

I AM EXPO



2022 Great Lakes EXPO
December 6-8, 2022
Devos Place, Grand Rapids, MI

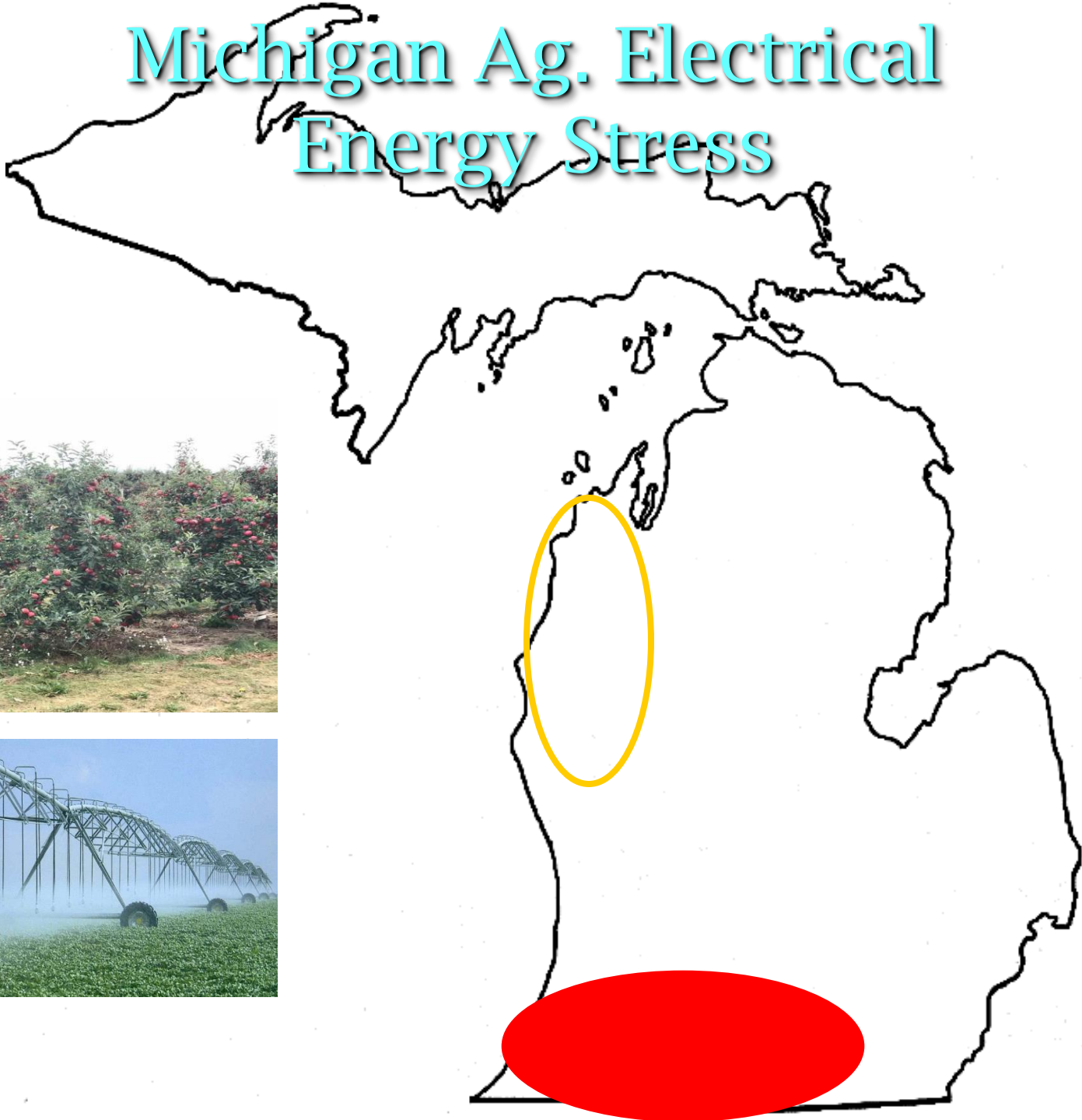
Electrical Grounding Safety & Energy Efficiency Potential for Irrigation

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Michigan Center Pivot Irrigation Systems



