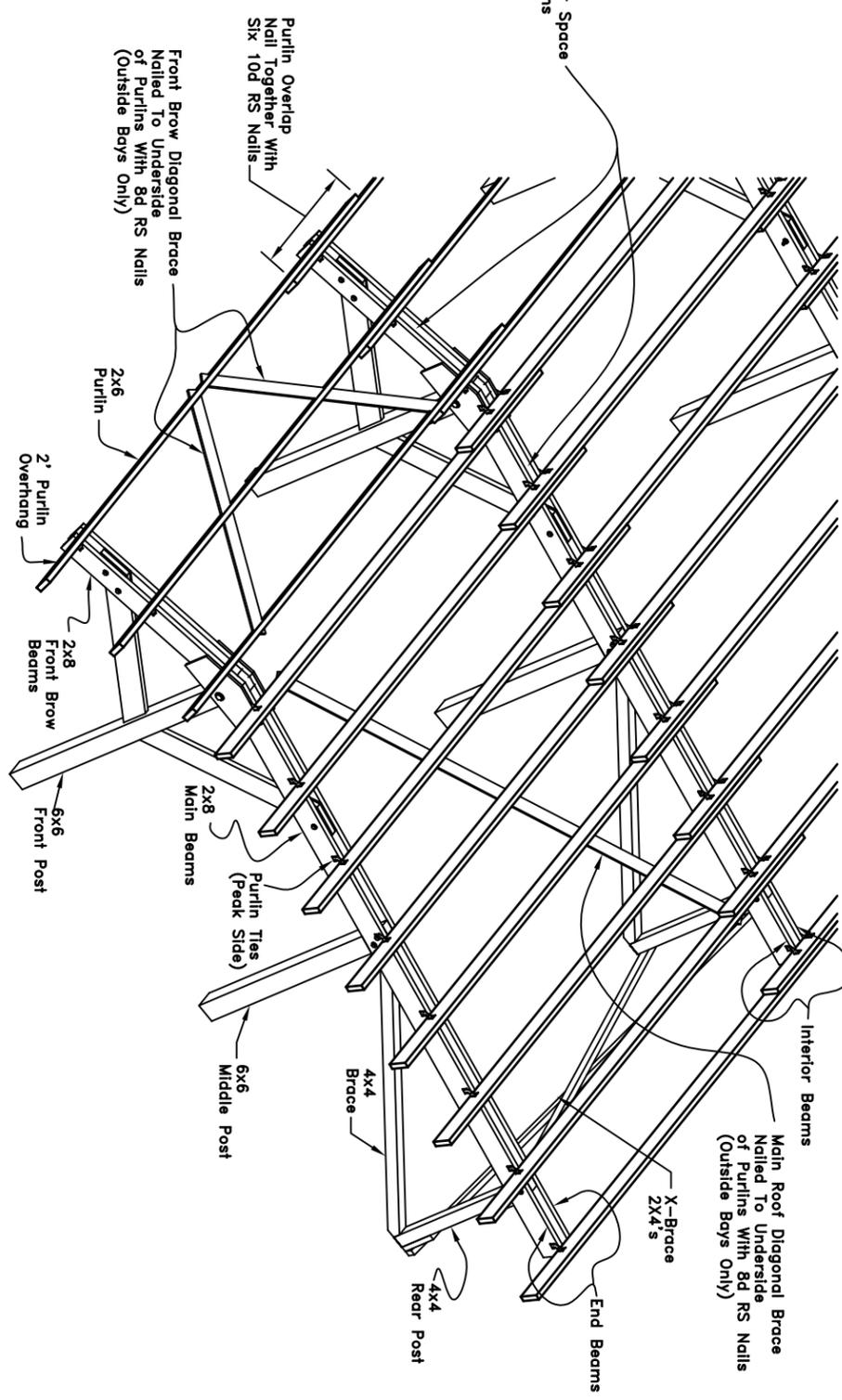
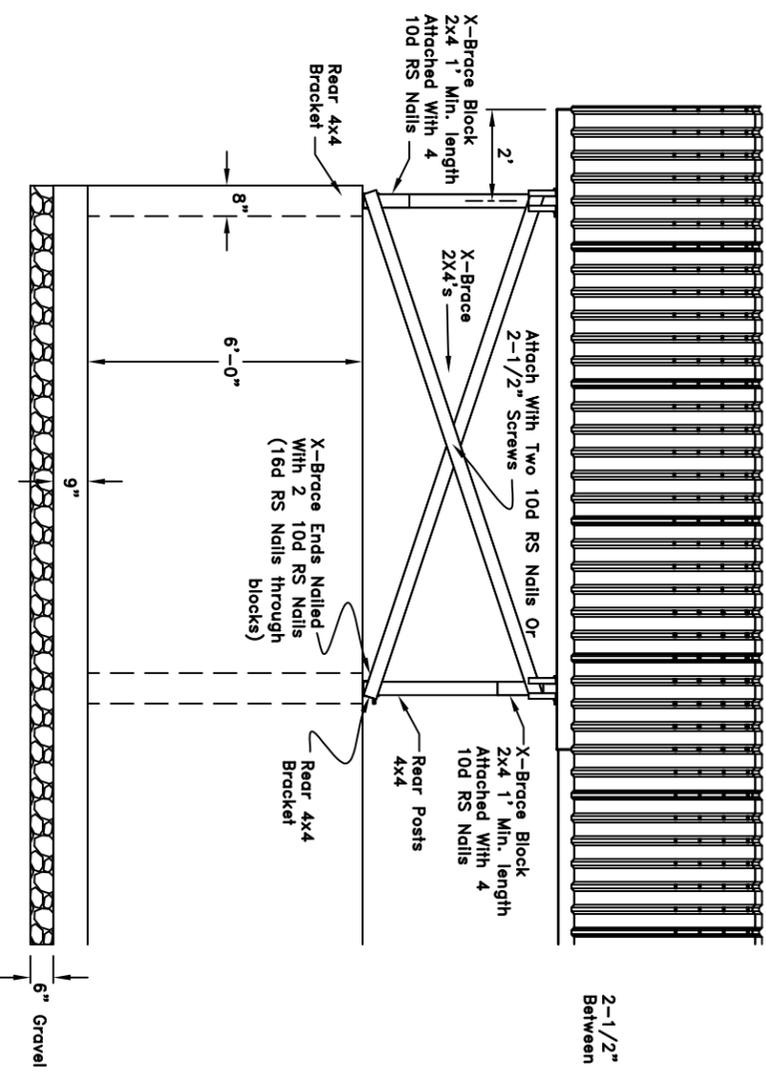


