

CHILLED WATER AIR HANDLING UNIT SCHEDULE																										
ITEM	AREA SERVED	INDOOR FAN COIL UNIT						COOLING COIL DATA										VFD (INTEGRAL REMOTE, NONE)	WEIGHT (LBS.)	MANUAL SHUTDOWN PER NFPA 90A (YES/NO)	SINGLE POINT POWER (YES/NO)	ELECTRICAL DATA	MANUFACTURER/ MODEL #	REMARKS		
		SUPPLY AIR (CFM)	OUTSIDE AIR (CFM)	HP	ESP (IN.)	RPM	TOTAL BTUH	SENSIBLE BTUH	ENT. AIR		LVG. AIR		E.W.T.	L.W.T.	G.P.M.	W.P.D. (FT.)	A.P.D. (IN.)								FV (FPM)	ROWS
AHU-1	GYMNASIUM A125	11,500	1500/750	10	1.25"	1767	430,416.0	302,161.0	78.2°F	85.8°F	54.2°F	53.4°F	44.0°F	53.9°F	87.0	14.9'	0.6"	500.0	5.0	NONE	2418	YES	YES	208V/3Ø/60HZ	DAKIN/CAHQ24GDAM	

PUMP SCHEDULE																
ITEM	SYSTEM	TYPE	FLUID TYPE	FLUID FLOW (GPM)	HEAD (FEET)	IMPELLER DIAMETER (IN.)	PIPING CONNECTIONS SUCTION	DISCHARGE	PUMP EFFICIENCY (%)	RPM	H.P.	NPSHR (FT. W.C.)	VFD (INTEGRAL REMOTE, NONE)	ELECTRICAL DATA	MANUFACTURER/ MODEL #	REMARKS
FP-1	FREEZE PROTECTION CIRCULATION	IN-LINE	WATER	18.0	20.0'		3"	3"	--	1,725	1/2	--	NONE	120V/1Ø/60HZ	TACO/IL132	

