

MWPS-73293

Grain-Feed Handling Center

Work Tower Across Drive, One-way Shed.

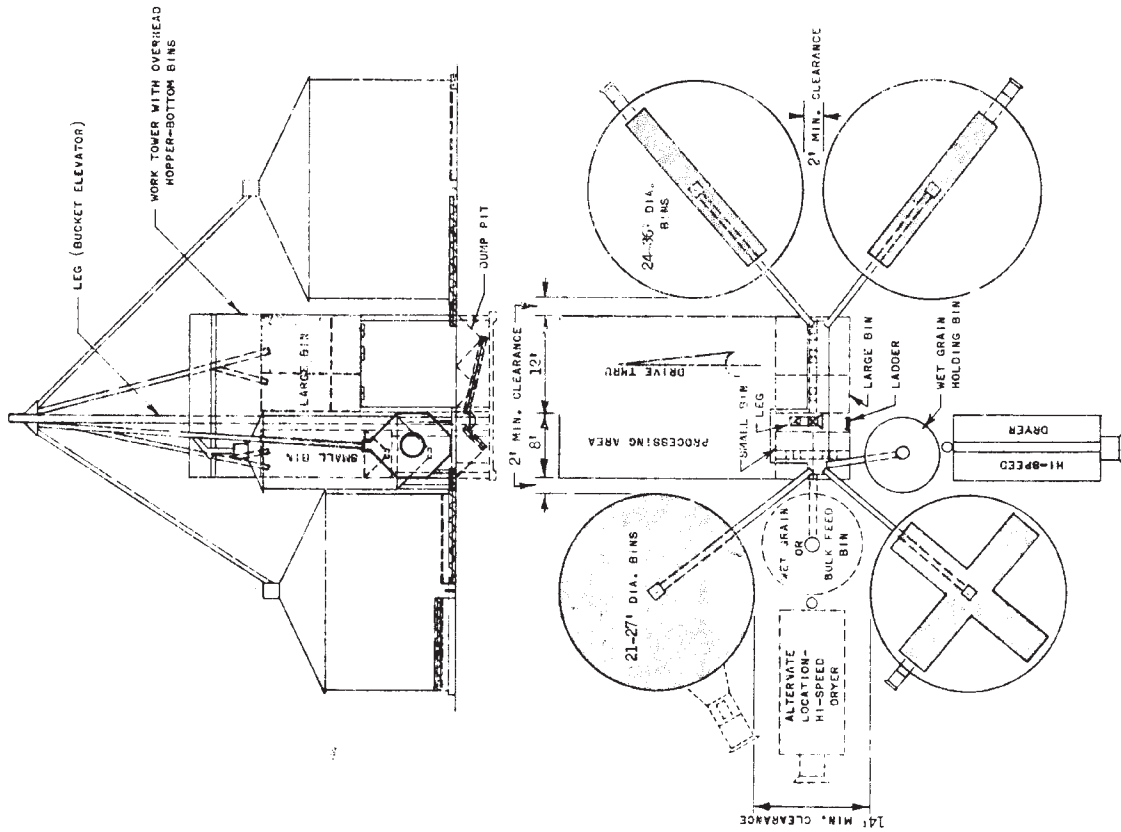
CAUTION!

Additional professional services will be required to tailor this plan to your situation, including but not limited to: assurance of compliance with codes and regulations; review of specifications for materials and equipment; supervision of site selection, bid letting and construction; and provision for utilities, waste management, roads or other access. **Furthermore, any deviation from the given specifications may result in structural failure, property damage, and personal injury including loss of life.**

WARRANTY DISCLAIMER

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MIDWEST PLAN SERVICE
Cooperative Extension Work in Agriculture and Home Economics and Agricultural Experiment Stations of North Central Region - USDA Cooperating
Grain-Feed Handling Center Work Tower Across Drive, One-Way Shed
Title Page
MIDWEST PLAN NO. 73293



LAYOUT & MECHANIZATION SCHEMATIC

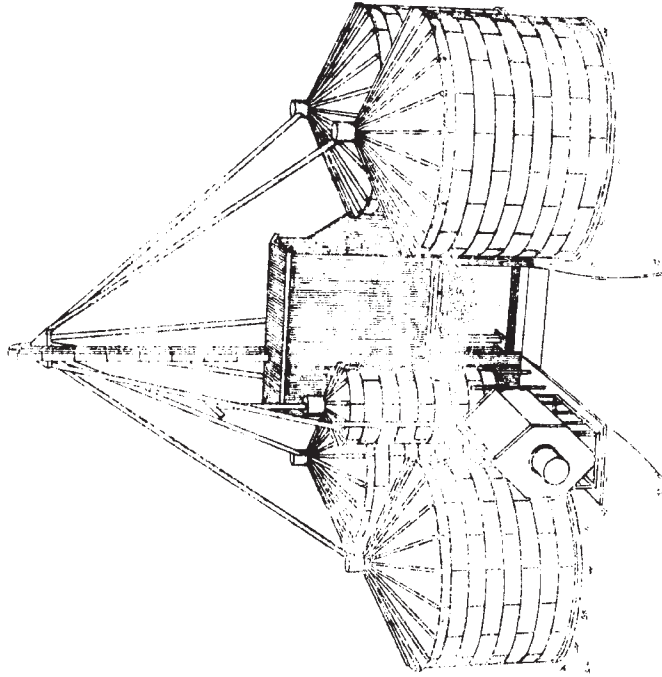


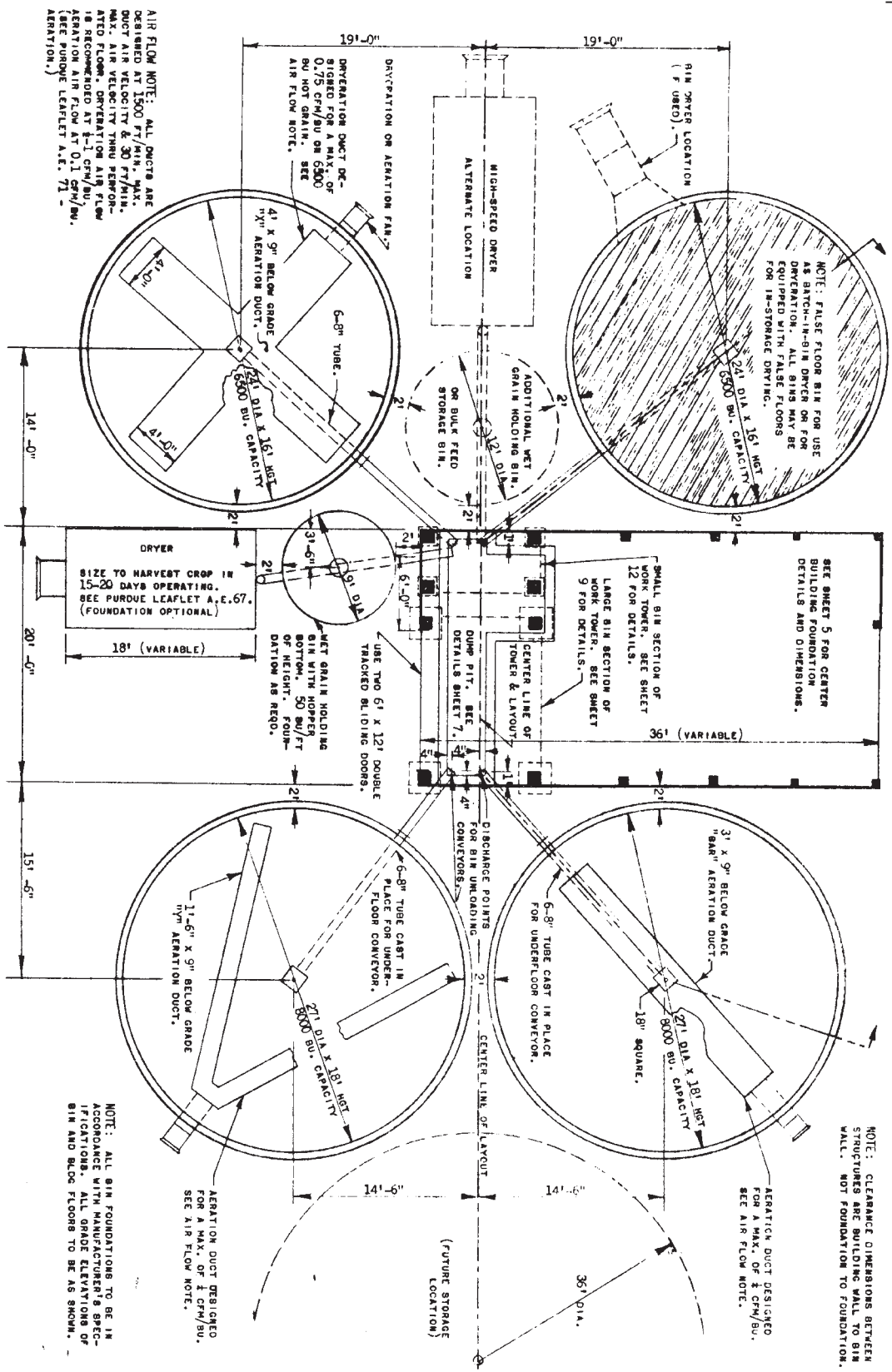
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This plan was developed and prepared by Bruce A. McKenzie and John E. Metzger, Extension Agricultural Engineers, and W. H. Friday, Assistant Professor, Agricultural Engineering Department, Purdue University, Lafayette, Indiana.