Michigan Ag. Electrical Energy Stress



High-Pressure Sprinklers



Low-Pressure Sprinklers



Electric Power to Operate Irrigation Motors





R.D. Schnieder, Nebraska Extension
EC 77-719

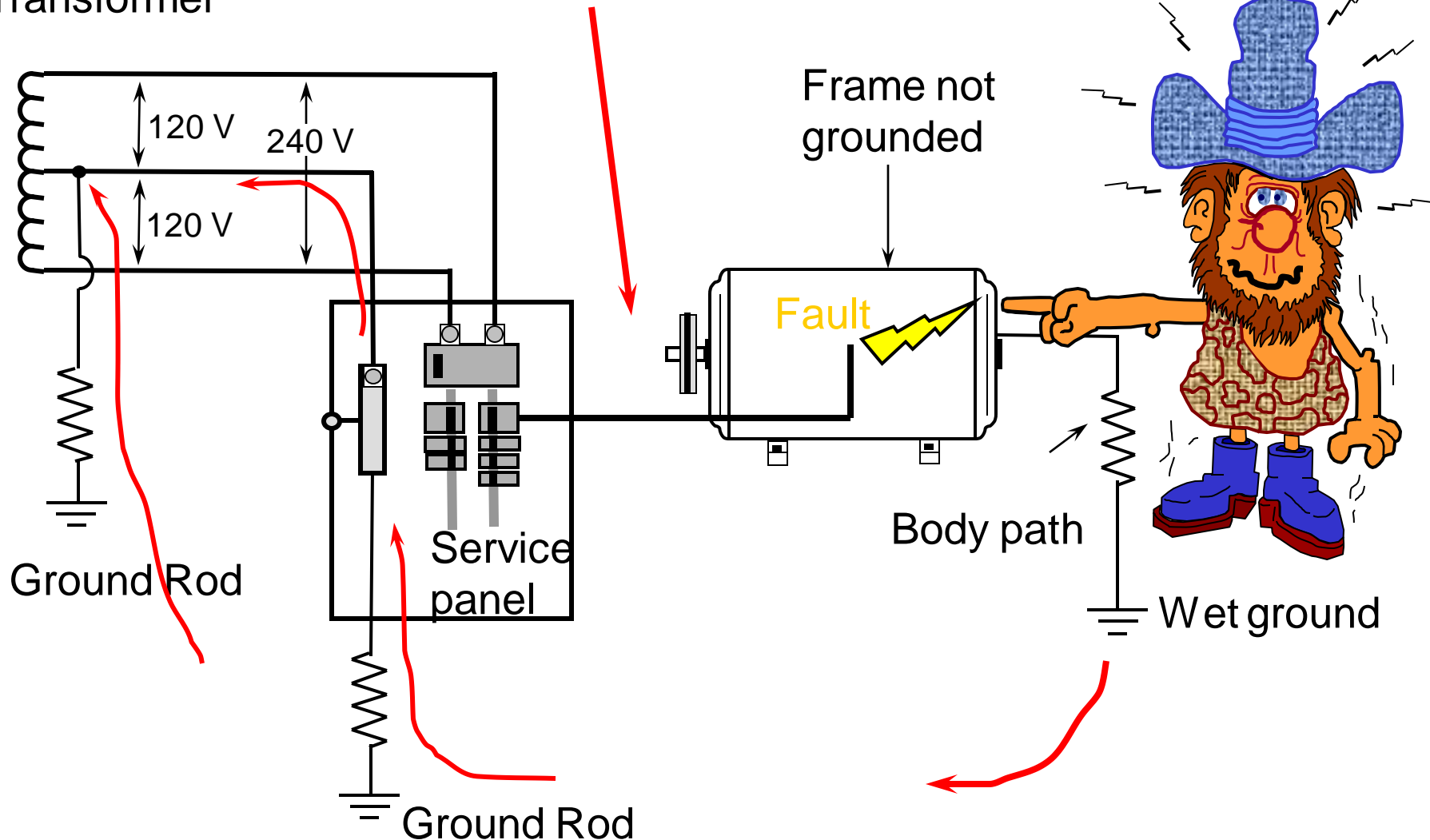
All about proper grounding & having
certified electricians install your system

