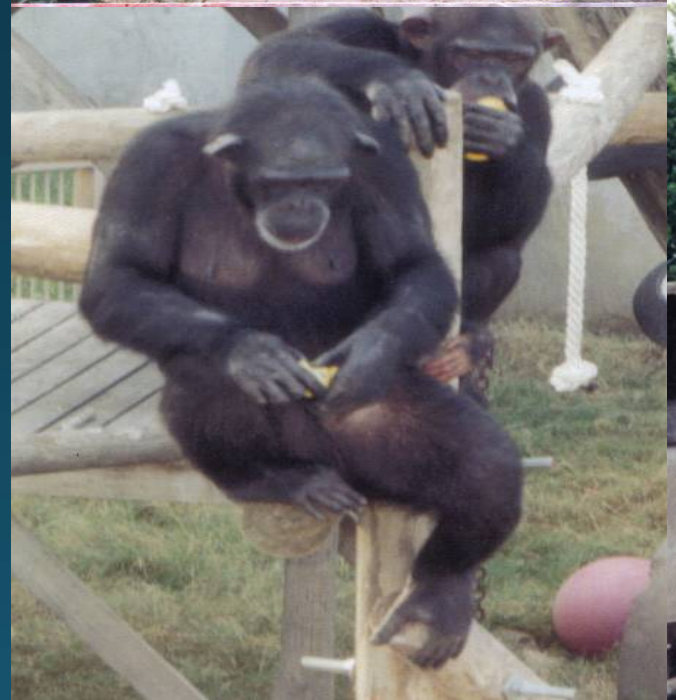
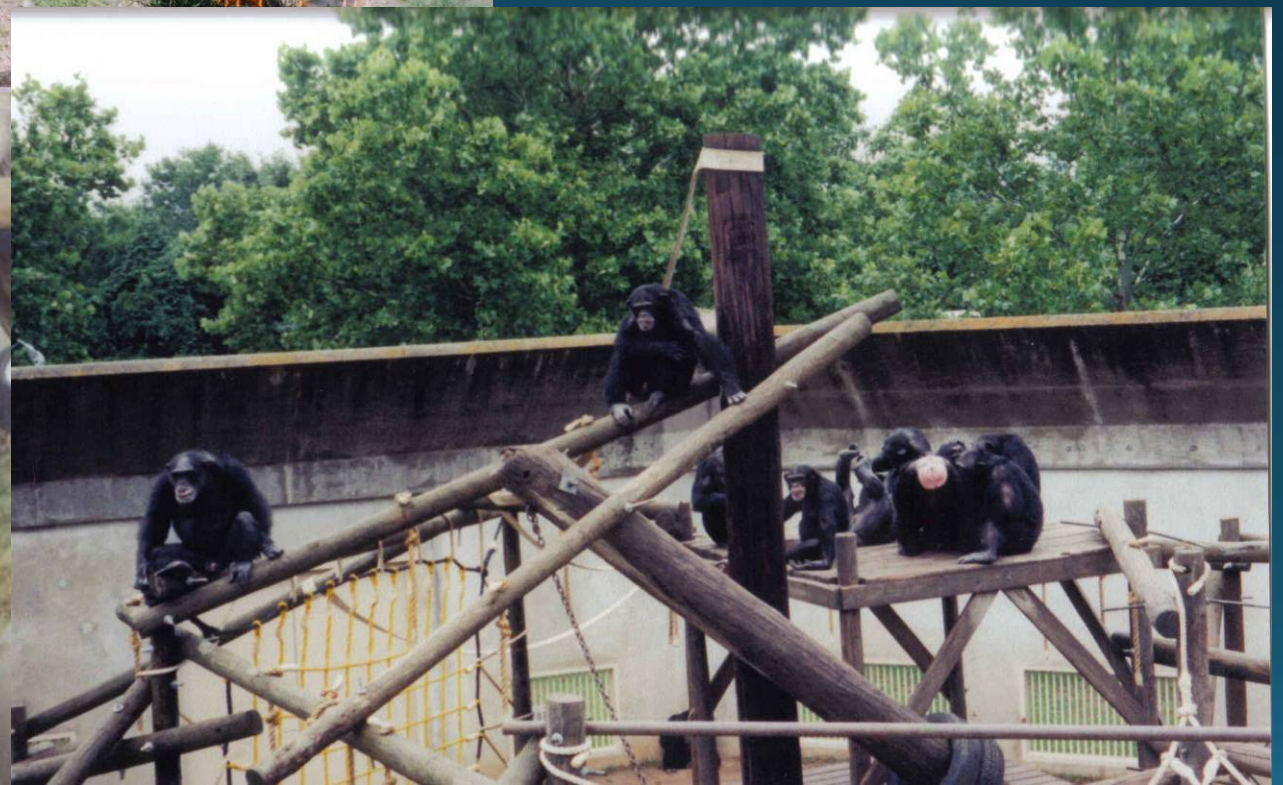
Creating Environments that Support Species-Specific Behaviors for Captive Chimpanzees

