

Heifer Housing in Subtropical Climates



JGM  , Inc.
Dairy Design Engineers

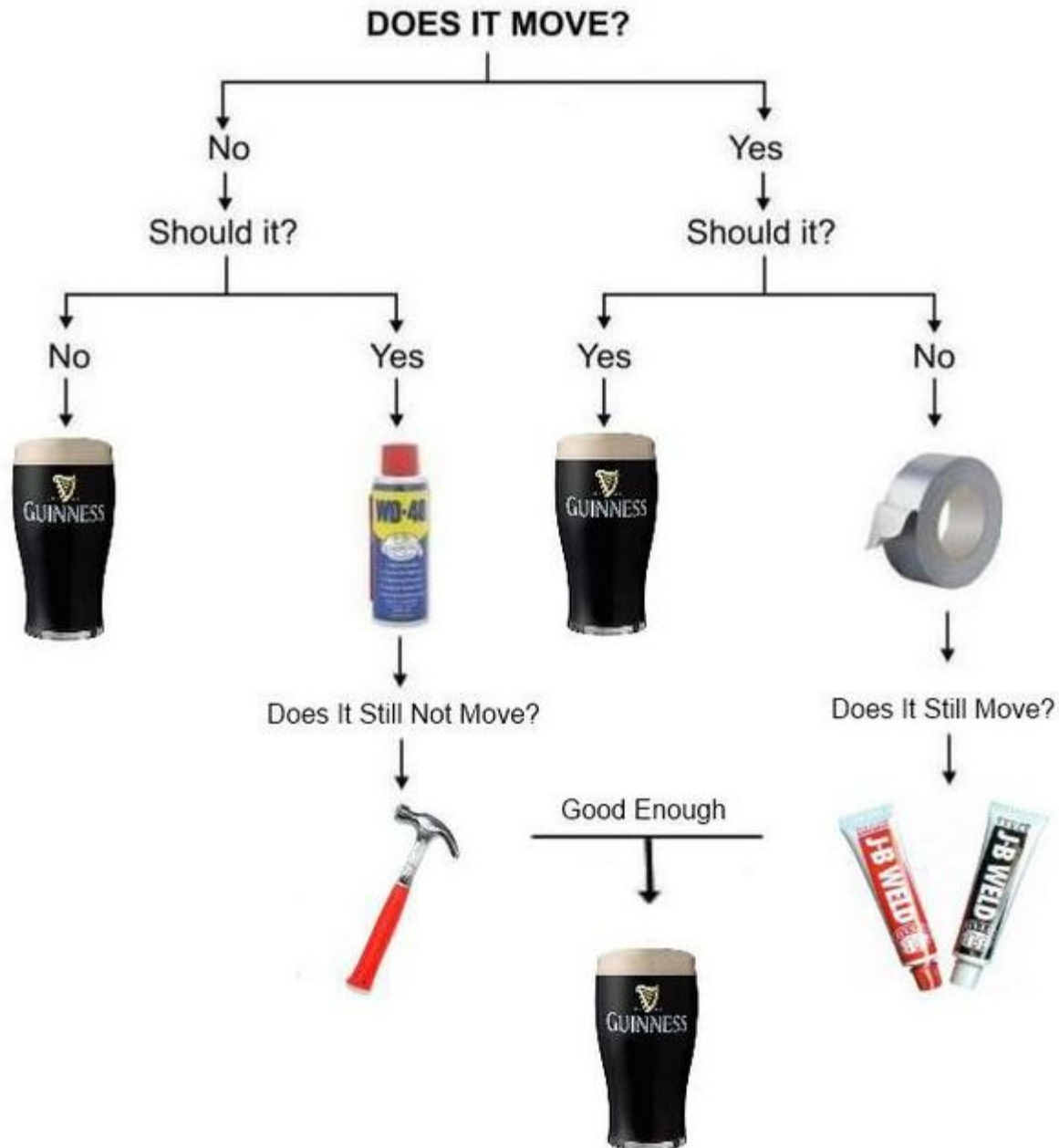
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Why consider heifer housing?

- ❖ *Producers asking if there are alternatives to traditional system*
- ❖ *First & foremost – is alternative solving a problem?*



Engineering Flowchart



Why consider heifer housing?

❖ *Typical Southeastern US Heifer Housing*



Why consider heifer housing?

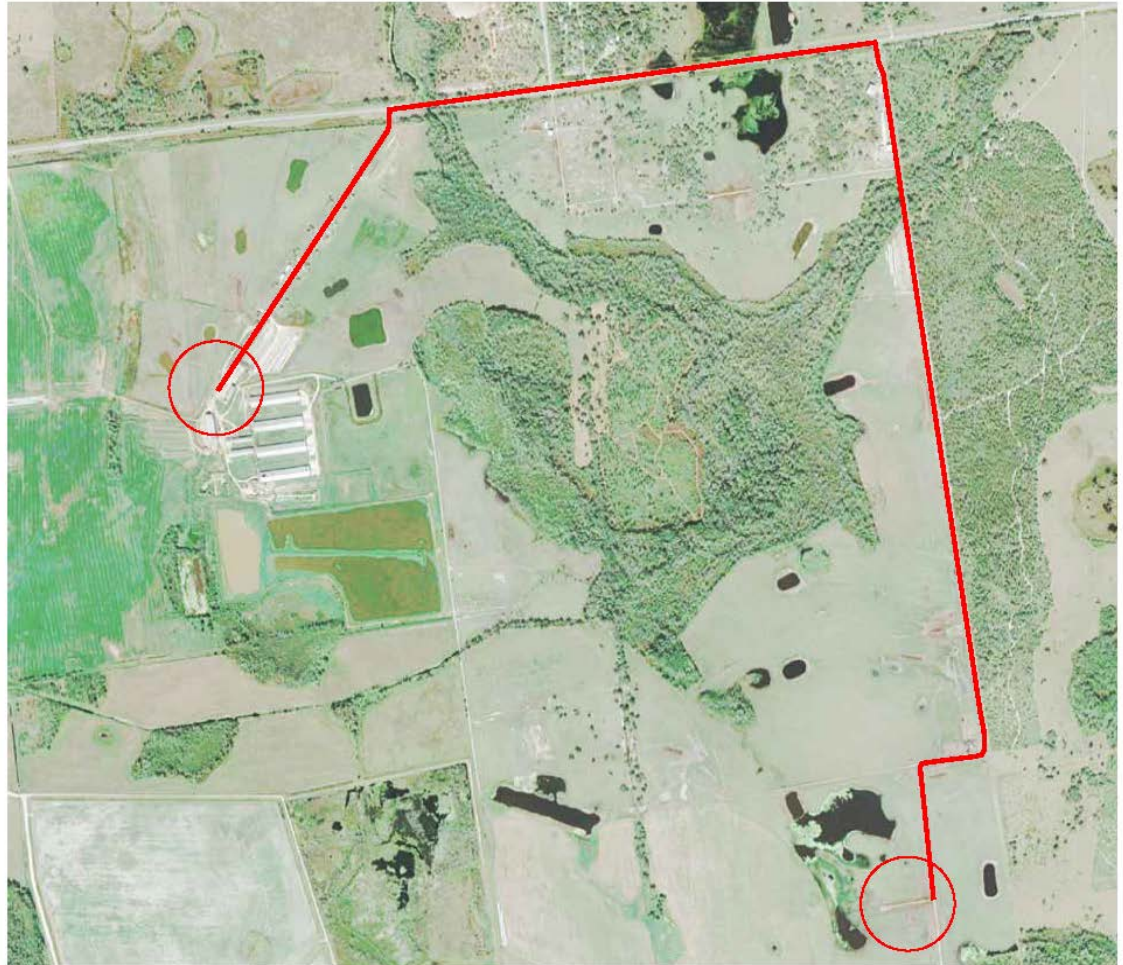
- ❖ ***Use Less Land for Youngstock***
 - ❖ *Opportunity cost of land?*



Why consider heifer housing?

❖ *Possible Labor Efficiencies*

❖ *Sustainable?*



Why consider heifer housing?

❖ ***Inclement Weather***

- ❖ ***“People in better environments do a better job”***



Why consider heifer housing?

- ❖ **Consumer Expectations**
 - **Avoidance of Negative Public Perception**



Why consider heifer housing?

❖ *Avoidance of Potential Environmental Issues*



Why consider heifer housing?

- ❖ ***Potential Increased Rate of Gain***
 - ❖ *Animal comfort - Shade & Ventilation necessary*
- ❖ ***Potential greater feed efficiency***



Why consider heifer housing?

