SPECIALIST SUB-TRADES AND MANUFACTURER'S REPRESENTATIVES.

.2 THE FOLLOWING SYSTEMS SHALL BE DEMONSTRATED IN REGARDS TO PERFORMANCE AND SAFETY FEATURES (TO THE FULLEST):
.1 AIR HANDLING SYSTEMS (SUPPLY, RETURN, EXHAUST)
.2 HEATING SYSTEMS (CHILLS.)
.3 CONTROLS SYSTEM
.4 PLUMBING SYSTEMS

.3 OBTAIN A SIGNED STATEMENT FROM THE OWNER CERTIFYING THAT THE DEMONSTRATION AND INSTRUCTIONS HAVE BEEN GIVEN TO HIS SATISFACTION.

1.2.1 TEMPORARY FACILITIES

.1 PROVIDE ANY TEMPORARY BUILDINGS AND WORKSHOPS THAT MAY BE REQUIRED FOR WORKMEN, ON-THE-SITE OPERATIONS, STORAGE OF MATERIALS, SEWER CONNECTED WATER CLOSETS FOR THE USE OF WORKMEN. PROVIDE, NEAR THE SITE AND KEEP OPEN AT ALL TIMES DURING CONSTRUCTION ON THE PROJECT, AN OFFICE FOR HIS OWN USE WHERE ALL NOTICES AND INSTRUCTIONS FROM THE CONSULTANT WILL BE RECEIVED AND ACKNOWLEDGED BY HIMSELF OR HIS AUTHORIZED REPRESENTATIVE. ACCOMMODATIONS SHALL CONFORM IN APPEARANCE TO THE GENERAL CONTRACTOR'S.

15042 TESTING:

.1 PERFORM ALL TESTING REQUIRED BY THE AUTHORITY HAVING JURISDICTION.

.2 OBTAIN TEST CERTIFICATES FOR ALL TESTS PERFORMED AND INCLUDE IN OPERATING MANUALS.

.3 PERFORM THE FOLLOWING TEST: (WHERE APPLICABLE)
.1 SANITARY & STORM HYDRAULIC TEST.
.2 DOMESTIC WATER TEST TO 1 1/2 TIMES MAX WATER PRESSURE OR (1200PSI).
.3 DUCTWORK - TEST MEDIUM VELOCITY SYSTEMS TO A STATIC PRESSURE OF SYSTEM + 2" OF W.G.
.4 DROP TEST ALL FIRE DAMPERS.

.4 ALL TEST SHALL BE DOCUMENTED AND WITNESSED BY THE CONSULTANT OR GENERAL CONTRACTOR.

15043 BALANCING

.1 CONTRACTOR IS TO PROVIDE THE SERVICES OF A APPROVED PROFESSIONAL TESTING & BALANCING FIRM.

.2 PROVIDE A BALANCE REPORT OF ALL AIR & WATER BALANCE POINTS AND PERFORMANCE TESTING & BALANCING OF ALL EQUIPMENT AS PER THE AABC.

.3 BALANCE ALL AIR AND WATER QUANTITIES TO - 5% OR + 10% OF THE DESIGN REQUIREMENT.

.4 PROVIDE ALL REQUIRED SHEAVE, BELT AND IMPELLER CHANGES TO ACHIEVE THE REQUIRED FAN AND PUMP FLOW RATES.

.5 MEASURE AND BALANCE THE FOLLOWING (WHERE APPLICABLE):
.1 SUPPLY, EXHAUST AND RETURN FAN VOLUMES AND SPEEDS.
.2 AIRFLOW AT EACH AIR OUTLET AND BRANCH CONNECTION.
.3 ADJUST PATTERN CONTROL ON SUPPLY DIFFUSERS.
.4 MOTOR AMPERAGE DRAW ON ALL MOTORS AND COMPARE WITH MOTOR RATING.
.5 WATER FLOW THROUGH ALL BALANCE VALVES. (CHW).

.6 ADDITIONAL TESTING OF THE SYSTEM MAY BE REQUESTED BY THE CONSULTANT TO SPOT CHECK AIR AND WATER FLOW QUANTITIES. (10% OF THE SYSTEM WILL BE RE-CHECKED AT THE DISCRETION OF THE CONSULTANT AT THE CONTRACTORS COST.

15060 PIPE & PIPE FITTINGS

.1 ENSURE ALL PIPE MATERIALS AND FITTINGS ARE ACCEPTABLE TO THE AUTHORITY HAVING JURISDICTION.

