

Vacuum Equipment Interfaces

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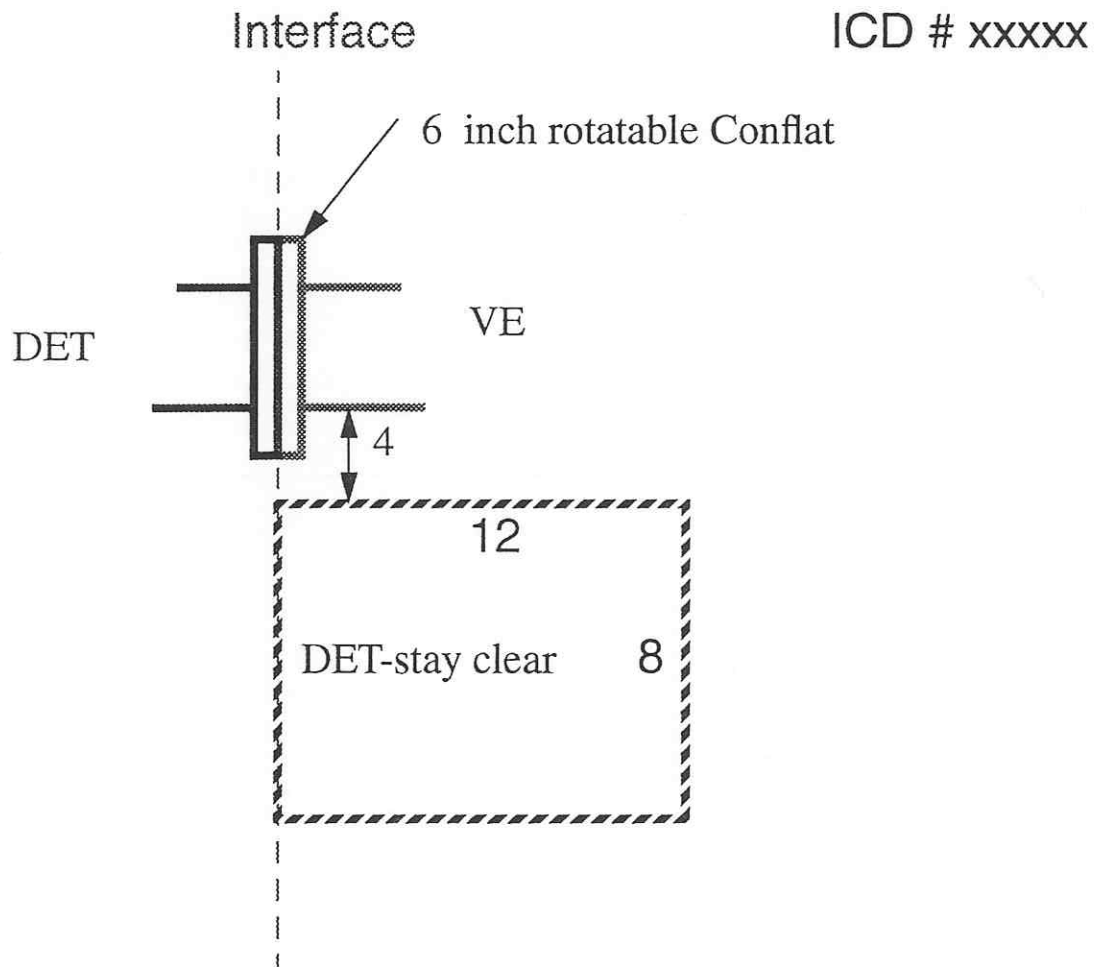
LIGO-G950041

VACUUM EQUIPMENT INTERFACES

- Four categories of interfaces to the Vacuum Equipment have been identified:
 - ›› BEAM TUBE
 - ›› BUILDINGS AND UTILITIES
 - ›› CONTROL SYSTEM
 - ›› INTERFEROMETER

VACUUM EQUIPMENT INTERFACES

- Interfaces can be controlled by the use of ICDs (Interface Control Documents). Only the details of the actual connection should be contained.



