

Mount Royal University: Safety Program		
<b>Hot Work Management</b>		
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**SAFETY PROGRAM:  
HOT WORK MANAGEMENT**

**PREAMBLE**

Hot work is an operation that involves open flame or that may produce heat, sparks, or other sources of ignition. Hot work operations include welding, brazing, soldering, torch or radial saw cutting, grinding, or using electrical equipment not classified for use in a hazardous location. Hot work fires and explosions can cause devastating losses to people, property, and organizations, so it’s critical that the hazards be controlled.

The goal of this hot work program is to prevent hot work ignition sources from coming into contact with combustible or flammable material, thereby reducing the risk of incident and injury.

**SCOPE**

This program applies to all MRU employees, contractors, and prime contractors when performing hot work on behalf of the University. Hot work includes tasks such as welding, brazing, soldering, metal grinding, powder-actuated tools, hot riveting and other similar applications that produce sparks, flame, or heat that could ignite nearby materials. It also applies to cold-work tasks that may produce sparks (e.g. drilling or cutting) if conducted in a potentially flammable atmosphere or other high-risk environment, and the use of unrated electrical equipment in hazardous electrical areas.

This program does not apply to the following:

- Low-risk hot work, such as the use of Bunsen burners, electrical soldering irons or heat presses. See Low-Risk Hot Work Safe Work Guidelines.
- Cooking equipment, including the use of small appliances in kitchen / lunchroom areas. See Small Appliance Safe Work Guidelines.

**Candles, pyrotechnics or other potentially ignitable special effects are not permitted on MRU property.**

Hot work operations in confined spaces require additional safeguards – contact Environmental, Health & Safety for information before proceeding.

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**LEGISLATION**

Alberta’s Occupational Health and Safety (OHS) Code outlines requirements for hot work procedures in Part 10, Fire and Explosion Hazards, Section 169.

**RESPONSIBILITIES**

Executive (President, Vice-Presidents):

- Provide management support and leadership necessary to provide a safe and healthy working environment for employees and students, in compliance with the Mount Royal Health and Safety Policy.
- Ensure that adequate resources are available to implement appropriate measures.

Associate Vice-Presidents / Deans / Directors / Department Managers:

- Ensure that this safety program is communicated to affected employees.
- Ensure that this safety program is understood and followed by affected employees.
- Identify tasks or processes that require the use of this program.
- Ensure required documentation and records are maintained.
- Ensure only trained and competent employees are authorized to perform hot work.
- Ensure that contractors who perform work requiring hot work are trained and competent to use the MRU program.

Supervisors / Chairs:

- Ensure employees required to perform hot work are provided with appropriate training and mentorship.
- Ensure only trained and competent employees perform hot work and permit authorization.
- Ensure employees understand and follow safety programs as outlined.
- Investigate all hot work-related incidents (including near misses) and ensure all are reported to EH&S.

MRU Employees (Staff, Faculty, or Volunteers):

- Complete required training.
- Follow the written hot work program.
- Notify the supervisor if there are questions or concerns or if the program is violated.
- Report all incidents (including close calls / near misses) to supervisors and EH&S (through the Incident / Injury Report Form).

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Prime Contractors:

- Will follow the MRU Hot Work Management Program when performing or overseeing hot work on campus.
- Ensure that their workers who perform hot work are trained and competent on the MRU hot work program.

Environmental, Health & Safety (EH&S):

- Provide assistance and guidance to departments regarding the hot work program.
- Work with supervisors to coordinate hot work training for employees and contractors.
- Audit the hot work program annually and maintain the MRU hot work program.

Building Operations:

- Provide qualified Hot Work Permit Authorizers and Fire Watch personnel for hot work on campus.
- Provide means or personnel for post-hot work fire monitoring.
- Communicate with other stakeholders regarding planned hot work on campus, as needed.
- Provide hands-on training and review of permitting process with contractors.

Security:

- Be trained on fire response and hot work monitoring procedures.
- Assist with fire monitoring tasks when requested by the Hot Work Permit Authorizer.

## HOT WORK PERMIT-SPECIFIC RESPONSIBILITIES

### Hot Work Supervisor / Permit Authorizer

- Review hot work operations to ensure they are being conducted in accordance with this program.
- Assess cold work alternatives or determine if the work can be moved to a hot work designated area.
- Designate qualified employees to complete hot work (Hot Work Operators) and serve as Fire Watch.
- Complete Hot Work Permits as required, and review with Hot Work Operators and Fire Watch. Share copy of the permit with Security so that they are aware of Hot Work Operations and Fire Watches on campus.

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- Ensure that automatic fire protection systems are in service and that there are no planned interruptions to service in the area when hot work is being performed. **When automatic fire protection systems are offline, no hot work is to be performed.**
- Verify that all required precautions are in place prior to authorizing the permit and initiating work. This includes additional required precautions if warranted due to a greater risk of fire or explosion. See [High Risk Hot Work Areas](#) for additional information.
- Limit permit authorization to a single shift. If work needs to be continued into a second shift, a new permit must be issued.
- Determine the appropriate level of post-work fire watch and fire monitoring, as per Table 1 (see [Required Precautions After Hot Work](#); also available on the back of the Hot Work Permit).
- Authorize the permit; keep Part 1 of the permit in the Building Operations office, and post Part 2 of the permit in the work area.
- After the fire monitoring is complete, conduct a final check of the hot work area for fire safe conditions to close out the permit. A visual check is recommended but verbal confirmation is acceptable for lower risk work areas.
- Combine Parts 1 and 2 of the completed hot work permit and file in the Building Operations office.
- MRU Hot Work Operators may authorize their own permit if work must be completed on an emergency basis or when there are no other trained workers available to act as Authorizer.
- Only the primary Permit Authorizers (Building Operations' Critical Systems Supervisor or HVAC Supervisor) or a formal designate may act as the Permit Authorizer for contractors, except in emergency situations.