.2 ALL TYPE 'K' COPPER MUST BE CERTIFIED TO ASTM B88. PROVIDE WRITTEN GUARANTEE THAT LEAD FEE SOLDER WAS USED ON ALL DOMESTIC WATER SYSTEMS.

.3 APPROVED PIPE & FITTINGS:

SERVICE	PIPE	FITTINGS
.1 SANITARY ABOVE GRADE	DWV COPPER	WROUGHT COPPER OR CAST BRASS 95-5 SOLDER
	CAST IRON	GASKET WITH STAINLESS STEEL COUPLING
	DWV-P.V.C.	SOLVENT WELD
.2 SANITARY BELOW GRADE	CAST IRON	GASKET WITH STAINLESS STEEL COUPLING
	ABS	SOLVENT JOINT
	P.V.C./DWV.	SOLVENT JOINT
.3 STORM DRAINAGE ABOVE	CAST IRON	GASKET WITH STAINLESS STEEL COUPLING
	COPPER	COPPER OR BRASS WITH 95-5 SOLDER
.4 STORM DRAINAGE BELOW	CAST IRON	GASKET WITH STAINLESS STEEL COUPLING
	ABS	SOLVENT JOINT
	P.V.C./DWV.	SOLVENT JOINT
.5 FOOTING DRAINAGE	P.V.C. SDR35	SOLVENT JOINT
.6 DOMESTIC WATER ABOVE	TYPE 'L' HARD COPPER	WROUGHT COPPER OR BRASS WITH 95.5% SOLDER (LEAD FREE)
	X-LINKED POLYETHYLENE C.P.V.C."FLOWGUARD" (UP TO 1" THROUGH FIRE SEPARATION)	BRASS COMP. SOLVENT WELD
.7 DOMESTIC WATER BURIED	P.V.C. RINGTIGHT	GROOVED MECHANICAL JOINTS
	CEMENT LINED DUCTILE	GROOVED JOINTS
	TYPE 'K' & 'L'SOFT COPPER	WROUGHT COPPER OR BRASS 95-5 SOLDER

.4 CONTRACTOR TO PROVIDE DRAINS AT ALL LOW POINTS IN THE PIPING SYSTEM.

15090 SUPPORT, ANCHORS & SEALS

.1 PROVIDE ALL NECESSARY SUPPORTS, AND HANGERS TO SECURE MECHANICAL SYSTEMS AND EQUIPMENT.

.2 PROVIDE FIRESTOPPING AT ALL DUCT AND PIPING PENETRATIONS THROUGH RATED FLOORS/WALLS AND SHAFTS.

.3 PROVIDE OVERSIZE HANGERS ON ALL COLD PIPES TO FIT OVER PIPE INSULATION WHERE REQUIRED.

.4 PROVIDE ISOLATION AND PREVENT CONTACT WITH DISSIMILAR METALS.

.5 ALL SLEEVES FOR MECHANICAL PIPING TO EXTEND 1" ABOVE THE FLOOR IN ALL MECHANICAL ROOM, SHAFT AND WEST AREAS.

.6 ALL DUCTWORK TO BE SUPPORTED AS PER SMACNA.

.7 ALL EXPOSED PIPING PENETRATIONS SHALL BE PROVIDED WITH ESCUTCHEONS.

15100 VALVES

.1 SCOPE
.1 PROVIDE VALVES FOR DOMESTIC WATER AND GAS SYSTEMS.
.2 PROVIDE GATE, GLOBE, BALL, BUTTERFLY, DRAIN AND CHECK VALVES.
.3 PROVIDE ALL NECESSARY VALVES SUITABLE FOR THE FLUID AND PIPING SYSTEM.
.4 ALL VALVES MUST BE SUITABLE FOR A WORKING PRESSURE 1380 KPA AT 121°.

.2 INSTALL ALL VALVES IN UPRIGHT OR HORIZONTAL POSITION.

.3 PROVIDE DRAIN VALVES AT ALL LOW POINTS IN THE PIPING SYSTEM.

.4 PROVIDE ISOLATION VALVE AT EACH PLUMBING FIXTURE.

.5 VALVES PERMITTED:

DOMESTIC HOT & COLD	& 2" DIAMETER	2" DIAMETER &
	GATE, BALL	GATE, BALL, BUTTERFLY

.6 VALVES UP TO 2" DIAMETER CAN BE SWEATED OR SCREWED CONNECTION. VALVES LARGER THAN 2" DIAMETER MUST BE SCREWED, FLANGED OR MECHANICALLY COUPLED TO PIPING SYSTEM.