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MIDWEST PLAN SERVICE Cooperative Extension Work in Agriculture and Home Economics and Agricultural Experiment Stations of the United States Department of Agriculture
GRAIN-FEED HANDLING CENTER WORK TOWER ACROSS DRIVE, One-Way Shed
Sheet 1 of 14 Sheets
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AIR FLOW NOTE: ALL DUCTS ARE DESIGNED AT 1500 FT/MIN. MAX. DUCT AIR VELOCITY & 30 FT/MIN. MAX. AIR VELOCITY THRU PERFORATED FLOOR. DRYER AIR FLOW, OPERATIONAL AIR FLOW, AIR FLOW THROUGH AUGER, ARE NOT SHOWN AT THIS SCALE. (SEE PURDUE LEAFLET A.E. 67, A.E. 71, A.E. 72 FOR DETAILS.)

NOTE: FALSE FLOOR BIN FOR USE AS BATCH-IN-BIN DRYER OR FOR OPERATIONAL. ALL BINS MAY BE OPERATED WITH FALSE FLOORS FOR IN-STORAGE DRYING.

SEE SHEET 5 FOR CENTER BUILDING FOUNDATION DETAILS AND DIMENSIONS.

SMALL BIN SECTION OF WORK TOWER. SEE SHEET 12 FOR DETAILS.

LARGE BIN SECTION OF WORK TOWER. SEE SHEET 9 FOR DETAILS.

NOTE: ALL BIN FOUNDATIONS TO BE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS. ALL GRADE ELEVATIONS OF BIN AND BLOC FLOORS TO BE AS SHOWN.

AERATION DUCT DESIGNED FOR A MAX. OF 1 CFM/BU. SEE AIR FLOW NOTE.

AERATION DUCT DESIGNED FOR A MAX. OF 1 CFM/BU. SEE AIR FLOW NOTE.

PIVOT PIN FOR UNLOADER MOUNTED ON SKELETON FRAME.

PERFORATED DRYING FLOOR.

GROUND LINE

SECTION A-A

CENTER BLOC FLOOR LINE.

6-8" TUBE.

LEG & DUMP PITT. SEE SHEET 7 FOR DETAILS.

BIN FLOOR ELEVATION 8" MIN. ABOVE CENTER BLOC FLOOR GRADE FOR 6" AUGER. ADJUST AS REQUIRED FOR OTHER AUGER DIA. UNDER-FLOOR AUGER MAY BE INCLINED TO INCREASE DISCHARGE HEIGHT.

8" TUBE.

6-8" TUBE.

6-8" TUBE.

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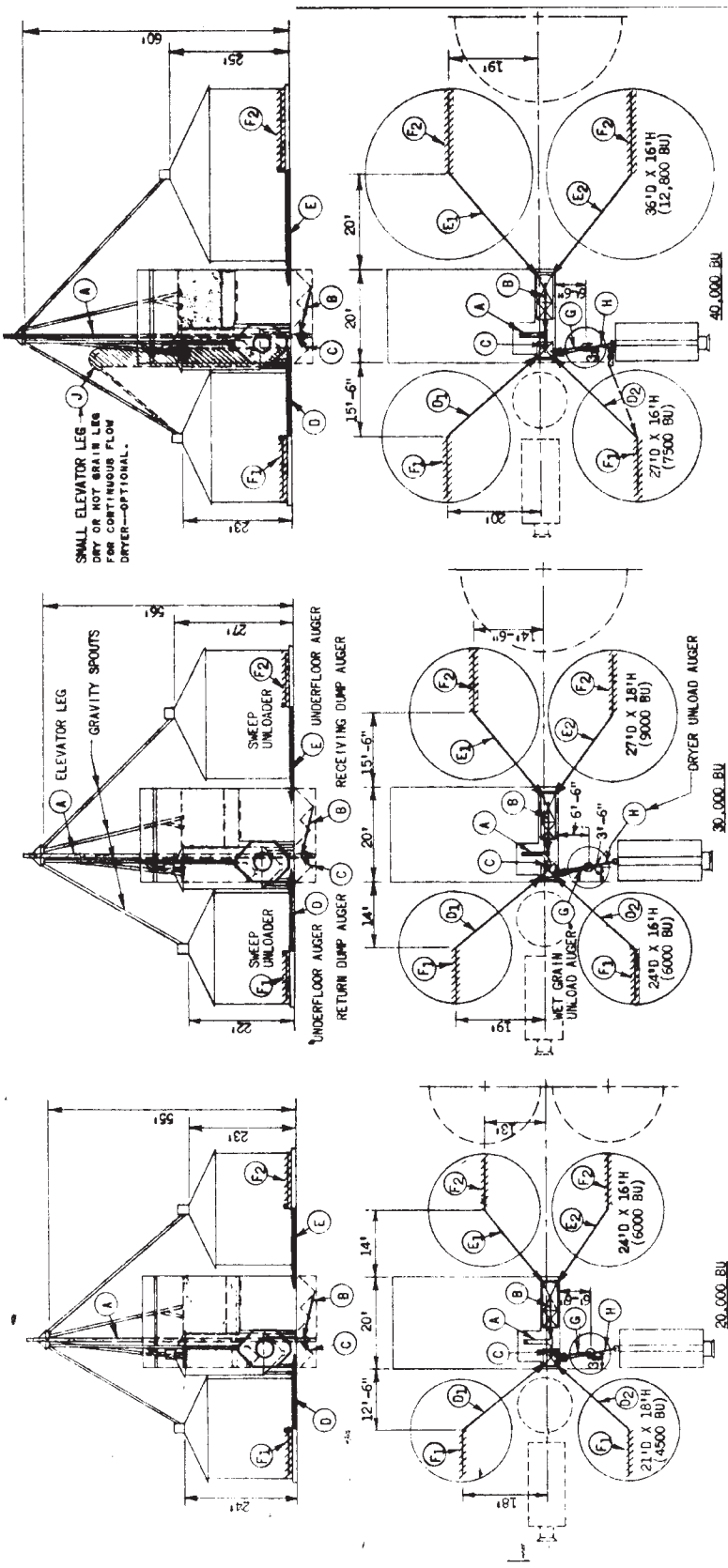
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**GRAIN-FEED HANDLING CENTER
WORK TOWER ACROSS DRIVE, One-Way Shed**

Sheet 2 of 5 sheets

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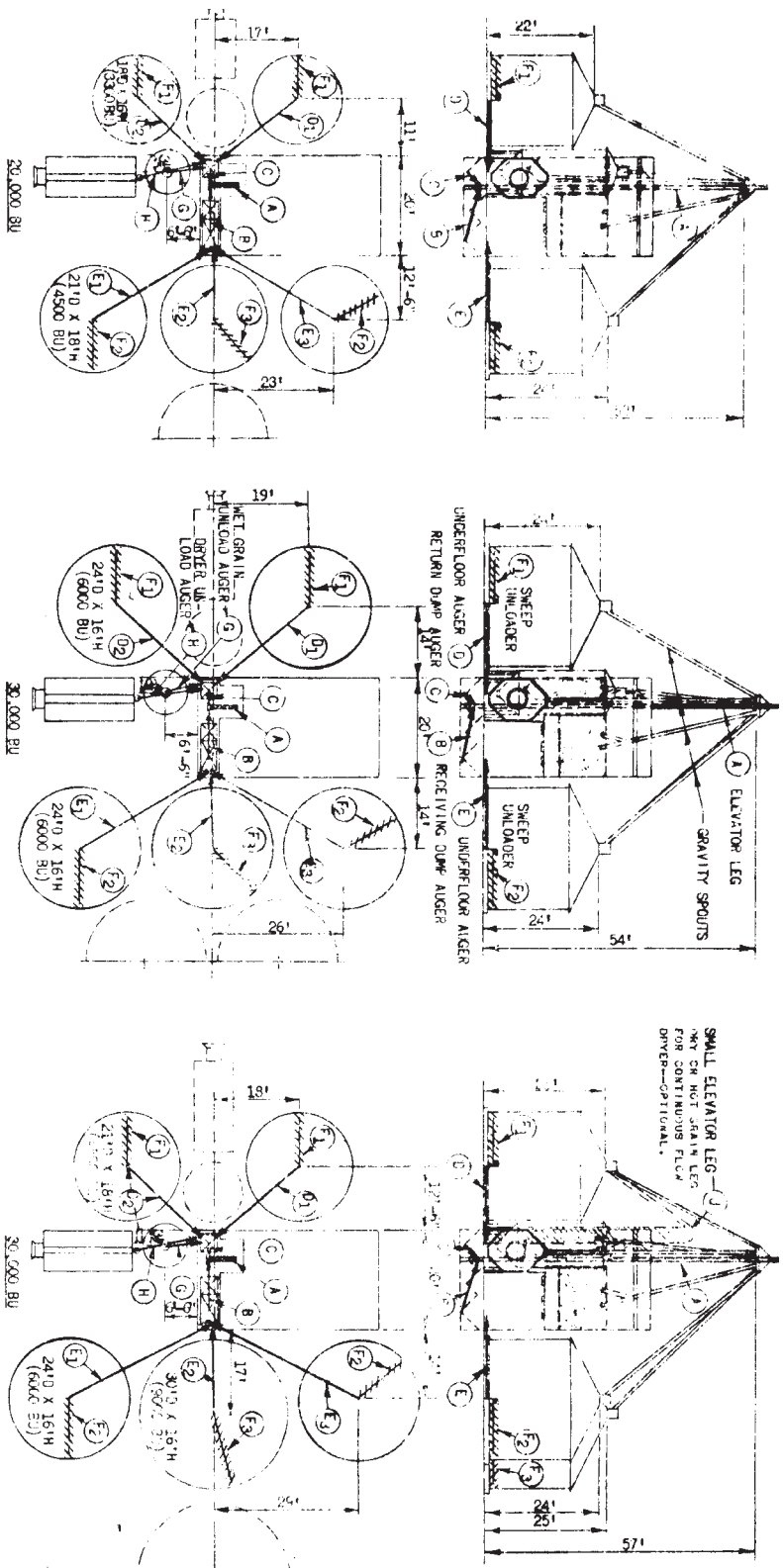


1. HANDLING FLOW RATES ILLUSTRATED ARE WORKABLE COMBINATIONS AND NOT LIMITED TO EACH SPECIFIC FACILITY.
2. AUGER INTAKE EXPOSURE MATCHED TO CAPACITY—MINIMUM EXPOSURE = AUGER DIAM.; MAXIMUM EXPOSURE 2 1/2'. ADDITIONAL EXPOSURE INCREASES HORSEPOWER NOT CAPACITY.
3. SWEEP UNLOADER CAPACITIES GIVEN FOR UNITS WITH GRAIN SHIELDS BEHIND AUGER.
4. FLAT STORAGE STRUCTURES CAN BE SUBSTITUTED FOR BIN ON RIGHT SIDE OF LAYOUT. DOTTED LINES SHOWN FOR FUTURE EXPANSION ARE INTERCHANGEABLE FOR ALL LAYOUTS.

