

## **Design Criteria: Experimental Floor/Access Corridor/Ring Mezzanine:**

### **Size:**

- Room: 2559' (780m) (L) x 56'-0"(W) x TBD(H).
- Doors: exterior man access doors and overhead rolling doors

### **Structural Data:**

- Floor loading: 250 psf, 12" to 18" thick
- Vibration Limits: VC-E

### **Finishes:**

- Walls: Gypsum Bd.
- Floor: Concrete
- Ceiling: Exposed Steel

### **Environmental:**

#### Acoustical treatment:

- Design Noise level: NC 60-65 Sound absorbent material in rafters.
- Temperature (max/min): 75 F ± 5 degree F
- Humidity (max/min): 50% (± 10%)
- Room Pressure: no requirement
- Air changes/Hr: TBD

### **Special Requirements:**

- EMI/ELF Magnetic Field shielding: Sensitivity to AC fields. Local shielding if required

### **Electrical:**

- Footcandles: 50 fc at task
- Light Type: Fluorescent or metal halide
- 120V Convenience outlets
- 208V /220V (1-3 phase): yes
- Clean power: No power conditioning required
- Grounding: special
- 75 – 95 kVA per sector, dedicated panel(s) per beamline
- 3000 – 3500 kW total demand
- Emergency Power: cold boxes, critical systems
- UPS: central UPS for control room. Other applications will be user provided

### **Telecommunication and special systems:**

- Voice connection: **Y**
- Data connection: **Y**
- Card access control: **Y**

### **Specialty Gases:**

- Nitrogen **Y**
- Liquid Nitrogen **Y**
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### **Process Piping:**

- DI Water **N**
- Compressed Air **Y**

## Design Criteria: Ring Tunnel:

### Size:

- Room: 2559' (780m) (L) x 9'-8" (W) x 9'-0" (H).
- Doors: exterior man access doors and overhead rolling doors (Approx. 500' O.C.)

### Structural Data:

- Floor loading: 250 psf, 12" to 18" thick
- Vibration Limits: 4 to 50 hz25 nm.

### Finishes:

- Walls: Concrete
- Floor: Concrete
- Ceiling: Concrete @ 9'-0"(2.75m)

### Environmental:

Acoustical treatment:

- Design Noise level: NA
- Temperature (max/min): 78 F ± 0.18 degree F (.1 degree C)
- Humidity (max/min): 50% ± 10%
- Room Pressure: no requirement
- Air changes/Hr: 6 per hour

### Special Requirements:

- EMI/ELF Magnetic Field shielding: Local shielding if required

### Electrical:

- Footcandles: 15 - 30 fc
- Light Type: Fluorescent impact resistant
- 120V Convenience outlets
- 208V /220V (1-3 phase): yes
- Clean power: No power conditioning required
- Grounding: special
- 4000 – 4500 kW total demand
- Emergency Power: compressors
- UPS: user provided
- Radiation: minimize penetrations, provide off-sets within the penetration

### Telecommunication and special systems:

- Voice connection: **Y**
- Data connection: **Y**
- Card access control: **Y**

### Sprinklers:

BNL normal design is wet design.

### Process Piping:

- DI Water **N**
- Clean Compressed Air **TBD**

### Specialty Gases:

- Nitrogen **TBD**
- Liquid Nitrogen **maybe**

## Design Criteria: Chemical Laboratory:

### Size:

- Room: 20' (L) x 24' (W) x 10'-0" to 12'-0"(H).
- Doors: (1) double door to the access corridor and (1) single door to LOB

### Structural Data:

- Floor loading: 125 psf, 6"thick
- Vibration Limits: 4 to 50 hz, 25nm

### Finishes:

- Walls: Gypsum Board
- Floor: Gypsum Board
- Ceiling: Acoustical Ceiling Grid

### Environmental:

Acoustical treatment:

- Design Noise level: NC 45-50
- Temperature (max/min): 75 F  $\pm$  5 degree F
- Humidity (max/min): 50%  $\pm$  10%
- Room Pressure: negative
- Air changes/Hr: 10 per hour

