

PART I – GENERAL

GENERAL

"General Conditions of the Contract for the Construction" with supplements thereto, special conditions, and Division 1 are hereby made a part of this division of the specifications and shall apply to the contractor, subcontractors, and all others furnishing labor, equipment, materials, or work under this division of the specifications and the drawings and must comply with current Canadian equivalent standards.

Other sections of Division 15 valid only when considered in conjunction with these General Provisions. These shall apply to all work specified in all sections 15100 through 15999. In addition, work in these sections is governed by all provisions of the Contract Documents.

Division of Contractors shall be as follows:

- Division 15000 - Work required for All contractor's below
- Division 15100 - Plumbing Work - Plumbing Contractor
- Division 15200 - Mechanical Work - Mechanical Contractor
- Division 15300 - Fire Protection Work - Sprinkler Contractor
- Division 07952 - Fire Retardant Sealant

The above contractors shall have the responsibility of incorporating Section 15000 along with each other's work and include any additional work required as reading through the other sections to provide a complete and operational system as described here-in and include in his bid an amount to do such work. Each contractor is responsible to read the other sections here-in for additional work. Submission of bid indicates such.

DEFINITIONS

1. "Provide" means to supply, erect, install and connect up complete, in readiness for regular operation, the particular work referred to.
2. "Furnish" means to supply and deliver to the job and install.
3. "Piping" includes, in addition to pipe, all fittings, flanges, valves, hangers, and other accessories related to such piping.
4. "Concealed" means hidden from sight in chases, furred spaces, shafts, hung ceilings, or embedded in construction.
5. "Exposed" means not installed underground or "concealed" as defined above.
6. "Regulating Authorities" means all Governmental Utility and Fire Protection Authorities having jurisdiction.

SINGULAR NUMBERS

Where any device or part of equipment is herein referred to in the singular number, such reference shall be deemed to apply to as many such devices as are required to complete the installation on as shown.

INTENT

It is the intention of the drawings and specifications to provide finished work, tested and ready for operation.

Any apparatus, appliance, material, or work not shown on the drawings, but mentioned in the specifications or visa versa, or any incidental accessories necessary to make the work complete and ready for operation, even if not particularly specified, shall be provided without additional expense to the Owner/PETSMART. Should there appear to be discrepancies or questions of intent in the Contract Documents, refer the matter to the Professional of Record or his authorized representative for his decisions, before ordering any materials or equipment or before the start of any related work. The decision of the Professional of Record, or his authorized representative, shall be final, conclusive and binding.

DRAWING AND DATA

- Drawings are generally diagrammatic and are intended to convey the scope of work and to indicate the general arrangement of equipment, ductwork, piping, and fixtures. The locations of all items not definitely fixed by dimensions are approximations only. The exact locations necessary to secure the best condition and results must be determined at the project and shall have the approval of the Professional of Record, or his authorized representative, before being installed. Do not scale drawings.
- Make reasonable modifications in the layout as needed to prevent conflict with work of other trades or for proper execution of the work without additional cost. Document all modifications and secure all approvals prior to implementing modifications.
- Minor details not usually shown or specified, but necessary for proper installation and operation of a system or piece of equipment, shall be included in the work and in the bid price, the same as if specified or shown.
- Should the particular equipment proposed to be installed require other space conditions than those shown on the drawings, the contractor must arrange for such space before submitting his bid. Such changes becoming necessary on account of failure to comply with this paragraph, the contractor shall make such changes at this (Contractor's) expense. Should conditions require any rearrangement to suit the design of equipment or piping furnished, submit working drawings showing in detail and schematic all changes and receive approved return copies before proceeding with work.

PART II – PRODUCTS

MATERIALS AND EQUIPMENT

- All materials and equipment shall be the standard product of a reputable manufacturer engaged in the manufacture of the items, they shall all be furnished by the same manufacturer, except where specified otherwise.
- All manufactured articles, material, and equipment shall be applied, installed, erected, connected, adjusted, tested, used, operated, cleaned, and conditioned according to the best practice as recommended by the manufacturer. Instructions from manufacturers shall be as published by the various manufacturers. Where published instructions are not

available for the manufacturer, the Contractor shall obtain new instructions in writing from the manufacturer.