APPROXIMATE TOTAL CAPACITY-- ALTERNATIVE HANDLING EQUIPMENT	20,000 BU			30,000 BU			40,000 BU		
	CODE	LENGTH OR HEIGHT	ESTIMATED CAPACITY BU/HR	CODE	LENGTH OR HEIGHT	ESTIMATED CAPACITY BU/HR	CODE	LENGTH OR HEIGHT	ESTIMATED CAPACITY BU/HR
ELEVATOR LEG	A	55'	1000-1200	A	56'	8x5 or 9x2	A	60'	9x6"
GRAVITY SPOUTS	B	11'	1200(MET)	B	11'	10"	B	11'	8"
RECEIVING DUMP AUGER	C	4'	1200(MET)	C	4'	10"	C	4'	12"
UNDERFLOOR AUGER	D1	23'	1000-1200	D1	24'	6"	D1	26'	8"
UNDERFLOOR AUGER	D2	21'	1000-1200	D2	22'	6"	D2	24'	8"
UNDERFLOOR AUGER	E1	20'	1000-1200	E1	20'	6"	E1	30'	8"
UNDERFLOOR AUGER	E2	18'	1000-1200	E2	20'	6"	E2	28'	8"
SWEEP UNLOADERS	F1	10'	1000	F1	11 1/2'	6"	F1	13'	6"
SWEEP UNLOADERS	F2	11 1/2'	1000	F2	13'	6"	F2	17 1/2'	6"
WET GRAIN UNLOAD AUGER	G	8'	1000-1200	G	8'	10"	G	8'	12"
DRYER UNLOAD AUGER	H	14'	1000-1200	H	14'	6"	H	14'	8"
SMALL ELEVATOR LEG (FOR CONTINUOUS FLOW DRYER)	J	39'	1000-1200	J	39'	8"	J	41'	4x6"

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GRAIN-LEED HANDLING CENTER
 WORK TOWER ACROSS DRIVE, EQUAL SHEDS
 MIDWEST PLAN NO. 73293
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APPROXIMATE TOTAL CAPACITY-- ALTERNATIVE HANDLING RATES--	20,000 BU 1000-1200 BU/HR FLOW RATE	30,000 BU 1500-2000 BU/HR FLOW RATE	36,000 BU 2500-3000 BU/HR FLOW RATE
ELEVATOR LEG	A	A	A
GRAIN HANDLING EQUIPMENT	CODE	CODE	CODE
GRAVITY LEG	8	8	8
RECEIVING DUMP AUGER	C	C	C
UNDERFLOOR AUGER	D1	D1	D1
UNDERFLOOR AUGER	D2	D2	D2
UNDERFLOOR AUGER	E1	E1	E1
UNDERFLOOR AUGER	E2	E2	E2
UNDERFLOOR AUGER	E3	E3	E3
UNDERFLOOR AUGER	F1	F1	F1
UNDERFLOOR AUGER	F2	F2	F2
UNDERFLOOR AUGER	F3	F3	F3
UNDERFLOOR AUGER	G	G	G
UNDERFLOOR AUGER	H	H	H
UNDERFLOOR AUGER	J	J	J
LENGTH OR HEIGHT	52'	54'	57'
SIZE	7.5"	8.5"	9.6"
ESTIMATED CAPACITY BU/HR	1000-1200	1500-2000	2500-3000
H-P	2-3	3-5	7-1

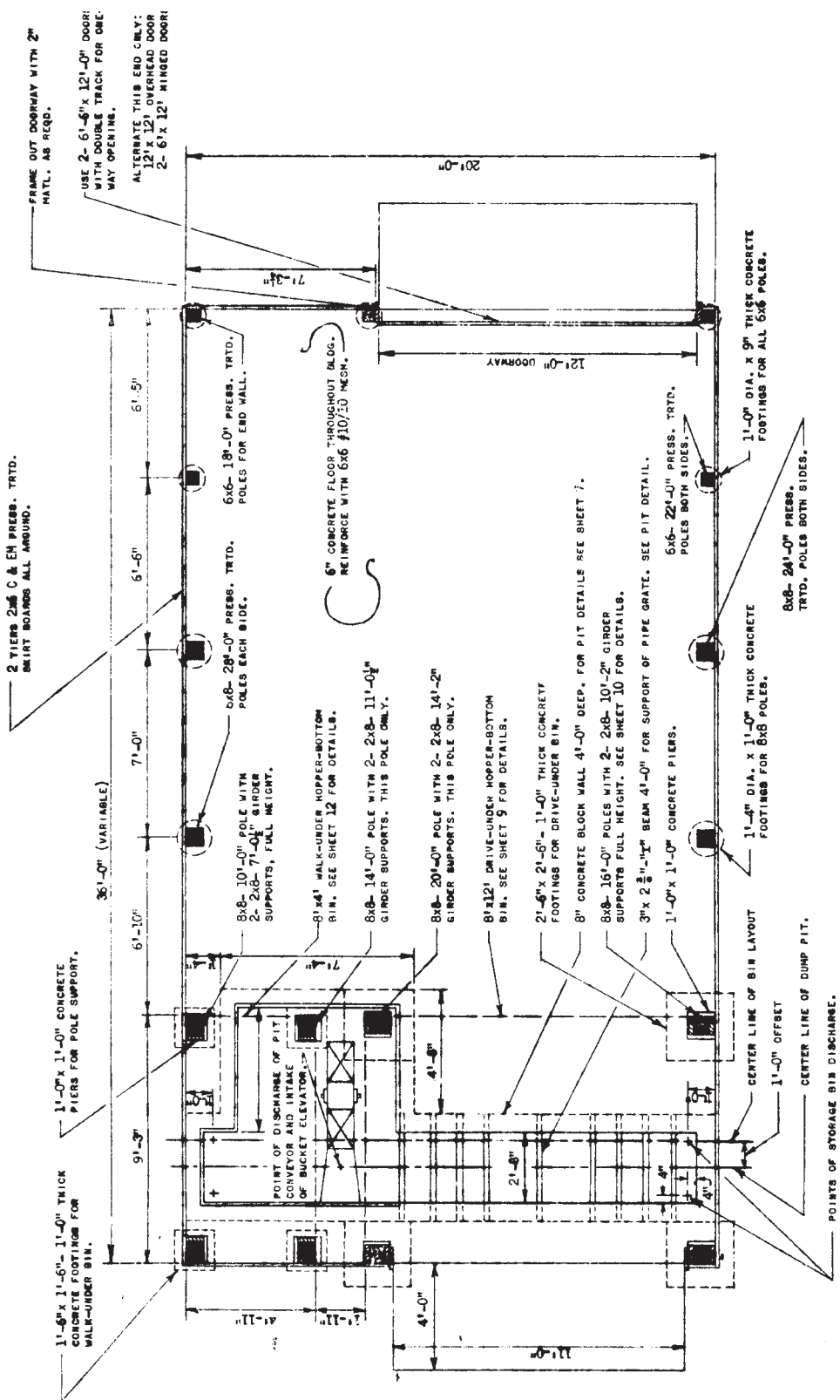
- HANDLING FLOW RATES ILLUSTRATED ARE WORKSHEET COMBINATIONS AND NOT LIMITED TO EACH SPECIFIC FACILITY
- AUGER INFLATE EXPOSURE MATCHED TO MAXIMUM EXPOSURE. ADDITIONAL EXPOSURE IS MEASURES NON-CAPACITY.
- SHEEP UNLOADER CAPACITIES GIVEN FOR UNITS WITH GRAIN SHIELDS BEHIND AUGER.
- FLAT STORAGE STRUCTURES CAN BE SUBSTITUTED FOR BIN ON RIGHT SIDE OF LAYOUT. DOTTED LINES SHOWN FOR FUTURE EXPANSION ARE INTERCHANGEABLE FOR ALL LAYOUTS.

