IEA, INC.

NORTHFIELD PUBLIC SCHOOLS

Management Plan
for
Welding, Cutting, & Brazing

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Northfield Public Schools

Management Plan for Welding, Cutting, & Brazing

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Northfield Public Schools Annual Review Form
Management Plan for Welding, Cutting, & Brazing

Certification

I certify that I have reviewed the information provided and accept this written management plan. With assistance from our EHS consultant, the district will implement the policies and procedures noted within this plan. The written plan is a working document that will be reviewed and revised annually, or as needed.

Justin Raabolle _____ _____
Print Name Signature Date

Program reviews and follow-up of program-related issues are documented below.

Date	Actions/Comments	Reviewed by:
4/04/24	Created new version – updated contact person	Cassie Bowser, IEA
04/03/25	Annual review	Cassie Bowser

1.0 Introduction

Welding, cutting, and brazing have the potential to create a wide variety of hazards, including toxic fumes and gases, explosion, fire, noise, ultraviolet (UV) radiation, and electrical shock. These hazards can result in complex safety and health issues.

2.0 Responsibilities

Employees initiating the hot-work process are responsible for ensuring that the requirements of this program are understood and followed. In addition, employees initiating the hot-work process are responsible for overseeing contractors who perform hot-work activities.

Supervisors:

- Ensure safe handling of the cutting or welding equipment and the safe use of the cutting or welding process.
- Ensure that the conditions in designated hot-work areas have not changed prior to authorizing hot work.
- Ensure that employees are trained in the operation of the equipment and safe use of the process.
- Ensure hot-work permits are completed for work under their supervision.
- Determine hazardous areas present, or likely to be present, in the work area. Communicate all hazards to employees and contractors.
- Ensure fire-protection and fire-extinguishing equipment are properly located at the site.
- Ensure fire watches are located at the site, when required, and ensure all employees are properly trained.
- Review and approve locations proposed for hot-work areas.
- Periodically inspect designated hot-work areas to ensure that conditions have not become unsafe for welding or cutting.
- Suspend welding, cutting and brazing work if conditions become unsafe for the work being performed.
- Ensure proper engineering and administrative controls are established to protect employees from welding, cutting, brazing hazards, and provide personal protective equipment (PPE) to employees when necessary.

Authorized employees:

- Read and understand the welding, cutting and brazing program.
- Complete hot-work training.
- Wear PPE that is appropriate for the specific hazard.
- Conduct welding, cutting, brazing and/or hot-work activities in accordance with all safety guidelines and procedures.
- Protect nearby personnel against heat, sparks, etc., when working in occupied workplaces.
- Inform supervisor of any hazards that arise.

Contractors:

- Follow the welding, cutting, and brazing program and all OSHA requirements.
- Provide employees with PPE and other engineering and administrative means to protect against harmful exposures during welding.

3.0 Hot-Work Area

3.1 Designated Areas

The following areas are designated as approved hot-work areas at Northfield Public Schools. Hot work can be performed in these areas without the issuance of a hot-work permit. Even though a permit is not required in these areas, authorized employees must inspect the area for combustibles and other hazards before performing any hot-work operations.

A fire extinguisher, appropriate for the type of fire hazard, is present while hot work is being performed in designated areas. At the end of each shift, each designated hot-work area is inspected to ensure no smoldering materials are present and all hot-work equipment is properly shut off and stored.

3.2 Prohibited Areas

Cutting or welding shall not be permitted in the following situations:

- In areas not approved by management.
- In sprinkled buildings where such protection is impaired.
- In the presence of explosive atmospheres, or explosive atmospheres that may develop inside uncleaned or improperly-prepared tanks or equipment which may have previously contained such materials, or that may develop in areas with an accumulation of combustible dusts.
- In areas near the storage of large quantities of exposed, readily-ignitable materials such as bulk sulfur, baled paper, or cotton.

3.3 Performing Hot Work in Confined Spaces

If hot work is conducted in a confined space, the space is assessed, and a confined space permit is issued in conjunction with the hot-work permit to control hazardous conditions in the confined space. Only authorized and trained employees are permitted to conduct hot work in a confined space. Lockout/tagout is used, to control energy hazards, when required.

