

# SD 61 – IA SHOP SAFETY INSPECTIONS





• Noratek Solutions Inc.





#### SD 61– District, AO & Staff Presentation – (Work We've done for SD 61)

SPP Program - School Inspections - Restarted in 2020

**SPP** - Education being provided - Loss Control Bulletins, Webinars, etc. (Plans for 2021)

SD 61 Shop Safety Audit 2016-2017

Review "Inspections" - October 2020

Presentation - Discussions & Moving forward - Feb 2-3, 2021

#### What we will discuss - Today

- IA Technology Shops Risk Management
  - Standards What do we inspect to??
- Audit Example & Audit Results & Discussions SD 61
- General Hazards Including Hazards note during October 2020 Inspections
- Lock Outs, Guards, Layouts & Hoists
- Responsibilities & Safety Programs in School Shops
- Questions??

#### Industrial Arts Shops Risk Management – What do we Inspect To





## IA Technology Shop Safety Codes & Standards (Examples)

- National & Provincial Building and Fire Code Requirements
  - Basic requirement and minimum standards for design, construction and isolation of hazards within buildings and schools
  - Only focus on "minimum requirements"…
  - Discuss various NFPA standards as part of the Code A few Below (Fire, Explosion, Safety):
    - ► NFPA 10-Fire Extinguishers
    - NFPA 30-Flammable & Combustible Liquid Storage
    - NFPA 33-Spray Painting, Powder Coating, Fiber-glassing Operations
    - NFPA-664 Fire & Explosion Prevention in Wood Working Operations (Dust Control & Mitigation)
    - NFPA-51 Cutting & Welding
    - Other NFPA Standards as required.

- **WCB** (Worksafe) & CSA Concerns and Requirements
  - Basics of safety planning and safety responsibilities - Supervisors & Teachers
  - Chapter 12 Safeguarding of machinery
  - Health & Safety for Small & Medium size wood shops (Worksafe Document)
  - Various safety issues on hoists, safety equipment, planning, training, equipment layout, dust mitigation, housekeeping, ventilation, etc.
  - CSA Z432-16 Safeguarding of machinery

- Provincial Guidelines for IA Technology Shop Safety
  - Various resources available from all Provinces
    - Saskatchewan Practical & Applied Arts
      - SSBA & "School Technology Shop Design and Safety Manual"
    - Manitoba "Keeping your facilities safe"
    - Alberta ASBIE Recommended practices for IA Shops
    - Australian Safety Standards for Schools
    - B.C. Ministry of Ed. & SPP-School Protection Program
       "Heads up for Safety Guidelines"
    - B.C. Schools Facilities Building Manual (1952, 1986 & 1992)

- OSHA standards or OH&S standards Occupational Health & Safety
  - Tend to be more national in scope
  - Discuss various safety concerns that tend to apply to all work places and jurisdictions
  - In some cased provide general guidelines for safety programs in other municipalities, provinces, etc.
  - Are listed as required practices in National and Provincial Safety Standards
  - Various CSA, ANSI standard dealing with storage, handling, eye protection, foot protection, etc.
  - CCOHS Canadian Centre for Occupational Health and Safety

### Compliance to various Standards, NFPA, CSA, etc.

Deal with specific items such as:

- National Electrical Code Occupancies that contain Dust, Flammable vapors, etc
- Other standards, regulations and documentation
- IA Technology Shop Safety Manual -(We've developed)
- https://www.bctea.org/machine-safetyzones/

### Example - 1952



## Example - 1952





BALUINA AND ASSEMBLY BENCH	_
CSERVICE BENCH	
DTOOL CUPBOARDS	
E CUPBARD FOR ELEC EQUIT. AND DRAWING SUFFLIE	
F CONDINATION DRAFT AND ELEC TABLE	
GMETALWORK BENCH	
W SACETMETAL BENCH	
SALDERING AND HEAT TREATMENT BENCH	_
K STAKE BENCH	
LUMBER STORAGE RACKS	
MMETAL STORAGE RACKS	
NWOODWORK PROJECT STORAGE RACKS	•
P DESK FOR ELEC. ROOM	
SATUDENTS' NOTICE BOARD AND BOOK SHELVES	
VHORIZONTAL LUMBER STORAGE	
WWOODWORK BENCH	

# Example - Distances Between Equipment -1986, 1992

	- covered exterior work area			
Furniture and Equipment	Typical main items of furniture and equipment with approximate dimensions are as follows:			
	(Note - safety dimensions of machine tools provided in parentheses)			
	- woodworking tables (two students per table) 900 x 1 500			
	- glueing assembly bench 900 x 1 500			
	<ul> <li>miter box saw 400 x 400 (600 mm front clear- ance)</li> </ul>			
	- 200 mm radial arm saw (1 600 d x 2 000 w + arms)			
	- disc sander 600 d x 1 100 w (1 400 x 1 400)			
	- router shaper 400 d x 800 w (1 200 x 1 100)			
	- 150 mm jointer (1 500 x 2 000)			
	- 200 mm jointer (1 600 x 2 500)			
	- thickness planer (1 600 x 1 800)			
	- vertical spindle sander 900 x 900 (1 700 x 1 200)			
	- circular saw 900 d x 1 500 w (1 900 x 1 800)			
	- band saw 800 d x 1 200 w (1 600 x 2 000)			
	- drill press (x 2) 560 d x 380 w (1 300 x 1 600)			
	- wood lathes (x 2) 1 150 x 400			
	- bench grinder 600 d x 450 w (1 400 x 800)			
	- materials storage racks			
	- dust collector			
	- tools cupboards			
	- wash trough			
	- safety station (see 3.6.9.3)			
	- paint storage cabinet (ULC approved)			
	- ceacher's desk, chair and filing cabinet			

#### Circular Saw / Table Saw

Recommended dimensions 900mm x 1500mm (36" X 60")

Recommended safety dimension
 1900 x 1 800mm (Beyond
 Equipment) (75`` x 32``)

### Circular or Table Saw - Example Full Safety Dimensions (BC School Building Manual)

1800 (70 inches)



