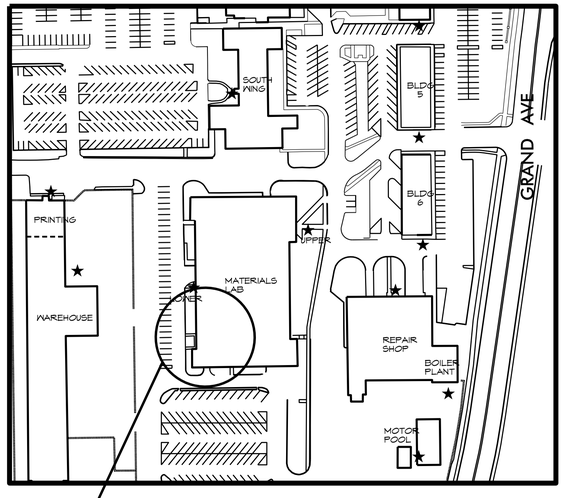
Materials Lab VAV Replacement

800 Lincoln Way
Ames, IA 50010
Project: BG–3A22(040)–80–85

IOWA DOT

OFFICE OF FACILITIES SUPPORT
800 LINCOLN WAY, AMES, IOWA 50010

INDEX OF DRAWINGS:



PROJECT LOCATION
SCALE: 1" = 1 MILE

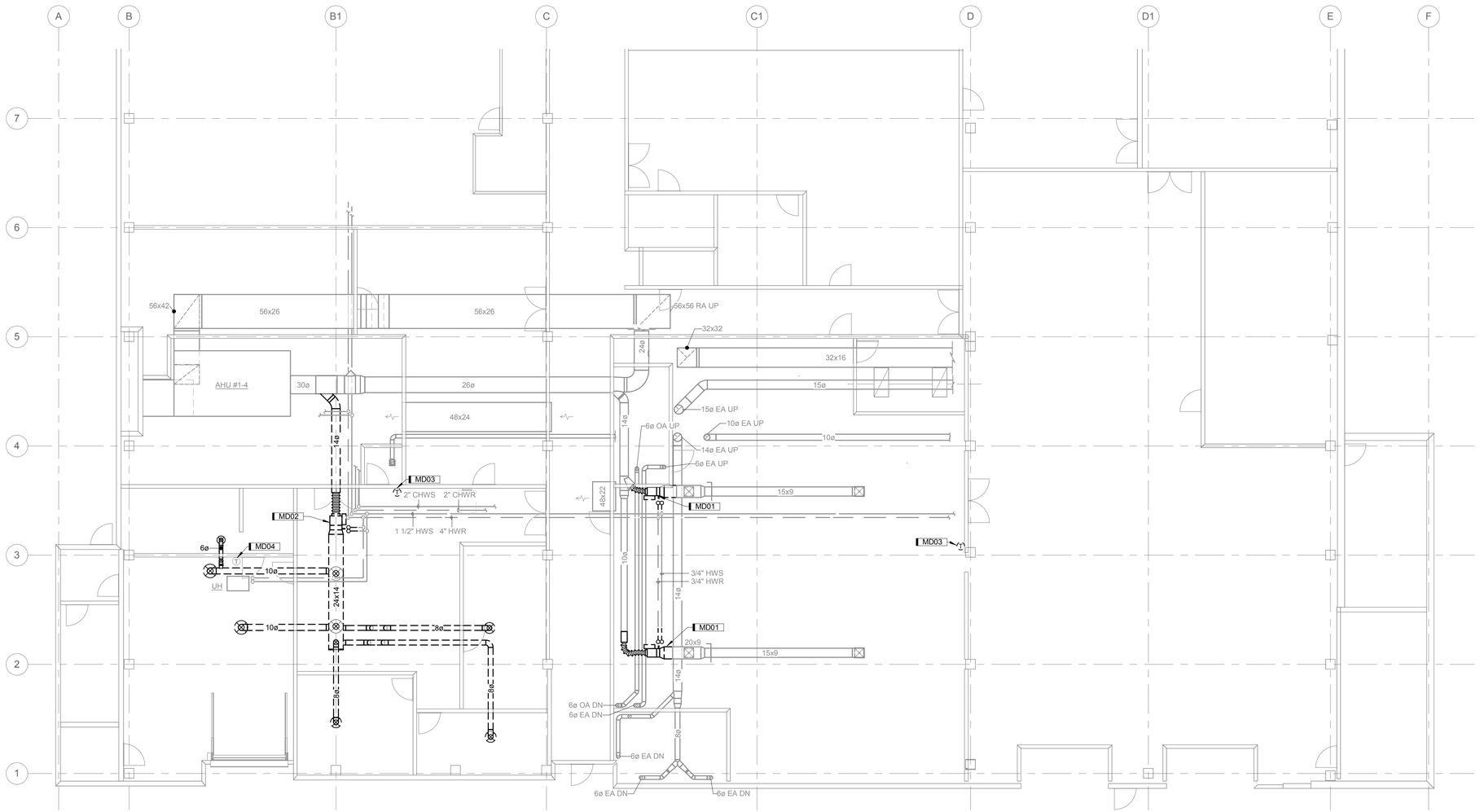
NORTH

DGN_LOC

KEYNOTE LEGEND	
MD01	REMOVE VAV BOX, FLEX DUCT, HARD DUCT, ASSOCIATED CONTROLS AND HWS/R PIPING AS REQUIRED FOR INSTALLATION OF NEW VAV BOX.
MD02	REMOVE VAV BOX, FLEX DUCT, ASSOCIATED CONTROLS AND ALL DOWNSTREAM DUCTWORK. REMOVE HWS/R PIPING AS REQUIRED FOR INSTALLATION OF NEW VAV BOXES.
MD03	REMOVE THERMOSTAT AND ASSOCIATED CONTROLS.
MD04	EXISTING THERMOSTAT FOR UH TO REMAIN.

GENERAL DEMOLITION NOTES

1. THIS DRAWING DIAGRAMMATICALLY REPRESENTS THE LAYOUT OF EXISTING CONDITIONS WITH MAJOR MECHANICAL AND ELECTRICAL COMPONENTS. THEY ARE NOT INTENDED TO SHOW ACCESSORIES OR INCIDENTALS COMMON TO EQUIPMENT INDICATED, THOUGH THESE ITEMS ARE TO BE REMOVED. ACCESSIBILITY TO DEMOLITION ITEMS SHALL NOT BE INFERRED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFICATION OF BUILDING AND EXISTING CONDITIONS, PRIOR TO BID SUBMISSION.
