

RESIDENCE INN

BY MARRIOTT
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CONSTRUCTION MANAGEMENT



Appendix E: Controls Energy and Unit Calculations

The following can be found in this Controls Appendix:

- *Delta DNT – 103 Specification/Cut Sheet*
- *BACnet Testing Labs – Test Sheet*
- *Weather Data for Alexandria, VA*
- *Drawing E 3.3*
- *Drawing M – 602*
- *Virginia Dominion Power, GS – 4 Schedule*
- *Energy and Cost Calculations*
- *Detail from Drawing E 2.1, Unit C*
- *Original Wiring Diagram*
- *INNCOM Wiring Diagrams*

Network Thermostats

BACstat II: DNT-T103/H103

Description

The DNT-T103 is an intelligent room thermostat with a custom 3-value, 96 segment, LCD display. The DNT-T103 can communicate on Delta's LINKnet network or directly on a BACnet MS/TP network.

The DNT-T103 can display a wide-range of digital or analog values including setpoints, temperature, airflow, heating and cooling status, fan speed, valve and damper position, and more. When connected on a BACnet MS/TP network, the DNT-T103 functions as an independent BACnet thermostat. When connected to a Controller, on a LINKnet network, the DNT-T103 provides a programmable remote sensor and expanded I/O capabilities.



Application

The DNT-T103 is designed to be a low-cost solution for control of unitary equipment. It has built-in, configurable algorithms for VAV, VVT, fan coil/unit ventilator, heat pump, radiation and humidification applications.

The DNT-T103 may also be connected to a LINKnet network to provide programmable remote sensor and expanded I/O capabilities.

Features

- Native BACnet™ firmware
- BACnet MS/TP or LINKnet communications
- Configurable 3-value, 96 segment, LCD display (with optional backlighting)
- 4 Configurable push buttons
- Derived Network Addressing (DNA) for simple integration into a standard network architecture
- Field selectable applications
- Service port

Specifications

BACnet Device Profile

BACnet Application Specific Controller (B-ASC)

LCD

3-value and various icons (96 total segments) with optional backlighting

Push Buttons

4 stylized momentary push buttons

Temperature Sensor

Thermistor Input - 10kΩ at 77°F (25°C)

Accuracy +/-0.36°F from 32-158°F
(+/- 0.2°C from 0-70°C)

Display resolution of 0.1°

Stability 0.24°F over 5 years (0.13°C)

Humidity Sensor

Accuracy of +/-2% RH from 0-100% RH
(25°C, Vsupply = 5Vdc)

Display resolution of 0.1%

Stability of +/- 1% RH (typical at 50% RH over 5 years)

Note: Extended exposure to >90% RH causes a reversible shift of 3% RH

Inputs

1 Universal input - 10 bit (supporting 0-5v, 0-10v, 10kΩ)

Outputs

3 Binary triac outputs (supporting binary, PWM or tri-state)

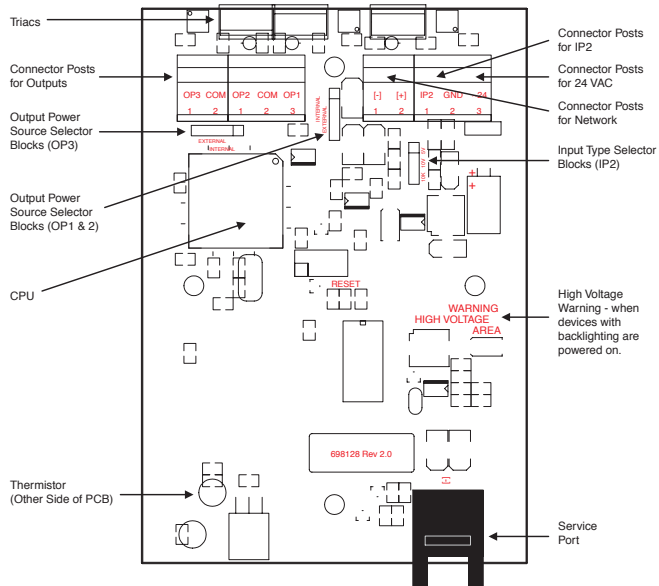
Technology

8-bit processor with internal A/D, Flash and RAM

Document Edition 1.2 August 2004

Network Thermostats

BACstat II: DNT-T103/H103 Board Layout Diagram



Specifications (Continued)

Device Type

Configured as a LINKnet or subnet device

Device Addressing

Set via keypad

Communications Ports

BACnet MS/TP @ 9600, 19200, 38400 or 76800 bps (maximum of 99 devices per BACnet MS/TP segment)

Delta LINKnet @76800 bps (maximum 12 devices, depending on the controller with no more than 2 DFM/DNT devices per LINKnet segment)

Connectors

Screw-type terminal connectors

Wiring Class

Class 2

Power

24V AC

41 VA (with internally powered outputs)

Ambient

32° to 131°F (0° to 55°C)

10 - 90% RH (non-condensing)

Dimensions

5 x 3.25 x 1 in. (12.7 x 8.3 x 2.5 cm) with housing

0.3 lb. (120 g) with housing

Approvals/Standards

UL 916 Listed

CE

FCC Class B

BTL Listed

Accessories

RPT-768—Delta Network Repeater for BACnet MS/TP

TRM-768—Delta Network Terminator for BACnet MS/TP

CON-768—Delta Network Converter

Ordering

Order the DNT-T103/H103 with the desired options, according to the following product numbers:

DNT-T103—Internal Thermistor Input, Additional I/O (1 IP and 3 OP), Backlighting (Option B), External Thermistor Terminator (Option X)

DNT-H103—Internal Thermistor Input, Internal Humidity Input, Additional I/O (1 IP and 3 OP), Backlighting, External Thermistor Terminator

An appended button icon code must be included to specify the desired icons embossed on the buttons. If a button icon code is not specified, the product is shipped with the default button icons.

Default—Bottom 2 buttons are ▼ & ▲ (Setpoint Adjust), top 2 buttons are OFF and ON

INT—Bottom 2 buttons are ▼ & ▲ (Setpoint Adjust), top 2 buttons are 0 and 1 (International)



BACnet is a registered trademark of ASHRAE. ASHRAE does not endorse, approve or test products for compliance with ASHRAE standards. Compliance of listed products to the requirements of ASHRAE Standard 135 is the responsibility of the BACnet Manufacturers Association (BMA). BTL is a registered trademark of the BMA.

BACnet Testing Labs Product Listing

This product has been tested at the BACnet Testing Labs and found to comply with all the necessary interoperability requirements in place on the published test date. This listing represents the tested capability of the Listed Product. For information on additional functionality that was not covered in the test process, refer to the Manufacturer's PICS statement on the BMA website.

Listing Information

Vendor		Listing Status
Delta Controls 17850 - 56th Ave. Surrey, BC, Canada V3S 1C7		Listed Product
Test Requirements	BACnet Protocol Revision	Date Tested
Requirements as of January 2002	135-1995b	January 2002

Product Name	Model Number	Software Version
BACstat II	DNS-24, DNT-T103, DNT-T221	Release 2

Product Name	Link to PICS on BMA Website
BACstat II	http://www.bacnetassociation.org/delta_controls/BACstat II

Device Profiles

Profile	Model Numbers
BACnet Application Specific Controller (B-ASC)	DNS-24, DNT-T103, DNT-T221

BIBBs Supported

Data Sharing	ReadProperty-B	DS-RP-B
	ReadPropertyMultiple-B	DS-RPM-B
	WriteProperty-B	DS-WP-B

Device and Network Management	Dynamic Device Binding-B	DM-DDB-B
	Dynamic Object Binding-B	DM-DOB-B
	DeviceCommunicationControl-B	DM-DCC-B
	ReinitializeDevice-B	DM-RD-B

Object Type Support

Analog Input	Analog Value	Device

Data Link Layer Options

Media	Options
MS/TP master	9600, 19200, 38400, 76800

Device Binding Support

Static Binding is supported.

Character Set Support

ANSI X3.4

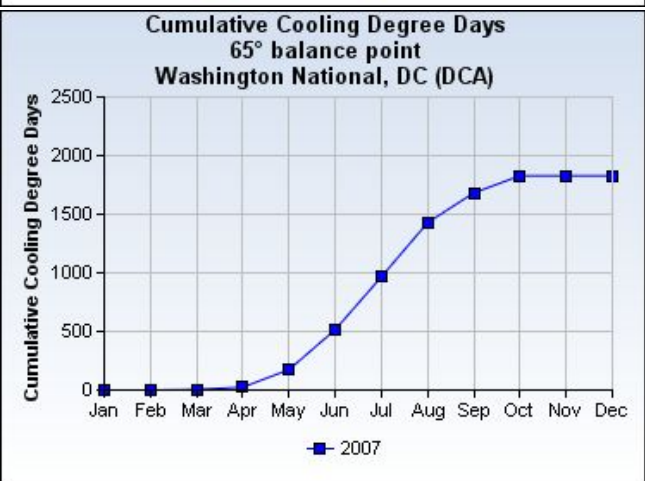
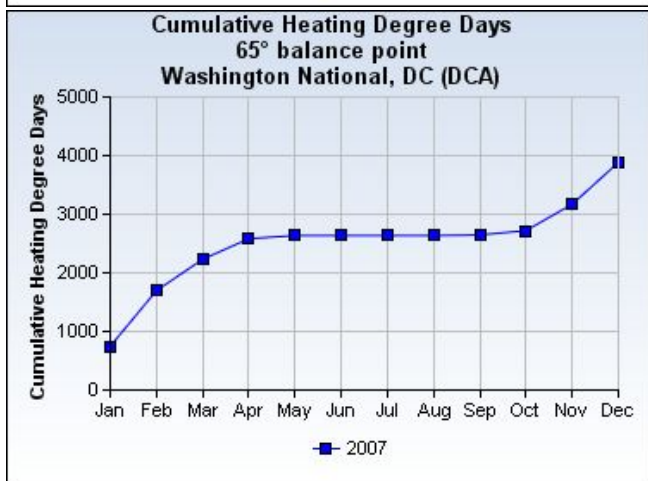
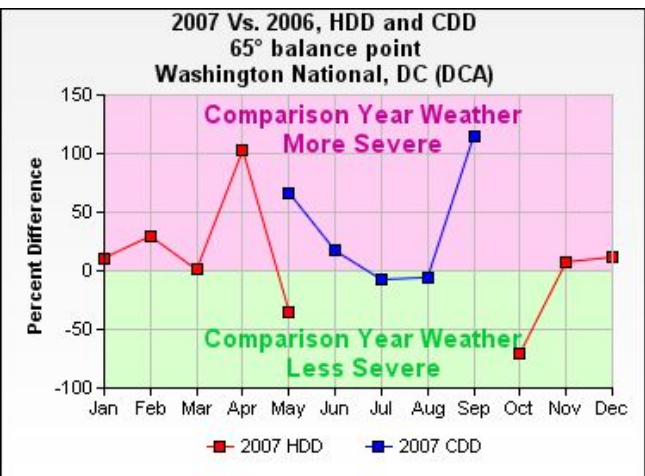
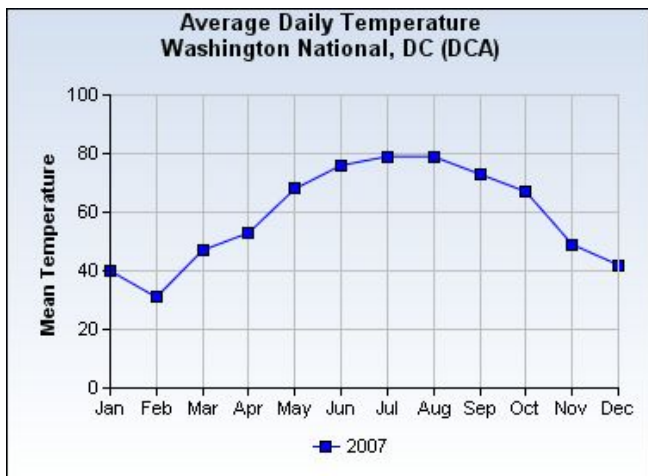
Region: Middle Atlantic ([Change Region](#))

Station: Washington National, DC (DCA)

FREE Degree Day Report

Chart Value Settings

Range Begin: 2007 Base Year: 2006
 Range End: 2007 Comp Year: 2007
 Balance Point: 65 (What is this?)




