MECHANICAL SPECIFICATION

PART 1

1.1 FURNISH AND INSTALL ALL LABOR AND MATERIALS NECESSARY TO PROVIDE A COMPLETE INSTALLATION OF ALL MECHANICAL SERVICES AND SYSTEMS INDICATED AND AS MAY BE REQUIRED TO MAKE THE WORK COMPLETE FOR THE PURPOSE INTENDED LAYOUTS SHOWN ARE DIAGRAMMATIC - INSTALL DUCTWORK, PIPING AND EQUIPMENT TO MEET ACTUAL FIELD CONDITIONS.

1.2 BIDDING REQUIREMENTS- VISIT SITE PRIOR TO BIDDING TO FULLY ACQUAINT HIMSELF WITH ALL FIELD CONDITIONS AND TO DETERMINE FULL EXTENT OF WORK REQUIRED COORDINATE NEW INSTALLATIONS WITH EXISTING SYSTEMS. ANY ITEMS NOT SPECIFICALLY INDICATED ON DRAWINGS THAT ARE IN CONFLICT WITH CONTRACT WORK SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO BID FOR A DECISION. BIDDERS SHALL ACQUAINT THEMSELVES WITH THE WORKING CONDITIONS AND REQUIREMENTS OF THE ENTIRE PROJECT AS ANY CONTRACT FOR THIS WORK WILL BE BASED UPON FURNISHING ALL LABOR AND MATERIALS REQUIRED TO ENTIRELY COMPLETE WORK READY FOR USE.

1.3 CODES: ALL WORK SHALL COMPLY WITH LOCAL, MUNICIPAL, STATE HVAC CODES. ALL MATERIALS SHALL BE IN COMPLIANCE WITH NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) STANDARDS.

1.4 OBTAIN AND PAY FOR ALL LICENSES PERMITS AND INSPECTIONS FOR ALL WORK REQUIRED ALL CERTIFICATES OF INSPECTION SHALL BE DELIVERED TO THE OWNER.

1.5 SHOP DRAWINGS TO BE SUBMITTED (SIX COPIES) FOR ALL EQUIPMENT, DUCTWORK AND PIPING LAYOUTS WITHIN 14 DAYS OF CONTRACT AWARDING FOR REVIEW. ANY MINOR CHANGES IN LOCATION OF EQUIPMENT, PIPING OR DUCTWORK FROM THOSE SHOWN ON THE DRAWINGS SHALL BE MADE WITHOUT CHARGE IF SO DIRECTED BY THE ARCHITECT BEFORE INSTALLATION.

1.6 SCHEDULE ALL WORK TO AVOID DOWNTIME AND INCONVENIENCE TO OWNER. OWNER'S EXISTING FACILITY SHALL REMAIN IN OPERATION AT ALL TIMES. ALL REQUIRED SHUTDOWN OF EXISTING UTILITIES SHALL BE SCHEDULED WITH OWNER'S OPERATING PERSONNEL. NOTIFY OWNER'S REPRESENTATIVE 48 HOURS IN ADVANCE PRIOR TO ANY SHUTDOWN OF EXISTING SYSTEMS.

1.7 TEMPORARY SERVICES ARE TO BE PROVIDED TO MAINTAIN OPERATION OF FACILITY DURING THE PHASING OF WORK, INCLUDING TEMPORARY EQUIPMENT, PIPING, DUCTWORK AND UTILITY SERVICES.

1.8 OWNER TRAINING IN THE PROPER OPERATION, MAINTENANCE AND SERVICING OF ALL SYSTEMS IS TO BE PROVIDED VIDEOTAPE ALL TRAINING SESSIONS. PROVIDE IN A BOUND FORM TWO (2) SETS OF OPERATIONS MAINTENANCE AND INSTRUCTION MANUALS INCLUDING INFORMATION ON SPARE PARTS LUBRICATION SCHEDULE WIRING DIAGRAMS ETC., FOR ALL MATERIALS AND EQUIPMENT PROVIDE TWO (2) SETS OF ACCURATELY MARKED 'AS BUILT' PRINTS, ELECTRONIC FILE OF AS-BUILTS, AND TWO COPIES OF TRAINING SESSION VIDEO (DVD FORMAT).