Fire Watch

- Perform a continuous fire watch over the hot work area, maintaining a view of the entire hot work area and Hot Work Operator for the duration of the work and the post-work fire watch. If the Fire Watch needs to leave the area (e.g. breaks), the role may be passed to another qualified worker.
- Monitor the hot work area to ensure it remains free of combustibles; that precautions remain in place (e.g. welding pads or blankets); and that ignition sources remain in the defined hot work area.
- Stop work if unsafe conditions develop.
- Be trained and competent with the use of a fire extinguisher, and be able to use one in the event of a controllable fire emergency that arises during or after hot work.
- Sound alarm and notify emergency contacts in the event of a fire, before attempting to extinguish the fire with an extinguisher.

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- A second fire watch may be needed for hot work jobs when the hot work area and Hot Work Operator cannot be viewed from a single vantage point, or if the hot work area extends over different levels or through a building assembly (e.g. near a stairwell or adjacent to a thermally conductive wall).
- The Hot Work Operator may perform fire watch duties if the risk of fire or explosion is assessed by the Permit Authorizer to be low; if the Hot Work Operator can see all areas that could be ignited by the hot work; and if the work area can be fully controlled to ensure that no combustibles are introduced while work is occurring.

Hot Work Operator

- Complete required hot work training prior to conducting any hot work activities.
- Inspect all equipment for defects or damage prior to each use.
- Use all required personal protective equipment.
- Only complete hot work within hot work designated areas, or with a signed hot work permit issued by a Hot Work Permit Authorizer
- Only complete hot work as outlined on the hot work permit; if the scope of work changes, contact the Hot Work Permit Authorizer to update the permit.
- Cease hot work immediately if unsafe conditions develop.
- The Hot Work Operator may perform Fire Watch duties if the risk of fire or explosion is assessed by the Permit Authorizer to be low; if the Hot Work Operator can see all areas that could be ignited by the hot work; and if the work area can be fully controlled to ensure that no combustibles are introduced while work is occurring.
- MRU Hot Work Operators may authorize their own permit if work must be completed on an emergency basis or when there are no other trained workers available to act as Authorizer.

**HOT WORK GENERAL PRACTICES**

Before performing hot work, the following steps should be taken:

1. Seek alternative cold work methods
2. Consider relocating the work to a hot work designated area
3. Use the hot work permit system when conducting hot work outside hot work designated areas

**COLD WORK ALTERNATIVES**

The most effective way to control a hazard is to eliminate it. When considering the use of hot work operations, consideration should first be given to cold work alternatives.

Some examples of cold work alternatives are listed below in Table 1. This list is not exhaustive – consult your task supervisor to discuss additional options.

TABLE 1: HOT WORK AND COLD WORK ALTERNATIVES

Instead of:	Use:
Saw or torch cutting	Manual hydraulic shears
Welding	Mechanical bolting
Sweat soldering	Screwed or flanged pipe
Torch or radial saw cutting	Mechanical pipe cutter

When considering cold work alternatives, also assess the alternate method for hazards. The intent of selecting an alternative method is to reduce the risk, not increase it.

### HOT WORK DESIGNATED AREAS

When cold work alternatives are not available, the next step is to consider relocating work to a hot work designated area.

Hot work designated areas are locations maintained free of combustible and flammable material, enclosed to prevent hot work ignition sources from escaping the area, and protected by automatic sprinkler systems. The hot work permit system is not required for work performed in hot work designated areas, provided combustible, ignitable, or flammable materials remain controlled and safeguarded.

Hot work designated areas at MRU include:

- U100 Fabrication Room – welding and high risk hot work
- I112 Critical Systems Workspace – lower risk hot work only (no sparks, limited heat)

Hot work designated areas will be inspected at least monthly as part of the monthly Workplace Safety Inspection, to ensure that they remain clear of uncontrolled combustible, ignitable, or flammable materials.

### HOT WORK PERMIT SYSTEM

The MRU Hot Work Permit System is required any time hot work must be performed outside of a hot work designated area and cold work alternatives are not feasible.

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When working under a hot work permit, combustible and flammable material must be removed or isolated from the area. Refer to [Preparing the Hot Work Area](#), below.

Both automatic and manual fire protection systems and equipment must be available, and the hot work must be supervised both during work and after completion.

### PERMIT AUTHORIZATION

All hot work permits will be reviewed and authorized by an MRU-designated Permit Authorizer. The primary Permit Authorizers are the Building Operations' Critical Systems Supervisor or HVAC Supervisor. When they are unavailable, another hot work-trained MRU employee may act as Permit Authorizer for work being conducted by MRU staff. Only the primary Permit Authorizers or a formal designate may act as the Permit Authorizer for contractors, except in emergency situations.

Responsibilities of the Hot Work Permit Authorizer, the Fire Watch, and the Hot Work Operator are outlined in [Hot Work Permit-Specific Responsibilities](#).