D. RICK LEE, DVM
Director, HPC
Alpha Genesis Inc.

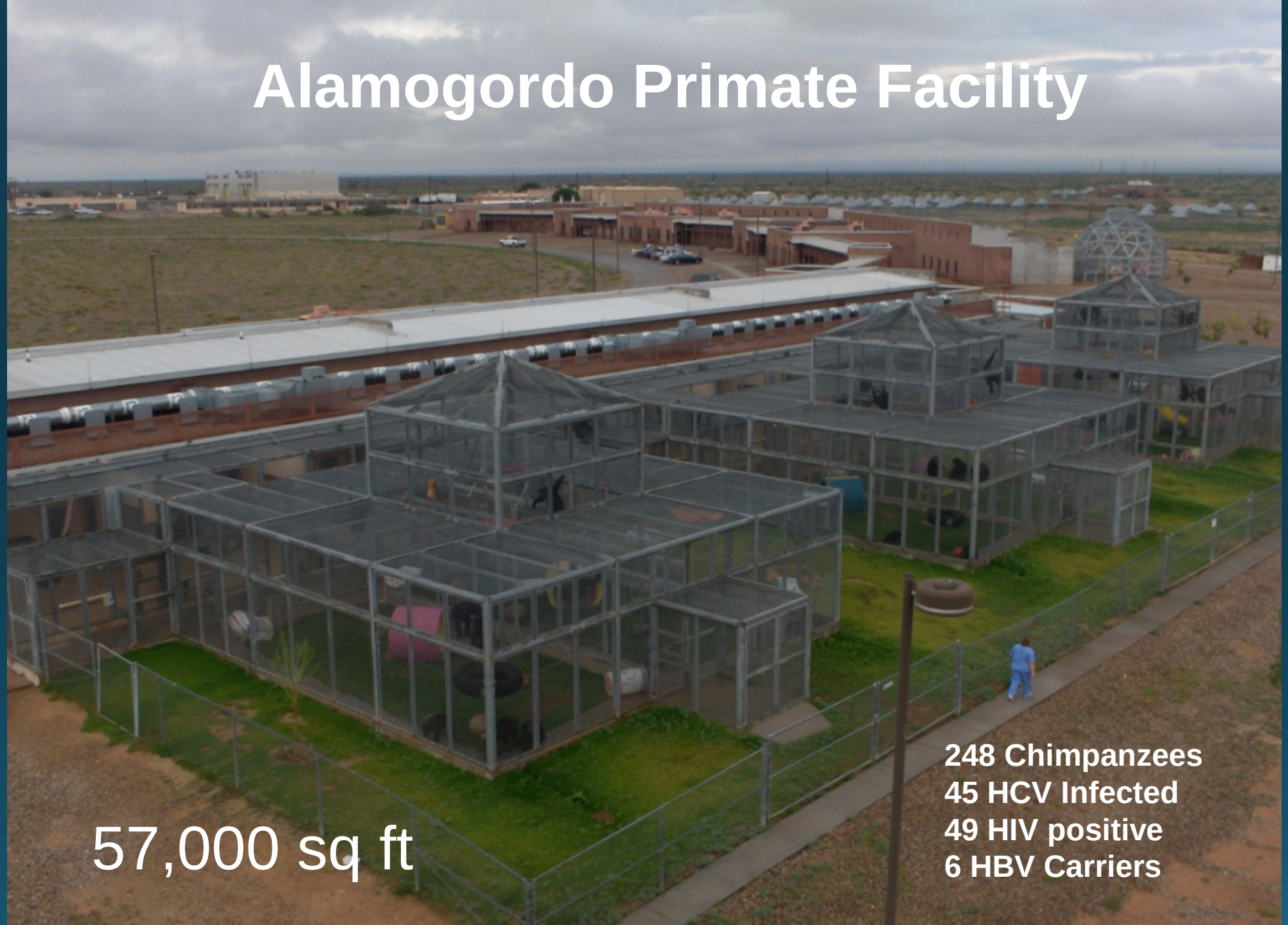
Southwest National Primate Research Center





