Research Facilities Improvement Program
NCRR Workshop
Perspective of a Grant Reviewer

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President
Nalls Architecture, Inc.

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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.

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
- Better Animal Care
- 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:**

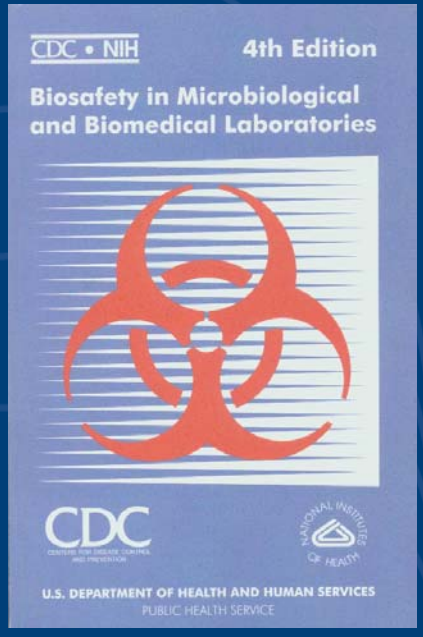
  - <u>Biosafety in Microbiological and Biomedical Laboratories (4th Edition)</u>

  (CDC-NIH)

  - Principles of Biosafety
  - Biosafety Level Identification
  - Methods of Biocontainment

  - General Lab Safety:

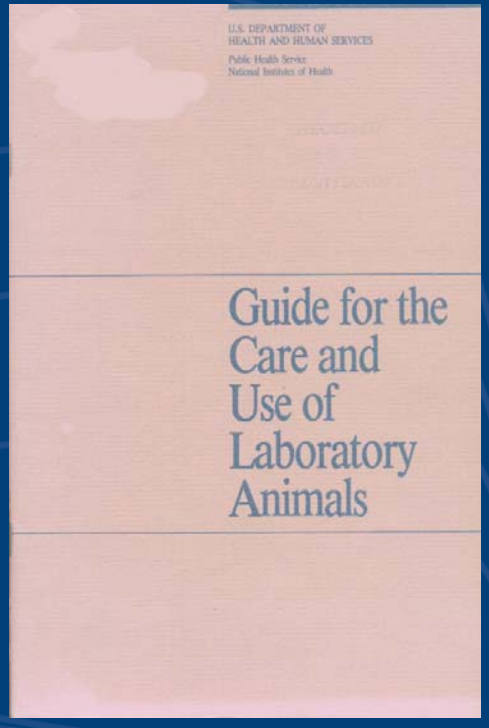
  - NFPA 45 (Fire Protection for Laboratories)
  - NFPA 101 (Life Safety Code)
  - Local Building Codes (IBC 2003?)



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



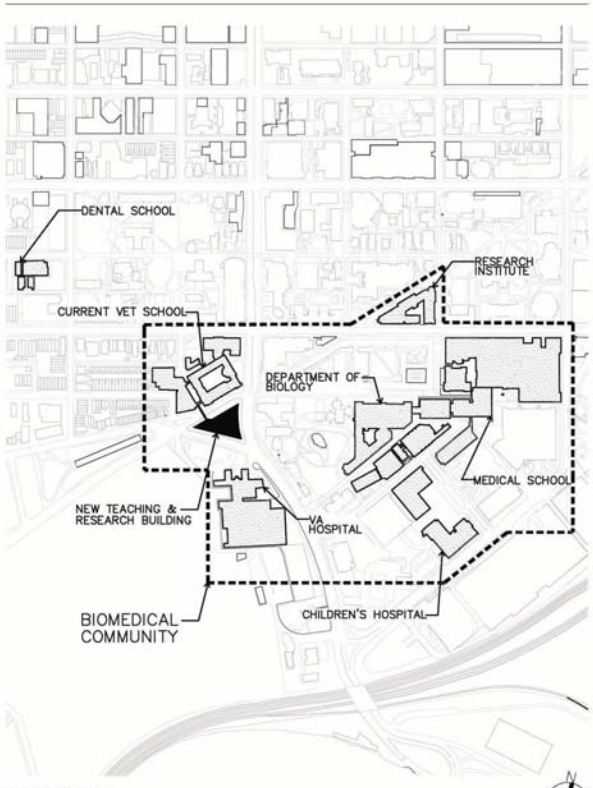
Appropriateness and Suitability

- **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, 4th Edition:
    - http://www.cdc.gov/od/ohs/biosfty/bmbl4/b4af.htm
  - For grants, address both physical and personnel measures used to achieve security

