

BUILDING OR REMODELING LIVESTOCK OR POULTRY BUILDINGS

Recommended Guidelines

Fire Containment

1. New structures should not be built within 50 feet of an existing building or structure (i.e. grain bin, grain dryer, etc.). When possible, consideration should be given to maintaining separation distances greater than the minimum of 50 feet between buildings.
2. Interior wall and ceilings within 10 feet of a door entering or exiting a common corridor, between multiple sections of a livestock confinement complex, should be constructed of materials* which possess a Class A Fire Rating based on ASTM E-84 Standard (Standard Test Method of Surface Burning Characteristics of Building Materials). Materials that would be considered acceptable**, may include, but not be limited to the following:
 - Class A FRP Board over 3/8-inch plywood
 - Class C FRP board over 3/8-inch plywood covered with 15 mils of Contego Intumescent Paint*** applied by a painting contractor in accordance with the paint manufacturer specifications over the Class C FRP board
 - HDPE (High Density Polyethylene) sheeting over 3/8-inch plywood covered with 15 mils of Contego Intumescent Paint*** applied by a painting contractor in accordance with the paint manufacturer specifications over the HDPE sheeting
 - Corrugated sheet metal over wood or steel studs
 - Aluminum faced plywood sheeting
 - Other materials listed as Class A Fire Rated materials based on ASTM E-84 Standard.
 - The common corridor between buildings, outside of this 10 feet distance, should be constructed of light weight framing so as to prevent rapid fire spread from one section of the complex to another via the walkway between buildings. (See Item # 5 below).

* Materials within 4 feet of the floor in hog confinement buildings and within 5 feet of the floor in cattle confinement buildings should be designed to withstand continual physical contact by livestock. Some of the materials listed above would meet the fire criteria required but may not withstand contact of livestock on a daily basis. Material selection should take this into account.

** The Class A materials listed above would be acceptable assuming there is no insulation behind the materials which requires a 15-minute thermal barrier. If insulation such as polystyrene or polyurethane foam or board stock is present, a 15-minute thermal barrier would be required over the insulation prior to installing the Class A fire rated material or the insulation should be removed and replaced with insulation such as unfaced fiberglass batt insulation.

*** In addition to Contego Intumescent Paint, an approved equivalent paint product which has been tested by an outside independent third party and/or has been evaluated by Grinnell Mutual Reinsurance Company, in advance of application, may be considered acceptable over Class C FRP and HDPE within the sections of the building mentioned above.

3. One hour self-closing fire rated door**** (which will withstand exposure to corrosive environment) should be installed between the livestock area and the walkway within a multiple building complex. These doors should not be blocked open at any time.
4. If there is an attic area above the walkway, there must be a firestop in the attic area above each fire rated self-closing door.
5. We recommend light weight framing within the middle section of the walkways between buildings. Should a fire originate within one building of a multi-building complex, a tractor with loader, Skidsteer loader, etc. could be used to remove or separate a portion of the walk-way from the balance of the structure thus reducing the probability of fire spread between buildings via the frame walk-way. This should only be done if it could be done safely, with no chance of injury to the person on the tractor or related equipment.

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6. High Hazard areas such as generator equipment rooms, vehicle or equipment storage or repair areas, feed grinding or mixing rooms, etc. should be separated from the livestock handling area by 2-hour fire rated construction in accordance with the 2009 Edition of NFPA 150, Standard for Fire and Life Safety in Animal Housing Facilities.

**** An approved equivalent door which has been tested by an outside third party and/or has been evaluated by Grinnell Mutual Reinsurance Company, in advance of installation, may be considered an acceptable substitute for a one hour fire rated door.

Firestops and Firewalls

Firestops will be required for livestock or poultry buildings if the combined value of the building, equipment and animals, totals up to \$ 1,000,000 or more and the building is over 100 feet long. We strongly recommend firestops in the attics of all agricultural buildings over 100 feet long.

The firestops should be composed of a fire resistive material such as 5/8-inch fire rated gypsum wall board, (if used in a dry area) or an equivalent material and located at least every 75 feet to 100 feet or at other logical division areas in the building. The firestops should run from an imaginary line running from roof eave to eave and then to the roof peak, covering both sides of one truss and contacting the roof. The fire resistive material may need appropriate notching for the purlins to allow the firestop to fit tight against the roof in that area. If firestops are located above existing division walls, that wall should be lined with an appropriate fire resistive material to create a floor to peak-of-the roof firewall.

Electrical

Electrical systems in livestock and poultry buildings and sections of other agricultural buildings are subjected to corrosive manure gases, potential moisture problems, and dust problems. These buildings must be wired in accordance with Article 547 of the National Electrical Code (NFPA 70) and the other sections of the code that apply.

