

# MECHANICAL OUTLINE SPECIFICATIONS

## I. Section 15010 - Basic Mechanical Requirements

- A. The work of each of the mechanical sections includes furnishing and installing the material, equipment, and systems complete as indicated on drawings. The mechanical installations, when finished, shall be complete and coordinated, ready for satisfactory service of the building.
- B. All work under this contract shall be done in strict accordance with all applicable municipal, state, NFPA, BOCA codes and County Public Work, that govern each particular trade.
- C. The contractor shall make applications and pay all charges for all necessary permits, licenses and inspections as required under the above codes. Upon completion of the work, the customary certifications of approval shall be furnished.
- D. No materials or equipment shall be used in the work until approved. Before submission of the shop drawings, and not more than fifteen (15) days after award of the contract, the contractor shall submit for approval a complete list of materials and equipment which he intends to furnish, giving manufacturer and catalog numbers.
- E. The contractor shall examine all drawings and specifications and shall. Failure to comply with this requirement will not relieve the contractor of responsibility for complying with the intent of the contract documents.
- F. The drawings indicate the general arrangement of the mechanical installations. Details of proposed departures due to actual field conditions or other causes shall be submitted for approval prior to installation. Reworking of completed items due to improper field coordination shall be at the contractor's expense.
- G. Provide sufficient access and clearance for all items of equipment requiring servicing and maintenance, such as valves, drains, vents, etc....
- H. The contractor shall prepare three (3) copies of a record and information booklet. The booklet shall be bound in a three-ring loose-leaf binder. Provide the following data in the booklet:
  - 1) Catalog data on each piece of equipment furnished.
  - 2) Approved shop drawings on each piece of equipment furnished.
  - 3) Maintenance, operation and lubrication instruction on each piece of equipment furnished.
  - 4) Simplified temperature control diagram.
  - 5) Manufacturer's and contractor's guarantees.
  - 6) Air balancing reports.
  - 7) Commissioning reports.
  - 8) Schedule/description of all service work/maintenance inspections required by paragraphs P, Q and R of this section.

- Inspect all belts for adjustment and condition and replace as required;
- Inspect and clean all water strainers;
- Check operating pressures and refrigerant charge;
- Inspect all controls for correct operation and calibrate as required;
- Perform all maintenance as outlined in the equipment manufacturers operation and maintenance manuals.

Upon completion of each scheduled inspection, the contractor shall deliver to the building owner/owner's representative within forty-eight (48) hours of completion, two (2) copies of the completed inspection report for record purposes.

R. The mechanical or service contractor shall, at the ninth month, advise the owner of the termination date of the above service. This contractor shall also provide the owner with a detailed proposal, reflecting annual escalation, for the continuation of the service and inspections described above.

## 2. Section 15060 - Basic Mechanical Piping Material & Methods

- A. Provide all labor and materials necessary to furnish and install all piping systems on this project, including sanitary, sanitary vent, domestic water, refrigerant piping and condensate drain.
- B. Piping and valves shall be as follows:
  - 1) Sanitary drains below grade.

Pipe	Standard weight cast iron uncoated bell and spigot soil pipe.
Fittings	Standard weight cast iron bell and spigot uncoated soil pipe fittings.
Joints	Neoprene push-lock fittings.
  - 2) Sanitary wastes & vents piping above floor, inside building.

Pipe	Cast iron no-hub soil pipe
Fittings	Cast iron no-hub soil pipe fittings
Joints	No-hub stainless steel gasketed fittings
  - 3) Domestic hot and cold water and hot drain piping.

Pipe	All water lines - hard copper type L
Fittings	Solder type wrought copper - lead free solder.
Ball valves	Two piece body, ISO lb. chrome plated full port bronze body and stem, reinforced the seat rings, Nibco S-585-70.
Unions	125 lb. wrought copper, ground joint solder ends.
  - 4) Atmospheric condensate drains.

Pipe	Type DWV seamless copper tubing
Fittings	Wrought copper solder drainage fittings
  - 5) Natural gas piping.

Pipe	Schedule 40 black steel
Fittings	Long radius welding
Flanges	Class 150 welding neck NIBCO convoluted flange #211 or approved equal
Gate valves	2" and smaller shall be bronze solid wedge union bonnet, threaded ends rising stem NIBCO HT-114-A.

