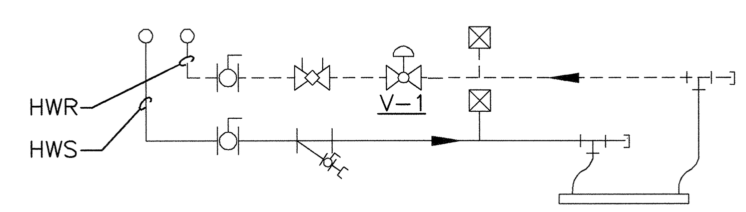
RADIANT HEATING PANEL CONTROL SEQUENCE

WHEN THE ROOM AIR TEMPERATURE, AS SENSED BY THE WALL-MOUNTED THERMOSTAT IS BELOW THE USER-ADJUSTABLE SETPOINT, RADIANT HEATING PANEL CONTROL VALVE, V-1 SHALL BE MODULATED TO MAINTAIN ITS RESPECTIVE SPACE TEMPERATURE SET POINT.



RADIANT HEATING PANEL

(AI) T — WALL-MOUNTED THERMOSTAT

SEE PLANS FOR LOCATION

A1 RADIANT HEATING PANEL CONTROL SEQUENCE

SCALE: NONE

JOB:
BUILDING:
PAGE:

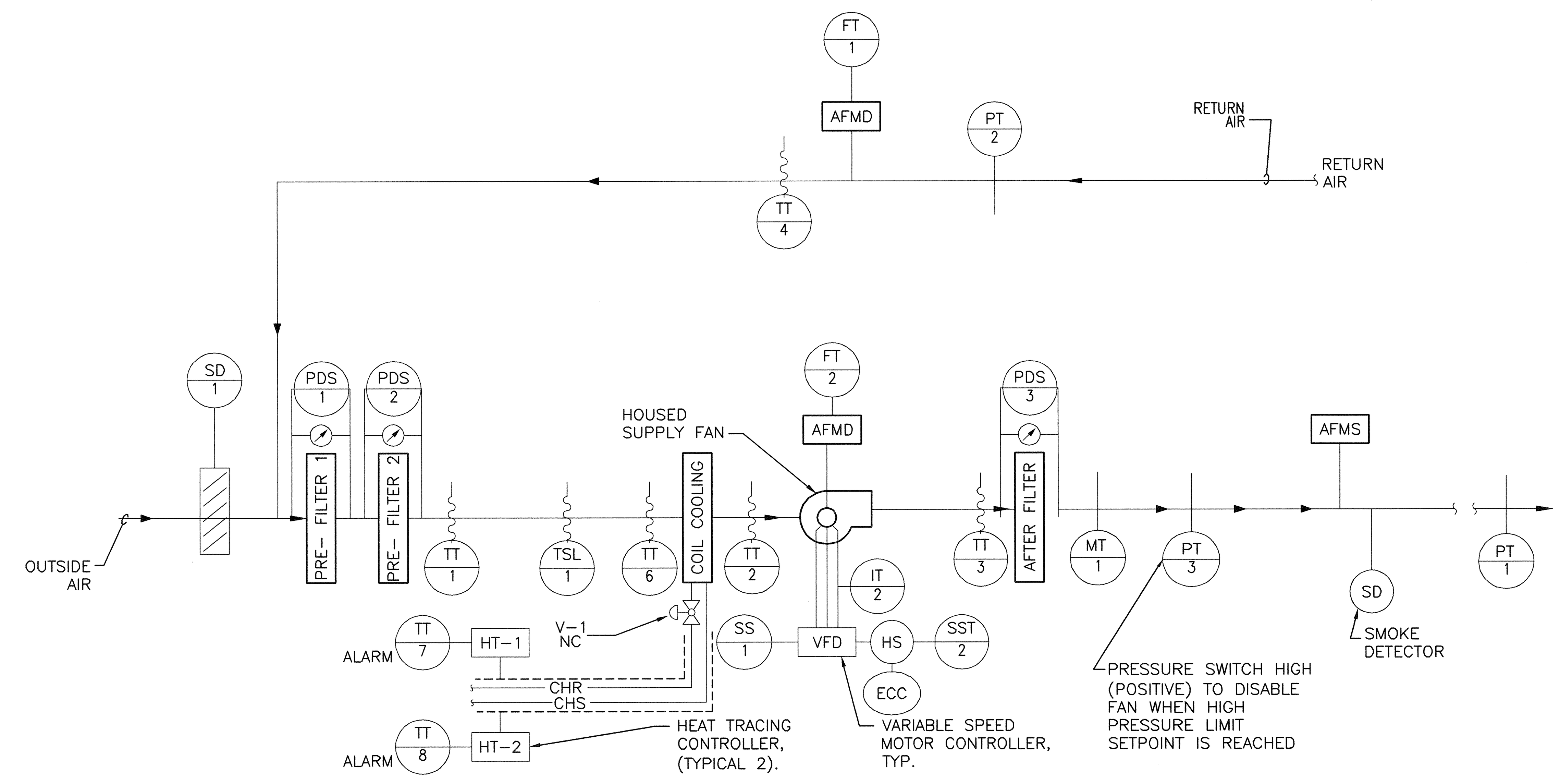
SYSTEM: 1-AHU-1, 1-EF-1, & ASSOCIATED SYSTEMS