❖ *Easier Security/Biosecurity*



How many spaces?

| Group | Avg. Wt. | # days | Head | Notes: | DVA Rule-of-Thumb: | | | | | |
|-------------------------------|----------|--------|-------|-----------------------------|--------------------------|-------------------------------------|-------------------------------------|------------------------|-----------------|--|
| Total Lactating Cows: | 1,400 | | 1,000 | | 0.5 | animals freshening/day/100 cows | Base Assumptions: | | | |
| Total Dry Cows: | 1,500 | 68 | 180 | | 0.3 | dry cows/day/100 cows | 13.5 month calving interval | | | |
| Total Adult Animals: | | | 1,180 | | 13.5 | month calving interval assumed | 30% replacement rate | | | |
| Milking Herd Housing Barns: | | | | | 24 | mo. at first calving | (6%death; 16%invol, 8%vol.) | | | |
| Healthy Milking Cattle: | 1,400 | | 929 | | PRE-FRESH MATERNITY PEN | | | | | |
| Fresh Cows/Heifers: | 1,400 | 21 | 71 | | 1,000 | cows | | | | |
| Total Milking Herd: | | | 1,000 | | 10% | calvings per month (cows & heifers) | | | | |
| Youngstock:** | | | | | FRESH PEN (2 - 23 days) | | **Assumed Heifer Cull/death Losses: | | | |
| Calves, Female (0 - 2mo): | 150 | 60 | 117 | ** See losses | 3.3 | calvings per day (cows & heifers) | Baby Calves | | 5.0% DOA | |
| Calves, Bulls (0 - 7days): | 150 | 14 | 17 | ** See losses | 21 | days in fresh pen | Weaned Calves: | | 5.0% Death | |
| Total Baby Calves: | | | 134 | | 71 | cows in just-fresh pen | Growing Heifers: | | 3.0% Cull/death | |
| Heifers, Weaned (2 - 5mo): | 300 | 90 | 167 | ** See losses | 1.5 | safety factor | Breeding Heifers: | | 4.0% Not bred | |
| Heifer, Growing (5 - 12mo): | 550 | 210 | 378 | ** See losses | 107 | cows in just-fresh pen | Bred Heifers: | | 2.0% Cull/death | |
| Heifer, Breeding (12 - 16mo): | 800 | 120 | 207 | ** See losses | **BABY CALF DISTRIBUTION | | | | | |
| Heifer, Bred (16 - 23mo): | 1,100 | 231 | 391 | ** See losses | 0.62 | heifer calves | Calf Calculations with Sexed Semen | | | |
| Total Heifer Spaces: | | 730 | 1,303 | | 0.38 | bull calves | Group Cow | Percentage of herd 67% | % Hfr 50% | |
| | | | 2,508 | Total Animal Spaces On Farm | | | Heifer | 33% | 85% | |
| | | | | | | Total | | | 62% | |

Heifer Groups Based on Size & Age (Holstein)

| | | |
|---------|----------------------------------|---------------------|
| Group 1 | Birth to 2 months | Birth to 175 lbs. |
| Group 2 | 2 to 4 months | 175 to 300 lbs. |
| Group 3 | 4 to 8 months | 300 to 500 lbs. |
| Group 4 | 8 to 12 months | 500 to 700 lbs. |
| Group 5 | 12 to 16 months | 700 to 900 lbs. |
| Group 6 | 16 to 20 months | 900 to 1,100 lbs. |
| Group 7 | 20 months to 1 month pre-calving | 1,100 to 1,300 lbs. |
| Group 8 | Pre-calving 2 to 4 weeks | |

Group 1: Birth to 2mo. – Baby Calves

Group 1: Birth to 2mo.

❖ *Individual hutch/pen outside*



Group 1: Birth to 2mo.

- ❖ *Individual hutch/pen under common roof*



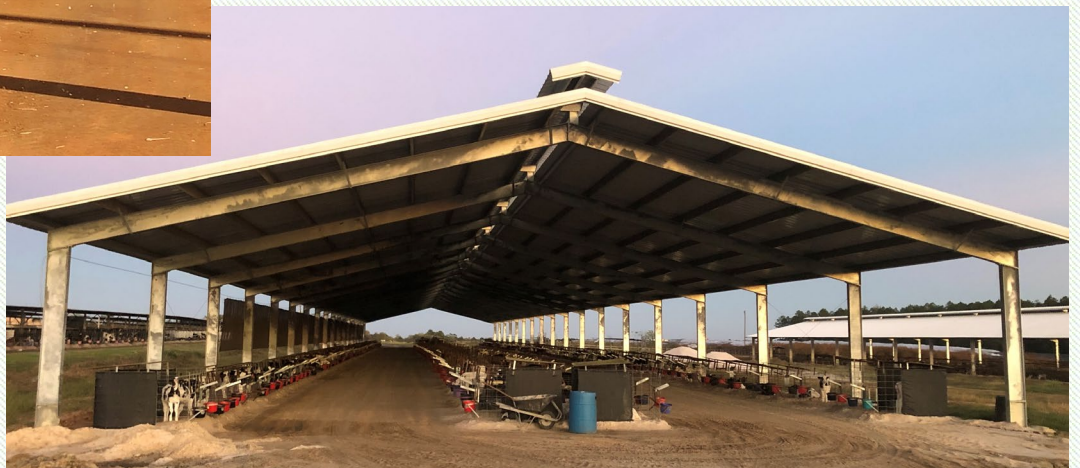
Group 1: Birth to 2mo.

- ❖ *Individual hutch/pen under common roof*



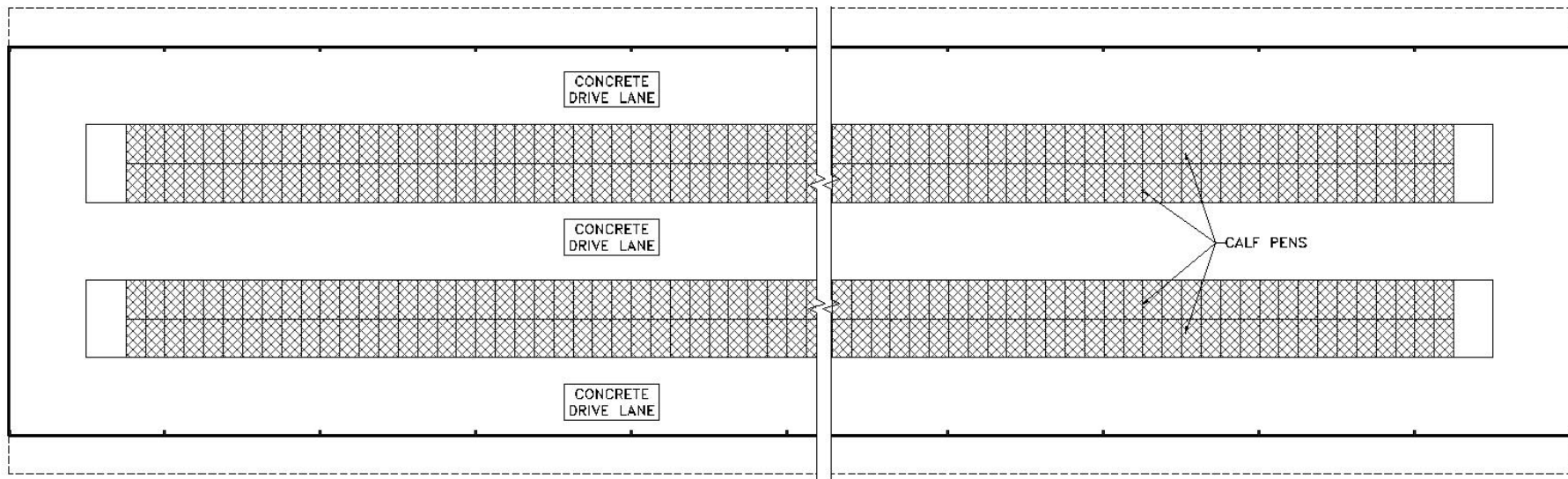
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- ❖ *Individual hutch/pen under common roof*