Weather data provided by AccuWeather.com

weatherdatadepot

Degree Day Comparison Report

Provided by
EnergyCAP Energy Efficiency Software
and AccuWeather

Weather Station Code: DCA
Weather Station Location: Washington National, DC
Balance Point Temperature: 65°

[Print Friendly Version](#) 

	Base Year = 2006			Comparison Year = 2007			Comparison Percentages**		
Month	Heating	Cooling	Total	Heating	Cooling	Total	Heating	Cooling	Total
Jan	672	0	672	746	0	746	11%	N/A	11%
Feb	733	0	733	950	0	950	29.6%	N/A	29.6%
Mar	529	6	535	534	5	539	0.9%	N/A	0.7%
Apr	174	16	190	353	19	372	102.9%	N/A	95.8%
May	81	90	171	53	150	203	-34.6%	66.7%	18.7%
Jun	0	291	291	0	341	341	N/A	17.2%	17.2%
Jul	0	487	487	0	451	451	N/A	-7.4%	-7.4%
Aug	0	490	490	0	462	462	N/A	-5.7%	-5.7%
Sep	22	118	140	10	254	264	N/A	115.3%	88.6%
Oct	250	20	270	74	146	220	-70.4%	N/A	-18.5%
Nov	419	0	419	451	0	451	7.6%	N/A	7.6%
Dec	639	0	639	713	0	713	11.6%	N/A	11.6%
Totals YTD:	3519	1518	5037	3884	1828	5712	10.4%	20.4%	13.4%

**Please note: When the monthly degree days in either the base year or the comparison year are less than 30, a percentage comparison is not calculated. HOWEVER, all total comparison percentages (month and year) do include all heating and cooling degree days. YTD means Year-To-Date.

Degree Day Comparison Report Provided by EnergyCAP and weatherDataDepot
<http://www.weatherdatadepot.com>

Weather Information Provided by AccuWeather
<http://www.accuweather.com>

FEEDER SCHEDULE

ALL FEEDERS LISTED ARE BASED ON 75°C COPPER CONDUCTORS PER SET

NO.	PHASE	NEUTRAL	GROUND	CONDUIT	NO. SETS	PHASE	NEUTRAL	GROUND	CONDUIT
(1)	1	#12	#12	3/4"	(3)	1	350 kcmil	—	#3
(2)	1	#12	#12	3/4"	(3)	1	350 kcmil	500 kcmil	#3
(3)	1	#12	#12	3/4"	(3)	1	350 kcmil	250 kcmil	#3
(4)	1	#10	#10	3/4"	(3)	2	350 kcmil	—	#2
(5)	1	#10	#10	3/4"	(3)	2	350 kcmil	—	#2
(6)	1	#8	#8	1"	(3)	2	250 kcmil	—	#2
(7)	1	#8	#8	1"	(3)	2	250 kcmil	—	#2
(8)	1	#6	#6	1 1/4"	(3)	2	350 kcmil	—	#2
(9)	1	#6	#6	1 1/4"	(3)	2	350 kcmil	—	#2
(10)	1	#4	#4	1 1/4"	(3)	2	350 kcmil	—	#2
(11)	1	#4	#4	1 1/4"	(3)	2	350 kcmil	—	#2
(12)	1	#3	#3	1 1/2"	(3)	2	350 kcmil	—	#2
(13)	1	#3	#3	1 1/2"	(3)	2	350 kcmil	—	#2
(14)	1	#3	#3	1 1/2"	(3)	2	350 kcmil	—	#2
(15)	1	#2	#2	1 1/2"	(3)	3	350 kcmil	—	#2
(16)	1	#2	#2	1 1/2"	(3)	3	350 kcmil	—	#2
(17)	1	#2	#2	1 1/2"	(3)	3	350 kcmil	—	#2
(18)	1	#2	#2	1 1/2"	(3)	3	350 kcmil	—	#2
(19)	1	#2	#2	1 1/2"	(3)	3	350 kcmil	—	#2
(20)	1	#2	#2	1 1/2"	(3)	3	350 kcmil	—	#2
(21)	1	#2	#2	1 1/2"	(3)	3	350 kcmil	—	#2
(22)	1	#2	#2	1 1/2"	(3)	3	350 kcmil	—	#2
(23)	1	#2	#2	1 1/2"	(3)	3	350 kcmil	—	#2
(24)	1	#2	#2	1 1/2"	(3)	3	350 kcmil	—	#2
(25)	1	#2	#2	1 1/2"	(3)	3	350 kcmil	—	#2
(26)	1	#2	#2	1 1/2"	(3)	3	350 kcmil	—	#2
(27)	1	#2	#2	1 1/2"	(3)	3	350 kcmil	—	#2
(28)	1	#2	#2	1 1/2"	(3)	3	350 kcmil	—	#2
(29)	1	#2	#2	1 1/2"	(3)	3	350 kcmil	—	#2
(30)	1	#2	#2	1 1/2"	(3)	3	350 kcmil	—	#2
(31)	1	#2	#2	1 1/2"	(3)	3	350 kcmil	—	#2
(32)	1	#2	#2	1 1/2"	(3)	3	350 kcmil	—	#2
(33)	1	#2	#2	1 1/2"	(3)	3	350 kcmil	—	#2
(34)	1	#2	#2	1 1/2"	(3)	3	350 kcmil	—	#2
(35)	1	#2	#2	1 1/2"	(3)	3	350 kcmil	—	#2
(36)	1	#2	#2	1 1/2"	(3)	3	350 kcmil	—	#2
(37)	1	#2	#2	1 1/2"	(3)	3	350 kcmil	—	#2
(38)	1	#2	#2	1 1/2"	(3)	3	350 kcmil	—	#2
(39)	1	#2	#2	1 1/2"	(3)	3	350 kcmil	—	#2
(40)	1	#2	#2	1 1/2"	(3)	3	350 kcmil	—	#2

SWITCHBOARD SCHEDULE

3000 A, 480/277V, 3φ, 4W 200,000 A.I.C.

NO.	POLE FRAME	GRABIT BREAKER TRIP	SWITCH	FUSE	EQUIPMENT SERVED
1	3	—	—	—	EQUIPMENT SERVED
2	3	—	—	—	EMERGENCY TAP SECTION
3	3	—	—	—	OWNER METERING
4	3	—	—	—	MAIN BPS SWITCH *
5	3	200	—	—	PANEL EH
6	3	400	225	—	PANEL EH1
7	3	400	250	—	PANEL EH
8	3	400	250	—	PANEL EH
9	3	400	400	—	CHILLER CH-1
10	3	400	400	—	PANEL HP
11	3	200	150	—	PANEL HWZ
12	3	400	—	—	SPACE WITH BUSBAR PROVISIONS
13	3	400	—	—	SPACE WITH BUSBAR PROVISIONS
14	3	400	—	—	SPACE WITH BUSBAR PROVISIONS
15	3	—	—	—	TRANSFORMER PRIMARY BPS
16	3	—	—	—	TRANSFORMER PRIMARY BPS

NEC TOTAL LOAD : 1592.2KW -----1793.9 AMPS
* PROVIDE GROUND FAULT PROTECTION SET AT 600 AMPS.

EMERGENCY GENERATOR SCHEDULE

450KW, 480/277V, 3φ, 4W DIESEL GENSET
50% GENERATION DAY TANK

STEP	LOAD SERVED	IP	MAXIMUM SIM. REQ. LOAD	516 KW
1	BUILDING EMERGENCY LIGHTING	—	15.0	15.0
2	FIRE ALARM SYSTEM	—	10.0	10.0
3	FIRE PUMP	—	125.0	125.0
4	MISCELLANEOUS BUILDING EQUIPMENT	—	98.3	98.3
5	STAIRWELL PRESURIZATION FANS ST-575	—	35.0	35.0
6	MAL-01 AND -02	—	21.4	21.4
7	BUILDING ELEVATORS - (1 ELEVATORS)	—	13.0	13.0
8	SPARE	—	149.8	149.8
9	TOTAL	—	353.3	353.3

TOTAL GENERATOR LOAD SUMMARY

PLUG-IN BUSWAY CALCS

1	GENERAL LIGHTING (181 UNITS x 497 5/8" AVERAGE x 3W/5')	= 269,871 VA
2	TWO SMALL APPLIANCE CIRCUITS (181 UNITS x 3,000W)	= 543,000 VA
3	DISHWASHER (181 UNITS x 1,100W)	= 199,100 VA
4	GARBAGE DISPOSAL (181 UNITS x 850W)	= 154,500 VA
5	MICROWAVE (181 UNITS x 1,100W)	= 199,100 VA
6	ELECTRIC RANGE (181 UNITS x 2,500W)	= 452,500 VA
7	FANS (189 UNITS x 450W)	= 85,050 VA
8	ELECTRIC HEATING COIL (189 UNITS x 2000W)	= 376,000 VA
TOTAL		2,271 KVA
DEMAND FACTOR 23% PER NEC 220.32		522.3 KVA
TOTAL DEMAND LOAD (1451.2 AMP)		26.5 KVA
PANEL LL		107.3 KVA
TOTAL		666.1 KVA (1,923.3 AMP)

ELECTRICAL SERVICE: 2800 AMPERES 120/208 VOLTS 3 PHASE - 4 WIRE

* AVERAGE ELECTRIC HEATING COIL FOR 140 UNITS @ 1.5KW, 33 @ 3.0KW, AND 8 @ 2.500W x 2

EQUIPMENT SCHEDULE

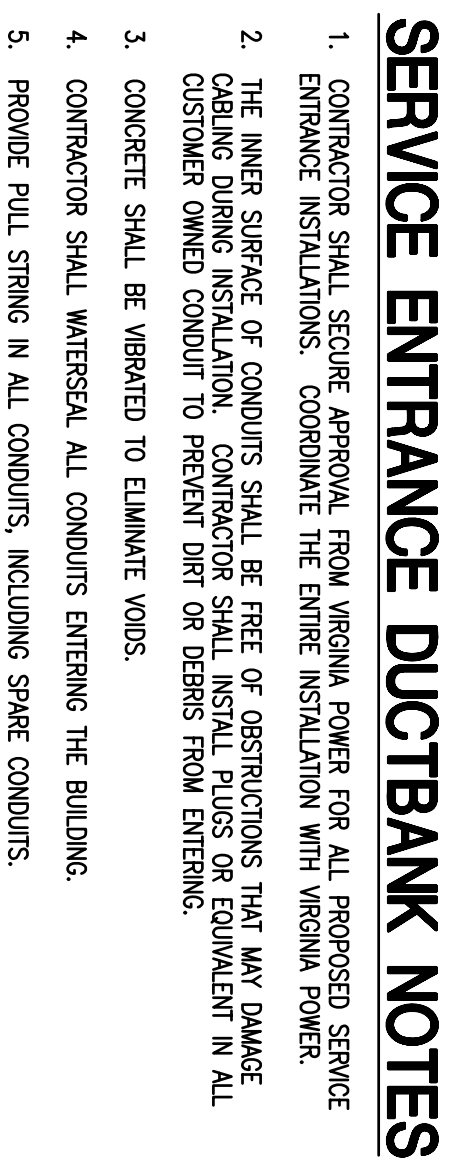
ITEM	DESCRIPTION
◇	NOT USED
◇	STANDBY DIESEL GENERATOR 450KW, 480/277V, 3φ, 4W, W/ (2) WBS AS INDICATED ON POWER RISER
◇	CHILLER #1 315KVA, 460V, 3φ
◇	DRY-TYPE TRANSFORMER 300KVA, 480-208/120V, 3φ
◇	DRY-TYPE TRANSFORMER 45 KVA, 480-208/120V, 3φ
◇	AUTOMATIC TRANSFER SWITCH, 200A, 480V, 3φ 0-1 MINUTE TIME DELAY, 65,000 MC SERIES RATED
◇	AUTOMATIC TRANSFER SWITCH, 250A, 480V, 3φ 0-1 MINUTE TIME DELAY, 65,000 MC SERIES RATED
◇	TRANSIENT VOLTAGE SURGE SUPPRESSION UNIT (TVSS) WITH INTERNAL DISCONNECT, 300KA
◇	DRY-TYPE TRANSFORMER, 75 KVA, 480-208/120V, 3φ
◇	3/60/50 FUSED SAFETY SWITCH FOR PANELS 3"IP."
◇	3/400/400 FUSED SAFETY SWITCH FOR PANELS 3"IP."
◇	20A, 1P ENCLOSED CIRCUIT BREAKER FOR ELEV. LITS. AND CORRIBS

GROUND CONDUCTOR SCHEDULE

ALL CONDUCTORS ARE COPPER

NO.	DESCRIPTION
(31)	#8 INSULATED GROUND CONDUCTOR
(32)	#6 INSULATED GROUND CONDUCTOR
(33)	#4 INSULATED GROUND CONDUCTOR
(34)	#2 INSULATED GROUND CONDUCTOR
(35)	#1/0 INSULATED GROUND CONDUCTOR
(36)	#2/0 INSULATED GROUND CONDUCTOR
(37)	#3/0 INSULATED GROUND CONDUCTOR
(38)	#4/0 INSULATED GROUND CONDUCTOR
(39)	#5/0 INSULATED GROUND CONDUCTOR
(40)	#750 KCMIL INSULATED GROUND CONDUCTOR

DUCTBANK SECTION SWITCHBOARD A



CONTRACTOR SHALL VERIFY APPROVAL FROM NEARBY OWNERS FOR ALL PROPOSED SERVICE ENTRANCE INSTALLATIONS. COORDINATE THE SERVICE INSTALLATION WITH NEARBY POWER.

