

Laboratory Design Sampling

QA Lab Design

Complete engineering and detailed design was provided for a Quality Assurance Lab including:

Architectural Services

- Develop lab layout — benches, fume hoods, major free-standing equipment, flammable storage room, gas bottle storage room, wash-up area
- Fire separation details
- Gas bottle storage fixtures
- Lab bench and fume hood specifications

Mechanical Services

- HVAC design and specification — including general lab ventilation, fume hood exhaust, storage cabinet exhaust, exhaust for cylinder storage. Overall lab to be a lower pressure than adjacent hallways and rooms.
- Mechanical services design and specification — including hot and cold city water, specialty gases distribution [H₂, He and Air], natural gas distribution, sink drainage including fume hood cup sinks, trap priming, grease and glass interceptor to tie point in hallway.

Electrical Services

- Lighting
- Power distribution to lab bench pedestal outlets and wall-mounted wiremold chase
- Power services to lab equipment
- Data cable distribution and outlet locations, including adjacent lab offices
- Sensors, detectors and alarms as required by applicable codes for flammables or asphyxiants



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Formulation Development Laboratory HVAC Upgrade

The FD Lab HVAC upgrade work included incorporation of HEPA filters, increase of the corridor and air locks operating pressure, air balancing of the system after upgrading and incorporation of a new corridor air lock.

A preliminary assessment based on the balancing showed there was just enough air to service the laboratory and almost none to pressurize the corridor areas. To achieve the objectives, JNE proposed a two-phase approach to the project. The first phase identified the HVAC upgrade and specified the required equipment. The second phase prepared a design and bid package complete with drawings suitable for pricing by contractors.

JNE examined the overall capacity of the existing AHU and available space within the plant room with a view to understanding the current loading for the proposed system upgrading. The work included preparing fabrication and installation specifications for ductwork complete with additional terminal devices and piping and electrical design drawings for the equipment installation. Controls for operating the revised HVAC equipment were also evaluated and specified.

Hazardous Operations (HazOp) Study

A HazOp study was performed for a pharmaceutical expansion including a new analytical laboratory and support facilities plus other areas as follows:

- Analytical laboratory
- Walk-in fume hood (in the lab)
- Gas cylinder storage room
- Underground waste solvent tank
- Underground waste drug tank
- Emergency generator
- Inergen fire suppression system and secure document room
- Domestic hot water & cold water systems

The lab was to be used to perform a variety of analytical tests, predominantly high pressure liquid chromatography (HPLC), as well as gas chromatography (GC). As with any typical laboratory, a variety of solvents (of which some are flammable and combustible liquids) and other chemicals (including acids and bases) would be stored and handled there.