MICHAEL E. KEELING
CENTER FOR COMPARATIVE
MEDICINE & RESEARCH

Alamogordo Primate Facility



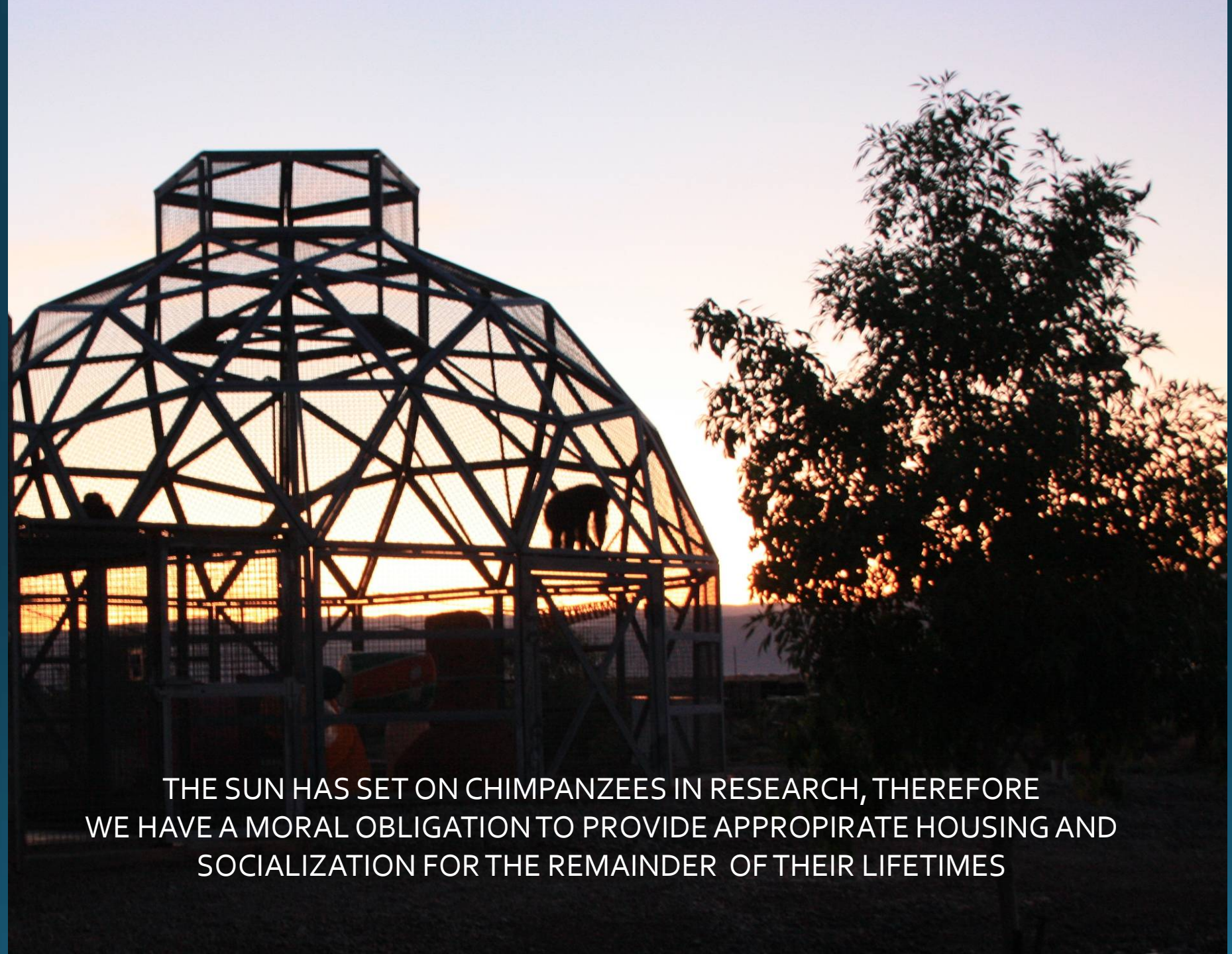
57,000 sq ft

248 Chimpanzees
45 HCV Infected
49 HIV positive
6 HBV Carriers

Primate Foundation of Arizona, Now WaNPRC

USE OF CHIMPANZEES IN BIOMEDICAL RESEARCH

- Space Program
- Virology and Immunology
- Reproductive Biology
- Behavioral Studies
- Aging and Obesity



THE SUN HAS SET ON CHIMPANZEES IN RESEARCH, THEREFORE
WE HAVE A MORAL OBLIGATION TO PROVIDE APPROPIRATE HOUSING AND
SOCIALIZATION FOR THE REMAINDER OF THEIR LIFETIMES

NIH-Supported Chimpanzee Facilities

- Alamogordo Primate Facility
- New Iberia Research Center
- Southwest National Primate Research Center at Texas Biomedical Research
- Keeling Center for Comparative Medicine & Research
- Yerkes National Primate Research Center
- Chimp Haven - Sanctuary

Functional Appropriate Captive Environments (FAE)

Regulatory Requirements

- Animal Welfare Act
- 9 CFR
- OLAW
- AAALAC-International Accreditation
- Institutional Animal Care and Use Comittees

Housing Design, Construction, and Space

- Primary Enclosures
- Outdoor Housing
- Naturalistic Environments

Social Environment

- Biology and Social Behavior
- Size and Composition of Social Groups

Colony Management

- Animal Care
- Behavioral Management
- Medical Management

AWA REGULATORY REQUIREMENTS

9 CFR Sec. 3.81 Environment enhancement to promote psychological well-being.

C. Special Considerations

(5) Great apes weighing over 110 lbs. (50 kg).

"Dealers, exhibitors, and research facilities must include in the environment enhancement plan special provisions for great apes weighing over 110 lbs. (50 kg), including additional opportunities to express species-typical behavior."

Guide for the Care and Use of Laboratory Animals Eighth Edition, 2010

Chapter 3: Environment, Housing, and Management

A. Housing

1. Primary Enclosure, pages 50-52
2. Environmental Enrichment, pages 52-54
3. Space, pages 55-56
4. Chimpanzees, pages 58-61

B. Behavioral and Social Management

1. Social Activity, pages 63-64
2. Social Environment, page 64
3. Training of Animals, pages 64-65

PRIMARY HOUSING OF CHIMPANZEES

Recommended Minimum Space for Nonhuman Primates Housed in Pairs or Groups (Guide 2010)

Group 8 - Chimpanzees (*Pan*)

