



Appendices



Appendix A

Detailed Estimate

MCZ Master Plan Capital

ESTIMATE DETAIL (Subcontractor Costs Only-before any mark-ups)

| Component | Notes | Quantity | Unit | Unit cost | Const. Cost | Subtotals |
|--|--|----------|------|-----------|-------------|------------------|
| West Entry | | | | | | 2,490,000 |
| Farm Walk-About & Site Improvements | | | | | | 830,443 |
| Site / Area Development | | | | | | 337,943 |
| | General Site Demolition and Preparation | 20,000 | sf | 0.5 | 10,000 | |
| | Utilities Relocation | 1 | ls | 50,000 | 50,000 | |
| | Utilities Connection to New Building | 1 | ls | 25,000 | 25,000 | |
| | Earthwork, Excavation (cut & fill) | 100 | cy | 20 | 2,000 | |
| | Landscaping | 10,000 | sf | 16 | 155,743 | |
| | Irrigation | 10,000 | ls | 2 | 20,000 | |
| | Hardscape: Paving, curbs, etc. | 4,400 | sf | 12 | 52,800 | |
| | Main Path Lighting | 7 | ls | 3,200 | 22,400 | |
| Outdoor Exhibit Area | | | | | | 90,500 |
| | Walk-About <i>perimeter</i> | 450 | lf | 50 | 22,500 | |
| | Walk-About <i>exhibit floor</i> | 16,000 | sf | 3 | 48,000 | |
| | Domestic Yard Adjustment | 100 | lf | 50 | 5,000 | |
| | Enrichment Placeholder | 1 | ls | 15,000 | 15,000 | |
| Holding / Support | | | | | | 360,000 |
| | Walk-About Holding | 2,400 | sf | 150 | 360,000 | |
| Interpretives & Signage package | | | | | | 32,000 |
| | Attraction Entry Sign | 1 | ea | 8,000 | 8,000 | |
| | Interactive Interpretives / Play | 1 | ls | 20,000 | 20,000 | |
| | Donor Recognition Program | 1 | ls | 4,000 | 4,000 | |
| Owner FFE | | | | | | 10,000 |
| | Benches, Trash Cans, Animal Play Equip, Keeper Tools, etc. | 1 | ls | 10,000 | 10,000 | |
| Splash Pad | | | | | | 700,000 |
| | Wet Play & Changing Rooms | 10,000 | sf | 55 | 550,000 | |
| | Dry Play | 1 | ls | 150,000 | 150,000 | |
| Farm Store & Deli | | | | | | 524,792 |
| | Gift Shop | 750 | sf | 300 | 225,000 | |
| | Storage | 150 | sf | 109 | 16,292 | |
| Food Service | | | | | | |
| | Kitchen | 400 | sf | 130 | 52,000 | |
| | Indoor Service | 400 | sf | 150 | 60,000 | |
| | Outdoor Dining | 1,200 | sf | 125 | 150,000 | |
| | Service Area | 100 | sf | 75 | 7,500 | |
| | Food Service Equipment | 1 | ls | 10,000 | 10,000 | |
| | Menu Boards & Graphics | 1 | ls | 4,000 | 4,000 | |

MCZ Master Plan Capital

ESTIMATE DETAIL (Subcontractor Costs Only-before any mark-ups)

| Component | Notes | Quantity | Unit | Unit cost | Const. Cost | Subtotals |
|--|-------|----------|------|-----------|-------------|------------------|
| Farmhouse Desserts | | | | | | 486,500 |
| Food Service | | | | | | |
| Kitchen Renovation | | 600 | sf | 100 | 60,000 | |
| Indoor Service Renovation / Expansion | | 600 | sf | 125 | 75,000 | |
| Outdoor Dining | | 2,000 | sf | 100 | 200,000 | |
| Indoor Seating Expansion | | 600 | sf | 150 | 90,000 | |
| Service Area | | 100 | sf | 75 | 7,500 | |
| Food Service Equipment | | 1 | ls | 50,000 | 50,000 | |
| Menu Boards & Graphics | | 1 | ls | 4,000 | 4,000 | |
| East Entry Retail | | | | | | 1,832,777 |
| Existing Gift Shop Renovation | | 1,900 | sf | 150 | 285,000 | |
| Existing Office Conversion | | 2,000 | sf | 200 | 400,000 | |
| Office Expansion | | 4,850 | sf | 191 | 927,359 | |
| Outdoor Overhang | | 2,500 | sf | 73 | 182,119 | |
| Existing Coffee Shop Renovation | | 500 | sf | 50 | 25,000 | |
| Storage | | 380 | sf | 35 | 13,300 | |
| Parking & Admissions Change-Over | | | | | | 1,383,250 |
| Tickets | | | | | | |
| Ticket Sales | | 1,500 | sf | 250 | 375,000 | |
| Covered Turnstiles | | 1,200 | lf | 150 | 180,000 | |
| Picnic Ticket Booth | | 65 | sf | 250 | 16,250 | |
| Entry Identity, Themed Signs & Operational Signage package | | | | | | 28,000 |
| Icon Sign / Way Finding | | 1 | ls | 10,000 | 10,000 | |
| Themed Signs | | 4 | ea | 2,000 | 8,000 | |
| Operational Signs | | 1 | ls | 4,000 | 4,000 | |
| Donor Recognition Program | | 1 | ls | 6,000 | 6,000 | |
| Traffic Control Barriers | | | | | | 10,000 |
| Placeholder | | 1 | ls | 10,000 | 10,000 | |
| Ticketing Software | | | | | | 600,000 |
| Software / Hardware / Training | | 1 | ls | 600,000 | 600,000 | |
| Fencing | | | | | | 174,000 |
| 72" Fence | | 2,300 | lf | 60 | 138,000 | |
| Vehicle Gate in perimeter fence | | 3 | ls | 12,000 | 36,000 | |
| Penguins / Tram Path | | | | | | 542,252 |
| Site / Area Development | | | | | | |
| General Site Demolition and Preparation | | 4,500 | sf | 0.5 | 2,250 | |
| Utilities Relocation | | 1 | ls | 50,000 | 50,000 | |

MCZ Master Plan Capital

ESTIMATE DETAIL (Subcontractor Costs Only-before any mark-ups)

| Component | Notes | Quantity | Unit | Unit cost | Const. Cost | Subtotals |
|--|-------|----------|------|-----------|-------------|-----------|
| Earthwork, Excavation (cut & fill) | | 100 | cy | 20 | 2,000 | |
| Landscaping | | 1,000 | sf | 16 | 15,574 | |
| Irrigation | | 1,000 | ls | 2 | 2,000 | |
| Hardscape: Paving, curbs, etc. | | 3,000 | sf | 12 | 36,000 | |
| | | | | | | 189,427 |
| Outdoor Exhibit Area | | | | | | |
| Penguins Expansion | | 600 | sf | 132 | 79,427 | |
| Existing Exhibit Renovation | | 1,600 | sf | 50 | 80,000 | |
| Enrichment Placeholder | | 1 | ls | 30,000 | 30,000 | |
| | | | | | | 60,000 |
| Holding / Support | | | | | | |
| Animal Holding Renovation | | 600 | sf | 100 | 60,000 | |
| | | | | | | 144,000 |
| LSS | | | | | | |
| Outdoor Freshwater System | | 12,000 | gls | 12 | 144,000 | |
| | | | | | | 36,000 |
| Interpretives & Signage package | | | | | | |
| Attraction Entry Sign | | 1 | ea | 16,000 | 16,000 | |
| Interactive Interpretives | | 1 | ls | 18,000 | 18,000 | |
| Donor Recognition Program | | 1 | ls | 2,000 | 2,000 | |
| | | | | | | 5,000 |
| Owner FFE | | | | | | |
| Benches, Trash Cans, Animal Play Equip, Keeper Tools, etc. | | 1 | ls | 5,000 | 5,000 | |
| | | | | | | 8,425,724 |
| Adventure Africa: Elephants | | | | | | 1,550,600 |
| Site / Area Development | | | | | | |
| General Site Demolition and Preparation | | 60,000 | sf | 0.5 | 30,000 | |
| Utilities Relocation | | 1 | ls | 50,000 | 50,000 | |
| Utilities Connection to New Building | | 1 | ls | 25,000 | 25,000 | |
| Earthwork, Excavation (cut & fill) | | 2,000 | cy | 20 | 40,000 | |
| Landscaping | | 6,500 | sf | 14 | 91,000 | |
| Irrigation | | 6,500 | ls | 2 | 13,000 | |
| Hardscape: Paving, curbs, etc. | | 1,000 | sf | 12 | 12,000 | |
| Main Path Lighting | | 28 | ls | 3,200 | 89,600 | |
| Elevated Visitor Circulation | | 20,000 | sf | 60 | 1,200,000 | |
| | | | | | | 1,565,000 |
| Outdoor Exhibit Areas | | | | | | |
| Elephant Yards <i>barrier</i> | | 1,300 | lf | 200 | 260,000 | |
| Exhibit floors | | 175,000 | sf | 3 | 525,000 | |
| Enrichment Placeholder | | 4 | ls | 25,000 | 100,000 | |
| Rockwork <i>placeholder</i> | | 17,000 | sf | 40 | 680,000 | |
| | | | | | | 2,968,500 |
| Holding / Support | | | | | | |
| Elephant Barn | | 14,500 | sf | 194 | 2,813,000 | |
| Australia House Renovation | | 3,300 | sf | 30 | 99,000 | |

MCZ Master Plan Capital

ESTIMATE DETAIL (Subcontractor Costs Only-before any mark-ups)

| Component | Notes | Quantity | Unit | Unit cost | Const. Cost | Subtotals |
|---|-------|----------|------|-----------|-------------|------------------|
| Outdoor Off-Exhibit Area | | 400 | lf | 100 | 40,000 | |
| Off-Exhibit Yard Renovation | | 550 | lf | 30 | 16,500 | |
| LSS / Water Filtration - Elephant | | | | | | 1,715,969 |
| Outdoor Elephant Freshwater System | | 100,000 | gls | 14 | 1,362,749 | |
| LSS Building Shell | | 2,000 | sf | 177 | 353,220 | |
| Concessions | | | | | | 90,000 |
| Food Carts | | 1 | ea | 50,000 | 50,000 | |
| Gift Shop - Cart | | 1 | ea | 40,000 | 40,000 | |
| Building Support | | | | | | 372,655 |
| Mechanical / Electrical | | 1,800 | sf | 134 | 240,867 | |
| Service Entrance | | 600 | sf | 134 | 80,289 | |
| Storage | | 500 | sf | 75 | 37,500 | |
| Service Yards | | 1,000 | sf | 14 | 14,000 | |
| Interpretives & Signage package | | | | | | 113,000 |
| Icon / Way Finding | | 2 | ls | 10,000 | 20,000 | |
| Attraction Entry Sign | | 1 | ea | 8,000 | 8,000 | |
| Interactive Interpretives / Play | | 1 | ls | 75,000 | 75,000 | |
| Donor Recognition Program | | 1 | ls | 10,000 | 10,000 | |
| Owner FFE | | | | | | 50,000 |
| Benches, Trash Cans | | 1 | ls | 20,000 | 20,000 | |
| Animal Play Equip | | 1 | ls | 20,000 | 20,000 | |
| Keeper Tools, etc. | | 1 | ls | 10,000 | 10,000 | |
| Adventure Africa: Rhinos | | | | | | 4,892,550 |
| Site / Area Development | | | | | | 232,800 |
| General Site Demolition and Preparation | | 20,000 | sf | 0.5 | 10,000 | |
| Utilities Relocation | | 1 | ls | 50,000 | 50,000 | |
| Earthwork, Excavation (cut & fill) | | 1,000 | cy | 20 | 20,000 | |
| Landscaping | | 6,500 | sf | 14 | 91,000 | |
| Irrigation | | 6,500 | ls | 2 | 13,000 | |
| Hardscape: Paving, curbs, etc. | | 3,000 | sf | 12 | 36,000 | |
| Main Path Lighting | | 4 | ls | 3,200 | 12,800 | |
| Pachyderm Building | | | | | | 4,073,000 |
| Existing Exhibit / Holding Renovations | | 15,000 | sf | 50 | 750,000 | |
| New Exhibit Areas | | 10,500 | sf | 250 | 2,625,000 | |
| Roof Over Pachy | | 11,000 | sf | 25 | 275,000 | |
| Holding Addition | | 2,500 | sf | 150 | 375,000 | |
| Expanded Food Prep | | 480 | sf | 100 | 48,000 | |