# METAL SHOP - INDUSTRIAL ARTS SHOP EQUIPMENT LIST AND SAFETY DISTANCES

Equipment	Recommended Spacing			
	Front	Back	Side	
Bench Grinder	36"	8"	12"	
Grinder / Finisher	36"	8"	12"	
Drill Press	36"	8"	12"	
Drilling Machine	36"	8"	12"	
Band Saws	36"	36"	12"	
Universal Bender	Review	Review	Review	
Forge Furnace	36"	8"	36"	
Metal Melter	36"	8"	36"	
Metal Lathes	36"	36"	24"	
Milling Machine	36"	8"	12"	
Squaring Shear	36'	36"	12"	
Plasma Cutter /	Own Designated	Own Designated	Own Designated	
Welder	Area	Area	Area	

# WOOD SHOP - INDUSTRIAL ARTS SHOP EQUIPMENT LIST AND SAFETY DISTANCES

Equipment	Recommended Spacing		
	Front	Back	Side
Mitre Box Saw	36"	8"	36"
Radial Arm Saw	36"	8"	36"
Disc Sander	36"	8"	12"
Router Shaper	36"	8"	12" to 36"
Jointer	36"	8"	36"
Thickness Planer	36"	36"	12"
Spindle Sander	36"	8"	24"
Table Saw	36"	36"	24"
Band Saw	36"	36"	12"
Drill Press	36"	8"	12"
Wood Lathes	36"	36"	24"
Bench Grinder	36"	8"	12"

# AUTO SHOP - INDUSTRIAL ARTS SHOP EQUIPMENT LIST AND SAFETY DISTANCES

Equipment	Recommended Spacing			
	Front	Back	Side	
Bench Grinder	36"	8"	12"	
Hydraulic Press	36"	36"	12"	
Tire Changer	36"	8"	36"	
Parts Washer	36"	8"	12"	
Drill Press	36"	8"	12"	
Brake Service Unit	36"	8"	24"	
Pedestal Grinder	36"	8"	12"	
Lathe	36"	36"	24"	

# AUDIT EXAMPLE, AUDIT RESULTS & DISCUSSIONS

SD 61 (2016-2017) Inspections

# SD 61- AO & Staff Presentation

IA Technology Shops - School Safety Surveys - November 2016 - High Schools & Maintenance Shop

Esquimalt High

Lambrick Park Secondary

Mt.Douglas Secondary

Oak Bay High

Reynolds Secondary

Spectrum Community

Victoria High

SD 61 - Maintenance Shops

# SD 61- AO & Staff Presentation

IA Technology Shops - School Safety Surveys - November 2016 - Middle Schools

Arbutus Middle Cedar Hill Middle Colquitz Middle Glanford Middle Lansdowne Middle Rockheights Middle Shoreline Middle Central Middle Gordon Head Middle Monterey Middle

# SD 61 - Each shop was evaluated and given a score/rank.

Emphasis was placed on:

Safety for staff and students

➤General loss prevention

Risk management and loss control

Designated safe operating distances recommended between equipment

>Safety requirements (Standards)



#### Wood Tech Shop - SD 61 Scores

Wood Shop Locations	Score
Spectrum Community School	64
Shoreline Community Middle School	48
Reynolds Secondary School	42
Victoria High School	40
Monterey Middle School	32
Lambrick Park Secondary School	28
Colquitz Middle School	27
Rockheights Middle School	26
Mount Douglas Secondary School	23
Gordon Head Middle School	23
Glanford Middle School	21
Cedar Hill Middle School	21
Oak Bay High School	21
Arbutus Global Middle School	19
Lansdowne Middle School	18
SD 61 Maintenance Wood Shop	16
Esquimalt High School	13
Central Middle School	12

#### Wood Tech Shop - Specific Areas of Concern

- Lack of standard eye wash testing
- Proximity of equipment
- Mixing of equipment
- Lack of guards
- Lack of isolation on dust collector
- Return air duct and input ducting concerns on dust collector
- Equipment not secured
- Review required for "Draw" on some Dust Collection Systems

#### Metal Tech Shop - SD 61 Scores

Metal Shop Locations	<u>Score</u>
Victoria High School	39
Esquimalt High School	35
Spectrum Community School	31
Reynolds Secondary School	30
Lambrick Park Secondary School	27
Mount Douglas Secondary School	24
Cedar Hill Middle School	19
Oak Bay High School	15
Shoreline Community Middle	15
School	
Arbutus Global Middle School	13
Central Middle School	8
SD 61 Maintenance Metal	2
Fabrication Shop	
SD 61 Maintenance IE Machine	2
Fitter Shop	
SD 61 Maintenance Metal Shop	1

#### Metal Tech Shop - Specific Areas of Concern

- Lack of standard eye wash, lack of testing
- Non-standard ventilation system
- Lacks of guards
- Metal work area concerns, forge, etc.
- Plasma use concerns
- Mixed use operations
- Non-standard equipment
- Storage, housekeeping concerns noted

# Auto & Autobody – SD 61 Scores

Auto & Auto Body Shop Locations	<u>Score</u>
Reynolds Secondary School	28
Spectrum Community School	14
Victoria High School Auto Body Shop	13
Esquimalt High School	12
Victoria High School	11
SD 61 Maintenance Auto Service	11
Mount Douglas Secondary School	10
Oak Bay High School	9

#### Auto Shop - Specific Areas of Concern

- Auto lift maintenance / inspections -Review
- Lack of standard eye wash or testing
- Lack of guards
- Equipment stability
- Flammable Liquid Storage
- Equipment storage
- Mixed use operations
- Review all storage areas

# Tech Shop – SD 61 Scores

Tech Shop Locations	<u>Score</u>
SD 61 Maintenance Glass Shop	11
Mount Douglas Secondary School Small Engine Shop	11
SD 61 Maintenance Paint Shop	6
Mount Douglas Secondary School Hanger Shop	3

#### Tech Shop - Specific Areas of Concern

- Lack of standard eye wash or testing
- Lack of guards
- Flammable Liquid Storage
- Equipment storage
- Review all storage areas

#### OTHER AREAS TO BE DISCUSSED & PART OF THE PLAN

- Review and subsequently develop a full set of policies and procedures for all IA Technology Shop Equipment, Classrooms and related areas in the District.
- Develop a Safety/Risk Management Program that will address all concerns as noted in the IA Tech Shop Safety Survey.
- Review and designate responsibilities of students, teaching staff and others pertaining to supervision, training requirements, operational requirements and safety requirements.
- Develop a fully documented maintenance and inspection program for all equipment in all of the IA Tech Shops.

