

GENERAL NOTES AND SPECIFICATIONS

PROJECT GENERAL SPECIFICATIONS

1. IT IS THE INTENT OF THESE DOCUMENTS THAT A COMPLETE AND WORKABLE INSTALLATION BE PROVIDED. TO THIS END, THE INSTALLING CONTRACTOR SHALL FURNISH LABOR, MATERIAL, EQUIPMENT, TOOLS, SUPERVISION, TRANSPORTATION, WAREHOUSE AND OTHER SERVICES REQUIRED TO COMPLETE THE WORK IN AN EFFICIENT AND TIMELY MANNER.

2. MECHANICAL CONTRACTOR SHALL FURNISH ALL LABOR AND MATERIALS, EQUIPMENT AND ACCESSORIES FOR COMPLETE AND FULLY OPERATING SYSTEM(S) INCLUDING (BUT NOT LIMITED TO): CONTROLS, DUCT, ACCESSORIES AND ALL REQUIRED FEES. WORK SPECIFIED ELSEWHERE AND BY OTHERS TO INCLUDE ELECTRICAL CONDUIT, LINE VOLTAGE WIRING, CARPENTRY AND PLATFORMS, CUTTING, BLOCKING, CORING AND DRILLING BY OTHERS.

3. ALL WORK, INCLUDING MATERIALS AND WORKMANSHIP, SHALL CONFORM TO THE REQUIREMENTS OF ALL LOCAL CODES, REGULATIONS, LAWS AND ORDINANCES AND THE LATEST ADOPTED EDITION (AT THE TIME OF INSTALLATION) OF:

- A. 2007 CALIFORNIA BUILDING CODE (CBC), [BASED ON 2006 INTERNATIONAL BUILDING CODE WITH L.A. CITY AMENDMENTS]
- B. 2007 CALIFORNIA ELECTRICAL CODE (CEC), [BASED ON 2005 NATIONAL ELECTRICAL CODE WITH L.A. CITY AMENDMENTS]
- C. 2007 CALIFORNIA MECHANICAL CODE (CMC), [2006 UNIFORM MECHANICAL CODE WITH L.A. CITY AMENDMENTS]
- D. 2007 CALIFORNIA PLUMBING CODE (CPC), [2006 UNIFORM PLUMBING CODE WITH L.A. CITY AMENDMENTS]
- E. 2001 CALIFORNIA FIRE CODE (CFC) PART 9, TITLE 24 [2000 UNIFORM FIRE CODE WITH CALIFORNIA AMENDMENTS]
- F. 2001 CALIFORNIA REFERENCED STANDARD CODE, PART 12 TITLE 24
- G. TITLE 19, PUBLIC SAFETY, STATE FIRE MARSHAL REGULATIONS
- H. NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
- I. NATIONAL ELECTRIC CODE (NEC)
- J. AMERICAN WELDING SOCIETY (AWS)
- K. CALIFORNIA ADMINISTRATIVE CODE (CAC)
- L. TITLE 8 STATE GENERAL INDUSTRY SAFETY ORDERS
- M. UNDERWRITER'S LABORATORIES, INC. (UL)
- N. NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION (NEMA)
- O. JOINT INDUSTRY COUNCIL (JIC) STANDARDS
- P. AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) SPECIFICATIONS
- Q. INSTITUTE OF ELECTRONIC AND ELECTRICAL ENGINEERING (IEEE) STANDARDS
- R. SHEET METAL AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION (SMACNA)
- S. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
- T. AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)
- U. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA)
- V. AMERICAN SOCIETY OF HEATING, REFRIGERATION AND AIR CONDITIONING ENGINEERS (ASHRAE)

4. WHERE THE PLANS SHOW MORE RESTRICTIVE REQUIREMENTS, THE PLANS SHALL GOVERN BUT NOTHING ON THESE PLANS SHALL BE INTERPRETED AS AUTHORITY TO VIOLATE ANY CODE BETWEEN ITEMS INDICATED ON THE PLANS OR WITH CODE REQUIREMENTS. THE NOTE, SPECIFICATION OR CODE WHICH PRESCRIBES AND RE-ESTABLISHES THE MORE COMPLETE JOB OR THE HIGHER STANDARD SHALL GOVERN.

5. SCOPE: THE WORK INCLUDES PROVIDING ALL LABOR, MATERIALS, EQUIPMENT AND SUPERVISION REQUIRED TO COMPLETE THE INSTALLATION AS DESCRIBED HEREIN AND ON THE CONSTRUCTION DRAWINGS. TASKS TO BE COMPLETED INCLUDE BUT ARE NOT NECESSARILY LIMITED TO THE FOLLOWING:

- A. INSTALL THREE, UTC MODEL 400 PURE CELL SYSTEM, 400KW, NATURAL GAS, FUEL CELLS IN A NEW FUEL CELL EQUIPMENT AREA AT THE EAST SIDE OF THE EXISTING CHILLER BUILDING;
- B. PROVIDE NEW NATURAL GAS SERVICE AND NATURAL GAS METER AT THE NORTH SIDE OF THE EXISTING CHILLER BUILDING;
- C. PROVIDE NEW REVERSE OSMOSIS WATER SERVICE THAT WILL BE CONNECTED TO THE EXISTING DOMESTIC WATER SERVICE THAT CURRENTLY SERVES THE CHILLER BUILDING;
- D. ROUTE HIGH GRADE HOT WATER FROM EACH FUEL CELL TO A NEW DISTRIBUTION PUMPING SYSTEM THAT WILL PUMP HIGH GRADE HOT WATER TO A NEW ABSORPTION CHILLER AND INTERCONNECT TO THE EXISTING HEATING HOT WATER SYSTEM LOCATED IN THE BOILER ROOM OF SERVICE BUILDING B. INSTALL NEW PLATE AND FRAME HEAT EXCHANGER IN THE BOILER ROOM OF SERVICE BUILDING B TO ISOLATE THE WATER SYSTEMS;
- E. ROUTE LOW GRADE HOT WATER FROM THE FUEL CELLS TO A NEW DISTRIBUTION PUMPING SYSTEM THAT WILL PUMP LOW GRADE HOT WATER TO THE EXISTING DOMESTIC HOT WATER GENERATION SYSTEM LOCATED IN THE BOILER ROOM OF SERVICE BUILDING B. INSTALL A DOUBLE WALL PLATE AND FRAME HEAT EXCHANGER IN THE BOILER ROOM OF THE SERVICE BUILDING B TO ISOLATE THE LOW GRADE HOT WATER FROM THE DOMESTIC HOT WATER SYSTEM;

F. INSTALL A NEW COOLING TOWER EQUIPPED WITH CHEMICAL TREATMENT SYSTEM AND CONDENSER PUMPING SYSTEM TO SERVE THE CONDENSER WATER COOLING NEEDS FOR THE NEW ABSORPTION CHILLER; CHEMICAL TREATMENT TO BE PROVIDED BY CBS TV.

G. ROUTE THE CHILLED WATER PIPING FROM THE NEW ABSORPTION CHILLER TO THE EXISTING CHILLED WATER RETURN LINE LOCATED AT THE SOUTH EAST CORNER OF THE EXISTING CHILLER ROOM TO HELP PRE-COOL THE RETURNING CHILLED WATER TO THE CHILLER BUILDING;

H. RECONFIGURE THE HOT WATER PIPING SYSTEM FOR THE SIX EXISTING TO REMAIN GAS FIRED BOILERS IN THE BOILER ROOM OF SERVICE BUILDING B TO IMPROVE OPERATION OF THE HEATING HOT WATER SYSTEM (SCOPE OF WORK NOT IN UTC CONTRACT).

I. PROVIDE SEISMIC SUPPORT AND ANCHORING AS REQUIRED ON ALL NEW MECHANICAL EQUIPMENT, DUCTWORK AND DIFFUSER/GRILLES AS REQUIRED;

J. PERFORM PRESSURE TESTING AND CLEANING PER UTC POWER INSTALLATION MANUAL. ALSO PERFORM TREATMENT AND BALANCING ON ALL NEW HYDRONIC SYSTEMS. ALL TEST, CLEANING, TREATMENT AND BALANCE REPORTS TO BE DELIVERED TO UTC FOR REVIEW AND APPROVAL;

K. PROVIDE COMMISSIONING ON NEW INSTALLATION. PROVIDE DOCUMENTATION TO UTC OF PROPER OPERATION OF ALL CONTROL SYSTEMS, VERIFICATION OF ALL SETPOINTS, FUNCTIONAL TEST REPORTS AND ACTUAL FIELD READINGS DEMONSTRATING PERFORMANCE;

L. PROVIDE START-UP, TESTING AND FACILITIES' STAFF TRAINING;

6. THE INSTALLING CONTRACTOR SHALL OBTAIN AND SHALL PAY FOR MECHANICAL PERMITS FROM THE LEGALLY CONSTITUTED AUTHORITIES HAVING JURISDICTION. THE INSTALLING CONTRACTOR SHALL ARRANGE FOR ALL MECHANICAL INSPECTIONS.

7. UNFORESEEN CONDITIONS MAY REQUIRE CHANGES IN THE SCOPE, BUDGET AND CONSTRUCTION SCHEDULE. THE INSTALLING CONTRACTOR SHALL VISIT THE SITE PRIOR TO SUBMITTING A BID TO ELIMINATE UNFORESEEN CHANGES.

8. THE INSTALLING CONTRACTOR SHALL PROTECT EXISTING BUILDINGS AND FACILITIES FROM DAMAGE. ANY DAMAGE CAUSED BY THE INSTALLING CONTRACTOR SHALL BE REPAIRED AT NO ADDITIONAL EXPENSE TO THE OWNER.

9. PORTIONS OF THESE DRAWINGS ARE ESSENTIALLY DIAGRAMMATIC TO THE EXTENT THAT ALL OFFSETS, BENDS, SPECIAL FITTINGS AND LOCATIONS ARE NOT EXACTLY LOCATED. ALL INDICATED DIMENSIONS ARE APPROXIMATE AND ARE GIVEN FOR ESTIMATE PURPOSES ONLY.

