BEFORE YOU BUILD

Before you start building your new grain bin, contact your local Touchstone Energy[®] Cooperative.

The call can help you properly place your new bin in relationship to existing power lines. Adequate clearances can reduce the risk of accidental contact between power lines and tall farm equipment such as portable grain augers, elevators or grain probing devices. The National Electrical Safety Code (NESC)* requires specific line clearance requirements for grain bins located near power lines. Building a grain bin too close to a power line may mean that it will have to be moved, often at the farmer's expense. For example, a 35-foot tall bin should be placed no less than 104 feet away from the power line. Taller bins that can be filled by a portable grain auger must be placed even further from power lines.

Proper siting of grain bins in relation to existing high voltage power lines is extremely important. In addition to safety considerations, there are also requirements for power line clearances which are mandated by national wiring codes. A bin placed too close to a power line may need to be moved or the power line relocated (i.e. raised or rerouted) due to a code violation. These changes are likely to be expensive and may be charged to the bin owner. Talk with your electric supplier **before** the bin site is confirmed.

The NESC specifies the line clearance requirements for grain bins located

close to power lines. The NESC specifies both the horizontal distance between the side of the bin and an adjacent power line and the vertical clearance above the bin to the nearest power line (NESC Article 234, Section F).

* The NESC is a code which specifies minimum construction standards for safe transmission and distribution of electricity to the meter location.



For more information, contact your local electric cooperative:

Black Hills Electric Cooperative PO Box 792 • Custer, SD 57730-0792 605-673-4461 • www.bhec.coop

Bon Homme Yankton Electric Assn. PO Box 158 • Tabor, SD 57063-0158 605-463-2507 • www.byelectric.com

Butte Electric Cooperative
PO Box 137 • Newell, SD 57760
605-456-2494 • www.butteelectric.com

Cam Wal Electric Cooperative
PO Box 135 • Selby, SD 57472
605-649-7676 • www.cam-walnet.com

Central Electric Cooperative PO Box 850 • Mitchell, SD 57301 605-996-7516 • www.centralec.coop

Charles Mix Electric Association PO Box 10 • Lake Andes, SD 57356 605-487-7321 • www.cme.coop

Cherry-Todd Electric Cooperative PO Box 169 • Mission, SD 57555 605-856-4416 • www.cherry-todd.com

Clay Union Electric Corporation
PO Box 317 • Vermillion, SD 57069
605-624-5525 • www.clayunionelectric.coop

Codington-Clark Electric Cooperative PO Box 880 • Watertown, SD 57201-0880 605-886-5848 www.codingtonclarkelectric.coop

Dakota Energy Cooperative
PO Box 830 • Huron, SD 57350-0830
605-352-8591 • www.dakotaenergy.coop

Douglas Electric Cooperative
PO Box 370 • Armour, SD 57313
605-724-2323 • kenvanzee@unitelsd.com

FEM Electric Association
PO Box 468 ● Ipswich, SD 57451
605-426-6891 ● www.femelectric.coop

Grand Electric Cooperative
PO Box 39 ● Bison, SD 57620
605-244-5211 ● www.grandelectric.coop

H-D Electric Cooperative
PO Box 1007 • Clear Lake, SD 57226
605-874-2171 • www.h-delectric.coop

Kingsbury Electric Cooperative PO Box 126 ● DeSmet, SD 57231-0126 605-854-3522 ● www.kec-sd.coop

of South Dakota

Touchstone Energy Cooperatives

Lacreek Electric Association
PO Box 220 • Martin, SD 57551
605-685-6581 • www.lacreek.com

Lake Region Electric Association
PO Box 341 • Webster, SD 57274
605-345-3379 • www.lakeregion.coop

Moreau-Grand Electric Cooperative PO Box 8 • Timber Lake, SD 57656 605-865-3511 • www.mge.coop

Northern Electric Cooperative
PO Box 457 • Bath, SD 57427
605-225-0310 • www.northernelectric.coop