APPROXIMATE TOTAL CAPACITY-- ALTERNATIVE HANDLING RATES--	20,000 BU 1000-1200 BU/HR FLOW RATE	30,000 BU 1500-2000 BU/HR FLOW RATE	36,000 BU 2500-3000 BU/HR FLOW RATE
ELEVATOR LEG	A	A	A
GRAIN HANDLING EQUIPMENT	CODE	CODE	CODE
GRAVITY LEG	8	8	8
RECEIVING DUMP AUGER	C	C	C
UNDERFLOOR AUGER	D1	D1	D1
UNDERFLOOR AUGER	D2	D2	D2
UNDERFLOOR AUGER	E1	E1	E1
UNDERFLOOR AUGER	E2	E2	E2
UNDERFLOOR AUGER	E3	E3	E3
UNDERFLOOR AUGER	F1	F1	F1
UNDERFLOOR AUGER	F2	F2	F2
UNDERFLOOR AUGER	F3	F3	F3
UNDERFLOOR AUGER	G	G	G
UNDERFLOOR AUGER	H	H	H
UNDERFLOOR AUGER	J	J	J
LENGTH OR HEIGHT	52'	54'	57'
SIZE	7.5"	8.5"	9.6"
ESTIMATED CAPACITY BU/HR	1000-1200	1500-2000	2500-3000
H-P	2-3	3-5	7-1

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GRANULED HANDLING CENTER
 1000-1200 BU/HR
 1500-2000 BU/HR
 2500-3000 BU/HR

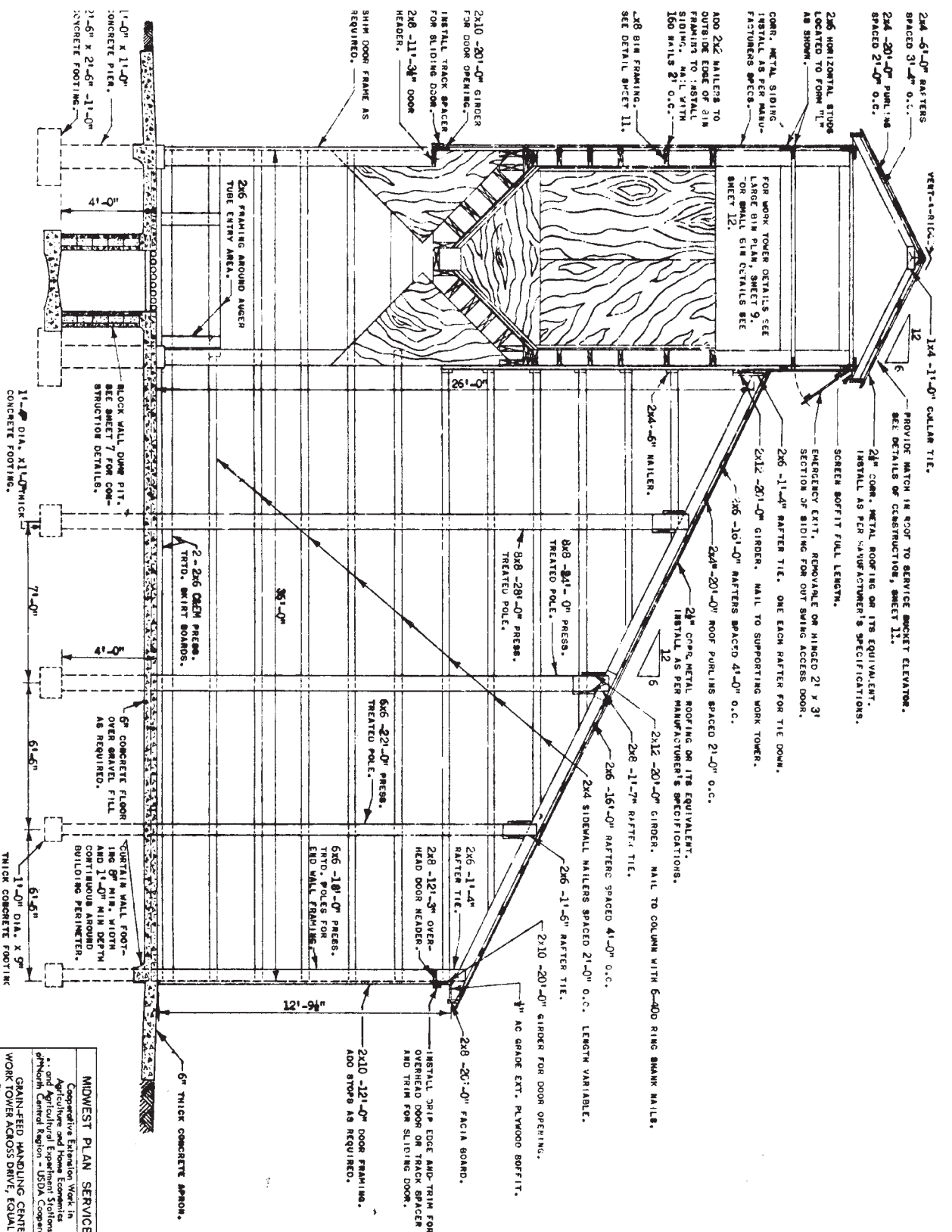
MIDWEST PLAN NO. 73293
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FLOOR & FOUNDATION PLAN
SCALE 3/8"=1'-0"

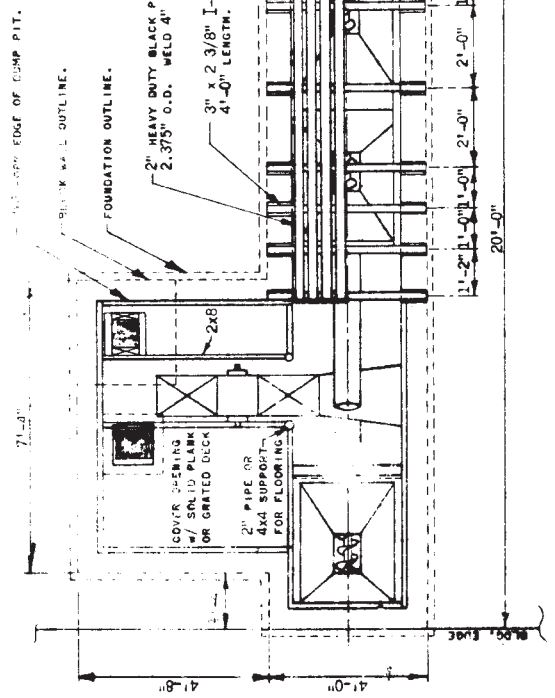
MIDWEST PLAN SERVICE Cooperative Extension Work in Agriculture and Home Economics and Agricultural Experiment Stations of North Central Region - USDA Cooperative
GRAIN-FEED HANDLING CENTER WORK TOWER ACROSS DRIVE, One-Hay Shed Sheet 5 of 14 Sheets
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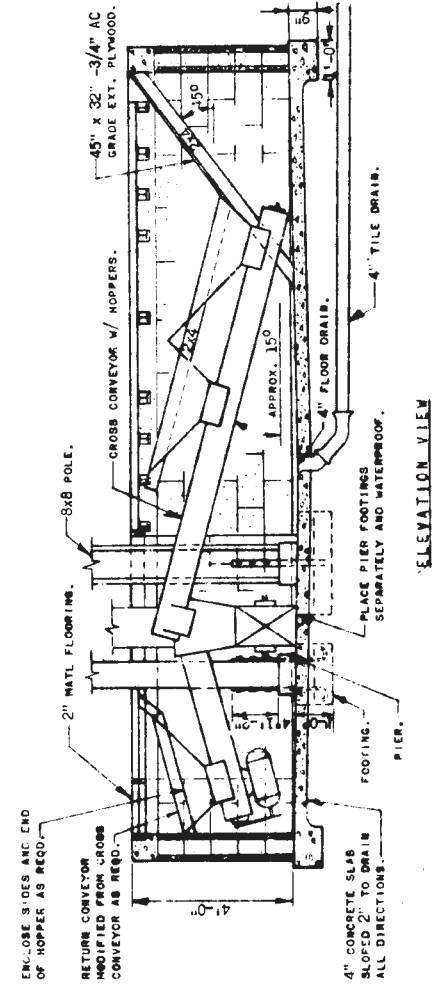


SECTION THRU DRIVEWAY

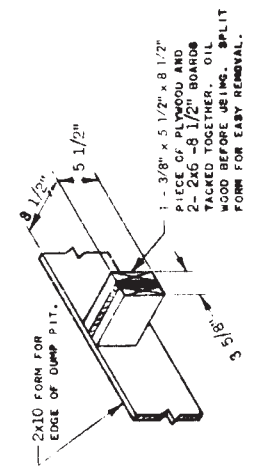
MIDWEST PLAN SERVICE Cooperative Extension Work in Agriculture and Home Economics and Agricultural Experiment Stations Midwest Central Region - USDA Cooperating	
GRAIN-FEED HANDLING CENTER WORK TOWER ACCESS DRIVE, EQUAL SHEDS	
Sheet 6 of 15 sheets	Midwest Plan No. 73293
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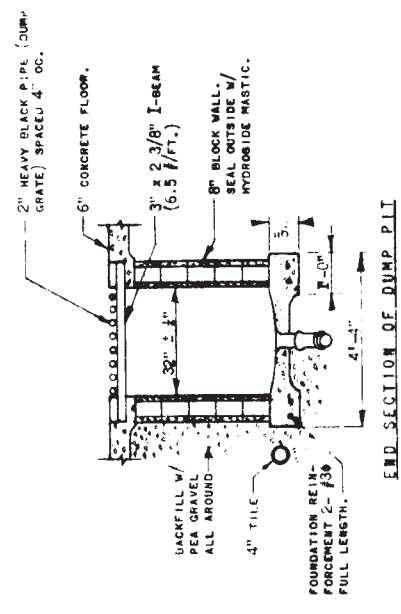
PLAN VIEW



ELEVATION VIEW



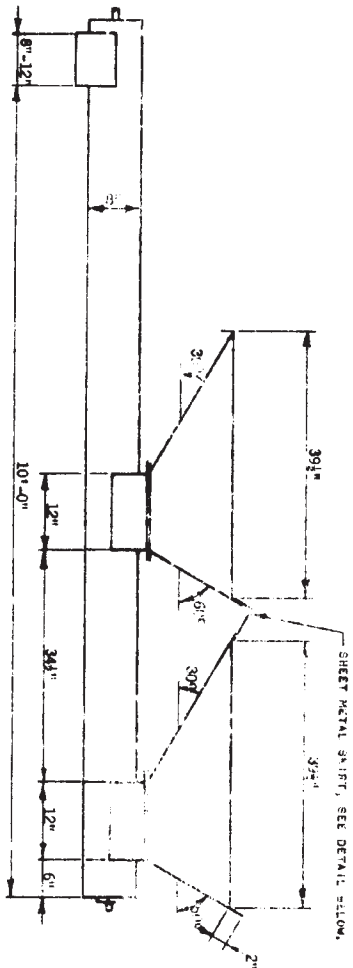
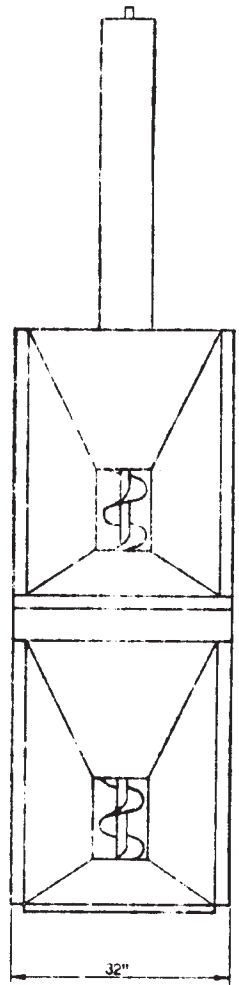
I-BEAM NOTCH FORMING DETAIL