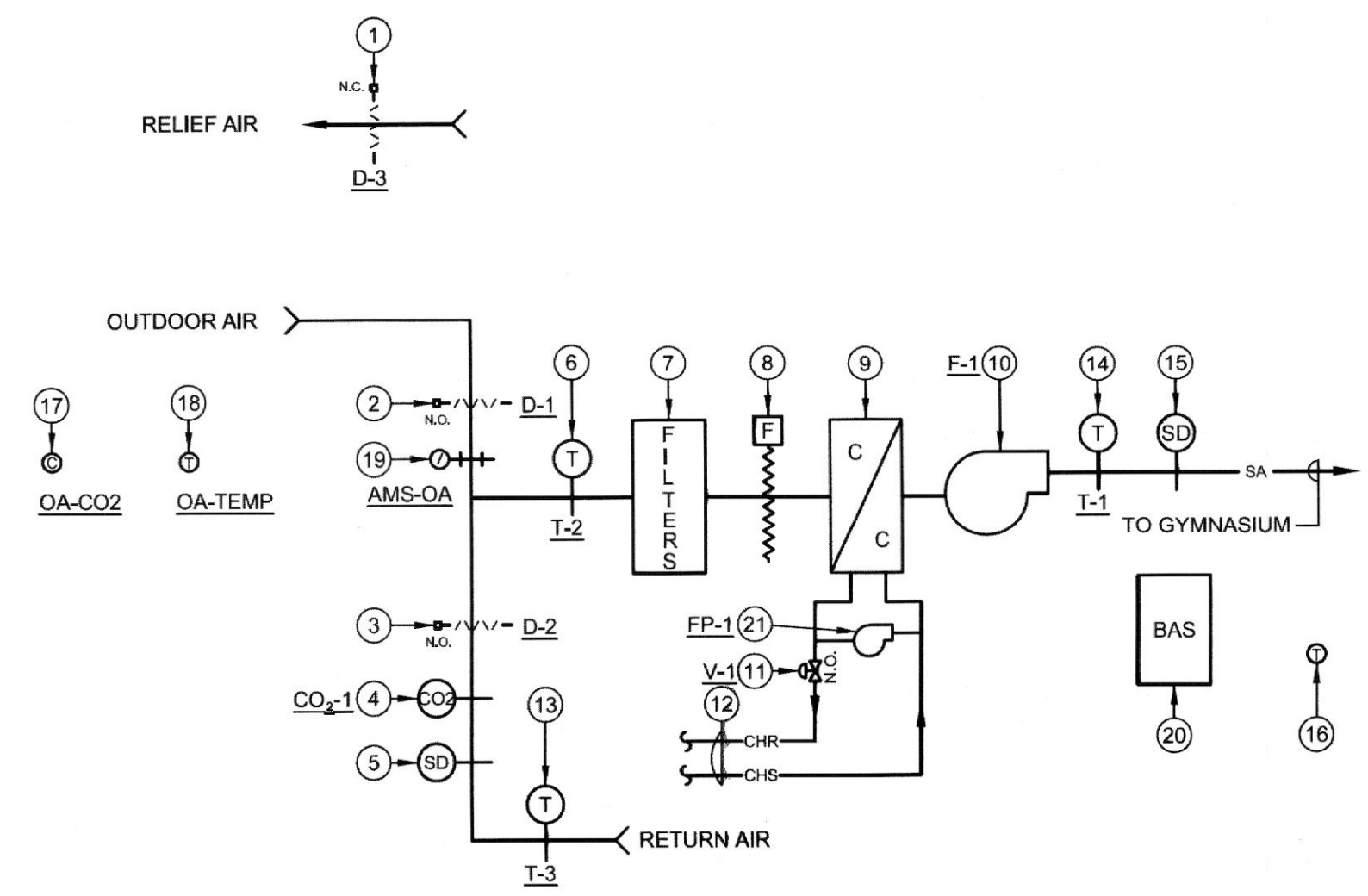
ENGINEER'S SEAL

ENGINEER'S CERTIFICATION STATEMENT

I certify that these documents were prepared or approved by me, and that I am a duly licensed engineer under the laws of the State of Maryland, license number 22464, expiration date, May 28, 2018.

DIAGRAM NOTES

- NORMALLY CLOSED RELIEF AIR DAMPER.
- NORMALLY CLOSED OUTDOOR AIR DAMPER.
- NORMALLY OPEN RETURN AIR DAMPER.
- CO₂ SENSOR MOUNTED IN DUCTWORK.
- RETURN DUCT MOUNTED SMOKE DETECTOR.
- MIXED AIR TEMPERATURE SENSOR.
- FILTERS.
- FREEZESTAT.
- CHILLED WATER COOLING COIL.
- SUPPLY AIR FAN.
- NORMALLY OPEN 2-WAY CONTROL VALVE.
- CHILLED WATER PIPING.
- RETURN AIR TEMPERATURE SENSOR.
- DISCHARGE AIR TEMPERATURE SENSOR.
- SUPPLY DUCT MOUNTED SMOKE DETECTOR.
- WALL MOUNTED ROOM THERMOSTAT WITH WIRE GUARD.
- OUTSIDE AIR CO₂ SENSOR.
- OUTSIDE AIR TEMPERATURE SENSOR.
- INTEGRAL AIRFLOW MEASURING STATION.
- EXISTING BUILDING AUTOMATION SYSTEM (BAS).
- IN-LINE FREEZE PROTECTION CIRCULATOR.



CONTROL DIAGRAM - CONSTANT AIR VOLUME AIR HANDLING UNIT WITH CHILLED WATER COOLING

NO SCALE (AHL-1)

SEQUENCE OF OPERATION:

GENERAL:
THE AIR HANDLING UNIT SHALL BE CONTROLLED BY THE EXISTING BUILDING AUTOMATION SYSTEM (BAS). OCCUPIED/UNOCCUPIED MODES OF OPERATION SHALL BE DETERMINED BY THE EXISTING BAS.

