

Installing Insulation in Homes with Knob-and-Tube Wiring

Issued March 2, 2012

The Energy Office recently received the attached correspondence from Randy Anderson, Executive Director of the State Electrical Board, regarding our December meeting and follow-up conversations that Energy Office staff have had with Mr. Anderson regarding insulating homes with Knob-and-Tube Wiring through Nebraska's Weatherization Assistance Program (WAP).

As the letter indicates, the Board agrees that "covering" the Knob-and-Tube Wiring to prevent direct contact with insulation is not in violation of the National Electric Code as long ***as the area covered around the wire provides a hollow space that allows air movement around the conductors.***

Based on this information, these Energy Office determinations have been made regarding insulating homes with Knob-and-Tube Wiring through the WAP:

- Exterior walls that have Knob-and-Tube Wiring shall ***not*** be insulated.
- Walls in additions on these homes that ***do not*** have Knob-and-Tube Wiring ***shall*** be insulated if the Energy Audit of the home indicates the insulation is cost-effective for implementation. The NEAT Audit of the home shall include appropriate areas/size calculations of the knob-and-tube walls with NONE selected as the "added insulation" option in the program. This will ensure appropriate heating and cooling sizing calculations are completed by the program for the sizing of the mechanical equipment.
- Attic areas with Knob-and-Tube Wiring that are indicated as cost-effective for implementation on the Energy Audit shall be insulated when the wiring has been appropriately covered to prevent direct contact with the insulation and to provide adequate air space for "cooling" of the wire. The costs associated with covering the Knob-and-Tube Wiring should be included in the cost, the SIR calculation, and the invoicing of the Measure so that the costs associated with the "covering" can be included as an Energy Efficiency Measure in the BCJO. In situations where the additional costs associated with "covering" the Knob-and-Tube Wiring impact the SIR to make the Measure ineligible those costs may also be invoiced as a Health and Safety cost.
- Attics where Knob-and-Tube Wiring has been previously covered with insulation, but the Energy Audit indicates that it is cost-effective to install additional insulation, can be insulated when it has been determined where the wiring is located and that it is actually still "live". This determination maybe completed by:
 - a licensed electrician
 - the use of a thermal imager/scanner
 - visually or physically locating the wires or
 - another verifiable option determined by the sub-grantee and approved by the Energy Office

Once the determination of the wire locations is documented in the client file, the wiring may be appropriately "covered" to prevent direct contact with the additional insulation and to provide adequate air movement space for cooling of the wire and insulation may be installed over the "covering".

- In attic areas where Knob-and-Tube Wiring penetrates the plane of the attic and extends up into a side or knee wall, a fire resistant baffling must be installed around the wire to provide sufficient space for air movement around the wire to provide adequate air space to accommodate the "cooling" of the wire.

The attached diagrams show NEO's recommended *options* for covering and/or baffling the Knob-and-Tube Wiring prior to installing insulation and should serve as a guide for WAP crews and contractors to ensure the requirements of the Electrical Board met. We understand that working in existing buildings rarely provides "standard" options and many situations will not fit into a typical option. Therefore instances that involve situations that greatly differ from the options provided shall be forwarded to the Energy Office for review prior to implementation.

In the case that one of the NEO recommended *options* are not feasible the sub-grantee must contact Lynn Chamberlin, Building Program Specialist for approval of an alternate method.

National Electrical Code Section References

394.10 Uses Permitted. Concealed knob-and-tube wiring shall be permitted to be installed in the hollow spaces of walls and ceilings, or in unfinished attics and roof spaces as provided by 394.23, only as follows:

- (1) For extensions of existing installations*
- (2) Elsewhere by special permission*