JOB: BUILDING:			POINT LEGEND		SYSTEM OUTPUTS – BINARY				SYSTEM OUTPUTS – ANA-LOG			SYSTEM INPUTS – BINARY							SYSTEM INPUTS – ANALOG									SYSTEM SOFTWARE/CONTROL – ALARM PROCESSING							SYSTEM SOFTWARE/CONTROL – APPLICATION/FUNCTION																PAGE:
SYSTEM COMPONENT:	POINT ID	ABBREVIATION	PRIORITY/ADD-ALTERNATE NO.	--	ELECTRIC DEVICE	START/STOP	OPEN/CLOSE	--	SPEED COMMAND	VALVE POSITION	DAMPER POSITION	STATUS	ALARM	PRESSURE	HIGH HUMIDITY	HIGH STATIC PRESSURE	LOW TEMPERATURE	--	TEMPERATURE (TI)	PRESSURE	POSITION	FLOW	PERCENT	STATIC PRESSURE	CARBON MONOXIDE	HUMIDITY	VACUUM	Local Alarm Panel	Area Alarm Panel	Master Alarm Panel	HIGH LIMIT	LOW LIMIT	--	--	SCHEDULE START/STOP	FUNCTION	DUTY CYCLE	TEMPERATURE ECONOMIZER	ENTHALPY ECONOMIZER	TEMPERATURE RESET	DEMAND LIMITING	TEMPERATURE OVERRIDE	STATIC PRESSURE RESET	--	--	PRESSURE/VOLUME CONTROL	FAILURE MODE	SPACE TEMP. CONTROL	FULL COMMUNICATION	TRENDING	REMARKS
RETURN AIR FLOW (CFM)	AI-1	FT-1											●									●									●																			●	
MIXED AIR TEMPERATURE	AI-2	TT-1											●						●																															●	
COOLING COIL TEMPERATURE	AI-3	TT-2											●						●												●																			●	
DISCHARGE AIR TEMPERATURE	AI-4	TT-3											●						●																					●										●	
DUCT STATIC PRESSURE	AI-5	PT-1											●											●							●												●							●	
DISCHARGE AIR HUMIDITY	AI-6	MT-1											●													●																								●	
SUPPLY AIR FLOW (CFM)	AI-7	FT-2											●									●									●																			●	
PRE-FILTER (PF-1) PDS	AI-8	PDS-1											●											●							●																			●	
PRE-FILTER (PF-2) PDS	AI-9	PDS-2											●											●							●																			●	
AFTER-FILTER (AF-1) PDS	AI-10	PDS-3											●											●							●																			●	
ISOLATION ROOM PRESSURE	AI-11	P-1																																																	
HEPA FILTER PDS	AI-12	PDS-4																																																	
RETURN LOW PRESSURE	BI-1	PT-2												●																																				●	
SUPPLY FAN STATUS	BI-2	IT-1										●																																						●	
MIXED AIR LOW LIMIT	BI-4	TSL-1															●															●																		●	
STATIC PRESSURE HIGH LIMIT	BI-5	PT-3														●															●																			●	
SUPPLY FAN VFD ALARM	BI-6	SF-ALA											●																																					●	
FREEZE THERMOSTAT	BI-7	TT-6															●																																	●	
SUPPLY FAN VSMC	AO-1	SS-1											●																																				●	●	FULL COMMUNICATION
COOLING VALVE V-1	AO-2	CLG-V1								●																																							●	●	FULL COMMUNICATION
EXHAUST FAN VSMC	AO-3	SS-2							●				●																																				●	●	FULL COMMUNICATION
SUPPLY FAN START/STOP	BO-1	SST-1				●																													●															●	
OUTSIDE AIR SMOKE DAMPER	BO-2	SD-1					●																					●		●																					
HEAT TRACE HT-1	AI-13	TT-7			●								●						●									●		●																					
HEAT TRACE HT-2	AI-14	TT-8			●								●						●									●		●																					