10. THE INSTALLING CONTRACTOR SHALL COORDINATE ITS WORK WITH THE WORK OF OTHER TRADES AND ALL JOB CONDITIONS.

11. ALL PERSONNEL OF THE INSTALLING CONTRACTOR'S SHALL BE RESTRICTED TO THE PARTICULAR JOB SITE OF THIS CONTRACT.

12. ANY APPURTENANCES, APPLIANCES, DEVICES, MATERIAL OR WORK NOT SHOWN ON THE DRAWINGS, OR ANY INCIDENTAL ACCESSORIES NECESSARY TO MAKE THE WORK COMPLETE AND READY FOR TESTING AND OPERATION, EVEN IF NOT PARTICULARLY SPECIFIED SHALL BE FURNISHED, DELIVERED AND INSTALLED BY THE INSTALLING CONTRACTOR UNLESS OUTSIDE THE SCOPE AGREED TO BY THE CONTRACTOR AND THE OWNER.

13. DURING CONSTRUCTION, THE INSTALLING CONTRACTOR SHALL MAINTAIN A DAILY RECORD OF ALL DEVIATIONS FROM THE PLAN CHECKED DRAWINGS. ALL DIMENSIONS AND OTHER INFORMATION NECESSARY TO COMPLETELY EXPLAIN AND LOCATE ALL ELEMENTS OF THESE DEVIATIONS SHALL BE RECORDED AND PROVIDED TO THE OWNER AT THE COMPLETION OF THE INSTALLATION.

14. THE INSTALLING CONTRACTOR SHALL AT ALL TIMES KEEP THE PREMISES FREE FROM ACCUMULATION OF WASTE MATERIAL OR RUBBISH GENERATED BY THE INSTALLING CONTRACTOR'S WORK; MAINTAIN THE WORK AREA IN A NEAT, ORDERLY MANNER AND LEAVE THE PREMISES IN A BROOM CLEANED CONDITION AT THE END OF EACH DAY.

15. HAZARDOUS WASTE IS NOT EXPECTED TO BE ENCOUNTERED AT THE PROJECT SITE. IF HAZARDOUS WASTE IS UNCOVERED DURING CONSTRUCTION, WORK WILL CEASE IN THE AREA WHERE HAZARDOUS WASTE IS IDENTIFIED AND WILL BE REPORTED TO THE OWNER FOR PROPER REMEDIATION AND DISPOSAL.

16. ANY INTERRUPTION AND/OR SHUTDOWN OF EXISTING SERVICES SHALL BE MADE ONLY WITH THE APPROVAL OF AND AT TIMES DESIGNATED BY THE OWNER.

17. UPON COMPLETION OF WORK, THE INSTALLING CONTRACTOR SHALL DEMONSTRATE THE OPERATION OF THE INSTALLED EQUIPMENT AND SYSTEMS TO THE INTENT OF THE DESIGN. ALL WORK SHALL BE COORDINATED WITH THE UTC PROJECT MANAGER BY PRIME CONTRACTOR'S SITE SUPERINTENDENT.

18. ALL WORK SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR FROM THE DATE OF THE FINAL ACCEPTANCE BY THE OWNER. DURING THIS PERIOD, ANY DEFECT FOUND IN MATERIAL OR WORKMANSHIP SHALL BE REPAIRED OR REPLACED AT NO COST TO THE OWNER.

19. THE INSTALLING CONTRACTOR SHALL COORDINATE WITH THE OWNER TO PROVIDE ALL NECESSARY BLOCKING, BACKING AND FRAMING FOR MECHANICAL EQUIPMENT AND ALL OTHER ITEMS REQUIRING SAME. ALL WORK SHALL BE SUPPORTED AND BRACED AGAINST SEISMIC FORCE TO CBC/IFCC AND SMACNA CODES AND REQUIREMENTS.

20. THE DESIGN ENGINEER AND/OR OWNER SHALL APPROVE ANY DESIGN CHANGES PROPOSED BY THE INSTALLING CONTRACTOR. CHANGES PROPOSED BY THE OWNER THAT REQUIRE SCOPE, BUDGET AND/OR SCHEDULE CHANGES SHALL BE NEGOTIATED PRIOR TO THE CHANGE BEING IMPLEMENTED. ALL CHANGES SHALL COMPLY WITH OSHA AND OTHER APPLICABLE CODES AND REGULATIONS.

21. PRIOR TO COMMENCING WORK FOR A REVISION OR ADDITION TO THE CONSTRUCTION DRAWINGS, A FIELD CHANGE ORDER SHALL BE OBTAINED AND APPROVED BY THE OWNER.

22. UNLESS SHOWN ON THESE DRAWINGS, NO CUTTING, CORING OR CHIPPING OF EXISTING CONCRETE SLABS, WALLS, BEAMS OR OTHER STRUCTURAL ITEMS PERMITTED.

23. ALL MATERIALS SHALL BE HANDLED AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS, INSTRUCTIONS AND RECOMMENDATIONS.

24. THESE DRAWINGS DO NOT INCLUDE THE NECESSARY PROVISIONS FOR CONSTRUCTION SAFETY.

25. DUST AND NOISE PROTECTION BARRIERS, IF REQUIRED, SHALL BE INCLUDED IN THIS SCOPE OF WORK. CONTRACTOR TO PROTECT EXISTING SWITCH GEAR FROM DUST AND DEBRIS DURING CONSTRUCTION.