- The contractor's attention is directed to the fact that the drawings and design of the system are based on definite makes or materials or equipment, which shall be considered the "specified standard".
- Where manufacturers are listed in the specification or scheduled on the drawings with model numbers, they are the "specified standard" for this project. Any other manufacturers listed without model numbers are acceptable manufacturers to provide the equipment only when they supply equipment, which meets or exceeds the quality of the "specified standard".
- Any material or equipment other than the "specified standard" shall be equivalent in such features as noise level, power requirements, metal gauges, vibration attenuation, finish, appearance, certification of recognized testing agencies and standards bureaus, allowable working pressure, physical size and arrangement so far as affects installation in the available space, factory-applied insulation, electrical devices, controls, access to internal parts, water and air-pressure drops, operating speeds, coil face areas, fan diameters, operating efficiencies, and all other features and capacities specified herein. The Professional of Record shall be the sole judge of the ability of any equipment and material other than the "specified standard" to meet the requirements of the specification and the burden of proof shall be the responsibility of the contractor.
- Applications for substitution in "prior approval" process during the bid period shall be done in accordance with the Professional of Record specifications.
- No substitute material or equipment shall be used or delivered to the job site without the prior written approval of the Professional of Record and PETSMART.

PART III – EXECUTION

INVESTIGATION OF CONDITIONS

Examine the contract drawings and all available information concerning existing installations, structure, excavations, and local conditions bearing on labor, transportation, handling and storage of materials, etc. Bidders on work under this section shall visit the site to satisfy themselves as to the nature and scope of all work to be done. The submission of bid will be taken as evidence that such an examination has been made and difficulties, if any, noted. Later claims for labor, work, materials, and equipment required for any difficulties encountered which could have been foreseen will be recognized and all such difficulties shall be properly taken care of by this contractor at no additional expense to the Owner. In no event will the Professional of Record assume any responsibility for any interpretation, deduction, or conclusion drawn from the examination of the site.

EXISTING INSTALLATION AND CONFLICTS

- Existing active services including water, rain, sewer, electric, other piping systems, when encountered, shall be protected against damage due to construction work. Do not prevent or disturb operation of active services, which are to remain. If work makes temporary shutdowns of services unavoidable, consult with Owner as to dates, procedures and estimated duration of shut-down period in advance of date work is to be performed. See Professional of Record's Specifications for Additional Information.
- Work shall be arranged for continuous performance to assure that any existing operating services will be shut down only during the time required to make necessary connections. If a system cannot be shut down, temporary bypass or jumpers shall be installed until connections are complete.
- Be responsible for all costs incurred by the above shutdowns including bypass or jumper installations for work performed under this Division.
- If existing active utility services are encountered which require relocation, make request to proper authorities for determination of procedures. Where existing services are to be abandoned, they shall properly terminate in conformance with requirements of the utility or municipal service involved.

CODE, ORDINANCES, PERMITS, AND FEES

See Instructions to Bidders for status of permits and fees. Permits and fees: All permits fees, meters, etc. shall be included in bid price.

Include in the work, without extra costs to the Owner, all labor, materials, services, apparatus, drawings (in addition to contract drawings and documents) required to comply with all applicable laws, ordinances, rules and regulations.

The drawings and specifications take precedence when they are more stringent than codes, ordinances, standards and statutes. Codes, ordinances, standards and statutes take precedence when they are more stringent or conflict with the drawings or specifications. The following industry standards, specifications and codes are minimum requirements:

- Owner's Insurance Underwriters Requirements
- Underwriters Laboratories Canada, Inc. Standards (ULC)
- Canadian Standards Association (CSA)
- American Society for Testing Materials Standards (ASTM)
- National Fire Protection Association Pamphlets (NFPA)
- Canadian Electrical Code (CEC)
- National Electrical Code (NEC)
- American Society of Mechanical Engineers Boiler and Pressure Vessel Codes (ASME)
- National Plumbing Code
- National Building Code
- Applicable Municipal, Provincial and Federal Sanitary Codes, Laws and Ordinances.