THE MAIN SERVICE OF CONDUITS SHALL BE FREE OF OBSTRUCTIONS THAT MAY PREVENT CABLED DURING INSTALLATION. CONTRACTOR SHALL INSTALL PLUS OF EQUIPMENT IN ALL CUSTOMER OWNED CONDUIT TO PREVENT DRIFT OR DEBERS FROM ENTERING.

CONCRETE SHALL BE MORTARED TO ELIMINATE VOIDS.

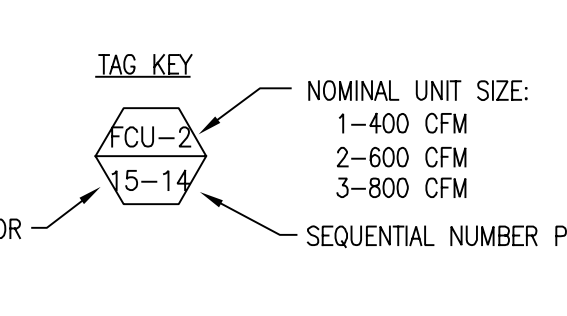
CONTRACTOR SHALL WATERSEAL ALL CONDUITS ENTERING THE BUILDING.

PROVIDE PULL STRING IN ALL CONDUITS, INCLUDING SPARE CONDUITS.

(TYPICAL) VERTICAL FAN COIL UNIT SCHEDULE

Table with 29 columns: SYMBOL, MANUFACTURER MODEL, TYPE, LOCATION, SERVICE, QTY, SUPPLY FAN (SUPPLY CFM, OSA, TSP, ESP, ELEV, DRIVE, BHP, HP), CHILLED WATER COOLING COIL (TOTAL, SENSIBLE, EDB, EWB, LDB, LWB, ΔPA, FLOW, EWT, LWT, ΔPW, ROWS, FPI), ELECTRIC HEATING COIL (CAPACITY, EAT, LAT, ΔPA, VOLTAGE, FLA, MCA), ELECTRICAL (TYPE, SIZE), FILTERS (ISOLATION, OPER WGT), and REMARKS. Rows include units FCU-1 through FCU-15-14.

- NOTES: 1. 1/2" THICK, 3 POUND DENSITY, NEOPRENE COATED INSULATION. 2. WALL MOUNT 24V THERMOSTAT WITH MANUAL CHANGE OVER. FAN SHALL HAVE A MEDIUM/HIGH BUT NO OFF POSITION. 3. 3-WAY ELECTRIC VALVE PACKAGE. 4. STAINLESS STEEL DRAIN PAN WITH FORMED P-TRAP CONNECTION. 5. TRANSFORMER. 6. DOUBLE DEFLECTION ALUMINUM SUPPLY AIR GRILLE. 7. DUCTED SUPPLY AIR CONNECTION. 8. INTEGRAL ELECTRIC DISCONNECT.



BUILDING AUTOMATION SYSTEM PANEL SCHEDULE

Table with 5 columns: TAG, LOCATION, CONTROL VA, CONVENIENCE OUTLET-AMPS, ELECTRICAL DATA (POWER VOLTS/PH/Hz, EMERGENCY POWER). Rows include BMS-1 through BMS-8.

SPA DE-HUMIDIFICATION UNIT SCHEDULE

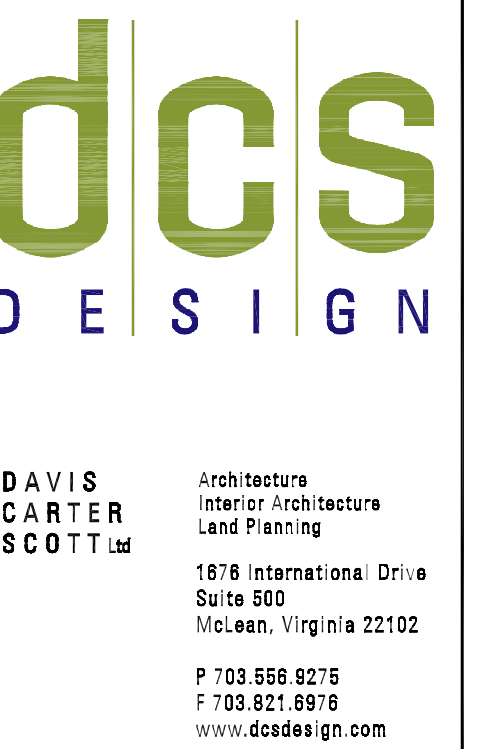
Table with 19 columns: SYMBOL, MANUFACTURER MODEL, TYPE, LOCATION, SERVICE, SUPPLY FAN (SUPPLY, RETURN, MIN OSA, TSP, ESP, FAN RPM, ELEV, FAN TYPE, DRIVE, BHP, HP), DEHUMIDIFICATION CAPACITY (TOTAL, SENSIBLE, SPACE TEMP, SPA TEMP), ELECTRICAL DATA (MOISTURE REMOVAL, MCA, MOP, POWER), FILTERS, VIBRATION ISOLATION, OPER WGT, and REMARKS. Row includes DHU 01.

AIR COOLED CONDENSER SCHEDULE

Table with 11 columns: SYMBOL, MANUFACTURER MODEL, LOCATION, SERVICE, CAPACITY (AMBIENT, CAPACITY), ELECTRICAL DATA (# FANS, FLA, POWER), VIBRATION ISOLATION, OPER WGT, and REMARKS. Row includes CU 2.

ELECTRIC DUCT HEATER SCHEDULE

Table with 14 columns: SYMBOL, MANUFACTURER MODEL, LOCATION, SERVICE, CAPACITY (AIRFLOW, EXH, LAT, # STGS), ELECTRICAL DATA (POWER), and REMARKS. Row includes DH 01.



- REVISIONS: PERMIT SET OCT. 20, 2008; 95% PRICING DEC. 01, 2008; CITY OF ALEXANDRIA PERMIT COMMENTS DEC. 12, 2008; CITY OF ALEXANDRIA PERMIT COMMENTS #2 JAN. 23, 2007; FINAL CONSTRUCTION SET FEB. 16, 2007.

Table with 2 columns: REVISION NUMBER and DESCRIPTION.

PROJECT TITLE: RESIDENCE INN BY MARRIOTT. Address: 2345/2347 MILL ROAD ALEXANDRIA, VIRGINIA. PROJECT NO. 305412.00.

DRAWING TITLE: MECHANICAL SCHEDULES. Includes scale (NO SCALE), date (OCTOBER 20th, 2006), and drawing number (M-602). SHEET 0 OF 00.

SEE WMATA NOTE ON SHEET A-001.

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Schedule GS-4
LARGE GENERAL SERVICE
PRIMARY VOLTAGE

I. APPLICABILITY

Except as modified herein, this schedule is applicable only to a non-residential transmission or primary voltage Customer (as defined in Paragraph XI.) who elects to receive Electricity Supply Service and Electric Delivery Service from the Company and whose peak measured demand has reached or exceeded 500 kW during at least three billing months within the current and previous 11 billing months.

For a Customer served under this schedule whose peak measured demand has decreased to less than 500 kW, this schedule shall remain applicable to the Customer and the Customer shall not have the option to purchase electricity under Schedule GS-1, GS-2, or GS-2T until such time as the maximum measured demand has remained at less than 500 kW during all billing months within the current and previous 11 billing months.

At such time the Customer no longer meets the above applicability requirements, the Customer shall remain on this schedule for the period (not exceeding two additional billing months) required to achieve an orderly transfer to the applicable schedule.

For new service, this schedule is applicable when the anticipated kW demand meets the above criteria.

II. 30-DAY RATE

A. Distribution Service Charges

1. Basic Customer Charge
Basic Customer Charge \$127.60 per billing month.

2. Plus Distribution Demand Charge

First 5000 kW of Distribution Demand	@	\$1.000 per kW
Additional kW of Distribution Demand	@	\$0.755 per kW

3. Plus rkVA Demand Charge @ \$0.15 per rkVA

(Continued)

Schedule GS-4
LARGE GENERAL SERVICE
PRIMARY VOLTAGE

II. 30-DAY RATE (Continued)

B. Electricity Supply Service Charges

1. On-Peak Electricity Supply Demand Charge
 - a. All On-Peak Electricity Supply Demand for
Primary Service Voltage @ \$ 12.003 per kW
 - b. All On-Peak Electricity Supply Demand for
Transmission Service Voltage @ \$ 11.715 per kW
2. Plus Off-Peak Electricity Supply Demand Charge
All Off-Peak kW Demand @ \$ 0.632 per kW
3. Plus Electricity Supply Adjustment Demand Charge
First 5000 kW of Demand @ (\$ 0.421) per kW
Additional kW of Demand @ (\$ 0.318) per kW
4. Plus Electricity Supply kWh Charge
All On-peak kWh @ 0.404¢ per kWh
All Off-Peak kWh @ 0.272¢ per kWh
5. Each Electricity Supply kilowatthour used is subject to Fuel Charge Rider A.

C. The minimum charge shall be as may be contracted for.

(Continued)

Schedule GS-4
LARGE GENERAL SERVICE
PRIMARY VOLTAGE

III. DETERMINATION OF ON-PEAK AND OFF-PEAK HOURS

The following on-peak and off-peak hours are applicable to the billing of all charges stated in this schedule.

A. On-peak hours are as follows:

1. For the period of June 1 through September 30, 10 a.m. to 10 p.m., Mondays through Fridays.
2. For the period of October 1 through May 31, 7 a.m. to 10 p.m., Mondays through Fridays.

B. All hours not specified in III.A. are off-peak.

IV. DETERMINATION OF DISTRIBUTION DEMAND

A. Distribution Demand shall be billed only where the normal service delivery voltage is less than 69 kV.

B. The Distribution Demand billed under Paragraph II.A.2. shall be such as may be contracted for but not less than the highest of:

1. The highest average kW measured at the location during any 30-minute interval of the current and previous 11 billing months.
2. 500 kW.

C. When the Customer's power factor is less than 85 percent, a minimum distribution demand of not less than 85 percent of the Customer's maximum kVA demand may be established.

V. DETERMINATION OF rkVA DEMAND

The rkVA of demand billed shall be the highest average rkVA measured in any 30-minute interval during the current billing month.

(Continued)

Schedule GS-4
LARGE GENERAL SERVICE
PRIMARY VOLTAGE

VI. DETERMINATION OF ON-PEAK ELECTRICITY SUPPLY DEMAND

The kW of demand billed under II.B.1. shall be the highest of:

- A. The highest average kW measured in any 30-minute interval of the current billing month during on-peak hours.
- B. Seventy-five percent of the highest kW of demand at this location as determined under VI.A., above, during the billing months of June through September of the preceding 11 billing months.
- C. 100 kW.

VII. DETERMINATION OF OFF-PEAK ELECTRICITY SUPPLY DEMAND

The kW of demand billed under Paragraph II.B.2. shall be the off-peak demand which is in excess of 90% of the On-Peak Electricity Supply Demand determined under Paragraph VI.

VIII. DETERMINATION OF ELECTRICITY SUPPLY ADJUSTMENT DEMAND

This credit is required in order to achieve customer bill neutrality, arising from changes to the Distribution Demand Charge while maintaining the overall capped rates. The kW of demand billed under Paragraph II.B.3. shall be the Distribution Demand determined under Paragraph IV.

IX. METER READING AND BILLING

When the actual number of days between meter readings is more or less than 30 days, the Basic Customer Charge, the Distribution Demand Charge, the rkVA Demand Charge, the On-Peak Electricity Supply Demand Charge, the Off-peak Electricity Supply Demand Charge, the Electricity Supply Adjustment Demand Charge, and the minimum charge of the 30-day rate will each be multiplied by the actual number of days in the billing period and divided by 30.

