UNIVERSITY of CALIFORNIA Riverside

ENVIRONMENTAL HEALTH & SAFETY EXPANSION

DETAILED PROJECT PROGRAM

OCTOBER 2004

B A U E R A N D W I L E Y

A R C H I T E C T S

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Signature Approval

Introduction

The document herein is a Detailed Project Program (DPP) for the UCR Environmental Health and Safety Building. BAUER AND WILEY Architects, the DPP Consultant, commenced work on the DPP in February, 2004 and completed this DPP in June, 2004.

The process of developing the DPP was directed by the Office of Academic Planning and Budget - Capital and Physical Planning with input and collaboration with the Project Management Team (PMT) and the Environmental Health and Safety (EH&S) staff through a series of interviews, worksessions, and presentation reviews. The team also received input from the UCR Design Review Board (DRB) that has been incorporated into the body of the study. At the beginning of the process, the PMT visited the EH&S facilities at the University of California, Irvine (UCI) and the University of California, San Diego (UCSD) as relevant benchmarks in preparation for the small group worksessions where the bulk of the programming was developed.

The DPP includes: an executive summary; a program for the proposed new building; site analysis observations; the preferred conceptual plan and massing; building systems criteria that make recommendations for each of the major building systems to support the proposed scheme; a budget and schedule for the implementation of the project; an outline of the US Green Building Council Leadership in Energy and Environmental Design (LEED™) Strategies and an Appendix that compiles all of the pertinent background and reference materials related to the study, including detailed meeting minutes.

Acknowledgements

No programming effort can be undertaken without a team of dedicated and involved participants. The clear objectives and active guidance from the Project Management Team are the foundation upon which the program is based. The thoughtful interchanges and dialogs between the college and the design team members have contributed to the fabric and concepts which when realized will form the new facility. To all the participants we simply say 'thank you' for your time and interest in helping realize this significant new facility.

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Table of Contents

Overview

This Detailed Project Program documents recommendations supporting a new 30,500 gross square feet (GSF) Environmental Health and Safety facility located on a site at the northeast corner of the campus. The new EH&S facility replaces an existing facility that was occupied in 1989. The existing facility site is undersized and severely impacted by the Calstrans expansion plans along the I-215/SR-60 right-of-way.

Background

The 1,112-acre UC Riverside campus is located three miles east of downtown Riverside, California and is bisected by the I-215/SR-60 freeway. The 600.8-acre portion of the campus east of the freeway includes the academic core, within which is located most of the existing instructional and research facilities. UCR is currently experiencing a growth cycle, with a current enrollment of approximately 14,200 full time equivalent (FTE) in 2002-03 that is expected to increase to 20,320 FTE by 2010-11.

UCR is currently updating its Long Range Development Plan (LRDP). The Draft 2004 LRDP update contemplates the increase of academic programs in the sciences that, in time, will impact the capacity of the existing Environmental Health & Safety facility in the functional areas of industrial hygiene, materials handling, training programs and administration.

Environmental Health & Safety Vision

The EH&S stated vision is to enhance the research and educational process by fully integrating the continuous improvement of health, safety and environmental (HSE) performance into our culture, work practices and all campus activities.

Environmental Health & Safety Mission

The EH&S stated mission is to provide leadership and outstanding services so that the risk of injury, illness, environmental damage and losses to the campus community and its neighbors is continuously reduced.

Objectives

The new EH&S facility provides a long-term, consolidated campus facility for all EH&S functions including Administration, Safety, Training and Hazardous Materials Assessment, Mitigation and Storage. The new facility seeks to enhance and facilitate, for generations to come, the critical services EH&S provides to the research, training and administration community at UCR. The building itself will be a model of environmental sustainability.

Site

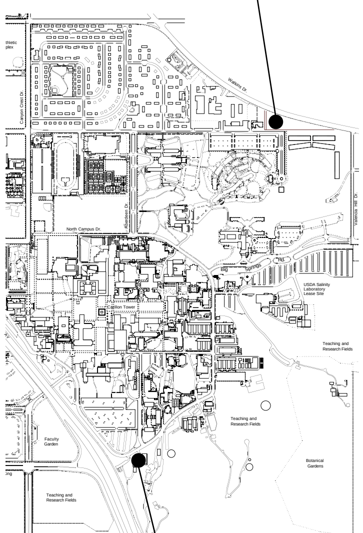
Existing Facility / Site

The existing EH&S facility is located in the south-central area of the Campus. Occupied in 1989, the 6,763 ASF / 8,566 GSF facility includes a main building, modular trailer offices and numerous storage containers. The site itself is 117,612 sf or 2.7 acres of hilly terrain immediately adjacent to the I-215/SR-60 freeway. An expanded freeway alignment will bring the freeway adjacent to the current EH&S service yard and modular office area. The site is accessed from South Campus drive via a steeply sloping, narrow driveway which limits large truck maneuverability, loading and unloading. There is extremely limited buildable site area for any expansion due to the surrounding topography. The current facility is significantly under-sized for the current demand and regulated practices and is inappropriate for renovation or expansion. Also, the intent to maintain operations during construction would pose a considerable obstacle.

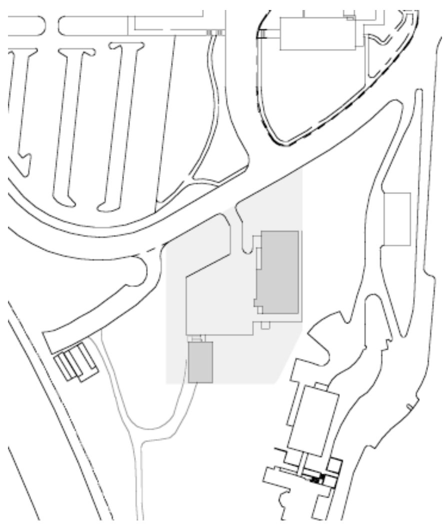
Proposed Site

The proposed site is located adjacent to the Corporate Yard and the TAPS (Transportation and Parking Services) facility in the northeast corner of the campus between Linden Street and Watkins Drive. This location provides both direct access from the campus for campus pedestrians and vehicles, as well as direct access from a public roadway for commercial waste handlers and vendors (Watkins Drive). While the triangular shape is not ideal, the site is sufficiently sized for the planned use. The eastern portion of the site is the least suited for a building due to the limited site width and its distance from the internal campus streets; this was a major factor in locating the building on the site.

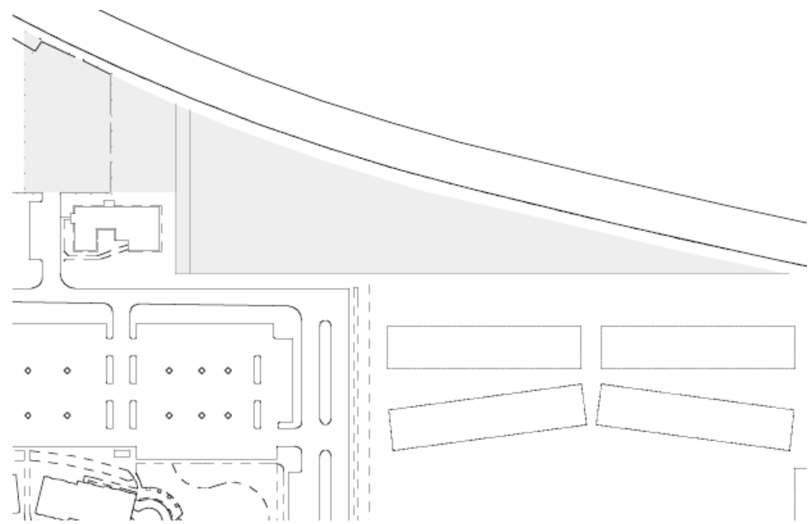
proposed EH&S site



existing EH&S site



Existing Site



Proposed Site

Program Summary

The new EH&S facility is composed of four types of space: office/administrative; training; laboratory; and materials handling. In addition, outside yard areas house specialized storage containers and secure, materials handling access.

The 30,089 GSF building includes 6,498 assignable square footage (ASF) of administrative/office space; 1,975 ASF for the safety learning center; 1,271 ASF of laboratories; and 8,221 ASF of materials handling for chemical, radiation, biomedical and universal waste.

	PROGRAM SUMMARY BY SPACE TYPE	
1	ADMINISTRATION	6,498
2	SAFETY LEARNING CENTER	1,975
3	LABORATORIES	1,271
4	MATERIALS HANDLING	8,221
	TOTAL ASSIGNABLE AREA (ASF)	**17,964**
	TOTAL OUTSIDE GROSS AREA (GSF)	**30,089**
	EFFICIENCY FACTOR	60%

Planning Summary

The proposed EH&S facility is planned as a two level building extending east to west across the selected site. The high-bay, one-story Materials Handling portion is to the west. The two-story portion is comprised of laboratories, training components and a main building lobby on the first floor with the administrative areas above. The primary campus access for pedestrians/ visitors is from the south along Linden Street to the main building entry. Primary vendor/service access is from the north, off Watkins and through the existing TAPS yard into a secure EH&S yard.

The main building entry is at the intersection of Linden Street and Pentland Way into a controlled lobby. From the lobby, controlled access is gained to the *Safety Learning Center*, Administrative functions and Laboratories with additional control provided for access to the Materials Handling areas of the facility to the west. The building is organized around a circulation path that runs east/west.

Site access to the yard area is through a new drive into the TAPS yard off of Watkins Drive to the north for all vendor traffic. 'Authorized vehicle only' access (for EH&S employees) to the yard is from the campus off of Linden Street and through the TAPS yard. The EH&S yard gate leads to a controlled dock area serving the materials handling area and to site storage containers and parking spaces.

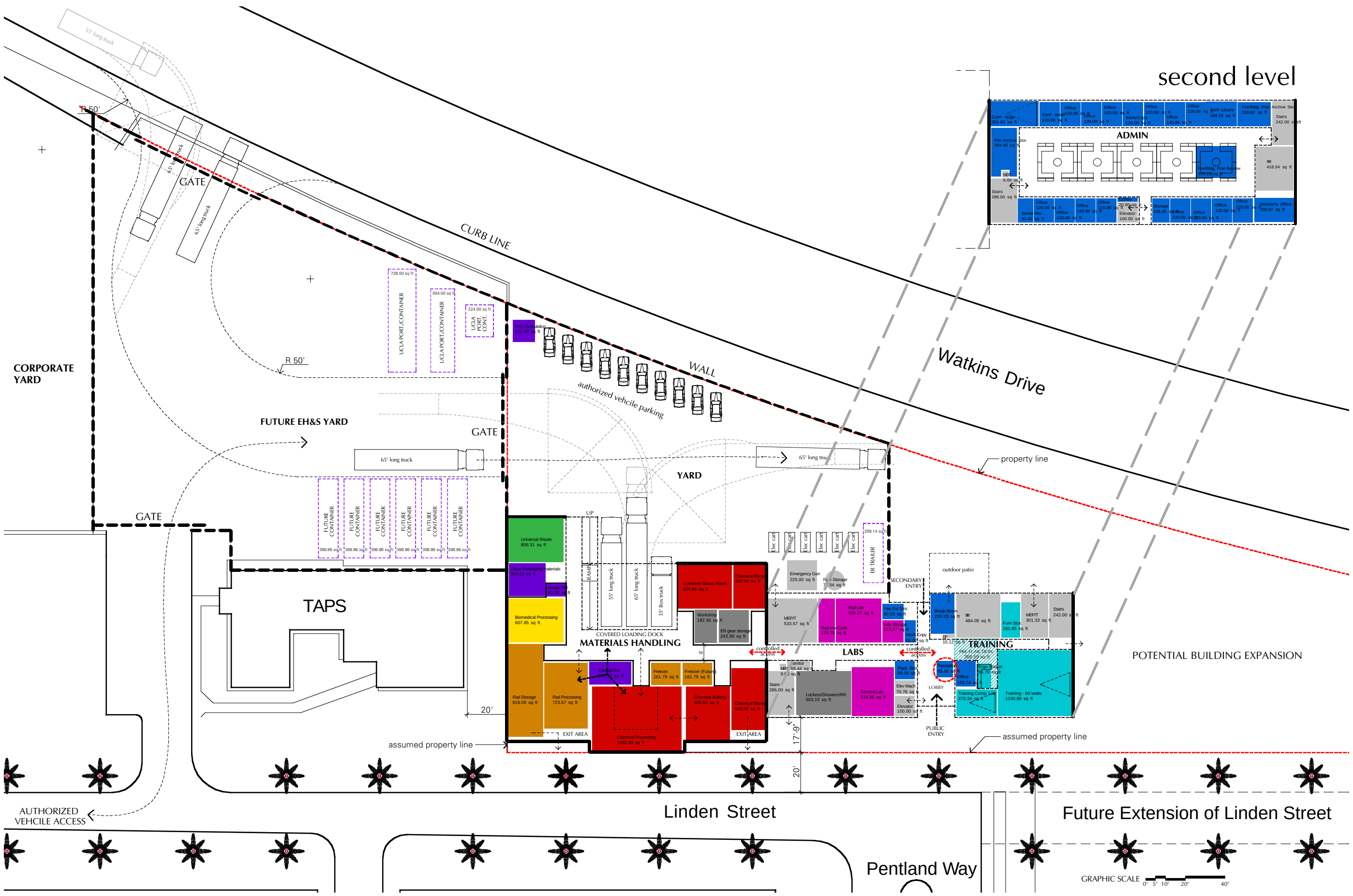
The eastern portion of the site is the least suited for a building due to the limited site width and its remote distance from the internal campus streets. This was a major factor in locating the building on the western portion of the site to allow for shared access and storage in the TAPS yard and to allow for a public entry along Linden. Additionally, this doesn't place any building or yard (potentially only a parking lot) directly north of the proposed Arroyo Housing project which will create the least negative visual impact as seen from the different floors of the housing.

Planning premises include:

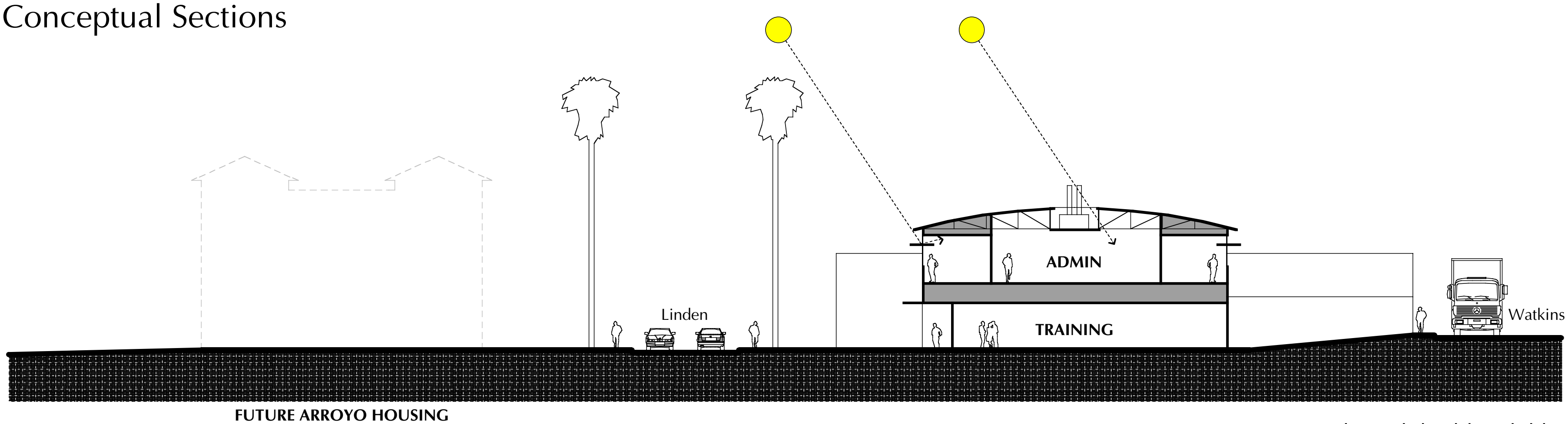
- Organize the building with the materials handling and yard to the west to make use of the TAPS yard for access and future storage, while locating the administrative/training/labs spaces to the east.
- Create a clear building entry point that controls access to the different areas of the facility. Locate the public spaces at the entry/lobby with controlled access to the rest of the building from this point.
- Locate the main building entry on the south, at the intersection of Linden Street and Pentland Way, to serve as a 'front door' to the campus with a secondary entry from the north.
- Clearly define (architecturally and programmatically) the different components of the building (administrative, training, labs, materials handling) to allow for simple and cost effective strategies for building systems (heating, cooling, security, lighting, emergency power, etc.) and code requirements.
- Orient the building along an east/west axis, utilizing the north and south exposures for daylight and making the east and west exposures solid to mitigate heat gain.
- To place the building on the site to allow for future expansion of the EH&S facility.

Conceptual Plan

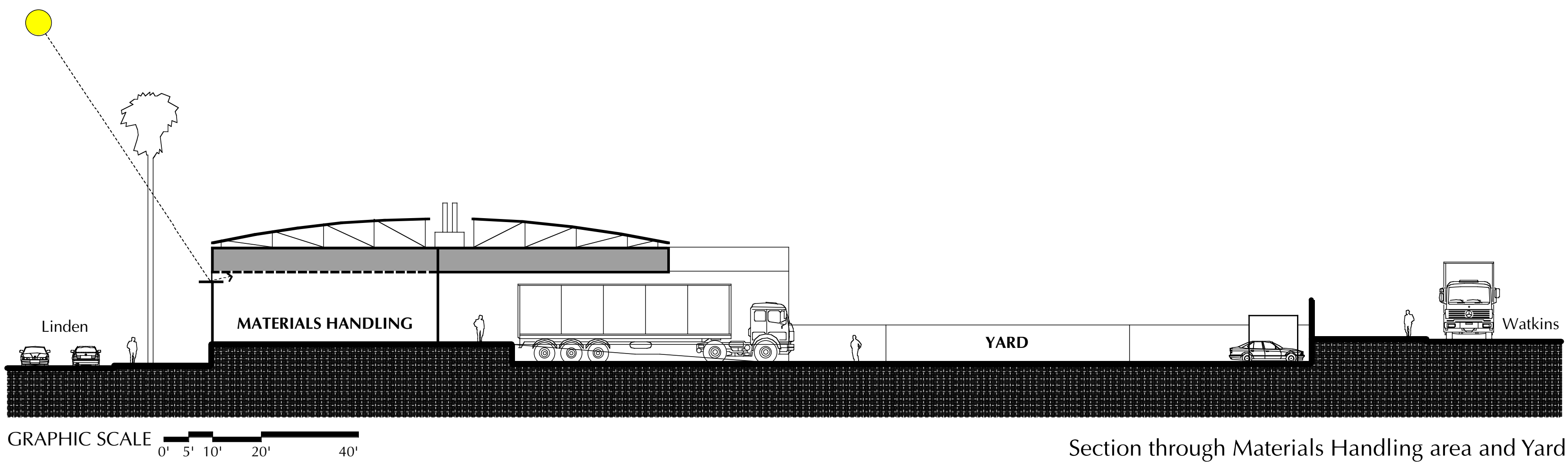
This represents the preferred planning scheme. Each area (administrative, training, labs, materials handling) is shown independently and larger in the *Conceptual Plan* section later in this document.



Conceptual Sections



Section through building lobby



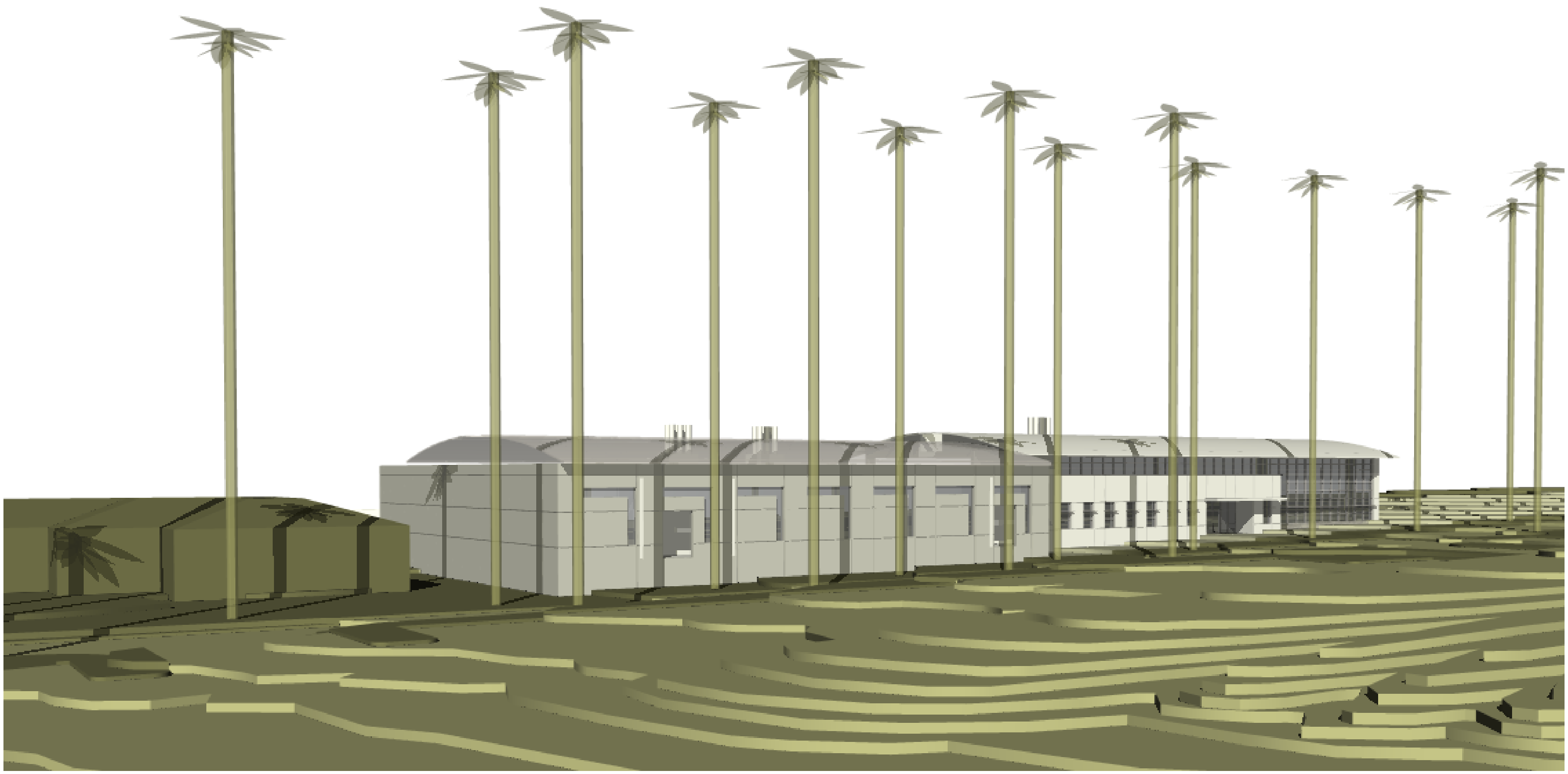
Section through Materials Handling area and Yard

Conceptual Massing

Axonometric view from southeast

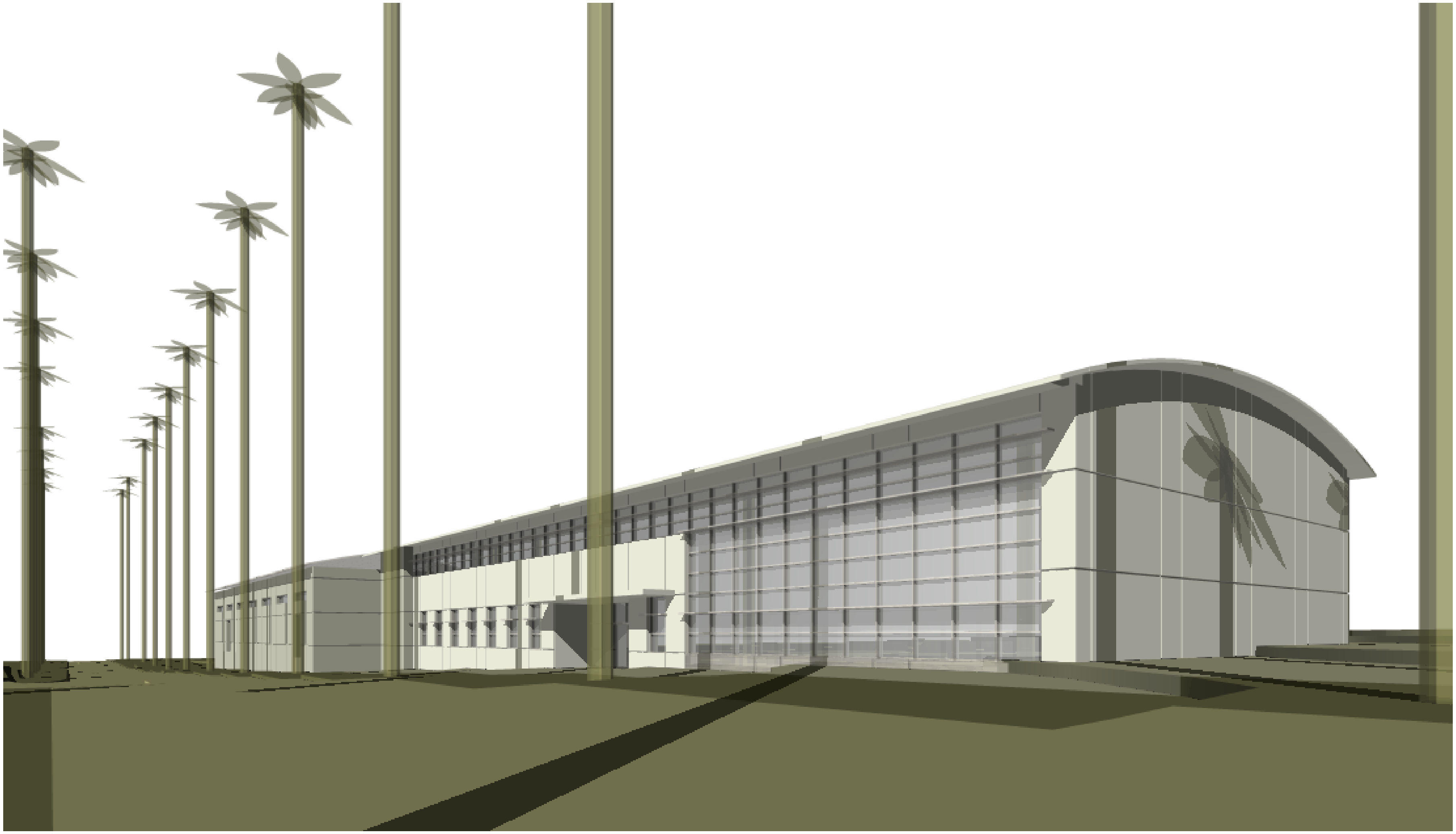
Conceptual Massing

View from existing Aberdeen-Inverness Residence Hall



Conceptual Massing

Eye-level view from the southeast



Building Description Summary

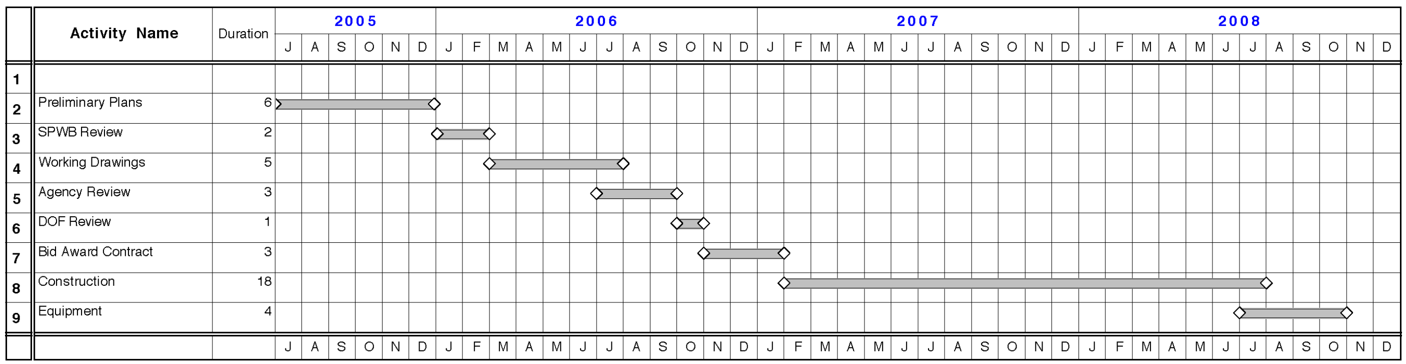
The building form and material use recalls the main UCR campus while also fitting comfortably near the more utilitarian buildings of the campus corporate yard including the TAPS building. Each of the major building elements – administration, training, laboratory and materials handling are reflected in the scale, massing and materials use proposed for the building. Sloped/pitched galvalum metal roof forms are utilized to shade the building from the harsh south sun and screen significant rooftop equipment.

The primary building skin is concrete block, which can be implemented with different colors/types. The materials handling walls are primarily solid concrete block with some south-facing "slot" windows to provide some daylight to these southern spaces. The north and east portion of the yard wall is concrete block, while the west portion (which fronts the TAPS yard) will be of a less costly material that still screens the view into the EH&S yard. The two-story portion of the building is composed of concrete block with south and north facing windows/curtain walls and solid east/west walls. The south facade has "punched" window openings for the lab spaces. The upper story and training area are clad in curtain wall systems (with insulating glass). Light shelves/sun shades (painted aluminum) are located at each window and run continuous for the length of the curtain wall areas. The glass curtain wall lobby entry is recessed into the south facade and is shaded by a perforated painted metal canopy.

Budget and Schedule Summary

The project budget is $11,964,000 including a construction budget of $10,614,000. A Winter 2006 construction start and Winter 2008 occupancy are assumed.

The $328/GSF construction cost compares favorably to other similar, recent facilities planned for the UC System.



Overview

The program for the proposed EH&S facility envisions a 17,964 ASF building with a 60:40 ASF/GSF ratio that yields a 30,089 GSF project. In addition, the project includes important site elements for storage and handling of waste materials. The site elements total some 6,400 square feet and are to be located in the yard area.

PROJECT GOALS

Organizational Mission

- Develop A WORLD-CLASS EH&S Facility
- ENHANCE and FACILITATE the critical services EH&S provides to the research and education community at UCR for generations to come.
- Provide a building that serves as a model for ENVIRONMENTAL SUSTAINABILITY

Function
People/Activities/Relationships

- To provide EASY ACCESS for both the campus community and off-campus vendors and waste haulers
- To provide a USER FRIENDLY, VISIBLE yet SECURE environment
- To meet REGULATORY REQUIREMENTS
- To create CONTIGUOUS operations for all FUNCTIONS
- To provide for ADMINISTRATION requirements
- To provide for TRAINING requirements
- To provide for LABORATORY requirements
- To provide for "CRADLE to GRAVE" WASTE MANAGEMENT
- To provide an appropriate and functional YARD area
- To meet SPECIALIZED requirements of: HAZARDS/SECURITY; CHEMICAL RECYCLING; POTENTIALLY EXPLOSIVE CHEMICALS; RADIOISOTOPES; RADIATION USER MATERIALS STORAGE; HIGH ENERGY RADIO ACTIVE SECURE STORAGE
- To meet all requirements of ENVIRONMENTAL SAFETY
- To accommodate a FUTURE STAFF LEVEL of up to ± 28 people by 2008
- To support STATE-OF-THE-ART technical, regulatory and practical knowledge and experience
- To provide a SAFE working ENVIRONMENT for all personnel

PROJECT GOALS

Project Form
Space/Environment/Quality

- To become a MODEL of ENVIRONMENTALLY RESPONSIBLE design. (Leadership in Energy and Environmental Design (LEED™) Certified equivalent)
- To RESPECT the ADJACENT USES
- To provide for appropriate level(s) of SECURITY
- To fit COMFORTABLY on the UCR campus
- To be COMPATIBLE with the UCR Campus Plan
- To give PHYSICAL FORM to ENVIRONMENTAL and SUSTAINABLE goals
- To provide for clear IDENTITY for the PUBLICLY ACCESSIBLE portions of the new facility
- To create an UPLIFTING, ACTION-ORIENTED, work environment
- To provide a MODULAR, FLEXIBLE workplace with a “loose-fit” to accommodate GROWTH and CHANGE
- To present an OPEN, PROFESSIONAL and APPROACHABLE IMAGE to the campus and the public
- To present a PERCEIVED SENSE of SAFETY to the campus and surrounding neighborhood
- To provide QUALITY, DURABLE and APPROPRIATE material choices

Project Economy
Initial Budget/Operating Costs/ Life Cycle Costs

- To complete the project for a CONSTRUCTION BUDGET of $ ± 10.6 M

Project Timing
Past/Present/Future

- To accommodate anticipated staff growth by allowing FLEXIBILITY and CONVERTIBILITY
- To allow CONTINUING OPERATION of the existing facility DURING CONSTRUCTION
- To provide for future EXPANSION OPPORTUNITIES for building and site function

Overview

The following space list categorizes space by the UC standard. The *gross space* elements noted after the space summary are shown here because they are not part of the ASF (assignable square footage), but have been studied, sized and planned as part of the programming effort. The *yard components* are not part of the gross area, but are listed because they are program elements required to be accommodated in the yard.

The lab module is 10′-6″ x 22′-0″ (231 sf). All of the lab spaces are based on this module.
The waste module is 11′-0″ x 22′-0″ (242 sf). All of the materials handling spaces are based on this module.

Detailed Space List

Space #	Space Name	quantity	mod no.	mod size	ASF each	total ASF
1	**ADMINISTRATION**					
	Offices					
1.01	Director's Office	1			240	240
1.02	Office (near reception)	1			120	120
1.03	Program Managers	14			120	1680
	Open Office Area					
1.12	Staff	14			64	896
1.13	Reception	1			80	80
1.14	Fire/Bldg. Plan Review	1			320	320
1.15	Lateral Files (2 - 18"x48" per person)	14			12	168
1.16	Circulation	1			919	919
	Meeting Rooms					
1.17	Conference Room - small	1			125	125
1.18	Conference Room - large	1			360	360
	Support					
1.21	Break Room	1			240	240
1.22	Work/Copy Room (level 2)	1			120	120
1.23	Work/Copy Room (level 1)	1			60	60
1.24	Technical Library	1			190	190
1.26	Package Storage @ Reception	2			50	100
1.27	Archive Storage	1			310	310
1.28	Fire/Bldg. Plan Archive Storage	1			200	200
1.29	Fire Exinguisher Storage	1			80	80
1.30	Server Room	1			120	120
1.31	Storage Room	1			120	120
1.32	Coffee Room/Niche (level 2)	1			50	50
	ADMINISTRATION SUBTOTAL					**6498**
2	**SAFETY LEARNING CENTER**					
	Training Rooms					
2.02	Training Room - 60 seats	1			1220	1220
2.04	Training Computer Lab	1			270	270
	Support					
2.11	Pre-function / Check-in Lobby / Ergonomics Station	1			325	325
2.13	Furniture Storage	1			160	160
	SAFETY LEARNING CENTER SUBTOTAL					**1975**

Detailed Space List

Space #	Space Name	quantity	mod no.	mod size	ASF each	total ASF
3	**LABORATORIES**					
	Laboratories					
3.01	Radiation Lab	1	2.00	231	462	462
3.03	General Lab	1	2.20	231	508	508
	Support					
3.11	Storage	1	0.50	231	116	116
3.12	Radiation Instrument Calibration/Rad Lab Support	1	0.80	231	185	185
	LABORATORIES SUBTOTAL					**1271**
4	**CHEMICAL WASTE**					
4.01	Chemical Processing Room	1	6.00	242	1452	1452
	Flammable - Corrosive Toxic	1	0.75	242	182	
	Oxidizers	1	0.50	242	121	
	Acids	1	0.50	242	121	
	Bases	1	0.50	242	121	
	Water Reactive Material	1	0.25	242	61	
	Non RCRA Material	1	0.50	242	121	
	Lead Acid Battery	1	0.25	242	61	
	Glove Box Cylinder Testing	1	0.25	242	61	
	Cylinder Cabinets	1	0.25	242	61	
	Circulation	1	2.25	242	545	
4.02	Chemical Bulking Room	1	2.50	242	605	605
	Drum Processing Space A	1	0.50	242	121	
	Drum Processing Space B	1	0.50	242	121	
	Chemical Holding Area	1	0.75	242	182	
	Circulation	1	0.75	242	182	
4.03	Decontamination Room (for containers & equipment)	1	2.50	242	605	605
4.04	Re-cycled Chemical Storage	1	1.50	242	363	363
	Computer Area	1	0.25	242	61	
	High Density Chemical Storage	1	0.50	242	121	
	Cylinder Storage + Circulation	1	0.75	242	182	
4.05	Chemical Drum Storage	1	2.25	242	545	545
	CHEMICAL WASTE SUBTOTAL					**3570**

Detailed Space List

Space #	Space Name	quantity	mod no.	mod size	ASF each	total ASF
5	**RADIATION WASTE**					
5.01	Radiation Processing Room	1	3.00	242	726	726
	Waste Area	1	1.00	242	242	
	Autoclave	1	0.50	242	121	
	Circulation	1	1.50	242	363	
5.02	Radiation Storage	1	3.38	242	818	818
	Storage Area	1	1.38	242	334	
	Rad Materials Holding	1	0.23	242	56	
	Circulation	1	1.77	242	428	
5.03	Walk-in freezer (shared with Biomedical waste)	1	0.67	242	162	162
5.04	Walk-in freezer (future)	1	0.67	242	162	162
	RADIATION WASTE SUBTOTAL					**1868**
6	**BIOMEDICAL WASTE**					
6.01	Biomedical Processing Room	1	2.50	242	605	605
	Mix Waste & Circulation	1	1.25	242	303	
	Infectious Medical Waste Unit	1	1.25	242	303	
	BIOMEDICAL WASTE SUBTOTAL					**605**
7	**UNIVERSAL WASTE**					
7.01	Universal Waste	1	2.50	242	605	605
	Computer Waste	1	1.00	242	242	
	Fluorescent Tubes	1	0.75	242	182	
	Misc. Storage	1	0.75	242	182	
8	**MATERIAL ENTRANCE**					
8.03	Control Room	1	1.00	242	242	242
8.04	Clean Packaging Material	1	1.25	242	303	303
	MATERIAL ENTRANCE SUBTOTAL					**545**
9	**BUILDING SUPPORT**					
9.01	Lockers/Showers/Restrooms	1	2.50	242	605	605
9.02	Emergency Response Gear Storage	1	1.00	242	242	242
9.03	Workshop	1	0.75	242	182	182
	BUILDING SUPPORT SUBTOTAL					**1029**

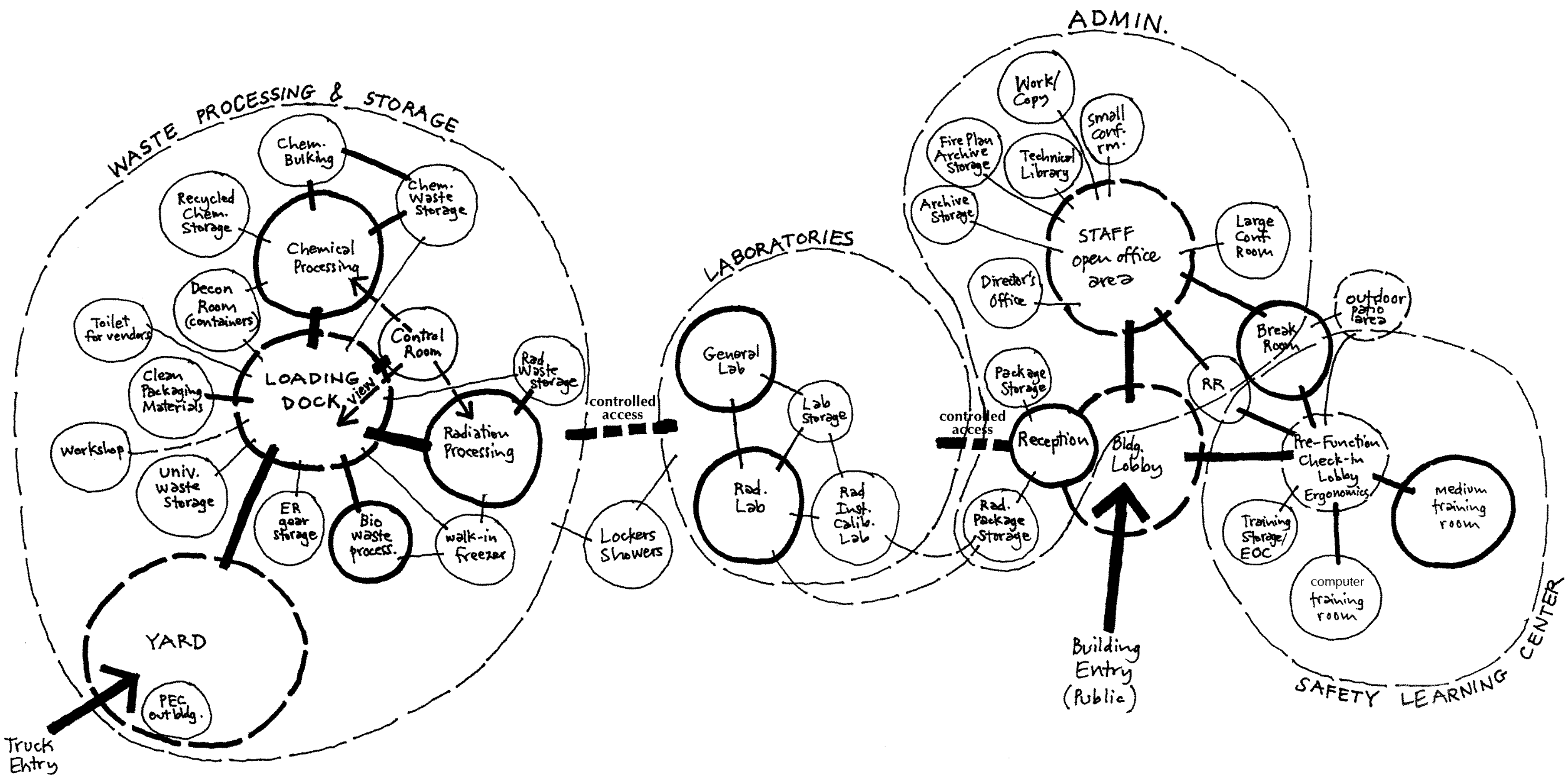
Detailed Space List Summary

	PROGRAM SUMMARY BY SPACE TYPE					
1	ADMINISTRATION					6498
2	SAFETY LEARNING CENTER					1975
3	LABORATORIES					1271
4	CHEMICAL WASTE					3570
5	RADIATION WASTE					1868
6	BIOMEDICAL WASTE					605
7	UNIVERSAL WASTE					605
8	MATERIAL ENTRANCE					545
9	BUILDING SUPPORT					1029
NET	**TOTAL ASSIGNABLE AREA (ASF)**					**17964**
USABLE	**NONASSIGNABLE AREA**					8080
	STRUCTURAL (Construction) AREA					2180
	BASIC GROSS AREA					28224
	COVERED UNENCLOSED GROSS AREA @ 50% (loading dock, covered truck well)					1865
	TOTAL OUTSIDE GROSS AREA					**30089**
	EFFICIENCY FACTOR					**60%**
	GROSS SPACE (included in the total outside gross area number)					
8.01	Loading Dock (3 dock bays)	1	2.00	242	484	484
8.02	Dock Toilet	1	0.25	242	61	61
						545
	YARD COMPONENTS					
	Cargo Containers	6			400	2400
	Emergency Response Trailer	1			300	300
	Portable/Storage Container	1			400	400
	Portable/Storage Container	1			450	450
	Portable/Storage Container	1			600	600
	Vehicle parking spaces	10			165	1650
	Electric Vehicle parking/charging spaces	6			100	600
	YARD SUBTOTAL					**6400**

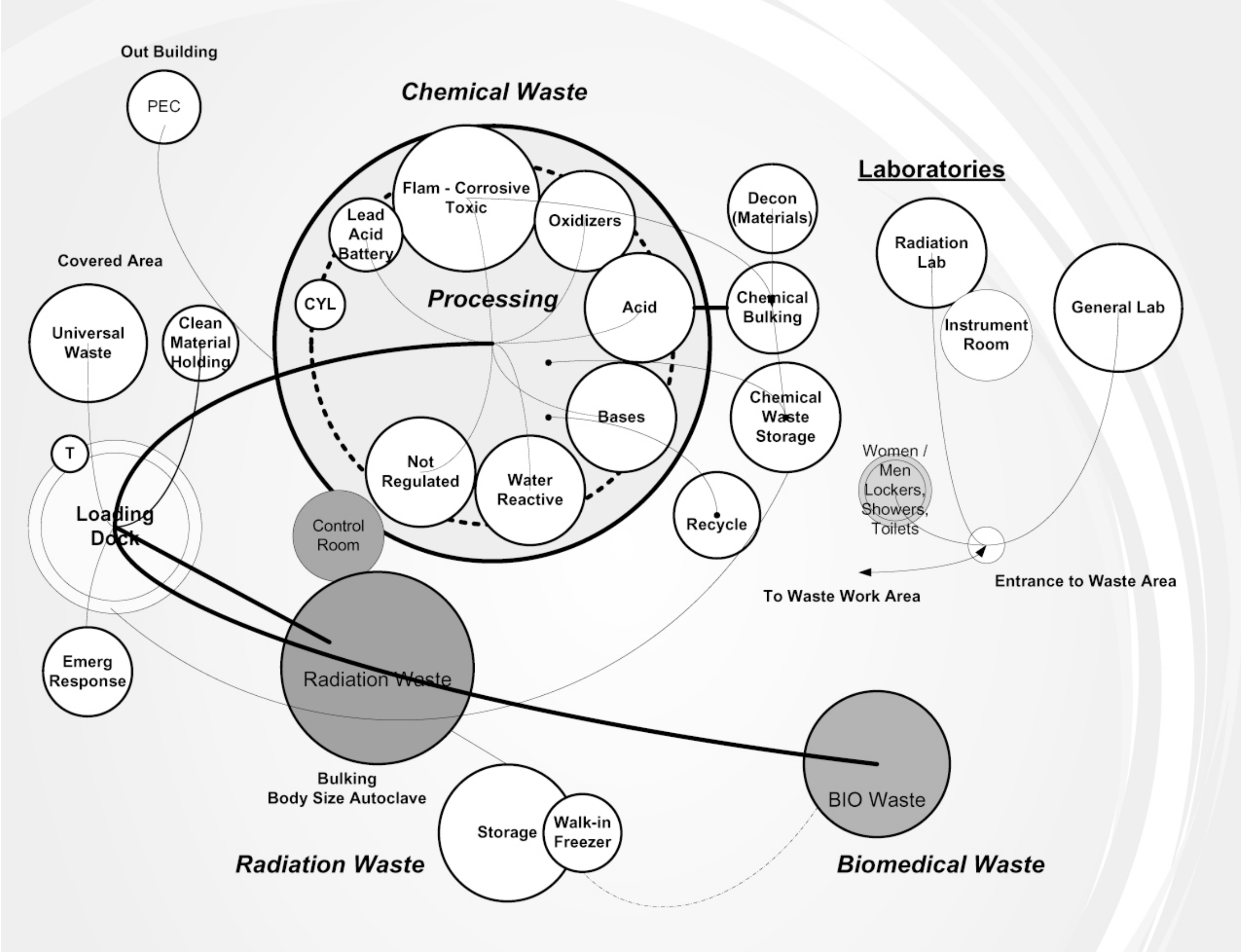
Introduction

The following concepts were developed through a series of interviews with the user groups. They are organized by type of area (administrative, training, labs, radiation waste, chemical waste, etc.). These concepts were used when developing the various planning options. The overall affinity diagram on the next page is an ideal diagram of the spaces, their groupings and relationships. The final planning option is a literal interpretation of this diagram.

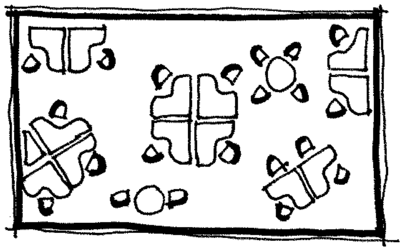
Overall Affinity Diagram



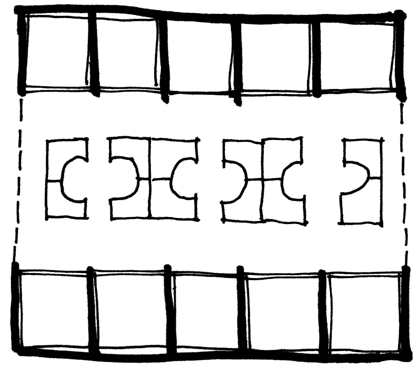
Materials Processing
Flow Diagram



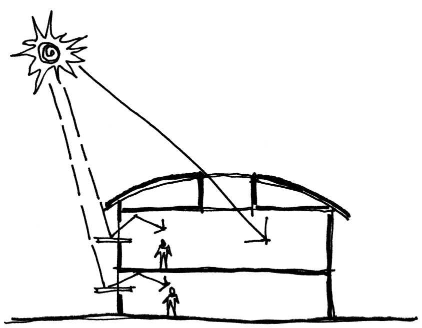
Administration



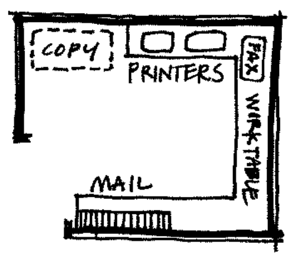
CONSIDER AN **OPEN FLOOR PLAN** AND **MODERN WORKSTATION CONCEPTS** FOR THE ADMINISTRATIVE OFFICE AREA.



CONSIDER A **MIX** OF **OPEN OFFICE** WORKSTATIONS AND **PRIVATE OFFICES**

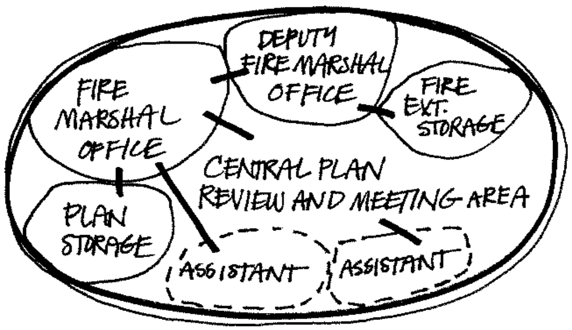


CONSIDER **EVEN, WARM, NATURAL LIGHTING** THROUGHOUT THE FACILITY INCLUDING INDUSTRIAL AREAS.

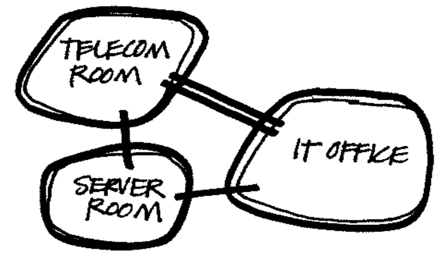


CONSIDER AN "**ALCOVE**" WITH SOUND BARRIERS FOR COPY, PRINT, MAIL LOCATED WITHIN MAIN OPEN OFFICE SPACE.

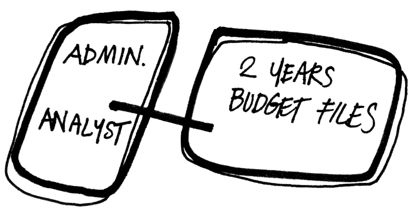
Administration



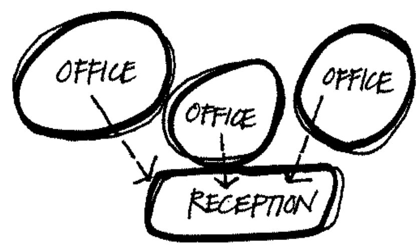
CENTRAL PLAN REVIEW AFFINITIES



CONSIDER THE **IT OFFICE** TO BE ADJACENT TO **TELECOM ROOM** AND **SERVER ROOM**

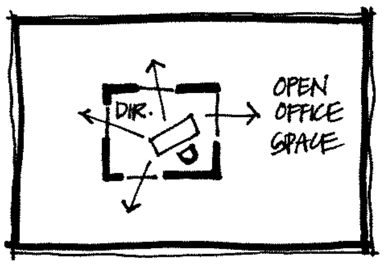


LOCATE THE **BUDGET FILES** ADJACENT TO THE **ADMINISTRATIVE ANALYST** OFFICE/WORKSTATION

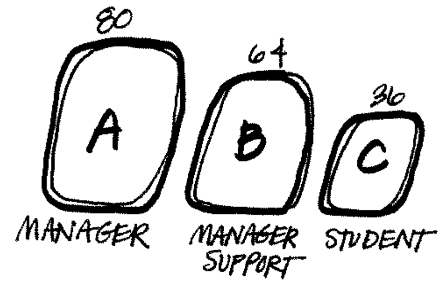


CONSIDER AN OFFICE(S) WITH **DIRECT ACCESS** AND/OR **VISIBILITY** TO RECEPTION.

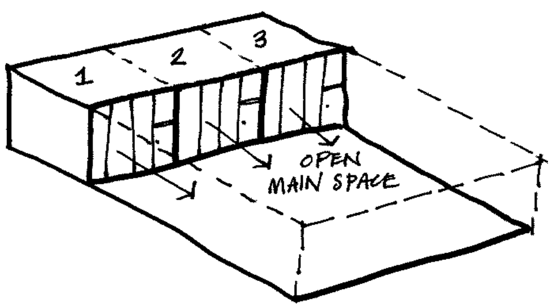
Administration



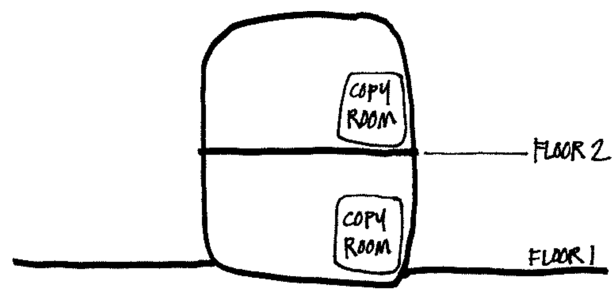
CONSIDER DIRECTOR'S OFFICE TO BE **PRIVATE** WITH WINDOWS TO ALLOW **VISIBILITY** TO REST OF ADMINISTRATION AREA.



CONSIDER **MULTIPLE SIZES** OF WORKSTATIONS

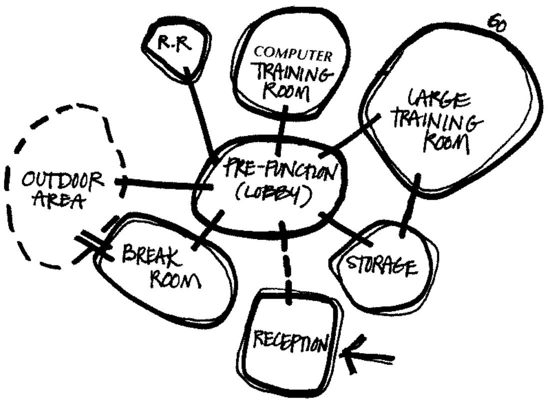


CONSIDER **SMALL CONFERENCE ROOMS** FOR 3-4 PEOPLE WITH GOOD **VISIBILITY** TO MAIN OPEN OFFICE SPACE.

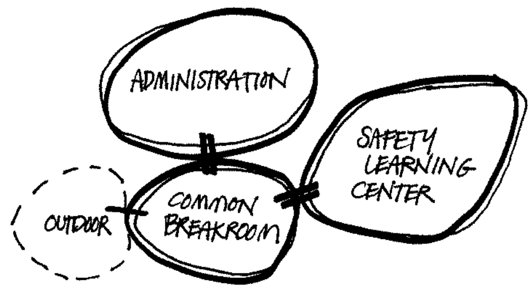


CONSIDER A **COPY ROOM** ON **EACH FLOOR** IF MULTI LEVEL BUILDING

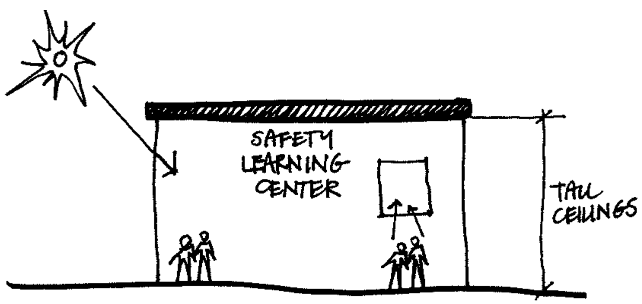
Safety Learning Center



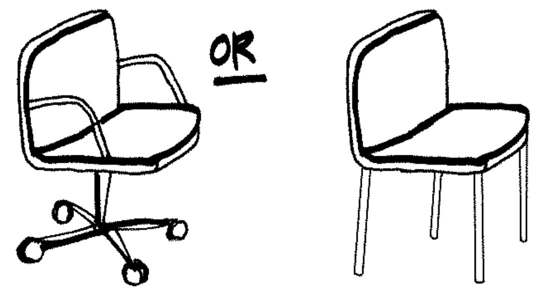
SAFETY LEARNING CENTER AFFINITIES



CONSIDER A **BREAKROOM** COMMON TO BOTH ADMINISTRATION AREA AND SAFETY LEARNING CENTER.

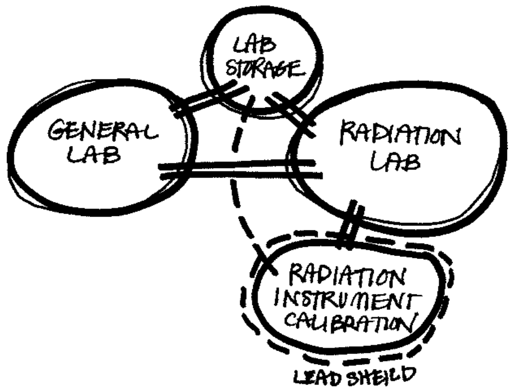


CONSIDER **TALL CEILINGS** IN THE SAFETY LEARNING CENTER FOR VISIBILITY & NATURAL LIGHT.

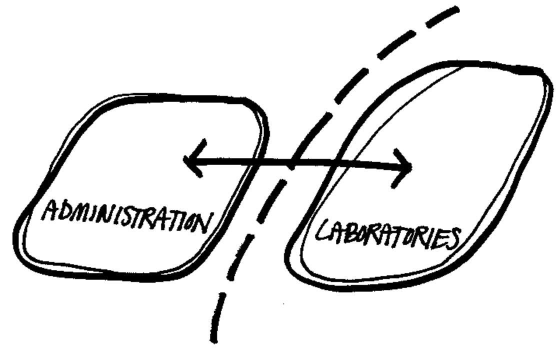


CONSIDER **DIFFERENT & FLEXIBLE** TYPES OF **SEATING** IN TRAINING ROOMS.

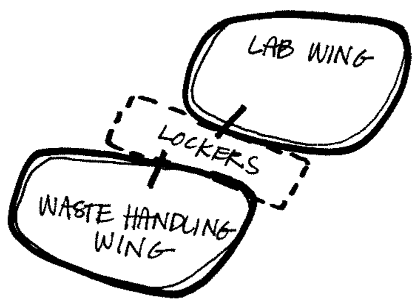
Laboratories



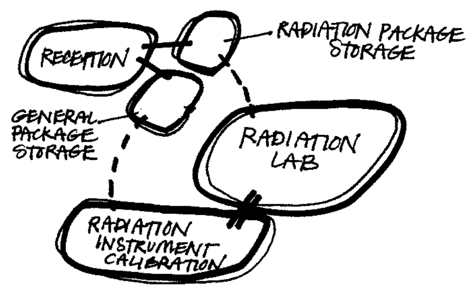
LABORATORY AFFINITIES



CONSIDER **CONTROLLED ACCESS** FROM ADMINISTRATION AREA TO LABORATORIES.

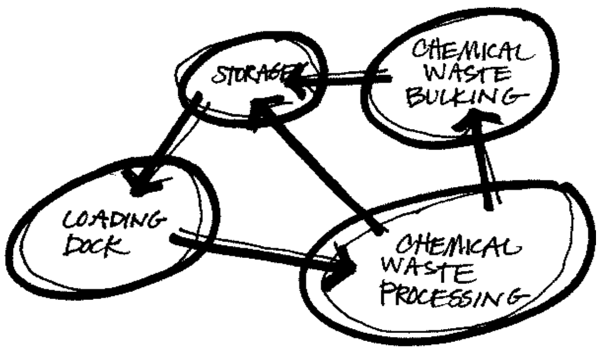


CONSIDER LOCATING **LOCKERS** BETWEEN THE 'LAB WING' AND THE 'WASTE HANDLING' WING.

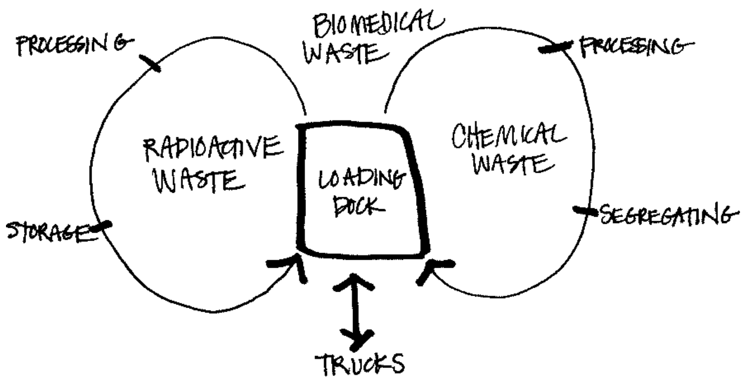


CONSIDER **TWO STORAGE ROOMS** ADJACENT TO RECEPTION FOR HOLDING PACKAGES FOR LAB EQUIPMENT & SUPPLIES

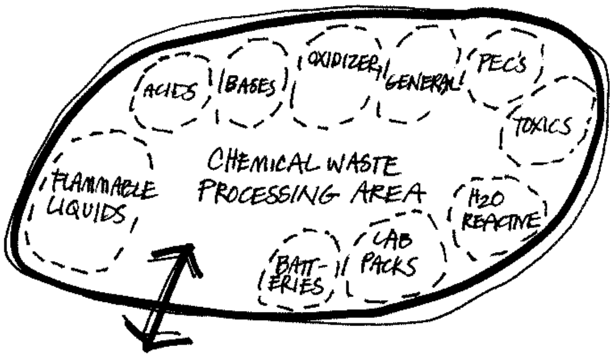
Chemical Waste



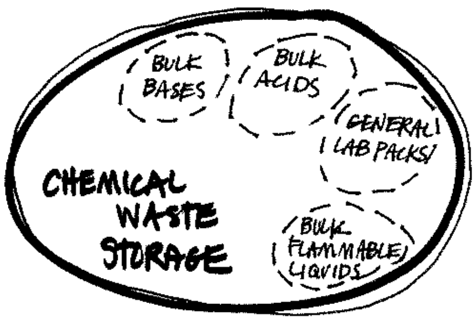
CHEMICAL WASTE AFFINITIES



WASTE FLOW DIAGRAM

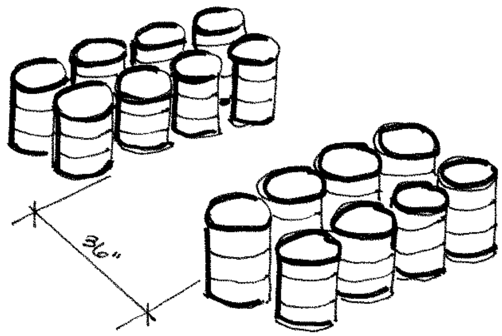


CHEMICAL WASTE PROCESSING "CELLS"

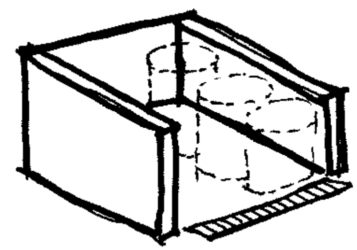


CHEMICAL WASTE STORAGE "CELLS"

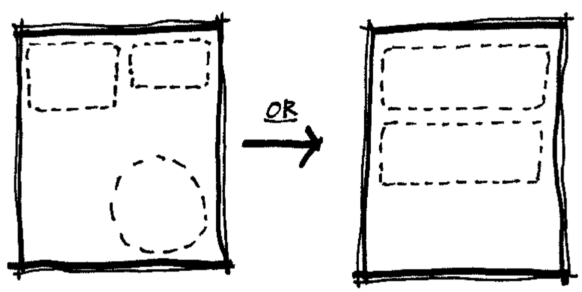
Chemical Waste



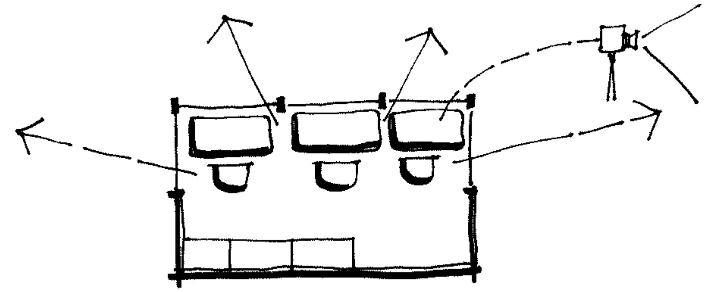
CONSIDER 36" **CLR SPACE** AROUND BARRELS FOR EASY INSPECTION.



CONSIDER **LOW, 1/2 WALLS** AND **TRENCH DRAINS** FOR WASTE CELLS.

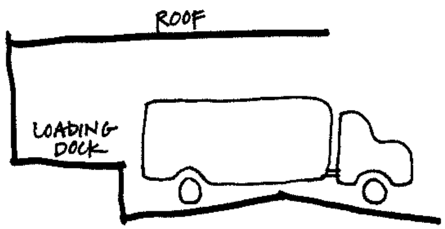


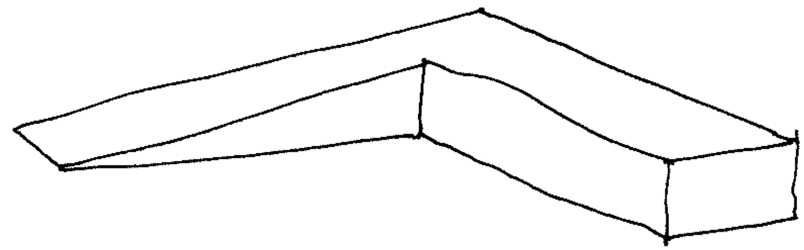
CONSIDER **FLEXIBILITY** OF SPACES IN CHEMICAL WASTE AREAS TO ALLOW FOR FUTURE GROWTH.



CONSIDER A **"CONTROL ROOM"** (OFFICE) FOR VISIBILITY TO LOADING DOCK AND PROCESSING ROOMS

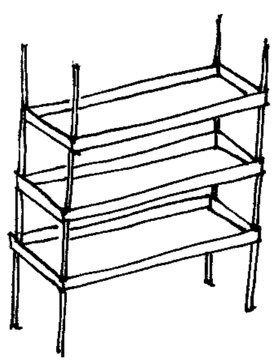
Chemical Waste

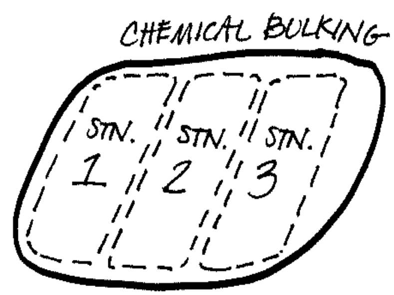




CONSIDER A **ROOF OVERHANG** COVERING LOADING DOCK AREA FOR WEATHER PROTECTION

CONSIDER A **RAMP** FROM LOADING DOCK

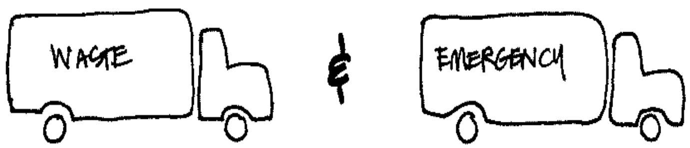


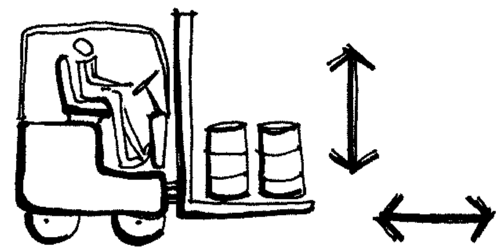


CONSIDER **RACKS** FOR CONTAINERS AND SUPPLY STORAGE.

CONSIDER **3-4** CHEMICAL BULKING **STATIONS**

Chemical Waste

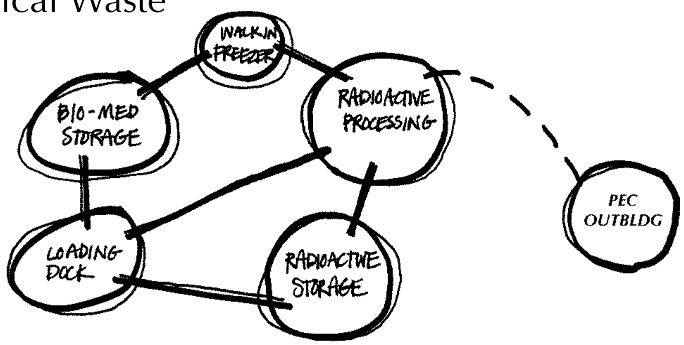




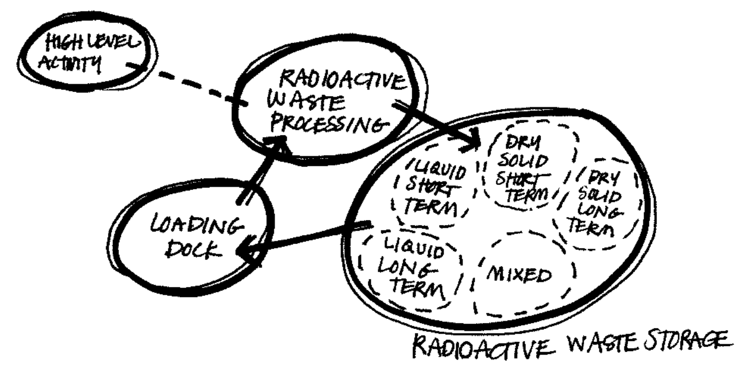
CONSIDER TWO **SEPARATE TRUCKS** FOR WASTE AND EMERGENCIES. CURRENTLY ONE TRUCK FOR BOTH

CONSIDER A **LIFT/CRANE** IN CENTRAL CHEMICAL PROCESSING SPACE

Radioactive and Biomedical Waste

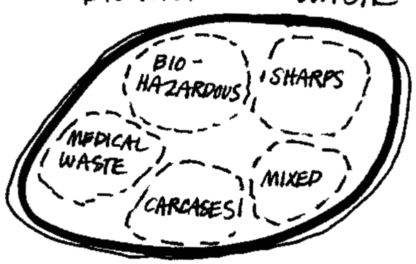


RADIOACTIVE WASTE & BIO-MEDICAL WASTE AFFINITIES

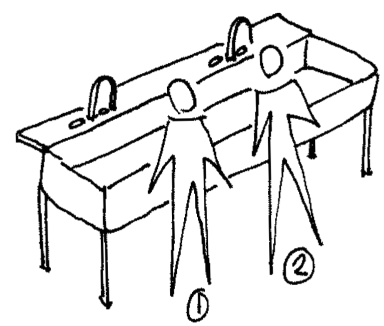


RADIOACTIVE WASTE AFFINITIES

BIO·MEDICAL WASTE

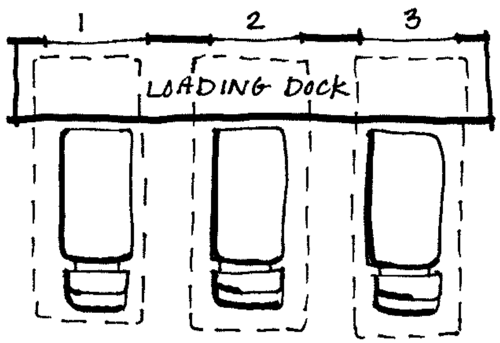


BIO-MEDICAL WASTE COMPONENTS

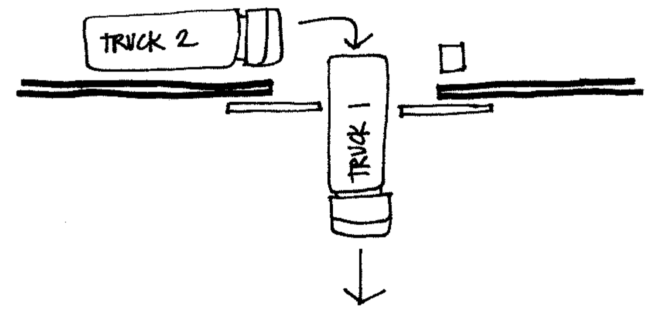


CONSIDER A **LARGE STAINLESS STEEL SINK** IN RADIOACTIVE LIQUID PROCESSING AREA

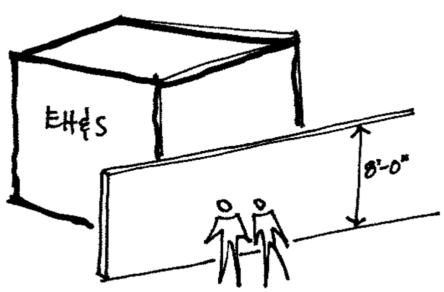
Yard



CONSIDER **3 STALLS** FOR LOADING DOCK



CONSIDER SPACE FOR **QUEING**
AT LEAST ONE TRUCK OUTSIDE OF YARD.

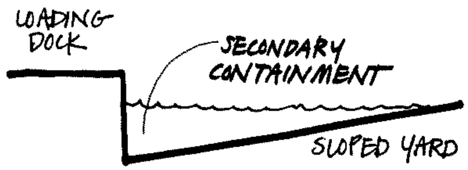


CONSIDER A **SECURE, 8'-0" FENCE/ SCREENWALL** AROUND FACILITY.

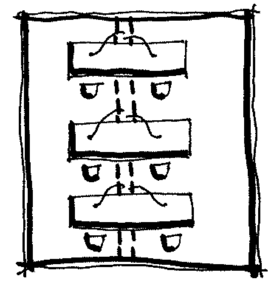
YARD:

- ☐ RECHARGE STATIONS & COVERED PARKING FOR 6 GOLF CARTS.
- ☐ COVERED PARKING FOR 3 VEHICLES
- ☐ 30'-0" EMERGENCY RESPONSE TRAILER
- ☐ SUPPLY CACHES [2 CARGO CONTAINERS]
- ☐ CARGO CONTAINERS ± 4
- ☐ "UCLA" PORTABLES (2 LARGE + 1 SMALL)
- ☐ SEMI-TRUCK MANEUVERABILITY
- ☐ SECURITY: 8'-0" WALL
  CALL BOX
  1 TRUCK QUEUE
- ☐ EMPLOYEE AND VISITOR PARKING (20 SPACES)

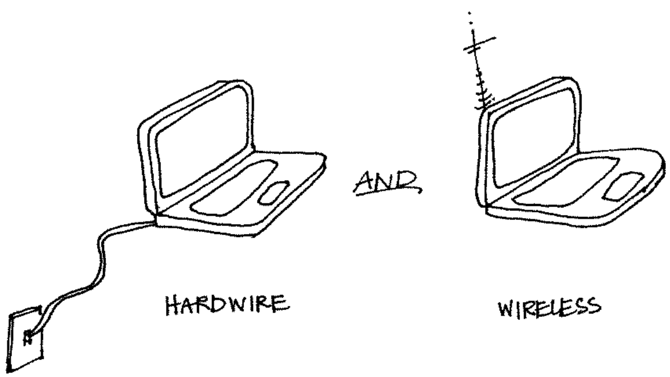
Building Systems



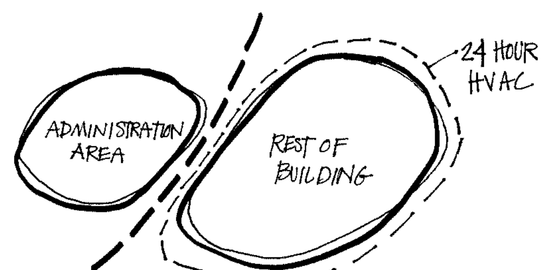
CONSIDER USING THE **LOADING DOCK** AS **SECONDARY CONTAINMENT** FROM FIRE SUPPRESSION RUN-OFF



CONSIDER A **TRENCH/DUCT BANK** FOR I.T. DISTRIBUTION IN **TRAINING ROOMS**.



CONSIDER **WIRELESS** AND **HARDWIRE CONNECTIONS** THROUGHOUT ENTIRE BUILDING.



CONSIDER ADMINISTRATION AREA SEPARATE FROM REST OF BUILDING WHICH **REQUIRES 24 HOUR HVAC**

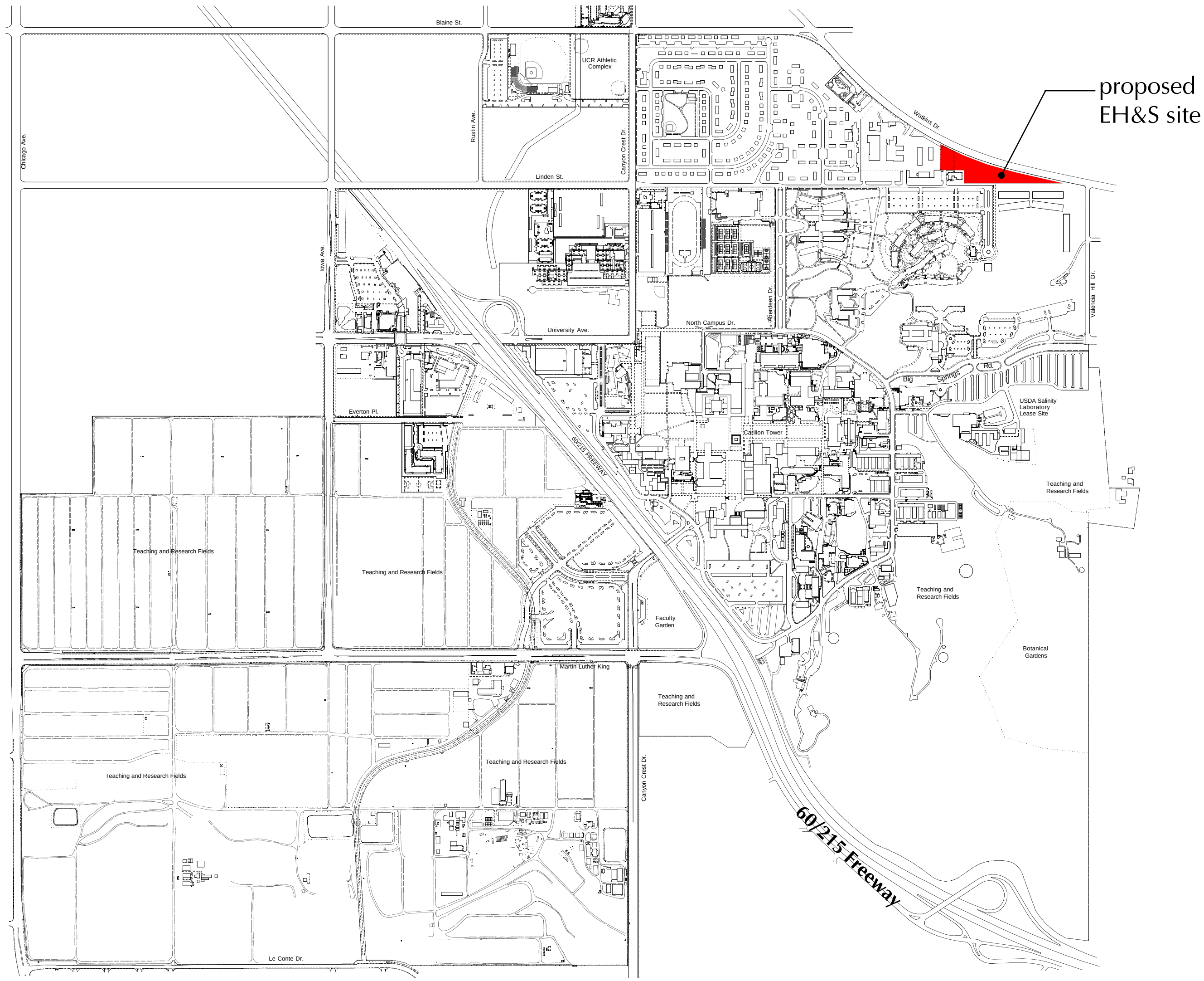
Overview

This section documents important conditions that will influence the design of the project. The SITE ANALYSIS section includes existing conditions of the site and surrounding buildings as well as site analysis diagrams. The site analysis was based on the background drawings provided by UCR. It was noted that portions of the drawings did not appear to be current with observed existing conditions and the information varied somewhat from one electronic file to another. The campus is going to have a site survey completed. Following is a complete list of the background information provided in this section:

Site Analysis
Vicinity Map
Site Context
Site Photographs
Site Coverage
Site Topography
Sun Path & Wind
Views
Noise
Vehicular Circulation & Access
Existing Surrounding Parking
Utility Service Connections

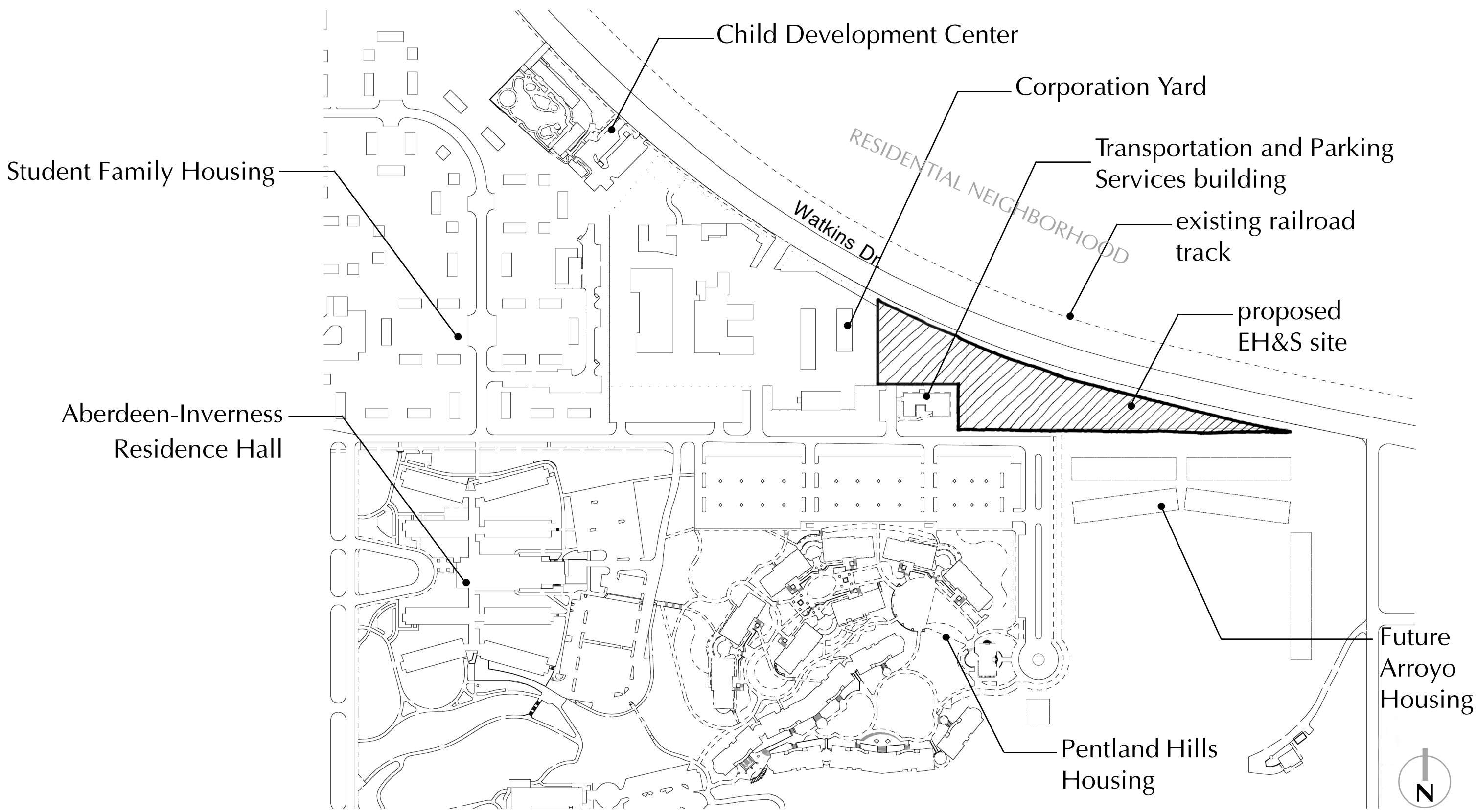
Climatic Data
Latitude: 34˚N
Elevation: 840 feet above sea level
Avg. Temp: 64˚F
Avg. High Temp: 78˚F
Avg. Low Temp: 50˚F
Summer Design Temp: 100˚F DB / 71˚F WB
Winter Design Temp: 29˚F DB
Heating Degree Days: 1,800
Cooling Degree Days: 1,500
Annual Rainfall: 10″

Vicinity Map
UCR Campus



Site Context

The site surroundings consist primarily of student housing (existing and proposed) to the west and southwest. The Corporation Yard and Transportation and Parking Services (TAPS) building are directly west of the proposed site. On the north side of Watkins Drive is a railroad track and north of that is a residential single-family neighborhood.



Site Photographs

view of site from northwest corner looking southeast

view looking southwest from the extension of Linden Street

Site Photographs

view of site from east corner looking west

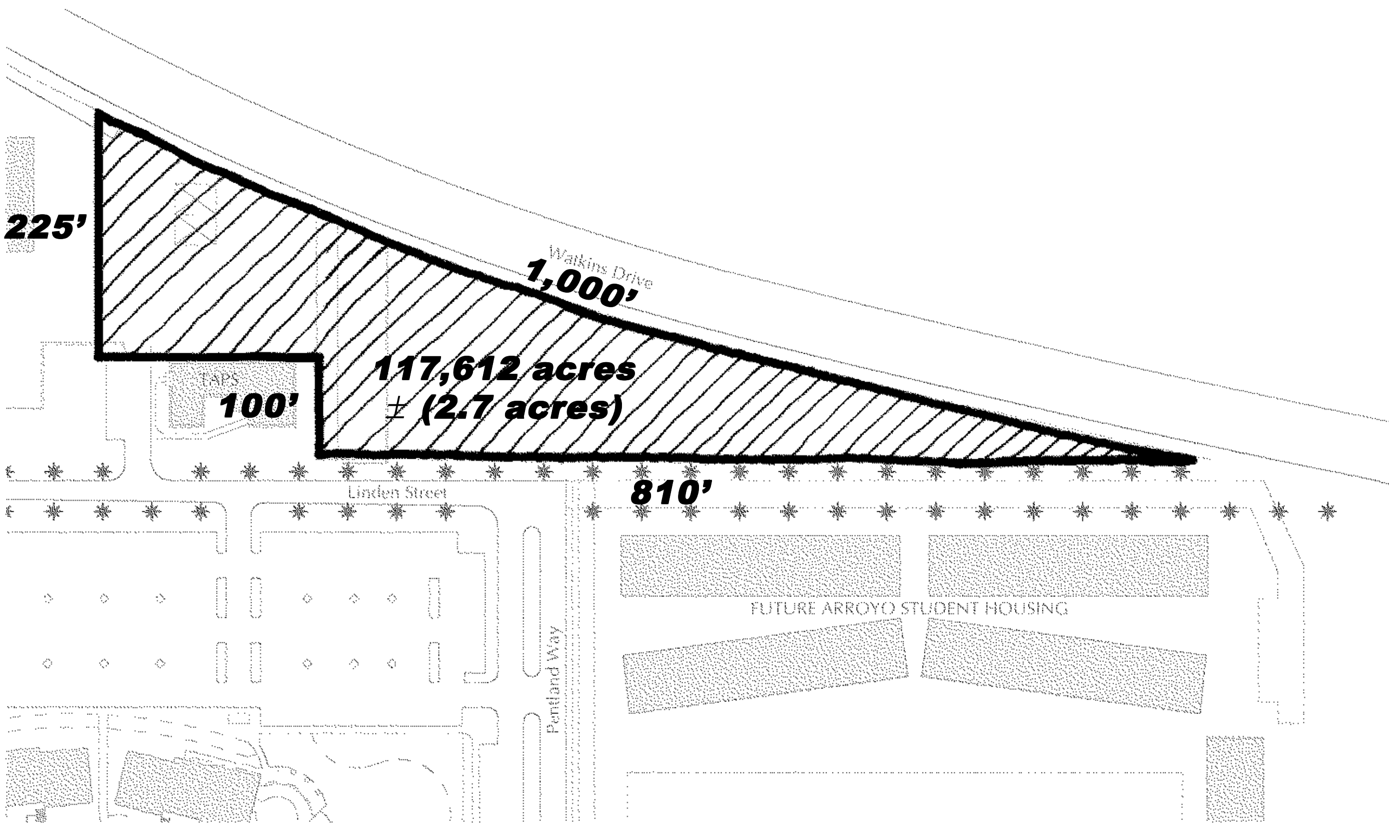
view west down Linden Street

view of TAPS yard at west end of site

Site Coverage

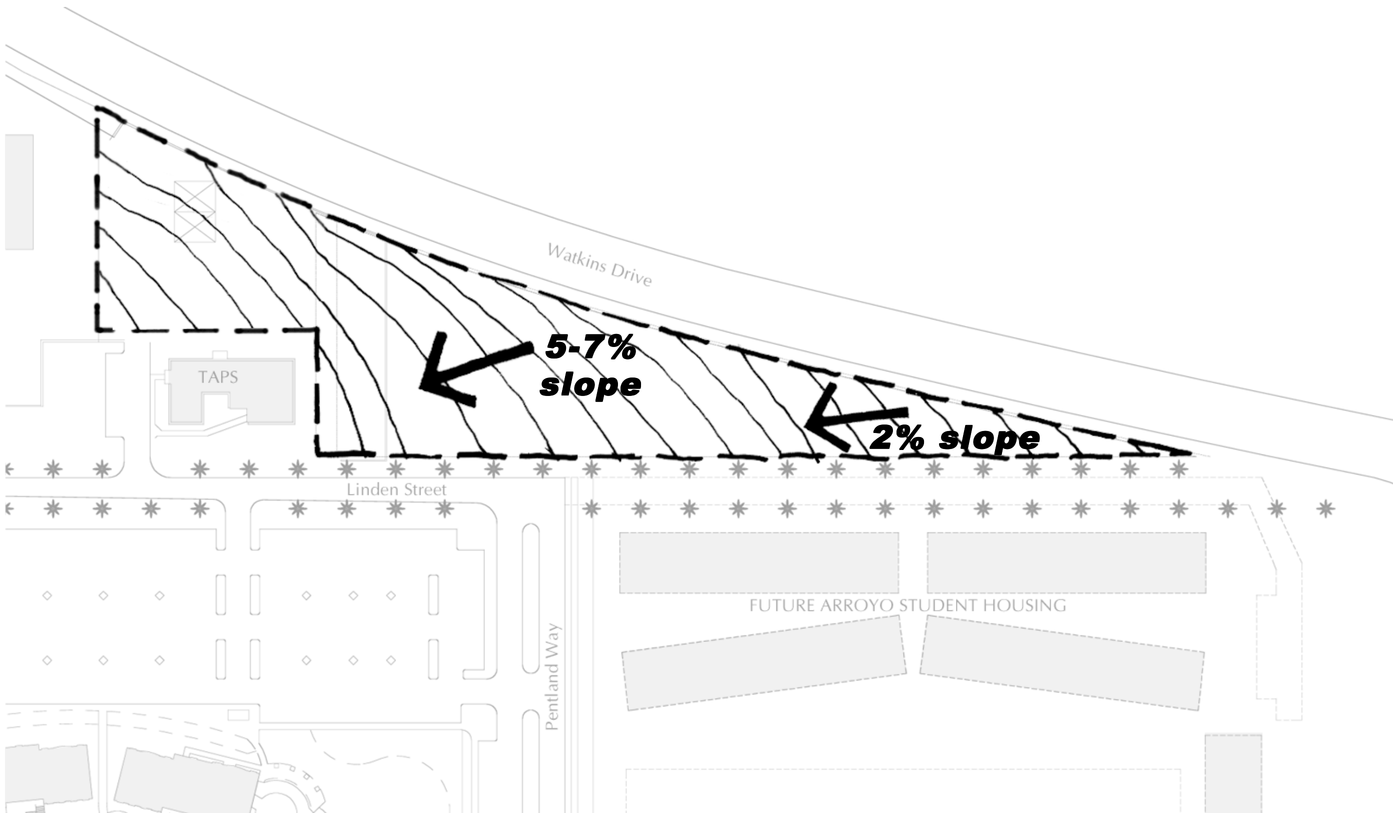
The available site area is approximately 117,600 sf which is equivalent to about 2.7 acres (87,500 sf of this site - which excludes the TAPS yard - was considered for potential building area). The required setbacks for the site are 20'-0" from the TAPS building on the west, 20'-0" from Linden along the south and the northern property line along Watkins Drive. The eastern portion of the site is the least suited for a building due to the limited site width and its distance from the internal campus streets; this was a major factor in how the building was located on the site.

