

Corporate Policy and Procedure



POLICY	Hot Work Program
CATEGORY	Corporate
AUTHORITY	All Departments
RELATED POLICES	Fire Safety Measures Policy Personal Protective Equipment Policy Contractor Safety Management Program
APPROVED BY	Executive Team
EFFECTIVE DATE	February 28, 2019
REVIEW DATE	February 2020

Policy Statement

Guided by our corporate values, the City of Guelph will take all reasonable steps to control the risk of fire hazards resulting from the use of processes deemed hot work.

Purpose

The purpose of this procedure is to outline the practices to be used during hot work activities to control fire hazards resulting from hot work.

Scope

This program applies to all city of Guelph facilities and worksites.

Note: This procedure does not apply, in regard to the use of a [Hot Work Permit](#), to hot work conducted in designated hot work areas.

Definitions

Competent Person

A person who,

- (a) is qualified because of knowledge, training and experience to organize the work and its performance,
- (b) is familiar with the Occupational Health & Safety Act and the regulations that apply to the work, and
- (c) has knowledge of any potential or actual danger to health or safety in the workplace

Designated Hot Work Area

Permanent area designed or approved for hot work operation. The area will be of non-combustible or fire resistant construction, essentially free of combustible and flammable content and suitably segregated from adjacent areas. Designated hot work areas must meet the following criteria:

- Area must be of non-combustible and fire resistant construction, or
- Combustible building areas with secured and sealed 1 hour fire rated non-combustible barriers over combustible floor, walls and ceiling.
- Suitably segregated from adjacent areas with a non-combustible enclosure or open space of at least 35 feet (11 meters)
- Equipped with fire protection – sprinklers, fire hose or fire extinguishers available.
- Free of combustible and flammable material, dusts and vapours.
- Adequately ventilated
- Have fixed signage identifying the area.

Fire Extinguishing Equipment

Any equipment used to extinguish a fire. This may include items such as a pail of water or sand, fire hose, or portable extinguisher.

Fire Watch

An individual who is qualified by means of training in the safe use and handling of fire suppression equipment, assigned to watch for signs of fire.

Hot Work

Any work using open flames, sources of heat or producing heat and/or sparks or other source of ignition. This includes, but is not limited to, the following activities:

- Welding, brazing, soldering
- Oxy/acetylene cutting
- Grinding metals
- Heat treatment
- Torch applied roofing

Hot Work Operator

An individual who is permitted to do hot work and holds the appropriate training certificates or is a qualified journeyman in related trades, i.e. Millwright, Boilermaker, Pipefitter, Ironwork, etc.

Hot Work Permit

A document issued by the Manager/Supervisor of the area where the hot work is to take place, authorizing the work to take place, identifying fire hazards and precautions to be taken.

Permit Authorizing Individual (PAI)

The individual designated by management to authorize hot work. The PAI must be aware of the fire hazards involved and be familiar with this procedure. The PAI must be a Manager or Supervisor, but cannot be the hot work operator.

Supervisor

A person who has charge of a workplace or authority over a worker.

Worker

Means any of the following, but does not include an inmate of a correctional institution or like institution or facility who participates inside the institution or facility in a work project or rehabilitation program:

1. A person who performs work or supplies services for monetary compensation.
2. A secondary school student who performs work or supplies services for no monetary compensation under a work experience program authorized by the school board that operates the school in which the student is enrolled.
3. A person who performs work or supplies services for no monetary compensation under a program approved by a college of applied arts and technology, university, private career college or other post-secondary institution.
4. Such other persons as may be prescribed who perform work or supply services to an employer for no monetary compensation;

Workplace

Any land, premises, location or thing at, upon, in or near which a worker works

Responsibilities

Executive Team

- Ensure that service area leaders are aware of the content of this policy, and support the successful implementation of the requirements as laid down.

Manager

- Ensure all applicable employees, including contractors are educated on the requirements of the hot work program.
- Determine appropriate designated hot work areas, and ensure they are identified.
- Ensure [Hot Work Permits](#) are completed for all hot work activity done outside of the designated hot work areas.
- Act as the Permit Authorizing Individual (PAI) if no supervisor is available to approve.
- Confirm fire suppression and hot work equipment is inspected and maintained in safe operating condition.
- Ensure appropriate personal protective equipment is provided.
- Ensure site specific flammable or combustible materials, hazardous processes and potential fire hazards are identified.
- Ensure all gas cylinders used for hot work processes are stored safely according to [safe storage instructions for oxygen and acetylene](#).
- Audit at least once annually to ensure all required components of this program are being carried out.