Safety at the Water Pumping Station



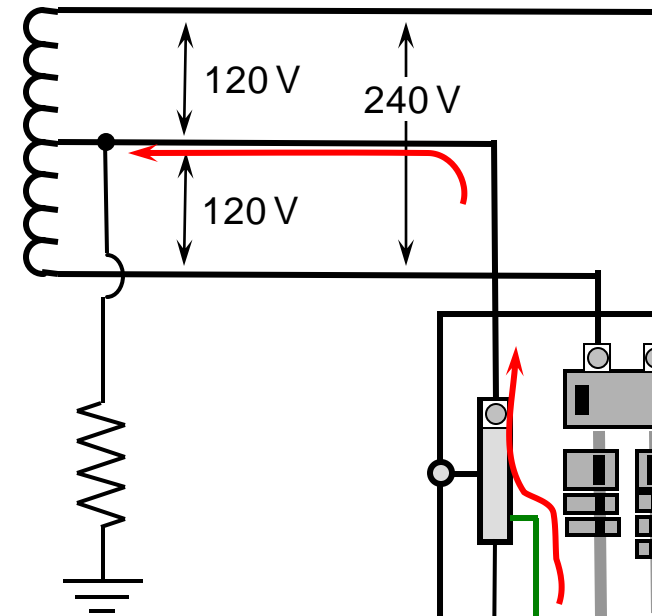
Irrigation motors or systems not connected to the service panel ground rods can result in a shocking experience. Be sure that the service panel is adequately grounded.

Transformer



Irrigation motors or systems connected to the service panel ground rods prevents a person from receiving a shock.