- Standards and Requirements of Local Utility Company Concerned.
- Fire Department Regulations.
- Sheet Metal and Air Conditioning Contractors/National Association Standards (SMACNA)
- Model Energy Code of Canada
- Occupational Safety and Health Act
- American Society of Heating, Refrigerating, and Air Conditioning Engineers Standards (ASHRAE)
- Air Movement and Control Association (AMCA.)
- Air Conditioning and Refrigeration Institute Standards (ARI)

LAYING OUT THE WORK

The contractor shall carefully lay out his work on the premises and make proper provision for the other work. The exact location of each item shall be measured at the building and in cooperation with other contractors. The contractor shall be responsible for accurately locating all openings for ducts, pipes, etc. and all access doors required.

The mechanical drawings do not give exact details as to elevations of lines, exact locations, etc., and do not show all the offsets, control lines, pilot lines and other installation details. The contractor shall carefully layout his work at the site to conform to the Professional of Record and structural conditions, to provide proper grading lines, to avoid all obstructions, to conform to details of installation supplied by the manufacturers of the equipment to be installed and, thereby, to provide an integrated, satisfactorily operating installation.

COORDINATION OF TRADES

- Schedule and coordinate work so as to execute expeditiously the contract and to avoid unnecessary delays.
- Examine fully the specifications and drawings for other trades to become familiar with all conditions affecting work, and consult and cooperate with other trades for determining space requirements and adequate clearances with respect to other equipment in the building. The Professional of Record reserves the right to determine space priority of the trades in the event of interference between piping, ductwork, conduit and equipment of the various trades.
- If the work is installed without coordinating with other trades, and the installation interferes with their installation, make any changes necessary in this work to correct the conditions without extra charges.
- If so directed by the Professional of Record, provide fabrication drawings of critical areas.

PROTECTION OF WORK AND PROPERTY

- Be responsible for the maintenance and protection of all equipment, materials, and tools supplied or installed on the job site, from loss or damage of all causes, until final acceptance by the Owner.

- Be responsible for the protection of any work of any trades from damage or defacement by these operations and remedy any such injury at his expense.
- At all times take such precautions as are necessary to protect the apparatus from damage caused by theft, the weather, and all building operations. Failure to protect the material and apparatus adequately to the entire satisfaction of the Professional of Record shall be sufficient cause for the rejection of any damaged material or equipment. All pipe and equipment openings shall be closed to prevent obstruction and damage.

TEMPORARY OPENINGS

Ascertain, from examination of the contract drawings and conditions to the sites whether any special temporary openings in the buildings will be required for the admission of apparatus furnished or provided and assume all costs of providing such openings.

SCAFFOLDING, RIGGING AND HOISTING

Provide all scaffolding, rigging, hoisting and services necessary for erection and delivery into the premises for all equipment and materials provided under these Sections and remove the same from premises when no longer required.

EXCAVATION AND BACKFILL

The contractor shall do all excavating, filling, and backfilling necessary for the installation of his work including shoring, bailing, and pumping as required to maintain his trenches and keep in dry condition until the work required has been installed, tested, and approved.

Excavation and backfill shall be in accordance with all requirements of Division 2 in the Professional of Record Specifications.

CUTTING AND PATCHING

- All necessary cutting and patching of wall, floors, partitions, ceiling, etc., required for the proper installation of the work under this contract, shall be done at the expense of the contractor in a neat and workmanlike manner, and as approved by the Professional of Record. No hoists, beams, girders, columns, or other structural members shall be cut by any contractor without first obtaining written permission from the Professional of Record and the contractor shall exercise due diligence to avoid cutting openings larger than necessary or in wrong locations.
- Labor and materials required to replace or rebuild parts cut or damaged shall be furnished at the expense of this contractor, subject to the satisfaction of the Professional of Record.
- Patched areas shall be finished the same as adjacent areas whether new or existing.

SLEEVES

- Be responsible for the location and maintaining in proper position of all sleeves, inserts, and anchor bolts supplied or set in place. In the event that failure to do so required cutting and patching of finished work, it shall be done at no additional expense.
- All pipe passing through floors, walls, or partitions shall be provided with sleeves having an internal diameter 1" larger than the outside diameter of the pipe, or insulation on covered lines. Concrete slabs on grade and concrete floors may be formed with an opening 1" larger than the outside diameter of the pipe and grouted solid and sealed after installing the pipe.
- Sleeves passing through walls, floors, and partitions and through firewalls shall be packed between sleeve and pipe using approved caulking material.
- Sleeves through masonry or concrete floors or interior masonry or concrete walls shall be Schedule 40 black steel pipe, set flush with finished wall or ceiling surfaces but extending 1" above finished floors. See detail on drawings for installation.
- Sleeves through interior walls other than masonry or concrete shall be 22 gauge galvanized sheet steel, set flush with finished surfaces for the partitions.