Hot Work Operator

- Participate in training on this procedure and apply the knowledge to the work.

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- Successfully complete all trade educational requirements to conduct hot work.
 - Participate in a hazard assessments of the work and inspect work area.
 - Comply with all instruction contained on the [Hot Work Permit](#).
 - Wear the personal protective equipment identified on the [Hot Work Permit](#).
 - Obtain a [Hot Work Permit](#) from a Permit Authorizing Individual (PAI).
 - Ensure the [Hot Work Permit](#) is available where the hot work is taking place.
 - Place welding screens/shields/barriers around the work in order to protect surrounding workers.
 - Watch for any stray sparks
 - Adjust controls to keep sparks inside the controlled area.
 - Return [Hot Work Permit](#) to the Permit Authorizing Individual (PAI) when work is complete or at the end of the shift where a fire watch is not required.
 - Complete monthly leak testing for all gas cylinders and equipment used in hot work processes, and record using the [Oxygen/Acetylene Checklist](#).
 - Report any change in conditions to the Supervisor or Lead Hand immediately.
 - Stop work until hazards are re-assessment and additional precautions taken.

Supervisor

- Ensure workers are educated on the [Hot Work Permit](#) system.
- Act as the primary Permit Authorizing Individual (PAI).
- Assess work area for fire hazards and implement controls.
- Notify the Fire Department if fire suppression systems, where applicable, need to be put on bypass while hot work is completed.
- Determine if a Fire Watch is required for the hot work activity, and assign accordingly.
- Complete a fire hazard assessment prior to the start of any hot work outside designated hot work areas.
- Ensure work barriers/welding shields are placed as appropriate.
- Confirm that any contractors are advised about site specific requirements, including the contents of this program, hazardous processes or conditions, and potential fire hazards.
- Ensure that required fire protection and extinguishing equipment are provided.
- Ensure [monthly leak testing](#) is performed and a record kept for all gas cylinders and equipment used in hot work processes, using the [Oxygen/Acetylene Checklist](#).
- Ensure [Hot Work Permits](#), [Fire Watch Checklists](#) and [Oxygen/Acetylene Checklists](#) are completed and retained for a minimum of one (1) year.

Fire Watch

- Participate in training provided
- Carry a suitable means of communication (i.e. portable radio or cell phone) in order to raise the alarm in the event of an emergency.
- Know the location of the closest fire alarm pull station in the event of a fire.
- Continuously monitor the hot work area and other affected areas for at least 60 minutes after work stops and complete an inspection of the area at least once per hour for an additional 3 hours.

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- Complete the [Fire Watch Checklist](#) sheet at the end of the first hour and after each subsequent inspection.
 - Ensure a fire extinguisher is readily available (within 10 feet of the hot work)
 - Use fire extinguishing equipment and material as required.
 - Report any hazards to the Supervisor or Lead Hand.
 - Call 911 immediately if a fire starts.

Health & Safety

- Develop a Hot Work Program.
- Review the Hot Work Program annually and revise as necessary.
- Audit compliance to the Hot Work Program.

Procedure

Prior to performing hot work, alternate methods of conducting the work should be considered with a view to selecting a safer method if available. If hot work must be conducted, complete the work in a designated hot work area whenever possible.

Where hot work must be done in areas other than the designated hot work area follow the steps laid out in [Appendix A - Hot Work Permit System Flow Chart](#) and ensure the following have been completed prior to starting work:

- An assessment has been conducted to identify any potential fire hazards
- Fire hazards have been removed or controlled
- [Hot Work Permit](#) has been obtained and completed
- All precautions identified on the [Hot Work Permit](#) have been complied with
- Workers trained on the hazards and necessary precautions

Note: Should conditions change the [Hot Work Permit](#) becomes invalid and all work must stop until the situation is re-assessed and all necessary controls are put in place. Work will only re-commence once a new permit is issued.

