

**SECTION ME-1**  
**MECHANICAL AND ELECTRICAL**  
**COMMON REQUIREMENTS**

**1. GENERAL**

- a. Unless otherwise specified provisions of General and Special Conditions govern work under mechanical and electrical sections.
- b. Where the intent of portions of the contract documents is unclear, clarify with Engineer before proceeding with work.

**2. SCOPE**

- a. The work in Section ME-1 includes furnishing and installing the mechanical and electrical work completely coordinated and ready for satisfactory service.
- b. Requirements specified govern work of all Mechanical and Electrical Sections.

**3. REFERENCES, DEFINITIONS**

- a. References to catalogs, standards, codes, specifications and recommendations are latest edition in effect at date of invitation to bid.
- b. Following are definitions of terms and expressions used in mechanical and electrical sections.

- (1) "Provide" - "furnish and install"
- (2) "Directed" - "directed by Engineer"
- (3) "Indicated" - "indicated in Contract Documents"
- (4) "Concealed" - "hidden from normal sight; includes items in crawl spaces and service tunnels used solely for repairs and maintenances."
- (5) "Exposed" - not "concealed"
- (6) "Piping" - includes pipe, fittings, valves, hangers and accessories comprising a system.
- (7) "Ductwork" - includes ducts, fittings, housings, dampers, hangers and accessories comprising a system.

**4. CONTRACT DRAWINGS AND SPECIFICATIONS**

- a. Contract drawings for mechanical and electrical work are diagrammatic, intended to convey scope and general arrangement.
- b. Specifications establish quality of materials, equipment, workmanship and methods of construction.
- c. Follow drawings and specifications in laying out work. Consult other drawings and specifications, become familiar with conditions affecting work.
- d. Bring to Engineer's attention discrepancies in documents. Remove incorrect work due to resolving discrepancies without Engineer's approval and reinstall at no cost to Owner.
- e. In case of conflict between drawings and specifications, Engineer shall decide which shall govern.
- f. Where job conditions require reasonable changes from contract documents after obtaining Engineer's approval make such changes without additional cost to Owner.

**5. CONTRACTOR'S INSTALLATION DRAWINGS**

- a. Submit six copies of minimum scale 1/2" = 1' installation drawings of equipment room layouts, pipe and electrical shafts or any crowded location.
- b. Only drawings bearing Engineer's stamp of approval shall be used for construction.
- c. Keep drawings on job at all times.

**6. AS BUILT DRAWINGS**

- a. Keep at the job site one set of black and white prints, and indicate in red ink all changes in the work as soon as the changes are made. Prints are to be kept in good condition at all times.
- b. Before trenches are backfilled, locate by dimension, from from the building walls, the exact location and invert of piping or other work that is buried.
- c. Deliver the completed marked set of "as built drawings" to the Architect before final inspection.

**7. MATERIAL AND EQUIPMENT REQUIREMENTS**

- a. Materials and equipment shall be new.
- b. Use products of one manufacturer where two or more items of same kind of equipment are required.
- c. Materials and equipment shall have a record of one year successful field use.
- d. Except for the mechanical items named in the bid form, one manufacturer's name and model number, plus additional acceptable manufacturer's names are listed for each item. Items furnished must be selected from the listed manufacturers. Only equipment named with a model number has been checked for this project by the Engineer. Contractor must check allocated space and structure for suitability of equipment of alternate manufacturer, including parts replacement and servicing.

**8. MATERIAL AND EQUIPMENT LIST**

- a. Within 30 days after award of the Contract, submit for Engineer's approval a list of manufacturer's names for items proposed for this project.

- b. Failure to submit list or name manufacturers acceptable to Engineer within time limit will result in Engineer's selecting a list of manufacturers, and selection shall be binding upon Contractor.

**9. SHOP DRAWINGS AND DESCRIPTIVE DATA**

- a. Upon receipt of approved material and equipment list submit six copies of manufacturers' shop drawings and descriptive data.
- b. Coordinate and approve all drawings and data before submitting.
- c. Call attention in writing to deviations from Contract requirements.
- d. Do not fabricate, deliver to site, or install any item until approved by Engineer.
- e. Only approved drawings and data shall be used for construction.

**10. WORKMANSHIP**

- a. Remove and replace, at no extra cost, all work not orderly, reasonably neat, or workmanlike.
- b. Coordinate all work and cooperate with other trades in building to facilitate execution of work.

**11. GUARANTEE**

- a. Guarantee complete mechanical and electrical installation free from defects of material, equipment, and workmanship for one year from date of final acceptance.
- b. During this period correct defects or maladjustments promptly at no cost to Owner.
- c. Work will be accepted when Engineer certifies Contractor's obligations have been fulfilled.
- d. Deliver to the Owner all certificates of equipment warranty extending beyond the guarantee period.

**12. SITE EXAMINATION**

- a. Failure to visit site and become familiar with local conditions prior to bidding will not relieve the Contractor of responsibility for complying with the Contract documents.

