

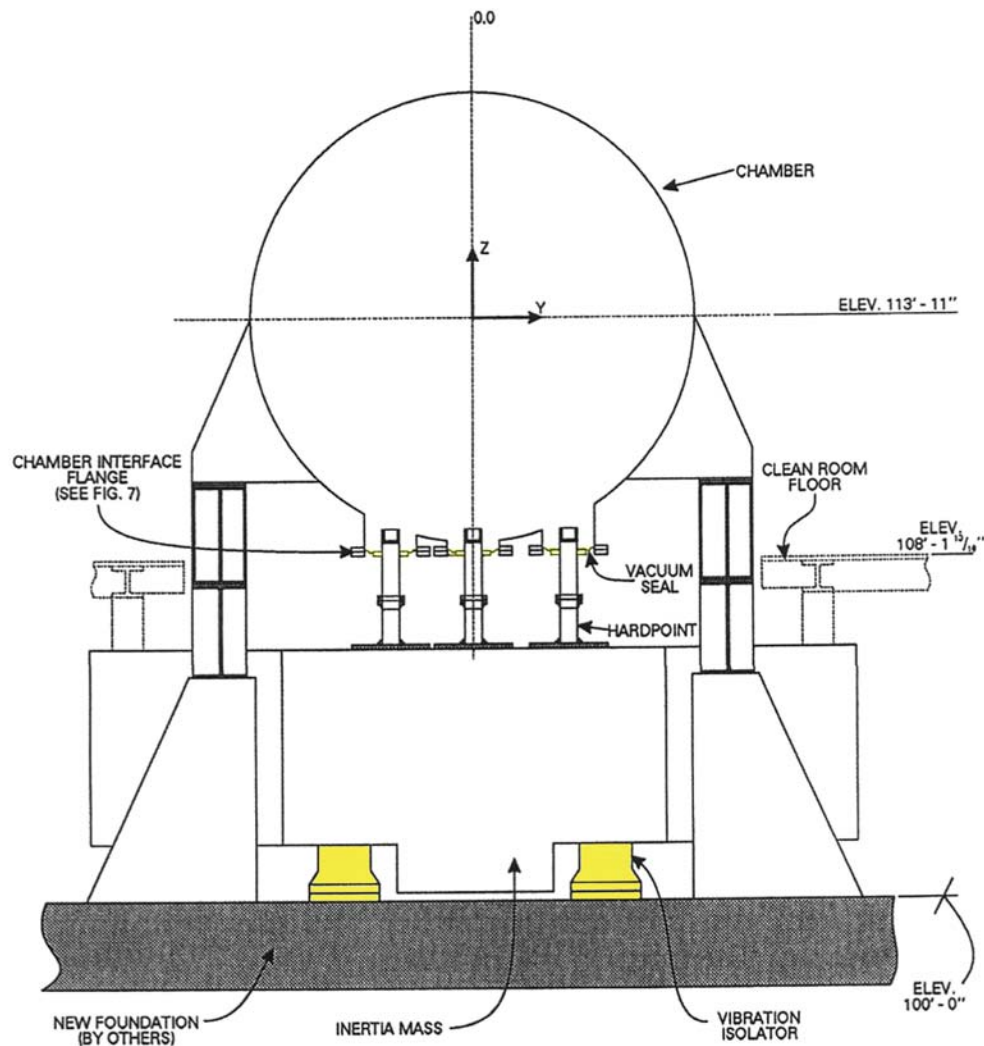
Vacuum Chamber Isolation Arnold Air Force Base

Fabreeka was awarded the contract to furnish the optical chamber platform and isolation system to provide low frequency attenuation for a sensor alignment system which will be under test with an optical collimator and scan mirror as part of the chamber optical system. Visible and infrared sensors will be tested.

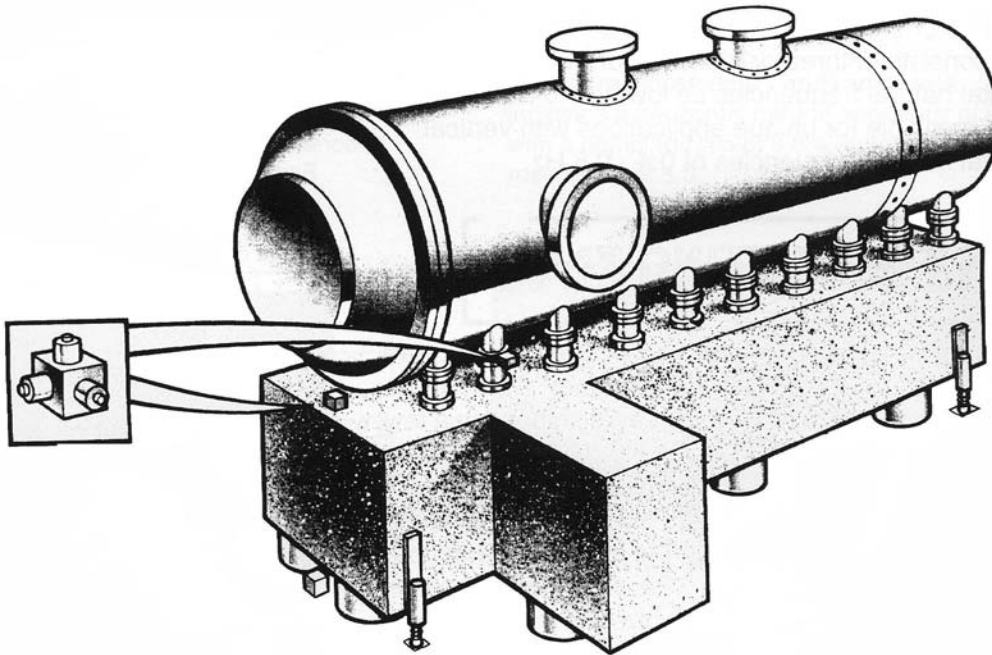
Ten Fabreeka PAL 416-12 pneumatic, vibration isolators support the mass and the chamber payload, providing low frequency attenuation. Each isolator has a vertical natural frequency of 1.8 Hz, a horizontal natural frequency of 2.0 Hz and has a load capacity of 41,600 lbs. Laminar flow damping allows stable, repeatable settling of the mass.