For this study, the portion of the site that is the current TAPS yard was considered for access and potential future storage only.



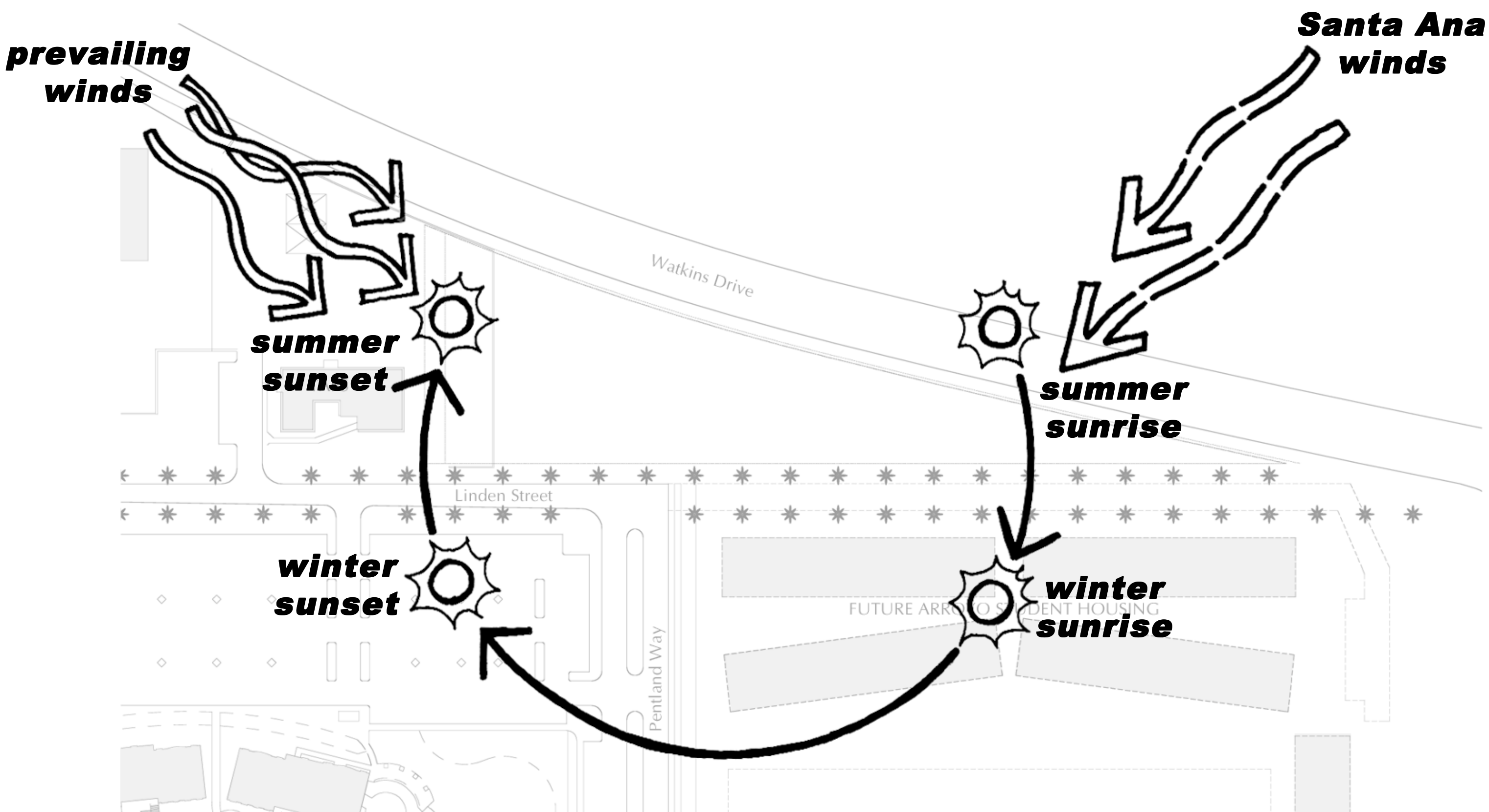
Topography

The site slopes from the eastern point to the southwestern corner at slope of 5-7%. The site is essentially a vacant unimproved lot with little vegetation. Palm trees border the south edge of the site along Linden Street and its extension while Watkins Drive forms the northern boundary.



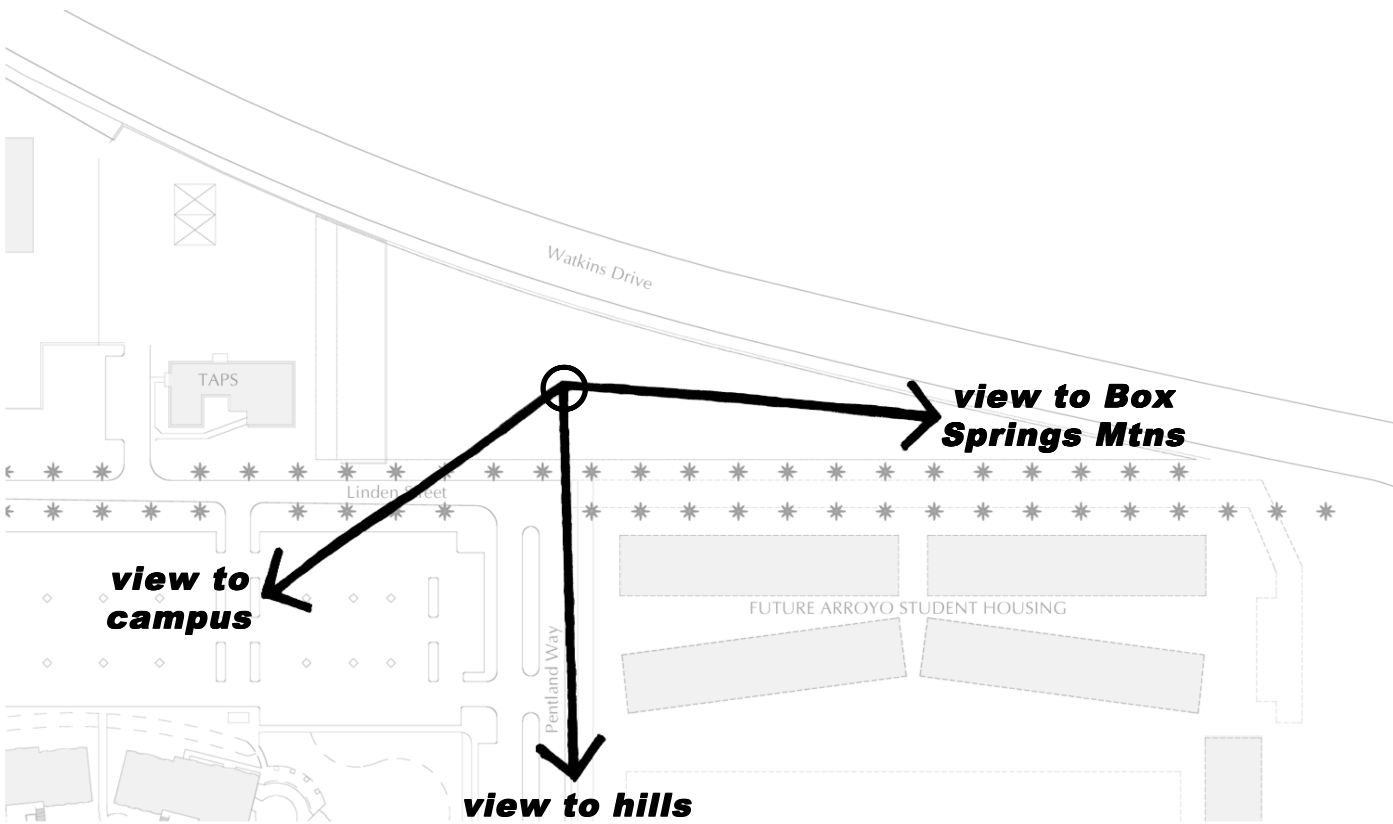
Sun Path & Wind

The summer sun rises and sets further north than does the winter sun as shown in the diagram below. The prevailing winds come from the northwest and the hot and fast-moving *Santa Ana* winds come from the northeast.



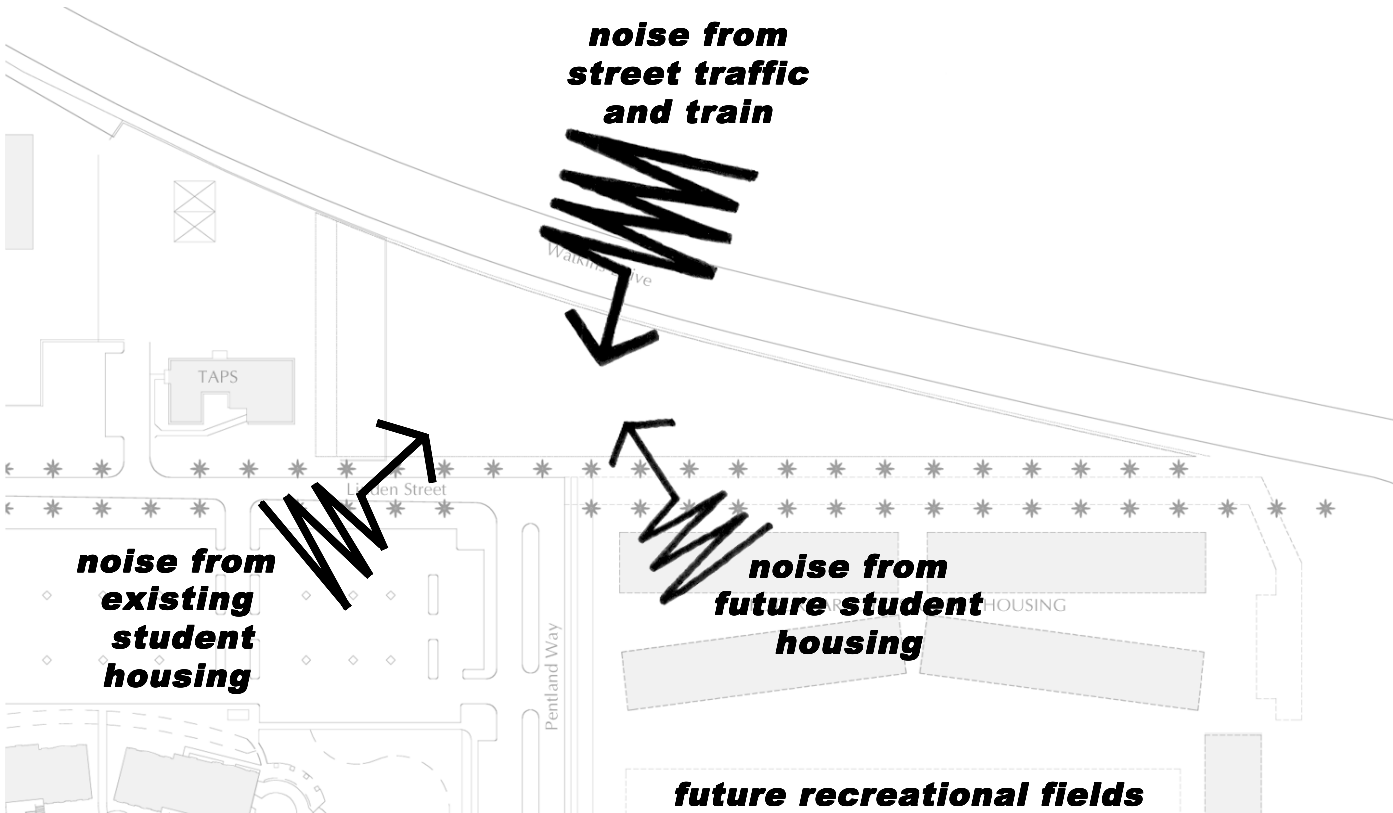
Views

Once the Arroyo Student Housing Project is completed the views south and southeast will be much more limited because of the proposed three-story height for the buildings. However, the Box Springs Mountains to the east will still be visible from the site. Between the future Arroyo Student Housing Project and the existing Pentland Hills residence halls will be a small framed view of the hills to the south. From the second story of the new EH&S building some views back towards the center of campus may be possible.



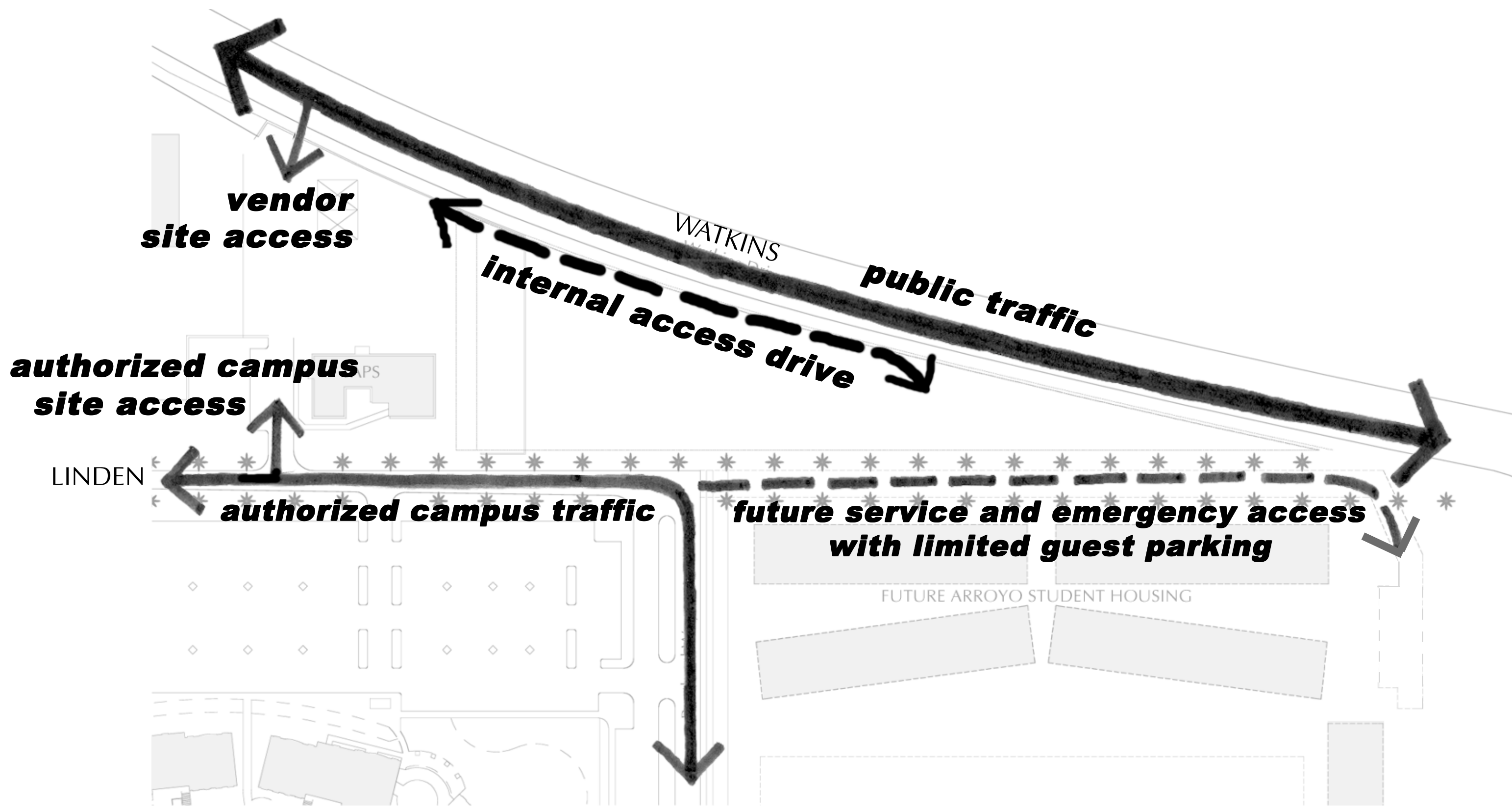
Noise

The site is on the northeastern corner of the UCR campus with public streets and single-family residential housing to the north and east. To the north of Watkins Drive is a railroad track, which along with the automobile traffic, will create the most noise impact on the site. The future Arroyo Student Housing Project with its associated recreation fields might have a minimal noise impact on the site. Overall, there aren't any major noise factors that should be mitigated (from the adjacent neighborhood) or need to be mitigated (from the project) in the design process.



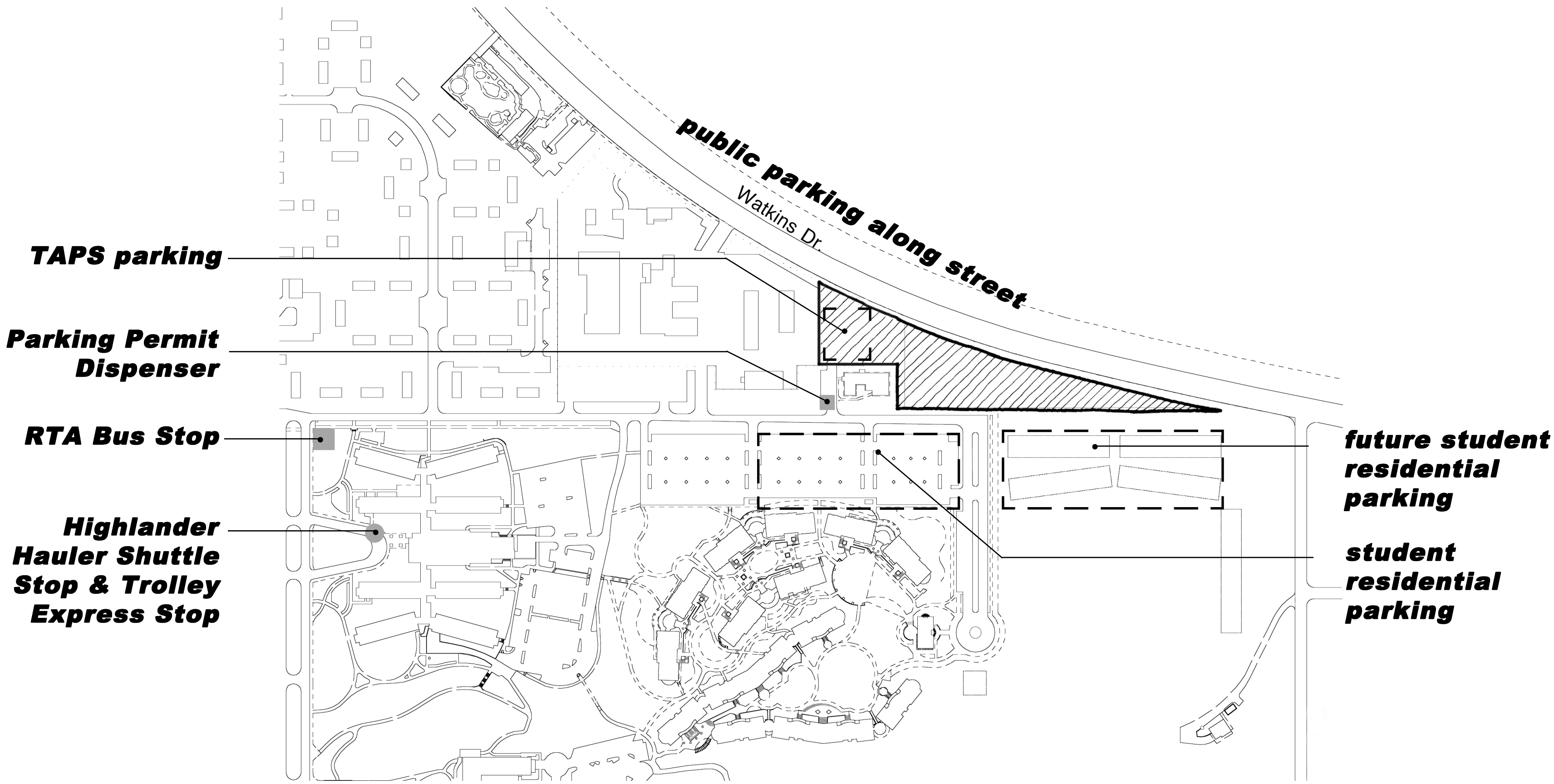
Vehicular Circulation & Access

The northern boundary of the site is Watkins Drive which is a public street with parallel public parking on both sides. The public/vendor vehicular access to the site will be from Watkins Drive. In the future plans for the campus, Linden Street will become a restricted access road - only allowing authorized campus traffic. Authorized EH&S vehicles could access the site from Linden Street or the future planned extension of Linden Street. The extension of Linden Street will be developed with the future Arroyo Student Housing project for service and emergency access only with limited guest parking.



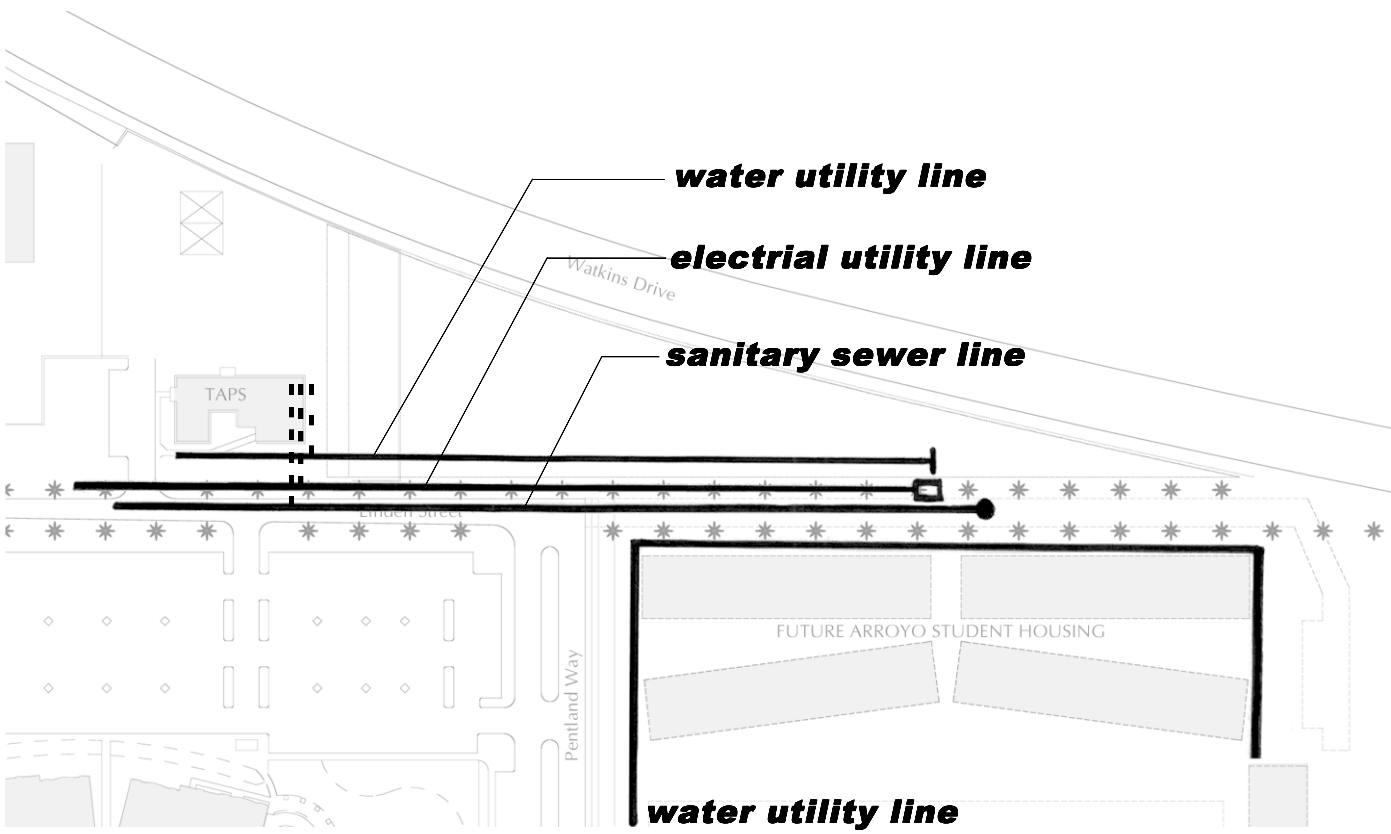
Surrounding Parking

All of the parking areas near the proposed site are dedicated for either student residential parking, Corporation Yard or TAPS. Due to the dedicated parking requirements for each, opportunity for sharing these lots with EH&S is limited. Besides the parallel public parking option along Watkins Drive, campus parking is controlled. The Riverside Transit Agency (RTA) provides a bus stop at the corner of Linden and Canyon Crest Drive. The UCR Highlander Hauler Shuttle and Trolley Express both stop in front of the Aberdeen-Inverness Residence Hall. In front of the TAPS building there is a parking permit dispenser for the nearby parking lots.



Utility Service Connections

It is assumed that the infrastructure improvements described in the East Campus Infrastructure DPP and the Arroyo Housing Project will be completed and available for use prior to construction of the Environmental Health & Safety Building.



Overview

The proposed EH&S facility is planned as a two-story building extending east to west across the selected site. The high-bay, one-story materials handling portion is to the west. The two-story portion is comprised of laboratories, training components and a main building lobby on the first floor with the administrative areas above. The *overall affinity diagram* (on page 2.14) is the basis for the conceptual plan.

The materials handling area is organized around the loading dock. The need for most of the spaces to have an adjacency/ connection to the loading dock was the guiding factor in planning this area. This requirement tends to make this area square and compact rather than long and linear. The materials handling area should be linked to the training/administrative area by the laboratory area. The laboratories are a small compact portion of the program that provide the controlled building access to the materials handling area. The labs, administrative and training areas have been planned to provide the maximum opportunity for daylight by placing spaces along the longer northern and southern exposures with a central circulation path in the middle running east/west. This also proves to be an efficient way of organizing the space. With the location of the two-story portion of the building, opportunities are available for future expansion to the east and north.

The primary campus access for pedestrians/visitors is from the south along Linden Street to the main building entry. Primary vendor/service access is from the north, off Watkins and through the existing TAPS yard into a secure/access controlled EH&S yard.

The main building entry is at the intersection of Linden Street and Pentland Way into a controlled lobby. From the lobby, controlled access is gained to the *Safety Learning Center*, Administrative functions and Laboratories with additional control provided for access to the Materials Handling areas of the facility to the west. The building is organized around a circulation path that runs east/west.

Site access to the yard area is through a new drive into the TAPS yard off of Watkins Drive to the north for all vendor traffic. 'Authorized vehicle only' access (for EH&S employees) to the yard is from the campus off of Linden Street and through the TAPS yard. The EH&S yard gate leads to a controlled dock area serving the materials handling area and to site storage containers and parking spaces for EH&S and vendor vehicles.

The eastern portion of the site is the least suited for a building due to the limited site width and its remote distance from the internal campus streets. This was a major factor in locating the building on the western portion of the site to allow for shared access and storage in the TAPS yard and to allow for a public entry along Linden. Additionally, this doesn't place any building or yard directly north of the proposed Arroyo Student Housing project which will preserve views to the north as seen from the housing.

Planning Premises

• Organize the building with the materials handling area and yard to the west to make use of the TAPS yard for access and future storage, while locating the administrative/training/labs spaces to the east.

• Create a clear building entry point that controls access to the different areas of the facility. Locate the public spaces at the entry/lobby with controlled access to the rest of the building from this point.

• Locate the main building entry on the south, at the intersection of Linden Street and Pentland Way, to serve as a 'front door' to the campus users with a secondary entry from the north for off-campus users.

• Clearly define (architecturally and programmatically) the different components of the building (administrative, training, labs, materials handling) to allow for simple and cost effective strategies for building systems (heating, cooling, security, lighting, emergency power, etc.) and code requirements.

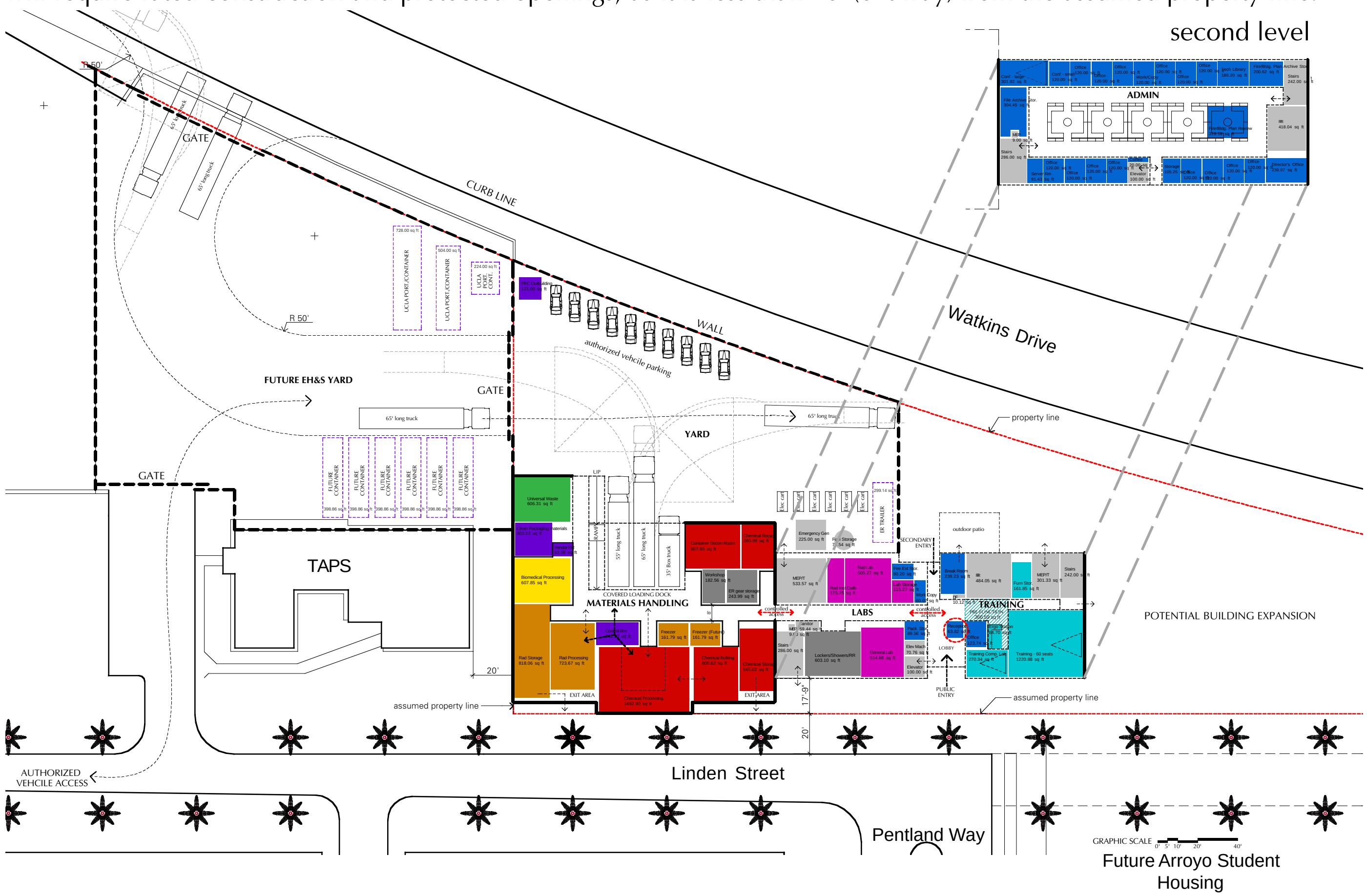
• Orient the building along an east/west axis, utilizing the northern and southern exposures for daylight and making the eastern and western exposures solid to mitigate heat gain.

• Place the building on the site to allow for expansion opportunities in the future.

Conceptual Plan

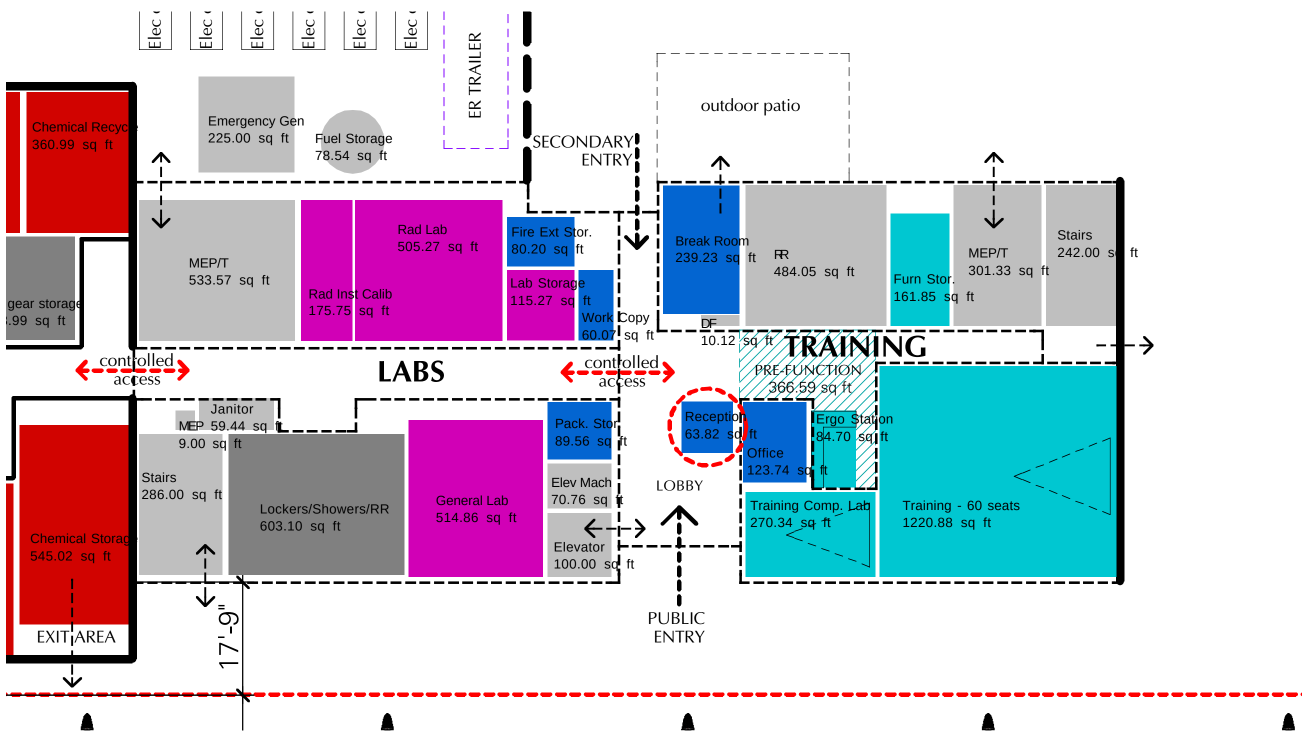
This represents the preferred planning scheme. Each area (administrative, training, labs, materials handling) is shown independently and larger in the following pages. Please note the property lines (both assumed and actual). For code purposes, an assumed property line must be established between the existing TAPS building and the new EH&S building. The west wall of the materials handling portion of the EH&S building will sit on the assumed property line between the buildings. Placement of the assumed property line 20′ away from the existing TAPS building preserves code compliance of the existing unprotected openings ofthe TAPS building without requiring modification. The west wall of the EH&S building will require rated construction and protected openings, as it is less than 20′ (0′ away) from the assumed property line.

During the design process, the possibility of keeping the existing drive between the TAPS building and the new EH&S building can be studied. This would involve moving the building east about twenty feet which will affect the grading and building entry.



Safety Learning Center & Laboratories

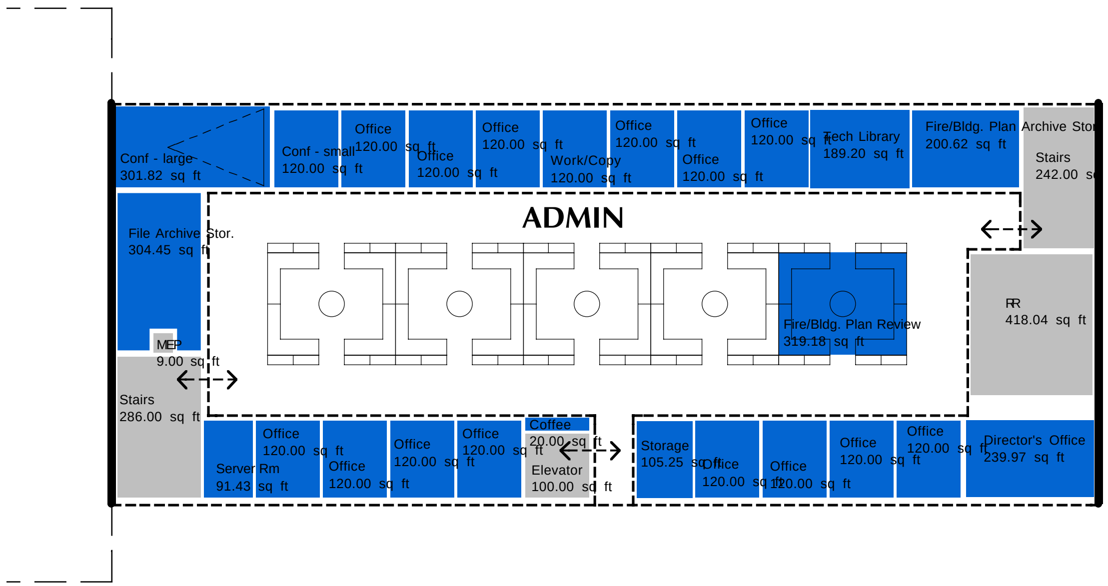
The main public building entry and lobby is in the middle of the two-story portion of the proposed building into a lobby. From the lobby, controlled access is gained to the *safety learning center* to the east and laboratories to the west (by means of card key access and reception "surveillance"). The labs act as the 'gateway' to the *materials handling* area. A locker/shower/restroom is located in the laboratory area at the access point to the *materials handling* area for use in decontamination when going from one area to the other. The *safety learning center* (training area) has a pre-function area with an ergonomics training workstation just off the building lobby. Restrooms for the training area and laboratories are centrally located off the lobby. An elevator is located in the lobby just west of the entry and two stairs are located at the east and west ends of the two story portion of the building. A secondary entry is provided from the north for people who might be parking along Watkins or entering/exiting from the north. A break room, for use by the EH&S employees as well as training classes, is located directly off the lobby and opens onto an outdoor patio area to the north. The laboratories and training spaces are oriented along a east/west axis to allow for the optimum use of daylight within these spaces.



scale: 1" = 30'-0"

Administrative/Office

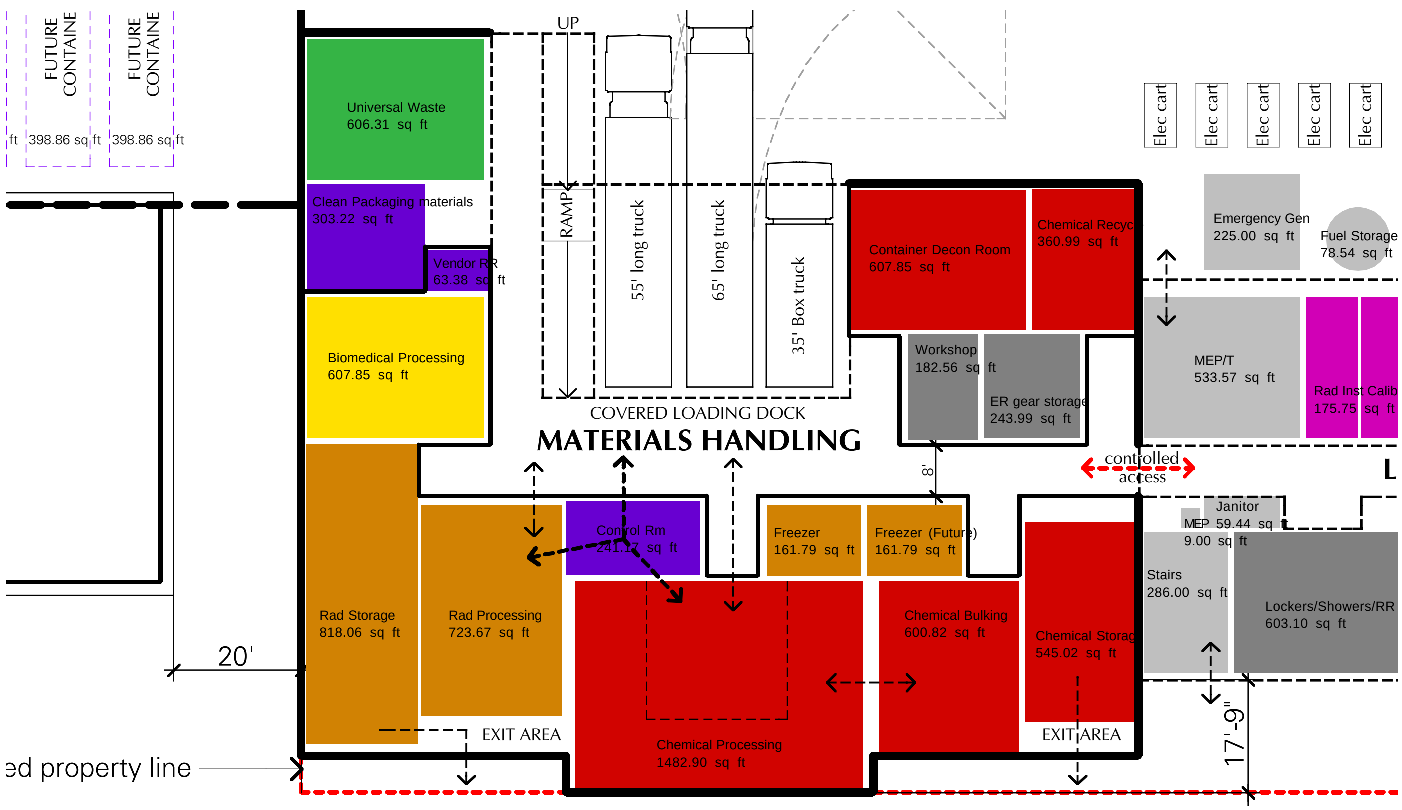
The EH&S administrative area is entered from the elevator or through either stairway. The overall organization places private offices and conference rooms along the north and south walls to allow for optimum daylight exposure. Daylight can be provided to the offices through north and south facing glass. Open-office workstations are located in the middle of the floor. Daylight can be provided to the workstations via “borrowed light” from the perimeter offices by providing glass on the office interior perimeter walls as well as from rooftop clerestories. The support spaces not requiring daylight are located along the solid east and west walls.



scale: 1″ = 30′-0″

Materials Handling Access

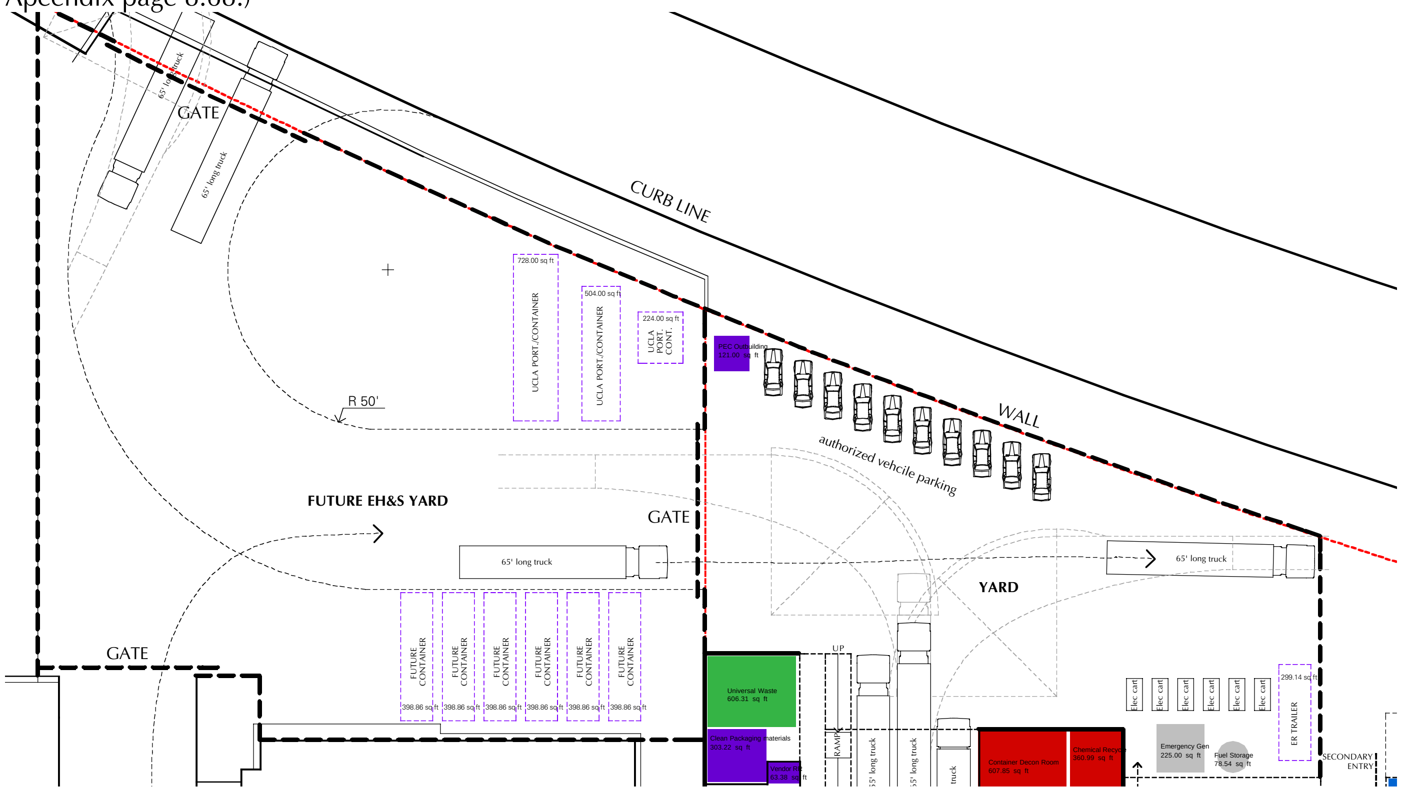
Access to the *materials handling* area is either from the lab area or from the loading dock - both of which are monitored and controlled. Lockers/showers/restrooms are located on the west end of the lab area which are to be used as a decontamination facility as desired for people coming and going into the *materials handling* area. The control room is located at the loading dock with direct views to the loading dock, chemical processing room and the radiation processing room. The “universal waste” and “clean packaging” areas are covered, caged and unconditioned. There is a ramp that connects the lower yard ground level with the building floor level. Some of the southern spaces may require that the secondary exits open out the south wall which could require stairs (depending on the final design and grading) - this is shown as the “exit areas.” A critical planning driver was the fact that the chemical waste spaces (in red) need to have 25% of the room perimeter wall on the exterior - this limited the placment of these spaces. Daylighting opportunities via “slot” windows are possible along the south wall to provide some daylight to the chemical and radiation processing/storage spaces.



scale: 1″ = 30′-0″

Yard

The yard is defined by an 8′ tall enclosure that doesn't allow for view into the yard area. Vendor access to the EH&S yard is from Watkins Drive through the TAPS yard to a controlled gate at the west end of the EH&S yard. Access for authorized campus vehicles only will be from Linden Street and through the TAPS yard. The yard will house some existing portable containers (obtained from UCLA), the PEC (potentially explosive compounds) outbuilding and parking for 10 vehicles and 6 electric carts. Manuevering clearances for semi-trucks (up to 65′ feet long) will need to be provided (the diagram below shows the proposed manuevering routes for these trucks). An additional gate is located on the east side of yard which leads to an access drive to a potential parking lot to the east of the building. Also shown in the TAPS yard are the TAPS buses, bus canopies and potential new area for the bus wash. In the future, the portable offices and containers north of the TAPS building will need to be removed to allow for the EH&S containers if they are to be placed in the location shown (See Apeendix page 8.68.)



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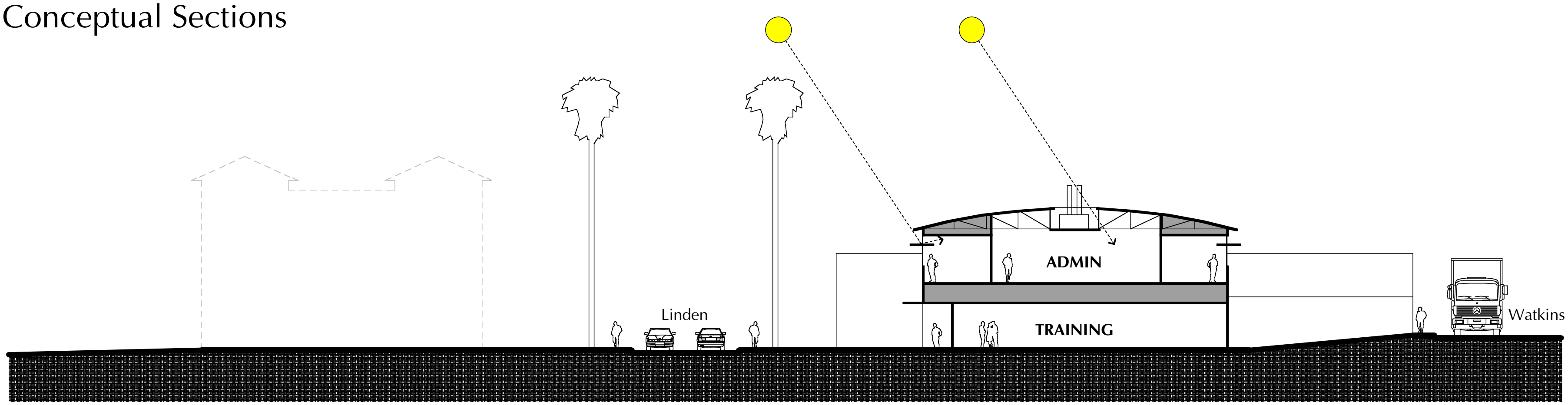
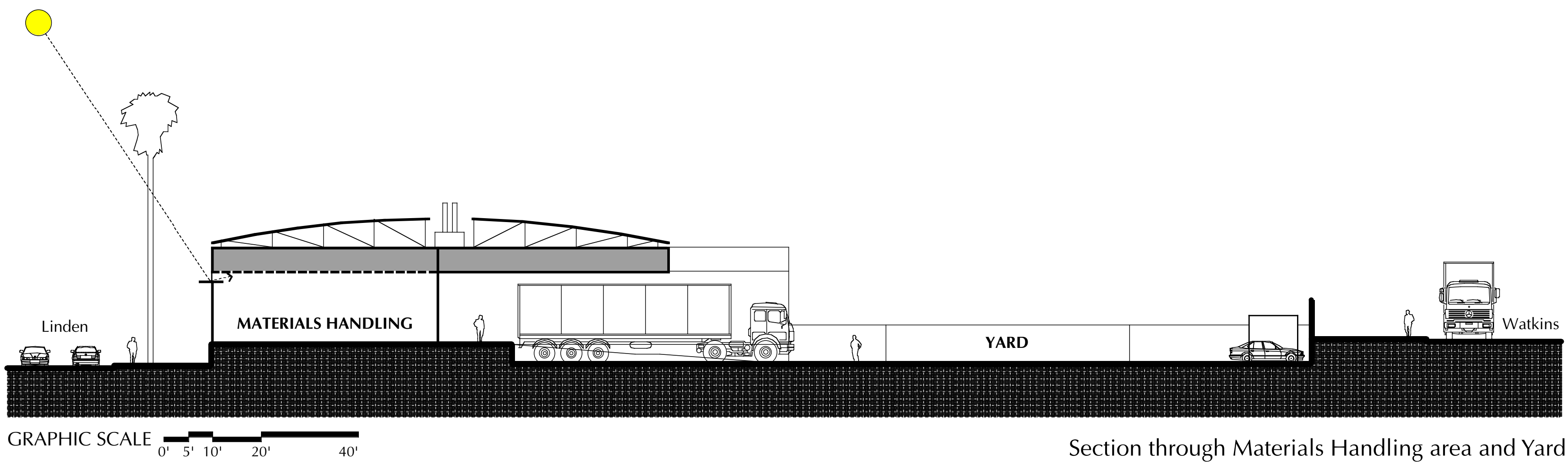
Conceptual Sections



Section through building lobby



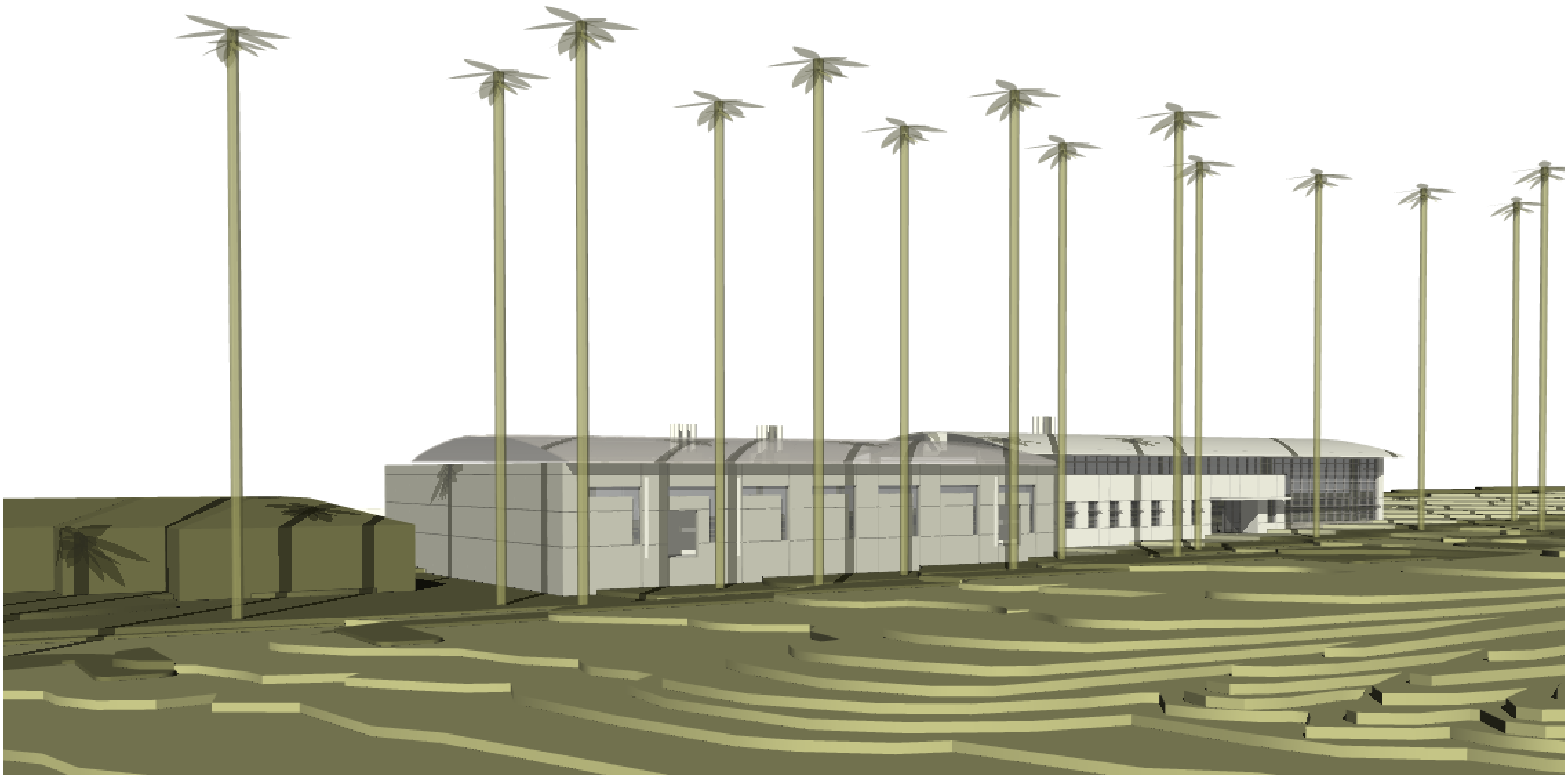
Section through Materials Handling area and Yard

Conceptual Massing

Axonometric view from southeast

Conceptual Massing

View from existing Aberdeen-Inverness Residence Hall

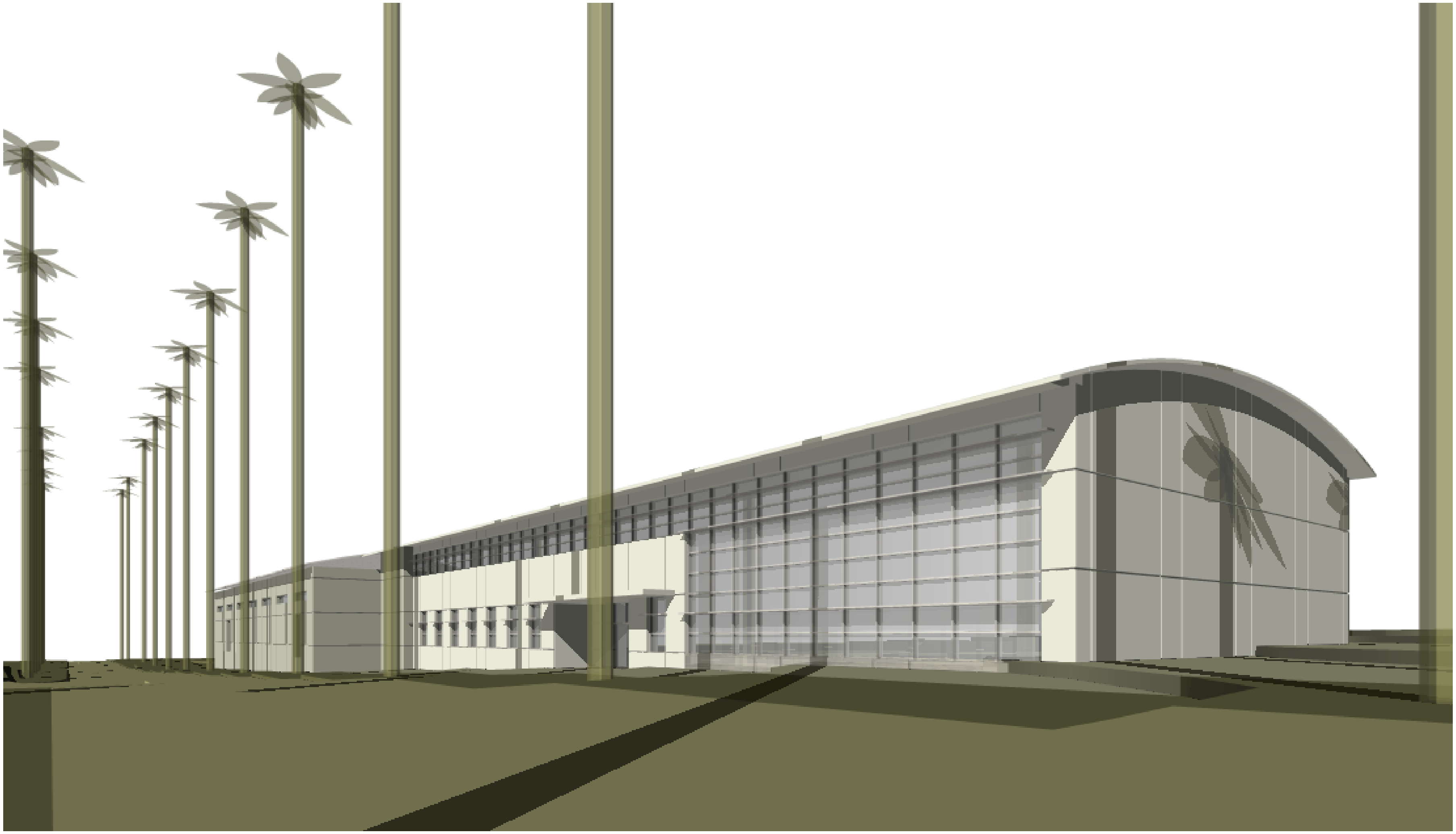


Conceptual Massing

South Elevation

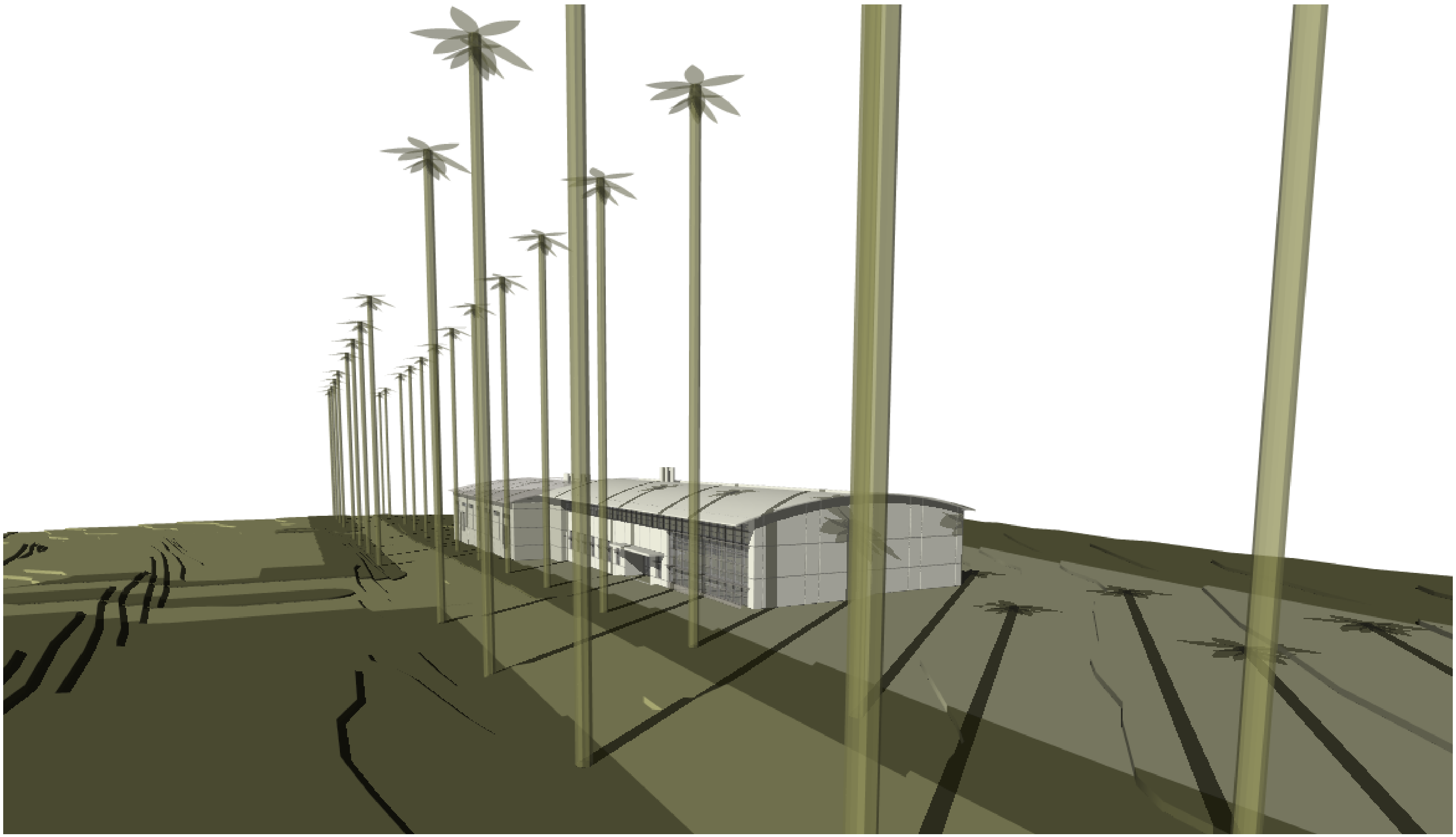
Conceptual Massing

Eye-level view from the southeast



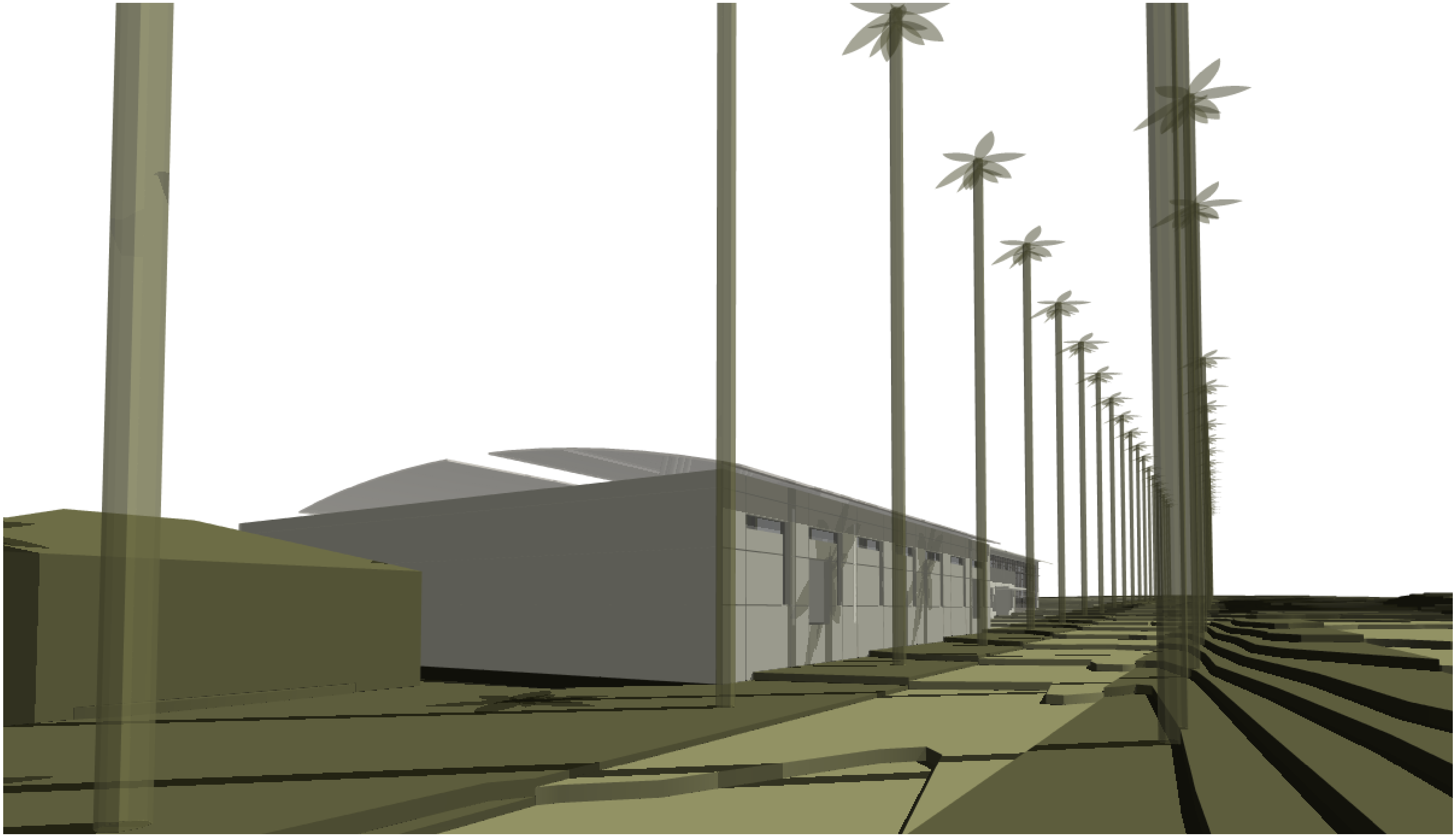
Conceptual Massing

Approximate view from the third level of future Arroyo Housing Student Residence Hall



Conceptual Massing

Eye-level view from southwest along Linden



Overview

This section of the report describes the various systems that comprise the proposed new facility.

Beginning with a description of the code, regulatory and fire protection requirements that the project will likely be subject to, the Systems section continues with recommendations for each major building and site system.

Each building or site system is then portrayed in the following categories: Architectural (interior and exterior), Civil, Structural, Mechanical/Plumbing and Electrical.

General Building Codes, Regulations & Fire Protection

INTRODUCTION

The University of California, Riverside EH&S Facility is a new, combined chemical and radioactive waste handling and office/training facility. The building consists of H-2, H-3, H-7, B and A-3 occupancies. The yard includes a H-1 occupancy trailer.

The quantities of chemicals in the waste handling section will be changing throughout the life of the facility. Because of the unknown amounts, the design approach is based on the possibility of all substances within the defined occupancies to be over the exempt amounts, with the exception of toxic and highly toxic compressed gases.

This report summarizes the key issues in the California Building Code (CBC) and the California Fire Code (CFC) 2001 Editions as adopted by the State Fire Marshal. In general, the key issues deal with general building code requirements and special protection features such as, explosion control, ventilation, containment, and drainage specifically designed for the protection of the building, occupants, and outside environment.

KEY FIRE PROTECTION FEATURES

This portion of the DPP contains a brief description of some of the key fire and life safety systems for the EH&S Facility.

OCCUPANCY CLASSIFICATION

Spaces	Occupancy Classification
Administration	B
Safety Learning Center – General	B
Training Room – Small	B
Training Rooms – Med/Large	A-3
Laboratories	B
Chemical Waste – General	H-3/H-7
Chemical Bulking Room	H-2/H-7
Radiation Waste	H-7
Biomedical Waste	H-7
Universal Waste	B
Yard Trailer	H-1

General Building Codes, Regulations & Fire Protection

STRUCTURAL REQUIREMENTS

Construction Type

The UCR EH&S Facility can be constructed of nominal Type-II, one-hour construction. The table below outlines the general fire-resistive requirements (in hours) for Type-II, one-hour construction taken from Table 6A of the CBC.

Building Element	Type-II one-hour
Interior Bearing Walls	1
Structural Frame	1
Permanent Partitions	1
Roofs and Roof-Ceilings	1

Exterior Wall Requirements

Chapter 5 of the California Building Code provides requirements for the protection of exterior walls and openings. The intent of providing exterior wall protection is to address fire exposure from one building to an adjacent building.

If the assumed property lines are established greater than twenty feet from any exterior wall, they may be of non-rated, non-combustible construction, with unprotected openings. If any of the walls are closer than 20 feet to an assumed property line, they will need to be rated construction with protected openings. On a University campus, actual property lines often don't exist in the interior of the campus, so property lines must be assumed and noted.

In addition to these requirements, not less than 25 percent of the perimeter wall of the H-2 and H-3 occupancies must be an exterior wall.

General Building Codes, Regulations & Fire Protection

Occupancy Separations

Occupancy separations are intended to provide protection from one occupancy to another. Where common walls and floor/ceiling assemblies exist between different occupancies in the same building, fire-resistive separations are to be provided per Table 3-B of the CBC.

A one-hour rated separation with one-hour rated opening protection will be provided between the office area (B) and (H-7) and (H-3). H-2 occupancies need to be separated from other areas by a two-hour occupancy separation with one-and one-half-hour opening protection. A four-hour occupancy separation with no openings must be provided between the A-3 training rooms and (H-3) and (H-7) uses.

Interior Finish Requirements

The table below outlines the interior finish requirements for the building. The ratings shown account for the allowable reduction permitted due to the automatic sprinkler system.

Group A, B and H Occupancies	Class	Maximum Flame Spread	Maximum Smoke Density
a. Exitways	III	200	450
b. Rooms or areas	III	200	450

EGRESS REQUIREMENTS

The small occupant loads of the facility allow the use of minimum required widths for each egress component. Exit corridors are required to be 36 inches in width, unless they serve more than 120 people. Exit doors must have a 36-inch and 32-inch clear width, respectively, unless they serve more than 105 people.

Doors of H occupancies opening into exit corridors are required to be of three-fourths-hour fire-rated protection unless part of an occupancy separation in which case these requirements would govern. These doors are also required to open in the direction of egress travel.

General Building Codes, Regulations & Fire Protection

At least two exits are required for each H occupancy, if they have areas in excess of 200 square feet. The travel distance from any point in the H-2 and H-3 occupancies, to an exit door, must not exceed 75 feet. The travel distance from an H-7 occupancy must not exceed 100 feet to an exit. In addition, the travel distance from any area of the building must not exceed 200 feet.

SUPPRESSION SYSTEMS

Automatic sprinklers and portable fire extinguishers are required in the facility. An ancillary High Expansion Foam or AFFF closed head system may be considered for suppression in the H-2 and H-3 hazardous materials areas.

Automatic Sprinklers

The H-2 and H-3 hazardous material areas are classified as Extra Hazard Occupancies Group 2 and will be designed to provide a minimum of 0.38 gallons per minute per square foot over the most remote 3,000 square feet. Sprinkler coverage for Extra Hazard Occupancies will not exceed 100 square feet.

The H-7 hazardous material areas are classified as Ordinary Hazard Group 2 and will be designed to provide a minimum of 0.17 gallons per minute per square foot over the most remote 3,000 square feet. Sprinkler coverage for Ordinary Hazard Classifications will not exceed 130 square feet.

The sprinkler system within the A and B occupancies will be designed to provide a minimum of 0.10 gallons per minute per square foot over the most remote 1,500 square feet for Light Hazard Occupancies. No single sprinkler coverage will exceed 225 square feet in area.

Portable Fire Extinguishers

Portable fire extinguishers must be located so that the maximum travel distance from any point in the building to an extinguisher does not exceed 50 feet. For rooms with flammable and combustible liquids over the exempt amounts, at least one portable fire extinguisher with a minimum rating of 20-B is required to be located outside of the room within ten feet of the door.

General Building Codes, Regulations & Fire Protection

Foam Systems

The campus EH&S Director and Fire Marshal have indicated that an ancillary or alternate foam suppression system should be considered for the protection of the spaces where flammable and combustible liquids are handled or stored. High Expansion Foam or Closed Head AFFF systems, installed in accordance with NFPA are to be evaluated and presented to these stakeholders to determine an acceptable alternative.

ALARM SYSTEMS

An approved fire alarm system must be installed in all H occupancies. Smoke detection is required in the H-2 and H-3 occupancies. Manual initiating devices are to be located outside of all exit doors from the H rooms and from the building. The activation of this alarm system by sprinkler water flow, smoke detectors, or manual devices must initiate a local visual and audible alarm to alert occupants.

Contamination detection is required for all the H-7 occupancies with radioactive materials. A continuous gas detection system must be provided in any chlorine storage room to detect gas at or below permissible exposure limits. The radioactive contamination and gas detection systems must initiate distinct audible and visual alarms inside and outside the rooms.

The emergency alarm, detection and automatic fire-extinguishing systems must be supervised by an approved central, proprietary or remote station service or must initiate an audible and visual signal at a constantly attended on-site location.

EMERGENCY AND STANDBY POWER

Emergency power shall be supplied automatically to both the exit illumination and exit signs in the event of the premises' wiring system failure. Emergency power is required to be provided in ten seconds.

All required electrical equipment is required to be connected to a standby source of power (i.e. ventilation, emergency alarm system). Standby power is required to be provided in 60 seconds.

In all H-7 occupancies and if highly toxic, highly volatile liquids are used or dispensed, emergency power must be provided in lieu of standby power.

General Building Codes, Regulations & Fire Protection

HAZARDOUS OCCUPANCY SPECIFIC REQUIREMENTS

The requirements shown in the table below are based on the assumption that all hazardous materials within the H-2 and H-3 classifications may be over the exempt amounts with the exception of toxic and highly toxic compressed gases.

Protection Feature	H-2	H-3	H-7
Spill Control	Yes	Yes	Yes
Drainage Control	Yes	Yes	Yes
Secondary Containment	Yes	Yes	Yes[1]
Ventilation	Yes[2]	Yes	Yes
Explosion Control	Yes	No	No
Liquid-tight Floor	Yes	Yes	Yes
Non-combustible Floor	Yes	Yes	Yes
Exhaust Scrubbers	Yes[3]	Yes	No

1 Secondary containment is not required if all radioactive materials are solids.

2 When Class 3 materials are dispensed or used, mechanical exhaust ventilation is required at the point of generation.

3 Exhaust scrubbers are required where a spill or other accidental release of highly toxic liquids is expected to release highly toxic vapors.

General Building Codes, Regulations & Fire Protection

In addition to the provisions outlined above, the following requirements are also applicable:

1. Hazardous materials in excess of the quantities listed in the CFC Table 8003.1.A (shown below) are not to be located in the facility.

TABLE 8003.1-A –REQUIRED DETACHED STORAGE

DETACHED STORAGE IS REQUIRED WHEN THE QUANTITY OF MATERIAL EXCEEDS THAT LISTED

Material		Solids and Liquids (tons) [4,5] X 907.2 for kg	Gases (cubic feet) [4,5] X 0.0283 for m^3
1. Explosives, blasting agents, black powder, fireworks, detonatable organic peroxides 2. Class 4 oxidizers 3. Class 3 or 4 detonatable unstable (reactives)		Over exempt Amounts	Over exempt Amounts
4. Oxidizers, liquids and solids	Class3 Class 3	1,200 2,000	N.A. N.A.
5. Organic peroxides	Class I Class II Class III	Over exempt Amounts 25 50	N.A. N.A. N.A.
6. Unstable (reactives)	Class 4 Class 3 Class 2	1/1,000 1 25	20 2,000 10,000
7. Water reactives	Class 3 Class 2	1 25	N.A. N.A.
8. Pyrophoric gases		N.A.	2,000

[4] For materials which are detonable, the distance to other buildings or property lines shall be as specified in the Building Code. (See C.B.C. Tables 3-F: 3-G, Footnote 1; and 5-A.)

[5] "Over exempt amounts" means over the quantities set forth in Table 8001.13-A.

General Building Codes, Regulations & Fire Protection

2. Static-producing equipment is required to be grounded in H-2 occupancies and where flammable mixtures may be ignited by static electricity.

3. Class I, Division 1 electrical wiring and equipment is required in the H-2 occupancies.

4. Separation of non-compatible materials is required, when the stored materials are in containers having a capacity of at least five pounds or one-half gallon, including within the drainage system. The separation is to be accomplished by one of the following:

   a. Segregating incompatible materials by a minimum of 20 feet.

   b. Isolating incompatible materials by a non-combustible partition extending a minimum of 18 inches above and to the sides of the stored material.

   c. Storage in hazardous materials storage cabinets.

SPILL CONTROL

Floors are required to be sloped with a collection system recessed four inches. Liquid-tight non-combustible sills are also required to retain a spill. At the door openings, an open-grate trench that connects to an approved drainage system may replace the sill.

DRAINAGE CONTROL AND SECONDARY CONTAINMENT

The drainage system is provided to direct liquids to an approved location designed for secondary containment. A minimum slope of one percent to the drain is required. This system is required to handle the maximum worst case spill plus the volume of fire-protection water from the system over the design area for twenty minutes. Incompatible materials are required to be separated. Overflow of the secondary containment is required to be directed to a safe location. The primary container must be monitored for leakage of hazardous materials.

General Building Codes, Regulations & Fire Protection

VENTILATION

Continuously operating ventilation of not less than one cubic foot per minute per square foot of floor area is required. For explosion control, the H-2 room will require increased ventilation at a minimum rate of one and one-half cubic feet per minute. Manual shut-off control switches of the break-glass type labeled "VENTILATION SYSTEM EMERGENCY SHUTOFF" are required. For rooms with fumes or vapors heavier than air, exhaust vapors must be taken at least 12 inches from the floor.

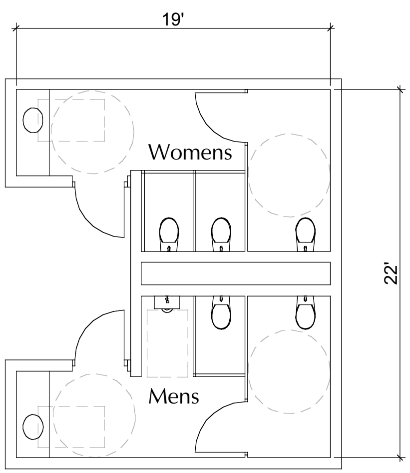
EXPLOSION CONTROL

Explosion Control is required where flammable or explosive vapors may be present. This potential hazard exists for the H-2 room and, therefore, explosion control will be provided with ignition control (active and static), ventilation, and frangible explosion venting.

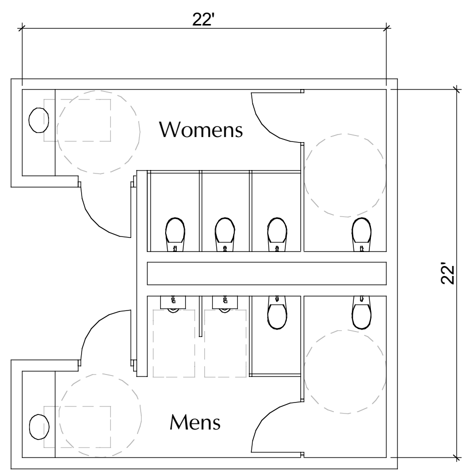
Plumbing Fixture Count Assumptions

Plumbing Fixture Count per 1998 CPC, Table 4-1

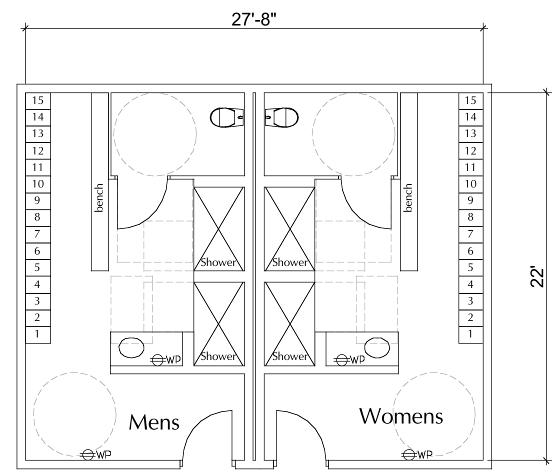
Space	Net Square Feet	notes	Occ. Load Factor CBC Table 10-A	Occupants		Male			Female		Showers	Drinking Fountains	Comments
				Males	*Females*	*WC*	*Urinal*	*Lavatories*	*WC*	*Lavatories*			
Admin (level 2)	4060		100	20	20	2	1	1	3	1		1	df required?
Admin & Labs (level 1)	1620		100	8	8	1	0	1	1	1			df required?
Training	1490	for public	15	50	50	1	1	1	3	1		1	
Materials Handling	7875	warehouse	500	8	8	1		1	1	1	2	1	
Totals	**15045**			**86**	**86**	**5**	**2**	**4**	**8**	**4**	**2**	**3**	



Admin (level 2)



Admin, Labs, Training (level 1)



Materials Handling

Architectural

The building form and material use recalls the main UCR campus while also fitting comfortably near the more utilitarian buildings of the campus corporate yard including the TAPS building. Each of the major building elements – administration, training, laboratory and materials handling are reflected in the scale, massing and materials use proposed for the building. Sloped/pitched galvalum metal roof forms are utilized to shade the building from the harsh south sun and screen significant rooftop equipment.

The primary building skin is assumed to be concrete block. The two story building portion is concrete block with windows and shaded glass curtain wall systems. The materials handling walls are also of conctete block with some “slot” windows along the south. The yard is defined by a decorative concrete block wall around the north and east and a less-expensive screen-wall/fence along the west (adjacent to TAPS).

PROPOSED EXTERIOR ENVELOPE

Walls
Each of the three major building elements is enclosed in a distinctive manner expressing the functions within; these are Administrative/Office/Training, Laboratory, and Materials Handling. In addition, the site yard adjoining the materials handling area is treated with an architectural enclosure.

Administrative/Training
East/West Walls – concrete block (different colors and types to create hierarchy)
North/South Walls – Patterned, insulating glass and aluminum panels in aluminum frames with integral light shelves/sun screens (painted aluminum) and some operable windows
Lobby – primarily patterned glass in aluminum frames with a painted metal entry canopy.

Laboratory
North/South Walls – concrete block with individual, fixed, patterned, insulating glass windows in aluminum frames.

Materials Handling
Generally, concrete with limited quantities of glass block for daylight.

Architectural

Roof
As with the wall materials, the roof of the building changes with the function.

Materials Handling - (one story)
The primary roof system is a multi-ply bitumen roof, with a light color weather coat, over rigid insulation on the structural roof diaphragm. A sloped/pitched roof element (perforated Galvalum) is located above the flat roof to screen the extensive rooftop equipment.

Administrative/Training/Labs - (two story)
This portion of the buildling is roofed with a sloped/pitched standing seam Galvalum roof with a central mechanical well/clerestory to screen rooftop equipment and provide daylight to the central open office area of the administrative level.

INTERIOR FINISHES

Walls
Interior walls are steel stud with painted gypsum board on both sides, framed to structure where required for code or acoustic reasons. Acoustical batting is required between offices, training and conference rooms and restroom areas. The interior of the exterior walls are furred and covered with painted gypsum board. Training and conference rooms may require acoustical wall finishes, marker and tack surfaces. The lobby and primary circulation areas receive premium finishes such as wood, glass and metal to reduce long-term maintenance costs and to recall the exterior materials.

Materials handling areas are of epoxy painted, concrete masonry with some painted gypsum board where functional requirements permit. Some materials handling area walls (universal waste as an example) only require welded wire grid walls in steel frames. Some observation/safety windows are required in specific rooms.

Restroom areas are ceramic tile up to six feet high with epoxy painted gypsum board above.

Ceilings
Generally ceilings throughout the administrative/office/training and laboratory areas are 2 x lay-in acoustic products of varying performance and finish. Areas such as the lobby may receive premium-ceiling treatments such as premium tile, painted gypsum board or wood in keeping with their function. Restroom areas are epoxy painted gypsum board.

Generally ceilings in the materials handling areas are painted exposed structure. Exceptions include: control room (suspended ceiling) and lockers/showers/restroom (epoxy painted gypsum board).

Architectural

Floors

Generally floors throughout the Administrative/Office/Training area are modular carpet tile. Lobby and main circulation areas are of a more durable, low maintenance material such as epoxy terrazzo, 3/8″ thick over the structural slab or linoleum.

Laboratories are typically high quality vinyl tile. Restrooms are ceramic tile. Support spaces such as storage and mechanical/electrical are sealed concrete.

The Materials Handling areas are sealed, industrial grade concrete with an epoxy finish.

Civil

SERVICE AND UTILITIES

Required services for the Environmental Health & Safety Building will include natural gas, potable water, sanitary and storm-sewers, fire protection, electric power, telephone and data/communication. To the extent possible, all utilities will come from existing campus supply sources. It is assumed that the infrastructure improvements described in the East Campus Infrastructure DPP will be completed and available for use prior to construction of the Environmental Health & Safety Building. It may be possible, however, to connect to existing utilities serving the TAPS building.

Criteria used on the design of the sewer, storm drain and water facilities should correspond to the Uniform Plumbing Code, Riverside County Fire Department Standards, State Fire Marshal Standards, Campus Fire Marshal, and any state and federal requirements and be coordinated with the University Design and Construction. The costs for tying all site utilities back to existing facilities are to be borne by the project.

All existing buildings in the vicinity will remain operational during demolition, removal, and installation of all new site utilities. The construction of utility relocations and tie-ins will be closely coordinated with UCR Planning, Design and Construction.

Site Sewer System

The East Campus Infrastructure project recommends that a new 12″ sanitary sewer be constructed in Linden Street adjacent to the Environmental Health & Safety Building. The new sewer lateral for the Environmental Health & Safety Building will connect to this line. Piping material for the new sewer laterals shall be PVC SDR 35, consistent with Campus Design and Construction practice.

Site Storm Water

Existing site drainage is to the southwest. Consistently, the storm water drainage system developed for the building and site around the building will be directed to Linden Street. Storm drain piping material shall be PVC SDR 35 consistent with Campus Design and Construction practice.

Depending upon the LEED strategy (or LEED equivalent), filtration of storm water should be considered.

Civil

Domestic and Fire Water

The East Campus Infrastructure project recommends that a new water main loop in Linden Street adjacent to the Environmental Health & Safety Building. Water supply for the Environmental Health & Safety Building will connect to this line. Site water piping shall be PVC SDR 14, consistent with University of California Campus Design and Construction practice. Both the domestic and fire laterals will require backflow preventors in accordance with UCR list of approved backflow devices.

Natural Gas

The Southern California Gas Company (SGC) supplies natural gas to the campus. Based on a review of the Arroyo Student Housing DPP, it appears that a new gas service is envisioned in Linden Street. Natural gas for the Environmental Health & Safety Building will likely connect to the proposed service in Linden.

GRADING

Based on a review of an available topographical map, the site falls roughly 16 feet with the high point being the eastern tip of the site and the low point the southwest corner of the site. Some retaining systems may be required to create a workable service and loading area. Based on one concept, the retaining walls vary in height from zero to six feet. Likewise, due to the existing slope the building will likely be located in a cut-fill transition zone. We estimate that there could be as much as seven feet of fill under the west end of the building.

Structural

Foundations:

Typical foundation for all the buildings in the complex consists of conventional interior and exterior shallow strip footings with 2′-0″ minimum embedment into the lowest adjacent grade, spread footings under the columns, and concrete slab on grade with minimal reinforcing.

Vertical Load Carrying System:

- Administration and Training Portion: A steel space frame two-story building, with steel beams and girders and columns supporting a steel roof deck, and steel beams and girders supporting metal deck with light weight concrete infill floor system. The exterior cladding consists of concrete masonry units and glass curtain walls with light shelves/ sun shades.

- Waste Handling Portion: Steel beams and steel columns supporting a steel deck roof, with exterior perimeter concrete block bearing walls.

Lateral Force resisting System:

The lateral system for the Administration and Training building shall be steel braced frames, steel moment-resisting frames, or a combination of the two systems. The perimeter concrete block walls will act as shear wall to resist the lateral forces in the Waste Handling building.

The occupancy category for the Waste Handling Building, as defined in Table 16-K of California Building Code, is Hazardous Facilities with a Seismic Importance Factor of 1.25. The occupancy category for the Administration Building is Standard Occupancy with a Seismic Importance Factor of 1.0.

Lab & Materials Handling

The following criteria are to be used as a portion of the framework for the technical systems design of University of California Riverside - Environmental Health Safety Building. They establish the parameters for the laboratory and material handling spaces for various structural, mechanical, and electrical systems, to be built upon, as further information for the new building is determined. Further elaboration will be required as the building proceeds through Schematic Design/Design Development phases.

The building is divided into three basic area types; office/training, laboratory and materials handling.

Structural and Vibration Control Systems

The most critical function in this category is the laboratory area consisting of the General Lab with its attached, shielded Instrument Calibration Lab and the Radiation Laboratory. Located in this same area is a storage room that should be designed to the same criteria to provide laboratory expansion space when required. This space is designed to meet modern laboratory standards with a 10'-6" wide planning grid with multiples of 11'- 0" used for the depth.

> The increasing use of scientific instrumentation with sensitivity of these instruments to vibration interference suggests a live floor loading in excess of code requirements for all laboratory spaces and a requirement for mass in the structure to minimize vibration interference potential.
>
> Because vibration is such a critical matter, this portion of the building shall be nominally designed to a velocity of 4000 micro inches per second, which will provide adequate stability for the use of 50X microscopes and sensitive calibration equipment.
>
> Coordination between the structural and mechanical engineers is important. Particular attention will be given to the vibration isolation of air handling units, fume hood exhaust fans, associated ductwork and piping and their interaction with the building structure.

A less critical area is the Material Handling space which includes the movement of fork-lifts and material handling dollies. To provide access for moving materials in a safe and efficient manner a planning grid of 11'-0" in width and multiples of 11'-0" in depth was determined to be most efficient. A clear height of fifeteen feet is to be maintained, equivalent to three pallet rack high storage systems, below structural and mechanical/ plumbing/ electrical components in the processing areas. Even though this area is to be noisier because of the processing and equipment present it is still important to minimize noise and vibration as much as possible. The structure is also to be designed to allow for a comfortable level of natural illumination in an even light level throughout the material handling area. Explosion relief is to be provided for selected rooms as indicated in the Room Data Sheets.

Lab & Processing

The following are recommended - See the Room Data Sheets for the individual room conditions:

1. Vibration, Noise and Acoustics
   a. General: The surface finishes of laboratories and processing areas are required to be hard wearing, chemically resistant, and easily cleaned. This usually results in surfaces, which are hard and non-porous. These in turn are highly sound reflecting and result in rooms which are excessively reverberant. Reverberant rooms have the following characteristics:
      (1) High ambient noise level.
      (2) Limited decrease in the noise level with distance from the noise source.
      (3) Poor intelligibility of speech
   b. Surface Finishes: Sound absorbing surfaces are usually porous, soft or fibrous, making them unsuitable for laboratory walls and floors. It is recommended that some absorption be introduced on the ceiling.
   c. Floor Covering: Footfall on hard floors in the laboratories produces noise and excites the floor, creating vibration. Code issues require the floor be liquid-tight. Processing areas are less critical to vibration.
   d. Criteria: The recommended criteria for various spaces are tabulated below [based on current ASHRAE guidelines]:

Space Category	Noise Criterion
Laboratories	NC 45-50
Conference Rooms	NC 25-30
Private Offices	NC 30-35
Reception, Lobbies, Open Offices	NC 35-40
Corridors, Stairways (Non-sensitive listening)	NC 35-40
Processing Areas	NC 45-50

Lab & Processing

Building Codes, Design Guidelines and Standards

A detailed code search should be performed at the beginning of the Schematic Design Phase after the scope of the project has been developed. The information in this section is not the result of a comprehensive code search, but merely a listing of code and standard requirements that have been determined to date.

