

1.1 KETTLE/TANKER FIRE SAFETY PRECAUTIONS

- A. General: All work, including but not limited to the use of bitumen kettles, shall conform to the requirements of the New Jersey State Fire Prevention Code.
- B. Permit Requirements
 - 1. The Contractor must obtain a "Hot Work Permit" from Rutgers University Emergency Services Department, prior to performing any roofing utilizing bitumen kettles. Refer to Special Conditions for additional information on permit procedures.
- C. Fired bitumen kettles shall not be left unattended.
- D. The Contractor shall provide at least one portable fire extinguisher with a minimum 20-B:C rating within thirty (30) feet of each bitumen kettle during the period such kettle is being utilized, and one (1) additional portable fire extinguisher with a minimum 20-B:C rating on the roof being covered.
- E. All bitumen kettles shall be equipped with tight-fitting covers.
- F. Bitumen kettles, when in operation, shall be placed a safe distance away from any structure or combustible material.
- G. Where liquefied petroleum gas (LPG) cylinders or containers are utilized for fueling bitumen kettles, the LPG cylinder shall be protected against tampering and vandalism.
 - 1. All LPG cylinders or containers shall be placed in a secured area for protection against tampering.
 - 2. The storage of LPG cylinders on rooftops is prohibited.

1.2 TORCH SAFETY PRECAUTIONS

- A. General: All torch-applied roofing shall be installed in accordance with recommendations provided in Factory Mutual Property Loss Prevention Data Sheet 1-33, "Safeguarding Torch Applied Roof Installations" and shall comply with the New Jersey State Fire Prevention Code (latest edition).
- B. Permit Requirements
 - 1. The Contractor must obtain a "Hot Work Permit" from Rutgers University Emergency Services Department, prior to performing any torch-applied roofing installation. Refer to Special Conditions for additional information on permit procedures.

C. Installation Safeguards

1. Torches used to secure roofing membranes should be used in accordance with manufacturer's recommendations. The flame from a hand-held torch should be constantly moved from side to side. If a mobile heating apparatus is used, it should be kept in constant motion while operating. To prevent smoldering or ignition of membranes, they should not be overheated.
2. Caution should be used when working around roof openings, penetrations or flashings. Wood nailers, cant strips and metal flashing should not come in direct contact with the flame of the torch. Small torches should be used to heat the underside of the membrane away from these areas before securement. The torch should not be used in areas where the flame impingement cannot be fully viewed. Open flames should not be left unattended. Roof openings/vents should be covered with a stable noncombustible cover to prevent ignition of building components or contents.
 - a. Extreme caution should be used near penetrations such as exhaust vents to prevent ignition of accumulated flammable discharges. Such accumulations should be cleaned/removed before roofing work begins.
 - b. Air conditioning units and ventilating fans should be shut down before torch work is done in surrounding areas.
 - c. Expansion joints should be filled with mineral wool or ceramic fiber with a steel cover plate below.
3. A torch stand should be used to direct the flame upward when momentarily not in use. The cylinder valve should be closed to burn off propane in the line before shutting off the torch head. The gas supply should be shut off whenever a propane odor is detected.
4. Installations should be coordinated with concerned parties, and close supervision should be provided.
5. Torches should not be used near gas lines, electrical wires or flammable liquids during roof construction.
6. The torch flames should not be applied to a combustible substrate when installing the membrane. When foam plastic, Kraft-faced glass fiber, wood fiber insulation or cant strips, or plastic fastener plates are to be used, they should be covered with a minimum 40 lb. organic felt base sheet or a glass fiber base sheet before the torch applied membrane is installed. Torch flames should not come in contact with exposed plastic roofing cement.
7. **The operator of the torch shall remain on the premises to perform a fire watch for a minimum of one (1) hour after the torch is utilized.** All roof areas worked on should be checked for "hot spots" and signs of smoldering. The inside of the building should also be inspected for signs of fire or smoke. All "hot spots" or fires, even if extin-

guished, should be reported to Rutgers University Emergency Services.

D. Equipment Safeguards

1. Proper equipment should be used to heat roofing membranes. Torches should be equipped with a pilot adjustment, flame height adjustment, 25 to 50 feet of approved or listed hose, pressure gauge and regulator. A spark ignitor should be used. Torch trolleys and multiple torch head machines should be equipped with listed safety valves.
 - a. Safety caps should be tied to all propane cylinders and installed on the valve whenever cylinders are not in use. Carts used to transport propane cylinders should be stable. Tall, narrow, standing cylinders should be chained against walls or in proper carts.
2. The propane cylinder should be adequately sized for the torch used. If frost buildup occurs on the propane cylinders and the rate of vapor withdrawal is no longer adequate for operating conditions, the cylinder should not be placed on it's side or heated with the torch flame. The hose should be disconnected and a larger cylinder used. Liquid propane cylinders may be of either the vapor withdrawal or liquid withdrawal type.
 - a. Liquid withdrawal cylinders are preferred due to frost buildup associated with vapor withdrawal cylinders. However, when vapor withdrawal cylinders are used, or if temperatures are below 20 degrees F, 40 or 100 lb. cylinders should be used with larger torches (such as those used on the field of the roof).
3. Equipment should be thoroughly inspected and repaired as needed. Propane cylinders should be inspected for dents. If dents larger than 1" in diameter are found, the cylinder should be replaced. Torch and cylinder connectors should be visually inspected and checked for leaks with a soap and water solution. An open flame should not be used to test for leaks.
 - a. Leaky equipment should not be used. Regulator adjustments and pressure gauges should be checked to assure they are operable. The vent on the regulator should be checked to ensure it is not blocked. If an unstable flame occurs (one which roars loudly and tends to blow itself out), the equipment should be repaired or replaced immediately.
4. **A fire watch of all equipment utilized for the torching application should be conducted for at least one (1) hour after torch work has been completed.**

E. Fire Extinguishing Equipment

1. The Contractor shall provide, on the roof, at least one (1) portable fire extinguisher with a minimum 4-A rating, two

(2) portable fire extinguishers with a minimum 2-A rating each, or a water hose connected to a water supply at the building where the torching is being done. In addition, there should be at least one 10-lb. multipurpose dry chemical portable extinguisher within 20 feet horizontal travel distance of torch-applied roofing equipment.

F. Fuel Handling Safeguards

1. Fuel containers, burners and related appurtenances of roofing equipment in which liquefied petroleum gas is used for heating should comply with Factory Mutual Data Sheet 7-50; "Compressed Gases in Cylinders" and NFPA 58; "Standard for the Storage and Handling of Liquefied Petroleum Gases".
 - a. All fuel containers should be located at least 10 feet from the burner flame or at least 2 feet away when properly insulated from heat or flame.
 - b. **Storage of LPG cylinders or containers on rooftops is prohibited.** All LPG cylinders or containers shall be removed from the rooftop and placed in a secure area, protected against tampering, at the end of each work shift.
 - c. Propane cylinders should not be hoisted by their valves. Straps placed around the cylinders should be utilized.