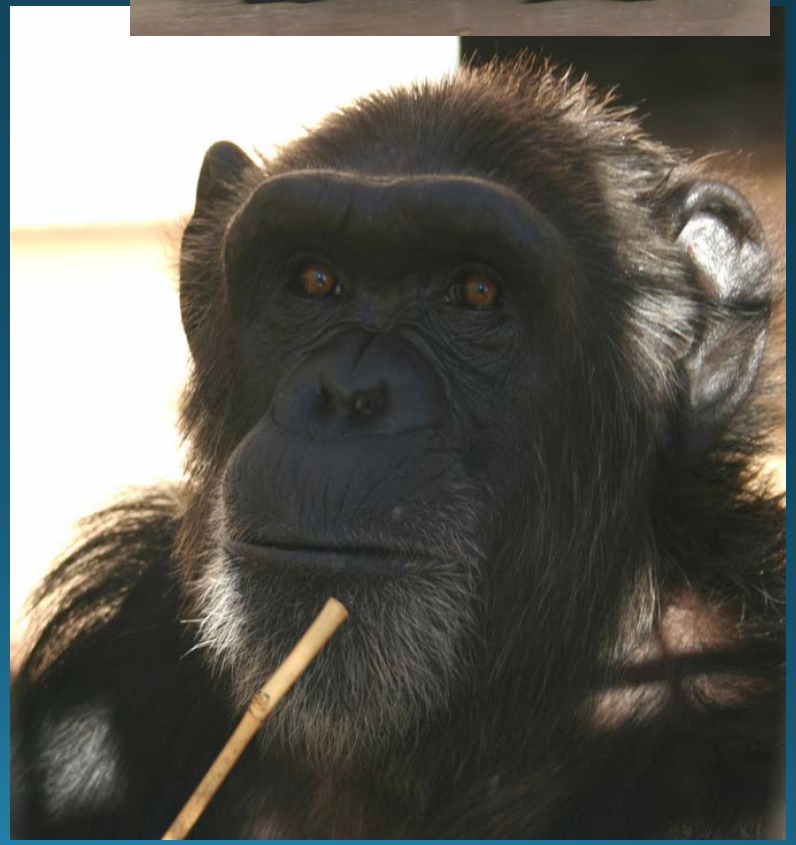
Age	Weight (kg)	Floor Space (Square feet)	Height (Inches)
Juveniles	<10	15ft	60
Adults	>10	≥25	84

For other apes and large brachiating species cage height should be such that an animal can, when fully extended, swing from the cage ceiling without having its feet touch the floor. Cage design should enhance brachiating movement.

Functionally Appropriate Captive Chimpanzee Environments (FAE)

1. Housing Design, Construction, and Space
    a. Primary Enclosures
        - Environmental Design
        - Construction Materials
        - Housing Size and Density
    b. Outdoor Housing
        - Design and Construction
        - Vertical Height
        - Complexity
    c. Naturalistic Environments

BEHAVIOR AND BIOLOGY OF CHIMPANZEES



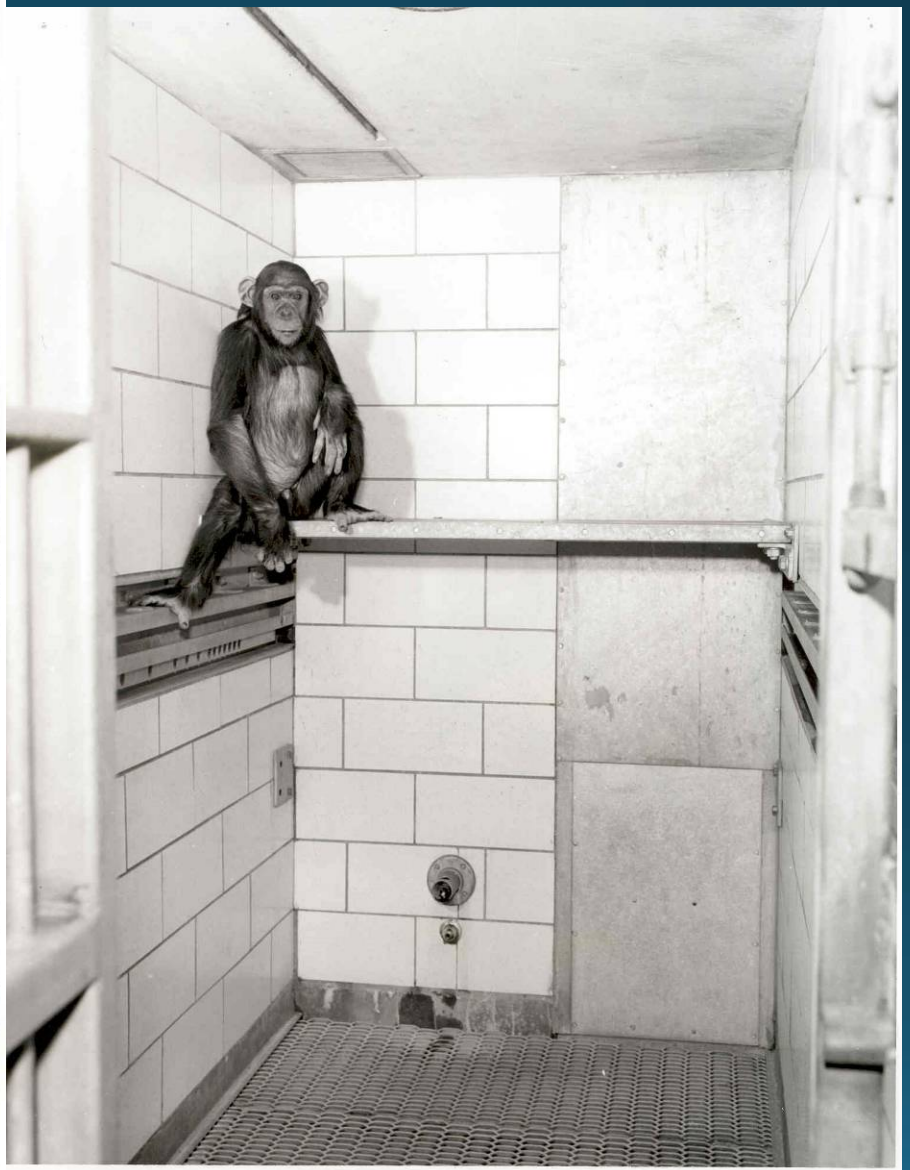
Biology of Chimpanzees

- Size
- Strength
- Intelligence
- Complexity of Social Structure
- Susceptibility to Disease
- Special Considerations