Contractors, including prime contractors, are required to follow the MRU hot work permit system when performing hot work on MRU property. The Hot Work Permit Authorizer will confirm that the contractor Hot Work Operator and Fire Watch have the appropriate training prior to issuing the hot work permit. The Hot Work Permit Authorizer will assign post-hot work fire monitoring duties to MRU personnel or contractors performing the work, when unmanned methods are not available.

Permits shall be retained after the hot work has been completed. See [Auditing](#) for additional information.

### ESTABLISHING THE HOT WORK AREA

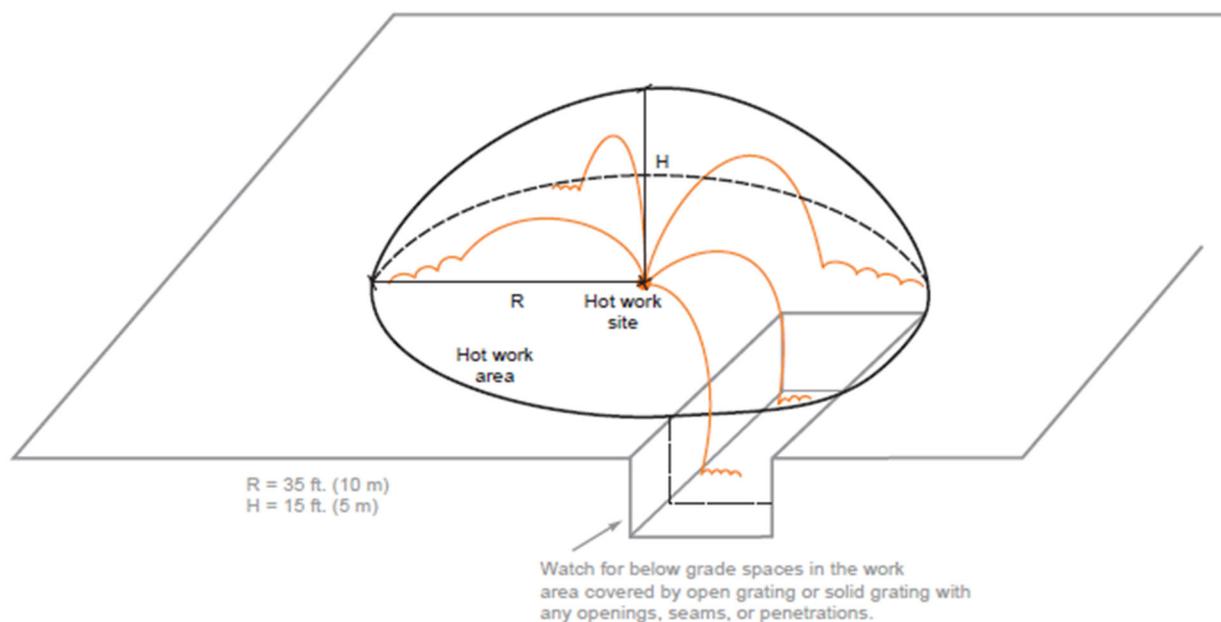
Whenever possible, the hot work area should be defined as 10 m / 35 ft horizontal radius and 5 m / 15 ft vertically from the site of the hot work (see Figure 1) when performing higher risk hot work (e. g. welding, other tasks that produce sparks or open flame).

- If conducting hot work at heights or working a drafty environment, extend the horizontal work area to 15 m / 50 ft.
- If torch cutting, radial grinding / cutting, or electric arc welding, extend the vertical work area to 10 m / 35 ft

Where it is not feasible to establish a hot work area of 10 m (e.g. repair work in classrooms), the Hot Work Operator will establish a hot work zone that is reasonable for the risk presented by the work, taking into consideration the distance that any heat, flame or sparks produced might travel.

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FIGURE 1 – HOT WORK PERMIT-REQUIRED AREA WITH A SINGLE HOT WORK SITE



The hot work area will need to be expanded if:

- There is a risk that hot work ignition sources could travel to other areas of the building, e.g. through openings in walls, ceilings, or floors (e.g. down stairways, through ductwork).
- The hot work site is on or near thermally conductive materials that pass through the building assembly (e.g. metal piping).
- The hot work is being performed near combustible-lined equipment, piping, or ducts in the hot work area.

Where possible, cover openings with FM Global-approved fire blankets and pads. If the openings cannot be covered, additional Fire Watches will need to be put in place for areas that can't be seen by the main Fire Watch.

#### PREPARING THE HOT WORK AREA

All combustible or ignitable material in the hot work area must be removed or isolated from ignition sources. Items to consider include:

- Combustible equipment, such as gas operated equipment
- Flammable chemicals and solvents
- Combustible accumulations, such as debris, dust, ignitable liquid (e.g. oil spills)

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Clean up any combustible or ignitable spills and dispose of rags in flammable waste containers. Ensure that flammable chemicals are removed from the area or stored in closed flammable cabinets.

Vacuum away combustible debris and dust from floors and inside ventilation and other service duct openings. Seal any cracks in ducts. Inspect the hot work area for accumulations that may be hidden from sight, such as in structures, underneath equipment, or in ductwork. Wetting material is NOT an adequate control.

If combustible materials cannot be moved (e.g. wall or ceiling surfaces), isolate the materials from the ignition source (or the ignition source from the materials) by using FM Global-approved welding pads, blankets, or curtains. For most maintenance work performed at MRU, blankets are appropriate. Use welding pads where there is a high potential for ignition. Curtains may be used where there is a low risk of ignition. Ensure that seams between multiple pads, blankets, and/or curtains overlap sufficiently and openings at the bottoms of curtains are covered.

