

1) Structural Requirements

- a. Is there a minimum floor load that is desirable for this project? If not, will a 60 lb. floor load be acceptable? **A 60 psf floor load is acceptable per ICC 1607.1.**
- b. Does the building need to be labeled by the state of Virginia as a modular building? **No.**
- c. Does NASA require the plans to be stamped by an architect? **Plans need to be stamped by a PE.**
- d. Is the modular building required to be installed in the facility in such a way that would limit horizontal movement should wind loads be applied (i.e. does the building need to be anchored to the concrete, or can it merely just sit on the concrete?) **The modular lab should be affixed to the concrete slab. The expectation is that the method will be supplied by the vendor and then NASA personnel will actually bolt it down under vendor supervision.**
- e. For structural engineering, details on the existing concrete slab will be needed. Are these available?

2) Architectural Requirements:

- a. Is there a min. roof slope required? **No. The labs are to be located within a high bay and a flat roof would be preferred.**
- b. Do the exterior doors to lab need to be lockable? If so, is there a required brand/type of the lock desired? **No.**
- c. What size is the door between the two sections? **48"**
- d. What are the height requirements of the doors? (80" or 84") **84"**
- e. Must this building conform to ADA or ANSI A117.1-2009 requirements per IBC 2012? If so, the secondary egress will need to be enlarged to 36" in width to accommodate wheel chairs. **The building does not need to conform to ADA or ANSI A117.1-2009 requirements.**
- f. Is the vendor required to supply entry/exit stairs or ramps? Note: A ramp will be needed for ingress/egress to comply with accessibility requirements. **No.**
- g. Are there any exterior lighting requirements? If so, what is the desired type and location of the fixtures? **There are no exterior lighting requirements.**
- h. Are there any requirements for the refrigerator or icemaker? **The refrigerator should be a standard explosion proof laboratory refrigerator with a minimum internal volume of 20 cu. ft. The icemaker should be a standard icemaker.**
- i. Concerning the 3'X3' pad indicated on page 6 of the specifications; is the pad provided by NASA or supplied by the Vendor? **It is NASA supplied and installed.**
- j. Are the "K" Bottles required to be secured from falling? If so, is the vendor required to provide a method to secure the bottles from falling? **The "K" bottled must be secured and the method is vendor supplied.**

3) Hazardous Materials

- a. Are there any hazardous materials stored or used in laboratory which is in excess of those quantities listed in IBC table 307.1(1) or 307.1(2)? **No.**
- b. What type and volume of chemicals are planned to be in the laboratory? **Flammables, corrosives, acids and bases.**
 - i. Where are they stored within the laboratory? **Chemicals will be stored either in flammable/corrosive cabinets under the hoods or on the shelves.**

4) Casework

- a. What is the desired work height for the countertop (i.e. standing height or sitting height) **36"**
- b. What is the desired material that the cabinets are constructed of? **The cabinets should be steel.**

- c. What is the desired material for the counter top? **Chemical resistant epoxy resin**
- d. Do the cabinets require locks? **No.**
- e. Are all of the cabinets required to be 42" wide? **No, 42" is a notional value.**
- f. The upper cabinets are depicted in the isometric drawings without doors (just shelves). Is that desired? **No. Upper cabinets should have sliding glass doors.**

5) Electrical

- a. To confirm, the Emergency Exit signs are being supplied by others. Vendor is required to supply a junction box and conduit. **That is correct.**
- b. Please define requirements for "Fire Alarm at Door." **Conduit and junction box for fire alarm pull stations should be installed next to each external door.**
- c. On sheet 3, under the right Fume Hood, what is meant by "1X 110 VAC6X 110V Outlet"? Should it read like the others "6X 110V Outlet". **Yes.**
- d. In what locations should the outlets be installed? **Outlets should be installed on wall in general area specified on drawing.**
- e. Is an electrical plan available? **Vendor to supply modular lab electrical plan.**
- f. Is the power panel required to be flush mounted or surface mounted? **Either is acceptable.**

6) Plumbing

- a. The specifications require no floor drains, but an emergency shower is shown on the plans. Where is the water being drained/diverted to? **This is a NASA environmental specification. In the event of an emergency, appropriate personnel would remove the water.**
- b. What brand/model of emergency shower is desired? **Standard laboratory emergency safety shower. Brand/model not specified.**
 - i. Would NASA like the emergency shower to have an eye wash station? **No. Eyewashes are to be located at sinks.**
- c. What types of fittings are required at termination point of the Argon Lines? **Shut off valves with hose bibs.**
- d. Where in relation to the building is the existing fresh water connection? **Fresh water connection is located near the bottom right corner of lab as indicated in Figure 1.**
- e. Where in relation to the build is the sewer connection? **Sewer connection at same location.**
- f. The International Plumbing Codes required a 10' (ten foot) separation between supply and waste connections. Is that going to cause an issue during installation? **NASA is responsible for water/sewer connections.**

7) HVAC, Ventilation, and Fume Hoods

- a. Make-Up Air Unit / AC
 - i. Are the details depicting wall mounted "Baird" units? Are these intended to provide both conditioned air as well as make-up air or is a separate make up air unit required in addition to the four "Baird" units. **Those are notional units. Vendor will determine the HVAC requirements to maintain specified temperature and humidity.**
 - ii. It seems that 4 Baird units is rather excessive for 768 square feet. What is the justification for installing 4 units? **See above.**
 - iii. Are the four units controlled independently of each other or are they tied together? **That would be up to the vendor, but it would seem that tying them together would be preferable.**
- b. Fume hood
 - i. Is the requirement for the Fume Hood to be freestanding or bench top? **Bench top with flammable and corrosive storage cabinets located underneath.**
 - ii. If the Fume Hood required to be ducted or ductless? **Ducted.**

1. Where is the fume hood exhaust being discharged to?
 - a. Is the exhaust being discharged to the outside of the modular laboratory (inside building 1146?) or must it discharge outside building 1146? **Outside building 1146.**
 - b. If the exhaust must discharge outside building 1146 who is responsible for those connections? **NASA**
2. Must the discharge air need to be filtered? **No.**
- iii. What is the desired construction of the fume hood (metal or plastic)? **See HS Safeaire II as a representative style of fume hood.**

8) Vacuum System

- a. What type of vacuum system is required? Can NASA provide information about the type and configuration of the system? **The vacuum system is to be an on demand local area system supplied by a central corrosion resistant vacuum pump that is located external to the modular laboratory. Each work station (one in each hood and 2 on bench areas as specified) is to have a flow control valve combined with a shutoff valve for regulating the supplied vacuum. All valves, tubing and connectors should be corrosion resistant. System should be capable of pulling 30 inHg at each work station.**

9) General

- a. Does the vendor need to be a licensed general contractor in the State of Virginia? **No.**
- b. Does the vendor need to provide stamped Architectural, Structural, Electrical, Mechanical, and Plumbing drawings? **Yes.**
- c. Who is actually responsible for connecting the laboratory to electrical power, water supply, and waste water? **NASA.**