

VICTORIA UNIVERSITY HEALTH AND SAFETY PROCEDURE

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Review/Revise Date:

HOT WORK

PURPOSE

The purpose of this procedure is to ensure that the process of conducting hot work is done safely and in such a manner that it does not endanger University staff, workers or property.

SCOPE

Hot work is defined as any welding, cutting, grinding or any other activity involving open flames, sparks or other ignition sources that may cause smoke or fire which may trigger detection systems. The following procedure will define how the hot work permit is to be filled out and what precautions must be taken before and during this process.

STANDARDS/PROCEDURES

Based on the potential risks associated with performing hot work the following hazards have been identified:

Safety Hazards Include:

- Cuts
- Eye injuries
- Electrical

Physical Hazards Include:

- Radiation
- Noise
- Extreme Temperatures
- Infra-radiation
- X-Rays
- Burns
- Visible light
- Gamma Rays
- Stray Currents

Chemical Hazards Include:

- Fumes
- Vapours/Gases
- Dusts

Fire/Explosion:

There is always a threat of a fire or explosion occurring when performing hot work. This results from either chemicals reacting with one another to form explosive or flammable mixtures or sparks from cutting and grinding igniting flammables or combustibles.

WHO MAY PERFORM HOT WORK

- Hot work will be performed by the I&S workers or contractors.
- All I&S workers performing hot work will have undergone Victoria University's hot work training program.
- Contractors will abide by the University hot work permit

PROTECTIVE EQUIPMENT

- Fire Extinguisher
- Welding Screens
- Protective Coverings where required
- While performing hot work the worker will use the applicable personal protective equipment. This could include any or all of the following:
 - Respirator
 - Welding helmets and shield
 - Hearing protection (ear plugs)
 - Fireproof clothing
 - Leather gloves
 - Leather apron
 - Leather chaps
- Any other equipment as required for the protection of equipment, building and people.

INITIAL CHECK / PROTECTIVE MEASURES

- To be completed prior to the start of the job the manager (or designated supervisor) and the worker or contractor shall ensure that the following precautions are met:
 - Area secured/guarded- this is to be done to safeguard other personnel in the area or who may enter the area
 - 15m radius around the hot work location is cleared of flammable or combustible materials or if items cannot be removed are appropriately shielded by a non-combustible barrier or fire rated barrier
 - Floors swept clean to remove any materials that may ignite or pose trip or fall hazards
 - No explosive atmospheres are present
 - Ducts that may carry sparks out of the work area are shielded or shut down
 - Wall and floor openings are covered (openings or cracks in walls, floors, ducts are covered or sealed with fire-rated or non-combustible material)

- Hot work completed near walls, partitions, ceilings or roofs of combustible construction, appropriate shielding must be provided to prevent fires
 - Appropriate other barriers such as welding shields have been installed to protect any worker/student/ etc. who may be passing by from exposure to welding hazards
 - Fire extinguisher is readily available and under the control of the person assigned as fire watch
 - Adequate ventilation must be provided. This may include the use of a portable ventilation system.
 - Equipment to be used is in good repair – all equipment to be used for the job will be inspected prior to use and must be in good working order. Cylinders, piping and fittings used in welding and cutting must be protected against damage.
 - Containers purged of flammable vapours – this is a special precautionary item and must be discussed with the Manager.
- To avoid explosion hazards, particular precautions must be adhered to when welding or cutting in a dusty or gaseous environment.
 - Put stub ends of welding rods in a suitable refuse container.

Additional Rules

- Dirty and oily rags must be cleared from the hot work area prior to hot work beginning.
- An arc welding electrode or ground lead must never be hung over a compressed gas cylinder.
- In the case of electrical welding, the area will be kept free of electrode studs and metal scrap.
- Receptacles, for electrode studs are to be provided and used.

DURING HOT WORK ACTIVITIES

- Hot work permit must be displayed in the work area where the activity is taking place
- Worker/contractor performing the work shall ensure that they have the appropriate PPE and other safety equipment to conduct the job in a safe manner. Continuous housekeeping of the area shall occur to ensure no trip or falls hazards or accumulation of any debris that may cause a fire hazard or any other safety hazard.
- Worker/contractor assigned to conduct 'Fire Watch' activities shall ensure the following conditions:
 - In control of an appropriate fire extinguisher based on the type of fire
 - Combustible materials are more than 15m away or if not possible remains appropriately shielded/guarded
 - No sparks are falling to lower areas, under machines or equipment or out of the protected area

- Monitor for any fires or smoldering fires during and after the hot work activity and taking appropriate action if required (i.e. use fire extinguisher, stop hot work activity, etc.)
- Be familiar with the location, know the location of the closest fire alarm and process to activate the fire alarm.
- Once hot work activities are completed, the worker conducting the hot work activity shall clean up the area and return and safety control devices.