ESCUTCHEONS

Where exposed pipes or conduit pass through floors, walls, or ceilings, they shall be fitted with chrome brass plates with round head set screws. Spring clips will not be acceptable. Plates shall be secured to the pipe or conduit.

Escutcheons shall be of sufficient outside diameter to cover the sleeve opening and shall fit snugly around the pipe. Where necessary to cover heads of fittings or sleeves extending through floors, special deep escutcheons shall be provided.

PIPE EXPANSION

All pipe connections shall be installed to allow for freedom of movement of the piping during expansion and contraction. Expansion loops and expansion joints with proper anchor and guides shall be provided as required. Anchors and guides shall be subject to the review of the Professional of Record. All supports shall be installed to permit the materials to contract and expand freely without putting a strain or stress on any part of the system. Provide anchors as necessary.

SEISMIC RESTRAINT

All mechanical equipment including diffusers and grilles, ductwork, piping, roof top fans and air conditioning systems, etcetera shall be supported from the building structure with appropriate supports, anchorages, and restraints to meet governing Building Code where applicable.

The Contractor shall arrange and pay for the services of a seismic engineer registered in province to review the design and installation of seismic

supports and anchorage. Prior to substantial performance a letter from the seismic engineer shall be forwarded to the consultant certifying that all mechanical equipment has been seismically restrained and the installation has been reviewed in accordance with the governing Building Code.

HANGERS, INSERTS, SUPPORTS

- Furnish required structural members, hangers, supports, and inserts to keep piping in proper alignment and prevent transmission of injurious thrusts and vibrations. In cases where supported from concrete or penetrating waterproofed decks or slabs, care shall be taken not to weaken concrete or penetrate waterproofing. All hangers and supports shall be capable of screw adjustment after piping or conduit is erected. All such hangers shall be finally adjusted, both in the vertical and horizontal direction under operating conditions.
- Professional of Record shall review, in writing, method of supporting pipes from the building structure prior to starting any work.
- All piping shall be braced and sway braced for LOCAL SEISMIC ZONE REQUIREMENTS in accordance with Uniform Building Code and Uniform Mechanical Code.

BASES AND SUPPORTS

- Provide all bases and supports, not part of the building structure, for all materials and equipment furnished or provided under this Division.
- Concrete bases (reinforced as required) will be provided by the general contractor specified in Division 3.
- Furnish general contractor all required anchor bolts, templates, complete dimensional drawings, and instructions for all equipment requiring concrete foundations.
- All equipment and accessories shall be braced and sway braced for LOCAL SEISMIC ZONE REQUIREMENTS in accordance with Uniform Building Code and Uniform Mechanical Code.

NOISE REQUIREMENTS

All power-driven equipment shall be quiet in operation and free from vibration. All metal partitions, ducts, sheet metal housing, etc., shall be so constructed and braced that there will be no vibration or rattling when the system is in operation. Connections to equipment shall be so designed and constructed that noise and vibration will not reach the conditioned area through ducts, piping, sheet metal construction or building construction.

ROOF CURBS

Roof curbs are a Required Vendor item by Lennox. All roof curbs shall have the bottom-bearing flange following the roof slope. Maximum shim tolerance is 1/16" per linear foot in any direction. The above mentioned shall include all mechanical and plumbing equipment. Refer to individual specifications and ratings for locations of roof curbs required.

All roof curbs 24" sq. and below shall be fabricated of 18 Ga. galv. steel with cant. All roof curbs 26" sq. and above shall be fabricated of 16 Ga. (min.) gal. steel with cant. All curbs shall be insulated. Curbs shall be engineered by the manufacturer to support the intended loads. Manufacturer shall have the responsibility of coordinating and obtaining the intended weight from the appropriate subcontractor and design the curbs to support such loads. If required, curb manufacturer shall submit engineering calculations for review by the Professional of Record. Roof curbs for exhaust fans shall be provided by fan manufacturer thru Lennox Required Vendor.