# **Questions:**



#### BASIC AUDIT REPORT STRUCTURE (Discussions)

#### **Risk Management Audit**

#### Report structure

#### Hazardous Materials, Welding Operations, Welding Cubicles, Plasma Operations.

HAZARDOUS MATERIALS

Hazardous Operations	Satisfactory	Unsatisfactory	Comments
1. Flammable Liquids			
Properly Stored		X	Need inventory, (see recommendations).
Isolation		X	See recommendations
Ventilated Area		X	See recommendations
Electrical	X		Appears to be standard.
2. Welding Operations			
Gas Cylinder Storage	×		In carriage or chained to support member
Isolation		X	Congested areas noted, (see recommendations).
Equipment Condition		X	Fair, need for housekeeping, (see recommendations).
Flashback arrestors in place	X		Appears to be standard.
3. Welding Cubicles			
Gas Cylinder Storage		х	Congested area, (see recommendations).
Isolation		X	Congested area, (see recommendations).
Equipment Condition		X	Congested area, (see recommendations).
Flashback arrestors in place	×		Appears to be standard.

#### Report structure

#### Hazardous Materials, Welding Operations, Welding Cubicles, Plasma Operations.

4. Plasma Operations	Satisfactory	Unsatisfactory	
Gas Cylinder Storage		X	Concern noted with location of device, (see recommendation).
Isolation		X	Should be isolated in own area / room with own ventilation, (see recommendations).
Equipment Condition		X	Non standard location, (see recommendations).
Flashback arrestors in place	X		Appears to be standard.



#### Report structure

#### Ventilation/Dust Collection Systems, Finishing Room.

#### VENTILATION / DUST COLLECTION SYSTEMS

Dust Collection Systems	Satisfactory	Unsatisfactory	Comments
1.			
Fire Resistive Enclosure	×		Located outside the building.
Electrical	X		Appears to be standard.
Maintenance	X		Appears to be in a good condition.
Housekeeping	X		Appears to be standard.
Return Air Duct	X		Located outside the building.

#### **FINISHING ROOM**

Finishing Room	Satisfactory	Unsatisfactory	Comments
1.	None Noted		
Fire Resistive Enclosure	N/a.		
Electrical	N/a.		
Maintenance	N/a.		
Housekeeping	N/a.		
Ventilation	N/a.		
Flammable Liquid Storage	N/a.		

## Report structure

### Personal Protection - Students & Staff (safety station)

PERSONAL PROTECTION - STUDENTS & STAFF (SAFETY STATION)

Safety Equipment	Satisfactory	Unsatisfactory	Comments
Eye Wash Station		Х	Lacks testing, (see recommendations).
Emergency Stops	X		Appears to be standard.
(3 minimum)			
Gas cut off switch	X		Appears to be standard.
Fire Extinguishers	X		Appears to be standard.
Fire Blankets	X		Appears to be standard.
Emergency		X	Should be reviewed.
Response			
Procedures			
Intercom / Office	X		Appears to be standard.
Contact			
First Aid Supplies	X		Appears to be standard.
Eye Protection		X	Should be reviewed.
Emergency	N/a.	N/a.	
Shower			
<b>Protective Clothing</b>		X	Should be reviewed.
Hearing Protection		X	Should be reviewed.
## **Report structure**

## Recommendations.

#### RECOMMENDATIONS

рното	STANDARD & HAZARD RATING		REMARKS
	BC School Facilities Building Manual, Heads Up for Safety & NFPA standards	н	<ol> <li>Safety Station</li> <li>Non standard eye wash station</li> <li>Monthly testing of eye wash station is note being provided</li> </ol>
	BC School Facilities Building Manual & Heads Up for Safety Manual	Н	Housekeeping issues noted.

## Report structure

РНОТО	STANDARD & HAZARD RATING		REMARKS
	BC School Facilities Building Manual & Heads Up for Safety Manual	Н	Housekeeping issues noted.
	BC School Facilities Building Manual & Heads Up for Safety Manual	н	Housekeeping issues noted. Inventory should be provided.
	BC School Facilities Building Manual, Heads Up for Safety & NFPA standards	Н	Cutting & Welding Areas <ol> <li>Non standard isolation</li> <li>Non standard housekeeping and maintenance</li> <li>Exposed electrical wiring</li> </ol>

## **Report structure**

РНОТО	STANDARD & HAZARD RATING		REMARKS
	BC School Facilities Building Manual, Heads Up for Safety & NFPA standards	Η	<ul> <li>Forge &amp; Metal Melting Areas</li> <li>1. Non standard isolation</li> <li>2. Non standard housekeeping and maintenance</li> <li>3. Exposed electrical wiring</li> <li>4. Non standard screening</li> <li>5. Non standard signage</li> </ul>
	BC School Facilities Building Manual, Heads Up for Safety & NFPA standards	н	<ul> <li>Forge &amp; Metal Melting Areas</li> <li>1. Non standard isolation</li> <li>2. Exposed gas line.</li> <li>3. Non standard housekeeping and maintenance</li> </ul>
	BC School Facilities Building Manual, Heads Up for Safety & NFPA standards	н	Forge & Metal Melting Areas 1. Non standard isolation 2. Non standard housekeeping and maintenance

## Report structure

РНОТО	STANDARD & HAZARD RATING		REMARKS
	BC School Facilities Building Manual, Heads Up for Safety & NFPA standards	н	<ol> <li>Plasma Welding</li> <li>Non standard isolation</li> <li>Exposed electrical wiring</li> <li>Protective equipment not in use</li> <li>Non standard ventilation</li> <li>Non standard screening</li> <li>Non standard signage</li> <li>Lacks Isolation</li> </ol>
	BC School Facilities Building Manual & Heads Up for Safety Manual	н	Lathe Guards Protective Guards (Contact Guards) should be provided for all exposed Lathes.
	BC School Facilities Building Manual	н	Equipment in Need of Repair Equipment is in need of repair and or replacement.

## **Report structure**

РНОТО	STANDAR & HAZARI RATING	D	REMARKS
	BC School Facilities Building Manual	Н	Equipment in Need of Repair Equipment is in need of repair and or replacement. Exposed pulley noted.
	BC School Facilities Building Manual	Η	Buffer / Grinder Guards Buffer / Grinder protective guards are in need of adjustment or replacement.
GARAGE	BC School Facilities Building Manual	Н	Buffer / Grinder Guards Buffer / Grinder protective guards are in need of adjustment or replacement.

