



CROCKER CONSULTING ENGINEERS, INC.

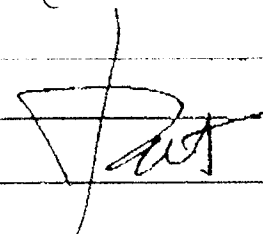
FACSIMILE TRANSMITTAL SHEET

TO: <u>Jeff Glazier</u>	FROM: <u>Pat</u>
COMPANY: <u>DPZ</u>	DATE: <u>2003-09-11</u>
FAX NUMBER: <u>833-4459</u>	TOTAL # OF PAGES INCLD. COVER: <u>5</u>
PHONE NUMBER:	SENDER'S PHONE NUMBER: <u>417-883-4056</u>
RE: <u>Gleph. House</u>	SENDER'S FAX NUMBER: <u>417-883-4057</u>
<u>Light fixtures</u>	
<input type="checkbox"/> URGENT <input type="checkbox"/> FOR REVIEW <input type="checkbox"/> CONFIDENTIAL <input type="checkbox"/> PLEASE REPLY	

NOTES/COMMENTS:

Look these over

Light fixture "B" $\frac{1}{2}$ " "B1"
(quick-start)



*If you have any problems receiving this document or reading it, please call
 (417) 883-4056 or Fax (417) 883-4057*



MEP ENGINEERS
 STRUCTURAL ENGINEERS
 CIVIL ENGINEERS

PROJECT
 NEW HOLDING EXHIBITS IMPROVE!

3043 N. F
 SPRINGFIELD
 MISSOURI

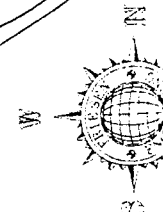
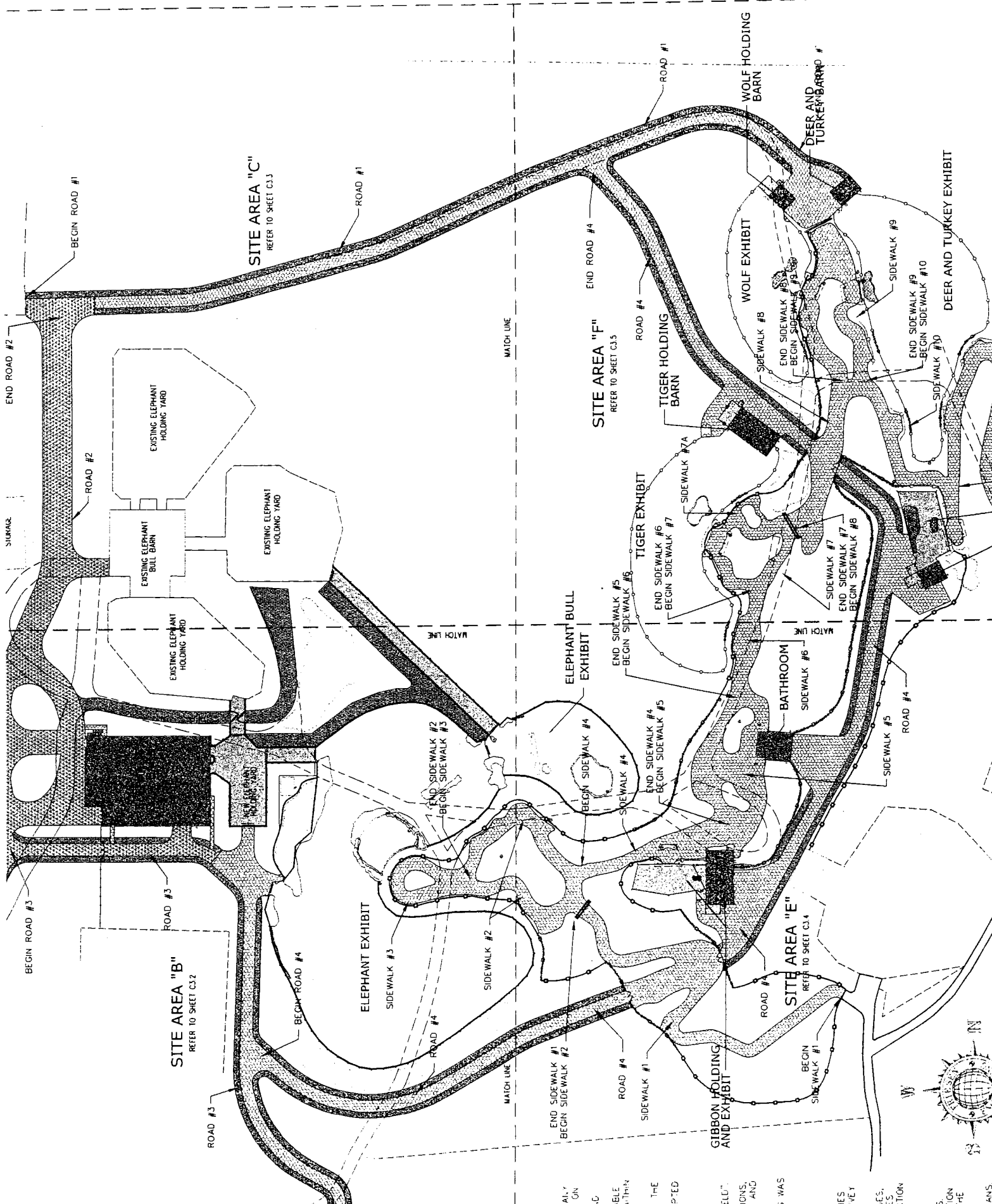
REVISIONS



