NOTES: 1. THREE SIZES OF BUILDINGS ARE REPRESENTED:
   80 x 128 60,000 C.Y.C. SINGLE EXTERIOR WALL (ACROSS ALLEY)
   80 x 192 80,000 C.Y.C. SINGLE EXTERIOR WALL (ACROSS ALLEY)
   80 x 208 60,000 C.Y.C. DOUBLE EXTERIOR WALL (ACROSS ALLEY)

   CAUTION: THE DIFFERENT SIZE BUILDINGS HAVE STORAGE RING WITH DIFFERENT VENTILATION DUCTS AND AIR REQUIREMENTS. SEE SHEET B FOR VARIATIONS IN DUCT DIMENSIONS.

   WHEN DETAILS ARE THE SAME FOR EACH, ONE VIEW OR SECTION SUFFICE FOR ALL 3 SIZES. ON SOME DRAWINGS ONLY ONE BASIC VIEW IS GIVEN WITH DIMENSION ALTERNATIVES COVERING.

   ACCORDING TO BUILDING SIZE, SEE DIMENSIONS ALTERNATIVE COVERING. PLACE VIEW AND SECTIONAL VIEW TO THE LEFT OF THE SIZE APPLIES, WHERE 2 SIMILAR VIEWS ON SECTIONS APPEAR, THE 0.0 OR 2.0 IS DRAWN BY A LARGER SCALE THAN THE OTHER SIZE. THE ORIGINAL PLANS WERE COOPERATIVELY DEVELOPED BY EXTENSION AGRICULTURAL ENGINEERING, NORTHERN IOWA STATE UNIVERSITY, FRED, IOWA. THE VEGI-VEY VALLEY POTATO RESEARCH CENTER, AND THE RED RIVER VALLEY POTATO HUB, ROY, ND. "THE COMPLETE SET FOR A SPECIFIC SIZE MAY BE PURCHASED FROM EXTENSION AGRICULTURAL ENGINEERING, NDU, FRED, ND 58034-3036.

   2. THESE DRAWINGS ARE NOT COMPLETE BUILDING PLANS, BUT MAY BE USED IN CONSTRUCTION OF COMPLETE BUILDING PLANS. SEE SHEET B.

GENERAL DESIGN CRITERIA:

1. FLOOR-FOUNDATION DESIGN BASED ON 2000 LB./SQ. FT. VERTICAL LOAD CAPACITY AND A CONCENTRATED TRUCK WHEEL LOAD OF 4000 LB.
2. PASTURE SPECIFIC WEIGHT OF 162 LB. PER CUBIC FOOT (57.1 G/L). 3. CLEAN, WET, SMOOTH SURFACES, BUMPED POTS (E.G., MACHINES) THAT EXERT A HORIZONTAL WIND PRESSURE OF AN EQUIVALENT FLUID DENSITY OF 12 LBS PER CUBIC FOOT.
4. MAXIMUM GROUND DEPTH OF 17 FT WITH BIMAXIMUM SAVAGE HEIGHT OF 30 FT ON 3 FT HIGH SUPPORT WALLS.
5. LUMBER BENDING STRESS (S = (750 fl) 2) IS MORE CRITICAL THAN HORIZONTAL SHEAR STRESS (T = 56) FOR STUDS. THE ALLOYABLE COMPRESSION STRESS WAS 20 & 57MPA FOR PERPENDICULAR TO GRAIN.
6. LUMBER DESIGN ALLOWABLE STRESSES WERE NOT ADJUSTED FOR MEASUREMENTS OR TEMPERATURE AS PERMITTED BY THE 1951 NATIONAL DESIGN SPECIFICATIONS.
7. NO SPECIAL DESIGN CONDITIONS WERE USED FOR SNOW OR WIND LOADS. THE DESIGN SNOW LOAD AS 25 LBS PER 100 FT OF ROOF.
8. CHIMNEY BAKERS MUST BE DEPOSITED INSTALLED AND INSTALLATION STAYS DEMOLISHED ALONG WITH MACHINES AND TAINS.
9. PURCHASE TRUSSES TO CONFORM WITH BUILDING WIDTH/POTATO AND LOCAL SNOW LOAD CONDITIONS. SECURELY FASTENED AGAINST HORIZONTAL AND VERTICAL LOADS.