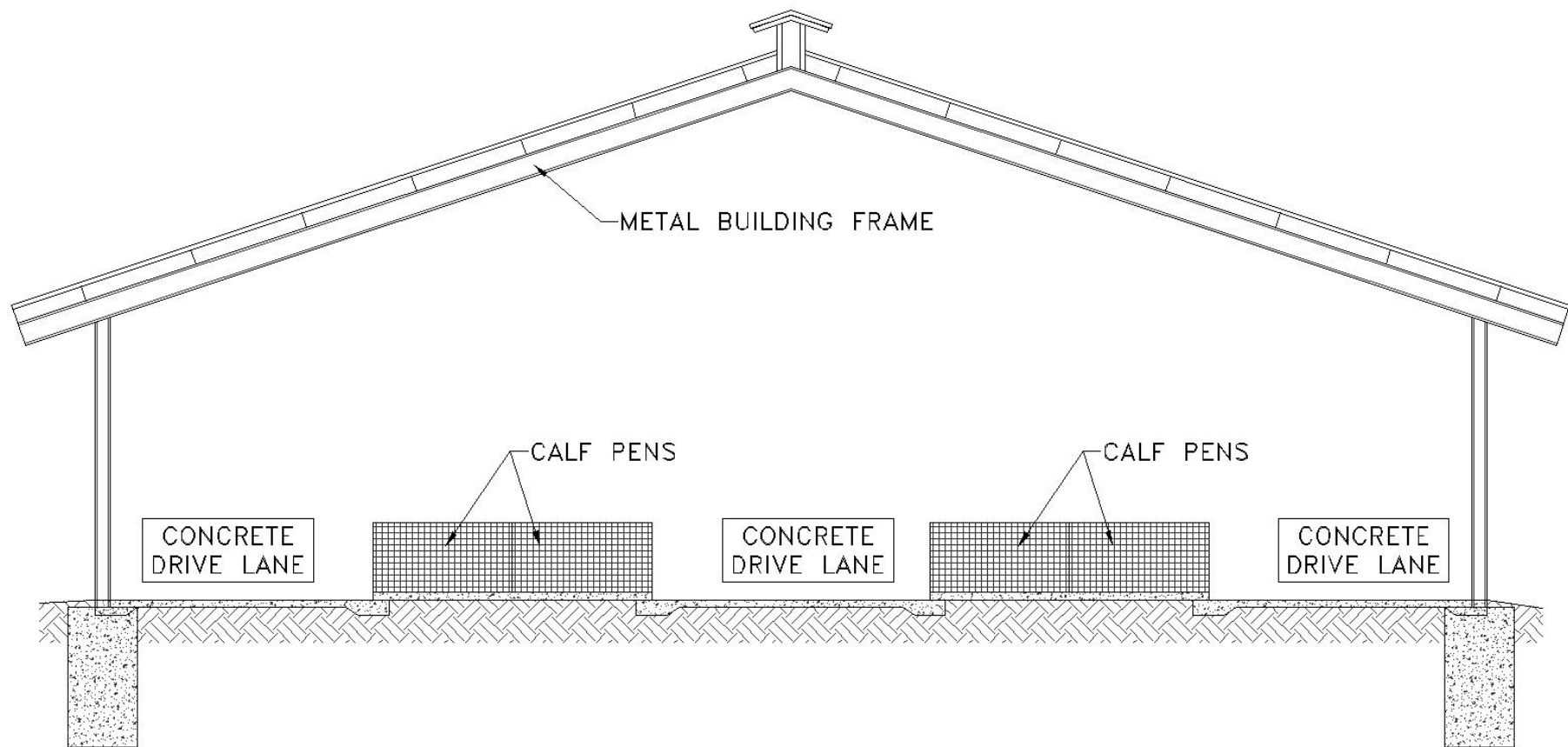
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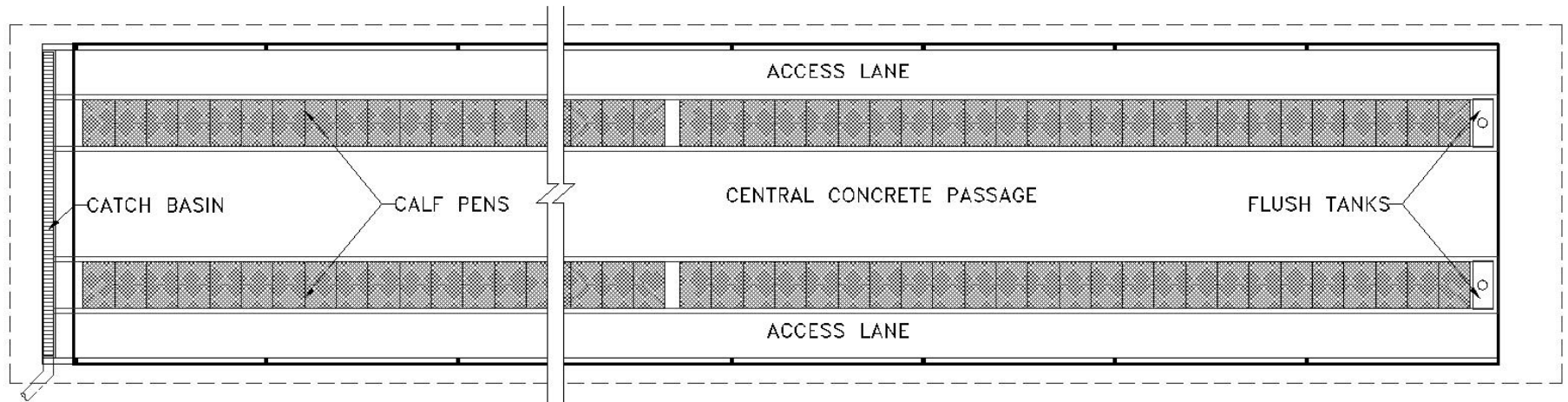
Group 1: Birth to 2mo.

- ❖ *Individual elevated crate under roof*



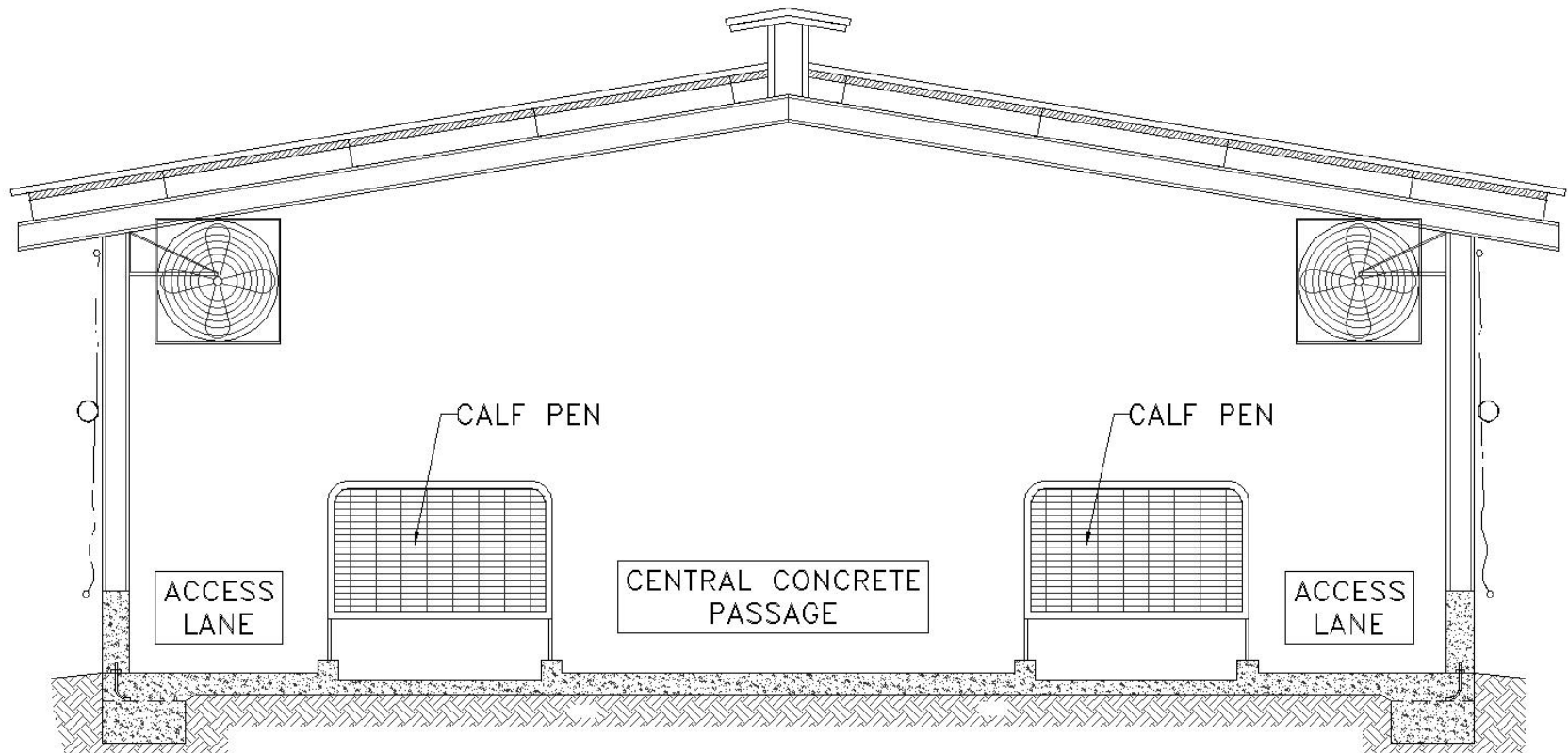
Group 1: Birth to 2mo.

- ❖ ***Individual elevated crate under roof***



Group 1: Birth to 2mo.

- ❖ *Individual elevated crate under roof*



Group 1: Birth to 2mo.