2. DEMOLITION SHALL INCLUDE ALL HANGERS, SUPPORTS, FITTINGS, DAMPERS, VALVES, ETC.
3. REPAIR ANY INSULATION DAMAGED DURING REMOVAL, REPAIR WORK TO BE SAME AS NEW.
4. LIGHT LINES INDICATE EXISTING DUCT, PIPING, EQUIPMENT, ETC. TO REMAIN. BOLD DASHED LINES INDICATE DEMOLITION WORK.
5. CONTRACTOR SHALL PATCH ALL UNUSED OPENINGS AND MODIFIED FINISH SURFACES. PATCHWORK SHALL MATCH MATERIALS, FINISH, AND TEXTURE OF ADJACENT SURFACES.
6. PROTECT ALL EXISTING EQUIPMENT FROM DAMAGE DURING CONSTRUCTION.
7. NOTE NOT ALL EXISTING CONDITIONS ARE SHOWN ON PLANS. CONTRACTOR SHALL FIELD VERIFY PRIOR TO SUBMITTING BID.



NORTH

A4 MECHANICAL DEMOLITION PLAN
1/8" = 1'-0"

SHIVEHATTERY
ARCHITECTURE + ENGINEERING
4125 Westown Pkwy, Suite 100 | West Des Moines, Iowa 50266
515.223.8194 | fax 515.223.8022 | www.shive-hattery.com
Iowa | Illinois | Indiana

IDOT - MATERIAL LAB ELECTRICAL PANEL AND VAV BOX REPLACEMENT

IOWA DOT
800 LINCOLN WAY AMES, IA 50010

DRAWN: TLS
APPROVED: BAS
ISSUED FOR: CONSTRUCTION
DATE: 09/09/2016
PROJECT NO: 4163720
FIELD BOOK:

MECHANICAL DEMOLITION PLAN

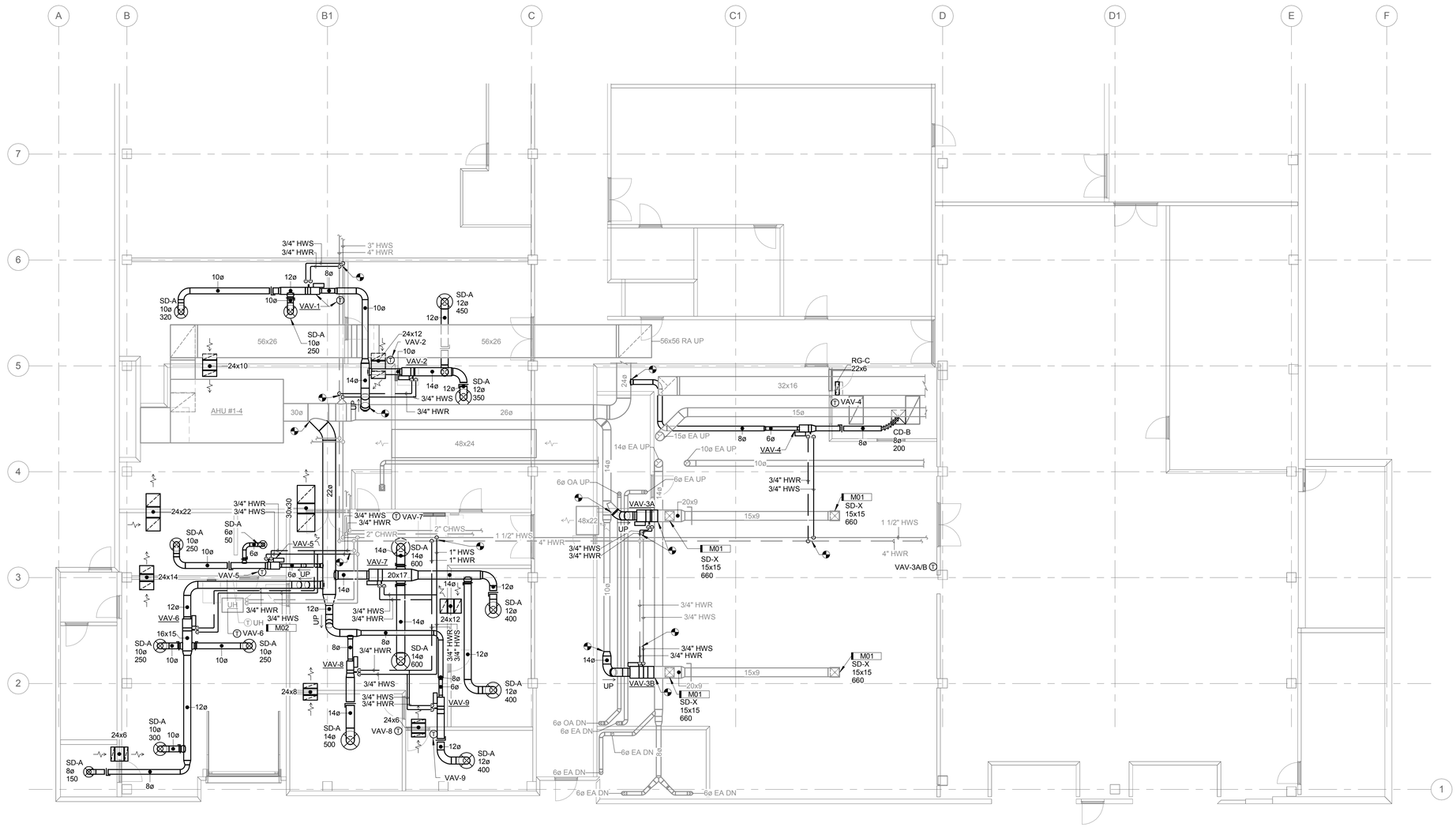
MD01

Printed:

KEYNOTE LEGEND	
M01	REBALANCE EXISTING SUPPLY DIFFUSER TO FLOW INDICATED.
M02	SET EXISTING UNIT HEATER T-STAT FOR 5°F BELOW VAV-6 SETPOINT.

