

Requirements Specification for Modular Chemical Wet Laboratory

Overview

This specification list is for a turnkey modular chemistry lab that is to be located at NASA Langley in Hampton, VA in building 1146, within room 111. (Dimensions are described in Figure 4.)

General Specifications

Modular laboratory shall be built to the following specifications listed and measurements indicated in attached drawings:

All construction shall be in accordance with International Building Code (IBC) standards and shall specifically meet NFPA 45 and NFPA 101 requirements.

Laboratory shall be able to be separated into separate units capable of fitting through a roll-up door (15' wide by 16' high) for installation.

Laboratory shall rest on 200-psf-rated concrete floor.

Laboratory shall maintain ambient temperature and humidity ranges of: 68-74°F and 45 - 55% RH.

Fume hood make-up air shall be conditioned.

Fume hoods shall be able to maintain a face velocity of 100 cfm, be suitable for standard chemical operations, and comply with NFPA and International Mechanical Code.

Fume hoods shall be equipped with explosion proof lighting.

Argon lines in fume hoods and bench areas to be fed from 6 "K" bottles located on exterior of lab. (Figure 1)

Laboratory to contain built in vacuum system with ports (6) as indicated on attached drawings. (Figure 1) Vacuum pump used for system to be located on exterior.

Sinks shall be either epoxy or polyolefin laboratory sinks with attached eye wash stations.

Laboratory to have open ceiling plan (no drop ceiling).

Floor-to-ceiling height shall be 10'.

Overhead support tracks for power, gas lines, Internet, and phone lines.

Interior lighting shall be LED or fluorescent.

Conduit and fixtures for internal lighted Emergency Exit signs should be installed over doors. Lights to be procured under a separate project.

Wet fire suppression plumbing is required throughout interior of lab in accordance with NFPA 13 standards (design density shall not be less than 0.15 gpm/sq.ft. over entire space).

Fire alarms to be located near doors.

Structure shall be metal with sheetrock interior walls covered with fiber reinforced paneling (FRP) or PVC. Exposed exterior wall and ceiling finishes shall be Class A with a flame spread of 0-25 as per NASA requirements and ASTM E-84 test. Bidders shall supply data that finish materials comply with requirements.

Floor shall not have floor drains.

Chemical resistant floor covering is required throughout entire lab.

Roof structure shall be capable of supporting at least 30 lb/ft².