MCZ Master Plan Capital

ESTIMATE DETAIL (Subcontractor Costs Only-before any mark-ups)

| Component | Notes | Quantity | Unit | Unit cost | Const. Cost | Subtotals |
|--|--------------------------|----------|------|-----------|-------------|------------------|
| Outdoor Exhibit Areas | | | | | | 433,750 |
| Rhino Yards | barrier | 800 | lf | 200 | 160,000 | |
| Giraffe Expansion | | 250 | lf | 75 | 18,750 | |
| Exhibit floors | | 50,000 | sf | 3 | 150,000 | |
| Enrichment Placeholder | | 1 | ls | 25,000 | 25,000 | |
| Rockwork | placeholder | 2,000 | sf | 40 | 80,000 | |
| Interpretives & Signage package | | | | | | 103,000 |
| Icon / Way Finding | | 1 | ls | 10,000 | 10,000 | |
| Attraction Entry Sign | | 1 | ea | 8,000 | 8,000 | |
| Interactive Interpretives / Play | | 1 | ls | 75,000 | 75,000 | |
| Donor Recognition Program | | 1 | ls | 10,000 | 10,000 | |
| Owner FFE | | | | | | 50,000 |
| Benches, Trash Cans | | 1 | ls | 20,000 | 20,000 | |
| Animal Play Equip | | 1 | ls | 20,000 | 20,000 | |
| Keeper Tools, etc. | | 1 | ls | 10,000 | 10,000 | |
| Train Gift Shop | | | | | | 96,517 |
| Gift Shop | | 300 | sf | 300 | 90,000 | |
| Storage | | 60 | sf | 109 | 6,517 | |
| Alaska's Cold Coast: Sea Lions | | | | | | 9,330,356 |
| Site / Area Development | | | | | | 622,000 |
| General Site Demolition and Preparation | | 30,000 | sf | 0.5 | 15,000 | |
| Utilities Relocation | | 1 | ls | 50,000 | 50,000 | |
| Utilities Connection to New Building | | 1 | ls | 25,000 | 25,000 | |
| Earthwork, Excavation (cut & fill) | | 3,000 | cy | 20 | 60,000 | |
| Landscaping | | 20,000 | sf | 14 | 280,000 | |
| Irrigation | | 20,000 | ls | 2 | 40,000 | |
| Hardscape: Paving, curbs, etc. | | 10,000 | sf | 12 | 120,000 | |
| Main Path Lighting | | 10 | ea | 3,200 | 32,000 | |
| Pinniped Exhibit | | | | | | 5,542,956 |
| Area Development site | | 3,200 | sf | 35 | 112,000 | |
| Area Development infrastructure upgrades | | 1 | ls | 50,000 | 50,000 | |
| Arena Seating | rockwork | 3,200 | sf | 46 | 147,200 | |
| Arena Seating | shade structure | 1,440 | sf | 65 | 93,600 | |
| Exhibit | existing modifications | 1,600 | sf | 20 | 32,000 | |
| Exhibit | dry resting | 1,200 | sf | 35 | 42,000 | |
| Exhibit | interaction program ramp | 240 | sf | 35 | 8,400 | |
| Exhibit | new pool | 2,000 | sf | 55 | 110,000 | |
| Underwater View | ramping | 2,300 | sf | 24 | 55,200 | |
| Underwater View | retaining structure | 89 | cy | 850 | 75,556 | |
| Underwater View | viewing structure | 3,000 | sf | 480 | 1,440,000 | |

MCZ Master Plan Capital

ESTIMATE DETAIL (Subcontractor Costs Only-before any mark-ups)

| Component | Notes | Quantity | Unit | Unit cost | Const. Cost | Subtotals |
|--|------------------------|----------|------|-----------|-------------|------------------|
| LSS | saltwater system | 108,000 | gal | 20 | 2,160,000 | |
| LSS | chiller-upgrade | 108,000 | gal | 4 | 432,000 | |
| Holding | renovation of existing | 1,800 | sf | 125 | 225,000 | |
| LSS Room | addition | 3,000 | sf | 180 | 540,000 | |
| Enrichment Placeholder | | 1 | ls | 20,000 | 20,000 | |
| Brown Bear Exhibit | | | | | | 2,193,400 |
| Area Development site | | 10,000 | sf | 35 | 350,000 | |
| Area Development infrastructure upgrades | | 1 | ls | 50,000 | 50,000 | |
| Exhibit | existing modifications | 6,000 | sf | 15 | 90,000 | |
| Exhibit | new yard | 240 | sf | 160 | 38,400 | |
| Underwater Viewing / Shade Structure | | 900 | sf | 350 | 315,000 | |
| LSS | freshwater | 50,000 | gal | 14 | 700,000 | |
| Holding | renovation of existing | 1,800 | sf | 50 | 90,000 | |
| LSS Room | addition | 3,000 | sf | 180 | 540,000 | |
| Enrichment Placeholder | | 1 | ls | 20,000 | 20,000 | |
| Outdoor Exhibit Area | | | | | | 717,000 |
| Caribou Improvements | | 7,000 | sf | 15 | 105,000 | |
| Eagle | mesh | 4,000 | sf | 98 | 392,000 | |
| Eagle | exhibit floor | 4,000 | sf | 55 | 220,000 | |
| Concessions | | | | | | 136,000 |
| Gift Shop - Cart | | 1 | ls | 40,000 | 40,000 | |
| Elevated Dining Platform | | 1,600 | sf | 60 | 96,000 | |
| Interpretives & Signage package | | | | | | 99,000 |
| Attraction Entry Sign | | 2 | ea | 8,000 | 16,000 | |
| Interactive Interpretives / Play | | 1 | ls | 75,000 | 75,000 | |
| Donor Recognition Program | | 1 | ls | 8,000 | 8,000 | |
| Owner FFE | | | | | | 20,000 |
| Benches, Trash Cans | | 1 | ls | 5,000 | 5,000 | |
| Animal Play Equip | | 1 | ls | 10,000 | 10,000 | |
| Keeper Tools, etc. | | 1 | ls | 5,000 | 5,000 | |
| Alaska's Cold Coast: Polar Bears | | | | | | 8,287,928 |
| Site / Area Development | | | | | | 565,500 |
| General Site Demolition and Preparation | | 25,000 | sf | 0.5 | 12,500 | |
| Utilities Relocation | | 1 | ls | 50,000 | 50,000 | |
| Utilities Connection to New Building | | 1 | ls | 25,000 | 25,000 | |
| Earthwork, Excavation (cut & fill) | | 4,500 | cy | 20 | 90,000 | |
| Landscaping | | 14,000 | sf | 14 | 196,000 | |
| Irrigation | | 14,000 | ls | 2 | 28,000 | |
| Hardscape: Paving, curbs, etc. | | 11,000 | sf | 12 | 132,000 | |

MCZ Master Plan Capital

ESTIMATE DETAIL (Subcontractor Costs Only-before any mark-ups)

| Component | Notes | Quantity | Unit | Unit cost | Const. Cost | Subtotals |
|----------------------------------|----------------------------|----------|------|-----------|-------------|----------------|
| Main Path Lighting | | 10 | ea | 3,200 | 32,000 | |
| Polar Bear Exhibit | | | | | | 5,756,428 |
| Area Development | site | 4,800 | sf | 35 | 168,000 | |
| Area Development | infrastructure upgrades | 1 | ls | 50,000 | 50,000 | |
| Exhibit | main exhibit area, barrier | 16,000 | sf | 160 | 2,560,000 | |
| Exhibit | off-exhibit area, barriers | 250 | lf | 55 | 13,750 | |
| Exhibit | existing modifications | 3,000 | sf | 24 | 72,000 | |
| Exhibit Pool Shell | rockwork | 2,880 | sf | 55 | 158,400 | |
| Underwater View | ramping | 2,500 | sf | 24 | 60,000 | |
| Underwater View | retaining structure | 44 | cy | 850 | 37,778 | |
| Underwater View | viewing structure | 2,000 | sf | 180 | 360,000 | |
| LSS Upgrade | fresh water system | 94,500 | gal | 8 | 756,000 | |
| LSS Upgrade | chiller addition | 94,500 | gal | 4 | 378,000 | |
| LSS Room | addition | 3,500 | sf | 185 | 647,500 | |
| Holding | renovation of existing | 4,000 | sf | 30 | 120,000 | |
| Shade Structure | | 2 | ls | 150,000 | 300,000 | |
| Enrichment Placeholder | | 1 | ls | 75,000 | 75,000 | |
| Sea Otter Exhibit | | | | | | 1,852,000 |
| Site Component | | 1 | ls | 322,000 | 322,000 | |
| Exhibit | | 1 | ls | 117,000 | 117,000 | |
| LSS Yard | | 1 | ls | 1,050,000 | 1,050,000 | |
| LSS | | 1 | ls | 268,000 | 268,000 | |
| Holding | | 500 | sf | 150 | 75,000 | |
| Enrichment Placeholder | | 1 | ls | 20,000 | 20,000 | |
| Interpretives & Signage package | | | | | | 94,000 |
| Icon / Way Finding | | 1 | ls | 20,000 | 20,000 | |
| Attraction Entry Sign | | 2 | ea | 8,000 | 16,000 | |
| Interactive Interpretives / Play | | 1 | ls | 50,000 | 50,000 | |
| Donor Recognition Program | | 1 | ls | 8,000 | 8,000 | |
| Owner FFE | | | | | | 20,000 |
| Benches, Trash Cans | | 1 | ls | 5,000 | 5,000 | |
| Animal Play Equip | | 1 | ls | 10,000 | 10,000 | |
| Keeper Tools, etc. | | 1 | ls | 5,000 | 5,000 | |
| Bear View Restaurant | | | | | | 150,000 |
| Food Service | | | | | | |
| Façade Renovations | | 1 | ls | 75,000 | 75,000 | |
| Indoor Seating Renovations | | 1 | ls | 25,000 | 25,000 | |
| Outdoor Dining Renovations | | 1 | ls | 50,000 | 50,000 | |
| Bear Garden | | | | | | 279,500 |

MCZ Master Plan Capital

ESTIMATE DETAIL (Subcontractor Costs Only-before any mark-ups)

| Component | Notes | Quantity | Unit | Unit cost | Const. Cost | Subtotals |
|---|------------------|----------|------|-----------|-------------|------------------|
| Food Service | | | | | | |
| Outdoor Covered Service | | 300 | sf | 150 | 45,000 | |
| Outdoor Dining | | 2,000 | sf | 100 | 200,000 | |
| Service Area | | 300 | sf | 75 | 22,500 | |
| Food Service Equipment | | 1 | ls | 10,000 | 10,000 | |
| Menu Boards & Graphics | | 1 | ls | 2,000 | 2,000 | |
| | | | | | | 6,633,627 |
| Escape to the Islands | | | | | | |
| Site / Area Development | | | | | | 234,323 |
| General Site Demolition and Preparation | | 20,000 | sf | 0.5 | 10,000 | |
| Utilities Relocation | | 1 | ls | 50,000 | 50,000 | |
| Utilities Connection to New Building | | 2 | ls | 25,000 | 50,000 | |
| Earthwork, Excavation (cut & fill) | | 500 | cy | 20 | 10,000 | |
| Landscaping | | 3,000 | sf | 16 | 46,723 | |
| Irrigation | | 3,000 | ls | 2 | 6,000 | |
| Hardscape: Paving, curbs, etc. | | 4,800 | sf | 12 | 57,600 | |
| Main Path Lighting | | 800 | sf | 5 | 4,000 | |
| | | | | | | 550,000 |
| ARC Building | | | | | | |
| Exhibit Renovations | | 6,000 | sf | 75 | 450,000 | |
| Herp Exhibits | | 1,000 | sf | 100 | 100,000 | |
| | | | | | | 2,838,903 |
| Shark Exhibit Pavillion Addition | | | | | | |
| | | 8,644 | sf | 572 \$/sf | | |
| Selective Demolition | | 1 | ls | 15,000 | 15,000 | |
| Infrastructure Upgrades | | 1 | ls | 35,000 | 35,000 | |
| Pool Shell | shark | 236 | cy | 930 | 219,893 | |
| Pool Shell | rays, touch pool | 25 | cy | 930 | 23,147 | |
| Pool Shell | acrylic | 385 | sf | 400 | 154,000 | |
| Building Shell Over Shark Pool | | 1,440 | sf | 309 | 445,396 | |
| Building Shell Over Ray Pool | | 224 | sf | 309 | 69,284 | |
| Building Shell Over Birds Exhibits | | 1,000 | sf | 309 | 309,303 | |
| Birds | | 500 | sf | 180 | 90,000 | |
| Iguana | | 500 | sf | 180 | 90,000 | |
| LSS Room | shark | 2,000 | sf | 260 | 520,000 | |
| LSS Room | rays, touch pool | 330 | sf | 260 | 85,800 | |
| Guest Circulation | | 1,750 | sf | 377 | 659,391 | |
| Support Rooms | electrical, MEP | 900 | sf | 136 | 122,689 | |
| | | | | | | 1,376,440 |
| Komodo Dragon Pavillion Addition | | | | | | |
| | | 4,500 | sf | 533 \$/sf | | |
| Selective Demolition | | 1 | ls | 15,000 | 15,000 | |
| Infrastructure Upgrades | | 1 | ls | 10,000 | 10,000 | |
| Exhibit Building | small pool | 2,000 | sf | 336 | 672,400 | |
| Holding Building | | 900 | sf | 293 | 264,124 | |
| Guest Circulation | | 1,200 | sf | 300 | 360,388 | |
| Support Rooms | electrical, MEP | 400 | sf | 136 | 54,528 | |