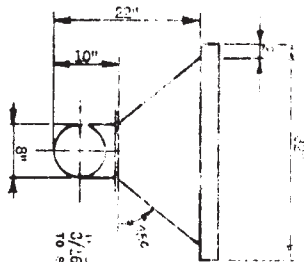
END SECTION OF DUMP PIT

MIDWEST PLAN SERVICE Cooperative Extension Work in Agriculture and Home Economics and Agricultural Experiment Stations of North Central Region - USDA Cooperating
AUGER DUMP PIT DETAILS
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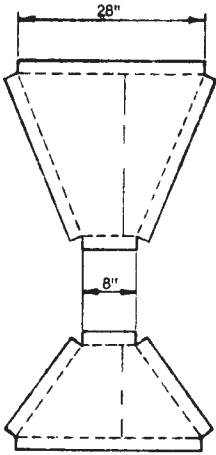
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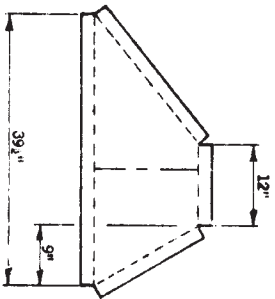
SHEET METAL SKIRT, SEE DETAIL BELOW.



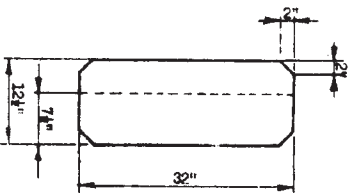
1" - SIDE IS OPENING OUT
3/16" x 3/4" BAW SCREW
TO SPACE EACH SIDE.



HOPPER END PANELS



HOPPER SIDE PANELS



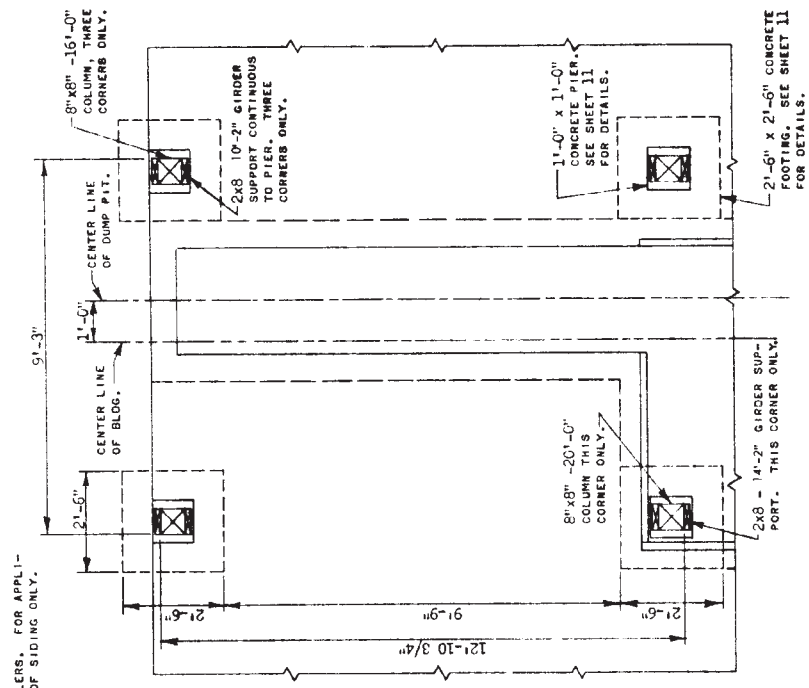
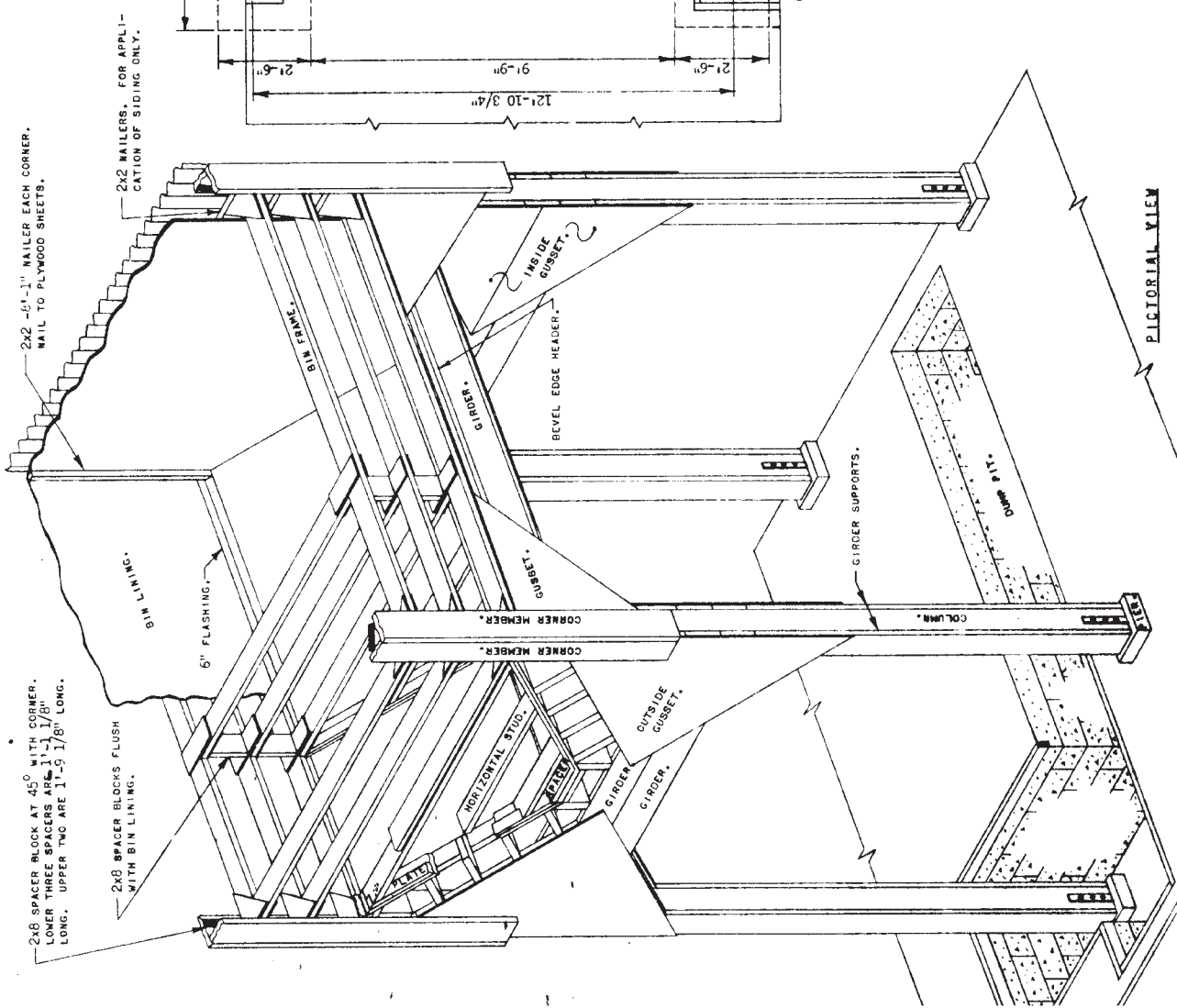
SKIRT BETWEEN HOPPERS

NOTE: ALL FLANGES ARE DRAWN 2" BUT
MAY BE MODIFIED TO EASE FABRICATION.
TO SAVE STEEL IS SUGGESTED. MODIFI-
CATIONS MAY BE NECESSARY TO ADAPT TO
A PARTICULAR SCREW CONVEYOR.

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AUGER DUMP PIT ACCESSORIES	Sheet 8 of 14 Sheets
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NOTE: ALL LUMBER SIZES (NOMINAL DIMENSIONS) EXCEPT 8"x8" COLUMNS. DIMENSIONS SHOULD BE CORRECTED IF FULL DIMENSION LUMBER IS USED.