CONSTRUCT _____ BINS

ENGINEERING JOB CLASS _____

(Total Bin Capacity, cu.ft. _____)



LANDOWNER
TWSP SEC CO MN
ANIMAL MORTALITY COMPOSTING FACILITY
GENERAL LAYOUT

| | | Date |
|----------|-----------------|-------|
| Designed | Swanberg | 2/05 |
| Drawn | Axell, Swanberg | 11/12 |
| Checked | Pearson | 2/05 |
| Approved | Brach | 1/12 |

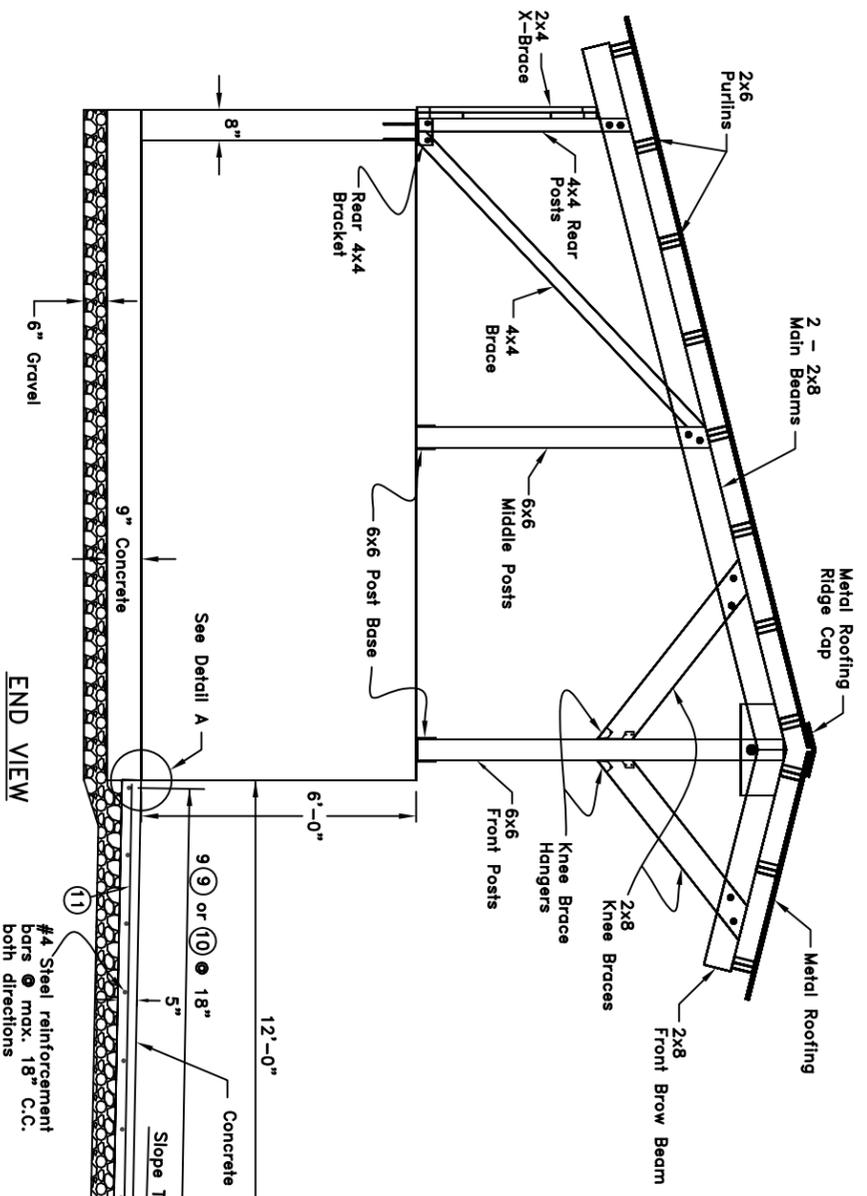
File Name
MN616.DWG

Drawing Number
MN-ENG-616

Date: 11/19/2012

Sheet 1 of 5

NOT TO SCALE



END VIEW

#4 Steel reinforcement bars @ max. 18" C.C. both directions

Center 4x4 Rear Posts at Intersection Between Back Wall and End/Interior @'s.

