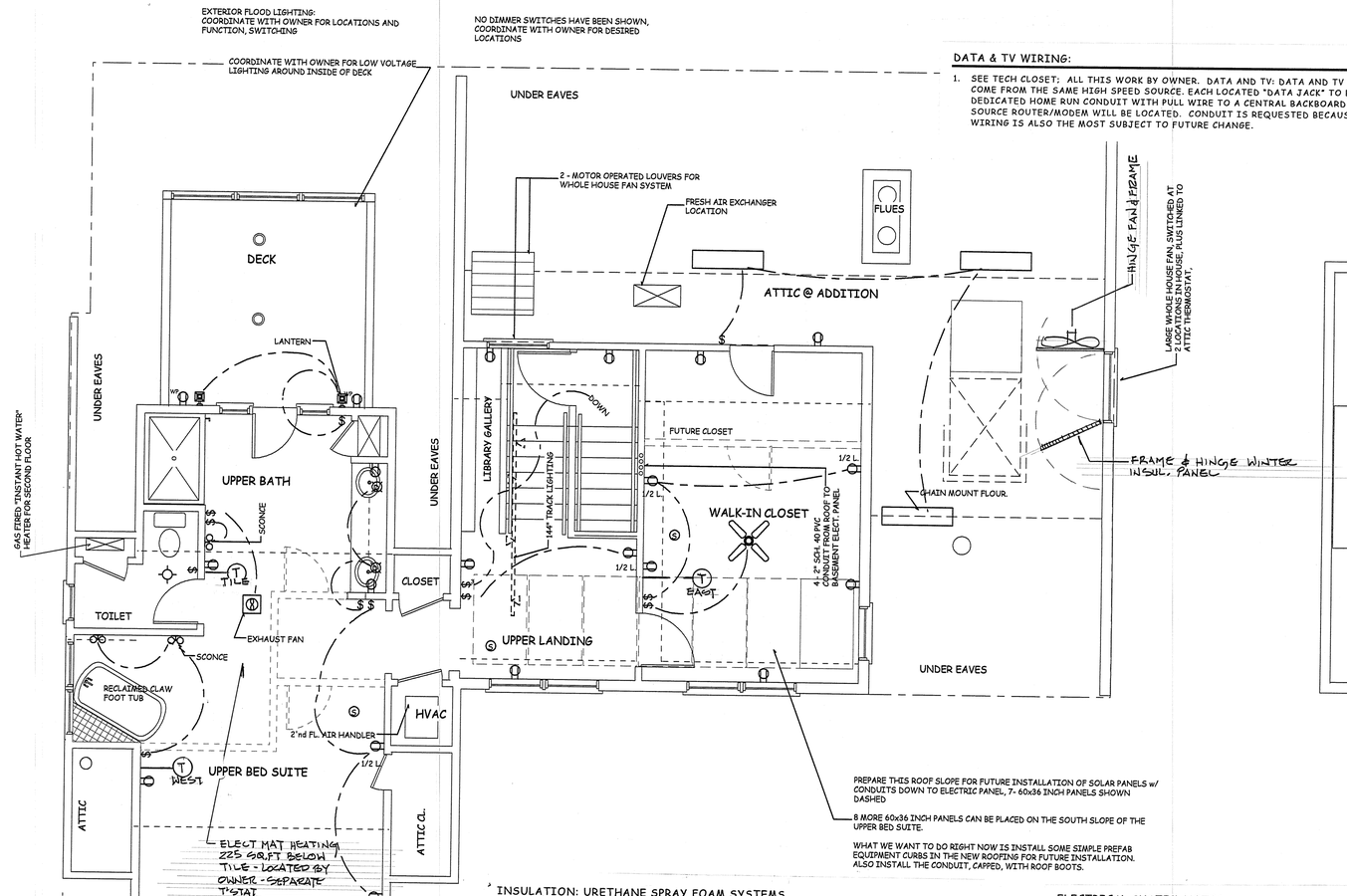
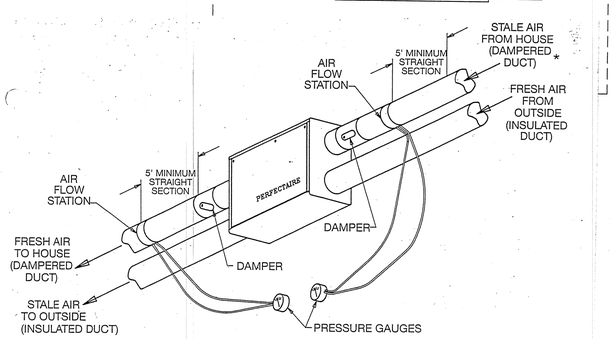