- C. The installation shall include, but are not limited to valves, flow switches, sprinkler heads, and escutcheons, piping, fittings, hangers and signs and other identification markings, as required.
- D. The sprinkler contractor shall carefully examine all documents during the bidding period. He shall familiarize himself with project conditions such as building construction and pipe and ductwork locations and elevations.
- E. Sprinkler heads shall be installed to properly cover and protect the clean storage and soiled holding areas. Any sprinkler heads installed in finished ceilings shall be brushed chrome semi recessed type.
- F. The contractor shall arrange for approval of the sprinkler systems, and conduct tests in accordance with NFPA 13.
- G. The sprinkler contractor shall provide a detailed shop drawing showing piping layout, head locations, elevations and coordination with all building structure, electrical and plumbing trades. The contractor shall submit detailed sprinkler shop drawings with actual heads for architect approval prior to any fabrication.
- H. The sprinkler contractor must submit one set of sprinkler shop drawings and hydraulic calculations to county fire department/marshal prior to any fabrication or construction.

## 4. SECTION 15400 - PLUMBING

- A. The work covered by this section of the specifications consists of furnishing all labor, equipment and materials in connection with the rough-in, final setting and connections to all plumbing fixtures. The contractor shall carefully review the conditions at the site and all contract drawings to determine the extent of the plumbing work required.
- B. All plumbing fixtures shall be complete in every detail with all trimmings and connections. All fixtures shall be designed to prevent the backflow of polluted water or waste into the water supply system. Fixtures shall be American Standard or approved equal as follows:
  - P-1 Water closet (handicapped). #2108-408 Cadet, IT-1/2" high elongated toilet, water saver 1.6 gallon flush with vitreous china construction, siphon jet flush action, close-coupled tank, bolt caps, flush open front white seat with cover, rigid supply with angle stop valve.
  - P-1A Bedpan Cleaning Assembly. #1880-091 assembly which includes vacuum breaker, nozzle with hook, pedal valve and loose key supply
  - P-2 Wall Hung Sink (handicapped). #0355-012 Lucerne, vitreous china construction, front overflow, faucet ledge. Lavatory to be fitted with Elkay #LK-4417-L, single lever center-set faucet, complete with grid drain, tailpiece, cast brass "P" trap, tubing to wall escutcheon, key operated supply valves with rigid supplies and chair carrier. All exposed waste piping and hot and cold water piping shall be insulated with urethro hand luv-guard model 102 insulation kit with white finish.
  - P-2A Procedure Sinks. #LR-1722 by Elkay, 18 gauge-type 302-self rim bowl with Sloan Optima ETP-T10 electronic gooseneck hand faucet with infrared sensor with trim plate for 4" center-set sink. Sink to be complete with grid drain, tailpiece, cast brass "P" trap, tubing to wall escutcheon, key operated supply valves with rigid supplies.
  - P-2B Nurse/Clean/Spilled Work Sink. #LR-1722 by Elkay, 18 gauge-type 302-self rim bowl. Inside shall be #3574 By Delta, 11" high gooseneck spout with 4" wrist blade handles. Sink to be complete with grid drain, tailpiece, cast brass "P" trap, wall escutcheon and supply valves with chrome supplies. Provide a faucet mounted eye wash by Watersaver #EWH101 with duct covers and chain (eye wash for the nurse work area sink only refer to note 24 on sheet for water temperature control).
  - P-2C Lounge Sink. #CR-3522 by Elkay, 20 gauge-type 302-self rim bowl double bowl sink a (32-1/2" x 16-1/2" x 12" each, overall 33"x22", 4-hole, faucet #LK2351B15 by Elkay with 5" handles, swinging hi-spray and retractable hose and spray. Sink to be complete with grid drain, tailpiece, cast brass "P" trap, tubing to wall escutcheon, key operated supply valves with rigid supplies.
  - P-2D Scrub Sink. #E4NA-4820-C by Elkay, 14 gauge, stainless steel multiple station wash sink with 1/4" radius covered corners, full height 10" high backsplash, exposed surfaces are hand-blended to a uniform lustrous satin finish. Furnished with wall hangers and stainless steel support brackets. Provide pair (2) of back mounted 4" tubular gooseneck spouts #LK-345 by Elkay, each controlled by a knee action mixing valve, #LK-347-C by Elkay.