**13. REGULATIONS AND PERMITS**

- a. Comply with regulations of NFPA, Maryland Fire Underwriters Rating Bureau; State and County, building ordinances, codes and regulations.
- b. Within 60 days after award of contract and before commencement of work apply for permit and inspection services and send Engineer a copy of applications.
- c. Pay for all required permits and inspections.
- d. Submit certificates of approval from inspecting agencies listed in paragraph "a" above.

**14. CUTTING AND PATCHING**

- a. Unless otherwise directed do cutting and patching. Damaged fireproofing and waterproofing shall be repaired by skilled mechanics.
- b. Do not cut walls, floors, reinforced concrete or structural steel without Engineer's permission. Install services without affecting reinforcing steel.
- c. In precast concrete plank drill all holes with a Carbobloy tipped drill. Follow instructions of plank manufacturer. Cut no reinforcing bars.

**15. CLEANING UP**

- a. Keep premises free from accumulation of debris.
- b. Remove tools, scaffolding, surplus material, debris, and leave premises broom clean.

**16. COORDINATING ELECTRICALLY OPERATED EQUIPMENT AND CONTROLS**

- a. General
- (1) Starters, disconnect switches, and work pertaining to equipment power connections not specified elsewhere are specified in Electrical Section.
  - (2) Wiring, including interlocking wiring for starters and pilot devices such as pushbuttons, thermostats, flow switches and similar items associated with the automatic control of equipment not specified under the Automatic Control Section or Electrical Division shall be the work of the Section covering the equipment. Do this work in accordance with requirements of Electrical Section.
  - (3) Control devices shall be suitable for operation on following current characteristics:  

Power Service Voltage	Control Voltage
240 and under	Line
over 240	120
- b. Horsepower and kilowatt ratings indicated are estimates requirements of equipment specified. Where equipment changing these requirements is furnished; cost of changes, including wiring starters, circuit breakers, and switches, shall be Contractor's responsibility.

**17. MOTORS**

**a. General**

- (1) Motors smaller than 1/2 horsepower shall be suitable for operation on 120 volts, single phase, 60 cycle circuits.
- (2) Motors 1/2 horsepower and larger shall be suitable for operation on 480 volt, 3 phase, 60 cycle circuits.
- (3) Motors shall have Class "A" insulation unless otherwise indicated.
- (4) Motors shall meet NEMA Standards.
- (5) Rated full load horsepower shall not be less than brake horsepower of the driven equipment at the specified duty. Starting torque to be suitable for driven equipment. The NEMA Standard service factory may be applied only to water or refrigerant cooled motors.

**b. Construction - unless otherwise indicated**

- (1) Three phase - NEMA Design B, induction, squirrel cage, open dripproof.
- (2) Single phase  
 (a) Capacitor start, open.  
 (b) 1/6 Horsepower or less, split phase or shaded pole.
- (3) Motors for belt drive - Provide cast iron or steel base with slide rails having screw adjustment.

**c. Installation**

Align motors, drives, and driven equipment to avoid excessive strain or wear.

**d. Approved Manufacturers**

Westinghouse, General Electric, Electric Machinery Corporation, Reliance, Louis Allis, Allis-Chalmers, Continental, or as approved.

**18. EXCAVATION AND BACKFILL**

**a. General**

- (1) Do excavating and backfilling required to install underground mechanical and electrical work.
- (2) Establish required lines and grade.
- (3) Excavate to sufficient depth to give 30 inch minimum cover, unless otherwise indicated.
- (4) Keep excavation drained and pumped out.
- (5) Remove excavated materials not required or suitable for backfill and waste.

**b. Protection**

- (1) Existing utilities and underground work shall be protected by shoring and bracing.
- (2) Provide shoring, sheet piling and bracing for protection of work and safety of personnel.
- (3) Provide guard rails, lamps, flags and other safeguards at temporary walk and road crossings.
- (4) Protect trees, structures, and other property from injury during work.
- (5) Prevent debris and other materials from entering piping and drains.

**c. Trenching**

- (1) Excavate to depth and width required for proper laying of pipe, with a minimum of 8 inches on each side of pipe bell.
- (2) Sides shall be vertical.
- (3) Provide uniform bearing for each section of pipe except for bell holes.
- (4) Excavate rocks to a minimum 6 inches overdepth and backfill overdepth with firmly compacted sand or fine gravel.
- (5) Except where rock is encountered, do not excavate below indicated depths.

**d. Backfill**

- (1) As pipe is laid place backfill on both sides to resist lateral movement.
- (2) After tests and inspections are complete, backfill clean earth or sand in 6 inch layers, carefully tamped, until pipe has 1 foot of cover.
- (3) Deposit remainder of backfill in 8 inch layers and tamp.
- (4) Backfill inadvertent overdepths with firmly compacted sand or gravel.
- (5) Backfill around foundation drains with a bed of clean No. 2 stone 18 inches wide and 18 inches above top of pipe. Cover stone bed with roofing felt.
- (6) Inside building, backfill material, sand, graded crushed stone or washed gravel. Place and compact in manner specified above when using clean earth.