DATA & TV WIRING:

1. SEE TECH CLOSET; ALL THIS WORK BY OWNER. DATA AND TV: DATA AND TV PROBABLY COME FROM THE SAME HIGH SPEED SOURCE. EACH LOCATED "DATA JACK" TO BE A DEDICATED HOME RUN CONDUIT WITH PULL WIRE TO A CENTRAL BACKBOARD WHERE THE SOURCE ROUTER/MODEM WILL BE LOCATED. CONDUIT IS REQUESTED BECAUSE DATA WIRING IS ALSO THE MOST SUBJECT TO FUTURE CHANGE.

WHOLE HOUSE FAN SYSTEM

1. THE PURPOSE IS TO CREATE A FORCED VENTILATION SYSTEM. GENERALLY, THESE SYSTEMS ARE INSTALLED TO BRING IN COOL EXTERIOR AIR VIA WINDOWS, THUS REDUCING NEED FOR SUMMER SEASON AIR CONDITIONING.
2. RUN AND COOL HOUSE WITH THE EARLY MORNING AIR, THEN CLOSE UP THE HOUSE TO PREVENT INTRODUCTION OF HOT HUMID AIR DURING THE DAY. IN THE EVENING, AFTER THE SUN GOES DOWN, USE THE SYSTEM TO EXHAUST THE STALE HOUSE AIR, REPLACING WITH COOL EVENING AIR. USE IN COMBINATION WITH AC FOR MOST EFFECTIVE COMFORT.
3. WITH USE OF A "LIMIT" THERMOSTAT IN THE ATTIC, THE FAN WILL AUTOMATICALLY TURN ITSELF OFF AT A PRESET TEMP, AND NOT RUN ALL NIGHT.
4. A GOOD CONTROL PACKAGE CAN MAKE THE SYSTEM MOST EFFECTIVE. SHOULD HAVE SPEED CONTROL, DIGITAL TIMER, LINKED TO LIMITING STAT.
5. THE COST OF BUILDING MANAGEMENT SOFTWARE IS COMING DOWN ALL THE TIME. THIS COULD BE A "SMART HOUSE" WHERE THE ENERGY SAVING PAYS FOR THE TECHNOLOGY USED.
6. THE FAN MUST BE LOCATED IN THE LAST INSULATION LAYER OF HOUSE. USE AS BIG A FAN AS POSSIBLE, TURNING AS SLOWLY AS POSSIBLE FOR BEST EFFECT WITHOUT TOO MUCH FAN NOISE OR WIND VELOCITY. INSTALL FAN ON HINGES SO IT CAN BE EASILY SWUNG ASIDE AND AN INSULATION BOARD INSTALL FOR WINTER.
7. EXHAUST FANS CAN ONLY EXHAUST AIR IN THE SAME PROPORTION AS MAKE-UP AIR COMING IN. IF THE WHOLE HOUSE FAN IS SPINNING TO MOVE 1,000 CUBIC FEET PER MINUTE (CFM), THEN 1,000 MUST BE ALLOWED IN THROUGH THE WINDOWS OR THE FAN WILL "STALL." OPEN WINDOWS TO DETERMINE WHERE INCOMING AIR PULLS FROM. AIR WILL FOLLOW THE PATH OF LEAST RESISTANCE.
8. LIKE THE HVAC, THE HOUSE IS DIVIDED INTO TWO ZONES, FIRST FLOOR AND SECOND FLOOR, THERE ARE TWO LOUVERS SHOWN FROM THE ATTIC TO THE INTERIOR. DEPENDING ON HOW THE LOUVERS ARE OPENED WILL DETERMINE AIR FLOW AND BALANCE. THESE LOUVERS CAN BE EITHER GRAVITY OPERATION, OR INSTALLED WITH MOTORS LINKED TO FAN.



