in the normal outside air intake will be indexed fully open,
  - d. The smoke management damper in the return air duct will be indexed fully closed,
  - e. The smoke management damper in the general exhaust air duct will be indexed fully closed.
  - f. The smoke management damper in the smoke exhaust air duct will remain closed.
  - g. The AHU fan will be indexed to the full fan speed.
- F. Exhaust Mode: When commanded into exhaust mode, the individual AHU's normal sequence will be overridden by the following sequence:
- a. The AHU fan will be de-energized.
  - b. All terminal units served by the AHU will be indexed to minimum cooling cfm and all heat de-energized.
  - c. The smoke management damper in the smoke management outside air intake will be maintained in fully closed position,
  - d. The modulating damper in the normal outside air intake will be indexed fully closed,
  - e. The smoke management damper in the return air duct will be indexed fully closed,
  - f. The smoke management damper in the general exhaust air duct will be indexed fully open.
  - g. The smoke management damper in the smoke exhaust air duct will be indexed fully open.
  - h. The smoke exhaust fan on the roof of the building will be indexed to full speed.
- G. AHU's not in Pressurization or Exhaust Mode during Smoke Management Operation in the Building:
- a. All AHU's will have their smoke management dampers in the general exhaust air duct indexed to the fully closed position.
  - b. If directed by the AHU, all AHU's will be indexed to off position.

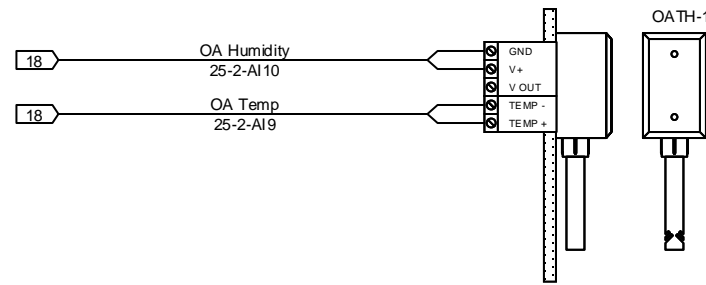
<b>Manatee County Judicial Center</b> Bradenton, Florida			
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Smoke Management Sequence			
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# Misc Equipment Schematic



## Building Demand Meter Wiring Detail

Located in Main Electric Room on First Floor  
Pulse Input Provided in Main Electric Room from  
Outside Meter By Div.16



## Outdoor Air Temperature Sensor Wiring Detail

Locate on North Side of Building

### General Notes:

1. All communications wiring to be Magnum Cable Corporation A3ARC156, 22/2 single twisted pair unless indicated otherwise.
2. Panel wiring to be 18 AWG on binary outputs and 22 AWG on all binary inputs.
3. All control wiring in mechanical room to be in conduit.
4. All of the wiring to be plenum rated.
5. Refer to ALC Technical Documentation for specifications on Modules and wiring.
6. Refer to Network Diagram for details.
7. Relays as required due to different operating voltages, power sources, or loads.

## Bill of Materials

DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
OATH-1	OA TEMPHUMIDITY SENSOR W/WEATHER PROOF ENC	BAPI	ALC/10K-2-H200-O-WP	1 ea

### Sequence of Operation

#### OA Conditions

Outside air temperature and humidity will be monitored continuously by the DDC system and broadcasted across the Arcnet network to all other control devices. High and low outside air temperatures will be available for Current Day, Previous Day, Current Month, Previous Month, Current Year and Previous Year.

#### Electric Meter

Electrical demand and usage will be calculated and monitored by the DDC system, and demand level will be broadcasted across the Arcnet network to all other control devices. High and low electrical demand and usage will be available for Current Day, Previous Day, Current Month, Previous Month, Current Year and Previous Year.

Alarms will be provided for Loss of Pulse.