26. THE INSTALLING CONTRACTOR SHALL REQUEST A FINAL INSPECTION NOT MORE THAN FIVE (5) DAYS PRIOR TO THE ANTICIPATED COMPLETION OF THE WORK. ALL WORK SHALL BE COORDINATED WITH THE UTC PROJECT MANAGER BY PRIME CONTRACTOR'S SITE SUPERINTENDENT.

B. MATERIALS

1. ALL EQUIPMENT AND MATERIALS ARE TO BE NEW UNLESS NOTED OTHERWISE. ALL ROOF PENETRATIONS TO BE FLASHED AND SEALED WATER TIGHT.

2. NEW EQUIPMENT SHALL HAVE CAPACITIES AND CHARACTERISTICS AS SCHEDULED.

3. THE FLOW DIAGRAMS, TEMPERATURE CONTROL AND WIRING DIAGRAMS SHOWN HEREON ARE FOR THE PURPOSE OF INDICATING THE FUNCTIONAL OPERATION OF THE MECHANICAL EQUIPMENT ONLY.

4. USE ONLY NEW MATERIALS. EQUIPMENT AND MATERIALS SHALL CONFORM TO REQUIREMENTS OF THE A.C.A., STATE FIRE MARSHALL AND SHALL BE UL LISTED AND MEET ALL LOCAL AND STATE CODE REQUIREMENTS.

5. ABOVE GROUND PROCESS HOT WATER PIPING SHALL BE PRE-INSULATED ASTM A53, SCHEDULE 40, BLACK STEEL PIPE WITH ASTM A234 FORGED STEEL WELDED TYPE FITTINGS AND WELDED JOINTS, FLANGES TO BE RATED AT 150 LBS. (THERMACOR FERRO-THERM OR APPROVED EQUAL)

6. BELOW GRADE PROCESS HOT WATER PIPING SHALL BE PRE-INSULATED ASTM A53, SCHEDULE 40, BLACK STEEL PIPE WITH ASTM A234 FORGED STEEL WELDED TYPE FITTINGS AND WELDED JOINTS, FLANGES TO BE RATED AT 150 LBS. (THERMACOR FERRO-THERM OR APPROVED EQUAL)

7. PROCESS HOT WATER PIPING AND FITTINGS SHALL BE PRE-INSULATED WITH A NOMINAL 1.5 INCH THICK (PER 2008 C.E.C. T-24 STANDARD TABLE 123-A), RIGID POLYURETHANE FOAM WITH A MINIMUM 2.0 LBS./CF DENSITY, 90% MINIMUM CLOSED CELL CONTENT AND A "K" FACTOR NOT HIGHER THAN 0.15 AT 75°F PER ASTM C518. THE POLYURETHANE FOAM SHALL BE CFC-FREE. THE POLYURETHANE FOAM SHALL COMPLETELY FILL THE ANNULAR SPACE BETWEEN THE SERVICE PIPE AND JACKET AND SHALL BE BONDED TO BOTH. JACKET SHALL BE TYPE 1, CLASS 1 PVC WITH PRESSURE SENSITIVE TAPE TO SEAL AROUND JOINT SLEEVES WHILE PROVIDING THREE INCHES OF OVERLAP. (THERMACOR FERRO-THERM OR APPROVED EQUAL)

8. NATURAL GAS PIPING BELOW GRADE SHALL BE ASTM A53 SCHEDULE 40 BLACK STEEL PIPE WITH ASTM A234/A234M FORGED STEEL WELDED TYPE FITTINGS AND ASME B31.9 WELDED JOINTS. JACKET SHALL BE AWWA C105 POLYETHYLENE JACKET OR DOUBLE LAYER, HALF-LAPPED 10 MIL POLYETHYLENE TAPE OR DRISCOPLEX 6500 POLYETHYLENE WITH DRISCOPLEX 6500 POLYETHYLENE FITTINGS;

9. NATURAL GAS PIPING ABOVE GRADE SHALL BE ASTM SCHEDULE 40 BLACK STEEL PIPE WITH ASME B16.3, MALLEABLE IRON OR ASTM A234/A234M FORGED STEEL WELDED TYPE FITTINGS AND NFPA 54, THREADED OR ASME B31.9 JOINTS.

10. DOMESTIC WATER PIPING BELOW GRADE SHALL BE ASTM B42, HARD DRAWN, TYPE K, COPPER TUBING WITH ASME B16.18 CAST COPPER ALLOY OR ASME B16.22 WROUGHT COPPER AND BRONZE FITTINGS WITH AWS A5.8, BCuP SILVER BRAZED JOINTS.

11. DOMESTIC WATER PIPING ABOVE GRADE SHALL BE ASTM B88, TYPE L, HARD DRAWN COPPER TUBING WITH ASME B16.18, CAST COPPER ALLOY OR ASME B16.22 WROUGHT COPPER AND BRONZE FITTINGS AND ASTM B32, GRADE 95TA, SOLDERED JOINTS.

