PART 3 – EXECUTION

3.01 INSTALLATION – PIPE AND DUCT INSULATION.
A. EXAMINE AREAS AND CONDITIONS UNDER WHICH MECHANICAL INSULATION WILL BE INSTALLED. DO NOT PROCEED WITH WORK UNTIL UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.
B. INSTALL INSULATION PRODUCTS IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS, AND IN ACCORDANCE WITH RECOGNIZED INDUSTRY PRACTICES TO ENSURE THAT INSULATION SERVES ITS INTENDED PURPOSE.
C. INSTALL INSULATION ON MECHANICAL SYSTEMS SUBSEQUENT TO TESTING AND ACCEPTANCE OF TESTS.
D. CLEAN AND DRY MECHANICAL SURFACES PRIOR TO INSULATING. BUTT INSULATION JOINTS FIRMLY TOGETHER TO ENSURE COMPLETE AND TIGHT FIT OVER SURFACES TO BE COVERED.
E. MAINTAIN INTEGRITY OF VAPOR–BARRIER JACKETS ON MECHANICAL INSULATION AND PROTECT TO PREVENT PUNCTURE OR OTHER DAMAGE.
F. COVER VALVES FITTINGS AND SIMILAR ITEMS IN EACH PIPING SYSTEM WITH EQUIVALENT THICKNESS AND COMPOSITION OR EFFICIENCY OF INSULATION AS APPLIED TO ADJOINING PIPE RUN.
G. EXTEND MECHANICAL INSULATION WITHOUT INTERRUPTION THROUGH WALLS, FLOORS AND SIMILAR PIPING PENETRATIONS, EXCEPT WHERE OTHERWISE INDICATED.
H. INSTALL PROTECTIVE METAL SHIELDS AND INSULATED SADDLES TO PREVENT COMPRESSION OF INSULATION.
I. REPAIR DAMAGED SECTIONS OF EXISTING MECHANICAL INSULATION, DAMAGED DURING THIS CONSTRUCTION PERIOD. USE INSULATION OF SAME THICKNESS AS EXISTING INSULATION, INSTALL NEW JACKET LAPPING AND SEALED OVER EXISTING.

END OF SECTION 200700

PART 1 – GENERAL

1. PROVIDE MECHANICAL SYSTEMS COMMISSIONING IN ACCORDANCE WITH LOCAL ENERGY CODE AND THE REQUIREMENTS OF THIS SPECIFICATION. ALL CONTROL SEQUENCES SHALL BE FUNCTIONALLY TESTED TO ENSURE THEY OPERATE IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS.
2. PROVIDE CHECK OUT OF ALL PLUMBING SYSTEMS FOR PROPER OPERATION INCLUDING HOT AND COLD WATER AT ALL FAUCETS, WATER HEATERS SET FOR PROPER TEMPERATURE, OPERATION OF ALL VALVES, GREASE TRAPS, GAS VALVES, MIXING VALVES. RECORD DATA ON ALL DEVICES CHECKED AND THE STATUS OF THEIR OPERATION.
3. VERIFY SMOKE DETECTOR SHUTDOWN OF ANY FAN UNITS SCHEDULED FOR SMOKE DETECTOR SHUTDOWN.
4. VERIFY PROPER OPERATION OF ANY OTHER HVAC EQUIPMENT THAT IS INTERLOCKED WITH OTHER EQUIPMENT.
5. CHILLED WATER UNITS: OPERATE SYSTEM IN COOLING MODE; RECORD OUTSIDE AIR TEMPERATURE, MIXED AIR TEMPERATURE, SUPPLY AIR TEMPERATURE. VERIFY THAT COOLING COIL SENSIBLE CAPACITY MATCHES THE TEMPERATURE DROP ON THE COOLING COIL VIA THE FORMULA COOLING CAPACITY (BTU/H) = AIRFLOW(CFM) X (1.1) X DELTA T (MIXED AIR TEMPERATURE DEGREES F). VERIFY THE OPERATION OF ANY CONTROL VALVES WHERE PRESENT (CHILLED WATER). VERIFY THAT EACH AHU OPERATES WITH THE CORRECT THERMOSTAT/SENSOR. SET THERMOSTATS FOR 70°F HEATING SET POINT AND 73°F COOLING SET POINT. FANS SHALL RUN CONTINUOUSLY DURING OCCUPIED MODE AND CYCLE ON/OFF DURING UNOCCUPIED MODE. SETUP AND VERIFY HOURS ON OPERATION (TIME SCHEDULE) FOR OCCUPIED/UNOCCUPIED MODE AND HOLIDAY/WEEKEND SCHEDULING.