Manatee County Judicial Center  
Bradenton, Florida

Section 15950

Misc Equipment Schematic

REV: 1	Submittal	8/14/2006	JOB NO: 29083
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**BOYD**  
**BROTHERS**  
**SERVICE, INC.**

CHECK BY: CLT


CORE NO: 1007

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# Terminal Unit Schedules (1 of 3)

VARIABLE AIR VOLUME TERMINAL UNIT SCHEDULE									
Equipment Tag	Design CFM	Minimum CFM	Heater Coil Data				Device Address		
			kW	Steps	EAT (°F)	LAT (°F)		Heating CFM	
VTU-I-1	570	170	3	2	55	85	285	2,1	
VTU-I-2	155	45		-	-	-		2,2	
VTU-I-3	275	80	1.5	1	55	85	135	2,3	
VTU-I-4	320	95	1.5	1	55	85	160	2,4	
VTU-I-5	210	65	1	1	55	85	105	2,5	
VTU-I-6	100	30	0.5	1	55	85	50	2,6	
VTU-I-7	540	160	3	2	55	85	270	2,7	
VTU-I-8	390	120	2	1	55	85	195	2,8	
VTU-I-9	320	95	1.5	1	55	85	160	2,9	
VTU-L-1	700	210	3.5	2	55	85	350	6,8	
VTU-L-2	540	160	3	2	55	85	270	6,9	
VTU-L-3	130	40	1	1	55	85	65	6,10	
VTU-L-4	845	250	4	2	55	85	420	6,11	
VTU-L-5	590	175	3	2	55	85	295	6,12	
VTU-L-6	1800	540	9	3	55	85	900	6,13	
VTU-L-7	420	125	2	1	55	85	210	6,14	
VTU-L-8	220	65	1	1	55	85	110	6,16	
VTU-L-9	910	275	4.5	2	55	85	455	6,17	
VTU-L-10	560	170	3	2	55	85	280	6,18	
VTU-L-11	200	60	1	1	55	85	100	6,19	
VTU-L-12	400	120	2	1	55	85	200	6,20	
VTU-L-13	500	150	NO HEAT IN THIS BOX						
VTU-1-1	2800	840	15	3	55	85	1400	6,1	
VTU-1-2	790	235	5	2	55	85	395	6,2	
VTU-1-3	125	35	1	1	55	85	65	6,3	
VTU-1-4	100	30	0.5	1	55	85	50	6,4	
VTU-1-5	140	40	1	1	55	85	70	6,5	
VTU-1-6	2590	775	15	3	55	85	1295	6,6	
VTU-1-7	2790	840	15	3	55	85	1400	6,7	
VTU-2-1	570	170	3	2	55	85	285	2,10	
VTU-2-2	965	290	5	2	55	85	480	2,11	
VTU-2-3	2000	600	NO HEAT IN THIS BOX						2,12
VTU-2-4	940	280	5	2	55	85	470	2,13	
VTU-2-5	2710	815	15	3	55	85	1355	2,14	
VTU-2-6	170	50	1	1	55	85	85	2,16	
VTU-2-7	2710	815	15	3	55	85	1355	2,17	
VTU-2-8	2710	815	15	3	55	85	1355	2,18	
VTU-2-9	190	60	1	1	55	85	95	2,19	
VTU-2-10	2880	865	15	3	55	85	1440	2,20	
VTU-2-11	190	60	1	1	55	85	95	2,21	
VTU-2-12	1120	335	6	2	55	85	560	2,22	