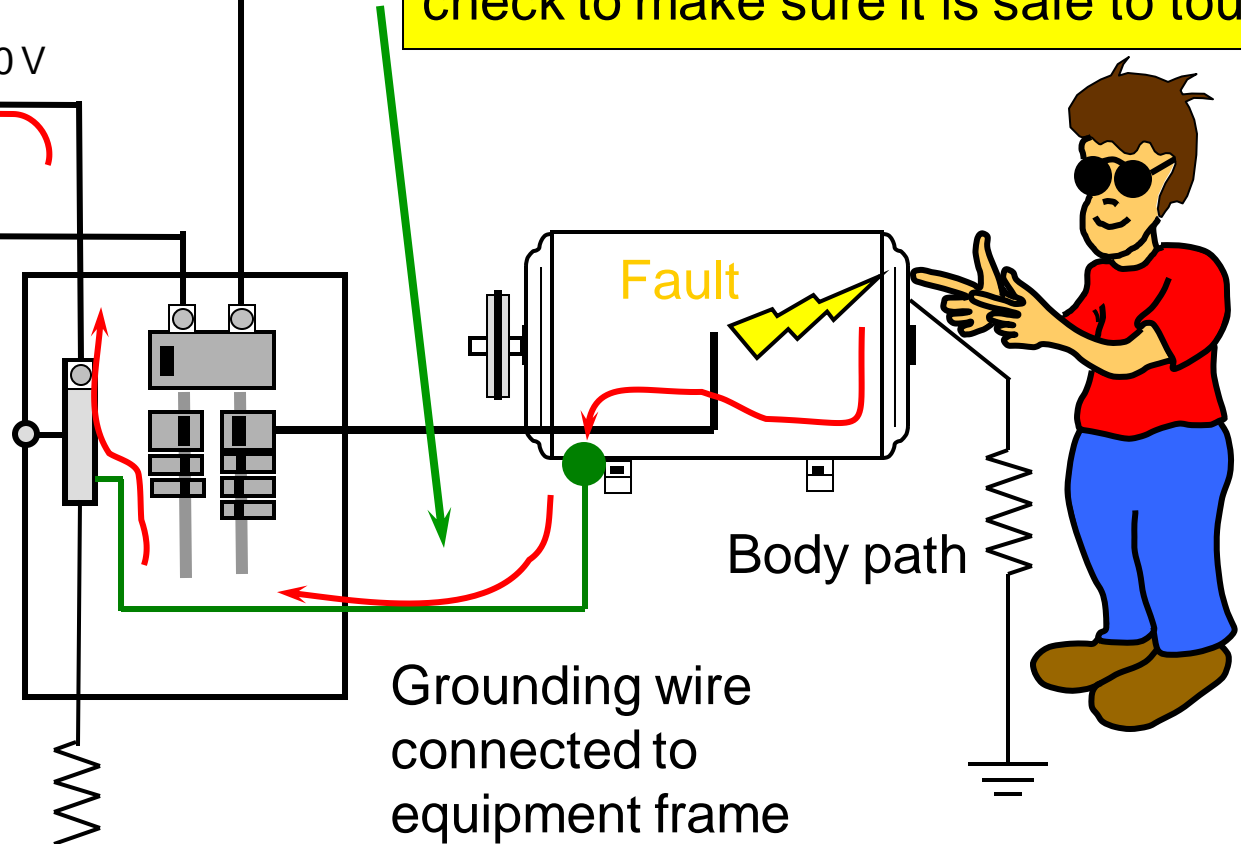
Transformer



Ground Rod

Ground Rod

When a motor is powered-up always check to make sure it is safe to touch

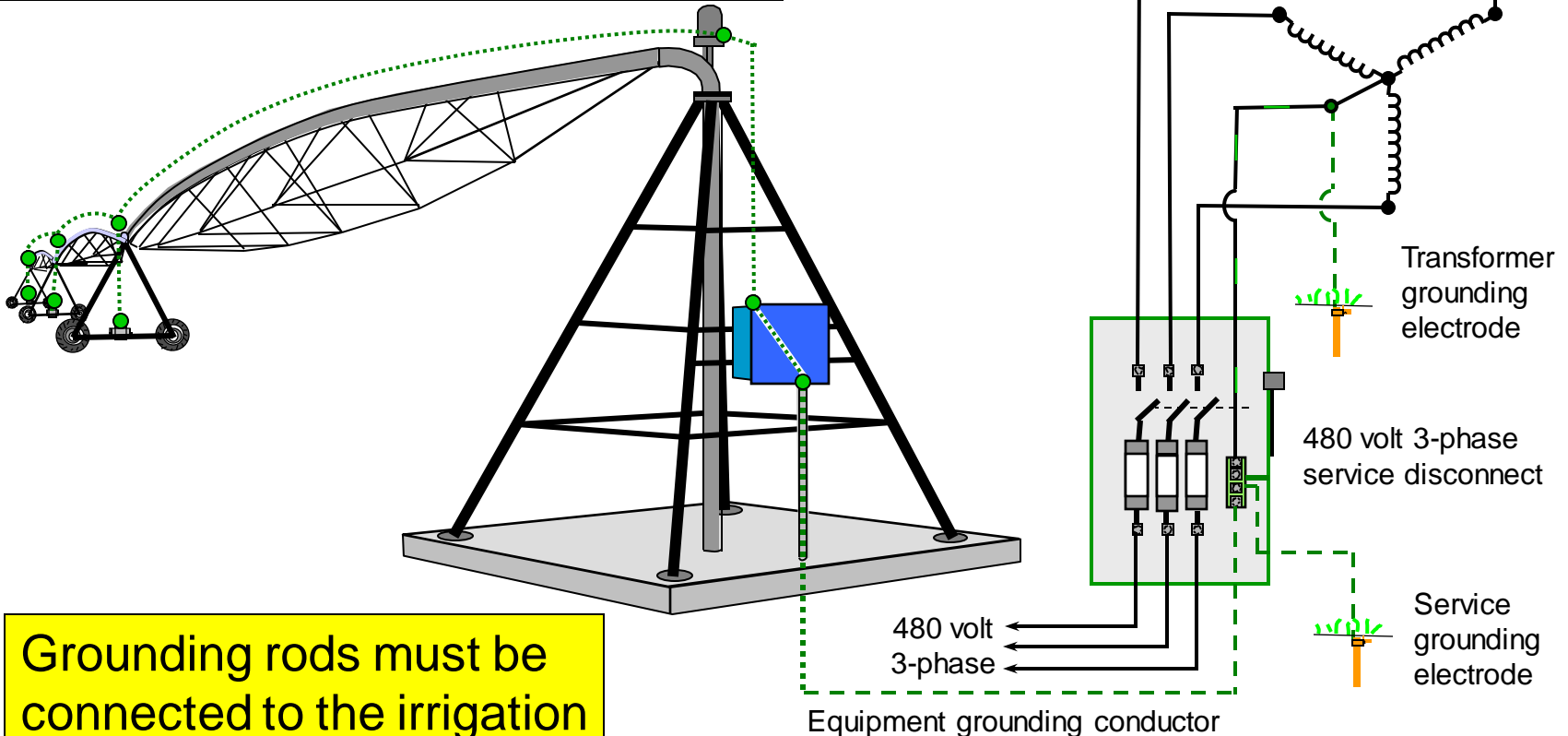


Body path

Grounding wire
connected to
equipment frame

Safety at the Center Pivot