FLOOR PLAN

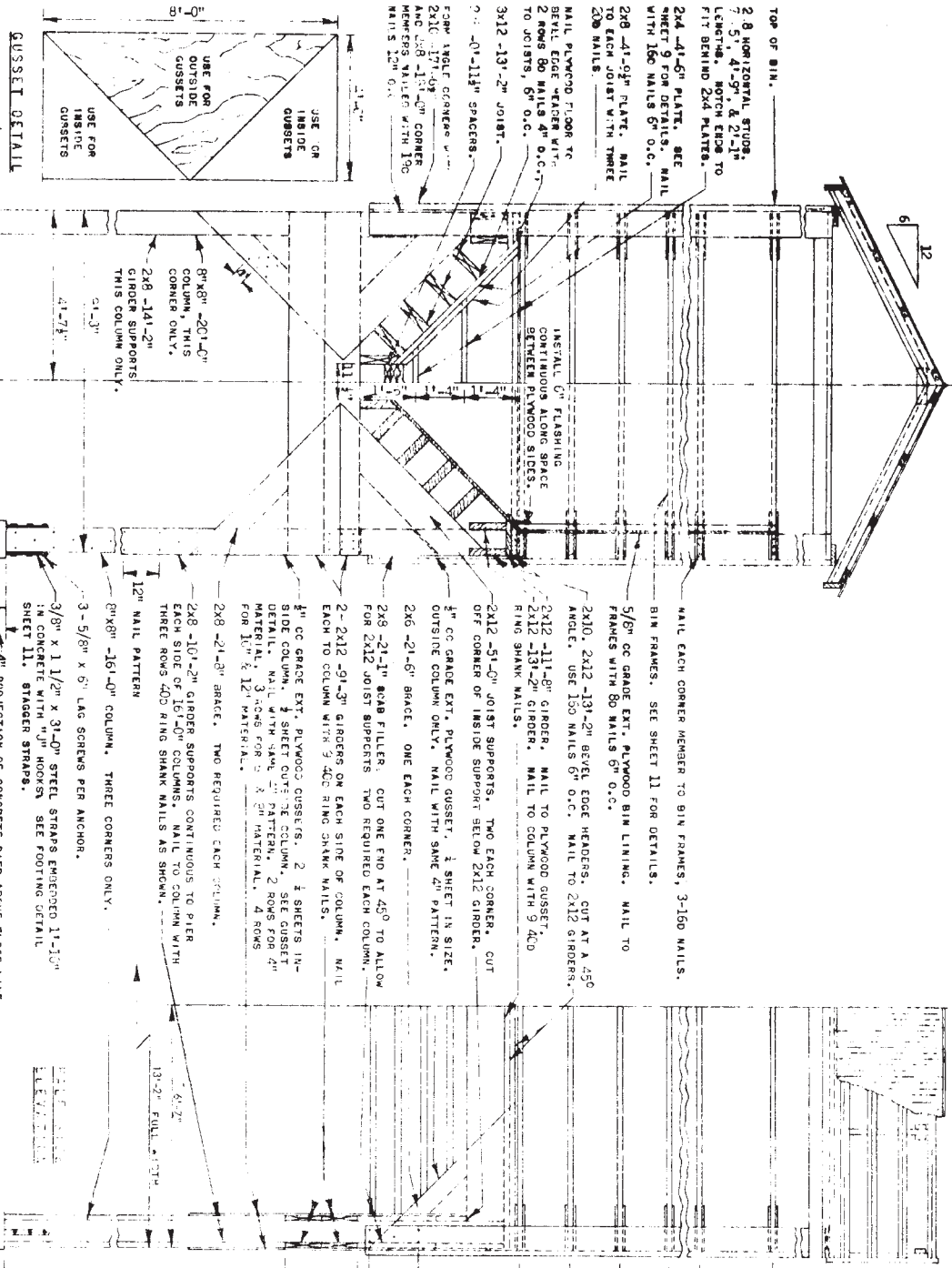
BIN CAPACITY

230 BU.	450 BU.
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**WORK TOWER, LARGE BIN,
 FLOOR PLAN**

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WORK TOWER - LANGE BIN

MIDWEST POWER SERVICE
 2100 North Central Expressway
 North Central Station - 152A Computing
 Chicago, Illinois 60610

PROJECT NO. 73252
 SHEET NO. 12 SHEET

WORK TOWER - LANGE BIN

MIDWEST PLANS	73252
Sheet 12 of 12 Sheets	

NOTE: SECURE HATCH DOOR FROM INSIDE WITH HOOKS AS NECESSARY.

SHEET METAL. FOLD OVER FRAME.

3/4" CC GRADE EXT. PLYWOOD.

2x2 FRAME.

2 1/2" CORR. SHEET METAL ROOF.

2x4 RIFTS.

2x4 PURLINS SPACED APPROX. 11-10" O.C. USE LENGTHS OF 14' & 21' AND CUT AS REQUIRED.

2x6 -54-4" PLATE. AND ONE ON EDGE TO FORM "L".

2x6 -20-31" FASCIA.

2x6 -20-31" PLATES. ONE FLAT AND ONE ON EDGE TO FORM "L".

2x6 -131-3" MAILER. ONE FLAT AND ONE ON EDGE TO FORM "L".

2x6 -54-4" MAILER. 2x6 -61-1" MAILER.

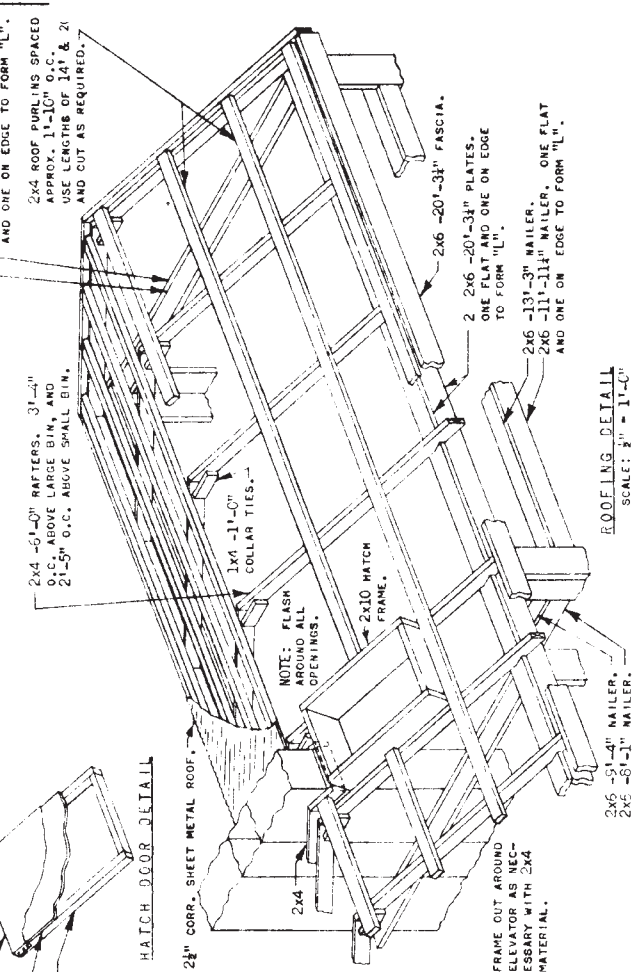
2x4 COLLAR TIES.

2x4 CORNERS.

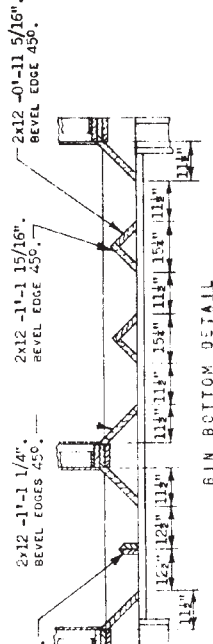
2x4 FRAME OUT AROUND ELEVATOR AS NECESSARY WITH 2x4 MATERIAL.

NOTE: FLASH AROUND ALL OPENINGS.

2x10 HATCH FRAME.



ROOFING DETAIL
SCALE: 3/4" = 1'-0"



BIN BOTTOM DETAIL
SCALE: 3/4" = 1'-0"

HATCH DOOR DETAIL

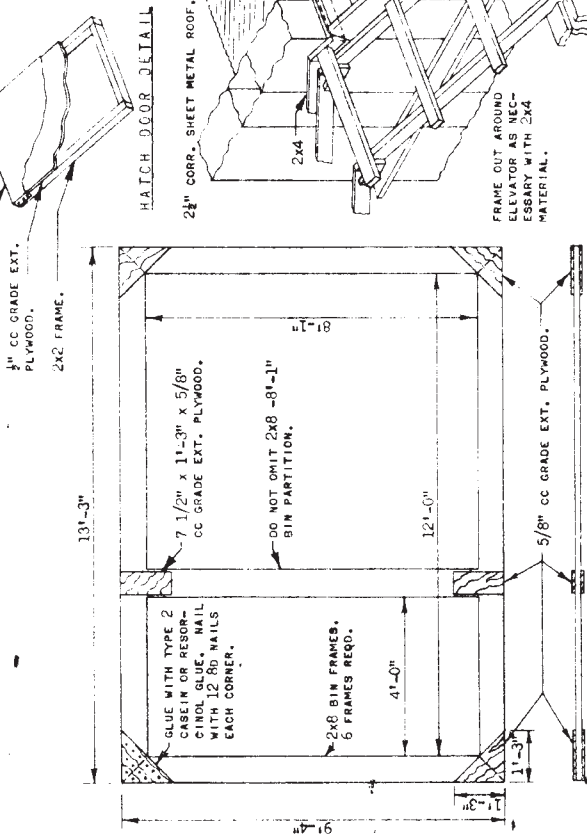
2 1/2" CORR. SHEET METAL ROOF.

2x4 CORNERS.

2x4 FRAME OUT AROUND ELEVATOR AS NECESSARY WITH 2x4 MATERIAL.

NOTE: FLASH AROUND ALL OPENINGS.

2x10 HATCH FRAME.



BIN FRAME DETAIL
SCALE: 3/4" = 1'-0"

2x12 -01-8" BEVEL EDGE 45°.

2x12 -11-1 1/2" BEVEL EDGE 45°.

2x12 -01-11 5/16" BEVEL EDGE 45°.

2x12 -11-1 1/2" BEVEL EDGES 45°.

2x4 -11-1" JOIST.

2x6 -11-1" MAILER.

2x6 -54-4" MAILER.

2x6 -61-1" MAILER.

2x10 JOIST.

2x4 FRAME.

2x4 CORNERS.

2x4 FRAME OUT AROUND ELEVATOR AS NECESSARY WITH 2x4 MATERIAL.

NOTE: FLASH AROUND ALL OPENINGS.

2x10 HATCH FRAME.