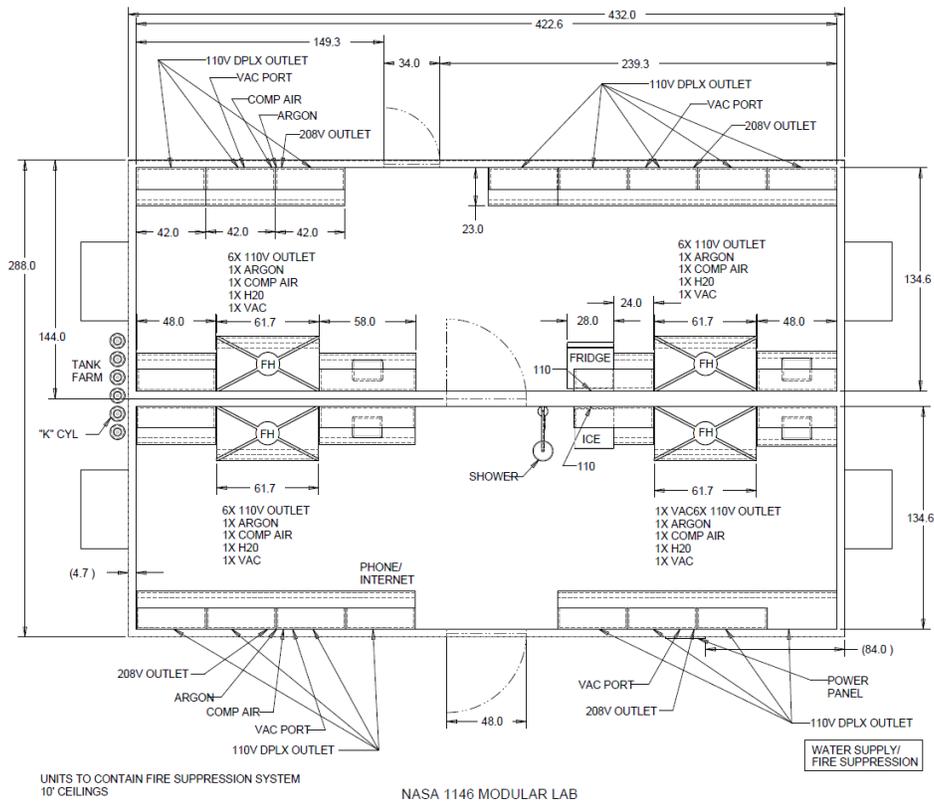


Figure 1. General laboratory schematic detailing location of 120V and 208V electrical outlets, fume hoods, sinks, safety shower, refrigerator, ice maker, doors, case work, inert gas and vacuum ports, HVAC units, and building structural dimensions. Location of phone/internet jack, power panel and water supply for fire suppression system also indicated. Note: external drain is located at water supply position.