NOTE: ALL CONTROLS POINTS REQUIRED, WHETHER SCHEDULED ABOVE, SHOWN IN THE SYSTEM SCHEMATIC, OR REQUIRED TO MAKE THE SEQUENCE WORK, SHALL BE PROVIDED.

C1 CONTROL POINTS LIST

SCALE: NONE



C7 VAV AHU CONTROL POINTS DIAGRAM

SCALE: NONE

1. OCCUPIED MODE

   1.1. HOURS OF OCCUPANCY SHALL BE DETERMINED BY THE VA COR.

   1.2. UNIT IS NORMALLY STARTED AND STOPPED REMOTELY AT THE ENGINEER CONTROL CENTER (ECC). H-0-A SWITCH SHALL BE KEPT IN THE "AUTO" POSITION. "HAND" AND "OFF" POSITIONS SHALL BE USED ONLY FOR MAINTENANCE.

2. TEMPERATURE CONTROL

   1.1. SUPPLY AIR TEMPERATURE (SAT), SENSED BY TT-1, SHALL BE MAINTAINED AT A SET POINT VIA DIGITAL CONTROL PANEL (DCP) BY MODULATING COILING COIL VALVE, CLG-V1.

3. AIR FLOW CONTROL

   1.1. THE SUPPLY AIR FLOW (SAF) SHALL BE CONTROLLED BY THE DCP MODULATING THE SUPPLY FAN VARIABLE SPEED MOTOR CONTROLLER TO MAINTAIN DUCT STATIC PRESSURE SETPOINT, SENSED BY PT-1. RESET STATIC PRESSURE BASED ON ACTUAL BUILDING LOAD BY POLLING ALL AIR TERMINAL UNITS.

   1.2. THE DCP, USING TOTAL SUPPLY AIR AND RETURN AIR FLOW SIGNALS, SHALL RESET THE SUPPLY AIR FAN VSMC TO MAINTAIN A CONSTANT AIR FLOW DIFFERENCE BETWEEN THE SUPPLY AIR AND THE RETURN AIR EQUAL TO MINIMUM OUTSIDE AIR. (OUTSIDE AIR CFM IS GREATER THAN EXHAUST AIR CFM TO MAINTAIN BUILDING PRESSURIZATION, DIFFERENCE BETWEEN OUTSIDE AIR AND EXHAUST AIR SHALL BE RELIEVED AT UNIT).

   1.3. HIGH PRESSURE SENSOR, PT-3 LOCATED AT THE SUPPLY FAN DISCHARGE, SHALL PREVENT THE SUPPLY FAN FROM DEVELOPING OVER 7.5" (ADJUSTABLE) OF STATIC PRESSURE. IF THE STATIC PRESSURE AT PT-3 DOES EXCEED 7.5", THE SUPPLY AIR FAN SHALL STOP. PT-3 SHALL BE HARDWIRED TO THE SUPPLY FAN VSMC AND THE UNIT SHALL BE SHUTDOWN IN HAND, AUTO OR BYPASS MODE. PT-3 SHALL REQUIRE MANUAL RESET AT THE DEVICE.

   1.4. THE LOW PRESSURE SENSOR, PSL LOCATED NEAR THE RETURN AIR INLET SHALL SHUTDOWN THE SUPPLY FAN WHEN ITS SETPOINT IS REACHED.