(Continued)

Schedule GS-4
LARGE GENERAL SERVICE
PRIMARY VOLTAGE

X. STANDBY, MAINTENANCE OR PARALLEL OPERATION SERVICE

A Customer requiring standby, maintenance or parallel operation service may elect service under this schedule provided the Customer contracts for the maximum kW which the Company is to supply. Standby, maintenance or parallel operation service is subject to the following provisions:

- A. Suitable relays and protective apparatus shall be furnished, installed, and maintained at the Customer's expense in accordance with specifications furnished by the Company. The relays and protective equipment shall be subject, at all reasonable times, to inspection by the Company's authorized representative.
- B. In case the Distribution Demand determined under Paragraph IV. exceeds the contract demand, the contract demand shall be increased by such excess demand.
- C. The demand billed under II.A.2. and II.B.3. shall be the contract demand.

XI. DEFINITION OF TRANSMISSION, PRIMARY AND SECONDARY VOLTAGE CUSTOMER

- A. A transmission voltage Customer is any Customer whose delivery voltage is 69 kV or above.
- B. A primary voltage Customer is any Customer (a) served from a circuit of 69 kV or more where the delivery voltage is 4,000 volts or more, (b) served from a circuit of less than 69 kV where Company-owned transformation is not required at the Customer's site, (c) where Company-owned transformation has become necessary at the Customer's site because the Company has changed the voltage of the circuit from that originally supplied, or (d) at a location served prior to October 27, 1992 where the Customer's connection to the Company's facilities is made at 2,000 volts or more.
- C. A secondary voltage Customer is any Customer not defined in XI.A. or XI.B. as a transmission or primary voltage Customer.

(Continued)

Schedule GS-4
LARGE GENERAL SERVICE
PRIMARY VOLTAGE

(Continued)

XII. TERM OF CONTRACT

The contract shall be open order unless (a) standby, maintenance or parallel operation service is provided, or (b) the Customer or the Company requests a written contract. In such cases, the term of contract for the purchase of electricity under this schedule shall be as mutually agreed upon, but for not less than one year. During the minimum term of applicability, the Customer may be billed under the corresponding Unbundled Rate Schedule GS-4U, if applicable.



JULIA E. PHILLIPS
 CONSTRUCTION MANAGEMENT

Current Energy Use Based on 24/7 Run Schedule

Based on Degree Day Weather Data:

Heating = 68% of Total Year

Cooling = 32% of Total Year

*** Assumed Set Point of 65° F**

Average Electric Heating Units (Drawing E 3.3)

140 x	1.50	kW	
33 x	3.00	kW	
16 x	2.50	kW	
189 units	349	kW	

Average Horsepower per fan = 0.05kW

Total Electric for Cooling = 189*0.05 = 9.45kW

Building Demand = 656.1 kVA



*** Assume GS - 4 Determined by Virginia Dominion Power**

*** Assume 81% Occupancy**



147 Rooms Filled of 181

Total Heating Energy Use = (0.81)(358.45 kW) = 290.34 kW

Total Cooling Energy Use = (0.81)(9.45 kW) = 7.65 kW

Total Heating Energy Use per Day = (0.81)(0.68*24 Hrs)(358.45 kW) = 3,939.19 kWh

Total Cooling Energy Use per Day = (0.81)(0.32*24 Hrs)(358.45 kW) = 1,853.74 kWh

Peak Time



6/1 to 9/30 Monday through Friday from 10:00am to 10:00pm
 10/1 to 5/31 Monday through Friday from 7:00am to 10:00pm
 \$0.404 per kWh
 261 Peak Days

Off-Peak Time



1/1 to 12/31 Evenings and Weekends
 \$0.272 per kWh
 104 Off-Peak Days

Energy Cost Calculations

Peak Time Cost - Heating

$$\begin{aligned}
 &= (290.34) * \left[\left(\frac{12 \text{ hrs.}}{1 \text{ Day}} \right) \left(\frac{99 \text{ Days}}{1 \text{ Year}} \right) + \left(\frac{16 \text{ hrs.}}{1 \text{ Day}} \right) \left(\frac{179 \text{ Days}}{1 \text{ Year}} \right) \right] * 0.58 \\
 &= 720,832.48 \quad \text{kWh} \\
 &= \$2,912.16
 \end{aligned}$$



JULIA E. PHILLIPS
CONSTRUCTION MANAGEMENT

Peak Time Cost - Cooling

$$\begin{aligned} &= (7.65) * \left[\left(\frac{12 \text{ hrs.}}{1 \text{ Day}} \right) \left(\frac{88 \text{ Days}}{1 \text{ Year}} \right) + \left(\frac{18 \text{ hrs.}}{1 \text{ Day}} \right) \left(\frac{178 \text{ Days}}{1 \text{ Year}} \right) \right] * 0.32 \\ &= 8942.91 \quad \text{kWh} \\ &= \$36.13 \end{aligned}$$

Off-Peak Time Cost - Heating

$$\begin{aligned} &= (290.34) * \left[\left(\frac{24 \text{ hrs.}}{1 \text{ Day}} \right) \left(\frac{104 \text{ Days}}{1 \text{ Year}} \right) + \left(\frac{12 \text{ hrs.}}{1 \text{ Day}} \right) \left(\frac{88 \text{ Days}}{1 \text{ Year}} \right) + \left(\frac{18 \text{ hrs.}}{1 \text{ Day}} \right) \left(\frac{178 \text{ Days}}{1 \text{ Year}} \right) \right] * 0.68 \\ &= 1,008,691.63 \quad \text{kWh} \\ &= \$2,743.64 \end{aligned}$$

Off-Peak Time Cost - Cooling

$$\begin{aligned} &= (7.65) * \left[\left(\frac{24 \text{ hrs.}}{1 \text{ Day}} \right) \left(\frac{134 \text{ Days}}{1 \text{ Year}} \right) + \left(\frac{12 \text{ hrs.}}{1 \text{ Day}} \right) \left(\frac{88 \text{ Days}}{1 \text{ Year}} \right) + \left(\frac{18 \text{ hrs.}}{1 \text{ Day}} \right) \left(\frac{178 \text{ Days}}{1 \text{ Year}} \right) \right] * 0.32 \\ &= 26,592.65 \quad \text{kWh} \\ &= \$72.33 \end{aligned}$$

Total kWh = 1,765,059.67

Total Cost = \$5,764.27



JULIA E. PHILLIPS
 CONSTRUCTION MANAGEMENT

New Energy Use Based on Adjustable Run Schedule

Based on Degree Day Weather Data:

Heating = 68% of Total Year

Cooling = 32% of Total Year

*** Assumed Set Point of 65° F**

Average Electric Heating Units (Drawing E 3.3)

140 x	1.50	kW
33 x	3.00	kW
16 x	2.50	kW

189 units	349	kW
-----------	-----	----

Average Horsepower per fan = 0.05kW

Total Electric for Cooling = 189*0.05 = 9.45kW

Average Horsepower per fan = 0.05kW

Total Electric for Cooling = 189*0.05 = 9.45kW

Building Demand = 656.1 kVA



*** Assume GS - 4 Determined by Virginia Dominion Power**

*** Assume 81% Occupancy**



147 Rooms Filled of 181

Total Heating Energy Use = (0.81)(358.45 kW) = 290.34 kW

Total Cooling Energy Use = (0.81)(9.45 kW) = 7.65 kW

Total Heating Energy Use per Day = (0.81)(0.68*24 Hrs)(358.45 kW) = 3,939.19 kWh

Total Cooling Energy Use per Day = (0.81)(0.32*24 Hrs)(358.45 kW) = 1,853.74 kWh

Peak Time



6/1 to 9/30 Monday through Friday from 10:00am to 10:00pm
 10/1 to 5/31 Monday through Friday from 7:00am to 10:00pm
 \$0.404 per kWh
 261 Peak Days

Off-Peak Time



1/1 to 12/31 Evenings and Weekends
 \$0.272 per kWh
 104 Off-Peak Days

Trace Schedule for Hotel Occupancy Rate:

12 am - 9 am =	100%
9 am - 11 am =	20%
11 am - 5 pm =	0%
5 pm - 12 am =	100%



JULIA E. PHILLIPS
 CONSTRUCTION MANAGEMENT

The Residence Inn is slated for mainly long term business people. Average hours of commute are between 7 am and 9 am.

Adjusted Schedule for Hotel Occupancy Rate:

- 12 am - 9 am = 85% * Assumes leaving at 7:30 am
- 9 am - 11 am = 0%
- 11 am - 5 pm = 0%
- 5 pm - 12 am = 100%

Energy Cost Calculations

"Over-ride" Heating Usage = All Off-Peak Time from 10:00pm to 7:00am

$$= (290.34) * \left[\left(\frac{9 \text{ hrs}}{1 \text{ Day}} \right) \left(\frac{365 \text{ Days}}{1 \text{ Year}} \right) \right] * 0.68$$

$$= 648,571.54 \text{ kWh}$$

$$= \$1,764.11$$

"Over-ride" Cooling Usage = All Off-Peak Time from 10:00pm to 7:00am

$$= (7.65) * \left[\left(\frac{9 \text{ hrs}}{1 \text{ Day}} \right) \left(\frac{365 \text{ Days}}{1 \text{ Year}} \right) \right] * 0.32$$

$$= 8,046.41 \text{ kWh}$$

$$= \$21.89$$

User Controlled Heating Usage = All Peak Time = 5.65 hrs total of Day

$$= (290.34) * \left[\left(\frac{5.65 \text{ hrs}}{1 \text{ Day}} \right) \left(\frac{365 \text{ Days}}{1 \text{ Year}} \right) \right] * 0.68$$

$$= 407,158.80 \text{ kWh}$$

$$= \$1,644.92$$

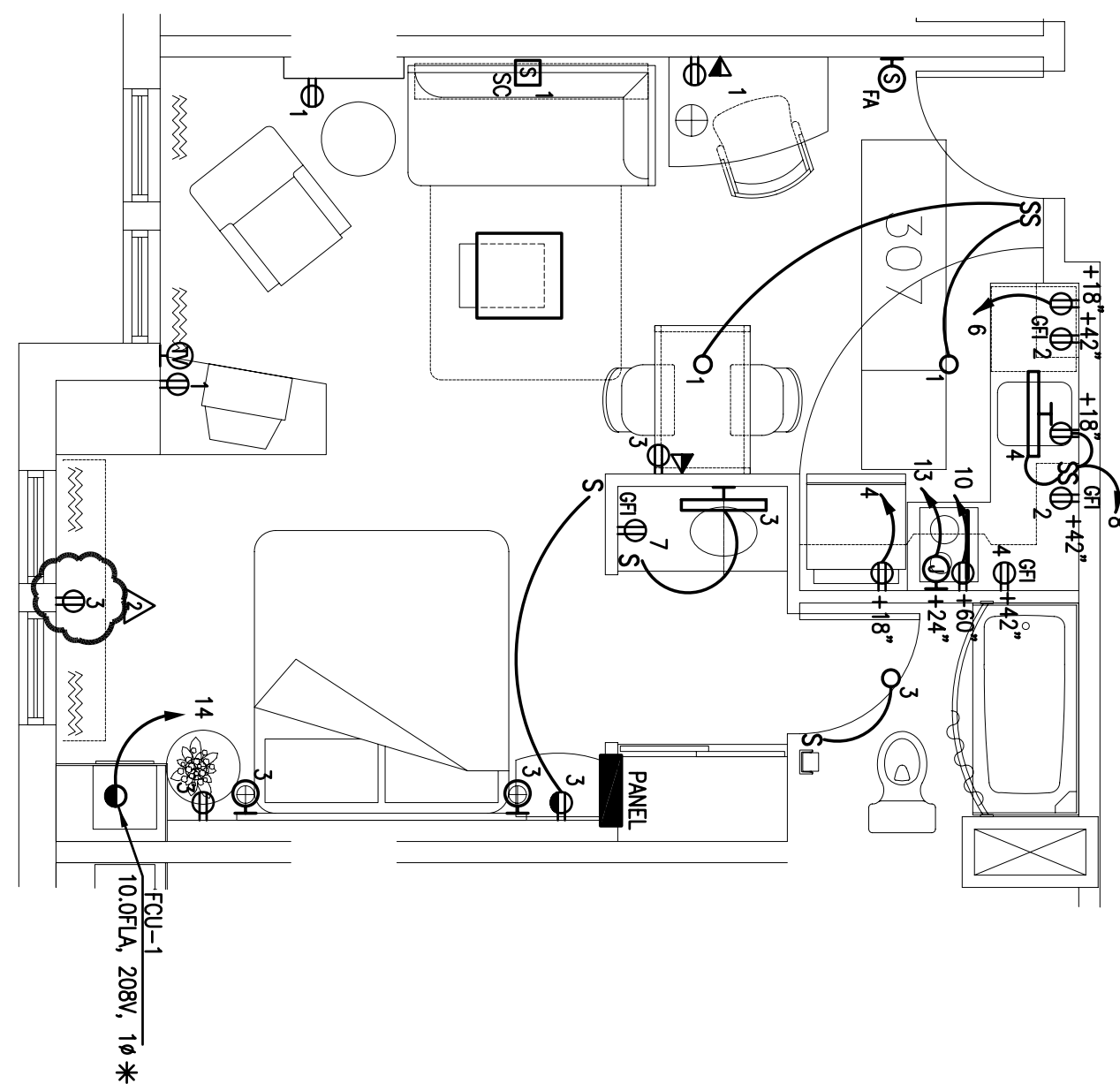
User Controlled Cooling Usage = All Peak Time = 5.65 hrs total of Day