### Special Requirements:

- EMI/ELF Magnetic Field shielding: Local shielding if required

### Electrical:

- Footcandles: 50 - 75 fc
- Light Type: Fluorescent
- 120V Convenience outlets
- 208V /220V (1-3 phase): yes
- Clean power: No power conditioning required
- Grounding: single point ground
- Emergency Power: none
- UPS: user provided

### Telecommunication and special systems:

- Voice connection: **Y**
- Data connection: **Y**
- Card access control: **Y**

### Sprinklers:

BNL normal design is wet design.

### Process Piping:

- DI Water **Y**
- Clean Compressed Air **Y**

### Specialty Gases:

- Nitrogen **Y**
- Liquid Nitrogen **maybe**

### Other:

- HEPA Filtered Fume Hood Required
- Typical Laboratory Cabinetry Required
- Sink Required

# Design Criteria: Biology Laboratory:

## Size:

- Room: 20' (L) x 24' (W) x 10'-0" to 12'-0"(H).
- Doors: (1) double door to the access corridor and (1) single door to LOB

## Structural Data:

- Floor loading: 125 psf, 6"thick
- Vibration Limits: 4 to 50 hz, 25nm

## Finishes:

- Walls: Gypsum Board
- Floor: Gypsum Board
- Ceiling: Acoustical Ceiling Grid

## Environmental:

Acoustical treatment:

- Design Noise level: NC 45-50
- Temperature (max/min): 75 F ± 5 degree F
- Humidity (max/min): 50% ± 10%
- Room Pressure: negative
- Air changes/Hr: 10 per hour

## Special Requirements:

- EMI/ELF Magnetic Field shielding: Local shielding if required

## Electrical:

- Footcandles: 50 - 75 fc
- Light Type: Fluorescent
- 120V Convenience outlets
- 208V /220V (1-3 phase): yes
- Clean power: No power conditioning required
- Grounding: single point ground
- Emergency Power: none
- UPS: user provided

## Telecommunication and special systems:

- Voice connection: **Y**
- Data connection: **Y**
- Card access control: **Y**

## Sprinklers:

BNL normal design is wet design.

## Process Piping:

- DI Water **Y**
- Clean Compressed Air **Y**

## Specialty Gases:

- Nitrogen **Y**
- Liquid Nitrogen **maybe**

## Other:

- HEPA Filtered Fume Hood Required
- Typical Laboratory Cabinetry Required
- Sink Required

## Design Criteria: Electronics Laboratory:

### Size:

- Room: 20' (L) x 24' (W) x 10'-0" to 12'-0"(H).
- Doors: (1) double door to the access corridor and (1) single door to LOB

### Structural Data:

- Floor loading: 125 psf, 6"thick
- Vibration Limits: 4 to 50 hz, 25nm

### Finishes:

- Walls: Gypsum Board
- Floor: Gypsum Board
- Ceiling: Acoustical Ceiling Grid

### Environmental:

Acoustical treatment:

- Design Noise level: NC 45-50
- Temperature (max/min): 75 F ± 5 degree F
- Humidity (max/min): 50% ± 10%
- Room Pressure: no requirement
- Air changes/Hr: 10 per hour

### Special Requirements:

- EMI/ELF Magnetic Field shielding: Local shielding if required

### Electrical:

- Footcandles: 50 - 75 fc
- Light Type: Fluorescent
- 120V Convenience outlets
- 208V /220V (1-3 phase): yes
- Clean power: No power conditioning required
- Grounding: single point ground
- Emergency Power: none
- UPS: user provided

### Telecommunication and special systems:

- Voice connection: **Y**
- Data connection: **Y**
- Card access control: **Y**

### Sprinklers:

BNL normal design is wet design.