MORNING COOL DOWN:
WHEN INDEXED TO THE OCCUPIED MODE BY THE TIME SCHEDULE OF THE EXISTING BAS, RETURN AIR DAMPER D-2 SHALL BE OPEN, OUTSIDE AIR DAMPER D-1 SHALL BE CLOSED, SUPPLY AIR FAN F-1 SHALL BE ENERGIZED AND COOLING COIL TWO WAY CONTROL VALVE V-1 SHALL OPEN.
MORNING COOL DOWN MODE SHALL CONTINUE AS LONG AS THE RETURN AIR TEMPERATURE IS ABOVE 75°F AS SENSED BY RETURN AIR TEMPERATURE SENSOR T-3.
WHEN THE RETURN AIR TEMPERATURE REACHES 75°F, THE MORNING COOL DOWN SEQUENCE SHALL BE COMPLETED AND THE AIR HANDLING UNIT SHALL FUNCTION IN THE OCCUPIED MODE.

OCCUPIED MODE:
WHEN THE MORNING COOL DOWN SEQUENCE IS COMPLETE, OUTDOOR AIR DAMPER D-1 SHALL OPEN TO THE MINIMUM POSITION AND RETURN AIR DAMPER D-2 SHALL CLOSE PROPORTIONALLY.
THE ROOM THERMOSTAT SHALL MODULATE COOLING COIL TWO WAY CONTROL VALVE V-1 TO MAINTAIN THE COOLING OCCUPIED SETPOINT (75°F, ADJUSTABLE).

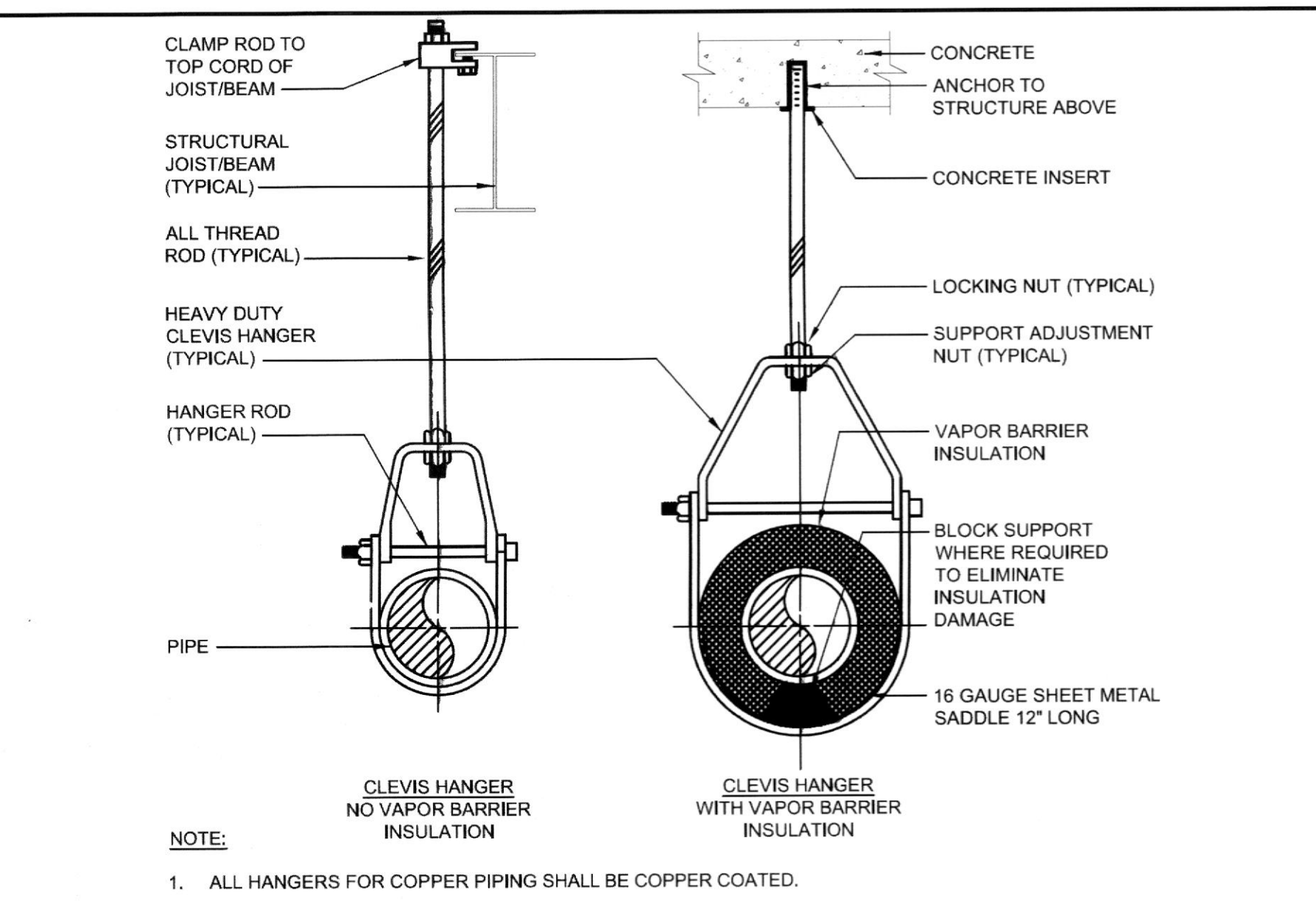
ECONOMIZER CONTROL:
WHEN THE OUTDOOR AIR TEMPERATURE IS BELOW 60°F, THE SPACE TEMPERATURE IS ABOVE THE SETPOINT AND COOLING COIL TWO WAY CONTROL VALVE V-1 IS COMPLETELY CLOSED, OUTDOOR AIR DAMPER D-1 SHALL MODULATE OPEN, RETURN AIR DAMPER D-2 SHALL MODULATE CLOSED PROPORTIONALLY TO MAINTAIN THE SPACE TEMPERATURE AND RELIEF AIR DAMPER D-3 SHALL OPEN.
UPON A RISE IN OUTDOOR AIR TEMPERATURE ABOVE 65°F, OUTDOOR AIR DAMPER D-1 SHALL CLOSE TO THE MINIMUM POSITION, RETURN AIR DAMPER D-2 SHALL OPEN TO THE MAXIMUM POSITION AND RELIEF AIR DAMPER D-3 SHALL CLOSE.