MCZ Master Plan Capital

ESTIMATE DETAIL (Subcontractor Costs Only-before any mark-ups)

| Component | Notes | Quantity | Unit | Unit cost | Const. Cost | Subtotals |
|---|------------------|----------|------|-----------|-------------|------------------|
| ISS | | | | | | 1,438,560 |
| Saltwater System | shark | 85,500 | gal | 16 | 1,368,000 | |
| Saltwater System | rays, touch pool | 5,040 | gal | 14 | 70,560 | |
| Concessions | | | | | | 10,000 |
| Gift Shop - Cart | | 1 | ls | 10,000 | 10,000 | |
| Building Support | | | | | | 31,400 |
| System Upgrade | | 200 | sf | 40 | 8,000 | |
| Storage | | 200 | sf | 75 | 15,000 | |
| Service Yard | | 600 | sf | 14 | 8,400 | |
| Interpretives & Signage package | | | | | | 134,000 |
| Icon / Way Finding | | 1 | ls | 10,000 | 10,000 | |
| Attraction Entry Sign | | 2 | ea | 8,000 | 16,000 | |
| Interactive Interpretives | | 1 | ls | 100,000 | 100,000 | |
| Donor Recognition Program | | 1 | ls | 8,000 | 8,000 | |
| Owner FFE | | | | | | 20,000 |
| Benches, Trash Cans | | 1 | ls | 5,000 | 5,000 | |
| Animal Play Equip | | 1 | ls | 10,000 | 10,000 | |
| Keeper Tools, etc. | | 1 | ls | 5,000 | 5,000 | |
| The Jungle: Core Experience | | | | | | 6,555,243 |
| Site / Area Development | | | | | | 256,149 |
| General Site Demolition and Preparation | | 40,000 | sf | 0.5 | 20,000 | |
| Utilities Relocation | | 1 | ls | 50,000 | 50,000 | |
| Utilities Connection to New Building | | 1 | ls | 25,000 | 25,000 | |
| Earthwork, Excavation (cut & fill) | | 500 | cy | 20 | 10,000 | |
| Landscaping | | 2,000 | sf | 16 | 31,149 | |
| Irrigation | | 2,000 | ls | 2 | 4,000 | |
| Hardscape: Paving, curbs, etc. | | 5,000 | sf | 12 | 60,000 | |
| Main Path Lighting | | 10 | ea | 3,200 | 32,000 | |
| Privacy Fencing | | 600 | lf | 40 | 24,000 | |
| Existing Buildings | | | | | | 1,282,000 |
| Guenon / Colobu: old orang holding | | 825 | sf | 180 | 148,500 | |
| Dwarf Mongoose / Elephant Shrew | | 200 | sf | 250 | 50,000 | |
| Lemur old colobus | | 700 | sf | 180 | 126,000 | |
| Sm Mammal 1 old siamang | | 500 | sf | 180 | 90,000 | |
| Sm Mammal 2 new | | 200 | sf | 250 | 50,000 | |
| Sm Mammal 3 new | | 100 | sf | 250 | 25,000 | |
| Invertebrates new | | 50 | sf | 250 | 12,500 | |
| Bonobo / Gorilla Improvements | | 15,000 | sf | 25 | 375,000 | |

MCZ Master Plan Capital

ESTIMATE DETAIL (Subcontractor Costs Only-before any mark-ups)

| Component | Notes | Quantity | Unit | Unit cost | Const. Cost | Subtotals |
|--|---------------|--------------|-----------|------------------|-------------|------------------|
| Holding Improvements | | 8,000 | sf | 25 | 200,000 | |
| Theming / Softening Guest Area | | 1 | ls | 75,000 | 75,000 | |
| Enrichment Placeholder | | 1 | ls | 40,000 | 40,000 | |
| New Entry | | 600 | sf | 150 | 90,000 | |
| Primate Building Addition | | 5,400 | sf | 719 \$/sf | | 2,227,554 |
| Selective Demolition | | 1 | ls | 15,000 | 15,000 | |
| Infrastructure Upgrades | | 1 | ls | 35,000 | 35,000 | |
| Orangutan Exhibit extends into existing bldg | | 3,000 | sf | 180 | 540,000 | |
| Siamang Exhibit | | 1,200 | sf | 180 | 216,000 | |
| Building Shell Over Orangutan | | 1,500 | sf | 309 | 463,954 | |
| Building Shell Over Siamang | | 1,200 | sf | 309 | 371,164 | |
| Guest Circulation | | 800 | sf | 377 | 301,436 | |
| Holding | | 1,900 | sf | 150 | 285,000 | |
| Outdoor Exhibit Area | | | | | | 2,157,541 |
| Orangutan | mesh | 5,000 | sf | 98 | 488,541 | |
| Orangutan | exhibit floor | 5,000 | sf | 55 | 275,000 | |
| Siamang | mesh | 3,000 | sf | 98 | 294,000 | |
| Siamang | exhibit floor | 3,000 | sf | 55 | 165,000 | |
| Siamang | trail | 150 | lf | 100 | 15,000 | |
| Entry Exhibit | | 1,500 | sf | 100 | 150,000 | |
| Colobus Improvements | | 1,400 | sf | 50 | 70,000 | |
| Gorilla / Bonobo Improvements | | 4,000 | sf | 50 | 200,000 | |
| Viewing Structures | | 3 | ls | 150,000 | 450,000 | |
| Enrichment Placeholder | | 1 | ls | 50,000 | 50,000 | |
| Retail | | | | | | 40,000 |
| Gift Shop - Cart | | 1 | ls | -40,000 | 40,000 | |
| Building Support | | | | | | 48,000 |
| Mechanical / Electrical / Service Upgrades | | 1,200 | sf | 40 | 48,000 | |
| Interpretives & Signage package | | | | | | 494,000 |
| Icon / Way Finding | | 1 | ls | 50,000 | 50,000 | |
| Attraction Entry Sign | | 2 | ea | 12,000 | 24,000 | |
| Interactive Interpretives / Play | | 4 | ls | 100,000 | 400,000 | |
| Donor Recognition Program | | 1 | ls | 20,000 | 20,000 | |
| Owner FFE | | | | | | 50,000 |
| Benches, Trash Cans | | 1 | ls | 20,000 | 20,000 | |
| Animal Play Equip | | 1 | ls | 20,000 | 20,000 | |
| Keeper Tools, etc. | | 1 | ls | 10,000 | 10,000 | |

The Jungle: Plaza 1,969,272

MCZ Master Plan Capital

ESTIMATE DETAIL (Subcontractor Costs Only-before any mark-ups)

| Component | Notes | Quantity | Unit | Unit cost | Const. Cost | Subtotals |
|--|---|----------|------|-----------|-------------|------------------|
| Site / Area Development | | | | | | 466,872 |
| | General Site Demolition and Preparation | 40,000 | sf | 0.5 | 20,000 | |
| | Utilities Relocation | 1 | ls | 50,000 | 50,000 | |
| | Utilities Connection to New Building | 1 | ls | 25,000 | 25,000 | |
| | Earthwork, Excavation (cut & fill) | 500 | cy | 20 | 10,000 | |
| | Landscaping | 5,000 | sf | 16 | 77,872 | |
| | Irrigation | 5,000 | ls | 2 | 10,000 | |
| | Hardscape: Paving, curbs, etc. | 2,500 | sf | 12 | 30,000 | |
| | Main Path Lighting | 20 | ea | 3,200 | 64,000 | |
| | Elevated Visitor Circulation | 3,000 | sf | 60 | 180,000 | |
| Outdoor Exhibit Area | | | | | | 612,500 |
| | Monkey Island Improvements | 16,500 | sf | 25 | 412,500 | |
| | Viewing Structures | 1 | ls | 150,000 | 150,000 | |
| | Enrichment Placeholder | 1 | ls | 50,000 | 50,000 | |
| Play Area | | | | | | 325,000 |
| | Play Structures | 1 | ls | 150,000 | 150,000 | |
| | Soft Surface | 6,000 | sf | 25 | 150,000 | |
| | Entry Icon | 1 | ls | 25,000 | 25,000 | |
| Picnic Area | | | | | | 226,900 |
| | Site | 20,000 | sf | 5 | 100,000 | |
| | Toilets / Food Prep | 300 | sf | 423 | 126,900 | |
| Food & Bev | | | | | | 40,000 |
| | Cart | 1 | ls | 40,000 | 40,000 | |
| Interpretives & Signage package | | | | | | 248,000 |
| | Way Finding | 1 | ls | 4,000 | 4,000 | |
| | Attraction Entry Sign | 2 | ea | 12,000 | 24,000 | |
| | Interactive Interpretives / Play | 1 | ls | 200,000 | 200,000 | |
| | Donor Recognition Program | 1 | ls | 20,000 | 20,000 | |
| Owner FFE | | | | | | 50,000 |
| | Benches, Trash Cans | 1 | ls | 20,000 | 20,000 | |
| | Animal Play Equip | 1 | ls | 20,000 | 20,000 | |
| | Keeper Tools, etc. | 1 | ls | 10,000 | 10,000 | |
| Wild Woods | | | | | | 6,245,916 |
| Site / Area Development | | | | | | 1,320,545 |
| | General Site Demolition and Preparation | 20,000 | sf | 0.5 | 10,000 | |
| | Utilities Relocation | 1 | ls | 50,000 | 50,000 | |
| | Utilities Connection to New Building | 1 | ls | 25,000 | 25,000 | |
| | Earthwork, Excavation (cut & fill) | 500 | cy | 20 | 10,000 | |

MCZ Master Plan Capital

ESTIMATE DETAIL (Subcontractor Costs Only-before any mark-ups)

| Component | Notes | Quantity | Unit | Unit cost | Const. Cost | Subtotals |
|--------------------------------|------------------|----------|------|-----------|-------------|------------------|
| Landscaping | | 600 | sf | 16 | 9,345 | |
| Irrigation | | 600 | ls | 2 | 1,200 | |
| Hardscape: Paving, curbs, etc. | | 12,000 | sf | 12 | 144,000 | |
| Main Path Lighting | | 17 | sf | 3,000 | 51,000 | |
| Elevated Visitor Circulation | | 17,000 | sf | 60 | 1,020,000 | |
| Small Mammal Building | | | | | | 1,205,000 |
| Selective Demolition | | 1 | ls | 15,000 | 15,000 | |
| Infrastructure Upgrades | | 1 | ls | 35,000 | 35,000 | |
| Renovation | | 8,800 | sf | 75 | 660,000 | |
| Holding Addition | | 3,300 | sf | 150 | 495,000 | |
| Outdoor Exhibit Area | | | | | | 2,451,335 |
| Moose | fence only | 1,300 | lf | 13 | 16,390 | |
| Moose Pool Shell | | 4,000 | sf | 25 | 100,000 | |
| Feed Structure | | 1 | ls | 150,000 | 150,000 | |
| Cougar | mesh | 5,000 | sf | 98 | 490,000 | |
| Cougar | exhibit floor | 5,000 | sf | 90 | 450,000 | |
| Elk | fence only | 650 | lf | 13 | 8,195 | |
| Grey Wolf | fence / den only | 650 | lf | 55 | 35,750 | |
| Wolf Pool Shell | | 1,000 | sf | 25 | 25,000 | |
| Lynx | mesh | 2,500 | sf | 98 | 245,000 | |
| Lynx | exhibit floor | 2,500 | sf | 90 | 225,000 | |
| Fisher | mesh | 2,000 | sf | 98 | 196,000 | |
| Fisher | exhibit floor | 2,000 | sf | 55 | 110,000 | |
| Wolverine | | 2,000 | sf | 125 | 250,000 | |
| Enrichment Placeholder | | 5 | ls | 30,000 | 150,000 | |
| Holding / Support | | | | | | 495,200 |
| Elk Holding Building | | 2,800 | sf | 175 | 490,000 | |
| Outdoor Off-Exhibit Areas | | 400 | lf | 13 | 5,200 | |
| Discovery Garden | | | | | | 337,500 |
| Interpretives / Play | | 1 | ls | 75,000 | 75,000 | |
| Raptor Enclosures | | 3 | ls | 25,000 | 75,000 | |
| Amphitheater | | 2,500 | sf | 75 | 187,500 | |
| LSS | | | | | | 190,983 |
| Moose Freshwater System | | 15,000 | gal | 6 | 90,000 | |
| Grey Wolf Freshwater System | | 8,000 | gal | 6 | 48,000 | |
| LSS Rooms | | 300 | sf | 177 | 52,983 | |
| Building Support | | | | | | 49,354 |
| Mech / Elec / Service | | 250 | sf | 134 | 33,454 | |
| Storage | | 100 | sf | 75 | 7,500 | |