Block off duct work openings and cracks between floorboards, along baseboards and walls, and under door openings, with FM Global-approved welding pads or blankets. Close doors and windows.

Secure, isolate, and vent pressurized vessels, piping and equipment as needed before beginning hot work. Follow the MRU Control of Hazardous Energy (Lock Out / Tagout) Procedure and conduct a job safety analysis to identify hazardous energy sources and determine the appropriate isolation method.

Protect or shut down ventilation and conveying systems in the hot work area as they may contain combustible material or transport hot work ignition sources outside the hot work area to downstream combustible accumulations or filters. If ventilation is needed for an enclosed hot work site, provide the following safeguards:

- Use a temporary ventilation system constructed of noncombustible components and remove air filters. If particulate filtration is needed, use an FM Global-approved Class 1 air filter.
- If negative ventilation is used, extend the hot work area to include the area around the fan discharge.
- If positive ventilation is used, ensure the airflow does not disperse hot work ignition sources outside the hot work area or compromise the arrangement of hot work blankets and curtains if in place.

If the work area may contain flammable vapours or gas, test the hot work area prior to work and as-needed during work. When conducting atmosphere monitoring, immediately stop work if the atmosphere exceeds 1% of the lower explosive limit (LEL).

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Ensure that manual firefighting equipment, including supplemental fire extinguishers and fire blankets, are available, and that the fire extinguishers are rated and sized appropriately for the hazard. For most maintenance work performed at MRU, a basic ABC extinguisher would be adequate.

**HIGH-RISK HOT WORK AREAS**

High-risk hot work areas pose an increased level of risk in comparison with other areas at MRU. Because of the increased risk of fire or explosion, additional required precautions may be necessary for work to continue.

The pre-work safety review in these high-risk areas should strongly consider alternative cold work methods or relocating the work to a hot work designated area.

The following types of hot work are considered high risk and require additional precautions not noted above:

- Hot work on combustible-lined equipment, piping, or ductwork
- Hot work on thermally-conductive materials at or near penetrations into combustible building assemblies, e.g. working on pipes adjacent to combustible materials
- Hot work on combustible building assemblies, e.g. welding seams of insulated metal panels or cutting through a steel deck roof
- Hot work on torch-applied roofing systems

Examples of additional precautions to be applied are below. The list is not comprehensive and other precautions may be effective and appropriate. Discuss with one of the main Permit Authorizers (Critical Systems or HVAC Supervisors) to determine the best hazard controls for the situation:

- Remove the combustible linings, materials, or portions of the building assembly from the area, and replace with non-conductive alternatives
- Monitor temperature of thermally-conductive materials during hot work and during the post-work fire watch
- Use an infrared camera to perform fire watch and stop work immediately if hot spots are detected
- Flood equipment, piping, or ductwork with water, or continuously wet-down combustible surfaces with water spray during hot work and during the post-work fire watch (ensure electrical circuits in the area have been de-energized)

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**REQUIRED PRECAUTIONS DURING HOT WORK**

Part 2 of the hot work permit must be posted at the worksite as a warning, as a reference of the required precautions, and for documenting during- and post-work precautions such as periodic atmospheric gas monitoring (when required) and post-work sign-offs. Part 1 of the permit is posted in the Building Operations office.

A continuous Fire Watch is required during hot work, and must perform the following duties:

- Continuously supervise the hot work area and the person performing the work to ensure fire-safe conditions are maintained. The fire watch must be maintained from the start to completion of work, even over breaks. If the fire watch needs to leave the hot work area (e.g. lunch, coffee, bathroom breaks), assign a temporary replacement to maintain a continuous watch.
- Ensure that hot work ignition sources are confined within the defined hot work area.
- Maintain required precautions (e.g. fire extinguisher, gas monitors).
- Stop work if a hazardous condition is identified.
- In the event of a fire, notify the emergency contacts (noted on hot work permit) before attempting to extinguish the blaze, regardless of size.

An MRU Hot Work Operator can act as their own fire watch if the risk of ignition is determined by the Hot Work Permit Authorizer to be low; if the Operator can see all areas that could be ignited by the hot work; and if the work area can be fully controlled to ensure that no combustibles are introduced while work is occurring.

A second Fire Watch is required whenever a single fire watch can't see the entire hot work area due to the area configuration, or when there is a risk of fire to areas that can't be seen by a single vantage point (e.g. the other side of walls made of conductive materials, or through holes / openings such as down a flight of stairs).

The Hot Work Operator is responsible for restricting the scope of the work to that defined on the hot work permit. If the type of hot work or the location changes from what is stated on the permit, stop work and contact the Permit Authorizer to update and reauthorize the permit before continuing.

**REQUIRED PRECAUTIONS AFTER HOT WORK**

Fire watch and monitor is required for the entire hot work area (including any areas that required a second fire watch). The post-work fire watch responsibilities are the same as those performed during hot work (see [Required Precautions During Hot Work](#)).