1. Install as much as possible of the electrical system, such as the electrical service entrance panel, time clocks, etc., outside of the animal area in an office or workroom. The next most desirable area is in a weatherproof electrical box on the outside of the building. If the electrical service entrance panel is located in the animal area, it should be mounted in a moisture, dust and corrosive resistive enclosure that meets the requirements of Article 547 of the National Electrical Code (NFPA 70).
2. Use one of the following types of electrical wire, as listed by the National Electric Code for use in wet or corrosive atmospheres:
 - a. Type UF (underground feeder) wire.
 - b. Type NMC wire (NMC stands for nonmetallic-sheathed cable; for both exposed and concealed work in dry, moist, damp or corrosive locations.) Type NM wire should not be used in livestock or poultry facilities.
 - c. Non-metallic conduit such as polyvinyl chloride (PVC) conduit. If the PVC conduit is used in a non-environmentally controlled building (such as an open front finishing building) the PVC should have expansion couplers installed in it. Metal conduit should not be used in livestock or poultry facilities unless it is needed for physical protection of the wire from damage by livestock or poultry.
3. Moisture and corrosive resistant electrical boxes and protective globes on lights should be used for those electrical components installed in the livestock or poultry area. Globes should be used in haymows, feed rooms and other dusty areas.
4. If Type UF electrical wire, Type NMC electrical wire, or PVC conduit is used with moisture and corrosive resistant electrical boxes and protective globes on lights, the electrical system should be surface mounted. In those areas where the wiring system is subject to physical damage (such as inside a pen of livestock) the electrical wire should have physical protection from damage such as with the use of metal conduit.

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5. The electrical service entrance panel should be located on an interior division wall. However, if mounted on an outside wall, there should be a minimum clearance of 1-inch air space behind the service entrance panel and the wall.
6. If the electrical service entrance head is located outside of the building, the electrical service entrance raceway conduit should be connected to either the side or bottom of the service entrance panel. This will prevent condensation from running down over the electrical fuses or breakers if the conduit entered the top of the box.
7. Electrically heated livestock waterers should be grounded using a three wire (third wire grounded) system for protection from electrocution. Please refer to the GMRC Loss Control Bulletin on this topic.
8. A surge protection device should be installed on the building's incoming electrical service entrance lines or at the electrical service entrance panel. Avoid yard pole installations.
9. The electrical power supplier should be requested to review the electrical blueprints for the building and/or visually inspect the electrical apparatus for an auxiliary powered generator should one be used.
10. Generators installed in a building should be enclosed in a 2-hour fire rated room to reduce the chance of fire spreading throughout the building from a generator malfunction. Adequate combustion air must be provided and the exhaust pipe must have adequate clearances from combustible material as it passes through a wall or ceiling.

Ground Fault Circuit Interrupters (GFCIs) and Equipotential Planes

1. All power washers must be protected with GFCI technology. The manufacturer must wire the GFCI into the power cord or, the electrical outlet the power washer is plugged into, must be a GFCI outlet, or protected by a GFCI breaker. This applies to both 120 volt and 240 volt power washers.
2. All outside outlets, bathroom outlets, shower room outlets, garage outlets, outlets used for power tools, outlets within 6 feet of a sink, outlets in locations that could be damp or wet and all other areas required by the National Electrical Code (NFPA 70), must have GFCI protection.
3. Grounding the building(s) electrical system must be done to comply with National Electrical Code. Additional grounding measures may be needed in an effort to reduce the chance of stray voltage in the building, such as equipotential planes. This is especially true in dairy facilities.
4. Equipotential planes shall be installed in all concrete floor confinement areas of livestock buildings that contain metallic equipment that is accessible to animals. (Section 547.10, in the 2011 edition of the National Electrical Code, NFPA 70).
5. Equipotential planes shall also be installed in outdoor confinement areas such as feedlots, around metallic equipment that is accessible to animals. The equipotential plane shall encompass the area around the equipment where the animal stands while accessing the equipment (Section 547.10, in the 2011 edition of the National Electrical Code, NFPA 70).

Lightning Protection and Surge Protection Devices

1. Due consideration should be given to installing a lightning protection system on the building in accordance with the National Fire Protection Association's (NFPA) Lightning Protection Code (NFPA 780).
2. Bulk tanks or other metal structures setting next to the building (if taller than the building) should be grounded, with lightning protection cable, to a ground rod for lightning protection purposes.
3. As mentioned in the Electrical Section, surge protection devices should be installed on the building's electrical service entrance panel.