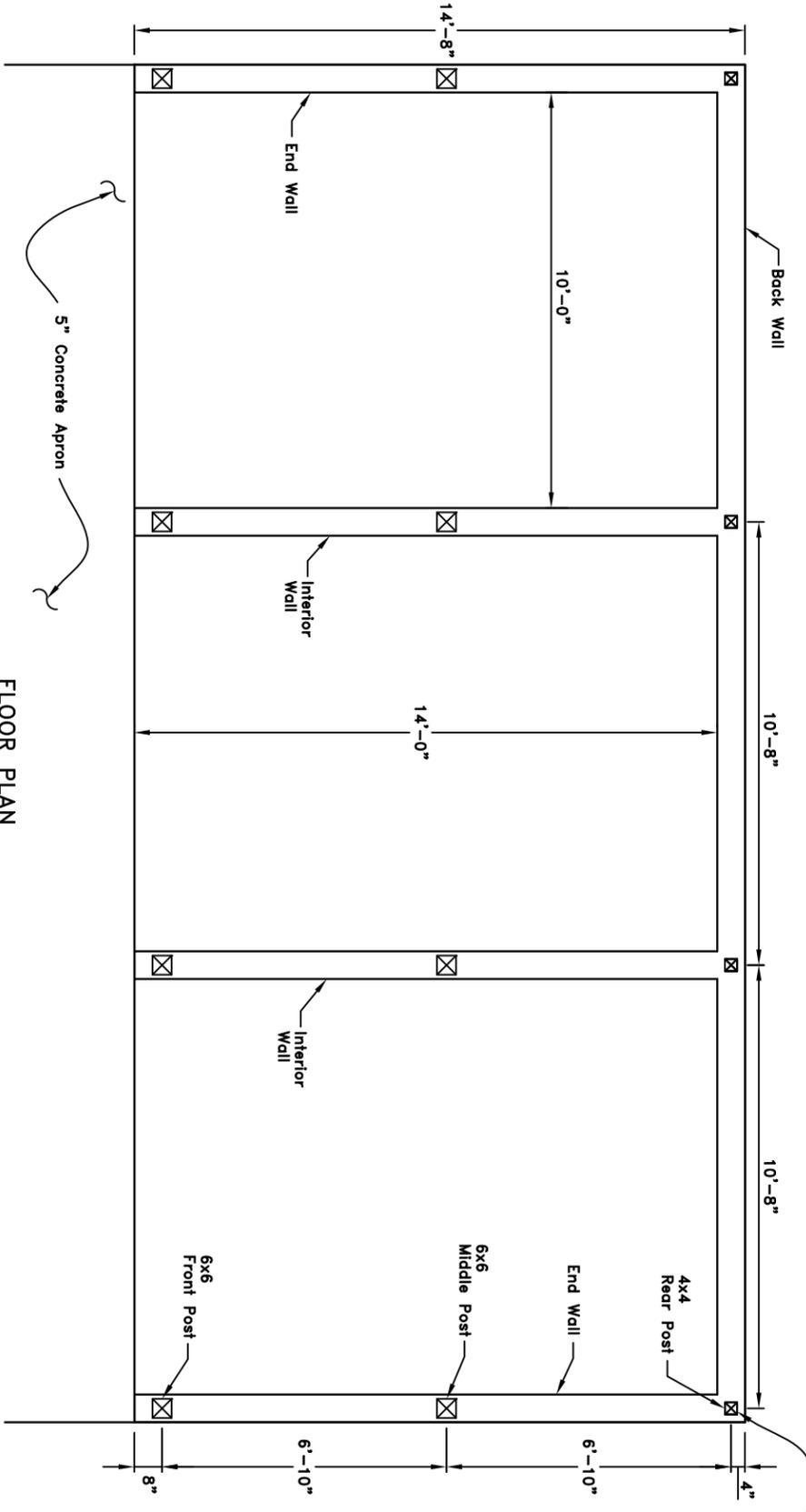
DETAIL A: Junction between floor slab and front apron

| # Bins | #Tie Bars | Bond Breaker between floor and apron slabs. | Bond Breaker between floor and apron slabs. |
|--------|-----------|---|---|
| 3 | 12 | | |
| 4 | 15 | | |
| 5 | 19 | | |
| 6 | 22 | | |

OPTIONAL DETAIL

Tie Bars #4 Steel Reinforcement 32" long, spaced 36"

Bond breaker shall extend a minimum of 1/3 the thickness of the apron slab down from the top of the slab (5" = 1 5/8"). It may extend the whole thickness of the apron slab.