394.12 Uses Not Permitted: Concealed knob and tube wiring shall not be used in the following:

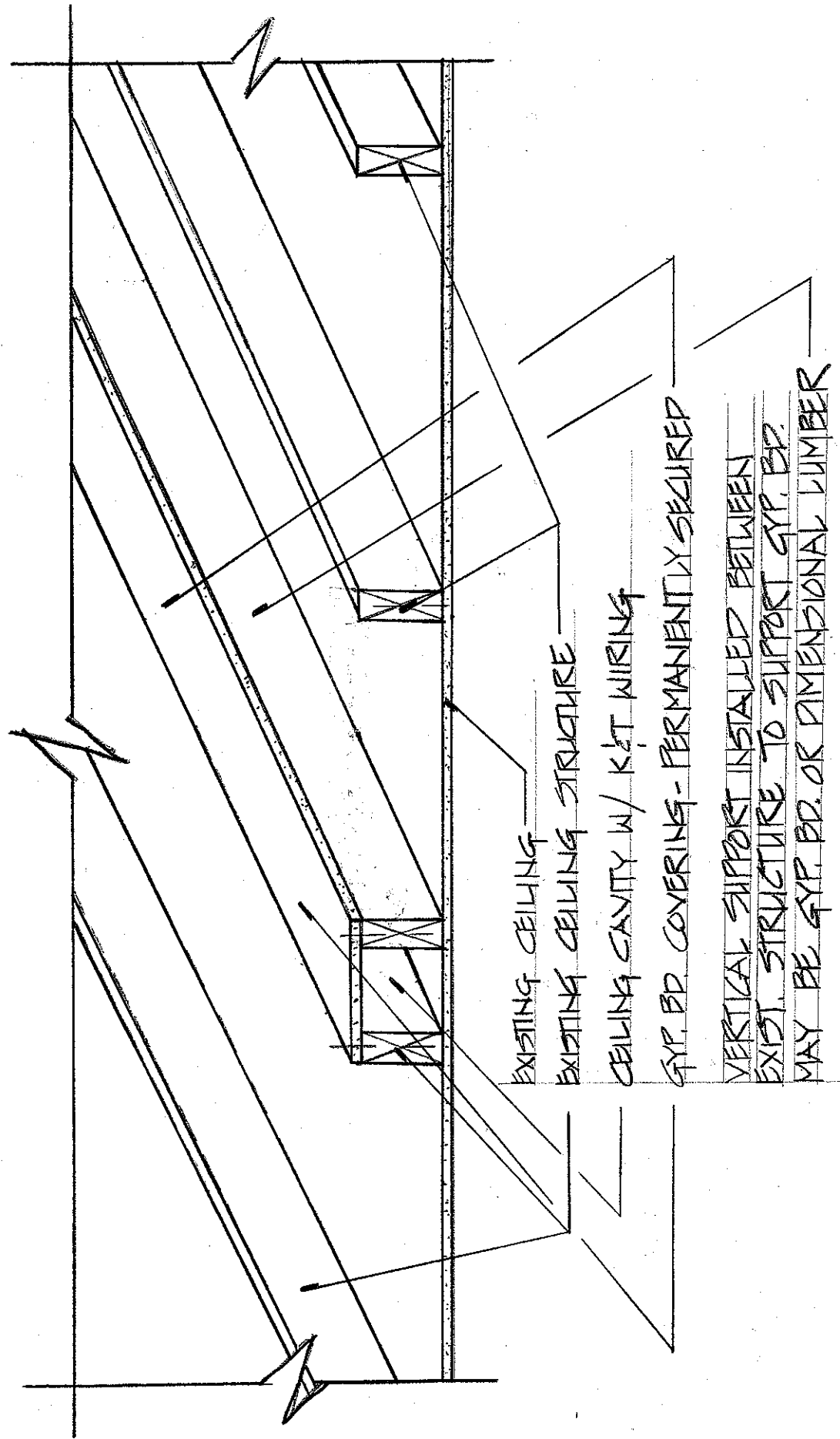
- (1) Commercial Garages*
- (2) Theatres and similar locations*
- (3) Motion picture studios*
- (4) Hazardous (classified) locations*
- (5) Hollow spaces of walls, ceilings, and attics where such spaces are insulated by loose, rolled, or foamed-in-place insulating material that envelops the conductors.*

Regarding Weatherization homes that utilize Fuses to protect against sudden large overloads of electric flow:

- The existing fuses shall remain intact if no insulation is being completed in the home;
- If attic installation is being installed as per the directive given above, the Nebraska State Electrical Board recommends the use of a licensed electrician for the installation of safety fuses as is indicated in the National Electrical Code.

If you have any questions please contact Lynn Chamberlin, Building Program Specialist at 402/471-3358 or at lynn.chamberlin@nebraska.gov.