15160 VIBRATION ISOLATION

.1 SCOPE
.1 PROVIDE VIBRATION ISOLATION FOR ALL MOTOR DRIVEN EQUIPMENT. TO MAINTAIN NOISE CRITERIA LEVELS AT OR BELOW ASHRAE RECOMMENDED LEVELS.

.2 PROVIDE SPRING ISOLATOR FOR ALL MOTOR DRIVEN EQUIPMENT LARGER THAN 1/2 H.P. FOR EQUIPMENT 1/2 H.P. AND LESS NEOPRENE ISOLATORS MAY BE USED.

.3 ALL ISOLATORS PROVIDED SHALL INCORPORATE SEISMIC RESTRAINTS. ISOLATORS FOR BASE MOUNTED EQUIPMENT SHALL BE SEISMIC ISOLATORS.

.4 PROVIDE HORIZONTAL LIMIT SPRINGS ON ALL FANS (EXCEPT VERTICAL DISCHARGE) IN EXCESS OF Ø.3" STATIC PRESSURE.

.5 ALL FLOOR MOUNTED NON ISOLATED EQUIPMENT (IE. BOILERS, TANKS, AIR HANDLING UNITS) SHALL BE BOLTED TO STRUCTURE AND BE DESIGNED FOR A 2G APPLIED HORIZONTAL FORCE.

.6 SUBMIT SHOP DRAWINGS OF ISOLATOR WHICH ARE NOT SUPPLIED BY THE EQUIPMENT MANUFACTURER.

.7 ALL ELECTRICAL CONNECTIONS TO EQUIPMENT TO BE PROVIDED WITH FLEXIBLE CONNECTORS AND CABLE WITH A MINIMUM 30 DIEG. BEND OR FLEXIBLE CONDUIT.

.8 PROVIDE FLEXIBLE DUCTWORK AND PIPING CONNECTIONS TO ALL EQUIPMENT WHICH INCORPORATES VIBRATION ISOLATIONS.

15200 SEISMIC REQUIREMENTS

.1 SCOPE
.1 SEISMIC RESTRAINTS FOR ALL EQUIPMENT, DUCTWORK, AND PIPING COVERED BY DIVISION 15. ATTACHMENT SHALL BE TO STRUCTURAL MEMBERS.

.2 REFERENCE STANDARDS
SEISMIC REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE FOLLOWING:

.1 2006 B.C. BUILDING CODE
.2 N.F.P.A. 13, N.F.P.A. 13R.
.3 N.F.P.A. 20.
.4 SMACNA "GUIDELINES FOR SEISMIC RESTRAINTS OF MECHANICAL SYSTEMS AND PLUMBING PIPING SYSTEMS".

.3 CONTRACTOR TO PROVIDE PROFESSIONAL CERTIFICATION FROM SPECIALIST SEISMIC ITEMS TRADE PRIOR TO REPORT FOR COMPLETION OR OCCUPANCY INSPECTION, WHICHEVER IS THE EARLIER.

.4 INSTALLATION REQUIREMENTS

.1 PROVIDE AND INSTALL SEISMIC RESTRAINTS FOR ALL EQUIPMENT, DUCTWORK AND PIPING INSTALLED BY THIS DIVISION IN ACCORDANCE WITH ALL CURRENT APPLICABLE CODES.

.2 THE INSTALLATION OF SEISMIC RESTRAINS SHALL NOT COMPROMISE VIBRATION ISOLATION CAPABILITIES.

.3 PRIOR TO CONSTRUCTION COMMENCEMENT, CONTRACTOR SHALL ORGANIZE A MEETING WITH THE GENERAL CONTRACTOR, MECHANICAL CONTRACTOR, STRUCTURAL CONSULTANTS AND OTHER APPROPRIATE PARTIES. AT THAT MEETING, THE CONTRACTOR SHALL PRESENT IN GENERAL THE APPROACHES/DETAILS USED TO PROVIDE SEISMIC BRACING FOR EQUIPMENT, DUCTWORK AND PIPING HIGHLIGHTING ATTACHMENTS TO STRUCTURE AND TRADE COORDINATION.

.4 SEISMIC RESTRAINTS FOR HOT WATER TANKS TO BE VIBRA-SONIC CONTROL MODEL VS-100 FOR TANKS LARGER THAN 50 GALLONS. SMALL TANKS TO BE PROVIDED WITH STEEL STRAP SECURED TO STRUCTURE.