FIRE WATCH (after hot work activities have concluded)

- A fire watch will be provided during and for 60 minutes continuously after the work has been completed, including any coffee and lunch breaks including but not limited to:
 - Inspecting all ceilings, walls, and floors for signs of indication of ignition or heat
 - Indication of smoldering fire or ignition sources
- A Worker/contractor may be assigned to conduct further fire watch monitoring (periodic checks) of the area for 3 hours after the 60min continuous fire watch, to verify that no smoldering occurs or other fire ignition. This fire watch may carry past the current shift, the duties will be assigned to another designated worker who must sign off on the permit.
- A fire watch may be required for adjoining areas, above, and below.
- Once fire watch activities are completed, the permit must be completed and returned to the Senior Campus Manager for record keeping.

EMERGENCY SITUATIONS

- In the event that the hot work may lead to a fire or another emergency situation an assistant will be provided with a fire extinguisher. This assistant will also be trained on the hot work procedures.
- In the event that the two workers cannot control the emergency situation they will immediately notify their manager and sound the appropriate alarms as outlined in Victoria University's Emergency Preparedness procedures.
- Workers will immediately leave the building by the closest and/or safest possible exit.

HOT WORK RESTRICTIONS

- Welding shall not be permitted in wet areas unless approved safety measures have been applied, such as de-energizing of equipment or electrical circuits.
- Welding, cutting or other hot work shall not be performed on containers, equipment or piping containing flammable liquids, combustible liquids, or flammable gases unless they have been cleaned, tested and found to be free of residual liquid, vapour or gas. Sampling with a combustible gas detection meter is required in order to satisfy this requirement.

- Welding or cutting shall not be undertaken on a totally enclosed container.

HOT WORK PERMIT COMPLETION

- A hot work permit is only required when welding, cutting, burning, etc. is performed in any area. Before hot work is to begin, the maintenance employee must verify that the location has been examined, and precautions have been taken to prevent a fire. (see attached form)

Filling out the permit

Proposal: To be completed by the person responsible for carry out the work

- Building
- Exact location of the proposed work
- Nature of hot work to be undertaken
- Signed
- Date
- Name (print in block capitals)
- Position
- Contractor (where applicable)
- The checklist on the reverse of the form has been reviewed and the appropriate boxes have been ticked. The permit is **NOT** valid until the initial check list on the reverse of the form has been done and signed by the permit holder.

Agreement: To be completed by the company fire officer or other nominated person.

- Time of issue of permit (when the hot work starts)
- Time of expiry of permit (when the hot work is completed and after the 1 hour fire watch)
- Final fire check of the work area
- Additional conditions or special precautions required – any special precautions that must be taken before the job can be started to ensure the safety of the permit holder, other personnel and equipment.
- Signed
- Name printed in BLOCK CAPITALS
- Date
- Position
- The permit is **NOT** valid until the initial check list has been done and signed by the permit holder.

Fire Watch: To be completed by member of staff or contractor responsible for the work before returning this permit to the issuer (i.e. qualified trades person).

- Signed
- Name printed in BLOCK CAPITALS
- Date

- Position
- Contractor if applicable
- The permit is **NOT** valid until the initial check list has been done and signed by the permit holder.
- Fire checks must be done and signed after the Hot Work is completed.
- Once the 1 hour fire watch is complete, the hot work permit must be signed off and filed with the Senior Campus Manager. Records will be kept for 1 year.

ROLES AND RESPONSIBILITIES

It is the responsibility of the Senior Campus Manager to enforce this procedure and ensure that all maintenance workers conducting hot work are trained in its' requirements. The manager is responsible for determining when and how the hot work procedure is to be used.

COMMUNICATION

- All procedures will be communicated to University employees annually.

TRAINING

- The Senior Operations manager and I&S staff will be trained in both the technical and safety aspects of their work. The training will include but not be limited to:
 - Hazard identification
 - Safe welding, brazing, cutting procedures
 - Fire and safety precautions
 - Control methods
 - Proper use and maintenance of the welding equipment
 - Proper use and maintenance of the personal protective equipment
 - Proper use and completion of the hot work permit
 - Training records will be maintained in the employees Human Resources file.

EVALUATION

- A review of the management and worker/supplied labour responsibilities will be done on an annual basis. This evaluation will measure each health & safety responsibility.
- The performance evaluation system must be formalized and measure each health & safety responsibility.
- This procedure will be reviewed by both the Joint Health and Safety Committee and the Maintenance Manager at Victoria University every 3 years or if legislation changes or an incident occurs.

FORMS

- Hot Work Permit

RELATED PROCEDURES

- Health and Safety Responsibilities

REFERENCE MATERIALS

- Ontario legislation – OHS section 25, 26, 27 and 28
- CSA Standards.

Approved Signature:	Date:
Distribution to: JHSC Physical Plant	Document to be posted: NO

Hot Work Permit

PROPOSAL

To be completed by the person responsible for carrying out the work.

Building: _____ Exact location of proposed work: _____

Nature of hot work to be undertaken:

The above location has been examined and the precautions listed on the reverse side of this form have been complied with as indicated.