MCZ Master Plan Capital

ESTIMATE DETAIL (Subcontractor Costs Only-before any mark-ups)

| Component | Notes | Quantity | Unit | Unit cost | Const. Cost | Subtotals |
|---|-------|----------|------|-----------|-------------|------------------|
| Service Yard | | 600 | sf | 14 | 8,400 | |
| Interpretives & Signage package | | | | | | 176,000 |
| Icon / Way Finding | | 1 | ls | 10,000 | 10,000 | |
| Attraction Entry sign | | 1 | ea | 8,000 | 8,000 | |
| Interactive Interpretives / Play | | 1 | ls | 150,000 | 150,000 | |
| Donor Recognition Program | | 1 | ls | 8,000 | 8,000 | |
| Owner FFE | | | | | | 20,000 |
| Benches, Trash Cans | | 1 | ls | 5,000 | 5,000 | |
| Animal Play Equip | | 1 | ls | 10,000 | 10,000 | |
| Keeper Tools, etc. | | 1 | ls | 5,000 | 5,000 | |
| Woody's Restaurant | | | | | | 846,200 |
| Food Service | | | | | | |
| Kitchen | | 900 | sf | 130 | 117,000 | |
| Outdoor Dining | | 1,000 | sf | 100 | 100,000 | |
| Indoor Seating | | 1,350 | sf | 150 | 202,500 | |
| Service Area | | 640 | sf | 45 | 28,800 | |
| Food Service Equipment | | 1 | ls | 150,000 | 150,000 | |
| Menu Boards & Graphics | | 1 | ls | 4,000 | 4,000 | |
| Toilets | | 600 | sf | 250 | 150,000 | |
| Façade | | 185 | lf | 300 | 55,500 | |
| Walk-in Cooler | | 240 | sf | 160 | 38,400 | |
| Asia Trail | | | | | | 2,003,295 |
| Site / Area Development | | | | | | 365,795 |
| General Site Demolition and Preparation | | 20,000 | sf | 0.5 | 10,000 | |
| Utilities Relocation | | 1 | ls | 50,000 | 50,000 | |
| Earthwork, Excavation (cut & fill) | | 2,000 | cy | 20 | 40,000 | |
| Landscaping | | 8,000 | sf | 16 | 124,595 | |
| Irrigation | | 8,000 | ls | 2 | 16,000 | |
| Hardscape: Paving, curbs, etc. | | 7,500 | sf | 12 | 90,000 | |
| Main Path Lighting | | 11 | ls | 3,200 | 35,200 | |
| Outdoor Exhibit Area | | | | | | 1,512,500 |
| Tiger Expansion | | 5,000 | sf | 150 | 750,000 | |
| Tiger Renovation | | 5,000 | sf | 25 | 125,000 | |
| Hoofstock Expansion | | 3,500 | sf | 100 | 350,000 | |
| Hoofstock Renovations | | 5,500 | sf | 20 | 110,000 | |
| Small Asian Exhibit | | 800 | sf | 100 | 80,000 | |
| Red Panda Renovations | | 900 | sf | 25 | 22,500 | |
| Enrichment Placeholder | | 1 | ls | 75,000 | 75,000 | |

MCZ Master Plan Capital

ESTIMATE DETAIL (Subcontractor Costs Only-before any mark-ups)

| Component | Notes | Quantity | Unit | Unit cost | Const. Cost | Subtotals |
|--|-------|----------|------|-----------|-------------|----------------|
| | | | | | | 75,000 |
| Holding / Support | | | | | | |
| Existing Holding Renovations | | 1,000 | sf | 75 | 75,000 | |
| | | | | | | 40,000 |
| Interpretives & Signage package | | | | | | |
| Attraction Entry Sign | | 2 | ea | 8,000 | 16,000 | |
| Interactive Interpretives | | 1 | ls | 20,000 | 20,000 | |
| Donor Recognition Program | | 1 | ls | 4,000 | 4,000 | |
| | | | | | | 10,000 |
| Owner FFE | | | | | | |
| Benches, Trash Cans, Animal Play Equip, Keeper Tools, etc. | | 1 | ls | 10,000 | 10,000 | |
| | | | | | | 200,000 |
| Adventure Challenge Course | | | | | | |
| Equipment | | 1 | ls | 200,000 | 200,000 | |
| High Ropes | | | | | | |
| Low Ropes | | | | | | |
| 3 Ziplines | | | | | | |
| | | | | | | 360,000 |
| Appraction | | | | | | |
| App | | 1 | ls | 150,000 | 150,000 | |
| Development | | | | | | |
| Analog Interactive | | 6 | ls | 15,000 | 90,000 | |
| Interactive | | | | | | |
| RFID / AR Interactives | | 2 | ls | 60,000 | 120,000 | |
| Interactive | | | | | | |
| | | | | | | 700,000 |
| Show | | | | | | |
| Theater Renovation | | 1 | ls | 350,000 | 350,000 | |
| Lighting | | | | | | |
| Audio | | | | | | |
| Stage & Seating | | | | | | |
| Production Development | | 1 | ls | 350,000 | 350,000 | |
| Staff | | | | | | |
| Costuming | | | | | | |
| Miscellaneous | | | | | | |
| | | | | | | 807,712 |
| Destination Dining Counter Service 10-15% | | | | | | |
| Food Service | | 800 | sf | 130 | 104,000 | |
| Kitchen | | 800 | sf | 200 | 160,000 | |
| Indoor Service | | 1,800 | sf | 125 | 225,000 | |
| Outdoor Dining | | 750 | sf | 200 | 150,000 | |
| Indoor Seating | | 400 | sf | 75 | 30,000 | |
| Service Area | | 300 | sf | 159 | 47,685 | |
| Freezer / Cooler / Storage | | 40 | sf | 151 | 6,027 | |
| Offices | | | | | | |

MCZ Master Plan Capital

ESTIMATE DETAIL (Subcontractor Costs Only-before any mark-ups)

| Component | Notes | Quantity | Unit | Unit cost | Const. Cost | Subtotals |
|------------------------|-------|----------|------|-----------|-------------|-----------|
| Food Service Equipment | | 1 | ls | 75,000 | 75,000 | |
| Menu Boards & Graphics | | 1 | ls | 10,000 | 10,000 | |



Appendix B

Eliminated Creative Concepts

The African Wild

Naturalistic grasslands exhibit highlighting African savanna species. Ecosystem focus rather than individual iconic species. Indoor space dedicated to animal care with limited and carefully narrated viewing. Expansion of existing facilities to create flexibility and room.

Estimate: **\$16 million**

Experiential Concept

'Lost in the last wild frontier'

- Quintessential expectation of Africa
- Minimal architectural theming influenced by traditional bomas and tribal villages
- Multiple expansive yards with protected plantings and mounding
- Winding guest trails to simulate 'wild' with rustic resting areas for gathering and storytelling (demos)
- Hidden barriers and borrowed landscape for strategic long vistas
- Conservation message of 'no truly wild lands left' in the world—even the wilds of Africa are managed

Rustic and wild setting



| Animal | Pop. | Out. Exhibit: Required | Out. Exhibit: Recommend. | Indoor Exhibit: Required | Indoor Exhibit: Recommend. | Holding: Required | Holding: Recommend. | Pool Size (gal) | Barriers |
|----------|------|------------------------------------|--------------------------|--------------------------|----------------------------|--|---|---------------------|--|
| Hippo | 3 | 1200 sf / 1; 600 sf per additional | 9,800 | N/A | 3,000 | 12' x 14' stall w/ 10' x 12' x 4' pool | (3) 14' x 14' stalls w/ 10' x 14' x 4' pool | Min. 10' x 12' x 5' | Vertical Wall / Fence: 6'; Moat: 7' wide; Vertical above Water: 3-5' |
| Rhino | 5 | 1500 sf / animal | 15,000 | N/A | 7,500 | 200 sf / animal | (5) 15' x 15' stalls | N/A; Mud wallow | Vertical Wall / Fence: 5' |
| Zebra | 5 | 1800 sf / 3; 650 sf per additional | 12,400 | N/A | 3,100 | N/A | (5) 10' x 10' stalls | N/A | Vertical Wall / Fence: 8' |
| Giraffe | 6 | 900 sf / animal | 16,200 | N/A | 5,400 | 225 sf / animal w/ 20' ceiling | (6) 20' x 20' stalls | N/A | Vertical Wall / Fence: 5' |
| Antelope | 8 | 300 sf / animal | 19,200 | N/A | 2,400 | 100 sf / animal | (8) 10' x 10' stalls | N/A | Vertical Wall / Fence: 8' |

Journey through Asia

Vertical habitat with operable walls for seasonality and extension of views. Multiple outdoor habitats allow flexibility and exercise. Views from indoor space extend to adjacent outdoor exhibits for multiple species of Asian animals.

Experience the forest like an Orang

Estimate: **\$14 million**

Experiential Concept

'Through the eyes of Orangs'

- Bring the guest into the tree top world of the Orangutan. Experience what it is like to live in the treetops—see other animals from Orang point of view
- Flip the traditional exhibit experience; guests are in an enclosure that snakes it's way through the surrounding space.
- Natural materials with minimal architectural intrusion. Vines and 'natural' play structure amongst vegetation.
- Walking structure for guests sways to simulate being in the trees



| Animal | Pop. | Out. Exhibit: Required | Out. Exhibit: Recommend. | Indoor Exhibit: Req. | Indoor Exhibit: Recommend. | Holding: Required | Holding: Recommend. | Barriers |
|---------------|------|-----------------------------------|--------------------------|----------------------|----------------------------|----------------------------|----------------------|---|
| Komodo Dragon | 2 | N/A | 2,000 | N/A | 1,500 | N/A | (2) 12' x 12' stalls | Moat or Vertical Wall: 8'; Mesh enclosure |
| Takin | 3 | 400 sf / 2; 100 sf per additional | 2,500 | N/A | N/A | 120 sf per stall | (3) 12' x 12' stalls | Moat or Vertical Wall / Fence: 12' |
| Tahr | 5 | 500 sf / 2; 100 sf per additional | 2,400 | N/A | N/A | 90 sf / 2 female or 1 male | (4) 10' x 10' stalls | Vertical Wall / Fence: 8' |

Penguins

Indoor / outdoor habitats for multi-species penguins exhibited in their natural environments. Guest path and slides threaded through pool creates stunning views of penguins in their element.

