

2"x 4" PURLINS (ON EDGE) AT ____" O.C. MAX.
(LAPORTE/ST. JOSEPH CO. = 16", REST OF INDIANA = 24")

2"x ____"x ____' RAFTERS AT 10' O.C.

29 GA. CORRUGATED SHEET METAL

SEE DETAIL

2"x ____"x 6'-0"

SEE KNEE BRACE DETAIL

ORIENTATION

9'-8"

1' MIN

CROSS BRACE

5" CONCRETE SLAB OR GRAVEL PAD

6x6 - 10/10 WIRE MESH

SLOPE TO DRAIN

SLOPE TO DRAIN

6" GRAVEL BASE

COMPACTED EARTH BACKFILL AROUND ALL POSTS

L/2=____'

L/2=____'

L+2' = ____'

13'-0"

END VIEW

CROSS BRACE

6" MIN

10'-0"

10'-0"

10'-0"

6" MIN

A

2"x 8" PLANKS

5" CONCRETE FLOOR (REQUIRED)

4"x 4"

L=____'

9'-10"

10'-0"

9'-10"

E

D

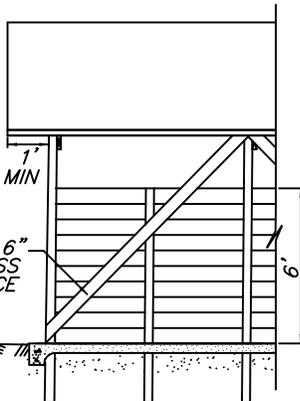
5" CONCRETE SLAB OR GRAVEL PAD

ORIENTATION

(# BINS)x(10') + 1' = ____'

FLOOR PLAN

NOT TO SCALE



PARTIAL REAR ELEVATION

NOTES:

1 - CRACK CONTROL JOINTS SHALL BE PROVIDED AT 30'.

2 - CCA TREATMENT (0.4 LBS/CU FT) ON ALL LUMBER EXCEPT RAFTERS, PURLINS, & KNEE BRACES/GUSSETS.

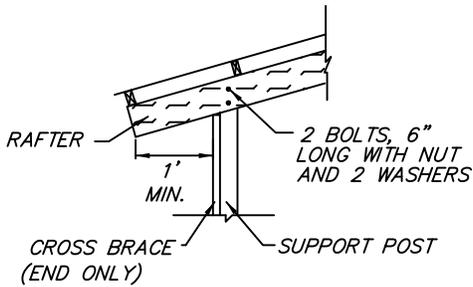
3 - ATTACH PURLINS TO RAFTERS WITH MANUFACTURED FRAMING ANCHORS. PURLIN JOINTS SHALL OVERLAP ABOVE RAFTERS.

4. METAL ROOF SHALL BE ATTACHED WITH 1-1/4" LONG GROMMETED SCREWS TO EACH ROW OF PURLINS AT A SPACING OF NO MORE THAN 8" AT EDGES AND OVERLAPS AND NO MORE THAN 24" IN SHEET CENTERS.

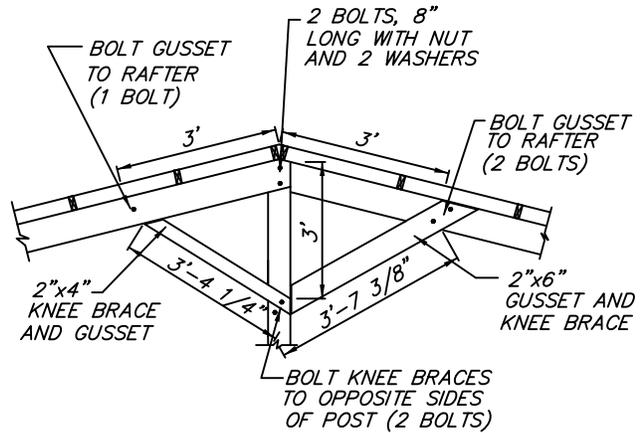
COOPERATOR _____		COUNTY SWCD, INDIANA	
LOCATION _____			
SWINE COMPOSTING FACILITY TREATED TIMBER STRUCTURE GENERAL LAYOUT INDIANA			
U. S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE			
Designed _____	Date _____	Approved By _____	Date _____
Drawn _____		Title _____	
Traced _____		Title _____	
Checked _____		Sheet _____	Drawing No. _____
		No. _____	of _____
		IN-ENG-59 (1 OF 4)	