1.9 WARRANTY ANY DEFECTS TO ALL EQUIPMENT MATERIALS AND LABOR FOR A PERIOD OF ONE (1) YEAR AFTER FINAL ACCEPTANCE OF THE BUILDING BY THE ARCHITECT AND ENGINEER (FIVE YEARS FOR REFRIGERATION COMPRESSORS - PARTS AND LABOR). DEFECTIVE EQUIPMENT AND MATERIALS SHALL BE REPAIRED OR REPLACED AT NO COST TO THE OWNER. GUARANTEE THAT ALL WORKMANSHIP IS OF HIGH QUALITY AND THAT ALL EQUIPMENT FURNISHED UNDER THIS CONTRACT FULFILLS THE REQUIREMENTS OF THE SPECIFICATIONS. CONDUCT, AT NO COST TO THE OWNER, CAPACITY TESTS ON ANY EQUIPMENT FURNISHED BY HIM WHEN SO REQUESTED BY THE ARCHITECT OR HIS REPRESENTATIVE WITHIN THE ONE YEAR PERIOD

PART 2 - AIR DISTRIBUTION SYSTEMS

2.1 DUCTWORK TO BE GALVANIZED SHEETMETAL FABRICATED ACCORDING TO SMACNA'S DUCT CONSTRUCTION STANDARDS (LATEST EDITION). UTILIZE PITTSBURGH LOCK SEAMS FOR ALL LONGITUDINAL SEAMS (NO EXCEPTIONS). SEAL ALL JOINTS AND SEAMS FOR AN AIRTIGHT INSTALLATION. EXPOSED DUCTWORK AND SHEETMETAL PANS IN FINISHED AREAS ARE TO BE PROVIDED WITH PAINT-GRIP READY FOR PRIMING AND PAINTING. ALL EXPOSED ROUND DUCTWORK TO BE SPIRAL TYPE DUCTWORK AND FITTINGS.

2.2 FLEXIBLE DUCTWORK TO BE EQUIVALENT TO THERMAFLEX MODEL MKE AND SHALL BE UL LABELED FOR USE IN RETURN AIR PLENUM. FLEXIBLE DUCTWORK MAY BE USED TO THE INLET OF REGISTERS, GRILLES AND DIFFUSERS AND TO BE 5'-0 MAXIMUM LENGTH, SUPPORTED WHERE REQUIRED TO PREVENT MOVEMENT

2.3 DUCTWORK INSULATION: EXHAUST AIR DUCTWORK SHALL BE WRAPPED WITH 1-1/2 THICK FIBERGLASS INSULATION (MIN. R-6) WITH FRK VAPOR BARRIER. ALL INSTALLATION. TAPES MASTICS, ETC. TO BE AS PER INSULATION MANUFACTURER'S RECOMMENDATIONS.

2.4 BALANCING DAMPERS TO BE EQUIVALENT TO AMERICAN WARMING MODEL VC-8/9 AND SHALL HAVE LOCKING QUADRANT REGULATORS WITH SPRING LOADED END BEARING. INSTALLATION SHALL BE RATTLE FREE. COORDINATE LOCATIONS WITH BALANCING CONTRACTOR. PROVIDE DAMPERS AT EACH DUCTWORK TAKE-OFF INCLUDING TAKEOFFS TO EACH AIR DISTRIBUTION DEVICE.

2.5 REGISTERS, GRILLES AND DIFFUSERS TO BE EQUIVALENT TO AS SCHEDULED ON DRAWINGS AND TO BE AS MANUFACTURED BY CARNES, METALAIRE, PRICE, NAILOR, TITUS AND KRUEGER. VERIFY CEILING STYLES AND TYPES BEFORE ORDERING REGISTERS, GRILLES AND DIFFUSERS PROVIDE APPROPRIATE FRAME STYLES AS REQUIRED TO MATCH CEILING STYLE AND TYPES.

PART 3 - HVAC PIPING & ACCESSORIES:

3.1 NATURAL GAS PIPING TO BE SCHEDULE 40 BLACK STEEL PIPE ASTM A-120 WITH MALLEABLE FITTINGS. PROVIDE GAS COCKS (CRANE 80E) AND DRIP LEG AT EACH PIECE OF EQUIPMENT MAKE SOAP TEST ON ALL PIPING TO PROVIDE TIGHT COORDINATE SERVICE INSTALLATION WITH LOCAL UTILITY COMPANYALL UNDERGROUNG GAS PIPING SHALL BE ROUTED IN PIPE SLEEVE ELCLOSURES AND VENTED TO ATMOSPHERE.