When a pivot is powered-up always check to make sure it is safe to touch

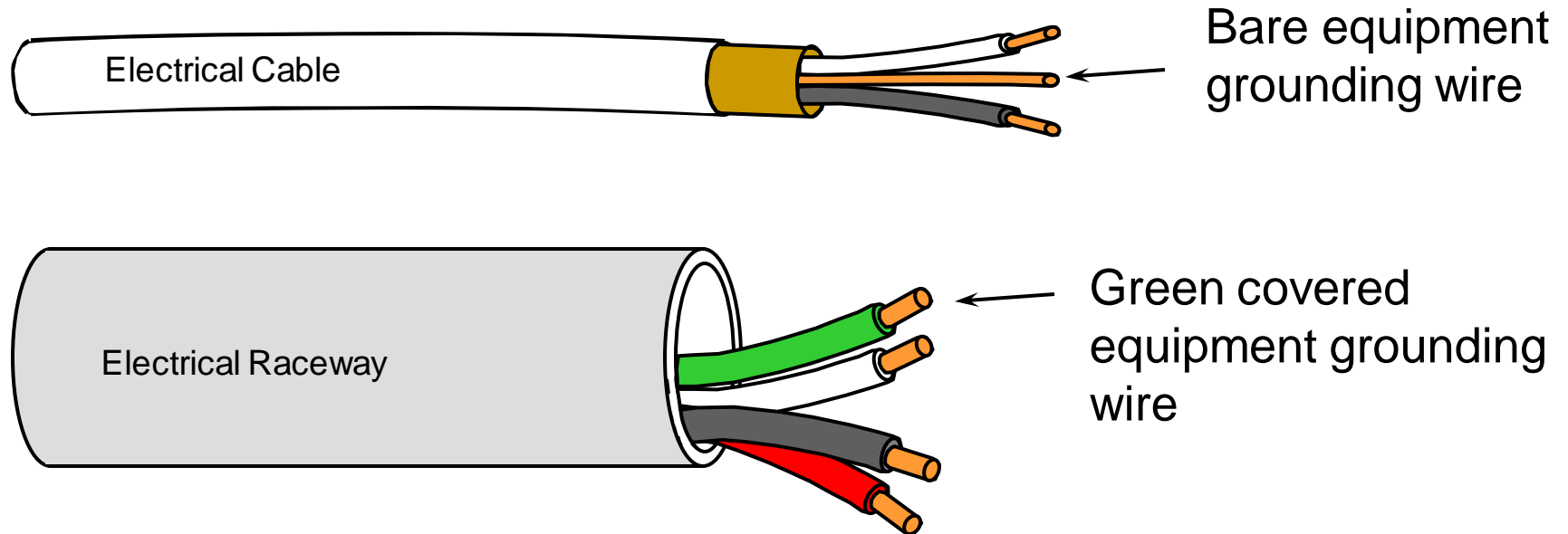


Grounding rods must be connected to the irrigation System electrical system

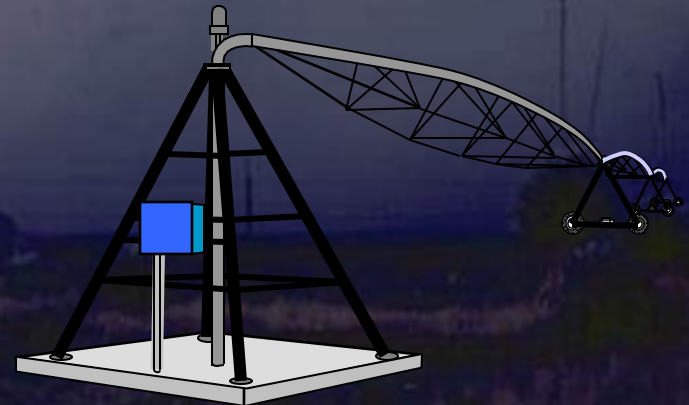
Recommend 3-4 8 feet connected ground rods 10 feet apart.