ACCESS DOORS

Furnish to the general contractor access doors in all locations where necessary to provide access to concealed valves, dampers, controls, cleanouts, and other equipment requiring service or inspection. General contractor shall install such access doors and frames in locations designated after such locations are reviewed by the Professional of Record.

Access doors shall be provided per section 08305.

MANUFACTURER'S IDENTIFICATION

Manufacturer's nameplate, name or trademark shall be permanently affixed to all equipment and material furnished under this specification. The nameplate of a subcontractor or distributor will not be acceptable.

VALVE TAG, DIRECTORIES, AND CODING

- All items of mechanical equipment, including but not limited to RTU's, exhaust fans, air cleaners and electric unit heaters, shall be identified by approved nameplates. Nameplates shall be securely fastened to each individual piece of equipment. Nameplates shall bear notations corresponding to the notations on the operating instruction. Nameplates shall be 1/16" thick black bakelite with engraved white core letters and 4 edge bevel, 2-1/2 by 3/4" or aluminum with black enameled background and etched or engraved natural aluminum lettering 2-1/4" x 3/4".
- All valves, except fixture stops, shall be tagged with brass tags not less than 1-1/2" diameter with depressed black filled letters and numbers. Numbers not less than 1/2" high, letters not less than 1/4" high. Plumbing valve tags to be labeled "Plbg" plus valve identification number. Mechanical valve tags to be labeled "Mech" plus valve identification number.
- Tags shall be securely fastened to valves with approved brass "S" hooks or nickel-plated bead chain viewable from floor.
- At the end of the construction phase, the Contractor shall supply PetSmart with a full set of as-built drawings indicating numbers and locations of all control valves. A half size set of such as-built drawings and Control Valves Schedule for each division in clear laminate cover is to be placed on the wall in the Maintenance Room. Control Valves Schedule shall include valve numbers per plans and

what area is controlled by each valve and is to be placed next to the laminated drawings.

PAINTING AND IDENTIFICATION

- Finish painting is included in the general contract under SECTION 09900.1 except when specifically called for under this section.
- Certain shop and/or prime painting specified as part of the mechanical trades work is included herein.
- Work installed under this section shall be left free from dirt, grease and foreign matter, ready for painting.
- After finish painting is complete, stencil identification labels on all pipe and duct. Labels shall be placed at sufficient intervals throughout the systems, preferably adjacent to valves and fittings, to ensure ready recognition. Maximum spacing shall be 20 foot on center. In concealed areas provide identification at all access panels including access in removable tile ceilings. In finished areas exposed pipe or ducts shall be labeled only as directed by the Professional of Record. Size of stencil letters shall conform to ANSI A13.1 except that identification tags may be used when outside diameter of pipe or covering is less than 1". Stencils placed to be legible from floor level. Provide stencil flow arrows in addition to labels.

LINE	PIPE OR BAND COLOR	STENCIL
Drains, Waste & Vent	Black	None
Cold Water – Domestic	Yellow	CW
Hot Water – Domestic	Yellow	HW
Fire Line (by fire sprinkler contractor)	Red	F

Note: Painting of pipelines is not required where concealed.

MOTORS AND STARTERS

- All electric motors and starters shall conform to requirements of NEMA, ULC, CEC, CSA and be suitable for required load, voltage, duty, phase, frequency, service and location.
- Motors shall have permanently lubricated and sealed ball or fuller bearing except where otherwise specified and shall be limited at 1750 RPM maximum unless specified otherwise. Furnish all single-phase motors with internal overload protection.
- All belt drives shall be designed for 150% of motor rated drive, Assemblies up to two belts shall have adjustable motor shaft with midpoint of the adjustment range at rpm required for submitted performance. All multiple belt drives shall be factory marked match sets. Unless otherwise specified all two speed motors shall be two winding motors.

- All starters will be provided by the electrical contractor, except when starters are furnished as an integral part of the mechanical equipment or as noted.
- The contractors shall acquaint themselves with those portions of the electrical drawings and specifications which establish characteristics of electrical service and shall furnish equipment to operate on the service.

INTERFERENCE

Arrange the work schedule to prevent interference with the work of other trades and cooperate with other trades.