DATE: NC
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 SHEET TITLE

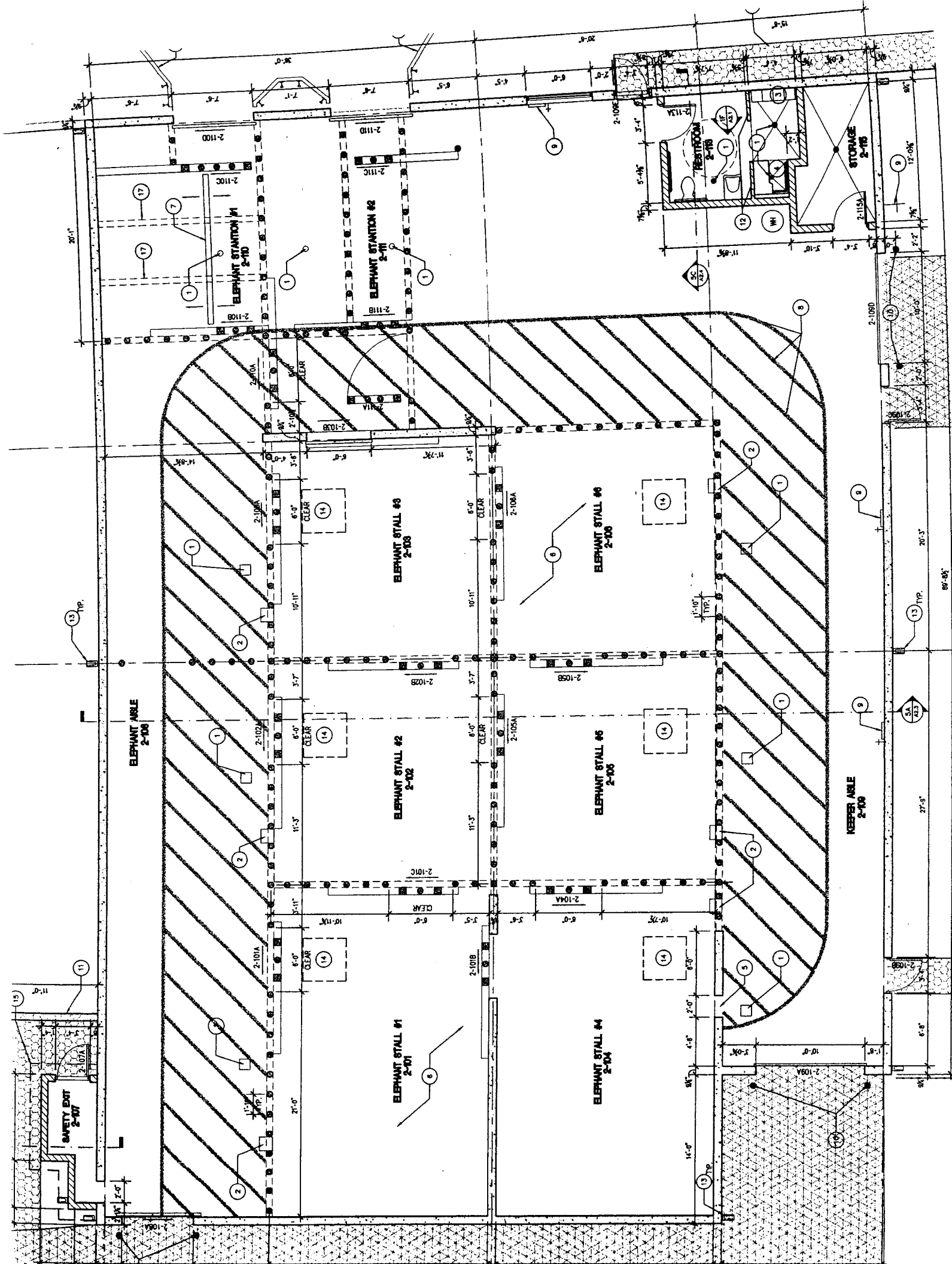


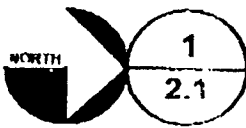
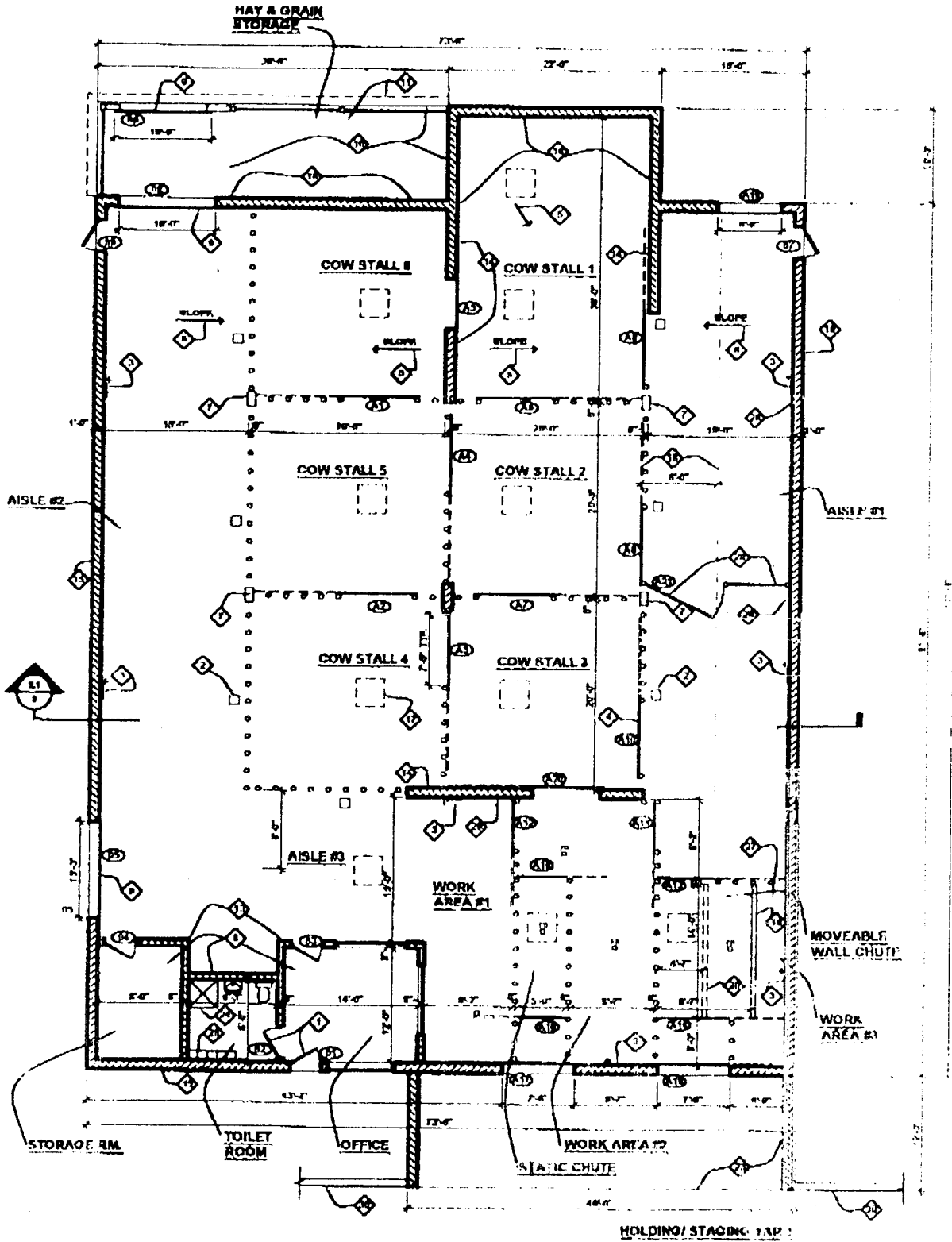
SIN



DATE: NC
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PLANS





1 FLOOR PLAN - PROPOSED COW ELEPHANT BARN

2.1 1/16" = 1'-0"