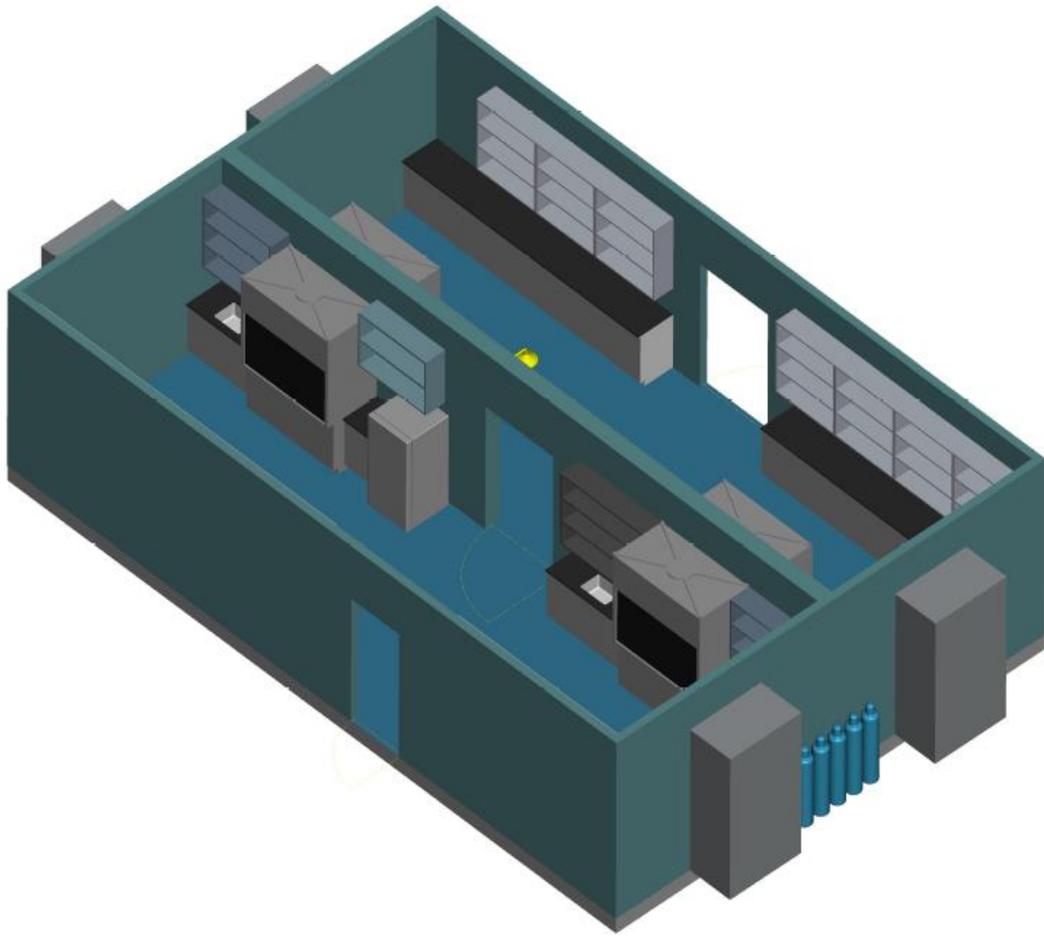


Figure 2. 3D rendering of proposed laboratory