Fire Prevention Precautions

Before work begins in an area not designated for hot work, the following precautions shall be taken to prevent a fire or explosion:

- Where practicable, the object to be welded or cut shall be moved to a location free from fire hazards.
- The area shall be made fire safe by removing or protecting combustibles from sources of ignition.
- Combustible floors (except wood on concrete) must be kept wet, covered with damp sand, or protected by noncombustible or fire retardant shields, using extra precautions to prevent electric shock.
- Floors are to be swept clean; grease and oil must be removed.
- Combustible material must be relocated at least 35 ft. (11 m) in all directions from the work site,
 - if relocation is impractical, combustibles, such as walls, partitions, ceilings, and roofs must be protected with fire retardant covers, guards, curtains or otherwise shielded with metal – edges of covers at the floor must be tight to prevent the entrance of sparks.

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- Openings or cracks in walls, floor or ducts within the 35 ft. (11 m) of the work site must be tightly covered with fire-retardant or noncombustible material to prevent the passage of sparks to adjacent areas, and
 - Ducts or conveyor systems that might carry sparks to distant combustible materials must be shielded, shut down or both.

NOTE: when performing hot work at an elevated level, it should be noted that sparks or slag can travel and land further than 35 ft. (11 m) horizontally from the work site and worksite should be prepared accordingly.

Storage of Oxygen and Acetylene Cylinders

When not in use, the following steps must be taken for the storage of welding gases under pressure, such as oxygen and acetylene.

- Store cylinders in a clearly identified, dry, well-ventilated storage area that is not exposed to heat or the direct rays of the sun, and away from doorways, aisles, elevators, and stairs.
- Post "no smoking" signs in the area.
- Store cylinders, both empty and full, in the upright position and secure with an insulated chain or non-conductive belt.
- During storage, close the cylinder valves with the protective caps in place.
- With outside storage, place on a fireproof surface and enclose in a tamper-proof enclosure.
- Protect cylinders from contact with ground, ice, snow, water, salt, corrosion, and high temperatures.
- Protect cylinders from falling. Use a chain or adequate support system. Consider securing each cylinder separately to prevent other cylinders from falling when items are removed from storage.
- Store oxygen cylinders and fuel gas cylinders separately. Indoors, separate oxygen from fuel gas cylinders by at least 6.1 m (20 ft), or by a wall at least 1.5 m (5 ft) high with a minimum half-hour fire resistance.
- Cylinders must also be separated away from flammable and combustible liquids and from materials that easily ignite (such as wood, paper, oil, grease, etc.) by similar requirements as oxygen cylinders (6.1 m, or a fire wall at least 1.5 m high with ½ hr fire resistance).

Use of a Fire Watch

A person shall be assigned the duty of being fire watch whenever hot work is performed in locations where the following conditions exist:

- Combustible material is closer than 11 m, and is unprotected and easily ignitable
- Wall or floor openings are within 11 m radius and expose combustible material
- Combustible material is adjacent to the opposite side of metal partitions, walls, ceilings, or roofs and has the potential to be ignited by heat conduction or heat radiation from the work
- Sparks can enter the cracks or fall to the lower levels

Ventilation

Mechanical dilution ventilation and local exhaust ventilation shall be used whenever possible to reduce concentrations of airborne contaminants, prevent the accumulation of combustible gases or vapours and prevent oxygen deficient or oxygen enriched atmospheres.

Leak Test Procedure

A major cause of accidents with gas equipment are leaking connections and the subsequent ignition of leaking acetylene or the increased flammability of materials in the presence of oxygen. A monthly inspection utilizing the following procedure must be followed for all gas cylinders and equipment used in hot work processes such as welding, burning and cutting:

Test for acetylene leaks **first**.

Using a soapy water solution

- Spray directly onto the joints and connections
- Check that torch valves are closed and that regulators are set to zero outlet pressure
- Open acetylene cylinder valve very slowly (sudden opening may cause damage to the regulator)
- Adjust regulator to an outlet pressure of 50 to 60 kPa.
- Open torch acetylene valve for a short period (4 to 5 seconds) to purge air from hoses
- Close torch valve
- Apply soapy water solution to all acetylene connections starting at cylinder valve spindle, regulator stem and work through all connections up to the torch inlet
- Leaks will be clearly indicated by foaming bubbles at point of leak
- Leaks must be corrected immediately by further tightening the leaking joint
- If leak persists the connection is faulty and must be replaced
- A leaking cylinder valve spindle may be corrected by tightening the spindle nut - the regulator spanner is the same size hexagon
- After testing shut on the acetylene valve, open the torch valve to release pressure
- Adjust regulator to zero outlet pressure
- Close torch valve.

