LESSONS LEARNED / BEST PRACTICE

Title:	2022/01 – Torch-on Roofing

Overview of Torch-on Roofing

Torch-on roofing refers to a roof covering solution that involves layers of felt melt-welded onto a roof by means of a hot flame (blowtorch) to create a waterproof seal, as illustrated.

Typically, three (3) layers are used - a vapour control sheet, a reinforced felt and a mineral finish top layer. Torch-on felt roofing must be undertaken by competent professionals, suitably experienced and trained in roofwork, working at height and in the use of a hot flame.

Health and Safety Considerations for Torch-on Roofing

Accidents involving gas cylinders and work at height can cause serious injury and even death. There are a number of health and safety considerations involving torch-on roofing, including those listed under various headings:

Equipment:

- **Connections** - the regulator should be a left-hand threaded for fuel gases, with the hexagonal nut on the union connections notched to aid identification. It should also have a safety cut-off valve to isolate the gas supply
- **Hoses** - LPG hoses should be orange in colour and include the year of manufacture. The normal useful service life for a hose is approx. five (5) years, after which time they should be replaced. Carry out routine checks for visual signs of cuts, cracks, fading, brittleness, hot spots.
- **Torches** – use only with propane fuel gas. Gas torches should be accompanied by a stand to ensure the hot burner does not come into contact with the roof surface. Torches that self-ignite and extinguish by using an electronic ignition system are deemed safer and use less gas. Gas torches that are manually lit, must be extinguished after use; never leave a gas torch running on a pilot flame. Undertake pre-use checks to ensure torches are clean (i.e. no grease or oil evident), and follow the manufacturer's operating and maintenance instructions.
- **Fire extinguishers** – extinguisher(s) should be carefully selected and have an up-to-date service record. It may be necessary to provide more than one type of fire extinguisher.
- **PPE** – personal protective equipment shall be selected based on risk assessment. Standard PPE for use when carrying out hot works would include: hard hat (with chin strap for work at height), hi-vis vest, steel toe-capped boots, heat resistant gloves, safety goggles, and long-sleeved flame retardant workwear.

Handling / Storage / Use of LPG Cylinders:

- Be mindful of manual handling training, and use appropriate gloves to maintain a firm grip on gas cylinders during manoeuvres
- Maintain an LPG cylinder upright when in use, and avoid rolling cylinders on their side
- Use a purpose-built trolley (with a chain attachment) to secure the cylinder during transfers
- Do not use the LPG bottle cap, valve or shroud to lift the cylinder
- Confirm 'empty' cylinders don't contain LPG - rock them gently to detect any residual liquid
- Do not open the valve of an unconnected LPG cylinder, even empty cylinders
- Store LPG cylinders in well-ventilated places (outdoors), away from heat and ignition sources

- When mixed with air, LFG can burn or explode if there is a source of ignition
- LPG containers are liable to explode if they are involved in a fire
- Do not disconnect the regulator if the flame doesn't go out
- Identify leaks by smell, noise, use of an approved leak detection solution or leak detector
- Consult Safety Data Sheets supplied before use.

Use of Torches:

- Undertake pre-use checks of all equipment as per manufacturer's maintenance instructions
- Only use only with propane fuel gas
- Never apply a torch direct to a timber roof deck or timber upstands, even with a primer
- Maintain a fire watch during works (including breaks), and for at least 1-hour thereafter.

Work at Height:

- Do not undertake any roof work, painting or repairs yourself unless you are competent to do so. Work on fragile and cladded type roofs requires the worker to be competent and in possession of a valid SOLAS Construction Skills Certification Scheme (CSCS) for Roof Cladding.
- Carry out the work in a safe manner, as per the HSA Code of Practice for Safety in Roofwork
- Assume all roofing materials are fragile unless confirmed otherwise by a competent person. Be mindful of fragile roofing materials, such as:
    - Rooflights and perspex sheeting (often difficult to identify due to weathering)
    - Liner sheets on built-up roofs
    - Unreinforced cement sheets including asbestos cement sheeting
    - Glass (including wired glass)
    - Wood wool slabs
- Risk assess the work including considering all specific hazards such as fragile roofs.

Fire Watch

- Maintain a continuous fire watch at the location of hot works, and for the duration of the work
- Maintain a fire watch during breaks and for at least 1-hour following the cessation of hot work
- Avoid starting hot work near the end of the working day, mindful of the need for a fire watch
- The fire watch should consider whether the work breaches walls, floors and ceilings; this could lead to a fire in an area not directly visible from where the hot work is being carried out.

Why the Need for a Fire Watch?

On 28th August 2018 around 11am, a fire broke out on the roof of the Primark building in Belfast City Centre. Despite a rapid response from the emergency services, fire quickly took hold of the >230-year-old building, and it was destroyed, aside from the stone structure.

Though no official report has yet been published, it had been suspected that the fire was connected to work being carried out on the roof as part of a £30 million redevelopment, where (reportedly), a brief repair on the roof required hot works but a fire watch was not in place beyond completion of work.

Further Guidance

The UK' National Federation of Roofing Contractors Ltd: https://www.nfrc.co.uk/

HSA' Code of Practice for Roofwork: https://www.hsa.ie/eng/Publications_and_Forms/