GENERAL MECHANICAL NOTES

1. LIGHT LINES INDICATE EXISTING PIPING, DUCTWORK, EQUIPMENT, ETC. TO REMAIN. BOLD LINES INDICATE PIPING, DUCTWORK, EQUIPMENT, ETC. TO BE INSTALLED THIS CONTRACT UNLESS NOTED OTHERWISE.
2. DRAWINGS INDICATES APPROXIMATE ROUTING OF PIPING OR DUCTWORK AND DOES NOT INCLUDE ALL OFFSETS, FITTINGS, ETC. CONTRACTOR TO FIELD VERIFY EXISTING PIPE/DUCT SIZES AND SERVICE PRIOR TO FINAL CONNECTION.
3. COORDINATE ROUGH-IN AND FINAL LOCATION OF DUCTWORK AND PIPING WITH LIGHTING, STRUCTURE, SPRINKLER, ETC. PROVIDE OFFSETS AND/OR EASEMENTS, OR RELOCATE AS REQUIRED TO AVOID CONFLICTS WITH WORK OF OTHER TRADES.
4. PROVIDE TEMPORARY FILTRATION ON RETURNS DURING CONSTRUCTION TO PREVENT DUST FROM SPREADING TO DUCTWORK, HVAC EQUIPMENT AND NON CONSTRUCTION AREAS.
5. BREAK CONNECTIONS ARE REQUIRED AT ALL MAJOR EQUIPMENT AND ALL PIPING ITEMS THAT REQUIRE REMOVAL FOR MAINTENANCE.
6. FIRE SAFE ALL PIPE PENETRATIONS PER UL AT RATED WALLS.
7. ANY AND ALL SHUTDOWNS SHALL BE COORDIANTED WITH THE OWNER.
8. DUCT SIZES SHOWN ON DRAWINGS ARE NET INSIDE DIMENSIONS. INCREASE DUCT SIZES AS REQUIRED TO ALLOW FOR INSTALLATION OF DUCT LINER, WHERE SPECIFIED.
9. ALL DUCT DIFFUSERS TO TERMINATE APPROX. 9'-0" AFF.
10. MOUNT ALL TRANSFER DUCTS AS HIGH AS POSSIBLE.
11. TEMPERATURE CONTROL SYSTEM SHALL BE PROVIDED AND INSTALLED BY JOHNSON CONTROLS UNDER A SEPERATE CONTRACT WITH THE IDOT AND ARE NOT PART OF THIS BID. THIS CONTRACTOR SHALL BE RESPNSIBLE FOR COORDINATING WITH JOHNSON CONTROLS PRIOR TO BID.



NORTH

A4 MECHANICAL NEW WORK PLAN
1/8" = 1'-0"

SHIVEHATTERY
ARCHITECTURE + ENGINEERING
4125 Westown Pkwy, Suite 100 | West Des Moines, Iowa 50266
515.223.9194 | fax 515.223.6022 | www.shive-hattery.com
Iowa | Illinois | Indiana

IDOT - MATERIAL LAB ELECTRICAL
PANEL AND VAV BOX REPLACEMENT

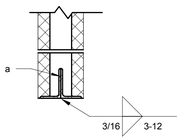
IOWA DOT
800 LINCOLN WAY AMES, IA 50010

DRAWN: TLS
APPROVED: BAS
ISSUED FOR: CONSTRUCTION
DATE: 08/09/2016
PROJECT NO: 4163720
FIELD BOOK:

MECHANICAL
NEW WORK PLAN

M101

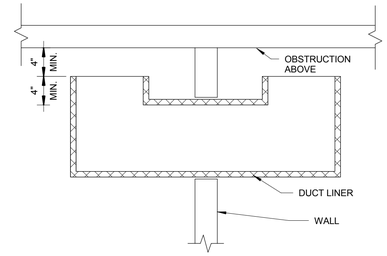
Printed:

LINTEL SCHEDULE			
TYPE	MATERIAL	CONFIGURATION	REMARKS
L2	a. (2) L5x3-1/2x5/16 - AT 8" CMU b. (2) L3-1/2x2-1/2x5/16 - AT 6" CMU		FOR USE AT DUCT OPENINGS IN CMU WALLS 1'-0" TO 6'-0" UNLESS NOTED OTHERWISE