FRESH AIR EXCHANGER SYSTEM

FRESH AIR EXCHANGE SYSTEM:

1. AS BUILDINGS ARE MADE TIGHTER AND TIGHTER MECHANICAL CODES ARE SUGGESTING THE INTRODUCTION OF EXTERIOR FRESH AIR INTO OCCUPIED ENVIRONMENTS TO PREVENT "SICK BUILDING SYNDROME."
2. INSTALL ENERGY RECOVERING FRESH AIR EXCHANGER. THIS UNIT TO BE A STAND ALONE PACKAGE, DIRECTING AIR TO THE RETURNS OF EACH FLOOR'S AIR HANDLER. DOES NOT HAVE TO BE A HARD CONNECTION. SEE DRAWING FOR LOCATION IN ATTIC. UNIT SHALL NOT RUN CONSTANTLY, BUT SHALL HAVE CONTROL INTERCONNECTION AND RUN ONLY WHEN AIR HANDLERS ARE OPERATING, WITH OVERRIDE.
3. PRODUCT: PERFECTAIRE, MODEL 8100 FRESH AIR EXCHANGER, OR APPROVED EQUAL.

INSULATION: URETHANE SPRAY FOAM SYSTEMS

1. MATERIAL SHALL BE CLOSED CELL, URETHANE BASED, WITH NO FORMALDEHYDE PRODUCTS. R-VALUE IS GENERALLY 6.50 PER INCH, AGED. PRODUCT SHALL BE EXPANDING, SELF SKINNING, AND BE FROM A NATIONALLY RECOGNIZED MANUFACTURER.
2. INSTALLER SHALL BE EXPERT IN THE USE AND APPLICATION OF THESE SPRAY FOAM PRODUCTS, WITH A MINIMUM OF 3-YEARS EXPERIENCE AND CERTIFIED BY THE MANUFACTURER OF THE PRODUCTS BEING USED.
3. THE BUILDING CODE HAS REQUIREMENTS FOR THE PROTECTION OF FOAM PLASTIC INSULATIONS. IN GENERAL AN IGNITION BARRIER IS REQUIRED IN OCCUPIED SPACE. IN FINISHED "LIVING" SPACE, THE FOAM SPRAYED BETWEEN STUDS AND RAFTERS WILL BE COVERED WITH 1/2" GYPSUM DRYWALL, WHICH HAS A 20-MINUTE FIRE RATING. THE INSTALLER SHALL BE EXPERT IN UNDERSTANDING CODE REQUIREMENTS AS THEY APPLY TO THESE PRODUCTS. BEFORE QUOTING THE JOB, THE INSTALLER SHALL COORDINATE WITH THE LOCAL INSPECTOR FOR CLARIFICATION. PROVIDE A CODE APPROVED "SPRAY APPLIED IGNITION BARRIER" WHERE REQUIRED.
4. BEFORE QUOTING THE JOB, THE INSTALLER SHALL COORDINATE WITH THE LOCAL INSPECTOR FOR CLARIFICATION REGARDING APPROVAL SUBMISSIONS.
5. IF REQUIRED, INSTALLER SHALL PREPARE AND PROVIDE ALL DOCUMENTS NECESSARY SHOWING COMPLIANCE WITH EITHER THE INTERNATIONAL RESIDENTIAL CODE, CHAPTER 11, ENERGY EFFICIENCY, SECTION N1102.1.3, TOTAL UA ALTERNATIVE; OR WITH, THE INTERNATIONAL ENERGY CONSERVATION CODE, SECTION 404, ALTERNATIVE "PERFORMANCE METHOD.
6. WEATHER BARRIER: FOR INFO, THE BUILDING CODE REQUIRES A WATER TIGHT BARRIER TO PREVENT MOISTURE PENETRATION FROM THE EXTERIOR. THIS IS SEPARATE FROM THE "AIR" OR "VAPOR" BARRIER.
7. AIR BARRIER: FOR INFO, THE ENERGY CONSERVATION CODE REQUIRES AN "AIR BARRIER" AS PART OF THE "BUILDING ENVELOPE." ONE-THIRD OF HEAT LOSS IS DUE TO INFILTRATION.
8. VAPOR BARRIER: FOR INFO, THE ENERGY CONSERVATION CODE REQUIRES A "VAPOR BARRIER" AS PART OF THE "BUILDING ENVELOPE." IN COOL CLIMATES, INTERIOR VAPOR BARRIERS ARE REQUIRED TO PREVENT TRANSFER OF MOISTURE FROM WARM CONDITIONED SPACE INTO THE PERIMETER WALL CONSTRUCTION CAVITIES WHERE IT CAN CONDENSE BACK TO MOISTURE, DETERIORATING FRAMING, AND INCREASING POTENTIAL F MOLD GROWTH.
9. CLOSED CELL SPRAY FOAM SATISFIES THE REQUIREMENTS FOR BOTH THE AIR BARRIER, AND THE VAPOR BARRIER, WHEN APPLIED AT A THICKNESS OF 2-INCHES OR GREATER.
10. NON-VENTILATED ATTICS: ATTICS DO NOT REQUIRE VENTILATION WHEN ATTIC BECOMES PART OF THE INSULATED ENVELOPE. NO SOFFIT OR RIDGE VENTING IS USED. DUCTWORK IN ATTICS WILL NOT REQUIRE AS MUCH INSULATION, JUST ENOUGH TO PREVENT "SWEATING." R-800,4
11. BASE BID: FORM A CONTINUOUS, MONOLITHIC, ENVELOPE OF CLOSED CELL POY INSUL. AROUND THE ENTIRE BUILDING, INCLUDING BASEMENTS, CRAWL SPACES, AND ALL ATTICS.
    A. R-19 (MIN. 3 INCHES) TO BE SPRAYED CONTIUNOUS ON ALL EXTERIOR PERIMETER WALLS, FROM THE BOTTOM OF BASEMENT OR CRAWLSPACE SLABS UP TO THE ROOF RIDGES.
    B. R-30 (MIN. 5 INCHES) TO BE SPRAYED TO THE UNDERSIDE OF ALL ROOFS, MERGING INTO THE WALL LAYER.