Signed: _____ Name (BLOCK CAPITALS): _____

Date: _____ Position: _____

Contractor (where applicable): _____

AGREEMENT

To be completed by the Campus Manager or designate.

This Hot Work Permit is issued subject to the following conditions:

Time of issue of permit: _____ Time of expiry of permit:*

A final fire check of the work area shall be made, not before:

Additional conditions required:

Signed: _____ Name (BLOCK CAPITALS): _____

Date: _____ Position: _____

FIRE WATCH

To be completed by member of staff or contractor responsible for the work before returning this permit to the issuer.

The work area and all adjacent areas to which sparks and heat might have spread (such as floors below and above, and areas on other sides of walls) have been inspected and found to be free of fire following completion of work.

Time inspection completed (**This must be at least 1 hour continuous monitor after work was completed**): _____

Signed: _____ Name (BLOCK CAPITALS): _____

Date: _____ Position: _____

Contractor (where applicable): _____

3 hour Time inspection completed when needed (**spot check after work was completed**): _____

Signed: _____ Name (BLOCK CAPITALS): _____

Date: _____ Position: _____

Contractor (where applicable): _____

**It is not desirable to issue permits for protracted periods. Fresh permits should be issued, for example, where work extends from morning to afternoon.*

N.B.: Where work is being carried out by a contractor, the issuer of the permit should ensure that the contractor has complied with the requirements prior to work being carried out, and should be satisfied that the area is free of fire when work is completed.

PROCEDURE FOR HOT WORK PERMITS

The person nominated to authorize hot work, normally the fire or safety officer, must have experience or training in the problems associated with hot work and be of suitable status to ensure compliance with the procedures.

Prior to the commencement of work a **hot work permit** should be obtained from the authorized person. This should be done on every occasion that hot work of any type is undertaken within or upon the fabric of established buildings or any structures or plant in the open. This procedure should also apply to construction sites once fitting out has commenced, and to all buildings which are being refurbished.

A hot work permit should not be issued without considering the significance of any other permits to work in the vicinity, or adjacent manufacturing processes which may involve the use of flammable liquids or gases.

A hot work permit should also be issued for a specific task that is undertaken in a clearly identified area. Hot work permits should not be issued for protracted periods. Separate hot work permits should be issued for work which extends from morning to afternoon periods.

Before completing the first part of the hot work permit, the person responsible for carrying out the work should complete the check-list shown below to indicate that fire protection measures are adequate, suitable precautions have been taken and the equipment to be used is safe.

If the person authorized to issue the hot work permit is not satisfied with the arrangements, further measures may be requested, and any additional conditions should be entered in the space provided. The earliest time at which a final fire check should be made will also be specified. This will normally be at least one hour after the time of expiry of the hot work permit, when work must be complete. If trained personnel will not be available to make this check (for example in the case of a permit issued late in the day) work must not be commenced.

The hot work permit should be completed in duplicate, with the top copy being handed to the person responsible for carrying out the work. The second copy should be retained by the issuer who may wish to inspect the site of the work or instigate spot checks to ensure that conditions have been met and that work is complete before the hot work permit expires.

The completed form should be returned to the issuer and retained for future reference.

HOT WORK PERMIT CHECK LIST

Can this job be avoided? Is there a safer way? (The person carrying out this check should tick the appropriate boxes.)

FIRE PROTECTION

- Where sprinklers are installed they are operative.
- A trained person not directly involved with the work will provide a continuous fire watch during the period of hot work and for at least one hour after it ceases, in the work area and those adjoining areas to which sparks and heat may spread.
- At least two suitable extinguishers or a hose reel are immediately available. Both the personnel undertaking the work and providing the fire watch are trained in their use.
- Personnel involved with the work and providing the fire watch are familiar with the means of escape and method of raising the alarm/calling the fire brigade.

PRECAUTIONS WITHIN 15 METRES (MINIMUM) OF THE WORK

- Combustible materials have been cleared from the area. Where materials cannot be removed, protection has been provided by non-combustible or purpose made blankets, drapes or screens.
- Flammable liquids have been removed from the area.
- Floors have been swept clean.
- Combustible floors have been covered with overlapping sheets of non-combustible material or wetted and liberally covered with sand. All openings and gaps (combustible floors or otherwise) are adequately covered.
- Protection (non-combustible or purpose made blankets, drapes or screens) has been provided for:
 - Walls, partitions and ceilings of combustible construction or surface finish
 - All holes and other openings in walls, partitions and ceilings through which sparks could pass.
- Combustible materials have been moved away from the far side of walls or partitions where heat could be conducted, especially where these incorporate metal.
- Enclosed equipment (tanks, containers, dust collectors etc.) has been emptied and tested, or is known to be free of flammable concentrations of vapors or dust.

EQUIPMENT

- Equipment for hot work has been checked and found to be in good repair.
- Gas cylinders have been properly secured.