ACCESSIBILITY

Unions, valves, controls, etc., shall not be placed in any pipeline at a location that will be inaccessible after the system is complete.

All valves, damper quadrants, motors, bearings, controls, and other apparatus which must be located in an inaccessible location shall be provided with suitable hinged access doors for operation and servicing of the apparatus.

TEST AND ADJUSTMENTS

- Labor, materials, instruments and power required for testing shall be provided for work under this Division.
- Tests shall be performed to the satisfaction of the Professional of Record and the regulating authority having jurisdiction. Submit to the Professional of Record, a written certificate that all tests have been performed in accordance with the specifications requirements.
- Pressure tests shall be applied to piping only before connections of equipment. In no case shall piping, equipment, or accessories be subject to pressure exceeding their rating.
- All defective work shall be promptly repaired or replaced and the test repeated until the particular system and component parts thereof receive the approval of the PETSMART Representative and the regulating authority. Any damages resulting from tests shall be repaired and damaged materials replaced, all to the satisfaction of the PETSMART Representative and at no cost to the Owner.
- Equipment and systems which normally operate during certain seasons of the year shall be tested during the appropriate season. Tests shall be performed on individual equipment or system, under test is interrelated which depends upon the operation of other equipment, functioning and performance, the latter to be operated simultaneously with the equipment or system being tested.
- No piping in any locations shall be closed up, furred in or covered before testing.
- Notify the regulating authorities and the PETSMART representative 3 working days before tests are to be conducted.

- All systems shall be tested as specified under the various applicable divisions of the specifications. The duration of all tests shall be as determined by the authority having jurisdiction but in no case less than the time prescribed in the specifications.
- Water used for testing shall be drained from the system after tests are complete. Any damages caused by freezing or water left in a system shall be repaired and replaced.
- Schedule of Testing: A schedule of testing shall be drawn up by each contractor in such a manner that it will show areas tested, test pressure, length of test, date, time and signature of testing personnel. All testing must be performed in the presence of the general contractor. His signature for verification of test must appear on schedule. All testing must be performed in accordance with the procedures set forth in the plumbing, fire protection, and HVAC sections of these specifications. At completion of testing, the schedule shall then be submitted in triplicate to the Professional of Record.

CLEANING

- At all times keep the job site free from accumulations of waste materials or rubbish caused by these operations. At the completion of the work, remove all rubbish, tools, construction equipment, and surplus materials from the job site and leave the premises in a clean condition.
- During the course of construction, all ducts and piping shall be capped in an approved manner to insure adequate protection against the entrance of foreign substances.
- Thoroughly clean all items of work under this contract including piping, ducts, and equipment of all foreign substances inside and out before operation of any related system.
- If any part of the respective system should be stopped by any foreign matter after being placed in operation, the system shall be disconnected, cleaned, and reconnected wherever necessary to locate and remove obstructions and shall be repaired or replaced when the respective system is reconnected at no additional cost to the Owner.

ELECTRIC WIRING

Mechanical equipment having electrical motors shall be furnished with all necessary control equipment for the protection of each motor and for automatic and/or manual control. All motor starters that are an integral part of the HVAC equipment shall be furnished under this division.

All control wiring, controls, and relays are furnished and installed this division. Room thermostat and control switches shall be located as shown or directed and all controls, relays, starters, and wiring shall conform to the Canadian Electrical Code and applicable local codes. All controls shall be furnished and properly identified with instruction for proper electrical connections. The responsibility for proper connections and operation is

included under this division. All power wiring, all conduit, and raceways shall be furnished and installed under Division 16, Electrical.

QUALIFICATIONS OF WORKMEN

Use sufficient journeyman craftsman and competent supervisors in the execution of this portion of the work to insure prompt and adequate installation of the work throughout. In the acceptance or rejection of installed plumbing or mechanical no allowance will be made for lack of skill on the part of workmen.

LEAK DAMAGE

The contractor shall be responsible for damage to the work of other contractors or to the building, or to its contents, people, etc., caused by leaks in any of the equipment or material installed by him through equipment or material failures or disconnect pipes or fittings and shall make at his own expense, all repairs or replacement required as a result of damage.

SAFETY GUARDS

Provide safety guards of reinforced sheet metal around all motor drives, fan belts, flexible couplings, etc. as required in order to obtain certificates of inspection and approval from any authorities having lawful jurisdiction, and which are considered satisfactory by the manufacturer of the equipment and the Professional of Record.