VENTILATION DESIGN:

1. VENTILATION DUCT AREA OF 1 CU. FT. PER MINUTE PER C.Y.C. (1 C.P./C.U.)
2. VENT MAXIMUM AEROSPEED OF 1500 FEET PER MINUTE (17 MPH).
3. THROUGH TYPE VENTILATION WITH A 75% DETERMINATION FOR VENTS ALONG EACH SIDES AND 25% THROUGH THE BOTTOM CENTER OF THE BIN. EXTRA AIR CAPACITY IS REQUIRED FOR WALL VENTS THE SINGLE-VENT DESIGNS.
4. SINGLE-WALL SHELVING VENTILATION RATE OF 1 CU. FT. PER MINUTE PER SQ. FT. OF WALL SURFACE ALONG AEROSPEED REGULATED BY RESTRICTION AT TOP WALL VENT OPENING.
5. AT VENT DUCT TRANSITIONS, A DOWNSWEEP DUCT CROSS-SECTION AREA OF 0.75 TO 0.87 MINIMUM OF UPSTREAM CROSS-SECTION DUCT AREA.
6. IN DETERMINATION OF CROSS DUCT CROSS-SECTION AREA TO AIR EXIT SLOT AREA OR AN EFFECTIVE DUCT AREA TO EFFECTIVE AIR EXITATION AREA OF 0.75.
7. EXPERIENCE IS LIMITED WITH THE PLYWOOD-COVERED LEAVES DUCTS. UNDER EXTREME CONDITIONS OF WEATHER, SMALL POTATOES AND VERY LARGE DUCTS A CENTER SLOT IN THE PLYWOOD MAY BE NEEDED TO LET SOME AIR THROUGH. THEN DESIGN FOR 3 SLOTS INSTEAD OF 2.
8. SEE THE MOST UP TO DATE PUBLICATION FOR AIR HEATING DESIGN RECOMMENDATIONS.

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NOTES:
1. LEANER DUCTS DIFFER WITH EACH OF THE THREE BUILDING SIZES. 
   SEE LETTER A, B, C, D, E, F, AND G AS APPROPRIATE.
2. BOTH 80' x 172' AND 80' x 204' ARE OF SIMILAR DESIGN.
   THE MAJOR DIFFERENCES ARE THE USE OF LARGER BINS.
   THIS IN TURN AFFECTS VENTILATION AIR SYSTEM DESIGN
   WHICH IS A MAJOR PART OF CONTROLLED ENVIRONMENT
   POTATO STORAGE.

DIMENSION THE SAME AS 80' x 204' ONLY
THE LEANER DUCTS DIFFER

(60' x 204') FLOOR PLAN

(80' x 172') FLOOR PLAN

(80' x 204') FLOOR PLAN
EXTerior Wall Plate Detail
For 80' x 172' & 80' x 204' SIZES.

Single Exterior Wall Sill & Adjacent Lealer Ventilation Duct Inlet Detail
(NO RESIST POTATO LOAD)

1/2" x 8" SILL ANCHOR BOLTS 4' O.C. STAGGERED
1/2" OFF E

Exterior Wall (no potato load) Foundation Reinforcement for 80' x 204' Double Exterior Wall Design (not to scale)

NOTE: Design and Dimensions are Same for All Sizes Except Where Specified
NOTE: Drawings are intended to show concepts and typical features of potato storage buildings; a structural engineer should be consulted when a specific building is to be built.
LATCH FOR INSULATED (EXTERIOR) BIN DOORS

NOTE: The net open area of the trench cover must be equal or larger than the sloped floor trench area directly below bin front doors.

FLOOR TRENCH COVER & DETAIL