DRAWING NOTES, SHEET 2.1:

1. HOLLOW METAL DOOR & FRAME, TYP.
2. 12" x 12" FLOOR DRAIN @ STALL AREA, TYP.
3. HOSEBIB & HOSE RACK LOCATION. PROTECT AT ALL ELEPHANT TRANSFER AREAS.
4. SLIDING TRANSFER DOOR, TYP.
5. SEALED CONCRETE FLOOR SLAB IN HOLDING STALL, 6" MIN. THICKNESS, SLOPE 3/8" PER FOOT TO DRAIN.
6. SEALED CONCRETE FLOOR SLAB IN SERVICE AISLE, SLOPE 1/8" TO 1/4" PER FOOT TO DRAIN.
7. ELEPHANT DRINKING TROUGH LOCATION. SEE 11/2.2.
8. PROVIDE WASHABLE CEILING PANELS IN OFFICE, STORAGE ROOM, AND TOILET ROOM.
9. INSULATED OVERHEAD ROLLING DOOR, 12" HIGH.
10. EXTERIOR CONCRETE SLAB AT GRADE.
11. PREFABRICATED METAL BUILDING AT HAY/GRAIN STORAGE AREA.
12. PIPE BARRIER, SEE 10/2.2.
13. 8" CMU INTERIOR WALL, 10 FT. HIGH.
14. 12" CMU INTERIOR WALL, GROUTED SOLID. (ELEPHANT CONTACT).
15. EXTERIOR WALL CONSTRUCTION TYPE 1 (NO ELEPHANT CONTACT): INSULATED 12" CMU, OR INSULATED CONCRETE TILT-UP PANEL.
16. EXTERIOR WALL CONSTRUCTION TYPE 2 (ELEPHANT CONTACT): 12" CMU GROUTED SOLID, OR C.I.P. CONCRETE WALL, OR NON-INSULATED CONCRETE TILT-UP PANEL.
17. SKYLIGHT LOCATION, TYP. OF (8).
18. 8 FT. TRUNK REACH ZONE.
19. MOVABLE WALL IN OPEN POSITION.
20. MOVABLE WALL IN CLOSED POSITION.
21. CONCRETE OR STEEL BEAM.
22. ROOF CONSTRUCTION: PRECAST CONCRETE PLANK 1/4" PER FOOT SLOPE, WITH RIGID INSULATION AND MEMBRANE ROOF.
23. EXTERIOR SHADE ROOF CONSTRUCTION: PRECAST CONCRETE PLANKS WITH MEMBRANE ROOF AND PROTECTED GUTTER, SUPPORTED ON CMU WALLS GROUTED SOLID. ROOF HEIGHT TO BE 22 FT. ABOVE GRADE.
24. SHOWER LOCATION.
25. LOCKER LOCATION.
26. PROVIDE SLAB AND WALL REINFORCEMENT FOR FUTURE TEMPORARY STALL.
27. LOCATE SCALE FOR ELEPHANT AT MOVABLE WALL CHUTE LOCATION.
28. 6 FT. HIGH MANUAL ELEPHANT GATE WITH STATIONARY SIDE PANEL TO MATCH.
29. LOCATION FOR DOOR CONTROLS FOR ALL CYLINDER OPERATED ELEPHANT DOORS.
30. STEEL RAIL BARRIER AT HOLDING/ STAGING YARD.

sliding doors?

people doors in service aisles?

- code

*Need to be able to see door being operated
May need controls in several different areas*

1902 Dana Avenue
Cincinnati, Ohio 45207

Phone: 513-841-1116
Fax: 513-841-1803
E-mail: mmccollow@fuse.net



FAX COVER LETTER

TO:	Mike Crocker or Jeff Glazier	FAX:	1-417-833-4459
COMPANY:	Dickerson Park Zoo	DATE:	7/10/02
FROM:	Mark McCollow	PAGES (INCLUDING COVER):	3
RE:	Cow Elephant Barn	COPIES TO:	

NOTES:

Mike or Jeff:

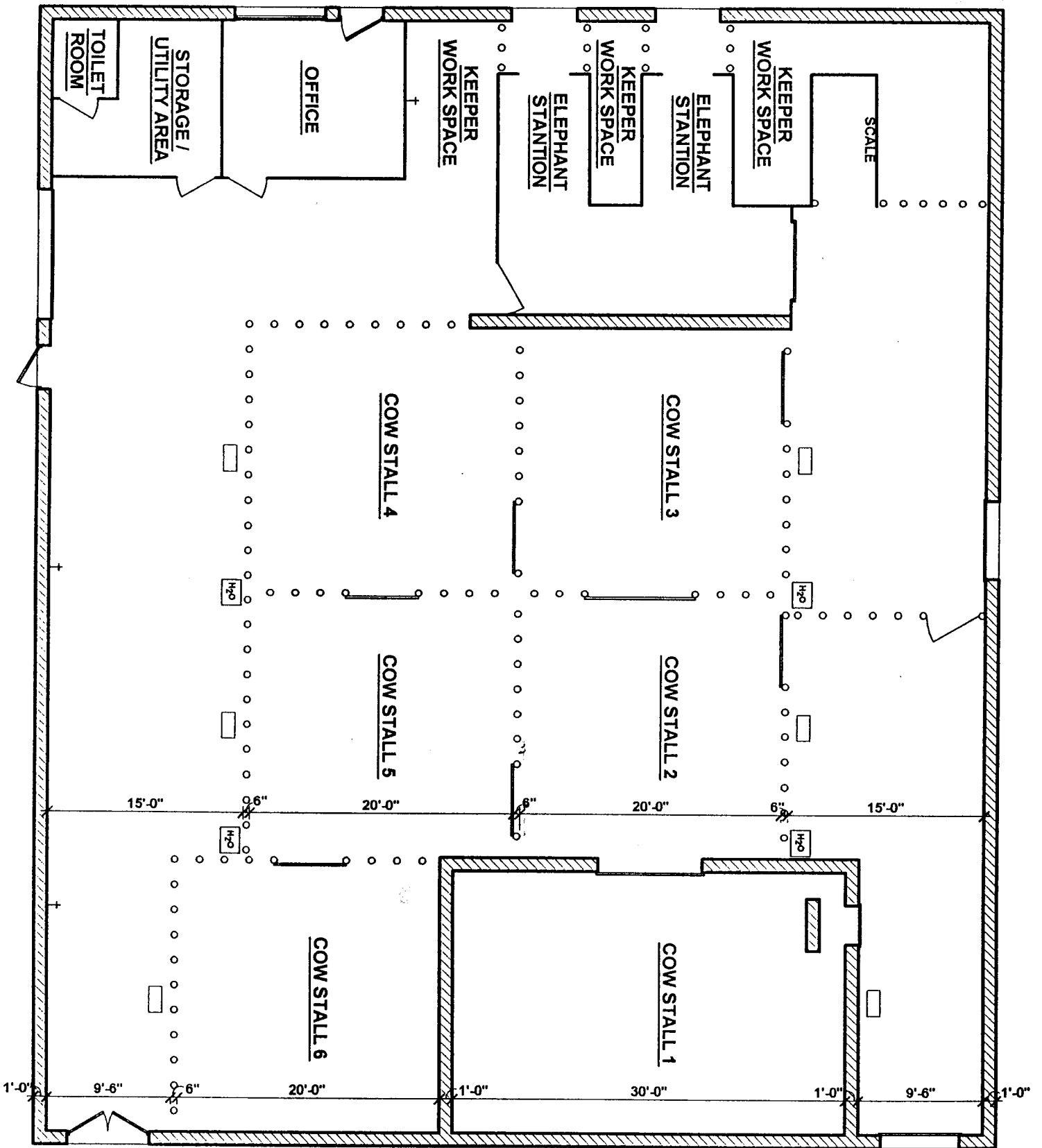
Attached please find a current Cow Elephant Barn Floor Plan, and a sheet of drawing notes.
If you have a chance before our 9:00 phone call tomorrow, please revive the attached floor plan.