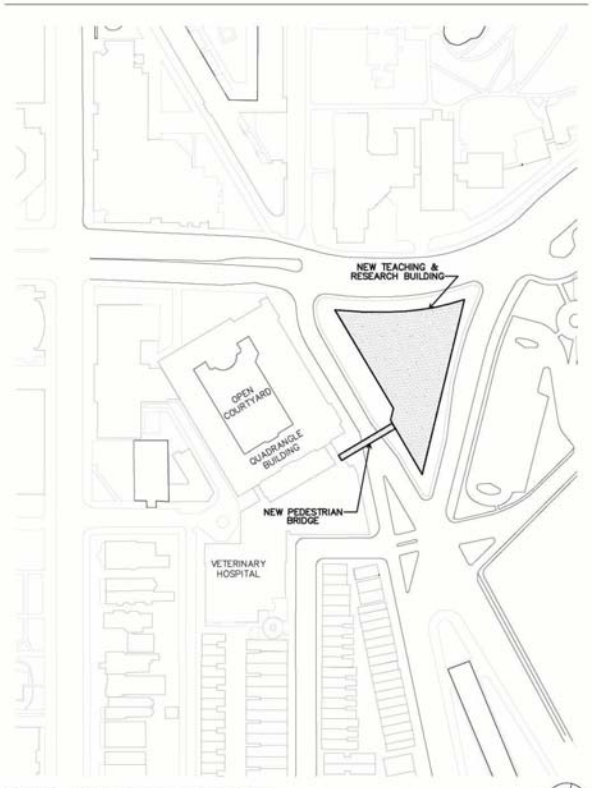
Drawings - General

- 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



CAMPUS MAP
VIVARIA TO BE CONSOLIDATED INTO NEW FACILITY
FIGURE 1



SCHOOL OF VETERINARY MEDICINE
CAMPUS MAP
FIGURE 2

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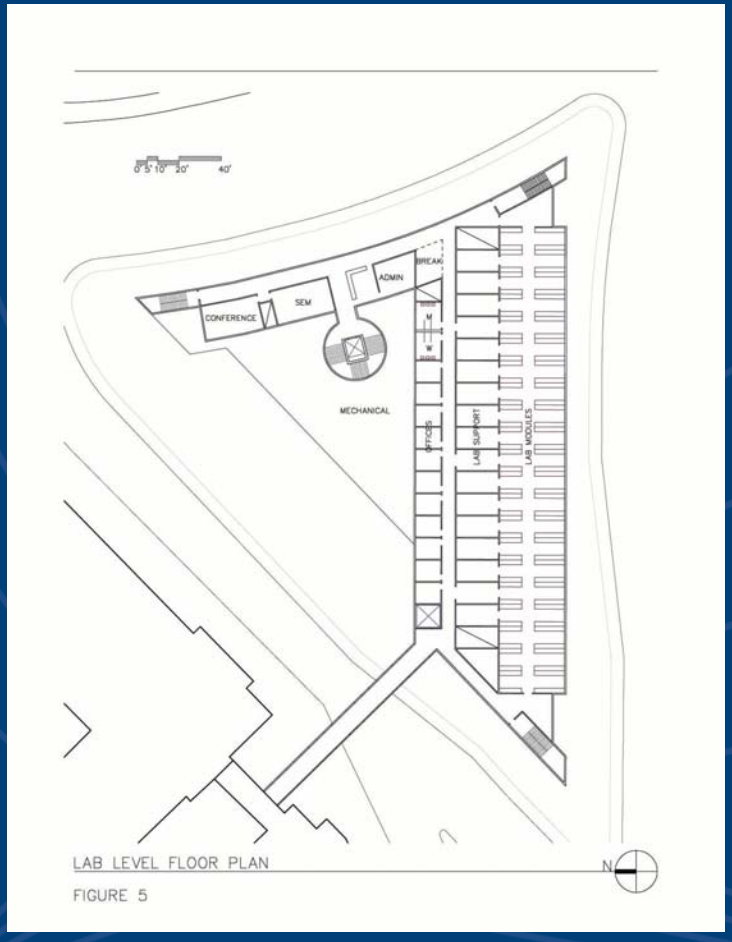
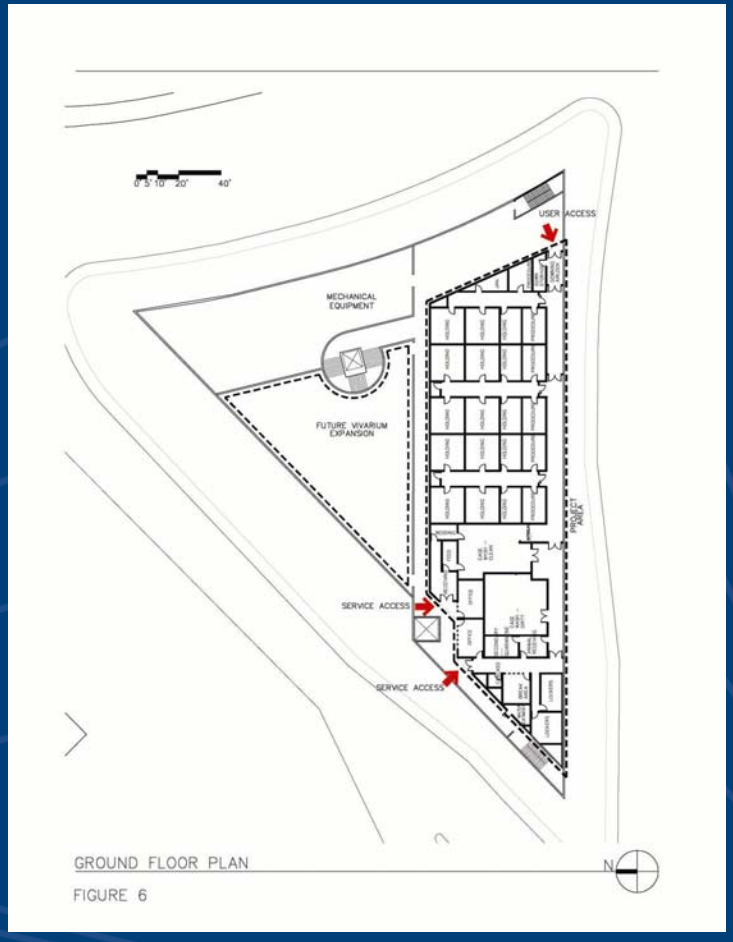
Overall Facility Plans Including Key Access Points