### Process Piping:

- DI Water **Y**
- Clean Compressed Air **Y**

### Specialty Gases:

- Nitrogen **Y**
- Liquid Nitrogen **maybe**

### Other:

- No Fume Hood Required
- Typical Laboratory Cabinetry Required

## Design Criteria: Assembly Laboratory:

### Size:

- Room: 20' (L) x 24' (W) x 10'-0" to 12'-0"(H).
- Doors: (1) double door to the access corridor and (1) single door to LOB

### Structural Data:

- Floor loading: 125 psf, 6"thick
- Vibration Limits: 4 to 50 hz, 20 to 30nm, 20nm for water in pipes.

### Finishes:

- Walls: Gypsum Board
- Floor: Gypsum Board
- Ceiling: Acoustical Ceiling Grid

### Environmental:

Acoustical treatment:

- Design Noise level: NC 45-50
- Temperature (max/min): 75 F  $\pm$  5 degree F
- Humidity (max/min): 50%  $\pm$  10%
- Room Pressure: no requirement
- Air changes/Hr: 10 per hour

### Special Requirements:

- EMI/ELF Magnetic Field shielding: Local shielding if required

### Electrical:

- Footcandles: 50 - 75 fc
- Light Type: Fluorescent
- 120V Convenience outlets
- 208V /220V (1-3 phase): yes
- Clean power: No power conditioning required
- Grounding: single point ground
- Emergency Power: none
- UPS: user provided

### Telecommunication and special systems:

- Voice connection: **Y**
- Data connection: **Y**
- Card access control: **Y**

### Sprinklers:

BNL normal design is wet design.

### Process Piping:

- DI Water **Y**
- Clean Compressed Air **Y**

### Specialty Gases:

- Nitrogen **Y**
- Liquid Nitrogen **maybe**

### Other:

- No Fume Hood Required
- Typical Laboratory Cabinetry Required

## Design Criteria: Sample Characterization Laboratory:

### Size:

- Room: 20' (L) x 24' (W) x 10'-0" to 12'-0"(H).
- Doors: (1) double door to the access corridor and (1) single door to LOB

### Structural Data:

- Floor loading: 125 psf, 6"thick
- Vibration Limits: 4 to 50 hz, 25nm

### Finishes:

- Walls: Gypsum Board
- Floor: Gypsum Board
- Ceiling: Acoustical Ceiling Grid

### Environmental:

Acoustical treatment:

- Design Noise level: NC 45-50
- Temperature (max/min): 75 F  $\pm$  5 degree F
- Humidity (max/min): 50%  $\pm$  10%
- Room Pressure: no requirement
- Air changes/Hr: 10 per hour

### Special Requirements:

- EMI/ELF Magnetic Field shielding: Local shielding if required

### Electrical:

- Footcandles: 50 - 75 fc
- Light Type: Fluorescent
- 120V Convenience outlets
- 208V /220V (1-3 phase): yes
- Clean power: No power conditioning required
- Grounding: single point ground
- Emergency Power: none
- UPS: user provided

### Telecommunication and special systems:

- Voice connection: **Y**
- Data connection: **Y**
- Card access control: **Y**

### Sprinklers:

BNL normal design is wet design.

### Process Piping:

- DI Water **Y**
- Clean Compressed Air **Y**

### Specialty Gases:

- Nitrogen **Y**
- Liquid Nitrogen **maybe**

### Other:

- No Fume Hood Required
- Typical Laboratory Cabinetry Required

# Design Criteria: Metrology Laboratory:

## Size:

- Room: 20' (L) x 24' (W) x 10'-0" to 12'-0"(H).
- Doors: (1) double door to the access corridor and (1) single door to LOB

## Structural Data:

- Floor loading: 125 psf, 6"thick
- Vibration Limits: 4 to 50 hz, 20 to 30nm, 20nm for water in pipes.

