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| 1. **INTRODUCTION TO WORKING ON ROOFS** |
| It is very risky to work on roofs as a fall from a roof could cause serious injury or even death, more so than with any other forms of working at height. It is therefore important to take proper precautions. |

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| 1. **EXPLANATION & RISKS** | |
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| 1. Definitions:  * working on sloping roofs = roofs with a slope of at least 15% * working on flat roofs = roofs with a slope of up to 15% * fragile roof = a roof that will collapse if a reasonably predictable weight is placed on it   + Fall height (defined in TSR - Working at height):   * > 2 metres ( > 2,5 m in NL) or * < 2 meters (< 2,5 m in NL) and on protruding parts or above water or traffic   + near cliffs (site on steep slopes) | Examples:  *Maintenance on/to:*  🡪canopies at filling stations  🡪feeders  *And on/to roofs of:*  🡪shops  🡪technical areas  🡪storage tanks at depots  🡪warehouses and storage areas  🡪loading racks at depots  🡪offices  🡪jetties at depots |
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| 1. The following risks are present:  * **persons falling** from roof edges, holes in roofs and through fragile roof covers and roof edge lighting * **falling material** (accidentally or when it is thrown down) | |

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| 1. **SAFETY REQUIREMENTS** | |
| **ALWAYS:**  **CHECK** | |
| 1. **PERSONAL PROTECTIVE EQUIPMENT** |  |
| 1. safety shoes or boots |  |
| * + - Anti-slip     - with steel toes and steel soles |  |
| 1. protection against extreme heat and cold by means of adequate clothing and/or other protective equipment |  |
| 1. + depending on the nature of the work |  |
| * + - fire retardant clothing     - safety glasses     - safety shoes     - safety helmet     - hearing protection     - respiratory protection     - knee protection |  |
| 1. + with unavoidable risk of falling |  |
| * + - personal fall-arrest equipment (see below)     - life jacket near water (e.g. jetty) |  |
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| 1. **PREPARATION** |  |
| 1. visual inspection in accordance with the safety measures |  |
| 1. preliminary risk analysis and implementation plan including the following aspects |  |
| * + - entrances, exits and emergency exits     - structural integrity of the roof, including the cover and beams     - distribution of weight on the roof     - presence of existing fall prevention and protection measures     - need for additional fall prevention and protection     - asbestos register (if applicable)     - other factors that could affect the safety of workers     - staff training     - emergency plan |  |
| 1. check if all safety measures have been taken and if the appropriate signage is in place |  |
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| **ALWAYS:**  **CHECK** | |
| 1. **WORKING ON SLOPING ROOFS** |  |
| 1. roof edge safety - in order of preference: |  |
| * + 1. permanent fencing and railings with the same requirements as scaffolds,  see TSR – Scaffolding     2. safety nets, scaffold or platform  see TSR – Scaffolding     3. individual fall protection equipment (PPE) |  |
| 1. safety on a sloping roof |  |
| * + - close off openings and fragile parts     - roof ladders for moving on a sloping roof  (not directly on the tiles)     - work platforms around chimneys (if work is required there) |  |
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| 1. **WORKING ON FLAT ROOFS** |  |
| 1. working > 4 m from the edge of the roof |  |
| * + - = secure zone     - 4 m distance marker (e.g. paint) on the roof     - no other protection is required within the marked area |  |
| 1. working between 2 and 4 m from the edge of the roof |  |
| * + - is only a secure zone of:       * there is a physical barrier in place       * 2 metres from the edge of the roof       * parallel to the edge of the roof   (e.g. posts with a chain)  OR   * + - see edge of roof safety for sloping roofs |  |
| 1. working at < 2 meters from the edge of the roof |  |
| * + - see edge of roof safety for sloping roofs |  |
| 1. safety on a flat roof |  |
| * + - close off openings and fragile parts |  |
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| **ALWAYS:**  **CHECK** | |
| 1. **WORKING ON FRAGILE AND DIFFICULT ROOFS** |  |
| E.g.: steep roofs, small roofs (limited m³), ​​corrugated roofs of warehouses, old roofs, feeders (plastic), aerial storage tank roofs (see further) ... |  |
| 1. consider alternatives (risk analysis), such as |  |
| * + - perform the work on the ground - if at all possible/feasible     - use an elevated platform if it is possible to work from there without stepping onto the roof  (see TSR – MEWP)     - use a scaffolding to work from there without stepping onto the roof (see TSR – Scaffolding) | |