1. Jurisdiction
2. Adopted Building Codes
3. Federal Regulations
   The following Federal Regulations are not building codes, but may impact the design, construction, and operation of project:
   a. Federal Occupational Safety and Health Act of 1970 (OSHA)
   b. U.S. Environmental Protection Agency Regulations
   c. Americans with Disabilities Act, Accessibility Guidelines for Buildings and Facilities.
4. Design Guidelines, Standards and References
   The following documents are applicable to laboratory building design, in addition to the codes listed above:
   a. NFPA, including the following sections:
      (1) NFPA 10, Fire Extinguishers
      (2) NFPA 13, Installation of Sprinkler Systems
      (3) NFPA 14, Standpipe and Hose Systems
      (4) NFPA 24, Private Fire Mains
      (5) NFPA 45, Fire Protection for Laboratories Using Chemicals
      (6) NFPA 45-3-4.1, Egress
      (7) NFPA 45-13, Automatic Sprinklers
      (8) NFPA 70, National Electrical Code
      (9) NFPA 72, Fire Alarm Code
      (10) NFPA 101, Life Safety Code
   b. ASHRAE 110-1995 (Methods of Testing Performance of Laboratory Fume Hoods)
   c. ASHRAE HANDBOOK, 1993: Heating, Ventilating and Air Conditioning Systems and Applications. Chap. 30: Laboratories
   d. ANSI Z358.1 (Emergency Eyewash and Shower Equipment)
   e. ACGIH Industrial Ventilation Manual
   f. NIH Guidelines for the Laboratory Use of Chemical Carcinogens, (US DHHS)

Lab & Processing

g. Prudent Practices for Handling Hazardous Chemicals in Laboratories. National Research Council. National Academy Press, 1981

h. Safety in Academic Chemistry Laboratories, American Chemical Society, 1990 (suggestions for design and use)

i. CDC-NIH Biosafety in Microbiological and Biomedical Laboratories, (US DHHS, 1993)

j. Standard Number 49, Class (II) (Laminar Flow) Biohazard Cabinetry. National Sanitation Foundation, (1992)

k. Guidelines for Research Involving Recombinant DNA Molecules, (NIH Guidelines) United States Department of Health and Human Services

l. UC Lab Safety guidelines

Mechanical, Plumbing & Electrical

These mechanical, plumbing, and electrical system design narratives are descriptions and design criteria for the following systems as they are impacted on this project: HVAC, plumbing, electrical power, lighting, telephone, voice/data networking, and fire alarm.

CODES AND STANDARDS

All mechanical, plumbing, and electrical work will comply with the latest versions of the following codes and standards:

- California Code of Regulations, Title 24
  - Part 3, the California Electrical Code
  - Part 4, the California Mechanical Code
  - Part 5, the California Plumbing Code
  - Part 6, the California Energy Code
  - Part 9, the California Fire Code
- National Fire Protection Association (NFPA)
- National Electric Code (NEC), 1996 Edition and all local amendments thereto
- National Electrical Manufacturer's Association (NEMA)
- Institute of Electrical and Electronic Engineers (IEEE)
- American National Standards Institute (ANSI)
- Underwriters Laboratories, Inc. (UL)
- All local agencies having jurisdiction

In case of conflicts among the referenced codes and standards, the more stringent provision will govern.

Mechanical, Plumbing & Electrical

HVAC SYSTEMS

The HVAC systems described below are the equipment and systems currently recommended to provide space comfort, ventilation, safety, and code compliance, in an energy efficient manner, and within the current project budget constraints. The primary HVAC units are high-SEER rooftop package units (RTUs).

The UC Riverside has, however, expressed a preference for certain alternative HVAC systems if the project budget is augmented or if future cost estimating determines that such alternative systems are possible within the cost model. These alternative HVAC equipment and systems involve replacing the RTUs with air handling units (AHUs) using chilled water (CHW) cooling coils and heating hot water (HHW) heating coils. CHW would be generated in a local air-cooled chiller and would be pumped and distributed around to the AHUs in a CHW hydronic loop. HHW would be generated in a hot water boiler and would be pumped and distributed around to AHUs and terminal reheat coils in an HHW hydronic loop. More details on these alternative HVAC equipment and systems can be found at the end of the "HVAC Systems" section.

General - Package Rooftop HVAC Units

The building heating, ventilating, and cooling (HVAC) will generally be provided by package, rooftop, gas furnace heating, electric DX cooling, HVAC units, hereinafter referred to as rooftop units (RTUs).

The RTUs will all be high efficiency units (14 to 16 SEER, Seasonal Energy Efficiency Ratio), and will each include a direct expansion cooling coil, semi-hermetic reciprocating compressors, a gas furnace heater, a supply fan, a premium efficiency supply fan motor, double wall construction, and a 30% efficient pre-filter with a 85% (MERV 13, minimum efficiency reporting value) final filter. Thermostats furnished with the RTUs shall be the programmable type. All RTU controls will be direct digital controls (DDC) furnished and packaged by the RTU manufacturer, and connected into the campus energy management system (EMS). RTU refrigerant shall be a non-CFC refrigerant; probably R-22, but R-410 will be considered if available. Each RTU will be mounted on a curb with spring vibration isolators. The curb will be mounted on top of a minimum 4" thick light weight concrete pad which will extend minimum 24" beyond curb dimensions. Some RTUs will have certain customized features as described below for the RTU that serves each individual area. RTUs will be screened from public as well as campus views.

Mechanical, Plumbing & Electrical

Administration Area

The Administration Area (second floor) will be served by three RTUs (RTU-1, RTU-2, and RTU-3), all mounted on the roof directly above their respective service areas, with downshot supply air and return air ductwork. Each RTU will be variable air volume (VAV) with a variable frequency drive (VFD) on the supply fan motor. Each RTU will have a 100% automatic economizer with barometric relief for the exhaust. Indoor air quality will be monitored and controlled through carbon dioxide sensors integrated with the Energy Management System (EMS). The carbon dioxide sensors will be located near the thermostat in the area served and in the outside air intake for comparative measuring. The carbon dioxide sensors in the zones will integrate with the automatic economizer control such that sufficient minimum outside air is brought in to keep room carbon dioxide levels below 600 to 800 ppm.

The server room will have a dedicated, roof-mounted, packaged, heat pump. This will allow it to receive space conditioning service 24 hours per day/7 days per week, even when the main RTUs are shut down during non-occupancy periods.

RTU-1. RTU-1 will serve all the northside rooms between the director's office and the fire/building plan archive storage room, inclusive. There will be three zones on RTU-1, which will each have a VAV modulating damper tied to a thermostat. As the set temperatures are achieved in the zones, the thermostats will modulate their respective VAV dampers towards a more closed position. The duct pressure sensor will, in turn, sense an increase in duct static pressure and will modulate the VFD to slow down the supply fan motor to return duct static pressure to the set point. Code minimum ventilation rates will be maintained however.

Zone 1 will be the director's office, the small conference room adjacent to it on the east, and the office adjacent to the small conference room on the east. The thermostat for Zone 1 will be in the director's office. This will also be the main thermostat controlling RTU-1.

Zone 2 will be the three offices and work/copy room immediately to the east of Zone 1. The thermostat for Zone 2 will be in the office just west of the work/copy room.

Zone 3 will be the three offices and the fire/building plan archive storage room immediately to the east of Zone 2. The thermostat for Zone 3 will be in the office just west of the fire/building plan archive storage room.

RTU-2. RTU-2 will serve all the southside rooms, including the seven offices, the tech library, and the large conference room. There will be four zones on RTU-2, which will each have a VAV modulating damper tied to a thermostat. As the set temperatures are achieved in the zones, the thermostats will modulate their respective VAV dampers towards a more closed position. The duct pressure sensor will, in turn, sense an increase in duct static pressure and will modulate the VFD to slow down the supply fan motor to return duct static pressure to the set point. Code minimum ventilation rates will be maintained however.

Zone 1 will be the four offices on the west side of the RTU-2 service area. The thermostat for Zone 1 will be in the second office from the west end. This will also be the main thermostat controlling RTU-2.

Zone 2 will be the tech library. The thermostat for Zone 2 will be in the tech library.

Zone 3 will be the three offices between the tech library and the large conference room. The thermostat for Zone 3 will be in the middle office.

Zone 4 will be the large conference room. The thermostat for Zone 4 will be in the large conference room.

RTU-3. RTU-3 will serve all the interior open office space, the file archive storage room, and the rest rooms. There will be a single zone on RTU-3. As the set temperatures are achieved in the zone, the thermostat will modulate the VFD to slow down the supply fan motor. Code minimum ventilation rates will be maintained however. The thermostat will be located on the south interior wall common with the tech library.

Training Area

The Training Area (first floor) will be served by three RTUs (RTU-4, RTU-5, and RTU-6), all mounted on the roof. Supply air and return air ductwork will pass from the roof to the Training Area on the first floor through shafts. As such, RTUs serving the Training Area will likely be the horizontal discharge type, rather than downshot. Each RTU will have a 100% automatic economizer with barometric relief for the exhaust. Indoor air quality will be monitored and controlled through carbon dioxide sensors integrated with the EMS. The carbon dioxide sensors will be located near the thermostat in the area served and in the outside air intake for comparative measuring. The carbon dioxide sensors in the zones will integrate with the automatic economizer control such that sufficient minimum outside air is brought in to keep room carbon dioxide levels below 600 to 800 ppm.

The elevator machine room will have an exhaust fan connected to a room thermostat. The exhaust fan will activate whenever room temperature reaches 85 degrees rising.

Mechanical, Plumbing & Electrical

RTU-4. RTU-4 will serve the training room with 60 seats and the training computer lab. It will be a VAV unit with a variable frequency drive (VFD) on the supply fan motor. There will be two zones on RTU-4, which will each have a VAV modulating damper tied to a thermostat. As the set temperatures are achieved in the zones, the thermostats will modulate their respective VAV dampers towards a more closed position. The duct pressure sensor will, in turn, sense an increase in duct static pressure and will modulate the VFD to slow down the supply fan motor to return duct static pressure to set point. Code minimum ventilation rates will be maintained however.

Zone 1 will be the training room with 60 seats. The thermostat for Zone 1 will be in this room, located on the interior wall near the door. This will also be the main thermostat controlling RTU-4.

Zone 2 will be the training computer lab. The thermostat for Zone 2 will be in this room, located on the interior wall near the door.

RTU-5. RTU-5 will serve the break room, rest rooms, and furniture storage. It will be a constant air volume (CAV) unit with a single thermal zone. The programmable thermostat will be located in the break room on an interior wall near the door. It will control the activation and deactivation of RTU-5 based on the programmed occupancy schedule. It will also automatically control the condensing unit and gas furnace to maintain set temperature in the space during the occupied period.

The rest rooms will also be served by a single roof-mounted exhaust fan to which rest room air will be ducted up through the shaft to the roof. This exhaust fan will be interlocked with RTU-5.

RTU-6. RTU-6 will serve the lobby, reception, corridor, pre-function, ergo station, and office. It will be a VAV unit with a variable frequency drive (VFD) on the supply fan motor. There will be three zones on RTU-6, which will each have a VAV modulating damper tied to a thermostat. As the set temperatures are achieved in the zones, the thermostats will modulate their respective VAV dampers towards a more closed position. The duct pressure sensor will, in turn, sense an increase in duct static pressure and will modulate the VFD to slow down the supply fan motor to return duct static pressure to set point. Code minimum ventilation rates will be maintained however.

Zone 1 will be the office. The thermostat for Zone 1 will be in this room, located on the interior wall near the door. This will also be the main thermostat controlling RTU-6.

Zone 2 will be the lobby, reception, corridor, and pre-function. The thermostat for Zone 2 will be on the interior wall behind the reception area.

Zone 3 will be the ergo station. The thermostat for Zone 3 will be in this area, located on the south interior wall.

Mechanical, Plumbing & Electrical

Labs Area

The Labs Area (first floor) will be served by two RTUs (RTU-7 and RTU-8), both mounted on the roof. Supply air and exhaust air ductwork will pass from the roof to the Labs Area on the first floor through shafts. As such, RTUs serving the Labs Area will likely be the horizontal discharge type, rather than downshot. These two RTUs will be 100% outside air. As such, they will have no economizers or barometric exhaust relief. Also, since these are 100% outside air HVAC systems, no carbon dioxide sensors are needed for indoor air quality monitoring and carbon dioxide control.

RTU-7. RTU-7 will supply conditioned air to the radiation lab, radiation instrument calibration room, fire extinguisher storage, and lab storage. No air will be returned from these areas, since RTU-7 will be a 100% outside air HVAC system. RTU-7 will be a constant air volume (CAV) unit with a single thermal zone. During the occupied period, the radiation lab and the radiation instrument calibration room will be provided with a minimum of six air changes per hour, however the exhaust air flow requirements for the two hoods in the radiation lab will probably dictate higher supply air flow requirements. RTU-7 shall be capable of turndown to two to three air changes and hour during the unoccupied period. A VFD, connected to the programmable thermostat, shall be provided with RTU-7 to allow this turndown during the unoccupied period. The programmable thermostat will be located in the radiation lab on an interior wall near the door. It will control the activation and slow down of RTU-7 based on the programmed occupancy schedule, taking into account hood exhaust fan operational requirements as well. It will also automatically control the condensing unit and gas furnace to maintain set temperature in the space during the occupied period.

A six-foot wide radioisotope fume hood with a HEPA filter on the exhaust and a six-foot wide lead-shielded (internal) fume hood with an isotope filter system will be located in the radiation lab. These will be the primary exhaust for this room, as well as for the radiation instrument calibration room, fire extinguisher storage, and lab storage from which supplied air will be allowed to flow through transfer grilles to the radiation lab where it will all be exhausted through the hoods. As such, the hoods should have bypass sashes. The exhaust fan for these hoods will also be interlocked with RTU-7, such that whenever RTU-7 operates, the exhaust fan operates as well. A VFD on the exhaust fan shall operate the fan at a slower speed during the unoccupied period. The radiation lab and the entire RTU-7 service area shall be maintained under negative pressure with respect to the adjacent corridor. Therefore, the air supplied to these rooms should be slightly less than the air exhausted from the radiation lab through the hoods.

Hood exhaust ductwork will be continuously welded 316 stainless steel, minimum 18 gauge, sealed to at least Class 3. Exhaust velocities will range from 1,500-1,800 feet per minute increasing from the hoods to the roof-mounted exhaust fan. Hood collar connections will be made with concentric transitions. Ductwork will be routed up a shaft to the roof and will take the straightest route as possible minimizing bends and horizontal runs. The exhaust fan for the hoods shall be a roof-mounted upshot utility fan, designed for continuous duty service with air containing radioactive, corrosive, and flammable vapors and gases. It shall have a stack that, combined with the fan, has an exhaust discharge point 10 feet above the roof. The exhaust fan shall be the fiberglass reinforced plastic (FRP), high-plume dilution type that entrains air at the fan in a jet action to project the exhaust plume well up and away from the building.

Air velocities at the hoods and the biological safety cabinets shall be designed and tested in accordance with the American Society of Heating, Refrigerating, and Air Conditioning Engineers/American National Standard Institute Standard 110-1985 (ASHRAE/ANSI Standard 110-1985), entitled “Method of Testing Performance of Laboratory Fume Hoods,” and in accordance with the American Industrial Hygiene Association Standard Z9.5-1192 (ANSI/AIHA Standard Z9.5-1992), entitled “American National Standard for Laboratory Ventilation.” Essentially, the hoods must meet requirements for minimum air flow face velocities. Actual air flow face velocities are determined through a testing procedure as set forth in ASHRAE/ANSI Standard 110-1985. The open face of each hood is divided into a grid of 12 square inch sections. The air flow velocity is measured at the center of each 12 square inch section using a thermoanemometer. To comply with ANSI/AIHA Z9.5-1992, measured air velocities in each section should be between 60 and 120 feet per minute (fpm). The average air velocity should be a minimum of 100 fpm. No reading should be below 60 fpm.

RTU-8. RTU-8 will supply conditioned air to the general lab, package storage, lockers/showers/rest rooms, the janitor’s closet, and the lab corridor. No air will be returned from these areas, since RTU-8 will be a 100% outside air HVAC system. RTU-8 will be a constant air volume (CAV) unit with a single thermal zone. The general lab and the package storage room will be provided with a minimum of six air changes per hour, however the exhaust air flow requirements for the fume hood in the general lab may dictate higher supply air flow requirements. The programmable thermostat will be located in the general lab on an interior wall near the door. It will control the activation and deactivation of RTU-8 based on the programmed occupancy schedule, taking into account fume hood exhaust fan operational requirements as well. It will also automatically control the condensing unit and gas furnace to maintain set space temperature during the occupied period.

A six-foot wide chemical fume hood and an exhausted glass fronted charging station will be located in the General Lab. These will be the primary exhaust for this room, as well as for the package storage room from which supplied air will be allowed to flow through a transfer grille to the general lab where it will be exhausted through the fume hood and the glass fronted charging station. As such, the fume hood should have a bypass sash. The exhaust fan for the fume hood and the glass fronted charging station will also be interlocked with RTU-8, such that whenever RTU-8 operates, the exhaust fan operates as well. The general lab and the package storage room shall be maintained under negative pressure with respect to the adjacent corridor. Therefore, the air supplied to these rooms should be slightly less than the air exhausted from the general lab through the fume hood and the glass fronted charging station.

Mechanical, Plumbing & Electrical

Exhaust ductwork for the fume hood and glass fronted charging station will be continuously welded 316 stainless steel, minimum 18 gauge, sealed to at least Class 3. Exhaust velocities will range from 1,500-1,800 feet per minute increasing from the fume hood to the roof-mounted exhaust fan. Hood collar connections will be made with concentric transitions. Ductwork will be routed up a shaft to the roof and will take the straightest route as possible minimizing bends and horizontal runs. The fume hood exhaust fan shall be a roof-mounted upshot utility fan, designed for continuous duty service with air containing corrosive and flammable vapors and gases. It shall have a stack that, combined with the fan, has an exhaust discharge point 10 feet above the roof. The fume hood exhaust fan shall be the fiberglass reinforced plastic (FRP), high-plume dilution type that entrains air at the fan in a jet action to project the exhaust plume well up and away from the building.

Air velocities at the fume hood shall be designed and tested in accordance with the American Society of Heating, Refrigerating, and Air Conditioning Engineers/American National Standard Institute Standard 110-1985 (ASHRAE/ANSI Standard 110-1985), entitled “Method of Testing Performance of Laboratory Fume Hoods,” and in accordance with the American Industrial Hygiene Association Standard Z9.5-1192 (ANSI/AIHA Standard Z9.5-1992), entitled “American National Standard for Laboratory Ventilation.” Essentially, the fume hood must meet requirements for minimum air flow face velocities. Actual air flow face velocities are determined through a testing procedure as set forth in ASHRAE/ANSI Standard 110-1985. The open face of the fume hood is divided into a grid of 12 square inch sections. The air flow velocity is measured at the center of each 12 square inch section using a thermoanemometer. To comply with ANSI/AIHA Z9.5-1992, measured air velocities in each section should be between 60 and 120 fpm. The average air velocity should be a minimum of 100 fpm. No reading should be below 60 fpm.

The lockers/showers/rest rooms and the janitor’s closet will also be served by a single roof-mounted exhaust fan to which exhaust air will be ducted up through the shaft to the roof. This exhaust fan will be interlocked with RTU-8.

Materials Handling Area

The Materials Handling Area (first floor) will be served by three RTUs (RTU-9, RTU-10, and RTU-11), all mounted directly above their respective service areas, with downshot supply air ductwork. These three RTUs will be 100% outside air. As such, they will have no economizers or barometric exhaust relief. Also, since these are 100% outside air HVAC systems, no carbon dioxide sensors are needed for indoor air quality monitoring and carbon dioxide control.

Mechanical, Plumbing & Electrical

The walk-in freezers will have their own self-contained HVAC systems specifically designed for freezer applications.

RTU-9. RTU-9 will supply conditioned air to the chemical processing room, chemical bulking room, chemical storage room, and workshop. No air will be returned from these areas, since RTU-9 will be a 100% outside air HVAC system. RTU-9 will be a constant air volume (CAV) unit with a single thermal zone. The chemical processing room and the chemical bulking room will be provided with a minimum of ten to twelve air changes per hour with low velocity, and the chemical storage room and workshop will be provided with a minimum of six air changes per hour. The programmable thermostat will be located in the workshop on an interior wall near the door. It will control the activation and deactivation of RTU-9 based on the programmed occupancy schedule, taking into account fume hood exhaust fan operational requirements as well. It will also automatically control the condensing unit and gas furnace to maintain set temperature in the space during the occupied period.

A five-foot wide chemical fume hood, three snorkel exhausts, exhausted cabinets, and back draft slots will be located in the chemical processing room. These will be the exhaust for this room. As such, the fume hood should have a bypass sash. The chemical processing room shall be maintained under negative pressure with respect to the adjacent loading dock area. Therefore, the air supplied to this room should be slightly less than the air exhausted from the chemical processing room through the fume hood, three snorkel exhausts, exhausted cabinets, and back draft slots.

Two six-foot rising sash drum hoods, and three low general exhaust grilles will be located in the chemical bulking room. These will be the exhaust for this room. The chemical bulking room shall be maintained under negative pressure with respect to the adjacent loading dock area. Therefore, the air supplied to this room should be slightly less than the air exhausted from the chemical bulking room through the two six-foot rising sash drum hoods, and three low general exhaust grilles.

Exhaust for the chemical storage room will consist of two low exhausts in the corners of the room and general room exhaust. Exhaust for the workshop will consist of general room exhaust and localized dust collection exhaust. The chemical storage room and workshop shall be maintained under negative pressure with respect to the adjacent loading dock corridor area. Therefore, the air supplied to these rooms should be slightly less than the air exhausted from them.

Exhaust ductwork from the various exhaust sources in the chemical processing room, chemical bulking room, chemical storage room, and workshop will be continuously welded 316 stainless steel, minimum 18 gauge, sealed to at least Class 3. The various exhaust duct branches will be manifolded together on the roof into a trunk exhaust duct that runs over to the roof-mounted exhaust fan. Exhaust velocities will range from 1,500-1,800 feet per minute increasing from the exhaust sources to the roof-mounted exhaust fan. Fume hood collar connections will be made with concentric transitions. Ductwork

Mechanical, Plumbing & Electrical

will take the straightest route possible, minimizing bends and horizontal runs. The exhaust fan shall be a roof-mounted upshot utility fan, designed for continuous duty service with air containing corrosive and flammable vapors and gases. It shall have a stack that, combined with the fan, has an exhaust discharge point 10 feet above the roof. The exhaust fan shall be the fiberglass reinforced plastic (FRP), high-plume dilution type that entrains air at the fan in a jet action to project the exhaust plume well up and away from the building. The exhaust fan will also be interlocked with RTU-9, such that whenever RTU-9 operates, the exhaust fan operates as well.

Air velocities at the fume hood shall be designed and tested in accordance with the American Society of Heating, Refrigerating, and Air Conditioning Engineers/American National Standard Institute Standard 110-1985 (ASHRAE/ANSI Standard 110-1985), entitled "Method of Testing Performance of Laboratory Fume Hoods," and in accordance with the American Industrial Hygiene Association Standard Z9.5-1192 (ANSI/AIHA Standard Z9.5-1992), entitled "American National Standard for Laboratory Ventilation." Essentially, the fume hood must meet requirements for minimum air flow face velocities. Actual air flow face velocities are determined through a testing procedure as set forth in ASHRAE/ANSI Standard 110-1985. The open face of the fume hood is divided into a grid of 12 square inch sections. The air flow velocity is measured at the center of each 12 square inch section using a thermoanemometer. To comply with ANSI/AIHA Z9.5-1992, measured air velocities in each section should be between 60 and 120 feet per minute (fpm). The average air velocity should be a minimum of 100 fpm. No reading should be below 60 fpm.

RTU-10. RTU-10 will supply conditioned air to the radiation processing room, radiation storage room, biomedical processing room, and control room. No air will be returned from these areas, since RTU-10 will be a 100% outside air HVAC system. RTU-10 will be a constant air volume (CAV) unit with a single thermal zone. The radiation processing room, radiation storage room, and biomedical processing room will be provided with a minimum of six air changes per hour. The programmable thermostat will be located in the control room on an interior wall near the door. It will control the activation and deactivation of RTU-10 based on the programmed occupancy schedule, taking into account exhaust fan operational requirements as well. It will also automatically control the condensing unit and gas furnace to maintain the set temperature in the space during the occupied period.

A two-drum hood, a snorkel, equipment exhaust connections, a canopy exhaust above the autoclave, and general room exhaust will be located in the radiation processing room. These will be the exhaust for this room, and there shall be a HEPA filter (bag in/bag out type) on the exhaust. The radiation processing room shall be maintained under negative pressure with respect to the adjacent loading dock area. Therefore, the air supplied to this room should be slightly less than the air exhausted from the radiation processing room through the two-drum hood, the snorkel, equipment exhaust connections, the canopy exhaust above the autoclave, and the general room exhaust.

Mechanical, Plumbing & Electrical

A general exhaust grille shall be provided in the radiation storage room. This will be the exhaust for this room, and there shall be a HEPA filter on the exhaust. The radiation storage room shall be maintained under negative pressure with respect to the adjacent loading dock area. Therefore, the air supplied to this room should be slightly less than the air exhausted from the radiation storage room.

A general exhaust grille shall be provided in the biomedical processing room. This will be the exhaust for this room. In addition, certain equipment in this room will be direct vented to outside atmosphere. The biomedical processing room shall be maintained under negative pressure with respect to the adjacent loading dock area. Therefore, the air supplied to this room should be slightly less than the air exhausted from the biomedical processing room.

Air supplied to the control room will be exhausted through a door louver to the outside.

Exhaust ductwork from the various exhaust sources in the radiation processing room, radiation storage room, and biomedical processing room will be continuously welded 316 stainless steel, minimum 18 gauge, sealed to at least Class 3. The various exhaust duct branches will be manifolded together on the roof into a trunk exhaust duct that runs over to the roof-mounted exhaust fan. Exhaust velocities will range from 1,500-1,800 feet per minute increasing from the exhaust sources to the roof-mounted exhaust fan. Fume hood collar connections will be made with concentric transitions. Ductwork will take the straightest route possible, minimizing bends and horizontal runs. The exhaust fan shall be a roof-mounted upshot utility fan, designed for continuous duty service with air containing radioactive, corrosive, and flammable vapors and gases. It shall have a stack that, combined with the fan, has an exhaust discharge point 10 feet above the roof. The exhaust fan shall be the fiberglass reinforced plastic (FRP), high-plume dilution type that entrains air at the fan in a jet action to project the exhaust plume well up and away from the building. The exhaust fan will also be interlocked with RTU-10, such that whenever RTU-10 operates, the exhaust fan operates as well.

RTU-11. RTU-11 will supply conditioned air to the container decontamination room, recycled chemical storage room, and emergency response gear storage room. No air will be returned from these areas, since RTU-11 will be a 100% outside air HVAC system. RTU-11 will be a constant air volume (CAV) unit with a single thermal zone. The container decontamination room, recycled chemical storage room, and emergency response gear storage room will be provided with a minimum of six air changes per hour. The programmable thermostat will be located in the container decontamination room on an interior wall near the door. It will control the activation and deactivation of RTU-11 based on the programmed occupancy schedule, taking into account fume hood exhaust fan operational requirements as well. It will also automatically control the condensing unit and gas furnace to maintain set temperature in the space during the occupied period.

A six-foot wide chemical fume hood will be located in the container decontamination room. This will be the exhaust for this

Mechanical, Plumbing & Electrical

room. As such, the fume hood should have a bypass sash. The container decontamination room shall be maintained under negative pressure with respect to the adjacent loading dock area. Therefore, the air supplied to this room should be slightly less than the air exhausted from the container decontamination room through the fume hood.

Exhaust for the recycled chemical storage room will consist of two low exhausts, exhaust at the cylinders, exhaust through the flammable storage cabinets, and a general room exhaust. The recycled chemical storage room shall be maintained under negative pressure with respect to the adjacent loading dock corridor area. Therefore, the air supplied to this room should be slightly less than the air exhausted from it.

A general exhaust grille shall be provided in the emergency response gear storage room. The emergency response gear storage room shall be maintained under negative pressure with respect to the adjacent loading dock corridor area. Therefore, the air supplied to this room should be slightly less than the air exhausted from it.

Exhaust ductwork from the various exhaust sources in the container decontamination room, recycled chemical storage room, and emergency response gear storage room will be continuously welded 316 stainless steel, minimum 18 gauge, sealed to at least Class 3. The various exhaust duct branches will be manifolded together on the roof into a trunk exhaust duct that runs over to the roof-mounted exhaust fan. Exhaust velocities will range from 1,500-1,800 feet per minute increasing from the exhaust sources to the roof-mounted exhaust fan. Fume hood collar connections will be made with concentric transitions. Ductwork will take the straightest route possible, minimizing bends and horizontal runs. The exhaust fan shall be a roof-mounted upshot utility fan, designed for continuous duty service with air containing corrosive and flammable vapors and gases. It shall have a stack that, combined with the fan, has an exhaust discharge point 10 feet above the roof. The exhaust fan shall be the fiberglass reinforced plastic (FRP), high-plume dilution type that entrains air at the fan in a jet action to project the exhaust plume well up and away from the building. The exhaust fan will also be interlocked with RTU-11, such that whenever RTU-11 operates, the exhaust fan operates as well.

Air velocities at the fume hood shall be designed and tested in accordance with the American Society of Heating, Refrigerating, and Air Conditioning Engineers/American National Standard Institute Standard 110-1985 (ASHRAE/ANSI Standard 110-1985), entitled “Method of Testing Performance of Laboratory Fume Hoods,” and in accordance with the American Industrial Hygiene Association Standard Z9.5-1192 (ANSI/AIHA Standard Z9.5-1992), entitled “American National Standard for Laboratory Ventilation.” Essentially, the fume hood must meet requirements for minimum air flow face velocities. Actual air flow face velocities are determined through a testing procedure as set forth in ASHRAE/ANSI Standard 110-1985. The open face of the fume hood is divided into a grid of 12 square inch sections. The air flow velocity is measured at the center of each 12 square inch section using a thermoanemometer. To comply with ANSI/AIHA Z9.5-1992, measured air velocities in each section should be between 60 and 120 feet/minute (fpm). The average air velocity should be a minimum

Mechanical, Plumbing & Electrical

of 100 fpm. No reading should be below 60 fpm.

Other Support Areas

The loading dock and its accompanying corridor are outside locations, and as such have no HVAC requirements.

Universal waste is an exterior caged storage area, and has no HVAC requirements.

The unisex vendor restroom (or loading dock toilet) will have a small ceiling-mounted exhaust fan connected to an exhaust roof jack. It will be interlocked with the light switch. The door shall be undercut through which to draw in air.

Clean packaging material is also an exterior, partially caged area, and has no HVAC requirements.

Supply Air Distribution

Medium pressure supply air will be ducted above the roof, in shafts, and above and below ceilings. Supply air ductwork will be sized at a friction loss of 0.08" w.g. per 100 feet, and duct sizing will be such that air velocity will not exceed 1,600 fpm. Branch supply ducts will terminate at ceiling diffusers with maximum six foot long flexible duct connections.

Return Air Distribution

The Administration Area return air will be returned from the space using a return air ceiling plenum and short ducted connections directly up through the roof into the bottom return air connections of RTU-1, RTU-2, and RTU-3. The Training Area return air will be returned from the space using full ducted returns above the ceilings, up the shafts, and across the roof to the horizontal return air connections to RTU-4, RTU-5, and RTU-6. Return air ductwork will be sized for a maximum air velocity of 1,600 fpm.

Manual volume dampers will be provided in all supply and return branches to inlets and outlets. To minimize noise, manual volume dampers will be installed at the furthest allowable point away from inlet or outlet. Return air grilles will be non-ducted and located in ceiling where there will be no obstructions. Return grilles will be sized for a maximum 300 fpm velocity through the net face area. All ductwork connections will be low-pressure drop fittings. Radius elbows will be used wherever possible.

Mechanical, Plumbing & Electrical

Exhaust Air Distribution

(See descriptions of individual exhaust systems under the various **RTU** paragraphs above.)

DDC Controls

All the HVAC systems will be monitored and controlled by a direct digital control (DDC) energy management system (EMS). The EMS will communicate with the main operator work station located at the Central Steam Plant via the existing fiber optic network. The DDC EMS will allow for manual or automatic control.

Project graphics will be generated, and will include graphics of individual rooftop unit (RTU) HVAC systems, fume hood exhaust systems, and floor plans showing actual temperature conditions and their respective setpoints. Graphic displays will show values and status of:

- RTU system points and commands
- VAV damper position (% open) and commands
- Actual room temperatures and setpoints
- Fume hood sash positions
- Fume hood proximity status (on/off)
- Fume hood flow rate (cfm)

The EMS vendor and the Physical Plant will jointly select the system and control point names for the building in order to remain consistent with the campus naming protocol. The EMS vendor will provide training for the Physical Plant personnel.

Alternative HVAC Equipment and Systems

The UC Riverside Physical Plant staff has expressed a preference for certain alternative HVAC systems if the project budget is augmented or if future cost estimating determines that such alternative systems are possible within the cost model.

Air Handling Units. Rooftop air handling units, screened from public and campus view, would be used as the primary HVAC units instead of the RTUs described above. The AHUs would have chilled water (CHW) cooling coils. Cooling coil

Mechanical, Plumbing & Electrical

control valve actuators would be electronic and controlled by a discharge air temperature sensor through the EMS. Color coded labeling would be provided on all CHW piping that will show direction of flow, fluid in pipe and system(s) served. All cooling coils, isolation valves, control valves, strainers, etc. would be fully accessible for maintenance and safety.

Where conditions permit, AHUs would be variable air volume (VAV) and would be automatically economized. Where conditions do not permit, AHUs would be constant air volume (CAV) and would be 100% outside air. These conditions are the same as those described for areas served by RTUs above. Although 11 RTUs are required in the basic description above, only three AHUs would be used under this Alternative HVAC Equipment and Systems. There would be one AHU for the Administration Area and Training Area, one for the Labs Area, and one for the Materials Handling Area.

Air-Cooled Chiller and CHW Distribution System. CHW would be generated in a local air-cooled chiller and would be pumped and distributed in insulated copper piping around to the AHUs in a CHW hydronic loop. The hydronic CHW distribution system would consist of CHW supply (CHWS) and CHW return (CHWR) insulated copper piping throughout the building, two CHW pumps, air separator, compression tank, and other hydronic specialties. CHWS would be circulated at 43 degree F (adjustable) from the chiller. CHWR would return at 58 degree F (adjustable) to the chiller. The two CHW pumps would be capable of 100% of maximum CHW flow to provide redundancy. The air-cooled chiller and its ancillary CHW equipment would be roof-mounted or ground-mounted, and would be screened from public and campus view.

Heating Hot Water Boiler and HHW Distribution System. The space heating medium would be heating hot water (HHW), generated by a gas-fired, HHW boiler. The boiler would be a pulse, condensing boiler with over 90% efficiency. It would also have a low NOx burner. The boiler and its ancillary HHW equipment would be roof-mounted or ground-mounted, and would be screened from public and campus view.

The hydronic HHW distribution system would consist of HHW supply (HHWS) and HHW return (HHWR) insulated copper piping throughout the building, two HHW pumps, air separator, expansion tank, and other hydronic specialties. HHWS will be circulated at 180 degree F (adjustable) from the HHW boiler. HHWR will return at 140 degree F (adjustable) to the boiler. The two HHW pumps would be capable of 100% of maximum HHW flow to provide redundancy. The hydronic HHW distribution piping would serve hot water reheat coils located at VAV and CAV terminal reheat boxes in the branch ductwork for each thermal zone.

Reheat coil control valves would be the three-way type, and their actuators would be electronic and controlled by local thermostats through the EMS. Color coded labeling would be provided on all HHW piping that will show direction of flow, fluid in pipe and system(s) served. All reheat coils, isolation valves, control valves, strainers, etc. would be fully accessible for maintenance and safety.

Mechanical, Plumbing & Electrical

PLUMBING SYSTEMS

The plumbing systems consist of domestic cold water (DCW), industrial cold water (ICW), domestic hot water (DHW), domestic hot water return (DHWR), industrial hot water (IHW), industrial hot water return (IHWR), natural gas (G), sanitary waste (W), lab waste (LW), sanitary vent (V), lab waste vent (LWV), 100 psig compressed air (A), 15 psig laboratory compressed air (LA), laboratory vacuum (LV), steam (STM), storm water (SW), and fire water (FW).

General Plumbing Utilities

Domestic Cold Water (DCW). DCW will be connected at approximately 5'-0" outside of the building. DCW will be piped into the building, and an isolation valve, a reduced pressure backflow preventer, and a pressure reducing valve (PRV) will be used (if needed) and located in this area. The PRV will limit water pressure inside the building such that minimum pressure to the furthest outlet shall be 35 psig with a maximum pressure being approximately 50 psig to minimize water hammer. DCW will be piped to the domestic hot water (DHW) system, emergency eyewash/shower fixtures, and to various plumbing fixtures in the building. DCW will be piped to a reduced pressure backflow prevention device for the laboratory ICW and IHW system. DCW piping will be Type L copper piping with sweat fittings.

Industrial Cold Water (ICW). The industrial cold water (ICW) system will be distributed to laboratory fixtures and to the industrial hot water heater. Fixtures utilizing industrial cold water will have an approved sign stating "Danger-Non-Potable Water". ICW piping will be Type L copper piping with sweat fittings. A backflow preventer will prevent ICW from entering the potable water systems.

Domestic Hot Water (DHW). DHW will be generated by a DHW water heater located in the mechanical room and will be distributed in insulated DHW pipes. The DHW hot water heater will produce DHW at about 120 ˚F. A DHW recirculation system, consisting of DHW supply (DHWS) piping, DHW return (DHWR) piping, a circulation pump, and a temperature aquastat will be used to ensure near immediate availability of DHWS at all designated locations. DHW piping will be Type L copper piping with sweat fittings.

Industrial Hot Water (IHW). Industrial hot water will be generated by a gas-fired, IHW water heater located in the mechanical room and will be distributed to laboratory fixtures and equipment in insulated IHW pipes. Fixtures and equipment utilizing IHW will have an approved sign stating "Danger-Non-Potable Water". The IHW hot water heater will produce IHW at about 120 ˚F. An IHW recirculation system, consisting of IHW supply (IHWS) piping, IHW return

(IHWR) piping, a circulation pump, and a temperature aquastat will be used to ensure near immediate availability of IHWS at all designated locations. IHW piping will be Type L copper piping with sweat fittings. A backflow preventer will prevent IHW and IHWR from entering the potable water systems.

Natural Gas (G). Medium pressure natural gas (G) will be connected at approximately 5'-0" outside of the building. A pressure regulating gas valve and a seismic shut-off valve shall be provided prior to the gas entering the building. Natural gas (G), at seven inches of water column, will be piped to the DHW water heater, IHW water heater, rooftop units (RTUs), and laboratories. Natural gas (G) piping will be black steel with malleable fittings. Allow four cfh for each laboratory G outlet.

Sanitary Waste (W). Sanitary waste (W) piping (or sanitary sewer) will be connected at approximately 5'-0" outside of the building. Sanitary waste (W) pipes will be installed from various plumbing fixtures throughout the building. Sanitary waste (W) pipes will be cast iron.

Lab Waste (LW). A separate lab waste (LW) drainage system will be installed. Lab waste piping will be constructed of corrosion resistant duriron. Either a central neutralization tank, several local neutralization tanks, or a sample tank will be installed.

Sanitary Vent (V). New sanitary vents (V) will be provided as required and will be routed up to the building roof. Sanitary vent (V) piping will be cast iron.

Lab Waste Vent (LWV). A separate lab waste vent (LWV) system will be installed. Lab waste vent (LWV) piping will be constructed of corrosion resistant polypropylene with mechanical joints.

Compressed Air (A) and Laboratory Compressed Air (LA). The laboratories will have a central compressed air (LA) system that will be located in the mechanical room. A complete compressed air system will be provided, consisting of a duplex air compressor, refrigerated air dryer, coalescing filter, high flow regulator, compressed air receiving tank, compressed air piping, wiring and electrical devices, controls, flexible connectors, vibration isolators and all additional accessories as required for a complete system. Compressed air (A) and laboratory compressed air (LA) piping will be Type L copper piping with sweat fittings. Compressed air will be produced at 120 psig and reduced to 100 psig for compressed air (A). It will be distributed around the building at 100 psig. At the lab rooms, the compressed air (A) will be further reduced to 15 psig for laboratory compressed air (LA). All laboratory compressed air (LA) distributed to laboratory fixtures shall be instrument grade, filtered to remove hydrocarbons and particles in accordance with the "Standard for Quality Instrument Air" as sponsored by the Instrument Society of America, and dried to a -12 degree F atmospheric dewpoint. Allow five scfm for

Mechanical, Plumbing & Electrical

each laboratory LA outlet.

Laboratory Vacuum (LV). The laboratories will have a central laboratory vacuum (LV) system that will be located in the mechanical room. A complete vacuum system will be provided, consisting of a vacuum pump and required ancillary equipment, appurtenances, piping and controls. Laboratory vacuum (LV) piping will be Type L copper piping with sweat fittings. The laboratory vacuum (LV) system will be sized to provide 26″ Hg (4″ Hg A) at the farthest laboratory inlet. Allow _ scfm for each laboratory LV inlet.

Steam (STM). Saturated steam (STM) will be locally generated at 80 to 100 psig for use in the autoclave in the radiation processing room and for use in the SSM Sterilization and Maceration System in the biomedical processing room. Minimum steam capacity shall be 800 lbs./hr.

Storm Water (SW). A complete roof drainage system will be provided which will tie into the site storm water drain system at 5′-0″ outside the building. Storm water (SW) piping will be cast iron.

Fire Water (FW). Fire water (FW) piping will be connected at approximately 5′-0″ outside of the building. Fire water piping will be provided to the building for connection to the fire sprinkler system.

The fire water system will be provided complete, including, but not limited to, underground and above ground piping, a fire riser assembly, valves and fittings, alarms, controls, and an overhead sprinkler system generally throughout the building, except where noted that foam will be used.

Fixtures and Equipment Requiring Plumbing

Presented in the following tables are required plumbing connections at fixtures and equipment in rooms throughout the building. There may be additional fixtures and equipment that require plumbing connections as well.

Administration Area.

Room	Fixture or Equipment	Plumbing Connections
Large conference room	Mini bar sink	DCW, DHW, W, V

Mechanical, Plumbing & Electrical

Training Area.

Room	Fixture or Equipment	Plumbing Connections
Break room	Sink	DCW, DHW, W, V
Break room	Refrigerator	DCW
Rest rooms	Water closets	DCW, W, V
Rest rooms	Urinals	DCW, W, V
Rest rooms	Lavatories	DCW, DHW, W, V
Rest rooms	Floor Drains	DCW, W, V

Labs Area.

Room	Fixture or Equipment	Plumbing Connections
Radiation lab	Lab wall bench with sink	DCW, DHW, ICW, IHW, LW, LWV, G, LV, LA
Radiation lab	Lab island bench	G, LV, LA
Radiation lab	Radioisotope hood	G, LA
Radiation lab (in corridor)	Emergency eyewash/shower	DCW
General lab	Fume hood	ICW, LW, LWV, G, LV, LA
General lab	Island lab bench	ICW, IHW, LW, LWV
MEP room	Domestic hot water heater	DCW, DHW, DHWR, G
MEP room	Industrial hot water heater	DCW, IHW, IHWR, G
MEP room	Floor drain	DCW, W, V
MEP room	Air compressor system	A
MEP room	Vacuum system	LV
Lockers/showers/restrooms	Water closets	DCW, W, V
Lockers/showers/restrooms	Urinals	DCW, W, V
Lockers/showers/restrooms	Lavatories	DCW, DHW, W, V
Lockers/showers/restrooms	Showers	DCW, DHW, W, V
Janitor's closet	Mop Sink	DCW, DHW, W, V
Janitor's closet	Floor drain	DCW, W, V

Mechanical, Plumbing & Electrical

Materials Handling Area.

Room	Fixture or Equipment	Plumbing Connections
Chemical processing room	Sink	DCW, DHW, LW, LWV
Chemical processing room	Fume hood	ICW, IHW, LW, LWV
Chemical processing room	Emergency eyewash/shower	DCW
Chemical processing room	Trench drains with 60-gallon holding tanks	LW, LWV
Chemical processing room	Other	A
Chemical processing room	Fire Protection	Foam
Chemical bulking room	Drum Hoods	LA
Chemical bulking room	Emergency eyewash/shower	DCW
Chemical bulking room	Trench drains with 60-gallon holding tanks	LW, LWV
Chemical bulking room	Other	A
Chemical bulking room	Fire Protection	Foam
Chemical storage room	Emergency eyewash/shower	DCW
Chemical storage room	Trench drains with 60-gallon holding tanks	LW, LWV
Workshop	Wall bench with sink	ICW, IHW, LW, LWV
Workshop	Shop tables	A
Radiation processing room	Sink	ICW, IHW, LW, LWV
Radiation processing room	Autoclave	ICW, STM
Radiation processing room	Emergency eyewash/shower	DCW
Radiation processing room	Trench drain with 60-gallon holding tank	LW, LWV
Radiation processing room	Floor drains	W, V
Radiation processing room	Fire Protection	Foam
Biomedical processing room	Sink	ICW, IHW, LW, LWV
Biomedical processing room	Emergency eyewash/shower	DCW
Biomedical processing room	Trench drain with 60-gallon holding tank	LW, LWV
Biomedical processing room	Floor drains	W, V

Mechanical, Plumbing & Electrical

Biomedical processing room	Other	DCW, DHW, ICW, and IHW @ 40-60 psig (1" pipes), A @ 100-120 psig constant
Container decontamination room	Sink	ICW, IHW, W, V
Container decontamination room	Container Washer	ICW, IHW, W, V
Container decontamination room	Fume hood	ICW, IHW, LW, LWV, LA
Container decontamination room	Trench drains	W, V
Container decontamination room	Other	A
Container decontamination room	Fire Protection	Foam
Recycled chemical storage	Emergency eyewash/shower	DCW
Recycled chemical storage	Spill holding tank at door – 60 gal.	LW
Recycled chemical storage	Fire Protection	Foam
Loading dock	Trench drains	W with holding tank, V
Vendor restroom	Water closet	DCW, W, V
Vendor restroom	Urinal	DCW, W, V
Vendor restroom	Lavatory	DCW, DHW, W, V

Mechanical, Plumbing & Electrical

ELECTRICAL SYSTEMS

POWER DISTRIBUTION SYSTEM

Incoming Power. 12 kV power connections will be made at the existing power manhole southwest of the Parking Services Building. Dual circuits parallel feed configuration with selector switching will be utilized to increase the reliability of the power distribution system.

A new pad-mounted transformer will be provided adjacent to the building to support this facility. The secondary voltage will be 480/277 volt, three-phase, 4-wire grounded.

An on-site, diesel, engine-generator shall be provided. Loss of normal electrical power in a building shall trigger an alarm that will annunciate at the Campus Police Station, the Central Steam Plant Control Room, and the Electrical Shop.

A main electrical room will be located on the ground floor. The electrical room will house the main switchboard, automatic transfer switch, dry type step down transformer and distribution panels.

Power Distribution. Panelboards at 480/277 volt, 3-phase, 4-wire served from the main switchboard will be provided to supply power for lighting, elevator and HVAC equipment 0.75 hp or more.

Dry-type step down transformers will be used to supply 208/120 volt power to distribution panelboards. Distribution panelboards will be located in the main electrical room and in a second floor electrical closet to accommodate receptacles and small appliances.

Power surge protection will be provided for sensitive electronic and laboratory equipment.

All cables and wiring will be in conduits concealed at all public spaces and finished areas. Minimum conduit size will be 3/4″ except buried conduits will be minimum 1″. Conduit types will be electric metallic, intermediate metallic, or rigid galvanized steel as required. Underground conduit may be PVC and concrete encased where necessary.

All cables will be copper with THWN / THHN 600V insulation. Color coding will be as stipulated by NEC.

Mechanical, Plumbing & Electrical

Motors. Motors and other appliances _ hp and below will be served at 120 volt, single-phase; 0.75 hp and above will be at 480 volt, three-phase. Premium efficiency motor shall be used.

Motors 25 hp and above will be provided with reduced current solid state starters.

Motor control centers or switchboards will be utilized to serve 3-phase motors.

Wiring Devices. All junction boxes will be recessed-mounted on finished areas and will be of the one-piece galvanized pressed steel knock-out type, minimum 4″ square by 1.5″ deep.

All 120-volt duplex receptacles for general usage will be rated 20-ampere with ground connection.

All lighting switches will be minimum 20-ampere rated and of the quiet action type.

Galvanized steel cover plates will be provided in all electrical, mechanical, and utility rooms. Plastic cover plates of proper color finish will be utilized for other areas.

Explosion proof equipment suitable for NEC Class One, Division One application shall be utilized in the Chemical Bulking Area.

Grounding System. All parts of the power distribution system will be provided with an equipment ground conductor. The grounding system will extend from the switchboard to the branch circuit load or device via ground conductor.

The grounding system will be established from a structural ground grid as follows:

1. A No. 4/0 AWG bare copper UFER ground will be installed below grade adjacent to the main electrical room. Steel columns and cold water piping will be bonded to become part of the grounding system.

2. A wall mounted copper ground bus will be located in the main electrical room and a second floor electrical closet. The main electrical room ground bus will be connected to the exterior ground loop and a separate insulated ground wire in conduit will be provided from the main electrical room ground bus to each floor electrical room ground bus.
3. A No. 4/0 AWG bare copper grounding electrode conductor will be extended to all telephone closets, so that those systems can be properly bonded.
4. A separate ground wire will be provided for all branch circuits and all feeders serving panelboards, distribution panelboards, motor control centers, and switchboards.

Mechanical, Plumbing & Electrical

Emergency Power System

A 500kw to 750kw emergency engine-generator will be provided to support all code required life safety equipment, fume hoods, fans for gas cabinets, and cold rooms. A maximum 35% voltage dip will be used for sizing criteria. A sound attenuating enclosure will be used to minimize noise pollution. Tall exhaust stacks will be located to avoid intrainment of generator exhaust into the building air intakes.

A 1,000 gallon, aboveground, base-mounted, diesel fuel, storage tank will be provided. This will supply 72 hours of fuel for the emergency engine-generator assuming some load shedding is implemented under emergency conditions.

Lighting System

Lighting will be accomplished by a variety of fixture types. The most typical interior fixtures will be compact fluorescent down lights and 2-foot x 4-foot fluorescent fixtures with electronic ballasts. Metal halide and high-pressure sodium fixtures will be used to light the exterior of the building. Exterior lighting fixtures will have internal shields for light spill control in conformance with LEED requirement. Lighting will be zoned and controlled by a programmable lighting control system per the latest Title 24 requirements. Some local overrides will also be provided.

Fluorescent Fixtures. Fluorescent fixtures will be 2′ x 4′, two or three lamps, suitable for recess mounting in an inverted T-bar ceiling, and equipped with 0.125″ thick prismatic acrylic pattern No. 12 lenses in regressed extruded aluminum hinged and latched door frames.

Industrial fixtures will be provided in all mechanical, electrical, storage and other utility rooms.

Lamps. Fluorescent lamps will be 48″ long, T8, warm-white, energy saving type, rated 32-watt and producing a minimum of 2,950 initial lumens.

Incandescent lamps will be the inside-frosted type, rated 130-volt.

High intensity discharge lamps will be the phosphor-coated, color connected type.

Ballasts. Fluorescent ballasts will be of the high-efficiency, instant start, high power factor, reduced harmonics electronic type, UL listed class “P”, certified by ETS/CBM, minimum power factor 95% with integral automatic reset thermal protector.

High intensity ballasts will be of the constant-wattage regulator type.

Mechanical, Plumbing & Electrical

Lighting Controls. Motion sensors will be used for most interior fixtures when applicable. Multi-level switching along with automatic day lighting control will be implemented

All interior switching will comply with California Administrative Code, Title 24, Part 6.

Energy efficient LED exit signs will be used.

Exterior lights will be controlled by the lighting control panel through the building energy management system.

Illumination Level and Calculation. Illumination foot-candle level will be as prescribed in the latest edition of the Illuminating Engineer's Society Handbook. The level will be as measured at 30″ above finished floor.

Maintenance factor used for calculation and for test measurement purposes will be 0.85.

Coefficient of Utilization will be based on the actual room reflectance anticipated and the published test data for the selected light fixture.

Data Networking and Communication System

The existing University data/communication backbone system shall be extended from the existing communications manhole at the parking area northwest of the Pentland Hills Residential Halls. New cable and conduit pathway shall be deployed to support the new Environmental Health and Safety (EH&S) Building as well as the future Arroyo Student Housing project to minimize overall construction cost. There shall be no more than two 90 degree bends between pulling junctions, and there shall be less than 500 feet between these junctions. Outside plant infrastructure shall consist of a minimum of four 4″ conduits connecting to the new building. There shall be no more than two 90 degree bends between pulling junctions, and there shall be less than 500 feet between these junctions.

Seven Air Blown Fiber tubes infrastructure shall be provided from the existing Tube Distribution Unit (TDU) in the existing communications manhole at the parking area northwest of the Pentland Hills Residential Halls, to a new TDU located in the EH&S building's Main Distribution Frame (MDF). All Air Blown Fiber products shall be Sumitomo FutureFlex System or equal, and Air Blown Fiber tube installers shall be Sumitomo (or equal) certified installers.

Six strands (3 pair) of single-mode fiber shall be run from the new Fiber Termination Unit (FTU) in the building's MDF to the nearest existing FTU associated with campus network and voice electronics.

Mechanical, Plumbing & Electrical

The new MDF will be located in the data/communications room next to the main telephone backboard. Combination outlets (data and voice/telecom connections) will be provided throughout the building as required with conduit home runs to the MDF. Local distribution frames (LDFs) will be provided in between any outlets and the MDF when a cable run direct to the MDF would exceed 250 feet.

Telephone System

Service. A 100-pair telephone cable will be brought from the existing communications manhole at the parking area northwest of the Pentland Hills Residential Halls, to the new main telephone backboard in the EH&S building.

Main Telephone Backboard. A new main telephone backboard of appropriate size will be located in the main data communications room on the ground floor of the EH&S building.

Distribution. A new telephone terminal cabinet will be located on each floor, and will be connected by conduits to form a vertical riser system. The telephone contractor will then use this in their design, furnishing, and installing of telephone wiring and equipment. These risers will terminate in the main telephone backboard in the data communications room. Empty branch conduit and outlet boxes for telephone receptacles will be provided as required. Connections for wireless routers will be installed to provide wireless connectivity to campus network.

Workstations (Data/Communication Port Counts). Each station outlet shall be designed to serve a variety of current communications needs and provide sufficient flexibility and adaptability for future technologies. Voice and data connections will be deployed per the following schedule (all copper is Enhanced Category 5):

Office	1 voice and 2 data per 100 square feet
Open/modular	1 voice and 2 data per 60 square feet
Director's office	1 voice and 3 data per 100 square feet
Computer teaching facility	4 data per 100 square feet; 1 voice, 1 wireless, and 1 fiber port per facility
Research lab	3 data per 100 square feet; 1 voice, 1 wireless, and 1 fiber port per facility
Classrooms	6 per facility (3 data and 1 voice at lectern, 1 voice at door, 1 wireless)
Training room	4 data per 100 square feet; 1 voice, 1 wireless, and 1 fiber port per facility
Computer lab	6 data per 100 square feet; 1 voice, 1 wireless, and 1 fiber port per facility
Library, public access areas	3 data per 100 square feet, 1 voice and 1 wireless per 1,000 square feet
Conference/seminar	4 data and 1 voice per 100 square feet

Mechanical, Plumbing & Electrical

Break room	3 data per 100 square feet; 1 voice, 1 wireless per facility
Photocopy/mail	3 per room (1 voice and 2 data)
Service/storage areas	3 per room (1 voice and 2 data)
Elevators	1 voic

Grounding. Grounding for the telephone system will be provided per the campus requirements at the main telephone backboard in the data communications room.

Telephone Outlets. All public service and staff workstations will have wall-mounted combination outlets (data and voice/telecom connections). Recessed floor mounted junction boxes will be installed to provide connection for system furniture in open work areas.

Fire Alarm System

A new microprocessor based, multiplexed, addressable fire alarm system will be provided for the new building. The system will utilize individual addressable photoelectric smoke detectors, duct smoke detectors, heat detectors, strobe/horns, addressable manual pull stations, magnetic hold-opens on hazard doors , addressable monitor and control modules. The system will monitor all sprinkler supervisory and water flow switches and will interface with elevators, HVAC smoke control, and smoke fire dampers. The fire alarm system shall be manufactured by Simplex and will be compatible with the existing campus system and will meet current ADA requirements.

Overview

Consistent with the charter given to the project, the planned EH&S facility can achieve a LEEDTM certified rating of at least 26 Points and up to 32 Points, based on the current US Green Building Council LEED 2.1 Rating SystemTM.

The assumed campus contribution to the LEEDTM point goal includes 5 Points and 2 Prerequisites. In addition, the Point total assumes a 4 Point and 1 Prerequisite contribution from the construction phase of the project. The building planning and design contributes 23 or 72% of the assumed Point total. However, in the building and planning design phases the University must make the commitment to a LEEDTM certified rating as the project team considers design decisions that may affect first cost vs. life-cycle costs, operational issues, materials selections, maintenance, etc. A 6 Point contingency is assumed and reflected in the Point spread shown on the LEEDTM Matrix. The Univeristy of California Policy on Green Building Design and Clean Energy Standards is included in the Appendix.

Strategies and Recommendations

Key to the success of the EH&S project achieving a LEED™ certification is the recognition that the campus must fulfill approximately 19% of the minimum points and important prerequisites such as: “Fundamental Building Systems Commissioning” and “Environmental Tobacco Smoke Control.”

The building design strategies that are key to the LEED™ success include: energy efficient building systems, daylight, recycled material choices, and indoor air quality strategies.

The current project schedule envisions a Winter 2008 project completion, which would mean that official LEED™ certification might not be realized until 2009.

Matrix Legend

1) Prerequisite: If a point is a prerequsite in either LEED™ 2.1 or Labs21 EPC, it is marked in the Prerequisite column.
2) Baseline Points indicates whether a point is incorporated into a Campus Baseline.
3) Additioinal Points indicates whether a point is claimed as a project-specific point in addition to the points included in the Campus Baseline.
4) The equivalent to ‘LEED™ Certified’ equals 26 earned points and all applicable prerequisites.
Equivalencies to other LEED™ rating levels are as may be determined by the US Green Building Council from time to time.

Sustainability Matrix

Env. Health & Safety
UCR

Attachment 3A - UC Green Building Guide
Project Scoresheet

Scope	LEED 2.1	Item	Baseline Points	Additional Points
Sustainable Sites	Y	SS Prerequisite 1 - Erosion & Sedimentation Control		
Sustainable Sites	Y	SS 1 - Site Selection	1	
Sustainable Sites	Y	SS 2 - Development Density	0	
Sustainable Sites	Y	SS 3 - Brownfield Redevelopment	0	
Sustainable Sites	Y	SS 4.1 - Alternative Transportation- Public Transportation Access	1	
Sustainable Sites	Y	SS 4.2 - Alternative Transportation - Bicycle Storage & Changing Rooms	0	1
Sustainable Sites	Y	SS 4.3 - Alternative Transportation - Alternative Fuel Vehicles	0	1
Sustainable Sites	Y	SS 4.4 - Alternative Transportation- Parking Capacity	1	
Sustainable Sites	Y	SS 5.1 - Reduced Site Disturbance- Protect or Restore Open Space	0	1
Sustainable Sites	Y	SS 5.2 - Reduced Site Disturbance- Development Footprint	0	
Sustainable Sites	Y	SS 6.1 - Stormwater Management- Rate and Quantity	0	1
Sustainable Sites	Y	SS 6.2 - Stormwater Management- Treatment	0	
Sustainable Sites	Y	SS 7.1 - Heat Island Effect - Non-Roof	1	
Sustainable Sites	Y	SS 7.2 - Heat Islands Effect - Roof	1	
Sustainable Sites	Y	SS 8.1 - Light Pollution Reduction - Exterior Lighting	1	
SUSTAINABLE SITES SUBTOTAL:			**6**	**0**

Sustainability Matrix

Scope	LEED 2.1	Item	Baseline Points	Additional Points
Water Efficiency		Labs21 WE Prerequisite 1 - Laboratory Equipment Water Use		
Water Efficiency	Y	WE 1.1 - Water Efficient Landscaping- Reduce by 50%	1	
Water Efficiency	Y	WE 1.2 - Water Efficient Landscaping- No Potable Use or No Irrigation	0	
Water Efficiency	Y	WE 2 - Innovative Wastewater Technologies	0	
Water Efficiency	Y	WE 3.1 - Water Use Reduction - 20% Reduction	0	1
Water Efficiency	Y	WE 3.2 - Water Use Reduction- 30% Reduction	0	
Water Efficiency		Labs21 WE 4.1 - Process Water Eficiency	0	
Water Efficiency		Labs21 WE 4.1 - Process Water Eficiency	0	
WATER EFFICIENCY SUBTOTAL:			**1**	**1**

Sustainability Matrix

Scope	LEED 2.1	Item	Baseline Points	Additional Points
Energy & Atmosphere	Y	EA Prerequisite 1 - Fundamental Building Systems Commissioning		
Energy & Atmosphere	Y	EA Prerequisite 2 - Minimum Energy Performance		
Energy & Atmosphere	Y	EA Prerequisite 3 - CFC Reduction in HVAC&R Equipment		
Energy & Atmosphere		Labs21 EA Prerequisite 2 - Assess Minimum Ventilation Requirements		
Energy & Atmosphere	Y	EA Credit 1 - Optimize Energy Performance	4	
Energy & Atmosphere		EA Credit 1 - Optimize Energy Performance	0	
Energy & Atmosphere	Y	EA 2.1 - Renewable Energy- 5%	0	
Energy & Atmosphere	Y	EA 2.2 - Renewable Energy - 10%	0	
Energy & Atmosphere	Y	EA 2.3 - Renewable Energy- 20%	0	
Energy & Atmosphere	Y	EA 3 - Additional Commissioning	0	1
Energy & Atmosphere	Y	EA 4 - Ozone Protection	0	1
Energy & Atmosphere	Y	EA 5.1 - Measurement and Verification - Building Systems	1	
Energy & Atmosphere		(Campus AG) EA 5.2 - Measurement and Verification – Central Monitoring and Control		
Energy & Atmosphere	Y	EA 6 - Green Power	1	
Energy & Atmosphere		(Campus AG) EA 7 - Atmospheric Emissions		
Energy & Atmosphere		(Campus AG) EA 8 - CO2 Reduction		
Energy & Atmosphere		(Campus AG) EA 9.1 - Combined Heat and Power – 60% Efficiency		
Energy & Atmosphere		(Campus AG) EA 9.2 - Combined Heat and Power – 75% Efficiency		
Energy & Atmosphere		Labs21 EA 10 - Energy Supply Efficiency		
Energy & Atmosphere		Labs21 EA 11 - Improve Laboratory Equipment Efficiency		
Energy & Atmosphere		Labs21 EA 12.1 - Right-size Laboratory Equipment Load		
Energy & Atmosphere		Labs21 EA 12.2 - Right-size Laboratory Equipment Load - Metering		
ENERGY & ATMOSPHERE SUBTOTAL:			**6**	**2**

Sustainability Matrix

Scope	LEED 2.1	Item	Baseline Points	Additional Points
Materials & Resources	Y	MR Prerequisite 1 - Storage & Collection of Recyclables		
Materials & Resources		Labs21 MR Prerequisite 2 - Hazardous Material Handling		
Materials & Resources	Y	MR 1.1 - Building Reuse- Maintain 75% of Existing Walls, Floors and Roof	0	
Materials & Resources	Y	MR 1.2 - Building Reuse-Maintain 100% of Existing Walls, Floors and Roof	0	
Materials & Resources	Y	MR 1.3 - Building Reuse- Maintain 100% of Shell/Structure and 50% of Non-Shell/Non-Structure	0	
Materials & Resources	Y	MR 2.1 - Construction Waste Management- Divert 50% From Landfill	1	
Materials & Resources	Y	MR 2.2 - Construction Waste Management- Divert 75% From Landfill	0	
Materials & Resources	Y	MR 3.1 - Resource Reuse: 5%	0	
Materials & Resources	Y	MR 3.2 - Resource Reuse- 10%	0	
Materials & Resources	Y	MR 4.1 - Recycled Content: Use 5% post-consumer or 10% postconsumer + post-industrial	0	1
Materials & Resources	Y	MR 4.2 - Recycled Content: Use 10% post-consumer or 20% post-consumer + post-industrial	0	
Materials & Resources	Y	MR 5.1 - Regional Materials- 20% manufactured regionally	1	
Materials & Resources	Y	MR 5.2 - Regional Materials- 50% extracted regionally	0	
Materials & Resources	Y	MR 6 - Rapidly Renewable Materials	0	
Materials & Resources	Y	MR 7 - Certified Wood	0	1
Materials & Resources		(Campus AG) MR 8 - Site Recycling and Solid Waste Management Master Plan & Labs21 MR 8 - Chemical Resource Management		
MATERIALS & RESOURCES SUBTOTAL:			**2**	**2**

Sustainability Matrix

Scope	LEED 2.1	Item	Baseline Points	Additional Points
Indoor Envt'l Quality	Y	IEQ Prerequisite 1 - Minimum IAQ Performance		
Indoor Envt'l Quality	Y	IEQ Prerequisite 2 - Environmental Tobacco Smoke (ETS) Control		
Indoor Envt'l Quality		Labs21 IEQ Prerequisite 3 - Laboratory Ventilation		
Indoor Envt'l Quality		Labs21 IEQ Prerequisite 4 - Exterior Door Notification System		
Indoor Envt'l Quality	Y	IEQ 1 - Carbon Dioxide (CO2) Monitoring	0	
Indoor Envt'l Quality	Y	IEQ 2 - Ventilation Effectiveness	0	1
Indoor Envt'l Quality	Y	IEQ 3.1 - Construction IAQ Management Plan- During Construction	1	
Indoor Envt'l Quality	Y	IEQ 3.2 - Construction IAQ Management Plan- After Construction	1	
Indoor Envt'l Quality	Y	IEQ 4.1 - Low-Emitting Materials- Adhesives & Sealants	1	
Indoor Envt'l Quality	Y	IEQ 4.2 - Low-Emitting Materials- Paints and Coatings	1	
Indoor Envt'l Quality	Y	IEQ 4.3 - Low-Emitting Materials- Carpet	1	
Indoor Envt'l Quality	Y	IEQ 4.4 - Low-Emitting Materials- Composite Wood	0	
Indoor Envt'l Quality	Y	IEQ 5 - Indoor Chemical & Pollutant Source Control	1	
Indoor Envt'l Quality	Y	IEQ 6.1 - Controllability of Systems- Perimeter Spaces	0	1
Indoor Envt'l Quality	Y	IEQ 6.2 - Controllability of Systems- Non-Perimeter Spaces	0	
Indoor Envt'l Quality	Y	IEQ 7.1 - Thermal Comfort- Compliance with ASHRAE 55-1992	1	
Indoor Envt'l Quality	Y	IEQ 7.2 - Thermal Comfort- Permanent Monitoring System	1	
Indoor Envt'l Quality	Y	IEQ 8.1 - Daylight and Views- Daylight 75% of Spaces	0	1
Indoor Envt'l Quality	Y	IEQ 8.2 - Daylight and Views- Views for 90% of Spaces	0	
Indoor Envt'l Quality		(Campus AG) IEQ 9 - Lighting Quality	0	
Indoor Envt'l Quality		(Campus AG) IEQ 10 - Acoustic Quality	0	
Indoor Envt'l Quality		Labs21 IEQ 11 - Indoor Environmental Safety		
INDOOR ENVIRONMENTAL QUALITY SUBTOTAL:			**8**	**3**

Scope	LEED 2.1	Item	Baseline Points	Additional Points
Innovation in Design	Y	ID 1 - Innovation in Design	0	
Innovation in Design	Y	ID 2 - LEED Accredited Professional	1	
		INNOVATION IN DESIGN SUBTOTAL:	**1**	**0**
		PROJECT TOTAL:	**24**	**8**

Overview

The project budget is $11,964,000 including a construction budget of $10,614,000. A Winter 2006 construction start and Winter 2008 occupancy are assumed.

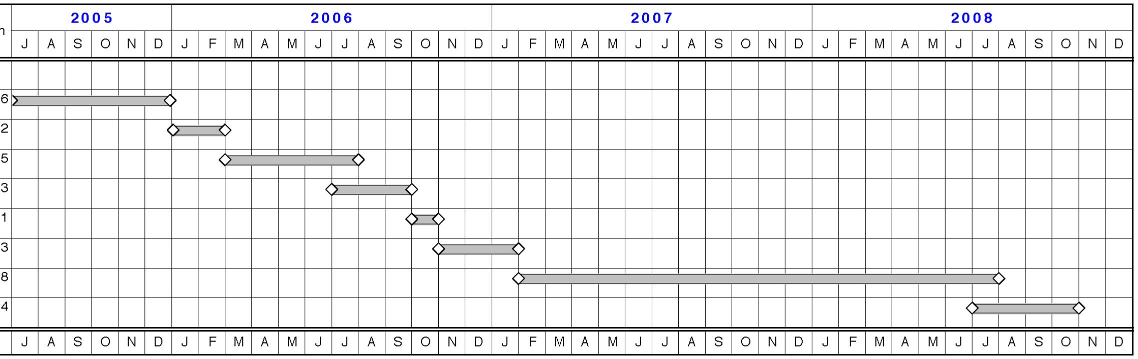
The $344/GSF construction cost compares favorably to other similar, recent facilities planned for the UC System.

Budget

Under Separate Cover

Schedule

	Activity Name	Duration
1		
2	Preliminary Plans	6
3	SPWB Review	2
4	Working Drawings	5
5	Agency Review	3
6	DOF Review	1
7	Bid Award Contract	3
8	Construction	18
9	Equipment	4



Overview

This section contains all of the pertinent background information related to the DPP. Following is a complete list of the background information provided in this section:

Room Data Sheets
Preferred planning option with TAPS components
Alternate Planning Options
UCI and UCSD Building Tours Notes
Meeting Minutes
Detailed Budget Information
Lab and Materials Handling Background Information / Cut Sheets
User provided background documents
UC Policy on Sustainability

Table of Contents

1. ADMINISTRATIVE SPACE
1.01 Director's Office

General Information

Projected No. of Spaces	1
Assignable Area (NSF)	240
Use or Function	Director's personal office
Adjacencies	Administration, program managers, Associate Director
Critical Dimension	
Ceiling Height	9'-6"
Occupants	1+4 guests
Hours of Operation	7:00 AM - 6:00 PM
Access	Director
Security	Lock
Notes	Views to open office area

Architectural Finishes

Floor	Carpet
Wall	Paint
Ceiling	Suspended Ceiling
Casework	
Notes	

Environmental Criteria

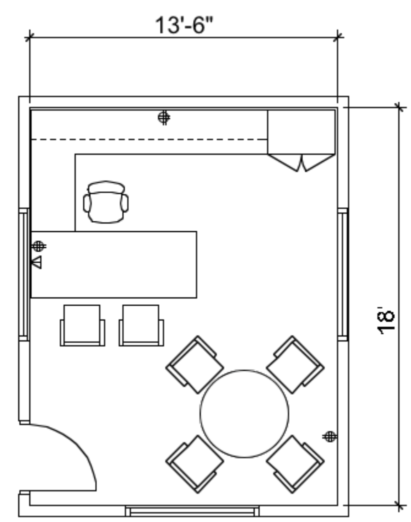
Natural Lighting	Desired
Artificial Lighting	50 foot-candles (fc), task lighting
Switching/Dimming	Multiple Switching
Temperature	Individual Temp Control
Acoustics/Noise	
Notes	

Utilities and Services

Normal Power	Yes
Emergency Power	Yes
Plumbing	
Fire Protection	Yes
Telecom	(4 tel, 6 data), Overall Building PA system
Notes	TV

Group II Furnishings and Accessories

Chairs	1+4 guests
Tables	U-shaped workstation and conference table for 4
Shelving	Bookshelves
Files	4
Trash Receptacle	1
Fixtures	
Equipment	
Audiovisual	Starboard, LCD projector, screen
Special	Bulletin Board, White Board, Name plates



1. ADMINISTRATIVE SPACE
1.02 Private Office

General Information

Projected No. of Spaces	1
Assignable Area (NSF)	120
Use or Function	Private office
Adjacencies	Reception
Critical Dimension	
Ceiling Height	9'-6"
Occupants	1+2 guests
Hours of Operation	7:00 AM - 6:00 PM
Access	Staff
Security	Lock
Notes	View to reception desk

Architectural Finishes

Floor	Carpet
Wall	Paint
Ceiling	Suspended Ceiling
Casework	
Notes	

Environmental Criteria

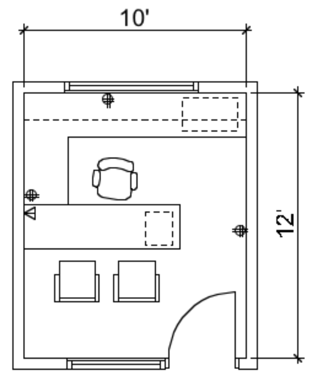
Natural Lighting	Desired
Artificial Lighting	50 foot-candles (fc)
Switching/Dimming	Multiple Switching
Temperature	Individual Temp Control
Acoustics/Noise	
Notes	

Utilities and Services

Normal Power	Yes
Emergency Power	Yes
Plumbing	
Fire Protection	Yes
Telecom	(4 tel, 6 data), Overall Building PA system
Notes	

Group II Furnishings and Accessories

Chairs	1+2 guests
Tables	U-shaped workstation
Shelving	Bookshelves
Files	2
Trash Receptacle	1
Fixtures	
Equipment	
Audiovisual	
Special	Bulletin Board, White Board



1. ADMINISTRATIVE SPACE
1.11 Program Managers

General Information

Projected No. of Spaces	14
Assignable Area (NSF)	120
Use or Function	Private office
Adjacencies	Director's Office, Associate Director, Admin
Critical Dimension	
Ceiling Height	
Occupants	1
Hours of Operation	7:00 AM - 8:00 PM
Access	Program Manager
Security	
Notes	glass storefronts onto common area for visibility

Architectural Finishes

Floor	Carpet
Wall	Paint
Ceiling	Suspended Ceiling
Casework	
Notes	

Environmental Criteria

Natural Lighting	Desired
Artificial Lighting	50 foot-candles (fc)
Switching/Dimming	Multiple Switching
Temperature	
Acoustics/Noise	Minimize sound between workstations
Notes	

Utilities and Services

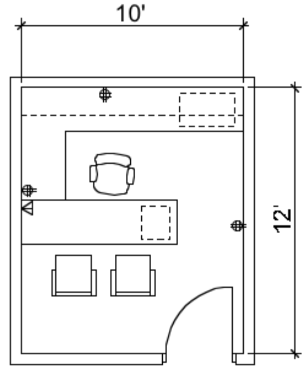
Normal Power	Yes
Emergency Power	Yes
Plumbing	
Fire Protection	Yes
Telecom	(2 tel, 4 data), Overall Building PA system
Notes	

Group II Furnishings and Accessories

Chairs	1+2 guests
Tables	U-shaped workstation
Shelving	Bookshelves (Manuals, Reference Materials)
Files	2
Trash Receptacle	1
Fixtures	
Equipment	
Audiovisual	
Special	Bulletin Board, White Board

Job Titles

Associate Director
Administration
Biosafety Officer
Emergency Managemenat Specialist
Environmental Compliance Specialist
Environmental Health Specialist
Fire Marshall
Integrated Waste Program Manager
Training and Publications specialist
Radiation Safety Officer
Laboratory/Research Safety Specialist
Information Systems Specialist
Industrial Hygiene and Safety Leader
Hazardous Materials Specialist



1. ADMINISTRATIVE SPACE
1.12 Staff - Open Office

General Information

Projected No. of Spaces	14
Assignable Area (NSF)	64 (8 x 8)
Use or Function	Typical staff workstation
Adjacencies	Reception, Director's Office
Critical Dimension	
Ceiling Height	
Occupants	1
Hours of Operation	7:00 AM - 6:00 PM
Access	Staff
Security	
Notes	

Architectural Finishes

Floor	Carpet
Wall	Paint
Ceiling	Suspended ceiling
Casework	
Notes	

Environmental Criteria

Natural Lighting	Desired
Artificial Lighting	50 foot-candles (fc)
Switching/Dimming	Multiple Switching
Temperature	
Acoustics/Noise	Minimize sound between workstations
Notes	

Utilities and Services

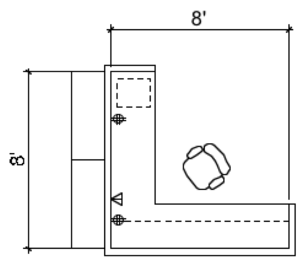
Normal Power	Yes
Emergency Power	Yes
Plumbing	
Fire Protection	Yes
Telecom	(2 tel, 4 data), Overall Building PA system
Notes	

Group II Furnishings and Accessories

Chairs	1+1/2 guest chairs
Tables	
Shelving	Bookshelves (Manuals, Reference Materials)
Files	2
Trash Receptacle	1
Fixtures	
Equipment	
Audiovisual	
Special	Bulletin Board

Job Titles

Administrative Analyst
Emergency Management Principal Technician
Deputy Fire Marshall
Fire Prevention Technician
Waste Operations Principal Technician
Senior Waste Technician
Senior Radioactive Waste Technician
Training Specialist
Assistant Radiation Safety Officer
Principal Radiation Safety Technician
Radiation Safety Technician
Lab Safety Specialist
Information Systems Specialist
Enterprise System Developer
Industrial Hygienist
Industrial Hygiene Safety Specialist
Agricultural Health and Safety Specialist
Occupational Health Program Specialist
Industrial Hygiene Safety Technician



1. ADMINISTRATIVE SPACE
1.13 Reception

General Information

Projected No. of Spaces	1
Assignable Area (NSF)	80
Use or Function	Reception desk and public check-in
Adjacencies	Lobby
Critical Dimension	
Ceiling Height	
Occupants	1
Hours of Operation	7:00 AM - 6:00 PM
Access	Receptionist
Security	
Notes	

Architectural Finishes

Floor	Carpet
Wall	Paint
Ceiling	Suspended ceiling
Casework	
Notes	

Environmental Criteria

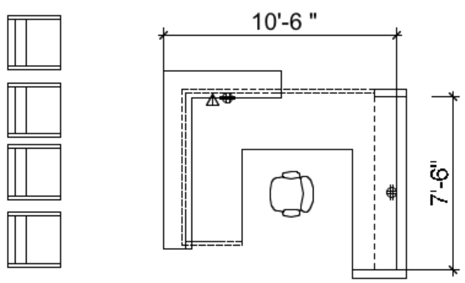
Natural Lighting	Desired
Artificial Lighting	50 foot-candles (fc), task lighting
Switching/Dimming	Multiple Switching
Temperature	
Acoustics/Noise	
Notes	

Utilities and Services

Normal Power	Yes
Emergency Power	Yes
Plumbing	
Fire Protection	Yes
Telecom	(2 tel, 4 data), Overall Building PA system, (2 guest phone/4 guest data)
Notes	PA station; CCTV for security monitoring?

