

Research Facilities Improvement Program  
NCRR Workshop  
Perspective of a Grant Reviewer

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# Grant Application in a Nutshell

## The Storyline

- Here's all the great research/animal care that we're already doing.
- Here's the expanded and improved research/animal care that we COULD be doing.
- Here's a description of why we can't do the research/animal care now and what we need to make it possible.
- Here's what it all costs and how long it takes.
- Please send the money.

# Research Facilities Improvement Program

## NIH-Supported Research Goals

- Advance our understanding of biological systems, improve control of disease, and enhance health.

## Criteria for Reviewing Scientific Proposals

- Significance of problem addressed.
- Approach and conceptual framework.
- Innovation in concepts and methods.
- Suitability of Investigator.
- Appropriateness of Scientific Environment.

# Research Facilities Improvement Program

## Major Objectives of C06 Applications

- Expand, remodel, renovate, alter existing, or construct new research facilities in support of basic and clinical biomedical and behavioral research and research training.

## Major Objectives of G20 Applications

- Upgrade animal facilities to support PHS supported biomedical and behavioral research.
- Assist institutions in complying with the USDA Animal Welfare Act and DHHS policies related to the care and use of laboratory animals.
- Assist biomedical research institutions in the development of administratively centralized and uniformly effective programs of research animal care in support of PHS-funded research.

## Describing Impact of Improvements

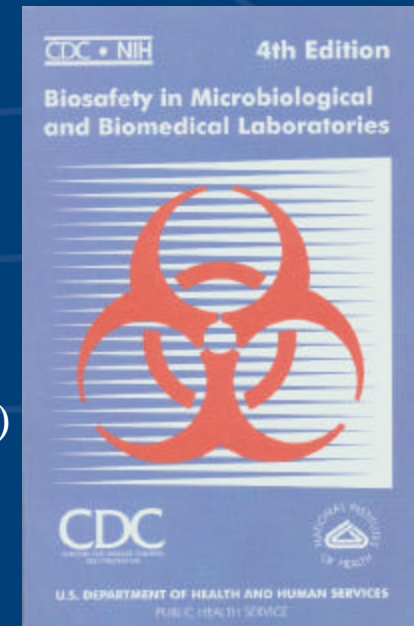
- **More Science**
- **Better Science**
- **Better Collaboration**
- **NOT Simply Greater Ease or Convenience**

## **Impact on Advancement or Expansion**

- **Particularly Applicable to Institutions with Limited PHS Support**
- **Eliminate Current Limitations**
- **Document and Justify Growth**
- **Use “Benchmarks” of Past Successes**
- **Aid in Recruitment**
- **Support a Growing Kernel of Research : Improvements Will Allow for Growth, NOT Cause It**

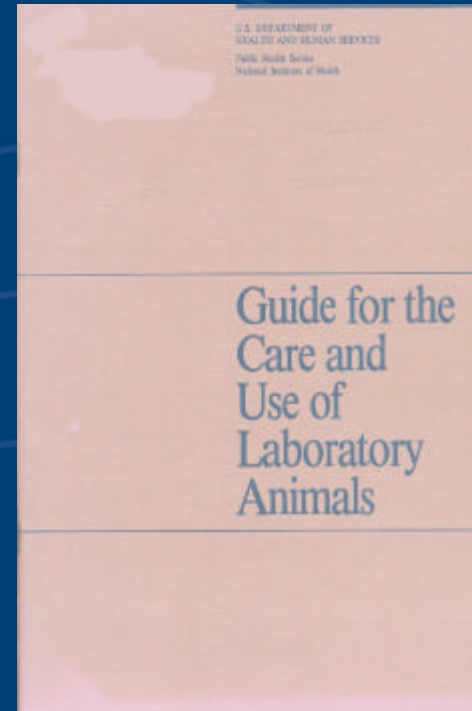
# Appropriateness and Suitability

- **Biosafety:**
  - Biosafety in Microbiological and Biomedical Laboratories (4<sup>th</sup> Edition)  
(CDC-NIH)
    - Principles of Biosafety
    - Biosafety Level Identification
    - Methods of Biocontainment
  - **General Lab Safety:**
    - NFPA 45 (Fire Protection for Laboratories)
    - NFPA 101 (Life Safety Code)
    - Local Building Codes (IBC 2000?)



# Appropriateness and Suitability

- **Fundamental Planning Criteria:**
  - NIH Design and Policy Guidelines (<http://des.od.nih.gov>)
- **Animal Facilities:**
  - The Guide for the Care and Use of Laboratory Animals
  - Institutional Long-Range Plan
  - The Animal Welfare Act
  - AAALAC Reports/Accreditation Effort