If you can Xerox enlarge it to 11x17, it would be easier to read.

We are e-mailing David Beach this drawing as well as other drawings this afternoon, so he may be able to bring full size drawings along tomorrow.

Thanks

Mark



03/14



DRAWING NAME

ELEPHANT BLD
1/8" = 1'-0"

MacCallow & A



3043 North Fort
Springfield, MO 65803
Phone (417) 833-1570
Fax (417) 833-4459

Post-it® Fax Note	7671	Date	6-19-02	# of pages	▶ 3
To	Mark McCollow	From	Jeff Glazier		
Co./Dept.	McCollow & Associates	Co.	DPZ		
Phone #	513-841-1116	Phone #	417-833-1570		
Fax #	513-841-1803	Fax #	417-833-4459		

19 June 2002

McCollow & Associates
ATTN: Mark
1902 Dana Avenue
Cincinnati, OH 45207

Mark:

I am sending along the prioritized list of features we would like to see in the new elephant barn, as you requested. The elephant staff was fine with the compost area for the barn location, but were not wild about the soft moat type of barrier in the exhibit yard, citing problems experienced with these types of barriers at zoos such as Pittsburgh and St. Louis.

We may also want to consider flipping the barn floorplan (mirror image) if we go with the compost area location, to allow for easier access for getting cows over to the breeding facility.

The source where Ringling obtained the steel pipe for their facilities is:

Lally Pipe & Tube
8770 Railroad Dr.
Covington, KY 41015
Contact Person: Kathy Eckert
Phone: 800/5720870
859/431-8300

Let us know if you have questions or concerns.

Jeff Glazier
Senior Keeper

Enclosure

Accredited Member



AMERICAN ZOO AND AQUARIUM
ASSOCIATION

DICKERSON PARK ZOO
ELEPHANT BARN (COW) PLANNING

PRIORITY FEATURES

1) STATIC CHUTES OR STANCHIONS

- Listed by all five staff persons
 - two mentioned stanchions
 - one mentioned three stanchions
 - two mentioned 4 stanchions
- High priority to maintain proper husbandry

2) BOBCAT LOADER ACCESSIBILITY

- Listed by four staff persons
 - specifically desirable is the ability to access three sides of stalls for efficient removal of waste

3) SEMI-TRUCK ACCESSIBILITY

- Listed by three staff persons
 - specifically desirable is the ability to unload from the side or rear doors of a trailer into a secure walkway with options for securing ropes and chains

4) AT LEAST TWO ELEPHANT DOORS FROM THE BARN TO THE YARD

- Listed by three staff persons
 - specifically desirable would be outside access from each stanchion, spaced apart somewhat so that one elephant could not prevent others from transferring;
 - if possible, a third access way that bypasses the stanchions could prove valuable, especially in an emergency situation

5) OFFICE

- Listed by three staff persons
 - specifically with a large window(s) to allow for observation of elephants and staff

IMPORTANT ITEMS

- Best possible utilities (water, sewer, lighting, etc.)
 - two keepers specifically mentioned water pressure, a two-inch water line or booster pump is desirable
- Floor heating that works is desirable
- Good floor slope, large diameter sewer lines with adequate drain placement, and cleanouts that are accessible are desirable
- Good lighting (skylights and fixtures)
- Adequate electrical service to accommodate accessory items such as grinders, pressure washers, welders, etc.

IMPORTANT ITEMS (Cont.)

- Vertical pipe barriers with 16 inches of space between verticals is desirable
- 15-foot aisles in service areas is desirable for keeper safety
- Birth/isolation stall with at least two concrete walls

FEATURES OF LESSER IMPORTANCE

- A partially covered, possibly heated area just outside the barn stanchions, that could be utilized for outside access on cold days, or as a staging area when transferring elephants to and from the yard
- Hay storage area
500-1000 bale capacity

* prioritize

Elephant Barn Priority Features

Staff person #1

1. Static chutes or stanchions
2. Vertical pipe (c. 5" diameter) barriers on stalls
3. Floor heating that works
4. Covered, possibly heated, outside holding area that could be utilized to get elephants outside some, even on cold days
5. Good water pressure
6. Good lighting (skylights and fixtures)

Staff person #2

1. Semi truck accessibility to unload from side and rear of trailer into elephant "walkway"
2. 2 elephant doors exiting to yard
3. 3 stanchions – 2 fixed position, 1 with moveable wall – to restrict or allow movement (scale could be installed in a fixed position stanchion)
4. Bobcat loader accessibility to three sides of stalls
5. Floors slightly sloped to drains
6. Office

Staff person #3

1. Birth stall with at least two sides concrete, other one or two barred so cow can have privacy but still maintain visual access to other cows. Needs to be adjacent to a barred stall, with door centered and lined up with each other to utilize chain keepers
2. Skid loader access around and in stalls
3. Semi truck access from side and rear of trailer into elephant walkway or secure space
4. Two doors leading out to the yard, spaced apart so one cow can't guard the door.
5. Four stanchions side by side with at least one, preferably two of them, with a moveable wall
6. 15 foot aisles (service areas) adjacent to the barred stalls for keeper safety

Staff person #4

1. Stanchions
2. Office with big windows
3. Bobcat loader access to both sides of stalls
4. Outside access for each stanchion (2)
5. 15-foot safety space between stall and walls
6. Best possible utilities – electric, water pressure, sewer/drainage