FLOOR PLAN

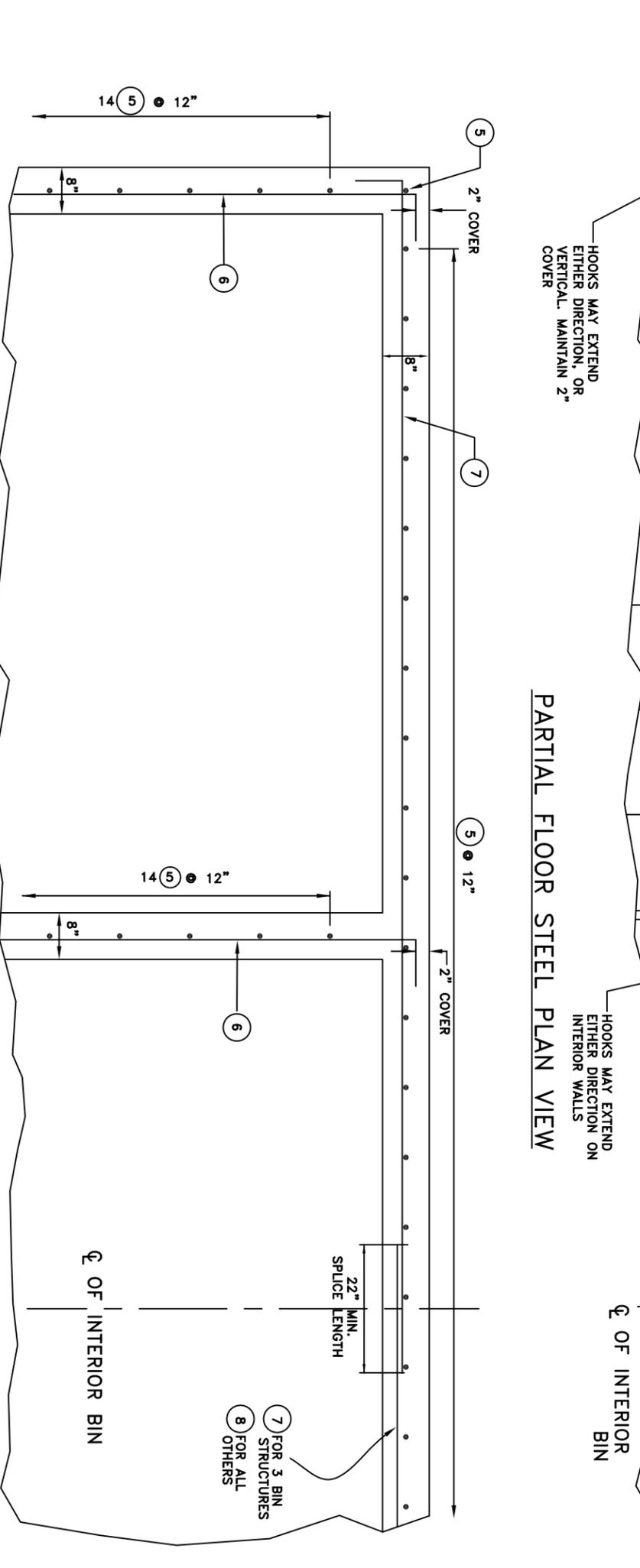
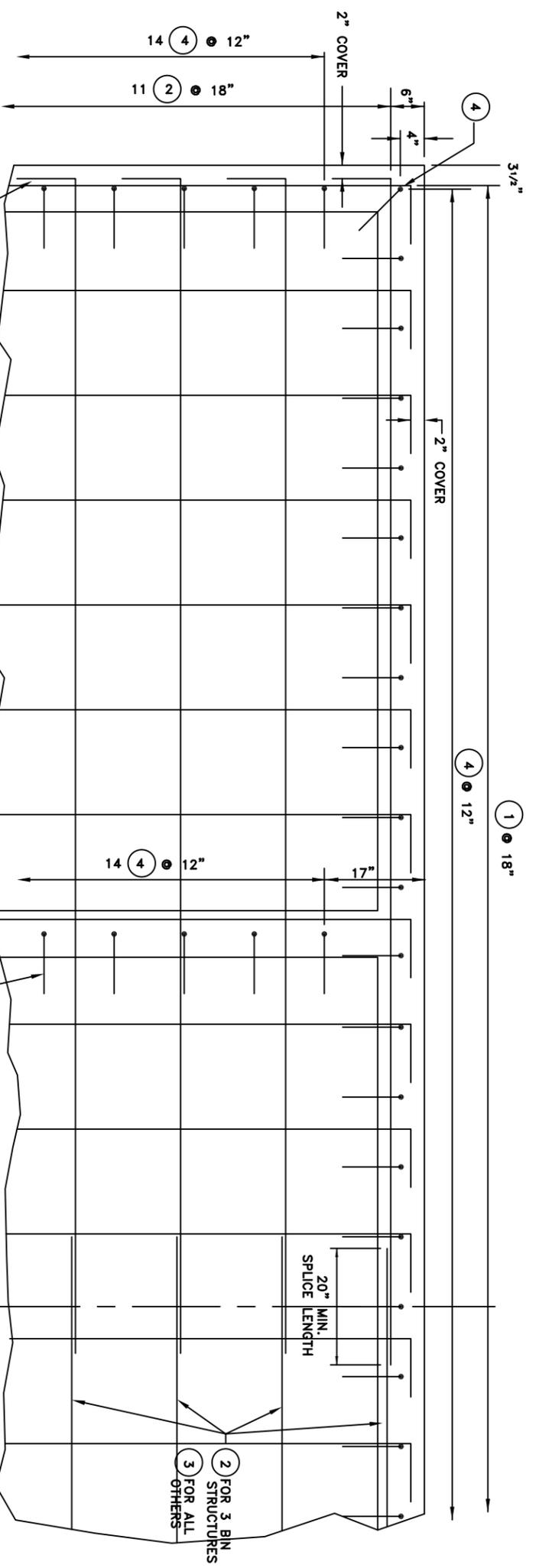
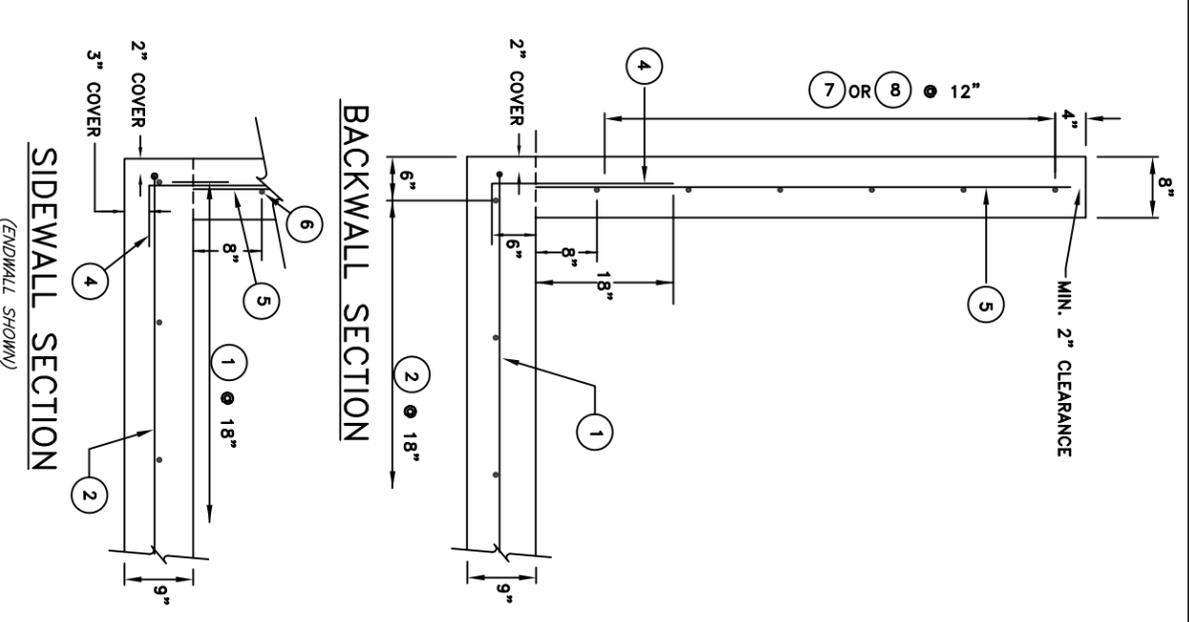
NOTE:
Post Bases Shall be Installed So That The Bottom of The Base is Flush With The Top of The Concrete Wall.