- ❖ *Loose housing under roof (manual feeding)*



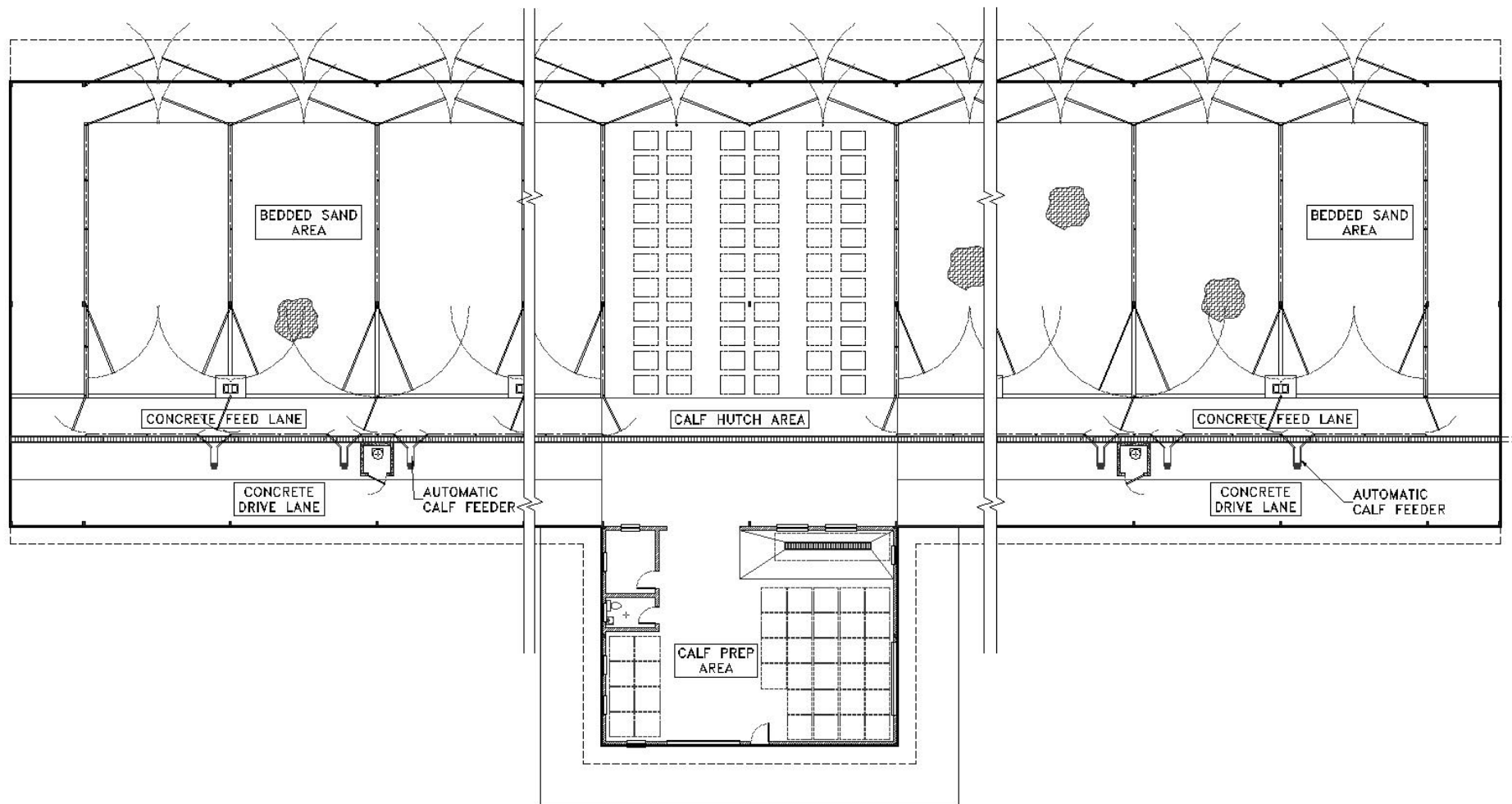
Group 1: Birth to 2mo.

- ❖ *Loose housing under roof (automatic feeding)*



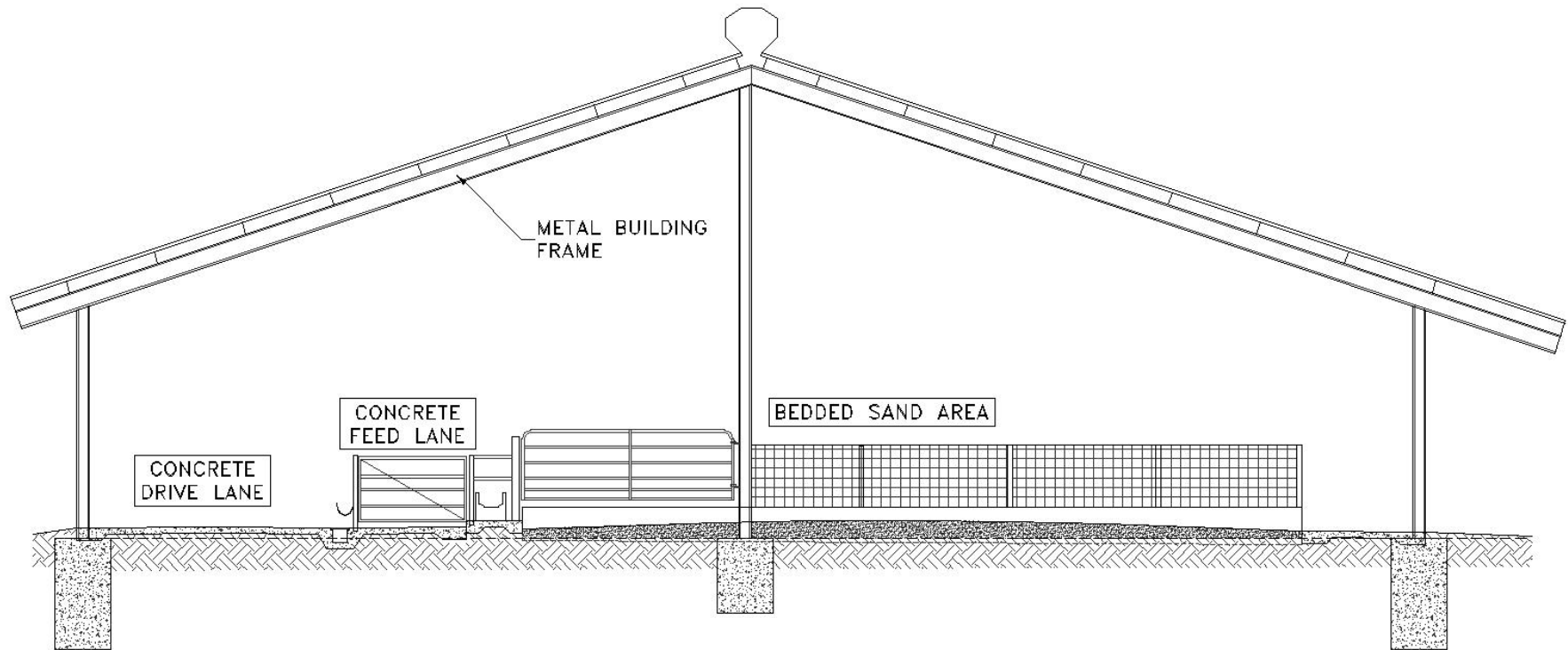
Group 1: Birth to 2mo.

- ❖ *Loose housing under roof (automatic feeding)*



Group 1: Birth to 2mo.

- ❖ *Loose housing under roof (automatic feeding)*



Group 1: Birth to 2mo.

❖ *Freestalls?*



Group 2/3: 2 to 8mo. – Weaned Hfrs

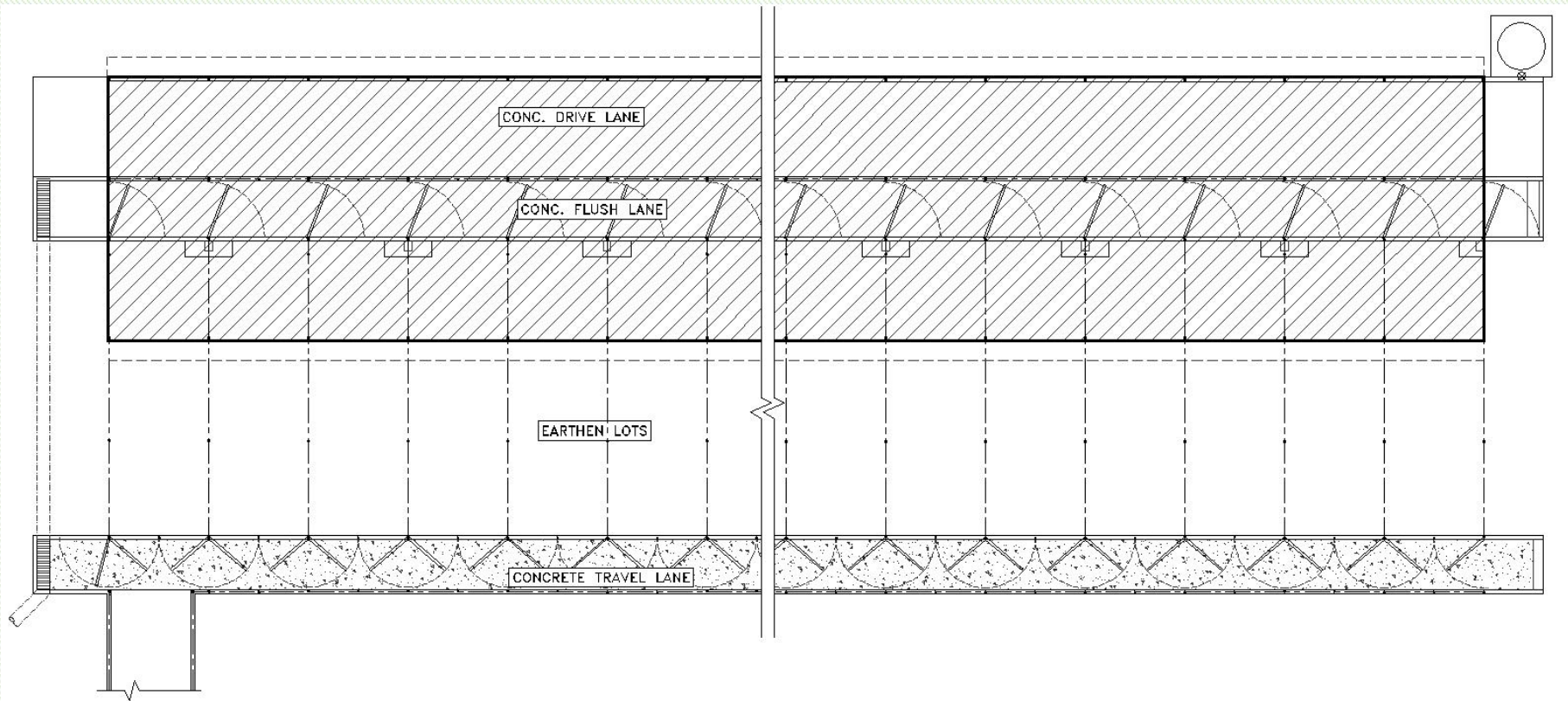
Group 2/3: 2 to 8mo.