Behaviors Exhibited by Wild Chimpanzees

1. Foraging – Time and variety of food
2. Nesting – Time and materials
3. Activity – Traveling, climbing, brachiation
4. Problem Solving – Tools and complexity

Old Housing Strategies (60's)



Chimpanzee Housing

STRATEGIES TO ENHANCE CHIMPANZEE WELFARE

- Functionally Appropirate Environments
- Promote the Highest Standards of Care
- Provide the Best Healthcare
- Enhance Quality of Life
- Provide Lifetime Care
- Define Humane End Points

HOUSING CONSIDERATIONS FOR CHIMPANZEES

- Infectious Status
- Behavioral Incompatibility
- Optimal Group Size
- Time to Form Groups
- Individual Health Problems
- Age or Size Differences

Space and Usage

- Size – Quality is more important than Quantity
- Complexity – Visual barriers, climbing, substrate
- Quality – Novel and allows for species typical behavior

Group Size and Space Use

- Ideally 7 or more animals
- Multi-male and multi-female
- Density - At least 250 sf per animals
- Vertical Height at least 20 feet
- Complex climbing and brachiation
- Quality of environment is more important that quantity

Population Density

- Chimpanzees compensate by changing social behavior in crowded conditions.
- Chimpanzees do better in larger groups rather than with more space and isolation.
- Increased function and complexity can compensate for smaller space.

Chimpanzee Healthcare

- Preventive Medicine
- Treatment Strategies
- Cooperative Training for Medical Procedures
- Geriatric Medicine
- Veterinary Medical Procedures
- Medical Treatment of Abnormal Behaviors

Medical Housing Considerations

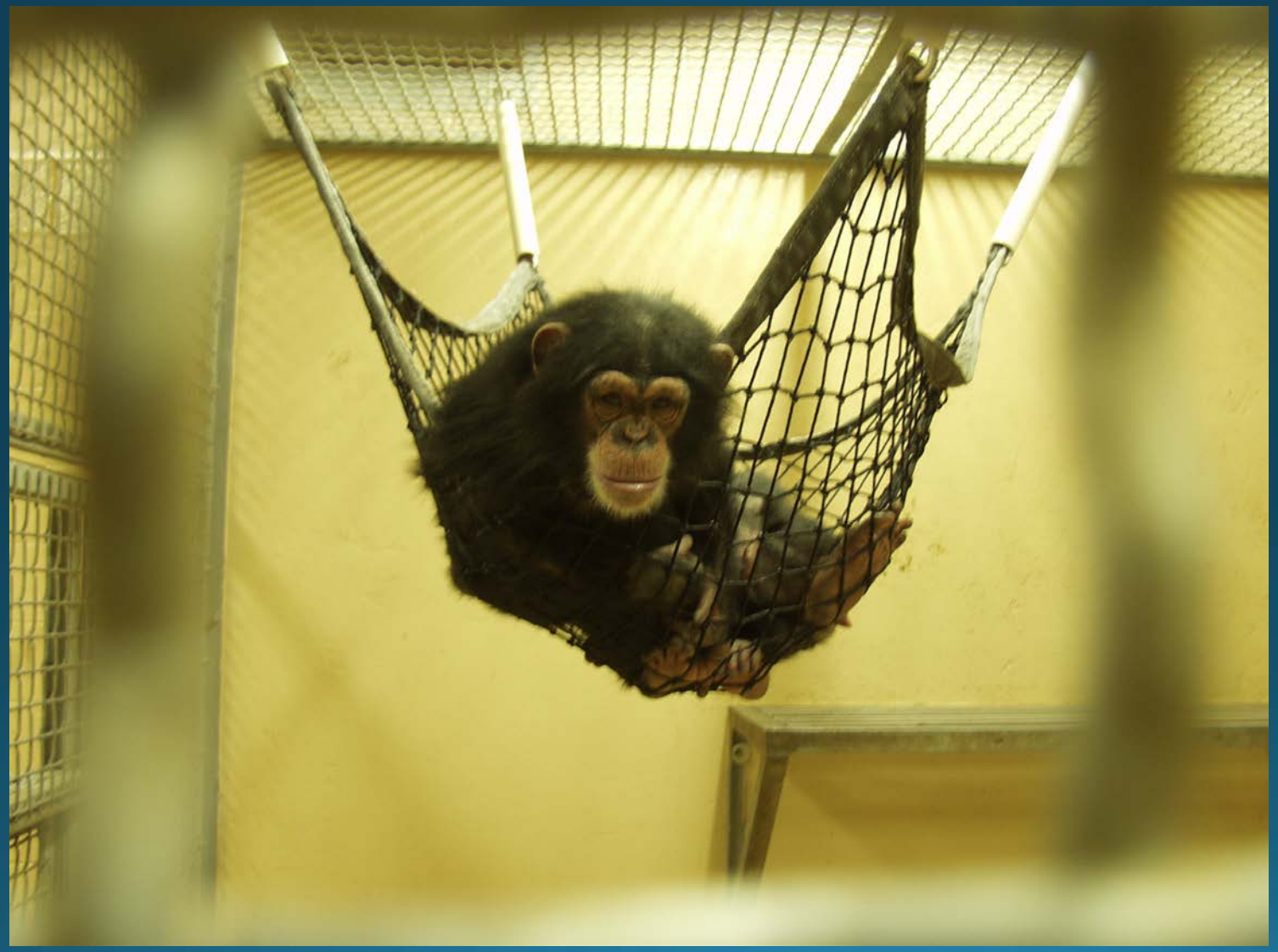
- Quarantine
- Immunoprophylaxis
- Anthelmintics
- Dental Prophylaxis
- Breeding Contraception
- Intensive Monitoring
- Enhanced Nutrition for Sick