**ANIMAL MORTALITY COMPOSTING FACILITY
10'W x 14'L x 6'H BINS
GENERAL LAYOUT**

| Designed | Swanberg | Date | 2/05 |
|----------|----------------|------|-------|
| Drawn | Axell/Swanberg | | 11/11 |
| Checked | Pearson | | 2/05 |
| Approved | Brach | | 1/12 |

File Name: MN616.DWG
Drawing Number: MN-ENG-616
Date: 1/12/2012
Sheet 2 of 5



STEEL SCHEDULE

| MARK | SIZE | QUANTITY | | | TYPE | LENGTH | B | C |
|---------------------------|------|----------|-----|-----|------|--------|-------|------|
| | | 3 | 4 | 5 | | | | |
| STRUCTURE FLOOR AND WALLS | | | | | | | | |
| 1 | 5 | 23 | 30 | 37 | 44 | 21 | 15-2 | 0-10 |
| 2 | 5 | 22 | 22 | 22 | 22 | 21 | 17-10 | 0-10 |
| 3 | 5 | - | 11 | 22 | 33 | 1 | 12-4 | - |
| 4 | 4 | 89 | 114 | 139 | 163 | 21 | 2-8 | 0-8 |
| 5 | 4 | 89 | 114 | 139 | 163 | 1 | 5-10 | - |
| 6 | 4 | 24 | 30 | 36 | 42 | 21 | 15-0 | 0-8 |
| 7 | 4 | 12 | 12 | 12 | 12 | 21 | 17-9 | 0-8 |
| 8 | 4 | - | 6 | 12 | 18 | 1 | 12-6 | - |
| FRONT APRON | | | | | | | | |
| 9 | 4 | 18 | 18 | 18 | 18 | 1 | 16-10 | - |
| 10 | 4 | - | 9 | 18 | 27 | 1 | 11-4 | - |
| 11 | 4 | 23 | 30 | 37 | 44 | 1 | 11-8 | - |

| SIZE | TOTAL LENGTH | | | |
|------|--------------|---------|----------|----------|
| | 3 | 4 | 5 | 6 |
| 4 | 1,900-10 | 2,462-0 | 3,023-2 | 3,575-10 |
| 5 | 741-2 | 983-0 | 1,224-10 | 1,466-8 |

STEEL TYPES



Front Apron Mark 9 & 10 bars assume a 16" lap splice in the middle of the slab.