LAB LEVEL FLOOR PLAN

FIGURE 5



GROUND FLOOR PLAN

FIGURE 6

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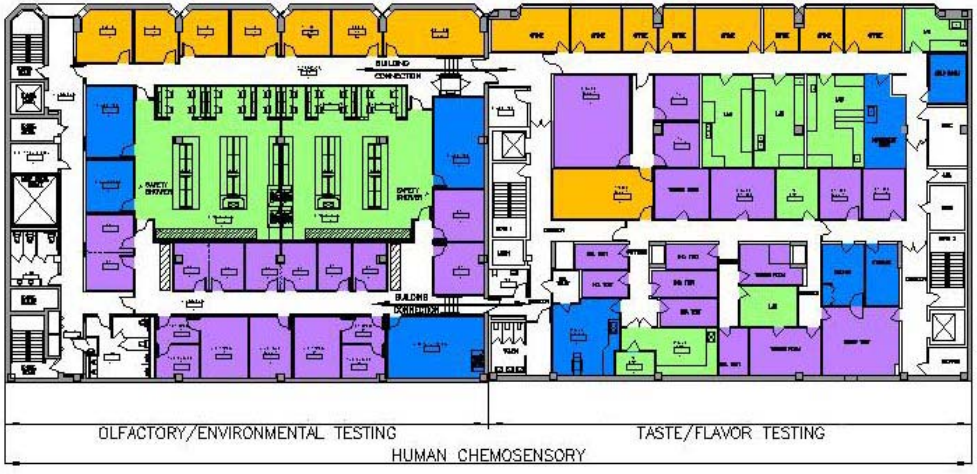
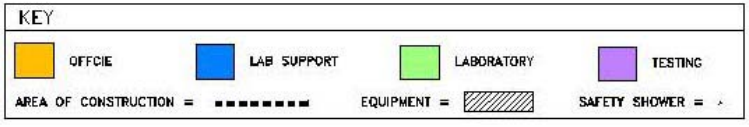
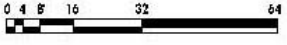
Overall Adjacency Plan

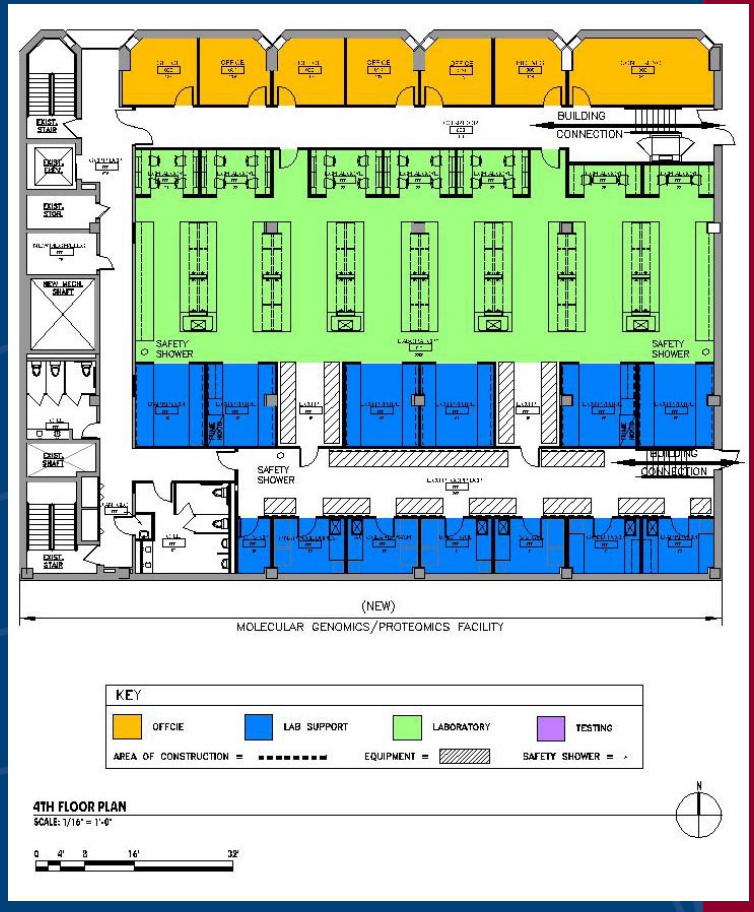




COMBINED 3RD FLOOR PLAN
SCALE: 1/32" = 1'-0"



Floor Plans



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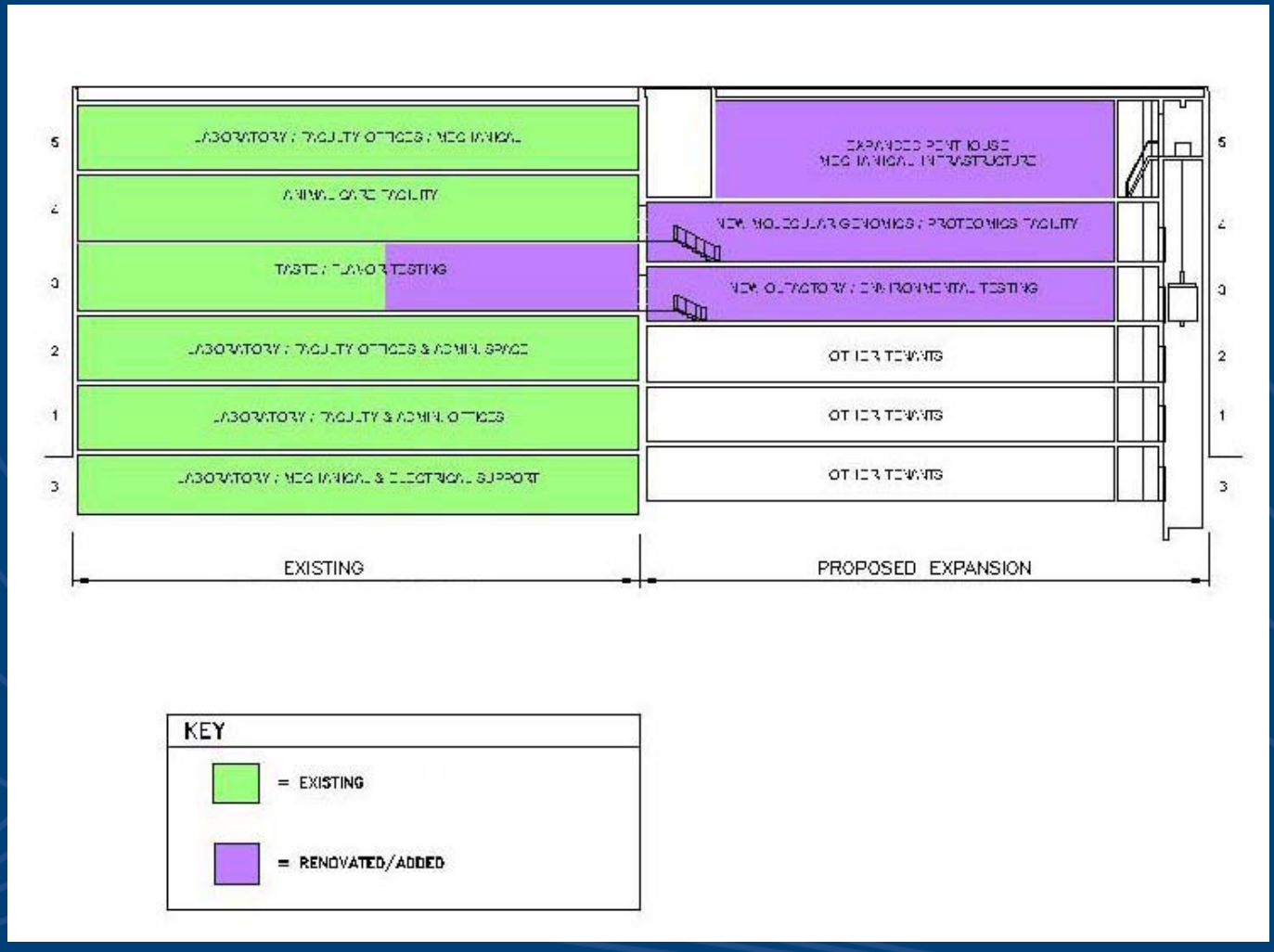
Diagrammatic Section