NOTES:

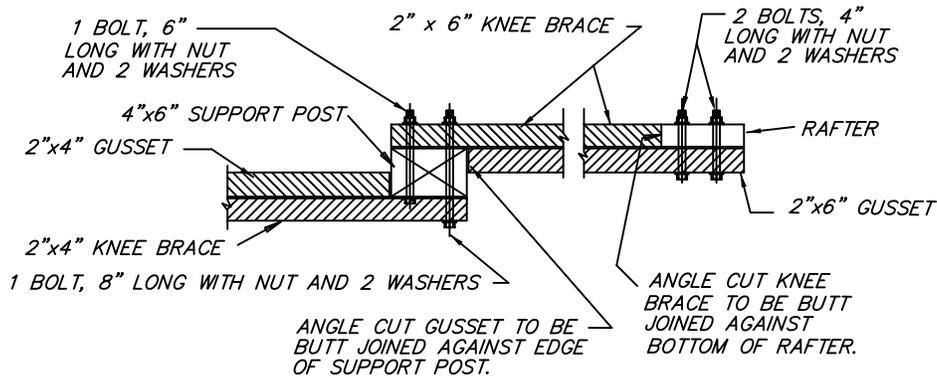
- 1- ALL BOLTS SHALL BE 5/8" DIAMETER WITH WASHERS AT BOTH ENDS, EXCEPT 3/4" BOLTS SHALL BE USED IN LAPORTE AND ST. JOSEPH COUNTIES.
- 2- ALL 16d NAILS SHALL BE RING SHANKED.
- 3- NAIL GUSSET AND KNEE BRACE TOGETHER.



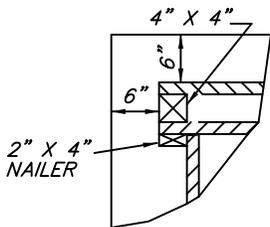
END/MIDDLE POST DETAIL



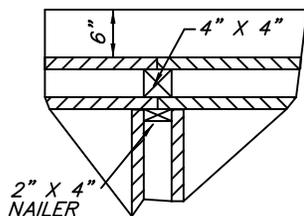
KNEE BRACE DETAIL



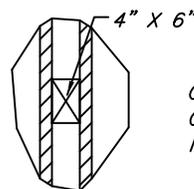
PLAN VIEW - KNEE BRACE



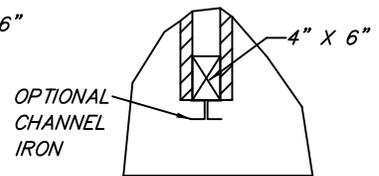
DETAIL A



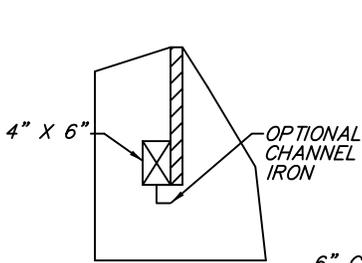
DETAIL B



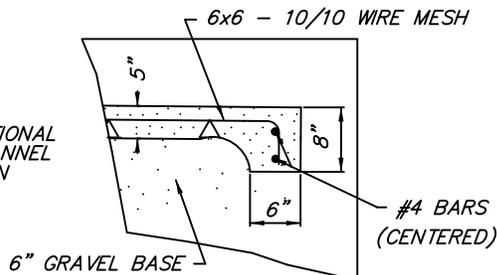
DETAIL C



DETAIL D



DETAIL E



DETAIL F

(REQUIRED ON ALL OUTER EDGES OF CONCRETE)

COOPERATOR _____
 COUNTY SWCD, INDIANA
 LOCATION _____

SWINE COMPOSTING FACILITY
 TREATED TIMBER STRUCTURE
 DETAILS
 INDIANA

U. S. DEPARTMENT OF AGRICULTURE
 NATURAL RESOURCES CONSERVATION SERVICE

Designed	Date	Approved By	Date
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TOTAL BIN VOLUME (CU.FT.)					
NUMBER OF BINS	BIN LENGTH, L (FT)				
	10	11	12	13	14
3	1676	1844	2012	2179	2347
6	3353	3688	4023	4358	4694
1 STORAGE	559	614	671	727	782

