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105 E SPRINGFIELD, SUITE 400
SPRINGFIELD, MO 65802

HVAC OUTDOOR AIR REQUIREMENTS

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

- SHOWROOM = 3510 SQUARE FEET
- HARD PARTS = 3715 SQUARE FEET

SHOWROOM (SALES)
 $3510 \text{ (SQUARE FEET)} \div 1000 \text{ (SQUARE FEET)} = 3.5100$
 $3.5100 \times 15 \text{ (PERSONS/1000 SQUARE FEET)} = 53 \text{ PERSONS}$
 $(\text{CFM/ PERSON} \times \text{PERSONS}) + (\text{CFM/SQUARE FEET} \times \text{SQUARE FEET}) = \text{CFM}$
 $(7.5 \times 53) + (.12 \times 3510) = 816.08 \text{ CFM OF OUTSIDE AIR REQUIRED}$
 $816.08 \div .8 \text{ (EFFECTIVENESS)} = 1020.09 \text{ CFM}$

HARD PARTS (STORAGE ROOM)
 $3715 \times .12 \text{ (CFM/SQUARE FEET)} = 445.80 \text{ CFM OF OUTSIDE AIR REQUIRED}$
 $445.80 \div .8 \text{ (EFFECTIVENESS)} = 557.25 \text{ CFM}$
 $1020 \text{ CFM} + 557 \text{ CFM} = 1577 \text{ TOTAL CFM}$

TOTAL OUTSIDE AIR MINIMUM REQUIRED BY CODE: 1577 CFM
 OUTSIDE AIR SPECIFIED ON PLAN SHEET M1: 1500 CFM

- ### HVAC - KEYNOTES
- 1" x 12" DUCT WITH ELBOW FROM "R2" TO JUST ABOVE THE CEILING PLATFORM.
 - 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.

OUTSIDE AIR SETUP:

CONTRACTOR TO SET DAMPERS AS FOLLOWS:

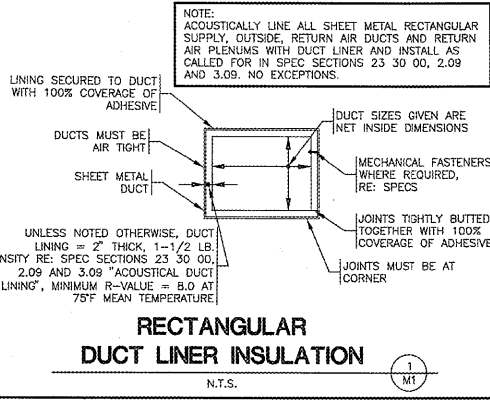
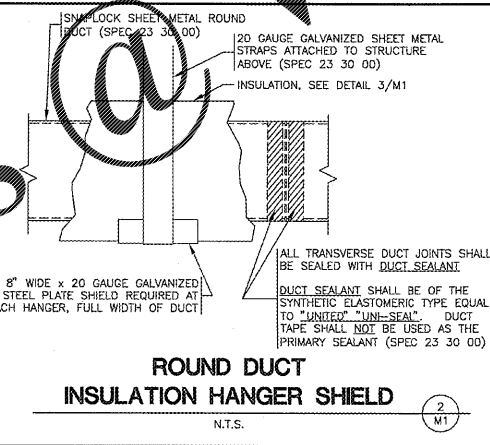
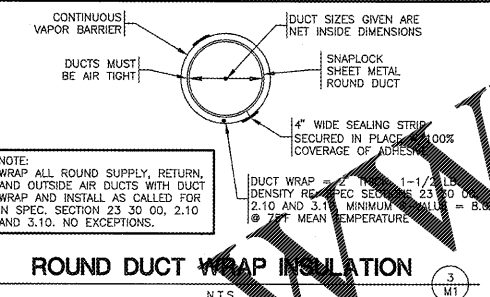
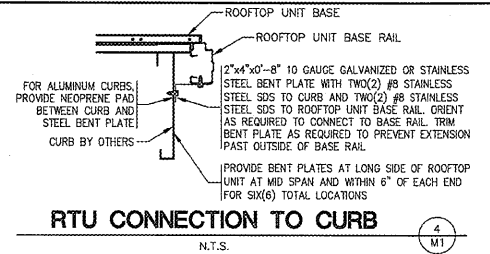
ECONOMIZER MODE MAXIMUM CFM PER UNIT
 7.5 TON RTU = 3,000
 5 TON RTU = 2,000

