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ENGINEERING LABORATORY DESIGN, INC.

Designers and Manufacturers of Quality
Engineering Laboratory Equipment since 1962.

SPECIFICATIONS

12" RECIRCULATING SUBSONIC WIND TUNNEL - MODEL 403

General: The system is a closed, recirculating design. The flow loop may be arranged in either a horizontal or vertical configuration.

System components include: flow ducts, test section, fan, motor with variable frequency speed controller, a heat exchanger and supporting frame(s).

Overall dimensions of the unit are: Horizontal configuration: length, 19'-2" (5.84m); height, 6'-4" (1.93m); width, 6'-5" (1.96m); horizontal interior dimension between test section side wall and fan shell, 1'-0" (30.5cm); test section centerline height, 4'-6" (137.2cm). Vertical configuration: length, 19'-2" (5.84m); height, 7'-3" (2.21m); width, 4'-10" (147.3cm); test section centerline height, 5'-5" (1.65m). The total weight is approximately 2,100 lbs (955kg).

Flow Sections: The ducts bounding the air stream are fabricated of fiberglass reinforced plastic molded over precision tooling. Interior surfaces are glass smooth , white, gel-coat. Exterior surfaces are spray finished with polyester gel-coat enamel. A medium blue color is standard. Miter flanges, fastened with stainless steel bolts and sealed with elastomeric sealant, join the longitudinal corners of the duct sections. Face flanges, joining adjacent ducts sections are sealed with a resilient, closed cell, urethane foam gasket. The flanges are bolt fastened. Careful attention is paid to the fit and alignment of mating sections to insure that no leaks or discontinuities exist which would disturb the flow.

The contraction has a 6.25:1 area ratio, with a symmetrical cross section and analytically developed contours. The primary diffusion section expands with a total included angle of 6°.

High efficiency, turning vane cascades, fabricated of galvanized steel or extruded aluminum, are installed in each of the four circuit elbows.

A 1" X 2" (2.54cm X 5.08cm) mesh safety grid is provided at the downstream end of the primary diffuser.

Test Section: 3/4" (19mm) thickness, clear, GM grade, acrylic plexiglass will be used to fabricate the top, sides and bottom of the test section. The interior dimensions of the test section will be: length, 24.00" (61.0cm); width, 12.00" (30.5cm); height, 12.00" (30.5cm). The section will be fitted with aluminum end flanges. The flanges will be bolt fastened to the contraction and the diffuser ducts. The cover of the working section will be removable and fitted with quick release fasteners. The bottom can also be made detachable if desired. Wall ports, closed with flush fitting, flanged plexiglass plugs, can be provided in either or both side walls. Location and size of the ports should be specified prior to fabrication of the test section.

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Speed, in a clear test section, will be continuously variable from 300 fps (91.4 m/s), using a 40 HP motor, or 180 fps (55 m/s), using a 15 HP motor, down to approximately 10 fps (3 m/s). Velocity variation will be less than $\pm$ 1% variation from the mean, free stream, velocity. Turbulence level will be less than 0.25%.

Flow Straighteners: The setting length, upstream of the contraction, will be fitted with a precision, hexagonal cell, aluminum honeycomb section. Graduated mesh, high porosity (60%), stainless steel screens, mounted and tensioned in proprietary design, extruded aluminum frames will be furnished.

Heat Exchanger: A commercial quality, aluminum fin/copper tube, staggered row, heat exchanger will be installed between the third and fourth elbows. The heat exchanger is intended for use with either building water or chilled water on the liquid side at a rate of up to 10 GPM (37.85 Lpm). The buyer is responsible for providing a means of regulating the water supply (i.e. a modulating valve).

Supporting Frames: The individual duct sections will be supported by frame fabricated of structural steel tubing joined by welding. The frames will be etched, prime coated and spray finished with acrylic enamel. Each frame leg is fitted with an adjustable leveling pad (horizontal). A one-piece frame, fitted with swivel casters, supports the vertical configuration system. Rubber-in-shear mounts are used extensively to isolate the duct sections from room or fan vibration.

Fan Assembly: A centaxial fan will be furnished. The fan will be powered by either a 40 HP or a 15 HP, ODP, AC induction motor.