CO₂ MONITORING (DEMAND CONTROL VENTILATION):
DEMAND CONTROL VENTILATION SHALL BE IN ACCORDANCE WITH THE MOST CURRENT ASHRAE 62.1 STANDARD FOR VENTILATION RATE PROCEDURE. FACTORY-MOUNTED ASHRAE STANDARD 62 OUTSIDE AIRFLOW MONITORING AND CONTROL STATION AMS-OA SHALL CONTINUOUSLY SEND A SIGNAL TO THE EXISTING BAS INDICATING THE QUANTITY OF OUTSIDE AIR ENTERING THE AIR HANDLING UNIT (AHL-1). THE MONITOR SHALL TRACK A VARIABLE OUTSIDE AIR QUANTITY FOR VENTILATION DEMAND FLOW CONTROL AND VENTILATION FLOW DOCUMENTATION.
RETURN AIR CO₂ SENSOR CO₂-1 SHALL BE LOCATED IN THE RETURN AIR DUCT AND SHALL CONTINUOUSLY MONITOR THE CO₂ LEVELS.
GYMNASIUM CO₂ CONCENTRATION SHALL NOT EXCEED 700 PPM (ADJUSTABLE) ABOVE THE OUTSIDE AIR CO₂ CONCENTRATION AS MEASURED BY OUTSIDE AIR CO₂ SENSOR OA-CO₂. IF GYMNASIUM CO₂ LEVEL AS SENSED BY RETURN AIR CO₂ SENSOR CO₂-1 IS 700 PPM (ADJUSTABLE) ABOVE THE OUTSIDE AIR CO₂ CONCENTRATION AS SENSED BY OUTSIDE AIR CO₂ SENSOR OA-CO₂, OUTSIDE AIR DAMPER D-1 AND RELIEF AIR DAMPER D-3 SHALL MODULATE OPEN IN 5% INCREMENTS (ADJUSTABLE). RETURN AIR DAMPER D-2 SHALL MODULATE CLOSED PROPORTIONATELY. PROVIDE TEN (10) MINUTES (ADJUSTABLE) BETWEEN MODULATIONS.
WHEN THE CO₂ LEVEL AS SENSED BY THE RETURN AIR CO₂ SENSOR CO₂-1 NO LONGER EXCEEDS 700 PPM (ADJUSTABLE) ABOVE THE OUTSIDE AIR CO₂ CONCENTRATION, OUTSIDE AIR DAMPER D-1 SHALL CLOSE TO THE MINIMUM POSITION AND RELIEF AIR DAMPER D-3 SHALL CLOSE.
ECONOMIZER SYSTEM OPERATION SHALL OVERRIDE MAXIMUM VENTILATION OUTSIDE AIR DAMPER D-1 POSITION.