12. WASTE LINE PIPING SHALL BE CSPI 301, HUB-LESS CAST IRON PIPE WITH CAST IRON FITTINGS AND CSPI 310, NEOPRENE GASKET AND STAINLESS STEEL CLAMP AND SHIELD ASSEMBLIES.

13. STORM DRAIN PIPING SHALL BE ASTM D3034 SDR 35 PVC PIPE WITH PVC FITTINGS AND ASTM F477, ELASTOMERIC GASKETED JOINTS.

14. NITROGEN GAS PIPING SHALL BE ASTM B88, TYPE K, HARD DRAWN, COPPER TUBING WITH ASME B16.18 CAST ALLOY OR ASME B16.22, WROUGHT COPPER FITTINGS AND AWS A5.8 CLASSIFICATION BCuP-3 OR BCuP-4 SILVER BRAZE JOINTS.

15. CONDENSATE PIPING AND EQUIPMENT DRAIN AND OVERFLOW PIPING SHALL BE ASTM B88 TYPE L, HARD DRAWN WITH ASME B16.18 CAST BRASS, OR ASME B16.22 SOLDER WROUGHT COPPER FITTINGS, AND SOLDER LEAD FREE. ASTM B32, 95-5 TIN-ANTIMONY, OR TIN AND SILVER, WITH MELTING RANGE 430 TO 535 DEGREES F JOINTS.

16. AUTOMATIC AIR VENTS SHALL BE SPIROTHERM SPIROTOP AUTOMATIC AIR VENTS WITH CAST IRON BODY AND 1/2" NPT INLET AND 1/2" NPT OUTLET. MAXIMUM WORKING PRESSURE EQUAL TO 150 PSIG, MAXIMUM TEMPERATURE EQUAL TO 270° F. (BELL & GOSSET MODEL NUMBER 107A HIGH CAPACITY AIR VENT IS ACCEPTABLE SUBSTITUTION).

17. BALL VALVES USED ON DOMESTIC WATER PIPING 2 INCHES AND LESS SHALL BE NIBCO 10580 TWO-PIECE BRONZE BALL VALVES WITH THREADED FULL PORT (1/4"-1") AND CONVENTIONAL PORT (1-1/4"-3") WITH STAINLESS TRIM.

18. BUTTERFLY VALVES SHALL BE USED ON PIPING 2-1/2 INCHES AND LARGER AND SHALL BE ASTM A536 NIBCO LD-2000 DUCTILE IRON BODY, EXTENDED NECK, GEOMETRIC DRIVE, MOLDED-IN SEAT LINER LUG STYLE AND RATED FOR 200 PSI. INFINITE POSITION LEVER HANDLE WITH MEMORY STOP. FURNISH GEAR OPERATORS FOR VALVES 8 INCHES AND LARGER AND CHAIN-WHEEL OPERATORS FOR VALVES MOUNTED OVER 8 FEET ABOVE FLOOR.

19. REDUCED PRESSURE BACKFLOW PREVENTER SHALL BE WATTS LF909MIQT FURNISHED WITH FULL PORT, RESILIENT SEATED AND LEAD FREE BRONZE BALL VALVE SHUTOFFS AND STRAINER.

20. PRESSURE GAGES SHALL BE ASME B40.1 WITH TYPE 316 STAINLESS STEEL BOURDON TUBE, ROTARY BRASS MOVEMENT, BRASS SOCKET, BLACK SCALE ON WHITE BACKGROUND WITH STAINLESS STEEL CASE AND LEXAN WINDOW; 4-1/2 INCH DIAMETER DIAL SIZE; ONE PERCENT MID-SCALE ACCURACY; AND PSI SCALE. PRESSURE GAGE SHALL HAVE A SCALE THAT WILL ALLOW THE NORMAL OPERATING PRESSURE TO FALL MID SCALE. (WEISS MODEL ACTS OR EQUAL)

21. ALL MECHANICAL EQUIPMENT AND PIPING SHALL BE ANCHORED TO RESIST SEISMIC FORCES. THE SEISMIC BRACING AND ANCHORAGE OF PIPES AND EQUIPMENT SHALL BE IN ACCORDANCE WITH "GUIDELINES FOR SEISMIC RESTRAINTS OF MECHANICAL AND PLUMBING SYSTEMS", PUBLISHED BY SMACNA AND PPIC.

22. VERIFY ELECTRICAL POWER REQUIREMENTS ON SITE. MAINTAIN SERVICE TO ALL EXISTING EQUIPMENT AND SYSTEMS DURING CONSTRUCTION. PERFORM A SITE INVESTIGATION PRIOR TO BIDDING TO VERIFY ALL CONDITIONS AND CONNECTIONS. CONTRACTOR SHALL INSTALL COMPLETE AND OPERATING SYSTEM(S) TO INCLUDE ANY ITEMS THAT MAY NOT BE SPECIFICALLY NOTED ON PLANS.