A transistor invertor type variable frequency controller will regulate fan shaft RPM. The controller will be arranged for either 208-230 or 460-480 VAC/3 phase/60 Hz electric service. A fusible disconnect will be furnished to protect the control and motor. A remote speed control station, located adjacent to the test section, will regulate test section velocity.

The buyer will be responsible for arranging for the installation of permanent wiring from the building mains to the disconnect.

Miscellaneous: The wind tunnel will be assembled and tested in the ELD plant facility prior to shipment. Interested members of the buyer's organization are invited to visit the plant during the testing period.

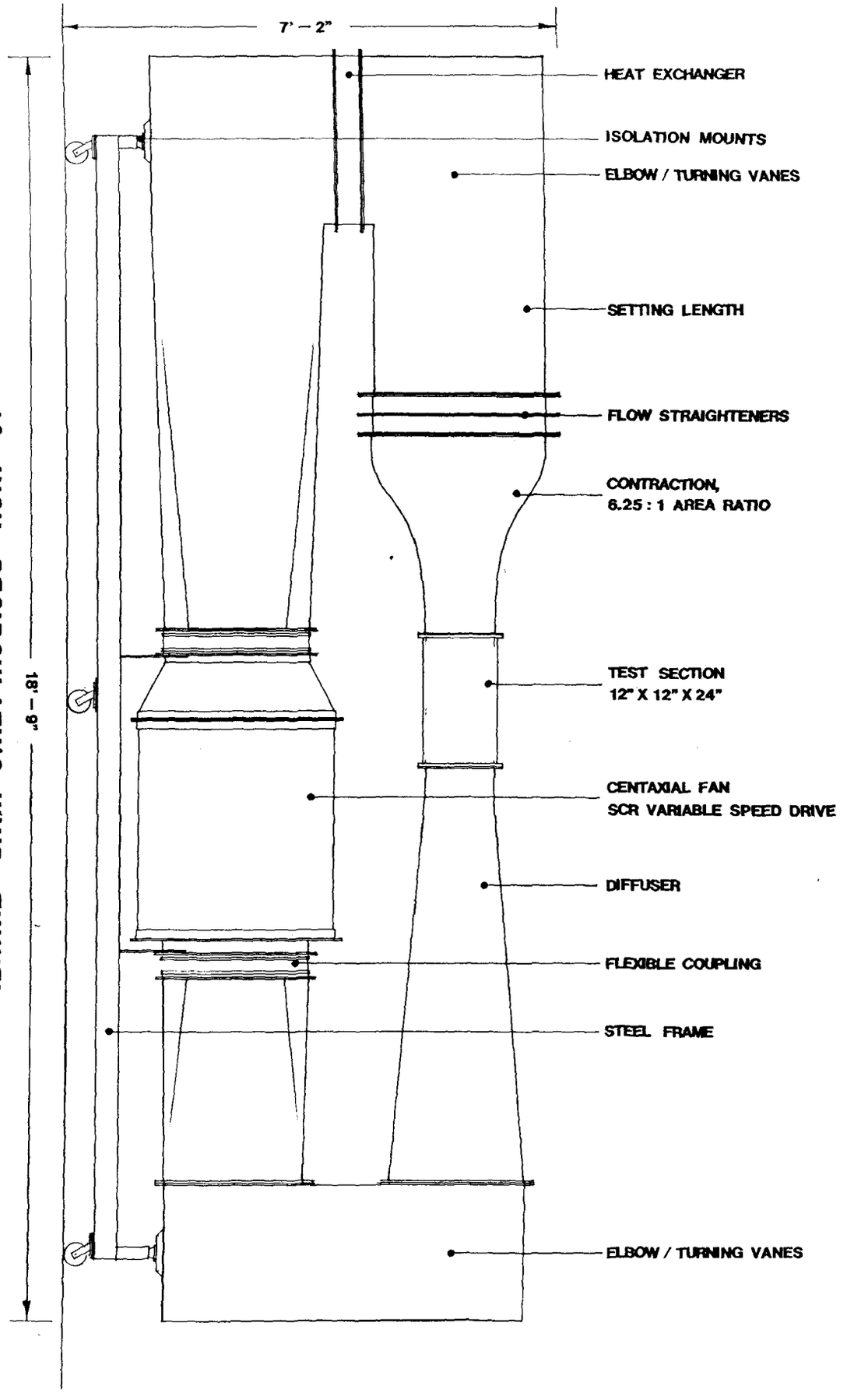
The wind tunnel will be disassembled and shipped via motor freight transport. Complete installation, operation, and maintenance instructions will be furnished with the equipment. Alternatively, an ELD representative can be contracted to supervise and participate in the unloading, placement, assembly, and start-up of the wind tunnel system.