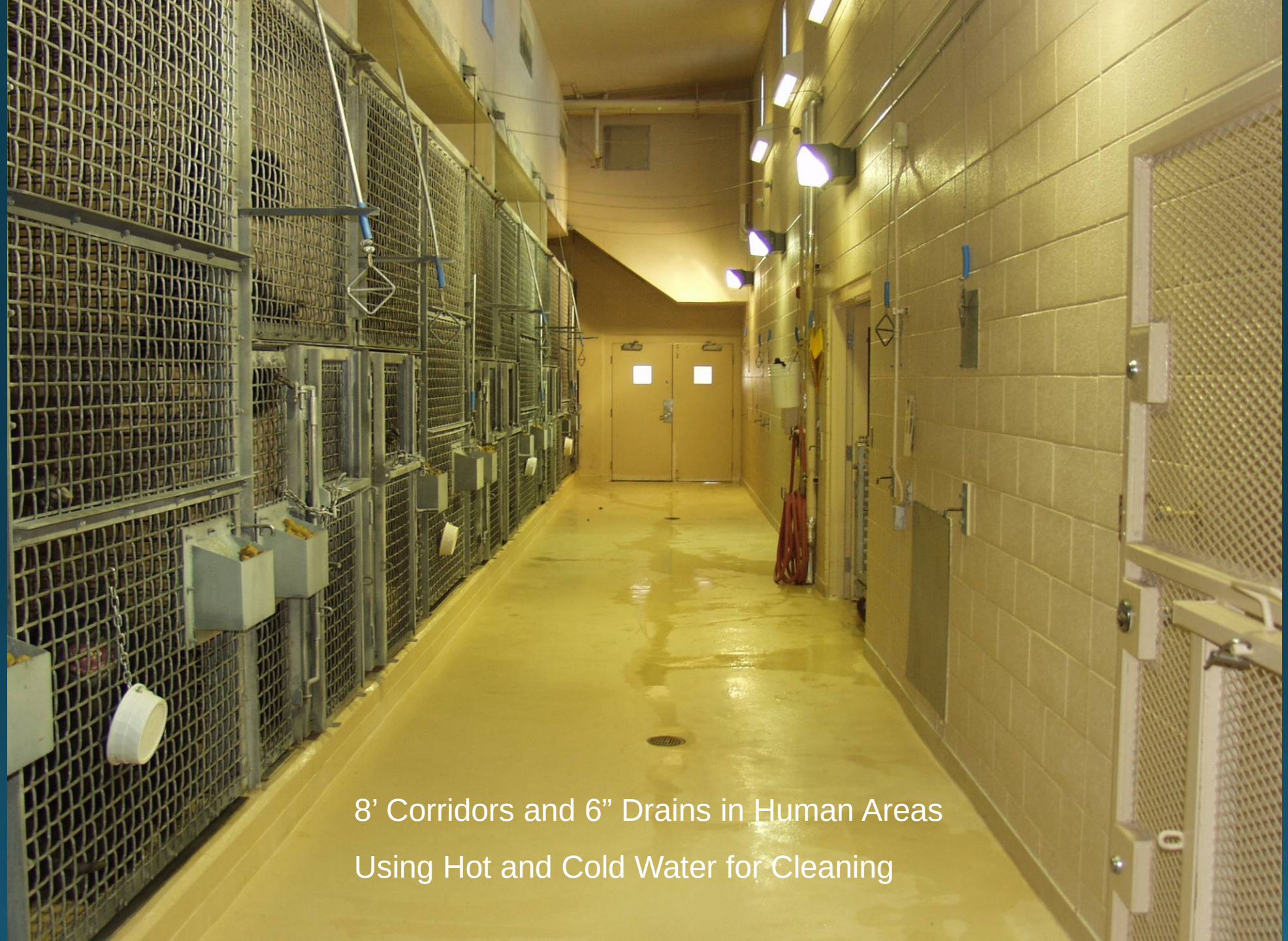
Indoor/Outdoor Runs

- Divided by 1/3rd and 2/3rd
- 180 ft² Indoor
- 240 ft Outdoor
- 6 gauge mesh
- 3 feeders per den
- Transfer box adapter
- 2 Guillotine Doors
- Free Outdoor Access
- Epoxy Flooring
- 6 inch drains
- Enrichment Devices
- Radiant Heat
- Forced Air HVAC