Hot-work operations in confined spaces require additional safeguards and present serious safety hazards. The following safety precautions are followed while performing hot work in a confined space:

- Gas cylinders and welding machines are left outside the confined space. Before operations are started, heavy portable equipment mounted on wheels is securely blocked to prevent accidental movement.
- When an employee must enter a confined space through a manhole or small opening, means for quick removal is provided in case of emergency.
- When arc welding is suspended for any substantial period of time, all electrodes are removed from the holders, the holders are carefully located so that accidental contact cannot occur, and the machine is disconnected from the power source.
- When not in use, torch valves are closed, and the fuel-gas and oxygen supply to the torch is positively shut off at some point outside the confined space. Where practical, the torch and hose are removed from the confined space.
- The welder marks the hot metal or provides some other means of warning other workers, upon completion of welding operations.
- The dimensions of the space, the number of welders, and the possible evolution of fumes, gases, or dust are considered when governing the amount of contamination to which welders may be exposed.
- When welding operations must be conducted using screens on all sides, they are arranged so that no serious restriction of ventilation exists. Screens are mounted so they are approximately 2’ above the floor unless the work is performed at so low a level that the screen must be extended nearer to the floor to protect nearby workers from the glare of welding.
- Local exhaust or general ventilation is provided and arranged to keep the amount of toxic fumes, gases, or dusts below the maximum allowable concentration as specified in OSHA 29 CFR 1910.1000.

Conducting hot work in confined spaces changes classification of the space. Therefore, employees of Northfield Public Schools are prohibited from conducting hot work within any confined space.

4.0 Safety Precautions

All hot work is performed by authorized employees in an area designated for hot work. If work cannot be performed in a designated area, a Hot-Work Permit is required. Prior to each job, the condition of the equipment is inspected. Equipment in poor condition is not used until replaced or repaired.

Prior to hot work:

- If the object to be welded or cut cannot readily be moved, all movable fire hazards in the vicinity are taken to a safe place.
- If the object to be welded or cut cannot be moved, and if all the fire hazards cannot be removed, then guards are used to confine the heat, sparks, and slag, and to protect the immovable fire hazards.
- The work area is inspected for materials that are combustible or flammable. Combustible and flammable materials are moved to a safe distance from the work.
- Wherever there are floor openings or cracks in the flooring that cannot be closed, precautions are taken so that no readily combustible materials on the floor below will be exposed to sparks, which might drop through the floor. The same regards apply to cracks or holes in walls, open doorways, and open or broken windows.
- Confirm that fire protection equipment, including fire extinguishers and sprinkler systems, are in working order.
- Confirm that exhaust systems, where needed, are operating.
- Obtain and complete the hot-work permit, if required and post at the job site until hot work is completed.
- Know when a fire watch is required, and do not start hot work until the fire watch is present.
- Obtain and wear the necessary PPE.
- Welding screens are used where people in the area may be exposed to arc flash and/or cutting or welding splatter.
- Proper barriers are in place to prevent people from inadvertently entering the area.

4.1 Signage

Where hot-work area is accessible to persons other than the operator of the hot-work equipment, signs are posted to warn others before they enter the hot-work area. Such signs display the following warning:

CAUTION - HOT WORK IN PROGRESS - STAY CLEAR

4.2 Special Precautions

Where either of the following conditions exist, additional safety precautions are taken. The final protection measures will be determined by a supervisor prior to beginning work.

Potentially explosive atmospheres – If there is a potential for mixtures of flammable gases, vapors, liquids or dust in the air, no hot work is conducted until air monitoring has confirmed that there is no danger of an explosion.

Containers – No hot work is performed on used drums, barrels, tanks or other containers until they have been cleaned thoroughly. The hot-work approver must determine that no flammable materials, and no substance such as greases, tars, acids, or other material, which might produce flammable or toxic vapors if exposed to heat, are present.