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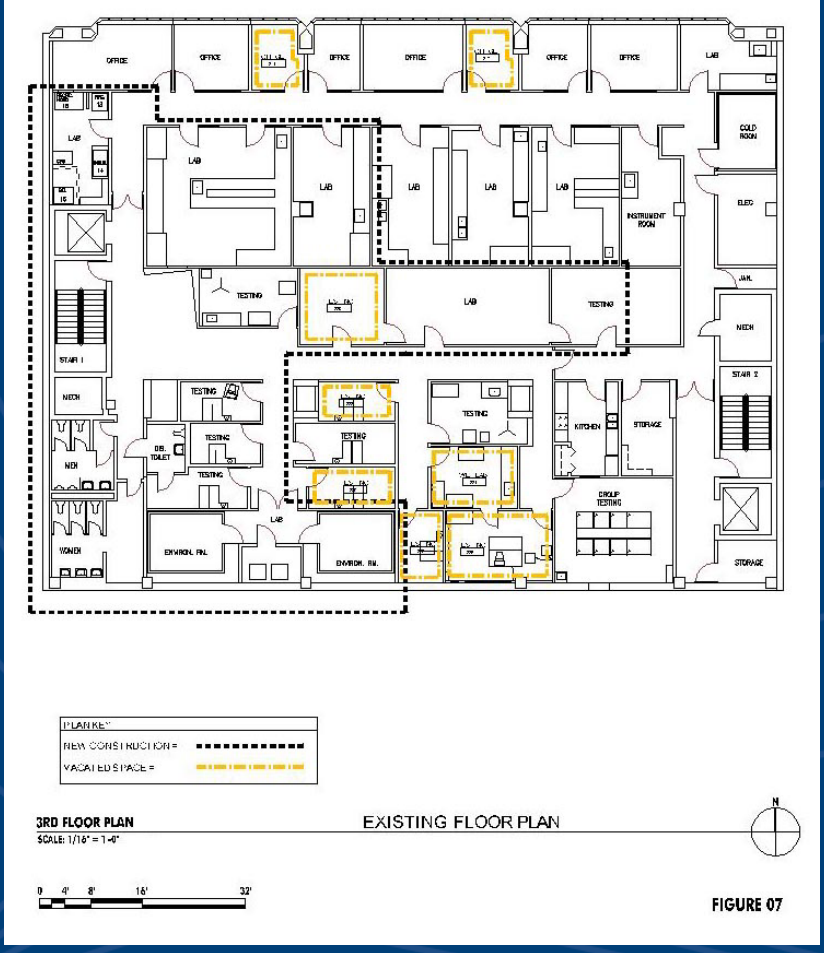
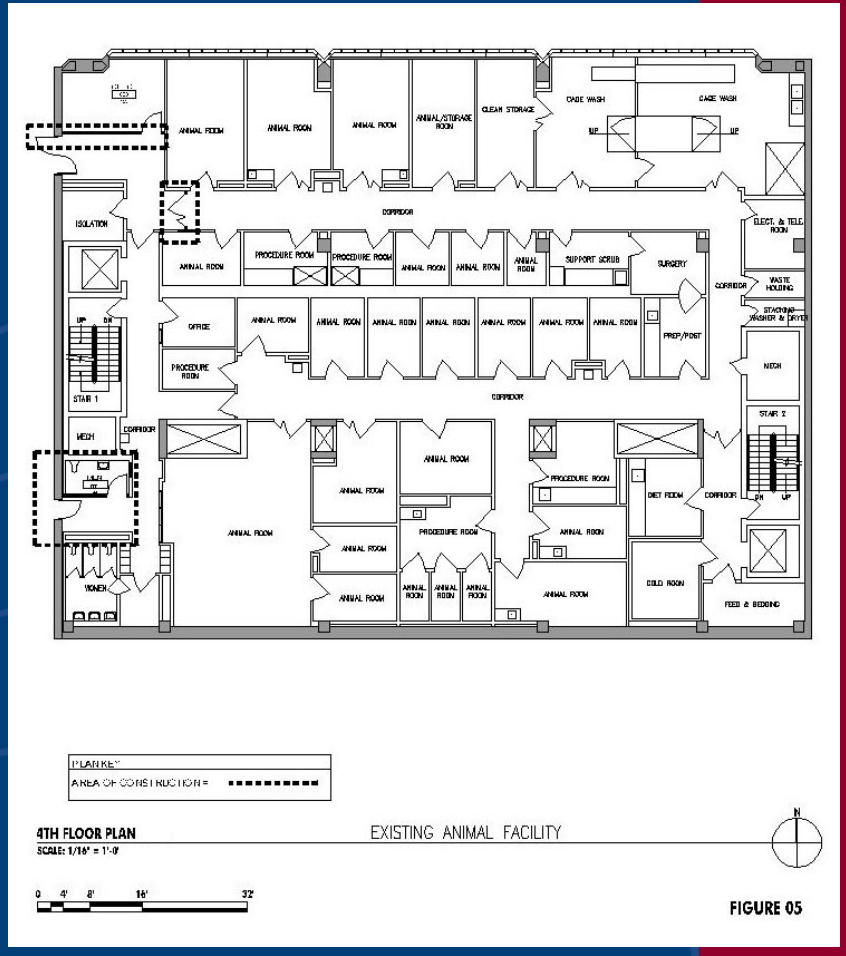
Partial Renovation Plans