**19. CONCRETE WORK**

- a. **Application** - Foundation; piers; pedestals; pipe and electric duct encasement; cradles or saddles for tanks or pipes; and where indicated under mechanical and electrical work.

**b. Material**

- (1) Ultimate compressive strength after 28 days of 3000 psi. minimum.
- (2) Each cubic yard of concrete shall contain a minimum of six bags of Portland cement and a maximum of 6-1/2 gallons of water.
- (3) Portland cement: ASTM C150, Type I
- (4) Concrete aggregate: ASTM C33
- (5) Water: clear, suitable for domestic consumption.
- (6) Ready-mix, if used: ASTM C94
- (7) Grout: Pre-mixed metallic compound, Embeco, Kemox-Cor as approved.

**c. Installation**

- (1) Vibrate or spade, fill voids as required.
- (2) Protect from freezing and from drying effects of wind and sun.
- (3) Bevel exposed vertical and horizontal edges 3/4"

**20. EQUIPMENT SUPPORTS**

- a. Provide equipment supports consisting of platforms, concrete pads, gratings, cradles, structural members, hangers, rods, racks and incidental materials.

**b. Concrete equipment bases.**

- (1) Provide concrete base where indicated not less than 4" high and projecting 3" on all sides beyond equipment for floor mounted equipment unless otherwise specified.
- (2) Anchor bolts shall be placed in steel pipe sleeves, with a plate at bottom end of sleeve to hold bolt.
- (3) Grout between base plate and foundation.

- c. Floor mounted stands - Construct with structural steel members or steel pipe and fasten with flanges bolted to floor.

- d. Ceiling suspended platforms - Construct with steel hangers. Brace and fasten to building structure.

- e. Wall mounted platforms - Construct with steel brackets.

- f. Design and construct supporting structures of strength to safely withstand stresses to which they may be subjected and to properly distribute the load and impact over building areas.

- g. Saddles for tank supports, cast iron or welded steel of curvature to fit tank. Locate supports to avoid undue strain on shell and interference with pipe connections to tank outlets.

- h. Submit detailed shop drawings of all supports. Obtain Engineer's approval before fabricating or constructing.

**21. VIBRATION ISOLATION**

**a. General**

- (1) Mechanical equipment shall be mounted on vibration isolators to prevent transmission of vibration to building structure.
- (2) Select isolators for uniform static deflections according to distribution of weight.
- (3) Select isolators for not less than the indicated isolation efficiency with the lowest rotational speed of the equipment as the disturbing frequency unless otherwise indicated.
- (4) Concrete pads under the isolation shall be reinforced with rods or mesh to act as a mean reinforcing floor slab.

**b. Material**

- (1) Rubber-in-shear isolators - double or single deflection with provision for bolts to equipment and sub-base.
- (2) Spring isolators, Type A - free standing laterally stable, equipped with 1/4" sound deadening pads, leveling bolts, provision for bolting to equipment and sub-base. Outside diameter of each spring shall be:

	Deflection			
	1"	1-1/2"	2"	3-1/2"
Up to 1000 lbs.	2-1/2"	4-1/2"	5-1/2"	7"
1000 lbs-2000 lbs.	4"	5-1/2"	7"	8"
2000 lbs-3000 lbs.	5-1/2"	7"	8"	8"

Minimum deflection with operating load shall be 1.0".

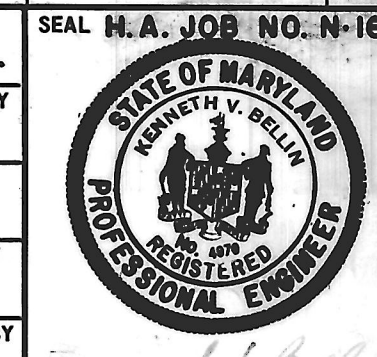
- (3) Spring isolators, Type B = Steel or cast housings with 1 or more springs, resilient lateral snubbers, equipped with 1/4" sound deadening pads, leveling bolts, provision for bolting to equipment and sub-base equal to Vibration Eliminator Type OS.

- (4) Spring suspension isolators - equipped with sound pad and adjusting bolt equal to Vibration Eliminator Type SNC.
- (5) Rubber-in-shear suspension isolators - double deflection units equal to Vibration Eliminator Type CD.

- c. **Approved Manufacturers:** The Vibration Eliminator Company, The Korfund Company, Amber/Booth.

REVISIONS			
NO.	DATE	ITEM	REF.

FIRM H.A. INC.  
DESIGNED BY  
DRAWN BY  
CHECKED BY AEW  
APPROVED BY KVB



**CHRISTIE, NILES & ANDREWS**  
ARCHITECTS

**OFFICE BUILDING**  
**FOR**  
**NOTTINGHAM FARMS INC.**  
102 W. PENNSYLVANIA AVE.  
TOWSON, MARYLAND 21204

JOB NO.	6522	<b>ME</b> <b>1</b>
SCALE		
DATE	SEPT. 27, 1966	
LAST REV.		

MICROFILMED