Indoor Housing Accessories

INDOOR NESTING





8’ Corridors and 6” Drains in Human Areas

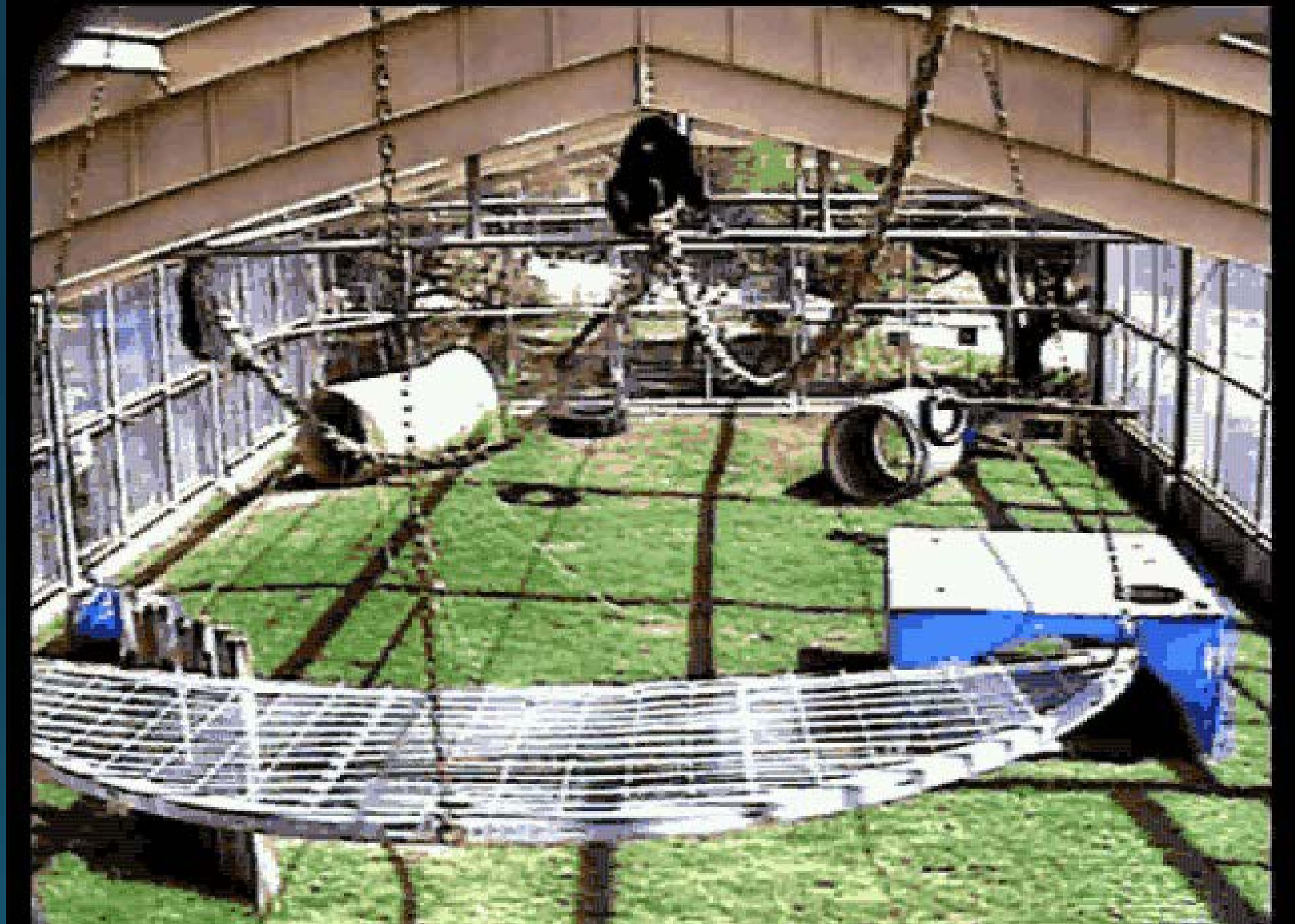
Using Hot and Cold Water for Cleaning

Lighting and Safety Door

Drain Systems Inside and Outside

Safety Doors

- Improved vision
- Stronger design
- Transfer box
  adapter
- Darts or injections
- Less rusting
- More security



PRIMADOME Relocatable External Primate Enclosure (REPE)

Primadome™ Specifications

- 34' Diameter Geodesic Dome consisting of 75 panels
- Each panel is constructed of 3" x 3" x 3/16" angle iron
- After fabrication, all 75 panels are hot dipped galvanized & shipped to the site for erection
- 6 Gauge (1/4”) Woven Crimped Wire
- 8’ Tall base walls are added below the geodesic dome