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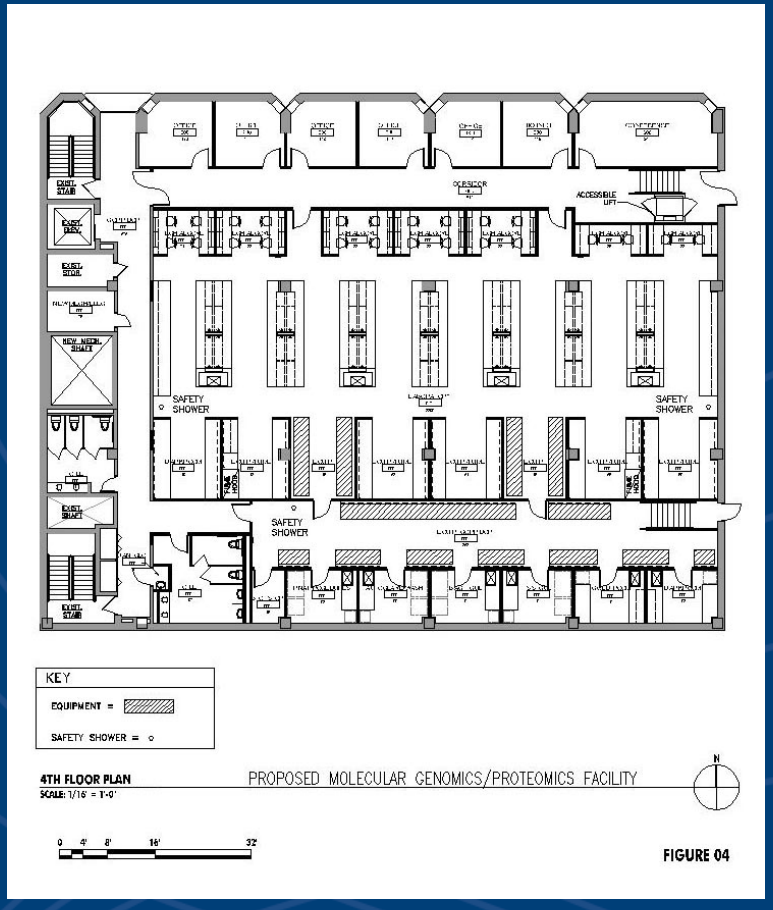
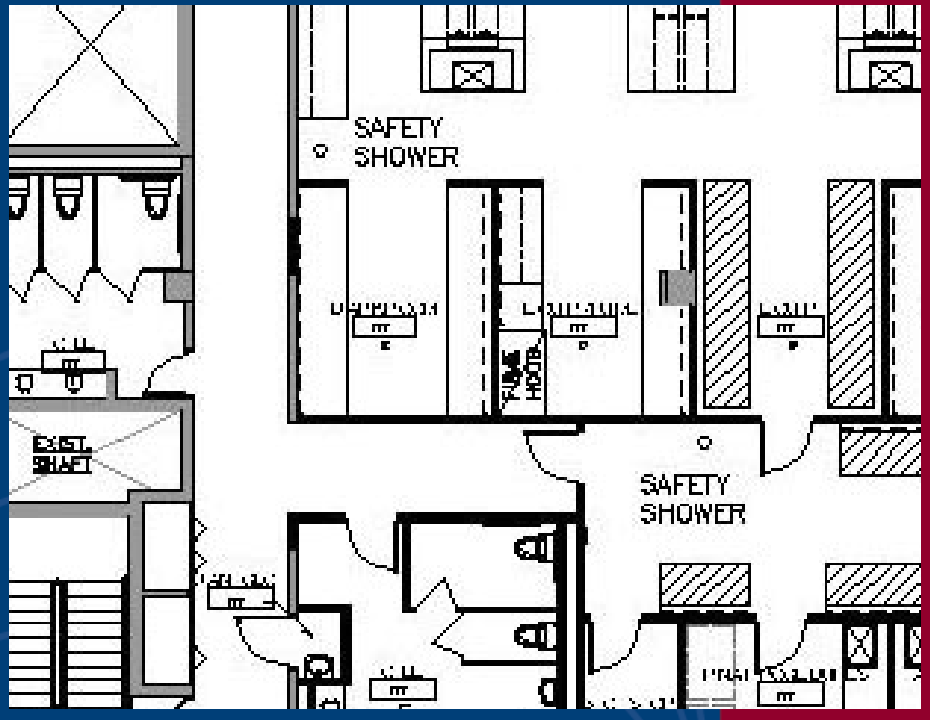
Enlarged Plans

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

Enlarged Plans





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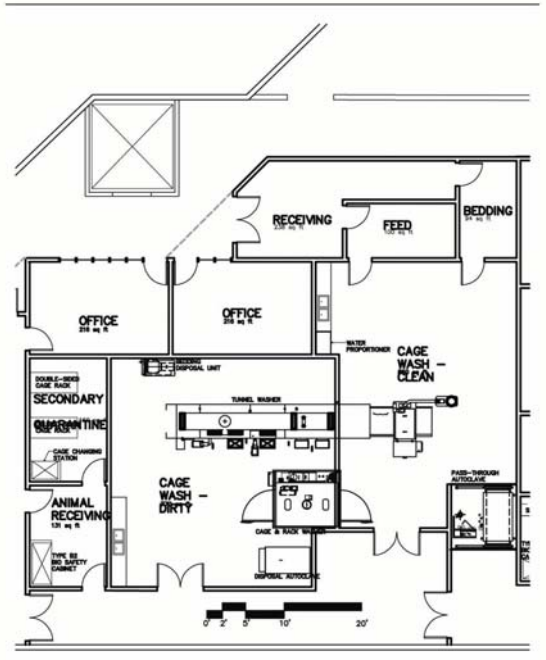
Enlarged Plans