## 6. Section 15500 - Heating, Ventilating & Air Conditioning (HVAC)

- A. The work to be performed shall include all labor, materials and equipment necessary to furnish and install complete, all hvac mechanical equipment as shown on drawings and/or hereinafter specified. It is the intent that the systems be installed complete with all items necessary to provide satisfactory service.
- B. All heating, ventilating and air conditioning equipment which contains compressors shall be provided with extended warranties (minimum four (4) years) for the compressors.
- C. Air Cooled Heatpump Unit.
  - 1) Furnish and install outdoor mounted, air cooled, split system air conditioner unit suitable for ground installation.
  - 2) Unit shall consist of a hermetic compressor, an air cooled coil, propeller-type condenser fan, and a control box.
  - 3) Unit shall discharge supply air upward as shown on contract drawings.
  - 4) Unit shall be used in a refrigeration circuit to match up to a packaged fan coil or coil unit.
  - 5) Unit will be rated in accordance with the latest edition of air standard 210 and 210A.
  - 6) Unit will be certified for capacity, efficiency and sound and listed in the latest air directory.
  - 7) Unit construction shall comply with latest edition of ans/ashrae and with nec.
  - 8) Unit shall be constructed in accordance with ul standards and will carry the ul label of approval.
  - 9) Unit cabinet shall be capable of withstanding federal test method standard no. 141 (method 6061) 500-hour salt spray test.
  - 10) Air cooled condenser coils will be leak tested at 150 psig and pressure tested at 300 psig.
  - 11) Unit shall be factory assembled, single piece, air cooled air conditioner unit contained within the unit enclosure is all factory wiring, piping, control, compressor, refrigerant charge (R-22), and special features required prior to field start-up.
  - 12) Unit cabinet shall be constructed of galvanized steel, bonderized and coated with a powder coat paint.
- 13) Condenser fan will be direct drive propeller type, discharging air upward. Condenser fan motors will be totally enclosed, 1-phase type with class B insulation and permanently lubricated bearings. Shafts will be corrosion resistant. Fan blades shall be statically and dynamically balanced. Condenser fan openings shall be equipped with pvc coated steel wire safety guards.
- 14) Compressor.
  - a) Compressor shall be hermetically sealed.
  - b) Compressor shall be mounted on rubber vibration isolators.
- 15) Condenser coil.
  - a) Condenser coil shall be air cooled.
  - b) Coil shall be constructed of aluminum fins mechanically bonded to copper tubes which are then cleaned, dehydrated, and sealed.
- 16) Refrigeration components.
  - a) Refrigeration circuit components shall include liquid line shut-off valve with sweat connections, suction shut-off valves with sweat connections, system charge of refrigerant R-22, and compressor oil.
- 17) Nominal unit electrical characteristics shall be 208v, 3 phase, 60 hertz.
- 18) Unit electrical power shall be single point connection. control circuit will be 24v.
- 19) Unit accessories shall include:
  - a) Motormaster head pressure control shall permit unit to operate down to 24" Hg. Multiple station wash sink system temperature during low outdoor ambient temperatures.
  - b) Service entry shall lock out compressor in case of safety switch trip, and light a 24 volt signal light.
  - c) 5 year compressor warranty.

12) The following accessories for field installation shall be provided:

1. Thermostatic expansion valve kit to replace standard refrigerant metering device.
2. Freeze thermostat to provide primary freeze protection for the evaporator coil in low ambient cooling applications.
3. Liquid line filter drier to remove contaminants from the refrigerant circuit.
4. Latent capacity control kit to maximize latent cooling capacity at part load.
5. Factory installed electric heating coil.

13) Unit shall be Carrier, Comfort Maker and York.

## E. Procedure Room HVAC Unit.

- (1) The indoor air handler shall be mounted above ceiling, supplemental DX-Air Handling Evaporator. The air handling section shall house, as a minimum, the evaporator coil, expansion valve, evaporator blower/motor and associated electrical and refrigeration components. The evaporator section shall be located at some distance from its corresponding outdoor remote air cooled condenser. The system's compressor shall be located with the Remote Condensing Section.
  - (2) The remote outdoor shall be a remote air cooled condensing unit with direct-driven propeller fan. The system compressor shall be located with the remote condensing unit section. The condensing unit cabinet shall also house the condenser coil, blower and blower motor and Nema 3R condensing unit motor control/enabling box.
- The condensing unit shall be sized to provide the total heat of rejection of the system at a 95°F DB ambient temperature for the corresponding model AHU Air Handling Unit. Split system units shall be manufactured by ATS.

