

Anchor Bay School District Lighthouse Elementary School

51880 Washington St.
New Baltimore, MI 48047

Centrix Energy
792 Lois Dr.
Sun Prairie, WI 53590



Centrix Energy
5700 Lake Dr
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No.	Description	D

ANCHOR BAY
SCHOOL DISTRICT
DDC CONTROLS
UPGRADES

LIGHTHOUSE
ELEMENTARY
SCHOOL

REQUEST FOR PROPOSAL
MECHANICAL
COVER SHEET

REQUEST FOR PROPOSAL
Project Number:
Date: 3/13/2023
M000

REQUEST FOR PROPOSAL	
EXISTING	
DDC - ALC	
REQUEST FOR PROPOSAL	
Project Number:	
Date:	3/13/2002
M001	



Lighthouse Elementary

Item #	Area Served	Legacy Control's Page Number	Notes
RTU-1	Office Area	5 of 20	Include (6) zones w/ RH coils
RTU-2	Stage, Platform, Workroom		Include (3) zones w/ RH coils
RTU-3	Computer Lab, Innovation Center, Office	8 of 20	Include (3) zones w/ RH coils
RTU-4	Gymnasium	15 of 20	
RTU-5	Corridors	8 of 20	Include (5) zones w/ RH coils
RTU-6	Office Area D110, 108, 107, 106, 105	8 of 20	Single zone
RTU-7	Media Center	8 of 20	
RTU-8	Band Area D-132, 128, 129, 131	8 of 20	Include (6) zones w/ RH coils
RTU-Kitchen	Kitchen		
RTU-Café	Cafeteria and Serving		Include (6) zones w/ RH coils
BC-1	Blower Coil - Locker Rooms	18 of 20	
BC-2	Blower Coil - Locker Rooms	18 of 20	
UV's	Classroom Unit Ventilators		qty of 24
CUH	Vestibules		qty of 2
RWP	Media Center		qty of 5
Efs	Exhaust Fans - Restrooms		qty of 2

[illegible]

ANCHOR BAY
SCHOOL DISTRICT
DDC CONTROLS
UPGRADES

LIGHTHOUSE
ELEMENTARY
SCHOOL

REQUEST FOR PROPOSAL

EQUIPMENT
SCHEDULE FOR
DDC UPGRADE

REQUEST FOR PROPOSAL

Date: 3/13/2022

M002



FLOORPLAN FOR DDC UPGRADE

No.	Description
1	
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ANCHOR BAY
SCHOOL DISTRICT
DDC CONTROLS
UPGRADES

LIGHTHOUSE
ELEMENTARY
SCHOOL

REQUEST FOR PROPOSAL

FLOORPLAN FOR
DDC UPGRADE

REQUEST FOR PROPOSAL

Project Number:

Date:

3/13/2022

M003

TEMPERATURE CONTROLS
FOR

ANCHOR BAY SCHOOLS
Lighthouse Elementary School

by

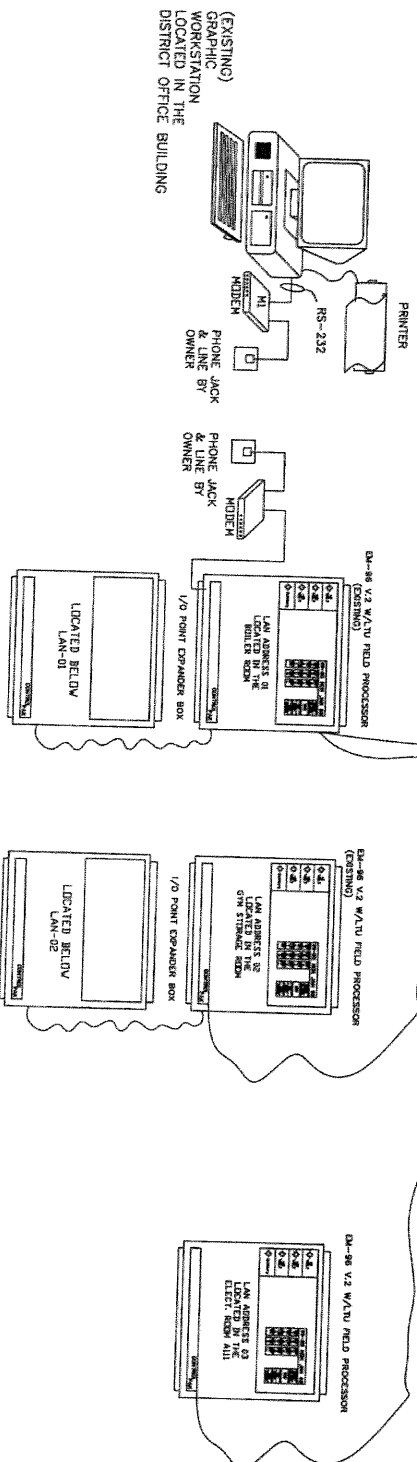
CT_I CONTROLLED TEMPERATURE INC.

1897 BEST DRIVE , WALLED LAKE MICH. 48390 TEL. (248) 669-0500

TEMPERATURE CONTROLS FOR

ANCHOR BAY SCHOOLS Lighthouse Elementary School

SYSTEM ARCHITECTURE



Anchor Bay Schools

Lighthouse Elementary School

51980 Washington, New Baltimore, ME

SYSTEM
TITLE PAGE

CT CONTROLLED TEMPERATURE INC.

1897 WEST DRIVE, WAILED LAKE HIGH 48390 TEL. (248) 669-0900

FILE NAME: C:\JOB\ANCHOR BAY SCHOOL\SYSTEM ARCHITECTURE.dwg

DRAWN BY: KES DATE: 07/21/04

JOB NO: 04136

ASBULL10/15/04

01

PAGE NUMBER

AI#	DESCRIPTION	EQUIPMENT	AREA SERVED
AI- 1	CALIBRATION RESISTOR		
AI- 2	SPARE	RTU-3	E-104,106,103
AI- 3	DA TEMP	RTU-4	GYM
AI- 4	MA TEMP	RTU-4	GYM
AI- 5	DA TEMP	RTU-4	GYM
AI- 6	RA TEMP	RTU-4	GYM
AI- 7	SPACE TEMP	RTU-4	GYM
AI- 8	RA TEMP	RTU-5	E-111,101,109
AI- 9	DA TEMP	RTU-5	E-111,101,109
AI- 10	RA TEMP	RTU-6	E-111,101,109
AI- 11	DA TEMP	RTU-6	
AI- 12	RA TEMP	RTU-7	
AI- 13	DA TEMP	RTU-7	
AI- 14	RA TEMP	RTU-8	
AI- 15	DA TEMP	RTU-8	D-132,128,129,131
AI- 16	SPARE	RTU-8	D-132,128,129,131

* INDICATES NEW
CONTROL POINT

AI#	DESCRIPTION	EQUIPMENT	AREA SERVED
AI- 17	DA TEMP	BC-1	
AI- 18	SPARE		
AI- 19	SPARE	RTU-6	
AI- 20	SPACE TEMP	FTR-2	D-106
AI- 21	SPACE TEMP	TC-13	D-132
AI- 22	SPACE TEMP	TC-14	D-128
AI- 23	SPACE TEMP	TC-15	D-129
AI- 24	SPACE TEMP	TC-16	D-130
AI- 25	SPACE TEMP	TC-17	D-131
AI- 26	SPACE TEMP	RWP	E-100
AI- 27	HWS TEMP	RTU-7	
AI- 28	SPACE TEMP	EDU-3	E-100
AI- 29	SPACE TEMP	RWP	E-104
AI- 30	SPACE TEMP		E-106
AI- 31	SPACE TEMP		
AI- 32	SPACE TEMP		

AI#	DESCRIPTION	EQUIPMENT	AREA SERVED
AI- 33	SPACE TEMP	TC-5	E-103
AI- 34	SPACE TEMP	TC-1	E-111
AI- 35	SPACE TEMP	TC-2	E-101
AI- 36	SPACE TEMP	TC-8	
AI- 37	SPACE TEMP	TC-9	F-115
AI- 38	SPACE TEMP	TC-7	F-109
AI- 39	MA TEMP	RTU-1	OFFICE AREA
AI- 40	DA TEMP	RTU-1	OFFICE AREA
AI- 41	SPACE TEMP	TC-1	OFFICE
AI- 42	SPACE TEMP	TC-2	WORKROOM C112
AI- 43	SPACE TEMP	TC-3	SPEECH
AI- 44	SPACE TEMP	TC-4	CONFERENCE
AI- 45	SPACE TEMP	TC-5	MAIL C114
AI- 46	SPACE TEMP	TC-6	PRINCIPAL C113
AI- 47	SPACE TEMP		
AI- 48	SPACE TEMP		

AO#	DESCRIPTION	EQUIPMENT	AREA SERVED
AO- 1	SPARE		
AO- 2	HW VALVE	RTU-3	E-104,106,103
AO- 3	MA DAMPERS	RTU-4	GYM
AO- 4	HW VALVE	RTU-4	GYM
AO- 5	HW VALVE	RTU-1	OFFICE AREA
AO- 6	HW VALVE	RTU-5	E-111,101,109
AO- 7	HW VALVE	TC-1	OFFICE
AO- 8	HW VALVE	RTU-6	WORKROOM C112
AO- 9	HW VALVE	TC-2	
AO- 10	HW VALVE	RTU-7	
AO- 11	HW VALVE	TC-3	SPEECH
AO- 12	HW VALVE	RTU-8	D-132,128,129,131
AO- 13	HW VALVE	TC-4	CONFERENCE
AO- 14	HW VALVE	BC-1	LOCKER ROOM
AO- 15	HW VALVE	TC-5	MAIL C114
AO- 16	HW VALVE	TC-6	PRINCIPAL C113