ENLARGED HOLDING SUITE PLAN

FIGURE 7



ENLARGED CAGE/PROCEDURE ROOM PLAN

FIGURE 8

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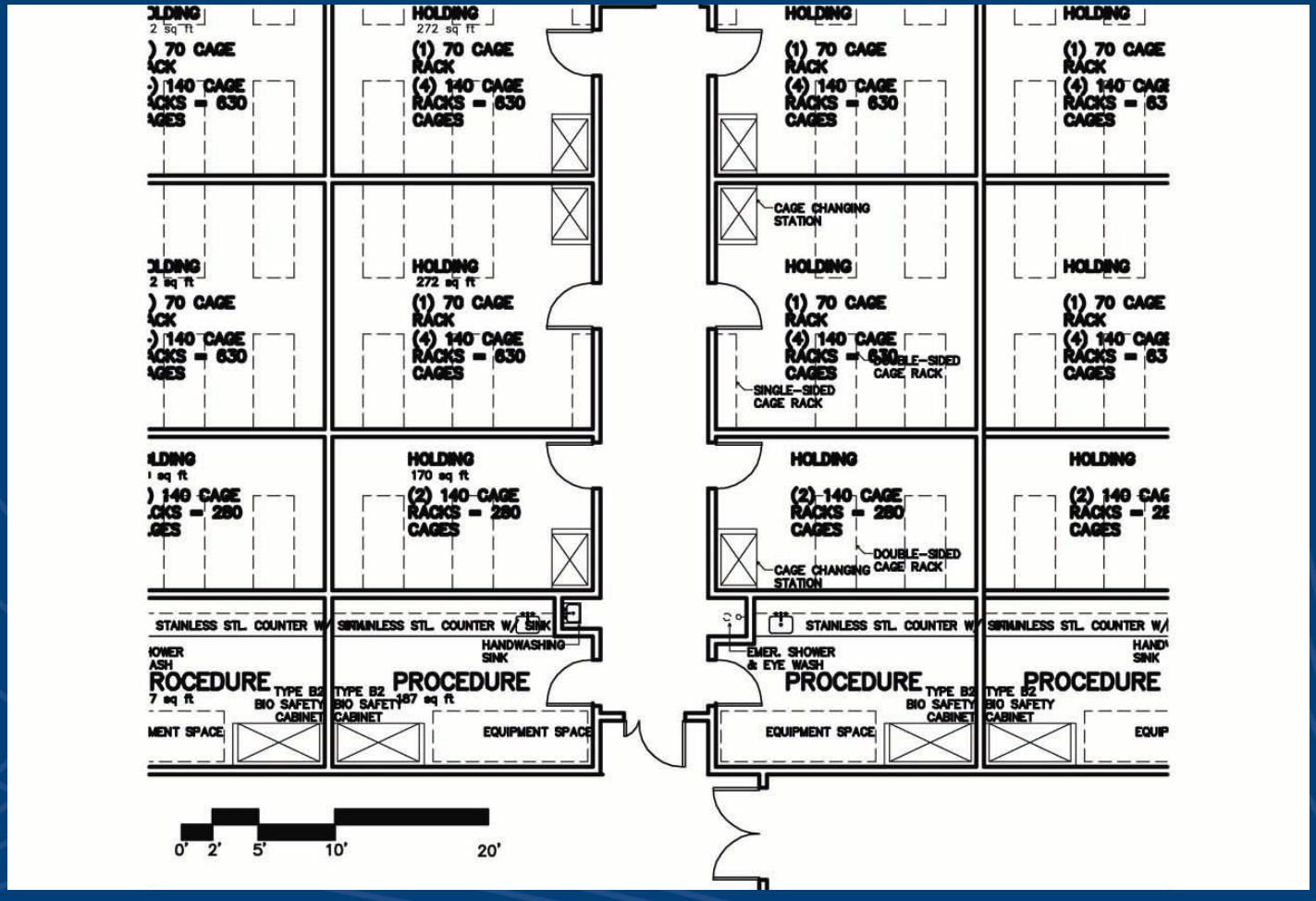
Enlarged Plans