❖ *Partially Covered Open Lot*



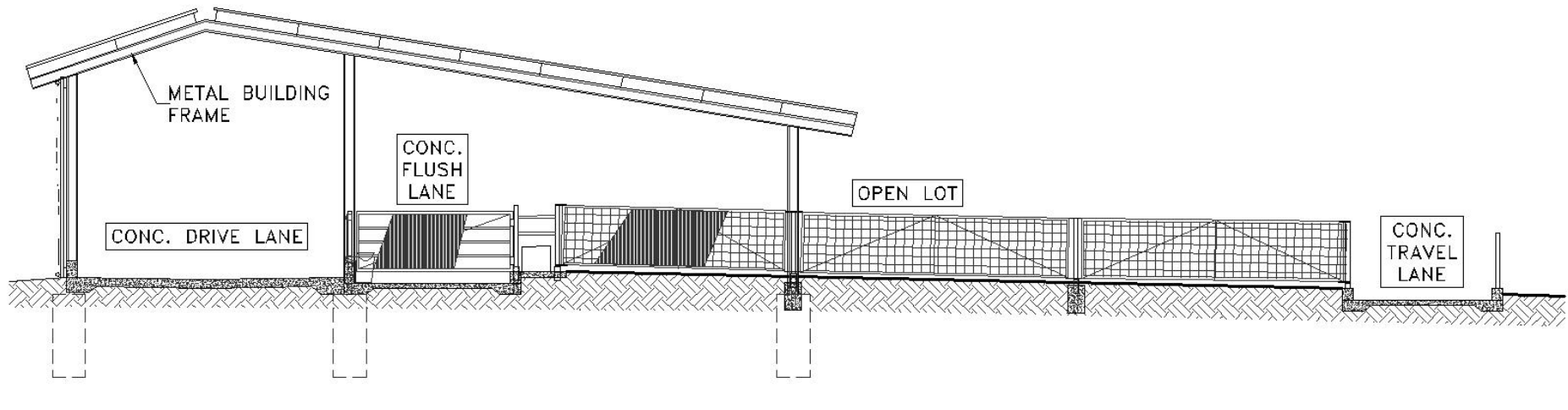
Group 2/3: 2 to 8mo.

❖ *Partially Covered Open Lot*



Group 2/3: 2 to 8mo.

❖ *Partially Covered Open Lot*



Group 2/3: 2 to 8mo.

❖ *Bedded Pack Under Roof*



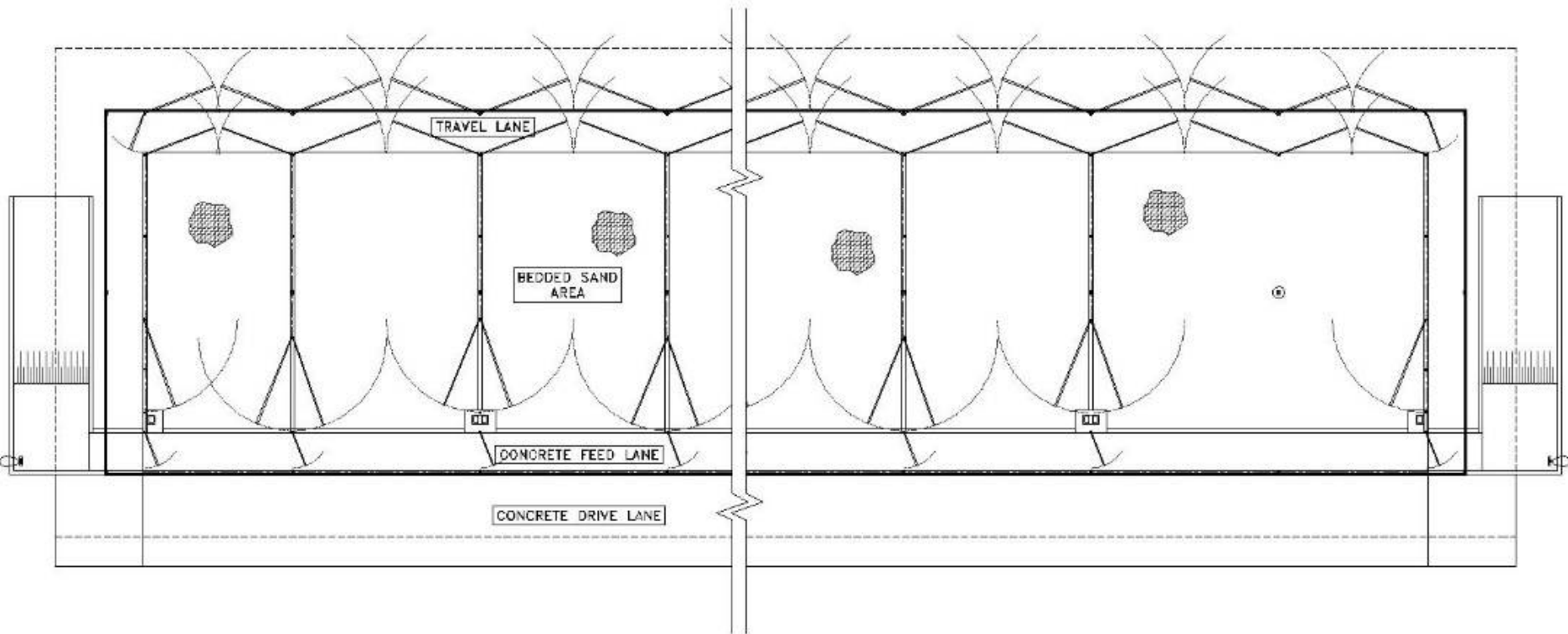
Bedded Pack

- ❖ ***Average Bedded Pack Dimensions for Hot/Humid Climates***
 - ❖ *Larger than northern climates*

| Animal Information | | Pack Dimensions | | | | |
|--------------------|----------|------------------------|----------------------------|-----------------------------|--------------------------------|------------------------------|
| Group | Age | Density (sq.ft./hd) | Feed Drive Lane (ft) | Feed Alley Width (ft) | Outside Travel Lane (ft) | Min. Feed Face (in/hd) |
| 1 | 0-2 mo | | | | | |
| 2 | 2-4 mo | 45 | 15 | 10 | 9 | 15 |
| 3 | 4-8 mo | 55 | 15 | 10 | 10 | 15 |
| 4 | 8-12 mo | 65 | 18 | 12 | 10 | 17 |
| 5 | 12-16 mo | 75 | 18 | 12 | 10 | 19 |
| 6/7 | 16-23 mo | 80-90 | 18 | 14 | 10 | 22 |

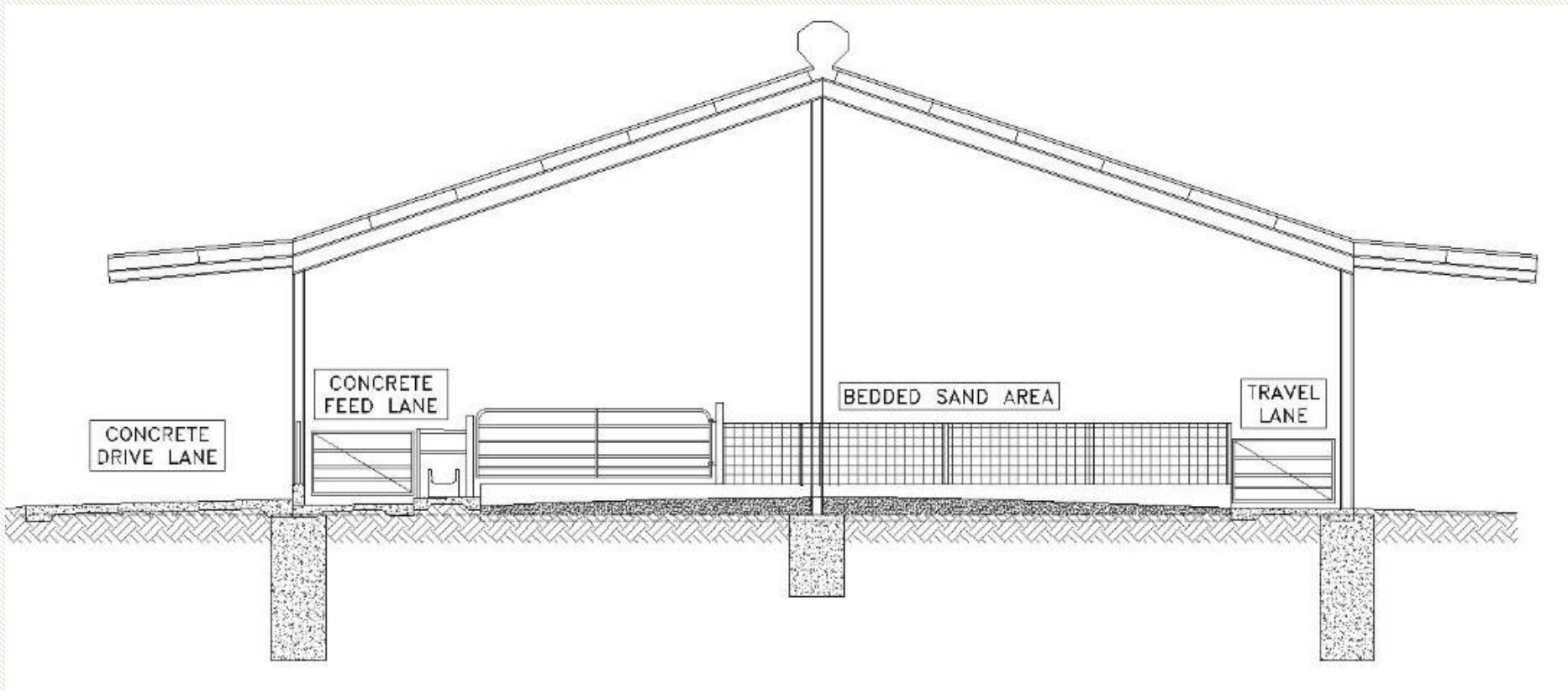
Group 2/3: 2 to 8mo.