.5 CONTRACTOR TO PROVIDE PROFESSIONAL CERTIFICATION FOR ALL ITEMS INSTALLED BY THIS DIVISION.

15250 INSULATION

.1 INSTALLATION SHALL CONFORM TO THE B.C.I.C.A. QUALITY STANDARDS MANUAL FOR MECHANICAL INSULATION.

.2 PIPING INSULATION:
.1 PROVIDE VAPOUR BARRIER FOR ALL COLD PIPES.
.2 EXPOSED RAIN WATER LEADERS TO BE INSULATED IN ALL HEATED SPACES. PROVIDE INSULATION FOR FIRST 10'-0" IN CEILING SPACE.
.3 INSULATION IS NOT REQUIRED FOR IN-SUITE DOMESTIC HOT & COLD WATER PIPING.
.4 INSULATION TO BE PROVIDED FOR ALL DOMESTIC HOT AND COLD AND RECIRC. PIPING IN THE CORRIDOR AND RISERS 1"1 AND LARGER.
.5 INSULATE ALL PLUMBING TRAPS IN UNHEATED UNDERGROUND PARKADES WITH REMOVABLE INSULATED CAP.
.6 ALL EXPOSED PIPING TO BE COMPLETE WITH PF-3 ECONOMY FINISH. NO FINISH REQUIRED ON CONCEALED PIPING.
.7 PROVIDE INSULATION THICKNESS AND TYPE AS FOLLOWS: (WHERE APPLICABLE)

SERVICE	SIZE	INSULATION THICKNESS	TYPE
DOMESTIC HOT & COLD	UP TO 1"	1/2"	MINERAL FIBRE
DOMESTIC HOT & COLD	1 1/2" & UP	1"	MINERAL FIBRE
PLUMBING TRAPS	ALL	1/2"	MINERAL FIBRE (REMOVABLE CAP)
STORM RWL.	ALL	1/2"	MINERAL FIBRE

.8 INSULATE ALL EXPOSED TRAPS UNDER HANDICAPPED SINKS WITH FACTORY INSTALLATION KIT.

.3 DUCTWORK INSULATION

.1 PROVIDE EXTERNAL DUCTWORK INSULATION AS PER THE FOLLOWING: (WHERE APPLICABLE)

SERVICE	THICKNESS	TYPE
AIR CONDITIONED SUPPLY	1"	FLEXIBLE FOIL FACE FIBREGLASS
HEATING SUPPLY AIR DUCT	1"	FLEXIBLE FOIL FACE FIBREGLASS
OUTSIDE AIR INTAKE	1"	FLEXIBLE FOIL FACE FIBREGLASS
DUCTWORK IN UNHEATED SPACE	1"	FLEXIBLE FOIL FACE FIBREGLASS

.2 ALL EXPOSED DUCTWORK IN MECHANICAL ROOMS TO BE RIGID INSULATION WITH RF4 ECONOMY FINISH.

.3 EXPOSED HEATING AND AIR CONDITIONED DUCTWORK INSTALLED IN A EXPOSED AREA IN WHICH IT IS SERVING, NEED NOT BE INSULATED.

.4 EXTERNAL INSULATION IS NOT REQUIRED WHERE DUCTWORK IS INTERNALLY LINED.

.5 DUCTWORK EXPOSED TO THE WEATHER SHALL BE PROVIDED WITH WEATHER PROOF JACKETING (P.V.C. OR ALUMINUM).

.4 ACOUSTIC INSULATION

.1 PROVIDE 1" INTERNAL ACOUSTIC INSULATION UPSTREAM AND DOWNSTREAM A MINIMUM OF 10'-0" FROM ALL SUPPLY, RETURN AND EXHAUST FANS 1/2 HP AND LARGER.

.2 PROVIDE 1" INTERNAL ACOUSTIC INSULATION WHERE SHOWN HATCHED ON DRAWINGS.

.3 ALL INSULATION EDGES MUST BE SEALED. PROVIDE FASTENERS AT 12" O.C. WITH PINS CUT AND CAPPED.

15400 PLUMBING GENERAL

.1 TO COMPLY WITH BC BUILDING CODE 2006 AND LOCAL MUNICIPALITY REQUIREMENTS.

.2 FIRE STOP ALL PENETRATIONS THROUGH RATED SEPARATIONS. PROVIDE NECESSARY THERMAL INSULATION AND VAPOUR BARRIER AT PENETRATIONS. CONTRACTOR TO PROVIDE PROFESSIONAL CERTIFICATION FROM SPECIALIST FIRE-STOPPING TRADE PRIOR TO REPORT FOR COMPLETION OR OCCUPANCY INSPECTION, WHICHEVER IS THE EARLIER.