| **IF IT IS NECESSARY TO STEP ONTO THE ROOF:** |  |
| 1. screen off the fragile sections |  |
| * + - edge protection on fragile points     - complete roof edge protection if the entire roof is fragile |  |
| 1. prevent unauthorised access |  |
| * + - by blocking access to roof ladders     - and put appropriate signs in place |  |
| 1. work from work platforms |  |
| * + - with top and middle railings and edge protection     - of sufficient size     - supported by the non-fragile parts |  |
| **IF WORK PLATFORMS ARE NOT AN OPTION:** |  |
| 1. hang safety nets under the roof or |  |
| 1. use individual fall protection equipment |  |
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| 1. **MATERIAL FOR WORKING ON ROOFS & WASTE** |  |
| 1. always keep the roof tidy and clean |  |
| 1. pay extra attention to the placement of material on fragile roofs |  |
| 1. Use chutes or containers for taking waste down |  |
| 1. do not leave any material behind on the roof after finishing work |  |
| * + - especially during weekends and on holidays     - if material remains, ensure that the material is secured so it will not be blown off the roof during stormy weather (e.g. advertising)     - always remove gas bottles and/or other dangerous goods |  |
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| **ALWAYS**  **CHECK** | |
| 1. **TRAINING** |  |
| 1. inform workers of the risks involved with working on roofs |  |
| 1. provide all training needed regarding the fall prevention and/or safety |  |
| * + - scaffolding: see TSR – Scaffolding  🡪also for the construction of edge of roof scaffolding/protection     - elevated platforms: (see TSR – MEWP)     - ladders: see TSR – Ladders |  |
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| 1. **EVACUATION & EMERGENCY** |  |
| 1. provide an emergency plan with a scenario for accidents on the roof |  |
| 1. ensure that adequate escape routes are available on the roof |  |
| * + - if necessary through additional scaffolding/stairs towers  (see TSR – Scaffolding) |  |
| 1. **ADDITIONAL PRECAUTIONS** |  |
| 1. with "hot work" on the roof, see TSR - Hot Work |  |
| 1. when working on electrical installations, see TSR - Electrical Installations |  |
| 1. for hoisting and lifting, see TSR - Hoisting/Lifting |  |
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| U:\To check & clean\Tank roof entry\tank-gauging-proservo-landscape.jpg**TANK ROOF ENTRY & WORKS** E.g.: gauging, sampling, visual inspections,  working on sprinklers and annular water piping,  calibration of measuring equipment …  **CHECK** | |
| 1. ***PRINCIPAL = DO NOT ENTER*** |  |
| 1. Consider alternatives (risk analysis), such as |  |
| * + - U:\To check & clean\Tank roof entry\Scaff 1.pngperform the work on the ground - if at all possible/feasible     - use an elevated platform if it is possible to work from there (see TSR – MEWP)     - use a scaffolding (see TSR – Scaffolding) |  |
| 1. Refer also to the requirements for fragile and difficult roofs in point 5. |  |
| 1. **IF THE TANK ROOF ENTRY IS NECESSARY/INEVITABLE:** |  |
| 1. Fall protection |  |
| * + - Always mandatory when working on the edge of the roofs or near the access stairs and bridge platforms     - Not mandatory for inspections (e.g. visual inspections and calibrations) and sampling, provided there is a proper edge protection and the risk of tripping is excluded |  |
| 1. Additional task risk assessment (TRA) with attention for |  |
| * + - Nature of the works and work method     - existing control measures (stairs, guardrails, antiskid paths …)     - additional control measures (work method, collective and personal protection, emergency plan …) | |
| 1. Start work meeting and work permit |  |
| * + - identification of weather conditions (also see point 11)     - visual check of the condition of:       * stair(s) towards the tank roof, from the ground       * roof surface(s), from the stairs if safe       * bridge platform(s) between tanks using the safest method     - check the presence and the condition of the collective and personal protective equipment     - with all involved employees, go through the work method, the risks, the control and emergency measures (TRA) | |
| 1. **ONCE ON THE TANK ROOF, THE FOLLOWING IS IMPORTANT** |  |
| 1. \\BEGATFS03\Data\HSSE\HSSE Data\HSSE REPORTING\INCIDENT MANAGEMENT\Incident Investigations\2016-2017\2017-02-13 6514 Contractor slipped on tank - LWC - OPEN\3. Pics\Gent tank roof - LWC chubb (3).jpgWhen moving/walking, stay on the  antiskid walkways 2. Avoid crossing other people, also on the antiskid walkways 3. When doing inspections or sampling, working alone is allowed when additional measures are taken |  |
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