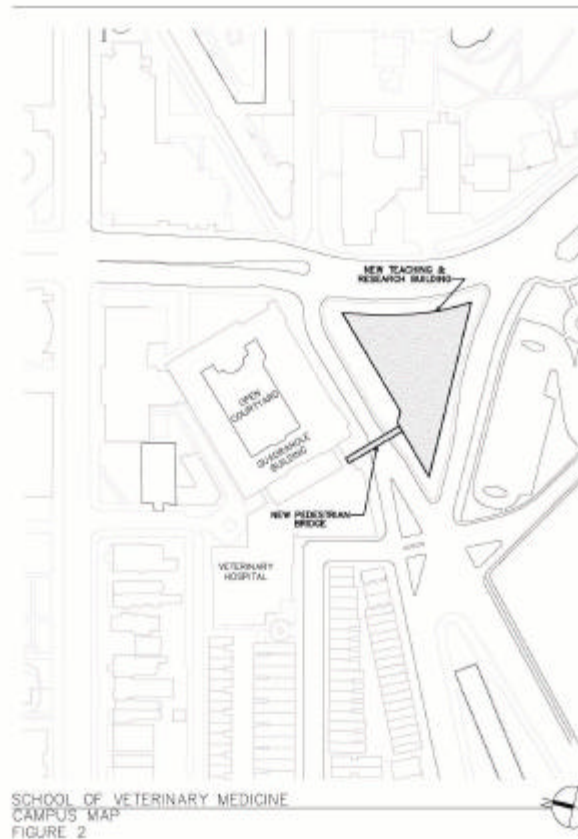
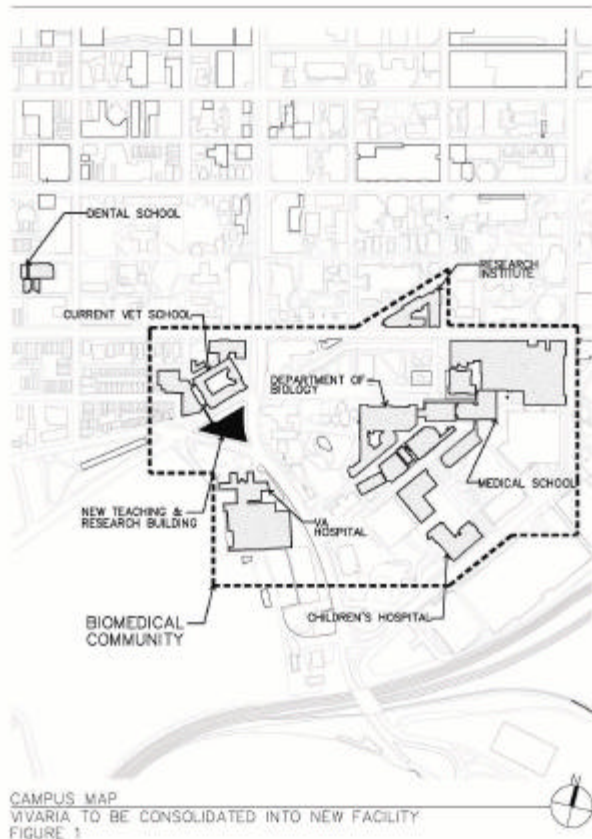
# Appropriateness and Suitability

- **Facilities Using “Select Agents”:**
  - New Emphasis Due to Bioterrorism
    - Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (PL 107-188)
  - Information Available at:
    - <http://www.niaid.nih.gov/biodefense/research/addinfo.htm>
  - “Appendix F” to Biosafety in Microbiological and Biomedical Laboratories, 4<sup>th</sup> Edition:
    - <http://www.cdc.gov/od/ohs/biosfty/bmbl4/b4af.htm>
  - For grants, address both physical and personnel measures used to achieve security

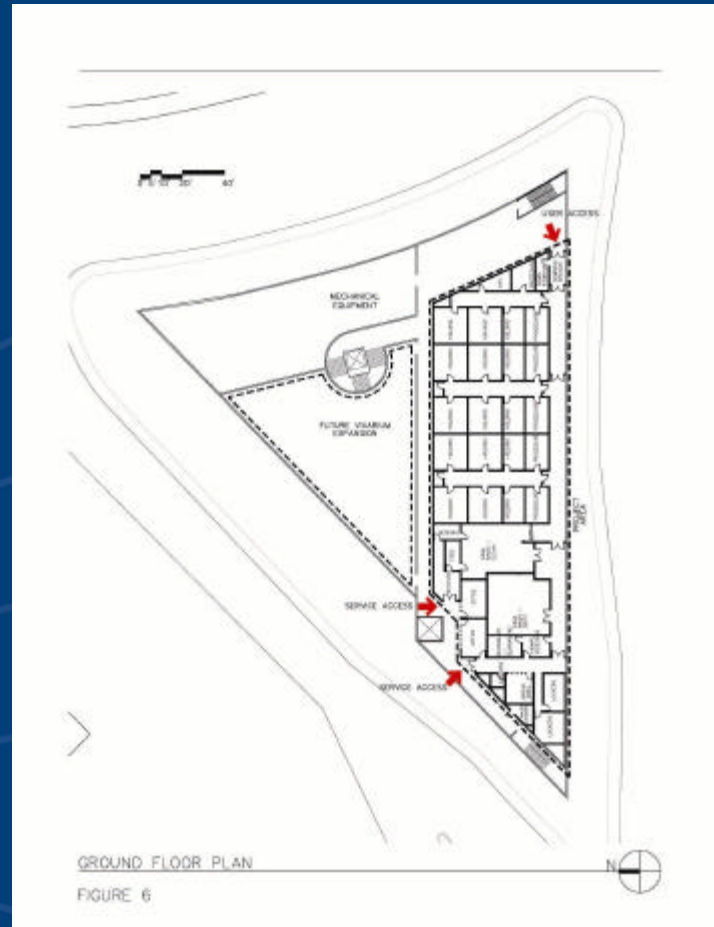
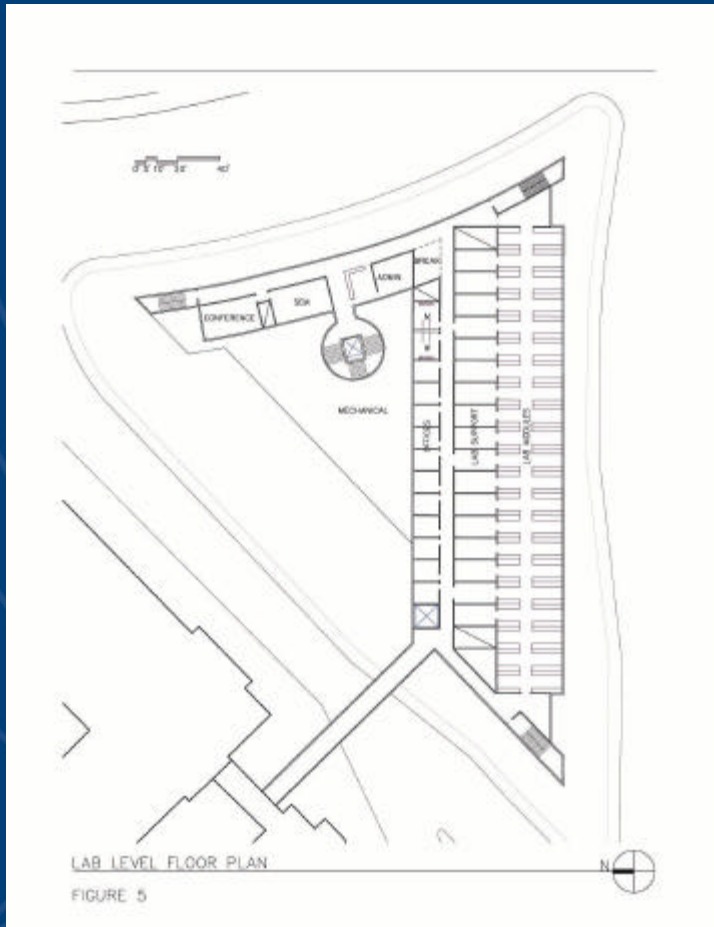
## Drawings - General