Group II Furnishings and Accessories

Chairs	1 + 4 guest chairs
Tables	Desk with public check-in counter
Shelving	
Files	4
Trash Receptacle	1
Fixtures	
Equipment	
Audiovisual	
Special	



1. ADMINISTRATIVE SPACE
1.14 Fire Plan Review - Open Office

General Information

Projected No. of Spaces	1
Assignable Area (NSF)	320
Use or Function	Review and Discuss Plan Submittals
Adjacencies	Fire Marshall, Fire Plan Archive Storage
Critical Dimension	
Ceiling Height	
Occupants	3
Hours of Operation	7:00 AM - 6:00 PM
Access	Staff
Security	
Notes	

Architectural Finishes

Floor	Carpet
Wall	Paint
Ceiling	Suspended Ceiling
Casework	
Notes	

Environmental Criteria

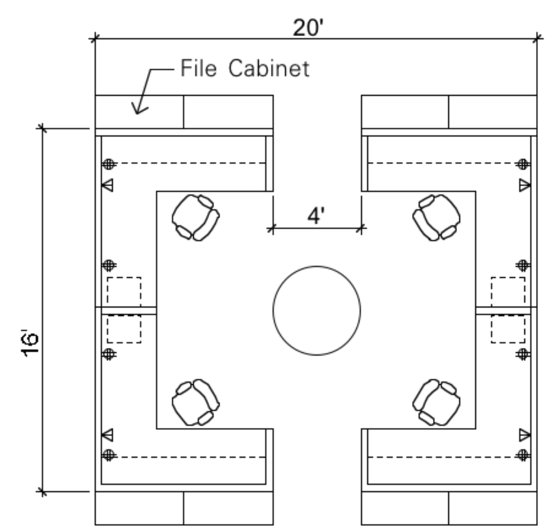
Natural Lighting	Desired
Artificial Lighting	50 foot-candles (fc), task lighting
Switching/Dimming	Multiple Switching
Temperature	
Acoustics/Noise	Minimize sound between workstations
Notes	

Utilities and Services

Normal Power	Yes
Emergency Power	Yes
Plumbing	
Fire Protection	Yes
Telecom	(4 tel, 8 data), Overall Building PA system
Notes	

Group II Furnishings and Accessories

Chairs	3 + guest
Tables	Rectangular tables/counters
Shelving	Bookshelves (Manuals, Reference Materials)
Files	4 Plan Files
Trash Receptacle	3
Fixtures	
Equipment	
Audiovisual	
Special	Bulletin Board, sign, name plates



1. ADMINISTRATIVE SPACE
1.17 Conference Room - small

General Information

Projected No. of Spaces	1
Assignable Area (NSF)	125
Use or Function	Small group conferencing
Adjacencies	Administration
Critical Dimension	
Ceiling Height	9'-6"
Occupants	6
Hours of Operation	7:00 AM - 6:00 PM
Access	Staff/Guests
Security	Lock
Notes	

Architectural Finishes

Floor	Carpet
Wall	Paint
Ceiling	Suspended Ceiling
Casework	Credenza for storage, telephone, food service
Notes	

Environmental Criteria

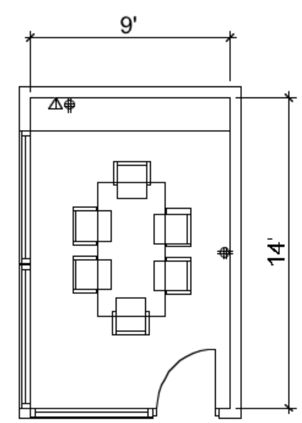
Natural Lighting	
Artificial Lighting	50 foot-candles (fc)
Switching/Dimming	Multiple Switching
Temperature	
Acoustics/Noise	
Notes	

Utilities and Services

Normal Power	Yes
Emergency Power	Yes
Plumbing	
Fire Protection	Yes
Telecom	(2 tel, 4 data), Overall Building PA system
Notes	TV, DVD, VCR

Group II Furnishings and Accessories

Chairs	6
Tables	Small conference room table
Shelving	
Files	
Trash Receptacle	1
Fixtures	
Equipment	Conference telephone
Audiovisual	Video projector, projection screen, starboard system
Special	White Board



1. ADMINISTRATIVE SPACE
1.18 Conference Room - large

General Information

Projected No. of Spaces	1
Assignable Area (NSF)	360
Use or Function	Large group conferencing
Adjacencies	Administration
Critical Dimension	
Ceiling Height	9'-6"
Occupants	16
Hours of Operation	7:00 AM - 6:00 PM
Access	Staff/Guests
Security	Lock
Notes	

Architectural Finishes

Floor	Carpet
Wall	Paint
Ceiling	Suspended Ceiling
Casework	Credenza for sink, storage, telephone, food service
Notes	

Environmental Criteria

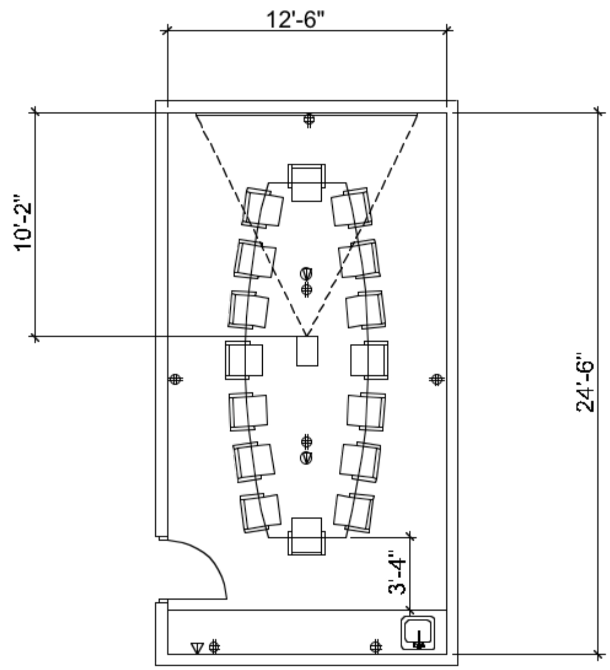
Natural Lighting	
Artificial Lighting	50 foot-candles (fc)
Switching/Dimming	Multiple Switching
Temperature	
Acoustics/Noise	
Notes	

Utilities and Services

Normal Power	Yes; power in floor for connection to table top
Emergency Power	Yes
Plumbing	Yes
Fire Protection	Yes
Telecom	4 (2 tel, 4 data); Overall Building PA system; table top
Notes	TV, DVD, VCR

Group II Furnishings and Accessories

Chairs	30
Tables	Conference room table
Shelving	
Files	
Trash Receptacle	2
Fixtures	Small bar sink
Equipment	Conference telephone
Audiovisual	Video projector, projection screen, starboard system
Special	White Board



1. ADMINISTRATIVE SPACE
1.21 Break Room

General Information

Projected No. of Spaces	1
Assignable Area (NSF)	240
Use or Function	Breakroom/Lounge/Gathering space
Adjacencies	Training Rooms, Outdoor Area, Admin Area
Critical Dimension	
Ceiling Height	9'-6"
Occupants	8 at tables
Hours of Operation	7:00 AM - 6:00 PM
Access	Faculty, Staff, Student
Security	Lock
Notes	

Architectural Finishes

Floor	VCT
Wall	Paint
Ceiling	Clean Room
Casework	Food prep counters with storage below
Notes	

Environmental Criteria

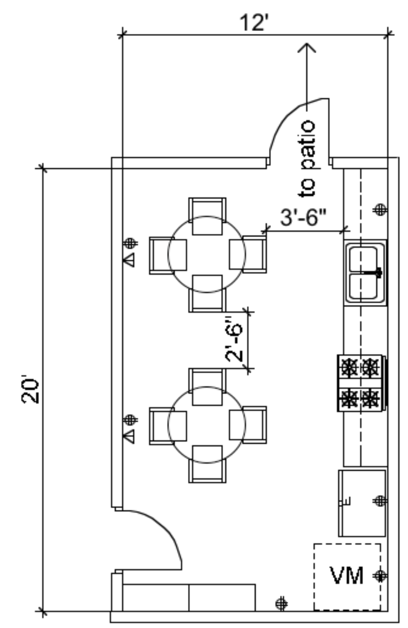
Natural Lighting	Desired
Artificial Lighting	50 foot-candles (fc)
Switching/Dimming	Multiple Switching
Temperature	Individual Temp Control
Acoustics/Noise	
Notes	

Utilities and Services

Normal Power	Yes
Emergency Power	Yes
Plumbing	Sink, Refrigerator
Fire Suppression	Yes
Telecom	(2 tel, 4 data), Overall Building PA system
Notes	TV, DVD, VCR

Group II Furnishings and Accessories

Chairs	8
Tables	2
Shelving	Storage Closets
Files	
Trash Receptacle	2
Fixtures	Sink, Stove/Oven, Refrigerator
Equipment	Vending machine, coffee maker, microwave oven
Audiovisual	
Special	Bulletin Board, White Board



1. ADMINISTRATIVE SPACE
1.22 Work/Copy Room (on second level)

General Information

Projected No. of Spaces	1
Assignable Area (NSF)	120
Use or Function	Mailroom, copies, fax, printing
Adjacencies	Administration
Critical Dimension	
Ceiling Height	9'-6"
Occupants	2 to 3
Hours of Operation	7:00 AM - 6:00 PM
Access	Staff
Security	
Notes	

Architectural Finishes

Floor	Carpet
Wall	Paint
Ceiling	Suspended Ceiling
Casework	Prep counters and mailboxes
Notes	

Environmental Criteria

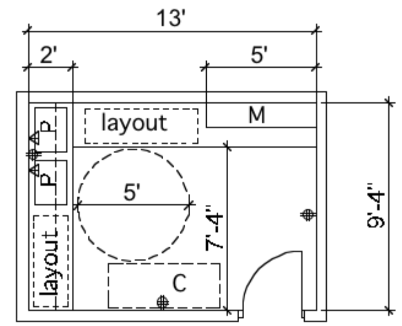
Natural Lighting	
Artificial Lighting	50 foot-candles (fc)
Switching/Dimming	
Temperature	
Acoustics/Noise	
Notes	

Utilities and Services

Normal Power	Yes
Emergency Power	Yes
Plumbing	
Fire Protection	Yes
Telecom	2 (2 tel, 4 data), Overall Building PA system
Notes	Outlets

Group II Furnishings and Accessories

Chairs	
Tables	
Shelving	Storage shelves
Files	
Trash Receptacle	2
Fixtures	
Equipment	Photocopy machine, fax machine, paper shredder, printers
Audiovidual	
Special	Mailboxes, typewriter with table, signage



1. ADMINISTRATIVE SPACE

1.23 Work/Copy Room (on ground level)

General Information

Projected No. of Spaces	1
Assignable Area (NSF)	60
Use or Function	copying, printing
Adjacencies	Administration
Critical Dimension	
Ceiling Height	9'-6"
Occupants	2 to 3
Hours of Operation	7:00 AM - 6:00 PM
Access	Staff
Security	
Notes	

Architectural Finishes

Floor	Carpet
Wall	Paint
Ceiling	Suspended Ceiling
Casework	Prep counter
Notes	

Environmental Criteria

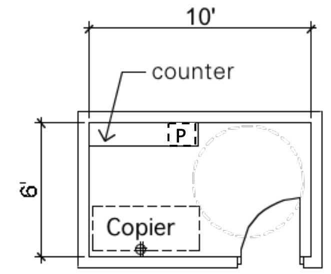
Natural Lighting	
Artificial Lighting	50 foot-candles (fc)
Switching/Dimming	
Temperature	
Acoustics/Noise	
Notes	

Utilities and Services

Normal Power	Yes
Emergency Power	Yes
Plumbing	
Fire Protection	Yes
Telecom	2 (2 tel, 4 data), Overall Building PA system
Notes	

Group II Furnishings and Accessories

Chairs	
Tables	
Shelving	Storage shelves
Files	
Trash Receptacle	2
Fixtures	
Equipment	Photocopy machine/printer
Audiovidual	
Special	



1. ADMINISTRATIVE SPACE
1.24 Technical Library

General Information

Projected No. of Spaces	1
Assignable Area (NSF)	190
Use or Function	Technical books and manuals library
Adjacencies	Administration
Critical Dimension	
Ceiling Height	9'-6"
Occupants	
Hours of Operation	7:00 AM - 8:00 PM
Access	Staff
Security	Lock
Notes	

Architectural Finishes

Floor	Carpet
Wall	Paint
Ceiling	Suspended Ceiling
Casework	
Notes	

Environmental Criteria

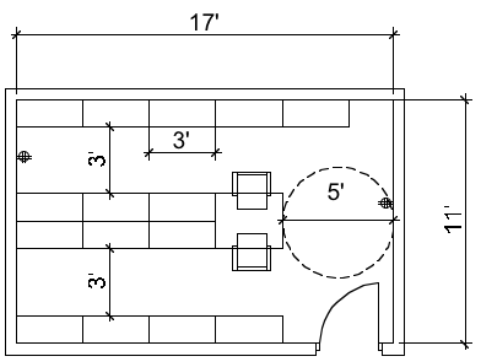
Natural Lighting	No
Artificial Lighting	50 foot-candles (fc), task lighting
Switching/Dimming	Multiple Switching
Temperature	Individual Temp Control
Acoustics/Noise	
Notes	outlets

Utilities and Services

Normal Power	Yes
Emergency Power	Yes
Plumbing	
Fire Protection	Yes
Telecom	(2 tel, 4 data), Overall Building PA system
Notes	

Group II Furnishings and Accessories

Chairs	2
Tables	1
Shelving	Full height bookshelves
Files	magazine rack, index card system, labels on shelves
Trash Receptacle	1
Fixtures	
Equipment	
Audiovidual	
Special	Step stools, sign on door



1. ADMINISTRATIVE SPACE
1.26 Package Storage Room

General Information

Projected No. of Spaces	2 (1 for radioactive packages; 1 for normal packages)
Assignable Area (NSF)	50
Use or Function	Temporary Package storage
Adjacencies	Reception
Critical Dimension	
Ceiling Height	9'-0"
Occupants	
Hours of Operation	7:00 AM - 6:00 PM
Access	Staff
Security	Lock
Notes	

Architectural Finishes

Floor	VCT
Wall	Paint
Ceiling	
Casework	
Notes	

Environmental Criteria

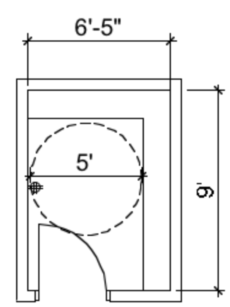
Natural Lighting	No
Artificial Lighting	
Switching/Dimming	
Temperature	
Acoustics/Noise	
Notes	

Utilities and Services

Normal Power	Yes, outlets
Emergency Power	Yes
Plumbing	
Fire Protection	Yes
Telecom	
Notes	

Group II Furnishings and Accessories

Chairs	
Tables	
Shelving	All walls
Files	
Trash Receptacle	
Fixtures	
Equipment	
Audiovidual	
Special	



1. ADMINISTRATIVE SPACE
1.27 Archive Storage Room

General Information

Projected No. of Spaces	1
Assignable Area (NSF)	310
Use or Function	Archive files storage (30 years)
Adjacencies	Reception
Critical Dimension	
Ceiling Height	9'-6"
Occupants	
Hours of Operation	7:00 AM - 6:00 PM
Access	Staff
Security	Lock
Notes	

Architectural Finishes

Floor	Carpet
Wall	Paint
Ceiling	Suspended Ceiling
Casework	
Notes	

Environmental Criteria

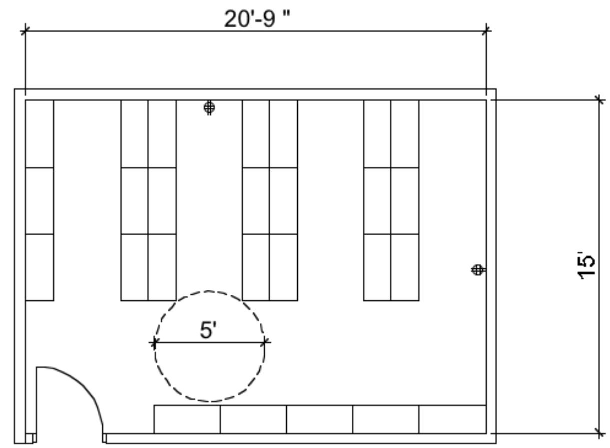
Natural Lighting	No
Artificial Lighting	
Switching/Dimming	
Temperature	
Acoustics/Noise	
Notes	

Utilities and Services

Normal Power	Yes
Emergency Power	Yes
Plumbing	
Fire Protection	Yes
Telecom	
Notes	

Group II Furnishings and Accessories

Chairs	
Tables	
Shelving	
Files	All walls
Trash Receptacle	
Fixtures	
Equipment	
Audiovidual	
Special	Step stools, sign on door



1. ADMINISTRATIVE SPACE
1.28 Fire Plan Archive Storage Room

General Information

Projected No. of Spaces	1
Assignable Area (NSF)	200
Use or Function	Plan archive storage
Adjacencies	Fire Plan Review
Critical Dimension	
Ceiling Height	9'-6"
Occupants	
Hours of Operation	7:00 AM - 6:00 PM
Access	Staff
Security	Lock
Notes	

Architectural Finishes

Floor	Carpet
Wall	Paint
Ceiling	Suspended Ceiling
Casework	
Notes	

Environmental Criteria

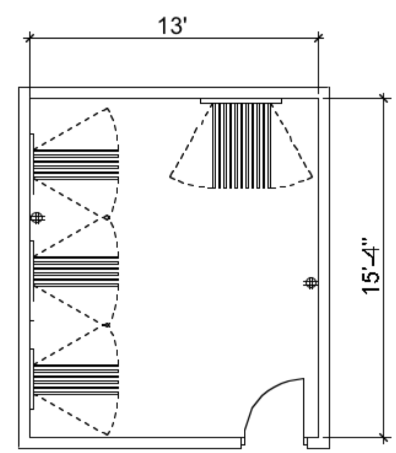
Natural Lighting	No
Artificial Lighting	General Lighting
Switching/Dimming	
Temperature	
Acoustics/Noise	
Notes	

Utilities and Services

Normal Power	Yes
Emergency Power	Yes
Plumbing	
Fire Protection	Yes
Telecom	
Notes	

Group II Furnishings and Accessories

Chairs	
Tables	
Shelving	Drawing racks
Files	Plan files
Trash Receptacle	
Fixtures	
Equipment	
Audiovidual	
Special	step stools, sign



1. ADMINISTRATIVE SPACE
1.29 Fire Extinguisher Storage Room

General Information

Projected No. of Spaces	1
Assignable Area (NSF)	80
Use or Function	Fire Extinguisher Storage
Adjacencies	Fire Plan Review
Critical Dimension	
Ceiling Height	9'-0"
Occupants	
Hours of Operation	7:00 AM - 6:00 PM
Access	Staff
Security	Lock
Notes	

Architectural Finishes

Floor	Carpet
Wall	Paint
Ceiling	Suspended Ceiling
Casework	
Notes	

Environmental Criteria

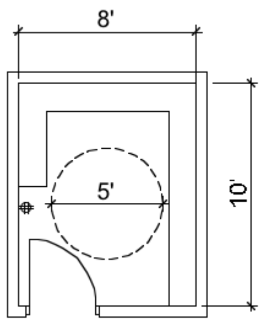
Natural Lighting	No
Artificial Lighting	
Switching/Dimming	auto on/off
Temperature	
Acoustics/Noise	
Notes	

Utilities and Services

Normal Power	Yes
Emergency Power	Yes
Plumbing	
Fire Protection	Yes
Telecom	
Notes	

Group II Furnishings and Accessories

Chairs	
Tables	
Shelving	All walls
Files	
Trash Receptacle	
Fixtures	
Equipment	
Audiovidual	
Special	



1. ADMINISTRATIVE SPACE
1.30 Server Room

General Information

Projected No. of Spaces	1
Assignable Area (NSF)	120
Use or Function	house servers for building
Adjacencies	IT Manager's Office; if possible, Main Telecom room
Critical Dimension	
Ceiling Height	9'-6"
Occupants	
Hours of Operation	24 hours
Access	Staff
Security	Lock
Notes	

Architectural Finishes

Floor	anti static vinyl
Wall	Paint
Ceiling	Suspended Ceiling
Casework	
Notes	

Environmental Criteria

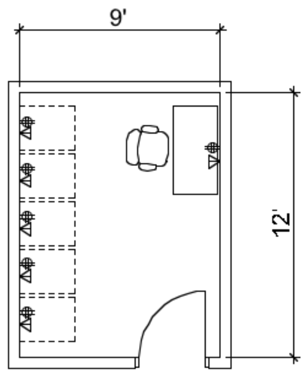
Natural Lighting	No
Artificial Lighting	
Switching/Dimming	
Temperature	dedicated HVAC 24/7
Acoustics/Noise	
Notes	

Utilities and Services

Normal Power	Yes
Emergency Power	Yes
Plumbing	
Fire Protection	Yes
Telecom	
Notes	

Group II Furnishings and Accessories

Chairs	1 desk chair + 1 guest chair
Tables	1 work table
Shelving	
Files	
Trash Receptacle	1
Fixtures	
Equipment	5 server racks
Audiovidual	
Special	



1. ADMINISTRATIVE SPACE
1.31 Storage (on second level)

General Information

Projected No. of Spaces	1
Assignable Area (NSF)	120
Use or Function	admin storage
Adjacencies	admin
Critical Dimension	
Ceiling Height	9'-0"
Occupants	
Hours of Operation	7:00 AM - 6:00 PM
Access	Staff
Security	Lock
Notes	

Architectural Finishes

Floor	Carpet
Wall	Paint
Ceiling	Suspended Ceiling
Casework	
Notes	

Environmental Criteria

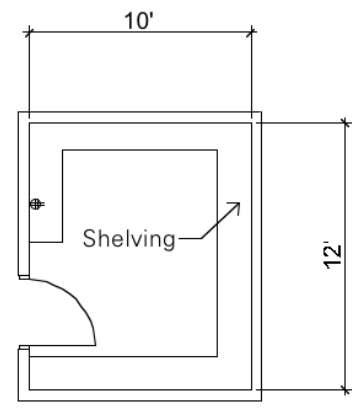
Natural Lighting	No
Artificial Lighting	
Switching/Dimming	auto on/off
Temperature	
Acoustics/Noise	
Notes	

Utilities and Services

Normal Power	Yes
Emergency Power	Yes
Plumbing	
Fire Protection	Yes
Telecom	
Notes	

Group II Furnishings and Accessories

Chairs	
Tables	
Shelving	shelving units
Files	
Trash Receptacle	
Fixtures	
Equipment	
Audiovidual	
Special	



1. ADMINISTRATIVE SPACE
1.32 Break Room

General Information

Projected No. of Spaces	1
Assignable Area (NSF)	50
Use or Function	coffee preparation
Adjacencies	admin
Critical Dimension	
Ceiling Height	9'-0"
Occupants	
Hours of Operation	7:00 AM - 6:00 PM
Access	Staff
Security	Lock
Notes	

Architectural Finishes

Floor	VCT
Wall	Paint
Ceiling	Suspended Ceiling
Casework	counter
Notes	

Environmental Criteria

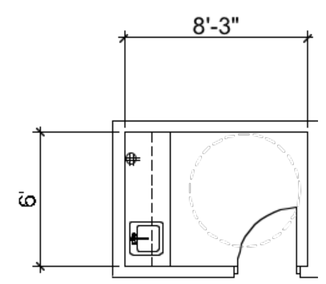
Natural Lighting	No
Artificial Lighting	
Switching/Dimming	auto on/off
Temperature	
Acoustics/Noise	
Notes	

Utilities and Services

Normal Power	Yes
Emergency Power	Yes
Plumbing	small sink
Fire Protection	Yes
Telecom	(2 tel, 4 data), overall building PA system
Notes	

Group II Furnishings and Accessories

Chairs	
Tables	
Shelving	cabinets
Files	
Trash Receptacle	
Fixtures	
Equipment	coffee maker, under counter refrigerator
Audiovidual	
Special	bulletin board



2. SAFETY LEARNING CENTER
2.02 Training Room - 60 seats

General Information

Projected No. of Spaces	1
Assignable Area (NSF)	1220
Use or Function	Medium size group training/seminar
Adjacencies	Pre-function Check-in
Critical Dimension	
Ceiling Height	12'* allow proper sight lines to projection screens
Occupants	60
Hours of Operation	7:00 AM - 6:00 PM
Access	Staff/Faculty/Guests
Security	Lock
Notes	

Architectural Finishes

Floor	Carpet
Wall	Paint
Ceiling	Suspended Ceiling
Casework	
Notes	

Environmental Criteria

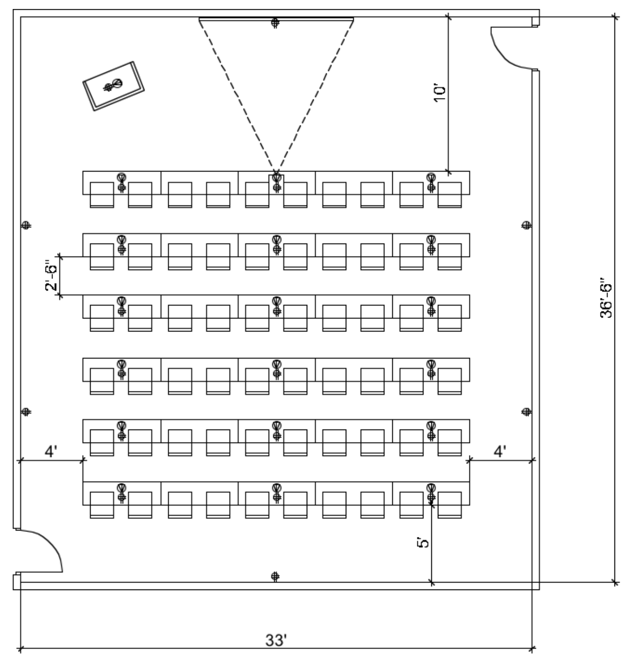
Natural Lighting	Desired, Darkening Shades
Artificial Lighting	50 foot-candles (fc)
Switching/Dimming	Multiple Switching/Multiple Zones
Temperature	Individual Temp Control with override capabilities for late classes
Acoustics/Noise	NRC 25-30
Notes	

Utilities and Services

Normal Power	Yes
Emergency Power	Yes
Plumbing	
Fire Protection	Yes
Telecom	(2 tel, 4 data), floor outlets, overall building PA system
Notes	TV/DVDC/VCR

Group II Furnishings and Accessories

Chairs	60
Tables	30 training tables
Shelving	
Files	
Trash Receptacle	1
Fixtures	
Equipment	CPU's, Flat Screen Monitors, Headphones
Audiovidual	Multiple Ceiling LCD projectors and TV/VCR/SDVD Projection screen, Starboard computer tablet, video camera Wireless microphone system and speakers
Special	podium, white boards



2. SAFETY LEARNING CENTER
2.04 Computer Training Room

General Information

Projected No. of Spaces	1
Assignable Area (NSF)	270
Use or Function	Small size group training/seminar
Adjacencies	Pre-function Check-in
Critical Dimension	
Ceiling Height	* allow proper sight lines to projection screens
Occupants	8 at central table + 6 at perimeter
Hours of Operation	7:00 AM - 6:00 PM
Access	Staff/Faculty/Guests
Security	Lock
Notes	

Architectural Finishes

Floor	Carpet
Wall	Paint
Ceiling	Suspended Ceiling
Casework	Counter with lockable storage below
Notes	

Environmental Criteria

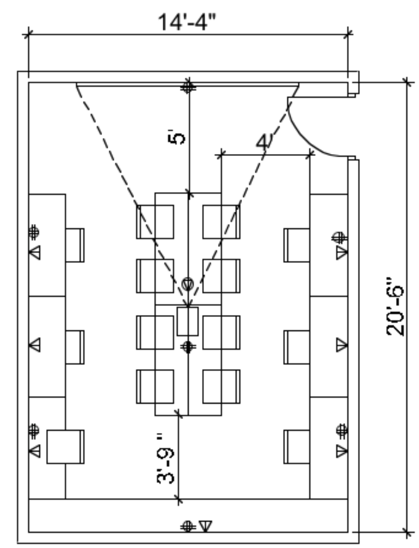
Natural Lighting	Desired, Darkening Shades
Artificial Lighting	50 foot-candles (fc)
Switching/Dimming	Multiple Switching, multi zones
Temperature	Individual Temp Control with override capabilities for late classes
Acoustics/Noise	NRC 25-30
Notes	

Utilities and Services

Normal Power	Yes
Emergency Power	Yes
Plumbing	
Fire Protection	Yes
Telecom	3 (2 tel, 4 data), overall building PA system
Notes	TV, DVD, VCR

Group II Furnishings and Accessories

Chairs	14 Ergonomic
Tables	6 computer workstations, 4 training tables
Shelving	
Files	
Trash Receptacle	1
Fixtures	
Equipment	CPU's, Flat Screen Monitors, Headphones
Audiovidual	Ceiling mounted LCD projector and TV/VCR/SDVD
	Projection screen, Starboard computer tablet
Special	Center console, white board



2. SAFETY LEARNING CENTER
2.11 Pre-function/Check-in Lobby/ Ergonomics Station

General Information

Projected No. of Spaces	1
Assignable Area (NSF)	325
Use or Function	Pre-function check-in Lobby
Adjacencies	Training Room, Reception, Breakroom
Critical Dimension	
Ceiling Height	
Occupants	
Hours of Operation	7:00 AM - 6:00 PM
Access	Staff/Guests
Security	
Notes	

Architectural Finishes

Floor	Carpet
Wall	Paint
Ceiling	Suspended Ceiling
Casework	
Notes	

Environmental Criteria

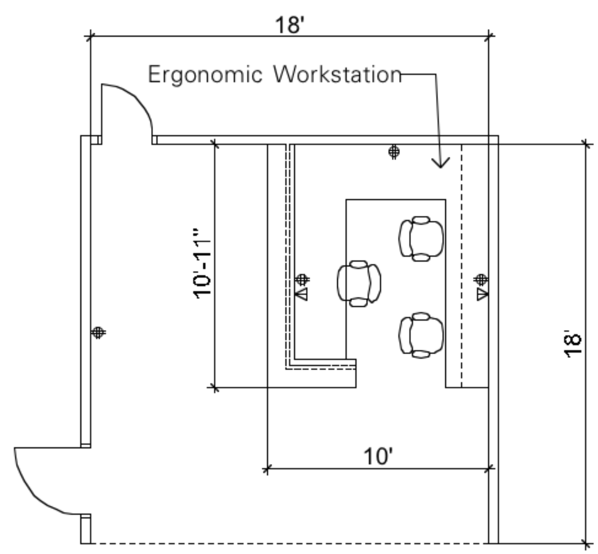
Natural Lighting	Desired
Artificial Lighting	50 foot-candles (fc)
Switching/Dimming	Multiple Switching
Temperature	Individual Temp Control
Acoustics/Noise	
Notes	

Utilities and Services

Normal Power	Yes
Emergency Power	Yes
Plumbing	
Fire Protection	Yes
Telecom	(2 tel, 4 data), overall building PA system
Notes	

Group II Furnishings and Accessories

Chairs	3
Tables	
Shelving	
Files	
Trash Receptacle	1
Fixtures	
Equipment	
Audiovidual	
Special	Ergonomic Lab Display, bulletin board, white board, space for moveable fume hood, sign



2. SAFETY LEARNING CENTER
2.13 Furniture Storage

General Information

Projected No. of Spaces	1
Assignable Area (NSF)	160
Use or Function	Training room furniture storage
Adjacencies	Pre-function, Training rooms
Critical Dimension	
Ceiling Height	9'-0"
Occupants	
Hours of Operation	7:00 AM - 6:00 PM
Access	Staff
Security	Lock
Notes	

Architectural Finishes

Floor	Carpet
Wall	Paint
Ceiling	Suspended Ceiling
Casework	
Notes	

Environmental Criteria

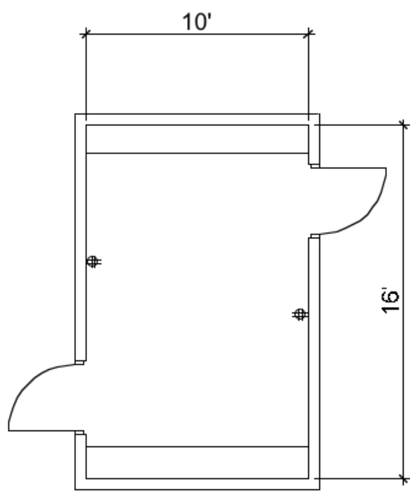
Natural Lighting	No
Artificial Lighting	
Switching/Dimming	
Temperature	
Acoustics/Noise	
Notes	

Utilities and Services

Normal Power	Yes
Emergency Power	Yes
Plumbing	
Fire Protection	Yes
Telecom	
Notes	

Group II Furnishings and Accessories

Chairs	
Tables	
Shelving	
Files	
Trash Receptacle	
Fixtures	
Equipment	
Audiovidual	
Special	Furniture dollies



3. LABORATORIES
3.01 Radiation Lab

General Information

Projected No. of Spaces	1
Assignable Area (NSF)	462
Use or Function	Laboratory
Adjacencies	Instrument Room
Critical Dimension	21'-0"
Ceiling Height	9'-6"
Occupants	1 to 5 people
Hours of Operation	24/7
Access	Radiation Safety Group
Security	Card Key
Notes	3'-6" Door

Architectural Finishes

Floor	Sealed sheet vinyl w/ coved corners
Wall	Gypsum wall board or w/ epoxy paint
Ceiling	Suspended Ceiling
Casework	Metal furniture w/ epoxy tops
Notes	

Environmental Criteria

Natural Lighting	Desired
Artificial Lighting	Fluorescent: 80-100 fc at work surface - even illumination
Switching/Dimming	Dual level
Temperature	72°F ± 3°F; 20-50% RH
Acoustics/Noise	Lab
Notes	

Utilities and Services

Normal Power	120/208V, 3 phase, 5 wire
Emergency Power	To be determined
Plumbing	VLV, G, LA, HW, CW, IHW, ICW
Fire Protection	Sprinklers
Telecom	3 (2 tel, 4 data)
Notes	Magnetic Hold Opens

Furnishings and Accessories

Chairs	
Stools	3
Tables	
Shelving	Bookshelves, Lab shelving
Files	
Trash Receptacle	3
Fixtures	
Equipment	(3) Scintillation counters (O.F.O.I.), refrigerator/freezer
Audiovisual	
Special	

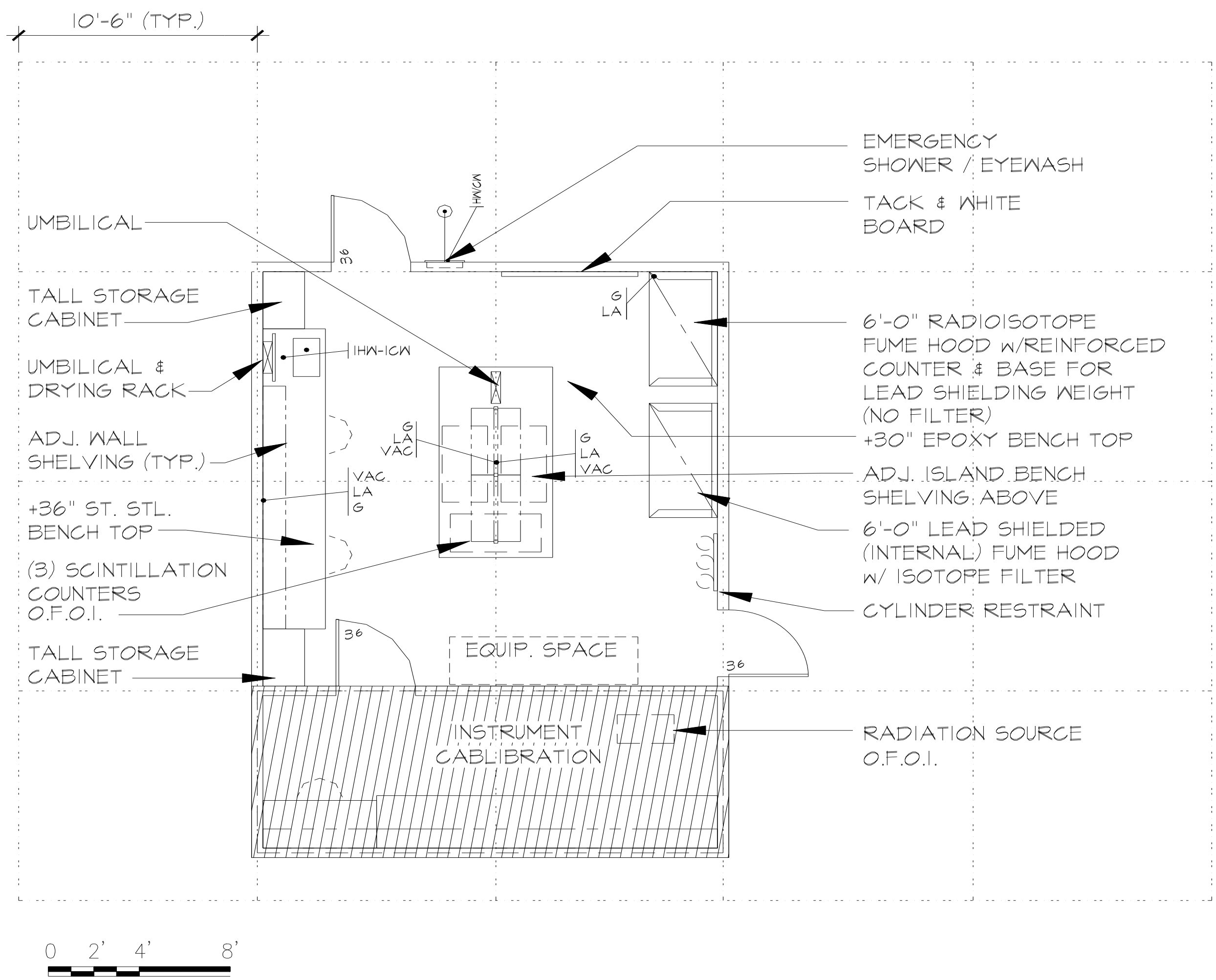
Building Systems

Hazardous Class.	Occ. Class. B
Sink Size	Wall bench: 17"x21"x10"
Eyewash	As per ANSI Z358.1-1998, Locate in hall
Emergency Shower	As per ANSI Z358.1-1998, Locate in hall
Spill Control	
Floor Drain(s)	None
Secondary Containment	
Acid Waste	Yes
Plaster / Soil Trap	
Explosion Protection	
Leak Detection	
Other	

HVAC

Fume Hood	(1) 6' Radioisotope Hood w/ reinforced top and cabinet, filter not required
Changes/hr	Minimum 6/hr
Filtration	HEPA at hood; Building standard
Exhaust	Chemical
Pressure	Negative
Ventilation	100% supply and exhaust
	(1) 6' internally lead shielded w/ Isotope filter system

3. LABORATORIES
3.01 Radiation Lab



3.03 LABORATORIES
3.03 General Lab

General Information

Projected No. of Spaces	1
Assignable Area (NSF)	508
Use or Function	Industrial Hygiene, Environmental, Biosafety
Adjacencies	Radiation Lab
Critical Dimension	21'-0"
Ceiling Height	9'-6"
Occupants	4 to 6
Hours of Operation	24/7
Access	Waste Staff
Security	Latch set
Notes	Card Key

Architectural Finishes

Floor	Sheet vinyl w/ coved base
Wall	Gypsum wall board w/ epoxy paint
Ceiling	Suspended Ceiling
Casework	Metal lab furniture w/ epoxy resin tops
Notes	

Environmental Criteria

Natural Lighting	Desired
Artificial Lighting	Fluorescent: 80-100 fc at work surface - even illumination
Switching/Dimming	Dual level
Temperature	72°F ± 3°F; 20-50% RH
Acoustics/Noise	Lab
Notes	

Utilities and Services

Normal Power	120/208V, 3 phase, 5 wire
Emergency Power	To be determined
Plumbing	VAC, G, LA, HW, CW, IHW, ICW
Fire Protection	Sprinklers
Telecom	4 (1 tele, data)
Notes	Magnetic Hold Opens

Furnishings and Accessories

Chairs	3
Stools	3
Tables	
Shelving	Bookshelves, Lab shelving
Files	1
Trash Receptacle	3
Fixtures	
Equipment	4' BSC II/A2, Refrigerator (O.F.O.I.)
Audiovisual	
Special	

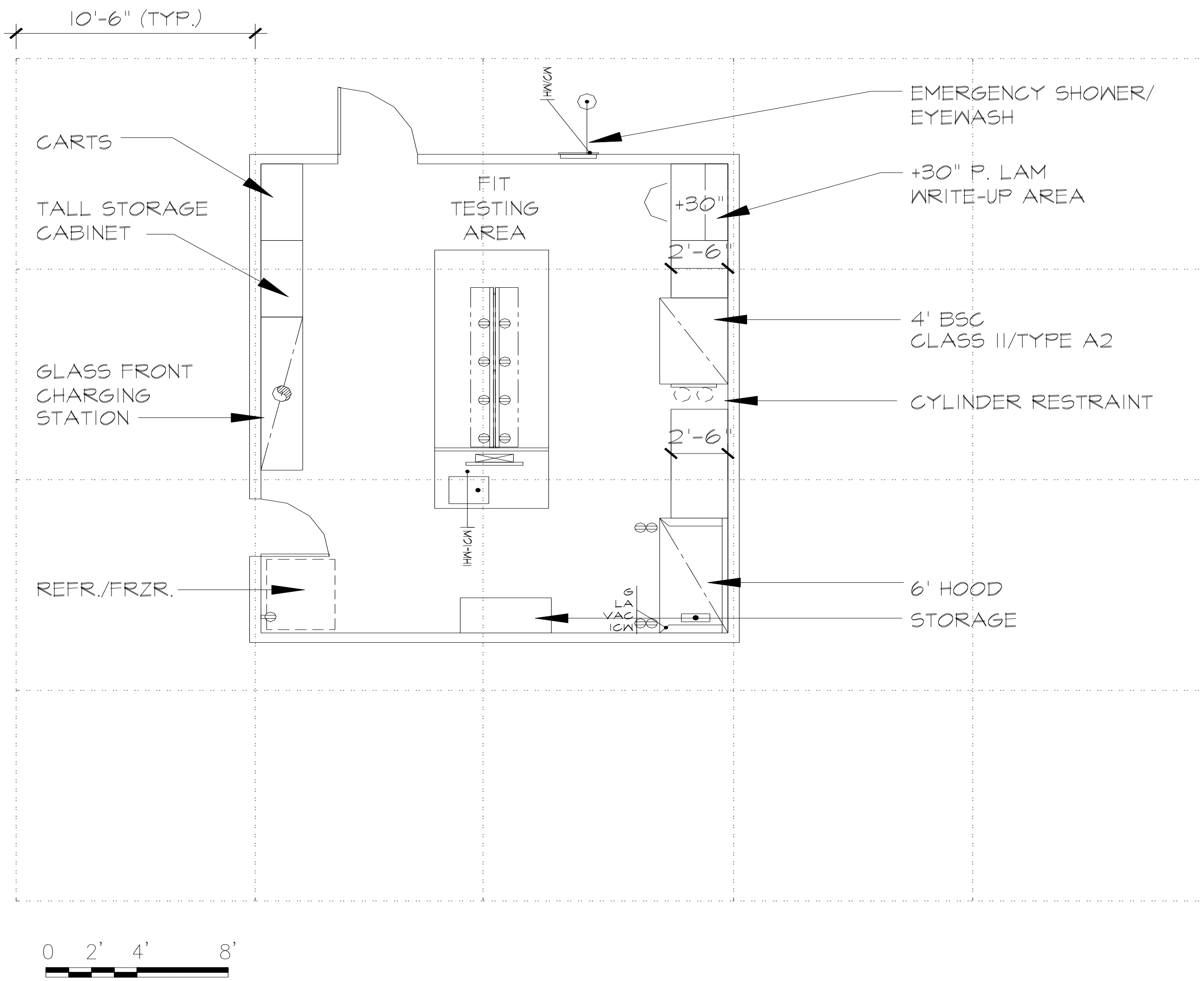
Building Systems

Hazardous Class.	Occ. Class. B
Sink Size	Island bench: 17"x21"x10"
Eyewash	As per ANSI Z358.1-1998
Emergency Shower	As per ANSI Z358.1-1998
Spill Control	
Floor Drain(s)	None
Secondary Containment	
Acid Waste	Yes
Plaster / Soil Trap	
Explosion Protection	
Leak Detection	
Other	

HVAC

Fume Hood	(1) 6' Fume Hood
Changes/hr	Minimum 6/hr
Filtration	Building Standard
Exhaust	Chemical
Pressure	Negative
Ventilation	100% supply and exhaust

3.03 LABORATORIES
3.03 General Lab



3. LABORATORIES
3.11 Storage

General Information

Projected No. of Spaces	1
Assignable Area (NSF)	116
Use or Function	Storage
Adjacencies	Laboratories
Critical Dimension	10'-6"
Ceiling Height	9'-6"
Occupants	0
Hours of Operation	24/7
Access	EH&S Staff
Security	Latch set, card key
Notes	

Architectural Finishes

Floor	VCT
Wall	Gypsum wall board w/ epoxy paint
Ceiling	Suspended Ceiling
Casework	Wood shelving
Notes	

Environmental Criteria

Natural Lighting	None
Artificial Lighting	Fluorescent: 60 fc at work surface
Switching/Dimming	
Temperature	72°F ± 3°F; 20-50% RH
Acoustics/Noise	None
Notes	

Utilities and Services

Normal Power	120V
Emergency Power	Needs Power
Plumbing	None
Fire Protection	Sprinklers
Telecom	None
Notes	Magnetic Hold Opens

Furnishings and Accessories

Chairs	
Stools	
Tables	
Shelving	Wall and free-standing
Files	
Trash Receptacle	
Fixtures	
Equipment	
Audiovisual	
Special	cabinets

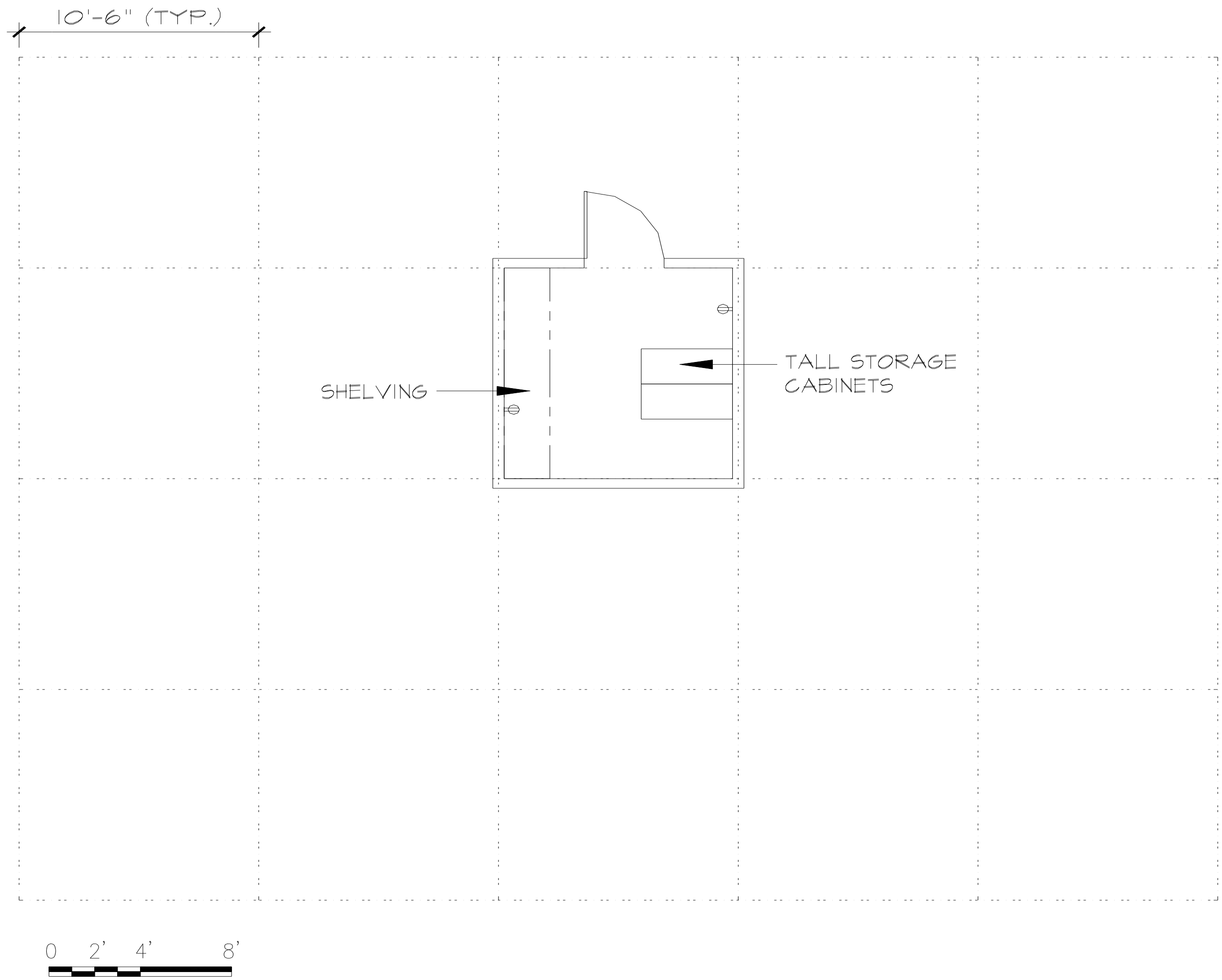
Building Systems

Hazardous Class.	Occ. Class. B
Sink Size	None
Eyewash	As per ANSI Z358.1-1998
Emergency Shower	As per ANSI Z358.1-1998
Spill Control	
Floor Drain(s)	None
Secondary Containment	None
Acid Waste	None
Plaster / Soil Trap	
Explosion Protection	
Leak Detection	
Other	

HVAC

Fume Hood	
Changes/hr	Minimum 6/hr
Filtration	Building Standard
Exhaust	Chemical
Pressure	Negative
Ventilation	100% supply and exhaust

3. LABORATORIES
3.11 Storage



3. LABORATORIES
3.12 Radiation Instrument Calibration / Radiation Lab Support

General Information

Projected No. of Spaces	1
Assignable Area (NSF)	185
Use or Function	Instrument Calibration
Adjacencies	General Lab
Critical Dimension	30'-0" clear
Ceiling Height	9'-6"
Occupants	1
Hours of Operation	8:00 AM to 6:00 PM
Access	Radiation Safety Group
Security	Latch key
Notes	3'-6" Door

Architectural Finishes

Floor	Sealed sheet vinyl w/ coved base
Wall	Gypsum wall board w/ epoxy paint
Ceiling	Suspended Ceiling
Casework	Metal furniture w/ epoxy tops
Notes	

Environmental Criteria

Natural Lighting	Desired
Artificial Lighting	Fluorescent: 80-100 fc at work surface - even illumination
Switching/Dimming	On/off
Temperature	72°F ± 3°F; 20-50% RH
Acoustics/Noise	Lab
Notes	

Utilities and Services

Normal Power	120/208V, 3 phase, 4 wire
Emergency Power	To be determined
Plumbing	
Fire Protection	Sprinklers
Telecom	(2 tele,4 data)
Notes	Magnetic Hold Opens

Furnishings and Accessories

Chairs	1
Stools	1
Tables	
Shelving	Bookshelves, lab shelving
Files	1
Trash Receptacle	1
Fixtures	
Equipment	
Audiovisual	
Special	

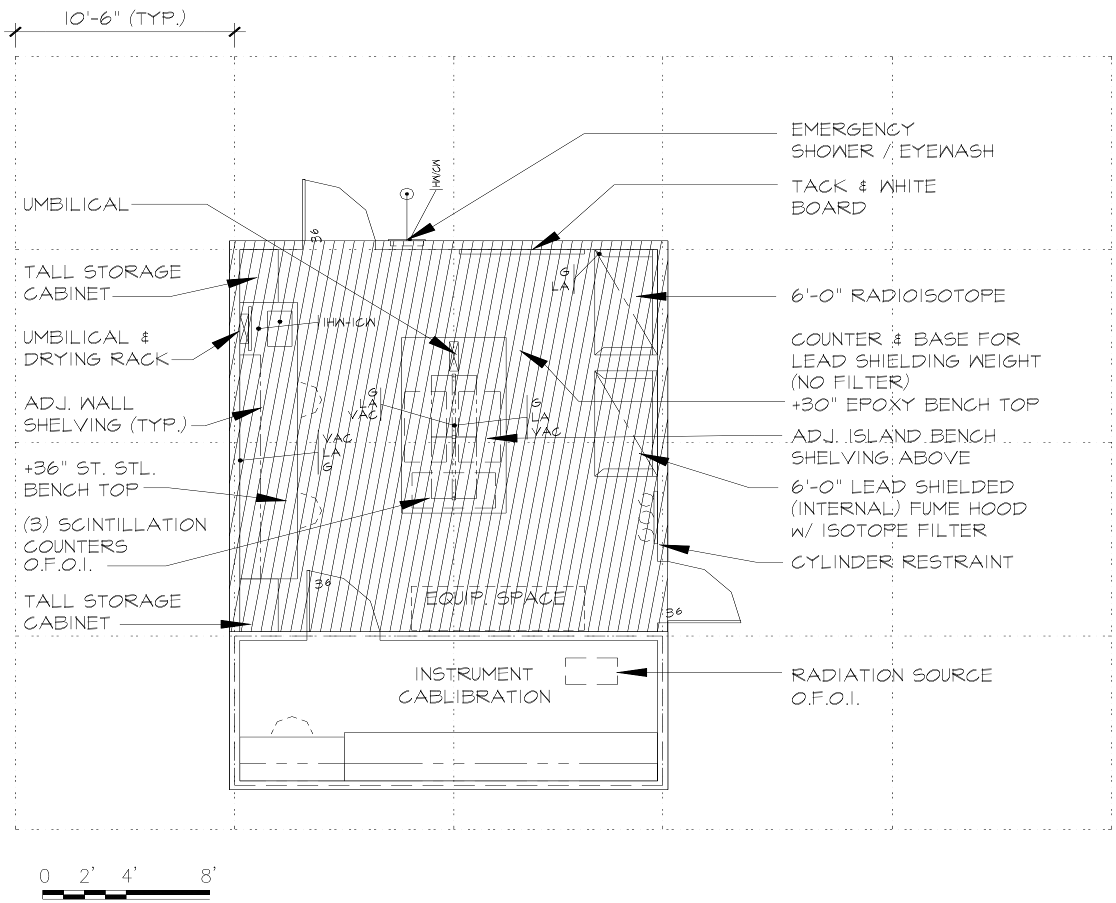
Building Systems

Hazardous Class.	Occ. Class. B
Sink Size	None
Eyewash	As per ANSI Z358.1-1998 - in corridor
Emergency Shower	As per ANSI Z358.1-1998 - in corridor
Spill Control	
Floor Drain(s)	None
Secondary Containment	
Acid Waste	None
Plaster / Soil Trap	
Explosion Protection	
Leak Detection	
Other	Gamma radiation source shielded from building and occupants

HVAC

Fume Hood	None
Changes/hr	Minimum 6/hr
Filtration	Building standard
Exhaust	Chemical
Pressure	Negative
Ventilation	100% supply and exhaust

3. LABORATORIES
3.12 Radiation Instrument Calibration / Radiation Lab Support



4. CHEMICAL WASTE
4.01 Processing Room

General Information

Projected No. of Spaces	1
Assignable Area (NSF)	1452
Use or Function	Materials processing and segregation
Adjacencies	Loading dock, Control room
Critical Dimension	44'-0"
Ceiling Height	3 pallet racks high (15'-0" CLR)
Occupants	3 to 5 people
Hours of Operation	24/7
Access	Waste staff
Security	Card Key
Notes	

Architectural Finishes

Floor	Trowelled on epoxy w/ coved base
Wall	CMU w/ epoxy paint
Ceiling	Exposed
Casework	Metal
Notes	

Environmental Criteria

Natural Lighting	Desired
Artificial Lighting	Fluorescent: 80-100 fc at work surface
Switching/Dimming	Zoned - even illumination
Temperature	65°F to 80°F
Acoustics/Noise	Noise producing
Notes	

Utilities and Services

Normal Power	120/208V, 3 phase, 5 wire
Emergency Power	Building on emergency power
Plumbing	A, HW, CW, IHW, ICW, LALV
Fire Protection	Foam
Telecom	2 tel, 4 data
Notes	Magnetic Hold Opens, Provide sink if one is not close, provide ground bar at hood.

Furnishings and Accessories

Chairs	1
Stools	2
Tables	
Shelving	Heavy duty non-corrosive
Files	1
Trash Receptacle	2
Fixtures	
Equipment	(4) Gas cabinets, flammable, corrosive & toxic acid cabinet, cylinder inspecting glovebox
Special	

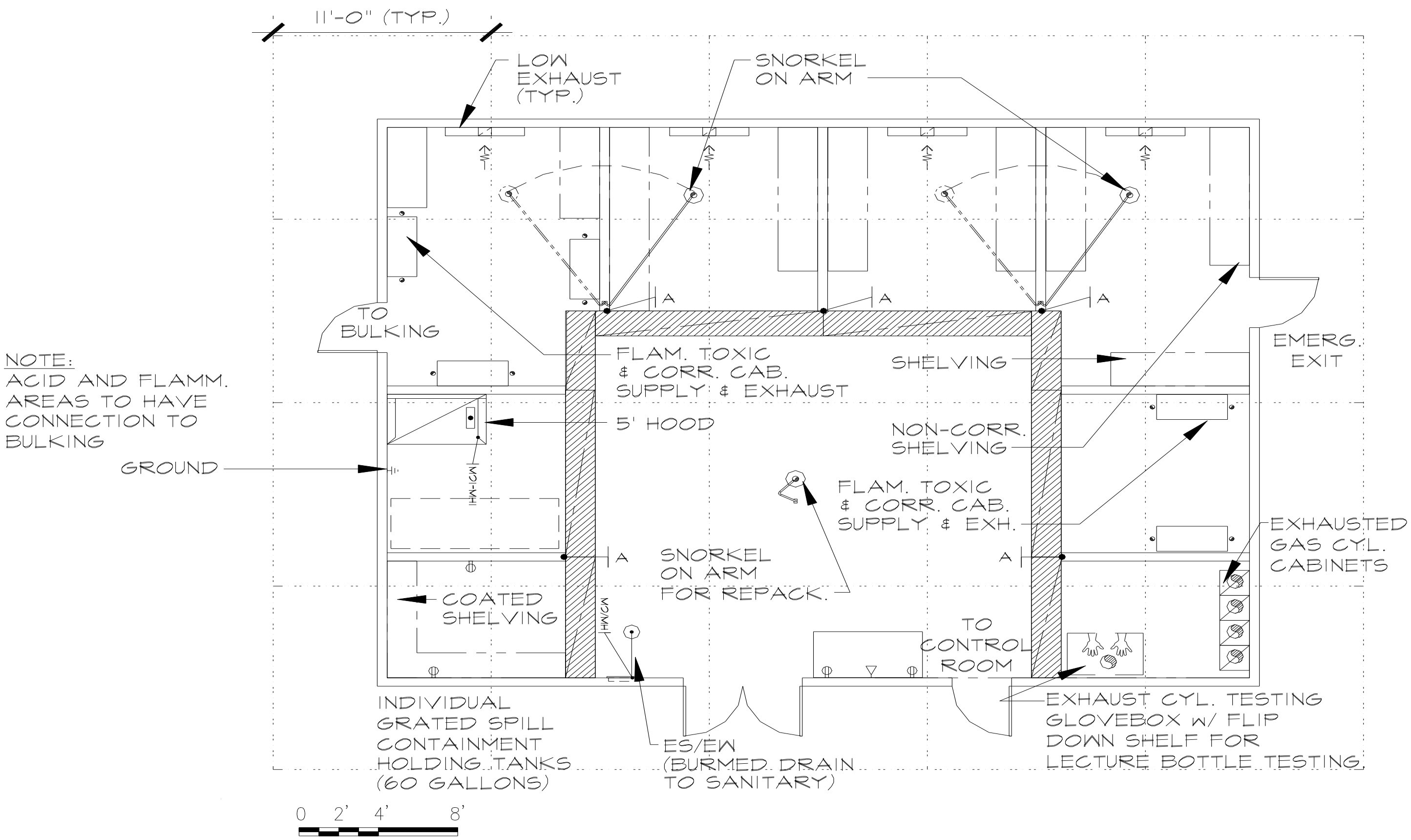
Building Systems

Hazardous Class.	Occ. Class. H3/H7
Sink Size	Handwash
Eyewash	As per ANSI Z358.1-1998
Emergency Shower	As per ANSI Z358.1-1998
Spill Control	Trenches to holding tank
Floor Drain(s)	Segregrated Trenches
Secondary Containment	Yes
Acid Waste	Yes
Plaster / Soil Trap	No
Explosion Protection	No
Leak Detection	No
Other	

HVAC

Fume Hood	(1) 5' Fume Hood, back draft slots & vented cabinets, & equip.
Changes/hr	Chemical - high ventilation rate - low velocity 10 to 12 air changes
Filtration	Building standard
Exhaust	(3) Snorkel exhausts
Pressure	Negative
Ventilation	100% supply and exhaust

4. CHEMICAL WASTE
4.01 Processing Room



4. CHEMICAL WASTE
4.02 Chemical Bulking Room

General Information

Projected No. of Spaces	1
Assignable Area (NSF)	605
Use or Function	Chemical Bulking
Adjacencies	Chemical Processing
Critical Dimension	22'-0" x 27'-5"
Ceiling Height	Exposed
Occupants	4
Hours of Operation	24/7
Access	Waste Staff
Security	Card Key
Notes	

Architectural Finishes

Floor	Trowelled on epoxy w/ coved base - bonded and grounded
Wall	CMU w/ epoxy paint
Ceiling	Exposed
Casework	Metal cabinets and epoxy tops
Notes	

Environmental Criteria

Natural Lighting	Desired
Artificial Lighting	Fluorescent: 80-100 fc at work surface; explosion proof
Switching/Dimming	Dual level - even illumination
Temperature	75°F to 80°F
Acoustics/Noise	
Notes	

Utilities and Services

Normal Power	120/208V, 3 phase, explosion proof
Emergency Power	To be determined
Plumbing	Air, HW, CW, AV
Fire Protection	Foam
Telecom	(2 tele, 4 data)
Notes	Grounding bar around room

Furnishings and Accessories

Chairs	
Stools	
Tables	
Shelving	
Files	
Trash Receptacle	2
Fixtures	
Equipment	
Audiovisual	
Special	

Building Systems

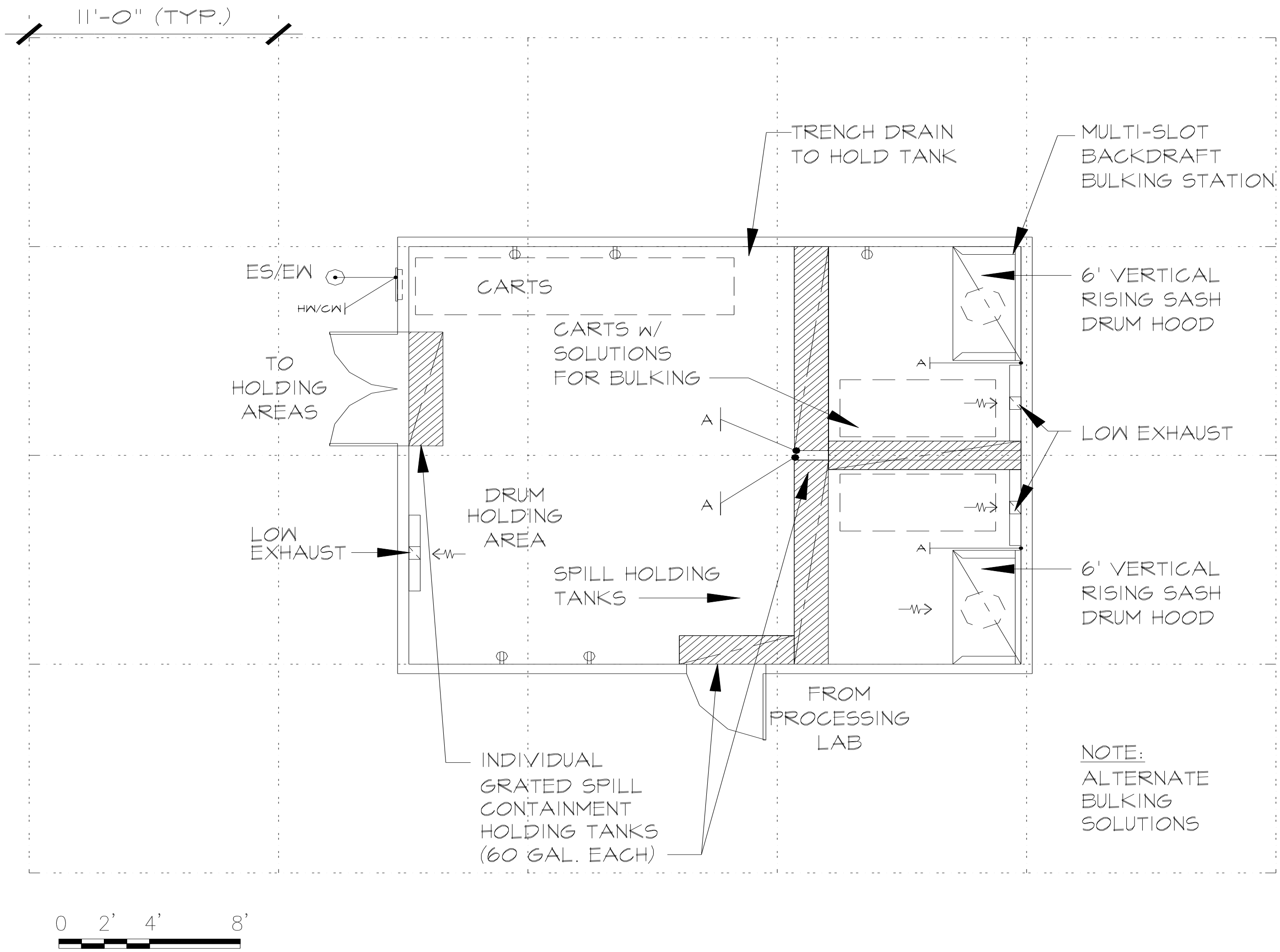
Hazardous Class.	Occ. Class. H2/H7; Electrical Class I, Division 2
Sink Size	None
Eyewash	As per ANSI Z358.1-1998
Emergency Shower	As per ANSI Z358.1-1998
Spill Control	Trench to holding tanks
Floor Drain(s)	Trench with individual 60 gallon tank
Secondary Containment	Yes
Acid Waste	Yes
Plaster / Soil Trap	
Explosion Protection	Explosion Control Required
Leak Detection	
Other	

HVAC

Fume Hood	Floor-mounted barrel hoods
Changes/hr	Chemical - high ventilation rate - low velocity
Filtration	Building standard
Exhaust	Chemical
Pressure	Negative
Ventilation	100% supply and exhaust

4. CHEMICAL WASTE

4.02 Chemical Bulking Room



4. CHEMICAL WASTE
4.03 Decontamination Room (Containers)

General Information

Projected No. of Spaces	1
Assignable Area (NSF)	605
Use or Function	Decontamination of equipment
Adjacencies	Chemical Bulking and Processing Room
Critical Dimension	22'-0"
Ceiling Height	Exposed
Occupants	3
Hours of Operation	24/7
Access	Waste Staff
Security	Card Key
Notes	

Architectural Finishes

Floor	Trowelled on epoxy w/ coved base
Wall	CMU w/ epoxy paint
Ceiling	Exposed
Casework	Stainless steel furniture w/ epoxy tops
Notes	

Environmental Criteria

Natural Lighting	Desired
Artificial Lighting	Fluorescent: 60 fc at work surface
Switching/Dimming	Dual level - even illumination
Temperature	65°F to 80°F
Acoustics/Noise	
Notes	

Utilities and Services

Normal Power	120/208V, 3 phase, 5 wire
Emergency Power	To be determined
Plumbing	LA, A, HW, CW, IHW, ICW
Fire Protection	Foam
Telecom	(2 tele, 4 data)
Notes	Magnetic Hold Opens

Furnishings and Accessories

Chairs	
Stools	
Tables	
Shelving	Epoxy coated metal shelving
Files	
Trash Receptacle	2
Fixtures	
Equipment	Container washer (O.F.O.I.)
Audiovisual	None
Special	

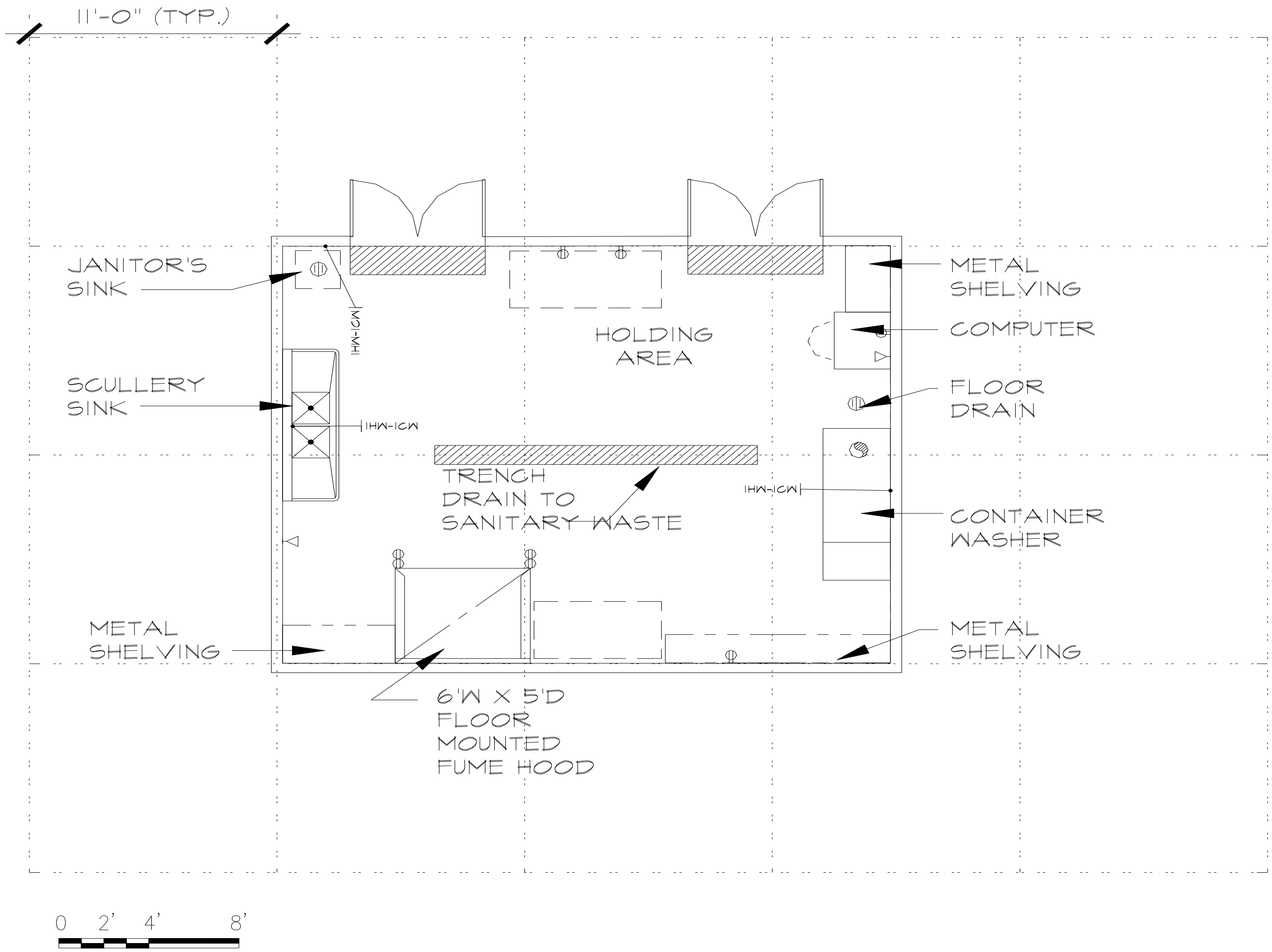
Building Systems

Hazardous Class.	Occ. Class H3/H7
Sink Size	Scullery Sink-Stainless Steel
Eyewash	As per ANSI Z358.1-1998
Emergency Shower	As per ANSI Z358.1-1998
Spill Control	
Floor Drain(s)	Trench drains to sanitary
Secondary Containment	Required
Acid Waste	Sanitary
Plaster / Soil Trap	
Explosion Protection	
Leak Detection	
Other	

HVAC

Fume Hood	6' x 5' deep floor-mounted fume hood
Changes/hr	Chemical
Filtration	Building standard
Exhaust	Chemical, Exhaust at container washer
Pressure	Negative
Ventilation	100% supply and exhaust

4. CHEMICAL WASTE
4.03 Decontamination Room (Containers)



4. CHEMICAL WASTE
4.04 Recycled Chemical Storage (SCRAPS program)

General Information

Projected No. of Spaces	1
Assignable Area (NSF)	363
Use or Function	Chemical Storage for re-use
Adjacencies	Chemical Processing
Critical Dimension	22'-0"
Ceiling Height	Exposed
Occupants	0
Hours of Operation	24/7
Access	Hazardous Material, Waste staff and guests
Security	Card Key
Notes	

Architectural Finishes

Floor	Trowelled on epoxy w/ coved base
Wall	CMU w/ epoxy paint
Ceiling	Exposed
Casework	None
Notes	

Environmental Criteria

Natural Lighting	Desired
Artificial Lighting	Fluorescent: 60 fc at work surface, task lighting
Switching/Dimming	On/off
Temperature	65°F to 80°F
Acoustics/Noise	
Notes	

Utilities and Services

Normal Power	120V power
Emergency Power	To be determined
Plumbing	HW, CW
Fire Protection	Foam
Telecom	(2 tele, 4 data)
Notes	

Furnishings and Accessories

Chairs	1 + 1 guest
Stools	
Tables	Computer
Shelving	High density shelving-metal
Files	1
Trash Receptacle	1
Fixtures	
Equipment	Cylinder holding, flammable storage cabinets
Audiovisual	None
Special	

Building Systems

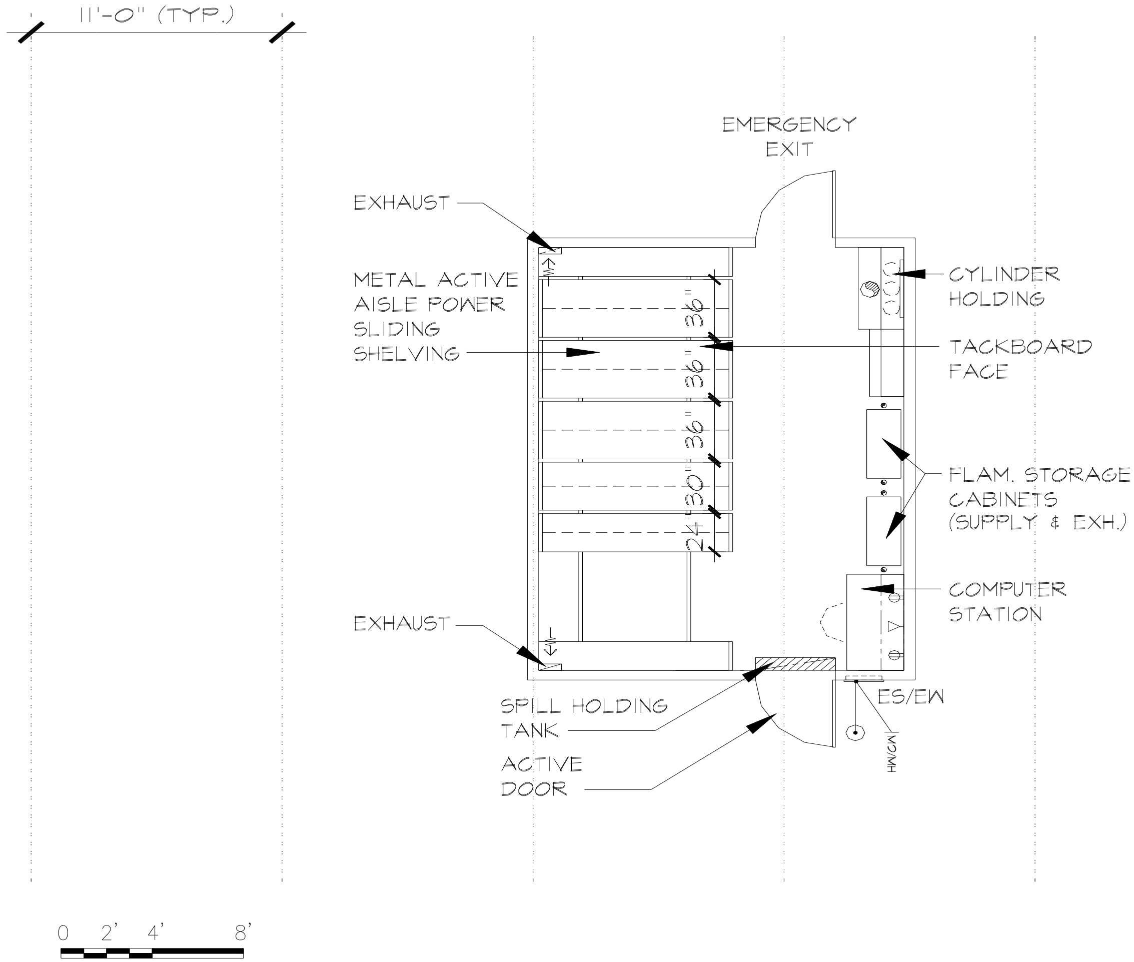
Hazardous Class.	Occ. Class H3/H7
Sink Size	None
Eyewash	As per ANSI Z358.1-1998
Emergency Shower	As per ANSI Z358.1-1998
Spill Control	Spill holding tank at door - 60 gallon
Floor Drain(s)	None
Secondary Containment	Spill holding tank at door - 60 gallon
Acid Waste	
Plaster / Soil Trap	
Explosion Protection	
Leak Detection	
Other	

HVAC

Fume Hood	Room exhaust, low exhaust, cylinder holding area exhaust, supply and exhaust through flammable storage cabiets
Changes/hr	Minimum 6/hr
Filtration	Building standard
Exhaust	Chemical
Pressure	Negative
Ventilation	100% supply and exhaust

4. CHEMICAL WASTE

4.04 Recycled Chemical Storage ("Pharmacy")



4. CHEMICAL WASTE
4.05 Chemical Storage

General Information

Projected No. of Spaces	1
Assignable Area (NSF)	545
Use or Function	Full Chemical Drum Storage
Adjacencies	Chemical Processing
Critical Dimension	17'-0" clear wide minimum
Ceiling Height	3 pallet racks high (15'-0" CLR)
Occupants	0
Hours of Operation	24/7
Access	
Security	
Notes	Fork lift accessible - 3 pallets high

Architectural Finishes

Floor	Trowelled on epoxy w/ coved base
Wall	CMU w/ epoxy paint
Ceiling	Exposed
Casework	Pallet racks
Notes	

Environmental Criteria

Natural Lighting	Desired
Artificial Lighting	Fluorescent: 60 fc at work surface
Switching/Dimming	On/off
Temperature	65°F to 80°F
Acoustics/Noise	
Notes	

Utilities and Services

Normal Power	120V outlets
Emergency Power	To be determined
Plumbing	HW, CW
Fire Protection	Sprinklers
Telecom	(1 tele, data)
Notes	Magnetic Hold Opens

Furnishings and Accessories

Chairs	
Stools	
Tables	
Shelving	Pallet racks - 3 high
Files	
Trash Receptacle	
Fixtures	
Equipment	
Audiovisual	
Special	Forklift: Clark NPR20 (O.F.O.I.)

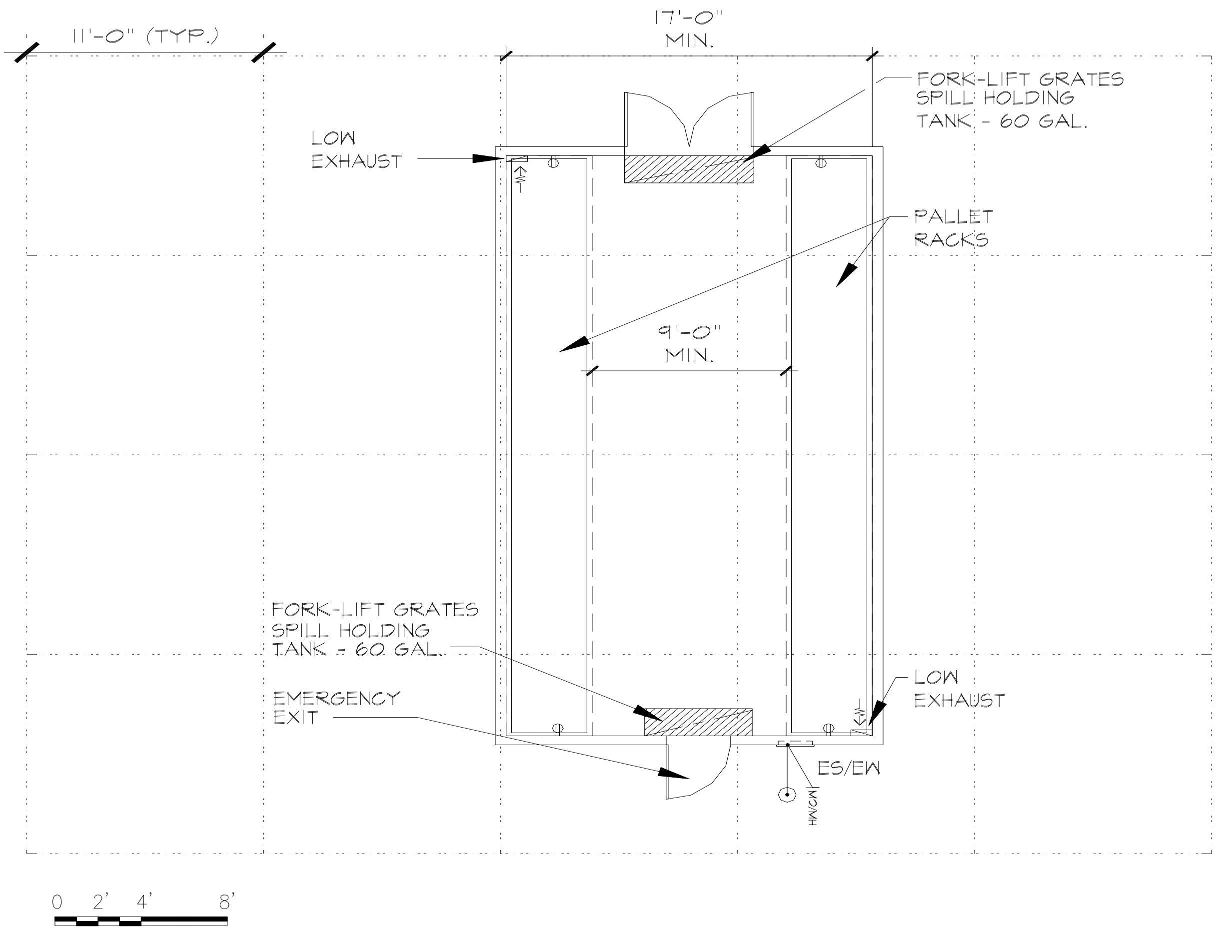
Building Systems

Hazardous Class.	Occ. Class. H3/H7
Sink Size	None
Eyewash	As per ANSI Z358.1-1998
Emergency Shower	As per ANSI Z358.1-1998
Spill Control	Spill holding tank at doors
Floor Drain(s)	Trench w/ 60 gallon storage
Secondary Containment	Required
Acid Waste	
Plaster / Soil Trap	
Explosion Protection	
Leak Detection	
Other	

HVAC

Fume Hood	
Changes/hr	Minimum 6/hr
Filtration	Building standard
Exhaust	Chemical
Pressure	Negative
Ventilation	100% supply and exhaust

4. CHEMICAL WASTE
4.05 Chemical Storage



5. RADIATION WASTE
5.01 Radiation Processing Room

General Information

Projected No. of Spaces	1
Assignable Area (NSF)	726
Use or Function	Radiation Processing
Adjacencies	Loading dock, Walk-in freezer, Control Room
Critical Dimension	22'-0" for lab
Ceiling Height	Exposed
Occupants	4
Hours of Operation	24/7
Access	Waste Staff
Security	Card Key
Notes	

Architectural Finishes

Floor	Trowelled on epoxy w/ coved base
Wall	CMU w/ epoxy paint
Ceiling	Exposed
Casework	316 St. Stl. - sink and counter
Notes	

Environmental Criteria

Natural Lighting	Desired
Artificial Lighting	Fluorescent: 80-100 fc at work surface, task lighting
Switching/Dimming	Zoned - even illumination
Temperature	65°F to 80°F
Acoustics/Noise	
Notes	

Utilities and Services

Normal Power	120/208V, 3 phase, 5 wire
Emergency Power	To be determined
Plumbing	HW, CW, IHW, ICW, Stm.
Fire Protection	Foam
Telecom	(2 tele, 4 data)
Notes	Magnetic Hold Opens

Furnishings and Accessories

Chairs	
Stools	
Tables	Computer
Shelving	
Files	
Trash Receptacle	Drum
Fixtures	
Equipment	Compactor; isotope dilution containers; Bulk Sterilizer, 39" deep x 27" wide x 36" high; Vial crusher similar to Vyleater
Special	

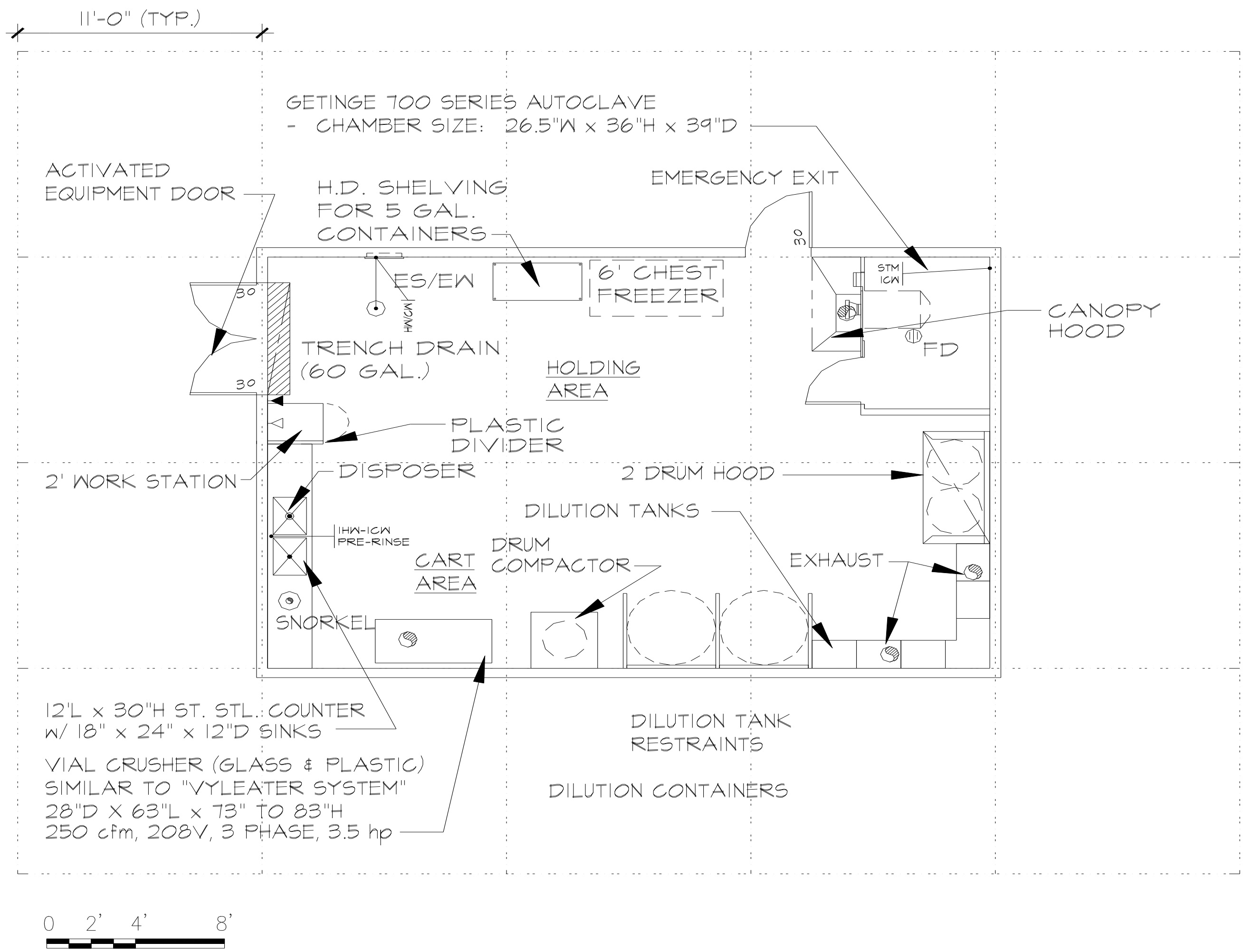
Building Systems

Hazardous Class.	Occ. Class. H7
Sink Size	Scullery Sink w/ disposer
Eyewash	As per ANSI Z358.1-1998 - minor slope to trench drain
Emergency Shower	As per ANSI Z358.1-1998 - minor slope to trench drain
Spill Control	
Floor Drain(s)	Yes - to sanitary
Secondary Containment	Yes - Trench at door w/ 60 gallon holding tank
Acid Waste	Yes
Plaster / Soil Trap	No
Explosion Protection	No
Leak Detection	Yes
Other	

HVAC

Fume Hood	Snorkels and equipment connection, canopy hood at autoclave
Changes/hr	Minimum 6/hr
Filtration	Building standard
Exhaust	Chemical
Pressure	Negative
Ventilation	100% supply and exhaust

5. RADIATION WASTE
5.01 Radiation Processing Room



5. RADIATION WASTE
5.02 Radiation Storage

General Information

Projected No. of Spaces	1
Assignable Area (NSF)	818
Use or Function	Storage
Adjacencies	Radiation Processing, Loading Dock
Critical Dimension	17'-0" clear wide minimum
Ceiling Height	3 pallet racks high (15'-0" CLR)
Occupants	0
Hours of Operation	24/7
Access	Card key
Security	Lock
Notes	

Architectural Finishes

Floor	Trowelled on epoxy w/ coved base
Wall	CMU w/ epoxy paint
Ceiling	Exposed
Casework	
Notes	

Environmental Criteria

Natural Lighting	Not required
Artificial Lighting	Fluorescent: 60 fc at work surface
Switching/Dimming	On/off
Temperature	65°F to 80°F
Acoustics/Noise	None
Notes	

Utilities and Services

Normal Power	120V
Emergency Power	To be determined
Plumbing	None
Fire Protection	Sprinklers
Telecom	(1 tele, data)
Notes	

Furnishings and Accessories

Chairs	
Stools	
Tables	
Shelving	Reinforced shelving, pallet racks
Files	
Trash Receptacle	
Fixtures	
Equipment	
Audiovisual	
Special	Forklift: Clark NPR20 (O.F.O.I.)

Building Systems

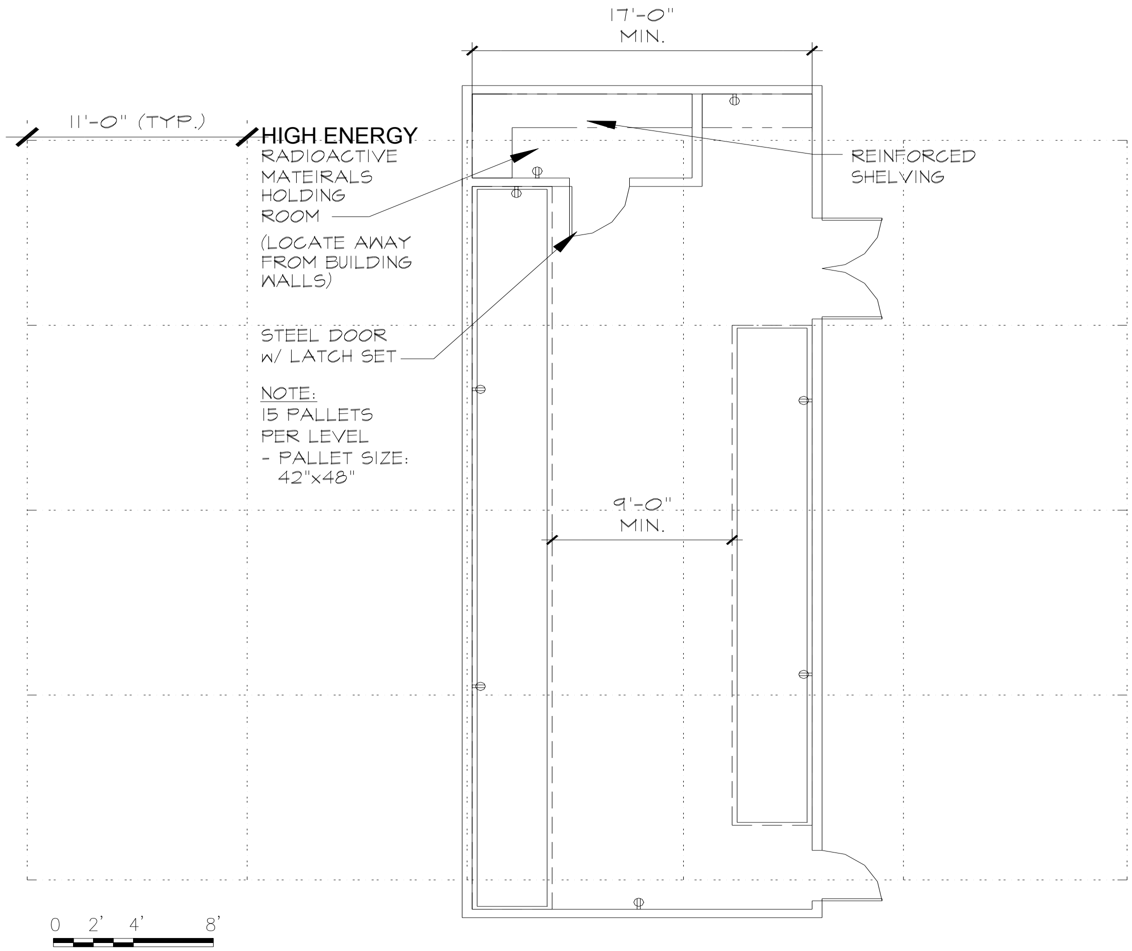
Hazardous Class.	Occ. Class. H7
Sink Size	None
Eyewash	As per ANSI Z358.1-1998
Emergency Shower	As per ANSI Z358.1-1998
Spill Control	None
Floor Drain(s)	None
Secondary Containment	None
Acid Waste	
Plaster / Soil Trap	
Explosion Protection	
Leak Detection	
Other	

HVAC

Fume Hood	
Changes/hr	Minimum 6/hr
Filtration	Building standard
Exhaust	HEPA filtered
Pressure	Negative
Ventilation	100% supply and exhaust

5. RADIATION WASTE

5.02 Radiation Storage



5. RADIATION WASTE

5.03 Walk-in Freezer (Shared w/ Bio Waste); 5.04 Future Walk-in Freezer

General Information

Projected No. of Spaces	2
Assignable Area (NSF)	162
Use or Function	Storage
Adjacencies	Radiation Processing, Loading Dock, Biomed Waste
Critical Dimension	16'0" wide
Ceiling Height	8'-6"
Occupants	0
Hours of Operation	24/7
Access	
Security	Card Key w/ emergency release
Notes	Can be pre-fab box, "food-service" quality

Architectural Finishes

Floor	Trowelled on epoxy w/ coved base
Wall	Pre-packaged unit
Ceiling	Pre-packaged unit
Casework	None
Notes	Possible insulated floor-depressed

Environmental Criteria

Natural Lighting	Not required
Artificial Lighting	Fluorescent: 60 fc at work surface
Switching/Dimming	On/off
Temperature	0°F ± 2°F
Acoustics/Noise	None
Notes	

Utilities and Services

Normal Power	120V
Emergency Power	Yes
Plumbing	None
Fire Protection	Sprinklers
Telecom	
Notes	

Furnishings and Accessories

Chairs	
Stools	
Tables	
Shelving	Stainless steel shelving (2' cube box storage)
Files	
Trash Receptacle	
Fixtures	
Equipment	
Audiovisual	
Special	2' cube box storage

Building Systems

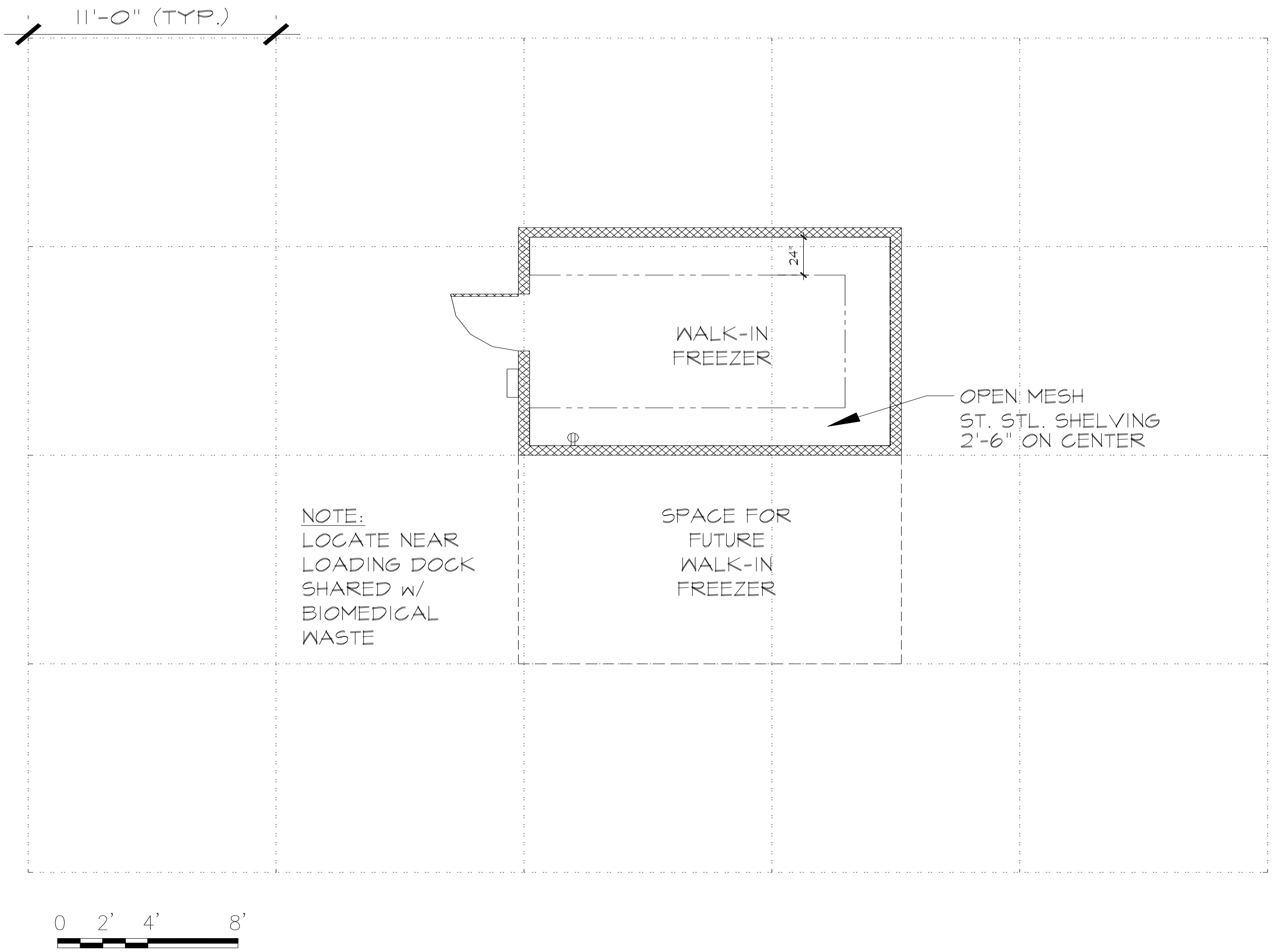
Hazardous Class.	Occ. Class. H7
Sink Size	None
Eyewash	As per ANSI Z358.1-1998
Emergency Shower	As per ANSI Z358.1-1998
Spill Control	None
Floor Drain(s)	None
Secondary Containment	None
Acid Waste	
Plaster / Soil Trap	
Explosion Protection	
Leak Detection	
Other	

HVAC

Fume Hood	
Changes/hr	Minimum 6/hr
Filtration	Building standard
Exhaust	Building standard
Pressure	Neutral
Ventilation	Storage room

5. RADIATION WASTE

5.03 Walk-in Freezer (Shared w/ Bio Waste); 5.04 Future Walk-in Freezer



6. BIOMEDICAL WASTE
6.01 Biomedical Processing Room

General Information

Projected No. of Spaces	1
Assignable Area (NSF)	605
Use or Function	Biomedical Processing
Adjacencies	Loading Dock
Critical Dimension	22'-0" wide
Ceiling Height	Exposed
Occupants	2
Hours of Operation	24/7
Access	Integrated waste, Biosafety staff
Security	Card Key
Notes	Share walk-in freezer with Rad. Waste

Architectural Finishes

Floor	Trowelled on epoxy w/ coved base
Wall	CMU w/ epoxy paint
Ceiling	Exposed
Casework	Metal w/ epoxy top, Heavy duty metal storage shelving
Notes	

Environmental Criteria

Natural Lighting	Desired
Artificial Lighting	Fluorescent: 80-100 fc at work surface
Switching/Dimming	Dual level - even illumination
Temperature	65°F to 80°F
Acoustics/Noise	
Notes	

Utilities and Services

Normal Power	120/208V, 3 phase, 5 wire + 480V, 3 phase, 200A for equip.
Emergency Power	To be determined
Plumbing	HW, CW @ 40 to 60 psi - 1# pipe; IHW, ICW, 100 to 120 psi constant compressed air
Fire Protection	Sprinklers
Telecom	(1 tele, data) plus connection to equipment
Notes	Magnetic Hold Opens

Furnishings and Accessories

Chairs	
Stools	1
Tables	
Shelving	Heavy duty metal storage
Files	
Trash Receptacle	2
Fixtures	
Equipment	Infectious medical waste unit similar to WPS SSM-150
Audiovisual	24 hr operation use; full duty cycle
Special	

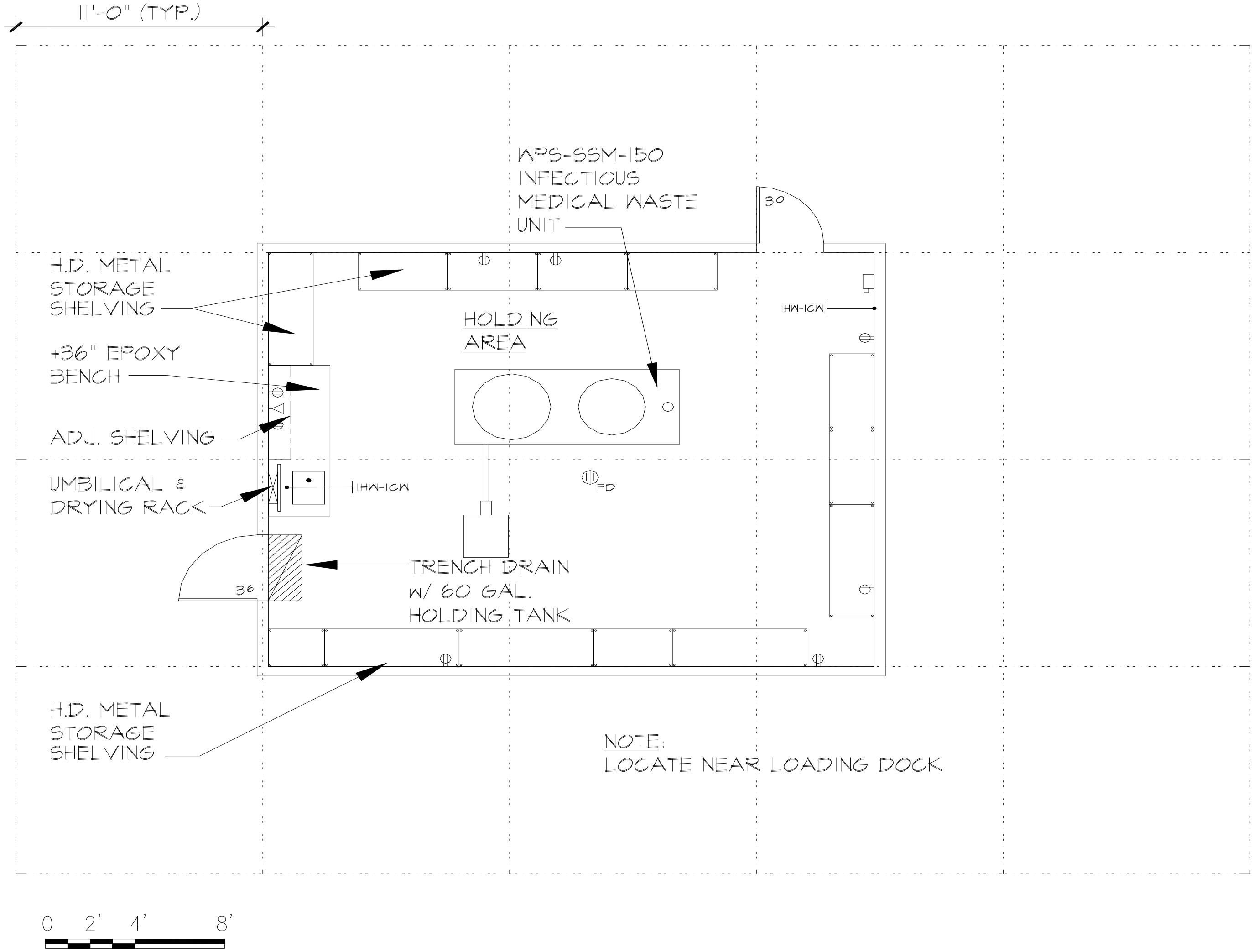
Building Systems

Hazardous Class.	Occ. Class. H7
Sink Size	Wall bench: 17"x21"x10"
Eyewash	As per ANSI Z358.1-1998
Emergency Shower	As per ANSI Z358.1-1998
Spill Control	Yes
Floor Drain(s)	4' at equipment
Secondary Containment	Trench drain w/ 60 gallon capacity
Acid Waste	Sink
Plaster / Soil Trap	
Explosion Protection	
Leak Detection	
Other	

HVAC

Fume Hood	
Changes/hr	Minimum 6/hr
Filtration	Building standard
Exhaust	Heat, Chemical
Pressure	Negative
Ventilation	100% supply and exhaust; vent to atmosphere for equip.
Notes	25k BTU/hr - Sensible heat load from equipment

6. BIOMEDICAL WASTE
6.01 Biomedical Processing Room



7. UNIVERSAL WASTE
7.01 Storage

General Information

Projected No. of Spaces	1
Assignable Area (NSF)	605
Use or Function	Storage - E-waste & Universal waste
Adjacencies	Off Loading dock
Critical Dimension	Area
Ceiling Height	3 pallet racks high (15'-0" CLR)
Occupants	0
Hours of Operation	24/7
Access	EH&S Staff
Security	Latch set
Notes	

Architectural Finishes

Floor	Hardened, sealed concrete
Wall	CMU w/ epoxy paint & locked fence
Ceiling	Exposed
Casework	Tall metal storage cabinet and shelving
Notes	

Environmental Criteria

Natural Lighting	Required
Artificial Lighting	60 fc at work surface
Switching/Dimming	On/Off
Temperature	Covered storage
Acoustics/Noise	
Notes	

Utilities and Services

Normal Power	120V
Emergency Power	None
Plumbing	None
Fire Protection	None
Telecom	(1 tele, data)
Notes	

Furnishings and Accessories

Chairs	
Stools	
Tables	
Shelving	Pallet storage system and heavy duty storage
Files	
Trash Receptacle	
Fixtures	
Equipment	
Audiovisual	
Special	Forklift: Clark NPR20 (O.F.O.I.)