AO#	DESCRIPTION	EQUIPMENT	AREA SERVED
AO- 17	HW VALVE	TC-3	E-104
AO- 18	HW VALVE	TC-4	E-106
AO- 19	HW VALVE	TC-5	E-103
AO- 20	HW VALVE	TC-1	E-111
AO- 21	HW VALVE	TC-2	E-101
AO- 22	HW VALVE	TC-8	E-100
AO- 23	HW VALVE	RWP	F-109
AO- 24	HW VALVE	TC-7	F-115
AO- 25	HW VALVE	TC-9	D-132
AO- 26	HW VALVE	TC-13	D-128
AO- 27	HW VALVE	TC-14	D-129
AO- 28	HW VALVE	TC-15	D-130
AO- 29	HW VALVE	TC-16	D-131
AO- 30	HW VALVE	TC-17	
AO- 31	HW VALVE	FTR-1	BAND
AO- 32	HW VALVE	FTR-2	

Anchor Bay Schools
Lighthouse Middle School

SYSTEM
LAN 2 Point Terminations
LAN ADDRESS: 02

CT CONTROLLED TEMPERATURE INC.
1897 BEST DRIVE, VALLED LAKE MICH 48391 TEL: (248) 669-0500

FILE NAME: CTSYMACIOR BAY SCHOOLS\LIGHTHOUSE MIDDLE SCHOOL\POINT Terminations.dwg
DRAWN BY: KRS DATE: 07/01/03 JOB NO: 03025 ASBULL79-9-03 PAGE NUMBER

DI#	DESCRIPTION	EQUIPMENT	AREA SERVED
DI- 1	S.FAN STATUS	RTU-3	E-104,106,103
DI- 2	S.FAN STATUS	RTU-4	GYM
DI- 3	S.FAN STATUS	RTU-5	E-101,111,F-109
DI- 4	S.FAN STATUS	RTU-6	
DI- 5	S.FAN STATUS	RTU-7	
DI- 6	S.FAN STATUS	RTU-8	D-132,128,129,130
DI- 7	S.FAN STATUS	BC-1	LOCKER ROOM
DI- 8	PUMP STATUS	CP-5	E-100 MEDIA CENTER
DI- 9	R.FAN STATUS	RTU-4	GYM
DI- 10	S.FAN STATUS	RTU-1	OFFICE AREA
DI- 11	SPARE		
DI- 12	SPARE		
DI- 13	SPARE		
DI- 14	SPARE		
DI- 15	SPARE		
DI- 16	SPARE		

DI#	DESCRIPTION	EQUIPMENT	AREA SERVED
DI- 1	SF ON/OFF	RTU-3	E-104,106,103
DI- 2	1ST STG COOL	RTU-3	E-104,106,103
DI- 3	2ND STG COOL	RTU-3	E-104,106,103
DI- 4	EXH. FAN ON/OFF	EF-1	TOILET ROOM C111
DI- 5	SF ON/OFF	RTU-4	GYM
DI- 6	SF ON/OFF	RTU-5	E-101,111,F-109
DI- 7	1ST STG COOL	RTU-5	E-101,111,F-109
DI- 8	2ND STG COOL	RTU-5	E-101,111,F-109
DI- 9	SPARE	RTU-5	E-101,111,F-109
DI- 10	SF ON/OFF	RTU-6	
DI- 11	1ST STG COOL	RTU-6	
DI- 12	SF ON/OFF	RTU-7	
DI- 13	1ST STG COOL	RTU-7	
DI- 14	2ND STG COOL	RTU-7	
DI- 15	3RD STG COOL	RTU-7	
DI- 16	SF ON/OFF	RTU-8	D-132,128,129,130

DI#	DESCRIPTION	EQUIPMENT	AREA SERVED
DI- 17	1ST STG COOL	RTU-8	
DI- 18	2ND STG COOL	RTU-8	
DI- 19	EDH ON/OFF	EDH-3	
DI- 20	UV OCC/UNOCC	UNIT VENTS	D-WING
DI- 21	UV OCC/UNOCC	UNIT VENTS	F-WING SOUTH
DI- 22	UV OCC/UNOCC	UNIT VENTS	F-WING NORTH
DI- 23	FC ON/OFF	FC-2	
DI- 24	PUMP ON/OFF	CP-5 OR 6	E-100 MEDIA
DI- 25	SF ON/OFF	BC-1	LOCKER ROOM
DI- 26			
DI- 27	SF ON/OFF	RTU-1	OFFICE AREA
DI- 28	1ST STG COOL	RTU-1	OFFICE AREA
DI- 29	2ND STG COOL	RTU-1	OFFICE AREA
DI- 30	EF-1 ON/OFF	EF-1	OFFICE RESTROOMS
DI- 31			
DI- 32			

Anchor Bay Schools
Lighthouse Middle School

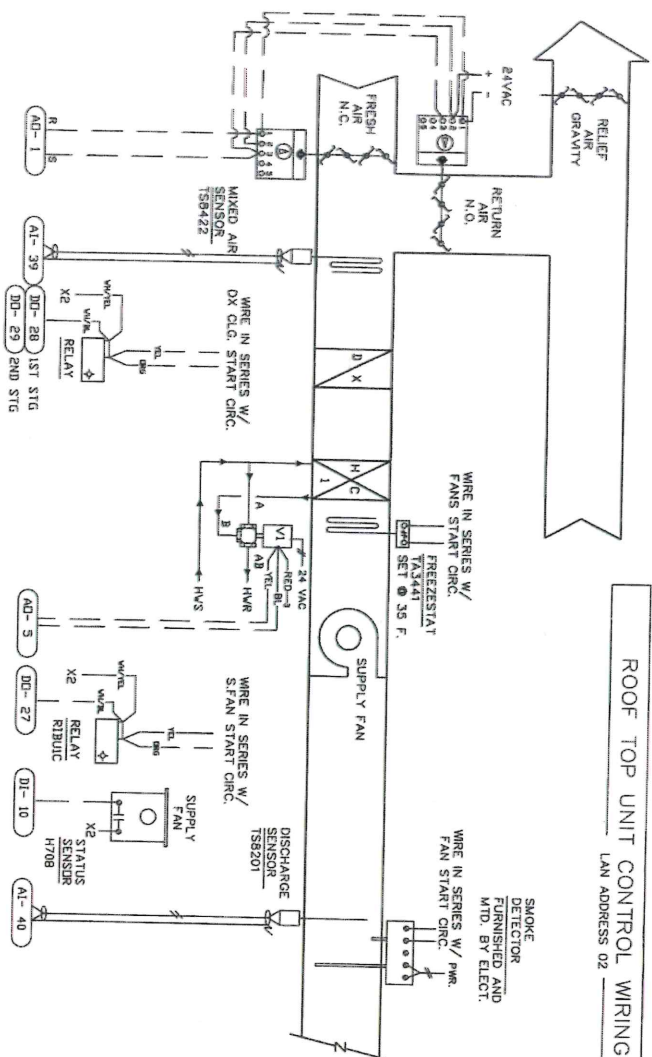
SYSTEM
LAN 02 Point Terminations Continued

CT CONTROLLED TEMPERATURE INC.
1897 BEST DRIVE, WALLED LAKE, MICH. 48090 TEL. (248) 669-6500

FILE NAME: JMSVANCHOR BAY SCHOOLS.LIGHTHOUSE.MIDDLE.SCHOOL.VPRINT Terminations Continued
DRAWN BY: KXS DATE: 07/01/03 JOB NO.: 03025 ASBULLY 9-09-03 PAGE NUMBER

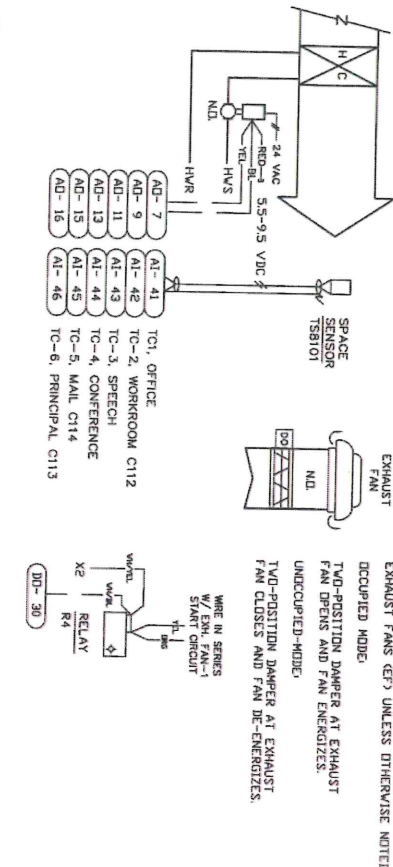
ROOF TOP UNIT CONTROL WIRING DIAGRAM

LAN ADDRESS 02



BILL OF MATERIALS

ITEM	QTY	PART NUMBER	DESCRIPTION	VA	MANUF.
CS1	1	H-708	MAKETE CORREN SENSING SWITCH	--	VERIS
LL1	1	TAS441	LOW TEMPERATURE THERMOSTAT N/R	--	INVENTIS
RL1-3	3	RIBUC	PROVIDED BY OTHERS	0.8	FD
TS1	1	TS-6482	AVG. DUCT TEMPERATURE SENSOR	--	INVENTIS
TS2	1	TS-8201	DUCT TEMPERATURE SENSOR	--	INVENTIS
TS3	3	TS-8101	SPACE TEMPERATURE SENSOR	--	INVENTIS
V1	1	166112-0	160/24VAC TRANSFORMER, V/BREACKER	75	JCL
V2	2	VS7312-201-4-02	3-WAY MIXING VALVE	18	INVENTIS
V3	1	VS7311-201-4-02	TS-122 24V/PRO-2-WAY VALVE	18	INVENTIS
		VS7311-201-4-02	TS-3, 24V, PRO-2-WAY VALVE	18	INVENTIS