END OF SECTION 200800

DIVISION 21 – FIRE SUPPRESSION

SECTION 211000 FIRE PROTECTION SYSTEM

PART 1 – GENERAL
1.01 DESCRIPTION
A. GENERAL INFORMATION:
1. THE OTHER CONTRACT DOCUMENTS COMPLEMENT THE REQUIREMENTS OF THIS SECTION.
2. REQUIREMENTS OF DIVISION 00 AND DIVISION 01 APPLY TO THE WORK OF THIS SECTION.

1.02 WORK INCLUDED
A. INSIDE AND OUTSIDE PIPING, INCLUDING SPRINKLER HEADS, VALVES, HANGERS AND SUPPORTS, SLEEVES, AND ACCESSORIES.
B. THE DRAWINGS SHOW THE LOCATION OF SOME OF THE COMPONENTS. THE CONTRACTOR SHALL PROVIDE A COMPLETE DESIGN AND INSTALLATION TO PROVIDE SPRINKLER PROTECTION FOR THE AREAS SHOWN CONFORMING TO ALL NFPA 13 REQUIREMENTS AND LOCAL JURISDICTION REQUIREMENTS.
1. PROVIDE SPRINKLER PROTECTION FOR THE BUILDING INCLUDING COMBUSTIBLE VOID SPACES, CEILING SPACES, ATTIC SPACES, AND IN ACCORDANCE WITH NFPA 13 AND LOCAL JURISDICTION REQUIREMENTS. NOTE THAT SMOKE/HEAT DETECTORS WILL NOT BE PROVIDED IN VOID SPACES, THEREFORE SPRINKLER PROTECTION IS REQUIRED ABOVE CEILINGS AND IN VOID SPACES.

1.03 QUALITY ASSURANCE
A. SPRINKLER EQUIPMENT LAYOUT AND INSTALLATION APPROVED BY THE FIRE MARSHALL.
B. EQUIPMENT AND INSTALLATION TO MEET REQUIREMENTS OF NFPA NO. 13, STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS.
C. ONLY CONTRACTORS AND WORKMEN EXPERIENCED IN, AND REGULARLY ENGAGED IN THE INSTALLATION OF FIRE SPRINKLER SYSTEMS SHALL BE PERMITTED TO INSTALL THE SPECIFIED SYSTEM(S). THE SPRINKLER CONTRACTOR SHALL MEET ALL LEGAL REQUIREMENTS REQUIRED BY THE STATE OR LOCAL JURISDICTION AND SHALL BE LICENSED TO PREPARE SPRINKLER DRAWINGS AND INSTALL FIRE PROTECTION SYSTEMS.
D. THE GENERAL CONTRACTOR AND THE SPRINKLER SUB–CONTRACTOR SHALL MEET WITH THE LOCAL BUILDING DEPARTMENT AND FIRE DEPARTMENT TO REVIEW PROCEDURES FOR HANDLING SUBMITTALS, TESTING AND FOR GENERAL COORDINATION.
E. PROVIDE ARCHITECT WITH A LETTER OF APPROVAL FROM THE FIRE MARSHAL AFTER INSTALLATION IS COMPLETE.

1.04 REFERENCE STANDARDS
A. NFPA STANDARD NO. 13 CURRENT EDITION: SPRINKLER SYSTEMS.
B. UNDERWRITERS LABORATORIES APPROVED FIRE PROTECTION EQUIPMENT LIST.

1.05 SUBMITTALS
A. SUBMIT SHOP DRAWINGS IN ACCORDANCE WITH SECTION 013300.
B. SUBMIT PRELIMINARY LAYOUT SHOWING ONLY HEAD LOCATIONS FOR REVIEW BY ARCHITECT/ENGINEER. FURNISH ADDITIONAL HEADS WHICH MAY BE REQUIRED FOR COORDINATED CEILING PATTERN WITHOUT ADDED COST EVEN THOUGH NUMBER OF HEADS MAY EXCEED MINIMUM CODE REQUIREMENTS. AT 2X4 GRID CEILINGS, HEADS SHALL BE LOCATED A MINIMUM OF 2" FROM ANY GRID MEMBER.
C. SUBMIT SHOP DRAWINGS STAMPED BY A LICENSED INDIVIDUAL (MINIMUM OF NICET LEVEL III OR REGISTERED FIRE PROTECTION ENGINEER) OF THE ENTIRE SPRINKLER SYSTEM, FOR REVIEW BY ARCHITECT. AFTER ARCHITECT'S COMMENTS HAVE BEEN ADDRESSED SUBMIT SHOP DRAWINGS TO BUILDING DEPARTMENT/FIRE MARSHAL FOR APPROVAL. COMPLETION OF SHOP DRAWINGS SHALL BE DONE SO THAT FIRE MARSHAL CAN REVIEW FIRE ALARM SHOP DRAWINGS WITH THE SPRINKLER SHOP DRAWINGS. COORDINATE AS REQUIRED WITH FIRE ALARM SUB–CONTRACTOR.
D. OBTAIN AND SUBMIT FROM EACH AUTHORITY HAVING JURISDICTION WRITTEN CERTIFICATION THAT THE PERMANENT INSTALLATION HAS BEEN INSPECTED BY THE AUTHORITY AND THAT IT COMPLIES WITH ALL DETAILS OF THE AUTHORITY'S PUBLISHED REGULATIONS AND REQUIREMENTS.