## **Report structure**

РНОТО	STANDARD & HAZARD RATING		REMARKS
	BC School Facilities Building Manual	М	Safety Dimensions Recommended distances between equipment (safety dimensions) were found to be non standard.
	BC School Facilities Building Manual	м	Safety Dimensions Recommended distances between equipment (safety dimensions) were found to be non standard.
	BC School Facilities Building Manual	М	Safety Dimensions Recommended distances between equipment (safety dimensions) were found to be non standard.

## Arbutus Middle School

Arbutus Middle School <sup>2306 Edgelow Street</sup> Victoria, BC METAL TECHNOLOGY SHOP SAFETY SURVEY



Inspected By: Alan Kavanaugh, CRM, CCPI Date of Inspection: November 17, 2016

Equipment	Model / Cat Number	Serial Number	Year (estimated)
1. Rockwell Belt and Buffer	429033140107	F31814	1975
2. Rockwell Grinder	429033140103	G6910	1975
3. Rockwell Drill	15-665	1504715	1980
4. Makita Chop Saw	2414	654106	2000
5. Wells Metal Band Saw	300	2197	1990
6. Unison Plasma	375	Undetermined	1998
7. Millermatic Wire Welder	130XP	Undetermined	1998
8. Spray Booth	Undetermined	Undetermined	2000
9. Standard Modern Lathes X 2	5-1000	Undetermined	1975
10. Delta Scroll Saw	40-650L	K9752	1998
11. Mastercraft Sand Blaster	29955114	G23D-01402015	2015

EQUIPMENT	Recommended Spacing		Delineation Lines, Non Skid Areas		Guards	
	Satisfactory	Unsatisfactory	Satisfactory	Unsatisfactory	Satisfactory	Unsatisfactory
1. Rockwell Belt and Buffer	x			x		x
2. Rockwell Grinder	x			x		x
3. Rockwell Drill	X			x	X	
4. Makita Chop Saw	x			x		x
5. Wells Metal Band Saw	x			x	x	
6. Unison Plasma	x			x	X	
7. Millermatic Wire Welder	x			x	x	
8. Spray Booth	x			x	x	
9. Standard Modern Lathes X 2	x			x		x
10. Delta Scroll Saw	x			x	X	
11. Mastercraft Sand Blaster	x			x	x	

#### METAL - INDUSTRIAL ARTS SHOP EQUIPMENT LIST, LAYOUT & GUARDS

#### HAZARDOUS MATERIALS

Hazardous Operations	Satisfactory	Unsatisfactory	Comments				
1. Flammable Liquids							
Properly Stored		x	Full review should be provided.				
Isolation		x	Full review should be provided.				
Ventilated Area		x	Full review should be provided.				
Electrical		x	Full review should be provided.				
2. Welding Operation	ns						
Gas Cylinder Storage		x	Full review should be provided.				
Isolation		x	Full review should be provided.				
Equipment Condition		x	Full review should be provided.				
Flashback arrestors in place		x	Full review should be provided.				
3. Welding Cubicles			•				
Gas Cylinder Storage		x	Full review should be provided.				
Isolation		x	Full review should be provided.				
Equipment Condition		x	Full review should be provided.				
Flashback arrestors in place		x	Full review should be provided.				
4. Plasma Operation	5		•				
Gas Cylinder Storage		x	Full review should be provided.				
Isolation		x	Full review should be provided.				
Equipment Condition		x	Full review should be provided.				
Flashback arrestors in place		x	Full review should be provided.				

#### VENTILATION / DUST COLLECTION SYSTEMS

Metal Dust Collection Systems	Satisfactory	Unsatisfactory	Comments
Fire Resistive		X	Draw concerns were noted. Full review
Enclosure			should be provided.
Electrical		X	Draw concerns were noted. Full review
Electrical			should be provided.
Maintenance		x	Draw concerns were noted. Full review
			snouid be provided.
Housekeening		X	Draw concerns were noted. Full review
nousekeeping			should be provided.
		X	Draw concerns were noted. Full review
Return Air Duct			should be provided.

FINISHING ROOM - N/A

#### PERSONAL PROTECTION - STUDENTS & STAFF (SAFETY STATION)

Safety Equipment	Satisfactory	Unsatisfactory	Comments
Eye Wash Station		x	Lacks standard testing of eye wash station.
Emergency Stops (3 minimum)	x		Appears to be standard.
Gas cut off switch	x		Appears to be standard.
Fire Extinguishers	x		Appears to be standard.
Fire Blankets	x		Appears to be standard.
Emergency Response		x	Should be reviewed.
Procedures			
Intercom / Office Contact	x		Appears to be standard.
First Aid Supplies	x		Appears to be standard.
Eye Protection		x	Should be reviewed.
Emergency Shower	N/A	N/A	
Protective Clothing		x	Should be reviewed.
Hearing Protection		x	Should be reviewed.

### Arbutus Middle School METAL TECHNOLOGY SAFETY SURVEY Inspected: November 9, 2016 <u>RECOMMENDATIONS</u>

рното	STANDARD & HAZARD RATING		REMARKS	
	General Shop Safety	н	Safety Station Concerns noted due to lack of eye wash station inspections. All eye washes should be inspected & tested a minimum of once every month.	
	General Shop Safety	н	Ventilation System A full review should be provided. Non-standard venting appears to be provided at this time. Concerns were noted with overall draws and removal of exhaust fumes from the work areas. Unit should not be used for cutting & welding.	
	General Shop Safety	н	Sanders & Buffers - Guards To help minimize exposure to injury, standard guards and guides should be maintained for all exposed sanders & buffers.	

рното	STANDARD	R. NG	REMARKS
	General Shop Safety	н	Safety Zones  1. Areas should be well marked 2. Non slip floors should be provided for all related areas
	General Shop Safety	н	Safety Zones  1. Areas should be well marked 2. Non slip floors should be provided for all related areas
	General Shop Safety	н	Grinders - Guards To help minimize exposure to injury, standard guards and guides should be maintained for all exposed grinders.