Oahe Electric Cooperative
PO Box 216 • Blunt, SD 57522
605-962-6243 • www.oaheelectric.com

Rosebud Electric Cooperative
PO Box 439 • Gregory, SD 57533
605-835-9624 • www.rosebudelectric.com

Sioux Valley Energy PO Box 216 • Colman, SD 57017 605-534-3535 • www.siouxvalleyenergy.com

Southeastern Electric Cooperative PO Box 388 • Marion, SD 57043-0388 605-648-3619 www.southeasternelectric.com

Traverse Electric Cooperative
PO Box 66 • Wheaton, MN 56296
320-563-8616 • www.traverseelectric.com

Union County Electric Cooperative PO Box 459 • Elk Point, SD 57025-0459 605-356-3395 • www.unioncounty.coop

West Central Electric Cooperative PO Box 17 • Murdo, SD 57559 605-669-2472 • www.wce.coop

West River Electric Association PO Box 412 • Wall, SD 57790 605-279-2135 • www.westriver.com

Whetstone Valley Electric Co-op PO Box 512 • Milbank, SD 57252 605-432-5331 • www.whetstone.coop

Basin Electric Power Cooperative 1717 E. Interstate Ave. • Bismarck, ND 58503 701-223-0441 • www.basinelectric.com

East River Electric Power Cooperative PO Box 227 • Madison, SD 57042-0227 605-256-4536 • www.eastriver.coop

Rushmore Electric Power Cooperative PO Box 2414 • Rapid City, SD 57709 605-342-4759 • www.rushelec.com



GRAIN BINS PLAN BEFORE YOU BUILD

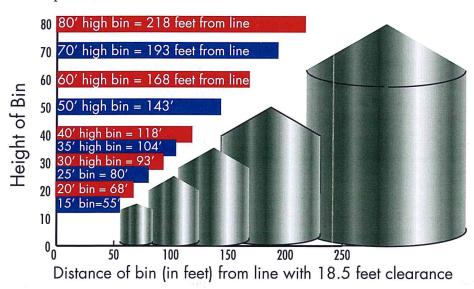
If you're in the market for a grain bin, you've given plenty of thought to the size you'll need to handle your crop. But before you pour the concrete, give your local electric cooperative a call to ensure that your bin is properly placed in relationship to any nearby power lines. This call can save you hundreds of dollars and lots of frustration.

To assist in understanding clearance rules mandated by the NESC, a further explanation is provided in Appendix I of this pamphlet. Appendix II provides a complete listing of the requirements as reprinted from the NESC. Notice that bins filled by permanently installed augers, conveyers or elevator systems are treated separately from bins filled by portable augers. These rules also apply to feed storage bins, such as hopper bottom bins serving livestock production buildings. Anyone involved in the site planning and construction of grain bins should read and understand Appendix II.

Note: Requirements of the National Electrical Safety Code, Article 234, Section F pertain only to bins or power lines constructed after August 1989. Bins or power lines installed prior to this date are not required to conform to these clearance rules. However, additions to an older bin which increases its height may cause it to now be covered by NESC requirements.

The simplest and least expensive way to avoid these costly line construction requirements is to locate bins far enough away from overhead power lines so that the NESC clearance envelope is not violated. The table below lists the minimum horizontal distance needed between grain bins of various sizes and a typical power line. Placing bins at these distances reduces the chance of an electrical accident and avoids the need for special power line construction. This helps both the farmer and the power supplier.

The taller the bin, the greater the distance it must be from the power line.



Based on a typical power line having a vertical clearance of 18.5 feet above the ground and a supply line phase to ground voltage of more than 750 V to 22KV; National Electrical Safety Code Rule 232.

Appendix I: Discussion of National Electrical Safety Code, Article 234, Section F

This section provides additional discussion and details on the requirements of NESC 234, Section F. Note that only bins or power lines constructed after August 1989 are affected by these requirements.