After the post-work fire watch has concluded, perform fire monitoring within the hot work area, using one of the methods listed below:

- Automatic smoke detection system with remote alarm that sounds in a constantly-attended location
- Security video cameras with clear coverage of the hot work area (cameras with infrared capability are preferred)
- Workers routinely present in the hot work area – ensure workers are trained to monitor for fire-safe conditions, maintain required precautions in place, and notify emergency contacts before making any attempt to extinguish the fire
- Have personnel patrol the hot work area for fire-safe conditions at least every 15 minutes – ensure personnel are trained to monitor for fire-safe conditions, maintain required precautions in place, and notify emergency contacts prior to attempting to extinguish a fire, regardless of size.

Permit-required hot work will be provided with post-work fire watches and fire monitoring periods as noted in Table 2, below (also available on the back of the hot work permit). The cells highlighted in blue are the periods that will apply to MRU worksites.

**TABLE 2 – CONSTRUCTION AND OCCUPANCY FACTORS FOR DETERMINING POST-WORK FIRE WATCH AND FIRE MONITORING PERIODS**

		Construction Factors					
		Noncombustible construction or FM Approved Class 1 or Class A building materials		Combustible construction without concealed cavities <sup>1</sup>		Combustible construction with unprotected concealed cavities <sup>2</sup>	
		Watch	Monitor	Watch	Monitor	Watch	Monitor
<b>Occupancy Factors</b>	Noncombustible with any combustibles contained within closed equipment (e.g., ignitable liquid within piping)	30 min.	0 hours	1 hour	3 hours	1 hour	5 hours
	Office, retail, or manufacturing with limited combustible loading	1 hour	1 hour	1 hour	3 hours	1 hour	5 hours
	Manufacturing with moderate to significant combustible loading except as noted below	1 hour	2 hours	1 hour	3 hours	1 hour	5 hours
	Warehousing	1 hour	2 hours	1 hour	3 hours	1 hour	5 hours
	Exceptions: Occupancies with processing or bulk storage of combustible materials capable of supporting slow-growing fires (e.g., paper, pulp, textile fibers, wood, bark, grain, coal or charcoal)	1 hour	3 hours	1 hour	3 hours	1 hour	5 hours

<sup>1</sup> This construction type does not contain small combustible wall or ceiling cavities where smoldering fires can grow undetected.  
<sup>2</sup> This construction type allows for smoldering fires to grow undetected within small combustible wall or ceiling cavities.

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### EMERGENCY REPAIRS

Occasions will arise when emergency repairs are required and there is no time to provide the full FM Global training to a hired third party contractor. In these instances, it is recommended that the Permit Authorizer provide the contractor with a brief overview of the MRU Hot Work Program expectations and act as Fire Watch for the repairs to provide onsite supervision and ensure that the contractor is following the MRU program.

### INCIDENTS

All hot work-related incidents will be reported via the Injury / Incident Report Form (including close calls / near misses). EH&S and the department supervisor (or designate) will conduct an investigation of all hot work-related incidents and identify root causes and corrective actions.

### TRAINING

Initial and annual refresher training on the hot work permit system is required for all facility and contractor personnel conducting hot work, performing fire watch or fire monitoring, and any MRU personnel acting as Permit Authorizer.

Training elements include:

- Completion of the FM Global online training course, “Managing Hot Work Using FM Global’s Hot Work Permit System”, available through EH&S
- Review of this document, including:
  - Roles and responsibilities of the Permit Authorizer, Fire Watch, and Hot Work Operators
  - Locations of Hot Work Designated Areas
  - Overview of permit authorization, permit expiration and reauthorization process
- Contractor supervision expectations as outlined in the
- Fire extinguisher training and review of emergency response procedures

All training records will be retained by the department, with copies available with EH&S. Certificates will be retained for at least the duration of worker employment with MRU.

Contractors, including prime contractors performing hot work on MRU property must follow the MRU Hot Work Management Program and complete the required training. See [Appendix B](#) for additional information.

### AUDITING

The following hot work management records shall be retained for program auditing:

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- Completed hot work designated area inspections
- Completed hot work permits
- Hot work incident reports, including near misses

EH&S will conduct a monthly audit of hot work permits and an annual audit of the overall hot work program, including a review of program records and facility changes.

**DEFINITIONS**

**Additional Required Precautions:** Additional precautions beyond the standard required precautions listed on the permit, which may be needed to safely conduct hot work when working in hot work high-risk areas.

**Alternative Cold Work Method:** A non-hot work method of performing work that doesn't post a fire or explosion hazard.

**Contractor:** An independent legal entity that is engaged in the business of providing work in exchange for payment. An independent legal entity includes an individual, sole proprietorship, partnership or a corporation.

**Combustible Construction:** Walls, ceilings, or roofs that contain wood or plastic material that are not approved by MRU's insurance provider, FM Global. Non-combustible materials include metal, concrete, or FM-approved plastic materials or roofing assemblies.

**Employee:** Volunteers or individuals who are engaged to work for the University under an employment or apprenticeship contract, including Faculty, Staff, exempt Employees, Management Employees, and Undergraduate, Graduate or Postgraduate students carrying out work for the University.

**Fire Monitoring:** Methods such as automatic smoke detection system, video cameras, or the presence of trained operators and personnel to patrol an area following the completion of the post-work fire watch.

**Fire Watch:** Continuous supervision of the hot work area and the person performing the work to ensure firesafe conditions are maintained during work and for a predetermined period of time following work completion.

**FM Approved:** Products and services that have satisfied the criteria for approval by FM Approvals. A list can be obtained through Risk Services or EH&S.

**FM Global:** Mount Royal University's liability insurance provider, and provider of hot work training and permit system.