РНОТО	STANDARI HAZARD RA	D & TING	REMARKS	
	General Shop Safety	Η	Metal Saws - Guards To help minimize exposure to injury, standard guards should be maintained for all exposed metal saws.	
	General Shop Safety	н	Plasma Welding – Special requirements for plasma cutters 1. Provide standard isolation 2. Provide standard housekeeping and maintenance 3. Provide standard ventilation 4. Provide standard screening 5. Provide standard signage	
	General Shop Safety	н	<ul> <li>Welding – Requirements</li> <li>1. Provide standard isolation</li> <li>2. Provide standard housekeeping and maintenance</li> <li>6. Provide standard ventilation</li> <li>7. Provide standard screening</li> <li>8. Provide standard signage</li> </ul>	

РНОТО	STANDARD & HAZARD RATING	REMARKS
	General Shop Safety	H Flammables and Combustible Liquid Storage Full inventory should be provided Remove all materials no longer used Standard isolation and ventilation should be maintained at all times



Inspected By: Alan Kavanaugh, CRM, CCPI Date of Inspection: November 17, 2016

Equipment	Model / Cat Number	Serial Number	Year (estimated)
1. Mastercraft Drills X 2	0980	03012013, 02122013	2013
2. Delta Drills X 2	DP300, 11-990	030010673W3051C, 011154W2032C	2006
3. Hegner Scroll Saw	401446	Undetermined	1990
4. Delta Scroll Saws X 3	40-650C	K9752, K9730, K9748	2005
5. Dewalt Scroll Saws X 2	DW788	201420CJ59398, 40CJ64059	2014
6. Rockwell Drill	15-665	1504720	1980
7. Delta Boss Post Sander	31-780C	J9918	2008
8. Down Draft Table (Various Pieces)	Undetermined	Undetermined	2006
9. King Belt/Disk Sander	KC760L	Undetermined	2005
10. Rockwell Sander	M31426	EJ4297	1985
11. Delta Disk/Belt Sander	31-280C	97E89547	1990
12. Rockwell Lathes X 2	46-200	63523, 63522	1975
13. Wadkins Jointer	9BFT	692086	1970
14. Delta Jointer	DJ1537150	1746	2000
15. Rockwell Band Saw	3314	66059	1990
16. Delta Scroll Saw	40-440	EX1741	2006
17. Saw Stop Table Saw	PC531230	134832646	2008
18. General Planer	130	E1362	1980
19. Dewalt Router Table	3436	82210461	2006
20. Makita Chop Saw	LS1017L	38675	2005
21. Rockwell Grinder	429023140104	G6909	1975

EQUIPMENT	Recommended Spacing		Delineation Lines, Non Skid Areas		Guards	
	Satisfactory	Unsatisfactory	Satisfactory	Unsatisfactory	Satisfactory	Unsatisfactory
1. Mastercraft Drills X 2	x			x	X	
2. Delta Drills X 2	x			x	x	
3. Hegner Scroll Saw	X			x	X	
4. Delta Scroll Saws X 3	X			x	X	
5. Dewalt Scroll Saws X 2	x			x	X	
6. Rockwell Drill	X			x	X	
7. Delta Boss Post Sander	X			x	X	
8. Down Draft Table (Various Pieces)	x			x	X	
9. King Belt/Disk Sander	X			x	X	
10. Rockwell Sander	X			x	x	
11. Delta Disk/Belt Sander	X			x	X	
12. Rockwell Lathes X 2	x			x		x
13. Wadkins Jointer	x			x	X	
14. Delta Jointer	X			x	x	
15. Rockwell Band Saw	X			x	X	
16. Delta Scroll Saw	x			x	X	
17. Saw Stop Table Saw	x			x	X	
18. General Planer	x			x	x	
19. Dewalt Router Table	X			x	x	
20. Makita Chop Saw	x			x	X	
21. Rockwell Grinder	x			x		x

#### WOOD - INDUSTRIAL ARTS SHOP EQUIPMENT LIST, LAYOUT & GUARDS

#### HAZARDOUS MATERIALS

Hazardous Operations	Satisfactory	Unsatisfactory	Comments			
1. Flammable Liquids						
Properly Stored		x	Need to be reviewed.			
Isolation		x	Need to be reviewed.			
Ventilated Area	x		Appears to be standard.			
Electrical	x		Appears to be standard.			

#### VENTILATION / DUST COLLECTION SYSTEMS

Dust Collection Systems	Satisfactory	Unsatisfactory	Comments
Fire Resistive		X	Draw concerns and hose connections.
Enclosure			Full review is recommended.
Florenier		X	Draw concerns and hose connections.
Electrical			Full review is recommended.
Maintenance		X	Draw concerns and hose connections.
Maintenance			Full review is recommended.
U.S. San		X	Draw concerns and hose connections.
Housekeeping			Full review is recommended.
Between Alia Durat		X	Draw concerns and hose connections.
Keturn Air Duct			Full review is recommended.

#### FINISHING ROOM - In Open Area

Finishing Room	Satisfactory	Unsatisfactory	Comments
Fire Resistive		X	Full review for this area is
Enclosure			recommended.
Flantsian		X	Full review for this area is
Electrical			recommended.
Maintenance		X	Full review for this area is
			recommended.
University		X	Full review for this area is
Housekeeping			recommended.
Manatilastina		X	Full review for this area is
ventilation			recommended.
Flammable Liquid		X	Full review for this area is
Storage			recommended

#### PERSONAL PROTECTION – STUDENTS & STAFF (SAFETY STATION)

Safety Equipment	Satisfactory	Unsatisfactory	Comments
Eye Wash Station		x	Lacks standard testing of eye wash.
Emergency Stops (3 minimum)	x		
Gas cut off switch	x		
Fire Extinguishers	x		
Fire Blankets	x		
Emergency Response Procedures		x	Should be reviewed.
Intercom / Office Contact	x		
First Aid Supplies	x		
Eye Protection		x	Should be reviewed.
Emergency Shower	N/A	N/A	
Protective Clothing		x	Should be reviewed.
Hearing Protection		x	Should be reviewed.