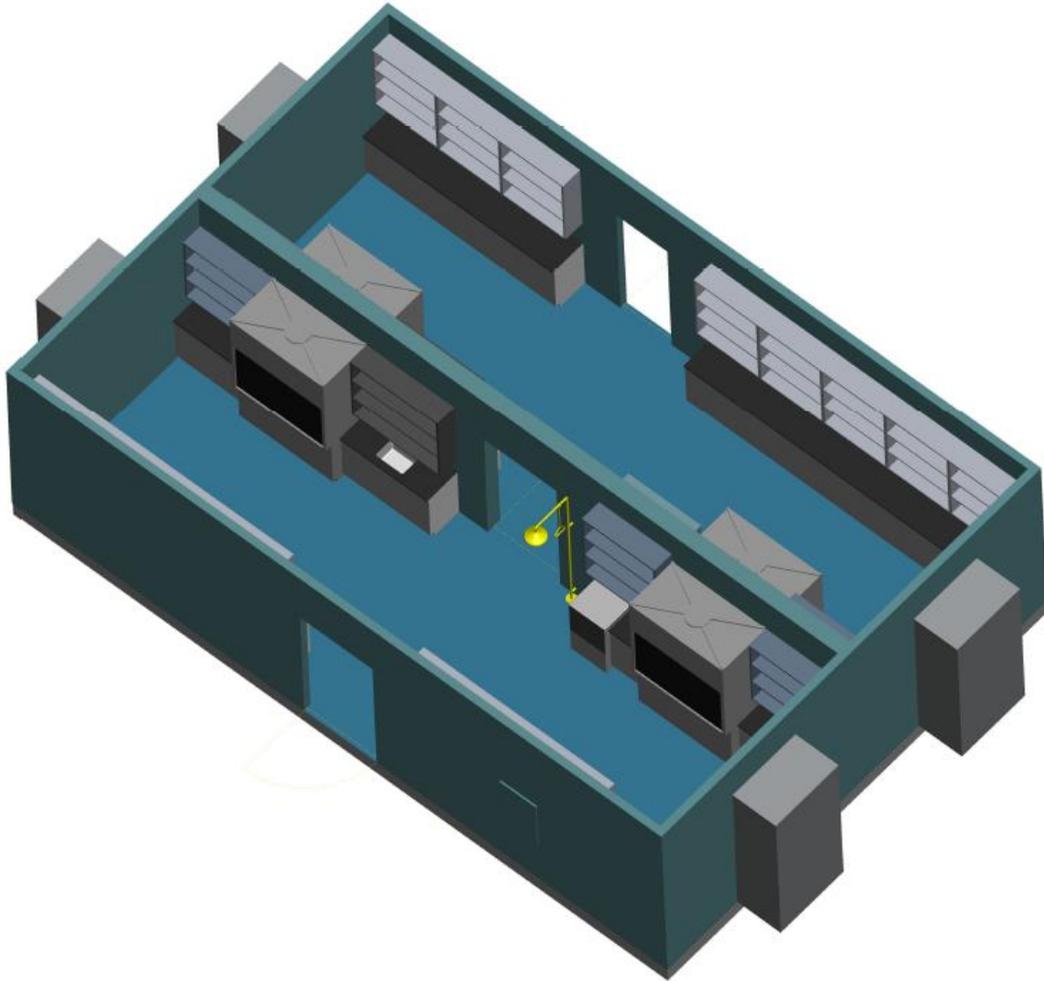
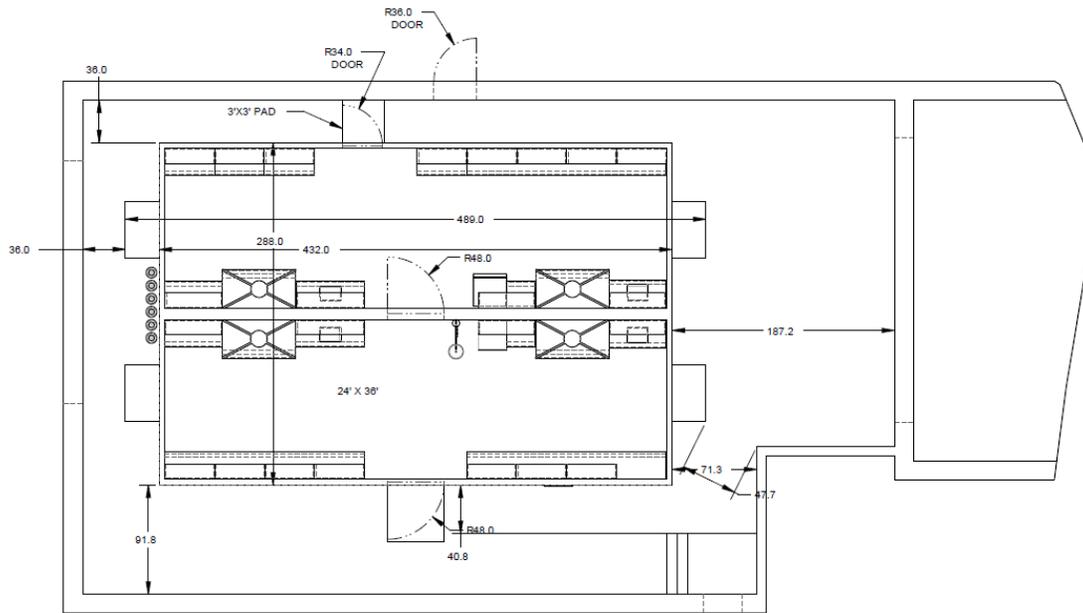