VARIABLE AIR VOLUME TERMINAL UNIT SCHEDULE								
Equipment Tag	Design CFM	Minimum CFM	Heater Coil Data				Device Address	
			kW	Steps	EAT (°F)	LAT (°F)		Heating CFM
VTU-3-1	1250	375	NO HEAT IN THIS BOX					31,1
VTU-3-2	1300	390	NO HEAT IN THIS BOX					31,2
VTU-3-3	1500	450	8	2	55	85	750	31,3
VTU-3-4	310	90	1.5	1	55	85	155	31,4
VTU-3-5	470	140	2.5	1	55	85	235	31,5
VTU-3-6	1600	480	8	2	55	85	800	31,6
VTU-3-7	2105	630	11	3	55	85	1050	31,7
VTU-3-8	470	140	2.5	1	55	85	235	31,8
VTU-3-9	345	100	2	1	55	85	170	31,9
VTU-3-10	225	65	1	1	55	85	110	31,10
VTU-3-11	280	85	1.5	1	55	85	140	31,11
VTU-3-12	475	140	2.5	1	55	85	240	31,12
VTU-3-13	525	155	2.5	1	55	85	260	31,13
VTU-3-14	605	180	3	2	55	85	300	31,14
VTU-3-15	1600	480	8	2	55	85	800	31,16
VTU-5-1	150	45	NO HEAT IN THIS BOX					8,1
VTU-5-2	205	60	1	1	55	85	100	8,2
VTU-5-3	600	180	3	2	55	85	300	8,3
VTU-5-4	750	225	NO HEAT IN THIS BOX					8,4
VTU-5-5	500	150	NO HEAT IN THIS BOX					8,5
VTU-5-6	1080	325	6	2	55	85	540	8,6
VTU-5-7	2000	600	10	3	55	85	1000	8,7
VTU-5-8	2000	600	10	3	55	85	1000	8,8
VTU-5-9	1100	330	6	2	55	85	550	8,9
VTU-5-10	300	90	1.5	1	55	85	150	8,10
VTU-5-11	1540	460	8	2	55	85	770	8,11
VTU-5-12	480	145	2.5	1	55	85	240	8,12
VTU-5-13	420	125	2	1	55	85	210	32,1
VTU-5-14	2555	765	13	3	55	85	1275	32,2
VTU-5-15	1000	300	5	2	55	85	500	32,3
VTU-5-16	355	105	2	1	55	85	175	32,4
VTU-5-17	250	75	1.5	1	55	85	125	32,5
VTU-5-18	325	95	1.5	1	55	85	160	32,6
VTU-5-19	475	140	3	2	55	85	240	32,7
VTU-5-20	2555	765	13	3	55	85	1275	32,8
VTU-5-21	330	100	2	1	55	85	165	32,9
VTU-5-22	550	165	3	2	55	85	275	32,10
VTU-5-23	435	130	2.5	1	55	85	215	32,11
VTU-5-24	550	165	3	2	55	85	275	32,12
VTU-5-25	435	130	2.5	1	55	85	215	32,13
VTU-5-26	550	165	3	2	55	85	275	32,14
VTU-5-27	480	145	2.5	1	55	85	240	32,16
VTU-5-28	730	220	3.5	2	55	85	365	32,17
VTU-5-29	180	55	NO HEAT IN THIS BOX					32,18
VTU-5-30	1030	310	5	2	55	85	515	32,19
VTU-5-31	1920	575	10	3	55	85	960	32,20
VTU-5-32	600	180	3	2	55	85	300	32,21

<b>Manatee County Judicial Center</b>			
Bradenton, Florida			
Section 15950			
Terminal Unit Schedules (1 of 3)			
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# Terminal Unit Schedules (2 of 3)


VARIABLE AIR VOLUME TERMINAL UNIT SCHEDULE									
Equipment Tag	Design CFM	Minimum CFM	Heater Coil Data				Device Address		
			kW	Steps	EAT (°F)	LAT (°F)		Heating CFM	
VTU-6-1	255	75			55	85	125	14,1	
VTU-6-2	2390	715	12	3	55	85	1195	14,2	
VTU-6-3	420	125	2	1	55	85	210	14,3	
VTU-6-4	2250	675	11	3	55	85	1125	14,4	
VTU-6-5	390	115	2	1	55	85	195	14,5	
VTU-6-6	1395	420	7	2	55	85	695	14,6	
VTU-6-7	585	175	3	2	55	85	290	14,7	
VTU-6-8	500	150	NO HEAT IN THIS BOX						14,8
VTU-6-9	750	225	NO HEAT IN THIS BOX						14,9
VTU-6-10	1700	510	9	3	55	85	850	14,10	
VTU-6-11	250	75	1.5	1	55	85	125	14,11	
VTU-6-12	2680	805	13	3	55	85	1340	14,12	
VTU-6-13	360	110	2	1	55	85	180	14,13	
VTU-6-14	380	115	2.5	1	55	85	190	14,14	
VTU-6-15	915	275	5	2	55	85	455	14,16	
VTU-6-16	400	120	2	1	55	85	200	14,17	
VTU-6-17	2680	805	13	3	55	85	1340	14,18	
VTU-6-18	1410	425	7	2	55	85	705	14,19	
VTU-6-19	450	135	2.5	1	55	85	225	14,20	
VTU-6-20	1410	425	7	2	55	85	705	14,21	
VTU-6-21	320	95	1.5	1	55	85	160	14,22	
VTU-6-22	4115	1235	20	4	55	85	2055	14,23	
VTU-6-23	440	130	2.5	1	55	85	220	14,24	
VTU-6-24	270	80	1.5	1	55	85	135	14,25	
VTU-6-25	215	65	NO HEAT IN THIS BOX						14,26
VTU-6-26	600	180	3		55	85	300	14,27	
VTU-7-1	255	75	1.5	1	55	85	125	16,1	
VTU-7-2	2450	735	12	3	55	85	1225	16,2	
VTU-7-3	420	125	2	1	55	85	210	16,3	
VTU-7-4	2250	675	11	3	55	85	1125	16,4	
VTU-7-5	390	115	2	1	55	85	195	16,5	
VTU-7-6	1380	415	7	2	55	85	690	16,6	
VTU-7-7	820	245	4	2	55	85	410	16,7	
VTU-7-8	500	150	NO HEAT IN THIS BOX						16,8
VTU-7-9	750	225	NO HEAT IN THIS BOX						16,9
VTU-7-10	1700	510	9	3	55	85	850	16,10	
VTU-7-11	250	75	1.5	1	55	85	125	16,11	
VTU-7-12	2680	805	13	3	55	85	1340	16,12	
VTU-7-13	435	130	2	1	55	85	200	16,13	
VTU-7-14	NOT USED								
VTU-7-15	950	285	5	2	55	85	475	16,16	
VTU-7-16	400	120	2	1	55	85	200	16,17	
VTU-7-17	2680	805	13	3	55	85	1340	16,18	
VTU-7-18	3730	1120	18	3	55	85	1865	16,19	
VTU-7-19	450	135	2.5	1	55	85	225	16,20	
VTU-7-20	320	95	1.5	1	55	85	160	16,21	
VTU-7-21	4115	1235	20	4	55	85	2055	16,22	
VTU-7-22	440	130	2.5	1	55	85	220	16,23	
VTU-7-23	270	80	1.5	1	55	85	135	16,24	
VTU-7-24	215	65	NO HEAT IN THIS BOX						16,25
VTU-7-25	710	215	3.5	2	55	85	355	16,26	