❖ *Bedded Pack Under Roof*



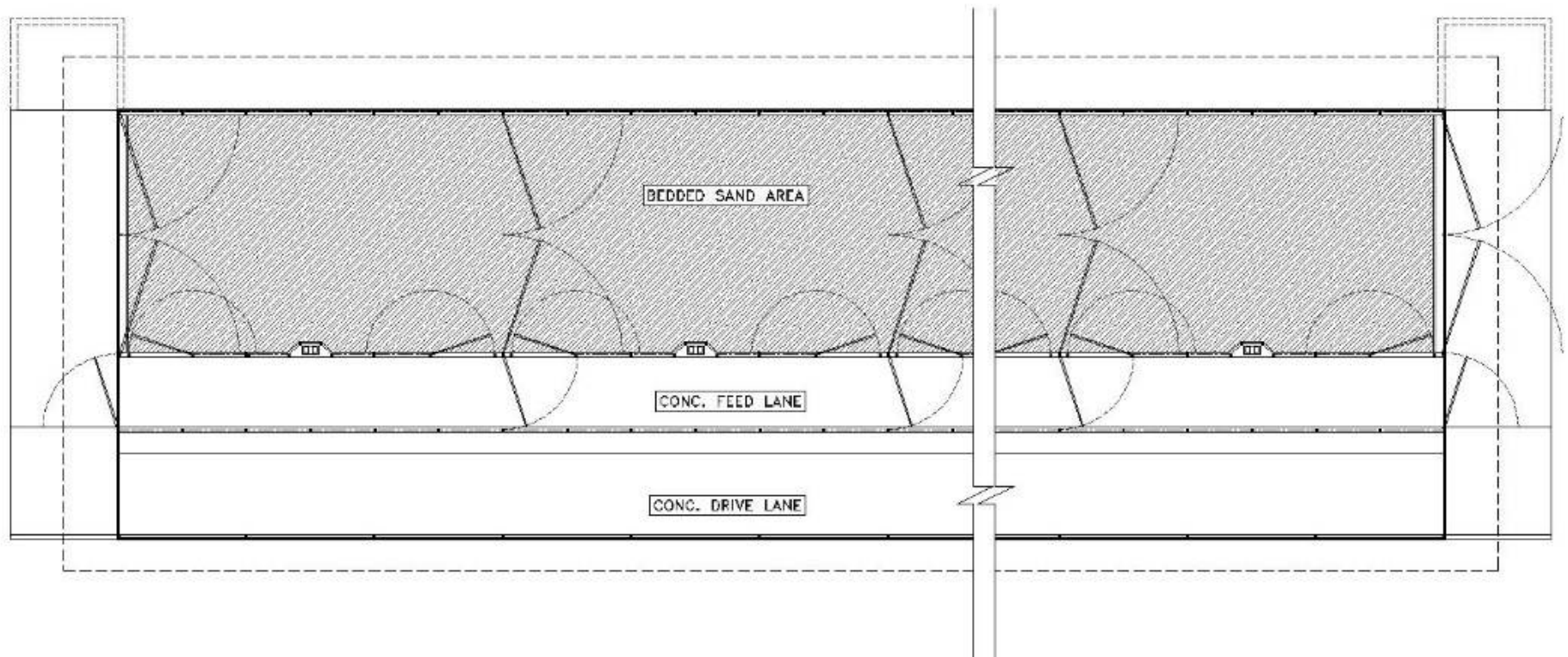
Group 2/3: 2 to 8mo.

❖ *Bedded Pack Under Roof*



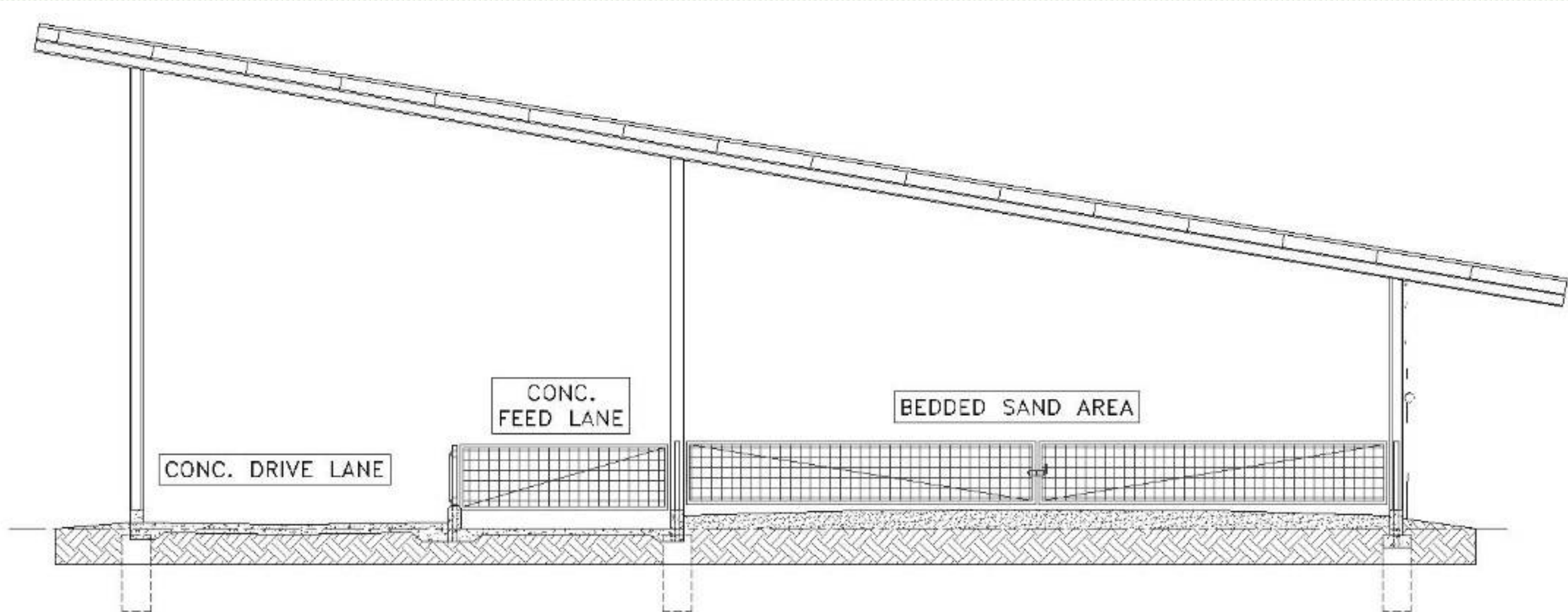
Group 2/3: 2 to 8mo.