4.3 Electrical Shock

Electrical shock from electrical welding and cutting equipment can result in death or severe burns. Additionally, serious injury can occur if the welder falls because of the shock. This safety hazard is associated with operations that use electricity to generate heat, such as arc and resistance welding and cutting.

Employees use proper precautionary measures and recommended safe practices to avoid electrical shocks. Personnel using electrical welding and cutting equipment must be trained on safe work practices and procedures before use of this equipment. Some measures to prevent electrical shock include:

- Never use a bare hand or wet glove to change electrodes.
- Do not touch an energized electrode while you are in contact with the work circuit.
- Never stand on a wet or grounded surface when changing electrodes.
- Do not allow the electrode holder or electrode to come in contact with any other person or any grounded object.
- Ground the frames of welding units.
- Insulate yourself from the work piece, and ground using dry insulating mats or covers big enough to prevent any physical contact with the work or ground or wear properly designed and approved rubber-soled boots in good condition.
- Suspend long lengths of cable overhead whenever possible.
- If cables run along the floor make sure they do not create a tripping hazard.

Additional safety precautions are required when welding is performed under any of the following hazardous electrical conditions:

- In damp locations or while wearing wet clothing.
- On metal floors, gratings, scaffolds, or other metal structures.
- When there is a high risk of unavoidable or accidental contact with the work piece and ground.

Where these conditions are present, use one of the following types of equipment:

- Semiautomatic DC constant-voltage metal electrode (wire) welder.
- DC manual-covered electrode (stick) welder.
- AC welder with reduced open-circuit voltage. In most situations, use of a DC constant-voltage wire welder is recommended.

4.4 Fumes and Gases

When engaging in welding, cutting, or brazing activities, various fumes, gases, and vapors are generated from the metals, fluxes, and fillers being used in addition to coatings, paints, galvanizing and plating. To protect employees from these hazards, appropriate personal protective equipment (PPE) in the form of a respirator and/or ventilation is recommended if exposure limits are exceeded. Fume and gas hazards to be considered are:

- **Fumes (metals)** – Aluminum, Antimony, Arsenic, Beryllium, Cadmium, Chromium, Cobalt, Copper, Iron Oxide, Lead, Manganese, Molybdenum, Nickel, Silver, Tin, Titanium, Vanadium, and Zinc Oxide
- **Shielding Gases** – Argon, Helium, Nitrogen, Carbon Dioxide
- **Process Gases** – Nitric Oxide, Nitrogen Dioxide, Carbon Monoxide, Ozone, Phosgene, Hydrogen, Fluoride, and Carbon Dioxide.

5.0 Fire Prevention and Protection

5.1 Preparation of Work Area

Combustible/Flammable Materials - If object to be welded or cut cannot be moved to a designated hot-work area, all moveable fire hazards are relocated at least 35 feet horizontally from hot work. When relocation of combustible materials is not feasible, combustibles are protected with flame-proof covers. If fire hazards cannot be avoided, then guards are used to confine heat, sparks, and slag and to protect the immoveable fire hazards. If the above requirements cannot be met, then welding, cutting or other hot work is performed with a fire watch.

Floor Openings/Coverings – Floors are protected from exposure to flames, sparks, slag or other hot materials whenever there are combustible floors or materials on the floor, floor openings or cracks in the floors. Protections may include:

- Fire-resistant shields or material
- Wetting down floors
- Covering floors with damp sand
- Sweeping combustibles from floor
- Additional protections deemed necessary by the hot-work approver

Floors are swept clean of all combustible materials such as paper clippings, wood shavings, or textile fibers for a radius of 35 feet. Welding or cutting on pipes or other metal in contact with combustible walls, partitions, ceilings, or roofs is not done if the work is close enough to cause ignition by conduction.