- Schematics are Adequate
- Build from Macro to Micro
- Show Adjacent Uses
- Illustrate Access to Related Support Functions
- Comply with NFPA 45 and Biosafety in Microbiological and Biomedical Laboratories for Layout Planning
- Comply with The Guide for the Care and Use Laboratory Animals for Animal Facility Layout Planning
- Drawings Must be Legible *After* Copying

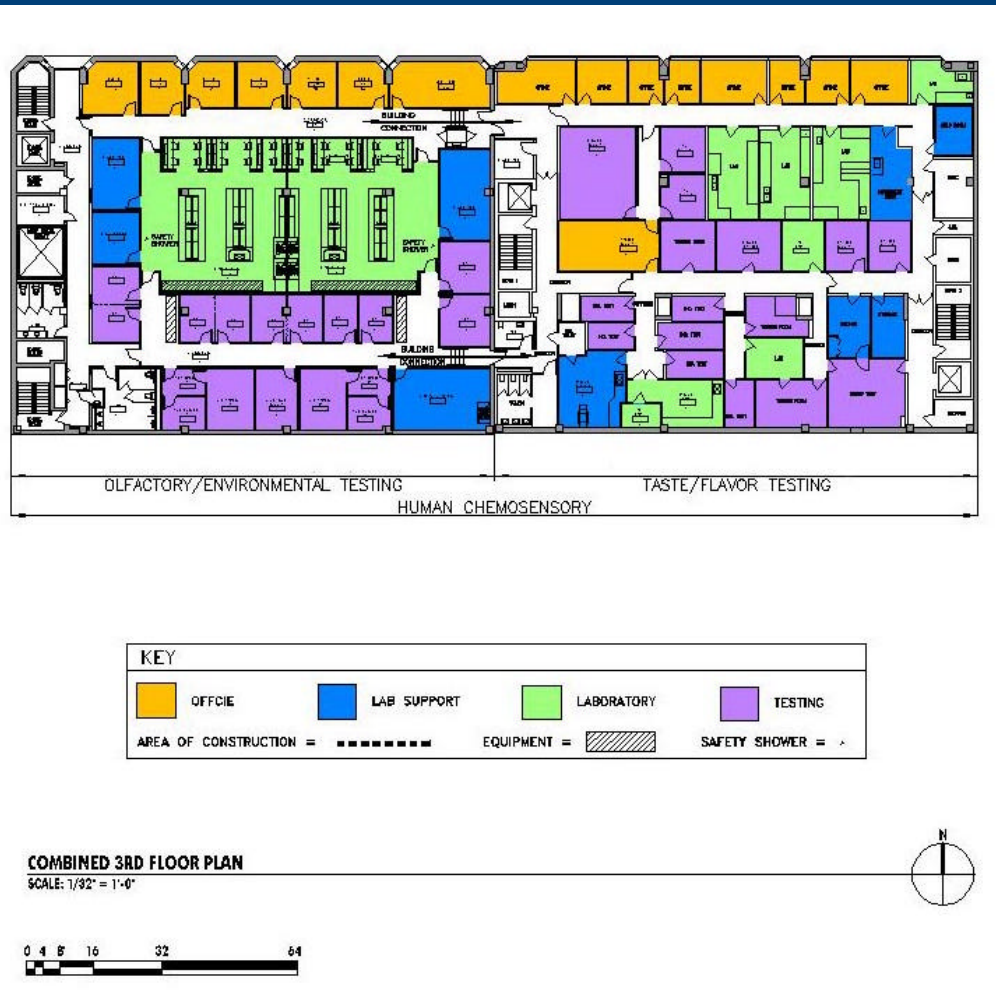
# Location/Adjacency Plans



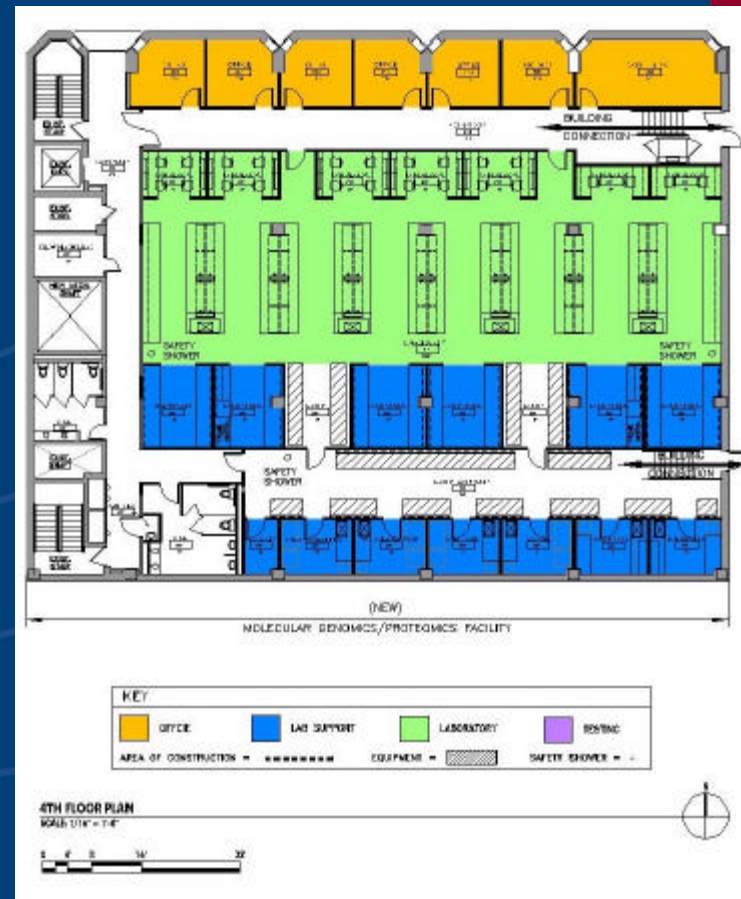
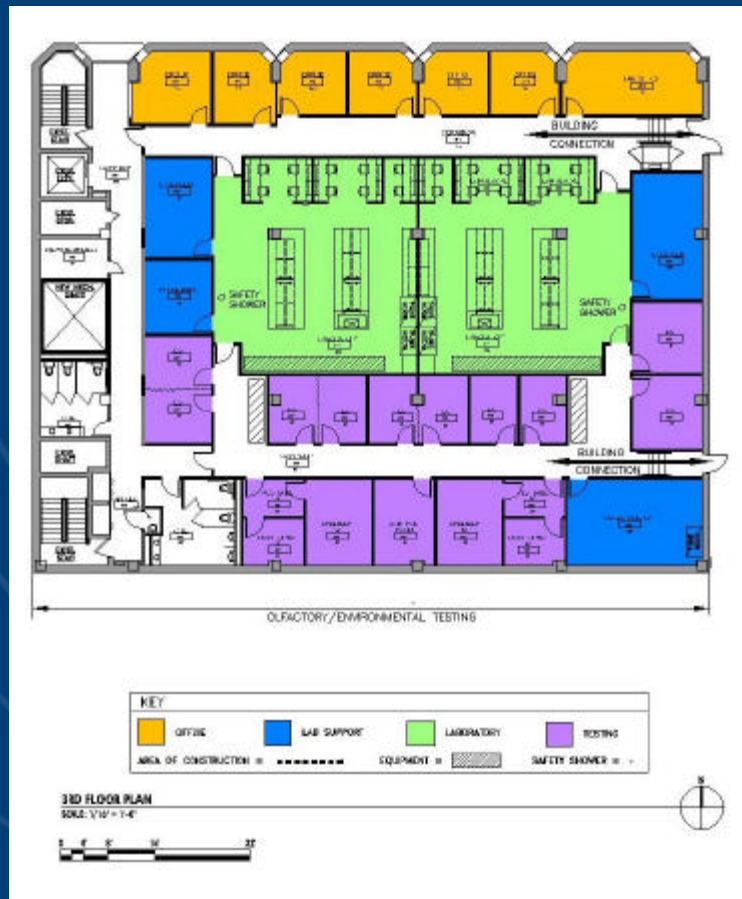
# Overall Facility Plans Including Key Access Points