PARTIAL WALL STEEL PLAN VIEW

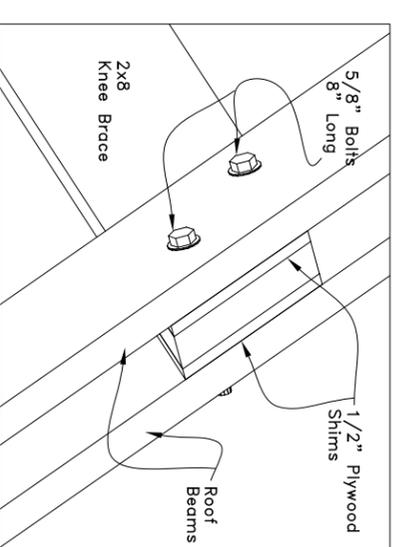
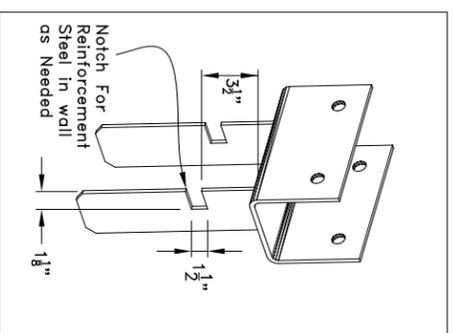
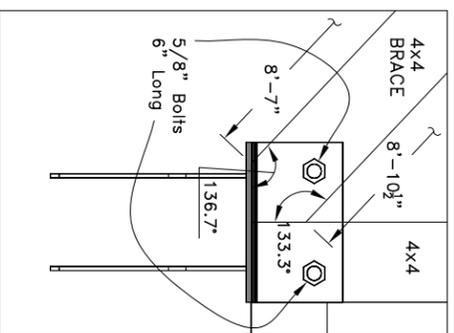
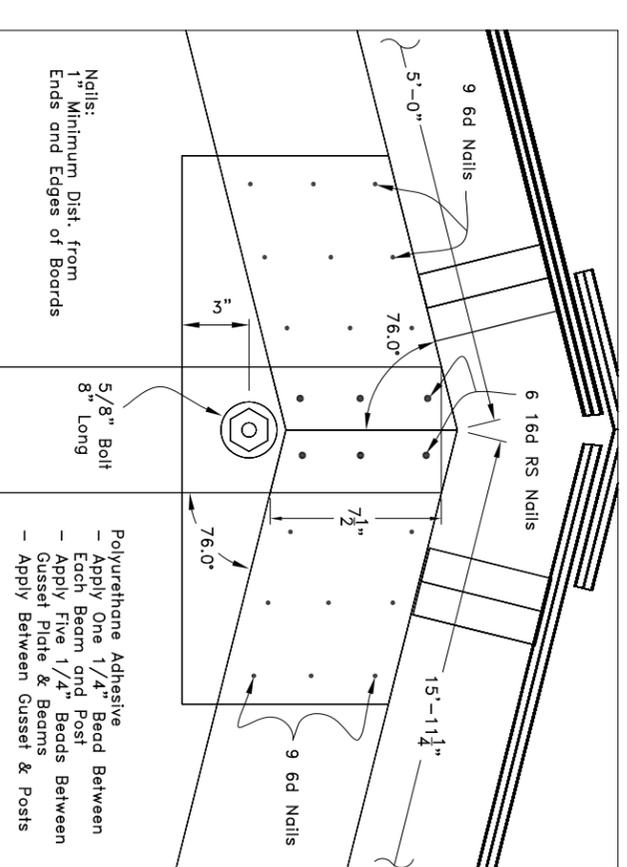
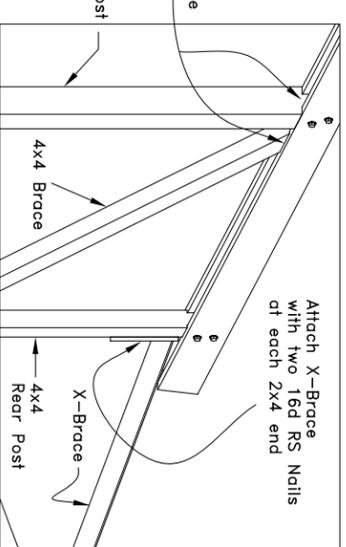
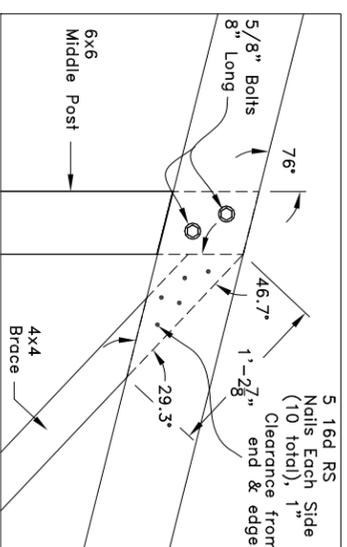
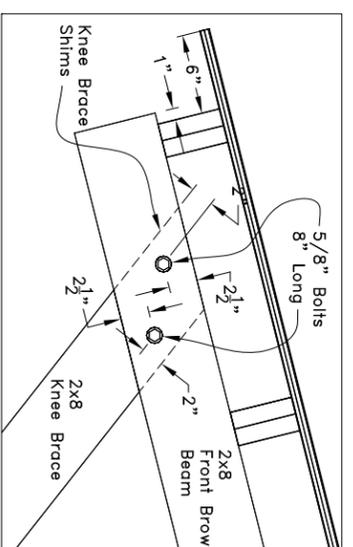
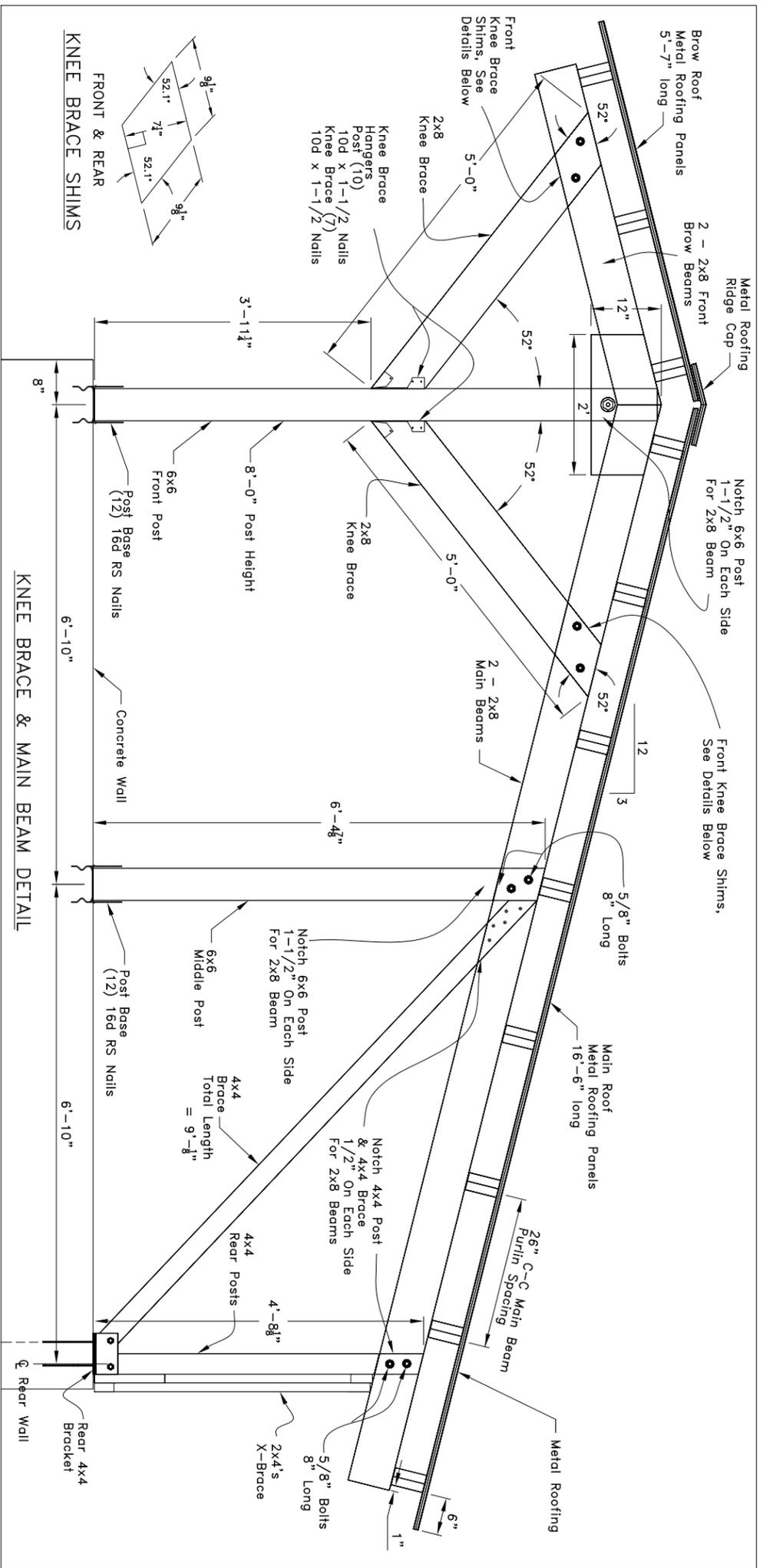
PARTIAL FLOOR STEEL PLAN VIEW