ELECTRICAL SYSTEM NOTES:

1. LICENSED ELECTRICIANS REGISTERED IN THE MUNICIPALITY SHALL DO ALL WORK IN ACCORDANCE WITH THE LOCAL AND NATIONAL ELECTRICAL CODE. ELECTRICIAN SHALL PROVIDED AN UNDERWRITER'S CERTIFICATE AT THE CONCLUSION OF WORK.
2. ELECTRICIAN SHALL COMPLETE HIS PART OF THE BUILDING PERMIT APPLICATION. IF MUNICIPALITY REQUIRES LOAD CALCULATIONS OR DIAGRAMS, THEN ELECTRICAL CONTRACTOR SHALL PROVIDE.
3. SOME RECEPTACLES ARE INDICATED TO BE "ISOLATED HOME RUNS" FOR SPECIAL USE. THESE CIRCUITS, GENERALLY FOR AUDIO-VIDEO OR COMPUTER LOCATIONS, SHALL BE LOCATED "FIRST" OR AT THE TOP OF THE DISTRIBUTION PANEL TO MINIMIZE INTERFERENCE OR "ELECTRICAL NOISE".
4. THE MINIMUM WIRE SIZE FOR RECEPTACLES SHALL BE 12 GA., THE MINIMUM WIRE SIZE FOR LIGHTING SHALL BE 14 GA., ALL COPPER. ALL CIRCUITS SHALL BE GROUNDED.
5. LAMPING: ALL NEW FIXTURES SHALL HAVE THE APPROPRIATE LAMP INSTALLED.
6. IF OWNER DOES NOT PROVIDE OR APPROVE A LIGHT FIXTURE AT TIME OF FINAL ELECTRICAL INSPECTION, THEN INSTALL SIMPLE PORCELAIN SOCKETS AND BULB.
7. ELECTRICAL DEVISE DESIGN SHALL BE "DECORA" BY LEVITON, OR APPROVED EQUAL. ALL FACE PLATES SHALL BE MATCHING PLASTIC. ALL DEVISES TO BE WHITE. MOUNTING HEIGHTS, IN GENERAL, USE RECOMMENDATIONS IN THE "ADA" GUIDELINES.
8. ARCHITECT'S DRAWINGS ONLY SHOW ELECTRICAL NOTES, DEVISE LOCATIONS, AND CONTROL SCHEMATICS. THE ELECTRICIAN SHALL DO ALL CIRCUIT & LOAD DISTRIBUTION DESIGN. DISTRIBUTION PANEL SHALL BE CLEARLY LABELED.
9. SEPARATE POWER CIRCUITS FROM LIGHTING CIRCUITS. DO NOT MAXIMIZE CIRCUIT CAPACITY, INSTEAD MAXIMIZE CLARITY OF ORGANIZATION AND SAFETY FOR THE OWNER. DESIGN CIRCUITS SUCH THAT THERE IS ONE (1) BREAKER PER ROOM FOR POWER, LIGHTING MAY BE MORE THAN A SINGLE ROOM, BUT SHALL BE INTELLIGENT ZONES. MAJOR EQUIPMENT, INCLUDING REFRIGERATORS, SHOULD HAVE DEDICATED CIRCUITS.