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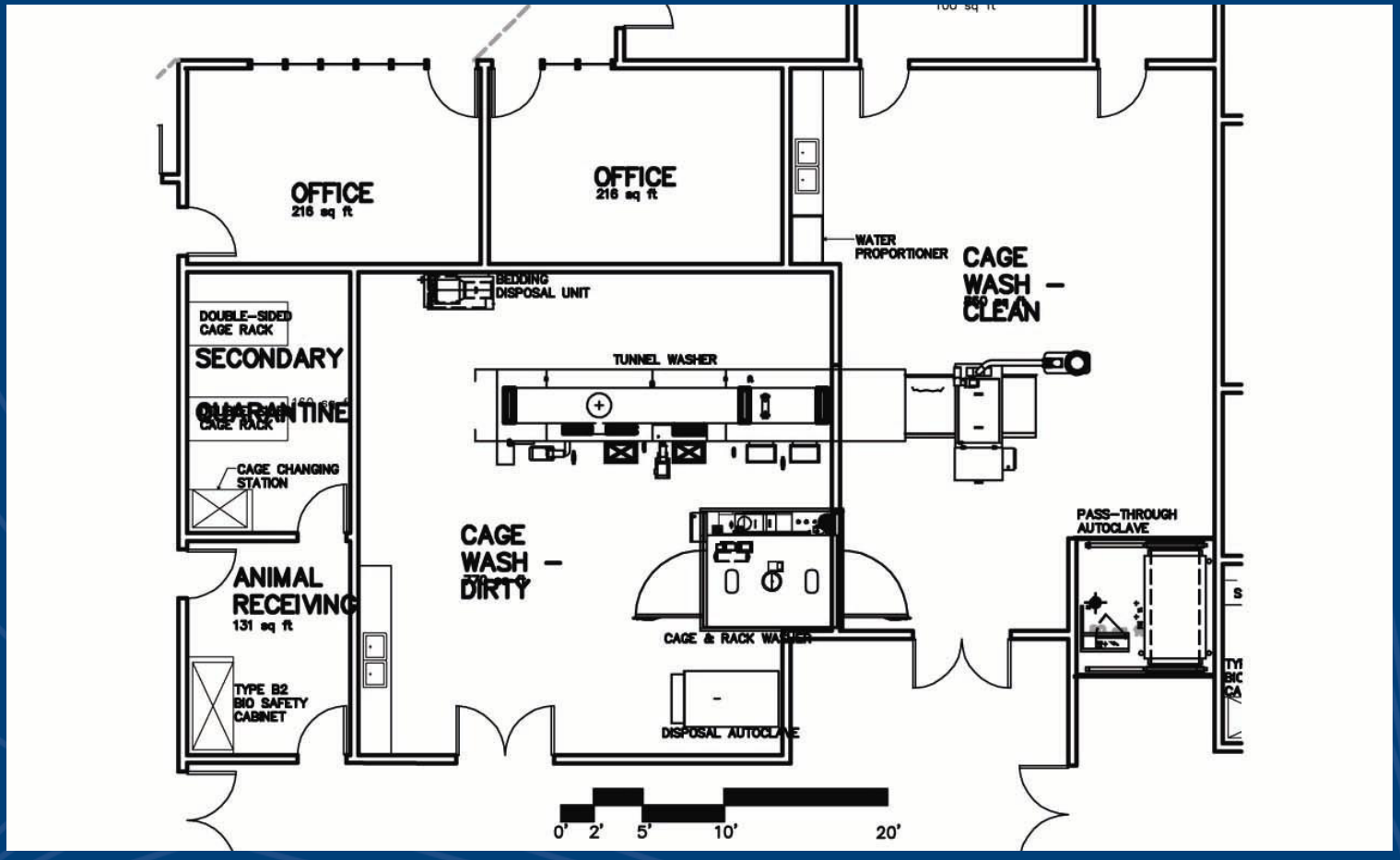
Enlarged Plans



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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

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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.