PART 4 -- TESTING AND BALANCING

4.1 TEST ADJUST AND BALANCE ALL AIR AND WATER SYSTEMS TO VALUES INDICATED ON PLANS AND AS REQUIRED AS PER TABB AND NEBB GUIDELINES. TESTING AND BALANCING TO BE DONE BY ONE OF THE FOLLOWING COMPANIES:

AAARON ENGINEERING SERVICES
5420 W. ROOSEVELT RD
CHICAGO, IL 60644

B. MECHANICAL TEST & BALANCE
P.O BOX 182
CROWN POINT, IN 46307

C.CONTROLLED ENVIRONMENT TESTING & BALANCING
1350 REMINGTON ROAD
SCHAUMBURG, IL 60173

4.2 REGULATE AND ADJUST ALL FANS AND BALANCING DAMPERS FOR THE REQUIRED AIR QUANTITIES OF ALL FAN SYSTEMS AND FOR ALL RESPECTIVE AIR OPENINGS THIS SHALL INCLUDE SETTING UP DAMPER POSITION FOR MINIMUM OUTSIDE DAMPERS MARK POSITION OF DAMPERS INDICATING FINAL BALANCE POSITIONS.

4.3 SUBMIT SIX (6) COPIES OF FINAL CERTIFIED TEST READINGS WITH THE FOLLOWING INFORMATION.

A.CFM QUANTITY, STATIC PRESSURE, FAN RPM, MOTOR AMPERAGE, ETC. FOR ALL SUPPLY, RETURN AND EXHAUST FAN SYSTEMS

B. CFM QUANTITY FOR ALL SUPPLY AIR, RETURN AIR, OUTSIDE AIR AND EXHAUST AIR OPENING/DEVICE FOR ALL AIR SYSTEMS

4.4 WHERE MODIFICATIONS ARE BEING MADE TO EXISTING AIR SYSTEMS, TEST EXISTING FANS OR PUMPS BEFORE TESTING AND BALANCING NEW WORK AND IS TO INCREASE/DECREASE THE FLOW RATE OF THE EXISTING FANS AS REQUIRED FOR THE NEW MODIFICATIONS. MAINTAIN EXISTING FLOW RATES FOR EXISTING PORTIONS OF AIR SYSTEMS. OBTAIN AND REFER TO EXISTING BALANCING REPORTS OR EXISTING DRAWINGS FROM OWNER TO DETERMINE EXISTING SYSTEM BALANCING REQUIREMENTS

PART 5 - WORK IN EXISTING BUILDINGS

5.1 FIELD VERIFY IF EXISTING ASBESTOS WILL BE ENCOUNTERED PRIOR TO STARTING ANY WORK. IF ASBESTOS IS PRESENT, THE OWNER WILL PROVIDE FOR THE REMOVAL OF ANY MATERIAL CONTAINING ASBESTOS SEE SPECIFICATIONS FOR FURTHER REQUIREMENTS.

5.2 REMOVE ALL EXISTING CEILINGS REQUIRED FOR INSTALLATION OF NEW WORK. CONTRACTOR IS TO REINSTALL CEILING UPON COMPLETION OF WORK. REPLACE ALL DAMAGED CEILING MATERIALS TO MATCH EXISTING.

5.3 ALL EXISTING EQUIPMENT, DUCTWORK, PIPING, ETC., SHALL BE REMOVED AS NOTED ON DRAWINGS AND AS REQUIRED TO MEET NEW SCOPE OF WORK. ALL EXISTING EQUIPMENT SHALL REMAIN PROPERTY OF THE OWNER AND OWNER SHALL DETERMINE IF CONTRACTOR IS TO STORE EQUIPMENT ON SITE AT OWNER SELECTED LOCATION OR IF CONTRACTOR IS TO ABANDON OR REMOVE EQUIPMENT FROM SITE.

5.4 REMOVED PIPING IS TO BE TERMINATED PROPERLY BACK TO EXISTING MAINS PATCH AND SEAL EXISTING CAP PIPING WATERTIGHT NO DUCTWORK, PIPING, SUPPORTS, HANGERS, OR EQUIPMENT IS TO BE LEFT ABANDONED VERIFY LOCATION AND ELEVATION OF EXISTING TO BE REMOVED IN FIELD PATCH ALL EXISTING FLOOR, WALL ROOF AND CEILING OPENINGS RESULTING FROM REMOVAL OF EXISTING MATERIALS AND EQUIPMENT AND PROVIDE FINISH THAT WILL MATCH EXISTING IN SURROUNDING AREAS. OPENINGS IN MASONRY WALLS RESULTING FROM REMOVED THERMOSTATS ARE TO BE COVERED WITH A BLANK STAINLESS STEEL COVER PLATE.