MINIMUM OUTSIDE AIR CFM PER ROOFTOP DURING OCCUPIED HOURS ONLY:
 5 TON UNIT (TYPICAL) = 400
 7.5 TON UNIT (TYPICAL) = 600

- ### HVAC GENERAL NOTES
- DRAWING IS DIAGRAMMATIC AND IS NOT TO BE SCALED. REFER TO ARCHITECTURAL PLANS OR FIELD MEASUREMENTS FOR DIMENSIONS.
 - ALL WORK IS TO BE PERFORMED IN ACCORDANCE WITH THE APPLICABLE CODE(S) NOTED ON THE COVER SHEET.
 - THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONSTRUCTION PRIOR TO SUBMITTING HIS BID. NO EXTRAS WILL BE PAID DUE TO UNANTICIPATED EXISTING CONDITIONS.
 - 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.
 - 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.
 - THE PROPER PERFORMANCE OF THE CONTROL SYSTEM IS THE RESPONSIBILITY OF THE CONTRACTOR.
 - THE CONTRACTOR SHALL COOPERATE AND COORDINATE HIS WORK WITH THE WORK OF OTHER SUBCONTRACTORS OF THE PROJECT. COORDINATION DOES NOT MEAN "I WAS HERE FIRST".
 - 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.
 - DUCT DIMENSIONS ON PLANS ARE TO BE FINISHED INSIDE DIMENSIONS.
 - DUCT MATERIALS SHALL BE AS FOLLOWS:
 ROUND SUPPLY AIR DUCT (SPEC 23 30 00)
 RECTANGULAR SUPPLY AND RETURN AIR DUCT WORK - (SPEC 23 30 00) INSTALL TURNING VANES IN ALL ELBOWS. DO NOT SUBSTITUTE RADIUS ELBOWS, RUNGUTS TO DISCONNECTS - (SPEC 23 30 00) (SEE DIFFUSER INSTALLATION DETAIL).
 EXHAUST DUCT - (SPEC 23 30 00)
 TRANSITIONS - SHALL CONFORM TO SMACNA STANDARDS. ARMAFLEX
 - INSULATE HVAC CONDENSATE DRAIN PIPING WITH 1/2" ARMAFLEX
 - ALL WORK IS TO BE GUARANTEED FOR ONE YEAR UPON OCCUPANCY.
 - NO EQUIPMENT OR FIXTURE SUBSTITUTIONS (THAT ARE NOT CURRENTLY LISTED) WITHOUT PRIOR WRITTEN APPROVAL OF THE OWNER.
 - UPON COMPLETION BALANCE SYSTEMS TO AIR FLOWS SHOWN. REPORT THE BALANCING MEASUREMENTS ON THE "AS BUILT" DRAWINGS.
 - MOUNT CONDENSATE AND REFRIGERANT LINES AS HIGH AS POSSIBLE.
 - CONTROL WIRING BY HVAC CONTRACTOR. FINAL CONNECTIONS BY HVAC CONTRACTOR.
 - ALL CAULKING ON BUILDING PENETRATIONS SHALL BE A ONE-COMPONENT NON-SAG URETHANE ELASTOMERIC SEALANT. ANY CONTRACTOR WHO USED SILICONE OR ANY OTHER CAULKING WILL BE REQUIRED TO REMOVE AND REPLACE WITH A SPECIFIED SEALANT (SPEC: 07 92 00).
 - THE HVAC SYSTEM SHALL BE CONSTRUCTED IN ACCORDANCE WITH NFPA 101:7-2 and NFPA 90A STANDARD FOR THE INSTALLATION OF AIR CONDITIONING AND VENTILATION SYSTEMS.
 - ALL HVAC SYSTEM FLUES & VENTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH NFPA 54 (LATEST EDITION).
 - PROVIDE AIR FILTRATION MEDIA FOR OUTSIDE AND RETURN AIR PRIOR TO OCCUPANCY THAT PROVIDES AT LEAST A MINIMUM EFFICIENCY REPORTING VALUE (MERV) OF 8.
 - COVERING OF DUCT OPENINGS AND PROTECTION OF MECHANICAL EQUIPMENT DURING CONSTRUCTION TO THE TIME OF ROUGH INSTALLATION, OR DURING STARTUP OF THE HEATING AND COOLING EQUIPMENT, DUCT AND OTHER RELATED AIR DISTRIBUTION COMPONENT OPENINGS SHALL BE COVERED WITH 1/2" SHEETMETAL OR OTHER METHODS ACCEPTABLE TO THE ENFORCING AGENCY TO PREVENT THE ACCUMULATION OF DEBRIS WHICH MAY COLLECT IN THE SYSTEM.
 - ALL HVAC CONDENSATE LINES SHALL RUN AT A MINIMUM SLOPE OF 1/8" PER FOOT.