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**Hot Work Area:** The space surrounding a hot work site defined by the horizontal and vertical reach of hot work ignition sources, within which combustible, ignitable, and flammable materials are temporarily removed or isolated. At MRU, this is typically 10 m or 35 ft.

**Hot Work Designated Area:** An area of a facility that is maintained free of combustible and flammable material, enclosed to prevent hot work ignition sources from escaping the area, and protected by automatic sprinkler systems.

**Hot Work High-Risk Area:** An area of a facility in which hot work can be conducted with a Hot Work Permit, but additional required precautions may be necessary given an increased likelihood of fire or explosion.

**LEL:** Lower Explosive Limit. The lowest level of concentration of flammable gases or vapours in the air that can ignite.

**Low-Energy Hot Work:** Any temporary or routine work capable of producing electrical or electrostatic sparks, or hot surfaces of sufficient energy to ignite ignition-sensitive materials or ordinary combustibles due to prolonged contact with hot surfaces. Examples of low-energy hot work operations include the use of electrically heated hot irons or hot-air blowers, and small scale / hobby-sized soldering kits.

**Permit Authorizer:** Person who decides if there’s a safer way to conduct hot work operations and, if hot work is unavoidable implements the Hot Work Permit system for the operation.

**Prime Contractor:** A contractor that has been assigned health and safety responsibility for a defined work zone, as outlined in the Alberta Occupational Health and Safety Code.

**Thermally Conductive Materials:** Metal piping, steel structural member, and other materials that pass through a building assembly (wall, ceiling or roof) that may conduct heat into and through the assembly when hot work is completed on them, potentially igniting materials on the other side.

**REFERENCES**

Alberta Occupational Health and Safety Act, Regulation, and Code

Canadian Centre for Occupational Health and Safety, Welding – Hot Work, [https://www.ccohs.ca/Oshanswers/safety\\_haz/welding/hotwork.html](https://www.ccohs.ca/Oshanswers/safety_haz/welding/hotwork.html)

FM Global, Guide to Hot Work Loss Prevention, Sixth Edition

FM Global, Property Loss Prevention Data Sheet 10-3, Hot Work Management

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**REVISION HISTORY**

Date	Revision	Notes
September 2019	01	Creation of Safety Program
March 2020	02	Updated: <ul style="list-style-type: none"> <li>• Updated incident reporting information to current form</li> <li>• Responsibilities for Hot Work Operator, Fire Watch, Permit Authorizer (operator can be fire watch or authorizer in some cases)</li> <li>• Hot Work Designated Areas (include I112)</li> <li>• Permit Authorization section updated to reflect current roles / responsibilities for permit authorization</li> <li>• Establishing the Hot Work Area (can be less than 10 m radius)</li> <li>• Preparing hot work area – clarified when welding pads are needed and when air testing is required</li> <li>• Incident reporting (replaced old reporting form titles with new one)</li> <li>• Auditing (to include monthly permit audit)</li> </ul>
October 2020	03	Added Emergency Repair section

**APPENDICES**

[Appendix A: Sample Hot Work Permit](#)

[Appendix B: Contractor Training Requirements](#)

APPENDIX A: SAMPLE HOT WORK PERMIT

Copies of the Hot Work Permit are available through the EH&S Department or by using the FM Global Hot Work Permit app.

Figure A-1: Hot Work Permit (page 1)

# HOT WORK PERMIT

**STOP!**  
Avoid hot work when possible! Consider using an alternative cold work method.

This Hot Work Permit is required for any temporary operation involving open flames or producing heat and/or sparks conducted outside a Hot Work Designated Area. This includes, but is not limited to: brazing, cutting, grinding, soldering, torch-applied roofing and welding.