Considering horizontal clearances first, the NESC specifies clearances for both the nonloading and loading sides of a grain bin (refer to Figure 234-3 on the adjoining page). The nonloading side of a bin is that area where an auger, conveyor, elevator or other filling device cannot operate due to an obstruction. Typical obstructions include public roads, permanent fences, abutting buildings or any other permanent structure. Just because the bin is not typically filled from a particular side does not define it as the nonloading side of the bin. A permanent obstruction must exist that prevents loading of the bin.

The required distance from the power line to the side wall of the bin for nonloading sides must be at least 15 feet. If the 15-foot distance is not met, either the power line or the grain bin must be moved.

On the loading side(s) of the bin, distances must be greater, due to a greater risk of accidents. The distance horizontally from the bin wall to the power line is determined by the height of the highest access door or other probing port of the bin. In 234-3, this height is defined as V. Adding a distance of 18 feet to V determines the value H in Figure 234-3. Beyond this H distance, a minimum sloped clearance of 1 foot vertical drop for each 1.5 feet of horizontal travel must be designed. The NESC ruling also specifies the vertical clearance above the bin between the top of the bin and the nearest overhead line. A clearance of at least 18 feet directly above the highest opening or probing port must be maintained. This 18-foot clearance must encircle the bin around all loading sides, out to distance H as shown in the figure. These rules define the "envelope clearance" that must exist around the bin.

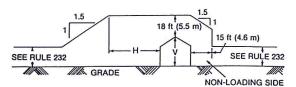
Appendix II: Reprint of Article 234, Section F from

the National Electrical Safety Code.

Clearances of Wires, Conductors, Cables and Rigid Live Parts From Grain Bins

1. Grain Bins Loaded By Permanently Installed Augers, Conveyors or Elevator Systems:

All portions of grain bins that are expected to be loaded by the use of a permanently installed auger, conveyer or elevator system may be considered as a building or other installation under Rule 234C for the purpose of determining appropriate clearances of wires, conductors, cables and rigid live parts, except that a vertical clearance above the bin of not less than 18 feet (5.5 meters) shall be maintained above the level of the highest probe port.



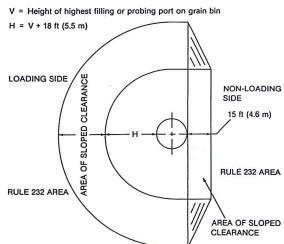


Fig. 234-3 - Clearance Envelope for Grain Bins Filled by Portable Augers, Conveyors or Elevators

REFERENCE: Reprinted from IEEE Std C2-1993,1993 National Electrical Safety Code, Copyright ©1993 by The Institute of Electrical and Electronics Engineers, Inc. The IEEE takes no responsibility from the reader's misinterpretation of said information resulting from the placement and context in this publication. Information is reproduced with the permission of the IEEE.

2. Grain Bins Loaded by Portable Augers, Conveyors or Elevators (With No Wind Displacement)

a. The clearance of wires, conductors, cables and rigid live parts from grain bins that are expected to be loaded by the use of portable auger, conveyer or elevator shall be not less than the values illustrated in Fig. 234-3.

EXCEPTION: Clearances of the following items on the nonloading side of grain bins shall be not less than those required by Rule 234C for clearances from buildings:

- 1) support arms, effectively grounded equipment cases
- 2) Insulated communication conductors and cables, messengers, surgeprotection wires, grounded guys, neutral conductors meeting Rule 230E1 and supply cables meeting Rule 230C1.
 - 3) Supply cables of 0 to 750 V meeting Rules 230C2 or 230C3
- b. Any side of a grain bin is considered to be a nonloading side if it is so designated or if it is so closely abutting another structure or obstruction or so close to a public road or other right-of-way that a portable auger, conveyor or elevator is not reasonably anticipated to be used over that side or portion to fill the arain bin.
- c. Where an agreement excludes the use of portable augers, conveyors or elevators from a designated portion of a grain bin, such portion is considered to be a nonloading side.