## F. Wall mounted electric heater.

- (1) Furnish and install Omark, Berko or approved equal.
- (2) Equipment shall be constructed with the following:
  - A) Tamper resistant construction
  - B) Integral thermostat
  - C) Heavy duty 16 gauge bar grille

## 6. SECTION 15800 - Air distribution

- A. Furnish all labor and materials necessary to complete the sheet metal work associated with the heating, ventilating, air conditioning and exhaust systems, and other miscellaneous items shown and required.
- B. All ductwork shall be constructed and installed in accordance with the sheet metal and air conditioning contractors national association (smacna) standards, ashrae standards and boca standards.
- C. Flexible ductwork shall be Hart 4 Cooley type F214 or approved equal. Flexible duct shall comply with nipa bulletin 90a and shall be UL listed as class 1 air duct and connector, standard 181.
- D. Support horizontal ducts with hangers spaced not more than six (6) feet apart. Use straphangers for ducts up to thirty (30) inches wide, angle hangers or rods for ducts over thirty (30) inches wide. Straphangers to be one (1) inch wide, 20 gauge minimum; fasten to sides and bottom of duct with sheet metal screws.
- E. Ducts shall be straight and smooth on the inside, with joints neatly finished. Ducts shall be suspended from the construction and shall be free from vibration. Curved elbows shall have a center radius equal to one and one-half (1-1/2) times the width of the duct. All square turns shall be vanned. Vanes consisting of curved metal blades shall permit the air to make abrupt turns without turbulence.
- F. All joints in the heating, ventilating, air conditioning and exhaust system ductwork shall be sealed.
 

Sealant shall be as manufactured by united inc. or approved equal, sealant shall be smacna and ul approved, with a flame spread of 10 and a smoke developed of 0, non-toxic and non-flammable. Sealant shall be approved for operating temperatures from 0 degrees f. to 200 degrees f.

Sealant system shall be installed in strict accordance with the manufacturer's recommendations and when applied shall provide a permanent seal without any deterioration.
- G. All ductwork supply and return air ductwork, except any within the Procedure area, shall be lined on the interior for thermal and sound attenuation. Lining shall have a one (1) inch thickness and shall be gilded with one hundred (100) percent coverage and additionally secured with pins. Increase duct sizes indicated two (2) inches direction to accommodate the interior lining.
- H. Supply air diffusers shall have all steel construction, Titus model TMS (louvered face and finished with #26 off-white enamel).
- I. Return air register/grille shall have all steel construction, Titus model 25R (louvered face and finished with #26 off-white enamel).
- J. Return air device shall be perforated type with built in fire damper at ceiling with all steel construction. Return air device (air transfer with oxygen room ceiling only) shall be Titus model PAR-FR with #26 off-white enamel finish.
- K. Ceiling/in-line fans shall be gemini models as manufactured by cook. Fans shall have acoustically insulated housings and shall have a maximum sound level rating of 6.0 sones. Air deliveries shall be as indicated on the drawings and all fans shall bear the amca certified ratings seal and the ul label. Integral backdraft damper shall be totally chatterproof with no metal contact. Fan shall have true centrifugal wheels with inlet perpendicular to, or remote from, inlet grille. Grille shall be of aerodynamic design of white molded plastic aggregate shape and provide eighty-five (85) percent free open area. Keep the dust cap on the inlet side of the housing with cord plug and receptacle inside the housing. Entire fan, motor and wheel assembly shall be easily removable without disturbing the housing. Motor speeds shall not exceed 1600 rpm and all fan motors shall be suitably grounded and mounted on rubber-in-shear vibration isolators. Fans shall be controlled by a wall mounted light switch. Switch and connection shall be by electrician.

## SECTION 15450 - Controls

- A. The contractor under this heading shall furnish and install all wiring necessary for a complete electric system of automatic temperature control. The system shall include all necessary thermostats, relays, switches, etc. required for successful operation. electrical work in connection with the temperature control system shall be performed by the control contractor.