SEQUENCE OF OPERATION

1. WITH THE SUPPLY FAN MOTOR STARTER HAND/OFF/AUTO SWITCH IN THE "AUTO" POSITION, THE SUPPLY FAN WILL BE AUTOMATICALLY STARTED AND STOPPED BASED ON THE OPTIMUM START PROGRAM AND THE OCCUPANCY SCHEDULE AS PROGRAMMED THROUGH THE ENERGY MANAGEMENT SYSTEM EMS/DIRECT DIGITAL CONTROL SYSTEM (DDC).
2. DURING THE UNOCCUPIED MODE, RTU-1 SUPPLY FAN WILL BE CYCLED ON AND OFF BY THE NIGHT CYCLE PROGRAM TO MAINTAIN SPACE TEMPERATURE ABOVE 60°F. (AOJ).
3. IF THE SUPPLY FAN IS STARTED PRIOR TO THE OCCUPANCY HOUR BY THE OPTIMUM START PROGRAM OR DURING THE NIGHT CYCLE, THE OUTSIDE AIR DAMPER WILL REMAIN CLOSED, THE RETURN AIR DAMPER WILL BE FULLY OPEN.
4. WHEN THE SUPPLY FAN IS STARTED DURING THE OCCUPANCY PERIOD, THE OUTSIDE AIR DAMPERS WILL OPEN TO MINIMUM POSITION, SMOOTH.
5. PROOF OF FLOW STATUS FOR THE SUPPLY FAN WILL BE PROVIDED TO THE DDC SYSTEM BY MEANS OF THE FAN MOTOR CURRENT SMOOTH.
6. THE DISCHARGE AIR TEMPERATURE SENSOR THROUGH DDC WILL MODULATE IN SEQUENCE THE OUTSIDE AND RETURN DAMPERS TO MAINTAIN DISCHARGE AIR TEMPERATURE IS 25 F. OR ABOVE AND THE DISCHARGE AIR TEMPERATURE SET POINT WILL BE 65°F. (AOJ) WHENEVER THE OUTSIDE AIR TEMPERATURE IS 25°F. OR BELOW (AOJ).
7. WHEN HOT HEATING IS AVAILABLE, AS SENSED BY THE BOILER OPERATOR THROUGH THE DDC SYSTEM, THE SPACE TEMPERATURE SENSOR FURTHER REDUCES THE SET POINT OF 75°F. (AOJ) WILL CONTROL THE STAGES OF THE DIRECT EXPANSION (DX) COOLING TO MAINTAIN SPACE TEMPERATURE. WHEN HEATING IS NOT AVAILABLE, AS SENSED BY THE BOILER OPERATOR THROUGH THE DDC SYSTEM, THE AVERAGE SPACE TEMPERATURE WILL CONTROL THE STAGES OF THE DIRECT EXPANSION (DX) COOLING TO PREVENT THE AVERAGE SPACE TEMPERATURE FROM EXCEEDING 75°F. (AOJ).
8. THE ZONE SPACE TEMPERATURE SENSOR THROUGH DDC WILL MODULATE ITS RESPECTIVE HOT WATER TEMPERING COIL CONTROL VALVE TO MAINTAIN SPACE TEMPERATURE SET POINT.
9. IF SMOKE IS DETECTED IN THE AIRSTREAM BY A SMOKE DETECTOR, THE SUPPLY FAN WILL BE DE-ENERGIZED.
10. IF THE SET POINT OF A FREEZE STAT IS REACHED, THE SUPPLY FAN WILL BE DE-ENERGIZED.
11. WHEN THE RTU SUPPLY FAN IS DE-ENERGIZED, THE DX COOLING WILL BE DE-ENERGIZED, THE OUTSIDE AIR DAMPER WILL CLOSE AND THE RETURN AIR DAMPER WILL OPEN FULLY.

ANCHOR BAY SCHOOLS
LIGHTHOUSE ELEMENTARY SCHOOL

51980 WASHINGTON, NEW BALTIMORE, MI

SYSTEM

ROOF TOP UNIT CONTROL WIRING DIAGRAM

LAN ADDRESS 02

OFFICE AREA

CT CONTROLLED TEMPERATURE INC.
1897 BEST DRIVE, WALLED LAKE, MI 48390 TEL: (248) 660-9506

05

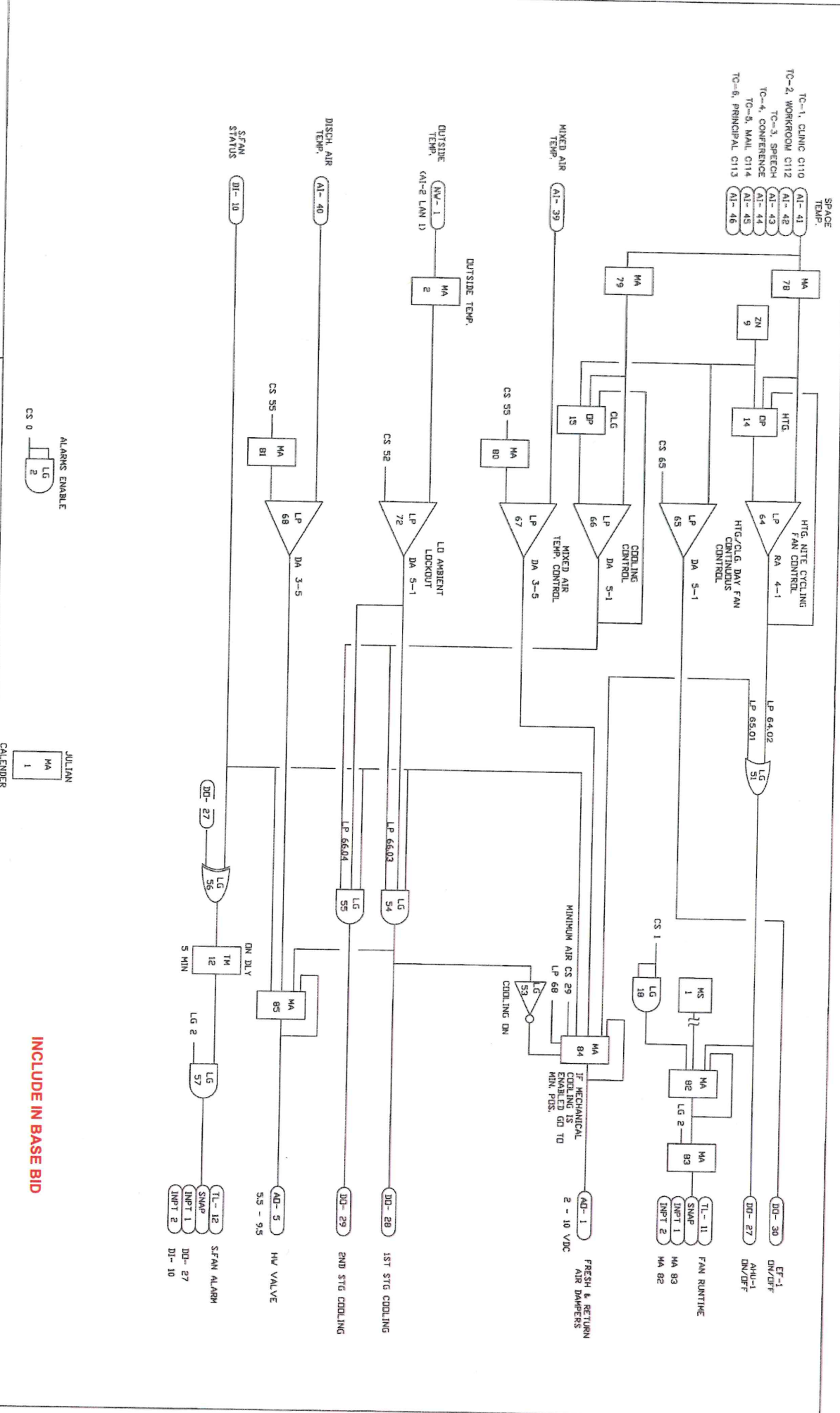
FILE NAME: CDS\ANCHOR BAY SCHOOL\LIGHTHOUSE ELEMENTARY SCHOOL\LAN 02\RTU1.dwg
DRAWN BY: KMS DATE: 08-30-02 JOB NO: 02-085 ASBULL: 09-09-03 PAGE NUMBER