2 PICES 3/4" x 3" x 3/4" -11-12" ANGLE. ONE EACH SIDE FOR GRAIN DOORS TO SLIDE ON.

NOTE: COMMERCIAL CLOSURES OR OTHER SLIDE ARRANGEMENTS MAY BE USED.

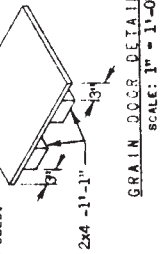
3/4" x 11-1" x 11-5/4" CC GRADE EXT. PLYWOOD.

5/8" CC GRADE EXT. PLYWOOD.

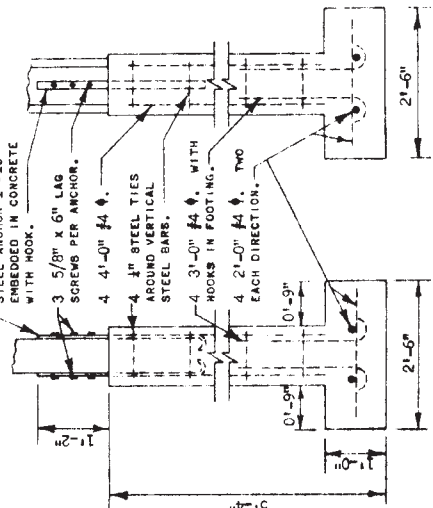
2x8 BIN FRAME.

2x4 -11-1" CORNER ANGLE SLIDING DETAIL.

SCALE: 1" = 1'-0"



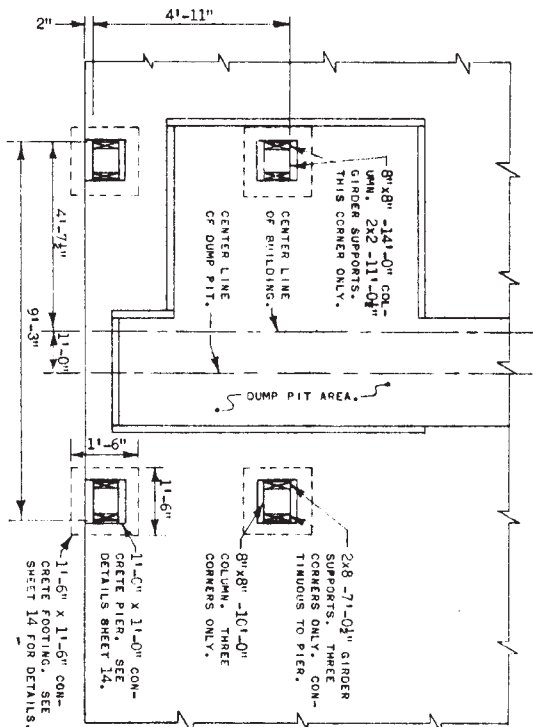
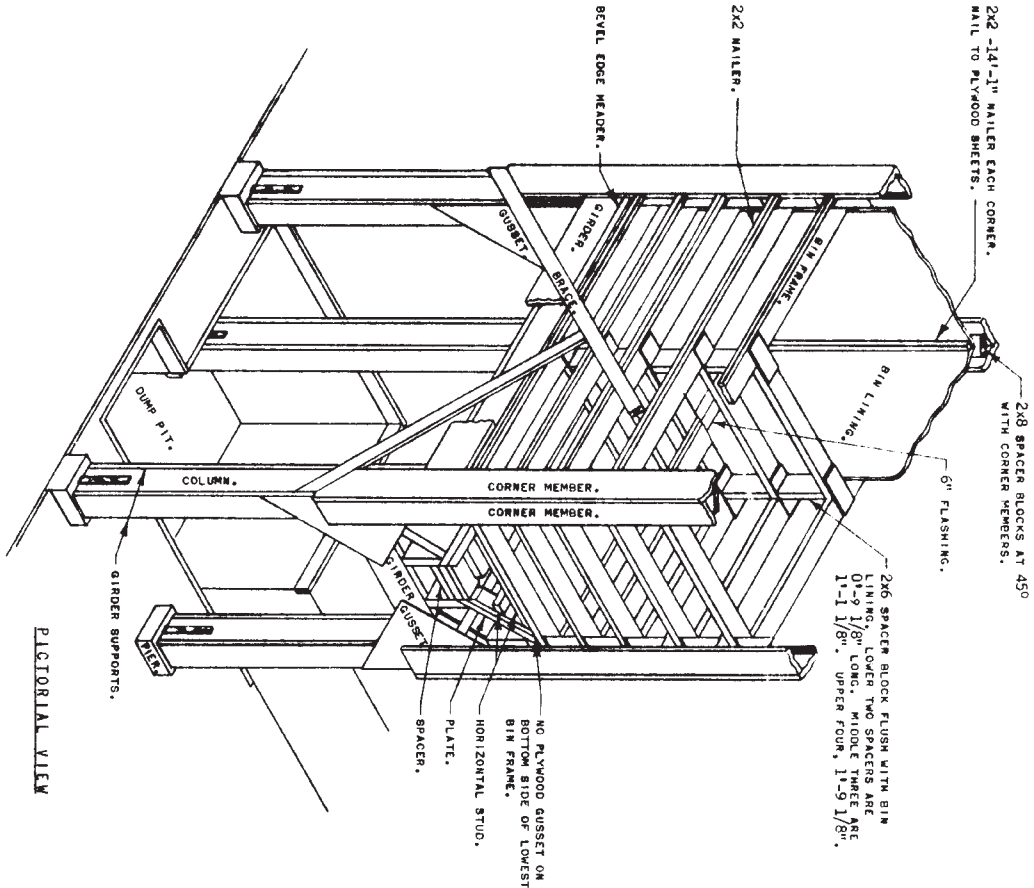
GRAIN DOOR DETAIL
SCALE: 1" = 1'-0"



FOOTING DETAIL
SCALE: 3/4\"/>

SEE SHEET 10 FOR THE SHORT FOOTING DETAIL.

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BIN CAPACITY

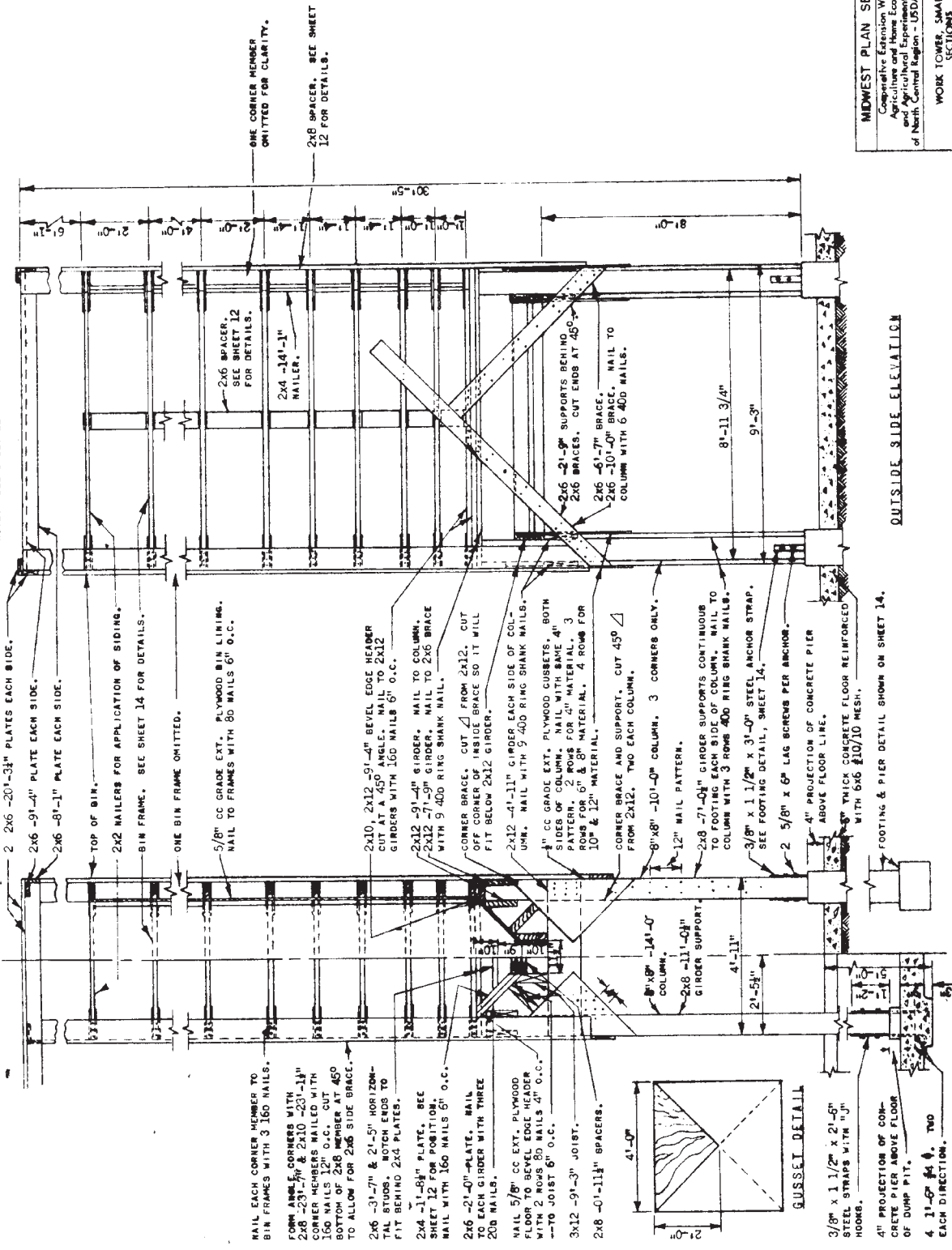
180 BU.
180 BU.