1.06 ADDITIONS OR DELETIONS
A. NO CHANGE ORDERS WILL BE ISSUED FOR ADDITIONS OR DELETIONS OF SPRINKLERS EXCEPT AS SUCH ADDITIONS OR DELETIONS STEM FROM CHANGES IN BUILDING CONSTRUCTION MADE SUBSEQUENT TO APPROVAL OR SPRINKLER SYSTEM SHOP DRAWINGS.

1.07 SYSTEM DESIGN
A. GENERAL: DESIGN AND INSTALL SYSTEMS SO THAT NO PARTS INTERFERE WITH DOORS, WINDOWS, HEATING, PLUMBING, AIR–CONDITIONING SYSTEMS OR ELECTRICAL EQUIPMENT. COMPLY WITH REQUIREMENTS OF NFPA NO. 13. SPRINKLER SUB–CONTRACTOR IS REQUIRED TO FULLY COORDINATE SPRINKLER WORK WITH ALL OTHER TRADES. PIPING SHALL NOT RUN OVER TOP OF ELECTRICAL PANELS OR SWITCH GEAR.
B. HYDRAULIC CALCULATIONS: PREPARE IN ACCORDANCE WITH NFPA NO. 13.
C. SYSTEM LAYOUT:
1. SPACE, LOCATE, AND POSITION SPRINKLER HEADS ACCORDING TO NFPA NO. 13 AND AS SHOWN ON THE DRAWINGS AND AS REQUIRED BY LOCAL FIRE MARSHALL AND BUILDING DEPARTMENT.
2. PIPE SIZES AND CONFIGURATIONS SHALL BE ON THE BASIS OF HYDRAULIC CALCULATIONS.
3. PROVIDE RISERS, FLOW SWITCHES, INSIDE SHUT–OFF VALVES, TAMPER SWITCHES, POST INDICATOR VALVES, BACK FLOW PREVENTERS AND VAULTS, ETC., AS REQUIRED.
4. PROVIDE IN GENERAL, ORDINARY HAZARD WET SPRINKLER COVERAGE. PROVIDE ORDINARY HAZARD COVERAGE WHERE REQUIRED BY AUTHORITIES HAVING JURISDICTION.
5. PROVIDE ALL TAMPER SWITCHES, VALVES, ETC. REQUIRED. THE SYSTEM SHALL HAVE CONTROL STATION SUPERVISION.

PART 2 – PRODUCTS
2.01 ACCEPTABLE MANUFACTURERS
A. MANUFACTURERS OF EQUIPMENT SPECIFIED IN THIS SECTION SHALL BE REGULARLY ENGAGED IN THE MANUFACTURE OF COMPONENTS SPECIFIED AND SHALL PUBLISH CATALOGS LISTING ALL PERTINENT SPECIFICATIONS OF ITEMS MANUFACTURED.
B. MANUFACTURERS NAME AND MODEL IDENTIFICATION USED THROUGHOUT THIS SECTION IS TO ESTABLISH GENERAL CONFIGURATION, FUNCTION, SIZE PERFORMANCE AND QUALITY.
C. ALL EQUIPMENT, MATERIAL, AND COMPONENTS SHALL BE U.L. LISTED OR APPROVED BY THE LOCAL AUTHORITY HAVING JURISDICTION.
D. SUBSTITUTIONS: NOT ALLOWED