Tool Use with Termite Mound

NEW IBERIA RESEARCH CENTER, LOUISIANA

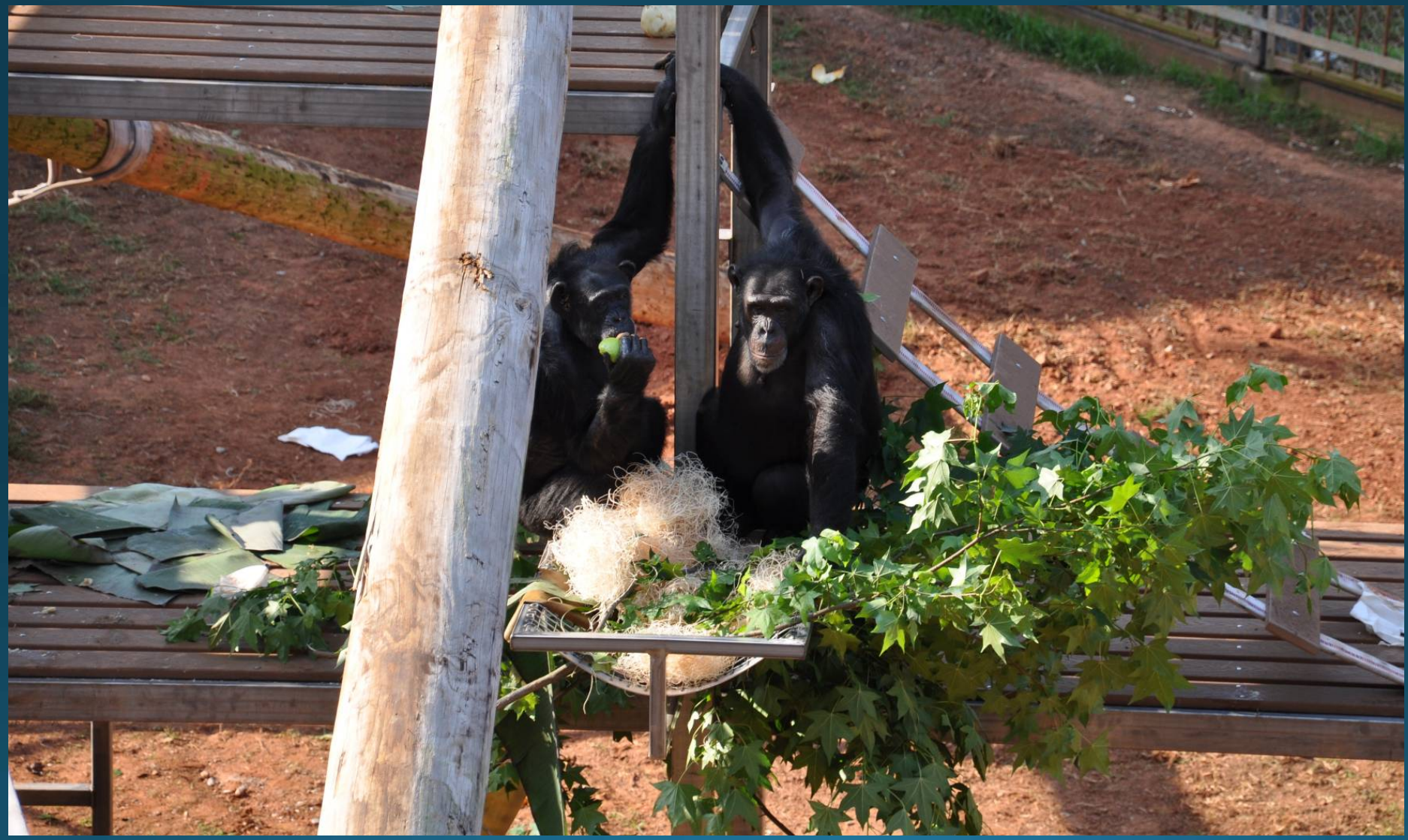
PRIMADOME VILLAGE

HAFB ISLANDS WITH MOTE

YERKES NATIONAL PRIMATE RESEARCH CENTER

CORRALS

Nest Building



TEAM APPROACH TO DESIGN

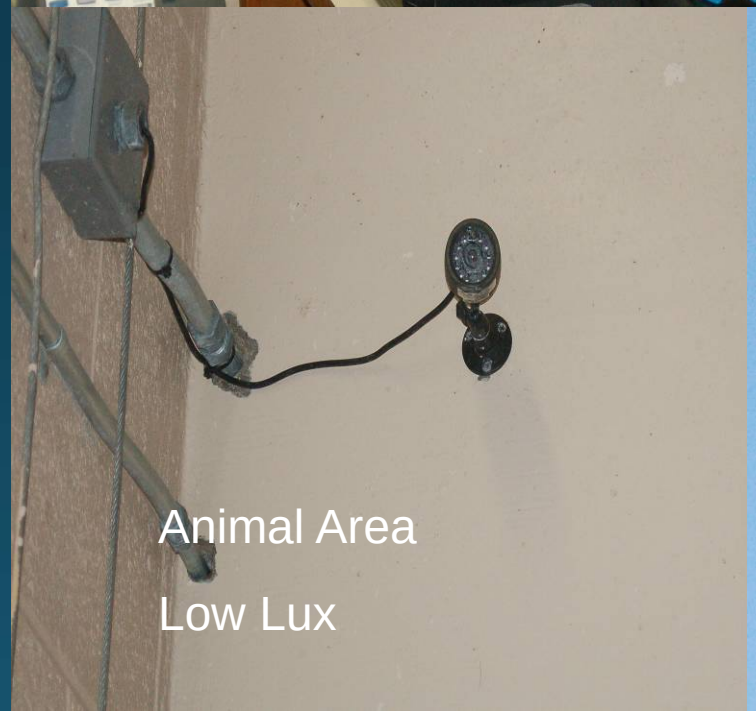
- Get engineers to do evaluation
- Network with contractors
- Have work done in-house
- Be creative and innovative
- Foster teamwork and empowerment

FAE Summary

- Quality of environment is more important than quantity
- Large social groups – at least 7 per group
- Designs and materials for managing groups
- Space density – at least 250 sf per animal
- Outdoor Access – continuous and year round
- Vertical Height for climbing and brachiating
- Foraging opportunities – varied and nutritious
- Nesting materials – available daily
- Opportunities for choice of enrichment
- Experiences staff with proper training

Questions?

Auxiliary Area High Lux



Animal Area

Low Lux

Pan-Tilt-Zoom for Monitoring