Wall Openings – Walls are protected from exposure to flames, sparks, slag or other hot materials whenever there are combustible walls, wall openings, pipe penetrations or ducts. Protections may include:

- Fire-resistant shields or materials
- Shutting down and/or protecting ducts or conveyer systems
- Shutting dampers
- Separate fire watch on the other side of the walls
- Additional protections deemed necessary by the hot-work approver

5.2 Fire Watch

A fire watch is required when hot work is performed in a location where the following condition(s) exist:

1. Combustible materials in building construction or building contents are closer than 35 feet to the point of operation of the hot work.
2. Combustible materials are more than 35 feet away but are easily ignited by sparks.
3. Wall or floor openings within a 35 feet radius expose combustible materials in adjacent areas, including concealed spaces in walls or floors.
4. Combustible materials are adjacent to the opposite side of partitions, walls, ceiling, or roofs and are likely to be ignited.

Trained fire watchers are required to be present at all times when hot work is being conducted and have fire-extinguishing equipment readily available (minimum required fire protection is a 2A.20BC-rated fire extinguisher). Contractors are required to provide their own fire watchers and fire extinguishers.
The fire watcher is required to:

1. Be aware of the inherent hazards of the work site.
2. Actively monitor whether safe conditions are being maintained during the hot-work operation.
3. Stop the hot-work operations if unsafe conditions develop.
4. Have fire extinguishing equipment immediately available and be trained on how to use it.
5. Activate emergency response in the event of a fire.

Once the hot work is completed, the fire watcher remains on the hot-work jobsite for at least 30 minutes to monitor the worksite and make certain there is no smoldering combustion taking place. After the 30-minute monitoring period is complete, the fire watcher signs the hot-work permit which states, "the work area was observed for at least 30 minutes after work was completed and found to be safe". The fire watcher returns the completed permit to the responsible supervisor.

Upon receipt of the signed permit, the responsible supervisor completes a walkthrough of the hot-work job site and contacts the employee issuing the permit so that the alarm and/or sprinkler system can be returned to service as needed.

6.0 Contractor Acknowledgement

If outside personnel or contractors are to be engaged in activities covered under the scope of this program, they are informed of the contents of this program, the way it functions, and other important details of the welding, cutting, brazing program as it applies to the work being done. Contractors are required to comply with the provisions and procedures of this program unless otherwise noted. In some cases, the contractor is responsible to inform the school district of their own welding, cutting, brazing procedures. The exchange of this information is documented and filed at the District Office.

7.0 Personal Protective Equipment (PPE)

Employees exposed to the hazards created by welding, cutting, or brazing operations are protected by PPE. Appropriate protective clothing required for any welding operation will vary with the size, nature, and location of the work to be performed. PPE must protect against hazards such as burns, sparks, spatter, electric shock, photokeratitis, and inhalation hazards as identified below.

7.1 Protective Clothing

Appropriate protective clothing required for any welding operation will vary with size, nature, and location of the work to be performed. Employees should always select clothing materials that will provide maximum protection from sparks, hot metal, and arc flash. Covering all parts of the body is recommended to protect against ultraviolet and infrared ray flash burn. Dark clothing works best to reduce reflection under the face shield. Heavier materials such as wool clothing, heavy cotton or leather are preferred as they resist deterioration. Materials that can melt or can cause severe burn due to sparks that may lodge in rolled-up sleeves, pockets of clothing or pant cuffs are not recommended. Leather aprons and gloves provide the best protection. Cotton will burn and turn to ash rather than reacting like most synthetic fibers. Therefore, it is also an appropriate option for clothing. Shirts should have full sleeves, no pockets, and should be worn outside the pants with collar buttoned. High-top leather work shoes covering the ankle should be worn by employees performing hot work.

7.2 Eye/Face Protection

Helmets and hand shields protect the face, forehead, neck, and ears to a vertical line behind the ears, from the arc's direct radiant energy, and weld splatter. Goggles or other suitable eye protection are used during all gas welding or oxygen cutting operations. All operators and attendants who conduct resistance welding or resistance brazing use transparent face shields or goggles, depending on the job, to protect their faces or eyes. Goggles are ventilated to prevent fogging of the lenses. See Appendix A for proper shade selection for eye protection during welding operations.

> **Note**: Spectacles without side shields, with suitable filter lenses, are permitted for use during gas welding operations on light work, for torch brazing, or for inspection.