### Arbutus Middle School WOOD TECHNOLOGY SHOP SAFETY SURVEY Inspected: November 9, 2016 <u>RECOMMENDATIONS</u>

РНОТО	STANDARD & HAZARD RATING		RECOMMENDATIONS
	General Shop Safety	н	Safety Station Concerns noted due to lack of eye wash station inspections. All eye washes should be inspected & tested a minimum of once every month.
	General Shop Safety	н	Dust Collection System Full dust collector review should be provided Concerns include 1. Overloading of system 2. Lack of Draws 3. Lack of Fire Dampers, Standard hoses, Abort gates and other safety items
	General Shop Safety	н	Dust Collection System Full dust collector review should be provided Concerns include 1. Overloading of system 2. Lack of Draws 3. Lack of Fire Dampers, Standard hoses, Abort gates and other safety items

General Shop Safety	Η	Flammables and Combustible Liquid Storage Full inventory should be provided Remove all materials no longer used Standard isolation and ventilation should be maintained at all times
General Shop Safety	H	Flammables and Combustible Liquid Storage Full inventory should be provided Remove all materials no longer used Standard isolation and ventilation should be maintained at all times
General Shop Safety	H	Finishing Rooms  1. Non-standard isolation 2. Provide ULC listed Self Closing Door and Frame 3. Non-standard interior storage of flammables 4. Housekeeping issues noted 5. Non-standard electrical 6. Non-standard ventilation
General Shop Safety	н	Finishing Rooms  1. Non-standard isolation 2. Provide ULC listed Self Closing Door and Frame 3. Non-standard interior storage of flammables 4. Housekeeping issues noted 5. Non-standard electrical 6. Non-standard ventilation

General Shop Safety	н	Shop Equipment (Electrical) To help minimize exposure to injury, all electrical equipment, connections and switches need to meet the requirements for dust laden occupancies. A full review is recommended.
General Shop Safety	н	Safety Zones  1. Areas should be well marked  2. Non slip floors should be provided for all related areas
General Shop Safety	н	Safety Zones  1. Areas should be well marked 2. Non slip floors should be provided for all related areas
General Shop Safety	н	Safety Zones 1. Areas should be well marked 2. Non slip floors should be provided for all related areas

	General Shop Safety	н	Safety Zones 1. Areas should be well marked 2. Non slip floors should be provided for all related areas	
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РНОТО	STANDARD & HAZARD RATING		RECOMMENDATIONS
	General Shop Safety	н	Sanders - Guards To help minimize exposures to injury, standard guards should be maintained on all exposed sanders.
	General Shop Safety	H	Lathes – Guards To help minimize exposures to injury, standard guards should be maintained on all exposed lathes.

General Shop Safety	н	Table Saws – Guards To help minimize exposures to injury, standard guards should be maintained on all exposed table saws.
General Shop Safety	н	Grinders – Guards and Guides To help minimize exposures to injury, standard guards and guides should be maintained on all exposed table saws.
General Shop Safety	н	Equipment Review To help minimize exposures to injury, a full review should be provided for the following: 1. Storage between equipment 2. Equipment use 3. Safe work areas (distances between equipment, safe zones, etc.)

## Expectations of Teaching Staff -Responsibilities



Student Safety & Supervision

- Monthly inspections
  - Eye wash station
  - Monthly Auto Hoist Inspections
- •Flammable & Combustible Storage
- House keeping
- Material storage
- •Hazard Identification

## General Hazards & Examples

- Training & Instruction
- Emergency Procedures
- Location of Safety Equipment
- Ongoing reminders and Training -Supervision
- Isolation of Hazards



# Shop Safety-Wiring & Guards



# Shop Safety-Wiring & Dust



# Shop Safety-Guards not in Place



# Shop Safety-Door Blocked Open



# Shop Safety-Housekeeping Issues, Isolation, etc.



## Location of Fire Extinguisher



## General Storage Problem



# Lack of Housekeeping



# Missing guard


### Tanks not secure



# Concerns - parts washer & Combustible absorbent



# School Safety-Housekeeping



# Lacks guards

















# Lock Outs, Guards and Hoists - Auto Lifts

# Lock Outs

### Lock Outs - When required

Servicing of Equipment

Belt changes

Blade changes

- Cleaning of Equipment
- Any other lock outs develop a policy & procedure
- OHS Regulation Part 10: De-energization and Lockout

# Five steps to de-energize and lock out machinery or equipment

- Identify machinery/equipment to lock out.
- Shut off machinery/equipment. ...
- De-energize energy sources. ...ALL
- Apply personal lock. ...
- Test de-energization and lockout process.









# Guards & Layouts

### **Guards- When required**

- Sharp point an edges
- Moving pieces of equipment
- Potential for Injury
- Worksafe BC Standards Part 12
- CSA based standard
- Owners manual & recommended practices





#### Guard Examples After Market -Metal Lathe chukc area



### **Guard Examples**



### Guard Examples - After Market Wood Lathe



### **Guard Examples**



### Guard Examples - Home built Dado Guard



#### Guard Examples - Table Saw



#### Guard Examples - Contact Guards



#### Guard Examples - Press Guards



### Guard Examples - Layout areas



### Layouts



#### Hoists - Auto

- Worksafe BC Specific requirements developed for Teachers and Student
- Based on injuries that occurred in lower mainland number of years ago





#### Hoists - Auto

#### **YoungWorkers**

6-minute safety talk for auto mechanics

#### **Instructor Guide**

#### Auto lift or hoist

**Topic Overview** (why the topic is important to the students) Auto lifts have the potential to cause serious injury and death. Students must be trained in safe work procedures before using a lift or hoist. The Regulation (Section 12.78) requires that auto lifts be inspected and tested at least monthly.

**Demonstration and Discussion Topics** 

- Discuss the hazards associated with various types of lifts or hoists.
- □ **Tour the lifts** in the shop with the students, pointing out the hazards.
- Distribute the student handout.
- □ **Use** the student handout as your discussion guide.
- Discuss how injuries can occur if lifts or hoist are used incorrectly.
- Explain what can be done in the workplace to minimize the risk of injuries associated with lifts (e.g., good maintenance, good work habits).
- Make it real. Tell at least two stories of hoist injuries from your experience or use the examples below:
  - A student died when a vehicle that he was working under rolled forward and off a drive-on lift because the wheel chocks were not properly placed.
  - A mechanic was killed when a vehicle he was guiding onto a hoist accidentally lurched forward, pinning him against a workbench. The mechanic was standing directly in front of the hoist, directing a customer-driven vehicle.

- Discuss the attitude that "it won't happen to me". Remind them that an injury can and will happen if they take shortcuts or are careless.
- Instruct the students to identify and report any safety concerns about hoists.
- Answer any questions or concerns they might have.
- Set a good example by working safely at all times.