LUBRICATION

Lubricate as required, all motor, bearings, fans, etc., before operation of any equipment during construction.

Also, provide a final lubrication to all equipment requiring same before turning over the system to the Owner.

EMERGENCY REPAIRS

The Owner reserves the right to make emergency repairs as required to keep systems in operation without relieving the contractor, of his responsibilities during the guarantee or bonding periods.

OPERATION BY OWNER

The Owner may require operation of all of the respective installations prior to final completion. Cost of utilities for such operation shall be paid for by the Contractor, unless the Owner has occupancy of the project. Operation of the installation shall not be construed as acceptance of the work.

INSTRUCTION OF OWNER'S PERSONNEL

Prior to the acceptance of the work during a time to be designated by the PETSMART Representative, provide the necessary qualified personnel to operate each system in the entire installation for a period of two consecutive, full working days.

During the operating period, fully instruct the Owner's representative in the complete operation, adjustment and maintenance of each respective installation.

INSTALLATION MANUAL

Thirty calendar days prior to the completion of the installation and final inspection of the work, furnish the Professional of Record for approval, one copy of complete instruction manual, bound in booklet form and indexed for each representative trade specified under mechanical division, including such other divisions as directed which customarily would require an instruction manual.

Each manual shall contain the following items:

1. List of all equipment with manufacturer's name, model number, and local representative, service facilities, and normal channel or supply for each item.
 2. Manufacturer's literature describing each item of equipment, with detailed parts list. For fans and pumps provide operation data including fan curves and pump curves.
 3. Detailed step by step instructions for starting, summer operation, winter operation, and shutdown of each system.
 4. Detailed maintenance instructions for each system and piece of equipment.
 5. Copy of valve chart.
 6. Individual equipment guarantees.
 7. Certificates of Inspection.
 8. Blueprints of as-built construction and related shop drawings.
- See paragraph below for instructions.

After approval of manual and corrections have been made, resubmit four (2) copies to PETSMART representatives.

All written material contained in the manual shall be typewritten.

RECORD DRAWINGS: AS-BUILT DRAWINGS FOR EACH PHASE OF THE WORK

- Mechanical and plumbing contractors shall provide as-built drawings which shall clearly show all differences between the contract work as drawn and installed for all concealed work, as well as work added to the contract drawings. All addenda and change order work shall be shown and drawn on as-builts.
- Concealed shall mean work installed underground or in the area which cannot be readily inspected by use of access panels, inspection plates or other removable features.
- Contractor shall maintain a set of record drawings at the job site. These shall be kept legible and current and shall be available for inspection at all times by the Professional of Record.
- Upon completion of the work, transfer the information from the record prints to the as-built sepia drawings.
- Prepare as-built drawings on reproducible sepia prints or original drawings. The contractor shall pay the cost of printing sepias.
- Prepare separate sets of as-built drawings for the heating, air conditioning, refrigeration and plumbing work.

- In showing the installed changes in the work, work indicated on the drawings, or added work, use the same legends as were used on the contract drawings. Indicate exact locations by dimensions and exact elevations, given in job datum, by depth. Give dimensions from a permanent point. Give elevations to sewer and storm drainage lines to the invert elevation. All changes in elevation, location, size, or material, and all offsets and valves shall be clearly indicated and dimensioned. All underground, concealed or buried piping shall be located by two or more dimensions per run of pipe between each direct change. All elevations (invert or center line) shall be shown with the point of elevation change clearly located. All valves shall be numbered and lettered to correspond with the numbers and letter of the valve charts.
- Mechanical and plumbing as-built drawings shall indicate routing of all major piping, ductwork, plumbing and control wiring, etc., location and function of all controls and whether manual or automatic.
- As-built drawings shall contain the names, addresses, and phone numbers of the subcontractors and shall be signed by the contractor on the front cover.
- Upon completion of the project work, submit one printed copy of the as-built sepia drawings to the general contractor and then through the Professional of Record for approval. Upon receipt of notice of approval of the as-built drawings deliver the as-built sepia drawings, together with two sets of prints to the Professional of Record.
- Professional of Record shall approve the as-built drawings and he shall be the sole judge of the acceptability of these drawings. Receipt and approval of as-built drawings is a pre-requisite for final acceptance (refer to Section 01700).