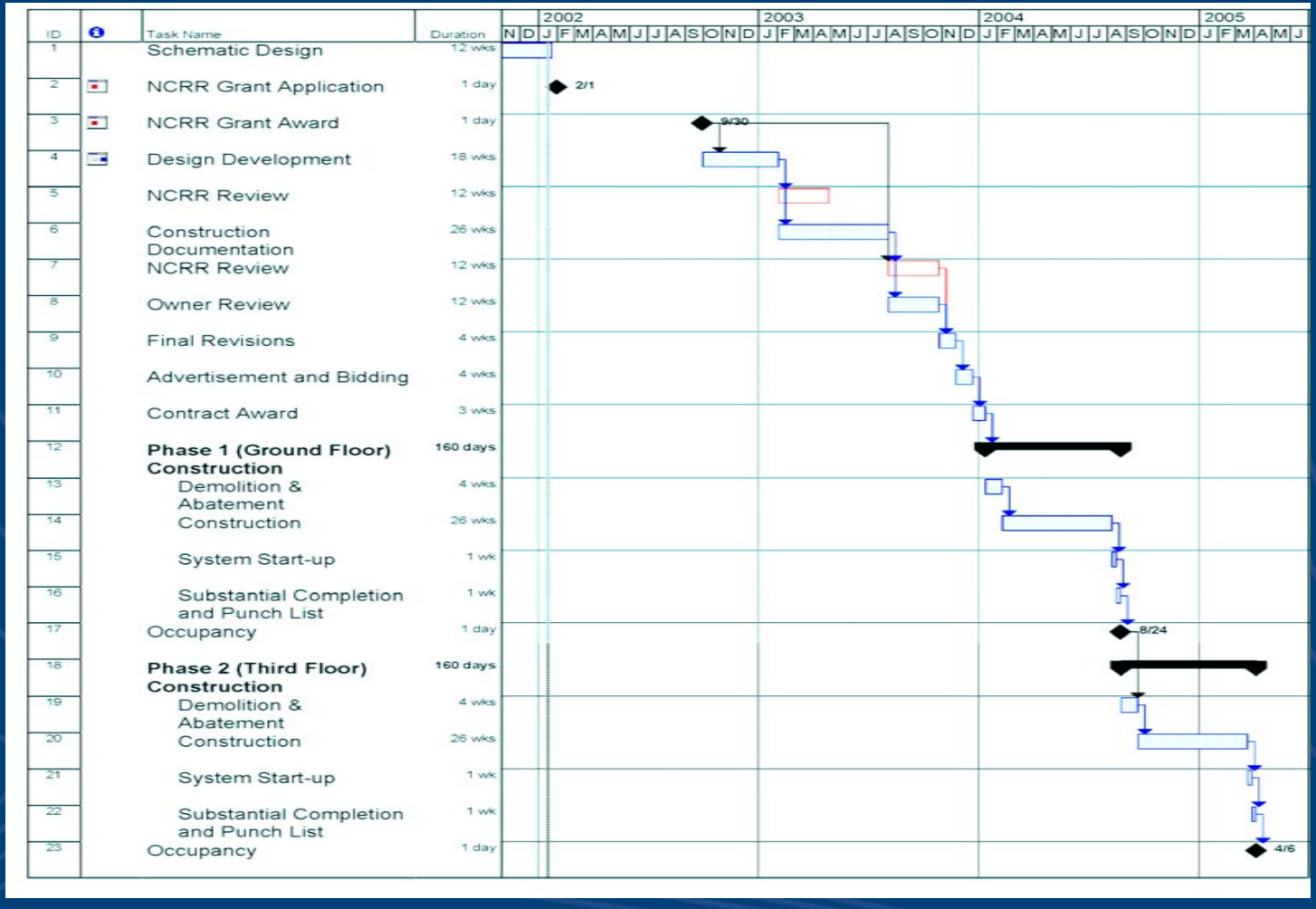
Temperature and Humidity Control

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

Schedule



ID	Task Name	Duration
1	Schematic Design	12 wks
2	NCRR Grant Application	1 day
3	NCRR Grant Award	1 day
4	Design Development	18 wks
5	NCRR Review	12 wks
6	Construction Documentation	26 wks
7	NCRR Review	12 wks
8	Owner Review	12 wks
9	Final Revisions	4 wks
10	Advertisement and Bidding	4 wks
11	Contract Award	3 wks
12	**Phase 1 (Ground Floor) Construction**	160 days
13	Demolition & Abatement	4 wks
14	Construction	26 wks
15	System Start-up	1 wk
16	Substantial Completion and Punch List	1 wk
17	Occupancy	1 day
18	**Phase 2 (Third Floor) Construction**	160 days
19	Demolition & Abatement	4 wks
20	Construction	26 wks
21	System Start-up	1 wk
22	Substantial Completion and Punch List	1 wk
23	Occupancy	1 day

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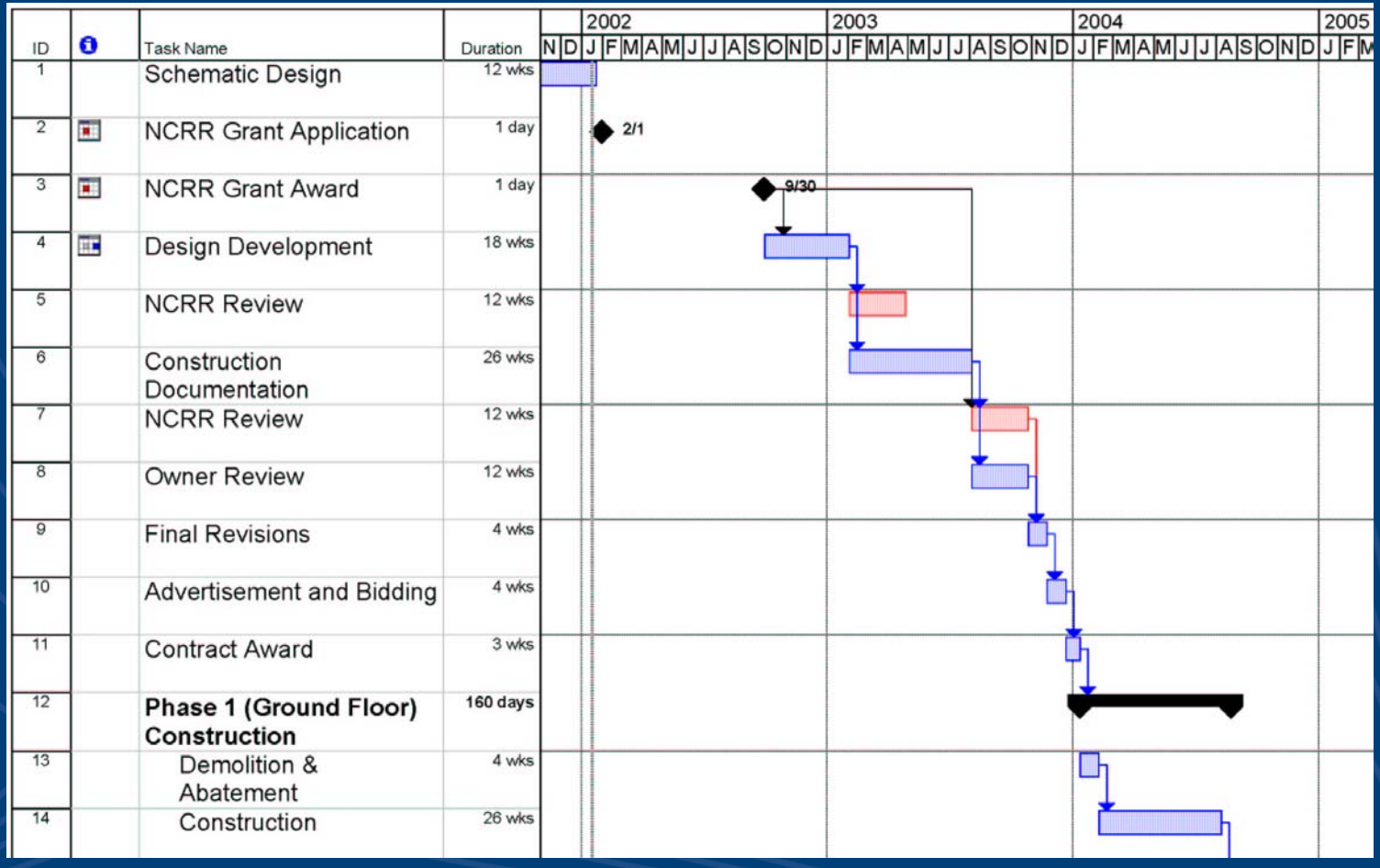
Schedule



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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
	Facility						
A.	New fMRI Scanner Facility						
	New Construction						
	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
	Ground Floor Renovation						
	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
	Third Floor Renovation						
	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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	Testing Room	0	66	$ 204	$13,448	$ 6,401	66
	Testing Room	0	66	$ 204	$13,448	$ 6,401	66
	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

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Budget

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Research Facilities Improvement Program

Summary Perspective

- Read instructions carefully and ask NCRR 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
- Present a complete understanding in main body of grant. Appendices should be supporting details which are not essential to "telling the story".
- Verify legibility of finished product *after* copying

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