Equipment grounding wire must be run with circuit wires to all electrical loads

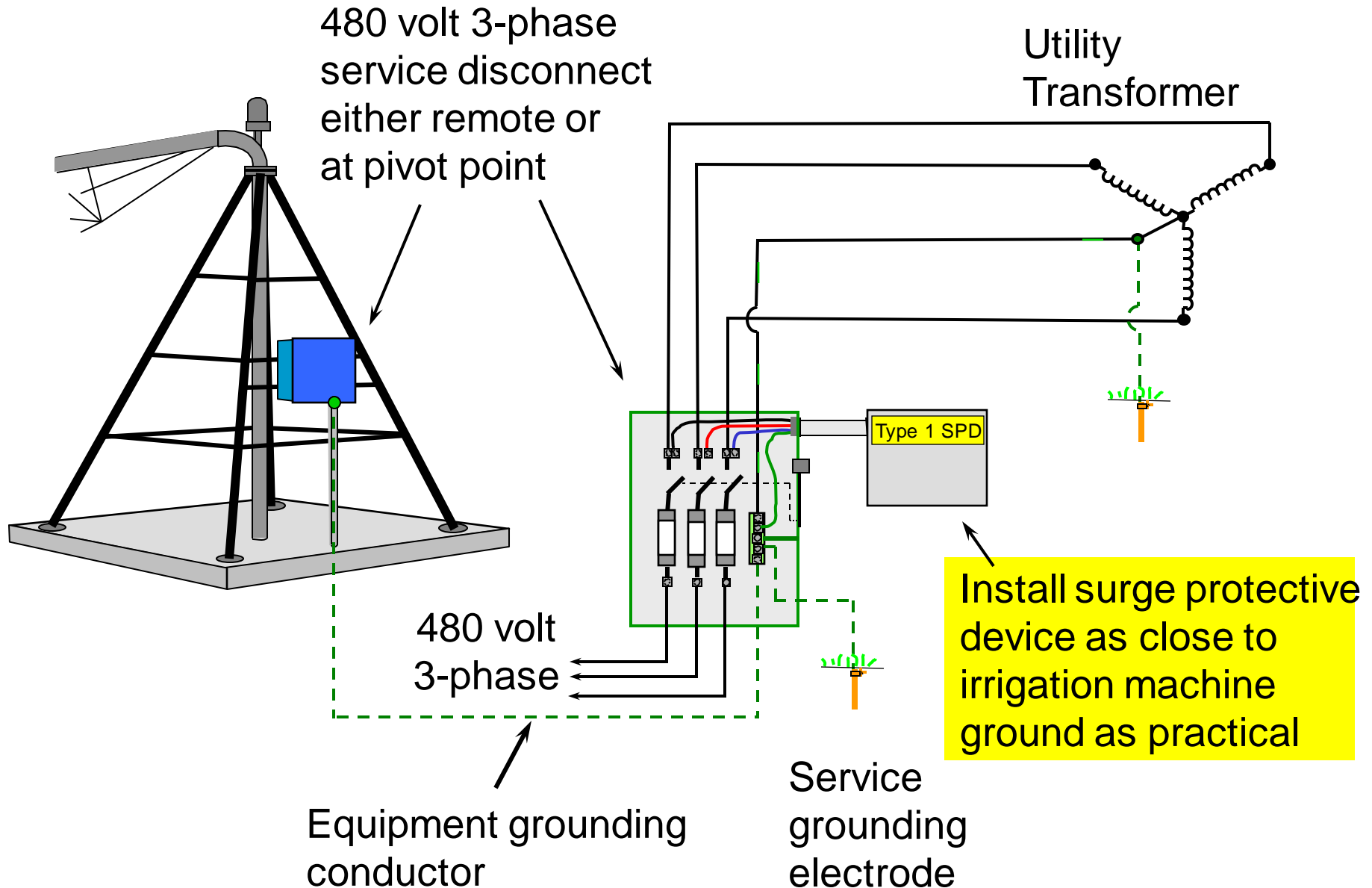
Equipment grounding wire must be either bare or with green insulation or green covering