   1.5. UPON ACTIVATION OF THE SUPPLY AIR SMOKE DETECTOR, THE UNIT UNIT SHALL DE-ENERGIZE AND THE OUTSIDE AIR SMOKE DAMPERS SHALL CLOSE.

4. FREEZE PROTECTION

   1.1. IF THE AIR TEMPERATURE AS SENSED BY TT-3 FALLS BELOW 45°F, AN ALARM SIGNAL SHALL INDICATE AT THE DCP AND ECC. IF THIS TEMPERATURE FALLS BELOW 40°F, AS SENSED BY THE TSL, THE SUPPLY FAN SHALL SHUT DOWN AND A CRITICAL ALARM SHALL INDICATE AT THE DIGITAL CONTROL PANEL AND ECC. TSL SHALL BE HARDWIRED TO THE SUPPLY FAN VSMC AND THE UNIT SHALL BE SHUTDOWN IN HAND, AUTO OR BYPASS MODE. TSL SHALL REQUIRE MANUAL RESET AT THE DEVICE.

5. EMERGENCY CONSTANT SPEED OPERATION

   1.1. UPON FAILURE OF THE VFD, ALARM SHALL BE SENT TO ECC AND THE SUPPLY AND RETURN FANS SHALL BE STARTED/STOPPED MANUALLY AT THE DIGITAL CONTROL PANEL OR THE ECC THROUGH THE BYPASS STARTER. FANS SHALL THEN OPERATE AT CONSTANT SPEED.

F6 VAV AHU CONTROL SEQUENCE

SCALE: NONE

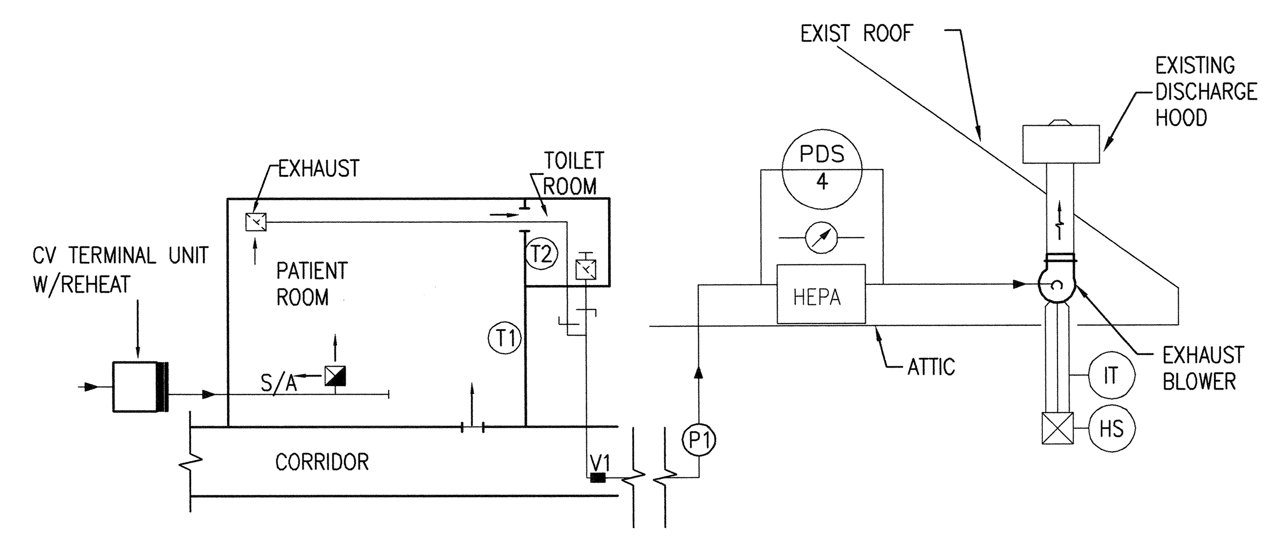
GENERAL SHEET NOTES

A. NEW EQUIPMENT, CONTROLS, MONITORS, ALARMS, ETC. SHALL BE FULLY INTEGRATED WITH THE EXISTING CONTROLS SYSTEM. CONTROLS CONTRACTOR SHALL INSTALL AND INTEGRATE FOR FULL SYSTEM FUNCTIONALITY AT THE EXISTING ENGINEERING CONTROL CENTER (ECC). COORDINATE ALL WORK AND PROJECT/LOCATION SPECIFIC REQUIREMENTS WITH COR AND VA ENGINEERING DEPARTMENT. COORDINATE INTEGRATION OF NEW SYSTEM WITH EXISTING CONTROLS PROVIDER FOR VA.