VARIABLE AIR VOLUME TERMINAL UNIT SCHEDULE									
Equipment Tag	Design CFM	Minimum CFM	Heater Coil Data				Device Address		
			kW	Steps	EAT (°F)	LAT (°F)		Heating CFM	
VTU-8-1	255	75	1.5	1	55	85	125	18,1	
VTU-8-2	2450	735	12	3	55	85	1225	18,2	
VTU-8-3	420	125	2	1	55	85	210	18,3	
VTU-8-4	2250	675	11	3	55	85	1125	18,4	
VTU-8-5	390	115	2	1	55	85	195	18,5	
VTU-8-6	1380	415	7	2	55	85	690	18,6	
VTU-8-7	820	245	4	2	55	85	410	18,7	
VTU-8-8	500	150	NO HEAT IN THIS BOX						18,8
VTU-8-9	750	225	NO HEAT IN THIS BOX						18,9
VTU-8-10	1700	510	9	3	55	85	850	18,10	
VTU-8-11	250	75	1.5	1	55	85	125	18,11	
VTU-8-12	2575	770	13	3	55	85	1290	18,12	
VTU-8-13	385	115	2	1	55	85	200	18,13	
VTU-8-14	140	40	1	1	55	85	70	18,14	
VTU-8-15	1050	315	5	2	55	85	525	18,16	
VTU-8-16	400	120	2	1	55	85	200	18,17	
VTU-8-17	2575	770	13	3	55	85	1290	18,18	
VTU-8-18	3730	1120	18	3	55	85	1865	18,19	
VTU-8-19	450	135	2.5	1	55	85	225	18,20	
VTU-8-20	320	95	1.5	1	55	85	160	18,21	
VTU-8-21	4115	1235	20	4	55	85	2055	18,22	
VTU-8-22	440	130	2.5	1	55	85	220	18,23	
VTU-8-23	270	80	1.5	1	55	85	135	18,24	
VTU-8-24	215	65	NO HEAT IN THIS BOX						18,25
VTU-8-25	710	215	3.5	2	55	85	355	18,26	
VTU-9-1	530	160	2.5	1	55	85	265	20,1	
VTU-9-2	695	210	3.5	2	55	85	350	20,2	
VTU-9-3	600	180	3	2	55	85	300	20,3	
VTU-9-4	330	100	2	1	55	85	165	20,4	
VTU-9-5	330	100	2	1	55	85	165	20,5	
VTU-9-6	330	100	2	1	55	85	165	20,6	
VTU-9-7	950	285	5	2	55	85	475	20,7	
VTU-9-8	840	250	4	2	55	85	420	20,8	
VTU-9-9	610	180	3	2	55	85	305	20,9	
VTU-9-10	230	70	1.5	1	55	85	115	20,10	
VTU-9-11	345	105	2	1	55	85	170	20,11	
VTU-9-12	130	40	1	1	55	85	65	20,12	
VTU-9-13	1350	405	7		55	85	675	20,13	
VTU-9-14	500	150	NO HEAT IN THIS BOX						20,14
VTU-9-15	750	225	NO HEAT IN THIS BOX						20,15
VTU-9-16	560	170	3	2	55	85	280	20,16	
VTU-9-17	130	40	1	1	55	85	65	33,1	
VTU-9-18	240	70	1.5	1	55	85	120	33,2	
VTU-9-19	1200	360	6	2	55	85	600	33,3	
VTU-9-20	330	100	2	1	55	85	165	33,4	
VTU-9-21	330	100	2	1	55	85	165	33,5	
VTU-9-22	345	105	2	1	55	85	170	33,6	
VTU-9-23	855	180	4.5	2	55	85	425	33,7	
VTU-9-24	950	285	5	2	55	85	475	33,8	