2.02 SPRINKLER HEADS
A. PROVIDE AUTOMATIC SPRAY TYPE SPRINKLER HEADS OF THE FOLLOWING TYPE AND FINISH FOR THE AREAS AND CEILING CONSTRUCTION DESIGNATED:
B. MANUFACTURERS AND TYPE:
1. FLUSH TYPE CONCEALED: VIKING HORIZON MIRAGE MODEL VK404 CONCEALED AUTOMATIC CEILING SPRINKLER.
2. UPRIGHT: RELIABLE MODEL G UPRIGHT OR APPROVED VIKING EQUAL.
3. SIDEWALL: RELIABLE MODEL F1 WITH 1/2" ORIFICE OR APPROVED VIKING EQUAL.
4. DRY PENDENT OR SIDEWALL: RELIABLE MODEL G3 AND G3A DRY SPRINKLERS WITH 1/2" ORIFICE OR APPROVED VIKING EQUAL.
C. OPERATING TEMPERATURE: PER NFPA 13. SELECT TO COMPENSATE FOR THE MAXIMUM TEMPERATURES WHICH OCCUR IN A PARTICULAR AREA DURING EITHER WINTER OR SUMMER CONDITIONS FROM SUCH SOURCES AS UNIT HEATERS AND SUNLIGHT.
D. EXTENDED COVERAGE SPRINKLERS MAY BE USED SUBJECT TO THE AUTHORITY HAVING JURISDICTION.

2.03 ESCUTCHEONS
A. PROVIDE SELF–ADJUSTING TYPE, SPRING–LOADED, OR FRICTION FIT ON EACH PENDANT SPRINKLER HEAD FITTING AGAINST CEILING.

2.04 SPARE HEADS AND SPRINKLER WRENCHES
A. PROVIDE SPARE HEADS AND ONE SET OF WRENCHES. THE NUMBER OF SPARE HEADS FURNISHED SHALL BE NOT LESS THAN 1 PERCENT OF THE NUMBER OF EACH TYPE OF HEAD INSTALLED IN THE SYSTEM. HEADS AND WRENCHES MOUNTED IN A SHEET METAL CABINET MARKED "AUTOMATIC SPRINKLERS – RESERVE SUPPLY".

2.05 WATER FLOW INDICATORS (FLOW SWITCHES)
A. PROVIDE VANE TYPE FLOW SWITCHES WHERE INDICATED ON DRAWINGS AND HWERE REQUIRED. GRINNELL MODEL F620 OR WFD.

2.06 VALVE MONITORING SWITCHES
A. PROVIDE SUPERVISORY DEVICE FOR EACH OS&Y GATE VALVE AND EACH VALVE REQUIRING SUPERVISION. GRINNELL MODEL F640. PROVIDE ALSO FOR P.I.V.'S SHOWN ON CIVIL DRAWINGS.

2.07 DETECTION CHECK VALVE ASSEMBLY
A. CENTRAL SPRINKLER CORPORATION, RISER CHECK VALVE WITH TRIM, MODEL 90 (SHOTGUN–90). PROVIDE DETECTION CHECK VALVES FOR WET SYSTEMS COMPLETE WITH FITTINGS, INTERCONNECTING PIPING, TAMPER SWITCHES AND DEVICES REQUIRED FOR VALVE OPERATION.

PART 3 – EXECUTION
3.01 INSTALLATION
A. RUN PIPING CONCEALED ABOVE FURRED CEILINGS TO MINIMIZE OBSTRUCTIONS. EXPOSE ONLY HEADS. ONLY SPRINKLER PIPING SPECIFICALLY CALLED OUT ON DRAWINGS AS BEING EXPOSED SHALL BE BELOW CEILING CONSTRUCTION. RUN PIPING THROUGH HOLES IN BEAMS WHERE SO NOTED ON DRAWINGS.
B. PROVIDE 1" DIAMETER NIPPLE AND 1" X 1/2" REDUCING FITTING FOR EACH UPRIGHT HEAD.
C. INSTALL SYSTEM AND AUXILIARY DRAINS TO DISCHARGE TO THE OUTSIDE AT PLANTER AREAS, TO A SUITABLE WASTE WITHIN THE BUILDING OR TO OTHER LOCATIONS AS INDICATED OR REQUIRED BY THE AUTHORITY HAVING JURISDICTION. DRAINS SHALL NOT DISCHARGE ONTO WALKWAYS OR PAVING. DRAIN LOCATIONS SHALL BE APPROVED BY THE ARCHITECT. LABEL PANEL "SPRINKLER SYSTEM DRAIN VALVE #32, ETC." PROVIDE MAIN SPRINKLER SYSTEM DRAIN.
D. INSTALL TEST PIPES PER NFPA AND THE LOCAL AUTHORITY HAVING JURISDICTION WITH DISCHARGE PIPE TO A SUITABLE DRAIN. NAMEPLATE LEGEND TO READ "WATER SUPPLY TEST VALVE".
E. REFER TO COORDINATION REQUIREMENTS IN PARAGRAPH 1.07.
F. THE INSTALLER OF THE FIRE PROTECTION (SPRINKLERS) SHALL BE FAMILIAR WITH THE ARCHITECTURAL CONSTRUCTION OF THE BUILDING. THE INSTALLER SHALL REVIEW ALL CONTRACT DOCUMENTS. SPRINKLER PIPING SHALL NOT:
1. REDUCE HEADROOM TO LESS THAN 7'–0".
2. PROJECT INTO ANY CATWALK, PASSAGEWAY, LADDER RUN, ACCESS OR EGRESS.
3. INTERFERE WITH ELECTRICAL EQUIPMENT OR ACCESS TO MECHANICAL UNITS (INCLUDING FILTERS). SPRINKLER PIPING WHICH, IN THE OPINION OF THE ARCHITECT, DOES NOT COMPLY WITH ANY OF THE ABOVE SHALL BE RELOCATED IN A MANNER WHICH IS ACCEPTABLE TO THE ARCHITECT. SUCH RELOCATION MAY BE DIRECTED DURING SHOP DRAWING REVIEW AND/OR DURING CONSTRUCTION. IF DOUBT SHOULD EXIST AS TO THE COMPLIANCE OF THE ABOVE, THE CONTRACTOR OR INSTALLER SHALL REVIEW THE SITUATION WITH THE ARCHITECT PRIOR TO ROUGH–IN.
G. NO FIRE PROTECTION WORK SHALL BE DONE WITHOUT APPROVED SHOP DRAWINGS.