The same process must also be completed for oxygen. A copy of the Oxy/Acetylene Checklist must be completed and filed for each monthly inspection.

Personal Protective Equipment

PPE	Hazard	Prevention
Safety Glasses, Face Shield or Welding Helmet.	Facial burns, temporary or permanent eye strain or blindness due to sparks, spatter.	Best practice: <ul style="list-style-type: none">• Face shield during grinding operations.

		<ul style="list-style-type: none"> Welding helmet during welding and cutting operations.
Flame Retardant Clothing.	Burns from sparks and spatter.	<ul style="list-style-type: none"> Flame retardant welding jackets shall be worn over regular clothing. Cotton or wool shirts with long sleeves and button cuffs. Cotton or wool, long pants without cuffs worn over the top of work boots.
Gloves.	Burns, cuts, scratches on hands.	<ul style="list-style-type: none"> Flame/heat-resistant gloves. Leather highly recommended.
Respiratory Protection.	Metal fumes, gases and other contaminants.	<p>Local Exhaust Ventilation</p> <p>Where possible LEV shall be placed in position to prevent any particulate from entering the breathing zone.</p> <p>Where not possible a hazard assessment will be conducted to determine the appropriate respiratory protection.</p>

Training

All workers performing or approving hot work must be deemed as a competent person and must be educated on the following not less than every three years, or sooner should circumstance change:

- Hot Work Program Requirements
- Fire Extinguisher Basic Instruction
- Fire prevention and precautions, including the site Fire Safety Plan.

Workers performing welding or other high-risk hot work operations must have completed a valid trade certification at a recognized higher educational institute.