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## Terminal Unit Schedules (3 of 3)

VARIABLE AIR VOLUME TERMINAL UNIT SCHEDULE									
Equipment Tag	Design CFM	Minimum CFM	Heater Coil Data				Device Address		
			kW	Steps	EAT (°F)	LAT (°F)		Heating CFM	
VTU-11-1	390	115	2	1	55	85	195	24,1	
VTU-11-2	475	140	2.5	1	55	85	235	24,2	
VTU-11-3	300	90	1.5	1	55	85	150	24,3	
VTU-11-4	510	150	2.5	1	55	85	255	24,4	
VTU-11-5	575	170	3	2	55	85	290	24,5	
VTU-11-6	770	230	4	2	55	85	385	24,6	
VTU-11-7	820	245	4	2	55	85	410	24,7	
VTU-11-8	630	190	3	2	55	85	315	24,8	
VTU-11-9	1365	410	7	2	55	85	680	24,9	
VTU-11-10	290	90	1.5	1	55	85	145	24,10	
VTU-11-11	820	245	4	2	55	85	410	24,11	
VTU-11-12	1990	600	10	3	55	85	995	24,12	
VTU-11-13	200	60	1	1	55	85	100	24,13	
VTU-11-14	560	170	3	2	55	85	280	24,14	
VTU-11-15	1365	410	7	2	55	85	680	24,16	
VTU-11-16	450	135	2.5	1	55	85	225	35,1	
VTU-11-17	505	150	2.5	1	55	85	250	35,2	
VTU-11-18	810	245	4	2	55	85	405	35,3	
VTU-11-19	445	135	2.5	1	55	85	220	35,4	
VTU-11-20	810	245	4	2	55	85	405	35,5	
VTU-11-21	770	230	4	2	55	85	385	35,6	
VTU-11-22	290	90	1.5	1	55	85	185	35,7	
VTU-11-23	400	120	2	1	55	85	200	35,8	
VTU-11-24	445	130	2.5	1	55	85	220	35,9	
VTU-11-25	770	230	4	2	55	85	385	35,10	
VTU-11-26	770	230	4	2	55	85	385	35,11	
VTU-11-27	290	90	1.5	1	55	85	145	35,12	
VTU-11-28	770	230	4	2	55	85	385	35,13	
VTU-11-29	570	170	3	2	55	85	285	35,14	
VTU-11-30	500	150	2.5	1	55	85	250	35,16	
VTU-11-31	430	130	2	1	55	85	215	35,17	
VTU-11-32	495	150	2.5	1	55	85	245	35,18	
VTU-11-33	490	150	2.5	i	55	85	245	35,19	
VTU-11-34	290	90	1.5	1	55	85	145	35,20	
VTU-11-35	200	60	1	1	55	85	100	35,21	
VTU-11-36	1900	570	10	3	55	85	950	35,22	
VTU-11-37	500	150	NO HEAT IN THIS BOX						35,23
VTU-11-38	750	225	NO HEAT IN THIS BOX						35,24

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