

RECEIVED  
AUG 21 2017  
1732 E. SUNSHINE ST. SUITE 417  
SPRINGFIELD, MO

**OUTSIDE AIR SETUP:**

CONTRACTOR TO SET DAMPERS AS FOLLOWS:  
 ECONOMIZER MODE MAXIMUM CFM PER UNIT  
 7.5 TON RTU = 3,000  
 9 TON RTU = 2,000  
 MINIMUM OUTSIDE AIR CFM PER RTU  
 (TYPICAL) = 530 DURING OCCUPIED HOURS ONLY.

**HVAC OUTDOOR AIR REQUIREMENTS**

MECHANICAL CODE REFERENCE:  
FOR REQUIRED OUTDOOR VENTILATION AIR IN RETAIL - "SALES/STORAGE ROOM"

1. SHOWROOM =	3510	SQUARE FEET
2. HARD PARTS =	3757	SQUARE FEET
SHOWROOM (SALES)		
3510 (SQUARE FEET) + 1000 (SQUARE FEET) =	3,510	
3,510 x 15 (PERSONS/1000 SQUARE FEET) =	53	PERSONS
(CFM/ PERSON x PERSONS) + (CFM/SQUARE FEET x SQUARE FEET) =	CFM	
(7.5 x 53) + (.12 x 3510) =	1818.70	CFM OF OUTSIDE AIR REQUIRED
1818.70 ÷ .8 (EFFECTIVENESS) =	1023	CFM
HARD PARTS (STORAGE ROOM)		
3757 x .12 (CFM/SQUARE FEET) =	450.84	CFM OF OUTSIDE AIR REQUIRED
450.84 ÷ .8 (EFFECTIVENESS) =	563	CFM
1023 CFM + 563 CFM =	1586	TOTAL CFM
TOTAL OUTSIDE AIR MINIMUM REQUIRED BY CODE:	1586	CFM
OUTSIDE AIR SPECIFIED ON PLAN SHEET M1:	1590	CFM

**HVAC SYSTEMS TESTING & BALANCING**

THE HVAC SYSTEM SHALL BE TESTED AND BALANCED (T&B) BY THE CONTRACTOR PER SPEC SECTION: 23\_05\_93 AND IN ACCORDANCE WITH THE PROCEDURES OF AABC OR NEBB. CONTRACTOR SHALL SUBMIT WRITTEN T&B REPORTS TO THE OWNER. SINCE THIS O'REILLY STORE IS LESS THAN 50,000 SQ. FT. THEN SYSTEM COMMISSIONING IS NOT REQUIRED PER ASHRAE 90.1.