VACUUM EQUIPMENT INTERFACES

- BEAM TUBE INTERFACES:

- ›› Weld joint at module ends - 122cm gate valve supplied by VE contractor is mounted here.
- ›› Conflat flanges at each of 9 ports along each module - Rough and turbo pumps supplied by VE contractor connect to these flanges.

This information will be transmitted to the Vacuum Equipment Contractor in the form of an ICD.

VACUUM EQUIPMENT INTERFACES

- BUILDINGS AND UTILITIES INTERFACES - to be proposed and documented by the VE contractor - should include:
 - ››Footprint of installed chambers, piping and other devices (LN2 tanks, air compressors) - including loads to be carried, anchor details, wall penetrations for piping.
 - ››Crane connection needed (if special).
 - ››Electrical requirements - voltage, power, outlet type, location, grounding points.
 - ››Compressed air, cooling water connections, if any. If so; flow rates, pressures, temperatures, fitting type, size, and location.

This information will be transmitted to the building designer (Parsons) in the form of an ICD.

VACUUM EQUIPMENT INTERFACES

- CONTROL SYSTEM INTERFACES - to be proposed and documented by the VE contractor - LIGO will set the location of terminal blocks in the building to which the VE contractor will connect. Information should include:
 - ››conductor identification - size, color, cable number.
 - ››signal levels, impedances, power outputs.
 - ››signal name.

VACUUM EQUIPMENT INTERFACES

- **INTERFEROMETER INTERFACES** - to be proposed and documented by the LIGO Detector group. Currently the interface is defined (but not well controlled) as the support beam flanges on the chambers. Additional information needed includes:
 - ›› stay clear regions around the support beam ports both inside and outside the vacuum.
 - ›› stay clear regions for the support pillars.
 - ›› stay clear regions for any critical cabling runs.
 - ›› TMC details concerning the lift mechanism - additional ports, stay clear regions, any loads to be carried by the chamber structure.

VACUUM EQUIPMENT INTERFACES

- **INTERFEROMETER INTERFACES or REQUIREMENTS??**

- ›› Clean room sizes, apertures, port locations, internal attachment points - these items may be well enough controlled by the design process and the resulting drawings. (Apertures and port locations are primary requirements imposed by the VE specification.)