23. THERMOMETER SHALL BE ASTM E1, RED APPEARING MERCURY, LENS FRONT TUBE, CAST ALUMINUM CASE WITH ENAMEL FINISH; 12 INCH SCALE; CLEAR LEXAN WINDOW; 3-1/2 INCH LONG BRASS STEM; 2 PERCENT ACCURACY, DEGREES F CALIBRATION; THERMOMETER SHALL HAVE A SCALE THAT ALLOWS THE NORMAL OPERATING TEMPERATURE TO FALL MID SCALE.

24. INFINITE POSITION LEVER HANDLE WITH MEMORY STOP. FURNISH GEAR OPERATORS FOR VALVES 8 INCHES AND LARGER AND CHAIN-WHEEL OPERATORS FOR VALVES MOUNTED OVER 8 FEET ABOVE FLOOR.

C. EXECUTION

1. ALL NEW MATERIALS AND EQUIPMENT SHALL BE INSTALLED IN STRICT ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS.

2. COORDINATE WORK WITH ALL TRADES TO AVOID CONFLICTS. ALL WORK TO COMPLY WITH APPLICABLE CODES AND REGULATIONS.

3. PRIME CONTRACTOR TO PROVIDE OPERATING AND MAINTENANCE MANUALS FOR ALL EQUIPMENT AND TO INSTRUCT IN PROPER OPERATION AND REQUIRED MAINTENANCE OF EQUIPMENT. SUBMITTALS AND TRAINING OF STAFF SHALL BE BY PRIME CONTRACTOR THROUGH COORDINATION WITH COTR.

4. ALL NEW PIPING, AND EQUIPMENT SHALL BE SEISMICALLY BRACED AND ANCHORED IN ACCORDANCE WITH SMACNA GUIDELINES FOR SEISMIC RESTRAINT OF MECHANICAL SYSTEMS.

5. VERIFY LOCATION OF ALL EQUIPMENT AND COORDINATE WITH APPROVED STRUCTURAL PLANS. ALL DUCTS AND PIPING TO BE INSTALLED TO MAINTAIN REQUIRED CLEARANCES FROM STRUCTURE AND UTILITIES. PROVIDE OFFSETS, BEAM BOXES, TRANSITIONS AND FITTINGS AS REQUIRED. MAINTAIN ALL MINIMUM REQUIRED EQUIPMENT SERVICE CLEARANCES AND ACCESS. ALL EQUIPMENT TO BE INSTALLED PER MANUFACTURERS' SPECIFICATIONS.

6. PROVIDE AND MAINTAIN ACCESS AND WORKING SPACE NEAR MECHANICAL, ELECTRICAL AND CONTROL EQUIPMENT TO PERMIT READY AND SAFE OPERATION, EXAMINATION AND MAINTENANCE.

7. INSTALL ALL WORK (EXCEPT UNDERGROUND PIPING) READILY ACCESSIBLE FOR NORMAL OPERATION, READING OF INSTRUMENTS, ADJUSTMENT, SERVICE, INSPECTION AND REPAIR. PROVIDE ACCESS PANELS WHERE REQ'D.

8. CONTRACTOR TO PERFORM WATER BALANCE ON ALL NEW HYDRONIC SYSTEMS TO ENSURE FLOWS INDICATED ON PLANS ARE OBTAINED. CONTRACTOR TO PROVIDE COPIES OF THE WATER BALANCING REPORT TO ENGINEER FOR APPROVAL.

9. FURNISH AND INSTALL DIELECTRIC UNIONS AT CONNECTIONS OF DISSIMILAR METALLIC PIPING MATERIALS.

10. UPON COMPLETION OF INSTALLATION, ALL NEW PIPING SHALL THOROUGHLY CLEANED BEFORE PLACING IN OPERATION TO RID THE SYSTEM OF DIRT, PIPING COMPOUND, MILL SCALE, OIL AND ALL OTHER MATERIAL FOREIGN TO THE WATER PIPING BEING CIRCULATED. CLOSE OFF ALL VALVES AT THE FUEL CELL, COOLING MODULE AND HEATING HOT WATER POINT OF CONNECTION WHEN FLUSHING. DO NOT FLUSH EITHER MODULE OR EXISTING HEATING HOT WATER SYSTEM. FAILURE TO CLOSE VALVES MAY RESULT IN DAMAGE TO THE MODULES AND FLUSHING OF THE ENTIRE EXISTING HEATING HOT WATER SYSTEM.

11. NITROGEN PIPING AND FITTINGS SHALL BE WASHED INSIDE WITH A HOT SOLUTION OF SODIUM CARBONATE OR TRISODIUM PHOSPHATE MIXED 1 LB TO 3 GALLONS OF WATER; RINSE WITH WATER AND BLOW DRY WITH OIL-FREE DRY NITROGEN OR COMPRESSED AIR.

12. UPON COMPLETION OF THE PIPING INSTALLATION, AND PRIOR TO INSULATION OF JOINTS AND BACKFILL OF UNDERGROUND PIPING, ALL NEW HYDRONIC PIPING SYSTEMS SHALL BE TESTED TO PROVE FREE OF LEAKS. COOLING MODULE AND FUEL CELL EQUIPMENT SHALL BE ISOLATED FROM THE REST OF THE HYDRONIC PIPING SYSTEM TO ENSURE THAT THE EQUIPMENT IS NOT OVER PRESSURED DURING THE PRESSURE TESTING. FAILURE TO ISOLATE THE COOLING MODULE, AND FUEL CELL MAY CAUSE DAMAGE TO THESE SYSTEMS. HYDRONIC PIPING TO BE PRESSURIZED WITH AIR AT 1.5 TIMES THE WORKING PRESSURE SYSTEM PRESSURE SHOULD BE MAINTAINED FOR A PERIOD OF FOUR HOURS WITHOUT ANY NOTICEABLE DROP IN PRESSURE. PROVIDE COPY OF TEST RESULTS TO ENGINEER FOR APPROVAL.