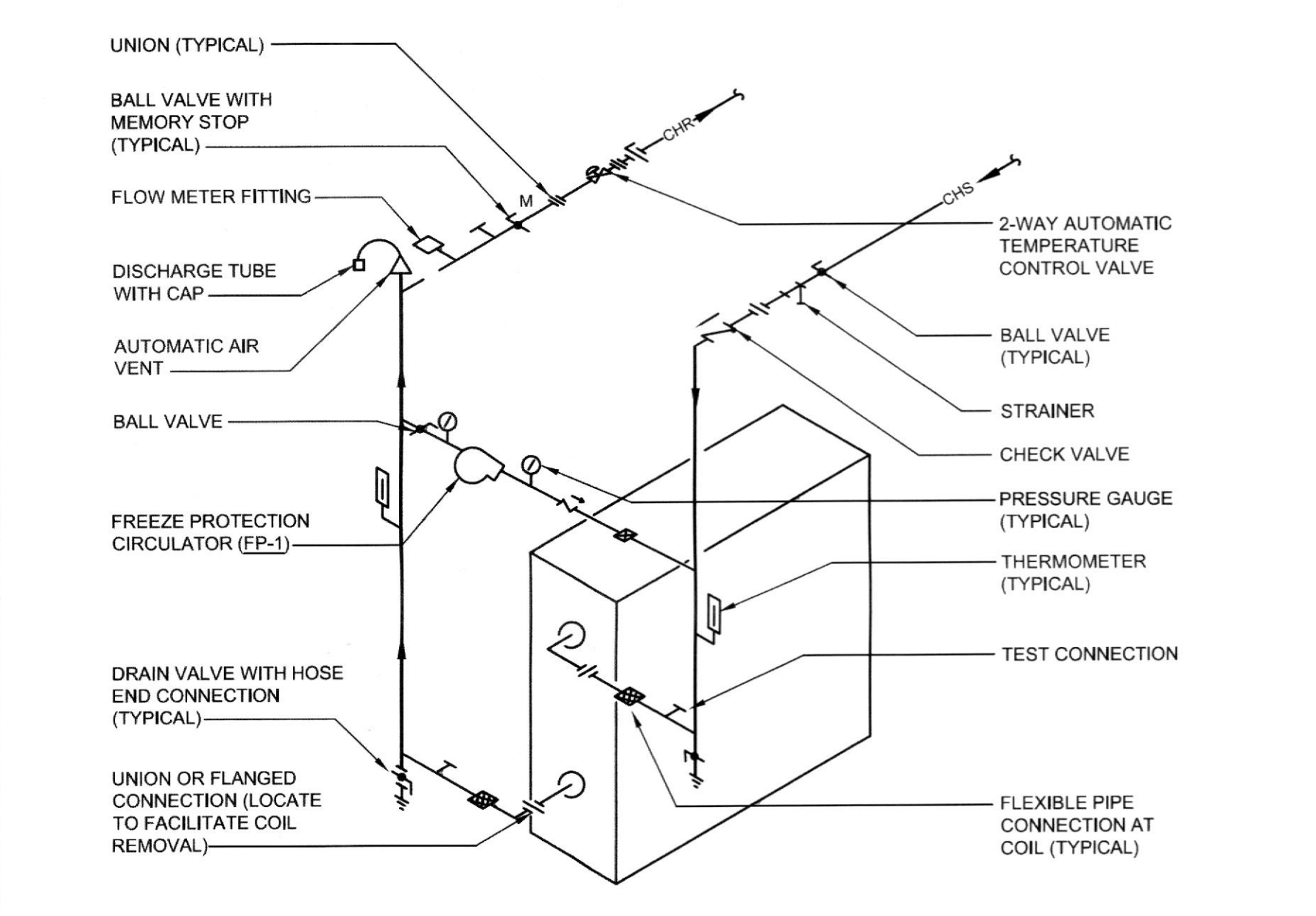
UNOCCUPIED MODE:
WHEN INDEXED TO THE UNOCCUPIED MODE BY THE TIME SCHEDULE OF THE EXISTING BAS, SUPPLY AIR FAN F-1 SHALL CYCLE TO MAINTAIN THE UNOCCUPIED COOLING SETPOINT (85°F, ADJUSTABLE).
OUTDOOR AIR DAMPER D-1 SHALL REMAIN CLOSED AND RETURN AIR DAMPER D-2 SHALL REMAIN OPEN. COOLING COIL TWO WAY CONTROL VALVE V-1 SHALL REMAIN CLOSED.
SAFETY AND EMERGENCY CONTROLS SHALL FUNCTION DURING THE UNOCCUPIED SEQUENCE THE SAME AS DURING THE OCCUPIED SEQUENCE.