❖ *Bedded Pack Under Roof*



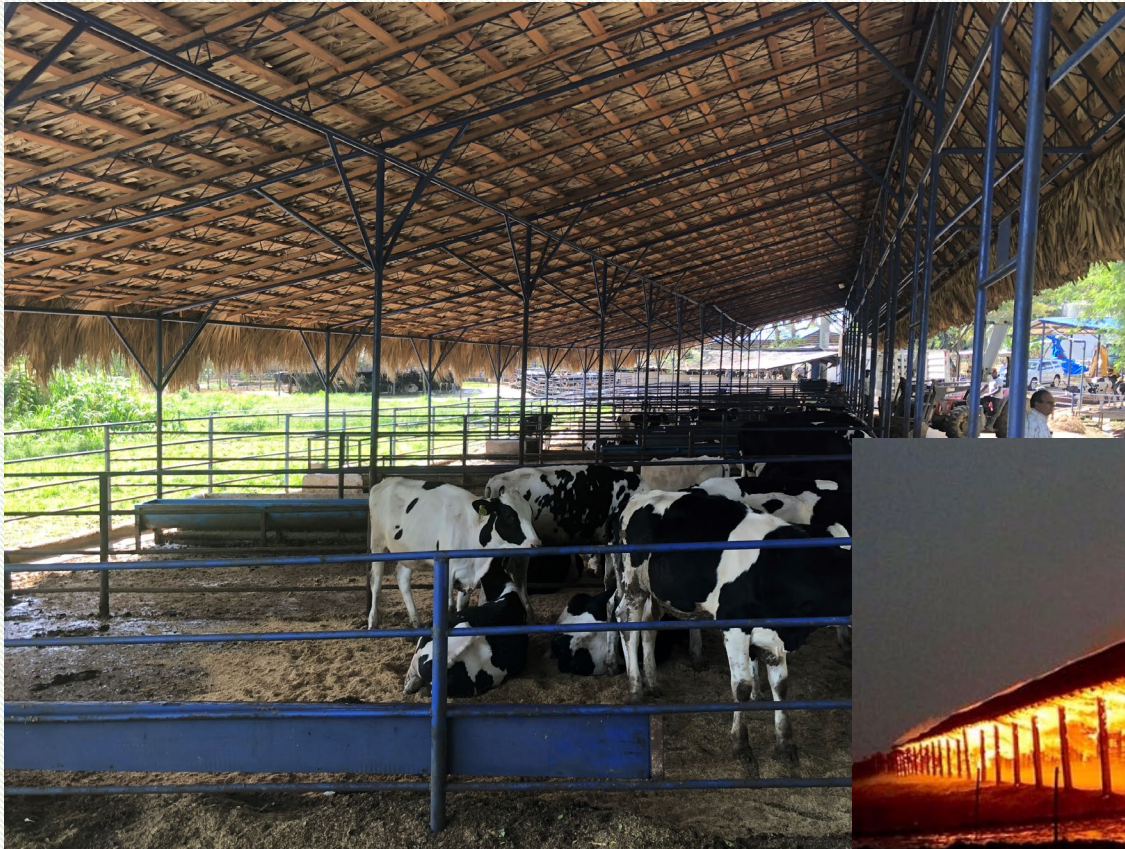
Group 2/3: 2 to 8mo.

❖ *Bedded Pack Under Roof*



Group 2/3: 2 to 8mo.

❖ *Bedded Pack Under Thatched Roof*



Group 2/3: 2 to 8mo.

❖ “Bedded Pack” - NOT



Group 2/3: 2 to 8mo.

- ❖ *Low Roof = poor ventilation & limited equipment access*



Group 2/3: 2 to 8mo.

- ❖ ***Ventilation necessary in SE***
 - ❖ ***Helps dry pack***



Group 3: 4 to 8mo. – Older Weaned Hfrs

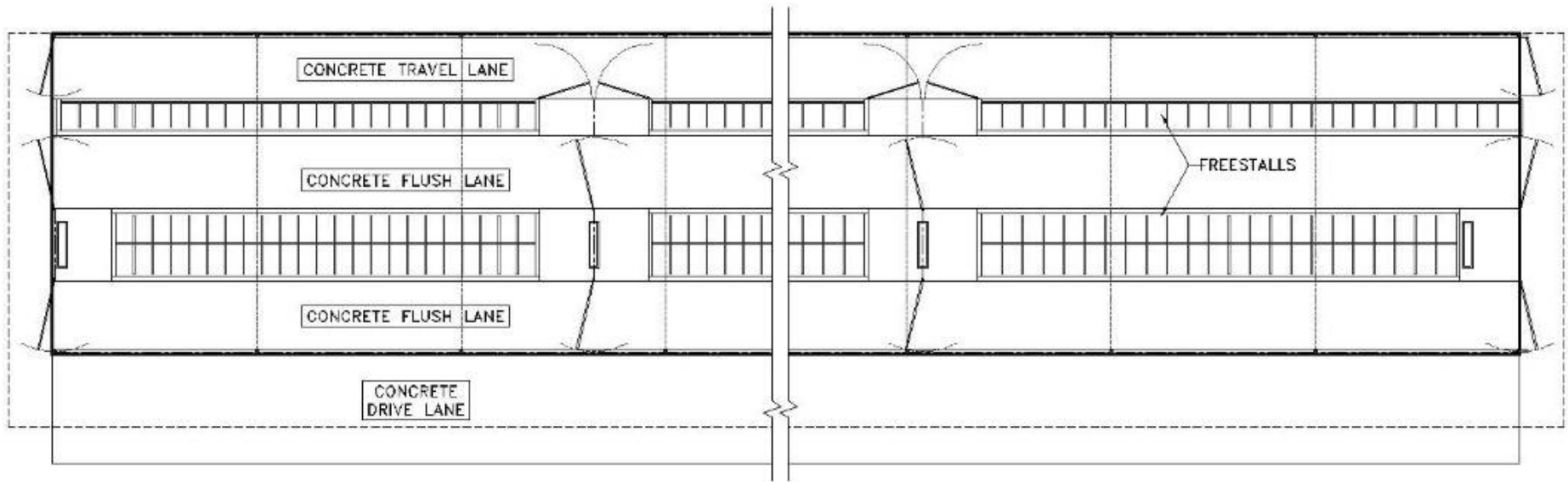
Group 3: 4 to 8mo.

❖ *Freestalls*



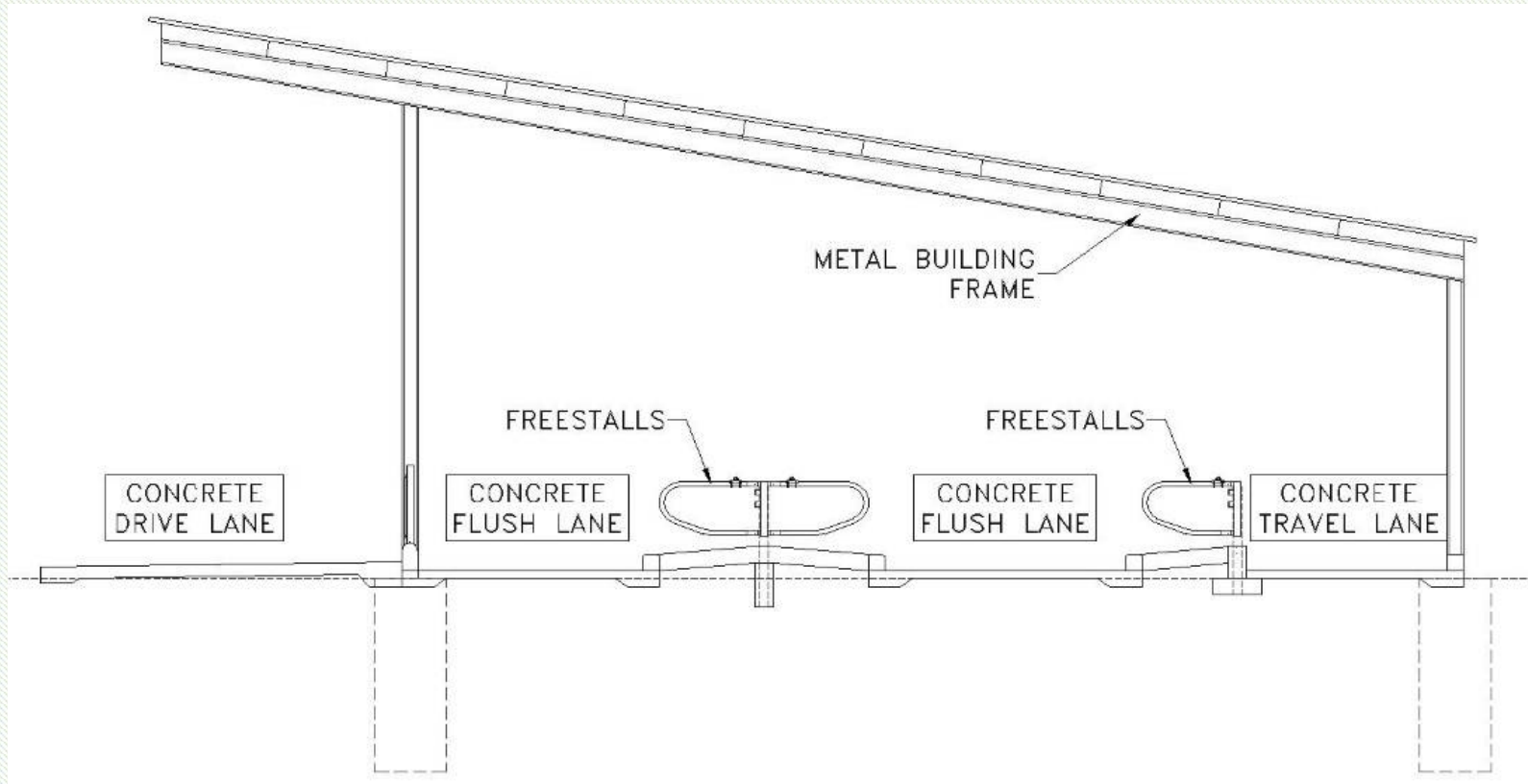
Group 3: 4 to 8mo.

❖ *Freestalls*



Group 3: 4 to 8mo.

❖ *Freestalls*



Group 4-8: 8 to 24mo. – Breeding/Bred

Group 4-8: 8 to 24mo.

❖ *Pastures*



Group 4-8: 8 to 24mo.

❖ *Freestalls*



Group 4-8: 8 to 24mo.