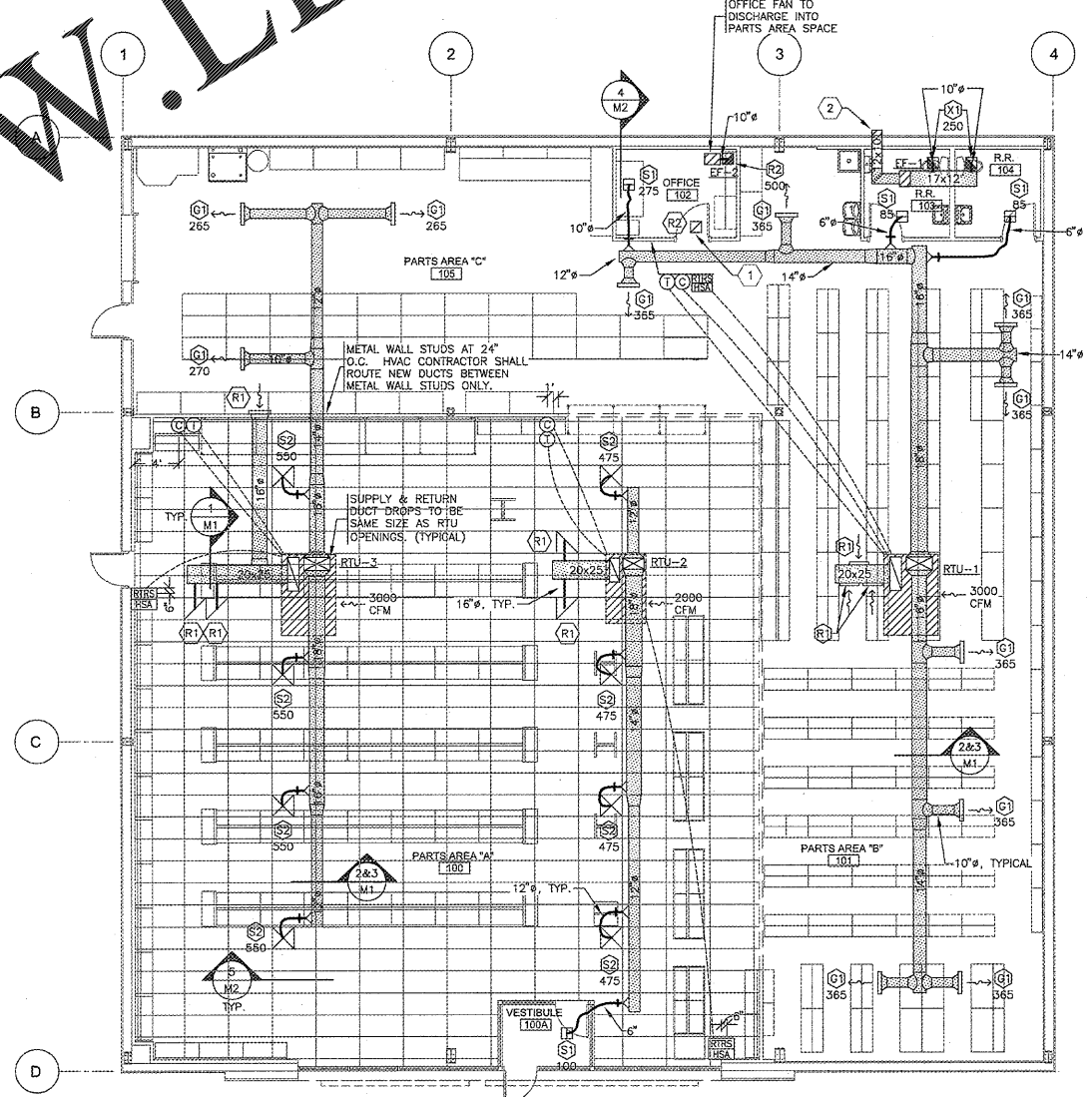
HVAC SYSTEMS TESTING & BALANCING

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 ASHRAE OR NEBS. CONTRACTOR SHALL SUBMIT WRITTEN T&B REPORTS TO THE OWNER. IF THE SYSTEM'S FLOW CAPACITY IS LESS THAN 50,000 SQ. FT. THEN T&B COMMISSIONING IS NOT REQUIRED PER ASHRAE 90.1.



HVAC LEGEND

- SUPPLY DIFFUSER (4")
- SUPPLY DAMPER (2 WAY)
- RETURN AIR GRILLE
- EXHAUST REGISTER
- RECTANGULAR OR ROUND DUCT
- ROUND DUCT
- FLEXIBLE DUCT (MAX. LENGTH = 8'-0")
 NOTE: LOCATION OF FLEX DUCT SHALL BE ONLY AS INDICATED ON PLAN VIEW DRAWING
- 1" CONDENSATE PIPING
- REFRIGERANT PIPING
- AIR FLOW INDICATOR
- SADDLE TAP FITTING (WITH DAMPER)
- COMMUNICATION CABLE
- TURNING VANES
- THERMOSTAT (SEE EM SHEETS).
 SEE EM SHEETS FOR THERMOSTAT MOUNTING HEIGHTS AND TYPICAL WIRING.
- CO2 SENSOR FOR DEMAND CONTROL VENTILATION (FACTORY SUPPLIED WITH ROOFTOP UNIT). FIELD INSTALLED & WIRED BY CONTRACTOR. SEE EM SHEETS FOR SENSOR MOUNTING HEIGHTS.
- MOTORIZED DAMPER
- REMOTE TEST STATION FOR DUCT SMOKE DETECTOR (MOUNT AT 5'-0" A.F.F.)
- REMOTE ALARM/STROBE FOR DUCT SMOKE DETECTOR (MOUNT AT 7'-6" A.F.F.)



HVAC PLAN
 SCALE: 1/8" = 1'-0"
 CONST. N

NOTE: BOTTOM OF ALL HVAC EQUIPMENT & DUCTS SHALL BE @ A MINIMUM OF 12'-3" A.F.F. EXCEPT WHERE OTHERWISE NOTED.

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PROJECT: NEW O'REILLY AUTO PARTS STORE
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 HVAC PLAN

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 REVISION
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