DIVISION 22 – PLUMBING

PART 1 – GENERAL
1.01 SCOPE OF WORK
FURNISH AND INSTALL COMPLETE AND OPERATIONAL PLUMBING SYSTEM AS INDICATED ON THE DRAWINGS AND IN THIS SPECIFICATION. WORK SHALL INCLUDE, BUT NOT LIMITED TO THE FOLLOWING:
A. WATER, WASTE AND VENT PIPING SYSTEMS.
B. VERIFYING LOCATION OF EXISTING AND CONNECTIONS TO BUILDING WATER AND WER SYSTEMS.
C. ACCESS PANELS AS SHOWN AND REQUIRED BY CODE.
D. HANGERS, SUPPORTS AND GUIDES.
E. BACKING AND SECURING OF FLOOR AND WALL PENETRATIONS.
F. CAULKING AND SEALING OF FLOOR AND WALL PENETRATIONS.
G. PLUMBING FIXTURES, TRIM AND ACCESSORIES.
H. CUTTING, DRILLING AND PATCHING FOR PLUMBING SYSTEMS.
I. CLEANUP OF JOB SITE AND FIXTURES.
J. LICENSES, PERMITS AND FEES.

1.02 RELATED WORK INCLUDED UNDER OTHER SECTIONS
A. HVAC SECTION 233113
B. TESTING AND BALANCING SECTION 200593
C. ELECTRICAL DIVISION 26
D. FIRE PROTECTION SECTION 211000.

1.03 EXAMINATION OF SITE
A. CONTRACTOR SHALL VISIT SITE AND VERIFY ALL EXISTING CONDITIONS PRIOR TO SUBMITTING BID TO FAMILIARIZE HIMSELF WITH ALL EXISTING CONDITIONS INCLUDING ENTRANCE AND EXIT FACILITIES, ELEVATOR LIMITATIONS, HOURS OF PERMITTED BY THE BUILDING FOR TRANSPORTATION OF EQUIPMENT AND MATERIALS. CONTRACTOR SHALL SATISFY HIMSELF AS TO THE NATURE AND SCOPE OF THE WORK AND DIFFICULTIES THAT AFFECT THE EXECUTION AND COMPLETION OF THE WORK. THE CONTRACTOR SHALL EXAMINE THE SITE AND DETERMINE WHERE THE EXISTING SEWER, WATER AND GAS ARE LOCATED FOR THE PURPOSE OF CONNECTING NEW SYSTEMS.
B. SUBMISSION OF A BID WILL BE CONSTRUED AS EVIDENCE THAT SUCH AN EXAMINATION HAS BEEN MADE AND LATER CLAIMS FOR LABOR, EQUIPMENT OR MATERIALS REQUIRED, OR FOR ANY DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN AVOIDED HAD A PROPER EXAMINATION BEEN MADE WILL NOT BE COMPENSATED FOR OR RECOGNIZED.