$$= (7.65) * \left[\left(\frac{5.65 \text{ hrs}}{1 \text{ Day}} \right) \left(\frac{365 \text{ Days}}{1 \text{ Year}} \right) \right] * 0.32$$

$$= 5,051.36 \text{ kWh}$$

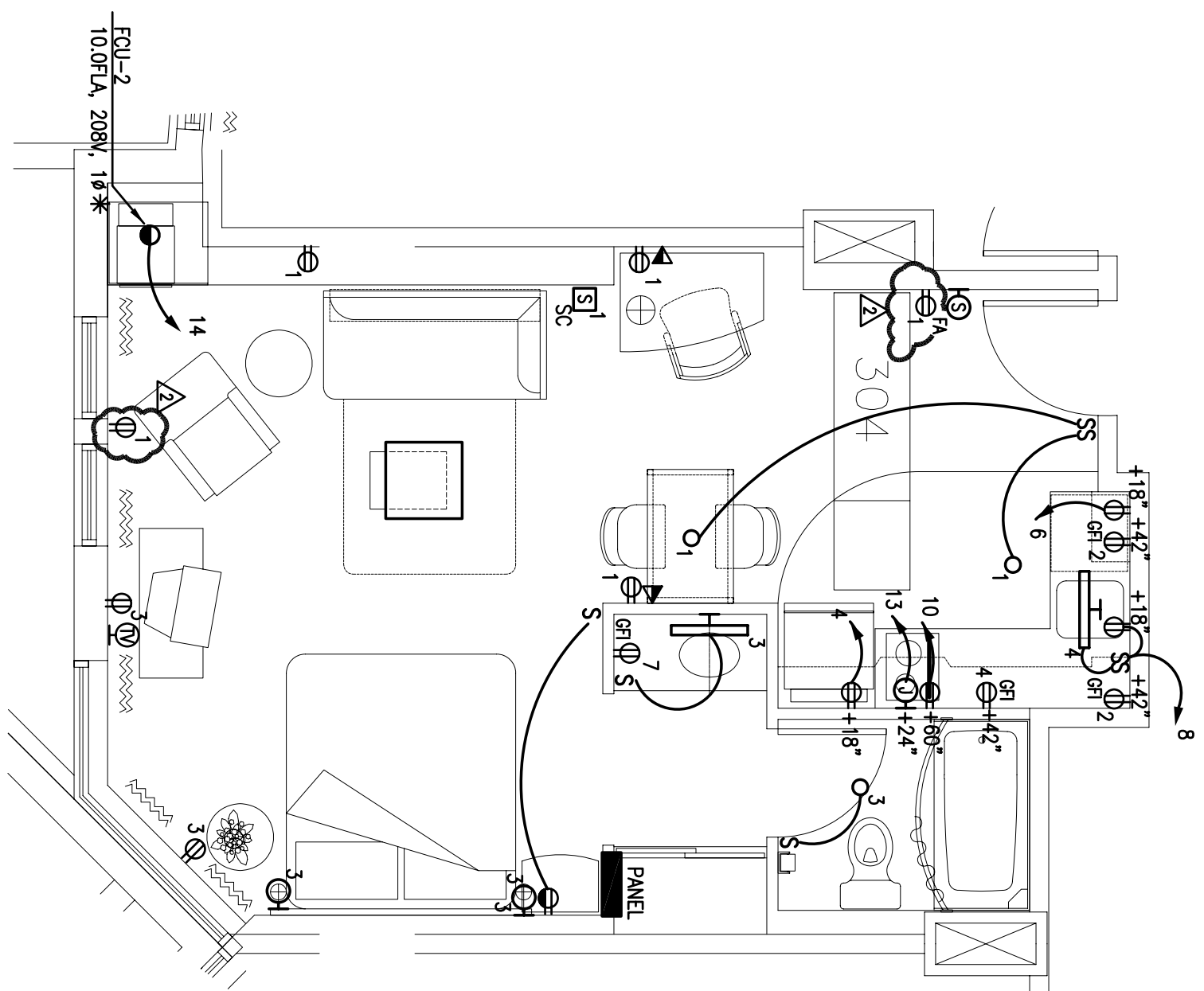
$$= \$20.41$$

Total kWh =	1,068,828.11
Total Cost =	\$3,451.33



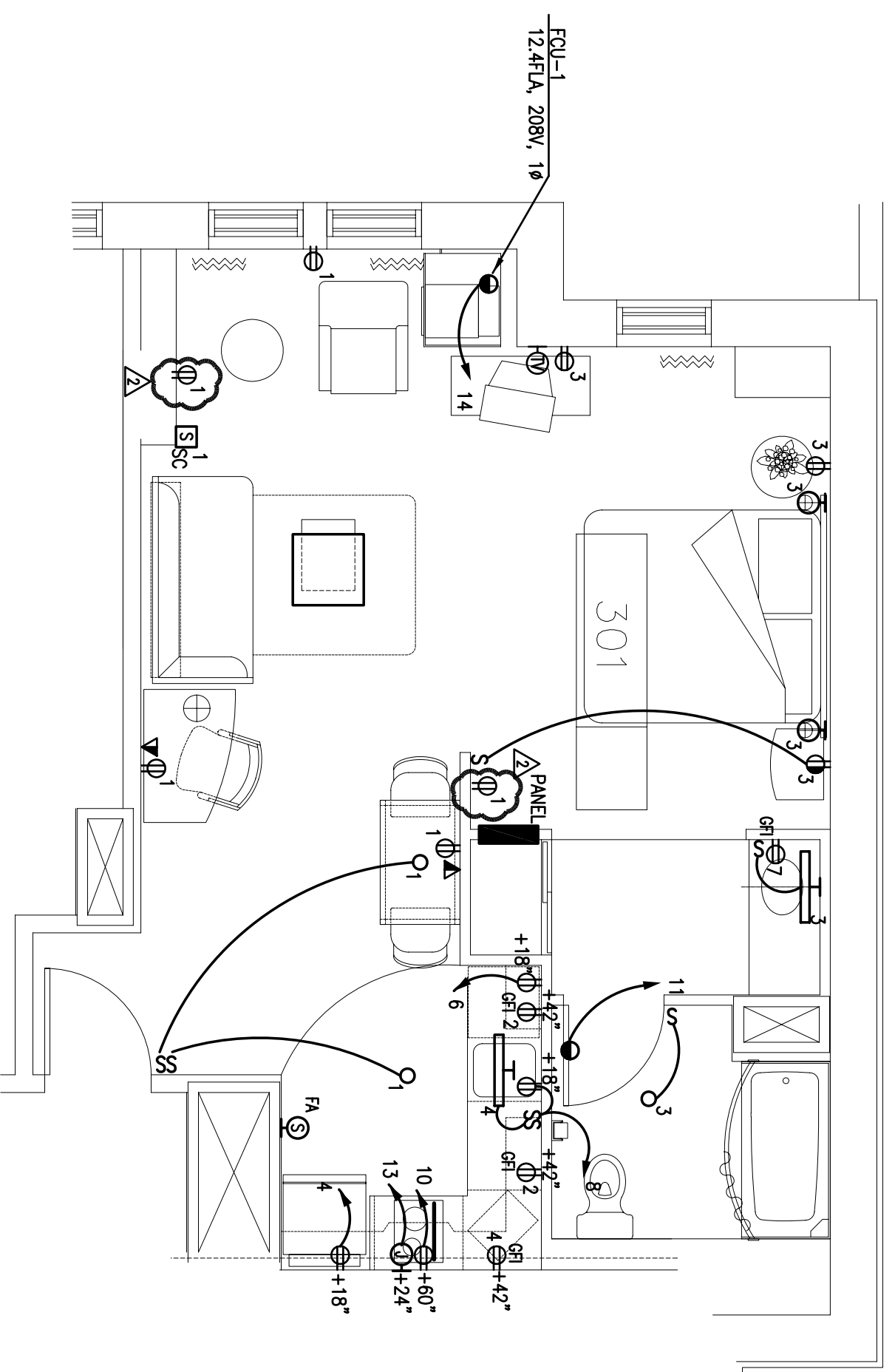
UNIT A, A1, A2, C, D, E

SCALE: 1/4" = 1'-0"
 * NOTE: UNIT A HAS 13.4 FIA (FCU-2, 1/9HP FAN, 2.00W HEAT)
 * NOTE: UNIT A HAS 7.6 FIA (FCU-1, 1/13HP FAN, 1.00W HEAT)



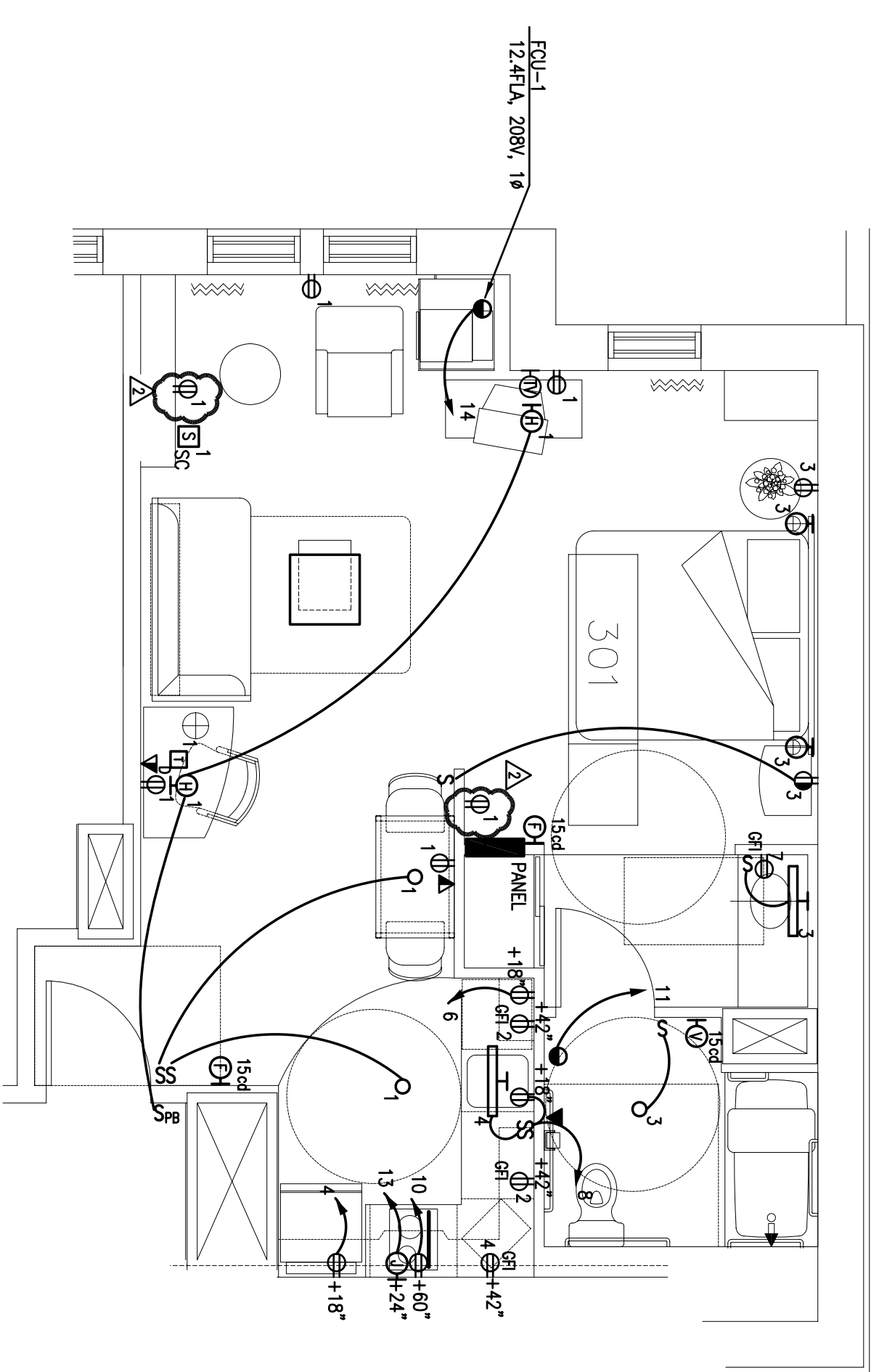
UNIT B1, B2, B3

SCALE: 1/4" = 1'-0"
 * NOTE: UNIT B1 FOU S 13.4 FIA (1/9HP FAN, 2.00W HEAT)