10. PROVIDE NEW 200 AMP SERVICE AND PANEL. NEW MAIN PANEL TO BE DIVIDED WITH MANUAL TRANSFER SWITCH, WITH SECTION RESERVED FOR "CRITICAL LOADS", THEN ROUGH IN FOR FUTURE EMERGENCY GENERATOR AT LOCATION SHOWN.
11. PROVIDE PANEL LARGE ENOUGH FOR THE WORK SHOWN, AND PROVIDE MINIMUM 6 SPARE 20 AMP BREAKERS. ALL BREAKERS SHALL BE FULL SIZE, NOT HALF-SIZE.
12. PROVIDE SUB-PANEL IN GARAGE.
13. SEE NOTES ABOUT PREPARATION FOR FUTURE PHOTOVOLTAIC COLLECTORS ON SOUTH ROOFS. ROUGH IN AS REQUIRED.
14. FOR OWNER'S APPROVAL, BEFORE WORK BEGINS, SUBMIT CATALOG CUTS FOR ALL FIXTURES, APPLIANCES, DEVISES, SWITCHES, ETC.
15. COORDINATE WITH THE HVAC CONTRACTOR AND PLUMBING CONTRACTOR TO PROVIDE SERVICE TO ALL EQUIPMENT AS REQUIRED.
16. ALL HOLES DRILLED INTO TOP OR BOTTOM WALL PLATES, INTERIOR AND EXTERIOR, SHALL BE SEALED, USE EXPANDABLE FOAM TO PREVENT VERTICAL PASSAGE OF AIR.

LOW VOLTAGE UNDER CABINET LIGHTING

1. UNDER CABINET LIGHTING WILL ADD FUN, EFFECT, DRAMA, AND VALUE TO A KITCHEN IF DONE WITH CARE AND USING THE RIGHT PRODUCTS.
2. "SEA GULL LIGHTING" HAS A GREAT LOW VOLTAGE MINI-TRACK SYSTEM THAT IS SLICK, EASILY CONCEALED, AND FLEXIBLE IN USE. SEE THE MFG'S INFO. THIS SYSTEM ALSO GREAT FOR ABOVE CABINET, COVE, AND CABINET INTERIOR LIGHTING. LIGHTED INTERIORS OF GLASS CABINETS MAKE A BEAUTIFUL KITCHEN.
3. FOR MAXIMUM FLEXIBILITY OF CONTROL, "HOME RUN" ALL SWITCHES AND LIGHT SECTIONS TO A CENTRAL BACKBOARD, MIN SIZE 30x30 INCHES. AT THIS BACKBOARD WILL BE ALL THE TRANSFORMERS AND CIRCUIT CONFIGURATIONS. ACCURATE LOCATION OF THE WIRING IN HIGHLY FINISHED AREAS LIKE KITCHENS REQUIRES CARE. ROUGH IN WELL IN ADVANCE OF FINISH OR CABINET INSTALLATIONS. LOW VOLTAGE MAKE IT MUCH EASIER AND SAFER.

