SPECIAL SPECIFICATION

15216S

HOUSE CLEANING VACUUM

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Section Includes:

1. One house cleaning vacuum system, including one pump and collection unit located on fan deck.

2. System to supply **the subfab and cleanroom** levels of MicroFab.

B. Work by others:

1. Building roof penetration by Major Contractor.

1.02 REFERENCES/PROJECT REQUIREMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

B. Requirements of the following Project Specification Sections apply to this section:

1. **Section 15050 Basic Mechanical Materials and MEthods**

2. **Section 15060 Hangers and Supports**

3. Section 15070 Vibration **Limits and Control**.

4. Section 13085S Seismic Protection

5. Section 16001-S Electrical Work

1.03 DEFINITIONS

A. not used

1.04 SYSTEM DESCRIPTION

A. Provide a house clean vacuum system capable of providing 2 inch Hg at a minimum for 70 scfm at most remote point from pumping units while supporting 5 use points simultaneously when utilizing 37.5 feet of 11/2" diameter hose with cleaning tool at the end. For design purposes, distribute 5 use points over 7 different sub-mains selecting worst case locations.

1.05 SUBMITTALS

A. Submit the following in accordance with Conditions of Contract:

1. Product Data

2. Coordination Drawings

1.06 QUALITY ASSURANCE

A. not used

1.07 DELIVERY, STORAGE, AND HANDLING

A. Storage : not used

B. Handling : not used

1.08 PROJECT/SITE CONDITIONS OR SPECIAL CONDITION

A. Provide vacuum pump with a capacity adjusted for the altitude **(See 2.05 D).**

1.09 SEQUENCING

A. Installation of distribution piping and mechanical equipment will be carried out under normal clean conditions **after the building is closed**.

B. Installation of floor outlets in cleanroom and clean support rooms will be carried out under very clean conditions **after the clean room is certified**.

1.10 - 1.15

A. not used

ART 2 - PRODUCTS

2.01 MANUFACTURERS

A. House Clean Vacuum System: Spencer

2.02 EXISTING PRODUCTS

A. not used

2.03 MATERIALS

A. not used

2.04 MANUFACTURED UNITS

A. not used

2.05 EQUIPMENT

A. The vacuum producer shall be a multi-stage centrifugal vacuum producer constructed with clearances of not less than 1/8" to avoid injurious wear from dust and dirt. The vacuum producer shall be of the Four Bearing Overhung design in which the impellers are mounted on a separate shaft supported by a 2 bearing bracket directly connected to the prime mover by means of a flexible coupling. The vacuum producer is required to be **installed on an inertia base.**

B. The impellers fabricated from 5052-H34 aluminum shall be statically and dynamically balanced to maintain machine amplitude of not greater than 1.5 mils when in operation. A deflector shall be located between each impeller constructed with suitably curved guide vanes for returning the air to the entrance to the succeeding impeller.

C. The vacuum producer casing shall be cylindrical and constructed of ASTM A569 hot rolled low carbon steel, or other metal determined to be appropriate for the application. All seams shall be continuously welded. There shall be an axial inlet connection of 6 in diameter tube. The exhaust outlet shall be tangential in the position # 1 and 8 in diameter tube with welded flange. The appropriate size rubber isolation sleeve and clamps shall be furnished for the inlet.

D. The vacuum producer shall be designed for 350 SCFM at 8” mercury vacuum based on handling air at an altitude of 5,500 feet above sea level and a barometric pressure of 24.43” of mercury, and a temperature of 70 Degrees F.

E. The vacuum producer motor shall be capable of operating continuously and have a rating of 30 HP and operate at 460 Volts, 3 Phase, 60 Hertz, and with a TEFC enclosure. The nominal motor speed shall be 3500 RPM.

F. The shaft shall be supported by two (2) anti-friction grease lubricated ball bearings. Each shall be sized so that the rotating assembly shall operate at a minimum of 20 percent above or below the first critical speed.

G. The vacuum producer shall be supplied with an adjustable blast gate for the air outlet, companion flange and outlet air noise silencer.

H. Fully automate system using one microprocessor with EPROM memory. The local panel shall be provided with timer to start and stop the house clean vacuum machine. The house clean vacuum machine shall be shut done with a delay of 15 minutes by activation of manual off buttons on the local panel. The number of hot start of the house clean vacuum machine shall be limited to two per 8 hour day shift.

I. Provide two remote start-up buttons on 1st floor and two remote start-up buttons in the subfab of MicroFab. The location of remote buttons will be determined by SNL.

J. Provide two dry (potential free) contacts, open when not running, to indicate running status of each pump, for use by others for remote monitoring purposes.

K. Provide a local header inlet pressure-indicating device. Locate at pumping units.

L. Provide system with common cause malfunction local indicators and one dry (potential free) contact, open in alarm, for all grouped malfunctions. This contact will be used by others for remote monitoring purposes.

M. Pump Isolation: Provide pumps with vibration isolators on inlet and outlet piping.

N. Impeller to be balanced to ISO Std. 1940 G2.5.

O. Vacuum Controller: **Provide a 120 Volt electrical bleed valve** connect**ed at the** remote end of manufacturing system piping main. Vacuum controller to prevent pumps from surging during low system usage.