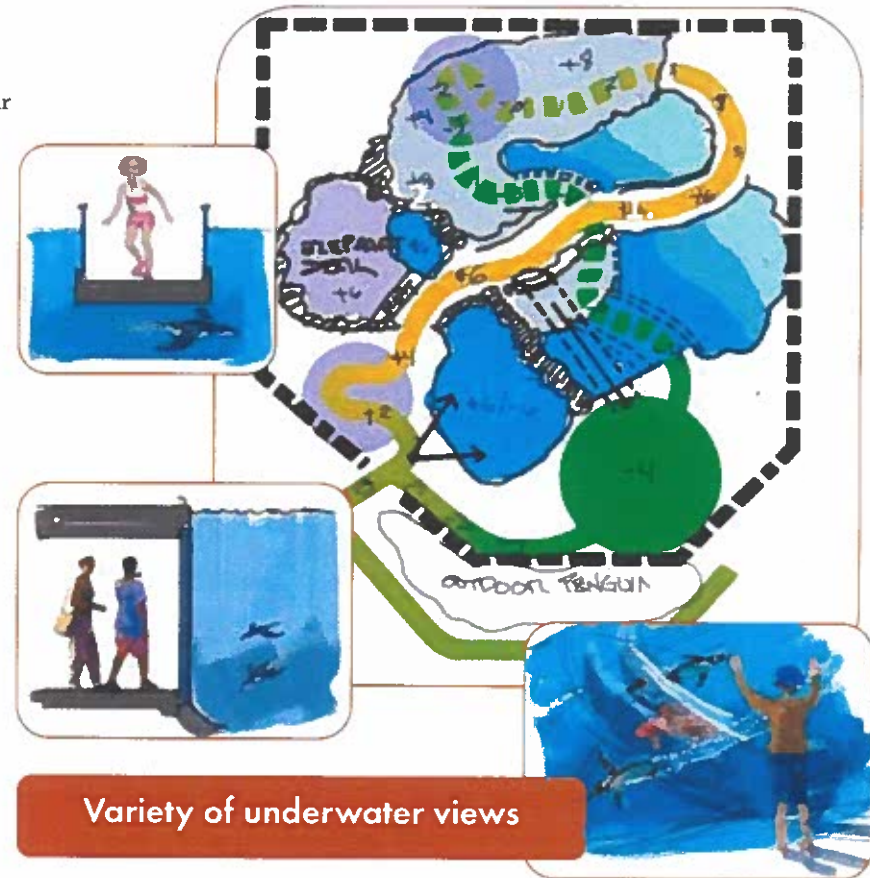
Estimate: **\$5 million**

Experiential Concept

'Play like a Penguin'

- Its all about play; just like penguins, above, transitioning and soaring below the frozen ice.
- Slides, behavior emulation, multi-sensory experiences
- Unique and impressive underwater views
- Highlights the extreme dangers of the fragile world by contrasting against the carefree experience of play.
- Interactive graphics explain behaviors and how they result from extreme dangers a penguin encounters at that moment in their fragile existence

New Products: Animal Attractions



| Animal | Pop. | Out. Exhibit: Required | Out. Exhibit: Rec. | Indoor Exhibit: Req. | Indoor Exhibit: Rec. | Holding: Required | Holding: Recommend. | Pool Size | Barriers |
|---------------|---------------|--|--------------------|--|----------------------|--|--|---|---|
| Warm Penguins | 20 | 96 sf / 6 animals; 8 sf per additional | 624 | N/A | N/A | 8 sf / animal per stall; Separate quarantine req | (2) 8' x 10' stalls w/ 4' x 10' pools | Half total exhibit size w/ min. 4' depth; Freshwater | Vertical Surface: 18"; Fully enclosed to prevent escape over low pool wall. |
| Cold Penguins | 40 (6 lg spp) | N/A | N/A | Emperor / King: 216 sf / 6 animals; 18 sf per add; or, as above. | 1,464 | Emperor / King: 18 sf / animal per stall; Otherwise, as above. | (1) 10' x 11' stall w/ 5' x 11' pool; (4) 8' x 10' stalls w/ 4' x min. 4' depth; Water temp betw 39 - 55 deg F; One of the 8' x 10' stalls to function as needed as quarantine | Half total exhibit size w/ min. 4' depth; Water temp betw 39 - 55 deg F; Freshwater | Vertical Surface: 18" for all species except rockhopper which need 3'; Fully enclosed to prevent escape over low pool wall. |

Adventure: Down Under

Indoor / outdoor experiences getting visitors close to the animals and viewing in unique ways. Much of the wildlife of Australia is nocturnal, and an indoor experience would highlight these small, interesting animals. Focus on authenticity and nature rather than larger-than-life characterization and stereotypes.

Estimate: **\$9 million**

Experiential Concept

'Two weeks in Australia'

- Experience the habitats of Australia by visiting national parks and eco-tour destinations
- Seek out nocturnal creatures, or bypass completely
- Wander at your will through a multi-species walk-about; feed a wallaby or kangaroo; search for koalas in the trees
- Fairy blue penguin parade mimics natural nightly event
- Indoor experience feels completely natural with simulated twilight / moonlight



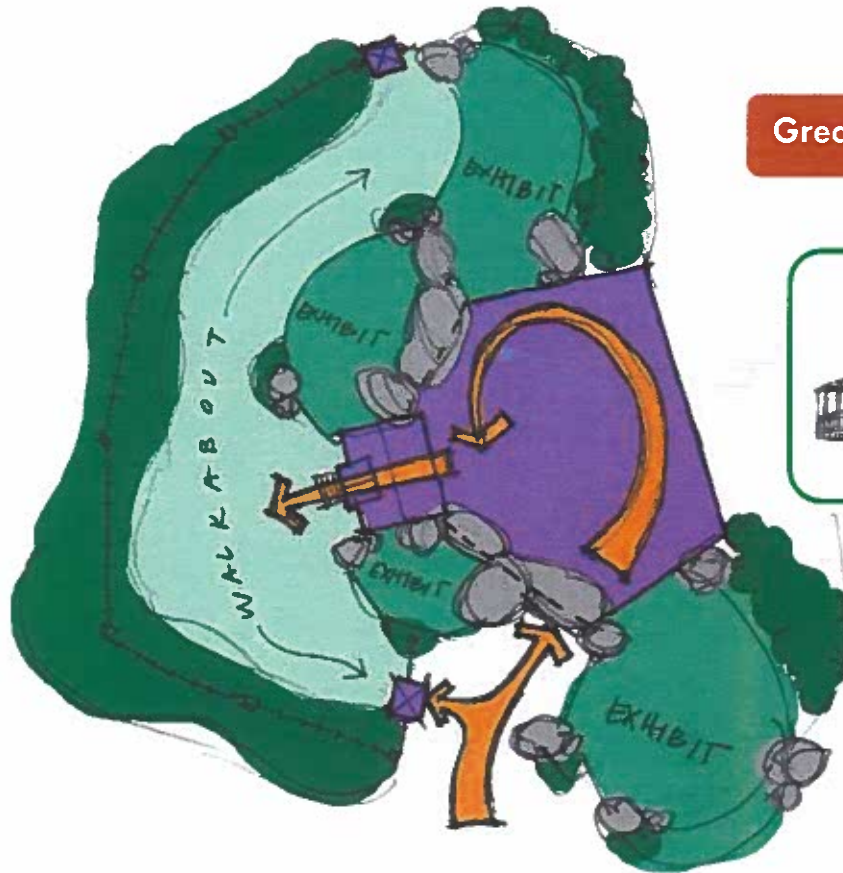
Walk amongst the animals



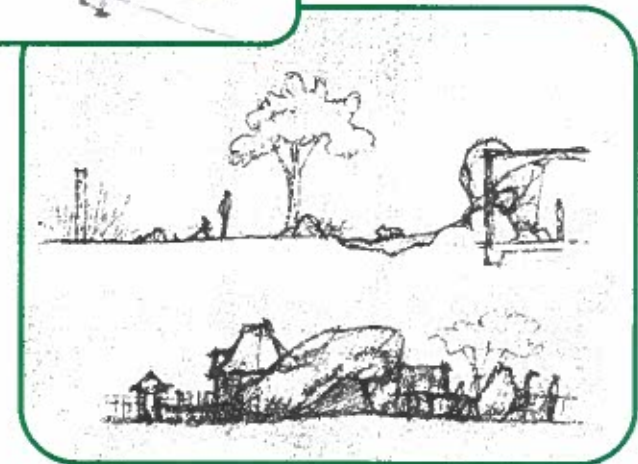
| Animal | Pop. | Out. Exhibit: Req. | Out. Exhibit: Rec. | Holding: Required | Holding: Rec. | Pool | Barrier |
|------------------------|------|--------------------------------------|--------------------|-----------------------------------|---|------------------|-------------------------------------|
| Walk-About (Kangaroos) | 6 | N/A | 3,680 | N/A | (1) 300 sf community stall; (1) 8' x 8' stall | N/A | Vertical Wall / Fence: 6' |
| Walk-About (Wallaby) | 10 | 320 sf / 2; 150 sf per additional | 3,040 | 300 sf / 2; 150 sf per additional | (1) 300 sf community stall; (1) 8' x 8' stall | N/A | Vertical Wall / Fence: 6' |
| Walk-About (Emu) | 3 | 2000 sf / 1; 1000 sf per additional | 4,000 | 13' x 6.5' per animal | (3) 14' x 7' stalls | 500 sf @ 3' deep | Vertical Wall / Fence: 5' |
| Aviary | 50 | N/A | 600 | N/A | (25) 3' x 4' cages | N/A | Full enclosure |
| Tree Kangaroo | 2 | 430 sf / 1; 100 sf per additional | 1,060 | N/A | (1) 6' x 6' stall | N/A | Full enclosure |
| Wombat | 2 | 43 sf / animal; 22 sf per additional | 390 | N/A | (2) 4' x 5' stalls | N/A | Vertical Wall: 3' w/ 2' dig barrier |