**HVAC - KEYNOTES**

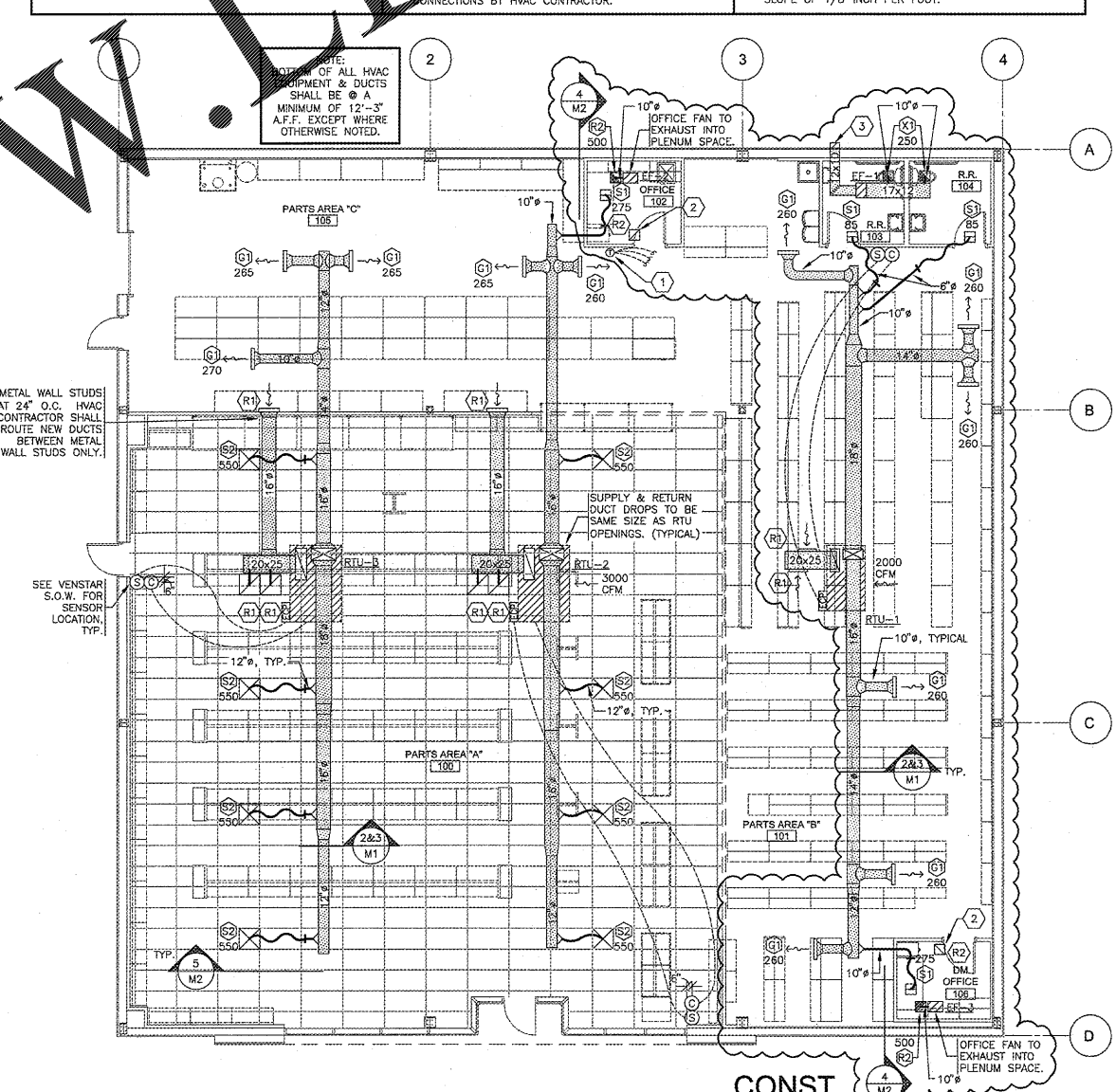
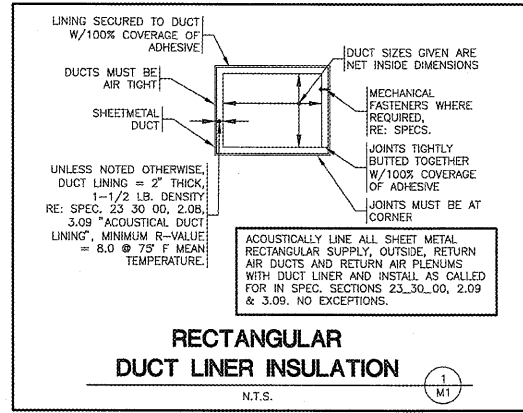
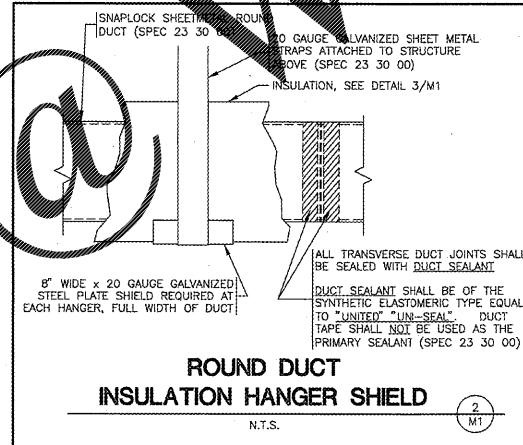
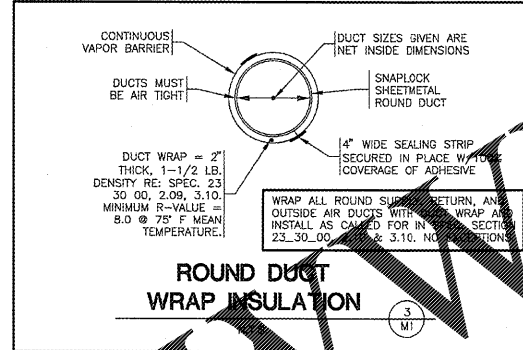
1. THERMOSTATS. (TYPICAL WIRING FOR EACH THERMOSTAT) SEE VS1 SHEET.
2. 12"x12" DUCT W/ ELBOW FROM "R2" TO JUST ABOVE THE CEILING PLATFORM.
3. WALL CAP 500 CFM EXHAUST. ARCHITECTURAL ELEVATIONS SHOW DIMENSIONED LOCATION.