UNIT F

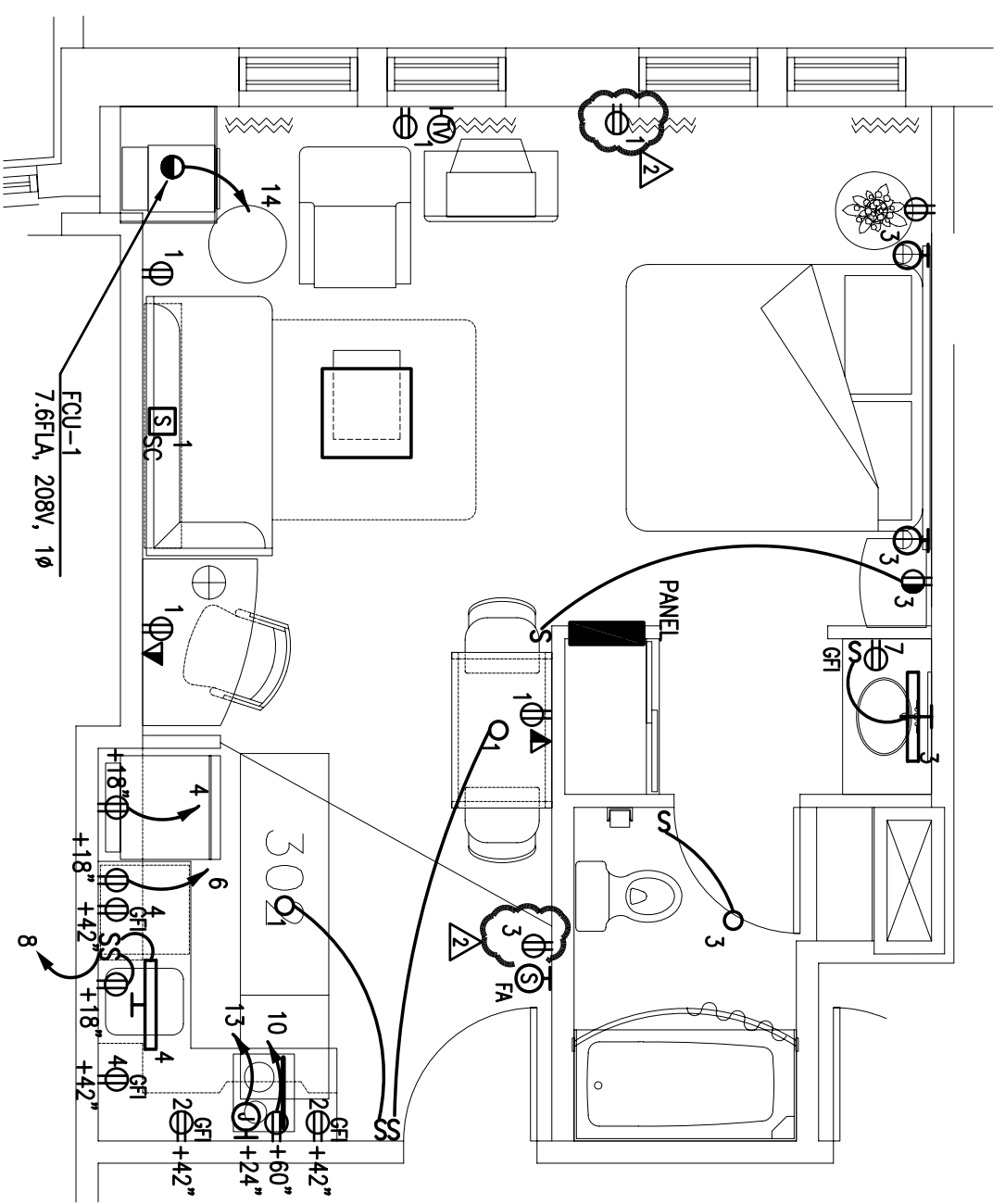
SCALE: 1/4" = 1'-0"



UNIT F ADA

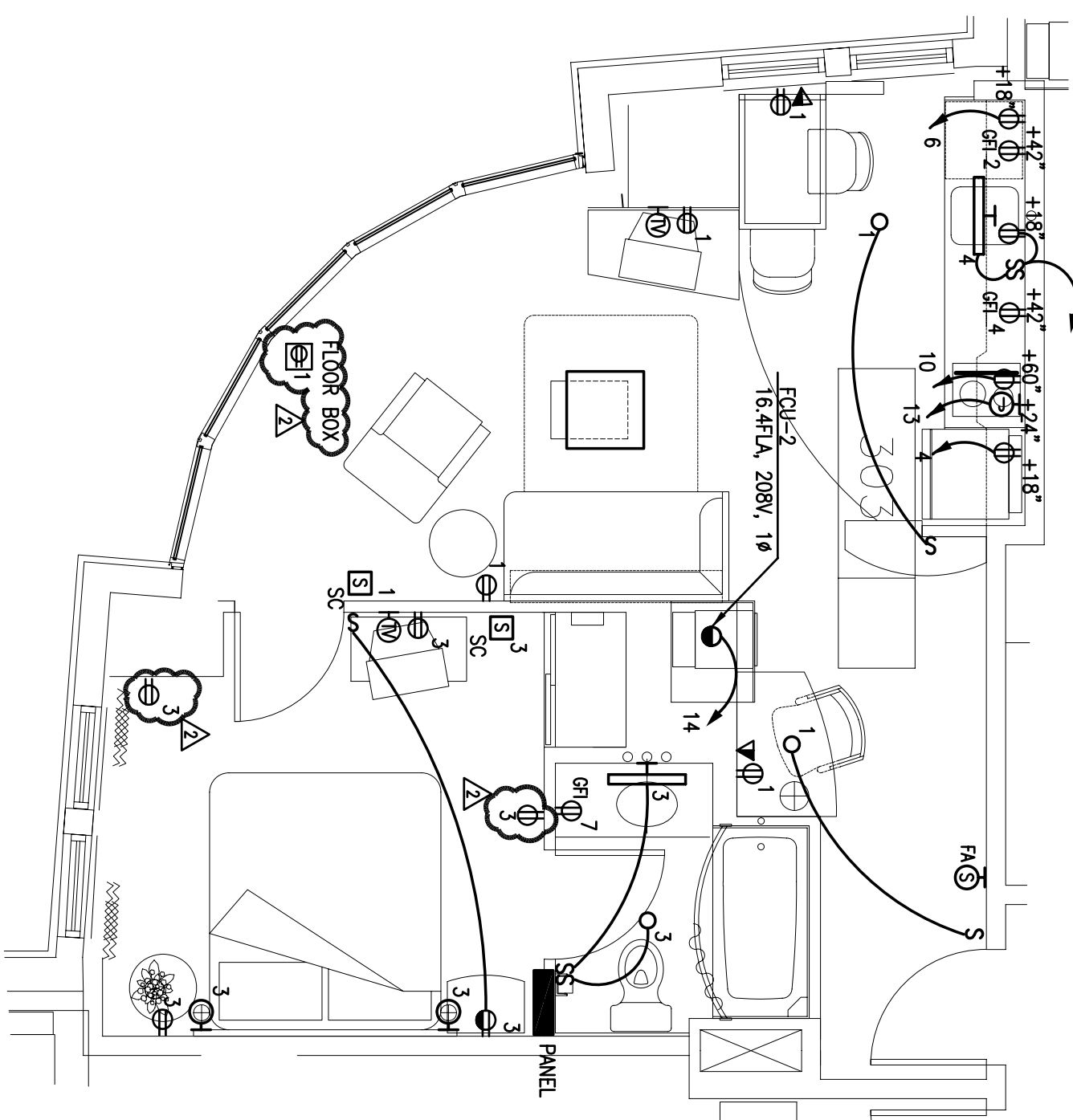
SCALE: 1/4" = 1'-0"
 * SEE ARCHITECTURAL DRAWINGS NOTE: UNIT B1 FOU S 13.4 FIA (1/9HP FAN, 2.00W HEAT)
 NOTE 1: INSTALL THE FOLLOWING EQUIPMENT IN HEATING WAGED UNITS. PUSH BUTTON SW, COMPRESSOR W/HEATED EQUIPMENT UNIT BE INSTALLED ONLY IN UNITS IDENTIFIED BY ARCHITECTURAL DRAWINGS.
 2. EXACT LOCATION OF DOOR KICKER SHALL BE FIELD COORDINATED.

SEE DRAWING E 22 FOR DRAWING NOTES, DWELLING UNIT NOTES AND MOUNTING HEIGHT INSTALLATION NOTES. SEE MECHANICAL DRAWING M-602 FOR ADDITIONAL INFORMATION ON FAN COILED UNITS AND ELECTRIC HEATERS.