TABLE A: BIN VOLUMES

REQUIRED CONCRETE SURFACE AREA, SA (SQ. FT.)					
NUMBER OF BINS	BIN LENGTH, L (FT)				
	10	11	12	13	14
3	372	403	434	465	496
3 + 1	492	533	574	615	656
6	732	793	854	915	976
6 + 1	852	923	994	1065	1136

TABLE C: SURFACE AREAS

	BIN LENGTH, L (FT)				
	10	11	12	13	14
RAFTERS					
SIZE, NOMINAL	2x6	2x6	2x6	2x8	2x8
NOMINAL LENGTH, R	12'	14'	14'	16'	16'
POST HEIGHTS					
FRONT, H1	12'-2"	12'-5"	12'-8"	12'-11"	13'-2"
MIDDLE, H2	10'-11"	11'-0"	11'-2"	11'-4"	11'-5"
NOMINAL POST LENGTH (FEET)					
FRONT	16	16	16	16	16
MIDDLE	14	14/16	14/16	16	16
LAPORTE/ST. JOSEPH COUNTY REQUIREMENTS					
RAFTER SIZE, NOMINAL	2x6	2x8	2x8	2x8	2x10
ALL BOLTS SHALL BE 3/4" DIAMETER.					

TABLE B: BIN DESIGN

BILL OF MATERIALS

	NUMBER OF BINS			
	3	3+1	6	6+1
CONCRETE FLOOR (REQUIRED)				
CONCRETE = (SA= _____ /64) + 1.5 = _____ CU. YDS.				
6 x 6 - 10/10 WIRE MESH = SA = _____ SQ. FT.				
1/2" REINFORCING ROD = 4 X [(# BINS= _____ X10)+(L= _____)+1] = _____ LIN. FT.				
GRAVEL BASE - INDOT #8 STONE = SA= _____ X 0.0275 = _____ TONS				
CONCRETE PAD (OR GRAVEL, SEE BELOW)				
CONCRETE, CU. YD.	7	9	14	16
6 x 6 - 10/10 WIRE MESH, SQ. FT.	403	533	793	923
1/2" REINFORCING ROD, LIN. FT. (ADDITIONAL)	52	52	52	52
GRAVEL BASE - INDOT #8 STONE, TONS	11	15	22	26
GRAVEL PAD (IF USED)				
INDOT #53 STONE, TONS	11	15	22	26
CCA TREATED LUMBER, #2 SOUTHERN PINE				
POSTS				
4" x 6" _____ - FRONT	4	5	7	8
4" x 6" _____ - MIDDLE	4	5	7	8
4" x 4" x 14' - REAR	4	5	7	8
4" x 4" x 10' - CENTER REAR	3	4	6	7
2" x 8" PLANKING				
L = _____	60	80	120	140
10'-0"	30	40	60	70
NAILERS				
2" x 4" x 6'-0"	4	5	7	8
CROSS BRACES				
2" x 6" x 14'-0"	3	4	6	7
NON-TREATED LUMBER, #2 SOUTHERN PINE				
2" x W= _____ x R= _____ - RAFTERS	4	5	7	8
2" x W= _____ x 6'-0" - OVERHANG RAFTERS	4	5	7	8
2" x 6" x 4'-0" - KNEE BRACE/GUSSET	8	10	14	16
2" x 4" x 4'-0" - KNEE BRACE/GUSSET	8	10	14	16
2" x 4" x 12'-0" - PURLINS = [(R= _____ +6)/2* + 2] X (# BINS= _____) = _____ BRDS				
ROOFING MATERIAL				
29-GA. CORRUGATED SHEET METAL = (R= _____ +6) X [2+(10 X #BINS= _____)] = _____ SQ. FT.				
BOLTS AND NUTS- 5/8" DIAM. (USE 3/4" IN LAPORTE/ST. JOSEPH COUNTIES)				
4" LENGTH	12	15	21	24
6" LENGTH	20	25	35	40
8" LENGTH	12	15	21	24
WASHERS	88	110	154	176
FRAMING ANCHORS = [(R= _____ + 6)/2* + 2] X (# BINS= _____ + 1) = _____ ANCHORS				

* FOR LAPORTE/ST. JOSEPH COUNTY, REPLACE 2' WITH 1.3' PURLIN SPACING.