The 310,000 lb reinforced seismic mass was designed by Fabreeka. FEM and NASTRAN analysis were used to design the mass to have a first response mode greater than 80.0 Hz. Four proximity sensors (one at each corner of the mass) provide the height and position of the mass/chamber to the nearest mil via electronic display.

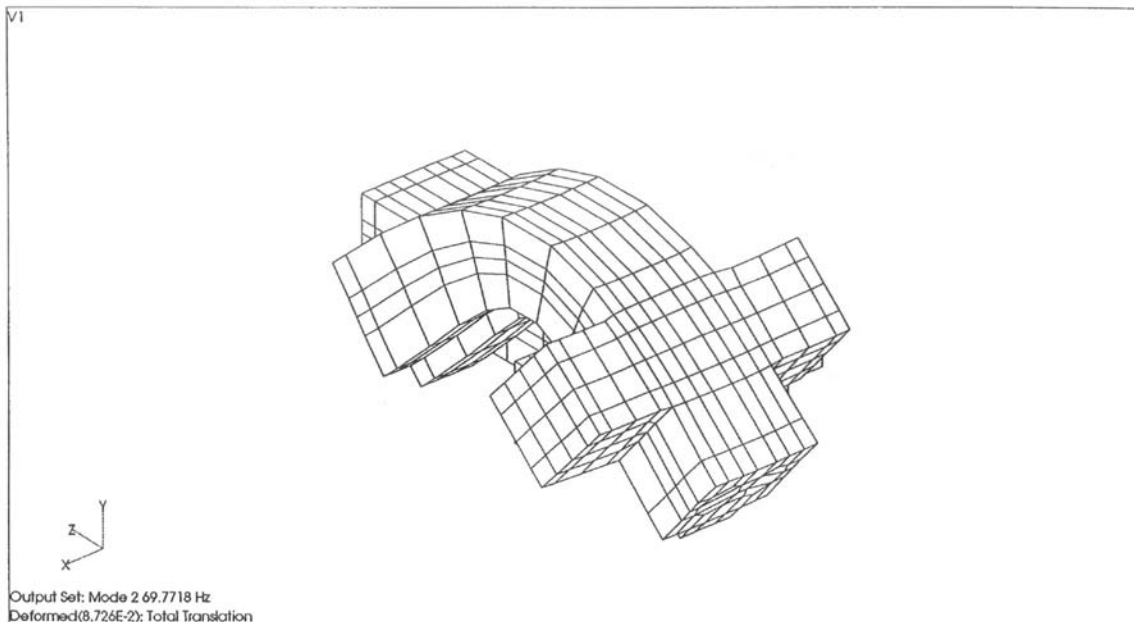
Additional requirements for this program were monitor and control instrumentation, which provide automatic height and level control of the platform and provide vibration monitoring at designated locations. Triaxial velocity sensors and proximity sensors were installed on the platform and provide, via electric display, the position of the platform as well as amplitude and frequency content of vibration.



10V chamber - vibration isolation system - end view



Fabreeka's isolation system and platform provide a stable bench for the sensor components, isolating them from ground-transmitted or vacuum chamber induced vibrations while maintaining a rigid platform for attaining precise optical system alignment.



Rigid body and bending modes are verified using FEM and NASTRAN analysis.