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Fire Protection and Exiting

1. A 10-pound ABC dry chemical fire extinguisher (or its equivalent) should be installed in the building. If the building is over 200 feet long, an additional 10-pound ABC dry chemical fire extinguisher should be installed for each additional 100 feet.
2. The owner should draft and implement a fire exit plan for the building.
3. There should be a minimum of two separate and remote exits from each building. The maximum travel distance to reach an exit should not exceed 75 feet.
4. All exit doors must be able to be easily unlocked and opened from the inside without the use of keys or tools.
5. If the facility does not have an automatic start generator, illuminated exit signs and emergency lighting fixtures with battery back-up should be installed within the building to illuminate the path to exit doors.
6. The owner should contact the fire department and invite them to the site to visually inspect the operation and to implement a plan of attack in event of a fire.

Insulations

1. Grinnell Mutual only permits two types of insulation to be left exposed in an Agricultural building. Celotex Thermax (formerly called TF 600) insulation, with fiberglass strands embedded in it or fiberglass insulation with a backing material that has a flame spread of 25 or less.
2. Other insulations must be covered with an approved 15-minute thermal barrier or a flame barrier as recommended by the manufacturer. Some examples of a 15-minute thermal barrier would be 1/2 inch fire-rated drywall or 1/2 inch fire-rated plywood (in dry locations) or 5/8ths inch exterior grade plywood (in damp or wet locations).

Heating Systems

1. Only heaters listed by UL, ULC, AGA or another Nationally Recognized Testing Laboratory (NRTL) should be used. The heaters should be listed for use in an agricultural building. The heating system must be installed in accordance with national, state and local codes.
2. Unvented agricultural or construction heaters (designed to be used in animal areas with mechanical ventilation or buildings under construction) will not be allowed in office areas, shop areas or other areas where people are present or work, if there is no mechanical ventilation.
3. LP gas systems must comply with the most current editions of NFPA 58, LP Gas Code and NFPA 54, National Fuel Gas Code.
4. Natural gas systems must comply with the most current edition of NFPA 54, National Fuel Gas Code.
5. Plastic coated flexible corrugated metal gas tubing, is not listed for use in animal confinement buildings.
6. Stainless steel corrugated metal gas tubing, is not listed for use in animal confinement buildings.
7. Two-stage regulation (a 1st stage regulator at the tank and a 2nd stage regulator at the building) must be used for LP gas systems.
8. First stage and second stage regulator vents must be pointed downward and designed, installed or protected so their operation will not be affected by the elements (freezing rain, sleet, snow, ice, mud or debris).
9. Regulator vents must not be painted or otherwise blocked.
10. Regulators must be replaced as often as recommended by the regulator manufacturer. Regulators 15 years old and older must be replaced.

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11. Above ground LP gas lines must be protected from physical damage.
12. Buildings that have two different LP-Gas lines with different LP-Gas pressures in them must be identified with the pressure in each line.

Miscellaneous

1. The owner should develop and implement a maintenance program for the building and equipment.
2. If an incinerator is used, it should be 50 feet or more from the building.
3. Weeds and grass must be mowed at least 20 feet on all sides of the building.
4. If open burning is done, it should be done 100 feet or more away from the building and not during dry or windy conditions.
5. Above ground flammable and combustible liquids tanks must be kept at least 40 feet away from important buildings.
6. An alarm system that monitors power outage and temperature extremes combined with an auxiliary generator should be considered for totally enclosed animal buildings.
7. Building components should be protected from the corrosive environment that may be present in agricultural buildings. This may include using epoxy coated steel rebar in the concrete and covering metal truss plates with a protective coating or using stainless steel truss plates.
8. Before building or remodeling we recommend you contact the extension agricultural engineer or the Midwest Plan Service office in your state for current information on similar structures.
9. When you begin thinking about building a new building, be sure to contact Grinnell Mutual about specific recommendations we may have for your building and operation. If you are not insured with Grinnell Mutual, contact your own insurance carrier, to see if they have any requirements or recommendations before you build.
10. When agitating manure pits, KEEP OUT of the building during pit agitation and for at least 1 hour after agitating or pumping stops. All the fans in the building must be running on their highest setting and/or the curtains in the building must be lowered. If any dead hogs are noticed as employees re-enter the building, employees must exit the building immediately, and not re-enter the building until the atmosphere in the building has been deemed safe to enter. This could be done with a toxic gas monitor or by allowing the ventilation fans to run for another hour.

Disclaimer

These guidelines have been prepared as an underwriting reference for members of Grinnell Mutual Reinsurance Company and does not signify approval or disapproval by the Company of any product or device nor does it warrant or guarantee the insurability of a building or the performance of the product or building or safety to the user. Quotation here from is not permitted without written permission of the Company.

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