ANCHOR BAY SCHOOLS LIGHTHOUSE ELEMENTARY SCHOOL

51980 WASHINGTON, NEW BALTIMORE, MI

SYSTEM
ROOF TOP UNIT CONTROL LOGIC DIAGRAM
LAN ADDRESS 02
"C" VING

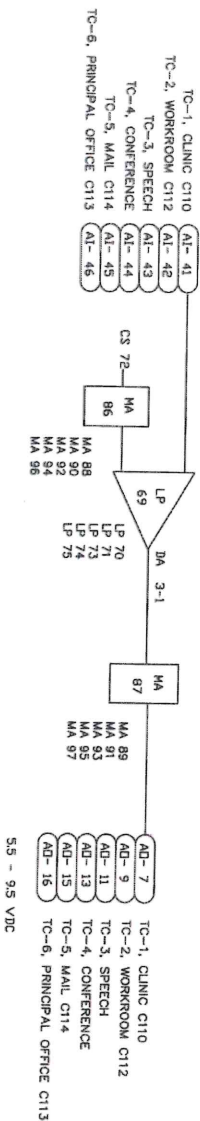
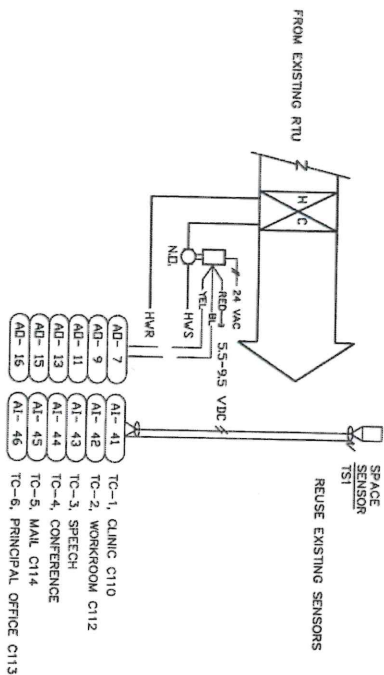
CT CONTROLLED TEMPERATURE INC.
1897 BEST DRIVE, VALLEY LAKE, ILL. 60090 TEL. (248) 669-6500
FILE NAME: JES-ANCHOR_BAY_SCHOOL-SV-LIGHTHOUSE-VLAN_DEV-RTU-1-LOGIC.dwg
DRAWN BY: KIS DATE: 08-30-02 JOB NO: 02-085



INCLUDE IN BASE BID

BILL OF MATERIALS				
ITEM	QTY.	PART NUMBER	DESCRIPTION	MANUF.
TS1	2	TS-BIO1	SPACE TEMPERATURE SENSOR	INVENTYS

VALVE SCHEDULE				
UNIT	QTY.	PART NUMBER	DESCRIPTION	MANUF.
TC-1	1	VS2211-201-4-02	24VAC, PRDP, 2-WAY, CV 1.3, GPM 1.7 VALVE	INVENTYS
TC-2	1	VS2211-201-4-01	24VAC, PRDP, 2-WAY, CV 0.4, GPM 0.6 VALVE	INVENTYS
TC-3	1	VS2211-201-4-01	24VAC, PRDP, 2-WAY, CV 0.4, GPM 0.6 VALVE	INVENTYS
TC-4	1	VS2211-201-4-02	24VAC, PRDP, 2-WAY, CV 1.3, GPM 1.7 VALVE	INVENTYS
TC-5	1	VS2211-201-4-02	24VAC, PRDP, 2-WAY, CV 1.3, GPM 1.7 VALVE	INVENTYS



INCLUDE IN BASE BID

ANCHOR BAY SCHOOLS LIGHTHOUSE ELEMENTARY SCHOOL

SYSTEM

OFFICE AREA TEMPERING COILS WIRING DIAGRAM

51980 WASHINGTON, NEW BALTIMORE, MI

LAN ADDRESS 02

OFFICE AREA

CT1 CONTROLLED TEMPERATURE INC.

1897 BEST DRIVE, VALLEY LAKE, ILL. 60050

FILE NAME: J055ANCHOR BAY SCHOOL LIGHTHOUSE LAN 02V.C. RTU TEMPERING COILS.DWG

DRAWN BY: KDS DATE: 07/01/03 JOB NO: 03025 ASBULL109-09-03

07

PAGE NUMBER

ROOF TOP UNIT CONTROL DIAGRAM

LAN ADDRESS 02

SEE PAGE 22 FOR TC LOGIC

RTU-3 HAS DDX(HC) AND TC(3) IN AREA 'E'.
RTU-5 HAS DDX(HC) AND TC(3) IN AREA 'E'.
RTU-6 HAS DDX(HC) IN AREA 'E'.
RTU-7 HAS DDX(HC) IN AREA 'E'.
RTU-8 HAS DDX(HC) AND TC(6) IN AREA 'D'.

SMOKE DETECTOR FURNISHED
WIRE AND INSTALLED BY ELECT.
CONTROL CONTRACTOR (TYP)

SMOKE
DETECTOR
VIRING NOTE

SD INTERLOCKED
W/ S.F. M/S

FREEZE STAT
TC 5241
SET @ 35 F.

WIRE IN SERIES W/ WIRE IN SERIES W/
1ST STG. COOLING 2ND STG. COOLING
RTU-7 ONLY

WIRE IN SERIES V/
S. FAN START CIRC.

S. FAN
STATUS
SENSOR
M-708
LOC. IN RTU

RELAY(3)
RIBUC

RELAY(3)
RIBUC

RELAY(3)
RIBUC

RELAY(3)
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RELAY(3)
RIBUC

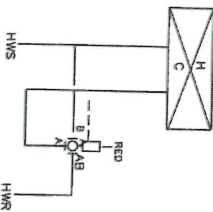
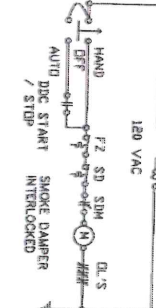
RELAY(3)
RIBUC

RELAY(3)
RIBUC

RELAY(3)
RIBUC

RELAY(3)
RIBUC

RELAY(3)
RIBUC



- RTU-3(HC-3) 2 WAY 1/2" VALVE
VS-721-201-4-04
CV=4.4 GPM= 7.4
- RTU-5(HC-5) 2 WAY 1/2" VALVE
VS-721-201-4-02
CV=4.4 GPM= 7.3
- RTU-6(HC-6) 2 WAY 1/2" VALVE
VS-721-201-4-02
CV=1.3 GPM= 2.2
- RTU-7(HC-7) 3 WAY 1/2" VALVE
VS-731-201-4-04
CV=4.4 GPM= 7.7
- RTU-8(HC-8) 3 WAY 1/2" VALVE
VS-721-201-4-04
CV=4.4 GPM= 8.9

INCLUDE IN BASE BID

CT CONTROLLED TEMPERATURE INC.

1897 BEST DRIVE, VALLED LAKE MICH 48390 TEL. (248) 665-0500

ANCHOR BAY SCHOOL DISTRICT
LIGHTHOUSE MIDDLE SCHOOL

31980 WASHINGTON NEW BALTIMORE MD

FILE NAME: ABLH023 LAN ADDRESS 02 SKD

UPDATED 5/8/02 DATE 07-16-99 SHEET 7 OF 19 JOB NO. 98-252

SEQUENCE OF OPERATION

TYPICAL DX, ROOF TOP UNIT CONTROL
(RTU-3, RTU-5, RTU-6, RTU-7, RTU-8)

1. WITH THE SUPPLY FAN MOTOR STARTER HAND/OFF/AUTO SWITCH IN THE AUTO POSITION, THE SUPPLY FAN SHALL BE AUTOMATICALLY STARTED BY THE DDC BASED ON A MINIMUM START PROGRAM AND OCCUPANCY SCHEDULE. DURING THE UNOCCUPIED MODE, THE SUPPLY FAN SHALL BE STOPPED BY THE DDC TO MAINTAIN A NIGHT SETBACK TEMPERATURE IN THE SPACE. THE SUPPLY FAN IS STARTED BY ANY OF THE ROOM TEMPERATURE SENSORS, DEGREES F (ADU) AS SENSED BY THE ROOM TEMPERATURE SENSORS. THE SUPPLY FAN IS STOPPED PRIOR TO THE OCCUPANCY HOUR BY THE DDC. THE SUPPLY FAN SHALL BE STOPPED AND THE RETURN AIR DAMPER SHALL BE OPENED IN A 100% RECIRCULATION MODE THROUGH DDC UNTIL OCCUPANCY TIME IS REACHED.
2. WHEN THE SUPPLY FAN IS STARTED DURING THE OCCUPIED MODE, THE RETURN AIR DAMPER SHALL OPEN TO MINIMUM POSITION AS PROGRAMED THROUGH THE DDC SYSTEM (REFER TO MECHANICAL RTU SCHEDULE FOR MINIMUM OUTSIDE AIR REQUIREMENTS).
3. WITH TOILET EXHAUST FAN MOTOR STARTER HAND/OFF/AUTO SWITCH IN THE AUTO POSITION, THE EXHAUST FAN SHALL BE STARTED AND RUN CONTINUOUSLY. THE TOILET EXHAUST FAN SHALL BE DE-ENERGIZED WHENEVER THE UNIT IS IN THE UNOCCUPIED MODE.