Staff person #5

1. Four stanchions, either moving wall or stationary, one for each adult cow (one restrain chute for sequential husbandry of cows will not work) as evidenced by their negative response to the bull restraint device. This is the highest priority.
2. Water pressure high, minimum 2" line
3. Adequate/efficient drain placement and biggest drain pipe feasible with good floor slope for drainage
4. Most zoo elephant facilities are overbuild to the extreme. An excessive amount of steel and concrete is not required, particularly for a cow elephant facility. It is a waste of resources. The focus should be on function. The smooth efficient movement of people, elephants, machines and waste material.
5. Reasonable access for service vehicles and tractor trailers.
6. Office



Animal Facilities

Program Document

(Draft: 6/07/02)



and
H Design Group, LLC

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Cincinnati, Ohio 45207

Phone: 513-841-1116
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PROGRAM DATA

DICKERSON PARK ZOO EXHIBIT: ELEPHANT EXHIBIT

GENERAL DATA

Species	Asian elephant
# of Animals Exhibited	(6) cow, (1) Bull
Animal Weight / Speed Design Factor	
Key Animal Behavior Issues	Cow/Bull behavioral differences, musth, Bull can be destructive
Breeding Program Requirements	AZA Standards
Applicable Regulations: AZA, USDA, SSP, Animal Provider	AZA Standards for Elephant Management and Care
Vet Needs	
Special Staff Needs	See attached "List of Staff Priorities"
# of Staff Working Exhibit	(6) staff
Good Exhibits at Other Zoos	St. Louis
Key Design Issues	Bull containment, protected contact, design of exhibit for close-up viewing, feel "tropical" & "Asian"
Conservation Message(s)	See "AZA Conservation Messages" List attached for options
Conservation Themes(s)	TBD
Education Message(s)	TBD
Education Theme(s)	Tropical Asia: characterized by lush forests due to rainfall

EXHIBIT DATA

EXTERIOR EXHIBIT

Size of Exhibit	As large as funds allow, preferably one acre
# of Exhibits	One exhibit for cow and bull, or separate cow and bull exhibits
Focus of Exhibit	Forest Habitat, water feature
Habitat Description / Main Elements	Edge of Forest, clearing, dense planting
Enrichment Items	See attached list by staff

PRIMARY ENCLOSURE

Types of Acceptable Barriers	Soft moat, cable barrier, rail fence, rockwork wall
Height, Critical Dimensions	

Keeper Access	3 ft. wide steel bar gate
Service Access	10 ft. wide steel bar gates, pair
Digging Barrier	Not required
Hot Wire at Barrier	Yes at Cow barrier, Yes at Bull barrier
Secondary Barrier	Not required
Substrate(s)	Grass if possible, limesand (3/16" to fines)
Grading	For good drainage, not too steep
Sanitary Drain	Not required
Storm Drainage	Yes, for well-drained yard
Hosebib	Yes
Hose Rack	Yes
Night Lighting	For keeper if elephants out at night, not for public
Water Drinker	Yes
Feeding Device	
Excrement Removal	
Shade / Wind / Rain	Shade from large trees preferred, if not provide shade structure
Vegetation in Exhibit	Yes
Vegetation Protection	Yes: hot wire acceptable at cow yard, hot wire not acceptable at Bull Yard
Water Feature	Pool for elephants, close to public, 6ft water depth preferred, 3-4 ft. water depth o.k.
Type of Viewing	Soft Moat <i>or Cable Barriers</i>
Perimeter Kid Fence	Yes, 4 ft. high

HOLDING BUILDING DATA

HOLDING BUILDING

# of Stalls / Animals	(6) stalls, possible holding at aisle, plan for future addition for additional stalls
Size of Stalls	(5) 20'x20', (1) 20'x30' maternity/isolation stall
Walls	Pipe barrier preferred, or concrete
Roof	20 ft. min height for trunk reach
Animal Doors	Steel pipe, sliding, hydraulic
Floor Slope	1/4" to 3/8" floor slope, slope to drains
Floor Finish	Sealed concrete
Drains	Larger than existing bull drains, basket, settling tank
Squeeze	Provide "chute" areas for daily transfer to yard, provide access to bull ERD
Resting Bench	
Feeding Device	No
Excrement Removal	
Howdy Doors	

KEEPER AREA

Sink	Yes
Counter	Yes
Refrigerator	No
Freezer	No
Hosebib (#)	Yes, consider high pressure water system, # TBD

Yes

MATERNITY AREA Yes, 20x30 stall, can also be used for isolation
Cow and Calf could also utilize exterior bull exhibit

HOLDING YARD Yes
Size TBD
Concrete Slab TBD
Barrier Rail fence, sim to existing

SPECIAL EQUIPMENT
TBD

BUILDING MEP PLUMBING

H & C Water Both
Drains
Animal Drinker: Manual / Automatic Automatic fill and drain

ELECTRIC
Lighting Similar to existing Bull Barn
Outlets TBD

HVAC
Heat, Design Temp.
Cool, Design Temp. No cooling
Ventilate: Air Changes/hr.
Humidity

TRANSFER DOORS
Size: Opening for Door
Type Sliding
Material Steel pipe or concrete
Operation: Manual / Other Hydraulic
Operate from Where TBD

INTERIOR ENRICHMENT ITEMS
See attached List by Staff

Elephant Barn Visit

Similar unit for elephant cows as existing unit. Cows not as forceful (smaller units) There are no severe maintenance problems with existing units.

- Five stalls in horseshoe arrangement.
- 400 square feet needed per elephant.
- Floor heater (in slab) no longer working due to calcium deposits. Would prefer floor heat again. Maintenance remains an issue, however.
 - 60 degrees in winter
 - Stall at 70 degrees
- Would like Protective Contact Care in new facility (need to find information)
- 5" Pipe for bars with 16 ½ " or less between the pipes (15)
- Floor System: Preferred SMOOTH
- Covered area out of barn with exterior heater (windbreak and cover needed) for elephants to get out of stall.

Morning work out and evening work out.

Most foot problems are caused by water. Floors need adequate slope and high side for elephants to get out of the water. The animals are outside for several hours almost year round.

- Drain 6" to 8" is working adequately. Not wild about trough drain.
- 2 types of tanks: One with strainer to catch floating hay & One to catch droppings
- Drain should have 1' to 2' grate.
- Clean out is major issue. Helps if drains are grouped.
- 1 ½ water line minimum – Water pressure is an issue.
- Booster pump is a possibility.
- Possibly a strainer basket in each drain..
- Containment is always an issue.
- Link to each is important.