Welding helmets with filter plates are intended to protect users from arc rays and from weld sparks and spatters which strike directly against the helmet. They are not intended to protect against slag chips, grinding fragments, wire wheel bristles, and similar hazards which can ricochet under the helmet. Spectacles, goggles or other appropriate eye protection is worn to protect against these impact hazards. All filter lenses and plates must meet the test for transmission of radiant energy prescribed in the ANSI standard Z87.2010.

When employees are exposed to open arcs, helmets or hand shields with filter lenses and cover plates are used. Spectacles with a shade 2 lens are recommended for general purpose protection for viewers. When resistance welding or brazing, operators of resistance welding must use face shields, spectacles, or goggles depending on the job to protect their faces and eyes from welding hazards.

7.3 Respiratory Protection

Respiratory protection may be required when welding or cutting materials. Factors affecting employee exposure include length of work, amount of work, size of work area, ceiling height, and work area ventilation. Exposure monitoring is the method utilized to determine when respiratory protection is required. When respirators are used, they are used in accordance with the district's Respiratory Protection Management Plan.

7.4 Ventilation

Local exhaust mechanical ventilation may be required when welding or cutting of materials that may release toxic fumes such as zinc, lead, beryllium, cadmium, stainless steel, or other coatings. Adequate ventilation maintains exposures to hazardous concentrations of airborne contaminants below the allowable limits. When controls such as ventilation fail to reduce air contaminants to allowable levels or when the implementation of such controls are not feasible, respiratory protective equipment is used to protect personnel from hazardous concentrations of airborne contaminants. Adequate ventilation is required when performing welding and cutting operations in confined spaces. Whenever materials exceed the allowable limits in confined space operations, local exhaust mechanical ventilation and, when required, respiratory protection is used. Mechanical ventilation is required if the work area has a volume of less than 10,000 cubic feet per welder or a ceiling height less than 16 feet. See ANSI Z49.1 and OSHA 1910.252 for additional requirements.

8.0 Oxygen-Fuel Gas Welding and Cutting

Oxygen-fuel welding, commonly referred to as gas welding, is a process which relies on combustion of oxygen and acetylene gases. When mixed in correct proportions within a hand-held torch or blowpipe, a relatively hot flame is produced with a temperature of about 3,200 deg. C.

8.1 General Requirements

Mixtures of fuel gases and air or oxygen may be explosive. No device or attachment facilitating or permitting mixtures of air or oxygen with flammable gases prior to consumption, except at the burner or in a standard torch, is allowed. Under no condition is acetylene generated, piped, or utilized at a pressure in excess of 15 PSIG (pounds per square inch gauge) or 30 psia (pounds per square inch absolute).

8.2 Storage of Cylinders

Gas cylinders are stored in approved spaces and are secured from falling. The control valves of cylinders not in use are covered by protective caps, and cylinders are legibly marked to identify the gas contents.

Cylinders are stored in accordance with the district's Compressed Gas Management Plan.