4. THE SPACE TEMPERATURE SENSORS THROUGH DDC SHALL MODULATE THEIR RESPECTIVE HOT WATER HEATING COIL CONTROL VALVE TO PREVENT SPACE TEMPERATURE FROM DROPPING BELOW THEIR SETPOINTS. THE SPACE TEMPERATURE SENSORS CALLING FOR THE DX COOLING COIL SHALL MODULATE THE MIXED AIR DAMPERS AND CYCLE THE DX COOLING COIL. CALLING FOR SETPOINTS TO PREVENT THE SPACE TEMPERATURE FROM RISING ABOVE THEIR SETPOINTS. WHEN ALL THE SPACE TEMPERATURE COILS ARE AT THEIR SETPOINTS, THE RTU MIXED AIR DAMPERS SHALL BE AT ITS MINIMUM POSITION.
5. THE MIXED AIR TEMPERATURE SENSOR THROUGH THE RTU CONTROL PANEL SHALL MODULATE THE MIXED AIR DAMPERS TO PREVENT THE MIXED AIR TEMPERATURE FROM DROPPING BELOW ITS LOW SETPOINT OF 40 DEGREES F.
6. THE GRAVITY RELIEF DAMPER SHALL AUTOMATICALLY OPEN WHENEVER SPACE PRESSURIZATION EXCEEDS THE GRAVITY DAMPERS SETPOINT.
7. IF SMOKE IS DETECTED IN THE AIRSTREAM BY A SMOKE DETECTOR OR THE SETPOINT OF A FREEZESTAT IS REACHED, THE SUPPLY FAN SHALL BE DE-ENERGIZED.
8. WHEN THE SUPPLY FAN IS DE-ENERGIZED, THE OUTSIDE AIR DAMPER SHALL CLOSE AND THE DX COOLING COIL SHALL BE DE-ENERGIZED.
9. IF SMOKE IS DETECTED IN THE AIR STREAM BY A DUCT SMOKE DETECTOR, THE SUPPLY FAN SHALL BE DEENERGIZED AND AN ALARM SHALL BE SENT TO THE DDC SYSTEM

INCLUDE IN BASE BID

CT CONTROLLED TEMPERATURE INC.

1897 WEST DRIVE, WALKED LAKE MICH 48390 TEL. (248) 669-6500

PROJECT:

ANCHOR BAY SCHOOL DISTRICT
LIGHTHOUSE MIDDLE SCHOOL

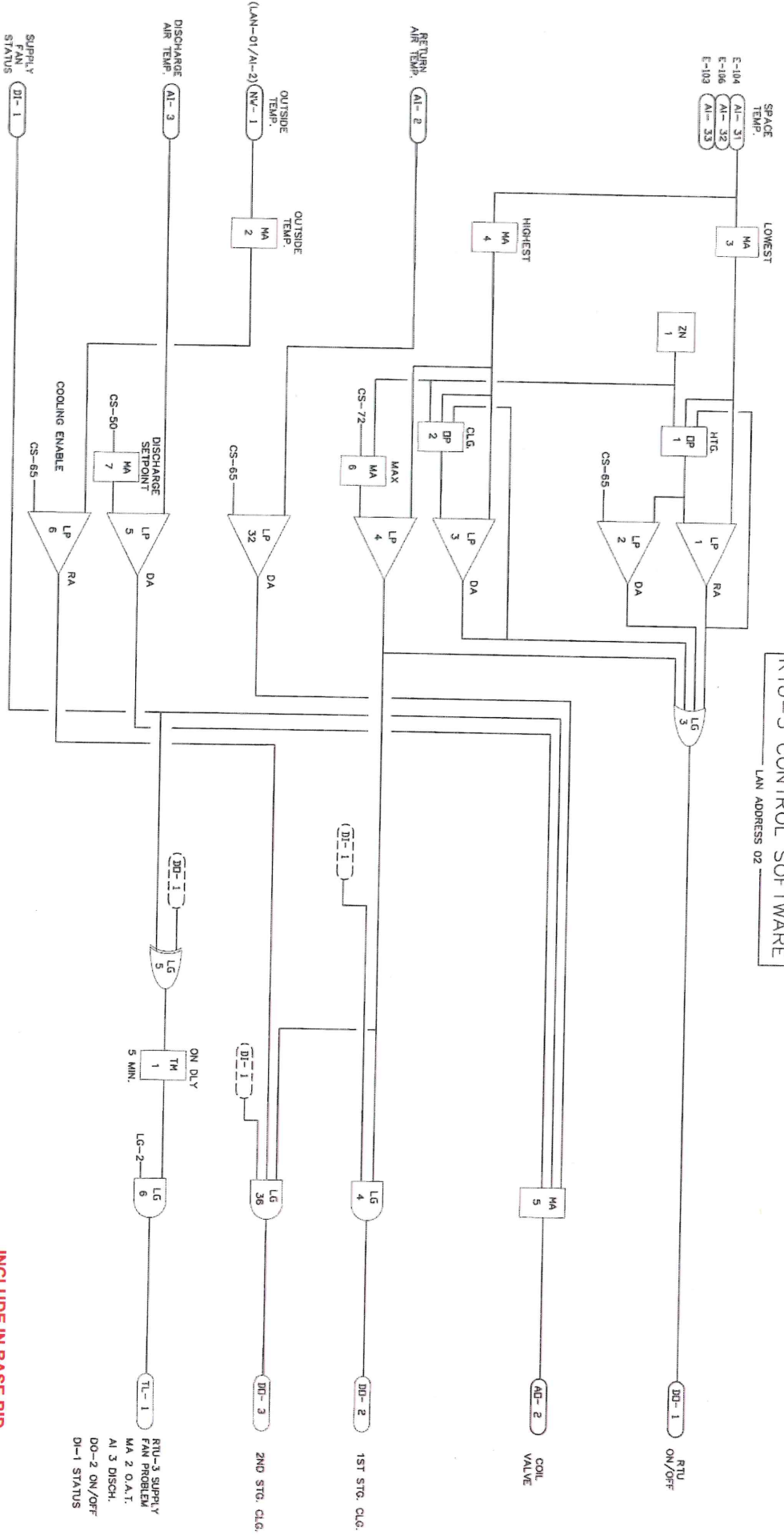
31980 WASHINGTON NEW BALTIMORE MD

FILE NAME: ARLH0204 LAN ADDRESS: 025X0

FILE NAME	UPDATED	DATE	SHEET	OF	JOB NO.
LMF	05-15-00	07-16-99	8	19	98-232

RTU-3 CONTROL SOFTWARE

LAN ADDRESS 02



INCLUDE IN BASE BID

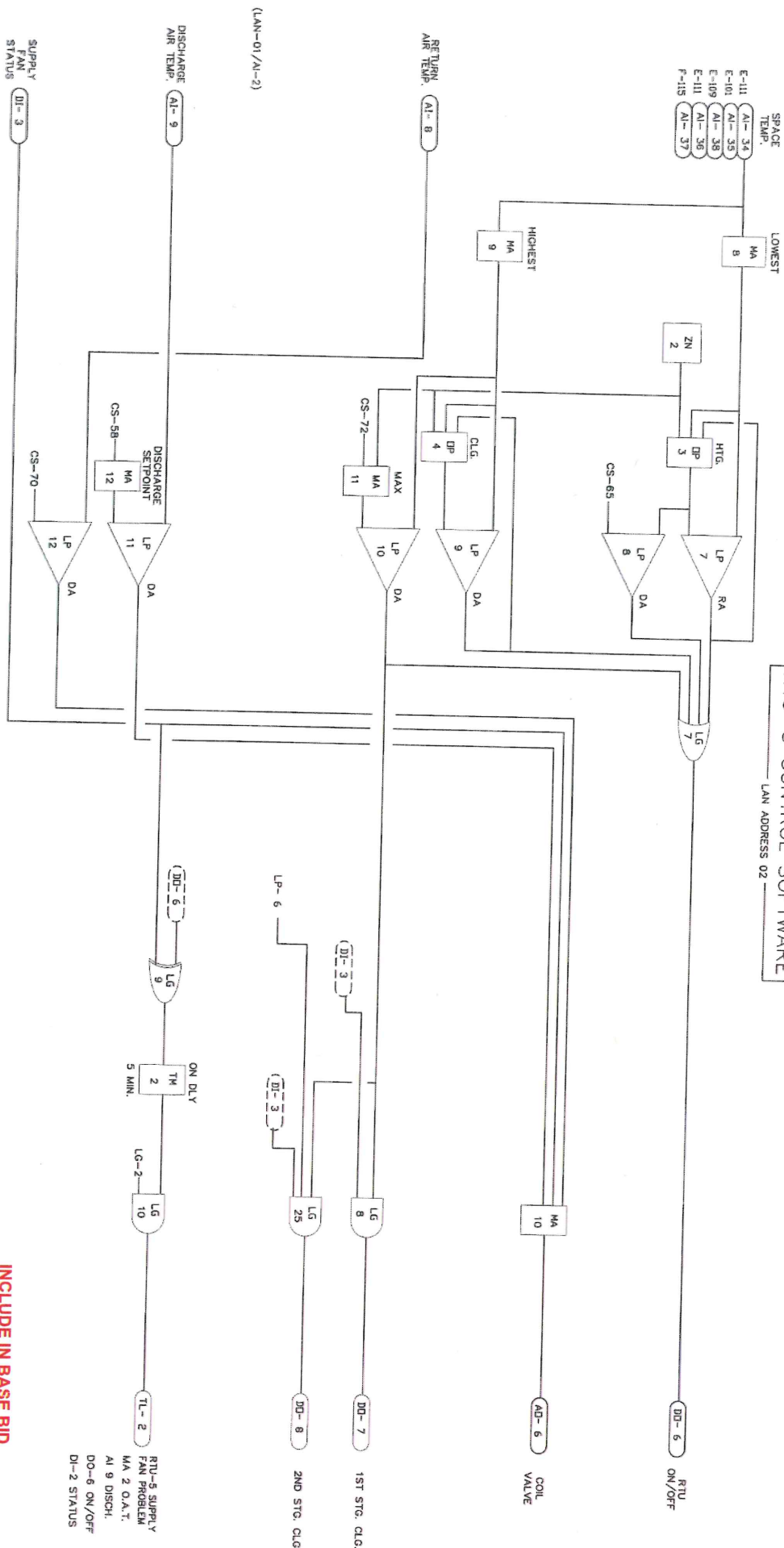
CT CONTROLLED TEMPERATURE INC.
1897 BEST DRIVE, VALLEY LAKE MICH 48390 TEL. (248) 669-0900