Adventure: Down Under

New Products: Animal Attractions



Greatest hits of Australia



Appendix C

Animal Exhibits Program

Product Program: Animal Attractions

75847-00 Milwaukee County Zoo Master Plan

| Project | # of Animals | Outdoor Exhibit: Required Area | Outdoor Exhibit: Recommended Area (sf) / Volume (gal) | Indoor Exhibit: Required Area | Indoor Exhibit: Recommended Area (sf) / Volume (gal) | Holding: Required Area | Holding: Recommended Area | Pool Size (gal or sf) | Barriers | Unique Exhibit Attributes | Special Experience | Possible Enrichment | Recommended / Requirements Source |
|-------------------------------------|--------------|---|---|-------------------------------|--|---|---|--------------------------------|---|--|---|--|--|
| 1. Submersible Exhibit | | | | | | | | | | | | | |
| African Bull Elephants | 5 | 5400 sf / animal | 150,000 total between 3 yards (1 shared w/ giraffes, antelope, N/A; Not incl in this project) | N/A | 7,850 sf (total holding... all on exhibit) | 600 sf / bull, 24' vertical clear | (2) 750 sf stalls; (1) 500 sf stall; (1) 850 sf stall; (1) 1000 sf stall; (1) 4000 sf Community | N/A | Vertical Wall / Fence 10' | Unique views | Tactile interaction. Interactive water play. Training area on exhibit | Foraging, tactile / scratching, manipulative objects, water sprays, feeders via tool use, interactive elements | AZA Standards for Elephant Management and Care, 2011 |
| Hippo | 3 | 1200 sf / 1,800 sf per additional | N/A | N/A | 3,000 | 17' x 14' stall w/ 10' x 12' x 4' pool | (2) 20' x 20' stalls | N/A | Vertical Wall / Fence: 6' Moat, 7' wide, Vertical above Water, 3-5' Vertical Wall / Fence: 5' | Underwater viewing of hippo and fish | Play area. Behind the Scenes views | Water sprays, soft surface brush | AZA Minimum Husbandry Guidelines, 1997 |
| Black Rhino | 2 | 1500 sf / animal | 12,000 | N/A | 3,000 | 200 sf / animal | (2) 20' x 40' stalls | N/A | Vertical Wall / Fence: 5' | N/A | Tactile interaction | Foraging, tactile / scratching, manipulative objects, water sprays, feeders via tool use. | AZA Minimum Husbandry Guidelines, 1997 |
| White Rhino | 2 | 1500 sf / animal | 12,000 | N/A | 3,000 | 200 sf / animal | (2) 20' x 40' stalls | N/A | Vertical Wall / Fence: 5' | N/A | Tactile interaction | Foraging, tactile / scratching, manipulative objects, water sprays, feeders via tool use. | AZA Minimum Husbandry Guidelines, 1997 |
| Giraffe | 3 | 1500 sf / animal | 14,850 | N/A | 5,000 | 225 sf / animal w/ 20' ceiling | (5) 10' x 10' stalls | N/A | Vertical Wall / Fence: 8' | N/A | Tactile interaction | Foraging, tactile / scratching, manipulative objects, water sprays, feeders via tool use. | AZA Minimum Husbandry Guidelines, 1997 |
| Zebra | 6 | 900 sf / animal | N/A; Existing Access to Shared w/ Rhino | N/A | 5,000 | N/A | (4) 10' x 15' stalls | N/A | Vertical Wall / Fence: 8' | N/A | Tactile interaction | Foraging, tactile / scratching, manipulative objects, water sprays, feeders via tool use. | AZA Minimum Husbandry Guidelines, 1997 |
| Antelope spp. (based on largest) | 5 | 1800 sf / 3,650 sf per additional | 15,000 | N/A | 2,400 | 100 sf / animal | (3) 10' x 15' stalls | N/A | Vertical Wall / Fence: 5' | N/A | Tactile interaction | Foraging, tactile / scratching, manipulative objects, water sprays, feeders via tool use. | AZA Minimum Husbandry Guidelines, 1997 |
| Warthog | 8 | 300 sf / animal | 15,000 | N/A | 400 | 50 sf / animal | (5) 10' x 10' stalls; (2) 20' x 20' outdoor stalls | Shallow pool of approx. 500 sf | Vertical Wall / Fence: 5' + 3' backback, 12" dig barrier | N/A | Tactile interaction | Foraging, tactile / scratching, manipulative objects, dig pits, water play, chase play (like cheetah run?) | AZA Minimum Husbandry Guidelines, 1997 |
| African Wild Dog | 2 | 5000 sf / pair; 1000 sf per additional | 12,000 | N/A | N/A | 200 sf / animal | (5) 10' x 10' stalls; (2) 20' x 20' outdoor stalls | Shallow pool of approx. 500 sf | Vertical Wall / Fence: 5' + 3' backback, 12" dig barrier | N/A | Tactile interaction | Foraging, tactile / scratching, manipulative objects, dig pits, water play, chase play (like cheetah run?) | AZA Minimum Husbandry Guidelines, 1997 |
| 2. The Jungle | | | | | | | | | | | | | |
| Orangutan | 5 | 200 sf / animal | 5,000 | 200 sf / animal | 2,000 | 6' x 12' per night room / animal; 12' x 20' x 20' day room; 2x breed to tail length per dimension (12' x 12') | (6) 12' x 12' stalls; (1) 25' x 30' x 20' day room | N/A | Moat or Vertical Wall: 14.5'; Mesh enclosure | Overhead transfer; Kids mimic play structure | Training areas on exhibit. Play w/ orangutan (via touchactive game?) | Climbing structures, feeders via tool use, foraging, interactive elements | Orangutan SSP Husbandry Manual, 2007 |
| Gorilla / Colobus Monkey | 5 | 5x head to tail length per animal dimension (30' x 30') | 3,375 | N/A | 1,125 | Either indoor or outdoor, not both | (2) 12' x 12' | N/A | Full enclosure | N/A | Training areas on exhibit. Play w/ orangutan (via touchactive game?) | Climbing structures, feeders via tool use, foraging, interactive elements | AZA Minimum Husbandry Guidelines, 1997 |
| Black-Footed Cat (n) | 1 | 43 sf / animal | 258 | N/A | N/A | Either indoor or outdoor, not both | (1) 4' x 4' stall | N/A | Vertical Wall: 5' w/ dig barrier | N/A | Training areas on exhibit. Play w/ orangutan (via touchactive game?) | Climbing structures, feeders via tool use, foraging, interactive elements | AZA Minimum Husbandry Guidelines, 1997 |
| Fennec Fox (n or d) | 4 | 43 sf / animal | 1,032 | N/A | N/A | Either indoor or outdoor, not both | (2) 5' x 5' stalls | N/A | Full enclosure | N/A | Training areas on exhibit. Play w/ orangutan (via touchactive game?) | Climbing structures, feeders via tool use, foraging, interactive elements | AZA Minimum Husbandry Guidelines, 1997 |
| Lemur | 6 | 25 sf / 2 | 600 | N/A | N/A | Either indoor or outdoor, not both | N/A | N/A | Full enclosure w/ dig barrier | N/A | Training areas on exhibit. Play w/ orangutan (via touchactive game?) | Climbing structures, feeders via tool use, foraging, interactive elements | AZA Minimum Husbandry Guidelines, 1997 |
| Springhaas (n) | 2 | 16 sf / 2 | 128 | N/A | N/A | Either indoor or outdoor, not both | N/A | N/A | Full enclosure or free-ranging indoors | N/A | Training areas on exhibit. Play w/ orangutan (via touchactive game?) | Climbing structures, feeders via tool use, foraging, interactive elements | AZA Minimum Husbandry Guidelines, 1997 |
| Tamarins | 10 | 32 sf / 6 | 578 | N/A | N/A | Either indoor or outdoor, not both | N/A | N/A | Full enclosure or free-ranging indoors | N/A | Training areas on exhibit. Play w/ orangutan (via touchactive game?) | Climbing structures, feeders via tool use, foraging, interactive elements | AZA Minimum Husbandry Guidelines, 1997 |
| Two-Toed Sloth (n) | 4 | 12 sf / animal @ 12' height (height x hoarse diam) | 192 | N/A | N/A | Either indoor or outdoor, not both | N/A | N/A | Full enclosure or free-ranging indoors | N/A | Training areas on exhibit. Play w/ orangutan (via touchactive game?) | Climbing structures, feeders via tool use, foraging, interactive elements | AZA Minimum Husbandry Guidelines, 1997 |
| Other Primates | | | | | | | | | | | | | |
| Dwarf Mongoose (d) | 2 | | | | | | | | | | | | |
| Black and Rufous Elephant Shrew (d) | 2 | | | | | | | | | | | | |
| Owl Monkey (n) | 1 | | | | | | | | | | | | |
| Michael's Bushbaby (n) | 2 | | | | | | | | | | | | |
| Potto (n) | 3 | | | | | | | | | | | | |
| Sugar Glider (n) | 3 | | | | | | | | | | | | |
| Kinkajou (n) | 1 | | | | | | | | | | | | |
| Southern Three Banded Armadillo (n) | 2 | | | | | | | | | | | | |
| Bats | 17 | | | | | | | | | | | | |
| Vampire Bat (n) | 10 | | | | | | | | | | | | |
| Straw-Colored Fruit Bat (n) | 1 | | | | | | | | | | | | |
| Badger (n) | 1 | | | | | | | | | | | | |
| Tayra (n or d) | 2 | | | | | | | | | | | | |
| Goeldi's Monkey (d) | 3 | | | | | | | | | | | | |

Product Program: Animal Attractions

75047-00 Milwaukee County Zoo Master Plan

Alaska's Cold Coast
Polar Bear

| Animal | Quantity | Cost | Notes | Dimensions | Volume | Material | Water | Substrate | Viewing | Training | Feeding | Enrichment | Standards |
|---|----------|--|---------------|--|----------------------------|---------------------------|--|---|--|---|---|---|---|
| Pinniped (All sea lions and seals, except Steller's and Elephant) | 6 | 250 sf / animal (total area), 83 sf per additional | 3,000 | N/A | N/A | N/A | N/A | N/A | Vertical Wall: 8' Existing | Training on exhibit, Feed demo, Potential swim-with experience | Bubbler, manipulative objects, underwater feeders, water sprays, interactive elements | APHIS, 2001 | |
| Caribou | 3 | 1800 sf / animal | N/A, Existing | N/A | N/A | N/A, Existing | N/A, Existing | N/A, Existing | Vertical Wall: 17' Existing | Underwater viewing, Meadow, Stream | Scent, foraging, tactile / scratching, climbing, manipulative objects, dig pits | AZA Minimum Husbandry Guidelines, 1997 | |
| Grizzly Bear | 6 | 500 sf / pair, 80 sf per additional | 19,700 | N/A | N/A | N/A, Existing | N/A, Existing | N/A, Existing | Vertical Wall: 17' Existing | Underwater viewing, Meadow, Stream | Water sprays, tactile / scratching, floating feeder, manipulative objects | AZA Minimum Husbandry Guidelines, 1997 | |
| 4 Wild Woods Moose | 4 | 1800 sf / animal | 19,800 | N/A | N/A | 150 sf / stall per animal | (5) 10' x 15' stalls; (2) 1000 sf off-exhibit yards; Squeeze | Include a pool deep enough for full submersion (7'); Freshwater | Vertical Wall / Fence: 10' | Feeding station to pond | Feeding experience | Puzzle feeder, manipulative objects, tactile / scratching, scent | AZA Minimum Husbandry Guidelines, 1997 |
| Mountain Lion | 2 | 700 sf / animal, 100 sf per additional | 4,800 | N/A | N/A | N/A | (2) 10' x 10' stalls; (1) equine stall | Pool maximum 25% of total exhibit area. Include slides and slides. Freshwater | Vertical Wall / Fence: 5' | Training on exhibit, Large scent to; Meet n greet experience | Puzzle feeder, manipulative objects, tactile / scratching, scent, underwater feeder, tactile / scratching, scent, manipulative objects, interactive elements, water sprays, water slide, bubblebers | AZA Minimum Husbandry Guidelines, 1997 | |
| River Otter | 3 | 1815 sf / 2 animals, 1,995 sf per additional | 3,000 | N/A | N/A | N/A | (2) 5' x 5' stalls w/ 2' x 5' pool | | Fully enclosed | Natural substrate, vegetation, Pop-ups, slide through, Training panel | | | AZA Standardized Minimum Husbandry Guidelines—Otter, 2007 |
| Wolverine | 2 | | 1,600 | N/A | N/A | N/A | (3) 5' x 6' stalls | | Fully enclosed | Natural substrate, vegetation, Pop-ups, slide through, Training panel | | | |
| Lynx | 2 | | 1,600 | N/A | N/A | N/A | (3) 5' x 5' stalls | | Fully enclosed | Natural substrate, vegetation, Pop-ups, slide through, Training panel | | | |
| Fisher | 2 | | 1,600 | N/A | N/A | N/A | (4) 10' x 15' stalls; (2) 1000 sf off-exhibit | | Vertical Wall / Fence: 10' | Vertical terrain w/ natural substrate, vegetation, Training panel | Training on exhibit | Scent, foraging, tactile / scratching, manipulative objects, dig pits, water play, chase play (like cheetah run?) Mud wallows | AZA Minimum Husbandry Guidelines, 1997 |
| Elk | 8 | 1800 sf / animal | 21,600 | N/A | N/A | N/A | (6) 8' x 8' stalls; (1) equine stall | Shallow pool and/or stream for wading, Max. depth 5', N/A | Vertical Wall / Fence: 8' w/ lockback into exhibit and underground dog barrier | Vertical terrain w/ natural substrate, vegetation, Training panel | Training on exhibit | | |
| Mexican Grey Wolf | 5 | 150 sf / animal, 75 sf per additional | 12,150 | N/A | N/A | N/A | (3) 12' x 12' stalls; Squeeze | | Vertical Fence: 7' | Rocky terrain surrounded by trees for shade. No trees in exhibit | | | |
| Wood Bison | 2 | | 15,000 | N/A | N/A | N/A | | | Vertical Wall / Fence: 10' | Numerous fish species including 6 long sharks | Tactile, bubbles, underwater feeder | Elasmobranch Husbandry Manual, 2004 | |
| Escape to the Islands Shark Tank | Many | N/A | N/A | Dim. based on ave. max. length of largest species to be held. Pool Length = 12 x ave. length. Pool Width = 5 x ave. length. Pool Depth = 2 x ave. length | 3000 sf / 245,000 gal | N/A | 40' x 15' x 6' pool / 30,000 gal | Exhibit to avoid rectangular shape with rounded corners. Saltwater | N/A | | | | |
| Ray Touch | Many | N/A | N/A | N/A | 2500 sf / 25,000 gal | N/A | (1) 10' diam holding pool w/ 5' depth (as part of exhibit) | Exhibit to avoid rectangular shape with rounded corners. Saltwater | N/A | Natural look with mangrove and beach | Touch experience | | |
| Komodo Dragon | 3 | N/A | 1,500 | N/A | 1,200 | N/A | (4) 12' x 12' stalls | | Moat or Vertical Wall: 8'. Mesh enclosure | Pop-up | Swim / Feed demo? (Swim to island where fed) | Scent, foraging, heat / cool spots, water play | |
| Sturgeon Touch (alt to Ray) | 25 | N/A | N/A | N/A | 20' x 8' x 2.5' / 3000 gal | N/A | N/A | Chilled freshwater | N/A | Underwater viewing | Touch experience | | |
| Giant Japanese Salamander | 1 | N/A | N/A | N/A | 15' x 5' x 3' / 1700 gal | N/A | N/A | | | | | | |

Minor Projects

1. Penguins

Product Program: Animal Attractions

75847-00 Milwaukee County Zoo Master Plan

Husbandry Programs

| | | | |
|----|--|-------------------|-----|
| 20 | 96 sf / 6 animals, 6 sf per additional | Existing + 600 sf | N/A |
| 12 | N/A | N/A, Existing | N/A |
| 3 | 2000 sf / 1: 1000 sf per additional | | N/A |

N/A
8 sf / animal per stall. Separate quarantine required

(1) 10' x 10' stall w/ 4' x 3' x 3' pool; (2) 6' x 4' isolation stalls; 8' x 2' nest area for 10 boxes

Emoting + 10' diameter, 1' deep pool w/ waterfall, Freshwater

Vertical Surface: 16'; Fully enclosed to prevent escape over low pool wall & deter predation

Multiple substrates. Underwater viewing; Child-level viewing

Feeding experience, Paint with experience

Bubbles, underwater feeder, nest boxes, soap bubble machine, snow machine, fetch, reflections / shadows in water.