A one year limited warranty is provided with the equipment.

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ENGINEERING LABORATORY DESIGN, INC. · BOX 278 · LAKE CITY, MN 55041

12 INCH RECIRCULATING WIND TUNNEL



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Reference

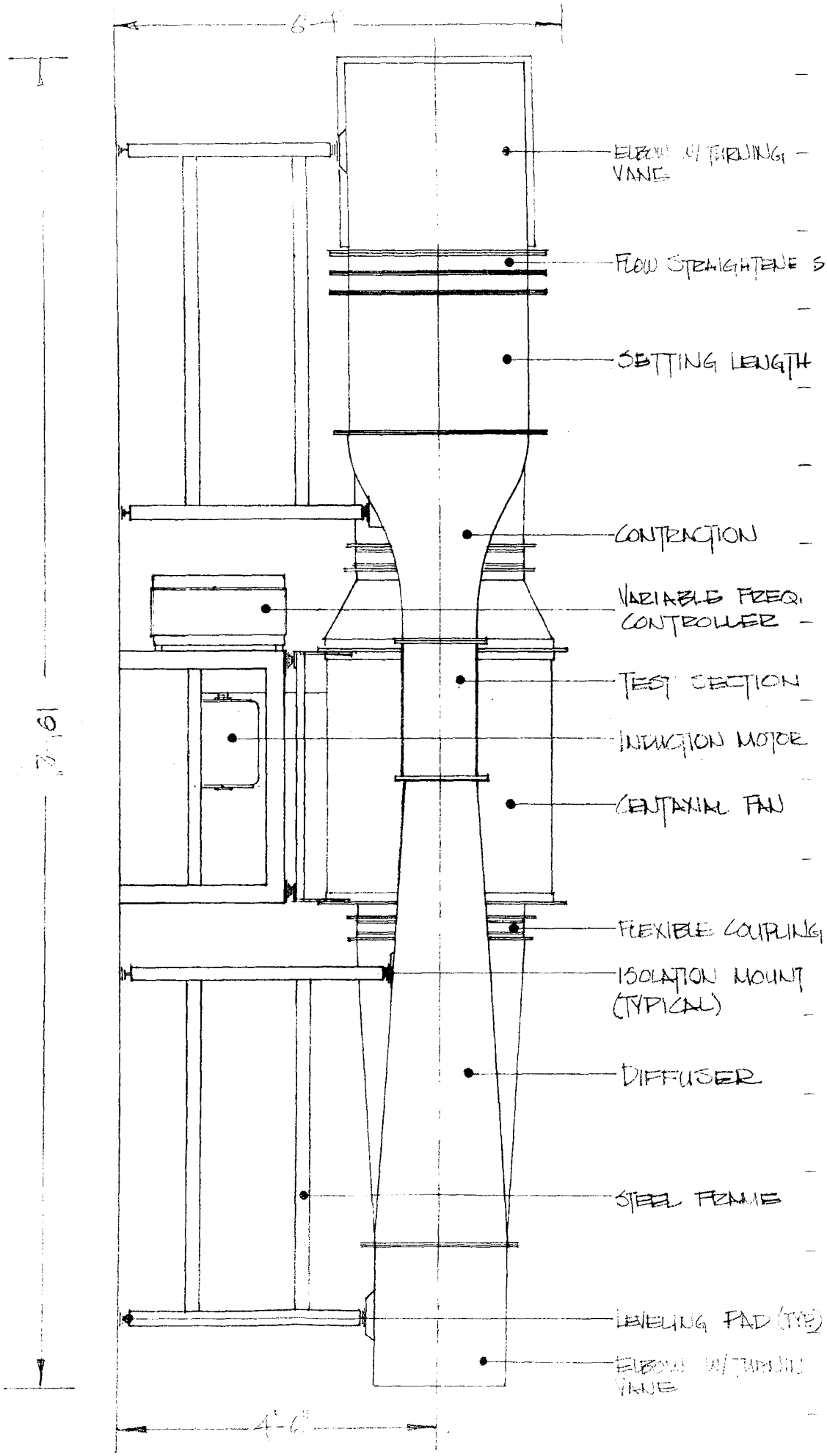
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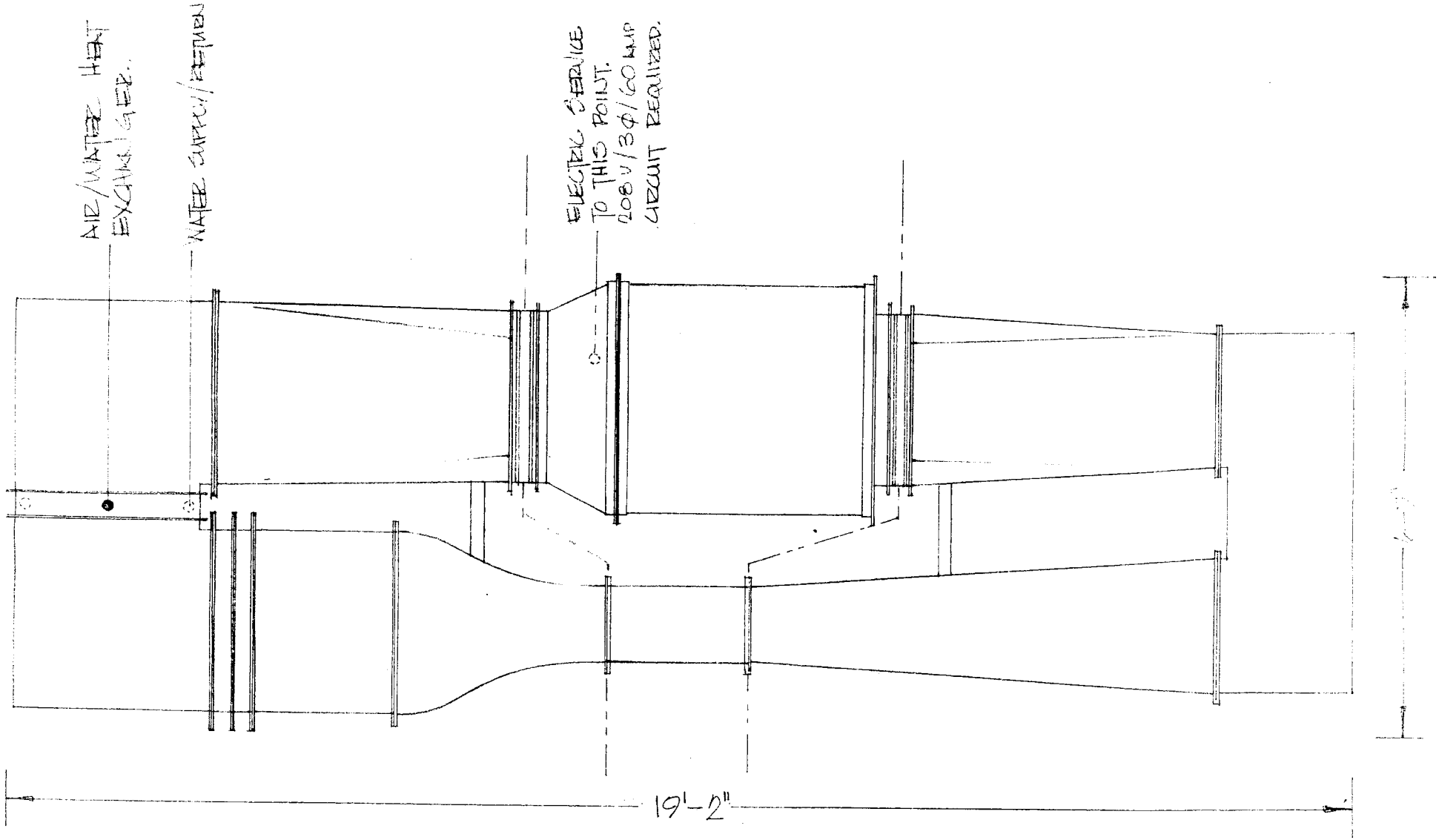
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12" DIAMETER

ELEVATION



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PLAN

NOTE: THE WING JOINTS MAY BE CONVENIENTLY DISASSEMBLED AT THE PLACES INDICATED BY THE BROKEN LINES.

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Scale 1/2" = 1'-0"

12' [illegible] WING JOINTS

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