PROJECT
ANCHOR BAY SCHOOL DISTRICT
LIGHTHOUSE MIDDLE SCHOOL

FILE NAME: ABL10205	DATE: 07-16-99	SHEET: 9	JOB NO: 98-252
UPDATED: 5-15-00	DATE: 07-16-99	SHEET: 9	JOB NO: 98-252
FILE NAME: ABL10205	DATE: 07-16-99	SHEET: 9	JOB NO: 98-252

RTU-5 CONTROL SOFTWARE

LAN ADDRESS 02



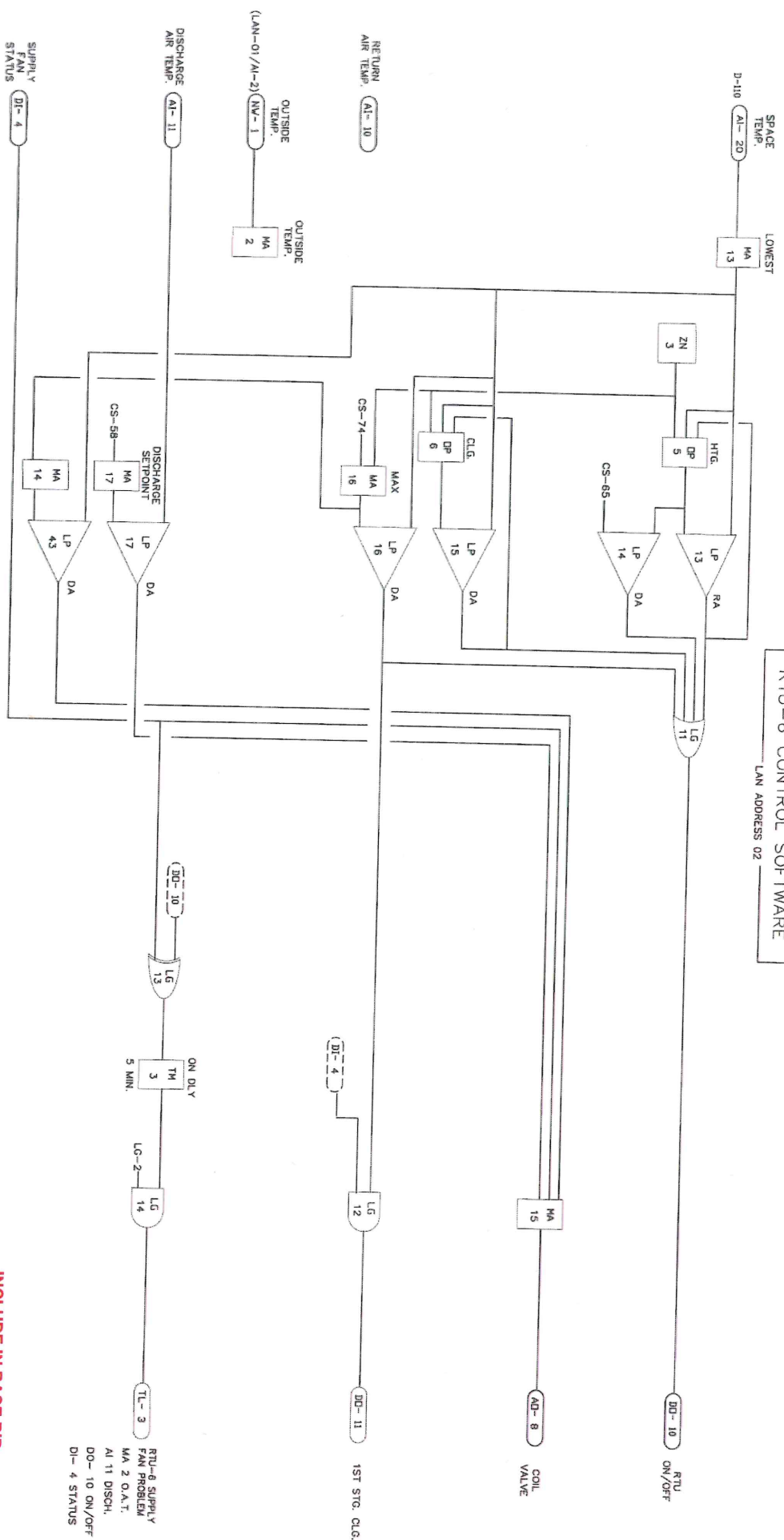
(LAN-01/A1-2)

INCLUDE IN BASE BID

CTI CONTROLLED TEMPERATURE INC.

PROJECT: ANCHOR BAY SCHOOL DISTRICT
LIGHTHOUSE MIDDLE SCHOOL

FILE NAME: ABLH0206	LAN ADDRESS: 02SKD	51980 WASHINGTON NEW BALTIMORE MD
UPDATED: LHP	DATE: 07-16-99	SHEET: 10 OF 19
DATE: 07-16-99	SHEET: 10	OF: 19
DATE: 07-16-99	SHEET: 10	OF: 19



RTU-6 CONTROL SOFTWARE
LAN ADDRESS 02

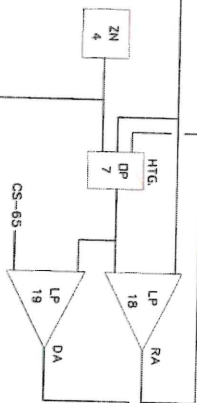
INCLUDE IN BASE BID

CT CONTROLLED TEMPERATURE INC. 1897 BEST DRIVE, VALED LAKE HIGH 4839 TEL. (240) 669-0500			
PROJECT: ANCHOR BAY SCHOOL DISTRICT LIGHTHOUSE MIDDLE SCHOOL			
FILE NAME: ABLH0207 UPDATED: 07-15-99		51990 WASHINGTON, NEW BALTIMORE, MD LAN ADDRESS: 02, SKD	
LMP: 5-13-00	DATE: 07-16-99	SHEET: 11	JOB NO: 98-252

RTU-7 CONTROL SOFTWARE

LAN ADDRESS 02

SPACE
TEMP.
AI-28
MEDIA
CENTER
MA 18
LOWEST



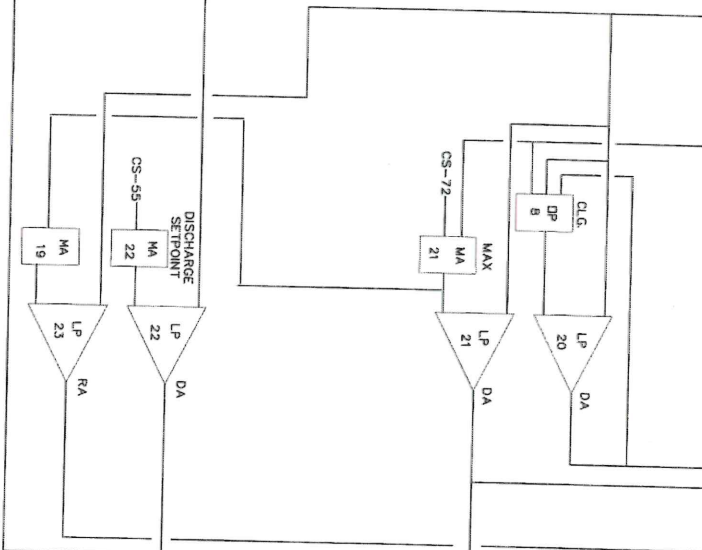
DO-12 RTU ON/OFF

RETURN
AIR TEMP.
AI-18

OUTSIDE
TEMP.
(LAN-01/AI-2) (NV-1)

DISCHARGE
AIR TEMP.
AI-13

SUPPLY
FAN
STATUS
DI-5



ON DLY
TM 4
5 MIN.

LG 24

TL-4

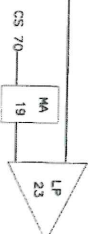
RTU-7 SUPPLY
FAN PROBLEM
AI 13 DISCH.
DO-12 ON/OFF
DI-5 STATUS

INCLUDE IN BASE BID

EDH-3 ELEC. HEATER CONTROL SOFTWARE

LAN ADDRESS 02

E-102 OFFICE
SPACE TEMP.
DO-19



EDH-3

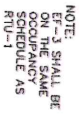
CT CONTROLLED TEMPERATURE INC.
1897 BEST DRIVE, VALLEY LANE HIGH, 46390 TEL. (248) 669-0500

PROJECT:
ANCHOR BAY SCHOOL DISTRICT
LIGHTHOUSE MIDDLE SCHOOL

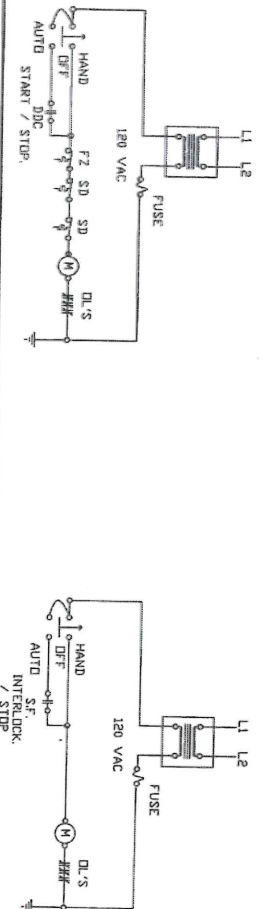
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31580 WASHINGTON NEW BALTIMORE, MD