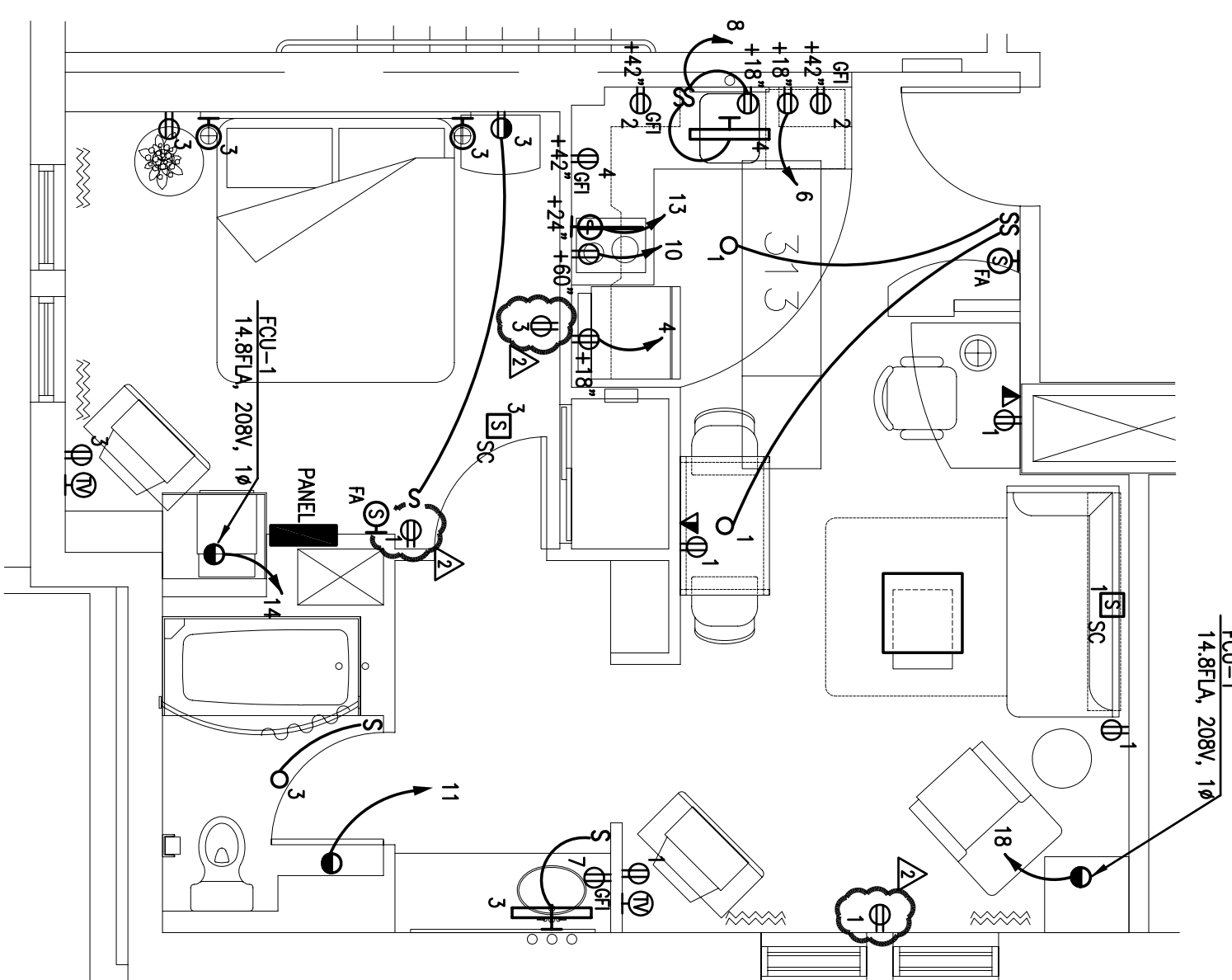
UNIT G

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



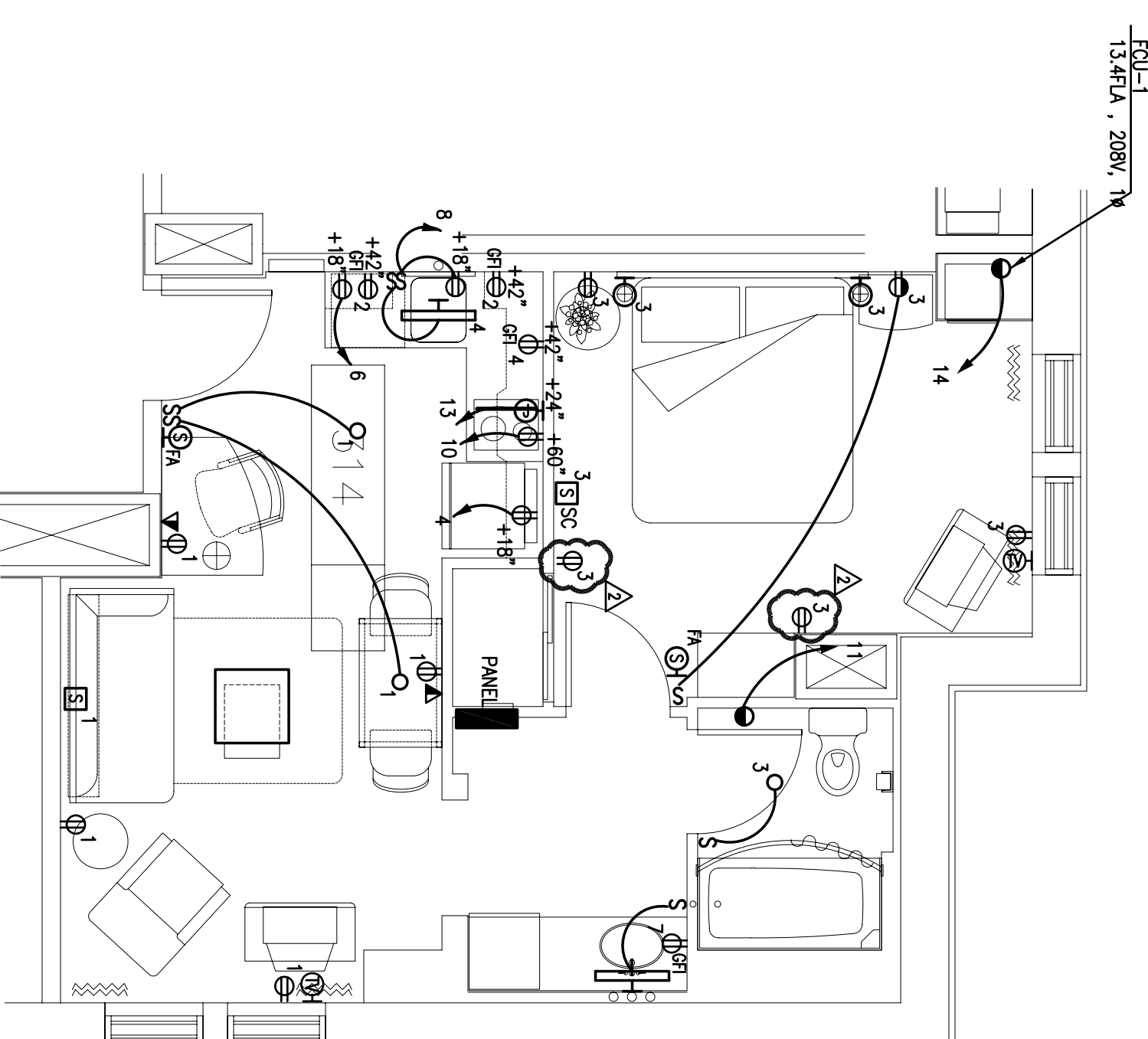
UNIT H

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



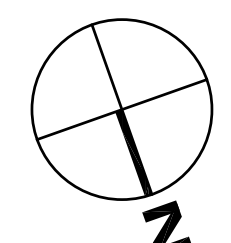
UNIT J

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



UNIT K

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



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 DESIGN: ACQ/AM DRAWN/LN/AM
 JOB No.: 050555.00 Q.A., DDJ

REVISIONS:

PERMIT SET	OCT. 20, 2006
FINAL PRICING	DEC. 01, 2006
CITY OF ALEXANDRIA PERMITS	
COMMENTS	DEC. 14, 2006
CITY OF ALEXANDRIA PERMITS	
COMMENTS #2	JUN. 25, 2007
FINAL CONSTRUCTION SET	SEP. 20, 2007
DESIGNER	ESJ

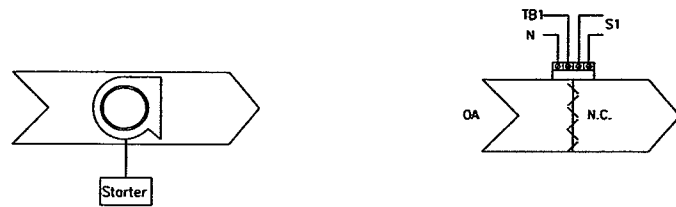
PROJECT TITLE	RESIDENCE INN BY MARRIOTT
DRAWING TITLE	1/4" SCALE GUEST ROOM LAYOUTS
PROJECT NO.	2346/2347 MILL ROAD ALEXANDRIA, VIRGINIA 30541200
DRAWING NUMBER	E 2.1
SHEET	01

2346/2347 MILL ROAD
 ALEXANDRIA, VIRGINIA
 PROJECT NO. 30541200

DATE: OCTOBER 20th, 2006
 DRAWN BY: [Name]
 CHECKED BY: [Name]

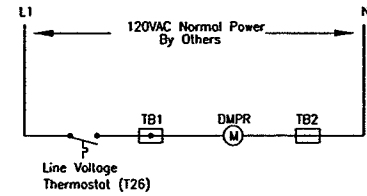
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Printed On: 2006/11/17 4:17 pm



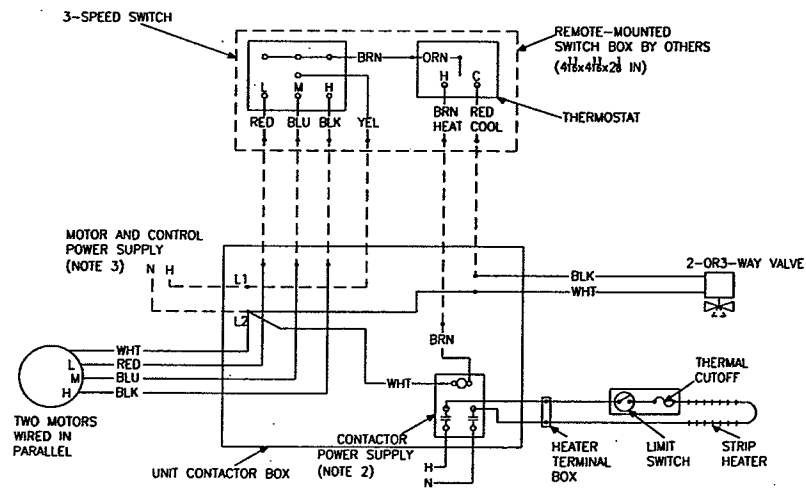
Equipment Room Exhaust Fan/Intake Damper

Typical of 2



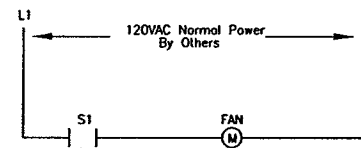
Damper Thermostat Wiring Detail

Typical of 5




FCU Wiring Diagram

Typical of 115 Guest Room

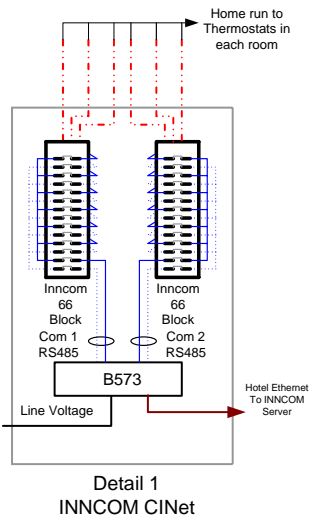
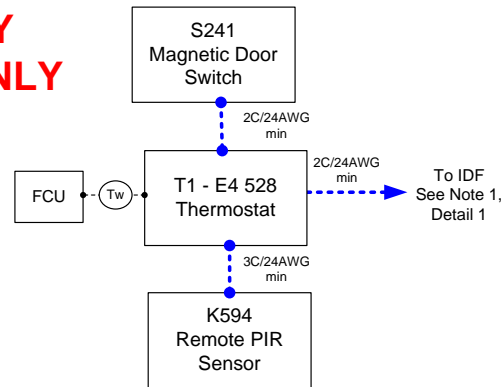
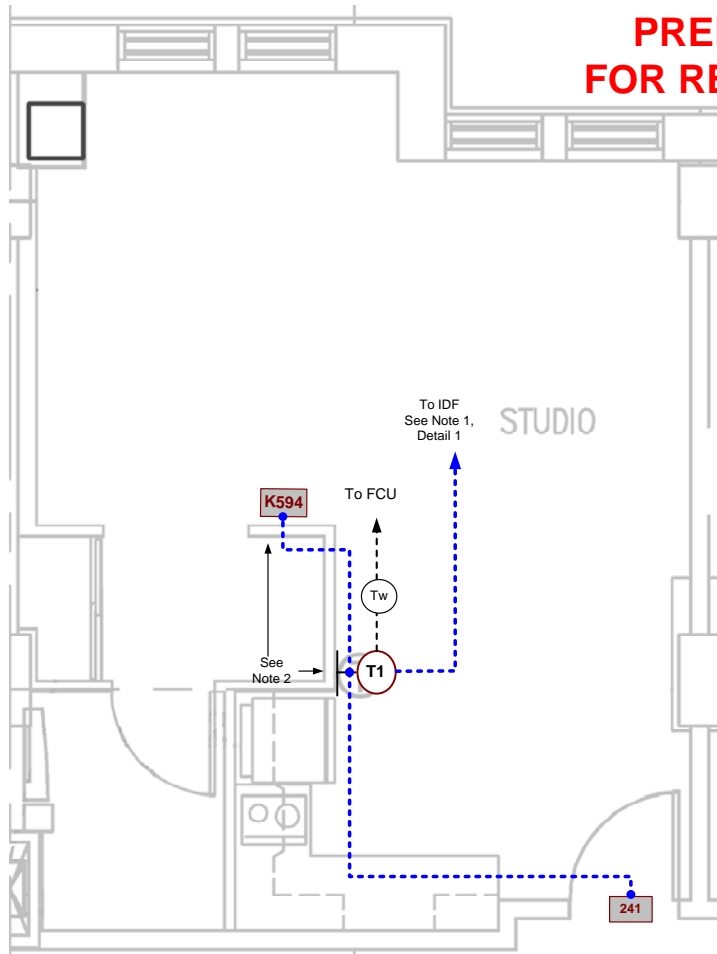


Exhaust Fan Motor Wiring Detail

Typical of 2

Residence Inn By Marriott 2345 / 2347 Mill Road, Alexandria, VA			
BUILDING AUTOMATION SYSTEM			
MISCELLANEOUS CONTROLS			
REV. 1	SUBMITTAL	5-24-2007	JOB NO.: 7116968
 Southland Industries 22340 Dresden St. Suite 177 Dulles, VA 20166 (703) 834-5570			ENGINEER: YZ
			DRAWN BY: YZ
			19 of 19