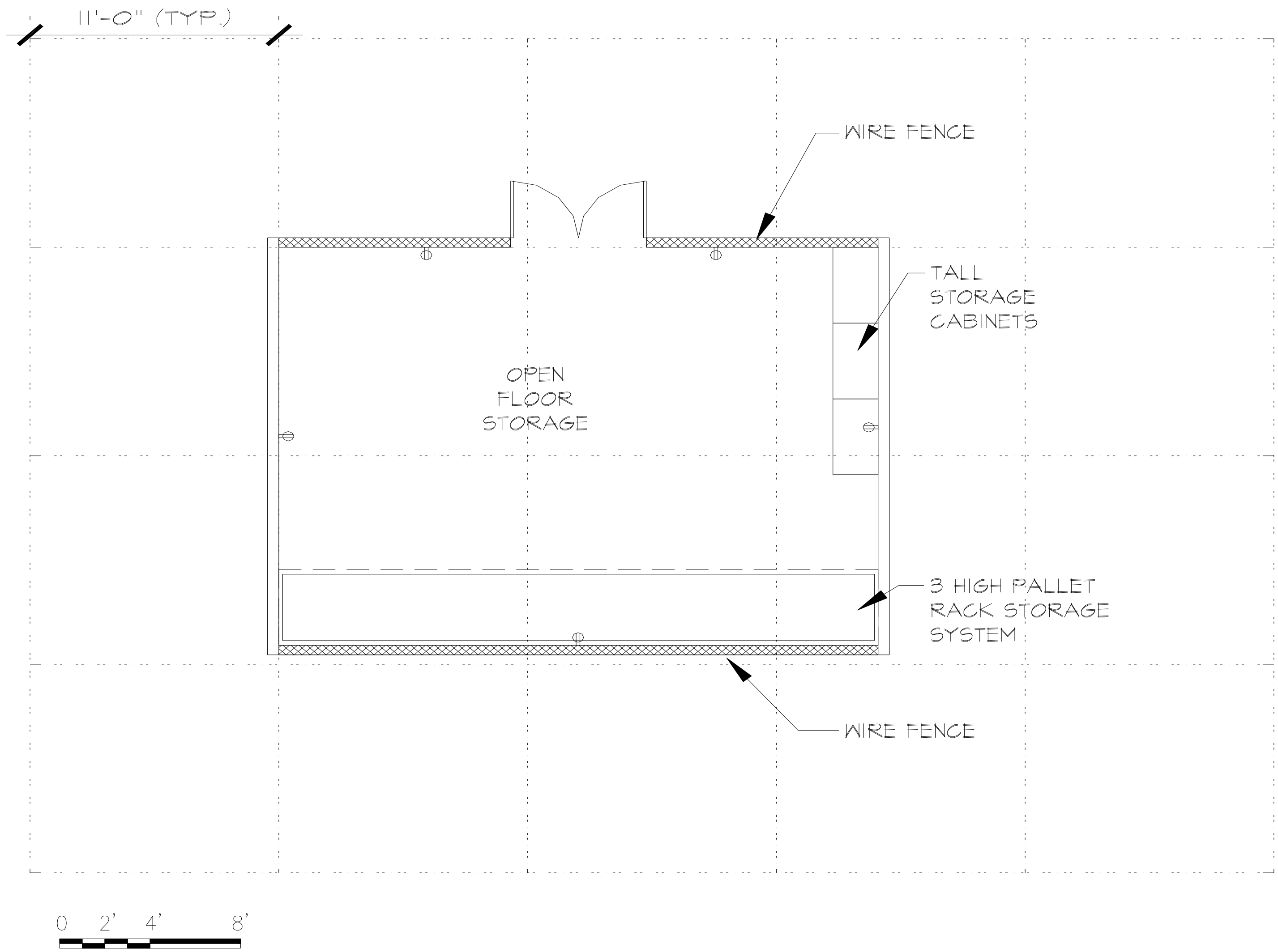
Building Systems

Hazardous Class.	Occ. Class. B
Sink Size	None
Eyewash	As per ANSI Z358.1-1998
Emergency Shower	As per ANSI Z358.1-1998
Spill Control	
Floor Drain(s)	
Secondary Containment	
Acid Waste	
Plaster / Soil Trap	
Explosion Protection	
Leak Detection	
Other	

HVAC

Fume Hood	None
Changes/hr	Exposed
Filtration	Exposed
Exhaust	Exposed
Pressure	Exposed
Ventilation	

7. UNIVERSAL WASTE
7.01 Storage



8. MATERIAL ENTRANCE
8.01 Loading Dock
8.02 Dock Toilet

General Information

Projected No. of Spaces	1
Assignable Area (NSF)	484 + 61 sf dock toilet
Use or Function	Material entrance
Adjacencies	Chem. Processing, Biomed. Waste, Radiation Waste
Critical Dimension	3 truck bays
Ceiling Height	Exposed
Occupants	
Hours of Operation	24/7
Access	Secured from exterior
Security	
Notes	3 Dock Bays with 16'-6" Marshalling area, 1 high + 2 low docks

Architectural Finishes

Floor	Trowelled on epoxy w/ coved base
Wall	CMU w/ epoxy paint
Ceiling	Exposed
Casework	None
Notes	

Environmental Criteria

Natural Lighting	Required
Artificial Lighting	Fluorescent: 60 fc at work surface
Switching/Dimming	On/off
Temperature	Exterior
Acoustics/Noise	
Notes	

Utilities and Services

Normal Power	120V
Emergency Power	To be determined
Plumbing	None
Fire Protection	Sprinklers
Telecom	(1 tele, data)
Notes	

Furnishings and Accessories

Chairs	
Stools	
Tables	
Shelving	
Files	
Trash Receptacle	
Fixtures	
Equipment	Forklift (O.F.O.I.)
Audiovisual	
Special	

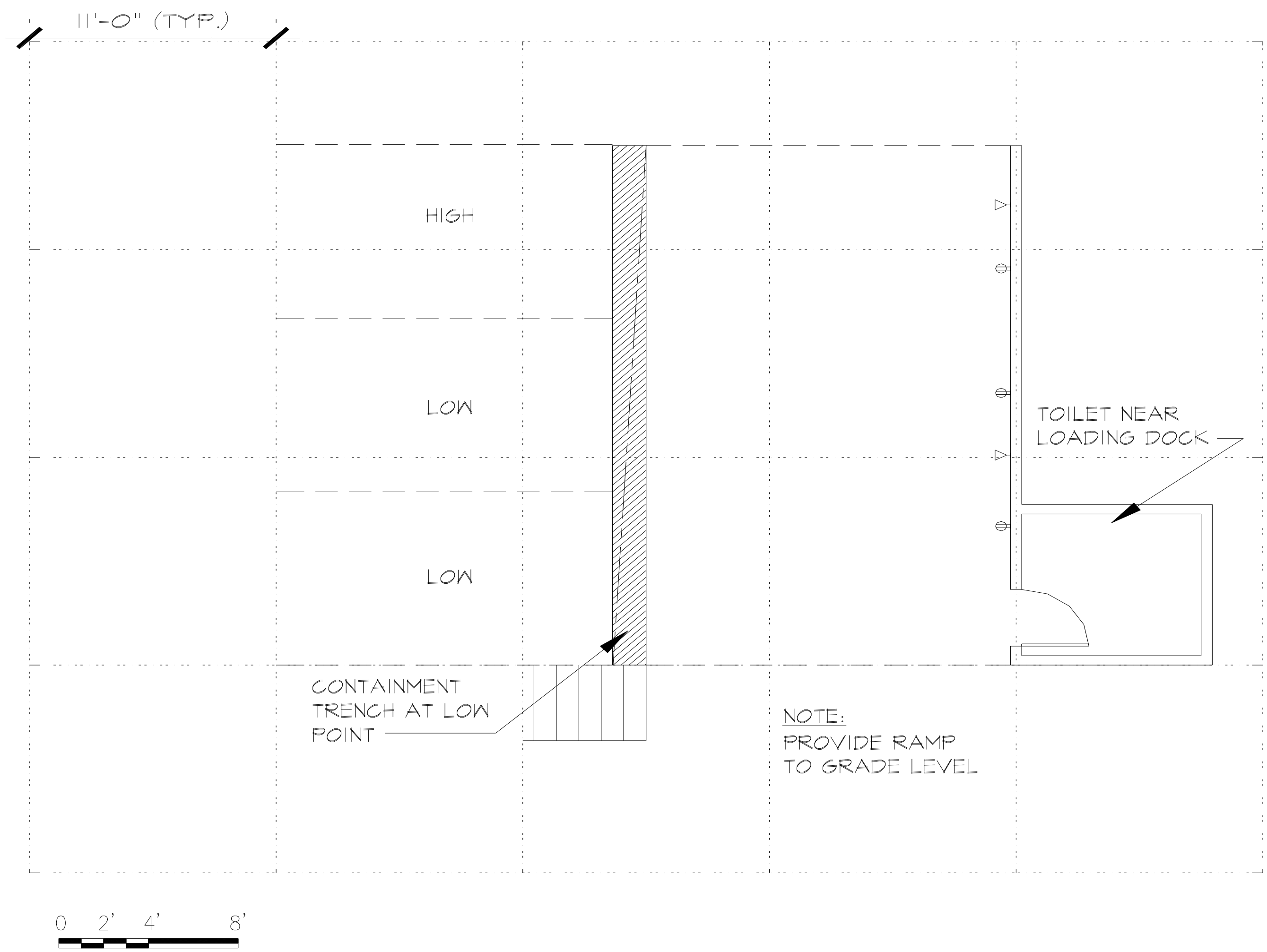
Building Systems

Hazardous Class.	Occ. Class H7 (Loading Dock)
Sink Size	None
Eyewash	As per ANSI Z358.1-1998
Emergency Shower	As per ANSI Z358.1-1998
Spill Control	At low portion of drain
Floor Drain(s)	Trench w/ holding tank
Secondary Containment	Required
Acid Waste	
Plaster / Soil Trap	
Explosion Protection	
Leak Detection	
Other	

HVAC

Fume Hood	
Changes/hr	Exposed
Filtration	Exposed
Exhaust	Exposed
Pressure	Exposed
Ventilation	Exterior

8. MATERIAL ENTRANCE
8.01 Loading Dock
8.02 Dock Toilet



8. MATERIAL ENTRANCE
8.03 Control Room

General Information

Projected No. of Spaces	1
Assignable Area (NSF)	242
Use or Function	Control of people and materials
Adjacencies	Chem. Processing, Loading Dock, Rad. Processing
Critical Dimension	11'-0" wide
Ceiling Height	9'-0"
Occupants	3
Hours of Operation	24/7
Access	Waste staff
Security	Card Key
Notes	

Architectural Finishes

Floor	VCT
Wall	CMU w/ epoxy paint
Ceiling	Suspended Acoustical Ceiling
Casework	Standing height bench w/ epoxy tops
Notes	

Environmental Criteria

Natural Lighting	Desired
Artificial Lighting	Fluorescent: 80-100 fc at work surface
Switching/Dimming	On/off - even illumination
Temperature	72°F ± 3°F
Acoustics/Noise	Office
Notes	

Utilities and Services

Normal Power	120/208V, 3 phase, 5 wire
Emergency Power	To be determined
Plumbing	None
Fire Protection	Sprinklers
Telecom	(2 tele, 4 data)
Notes	

Furnishings and Accessories

Chairs	5
Stools	
Tables	Office desks (O.F.O.I.)
Shelving	
Files	3
Trash Receptacle	3
Fixtures	
Equipment	
Audiovisual	
Special	Bulletin Board, Signs

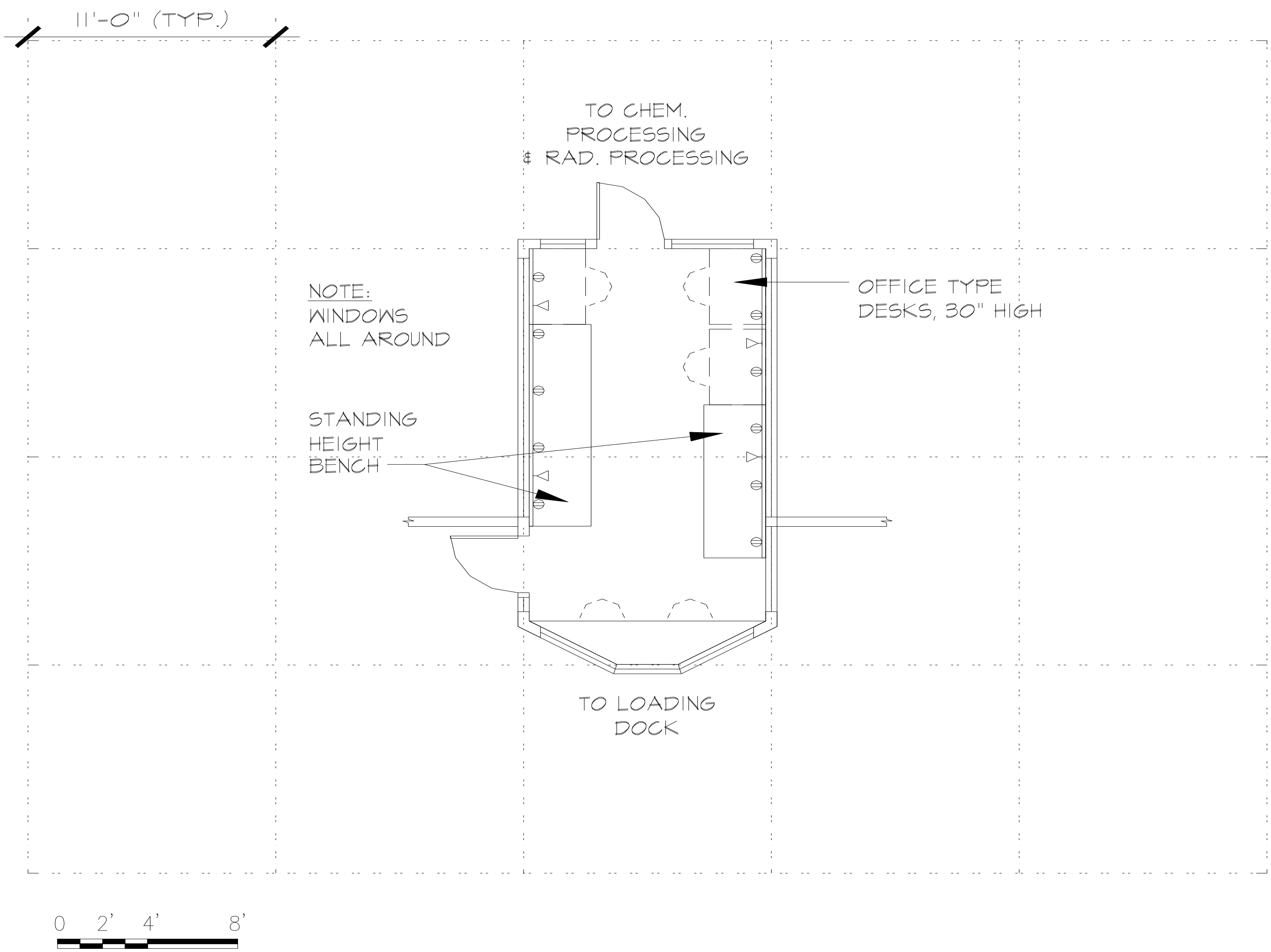
Building Systems

Hazardous Class.	Occ. Class. B
Sink Size	None
Eyewash	As per ANSI Z358.1-1998
Emergency Shower	As per ANSI Z358.1-1998
Spill Control	
Floor Drain(s)	None
Secondary Containment	None
Acid Waste	
Plaster / Soil Trap	
Explosion Protection	
Leak Detection	
Other	Monitoring of: gate, intercom, CCTV, chemical monitoring, gas cabinets

HVAC

Fume Hood	
Changes/hr	Office
Filtration	Building Standard
Exhaust	Office
Pressure	Positive
Ventilation	100% supply and exhaust

8. MATERIAL ENTRANCE
8.03 Control Room



8. MATERIAL ENTRANCE
8.04 Clean Packaging Material

General Information

Projected No. of Spaces	1
Assignable Area (NSF)	303
Use or Function	Storage of Clean Packaging Materials
Adjacencies	Loading Dock
Critical Dimension	17'-0" clear wide minimum
Ceiling Height	3 pallet racks high (15'-0" CLR)
Occupants	0
Hours of Operation	24/7
Access	EH&S staff
Security	Latch set
Notes	Packaging materials: Drums, boxes, carboys

Architectural Finishes

Floor	Hardened sealed concrete
Wall	CMU w/ epoxy paint and fenching
Ceiling	Exposed
Casework	None
Notes	Covered space with fencing

Environmental Criteria

Natural Lighting	Desired
Artificial Lighting	Fluorescent: 60 fc at work surface
Switching/Dimming	On/Off
Temperature	Outside
Acoustics/Noise	
Notes	

Utilities and Services

Normal Power	120V
Emergency Power	To be determined
Plumbing	None
Fire Protection	Sprinklers
Telecom	(1 tele, data)
Notes	

Furnishings and Accessories

Chairs	
Stools	
Tables	
Shelving	3 high pallet rack storage system
Files	
Trash Receptacle	
Fixtures	
Equipment	
Audiovisual	
Special	Forklift: Clark NPR20 (O.F.O.I.); signs

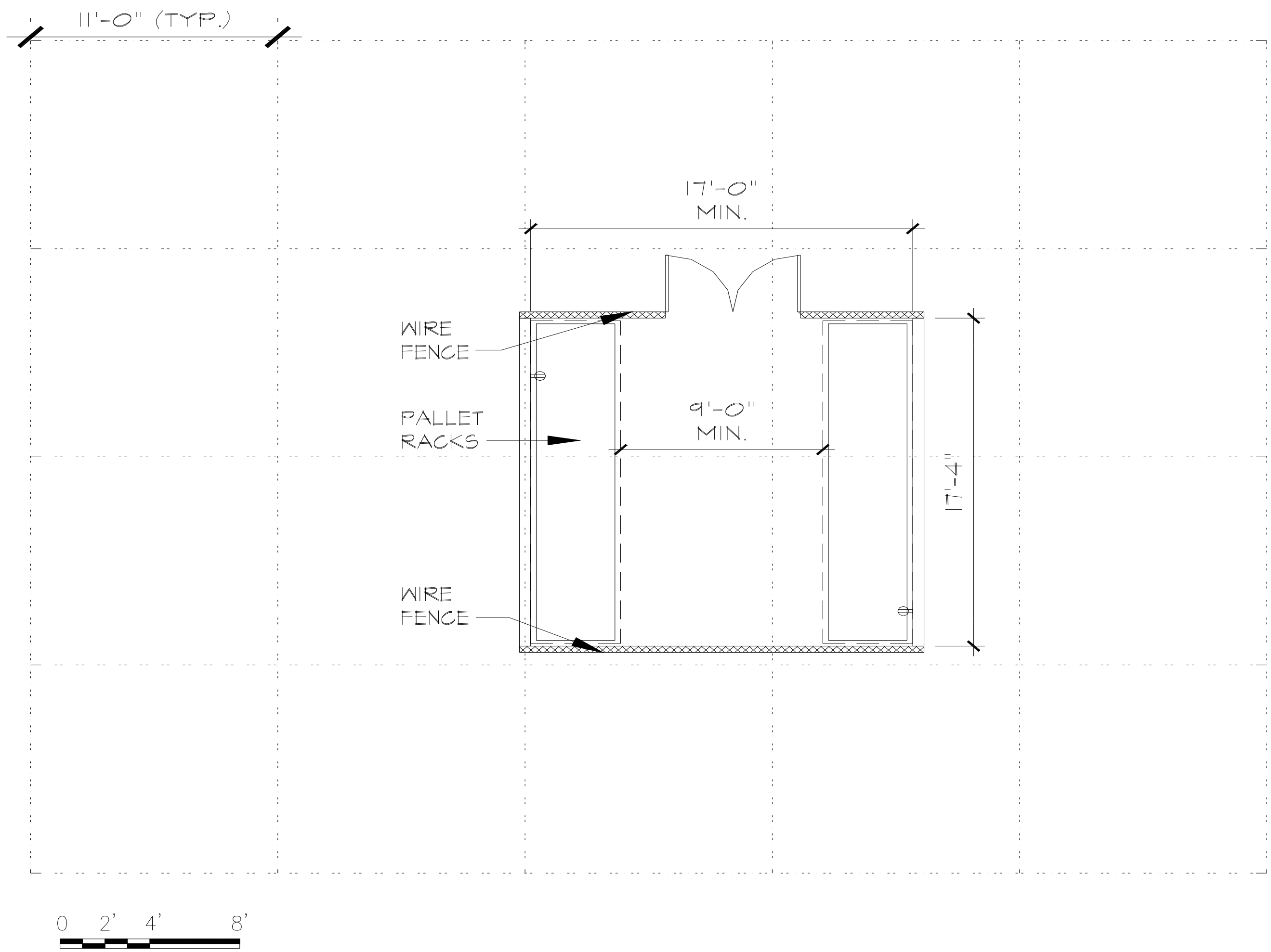
Building Systems

Hazardous Class.	Occ. Class. B
Sink Size	None
Eyewash	As per ANSI Z358.1-1998
Emergency Shower	As per ANSI Z358.1-1998
Spill Control	
Floor Drain(s)	
Secondary Containment	
Acid Waste	
Plaster / Soil Trap	
Explosion Protection	
Leak Detection	
Other	

HVAC

Fume Hood	
Changes/hr	Exposed
Filtration	Exposed
Exhaust	Exposed
Pressure	Exposed
Ventilation	Exterior

8. MATERIAL ENTRANCE
8.04 Clean Packaging Material



8. MATERIAL ENTRANCE
8.05 PEC Outbuilding (provided by EH&S)

General Information

Projected No. of Spaces	1
Assignable Area (NSF)	121
Use or Function	Storage of Potentially Explosive Chemicals (PECs)
Adjacencies	Loading Dock (90 ft.)
Critical Dimension	11'-0" wide
Ceiling Height	10'-0"
Occupants	0
Hours of Operation	24/7
Access	
Security	Lock
Notes	

Architectural Finishes

Floor	Grated floor/epoxy
Wall	Concrete Block/epoxy
Ceiling	Concrete Block
Casework	Shelving
Notes	Explosion proof - Pre-packaged unit

Environmental Criteria

Natural Lighting	Not required
Artificial Lighting	60 fc - explosion proof
Switching/Dimming	On/off
Temperature	25°Fto 80°F
Acoustics/Noise	
Notes	

Utilities and Services

Normal Power	120V - explosion proof
Emergency Power	To be determined
Plumbing	CW, Air
Fire Protection	To be determined
Telecom	
Notes	If pre-fab, provide 120V power and CW to location

Furnishings and Accessories

Chairs	
Stools	
Tables	
Shelving	Heavy Duty shelving - epoxy, grounded
Files	
Trash Receptacle	
Fixtures	
Equipment	
Audiovisual	
Special	

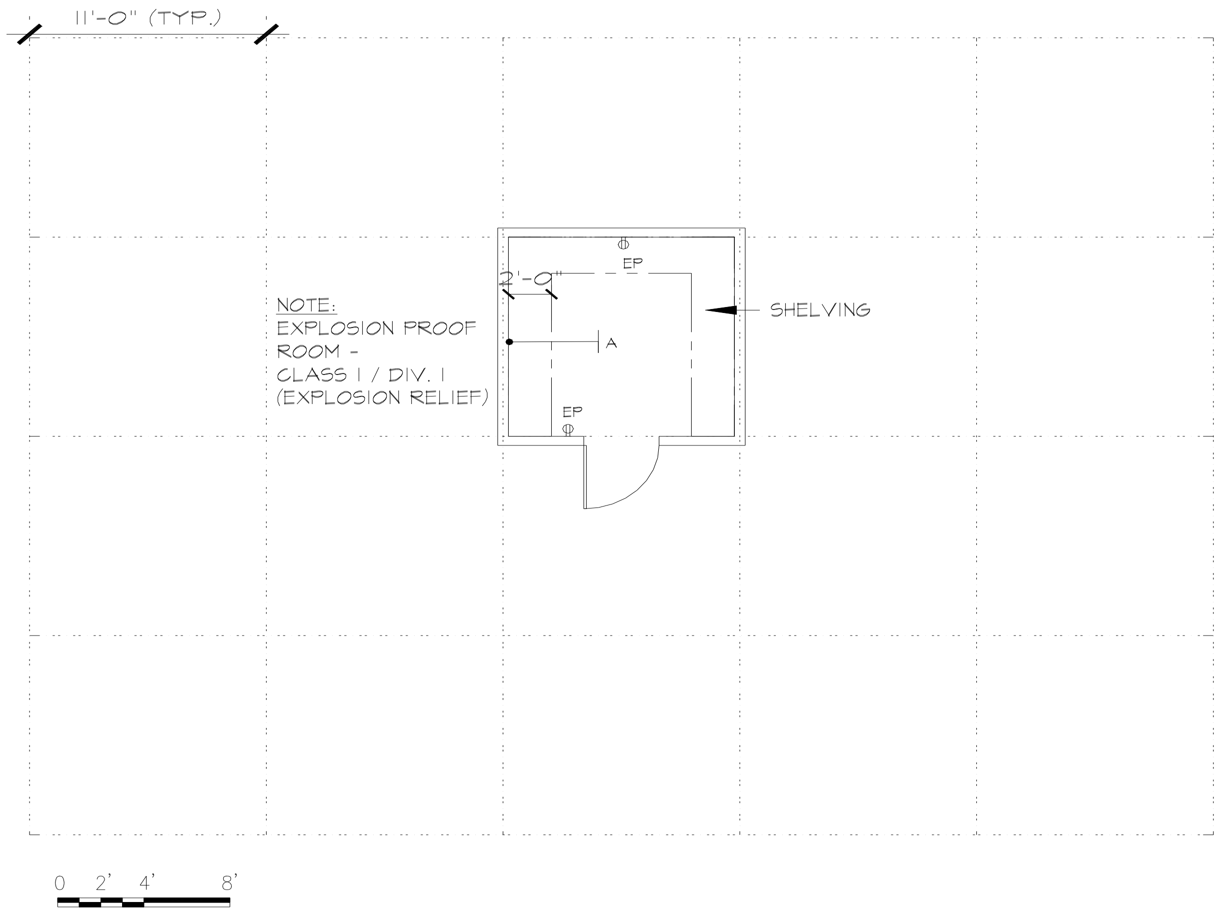
Building Systems

Hazardous Class.	Occ. Class. H2/H7; Electrical Division 1, Class 1
Sink Size	None
Eyewash	As per ANSI Z358.1-1998
Emergency Shower	As per ANSI Z358.1-1998
Spill Control	Required
Floor Drain(s)	
Secondary Containment	Required
Acid Waste	
Plaster / Soil Trap	
Explosion Protection	
Leak Detection	
Other	May be prefabricated box

HVAC

Fume Hood	
Changes/hr	Minimum 6/hr
Filtration	
Exhaust	Local unit
Pressure	Negative
Ventilation	100% supply and exhaust

8. MATERIAL ENTRANCE
8.05 PEC Outbuilding



9. BUILDING SUPPORT
9.01 Lockers/Showers/Restroom

General Information

Projected No. of Spaces	1
Assignable Area (NSF)	605
Use or Function	for employee use in waste/lab area
Adjacencies	materials handling, labs
Critical Dimension	
Ceiling Height	9'-6"
Occupants	
Hours of Operation	24/7
Access	
Security	
Notes	

Architectural Finishes

Floor	ceramic tile
Wall	ceramic tile to 6' AFF with epoxy painted GWB above
Ceiling	epoxy painted GWB
Casework	
Notes	

Environmental Criteria

Natural Lighting	not required
Artificial Lighting	suitable for wet application
Switching/Dimming	
Temperature	
Acoustics/Noise	
Notes	

Utilities and Services

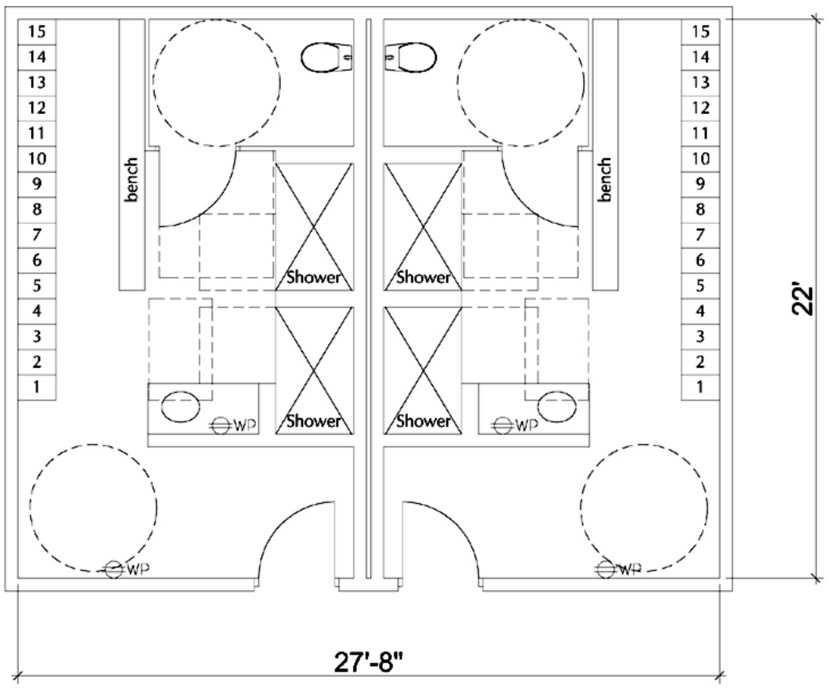
Normal Power	
Emergency Power	
Plumbing	sink, showers, toilets
Fire Protection	
Telecom	
Notes	

Group II Furnishings and Accessories

Chairs	changing bench
Tables	
Shelving	
Files	
Trash Receptacle	2
Fixtures	
Equipment	Lockers - 15 Male, 15 Female
Audiovisual	
Special	

9. BUILDING SUPPORT

9.01 Lockers/Showers/Restroom



9. BUILDING SUPPORT
9.02 Emergency Response Gear Storage

General Information

Projected No. of Spaces	1
Assignable Area (NSF)	242
Use or Function	Storage
Adjacencies	Loading Dock
Critical Dimension	11'-0" wide
Ceiling Height	Exposed
Occupants	0
Hours of Operation	24/7
Access	EH&S Staff
Security	Card Key
Notes	

Architectural Finishes

Floor	Hardened sealed concrete
Wall	CMU w/ epoxy paint
Ceiling	Exposed
Casework	Metal shelving
Notes	

Environmental Criteria

Natural Lighting	Desired
Artificial Lighting	Fluorescent: 60 fc at work surface
Switching/Dimming	On/off
Temperature	60°F ± 80°F
Acoustics/Noise	
Notes	

Utilities and Services

Normal Power	120/208V receptables
Emergency Power	To be determined
Plumbing	None, SCBA tank filling station (O.F.O.I.)
Fire Protection	Sprinkler
Telecom	(1 tele, data)
Notes	

Furnishings and Accessories

Chairs	
Stools	
Tables	
Shelving	Heavy duty shelving
Files	
Trash Receptacle	
Fixtures	
Equipment	SCBA filling station
Audiovidual	
Special	Cabinets

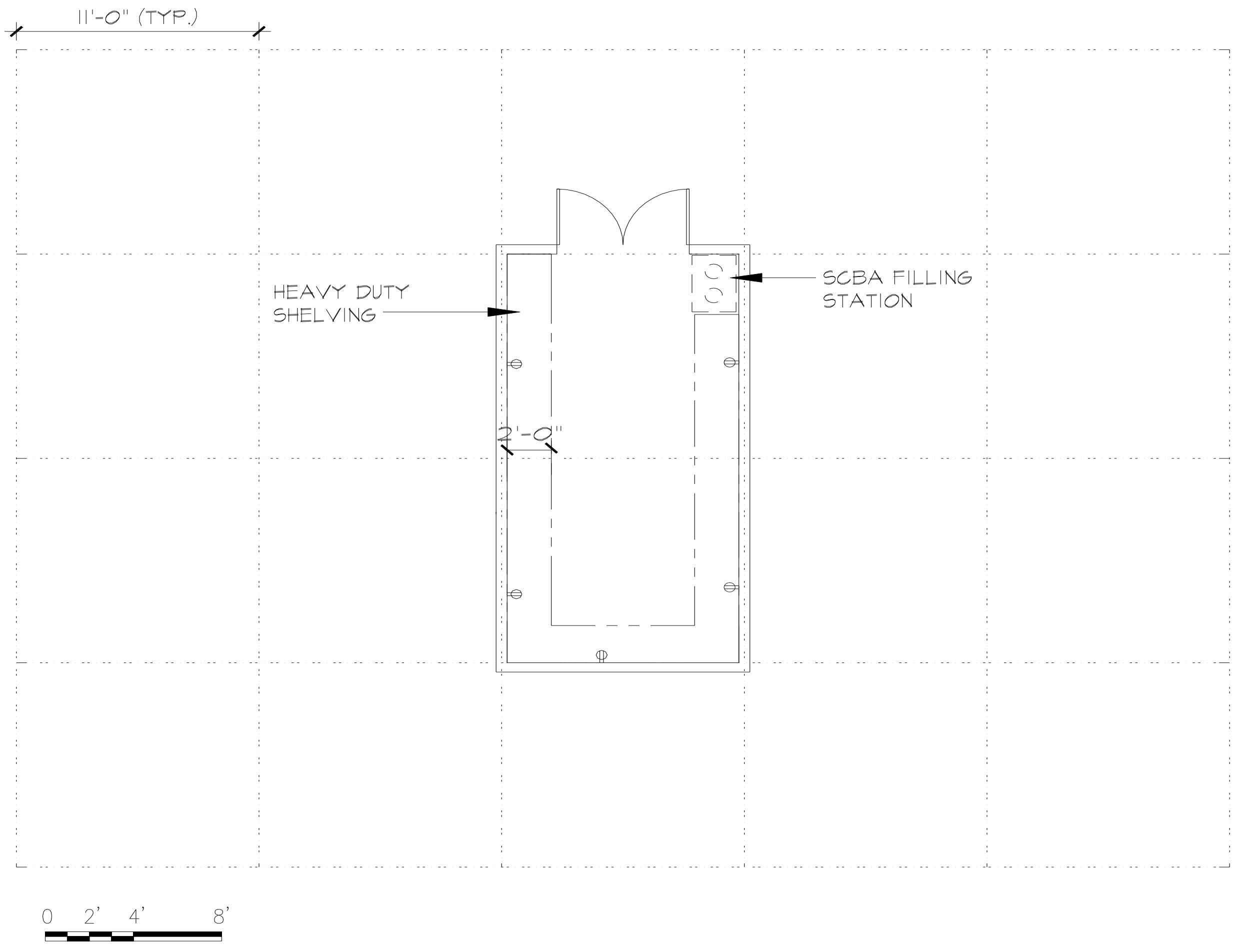
Building Systems

Hazardous Class.	Occ. Class. B
Sink Size	
Eyewash	As per ANSI Z358.1-1998
Emergency Shower	As per ANSI Z358.1-1998
Spill Control	
Floor Drain(s)	None
Secondary Containment	None
Acid Waste	
Plaster / Soil Trap	
Explosion Protection	
Leak Detection	
Other	

HVAC

Fume Hood	None
Changes/hr	Minimum 6/hr
Filtration	Building standard
Exhaust	Heat
Pressure	Negative
Ventilation	100% supply and exhaust

9. BUILDING SUPPORT
9.02 Emergency Response Gear Storage



9. BUILDING SUPPORT
9.03 Workshop

General Information

Projected No. of Spaces	1
Assignable Area (NSF)	182
Use or Function	Shop
Adjacencies	Off Loading dock
Critical Dimension	11'-0"
Ceiling Height	Exposed
Occupants	2
Hours of Operation	24/7
Access	EH&S staff
Security	Latchset
Notes	

Architectural Finishes

Floor	VCT
Wall	CMU w/ epoxy paint
Ceiling	Exposed
Casework	Tall metal storage cabinet, counter, sink
Notes	

Environmental Criteria

Natural Lighting	Required
Artificial Lighting	Fluorescent: 80-100 fc at work surface - even illumination
Switching/Dimming	On/off
Temperature	72°F ± 3°F; 20-50% RH
Acoustics/Noise	
Notes	

Utilities and Services

Normal Power	120/208V, 3 phase, 5 wire
Emergency Power	To be determined
Plumbing	IHW, ICW, A
Fire Protection	Sprinkler
Telecom	(1 tele, data)
Notes	

Furnishings and Accessories

Chairs	
Stools	2
Tables	2 shop tables
Shelving	Lab shelving
Files	
Trash Receptacle	1
Fixtures	
Equipment	Tool storage cabinets
Audiovidual	
Special	Shope Equipment (O.F.O.I.)

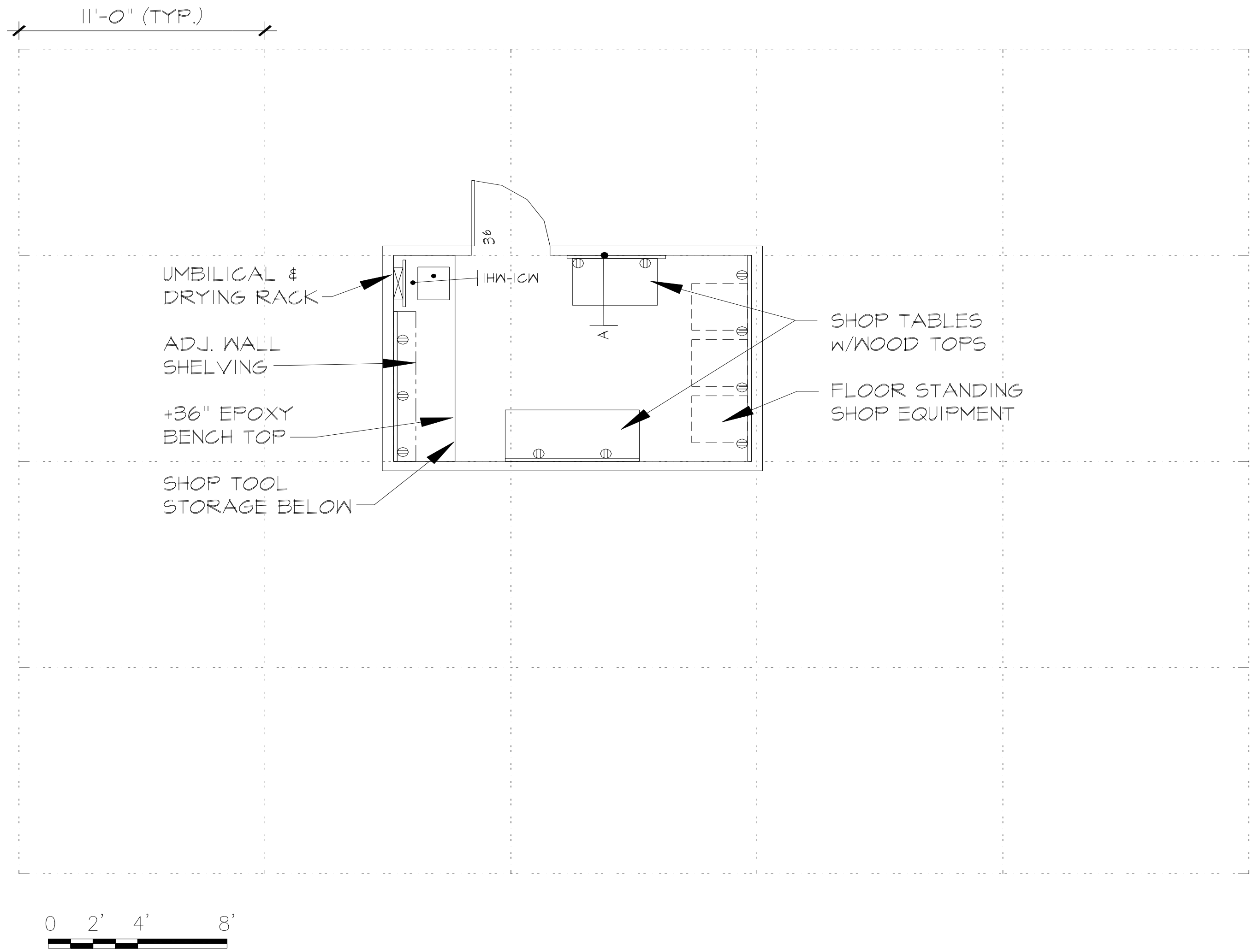
Building Systems

Hazardous Class.	Occ. Class. B
Sink Size	Wall bench: 17"x21"x10"
Eyewash	As per ANSI Z358.1-1998
Emergency Shower	As per ANSI Z358.1-1998
Spill Control	Dust control
Floor Drain(s)	
Secondary Containment	
Acid Waste	Required
Plaster / Soil Trap	
Explosion Protection	
Leak Detection	
Other	Tool Dust Control System

HVAC

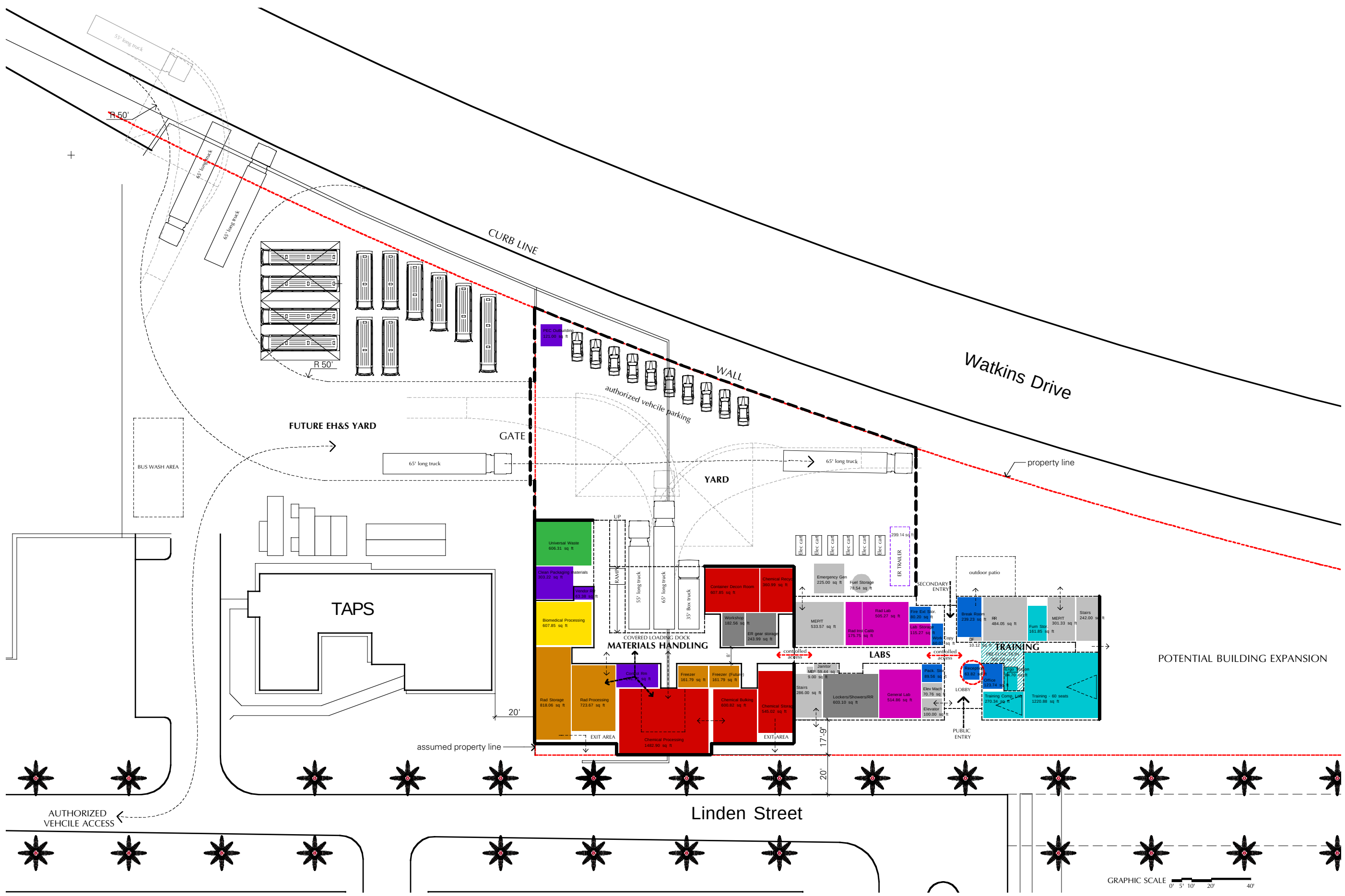
Fume Hood	Local dust collection
Changes/hr	Minimum 6/hr
Filtration	Building standard
Exhaust	Chemical, heat
Pressure	Negative
Ventilation	100% supply and exhaust

9. BUILDING SUPPORT
9.03 Workshop



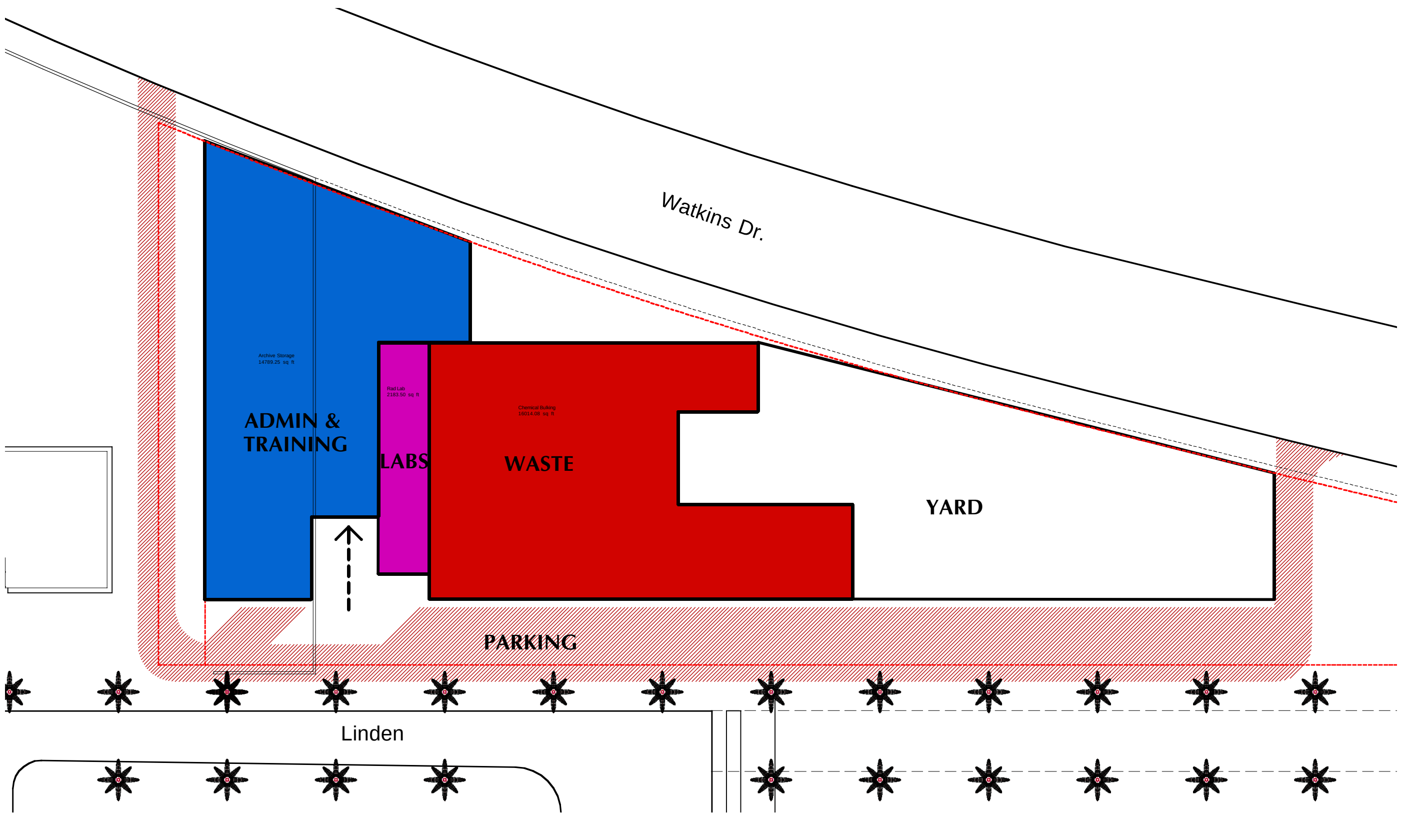
Preferred planning option showing TAPS components

This plan shows the proposed new EH&S building and yard with the modified TAPS yard and TAPS elements (buses, bus canopy, portable cointainers/buildings and a relocated bus washing pad.



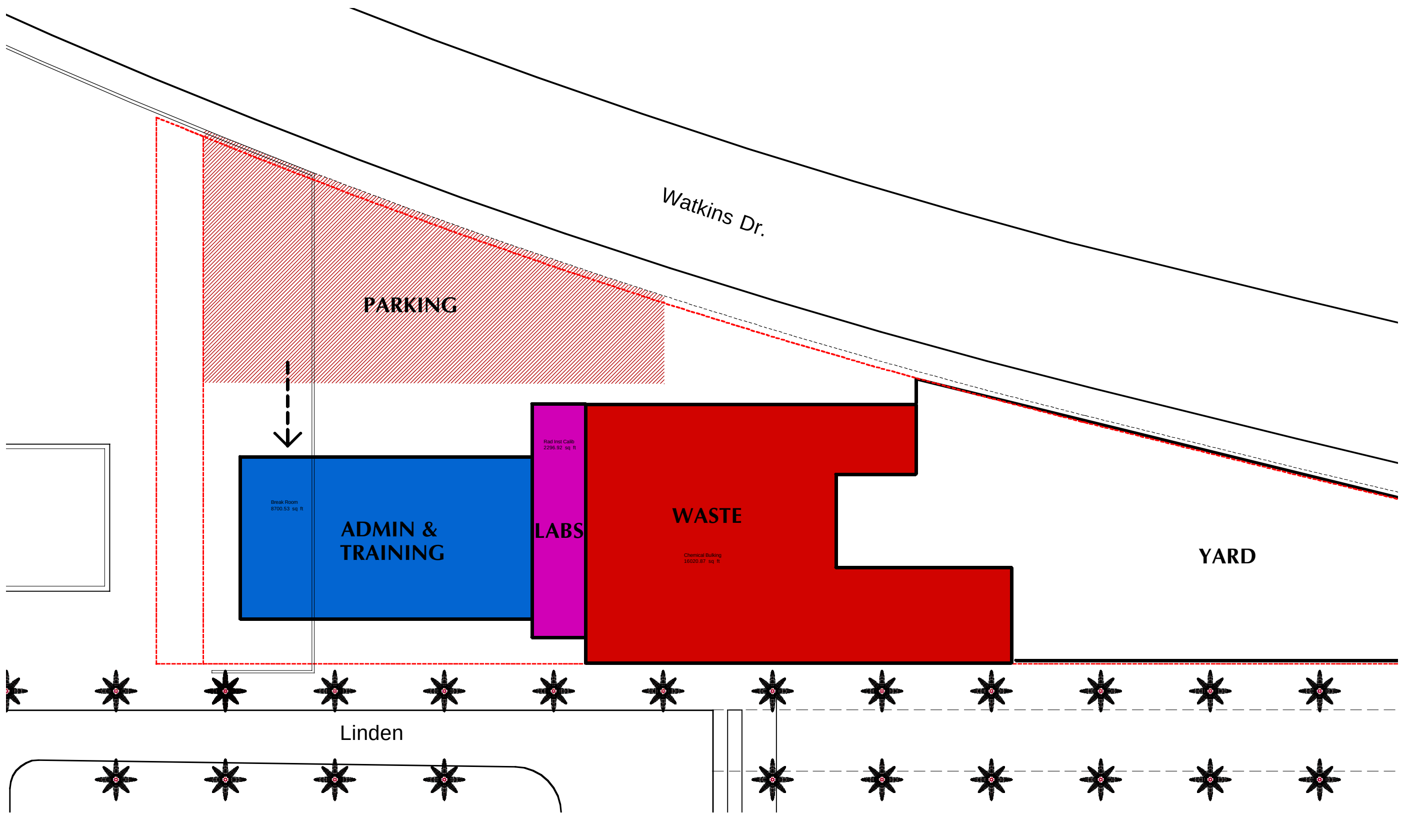
Alternate Planning Option A

This planning option showed a one story scheme for the entire building with the Materials Handling (Waste) facing east and the yard utilizing the the tip of the site. This scheme was unfavorable due to the lack of on-site circulation, enormous site coverage and difficult daylighting for offices and training rooms.



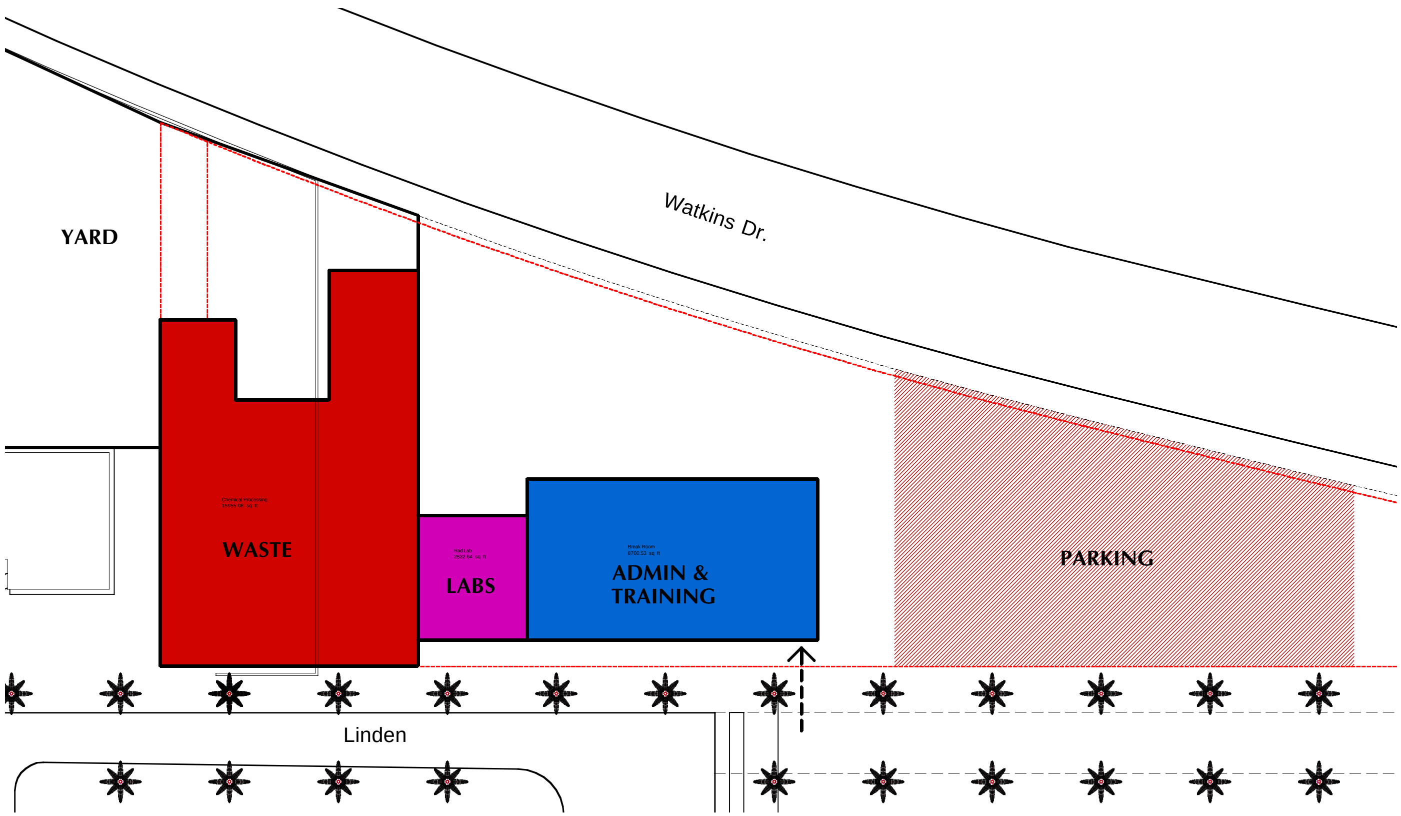
Alternate Planning Option B

Planning option B was a favored scheme that the design team continued to develop through most of the DPP process. The administration and training orientation gives adequate daylighting while also being adjacent to TAPS and the campus. The Materials Handling (Waste) is on the edge of campus with decent vehicular access to the yard off Watkins.



Alternate Planning Option C

Planning option C puts the administration portion of the building at the edge of campus with the entrance to the building at the edge of the site. The waste area requires the sharing of TAPS yard and all vehicular access would be through the coprorate yard. Truck manuvering to and from the loading dock is difficult and tight with this particular Materials Handling (Waste) arrangement. This option was chosen as the preferred scheme with some re-working of the Materials Handling space arrangement to push this portion further south to allow for a larger yard and truck maneuvering area.



Alternate Planning Option B

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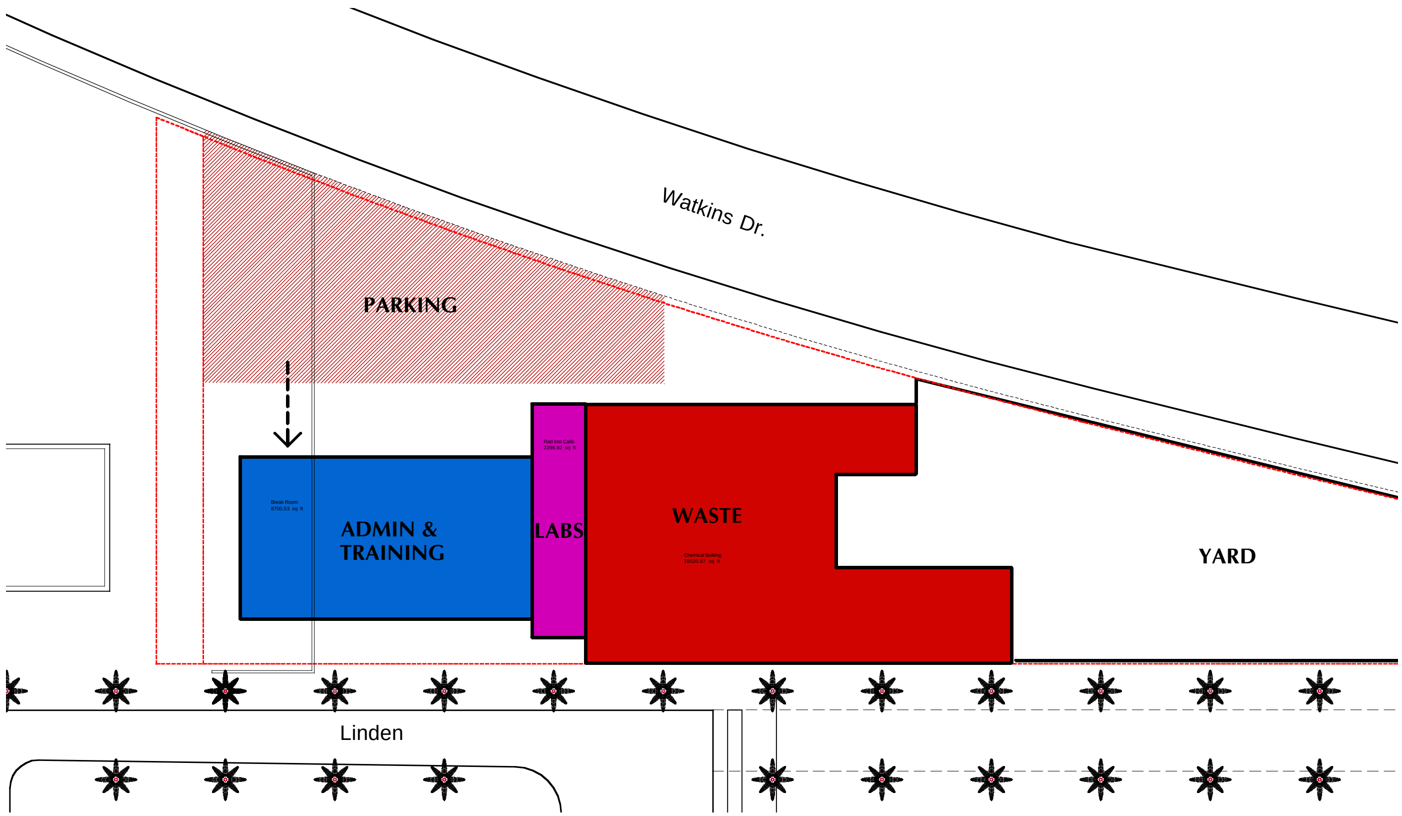
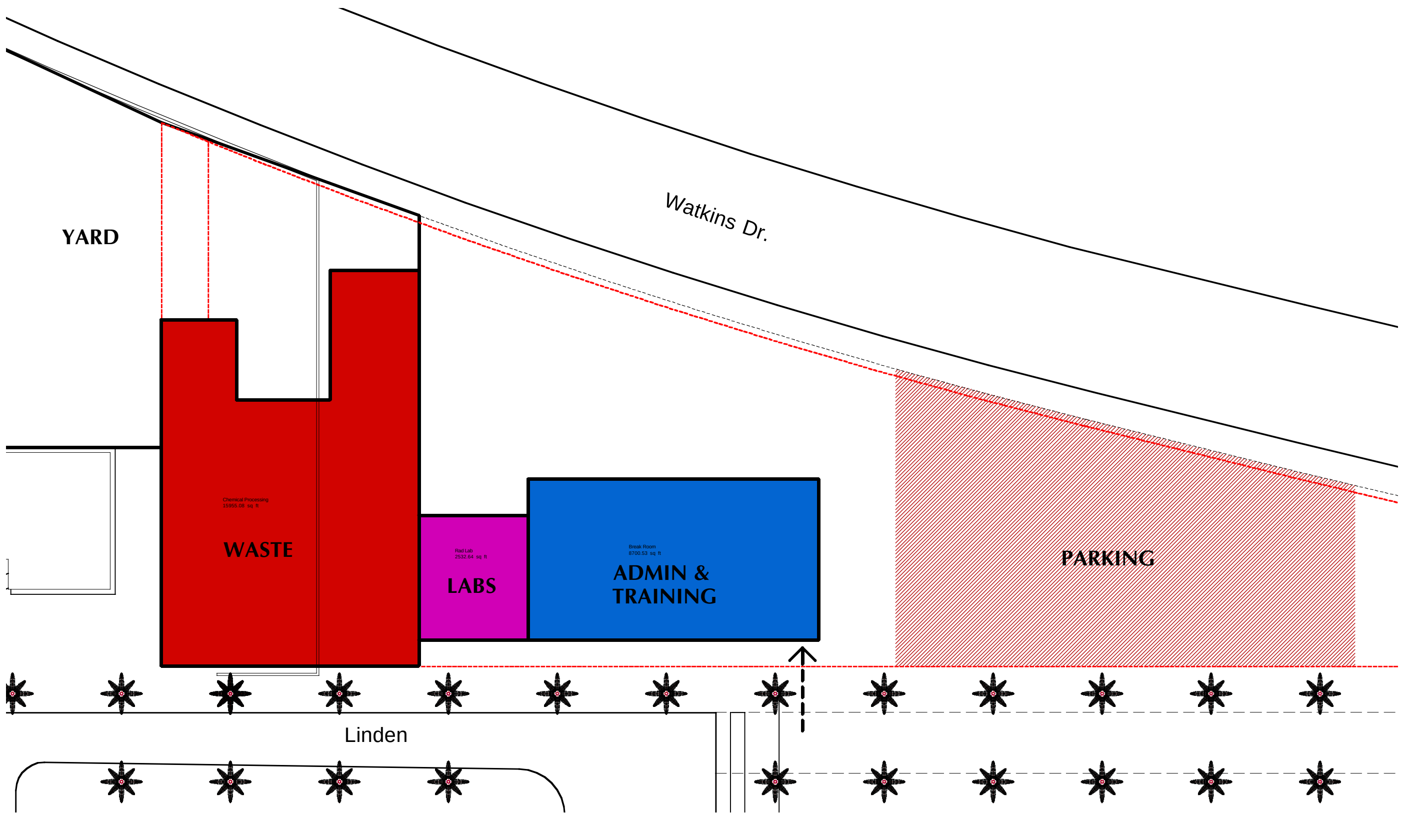


Alternate Planning Option C

Planning option C puts the administration portion of the building at the edge of campus with the entrance to the building at the edge of the site. The waste area requires the sharing of TAPS yard and all vehicular access would be through the coprorate yard. Truck manuvering to and from the loading dock is difficult and tight with this particular Materials Handling (Waste) arrangement. This option was chosen as the preferred scheme with some re-working of the Materials Handling space arrangement to push this portion further south to allow for a larger yard and truck maneuvering area.



UCI EH&S Tour Notes March 11, 2004

Attendees:
UCR - Ross Grayson, Russell Vernon, Kevin Simpson, Dan Rockholt, Luis Carrazana, Darius Maroufkhani
EWA - Michael Somin, Heather Porto
RJA - Dan Gemeny
BAUER AND WILEY – Jay Bauer, Annette Wiley, Brian Pratt, Jeff Anderson
Tour Guides – Marc Gomez, UCSD EH&S Waste Management Facility Director; Dale Saunders, Fire Marshall

Notes:
• The building is about four years old; it is an EOC building (downgraded to 1.15 seismic factor); it houses Radiation Safety, Environmental Safety, Chemical Safety, Fire Safety; 43 staff members; remote site on fringe of campus. All EH&S operations are consolidated at this facility.
• Waste (universal waste) requirements have increased since the building was completed, however it still accommodates the extra requirements and staff. (UCI FTE enrollment increased from 30,000 to 40,000 students).
• It was designed with extra open office space to be used for expansion as growth occurred. These areas are being filled in with workstations.
• An open space at the top of the atrium stairwell appears to have been planned for an informal conference/lounge area but no furniture was provided.
• Important to have a good ratio of conference rooms to staff members.
• H3 rooms had pressure problems when fire dampers were closed with fume hoods on – creating negative pressure so great that exiting doors can't be opened – better to run ducts directly to outside or add ventilation in wall.
• This building has all electrical circuits, lighting, etc., connected to emergency power with 48 hour fuel back-up system. (7000 KW generator.)
• Overflow system is contained in double-wall pipe system – need to be careful in construction to insure that it isn't damaged as happened here.
• There are two levels of security in the loading dock area – one area for vendors and one area for campus visitors. The building layout purposefully creates a complete separation of public access (visitors) and waste management traffic.
• Security system provides key card access that is monitored by campus police; no cameras are used. Initial door hardware needed modification as contacts didn't lock. The radioactive pits are not secured.
• Exterior motion detector alarms were sensitive to animals and birds and were changed.
• Building utilizes a paging system.
• Too much lab space built – under-utilized
• UCR would like to consider a central control room that has view to all the hazardous waste handling rooms. This might also have CCTV system for surveillance.

UCI EH&S Tour Notes
March 11, 2004

• UCR would like to consider a large room with a common area where waste can be staged and then moved to one of several "alcoves" segregated with half-height walls.
• Important question – how will materials be processed and moved through facility – forklift? Carts?
• UCI is considering receiving hazardous materials from community for processing and disposal (for fee?)
• H rooms have grounding bar in floor.
• This building has a storage room for food supplies (snacks for meetings) and EOC supplies.
• The lunchroom is sized for EOC operations. An outdoor patio with table seating is utilized often.
• They added vending machines in alcoves in corridors to serve training center.
• The large conference room seats 49 and has a operable partition to divide it into two rooms. Most often it is used with training tables for 20-30 people. The Audiovisual system is oriented the wrong way for optimal use – the room should be wider and need a sound amplification system.
• The Director's office is 12'x20' or approximately 240 sf and has a small conference table.
• The reception area has a private office directly adjacent with visibility for backup when receptionist is away.
• One conference room for each department was provided. One is a combined conference / library.
• The fire plan check area has a large, open common area for plan review and a large plan storage area. UCI currently has 70 projects under construction.
• Radioactive materials files to be kept for 30 years creating a large amount of archived files.
• UCR would like to consider placing the lockers/showers between the office space and the hazardous materials processing area as a transition for 'clean to dirty' spaces.

UCSD EH&S Tour Notes
March 12, 2004

Attendees:
UCR - Ross Grayson, Dan Rockholt, Luis Carrazana, Chemistry Professor Fred Lynch
EWA - Michael Somin, Heather Porto, Scott Lindner
BAUER AND WILEY – Jay Bauer and Annette Wiley
Tour Guide – Clark Martin, UCSD EH&S Waste Management Facility Director

Notes:
• The building was planned in 1991 and built in 1995/96.
• It is a split operation with waste accumulation and waste management functions only at this site. The administration and training space is located off campus in office building type space housing 60 staff.
Staff currently here is 14 FTE with planned growth of 2 more. This includes 9 students who work part-time. The total EH&S staff is 75.
• Warehouse of 16,000 SF and approximately 1,200 SF of administrative office space. The director feels the administrative space is inadequate and in fact they are in the process of converting a warehouse workshop to house office space for 4 workstations.
• The philosophy here is a 'manufacturing' analogy with a blue collar, construction, worker-bee mentality and separation from the 'corporate' culture of the administration functions.
• Campus growth causing expanded need for their services is anticipated due to bioengineering programs.
• Radioactive materials are declining in use due to more sophisticated computer-modeling techniques and government over-regulation and more stringent controls.
• This facility handles Scripps Oceanographic Institute and the Hospital.
• They do pickups and collections in trucks.
• Currently the handle 400,000 pounds per year of chemical waste, 60,000 pounds of radioactive waste and they are anticipating adding from 150,000 to 180,000 pounds of medical waste starting in April 2004.
• Their staff does training on handling hazardous materials. They have trainers for each department who go to users.
• The lunchroom functions as a 'departmental emergency center' in the case on an incident. This is not an essential building. The EOC is moving to the Police Department.
• They use radios to communicate with staff/students in field. Clark sees a move to wireless transmitters. The Bar Code readers are not used in field because it takes too much time and requires hands.
• There is only one lab space and it has inefficient and unused space due to changing testing requirements.
• The facility is organized around a wide open center spine with most of the storage rooms opening off this spine for easy access. A forklift is used in this center corridor.
• In planning the facility it was assumed the mostly likely spill would occur at the truck loading dock so containment was planned for a 55 gallon spill.

UCSD EH&S Tour Notes March 12, 2004

- The **Loading Dock** is covered and sprinklered but not ventilation is required as it is an outdoor space. The cover reaches over the trucks pulled into the dock.
- For fire suppression they use low expansion foam that can drain to sewer. Each door has a trap and containment overflow into a 12,000 gallon tank in the service yard (20 minutes of fire sprinklers).
- The building was designed with the process flow of materials in mind. The chemical waste is stored near the dock as it stays the shortest duration at the facility while radioactive is the longest and is stored farther away from the dock.
- They initially had a problem with driving rain coming into the dock area but solved this by adding louvers to the dock side wall.
- The chemical waste 55 gallon drums are stored adjacent to the loading dock separated into compartments with partial height block walls with 2 hour rating. The drums are stacked two high and the wall needs to extend 18″ above the top of the highest drum. A distance of 36″ is required between the drums in order to be able to read the label on every drum.
- A weighing platform is required at the dock for pricing materials being shipped out.
- The **chemical packing room** is used to segregate and consolidate waste materials. Alarmed gas cabinets are used for cylinders - 1 toxic and 1 flammable.
- Vermiculite is stored in a large vacuum cleaner-like apparatus and used for packing material.
- The compact the lab trash (glass tubes, etc.). Everything possible is intrinsically-safe (spark proof and airtight).
- Compressed air is provided for impact wrenches.
- 3 workstations are used for data input and computer work served with a wireless network.
- Old batteries are collected through the campus mail for recycling and stored in drums.
- 10 air changes per hour are provided with heat only.
- They utilize the 2 snorkels a lot which reach across the room to the open drums.
- Chemical Consolidation is done in the adjacent room which has problems with explosion ceiling panels that leak and have been painted out to keep heat out. The exhaust ventilation was designed to be fed from the floor and return behind the consolidation area but strong odors suggested the ventilation system was inadequate.
- The flooring has bonded, no spark, low carbon coating with a coved base.
- The painted HVAC ducts are peeling and might have been more durable not painted.
- The **General Storage Room** houses empty containers and collection supplies and is planned to be converted to also handle medical waste. There is a conflict in ceiling clearances with too many pipes that are too low for forklifts to access the top shelves of the storage racks.
- The epoxy flooring has not worn well and is scratched and dirty.
- Magnetic hold-opens are installed on all doors.
- The **Chemical Storage Room** stores and resells chemicals to the campus and utilizes a compact storage systems.

UCSD EH&S Tour Notes March 12, 2004

• **Radioactive Storage Room** is outfitted with a super-compactor that cost $60,000 but is not practical today. Other methods of disposal used are an incinerator and box compactor. A large industrial sink has a high pressure wash arm where they wash out paint waste, decontaminate refrigerators, etc. The drain empties to the sewer. The glass block on the exterior wall provides natural light.
• The **Radiactive Material Decay Room** provides for materials to be pumped into custom-made tanks, stored for decaying, then pumped into the sewer or drums for disposal pickup. Glass and plastic vials are crushed. A silver recovery (photographic waste) unit generates 996 oz of silver which is donated to the art department for jewelry making.
• **Radioactive Trash** (materials with a small amount of radioactive content) mostly paper and plastic is compacted into boxes. A freezer is used for mixed waste decaying.
• Intercoms with speakers are mounted in all rooms for safety but the system has never worked properly.
• Due to staffing increases, they are in the process of converting H7 lab storage space to 6 offices for technicians.
• There is a workshop and workbench for testing and repair of fire extinguishers.
• The center spine corridor has a high ceiling, skylights and mechanical ducts overhead that act as a plenum. It also has 5 handwashing sinks with foot pedals and hot water heaters. A custodial closet is required as the university janitorial won't service this facility. Uniform storage should be provided for in the locker room.
• This facility has no security gates on the yard as it is part of a larger 'yard' complex. The security alarm is a motion detector.
• A separate explosion room is a remote block building in a corner of the parking lot.

Meeting Minutes

Meeting Minutes #01

Project	UCR Environmental Health & Safety	
Purpose	Design Team Orientation Meeting	
Date/Location	February 18, 2004; 12:30 PM at UCR Capital Planning Offices, Bannock	
Attending	*UCR CAPITAL PLANNING* Dan Rockholt Tim Ralston Luis Carrazana Sharyl Murdock	*BAUER AND WILEY* Jay Bauer Brian Pratt Annette Wiley
Prepared by	Annette Wiley	
Distribution	Dan Rockholt, Those attending	

Meeting Minutes

Item No.	Description	Responsible Person Responsible Firm	Complete?
01.01	The purpose of the meeting was to orient the design and architectural team with the procedures and process to be followed in working with the University of California, Riverside. Initial discussions were held with Dan Rockholt with Tim Ralston, Luis Carrazana and Sharyl Murdock each joining the meeting for a short time.		n/a
01.02	Bauer and Wiley distributed a design team project directory. Dan requested this information be emailed to him so they can produce an overall PMT (Project Management Team) directory.	Brian Pratt BAUER AND WILEY	yes
01.03	The University's project committee will include Dan as project manager from Capital Planning with assistance from Tim and Luis who will cover for him in his absence of 3/7 to 3/13 for military duty. Darius Maroufkhani will attend all meetings if possible to represent Design and Construction.		n/a
01.04	All project communication with the University should go through Dan Rockholt. Meeting Minutes should be forwarded as a draft PDF format to Dan for review and comment prior to his distribution. Project meetings will be scheduled on Thursdays if possible.		n/a
01.05	Dan provided a draft of the Briefing Points to be submitted with the DPP/PPG on the EH&S project to the UC Office of the President (Larry Ahl?). The OOP will be concerned with the cost/SF and the projected staff count increase. A cap on the increase of FTEs to 2 years post buildout for the department is being discussed.As a compromise, options should be considered to build in flex space for administrative expansion in the future. Establishing an accurate budget is critical according to Luis.		n/a
01.06	Bauer and Wiley prepared a draft workplan for the DPP effort. The overall schedule has slipped at least 2 weeks due to a later project start. Dan's target date for Final DPP is May 15th. Brian to forward workplan as file attachment (Dan will try to open) and as PDF to Dan.	Brian Pratt BAUER AND WILEY	yes
01.07	Proposition 55 will likely be the funding source for the project. A 6 month delay in start of Design should be anticipated. Total construction budget was discussed as in the range of \$9.1 to \$9.33 million and needs further refinement. The cost per square foot will be an important indicator and a target number should be established. Benchmarking with other comparable facilities would be helpful.	Dan Rockholt UC RIVERSIDE	n/a
01.08	Dan will forward a copy of the UC Santa Barbara EH&S facility DPP for the team's reference. Other DPPs to refer to are UCI and UC Davis.	Dan Rockholt UC RIVERSIDE	yes

Meeting Minutes

Item No.	Description	Responsible Person Responsible Firm	Complete?
01.09	The following approvals and presentations will be required: Campus Design Review Board - April 6th or May 4th (1st Tues) (3 Faculty, Ralston, Johnson, Steven Ehrlich, Duke Oakley and Cathy Garcia, WRT). CPAC - Capital Programs Advisory Committee April 20 or May 17 (global overview/executive level summary) Agencies: Fire, EPA	BAUER AND WILEY	n/a
01.10	Dan requested the team arrange facility tours of other recent UC EH&S facilities (UCSB, UCI and UCSD) involving Ross Grayson, Russell Vernon, Mike Somin and Dan Gemeny and Bauer and Wiley along with capital planning from the different campuses for feedback on their projects. These should be scheduled prior to the interviews if possible on two days. The Design team should submit a cost for these tours as they were not included in the initial DPP scope.	Annette Wiley BAUER AND WILEY	yes
01.11	Sharyl Murdock will issue a PSA which will serve as authorization to proceed with work. Adjustment in Design fees for January billing rate changes, tours, etc., should be submitted to Dan Rockholt for consideration. A total lump sum plus reimbursables with no markup is requested. Invoices do not require copies of reimbursables and are paid within 2 weeks of approval by PM. Contact Sharyl with A/P questions.	Annette Wiley BAUER AND WILEY	yes
01.12	Site constraints were discussed. The freeway widening at the existing site will displace the sea containers currently being used for storing of hazardous materials. DOT requirements for traffic, circulation and transportation of Hazardous Materials will need to be investigated. Dan will forward an aerial photo and Cal Trans drawings on CAD.	Dan Rockholt UC RIVERSIDE	yes
01.13	A quick study confirming existing site will not work is required. Other studies not a part of this project scope but under consideration include the Campus Parking Office building - this department may move to a garage in the center of campus for more convenient access. The existing EH&S building is also being considered for conversion to instructional/research space for either Physics, Fine Arts/Welding or Custodial/Grounds.	Brian Pratt BAUER AND WILEY	n/a
01.14	Ross Grayson has produced a report on the Deficiencies of the current EH&S facility and includes an EPA audit which should remain confidential.		n/a
01.15	Revisions are currently underway to the 1990 LRDP (long range plan). The UCR design standards allow for building materials to include UCR brick (split face block), stucco, tile, aluminum and concrete.		n/a

Meeting Minutes

Item No.	*Description*	*Responsible Person* *Responsible Firm*	*Complete?*
01.16	The kickoff meeting with the PMT is scheduled for March 1st. Tours are targeted for the week of March 8th. Two days of departmental interviews will be arranged for the week of March 15 with the following: EH&S - Admin, Waste Handling, Fire, Training, Library, Conference Space, EOC Campus Working Group covering ADA, Physical Plant, Fire, Code		n/a

Meeting Minutes #02

Project	UCR Environmental Health & Safety		
Purpose	Project Kickoff Meeting		
Date/Location	March 1, 2004; 11:00 AM at UCR Capital Planning Offices, Bannockburn J102		
Attending	*UCR CAPITAL PLANNING* Dan Rockholt, Nita Bullock, Berent Pippert, Luis Carrazana *UCR DESIGN & CONSTRUCTION* Dan Johnson, Ted Chui, Darius Maroufkhani	*BAUER AND WILEY* Jay Bauer, Brian Pratt Annette Wiley *RJA* Dan Gemeny, Ann Chavez *EWA* Heather Porto	*EH&S* Ross Grayson, Russ Vernon, Hank Rosenfeld
Prepared by	Annette Wiley		
Distribution	Dan Rockholt, RJA, EWA, BAUER AND WILEY		

Meeting Minutes

Item No.	*Description*	*Responsible Person Responsible Firm*	*Complete?*
02.01	The meeting was the initial kick-off meeting with the Environmental Health and Safety Project Management Team (EH&S PMT) and the Design Consultants involved in the Detailed Project Program (DPP) effort to define the needs for the new facility.		n/a
02.02	Dan Rockholt, Project Manager from UCR Capital Planning, introduced the UCR Team members, gave a presentation of the DPP process including a description of the purpose, mission and contents of the DPP document. Funding for the project was identified as $11.2 million total in the draft State-funded Capital Improvements Program Budget. $1 million initial money is available in the next few years for design and working drawings. Funds are contingent on Bond Measure Prop.55 March election.		n/a
02.03	Dan continued with beginning assumptions for the project - 31,200 gross square feet and 20,300 assignable square feet, and showed campus aerial photos outlining the proposed site under consideration next to the Corporate Yard. The current EH&S site will also be tested for feasibility of expansion.		n/a
02.04	Facility tours with the PMT and the Design Consultants of other UC Environmental Health and Safety buildings are scheduled for Thursday, March 11th at UC Irvine and Friday, March 12th at UC San Diego. These facilities are considered to be recent and comparable with potential for good insight into the project challenges. A future tour might be arranged for UC Santa Barbara as Ross Grayson was involved in the planning of this facility.		n/a
02.05	Ross Grayson, EH&S Director, gave a comprehensive presentation on the Mission and Vision of the department and the 8 components of the Facility. This presentation was prepared for the Chancellor's Office review and copies are available from Dan Rockholt.		n/a
02.06	Key points in Mr. Grayson's presentation were the ability of the facility to last 30-50 years and to meet the needs of the fully built-out campus of 25-28,000 students plus the requirements of the current and projected huge increase in research programs in Science and Engineering. The anticipated staff increase cannot be funded now due to State budget problems however, the facility should be flexible enough to allow growth over time. Increases in materials capacity can be handled by adjusting throughput.		n/a
02.07	Ross stressed the importance of separation of the two major components of the facility: the public portion, dedicated to consultation and training, and the restricted operations of waste management. Siting will be a challenge to segregate these public/private uses including vehicles up to large trucks. He gave UC Irvine as an example of a successful, welcoming public face at the entry with a separate waste wing.		n/a

Meeting Minutes

Item No.	Description	Responsible Person Responsible Firm	Complete?
02.08	The Training and Learning Center needs to accomodate 500 classes a year and 40,000 students. Ross' goal is to design the Learning Center to be flexible enough for use by the rest of the campus when available and double as the campus Emergency Operations Center currently in the Police building (but thought to be inadequate in size). EH&S provides procedures and staffing for Emergency Management and requirements for an EOC can easily be incorporated into the new facility to provide redundancy.		n/a
02.09	The question of Code requirements for an EOC was discussed. Emergency generators and structural upgrades are two concerns that need to be addressed. Will this facility need to be an 'Essential' building? Dan Gemeny of RJA will research code requirements and report back to team.	Dan Gemeny RJA	yes
02.10	The waste management process flow will be particularly important. Will a forklift be required or will a hand truck be used? Will all campus incoming shipments of select agents be handled here or at a central campus receiving location? The yard should be flexible for staging and handling emergency operations. Russell Vernon mentioned that in the future ALL electronic computer components will be considered 'universal waste' and need to be accomodated here.		n/a
02.11	Ross mentioned that the only 'high tech' area requiring a "H" Class 1, Division 1 rating was the lab area for solvent pouring. He would like 3 labs: Industrial Hygiene/Emergency Response, Instrumentation, and ID and Analysis. The placement of the locker rooms is also seen as critical to allow for staff to transition safely between the clean and dirty areas. He would also like these facilities to double as the office staff restrooms if possible.		n/a
02.12	The current incinerator is owned by the Biology department and its future needs to be determined - maintain or decommission? It is remotely located and not a part of EH&S currently. They will need to be consulted.	Dan Rockholt UC RIVERSIDE	no
02.13	Hank Rosenfeld, UCR Police Department Chief, will involve the FBI and the Joint Terrorism Task Force regarding security issues, design standards and controls as required.	Hank Rosenfeld UC RIVERSIDE	no
02.14	Tim Paine inquired about the possibility of incorporating a lab bench and fume hood into the learning center to teach hands-on laboratory safety training.		n/a
02.15	The need to accomodate a potential change in the campus research direction (i.e, medical school therefore biomedical waste requiring much different kind of equipment, refrigeration) was discussed but will not be considered as another facility would be needed on the West campus if this were to develop.		no
02.16	Fire suppression models were discussed, including AFFF foam, sprinlkers and foam in sprinklers. Design will include secondary containment which will require trench drains, etc.		n/a

Meeting Minutes

Item No.	*Description*	*Responsible Person* *Responsible Firm*	*Complete?*
02.17	Jay Bauer introduced the consultant team members and reviewed the DPP Workplan. Four major components will occur almost concurrently in the next three months: Programming, Planning, Building Systems Criteria and Budget Development. PMT will participate in review sessions on March 25, April 8 and April 22. Thursdays at 1:30PM was selected as the most convenient time.		no
02.18	Campus Design Review Board and Capital Programs Advisory Committee presentations may be scheduled in May and will mainly concern site issues. Luis did not feel there would be possibility of major revisions due to the timing of Committee meetings not coinciding with DPP progress. DRB review is mostly for their information not approval. They may make suggestions like "screen the yard".		n/a
02.19	Programming interview sessions will be conducted on March 16th with the users for the Lab and Waste Management components and March 17th for the Administrative Offices, Learning Center and EOC. Bauer and Wiley will forward information for preparation for interviews.	Brian Pratt BAUER AND WILEY	yes
02.20	Dan Johnson questioned how much effort would be required in analyzing the existing site due to the obvious constraints. Luis Carrazana directed the team to only validate that the existing site won't work. Nita Bullock raised the possibility of using the TAPS building adjacent to the proposed site if necessary. She will provide guidelines (constraints sheet) from the campus master plan for the preferred site and the neighborhood for the design Team.	Nita Bullock UC RIVERSIDE	yes
02.21	Brian Pratt reviewed the draft goals prepared by Bauer and Wiley from materials received from UCR. Discussions ensued regarding projected image, need to balance appropriate quality with budget and schedule issues. The committee will forward any further comments to Dan Rockholt for the design team to incorporate and publish.	Dan Rockholt UC RIVERSIDE	yes
02.22	The proposed budget was thought to be sufficient to allow purchase of some of Group 2 and 3 equipment (furniture and audiovisual equipment for the Learning Center). Darius Maroufkhani will provide budget detail that was submitted to the Office of the President.	Darius Maroufkhani UC RIVERSIDE	n/a
02.23	The following handouts were made available during the meeting and will be distributed as attachments to the Meeting Minutes: Copy of Dan Rockholt's presentation, Kick-off Meeting Agenda, EH&S Plans of Existing Facility, @15 Freeway Map, Current and Proposed Site Plans, West Campus Site Plan, DPP Workplan, Programming Process Explanation and Draft Goals. A complete project directory will be attached to minutes as well.		no

Meeting Minutes

Item No.	*Description*	*Responsible Person* *Responsible Firm*	*Complete?*
02.24	Dan Rockholt will provide the Campus Housing Strategic Plan covering the area immediately adjacent to the corporate yard to the Design Team. Nita suggested that the Design Team also review the multi-modal transportation plan. Dan will forward a copy of this as well. Budget numbers for EH&S facilities at UCI, UCSD and UCSB will also be provided to the Design Team.	Dan Rockholt UC RIVERSIDE	no
02.25	Dan Rockholt asked the PMT and the Design Team to forward all communications through him for distribution to other team members.		n/a
02.26	Immediately following the meeting the design team, Ross, Russ and Dan toured the potential site at the Corporate Yard, an alternate site near the Maintenance yard with lath houses and the existing EH&S facility.		n/a

B A U E R A N D W I L E Y

Meeting Minutes #03

Project UCR Environmental Health & Safety

Purpose Programming Review Meeting

Date/Location March 25, 2004; 1:30 PM at UCR Capital Planning Offices, Bannockburn J102

Attending

UCR CAPITAL PLANNING
Dan Rockholt, Bill Johnson, Luis Carrazana
UCR DESIGN & CONSTRUCTION
Darius Maroufkhani
UC POLICE
Hank Rosenfeld

BAUER AND WILEY
Annette Wiley, Jeff Anderson, Katy Cadet, Brian Pratt
EWA
Michael Somin, Heather Porto

EH&S
Ross Grayson, Russ Vernon, Kevin Simpson

Prepared by Brian Pratt

Distribution Dan Rockholt, EWA, BAUER AND WILEY

Meeting Minutes

Item No.	Description	Responsible Person Responsible Firm	Complete?
03.01	Michael Somin reviewed the materials flow diagram and the adjacenies. The Ergonomics lab should be shown in the Learning Center Pre-function Lobby space and should include space for the mobil mock-up lab bench (approximately 10′ x 10′). The Decon (decontamination for people to change clothes) Room does not have to be directly adjacent to the Loading Dock but should be adjacent to Radiation area.		n/a
03.02	The high energy radioactive material holding room requires a shielded enclosure. The material enclosure can be below ground, then the shielding only has to be on the top of the vault. The room requires a winch/hoist with a minimum capacity of 500 lbs.		n/a
03.03	The team will determine if the PEC "out-building" requires air conditioning.	Michael Somin EWA	no
03.04	Ross referred the design team to his Powerpoint presentation for a photo of The University of Minnesota EH&S Control Room as a model.		n/a
03.05	Michael Somin requested clarification on forklift use. A ride along style with primary access along the corridor and loading dock is preferred. Chemical Processing requires no forklift manuevering area within the room. The staff will use palette jacks or drum carts to move materials.		n/a
03.06	The transition from the office adminstration space to the labs will require a clean room-type vestible or interruption of the corridor with mats for walkoff.		no
03.07	The walk-in freezer can be accessed directly off the Loading Dock.		n/a
03.08	Hank Rosenfeld suggested a non-load bearing wall between the locker rooms so that the rooms can be adjusted more easily to accommodate potential changes in the facility's gender dynamics.		n/a
03.09	The design team should discuss the telecom room requirements with the University's telecom people.	Brian Pratt BAUER AND WILEY	no
03.10	The medium sized Training Room should have the extra workstations along only one wall.		n/a
03.11	An EOC function includes five main groups as follows: Finance, Logistics, Operations, Planning and the EOC Manager. The groups are collectively referred to as "F.L.O.P." The intent is to provide all the functional spaces required to work as an EOC while designing the facility to be dual purpose so very little square footage is dedicated to an EOC.		no
03.12	Brian Pratt reviewed initial site coverage studies for both sites. The existing EH&S site does not have enough area to accommodate the program. The newly proposed site will likely require encroachment beyond the TAPS fence and will not accommodate the entire parking requirement. Ross pointed out that visitor parking is important and staff uses their personal vehicles for pick-ups and deliveries so parking should be adjacent to the building.		n/a