13. DO NOT PENETRATE STRUCTURAL MEMBERS.

14. ALL NEW PENETRATIONS THROUGH BUILDING WALLS, FLOORS AND ROOFS SHALL BE SEALED WATER TIGHT.

15. ALL PIPING SHALL BE SUPPORTED IN SUCH A MANNER THAT NEITHER THE INSULATION NOR THE VAPOR/WEATHER BARRIER IS COMPROMISED BY THE HANGER OR THE EFFECTS OF THE HANGER.

16. NEW PIPING SHALL BE RUN WITH OUT SAGS AND UNNECESSARY BENDS AND ELBOWS;

17. ALL NEW PIPING SHALL BE RUN AT A MINIMUM SLOPE OF 1/4 INCH PER FOOT AND SHALL BE SLOPED TO ALLOW WATER TO DRAIN TO EXISTING DRAINS;

18. ALL WORK CAN BE PERFORMED DURING NORMAL (8:00 AM TO 5:00 PM, MONDAY THROUGH FRIDAY) BUSINESS HOURS EXCEPT FOR TRENCHING ON ROADWAYS. TRENCHING SHOULD BE PERFORMED OUTSIDE OF NORMAL BUSINESS HOURS AND ROADS SHALL RETURN TO USABLE CONDITIONS THE FOLLOWING DAY.

19. ANY OUTAGES OF EXISTING SYSTEMS MUST BE SCHEDULED 14-CALENDAR DAYS IN ADVANCE WITH THE OWNER.

20. CONTRACTOR TO BE RESPONSIBLE FOR MAINTAINING THE AREA CLEAN OF DIRT AND DEBRIS AND PROTECT EXISTING COMPUTER EQUIPMENT FROM DUST DURING ALL PHASES OF CONSTRUCTION.

21. ALL MAJOR EQUIPMENT SHALL BEAR FIRMLY ATTACHED, MECHANICALLY FASTENED TO THE SURFACE, METAL NAMEPLATES, WHICH STATE NAME OF MANUFACTURER, MODEL NUMBER AND ELECTRICAL DATA. AN ADDITIONAL PERMANENT LABEL SHALL BE AFFIXED TO EACH PIECE OF EQUIPMENT, WHICH WILL CLEARLY INDICATE BY NUMBER WHICH OPERATING AND MAINTENANCE MANUAL EXPLAINS MAINTENANCE REQUIREMENTS IN DETAIL.

22. MARK EACH INDIVIDUAL PIPE FOR QUICK AND EASY IDENTIFICATION AND INDICATING DIRECTION OF FLOW, WITH IDENTO BANDS, ALUMINUM WITH ENAMEL FINISH, 1-1/2 INCHES WIDE, INSTALLED AS RECOMMENDED BY MANUFACTURER AFTER COMPLETION OF PIPING AND FINISH PAINTING. UNLESS OTHERWISE SPECIFIED, CODING SHALL CONFORM TO "SCHEME FOR THE IDENTIFICATION OF PIPING SYSTEMS" (ANSI A13.1-1956).

23. CLEAN EQUIPMENT AND MATERIALS THOROUGHLY. LEAVE SURFACES TO BE PAINTED SMOOTH, CLEAN, AND READY FOR PAINTERS. CLEAN ENTIRE PREMISE OF UNUSED MATERIALS, RUBBISH, DEBRIS, GREASE SPOTS AND DIRT.

24. HOLD HORIZONTAL PIPE RUNS FIRMLY IN PLACE USING APPROVED STEEL AND IRON HANGERS, SUPPORTS, AND/OR PIPE RESTS, UNLESS OTHERWISE INDICATED. SUSPEND HANGER RODS FROM CONCRETE INSERTS OR FROM APPROVED BRACKETS, CLAMPS OR CLIPS. HANG PIPES INDIVIDUALLY OR IN GROUPS IF SUPPORTING STRUCTURE IS ADEQUATE TO SUPPORT WEIGHT OF PIPING AND FLUID. HANG OR SUPPORT PIPE RUNS SO THEY MAY EXPAND OR CONTRACT FREELY WITHOUT STRAIN TO PIPE OR EQUIPMENT.

25. HORIZONTAL COPPER TUBING: FOR 2" DIAMETER AND OVER, PROVIDE HANGERS, EVERY 10 FEET. FOR 1-1/2" DIAMETER AND SMALLER, EVERY 6 FEET.