SAFETIES:
WHENEVER THE SETTINGS OF THE DUCT SMOKE DETECTOR, OR FREEZESTAT ARE EXCEEDED, THE SUPPLY AIR FAN F-1 SHALL BE DE-ENERGIZED, OUTDOOR AIR DAMPER D-1 SHALL CLOSE, RETURN AIR DAMPER D-2 SHALL CLOSE, COOLING COIL TWO WAY CONTROL VALVE V-1 SHALL OPEN, FREEZE PROTECTION PUMP FP-1 SHALL ENERGIZE AND A CRITICAL ALARM SHALL SIGNAL AT THE EXISTING BAS.

FAN STATUS:
IF THE SUPPLY AIR FAN F-1 FAILS TO START WHEN INDEXED, OR FAILS DURING OPERATION, A CRITICAL ALARM SHALL SIGNAL AT THE EXISTING BAS.



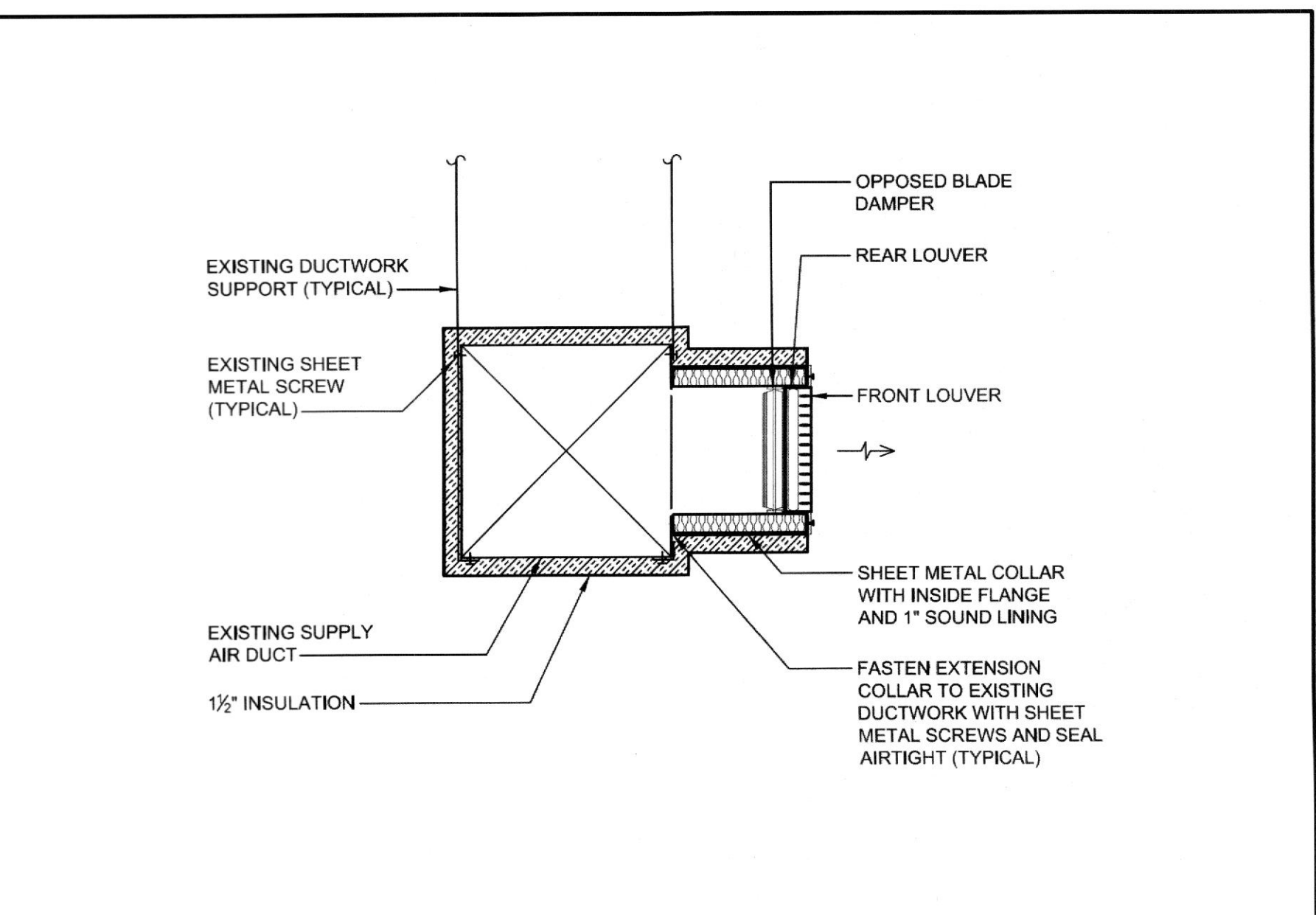
DETAIL - PIPE SUPPORT
NO SCALE



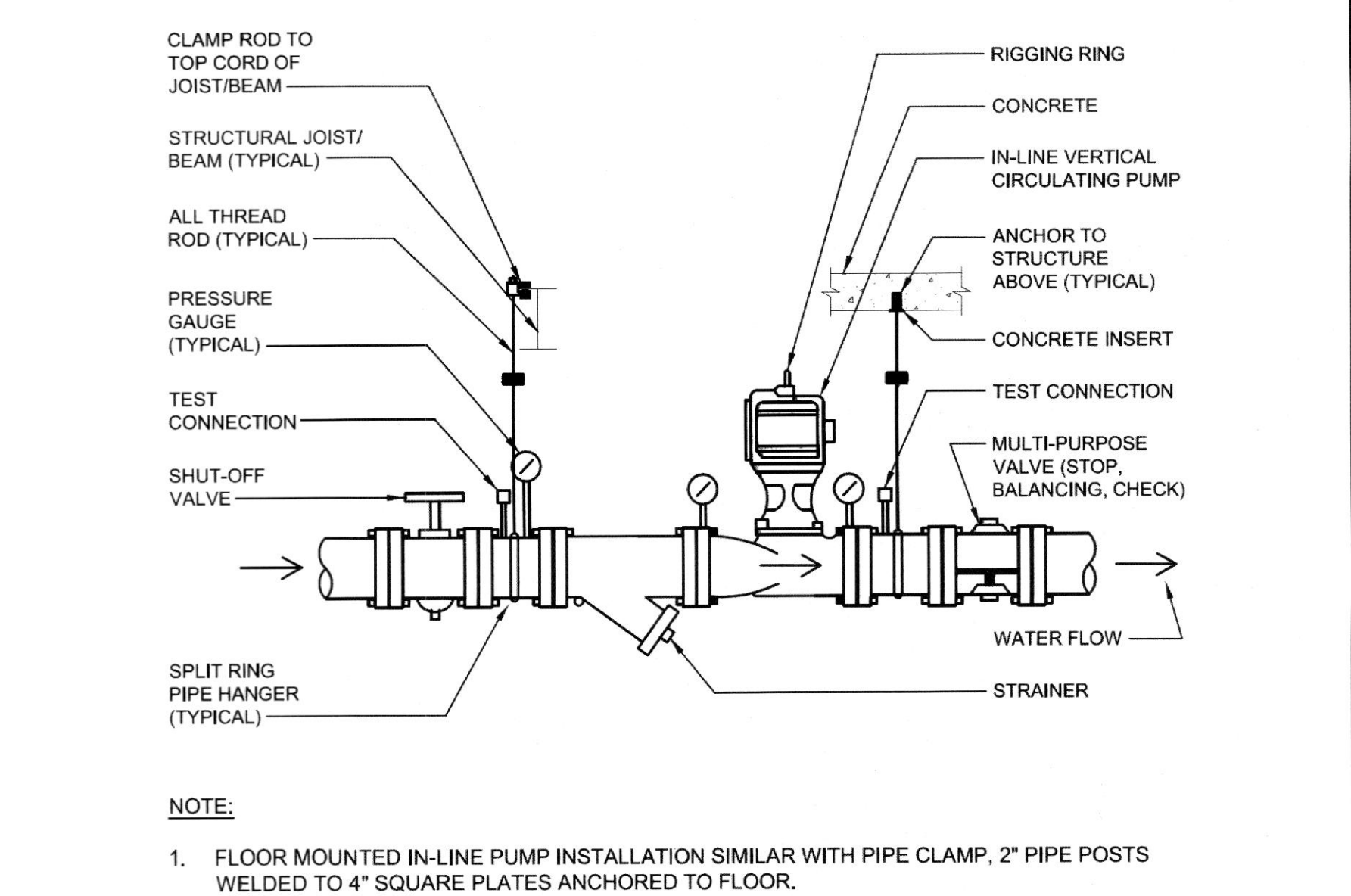
DETAIL - AIR HANDLING UNIT CHILLED WATER COIL CONNECTION (TWO-WAY VALVE)
NO SCALE

NOTES:

- REFER TO FLOOR PLANS FOR PIPE SIZES.
- REFER TO PUMP SCHEDULE FOR INFORMATION ON FREEZE PROTECTION CIRCULATOR.



DETAIL - SUPPLY AIR REGISTER (EXISTING SQUARE DUCT)
NO SCALE



DETAIL - IN-LINE PUMP
NO SCALE

NOTE:

- FLOOR MOUNTED IN-LINE PUMP INSTALLATION SIMILAR WITH PIPE CLAMP, 2" PIPE POSTS WELDED TO 4" SQUARE PLATES ANCHORED TO FLOOR.

NOTRE DAME PREPARATORY SCHOOL
GYMNASIUM AC UNIT UPGRADE
 815 HAMPTON LANE
 TOWSON, MARYLAND 21286

REVISIONS:

NO.	DESCRIPTION	DATE

LAST REV.:

PROJECT NO.: 16076B

DATE: 06/15/11

SCALE: NONE

TITLE: MECHANICAL DETAILS, SCHEDULES AND AIR HANDLING UNIT CONTROL DIAGRAM & SEQUENCE

SHEET:

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