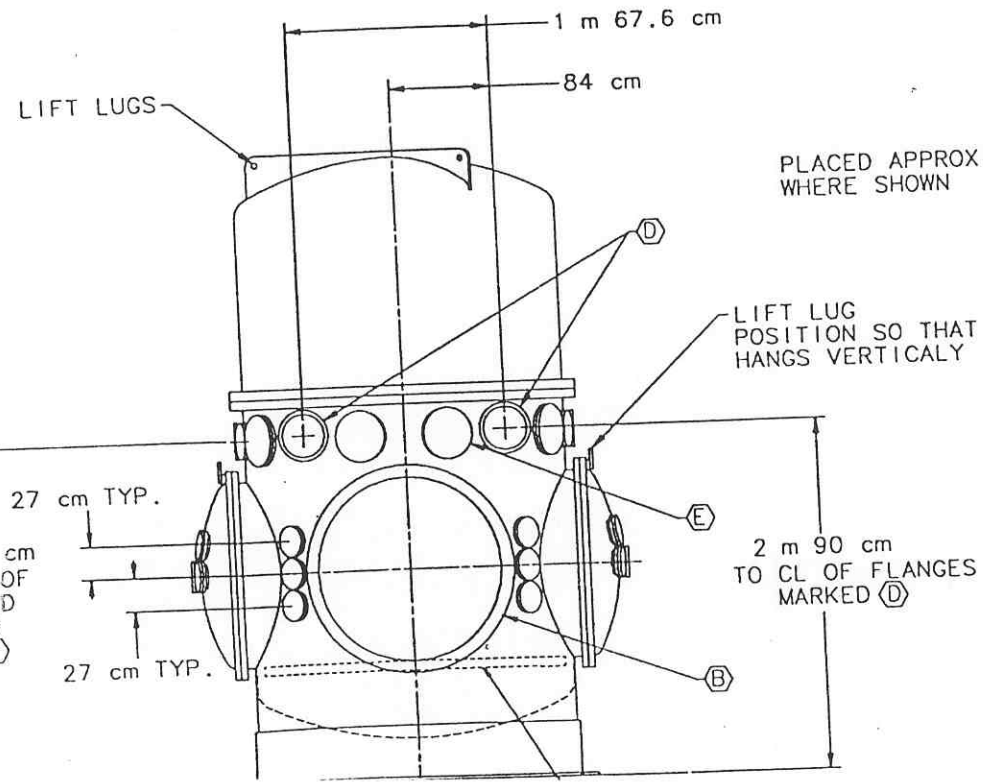
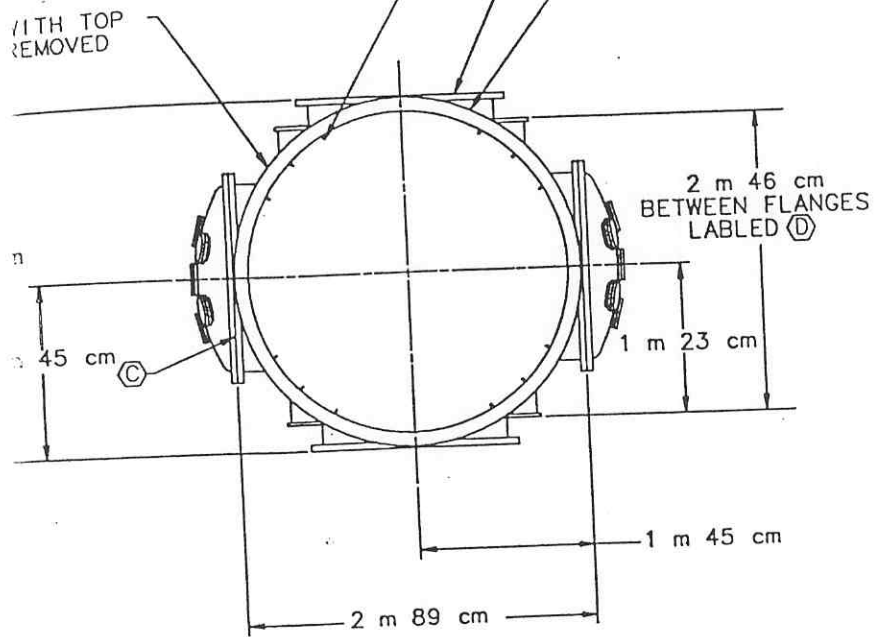
BRACKETS, SEE UNIT # 110000

VIEWPORT AXIS WITH OUTER SURFACE OF VACUUM SEAL
 4. TOLERANCES, UNLESS OTHERWISE SPECIFIED: LINEAR, ±0.25 CM
 ANGULAR, ± 1 DEGREE