P. Vacuum Silencer - Vacuum Controller Location:

1. Equip vacuum controller located at end of main with a silencing muffler to limit noise generated from controller.

2. Noise level outside a 10 foot radius around this controller: Maximum 80 decibels.

Q. Waste Collection:

1. One tubular bag separator with removable dirt shall be used for waste collection. The cylindrical separator shall have a two-stage filtration system for maximum efficiency. The first stage shall consist of a centrifugal separation chamber whereby dust-laden air enters the separator tangentially and is acted upon by a centrifugal force. The first stage shall act to remove the majority of particles allowing only finer particles to enter the second stage or bag chamber

of the separator. The separator shall be constructed with a 7.5 cubic foot removable dirt can held in place with a lever operated cam arrangement so that it may be removed for easier emptying lifting the lever and gaining access to remove the 4-mil disposable dirt can liner. The dirt can shall also have two handles, ball bearing casters and equalize line assembly.

R. Filter Bag:

1. Effective area: Minimum 102 square feet.

2. Description: the filter bag is polyester woven fabric with a calendared finish, sealed seams and a felted bag collar cuff. The filter bags shall be open at the bottom and attached to a mounting plate by a spring steel ring. The filter bags shall be closed at the top and supported by a shaker plate. Proper bag tension shall be maintained by a single-action, manually adjustable clamp that attaches the closed end of the bag to the shaker plate. Latched round access doors of suitable size shall be provided for filter bag maintenance.

3. Cleaning of filter bags shall be by means of an external mechanical shaker.

S. Piping Accessories:

1. At building acceptance provide following hoses complete with connections, handpipes, brushes, and stainless steel container housing on industrial grade rollers as attached:

2. Service outlets: Equip all outlets with spring return closures.

3. Tubing finish: Galvanized steel(zinc electroplated)

4. Fitting specifications:

   (a) Material: Galvanized steel (zinc electroplated), CPVC for Building 858

   (b) Connections: compression couplings

   (c) Transitions and offsets: long turning radius.

5. Tubing sizes:

   (a) Sub-mains with more than one outlet: 2-1/2 inches.

   (b) Outlets: 2 inches for 1-1/2 inch hoses.

2.06 - 2.11

A. not used

PART 3 - EXECUTION

3.01 - 3.04

A. not used

3.05 INSTALLATION

A. Power:

1. Pumps, collection and filtering equipment: 480 VAC, 3 phase, 60 Hz, with starters mounted on equipment skid.

2. Control system: 120 VAC, 1 phase, 60 hz.

3. Install conduit, wiring and accessories from 480 VAC I-Line panel

B. Tubing Routing – See Drawings

C. Service Outlets:

1. Vertically mount outlets in sub-fab levels to columns with air flowing in an upwards direction

2. Vertically mount outlets in return air chase with air flowing in an upward direction in clean room area where raised floor is not available.

3. Recess outlets on third manufacturing level and other raised floor areas and flush mount in raised floor with air flowing down.

4. Install cleanout tees at elevation changes and at end of all long horizontal runs.

D. Extend exhaust header outside building. Close in roof penetration and install roof curb in accordance with approved procedure from Owner.

E. Submit location of roof penetration to major contractor.

3.06 - 3.15

A. not used

Part	size	Material	Part #	#
Floor Valve	2"	304SS Body and Cover	VLV90227 Type G	
Wall inlet valve	2"	nickel plated	VLV-90083	
Wall inlet valve	**2”**	**Nickel plated**	**VLV90085**	
# of cabinet in Fab		stainless steel	VTL-90083	**1**
37' hose	11/2"		HOS-90079	4
37' hose	11/2"		HOS-90091	0
Hose to wand elbow connector	11/2"	Nickel plated	EVT-90003	4
52" Wand	11/2"	chrome plated	HDL-90036	4
2' Wall Hand extension	11/2"		HDL-90040	4
12" Bare Floor Tools	11/2"		VTL-90019	4
15" Bare Floor Tools	11/2"		VTL-90022	4
Carpet tools	11/2"		VTL-90013	0
45 Degree Elbow Connector	11/2"	nickel plated	EVT-90004	4
Elbow Floor valve connection	11/2"	Aluminum	EVT-90005	4
6" Hand Tool w/brush	11/2"		VTL90053	2
Hand tool	11/2"		VTL-90002	2
# of cabinet in Sub-Fab		steel	VTL-90083	**2**
37' hose	11/2"		HOS-90079	6
37' hose	11/2"		HOS-90091	0
Hose to wand elbow connector	11/2"	anodized aluminum	EVT-90002	6
52" Wand	11/2"	satin anodized	HDL-90033	6
2' Wall Hand extension	11/2"		HDL-90040	0
4' Wall Hand extension	11/2"		HDL-90040	6
12"Bare Floor Tools	11/2"		VTL-90019	3
15"Bare Floor Tools	11/2"		VTL-90022	3
20" Bare Floor Tools	11/2"		VTL-90022	3
Carpet tools	11/2"		VTL-90013	0
45 Degree Elbow Connector	11/2"	nickel plated	EVT-90004	6
6" Hand Tool w/brush	11/2"		VTL90053	3
Hand tool	11/2"		VTL-90002	3

END OF SECTION