UPDATED	DATE	SHEET	OF	JOB NO.
LMF	5-15-00	07-16-99	12	19
				98-232

RTU-4 HAS DX(1) . HC(1) in AREA "E"



RETURN FAN MOTOR STARTER WIRING DETAIL
RTU-1, RTU-4



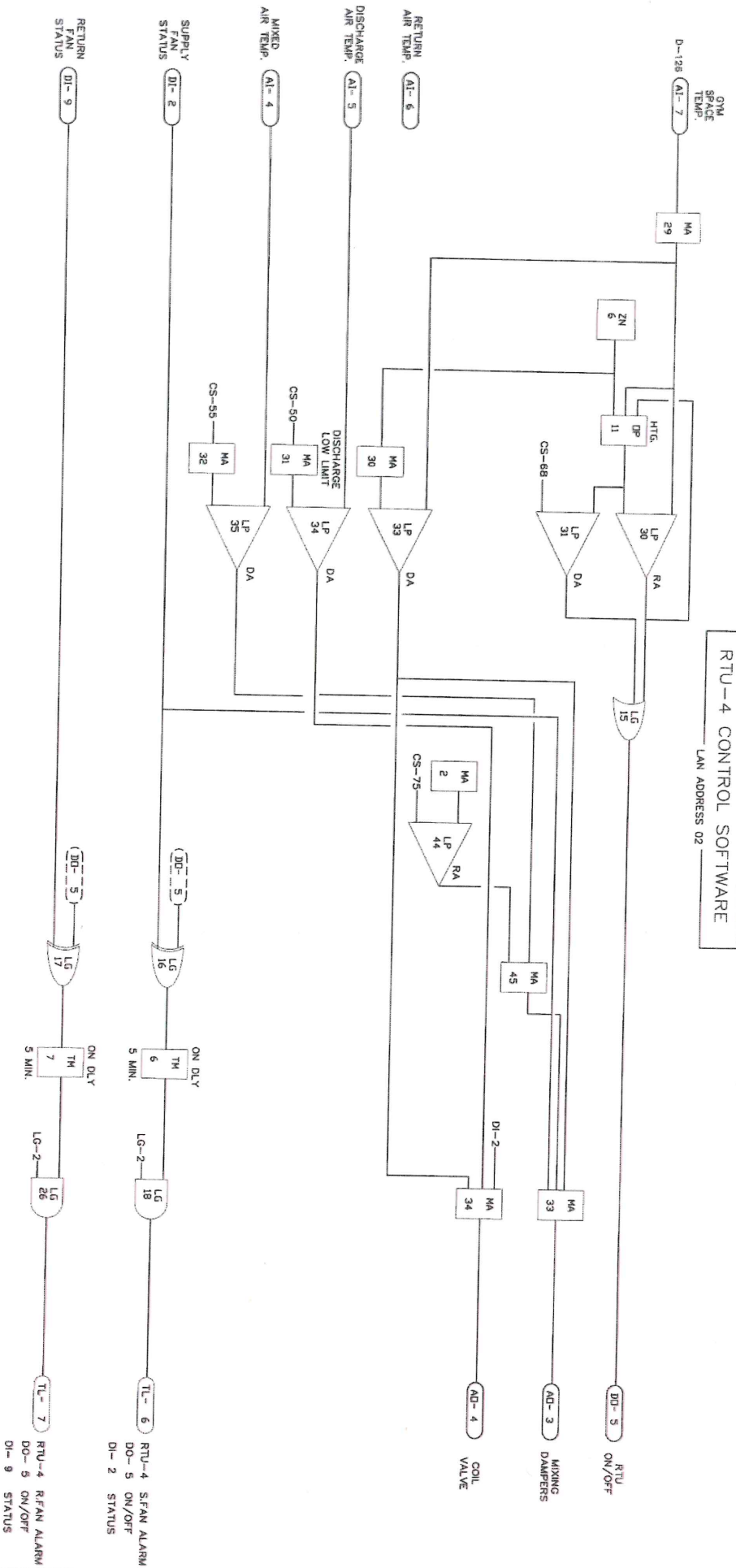
CT_I CONTROLLED TEMPERATURE INC.
1897 BEST DRIVE, VALLEJO LAKE HIGH 48390 TEL. (246) 668-0566

ANCHOR BAY SCHOOL DISTRICT
LIGHTHOUSE MIDDLE SCHOOL

FILE NAME		LAN ADDRESS		JOB NO.	
UPDATED	05-15-00	DATE	07-16-99	SHEET	OF
LMF				14	19

RTU-4 CONTROL SOFTWARE

LAN ADDRESS 02



INCLUDE IN BASE BID

CT CONTROLLED TEMPERATURE INC.

1897 WEST DRIVE, VALLEY LAKE MICH 48390 TEL. (248) 669-0500

PROJECT:

ANCHOR BAY SCHOOL DISTRICT
LIGHTHOUSE MIDDLE SCHOOL

51980 WASHINGTON NEW BALTIMORE MD

FILE NAME: ABL0211
UPDATED: 5-15-00
DATE: 07-16-99
SHEET: 15
JOB NO: 98-252

LAN ADDRESS 02



INCLUDE IN BASE BID

CT I CONTROLLED TEMPERATURE INC.
1897 BEST DRIVE, WALLED LAKE MICH. 48390 TEL. (248) 666-6500

PROJECT
ANCHOR BAY SCHOOL DISTRICT
LIGHTHOUSE MIDDLE SCHOOL

51980 WASHINGTON	NEW BALTIMORE MD
FILE NAME: ABLH0212	LAN ADDRESS 02.SKD

UPDATED LMF	UPDATED	DATE	SHEET	OF	JOB NO.
	5-15-00	07-16-99	16	19	98-252

(LAN 2) —
RWP in AREA "E"



RADIANT WALL PANEL (RWP) HOT WATER HEATING SUPPLY CONTROL

- TYPICAL LOCKER ROOM AIR HANDLING UNIT CONTROL

BLOWER COIL LOCKER ROOM CONTROL

1. WITH SUPPLY FAN MOTOR STARTER HAND-OFF-AUTO SWITCH IN THE "AUTO" POSITION, THE SUPPLY FAN SHALL BE AUTOMATICALLY STARTED AND STOPPED BASED ON THE OPTIMUM START PROGRAM AND THE OCCUPANCY SCHEDULE AS PROGRAMMED THROUGH THE DDC.
2. PROOF OF FLOW STATUS FOR THE SUPPLY FAN SHALL BE INDICATED TO THE DDC BY MEANS OF THE SUPPLY FAN MOTOR CURRENT SENSOR.
3. WHEN THE UNIT IS ENERGIZED, THE OUTSIDE AIR DAMPERS SHALL CLOSE WHEN THE UNIT IS DE-ENERGIZED THE OUTSIDE AIR DAMPERS SHALL FULLY CLOSE.
4. WITH TOILET EXHAUST FAN MOTOR STARTER HAND-OFF-AUTO SWITCH IN THE "AUTO" POSITION, THE EXHAUST FAN SHALL BE STARTED RUN CONTINUOUSLY, WHENEVER THE AIR HANDLING UNITS ARE STARTED AS CONTROLLED BY DDC.
5. DURING THE UNOCCUPIED MODE, THE AIR HANDLING UNIT SHALL BE CONTROLLED ON AND OFF BY THE NIGHT CYCLE PROGRAM BASED ON THE SPACE TEMPERATURE SENSOR TO MAINTAIN THE SPACE TEMPERATURE ABOVE 60 F (16.1C).
6. THE DISCHARGE AIR TEMPERATURE SENSOR, AS RESET BY THE SPACE TEMPERATURE SENSOR THROUGH DDC SHALL MODULATE THE HOT WATER HEATING COIL VALVE BETWEEN 70 TO 100 DEGREES F TO MAINTAIN SPACE TEMPERATURE SETPOINT.
7. WHEN THE SETPOINT OF THE FREEZESTAT IS REACHED THE SUPPLY FAN SHALL BE DE-ENERGIZED.
8. DURING THE UNOCCUPIED PERIOD THE SUPPLY FAN SHALL BE DE-ENERGIZED. WHEN THE SPACE TEMPERATURE FALLS BELOW UNOCCUPIED SPACE TEMPERATURE AND THE THERMISTOR SHALL OPEN, THE SUPPLY FAN SHALL BE ENERGIZED TO MAINTAIN UNOCCUPIED SETPOINT. WHEN THE UNIT IS REACHED THE OUTSIDE AIR DAMPER SHALL CLOSE AND THE SUPPLY FAN SHALL DE-ENERGIZE.