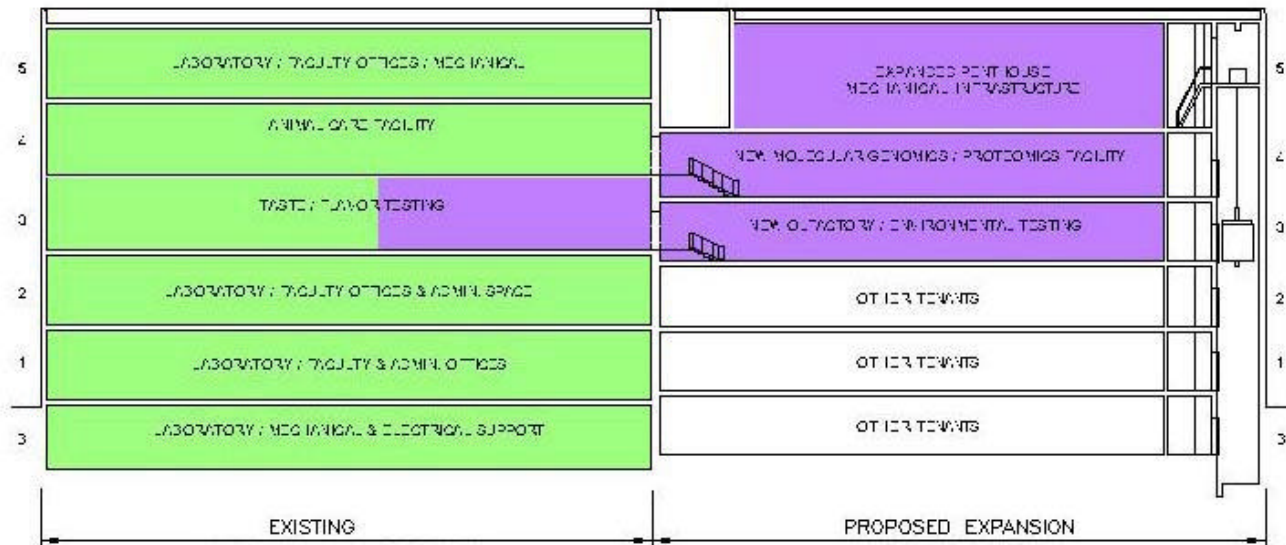
# Overall Adjacency Plan





# Floor Plans



# Diagrammatic Section



KEY	
	= EXISTING
	= RENOVATED/ADDED

# Partial Renovation Plans



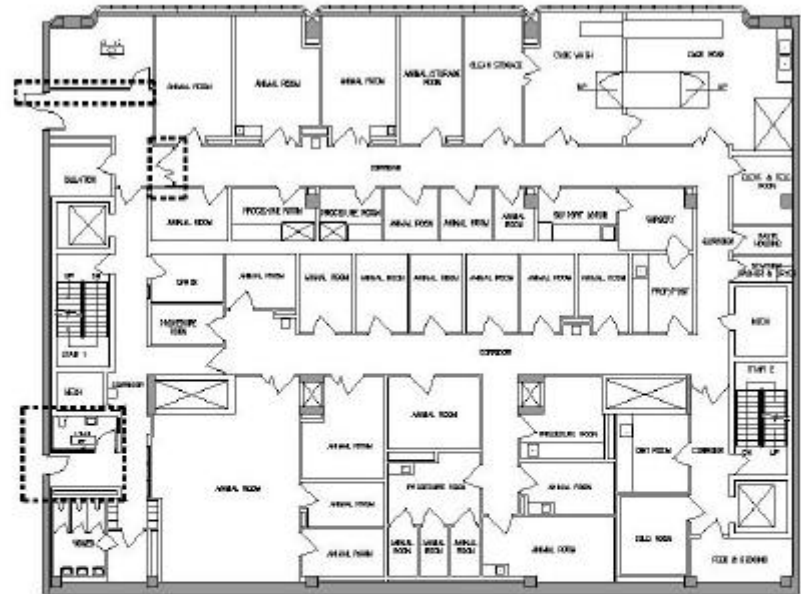
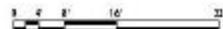
LEGEND:  
 AREA OF CONSTRUCTION = [Dashed line]  