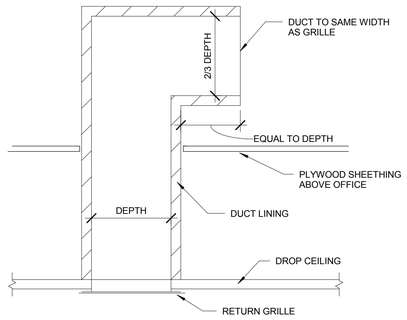
NOTES:

A. MINIMUM BEARING FOR ALL LINTELS SHALL BE 8" EACH END UNLESS OTHERWISE NOTED.
B. CMU WALLS SHALL BE GROUTED SOLID THREE COURSES BELOW LINTEL BEARING POINT AS A MINIMUM.
C. SEE DRAWINGS FOR SIZE AND LOCATION OF WALL OPENINGS.
D. SOLID MASONRY "BOND BEAM" LINTELS AND ITS GROUTED COURSES SHALL NOT BE PENETRATED UNLESS APPROVED BY ENGINEER.
E. FOR ALL LINTELS IN EXISTING WALLS, REMOVE EXISTING CMU AS REQUIRED FOR LINTEL INSTALLATION. SHORE EXISTING CMU. PATCH CMU AS REQUIRED. PATCHWORK SHALL MATCH EXISTING TEXTURE, STYLE, COLOR, AND FINISH.

A2 LINTEL SCHEDULE
NOT TO SCALE

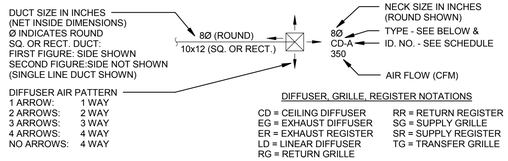


C1 TRANSFER DUCT DETAIL
NOT TO SCALE



C2 FREE AIR RETURN GRILLE
NOT TO SCALE

DIFFUSER NOTATION



LINE WEIGHTS

DEMOLITION APPLIES TO MD SHEETS

BOLD DASHED LINES INDICATE EXISTING EQUIPMENT, DUCTWORK, PIPING, ETC. TO BE REMOVED THIS CONTRACT UNLESS NOTED OTHERWISE.

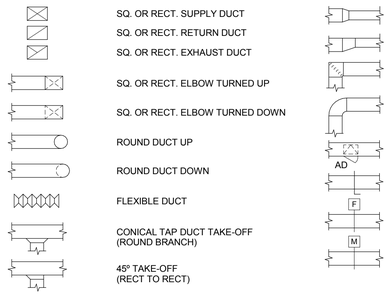
LIGHT SOLID LINES INDICATE EXISTING EQUIPMENT, DUCTWORK, PIPING, ETC. TO REMAIN UNLESS NOTED OTHERWISE.

NEW WORK

BOLD LINES INDICATE NEW EQUIPMENT, DUCTWORK, PIPING, ETC. THIS CONTRACT UNLESS NOTED OTHERWISE.

LIGHT SOLID LINES INDICATE EXISTING EQUIPMENT, DUCTWORK, PIPING, ETC. TO REMAIN UNLESS NOTED OTHERWISE.

MECHANICAL SYMBOLS

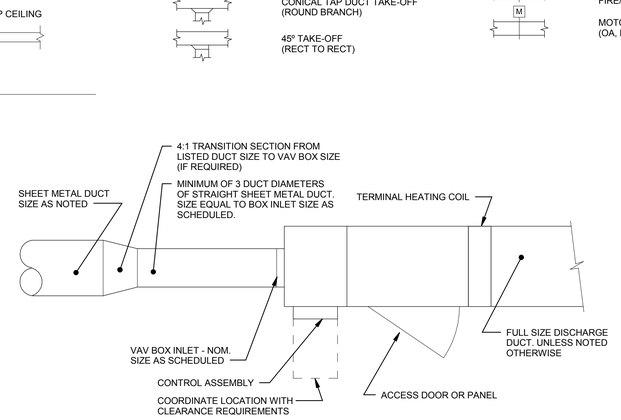


DIFFUSERS, REGISTERS, AND GRILLES SCHEDULE						
MARK	MATERIAL OF CONSTRUCTION	DESCRIPTION	FACTORY FINISH	BLOW PATTERN	DESIGN BASIS	REMARKS
A	ALUMINUM	ADJ. ROUND CEILING DIFFUSER	BY ARCH	360°, HORIZONTAL OR VERTICAL ADJUSTMENT	TITUS TMRA-AA	
B	ALUMINUM	24"x24" CEILING DIFFUSER	BY ARCH	4 WAY	TITUS TMSA-AA	
C	ALUMINUM	1/2"x1/2"x1/2" EGGCRATE	BY ARCH	-	TITUS 50F	