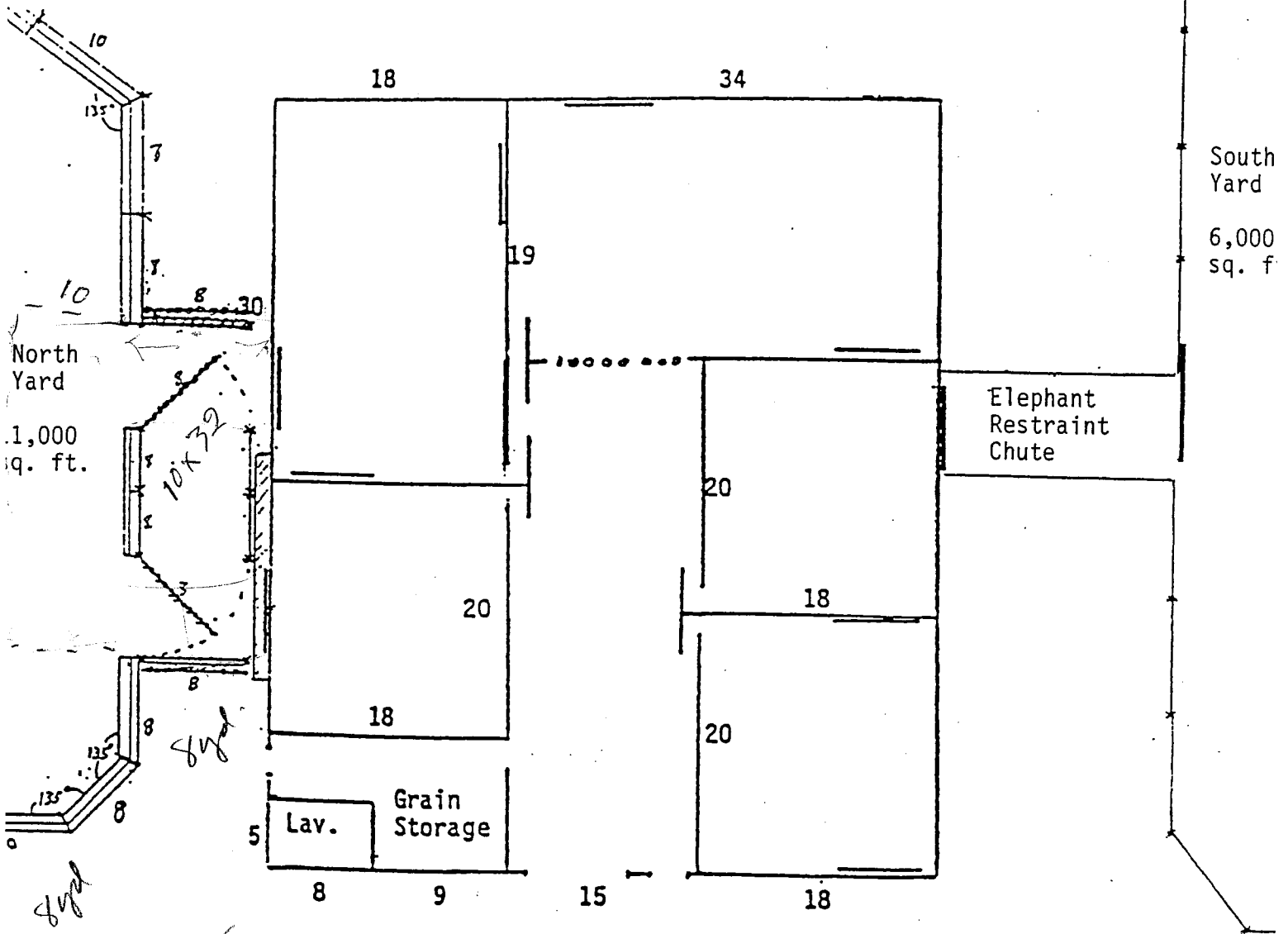
Hoof Stock Pole Barn

New facility will be to the northeast of the existing facility. Existing facility will be demolished. Zebra, Impala, Bonterang (sp??), Kudu, Ostrich, Horn Bills, and a few other in the summer (cranes and storks).

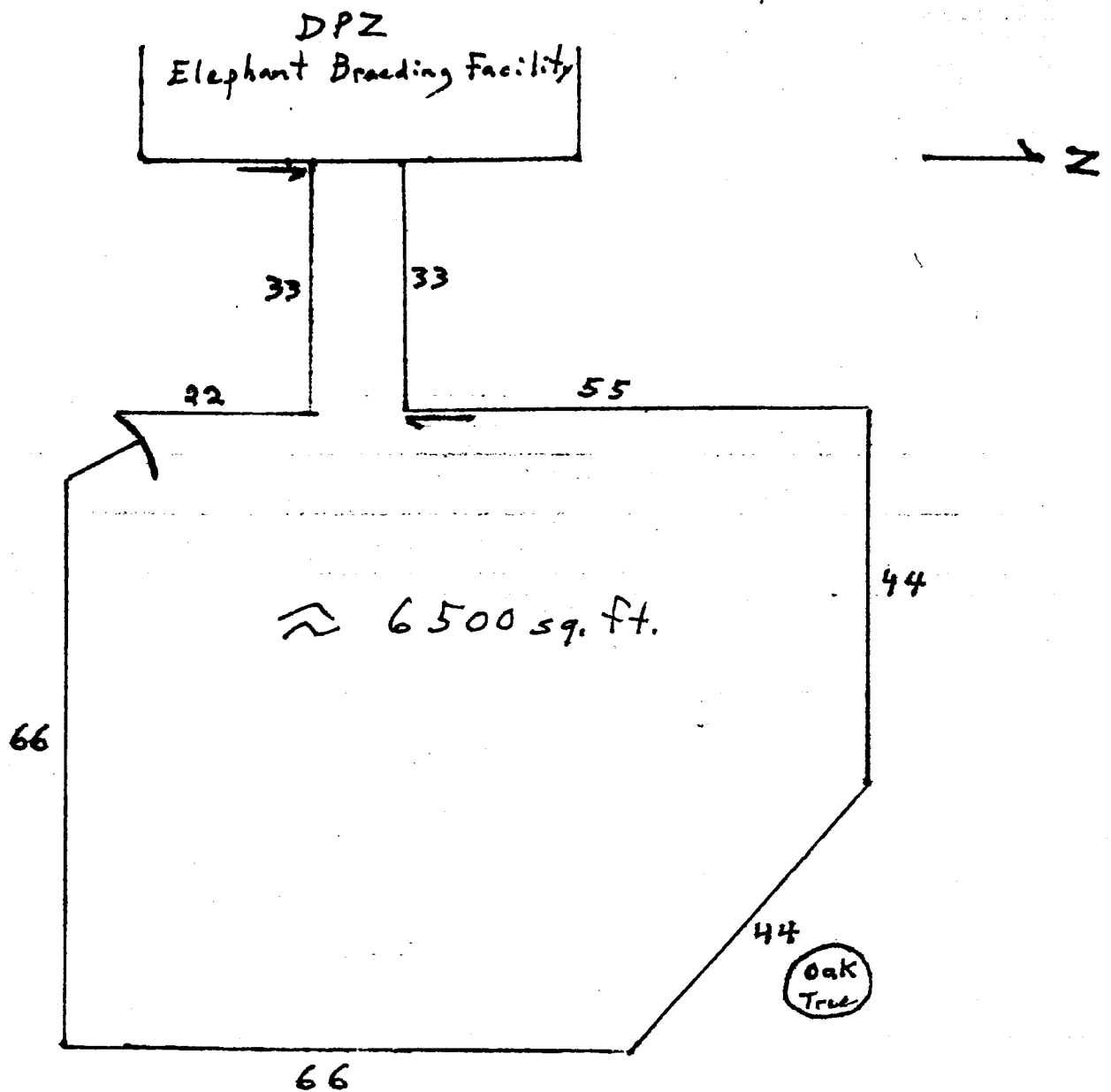
- Refer to Hoof Stock in Atlanta Zoo.