 ROOMS TO BE RENOVATED = [Yellow highlight]

3RD FLOOR PLAN  
SCALE: 1/8" = 1'-0"

EXISTING FLOOR PLAN



FIGURE 07



LEGEND:  
 AREA OF CONSTRUCTION = [Dashed line]

4TH FLOOR PLAN  
SCALE: 1/8" = 1'-0"

EXISTING ANIMAL FACILITY



FIGURE 08

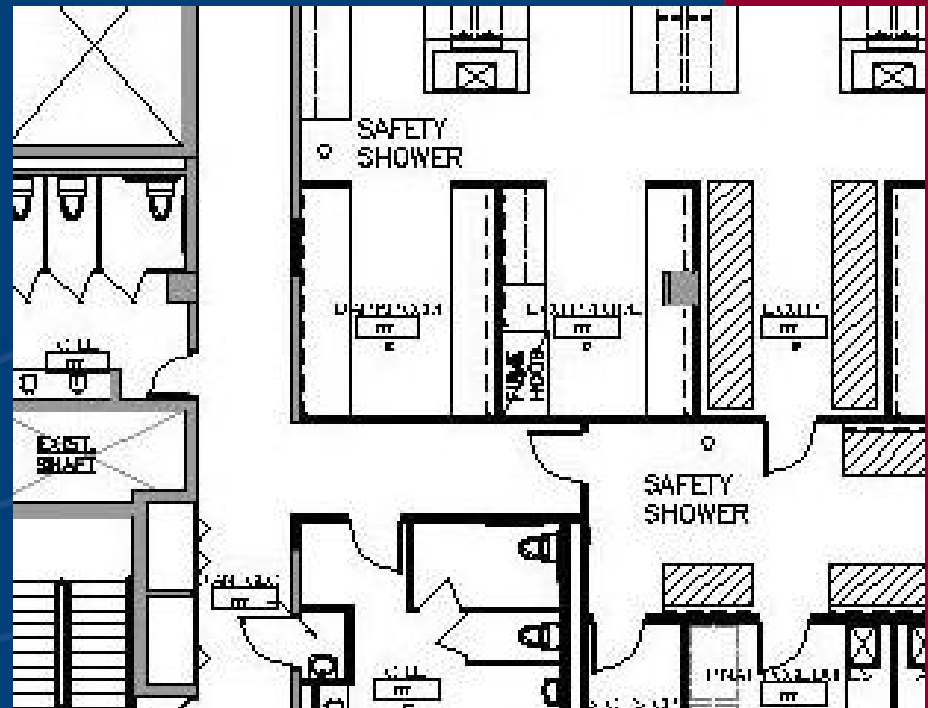
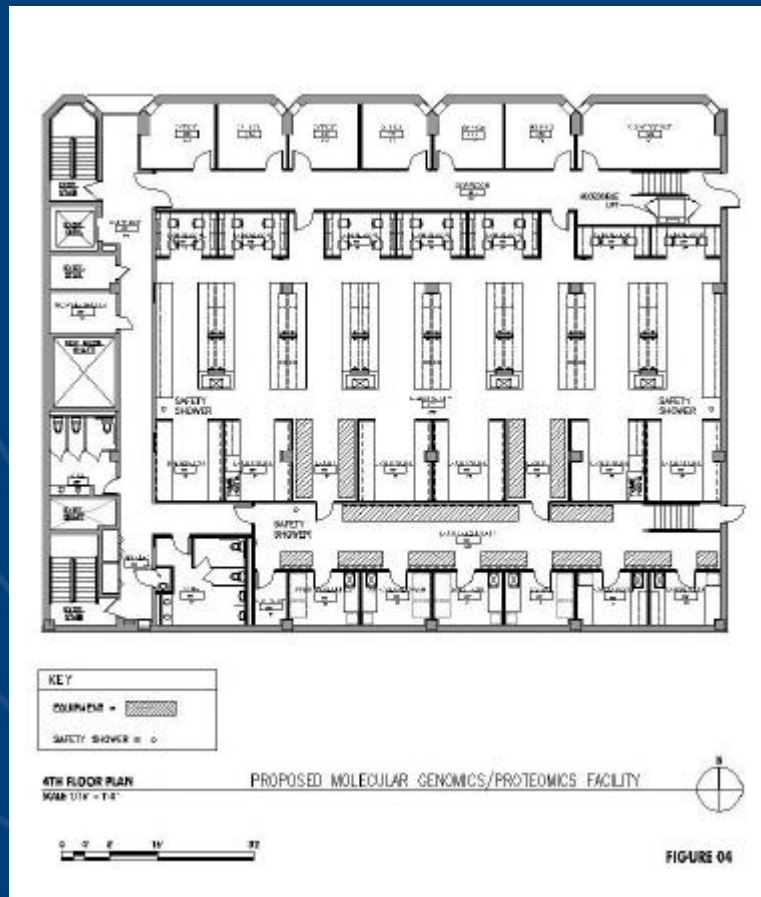