Prague TAG Husbandry Manual, 2009

2 The Ferns

Walk-Around (Kangaroo)
Walk-Around (Emu)

N/A
N/A
N/A
13' x 6.5' per animal

N/A, Existing
N/A, Existing

N/A
500 sf @ 3' deep

Vertical Wall / Fence: 6'
Vertical Wall / Fence: 3'

N/A
Husb. Manual for Emu, Swarbrick, 2009

Appendix D

Proposed West Entry Evaluation Report

Compiled by **K. SINGH & ASSOCIATES, INC.**

Subject: Milwaukee County Zoo – Egress & Ingress, and proposed West Entrance and Parking Lot Review

Date: December 4, 2013

Scope

Review Wisconsin Department of Transportation proposed Zoo Interchange Improvement and comment on potential impact to traffic entering and exiting the Milwaukee County Zoo. Review proposed conceptual plans for new Milwaukee County Zoo West Entrance. Comment on specific itemed list in the body of this Report.

The Traffic Analysis Design, Inc. (TADI) "Traffic Impact Analysis Technical Memo of August 2, 2013" and The SIGMA Group "Bliffert Site Parking Lot Final Preliminary Engineering Evaluation" of August 5, 2013 are referenced.

Item 1

Provide brief review and one page document identifying potential issues that will adversely impact traffic in and out of the Zoo based on the planned Zoo interchange ramp location. All information on the ramp location and traffic counts will be provided by Milwaukee County.

Zoo Main Exit on Bluemound Road:

The existing Zoo Main Exit located across from 98th Street would likely be affected by the overall Zoo interchange project and in particular the addition of a SB on-ramp from Bluemound Road (USH 18). This proposed new ramp, along with improvements to Bluemound Road and Hwy 100, would likely attract/add more traffic to Bluemound Road. The proposed ramp location and additional traffic are likely to make traffic operation more difficult than existing conditions for traffic exiting the Zoo. The additional traffic would likely result in more delay time, expected to be LOS F in the weekday PM Peak hours, for traffic exiting the Zoo. This delay is not conducive for a major recreational facility like the Milwaukee County Zoo. Note that the expected LOS "F" assumes the West Parking Lot is built and operational. Refer to Table E, August 2, 2013 Traffic Technical Memo.



Also there is a potential for traffic backup from the proposed SB on-ramp into the Zoo Main exit area. The right turns besides the left turns may become more difficult. This requires traffic modeling to predict expected queue length resulting from the proposed metered ramp.

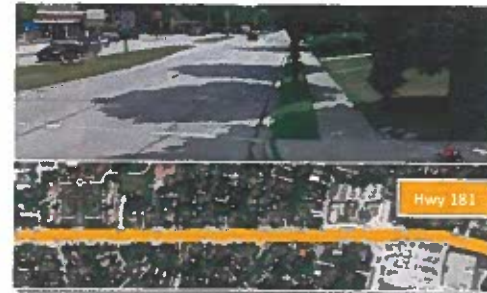
Access from Zoo to WB IH 94:

When exiting the Zoo under present condition, motorists can choose to quickly gain access to IH 94 WB and go west towards Madison by making a quick right on Bluemound then left on north 97th Street then taking the loop ramp at Wisconsin Avenue to SB USH 45 and continuing in the auxiliary right lane to merge with IH 94 WB. The proposed traffic flow to get to WB IH 94 would change to a left movement from the Zoo exit as follows: make a left from the Main Zoo exit, then west on Bluemound to Hwy 100 South to IH 94 WB. The difficulty is making a left turn from the existing exit is that it is a hindrance.

Most exiting traffic from the Main Zoo exit is likely to go right due to expected delay in the left and thru movement. Traffic from the Zoo that wants to go west on Bluemound or want to access IH 94 WB would likely have to go east on Bluemound instead of west. Traffic would then have to either make a U-turn and head back west on Bluemound towards Hwy 100 or continue east for one mile to reach STH 18 then turn right (south) to reach IH 94. The STH 18 option would add a 2-mile detour. This is expected mainly in the weekday PM peak hours. The proposed SB on-ramp only provides access to USH 45 SB and EB IH 894 and does not provide access to WB IH 94.

Access to the Zoo via EB IH 94/NB USH 45/Bluemound:

Current traffic heading to the Zoo from the west and using EB IH 94 can get to the Zoo via Hwy 100 & Bluemound Road. This access (Hwy 100) is getting improved. However, the option to use EB IH 94/USH 45 NB and exit to Bluemound would not be available with the future configuration due to the elimination of the exit loop ramp at Bluemound.



Recommendations:

- Investigate improvements to entering and exiting Zoo visitors' vehicular and pedestrian traffic.
- Investigate improvement to exiting Zoo traffic by enhancing the left turn movement.
- Utilize intersection modeling to analyze traffic flow at the intersection with Bluemound Road that incorporate ramp traffic.
- Provide a signal warrant study at the Main Zoo Entrance and Proposed West Entrance.

Item 6

Provide brief review and one page document summarizing the total and type of facilities needed and preliminary construction costs at the proposed northwest entrance on the Bliffert property. All information on the entrance, type, and other items will be provided by Milwaukee County.

West Parking Lot Entrance:

We have reviewed current roadway improvement plans and concept plans for the parking lot. The Bluemound improvement plans show 3-thru lanes and a driveway opening for the proposed West Parking Lot. The West Parking Lot entrance is located across from 106th Street (STA. 167BE+50).

The proposed Eastbound with the added third lane, would likely not function well with the proposed West Parking Lot entrance at 106th Street. EB traffic that needs to enter the West Parking Lot needs to slow down in a through lane and may even stop before turning right. This will interfere with EB Bluemound through traffic. Traffic heading east in the third outside lane would either have to slow down or stop or merge left. Merging left may be difficult as eastbound traffic will be heavy in a platoon from the signal. This merging may be a cause for rear end crashes or side swipes.

Recommendation:

Provide a separate right turn lane for the proposed West Parking Lot Entrance. This can be accomplished between STA. 164BE and STA. 167BE (50 taper and 250-foot right turn lane). The estimated allowance of \$175,000 that was specified in SIGMA's August 5, 2013 report is sufficient to cover the estimated construction cost of this acceleration/deceleration lane.

Item 6A Review of proposed west parking lot

[Refer to 11-29-13 e-mail from Milwaukee County]

The proposed parking lot 5% slope in Options A & B is not customary (Refer to August 5, 2013 SIGMA's Report). Normally, parking lots are designed and built between 2% and 3% Slope. We have looked at the estimate for both options. Overall the prices and estimates given are in order. We noticed that \$2/CY was estimated for grading. It is likely that \$4 will be in order. This would add \$80,000 to Option B and \$92,000 to Option A.



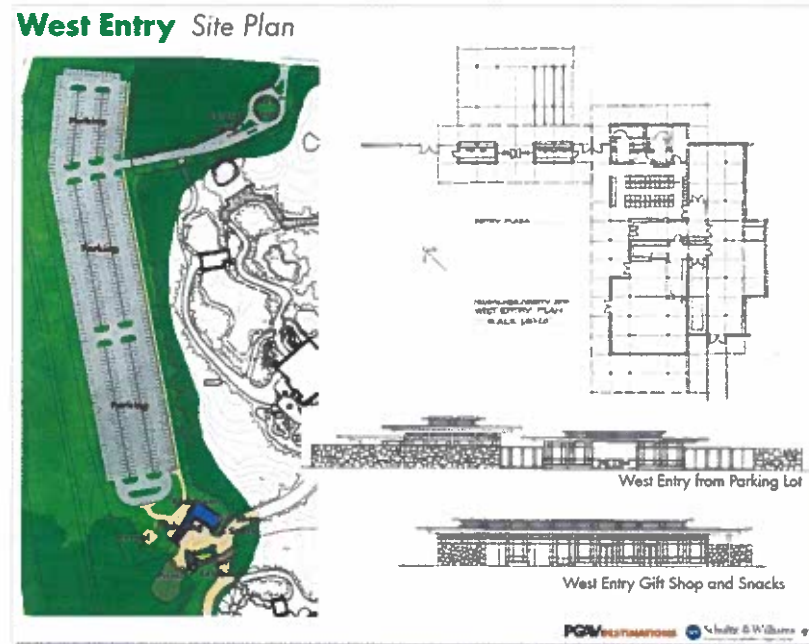
Item 6B Review of proposed access road from Bluemound Road to west parking lot only

[Refer to 11-29-13 e-mail from Milwaukee County:]

Making left turns to go west on Bluemound from the West Parking Lot would likely be difficult due to heavy traffic volumes on Bluemound Road and having to cross three though eastbound traffic lanes plus a left turn lane. LOS E is expected for this movement. Refer to Table E , August 2, 2013 Traffic Technical Memo.

Observation:

Making left turns from the West Parking Lot would likely be difficult due to heavy traffic volumes on Bluemound Road and having to cross four lanes of traffic.



Challenges:

The roundabout is located too close to Bluemound Road. Traffic waiting to exit would likely block the roundabout and hinder its use.

Recommendation:

Move roundabout closer to the parking lot and allow for more staking away from the roundabout. The estimated cost for the access road from the West Parking Lot to Bluemound Road is approximately \$150,000. Out of \$150,000 about \$50,000 is additional cost to SIGMA's estimate, because of change in the location and subsequent increase in the length of the access road.

Item 6H | Electrical Service

The electrical service for the new buildings at the west entrance gate is recommended to be 400 amp, 120/208V, 3 Phase, 4 Wire. The electrical service shall serve lighting, power, and mechanical branch circuits in the service, ticket, restroom and retail structures, site lighting for the new west parking lot and entry plaza, and power to the food kiosk.

The proposed service is to be connected to the existing 4160V medium voltage electrical distribution system serving the Zoo. One of the available sources for power (Option #1) would be to connect to the 4160V distribution that serves an existing transformer located in front of the Grizzly Bear Exhibit. This existing transformer has no load on it for 51 weeks during the year, but system capacity during the one week special event is unknown at this time. If this source of power were to be used, then a new MV duct package (two 2" conduits) would need to be extended north from the Grizzly Bear Exhibit area along the existing pathway that runs under the Safari Train Bridge to the new west entrance gate location. Terminate the MV ducts at a new pad mounted transformer located adjacent to the services structure at the Entry Plaza. Extend a 400 amps, 120/208V, 3 Phase, 4 Wire underground secondary service from the transformer to a main service panel located in the services structure.

➡ Cost for Option #1 is estimated to be \$105,000.

An alternate source of power (Option #2) could be extended from the 4160V distribution that serves the Small Mammals Building. However this portion of the system is older and is near or at capacity. The 4160V power would be extended from the existing MV manhole located in front of the Small Mammals Building with a new MV duct package (two 2" conduits) routed south and west along the existing pathway to the new west entrance gate location, and terminated at the new pad mounted transformer, as described in Option #1.

➡ Cost for Option #2 is estimated to be \$125,000.

Either option indicated above shall be dependent on the existing 4160V distribution system's ability to handle the additional electrical load of the west entry gate structures. Option #1 would be the preferred option, but if the existing 4160V distribution system does not have the capacity, then a third option would be to obtain a new underground electrical service from We Energies.

➡ Cost for Option #3 is estimated to be \$80,000.

Item 6I | Site Lighting

The new west parking lot and entry road to be provided with pole mounted light fixtures to provide adequate site lighting during the times that the Zoo is open for special events with extended hours. The proposed parking lot lighting would consist of approximately 11 single-head and twelve double-head light poles located within the parking lot and around the perimeter of the lot, and along the entry drive off of Bluemound Road.

Light fixtures to be 250 watt metal halide, full cutoff parking lot/roadway area light fixtures with IES Type III light distribution, mounted on 25' square steel poles with a concrete base. The concrete bases located within the parking lot to be elevated with the top of the base 30" above the pavement. Additional site lighting to be provided for the entry walkway, ticket/turnstiles, and entry plaza consisting of 100 watt metal halide post lights. Walkway lights to match existing walkway lights in the Zoo. Estimated cost for the site lighting to be \$195,000

An alternate to the metal halide light fixtures would be to provide LED light fixtures with equivalent light output. The increase in cost for LED light fixtures would add approximately \$73,500.

