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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**
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| **ALWAYS:****CHECK** |
| 1. **PERSONAL PROTECTIVE EQUIPMENT**
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| 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
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| * + - personal fall-arrest equipment (see below)
		- life jacket near water (e.g. jetty)
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| 1. **PREPARATION**
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| 1. visual inspection in accordance with the safety measures
 |  |
| 1. preliminary risk analysis and implementation plan including the following aspects
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| * + - 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 railingswith 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**
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| 1. working > 4 m from the edge of the roof
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| * + - = 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**
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| 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**
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| 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, alsoon the antiskid walkways
3. When doing inspections or sampling, workingalone is allowed when additional measuresare taken
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