## Enlarged Plans

- Show Fume Hoods and Biosafety Cabinets!
- Consider Accessibility
- Illustrate Egress and Security
- Show Public vs. Service Access
- Label the Rooms
- Provide a Graphic Scale

# Enlarged Plans

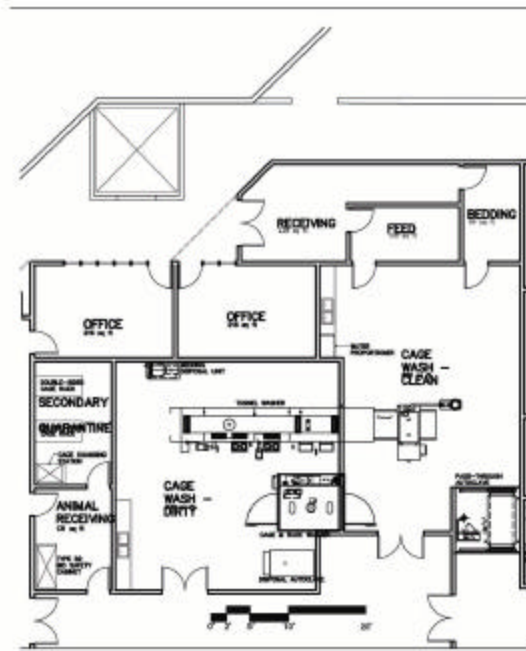


# Enlarged Plans



ENLARGED HOLDING SUITE PLAN

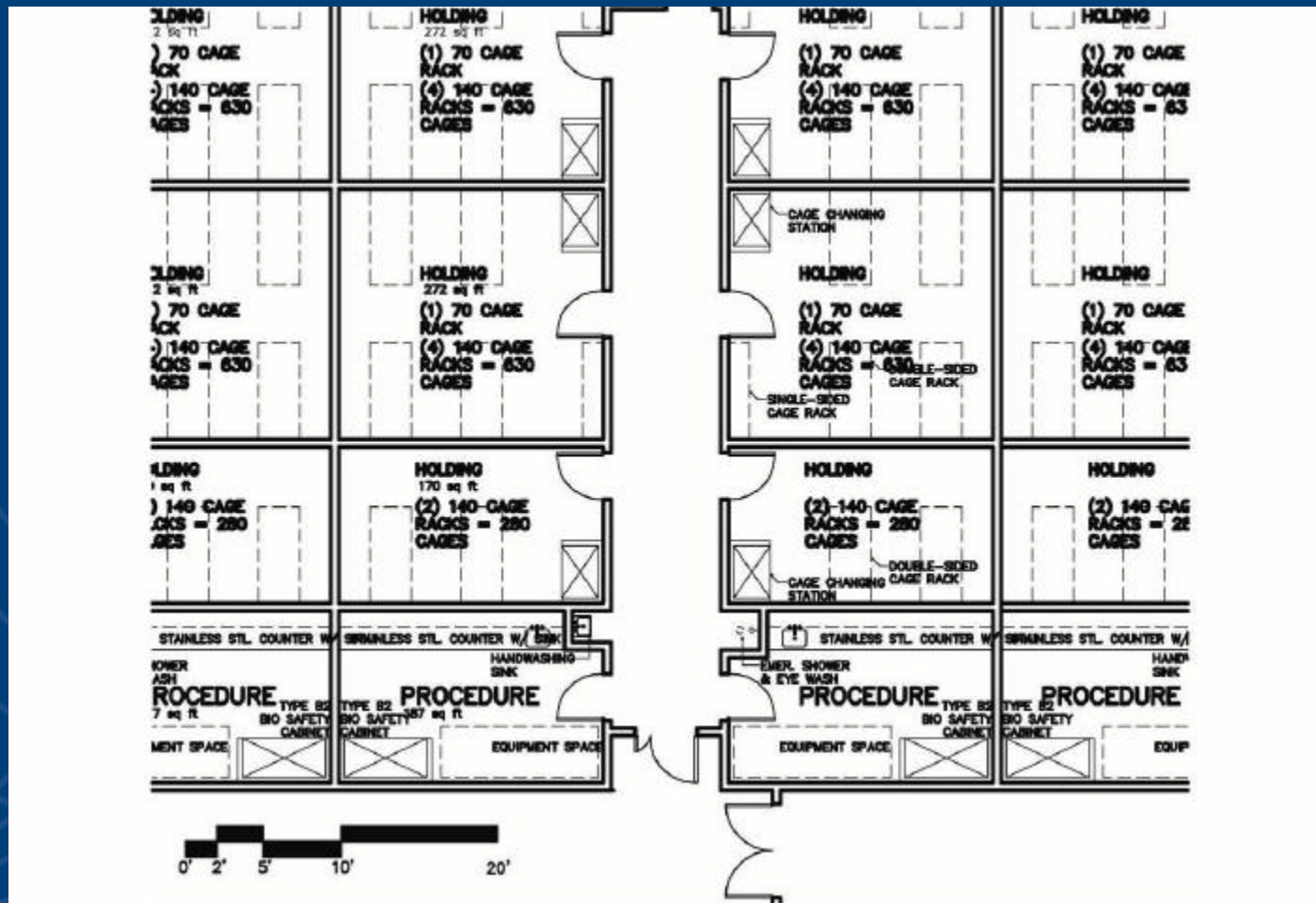
FIGURE 7



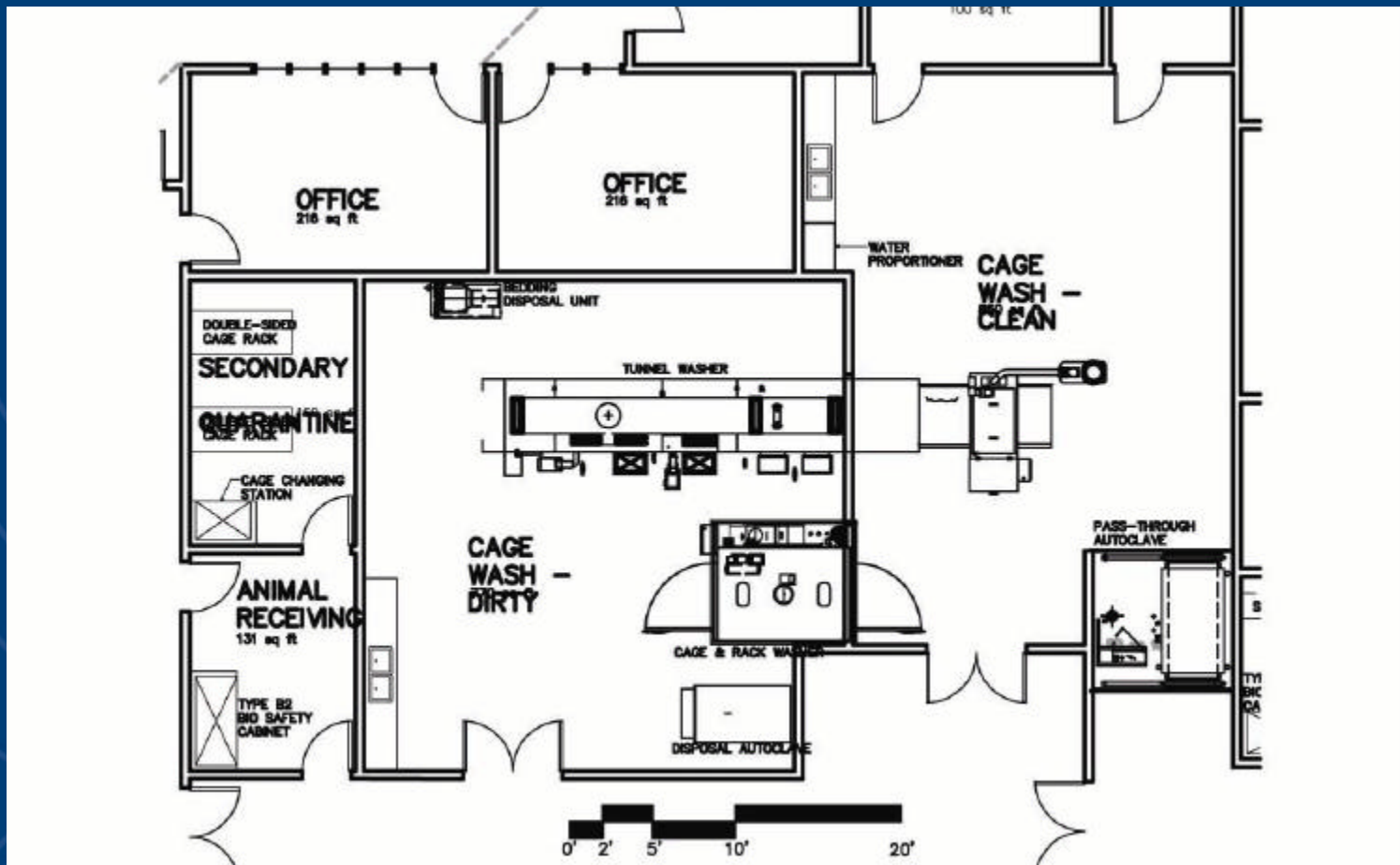
ENLARGED CAGE/PROCEDURE ROOM PLAN

FIGURE 8

# Enlarged Plans



# Enlarged Plans



# Highly Unofficial Plan Development Checklist

## Laboratory Facilities

- Labs over 1,000 square feet have two means of egress.
- **Where practical, all labs have two means of egress.**
- Lab egress doors swing in the direction of travel.
- Offices are not accessed solely through labs or high hazard areas.
- **Desks are located away from fume hoods and other hazards.**
- Where possible, desks are located outside of labs.
- Clear and adequate egress paths within labs are provided.

# Highly Unofficial Plan Development Checklist

## Laboratory Facilities

- Lab benches are shown.
- Fume hoods are shown and identified (such as “FH”).
- Biosafety Cabinets are shown and identified (such as “BSC”).
- **Fume and biosafety cabinets are located away from lab egress doors and primary travel paths.**
- Sinks are indicated.
- Emergency showers are indicated.
- Areas for major equipment are indicated.

# Highly Unofficial Plan Development Checklist

## Animal Facilities

- Personnel access to the facility is identified.