1.04 DRAWINGS
A. THE DRAWINGS ARE GENERALLY DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF EQUIPMENT, PIPING, AND FIXTURES.
B. THE CONTRACTOR SHALL COORDINATE HIS WORK WITH ALL CONTRACT DRAWINGS AND DRAWINGS OF OTHER TRADES.
C. THE CONTRACTOR SHALL WITHOUT EXTRA CHARGE, MAKE REASONABLE MODIFICATIONS IN THE LAYOUT AS NEEDED TO PREVENT CONFLICT WITH WORK OR OTHER TRADES AND STRUCTURAL MEMBERS OR FOR THE PROPER EXECUTION OF WORK.

1.05 RULES AND REGULATIONS
A. THE WORK AND MATERIALS SHALL CONFORM AND COMPLY WITH THE ORDINANCES, PLUMBING CODE AND MECHANICAL CODE ENFORCED AUTHORITY HAVING JURISDICTION INCLUDING THE NATIONAL ELECTRICAL CODE, NATIONAL FIRE PROTECTION ASSOCIATION AND LANDLORDS DESIGN CRITERIA MANUAL. FURNISH WITHOUT ANY EXTRA CHARGE, ANY ADDITIONAL MATERIAL AND LABOR WHEN REQUIRED TO COMPLY WITH THESE LAWS, ORDINANCES AND CODES THOUGH THE WORK BE NOT MENTIONED IN THIS SECTION OR SHOWN ON THE DRAWINGS.
B. CONTRACTOR SHALL OBTAIN ALL APPROVALS, TESTS, INSPECTIONS AND PERMITS, AND PAY ALL NECESSARY FEES FOR ALL WORK PERTAINING TO THIS PROJECT. ALL AGENCIES HAVING JURISDICTION SHALL BE COMPLIED WITH.

1.06 SHOP DRAWINGS AND MATERIALS SUBMITTALS
A. SUBMIT FOR REVIEW TO ARCHITECT (6 COPIES) A COMPLETE AND ALL–INCLUSIVE LIST OF ALL EQUIPMENT AND MATERIALS PROPOSED FOR USE, ACCOMPANIED BY MANUFACTURER'S DATA SHEET GIVING SIZES, CAPACITIES, ETC. DATA SHALL BE FORWARDED IN A SINGLE PACKAGE WRITTEN 15 DAYS AFTER AWARD OF CONTRACT. CONTRACTOR SHALL NOT INSTALL ANY EQUIPMENT WITHOUT ENGINEER'S APPROVAL.
B. A SET OF "AS–BUILT" DRAWINGS SHALL BE PREPARED BY THE CONTRACTOR SHOWING ALL EQUIPMENT AND PIPING AS INSTALLED IN THE FIELD, INCLUDING ALL SIZES AND CHANGES TO THE ORIGINAL DESIGN. A SET OF REPRODUCIBLE, ALONG WITH ONE SET OF BLUEPRINTS OF THESE "AS–BUILTS" SHALL BE DELIVERED TO THE OWNER UPON COMPLETION OF THE WORK AND PRIOR TO FINAL ACCEPTANCE OF THIS PROJECT.
C. THE CONTRACTOR SHALL COORDINATE THE WORK ARCHITECTURAL DRAWINGS AND WORK OF OTHER TRADES.

1.07 ELECTRICAL WORK
A. THE FOLLOWING ELECTRICAL WORK SHALL BE PART OF DIVISION 22 PERFORMED IN ACCORDANCE WITH DIVISION 26 SPECIFICATIONS.
B. PLUMBING CONTRACTOR SHALL VERIFY THE ELECTRICAL CHARACTERISTICS REQUIRED OF ALL EQUIPMENT WITH THE ELECTRICAL DRAWINGS, ELECTRICAL CONTRACTOR, AND FIELD CONDITIONS PRIOR TO ORDERING ANY EQUIPMENT.
C. ALL POWER WIRING SHALL BE BY ELECTRICAL CONTRACTOR.

1.08 OPERATION MANUALS AND OWNER INSTRUCTIONS
A. CONTRACTOR SHALL FURNISH OPERATING AND MAINTENANCE INSTRUCTION AT THE COMPLETION OF THE INSTALLATION. SUBMIT THREE COPIES OF BOUND MANUALS.
B. AT THE COMPLETION OF WORK THE CONTRACTOR SHALL IN THE CONJUNCTION WITH THE OWNERS REPRESENTATIVES, ARRANGE A MEETING FOR FULL INSTRUCTION OF ALL DETAILS OF OPERATION AND MAINTENANCE FOR THE EQUIPMENT PROVIDED. CONTRACTOR SHALL PROVIDE EQUIPMENT CHECK LIST SHOWN ON THOSE DRAWINGS.