- NOTES:
- Optional - exposed concrete edges and corners should be rounded or chamfered 1".
 - Bar spacing is measured from center to center.
 - Unless otherwise marked, vertical wall steel shall be centered in the wall.



ANIMAL MORTALITY COMPOSTING FACILITY
10'W x 14'L x 6'H BINS
CONCRETE STEEL REINFORCEMENT DETAILS

| | Designed | Swanberg/Pearson | Date | 6/11 |
|--|----------|------------------|------|------|
| | Drawn | Swanberg | | 6/12 |
| | Checked | Oolman | | 6/12 |
| | Approved | Brach | | 1/12 |



FRONT GUSSET DETAILS

4x4 BRACKET BOTTOM DETAILS

4x4 BRACKET BOTTOM MODIFICATION DETAILS

TYPICAL KNEE BRACE SHIM DETAIL

| | Designed | Swanberg | Date | 2/05 |
|--|----------|----------------|------|-------|
| | Drawn | Axell/Swanberg | | 11/12 |
| | Checked | Pearson | | 2/05 |
| | Approved | Brach | | 1/12 |

ANIMAL MORTALITY COMPOSTING FACILITY
10'W x 14'L x 6'H BINS
FRAMING DETAILS



File Name: MN616.DWG
Drawing Number: MN-ENG-616
Date: 11/19/2012
Sheet 4 of 5

GENERAL

This plan set shows details for three (3) composting bins. Additional bins may be added by duplicating the center concrete bins and roofing details.

This composting facility roof was designed based on a 90mph wind load and a 42 psf. snow load. An importance factor of 0.8 was applied to the snow load resulting in a design load of 33.6 psf.

Concrete Wall Loading
 Inside Load: 0 to 6 ft., 60 psf/ft
 Outside Load: 0 to 5 ft., 85 psf/ft (low to med plasticity silts & clays)

CONSTRUCTION NOTES

All operations shall be carried out in a safe and skillful manner. Safety and health regulations shall be observed and appropriate safety measures used.

Construction operations shall be carried out in such manner and sequence that erosion, air and water pollution will be minimized and held within tolerable limits.

The foundation area shall be cleared of trees, logs, stumps, roots, brush, boulders, sod, debris, structures, fences and frozen soil. Topsoil shall be stockpiled if needed for vegetation establishment. After stripping, the foundation shall be excavated as needed to allow the placement of the 6" gravel layer. The resulting subgrade shall be structurally uniform with no zones of soils that may cause differential settlement. The installed gravel shall be compacted by at least two passes of a vibrating plate compactor. The resulting gravel surface shall be level and uniform.

Post bases shall be cast into the concrete walls. The tops of the walls need to be level and the post bases spaced as shown on the drawings for the lumber dimensions to fit as shown.

Purlin joints will be staggered over rafters and overlapped. Overlapping purlins shall be nailed together with six (6) 10d RS nails. Purlins will be attached to rafters, on edge, with manufactured purlin ties. Two purlin ties shall be used at overlapped purlin locations, one tie on the end, single purlin locations. All purlin ties shall be installed on the up slope (peak side) of the purlins.

Boils shall be centered on single bolt connections. On multiple bolt connections the bolts shall follow the details as shown on the drawings. All bolts are 5/8" in diameter and shall utilize washers on both ends and a nut. Bolts hole diameter shall be 1/32" to 1/16" larger than bolt diameter. Minimum clearance from center of bolt hole to edge of member is 1.5".

Metal roofing shall be installed following the manufacturers recommendations.

VEGETATION

All disturbed areas shall be graded to drain away from structure and reseeded. Topsoil shall be added, if needed, to establish vegetation.