- ❖ *Freestalls – Same possible issues as adult cow housing*



Freestall Barn Size Estimation

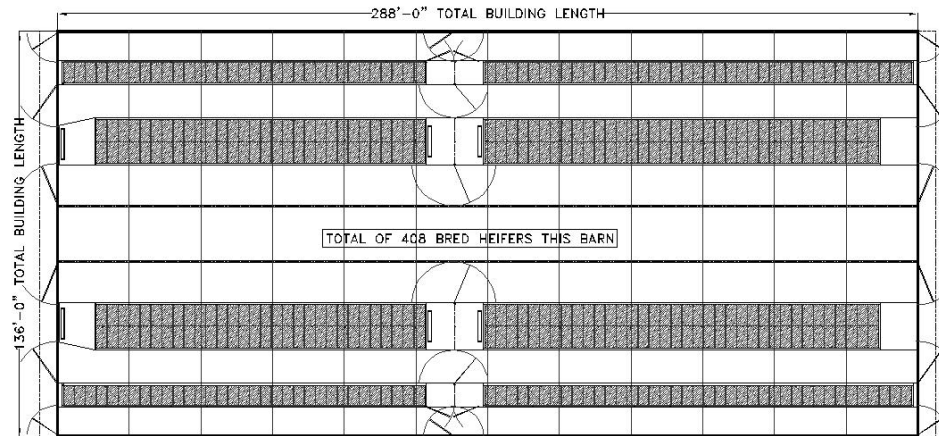
| Animal Information | | Typical Freestall Bed Dimensions | | Freestall Barn Est. Width (Holsteins) | | Typical no. of heifers/ft | |
|--------------------|----------|----------------------------------|-------------|---------------------------------------|------------|---------------------------|-------|
| Group | Age | Width (in) | Length (in) | 4-Row (ft) | 6-Row (ft) | 4-Row | 6-Row |
| 1 | 0-2 mo | | | *widths include outside travel lanes | | | |
| 2 | 2-4 mo | 30 | 60 | 93 | 103 | 1.27 | 1.90 |
| 3 | 4-8 mo | 34 | 60 | 95 | 105 | 1.14 | 1.74 |
| 4 | 8-12 mo | 36 | 72 | 106 | 118 | 1.12 | 1.71 |
| 5 | 12-16 mo | 40 | 96 | 116 | 132 | 1.00 | 1.55 |
| 6 | 16-20 mo | 44 | 96 | 120 | 136 | 0.96 | 1.39 |
| 7 | 20-23 mo | 46 | 96 | 120 | 136 | 0.81 | 1.34 |

Group 4-8: 8 to 24mo.

❖ **Freestalls- 6-row or 4-row**

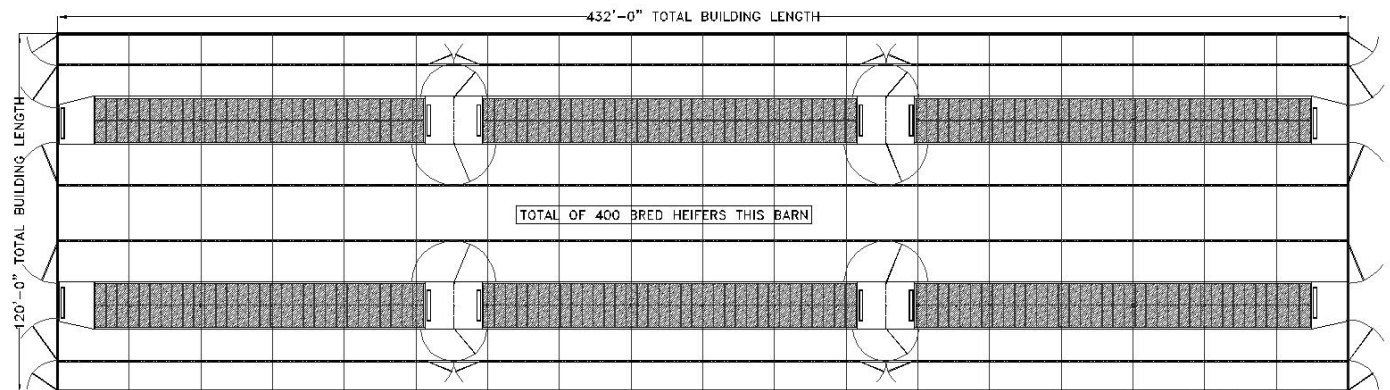
6-row barn:

- **408 bred heifers**
- **288ft X 136 ft**
- **39,168 sq.ft**



4-row barn:

- **400 bred heifers**
- **432ft X 120 ft**
- **51,840 sq.ft**



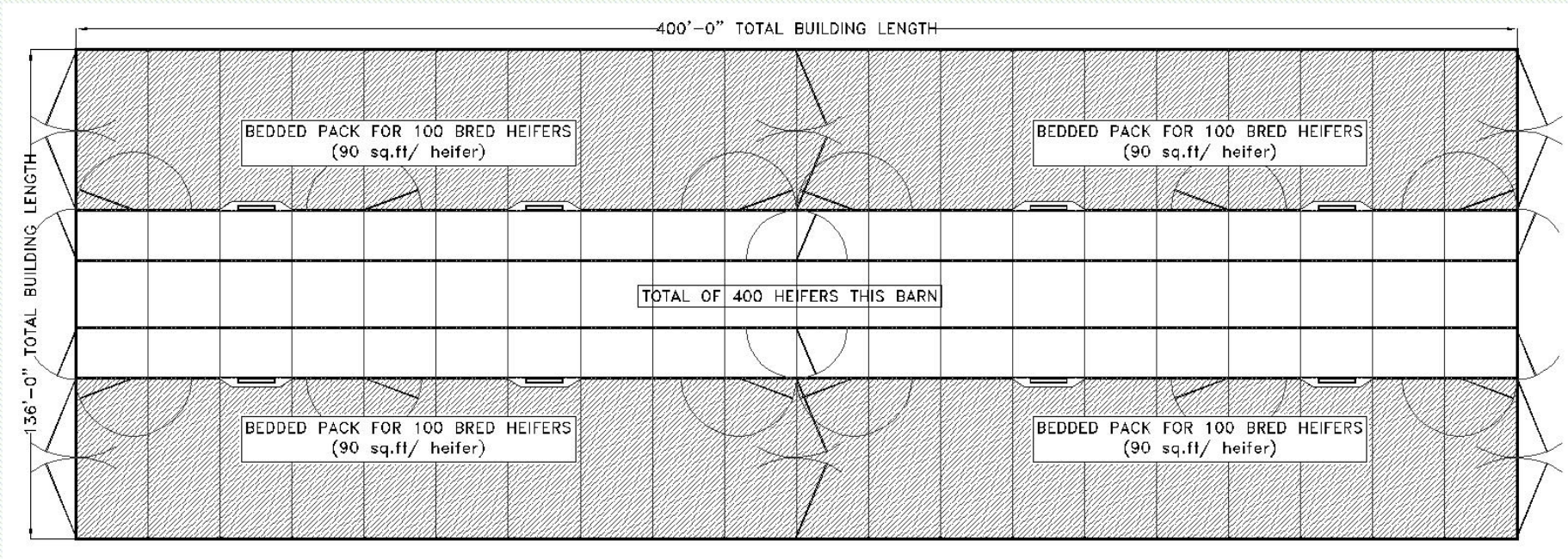
Group 4-8: 8 to 24mo.

❖ *Bedded Pack – potential issues in the Southeast*



Group 4-8: 8 to 24mo.

❖ *Bedded Pack*



Pack barn:

- *400 bred heifers*
- *400ft X 136 ft*
- *54,400 sq.ft*

Heifer Working Facilities

- ❖ *Easy to integrate into housing facilities*



Example Cost Estimates

YOUNGSTOCK FACILITY ESTIMATED CONSTRUCTION COSTS

| Item | Range of Cost/Animal | |
|--|----------------------|--------------|
| Baby Calves - Individual Pens Under Roof/Earthen Floor (Metal Bld. only) | \$700.00 | - \$900.00 |
| Baby Calves - Individual Pens Under Roof - Earthen Floors | \$800.00 | - \$1,100.00 |
| Baby Calves - Individual Pens Under Roof - Conc. Floors throughout | \$1,000.00 | - \$1,400.00 |
| Baby Calves - Bedded Pack w/Autofeeders + Concrete Feed Lane | \$1,100.00 | - \$1,500.00 |
| Weaned Calves - Covered Bedded Pack + Concrete Feed Lane | \$800.00 | - \$1,100.00 |
| Weaned Calves - Freestall Barn (3-row) | \$900.00 | - \$1,200.00 |
| Growing/Breeding Heifers - Freestall Barn (6-row) | \$1,200.00 | - \$1,500.00 |
| Breeding/Bred Heifers - Freestall Barn (6-row) | \$1,400.00 | - \$1,800.00 |

**** CYA:** Includes polling of recent SE projects. Based on 2019 material costs, minimal sitework, no civil works. Variations determined by general contractor vs farm labor, extent of electrical & ventilation, new vs reused equipment, etc. Costs are intended to represent relative values rather than exact prices. Every location is unique.



“There are three kinds of men. The one that learns by reading. The few who learn by observation. The rest of them have to pee on the electric fence for themselves.” Will Rogers

Questions?