1.09 CUTTING AND PATCHING
A. THE CONTRACTOR SHALL DO ALL CUTTING, DRILLING AND PATCHING WHICH MAY BE REQUIRED FOR THE INSTALLATION OF THE WORK UNDER THIS SPECIFICATION.
B. PATCHING SHALL BE OF THE SAME WORKMANSHIP, MATERIAL AND FINISH, AND SHALL MATCH ACCURATELY ALL SURROUNDING CONSTRUCTION IN A MANNER SATISFACTORY TO THE ARCHITECT/ENGINEER.
C. NO CUTTING OF THE STRUCTURE SHALL BE PERMITTED WITHOUT WRITTEN APPROVAL OF THE ARCHITECT/ENGINEER.
D. EXISTING UTILITIES ETC. THAT ARE DAMAGED DURING THE CONSTRUCTION PERIOD, WHETHER OR NOT DUE TO THE CONTRACTOR'S NEGLIGENCE SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR AND LEFT IN A CONDITION SATISFACTORY TO THE ENGINEER.
E. PROVIDE FIRE–SAFTING WHERE PENETRATIONS OCCUR IN RATED ASSEMBLIES. FIRE–SAFTING SHALL MAINTAIN THE INTEGRITY OF THE ASSEMBLY.

1.10 GUARANTEE
THE CONTRACTOR SHALL LEAVE THE ENTIRE INSTALLATION IN COMPLETE WORKING ORDER FREE FROM ANY DEFECTIVE MATERIAL, WORKMANSHIP OR FINISH. THE CONTRACTOR SHALL GUARANTEE TO REPAIR OR REPLACE, WITHOUT CHARGE, DEFECTS DUE TO FAULTY WORKMANSHIP OR MATERIALS FOR A PERIOD OF ONE YEAR FROM THE DATE OF FILING OF THE NOTICE OF COMPLETION.

PART 2 – PRODUCTS
2.01 PIPE AND FITTINGS
A. PIPE
1. SANITARY WASTE AND VENT: STANDARD WEIGHT CAST IRON AND FITTINGS WITH "NO–HUB" COUPLINGS. TYPE DWV COPPER WITH SANITARY DRAINAGE FITTINGS MAY BE USED.
2. DOMESTIC HOT AND COLD WATER PIPING: TYPE "L" HARD DRAWN COPPER PIPE AND WROUGHT COPPER FITTINGS WITH 95–5 TIN–ANTIMONY SOLDER. TYPE "K" UNDERGROUND WITH SILVER SOLDER JOINTS.

2.02 HANGERS AND SUPPORTS
A. SUPERSTRUT, GRINNEL OR APPROVED EQUAL. PROVIDE WHERE REQUIRED BY CODE A LAYER OF 15LB FELT SHALL BE PLACED BETWEEN COPPER AND FERROUS MATERIAL.

2.03 VALVES
A. BALL VALVES: 2" AND SMALLER, STAINLESS STEEL BALL & STEM, BRONZE BODY, 600 PSI WOG RATED, FULL PORT; NIBCO OR WATTS.
B. CHECK VALVES: 2–1/2" AND SMALLER, STOCKHAM B509, BRONZE VALVE, SWING CHECK VALVE, CLASS 125.
C. HOSE BIBB: CHICAGO, WOODLAND MODEL 24 OR EQUAL WITH VACUUM BREAKER AND TAMPER PROOF WITH LOOSE KEY.
D. TRAP PRIMER: PRECISION PRODUCTS CO. P–1 OR P–2.