.3 SUPPLY AND INSTALL CLEANOUTS ON ALL DRAINS. CHANGES IN DIRECTION AT BASE OF RISER AND ON MAIN SANITARY AND STORM LEAVING BUILDING IN ADDITION TO THE B.C. PLUMBING CODE.

.4 PROVIDE WATER METRE C/W REMOTE READ-OUT AS PER THE LOCAL AUTHORITY HAVING JURISDICTION. EACH WATER STATION SHALL BE COMPLETE WITH 2 P.R.V.'S BYPASS AND PRESSURE GAUGES.

.5 WHERE DRAINS ARE LOCATED OVER AN OCCUPIED AREA, MEMBRANE CLAMP IS TO BE PROVIDED WITH DRAIN FOR A WATERPROOF INSTALLATION.

.6 PRIOR TO COMMENCING THE UNDERGROUND PLUMBING INSTALLATION EXCAVATE AND VERIFY:
.1 THE LOCATION, ELEVATION AND SIZE OF STORM AND SANITARY SERVICE CONNECTIONS.
.2 THE SANITARY AND STORM LINES CAN BE ROUTED AND SUFFICIENTLY SLOPED WITH ADEQUATE COVER FOR FREEZING PROTECTION TO MEET THE SERVICE CONNECTIONS.
.3 INFORM THE ENGINEER IMMEDIATELY IF ANY CHANGES ARE REQUIRED.
.4 ALL FLOOR DRAINS SHALL HAVE TRAP PRIMER CONNECTION.
.5 PROVIDE INSTALLATION OF PLUMBING FIXTURES WHEN SUPPLIED BY OTHERS.
.6 MAINTAIN A MINIMUM HEADROOM CLEARANCE OF 7'1 IN PARKADE. KEEP HIGHER IF POSSIBLE.
.7 LEAD FREE SOLDER TO BE USED FOR ALL POTABLE WATER SYSTEMS. CONTRACTOR TO ISSUE GUARANTEE IN MAINTENANCE MANUAL.

.7 PROVIDE UNIONS TO ALL EQUIPMENT AND VALVE CONNECTIONS FOR 2-1/2" AND BELOW. FLANGED CONNECTIONS FOR 3" AND OVER.

.8 PROVIDE NECESSARY THRUST BLOCK, ANCHOR, ETC. TO UNDERGROUND WATER PIPING AT ALL CHANGE OF DIRECTION, ALL TEES AND AT THE END OF ALL MAINS AND BRANCHES.

.9 PROVIDE STAINLESS STEEL BELLOWS TYPE WATER HAMMER ARRESTORS ON WATER LINES CONNECTED TO CLOTHES WASHER AND DISH WASHER AND AT TOP OF RISERS. PROVIDE ACCESSIBLE ISOLATION VALVE AND ACCESS TO ARRESTORS FOR SERVICING.

.10 PROVIDE ANY EXCAVATIONS NECESSARY FOR THE INSTALLATION OF THE MECHANICAL WORK. NO CUTTING, BORING OR EXCAVATING NECESSARY FOR THIS WORK IN OR ABOUT THE BUILDING WHICH MAY CAUSE INTERFERENCE WITH THE PROGRESS OF THE WORK, OR WEAKEN THE STRUCTURE IN ANY WAY, SHALL BE UNDERTAKEN WITHOUT THE APPROVAL OF THE CONSULTANT BEFORE COMMENCING WORK. TRENCHES FOR ALL UNDERGROUND PIPING SHALL BE EXCAVATED TO A DEPTH SLIGHTLY MORE THAN REQUIRED AND GRADED SO AS TO SECURE ALL AVAILABLE FALL. SUPPORT EACH LENGTH OF PIPE WITH CONCRETE BLOCKS AND BRICKS, OR BACKFILL THE TRENCH WITH GRAVEL TO THE REQUIRED DEPTH AND GRADE. SANITARY AND STORM LINES OUTSIDE OF THE BUILDING SHALL BE KEPT AS DEEP AS PRACTICAL.

.11 BACKFILLING IN ALL TRENCHES SHALL BE WITH SAND OR PEA GRAVEL WHERE APPROVED, 150MM BELOW PIPE AND UP TO 150MM OVER TOP OF PIPING. REMAINDER OF ALL TRENCHES SHALL BE FILLED BY THE GENERAL CONTRACTOR.