HEATING / COOLING SYSTEM PERFORMANCE SPECIFICATION:

1. DEMOLITION: REMOVE EVERYTHING EXISTING INCLUDING, BOILER, (THE CHIMNEY IS BEING REMOVED) ALL RADIATORS, AND OIL TANK IN CRAWLSPACE. THIS MEANS REMOVE ALL ABANDONED PIPING, ECT. START CLEAN, NO CONFUSION. LARGE RADIATORS, DELIVER TO OWNER FOR STORAGE AND POSSIBLE USE IN GARAGE.
2. GENERAL: HVAC CONTRACTOR SHALL COMPLETE HIS PART OF THE BUILDING PERMIT APPLICATION. IF MUNICIPALITY REQUIRES SCHEMATICS, CALCULATIONS, DIAGRAMS, OR CATALOG CUTS, THEN HVAC CONTRACTOR SHALL PROVIDE.
3. SUBMITTALS: CONTRACTOR WILL PROVIDE HEAT GAIN AND HEAT LOSS CALCULATIONS TO DETERMINE EQUIPMENT AND DUCT SYSTEM SIZING.
4. SEE ALL INFO ABOUT "SPRAY FOAM INSULATION SYSTEMS" AND RADIANT BARRIERS. SPRAY FOAM SYSTEMS SIGNIFICANTLY REDUCE INFILTRATION, THUS REDUCING EQUIPMENT SIZING. USE SMALLER EQUIPMENT, AND WORK IT HARD AS REQUIRED.
5. REVIEW CALCULATIONS WITH THE ARCHITECT AND OWNER FOR APPROVAL BEFORE PROCEEDING. MARK UP THE ARCHITECT'S DRAWINGS TO PROVIDE SIMPLE SCHEMATICS AND CATALOG CUTS OF ALL EQUIPMENT FOR REVIEW AND APPROVAL BEFORE INSTALLATION.
6. EVERYTHING IS NEW, STARTING WITH NEW NATURAL GAS SERVICE AND NEW 200 AMP ELECTRICAL SERVICE.
7. HOUSE MUST PROVIDE ENVIRONMENTS FOR DIFFERENT AGE GROUPS. ROOMS FOR GRANDPARENTS WILL REQUIRE SUPPLEMENTAL HEATING. SEE ELECTRICAL DRAWINGS FOR ELECTRIC BASEBOARD. EACH ROOM WITH ELECT. BASEBOARD SHALL HAVE A SEPARATE PROGRAMMABLE THERMOSTAT FOR THAT ROOM CONTROLLING THE BASEBOARD.
8. BASIC CONCEPT: DUCTED AIR SYSTEM, CONVENTIONAL AIR HANDLING UNITS, TWO ZONES, ONE FOR FIRST FLOOR AND ANOTHER FOR SECOND FLOOR. CONVENTIONAL ELECTRIC COOLING. HOT WATER DUCT COILS FOR HEATING. DUCT COILS FEED BY HOT WATER BOILER. FIRST FLOOR AIR HANDLER AND DUCTWORK IN BASEMENT & CRAWLSPACES. SECOND FLOOR AIR HANDLER IN SECOND CLOSET WITH DUCTWORK IN ATTIC OR SOFFITS.
9. NEW HOT WATER BOILER TO BE GAS FIRED, HIGH EFFICIENCY, VARIABLE FLAME, SEALED COMBUSTION AIR INTAKE AND EXHAUST. LOCATE IN UTILITY AREA, RUN FULL ¾" "PEX" IF ALLOWED, OR COPPER, TO DUCT HEATER LOCATIONS. IT IS EXPECTED THAT BOTH MAIN FLOORS WILL BE DIVIDED INTO "EAST AND WEST ZONES" WITH A DUCT HEATER DEDICATED TO EACH, DRIVEN BY ONE FAN IN THE AIR HANDLER. PROVIDE APPROPRIATE ZONE CONTROL MANIFOLD AND ZONE PUMPS IN UTILITY AREA.
10. PROVIDE TACO "PRIORITY CONTROL" SYSTEM OR EQUAL.
11. BASEMENT SLAB TO HAVE RADIANT HEATING. HOT WATER SUPPLIED FROM INSTANT HOT WATER HEATER IDENTICAL TO DOMESTIC HOT WATER HEATER.
12. ALL NEW EQUIPMENT TO HAVE ENERGY STAR RATINGS, WITH MIN AC SEER RATING OF 13 OR BETTER.