## Finishes:

- Walls: Gypsum Board
- Floor: Gypsum Board
- Ceiling: Acoustical Ceiling Grid

## Environmental:

Acoustical treatment:

- Design Noise level: NC 45-50
- Temperature (max/min): 75 F ± 5 degree F
- Humidity (max/min): 50% ± 10%
- Room Pressure: no requirement
- Air changes/Hr: 1 to 2 per hour

## Special Requirements:

- EMI/ELF Magnetic Field shielding: Local shielding if required

## Electrical:

- Footcandles: 50 - 75 fc
- Light Type: Fluorescent
- 120V Convenience outlets
- 208V /220V (1-3 phase): yes
- Clean power: No power conditioning required
- Grounding: single point ground
- Emergency Power: none
- UPS: user provided

## Telecommunication and special systems:

- Voice connection: **Y**
- Data connection: **Y**
- Card access control: **Y**

## Sprinklers:

BNL normal design is wet design.

## Process Piping:

- DI Water **Y**
- Clean Compressed Air **Y**

## Specialty Gases:

- Nitrogen **Y**
- Liquid Nitrogen **maybe**

## Other:

- No Fume Hood Required
- Typical Laboratory Cabinetry Required



## Design Criteria: X-Ray Source/Crystal Polishing Laboratory:

### Size:

- Room: 20' (L) x 24' (W) x 10'-0" to 12'-0"(H).
- Doors: (1) double door to the access corridor and (1) single door to LOB

### Structural Data:

- Floor loading: 125 psf, 6"thick
- Vibration Limits: 4 to 50 hz, 25nm

### Finishes:

- Walls: Gypsum Board
- Floor: Gypsum Board
- Ceiling: Acoustical Ceiling Grid

### Environmental:

Acoustical treatment:

- Design Noise level: NC 45-50
- Temperature (max/min): 75 F ± 5 degree F
- Humidity (max/min): 50% ± 10%
- Room Pressure: no requirement
- Air changes/Hr: 10 per hour

### Special Requirements:

- EMI/ELF Magnetic Field shielding: Local shielding if required

### Electrical:

- Footcandles: 50 - 75 fc
- Light Type: Fluorescent
- 120V Convenience outlets
- 208V /220V (1-3 phase): yes
- Clean power: No power conditioning required
- Grounding: single point ground
- Emergency Power: none
- UPS: user provided

### Telecommunication and special systems:

- Voice connection: **Y**
- Data connection: **Y**
- Card access control: **Y**

### Sprinklers:

BNL normal design is wet design.

### Process Piping:

- DI Water **Y**
- Clean Compressed Air **Y**

### Specialty Gases:

- Nitrogen **Y**
- Liquid Nitrogen **maybe**

### Other:

- Fume Hood Required
- Typical Laboratory Cabinetry Required

# Design Criteria: Ultra High Vacuum Laboratory:

**Size:**

- Room: 20' (L) x 24' (W) x 10'-0" to 12'-0"(H).
- Doors: (1) double door to the access corridor and (1) single door to LOB

**Structural Data:**

- Floor loading: 125 psf, 6"thick
- Vibration Limits: 4 to 50 hz, 25nm

**Finishes:**

- Walls: Gypsum Board
- Floor: Gypsum Board
- Ceiling: Acoustical Ceiling Grid

**Environmental:**

Acoustical treatment:

- Design Noise level: NC 45-50
- Temperature (max/min): 75 F ±5 degree F
- Humidity (max/min): 50% ± 10%
- Room Pressure: no requirement
- Air changes/Hr: 10 per hour

**Special Requirements:**

- EMI/ELF Magnetic Field shielding: Local shielding if required

**Electrical:**

- Footcandles: 50 - 75 fc
- Light Type: Fluorescent
- 120V Convenience outlets
- 208V /220V (1-3 phase): yes
- Clean power: No power conditioning required
- Grounding: single point ground
- Emergency Power: none
- UPS: user provided

**Telecommunication and special systems:**

- Voice connection: **Y**
- Data connection: **Y**
- Card access control: **Y**

**Sprinklers:**

BNL normal design is wet design.

**Process Piping:**

- DI Water **Y**
- Clean Compressed Air **Y**

**Specialty Gases:**

- Nitrogen **Y**
- Liquid Nitrogen **maybe**

**Other;**

- Fume Hood Required
- Typical Laboratory Cabinetry Required