5. NOZZLE SCHEDULE PER TABLE BELOW:

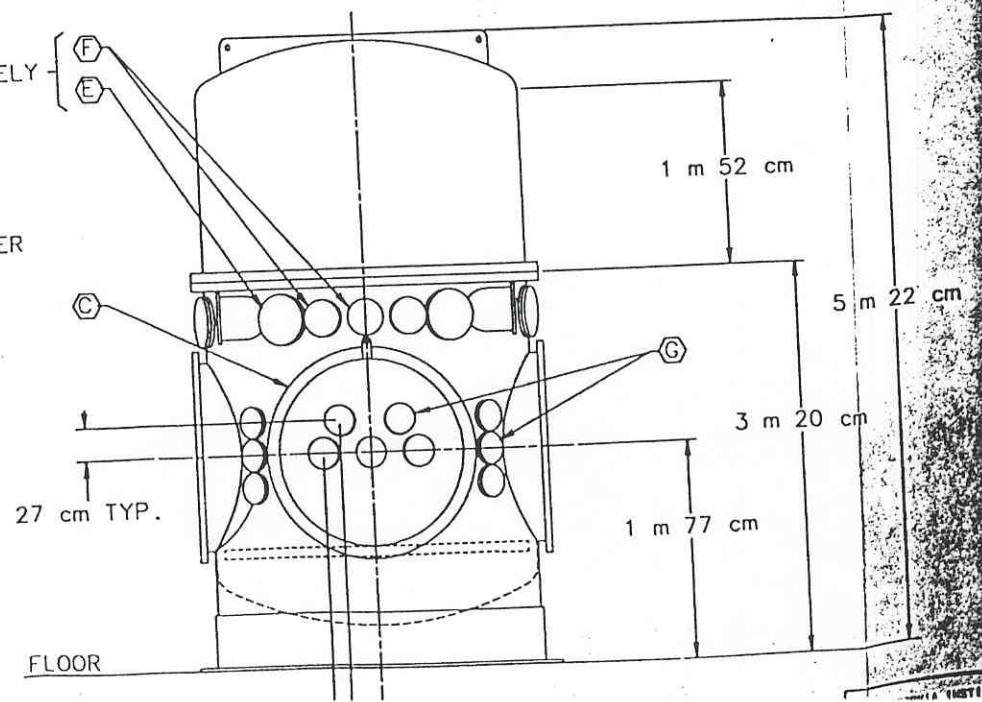
ITEM	SIZE	QUANTITY	FLANGE TYPE	PURPOSE
(A)	264cm ID TUBE	1	O/O-O/METAL*	MAJOR ACCESS
(B)	152cm ID TUBE	2	O/O-O/METAL*	LASER BEAM, ACCESS (MINIMIZE NECK LENGTH)
(C)	152cm ID TUBE	2	O/O-O/METAL*, WITH BLIND FLANGE	ACCESS (MINIMIZE NECK LENGTH)
(D)	35cm OD TUBE	4	CONFLAT**	SUPPORT BEAMS REFERENCE ICD # TBD
(E)	35cm OD TUBE***	8	CONFLAT**, WITH BLIND FLANGE	AIR SHWR, BACK-TO-AIR PU ROUGHING & ION PUMPS, UTIL
(F)	25cm OD TUBE***	6	CONFLAT**, WITH BLIND FLANGE	ELECTRICAL FEEDTHROUGHS
(G)	20cm OD TUBE***	22	CONFLAT**, WITH BLIND FLANGE	OBSERVATION, BEAM PICK-OFFS
(H)	3.8cm OD TUBE	1	CONFLAT**, WITH BLIND FLANGE	ANNULUS PUMPOUT (NOT SHOWN)

*DUAL O-RING DESIGN, WITH CAPABILITY OF REPLACING INBOARD O-RING WITH METAL SEAL. THESE FLANGES EACH INCLUDE AN ANNULAR CHANNEL BETWEEN O-RINGS, MANIFOLDED TO A SINGLE PUMPOUT PORT ON EACH CHAMBER, WITH CONFLAT** SEAL.
 **REGISTERED TRADEMARK, VARIAN VACUUM PRODUCTS; COMPATIBLE ALTERNATES ARE ACCEPTABLE.
 ***THESE FLANGES ARE TANGENT TO LOCAL VACUUM WALL, WITH MINIMUM NECK LENGTH.