MATERIALS

MATERIALS LIST

| MATERIALS LIST | SIZE | LENGTH | QUANTITIES | | | | | |
|--|--|---|--------------------------------------|--------------------------------------|--------------------------------------|---------------------------------------|--|--|
| | | | 3 BINS | 4 BINS | 5 BINS | 6 BINS | | |
| TIMBER | | | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | |
| FRONT POSTS | 6 x 6 | 8'-0" | 4 | 5 | 6 | 7 | | |
| MIDDLE POSTS | 6 x 6 | 6'-4 7/8" | 4 | 5 | 6 | 7 | | |
| REAR POSTS | 4 x 4 | 4'-8 1/8" | 4 | 5 | 6 | 7 | | |
| MAIN BEAMS | 2 x 8 | 16'-0" | 8 | 10 | 12 | 14 | | |
| FRONT BROW BEAMS | 2 x 8 | 5'-0" | 8 | 10 | 12 | 14 | | |
| 4x4 BRACES | 4 x 4 | 9'-1 7/8" | 4 | 5 | 6 | 7 | | |
| X BRACE | 2 x 4 | 1'-7" | 4 | 4 | 4 | 4 | | |
| X BRACE BLOCKS | 2 x 4 | 1'-0" | 4 | 4 | 4 | 4 | | |
| KNEE BRACES | 2 x 8 | 5'-0" | 8 | 10 | 12 | 14 | | |
| PURLINS | 2 x 6 | 14'-0" | 33 | 44 | 55 | 66 | | |
| DIAGONAL BRACING | | | | | | | | |
| MAIN ROOF | 1 x 4 | 16'-0" | 2 | 2 | 2 | 2 | | |
| BROW ROOF | 1 x 4 | 6'-0" | 4 | 4 | 4 | 4 | | |
| PLYWOOD | | | | | | | | |
| FRONT POST GUSSETS | 3/4" | exterior grade | 8 | 10 | 12 | 14 | | |
| KNEE BRACE SHIMS | 1/2" | exterior grade | 16 | 20 | 24 | 28 | | |
| HARDWARE | | | | | | | | |
| 6x6 POST BASES | USP W666 or Simpson PB66 | | 8 | 10 | 12 | 14 | | |
| 4x4 POST BASES | Simpson CC44-HDG | | 4 | 5 | 6 | 7 | | |
| KNEE BRACE HANGERS | USP LSSH210 or Simpson LSSU210 | | 8 | 10 | 12 | 14 | | |
| PURLIN TIES | USP RT3 or Simpson H3 | | 66 | 88 | 110 | 132 | | |
| BOLTS w/ NUTS & WASHERS | 5/8" | 6" | 8 | 10 | 12 | 14 | | |
| | 5/8" | 8" | 36 | 45 | 54 | 63 | | |
| NAILS | 8d x 1.5" 10d x 1.5" 6d (2") 8d RS (2.5") 10d RS (3") 16d RS (3.5") | ~Shank Dia. (0.131") (0.148") (0.120") (0.134") (0.148") (0.162") | 528 56 144 52 232 200 | 704 70 180 52 318 246 | 880 84 216 52 404 292 | 1056 98 252 52 490 338 | | |
| ROOFING PANELS | | | 795 ft ² | 1031 ft ² | 1286 ft ² | 1502 ft ² | | |
| CONCRETE STEEL REINFORCEMENT GRAVEL | | | 33.5 CY | 43.7 CY | 54.0 CY | 64.3 CY | | |
| MISCELLANEOUS | | | 2043 lbs | 2670 lbs | 3297 lbs | 3918 lbs | | |
| | | | 17 CY | 22 CY | 27 CY | 32 CY | | |
| | | | 59 oz. | 81 oz. | 102 oz. | 123 oz. | | |

Number of nails is approximate.

LUMBER
 Lumber sizes shown above are nominal. Actual sizes to be provided shall be the dressed size as follows.

- 6x6 - 5 1/2" x 5 1/2"
- 4x4 - 3 1/2" x 3 1/2"
- 2x8 - 1 1/2" x 7 1/4"
- 2x6 - 1 1/2" x 5 1/2"
- 2x4 - 1 1/2" x 3 1/2"
- 1x4 - 3/4" x 3 1/2"

All lumber will be No. 2 Spruce-Pine-Fir or better. 1x4, 2x6 & 2x8 lumber shall be kiln dried to 19% moisture content or drier. Posts, X-braces and 4x4 braces shall be CCA or ACQ treated.

HARDWARE
 All nails, screws, bolts, washers, and nuts shall be either Hot Dipped Galvanized (HDS) after fabrication, Stainless Steel or an equivalent suitable for contact with ACQ treated wood. Nails marked RS are ring shanked.

Contractor may request to replace nails with screws based on supplying documentation clearly showing the screws meet or exceed the pertinent properties of the nails specified. Commercially manufactured structural connectors shall be installed using the number and type of fasteners specified by the manufacturer.

METAL ROOFING

Metal roofing will be 29 gauge steel and galvanized. Metal roofing shall consist of panels long enough to reach from under the ridge cap to 6" beyond the eave, eliminating any horizontal joints. Panels shall have an allowable uniform inward load of 55 psf or more for a 2.5' span over 3 or more equal spans resulting in a maximum deflection ratio of L/180 of the span.

CONCRETE AND STEEL REINFORCING BARS

The concrete and steel reinforcing bars shall conform to Minnesota NRCS Construction Specification 32a, Reinforced Concrete, for Compost Structures. All concrete shall have a 28 day Compressive strength of 4000 pounds per square inch and shall be air entrained. See sheet 3 for the steel schedule. Steel shall have a fy = 60,000 psi.

MISCELLANEOUS

Gravel shall meet MNDOT standards for Class 5 gravel.

| | Date |
|----------|----------------|
| Designed | Swanberg 3/05 |
| Drawn | Swanberg 11/12 |
| Checked | Pearson 2/05 |
| Approved | Brach 1/12 |

**ANIMAL MORTALITY COMPOSTING FACILITY
 10'W x 14'L x 6'H BINS
 MATERIALS LIST & CONSTRUCTION NOTES**