<p style="text-align: center; margin: 0;"><b>Instructions for Permit Authorizer</b></p> <ol style="list-style-type: none"> <li>1. Specify the precautions to take.</li> <li>2. Fill out and keep <b>Part 1</b> during the hot work process.</li> <li>3. Issue <b>Part 2</b> to the person doing the job.</li> <li>4. Keep <b>Part 2</b> on file for future reference, including signed confirmation that the post-work fire watch and monitoring have been completed.</li> <li>5. Sign off the final check on <b>Part 2</b>.</li> </ol>	<p style="text-align: center; margin: 0;"><b>Part 1</b></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 10%; border: none;">Y</td> <td style="width: 10%; border: none;">N</td> <td style="border: none;"><input type="checkbox"/></td> <td style="border: none;">The fire pump is in operation and switched to automatic.</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/></td> <td style="border: none;"><input type="checkbox"/></td> <td style="border: none;"><input type="checkbox"/></td> <td style="border: none;">Control valves to water supply for sprinkler system are open.</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/></td> <td style="border: none;"><input type="checkbox"/></td> <td style="border: none;"><input type="checkbox"/></td> <td style="border: none;">Extinguishers are in service/operable.</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/></td> <td style="border: none;"><input type="checkbox"/></td> <td style="border: none;"><input type="checkbox"/></td> <td style="border: none;">Hot work equipment is in good working condition.</td> </tr> </table> <p style="margin: 5px 0;"><b>Requirements within 35 ft. (10 m) of hot work</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Shield combustible construction using listed (e.g., FM Approved) welding pads, blankets and curtains.</li> <li><input type="checkbox"/> Remove or shield nonremovable combustibles using listed (e.g., FM Approved) welding pads, blankets and curtains.</li> <li><input type="checkbox"/> Isolate potential sources of flammable gas, ignitable liquid or combustible dust/lint (e.g., shut down equipment).</li> <li><input type="checkbox"/> Remove ignitable liquid, combustible dust/lint and combustible residues.</li> <li><input type="checkbox"/> Shut down ventilation and conveying systems.</li> <li><input type="checkbox"/> Remove combustibles and consider a second fire watch on opposite side of floor, wall, ceiling or roof when openings exist or thermally conductive materials pass through.</li> <li><input type="checkbox"/> Is work on a combustible building assembly (e.g., Torch-Applied Roofing)? If yes, provide <b>ADDITIONAL REQUIRED PRECAUTIONS</b> below.</li> </ul> <p style="margin: 5px 0;"><b>Hot work on/in closed equipment, ductwork or piping</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Isolate equipment from service.</li> <li><input type="checkbox"/> Remove ignitable liquid and purge flammable gas/vapor.</li> <li><input type="checkbox"/> Prior to work, and/or during work, monitor for flammable gas/vapor. LEL reading(s): _____</li> <li><input type="checkbox"/> Remove combustible dust/lint or other combustible materials.</li> <li><input type="checkbox"/> Is work on/in equipment with nonremovable combustible linings or parts? If yes, provide <b>ADDITIONAL REQUIRED PRECAUTIONS</b> below.</li> </ul> <p style="margin: 5px 0;"><b>Fire watch/fire monitoring the hot work area</b> Times listed are sufficient for majority. Use Table at back of permit for guidance for combustible concealed cavities, roof work or favorable factors.</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Perform a continuous fire watch during hot work.</li> <li><input type="checkbox"/> Perform a continuous fire watch post-work for             <ul style="list-style-type: none"> <li><input type="checkbox"/> 1 hour or Other ___ hours.</li> </ul> </li> <li><input type="checkbox"/> Perform fire monitoring for             <ul style="list-style-type: none"> <li><input type="checkbox"/> 3 hours or Other ___ hours.</li> </ul> </li> </ul> <p style="margin: 5px 0;"><b>ADDITIONAL REQUIRED PRECAUTIONS:</b></p> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>	Y	N	<input type="checkbox"/>	The fire pump is in operation and switched to automatic.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Control valves to water supply for sprinkler system are open.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Extinguishers are in service/operable.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Hot work equipment is in good working condition.
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<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Extinguishers are in service/operable.														
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Hot work equipment is in good working condition.														

<p style="margin: 0;">HOT WORK BY</p> <p style="margin: 0;"><input type="checkbox"/> Employee</p> <p style="margin: 0;"><input type="checkbox"/> Contractor _____</p>	<p style="margin: 0;">DATE: _____</p> <p style="margin: 0;">JOB NUMBER: _____</p>
<p style="margin: 0;">LOCATION OF WORK (BUILDING/FLOOR/OBJECT)</p>	
<p style="margin: 0;">WORK TO BE PERFORMED</p>	
<p style="margin: 0;">NAME OF PERSON PERFORMING HOT WORK</p>	
<p style="margin: 0;">NAME OF PERSON PERFORMING FIRE WATCH</p>	
<p style="margin: 0; font-weight: bold;">I verify the above location has been examined, the Required Precautions have been taken, and permission is authorized for this work.</p>	
<p style="margin: 0;">PERMIT AUTHORIZER (PRINT AND SIGN)</p>	
<p style="margin: 0;"><b>THIS PERMIT EXPIRES ON (LIMIT AUTHORIZATION TO ONE SHIFT):</b></p> <p style="margin: 0;">DATE: _____ TIME: _____ AM/PM</p>	
<p style="margin: 0; border: 1px solid black; padding: 2px;"><b>Note:</b> Emergency notification on back of form.</p>	
<p style="margin: 0;"><b>Additional FM Global Resources:</b></p> <p style="margin: 0; font-size: x-small;">Property Loss Prevention Data Sheet 10-3, <i>Hot Work Management</i></p> <p style="margin: 0; font-size: x-small;">Hot Work Permit App via <a href="http://fmglobal.com/apps">fmglobal.com/apps</a></p> <p style="margin: 0; font-size: x-small;">Hot Work Permit form (F2630) via <a href="http://fmglobalcatalog.com">fmglobalcatalog.com</a></p> <p style="margin: 0; font-size: x-small;">Online training at <a href="http://training.fmglobal.com">training.fmglobal.com</a></p> <p style="margin: 0; font-size: x-small;">FM Approved equipment via <a href="http://fmapprovals.com">fmapprovals.com</a></p>	
<p style="margin: 0; font-size: x-small;">F2630 © 2018 FM Global. (01/2018) All rights reserved.</p>	

Figure A-2: Hot Work Permit (page 2)

WARNING

HOT WORK IN PROGRESS! Watch for fire!