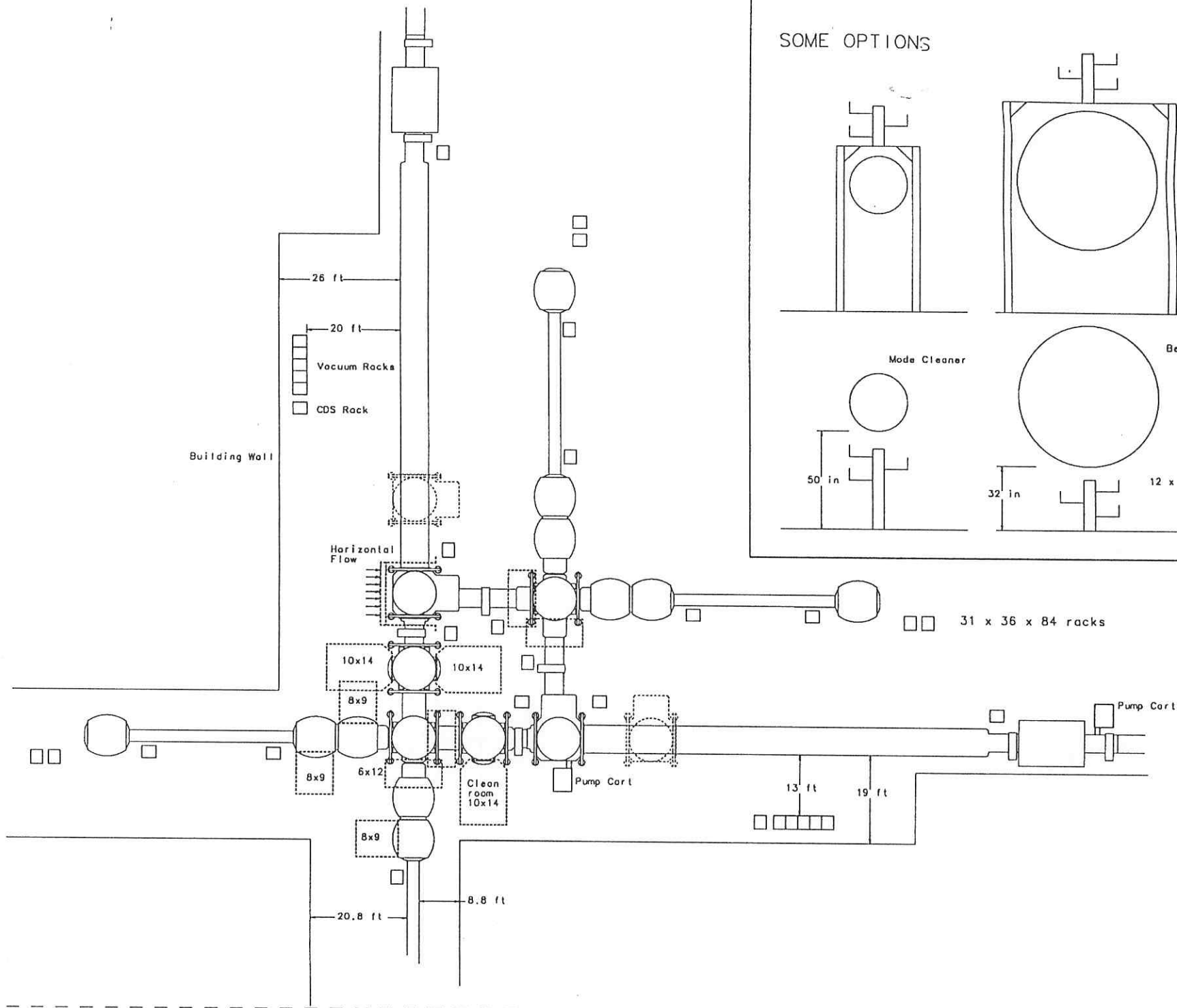


PLACED APPROXIMATELY WHERE SHOWN

LIFT LUG POSITION SO THAT COVER HANGS VERTICALLY



FLOOR



SOME OPTIONS