*Option for Covering Knob-and-Tube Wiring
To Prevent Contact with New Insulation*



EXISTING CEILING

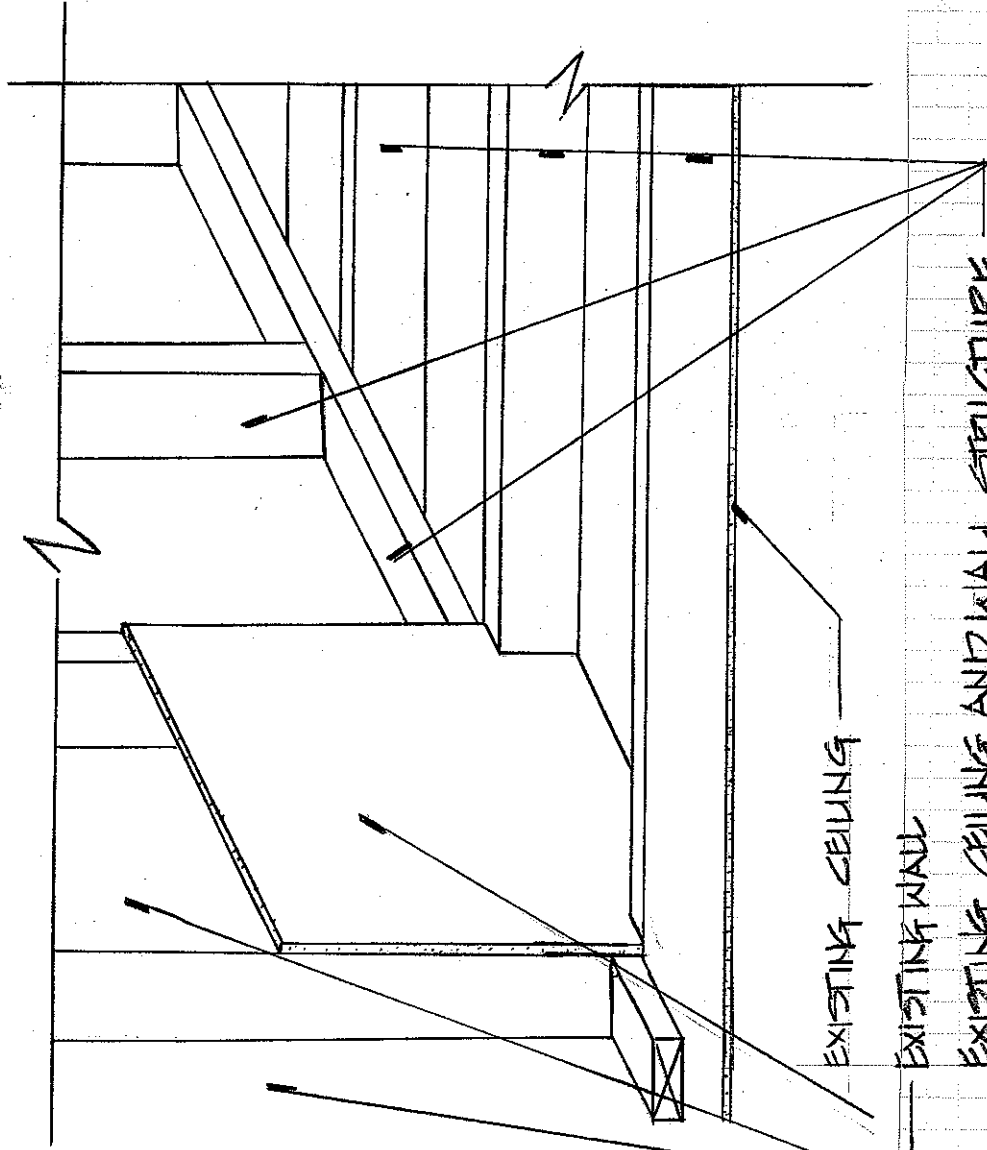
EXISTING CEILING STRUCTURE

CEILING CAVITY W/ K&T WIRING

GYP. BR. COVERING - PERMANENTLY SECURED

VERTICAL SUPPORT INSTALLED BETWEEN
EXIST. STRUCTURE TO SUPPORT GYP. BR.
MAY BE GYP. BR. OR DIMENSIONAL LUMBER

Option for Covering Knob-and-Tube Wiring
To Prevent Contact with New Insulation



EXISTING CEILING

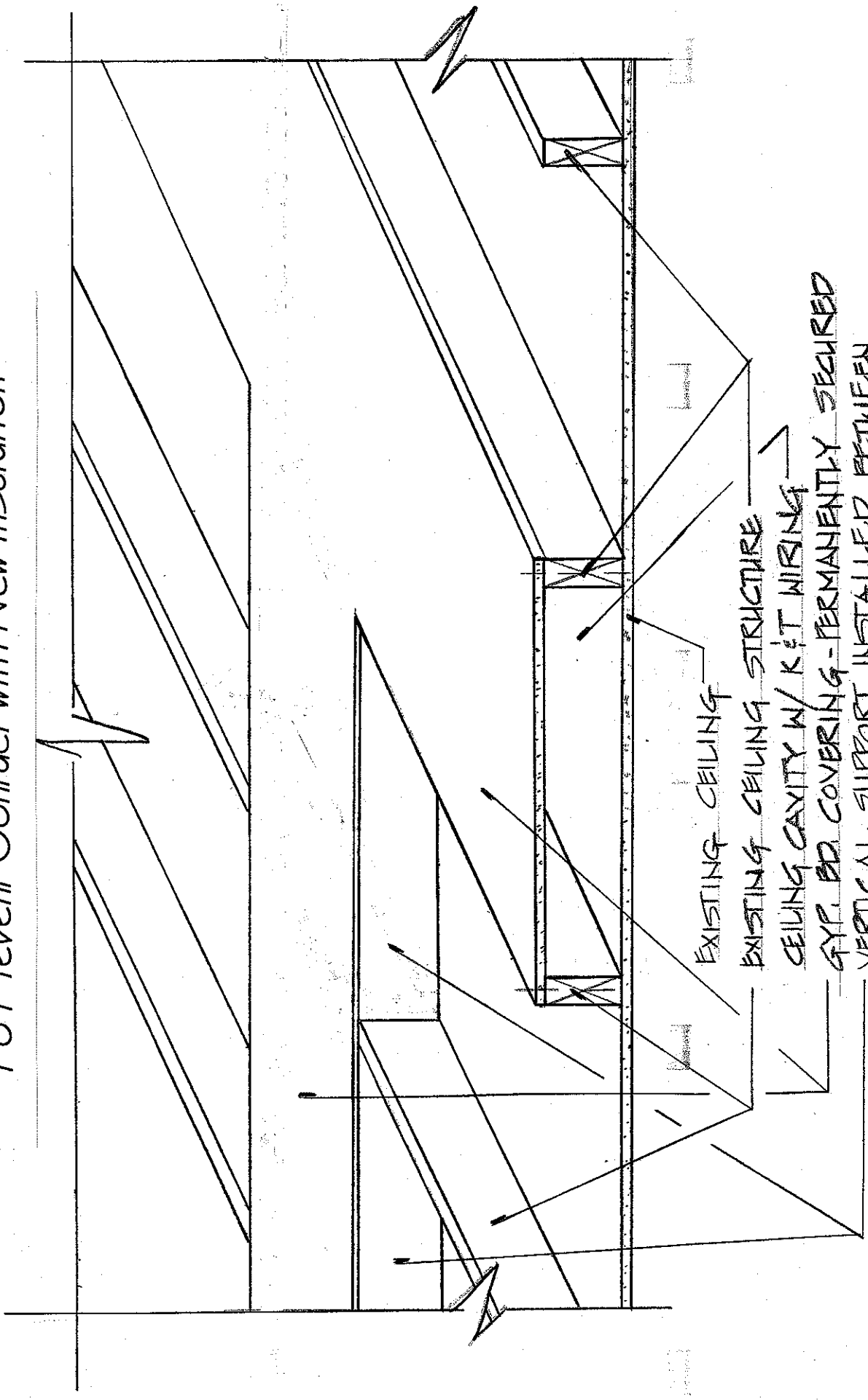
EXISTING WALL

EXISTING CEILING AND WALL STRUCTURE

WALL CAVITY W/ K&T WIRING

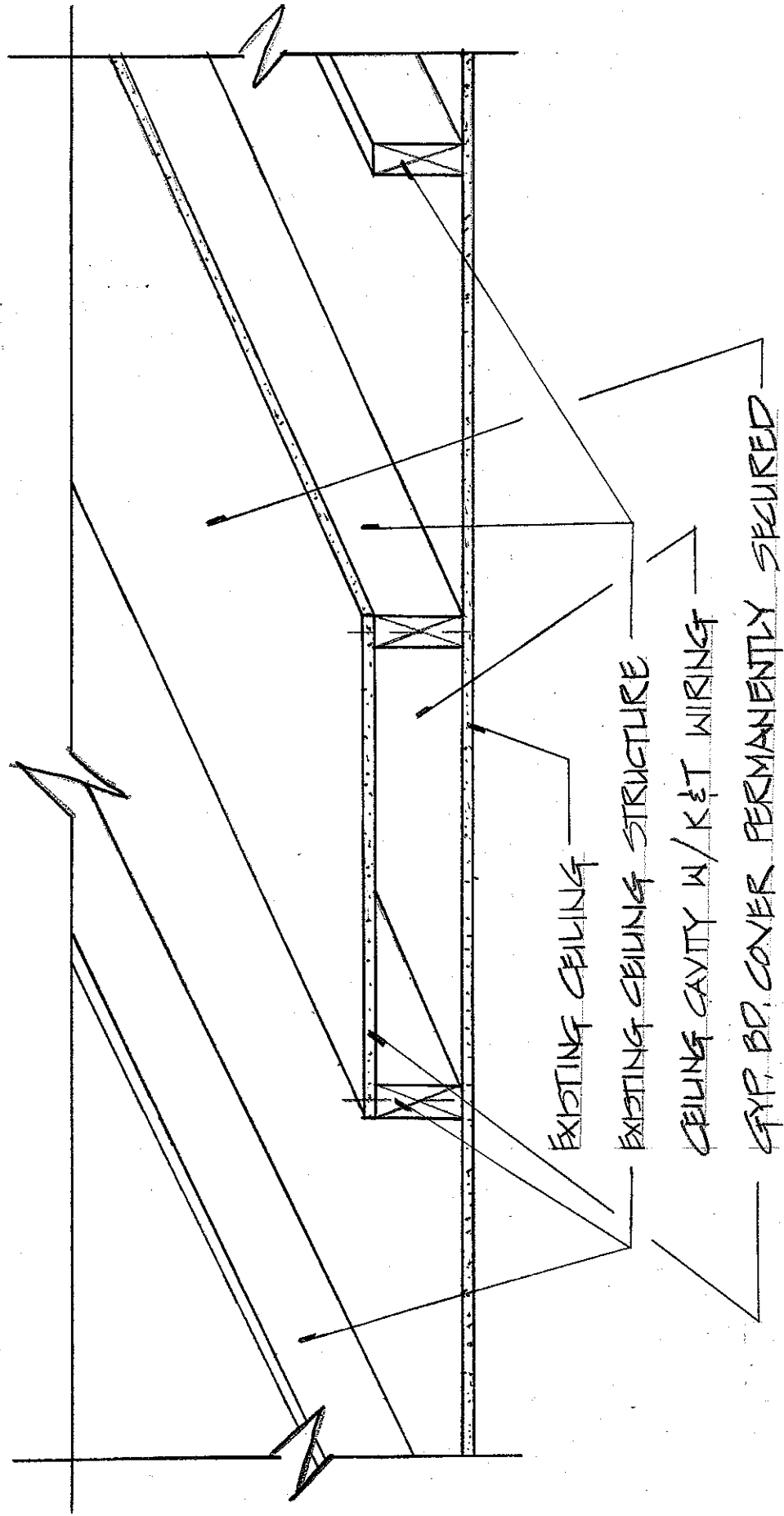
GYP. BR. COVER/BAFFLE PERMANENTLY SECURED

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To Prevent Contact with New Insulation*



EXISTING CEILING
EXISTING CEILING STRUCTURE
CEILING CAVITY W/ K&T WIRING
GYF. BR COVERING - PERMANENTLY SECURED
VERTICAL SUPPORT INSTALLED BETWEEN
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Dave Heineman
Governor

STATE OF NEBRASKA

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January 24, 2012

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RE: Insulation installed over knob-and-tube type electrical wiring

Ginger,

Per our phone conversation on 1/18/12 I am providing this letter to clarify what is allowed when insulating over knob-and-tube wiring in attics. As we discussed at the 12/9/11 State Electrical Board meeting, knob-and-tube wiring could be covered to prevent direct contact with insulation, however the Board felt the money would be better spent to replace the knob-and-tube wiring than to install a barrier. The exact method to accomplish this is up to the person installing the barrier, however when finished in must meet the requirements of the 2011 National Electrical Code Sections 394.10 & 394.12. The wiring must remain in a hollow space that allows air movement around the conductors.

I hope this helps you understand the requirements and the provisions of the National Electrical Code.

Sincerely,

Randy Anderson
Executive Director

Cc: Ron Francis, Chief State Electrical Inspector

RECEIVED

JAN 26 2012

STATE ENERGY OFFICE