8.3 Standard Operating Procedures

- Cylinders, cylinder valves, couplings, regulators, hose, and apparatus are kept free from oily or greasy substances.
- Oxygen cylinders or apparatus are not handled with oily hands or gloves.
- A jet of oxygen must never be permitted to strike any oily surface or greasy clothes or enter a fuel oil or other storage tank.
- If the valve outlet of a cylinder becomes clogged with ice, thaw with warm (not boiling) water.
- Prior to attaching the regulator, stand to one side of the cylinder, and open the valve slightly for an instant and then close it. This "cracking" of the cylinder valve will clean the valve of dust or dirt which may have accumulated during storage.
- Before a regulator is removed from a cylinder valve, the valve is closed. If the gas released from the regulator hoses show leaks, burns, worn places or other defects rendering it unfit for use, it is repaired or replaced. Hoses are never be taped to cover leaks.
- When inspecting hoses, employees look for charred sections close to the torch. These may have been caused by flash-back.
- Cylinders are kept far enough away from welding or cutting operations so that sparks, hot slag, or flames will not reach the cylinder. If this is not possible, a fire-resistant shield is used.
- Cylinders are not placed in an area where they might contact or become part of the electrical circuit.
- Cylinders are not used as a ground for an arc welder.
- Electrodes are not taped against cylinders.
- Cylinders without fixed hand wheels have keys, handles, or non-adjustable wrenches on valve stems while the cylinders are in service. Multiple cylinder applications require one key or handle for each manifold.
- Cylinders are never used as rollers or supports, whether full or empty.
- No person, other than the gas supplier, attempts to mix gases in a cylinder. No one, except the owner of the cylinder or person(s) authorized by the owner, refills the cylinder.
- No one tampers with or removes cylinder or valve safety devices.
- Drain valves are opened frequently and completely to drain excess fluid.
- Cylinder valves are opened slowly. Acetylene cylinder valves are not opened more than one and one-half turns, preferably no more than three-fourths of a turn. This permits adequate flow of acetylene and allows ready closing of the valve in an emergency. Cylinders are not used at more than 15 pounds of pressure.
- Fuel-gas from cylinders are never used through torches or other devices equipped with shutoff valves without using a regulator on the cylinder valve or manifold to reduce the pressure.

9.0 Arc Welding

Arc welding is a type of welding process that uses an electric arc to create heat of around 6,500 deg. C to melt and join metals. A power supply creates an electric arc between a consumable or non-consumable electrode and the base materials, using either direct (DC) or alternating (AC) currents.

9.1 Installation

The district documents that arc welding equipment has been properly installed. The frame or case of the welding machine (except engine-driven machines) is grounded under conditions and according to the methods prescribed in *29 CFR subpart S, Electrical*. Conduits containing electrical conductors are not used for completing a work-lead circuit. Under no conditions is the ground lead connected to an electrical conduit, a threaded pipe (a loose connection might generate a spark), bolted flanged joints (most have no flat-ground surfaces but have gaskets between them thus eliminating electric conductivity), or a caulked joint (caulking material can be an insulator).

9.2 Voltage

The following voltage limits are not exceeded:

- Alternating current (AC) machines:
  - Manual arc welding and cutting – 80 volts
  - Automatic (machine or mechanized) arc welding and cutting – 100 volts

- Direct current (DC) machines:
  - Manual arc welding and cutting – 100 volts
  - Automatic (machine or mechanized) arc welding and cutting – 100 volts

- For AC welding under wet conditions or warm surroundings where perspiration is a factor, the use of automatic controls for reducing no-load voltage is recommended to reduce the shock hazard.

9.3 Standard Operating Procedures

Before starting task:

- All connections to the machines are checked by an authorized employee to ensure that they are properly made.
- The work lead is firmly attached to the work.
- Magnetic clamps are free from adherent metal particles of spatter on contact surfaces.
- Coiled welding cable is spread out before use to avoid serious overheating and damage to insulation.

During welding task:

- Cables with splices within ten feet of the holder are not used.
- Welders do not coil or loop welding electrode cable around parts of the tank body.
- Cables with damaged insulation or exposed conductors are replaced.
- Joining lengths of work and electrode cables is be done using connecting means specifically intended for that purpose.

10.0 Resistance Welding

Resistance welding is the process of joining metals by applying pressure and passing current for a length of time through the metal area, which is to be joined.

10.1 Installation

The district documents that resistance welding equipment has been properly installed by a qualified electrician in conformance with *29 CFR subpart S, Electrical*. Welding machines are spotted and seamed:

- All doors, access panels, and control panels are kept locked and interlocked to prevent access to live portions of the equipment by unauthorized persons.
- When there is a possibility of the operator's fingers being under the point of operation, effective guards are used. Examples include electronic eye safety circuit and two-hand controls.

Protective shield guards, made of safety glass or suitable fire-resistant plastic, are installed at the point of operation to eliminate the hazard of flying sparks. Additional shields or curtains are installed, as necessary, to protect passing persons from flying sparks. All foot switches are guarded to prevent accidental operation of the machine. Two or more safety emergency stop buttons are provided on all special multiple spot-welding machines, including 2-post and 4-post weld presses.