**HVAC ROOF BRACING CONFLICTS**

CONTRACTOR TO FIELD VERIFY ROOF'S HORIZONTAL ROD BRACING LOCATIONS. IF NECESSARY, SHIFT RTU'S AND DUCTS AS REQUIRED TO AVOID CONFLICT WITH BRACING.

**HVAC GENERAL NOTES**

1. DRAWING IS DIAGRAMMATIC AND IS NOT TO BE SCALED. REFER TO ARCHITECTURAL PLANS OR FIELD MEASUREMENTS FOR DIMENSIONS.
2. ALL WORK IS TO BE PERFORMED IN ACCORDANCE WITH THE APPLICABLE CODE(S) NOTED ON THE COVER SHEET.
3. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONSTRUCTION PRIOR TO SUBMITTING HIS BID. NO EXTRAS WILL BE PAID DUE TO UNANTICIPATED EXISTING CONDITIONS.
4. ALL ROOF AND WALL PENETRATIONS REQUIRED SHALL BE COORDINATED WITH THE GENERAL CONTRACTOR. PROVIDE ALL SLEEVES, FLASHING, CURBS, REINFORCING ANGLES, SUPPORTING FRAMES, ETC., WHICH ARE REQUIRED UNLESS THEY ARE SPECIFICALLY CALLED OUT TO BE FURNISHED BY OTHERS.
5. A SUBMITTAL OF ALL MATERIALS AND EQUIPMENT PROPOSED TO BE USED ON THE JOB SHALL BE PREPARED AS SOON AS POSSIBLE AFTER AWARD OF THE CONTRACT. THE SUBMITTAL WILL BE REVIEWED BY THE OWNER FOR EQUAL QUALITY AND PERFORMANCE TO THE ITEMS SPECIFIED. ALL CONTROL DEVICES SHALL BE INCLUDED IN THE SUBMITTAL.
6. THE PROPER PERFORMANCE OF THE CONTRACT SYSTEM IS THE RESPONSIBILITY OF THE CONTRACTOR.
7. THE CONTRACTOR SHALL COOPERATE AND COORDINATE HIS WORK WITH THE WORK OF OTHER SUBCONTRACTORS OF THE PROJECT. COORDINATION DOES NOT MEAN "I WILL DO THIS HERE FIRST".
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING A COMPLETE AND FUNCTIONAL SYSTEM IN ACCORDANCE WITH THE INTENT OF THE PLANS, WHETHER OR NOT EVERY ELEMENT THEREOF IS SPECIFICALLY CALLED OUT.
9. DUCT DIMENSIONS ON PLANS ARE TO BE FINISHED INSIDE DIMENSIONS.
10. DUCT MATERIALS SHALL BE AS FOLLOWS:  
 RECTANGULAR SUPPLY AIR DUCT (SPEC 23 30 00)  
 RECTANGULAR SUPPLY AND RETURN AIR DUCT (SPEC 23 30 00)  
 INSTALL TURNING VANES IN ALL ELBOWS. DO NOT SUBSTITUTE RADIUSED ELBOWS FOR TURNING VANES - (SPEC 23 30 00).  
 ROUNDOUTS TO CURVES - (SPEC 23 30 00).  
 SEE DIFFUSER INSTALLATION DETAIL.
11. EXHAUST DUCT - (SPEC 23 30 00)  
 INSULATION SHALL CONFORM TO SMAGMA STANDARDS.  
 ARMATURE HVAC CONDENSATE DRAIN PIPING WITH 1/2" ARMATURE SHALL BE GUARANTEED FOR ONE YEAR UPON COMPLETION OF THE PROJECT.
12. EQUIPMENT OR FIXTURE SUBSTITUTIONS (THAT ARE NOT CURRENTLY LISTED) WITHOUT PRIOR WRITTEN APPROVAL OF THE OWNER.
13. UPON COMPLETE BALANCE SYSTEMS TO AIR FLOWS SHOW REPORT THE BALANCING MEASUREMENTS ON THE "BUILT" DRAWINGS.
14. MOUNT CONDENSATE AND REFRIGERANT LINES AS HIGH AS POSSIBLE.
15. CONTROL WIRING BY HVAC CONTRACTOR. FINAL CONNECTIONS BY HVAC CONTRACTOR.
16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING A COMPLETE AND FUNCTIONAL SYSTEM IN ACCORDANCE WITH THE INTENT OF THE PLANS, WHETHER OR NOT EVERY ELEMENT THEREOF IS SPECIFICALLY CALLED OUT.
17. ALL PENETRATIONS THROUGH BUILDING ENVELOPE SHALL BE A ONE-COMPONENT NON-SAG URETHANE ELASTOMERIC SEALANT. ANY CONTRACTOR WHO USED SILICONE OR ANOTHER SEALANT WILL BE REQUIRED TO REMOVE AND REPLACE WITH A SPECIFIED SEALANT (SPEC: 07 92 00).
18. ALL DUCTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH NFPA 101.1-2 and NFPA 90A STANDARD FOR THE INSTALLATION OF AIR CONDITIONING AND VENTILATION SYSTEMS.
19. ALL HVAC SYSTEM FLUES & VENTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH NFPA 54 (LATEST EDITION).
20. PROVIDE AIR FILTRATION MEDIA FOR OUTSIDE AND RETURN AIR PRIOR TO OCCUPANCY THAT PROVIDES AT LEAST A MINIMUM EFFICIENCY REPORTING VALUE (MERV) OF 8.
21. COVERING OF DUCT OPENINGS AND PROTECTION OF MECHANICAL EQUIPMENT DURING CONSTRUCTION. AT THE TIME OF ROUGH MECHANICAL INSTALLATION OR DURING STORAGE ON THE CONSTRUCTION SITE AND UNTIL FINAL STARTUP OF THE HEATING AND COOLING EQUIPMENT, ALL DUCT AND OTHER RELATED AIR DISTRIBUTION COMPONENT OPENINGS SHALL BE COVERED WITH TAPE, PLASTIC, SHEETMETAL OR OTHER METHODS ACCEPTABLE TO THE ENFORCING AGENCY TO REDUCE THE AMOUNT OF DUST OR DEBRIS WHICH MAY COLLECT IN THE SYSTEM.
22. ALL HVAC CONDENSATE LINES SHALL RUN AT A MINIMUM SLOPE OF 1/8-INCH PER FOOT.