B. SEE DETAILS A6 AND C6 ON SHEET M503 FOR VAV BOX CONTROLS

GENERAL NOTES:

1. MAINTAIN NEGATIVE AIR PRESSURE (0.01 INCH WATER COLUMN [2.5 PASCAL]) BETWEEN THE AII ROOM AND THE CORRIDOR BY MODULATING VALVE V1. AII ROOMS SHALL HAVE A PERMANENTLY INSTALLED DEVICE AND/OR MECHANISM TO CONSTANTLY MONITOR THE DIFFERENTIAL AIR PRESSURE BETWEEN THE PATIENT ROOM AND THE CORRIDOR.
2. A LOCAL VISUAL MEANS SHALL BE PROVIDED TO INDICATE WHENEVER NEGATIVE DIFFERENTIAL PRESSURE IS NOT MAINTAINED AND AN ALARM SHALL BE SENT TO THE CENTRAL BAS (AFTER ADJUSTABLE TIME DELAY) VIA THE AHU CONTROL PANEL.
3. THE PATIENT BEDROOM IS KEPT UNDER NEGATIVE PRESSURE BY ENSURING AIR MOVEMENT INTO THE BEDROOM SPACE FROM THE ADJOINING CORRIDOR.
4. THE SUPPLY AIR SYSTEM SHALL CONSIST OF THE CONSTANT VOLUME AIR DELIVERY FROM A DEDICATED AIR TERMINAL UNIT WITH REHEAT COIL TO THE ISOLATION SUITE AS FOLLOWS:
5. [310 CFM (SUPPLY) / 0.7] + 85 CFM (TOILET) =445 CFM + 85 CFM = 530 CFM (EXHAUST)
6. THE HEPA FILTRATION SYSTEM SHALL BE PROVIDED WITH DIFFERENTIAL PRESSURE MONITORS. SHOULD THE PRESSURE DROP ACROSS THE FILTERS EXCEED THE HIGH LIMIT (USER ADJ.) AN ALARM SHALL BE SENT TO THE CENTRAL BAS VIA THE AHU CONTROL PANEL. FAN AND HEPA FILTER PRESSURE SENSORS SHALL BE POWERED FROM THE VAN VFD.



LEGEND

- (T1) ROOM THERMOSTAT TO CONTROL COOLING AND HEATING, INCLUDING PERIMETER HEAT (IF ANY)
- (T2) TOILET THERMOSTAT TO CONTROL PERIMETER HEAT (IF ANY)
- V1 AIR FLOW CONTROL VALVES PRESSURE INDEPENDENT TYPE
- (P) PRESSURE SENSOR

F9 AIR SYSTEM FOR NEGATIVE ISOLATION ROOM

SCALE: NONE

REVISION NO.	REVISION DESCRIPTION	
Revisions		By Date

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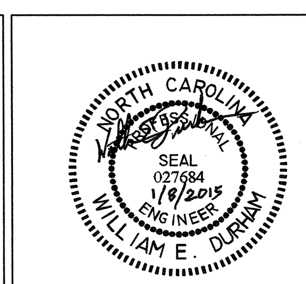

SEAL

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HDG PROJECT # 14001

APPROVALS:	
CHIEF OF ENGINEERING	

Drawing Title	Project Title			Date
MECHANICAL CONTROLS	RENOVATE 3B CLINIC FOR STEP-DOWN, B1			1/8/2015
				Project Number: 564-14-102
FULLY SPRINKLERED	Drawn: DWS	Building Number: 1	AutoCAD File Name	DRAWING No. M701
100% FINAL CONSTRUCTION DRAWINGS	Checked: DWS	Reviewed: JEM	Const. Contract No.	

Veterans Affairs

three inches = one foot
one and one half inches = one foot
one inch = one foot
three quarters inch = one foot
one half inch = one foot
three eighths inch = one foot
one quarter inch = one foot
one eighth inch = one foot