#### Resources

- Hazards involving automotive lifts http://www2.worksafebc.com/i/post ers/pdfs/2004/ws0405.pdf
- Monthly Auto Lift Inspection Checklist
  - http://www2.worksafebc.com/PDFs/ Regulation/autoliftcheck.pdf
- Hazard Alert: vehicle rolls off lift http://www2.worksafebc.com/i/post ers/pdfs/2002/ha0219.pdf
- □ Guide vehicles onto hoist from side http://www2.worksafebc.com/i/post ers/1999/fatal9906.html

WORK SAFE BC

### Hoists - Auto

**YoungWorkers** 

6-minute safety talk for auto mechanics

#### **Student Handout**

#### Auto lift or hoist

As one would expect from such a large and powerful piece of equipment, auto lifts or hoists have the potential to cause serious injury and death.

**Examples of hazards** 

□ lift failure

□ lift used improperly

□ vehicle slipping or shifting

Safety tips

- Do not use an auto lift to hoist or support anything other than a vehicle.
- Never overload the lift check the manufacturer's rated capacity on the nameplate attached to the lifts. If the nameplate is missing or you can't read it, ask your teacher, supervisor, or employer to check immediately with the manufacturer's representative before using.
- Before driving a vehicle into the shop, be sure the lift area is free of the following:
  - workers (or students)
  - grease and oil
  - tools
  - cords and hoses
  - trash and other debris
- Do not allow customers or by-standers in the lift area or in the vehicle when the lift is in use.



WORK SORE DC

#### MONTHLY AUTO LIFT INSPECTION

#### Hoists - Auto

Make:

Model:

#### Instructions:

- Check (<) the appropriate box as each item is completed. If there is more than one inspector, each person will initial the item they
  inspected.</li>
- 2. Record comments, observations and the date items were repaired or replaced.
- 3. If any item was not inspected, write "NI" in the comments box. If any item is not applicable to this auto lift, write "NA".
- 4. Sign and date at the bottom when all items are completed.

Inspection / Service Item	ок	Needs Repair	Repaired/ Replaced	Comments / Date Repaired or Replaced
15 minute leak test (vehicle elevated)				
HYDRAULIC SYSTEM				
CAPACITY lbs				
Test Function:				
Oil Level & Inspect for Leaks:				
Valves:	_			
Hoses:				
CABLES, CHAINS, V-BELTS, SPINDLES				
Check for Excess Play:				
Amount of Wear:				
Cables Lubricated:				
Pulleys Greased:				
PULLEYS, PINS & SPROCKETS				
Condition:				
COLUMNS, POSTS				
Rust / Damage / Wear:				
Alignment:				
Rubbing Blocks or Guide Rollers:				
ROLLING BRIDGE, WHEEL FREE				
Leak Test:				
Locks:				
Rollers or Slides:				
GENERAL				
Decking & Covers Secured				
Anchor Bolts & Other Fasteners	-			
Swing Arm Restraints, Telescoping Stops				
Wheel Chocks:				
Runway Stops:				
Drive-up Ramps:	-			
Test Lift Locks				
Inspect / Test Other Safety Features	-			
ELECTRICAL				
Function of Switchee				
Limit Switch				
Condition of Terminals:	-			
OTHER				

Inspected by:

Date completed:

#### Responsibilities & Safety Programs in School Shops
## Heads up for Safety - Ministry of Ed Guidelines (Teachers & Students)

Educators have a responsibility, to both students and their parents, to provide a safe learning environment in which the risk of personal injury is low. For technology educators, however, this responsibility is compounded by the fact that students generally have little or no experience working in hazardous environments where the knowledge of risks and the need for safe work practices are crucial.

## Safety in Schools - Shop Manual

## Discussions

- Division Responsibilities
- Staff Responsibilities
- AO Responsibilities
- Teacher Responsibilities
- Student Responsibilities
- Problem Students



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### IA TECHNOLOGY SHOPS SAFETY MANUAL







Prepared By: Noratek Solutions Inc.

Alan Kavanaugh, CRM, Member of NFPA Director of Loss Control

Service Commitment

The information contained in this loss control report has been prepared in compliance with commonly accepted risk control principles and practices. This report is intended to assist you in reducing the possibility of loss to the property described by bringing to your attention hazards and lack of control thereof. It is not intended to imply that all other hazards and conditions are properly controlled at the time of our impaction. Welfare Nonteels Solutions lice, nor the writee assumes any responsibility for any loss or damages to the present or subsequent owners of the property as a neult of the services being provided with our reports being only advisory in nature with the final decisions as to implementation of proper controls ultimately that of the property and.

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### Section 1

### School IA Technology Shop Safety Program

The purpose of a safety program is to insure a safe environment exists in all IA technology classrooms and shops. The safety program is designed to prevent injuries to students and teachers.

The teacher is responsible for the training of safe practices in their IA technology classrooms and shops.

Subsequently, if a student is not trained on specific IA technology classrooms and shops equipment or is thought to be a safety concern for others, then a student should not be allowed to operate in an IA technology classrooms and shops.

The safety program consists of more than lecturing and posting of safety rules and regulations. It includes active instruction that involves the student in learning and choosing behaviours that promote the safe use of equipment located in IA technology classrooms and shops.

The following factors are a short list of injury prevention criteria:

- Ample space is provided for machines and equipment.
- 2. Permanently placed machines are fastened to the floor or bench.
- 3. Safety zones are clearly marked around each piece of equipment.
- Approved PPE (Personal Protection Equipment) is worn when required.
- Standard emergency stations are provided.
- Machine guards are utilized at all times.
- All safety procedures are followed at all times.
- Full safety training is provided on all equipment before first use.
- Enforcement policies are provided which allow teachers to remove students from the IA technology classrooms and shops if they are thought to be a danger to the teacher or other students.

### Section 2

### Source Materials, Standards, Codes and Recommended Practices

- The purpose of this manual is to discuss the safe and recommended practices for IA technology classrooms and shops design and safety. The information in this manual includes various source materials in regard to IA technology classrooms and shops.
- National and Provincial Building Code
- National and Provincial Fire Code
- 1952 BC School Building Manual
- 1986 1992 BC School Building Manual
- School Protection Program "Heads up for Safety"
- School Safety Alberta
- School Safety Manitoba
- Work Safe & OH&S BC, Alberta and Saskatchewan
- Other related standards, regulations and documentation

## **Discussions on Safety Program**

- Clarify Duties of all staff, employees and students
- Develop Inspection & Information accumulation process
- List of Hazards in all Shops (Inspection / Audit)
- Develop Program to Mitigate Hazards

### Section 3

### **Responsibilities of District, Staff and Students**

The designed responsibilities for every level of operation within the School District in regard to safety in and around IA technology classrooms and shops follows the basic idea and recommended practice as discussed in various Provincial Work Safe recommended practices.