.12 WHERE SEWER, WATER OR STORM PIPES PASS UNDER A GRADE BEAM OR FOOTING THE TRENCH AROUND THE PIPING UP TO AND IN CONTACT WITH THE FOOTING, PROVIDE A 450 KG CONCRETE GROUTING SO AS TO SEAL THE OUTSIDE TRENCHING FROM NORMAL STORM RUN OFF AND BACKFLOW OF RAIN WATER THROUGH THE TRENCHING AND INTO THE CRAWL SPACE AND/OR UNDER THE BASEMENT FLOOR.

.13 WHERE SEWER, WATER OR STORM PIPES PASS THROUGH EXTERIOR WALLS BELOW GRADE, THE GENERAL CONTRACTOR SHALL INSTALL CORBELS ON THE EXTERIOR WALLS AND RUN BRIDGING FOR CORBEL TO UNDISTURBED SOIL FOR THE SUPPORT OF THE PIPES. ONE INCH THICK WATERPROOF MASTIC SHALL BE APPLIED AROUND THE PIPES WHICH PASS THROUGH THE WALL.

.14 PROVIDE CHROME ESCUTCHEON PLATE FOR ALL PLUMBING ROUGH-IN.

.15 PROVIDE LEAD SHEET FLASHING AND SHEET METAL COUNTER FLASHING FOR PIPE PASSING THROUGH ROOF DECK STRUCTURE.

.16 PROVIDE NON-CONDUCTING TYPE CONNECTION FOR JOINING OR SUPPORTING. PROVIDE SEPARATION BETWEEN DISSIMILAR METALS.

.17 PROVIDE STOP VALVE TO ALL EQUIPMENT AND PLUMBING FIXTURE CONNECTION. PROVIDE STOP VALVE TO BASE OF WATER RISERS. PROVIDE ISOLATION VALVES FOR ALL FIXTURE TRIM UNLESS COMPLETE WITH INTEGRAL STOPS.

.18 CONDENSATE DRAINS SHALL BE PIPED TO AND CONNECTED TO NEAREST RWL.

15450 PLUMBING FIXTURES & TRIM

.1 ALL PLUMBING FIXTURES AND TRIM SHALL BE MECHANICAL ENGINEER APPROVED.

.2 REFER TO PLUMBING FIXTURE SCHEDULE FOR REQUIRED FIXTURE DESCRIPTION.

15475 CLEANING & CHEMICAL TREATMENT

.1 PROVIDE FOR DEGREASING AND CLEANING OF ALL HEATING WATER SYSTEMS.

.2 PROVIDE FOR CLEANING AND DISINFECTION OF ALL DOMESTIC HOT & COLD WATER SYSTEMS.

.3 FOR HOT WATER HEATING SYSTEMS PERFORM A BAL OUT AND PROVIDE DEARBORN - 545 OR EQUIVALENT CHEMICAL TREATMENT.

.4 DURING SYSTEM FLUSHING ENSURE THAT ALL CONTROL VALVES AND OTHER SYSTEM VALVES ARE IN THE FULL OPEN POSITION.

.5 ALL DOMESTIC WATER PIPING SHALL BE THOROUGHLY FLUSH SO THAT IT IS FREE FROM ALL SCALE, SEDIMENT ETC.

.6 PROVIDE 30% BY VOLUME ETHYLENE GLYCOL TO ALL HEATING WATER SYSTEMS FOR FREEZE PROTECTION.

15560 FIRE STOPPING AND SMOKE SEALS

1. SCOPE
.1 FURNISH ALL LABOUR, MATERIAL, EQUIPMENT AND SERVICES NECESSARY TO SUPPLY AND INSTALL FIRESTOPPING AND SMOKE SEALS AROUND MECHANICAL SERVICE PIPING AND DUCT PENETRATIONS THROUGH FIRE RATED WALL AND FLOOR ASSEMBLIES, AS INDICATED AND AS SPECIFIED.

2. CONFORM TO MANUFACTURER'S RECOMMENDED TEMPERATURES, RELATIVE HUMIDITY AND SUBSTRATE MOISTURE CONTENT FOR APPLICATION AND CURING OF FIRESTOPPING MATERIALS.

3. USE ASBESTOS-FREE MATERIALS AND SYSTEMS CAPABLE OF MAINTAINING AN EFFECTIVE BARRIER AGAINST FLAME, SMOKE AND GASES IN COMPLIANCE WITH REQUIREMENTS OF CAN-S115-1169, OR ULI 1479 AND ASTM 814, AND NOT TO EXCEED OPENING SIZES FOR WHICH THEY ARE INTENDED.