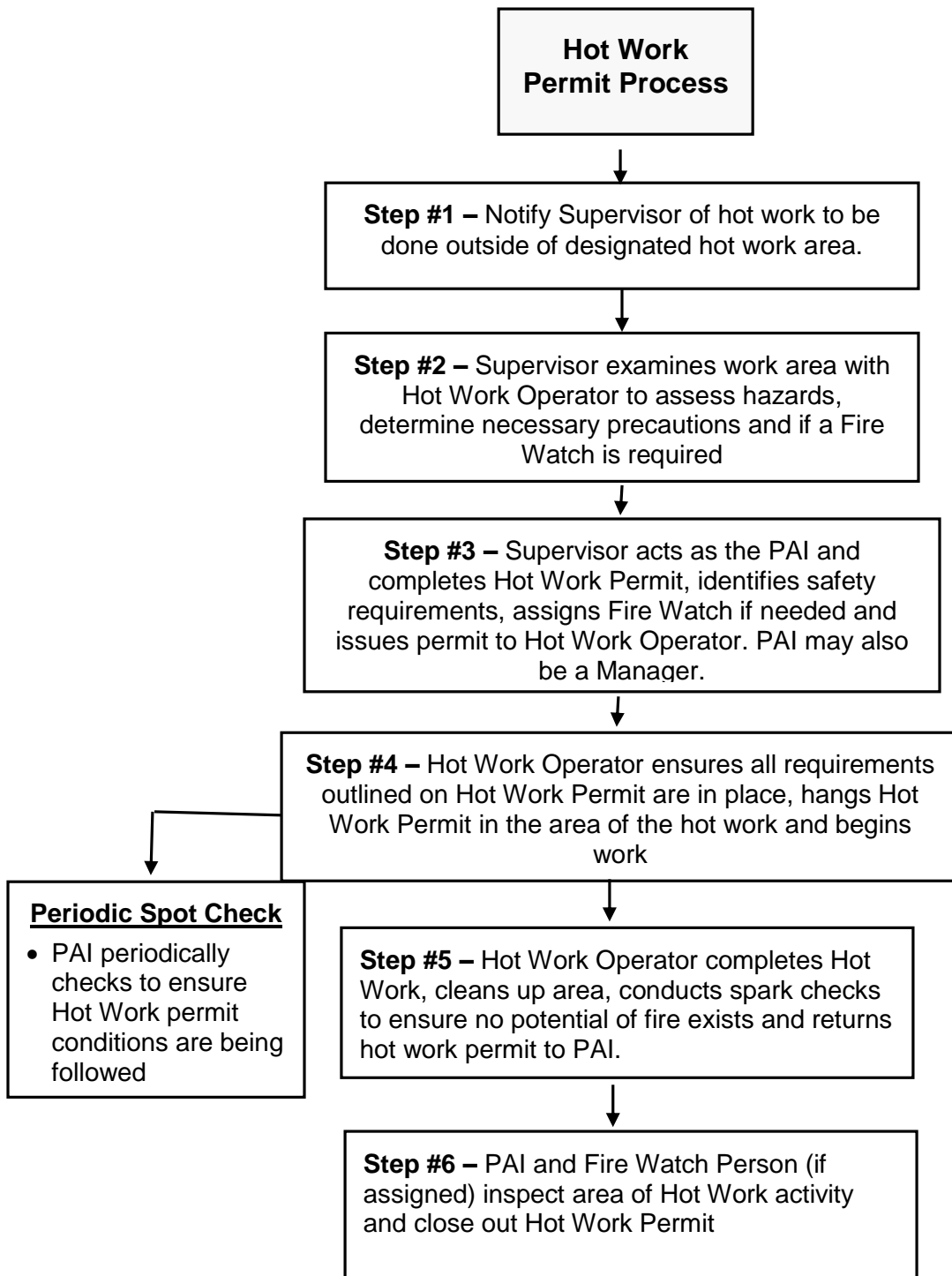
Reference Documents

Occupational Health and Safety Act, R.S.O. 1990, c. O.1
R.R.O. 1990, Reg. 851: INDUSTRIAL ESTABLISHMENTS
Fire Protection and Prevention Act, 1997, S.O. 1997, c. 4
O. Reg. 213/07: FIRE CODE
CSA W117.2-19 "Safety in welding, cutting and allied processes"

Revision History

Document Owner	Issue / Revised Date	Reason For Changes
Health & Safety	2007/02/07	Initial draft
Health & Safety	2019/04/01	Re-write of existing policy. Additions include instruction on storage of cylinders and leak testing procedures.

Appendix A - Hot Work Permit System Flow Chart



Appendix B - Hot Work Permit

**BEFORE INITIATING HOT WORK, ENSURE PRECAUTIONS ARE IN PLACE.
ENSURE AN APPROPRIATE MEANS OF FIRE SUPPRESSION IS READILY AVAILABLE.**

This Hot Work Permit is required for any operation involving open flames or producing heat and/or sparks. This includes but is not limited to burning, welding, grinding, cutting, brazing, soldering, or a similar operation that is capable of initiating fires or explosions.