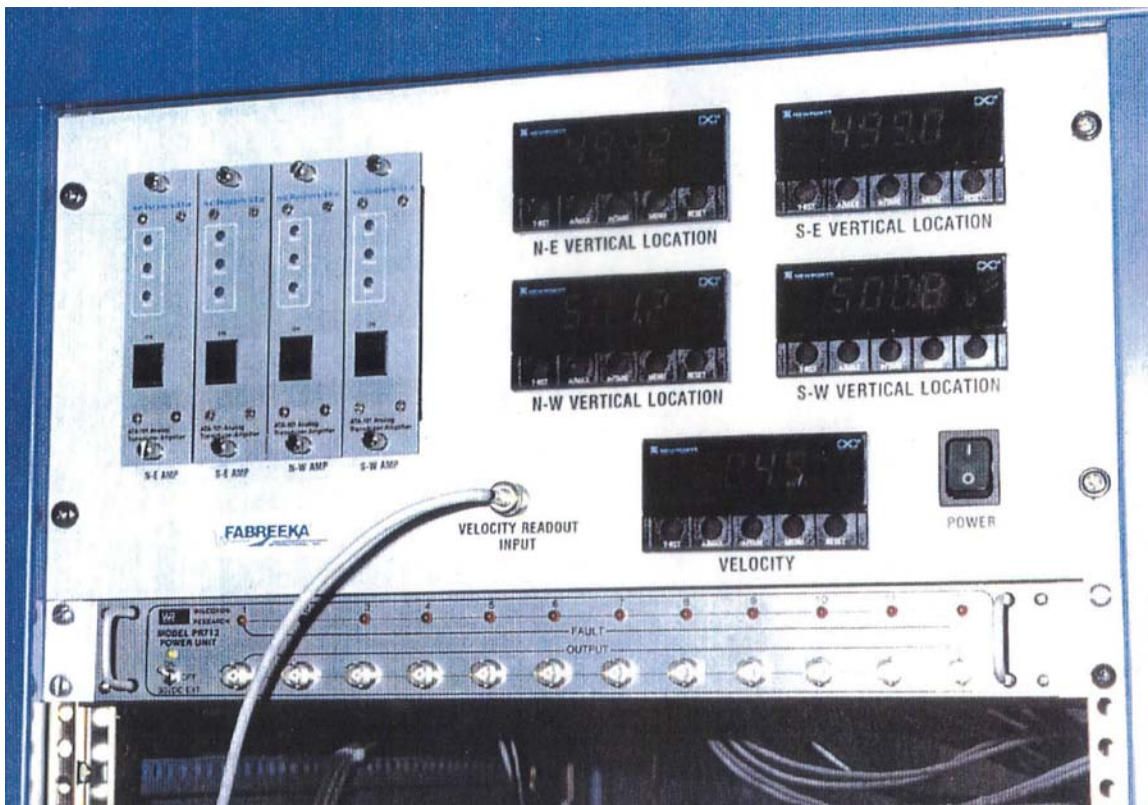
Forming the mass below the existing vacuum chamber. The vacuum chamber itself is supported by columns on the facility floor.



End view of the mass being formed. Note the hollow tubes positioned at the neutral axis of mass. The tubes reduce the overall weight to be supported and increase the stiffness (dynamic response modes) of the mass.



Completed seismic mass supported by pneumatic isolators.



Fabreeka supplied an electronics panel showing height and position of mass as well as the RMS velocity readings at the four (4) triaxial monitoring locations.



Underside view of the vacuum chamber. Thirty (30) chamber flanges protrude downward toward the mass. Adjustable "stand-offs" on the mass attach to the chamber at the flanges using a flexible vacuum seal.

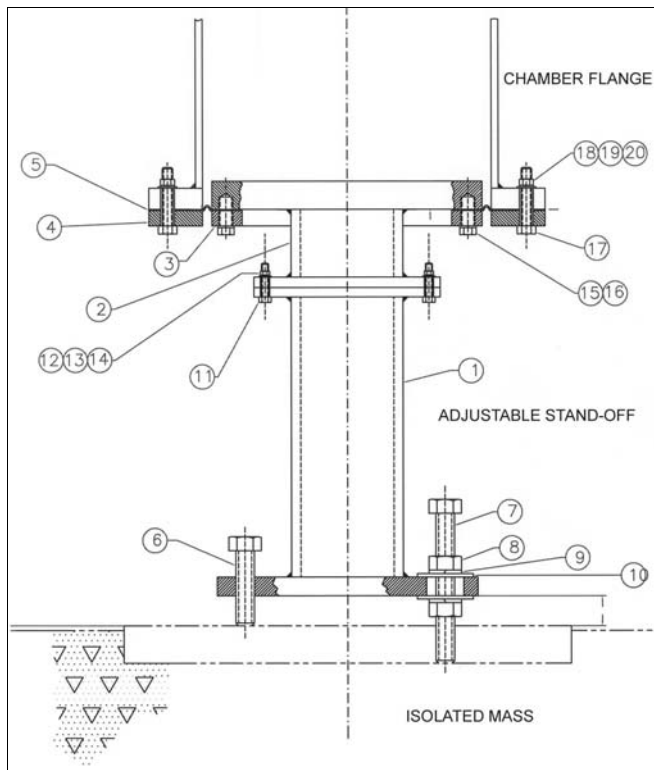


Diagram showing a cross section of the isolated mass, stand-off and chamber flange. The test articles inside the vacuum chamber are fixtured to the top of the stand-offs.