10.2 Voltage

All external weld-initiating control circuits operate on low voltage, not over 120 volts, for the safety of the operators.

10.3 Maintenance

Periodic inspections on equipment used for resistance welding are made by qualified maintenance personnel. Certification records are maintained for each periodic inspection and will contain the following:

- Date of inspection
- Signature of person performing inspection
- Serial number or other identifier of equipment inspected

Employees report any equipment defects to the district contact person, and the use of equipment is discontinued until safety repairs have been completed.

11.0 Training

Employees who conduct welding and cutting are trained on the safe use and operation of welding, cutting and hot-work equipment and on flammable materials or hazardous conditions that may be present during such operations. Documentation of training is maintained for a minimum of three years at the District Office.

12.0 Recordkeeping

This program is reviewed annually and updated when necessary.

13.0 References

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Appendix A

Lens Selection Guide for Eye Protection

Appendix A

Lens Selection Guide for Eye Protection

Task	Rod Size (1/32”)	Arc Current	Minimum Protective Shade
Stick Welding *(Shielded Metal Arc)*	Less than 3 3 - 5 5 - 8 More than 8	Less than 60 60 - 160 160 - 250 250 - 550	7 8 10 11
MIG/Wire Feed Welding *(Gas metal arc and flux core welding)*		Less than 60 60 - 160 160 - 250 250 - 550	7 10 10 10
TIG Welding (*Gas Tungsten arc welding)*		Less than 50 50 - 150 150 - 500	8 10 10
Arc Airing *(Air Carbon)*		Less than 500 500 - 1000	10 11
Plasma Cutting		Less than 300 300 - 400 400 - 800	8 9 10
Torch Brazing			3-4
Torch Soldering			2

Task	Plate Thickness (Inches)	Plate Thickness (mm)	Minimum Protective Shade
Gas Welding	Under 1/8” 1/8” – 1/2” Over 1/2”	Under 3.2 3.2 - 12.7 Over 12.7	4 5 6
Oxygen Cutting	Under 1” 1” to 6” Over 6”	Under 25 25 - 150 Over 150	3 4 5

Selection Guide for Lens during Hot Work OSHA 1910.133

Appendix B

Training Records
(Maintained in the District Office)

Appendix C

Hot-Work Permit and Checklist

NORTHFIELD PUBLIC SCHOOLS
Hot Work Permit

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 page 2 of this form have been complied with as indicated.

_____ _____
Signed Printed Name

_____ _____
Date Position

Contractor (where applicable): _____

A. Agreement

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

This hot work permit is issued subject to the following conditions:

Time of Issue of Permit: _____ **Time of Expiration of Permit*:** _____

A final fire check of the work area shall be periodically undertaken for one hour immediately after the hot works have been completed and before the permit is signed off.

_____ _____
Signed Printed Name

_____ _____
Date Position

B. Fire Watch

To be completed by a staff member or contractor responsible for the work before returning this permit to the issuer. A fire watch is required if combustible materials within 35 feet cannot be moved or covered with fire resistant covering or if the building does not have automatic sprinklers.

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 the work.

Time Inspection Completed: _____ (must be filled in one hour after hot works have been completed)

_____ _____
Signed Printed Name

_____ _____
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. Note: 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.*

Hot Work Permit Checklist

Can this job be avoided? Is there a safer way? ☐ Yes ☐ No

- ☐ Where sprinklers are installed they are operative or are in “test mode” – if in “test mode,” reinstate after work is complete.
- ☐ A trained person not directly involved with the work will provide a continuous fire watch, if applicable.
- ☐ A suitable extinguishers or a hose reel is 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 department.
- ☐ 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 vapor or dust.
- ☐ Equipment for hot work has been checked and found to be in good repair.
- ☐ Gas cylinders are properly secured in a vertical position and fitted with a regulator.
- ☐ Hazardous materials are removed from the hot work location as soon as work is completed.