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WORK TOWER, SMALL BIN,
 FLOOR PLAN

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NOTE: SEE SHEET 11 FOR ROOFING DETAIL.



OUTSIDE SIDE ELEVATION

HALF END ELEVATION - HALF SECTION

ONE CORNER MEMBER OMITTED FOR CLARITY.

2x8 SPACER, SEE SHEET 12 FOR DETAILS.

2x6 SPACER, SEE SHEET 12 FOR DETAILS.

2x4 -1 1/2" NAILER.

2x6 -2 1/2" SUPPORTS BEHIND 2x6 BRACES, CUT ENDS AT 45°

2x6 -5 1/2" BRACE

2x6 -10 1/2" BRACE, NAIL TO COLUMN WITH 6 40D NAILS.

2 2x6 -20 1/2 -3 1/2" PLATES EACH SIDE.
2x6 -9 1/2 -4 1/2" PLATE EACH SIDE.
2x6 -8 1/2 -1 1/2" PLATE EACH SIDE.

TOP OF BIN.
2x2 NAILERS FOR APPLICATION OF SIDING.
BIN FRAME. SEE SHEET 14 FOR DETAILS.
ONE BIN FRAME OMITTED.

5/8" CC GRADE EXT. PLYWOOD BIN LINING.
NAIL TO FRAMES WITH 8D NAILS 6" O.C.

2x10, 2x12 -9 1/2 -4 1/2" BEVEL EDGE HEADER CUT AT A 45° ANGLE. NAIL TO 2x12 GIRDERS WITH 10D NAILS 6" O.C.

2x12 -9 1/2 -4 1/2" GIRDER. NAIL TO COLUMN.
2x12 -7 1/2 -9" GIRDER. NAIL TO 2x6 BRACE WITH 9 40D RING SHANK NAIL.

CORNER BRACE. CUT FROM 2x12, CUT OFF CORNER OF INSIDE BRACE SO IT WILL FIT BELOW 2x12 GIRDER.

2x12 -4 1/2 -11" GIRDER EACH SIDE OF COLUMN. NAIL WITH 9 40D RING SHANK NAILS.

1" CC GRADE EXT. PLYWOOD CURSBETS, BOTH SIDES OF COLUMN. NAIL WITH SAME 4" PATTERN. 2 ROWS FOR 4" MATERIAL, 3 ROWS FOR 6" & 8" MATERIAL, 4 ROWS FOR 10" & 12" MATERIAL.

CORNER BRACE AND SUPPORT. CUT 45° FROM 2x12, TWO EACH COLUMN.

8"x8" -10 1/2 -0" COLUMN, 3 CORNERS ONLY. 12" MAIL PATTERN.

2x8 -7 1/2 -0" GIRDER SUPPORTS CONTIGUOUS TO FOOTING EACH SIDE OF COLUMN. NAIL TO COLUMN WITH 3 ROWS 40D RING SHANK NAILS.

3/8" x 1 1/2" x 31 -0" STEEL ANCHOR STRAP. SEE FOOTING DETAIL, SHEET 14.

2 5/8" x 6" LAG SCREWS PER ANCHOR.
4" PROJECTION OF CONCRETE PIER ABOVE FLOOR LINE.
1/2" THICK CONCRETE FLOOR REINFORCED WITH 6x6 #10/10 MESH.

FOOTING & PIER DETAIL SHOWN ON SHEET 14.

MAIL EACH CORNER MEMBER TO BIN FRAMES WITH 3 16D NAILS.

FORM BIN CORNERS WITH 2x8 -23" MEMBERS & 2x10 -23 1/2" CORNER MEMBERS. FILL WITH JOINTS 12" O.C. CUT BOTTOM OF 2x8 MEMBER AT 45° TO ALLOW FOR 2x6 SIDE BRACE.

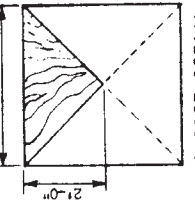
2x6 -3 1/2 -7" & 2 1/2 -5" HORIZONTAL STUDS, NOTCH ENDS TO FIT BETWEEN 2x4 PLATES.

2x4 -1 1/2 -8 1/2" PLATE. SEE SHEET 12 FOR POSITION. NAIL TO EACH GIRDER WITH THREE 20D NAILS.

MAIL 5/8" CC EXT. PLYWOOD FLOOR TO BEVEL EDGE HEADER WITH 2 ROWS 8D NAILS 4" O.C. TO JOIST 6" O.C.

3x12 -9 1/2 -3" JOIST.

2x8 -0 1/2 -11 1/2" SPACERS.



GUSSET DETAIL

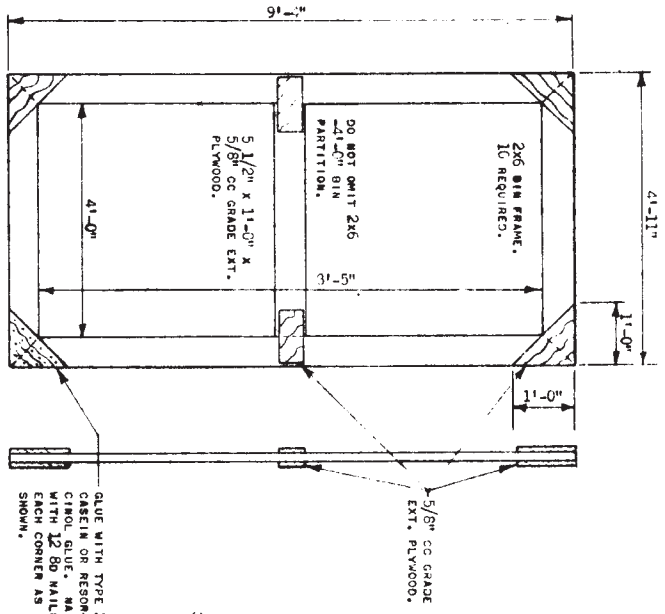
3/8" x 1 1/2" x 2 1/2" STEEL STRAPS WITH "J" HOOPS.

4" PROJECTION OF CONCRETE PIER ABOVE FLOOR OF DUMP PIT.
4 3 1/2" #4 #4, TWO EACH DIRECTION.

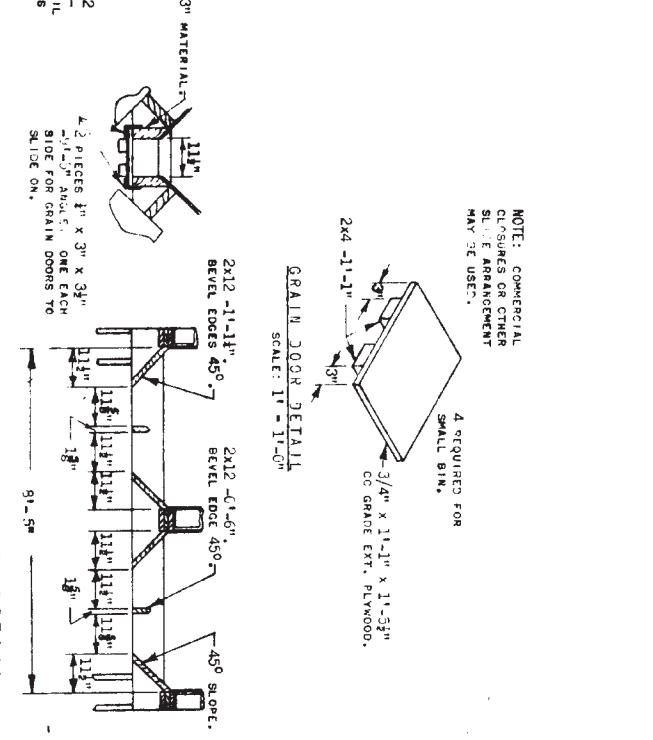
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NOTE: THE BOTTOM SIM FRAME IS CONSTRUCTED WITH PLYWOOD ONE SIDE ONLY. SEE SECTION DETAIL SHEET 13.



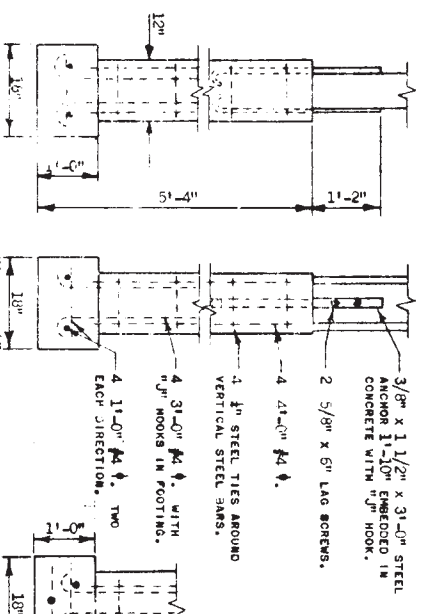
BIN FRAME DETAIL
SCALE: 3/4" = 1'-0"



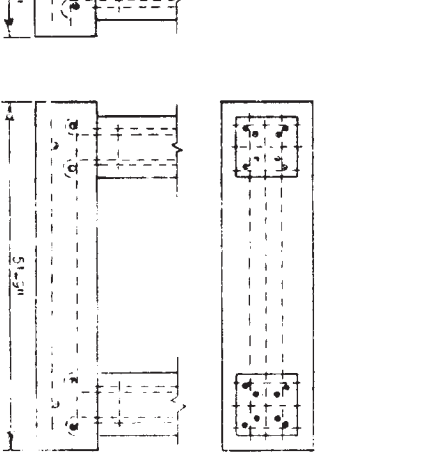
GRAIN DOOR DETAIL
SCALE: 1" = 1'-0"

BIN BOTTOM DETAIL

SEE SHEET 13 FOR DETAILS OF THE SHORT FOOTING.



FOOTING DETAIL
SCALE: 3/4" = 1'-0"



OPTIONAL FOOTING DETAIL
SCALE: 3/4" = 1'-0"

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