## 3. Section 15250 - Mechanical Insulation

- A. All supply/return (existing/new) ductwork and domestic water piping systems shall be insulated with fiberglass insulation. Insulate refrigerant piping with 1/2" Armaflex as needed.
- B. Pipe insulation shall be 1" premoled fiberglass insulation with an all service jacket, Owens Corning fiberglass SSI-11. Fittings shall be insulated and covered with pvc covers.
- C. Ductwork shall be insulated with 1-1/2" flexible duct wrap, Owens Corning Fiberglass type 75 with foil faced vapor barrier. Insulation shall be neatly installed. Any insulation damaged during construction shall be properly fixed.
- D. Interior duct lining shall be as specified under section 15800.

## 4. Section 15300 - Fire Protection

- A. All work, materials, equipment, and accessories shall comply with the standards of the national fire protection association and all state and local regulations.
- B. The sprinkler contractor shall extend the wet pipe sprinkler system to properly cover/protect the oxygen room. Final density flow per square foot shall be determined by fire marshall.

I. The entire new plumbing system shall be tested hydrostatically before installation covering is applied and proved tight under the following gauge pressures:

Sanitary and vent piping	As specified below
Domestic water	100 psig
Natural gas	100 psig
Fire protection	Per NFPA

J. All sanitary and vent piping shall be tested by the contractor. The entire new drainage system and venting system shall have all necessary openings plugged and filled with water to the level of ten (10) feet above the main or branch being tested. The system shall hold this water for thirty (30) minutes without showing a drop greater than four (4) inches.

Note: If any code or public utility requires testing which is different than the test listed above, the more stringent test shall be performed.

K. All parts of the heating, ventilating, air conditioning and exhaust systems shall be adjusted, checked, balanced and tested by an independent A.A.B.C. certified testing & balancing contractor approved by the owner. The contractor shall put all systems and equipment into full operation, and shall test and balance all devices to within ten (10) percent of capacities indicated on the drawings. Submit copies of the balancing reports as required by the contract. Permanently mark the position of each balancing damper and valve.

L. Upon completion of the mechanical installations, the contractor shall provide a complete set of color white mechanical contract drawings which shall be legibly marked in red pencil to show all changes and departures of the installation as compared with the original design. They shall be suitable for use in preparation of record drawings.

M. All piping systems shall be identified with labels. Materials shall be as manufactured by seton name plate corporation.

N. All mechanical installations, including all materials and labor shall be guaranteed for a period of one (1) year from date of owner acceptance. The above shall not in any way void or abrogate equipment manufacturer's guarantee or warranty. Certificates of guarantee shall be delivered to the owner.

O. After roughing in the entire water main with future stubs the entire potable water systems shall be disinfected prior to use. The method to be followed shall be that prescribed by the local health authority/code requirements.

P. Contractor shall also provide one (1) year free service to keep the equipment in operating condition. This service shall be provided per the following schedule and rendered upon request when notified of any equipment malfunction.

Q. In addition to the first year warranty period, the contractor shall provide, at no additional cost to the owner, a minimum of four (4) service calls and maintenance inspections. A complete outline of the required maintenance and the proposed schedule shall be included in the "record and information booklet" detailed in section 15010-basic mechanical requirements, paragraph I, for review and acceptance by the owner/representative and engineer. The inspections are to be performed at three (3) month intervals for a total of four (4) service calls and inspections during the first year warranty period (three (3) times during the year plus the original system start-up commissioning).

The service work and inspections shall include, but not be limited to the following:

- Replace all disposable air filters;
- Lubricate all motor and fan bearings as required;
- Clean condensate drain lines;
- Check and tighten all electrical connections;

REV#	DATE	REVISIONS	DESCRIPTION

**dp**

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TENANT RENOVATIONS FOR:  
**RMS LIFE LINE**  
WALL STREET AND WESLEY AVENUE  
NORWOOD, OHIO

DATE	9/26/01	DRAWING NO.	
SCALE	AS NOTED		
DESIGNED BY	DLI	SHEET	5 OF 5
DRAWN BY	DLI	FWA JOB NUMBER	2011215.00
			JLR# 1-100b