Meeting Minutes

Item No.	*Description*	*Responsible Person* *Responsible Firm*	*Complete?*
03.13	Luis Carrazana asked Dan Rockholt to send the design team site boundary information regarding how far east and west the site could extend. Dan will also provide the Arroyo Housing Plan to the design team.	Dan Rockholt UC RIVERSIDE	yes
03.14	The design team should consider how deep the yard loading dock area needs to be to accommodate a 100 gallon secondary containment capacity.		n/a
03.15	Preliminary Individual Room Data Sheets for each room or space were distributed for comments and additions. Ross requested an electronic file be forwarded to him for distribution. The team requested feedback prior to the next review meeting.	Brian Pratt BAUER AND WILEY	yes
03.16	The next PMT meeting will be an intermediate review meeting on April 8th in J-102 at 1:30 PM.		n/a

B A U E R A N D W I L E Y

Meeting Minutes #04

Project	UCR Environmental Health & Safety
Purpose	Physical Plant Meeting
Date/Location	April 8, 2004; 11:00 AM at UCR Capital Planning Offices, Bannockburn J102

Attending

UCR CAPITAL PLANNING	*UCR Physical Plant*	*BAUER AND WILEY*
Dan Rockholt, Luis Carrazana	Pat Simone	Brian Pratt
UCR DESIGN & CONSTRUCTION	Earl Levoss	*HENRIKSON OWEN*
Darius Maroufkhani	Brian Hambleton	Richard Henrikson
	Steve Burleson	

Prepared by	Brian Pratt
Distribution	Attendees, Henrikson Owen, BAUER AND WILEY

Meeting Minutes

Item No.	Description	Responsible Person Responsible Firm	Complete?
04.01	There was a general introduction of the project. Darius stated that the project is likely to be considered an "essential building" regardless of the EOC component. The building will be LEED certified equivalent.		n/a
04.02	The central plan utilities are far from the site, therefore this project will not utilize the University's central plant.		n/a
04.03	Brian H. suggested a higher threshold of quality for the MEP equipment because of the nature of the building, such as, oil-filled transformer, a copper bus, hinged panels on the electrical panels.		n/a
04.04	The team should assume high-efficiency units. Vibration may be an issue, so vibration control should be considered.		n/a
04.05	Earl stated that the design should implement energy saving measures such as occupancy sensors to shift the systems into high efficiency mode.		n/a
04.06	This building will be EMS connected with 24 pairs pulled to the site. 6 of the pairs will be reserved for mechanical systems. The University wants to be able to read through the EMS: fume hood sash height, fume hood exhaust cfm, general exhaust cfm, supply air cfm, and other standard HVAC points. UC Riverside accepts Johnson Controls and Siemens for EMS.		n/a
04.07	The design team should discuss the fire alarm system with Scott Corrin, the campus Fire Marshal. If fire alarm fiber optic connection goes in for fire alarm, then that can also be used for EMS.	Brian Pratt BAUER AND WILEY	no
04.08	There was a great deal of discussion about the utilities on or near the site. Dan brought a drawing with some information, though it appeared to be incomplete. The design team needs up-to-date inforamtion on utilities and points of connection for the DPP Systems Criteria and budget. Dan and Luis will provide the Arroyo Housing Survey to the design team so that the utilities are clear.	Dan Rockholt UC RIVERSIDE	yes
04.09	Dan will provide the Campus Design Standards for MEP.	Dan Rockholt UC RIVERSIDE	yes
04.10	The design team should get in contact with Doug Limberg for points of connections and requirements for data/communications (fiber optic). They may be trenching nearby anyway. Or, the nearest connection may be in the Parking Services Building adjacent to the site. See plan for connection point. Dan will arrange contact.	Dan Rockholt UC RIVERSIDE	n/a
04.11	There is a 12kv transformer reasonably close by that this project may be connected to.		n/a
04.12	100% of power in the building shall be on emergency power. An on-site, diesel-fired, engine-generator shall be provided. An above-ground, diesel fuel, storage tank shall be provided with 48 - 72 hours of fue. storage. The University will confirm the amount of fuel storage required.	Dan Rockholt UC RIVERSIDE	n/a
04.13	The design team should consider using high SEER HVAC equipment. Try to use R-410 refrigerant.		n/a

Meeting Minutes

Item No.	*Description*	*Responsible Person Responsible Firm*	*Complete?*
04.14	Consider integrated laboratory airflow control system for laboratory and for waste handling area, both of which have fume hoods.		n/a
04.15	Use Phoenix valves laboratory airflow control system (campus preference). This can integrate into EMS.		n/a
04.16	The closest power connection (12kv) appears to be southwest of the Parking Services Building. A radial feed, pad-mount transformer is there which we may be able to direct connect into. If not, do splice		n/a

B A U E R A N D W I L E Y

Meeting Minutes #05

Project	UCR Environmental Health & Safety
Purpose	Programming Review Meeting
Date/Location	April 8, 2004; 1:30 PM at UCR Capital Planning Offices, Bannockburn J102
Attending	*UCR CAPITAL PLANNING* Dan Rockholt, Luis Carrazana, Berent Pippert; *UCR DESIGN & CONSTRUCTION* Darius Maroufkhani; *UC POLICE* Hank Rosenfeld; *BAUER AND WILEY* Annette Wiley, Jay Bauer, Katy Cadet, Brian Pratt; *EWA* Michael Somin, Heather Porto; *EH&S* Ross Grayson, Tim Paine, Kevin Simpson, John Colladay, Scott Corrin, Bill Schmechel
Prepared by	Katy Cadet
Distribution	Dan Rockholt, EWA, BAUER AND WILEY

Meeting Minutes

Item No.	*Description*	*Responsible Person* *Responsible Firm*	*Complete?*
05.01	Brian Pratt reviewed the draft space list of 36,000 GSF. The PMT was asked to wrap up any pending program issues quickly in order to move the planning forward. He quickly reviewed the affinities and waste flow diagram to confirm any changes. Ross Grayson would like to have the control room directly adjacent to the chemical processing room. The details will be worked out in a consultant meeting with EWA and the PMT. The design team revised the affinities diagram per Ross's request.	Brian Pratt BAUER AND WILEY	yes
05.02	Dan Rockholt will verify that the property line is at the curb of Watkins. The team will work with Capital Planning to determine access from the north of the site (off Watkins).	Dan Rockholt UC RIVERSIDE	no
05.03	Site access from Linden will be limited to authorized vehicles only. Large trucks will access site from Watkins. Chemicals within vehicles may cross a public street but may not travel on a street, thus the service vehicle must access site from Linden (within the campus).		n/a
05.04	The team will work with Capital Planning to determine existing site utilities, which utilities will be provided by other projects (Arroyo Housing) and which utilities will be part of the EH&S project. A consultant meeting with Capital Planning was held prior to the review meeting to discuss these items.	Dan Rockholt UC RIVERSIDE	yes
05.05	Hank Rosenfeld explained the future traffic plan for UCR, stating that there will not be any personal vehicles allowed on campus streets. Transportation will consist of shuttles, biking and walking. All parking will be on the perimeter of campus in garages. Only service vehicles will be permitted on campus.		n/a
05.06	Luis Carrazana explained that parking for 30+ cars is not in this project's budget. He suggested providing parking for 8-10 cars including handicap parking. Ross asked the design team to provide space and plan for the 30+ future parking regardless of the funding.		n/a
05.07	Hank Rosenfeld agreed that parking is not in the budget, but suggested placing the parking area in a location near the TAPS building in order to share parking with TAPS employees. This sharing option might allow TAPS to aid in the funding requirements.		n/a
05.08	Brian Pratt and Jay Bauer introduced the different planning options. The group discussed the pros and cons of each scheme. Main issues discussed include: Access to parking and yard, proximity of entrance to campus, entrance relative to parking, expansion possibilities, sharing of TAPS and corporate yard.		n/a
05.09	Out of the schemes presented, option B was most favored. Jay Bauer made a revised sketch plan documenting the comments and suggested revisions. The design team will make adjustments to option B and provide a revised scheme based on the comments received in the meeting.	Brian Pratt BAUER AND WILEY	yes
05.10	The PMT would like to keep the majority of the project on the proposed site as opposed to using the TAPS yard for container storage. The option of entering the site and queing trucks via Corp yard or TAPS is a possibility.		n/a

Meeting Minutes

Item No.	Description	Responsible Person Responsible Firm	Complete?
05.11	Ross Grayson requests a secure yard (fence) for regulatory expansion. The option of sharing TAPS yard causes issues with fence location. It is preferred to secure only the EH&S site with a gate and call box on the perimeter.		n/a
05.12	The design team addressed sensitivity to the Santa Ana wind conditions regarding the waste portion of the building. Ross added that he is more concerned with no or low winds rather than fast hot winds. Ross did not see a problem with the waste side of the building being exposed to the Santa Ana winds.		n/a
05.13	The fire marshal, Scott Corrin was in favor of the administration/learning center (occupancy A) adjacency to TAPS (option B) rather than the waste portion (occupancy H) being adjacent to TAPS (option C, D). Option B requires less protection from TAPS due to occupancy type.		n/a
05.14	Berent Pippert suggested rotating the administration/learning center chip 90 degrees to compact the building and gain more site area. The design team responded that the current orientation is best for optimum lighting conditions.		n/a
05.15	The PMT would prefer to see the entrance of the building closer to the interior of the campus rather than on the edge of campus. If the schemes require an entrance on perimeter of campus it is ok but not preferred.		n/a
05.16	Michael Somin and Heather Porto reviewed the waste management room layouts and adjacencies with the PMT to get feedback and any comments. There were revisions to the affinities diagram regarding the control room and both processing rooms. Ross Grayson requested that the control room enter directly into the processing areas; not via a corridor. The design team will work together to adjust the layouts per the comments.		n/a
05.17	The Emergency Response Gear is currently in an unconditioned environment per our planning schemes. It needs to be in a conditioned space.		n/a
05.18	There will be a follow up meeting with EWA and the PMT to go over the intricacies of the waste management spaces as well as the waste management adjacencies.	Michael Somin EWA	yes
05.19	Luis Carrazana asked Ross Grayson to try to reduce the amount of space required for the labs and lab support. He reminded Ross that at UCI the lab space wasn't fully utilized and proposed that the labs may be a good place to shrink down in order to help the budget.	Ross Grayson UC RIVERSIDE	yes
05.20	Kevin Simpson expressed a concern for the surrounding neighbors in regard to noise and air quality. He wanted to stress the importance of security and visibility from off site.		n/a
05.21	The yard needs to be operational in the dark. Lighting should be provided for the yard with ability to turn off and on as needed.		n/a
05.22	For planning purposes the PMT would like the design team to place the yard containers in the drawings but not identify them as official spaces. The UCLA containers may require electrical and cold water utilities but no sewer or drain.	Brian Pratt BAUER AND WILEY	yes

Meeting Minutes

Item No.	*Description*	*Responsible Person* *Responsible Firm*	*Complete?*
05.23	Ross Grayson or Scott Corrin will give the design team the dimensions of the UCLA containers.	Ross Grayson UC RIVERSIDE	yes
05.24	The PMT requested PDF files of the planning options in order to review and discuss internally. Bauer and Wiley will send the PDFs by the end of the week.	Brian Pratt BAUER AND WILEY	yes
05.25	The next PMT meeting will be April 29th in J-102.		n/a

Meeting Minutes #06

Project UCR Environmental Health & Safety

Purpose Programming Review Meeting

Date/Location April 29, 2004; 1:30 PM at UCR Capital Planning Offices, Bannockburn J102

Attending

UCR CAPITAL PLANNING
Dan Rockholt, Luis Carrazana, Berent Pippert, Bill Johnson, Nita Bullock
UCR DESIGN & CONSTRUCTION
Darius Maroufkhani
UC POLICE
Hank Rosenfeld

EH&S
Ross Grayson, Tim Paine, Kevin Simpson, John Colladay, Scott Corrin, Bill Schmechel
ASUCR
Travis Randall
UCR Chemistry
Kevin Simpson

BAUER AND WILEY
Annette Wiley, Jay Bauer, Jeff Anderson, Brian Pratt
EWA
Michael Somin, Heather Porto

Prepared by Brian Pratt

Distribution Attendees

Meeting Minutes

Item No.	Description	Responsible Person Responsible Firm	Complete?
06.01	Dan Rockholt reviewed the results of the meeting held on 4/20 with Capital Planning, EH&S and the ASUCR (Travis Randall.) Several issues were discussed, including concerns, mitigation measures, regulatory safeguards, code requirements. He stated that it was a positive meeting and that Travis raised no objections to the project after the discussions. However, Travis had not yet responded to the meeting to Capital Planning.		n/a
06.02	Travis Randall arrived to the meeting late, and Dan confirmed his prior statement about his meeting with Travis and Ross Grayson.Travis stated that he had not yet responded to the meeting formally.		n/a
06.03	The Meeting Minutes from the meetings on 4/8/04 were adopted with no revisions.		n/a
06.04	Brian Pratt introduced the project status and noted the workplan and the goals of the meeting. Jeff began the review of the spacelist.		n/a
06.05	The spacelist deductions were reviewed in detail and Russell expressed concern that the deductions were made without EH&S consultation. Russell, Ross and Darius wanted to know why the deductions were made without EH&S review. The reductions made were primarily in Training and Conference areas.		n/a
06.06	Awkard pause		n/a
06.07	Luis Carrazana responded that there were several issues in play, but most important was the issue of budget and justification to the Office of the President.		n/a
06.08	Ross stated that there is not agreement on the reductions and that the Vice Chancellors are discussing the issue.		n/a
06.09	Jeff Anderson went on to review the spacelist and reductions. He reviewed the accompanying revisions to the Flow Chart and Affinity Diagram.		n/a
06.10	The program and requisite planning schemes are based on the reductions, with a total program GSF of approximately 30,600. There is some on-going discussion about some of the spaces that are identified as gross space that may need to be counted as assignable. The University will review the spacelist and efficiency factor calculation and provide guidance to the Design Team.	Dan Rockholt UC RIVERSIDE	yes
06.11	Jay Bauer briefly reviewed the process that resulted in the current scheme which was derived from Scheme B and an overlay sketch from the previous review. He then reviewed the main concepts of the current scheme, including the lobby access to the three major building components, parking opportunities, yard access. In summary, the current scheme is one story, yard opening to the east.		n/a
06.12	Travis expressed some concern about the access to the lobby from the south. Jay pointed out that there is flexibility in the architectural solution of the scheme, but this arrangement was the consensus from the previous review.		n/a

Meeting Minutes

Item No.	*Description*	*Responsible Person* *Responsible Firm*	*Complete?*
06.13	Hank Rosenfeld pointed out that there were significant security issues related to sharing the TAPS/Corp yard. Dan stated that he felt that not using the TAPS/Corp yard is a missed opportunity, and there will be City concerns with site access and curb cuts.		n/a
06.14	Jay reminded the group of the direction given in the previous meeting, discussion of several issues and resulting in the selection of the current scheme.		n/a
06.15a	Nita stated that the drawings provided to the Design Team showing the property line at the curb line of Watkins are incorrect. She supported the truck turnout to allow for queuing out of traffic. She feels that the TAPS site should be considered for future expansions, so any scheme should not preclude it.		n/a
06.15b	There was much discussion about parking and vehicular access to the internal campus. Jay stated that the scheme shows parking opportunities that may not be used.		n/a
06.16	Luis stated the scheme should accommodate parking for 8-10 vehicles within the yard.		n/a
06.17	Ross requested that the design accommodate parking for 30+ cars to be funded later. Ross stated that he requests that the schemes show parking opportunities as future, because no matter how they are funded, they are used to service the campus by the EH&S staff. Luis stated that the parking lots cannot dictate the location of the building. This is another discussion that the Vice Chancellors will be undertaking.		n/a
06.18	The University directed the design team to show the scheme with the Administration and lab portions shifted south with parking consolidated to the North.	Jeff Anderson BAUER AND WILEY	yes
06.19	There was discussion about which direction the trucks would be accessing the site from and which direction they will go when leaving the site.		n/a
06.20	The University will discuss the traffic issues with the City and relay them to the design team.	Dan Rockholt UC RIVERSIDE	yes
06.21	There was discussion about the lobby location. Ross stated that the Lobby will need to be a control point for the labs, training and admin areas. Russell prefers the scheme as shown that allows for entry from both sides of the building.		n/a
06.22	Jeff reviewed the detail of the scheme. The Calibration Lab should be adjacent to the Radiation lab, but does not need access to the corridor. Access can be throught the Rad. Lab.		n/a
06.23	There was general discussion about the perimeter screening wall and consensus that it should be about 8' high. The gates into the yard should be solid.		n/a
06.24	Russell questioned the interior arrangement of the private offices and workstations He suggested a scheme that places the private offices around the perimeter. The current scheme allows for maximum daylighting with interior offices.		n/a

Meeting Minutes

Item No.	Description	Responsible Person Responsible Firm	Complete?
06.25	There was some discussion about exterior architectural treatments. Everyone wants to make sure the rooftop equipment is adequately screened, especially from the Arroyo Housing project. Nita suggested architectural compatibility with the TAPS building. There was discussion about the use of UCR brick. Because this building is outside of the central campus and near the Corporate Yard area, UCR brick may not be important.		n/a
06.26	The design team should include complete Meeting Minutes in the Appendix of the DPP.	Brian Pratt BAUER AND WILEY	yes
06.27	Brian briefly touched on the LEED spreadsheet. He requested feedback from the University regarding the points indicated as possibilities, such as "Additional Commissioning," etc. Luis stated that it is likely that this project will actually submit for LEED certification instead of the previous direction that the project would be LEED certified equivalent.	Dan Rockholt UC RIVERSIDE	no
06.28	The design team should show the TAPS building and some site context in the presentation to the DRB.	Brian Pratt BAUER AND WILEY	yes
06.29	The design team should focus on site considerations for the DRB meeting. a review of the Program pieces is necessary and massing should be a part of the presentation as well.	Brian Pratt BAUER AND WILEY	yes
06.30	The University requested the presentation shown the DRB be provided in electronic format after the meeting for inclusion in the DRB meeting minutes.	Brian Pratt BAUER AND WILEY	yes
06.31	The University requested a meeting with the Cost Consultant and the Office of the President.		n/a
06.32	The PEC building should be kept around 80°F.		n/a
06.33	The design team should show truck access from the TAPS yard to the EH&S yard.		yes
06.34	The design team should include magnetic hold-opens for all doors in the waste area.	Brian Pratt BAUER AND WILEY	no
06.35	Brian briefly reviewed the contents of the Draft DPP submitted to the University. The University will provide comments to the design team in one week.	Dan Rockholt UC RIVERSIDE	yes
06.36	Brian briefly discussed the LEED opportunities for the project. He requested feedback from the University regarding the points indicated as possibilities, such as "Additional Commissioning," etc. Luis stated that it is likely that this project will actually submit for LEED certification.	Dan Rockholt UC RIVERSIDE	no

Meeting Minutes #07

Project	UCR Environmental Health & Safety	
Purpose	Draft Cost Estimate Review Meeting	
Date/Location	April 29, 2004; 3:30 PM at UCR Capital Planning Offices, Bannockburn J102	
Attending	*UCR CAPITAL PLANNING* Dan Rockholt, Luis Carrazana *UCR DESIGN & CONSTRUCTION* Darius Maroufkhani	*BAUER AND WILEY* Brian Pratt *EWA* Michael Somin, Heather Porto
Prepared by	Brian Pratt	
Distribution	Attendees, Alastair McPhail	

Meeting Minutes

Item No.	*Description*	*Responsible Person* *Responsible Firm*	*Complete?*
07.01	Brian reviewed the draft cost estimate, noting some specifics: there are some items counted in sitework that should be considered included in GSF, or are already included in the 30,574 GSF. The items are the Universal Waste, Dock Toilet and PEC Out Building. The Cost Estimator will correct and re-issue.	Alastair McPhail CUMMING	yes
07.02	UCR requested the estimate be formatted in a Component Cost Summary as Cumming has provide for UCR in the past.	Alastair McPhail CUMMING	yes
07.03a	There was much discussion about how to depict Escalation. Brian noted that this estimate reflects current pricing and therefore, the current market spike. Luis directed the design team to show the estimate in today's costs, with a line item for a CCCI factor with a line item for escalation to midpoint of construction.	Alastair McPhail CUMMING	yes
07.03b	The team agreed that May 2007 is the correct target for mid-point of construction. Luis questioned the 5% per year escalation and asked the Cost Estimator to confirm.	Alastair McPhail CUMMING	n/a
07.04	All agreed that the space-type format Cumming used is an effective tool in illustrating the cost allocation. However, everyone requested further clarity on how the unit costs are arrived at, what they include, and any assumptions associated with them.	Alastair McPhail CUMMING	yes

BAUER AND WILEY

Meeting Minutes #08

Project UCR Environmental Health & Safety

Purpose DRB Meeting

Date/Location May 4, 2004; 1:30 PM at UCR Capital Planning Offices, Bannockburn J102

Attending

UCR DESIGN REVIEW BOARD	UCR CAPITAL PLANNING	BAUER AND WILEY
Bob Clair	Dan Rockholt, Luis Carrazana	Jay Bauer
Tim Ralston	*UCR DESIGN & CONSTRUCTION*	Annette Wiley
Duke Oakley	Darius Maroufkhani	Jeff Anderson
Steven Ehrlich	Dan Johnson	Brian Pratt
Kathy Garcia		
John Gannon Eastman		

Prepared by Brian Pratt

Distribution Rockholt

Meeting Minutes

Item No.	*Description*	*Responsible Person* *Responsible Firm*	*Complete?*
08.01	The meeting was held to present the DPP progress and status to the campus' design review board.		n/a
08.02	Dan Rockholt introduced the project and the project team.		n/a
08.03	Jay Bauer presented the project mission, goals, program and planning schemes.		n/a
08.04	The Design Review Board members questioned the site selection and suggested consideration of the West Campus based on concern about proximity to dormitories, day-care and residential. Nita Bullock stated that many sites were considered by the University and the proposed site is the most viable for many reasons.		n/a
08.05	Kathy Garcia stated that her concern was more one of the Arroyo Housing project and it's orientation than a concern about the EH&S Facility itself.		n/a
08.06	Luis stated that the design team is currently studying other schemes that orient the yard toward the west, away from the Arroyo Housing Project. The Design review Board responded favorably to consideration of orienting the yard to the west. Duke Oakley stated that the building can succeed in either orientation if the design team performs well and designs a good building.		n/a
08.07	Kathy Garcia stated that the north edge of the project and the campus is very important to UCR and should be considered carefully in design. Kathy also stated an interest in relating to the palm trees with building rhythms.		n/a
08.08	There was brief discussion of the Training component of the facility and the notion that EH&S will be using some of the campus' other facilities for training. The high frequency of training and the high intensity of the training uses was discussed.		n/a
08.09	Duke Oakley advised the design team to carefully consider design criteria for the yard walls and project edges. Jay noted that there are not many service type building models at UCR for EH&S to take cues from.		n/a
08.10	The DRB was concerned about screening of the exterior containers, and requested a section showing the relationship to Arroyo Housing for the next DRB presentation.	Jeff Anderson BAUER AND WILEY	yes

B A U E R A N D W I L E Y

Meeting Minutes #09

Project	UCR Environmental Health & Safety		
Purpose	Review Meeting after DRB		
Date/Location	May 4, 2004; 3:00 PM at UCR Capital Planning Office Conference Room		
Attending	*UCR CAPITAL PLANNING* Dan Rockholt, Luis Carrazana *UCR DESIGN & CONSTRUCTION* Darius Maroufkhani	*EH&S* Ross Grayson, Russ Vernon	*BAUER AND WILEY* Jay Bauer Annette Wiley Jeff Anderson Brian Pratt
Prepared by	Brian Pratt		
Distribution	Attendees		

Meeting Minutes

Item No.	Description	Responsible Person Responsible Firm	Complete?
09.01	Dan Rockholt and Luis Carrazana summarized the DRB meeting and Luis reiterated the comments from the DRB to include qualitative documentation, perception issues, etc.		n/a
09.02a	Ross Grayson discussed some specifics of the space list and trade-offs. He requested the janitor/custodial room be deleted on the processing side. He requested deletion of the airlock/decon room, reduction of Universal waste to 600 sf, and conversion of Occupational Health to a computer lab at 270 sf.		n/a
09.02b	He requested sizing the large training room to 1100 to 1200 sf (to seat 50-60) by implementing reductions elsewhere. He also requested the second freezer be added back as a trade-off for the Univ waste reduction.		n/a
09.03a	The team discussed the net to gross factors and reasons why this project is on the low side of the expected efficiency ranges. Some of the reasons are the open office area and the arrangement of the workstations, resulting in additional circulation space.		n/a
09.03b	Another contributer to the perception of low efficiency is that some of the spaces that might be considered office gross space are actually shared with the other program components, for example, the restrooms and lobby spaces are also used by the labs and processing components.		n/a
09.04	Luis reviewed some of the campus' concerns with the proposed schemes, including significant off-sire improvement costs, longterm flexibility, and yard efficiency/flexibility. He stated that the design team needs to explore more options than those proposed. He directed the design team to reconsider use of the TAPS yard for access and access from Watkins via the TAPS yard. Capital Planning feels that the proposed schemes are not viable options.		n/a
09.05	The design team stated that the University gave clear direction to develop the proposed scheme and the PMT discarded the schemes that accessed the project from TAPS. Darius and Luis agreed, however, Luis felt that the decision to pursue the proposed scheme was made without adequate consideration of the possibilities in accessing EH&S from the TAPS yard.		n/a
09.06	Luis distributed a sketch scheme that he directed the design team to study. He noted that any improvements required in the TAPS yard would be a cost to the EH&S project. Ross suggested that Capital Planning have a conversation with Mike Webster about coordinating the use of the TAPS yard. The campus recognized that there may be site costs to this project that were not originally budgeted.		n/a
09.07	Jay stated that it is the goal of the design team to exceed the campus' expectations for it's facility and the services the design team provides. Jay, further, stated that the design team would reconsider the planning and provide the University with more viable alternatives.		n/a

Meeting Minutes

Item No.	*Description*	*Responsible Person Responsible Firm*	*Complete?*
09.08	There was brief discussion about the status of the estimate and the upcoming Office of the President meeting with the Estimators. One of the Campus' primary concerns was the treatment of escalation shown in the EH&S estimate compared to other projects. Luis reiterated the urgent need for cost estimate data.		n/a

Meeting Minutes #10

Project	UCR Environmental Health & Safety	
Purpose	DPP Review Meeting	
Date/Location	May 18, 2004; 1:00 PM at BAUER AND WILEY Office	
Attending	*UCR CAPITAL PLANNING* Dan Rockholt	*BAUER AND WILEY* Brian Pratt Jeff Anderson
Prepared by	Jeff Anderson	
Distribution	Attendees	

Meeting Minutes

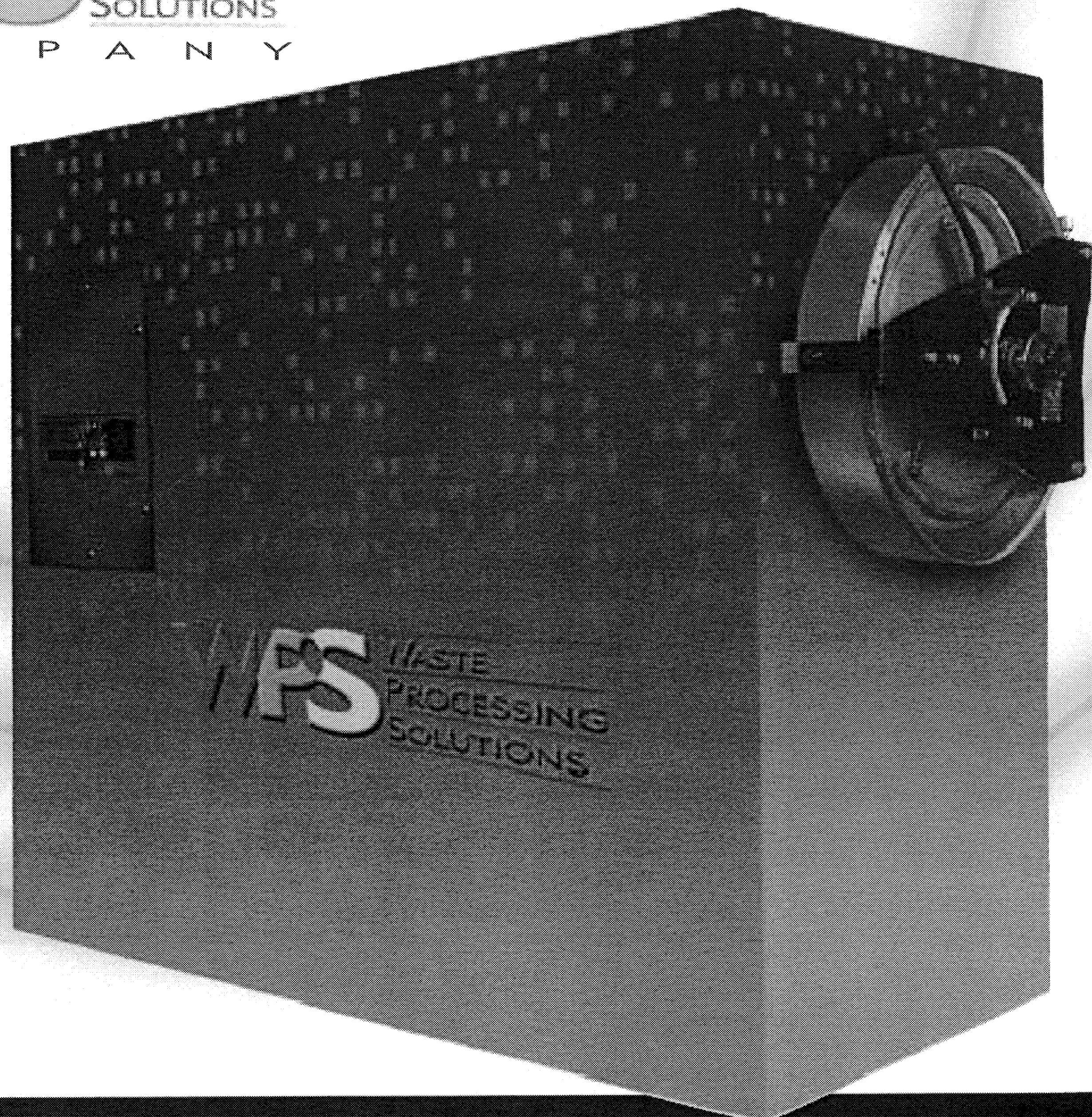
Item No.	*Description*	*Responsible Person* *Responsible Firm*	*Complete?*
10.01	The purpose of the meeting was to review input that UCR received from TAPS concerning opiton D3, comments from EH&S on option D3, the DPP outline and DPP comments from UCR.		n/a
10.02	Dan Rockholt is to give BAUER AND WILEY an outline for the upcoming DRB and CPAC meetings as well as massing examples that they would like BAUER AND WILEY to review as the massing options for EH&S are developed futher. Per the 5/11/04 phone call between BAUER AND WILEY and Dan Rockholt / Luis Carranza these were to be provided to BAUER AND WILEY one or two days after the phone call.	Dan Rockholt UC RIVERSIDE	yes
10.03	Brian Pratt stated that BAUER AND WILEY would like to be part of the DRB presentation as it our responsibility to present our work and hear and respond to potential comments.		n/a
10.04	Brian Pratt gave Dan Rockholt two copies of the revised workplan as requested by UCR.		n/a
10.05	Brian Pratt noted that it is important that all correspondence and meetings with BAUER AND WILEY consultants are coordinated through BAUER AND WILEY so we are aware of work being done or requested of our consultants.		n/a
10.06	Brian Pratt noted RJA stated that the code does not require this building to be an Essential Building. However, Dan mentioned that the University wants to have some level of Essential Building so that the EH&S facility can be used in an emergency situation. The exact Essential Building requirements need to be determined.	Dan Rockholt UC RIVERSIDE	no
10.07	Dan Rockholt noted that UCR will be having a survey done of the proposed EH&S site and TAPS area.		n/a
10.08	Dan Rockholt requested that the site area shown in the DPP include the TAPS yard.		n/a
10.09	Dan Rockholt reviewed comments from TAPS concerning option D3. Dan mentioned that the existing east driveway to TAPS will most likely be removed once the EH&S building is completed. Dan would like to show the TAPS bus parking (for 12 buses), wash station and other existing elements in the TAPS yard as well as show the bus manuevering paths. BAUER AND WILEY requested all of the existing information and bus sizes and locations to show on the planning option.	Dan Rockholt UC RIVERSIDE	n/a
10.10	Dan Rockholt reviewed comments from EH&S concerning option D3. Dan gave BAUER AND WILEY marked-up drawings of the comments to be picked-up for the final version of the planning option. EH&S asked whether the "UCLA portables" are the correct size. BAUER AND WILEY noted that these were estimated sizes based on limited informatin given by EH&S. BAUER AND WILEY requested that EH&S provide the actual sizes and spacing of these elements.	Dan Rockholt UC RIVERSIDE	yes
10.11	Dan Rockholt noted that the yard wall along Watkins Drive will be a solid block wall, but that the east and west facing portions of the yard wall could be a less costly fence/wall material.		n/a

Meeting Minutes

Item No.	*Description*	*Responsible Person* *Responsible Firm*	*Complete?*
10.12	Dan Rockholt reviewed Draft DPP comments from Tim Ralston with BAUER AND WILEY. Dan stated that he would give BAUER AND WILEY a hard copy of the comments so they can be incorporated into the Final DPP.	Dan Rockholt UC RIVERSIDE	yes
10.13	Dan Rockholt would like to include some text in the DPP that describes the opportunities for using the TAPS yard. BAUER AND WILEY asked that Dan provide an outline noting the main points from the University's perspective that explain the desire for using the TAPS yard (LRDP goals, potential future TAPS move, etc.).	Dan Rockholt UC RIVERSIDE	no
10.14	BAUER AND WILEY reviewed the current DPP outline with Dan Rockholt and explained why it is organized the way it is. As requested by Dan, we also compared the EH&S DPP outline with the Psychology Building 1 DPP outline and reviewed the similarities and differences.		n/a
10.15	Dan requested that the Room Data Sheets be located toward the back of the DPP or in the Appendix. Dan also requested that BAUER AND WILEY send an e-mail describing the reasons for the proposed DPP outline (with revisions based on the meeting) so he can review it with Luis Carranza and Tim Ralston.	Jeff Anderson BAUER AND WILEY	yes
10.16	BAUER AND WILEY noted that some of the Draft DPP content (Goals, Program Concepts) may now be incorrect or irrelevant due to the program changes. It was discussed that BAUER AND WILEY and Dan Rockholt review the Draft DPP and highlight items that either need to be deleted or revised and then the University can make a decision concerning each of these.	Jeff Anderson BAUER AND WILEY	no

Lab and Materials Handling Background Information / Cut Sheets

WPS Waste Processing Solutions
COMPANY



Medical Waste Technology

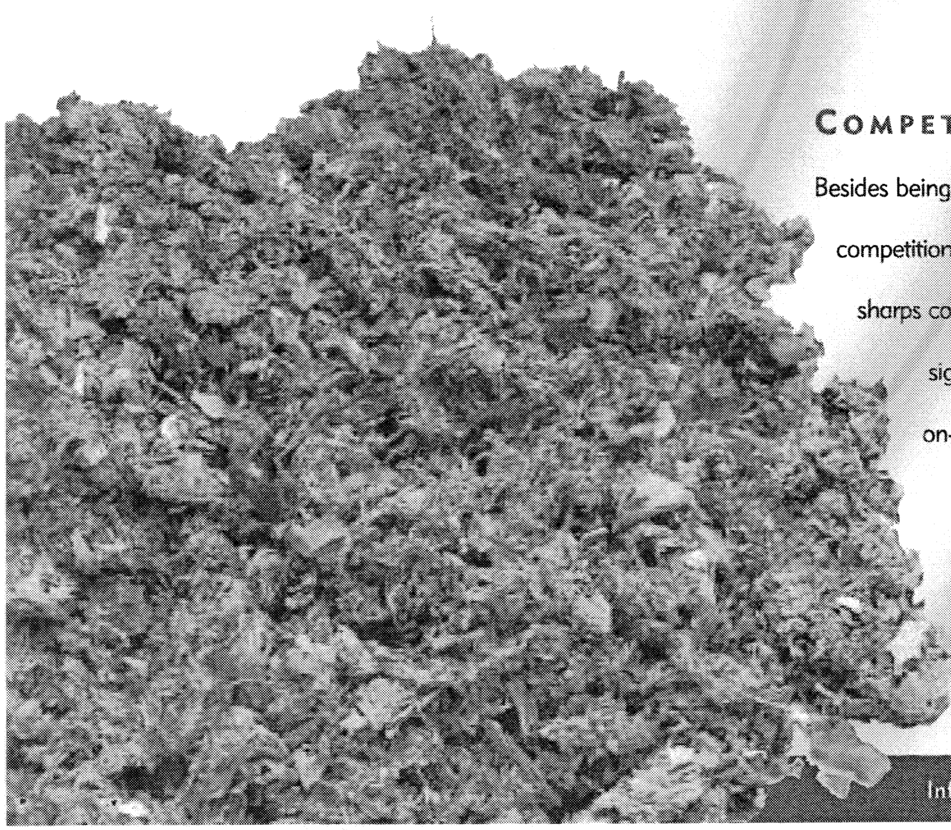
Waste Processing Solutions

Product Description

WPS manufactures and sells equipment that provides a cost-effective, on-site destruction and disposal solution for infectious medical waste. The company's SSM (Steam Sterilizer Macerator) reduces waste volume by 80% while providing full sterilization via steam and superheated water in a closed process. WPS' products can be used by (**1**) hospitals, (**2**) clinical laboratories, (**3**) pharmaceutical companies, (**4**) biotechnology firms, (**5**) Government healthcare and research providers, (**6**) surgical centers, (**7**) long-term health facilities and (**8**) prisons. The company distributes its products both domestically and internationally through various strategic alliances as well as by its own direct sales force.

Competitive Advantages:

Besides being unique and patent protected, the WPS technology has numerous advantages over that of our competition. The SSM technology is (**a**) capable of processing all red bag material, including sharps and sharps containers, (**b**) flexible enough to be sized to meet the capacity requirement of any institution, (**c**) significantly smaller, and most importantly, (**d**) the least expensive in terms of both initial costs and on-going associated expenses. Also, the SSM technology is more environmentally friendly than alternative methods of disposal due to its ability to sterilize infectious waste without using toxic chemicals, creating unpleasant odors or producing noxious gasses and by reducing the volume of waste by 80%.



Infectious waste after it has been converted to a sterile confetti-like substance.

How It Works

WPS' patented technology uses steam and superheated water to sterilize infectious material while it is being simultaneously cut up by the proprietary WPS cutting system. Particles of the cut material are immersed and surrounded by the steam and super-hot water for several minutes, rendering full sterilization within a 30 minute cycle. The resultant processed confetti is rendered non-infectious, non-hazardous and non-recognizable, satisfying OSHA's definition for non-regulated waste. Processed water is disposed in the sanitary sewer while solids are placed in the ordinary trash. The WPS technology produces no harmful emissions, odors or hazardous by-products and is both environmentally and community safe.

Benefits of WPS

The EPA and Medical Waste Institute have concluded that alternative technologies such as steam sterilization, which is used by WPS, are preferable to standard disposal methods such as hauling or incineration. The SSM is a perfect example of an affordable and environmentally pleasing alternative technology for the effective on-site management and disposal of infectious medical waste.

THE SSM

Loading

An operator loads infectious waste into the processing tank through the chamber opening, secures the hatch and presses the Start button to initiate a 30 minute cycle. Since no further interface with the machine is required during the cycle, the operator can leave to perform other responsibilities.

Processing Technique

Steam is injected into the process tank to pressurize the unit and create a "closed system." Super heated water and steam is then injected, totally surrounding the infected material. The pump grinder is activated and the infectious material is drawn through a proprietary cutting system and cut into small pieces. The material circulates within the closed system and continually macerated until it becomes a confetti-like slurry. After several minutes of cutting, formal sterilization is initiated.

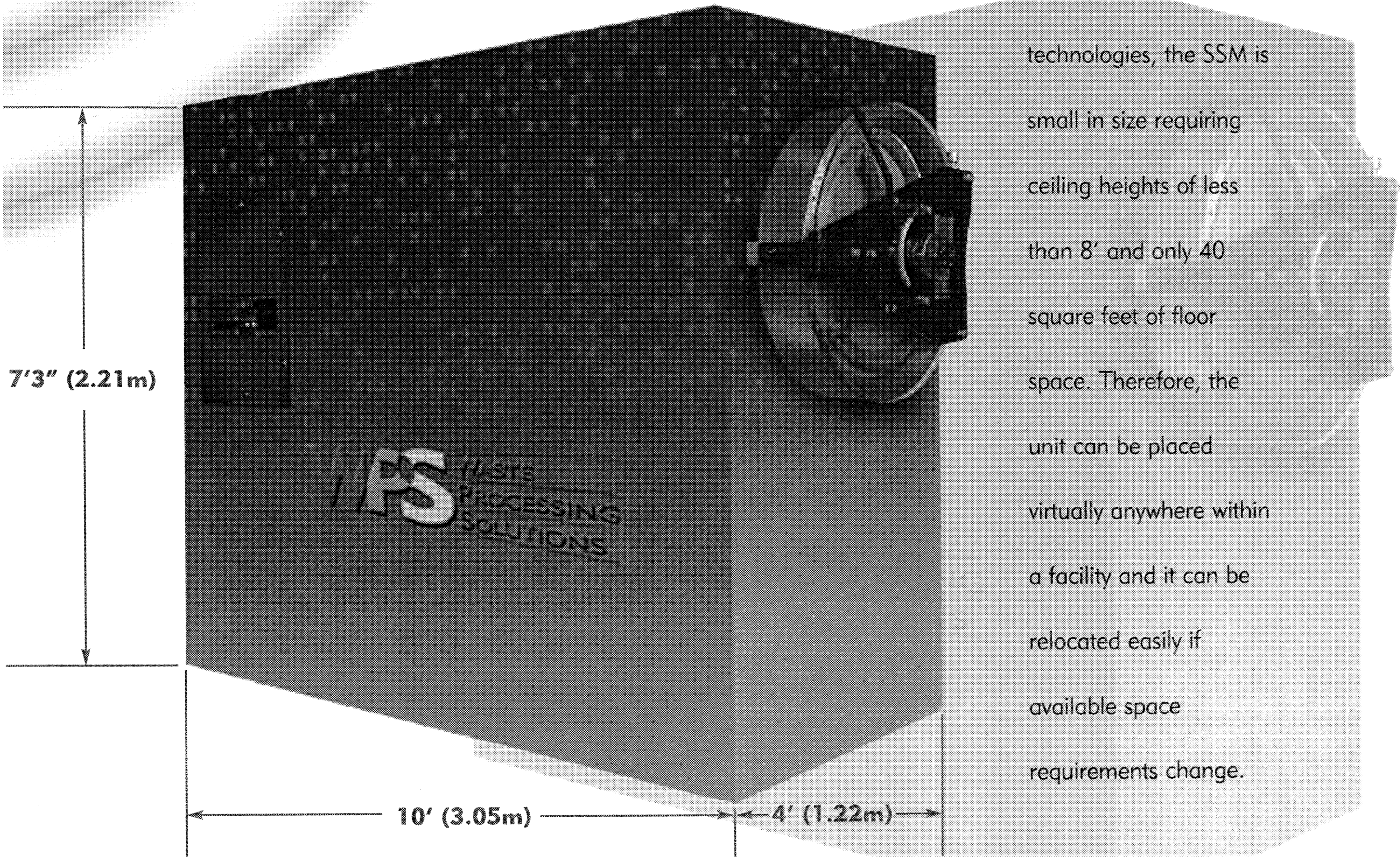
Sterilization

Pressure and temperature in the processing tank are held for a time equivalent of 250° F for 30 minutes to achieve sterilization. After sterilization, cold water is pumped into the process chamber to cool the material and lower the temperature of the liquid going into the sanitary sewer.

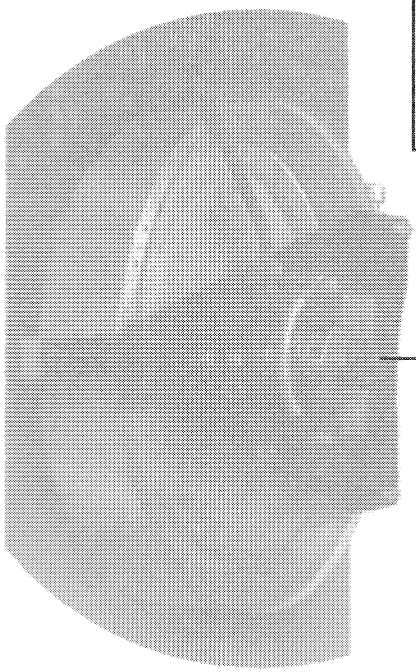
Filtering

The processed waste and waste water are drained into the Filter Separator where solids are separated from liquids. Liquids are drained into the sanitary sewer. Solids—now reduced in volume by 80%—are captured in the SSM filter separator, automatically discharged into a cart and disposed of as non-regulated waste.

Minimal Space Requirements



Unlike other on-site technologies, the SSM is small in size requiring ceiling heights of less than 8' and only 40 square feet of floor space. Therefore, the unit can be placed virtually anywhere within a facility and it can be relocated easily if available space requirements change.



Computerized

The operation of the SSM is controlled by a proprietary computer software system that requires minimal operator interaction. This unique control system allows service technicians to perform predictive and preventive maintenance reviews by either direct connecting on-site to The SSM or remotely from our corporate location via the built in modem. This service oriented feature allows WPS the ability to monitor the performance of the equipment 24/7.

Verifiable

At the end of each cycle, a sterilization report is automatically printed verifying sterilization and providing written documentation for accurate record keeping.

Easy To Operate

After loading the SSM, just a push of the START button is all it takes to process the waste.

Safe

An operator loads the "Red Bags" into the processing chamber through this 24" diameter opening. Unless the hatch is closed and locked, the system will not work.

Non-Regulated Waste

Use of WPS' equipment greatly reduces or eliminates Medical Waste Tracking Act requirements because the resultant processed "confetti" is rendered non-infectious, non-hazardous and non-recognizable, satisfying OSHA's definition for non-regulated medical waste.

Environmental Advantage

The technology does not use any toxic chemicals, nor does it produce any toxic emissions, unpleasant odors, or hazardous by-products. The pressurized, closed system provides a safe environment for workers, patients and the community.

Efficient

The SSM meets the capacity needs of all facilities.

Technology Built to Satisfy the Customer, Employees and Community

Based on extensive research and industry-related discussions, the ideal characteristics of a treatment process for the disposal of infectious medical waste are:

- cost-effective
- low maintenance
- minimal generator liability
- proven and accepted technology
- no unpleasant odor
- no harmful emissions
- no associated social stigma
- reasonable capacity
- small footprint
- no hazardous chemicals or other materials used in the process

The WPS solution effectively addresses each of these characteristics significantly better than other current technologies. Additionally, using the SSM technology, an institution's waste processing cost can potentially be reduced 20-50%.

Lower Disposal Cost:

According to medical waste trade surveys, the average disposal cost for infectious medical waste in domestic U.S. hospitals is $.28-$.32 per pound. Using the WPS technology, the total disposal cost is reduced between $.11-$.16 per pound depending on volume. Our clients select the most feasible financial option to meet there organizations' needs:

◆ Capital Purchase ◆ Operating Lease ◆ Turnkey on-site service agreement

Contact us for more details about these flexible options and allow us to demonstrate how your facility can reduce its medical waste processing costs.

Some Of Our Clients Include:

- Johns Hopkins School of Medicine
- VA Hospitals
- U.S. Naval Hospitals
- Quest Diagnostics
- Illinois Department of Public Health
- Hitachi Medical - Japan
- American Red Cross
- U.S. Air Force

THE SSM

Destroys "Red Bag" waste at the point of generation and renders it...

Non-Recognizable ◆ Non-Hazardous ◆ Non-Infectious

The End Product

Materials Processed by the SSM:

Bandages and surgical cloths
Syringes and scalpels
Sharps containers
Plastic bottles
Disposable clothing
Polyethylene bags
Tubing
Blood products
Hospital drapes
Surgical instruments
Suction canisters
Disposable laboratory equipment
Laboratory samples and cultures
Body fluids
Glass products
and so much more!

With the SSM you can be assured that your medical waste will be disposed in a way that complies with local, state, and federal regulations while significantly reducing the liability created by the transport and normal disposal methods of red bag waste.

WASTE PROCESSING SOLUTIONS COMPANY

If you would like more information on our waste management technologies, or for information on purchase, turnkey and leasing programs, please contact:

Bill Norton, President,

The WPS Company

3051 Washington Blvd

Baltimore, Maryland 21230

Phone: 443-524-4245

Fax: 443-524-4250

eMail: info@wasteprocessingsolutions.com

Web site: www.redbag.com

Medical Waste Technology

SPECIFICATION GUIDELINES FOR INSTALLATION OF THE WPS SSM-150 INFECTIOUS MEDICAL WASTE UNIT

Waste Processing Solutions

THE FOLLOWING SPECIFICATIONS ARE PER UNIT REQUIREMENTS

1.0 SITE SELECTION:

The location of the SSM-150 depends upon space availability of the facility but should be installed in a room/area with the following approximate minimum dimensions:

NOTE: Unit is shipped as two separate frames that are bolted together on site. Upon Receipt of the SSM system, DO NOT remove the SSM system from its shipping packaging. WPS technicians will remove the system upon arrival and place the system using our specific installation process.

Room Size	300 square feet (28 square meters)
Ceiling Height	9 feet - minimum (3.1 meters)
Door Opening Width	48 inches - 60 inches preferred (122cm – 152.4 cm)
Door Opening Height	78 inches - 84 inches preferred (198cm – 213 cm)
Maximum Frame Section Length	66 inches (168 cm) for shipping

The SSM machine should be located approximately 3 feet (1meter) from any wall to facilitate access for maintenance. The location should have a sanitary drain of at least 3-inches (7.6cm) diameter near-by. In addition the room must be compliant to and capable of the following requirements for SSM equipment.

Maximum Relative Humidity	90%
Room Temperature	40°F (4.5°C) to 100°F (37.8°C)
Room Air Exchange	Minimum 100 CFM (2.8 m^3 / minute)
Sensible Heat Load	25k BTU per hour

***NOTE:* All utility terminations (Water, Vent, Electrical, and Telephone) to the SSM system must be made by the customer or their contractor.**

2.0 WATER REQUIREMENTS:

The SSM-150 requires both hot and cold water plumbed to the unit: The water pressure requirements are between 40 psi (2.8 kg/sq cm) to a maximum of 60 psi (4.2 kg/sq cm) for both systems:

Hot Water:	¾ inch (1.905cm) pipe connection
Quantity	70 gals (265liters) – 2 times per hour
Flow Rate	10 gpm (37.8 liters)
Temperature	120°F (48.9 °C {minimum} to 150°F (65.6°C)
Cold Water:	1-inch (2.54cm) pipe connection
Flow Rate	40 gpm (151.4 liters)
Temperature	75°F (23.9 °C) maximum

Additional Water Requirements:

? Deep sink with hot and cold water to be accessible, within close proximity of SSM system
? Cold water line with hose bib to be located within close proximity of SSM system
? Both the sink and hose bib should be no greater than 20 feet (6.1 meters) from the SSM system.
? **SSM unit equipped with the boiler**: The following water requirements must be tested for by our customer and these water results must be supplied to WPS prior to installation:

Hardness	8-85 ppm [(-0.5) - 5 gpg]
P-Alkalinity	85-410 ppm [(-5) - 24 gpg]
T-Alkalinity	200-500 ppm (7 - 30 gpg)
PH	7.1 - 11.0

The SSM System's internal plumbing contains water hammer arrestors on both hot and cold water lines. Because local codes vary as to the type and installation requirements, a back flow arrester must be installed by the facility in both of the supply lines. The only other requirement is for manual shut-off ball valves located approximately 3 feet (91 cm) from the unit. For units fitted with load cells, all plumbing connections to have a minimum 12-inch long flexible connection to the SSM Unit, supplied by WPS.

3.0 SANITARY DRAIN:

The SSM-150 discharges the water separated from the processed solids into a sanitary drain. An additional floor drain is required for removal of floor water created during normal servicing and cleaning of the SSM equipment.

Sanitary Drain	3 inch (7.62 cm) - 4 inch (10 cm) Diameter
Flow Capacity	60 gpm (227 lpm)-75 gpm (284 lpm)
Discharge Temperature	145°F (63°C) or to suit local code requirements

4.0 VENT:

The SSM-150 requires a vent for releasing the pressure in the process tank to atmosphere. This vent is directed to the sanitary sewer atmospheric vent if its location is convenient; otherwise a vent to atmosphere needs to be provided.

Vent	½ inch (1.27 cm) pipe connection
Flow	15 ft^3 (.4245 m^3)
Discharge Temperature	210°F (99°C) maximum

5.0 ELECTRICAL REQUIREMENTS:

The SSM-150 requires the following electrical connections:
For each case listed below, both the 480V and the 110V power supplies to be provided with an in-room power disconnect for lock out safety. All wiring AWG sizes to be as specified in the NEC code with 125% correction factor and 75°C insulation. Units with the Load Cell weight measurement option must be wired with "loops" on the facility wiring to ensure correct weight recording.

NOTE: Due to the SSM computer requirements, WPS requires that the following power backup and protection be provided to ensure system protection from facility power failures and surges. The system will not be installed until these protective measures are in place.

110V Power Supply	UPS System with minimum 1-Hour Backup
480V Power Supply	3-Phase Surge Protection System

5.1 For Units with Automatic Screw Compression Filter (FS-6s):

110V Power Supply	20A

NOTE: If a facility compressed air supply is available this electrical requirement is not required. To ensure the facility compressed air supply meets the FS-6s requirements please refer to Section 7.0, *FS-6s Compressed Air Requirements.*

5.2 SSM WITH ELECTRIC BOILER:

480V Power supply	200A
110V Power supply	20A
Power Consumption	62-68 kw/h

Power supply for separator depends on customer preference

5.3 SSM WITH CUSTOMER SUPPLIED STEAM:

480V Power supply	40A
110V Power supply	20A
Power Consumption	24-28 kw/h

6.0 Steam Supply:

For installations where the client provides the steam for the SSM machine, the boiler is not required and a steam line is directed to the SSM-150 and then internally distributed to a heat exchanger and the process tank.

Steam Supply Specification:

Steam Pressure	80 to 100 psig (4.8 to 6.9 Bar) Saturated
Steam Flow Rate	Minimum of 800 lb/hr (363 kg/hr)
Steam Connection to SSM-150	1.5" inch (3.8 cm) NB pipe

7.0 FS-6s Compressed Air Requirements:

For installations where the client provides the compressed air for the FS-6s separator, the following requirements must be met to ensure proper and safe operation of the FS-6s and SSM systems. If the requirements cannot be met, an air compressor is required and the electrical requirements in Section 5.1 are required.

Compressed Air Specification:

Dedicated Air Pressure	100 to 130 psi (6.9 to 8.9 Bar) Constant
Compressed Air Connection to FS-6s	3/8" inch (0.95 cm) NB pipe

8.0 Telephone Line:

A standard telephone line connection capable of being connected to the SSM-150 control panel with direct dialing into the unit and the ability for the SSM-150 to call out is required. In addition, an additional line is required for operator and service personnel support.

For additional information please contact the WPS at 443-524-4245
E-mail: info@redbag.com

CUSTOMER SITE PREPARATION COMPLETION CHECK LIST FORM:

This following checklist is designed to provide the customer with a checklist to ensure that the site preparation for the WPS SSM-150 Unit is complete and ready for WPS personnel to complete the installation and start-up of the unit.

SSM-150 SITE PREPARATION COMPLETION CHECK LIST

To be Returned to WPS Upon Completion – Please Retain a Copy for Personal Record

Facility Hot Water Supply	Value - Yes/No	Date	Performed By:
3/4" Hot Water Line Installed	YES - NO		
Flow Rate (PSI / Bar)			
Maximum Temperature (°C / °F)			
Minimum Temperature (°C / °F)			

Facility Cold Water Supply	Value - Yes/No	Date	Performed By:
1" Cold Water Line Installed	YES - NO		
Flow Rate (PSI / Bar)			
Maximum Temperature (°C / °F)			
Minimum Temperature (°C / °F)			

Facility Vent	Value - Yes/No	Date	Performed By:
Vent Line Installed	YES - NO		
Vent Diameter			
Flow Rate (PSI / Bar)			
Maximum Temperature (°C / °F)			

Facility Sanitary Drain	Value - Yes/No	Date	Performed By:
Sanitary Drain Line Installed	YES - NO		
Sanitary Drain Diameter			
Flow Rate (PSI / Bar)			
Sanitary Drain Backflow Possible	YES - NO		
Maximum Temperature (°C / °F)			

120VAC Facility Electrical Supply	Value - Yes/No	Date	Performed By:
110-120VAC - 20A Circuit Installed	YES - NO		
110-120VAC Measurement			
110-120VAC Disconnect Installed	YES - NO		
110-120VAC UPS Installed	YES - NO		
110-120VAC UPS Backup Time (min)			
Disconnect Rating - If CB / Fused			

Facility Telephone Lines	Value - Yes/No	Date	Performed By:
Modem Line Installed	YES - NO		
Modem Number:			
Telephone Line Installed	YES - NO		
Telephone Number:			

Micellanious Facility Supply	Value - Yes/No	Date	Performed By:
Deep Sink w/ Hot & Cold Water	YES - NO		
Cold Water Line w/ Hose Bib	YES - NO		

SSM-150 SITE PREPARATION COMPLETION CHECK LIST (Continued)

Specific Information Related To Individual Installations. If Not Applicable To Your Site, Please Ignore.
To be Returned to WPS Upon Completion – Please Retain a Copy for Personal Record

BOILER UNIT SPECIFIC REQUIREMENTS:

Boiler Unit Facility Supply	Value - Yes/No	Date	Performed By:
Hot & Cold Facility Water Quality Tested	YES - NO		
480VAC - 3-Phase - 200A Service	YES - NO		
480VAC - 200A Disconnect Installed	YES - NO		
480VAC - 3-Phase Measurement:			
480VAC - 3-Phase - 200A - Frequency Modulation System Installed	YES - NO		

STEAM-INJECTOR UNIT SPECIFIC REQUIREMENTS:

Non-Boiler Unit Facility Supply	Value - Yes/No	Date	Performed By:
480VAC - 3-Phase - 40A Service	YES - NO		
480VAC - 40A Disconnect Installed	YES - NO		
480VAC - 3-Phase Measurement:			
480VAC - 3-Phase - 40A - Frequency Modulation System Installed	YES - NO		
Facility Boiler Supplied	YES - NO		
Facility Boiler Pressure (PSI / Bar)			
Facility Boiler Flow (pph)			

FS-6S SEPARATOR SPECIFIC REQUIREMENTS:

FS-6s Separator Facility Supply	Value - Yes/No	Date	Performed By:
120VAC - 20A Service	YES - NO		
120VAC Measurement			
120VAC Disconnect Installed	YES - NO		
Disconnect Rating - If CB / Fused			
Facility Compressed Air Available	YES - NO		
Dedicated Air Pressure (psi) min/max:	/		
3/8" Compressed Air Line Installed	YES - NO		

STEP-UP TRANSFORMER (IF REQUIRED) SPECIFIC REQUIREMENTS:

Step-Up Transformer Faclity Supply	Value - Yes/No	Date	Performed By:
Incoming 3-Phase Voltage Measurement:			
460/480VAC Output	YES - NO		
460/480VAC - 3-Phase Measurement:			
460/480VAC Disconnect Installed	YES - NO		

Customer Approved:______________________________ **Date:**____________

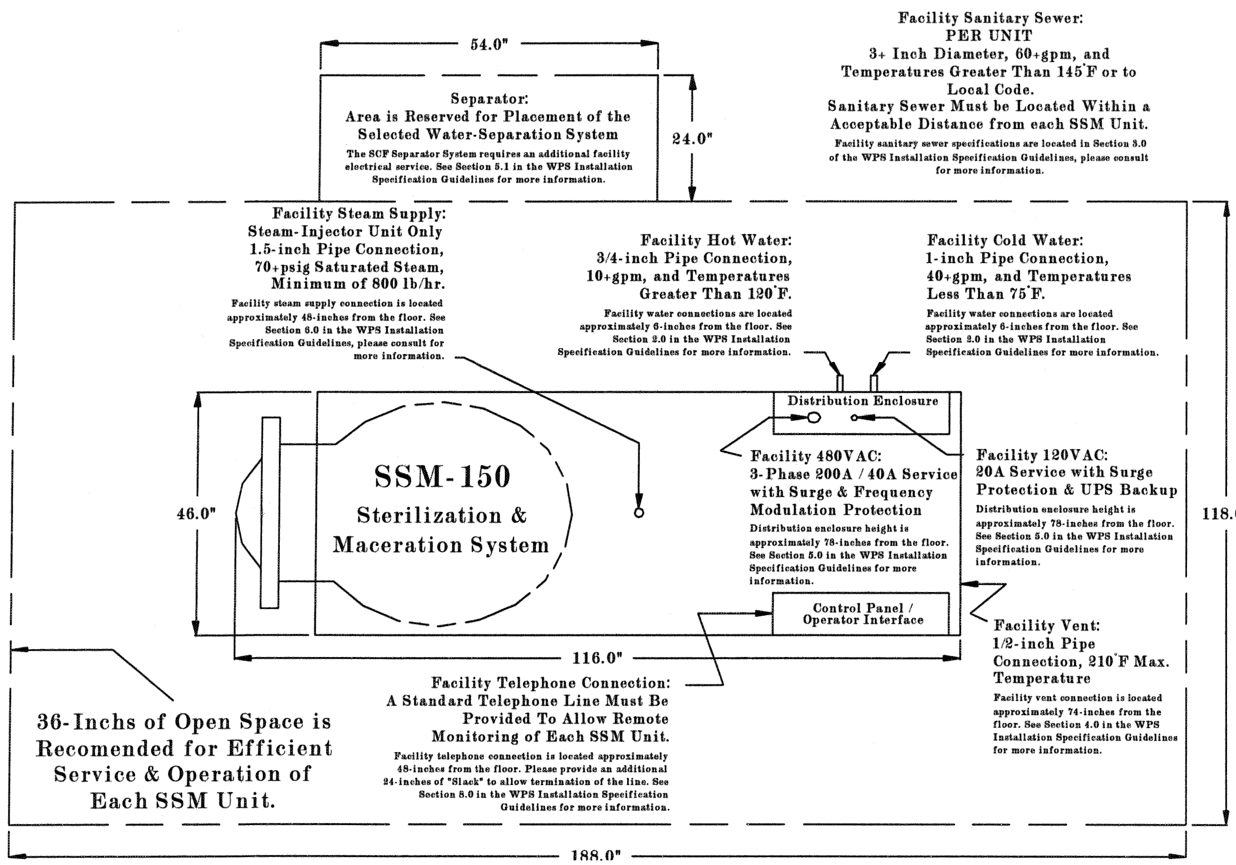
Print Name:______________________________

WPS Approved:______________________________ **Date:**____________

Print Name:______________________________

Appendix A:

Appendix A represents an example of termination/connection locations for facility services and utilities. Due to each facility's unique features, this diagram should not be used for installation of a SSM unit. Please contact the WPS Company to schedule a site survey and to provide a custom detailed layout of a SSM system in your facility.



Your Email
GO

S&G Enterprises, Inc.
N115 W19000
Edison Drive
Germantown, WI
53022
PHONE:
1-888-RAM-FLAT
(888 726-3528)
(262) 251-8300
FAX:
(262) 251-1616
E-MAIL:
info@ramflat.com
or
info@vyleater.com

Vyleater

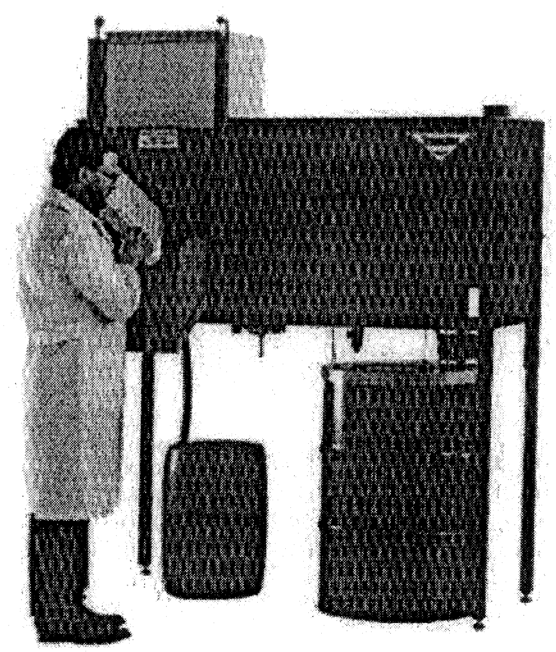
Vyleater Overview

Standard Vyleater | Enhanced Vyleater | Specifications

Printable PDF Flyer

Order Online

View Video



Destroy small vials by crushing and separating the liquid contents reducing the overall cost of product disposal.

Separate the liquid automatically as the Vyleater sends plastic or glass vial fragments to one destination while what used to be inside... goes to another.

Content recovery is now practical when thousands of vials per day are in need of disposal. The ability to easily collect liquid for sewer disposal or in bulk containers means reduced disposal costs.

Product destruction for cosmetic and pharmaceutical makers means complete control over what happens to the vials. Because Vyleater obliteration is total, nothing finds its way back into circulation.

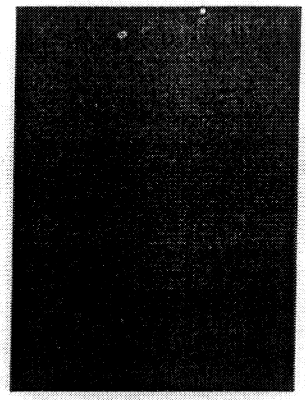
Specimen disposal is easier for laboratories by allowing the Vyleater to not only collect the liquid for disposal but also destroy any identifying marks on the containers.

Reduce storage space that is required for long-term storage of the vials prior to disposal.

Reduce exposure to hazardous materials by technicians. There is no need to come in direct contact with the vial or the contents. Vapor exposure is eliminated, as technicians no longer have to spend hours hand pouring the liquid out of the vials.

Ergonomic concerns are eliminated by reducing repetitive motion due to prying tops off vials by hand.

Lower disposal costs by reducing the overall waste volume. Why pay for the disposal of a full, lab-packed drum when the vials are half empty?



Some 55-gallon drums may contain only 5-gallons of actual hazardous fluid.

Custom machines have been built to resolve the varying needs of diagnostic labs, radiation safety officers, cosmetics, pharmaceutical and process manufactures alike. Units can include automatic vial washing options, automatic loading systems and explosion-proof designs.

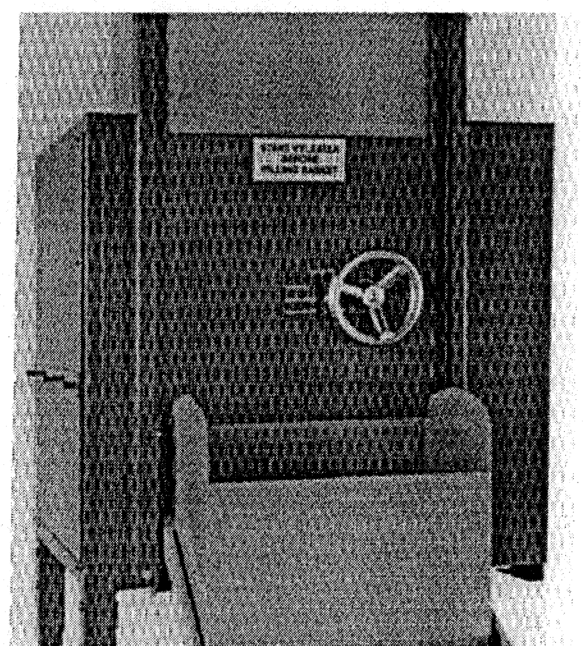
RAM FLAT Overview | **Vyleater Overview** | Waste Handling Products
Customer Support | Literature Download | Order Online
S&G Home | Company Profile | Contact Us | Sitemap

S&G Enterprises, Inc.
N115 W19000
Edison Drive
Germantown, WI
53022
PHONE:
1-888-RAM-FLAT
(888 726-3528)
(262) 251-8300
FAX:
(262) 251-1616
E-MAIL:
info@ramflat.com
or
info@vyleater.com

Vyleater

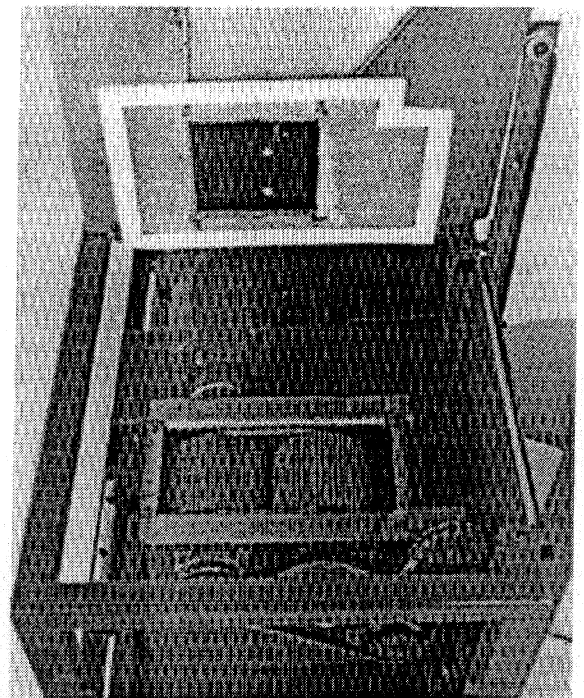
The Standard Vyleater

The Standard Vyleater is the perfect solution for the research or production operation generating glass vials requiring destruction and separation.



Hand-wheel adjusts Vyleater for different size glass vials.

Competence and economy are the reasons the real work in the Standard Vyleater is done by a special S&G roll crusher. This powerful device is adjustable for various vial sizes from ampoule up to a 4-ounce bottle to maximize the vial fragment. This improves liquid separation by minimizing the creation of small shards that make separation less efficient. The liquid is shaken loose from the crushed glass while after dropping onto a vibrating screened surface. This totally enclosed stainless conveyor system discharges the vial fragments from one end while liquid exits from the other. When it comes to simplicity and economy, there is no other machine that can separate vials from contents as fast and easily as the Vyleater.



Heavy-Duty roller mill crusher to destroy glass vials.

Vyleater Specification & Customization

Customize your Vyleater with...

- Internal wash system for rinsing, sanitizing or neutralizing
- Explosion proof electrical fittings for work in hazardous environments
- Liquid discharge directly into a sewer or pipeline
- Automatic loading conveyor
- Platform with casters to make the unit portable
- HEPA/charcoal filtration

Specifications:	
Adjustable Height	73-83 in.
Width	28 in.
Length	63 in.
Controls	Push Button
Exhaust Blower	250 CFM
Power Required	3ph/208-230/460
Total Horsepower	3.33

Shipping Weight:	
Standard Vyleater	1300 lbs.
Enhanced Vyleater	1500 lbs.

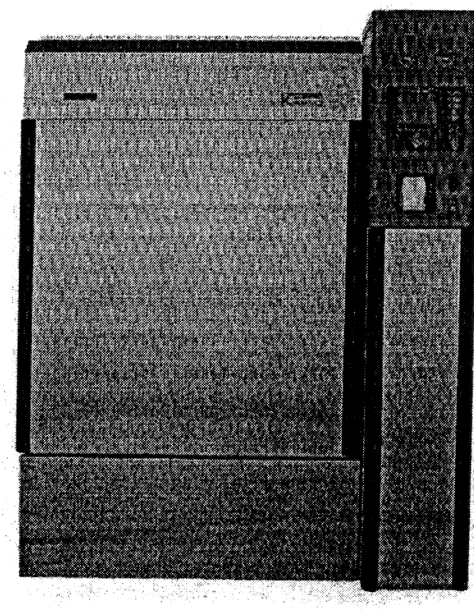
S&G Enterprises, Inc.
N115 W19000
Edison Drive
Germantown, WI
53022
PHONE:
1-888-RAM-FLAT
(888 726-3528)
(262) 251-8300
FAX:
(262) 251-1616
E-MAIL:
info@ramflat.com
or
info@vyleater.com

GETINGE

700 Series Vacuum/Gravity Steam Sterilizers for Life Science Applications

data and specifications

PRODUCT
The Model 733LS Vacuum/Gravity Steam Sterilizer employs both gravity/downward displacement with positive pulse conditioning and pressure/vacuum pulsing for dynamic air removal. Up to 19 cycles can be easily accessed in two easy steps. Custom cycle names can be designated for each cycle and each cycle can be reconfigured for easy access. All cycle phases are sequenced and monitored by the control system, providing both audible and visual notification of deviation from certain operating parameters.



APPLICATION
For general-purpose gravity or vacuum steam sterilization and decontamination of laboratory, research and animal care supplies. The sterilizer controls are specifically designed with the flexibility needed for scientific purposes and are not to be used to sterilize medical devices for patient use in healthcare applications. The selectable temperature range is from 230°F to 275°F (110°C to 135°C) and from 219°F to 275°F (104°C to 135°C) for liquid cycles. Typical applications include wrapped and unwrapped hard goods, animal cages with bedding, textiles, and linens and liquids in self-venting or unsealed containers. The liquid exhaust is microcomputer controlled for linear and consistent liquid cool down, programmable within a specified range and includes an optional Liquid RTD.

CHAMBER DIMENSIONS
26.5" (672mm) wide x 36" (920mm) high
☐ 39" (1000mm) 21.5 Cu Ft (616L)
☐ 53" (1350mm) 29.3 Cu Ft (831L)
☐ 61" (1550mm) 33.7 Cu Ft (955L)

SINGLE DOOR MOUNTING
☐ Recessed
☐ Cabinet

SINGLE DOOR DESIGNATIONS
☐ Right Hand Hinged, Left Hand Control Column
☐ Left Hand Hinged, Right Hand Control Column

DOUBLE DOOR MOUNTING (53" AND 61" ONLY)
☐ Cabinet, recessed one end
☐ Recessed both ends

DOUBLE DOOR DESIGNATIONS
☐ Control End (CE) Door- Right Hand Swing, Left Hand Control Column, Remote End (RE) door swing and column opposite.
☐ Control End (CE) Door- Left Hand Swing, Right Hand Control Column, Remote End (RE) door swing and column opposite.

BIOLOGIC SEALING FLANGE (BSF) CONTROLS DESIGNATION
☐ At Control End/Load End (CE), Printer at CE
☐ At Control End/Load End (CE), Printer at RE
☐ At Remote End/Unload End (RE), Printer at CE
☐ At Remote End/Unload End (RE), Printer at RE

CROSS CONTAMINATION BARRIER (CCB) CONTROLS DESIGNATION
☐ At Control End/Load End (CE), Printer at CE
☐ At Control End/Load End (CE), Printer at RE
☐ At Remote End/Unload End (RE), Printer at CE
☐ At Remote End/Unload End (RE), Printer at RE

CONTROL PANEL LOCATION
☐ On Unit
☐ Wall Mounted

STEAM SOURCE
☐ House steam

LANGUAGE (SELECT ONE)
☐ **ENGLISH**
☐ **FRENCH**
☐ **SPANISH**

OPTIONS
☐ Uninterrupted Power Supply (UPS). Provides 115V power for up to 30 minutes to complete a cycle in process.
☐ Air Compressor
☐ Liquid RTD (Load probe)
☐ Vacuum Pump
☐ Thermocouple Flange
☐ Stainless Steel Piping to Chamber

INTERIOR EQUIPMENT
☐ Rack with three shelves
☐ Loading Car, Qty. ________
☐ Transfer Carriage Qty. ________

STANDARDS AND CODES

The sterilizer shall comply with or meet the requirements of:

- ASME (Section VIII, Division 1) Code for Pressure Vessels
- Canadian Registration Number (CRN) Pressure Vessel Design
- Uniform Plumbing Code
- ETL Listed to UL 61010A-1 and UL 61010A2-041 by Intertek Testing Services
- ETL Listed to IEC 61010-1 and IEC 61010-2-041 by Intertek Testing Services
- cETL Listed to CSA C22.2 Nos. 1010.1 and 1010.2.041 by Intertek Testing Services
- Seismic Anchoring Requirements per California Building Code

MICROCOMPUTER CONTROLS

Getinge Sterilizers employ a Hitachi 20 MHz microprocessor on a dedicated controller (CPU) with 8 MB of RAM. The control panel consists of an operator interface panel (called OP30), a thermal printer, mechanical chamber and jacket pressure gauges, status indicators, active touch sensitive switches, and controls On/Off switch. A key lock is provided to insure all door power is disconnected when entering the chamber.

Controls are located next to the door in a vertical column for convenience. If specified, the control column can be located remotely from the sterilizer with up to 32.8 feet (10 m) of cable. An RS 232 port is provided for serial communications for central data collection or remote service analysis and is ready for T-DOC™ connection. The OP30 operator interface panel is a durable ¼ VGA 5.7 inch diagonal color screen with 320x240 pixels. Below the screen are five soft keys to access other screens or displays and to make changes to cycle parameters.

A screen saver extends the life of the back lit LCD. Touching any key illuminates and reactivates the display. Push-button switches, with international symbols and descriptive words, provide door seal and unseal and movement of the door. Audible and visible operator feedback is provided when a selection is made or a fault message is displayed. Temperature can be set, controlled and displayed in degrees Celsius or Fahrenheit and pressure in psia, bar or kPa. Double door models have a printer at one end and complete OP30 Operator Interface display at both ends of the sterilizer for full control capabilities at either door.

The temperature of the discharge water is controlled by a temperature device to be less than 140°F (60°C). This switch also conserves water usage. The chamber drain is continuously monitored for the presence of water during a cycle. If water is detected and cannot be automatically corrected, a water in drain alarm alerts the operator.

CYCLE DOCUMENTATION

The printer documents cycle performance using special thermal paper for a permanent record. Thermal printing allows for quiet operation. At cycle completion, a cycle performance record is printed. Paper is replaced by a "drop in and quick feed" method and the printed strips can be either accumulated on an automatic take-up reel, or torn off for individual cycle storage. A last cycle duplicate print and paper feed switch is provided. The printer is located on the control panel and documents the following on a 200-dpi dot matrix printer (1.88" [47.6mm] wide print width):

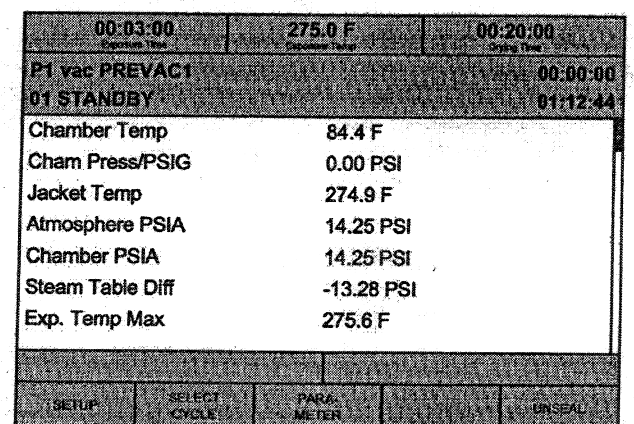
- Process start time and date, sterilizer name and number, daily cycle number and total cycle count.
- Cycle selected with time and temperature, with other adjustable parameters identified.
- Cycle phase transition points, temperature, pressure and total cycle time.
- Process fault information messages with time of occurrence.
- Summary verification of time at selected temperature (min/max exposure values).
- Cycle verification signature line.

OP30 Operator Interface Features

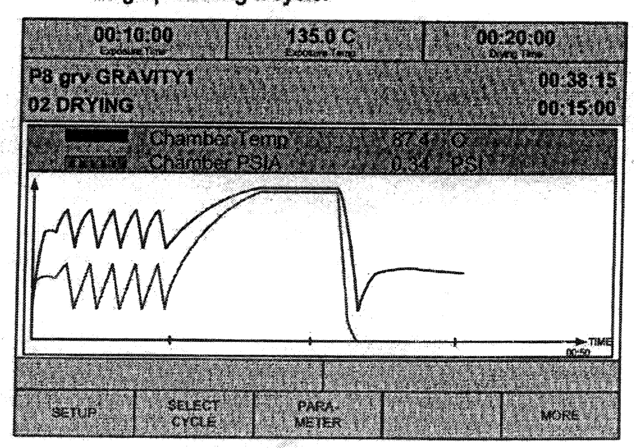
The OP30 color screen is divided into specific sections to display selection and performance information in a consistent manner. The top section identifies the time and temperature selected for the cycle. Below that is the type of cycle selected. The middle portion provides a choice of three screens to view actual, real time cycle information. "Pop-up" dialog boxes to change values appear within parameter selection screens to implement changes. Parameters are password protected.

The three screens are:

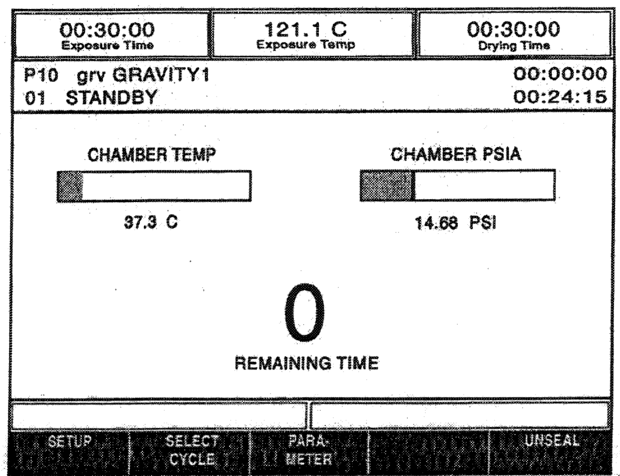
◆ **Detail.** Displays real time process information in text form.



◆ **Plot Graph.** Displays cycle temperature and pressure in colored graph during a cycle.



◆ **Bar Graph.** Displays temperature and pressure in a bar graph, with a large, easy to read, time remaining to the end of the cycle (averages the last three cycles for each cycle type).



The lower portion of the screen provides text alarm messages and non-critical system messages, both using color displays, and soft key identifications.

Navigating the various screens is accomplished by use of soft keys, directional arrows to move the cursor and change values, and the Enter key. Up to 19 factory recommended cycles are available. Time and temperature can be changed using a quick edit feature. Each change prompts operator acceptance by the use of a Yes/No acknowledgement and a "Save" soft key.

For Supervisor access, an alpha-numeric display provides levels of access for individual operators and service. Using the soft key labeled "Setup" provides the ability to:

- select operating screens
- print the last cycle
- adjust system menu for setting the calendar and to establish users
- establish passwords for each operator
- access the "about" selection to identify the model and system software number.
- choose language, date format, and temperature and pressure measurement
- Adjust parameters through password access

The supervisor can also select a Utilities Control feature, which provides a seven-day timer for programmed startup and shutdown of the sterilizer. The Utilities Control system shuts off water and steam to the unit to conserve energy. Cycles running beyond the programmed shutoff time will be completed.

The factory recommended cycles are:
MODEL 733LS (19 cycles total)

- 6 Gravity cycles of 30 minutes exposure at 250°F (121°C) with 30 minutes dry time.
- 6 Vacuum cycles of 3 minutes exposure at 250°F (121°C), with the following applications:
- 6 Liquid* Cycles at 250°F (121°C), with 30 minutes exposure.
- 1 Vacuum Leak Test cycle run at 268°F (131°C).

Note: Selection of time and temperatures other than factory recommendations require user verification of the cycle efficacy.

*The liquid cycle, if used, is not intended for the sterilization of liquids used directly for patient contact.

PERFORMANCE

When installed and connected to specified utility services, the system provides accurate and repeatable performance. During the timed exposure phase, the temperature will be controlled by the chamber sensor at 0.9°F (0.5°C) above the set point (± 0.2°C). Temperature selectivity is in 0.1°F (0.1°C) increments. Timing functions are selectable in one-second increments, and accuracy is within 0.04%. Temperature is controlled by a time proportioning continuous algorithm, called Proportional Integral (PI). A battery with a 10 year life holds programmed cycle values in memory. In the event of a power interruption, current cycle status is stored for up to 1 minute.

CYCLE PROGRESSION

- Gravity/Wrapped Goods (pressure pulse preconditioning)
  - a. Conditioning — steam flows into the chamber for a timed period, followed by a series of positive pressure pulses to remove chamber air.
  - b. Heat-Up — to selected temperature.
  - c. Exposure — selected chamber temperature is attained and timed.
  - d. Exhaust — chamber vented to atmospheric pressure.
  - e. Dry — filtered air is drawn through chamber for the duration of time selected (either Gravity or Vacuum Dry is selectable, Vacuum Dry is recommended).
  - f. Cycle Complete — signaled by a tone, display message and light.
- Vac/Wrapped Goods (Vacuum/Pressure Pulsing Pre-conditioning)
  - a. Conditioning – steam flows into the chamber for a time period, followed by a series of pressure/vacuum pulses to remove chamber air.
  - b. Heat up — to selected temperature.
  - c. Exposure — selected chamber temperature is attained and timed.
  - d. Exhaust — chamber vented to atmospheric pressure.
  - e. Dry — a vacuum is created for the duration of the time selected, filtered air is admitted at the end of the drying time; chamber to atmospheric pressure.
  - f. Cycle Complete — signaled by a tone, light and display message.
- Liquids —
  - a. Conditioning — steam flows into chamber for a timed period to remove air.
  - b. Heat-Up — to selected temperature.

c. Exposure — selected chamber temperature is attained and timed.

d. Exhaust — an adjustable linear exhaust.

e. Cycle Complete — signaled by a tone, light and display message.

PARAMETER ADJUSTMENTS

Utilizing a service software utility tool, an authorized service representative can adjust and modify the following cycle parameters:

- Set the number of pre-conditioning pulses.
- Set the height of positive pre-conditioning pressure pulses.
- Set the depth of negative pre-conditioning pressure pulses.
- Set over-drive.
- Adjust liquid cycle dwell time.
- Adjust liquid cycle exhaust rate.

CONSTRUCTION

The chamber is constructed of an inner shell reinforced by a series of "U" channels that form the outer jacket of the chamber. The gasket ring and backhead (on single door models) are formed and welded to the chamber body. Chamber material is 5mm (0.197") thick and door material is 6mm (0.236") thick, and both are constructed of Duplex Stainless Steel, Type 2205 (UNS S31803). The jacket material is 316Ti. The interior chamber finish is polished to a high luster finish. All pressure vessel construction meets ASME code requirements for working pressures up to 45 psig (310 kPa). The gasket ring holds a continuous, one-piece silicone gasket, 0.63" (16 mm) in diameter. The body assembly is thermally insulated with 1.5" fiberglass insulation and double thick between the jacket "U" channels.

A steam baffle is provided to prevent condensation from wetting the load. An extra threaded opening permits passage of thermocouple leads to monitor interior and load temperatures. Steam connection to the chamber and jacket are 316L material. A manual gasket retract valve is provided for emergency chamber access. When rack and shelves are supplied, shelf adjustments will be approximately every 2.5" (63.5mm). Individual rack supports and shelves shall be easy to remove for cleaning.

HINGED DOOR

The door operation is powered by an electric motor and is actuated by a switch. The open motion is in two steps. First, a slide to clear the door locking pins, then it swings open. The door will stop automatically if an obstruction is encountered. In an emergency, the power door can be opened manually by a qualified technician. At the beginning of the cycle, steam pressure behind the gasket automatically seals the door and retracts automatically at the end of the cycle. Sealing is positive and consistent. The gasket is recessed for added protection and long life. Once the cycle begins and the chamber is pressurized, the door cannot be opened. A safety switch prevents steam from entering the chamber when the door is not in the closed and sealed position. The door is insulated with fiberglass insulation and covered with a stainless steel panel.

BIOLOGIC SEALING FLANGE (BSF)

When specified, a ¼" thick, carbon steel, inner flange plate is seal welded around the chamber periphery. The flange plate is mated to a ⅜" thick wall frame installed in the building wall. The wall frame is shipped separately prior to the sterilizer. Studs welded on approximately three-inch centers are located around the flange plate and the wall frame. The mating surfaces are gasketed with a ¼" thick Buna-N rubber gasket using stainless steel clamping bars, nuts and lock washers. The completed assembly of the sealing flange and wall frame provides an airtight seal, which then prevents passage of airborne microorganisms from a "contaminated" room to a "clean" room. Any necessary penetrations in the flange plate for wiring or plumbing shall be through potted fittings. Infiltration tests show no cross contamination leakage through the sealing flange with pressure differential of 0.22 psig (6" W.C.). Unidirectional door operation is standard, meaning that one door is sealed at all times, and once the designated "Control End" (CE) door is opened, the sterilizer must complete a successful cycle before the door designated Remote End (RE) can be opened. Full operator interface is provided at both doors with the printer designated at one door (CE or RE). An emergency back-up system is provided to maintain the door gasket seal in the event of utility loss. Compressed air is used as the medium for gasket seal.

CROSS CONTAMINATION BARRIER (CCB)

The Cross Contamination Barrier has the same inner flange plate as the BSF, and is used when a barrier to maintain an air differential is needed on a recessed pass through unit. Sheet metal paneling is supplied to span the distance from the flange plate to the wall opening and is sealed with caulking compound, creating the barrier separation. Any necessary penetrations in the flange plate for wiring or plumbing shall be through compression fittings. Compressed air is used as the medium for sealing the sterilizer door gaskets. Unidirectional door operation as described for the BSF is standard.

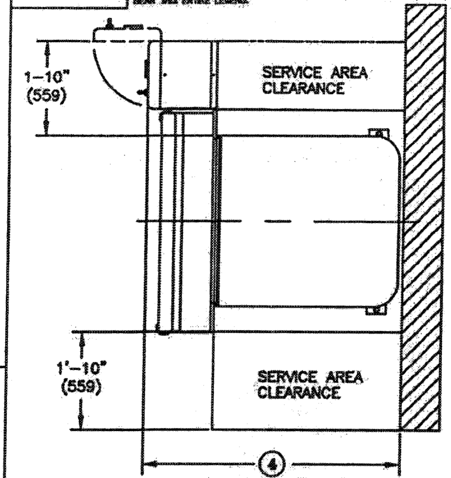
PANELING

The control panel and paneling is constructed of nominal 0.050" (1.27 mm) 300 series #3 brushed finished stainless steel and is hinged for easy access to electronic components. The trim panels are built-in to fit within a recessed wall or optional cabinet. When specified, the cabinet model will be made of the same material. The control column can be wall mounted.

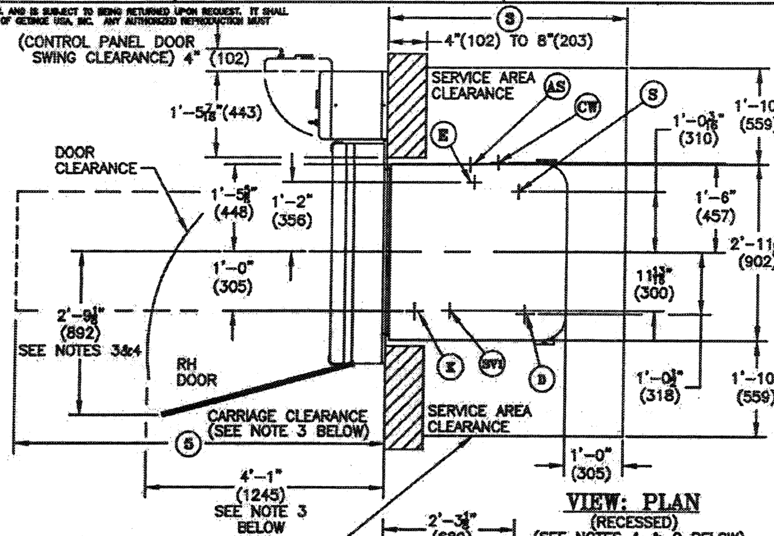
WARRANTY

Getinge USA, Inc. warrants that each sterilizer is carefully tested, inspected and leaves the factory in proper working condition, free from visible defects. Sterilizers are warranted for one year from the start of the warranty, including parts and labor (excluding expendable parts). The ASME pressure vessel is further warranted to the original owner against structural failure for a period of 15 years from the date of initial operation. See warranty pamphlet for complete details.