<p>HOT WORK OPERATOR and FIRE WATCH PERSONNEL:</p> <p>a) Verify precautions listed at right, or do not proceed with the work. b) Complete this permit in conjunction with Fire Watch Personnel. c) Document time started on permit and ensure the permit is available at hot work location d) Ensure fire watch and/or final check up occur and sign permit as required. e) When work is completed, indicate time completed on the permit and forward the permit to the supervisor for record keeping</p> <p>DATE: _____ WORK ORDER # _____</p> <p>LOCATION/BUILDING & FLOOR: _____</p> <p>NATURE OF JOB/OBJECT: _____</p> <p>NAME OF HOT WORK OPERATOR: _____</p> <p><input type="checkbox"/> Employee <input type="checkbox"/> Contractor</p> <p>PERMIT EXPIRES: DATE: _____ TIME: _____ AM/PM *max duration: 1 shift or 24 hours</p> <p>TIME STARTED: _____ AM/PM</p> <p>TIME ENDED: _____ AM/PM</p> <p>I verify the above location has been examined, the precautions checked on the Required Precautions Checklist have been taken to prevent fire, and permission is granted for work.</p> <p>_____ Hot Work Operator</p> <p>_____ Fire Watch Personnel</p> <p>_____ Supervisor</p> <p>FIRE WATCH SIGN OFF: Work area and all adjacent areas to which sparks and heat might have spread were inspected during the fire watch period and were found fire safe.</p> <p>_____ Signature</p> <p>_____ Print Name</p>	<p>REQUIRED PRECAUTIONS CHECKLIST</p> <p><input type="checkbox"/> Available sprinklers, hose streams, and extinguishers are in service/operable <input type="checkbox"/> Hot work equipment is in good repair</p> <p>Requirements within 11m/35ft of work:</p> <p><input type="checkbox"/> Flammable liquids, dust, lint and oil deposits removed <input type="checkbox"/> Explosive atmosphere in area are eliminated <input type="checkbox"/> Floors swept clean <input type="checkbox"/> Combustible floors wet down, covered with damp sand or fire-resistant sheets <input type="checkbox"/> Remove other combustibles where possible. Otherwise protect with fire-resistant tarpaulins or metal shields. <input type="checkbox"/> All wall and floor openings covered <input type="checkbox"/> Fire-resistant tarpaulins suspended beneath work</p> <p>Work on walls or ceilings: <input type="checkbox"/> N/A</p> <p><input type="checkbox"/> Construction is non-combustible and without combustible covering or insulation <input type="checkbox"/> Combustibles on other side of walls are moved away <input type="checkbox"/> No potential dangers exist by conduction of heat into another area <input type="checkbox"/> Enclosed equipment is cleaned of all combustibles <input type="checkbox"/> Containers purged of flammable liquids/vapours</p> <p>Fire watch/hot work area monitoring:</p> <p><input type="checkbox"/> Fire watch will be provided during and for 60 minutes after hot work completion, including any coffee or lunch breaks <input type="checkbox"/> Fire watch is supplied with suitable extinguishers <input type="checkbox"/> Fire watch is trained in the use of this equipment and in alarm procedures <input type="checkbox"/> Fire watch may be required for adjoining areas, above and below.</p> <p>Other precautions taken (circle)</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 10%;">Y</td><td style="width: 10%;">N/A</td><td>Confined space entry permit required</td></tr> <tr><td>Y</td><td>N/A</td><td>Area protected with smoke or heat detection</td></tr> <tr><td>Y</td><td>N/A</td><td>Lock out/tag out required</td></tr> <tr><td>Y</td><td>N/A</td><td>Ample ventilation to remove smoke/vapour(s)</td></tr> <tr><td>Y</td><td>N/A</td><td>Area is secured for safety (eg. signage, rope off)</td></tr> <tr><td>Y</td><td>N/A</td><td>Verified nearest telephone and escape route</td></tr> <tr><td>Y</td><td>N/A</td><td>Conduct air monitoring</td></tr> <tr><td>Y</td><td>N/A</td><td>Contact fire monitoring company</td></tr> <tr><td colspan="3">Other: _____</td></tr> </table>	Y	N/A	Confined space entry permit required	Y	N/A	Area protected with smoke or heat detection	Y	N/A	Lock out/tag out required	Y	N/A	Ample ventilation to remove smoke/vapour(s)	Y	N/A	Area is secured for safety (eg. signage, rope off)	Y	N/A	Verified nearest telephone and escape route	Y	N/A	Conduct air monitoring	Y	N/A	Contact fire monitoring company	Other: _____		
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Appendix C – Oxygen/Acetylene Checklist

Tank Set: _____ Date: _____

There are strict controls on the use of acetylene on City of Guelph property. Acetylene should only be used in a designated hot work area by designated personnel. When possible, another gas should be used in its place.

If the use of acetylene is necessary, only the minimum quantity shall be used. The cylinder valves must be closed at all times when not in use (including break/ lunch times, and nightly). Should the fire alarm in the building sound, the cylinder valves must be closed, and, where possible, removed from the building during the evacuation.

When oxy/acetylene is being used, this checklist must be used in conjunction with the **Hot Work Permit**.

GAS CYLINDERS	Yes	No	N/A
Are the cylinders secured in a carrier in the upright position?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are cylinder caps available to put on while transporting?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are all cylinders in good order?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PERSONAL PROTECTIVE EQUIPMENT			
Are fire retardant gloves available?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is suitable PPE available?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
REGULATORS & VALVES			
Are regulators the correct type and in good order?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is the oxygen regulator free from grease and oil?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is the valve assembly free of dust?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are connection nuts in good order?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are flash back arrestors fitted?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HOSES			
Are hoses in good order?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are clips factory fitted (not jubilee clips, etc.)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Have spliced hoses been checked?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

CUTTING TORCH/ WELDING TORCH			
Is the torch suitable and in good condition with no leaks from the valves, shank, mixer, or connections?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is the nozzle seated correctly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Name: _____

Signature: _____