4. FIRE RESISTANCE RATING OF INSTALLED FIRESTOPPING ASSEMBLY SHALL BE NOT LESS THAN THE FIRE RESISTANCE RATING OF SURROUNDING FLOOR AND WALL ASSEMBLY AS INDICATED.

5. INSPECT ALL SURFACES TO BE FIRESTOPPED. REPORT ANY UNSUITABLE OR UNSATISFACTORY CONDITIONS TO THE CONTRACTOR IN WRITING PRIOR TO COMMENCEMENT. ESTABLISH CORRECT THICKNESSES AND INSTALLATION OF MATERIALS. ENSURE THAT SUBSTRATES AND SURFACES ARE DRY AND FROST FREE.

6. INSTALL FIRESTOPPING AND SMOKE SEAL MATERIAL AND COMPONENTS IN ACCORDANCE WITH ULC CERTIFICATION AND MANUFACTURER'S INSTRUCTIONS TO PROVIDE A TEMPERATURE AND FLAME RATED SEAL NOT LESS THAN THE FIRE RESISTANCE RATING OF THE SURROUNDING WALL OR FLOOR ASSEMBLY.

7. SEAL HOLES OR VOIDS MADE BY THROUGH-PENETRATIONS, POKE-THROUGH TERMINATION DEVICES, AND UNPENETRATED OPENINGS OR JOINTS TO ENSURE CONTINUITY AND INTEGRITY OF FIRE SEPARATION ARE MAINTAINED. MINIMUM THICKNESS OF SEALANT SHALL BE 12 MM.

8. WHERE PRE-FORMED MINERAL WOOL PIPE INSULATION IS USED, THE MINERAL WOOL SHALL BE COMPRESSED TO 50% OF LOOSE RESTING VOLUME.

9. TOOL OR TROWEL EXPOSED SURFACES TO A NEAT FINISH. REMOVE EXCESS COMPOUND PROMPTLY AS WORK PROGRESSES AND UPON COMPLETION.

10. DO NOT COVER UP MATERIALS UNTIL PROPER CURING AND INSPECTION HAS TAKEN PLACE.

15600 SHEET METAL DUCTWORK

.1 DUCTWORK SHALL BE GALVANIZED STEEL, LOCK FORMED 2" W.G. SMACNA STANDARD FOR LOW VELOCITY AND MEDIUM VELOCITY DUCTWORK QUALITY. FABRICATED IN ACCORDANCE WITH SMACNA DUCT MANUALS AND ASHRAE HANDBOOKS. DUCTWORK SHALL MEET THE REQUIREMENTS OF NFPA 90A AND 91 AND CONFORM TO APPLICABLE CODES.

.2 PRIOR TO FABRICATION OF DUCTWORK, CHECK ALL CEILING SPACES AND HEIGHTS AND CONFLICTS WITH OTHER TRADES. INCLUDE AND PROVIDE NECESSARY OFFSET TO MAINTAIN CEILING HEIGHT, HEADROOM ETC.

.3 PROVIDE MINIMUM 300MM X 300MM (12"X 12") ACCESS PANELS TO MANUAL DAMPERS, EQUIPMENT, FIRE DAMPERS.

.4 ALL DUCTWORK SHALL BE DELIVERED TO SITE IN A CLEAN CONDITION AND REMAIN CLEAN. DURING INSTALLATION ALL OPEN ENDS OF DUCTWORK SHALL BE CAPPED AND KEPT CLEAN.

.5 PROVIDE FLEXIBLE DUCT CONNECTIONS FROM DUCT BRANCHES TO SUPPLY AIR DIFFUSERS, 1500MM (5'-0") MAXIMUM. FLEX SHALL BE THERMALLY INSULATED IF SUPPLY DUCTWORK IS INSULATED.

.6 ALL DUCTS ASSOCIATED WITH FANS, AND OTHER VIBRATION ISOLATED EQUIPMENT SHALL BE INSTALLED WITH FLEXIBLE CONNECTIONS ON THE INLET AND OUTLET OPENINGS.

.7 ALL DUCTWORK PENETRATING FLOOR SLABS ABOVE AND BELOW OR FIRE SEPARATIONS SHALL BE COMPLETE WITH FIRE DAMPERS.

.8 PROVIDE RETURN AIR OPENINGS AND/OR SOUND TRAPS WHERE INDICATED COMPLETE WITH 1" ACOUSTIC LINING.