The District/maintenance department is responsible to ensure they provide a safe work place for the staff/teachers.

The teachers are responsible to provide training, direction and supervision to the students to help mitigate potential injuries to the students.

The students are required to follow all the rules and regulations within the IA technology classrooms and shops and to ask questions if they have any concerns in regard to safety or operations.

Expanded responsibilities are discussed further, based on the following:

- Employer/District/Maintenance
- Staff/Teacher/Supervisor
- Student/Employee

#### GENERAL

- Educators have a responsibility to both students and their parents to provide a safe learning
  environment in which the risk of personal injury is low. For technology educators, however, this
  responsibility is compounded by the fact that students generally have little or no experience
  working in hazardous environments where the knowledge of risks and the need for safe work
  practices are crucial.
- Safety in the IA technology classrooms and shops is everyone's business.
- Below is a list of responsibilities as adapted from the Workers' Compensation Board in their Work Safe Online document entitled "Safety on the Job is Everyone's Business".

### (http://www.Work

Safe.com/publications/Health\_and\_Safety\_Information/by\_industry/assets/pdf/safetyonthejob. pdf)

### EMPLOYER (SCHOOL DISTRICT)

- To provide a safe environment;
- Take action immediately when the worker or supervisor tells you about a potentially hazardous situation;
- Initiate an immediate investigation into accidents;
- Report serious staff accidents to WCB; report student accidents to the school division office and the Schools Protection Program;
- Provide adequate first aid facilities and services; and
- Provide personal protective equipment where required.

#### SUPERVISOR (IA TECHNOLOGY SHOPS TEACHER)

- Instruct new students in safe work procedures;
- Train students for all tasks assigned to them and check their progress;
- Ensure that only authorized, adequately trained students operate tools and equipment;
- Enforce safety regulations;
- Correct unsafe acts and conditions;
- Identify students with problems such as drugs or alcohol that could affect their safety and the safety of others; follow up with interviews and referrals where necessary;
- Formulate safety rules and inspect for hazards in your own area;
- Keep accurate safety and training records; and
- Complete a School Incident Report each time an accident occurs.

### EMPLOYEE (STUDENT)

- Know and follow safety and health procedures affecting your work;
- If you don't know, ask for training before you begin work;
- Work safely and encourage your classmates to do the same;
- Correct or immediately report any unsafe conditions to your teacher; and
- Take the initiative make suggestions for improved safety conditions.

## Every supervisor (Principal) has a responsibility to

- ensure that each employee is properly trained to perform his/her job safely;
- be alert to unsafe working practices and conditions with a view to their correction;
- ensure that any observed or reported unsafe condition or act is corrected without undue delay;
- complete a WorkSafe Form or other type form for all worker loss time or medical aid accidents and submit the report to the Occupational Health and Safety Manager;

## Every supervisor (Principal) has a responsibility to(Continued)

- work in cooperation with the local Occupational Health and Safety Committee or worker representative to investigate all worker loss time or medical aid accidents;
- enforce workplace safety rules in accordance with the WorkSafe Regulation and the District Safety Program

# Every employee (Teacher) has a responsibility to

- work in such a manner so as to prevent injury to themselves or any other person;
- use and/or wear protective clothing and equipment in accordance with WorkSafe Regulation and the School District/Division Safety Program;
- comply with WorkSafe Health and Safety Regulations and School District/Division specific safety rules;
- promote safe working practices and positive attitudes towards accident prevention;
- refuse to carry out unsafe work;

# Every employee (Teacher) has a responsibility to (Continued)

- report all workplace related illnesses, injuries, violent incidents, challenging student behaviour or near miss incidents
- report observed unsafe acts or conditions directly to their immediate supervisor;
- not remove, impair or render ineffective any safeguard provided for the protection of students or workers;

## Industrial Arts Shop Safety

## Staff & Student Safety and Potential for Liability

### "DUTY OF CARE"

Society has a higher expectation for the designers, installers and maintainers of schools and recreational facilities.

## IA Technology Shop Safety

## Negligence (examples) If not followed can negate coverage

- A special standard of care exists for STUDENTS, children and seniors
- Professional Standards:
  - Shop safety, equipment, maintenance & inspection of equipment.
- Supervision and Instruction:
  - Dependent on age and degree of risk/hazard involved.
- Equipment and Facilities:
  - Deals with age, maintenance, safety inspections, layout, etc.

## IA Technology Shop Safety - Future Plan

## Ways & means of Minimizing Exposure to Loss

- Maintenance and Inspections Documented (Ongoing)
- Safety Surveys Short term and long term planning
- Supervision, Instruction and signage

## IA Technology Shop Safety

### mportance of <u>Risk Management</u> in Shops:

- Identify the exposure.
- Examine feasible alternative risk management techniques
- Select best combination of alternative risk management techniques
- Implement the chosen techniques
- Monitor the results to ensure the program is effective.
- (Basic Enterprise Risk Management 101)

# What's been done & ongoing since the Inspection 2016

- Updates to dust collection systems
- Updates to guarding
- Relocation of equipment
- Eye wash station review
- Ongoing review of Ventilation equipment
- Other safety factors
- Safety signage development (Next Slide)

## What do we do now - Inspection (Updates & Reminders)

- Review work areas, safe work areas
- Review guard requirements
- Review dust mitigation
- Review ventilation, Wood Dust, Metal Vapor and materials, Plasma cutters, Flammable and Combustible Liquid storage, etc.
- NO mixed use on ventilation
  - Wood dust only
  - Welding fumes only
  - Painting only
- Review isolation, electrical, operational requirements Owners manual, Doc Procedures

## What do we do now

- Training & Instruction
- Documentation! Documentation! Documentation! - WHMIS, SDS, Inventory sheets, Maintenance logs, etc.
- Emergency Procedures
- Location & Maintenance of Safety Equipment
- Mandatory use of Safety Equipment & Guards
- Emergency controls/shut-off's
- Isolation of Hazards proper storage & handling
- Safety controls for Chemicals / flammable & Combustible liquids

## **Contact Information**

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## **QUESTIONS & THANK YOU!!!**