- Service access to the facility is identified.
- Major access paths to labs and other related functions are indicated.
- Paths from animal holding areas to the cage washing area are identified.
- Security points are indicated.
- Doors are adequate in width (typically 42") for the movement of cages.
- Corridors are adequate in width (typically 84" minimum) for the movement of cages.
- **Cage layout and quantity is shown in holding rooms.**



# Highly Unofficial Plan Development Checklist

## Animal Facilities

- Cage changing stations, fume hoods, and biosafety cabinets are shown and identified.
- Lab benches and counters are indicated.
- **Sinks are indicated.**
- Emergency showers are indicated.
- Janitor's closets are indicated.
- Major pieces of equipment (such as cage washers, autoclaves, etc.) are indicated.
- Clean and dirty sides of cage washing facilities (if any) are shown.
- **Cage wash layout and size is based on reality. (Involve animal care staff).**

# Highly Unofficial Plan Development Checklist

## General Planning

- Entry points are indicated.
- Egress paths are shown and an adequate number of exits are indicated (typically 2).
- Access for wheelchair users is addressed.
- Elevator access is indicated.
- Elevator types (passenger, service, freight) are indicated.
- ADA required clearances are provided.
- Adjacent buildings, uses, and connections are shown.
- Location within the larger context is indicated.
- Scale of drawings is shown (graphic scales are recommended).
- All rooms are labeled.