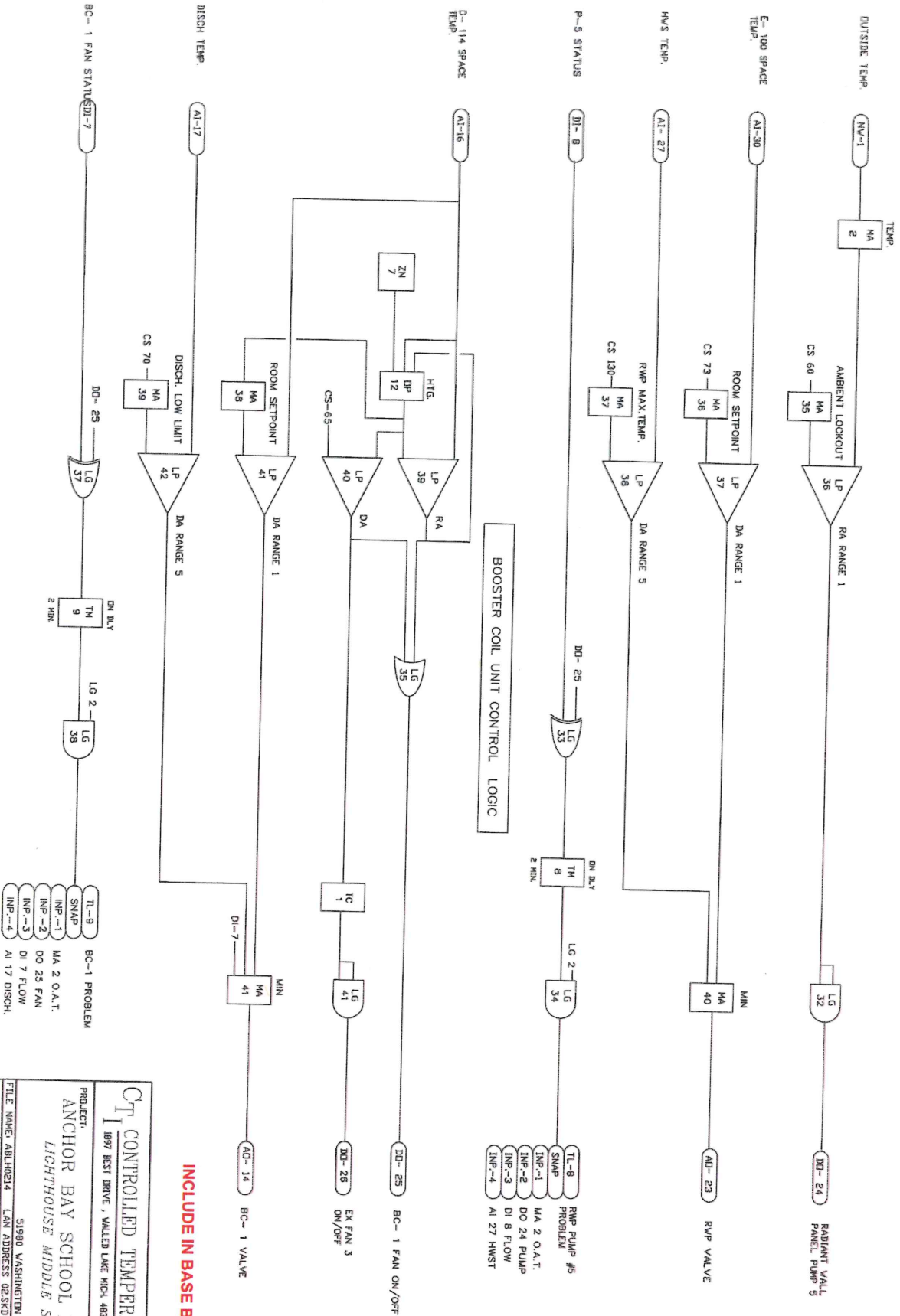
CT CONTROLLED TEMPERATURE INC.
1897 BEST DRIVE, VALLE LAKE HIGH. 48390 TEL. (248) 669-0501

ANCHOR BAY SCHOOL DISTRICT
LIGHTHOUSE MIDDLE SCHOOL

51980 WASHINGTON NEW BALTIMORE MD
FILE NAME: ABLH0213 LAN ADDRESS 02.SKD

UPDATED LMF	UPDATED	DATE	SHEET	CF	JOB NO.
	5-15-00	07-16-99	17	19	98-252

RADIANT WALL PANEL (RWP) HOT WATER HEATING SUPPLY LOGIC

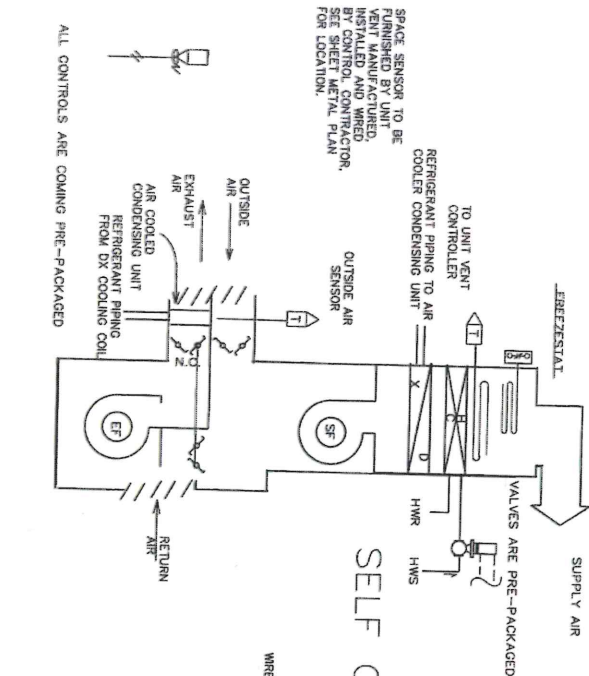


INCLUDE IN BASE BID

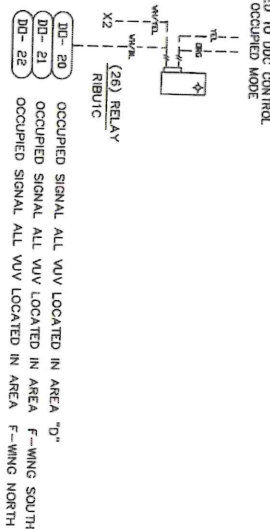
CT₁ CONTROLLED TEMPERATURE INC. 1897 BEST DRIVE, VALLEY LAKE HIGH 40370 TEL. (248) 669-0590			
PROJECT: ANCHOR BAY SCHOOL DISTRICT LIGHTHOUSE MIDDLE SCHOOL			
FILE NAME: ABLHQ214 LMF	UPDATED: 05-13-00	DATE: 07-16-99	SHEET: 18 19
51980 WASHINGTON NEW BALTIMORE, MD			

VERTICAL UNIT VENTILATOR CONTROL DIAGRAM

28 LIKE THIS
Existing VUV-1(10) in AREA "A" with new CH coil & 3-way valve.
VUV-2(10) in AREA "B"
VUV-2(4) in AREA "C"
VUV-2(2) in AREA "D"

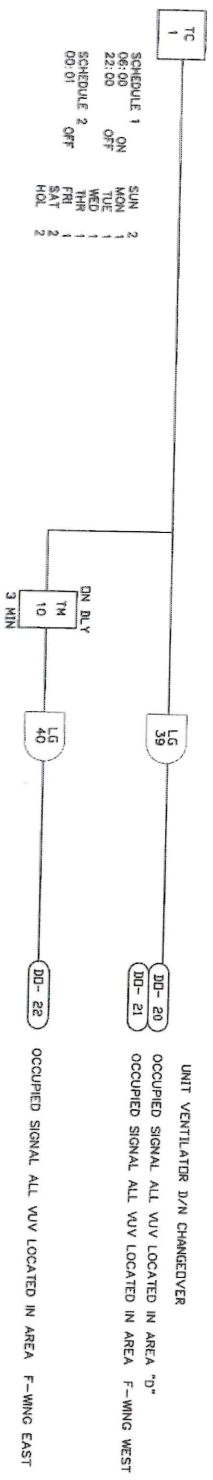


SELF CONTAINED

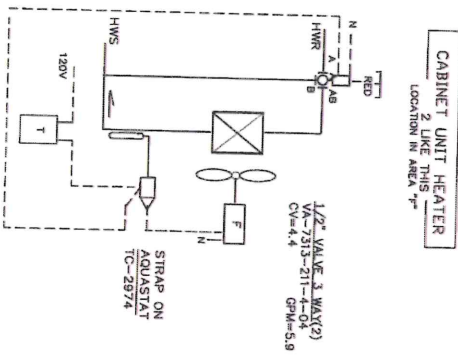


- TYPICAL VERTICAL UNIT VENTILATOR CONTROL.
1. THE DDC SYSTEM SHALL ISSUE A COMMAND TO THE UNIT VENTILATOR CONTROL TO ENERGIZE OR DE-ENERGIZE THE OCCUPIED OR UNOCCUPIED MODE.
 2. PRE-PACKAGED SELF CONTAINED UNIT

UNIT VENTILATOR DAY/NIGHT CHANGE-OVER SOFTWARE



- SEQUENCE OF OPERATION
1. UPON A CALL FOR HEATING FROM THE ROOM T-STAT, THE HWM COIL CONTROL VALVE SHALL OPEN AND THE CABINET UNIT HEATER VALVE SHALL BE CYCLED ON. WHEN THE ROOM T-STAT SETPOINT IS REACHED, THE HWM COIL CONTROL VALVE SHALL CLOSE AND THE CABINET UNIT HEATER FAN SHALL BE CYCLED OFF.
 2. AQUASTAT SHALL BE WIRED TO FAN TO PREVENT FAN OPERATION WHEN HEAT IS NOT AVAILABLE.



INCLUDE IN BASE BID

CT CONTROLLED TEMPERATURE INC.

ANCHOR BAY SCHOOL DISTRICT
LIGHTHOUSE MIDDLE SCHOOL

FILE NAME: ABL-H0215	LAN ADDRESS: 025CD	SHEET: 19	OF: 19	JOB NO: 90-252
UPDATED: 05-15-00	DATE: 07-16-99			