13. DUCTWORK: ALL DUCTWORK "MAINS" SHALL BE SHEET METAL. BRANCH DUCTWORK IS PREFERRED TO BE SHEET METAL, HOWEVER "FLEX DUCT WILL BE ACCEPTED IN LIMITED RUNS DIRECT TO DIFFUSERS. ALL SHEET METAL DUCTWORK SHALL BE CAPABLE OF FUTURE "CLEANING," THUS IT SHALL NOT BE INTERNALLY "LINED" WITH ANY SOFT MATERIALS.
14. DUCTWORK: THE IBC ENERGY CONSERVATION CODE REQUIRES THE SEALING OF ALL TRANSVERSE AND LONGITUDINAL DUCT JOINTS TO PREVENT AIR LEAKAGE. USE ROLL PRODUCTS WHICH HAVE VOC FREE BUTAL LAMINATED TO A FACING WHICH HAS A UL 181 LISTING. STANDARD "DUCT TAPE" IS NOT ACCEPTABLE.
15. HVAC CLOSET(S) TO BE FULLY ENCLOSED IN FIBERGLASS ACOUSTIC BATT INSULATION.
16. THERMOSTATS: PROVIDE LUX MOD# PSPA711. THESE ARE DUAL SETBACK, 7-DAY PROGRAMMABLE, HEATING AND COOLING, WITH BATTERY BACKUP. MAKE SURE CONTROL WIRING FOR BOTH HEATING AND COOLING GETS TO STAT LOCATIONS. ALTERNATES, BUT EQUAL, MAY BE PROPOSED. PROVIDE BEST UNITS AVAILABLE.
17. INSULATION OF DUCTWORK: ALL DUCTWORK INSTALLED IN NON-CONDITIONED SPACE SHALL BE WRAPPED WITH FIBERGLASS INSULATION BATTS WITH VAPOR BARRIERS. MIN. INSUL. VALUE SHALL BE R-19. ALL DUCTWORK INSTALLED IN CONDITIONED SPACE SHALL BE WRAPPED WITH FIBERGLASS INSULATION BATTS WITH VAPOR BARRIERS. MIN. INSUL. VALUE SHALL BE R-8.
18. AIR HANDLER FILTER RACKS: ALL FILTERS SHALL BE AT THE UNIT, SLIDE IN (LIKE DRAWERS) AND DESIGNED FOR EASY CHANGING. UNIT SHALL HAVE SPACE FOR TWO FILTERS: A) DUST AND PARTICULATE FILTER; B) CARBON FILTER FOR ODOR CONTROL (SEE DAYTON "AIR HANDLER" #6W737, SIZE 16"x25"x1"). MAKE SURE FANS AND AIR VELOCITY ARE DESIGNED FOR THE ADDITIONAL FILTER RESISTANCE.
19. EXHAUST FANS AND VENTS: SEE ELECTRICAL DRAWINGS FOR EXHAUST FAN LOCATIONS. ALL FANS SHALL BE MIN. 200 CFM. ALL VENTS SHALL BE DIRECT TO THE EXTERIOR THROUGH WALL OR ROOF VENT CAPS PROVIDED WITH GOOD BACK DRAFT PREVENTION. ALL DUCTWORK SHALL BE METALLIC. NO VENTING INTO ATTICS OR SOFFITS ALLOWED.

ELECTRICAL - SECOND FLOOR PLAN

SCALE 1/4" = 1'-0"

1/13

REV. #	REVISION DESCRIPTION	DATE
	START UP	OCT. 22, 2008
	FINAL PRELIMINARY REVIEW	12-11-2008
	FOR PERMIT SUBMISSION	01-05-2009
1	REVISED PER TWP. PERMIT REVIEW	6-12-09

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Eric C. Van Reed, Architect
Creative Design Associates, Inc.
ARCHITECTURE INTERIORS SITE & SPACE PLANNING
350 Callowhill Road
Chalfont, PA 18914
Voice: 215-672-1155
www.ArchitectVision.com

639 Walnut Avenue, East
ADDITIONS & RENOVATIONS
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