5.5 PROVIDE ALL CUTTING, CORE DRILLING AND PATCHING OF EXISTING FLOOR, AND WALL CONSTRUCTIONS REQUIRED FOR THE INSTALLATION OF NEW PIPING. SEAL PENETRATIONS THROUGH FLOOR, AND WALL STRUCTURE WATERTIGHT AND WITH AN APPROVED FIRE STOPPING MATERIAL, INCLUDING APPROVED FIRE RATED SLEEVE.

PART 6 - EXECUTION

6.1 PIPING ROUTE ALL NEW PIPING AS HIGH AS POSSIBLE TO AVOID CONFLICTS WITH OTHER TRADES. VERIFY CONDITIONS AND EXACT ROUTING IN FIELD PRIOR TO INSTALLATION. PIPING TO BE PRESSURE TESTED - SUBMIT REPORTS. PROVIDE DIELECTRIC FITTINGS BETWEEN PIPING OF DISSIMILAR MATERIALS. PROVIDE AIR-VENTS IN ALL HIGH POINTS OF WATER PIPING SYSTEMS.

6.2 DUCTWORK, PIPING, EQUIPMENT ETC. SHALL NOT BE SUPPORTED FROM THE BOTTOM CHORD OF ENGINEERED JOISTS WITHOUT WRITTEN APPROVAL FROM THE STRUCTURAL ENGINEER.

6.3 REGISTERS, GRILLES AND DIFFUSERS: COORDINATE EXACT LOCATION OF ALL CEILING REGISTERS, GRILLES AND DIFFUSERS WITH LIGHTING LAYOUT, SPRINKLER HEADS, AND CEILING GRID SEE ARCHITECTURAL REFLECTED CEILING PLAN. VERIFY EXACT LOCATION WITH ARCHITECT IN FIELD PRIOR TO INSTALLATION.

6.4 THE MINIMUM DISTANCE BETWEEN SUPPLY DIFFUSERS AND SMOKE OR HEAT DETECTORS IS TO BE A MINIMUM OF 3 ' COORDINATE WITH FIRE ALARM CONTRACTOR AS REQUIRED

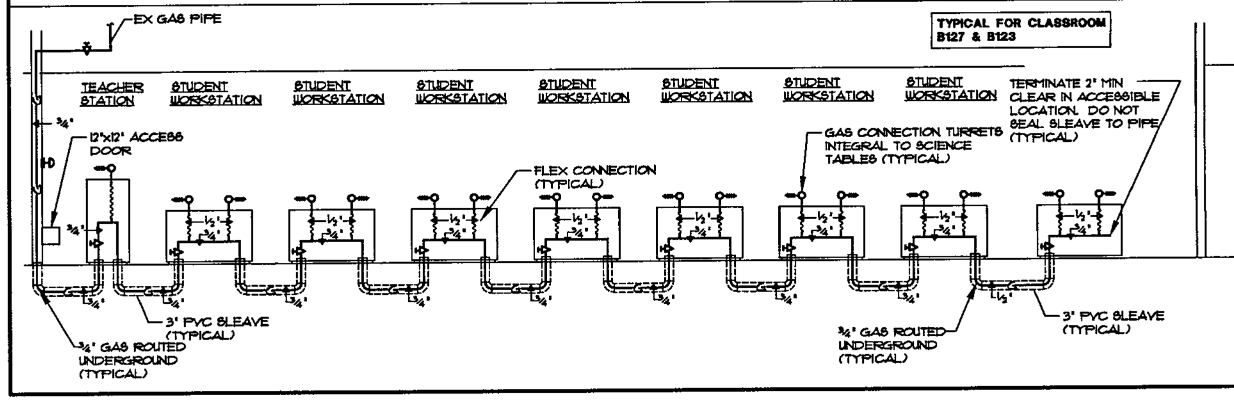
6.5 COORDINATION CONFER WITH THE OTHER CONTRACTORS REGARDING THE LOCATION AND SIZES OF DUCTWORK, PIPING AND EQUIPMENT IN ORDER THAT THERE MAY BE NO INTERFERENCES BETWEEN INSTALLATIONS OR THE PROGRESS OF THE WORK FOR ANY CONTRACTOR ON THE BUILDING. LAY OUT WORK TO AVOID CONFLICTS BETWEEN DUCTWORK, LIGHTING, CEILINGS PIPING AND BUILDING STRUCTURE COORDINATE ALL EQUIPMENT ELECTRICAL REQUIREMENTS (VOLTAGES PHASE LOAD ETC.) WITH ELECTRICAL CONTRACTOR BEFORE ORDERING ANY EQUIPMENT