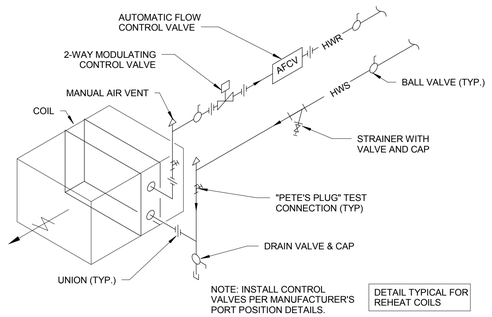
VAV BOX SCHEDULE															
		CFM					HEATING COIL DATA						AIR TEMPERATURE (°F)		
PLAN MARK	UNIT SIZE	COOLING MAX	HEATING MAX	MIN CFM	MAX APD (INCH W.C.)	MAX NC	ROWS	MBH	GPM	WPD (FT H20)	EWT (°F)	LWT (°F)	EAT	LAT	DESIGN BASIS	REMARKS
VAV-1	8	570	570	150	0.25	30	2	23.3	1.25	0.24	180	142	55	93	TITUS DESV	
VAV-2	10	800	310	200	0.25	30	1	12.3	1.00	0.13	180	155	55	92	TITUS DESV	
VAV-3A	14	1320	1000	450	0.25	30	2	41.6	1.50	0.15	180	123	55	94	TITUS DESV	
VAV-3B	14	1320	1000	450	0.25	30	2	41.6	1.50	0.15	180	123	55	94	TITUS DESV	
VAV-4	6	200	80	80	0.25	30	1	4.6	0.50	0.14	180	161	55	108	TITUS DESV	
VAV-5	6	300	215	80	0.25	30	2	9.3	0.50	0.06	180	142	55	95	TITUS DESV	
VAV-6	12	950	950	325	0.25	30	2	37.6	1.50	0.24	180	129	55	92	TITUS DESV	
VAV-7	14	2000	500	500	0.25	30	1	18.8	1.00	0.11	180	142	55	91	TITUS DESV	
VAV-8	8	500	400	145	0.25	30	2	16.4	0.75	0.14	180	135	55	93	TITUS DESV	
VAV-9	6	400	400	100	0.25	30	2	16.6	1.00	0.15	180	146	55	94	TITUS DESV	

NOTES: 1. HEATING DATA BASED ON WATER AT 180°F.