PART 3 – EXECUTION

3.01 INSTALLATION
A. GENERAL
1. INSTALL PIPING AND APPURTENANCES IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION PROCEDURES, APPLICABLE CODES AND STANDARDS, AND AS SPECIFIED.
2. COORDINATE PIPING INSTALLATION WITH OTHER WORK TO AVOID INTERFERENCE. COORDINATE AS NECESSARY TO ENSURE THAT ALL HANGERS, SUPPORTS, SLEEVES, AND OTHER BUILT–IN DEVICES AND INCORPORATED IN FORMS OR MASONRY TO AVOID NECESSITY OF CUTTING FINISHED STRUCTURE.
3. ALL MEASUREMENTS, BOTH HORIZONTAL AND VERTICAL, SHALL BE BASED ON ESTABLISHED LINES AND LEVELS. VERIFY ALL MEASUREMENTS AT SITE AND CHECK THE CORRECTNESS OF SAME AS RELATED TO THE WORK.
4. PROVIDE VALVES AT ALL EQUIPMENT SO THAT IT CAN BE EASILY REMOVED.
5. ALL BRANCH PIPING SHALL HAVE ACCESSIBLE SERVICE VALVES PROVIDE ACCESS PANELS AS REQUIRED.
B. PIPING
6. INSTALL PIPING AS SHOWN ON THE DRAWINGS AND STRAIGHT AND DIRECT AS POSSIBLE, FORMING RIGHT ANGLES OR PARALLEL LINES WITH BUILDING WALLS. NEATLY SPACED WITH RISERS PLUMB AND TRUE. NO COMPRESSION FITTINGS SHALL BE ALLOWED.
7. PIPING SHALL PITCH BACK TOWARD SYSTEM DRAIN VALVE AND ANY INSTALLED LOW POINTS OR POCKETS SHALL HAVE A HOSE AND DRAIN VALVE.
8. ERECT ALL PIPING TO OBTAIN SUFFICIENT FLEXIBILITY TO PREVENT EXCESSIVE BENDING MOMENTS AT JOINTS OR CONNECTIONS.
9. ARRANGE WATER PIPING SO THAT SYSTEM CAN BE COMPLETELY DRAINED. WHERE LINES ARE PURPOSELY PITCHED FOR DRAINAGE, A UNIFORM GRADE SHALL BE MAINTAINED. LINES SHALL BE SUPPORTED AS TO PREVENT POCKETING OF WATER,. NO LINES SHALL HAVE POCKETS DUE TO CHANGES IN ELEVATION UNLESS PROPER PROVISIONS FOR DRAINAGE ARE MADE.
10. INSTALLED PIPING SHALL NOT INTERFERE WITH THE OPERATION OR ACCESSIBILITY OF DOORS AND WINDOWS. SHALL NOT ENCROACH ON AISLES, PASSAGEWAYS AND EQUIPMENT, AND SHALL NOT INTERFERE WITH THE SERVICING OR MAINTENANCE OF ANY EQUIPMENT. ADJACENT PIPELINES SHALL BE GROUPED IN THE SAME HORIZONTAL OR VERTICAL PLANE.
11. INSTALL INSULATING UNIONS IN WATER PIPING BETWEEN COPPER PIPING AND FERROUS PIPING.
12. INSTALL UNIONS ADJACENT TO VALVES AND WHERE NECESSARY TO FACILITATE DISASSEMBLY OF PIPING.
13. SUPPORT PIPING INDEPENDENTLY OF EQUIPMENT TO WHICH IT IS CONNECTED.

3.02 HYDROSTATIC TEST
A. STORM AND SANITARY DRAINAGE AND VENTS:
1. TIGHTLY CLOSE ALL OPENINGS IN THE ENTIRE SYSTEM AND FILL IT WITH WATER TO THE POINT OF OVERFLOWING ABOVE THE ROOF. THE WATER LEVEL SHALL BE MAINTAINED FOR 24 HOURS.
2. WHEN PIPING IS TESTED IN SECTIONS, TEST PIPING WITH A PRESSURE EQUIVALENT TO A 10' WATER HEAD. THE WATER LEVEL SHALL BE MAINTAINED FOR 24 HOURS.
3. FOR PIPING ADDED, RELOCATED OR REPLACED ON EXISTING SYSTEM, INSTALL A TEST TEE AT THE LOWEST ELEVATION OF EACH ADDED, RELOCATED OR REPLACED PIECE OF PIPE AND FILL IT WITH WATER TO THE OVERFLOW LEVEL OF THE NEXT HIGHEST FIXTURE OUTLET OR DRAIN. THE WATER LEVEL SHALL BE MAINTAINED FOR 24 HOURS.
B. DOMESTIC WATER
4. CAP OR PLUG ALL OUTLETS, APPLY A HYDROSTATIC PRESSURE OF 150 PSI AND SUSTAIN SUCH PRESSURE FOR 24 HOURS.
5. FOR PIPING ADDED, RELOCATED OR REPLACED ON EXISTING SYSTEMS, APPLY A HYDROSTATIC PRESSURE OF 50 PSI ABOVE THE EXISTING PRESSURE FOR 24 HOURS.

END OF SECTION 221116

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Registrant's Name: MICHAEL N. HART
Serial No. 0402-030922

POTTERY BARN
WILLIAMS-SONOMA
Town Center Virginia Beach
173/177 Central Park Avenue
Virginia Beach, VA 23462
PROJECT #006-151817.00/#006-151412.00

ISSUED / REVISED	DATE
FEASIBILITY SET	08/10/17
PRELIMINARY SET	09/28/17
LL CD SET	11/30/17
PERMIT SET	12/18/17
BID SET	01/04/18

SPECIFICATIONS - MECHANICAL

M-902