.9 PROVIDE BALANCING DAMPERS WHERE INDICATED ON DRAWINGS AND AT ALL DUCT BRANCHES. PROVIDE ADDITIONAL BALANCE DAMPERS AT THE REQUEST OF THE BALANCING AGENT TO FACILITATE BALANCING.

.10 PAINT ALL VISIBLE DUCTWORK THROUGH SUPPLY, RETURN OR EXHAUST GRILLES MATT BLACK. COORDINATE ON SITE WITH GENERAL CONTRACTOR.

.11 SIZE ROUND DUCTS, INSTALLED IN PLACE OF RECTANGULAR DUCTS, FROM ASHRAE TABLE OF EQUIVALENT RECTANGULAR AND ROUND DUCTS. NO VARIATION OF DUCT CONFIGURATION OR SIZES PERMITTED EXCEPT BY PERMISSION FROM CONSULTANT.

.12 ALL EXPOSED AIR CONDITIONED SUPPLY DUCTWORK INSTALLED IN AN EXPOSED AREA IN WHICH IT IS SERVING WILL NOT REQUIRE EXTERNAL INSULATION.

.13 PROVIDE SEISMIC SUPPORTS FOR GRILLES AND DIFFUSERS.

.14 PROVIDE TURNING VANES FOR ALL RECTANGULAR ELBOWS INSTALLED AS PER SMACNA.

.15 ROOF MOUNTED DUCTS SHALL HAVE STANDING SEAMS AND SEALED WATER-TIGHT.

.16 SEAL ALL DUCT SEAMS WITHIN BUILDING WITH APPROVED DUCT SEALER.

.17 PROVIDE BACK DRAFT DAMPER TO ALL EXHAUST OUTLETS AT EXTERIOR.

.18 PROVIDE GALVANIZED STEEL SCREEN, 1/2" X 1/2" SQUARE MESH FOR EXTERIOR INTAKE & EXHAUST OUTLETS.

.19 PROVIDE FLASHING, CURB AND COUNTER FLASHING FOR ALL DUCTING PASSING THROUGH ROOF AND EXTERNAL ENVELOPE OF THE BUILDING.

15900 CONTROL SYSTEM ELECTRIC

.1 GENERAL
.1 PROVIDE COMPLETE CONTROL SYSTEM FOR ELECTRIC CONTROLS AS SPECIFIED HEREIN.

.2 THE MOTOR LIST AND WORK STATED THERE ON FORMS PART OF THE CONTRACT DOCUMENT.

.3 DIV16 TO PROVIDE WIRING TO DIV11 PHASE MOTOR & ALSO THE WIRING BETWEEN SUCH MOTOR & ITS CONTROL DEVICE SUCH AS THERMOSTAT AND TIME CLOCK. ALL OTHER WIRING ARE GENERALLY BY DIV.9. THE MOTOR LIST SCOPE OF WORK SHALL BE FOLLOWED.

.4 ALL DIV.9 WIRING & CONDUIT REQUIREMENTS TO FOLLOW DIV.16 SPECIFICATIONS FOR THIS PROJECT. THIS SHALL INCLUDE LOW-VOLTAGE WIRING.

.5 MOUNTING OF CONTROL DEVICES.
.1 BY ELECTRICAL CONTRACTOR - MOUNTING AND WIRING THERMOSTATS CONTROLLING SINGLE PHASE MOTOR, WIRING OF AQUASTATS AND TIMERS CONTROLLING SINGLE PHASE MOTORS.
.2 BY MECHANICAL CONTRACTOR - MOUNTING OF ALL IN-LINE PIPING DEVICES (WELL, VALVES, PRESSURE SWITCHES, ORIFICES, ETC.) MOUNTING OF AQUASTATS AND ALL CONTROL DEVICES.
.3 BY SHEET METAL CONTRACTOR - MOUNTING OF DAMPERS, BAFFLING IN MIXED AIR PLENUM TO CONTROL CONTRACTOR REQUIREMENTS, ACCESS DOOR FOR DUCT OR UNIT MOUNTED CONTROLS.

DATE	REVISIONS

DATE	ISSUED
1. NOV. 2 2010	ISSUED FOR BLDG PERMIT
2. DEC. 21 2011	ISSUED FOR CONSTRUCTION

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PROJECT : ST. JOSEPH'S CHURCH FOOD BANK

32550 - 7th AVENUE - MISSION BC

DRAWING TITLE : MECHANICAL SPECIFICATIONS

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DATE : NOV 2011

SCALE : NTS

JOB NO : 112521058

DR : NG

SHEET M-5.2