# Narrative for Research Facility Improvements

## Based on NIH Grant Requirements

- **Areas of Consideration**
  - Architectural
  - Mechanical
  - Plumbing
  - Fire Protection
  - Electrical
- **Refer to local and national codes and standards.**
- **Identify and address unusual circumstances (flooding, earthquakes, etc.).**

# Narrative for Animal Facility Improvements

## Guide for the Care and Use of Laboratory Animals

- Corridors
- Animal Room Doors
- Exterior Windows
- Floors
- Drains
- Walls
- Ceilings
- Temperature and Humidity Control
- Ventilation
- Power and Lighting
- Storage Areas
- Noise Control
- Facilities for Sanitizing Equipment and Supplies

# Sample Supporting Narrative

## Walls

All walls will be made of concrete masonry units and extend to the underside of the structural deck. Walls will be finished using block filler and epoxy-based paint to provide maximum water, chemical, and detergent resistance.

## Ceilings

Ceilings will be constructed of gypsum wallboard and painted with same epoxy-based paint used for the walls. All joints between ceilings and walls will be sealed.

## Temperature and Humidity Control

A new air handling system will be installed and dedicated for use for the vivarium. This unit will provide 100% fresh supply air and be coupled with a dedicated 100% exhaust system. The air change rate within the vivarium will be maintained at a rate of 15 air changes per hour. An individual terminal reheat coil to allow for room-by-room control will serve each animal room and surgery suite. This will allow for varying environmental conditions based on species. Humidity will be controlled to maintain a range of 40-60% relative humidity.

## Schedule

- Do Not Show Schedule that Exceeds Grant Time Limitations
- Recognize Realistic NIH Review Period
- Don't Show Construction Start Prior to Grant Approval
- Simple, Graphic Schedules are Ideal
- Indicate Phasing and Logistics where Appropriate







## Budget - General

- Budget Review is Both Qualitative and Quantitative
- Refer to Historical Precedent when Applicable
- Provide Supporting Vendor Quotes and Contractor Estimates when Available
- Clearly Define Costs as “Construction” or “Project”
- Clearly Define Areas as “Net” or Gross”
- Use NIH Recommended Format

## Budget – Eligible Equipment

- Check with NIH Staff if Questionable
- Provide Vendor Quotes When Available
- Typical Fixed Equipment:
  - Fume Hoods
  - Biosafety Cabinets with “Hard” Pipe or Duct Connections
  - Autoclaves
  - Cage and Rack Washers
  - Lab Casework (Often Included Under Construction Cost)
  - Animal Cage Racks that are Ducted to Building HVAC System
- Typical Movable Equipment:
  - Non-ducted Animal Cages and Racks
  - Refrigerator, Freezers, Centrifuges, and Other “Cord-and Plug” Connected Equipment

# Budget

## Summary Of Requested Research Space

Program Activity	Current Space	Space to be Added (NSF)	Unit Cost Per NSF	Total Project Cost	Requested NIH Funds	Future Total Space
<u>Facility</u>						
A. New fMRI Scanner Facility						
<u>New Construction</u>						
Scanner Room	0	403	\$ 875	\$352,633	\$ 167,862	403
Control Room	0	340	\$ 875	\$297,506	\$ 141,621	340
Computer Room	0	170	\$ 875	\$148,753	\$ 70,810	170
Storage	0	50	\$ 875	\$43,751	\$ 20,827	50
Sub-total	0	963		\$842,643	\$ 401,120	963
<u>Ground Floor Renovation</u>						
Screening Room	0	128	\$ 337	\$43,189	\$ 20,559	128
Debriefing/Procedure	0	125	\$ 337	\$42,176	\$ 20,077	125
Electronics Lab	0	347	\$ 216	\$74,932	\$ 35,670	347
Storage	0	210	\$ 216	\$45,348	\$ 21,587	210
Lavatory	0	55	\$ 337	\$18,558	\$ 8,834	55
Animal Prep	0	90	\$ 337	\$30,367	\$ 14,455	90
Machine Shop	0	350	\$ 148	\$51,961	\$ -	350
Sub-total	0	1,305		\$306,531	\$ 121,182	1,305
<u>Third Floor Renovation</u>						
MR Physicist	0	192	\$ 316	\$60,734	\$ 28,911	192
Technologist	0	101	\$ 316	\$31,949	\$ 15,208	101
Administrator	0	117	\$ 316	\$37,010	\$ 17,618	117
Research Assistant Office	0	155	\$ 204	\$31,582	\$ 15,034	155
Staff Area	0	303	\$ 316	\$95,846	\$ 45,625	303
Simulator Room	0	158	\$ 343	\$54,215	\$ 25,807	158
Testing Room	0	66	\$ 204	\$13,448	\$ 6,401	66
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Conference / Seminar Room	0	621	\$ 316	\$196,436	\$ 93,509	621
Visiting Fellows	0	150	\$ 316	\$47,448	\$ 22,587	150
File Room/Storage	0	87	\$ 316	\$27,520	\$ 13,100	87
Sub-total	0	2,148		\$636,530	\$ 303,004	2,148
Scanner Facility Subtotal	0	4,416		\$1,785,704	\$ 825,306	4,416

# Budget

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# Research Facilities Improvement Program

## Summary Perspective

- Read instructions carefully and ask NCRP staff for assistance
- Involve a design expert
  - Facility planning staff with biomedical experience
  - Outside architect with biomedical experience
- Keep the grant writing team to a few key people who are working closely together
- Assure That Data is Consistent Throughout Application:
  - Tables
  - Text
  - Plans
- Verify legibility of finished product *after* copying