- Cows often stay out all evening.
- Will elephants be turned out every night? Keeping elephants (and other animals) out is very important... at night as animals are given access to barns they tend to run in and hide (4 p.m.) Since there are still visitors still in the zoo at this time, not good!
- Questions: Outdoor exhibits overnight? Answer Yes (cows). Bulls go up every night. People are out of the park by 6 pm. St. Louis Zoo puts their elephants up at night.
- Key Issue is Flexibility
- Elephants move through "Static Chute." This chute has no hydraulics but is a protective chute which allows for secure work with the elephant. Waste removal on both sides would be preferred so waste can be removed more easily.
- Hay Storage
- Cow/Calf Stall is important... Should be solid all the way around (temperature is a concern, but not major). Temp must be at 70 degrees.
- 1 of 6 should be closed and larger.
 - 5 @ 20' by 20'
 - 1 @ 20' by 30' (doubles as an isolation stall)
- It's important to not isolate cows. They are herd animals. Two chutes make sense so they can "buddy up."
- AZA and USDA
- # of Staff – 6
- Key Behavior – NO
- Breeding Requirements: Space is an issue. Minimum requirement is fine.
- Focus: Pool... Is it a priority? Pool possibly as a divider. (Could BPS get us concrete cast of trees to use for posts?)
- Lime Sand with dirt. 3/16" fine dirt base
- Vegetation in Exhibit
- Thatch roof structure to serve as shade structure.
- Preferred drinking method: Need fresh water and pool (pool may be shallow).
- Always try to keep minimal outside gates.

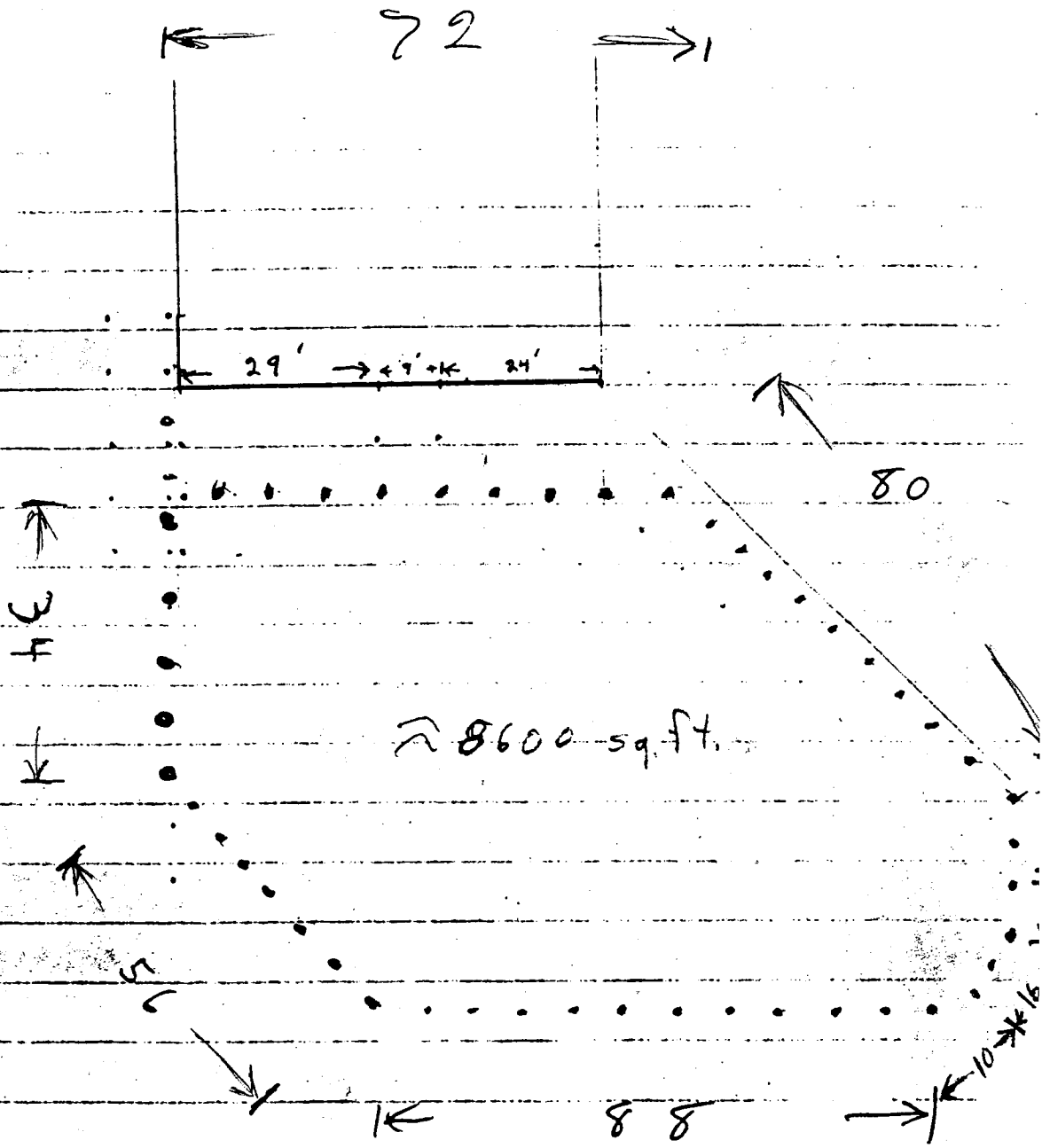
Elephant Breeding Building Floorplan
Dickerson Park Zoo