DESIGN INSTRUCTIONS:

1. USING TABLE A, DETERMINE BIN LENGTH (L) AND NUMBER OF BINS REQUIRED FOR CALCULATED COMPOST VOLUME. AN ADDITIONAL BIN MAY BE INCLUDED FOR STORAGE, IF DESIRED.
2. USING TABLE B, DETERMINE POST HEIGHTS AND RAFTER (R) VALUES.
3. USING TABLE C, DETERMINE CONCRETE SURFACE AREA.
4. FILL IN VALUES FROM TABLE B ON LAYOUT PAGE AND BILL OF MATERIALS.
5. CALCULATE QUANTITIES IN BILL OF MATERIALS.

COOPERATOR _____
 COUNTY SWCD, INDIANA
 LOCATION _____

SWINE COMPOSTING FACILITY
 TREATED TIMBER STRUCTURE
 DESIGN AND BILL OF MATERIALS
 INDIANA

U. S. DEPARTMENT OF AGRICULTURE
 NATURAL RESOURCES CONSERVATION SERVICE

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GENERAL

This plan set shows details for three (3) composting bins. This plan set is to be adapted for _____ bins and _____ extra storage bins.

This composting facility was designed to support a 16 psf wind load for Indiana. A 30 psf dead/snow load for LaPorte and St. Joseph counties and a 20 psf dead/snow load for the rest of Indiana were used.

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

MATERIALS

All lumber shall be #2 construction grade Southern Pine or stronger. CCA treatment of 0.4 pounds per cubic foot shall be applied on all lumber except rafters, purlins, and knee braces.

All concrete shall have an ultimate strength of 4000 pounds per square inch.

All reinforcing bars shall be Grade 60 steel.

All gravel shall meet INDOT standards for size and gradation as specified on the plans.

MANAGEMENT AND OPERATION

A management program shall be established by the operator to maintain the structural integrity of the facility and to operate it in an environmentally sound manner. Proper management is imperative to achieve the optimal compost action.

The proper carbon to nitrogen ratio shall be maintained by using a mix of 100 cubic feet of sawdust per 1000 pounds of carcass or other mix as specified to maintain a carbon to nitrogen ratio of 20-30 to 1. Ammonium nitrate may be added as needed to reach the optimum CN ratio.

The proper moisture content shall be maintained at 50-60 percent by:

- 1 - Using damp (but not wet) sawdust.
- 2 - Adding extra water as needed to reach the optimal moisture content.
- 3 - Allowing green (wet) sawdust to dry before using in compost mix.

The temperature of the compost shall be monitored and shall reach a minimum of 135 degrees F. The temperature probe must penetrate one third of the distance from the outside of the pile to the center of mass. Compost that does not reach this temperature shall be dismantled, corrected, and rebuilt in order to reach optimal temperature. When the temperature of the compost falls below 105 degrees F, compost shall be turned to a secondary storage bin.

The following items shall be followed during the loading of the facility:

- 1 - One foot of sawdust shall be placed on the bottom of the bin.
- 2 - Carcasses shall be placed in layers with at least one foot of sawdust in between each layer.
- 3 - Carcasses shall be completely covered with at least one foot of sawdust.
- 4 - Large carcasses shall have one foot of sawdust in between carcasses within a layer.
- 5 - A minimum of 6 inches of sawdust shall be maintained between the carcasses and the sides of the bins.

Other:

Compost shall be loaded in bins in the following manner:

- 1 - The first bin shall be filled over a two month period.
- 2 - The second bin shall be filled over the second two month period.
- 3 - After the second two month period, compost from the first bin shall be turned into the third bin for secondary composting.
- 4 - Bin #1 shall now be filled again for two months.
- 5 - After the two month period, compost from Bin #3 shall be removed for final disposal and Bin #2 shall be turned to Bin #3.
- 6 - Bin #2 shall now be filled again.

This method shall be used for the number of bins as specified in this plan.

The completed compost shall be land applied in accordance with the Nutrient Management Plan. When conditions are not suitable for application, the completed compost shall be stored until conditions are adequate.

COOPERATOR _____		_____ COUNTY SWCD, INDIANA	
LOCATION _____			
SWINE COMPOSTING FACILITY TREATED TIMBER STRUCTURE OPERATION AND MAINTENANCE INDIANA			
U. S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE			
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