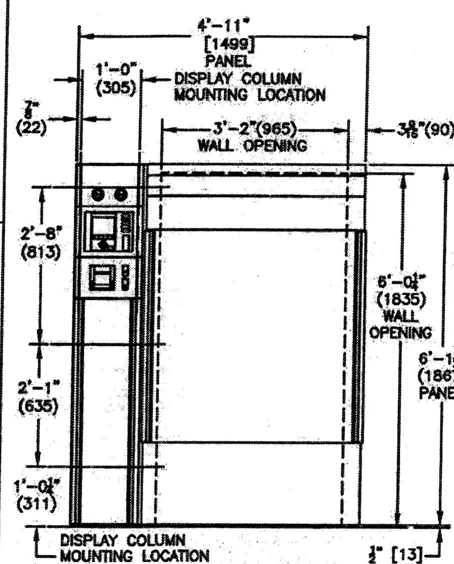
DRAWING/PART NO. HS4089



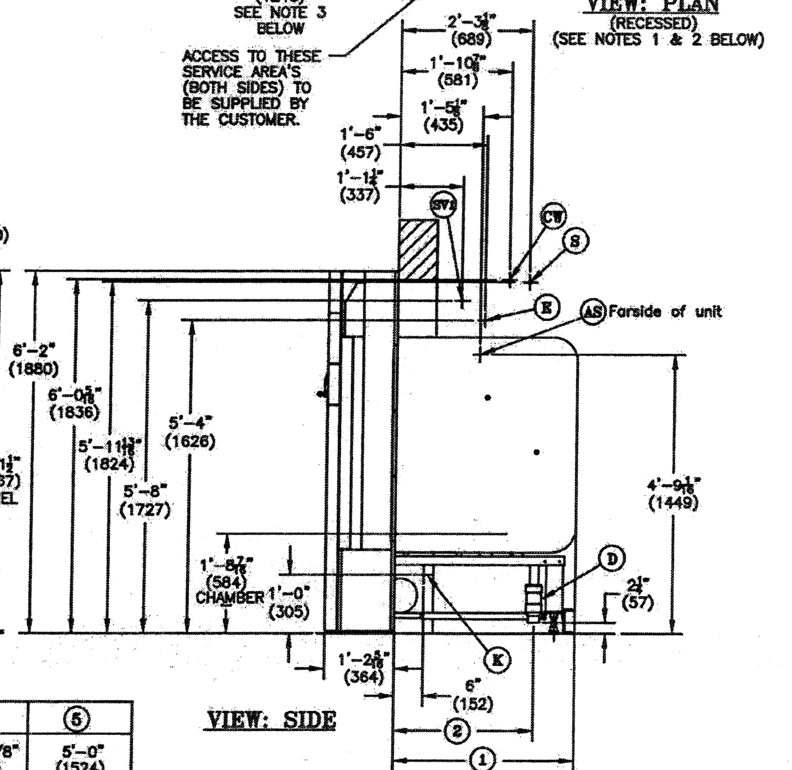
VIEW: PLAN
(CABINET)



VIEW: PLAN
(RECESSED)
(SEE NOTES 1 & 2 BELOW)



VIEW: FRONT



VIEW: SIDE

UNIT	①	②	③	④	⑤
39"	3'-1 1/4" (946)	2'-3 3/8" (695)	4'-1 1/4" (1251)	4'-4 5/8" (1337)	5'-0" (1524)
53"	4'-3 1/4" (1314)	2'-5 13/16" (757)	5'-3 1/4" (1607)	5'-6 5/8" (1692)	6'-0" (1829)
61"	4'-11 1/4" (1454)	2'-3 3/8" (695)	5'-11 1/4" (1810)	6'-2 5/8" (1895)	7'-0" (2134)

UNIT SIZE	HEAT LOSSES BTU/HR (KCal/HR) CONTROL AREA	RECESS AREA	CABINET MODEL
39" (1000)	3111 (784)	6055 (1526)	9166 (2310)
53" (1350)	3111 (784)	7697 (1940)	10808 (2724)
61" (1550)	3111 (784)	9340 (2354)	12451 (3138)

NOTES:
1) IF TWO OR MORE STERILIZERS ARE INSTALLED SIDE BY SIDE, ALLOW 1'-6" (457) CLEARANCE BETWEEN SIDES OF FACE PANELS.
2) TO INSTALL A REMOTELY LOCATED CONTROL PANEL, SEE DRAWING NO. HS4088. CABLE LENGTH FROM STERILIZER TO REMOTE CONTROL PANEL SHALL NOT EXCEED 32 FEET (9754).
3) CLEARANCES SHOWN ARE MINIMAL FOR EQUIPMENT FUNCTION AND SERVICING. CHECK STATE AND LOCAL CODES FOR APPLICABLE CLEARANCE REQUIREMENTS.
4) UTILITY CONNECTIONS SHOWN ARE THE SAME FOR BOTH DOOR CONFIGURATION. RH DOOR/LH COLUMN (SHOWN) OR LH DOOR/RH COLUMN AVAILABLE.

DIMENSIONS ARE FEET-INCHES (MILLIMETERS).
ALL DIMENSIONS GIVEN ARE FROM FINISHED SURFACES.
ITEM NO. ______ ROOM NO. ______

TITLE
700 SERIES ROUGHING-IN DRAWING, STEAM STERILIZER, SINGLE DOOR

LTR	ECO NO.	BY	DATE
E	120653	TL	10/22/02
D	120628	CC	10/07/02
C	120588	MF	8/22/02
B	120545	TL	5/15/02
A	120448	TL	4/18/02
F	120701	CC	12/05/02
G	121027	RR	2/10/03

REVISIONS

SERVICE CF 4/19/02 | MARKETING TKM 4/19/02 | ENGRG KHJ 4/18/02 | CHECK TDL 4/18/02 | DRAWN BY TDL 4/8/02 | SCALE NTS

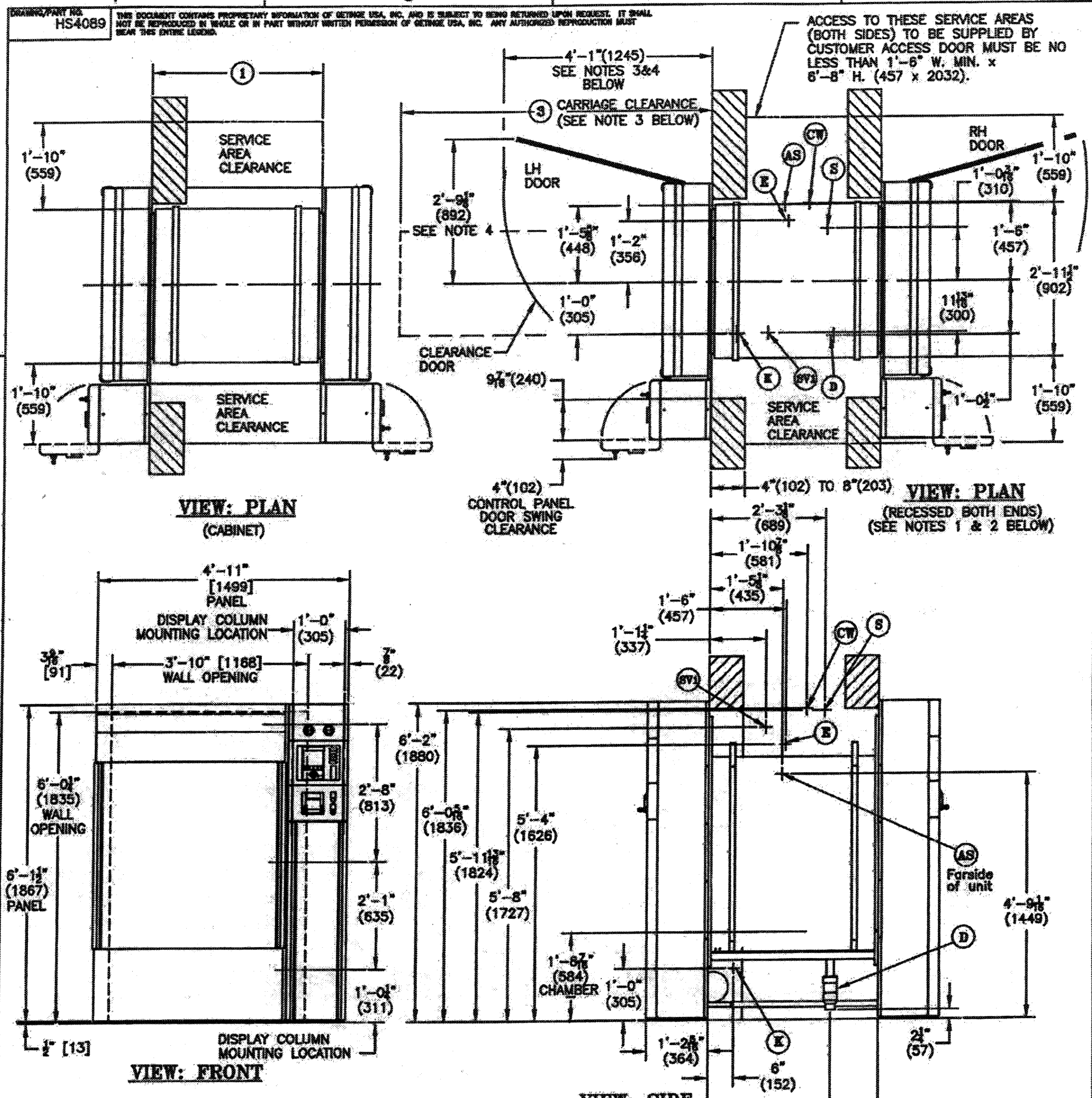
THIS DRAWING WAS MADE USING AUTOCAD SOFTWARE. CHANGES SHOULD BE MADE TO THE DATABASE AND NOT TO THIS TRACING. THE FILENAME IS: HS4089G1-8 THIS PLOT MADE: 2/10/03

Getinge USA, Inc.
1777 East Henrietta Road
Rochester, NY 14623-3133

SIZE C | SHEET 1 OF 8
PART NO. HS4089 | REV G

SCALE: 1 = 1 CHECK FOR REDUCTION

DRAWING/PART NO. HS4089



UNIT	①	②	③
53"	3'-3 15/16" (1014)	2'-5 13/16" (757)	6'-0" (1829)
61"	3'-11 15/16" (1218)	2'-3 3/8" (695)	7'-0" (2134)

UNIT SIZE	HEAT LOSSES BTU/HR (KCal/HR) CONTROL AREA	RECESS AREA	CABINET MODEL
53"	3111 (784)	6543 (1649)	9654 (2433)
61"	3111 (784)	7939 (2001)	5830 (1469)

NOTES:
1) IF TWO OR MORE STERILIZERS ARE INSTALLED SIDE BY SIDE, ALLOW 1'-6" (457) CLEARANCE BETWEEN SIDES OF FACE PANELS.
2) TO INSTALL A REMOTELY LOCATED CONTROL PANEL, SEE DRAWING NO. HS4088. CABLE LENGTH FROM STERILIZER TO REMOTE CONTROL PANEL SHALL NOT EXCEED 32 FEET (9754).
3) CLEARANCES SHOWN ARE MINIMAL FOR EQUIPMENT FUNCTION AND SERVICING. CHECK STATE AND LOCAL CODES FOR APPLICABLE CLEARANCE REQUIREMENTS.
4) UTILITY CONNECTIONS AND DOOR SWING ARE AS SHOWN. CE/RE CONTROL COLUMN'S ARE LOCATED TO MATCH DOOR CONFIGURATION SPECIFIED ON ORDER.

DIMENSIONS ARE FEET-INCHES (MILLIMETERS).
ALL DIMENSIONS GIVEN ARE FROM FINISHED SURFACES.

TITLE ITEM NO. ______ ROOM NO. ______

700 SERIES ROUGHING-IN DRAWING, STEAM STERILIZER, DOUBLE DOOR

SERVICE CF 4/19/02 | MARKETING TKM 4/19/02 | ENGRG KHJ 4/18/02 | CHECK TDL 4/18/02 | DRAWN BY TL 4/11/01 | SCALE NTS

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Rochester, NY 14623-3133

SIZE C | SHEET 2 OF 8 | PART NO. HS4089 | REV G

SEE SHEET 1

DRAWING/PART NO. HS4089

NOTICE: Work by others

Safe and efficient operation of this product is dependent upon the owner/user providing the services specified herein as well as any other normally accepted electrical, mechanical or plumbing interface between user's supply and this product. Getinge USA will not assume responsibility for problems that result from non-compliance with the above conditions.
The following conditions and services are required by Getinge USA equipment and are to be provided by others.

TABLE A: PLUMBING CONNECTIONS & UTILITIES

(Refer to notes 1–6 on sheet 4)

ON UNIT CONNECTION	PIPE SIZE TO UNIT	PRESSURE RANGE DYNAMIC AT UNIT	FLOW RATE MAX
S= Steam 1" (25) NPT female see note 4	1 1/4"(32) NPT	50–70 psig (3.5–4.9 kg/cm²)	300 lbs./Hr (136 kg/Hr)
CW= Cold water 1" (25) NPT female see note 1	1–1/4"(32) NPT	40–70 psig (2.8–4.9 kg/cm²)	11 gpm (1.4 m³/Hr)
D= Drain 2" (51) ODT	See note 2	Not applicable	See note 2
SV1(Jacket) = Sterilizer vessel pressure relief valve vent 1" (25) NPT female	See note 4	Not applicable	See note 4
AS = Air Supply A dry filtered, oil–less compressed air supply connection is 1/2" NPT at location indicated. A compressor for this purpose is available from Getinge/Castle (p/n 61301601462) at extra cost. Air quality will be clean, dry instrument quality.	1/2" NPT	50 – 90 PSIG	1 SCFM

TABLE B: ELECTRICAL CONNECTIONS & UTILITIES

(Refer to note 7 on sheet 4)

SERVICE	CONDUIT TRADE SIZE	UTILITY	MAX. CURRENT (AMPS)	BREAKER/FUSING RECOMMENDED	Consumption
E = Customer Interface Box (230V is optional)	1/2" (13)	115V~, 50/60 Hz, 1 Phase	12 A	15 A	7 W/Hr
	1/2" (13)	230V~, 50/60 Hz, 1 Phase	5 A		
K = JUNCTION BOX VACUUM PUMP UNITS (733LS) ONLY (OPTIONAL)	1/2" (13)	240V~, 60Hz, 3 Phase (4 wire w/ground)	7.8 A	10 A	N/A
		480V~, 60Hz, 3 Phase (4 wire w/ground)	3.9 A		

TABLE C: OPERATING ENVIRONMENTAL CONDITIONS

TEMPERATURE	PRESSURE	RELATIVE HUMIDITY
10°C (50°F) to 40°C (104°F)	Atmospheric from 0–6500 ft. (2000m) (Special software needed for elevations over 6500ft. (2000m)	10 to 90% non–condensing

VOLTAGE FLUCTUATIONS (Main supply)	OVERVOLTAGE CATAGORY	POLLUTION DEGREE
not to exceed ±10% of the nominal voltage	III	2

TITLE: 700 SERIES ROUGHING–IN DRAWING

SERVICE CF 4/19/02	MARKETING TKM 4/19/02	ENGRG JHK 4/18/02	CHECK TDL 4/18/02	DRAWN BY TL 4/11/02	SCALE NTS

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Rochester, NY 14623–3133

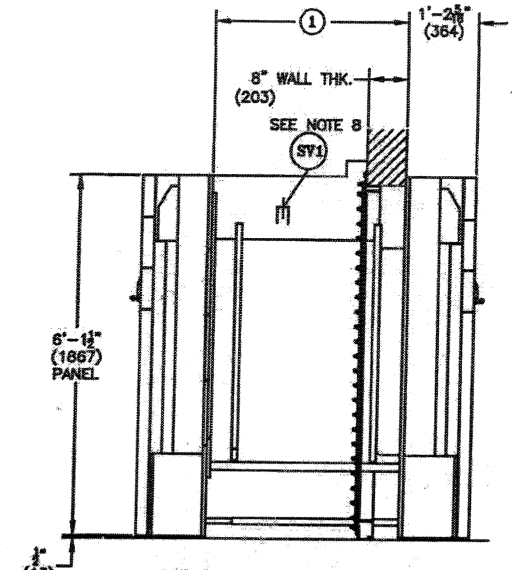
SIZE C | SHEET 3 OF 8 | PART NO. HS4089 | REV G

SEE SHEET 1

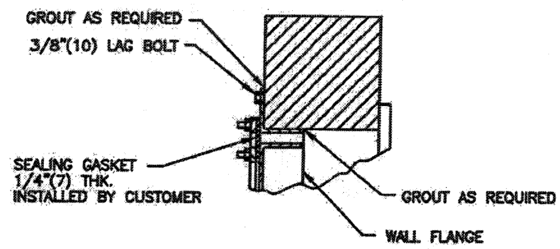
DRAWING/PART NO. HS4089

NOTES:

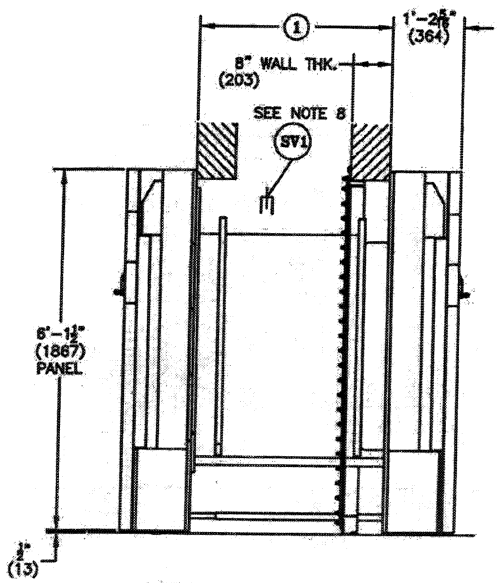
1) FOR SERVICE LOCATIONS, SPECIFICATIONS, AND ARCHITECT NOTES SEE SHEET 2. BIOLOGICAL FLANGE IS 53" & 61" ONLY.
2) FOR BIOLOGICAL FLANGE UNITS, CONTROLS ARE SWITCHED DEPENDING ON REQUESTED END FOR BIOLOGICAL FLANGE. IF (BFCE) IS REQUESTED, CONTROLS W/PRINTER ARE ON B/F END. IF (BFRE) IS REQUESTED, CONTROLS W/PRINTER ARE ON THE END OPPOSITE OF THE B/F. SERVICE LOCATIONS REMAIN THE SAME, AS INDICATED ON SHEET 2.
3) WALL FLANGE (SUPPLIED BY GETINGE USA) CAN BE SHIPPED AHEAD OF STERILIZER. WALL SHOULD BE BUILT BY CUSTOMER TO DIMENSIONS SPECIFIED FOR TIGHT FIT. SEE TYPICAL INSTALLATION.
4) SEE INSTALLATION INSTRUCTIONS P/N 61301608214 FOR MORE DETAIL.
5) DIMENSIONS ARE FEET-INCHES (MILLIMETERS).
6) FOR MOUNTING OF CABINET SEE GETINGE USA DRAWING P/N 61301608879 (53") OR 61301608880 (61").
7) IF THE UNITS RECESSED AT THE END OPPOSITE THE BIOLOGICAL FLANGE, REFER TO SHEET 7 FOR DIMENSIONAL INFORMATION.
8) DISCHARGE FROM CHAMBER RELIEF VALVE CAN PIPED (BY CUSTOMER) TO THE CONTAMINATED END OF THE STERILIZER.
9) CHAMBER DRAIN PIPING WILL BE CONSIDERED TO BE CONTAMINATED AND A METHOD AND MEANS OF DECONTAMINATION FOR THIS PIPING HAS NOT BEEN PROVIDED FOR DISASSEMBLY/SERVICING.
10) 1/2" [13] OD TUBING (JACKET) CAN BE PIPING TO SANITARY SEWER.



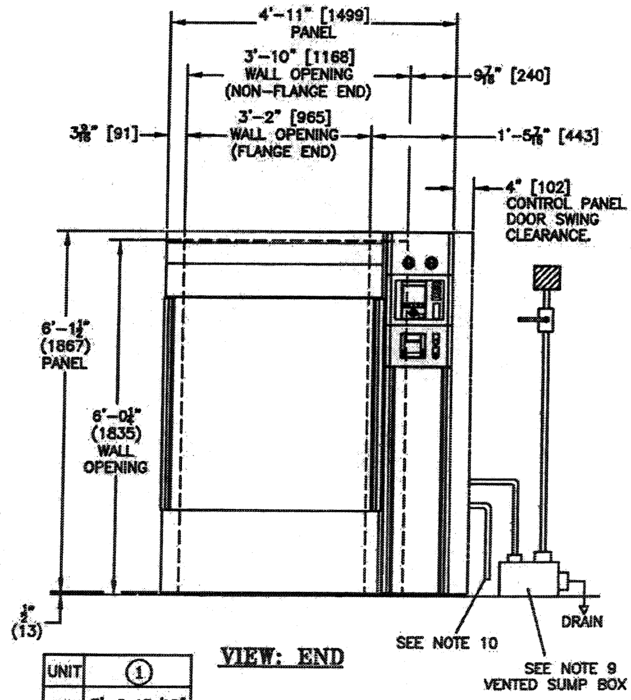
VIEW: SIDE W/CABINET



TYPICAL INSTALLATION



VIEW: SIDE RECESSED



VIEW: END

UNIT	1
53"	3'-3 15/16" (1014)
61"	3'-11 15/16" (1218)

TITLE

700 SERIES ROUGHING-IN DRAWING, STEAM STERILIZER, BIOLOGICAL FLANGE

SERVICE CF 4/19/02	MARKETING TKM 4/19/02	ENGRG KHJ 4/18/02	CHECK TDL 4/18/02	DRAWN BY TDL 5/14/02	SCALE NTS

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SIZE C | SHEET 5 OF 8 | PART NO. HS4089 | REV G

SEE SHEET 1

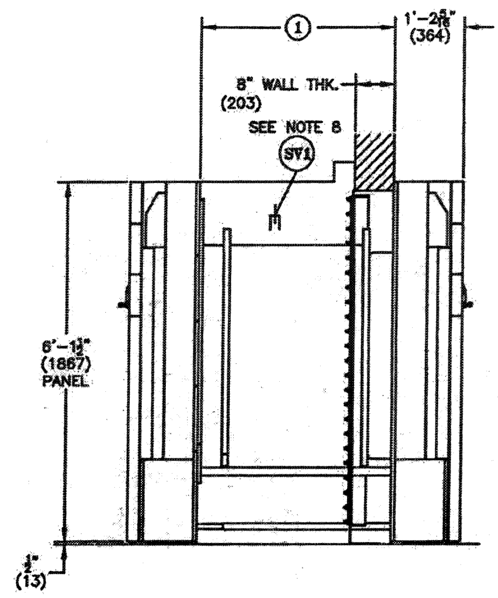
LTR | ECO NO. | BY | DATE
REVISIONS

SCALE 1 = 1 CHECK FOR REDUCTION

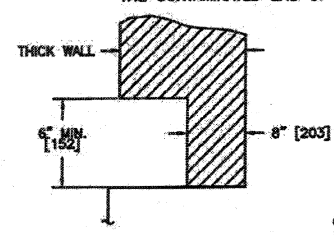
DRAWING/PART NO. HS4089

NOTES:

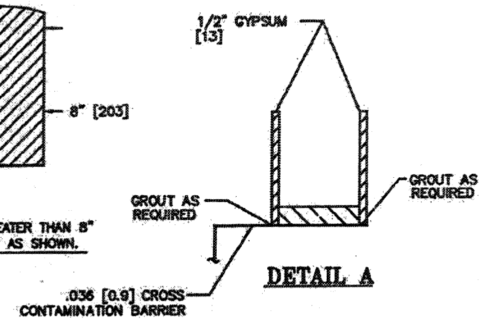
1) FOR SERVICE LOCATIONS, SPECIFICATIONS, AND ARCHITECT NOTES SEE SHEET 2. CROSS-CONTAMINATION BARRIER IS 53" & 61" ONLY.
2) FOR CROSS-CONTAMINATION BARRIER UNITS, CONTROLS ARE SWITCHED DEPENDING ON REQUESTED END FOR BARRIER FLANGE. IF (CCB-CE) IS REQUESTED, CONTROLS W/PRINTER ARE ON CCB END. IF (CCB-RE) IS REQUESTED, CONTROLS W/PRINTER ARE ON THE END OPPOSITE OF THE CCB. SERVICE LOCATIONS REMAIN THE SAME, AS INDICATED ON SHEET 2.
3) SEAL ALL CRACKS AND HOLES WITH GROUT OR RTV AS REQUIRED.
4) SEE INSTALLATION INSTRUCTIONS P/N 61301608214 FOR MORE DETAIL.
5) DIMENSIONS ARE FEET-INCHES (MILLIMETERS).
6) FOR MOUNTING OF CABINET SEE GETINGE USA DRAWING 61301608879 (53") OR 61301608880 (61").
7) IF THE UNITS RECESSED AT THE END OPPOSITE THE CCB, REFER TO SHEET 2 FOR DIMENSIONAL INFORMATION.
8) DISCHARGE FROM JACKET RELIEF VALVE CAN PIPED (BY CUSTOMER) TO THE CONTAMINATED END OF THE STERILIZER.



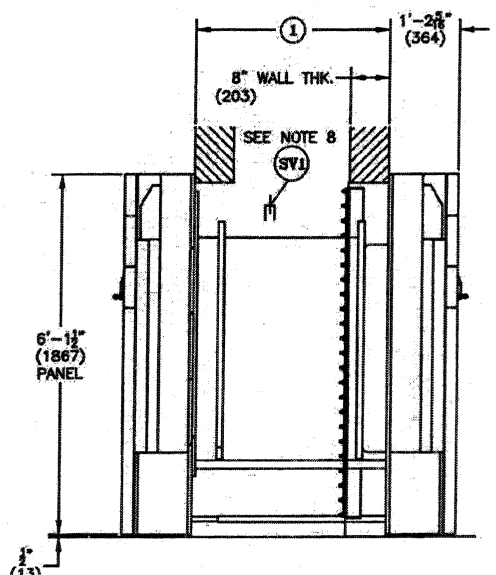
VIEW: SIDE W/CABINET



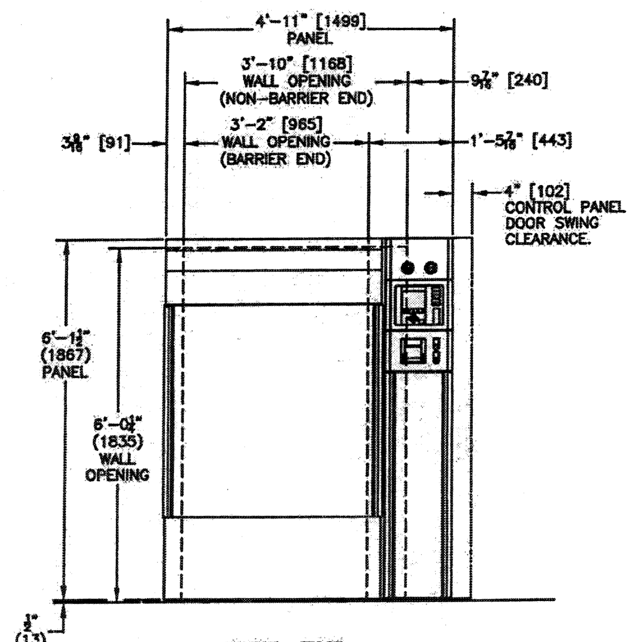
WHEN WALLS ARE GREATER THAN 8" THICK – INSTALL CCB AS SHOWN.



DETAIL A



VIEW: SIDE RECESSED



VIEW: END

UNIT	①
53"	3'-3 15/16" (1014)
61"	3'-11 15/16" (1218)

TITLE

700 SERIES ROUGHING-IN DRAWING, STEAM STERILIZER, CROSS-CONTAMINATION BARRIER

SERVICE CF 4/19/02	MARKETING TKM 4/19/02	ENGRG KHJ 4/18/02	CHECK TDL 4/18/02	DRAWN BY TDL 5/14/02	SCALE NTS

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GETINGE USA, Inc.
1777 East Henrietta Road
Rochester, NY 14623-3133

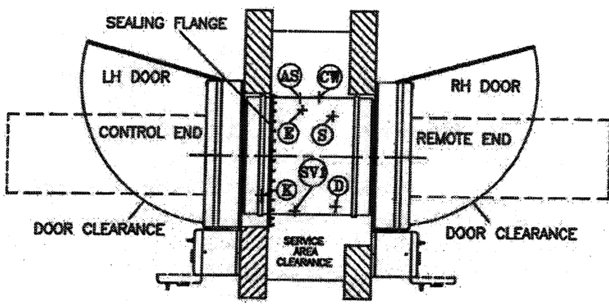
SIZE C | SHEET 6 OF 8 | PART NO. HS4089 | REV G

SEE SHEET 1

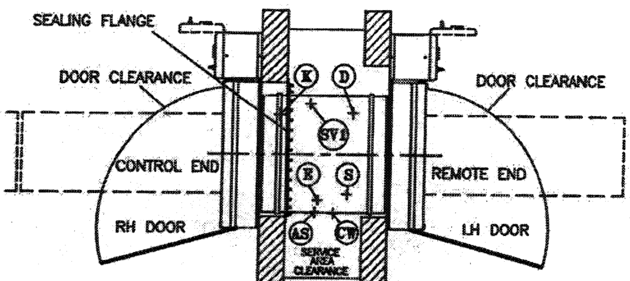
LTR | ECO NO. | BY | DATE
REVISIONS

SCALE: 1 = 1 CHECK FOR REDUCTION

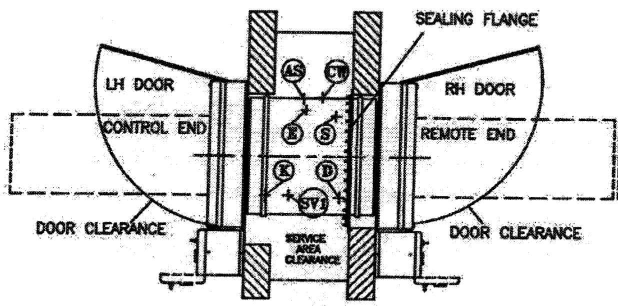
DRAWING/PART NO.
HS4089



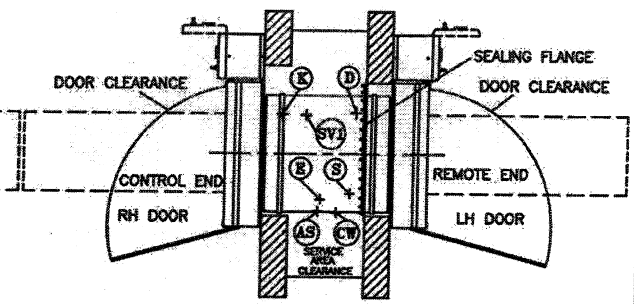
VIEW: PLAN
(RECESSED BOTH ENDS)
LH/RH DOOR CONTROL END WITH SEALING FLANGE



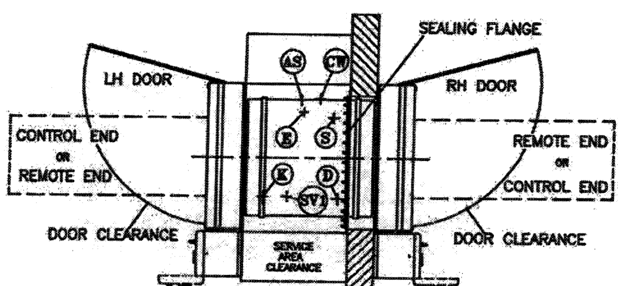
VIEW: PLAN
(RECESSED BOTH ENDS)
RH/LH DOOR CONTROL END WITH SEALING FLANGE



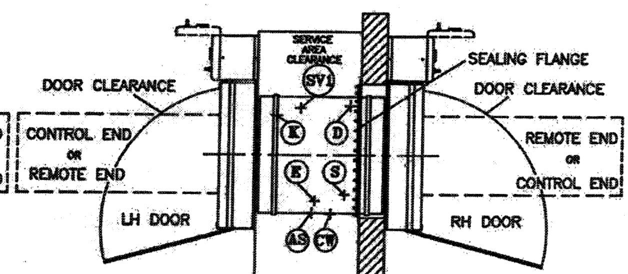
VIEW: PLAN
(RECESSED BOTH ENDS)
LH/RH DOOR REMOTE END WITH SEALING FLANGE



VIEW: PLAN
(RECESSED BOTH ENDS)
RH/LH DOOR REMOTE END WITH SEALING FLANGE



VIEW: PLAN
(CABINET)
LH/RH DOOR CONTROL END WITH SEALING FLANGE
LH/RH DOOR REMOTE END WITH SEALING FLANGE



VIEW: PLAN
(CABINET)
RH/LH DOOR CONTROL END WITH SEALING FLANGE
RH/LH DOOR REMOTE END WITH SEALING FLANGE

ITEM NO.__________ ROOM NO.__________

TITLE:
700 SERIES ROUGHING-IN DRAWING
STEAM STERILIZER CROSS-CONTAMINATION BARRIER
STEAM STERILIZER BIOLOGICAL FLANGE

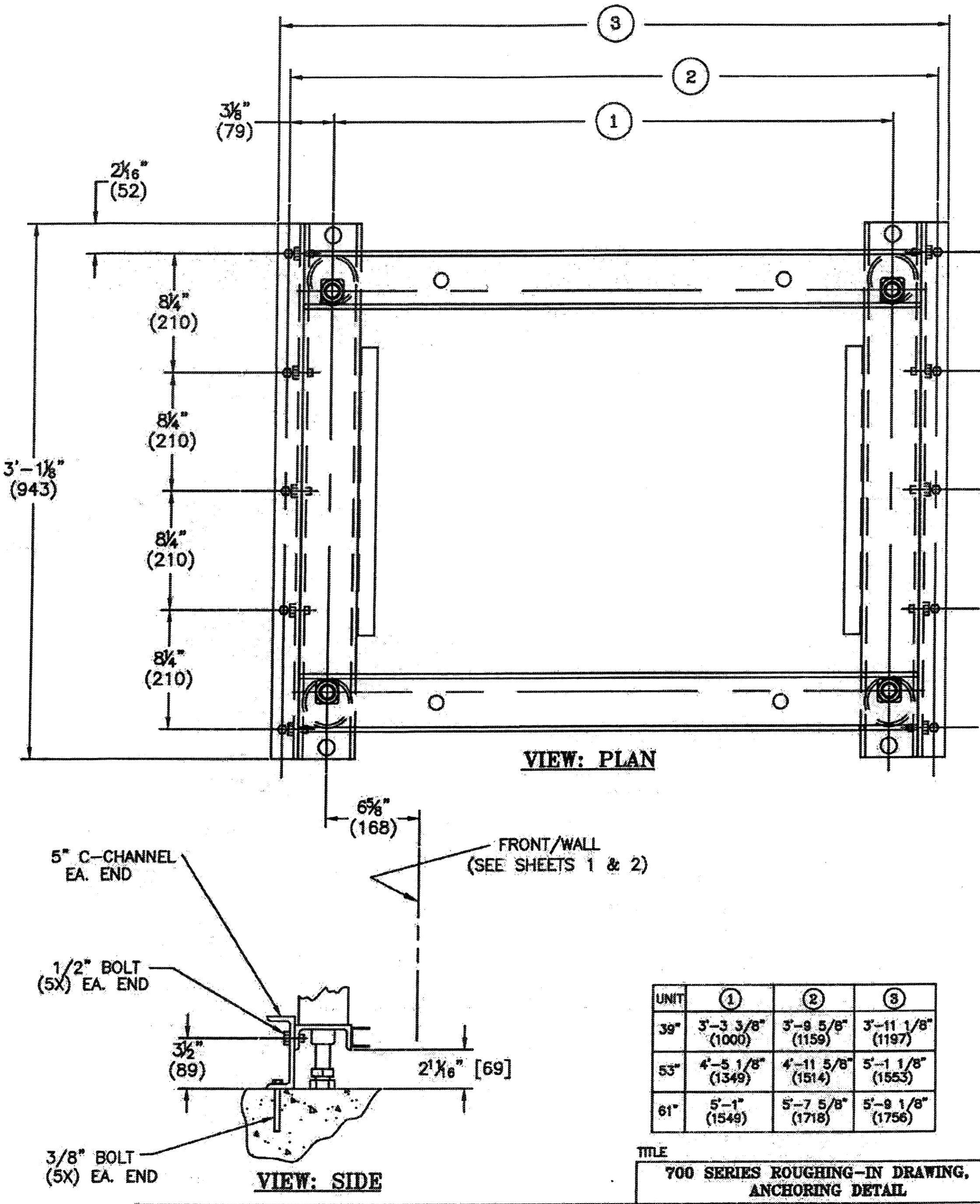
SERVICE CF 4/19/02	MARKETING TKM 4/19/02	ENGRG KHJ 4/18/02	CHECK TDL 4/18/02	DRAWN BY CDC 12/5/02	SCALE NTS
THIS DRAWING WAS MADE USING AUTOCAD SOFTWARE. CHANGES SHOULD BE MADE TO THE DATABASE AND NOT TO THIS TRACING. THE FILENAME IS: HS4089G1-8 THIS PLOT MADE: 2/10/03		GETINGE USA, Inc. 1777 East Henrietta Road Rochester, NY 14623-3133		SIZE C	SHEET 7 OF 8
				PART NO. HS4089	REV G

SEE SHEET 1

LTR	ECO NO.	BY	DATE
REVISIONS			

SCALE 1 = 1 CHECK FOR REDUCTION

HS4089



UNIT	①	②	③
39"	3'-3 3/8" (1000)	3'-9 5/8" (1159)	3'-11 1/8" (1197)
53"	4'-5 1/8" (1349)	4'-11 5/8" (1514)	5'-1 1/8" (1553)
61"	5'-1" (1549)	5'-7 5/8" (1718)	5'-9 1/8" (1756)

TITLE

700 SERIES ROUGHING-IN DRAWING, ANCHORING DETAIL

SERVICE CF 4/19/02	MARKETING TKM 4/19/02	ENGRG JHK 4/18/02	CHECK TDL 4/18/02	DRAWN BY TL 4/15/02	SCALE NTS
THIS DRAWING WAS MADE USING AUTOCAD SOFTWARE. CHANGES SHOULD BE MADE TO THE DATABASE AND NOT TO THIS TRACING. THE FILENAME IS: HS4089G1-8 THIS PLOT MADE: 2/10/03		GETINGE USA, Inc. 1777 East Henrietta Road Rochester, NY 14623-3133		SIZE C	SHEET 8 OF 8
				PART NO. HS4089	REV G

SEE SHEET 1

Getinge is constantly reviewing its products for improvements. Consequently, the actual product may differ slightly from the product pictured and described here.

GETINGE

Getinge USA, Inc 1777 East Henrietta Road Rochester, New York 14623-3133 U.S.A. Telephone (585) 475-1400 Facsimile (585) 272-5033
www.getingeusa.com info@getingeusa.com

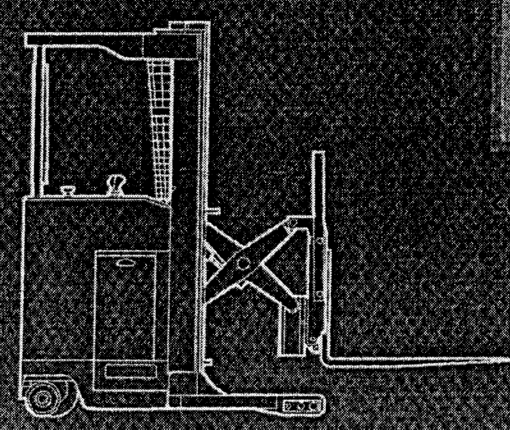
Printed in U.S.A.

NARROW AISLE

Narrow Aisle Reach and Straddle Trucks
Electric 24/36 Volt

NPR15D	3,000 lbs 1350 kg
NPR17	3,500 lbs 1600 kg
NPR20	4,000 lbs 1800 kg
NPR22/NSR22	4,500 lbs 2000 kg
NSR25	5,000 lbs 2275 kg

NPR15D/22
NSR22/25

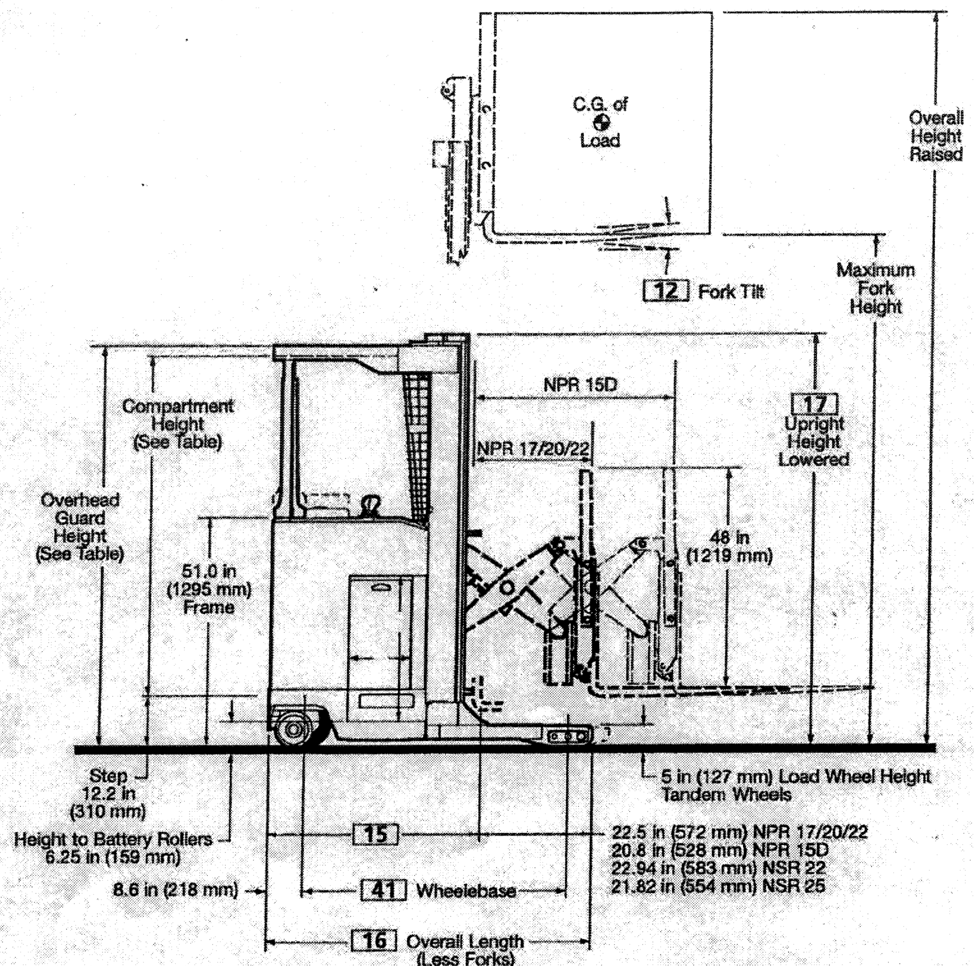


CLARK THE FORKLIFT.

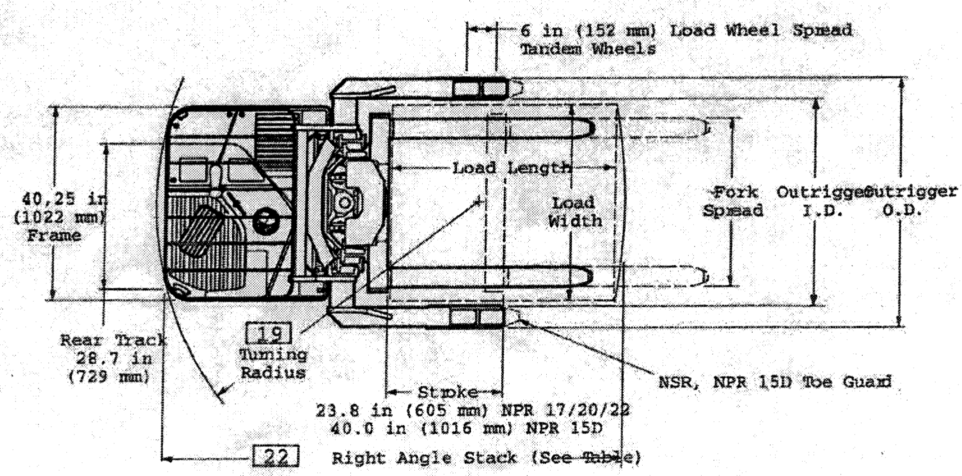
www.clarkmhc.com

DIMENSIONS

For corresponding data see Specification Chart.



NPR15D/22
NSR22/25



GENERAL DATA

Upright Table

Maximum Fork Height in	mm	Overall Height Lowered in	mm	Free Lift in	mm
198	5029	89	2261	54	1372
210	5334	95	2413	60	1524
240	6096	107	2718	72	1829
258	6553	113	2870	78	1981
270	6858	119	3023	84	2134
300	7620	131	3327	96	2438
318	8077	139	3531	104	2642
• 321	8153	139	3531	104	2642
330	8382	149	3785	114	2896
366	9296	161	4089	126	3200

• NPR 15D, NPR 22, NSR 25 only.
For overall height raised with load backrest, add 48 in (1219 mm) to maximum fork height. Other uprights available, contact Clark representative.

Carriage Widths*/Fork Spread in(mm)

Carriage Width in	mm	Fork Spread w/o Side Shifter max	min	Fork Spread w/ Side Shifter max	min
33	838	31.0(787)	13.0(330)	27.7(704)	22.3(566)
37	940	35.0(889)	13.0(330)	27.7(704)	22.3(566)

* 33 in. wide carriage availablewith outrigger I.D. through 37 in.; 33 or 37 in. wide carriages available with outrigger I.D. 38 in. and greater, 40 in. with 10.5 in. load wheels.

NPR Min. Right Angle Stack Aisle in(mm)*

Pallet or Load Size Length x Width	Battery Compartment (L) 13.88(353)	16.13(410)	18.5(470)**	21.0(533)**
36x30(914x762)	82.2(2088)	84.1(2136)	86.8(2205)	89.0(2261)
42x36(1067x914)	87.1(2212)	89.2(2266)	92.1(2339)	94.5(2400)
36x40(914x1016)	82.0(2083)	83.9(2131)	86.8(2205)	89.0(2261)
40x40(1016x1016)	84.8(2154)	86.8(2205)	89.6(2276)	91.9(2334)
48x40(1219x1016)	93.0(2362)	95.1(2416)	98.2(2494)	100.6(2555)
48x42(1219x1067)	92.8(2357)	94.9(2410)	98.0(2489)	100.4(2550)
48x44(1219x1118)	92.6(2352)	94.7(2405)	97.7(2482)	100.2(2545)
48x48(1219x1219)	92.2(2342)	94.3(2395)	97.3(2471)	99.8(2535)

* Add 6 to 8 inches clearance for ease of operation. Dimensions are based on 42 inch I.D. outrigger with 5 x 3.76 in. load wheels.
** Add 8" for NPR 15D (plus operating clearance).

NSR Min. Right Angle Stack Aisle in(mm)*

Pallet or Load Size Length x Width	Battery Compartment (L) 13.88(353)	16.13(410)	18.5(470)	21.0(533)
36x30(914x762)	79.7(2024)	81.6(2073)	86.1(2187)	88.3(2243)
42x36(1067x914)	82.3(2090)	84.3(2141)	87.6(2225)	89.8(2281)
36x40(914x1016)	82.0(2083)	83.9(2131)	88.2(2240)	90.4(2296)
40x40(1016x1016)	82.0(2083)	83.9(2131)	88.2(2240)	90.4(2296)
48x40(1219x1016)	89.5(2273)	91.6(2327)	95.1(2416)	97.4(2474)
48x42(1219x1067)	89.1(2263)	91.2(2316)	94.7(2405)	97.1(2466)
48x44(1219x1118)	88.8(2256)	90.9(2309)	94.4(2398)	96.7(2456)
48x48(1219x1219)	88.3(2243)	90.4(2296)	94.0(2388)	96.0(2438)

* Add 6 to 8 inches clearance for ease of operation. Dimensions are based on I.D. 2" wider than load, 5 x 3.76 load wheels and 7" clearance each side of load.

Grade Clearance

Battery Compartment Width (in/mm)	A%
13.38/340, 13.88/353	15.0%
16.13/410	14.5%
18.5/470	11.6%
21.0/533	10.9%

Outrigger Dimensions - I.D./O.D. (in)

Dual 5 x 3.76 Load Wheels Toe Box Width 140mm I.D.	O.D.	Dual 5 x 3.01 Load Wheels Toe Box Width 114mm I.D.	O.D.	Single 10.5 x 4.5 Load Wheels Toe Box Width 152mm I.D.	O.D.	Dual 4 x 2.62 Load Wheels Toe Box Width 114mm I.D.	O.D.
33	44	33	42	-	-	33	42
34	45	34	43	-	-	34	43
36	47	35	44	36.25	48.25	35	44
38	49	37	46	38.25	50.25	37	46
40	51	39	48	40.25	52.25	39	48
41	52	41	50	41.25	53.25	41	50
42	53	42	51	42.25	54.25	42	51
44	55	43	52	44.25	56.25	43	52
46	57	45	54	46.25	58.25	45	54
48	59	47	56	48.25	60.25	47	56
50	61	49	58	50.25	62.25	49	58
-	-	51	60	-	-	51	60

Outrigger Dimensions - I.D./O.D. (mm)

Dual 127 x 96 Load Wheels Toe Box Width 140mm I.D.	O.D.	Dual 127 x 76 Load Wheels Toe Box Width 114mm I.D.	O.D.	Single 267 x 114 Load Wheels Toe Box Width 152mm I.D.	O.D.	Dual 102 x 67 Load Wheels Toe Box Width 114mm I.D.	O.D.
838	1118	838	1067	-	-	838	1067
864	1143	864	1092	-	-	864	1092
914	1194	889	1118	921	1226	889	1118
965	1245	940	1168	972	1276	940	1168
1016	1295	991	1219	1022	1327	991	1219
1041	1321	1041	1270	1048	1353	1041	1270
1067	1346	1067	1295	1073	1378	1067	1295
1118	1397	1092	1321	1124	1429	1092	1321
1168	1448	1143	1372	1175	1480	1143	1372
1219	1499	1194	1422	1226	1530	1194	1422
1270	1549	1245	1473	1276	1581	1245	1473
-	-	1295	1524	-	-	1295	1524

Battery Compartment Dimensions

Width (W) in	mm	Length (L) in	mm	Height (H) in	mm
38.75	984	13.38	340	32.0	813
38.75	984	13.88	353	32.0	813
38.75	984	16.13	410	32.0	813
38.75	984	18.50	470	32.0	813
38.75	984	21.00	533	32.0	813

Maximum Battery Size

Width (W) in	mm	Length (L) in	mm	Height (H) in	mm
38.69	983	13.00	330	31.5	800
38.69	983	13.50	343	31.5	800
38.69	983	15.75	400	31.5	800
38.69	983	18.00	457	31.5	800
38.69	983	20.50	521	31.5	800

Operator Compartment/ Overhead Guard Dimensions

Maximum Fork Height in	mm	Compartment Inside in	mm	Overhead Guard Height in	mm
198	5029	75	1905	89	2261
210	5334	81	2057	95	2413
240	6096	81	2057	95	2413
258	6553	81	2057	95	2413
270	6858	81	2057	95	2413
300	7620	81	2057	95	2413
318	8077	81	2057	95	2413
*321	8153	81	2057	95	2413
330	8382	81	2057	95	2413
366	9296	81	2057	95	2413

*NPR 15D, NPR 22, NSR25 only.

SPECIFICATIONS

					Clark	Clark
General Information	1	Manufacturer			Clark	Clark
	2	Model	Manufacturer's Designation		NPR17	NPR20
	3	Load Capacity		lbs(kg)	3500 (1600)	4000 (1800)
	4	Load Center	Fork Face to Load CG	in(mm)	24 (600)	24 (600)
	5	Power Unit	Type		24 volt I 36 volt	24 volt I 36 volt
	6	Operator Type			Rider Reach	Rider Reach
	7	Tire Type			Solid	Solid
	8	Wheels (x=driven)	Front/Rear		4/2 (1x)	4/2 (1x)
Basic Dimensions[1,2]	10	Upright[3]	Lift height (data for 210 in MFH upright)	in(mm)	210 (5334)	210 (5334)
	11		Free Lift	in(mm)	60 (1524)	60 (1524)
	12	Fork Tilt	Back/Forward	degrees	4 / 3	4 / 3
	14	Fork	Std. Fork Size (T x W x L)	in(mm)	1.75 x 4 x 42 (44 x 102 x 1067)	1.75 x 4 x 42 (44 x 102 x 1067)
	15	Overall Dimensions	Length to Fork Face	in(mm)	48.1 (1222)	48.1 (1222)
	16		Overall Length, less forks	in(mm)	70.25 (1784)	70.25 (1784)
			Outrigger ID/OD	in(mm)	See Outrigger Dimensions Chart	See Outrigger Dimensions Chart
			Frame Width	in(mm)	40.25 (1022)	40.25 (1022)
			Height, Upright Lowered	in(mm)	95 (2413)	95 (2413)
	18		Height, Upright Extended	in(mm)	258 (6553)	258 (6553)
	19	Turning Radius		in(mm)	66.5 (1689)	66.5 (1689)
	22	Right Angle Stack Aisle[4]	48 in x 40 in pallet	in(mm)	93.0 (2362)	93.0 (2362)
		Battery Compartment	W x L x H	in(mm)	38.75 x 13.88 x 32 (984 x 353 x 813)	38.75 x 13.88 x 32(984 x 353 x 813)
Performance	23	Stability	According to ANSI		Yes	Yes
	24	Speeds	Travel Speed, Max w/ Load	mph(kph)	5.8 (9.3) I 6.7 (10.8)	5.7 (9.2) I 6.6 (10.6)
	25		Travel Speed, Max w/o Load	mph(kph)	6.3 (10.1) I 7.2 (11.6)	6.3 (10.1) I 7.2 (11.6)
	26		Lift Speed, with Load[5]	fpm(ms)	42 (.21) I 62 (.31)	40 (.20) I 60 (.30)
	27		Lift Speed, without Load[5]	fpm(ms)	65 (.33) I 95 (.48)	65 (.33) I 95 (.48)
	28		Lower Speed, with Load	fpm(ms)	80 (.41)	80 (.41)
	29		Lower Speed, without Load	fpm(ms)	90 (.46)	90 (.46)
Weights	34	Service weight	Including battery, less load	lbs(kg)	6660 (3024)	6940 (3151)
	35	Axle loading	With Load, Front	lbs(kg)	6390 (2901)	7030 (3192)
	36		With Load, Rear	lbs(kg)	3770 (1712)	3910 (1775)
	37		W/O Load, Front	lbs(kg)	2445 (1110)	2520 (1144)
	38		W/O Load, Rear	lbs(kg)	4215 (1914)	4420 (2007)
Chassis	39	Tires/Wheels	Number, Front/Rear		4 / 2	4 / 2
	40		Size, Load wheels	in(mm)	(4) 5 x 3.76 urethane (127 x 96)	(4) 5 x 3.76 urethane(127 x 96)
			Size, Rear Drive/Steer	in(mm)	13.5 x 5.5 rubber (343 x 140)	13.5 x 5.5 rubber (343 x 140)
			Size, Rear Caster	in(mm)	8 x 4 urethane (203 x 102)	8 x 4 urethane (203 x 102)
	41	Wheelbase		in(mm)	56.1 (1425)	56.1 (1425)
	44	Ground Clearance	With 5.0 diameter load wheels	in(mm)	1.75 (44)	1.75 (44)
	46	Service Brake	Type		Drum and Shoe	Drum and Shoe
	47	Parking Brake	Type		Automatic, Spring Applied	Automatic, Spring Applied
		Steering	Type		Hydraulic Assist, variable	Hydraulic Assist, variable
Drive Line	48	Battery	Type		Lead Acid	Lead Acid
			Capacity (6 hr rate) maximum	kWh	28.9 I 27.0	28.9 I 27.0
			Weight, minimum	lbs(kg)	1590 (722)	1590 (722)
	49	Motors, Controls	Drive Motor, diameter	in(mm)	6.7 (170)	6.7 (170)
			Hydraulic Motor, diameter	in(mm)	8.0 (203)	8.0 (203)
			Steer/Auxiliary Motor, diameter	in(mm)	6.4 (163)	6.4 (163)
			Drive Motor control	Type	Transistor, infinite	Transistor, infinite
			Speed control	Type	Solid state	Solid state
			Hydraulic Motor control	Type	Contactor	Contactor
			Steer/Auxiliary Motor control	Type	Transistor, infinite	Transistor, infinite

17:6

Notes:

1 Specifications are for tandem 5 in (127 mm) diameter x 3.76 in (96 mm) wide load wheels. Single 10.5 in (267 mm) diameter x 4.5 in (114 mm) load wheels and tandem 5 in (127 mm) diameter x 3.01 in (76 mm) wheels are also available.

2 Specifications are given for truck with 210 in (5334 mm) MFH upright, and 42 in (1067 mm) outrigger I.D. and 37 in (940 mm) sideshifter (deduct 50 lbs. (23 kg) for weight less sideshifter). Battery compartment dimensions as noted.

3 See Upright Table. Contact Clark Representative for additional lift heights.

4 Right angle stacking aisle for pallet size shown. See "General Data" section for right angle stack aisle with other pallet sizes.

5 High speed lift is standard on NPR 22 and 16D with 18.5 in (470 mm) and 21.0 in (533 mm) battery compartments; lift speeds will reduce when 16.13 in (409.7 mm) compartment is used.

SPECIFICATIONS

					Clark	Clark
General Information	1	Manufacturer			Clark	Clark
	2	Model	Manufacturer's Designation		NPR22	NPR15D
	3	Load Capacity		lbs(kg)	4500 (2000)	3000 (1350)
	4	Load Center	Fork Face to Load CG	in(mm)	24 (600)	24 (600)
	5	Power Unit	Type		36 volt	36 volt
	6	Operator Type			Rider Reach	Rider Double Reach
	7	Tire Type			Solid	Solid
	8	Wheels (x=driven)	Front/Rear		4/2 (1x)	4/2 (1x)
Basic Dimensions[1,2]	10	Upright[3]	Lift height (data for 210 in MFH upright)	in(mm)	210 (5334)	210 (5334)
	11		Free Lift	in(mm)	60 (1524)	60 (1524)
	12	Fork Tilt	Back/Forward	degrees	4 / 3	4 / 3
	14	Fork	Std. Fork Size (T x W x L)	in(mm)	1.75 x 4 x 42 (44 x 102 x 1067)	1.75 x 4 x 42 (44 x 102 x 1067)
	15	Overall Dimensions	Length to Fork Face	in(mm)	51.1 (1298)	61.0 (1550)
	16		Overall Length, less forks	in(mm)	75.9 (1928)	81.8 (2078)
			Outrigger ID/OD	in(mm)	See Outrigger Dimensions Chart	See Outrigger Dimensions Chart
			Frame Width	in(mm)	40.25 (1022)	40.25 (1022)
		Turning Radius	Height, Upright Lowered	in(mm)	95 (2413)	95 (2413)
	18	Right Angle Stack Aisle[4]	Height, Upright Extended	in(mm)	258 (6553)	258 (6553)
	19	Battery Compartment		in(mm)	69.7 (1770)	76.14 (1934)
	22	Stability	48 in x 40 in pallet	in(mm)	98.2 (2494)	106 (2692)
		Speeds	W x L x H	in(mm)	38.75 x 18.5 x 32 (984 x 470 x 813)	38.75 x 13.85 x 32(984 x 470 x 813)
Performance	23		According to ANSI		Yes	Yes
	24		Travel Speed, Max w/ Load	mph(kph)	6.5 (10.5)	6.5 (10.5)
	25		Travel Speed, Max w/o Load	mph(kph)	7.1 (11.4)	7.1 (11.4)
	26		Lift Speed, with Load[5]	fpm(ms)	72 (.37)	82 (.42)
	27		Lift Speed, without Load[5]	fpm(ms)	108 (.55)	108 (.55)
	28		Lower Speed, with Load	fpm(ms)	80 (.41)	77 (.39)
	29		Lower Speed, without Load	fpm(ms)	90 (.46)	90 (.46)
		Service weight				
		Axle loading				
Weights	34		Including battery, less load	lbs(kg)	8329 (3781)	8708 (3953)
	35		With Load, Front	lbs(kg)	8442 (3833)	6882 (3124)
	36		With Load, Rear	lbs(kg)	4387 (1992)	4826 (2191)
	37	Tires/Wheels	W/O Load, Front	lbs(kg)	3259 (1480)	3427 (1556)
	38		W/O Load, Rear	lbs(kg)	5070 (2302)	5281 (2398)
Chassis	39		Number, Front/Rear		4 / 2	4 / 2
	40		Size, Load wheels	in(mm)	(4) 5 x 3.76 urethane (127 x 96)	(4) 5 x 3.76 urethane(127 x 96)
		Wheelbase	Size, Rear Drive/Steer	in(mm)	13.0 x 5.5 urethane (330 x 140)	13.0 x 5.5 urethane (330 x 140)
		Ground Clearance	Size, Rear Caster	in(mm)	8 x 4 urethane (203 x 102)	8 x 4 urethane (203 x 102)
	41	Service Brake		in(mm)	61.7 (1567)	65.75 (1670)
	44	Parking Brake	With 5.0 diameter load wheels	in(mm)	1.75 (44)	1.75 (44)
	46	Steering	Type		Drum and Shoe	Drum and Shoe
	47		Type		Automatic, Spring Applied	Automatic, Spring Applied
		Battery	Type		Hydraulic Assist, variable	Hydraulic Assist, variable
Drive Line	48		Type		Lead Acid	Lead Acid
		Motors, Controls	Capacity (6 hr rate) maximum	kWh	37.6	37.6
			Weight, minimum	lbs(kg)	2175 (987)	2175 (987)
	49		Drive Motor, diameter	in(mm)	6.7 (170)	6.7 (170)
			Hydraulic Motor, diameter	in(mm)	8.0 (203)	8.0 (203)
			Steer/Auxiliary Motor, diameter	in(mm)	6.4 (163)	6.4 (163)
			Drive Motor control	Type	Transistor, infinite	Transistor, infinite
			Speed control	Type	Solid state	Solid state
			Hydraulic Motor control	Type	Contactor	Contactor
			Steer/Auxiliary Motor control	Type	Transistor, infinite	Transistor, infinite

Notes:

1 Specifications are for tandem 5 in (127 mm) diameter x 3.76 in (96 mm) wide load wheels. Single 10.5 in (267 mm) diameter x 4.5 in (114 mm) load wheels and tandem 5 in (127 mm) diameter x 3.01 in (76 mm) wheels are also available.

2 Specifications are given for truck with 210 in (5334 mm) MFH upright, and 42 in (1067 mm) outrigger I.D. and 37 in (940 mm) sideshifter (deduct 50 lbs. (23 kg) for weight less sideshifter). Battery compartment dimensions as noted.

3 See Upright Table. Contact Clark Representative for additional lift heights.

4 Right angle stacking aisle for pallet size shown. See "General Data" section for right angle stack aisle with other pallet sizes.

5 High speed lift is standard on NPR 22 and 15D with 18.5 in (470 mm) and 21.0 in (533 mm) battery compartments; lift speeds will reduce when 16.13 in (409.7 mm) compartment is used.

SPECIFICATIONS

General Information	1	Manufacturer			Clark	Clark
	2	Model	Manufacturer's Designation		NSR22	NSR25
	3	Load Capacity		lbs(kg)	4500 (2000)	5000 (2275)
	4	Load Center	Fork Face to Load CG	in(mm)	24 (600)	24 (600)
	5	Power Unit	Type		24 volt | 36 volt	36 volt
	6	Operator Type			Rider Straddle	Rider Straddle
	7	Tire Type			Solid	Solid
	8	Wheels (x=driven)	Front/Rear		4/2 (1x)	4/2 (1x)
Basic Dimensions[1,2]	10	Upright[3]	Lift height (data for 210 in MFH upright)	in(mm)	210 (5334)	210 (5334)
	11		Free Lift	in(mm)	60 (1524)	60 (1524)
	12	Fork Tilt	Back/Forward	degrees	4 / 3	4 / 3
	14	Fork	Std. Fork Size (T x W x L)	in(mm)	1.75 x 4 x 42 (44 x 102 x 1067)	1.75 x 4 x 42 (44 x 102 x 1067)
	15	Overall Dimensions	Length to Fork Face	in(mm)	49.3 (1251)	54.1 (1374)
	16		Overall Length, less forks	in(mm)	72.2 (1834)	75.9 (1928)
			Outrigger ID/OD	in(mm)	See Outrigger Dimensions Chart	See Outrigger Dimensions Chart
			Frame Width	in(mm)	40.25 (1022)	40.25 (1022)
			Height, Upright Lowered	in(mm)	95 (2413)	95 (2413)
	18		Height, Upright Extended	in(mm)	258 (6553)	258 (6553)
	19	Turning Radius		in(mm)	66.5 (1690)	72.1 (1832)
	22	Right Angle Stack Aisle[4]	48 in x 40 in pallet	in(mm)	93.0 (2362)	98.2 (2494)
		Battery Compartment	W x L x H	in(mm)	38.75 x 13.88 x 32 (984 x 353 x 813)	38.75 x 18.5 x 32 (984 x 470 x 813)
Performance	23	Stability	According to ANSI		Yes	Yes
	24	Speeds	Travel Speed, Max w/ Load	mph(kph)	5.7 (9.2) | 6.6 (10.6)	6.2 (10.0)
	25		Travel Speed, Max w/o Load	mph(kph)	6.3 (10.1) | 7.2 (11.6)	7.1 (11.4)
	26		Lift Speed, with Load[5]	fpm(ms)	40 (.20) | 60 (.30)	70 (.36)
	27		Lift Speed, without Load[5]	fpm(ms)	65 (.33) | 95 (.48)	108 (.55)
	28		Lower Speed, with Load	fpm(ms)	80 (.41)	80 (.41)
	29		Lower Speed, without Load	fpm(ms)	80 (.41)	90 (.46)
Weights	34	Service weight	Including battery, less load	lbs(kg)	6780 (3082)	7879 (3581)
	35	Axle loading	With Load, Front	lbs(kg)	7583 (3447)	8717 (3962)
	36		With Load, Rear	lbs(kg)	3697 (1680)	4162 (1892)
	37		W/O Load, Front	lbs(kg)	2460 (1118)	2962 (1346)
	38		W/O Load, Rear	lbs(kg)	4320 (1964)	4917 (2235)
Chassis	39	Tires/Wheels	Number, Front/Rear		4 / 2	4 / 2
	40		Size, Load wheels	in(mm)	(4) 5 x 3.76 urethane (127 x 96)	(4) 5 x 3.76 urethane(127 x 96)
			Size, Rear Drive/Steer	in(mm)	13.5 x 5.5 rubber (343 x 140)	13.0 x 5.5 rubber (330 x 140)
			Size, Rear Caster	in(mm)	8 x 4 urethane (203 x 102)	8 x 4 urethane (203 x 102)
	41	Wheelbase		in(mm)	56.1 (1425)	61.8 (1568)
	44	Ground Clearance	With 5.0 diameter load wheels	in(mm)	1.75 (44)	1.75 (44)
	46	Service Brake	Type		Drum and Shoe	Drum and Shoe
	47	Parking Brake	Type		Automatic, Spring Applied	Automatic, Spring Applied
		Steering	Type		Hydraulic Assist, variable	Hydraulic Assist, variable
Drive Line	48	Battery	Type		Lead Acid	Lead Acid
			Capacity (6 hr rate) maximum	kWh	28.9 | 27.0	37.6
			Weight, minimum	lbs(kg)	1590 (1722)	2175 (987)
	49	Motors, Controls	Drive Motor, diameter	in(mm)	6.7 (170)	6.7 (170)
			Hydraulic Motor, diameter	in(mm)	8.0 (203)	8.0 (203)
			Steer/Auxiliary Motor, diameter	in(mm)	6.4 (163)	6.4 (163)
			Drive Motor control	Type	Transistor, infinite	Transistor, infinite
			Speed control	Type	Solid state	Solid state
			Hydraulic Motor control	Type	Contactor	Contactor
			Steer/Auxiliary Motor control	Type	Transistor, infinite	Transistor, infinite

Notes:

1 Specifications are for tandem 5 in (127 mm) diameter x 3.76 in (96 mm) wide load wheels. Single 10.5 in (267 mm) diameter x 4.5 in (114 mm) load wheels and tandem 5 in (127 mm) diameter x 3.01 in (76 mm) wheels are also available.

2 Specifications are given for truck with 210 in (5334 mm) MFH upright, and 42 in (1067 mm) outrigger I.D. and 37 in (940 mm) sideshifter (deduct 50 lbs. (23 kg) for weight less sideshifter). Battery compartment dimensions as noted.

3 See Upright Table. Contact Clark Representative for additional lift heights.

4 Right angle stacking aisle for pallet size shown. See "General Data" section for right angle stack aisle with other pallet sizes.

5 High speed lift is standard on NPR 22 and 15D with 18.5 in (470 mm) and 21.0 in (533 mm) battery compartments; lift speeds will reduce when 16.13 in (409.7 mm) compartment is used.

DESCRIPTION

Clark NPR 15D/22 reach trucks and NSR 22/25 straddle trucks are designed to meet the increasing performance and reliability demands of narrow aisle applications. Easy operation with strong and reliable component systems provide high user value. General Electric transistor motor controls operate drive and power steering/reach/tilt and auxiliary functions, which add significantly to battery efficiency, with benefits of fewer parts and built-in diagnostics. Choice of either 24 or 36 volt operation (36 volt only on NPR15D, NPR22 and NSR25) with lift height outrigger configurations and options to suit the application needs of most users.

Operator Comfort/Controls

Stand-up compartment is configured for comfortable operation in forward or reverse, even for large operators. Padded, independently adjustable armrest and backpad enhance operator comfort and accommodate all body types and sizes. Full molded urethane compartment padding and soft touch control handle add to safety and comfort. Forward visibility is excellent with secondary lift cylinders and other upright components located behind upright rails. Operator orientation, facing left of forward, provides for high productivity through reduced operator movement for reverse travel and operator choice of stance.

Left-hand steering control with hydraulic power assist for very low steer effort. Single lever hand control with push buttons provides for operation of travel, lift/lower, reach (NPR), tilt and sideshift (optional) functions. Floor pedal provides emergency braking and parking brake with brake-on in up (normal) position. Depression of the pedal and subsequent release actuates independent brakes in both the drive and caster wheel. Formed wire guard prevents hand movement into the upright. Key switch and battery disconnect on control deck. Standard rear guard legs provide protection from intrusion of objects, such as rack beams, during backing and in tight aisle operations.

Motors/Electrical Controls

Series wound high torque drive and hydraulic pump motors and permanent magnet power steering motor are fan cooled and ventilated, and incorporate Class H insulation. Power steering and drive motors feature GE transistor motor controls. General Electric EV-T15 transistor drive motor control incorporates lift interrupt and diagnostic display with technician 'dial-in' adjustment features. Variable speed transistor motor controls provide extended usage between battery recharging. Low noise power steering motor has idle to full speed operation based on steering demand. A solenoid control card with diagnostic LED displays actuates the hydraulic pump contactor and lift, reach (NPR), tilt and sideshift functions. The single speed hydraulic motor utilizes contactor actuation. A large door at the left side of the truck and easy removal of the top cover provides excellent access to motor and control components.

Drive and Brake Assembly

A single, heavy-cast, rear axle supports the drive and the caster wheel assemblies. The drive assembly rotates on a large bearing for steering control. The drive wheel gears are bathed in lubricating oil. Independent spring-applied, hydraulic-release brake on the drive motor armature and within the hub of the caster wheel provide smooth controlled brake action. Service brakes are fully applied for parking when pedal is released. The axle articulates at its center enabling the truck to negotiate floor irregularities. The entire assembly can be easily removed for service.

Outrigger/Load Wheels

Outriggers and upright are a heavy weldment which is bolted to the frame. Toe boxes are welded to the outrigger. Dual load wheels articulate +/- 1/2 inch for smooth operation over expansion joints and floor irregularities. Load wheel assemblies have pressure lubricant points and feature snap ring retainment. Single 10.5 inch diameter load wheels are available. Yellow dichromate finish on load wheel rocker plates prevents corrosion.

Steering

Steering control of the drive wheel assembly is through a mechanical shaft with a hydraulic torque generator. Power steering motor idles at 850 RPM and increases to 2200-2400 RPM with increasing steer demand; reduces noise and energy consumption. Responsive 4.1 turns stop-to-stop with maximum steer tiller effort of 30 inch-lbs. Reverse steer operation is available.

Hydraulics

Separate power steering and main hydraulic pumps increase efficiency, improve performance and reduce noise. Integral pump and motor assemblies are reliable, easily serviced. Nylon sump tank of 8.4 gallon capacity withstands high temperatures, is easily cleaned. Spin-on return line filter, suction strainer and tank breather-filler cap. Two hydraulic test ports enable convenient pressure testing of lift and auxiliary functions. O-ring face seal fittings on high pressure lines are easily serviced and greatly reduce leaks.

Upright/Pantograph Assembly

Clark high-visibility, triple stage canted roller interlocking rail uprights with special channel and full I-beam construction. Lift cylinders have hard industrial chrome plating and urethane seals which provide long seal life. The pantograph mechanism of the NPR is a heavy fabrication with tapered roller bearings at the center pivot and is supported with spherical bushings at the attaching pins. Two standard carriage rollers at the front and rear operate in the upright inner rail and a similar rail attached to the pantograph fork carriage. The pantograph stroke is 24 inches on single reach units and 40 inches on double reach units. Fork tilt is provided on both the NPR and NSR by moving the fork heels forward with a hydraulic cylinder and lever. The NPR reach function utilizes two cylinders hydraulically supplied through a solenoid valve on the pantograph.

Hydraulic plumbing is internal with 50% fewer fittings than many other designs. Upright control devices include flow limiting valves which prevent rapid carriage descent in the event of a line failure, a lowering control valve which provides productive lowering speeds under varied load conditions; hydraulic cushioning between lift stages and a counterbalance valve that provides proper operation of tilt and reach functions. Forged forks are shaft mounted with pin type retainers.

Standard Features

Key switch, load backrest extension, electronic horn, rear overhead guard post protection, heavy-duty battery rollers and lift-out battery retainers, lever type battery connect-disconnect. Metal capacity plate, durable Operator Manual attached to truck and highly visible warning and instruction labels. Clark's *Employer's Guide to Material Handling Safety* and a "Safety Starts With You" video are also provided with the truck. Finish is high visibility Clark green with flat black upright and trim.

Available Equipment

Various battery compartment sizes, 4.0 in. articulating and 10.5 in. diameter single load wheels, side shifter, freezer conditioning, reverse steering, safety glass front panel, back-up alarm, strobe warning lights, operating lights, and U.L. Classified EE rating.

Notes

Performance may vary +5% and -10% due to motor and system efficiency tolerance. The performance shown represents nominal values which may be obtained under typical operating conditions.

Clark products and specifications are subject to change without notice.

ANSI/ASME and Insurance Classification

Standard truck meets all applicable mandatory requirements of ASME-B56.1 Safety Standard for Powered Industrial Trucks and Underwriters Laboratories requirements as to fire and electrical shock hazard for "E" classification. For further information contact a Clark representative.

For Your Safety

- **Keep feet, legs and all parts of body inside operator compartment during normal operation.**
- **Look where you drive. Watch for pedestrians. Allow safe stopping distance. Come to a complete stop before leaving operator compartment. Avoid obstructions, especially to the rear and overhead. Avoid drop offs.**
- **Do not operate this truck unless you are trained and authorized. Read, understand and follow instructions in the operator's manual attached to this truck before starting. Clark dealers have replacement manuals.**
- **Perform daily inspection before operating truck. Never operate a truck in need of repair.**

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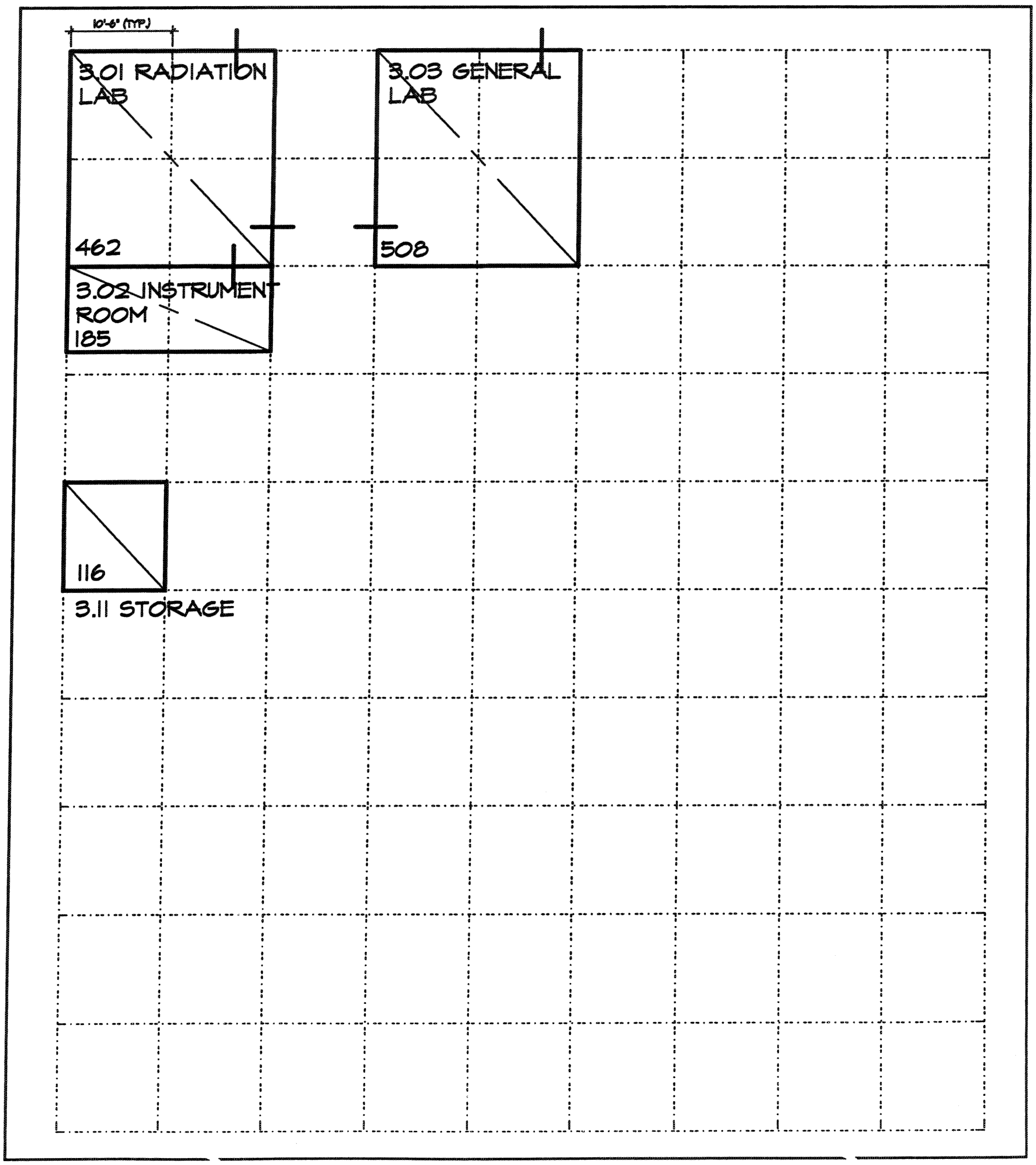
Korea CMHA
Changwon Headquarters
& Manufacturing
#40-1, Ungnam Dong
Changwon-City
Kyungnam, Korea 641-290
82-55-260-9001, 9008
www.clarkmhc.co.kr

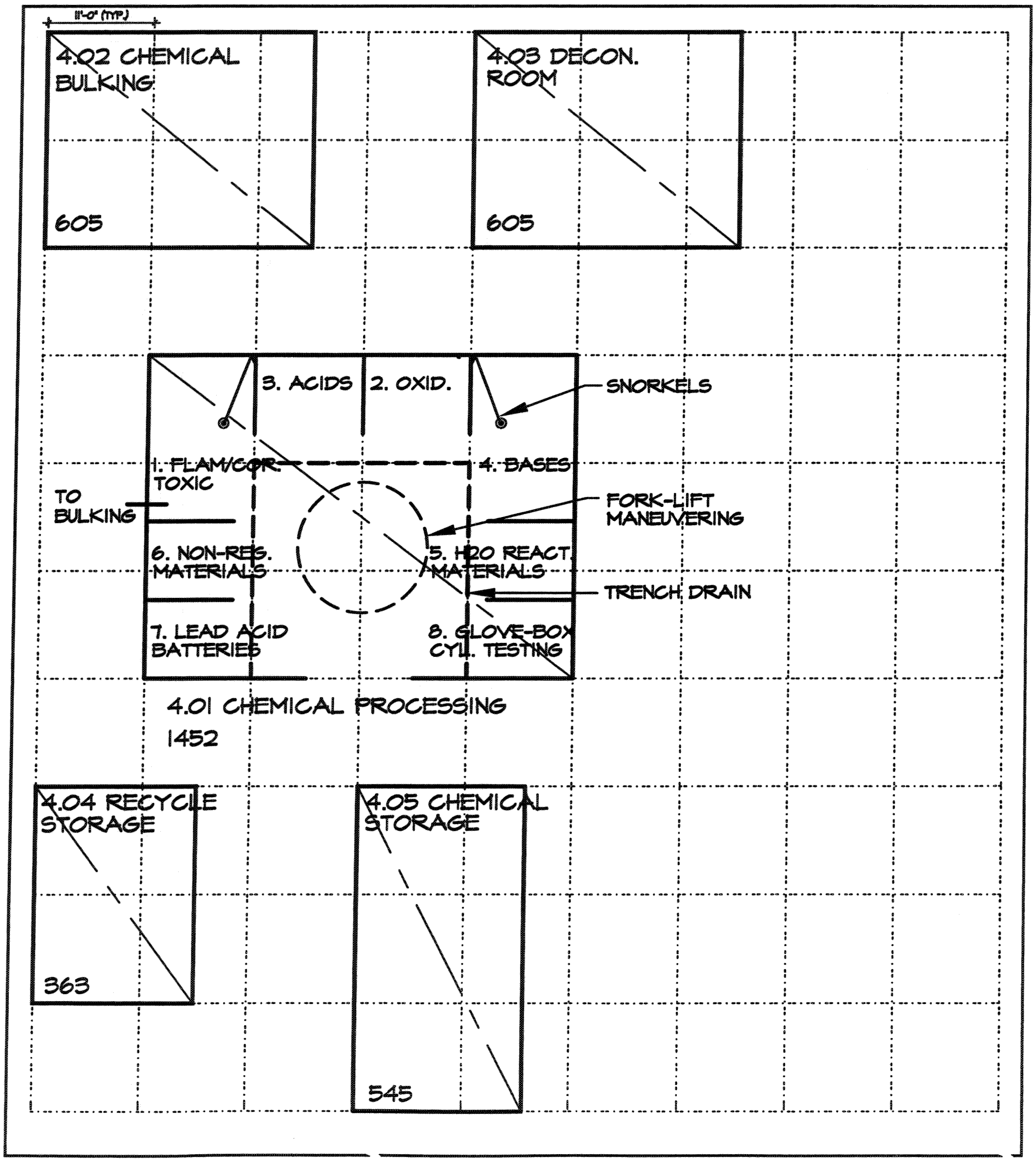
your authorized CLARK dealer is:

NPR 15D/17/20/22/25 NSR 22/25 Specification Sheet
59-894-1052 Printed in USA CCIrev0104

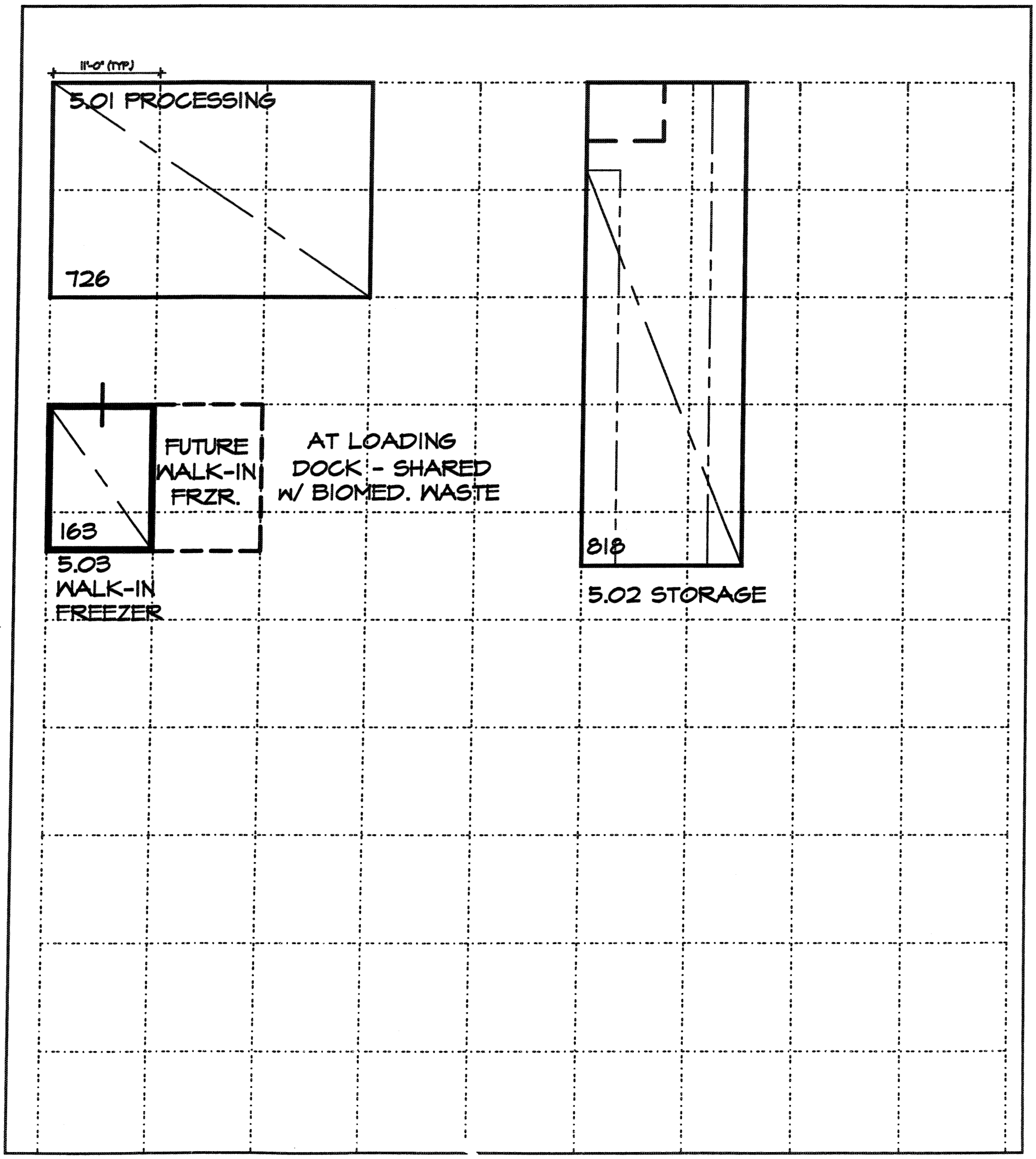
3. LABORATORIES



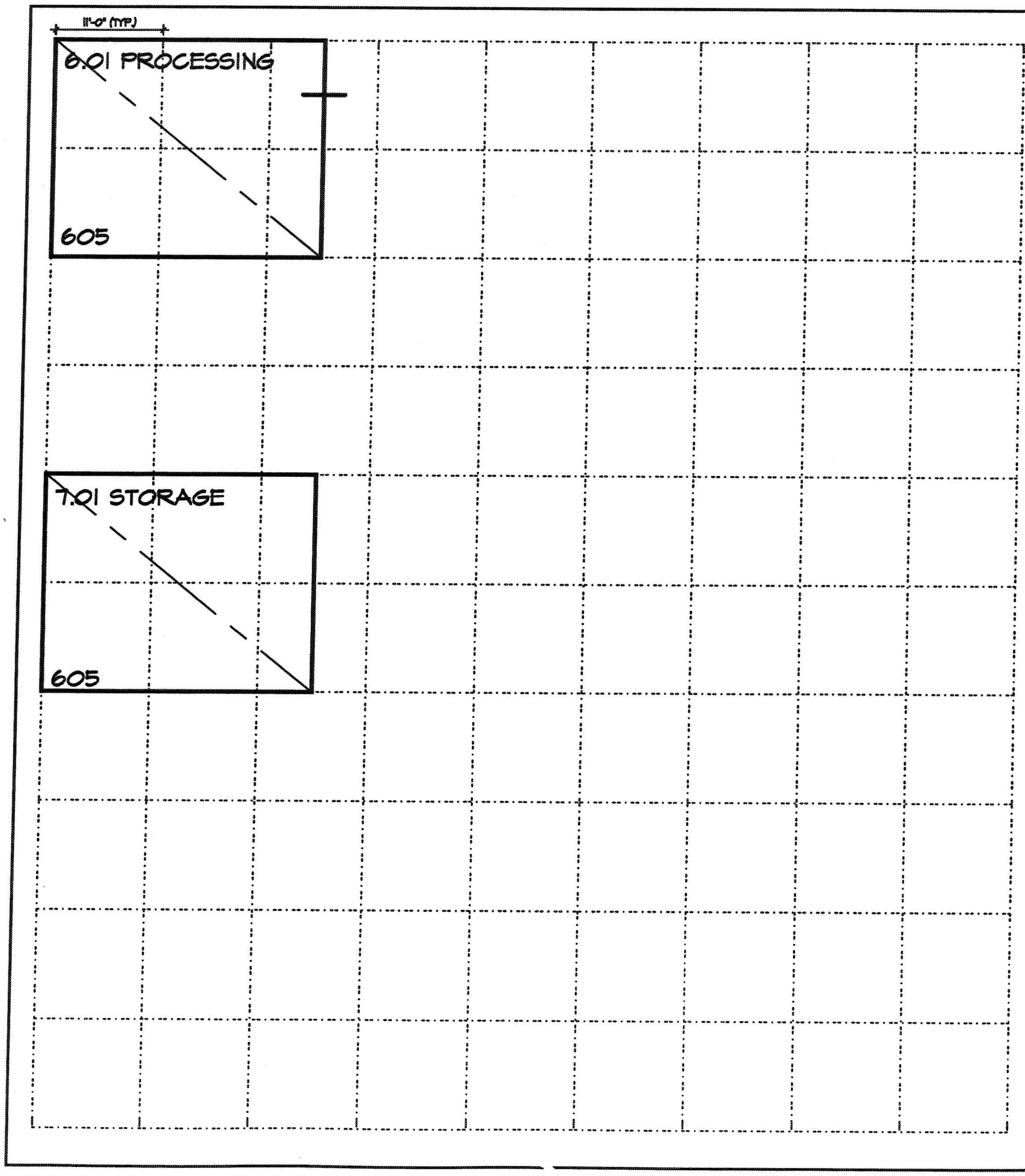
4. CHEMICAL WASTE



5. RADIATION WASTE



6. BIOMEDICAL WASTE
7. UNIVERSAL WASTE



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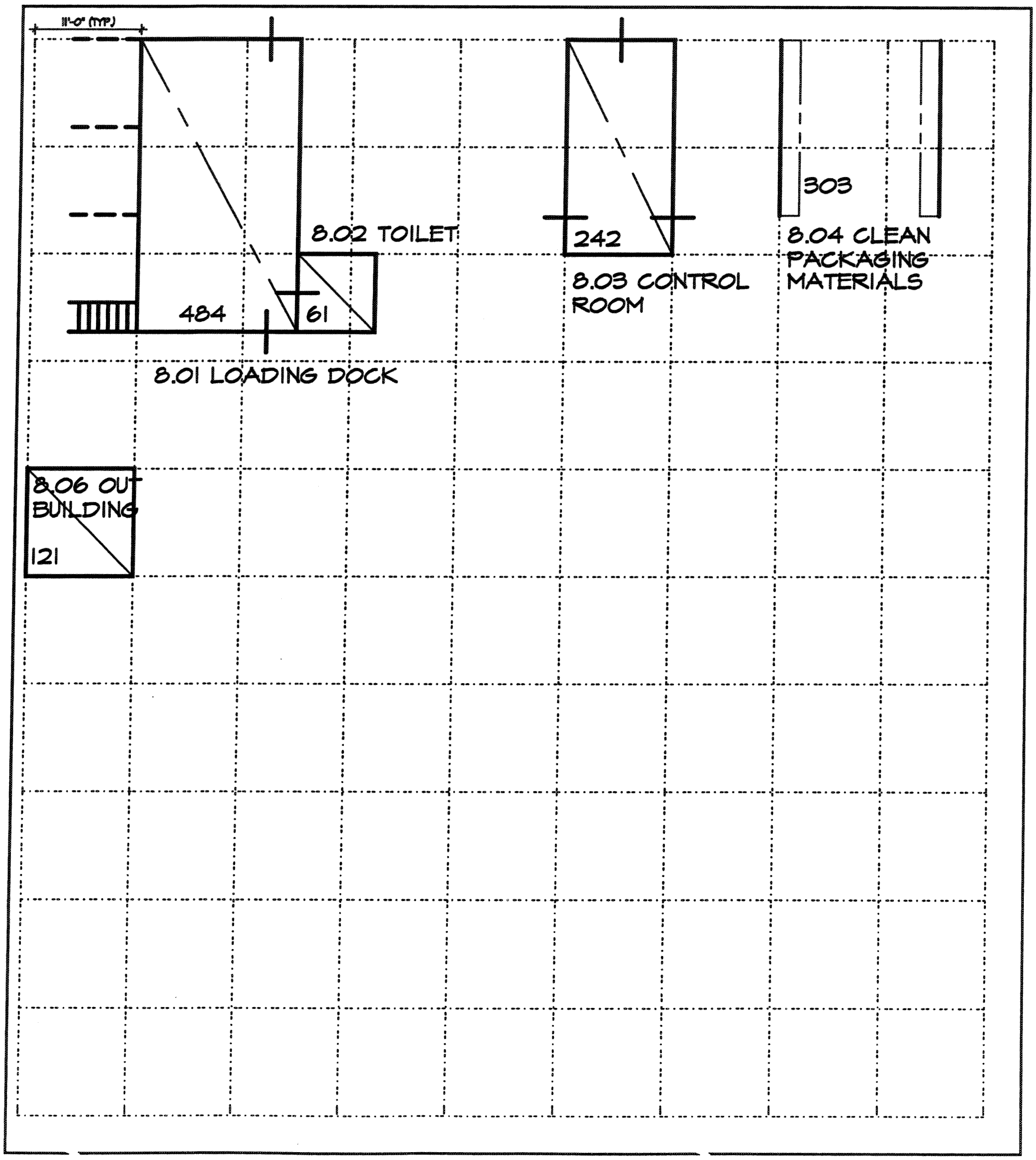
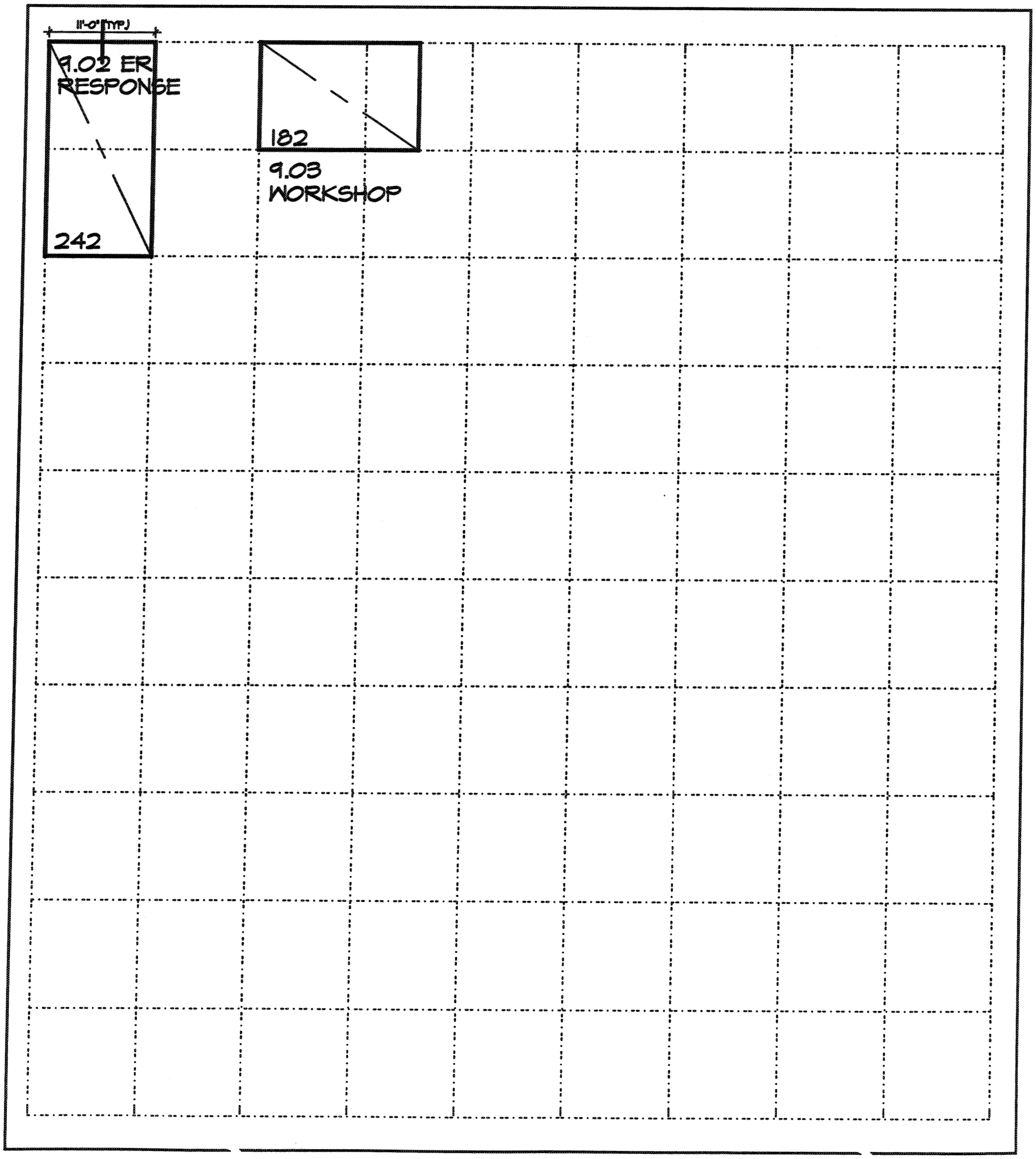
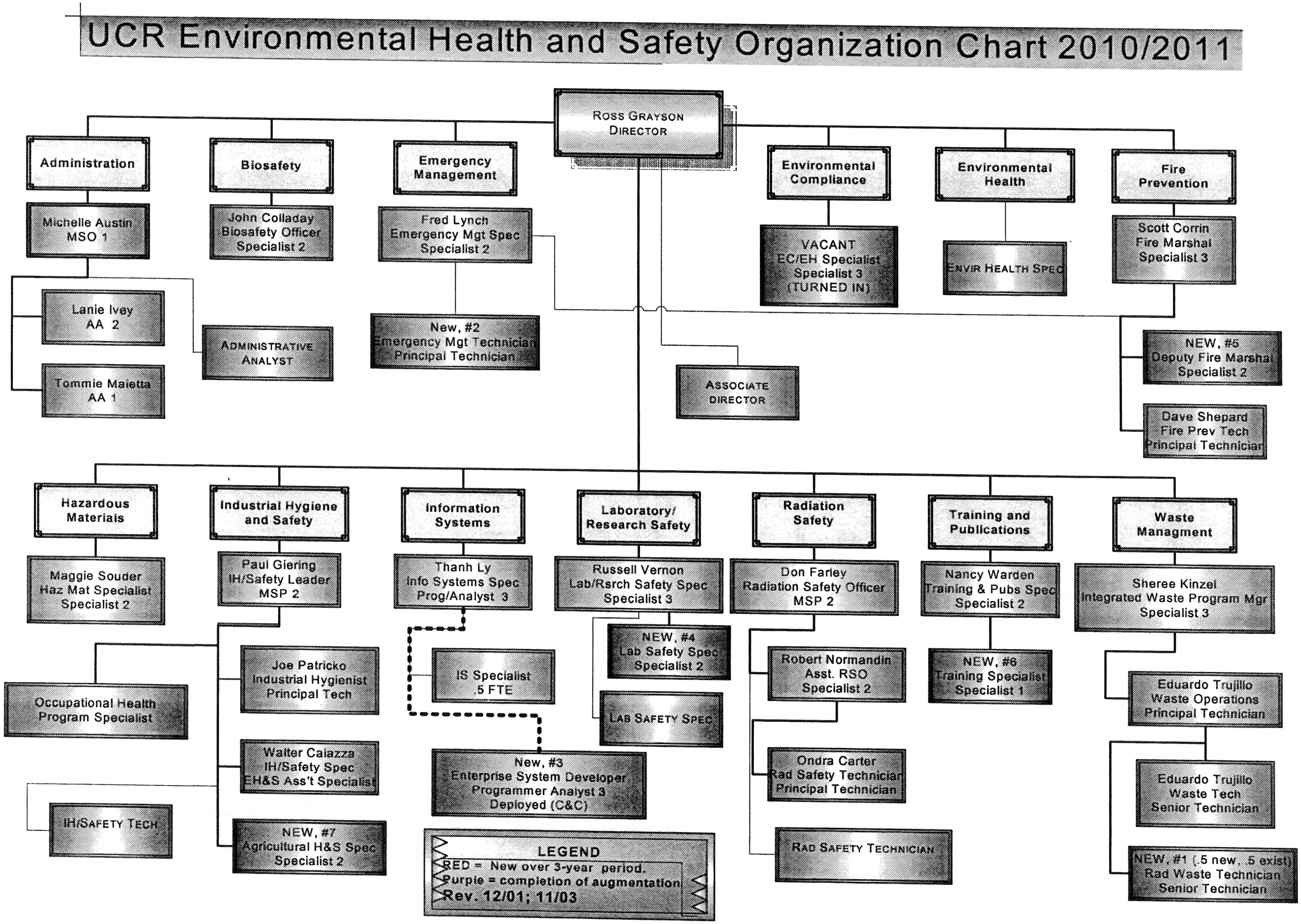


9. BUILDING SUPPORT



User provided
background documents


UCR Environmental Health and Safety Organization Chart 2010/2011
Ross Grayson Director
Administration
Michelle Austin MSO 1
Lanie Ivey AA 2
Tommie Maietta AA 1
Administrative Analyst
Biosafety
John Colladay Biosafety Officer Specialist 2
Emergency Management
Fred Lynch Emergency Mgt Spec Specialist 2
New, #2 Emergency Mgt Technician Principal Technician
Associate Director
Environmental Compliance
VACANT EC/EH Specialist Specialist 3 (TURNED IN)
Environmental Health
Envir Health Spec
Fire Prevention
Scott Corrin Fire Marshal Specialist 3
NEW, #5 Deputy Fire Marshal Specialist 2
Dave Shepard Fire Prev Tech Principal Technician
Hazardous Materials
Maggie Souder Haz Mat Specialist Specialist 2
Industrial Hygiene and Safety
Paul Giering IH/Safety Leader MSP 2
Occupational Health Program Specialist
Joe Patricko Industrial Hygienist Principal Tech
Walter Calazza IH/Safety Spec EH&S Ass't Specialist
IH/Safety Tech
NEW, #7 Agricultural H&S Spec Specialist 2
Information Systems
Thanh Ly Info Systems Spec Prog/Analyst 3
IS Specialist .5 FTE
New, #3 Enterprise System Developer Programmer Analyst 3 Deployed (C&C)
Laboratory/ Research Safety
Russell Vernon Lab/Rsrch Safety Spec Specialist 3
NEW, #4 Lab Safety Spec Specialist 2
Lab Safety Spec
Radiation Safety
Don Farley Radiation Safety Officer MSP 2
Robert Normandin Asst. RSO Specialist 2
Ondra Carter Rad Safety Technician Principal Technician
Rad Safety Technician
Training and Publications
Nancy Warden Training & Pubs Spec Specialist 2
NEW, #6 Training Specialist Specialist 1
Waste Managment
Sheree Kinzel Integrated Waste Program Mgr Specialist 3
Eduardo Trujillo Waste Operations Principal Technician
Eduardo Trujillo Waste Tech Senior Technician
NEW, #1 (.5 new, .5 exist) Rad Waste Technician Senior Technician
LEGEND
RED = New over 3-year period.
Purple = completion of augmentation
Rev. 12/01; 11/03

PROPOSED FACILITY:

■1. Administration
■2. Learning Center
■3. Laboratories
■4. Waste Management
■5. Yard
■6. Emergency Management
■7. Specialized Requirements
■8. Environmental/Safety Systems

The requirements for each area of the proposed facility is described below, a general summary is included in Attachment III.