6.6 CUTTING AND PATCHING TO BE PROVIDED SO THE WORK MAY BE PROPERLY INSTALLED ALL DISTURBED CONSTRUCTION OR FINISH MUST BE REPLACED OR REPAIRED TO THE ARCHITECT'S SATISFACTION AT THIS CONTRACTOR'S EXPENSE. UNDER NO CONDITION SHALL STRUCTURAL WORK BE CUT EXCEPT UPON APPROVAL OF THE ARCHITECT

6.7 CLEANING UPON COMPLETION OF INSTALLATION OF VENTILATION DUCTS, CLEAN ENTIRE SYSTEM OF RUBBISH, PLASTER, DIRT, ETC., BEFORE INSTALLING GRILLES OR DIFFUSERS REMOVE ALL DEBRIS FROM JOB SITE AND LEAVE ALL MECHANICAL EQUIPMENT CLEAN.

6.8 RETURN AIR PLENUMS: CEILING SPACES ARE RETURN AIR PLENUMS EXAMINE PLENUM BEFORE CEILING IS INSTALLED (OR REPLACED) AND COORDINATE WITH OTHER TRADES THE SEALING OF ALL OPENINGS AROUND PIPING, DUCTWORK, CONDUIT ETC., AND OPENINGS TO OUT-OF-DOORS AND ADJACENT SPACES. REPORT ALL DEFICIENCIES TO THE GENERAL CONTRACTOR.

SCIENCE TABLE GAS PIPING CONNECTION DETAIL



SYMBOLS/ABBREVIATIONS

SYMBOL	DESCRIPTION
	EXISTING DUCTWORK
	NEW DUCTWORK
	DUCTWORK TO BE REMOVED NEW DUCTWORK TO TIE INTO EXISTING DUCTWORK
	EXISTING DUCTWORK
	NEW DUCTWORK
	DUCTWORK TO BE REMOVED NEW DUCTWORK TO TIE INTO EXISTING DUCTWORK
	RETURN OR EXHAUST DUCT UP
	RETURN OR EXHAUST REGISTER
(T)	THERMOSTAT - ADJUSTABLE
	PIPING TO BE REMOVED
	EXISTING PIPING
	PIPE TURNED UP
	PIPE TURNED DOWN
	PIPE EXPANSION
	SHUT-OFF VALVE
	GAS COCK
	SHUT-OFF VALVE IN RISER
	PRESSURE REDUCING VALVE

ABBREVIATIONS	DESCRIPTION
OBD	OPPOSED BLADE DAMPER
TYP	TYPICAL

GRILLE, REGISTER & DIFFUSER SCHEDULE

TAG	MANUFACTURER	MODEL NO	DESCRIPTION	AIR PATTERN	MOUNTING	SIZE	TYPE OF CONTROL	REMARKS
R1	NAILOR	6145H-O	RETURN/EXHAUST REGISTER	LOUVERED GRILLE	LAY-IN PANEL	SEE PLANS	O.B.D	-

• ALL DIFFUSERS AND REGISTERS SHALL HAVE A WHITE FINISH UNLESS OTHERWISE NOTED

TRIA ARCHITECTURE

Millies Engineering Group
M/E/P ENGINEER

DUNELAND SCHOOL CORPORATION
2017 SCIENCE LAB RENOVATIONS AT:
CHESTERTON MIDDLE SCHOOL
651 W. MORGAN AVENUE, CHESTERTON, INDIANA 46304

PROJECT NUMBER: 11-026
PROJECT MANAGER: XXX
DRAWN BY: XXX
ISSUED FOR BID AND PERMIT: TBD
REVISIONS:

MECHANICAL SCHEDULES AND DETAILS

M2.00