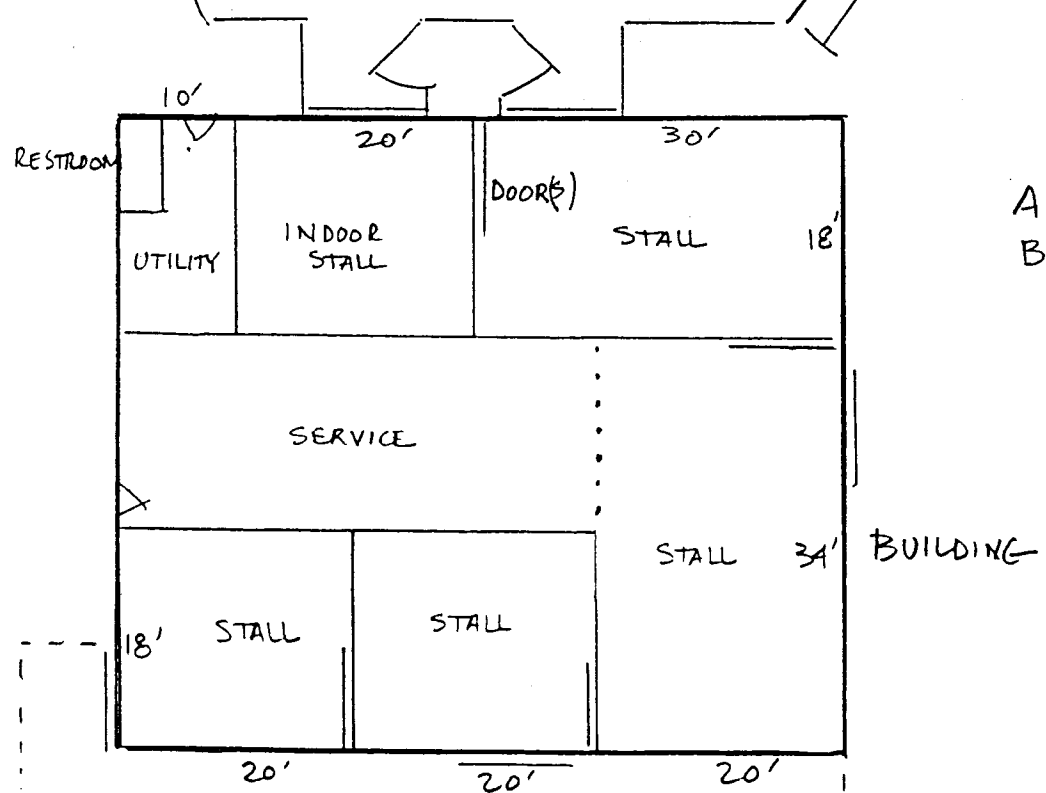
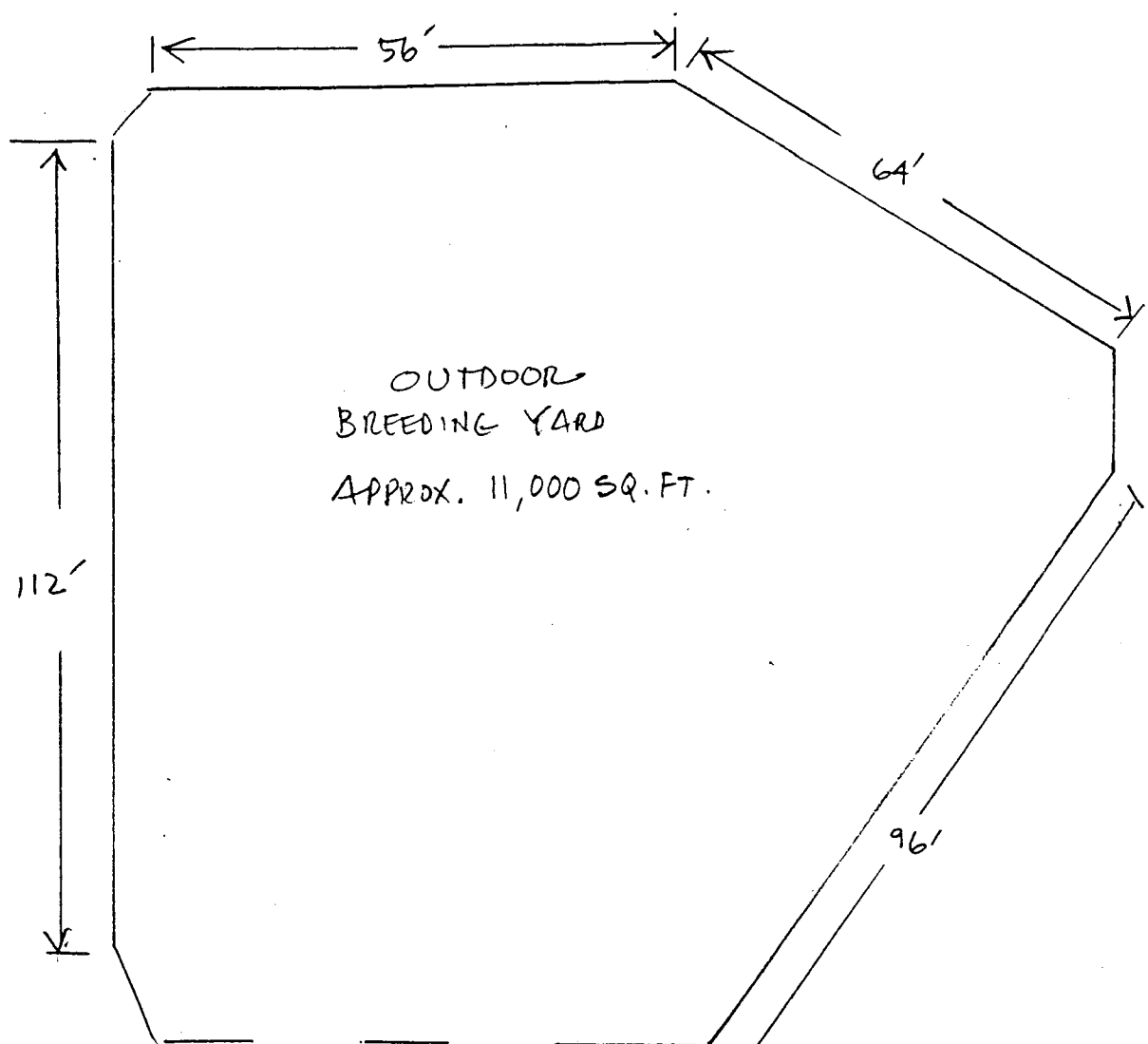
16 yd
concrete
+ rebar
\$1360



- design based on using 11 ft. pieces as horizontals
- perimeter is 374 linear ft.
- could be built initially with one hinged gate at S.W. corner with option of adding two sliding gates later
- leaves space near building for future options
- would require 35 verticals as drawn



yard perimeter 370-
 60 verticals = 1920



ASIAN ELEPHANT BREEDING FACILITY (OFF-EXHIBIT)

↓ Restraint and South Yard ↓