PRELIMINARY FOR REVIEW ONLY



Residence Inn Alexandria INNCOM Device Count				
Room Types				
Wayne Hakenjos				
30 Nov 2007				
		Device Count Per Room		
Unit Type	Keys	S241	E528	K594
Studio	140	1	1	1
1 Bedroom	33	1	1	1
2 Bedroom	8	1	2	1
Total	181			
		Total Device Count		
Unit Type		S241	E528	K594
Studio	140	140	140	140
1 Bedroom	33	33	33	33
2 Bedroom	8	8	16	8
Total	181	181	189	181

Design Notes

1. A spare pair of conductors from the data jack is not viable. A dedicated CAT5 cable would be required if the data jack is used or a spare phone pair of conductors can be used.
2. The thermostat location shown will not provide acceptable passive infrared room coverage. Note that the thermostat should be relocated, coverage angle is 178°. Alternately, use a remote PIR as shown.
3. Remote Passive IR sensors are added where the thermostat does not provide adequate coverage. Location of remote IR sensor is flexible, however locate to provide maximum room coverage. Coverage angle is 178°.
4. A B573 can support up to 80 room gateway devices (40 per Com 1 and 40 per Com 2) and must have an Ethernet connection in the IDF closet, static IP address required for each B573



277 W Main St
Niantic, CT
06357
860-739-4468

DEVICE LEGEND

- T1 E4 (528) Thermostat
- 241 Magnetic Door Switch
- K594 Remote PIR Sensor (INNCOM K594)

CABLE LEGEND

- S5 Communication bus
Cat5 preferred, refer to block cabling diagram for specific conductor requirement.
- Line voltage
- Thermostat Wire. Both low and nominal voltage systems to follow UL and local codes
- Cat5 cable, Non INNCOM S5 Communication bus

Project: **RESIDENCE INN
ALEXANDRIA**

Drawing: **Standard Studio Unit
INNCOM Cable Diagram** Rev: -

Drawn By: **WSH** AE:GS
OPS:MF

Date: **30 NOV 2007** Sheet **1/3**

File Name: T:\Customers\RI\Residence Inn Alexandria VA\Engineering\Drawings\INNCOM

PRELIMINARY FOR REVIEW ONLY



INNCOM
International Inc

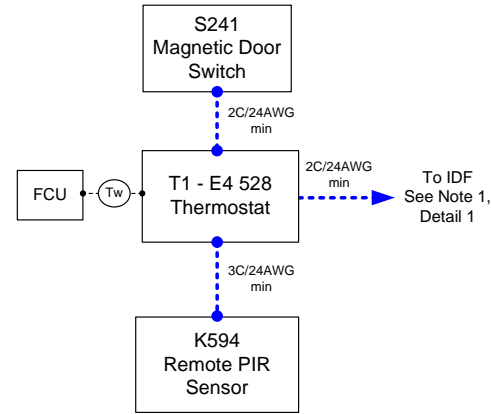
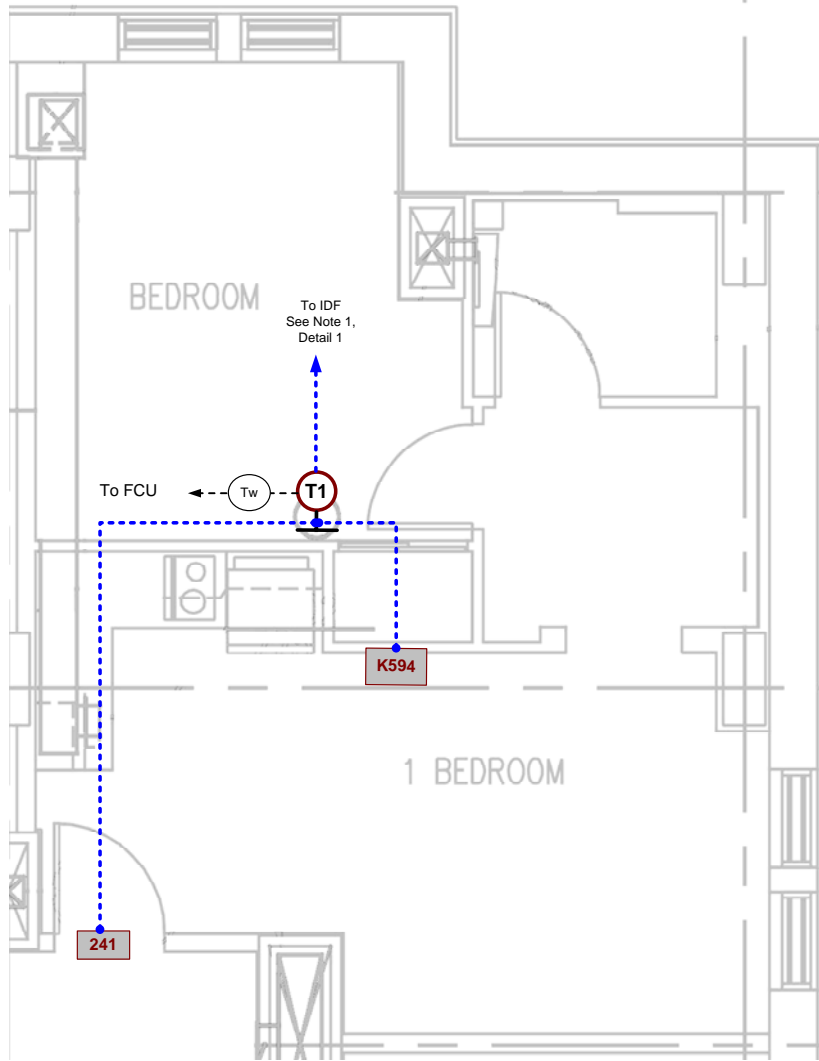
277 W Main St
Niantic, CT
06357
860-739-4468

DEVICE LEGEND

- T1 E4 (528) Thermostat
- 241 Magnetic Door Switch
- K594 Remote PIR Sensor (INNCOM K594)

CABLE LEGEND

- S5 Communication bus
Cat5 preferred, refer to block cabling diagram for specific conductor requirement.
- Line voltage
- Thermostat Wire, Both low and nominal voltage systems to follow UL and local codes
- Cat5 cable, Non INNCOM S5 Communication bus



Design Notes

1. A spare pair of conductors from the data jack is not viable. A dedicated CAT5 cable would be required if the data jack is used or a spare phone pair of conductors can be used.
2. The thermostat location shown will provide acceptable passive infrared room coverage. Note that the thermostats can be relocated, however note that coverage angle is about 178°. Thermostat must be positioned to provide IR coverage.
3. Remote Passive IR sensors are added where the thermostat does not provide adequate coverage. Location of remote IR sensor is flexible, however locate to provide maximum room coverage. Coverage angle is 178°
4. A B573 can support up to 80 room gateway devices (40 per Com 1 and 40 per Com 2) and must have an Ethernet connection in the IDF closet, static IP address required for each B573.

Project:		RESIDENCE INN ALEXANDRIA	
Drawing:		Standard 1 Bedroom Unit INNCOM Cable Diagrams	Rev: -
Drawn By:	WSH	AE:GS OPS:MF	
Date:	30 NOV 2007	Sheet	2/3
File Name: T:\Customers\IR\Residence Inn Alexandria VAI Engineering\Drawings\INNCOM			

PRELIMINARY FOR REVIEW ONLY



INNCOM
International Inc

277 W Main St
Niantic, CT
06357
860-739-4468

DEVICE LEGEND

- T1 E4 (528) Thermostat
- 241 Magnetic Door Switch
- K594 Remote PIR Sensor (INNCOM K594)

CABLE LEGEND

- S5 Communication bus
Cat5 preferred, refer to block cabling diagram for specific conductor requirement.
- Line voltage
- Thermostat Wire, Both low and nominal voltage systems to follow UL and local codes
- Cat5 cable, Non INNCOM S5 Communication bus

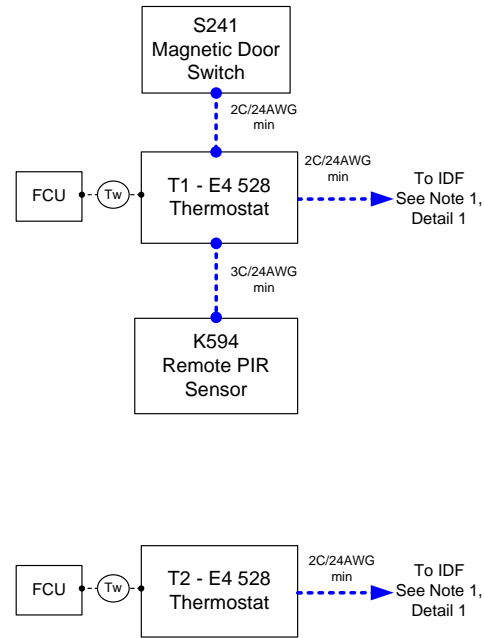
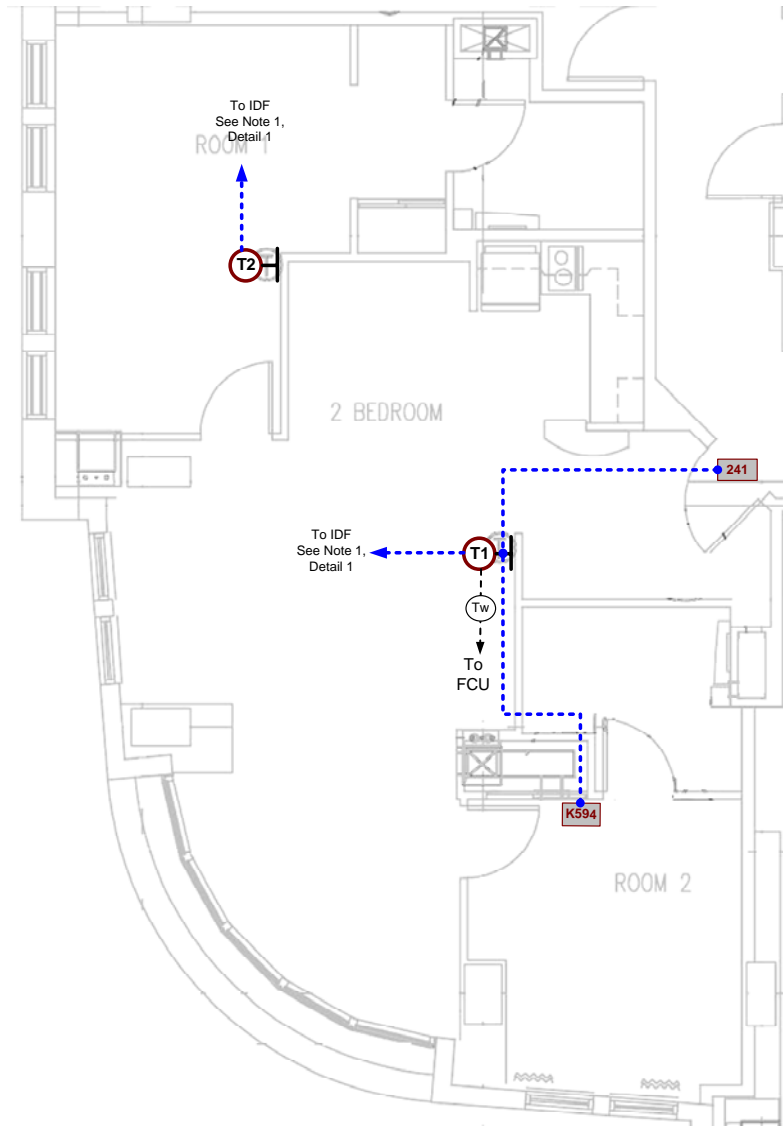
Project: **RESIDENCE INN
ALEXANDRIA**

Drawing: **Standard 2 Bedroom Unit
INNCOM Cable Diagrams** Rev: -

Drawn By: **WSH** AE: GS
OPS: MF

Date: **30 NOV 2007** Sheet **3/3**

File Name: **T:\Customers\I\Residence Inn Alexandria VA\Engineering\Drawings\INNCOM**



Design Notes

1. A spare pair of conductors from the data jack is not viable. A dedicated CAT5 cable would be required if the data jack is used or a spare phone pair of conductors can be used.
2. The thermostat locations shown provide acceptable passive infrared room coverage. Note that the thermostats can be relocated, however note that coverage angle is about 178°.
3. Remote Passive IR sensors are added where the thermostat does not provide adequate coverage. Location of remote IR sensor is flexible, however locate to provide maximum room coverage. Coverage angle is 178°.
4. A B572 Floor Bridge can support up to 80 room gateway devices (40 per Com 1 and 40 per Com 2) and must have an Ethernet connection in the IDF closet, static IP address required for each B572