■1. Administration

- **Office Complex** total ft^2

  1 - Directors office with about 240 ft^2 of floor space. Work space to include: desk/counter space, file/supply storage, conference table, white board,.

  6 - MSO/Managers offices, each with about 120 ft^2 of floor space with door. Work space to include: desk/counter space, white board, file/supply storage,.

  28 - Technologist/technician cubicles, each with about 80 ft^2 of floor space. Work space to include: desk/counter space, white board, file/supply storage,.

  4 - Student workstations, each with about 40 ft^2 of floor space. Work space to include: desk/counter space, file storage, computer with server and Internet hookups and electrical outlets.

  Office Support Area with about 200 ft^2 of floor space. This area to house files, printer, mail, copier, fax, supplies and possibly a charger for radio batteries. To be equipped with files and storage cabinets/shelves, work decks, mail slots, electrical outlets, phone, server and Internet hookups.

- **Technology Requirements**
  1. Central computer/server room
  2. PA/Intercom system
  3. Security System
  4. Cable Television
  5. Satellite receiver

- **Information Technology total** 250 ft^2

  Computer Support Area with about 150 ft^2 of floor space. Equipped with electrical outlets, centralized hubs for all server connections, failsafe power, vault for backups, security system, HVAC to maintain optimal environmental conditions and alarm to police if HVAC fails. Adjacent office for IT staff

- **Technical Library/Conference Room** 500 ft^2

  Equipped with, ability to control the light level in the room, AV equipment and Internet capability (e.g., VCR, DVD, computers, server connection, projection video, screen, overhead projector, white board, and storage shelves/cabinets)

- **Plan Review Area** 800 ft^2

  Equipped with plan review tables, plan storage, CAD station, server connection, . . .

- **Restrooms/Break Area** 600 ft^2

  Usual requirements, but also with electrical outlets and space for a refrigerator, coffee maker and microwave oven.

- File storage/archiving 200 ft^2

  File storage room for archiving miscellaneous mandated record retention

- **Custodial Closet**
  1. **For Physical Plant in Administrative part of the building**
  2. **For EH&S in Waste portion of the building**

- **Communications hub**

2. Learning Center

- **Learning Center/Training/Conference Rooms** total 2000 ft^2

  1 - Training room to accommodate -50-75: 1200 $ft^{2????}$
  1 – Training room to accommodate 20-30 people 500 sq ft
  1 - Training room to accommodate 6-8: 200 ft^2
  1 - Central projection room 100 sq ft

Each room equipped withmodern classroom training equipment, ability to control the light level in the room, AV equipment and Internet capability (e.g., VCR, DVD, computers, server connection, projection video, screen, overhead projector, white board, and storage shelves/cabinets)

■3. Laboratories

- **Laboratories**

The laboratories should be isolated from the processing/storage space by concrete blast/radiation shielding walls (to shield counting equipment and personnel).
Floors to have a surface that is: chemical resistant, impermeable and without seams or cracks.

Lab quality HVAC, (humidity controlled and filtered), compressed gas cylinder storage (exterior), outfitted with chemical resistant deck, hot and cold water, sink, fume hoods, storage cabinets, emergency shower/eyewash units, sufficient capacity electrical outlets, storage drawers and shelves, server connection and phone access, compressed air, vacuum and natural gas

Industrial Hygiene Area: total 700 ft^2

IH lab: Approximately 600 ft^2 :
This area will provide space for instrumentation and analytical operations related to environmental monitoring (e.g., air sampling, etc.), hazardous chemicals identification/analysis, respiratory protection (service, test, and fit-testing on users), and other industrial hygiene analyses.

IH Tech Office Area: 100 ft^2 :
These spaces are to be located close to related laboratory activities. They provide for the necessary office and file needs associated with the laboratory activity.

Radiation Safety Area: total 830 ft^2

Rad Safety, Wet Chemistry/Thyroid Uptake/Sample Prep And Analysis Lab: 400 ft^2
This area will provide space for radiation protection, related support activities and sample preparation/wet chemistry laboratory facilities. It must be radiation shielded

The area must be divided into three separate work areas. One work area for sample preparation and the other for sample analysis and thyroid uptake counting. Additional requirements include: for the sample analysis area, shielding to protect counting equipment from radiation sources in adjacent areas and provision for at least three compressed gas cylinders.

Radiation Safety Tech Office Area: 100 ft^2 : These spaces are to be located close to related laboratory activities. They provide for the necessary office and file needs associated with the laboratory activity.

Radiation Instrument Calibration Area: 200 ft^2 :
For calibrating radiation survey instruments, located with easy access to the Radiation Safety lab and is equipped with desk, storage drawers and shelves. In addition, depending on its location within the facility, significant radiation shielding may be required. Shielding must be specified after the location within the building is established.

Receiving Area For Radioactive Materials: 80 ft^3 :
For the purpose of receiving and monitoring shipments of radioactive materials, located with easy access to the Radiation Safety lab and loading dock, requires deck to support shielding with electrical outlets, server connection, storage drawers and shelves, hood, 2" L-block shield with shielded viewing, phone access, freezer storage (about 20 ft^3) and refrigerator storage (about 5 ft^3)

Radioactive Source Storage Area: 50 ft^2 :
For the storage of sealed sources and located with easy access to the Radiation Safety lab, requires electrical outlets, shelves and shielding as specified by the RSO is required.

Biosafety Area: total 250 ft^2

Biosafety Lab: 150 ft^2 : This area will provide space for instrumentation and analytical operations related to environmental monitoring and testing (e.g., autoclave, etc.) related to this program.

Biosafety Tech Office Area: 100 ft^2 : These spaces are to be located close to related laboratory activities. They provide for the necessary office and file needs associated with the laboratory activity, located with easy access to the Biosafety lab,.

Fire And Emergency Management Area: total 860 ft^2

Fire Prevention Equipment Operations: 700 ft^2 : This area will provide space for instrumentation and equipment related to this program (e.g., maintenance of fire extinguishers, etc.).

Fire Tech Office Area: 100 ft^2 : These spaces are to be located close to related laboratory activities. They provide for the necessary office and file needs associated with the laboratory activity, located to have easy access to Fire and Emergency Management area, requires storage drawers and shelves, electrical outlets server connection and phone access.

Recharge Area For Radio Batteries: Requires a few cubic feet at a central location, possibly the Office Support Area.

Environmental Programs Area: total 250 ft^2

Environmental Programs Lab: 150 ft^2 : This area will provide space for instrumentation and analytical operations related to environmental monitoring (e.g., water quality, etc.) related to this program. .

Environmental Programs Tech Office Area: 100 ft^2 : These spaces are to be located close to related laboratory activities. They provide for the necessary office and file needs associated with the laboratory activity, located to have easy access to Environmental Programs lab

4. Waste Management

- **Waste Management Area** 8,560 ft^2 waste management
  Waste Management Area: total 8,560 ft^2

This area will provide space for all aspects of waste management including: receipt and processing of materials and the instrumentation and analytical operations related to this program (e.g., HAZCAT, etc.).

To minimize decontamination efforts, floors to have a surface that is: mechanically durable (can withstand heavy use related to the handling of barrels and other heavy equipment), chemically resistant, and impermeable, without seams or cracks and extends up adjacent walls.

Loading Dock And Staging Area: 400 ft^2
: The loading dock is required to provide proper material handling mainly between the waste storage areas and the commercial transport vehicles used to ship materials off campus for final disposal.

Covered and equipped with two variable height (desired??) loading docks that can accommodate large tractor-trailers. Be compatible with the use of a forklift (???do we want a forklift???). Ramp or other means that will allow a forklift to travel from the loading dock to the service yard. The “staging area” to be configured with respect to processing and storage areas such that materials and/or waste arriving at and/or leaving the facility can be handled without cross contamination.

Sharable Chemicals Storage Area: 1,000 ft^2
is designed to allow segregation of chemicals into at least 5 hazard groups (areas), two of the areas (flammables and toxics) must satisfy H occupancy requirements. Other requirements include: shelving, spill containment in each of the 5 segregation areas, explosion proof refrigerators/freezers and adequate ventilation.

Hazardous Waste Lab: 200 ft^2
Used to perform analytical tests required by this program. Located to have easy access to Waste Management area, the laboratory should be isolated from the processing/storage areas by concrete blast walls and be outfitted with chemical resistant deck, sink, fume hoods, emergency shower/eyewash units, lab quality HVAC, hot and cold water, sufficient capacity electrical outlets, storage drawers and shelves, server connection and phone access, compressed air, vacuum and natural gas.

Integrated Waste Office Area: 200 ft^2 :
These spaces are to be located central to all waste areas with visual access in all directions. They provide for the necessary office and file needs associated with the activity. .

Locker Rooms: 700 ft^2:
These facilities must be adjacent to the processing areas to maintain personal hygiene, prevent contamination transfer to the work areas, and to meet regulations for carcinogen handling. Area to be equipped with restrooms, lockers, shower, washer, dryer, storage, etc.

Waste Processing Facility: total 2,400 ft^2
In this facility waste will be processed and packaged in preparation for shipment to an appropriate disposal site, so has many specialized requirements. The general requirements for this facility include:

- Appropriate fire suppression/detection system;
- Appropriate security system;
- Intrusion, fire, toxic materials, and radiation alarm systems hardwired to campus appropriate central campus location
- Separate storage areas for non-compatible materials;
- Spill containment in each of the separate storage areas;
- Spill containment via floor grates to in-floor sumps;
- Provide fume hoods in each work area
- Provide localized exhaust as required for high risk operations
- Adequate ventilation to maintain a safe work environment
- Heating and cooling sufficient to maintain a working and storage environment between 60° and 80° Fahrenheit and between ___ % and ___ % relative humidity.
- Lab benches, storage cabinets, wall shelves, sinks with hot and cold water, fume hoods (include walk-in fume food and other local exhaust ventilation systems)
- Emergency eyewashes and showers
- Provide concrete walls for blast protection and radiation shielding for occupied areas surrounding areas where hazardous materials are used or stored
- Provide explosion-proof electrical fixtures in all areas where hazardous materials area used or stored.
- Each storage area for holding hazardous materials/waste must be constructed on a concrete slab with drainage directed to a designated/isolated sump.

- Hazardous materials/waste storage areas must be fenced for security, covered for weather protection, and surrounded by berms sufficient to contain the total waste handling capacity of the facility.

Waste *processing*:

- Chemical Waste: 1,200 ft^2
  - Lab packing
  - bulking area
  - acid neutralization area
  - Bases
  - Flammable liquids

- Universal Waste: 500 sq ft
  - Computer monitors
  - Batteries
  - Other

- Fluorescent lights: 500 sq ft

- Radioactive Waste: 900 ft^2
  - radioactive materials compactor with localized exhaust that has HEPA filtration
  - freezer storage unit
  - shielded radioactive materials storage areas
  - shielded work areas

- Biohazardous/Medical Waste: 300 ft^2
  - Include freezer storage unit

Waste Storage: total 3,560 ft^2:
In this part of the facility, packaged waste will be stored until it can be shipped for final disposal.

With the exception that storage shelves will replace lab benches, the requirements for this area are similar to those specified for the "waste processing" area above.

Waste storage will be segregated into areas as follows:

- Hazardous Waste Storage Area: 1,500 ft^2
  - compressed gas storage cabinets: at least two, 10 ft^2 /each with exhaust ventilation
  - drum storage area

- Radioactive Waste Storage Area: 1,300 ft^2

  - Long Half-Life Radioactive Waste Decay Storage Area: 500 ft^2
    freezer storage 60 ft^3
    shielded radioactive materials storage areas
  - Short Half-Life Radioactive Waste Decay Storage Area: 800 ft^2
    freezer storage 60 ft^3
    shielded radioactive materials storage areas

- Biological hazardous/Medical Waste Storage Area: 200 ft^2:
  - freezer storage: 60 ft^3

- Waste Supplies Storage Area: 500 ft^2

5. Yard

- **Service Yard**

Total area dependant on configuration. A fenced, secured, lighted and paved (preferably concrete) area that provides: access to loading docks by large tractor-trailers, access to emergency response equipment, service access to the facility, parking for university vehicles and an area to stage shipments of waste and supplies to and from the facility. This area can also serve as a staging area for emergency response activities that involve outside agencies or as a focus for community outreach activities such as a household hazardous waste program.

- **Public and Staff Parking Area**

Staff parking: This parking area should be located near the office complex and separated from service areas. At this location there should be sufficient parking for most staff (staff often use their own cars to travel around campus).
Visitor parking:about 6 visitors.
Department vehicles
Waste transport
Service
Carts: covered parking for six (6) carts with recharge station

6. Emergency Management

Seismic criteria

Storage For Emergency Response Gear: 200 ft^2 located with easy access from outside the building. Requires storage shelves and electrical outlets required.

Emergency Operations Center (Learning Center)

Emergency Generator

7. Specialized Requirements

- **Facility Support** (e.g., utilities, HVAC):

  Mechanical rooms that house HVAC and utilities (e.g., electrical power, gas, communications) for the facility. Areas must be secure, and have access that is separate from that for public areas.

8. Environmental/Safety Systems

Sustainability
Emergency event
Fireflow containment
Fire supression
Alarm systems
Concrete sealants
Trench trains

EH&S Proposed Facility, Lab Portions

Laboratories

The laboratories should be isolated from the processing/storage space by concrete blast/radiation shielding walls (to shield counting equipment and personnel).
Floors to have a surface that is: chemical resistant, impermeable and without seams or cracks.

Lab quality HVAC, (single-pass, humidity controlled and filtered), compressed gas cylinder storage (exterior), outfitted with chemical resistant deck, hot and cold water, sink, fume hoods, storage cabinets, emergency shower/eyewash units, sufficient capacity electrical outlets, storage drawers and shelves, server connection and phone access, compressed air, vacuum and natural gas.
All areas should include consideration for the accessibility of disabled persons, rounded corners, height adjustable space, electric panels near the labs and a centrally located indicator panel for the status of the building systems (viz. HVAC, electricity, data, compressed air, vacuum, natural gas)

Industrial Hygiene Area: total 700 ft^2
Industrial Hygiene lab: Approximately 600 ft^2 :
This area will provide space for instrumentation and analytical operations related to environmental monitoring (e.g., air sampling, etc.), hazardous chemicals identification/analysis, respiratory protection (service, test, and fit-testing on users), and other industrial hygiene analyses. Fume hood for calibrations

Radiation Safety Area: total 910 ft^2
Rad Safety, Wet Chemistry/Thyroid Uptake/Sample Prep And Analysis Lab: 400 ft^2
This area will provide space for radiation protection, related support activities and sample preparation/wet chemistry laboratory facilities. It must be radiation shielded Two hoods are needed, one in the wet chem./sample prep./analysis lab and one in the receiving area for radioactive materials.

The area must be divided into three separate work areas. One work area for sample preparation and the other for sample analysis and thyroid uptake counting. Additional requirements include: for the sample analysis area, shielding to protect counting equipment from radiation sources in adjacent areas and provision for at least three compressed gas cylinders.

Radiation Instrument Calibration Area: 200 ft^2 :
For calibrating radiation survey instruments, located with easy access to the Radiation Safety lab and is equipped with desk, storage drawers and shelves. In addition, depending on its location within the facility, significant radiation shielding may be required. Shielding must be specified after the location within the building is established.

Receiving Area For Radioactive Materials: 80 ft^3 :
For the purpose of receiving and monitoring shipments of radioactive materials, located with easy access to the Radiation Safety lab and loading dock, requires deck to support shielding with electrical outlets, server connection, storage drawers and shelves, hood, 2" L-block shield with shielded viewing, phone access, freezer storage (about 20 ft^3) and refrigerator storage (about 5 ft^3)

Radioactive Source Storage Area: 50 ft ^{2}: MAYBE IN WASTE HANDLING AREA
For the storage of sealed sources and located with easy access to the Radiation Safety lab, requires electrical outlets, shelves and shielding as specified by the RSO is required.

Biosafety Area: total 250 ft^2
Biosafety Lab: 50 ft ^{2}: This area will provide space for instrumentation and analytical operations related to environmental monitoring and testing (e.g., autoclave, etc.) related to this program. Access to a 6' length of bench space, and refrigerator storage.

Environmental Programs Area: total 250 ft^2
Environmental Programs Lab: 150 ft ^{2} : This area will provide space for instrumentation and analytical operations related to environmental monitoring (e.g., water quality, etc.) related to this program.

It was discussed to have the IH/Bio and Environmental Programs labs collocated and expanded slightly to call it a 'General Use' or 'Chemistry' lab. This area would need one 6' fume hood and about 20 linear feet of bench space plus above and below bench storage cabinets and flammable & corrosive cabinets.

Office & Occupational Exam Facilities

Industrial Hygiene Technician Office & Occupational Exam Area: 100 ft ^{2}:
1. These spaces are to be located close to related laboratory activities. They provide for the necessary office and file needs associated with the laboratory activity; for respiratory fit tests.

Ergonomic Demonstration Area for Offices & Labs: 150 ft ^{2}:
Lab type bench area, partial mock fume hood, desk and cubicle areas for work station demonstrations

Radiation Safety Technician Office Area: 100 ft ^{2}: These spaces are to be located close to related laboratory activities. They provide for the necessary office and file needs associated with the laboratory activity.

Biosafety Tech Office Area: 100 ft ^{2}: These spaces are to be located close to related laboratory activities. They provide for the necessary office and file needs associated with the laboratory activity, located with easy access to the Biosafety lab.

Fire Technician Office Area: 100 ft^2: These spaces are to be located close to related laboratory activities. They provide for the necessary office and file needs associated with the laboratory activity, located to have easy access to Fire and Emergency Management area, requires storage drawers and shelves, electrical outlets server connection and phone access.

Environmental Programs Technician Office Area: 100 ft ^{2} : These spaces are to be located close to related laboratory activities. They provide for the necessary office and file needs associated with the laboratory activity, located to have easy access to Environmental Programs lab

Fire And Emergency Management Area: total 860 ft^2

Fire Prevention Equipment Operations: 700 ft ^{2} : This area will provide space for instrumentation and equipment related to this program (e.g., maintenance of fire extinguishers, etc.). Shop-type

6' bench workspace and cabinets and shelves for storage of back-up fire extinguishers and supplies

Recharge Area For Radio Batteries: Requires a few cubic feet at a central location, possibly the Office Support Area.

Storage Facilities

Adjacent to lab areas is needed for all program areas for lab supply storage, record storage and non-hazardous equipment storage. Total square footage of the lab areas could be diminished with co-locating the compatible functions and increasing the adjacent storage areas.

Learning Center Design Requirements

for New EH&S Facility

1 training room to accommodate 6-8 people

Potential uses for room

- Mini computer lab so that those without access to a computer can participate in web based training
- Small instructor-led training sessions
- Room for breakout sessions from sessions held in larger rooms
- Miscellaneous meetings
- Extra workstations for student help if needed
- Separate room for Policy Group as needed in a campus emergency

Media/Technology

- 6-8 computers around perimeter of room
  - flat screen monitors
  - internet access
  - headphones
- 1 computer for instructor
  - flat screen monitors
  - internet access
- Ceiling mounted LCD projector
- Projection Screen (electronic)
  - Go to Sizing projection screens for video projection file at http://www.classroomdesignforum.org/pages/
  - Go to Determining the throw distance for LCD projectors file at http://www.classroomdesignforum.org/pages/
- Ceiling mounted TV/VCR/DVD
  - cable access
  - flat screen monitor
- Computer tablet (instead of whiteboard)
  - Hitachi Starboard web page at http://www.hitachi-soft.com/starboard_1.1.3.htm
- Console to control technology at front of room, or built into the front of the room
- White boards in front and back of the room.
  - Dual whiteboards that slide up or down to provide more working space without having to erase the board might be better
- Lighting that provides maximum flexibility for all room uses

Furniture

- Computer workstations running along two sides of the room

    - Keyboard trays that pull out
- Fully adjustable ergonomic chairs for computers
- 4-6 tables together in the center of the room (giving the appearance of one long table) for meetings.
    - Tables need to be built so that the legs are on the ends of the table allowing two people to sit at each table comfortably
        - See example of table from Virginia Polytechnic Institute and State University at http://www.edtech.vt.edu/edtech/torgersen/1060a.jpg
        - Tables may need to be collapsible
- Ergonomic conference room chairs for tables in the middle of the room
    - Chairs should be appropriate for function
- Locking storage cabinet for classroom supplies

Room Layout

This room would have a more permanent layout because of the computers and the smaller space.

- See room layout from Duke. Duke classroom layout at http://www.aas.duke.edu/classrooms/icc/wd106layout.jpg
    - With the exception of having computers along three of the walls, the layout shown would work well for this room.
- Door should be at the back of the room, with at least a small window panel to allow people to see into the room without opening the door
- Room should have a high ceiling

1 training room to accommodate 20-30 people

Potential uses for the room

- EH&S instructor-led training sessions including CPR/First Aid training
- Computers for web based training as needed for those without computer access
- Miscellaneous meetings
- Video conferencing
- Department Safety Coordinator/BSEC meetings
- Emergency Operations Center or EOC breakout room

Media/Technology

- 10 - 15 computers along 2 walls of the room (maybe laptops instead?)
    - flat screen monitors
    - internet access
    - headphones
- 1 computer for instructor
    - flat screen monitors
    - internet access
- Ceiling mounted LCD projector
- Video camera
- Wireless microphone system (to be used for videoconferencing, videotaping purposes)
- Projection Screen (electronic)
    - Go to Sizing projection screens for video projection file at http://www.classroomdesignforum.org/pages/
    - Go to Determining the throw distance for LCD projectors file at http://www.classroomdesignforum.org/pages/
- Ceiling mounted TV/VCR/DVD
    - cable access
    - flat screen monitor
- Computer tablet (instead of whiteboard)
    - Hitachi Starboard web page at http://www.hitachi-soft.com/starboard_1.1.3.htm
- Console/lectern to control technology at front of room, or built into the front of the room
- White boards in front and back of the room.
    - Dual whiteboards that slide up or down to provide more working space without having to erase the board might be better
    - Both should have a strip running along the top of the whiteboard that will allow for tacking up paper
- Lighting that provides maximum flexibility for all room uses

Furniture

- Computer workstations running along two sides of the room
    - Keyboard trays that pull out
    - 6 EOC workstations "built-in", hidden behind perimeter casework
- Fully adjustable ergonomic chairs for computer workstations
- Ergonomic conference room chairs for tables
    - Chairs should be appropriate for function
- 15 tables that will seat two people
    - Tables need to be built so that the legs are on the ends of the table allowing two people to sit at each table comfortably
        - See example of table from Virginia Polytechnic Institute and State University at http://www.edtech.vt.edu/edtech/torgersen/1060a.jpg
        - Tables may need to be collapsible

Classroom Layouts

This room will need to be able to have multiple layouts depending on the training or event. To have that flexibility will require smaller tables that can be moved easily. In circumstances such as the CPR/First Aid training, tables must be moved back to have adequate floor space for the hands-on practice required within the course.

- Room layout options. See the examples of classroom layouts at http://www.ists.unimelb.edu.au/ts/seating.htm for a description of the different layout types.
    - U- Shaped
    - Theater style – no tables
    - Boardroom
    - Classroom
    - Café
- Door should be at the back of the room, with at least a small window panel to allow people to see into the room without opening the door
- Room should have a high ceiling, using upper wall space for lockable EOC storage/supplies, clearstory windows above
- Attached room for storage space for unused table/chairs

1 training room to accommodate 50-75 people

Potential uses for the room

- EH&S instructor-led training sessions including CPR/First Aid training
- Computers for web based training as needed for those without computer access
- Miscellaneous meetings
- Video conferencing
- Department Safety Coordinator/BSEC meetings
- Emergency Operations Center

Media/Technology

- Ability to plug in laptops throughout room (floor outlets/ports)
- 1 computer for instructor
    - flat screen monitor
    - internet access
- Ceiling mounted LCD projector
- Video camera
- Wireless microphone system (to be used for videoconferencing, videotaping purposes)
- Projection Screen (electronic)
    - Go to Sizing projection screens for video projection file at http://www.classroomdesignforum.org/pages/
    - Go to Determining the throw distance for LCD projectors file at http://www.classroomdesignforum.org/pages/
- Ceiling mounted TV/VCR/DVD
    - cable access
    - flat screen monitor
- Computer tablet (instead of whiteboard)
    - Hitachi Starboard web page at http://www.hitachi-soft.com/starboard_1.1.3.htm
- Console/lectern to control technology at front of room, or built into the front of the room
- White boards in front and back of the room and possible along all sides of room.
    - Dual whiteboards that slide up or down to provide more working space without having to erase the board might be better
    - Both should have a strip running along the top of the whiteboard that will allow for tacking up paper
- Lighting that provides maximum flexibility for all room uses

Furniture

- Ergonomic conference room chairs for tables
    - Chairs should be appropriate to function
- 25-40 tables that will seat two people

    - Tables need to be built so that the legs are on the ends of the table allowing two people to sit at each table comfortably
        - See example of table from Virginia Polytechnic Institute and State University at http://www.edtech.vt.edu/edtech/torgersen/1060a.jpg
        - Tables may need to be collapsible
- 15 EOC workstations "built-in", hidden behind perimeter casework
- Demountable partitions for creating private corners

Classroom Layouts

This room will also need to be able to have multiple layouts depending on the training or event. To have that flexibility will require smaller tables that can be moved easily. In circumstances such as the CPR/First Aid training, tables must be moved back to have adequate floor space for the hands-on practice required within the course.

- Room layout options. See the examples of classroom layouts at http://www.ists.unimelb.edu.au/ts/seating.htm for a description of the different layout types.
    - U- Shaped
    - Theater style – no tables
    - Boardroom
    - Classroom
    - Café
- Doors should be at the back of the room, with at least a small window panel to allow people to see into the room without opening the door
- Room should have a high ceiling, using upper wall space for lockable EOC storage/supplies, clearstory windows above
- Attached room for storage space for unused table/chairs

1 common lobby for Training/EOC rooms

This room will allow for pre-event gathering/breaks and allow organization to flow of traffic as people come in and leave training sessions.

Furniture

- Carpeted surface for sound control
- None designated

Layout

- This room should have adequate floor space for approximately one half the largest training room occupant load
- Room should have a high ceiling
- Natural lighting, if available, skylight acceptable
- Alcoves desired on perimeter to facilitate framing of pockets in adjacent rooms if required to maximize efficiencies

1 room for training storage

This room will be needed to store chairs and tables and any training equipment that needs to be removed from a room based on what the room use.

Furniture

- Shelving along the walls for organized storage

Layout

- Adequate floor space for equipment to be moved in and out with ease, but also have racks of shelving along the walls to be able to store and organize training materials

1 storage room for EOC related storage

This room will be needed to store general office and three day emergency preparedness supplies for EOC operations, including boxes of water, food, folding cots, and similar

Furniture

- Solid shelving along one wall for organized storage

Layout

- Adequate floor space for equipment to be moved in and out with ease, but also have racks of shelving along one wall to be able to store and access supplies.
- Door should be 4 ft wide, off center on wall, located so not to conflict with shelving
- Room should have a high ceiling

1 common break room for Training/EOC related uses

This room will be needed to provide space for food preparation and seated dining/break use.

Furniture

- Enclosed solid front full height cabinets along one wall for organized storage
- Solid surface counter top, space including sink, cabinet storage above
- Wall mounted shelving for microwave oven (not built-in)
- Floor space for electric stove/oven
- Tables and chairs for 12 seated occupants

Layout

- This room will need to have adequate floor space for 15 persons standing in addition to tables and chairs
- Two doors should be provided, located on opposite ends of walls, or corners
- Room may have an 8ft ceiling
- Natural lighting if available

1 media control room

This room will be needed as the central control room for all the media and technology uses of all three training rooms.

Media/Technology

- Media and technology to support the capabilities needed in all three training rooms

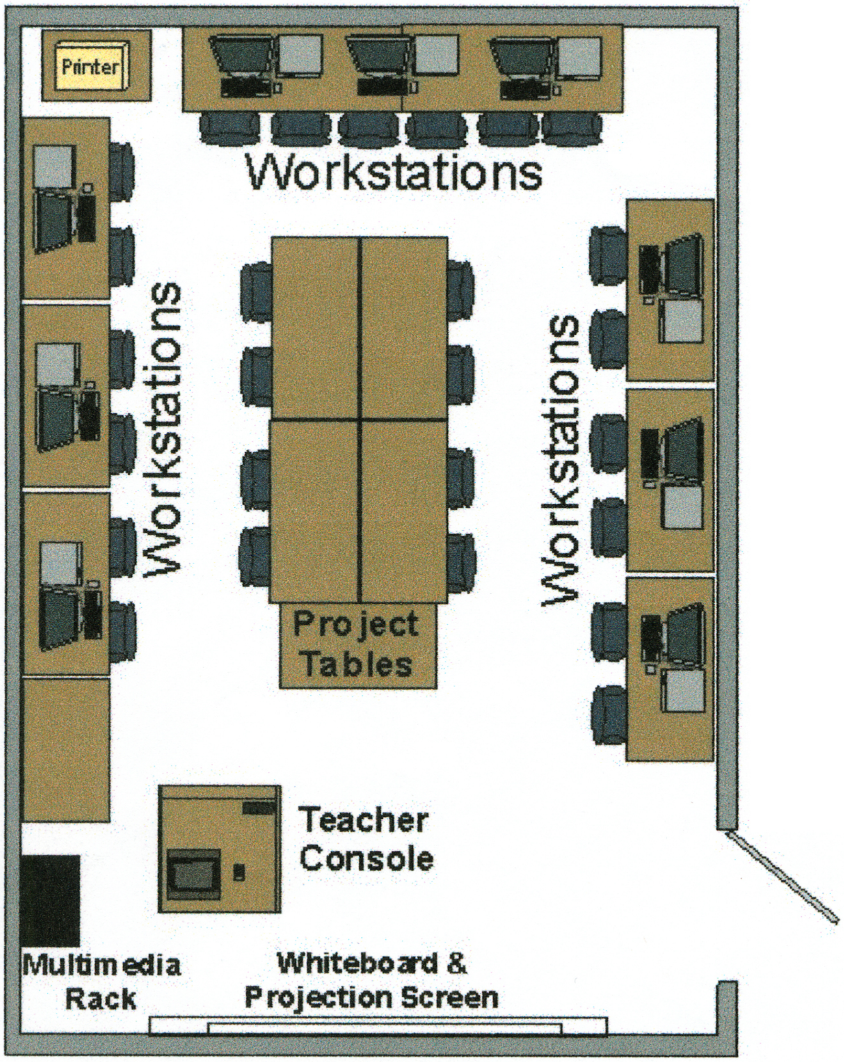
Furniture

- Shelving along the walls for organized storage
- Computer workstations as needed to support existing technology in the other rooms
    - flat screen monitors
    - internet access
    - headphones
- Fully adjustable ergonomic chairs for computers

Layout

- Controls and consoles for all the media and technology used in the three training rooms

Interactive Computer Classroom
West Duke 106



Vernon, Russell

From: Spicer, Michael [MSpicer@FACNET.UCLA.EDU]
Sent: Thursday, March 04, 2004 8:46 AM
To: 'Vernon, Russell'
Cc: Grayson, Ross
Subject: RE: The hazardous materials handling containers we obtained from you

Russ,

The two units that we used for chemical storage and processing have the following measurements:

Size: 52' X 14' X 9' Weight: 37,692 lbs.

Size: 16' X 14' X 9' Weight: 12,986 lbs.

The other unit that radiation safety used (with the A/C unit on the side) has the following measurements:

Size: 42' X 12' X 9' Weight: 29,300 lbs.

Good luck,

Mike

Michael C. Spicer
Hazardous Waste Program Manager
UCLA Office of Environment, Health and Safety
Hazardous Materials Division
501 Westwood Plaza, 4th Floor
Los Angeles, CA 90095
Office (310) 794-5569
Fax (310) 825-7076

-----Original Message-----
From: Vernon, Russell [mailto:Russell.Vernon@ehs.ucr.edu]
Sent: Thursday, March 04, 2004 8:16 AM
To: Spicer, Michael
Cc: Grayson, Ross
Subject: The hazardous materials handling containers we obtained from you

Hi Mike,

With Sheree gone for the next few weeks, I'm trying to review the plans for the concrete pad we are having poured. I found lots of information about the units, including pictures, but I have not been able to locate where Sheree has the dimensions. Can you tell me the lengths and widths of the three containers you gave us?

Thanks!
-Russ

Russell Vernon, Ph.D.
Laboratory / Research Safety Specialist
Environmental Health & Safety
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Admin: (909) 787-5528 [becomes (951) 827-5528]
Fax: (909) 787-5122 [becomes (951) 827-5122]

Safety Storage Information:

A. Foundation each unit must be located on a level surface that is able to handle a maximum load capacity for each building.

Unit 2C maximum load capacity – 190,000 lbs
Unit 3 maximum load capacity – 300,000 lbs
Unit 6 maximum load capacity – 84,000 lbs.

B. On-load and Off-load each unit upon arrival to and from the transport vehicle. A crane with spreader bars 7 straps is recommended. The crane should be a minimum of twice the tare weight capacity of each structure. A professional rigging company should be used. Safety Storage, Inc. to provide offloading suggestions only & will accept no liability on-loading or off-loading of the structures.

C. Hook-up the electrical Power to the exterior load center. The following are the amps & surges of each electrical option: Above Load Center in each unit sits Relay Box(es) that house the Alarm Dry Contacts for the separate alarm requirements.

Unit 2: (One-room) 3-phase load center
Three (3) 300 Watt Lights – 7.5 amps each x three (3) = 7.5 amps with a surge of 9.375 amps
Three (3) Fan – 4.5 amps each x three (3) = 13.5 amps with a surge of 16.875 amps
One (1) DCB Alarm = 0.07 amps with total surge of .09 amps
One (1) emergency Alarm Horn = .07 amps with surge of .09 amps
One (1) smoke alarm = 0.07 amps with surge of .09 amps
One (1) drum Pump = 2 amps with surge of 2.5 amps
One (1) sump Pump = 2 amps with surge of 2.5 amps
One (1) vial Crusher = 16.9 amps with surge of 21.12 amps.

Unit 3 (four Rooms) Single Phase load center
Four (4) 300 Watt Lights – 7.5 amps each x four (4) = 10 amps with a surge of 12.5 amps
Four (4) Fan – 4.5 amps each x four (4) = 18 amps with a surge of 22.5 amps
One (1) DCB Alarm = 0.07 amps with total surge of .09 amps
One (1) emergency Alarm Horn = .07 amps with surge of .09 amps
One (1) smoke alarm = 0.07 amps with surge of .09 amps

Unit 4 (One Room) – Single Phase load center
Two (2) 300 Watt Lights – 2.5 amps each x two (2) = 5 with a surge of 6.25 amps
Four (4) Fan – 4.5 amps each x four (4) = 18 amps with a surge of 22.5 amps
One (1) DCB Alarm = 0.07 amps with total surge of .09 amps
One (1) emergency Alarm Horn = .07 amps with surge of .09 amps
One (1) smoke alarm = 0.07 amps with surge of .09 amps

D. Tie-In of all Unit's Alarm systems to Centralized Station.

E. Supply Back-up or Emergency Power required for the "H" Occupancy Options

F. Grounding the unit

G. Seismic Tie-Down – the unit comes with "L" Brackets at each corner. Each corner needs to be tied town to meet Seismic Zone 4 Requirements and will need to use tie-down components and methods approved for the jurisdiction.

H. Vent Height Erection & Attachment.

I1. Dry Chem System initial arming, dump test & set up of a bi-annual maintenance contract.

I2 Hand-Held Fire Extinguisher – Enclosures will need to be installed in pre-established mounting holes & the extinguisher will need to be placed inside of the enclosure.

Sample Training Program Matrix
(Revised 1/10/01)

Subject	Key Components	Applies to Employees Covered by	Estimated Duration and Frequency (minimum hours underscored if listed in code)	Examples of Employees Covered
Above Ground Storage Tanks	• Operation of monitoring & alarm system • Emergency response	Fed: 40CFR parts 280-281 State: 8CCR 5589-5596		Maintenance staff Assigned employees
Aerial Device Safety	• Proper procedures for operating an aerial device • Employee must retrain if unsafe act witnessed or reported	Fed: 29CFR 1910.66 app C & 1910.67(c)(2)(ii) State: 8CCR 3424(b) & 3638(d)	Initial: yes 3 yrs.: yes	Aerial device operators
Agricultural Operations	• Operation of agricultural equipment • Formulation & application of restricted materials • Tool safety	State: 3CCR 6400 8CCR 3436 et seq.	Initial: 8 hrs. Annual: 2 hrs.	Agricultural & farm personnel
Asbestos Awareness	• Overview of asbestos hazards • How to minimize accidental exposure • Personal protective equipment • Location of ACBM • Recognition of hazardous exposures	Fed: 29CFR 1910.1001 State: 8CCR 5208	Initial: <u>2 hrs.</u> Annual: <u>2 hrs.</u>	Maintenance staff Plumbers Electricians Assigned employees
Asbestos Inspector	• Asbestos management for project inspectors • Public Relations • Understanding building systems	Fed: 29CFR 1910.1001 40CFR 763 State: 8CCR 5208	Initial: <u>24 hrs.</u> Annual: <u>4 hrs.</u>	EH&S staff
Asbestos Management Planner	• Asbestos management for project managers • Legal implications • Role of other professionals in abatement • Assembling and submitting management plans	Fed: 29CFR 1910.1001 40CFR 763 State: 8CCR 5208	Initial: <u>40 hrs.</u> Annual: <u>8 hrs.</u>	EH&S staff Facilities Project Planners
Asbestos Operations & Maintenance (O&M)	• Handling methods • Respiratory protection • Personal protection measures • Work practices	Fed: 40CFR 763.92 29CFR 1910.1001 29CFR 1926.58 29CFR 1910.134	Initial: <u>16 hrs.</u> Annual: <u>8 hrs.</u>	EH&S staff Maintenance staff Custodial staff
Asbestos Project Designer	• Asbestos management for project designers • Overview of construction projects • Asbestos specifications	Fed: 29CFR 1910.1001 State: 8CCR 5208	Initial: <u>24hrs.</u> Annual: <u>8 hrs.</u>	EH&S staff Maintenance staff
Asbestos Supervisor	• Asbestos management for project supervisors • State of the art practices • Supervisory techniques for asbestos abatement	Fed: 29CFR 1910.1001 40CFR 763 State: 8CCR 5208	Initial: <u>32hrs.</u> Annual: <u>8 hrs.</u>	EH&S staff Maintenance staff
Asbestos Worker	• Asbestos management for project workers • State of the art practices	Fed: 29CFR 1910.1001 40CFR 763 State: 8CCR 5208	Initial: <u>24hrs.</u> Annual: <u>8 hrs.</u>	Maintenance staff Plumbers Assigned employees
Back Safety	• Back injury prevention principles & techniques	State: 8CCR 3203	Initial: 2 hrs. Annual: 1 hr.	All classifications
Bicycle Safety		Local Campus and County Regs		
Bloodborne Pathogens/ Infectious Disease Control/ Medical Waste	• Identify medical waste • Label & store • Safe handling procedures • Personal protective equipment	State: 8CCR 3203, 3360 et seq., 5193 & 6004 H&S Code Chpt. 2 Div. 20	Initial: yes must cover all material Annual: yes for at-risk employees	Maintenance staff Custodial staff Animal handlers Healthcare personnel Public safety personnel Instructional support staff Faculty

Subject	Key Components	Applies to Employees Covered by	Estimated Duration and Frequency (minimum hours underscored if listed in code)	Examples of Employees Covered
Boating Safety	• Safe boating operation procedures	State: 8CCR 3203	Initial: yes	
Boiler Safety		State: 8CCR 750 et seq.		Building engineers Selected employees
Building Evacuation	• Emergency response • Life safety	State: 8CCR 3220 (e), 3221 (d)		All classifications
Carcinogens	• Proper procedures for working with carcinogenic materials	State: 8CCR 5209	Initial: yes must cover all material Annual: yes	Assigned faculty & staff
Chain Saw Safety	• Safe work practices in using chain saws	State: 8CCR 6283		Grounds workers
Compressed Gas Safety	• Storage • Transportation • Inspection	Fed: 29 CFR 1910.169 29 CFR 1926.35 State: 8CCR 450, 3304 et seq. & 4648		Building engineers Maintenance staff Healthcare personnel Instructional support staff
Confined Space Safety	• Proper procedures for entering a confined space	State: 8CCR 5157	Initial: 8 hrs. Annual: 2 hrs.	Building engineers Maintenance staff
Construction Safety		State: 1509 (a), (e) & 1510 (a), (c)		
Crane Safety	• Training and license requirements • Operator responsibilities • Crane safety devices • Daily checks and monthly inspections • Critical and High Value lifts • Rigging safety • Principles of overhead crane operation • Load calculations • Rigging equipment, selection and safe use	Fed: 29 CFR 1910.179 State: 8CCR 5006	Initial: 8 hrs. 5 years: 8 hrs.	Employees who use cranes or hoists and rigging for lifting items
Dangerous Plants & Animals	• Proper procedures for working with or around dangerous plants & animals • Appropriate response to harmful exposures	State: 8CCR 3421(f)	Initial: yes Annual: yes	Employees who are potentially exposed due to their work with or around dangerous plants or animals
Department Safety Coordinators	• Department safety procedures • Liaison with EH&S Department	State: 8CCR 3203	Initial: 2 hrs. Annual: 1 hr.	Department safety coordinators
Diving Operations (Dive Team Training)	• Proper procedures for scientific and/or recreational diving	Fed: 29CFR 1920.410 State: 8CCR 6052	Initial: yes Annual: yes for CPR	Scientific & recreational divers
Electrical Safety	• Proper procedures for protecting employees from electric shock	State: 8CCR 1518 & 3203	Initial: 2 hrs. Annual: 1 hr.	Building engineers Maintenance staff Instructional support staff
Elevated Work/Fall Protection	• Use of personal fall arrest systems • Fall protection systems	Fed: 29 CFR Subpart D 29 CFR 1910.21-1910.30 & 1910.66-1910.68 29 CFR 1926.104, 1926.450 & 1926.552(c) State: 8CCR 3298-3299, 3388, 3416 & 3620		Building engineers Maintenance staff

Subject	Key Components	Applies to Employees Covered by	Estimated Duration and Frequency (minimum hours underscored if listed in code)	Examples of Employees Covered
Emergency Response/Spill Clean-Up (HAZWOPER)	• Personal protective equipment • Permit-required confined spaces training • Standardized Emergency Management System (SEMS) • Site-specific Health & Safety Plan • Training requirements/supervisor training • Emergency Action Plan (including evacuation, fire response, small spill response, notification & documentation) • Fire Prevention Plan • Personal protective equipment (PPE) • Business Plan for emergency response	Fed: 29CFR 1910.120 State: 8CCR 5192 Respiratory protection 8CCR5144 Permit-required confined spaces 8CCR 5157 SEMS 19CCR 2428 Site-specific Health & Safety Plan 8CCR 3203 Training requirements/Supervisor training 8CCR 3220 Fire Prevention Plan 8CCR 3221 Employee emergency plans & fire prevention plans 8CCR 5192(q) PPE 8CCR 3380 Business Plan – 19CCR 2732	Initial: <u>40 hrs.</u> Annual: <u>8 hrs.</u>	EH&S staff Public safety officers Parking officers Shipping & receiving personnel Instructional support staff
Environmental Restoration – General Site Worker	• Regulatory requirements • Medical surveillance program • Site Health & Safety Plan • Toxicology • Fire & explosion hazards • Fundamentals of chemical hazards • Personal protective equipment (selection & maintenance) • Decontamination procedures	Fed: 29CFR 1910.120(e)	Initial: <u>40 hrs. + 24 hrs. supervised field experience</u> Annual: <u>8 hrs.</u>	Environmental restoration personnel
Environmental Restoration – Occasional Site Worker	• Regulatory requirements • Medical surveillance program • Site Health & Safety Plan • Toxicology • Fire & explosion hazards • Fundamentals of chemical hazards • Personal protective equipment (selection & maintenance) • Decontamination procedures	Fed: 29CFR 1910.120(e)	Initial: <u>40 hrs. + 24 hrs. supervised field experience</u> Annual: <u>8 hrs.</u>	Environmental restoration personnel
Ergonomics for Supervisors	• Safe work practices in using equipment	State: 8CCR 3203 & 5110	Initial: 2 hrs. Annual: 1 hr.	Supervisors
Excavations	• Safe work practices in excavation work	State: 8CCR 3203		
Explosives Safety	• Campus/Lab explosives safety policy • Functional types of explosives • Explosives classification system • Explosives storage and handling procedures • Review of campus/lab 's explosives accidents	Fed: 29 CFR 1910.109 State: 8CCR 5239	Initial: 3 hrs 5 yrs.: 3 hrs	Employees who work with, transport, or handle detonators, explosives or electroexplosives devices.
Field Worker Safety	• Pesticide safety	State: 3CCR 6764	Initial: yes 5 yrs: yes	Agricultural field workers
Fire & Life Safety	• Fire prevention & protection principles & techniques	State: 8CCR 3207 et seq., 3221 & 6150 et seq.	Initial: yes Annual: yes	All classifications
First Aid & CPR	• Basic first aid • Proper procedures for providing CPR	State: 8CCR 3203 & 3400	Initial: yes Refresher depends on agency providing training	All classifications

Subject	Key Components	Applies to Employees Covered by	Estimated Duration and Frequency (minimum hours underscored if listed in code)	Examples of Employees Covered
Food Safety	• Proper preparation, handling & storage of food • Good hygiene practices • Food-borne illness	State: H&S Code 113716	Requires re-certification every 3 yrs.	Certified food handlers (Recommended for all food service personnel)
Forklift Safety	• Proper procedures for operating a forklift	Fed: 29 CFR 1910.178 State: 8CCR 3668	Initial: yes 3 yrs.: yes	Forklift operators
Hanta Virus	• Proper procedures for working with or around the Hanta Virus • Appropriate response to harmful exposure	State: 8CCR 3203	Initial: yes Annual: yes	Employees who are potentially exposed due to their work with or around the Hanta Virus
Hazard Communication	• Hazard communication <u>program</u> • MSDS • Operations where hazardous materials are present • Labeling • Personal protective equipment and other measures to minimize exposure	Fed: 29CFR 1910.1200 State: 8CCR 337 et seq. & 5194	Initial: 4 hrs. Annual: 1 hr.	All classifications
Hazardous Material Transportation - Highway	• Container labels • License • Shipping papers • Placards • Packaging • General awareness & safety • Proper shipping names • Marking & labeling • Hazardous material table • Special provisions • Separation & segregation	Fed: 49CFR parts 171-179 & 190-197 State: 8CCR 3203 13CCR 1150 et seq. 22CCR 66428 et seq. & 66530 et seq.	Initial: yes 3 yrs.: yes Trainees must be "tested"	EH&S staff Shipping & receiving staff
Hazardous Material Use/Disposal	• Safe use, storage, labeling & disposal of hazardous materials	State: 8CCR 5160 et seq. 22CCR 66265.16	Initial: 24 hrs. Annual: 2 hrs.	Maintenance staff Instructional support staff Faculty
Hazardous Waste	• Safe handling, storage, labeling & storage of hazardous waste	Fed: 29CFR 1910.120 (Covers environmental restoration, TSDF & emergency responders. Does not address waste generators or other types of waste handlers.) State: 22CCR 66265.16	Initial: 40 hrs. Annual: 8 hrs. (HAZWOPER General Site Workers only - see environmental restoration & TSDF)	EH&S staff
Hazardous Waste Transportation	• Container labels, markings, placards, manifests & transporters • Core hazardous material transportation training • Proper shipping names for hazardous waste • Hazardous waste markings & labeling • Hazardous waste packaging (including lab paks) • Uniform Hazardous Waste Manifest	Fed: 49CFR parts 171-179 & 190-197 State: 8CCR 3203 13CCR 1150 et seq. 22CCR 66428 et seq. & 66530 et seq.	Initial: 8 hrs. 3 yrs.: yes Testing required.	EH&S staff Shipping & receiving staff
Hearing Conservation	• Proper procedures for working in noisy areas	State: 8CCR 5095-5100	Initial: 1 hr. Annual: 1 hr.	Building engineers Maintenance staff Grounds workers Instructional support staff

Subject	Key Components	Applies to Employees Covered by	Estimated Duration and Frequency (minimum hours underscored if listed in code)	Examples of Employees Covered
Heavy Equipment Operation	• Proper procedures for operating heavy equipment	State: 8CCR 3441 et seq., 3649 et seq. & 4342 et seq.	Initial: 8 hrs. Annual: 2 hrs.	Maintenance staff
High Voltage Electrical Safety	• Capacitor-holding charge • Amount of energy stored • Induced current • Projectile accelerator • Potential gradient on a ground wire • Charged dielectric surface • Failed components • RF energy	Fed: 29 CFR 1910.332 State: 8CCR 2320.1	Initial: 4 hrs	Employees who work with or around high-voltage research equipment including capacitor banks or who service or repair computers with exposed voltage >600V.
Industrial Ventilation	• Proper procedures for operating building ventilation systems	State: 8CCR 3203, 5139 et seq. & 5415 et seq.	Initial: 32 hrs. Annual: 8 hrs.	EH&S staff Building engineers
Injury & Illness Prevention Program	• EH&S overview • Fire & life safety • Hazard Communication Standard • Ergonomics and material handling • Emergency preparedness & response	State: 8CCR 1509, 3203	Initial: yes Annual: yes	All classifications
Laboratory Safety Awareness	• Basic safe work practices in laboratories • OSHA Laboratory Standard • Chemical hygiene practices	Fed: 29CFR 1910.1450 State: 8CCR 5191	Initial: 4 hrs. Annual: 1 hr.	Employees working in laboratories an/or with laboratory chemicals
Ladder Safety	• Inspection • Set up • Use	Fed: 29 CFR 1910.24-1910.26 & 29 CFR 1926.1050-1060 State: 8CCR 3276-3280		Building engineers Maintenance staff Instructional support staff
Laser Safety	• Proper procedures for working with lasers	State: 8CCR 3203	Initial: 16 hrs. Annual: 4 hrs.	Faculty Instructional support staff
Lead Awareness	• Overview of lead hazards • How to minimize accidental exposure • Personal protective equipment	State: 8CCR 5216	Initial: 1 hr. Annual: 1 hr.	Maintenance staff Plumbers Assigned staff
Lead/Construction	• Lead exposure awareness	Fed: 29CFR 1926.62 State: 8CCR 1532.1	Initial: 4 hrs. Annual: 1.5 hrs.	Maintenance staff Building trades staff Custodial staff Facilities staff
Lead/General Industry	• Inspect & assess lead paints • Abatement & monitoring • Safe handling procedures • Personal protective equipment	State: 8CCR 5216 17CCR	Initial: <u>40 hrs.</u> Annual: <u>8 hrs.</u>	EH&S staff Project managers
Less-than-90-day Accumulation Areas	• Use & maintenance of emergency response equipment • Emergency response & evacuation procedures • Emergency notification • Spill control	Fed: 40CFR 262.34 & 265.16	Initial: 4 hrs. Annual: 3 hrs. Additional site specific training	<90-day accumulation area workers
Lockout/Tagout	• Proper procedures for performing lockout/tagout	Fed: 29CFR 1910.147 State: 8CCR 3314 & 4355	Initial: 2 hrs. Annual: 1 hr.	Maintenance staff Building engineers Instructional support staff Equipment technicians

Subject	Key Components	Applies to Employees Covered by	Estimated Duration and Frequency (minimum hours underscored if listed in code)	Examples of Employees Covered
Machine Shop Safety	• Hand & power tool safety • Principles & design of machine guarding • Maintenance & use of point of operation tools & guards • Metal & wood working machinery safety	State: 8CCR 3940-3945		Building engineers Maintenance staff Grounds workers Instructional support staff
Non-ionizing Radiation	• Proper procedures for using non-ionizing radiation emitting sources and equipment	State: 8CCR 5075 et seq.	Initial: 1 hr. Annual: 1 hr.	Assigned employees
Occupational Tuberculosis	• Risk factors • Modes of transmission • Health effects • Methods to prevent exposure • Medical surveillance & treatment	State: 8CCR 5197	Initial: yes Annual: yes for at-risk employees N-95 training required for those in direct patient care	Healthcare personnel Public safety personnel Counseling service personnel Laboratory, clinical & research personnel
Office/General Safety	• Safe use of office equipment & materials • On-site survey • Administration & training • Fire & life safety • Emergency preparedness & response	State: 8CCR 3203	Initial: yes Annual: yes	Office workers Administrative assistants Laboratory workers
PCB Waste Handler	• Overview of PCB hazards • Labeling, storage & disposal • Safe handling procedures • Personal protective equipment		Initial: 2 hrs. Annual: 1 hr.	Assigned employees
Personal Protective Equipment	• Selection • Use • Limitation • Maintenance	Fed: 29 CFR 1910.132-139 & 29 CFR 1926.951 State: 8CCR 3401-3411, 5150, 5193 & 8414		Building engineers Maintenance staff Grounds workers Custodial staff Healthcare personnel Heavy equipment operators Instructional support staff Faculty
Pesticide Certification	• Pesticide hazards • Safe handling procedures • Medical surveillance • Personal protective equipment	Fed: 40 CFR parts 152-180 State: 3CCR 2450 et seq.	Initial: 40 hrs. Annual: 8 hrs.	Assigned employees
Pesticide Safety	• Overview of pesticide hazards • How to minimize accidental exposure • Personal protective equipment	Fed: 40 CFR parts 152-180 State: 3CCR 2450 et seq., 6724 & 6760	Initial: 4 hrs. Annual: 1 hr.	Grounds workers Agricultural & farm personnel Animal handlers
Pool Operator Safety	• Circulation • Filtration • Water Chemistry • Mechanical Equipment • Energy Management • Formulas & Tables	Requirements expected in new code changes: In Health & Safety Code and eventually in Title 22 (Div.4, Ch.20, Art.3)	Existing courses in "Certified Pool Operator" and "Aquatic Facility Operator" are typically 16 hours. No mention in materials I found of re-certification times.	Persons maintaining pools, for example: • Maintenance personnel • P.E. personnel (e.g., lifeguards)
Process Safety Management (required when using acutely hazardous materials above a list threshold)	• Specific health & safety hazards, operating procedures & safe practices	Fed: 29 CFR 1910.119 State: 8CCR 5189		All employees and contractors who use or may come in contact with acutely hazardous materials processes

Radiation Awareness	• Radioactive materials license condition • Overview of radiation hazards • How to minimize accidental exposure • Personal protective equipment	Fed: CRCR Title 17 10 CFR 20		Ancillary personnel

Subject	Key Components	Applies to Employees Covered by	Estimated Duration and Frequency (minimum hours underscored if listed in code)	Examples of Employees Covered
Radiation User Safety	• Safe work practices in using radioactive sources & equipment • Labeling & recordkeeping • Contamination control	Fed: 10 CFR 20 Radioactive Materials License	Initial: 24 hrs. Annual: 8 hrs.	Authorized radiation users
Radioactive Material Transportation (Basic) – single radionuclide shipments not including LSA, SCO, fissile or exclusive use shipments	• General awareness & safety • Unit conversion • "A" values • Types A & B, highway route controlled & limited quantities • Proper shipping names & papers • Packaging, marking, labeling & placarding • Package dose rates • Package surface contamination • Transportation limits • Reportable quantities	Fed: 49CFR 171-178	Initial: yes 3 yrs.: yest "Testing" is required	Radioactive material packaging & shipping personnel
Radioactive Material Transportation (Basic) – single radionuclide shipments not including LSA, SCO, fissile or exclusive use shipments	• General awareness & safety • Unit conversion • Basic radioactive material transportation (see above) • "A" values • RQs for multiple radionuclides • Radionuclides that must be listed on labels & shipping papers • LSA/SCO • Fissile radionuclides • Exclusive use	Fed: 49CFR 171-178	Initial: yes 3 yrs.: yest "Testing" is required	Radioactive material packaging & shipping personnel
Respiratory Protection	• Safe work practices in selecting, using & maintaining a respirator • Fit testing	State: 8CCR 5144	Initial: 4 hrs. Annual: 2 hrs.	Maintenance staff Building engineers Healthcare personnel Grounds workers Custodial staff Agricultural & farm personnel Animal handlers Heavy equipment operators Instructional support staff Faculty
Slips, Trips & Falls	• Slip, trip & fall hazard sources & preventive measures	Fed: 29CFR 1910.22 State: 8CCR 3203 & 3272-3273	Initial: yes Annual: yes	All classifications
Standardized Emergency Management System (SEMS)		State: Cal CCR Title 19, 2428		Campus first responsders
Supervisory Safety	• Recognition, evaluation & control of workplace hazards • Employee health & safety • Risk management • Workers' Compensation, vocational rehabilitation, return-to-work	State: 8CCR 3203	Initial: yes Annual: yes	HR designated supervisors

Subject	Key Components	Applies to Employees Covered by	Estimated Duration and Frequency (minimum hours underscored if listed in code)	Examples of Employees Covered
Telecommunications		State: 8CCR 8603		
Tractors	• Safe work practices for tractor operators	State: 8CCR 3664	Initial: yes Annual: yes	
Traffic Control at Construction Work Sites	• Safe work practices when working in traffic	State: 8CCR 1599 (f)		Parking officers Maintenance staff Assigned employees
Transportation Maintenance Safety	• Automotive lifts • Maintenance & repair operations	State: 8CCR 3325 et seq., 3540 et seq. & 3649 et seq.	Initial: 2 hrs. Annual: 1 hr.	Transportation maintenance personnel
Treatment, Storage & Disposal Facility (TSDF)	• Regulatory requirements • Procedures for using, inspecting, repairing & replacing facility emergency & monitoring equipment • Emergency preparedness & response (fires, explosions, groundwater contamination • Hazardous waste management procedures relevant to position in which employed • Key parameters for automatic waste feed cutoff systems • Shut down of operations • Hazard Communication Standard • Communication or alarm systems • Personal protective equipment • Medical surveillance program • Decontamination • Toxicology • Monitoring • Waste minimization program	HAZWOPER: Fed: 29CFR 1910.120(q) RCRA: Fed: 40CFR 264.16 & 165.16 Other: Large quantity generators 22CCR 66262.34(a) Small quantity generator 22CCR 66262.334(d) Hazardous waste transportation 22CCR 66263.13 Standards for handling and disposal asbestos-containing waste 22CCR 67100.5 Waste minimization 22 CCR 67450.4 Temporary household hazards waste collection facility 22CCR 252.32 Bloodborne Pathogens 8CCR 5193	HAZWOPER: Initial: <u>24 hrs.</u> Annual: <u>8 hrs.</u> RCRA: Initial: 4 hrs. Annual: 3 hrs. Initial must be taken within 6 months of employment or assignment	TSDF workers Facility personnel
TSDF Hazardous Waste Worker	• Sufficient instruction to perform duties in a way that ensures compliance • Procedures for using, inspecting, repairing and replacing facility emergency monitoring equip • Key parameters for automatic waste feed cutoff systems • Communication or alarm system • Response to fires or explosions • Response to groundwater contamination incidents • Sht down of operations • HW management procedures relevant to position in which employed (may include sections on BBP, Asbestos, etc.)	State: 14CCR 17897, 22CCR 66262; 66265.4; 66263.13; 66265.192; 67100.5; 67450.4; 65623; 8CCR 5193	Initial: yes Annual: yes Initial must be taken within 6 months of employment or assignment. Annual review required.	Facility personnel
Tree Maintenance	• Proper procedures in performing tree maintenance work	State: 8CCR 2950 & 3420 et seq.	Initial: Required.	Grounds workers assigned to tree work

Subject	Key Components	Applies to Employees Covered by	Estimated Duration and Frequency (minimum hours underscored if listed in code)	Examples of Employees Covered
Vehicular Safety	• Vehicle usage policies • Insurance coverage & accident reporting • Vehicle safety inspection & operation	State: 8CCR 3700 et seq.	Initial: yes	Employees driving on university business
Violence in the Workplace		State: 8CCR 3203 (a) (1)		
Welding Safety	• Proper procedures for operating welding equipment	State: 8CCR 4846 et seq.	Initial: 2 hrs. Annual: 1 hr.	Assigned employees
Window Cleaning Operations		State: 8CCR 3282 (f)		

NORTHROP GRUMMAN
Information Technology

Emergency Operations Center Design

PSI Emergency Operations Centers

EOC

A properly designed Emergency Coordination Center (EOC) should serve as an effective and efficient facility for coordinating emergency response efforts. An EOC may serve a number of uses including operations, training, meetings and other uses. The EOC can optimize communication and coordination by effective information management and presentation. The PSI Group of Northrop Grumman Information Technology has the depth of experience and qualifications to perform this for your agency.

EOC Training

The Incident Command System (ICS) provides a management structure and system for conducting emergency operations. It is applicable to small scale daily operational activities as well as major mobilizations. ICS, provides EOC and operational staff with a standardized operational structure and common terminology. Because of this, ICS provides a useful and flexible management system that is particularly adaptable to incidents involving multi-jurisdictional or multi-disciplinary responses. ICS provides the flexibility needed to rapidly activate and establish an organizational format around the functions that need to be performed. Northrop Grumman Information Technology offers annual and refresher training for ICS operations.

EOC Consulting

An EOC is the physical location where an organization comes together during an emergency to coordinate response and recovery actions and resources. These centers may alternatively be called command centers, situation rooms, war rooms, crisis management centers, or other similar terms. Regardless of the term, this is where the coordination of information and resources takes place. The EOC is not an incident command post; rather, it is the operations center where coordination and management decisions are facilitated.

Event Information Tracking

Managing response and recovery operations involves a tremendous amount of information. The EOC's job is to collect this information and to manage and control event information and response activities. Typically, the information flow will look something like this:

1. Incident occurs
2. Notification sent to staff
3. Status evaluated by EOC managers
4. EOC activated, Incident Log opened
5. SOPs implemented using checklists
6. Tasks assigned according to plan
7. Resource allocation (tracked in log)
8. Task performance (tracked in log)
9. Status briefings and updates to stakeholders

Information Management

All of this information will need to be managed and documented. A strong information management system will be a must. Emergency Managers need to provide a robust command, control, and monitoring function that will:

- Above all else - be easy and efficient to use
- Collect failure information to allow rapid and early contingency response
- Track multiple incidents and resources
- Communicate activities across the enterprise
- Provide documentation capability

Good information management tools can help contingency managers create and organize their plans as well as in exercising and executing them. While contingency plans often end up in binders or files, a good information management system can make plans and supportive materials easily available to managers.

Typically, the information flow is managed via a Computer Aided Dispatch (CAD) system, which logs and tracks events, coordinates information from disparate systems and acts as the platform for emergency first-responders (Law Enforcement, Fire and Emergency Medical Services) to receive calls from the public and manage resources in a prioritized manner.

- Operate an Alert Network
- Event Alert Evaluation and Triage
- Incident Logging
- Team Tasking
- Resource Deployment and Monitoring
- Status Boards
- Executive Briefings
- Documentation

The Ideal Information System

The ideal EOC would be an easy to use and robust information and decision management system that provides:

- Central command and control
- Inter-agency radio communications control
- Remote camera control and viewing
- Asset inventory management
- Video teleconference communications
- Geographic display of resources and incidents
- Early alert communications
- Functionality as a virtual EOC
- Secure data sharing over other networks
- Event tracking and logging
- SOP and contingency plan check-off lists
- Resource management
- Documentation of response actions

Two-way communications…a structured mechanism for receiving and sending information. Standard categorizations will be needed to route reports to the appropriate position in the Command Center. Emergency managers should be able to centrally receive and evaluate this event information from both inside and outside the enterprise. The system should help manage this information in real-time and keep records of events as they unfold.

Automated response and recovery checklists... for all of their major functions to ensure that the recovery is complete. The key is to put an automated checklist in the hands of the right person anywhere and everywhere in the organization. Make it easy for them to send the checklist results as data and make it easy for managers to see the progress in executive reports.

Alert notifications… with a sophisticated message sorting and distribution capability so managers can track and log multiple and varied notifications and ensure that the right information gets to the right individual.

Conclusion

You can be certain that good planning, training and design will improve emergency response and speed the recovery process. Having good plans in place, drilling on them and using a robust information management system (CAD) to implement and track their execution will prove to be invaluable, no matter what the problem.

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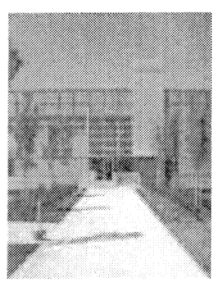
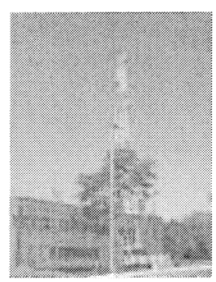
Washington Military Departm
Emergency Management Divis

Washington State
Emergency Operations Center
(EOC)

Home of the Emergency Management Division





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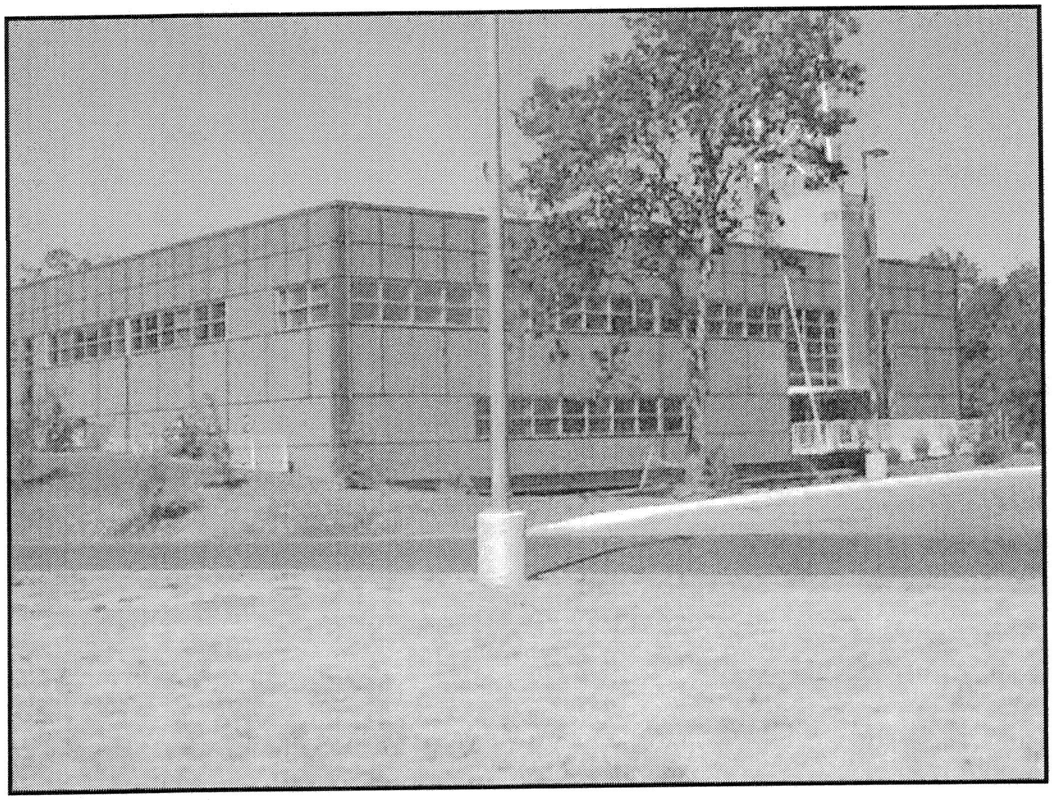


Washington State Emergency Operations Center

Building description: Two-story, 28,000 square feet. It accommodates 70+ staff persons during day-to-day operations and 225 during a catastrophic emergency.

Groundbreaking: March 26, 1997.

Fully Operational: July 10, 1998.

Location: Camp Murray, headquarters of the Washington Military Department. Exit 122 from Interstate 5, near Fort Lewis.

Purpose: To serve as the Washington State Emergency Operations Center during emergencies and as the Washington State Emergency Management Division headquarters. The division monitors, notifies and alerts state agencies and local governments of impending emergencies and disasters while performing emergency education, mitigation, preparation and recovery functions throughout the year. Emergency management personnel coordinate from the center with state, federal and local government agencies, non-government organizations, private businesses and industries.

Communications: The Emergency Operations Center telecommunications capabilities are fully self contained to ensure survivability after a major disaster, such as an earthquake. The center is equipped with it's own Private Branch Exchange (PBX), Local Area Network (LAN), radio and microwave network control centers, cellular telephone and satellite terminals. The center is linked by fiber optic and cable to several different public and commercial networks to ensure redundancy in communications. Commercial access is currently is provided by US West, AT&T, MCI, and AT&T wireless systems. Public network access is provided by microwave links to the Washington State Patrol and Washington State Department of Transportation microwave networks. These microwave links also provide access to the Department of Information Services leased networks. Voice and data connectivity to other branches of the Military Department are also available to the center utilizing both fiber and cable connectivity.

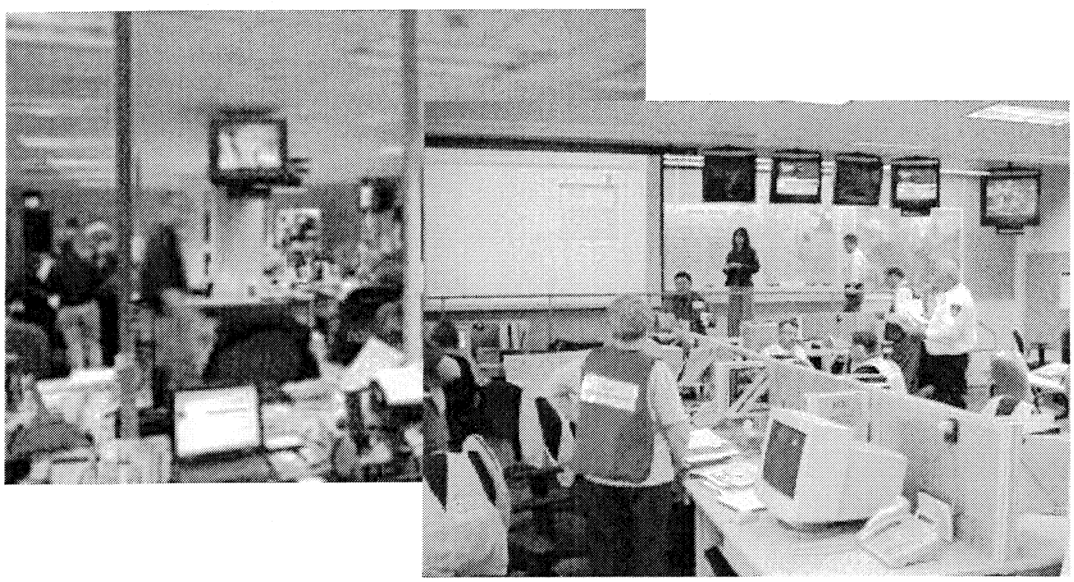
Key design feature: The building is designed to survive and operate in a major earthquake. It is a steel-frame building with a foundation isolated from upper floors by motion absorbers called "base isolators." Simply stated, stainless-steel and Teflon, ball-in-socket footings will allow the foundation to move with an earthquake while translating horizontal energy to vertical motion actually directing the energy up and down slightly - directing the forces into a direction the building is designed to withstand.

Cost: $9 million

Utilities and life support: The building relies on 3 phased, 500 kW diesel generators for redundant emergency power. The building will receive support from Camp Murray during protracted emergencies for lodging, feeding, emergency water supply and sanitation services.

For Further information, contact: Robert Harper, r.harper@emd.wa.gov, Public Information Officer, 253-512-7005.

DESIGN RECOMMENDATIONS AND CRITERIA FOR EMERGENCY OPERATIONS CENTERS



Michigan State Police
Emergency Management Division

February 2003

The purpose of this guidance is to help local jurisdictions improve emergency preparedness and management by ensuring that their Emergency Operations Centers (EOCs) have facility, decision support and telecommunications capabilities that provide flexibility, sustainability, security, survivability and interoperability.

While it is recognized that each jurisdiction has unique needs and wants, the Emergency Management Division has developed basic requirements that all EOC's should meet in order to provide Survivable Crisis Management (SCM) capability. These guidelines will not preclude the jurisdiction from constructing any facility. However, most sources of available federal financial aid is usually dependent upon meeting minimum standards as described here. Specific federal programs may include additional or modified requirements.

Emergency operations centers are essential for the effective direction, control, and coordination of emergency response efforts. Self-assessments shall consider the following characteristics in determining EOC needs and when submitting proposals for EOC projects:

- Flexibility – scale operations and adapt operational space to the all hazards event (e.g., have sufficient space, equipment, furniture, administrative supplies, telecommunications, computer support, etc., available to satisfy mission requirements.

- Sustainability – support operations for extended duration; e.g., be able to sustain operations 24 hours a day/seven days a week during all emergency situations without interruption; to the extent practical, be located in a place that is not a high-risk area for known hazards such as flood zone, other natural hazard, nuclear power plant, hazardous material sites, etc.

- Security – guard against potential risks and protect operations from the unauthorized disclosure of sensitive information, e.g., have sufficient security and structural integrity to protect the facility, its occupants, and communications equipment and systems from relevant threats and hazards.

- Survivability – sustain the effects of a realized potential risk and continue operations from the EOC or a fully-capable alternate location, e.g., have an alternate EOC that can be activated and used if the primary is destroyed, damaged, or not accessible.

- Interoperability – share common principles of operations and exchange routine and time-sensitive information with other EOCs, e.g., be able to communicate with local government EOCs, emergency response teams at or near an incident site, state EOC.

A. LOCATION

The EOC **must** be constructed in a location that will minimize the effects of any local hazards, cannot be in the 100 year flood plain, or change or alter listed or nationally designated historic sites or structures. It should also be located close to government offices or give easy access to agency representatives.

B. SIZE

The EOC **must** be sized to handle the maximum anticipated staff that would be called in the event of a major disaster. A minimum of 50 square feet per person is required (80 square feet preferred) including restrooms, etc.

C. DESIGN CRITERIA

The facility **must** be designed and built to comply with the Michigan Building Code 2000. This code addresses local hazards, high winds, snow loads, Americans with Disabilities Act (ADA) requirements, etc.

D. ROOMS/SPACE

The EOC **must** contain the following spaces/rooms to provide adequate working room:

1. Day-to-day office space for EMD Director and staff, including secretary/receptionist if applicable.
2. Meeting/lead agency/executive room.
3. Communications Room for radio/telephone and support equipment.
4. Operations room for emergency coordination.
5. Restrooms.
6. Mechanical/electrical switch room.
7. Kitchen/break area.
8. Storage area for maps, procedures, publications, supplies, etc.

E. OPERATIONS ROOM

The Operations Room, where agency representatives will assemble, **must** provide the essential elements that will be needed during a disaster. It must be large enough to provide sufficient space for one or two representatives from each planned agency based on the list developed during the planning process. The Operations Room **must** also incorporate the following features:

1. Telephone lines and logs.
2. Status display capability (manual or video with large format).
   - Maps
   - Charts
   - Logs
3. Computer, Internet, and network needs for automatic data processing.
4. 30 square feet per person.

F. COMMUNICATIONS

During a disaster the, EOC **must** be able to communicate with the responders in the field. These communication capabilities must include:

1. Telephone lines for each agency and other levels of government planned in the Operations Room (such that each agency has telephone access).
2. Telephone lines for other support areas (Director's office, secretary, executives, etc.).
3. Adequate analog phone lines for computer modems.
4. FAX line and machine.
5. Local Area Network (LAN)or Wide Area Network (WAN) system if applicable.
6. Weather monitoring capability.
7. Access to Emergency Alert System (EAS).
8. Capability to activate local warning systems.
9. Electromagnetic protection for facility and antenna (lightning).
10. A Communications Room adjacent to the Operations Room sized to accommodate the maximum staff expected, including space for amateur radio.
11. Radios with frequencies to communicate with field personnel (police, fire, parks, highways, health, school transportation systems, hospitals, public works, utilities, Red Cross, the state and other counties, etc.).
12. Radio tower to support radio equipment (may be remotely located).

G. EMERGENCY POWER

An emergency electrical power generator **must** be provided which is large enough to power the EOC and all facilities (HVAC, radios, elevator, computer systems, etc.), and is permanently wired with automatic start and transfer. It should be located so that noise or fumes do not interfere with the EOC and include a self-contained fuel system with a minimum four-day reserve.

H. OPERATING PROCEDURES/AGREEMENTS

It is **mandatory** that Standard Operating Procedures (SOP's) for managing the EOC during disaster activation be developed. In addition, when the EOC is located in a multiple use facility, such as a county jail, it is necessary that a Memorandum of Understanding (MOU) be developed and agreed to among the agencies using the facilities. The MOU should be explicit in outlining the use of the EOC, installation of antenna, and who bears the charges when the EOC is activated.

I. PLANNING

The first step in developing a new EOC is planning. Careful attention to detail will make execution of the project much easier.

1. Identify needs – how will the facility be used?
2. Design for dual use – the EOC is ideal for meetings and training.
3. Locate away from hazards, such as:
   - Technological and nuclear facilities
   - HAZMAT
   - Railroads
   - Highways
   - Airfield landing paths
   - Flood plains
   - Pipelines
   - High voltage power lines
4. Consider how the facility will be secured during activation.
5. Determine maximum staff size (see "Suggested EOC Disaster Staff" chart below).
6. Consider co-locating with 911 communications center or county jail.
7. If locating in an existing building, consider using basement or interior spaces.
8. Consider including showers in the restrooms.
9. Consider separate and adequate space for media assembly and briefing.
10. Develop a list of agency personnel that will staff the EOC during emergencies.
11. Consider a computer floor to facilitate reconfiguration of Operations Room.
12. Plan for an interruption of domestic water supply.
13. Consider fiber optics throughout the agency and/or connected to outside agencies.

I. PLANNING – continued

14. Acquire a local radio frequency for disaster coordination. Become the jurisdiction's advocate for frequency coordination.
15. Consideration should be given to including the Operations Room with the following features:
    - weather radar and other GIS
    - high ceiling
    - column free
    - video status/shelter, etc. logs
    - video tapes
    - local TV/CNN

16. An additional transfer switch should be considered, so that additional generators can be plugged into the system.
17. When considering automation, the Emergency Management Division has developed the following guidelines for computer specifications. These guidelines are subject to change due to the ever-changing computer industry:

    - Intel 800 MHz Pentium CPU with 256K or higher internal cache
    - 256 MB RAM
    - 20 GB Hard Drive min.
    - 3.5" Diskette Drive
    - 16 MB min. video card
    - 56K Baud Fax/Data Modem or 10/100 MB Ethernet Card
    - CD-ROM Drive (48x)
    - SVGA 15" Graphics Monitor

Suggested EOC Response Staff
Emergency Management Director
Chief Executive(s)
Public Information Officer
Communication & Warning Officer
State Liaison
Radio Operators
Telephone Attendants
Disaster Assessment Officer
Police Liaison
Fire Liaison
Public Works Liaison
Shelter Operations Liaison
Welfare Liaison
Medical & Health Liaison
Message Controller
Messengers and Plotters
Resource Officer
Security Officer

The chart below gives some ***examples*** of Allowable and Non-Allowable Costs that would be considered in funding EOC construction.

Refer to the allowable funding categories of the particular grant being pursued.

Allowable Costs	Non-Allowable Costs
• Design fees • Excavations for construction • Building shell construction and interior finishing • Modifications to existing building • Antenna and towers • Heating, ventilating, and air conditioning equipment • Display equipment for Operations Room • Furniture for Operations Room • Radio/communication equipment • Emergency generator • Kitchen/break room equipment	• Plumbing, electric • Antenna and towers • Landscaping • Parking lots • Construction of non-EMA space • Space less than 50 sq. ft. per person • Equipment designed for daily non-EMA use • Maintenance • Land purchase • Demolition

Digital Color Billing Form

Work Order Name ____________________

Work Order Number ____________________

CUSTOMER CALLED ☐ NAME:

CALLED CUSTOMER ☐ NAME:

NO COMPLICATIONS ☐

LEFT MESSAGE ☐ TIME:

CUSTOMER REDO ☐

SENT PROOF ☐ PRINTER:____________ COMPUTER:________

OCB REDO ☐

JOB INFORMATION

DESCRIPTION	TOTAL ORIGINALS	COPIES FROM ORIGINALS	TOTAL COPIES	MATERIAL STOCK	PAPER SIZE	OPERATION NUMBERS
	1	1	1			62012