26. SUPPORT VERTICAL PIPING AT EVERY FLOOR WITH WROUGHT IRON PIPE CLAMPS.

27. COMPLETE TESTING AND BALANCING OF LOW GRADE AND HIGH GRADE HOT WATER SYSTEMS, AND FOR THE DOMESTIC HOT WATER SYSTEM TO NEW DOMESTIC HOT WATER HEAT EXCHANGER SYSTEM. CONTRACTOR TO PROVIDE COPIES OF THE BALANCING REPORT TO ENGINEER FOR APPROVAL.

28. CONTRACTOR SHALL PUT ALL PARTS OF SYSTEMS IN FULL OPERATION AND SHALL CONTINUE THE OPERATION OF SAME DURING EACH WORKING DAY OF TESTING AND BALANCING.

29. INSTRUMENTS USED BY CONTRACTOR SHALL BE ACCURATELY CALIBRATED AND MAINTAINED IN GOOD WORKING ORDER. INSTRUMENTS SHALL HAVE CERTIFICATION BY THE MANUFACTURER OR AN APPROVED TEST LABORATORY WITHIN ONE YEAR OF THE TESTING DATE.

30. SHUTOFF VALVES SHALL BE INSTALLED AT EACH APPLIANCE OR MECHANICAL EQUIPMENT.

31. ACCESS SHALL BE PROVIDED TO ALL REQUIRED FULL-OPEN VALVES AND SHUTOFF VALVES.

32. UNLESS OTHER NOTED, ALL PIPING IS OVERHEAD, TIGHT TO UNDERSIDE OF SLAB, WITH SPACE FOR INSULATION IF REQUIRED.

33. INSTALL PIPING SO THAT ALL VALVES, STRAINERS, UNIONS, TRAPS, FLANGES AND OTHER APPURTENANCES REQUIRING ACCESS ARE ACCESSIBLE.

34. INSTALL ALL PIPING WITHOUT FORCING OR SPRINGING. ALL PIPING SHALL CLEAR DOORS AND WINDOWS.

35. INSTALL FLANGES, UNIONS OR COUPLINGS AT LOCATIONS REQUIRING SERVICING. USE UNIONS, FLANGES OR COUPLINGS DOWNSTREAM OF VALVES AND AT EQUIPMENT CONNECTIONS. DO NOT USE DIRECT WELDED OR THREADED CONNECTIONS TO VALVES AND EQUIPMENT.

36. ALL VALVES SHALL BE ADJUSTED FOR SMOOTH AND EASY OPERATION.

37. ALL VALVES (EXCEPT CONTROL VALVES) AND STRAINERS SHALL BE FULL SIZE OF PIPE BEFORE REDUCING SIZE TO MAKE CONNECTIONS TO EQUIPMENT AND CONTROLS.

38. UNLESS OTHERWISE NOTED, DRAINS SHALL BE INSTALLED AT ALL PIPING LOW POINTS AND AIR VENTS SHALL BE INSTALLED AT ALL PIPING HIGH POINTS AND ANY OTHER PLACE WHERE IT IS NECESSARY TO BLEED TRAPPED AIR IN THE SYSTEM.

39. ALL VALVES SHALL BE INSTALLED SO THAT THE VALVE REMAINS IN SERVICE WHEN EQUIPMENT OR PIPING ON EQUIPMENT SIDE OF VALVE IS REMOVED.

40. ALL PIPING WORK SHALL BE COORDINATED WITH ALL TRADES INVOLVED. OFFSETS IN PIPING AROUND OBSTRUCTIONS SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.

41. PROVIDE UNIONS, FLANGES, AND COUPLINGS DOWNSTREAM OF VALVES AND AT EQUIPMENT OR APPARATUS CONNECTIONS. UNIONS ARE NOT PERMITTED ON THE COOLING MODULE PIPING SYSTEM. PROVIDE FLANGES INSTEAD.

42. PROVIDE NON-CONDUCTING DIELECTRIC CONNECTIONS WHENEVER JOINTING DISSIMILAR METALS IN OPEN SYSTEMS.

43. VERIFY FIELD MEASUREMENTS PRIOR TO FABRICATION.

44. REMOVE SCALE AND DIRT ON INSIDE AND OUTSIDE BEFORE ASSEMBLY.

45. PREPARE PIPING CONNECTIONS TO EQUIPMENT WITH FLANGES OR UNIONS.

46. KEEP OPEN ENDS OF PIPE FREE FROM SCALE AND DIRT. PROTECT OPEN ENDS WITH TEMPORARY PLUGS OR CAPS.

END OF SECTION

MECHANICAL GENERAL NOTES AND SPECIFICATIONS

ID	DATE	REMARKS
1	17/02/12	PRELIMINARY DESIGN REVIEW
2	18/20/12	PLAN CHECK
3	19/04/12	FIELD CLARIFICATIONS
4	19/09/12	UTC RECOMMENDED CORRECTIONS
5	19/25/12	UTC COMMENTS/REVISIONS

ENGR:	WTB
DRWN BY:	KAP
CHK'D BY:	WTB
DATE:	9/19/12
JOB NO.:	12-010
SCALE:	AS NOTED

SHEET

MO.1



7800 BEVERLY BLVD.
LOS ANGELES, CALIFORNIA 90036

CBS TELEVISION CITY
FUEL CELL INSTALLATION PROJECT