Figure 3. 3D rendering of proposed laboratory (opposite view from previous drawing)



NASA 1146 MODULAR LAB INSTALLATION

Figure 4. Schematic of laboratory located within Bldg. 1146 – note clearances required around exterior of building. Sizes of external HVAC units are estimated.

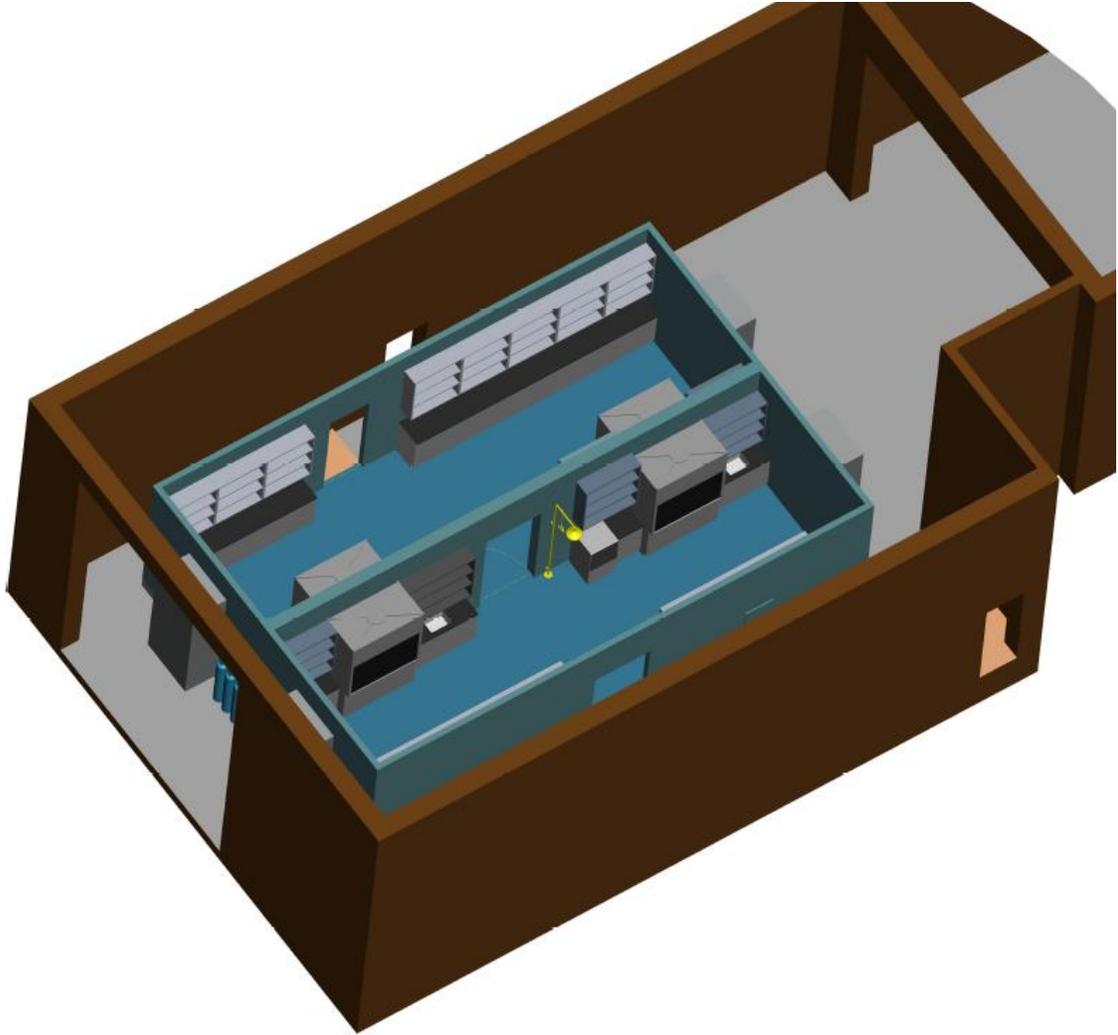
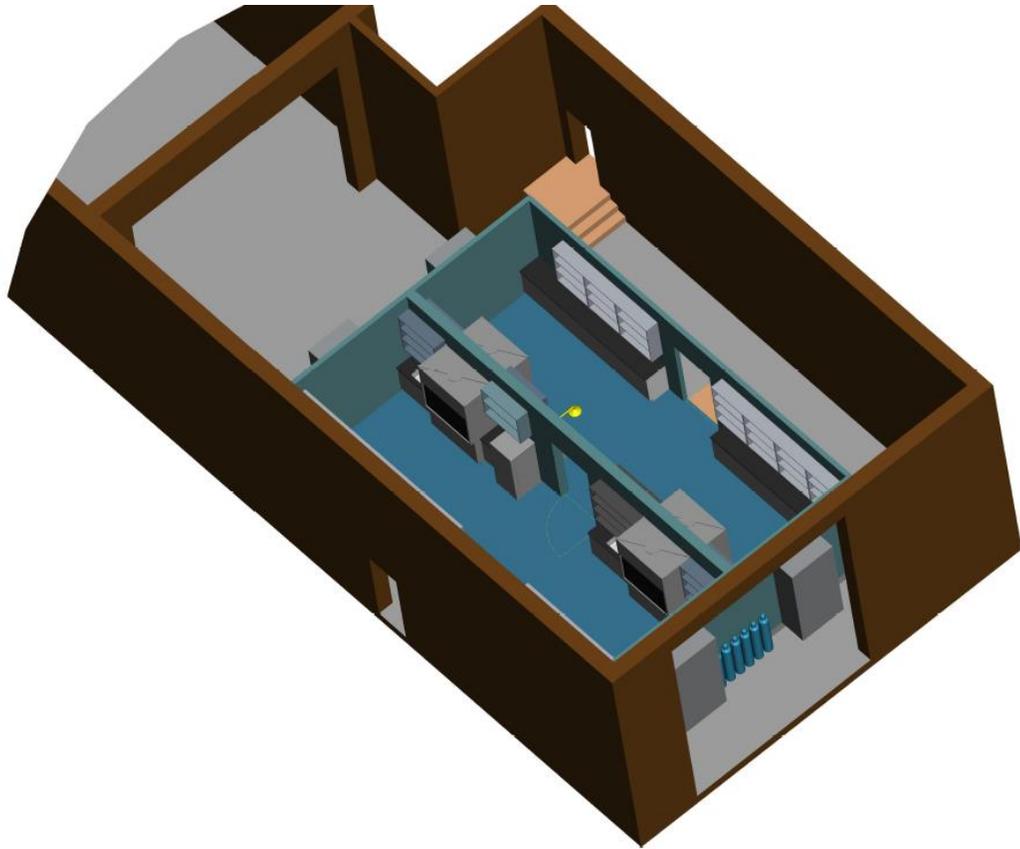


Figure 5. 3D rendering of laboratory located within Bldg. 1146



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Figure 6. 3D rendering of laboratory located within Bldg. 1146 (opposite view from previous drawing)

Utilities

Electrical power interface: single, 480V, 400A-service electrical panel mounted to end of building (Figure 1)

Electrical outlets (120V, single-phase and 208V, 3-phase) as per diagrams (Figure 1)

Gas lines (Argon and pressurized air) interface panel and supply lines from outside tank farm to interior connection points (Figure 1)

Water interface panel and supply lines from outside supply to fume hoods, sinks, refrigerator, ice maker, and emergency shower (Figure 1)

Accessories

Vendor to supply turnkey system including:

Water and gas shut-off valves.

Fume hood air flow monitoring capability. Flow meter to initiate local alarm should air flow stop.

Instruction/training manuals.

Training/support

Vendor shall:

Transport laboratory components to installation site

Supervise unloading of laboratory

Install interior and exterior mate line materials

Start up lab components and adjust as necessary

Provide necessary orientation and training to NASA personnel to ensure familiarity with operation of electrical and mechanical aspects of the lab

Other

Vendor shall provide a schematic with full 3D dimensions, brand names and model numbers of equipment (including HVAC(s), hoods, sinks, shelving) as part of proposal.