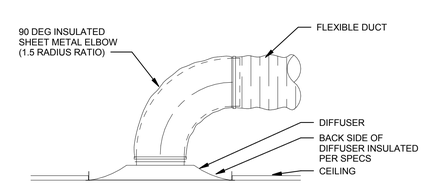
A. VARIABLE AIR VOLUME BOXES (VAV BOXES) SEQUENCE OF OPERATION (TYPICAL):
1. VARIABLE VOLUME BOXES SHALL BE MONITORED FOR AIRFLOW AND DISCHARGE AIR TEMPERATURE. EACH VARIABLE VOLUME BOX SHALL HAVE A ROOM SENSOR. THE VARIABLE VOLUME BOXES SHALL COMMUNICATE WITH THEIR RESPECTIVE AIR HANDLING UNIT TO VERIFY THAT THE UNIT IS IN THE COOLING MODE OR HEATING MODE AND OCCUPIED/UNOCCUPIED MODE. WHEN THE UNIT IS IN THE OCCUPIED MODE THE MINIMUM DAMPER POSITION SHALL BE MAINTAINED AS SCHEDULED ON THE DRAWINGS. THE MINIMUM DAMPER POSITION SHALL BE RESET THROUGH THE DDC SYSTEM BASED ON ROOM OCCUPANCY. IF UNOCCUPIED, THE DAMPER MAY BE ALLOWED TO CLOSE.
2. SPACE COOLING - UPON A RISE IN SPACE TEMPERATURE, THE VARIABLE AIR VOLUME BOX SHALL COMMUNICATE WITH THE AIR HANDLING UNIT TO VERIFY THAT THE UNIT IS IN THE COOLING MODE. THE BOX SHALL THEN MODULATE OPEN AND CLOSED AS REQUIRED TO PROVIDE ADDITIONAL COOLING TO THE SPACE TO SATISFY THE SPACE SETPOINT TEMPERATURE.
3. SPACE HEATING - WHEN THE ZONE IS IN THE HEATING MODE, THE HEATING LOOP SHALL MAINTAIN SPACE TEMPERATURE AT THE HEATING SETPOINT AS FOLLOWS:
   A. FROM 0%-50 LOOP SIGNAL, THE VARIABLE AIR VOLUME BOX SHALL BE SET TO THE MINIMUM AIRFLOW SETPOINT AND THE HEATING LOOP OUTPUT SHALL MODULATE THE DISCHARGE AIR TEMPERATURE SETPOINT UP TO 90°F TO SATISFY THE SPACE SETPOINT TEMPERATURE.
   B. FROM 50%-100% LOOP SIGNAL, THE HEATING LOOP OUTPUT SHALL MODULATE THE ZONE AIRFLOW SETPOINT FROM THE MINIMUM AIRFLOW SETPOINT TO THE MAXIMUM HEATING AIRFLOW SETPOINT TO SATISFY THE SPACE SETPOINT TEMPERATURE. THE SUPPLY AIR DISCHARGE TEMPERATURE REMAINS AT 90°F.
   C. THE HOT WATER VALVE SHALL BE MODULATED USING A PI CONTROL LOOP TO MAINTAIN THE DISCHARGE TEMPERATURE AT SETPOINT. NOTE THAT DIRECTLY CONTROLLING THE HOT WATER VALVE FROM THE ZONE TEMPERATURE PI LOOP IS NOT ACCEPTABLE SINCE IT WILL NOT ALLOW SUPPLY AIR TEMPERATURE TO BE UNDER CONTROL AND LIMITED IN TEMPERATURE TO PREVENT STRATIFICATION.;



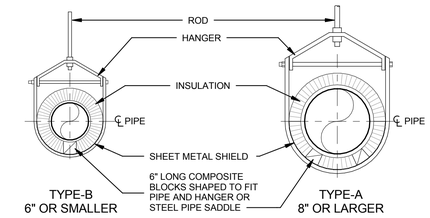
C3 VARIABLE VOLUME BOX (VAV) DETAIL
NOT TO SCALE



C4 VAV BOX HOT WATER PIPING DIAGRAM
NOT TO SCALE



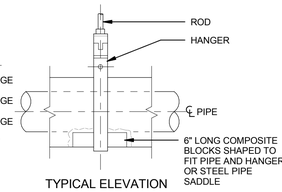
E3 DIFFUSER CONNECTION DETAIL
NOT TO SCALE



SHIELD SCHEDULE

2" AND SMALLER:	16 GAGE
2 1/2" TO 6":	14 GAGE
8" AND LARGER:	12 GAGE

LENGTH OF SHIELD TO BE AT LEAST 6" LONGER THAN THE OUTSIDE DIAMETER OF THE INSULATION



E4 INSULATED PIPE HANGER DETAIL
NOT TO SCALE

SHIVEHATTERY
ARCHITECTURE + ENGINEERING
4125 Westown Pkwy, Suite 100 | West Des Moines, Iowa 50266
515.223.9194 | fax 515.223.6022 | www.shive-hattery.com
Iowa | Illinois | Indiana

IDOT - MATERIAL LAB ELECTRICAL PANEL AND VAV BOX REPLACEMENT

IOWA DOT
800 LINCOLN WAY AMES, IA 50010

DRAWN: BAS
APPROVED: BAS
ISSUED FOR: CONSTRUCTION
DATE: 09/09/2016
PROJECT NO: 4163720
FIELD BOOK:

MECHANICAL SCHEDULES

M600

Printed