**HVAC PLAN**  
SCALE: 1/8" = 1'-0"

**HVAC LEGEND**

	SUPPLY DIFFUSER (4 WAY)
	SUPPLY DIFFUSER (1 WAY)
	RETURN DIFFUSER
	EXHAUST REGISTER
	RECTANGULAR OR ROUND DUCT
	ROUND DUCT
	FLEXIBLE DUCT (MAX. LENGTH = 8'-0" NO INDICATION OF FLEX DUCT SHALL BE ON THIS INDICATED ON PLAN VIEW DRAWING.)
	CONDENSATE PIPING
	REFRIGERANT PIPING
	AIR FLOW INDICATOR
	SADDLE TAP FITTING (WITH DAMPER)
	THERMOSTAT
	CATEGORY 5 COMMUNICATION CABLE
	TURNING VANES
	VENSTAR EQUIPMENT CONTROL PAC
	VENSTAR REMOTE SENSOR (FACTORY SUPPLIED WITH ROOFTOP UNIT). CONTRACTOR SHALL FIELD SPlice CABLE & EXTEND CABLE TO LOCATIONS SHOWN.
	CO2 SENSOR FOR DEMAND CONTROL VENTILATION (FACTORY SUPPLIED WITH ROOFTOP UNIT). FIELD INSTALLED & WIRED BY CONTRACTOR.)
	MOTORIZED DAMPER
	VENSTAR "SCOPE OF WORK" DOCUMENT SEE VS3 SHEET.

**Order Plans**

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