GUARANTEE

- Guarantee that all work installed will be free from any and all defects and that all apparatus will develop capacities and characteristics specified under the respective divisions covering the specific work, and that if during a period of two (2) years from date of completion and acceptance of work, except as specified for a longer period elsewhere; any such defects in workmanship, material, or performance appear, they will be immediately replaced, repaired, or otherwise corrected subject to approval by the Owner without cost to the Owner within a reasonable time, to be stated in the Notice to the Professional of Record.
- All heat exchangers are to be guaranteed for a period of ten (10) years from the date of manufacture.
- "Purchase and supply an additional four (4) year warranty on all motor compressors from the manufacturer (total of 5 years). Warranty certificates to show model number, serial number date of installation of motor compressor. Warranty certificates shall be

included in the manual under the warranty section. Warranties must be directly exercisable by PETSMART."

- Replace or repair to the satisfaction of the Owner any and all damage due to the building or its contents or to work of other trades on consequence of work performed in fulfilling the guarantee periods of two years. Coordinate with Professional of Record specifications.

ENERGY MANAGEMENT CHECKLIST

- The following checklist is to be fully executed by the Electrical, Mechanical and General Contractor prior to requesting Nexrev to perform checkout/start-up of the Energy Management System.
- At the time the attached checklist has been completed it shall be sent to: Nexrev.
- After receipt of a completed checklist and acceptance by Nexrev, a start-up will be scheduled within 7 to 10 working days. This start-up is only for Energy Management Controls not mechanical unit start-up.
- Immediately after Mechanical Units are powered up, the "Testing & Balancing" (T & B) Report to the PETSMART Project Website (Prior to millwork). The "Equipment Operation Check" (EOC) and Nexrev's deficiency report shall be performed, and all items must be repaired or completed prior to start of Building Punchlist. The "Correction Report" shall be attached to the "Punchlist Report".
- Coordinate scheduling of air balancing with unit start-up.
- Shop drawing will be provided with EMS equipment. If any questions or additional information is required, contact: Nexrev, Keith Svonovec (972) 303-8517, keithsvonovec@nexrev.com

ENERGY MANAGEMENT SYSTEM CHECK-OFF SHEET

PETSMART STORE NO. XXXX

LOCATION

ACTIVITY DESCRIPTION	CHECK WHEN COMPLETED
1. All transformers, sensors, and wiring are installed and terminated as shown on Novar installation drawings and EM sheets.	
2. Permanent power to the building by Electrical Contractor.	
3. Power installed to all roof top units by Electrical Contractor.	
4. All lighting installed and wired. Contractors include those as noted on EM Sheet.	
5. All conduit, cabling, and installation of Novar backplates in accordance with Novar installation drawings and EM Sheets.	
6. Two (2) dedicated 120-volt circuits installed at the location of the OPUS Controller.	
7. A dedicated working voice grade phone line with T1 outlet installed at the Novar OPUS Controller location, tagged with phone number provided by General Contractor and PETSMART. A dedicated working Data Jack installed at the Novar OPUS Controller	
8. Zone temperature sensors mounted and wired to each rooftop unit by Electrical Contractor	
9. HVAC units labeled/numbered per plans and in working order. All heating and cooling stages functional by Mechanical Contractor.	
10. HVAC start-up and equipment performance check completed by Mechanical Contractor (EOC) and Novar's Deficiency Report.	
11. Discharge Temperature Sensors and Electronic Thermostat Modules mounted and wired to each rooftop unit. Verify Rooftop unit manufacturer factory installed ETM-2051's.	
12. Economizers wired to interface relays for control by Electronic Thermostat Module (if applicable) by Mechanical Contractor. Humiditrol units in all sensors.	
13. Outdoor sensor assembly mounted and wires installed back to Novar OPUS Controller by Electrical Contractor.	
14. Verify kW demand meter with pulse contacts is provided and installed by Hill Phoenix. Wires to be installed and run back to Novar OPUS Controller.	

General Contractor Sign-off Signature

Completion Date

Mechanical Contractor Sign-off Signature

Completion Date

Electrical Contractor Sign-off Signature

Completion Date

END OF SECTION

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