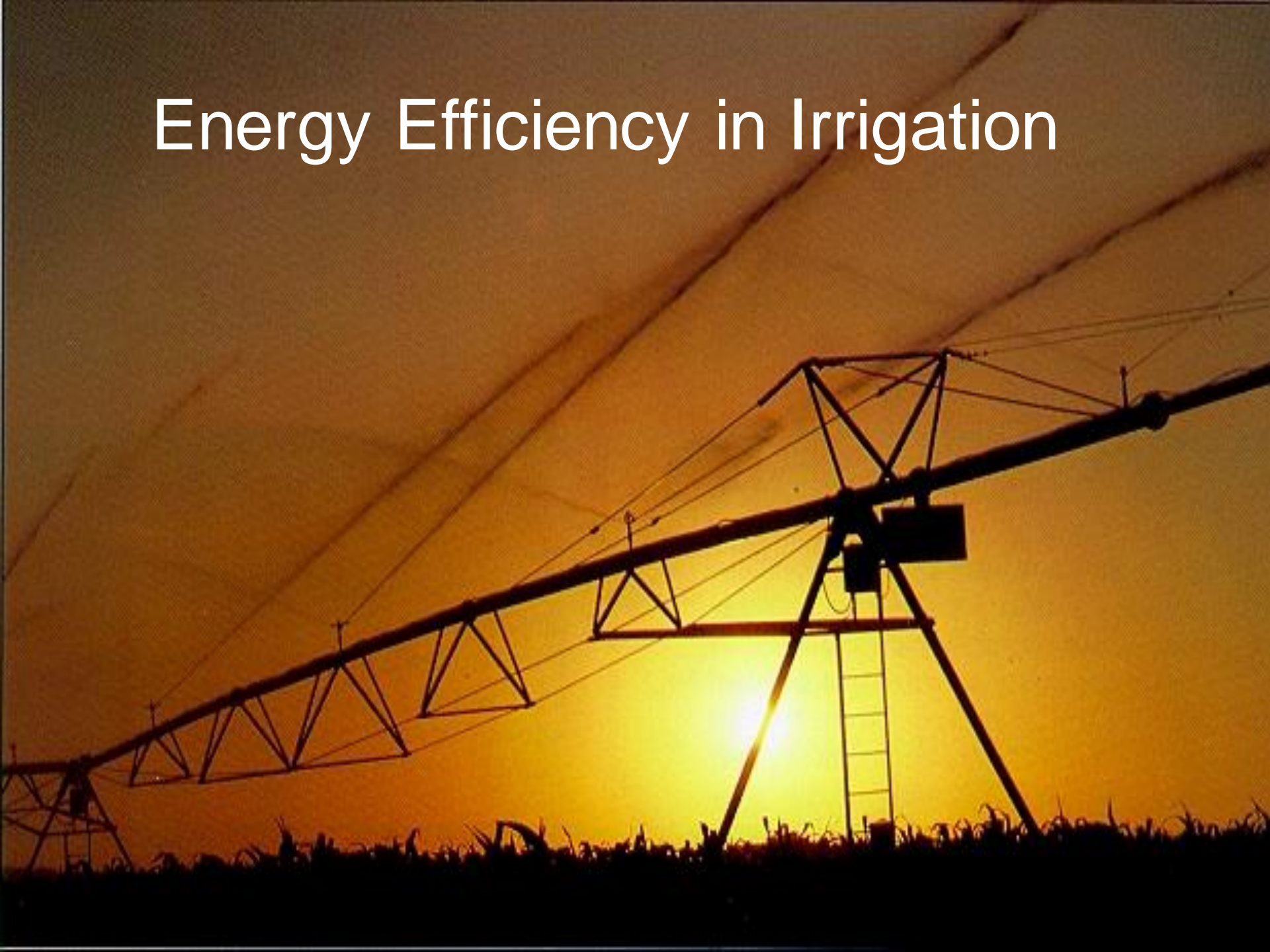
Lightning Protection



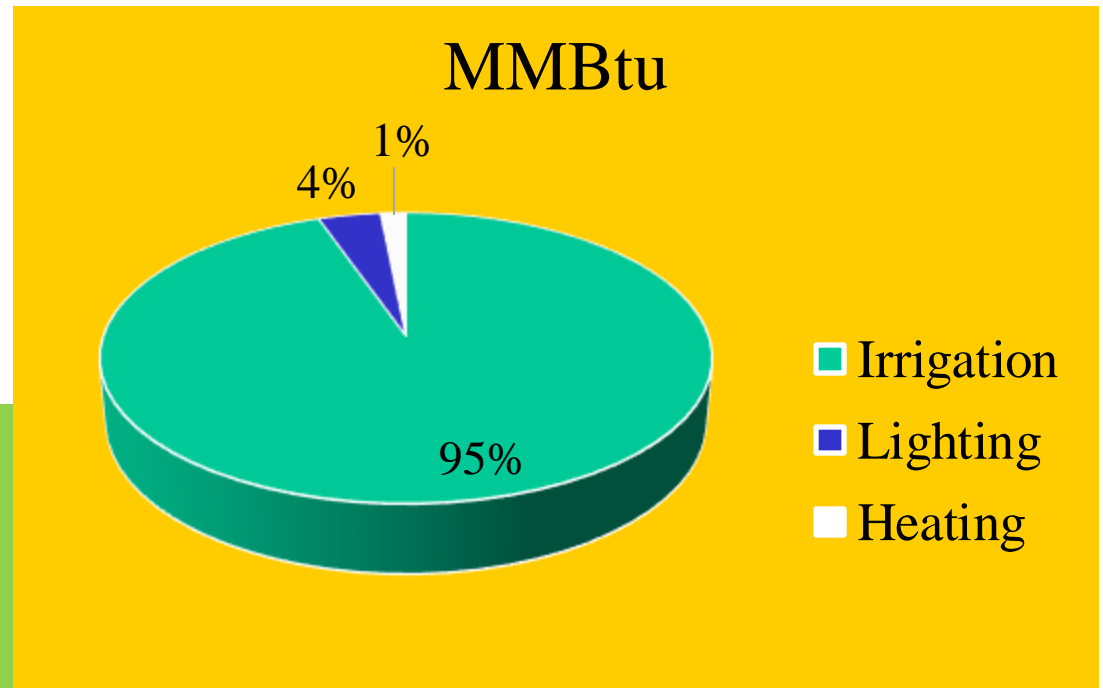
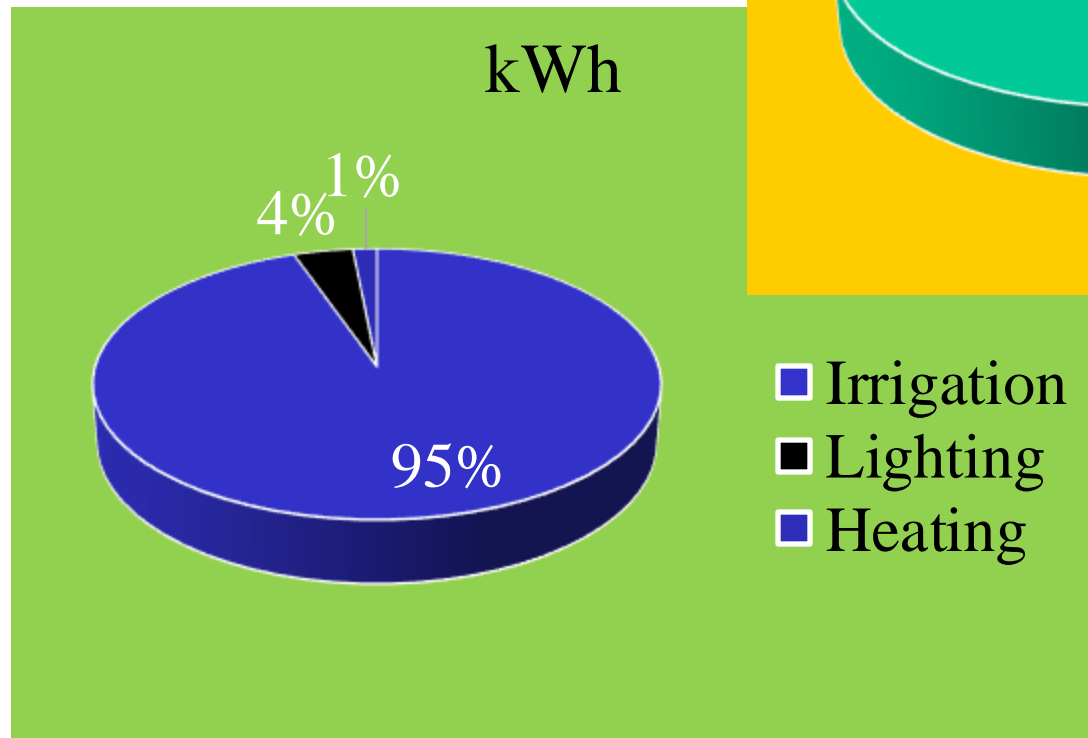
Lightning Surge Protection (SPD type 1)



Energy Efficiency in Irrigation



Irrigation Energy Use Breakdown



Energy Efficiency in Center Pivot Irrigation Systems

Number of Farm Operations: 20

Potential Annual Average Savings: \$21,737

Potential Annual Energy Savings: 238,866 kWh

Average Electrical Rate: \$0.11 per kWh

Average Implementation Cost: \$82,184

Average % Energy Savings: 53%

Average Payback on Investment: 3.8 years

Average Internal Rate of Return (15 years): 25.6%



For an energy audit, contact:
Aluel S. Go, goaluel@msu.edu

A photograph of a tall, brick Gothic-style tower, likely the Christ Church tower at Michigan State University, rising above a dense forest of bare trees in autumn. The tower has two large arched windows and a pointed roof. The scene is captured in a cinematic style with warm, golden-hour lighting.

MICHIGAN STATE
UNIVERSITY

Biosystems & Agricultural Engineering Department