<p style="text-align: center; font-weight: bold;">Instructions</p> <p><b>Person performing hot work:</b> Record time started and display permit at hot work area. After hot work is completed, record time and leave permit displayed for fire watch.</p> <p><b>Fire watch:</b> Watch area during hot work and after work completion. Prior to leaving area, perform final inspection, sign, leave permit displayed and notify Fire Monitor or Permit Authorizer.</p> <p><b>Fire Monitor:</b> Monitor area after post-work fire watch completion. Perform final inspection, sign and return to Permit Authorizer.</p> <p>HOT WORK BY  <input type="checkbox"/> Employee  <input type="checkbox"/> Contractor _____</p> <p>DATE _____ JOB NUMBER _____</p> <p>LOCATION OF WORK (BUILDING/FLOOR/OBJECT) _____</p> <p>WORK TO BE PERFORMED _____</p> <p>NAME OF PERSON PERFORMING HOT WORK _____</p> <p>NAME OF PERSON PERFORMING FIRE WATCH _____</p> <p style="background-color: yellow; font-weight: bold; font-size: 10px;">I verify the above location has been examined, the Required Precautions have been taken, and permission is authorized for this work.</p> <p>PERMIT AUTHORIZER (PRINT AND SIGN) _____</p> <p style="font-weight: bold; font-size: 10px;">THIS PERMIT EXPIRES ON (LIMIT AUTHORIZATION TO ONE SHIFT):</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">DATE:</td> <td style="width: 33%;">TIME:</td> <td style="width: 33%;">AM/PM</td> </tr> <tr> <td>Hot Work Date:</td> <td>Start Time:</td> <td>am/pm</td> </tr> <tr> <td></td> <td>Finish Time:</td> <td>am/pm</td> </tr> <tr> <td>Post-Work Fire Watch</td> <td>Finish Time:</td> <td>am/pm</td> </tr> <tr> <td>Name</td> <td></td> <td></td> </tr> <tr> <td>Fire Monitor <input type="checkbox"/> Person <input type="checkbox"/> Other</td> <td>Finish Time:</td> <td>am/pm</td> </tr> <tr> <td>Name/Other</td> <td></td> <td></td> </tr> <tr> <td>Final Check</td> <td>Time:</td> <td>am/pm</td> </tr> <tr> <td>Name</td> <td></td> <td></td> </tr> </table> <p style="font-size: 8px;">F2630 © 2018 FM Global. (Rev. 01/2018) All rights reserved.</p>	DATE:	TIME:	AM/PM	Hot Work Date:	Start Time:	am/pm		Finish Time:	am/pm	Post-Work Fire Watch	Finish Time:	am/pm	Name			Fire Monitor <input type="checkbox"/> Person <input type="checkbox"/> Other	Finish Time:	am/pm	Name/Other			Final Check	Time:	am/pm	Name			<p style="text-align: center; font-weight: bold;">Part 2</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%; text-align: center; font-size: 8px;">Y</td> <td style="width: 10%; text-align: center; font-size: 8px;">NA</td> <td style="width: 80%;"></td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td></td> <td>The fire pump is in operation and switched to automatic.</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td></td> <td>Control valves to water supply for sprinkler system are open.</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td></td> <td>Extinguishers are in service/operable.</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td></td> <td>Hot work equipment is in good working condition.</td> </tr> <tr> <td colspan="3" style="padding: 5px;"><b>Requirements within 35 ft. 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Figure A-3: Hot Work Permit (page 3)

# WARNING

## HOT WORK IN PROGRESS!

### Watch for fire!

In case of emergency, call the contacts listed below before attempting to extinguish the fire.

Contact	Number

**Construction and Occupancy Factors for Post-Work Fire Watch and Monitoring Periods**

		Construction Factors					
		Noncombustible construction, or FM Approved Class 1 or Class A building materials		Combustible construction without concealed cavities		Combustible construction with unprotected concealed cavities	
		Watch	Monitor	Watch	Monitor	Watch	Monitor
Occupancy Factors	Noncombustible with any combustibles contained within closed equipment (e.g., ignitable liquid within piping)	30 minutes	0 hours	1 hour	3 hours	1 hour	5 hours
	Office, retail or manufacturing with limited combustible loading	1 hour	1 hour	1 hour	3 hours	1 hour	5 hours
	Manufacturing with moderate to significant combustible loading except as noted below	1 hour	2 hours	1 hour	3 hours	1 hour	5 hours
	Warehousing	1 hour	2 hours	1 hour	3 hours	1 hour	5 hours
	<b>Exceptions:</b> Occupancies with processing or having bulk storage of combustible materials capable of supporting slow-growing fires (e.g., paper, pulp, textile fibers, wood, bark, grain, coal or charcoal)	1 hour	3 hours	1 hour	3 hours	1 hour	5 hours

When performing torch-applied roofing, apply additional precautions and conduct a minimum 2 hours fire watch and 2 hours fire monitoring. If an infrared camera is utilized, reduce to a 1 hour fire watch and 1 hour fire monitoring.

When performing hot work on/in equipment containing nonremovable combustible linings or parts, apply additional precautions and conduct a minimum 1 hour fire watch and 3 hours fire monitoring within the equipment, and in the surrounding areas per Table above.



Mount Royal University: Safety Program		
<b>Hot Work Management</b>		
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**APPENDIX B: CONTRACTOR TRAINING REQUIREMENTS**

Contractors performing or supervising hot work on MRU property must complete the required training:

- Review this program
- Complete the online FM Global training program, “Managing Hot Work Using FM Global’s Hot Work Permit System”

To register contractors for the online program, provide the following information to EH&S **at least 4 business days** before hot work is scheduled to start:

- Contractor company name
- Contractor employee’s name(s) and work email addresses
- Contractor hot work supervisor name and work email address

Once registration is confirmed, the online training course can be found at <http://training.fmglobal.com>.

Contractor employees must present copies of the training certificate to the MRU Hot Work Permit Authorizer when they request a permit. The Permit Authorizer will provide a short, hands-on review of the permit process.

Training must be refreshed annually.