⇒ Estimated cost for the site lighting to be \$268,500.

Site lighting circuits to be controlled by a photo cell to turn the lights on at dusk and a time clock to turn the lights off at a selected time. Selected light fixtures to be controlled by photo cell on/photo cell off for dusk to dawn security lighting. All site lighting branch circuits to be served from the electric service panel located in the services structure.

Item 6J | Water Service

Water and fire protection service is proposed to be extended from an existing 8" main southeast of the site located north of Evinrude Lake and across of the Grisly Bear Exhibit. It is approximately 700 feet from the site. 8" main with 6" lateral will be utilized with the addition of two Fire Hydrants.

⇒ Estimated Cost is: \$93,000.

Item 6K | Sanitary Sewer Lines

Sanitary sewer service is proposed to be connected to an existing sanitary sewer structure/manhole southeast of the site located north of Evinrude Lake and across of the Grisly Bear Exhibit. It is approximately 700 feet from the site. 12" main with 6" lateral will be utilized.

⇒ Estimated Cost is: \$79,800.

Item 6L | Storm Sewer Line

Storm sewer/drainage is proposed to be discharged into Lake Evinrude about 700 feet southeast of the site through a settling basin. 24" main and 12" lateral will be utilized.

⇒ Estimated Cost is: \$120,000.

Item 6M | Communication Network Service

The proposed communication network service is to be connected to the existing fiber optic distribution system serving the Zoo. The recommended source for connection to the fiber optic distribution system would be from the existing 12-port fiber uplink switch at the Special Exhibits, located north of Monkey Island near the Sea Loin Show. A new 12 strand single-mode direct burial (armored) fiber optic cable to be installed through the existing communication duct system that runs from Special Exhibits to the Small Mammals Building to the existing communication manhole located south of the Small Mammals Building, then through a new communication duct package (two 2" conduits) routed south and west

along the existing pathway to the new west entrance gate location. Terminate the communication ducts inside the services structure at the Entry Plaza.

The fiber optic cable to be terminated in an 8-port fiber switch located on a wall or shelf in the services structure. The switch to be connected to a 24 port patch panel to serve POS outlets in retail space and tickets area, data and telephone outlets, security cameras, time clock, and building energy management panel. All of the cabling installed between the outlets and the patch panel to be CAT 6. Cost for the communication network system is estimated to be \$80,000.

Provide a fire alarm panel to serve all of the structures associated with the west entrance gate. Provide a pull station at each exit door, ceiling mounted smoke detectors, and horn/strobe notification appliances. Fire alarm control panel is to be equipped with an automatic dialer to dial out to a remote monitoring station in the event of an alarm condition. Estimated cost for the fire alarm system to be \$7,500.

➡ Estimated cost for the communication network system with the fire alarm system is estimated to be \$87,500.

Item 6N | Gas Service

The existing natural gas distribution system currently serving the Zoo grounds is owned and maintained by We Energies. It is estimated that a gas service size of approximately 100-200MBH would be required to handle the new structures associated with the secondary gate entrance. This assumes approximately 40,000btuh for a water heater and another 60,000 to 80,000btuh furnace for heating. We Energies would provide the new gas service and up to 100 lineal ft of lateral for no cost. The cost per ft of additional lateral which may be required beyond 100 ft is currently \$6.06/lf for a 1" lateral with a winter premium of an additional \$4/lf if installed during the winter. Worst case for natural gas lateral length occurs if the tie-in is made on the main loop distribution piping. It is estimated that the length would be approximately 650 lineal ft. The We Energies cost would be approximately \$3500 for normal installation and \$6100 for winter installation. Site restoration cost for approximately 700 feet of utility trench is estimated at \$7,000.

➡ The Gas Service cost would is estimated to be \$13,100.

Conclusion

Further more detailed evaluation including traffic modeling and traffic signal warrant analysis is recommended to address both pedestrian and vehicle traffic movement at the Zoo Entrance that address normal traffic patterns and peak hours vs. Zoo special events. The reviewed utilities cost estimates are reasonably higher than Sigma's earlier estimate. We recommend that the utility service estimate supplied by SIGMA in their August 5, 2013 report be substituted with the updated estimate in this report. The site grading and paving work estimate provided by SIGMA are recommended to be increased by the following:

- Option A by: $\$92,000 + \$50,000 = \$142,000$
- Option B by: $\$80,000 - \$50,000 = \$130,000$
- Increase Allowance on both Option A & B by \$75,000 to \$250,000.

The cost estimate provide in this report are construction cost. They do not include markup for design, construction management, and delivery cost. We recommend adding 35% to the provided estimate for total project cost.

Appendix E

Summary of Zoo Interchange Project Potential Impacts on South Yard & Zoofari Conference Center

Compiled by **American Design**

I. SUMMARY OF ZOO INTERCHANGE PROJECT POTENTIAL IMPACTS ON SOUTH YARD

The Wisconsin Department of Transportation, (WDOT), project of reconfiguring the I-94 Zoo Interchange will result in expansion of freeway perimeters into Zoo properties. In one location, the Zoo South Service Yard, a new I-94 traffic ramp will be constructed. This roadway expansion will reduce the current space buffer between the freeway and the Zoo's South Yard facilities. A brief discussion of adverse impacts for the yard facilities in general and specifically for the horticultural shops and the bird winter quarters follows.



South yard freeway edge condition.

The South Service Yard is organized along a service drive with support structures to either side. The Zoo train maintenance and storage facility, animal commissary and hay barn are on the south with horticultural shops and the bird winter quarters north of the drive and adjacent to the freeway. Currently the freeway edge has a 40'-90' setback used for minor storage sheds and miscellaneous outdoor yard storage, see photo above. The I-94 plan is for this buffer to be significantly reduced. There will be short term, (construction), and longer term impacts from this transportation initiative.

A. Potential Construction Phase Impacts

Short term impacts as a result of construction activities include yard operational disruptions to clear the way, moving miscellaneous storage elsewhere. Also anticipated is car, truck or Zoo train access disruptions or schedule limitations as the tunnel connection from the yard to the Zoo grounds running beneath the freeway is extended. Utility infrastructure serving the yard will need to be coordinated with the freeway construction to assure minimal disruption. Yard surface storm drainage patterns post construction should be understood. Construction brings known adverse impacts that require mitigation including erosion, vibration, dust and noise.

The south service yard facilities directly adjacent to the freeway expansion zone are the horticultural shops and the bird winter quarters facilities, see photo below. The building is constructed of concrete block, (CMU). There is the potential that freeway construction vibration would result in exterior wall mortar joint or CMU cracking. The buildings walls should be monitored through construction for any deterioration.



South yard winter bird quarters.

The building has rooftop air units. Where air intakes exist filters should be frequently monitored. The anticipated increase in the amount of air bourn dust could impact the building ventilation system, interior air quality and HVAC equipment's performance and longevity.

The bird winter quarters located in close proximity to the freeway expansion work area will brings an added sensitivity to noise and vibration. There is a significant risk to disrupting the habits and well being of the Crested Screamers, three pair of vultures that are relocated each winter to nest and breed in the building. A detailed evaluation of this issue will need to be performed so measures can be taken to eliminate any negative impacts. The following table¹

lists typical noise levels of various types of construction equipment many of which are likely to be engaged in the freeway construction.

| Equipment | Typical Noise Level (dBA) 50' from source |
|----------------------|---|
| Air Compressor | 81 |
| Backhoe | 80 |
| Ballast Equalizer | 82 |
| Ballast Tamper | 83 |
| Compactor | 82 |
| Concrete Mixer | 85 |
| Concrete Pump | 82 |
| Concrete Vibrator | 76 |
| Crane, Derrick | 88 |
| Crane, Mobile | 83 |
| Dozer | 85 |
| Generator | 81 |
| Grader | 85 |
| Impact Wench | 85 |
| Jack Hammer | 88 |
| Loader | 85 |
| Paver | 89 |
| Pile Driver (Impact) | 101 |
| Pile Driver (Sonic) | 96 |
| Pneumatic Tool | 85 |
| Pump | 76 |
| Rail Saw | 90 |
| Rock Drill | 98 |
| Roller | 74 |
| Saw | 76 |
| Scarifier | 83 |
| Scraper | 89 |
| Shovel | 82 |
| Spike Driver | 77 |

| Equipment | Typical Noise Level (dBA) 50' from source |
|--------------|---|
| Tie Cutter | 84 |
| Tie Handler | 80 |
| Tie Inserter | 85 |
| Truck | 88 |

¹ Harris Miller Miller & Hanson, 1995. Transit Noise and Vibration Impact Assessment: Final Report May 2006. Office of Planning, Federal Transit Administration, U.S. Department of Transportation. Table 12-1, which is based on U.S. Environmental Protection Agency, "Noise from Construction Equipment and Operations, Building Equipment and Home Appliances," NTID300.1, December 31, 1971.

B. Potential Long Term/ Permanent Impacts

The new freeway ramp will route eastbound I-94 traffic to northbound highway 45. The ramp will rise up, curve north and flyover I-94. At the yard the freeway structure will be at least 40' in the air. This configuration suggests constant noise impacting the yard as traffic, particularly as semi truck traffic accelerates to climb the ramp. Freeway sidewall shields will be installed on the ramps. We understand, however, these are not sound shields but rather are intended to prevent snow and ice from dropping to the south yard below. Vibration impacts from this new configuration are unknown but should be further reviewed, defined and mitigated.

II. SUMMARY OF ZOO INTERCHANGE PROJECT POTENTIAL IMPACTS ON THE ZOOFARI CONFERENCE CENTER

The Zoofari Conference Center is a meeting and events venue available for booking for private party use. It is also a main Zoo storage and maintenance facility. Located at the northeast corner of the Zoo grounds and outside the Zoo's perimeter fence, it is operated as a profitable satellite rental facility by the Milwaukee County Zoo. Exposure and public access is along the busy Bluemound Road while Zoo storage and maintenance access is via a service drive through a gate in the Zoo's perimeter fence from the south.

WDOT's reconfiguring of the Highway 45 / I-94 interchange at Bluemound Road will result in expansion of the freeway by trimming land from the north and east perimeters of the Zoofari site. This roadway expansion will facilitate an eastbound Bluemound turning lane onto a new on ramp dropping down to the interchange moving to the south. This WDOT initiative will

negatively impact the Zoofari facility during construction and have several permanent impacts as discuss below.



Zoofari street front entry drop off.

A. Potential Construction Phase Impacts on the Zoofari Conference Center

Short term impacts as a result of construction activities will include access from Bluemound as the right of way on the north edge at the Conference Center entry is widened, see photo above. This widening will result in construction dust, noise and temporary access drive disruption. These conditions will have a negative impact the facility in that users lease the facility for limited events rather than longer term. Ease of access and the uncertainty of construction activity are pertinent to decisions by any potential user looking to lease the facility. The Zoo should anticipate reduced revenues for the duration of the construction.

Construction on the east edge of the property will again result in dust, noise and temporary east service drive disruption. This drive is used daily by Zoo service vehicles accessing the storage spaces at the east façade. It also serves the flow of Conference space users as they drop off attendees at the porte cochere on the north facade and continue around on the east drive to the parking lot, see next photo. Some congestion along this circulation should be anticipated as construction barriers are placed to allow for construction activity along the east edge of the property.



East edge of Zoofari building.

A. Potential Long Term/ Permanent Impacts on the Zoofari Conference Center

The impact of the reduced landscape buffer from the heavy traffic along Bluemound should not be undervalued. The facility is leased, (for weddings, etc.), in part because of its attractiveness. The drop off area at the north façade is the first impression of the venue to potential users. It's important this area be restored to a condition that enhances that first impression despite the reduced setback space.

Parking spaces, (40), along the east edge of the site will be lost and will need to be replaced south of the Conference Center's south parking lot. This location west of the Zoo's service entry drive will require moving the Zoo perimeter fence and sacrificing some of the Zoo's landscaped edge and possibly some mature trees along the Zoo visitors' exit drive. Loss of trees would be a negative result as they now buffer the Zoofari parking from the Zoo entry experience. This parking will extend the current lot south and is further from the facility entry. Circulation to this new parking will also increase the number of vehicles and pedestrians crossing paths with Zoo service and delivery vehicles accessing the building's south service doors. For these reasons this back 40 parking will be less attractive to potential lessees. See next photo.



Looking south toward Zoo's service access entry gate.